Enbridge Line 6B MP 608
Marshall, MI Pipeline Release

Monthly Progress Report for the
Time Frame of November 1 – 30, 2012

Prepared for United States Environmental Protection Agency and
Michigan Department of Environmental Quality

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

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Acronyms and Abbreviations

COPC	Chemical of Potential Concern
CSD	Cylindrical Sampling Device
CWA	Clean Water Act
CWP	Consolidated Work Plan
Enbridge	Enbridge Energy, Limited Partnership
FTC	Frac Tank City
IAPs	Incident Action Plans
ICS	Incident Command System
KRBEA	Kalamazoo River Bank Erosion Assessment
LDB	Left Descending Bank
Line 6B	The pipeline owned by Enbridge Energy, Limited Partnership that runs just south of Marshall, Michigan
LIWS	Liquid Industrial Waste Services
MDEQ	Michigan Department of Environmental Quality
MDEQ Order	Administrative Consent Order And Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership*, proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq.
MP	Mile Post
MSW	Municipal Solid Waste
OB	Overbank
RDB	Right Descending Bank
RDF	Recycling & Disposal Facility
RI	Remedial Investigation
RRD	Remediation and Redevelopment Division
SAP	Sampling and Analysis Plan
Supplemental Order	Supplement to Order for Compliance Under Section 311(c) of the Clean Water Act, issued by U.S. EPA Region 5 on September 23, 2010 to Enbridge Energy Partners, L.P. *et al*., Respondents, Docket No: CWA 1321-5-10-001
U.S. EPA	United States Environmental Protection Agency
U.S. EPA Order	U.S. EPA Removal Administrative Order Under Section 311(c) of the Clean Water Act, issued on July 27, 2010 to Enbridge Energy Partners, L.P., Docket Number: CWA 1321-5-10-001

VOCs	Volatile Organic Compounds
WSS	Walling Suspended Sediment
WTTD	Waste Treatment, Transportation, and Disposal
WTTD Plan	Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Waste Treatment, Transportation, and Disposal Plan.* Approved by U.S. EPA on May 17, 2011.

1.0 Introduction

This monthly progress report for the period of November 1 through and including November 30, 2012 is submitted to the United States Environmental Protection Agency (U.S. EPA) and to the Michigan Department of Environmental Quality (MDEQ) to satisfy reporting requirements for each agency as defined below describing activities completed during the prior month.

Paragraph 18 of the U.S. EPA *Removal Administrative Order Under Section 311(c) of the Clean Water Act* (CWA), issued on July 27, 2010 to Enbridge Energy Partners, L.P., Docket Number: CWA 1321-5-10-001 (U.S. EPA Order) as modified by Paragraph 6 of the Supplement to Order for Compliance Under Section 311(c) of the CWA, issued by U.S. EPA Region 5 on September 23, 2010 to Enbridge Energy Partners, L.P. *et al*., Respondents, Docket No: CWA 1321-5-10-001 (Supplemental Order) (U.S. EPA, 2010) requires monthly progress reports to be submitted to the U.S. EPA commencing on December 27, 2010 and continuing monthly thereafter (Supplemental Order, Paragraph 6(o)).

Paragraph 7.9 of the Administrative Consent Order and Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership,* proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq. signed on November 1, 2010 (MDEQ, 2010) (MDEQ Order) requires Enbridge Energy, Limited Partnership (Enbridge) to submit to the MDEQ, formerly Michigan Department of Natural Resources and Environment, written progress reports on the 27th day of each month.

Following this introduction, *Section 2* of this report is arranged by activity, for example 'Surface Water and Sediment Monitoring Activities'. In each subsection, the subject area work is introduced and an update of progress made in the previous month is described, including field activities performed, analyses completed, and reports submitted. Each section also summarizes future work planned. Conclusions are presented in *Section 3* and references are provided for each section in *Section 4.* Planning resources, including daily summaries of completed work referred to as *Incident Command System* (ICS) *214*, *Incident Action Plans* (IAPs), and work orders are provided as *Appendix A*.

Laboratory analytical reports of samples that were collected and received in November 2012 can be found in *Appendix B*. Laboratory analytical reports received in November 2012 for samples collected prior to November 2012 (but not previously submitted in the monthly report) can be found in *Appendix C*. All laboratory analytical results received for samples collected in November 2012 and received in December 2012 will be submitted with the December 2012 monthly progress report.

Work plans and procedures approved during November 2012 are provided in their entirety in *Appendix D.* The following work plans were approved in November 2012:

- *2012 Morrow Lake Delta and Morrow Lake Monitoring and Management Plan,* approved by U.S. EPA on November 15, 2012 (Enbridge, 2012(1)), and
- *Monitoring Well Abandonment - SOP EN-407,* approved by MDEQ on November 20, 2012 (Enbridge, 2012(2)).

Level 1 reviews of laboratory analytical results are included in *Appendix E*.

Waste manifests and bills of lading received in November 2012 are included in *Appendix F*.

2a.0 Surface Water and Sediment Monitoring Activities

2a.1 Introduction

In November 2012, monthly surface water monitoring activities were conducted per the *Addendum to the Sampling and Analysis Plan (SAP): Attachment C - Surface Water and Sediment Monitoring Supplement to the Sampling and Analysis Plan,* approved by MDEQ on May 18, 2012 (Enbridge, 2012). Sampling activities were completed at 18 routine monitoring locations to assess the quality of the surface water in the Kalamazoo River and Morrow Lake.

2a.2 Work Completed

2a.2.1 Surface Water Monitoring

In November 2012, 18 surface water samples were collected from 9 locations in the Kalamazoo River (between the Talmadge Creek confluence and Morrow Lake), 8 locations within Morrow Lake, and 1 location in the Kalamazoo River immediately downstream of the Morrow Lake Dam. The results of the laboratory analyses of the 18 samples (plus 1 duplicate) were compared to Michigan *Rule 57 Water Quality Standards* (MDEQ, 2011). There were no analytical results that exceeded these standards.

Sample locations are shown in *Figure 2a-1*. Surface water sample location identification number, location description, and latitude and longitude coordinates in decimal degrees for the surface water monitoring locations are provided in *Table 2a-1*.

Location ID	Location Description	Latitude	Longitude
ML-1	Morrow Lake	42.279011	-85.458466
SW-935	Morrow Lake	42.278255	-85.472069
ML-7	Morrow Lake	42.281063	-85.480469
ML-10	Morrow Lake	42.276375	-85.478920
SWKR3840C02	Morrow Lake	42.274991	-85.464724
SW-936	Morrow Lake	42.276611	-85.453972
SW-937	Morrow Lake	42.281200	-85.486115
SW-112	Downstream of Morrow Lake Dam	42.283659	-85.498262
SWKR3980C01	Morrow Lake Dam	42.282665	-85.491508
SW-105	15 Mile Bridge	42.258250	-84.998184
SW-115	Fort Custer State Park	42.324341	-85.358049
SWKR0510C01	Mile Post (MP) 5.10	42.265084	-85.048406
SWKR0600C01	MP 6.0	42.270887	-85.063948
SW-120	Shady Bend Campground, Augusta	42.347423	-85.329214
SWKR1480C01	MP 14.8	42.304726	-85.183417
SWKR1565C01	MP 15.5	42.312748	-85.184869
SWKR1948C01	MP 19.4	42.343617	-85.243147
SW-110	35th Street Bridge, Galesburg	42.280206	-85.429028

Table 2a-1. Surface Water Monitoring Locations-Kalamazoo River and Morrow Lake

2a.2.2 Sediment Monitoring

Sediment monitoring along the Kalamazoo River and Morrow Lake has been reduced to a quarterly frequency and was not performed in November 2012.

2a.3 Work Planned

2a.3.1 Surface Water Monitoring

The next monthly surface water monitoring event for the Kalamazoo River and Morrow Lake is scheduled for the week of December 17, 2012 per the *Addendum to the Sampling and Analysis Plan (SAP): Attachment C - Surface Water and Sediment Monitoring Supplement to the Sampling and Analysis Plan*, approved by MDEQ on May 18, 2012 (Enbridge, 2012).

2a.3.2 Sediment Monitoring

Sediment monitoring for the Kalamazoo River and Morrow Lake is conducted quarterly according to the *Addendum to the Sampling and Analysis Plan (SAP): Attachment C - Surface Water and Sediment Monitoring Supplement to the Sampling and Analysis Plan*, approved by

MDEQ on May 18, 2012 (Enbridge, 2012). The next sampling event is tentatively scheduled for the week of December 17, 2012.

2b.0 Water Quality Monitoring Activities

2b.1 Introduction

The Water Quality Monitoring Program was initiated in July 2011 in response to concerns about the potential risk to fish populations related to low dissolved oxygen levels. This monitoring program was implemented in accordance with the *Water Quality Measurement Standard Operating Procedure* (Enbridge, 2011), approved by MDEQ on September 22, 2011.

2b.2 Work Completed

Water quality monitoring was conducted on November 1 and November 2, 2012 during the removal of the sediment trap located at MP 36.10 NW. The locations and data collected during monitoring are shown on *Figures 2b-1* and *2b-2* and in *Tables 2b-1* and *2b-2*, respectively. Additional water quality monitoring was conducted on November 17 through and including November 19, 2012 as part of the E 4.0 boom curtain removal activities in Morrow Lake. The locations and data collected during monitoring are shown on *Figures 2b-3* through *2b-5* and in *Tables 2b-3* through *2b-5*, respectively. All readings were normal during monitoring activities.

2b.3 Work Planned

Water quality monitoring requirements will be evaluated and water quality monitoring will be continued as appropriate.

2c.0 Potable Water Monitoring Activities

2c.1 Introduction

In November 2012, there were no potable well samples collected. Potable water monitoring activities are conducted in accordance with the *Addendum to the Sampling Analysis Plan (SAP): Attachment B Drinking Water Well Supplement to the Sampling and Analysis Plan,* approved by MDEQ on May 18, 2012 (Enbridge, 2012). An amended sampling plan for wells not sampled on a quarterly basis is currently under review by the MDEQ.

2c.2 Work Completed

2c.2.1 Residential Potable Drinking Water Wells

During November 2012, there were no potable well samples collected.

Wells eligible for sampling fall into four categories: winterized, not accessible, refused permission, and yes. 'Yes' denotes the wells are being sampled at the quarterly frequency. Wells designated as 'winterized', 'not accessible', or 'refused permission' are eligible under the program but they are not currently being sampled.

The eligibility status of two wells was changed from 'winterized' to 'Yes' during November 2012. In addition, one well was removed from the monitoring program in November 2012. The well was not being used as a drinking water source, thus making it ineligible for the monitoring program. This change reduced the number of eligible wells in the monitoring program from 168 to 167.

Multiple sampling events have been completed at the 167 residential wells included in the Drinking Water Monitoring Program. The results and eligibility status for all eligible wells through November 30, 2012 are summarized on *Tables 2c-1* through *2c-3* (See Attached) and *Figure 2c-1*. Tables include updates on well locations, access status, sampling data, and landowner letters. The potable well locations, eligibility status, and constituent detections are also summarized on *Figure 2c-1*.

2c.2.2 Groundwater Monitoring

Groundwater sampling from the five monitoring wells at the Village of Augusta Municipal Wellfield and the five monitoring wells at the City of Kalamazoo Wellfield #39 has been transitioned to a quarterly sampling frequency and was not conducted in November 2012.

A letter report for the September 2012 monitoring well sampling at the Village of Augusta Wellfield, *September 11, 2012 Groundwater Sample Results* (Enbridge, 2012(1)), was prepared and submitted to the Village of Augusta, the Village of Augusta Chief of Police Jeff Heppler, and a courtesy copy was provided to MDEQ in November 2012.

A letter report for the September 2012 monitoring well sampling at the City of Kalamazoo Wellfield #39, *September 12, 2012 Groundwater Sample Results* (Enbridge, 2012(2)), was prepared and submitted to the City of Kalamazoo and a courtesy copy was also provided to MDEQ in November 2012.

2c.3 Work Planned

2c.3.1 Residential Drinking Water Wells

Residential drinking water sampling is planned to continue during December 2012 per the *Addendum to the Sampling Analysis Plan (SAP): Attachment B Drinking Water Well Supplement to the Sampling and Analysis Plan*, approved by MDEQ on May 18, 2012 (Enbridge, 2012(3)).

2c.3.2 Groundwater Monitoring

The next groundwater sampling event for the five monitoring wells at the Village of Augusta Wellfield and the five monitoring wells at the City of Kalamazoo Wellfield #39 is tentatively scheduled to be conducted during the week of December 17, 2012.

2d.0 Air Sampling and Monitoring Activities

2d.1 Introduction

Air sampling and monitoring activities are performed in 'community' and 'work areas' in accordance with the *Air Monitoring and Sampling Addendum to the Sampling and Analysis Plan* (Enbridge, 2012(1)). The term 'community' includes all individuals living or working near areas potentially impacted by the Enbridge Line 6B crude oil release or from subsequent response actions. 'Work areas' are those sites where workers are engaged in oil recovery activities. During November 2012, there were no air monitoring or sampling activities conducted.

The purpose of air monitoring and sampling activities is to assess community exposures to target analytes and worker exposure to chemicals of potential concern (COPCs). Target analytes are those volatile organic compounds (VOCs) associated with the Line 6B crude oil release and measured by modified U.S. EPA Method TO-15 laboratory analysis. All other VOCs reported from the TO-15 method are referred to as non-target analytes. COPCs are a subset of the 'target analytes' that includes:

- Benzene,
- Toluene,
- Ethylbenzene,
- Xylenes, and
- N-hexane.

2d.2 Work Completed

During November 2012, there were no submittals presented to the U.S. EPA for review. No air monitoring or sampling activities were conducted in November 2012.

2d.2.1 Community Air Monitoring

No community air monitoring was conducted during November 2012.

2d.2.2 Community Air Sampling

No community air sampling was conducted during November 2012.

2d.2.3 Work Area Air Monitoring

No work area air monitoring was conducted during November 2012.

Air monitoring activities were suspended on September 5, 2012 based on verbal approval of *Request for Modification of the Air Monitoring and Sampling Addendum to the Sampling and Analysis Plan* (Enbridge, 2012(2)), followed by a formal approval by U.S. EPA on September 10, 2012 as documented by *Approval of Temporary Suspension of Air Monitoring and Odor Response Activities* (U.S. EPA, 2012).

2d.2.4 Odor Response

In response to the release, Enbridge established a hotline number that remains available throughout the response activities for the public to communicate their concerns to Enbridge. As work activities were initiated, the public was encouraged to use the hotline to report any perceived odor issues related to these activities. The most recent odor complaint received on this hotline was in October 2011. There were no calls regarding odor issues that required air sampling or monitoring efforts in November 2012.

2d.3 Work Planned

As documented in *Section 2d.2.3*, air monitoring and sampling activities have been suspended per the approved *Request for Modification of the Air Monitoring and Sampling Addendum to the Sampling and Analysis Plan* (Enbridge, 2012(2)). Specifically, air monitoring and odor response activities are suspended; however, upon resumption of any active oil recovery activities and/or at any other time as directed by the U.S. EPA, air monitoring will be resumed as outlined in *Approval of Temporary Suspension of Air Monitoring and Odor Response Activities* (U.S. EPA, 2012).

2e.0 Submerged Oil Assessment and Recovery Activities

2e.1 Introduction

During November 2012, submerged oil assessment activities included sediment collection from Walling Suspended Sediment (WSS) samplers, bathymetry measurements along the E 4.0 boom and curtain locations, and logging and sampling of cores from the quantification evaluation study.

No submerged oil recovery field activities were conducted during November 2012.

2e.2 Work Completed

2e.2.1 E 4.0 Boom Bathymetry

Bathymetry measurements were collected before and after removal of the E 4.0 boom. Pre-removal bathymetry measurements were collected from November 12 through and including November 17, 2012. Post-removal measurements were collected from November 18 through and including November 20, 2012 and on November 29, 2012. Pre- and post-removal bathymetry data for the E 4.0 boom locations are shown on *Figures 2e-1* and *2e-2*, respectively.

2e.2.2 Walling Sediment Sampling

Additional field work for submerged oil activities included collection of suspended sediment from 20 WSS sample locations. The 20 WSS samplers were removed concurrently from the Kalamazoo River in anticipation of winter. Sediment collection was conducted from November 5 through and including November 9, 2012.

2e.2.3 Quantification Evaluation Study

Logging and sampling of quantification cores that had been frozen began on November 26 and continued through and including November 30, 2012. Two teams completed logging and sampling of 46 cores.

2e.2.4 Agitation Evaluation Study

No field work was conducted for the agitation evaluation study during November 2012.

2e.3 Work Planned

2e.3.1 Poling (Monitoring)

Poling monitoring at fixed locations on Morrow Lake including the Sediment Fan and Morrow Lake Delta is planned for December 2012.

2e.3.2 Walling Sediment Sampling

The WSS samplers were removed in November 2012 in anticipation of the freezing of the Kalamazoo River.

2e.3.3 Quantification Evaluation Study

Data compilation, review, and quality control will continue in December 2012.

2e.3.4 Agitation Evaluation Study

Data compilation, logging, and sampling of frozen cores may occur during December 2012.

2f.0 Remedial Investigation Activities

2f.1 Introduction

Remedial investigation (RI) activities conducted in November 2012 were in support of the Kalamazoo River RI Program. RI activities were conducted from November 1 through and including November 15, 2012. Activities for the remedial investigations were conducted in accordance with the following work plans:

- *Remedial Investigation Work Plan for Kalamazoo River (MP 5.80 to MP 11.00)* approved by MDEQ on February 10, 2012 (Enbridge, 2012(1)), and
- *Remedial Investigation Work Plan for Kalamazoo River (MP 11.00 to Morrow Lake Dam)* approved by MDEQ on March 8, 2012 (Enbridge, 2012(2)).

RI activities were suspended from November 16 through and including November 25, 2012 for the Thanksgiving holiday shutdown. In addition, RI activities were suspended from November 26 through and including November 30, 2012 due to logging and sampling of the submerged oil quantification cores.

2f.2 Work Completed

2f.2.1 Kalamazoo River Remedial Investigation

Field activities related to the Kalamazoo River RI were conducted from MP 9.75 to MP 11.25. Field activities included the following:

- Soil and sediment core collection via manual techniques,
- Soil and sediment sampling from the collected cores,
- Continuous logging of collected cores,
- Evaluation of soil and sediment cores using ultraviolet light,
- Installation of temporary monitoring wells in select soil borings,
- Groundwater sampling via low-flow techniques,
- Collection of surface water samples at select locations, and
- Global Positioning System collection of horizontal (x, y) coordinates for each boring and bulk sediment location.

Soil, sediment, groundwater, and surface water samples were collected and analyzed for:

- Polynuclear aromatic hydrocarbons,
- Four select metals (beryllium, vanadium, nickel, and molybdenum), and
- Total petroleum hydrocarbons as diesel range organics and oil range organics.

Per the approved work plans, all soil samples collected at locations upstream of MP 14.00 were analyzed for VOCs.

The locations of soil borings installed during the Kalamazoo River RI are presented in *Figure 2f-1*.

Compilation of Kalamazoo River RI data for Parcel Primer development (See *Section 2f.2.2*) and the development of several documents for submittal to the MDEQ were also performed in November 2012.

The following document was approved in November 2012:

- *Monitoring Well Abandonment – SOP EN-407* approved by MDEQ November 14, 2012 (Enbridge, 2012(3)).

The following documents were submitted as a draft for discussion purposes in November 2012:

- *Report of Findings for Response Action at the Source Area* submitted to MDEQ November 2, 2012 (Enbridge, 2012(4)),
- *Presentation of Data for Kalamazoo River Parcel KN-D-309 (04-530-075-00) (MP 22.50 to 22.75 RDB)* submitted to MDEQ November 13, 2012, (Enbridge, 2012(5)), and
- *Presentation of Data for Kalamazoo River Part of Parcel KN-D-289.001 (0133-00-026-0) (MP 19.75 to MP 20.00 RDB)* submitted to MDEQ November 19, 2012 (Enbridge, 2012 (6)).

Four documents remain in progress through November 2012:

- *Hydrocarbon Fingerprint Evaluation,*
- *Overbank Soil Background Metals Evaluation,*
- *Tier 1 LNAPL Conceptual Site Model for Line 6B Crude Oil,* and
- *Work Plan for Monitoring Well Abandonment.*

2f.2.2 Parcel Primers and Presentations

A Parcel Primer development and presentation procedure was initiated in June 2012. The purpose of the Parcel Primer is to provide the parcel owner with documentation of Enbridge and MDEQ concurrence that further operations and maintenance and/or remedial investigation activities are not required on the subject parcel.

Each parcel is categorized into one of three color code designations:

- "No Color" – Parcel does not require investigation, data compilation, or review,
- "Green-hatched" – Limited data compilation and a "Live GIS" presentation to show lack of historical issues, and
- "Orange" – Parcel requires RI activities and a full Primer package.

The final templates for the Parcel Primer package and concurrence form remain under review by MDEQ.

No Parcel Primers were submitted for MDEQ review and concurrence in November 2012.

A "No Regulatory Interest" letter will be requested for each "Green-hatched" Parcel to indicate the following:

- Field work was performed under MDEQ oversight,
- All submitted information has been reviewed by MDEQ staff,
- No oil, residual oil, or evidence of Line 6B oil was observed on the parcel, and
- The MDEQ will not compel Enbridge to enter the property unless additional information indicated the property was affected by the Line 6B release.

2f.2.3 Additional Investigations

No additional investigation activities were conducted in November 2012.

2f.3 Work Planned

Planned RI activities for December 2012 consist of the following:

- Continue data compilation and Parcel Primer generation with presentations as necessary,
- Complete and submit RI documents in progress through November 2012,
- Continue implementation of field activities for Kalamazoo River RI (MP 2.25 to MP 3.14) in accordance with *Remedial Investigation Work Plan for Kalamazoo River (MP 2.25 to MP 3.14)* approved by MDEQ on November 18, 2011 (Enbridge, 2011), as necessary,
- Continue implementation of field activities for the Kalamazoo River RI (MP 3.14 to Ceresco Dam (MP 5.80)) in accordance with *Remedial Investigation Work Plan for Kalamazoo River (MP 3.14 to Ceresco Dam (MP 5.80))* approved by MDEQ on January 13, 2012 (Enbridge, 2012(7)), as necessary,
- Continue implementation of the Kalamazoo River RI (MP 5.80 to MP 11.00) in accordance with *Remedial Investigation Work Plan for Kalamazoo River (MP 5.80 to MP 11.00)* approved by MDEQ on February 10, 2012 (Enbridge, 2012(1)), as necessary, and
- Continue implementation of the Kalamazoo River RI (MP 11.00 to Morrow Lake Dam) in accordance with the *Remedial Investigation Work Plan for Kalamazoo River (MP 11.00 to Morrow Lake Dam)* approved by MDEQ on March 8, 2012 (Enbridge, 2012(2)), as necessary.

2g.0 Temporary Facility Restoration and Demobilization Activities

2g.1 Introduction

Approximately 95 work sites have been used for release response activities to provide river access, staging of equipment and materials, decontamination, waste staging, and similar activities. As response and remediation work was completed, site decommissioning and site closure activities including removal of equipment and consumables, implementation of soil erosion and sediment control measures, restoration of the site to pre-response conditions, and inspections were performed. If appropriate, verification soil samples were collected for laboratory analysis in accordance with MDEQ requirements outlined in *RRD Operational Memorandum No. 2* (MDEQ, 2004) for comparison to applicable Part 201 of Michigan's Act 451 of 1994, as amended Generic Residential Criteria in accordance with the *Soil Staging, Decontamination & River Access Site Closure Plan* (Enbridge, 2011), currently under review by MDEQ and U.S. EPA. The MDEQ is notified of each sampling event.

2g.2 Work Completed

2g.2.1 River Access Sites and Other Work Sites

No soil samples were collected at river access sites or other work sites during November 2012.

2g.2.2 Soil Staging and Decontamination Areas

No site decommissioning samples were collected at soil staging and decontamination areas in November 2012.

2g.3 Work Planned

Sampling activities are tentatively planned for the northern area of Frac Tank City (FTC) and River Access Sites during December 2012.

2h.0 River Bank Erosion Control and Restoration Activities

2h.1 Introduction

In November 2012, erosion control and restoration activities were conducted at the Source Area portion of Talmadge Creek. No restoration or erosion control activities were completed at Kalamazoo River Bank Erosion Assessment (KRBEA) sites in November 2012. No additional sites requiring erosion control or restoration activities were identified during November 2012.

2h.2 Work Completed

During November 2012, restoration activities in the form of localized shrub and tree planting were completed in the Source Area portion of the Talmadge Creek corridor. These activities are summarized in *Table 2h-1* below.

Talmadge Creek Segment	Unique Site Identification	Work Completed
MP 0.00	Talmadge Creek (Source Area, Sub-Units A1-A4)	Installed 704 bare root shrubs and 55 trees to complete the restoration planting at the subject site.

Table 2h-1. Talmadge Creek Restoration Work Areas

Other restoration and assessment activities completed in November 2012 included:

- Continued to track the previously submitted MDEQ permit application package for bank restoration activities at the MP 23.10 right descending bank (RDB) site to the point of MDEQ permit issuance,
- Continued to provide supporting documents for Kalamazoo River RI sites, and
- Continued the evaluation of potential wetland and stream mitigation locations.

2h.3 Work Planned

During December 2012, river bank erosion control and restoration activities may include conducting the final KRBEA erosion review trip of the Kalamazoo River. These activities, if necessary, are subject to receipt of MDEQ comments and approval of the *Kalamazoo River Bank Erosion Assessment and Action Plan Summary Report – Monitoring Trip No. 9*," submitted to MDEQ on September 13, 2012 (Enbridge, 2012).

2i.0 Sediment Traps and Cylindrical Sampling Devices

2i.1 Introduction

2i.1.1 Phase I Sediment Traps

During November 2012, sediment trap and cylindrical sampling device (CSD) activities included monitoring of the six Phase I sediment traps and monitoring data compilation. During monitoring Round 9, no poling activities were conducted due to water and sediment temperatures being below 60°F.

The existing six Phase I sediment traps are installed at the following locations:

- MP 10.75 left descending bank (LDB),
- MP 14.75 RDB,
- MP 19.25 LDB,
- MP 21.50 RDB,
- MP 28.25 RDB, and
- MP 36.10 NW.

The sediment trap located at MP 36.10 NW was removed on November 1 and November 2, 2012. The sediment trap was removed in order to prevent the possible downstream migration of dislodged trees due to possible winter ice buildup. The removal was agreed upon by Enbridge, U.S. EPA, and MDEQ. trap.

2i.1.2 Phase II Sediment Traps

During November 2012, Phase II sediment trap and CSD activities included conducting Round 9 monitoring at the 11 Phase II sediment trap locations. Round 9 activities included monitoring and monitoring data compilation. No poling activities were conducted during Round 9 due to water and sediment temperatures being below 60°F.

The 11 Phase II sediment traps are installed at the following locations:

- Ceresco/MP 5.75,
- MP 10.40 N,
- MP 10.50 L2,
- OB 11.79 LDB,
- MP 26.00 RDB,
- MP 30.80 LDB,
- MP 33.00 A,
- MP 33.00 B,
- Delta A/MP 36.75,
- Delta Z/MP 37.50, and
- MP 37.75 Islands.

2i.2 Work Completed

During November 2012, data compilation and evaluation included calculating the rate of sedimentation within the CSD sample jars. The sedimentation rates were determined through review and evaluation of the data collected during Round 9 monitoring conducted at the Phase I and Phase II sediment traps. The results for the sedimentation rates within the CSD sample jars collected during monitoring Round 1 through and including Round 9 is shown graphically in *Figure 2i-1* and summarized in *Table 2i-1* (See Attached). Issues with the CSDs were observed and documented with the resulting evaluation indicating that the accumulation of sediment within the CSDs is not necessarily indicative of sedimentation within the actual sediment traps. The observed issues include scour and/or settling of the CSDs into the soft sediment, which tilted the CSDs. The observed issues are summarized in *Table 2i-1*.

2i.2.1 Sediment Trap Installation

During November 2012, no sediment traps were installed.

2i.2.2 Sediment Trap Monitoring

During November 2012, monitoring was conducted at all six Phase I sediment trap locations and the 11 Phase II sediment trap locations in accordance with the *Sediment Trap Monitoring and*

Maintenance Plan, approved by U.S. EPA on July 10, 2012 (Enbridge, 2012). Monitoring activities included measurement and sampling of the sediment collected in the CSD samplers.

In November 2012, no poling activities were conducted during Round 9 monitoring due to water and sediment temperatures being below 60°F.

In November 2012, sediment samples were collected, composited, and submitted for analysis from 26 CSD locations. The CSD sampling locations are summarized in *Table 2i-1* and shown in *Figure 2i-2*.

2i.2.3 Baseline Bathymetry Survey

In addition, baseline quarterly bathymetry data collected in September 2012 was compiled during November for 17 Phase I and Phase II sediment trap locations to construct a cross-sectional profile along the transects. The cross-sectional profiles were completed for all 17 of the Phase I and Phase II sediment traps, which are shown in *Figures 2i-3* through *2i-35*. Due to the low amounts of sedimentation observed within the Kalamazoo River and the relatively low precision of horizontal and vertical coordinate data acquisition, a more accurate survey method has been developed and implemented.

The new survey method includes the use of a Trimble S6 Robotic Total Station, 1 arc second Robotic Total Station to improve the accuracy of data collection. Collection of a new quarterly bathymetry baseline began at the Ceresco impoundment November 27 through and including November 30, 2012. The bathymetry data collected at Ceresco/MP 5.75 is shown on *Figure 2i-36*.

2i.3 Work Planned

During December 2012, monitoring of the six Phase I sediment traps and the 11 Phase II sediment traps is planned for the week of December 10, 2012. Bathymetry data collection is planned to continue at all of the Phase I and Phase II sediment traps. In addition, the amount of sediment within the CSD sample jars will also be compiled.

2j.0 Waste Management Activities

2j.1 Introduction

In November 2012, waste management activities were conducted in accordance with the *Waste Treatment, Transportation, and Disposal (WTTD) Plan* (WTTD Plan), approved by U.S. EPA on May 20, 2011 (Enbridge, 2011(1)), the *Addendum to the Revised Waste Treatment, Transportation and Disposal Plan*, approved by U.S. EPA on June 20, 2011 (Enbridge, 2011(2)), and the *Operation and Maintenance Excavation Work Plan titled Waste Best Management Practices*, approved by U.S. EPA on June 29, 2011 (Enbridge, 2011(3)).

Generated waste streams included, but were not limited to:

- Crude oil impacted debris,
- Non-impacted debris - municipal solid waste (MSW),
- Crude oil impacted soil,
- Miscellaneous other small volume materials,
- Crude oil impacted water, and
- Non-impacted precipitation.

Table 2j-1 provides a list of transporters and disposal facilities used for management of each waste stream.

Waste Stream	Disposal Company	U.S. EPA ID Number	Treatment Option	Transporter
Wastewater (Non-Hazardous)	Dynecol, Inc.	MID 074 259 565	Wastewater Treatment	PVS Transportation, HM Environmental, SET Environmental, Inc., and sub-contractors
Wastewater (Non-Hazardous)	Liquid Industrial Waste Services (LIWS)	MID 006 546 121	Wastewater Treatment	LIWS
Wastewater (Non-Hazardous)	Plummer's Environmental Services	MIK 111 229 563	Wastewater Treatment	Plummer's Environmental Services
Non-Hazardous Waste Solid	Republic Services C&C Landfill	MID 985 618 420	Landfill	SET Environmental, Inc. and sub-contractors
Non-Hazardous Soil	Republic Services C&C Landfill	MID 985 618 420	Landfill	SET Environmental, Inc. and sub-contractors

Table 2j-1. Waste Transporters and Disposal Facilities November 2012

2j.2 Work Completed

Table 2j-2 is a summary of the active waste streams and any shipments that occurred during November 2012. The cumulative amount of each waste type generated during response is the total shipped as of November 30, 2012. The processes that generate each waste stream are described further in the following sections. Waste manifests and bills of lading received in November 2012 are included in *Appendix F*.

Waste Stream	Shipped to	Quantity Shipped in November 2012	Cumulative Total Shipped as of November 30, 2012	Unit of Measure
Non-Hazardous Soil	C&C Landfill Marshall, MI	0.0	78,109	Cubic Yards
Non-Hazardous Debris (oily debris)	C&C Landfill Marshall, MI	24.44	7,147	Tons
Non-Hazardous Debris (MSW, non-impacted)	C&C Landfill Marshall, MI	0.0	1,801	Tons
Non-Hazardous Water (precipitation)	Battle Creek Publically Owned Treatment Works, MI	0.0	1,143,280	Gallons
Non-Hazardous Water	Dynecol Detroit, MI	0.0	981,792	Gallons
Non-Hazardous Water	LIWS, Inc.	0.0	1,376,757	Gallons
Non-Hazardous Water	Plummer's Environmental Services	0.0	476,726	Gallons

Table 2j-2. Waste Shipment Summary through November 30, 2012

2j.2.1 Oily Debris

Oily debris was segregated from non-oily debris and stored in lined 20-cubic yard roll off boxes and transported to Republic Services' C&C Landfill in Marshall, Michigan for disposal. Handling procedures for oily debris were conducted in accordance with procedures outlined in the approved WTTD Plan (Enbridge, 2011(1)). Based on how the waste was generated (e.g., control points), sampling and required analyses were performed in accordance with the WTTD Plan (Enbridge, 2011(1)).

2j.2.2 Non-Impacted Debris

Non-impacted (non-oily) debris or MSW generated at field locations was transported to Republic Services' C&C Landfill in Marshall, Michigan using lined 20-cubic yard roll off boxes. Non-impacted debris was not sampled and was not included in the recovered oil calculations. The non-hazardous designation for the debris was based on generator knowledge.

2j.2.3 Soil

Disposal requirements for oil impacted soil are based on an evaluation of analytical data. Handling and sampling procedures for non-hazardous oil impacted soil were conducted in accordance with the WTTD Plan (Enbridge, 2011(1)). Sampling frequency and required analyses were also performed in accordance with the WTTD Plan (Enbridge, 2011(1)).

Hazardous soil was not generated during November 2012.

2j.2.4 Miscellaneous Small Quantity Waste Streams

Miscellaneous small quantity waste streams have been generated throughout the project. These wastes have primarily been stored in drums and include, but are not limited to: used oil, batteries, small quantities of medical waste, and lab samples. These waste streams have been characterized individually and disposed at approved facilities as required.

2j.2.5 Decontamination and Precipitation Wastewater

Accumulated water from decontamination and precipitation at FTC's soil staging cell containment was not generated in November 2012.

2j.2.6 Recovered Oil Calculations

The quantity of oil contained in waste materials has been calculated since the beginning of the release response. Oil and grease analytical results for oily solids and oily liquids are used to calculate recovered oil volumes. The oil quantity calculation is based on the concentration of oil (analytical results) in the waste and the total amount of waste shipped. Recovered oil values are determined for each waste stream and a recovered oil summary is reported weekly to the U.S. EPA. A summary of this report through December 3, 2012 is provided in *Table 2j-3*.

Waste Stream	Weekly Oil Recovery Estimates (gallons)					Cumulative Oil Recovery Estimate (gallons)
	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	
Soil (Non-Haz) (Impacted Soil & Debris) C&C Landfill	0.0	0.0	0.0	0.0	0.0	**14,032**
Soil (Haz) (Impacted Soil & Debris) Envirosafe/Westside Recycling & Disposal Facility (RDF)	--	--	--	--	--	**278,665**
Geotube Sediment (Impacted Sediment) Westside RDF	--	--	--	--	--	**1,298**
Debris (Non-Haz) (Roll off boxes with Impacted Sorbents, boom, pads, plastic, Personal Protective Equipment, vegetation,and biomass)	1.8	6.4	0.0	19.9	1.7	**34,481**
Wastewater (Haz) FTC - Influent to Carbon Filtration System	--	--	--	--	--	**8,109**
Wastewater (Non-Haz) FTC - Water to Dynecol/ LIWS/Plummer's/City of Battle Creek	0.1	0.0	0.0	0.0	0.0	**46,176**
Wastewater (Non-Haz) Battle Creek - Non-Hazardous rain water Ceresco Dredge and C05 Inactive Decon Pad	--	--	--	--	--	**--**
Wildlife Center Wastewater (Non-Haz) Water to Plummer's	--	--	--	--	--	**--**
Ceresco Pretreatment System	--	--	--	--	--	**90**
A-1 Pretreatment System (Haz)	--	--	--	--	--	**9**
Oily Water (Non-Haz) Recoverable Petroleum Product to Griffith	--	--	--	--	--	**766,288**
						Total: 1,149,148

Table 2j-3. Weekly and Project Cumulative Recovered Oil through December 3, 2012

2j.3 Work Planned

During December 2012, waste management activities are planned to continue in accordance with the plans referenced in *Section 2j.1*. Soils with no free liquids will either be transported to FTC and stockpiled using a bill of lading or transported directly to a landfill using a manifest in

accordance with the approved *Addendum to the Revised Waste Treatment, Transportation, and Disposal Plan* (Enbridge, 2011(2)). Each soil stockpile will have a representative sample (one 4-point composite sample collected and homogenized for oil and grease analysis) collected for every 200 cubic yards of waste soil. Each load transported directly to the landfill will have one scoop (single point aliquot) of soil collected for oil and grease analysis prior to leaving the site per the approved *Operation and Maintenance Excavation Work Plan titled Waste Best Management Practices* (Enbridge, 2011(3)).

2k.0 Overbank Excavation Activities

2k.1 Introduction

During November 2012, no overbank (OB) excavation activities were performed.

2k.2 Work Completed

In November 2012, the *Report of Findings for Response Action at the Source Area* was submitted to MDEQ on November 2, 2012 (Enbridge, 2012(1)). In addition, response to U.S. EPA comments were completed for the following OB excavation locations:

- *Excavation Close Out Report for OB 8.97 I,* submitted to U.S. EPA on November 30, 2012 (Enbridge, 2012(2)),
- *Excavation Close Out Report for OB 9.10 LDB,* submitted to U.S. EPA on November 30, 2012 (Enbridge, 2012(3)),
- *Excavation Close Out Report for OB 10.37 RDB,* submitted to U.S. EPA on November 30, 2012 (Enbridge, 2012(4)), and
- *Excavation Close Out Report for OB 13.40 LDB,* submitted to U.S. EPA on November 30, 2012, (Enbridge, 2012(5)).

2k.3 Work Planned

No OB excavation activities are scheduled to be conducted during December 2012.

2I.0 Overbank Oil Recovery Activities

2I.1 Introduction

During November 2012, no OB oil recovery activities were conducted.

2I.2 Work Completed

No OB oil recovery activities were conducted during November 2012.

2I.3 Work Planned

No OB oil recovery activities are scheduled to be conducted during December 2012.

2m.0 Hydrodynamic Assessment and Model Activities

2m.1 Introduction

Hydrodynamic assessment data has been used to develop an understanding of the riverine and floodplain system by identifying physical patterns and migration rates of sediment caused by various river conditions.

2m.2 Work Completed

During November 2012, the *Addendum to the Response Plan for Downstream Impacted Areas, August 2, 2010 (Revised August 17, 2010 per U.S. EPA August 17, 2010 letter), Supplement to Source Area Response Plan, and Supplement to Response Plan for Downstream Impacted Areas, Referred to as Operations and Maintenance Work Plan, Commonly referred to as "Consolidated Work Plan from Fall 2011 through Fall 2012"* (CWP) (Enbridge, 2011) approved by U.S. EPA on December 21, 2011 was reviewed to determine the status of the hydrodynamic model in relation to the requirements of the CWP.

2m.3 Work Planned

No hydrodynamic assessment and model activities are scheduled to be conducted during December 2012.

3.0 Conclusion

As described in this monthly progress report for November 2012, Enbridge continued to conduct activities required under the U.S. EPA Order and Supplemental Order and to conduct activities pursuant to the MDEQ Order. The work conducted and data received during December 2012 will be included in the monthly report to be submitted in January 2013.

4.0 References

Section 1.0 Introduction

Enbridge, 2012(1). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; 2012 Morrow Lake Delta and Morrow Lake Monitoring and Management Plan.*" Approved by U.S. EPA on November 15, 2012.

Enbridge, 2012(2). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; Monitoring Well Abandonment - SOP EN-407."* Approved by MDEQ on November 20, 2012.

MDEQ, 2010. "Administrative Consent Order and Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership*, proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq. signed November 1, 2010."

U.S. EPA, 2010. "*Removal Administrative Order Section 311(c) of the Clean Water Act*, issued on July 27, 2010 to Enbridge Energy Partners, L.P., Docket Number: CWA 1321-5-10-001 as modified by Paragraph 6 of the Supplement to Order for Compliance Under Section 311(c) of the Clean Water Act, issued by the U.S. EPA Region 5 on September 23, 2010 to Enbridge Energy Partners, L.P. *et al.*, Respondents, Docket No: CWA 1321-5-10-001."

Section 2a.0 Surface Water and Sediment Monitoring Activities

Enbridge, 2012. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Addendum to the Sampling and Analysis Plan (SAP): Attachment C - Surface Water and Sediment Monitoring Supplement to the Sampling and Analysis Plan.*" Approved by MDEQ on May 18, 2012.

MDEQ, 2011. "*Rule 57 Water Quality Values*" "*Rule 323.1057 (Toxic Substances) of the Part 4 Water Quality Standards.*" June 2011.

Section 2b.0 Water Quality Monitoring Activities

Enbridge, 2011. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Water Quality Measurement Standard Operating Procedure.*" Approved by MDEQ on September 22, 2011.

Section 2c.0 Potable Water Investigation Activities

Enbridge, 2012(1). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *September 11, 2012 Groundwater Sample Results,"* Submitted to Village of Augusta, Village of Augusta Chief of Police Jeff Heppler, and a courtesy copy provided to MDEQ in November, 2012.

Enbridge 2012(2). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *September 12, 2012 Groundwater Sample Results,"* Submitted to City of Kalamazoo and a courtesy copy provided to MDEQ in November, 2012.

Enbridge, 2012(3). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Addendum to Sampling and Analysis Plan (SAP): Attachment B - Drinking Water Well Supplement to the Sampling and Analysis Plan.*" Approved by MDEQ on May 18, 2012.

Section 2d.0 Air Sampling and Monitoring Activities

Enbridge, 2012(1). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Air Monitoring & Sampling Addendum to the Sampling & Analysis Plan.*" Submitted to U.S. EPA on December 9, 2011 and resubmitted on January 31, 2012, March 28, 2012, and May 3, 2012. Approved by U.S. EPA on May 4, 2012.

Enbridge, 2012(2). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Request for Modification of the Air Monitoring and Sampling Addendum to the Sampling and Analysis Plan.*" Submitted to U.S. EPA on August 17, 2012.

U.S. EPA, 2012. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Approval of Temporary Suspension of Air Monitoring and Odor Response Activities."* Submitted to Enbridge on September 10, 2012.

Section 2f.0 Remedial Investigation Activities

Enbridge, 2011. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Remedial Investigation Work Plan for Kalamazoo River (MP 2.25 to MP 3.14)*." Approved by MDEQ on November 18, 2011.

Enbridge, 2012(1). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; Remedial Investigation Work Plan for Kalamazoo River (MP 5.80 to MP 11.00)."* Approved by MDEQ on February 10, 2012.

Enbridge, 2012(2). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; Remedial Investigation Work Plan for Kalamazoo River (MP 11.00 to Morrow Lake Dam).*" Approved by MDEQ on March 8, 2012.

Enbridge, 2012(3). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; Monitoring Well Abandonment – SOP EN-407,"* Approved by MDEQ November 14, 2012.

Enbridge, 2012(4). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; Report of Findings for Response Action at the Source Area,"* Submitted to MDEQ November 2, 2012.

Enbridge, 2012(5). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan*; Presentation of Data for Kalamazoo River Parcel KN-D-309 (04-530-075-00) (MP 22.50 to 22.75 RDB),"* Submitted to MDEQ November 13, 2012.

Enbridge, 2012(6). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan *Presentation of Data for Kalamazoo River Part of Parcel KN-D-289.001 (0133-00-026-0) (MP 19.75 to MP 20.00 RDB)* submitted to MDEQ November 19, 2012*;*

Enbridge, 2012(7). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Remedial Investigation Work Plan for Kalamazoo River (MP 3.14 to Ceresco Dam (MP 5.80))*." Approved by MDEQ on January 13, 2012.

Section 2g.0 Temporary Facility Restoration and Demobilization Activities

Enbridge, 2011. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Soil Staging, Decontamination and River Access Site Closure Plan.*" Submitted to U.S. EPA and MDEQ on January 11, 2011.

MDEQ, 2004. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *RRD Operational Memorandum No. 2, MDEQ Remediation and Redevelopment Division, Sampling and Analysis.*" October 22, 2004.

Section 2h.0 River Bank Erosion Control and Restoration Activities

(Enbridge, 2012). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Kalamazoo River Bank Erosion Assessment and Action Plan Summary Report – Monitoring Trip No. 9*", submitted to MDEQ on September 13, 2012

Section 2i.0 Sediment Traps and Cylindrical Sampling Devices

Enbridge, 2012. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Sediment Trap Monitoring and Maintenance Plan.*" Approved by U.S. EPA on July 10, 2012.

Section 2j.0 Waste Management Activities

Enbridge, 2011(1). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Waste Treatment, Transportation, and Disposal Plan.*" Approved by U.S. EPA on May 20, 2011.

Enbridge, 2011(2). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Addendum to the Revised Waste Treatment, Transportation and Disposal Plan.*" Approved by U.S. EPA on June 20, 2011.

Enbridge, 2011(3). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Operation and Maintenance Excavation Work Plan titled Waste Best Management Practices.*" Approved by U.S. EPA on June 29, 2011.

Section 2k.0 Overbank Excavation Activities

Enbridge, 2012(1). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Report of Findings for Response Action at the Source Area." S*ubmitted to MDEQ on November 2, 2012.

Enbridge, 2012(2). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Excavation Close Out Report for OB 8.97 I,"* Submitted to U.S. EPA on November 30, 2012 .

Enbridge, 2012(3). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Excavation Close Out Report for OB 9.10 LDB,"* Submitted to U.S. EPA on November 30, 2012.Enbridge, 2012(4). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Excavation Close Out Report for OB 10.37 RDB,"* Submitted to U.S. EPA on November 30, 2012.

Enbridge, 2012(5). "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Excavation Close Out Report for OB 13.40 LDB,"* Submitted to U.S. EPA on November 30, 2012.

Section 2m.0 Hydrodynamic Assessment and Model Activities

Enbridge, 2011. "Enbridge Line 6B MP 608 Pipeline Release Marshall, Michigan; *Addendum to the Response Plan for Downstream Impacted Areas, August 2, 2010 (Revised August 17, 2010 per U.S. EPA August 17, 2010 letter), Supplement to Source Area Response Plan and Supplement to Response Plan for Downstream Impacted Areas, Referred to as Operations and Maintenance Work Plan commonly referred to as "Consolidated Work Plan for Activities through 2012.*" Submitted to U.S. EPA on October 20, 2011.

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Tables

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

Table 2b-1. Water Quality Monitoring Results November 1, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
36.10-SED-TRAP-D01	Removal of sed trap 36.10 NW						
	11/1/2012	10:35	0	3.7	4.96	10.98	6.8
36.10-SED-TRAP-D02	Removal of sed trap 36.10 NW						
	11/1/2012	10:37	2	3.7	3.96	10.92	6.8
36.10-SED-TRAP-D03	Removal of sed trap 36.10 NW						
	11/1/2012	14:47	0	3.7	2.63	12.34	7.5
36.10-SED-TRAP-D04	Removal of sed trap 36.10 NW						
	11/1/2012	14:49	2	3.7	2.48	12.20	7.5
36.10-SED-TRAP-D05	Removal of sed trap 36.10 NW						
	11/1/2012	15:50	0	3.7	2.85	12.50	7.7
36.10-SED-TRAP-D06	Removal of sed trap 36.10 NW						
	11/1/2012	15:53	2	3.7	2.32	12.38	7.7
36.10-SED-TRAP-I01	Removal of sed trap 36.10 NW						
	11/1/2012	10:16	0	1.25	3.04	10.63	6.6
36.10-SED-TRAP-I02	Removal of sed trap 36.10 NW						
	11/1/2012	14:26	0	1.25	62.0	12.22	8.5
36.10-SED-TRAP-I03	Removal of sed trap 36.10 NW						
	11/1/2012	15:35	0	1.25	4.89	12.09	8.7
36.10-SED-TRAP-S01	Removal of sed trap 36.10 NW						
	11/1/2012	10:25	0	3.6	4.14	11.05	6.7
36.10-SED-TRAP-S02	Removal of sed trap 36.10 NW						
	11/1/2012	10:27	2	3.6	3.16	10.91	6.7
36.10-SED-TRAP-S03	Removal of sed trap 36.10 NW						
	11/1/2012	14:38	0	3.6	4.49	12.78	7.6

Table 2b-1. Water Quality Monitoring Results November 1, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
36.10-SED-TRAP-S04	Removal of sed trap 36.10 NW						
	11/1/2012	14:40	2	3.6	6.34	12.39	7.6
36.10-SED-TRAP-S05	Removal of sed trap 36.10 NW						
	11/1/2012	15:43	0	3.6	6.51	12.43	7.9
36.10-SED-TRAP-S06	Removal of sed trap 36.10 NW						
	11/1/2012	15:46	2	3.6	3.41	12.45	7.9
36.10-SED-TRAP-U01	Removal of sed trap 36.10 NW						
	11/1/2012	10:00	0	2.6	2.83	10.95	6.7
36.10-SED-TRAP-U02	Removal of sed trap 36.10 NW						
	11/1/2012	10:05	2	2.6	2.31	10.98	6.7
36.10-SED-TRAP-U03	Removal of sed trap 36.10 NW						
	11/1/2012	14:08	0	2.6	7.71	12.81	7.8
36.10-SED-TRAP-U04	Removal of sed trap 36.10 NW						
	11/1/2012	14:16	2	2.6	4.66	13.40	7.8
36.10-SED-TRAP-U05	Removal of sed trap 36.10 NW						
	11/1/2012	15:28	0	2.6	2.81	12.70	8.1
36.10-SED-TRAP-U06	Removal of sed trap 36.10 NW						
	11/1/2012	15:30	2	2.6	3.34	12.76	8.1

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)

Footnotes:

°C = degrees Celsius

D = downstream

DO = dissolved oxygen

DTB = depth to bottom

ft = feet

I = inside work area

mg/L = milligrams per liter

NTU = nephelometric turbidity units

S = along side of the work area

U = upstream

* = Any meter displaying readings outside of normal ranges was recalibrated in the field. If problem persisted, the meter was replaced.

Table 2b-2. Water Quality Monitoring Results November 2, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
36.10-SED-TRAP-D07	Removal of sed trap 36.10 NW						
	11/2/2012	10:35	0	4.0	3.59	11.28	6.7
36.10-SED-TRAP-D08	Removal of sed trap 36.10 NW						
	11/2/2012	10:37	2	4.0	2.96	11.89	6.7
36.10-SED-TRAP-D09	Removal of sed trap 36.10 NW						
	11/2/2012	10:39	4	4.0	2.63	11.17	6.7
36.10-SED-TRAP-D10	Removal of sed trap 36.10 NW						
	11/2/2012	12:27	0	4.0	3.55	11.67	7.0
36.10-SED-TRAP-D11	Removal of sed trap 36.10 NW						
	11/2/2012	12:29	2	4.0	2.91	11.61	7.0
36.10-SED-TRAP-D12	Removal of sed trap 36.10 NW						
	11/2/2012	12:32	4	4.0	3.35	11.63	7.0
36.10-SED-TRAP-I04	Removal of sed trap 36.10 NW						
	11/2/2012	10:16	0	1.2	4.05	9.88	6.4
36.10-SED-TRAP-I05	Removal of sed trap 36.10 NW						
	11/2/2012	11:56	0	1.2	12.00	10.90	7.1
36.10-SED-TRAP-S07	Removal of sed trap 36.10 NW						
	11/2/2012	10:25	0	3.4	3.93	11.27	6.7
36.10-SED-TRAP-S08	Removal of sed trap 36.10 NW						
	11/2/2012	10:27	2	3.4	2.48	11.23	6.7
36.10-SED-TRAP-S09	Removal of sed trap 36.10 NW						
	11/2/2012	12:19	0	3.4	5.25	12.11	7.0
36.10-SED-TRAP-S10	Removal of sed trap 36.10 NW						
	11/2/2012	12:22	2	3.4	3.24	11.29	7.0

Table 2b-2. Water Quality Monitoring Results November 2, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
36.10-SED-TRAP-U07	Removal of sed trap 36.10 NW						
	11/2/2012	10:03	0	3.6	3.82	11.08	6.6
36.10-SED-TRAP-U08	Removal of sed trap 36.10 NW						
	11/2/2012	10:07	2	3.6	4.20	11.18	6.6
36.10-SED-TRAP-U09	Removal of sed trap 36.10 NW						
	11/2/2012	11:45	0	3.6	3.25	11.92	7.2
36.10-SED-TRAP-U10	Removal of sed trap 36.10 NW						
	11/2/2012	11:47	2	3.6	2.88	11.88	7.2

Footnotes:

°C = degrees Celsius
D = downstream
DO = dissolved oxygen
DTB = depth to bottom
ft = feet
I = inside work area
mg/L = milligrams per liter
NTU = nephelometric turbidity units
S = along side of the work area
U = upstream
* = Any meter displaying readings outside of normal ranges was recalibrated in the field. If problem persisted, the meter was replaced.

Table 2b-3. Water Quality Monitoring Results November 17, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
WQM-E4 BOOM B-001	E4.0 curtain removal						
	11/17/2012	11:18	0.5	2.0	3.41	13.64	4.4
	11/17/2012	11:21	2.0	2.0	5.51	14.56	4.4
WQM-E4 BOOM B-002	E4.0 curtain removal						
	11/17/2012	11:50	0.5	2.0	4.44	12.27	4.6
	11/17/2012	11:53	2.0	2.0	3.65	12.98	4.7
WQM-E4 BOOM B-003	E4.0 curtain removal						
	11/17/2012	12:10	0.5	2.0	4.21	11.59	4.8
	11/17/2012	12:13	2.0	2.0	2.73	12.99	4.9
WQM-E4 BOOM C1-001	E4.0 curtain removal						
	11/17/2012	13:38	0.5	2.5	3.03	14.13	6.1
	11/17/2012	13:41	2.0	2.5	2.25	14.82	6.2
WQM-E4 BOOM C1-002	E4.0 curtain removal						
	11/17/2012	13:49	2.0	2.5	2.53	14.90	6.2
WQM-E4 BOOM C1-BG	E4.0 curtain removal						
	11/17/2012	13:25	0.5	2.0	3.47	13.62	5.7
	11/17/2012	13:28	2.0	2.0	2.66	13.60	5.7
WQM-E4 BOOM C2-001	E4.0 curtain removal						
	11/17/2012	14:12	0.5	3.5	2.31	14.35	6.4
	11/17/2012	14:16	2.0	3.5	2.55	15.01	6.3
	11/17/2012	14:18	3.5	3.5	2.59	14.85	6.4
WQM-E4 BOOM C2-002	E4.0 curtain removal						
	11/17/2012	14:31	0.5	3.5	3.00	14.40	6.6
	11/17/2012	14:33	2.0	3.5	2.92	15.20	6.5
	11/17/2012	14:36	3.5	3.5	2.43	15.05	6.5
WQM-E4 BOOM C2-003	E4.0 curtain removal						
	11/17/2012	15:00	0.5	5.5	3.88	13.78	6.5

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
	11/17/2012	15:04	2.0	5.5	3.01	14.32	6.5
	11/17/2012	15:08	3.5	5.5	2.63	14.35	6.3
	11/17/2012	15:11	5.5	5.5	17.4	14.22	6.4
WQM-E4 BOOM C2-004	E4.0 curtain removal						
	11/17/2012	15:33	0.5	5.5	4.69	12.53	6.7
	11/17/2012	15:35	2.0	5.5	2.64	13.22	6.6
	11/17/2012	15:38	3.5	5.5	3.06	13.58	6.5
	11/17/2012	15:40	5.0	5.5	2.59	13.70	6.5
WQM-E4 BOOM C2-005	E4.0 curtain removal						
	11/17/2012	15:58	0.5	5.5	2.58	12.42	6.8
	11/17/2012	16:01	2.0	5.5	2.74	13.20	6.6
	11/17/2012	16:04	3.5	5.5	2.50	13.47	6.6
	11/17/2012	16:06	5.0	5.5	2.38	13.69	6.6
WQM-E4 BOOM C2-006	E4.0 curtain removal						
	11/17/2012	16:17	0.5	5.5	3.08	13.85	6.7
	11/17/2012	16:20	2.0	5.5	2.95	14.50	6.6
	11/17/2012	16:22	3.5	5.5	3.10	14.62	6.6
	11/17/2012	16:25	5.0	5.5	3.02	14.56	6.6
WQM-E4 BOOM C2-BG	E4.0 curtain removal						
	11/17/2012	13:57	0.5	2.0	2.38	15.40	5.8
	11/17/2012	14:00	2.0	2.0	2.72	15.85	5.8
WQM-E4 BOOM-A-001	E4.0 curtain removal						
	11/17/2012	09:49	0.5	2.5	5.41	14.83	3.7
	11/17/2012	09:54	2.0	2.5	4.58	15.01	3.7
WQM-E4 BOOM-A-002	E4.0 curtain removal						
	11/17/2012	10:30	0.5	2.5	6.01	12.70	4.1
	11/17/2012	10:32	2.0	2.5	6.20	14.00	4.0
WQM-E4 BOOM-A-003	E4.0 curtain removal						
	11/17/2012	11:01	2.0	2.5	2.86	13.35	4.3

Table 2b-3. Water Quality Monitoring Results November 17, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
WQM-E4 BOOMA-BG	E4.0 curtain removal						
	11/17/2012	09:29	0.5	2.0	3.66	13.76	3.5
	11/17/2012	09:33	2.0	2.0	4.5	14.69	3.6
WQM-E4 BOOMB-BG	E4.0 curtain removal						
	11/17/2012	11:05	0.5	2.5	2.90	12.66	4.6
	11/17/2012	11:08	2.0	2.0	2.79	12.78	4.5
WQM-E4-BOOM C1-002	E4.0 curtain removal						
	11/17/2012	13:46	0.5	2.5	2.61	14.17	6.2
WQM-E4-BOOM-A-003	E4.0 curtain removal						
	11/17/2012	10:58	0.5	2.5	3.59	12.39	4.4

Footnotes:

BG = background

°C = degrees Celsius

DO = dissolved oxygen

DTB = depth to bottom

ft = feet

mg/L = milligrams per liter

NTU = nephelometric turbidity units

* = Any meter displaying readings outside of normal ranges was recalibrated in the field. If problem persisted, the meter was replaced.

Table 2b-4. Water Quality Monitoring Results November 18, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
WQM-B4 BOOM E2-001	E4.0 curtain removal						
	11/18/2012	13:52	2.0	4.5	2.47	15.48	5.9
WQM-E4 BOOM D-001	E4.0 curtain removal						
	11/18/2012	08:45	0.5	5.5	1.89	15.34	4.1
	11/18/2012	08:48	2.0	5.5	2.27	15.24	4.1
	11/18/2012	08:51	3.5	5.5	2.33	15.30	4.1
	11/18/2012	08:53	5.0	5.5	2.68	15.10	4.2
WQM-E4 BOOM D-002	E4.0 curtain removal						
	11/18/2012	09:22	0.5	5.5	2.15	15.65	4.2
	11/18/2012	09:24	2.0	5.5	2.13	15.40	4.2
	11/18/2012	09:27	3.5	5.5	2.35	15.51	4.2
	11/18/2012	09:30	5.0	5.5	2.00	15.35	4.2
WQM-E4 BOOM D-BG	E4.0 curtain removal						
	11/18/2012	08:29	0.5	3.5	3.96	15.01	4.1
	11/18/2012	08:33	2.0	3.5	2.29	15.31	4.1
	11/18/2012	08:36	3.0	3.5	1.90	15.17	4.2
WQM-E4 BOOM E1-001	E4.0 curtain removal						
	11/18/2012	09:58	0.5	5.5	2.37	15.60	3.8
	11/18/2012	10:05	3.5	5.5	2.16	15.15	3.8
	11/18/2012	10:08	5.0	5.5	2.53	15.40	3.9
WQM-E4 BOOM E1-002	E4.0 curtain removal						
	11/18/2012	10:34	0.5	5.5	2.13	15.50	4.0
	11/18/2012	10:37	2.0	5.5	2.41	15.37	4.0
	11/18/2012	10:40	3.5	5.5	2.21	15.26	4.1
	11/18/2012	10:42	5.0	5.5	2.61	15.01	4.1
WQM-E4 BOOM E1-003	E4.0 curtain removal						
	11/18/2012	11:07	0.5	6.0	2.51	15.55	4.5
	11/18/2012	11:10	2.0	6.0	2.13	15.56	4.5
	11/18/2012	11:12	4.0	6.0	2.48	15.51	4.5

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
	11/18/2012	11:14	5.5	6.0	2.36	15.31	4.6
WQM-E4 BOOM E1-004	E4.0 curtain removal						
	11/18/2012	11:47	0.5	6.0	2.54	14.77	4.9
	11/18/2012	11:49	2.0	6.0	2.74	14.75	4.9
	11/18/2012	11:53	4.0	6.0	3.84	14.97	4.9
	11/18/2012	11:56	5.5	6.0	2.68	14.95	4.9
WQM-E4 BOOM E1-005	E4.0 curtain removal						
	11/18/2012	12:14	0.5	6.0	4.67	14.99	5.2
	11/18/2012	12:16	2.0	6.0	4.22	15.01	5.2
	11/18/2012	12:18	4.0	6.0	4.33	15.20	5.2
	11/18/2012	12:23	5.5	6.0	4.37	15.04	5.3
WQM-E4 BOOM E1-006	E4.0 curtain removal						
	11/18/2012	12:24	0.5	6.0	3.78	14.74	5.3
	11/18/2012	12:27	2.0	6.0	5.41	14.97	5.4
	11/18/2012	12:29	4.0	6.0	6.05	15.09	5.4
	11/18/2012	12:31	5.5	6.0	6.66	15.15	5.3
WQM-E4 BOOM E1-BG	E4.0 curtain removal						
	11/18/2012	09:38	0.5	4.0	2.12	15.11	3.6
	11/18/2012	09:42	2.0	4.0	2.58	15.09	3.6
	11/18/2012	09:44	3.5	4.0	2.42	15.16	3.5
WQM-E4 BOOM E2-001	E4.0 curtain removal						
	11/18/2012	13:49	0.5	4.5	2.39	15.45	5.9
	11/18/2012	13:55	4.0	4.5	2.84	15.50	5.9
WQM-E4 BOOM E2-002	E4.0 curtain removal						
	11/18/2012	14:12	0.5	4.5	2.44	15.10	6.1
	11/18/2012	14:15	2.0	4.5	2.85	15.49	6.1
	11/18/2012	14:17	4.0	4.5	2.65	15.70	6.1
WQM-E4 BOOM E2-003	E4.0 curtain removal						
	11/18/2012	14:43	0.5	2.0	2.22	16.02	6.2

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
	11/18/2012	14:46	1.5	2.0	2.01	16.12	6.2
WQM-E4 BOOM E2-004	E4.0 curtain removal						
	11/18/2012	15:05	0.5	2.5	2.78	15.67	6.3
	11/18/2012	15:08	2.0	2.5	2.44	15.72	6.3
WQM-E4 BOOM E2-BG	E4.0 curtain removal						
	11/18/2012	13:28	0.5	6.0	3.65	14.70	5.9
	11/18/2012	13:29	2.0	6.0	3.14	14.50	5.9
	11/18/2012	13:32	4.0	6.0	3.59	14.57	5.9
	11/18/2012	13:34	4.5	5.0	3.29	14.52	6.0
WQM-E4-BOOM E1-001	E4.0 curtain removal						
	11/18/2012	10:01	2.0	5.5	2.98	15.33	3.8

Footnotes:

BG = background

°C = degrees Celsius

DO = dissolved oxygen

DTB = depth to bottom

ft = feet

mg/L = milligrams per liter

NTU = nephelometric turbidity units

* = Any meter displaying readings outside of normal ranges was recalibrated in the field. If problem persisted, the meter was replaced.

Table 2b-5. Water Quality Monitoring Results November 19, 2012
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
WQM-E4 BOOM F1-001	E4.0 curtain removal						
	11/19/2012	11:15	0.5	6.0	3.79	14.80	4.8
	11/19/2012	11:18	2.0	6.0	3.44	14.60	4.8
	11/19/2012	11:20	4.0	6.0	4.22	14.65	4.8
	11/19/2012	11:22	5.5	6.0	3.85	14.51	4.8
WQM-E4 BOOM F1-002	E4.0 curtain removal						
	11/19/2012	11:42	0.5	5.5	3.21	15.60	4.9
	11/19/2012	11:45	2.0	5.5	3.08	15.23	4.9
	11/19/2012	11:46	3.5	5.5	4.08	15.12	4.9
	11/19/2012	11:48	5.0	5.5	3.39	14.83	4.9
WQM-E4 BOOM F1-003	E4.0 curtain removal						
	11/19/2012	12:02	0.5	4.0	2.90	15.10	4.8
	11/19/2012	12:05	2.0	4.0	2.65	14.88	4.8
	11/19/2012	12:07	3.5	4.0	2.90	14.95	4.7
WQM-E4 BOOM F1-004	E4.0 curtain removal						
	11/19/2012	13:19	0.5	4.0	2.83	13.87	5.4
	11/19/2012	13:22	2.0	4.0	2.93	13.65	5.3
	11/19/2012	13:24	3.5	4.0	2.56	13.62	5.3
WQM-E4 BOOM F1-005	E4.0 curtain removal						
	11/19/2012	13:46	0.5	4.0	2.86	14.92	5.6
	11/19/2012	13:49	2.0	4.0	2.25	14.75	5.6
	11/19/2012	13:51	3.5	4.0	2.55	14.65	5.6
WQM-E4 BOOM F1-006	E4.0 curtain removal						
	11/19/2012	14:03	0.5	3.0	2.49	14.55	5.6
	11/19/2012	14:06	1.5	3.0	2.64	14.77	5.5
	11/19/2012	14:08	2.5	3.0	2.95	14.62	5.5
WQM-E4 BOOM F1-BG	E4.0 curtain removal						
	11/19/2012	11:03	0.5	3.5	2.91	14.60	4.6
	11/19/2012	11:06	2.0	3.5	2.91	14.10	4.6

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)
	11/19/2012	11:08	3.0	3.5	3.16	14.01	4.6
WQM-E4 BOOM F2-001	E4.0 curtain removal						
	11/19/2012	08:46	0.5	4.5	2.44	15.75	4.4
	11/19/2012	08:50	2.0	4.5	3.08	15.45	4.4
	11/19/2012	08:52	4.0	4.5	3.25	15.40	4.4
WQM-E4 BOOM F2-002	E4.0 curtain removal						
	11/19/2012	09:20	0.5	4.5	3.05	15.50	4.5
	11/19/2012	09:23	2.0	4.5	3.86	15.36	4.5
	11/19/2012	09:26	4.0	4.5	3.54	15.35	4.5
WQM-E4 BOOM F2-003	E4.0 curtain removal						
	11/19/2012	09:49	0.5	2.0	3.49	15.67	4.6
	11/19/2012	09:52	1.5	2.0	2.45	15.40	4.6
WQM-E4 BOOM F2-004	E4.0 curtain removal						
	11/19/2012	10:13	0.5	1.5	2.89	15.40	4.7
	11/19/2012	10:16	1.25	1.5	2.65	15.20	4.8
WQM-E4 BOOM F2-005	E4.0 curtain removal						
	11/19/2012	10:27	0.5	1.5	2.16	15.25	4.8
	11/19/2012	10:31	1.25	1.5	2.05	15.12	4.8
WQM-E4 BOOM F2-BG	E4.0 curtain removal						
	11/19/2012	08:30	0.5	3.0	3.26	15.60	4.2
	11/19/2012	08:34	1.5	3.0	3.25	15.45	4.3
	11/19/2012	08:37	2.5	3.0	3.75	15.30	4.3

Location	Date	Time	Sample Depth (ft)	DTB (ft)	Turbidity * (NTU)	DO * (mg/L)	Temperature (°C)

Footnotes:

BG = background

°C = degrees Celsius

DO = dissolved oxygen

DTB = depth to bottom

ft = feet

mg/L = milligrams per liter

NTU = nephelometric turbidity units

* = Any meter displaying readings outside of normal ranges was recalibrated in the field. If problem persisted, the meter was replaced.

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0004F3A	C0004F3 [redacted]	[redacted]	Ceresco MI	Calhoun	7.5	Permit but Call/Schedule Required	12-Sep-10	Prior to Sale or Occupation	8	7	**30-Jul-10**	21-Aug-10		
											31-Aug-10	01-Oct-10		Iron
											12-Sep-10	01-Oct-10		Iron
											20-Sep-10			Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											15-Sep-11	29-Nov-11		IRON, TOTAL
											16-Dec-11	20-Jan-12		
C001899A	C001899 [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Unattended Permission, Anytime	31-Aug-10	Prior to Sale or Occupation	12	12	**30-Jul-10**	21-Aug-10		
											31-Aug-10	14-Oct-10		Iron
											11-Oct-10	26-Oct-10		Iron
											12-Oct-10	26-Oct-10		Iron
											22-Oct-10	12-Nov-10		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C001899A	C001899 [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Unattended Permission, Anytime	31-Aug-10	Prior to Sale or Occupation	12	12	**30-Nov-10**	15-Dec-10		IRON, TOTAL
											05-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											12-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											19-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											19-Oct-11	08-Dec-11		
											19-Jan-12	09-Feb-12		
C0021FEA	C0021FE [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Permit but Call/Schedule Required	19-Sep-10	Prior to Sale or Occupation	12	12	**27-Jul-10**	21-Aug-10		
											31-Aug-10	14-Oct-10		Iron
											04-Sep-10	04-Oct-10		
											19-Sep-10	01-Nov-10		
											11-Oct-10	26-Oct-10		Iron
											24-Oct-10	30-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0021FEA	C0021FE [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Permit but Call/Schedule Required	19-Sep-10	Prior to Sale or Occupation	12	12	**05-Nov-10**	09-Dec-10		IRON, TOTAL
											05-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											12-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											19-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, TITANIUM
											20-Oct-11	08-Dec-11		IRON, TOTAL
											19-Jan-12	09-Feb-12		
C002471A	C002471 [redacted]	[redacted]	Marshall MI	Calhoun	1.25	Permit but Call/Schedule Required	01-Sep-10	Prior to Sale or Occupation	7	6	**31-Jul-10**	25-Aug-10		
											01-Sep-10	05-Oct-10		Iron
											04-Sep-10	13-Oct-10		
											17-Sep-10			Iron
											13-Oct-10	13-Nov-10		Iron
											29-Oct-10	04-Dec-10		IRON
											23-Feb-12	30-Mar-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0027CBA	C0027CB [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Unattended Permission, Anytime	31-Aug-10	Prior to Sale or Occupation	10	10	**07-Aug-10**	19-Aug-10		Iron
											31-Aug-10	14-Oct-10		Iron
											12-Sep-10	07-Jan-11		Iron
											17-Sep-10	08-Feb-11		Iron
											11-Oct-10	28-Oct-10		Iron
											21-Oct-10	13-Dec-10		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL
											30-Nov-10	15-Dec-10		IRON, TOTAL
											05-Jan-11	24-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											22-Feb-12	16-Mar-12		
C0040EEA	C0040EE [redacted]	[redacted]	Marshall MI	Calhoun	2.5	Permit but Call/Schedule Required	25-Oct-10	Prior to Sale or Occupation	11	11	**29-Jul-10**	21-Aug-10		
											25-Oct-10	12-Nov-10		
											03-Nov-10	19-Nov-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0040EEA	C0040EE [redacted]	[redacted]	Marshall MI	Calhoun	2.5	Permit but Call/Schedule Required	25-Oct-10	Prior to Sale or Occupation	11	11	**11-Nov-10**	21-Dec-10		IRON, TOTAL
											29-Nov-10	10-Dec-10		IRON, TOTAL
											14-Dec-10	26-Jan-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											05-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											11-Feb-11	07-Mar-11		IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-May-11	02-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											15-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											17-Nov-11	14-Dec-11		IRON, TOTAL
C005139A	C005139 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	12	12	**07-Aug-10**	19-Sep-10		Iron
											28-Aug-10	02-Oct-10		Iron
											13-Sep-10	04-Oct-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C005139A	C005139 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	12	12	21-Sep-10	08-Oct-10		Iron
											07-Oct-10	26-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											04-Jan-11	24-Jan-11		IRON, TOTAL
											08-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											15-Jul-11	02-Aug-11		IRON, TOTAL
											17-Oct-11	08-Dec-11		IRON, TOTAL
C0094BAPW1	C0094BA [redacted]	[redacted]	Marshall MI	Calhoun	1.75	Permit but Call/Schedule Required	01-Sep-10	Prior to Sale or Occupation	11	10	29-Jul-10	21-Aug-10		
											11-Sep-10	04-Oct-10		Iron
											25-Sep-10	07-Oct-10		Iron
											29-Oct-10	16-Dec-10		IRON
											25-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0094BAPW1	C0094BA [redacted]	[redacted]	Marshall MI	Calhoun	1.75	Permit but Call/Schedule Required	01-Sep-10	Prior to Sale or Occupation	11	10	**15-Feb-11**	03-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											16-Aug-11	29-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											17-Nov-11	14-Dec-11		IRON, TOTAL, NICKEL, TOTAL
											23-Feb-12	16-Mar-12		
C0108EFA	C0108EF [redacted]	[redacted]	Marshall MI	Calhoun	0.75	Unattended Permission, Anytime	24-Oct-10	Prior to Sale or Occupation	13	12	**01-Aug-10**	21-Aug-10		
											10-Aug-10	01-Nov-10		Iron
											12-Aug-10	05-Oct-10		Iron
											20-Aug-10	27-Sep-10		Iron
											24-Oct-10	30-Nov-10		
											03-Nov-10			
											11-Nov-10	09-Dec-10		IRON, TOTAL
											17-Dec-10	17-Feb-11		IRON, TOTAL, TITANIUM, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0108EFA	C0108EF [redacted]	[redacted]	Marshall MI	Calhoun	0.75	Unattended Permission, Anytime	24-Oct-10	Prior to Sale or Occupation	13	12	**07-Jan-11**	15-Feb-11		IRON, TOTAL
											11-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											02-May-11	12-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Aug-11	14-Sep-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, TITANIUM
											18-Nov-11	19-Dec-11		IRON, TOTAL
C0118AEA	C0118AE [redacted]	[redacted]	Ceresco MI	Calhoun	5.75	Permit but Call/Schedule Required	28-Aug-10	Prior to Sale or Occupation	12	12	**28-Jul-10**	21-Aug-10		
											28-Aug-10	01-Oct-10		Iron
											11-Sep-10	01-Oct-10		Iron
											20-Sep-10	09-Feb-11		Iron
											12-Oct-10	26-Oct-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0118AEA	C0118AE [redacted]	[redacted]	Ceresco MI	Calhoun	5.75	Permit but Call/Schedule Required	28-Aug-10	Prior to Sale or Occupation	12	12	**22-Oct-10**	30-Nov-10		IRON
											06-Nov-10	29-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											21-Jan-11	17-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											11-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-May-11	02-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
C0127FCA	C0127FC [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	16-Sep-10	Prior to Sale or Occupation	7	7	**01-Aug-10**	25-Aug-10		
											31-Aug-10	05-Oct-10		Iron
											23-Oct-10	12-Nov-10		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL
											30-Nov-10	15-Dec-10		IRON, TOTAL
											24-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0127FCA	C0127FC [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	16-Sep-10	Prior to Sale or Occupation	7	7	**11-Feb-11**	07-Mar-11		IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
C0129FBA	C0129FB [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	04-Sep-10	Prior to Sale or Occupation	11	11	**07-Aug-10**	19-Aug-10		Iron
											04-Sep-10	04-Oct-10		
											09-Sep-10	04-Oct-10		Iron
											24-Sep-10	07-Oct-10		Iron
											11-Oct-10	28-Oct-10		Iron
											21-Oct-10	12-Nov-10		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL
											30-Nov-10	15-Dec-10		IRON, TOTAL
											07-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0129FBA	C0129FB [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	04-Sep-10	Prior to Sale or Occupation	11	11	19-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
C013407A	C013407 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	19-Sep-10	Prior to Sale or Occupation	8	8	28-Jul-10	08-Sep-10		
											05-Sep-10	01-Oct-10		
											20-Sep-10	08-Feb-11		Iron
											06-Oct-10	20-Oct-10		
											15-Oct-10	26-Oct-10		Iron
											29-Oct-10	07-Jan-11		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL, NICKEL, TOTAL
											16-Nov-11	18-Jan-12		IRON, TOTAL
C0139BAA	C0139BA [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime	01-Sep-10	Prior to Sale or Occupation	13	11	02-Aug-10	25-Aug-10		
											01-Sep-10	05-Oct-10		Iron
											12-Sep-10	04-Oct-10		Iron
											19-Sep-10	08-Feb-11		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0139BAA	C0139BA [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime	01-Sep-10	Prior to Sale or Occupation	13	11	**03-Oct-10**	20-Oct-10		Iron
											16-Oct-10			Iron
											29-Oct-10	03-Dec-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											07-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											20-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											19-Oct-11	08-Dec-11		
C0144C0A	C0144C0 [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	12-Sep-10	Prior to Sale or Occupation	14	14	**27-Jul-10**	21-Aug-10		
											31-Aug-10	05-Oct-10		Iron
											12-Sep-10	04-Oct-10		Iron
											19-Sep-10	08-Feb-11		Iron
											01-Oct-10	08-Feb-11		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0144C0A	C0144C0 [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	12-Sep-10	Prior to Sale or Occupation	14	14	**14-Oct-10**	28-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											11-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											11-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											17-Nov-11	18-Jan-12		IRON, TOTAL
											24-Feb-12	16-Mar-12		
C01497DA	C01497D [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Permit but Call/Schedule Required	21-Sep-10	Prior to Sale or Occupation	8	7	**29-Jul-10**	25-Aug-10		
											31-Aug-10	14-Oct-10		Iron
											21-Sep-10	08-Oct-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01497DA	C01497D [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Permit but Call/Schedule Required	21-Sep-10	Prior to Sale or Occupation	8	7	10-Oct-10	28-Oct-10		Iron
											21-Oct-10	12-Nov-10		
											07-Nov-10	29-Nov-10		
											02-Dec-10	18-Dec-10		
C015098PW1	C015098 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	12	11	10-Aug-10	11-Nov-10		Iron
											28-Aug-10	02-Oct-10		Iron
											13-Sep-10	11-Nov-10		Iron
											19-Sep-10	08-Feb-11		Iron
											10-Oct-10	26-Oct-10		Iron
											20-Oct-10			Iron
											30-Oct-10	18-Nov-10		IRON
											03-Dec-10	18-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C015098PW1	C015098 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	12	11	**13-Sep-11**	30-Nov-11		IRON, TOTAL
											19-Dec-11	20-Jan-12		
C016277A	C016277 [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	06-Sep-10	Prior to Sale or Occupation	9	9	**07-Aug-10**	19-Aug-10		Iron
											08-Sep-10	05-Oct-10		Iron
											23-Oct-10	12-Nov-10		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL
											30-Nov-10	15-Dec-10		IRON, TOTAL
											07-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											06-Apr-11	26-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, TITANIUM
											19-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		IRON, TOTAL
C0173A0PW1	C0173A0 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	29-Aug-10	Prior to Sale or Occupation	12	11	**05-Aug-10**	20-Aug-10		
											20-Sep-10	01-Nov-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0173A0PW1	C0173A0 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	29-Aug-10	Prior to Sale or Occupation	12	11	**24-Jan-11**	17-Feb-11		IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											06-Apr-11	26-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											19-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											14-Sep-11	30-Nov-11		IRON, TOTAL
											19-Jan-12	09-Feb-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0179BEPW1	C0179BE [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	15-Sep-10	Prior to Sale or Occupation	12	11	**27-Jul-10**	21-Aug-10		
											13-Oct-10	13-Nov-10		
											23-Oct-10	14-Jan-11		
											05-Nov-10	09-Dec-10		
											01-Dec-10	15-Dec-10		NICKEL, TOTAL
											24-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Feb-11	07-Mar-11		MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											17-Nov-11	18-Jan-12		
											24-Feb-12	16-Mar-12		
C01855AA	C01855A [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.25	Unattended Permission, Anytime	23-Sep-10	Prior to Sale or Occupation	12	12	**10-Aug-10**	23-Aug-10		
											23-Sep-10	07-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01855AA	C01855A [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.25	Unattended Permission, Anytime	23-Sep-10	Prior to Sale or Occupation	12	12	**05-Oct-10**	20-Oct-10		
											16-Oct-10	28-Oct-10		Nickel
											29-Oct-10	04-Dec-10		
											11-Nov-10	09-Dec-10		
											29-Nov-10	10-Dec-10		
											12-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											11-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											11-Jul-11	21-Jul-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C01932EA	C01932E [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	01-Sep-10	Prior to Sale or Occupation	18	17	**07-Aug-10**	01-Sep-10		Iron
											01-Sep-10	01-Nov-10		
											12-Sep-10	04-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01932EA	C01932E [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	01-Sep-10	Prior to Sale or Occupation	18	17	**03-Oct-10**	07-Jan-11		
											16-Oct-10	26-Oct-10		
											30-Oct-10	18-Nov-10		
											01-Dec-10	06-Jan-11		
											12-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											31-Jan-11	02-Mar-11		MOLYBDENUM, NICKEL, TOTAL
											28-Feb-11	23-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Jun-11	22-Jun-11		MOLYBDENUM, TITANIUM
											14-Jul-11	02-Aug-11		MOLYBDENUM, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01932EA	C01932E [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	01-Sep-10	Prior to Sale or Occupation	18	17	**08-Aug-11**	11-Sep-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C019930PW1	C019930 [redacted]	[redacted]	Galesburg MI	Kalamazoo	33.5	Unattended Permission, Anytime	23-Oct-10	Prior to Sale or Occupation	8	8	**08-Aug-10**	01-Sep-10		Iron
											23-Oct-10	12-Nov-10		IRON
											04-Nov-10	23-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											10-Jan-11	16-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											31-Jan-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											28-Feb-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											16-Jan-12	09-Feb-12		
C0208B6A	C0208B6 [redacted]	[redacted]	Ceresco MI	Calhoun	7.25	Unattended Permission, Anytime	24-Sep-10	Prior to Sale or Occupation	14	12	**27-Jul-10**	01-Sep-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0208B6A	C0208B6 [redacted]	[redacted]	Ceresco MI	Calhoun	7.25	Unattended Permission, Anytime	24-Sep-10	Prior to Sale or Occupation	14	12	31-Jul-10	01-Sep-10		
											24-Sep-10	07-Oct-10		Iron
											06-Oct-10	01-Nov-10		Iron, Naphthalene
											16-Oct-10	28-Oct-10		Iron, Naphthalene
											30-Oct-10			IRON, NAPHTHALENE
											11-Nov-10			IRON, TOTAL, NAPHTHALENE
											29-Nov-10	10-Dec-10		IRON, TOTAL
											16-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											03-Jan-11	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											18-Oct-11	18-Jan-12		IRON, TOTAL
											18-Jan-12	09-Feb-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0218F7PW1	C0218F7 [redacted]	[redacted]	Marshall MI	Calhoun	2.25	Permit but Call/Schedule Required	01-Sep-10	Prior to Sale or Occupation	7	7	**27-Jul-10**	01-Nov-10		
											31-Jul-10	01-Nov-10		
											15-Sep-10	04-Oct-10		Iron
											22-Sep-10	13-Oct-10		Iron
											06-Nov-10	04-Dec-10		IRON
											17-Nov-11	14-Dec-11		IRON, TOTAL
											23-Feb-12	16-Mar-12		
C0227A5A	C0227A5 [redacted]	[redacted]ve	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	12	12	**07-Aug-10**	21-Sep-10		
											28-Aug-10	04-Oct-10		
											13-Sep-10	14-Oct-10		
											21-Sep-10	14-Oct-10		
											10-Oct-10	28-Oct-10		
											21-Oct-10	12-Nov-10		
											02-Nov-10	19-Nov-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0227A5A	C0227A5 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	12	12	02-Dec-10	18-Dec-10		IRON, TOTAL
											19-Jan-11	15-Feb-11		NICKEL, TOTAL, VANADIUM, TOTAL
											04-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											04-May-11	17-May-11		IRON, TOTAL, VANADIUM, TOTAL
											08-Aug-11	11-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
C024080PW1	C024080 [redacted]	[redacted]	Marshall MI	Calhoun	3	Permit but Call/Schedule Required	06-Sep-10	Prior to Sale or Occupation	10	9	08-Sep-10	03-Nov-10		Iron
											14-Dec-10	26-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											18-Jan-11	10-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											31-Jan-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											15-Feb-11	09-Mar-11		IRON, TOTAL, MOLYBDENUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C024080PW1	C024080 [redacted]	[redacted]	Marshall MI	Calhoun	3	Permit but Call/Schedule Required	06-Sep-10	Prior to Sale or Occupation	10	9	02-Mar-11	25-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Sep-11	29-Nov-11		IRON, TOTAL
											16-Dec-11	20-Jan-12		
C02433AWP1	C02433A [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	04-Sep-10	Prior to Sale or Occupation	11	10	04-Sep-10	13-Oct-10		
											17-Sep-10	13-Oct-10		Iron
											06-Oct-10			Iron
											15-Oct-10	26-Oct-10		Iron
											29-Oct-10	07-Jan-11		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											24-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Feb-11	03-Mar-11		IRON, TOTAL, MERCURY, TOTAL, TITANIUM, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C02433AWP1	C02433A [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	04-Sep-10	Prior to Sale or Occupation	11	10	**09-May-11**	26-May-11		IRON, TOTAL, TITANIUM
											11-Aug-11	29-Aug-11		IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											23-Feb-12	16-Mar-12		
C0248B2PW1	C0248B2 [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Permit but Call/Schedule Required	06-Sep-10	Prior to Sale or Occupation	11	11	**08-Sep-10**	13-Oct-10		Iron
											17-Sep-10	07-Oct-10		Iron
											06-Oct-10	20-Oct-10		Iron
											16-Oct-10	22-Nov-10		Iron
											06-Nov-10	23-Nov-10		IRON
											03-Dec-10	18-Dec-10		IRON, TOTAL
											12-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											08-Apr-11	05-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											14-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											19-Oct-11	08-Dec-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0248B2PW1	C0248B2 [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Permit but Call/Schedule Required	06-Sep-10	Prior to Sale or Occupation	11	11	16-Jan-12	09-Feb-12		
C0250C1WP1	C0250C1 [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Unattended Permission, Anytime		Prior to Sale or Occupation	10	8	**18-Oct-10**			Iron
											30-Oct-10	18-Nov-10		IRON
											03-Dec-10			IRON, TOTAL
											12-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											31-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											28-Feb-11	23-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											15-Dec-11	20-Jan-12		
C0286B9PW1	C0286B9 [redacted]	[redacted]	Marshall MI	Calhoun	1	Permit but Call/Schedule Required	24-Sep-10	Prior to Sale or Occupation	1	1	01-Mar-12	16-Mar-12		
C0292E1A	C0292E1 [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Permit but Call/Schedule Required	31-Aug-10	Prior to Sale or Occupation	8	7	**12-Aug-10**	01-Sep-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0292E1A	C0292E1 [redacted]	[redacted]	Marshall MI	Calhoun	1.5	Permit but Call/Schedule Required	31-Aug-10	Prior to Sale or Occupation	8	7	**31-Aug-10**	13-Oct-10		Iron
											22-Sep-10	13-Oct-10		Iron
											01-Oct-10			Iron
											14-Oct-10	26-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											16-Dec-11	20-Jan-12		
C0300B3WP1	C0300B3 [redacted]	[redacted]	Galesburg MI	Kalamazoo	33.25	Unattended Permission, Anytime	07-Sep-10	Prior to Sale or Occupation	7	7	**09-Sep-10**	16-Oct-10		Iron
											23-Oct-10	12-Nov-10		IRON
											29-Oct-10	04-Dec-10		IRON
											06-Nov-10	03-Dec-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											15-Dec-10	26-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0300B3WP1	C0300B3 [redacted]	[redacted]	Galesburg MI	Kalamazoo	33.25	Unattended Permission, Anytime	07-Sep-10	Prior to Sale or Occupation	7	7	10-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
C0304AAPW1	C0304AA [redacted]	[redacted]	Battle Creek MI	Calhoun	13.75	Unattended Permission, Anytime	29-Sep-10	Prior to Sale or Occupation	12	10	04-Sep-10	13-Oct-10		
											29-Sep-10	20-Oct-10		Iron
											12-Oct-10	26-Oct-10		Iron
											23-Oct-10	13-Jan-11	ETHYLBENZENE, M-P-XYLENE, O-XYLENE (1,2-DIMETHYLBENZENE)	IRON
											07-Nov-10			IRON
											03-Dec-10	18-Dec-10		IRON, TOTAL
											06-Jan-11	24-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											02-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM
											04-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C033469WP1	C033469 [redacted]	[redacted]	Augusta MI	Kalamazoo	28.25	Unattended Permission, Anytime	05-Sep-10	Prior to Sale or Occupation	7	6	08-Sep-10	21-Oct-10		Iron
											18-Sep-10	14-Oct-10		Iron
											08-Oct-10	26-Oct-10		Iron
											19-Oct-10			Iron
											05-Nov-10	09-Dec-10		IRON, TOTAL
											02-Dec-10	20-Dec-10		IRON, TOTAL
											14-Jan-11	17-Feb-11		IRON, TOTAL, TITANIUM
C0335FFWP1	C0335FF [redacted]	[redacted]	Augusta MI	Kalamazoo	27.5	Permit but Call/Schedule Required	29-Aug-10	Prior to Sale or Occupation	8	8	03-Oct-10	16-Nov-10		Iron
											27-Oct-10	14-Jan-11		IRON
											05-Nov-10	10-Dec-10		IRON, TOTAL
											02-Dec-10	18-Dec-10		IRON, TOTAL
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											12-Sep-11	29-Nov-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0335FFWP1	C0335FF [redacted]	[redacted]	Augusta MI	Kalamazoo	27.5	Permit but Call/Schedule Required	29-Aug-10	Prior to Sale or Occupation	8	8	15-Dec-11	20-Jan-12		
C033645WP1	C033645 [redacted]	[redacted]	Augusta MI	Kalamazoo	27.25	Unattended Permission, Anytime	12-Sep-10	Prior to Sale or Occupation	8	7	12-Sep-10			Iron
											27-Oct-10	14-Jan-11		IRON
											06-Nov-10	03-Dec-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											10-Jan-11	15-Feb-11		IRON, TOTAL, TITANIUM
											04-Feb-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											08-Aug-11	18-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
C0375FBWP1	C0375FB [redacted]	[redacted]	Battle Creek MI	Calhoun	12	Unattended Permission, Anytime	04-Sep-10	Prior to Sale or Occupation	12	12	24-Aug-10	14-Oct-10		Iron
											04-Sep-10	14-Oct-10		
											19-Sep-10	27-Oct-10		Iron
											11-Oct-10	26-Oct-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
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Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0375FBWP1	C0375FB [redacted]	[redacted]	Battle Creek MI	Calhoun	12	Unattended Permission, Anytime	04-Sep-10	Prior to Sale or Occupation	12	12	21-Oct-10	12-Nov-10		IRON
											01-Nov-10	19-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											05-May-11	17-May-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											22-Feb-12	16-Mar-12		
C0384A2WP1	C0384A2 [redacted]	[redacted]	Ceresco MI	Calhoun	5.75	Permit but Call/Schedule Required	05-Sep-10	Prior to Sale or Occupation	6	6	05-Sep-10	13-Oct-10		Iron
											21-Sep-10	13-Oct-10		Iron
											06-Oct-10	26-Oct-10		Iron
											15-Oct-10	28-Oct-10		Iron
											29-Oct-10	07-Jan-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0384A2WP1	C0384A2 [redacted]	[redacted]	Ceresco MI	Calhoun	5.75	Permit but Call/Schedule Required	05-Sep-10	Prior to Sale or Occupation	6	6	**02-Dec-10**	18-Dec-10		IRON, TOTAL
C038718WP1	C038718 [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Permit but Call/Schedule Required	21-Sep-10	Prior to Sale or Occupation	7	6	**11-Sep-10**	13-Oct-10		
											21-Sep-10	07-Jan-11		
											02-Oct-10			
											15-Oct-10	28-Oct-10		
											29-Oct-10	11-Jan-11		
											30-Nov-10	15-Dec-10		NICKEL, TOTAL
											24-Feb-12	16-Mar-12		
C043756WP1	C043756 [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime	07-Sep-10	Prior to Sale or Occupation	11	11	**09-Sep-10**	13-Oct-10		Iron
											21-Sep-10	13-Oct-10		Iron
											12-Oct-10	26-Oct-10		Iron
											22-Oct-10	12-Nov-10		IRON
											06-Nov-10	20-Dec-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C043756WP1	C043756 [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime	07-Sep-10	Prior to Sale or Occupation	11	11	**05-Jan-11**	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											19-Oct-11	08-Dec-11		
											19-Jan-12	09-Feb-12		
C044607PW1	C044607 [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Permit but Call/Schedule Required	08-Sep-10	Prior to Sale or Occupation	8	8	**09-Sep-10**	13-Oct-10		Iron
											21-Sep-10	13-Oct-10		Iron
											12-Oct-10	26-Oct-10		Iron
											22-Oct-10	12-Nov-10		IRON
											06-Nov-10	29-Nov-10		IRON
											06-Dec-10	18-Dec-10		IRON, TOTAL
											14-Sep-11	30-Nov-11		IRON, TOTAL
											19-Jan-12	09-Feb-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0470F1PW1	C0470F1 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	26-Aug-10	Prior to Sale or Occupation	11	11	**04-Sep-10**	13-Oct-10		
											21-Sep-10	13-Oct-10		Iron
											10-Oct-10	28-Oct-10		Iron
											21-Oct-10	12-Nov-10		IRON
											07-Nov-10	29-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											24-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											08-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											04-May-11	25-May-11		IRON, TOTAL, NICKEL, TOTAL
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											20-Feb-12	16-Mar-12		
C04757EWP1	C04757E [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Permit but Call/Schedule Required	07-Sep-10	Prior to Sale or Occupation	6	6	**07-Sep-10**	13-Oct-10		
											21-Sep-10	13-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C04757EWP1	C04757E [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Permit but Call/Schedule Required	07-Sep-10	Prior to Sale or Occupation	6	6	10-Oct-10	28-Oct-10		
											21-Oct-10	12-Nov-10		
											07-Nov-10	29-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
C053154PW1	C053154 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Permit but Call/Schedule Required	04-Sep-10	Prior to Sale or Occupation	3	2	09-Oct-10	28-Oct-10		Iron
											20-Oct-10			Iron
											30-Oct-10	18-Nov-10		IRON
C0568B5PW1	C0568B5 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	06-Sep-10	Prior to Sale or Occupation	12	11	08-Sep-10	13-Oct-10		Iron
											19-Sep-10	13-Oct-10		Iron
											01-Oct-10			Iron
											15-Oct-10	26-Oct-10		Iron
											29-Oct-10	03-Dec-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											24-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0568B5PW1	C0568B5 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	06-Sep-10	Prior to Sale or Occupation	12	11	**11-Feb-11**	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											17-Nov-11	18-Jan-12		IRON, TOTAL
											24-Feb-12	16-Mar-12		
C0601CEWP1	C0601CE [redacted]	[redacted]	Battle Creek MI	Calhoun	10.5	Unattended Permission, Anytime	11-Oct-10	Prior to Sale or Occupation	16	14	**20-Oct-10**	26-Jan-11		Iron
											01-Nov-10	19-Nov-10		IRON
											12-Nov-10	29-Mar-11		IRON, NICKEL
											17-Jan-11	10-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, VANADIUM, TOTAL
											27-Jan-11	02-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											15-Feb-11	09-Mar-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0601CEWP1	C0601CE [redacted]	[redacted]	Battle Creek MI	Calhoun	10.5	Unattended Permission, Anytime	11-Oct-10	Prior to Sale or Occupation	16	14	03-Mar-11	25-Mar-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											04-Apr-11	26-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											05-May-11	17-May-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											13-Sep-11	30-Nov-11		IRON, TOTAL
											20-Dec-11	20-Jan-12		
C0603E2WP1	C0603E2 [redacted]	[redacted]	Battle Creek MI	Calhoun	10	Permit but Call/Schedule Required	14-Sep-10	Prior to Sale or Occupation	4	3	30-Aug-10	15-Oct-10		Iron
											14-Sep-10			Iron
											13-Sep-11	30-Nov-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0603E2WP1	C0603E2 10-016-021-00	[redacted]	Battle Creek MI	Calhoun	10	Permit but Call/Schedule Required	14-Sep-10	Prior to Sale or Occupation	4	3	20-Dec-11	20-Jan-12		
C060441WP1	C060441 [redacted]	[redacted]	Battle Creek MI	Calhoun	10	Permit but Call/Schedule Required	25-Sep-10	Prior to Sale or Occupation	4	4	**04-Sep-10**	13-Oct-10		
											19-Sep-10	13-Oct-10		Iron
											13-Sep-11	30-Nov-11		IRON, TOTAL
											20-Dec-11	20-Jan-12		
C0605D7WP1	C0605D7 [redacted]	[redacted]	Battle Creek MI	Calhoun	10	Permit but Call/Schedule Required		Prior to Sale or Occupation	4	4	**06-Dec-10**	20-Dec-10		IRON, TOTAL
											17-Jan-11	10-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											13-Sep-11	30-Nov-11		IRON, TOTAL
											20-Dec-11	20-Jan-12		
C06827CA	C06827C [redacted]	[redacted]	Battle Creek MI	Calhoun	12.25	Unattended Permission, Anytime	28-Oct-10	Prior to Sale or Occupation	6	6	**19-Aug-10**	06-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											02-Dec-10	20-Dec-10		IRON, TOTAL, NICKEL, TOTAL
											06-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C06827CA	C06827C [redacted]	[redacted]	Battle Creek MI	Calhoun	12.25	Unattended Permission, Anytime	28-Oct-10	Prior to Sale or Occupation	6	6	**07-Feb-11**	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											05-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
C07313APW1	C07313A [redacted]	[redacted]	Galesburg MI	Kalamazoo		Unattended Permission, Anytime	15-Sep-10	Prior to Sale or Occupation	8	6	**15-Sep-10**			Iron
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											14-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											08-Aug-11	11-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-Sep-11	29-Nov-11		IRON, TOTAL, NICKEL, TOTAL
											15-Dec-11	20-Jan-12		
C0789C3PW1	C0789C3 [redacted]	[redacted]	Augusta MI	Kalamazoo	26.75	Permit but Call/Schedule Required	06-Sep-10	Prior to Sale or Occupation	4	4	**07-Dec-10**	20-Dec-10		IRON, TOTAL
											17-Jan-11	10-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											14-Nov-11	14-Dec-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0789C3PW1	C0789C3 [redacted]	[redacted]	Augusta MI	Kalamazoo	26.75	Permit but Call/Schedule Required	06-Sep-10	Prior to Sale or Occupation	4	4	20-Feb-12	16-Mar-12		
C0872B9PW2	C0872B9 [redacted]	[redacted]	Augusta MI	Kalamazoo	26.75	Unattended Permission, Anytime	29-Aug-10	Prior to Sale or Occupation	8	8	04-Sep-10	28-Oct-10		
											18-Sep-10	16-Nov-10		
											08-Oct-10	26-Oct-10		
											02-Dec-10	08-Feb-11		IRON, TOTAL
											13-Jan-11	15-Feb-11		IRON, TOTAL, VANADIUM, TOTAL
											07-Apr-11	02-May-11		IRON, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											17-Oct-11	14-Dec-11		
C090249WP1	C090249 [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.25	Unattended Permission, Anytime	26-Sep-10	Prior to Sale or Occupation	11	10	04-Oct-10	16-Nov-10		
											13-Oct-10	16-Nov-10		
											23-Oct-10	12-Nov-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C090249WP1	C090249 [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.25	Unattended Permission, Anytime	26-Sep-10	Prior to Sale or Occupation	11	10	**06-Nov-10**	03-Dec-10		
											01-Dec-10	15-Dec-10		
											12-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											11-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											11-Jul-11	21-Jul-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		IRON, TOTAL
											16-Jan-12	09-Feb-12		
											12-Jul-12			
C0947C2WP1	C0947C2 [redacted]	[redacted]	Marshall MI	Calhoun	2	Permit but Call/Schedule Required	05-Oct-10	Prior to Sale or Occupation	4	4	**02-Nov-10**	30-Nov-10		IRON
											17-Nov-10	02-Dec-10		IRON
											29-Nov-10	28-Jan-11		IRON, TOTAL
											05-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
C107264WP1	C107264 [redacted]	[redacted]	Ceresco MI	Calhoun	6.5	Unattended Permission, Anytime	28-Oct-10	Prior to Sale or Occupation	8	6	01-Aug-10			

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C107264WP1	C107264 [redacted]	[redacted]	Ceresco MI	Calhoun	6.5	Unattended Permission, Anytime	28-Oct-10	Prior to Sale or Occupation	8	6	**28-Oct-10**	17-Nov-10		IRON
											11-Nov-10	09-Dec-10		IRON, TOTAL
											29-Nov-10	10-Dec-10		IRON, TOTAL
											20-Jan-11			IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											08-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											13-Sep-11	29-Nov-11		IRON, TOTAL, NICKEL, TOTAL
											22-Feb-12	16-Mar-12		
C1426E4WP1	C1426E4 [redacted]	[redacted]	Battle Creek MI	Calhoun	21	Unattended Permission, Anytime	27-Oct-10	Prior to Sale or Occupation	9	10	**27-Oct-10**	14-Jan-11		IRON
											03-Nov-10	19-Nov-10		IRON
											03-Nov-10	12-Jan-11		IRON
											19-Nov-10	13-Dec-10		IRON, TOTAL
											02-Dec-10	20-Dec-10		IRON, TOTAL
											19-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											01-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C1426E4WP1	C1426E4 [redacted]	[redacted]	Battle Creek MI	Calhoun	21	Unattended Permission, Anytime	27-Oct-10	Prior to Sale or Occupation	9	10	**05-May-11**	17-May-11		IRON, TOTAL, VANADIUM, TOTAL
											10-Aug-11	24-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											21-Feb-12	16-Mar-12		
C0002C6A	C0002C6 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	25-Sep-10	Quarterly 2	13	13	**03-Aug-10**	13-Nov-10		
											25-Sep-10	07-Oct-10		Iron
											25-Oct-10	12-Nov-10		IRON
											29-Oct-10	07-Jan-11		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Feb-11	03-Mar-11		IRON, TOTAL, TITANIUM, VANADIUM, TOTAL
											09-May-11	26-May-11		IRON, TOTAL, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0002C6A	C0002C6 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	25-Sep-10	Quarterly 2	13	13	**16-Nov-11**	14-Dec-11		IRON, TOTAL
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		
C0029CCWP1	C0029CC [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	08-Sep-10	Quarterly 2	15	15	**03-Aug-10**	25-Aug-10		
											10-Sep-10	01-Oct-10		Iron
											12-Sep-10	01-Oct-10		
											25-Oct-10	12-Nov-10		
											29-Oct-10	07-Jan-11		
											30-Nov-10	15-Dec-10		
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, VANADIUM, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											01-Mar-11	25-Mar-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0029CCWP1	C0029CC [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	08-Sep-10	Quarterly 2	15	15	**04-Apr-11**	26-Apr-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											10-Jun-11	22-Jun-11		IRON, TOTAL, TITANIUM
											13-Sep-11	29-Nov-11		
											16-Dec-11	20-Jan-12		
											25-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		
C005315A	C005315 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Restricted Times	25-Oct-10	Quarterly 2	12	12	**01-Aug-10**	25-Aug-10		
											25-Oct-10	12-Nov-10		
											29-Oct-10	07-Jan-11		
											30-Nov-10	15-Dec-10		
											26-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Feb-11	03-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											09-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C005315A	C005315 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Restricted Times	25-Oct-10	Quarterly 2	12	12	**11-Aug-11**	29-Aug-11		IRON, TOTAL, MERCURY, TOTAL, NICKEL, TOTAL
											16-Nov-11	14-Dec-11		
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C011485A	C011485 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	19-Sep-10	Quarterly 2	14	14	**03-Aug-10**	25-Aug-10		
											19-Sep-10	08-Feb-11		Iron
											06-Oct-10	20-Oct-10		Iron
											16-Oct-10	28-Oct-10		Iron
											30-Oct-10	18-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											21-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											09-May-11	26-May-11		IRON, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C011485A	C011485 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	19-Sep-10	Quarterly 2	14	14	**11-Aug-11**	29-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											16-Nov-11	14-Dec-11		IRON, TOTAL
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		
C0223BCA	C0223BC [redacted]	[redacted]	Marshall MI	Calhoun	0.5	Unattended Permission, Anytime		Quarterly 2	13	10	**07-Aug-10**	25-Aug-10		Iron
											01-Nov-10	07-Jan-11		IRON
											01-Dec-10	06-Jan-11		IRON, TOTAL
											07-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											11-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	25-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0223BCA	C0223BC [redacted]	[redacted]	Marshall MI	Calhoun	0.5	Unattended Permission, Anytime		Quarterly 2	13	10	**15-Aug-11**	14-Sep-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											18-Nov-11			IRON, TOTAL
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C0254D8	C0254D8 [redacted]	[redacted]	Ceresco MI	Calhoun	7.5	Unattended Permission, Anytime	05-Sep-10	Quarterly 2	11	11	**05-Sep-10**	07-Oct-10		Iron
											24-Oct-10	12-Nov-10		IRON
											06-Nov-10	03-Dec-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											06-Jan-11	24-Jan-11		IRON, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0254D8	C0254D8 [redacted]	[redacted]	Ceresco MI	Calhoun	7.5	Unattended Permission, Anytime	05-Sep-10	Quarterly 2	11	11	**18-Oct-11**	18-Jan-12		IRON, TOTAL
											18-Jan-12	09-Feb-12		
											26-Jun-12	24-Jul-12		
											20-Sep-12	26-Oct-12		
C0273F9WP1	C0273F9 [redacted]	[redacted]	Ceresco MI	Calhoun	6.5	Unattended Permission, Anytime	03-Oct-10	Quarterly 2	15	14	**01-Sep-10**	01-Nov-10	Toluene	Iron
											03-Oct-10	27-Oct-10	Toluene	Iron
											24-Oct-10	30-Nov-10		IRON
											05-Nov-10		ETHYLBENZENE, TOLUENE	
											17-Nov-10	02-Dec-10		IRON
											29-Nov-10	10-Dec-10		IRON, TOTAL
											14-Dec-10	26-Jan-11		IRON, TOTAL, MOLYBDENUM, VANADIUM, TOTAL
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0273F9WP1	C0273F9 [redacted]	[redacted]	Ceresco MI	Calhoun	6.5	Unattended Permission, Anytime	03-Oct-10	Quarterly 2	15	14	**08-Feb-11**	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-May-11	02-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, NICKEL, TOTAL
											16-Nov-11	14-Dec-11		IRON, TOTAL
											22-Feb-12	16-Mar-12		
											26-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C030309WP1	C030309 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	08-Sep-10	Quarterly 2	15	15	**10-Sep-10**	13-Oct-10		
											11-Sep-10	13-Oct-10		
											20-Sep-10	13-Oct-10		
											06-Oct-10	20-Oct-10		
											15-Oct-10	28-Oct-10		
											29-Oct-10	07-Jan-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C030309WP1	C030309 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	08-Sep-10	Quarterly 2	15	15	**30-Nov-10**	15-Dec-10		
											26-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Feb-11	03-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											09-May-11	26-May-11		IRON, TOTAL, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											16-Nov-11	14-Dec-11		
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		
C0314EBWP1	C0314EB [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit but Call/Schedule Required	12-Oct-10	Quarterly 2	4	4	**15-Oct-10**	26-Oct-10		Iron
											12-Nov-10	02-Dec-10		IRON
											29-Nov-10	10-Dec-10		IRON, TOTAL
											19-Oct-11	07-Dec-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C031751PW1	C031751 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	26-Aug-10	Quarterly 2	12	11	28-Aug-10	01-Nov-10		Iron
											11-Sep-10			Iron
											24-Oct-10	30-Nov-10		IRON
											06-Nov-10	29-Nov-10		IRON, NICKEL
											30-Nov-10	15-Dec-10		IRON, TOTAL
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											09-May-11	26-May-11		IRON, TOTAL, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											16-Nov-11	14-Dec-11		
											25-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		
C0377D7A	C0377D7 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	25-Sep-10	Quarterly 2	15	14	15-Aug-10	02-Sep-10		
											28-Aug-10	01-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0377D7A	C0377D7 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	25-Sep-10	Quarterly 2	15	14	**25-Sep-10**	07-Oct-10		Iron
											06-Oct-10	20-Oct-10		Iron
											20-Oct-10			Iron
											06-Nov-10	29-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											09-May-11	26-May-11		IRON, TOTAL, TITANIUM
											16-Aug-11	29-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											16-Nov-11	14-Dec-11		
											22-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C03868EWP1	C03868E [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	04-Sep-10	Quarterly 2	13	13	04-Sep-10	13-Oct-10		
											21-Sep-10	07-Jan-11		
											06-Oct-10	20-Oct-10		
											15-Oct-10	01-Nov-10		
											29-Oct-10	07-Jan-11		
											30-Nov-10	15-Dec-10		
											21-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											10-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											12-May-11	02-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											11-Aug-11	29-Aug-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											16-Nov-11	18-Jan-12		
											25-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C07198APW1	C07198A [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Permit but Call/Schedule Required	04-Oct-10	Quarterly 2	10	9	08-Aug-10			
											04-Oct-10	16-Oct-10		Iron
											15-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											31-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											28-Feb-11	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL
											15-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, TITANIUM
											18-Oct-11	02-Dec-11		IRON, TOTAL
											21-Dec-11	20-Jan-12		
											17-Apr-12	16-May-12		
											27-Sep-12	26-Oct-12		
C086970PW1	C086970 [redacted]	Augusta Municipal Wells	Augusta MI	Kalamazoo	28.75	Permit but Call/Schedule Required	27-Oct-10	Quarterly 2	18	17	**27-Oct-10**	14-Jan-11		IRON
											03-Nov-10	04-Dec-10		IRON
											18-Nov-10	21-Jan-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C086970PW1	C086970 [redacted]	Augusta Municipal Wells	Augusta MI	Kalamazoo	28.75	Permit but Call/Schedule Required	27-Oct-10	Quarterly 2	18	17	02-Dec-10	18-Dec-10		IRON, TOTAL
											10-Jan-11	19-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											04-Feb-11	09-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											01-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											04-May-11	17-May-11		IRON, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											19-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											11-Aug-11	29-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											14-Sep-11	28-Nov-11		IRON, TOTAL
											15-Dec-11	20-Jan-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C086970PW1	C086970 [redacted]	Augusta Municipal Wells	Augusta MI	Kalamazoo	28.75	Permit but Call/Schedule Required	27-Oct-10	Quarterly 2	18	17	24-Apr-12	16-May-12		
											26-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C086970PW2	C086970 [redacted]	Augusta Municipal Wells	Augusta MI	Kalamazoo	28.75	Permit but Call/Schedule Required	27-Oct-10	Quarterly 2	17	17	**27-Oct-10**	14-Jan-11		IRON
											03-Nov-10	04-Dec-10		IRON
											18-Nov-10	09-Dec-10		IRON, TOTAL
											02-Dec-10	18-Dec-10		IRON, TOTAL
											10-Jan-11	19-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											04-Feb-11	09-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											01-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C086970PW2	C086970 [redacted]	Augusta Municipal Wells	Augusta MI	Kalamazoo	28.75	Permit but Call/Schedule Required	27-Oct-10	Quarterly 2	17	17	**04-May-11**	17-May-11		IRON, TOTAL, NICKEL, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											19-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											11-Aug-11	29-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Sep-11	28-Nov-11		IRON, TOTAL
											15-Dec-11	20-Jan-12		
											24-Apr-12	16-May-12		
											26-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C0881CCWP1	C0881CC [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	02-Oct-10	Quarterly 2	13	12	**04-Oct-10**	20-Oct-10		Iron
											16-Oct-10	26-Oct-10		Iron
											30-Oct-10	18-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0881CCWP1	C0881CC [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	02-Oct-10	Quarterly 2	13	12	**21-Jan-11**	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											09-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											11-Aug-11	29-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											16-Nov-11	14-Dec-11		IRON, TOTAL
											23-Feb-12	16-Mar-12		
											26-Jun-12	24-Jul-12		
											18-Sep-12	26-Oct-12		
C088276WP1	C088276 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit but Call/Schedule Required	12-Oct-10	Quarterly 2	9	9	**13-Oct-10**	13-Nov-10		Iron
											22-Oct-10	12-Nov-10		IRON
											06-Nov-10	29-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											21-Jan-11	15-Feb-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C088276WP1	C088276 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit but Call/Schedule Required	12-Oct-10	Quarterly 2	9	9	**10-Feb-11**	07-Mar-11		IRON, TOTAL, TITANIUM
											02-Mar-11	23-Mar-11		IRON, TOTAL
											19-Oct-11	07-Dec-11		
											26-Jun-12	24-Jul-12		
C0889FEWP1	C0889FE [redacted]	[redacted]	Galesburg MI	Kalamazoo	38	Permit but Call/Schedule Required		Quarterly 2	11	11	**01-Dec-10**	21-Dec-10		IRON, TOTAL
											15-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											04-Jan-11	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											04-Feb-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											01-Mar-11	29-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											15-Sep-11	28-Nov-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0889FEWP1	C0889FE [redacted]	[redacted]	Galesburg MI	Kalamazoo	38	Permit but Call/Schedule Required		Quarterly 2	11	11	18-Jan-12	09-Feb-12		
											24-Apr-12	16-May-12		
											26-Jun-12	24-Jul-12		
											19-Sep-12	02-Nov-12		
C0955AFPW1	C0955AF [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit But Call First		Quarterly 2						
C10619FWP1	C10619F [redacted]	[redacted]	Ceresco MI	Calhoun	8	Unattended Permission, Anytime	09-Oct-10	Quarterly 2	23	20	**30-Aug-10**	28-Oct-10		Iron
											31-Aug-10	06-Oct-10		Iron
											12-Oct-10	28-Oct-10	Toluene	Iron
											22-Oct-10		TOLUENE	IRON
											04-Nov-10		TOLUENE	IRON
											17-Nov-10	02-Dec-10	TOLUENE	IRON
											29-Nov-10	11-Dec-10	TOLUENE	IRON, TOTAL
											16-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells

Enbridge Line 6B MP 608 Marshall, MI Pipeline Release

Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C10619FWP1	C10619F [redacted]	[redacted]	Ceresco MI	Calhoun	8	Unattended Permission, Anytime	09-Oct-10	Quarterly 2	23	20	**03-Jan-11**	26-Jan-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											17-Jan-11	10-Mar-11	TOLUENE	IRON, TOTAL
											27-Jan-11	02-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											15-Feb-11	09-Mar-11		IRON, TOTAL, MOLYBDENUM
											03-Mar-11	29-Mar-11	TOLUENE	IRON, TOTAL, MOLYBDENUM
											04-Apr-11	26-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											12-May-11	02-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											18-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											12-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C10619FWP1	C10619F [redacted]	[redacted]	Ceresco MI	Calhoun	8	Unattended Permission, Anytime	09-Oct-10	Quarterly 2	23	20	**14-Sep-11**	29-Nov-11		IRON, TOTAL
											16-Dec-11	20-Jan-12		
											26-Jun-12	24-Jul-12		
											20-Sep-12	26-Oct-12		
C135093WP1	C135093 [redacted]	[redacted]	Marshall MI	Calhoun	0.25	Unattended Permission, Anytime	11-Oct-10	Quarterly 2	13	11	19-Aug-10			
											11-Oct-10	26-Oct-10		
											21-Oct-10	13-Dec-10		
											06-Nov-10	17-Feb-11		
											01-Dec-10	15-Dec-10		
											26-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											11-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C135093WP1	C135093 [redacted]	[redacted]	Marshall MI	Calhoun	0.25	Unattended Permission, Anytime	11-Oct-10	Quarterly 2	13	11	**18-Nov-11**			
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C152569WP1	C152569 [redacted]	[redacted]	Ceresco MI	Calhoun	7.25	Unattended Permission, Anytime		Quarterly 2	11	11	**17-Nov-10**	02-Dec-10		IRON
											29-Nov-10	13-Dec-10		IRON, TOTAL
											16-Dec-10	26-Jan-11		IRON, TOTAL, VANADIUM, TOTAL
											06-Jan-11	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											12-May-11	02-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											16-Nov-11	14-Dec-11		IRON, TOTAL
											22-Feb-12	16-Mar-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C152569WP1	C152569 [redacted]	[redacted]	Ceresco MI	Calhoun	7.25	Unattended Permission, Anytime		Quarterly 2	11	11	26-Jun-12	24-Jul-12		
											20-Sep-12	26-Oct-12		
C1528D4PW1	C1528D4 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime		Quarterly 2	12	11	**11-Nov-10**	06-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											29-Nov-10	06-Jan-11		IRON, TOTAL
											14-Dec-10	26-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											03-Jan-11	26-Jan-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-May-11	02-Jun-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											12-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C1528D4PW1	C1528D4 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime		Quarterly 2	12	11	**16-Nov-11**	14-Dec-11		
											23-Feb-12	16-Mar-12		
											25-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C153895PW1	C153895 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit But Call First		Quarterly 2	16	15	**17-Nov-10**	02-Dec-10		IRON
											29-Nov-10	10-Dec-10		IRON, TOTAL
											14-Dec-10	26-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											21-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-Mar-11	25-Mar-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C153895PW1	C153895 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit But Call First		Quarterly 2	16	15	**04-Apr-11**	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											09-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											10-Jun-11	22-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											20-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											11-Aug-11	29-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											14-Sep-11	29-Nov-11		IRON, TOTAL
											16-Dec-11	20-Jan-12		
											25-Jun-12	24-Jul-12		
											19-Sep-12	26-Oct-12		
C000749A	C000749 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Permit but Call/Schedule Required	19-Nov-10	Semi-Annual	9	9	**06-Aug-10**	20-Aug-10		Iron
											17-Nov-10	13-Dec-10		IRON, NICKEL
											29-Nov-10	11-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C000749A	C000749 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Permit but Call/Schedule Required	19-Nov-10	Semi-Annual	9	9	**17-Jan-11**	10-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											27-Jan-11	02-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											15-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											15-Nov-11	14-Dec-11		IRON, TOTAL
											20-Feb-12	16-Mar-12		
C001311A	C001311 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	06-Sep-10	Semi-Annual	11	11	**31-Jul-10**	25-Aug-10		
											08-Sep-10	04-Oct-10		Iron
											27-Oct-10	14-Jan-11		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL
											01-Dec-10	15-Dec-10		IRON, TOTAL
											24-Jan-11	15-Feb-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C001311A	C001311 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	06-Sep-10	Semi-Annual	11	11	**10-Feb-11**	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											17-Nov-11	14-Dec-11		IRON, TOTAL
											24-Feb-12	16-Mar-12		
C0042C2A	C0042C2 [redacted]	[redacted]	Battle Creek MI	Calhoun	13.5	Unattended Permission, Anytime	23-Oct-10	Semi-Annual	10	10	**02-Aug-10**	25-Aug-10		
											29-Oct-10	04-Dec-10		
											11-Nov-10	13-Jan-11	M,P-XYLENES	IRON, TOTAL
											29-Nov-10	10-Dec-10		IRON, TOTAL
											16-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											06-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0042C2A	C0042C2 [redacted]	[redacted]	Battle Creek MI	Calhoun	13.5	Unattended Permission, Anytime	23-Oct-10	Semi-Annual	10	10	11-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											15-Jul-11	02-Aug-11		IRON, TOTAL
											17-Oct-11	08-Dec-11		IRON, TOTAL
											17-Jan-12	09-Feb-12		
C00474DA	C00474D [redacted]	[redacted]	Battle Creek MI	Calhoun	13.75	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	11	10	02-Aug-10	25-Aug-10		
											05-Aug-10	20-Aug-10		
											24-Oct-10	12-Nov-10		IRON
											02-Nov-10	19-Nov-10		IRON
											03-Dec-10	18-Dec-10		IRON, TOTAL
											04-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											11-Apr-11	02-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C00474DA	C00474D [redacted]	[redacted]	Battle Creek MI	Calhoun	13.75	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	11	10	**17-Oct-11**	08-Dec-11		IRON, TOTAL
											18-Jan-12	09-Feb-12		
C0048DCA	C0048DC [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	12	11	**10-Aug-10**	25-Aug-10		
											23-Sep-10	07-Oct-10		Iron
											07-Oct-10	26-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											04-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											08-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											15-Jul-11	02-Aug-11		IRON, TOTAL, VANADIUM, TOTAL
											17-Oct-11	14-Dec-11		
											17-Jan-12	09-Feb-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C00589DA	C00589D [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Semi-Annual	13	13	10-Aug-10	25-Aug-10		Iron
											28-Aug-10	02-Oct-10		Iron
											13-Sep-10	04-Oct-10		Iron
											21-Sep-10	08-Oct-10		Iron
											07-Oct-10	26-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											04-Jan-11	24-Jan-11		IRON, TOTAL
											08-Apr-11	02-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, TITANIUM
											15-Jul-11	02-Aug-11		IRON, TOTAL
											17-Oct-11	08-Dec-11		IRON, TOTAL
											17-Jan-12	09-Feb-12		

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Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C00856DA	C00856D [redacted]	[redacted]	Augusta MI	Kalamazoo	27.25	Unattended Permission, Anytime	07-Sep-10	Semi-Annual	14	14	04-Aug-10	25-Aug-10		
											07-Sep-10	05-Oct-10		Iron
											17-Sep-10	08-Feb-11		Iron
											08-Oct-10	26-Oct-10		Iron
											18-Oct-10	12-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											13-Jan-11	15-Feb-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											04-Feb-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											28-Feb-11	25-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM

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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C00856DA	C00856D [redacted]	[redacted]	Augusta MI	Kalamazoo	27.25	Unattended Permission, Anytime	07-Sep-10	Semi-Annual	14	14	**09-Jun-11**	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											12-Sep-11	29-Nov-11		IRON, TOTAL
											15-Dec-11	20-Jan-12		
C00928FA	C00928F [redacted]	[redacted]	Augusta MI	Kalamazoo	26.5	Unattended Permission, Anytime	27-Oct-10	Semi-Annual	10	10	**03-Aug-10**	23-Aug-10		
											31-Aug-10	05-Oct-10		
											27-Oct-10	14-Jan-11		
											05-Nov-10	09-Dec-10		IRON, TOTAL
											02-Dec-10	18-Dec-10		IRON, TOTAL
											13-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											07-Apr-11	02-May-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL

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Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C00928FA	C00928F [redacted]	[redacted]	Augusta MI	Kalamazoo	26.5	Unattended Permission, Anytime	27-Oct-10	Semi-Annual	10	10	**17-Oct-11**	08-Dec-11		
											17-Jan-12	09-Feb-12		
C0137BDA	C0137BD [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime	01-Sep-10	Semi-Annual	13	13	**08-Aug-10**	01-Sep-10		Iron
											01-Sep-10	05-Oct-10		Iron
											11-Sep-10	04-Oct-10		Iron
											20-Sep-10	08-Feb-11		Iron
											02-Oct-10	08-Feb-11		Iron
											16-Oct-10	28-Oct-10		Iron
											05-Nov-10	09-Dec-10		IRON, TOTAL
											30-Nov-10	15-Dec-10		IRON, TOTAL
											07-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											20-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0137BDA	C0137BD [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime	01-Sep-10	Semi-Annual	13	13	19-Oct-11	08-Dec-11		
											19-Jan-12	09-Feb-12		
C015322A	C015322 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	07-Sep-10	Semi-Annual	16	14	**05-Aug-10**			
											07-Sep-10	07-Oct-10		Iron
											13-Sep-10	04-Oct-10		Iron
											16-Sep-10	07-Oct-10		Iron
											30-Sep-10	20-Oct-10		Iron
											14-Oct-10	28-Oct-10		Iron, Nickel
											28-Oct-10	17-Nov-10		IRON
											11-Nov-10	09-Dec-10		IRON, TOTAL
											29-Nov-10	11-Dec-10		IRON, TOTAL
											14-Jan-11	17-Feb-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C015322A	C015322 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	07-Sep-10	Semi-Annual	16	14	**07-Feb-11**	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											04-May-11	17-May-11		IRON, TOTAL
											11-Aug-11	29-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											15-Nov-11	18-Jan-12		IRON, TOTAL
											20-Feb-12	16-Mar-12		
C015481A	C015481 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	04-Sep-10	Semi-Annual	13	13	**05-Aug-10**	20-Aug-10		
											04-Sep-10	04-Oct-10		
											16-Sep-10	07-Oct-10		Iron
											30-Sep-10	20-Oct-10		Iron
											14-Oct-10	28-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C015481A	C015481 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	04-Sep-10	Semi-Annual	13	13	**14-Jan-11**	17-Feb-11		IRON, TOTAL, TITANIUM
											07-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											04-May-11	17-May-11		IRON, TOTAL
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Nov-11	18-Jan-12		IRON, TOTAL
											20-Feb-12	16-Mar-12		
C0156ADA	C0156AD [redacted]	[redacted]	Battle Creek MI	Calhoun	23.25	Unattended Permission, Anytime	01-Sep-10	Semi-Annual	15	14	**05-Aug-10**			
											01-Sep-10	14-Oct-10		Iron
											13-Sep-10	30-Nov-10		Iron, Nickel
											21-Sep-10	28-Oct-10		Iron, Nickel
											30-Sep-10	30-Nov-10		Iron, Nickel
											14-Oct-10	28-Oct-10		Iron
											28-Oct-10	30-Nov-10		IRON, NICKEL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0156ADA	C0156AD [redacted]	[redacted]	Battle Creek MI	Calhoun	23.25	Unattended Permission, Anytime	01-Sep-10	Semi-Annual	15	14	**11-Nov-10**	09-Dec-10		IRON, TOTAL
											02-Dec-10	18-Dec-10		IRON, TOTAL, NICKEL, TOTAL
											14-Jan-11	17-Feb-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											04-May-11	17-May-11		IRON, TOTAL, NICKEL, TOTAL
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											15-Nov-11	15-Mar-12		IRON, TOTAL
											20-Feb-12	16-Mar-12		
C01573BA	C01573B [redacted]	[redacted]	Battle Creek MI	Calhoun	23.25	Unattended Permission, Anytime	01-Sep-10	Semi-Annual	13	12	**05-Aug-10**			
											01-Sep-10	28-Oct-10		Iron
											13-Sep-10	04-Oct-10		Iron
											16-Sep-10	07-Jan-11		Iron
											30-Sep-10	08-Feb-11		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01573BA	C01573B [redacted]	[redacted]	Battle Creek MI	Calhoun	23.25	Unattended Permission, Anytime	01-Sep-10	Semi-Annual	13	12	**14-Oct-10**	26-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											02-Dec-10	20-Dec-10		IRON, TOTAL
											13-Jan-11	15-Feb-11		IRON, TOTAL
											11-Apr-11	02-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Jul-11	02-Aug-11		IRON, TOTAL
											17-Oct-11	08-Dec-11		IRON, TOTAL
											19-Jan-12	09-Feb-12		
C0165D4PW1	C0165D4M [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	16	14	**28-Aug-10**	04-Oct-10		Iron
											31-Aug-10	05-Oct-10		Iron
											14-Sep-10	05-Oct-10		Iron
											20-Sep-10	08-Feb-11		
											09-Oct-10	28-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0165D4PW1	C0165D4M [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	16	14	**19-Oct-10**	08-Feb-11		
											30-Oct-10	18-Nov-10		IRON
											18-Nov-10	09-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											06-May-11	26-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Nov-11	14-Dec-11		
											21-Feb-12	16-Mar-12		
C017595PW1	C017595 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.25	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	12	10	**29-Jul-10**	21-Aug-10		
											24-Oct-10	12-Nov-10		IRON
											02-Nov-10	19-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C017595PW1	C017595 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.25	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	12	10	01-Dec-10	15-Dec-10		IRON, TOTAL
											14-Jan-11	17-Feb-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											03-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-May-11	26-May-11		IRON, TOTAL, TITANIUM
											09-Aug-11	11-Sep-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											16-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C0177B9A	C0177B9 [redacted]	[redacted]	Battle Creek MI	Calhoun	14	Unattended Permission, Anytime	28-Sep-10	Semi-Annual	11	11	10-Aug-10	02-Sep-10		Iron
											28-Sep-10	20-Oct-10		Iron
											24-Oct-10	12-Nov-10		IRON
											07-Nov-10	29-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0177B9A	C0177B9 [redacted]	[redacted]	Battle Creek MI	Calhoun	14	Unattended Permission, Anytime	28-Sep-10	Semi-Annual	11	11	**25-Jan-11**	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL
											06-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											16-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C0180D5A	C0180D5 [redacted]	[redacted]	Battle Creek MI	Calhoun	14	Permit but Call/Schedule Required	31-Aug-10	Semi-Annual	15	13	**08-Aug-10**	19-Aug-10		Iron
											31-Aug-10	05-Oct-10		Iron
											14-Sep-10	05-Oct-10		Iron
											20-Sep-10			Iron
											07-Oct-10	28-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0180D5A	C0180D5 [redacted]	[redacted]	Battle Creek MI	Calhoun	14	Permit but Call/Schedule Required	31-Aug-10	Semi-Annual	15	13	**30-Oct-10**	17-Nov-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											19-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											08-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											17-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C018776A	C018776 [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.25	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	11	11	**10-Aug-10**	23-Aug-10		
											23-Sep-10	07-Oct-10		
											05-Oct-10	20-Oct-10		
											16-Oct-10	01-Nov-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C018776A	C018776 [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.25	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	11	11	**29-Oct-10**	04-Dec-10		
											01-Dec-10	15-Dec-10		
											12-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											11-Apr-11	02-May-11		TITANIUM, VANADIUM, TOTAL
											11-Jul-11	21-Jul-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C01948DPW1	C01948D [redacted]	[redacted]e	Galesburg MI	Kalamazoo	34.25	Unattended Permission, Anytime	06-Sep-10	Semi-Annual	11	10	**08-Sep-10**	16-Oct-10		
											17-Sep-10	08-Oct-10		
											08-Oct-10	26-Oct-10		
											18-Oct-10			
											30-Oct-10	18-Nov-10		
											01-Dec-10	06-Jan-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01948DPW1	C01948D [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.25	Unattended Permission, Anytime	06-Sep-10	Semi-Annual	11	10	**12-Jan-11**	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											07-Apr-11	05-May-11		MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C0229A2A	C0229A2M [redacted]	[redacted]	Battle Creek MI	Calhoun	14.75	Unattended Permission, Anytime	28-Sep-10	Semi-Annual	16	16	**02-Aug-10**	17-Nov-10		
											28-Sep-10	11-Nov-10		Iron
											12-Oct-10	11-Nov-10		Iron
											27-Oct-10	10-Jan-11		IRON, NICKEL
											05-Nov-10	20-Jan-11		IRON, TOTAL
											16-Dec-10	24-Jan-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0229A2A	C0229A2M [redacted]	[redacted]	Battle Creek MI	Calhoun	14.75	Unattended Permission, Anytime	28-Sep-10	Semi-Annual	16	16	**18-Jan-11**	17-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											01-Mar-11	23-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-May-11	26-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											15-Jul-11	02-Aug-11		IRON, TOTAL
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Nov-11	14-Dec-11		IRON, TOTAL
											21-Feb-12	16-Mar-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C023047A	C023047 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	31-Aug-10	Semi-Annual	15	14	07-Aug-10	01-Sep-10		Iron
											31-Aug-10	05-Oct-10		Iron
											13-Sep-10	04-Oct-10		Iron
											16-Sep-10	07-Oct-10		Iron
											30-Sep-10	20-Oct-10		Iron
											14-Oct-10	01-Nov-10		Iron
											28-Oct-10	17-Nov-10		IRON
											02-Dec-10	20-Dec-10		IRON, TOTAL
											14-Jan-11	17-Feb-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											14-Feb-11	03-Mar-11		IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, TITANIUM
											04-May-11	17-May-11		IRON, TOTAL
											08-Aug-11	11-Sep-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C023047A	C023047 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	31-Aug-10	Semi-Annual	15	14	**15-Nov-11**	18-Jan-12		IRON, TOTAL
											20-Feb-12	16-Mar-12		
C0231D1A	C0231D1 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	12	11	**07-Aug-10**	01-Sep-10		Iron
											25-Sep-10	07-Oct-10		Iron
											30-Sep-10			Iron
											14-Oct-10	28-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											02-Dec-10	20-Dec-10		IRON, TOTAL
											14-Jan-11	17-Feb-11		IRON, TOTAL, TITANIUM
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											04-May-11	17-May-11		IRON, TOTAL
											10-Aug-11	24-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL

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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0231D1A	C0231D1 [redacted]	[redacted]	Battle Creek MI	Calhoun	23	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	12	11	**15-Nov-11**	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C024723PW1	C024723 [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Unattended Permission, Anytime	26-Aug-10	Semi-Annual	16	15	**04-Sep-10**	07-Oct-10		
											17-Sep-10	07-Oct-10		
											06-Oct-10	20-Oct-10		
											19-Oct-10	12-Nov-10		
											06-Nov-10	03-Dec-10		
											03-Dec-10	18-Dec-10		
											12-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											31-Jan-11	02-Mar-11		IRON, TOTAL, VANADIUM, TOTAL
											28-Feb-11	25-Mar-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C024723PW1	C024723 [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Unattended Permission, Anytime	26-Aug-10	Semi-Annual	16	15	**02-May-11**	12-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, TITANIUM
											14-Jul-11	02-Aug-11		IRON, TOTAL, TITANIUM, VANADIUM, TOTAL
											12-Sep-11	29-Nov-11		
											15-Dec-11	20-Jan-12		
C0252EDA	C0252ED [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Permit but Call/Schedule Required	06-Sep-10	Semi-Annual	12	12	**24-Aug-10**	06-Oct-10		
											08-Sep-10	13-Oct-10		
											17-Sep-10	07-Oct-10		
											06-Oct-10	20-Oct-10		
											16-Oct-10	28-Oct-10		
											29-Oct-10	04-Dec-10		
											03-Dec-10	18-Dec-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0252EDA	C0252ED [redacted]	[redacted]	Galesburg MI	Kalamazoo	36.25	Permit but Call/Schedule Required	06-Sep-10	Semi-Annual	12	12	**13-Jan-11**	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											11-Apr-11	02-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C0269A6PW1	C0269A6 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	08-Oct-10	Semi-Annual	17	16	**29-Aug-10**	28-Oct-10		
											11-Sep-10			
											17-Sep-10	28-Oct-10		
											08-Oct-10	26-Oct-10		
											18-Oct-10	12-Nov-10		
											30-Oct-10	18-Nov-10		
											16-Dec-10	24-Jan-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0269A6PW1	C0269A6 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	08-Oct-10	Semi-Annual	17	16	**12-Jan-11**	15-Feb-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											31-Jan-11	02-Mar-11		BERYLLIUM, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											28-Feb-11	23-Mar-11		IRON, TOTAL, MOLYBDENUM
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											14-Jul-11	02-Aug-11		MOLYBDENUM, TITANIUM
											08-Aug-11	11-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C0271D5PW1	C0271D5 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.25	Unattended Permission, Anytime	25-Oct-10	Semi-Annual	9	9	**19-Sep-10**	11-Nov-10		
											25-Oct-10	12-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0271D5PW1	C0271D5 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.25	Unattended Permission, Anytime	25-Oct-10	Semi-Annual	9	9	**06-Nov-10**	03-Dec-10		IRON
											01-Dec-10	15-Dec-10		
											13-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											07-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Jul-11	02-Aug-11		IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C0298FFWP1	C0298FF [redacted]	[redacted]	Battle Creek MI	Calhoun	17	Permit but Call/Schedule Required	06-Oct-10	Semi-Annual	14	14	**07-Oct-10**	28-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											02-Dec-10	20-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0298FFWP1	C0298FF [redacted]	[redacted]	Battle Creek MI	Calhoun	17	Permit but Call/Schedule Required	06-Oct-10	Semi-Annual	14	14	**14-Jan-11**	17-Feb-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											01-Feb-11	02-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											01-Mar-11	25-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											05-May-11	17-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Jun-11	22-Jun-11		IRON, TOTAL, TITANIUM
											19-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											16-Aug-11	29-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											20-Oct-11	08-Dec-11		IRON, TOTAL
											18-Jan-12	09-Feb-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0298FFWP2	C0298FF [redacted]	[redacted]	Battle Creek MI	Calhoun	17	Permit but Call/Schedule Required	06-Oct-10	Semi-Annual	10	10	**07-Oct-10**	28-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON
											02-Dec-10	12-Jan-11		IRON, TOTAL
											14-Jan-11	17-Feb-11		BERYLLIUM, TOTAL, IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											01-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											05-May-11	17-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, NICKEL, TOTAL
											16-Aug-11	29-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											20-Oct-11	08-Dec-11		IRON, TOTAL
											18-Jan-12	09-Feb-12		
C030917WP1	C030917 [redacted]	[redacted]	Galesburg MI	Kalamazoo	32.5	Permit but Call/Schedule Required	07-Sep-10	Semi-Annual	11	11	**23-Oct-10**	12-Nov-10		IRON
											04-Nov-10	23-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C030917WP1	C030917 [redacted]	[redacted]	Galesburg MI	Kalamazoo	32.5	Permit but Call/Schedule Required	07-Sep-10	Semi-Annual	11	11	**18-Nov-10**	09-Dec-10		IRON, TOTAL
											01-Dec-10	21-Dec-10		IRON, TOTAL
											10-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											31-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM
											28-Feb-11	23-Mar-11		IRON, TOTAL, MOLYBDENUM
											05-Apr-11	26-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											10-Jun-11	22-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											12-Sep-11	29-Nov-11		IRON, TOTAL
											15-Dec-11	20-Jan-12		
C0310F2PW1	C0310F2 [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	14	14	**08-Sep-10**	16-Oct-10		Iron
											24-Oct-10	30-Nov-10		IRON
											05-Nov-10	09-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0310F2PW1	C0310F2 [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	14	14	**30-Nov-10**	15-Dec-10		IRON, TOTAL
											11-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											11-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MERCURY, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											04-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											02-May-11	12-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											19-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-Aug-11	14-Sep-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0310F2PW1	C0310F2 [redacted]	[redacted]	Marshall MI	Calhoun	3.25	Unattended Permission, Anytime	24-Oct-10	Semi-Annual	14	14	**14-Sep-11**	29-Nov-11		IRON, TOTAL
											16-Dec-11	20-Jan-12		
C0337D3WP1	C0337D3 [redacted]	[redacted]	Augusta MI	Kalamazoo	27.25	Unattended Permission, Anytime	04-Sep-10	Semi-Annual	11	10	**04-Sep-10**	13-Oct-10		
											18-Sep-10	13-Oct-10		Iron
											08-Oct-10	26-Oct-10		Iron
											18-Oct-10			Iron
											05-Nov-10	09-Dec-10		IRON, TOTAL
											02-Dec-10	18-Dec-10		IRON, TOTAL
											13-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											07-Apr-11	02-May-11		IRON, TOTAL, TITANIUM
											15-Jul-11	02-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM
											17-Oct-11	08-Dec-11		IRON, TOTAL
											17-Jan-12	09-Feb-12		
C03429BWP1	C03429B [redacted]	[redacted]	Augusta MI	Kalamazoo	26.75	Unattended Permission, Anytime	18-Oct-10	Semi-Annual	11	10	**07-Sep-10**	13-Oct-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C03429BWP1	C03429B [redacted]	[redacted]	Augusta MI	Kalamazoo	26.75	Unattended Permission, Anytime	18-Oct-10	Semi-Annual	11	10	**18-Sep-10**	13-Oct-10		Iron
											09-Oct-10	26-Oct-10		Iron
											20-Oct-10			Iron
											05-Nov-10	09-Dec-10		IRON, TOTAL
											02-Dec-10	18-Dec-10		IRON, TOTAL
											13-Jan-11	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL
											07-Apr-11	02-May-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											15-Jul-11	02-Aug-11		IRON, TOTAL
											17-Oct-11	08-Dec-11		IRON, TOTAL
											17-Jan-12	09-Feb-12		
C046713WP1	C046713 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Semi-Annual	14	12	**26-Aug-10**	30-Nov-10		Iron, Nickel
											28-Aug-10	13-Oct-10		
											13-Sep-10	13-Oct-10		
											21-Sep-10	13-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C046713WP1	C046713 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	26-Aug-10	Semi-Annual	14	12	**10-Oct-10**	01-Nov-10		
											21-Oct-10			
											01-Nov-10			
											17-Nov-10	02-Dec-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											19-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											01-Feb-11	02-Mar-11		IRON, TOTAL, VANADIUM, TOTAL
											04-May-11	17-May-11		IRON, TOTAL, VANADIUM, TOTAL
											08-Aug-11	11-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											15-Nov-11	18-Jan-12		NICKEL, TOTAL
C04879DWP1	C04879DM [redacted]	[redacted]	Battle Creek MI	Calhoun	14.75	Unattended Permission, Anytime	28-Sep-10	Semi-Annual	11	11	**28-Sep-10**	11-Nov-10		Iron
											12-Oct-10	11-Nov-10	p,m-Xylene	Iron

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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C04879DWP1	C04879DM [redacted]	[redacted]	Battle Creek MI	Calhoun	14.75	Unattended Permission, Anytime	28-Sep-10	Semi-Annual	11	11	**23-Oct-10**	14-Jan-11		IRON
											04-Nov-10	30-Nov-10		IRON
											19-Nov-10	06-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											06-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											14-Nov-11	14-Dec-11		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C0491E9PW1	C0491E9 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Permit but Call/Schedule Required	26-Aug-10	Semi-Annual	14	13	**28-Aug-10**	13-Oct-10		Iron
											13-Sep-10	13-Oct-10		Iron
											19-Sep-10	13-Oct-10		Iron

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Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0491E9PW1	C0491E9 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Permit but Call/Schedule Required	26-Aug-10	Semi-Annual	14	13	**10-Oct-10**	28-Oct-10		Iron
											20-Oct-10			Iron
											30-Oct-10	18-Nov-10		IRON
											03-Dec-10	20-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											04-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											14-Feb-11	03-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											06-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											10-Aug-11	29-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C052339PW1	C052339 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	26-Sep-10	Semi-Annual	12	11	**28-Aug-10**	13-Oct-10		Iron
											13-Sep-10	13-Oct-10		Iron

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C052339PW1	C052339 [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	26-Sep-10	Semi-Annual	12	11	**19-Sep-10**	13-Oct-10		Iron
											09-Oct-10	28-Oct-10		Iron
											19-Oct-10			Iron
											30-Oct-10	18-Nov-10		IRON
											03-Dec-10	18-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											03-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											06-May-11	26-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											09-Aug-11	15-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Nov-11	18-Jan-12		IRON, TOTAL
C052927WP1	C052927 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime		Semi-Annual	9	9	**14-Dec-10**	26-Jan-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL

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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C052927WP1	C052927 [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime		Semi-Annual	9	9	**03-Jan-11**	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											17-Jan-11	10-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											27-Jan-11	02-Mar-11		MOLYBDENUM, NICKEL, TOTAL
											02-Mar-11	25-Mar-11		MOLYBDENUM, NICKEL, TOTAL
											04-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											14-Sep-11	30-Nov-11		
											16-Dec-11	20-Jan-12		
C05354DA	C05354D [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	15-Sep-10	Semi-Annual	14	13	**15-Aug-10**	02-Sep-10		Iron
											28-Aug-10	02-Oct-10		Iron
											15-Sep-10	04-Oct-10		Iron
											22-Sep-10	14-Oct-10		Iron
											09-Oct-10	26-Oct-10		Iron

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C05354DA	C05354D [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	15-Sep-10	Semi-Annual	14	13	**19-Oct-10**			Iron
											30-Oct-10	30-Nov-10		IRON
											03-Dec-10	18-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											06-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											14-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C053761WP1	C053761 [redacted]	[redacted]	Battle Creek MI	Calhoun	18.25	Permit but Call/Schedule Required	09-Sep-10	Semi-Annual	11	11	**20-Sep-10**	13-Oct-10		Iron
											12-Oct-10	28-Oct-10		Iron
											25-Oct-10	03-Dec-10		IRON
											08-Nov-10	29-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C053761WP1	C053761 [redacted]	[redacted]	Battle Creek MI	Calhoun	18.25	Permit but Call/Schedule Required	09-Sep-10	Semi-Annual	11	11	**02-Dec-10**	18-Dec-10		IRON, TOTAL
											19-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											03-Feb-11	02-Mar-11		IRON, TOTAL
											05-May-11	17-May-11		IRON, TOTAL, NICKEL, TOTAL
											10-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											16-Nov-11	18-Jan-12		IRON, TOTAL
											22-Feb-12	16-Mar-12		
C0572EAWP1	C0572EA [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Permit but Call/Schedule Required	04-Sep-10	Semi-Annual	12	12	**07-Sep-10**	13-Oct-10		Iron
											20-Sep-10	13-Oct-10		Iron
											11-Oct-10	26-Oct-10		Iron
											23-Oct-10	12-Nov-10		IRON
											08-Nov-10	29-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
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Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0572EAWP1	C0572EA [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Permit but Call/Schedule Required	04-Sep-10	Semi-Annual	12	12	**19-Jan-11**	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											14-Feb-11	03-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											06-May-11	26-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											14-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C0574DFWP1	C0574DF [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	12	11	**28-Sep-10**	20-Oct-10		Iron
											12-Oct-10	28-Oct-10		Iron
											23-Oct-10	14-Jan-11		IRON
											09-Nov-10	02-Dec-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											18-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											08-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0574DFWP1	C0574DF [redacted]	[redacted]	Battle Creek MI	Calhoun	14.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	12	11	**06-May-11**	26-May-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											09-Aug-11	11-Sep-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											15-Nov-11	18-Jan-12		IRON, TOTAL
											21-Feb-12	16-Mar-12		
C059451PW1	C059451 [redacted]	[redacted]	Battle Creek MI	Calhoun	10.5	Permit but Call/Schedule Required	20-Sep-10	Semi-Annual	8	8	**04-Sep-10**	13-Oct-10		
											16-Dec-10	26-Jan-11		IRON, TOTAL, VANADIUM, TOTAL
											03-Jan-11	15-Feb-11		IRON, TOTAL
											08-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
											01-Mar-11	25-Mar-11		MOLYBDENUM, VANADIUM, TOTAL
											10-Jun-11	22-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											14-Sep-11	30-Nov-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C059451PW1	C059451 [redacted]	[redacted]	Battle Creek MI	Calhoun	10.5	Permit but Call/Schedule Required	20-Sep-10	Semi-Annual	8	8	20-Dec-11	20-Jan-12		
C06162CPW1	C06162C [redacted]	[redacted]	Battle Creek MI	Calhoun	14.75	Permit but Call/Schedule Required	20-Sep-10	Semi-Annual	12	12	**07-Sep-10**	07-Jan-11		Iron
											20-Sep-10	13-Oct-10		Iron
											11-Oct-10	08-Feb-11		Iron
											25-Oct-10	08-Feb-11	TOLUENE	IRON
											08-Nov-10	29-Nov-10		IRON
											02-Dec-10	18-Dec-10		IRON, TOTAL
											19-Jan-11	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											03-Feb-11	02-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, VANADIUM, TOTAL
											05-May-11	17-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											11-Aug-11	29-Aug-11		BERYLLIUM, TOTAL, IRON, TOTAL, MERCURY, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C06162CPW1	C06162C [redacted]	[redacted]	Battle Creek MI	Calhoun	14.75	Permit but Call/Schedule Required	20-Sep-10	Semi-Annual	12	12	**16-Nov-11**	18-Jan-12		IRON, TOTAL
											22-Feb-12	16-Mar-12		
C0668ECA	C0668EC [redacted]	[redacted]	Marshall MI	Calhoun	2.75	Unattended Permission, Anytime		Semi-Annual	9	9	**18-Aug-10**	24-Sep-10		
											24-Oct-10	12-Nov-10		IRON
											05-Nov-10	10-Dec-10		IRON, TOTAL
											30-Nov-10	15-Dec-10		
											07-Jan-11	15-Feb-11		IRON, TOTAL
											06-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											20-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											19-Jan-12	09-Feb-12		
C0678ADA	C0678AD [redacted]	[redacted]	Augusta MI	Kalamazoo	29.5	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	12	11	**13-Aug-10**	07-Sep-10		
											23-Sep-10	07-Oct-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0678ADA	C0678AD [redacted]	[redacted]	Augusta MI	Kalamazoo	29.5	Unattended Permission, Anytime	23-Sep-10	Semi-Annual	12	11	**08-Oct-10**	26-Oct-10		
											18-Oct-10			
											30-Oct-10	03-Dec-10		
											02-Dec-10	18-Dec-10		IRON, TOTAL
											10-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, PHENANTHRENE, TITANIUM
											31-Jan-11	02-Mar-11		
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											08-Aug-11	18-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											14-Nov-11	18-Jan-12		
											20-Feb-12	16-Mar-12		
C0693ABPW1	C0693AB [redacted]	[redacted]	Battle Creek MI	Calhoun	11	Permit but Call/Schedule Required	27-Oct-10	Semi-Annual	10	10	**20-Aug-10**	27-Sep-10		Iron, Nickel
											27-Oct-10	14-Jan-11		IRON
											03-Nov-10	19-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0693ABPW1	C0693AB [redacted]	[redacted]	Battle Creek MI	Calhoun	11	Permit but Call/Schedule Required	27-Oct-10	Semi-Annual	10	10	**17-Nov-10**	02-Dec-10		IRON
											02-Dec-10	20-Dec-10		IRON, TOTAL
											06-Jan-11	24-Jan-11		IRON, TOTAL
											12-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											20-Oct-11	08-Dec-11		IRON, TOTAL
											18-Jan-12	09-Feb-12		
C0730ACPW1	C0730AC [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	17	17	**01-Sep-10**	09-Nov-10		Iron
											14-Sep-10	09-Nov-10		
											22-Sep-10	09-Nov-10		Iron
											09-Oct-10	09-Nov-10		
											25-Oct-10	14-Jan-11		
											06-Nov-10	03-Dec-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0730ACPW1	C0730AC [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	17	17	01-Dec-10	15-Dec-10		
											12-Jan-11	21-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											31-Jan-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											28-Feb-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, VANADIUM, TOTAL
											05-Apr-11	26-Apr-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											09-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											14-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, TITANIUM, VANADIUM, TOTAL
											08-Aug-11	11-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											12-Sep-11	29-Nov-11		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0730ACPW1	C0730AC [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.5	Unattended Permission, Anytime	14-Sep-10	Semi-Annual	17	17	15-Dec-11	20-Jan-12		
C07824BPW1	C07824B [redacted]	[redacted]	Augusta MI	Kalamazoo	27.5	Unattended Permission, Anytime	29-Aug-10	Semi-Annual	10	10	**27-Oct-10**	14-Jan-11		IRON
											03-Nov-10	07-Jan-11		IRON
											19-Nov-10	04-Dec-10		IRON, TOTAL
											02-Dec-10	20-Dec-10		IRON, TOTAL
											10-Jan-11	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											04-Feb-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											03-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM
											08-Aug-11	11-Sep-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											14-Nov-11	14-Dec-11		IRON, TOTAL
											20-Feb-12	16-Mar-12		
C0876A0WP1	C0876A0 [redacted]	[redacted]	Battle Creek MI	Calhoun	19.25	Permit but Call/Schedule Required	04-Oct-10	Semi-Annual	9	9	**05-Oct-10**	20-Oct-10		Iron
											25-Oct-10	12-Nov-10		IRON

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0876A0WP1	C0876A0 [redacted]	[redacted].	Battle Creek MI	Calhoun	19.25	Permit but Call/Schedule Required	04-Oct-10	Semi-Annual	9	9	**07-Nov-10**	29-Nov-10		IRON
											03-Dec-10	20-Dec-10		IRON, TOTAL
											06-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											12-Apr-11	02-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											18-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL
											19-Oct-11	08-Dec-11		
											18-Jan-12	09-Feb-12		
C087736WP1	C087736 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.5	Unattended Permission, Anytime	27-Sep-10	Semi-Annual	11	10	**27-Sep-10**	28-Oct-10		Nickel
											09-Oct-10	26-Oct-10		
											19-Oct-10			
											03-Nov-10	19-Nov-10		IRON
											18-Nov-10	05-Jan-11		IRON, TOTAL
											01-Dec-10	15-Dec-10		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012 - Sampled Wells
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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C087736WP1	C087736 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.5	Unattended Permission, Anytime	27-Sep-10	Semi-Annual	11	10	**12-Jan-11**	15-Feb-11		IRON, TOTAL, VANADIUM, TOTAL
											07-Apr-11	02-May-11		IRON, TOTAL, TITANIUM
											14-Jul-11	02-Aug-11		IRON, TOTAL, TITANIUM
											18-Oct-11	18-Jan-12		
											16-Jan-12	09-Feb-12		
C0920E7PW1	C0920E7 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	23-Nov-10	Semi-Annual	8	8	**01-Dec-10**	15-Dec-10		
											15-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											04-Jan-11	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											01-Feb-11	07-Mar-11		IRON, TOTAL, VANADIUM, TOTAL
											28-Feb-11	25-Mar-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											06-Jun-11	21-Jun-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											13-Sep-11	29-Nov-11		

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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0920E7PW1	C0920E7 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Unattended Permission, Anytime	23-Nov-10	Semi-Annual	8	8	19-Dec-11	20-Jan-12		
C0949C5WP1	C0949C5 [redacted]	[redacted]	Battle Creek MI	Calhoun	13.75	Unattended Permission, Anytime	25-Sep-10	Semi-Annual	12	12	**25-Sep-10**	13-Oct-10		Iron
											12-Oct-10	26-Oct-10		Iron
											23-Oct-10	14-Jan-11		IRON
											07-Nov-10	29-Nov-10		IRON
											03-Dec-10	20-Dec-10		IRON, TOTAL
											06-Jan-11	24-Jan-11		IRON, TOTAL, MERCURY, TOTAL, NICKEL, TOTAL
											09-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											02-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											04-Apr-11	26-Apr-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											06-Jun-11	21-Jun-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											13-Sep-11	28-Nov-11		IRON, TOTAL

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Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0949C5WP1	C0949C5 [redacted]	[redacted]	Battle Creek MI	Calhoun	13.75	Unattended Permission, Anytime	25-Sep-10	Semi-Annual	12	12	19-Dec-11	20-Jan-12		
C1346E7WP1	C1346E7 [redacted]	[redacted]	Galesburg MI	Kalamazoo	38.75	Unattended Permission, Anytime	16-Oct-10	Semi-Annual	7	7	28-Sep-10	13-Nov-10		Iron
											16-Oct-10	26-Oct-10		Iron
											30-Oct-10	03-Dec-10		
											01-Dec-10	15-Dec-10		IRON, TOTAL
											04-May-11	17-May-11		IRON, TOTAL, VANADIUM, TOTAL
											09-Jun-11	21-Jun-11		TITANIUM, VANADIUM, TOTAL
											12-Sep-11	30-Nov-11		
C14123EWP1	C14123E [redacted]	[redacted]	Battle Creek MI	Calhoun	20.25	Unattended Permission, Anytime	20-Oct-10	Semi-Annual	10	10	24-Oct-10	12-Nov-10		IRON
											03-Nov-10	07-Jan-11		IRON, NICKEL
											18-Nov-10	21-Dec-10		IRON, TOTAL, NICKEL, TOTAL
											02-Dec-10	20-Dec-10		IRON, TOTAL
											15-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
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Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C14123EWP1	C14123E [redacted]	[redacted]	Battle Creek MI	Calhoun	20.25	Unattended Permission, Anytime	20-Oct-10	Semi-Annual	10	10	**03-Jan-11**	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL
											11-Apr-11	02-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											15-Jul-11	02-Aug-11		IRON, TOTAL
											17-Oct-11	08-Dec-11		IRON, TOTAL
											17-Jan-12	09-Feb-12		
C14332AWP1	C14332A [redacted]	[redacted]	Augusta MI	Kalamazoo	29.75	Permit but Call/Schedule Required		Semi-Annual	9	9	**19-Nov-10**	04-Dec-10		IRON, TOTAL
											29-Nov-10	11-Dec-10		IRON, TOTAL
											15-Dec-10	26-Jan-11		IRON, TOTAL, VANADIUM, TOTAL
											10-Jan-11	21-Apr-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											04-Feb-11	02-Mar-11		IRON, TOTAL, MOLYBDENUM, TITANIUM
											11-Apr-11	02-May-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											14-Jul-11	02-Aug-11		IRON, TOTAL, MOLYBDENUM, TITANIUM

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C14332AWP1	C14332A [redacted]	[redacted]	Augusta MI	Kalamazoo	29.75	Permit but Call/Schedule Required		Semi-Annual	9	9	**20-Oct-11**	08-Dec-11		IRON, TOTAL
											18-Jan-12	09-Feb-12		
C145599A	C145599 [redacted]	[redacted]	Battle Creek MI	Calhoun	11	Permit but Call/Schedule Required		Semi-Annual	8	8	**23-Aug-10**	01-Nov-10		Iron
											17-Nov-10	02-Dec-10		IRON
											01-Dec-10	15-Dec-10		IRON, TOTAL
											06-Jan-11	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL
											08-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											05-May-11	17-May-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											09-Aug-11	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											16-Nov-11	18-Jan-12		IRON, TOTAL
C145623WP1	C145623 [redacted]	[redacted]	Battle Creek MI	Calhoun	10.75	Unattended Permission, Anytime	28-Oct-10	Semi-Annual	8	8	**03-Nov-10**	07-Jan-11		IRON
											17-Nov-10	02-Dec-10		IRON
											29-Nov-10	10-Dec-10		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C145623WP1	C145623 [redacted]	[redacted]	Battle Creek MI	Calhoun	10.75	Unattended Permission, Anytime	28-Oct-10	Semi-Annual	8	8	**08-Feb-11**	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											01-Mar-11	25-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											10-Jun-11	22-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											13-Sep-11	08-Dec-11		IRON, TOTAL, NICKEL, TOTAL
											20-Dec-11	20-Jan-12		
C1509C0WP1	C1509C0 [redacted]	[redacted]	Battle Creek MI	Calhoun	20.5	Permit but Call/Schedule Required		Semi-Annual	12	10	13-Aug-10			
											07-Nov-10	10-Dec-10		IRON
											18-Nov-10	05-Jan-11		IRON, TOTAL
											29-Nov-10	11-Dec-10		IRON, TOTAL
											15-Dec-10	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											19-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL
											01-Feb-11	02-Mar-11		IRON, TOTAL, NICKEL, TOTAL
											05-May-11	17-May-11		IRON, TOTAL

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C1509C0WP1	C1509C0 [redacted]	[redacted]	Battle Creek MI	Calhoun	20.5	Permit but Call/Schedule Required		Semi-Annual	12	10	**10-Aug-11**	24-Aug-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
											16-Nov-11	14-Dec-11		
											20-Feb-12	16-Mar-12		
C1520E6WP1	C1520E6 [redacted]	[redacted]	Battle Creek MI	Calhoun	2.25	Unattended Permission, Anytime	19-Nov-10	Semi-Annual	9	8	09-Aug-10			
											02-Dec-10	26-Jan-11		
											03-Jan-11	26-Jan-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											17-Jan-11	10-Mar-11		IRON, TOTAL, VANADIUM, TOTAL
											01-Feb-11	07-Mar-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
											01-Mar-11	25-Mar-11		VANADIUM, TOTAL
											06-Jun-11	21-Jun-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											13-Sep-11	29-Nov-11		
											19-Dec-11	20-Jan-12		

Table 2c-1. Residential Well Sampling and Letter Status Through November 30, 2012- Sampled Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects

Notes:

05-Sep-10 Sample Date: Represents analytical results that have had a Level II Validation performed.

05-Sep-10 Sample Date: Represents analytical results that have had a Level I Review performed.

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes
Cnt: Count
DRO: Diesel Range Organics
GRO: Gasoline Range Organics
ORO: Oil Range Organics

Table 2c-2. Residential Well Sampling and Letter Status Through November 30, 2012 - Winterized Wells

Enbridge Line 6B MP 608 Marshall, MI Pipeline Releas

Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0250C1WP2	C0250C1 [redacted]	[redacted]	Galesburg MI	Kalamazoo	36	Unattended Permission, Anytime		Prior to Sale or Occupation	3	3	23-Oct-10	12-Nov-10		
											30-Oct-10	18-Nov-10		
											03-Dec-10	20-Dec-10		IRON, TOTAL
C0555CBA	C0555CB [redacted]	[redacted]	Marshall MI	Calhoun	3	Unattended Permission, Anytime	06-Sep-10	Prior to Sale or Occupation	9	7	15-Aug-10	01-Sep-10		Iron
											08-Sep-10	05-Oct-10		Iron
											19-Sep-10			Iron
											01-Oct-10			Iron
											14-Oct-10	26-Oct-10		Iron
											28-Oct-10	17-Nov-10		IRON
											30-Nov-10	15-Dec-10		IRON, TOTAL
											11-Jan-11	15-Feb-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											11-Feb-11	07-Mar-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
C0872B9PW1	C0872B9 [redacted]	[redacted]	Augusta MI	Kalamazoo	27	Unattended Permission, Anytime	29-Aug-10	Prior to Sale or Occupation	3	3	30-Aug-10	28-Oct-10		Iron
											18-Sep-10	16-Nov-10		Iron

Table 2c-2. Residential Well Sampling and Letter Status Through November 30, 2012 - Winterized Wells

Enbridge Line 6B MP 608 Marshall, MI Pipeline Releas

Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0872B9PW1	C0872B9 [redacted]	[redacted]	Augusta MI	Kalamazoo	27	Unattended Permission, Anytime	29-Aug-10	Prior to Sale or Occupation	3	3	08-Oct-10	26-Oct-10		Iron
C50318DWP2	C50318D [redacted]	[redacted]	Marshall MI	Calhoun	2.25	Permit but Call/Schedule Required	03-Dec-10	Prior to Sale or Occupation						
C062360A	C062360 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit but Call/Schedule Required		Quarterly 2	4	4	18-Aug-10	03-Nov-10		Iron
											20-Jul-11	02-Aug-11		IRON, TOTAL, NICKEL, TOTAL, TITANIUM
											11-Aug-11	29-Aug-11		IRON, TOTAL, MERCURY, TOTAL, NICKEL, TOTAL
											14-Sep-11	29-Nov-11		IRON, TOTAL
C01836FA	C01836F [redacted]	[redacted]	Battle Creek MI	Calhoun	14	Unattended Permission, Anytime	30-Aug-10	Semi-Annual	10	9	08-Aug-10	19-Aug-10		Iron
											30-Aug-10	05-Oct-10		Iron
											13-Sep-10	04-Oct-10		Iron
											20-Sep-10			Iron
											07-Oct-10	28-Oct-10		Iron
											17-Oct-10	01-Nov-10		Iron
											30-Oct-10	18-Nov-10		IRON

Table 2c-2. Residential Well Sampling and Letter Status Through November 30, 2012 - Winterized Wells
Enbridge Line 6B MP 608 Marshall, MI Pipeline Releas
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C01836FA	C01836F	[redacted]	Battle Creek	Calhoun	14	Unattended Permission, Anytime	30-Aug-10	Semi-Annual	10	9	**12-May-11**	02-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM
	[redacted]		MI											
											06-Jun-11	21-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
											13-Sep-11	30-Nov-11		IRON, TOTAL, NICKEL, TOTAL

Notes:

05-Sep-10 Sample Date: Represents analytical results that have had a Level II Validation performed.

05-Sep-10 Sample Date: Represents analytical results that have had a Level I Review performed.

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes
Cnt: Count
DRO: Diesel Range Organics
GRO: Gasoline Range Organics
ORO: Oil Range Organics

Table 2c-3. Residential Well Sampling and Letter Status Through November 30, 2012 - Wells Not Being Sampled
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C0246B5WP1	C0246B5 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	12-Oct-10	Prior to Sale or Occupation	1					
C025965WP1	C025965 [redacted]	[redacted]	Galesburg MI	Kalamazoo	34.75	Unattended Permission, Anytime	09-Oct-10	Prior to Sale or Occupation	3	1				
											16-Oct-10	01-Nov-10		Iron
											30-Oct-10			IRON
C038297	C038297 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Unattended Permission, Anytime	05-Sep-10	Prior to Sale or Occupation	9	8				
											05-Sep-10	07-Oct-10		
											24-Oct-10	30-Nov-10		NICKEL
											06-Nov-10	29-Nov-10		
											30-Nov-10	15-Dec-10		IRON, TOTAL
											20-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, VANADIUM, TOTAL
											08-Feb-11	07-Mar-11		BERYLLIUM, TOTAL, IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL

Table 2c-3. Residential Well Sampling and Letter Status Through November 30, 2012 - Wells Not Being Sampled
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C038297	C038297	[redacted]	Ceresco	Calhoun	6	Unattended Permission, Anytime	05-Sep-10	Prior to Sale or Occupation	9	8	**12-May-11**	02-Jun-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL, TITANIUM, VANADIUM, TOTAL
	[redacted]		MI											
											12-Aug-11	14-Sep-11		IRON, TOTAL, NICKEL, TOTAL, VANADIUM, TOTAL
C039759WP1	C039759	[redacted]	Ceresco	Calhoun	5.75	Permit but Call/Schedule Required	03-Oct-10	Prior to Sale or Occupation	4	3				
	[redacted]		MI											
											12-Oct-10	01-Nov-10		Iron
											23-Oct-10	03-Dec-10		BERYLLIUM, IRON
											08-Nov-10	03-Dec-10		IRON
C046882A	C046882	[redacted]	Battle Creek	Calhoun	22.75	Permit but Call and Schedule First	26-Aug-10	Prior to Sale or Occupation	12	11				
	[redacted]		MI											
											03-Aug-10	21-Sep-10		
											28-Aug-10	28-Oct-10		
											28-Aug-10	01-Nov-10		
											13-Sep-10	28-Oct-10		
											21-Sep-10			
											10-Oct-10	26-Oct-10		

Table 2c-3. Residential Well Sampling and Letter Status Through November 30, 2012 - Wells Not Being Sampled
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C046882A	C046882 [redacted]	[redacted]	Battle Creek MI	Calhoun	22.75	Permit but Call and Schedule First	26-Aug-10	Prior to Sale or Occupation	12	11	**20-Oct-10**	12-Nov-10		
											03-Nov-10	15-Feb-11		
											02-Dec-10	18-Dec-10		IRON, TOTAL
											19-Jan-11	15-Feb-11		NICKEL, TOTAL, VANADIUM, TOTAL
											01-Feb-11	02-Mar-11		IRON, TOTAL, VANADIUM, TOTAL
											04-May-11	17-May-11		IRON, TOTAL, VANADIUM, TOTAL
C0883E0WP1	C0883E0 [redacted]	[redacted]	Galesburg MI	Kalamazoo	37.5	Permit but Call/Schedule Required	07-Oct-10	Prior to Sale or Occupation	1					
C50318DWP1	C50318D [redacted]	[redacted]	Marshall MI	Calhoun	2.25	Permit but Call/Schedule Required	03-Dec-10	Prior to Sale or Occupation	4	3				
											03-Aug-10	25-Aug-10		
											06-Dec-10	20-Dec-10		IRON, TOTAL
											11-Jan-11	15-Feb-11		IRON, TOTAL, MOLYBDENUM, NICKEL, TOTAL
C002068A	C002068 [redacted]	[redacted]	Marshall MI	Calhoun	1.25	Refused Permission	31-Aug-10	Quarterly 2	7	7	**01-Aug-10**	01-Sep-10		
											31-Aug-10	28-Oct-10		Iron

Table 2c-3. Residential Well Sampling and Letter Status Through November 30, 2012 - Wells Not Being Sampled
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C002068A	C002068 [redacted]	[redacted]	Marshall MI	Calhoun	1.25	Refused Permission	31-Aug-10	Quarterly 2	7	7	12-Sep-10	21-Oct-10		
											22-Oct-10	12-Nov-10		
											05-Nov-10	20-Dec-10		
											30-Nov-10	15-Dec-10		
											05-Jan-11	24-Jan-11		IRON, TOTAL, NICKEL, TOTAL
C0023D2WP1	C0023D2 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit But Call First		Quarterly 2	1	1	28-Jul-10	21-Aug-10		
C0188E7A	C0188E7 [redacted]	[redacted]	Ceresco MI	Calhoun	6			Quarterly 2	1	1	08-Aug-10	02-Sep-10		
C032604WP1	C032604 [redacted]	[redacted]	Ceresco MI	Calhoun	6	Permit but Call/Schedule Required	15-Oct-10	Quarterly 2	1					
C01477APW1	C01477A [redacted]	[redacted]	Battle Creek MI	Calhoun	21	Refused Permission	29-Sep-10	Semi-Annual	2	1	08-Aug-10			Iron
											17-Aug-10	01-Sep-10		Iron
C035755WP1	C035755 [redacted]	[redacted]	Augusta MI	Kalamazoo	24.75	Refused Permission	05-Sep-10	Semi-Annual	5	5	08-Sep-10	13-Oct-10		Iron
											18-Sep-10	13-Oct-10		Iron
											08-Oct-10	26-Oct-10		Iron
											18-Oct-10	12-Nov-10		Iron
											06-Nov-10	03-Dec-10		IRON

Table 2c-3. Residential Well Sampling and Letter Status Through November 30, 2012 - Wells Not Being Sampled
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Well No	Property No/Tax ID	Address	City/State	County	Mile Post	Permission	Permission Date	Frequency	Sample Cnt.	Letter Cnt.	Sample Date	Letter Sent Date	BTEX, GRO, ORO, DRO Detects	Other Crude Oil Constituent Detects
C035755WP2	C035755 [redacted]	[redacted]	Augusta MI	Kalamazoo	24.75	Refused Permission	05-Sep-10	Semi-Annual	5	5	**08-Sep-10**	13-Oct-10		
											18-Sep-10	13-Oct-10		
											08-Oct-10	26-Oct-10		
											18-Oct-10	12-Nov-10		Iron
											06-Nov-10	03-Dec-10		
C0609FCWP1	C0609FC [redacted]	[redacted]	Battle Creek MI	Calhoun	14			Semi-Annual	1					
C068050PW1	C068050 [redacted]	[redacted]	Battle Creek MI	Calhoun	15	Refused Permission	22-Oct-10	Semi-Annual	1	1	**18-Aug-10**	24-Sep-10		
C0878A7WP1	C0878A7 [redacted]	[redacted]	Springfield MI	Calhoun	17.75			Semi-Annual	1					
C12624BPW1	C12624B [redacted]	[redacted]	Battle Creek MI	Calhoun	13.75			Semi-Annual						
C14255EWP1	C14255E [redacted]	[redacted]	Springfield MI	Calhoun	17.75	Refused Permission		Semi-Annual						
C14351FWP1	C14351F [redacted]	[redacted]	Battle Creek MI	Calhoun	14			Semi-Annual	1					

Notes:

05-Sep-10 Sample Date: Represents analytical results that have had a Level II Validation performed.

05-Sep-10 Sample Date: Represents analytical results that have had a Level I Review performed.

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes
Cnt: Count
DRO: Diesel Range Organics
GRO: Gasoline Range Organics
ORO: Oil Range Organics

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 1						
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	Yes	5/10/2012	8	19	12	16	1.94
			C02	5/2/2012	Yes	5/10/2012	8	25	19	22	2.75
			C03	6/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	Yes	5/11/2012	10	76	76	76	7.60
			C02	5/1/2012	Yes	5/11/2012	10	75	75	75	7.50
			C03	5/1/2012	Yes	5/11/2012	10	20	20	20	2.00
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	Yes	5/10/2012	8	25	25	25	3.13
			C02	5/2/2012	Yes	5/10/2012	8	37	37	37	4.63
			C03	5/2/2012	Yes	5/9/2012	7	3	3	3	0.43
			C04	5/2/2012	Yes	5/9/2012	7	13	13	13	1.86
			C05	5/2/2012	Yes	5/9/2012	7	30	15	23	3.21
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			C02	5/2/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			C03	5/2/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			C02	5/2/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			C03	5/2/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	Yes	5/11/2012	3	19	19	19	6.33
			C02	5/8/2012	Yes	5/11/2012	3	26	26	26	8.67
			C03	5/8/2012	Yes	5/11/2012	3	7	7	7	2.33

Table 2i-1. 2012 Sediment Trap Monitoring Rounds and CSD Sedimentation Rates Summary
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 2							
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Amount of Water Above CSD (ft)
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	5/16/2012	6	10	10	10	1.67	N/A
			C02	5/2/2012	No	5/16/2012	6	10	10	10	1.67	N/A
			C03	6/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	No	5/16/2012	5	50	50	50	10.00	N/A
			C02	5/1/2012	Yes	5/16/2012	5	78	70	74	14.80	N/A
			C03	5/1/2012	No	5/16/2012	5	25	25	25	5.00	N/A
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	5/16/2012	6	19	19	19	3.17	-0.05
			C02	5/2/2012	No	5/16/2012	6	19	19	19	3.17	N/A
			C03	5/2/2012	No	5/16/2012	7	3	3	3	0.43	-0.05
			C04	5/2/2012	No	5/16/2012	7	10	10	10	1.43	N/A
			C05	5/2/2012	No	5/16/2012	7	20	20	20	2.86	N/A
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	Yes	5/17/2012	15	51	76	64	4.23	N/A
			C02	5/2/2012	Yes	5/17/2012	15	95	38	67	4.43	N/A
			C03	5/2/2012	Yes	5/17/2012	15	114	140	127	8.47	N/A
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	5/18/2012	16	38	19	29	1.78	N/A
			C02	5/2/2012	Yes	5/18/2012	16	57	127	92	5.75	N/A
			C03	5/2/2012	Yes	5/18/2012	16	95	76	86	5.34	N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	No	5/17/2012	6	29	29	29	4.83	N/A
			C02	5/8/2012	No	5/17/2012	6	38	44	41	6.83	N/A
			C03	5/8/2012	No	5/17/2012	6	25	17	21	3.50	N/A

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 3							
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Amount of Water Above CSD (ft)
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	5/23/2012	13	22	22	22	1.69	N/A
			C02	5/2/2012	No	5/23/2012	13	17	17	17	1.31	N/A
			C03	6/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	No	5/23/2012	12	102	89	96	7.96	N/A
			C02	5/1/2012	No	5/23/2012	7	45	45	45	6.43	N/A
			C03	5/1/2012	No	5/23/2012	12	32	44	38	3.17	N/A
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	5/23/2012	13	19	19	19	1.46	-0.02
			C02	5/2/2012	No	5/23/2012	13	30	30	30	2.31	N/A
			C03	5/2/2012	No	5/23/2012	14	N/A	N/A	N/A	N/A	-0.02
			C04	5/2/2012	No	5/23/2012	14	32	32	32	2.29	N/A
			C05	5/2/2012	No	5/23/2012	14	41	41	41	2.93	N/A
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	No	5/24/2012	7	32	19	26	3.64	N/A
			C02	5/2/2012	No	5/24/2012	7	44	19	32	4.50	N/A
			C03	5/2/2012	No	5/24/2012	7	65	60	63	8.93	N/A
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	5/24/2012	22	31	57	44	2.00	0.01
			C02	5/2/2012	No	5/24/2012	6	10	10	10	1.67	N/A
			C03	5/2/2012	No	5/24/2012	6	13	13	13	2.17	N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	No	5/24/2012	13	50	50	50	3.85	N/A
			C02	5/8/2012	No	5/24/2012	13	51	57	54	4.15	N/A
			C03	5/8/2012	No	5/24/2012	13	44	31	38	2.88	N/A

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 4							
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Amount of Water Above CSD (ft)
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	5/31/2012	21	22	22	22	1.05	N/A
			C02	5/2/2012	No	5/31/2012	21	22	22	22	1.05	N/A
			C03	6/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	No	5/31/2012	20	107	101	104	5.20	N/A
			C02	5/1/2012	No	5/31/2012	15	31	50	41	2.70	N/A
			C03	5/1/2012	No	5/31/2012	20	31	36	34	1.68	N/A
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	5/31/2012	21	19	19	19	0.90	-0.25
			C02	5/2/2012	No	5/31/2012	21	50	50	50	2.38	-0.05
			C03	5/2/2012	No	5/31/2012	22			N/A	N/A	-0.30
			C04	5/2/2012	No	5/31/2012	22	51	51	51	2.32	N/A
			C05	5/2/2012	No	5/31/2012	22	76	70	73	3.32	N/A
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	No	6/1/2012	15	50	50	50	3.33	N/A
			C02	5/2/2012	No	6/1/2012	15	63	50	57	3.77	N/A
			C03	5/2/2012	No	6/1/2012	15	76	38	57	3.80	N/A
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	6/1/2012	30	31	57	44	1.47	-0.20
			C02	5/2/2012	No	6/1/2012	14	19	19	19	1.36	N/A
			C03	5/2/2012	No	6/1/2012	14	19	19	19	1.36	N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	No	5/30/2012	19	9	69	39	2.05	N/A
			C02	5/8/2012	No	5/30/2012	19	69	69	69	3.63	N/A
			C03	5/8/2012	No	5/30/2012	19	57	38	48	2.50	N/A

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 5										
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
													LDJ/Up	RDJ/Down	
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	7/9/2012	60	38	35	37	0.61	No	N/A	N/A	0.25
			C02	5/2/2012	No	7/9/2012	60	18	22	20	0.33	No	N/A	N/A	0.50
			C03	6/13/2012	No	7/9/2012	26	10	19	15	0.56	No	N/A	N/A	1.00
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	Yes	7/11/2012	61	125	136	131	2.14	No	N/A	N/A	0.75
			C02	5/1/2012	Yes	7/11/2012	56	55	110	83	1.47	No	Observed by field crew		N/A
			C03	5/1/2012	Yes	7/11/2012	61	90	85	88	1.43	No	N/A	N/A	1.10
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	7/10/2012	61	14	19	16.5	0.27	No	N/A	N/A	-0.60
			C02	5/2/2012	No	7/10/2012	61	52	48	50	0.82	No	N/A	N/A	-0.25
			C03	5/2/2012	No	7/10/2012	62	4	6	5	0.08	No	N/A	N/A	-0.50
			C04	5/2/2012	Yes	7/10/2012	62	135	135	135	2.18	No	N/A	N/A	0.10
			C05	5/2/2012	Yes	7/10/2012	62	107	120	114	1.83	No	N/A	N/A	N/A
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	Yes	7/12/2012	56	89	78	84	1.49	No	1.25	0.95	N/A
			C02	5/2/2012	Yes	7/12/2012	56	127	121	124	2.21	No	N/A	N/A	1.20
			C03	5/2/2012	Yes	7/12/2012	56	159	161	160	2.86	No	N/A	N/A	0.20
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	7/13/2012	72	47	45	46	0.64	No	N/A	N/A	-0.80
			C02	5/2/2012	No	7/13/2012	56	50	50	50	0.89	No	N/A	N/A	0.05
			C03	5/2/2012	No	7/13/2012	56	47	59	53	0.95	No	0.05	0.15	N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	Yes	7/16/2012	66	107	106	107	1.61	No	0.90	1.05	N/A
			C02	5/8/2012	Yes	7/16/2012	66	111	106	109	1.64	Yes	0.75	0.80	N/A
			C03	5/8/2012	Yes	7/16/2012	66	149	131	140	2.12	No	0.75	1.00	N/A

Table 2i-1. 2012 Sediment Trap Monitoring Rounds and CSD Sedimentation Rates Summary
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 6										
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
													LDJ/Up	RDJ/Down	
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	8/13/2012	95	17	30	24	0.25	No	N/A	N/A	0.70
			C02	5/2/2012	No	8/13/2012	95	54	50	52	0.55	No	N/A	N/A	0.60
			C03	6/13/2012	Yes	8/13/2012	61	117	77	97	1.59	No	N/A	N/A	1.20
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	No	8/14/2012	34	70	50	60	1.76	No	N/A	N/A	1.00
			C02	5/1/2012	No	8/14/2012	34	60	80	70	2.06	No	N/A	N/A	1.90
			C03	5/1/2012	No	8/14/2012	34	40	50	45	1.32	No	N/A	N/A	1.40
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	8/15/2012	97	18	16	17	0.18	No	N/A	N/A	-0.50
			C02	5/2/2012	No	8/15/2012	97	50	70	60	0.62	No	N/A	N/A	-0.10
			C03	5/2/2012	No	8/15/2012	98		10	10	0.10	No	Broken Jar	N/A	-0.50
			C04	5/2/2012	No	8/15/2012	36	50	50	50	1.39	No	N/A	N/A	0.40
			C05	5/2/2012	No	8/15/2012	36	60	45	53	1.46	No	N/A	N/A	1.00
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	Yes	8/17/2012	36	130	143	137	3.79	No	N/A	N/A	1.60
			C02	5/2/2012	Yes	8/17/2012	36	120	120	120	3.33	No	N/A	N/A	1.80
			C03	5/2/2012	Yes	8/16/2012	35	130	138	134	3.83	No	N/A	N/A	N/A
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	8/16/2012	106	57	70	63.5	0.60	No	N/A	N/A	-0.30
			C02	5/2/2012	No	8/16/2012	90	67	75	71	0.79	No	N/A	N/A	0.60
			C03	5/2/2012	No	8/16/2012	90	55	65	60	0.67	No	Turned over on side		0.80
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	Yes	8/21/2012	36	130	125	128	3.54	No	N/A	N/A	0.80
			C02	5/8/2012	Yes	8/21/2012	36	130	130	130	3.61	No	N/A	N/A	0.70
			C03	5/8/2012	Yes	8/21/2012	36	120	120	120	3.33	No	N/A	N/A	0.70

Table 2i-1. 2012 Sediment Trap Monitoring Rounds and CSD Sedimentation Rates Summary
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Baseline/Round 7										
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
													LDJ/Up	RDJ/Down	
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	9/14/2012	127	77	65	71	0.56	No	N/A	N/A	0.20
			C02	5/2/2012	No	9/14/2012	127	45	35	40	0.31	No	N/A	N/A	0.30
			C03	6/13/2012	Yes	9/14/2012	32	135	135	135	4.22	No	N/A	N/A	1.20
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	Yes	9/14/2012	65	105	85	95	1.46	No	N/A	N/A	0.60
			C02	5/1/2012	Yes	9/14/2012	65	115	135	125	1.92	No	N/A	N/A	1.40
			C03	5/1/2012	No	9/14/2012	65	60	110	85	1.31	No	N/A	N/A	1.20
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	9/14/2012	127	N/A	N/A	N/A	N/A	No	N/A	N/A	-0.60
			C02	5/2/2012	No	9/14/2012	127	N/A	N/A	N/A	N/A	No	N/A	N/A	-0.20
			C03	5/2/2012	No	9/14/2012	128	N/A	N/A	N/A	N/A	No	N/A	N/A	-0.50
			C04	5/2/2012	No	9/14/2012	66	70	70	70	1.06	No	N/A	N/A	0.10
			C05	5/2/2012	Yes	9/14/2012	66	92	90	91	1.38	No	N/A	N/A	0.80
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	Yes	9/14/2012	28	130	120	125	4.46	No	N/A	N/A	1.30
			C02	5/2/2012	Yes	9/14/2012	28	115	117	116	4.14	No	N/A	N/A	1.40
			C03	5/2/2012	Yes	9/14/2012	29	120	135	128	4.40	No	N/A	N/A	0.40
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	9/19/2012	140	N/A	N/A	N/A	N/A	No	N/A	N/A	-0.30
			C02	5/2/2012	Yes	9/19/2012	124	90	90	90	0.73	No	N/A	N/A	0.10
			C03	5/2/2012	Yes	9/19/2012	124	100	110	105	0.85	No	On side		N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	No	9/19/2012	29	75	65	70	2.41	No	N/A	N/A	0.80
			C02	5/8/2012	No	9/19/2012	29	71	65	68	2.34	No	N/A	N/A	0.60
			C03	5/8/2012	Yes	9/19/2012	29	70	65	68	2.33	No	N/A	N/A	0.60

Table 2i-1. 2012 Sediment Trap Monitoring Rounds and CSD Sedimentation Rates Summary
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 8										
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
													LDJ/Up	RDJ/Down	
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	Yes	10/8/2012	151	75	68	72	0.47	No	N/A	N/A	0.40
			C02	5/2/2012	No	10/8/2012	151	19	31	25	0.17	No	N/A	N/A	0.40
			C03	6/13/2012	No	10/8/2012	24	51	33	42	1.75	No	N/A	N/A	1.20
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	No	10/9/2012	25	29	28	29	1.14	No	0.55	0.75	N/A
			C02	5/1/2012	No	10/9/2012	25	27	26	27	1.06	No	N/A	N/A	1.40
			C03	5/1/2012	Yes	10/9/2012	90	75	85	80	0.89	No	N/A	N/A	1.10
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	10/9/2012	152	17	18	17.5	0.12	No	N/A	N/A	-0.60
			C02	5/2/2012	No	10/9/2012	152	43	51	47	0.31	No	N/A	N/A	-0.30
			C03	5/2/2012	No	10/9/2012	153	0	7	3.5	0.02	No	N/A	N/A	-0.40
			C04	5/2/2012	Yes	10/9/2012	91	81	71	76	0.84	No	N/A	N/A	0.20
			C05	5/2/2012	No	10/9/2012	25	17	21	19	0.76	No	N/A	N/A	0.80
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	No	10/9/2012	25	46	52	49	1.96	No	N/A	N/A	1.40
			C02	5/2/2012	No	10/9/2012	25	60	46	53	2.12	No	N/A	N/A	1.40
			C03	5/2/2012	No	10/9/2012	25	56	45	51	2.02	No	0.60	0.50	N/A
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	10/11/2012	162	46	64	55	0.34	No	N/A	N/A	-0.50
			C02	5/2/2012	No	10/11/2012	22	11	10	11	0.48	No	N/A	N/A	0.30
			C03	5/2/2012	No	10/11/2012	22	19	17	18	0.82	No	0.30	0.55	N/A
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	No	10/10/2012	50	51	57	54	1.08	No	N/A	N/A	0.80
			C02	5/8/2012	No	10/10/2012	50	48	51	50	0.99	No	0.85	0.75	N/A
			C03	5/8/2012	No	10/10/2012	21	16	17	17	0.79	No	N/A	N/A	0.80

Table 2i-1. 2012 Sediment Trap Monitoring Rounds and CSD Sedimentation Rates Summary
Enbridge Line 6B MP 608 Marshall, MI Pipeline Release
Enbridge Energy, Limited Partnership

Locations	Geomorphic Setting	Channel Gradient	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 9										
					Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate in CSD (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
													LDJ/Up	RDJ/Down	
MP 10.75 LDB	Backwater	2.7 ft/mile	C01	5/2/2012	No	11/5/2012	28	51	61	56	2.00	No	Observed No Measurement		1.20
			C02	5/2/2012	No	11/5/2012	179	19	42	30.5	0.17	No	0.60	0.50	N/A
			C03	6/13/2012	No	11/5/2012	52	24	20	22	0.42	No	0.40	0.50	N/A
MP 14.75 RDB	Cut off channel	0.5 ft/mile	C01	5/1/2012	Yes	11/6/2012	53	76	70	73	1.38	No	0.65	0.80	N/A
			C02	5/1/2012	No	11/6/2012	53	58	60	59	1.11	No	N/A	N/A	1.95
			C03	5/1/2012	No	11/6/2012	28	35	30	32.5	1.16	No	N/A	N/A	1.20
MP 19.25 LDB	Cut off channel	0.6 ft/mile	C01	5/2/2012	No	11/9/2012	183	16	15	15.5	0.08	No	-0.50	-0.40	N/A
			C02	5/2/2012	No	11/9/2012	183	50	55	52.5	0.29	No	-0.10	-0.20	N/A
			C03	5/2/2012	No	11/9/2012	184	5	5	5	0.03	No	N/A	N/A	-0.30
			C04	5/2/2012	No	11/9/2012	31	Trace	Trace	0	0.00	No	0.30	0.40	N/A
			C05	5/2/2012	No	11/9/2012	56	27	29	28	0.50	No	N/A	N/A	0.90
MP 21.50 RDB	Oxbow	0.5 ft/mile	C01	5/2/2012	Yes	11/6/2012	53	135	137	136	2.57	No	N/A	N/A	1.70
			C02	5/2/2012	Yes	11/6/2012	53	113	137	125	2.36	No	Dragged by large log on side		1.60
			C03	5/2/2012	Yes	11/6/2012	53	88	75	81.5	1.54	No	N/A	N/A	1.00
MP 28.25 RDB	Oxbow	0.4 ft/mile	C01	5/2/2012	No	11/6/2012	188	48	68	58	0.31	No	N/A	N/A	-0.20
			C02	5/2/2012	No	11/6/2012	48	60	42	51	1.06	No	N/A	N/A	0.70
			C03	5/2/2012	No	11/6/2012	48	32	25	28.5	0.59	No	N/A	N/A	0.70
MP 36.10 NW	Cut off channel	0.3 ft/mile	C01	5/8/2012	No	11/1/2012	72	75	90	82.5	1.15	No	N/A	N/A	1.00
			C02	5/8/2012	No	11/1/2012	72	80	80	80	1.11	No	N/A	N/A	1.00
			C03	5/8/2012	No	11/1/2012	43	20	45	32.5	0.76	No	N/A	N/A	0.90

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 7										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Ceresco/MP 5.75	Impoundment	0.0 ft/mile	9/12/2012	C01	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/13/2012	No	9/25/2012	12	30	40	35	2.92	No			1.00
				C03	9/13/2012	No	9/25/2012	12	45	30	37.5	3.13	No			1.00
				C04	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 10.40 N	Backwater (downstream side of point bar)	3.3 ft/mile	9/13/2012	C01	9/18/2012	No	9/28/2012	10	20	15	17.5	1.75	No			-0.05
				C02	9/18/2012	No	9/28/2012	10	12	2	7	0.70	No			-0.25
				C03	9/18/2012	No	9/28/2012	10	18	50	34	3.40	No			0.55
MP 10.50 L2	Backwater	3.3 ft/mile	9/14/2012	C01	9/18/2012	No	9/28/2012	10	45	43	44	4.40	No			0.10
				C02	9/18/2012	Yes	9/28/2012	10	100	108	104	10.40	No	Level with Sediment		0.60
				C03	9/18/2012	No	9/28/2012	10	0	0	0	0.00	No			-0.30
				C04	9/18/2012	No	9/28/2012	10	0	0	0	0.00	No			-0.60
				C05	9/18/2012	No	9/28/2012	10	23	15	19	1.90	No			0.10
MP 26.00 RDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/11/2012	C01	9/12/2012	No	9/27/2012	15			N/A	0.00	No			-0.80
				C02	9/12/2012	No	9/27/2012	15			N/A	0.00	No			-0.20
				C03	9/12/2012	No	9/27/2012	15			N/A	0.00	No			-0.80
				C04	9/12/2012	No	9/27/2012	15			N/A	N/A	No			N/A
				C05	9/12/2012	No	9/27/2012	15			N/A	N/A	No			N/A
MP 30.80 LDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/17/2012	C01	9/18/2012	No	9/28/2012	10			N/A	N/A	No			N/A
				C02	9/18/2012	No	9/28/2012	10			N/A	N/A	No			N/A
				C03	9/18/2012	No	9/28/2012	10			N/A	N/A	No			N/A
				C04	9/18/2012	No	9/28/2012	10			N/A	N/A	No			N/A
				C05	9/18/2012	No	9/28/2012	10			N/A	N/A	No			N/A
MP 33.00 A	Backwater (downstream side of point bar)	0.2 ft/mile	9/6/2012	C01	9/10/2012	No	9/24/2012	14	45	53	49	3.50	No			0.60
				C02	9/10/2012	No	9/24/2012	14	0	0	0	0.00	No			-0.20
				C03	9/10/2012	No	9/24/2012	14	50	65	57.5	4.11	No			0.90
				C04	9/10/2012	No	9/24/2012	14	58	58	58	4.14	No			0.50
				C05	9/10/2012	No	9/24/2012	14	25	28	26.5	1.89	No			0.30
MP 33.00 B	Backwater (downstream side of point bar)	0.2 ft/mile	9/14/2012	C01	9/18/2012	No	10/1/2012	13	0	0	0	0.00	No			-0.80
				C02	9/18/2012	No	10/1/2012	13	0	0	0	0.00	No			-0.50
				C03	9/18/2012	No	10/1/2012	13	27.5	27.5	27.5	2.12	No			0.40
				C04	9/18/2012	No	10/1/2012	13	22.5	22.5	22.5	1.73	No			1.40
				C05	9/18/2012	No	10/1/2012	13	37.5	32.7	35.1	2.70	No			2.50

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 8										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Ceresco/MP 5.75	Impoundment	0.0 ft/mile	9/12/2012	C01	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/13/2012	No	10/8/2012	25	26	42	34	1.36	No			0.90
				C03	9/13/2012	No	10/8/2012	25	55	46	50.5	2.02	No	0.70	0.85	
				C04	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 10.40 N	Backwater (downstream side of point bar)	3.3 ft/mile	9/13/2012	C01	9/18/2012	No	10/8/2012	20	19	10	14.5	0.73	No			0.05
				C02	9/18/2012	No	10/8/2012	20	11	20	15.5	0.78	No			-0.10
				C03	9/18/2012	No	10/8/2012	20	27	36	31.5	1.58	No	0.85	0.70	
MP 10.50 L2	Backwater	3.3 ft/mile	9/14/2012	C01	9/18/2012	No	10/8/2012	20	30	28	29	1.45	No			0.10
				C02	9/18/2012	Yes	10/8/2012	10	90	68	79	7.90	No	0.10	0.20	
				C03	9/18/2012	No	10/8/2012	20	0	0	0	0.00	No			-0.20
				C04	9/18/2012	No	10/8/2012	20	0	0	0	0.00	No			-0.60
				C05	9/18/2012	No	10/8/2012	20	30	24	27	1.35	No			0.10
MP 26.00 RDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/11/2012	C01	9/12/2012	No	10/11/2012	29	0	0	0	0.00	No			-0.80
				C02	9/12/2012	No	10/11/2012	29	29	24	26.5	0.91	Yes			0.20
				C03	9/12/2012	No	10/11/2012	29	0	0	0	0.00	No			-0.80
				C04	9/12/2012	No	10/11/2012	29	47	44	45.5	1.57	Yes			0.40
				C05	9/12/2012	No	10/11/2012	29	44	51	47.5	1.64	No			0.40
MP 30.80 LDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/17/2012	C01	9/18/2012	No	10/15/2012	27	11	10	10.5	0.39	No			0.60
				C02	9/18/2012	No	10/15/2012	27	18	19	18.5	0.69	No			0.70
				C03	9/18/2012	No	10/15/2012	27	29	41	35	1.30	No			1.30
				C04	9/18/2012	No	10/15/2012	27	24	18	21	0.78	No			1.10
				C05	9/18/2012	No	10/15/2012	27	1	2	1.5	0.06	No			0.60
MP 33.00 A	Backwater (downstream side of point bar)	0.2 ft/mile	9/6/2012	C01	9/10/2012	No	10/12/2012	32	55	64	59.5	1.86	No	0.80	0.60	
				C02	9/10/2012	No	10/12/2012	32	0	0	0	0.00	No			-0.20
				C03	9/10/2012	No	10/12/2012	32	52	65	58.5	1.83	No	0.85	0.75	
				C04	9/10/2012	No	10/12/2012	32	71	65	68	2.13	No	Observed by field crew		
				C05	9/10/2012	No	10/12/2012	32	19	19	19	0.59	No	0.50	0.20	
MP 33.00 B	Backwater (downstream side of point bar)	0.2 ft/mile	9/14/2012	C01	9/18/2012	No	10/15/2012	27	0	0	0	0.00	No			-0.80
				C02	9/18/2012	No	10/15/2012	27	13	13	13	0.48	No	-0.35	-0.50	
				C03	9/18/2012	No	10/15/2012	27	30	22	26	0.96	No	1.40	1.70	
				C04	9/18/2012	No	10/15/2012	27	21	20	20.5	0.76	No			1.40
				C05	9/18/2012	No	10/15/2012	27	49	24	36.5	1.35	No			2.50

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 9										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate in CSD (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Ceresco/MP 5.75	Impoundment	0.0 ft/mile	9/12/2012	C01	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/13/2012	No	11/5/2012	53	31	40	35.5	0.67	No			1.15
				C03	9/13/2012	No	11/5/2012	53	78	44	61	1.15	No	0.90	1.00	
				C04	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 10.40 N	Backwater (downstream side of point bar)	3.3 ft/mile	9/13/2012	C01	9/18/2012	No	11/5/2012	48	19	27	23	0.48	No			0.10
				C02	9/18/2012	No	11/5/2012	48	26	29	27.5	0.57	No			0.00
				C03	9/18/2012	No	11/5/2012	48	26	36	31	0.65	No	0.90	0.75	
MP 10.50 L2	Backwater	3.3 ft/mile	9/14/2012	C01	9/18/2012	No	11/5/2012	48	31	27	29	0.60	No			0.70
				C02	9/18/2012	Yes	11/5/2012	28	32	32	32	1.14	No			0.20
				C03	9/18/2012	No	11/5/2012	48	7	6	6.5	0.14	No			-0.10
				C04	9/18/2012	No	11/5/2012	48	7	8	7.5	0.16	No			-0.30
				C05	9/18/2012	No	11/5/2012	48	20	13	16.5	0.34	No	0.20	0.30	
MP 26.00 RDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/11/2012	C01	9/12/2012	No	11/6/2012	55	0	0	0	0.00	No			-0.80
				C02	9/12/2012	No	11/6/2012	55	42	60	51	0.93	No			0.55
				C03	9/12/2012	No	11/6/2012	55	0	0	0	0.00	No			-0.80
				C04	9/12/2012	Yes	11/6/2012	55	125	112	118.5	2.15	Yes			0.80
				C05	9/12/2012	Yes	11/6/2012	55	75	84	79.5	1.45	No			4.70
MP 30.80 LDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/17/2012	C01	9/18/2012	No	11/7/2012	50	37	37	37	0.74	No	0.00	-0.10	
				C02	9/18/2012	Yes	11/7/2012	50	165	121	143	2.86	No	0.20	0.10	
				C03	9/18/2012	Yes	11/7/2012	50	76	72	74	1.48	No	0.40	0.30	
				C04	9/18/2012	Yes	11/7/2012	50	85	85	85	1.70	No	0.30	0.50	
				C05	9/18/2012	No	11/7/2012	50	14	19	16.5	0.33	No			0.50
MP 33.00 A	Backwater (downstream side of point bar)	0.2 ft/mile	9/6/2012	C01	9/10/2012	Yes	11/7/2012	58	122	126	124	2.14	No	1.00	0.80	
				C02	9/10/2012	Yes	11/7/2012	58	96	88	92	1.59	No	-0.10	-0.20	
				C03	9/10/2012	Yes	11/7/2012	58	82	80	81	1.40	Yes	1.00	0.90	
				C04	9/10/2012	Yes	11/7/2012	58	106	96	101	1.74	No			0.50
				C05	9/10/2012	No	11/7/2012	58	52	50	51	0.88	No	0.50	0.40	
MP 33.00 B	Backwater (downstream side of point bar)	0.2 ft/mile	9/14/2012	C01	9/18/2012	No	11/7/2012	50	0	0	0	0.00	No			-0.80
				C02	9/18/2012	No	11/7/2012	50	22	24	23	0.46	No			-0.15
				C03	9/18/2012	Yes	11/7/2012	50	140	160	150	3.00	No	1.20	1.00	
				C04	9/18/2012	Yes	11/7/2012	50	51	69	60	1.20	No			2.40
				C05	9/18/2012	Yes	11/7/2012	50	120	117	118.5	2.37	No			2.80

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Sampling Pre-Removal of E 4.0 Containment System										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate in CSD (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Ceresco/MP 5.75	Impoundment	0.0 ft/mile	9/12/2012	C01	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	No Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 10.40 N	Backwater (downstream side of point bar)	3.3 ft/mile	9/13/2012	C01	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 10.50 L2	Backwater	3.3 ft/mile	9/14/2012	C01	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 26.00 RDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/11/2012	C01	9/12/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/12/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/12/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	9/12/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	9/12/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 30.80 LDB	Backwater (downstream side of point bar)	1.4 ft/mile	9/17/2012	C01	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 33.00 A	Backwater (downstream side of point bar)	0.2 ft/mile	9/6/2012	C01	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MP 33.00 B	Backwater (downstream side of point bar)	0.2 ft/mile	9/14/2012	C01	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	9/18/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 7										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Delta A/MP 36.75	Delta distributary channel	0.0 ft/mile	9/7/2012	C01	9/10/2012	No	9/25/2012	15	20	35	27.5	1.83	Yes			0.40
				C02	9/10/2012	No	9/25/2012	15	0	25	12.5	0.83	No			0.50
				C03	9/10/2012	No	9/25/2012	15	65	34	49.5	3.30	No	0.60	0.25	0.50
				C04	9/10/2012	Yes	9/25/2012	15	127	110	118.5	7.90	Yes			N/A
				C05	9/10/2012	No	9/25/2012	15	37	28	32.5	2.17	No			N/A
Delta Z/MP 37.50	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	No	10/4/2012	14	35	42	38.5	2.75	No	Observed by field crew		0.20
				C02	9/20/2012	No	10/5/2012	15	42	35	38.5	2.57	No			0.10
				C03	9/20/2012	No	10/5/2012	15	13	10	11.5	0.77	No	Observed by field crew		-0.05
				C04	9/20/2012	No	10/5/2012	15	27	24	25.5	1.70	No			0.30
				C05	9/20/2012	No	10/5/2012	15	40	33	36.5	2.43	No	Observed by field crew		0.90
				C06	9/20/2012	No	10/5/2012	15	10	8	9	0.60	No			-0.05
				C07	9/20/2012	No	10/4/2012	14	10	9	9.5	0.68	No			-0.15
				C08	9/20/2012	No	10/4/2012	14	35	35	35	2.50	No	Observed by field crew		0.40
				C09	9/20/2012	Yes	10/2/2012	12	75	78	76.5	6.38	No			0.70
				C10	9/20/2012	No	10/2/2012	12	30	33	31.5	2.63	No			0.40
37.75 Islands	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	No	10/3/2012	13	10	10	10	0.77	No			0.20
				C02	9/20/2012	No	10/3/2012	13	27	35	31	2.38	No			0.30
				C03	9/20/2012	No	10/3/2012	13	0	0	0	0.00	No			-0.80
				C04	9/20/2012	No	10/3/2012	13	50	47	48.5	3.73	No			1.20
				C05	9/20/2012	No	10/3/2012	13	60	60	60	4.62	No			2.10
OB 11.79 LDB	Flood plain	Unknown	9/21/2012	C01	9/13/2012	No	9/28/2012	15	0	0	0	0.00	No			-0.80
				C02	9/13/2012	No	9/28/2012	15	0	0	0	0.00	No			-0.80
				C03	9/13/2012	No	9/28/2012	15	0	0	0	0.00	No			-0.80

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 8										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Delta A/MP 36.75	Delta distributary channel	0.0 ft/mile	9/7/2012	C01	9/10/2012	No	10/10/2012	30	10	51	30.5	1.02	No	0.50	0.60	
				C02	9/10/2012	No	10/10/2012	30	18	54	36	1.20	No			0.50
				C03	9/10/2012	Yes	10/10/2012	30	101	60	80.5	2.68	No	0.75	0.65	
				C04	9/10/2012	Yes	10/10/2012	15	96	95	95.5	6.37	No	1.05	0.90	
				C05	9/10/2012	No	10/10/2012	30	29	53	41	1.37	No			1.80
Delta Z/MP 37.50	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	No	10/16/2012	26	42	59	50.5	1.94	Yes	0.30	0.10	
				C02	9/20/2012	No	10/16/2012	26	41	54	47.5	1.83	No	0.15	0.01	
				C03	9/20/2012	Yes	10/16/2012	26	93	80	86.5	3.33	No			-0.10
				C04	9/20/2012	No	10/16/2012	26	41	51	46	1.77	No			0.20
				C05	9/20/2012	No	10/16/2012	26	43	32	37.5	1.44	No			0.80
				C06	9/20/2012	No	10/16/2012	26	15	9	12	0.46	No			-0.10
				C07	9/20/2012	No	10/16/2012	26	18	16	17	0.65	Yes			-0.20
				C08	9/20/2012	No	10/16/2012	26	31	26	28.5	1.10	Yes			0.40
				C09	9/20/2012	No	10/16/2012	14	29	28	28.5	2.04	Yes	0.65	0.50	0.50
				C10	9/20/2012	No	10/16/2012	26	21	42	31.5	1.21	Yes			0.30
37.75 Islands	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	No	10/16/2012	26	28	24	26	1.00	No			0.10
				C02	9/20/2012	No	10/16/2012	26	55	62	58.5	2.25	No			0.40
				C03	9/20/2012	No	10/16/2012	26	0	0	0	0.00	No			-0.40
				C04	9/20/2012	No	10/16/2012	26	65	68	66.5	2.56	No			1.00
				C05	9/20/2012	Yes	10/16/2012	26	88	88	88	3.38	No			1.80
OB 11.79 LDB	Flood plain	Unknown	9/21/2012	C01	9/13/2012	No	10/12/2012	29	0	0	0	0.00	No			-0.40
				C02	9/13/2012	No	10/12/2012	29	0	0	0	0.00	No			-0.80
				C03	9/13/2012	No	10/12/2012	29	0	0	0	0.00	No			-0.80

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Monitoring Round 9										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate in CSD (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Delta A/MP 36.75	Delta distributary channel	0.0 ft/mile	9/7/2012	C01	9/10/2012	Yes	11/8/2012	59	64	99	81.5	1.38	Yes	0.50	0.60	
				C02	9/10/2012	Yes	11/8/2012	59	85	99	92	1.56	Yes	0.60	0.70	
				C03	9/10/2012	No	11/8/2012	29	60	70	65	2.24	Yes			0.70
				C04	9/10/2012	Yes	11/8/2012	29	174	174	174	6.00	Yes	0.90	1.10	
				C05	9/10/2012	Yes	11/8/2012	59	98	71	84.5	1.43	Yes			0.65
Delta Z/MP 37.50	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	Yes	11/8/2012	49	122	111	116.5	2.38	Yes	0.40	0.30	
				C02	9/20/2012	Yes	11/8/2012	49	75	72	73.5	1.50	No			0.15
				C03	9/20/2012	No	11/8/2012	23	21	23	22	0.96	No			0.00
				C04	9/20/2012	No	11/8/2012	49	65	62	63.5	1.30	No			0.30
				C05	9/20/2012	Yes	11/8/2012	49	104	66	85	1.73	Yes	Observation only no measurement		1.00
				C06	9/20/2012	No	11/8/2012	49	0	0	0	0.00	Yes			0.00
				C07	9/20/2012	No	11/8/2012	49	28	19	23.5	0.48	Yes			-0.10
				C08	9/20/2012	No	11/8/2012	49	54	39	46.5	0.95	Yes			0.45
				C09	9/20/2012	No	11/8/2012	37	8	76	42	1.14	Yes			0.60
				C10	9/20/2012	No	11/8/2012	49	76	66	71	1.45	Yes			0.30
37.75 Islands	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	No	11/8/2012	49	20	30	25	0.51	No			0.30
				C02	9/20/2012	Yes	11/8/2012	49	70	81	75.5	1.54	Yes			0.60
				C03	9/20/2012	No	11/8/2012	49	0	0	0	0.00	No			-0.30
				C04	9/20/2012	Yes	11/8/2012	49	108	89	98.5	2.01	No	1.30	1.20	
				C05	9/20/2012	No	11/8/2012	23	45	42	43.5	1.89	No			1.80
OB 11.79 LDB	Flood plain	Unknown	9/21/2012	C01	9/13/2012	No	11/5/2012	53	0	0	0	0.00	No			0.45
				C02	9/13/2012	No	11/5/2012	53	0	0	0	0.00	No			-0.80
				C03	9/13/2012	No	11/5/2012	53	0	0	0	0.00	No			-0.80

Locations:	Geomorphic Setting	Channel Gradient	Date Baseline Bathymetry Completed	Cylindrical Sampler Device Identification Number	Date Installed	Sampling Pre-Removal of E 4.0 Containment System										
						Sample Jars Collected	Date Conducted	# of Days	Measured Sediment LDJ (mm)	Measured Sediment RDJ (mm)	Measured Sediment (mm)*	Sedimentation Rate in CSD (mm/day)	Scour Observed	Amount of Water Above CSD if Titling Observed (ft)		Amount of Water Above CSD (ft)
														LDJ/Up	RDJ/Down	
Delta A/MP 36.75	Delta distributary channel	0.0 ft/mile	9/7/2012	C01	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C04	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C05	9/10/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Delta Z/MP 37.50	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	Yes	11/17/2012	9	35	41	38	4.22	N/A	N/A	N/A	N/A
				C02	9/20/2012	Yes	11/17/2012	9	21	26	23.5	2.61	N/A	N/A	N/A	N/A
				C03	9/20/2012	Yes	11/17/2012	32	55	46	50.5	1.58	N/A	N/A	N/A	N/A
				C04	9/20/2012	Yes	11/17/2012	58	82	78	80	1.38	N/A	N/A	N/A	N/A
				C05	9/20/2012	Yes	11/17/2012	9	26	28	27	3.00	N/A	N/A	N/A	N/A
				C06	9/20/2012	Yes	11/17/2012	58	13	13	13	0.22	N/A	N/A	N/A	N/A
				C07	9/20/2012	Yes	11/17/2012	58	33	26	29.5	0.51	N/A	N/A	N/A	N/A
				C08	9/20/2012	Yes	11/17/2012	58	55	65	60	1.03	N/A	N/A	N/A	N/A
				C09	9/20/2012	Yes	11/17/2012	46	15	105	60	1.30	N/A	N/A	N/A	N/A
				C10	9/20/2012	Yes	11/17/2012	58	77	99	88	1.52	N/A	N/A	N/A	N/A
37.75 Islands	Delta	0.0 ft/mile	9/19/2012	C01	9/20/2012	Yes	11/17/2012	58	31	35	33	0.57	N/A	N/A	N/A	N/A
				C02	9/20/2012	Yes	11/17/2012	9	27	32	29.5	3.28	N/A	N/A	N/A	N/A
				C03	9/20/2012	No	11/17/2012	58	0	0	0	0.00	N/A	N/A	N/A	N/A
				C04	9/20/2012	Yes	11/17/2012	9	27	30	28.5	3.17	N/A	N/A	N/A	N/A
				C05	9/20/2012	Yes	11/17/2012	32	61	45	53	1.66	N/A	N/A	N/A	N/A
OB 11.79 LDB	Flood plain	Unknown	9/21/2012	C01	9/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C02	9/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				C03	9/13/2012	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A	Either no sampler in location or not assessed during monitoring round
ft	Feet
mm	Millimeter
(mm)*	Measured sediment is the average between both jars in CSD
mm/day	Millimeters per day
LDB	Left Descending bank
RDB	Right Descending bank
LDJ	Left Descending Jar
RDJ	Right Descending Jar
TEXT	Sample device tilted due to scour or settling into soft sediment
	Sample jars replaced but no sample collected
	Sample device top at or above surface of water
TEXT	Sample device ovserved tilting upstream
TEXT	Sample device observed tilting downstream
TEXT	Sample device observed tilting toward left descending bank
TEXT	Sample device ovbserved tilting toward right descending bank

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Figures

Prepared for U.S. EPA and MDEQ

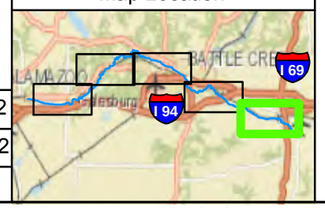
Enbridge Energy, Limited Partnership

Submitted: December 21, 2012



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

- Surface Water Sampling Location
- Kalamazoo River
- Talmadge Creek
- Quarter Mile Grid Segments
- SW-105 Sample Location ID - No Exceedances

N

0 1,000 2,000 4,000

Scale in Feet

FIGURE 2a-1
KALAMAZOO RIVER AND MORROW LAKE
SURFACE WATER MONITORING LOCATIONS
NOVEMBER 2012
SHEET 1 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2a-1_Surface_Water_Monitoring_Locations.mxd

Aerial Photography Date: April 2011 over August 2010

SWKR1565C01

SWKR1480C01

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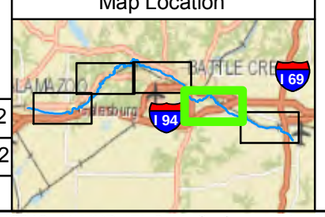
Map Location



Legend

- Surface Water Sampling Location
- Kalamazoo River
- Talmadge Creek
- Quarter Mile Grid Segments
- SW-105 Sample Location ID - No Exceedances

N

0 1,000 2,000 4,000

Scale in Feet

FIGURE 2a-1
KALAMAZOO RIVER AND MORROW LAKE
SURFACE WATER MONITORING LOCATIONS
NOVEMBER 2012
SHEET 2 OF 5

ENBRIDGE LINE 6B MP 608
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ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

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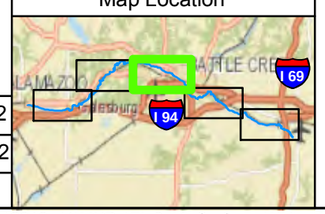
Aerial Photography Date: April 2011 over August 2010



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

- Surface Water Sampling Location
- Kalamazoo River
- Talmadge Creek
- Quarter Mile Grid Segments
- SW-105 Sample Location ID - No Exceedances

N

0 1,000 2,000 4,000

Scale in Feet

FIGURE 2a-1
KALAMAZOO RIVER AND MORROW LAKE
SURFACE WATER MONITORING LOCATIONS
NOVEMBER 2012
SHEET 3 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
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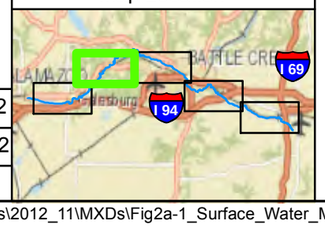
Aerial Photography Date: April 2011 over August 2010



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

- Surface Water Sampling Location
- Kalamazoo River
- Talmadge Creek
- Quarter Mile Grid Segments
- SW-105 Sample Location ID - No Exceedances

N

0 1,000 2,000 4,000

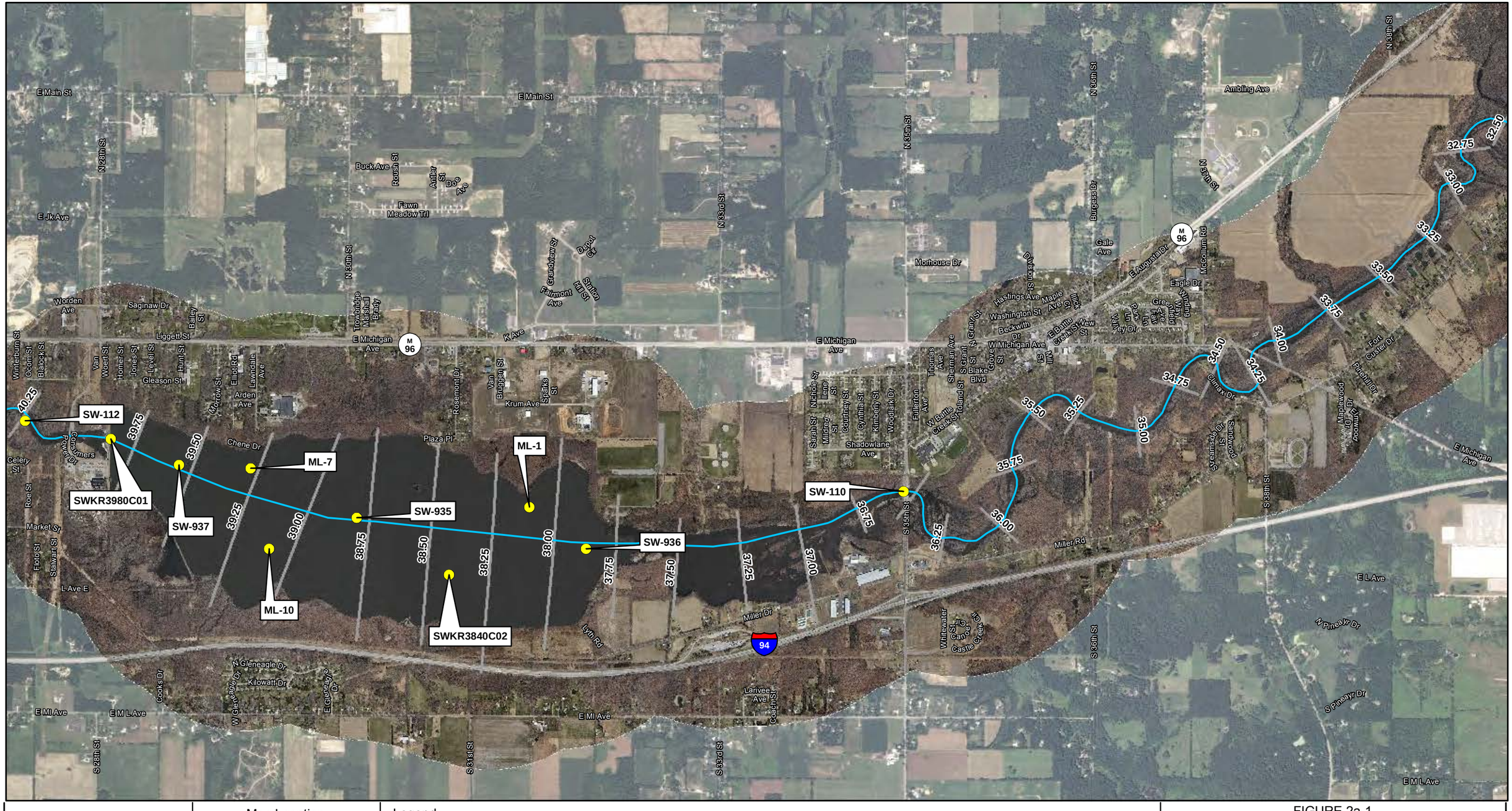
Scale in Feet

FIGURE 2a-1
KALAMAZOO RIVER AND MORROW LAKE
SURFACE WATER MONITORING LOCATIONS
NOVEMBER 2012
SHEET 4 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

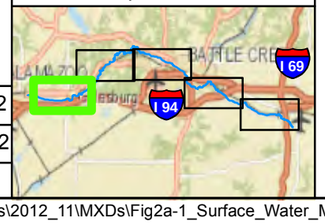
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2a-1_Surface_Water_Monitoring_Locations.mxd

Aerial Photography Date: April 2011 over August 2010



ENBRIDGE		
Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

- Surface Water Sampling Location
- Kalamazoo River
- Talmadge Creek
- Quarter Mile Grid Segments
- SW-105 Sample Location ID - No Exceedances

N

0 1,000 2,000 4,000

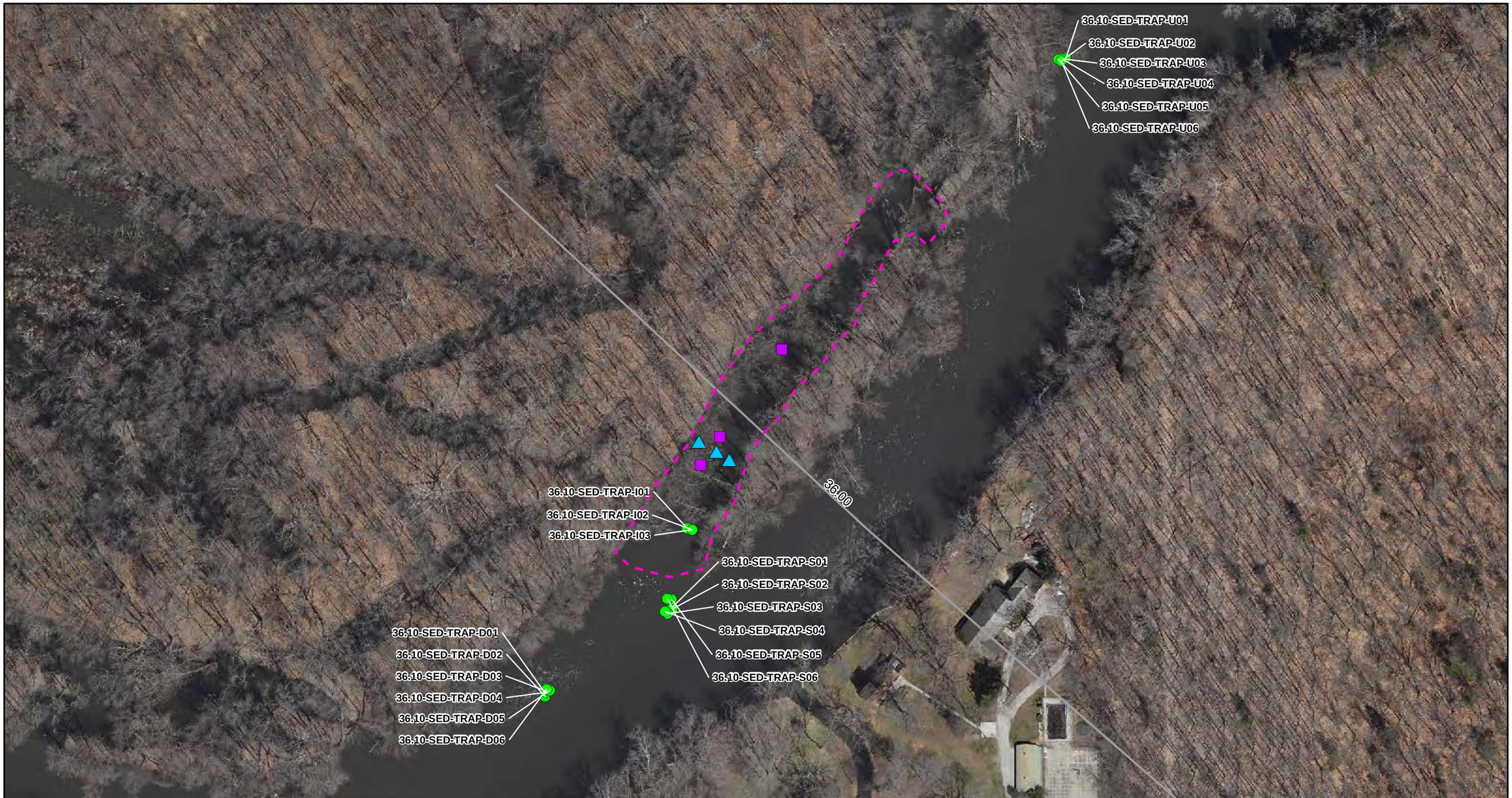
Scale in Feet

FIGURE 2a-1
KALAMAZOO RIVER AND MORROW LAKE
SURFACE WATER MONITORING LOCATIONS
NOVEMBER 2012
SHEET 5 OF 5

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2a-1_Surface_Water_Monitoring_Locations.mxd

Aerial Photography Date: April 2011 over August 2010



ENBRIDGE

Drawn:	NS	12/13/2012
Approved:	EE	12/13/2012
Project #:	60246209	

Map Location



Legend

Water Quality Monitoring Location

- DO > 4 mg/L & Turbidity < 50 NTU
- DO < 4 mg/L
- Turbidity > 50 NTU
- DO < 4 mg/L & Turbidity > 50 NTU

- Conifer Tree Structure (Former Location)
- Cylindrical Sampling Device
- Sediment Trap
- Quarter Mile Grid Segments

mg/L milligrams per liter
NTU Nephelometric Turbidity Units

N

0 50 100 200

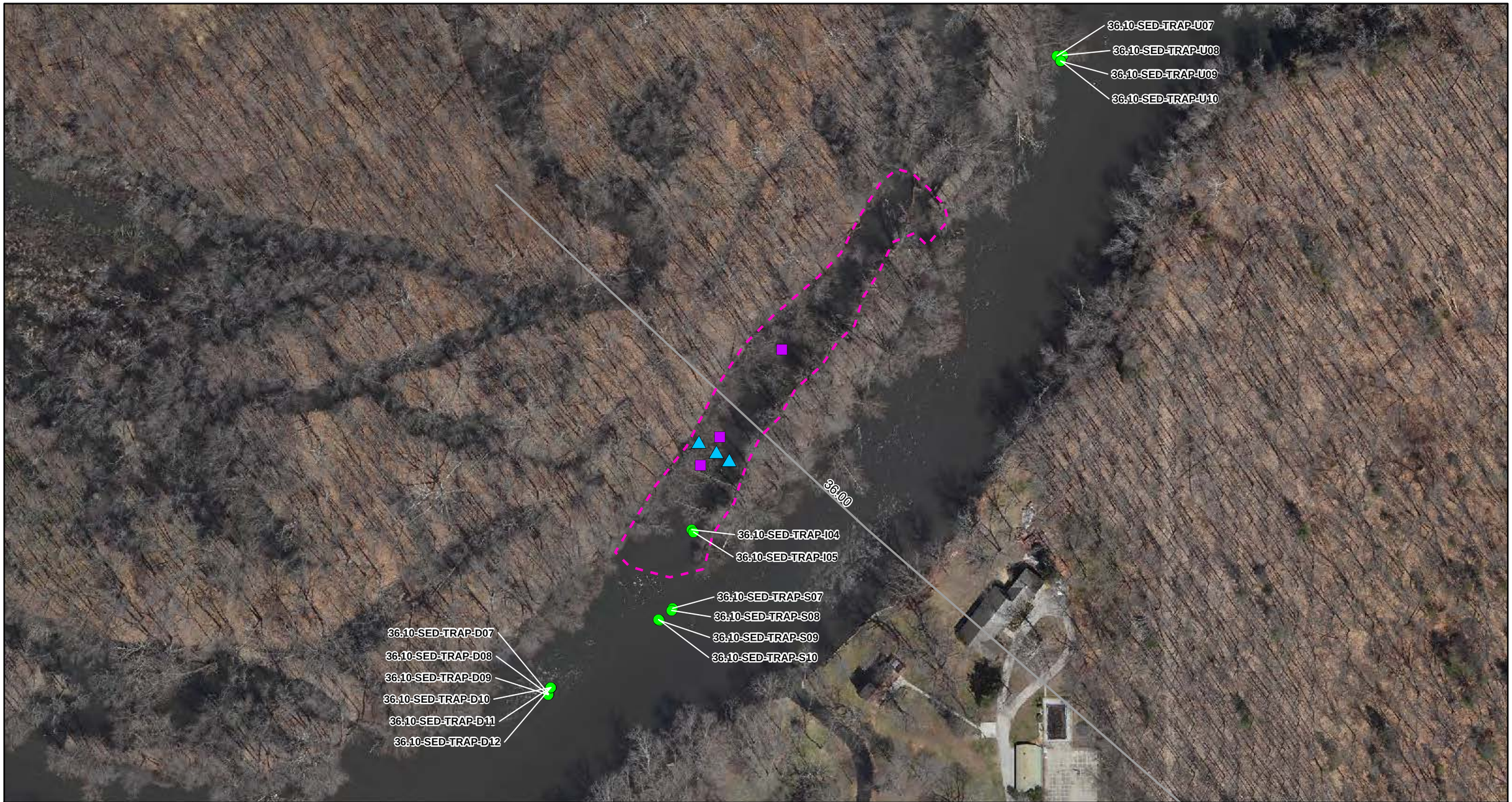
Scale in Feet

FIGURE 2b-1
WATER QUALITY MONITORING LOCATIONS
MP 36.10 NW TREE STRUCTURE REMOVAL
NOVEMBER 1, 2012
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2b-1_WQM_36_10_Tree_Structure_Removal_110112.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/13/2012
Approved:	EE	12/13/2012
Project #:	60246209	

Map Location



Legend

Water Quality Monitoring Location

- DO > 4 mg/L & Turbidity < 50 NTU
- DO < 4 mg/L
- Turbidity > 50 NTU
- DO < 4 mg/L & Turbidity > 50 NTU

- Conifer Tree Structure (Former Location)
- Cylindrical Sampling Device
- Sediment Trap
- Quarter Mile Grid Segments

mg/L milligrams per liter
NTU Nephelometric Turbidity Units

N

0 50 100 200

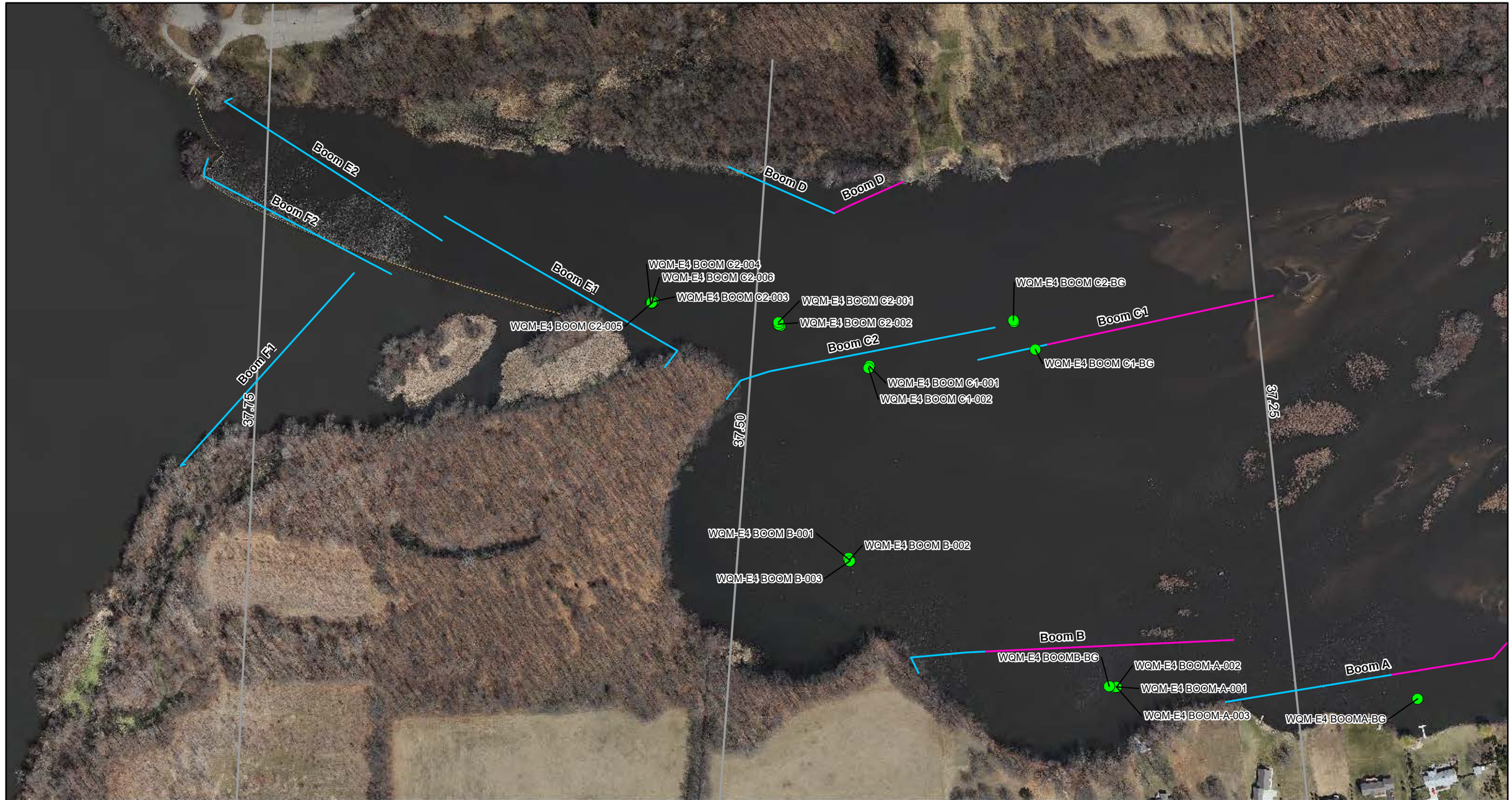
Scale in Feet

FIGURE 2b-2
WATER QUALITY MONITORING LOCATIONS
MP 36.10 NW TREE STRUCTURE REMOVAL
NOVEMBER 2, 2012
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2b-2_WQM_36_10_Tree_Structure_Removal_110212.mxd

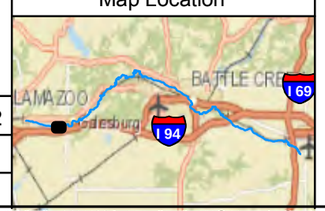
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/13/2012
Approved:	EE	12/13/2012
Project #:	60246209	

Map Location



Legend

Water Quality Monitoring Location

- DO > 4 mg/L & Turbidity < 50 NTU
- DO < 4 mg/L
- Turbidity > 50 NTU
- DO < 4 mg/L & Turbidity > 50 NTU

Quarter Mile Grid Segments

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

mg/L milligrams per liter
NTU Nephelometric Turbidity Units

N

0 125 250 500

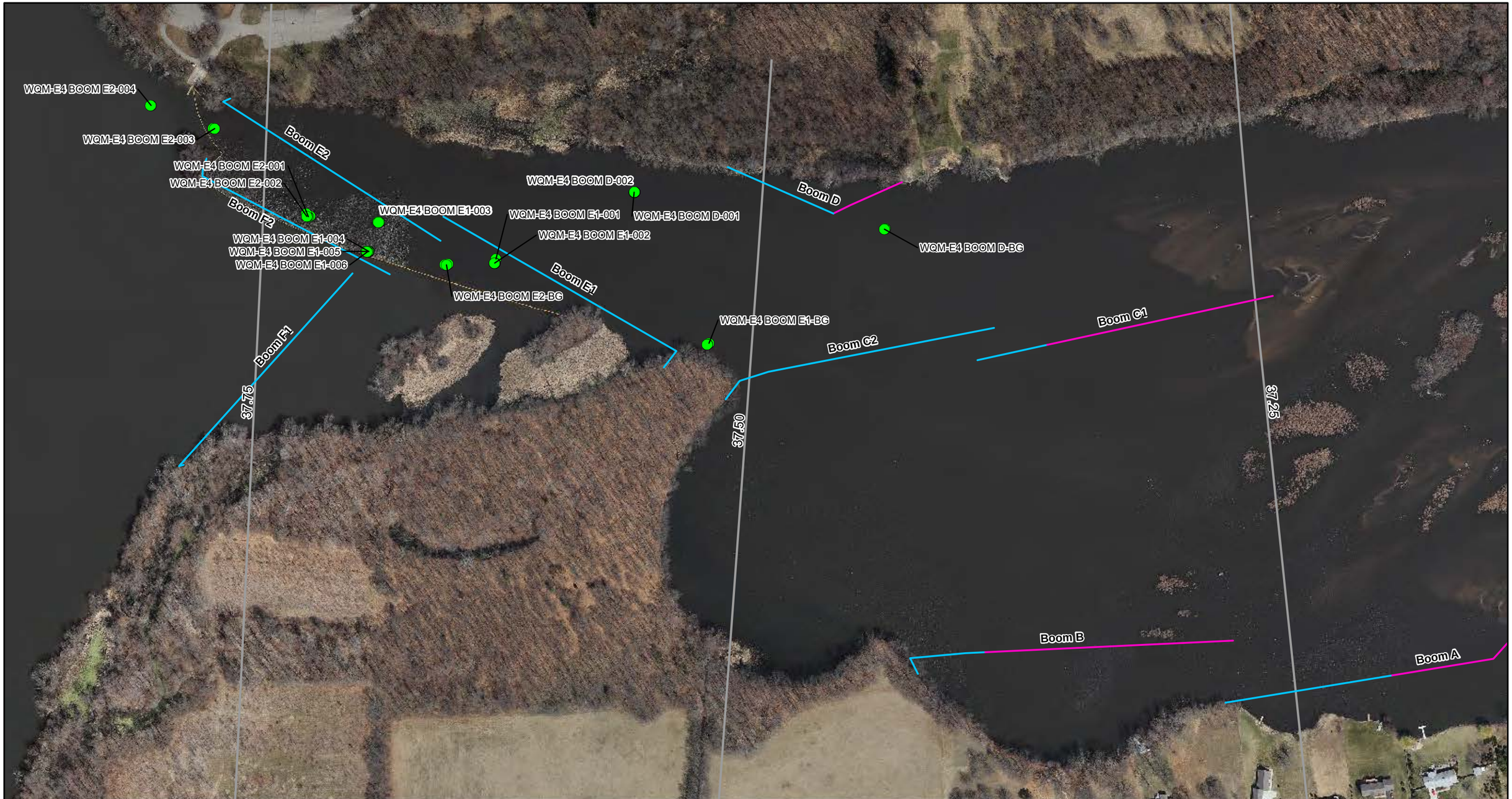
Scale in Feet

FIGURE 2b-3
WATER QUALITY MONITORING LOCATIONS
E 4.0 CURTAIN REMOVAL
NOVEMBER 17, 2012
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2b-3_WQM_E4_Curtain_Removal_111712.mxd

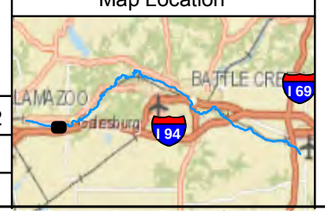
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/13/2012
Approved:	EE	12/13/2012
Project #:	60246209	

Map Location



Legend

Water Quality Monitoring Location

- DO > 4 mg/L & Turbidity < 50 NTU
- DO < 4 mg/L
- Turbidity > 50 NTU
- DO < 4 mg/L & Turbidity > 50 NTU

Quarter Mile Grid Segments

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

mg/L milligrams per liter
NTU Nephelometric Turbidity Units

N

0 125 250 500

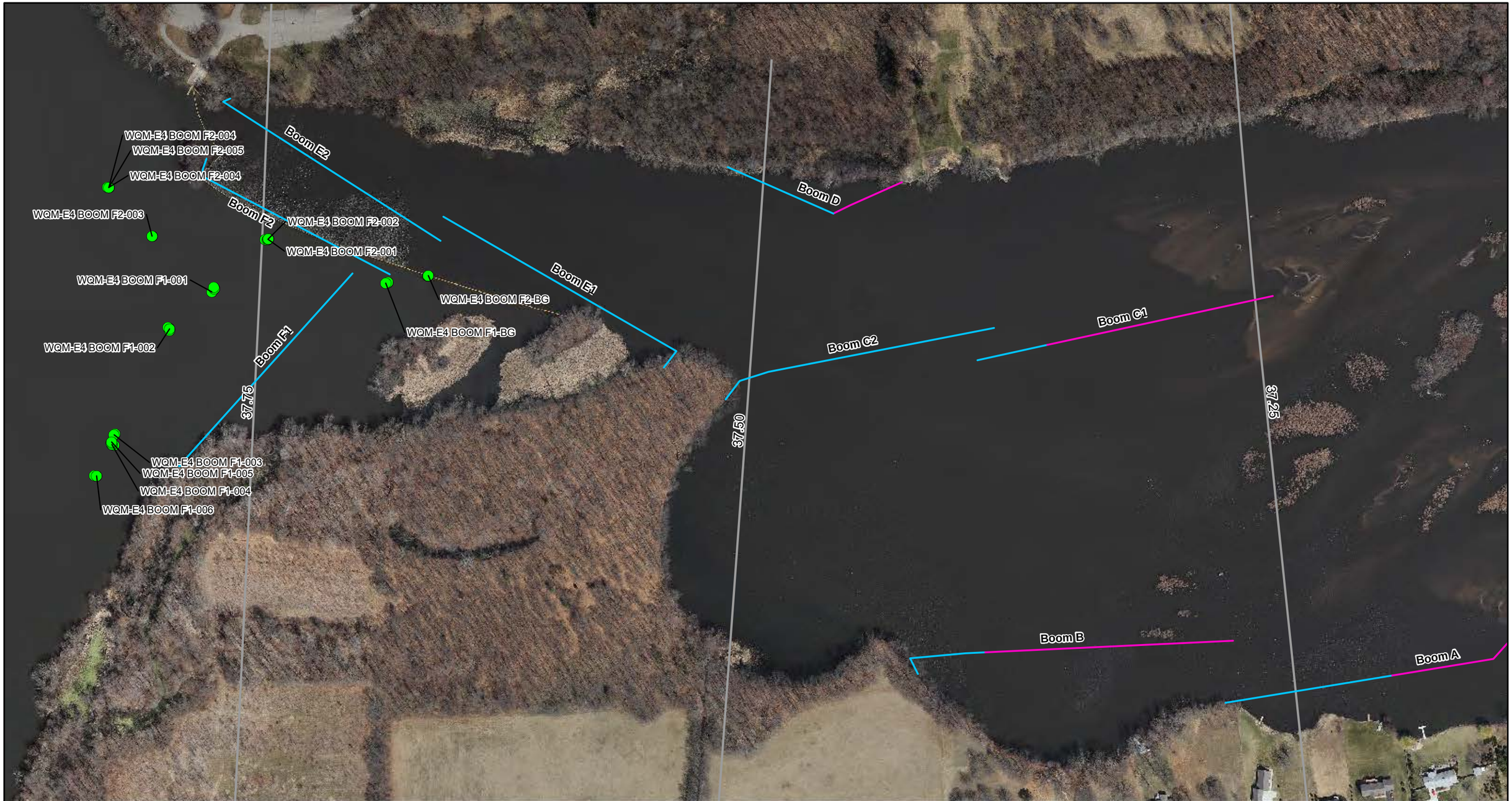
Scale in Feet

FIGURE 2b-4
WATER QUALITY MONITORING LOCATIONS
E 4.0 CURTAIN REMOVAL
NOVEMBER 18, 2012
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2b-4_WQM_E4_Curtain_Removal_111812.mxd

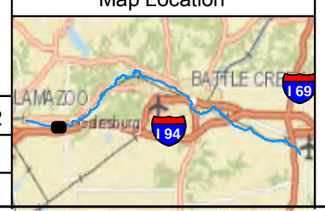
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/13/2012
Approved:	EE	12/13/2012
Project #:	60246209	

Map Location



Legend

Water Quality Monitoring Location

- DO > 4 mg/L & Turbidity < 50 NTU
- DO < 4 mg/L
- Turbidity > 50 NTU
- DO < 4 mg/L & Turbidity > 50 NTU

Quarter Mile Grid Segments

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

mg/L milligrams per liter
NTU Nephelometric Turbidity Units

N

0 125 250 500

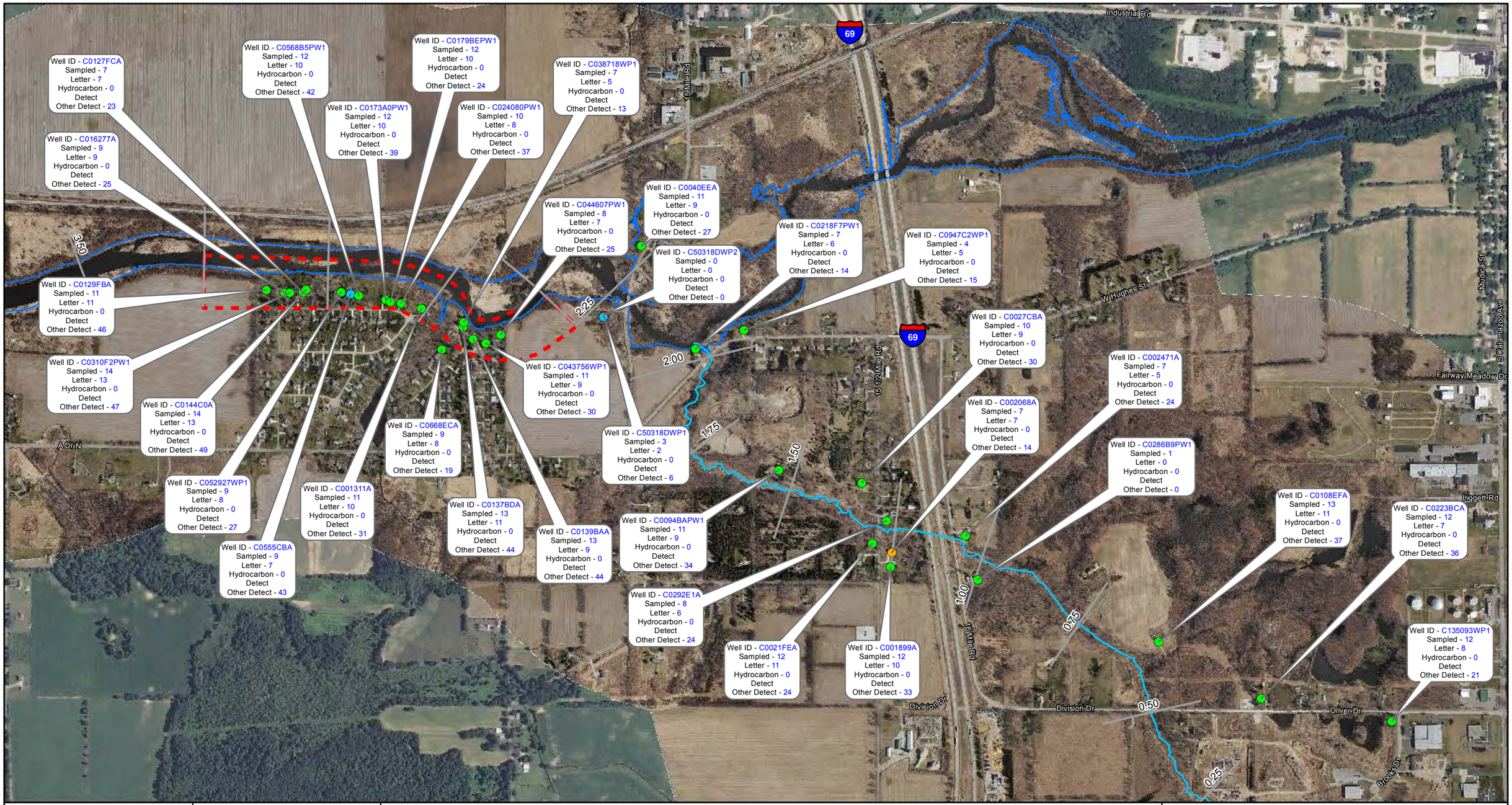
Scale in Feet

FIGURE 2b-5
WATER QUALITY MONITORING LOCATIONS
E 4.0 CURTAIN REMOVAL
NOVEMBER 19, 2012
SHEET 1 OF 1

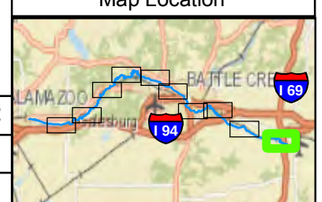
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2b-5_WQM_E4_Curtain_Removal_111912.mxd

Aerial Photography Date: April 2011



Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

Scale in Feet

ENBRIDGE

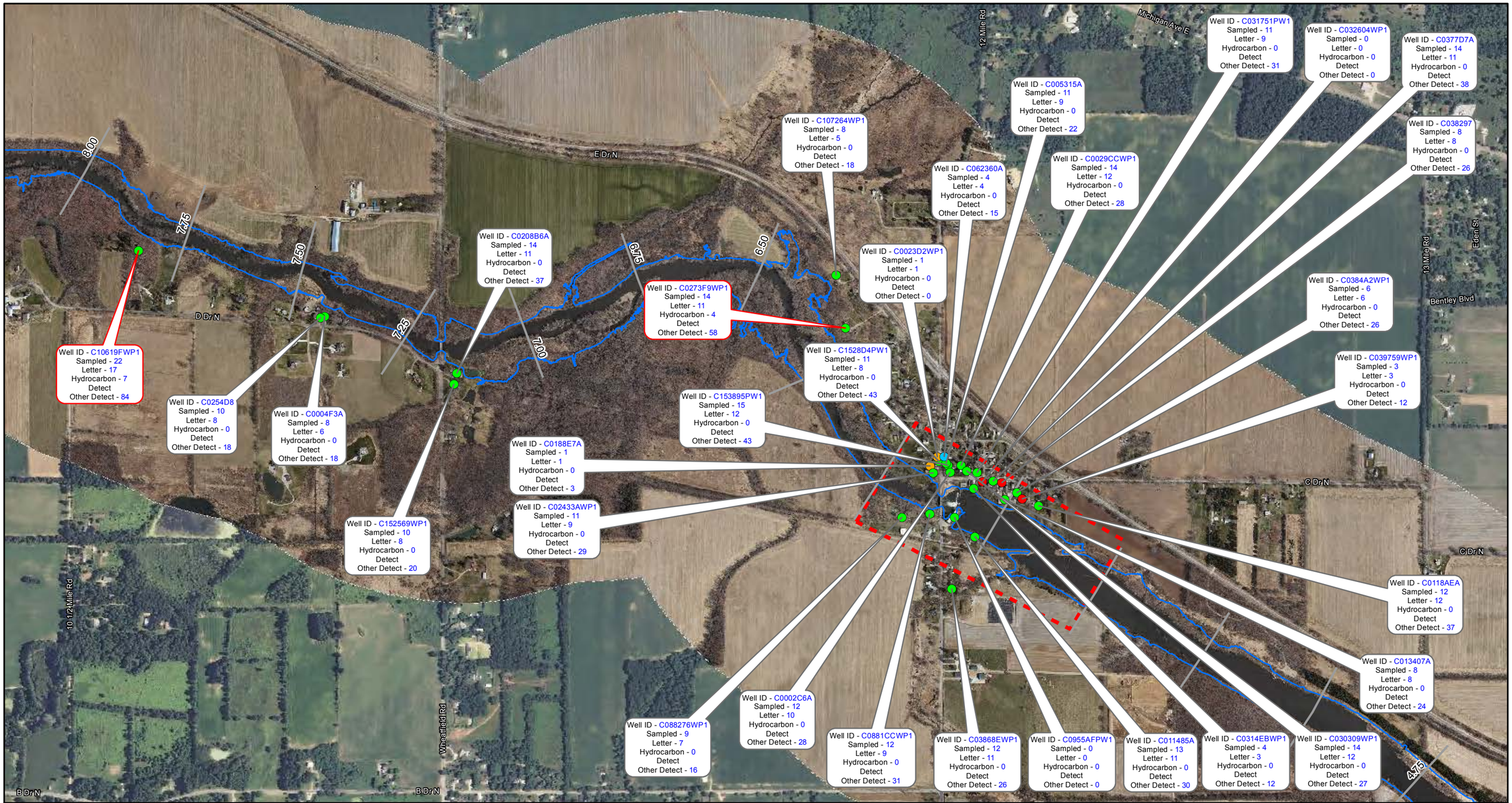
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 1 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

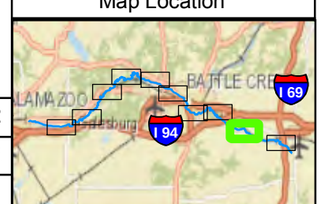
Aerial Photography Date: April 2011 over 2010



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 2 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

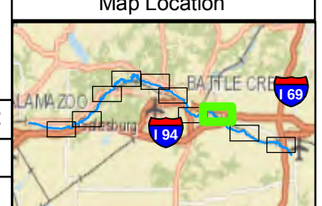
Aerial Photography Date: April 2011 over 2010



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

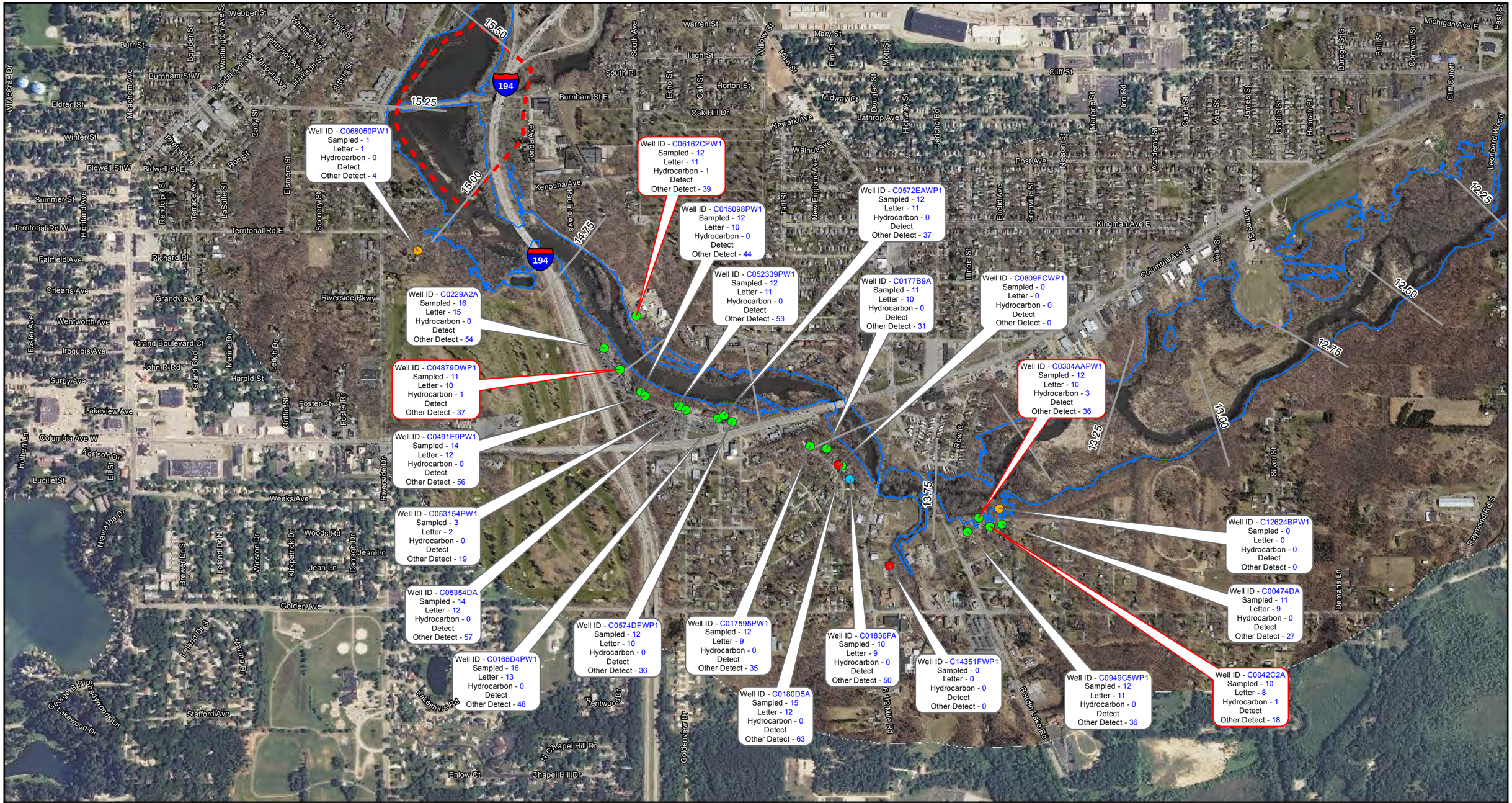
Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 3 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

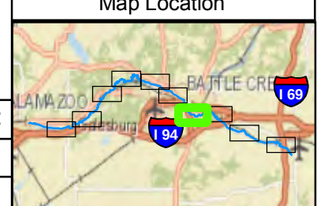
Aerial Photography Date: April 2011 over 2010



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 4 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

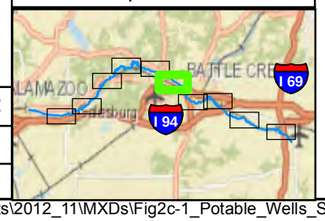
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

Aerial Photography Date: April 2011 over 2010



Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status
- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

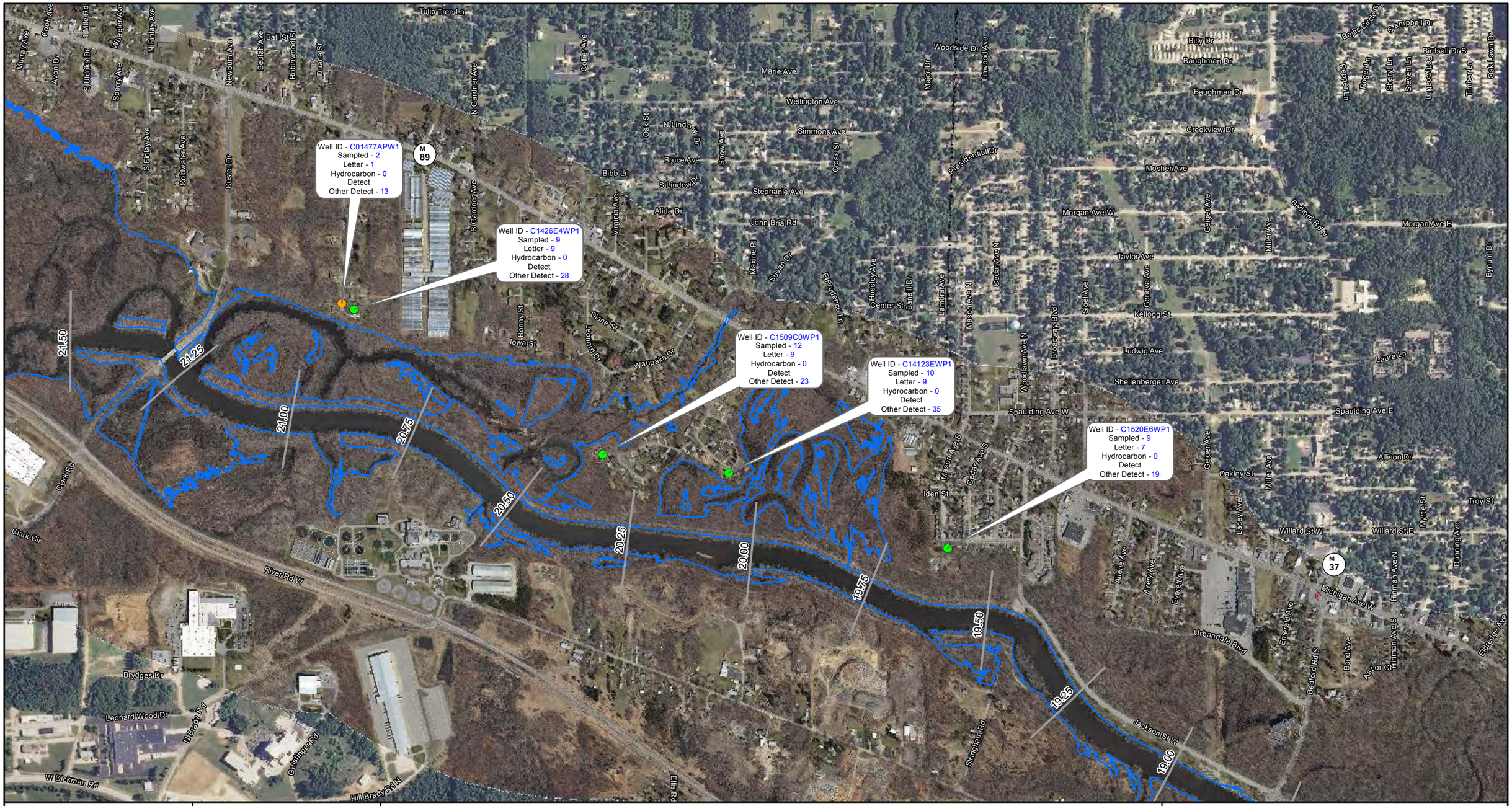
Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 5 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

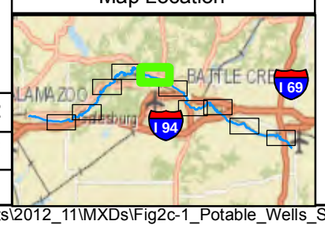
Aerial Photography Date: April 2011 over 2010



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 6 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

Aerial Photography Date: April 2011 over 2010

Well ID - C07824BPW1
Sampled - 10
Letter - 9
Hydrocarbon - 0
Detect
Other Detect - 24

Well ID - C00856DA
Sampled - 14
Letter - 13
Hydrocarbon - 0
Detect
Other Detect - 51

Well ID - C0872B9PW2
Sampled - 8
Letter - 8
Hydrocarbon - 0
Detect
Other Detect - 18

Well ID - C0789C3PW1
Sampled - 4
Letter - 3
Hydrocarbon - 0
Detect
Other Detect - 9

Well ID - C00928FA
Sampled - 10
Letter - 9
Hydrocarbon - 0
Detect
Other Detect - 23

Well ID - C03429BWP1
Sampled - 11
Letter - 9
Hydrocarbon - 0
Detect
Other Detect - 27

Well ID - C0872B9PW1
Sampled - 3
Letter - 3
Hydrocarbon - 0
Detect
Other Detect - 17

Well ID - C0337D3WP1
Sampled - 11
Letter - 9
Hydrocarbon - 0
Detect
Other Detect - 28

Well ID - C033645WP1
Sampled - 8
Letter - 7
Hydrocarbon - 0
Detect
Other Detect - 26

Well ID - C0335FFWP1
Sampled - 8
Letter - 7
Hydrocarbon - 0
Detect
Other Detect - 19

Well ID - C01573BA
Sampled - 13
Letter - 11
Hydrocarbon - 0
Detect
Other Detect - 37

Well ID - C0156ADA
Sampled - 15
Letter - 13
Hydrocarbon - 0
Detect
Other Detect - 62

Well ID - C0231D1A
Sampled - 12
Letter - 10
Hydrocarbon - 0
Detect
Other Detect - 40

Well ID - C04757EWP1
Sampled - 6
Letter - 6
Hydrocarbon - 0
Detect
Other Detect - 14

Well ID - C01497DA
Sampled - 8
Letter - 7
Hydrocarbon - 0
Detect
Other Detect - 14

Well ID - C0920E7PW1
Sampled - 8
Letter - 7
Hydrocarbon - 0
Detect
Other Detect - 19

Well ID - C005139A
Sampled - 12
Letter - 12
Hydrocarbon - 0
Detect
Other Detect - 41

Well ID - C015481A
Sampled - 13
Letter - 12
Hydrocarbon - 0
Detect
Other Detect - 32

Well ID - C015322A
Sampled - 16
Letter - 13
Hydrocarbon - 0
Detect
Other Detect - 53

Well ID - C000749A
Sampled - 9
Letter - 8
Hydrocarbon - 0
Detect
Other Detect - 29

Well ID - C023047A
Sampled - 15
Letter - 12
Hydrocarbon - 0
Detect
Other Detect - 57

Well ID - C0470F1PW1
Sampled - 11
Letter - 10
Hydrocarbon - 0
Detect
Other Detect - 26

Well ID - C046882A
Sampled - 11
Letter - 11
Hydrocarbon - 0
Detect
Other Detect - 27

Well ID - C0227A5A
Sampled - 12
Letter - 12
Hydrocarbon - 0
Detect
Other Detect - 41

Well ID - C00589DA
Sampled - 13
Letter - 12
Hydrocarbon - 0
Detect
Other Detect - 39

Well ID - C046713WP1
Sampled - 14
Letter - 12
Hydrocarbon - 0
Detect
Other Detect - 47

Well ID - C0048DCA
Sampled - 12
Letter - 10
Hydrocarbon - 0
Detect
Other Detect - 36

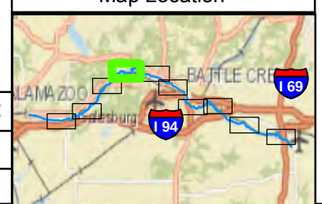
Well ID - C035755WP1
Sampled - 5
Letter - 5
Hydrocarbon - 0
Detect
Other Detect - 19

Well ID - C035755WP2
Sampled - 5
Letter - 5
Hydrocarbon - 0
Detect
Other Detect - 14

E E F Ave
N 46th St
Pin Oak Cir
Marsh Ridge Trl
Oriole Dr
Teal St
N 44th St
N Augusta Dr
Fort Custer Dr
Ann Ln
Martin Dr
James B Eagle Dr
River Rd W
W County Line Rd
William Shafter Cir W
Paul Lambert Trl
Duane Dewey Ln
William Shafter Cir N
William Shafter Cir S
Clark Rd

26.25
26.00
25.75
25.50
25.25
25.00
24.75
24.50
24.25
22.00
21.75

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

Scale in Feet

ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 7 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

Aerial Photography Date: April 2011 over 2010

Well ID - C086970PW1
Sampled - 17
Letter - 13
Hydrocarbon - 0
Detect
Other Detect - 43

Well ID - C086970PW2
Sampled - 16
Letter - 13
Hydrocarbon - 0
Detect
Other Detect - 40

Well ID - C033469WP1
Sampled - 7
Letter - 6
Hydrocarbon - 0
Detect
Other Detect - 24

Well ID - C0678ADA
Sampled - 12
Letter - 10
Hydrocarbon - 0
Detect
Other Detect - 32

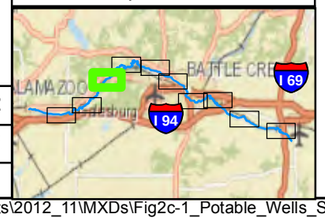
Well ID - C14332AWP1
Sampled - 9
Letter - 8
Hydrocarbon - 0
Detect
Other Detect - 22

N Augusta Dr
W Jefferson St
W Washington St
W Jackson St
W Van Buren St
W Michigan Ave
W Clinton St
Fayette St
N Lincoln St
N Chestnut St
N Webster St
W Canal St
E Canal St
N 39th St
E F G Ave
E G Ave
Circle Dr
Meadow Ln
Meadow St
S Lincoln St
S Chestnut St
S Webster St
E Michigan Ave
E Clinton St
E Augusta Dr
Fort Custer Dr
Harmonia Rd
Eagle Lake Dr
Chippewa Way
Fort Custer Rec Area Service
Fort Custer Rec Area Access
Augusta Climax Rd
Fort Custer Rec Area Campgrnd
Fort Custer Rec Area BAS
M 96

27.75
28.00
28.25
28.50
28.75
29.00
29.25
29.50
29.75
30.00
30.25
30.50
30.75

ENBRIDGE		
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status
- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000
Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 8 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

Aerial Photography Date: April 2011 over 2010

Well ID - C0246B5WP1
Sampled - 0
Letter - 0
Hydrocarbon - 0
Detect
Other Detect - 0

Well ID - C025965WP1
Sampled - 2
Letter - 1
Hydrocarbon - 0
Detect
Other Detect - 11

Well ID - C01932EA
Sampled - 18
Letter - 16
Hydrocarbon - 0
Detect
Other Detect - 46

Well ID - C01948DPW1
Sampled - 11
Letter - 9
Hydrocarbon - 0
Detect
Other Detect - 29

Well ID - C030917WP1
Sampled - 11
Letter - 10
Hydrocarbon - 0
Detect
Other Detect - 32

Well ID - C0300B3WP1
Sampled - 7
Letter - 7
Hydrocarbon - 0
Detect
Other Detect - 25

Well ID - C019930PW1
Sampled - 8
Letter - 7
Hydrocarbon - 0
Detect
Other Detect - 27

Well ID - C07198A_StandPipe
Sampled - 4
Letter - 1
Hydrocarbon - 0
Detect
Other Detect - 8

Well ID - C07198APW1
Sampled - 9
Letter - 6
Hydrocarbon - 0
Detect
Other Detect - 20

Well ID - C0271D5PW1
Sampled - 9
Letter - 8
Hydrocarbon - 0
Detect
Other Detect - 23

Well ID - C07313APW1
Sampled - 8
Letter - 5
Hydrocarbon - 0
Detect
Other Detect - 23

Well ID - C0730ACPW1
Sampled - 17
Letter - 16
Hydrocarbon - 0
Detect
Other Detect - 50

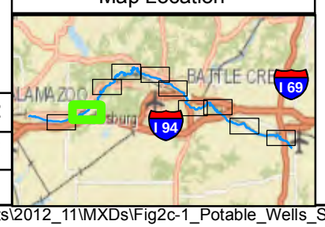
Well ID - C0269A6PW1
Sampled - 17
Letter - 15
Hydrocarbon - 0
Detect
Other Detect - 49

Well ID - C087736WP1
Sampled - 11
Letter - 9
Hydrocarbon - 0
Detect
Other Detect - 25

N 36th St
N 37th St
E Augusta Dr
Burgess Dr
Division St
Maple Ave
Hamilton St
Center St
New St
Beckwith Dr
E Michigan Ave
S Church St
Grove St
W Battle Creek St
Miller Rd
Territorial Rd
Bicycle Trail
Fort Custer Dr
Fire Hill Dr
N 40th St
W I-94/ Michigan Ramp
E Michigan Ave
M 96
I 94

32.25
32.50
32.75
33.00
33.25
33.50
33.75
34.00
34.25
34.50
35.25
35.50
35.00
35.75

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000
Scale in Feet

ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 9 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

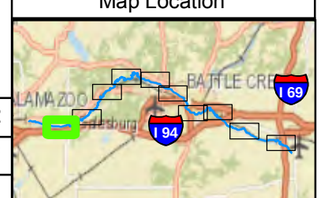
Aerial Photography Date: April 2011 over 2010



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Well Eligibility Status

- Eligible
- Not Accessible
- Winterized
- Refused Permission

- Target Area
- Kalamazoo River Flood Inundation Boundary
- Talmadge Creek
- Quarter Mile Grid Segments
- Hydrocarbon Detection

Well ID C14255EWP1 is not shown as owner refused permission to have a GPS location taken.

N

0 1,000 2,000

Scale in Feet

FIGURE 2c-1
POTABLE WELL LOCATIONS, ELIGIBILITY STATUS, AND WELLS SAMPLED AS OF NOVEMBER 30, 2012
SHEET 10 OF 10

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2c-1_Potable_Wells_Sampled.mxd

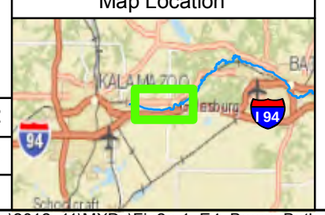
Aerial Photography Date: April 2011 over 2010

Boom E2
Boom E2
Boom E1
Boom E1
Boom D
Boom D
Boom C2
Boom C1
Boom B
Boom A
37.75
37.50
37.25

ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)
- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)
- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 125 250 500
Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
OVERVIEW
SHEET 1 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheet1.mxd

Aerial Photography Date: April 2011



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM A
SHEET 2 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

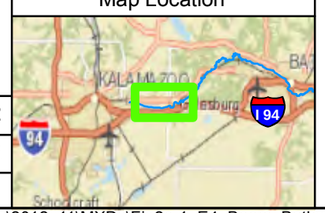
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

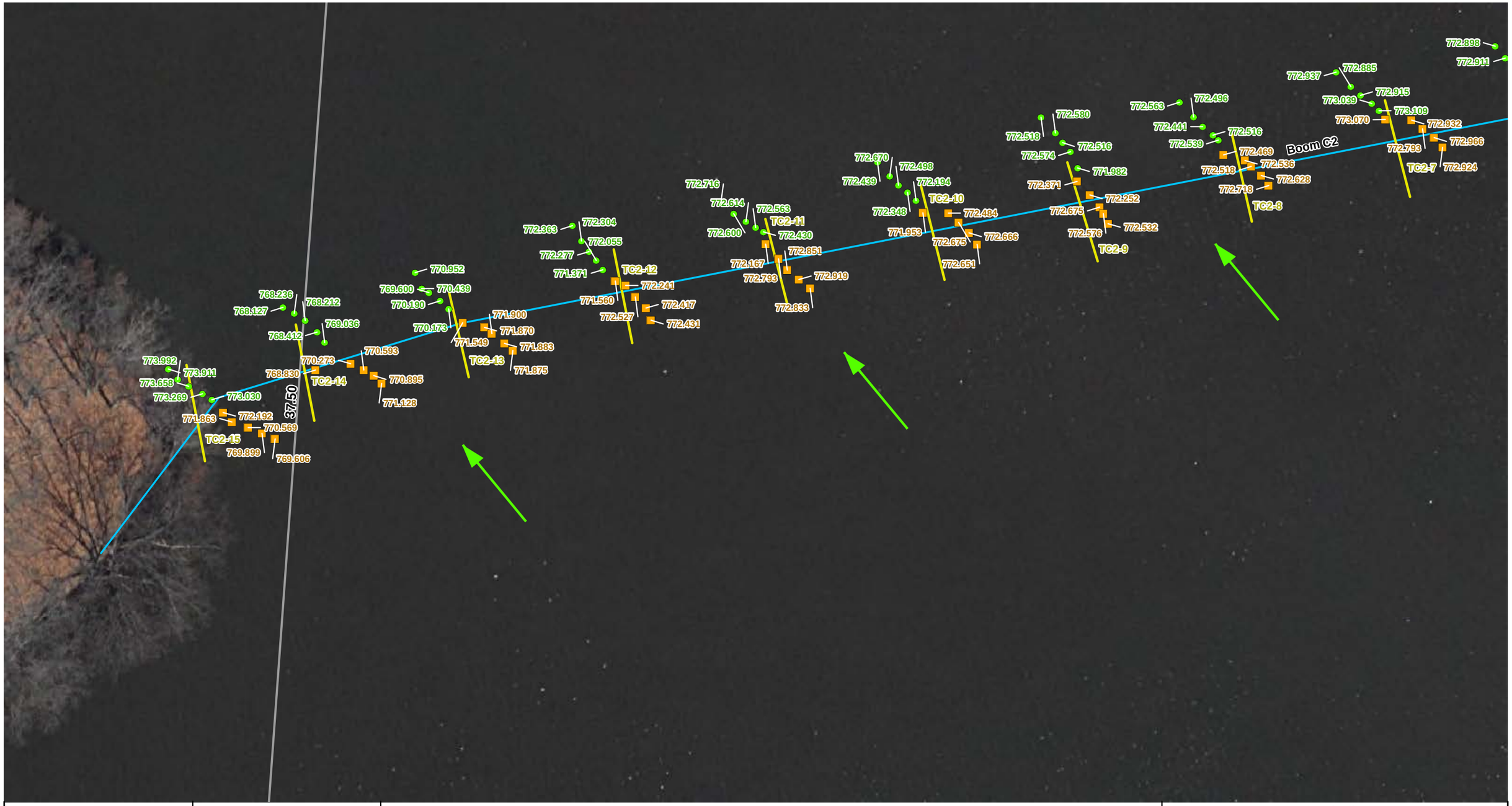
Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM B
SHEET 3 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)
- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)
- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

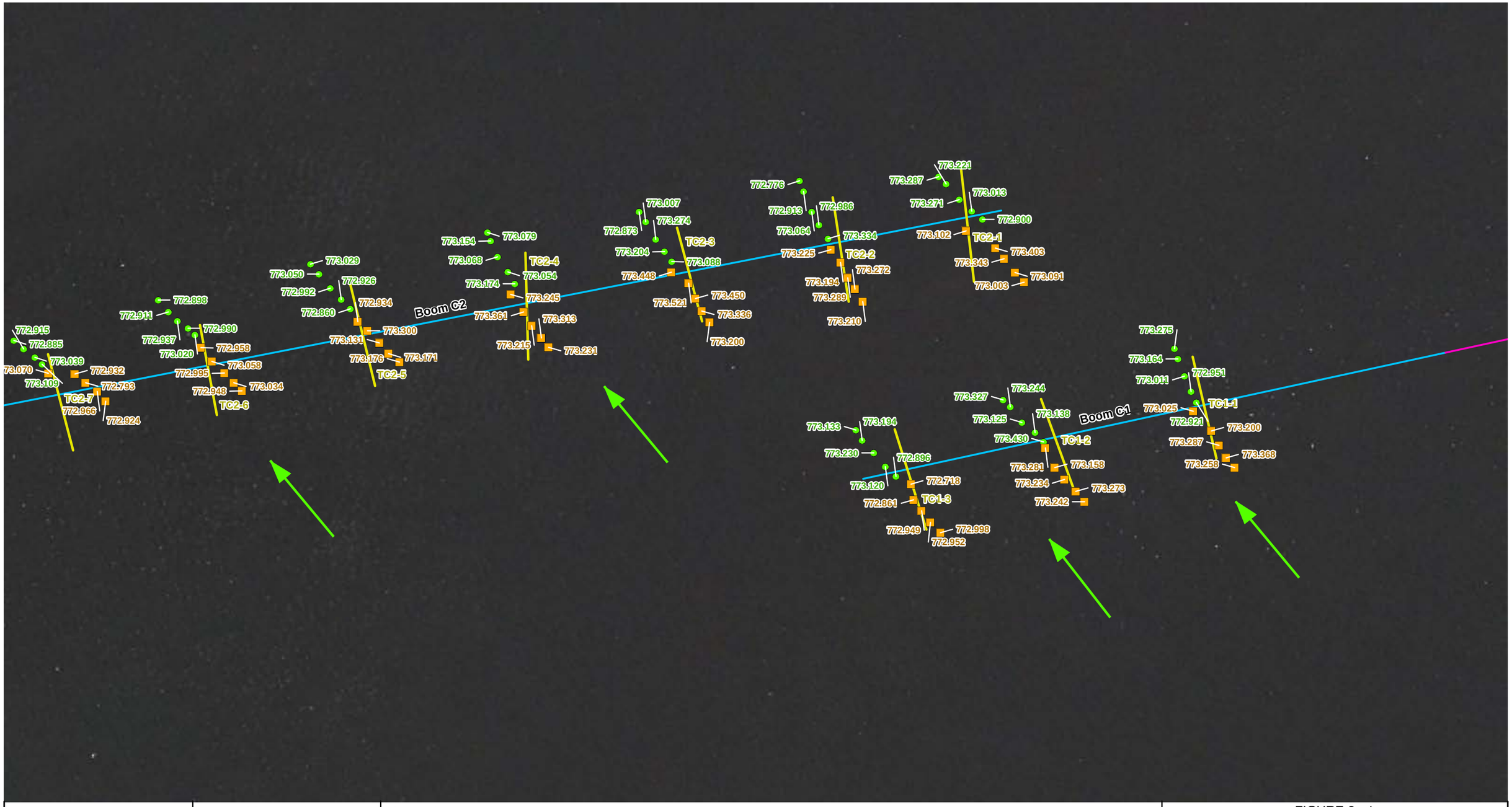
Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM C2
SHEET 4 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

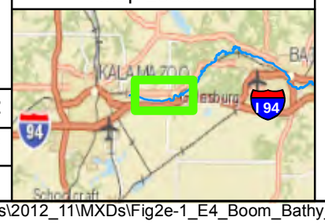
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM C2/C1
SHEET 5 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

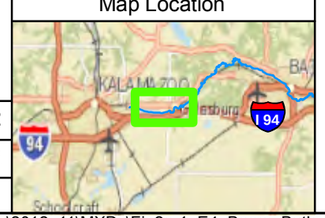
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM D
SHEET 6 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

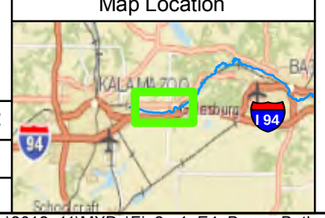
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

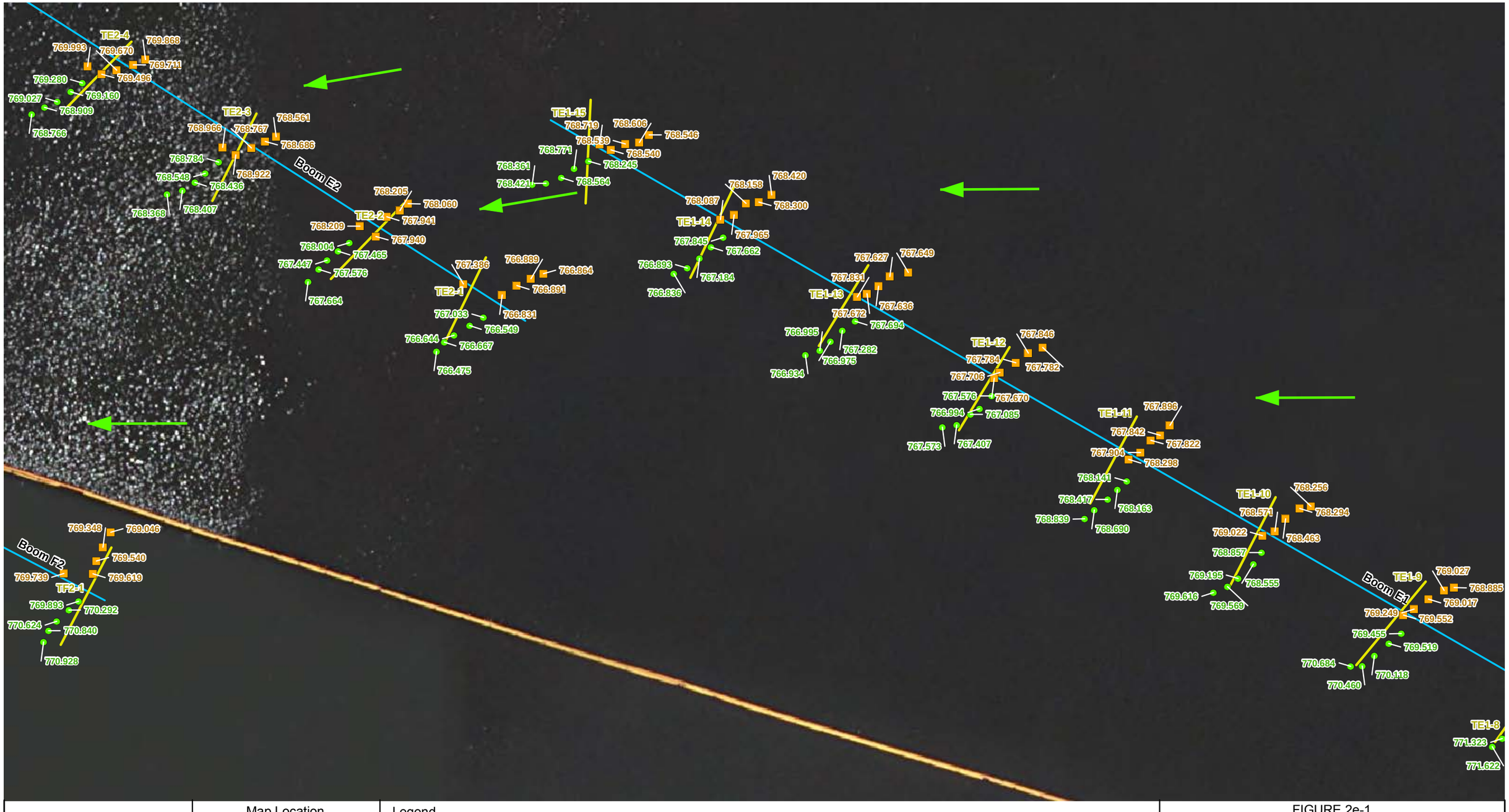
Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM E1
SHEET 7 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

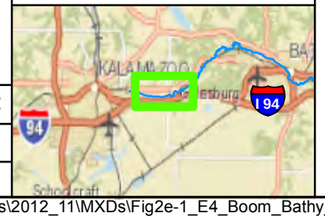
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

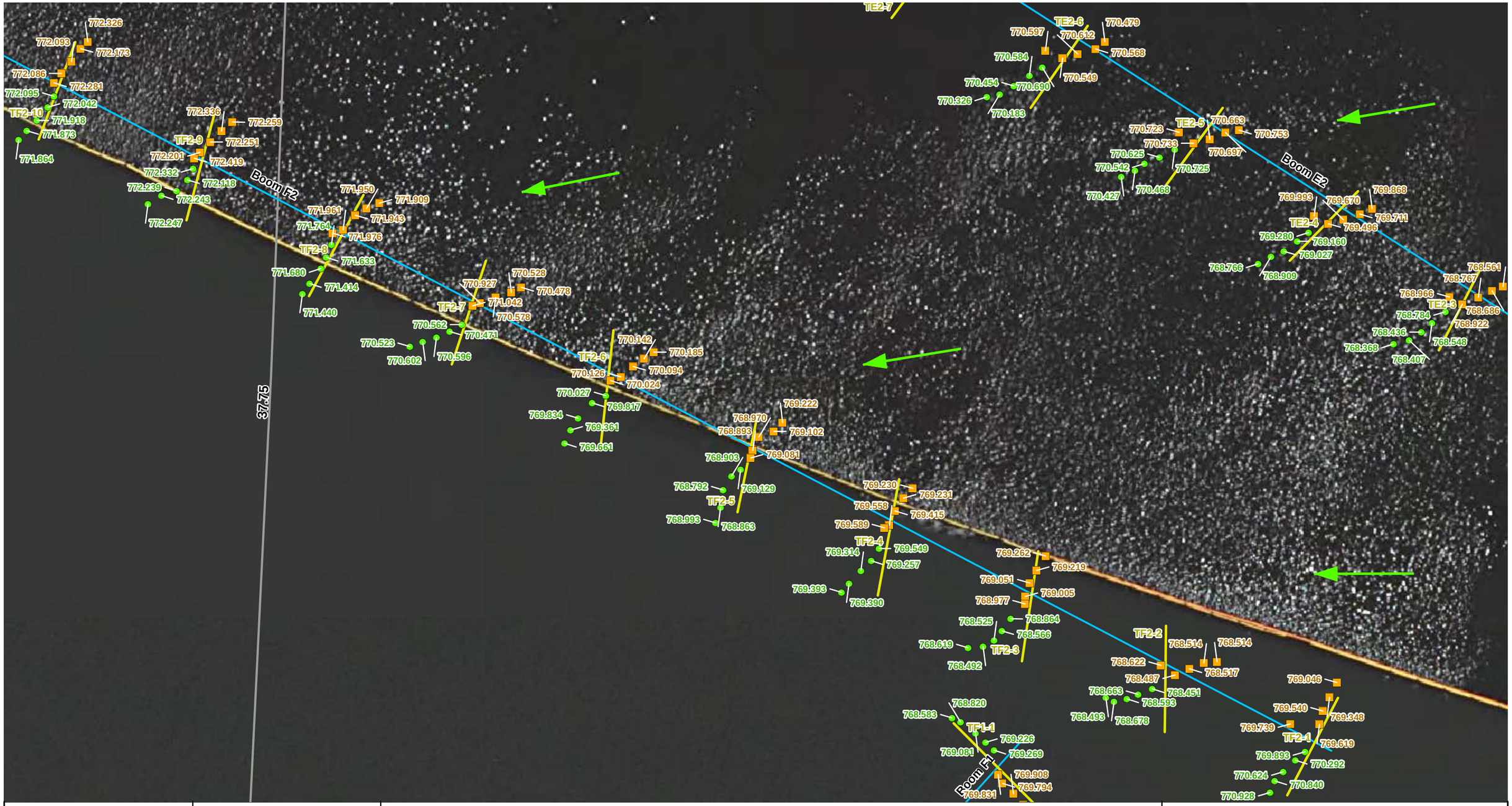
Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM E1/E2
SHEET 8 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM E2/F2
SHEET 9 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

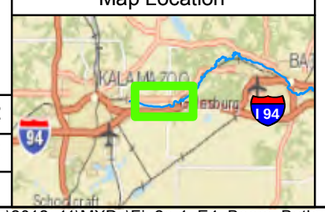
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

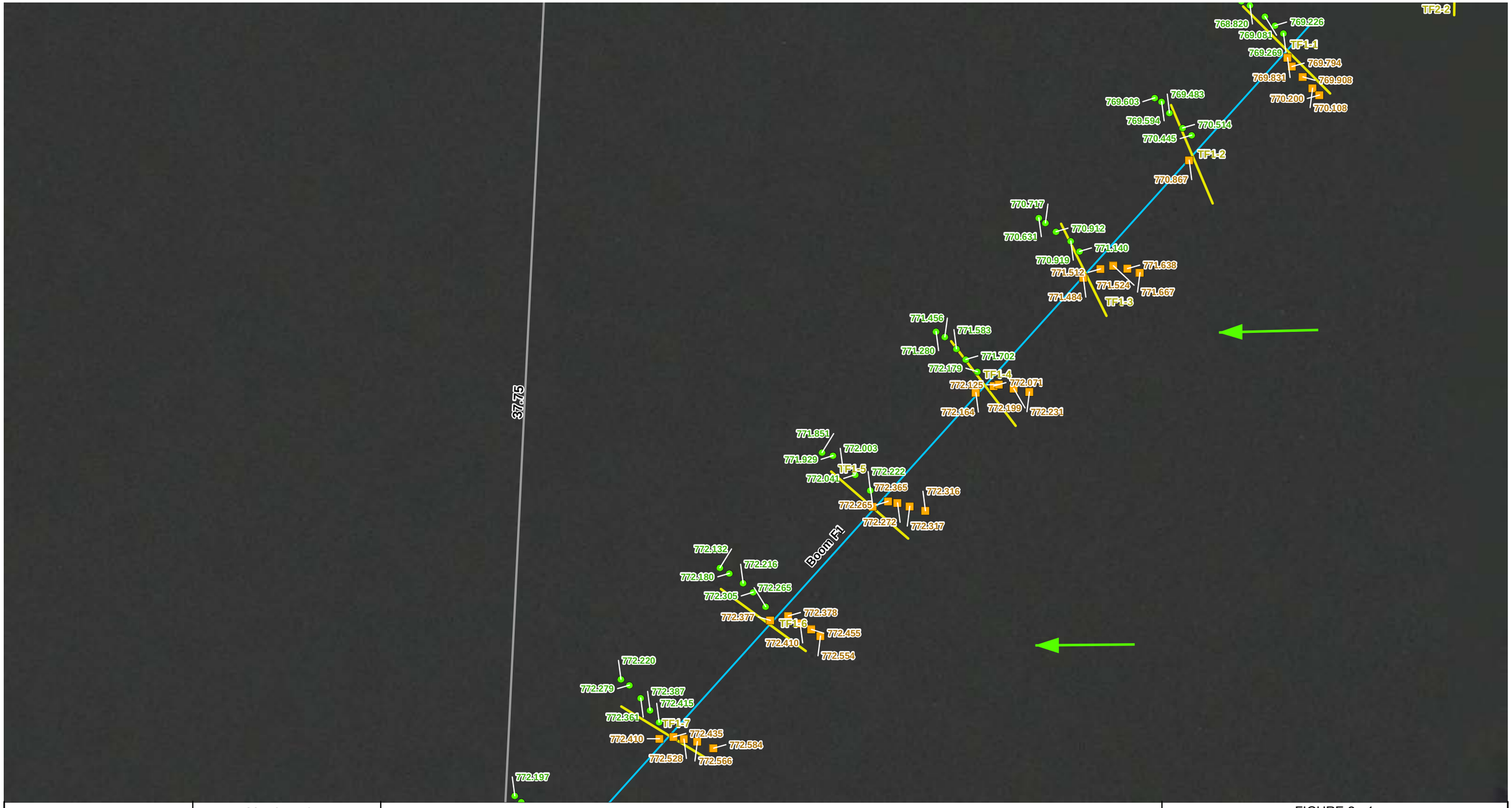
Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM E2/F2
SHEET 10 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



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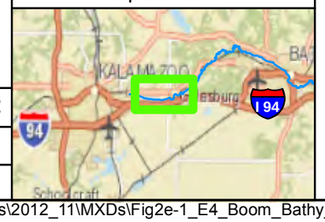
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM F1
SHEET 11 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

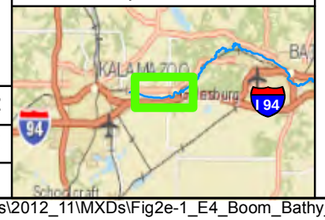
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/12/2012-11/17/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Approximate)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-1
E 4.0 BOOM BATHYMETRY POINTS
PRE-CURTAIN REMOVAL
BOOM F1
SHEET 12 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-1_E4_Boom_Bathy_Pre_Removal_Sheets2-12.mxd

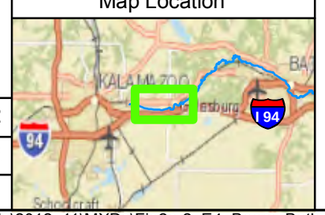
Aerial Photography Date: April 2011

Boom E2
Boom E2
Boom F2
Boom E1
Boom F1
37.75
Boom D
Boom D
37.50
Boom C2
Boom C1
37.25
Boom B
Boom A

ENBRIDGE

Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)
- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)
- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 125 250 500
Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
OVERVIEW
SHEET 1 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheet1.mxd

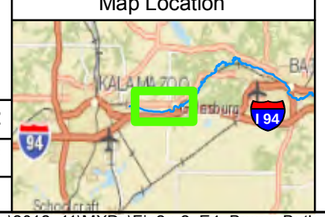
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM A
SHEET 2 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

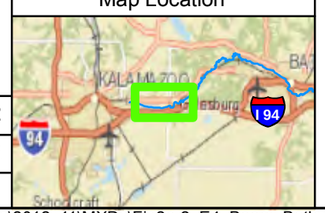
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

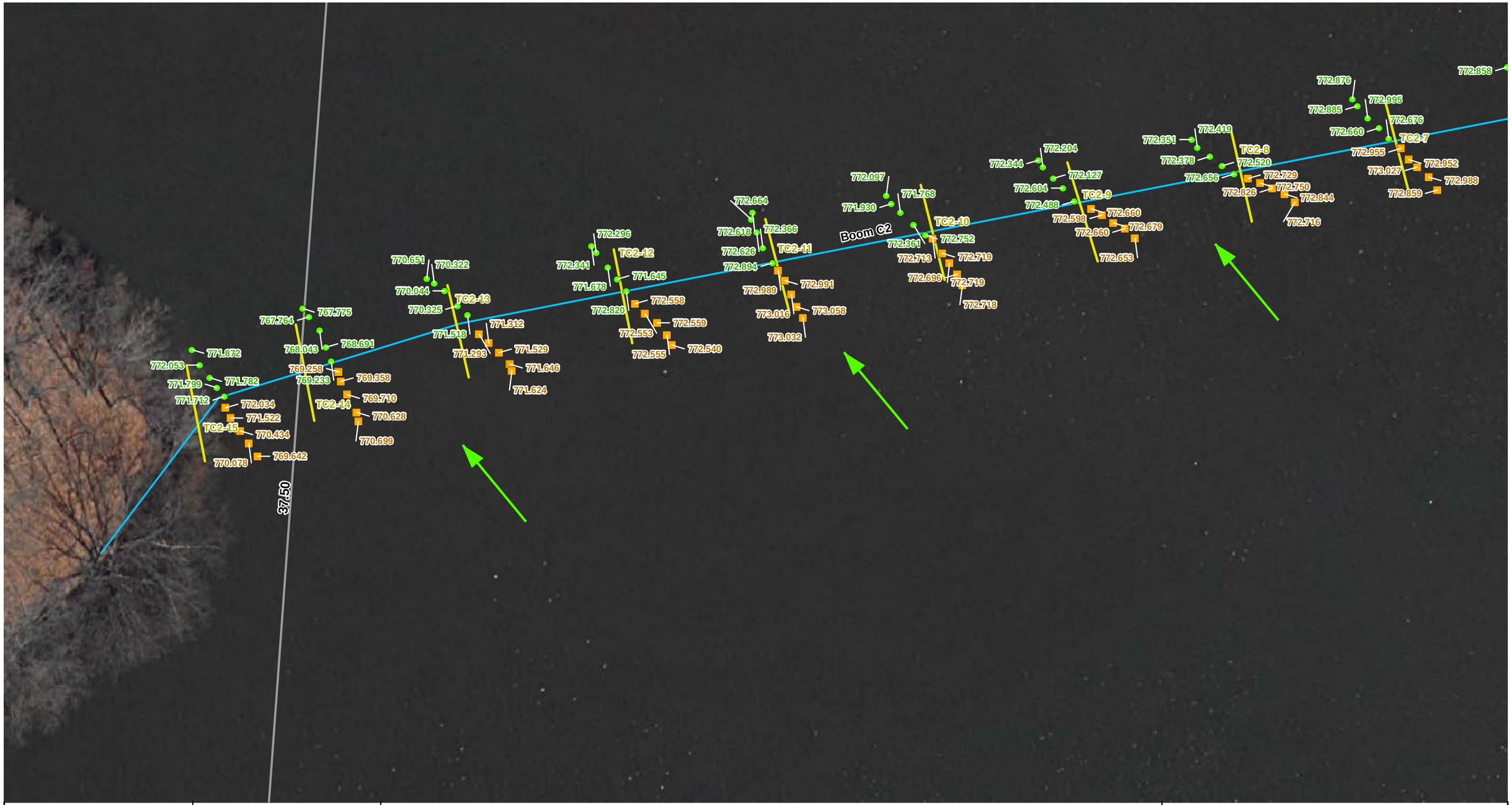
Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM B
SHEET 3 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



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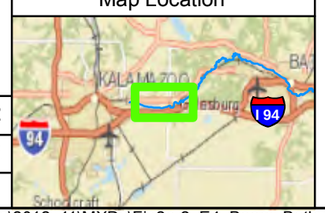
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

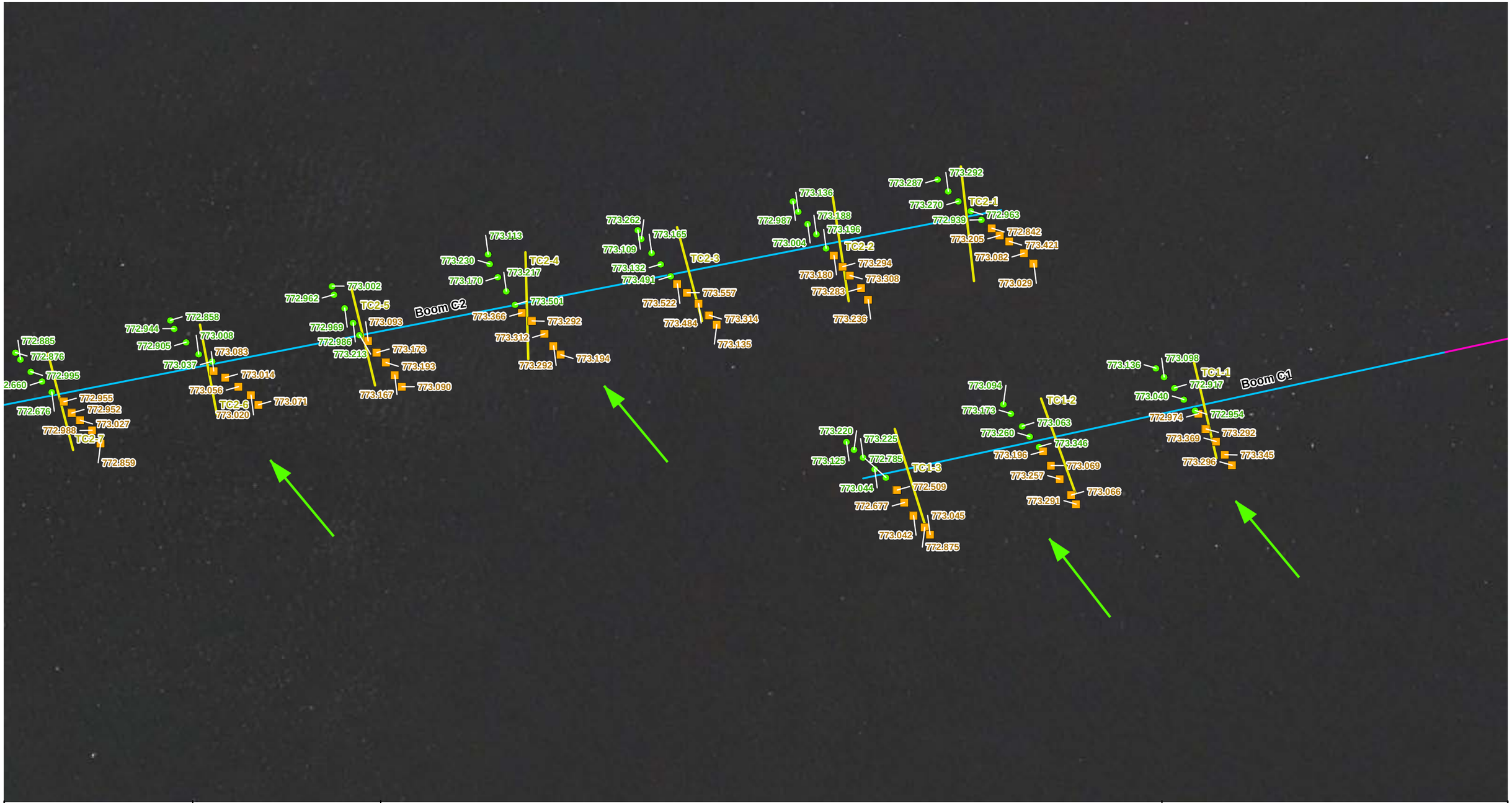
Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM C2
SHEET 4 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

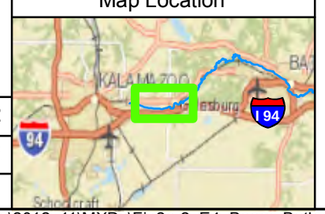
Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



ENBRIDGE		
Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM C2/C1
SHEET 5 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



ENBRIDGE

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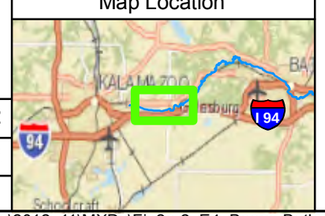
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM D
SHEET 6 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

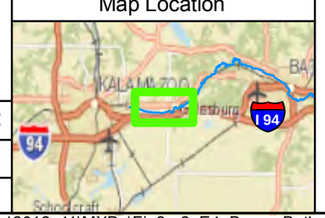
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

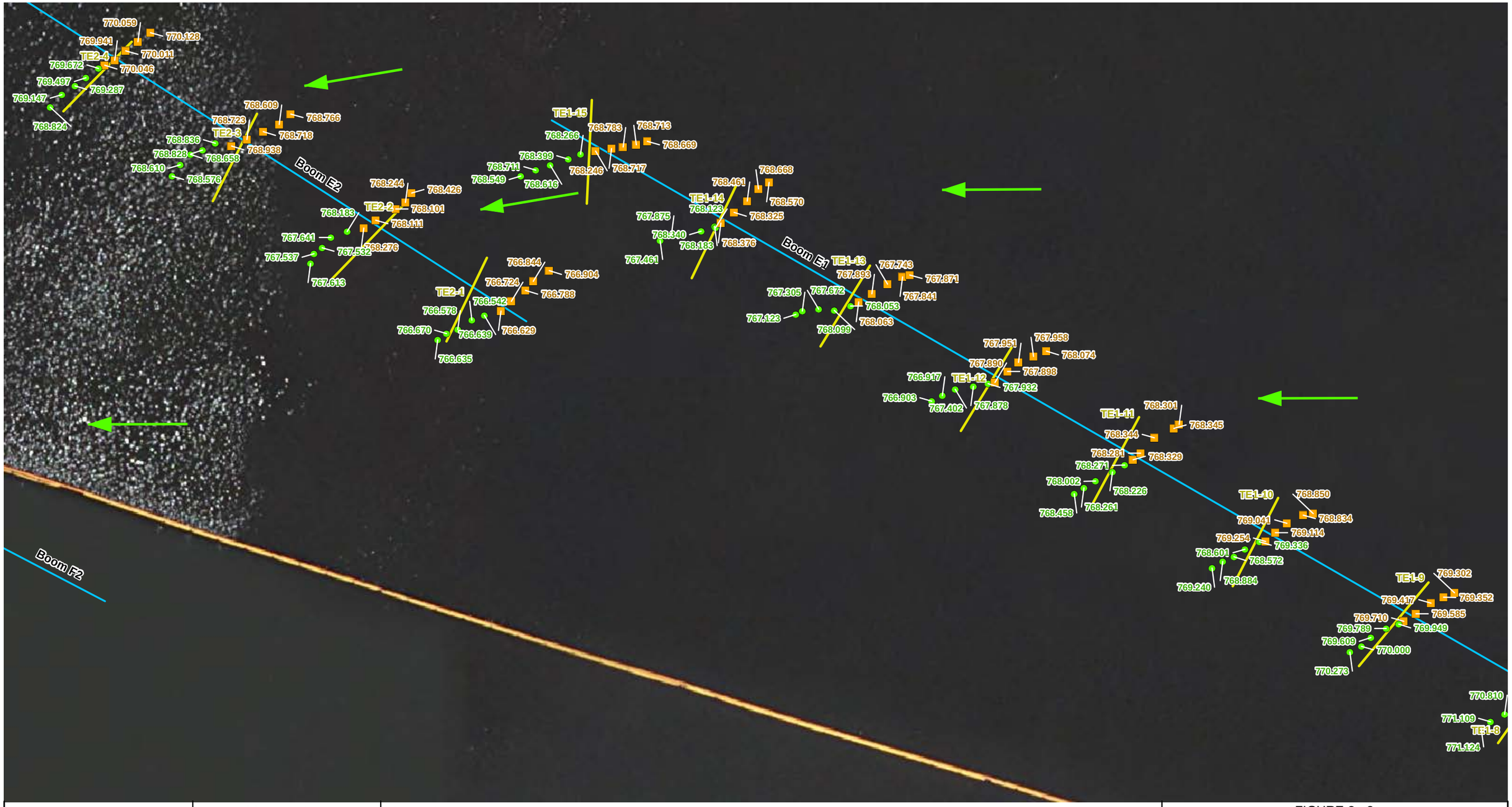
Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM E1
SHEET 7 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM E1/E2
SHEET 8 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

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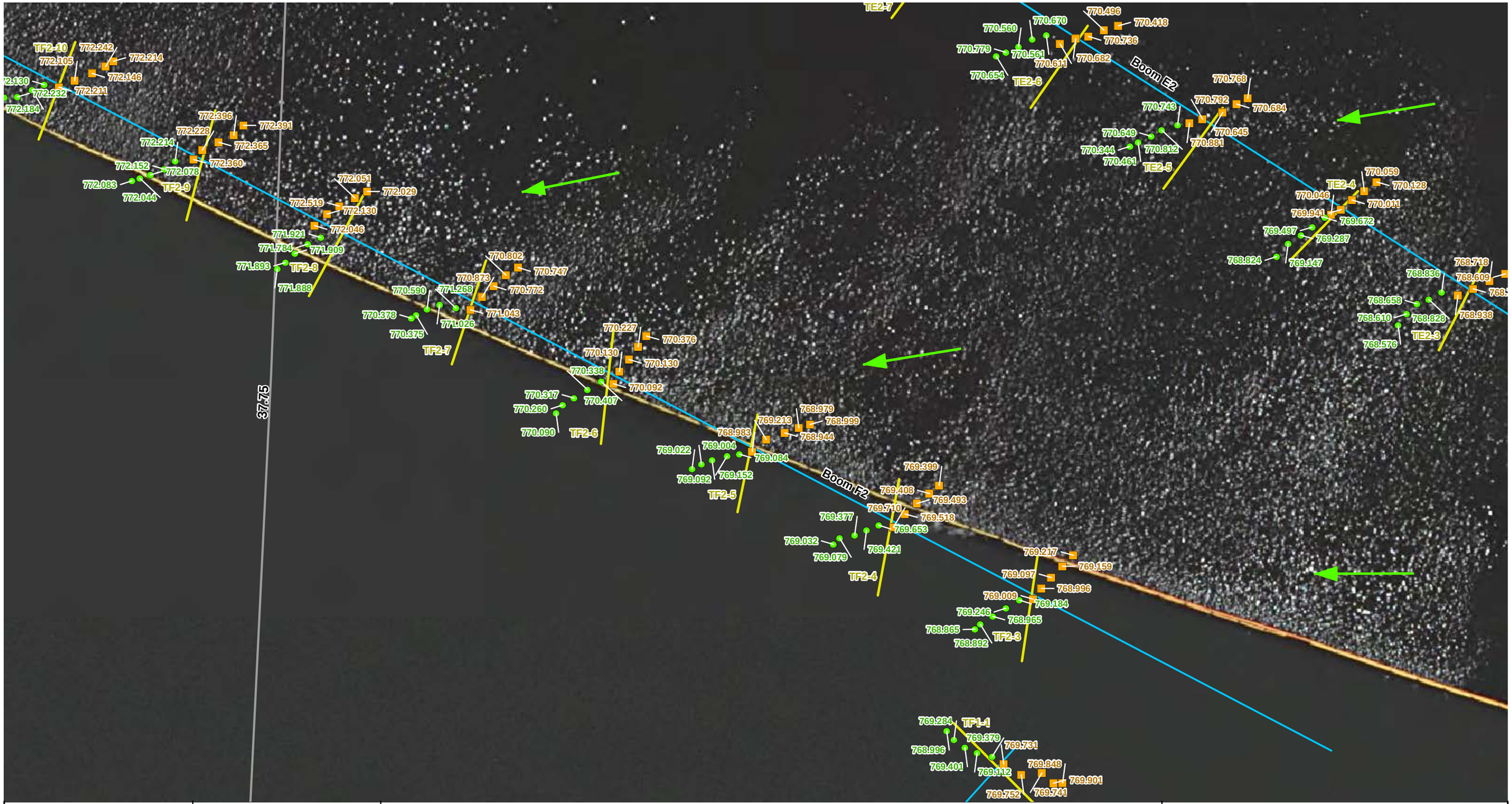

ENBRIDGE

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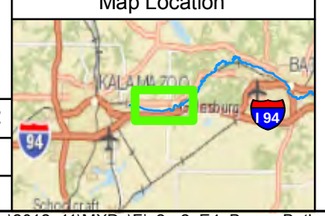
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM E2/F2
SHEET 9 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

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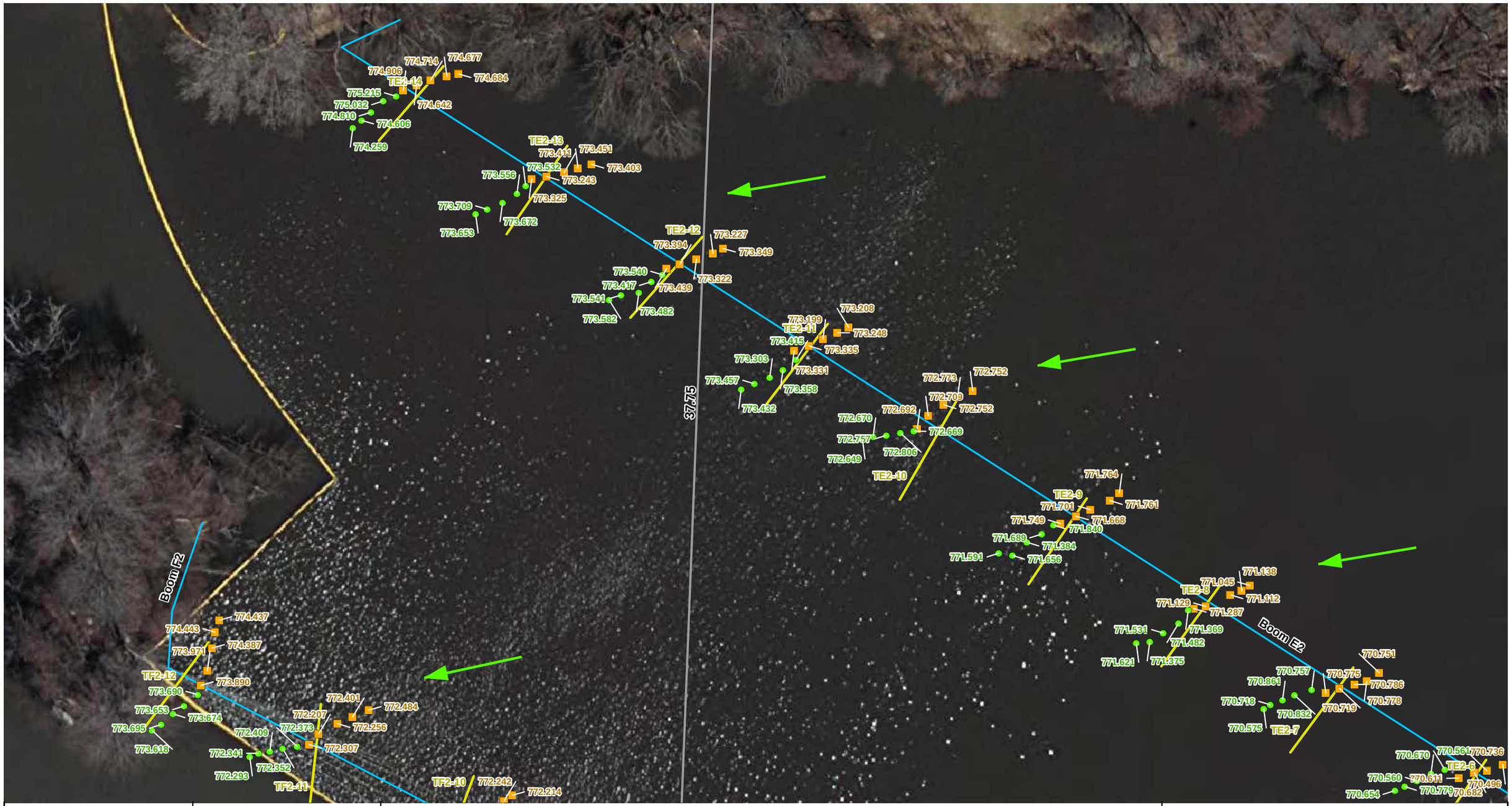

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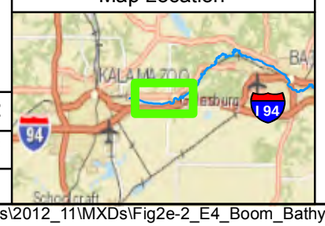
Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain

- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM E2/F2
SHEET 10 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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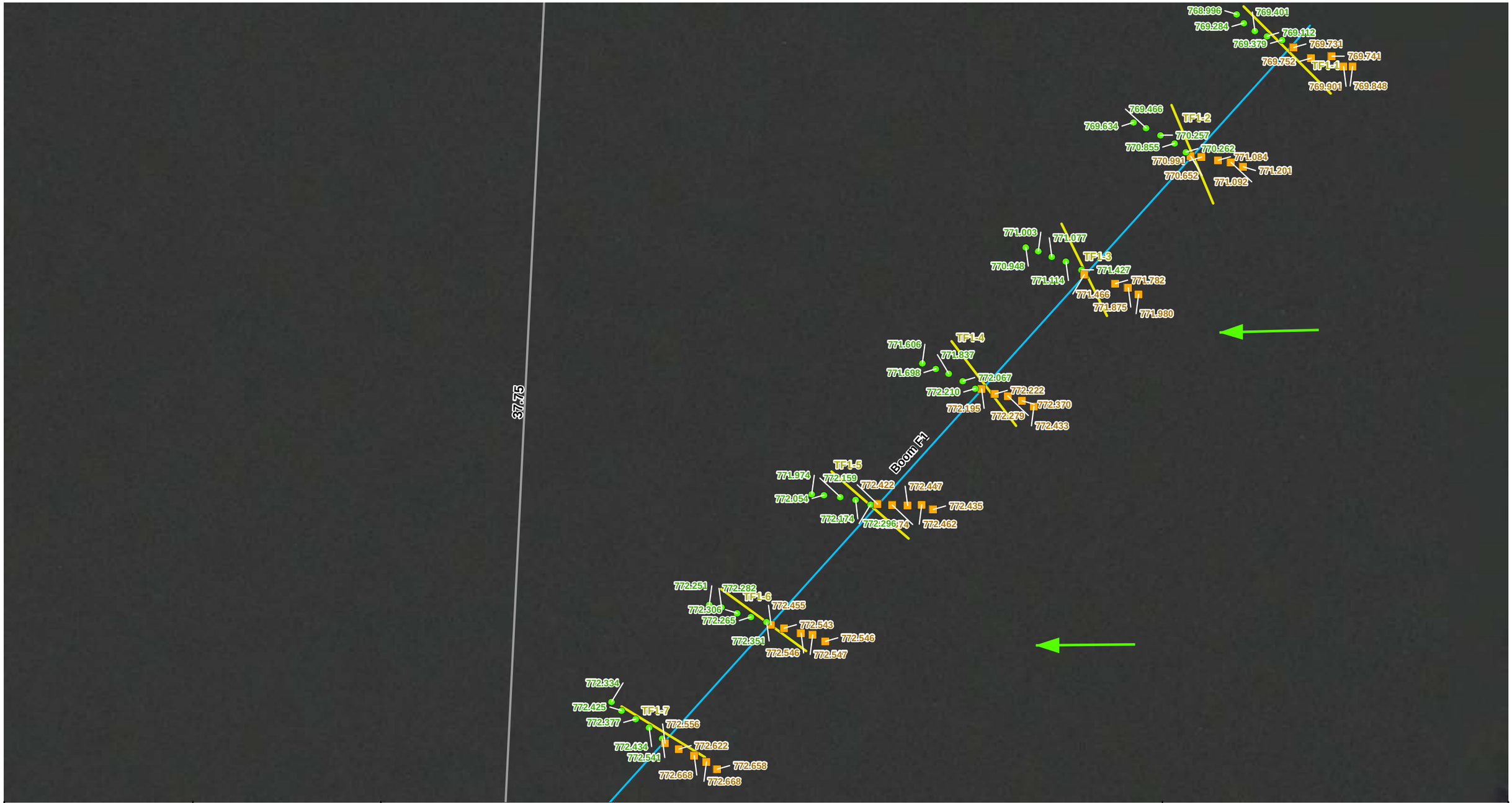

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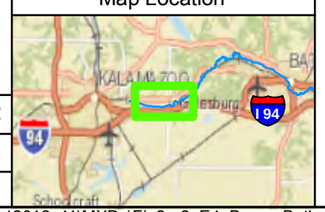
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM F1
SHEET 11 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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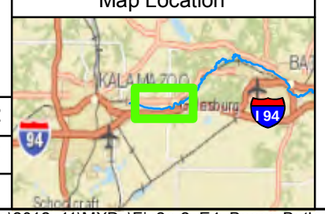
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/30/2012
Approved:	EE	11/30/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Points (11/18/2012-11/29/2012)

- Upstream
- Downstream

E 4.0 Containment Curtain (Former Location)

- X-TEX Sediment Curtain
- No Curtain
- Target Transect
- Quarter Mile Grid Segments
- Approximate Flow Direction Based on Hydrodynamic Model

N

0 15 30 60

Scale in Feet

FIGURE 2e-2
E 4.0 BOOM BATHYMETRY POINTS
POST-CURTAIN REMOVAL
BOOM F1
SHEET 12 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2e-2_E4_Boom_Bathy_Post_Removal_Sheets2-12.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Kalamazoo River Remedial Investigation Observations

- Oil
- Visible Sheen
- Fluoresced Oil
- Trace Fluorescence
- No Oil Observed
- Not Logged
- Temporary Well
- Kalamazoo River Flood Inundation Boundary
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2f-1
KALAMAZOO RIVER REMEDIAL INVESTIGATION
SAMPLE LOCATIONS
NOVEMBER 2012
SHEET 1 OF 4

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2f-1_Kalamazoo_River_RI.mxd

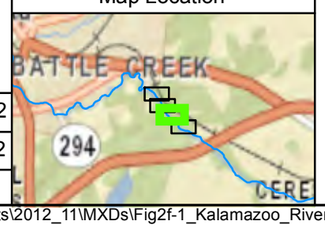
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Kalamazoo River Remedial Investigation

Observations

- Oil
- Visible Sheen
- Fluoresced Oil
- Trace Fluorescence
- No Oil Observed
- Not Logged

- Temporary Well
- Kalamazoo River Flood Inundation Boundary
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2f-1
KALAMAZOO RIVER REMEDIAL INVESTIGATION
SAMPLE LOCATIONS
NOVEMBER 2012
SHEET 2 OF 4

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2f-1_Kalamazoo_River_RI.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Kalamazoo River Remedial Investigation

Observations

- Oil
- Visible Sheen
- Fluoresced Oil
- Trace Fluorescence
- No Oil Observed
- Not Logged

- Temporary Well
- Kalamazoo River Flood Inundation Boundary
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

Scale in Feet

FIGURE 2f-1
KALAMAZOO RIVER REMEDIAL INVESTIGATION
SAMPLE LOCATIONS
NOVEMBER 2012
SHEET 3 OF 4

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2f-1_Kalamazoo_River_RI.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	11/28/2012
Approved:	EE	11/28/2012
Project #:	60246209	

Map Location



Legend

Kalamazoo River Remedial Investigation

Observations

- Oil
- Visible Sheen
- Fluoresced Oil
- Trace Fluorescence
- No Oil Observed
- Not Logged

- Temporary Well
- Kalamazoo River Flood Inundation Boundary
- Parcel Boundary
- Quarter Mile Grid Segments

N

0 75 150 300

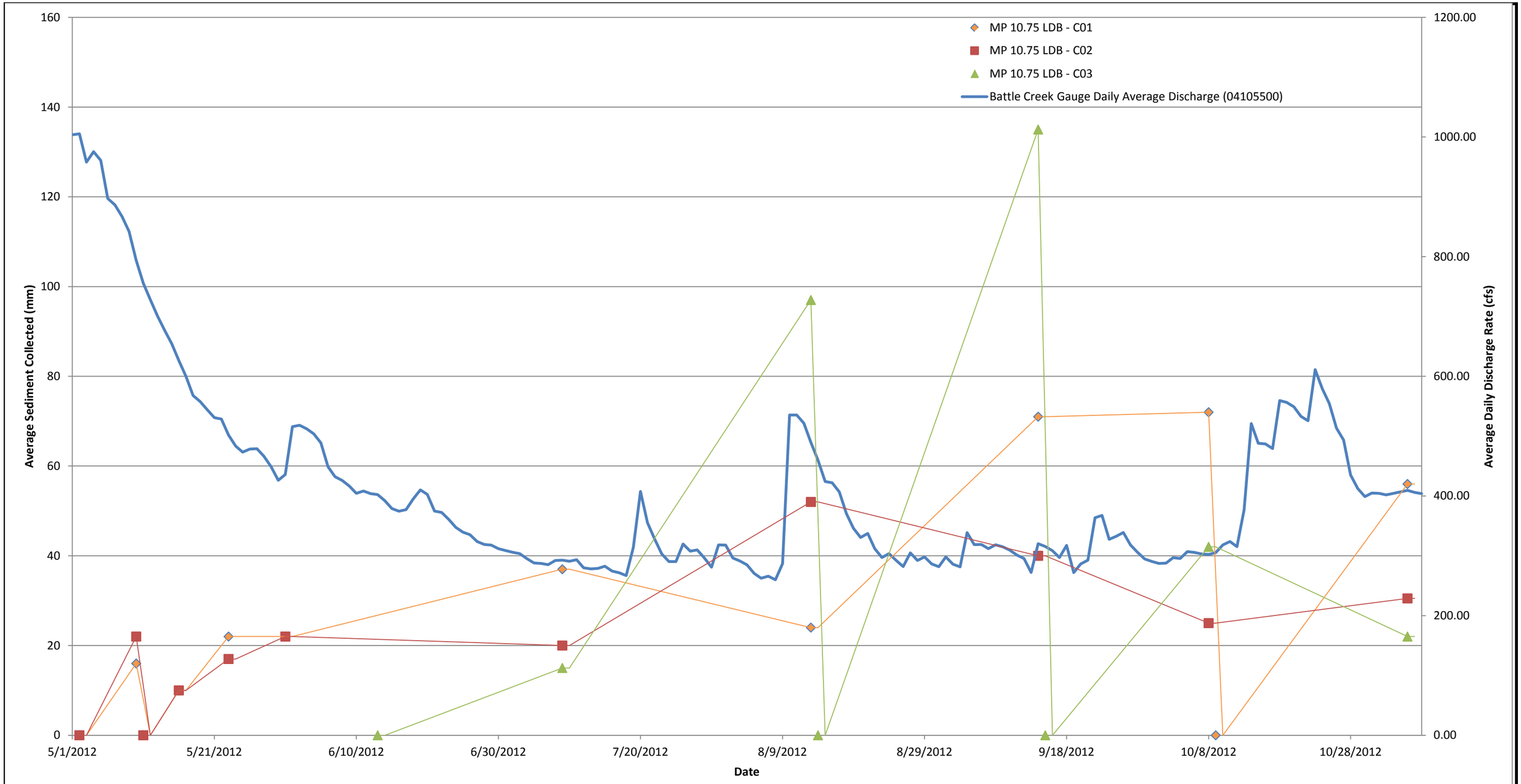
Scale in Feet

FIGURE 2f-1
KALAMAZOO RIVER REMEDIAL INVESTIGATION
SAMPLE LOCATIONS
NOVEMBER 2012
SHEET 4 OF 4

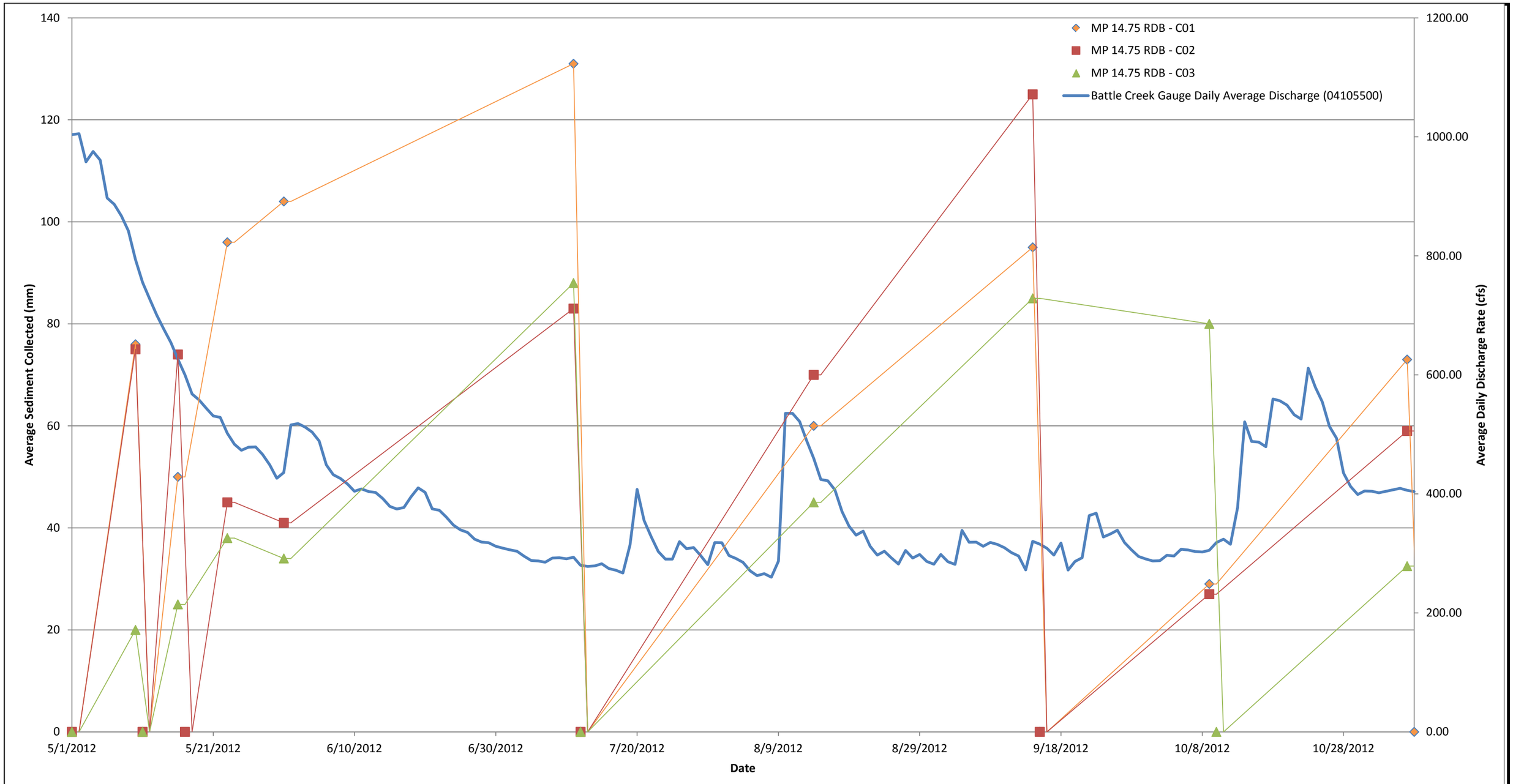
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2f-1_Kalamazoo_River_RI.mxd

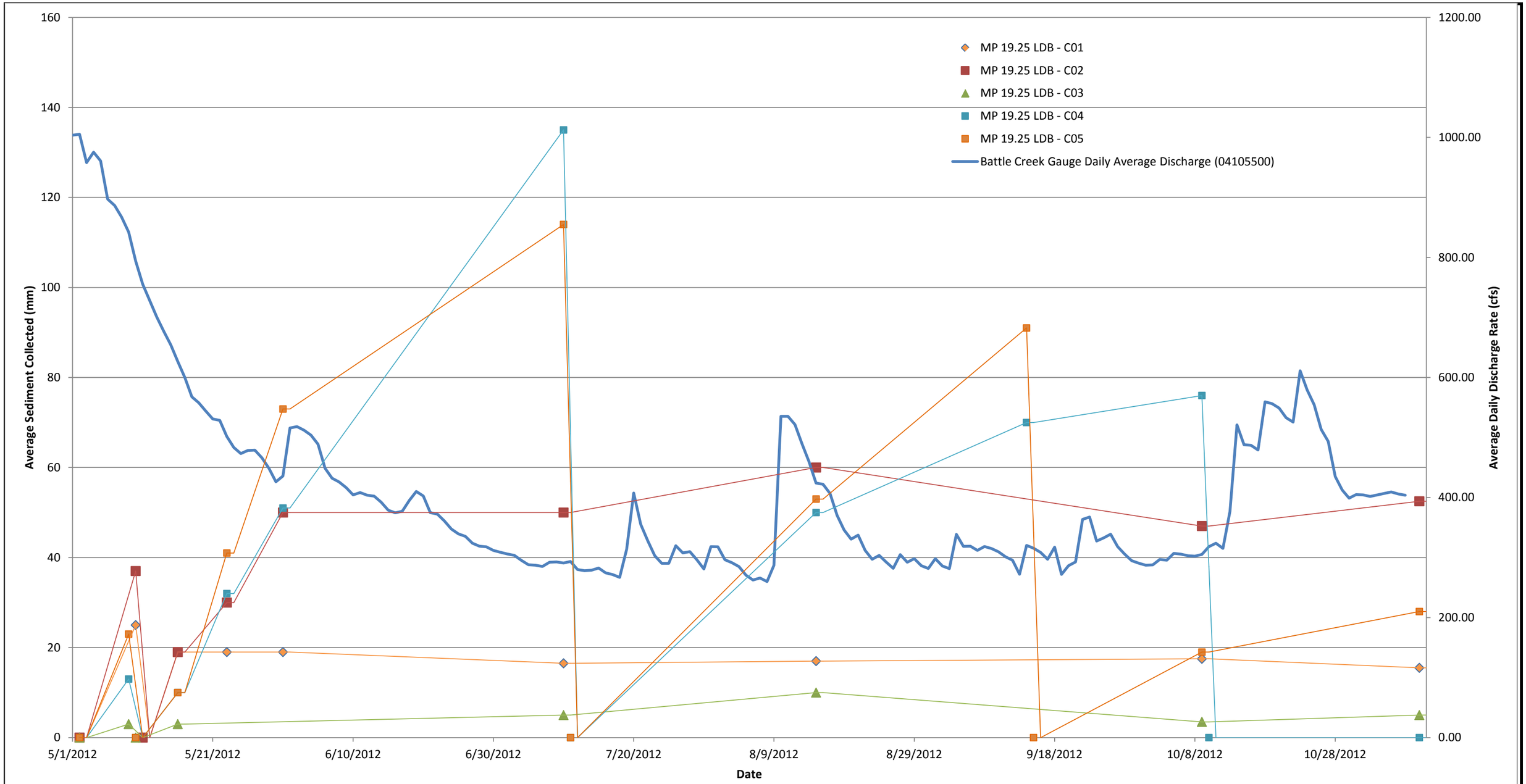
Aerial Photography Date: April 2011



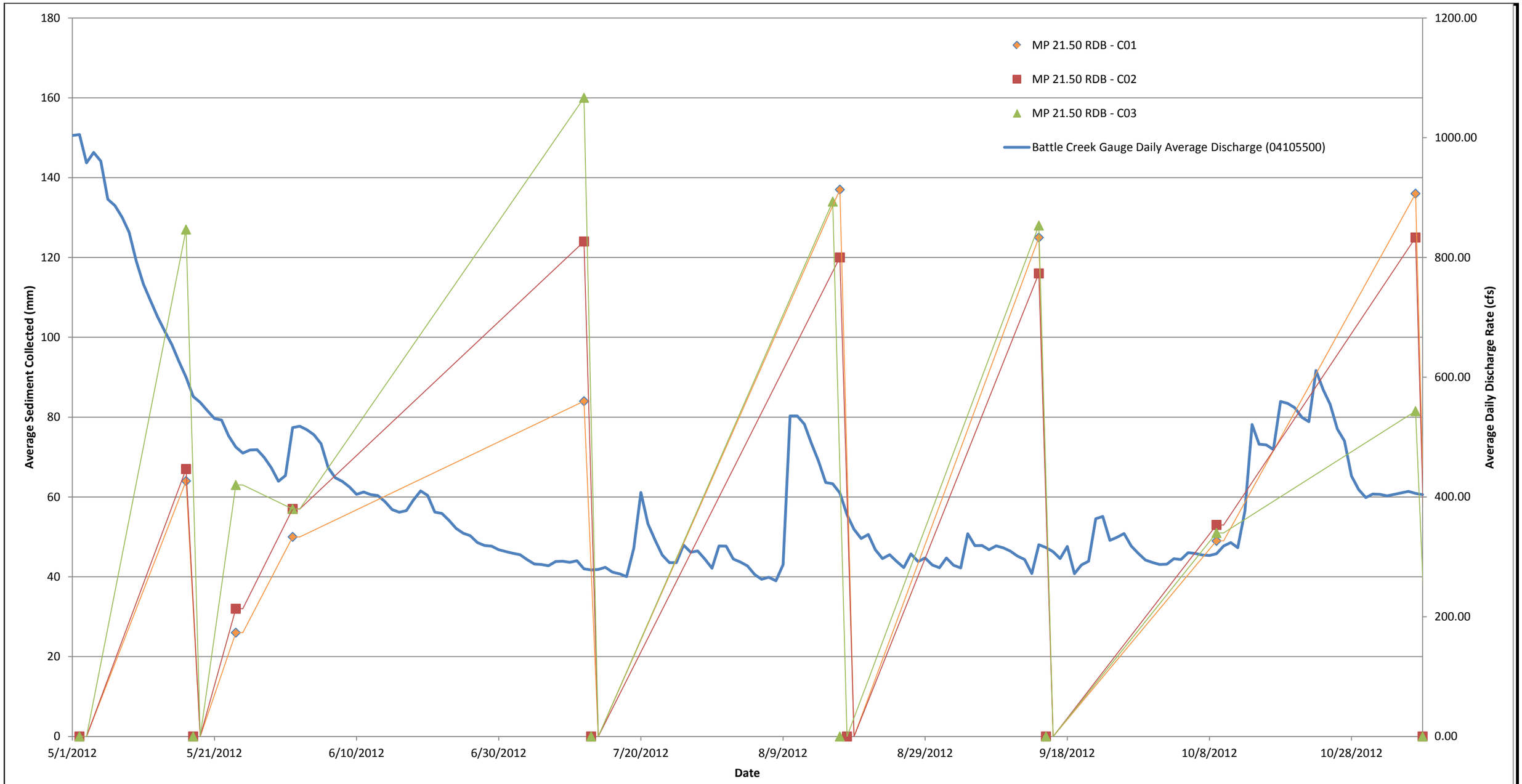
ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE I - MP 10.75 LDB SHEET 1 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE I - MP 14.75 RDB SHEET 2 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE I - MP 19.25 LDB SHEET 3 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: CW

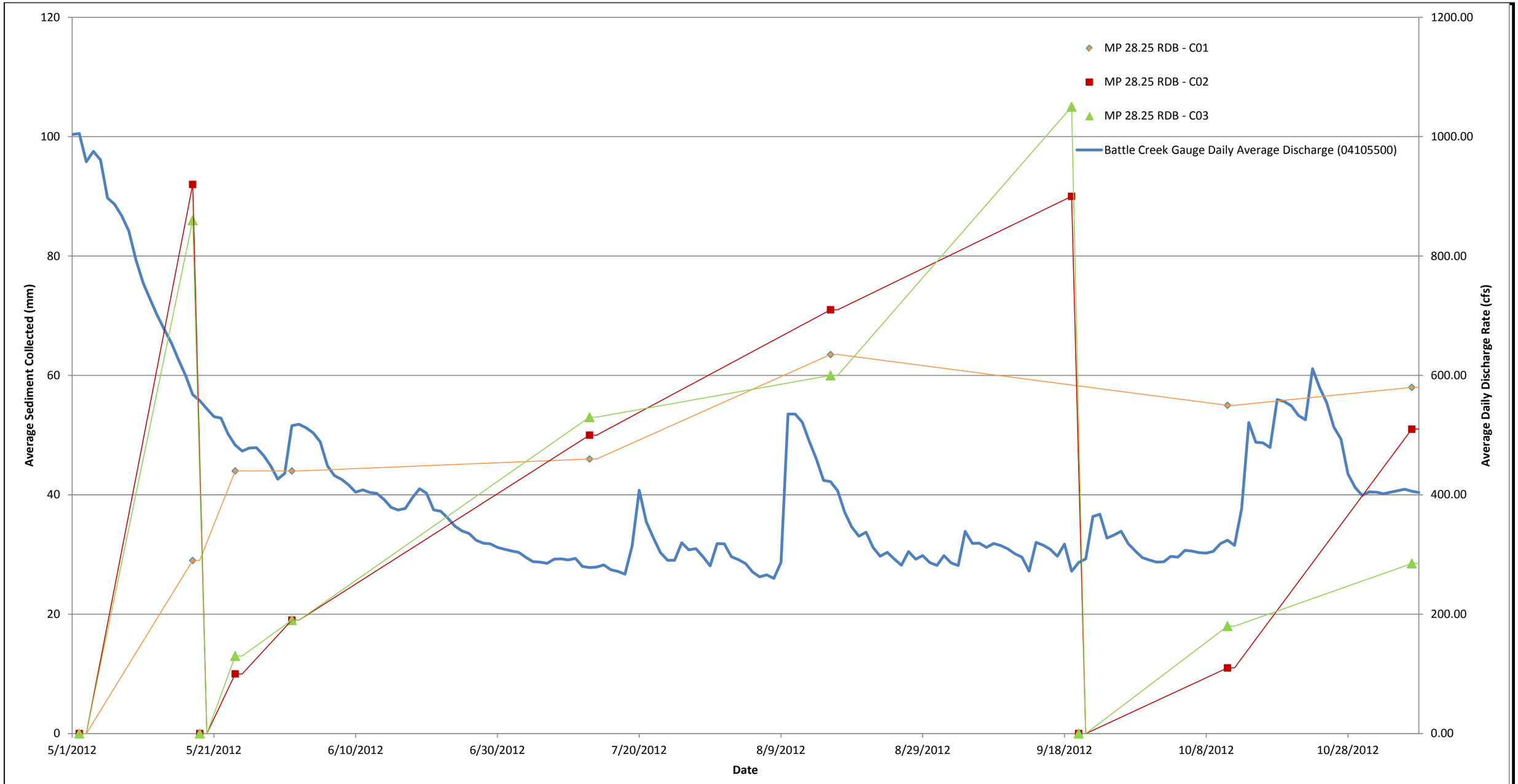
Approved: EE

Project#: 60246209

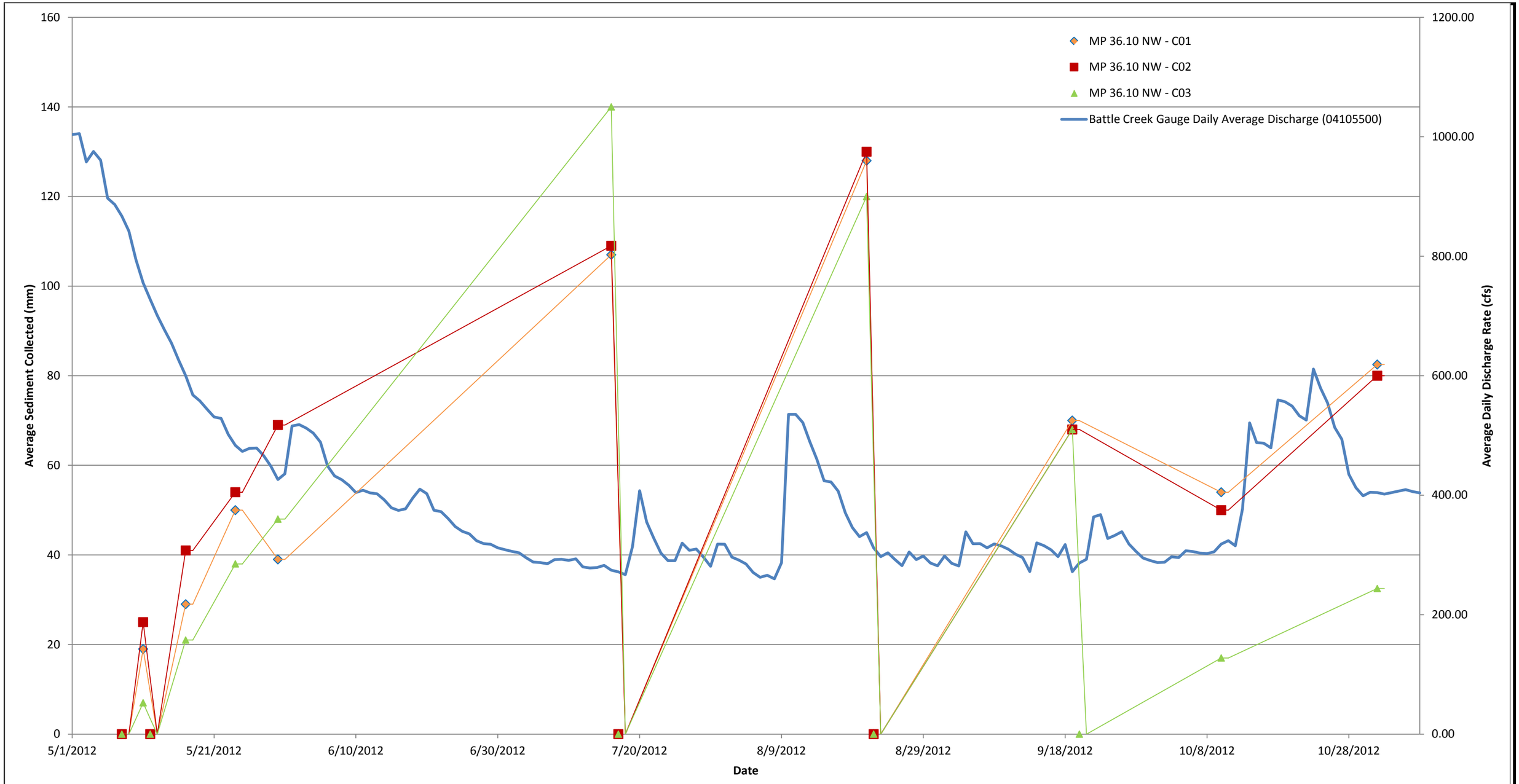
Legend:

cfs = cubic feet per second
mm = millimeter

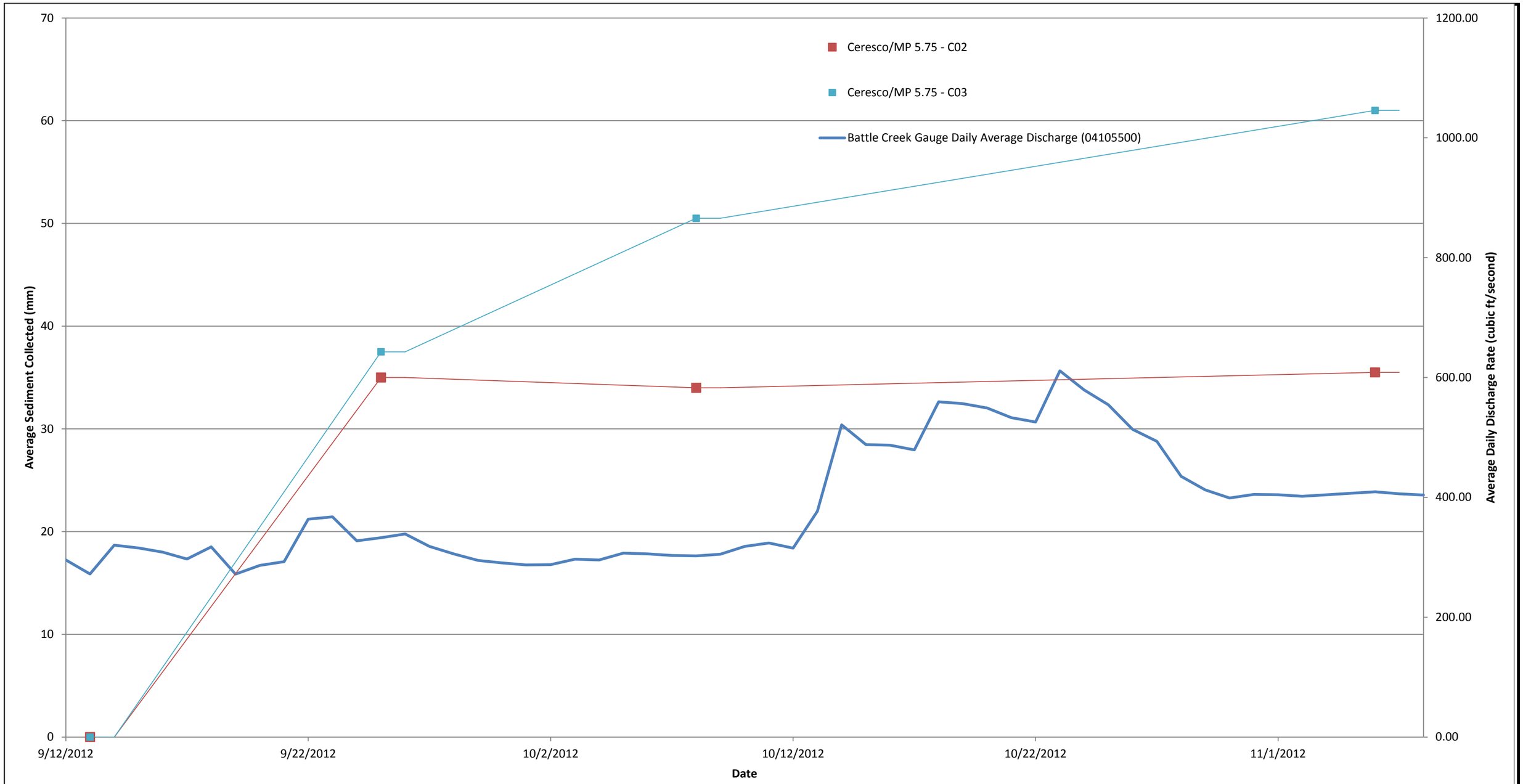
FIGURE 2i-1
CYLINDRICAL SAMPLING DEVICE DATA
PHASE I - MP 21.50 RDB
SHEET 4 OF 17
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE I - MP 28.25 RDB SHEET 5 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE I - MP 36.10 NW SHEET 6 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: CW

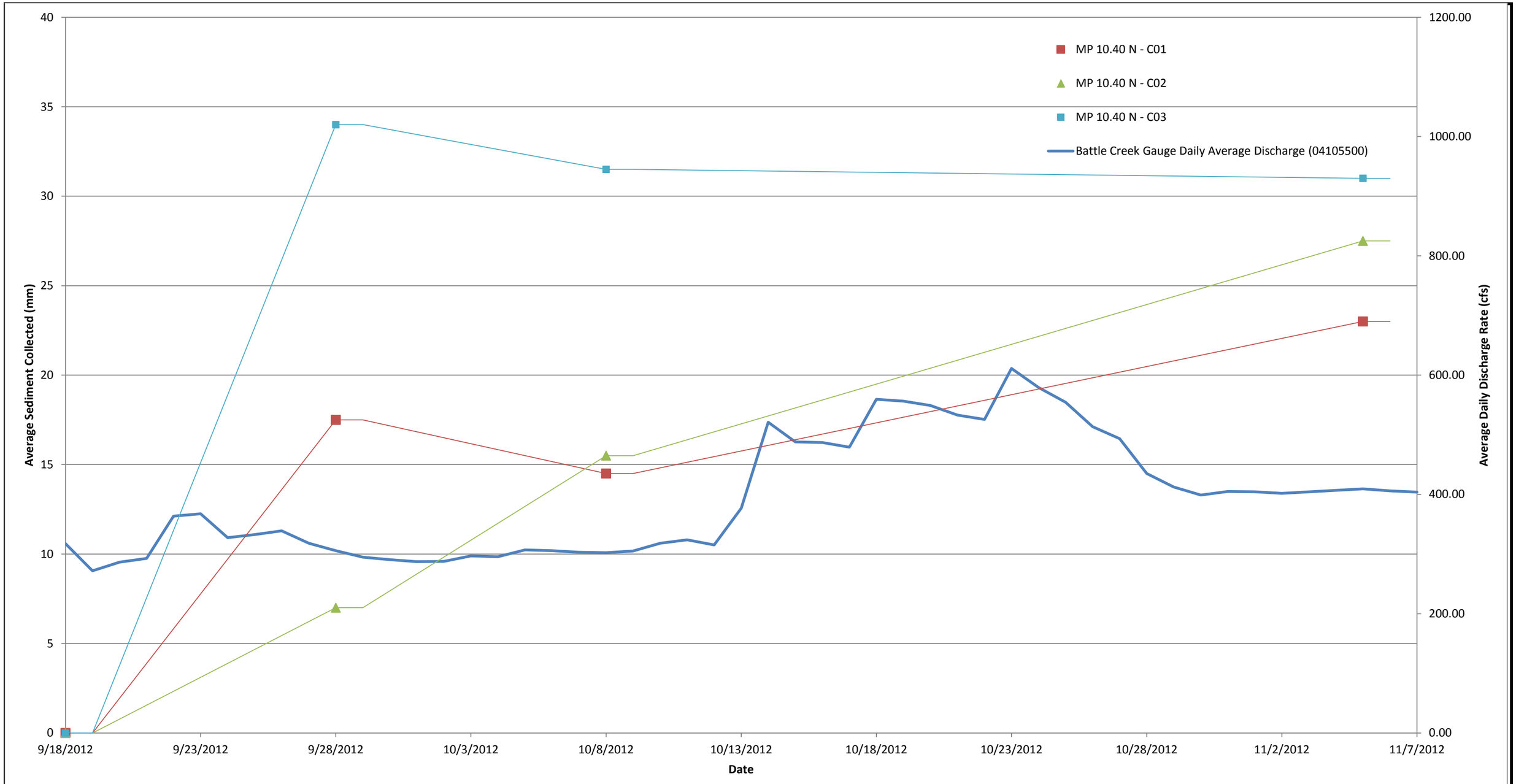
Approved: EE

Project#: 60246209

Legend:

cfs = cubic feet per second
mm = millimeter

FIGURE 2i-1
CYLINDRICAL SAMPLING DEVICE DATA
PHASE II - CERESCO/MP 5.75
SHEET 7 OF 17
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: CW

Approved: EE

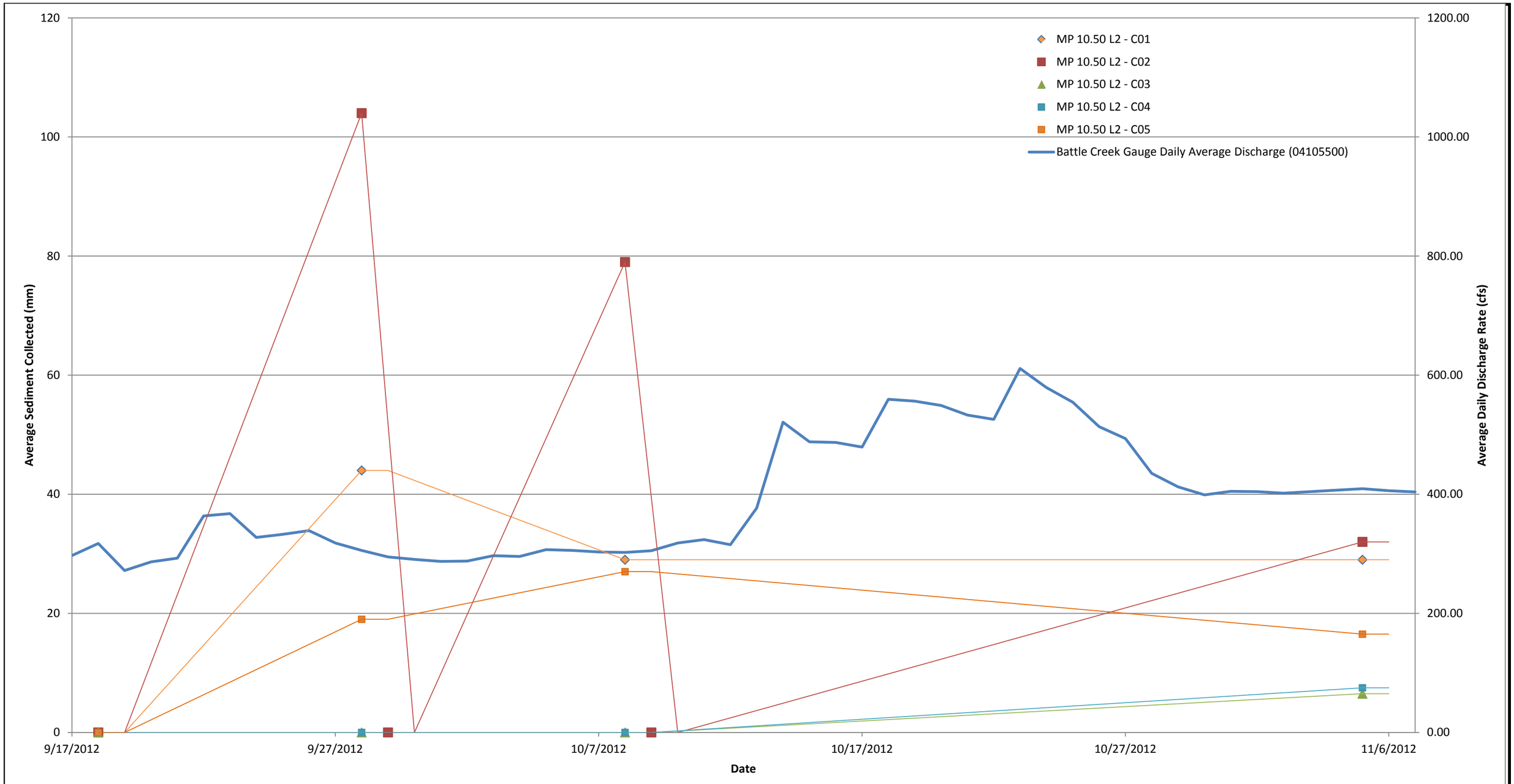
Project#: 60246209

Legend:

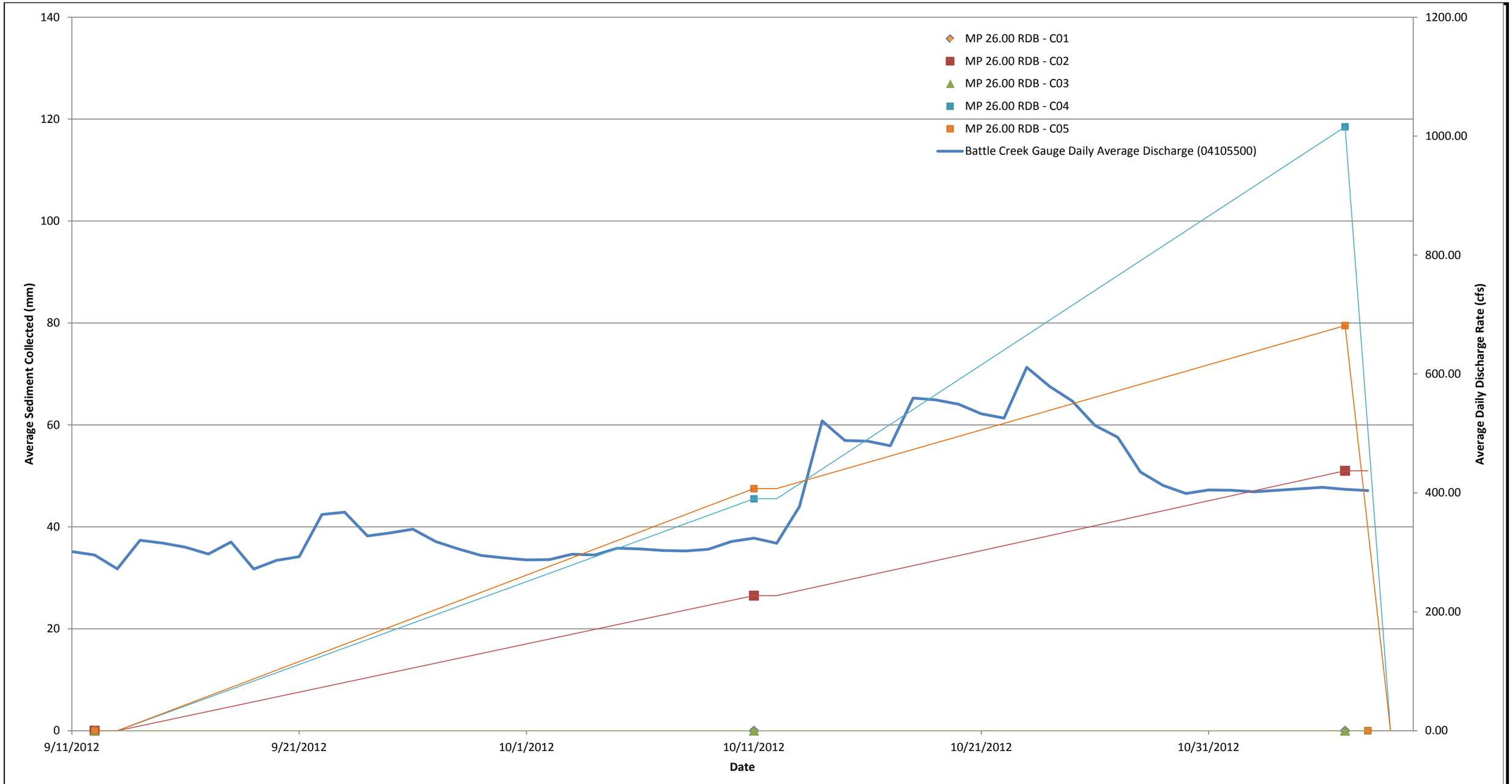
cfs = cubic feet per second

mm = millimeter

FIGURE 2i-1
CYLINDRICAL SAMPLING DEVICE DATA
PHASE II - MP 10.40 N
SHEET 8 OF 17
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP

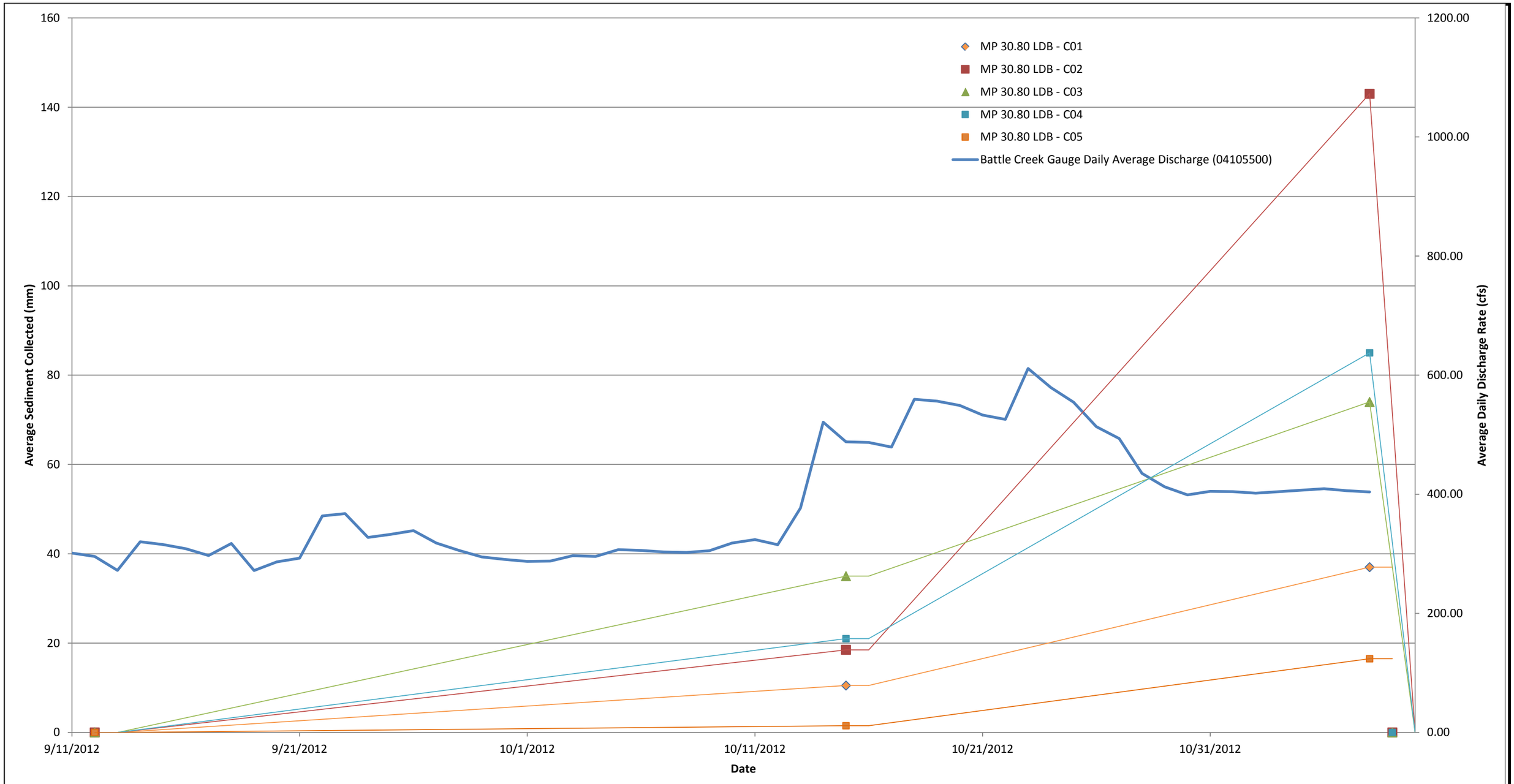


ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE II - MP 10.50 L2 SHEET 9 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

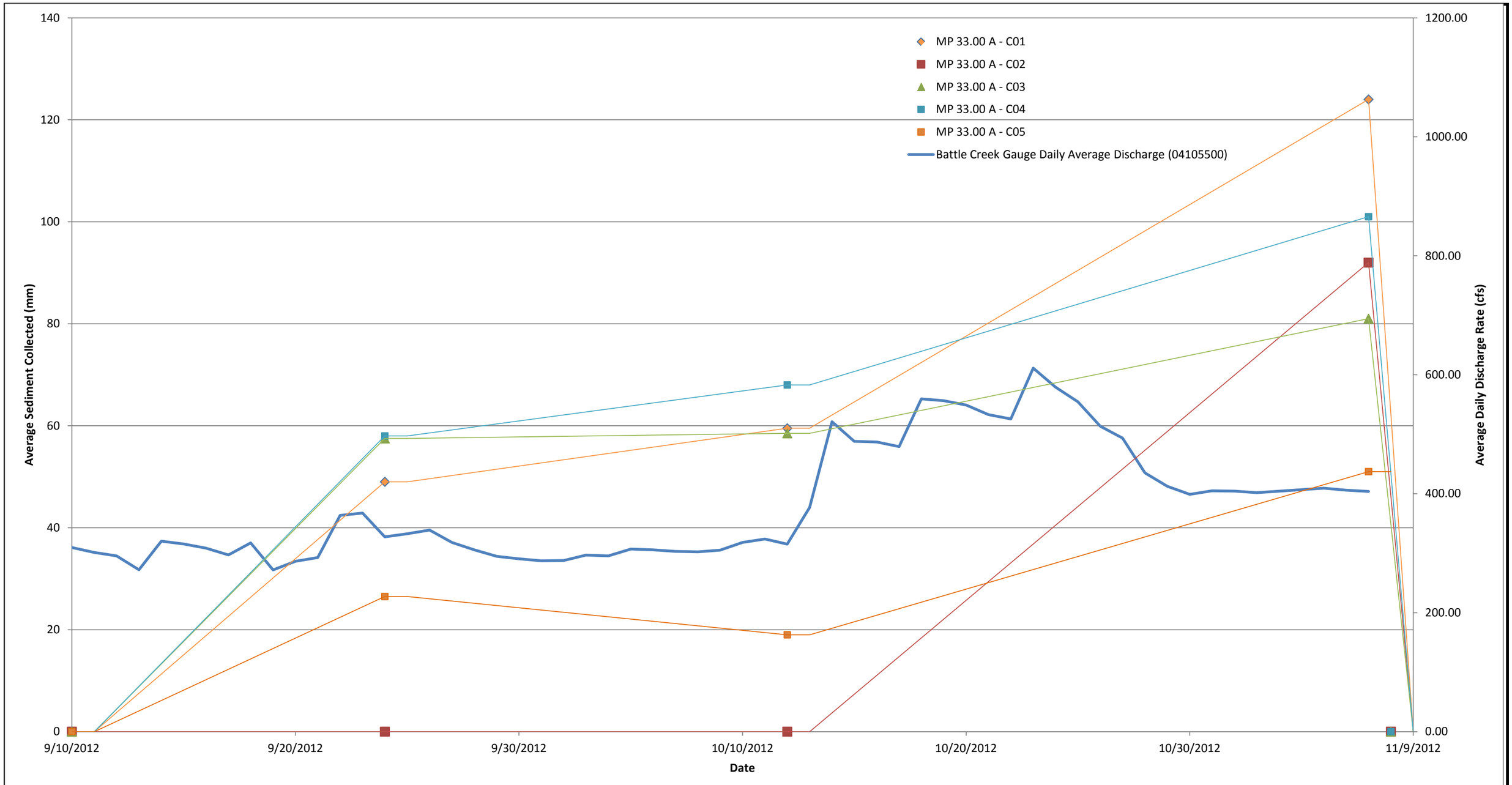


ENBRIDGE	Legend:
Drawn: CW	
Approved: EE	cfs = cubic feet per second mm = millimeter
Project#: 60246209	

FIGURE 2i-1
CYLINDRICAL SAMPLING DEVICE DATA
PHASE II - MP 26.00 RDB
SHEET 10 OF 17
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE II - MP 30.80 LDB SHEET 11 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: CW

Approved: EE

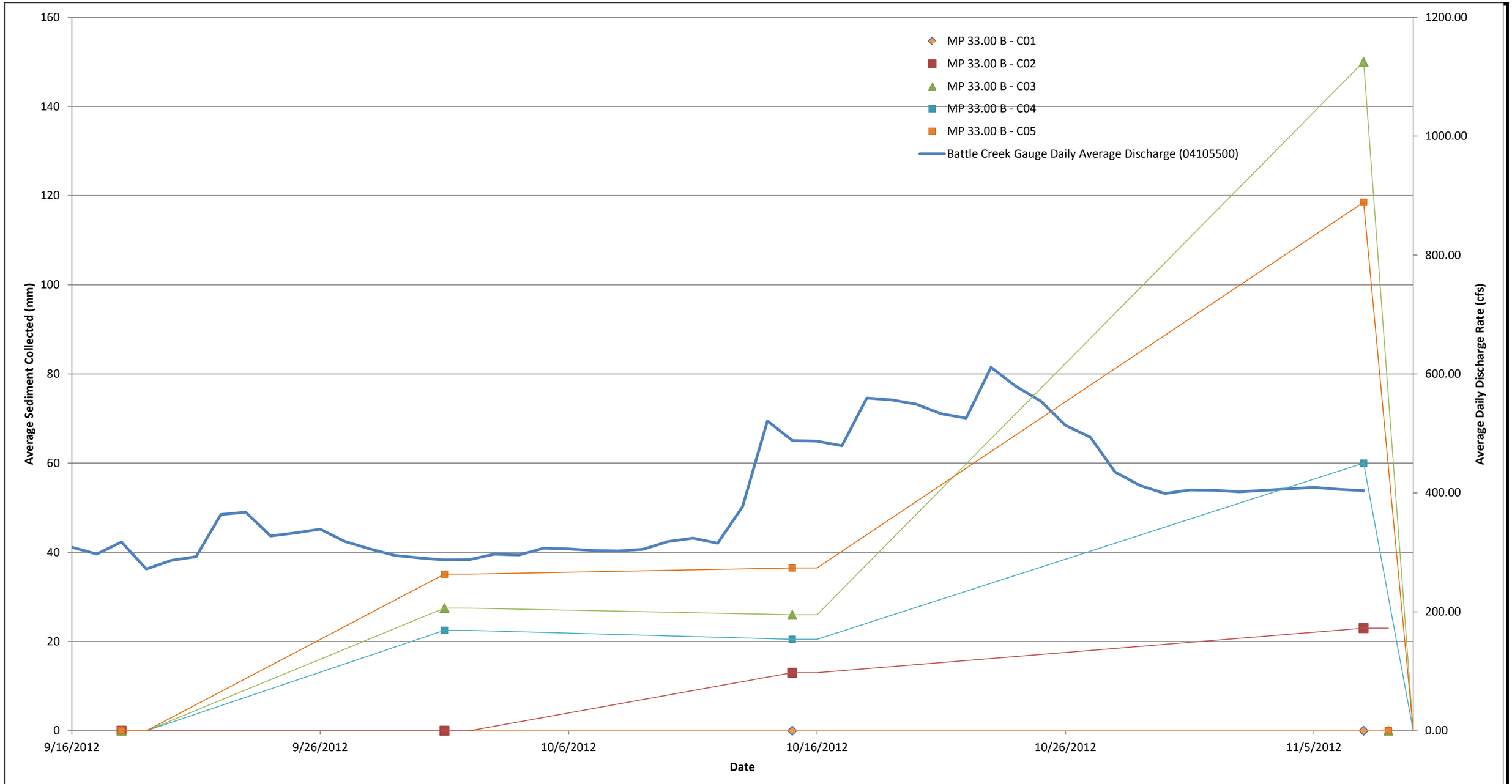
Project#: 60246209

Legend:

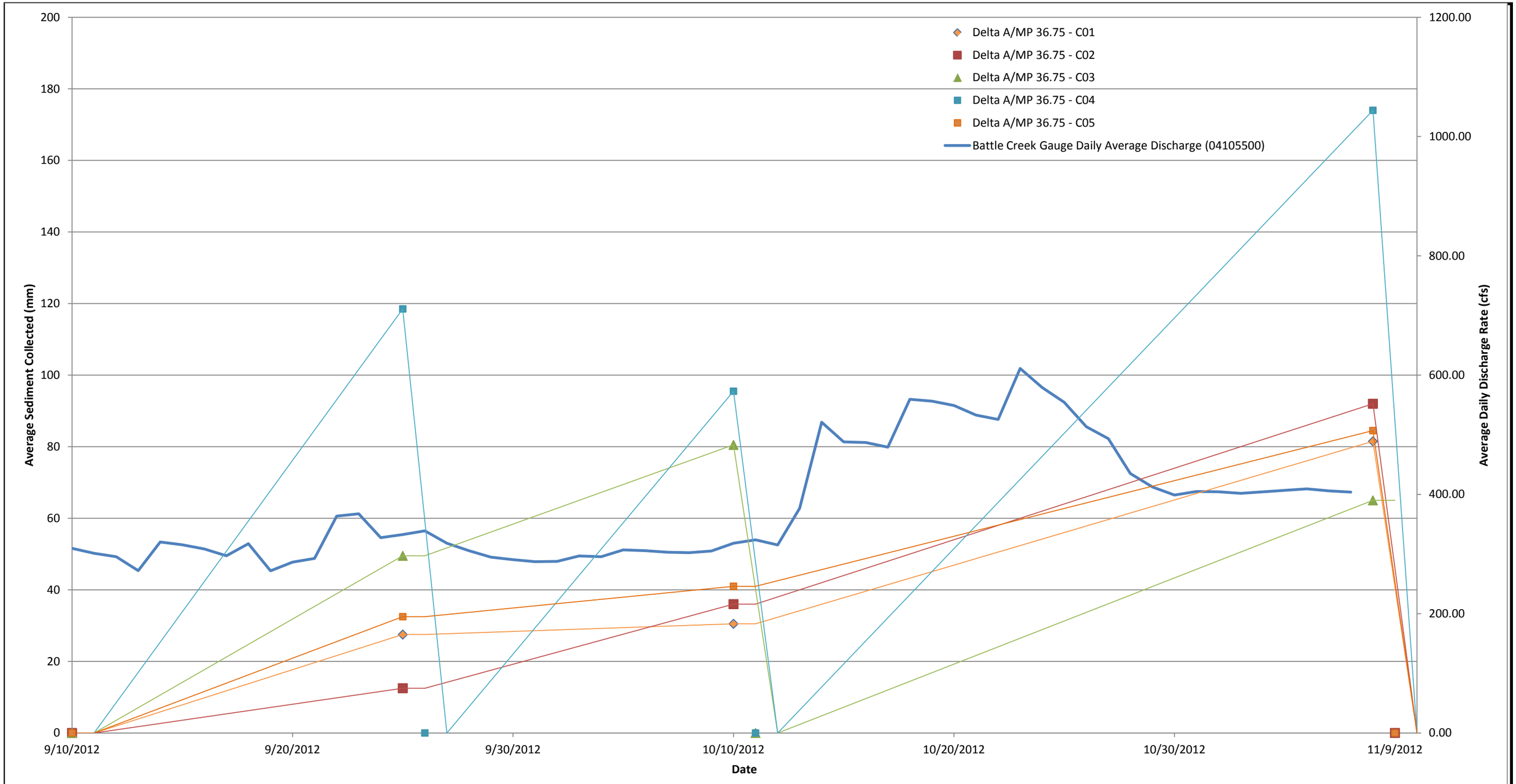
cfs = cubic feet per second

mm = millimeter

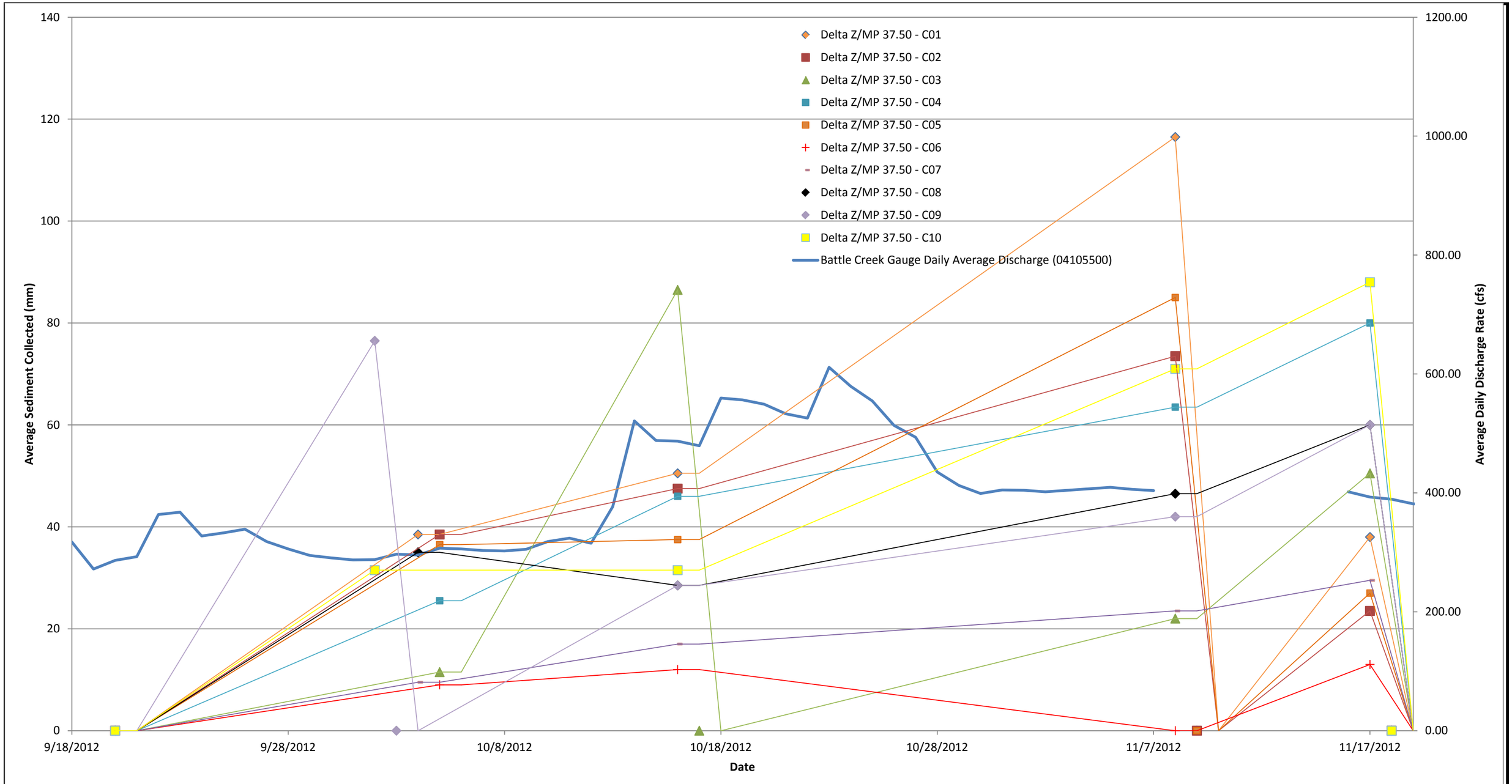
FIGURE 2i-1
CYLINDRICAL SAMPLING DEVICE DATA
PHASE II - MP 33.00 A
SHEET 12 OF 17
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE II - MP 33.00 B SHEET 13 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE II - DELTA A/MP 36.75 SHEET 14 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: CW

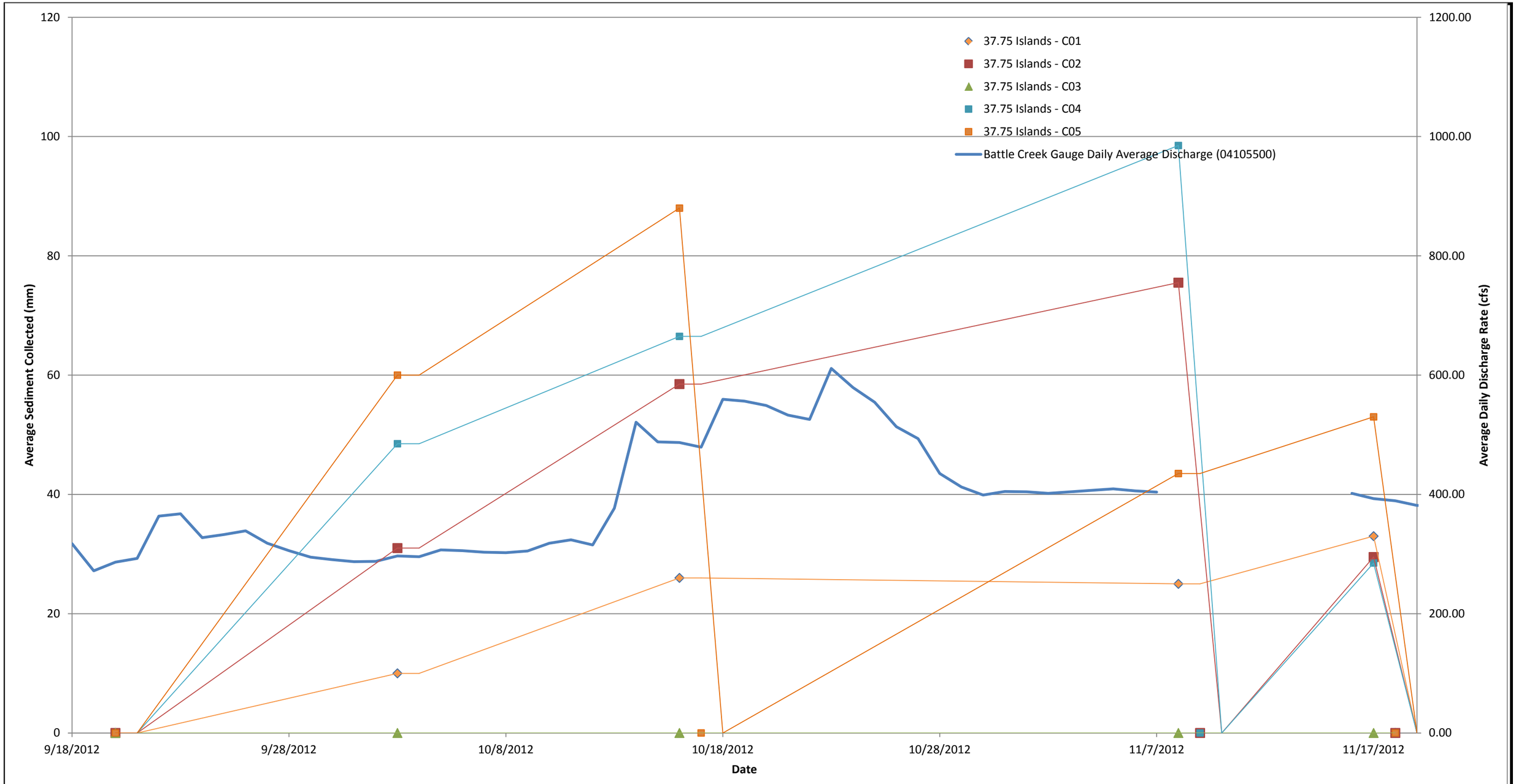
Approved: EE

Project#: 60246209

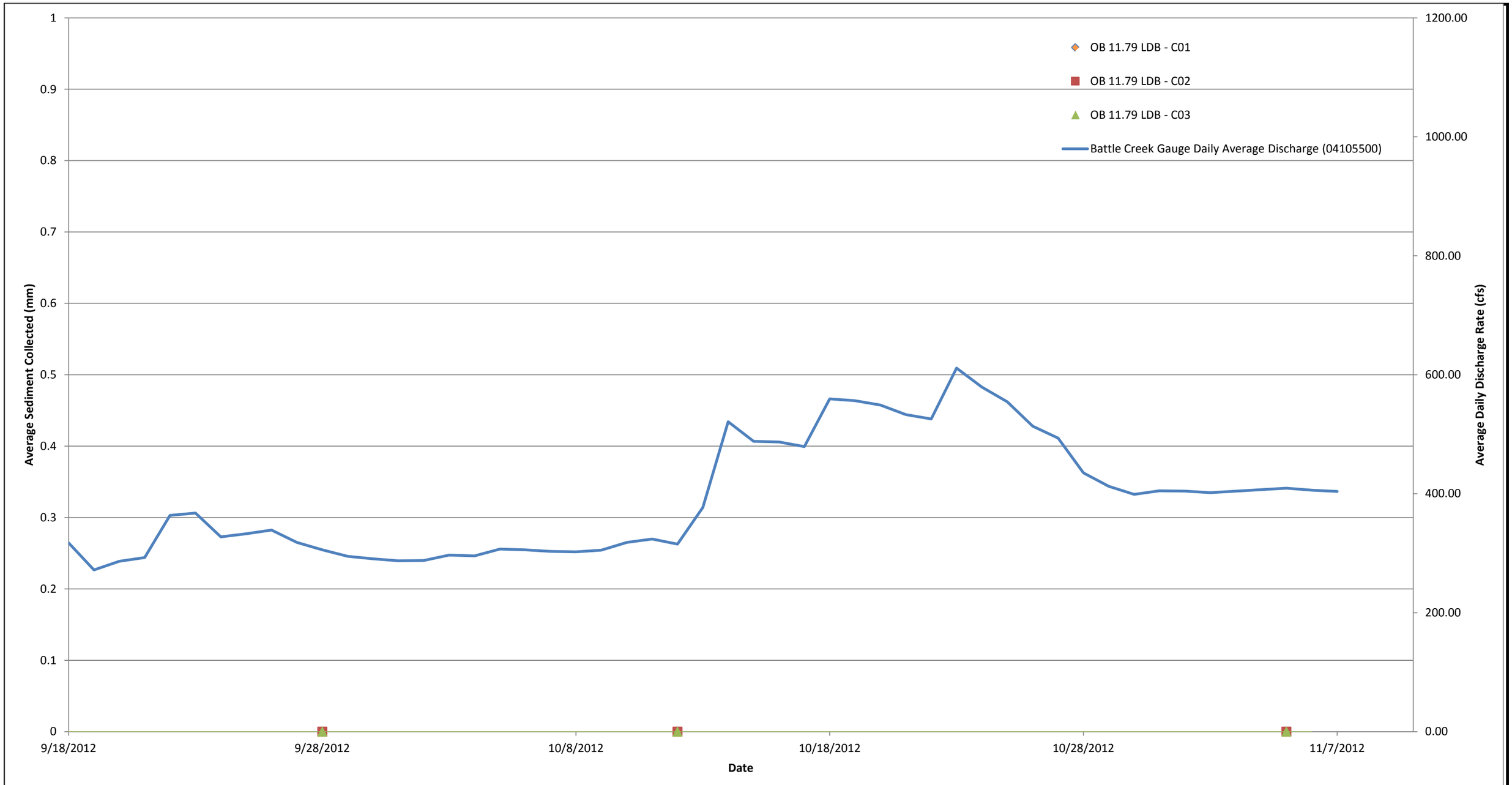
Legend:

cfs = cubic feet per second
mm = millimeter

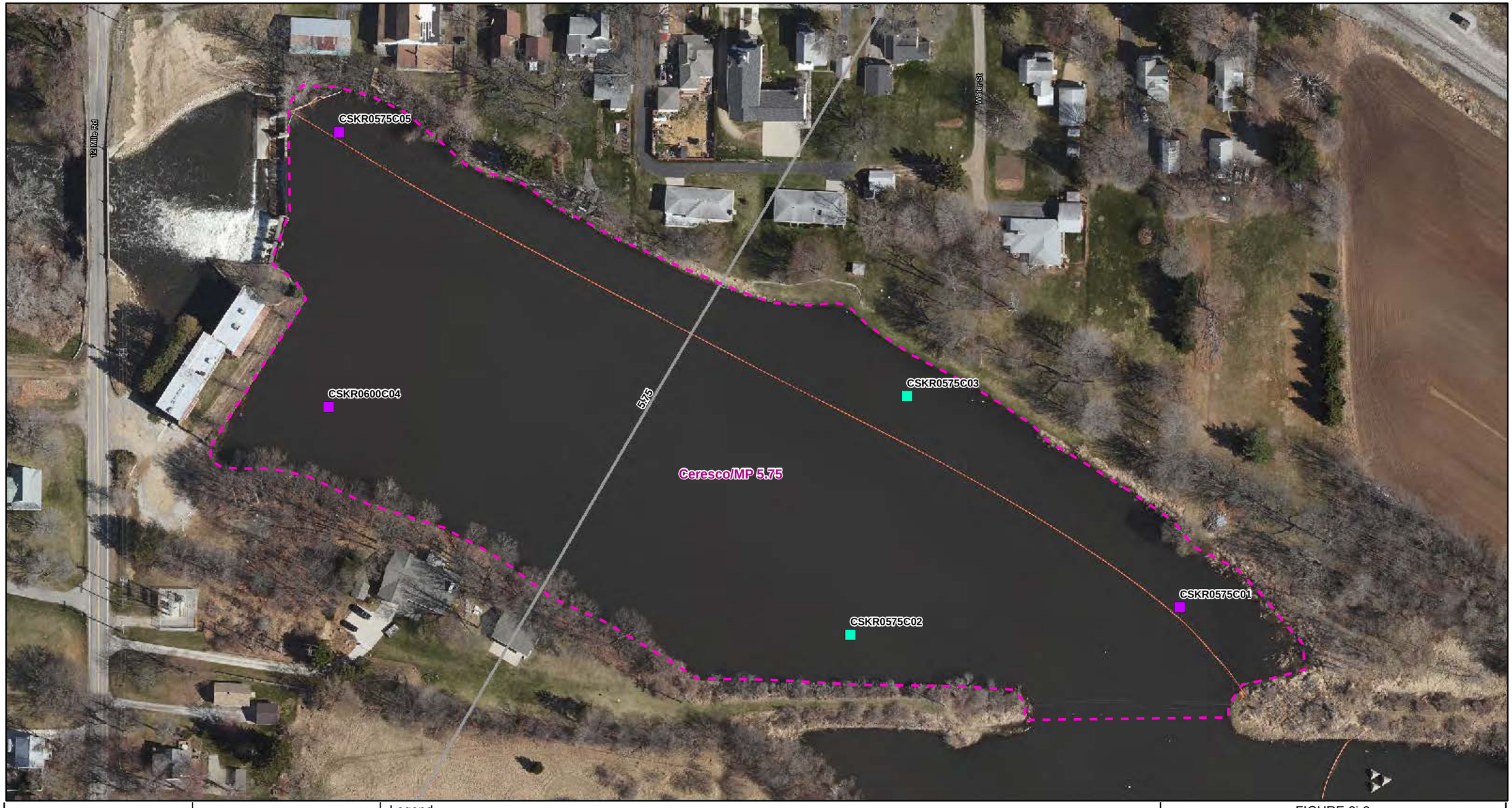
FIGURE 2i-1
CYLINDRICAL SAMPLING DEVICE DATA
PHASE II - DELTA Z/MP 37.50
SHEET 15 OF 17
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE II - 37.75 ISLANDS SHEET 16 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE Drawn: CW Approved: EE Project#: 60246209	Legend: cfs = cubic feet per second mm = millimeter	FIGURE 2i-1 CYLINDRICAL SAMPLING DEVICE DATA PHASE II - OB 11.79 LDB SHEET 17 OF 17 ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 50 100 200

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
CERESCO/MP 5.75
SHEET 1 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments
- **Cylindrical Sampling Device**
  - Installed
  - Proposed
  - Sampled In November 2012

N

0 25 50 100

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 10.40 N & MP 10.50 L2
SHEET 2 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 25 50 100

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 10.75 LDB
SHEET 3 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 50 100 200

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
OB 11.79
SHEET 4 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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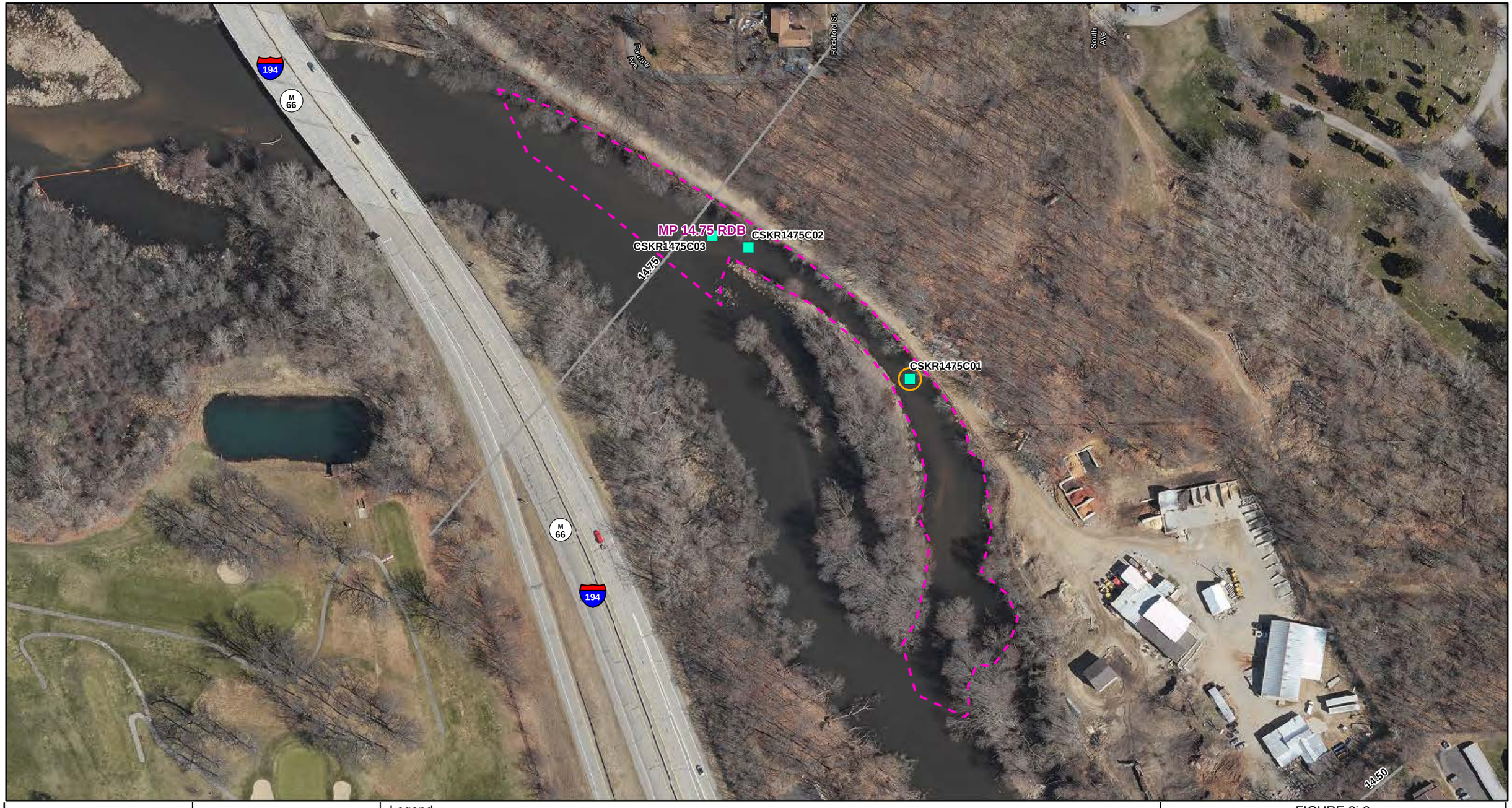
Aerial Photography Date: April 2011



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Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 70 140 280

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 14.75 RDB
SHEET 5 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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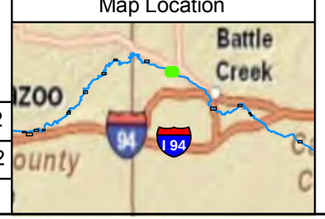
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 70 140 280

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 19.25 LDB
SHEET 6 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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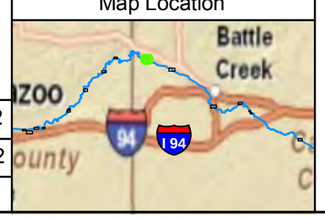
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 50 100 200

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 21.50 RDB
SHEET 7 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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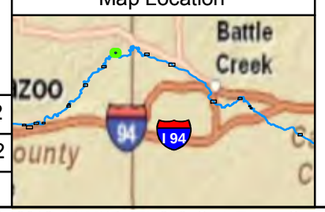
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 40 80 160

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 26.00 RDB
SHEET 8 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments
- **Cylindrical Sampling Device**
  - Installed
  - Proposed
  - Sampled In November 2012

N

0 50 100 200

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 28.25 RDB
SHEET 9 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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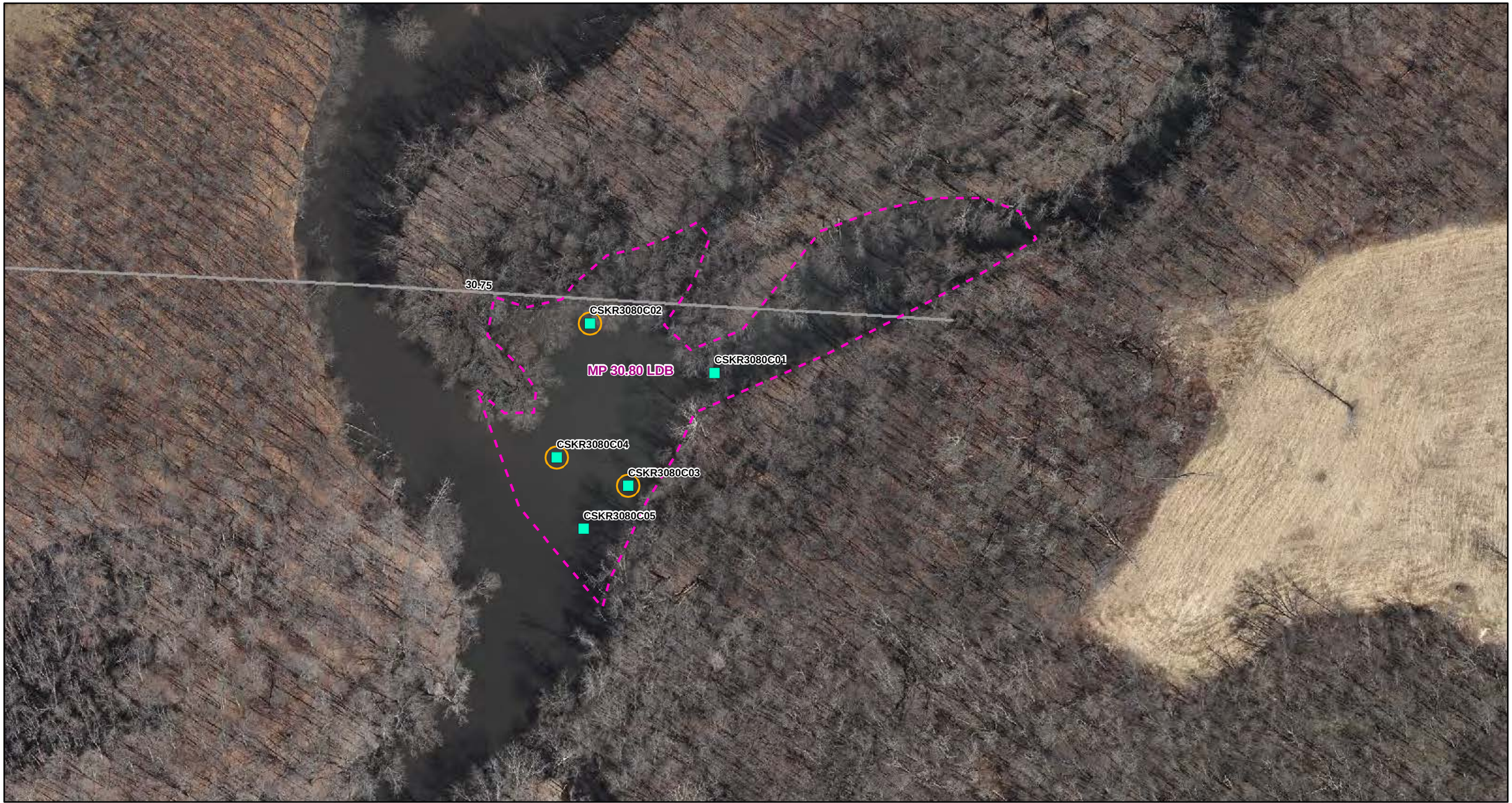
Aerial Photography Date: April 2011



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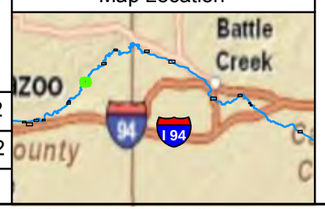
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 50 100 200

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 30.80 LDB
SHEET 10 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



ENBRIDGE

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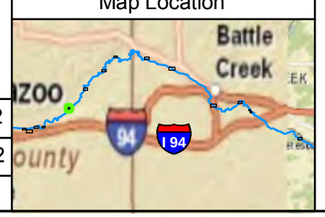
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 25 50 100

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 33.00 A
SHEET 11 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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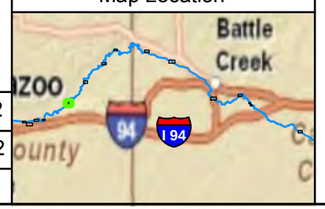
Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 40 80 160

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 33.00 B
SHEET 12 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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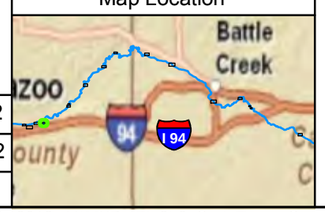
Aerial Photography Date: April 2011



Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 40 80 160

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 36.10 NW
SHEET 13 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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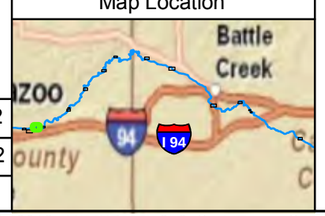
Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 50 100 200

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
DELTA A/MP 36.75
SHEET 14 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 70 140 280

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
DELTA Z/MP 37.50
SHEET 15 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Sediment Trap
- Quarter Mile Grid Segments

Cylindrical Sampling Device

- Installed
- Proposed
- Sampled In November 2012

N

0 40 80 160

Scale in Feet

FIGURE 2i-2
SAMPLED CYLINDRICAL SAMPLING DEVICES
NOVEMBER 2012
MP 37.75 ISLANDS
SHEET 16 OF 16

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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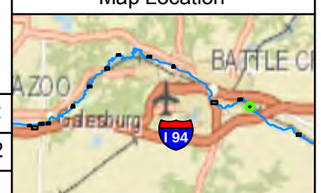
Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 25 50 100

Scale in Feet

FIGURE 2i-3
PHASE I SEDIMENT TRAP BATHYMETRY
MP 10.75 LDB
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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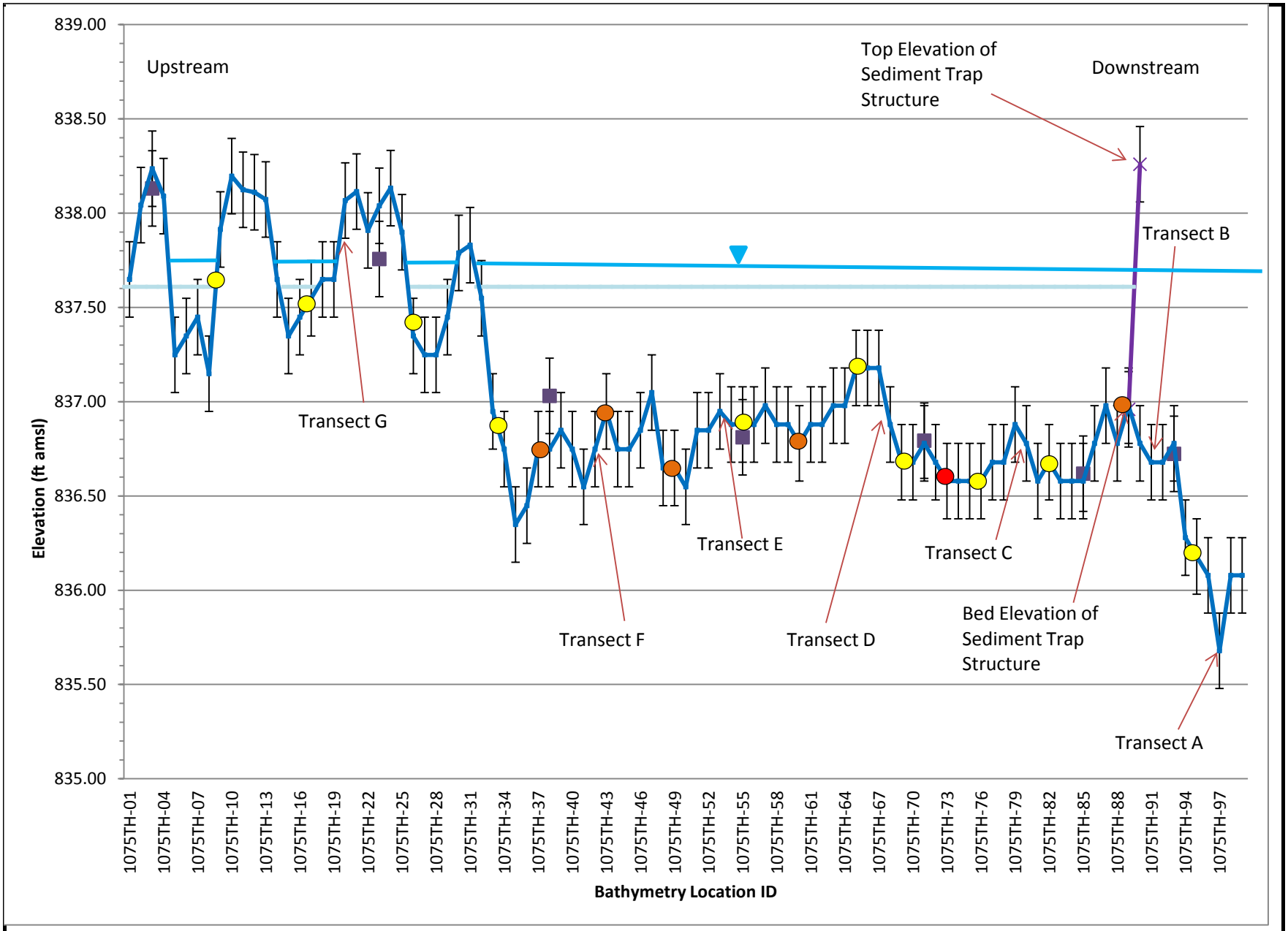
Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Sediment Trap 50% Capacity

Submerged Oil Category:

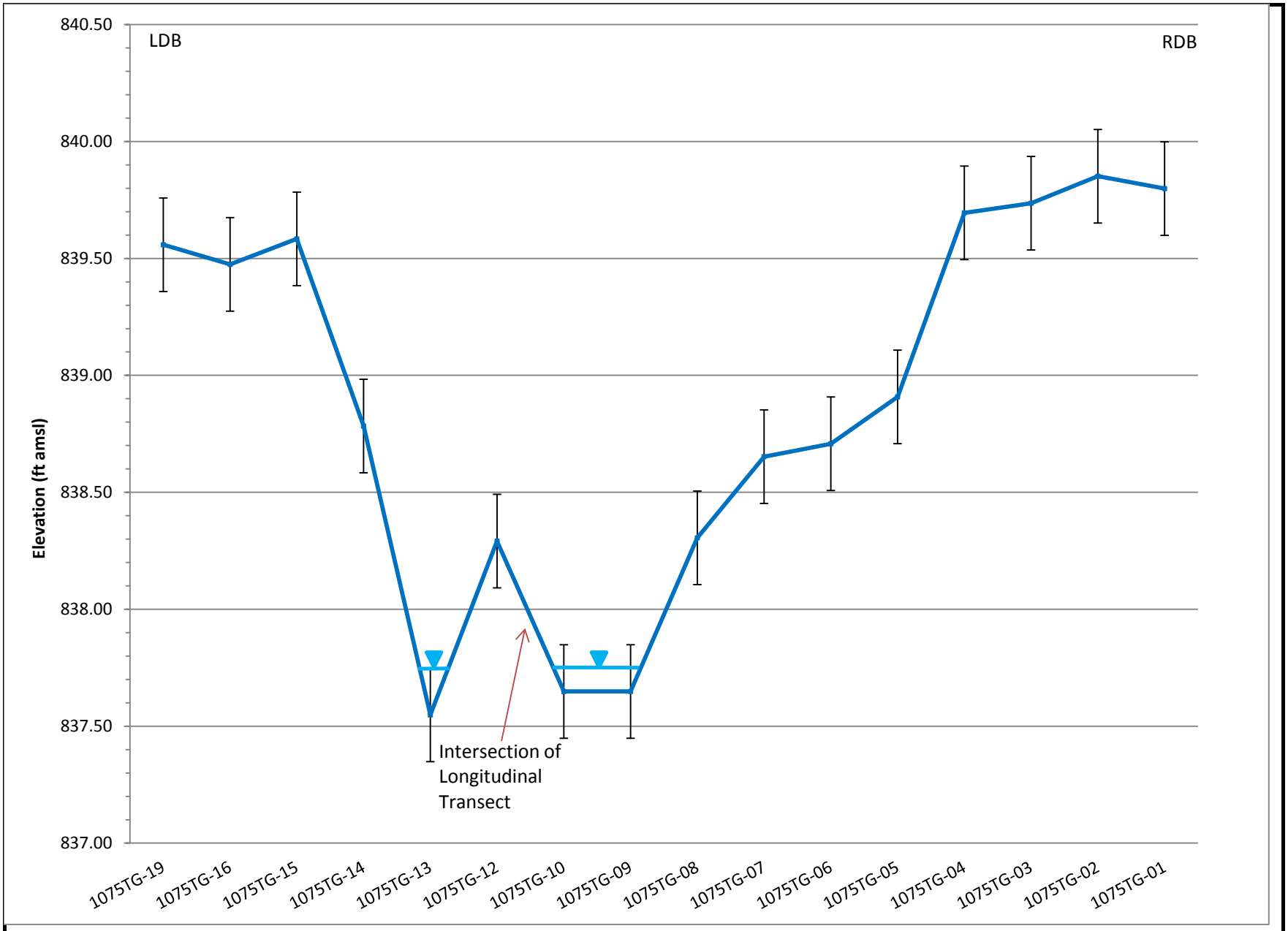
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

Sediment Trap Structure

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB LONGITUDINAL
SHEET 1 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

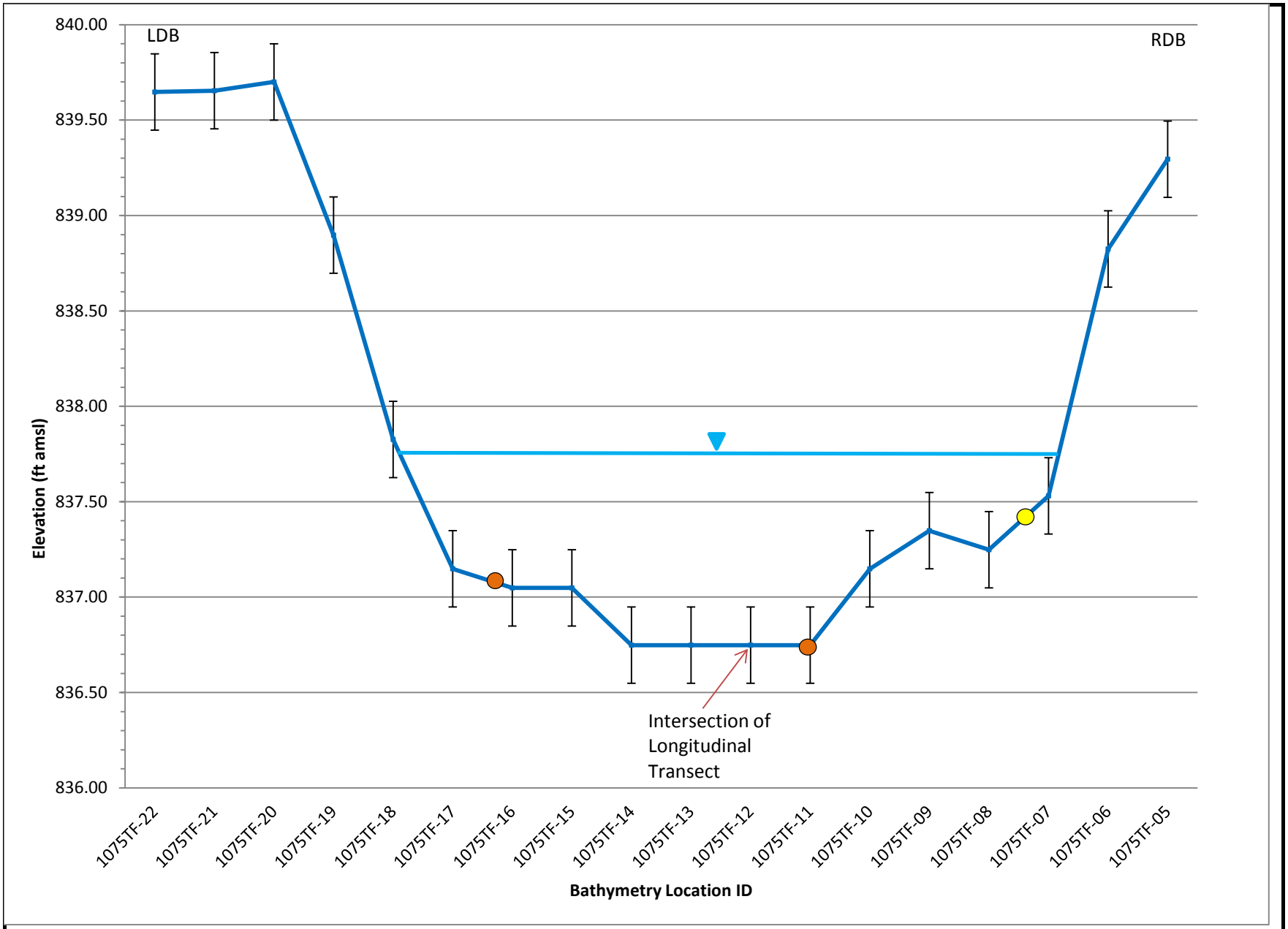
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT G
SHEET 2 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

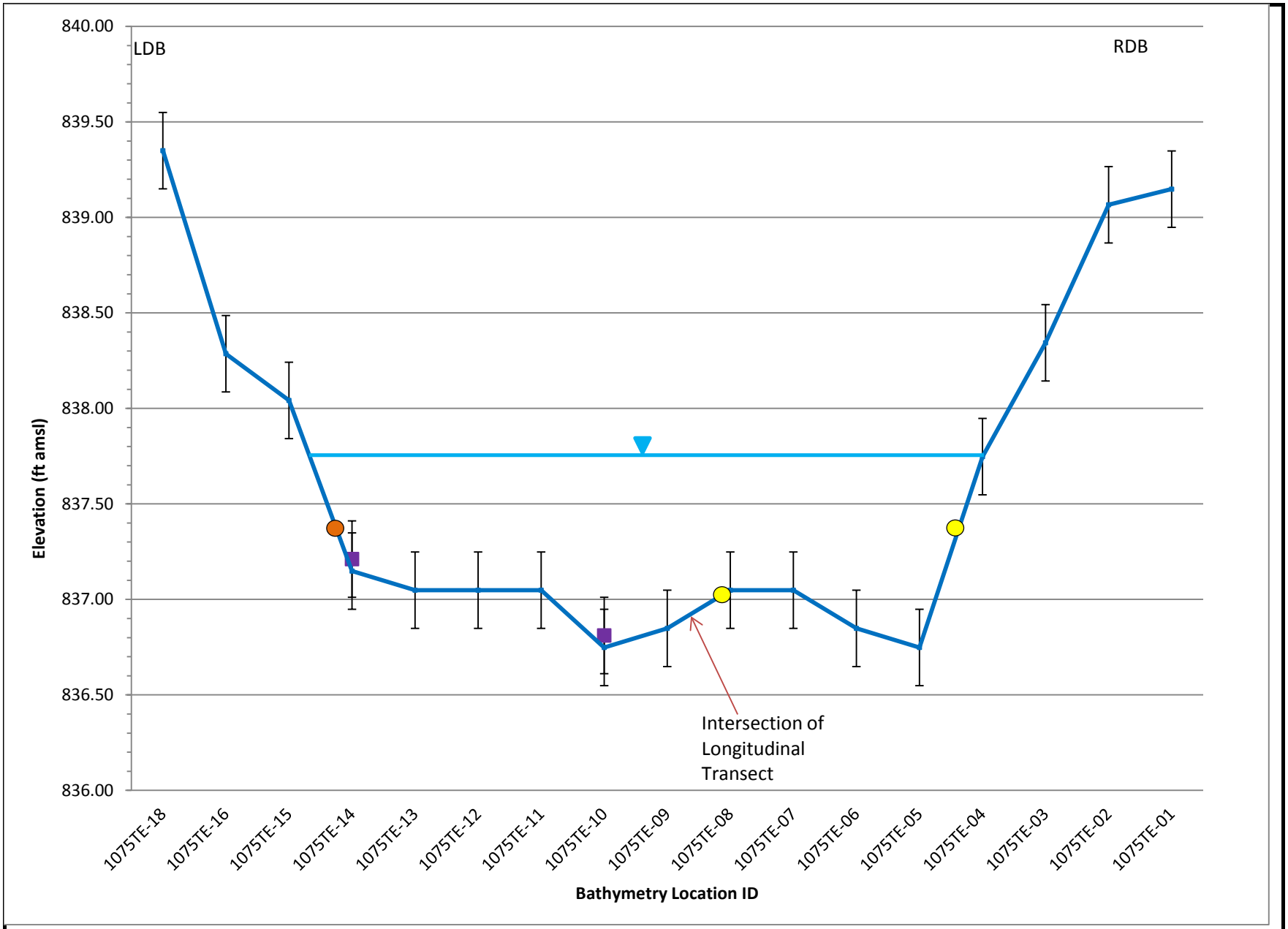
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT F
SHEET 3 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

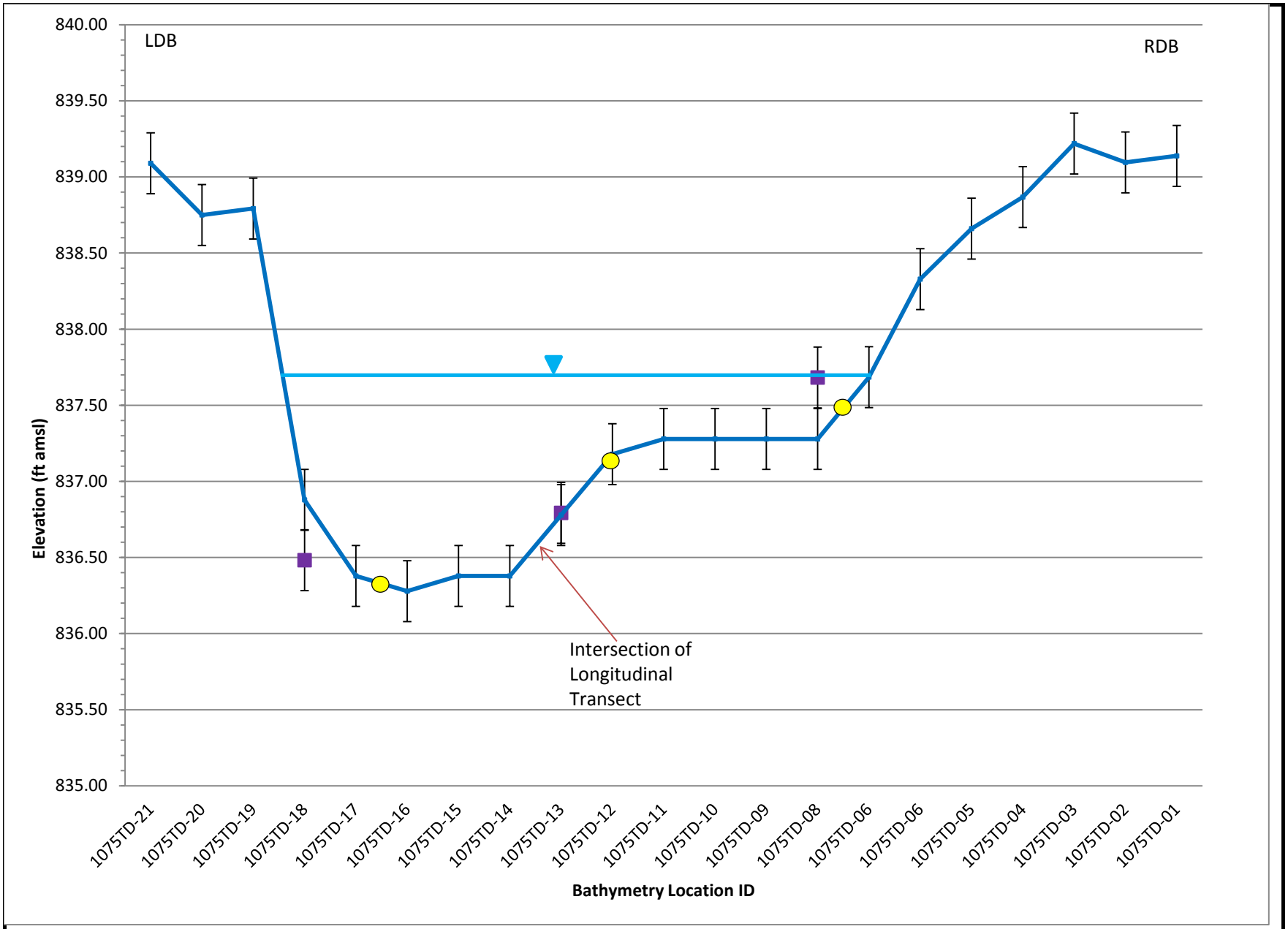
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT E
SHEET 4 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

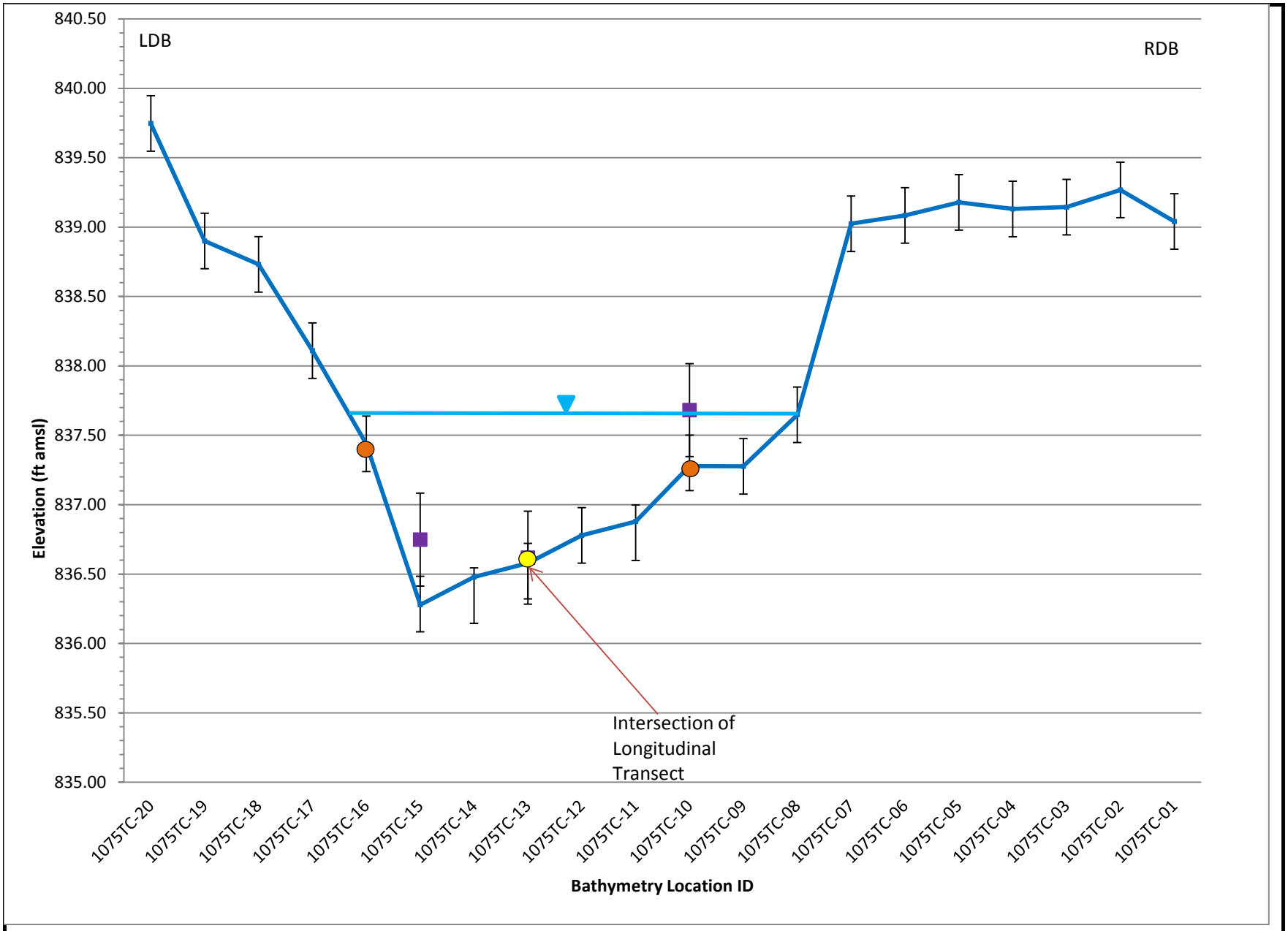
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT D
SHEET 5 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

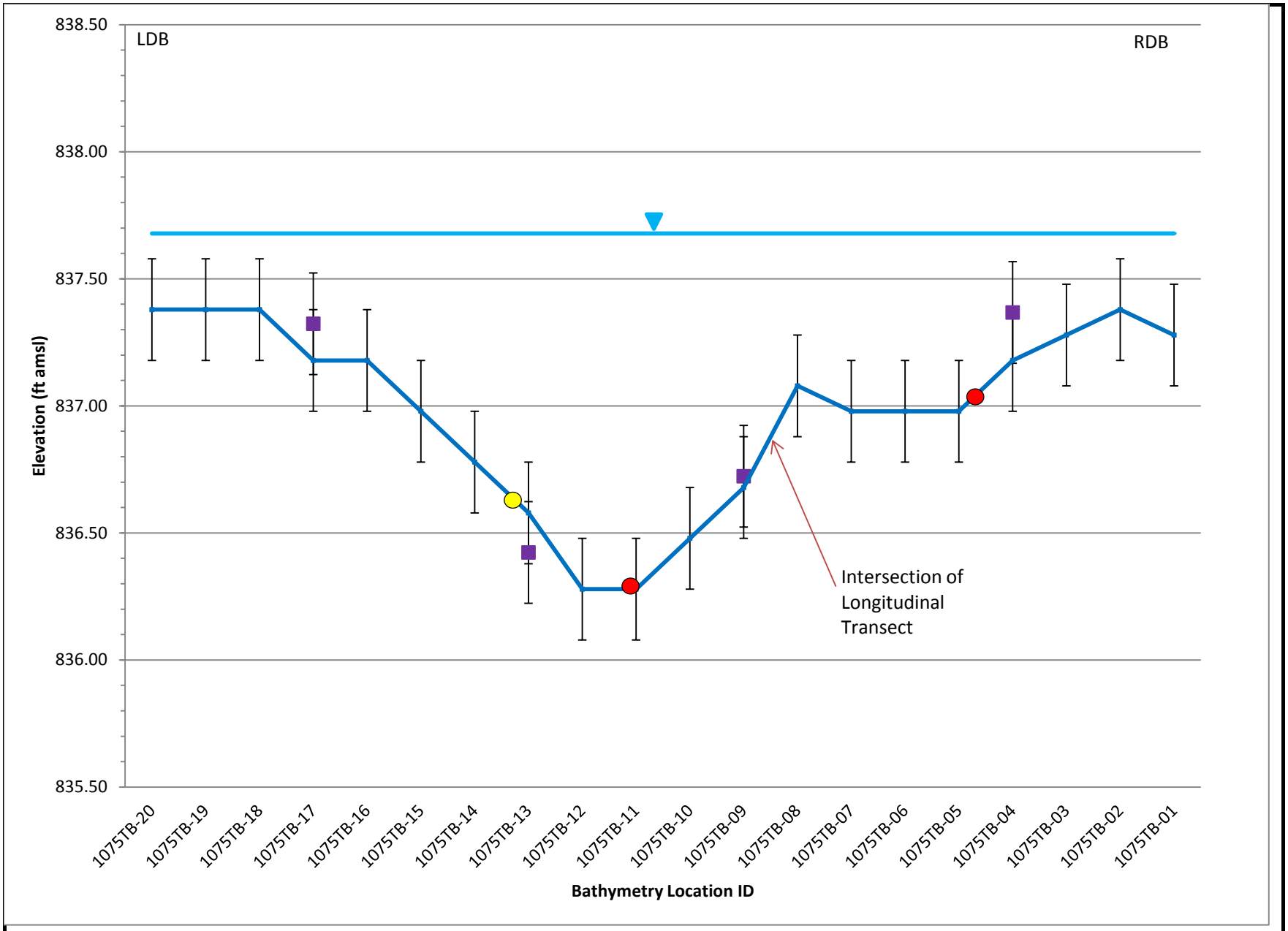
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT C
SHEET 6 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

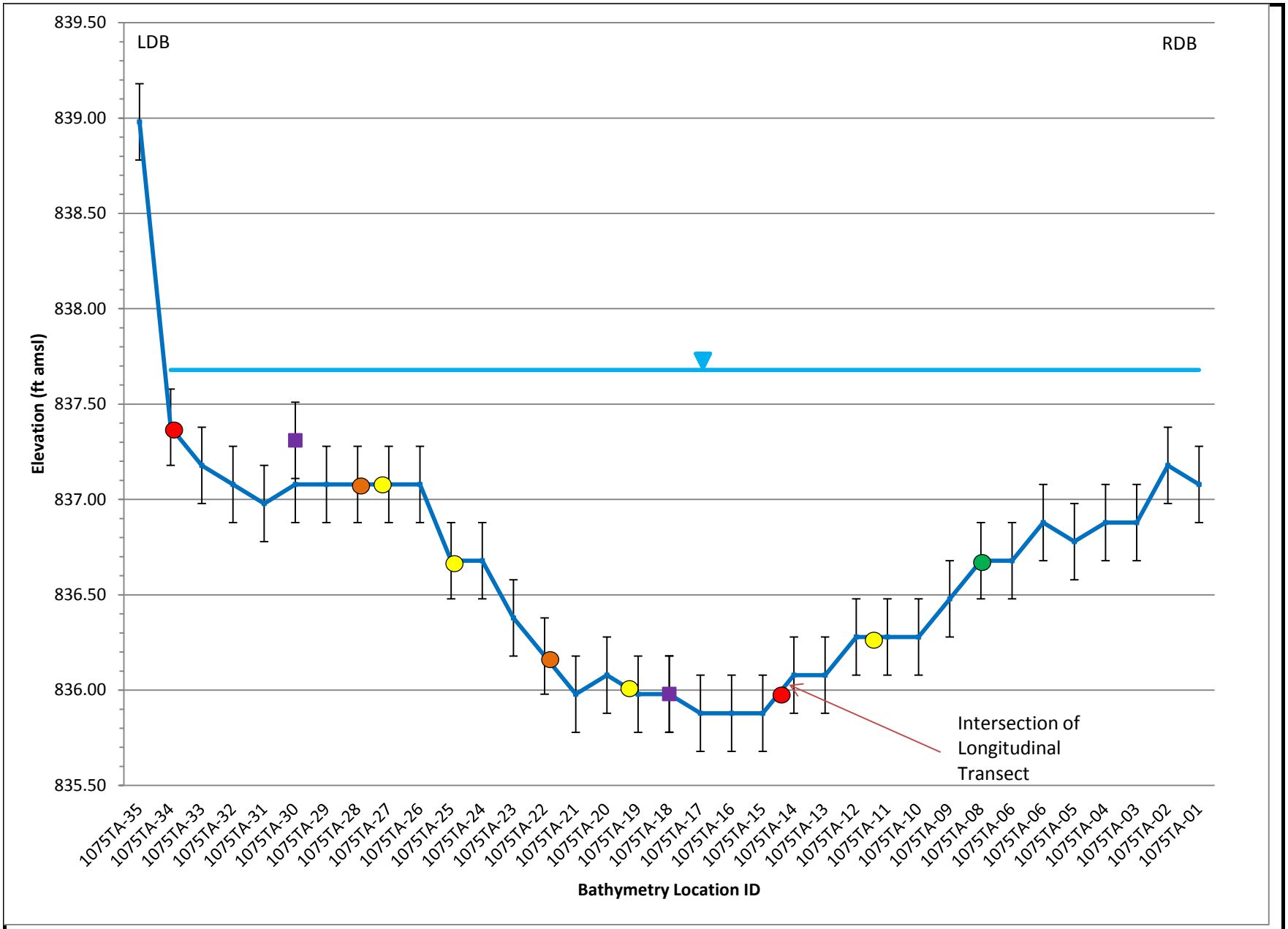
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT B
SHEET 7 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

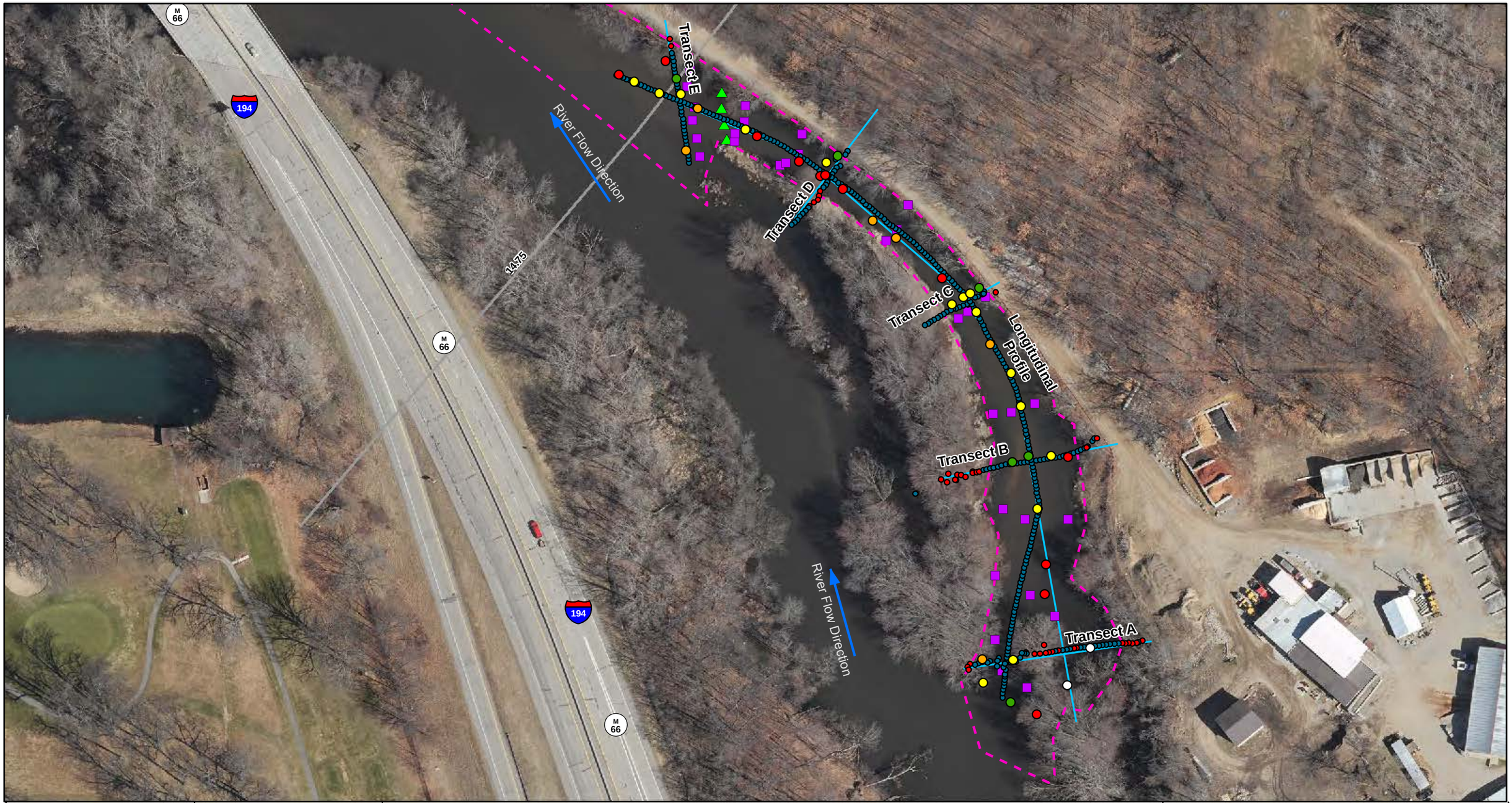
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

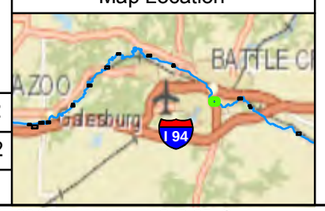
FIGURE 2i-4
SEDIMENT TRAP BATHYMETRY DATA
MP 10.75 LDB TRANSECT A
SHEET 8 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 50 100 200

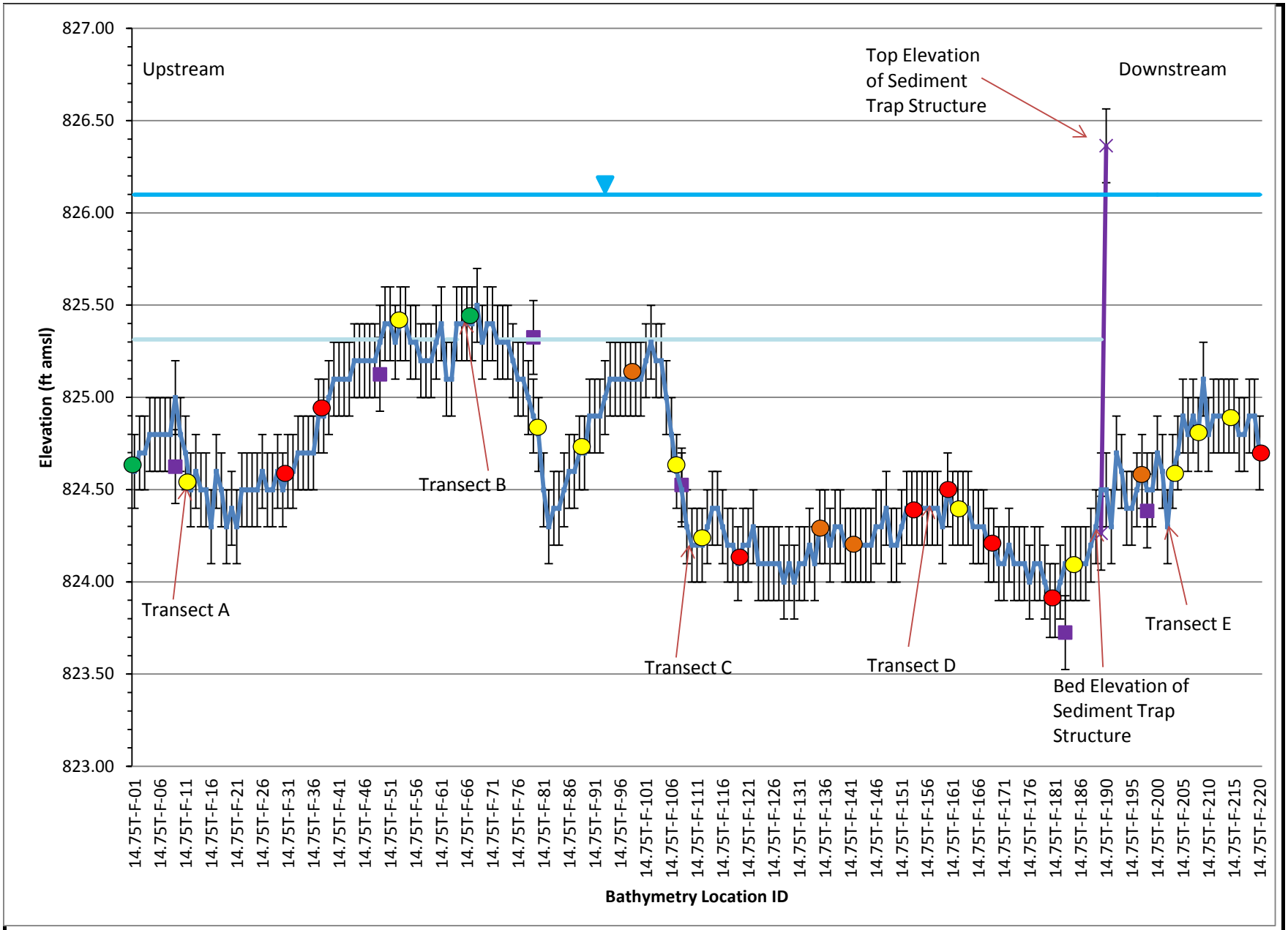
Scale in Feet

FIGURE 2i-5
PHASE I SEDIMENT TRAP BATHYMETRY
MP 14.75 RDB
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Sediment Trap 50% Capacity

Submerged Oil Category:

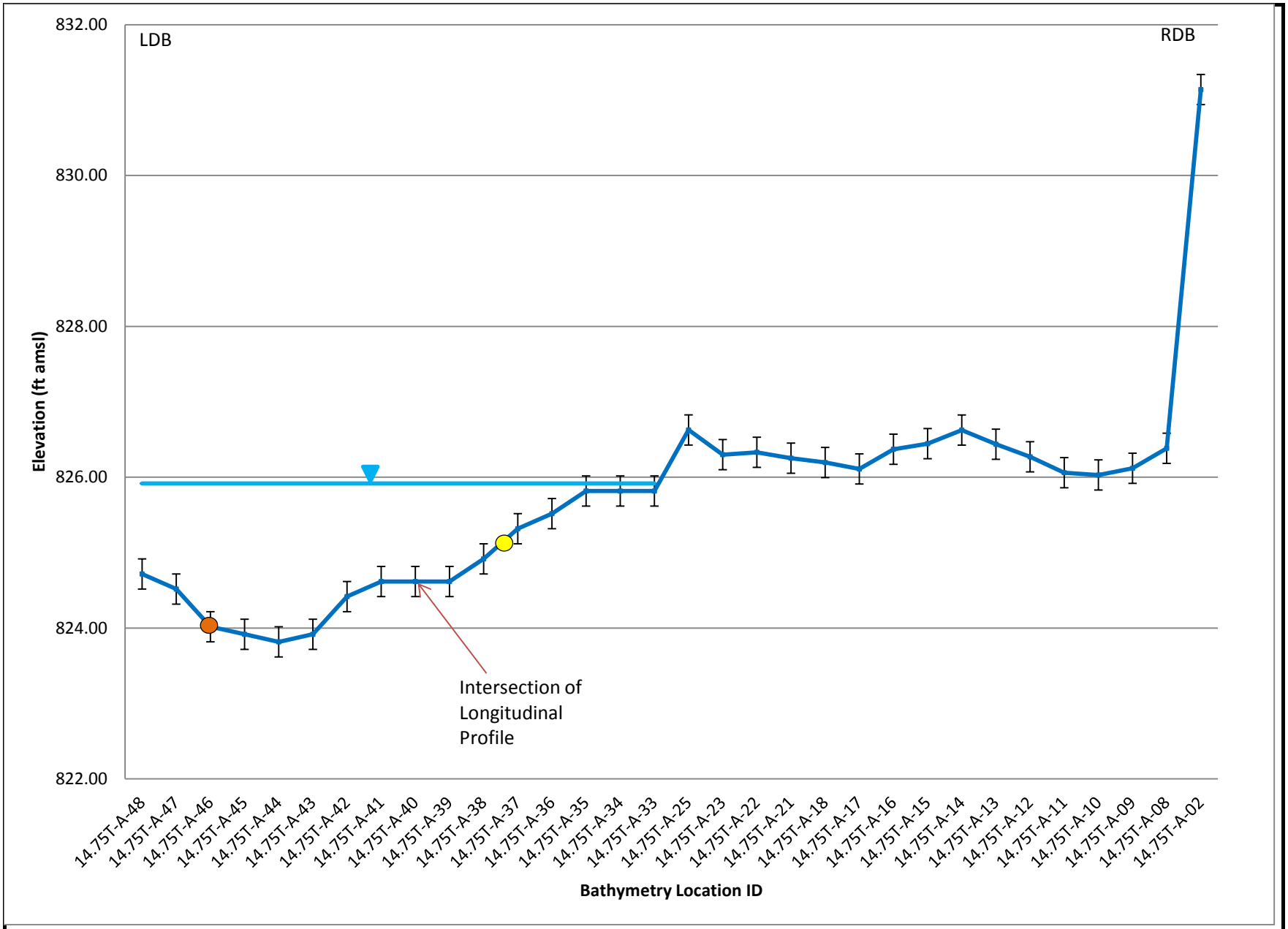
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

Sediment Trap Structure

ft amsl = feet above mean sea level

FIGURE 2i-6
SEDIMENT TRAP BATHYMETRY DATA
MP 14.75 RDB LONGITUDINAL
SHEET 1 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

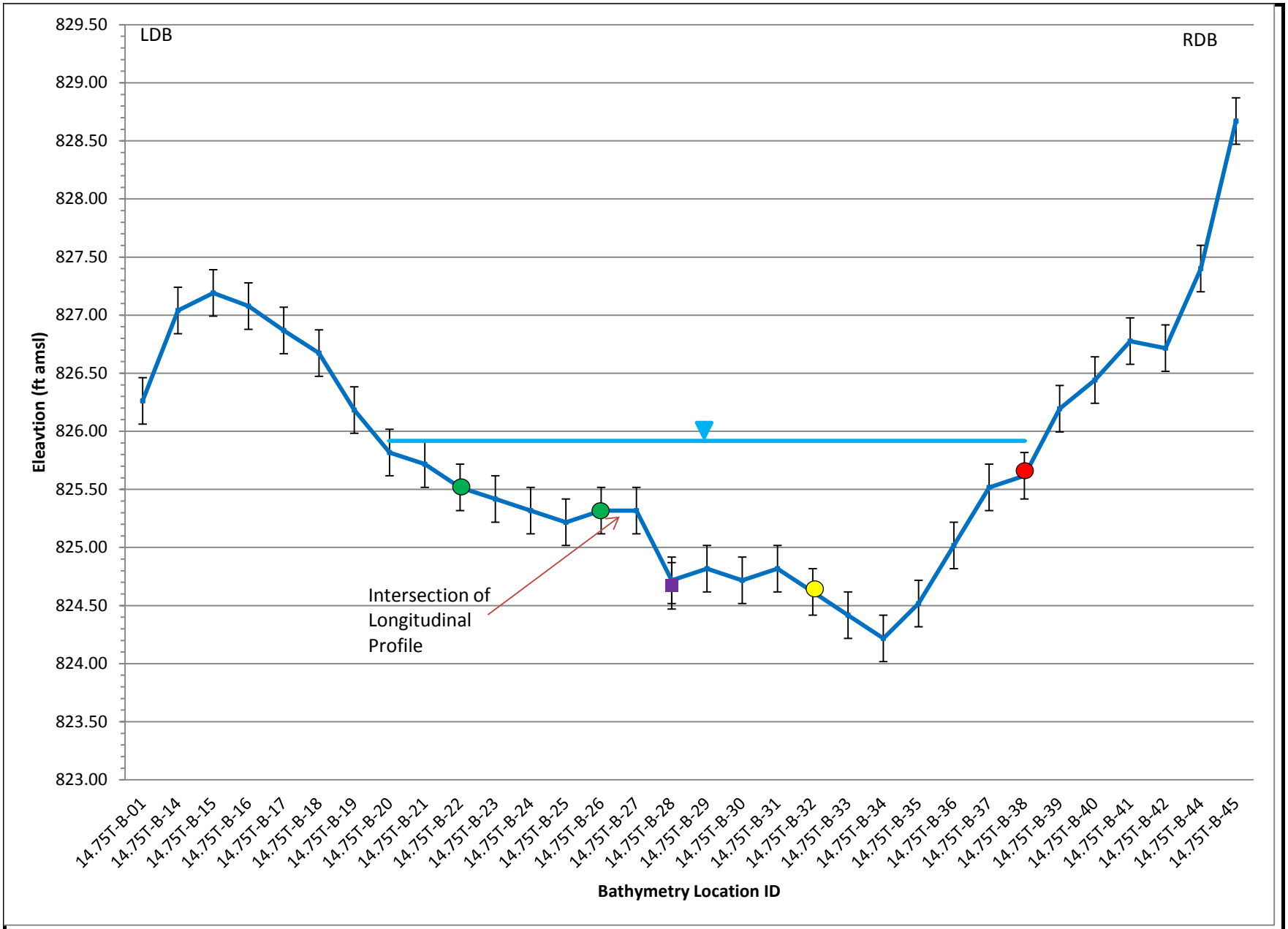
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-6
SEDIMENT TRAP BATHYMETRY DATA
MP 14.75 RDB TRANSECT A
SHEET 2 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

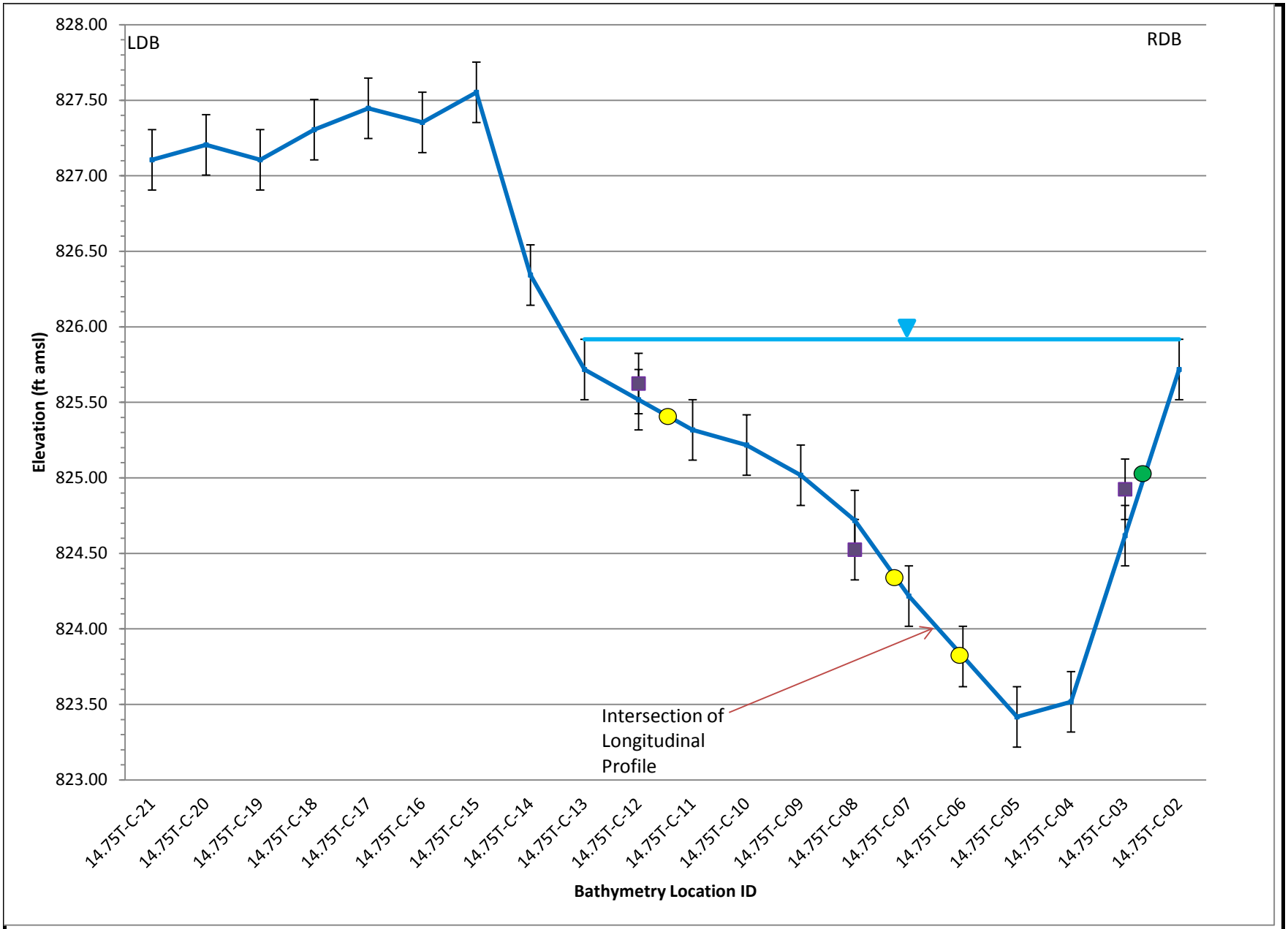
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-6
SEDIMENT TRAP BATHYMETRY DATA
MP 14.75 RDB TRANSECT B
SHEET 3 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

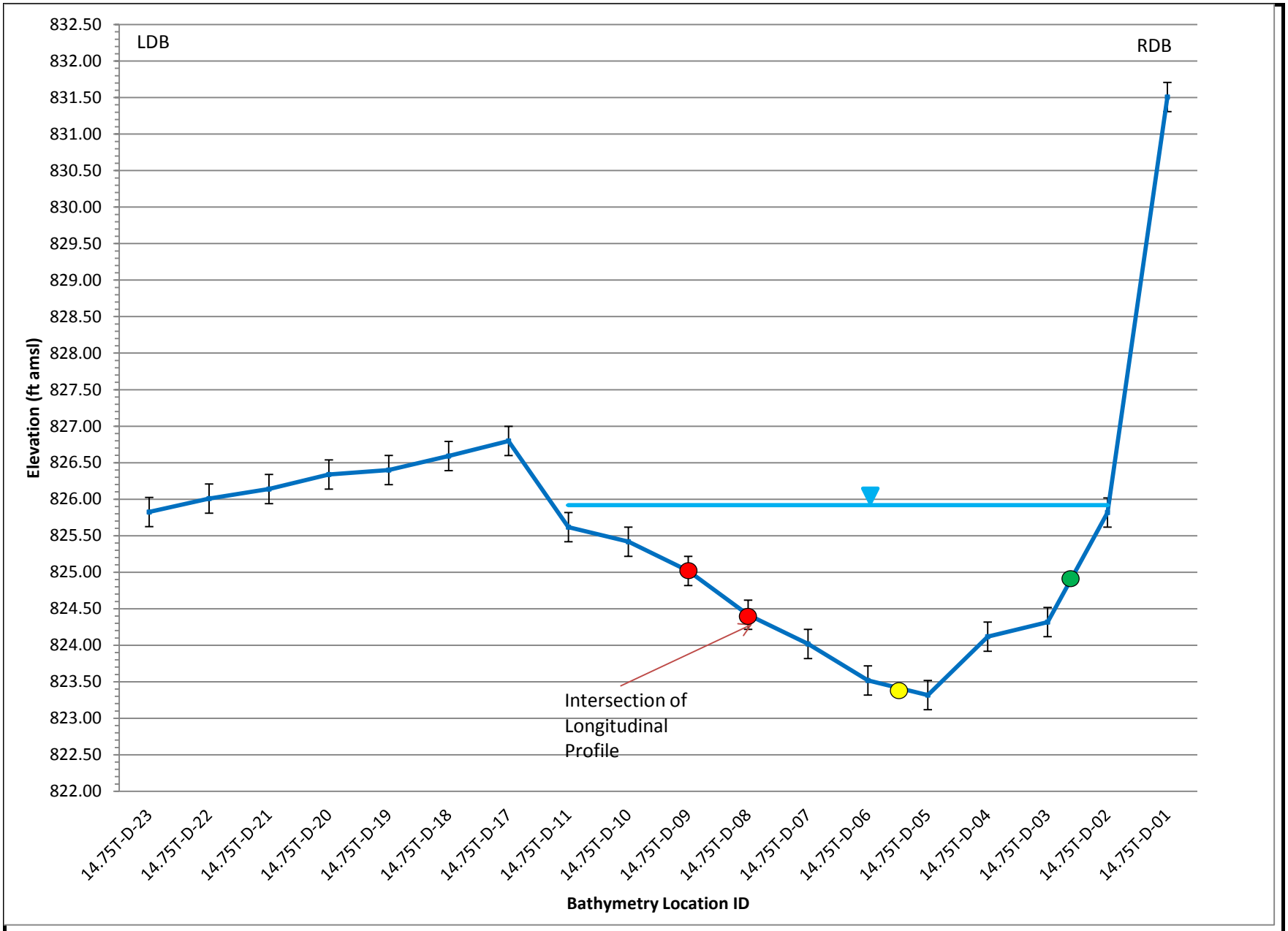
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-6
SEDIMENT TRAP BATHYMETRY DATA
MP 14.75 RDB TRANSECT C
SHEET 4 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

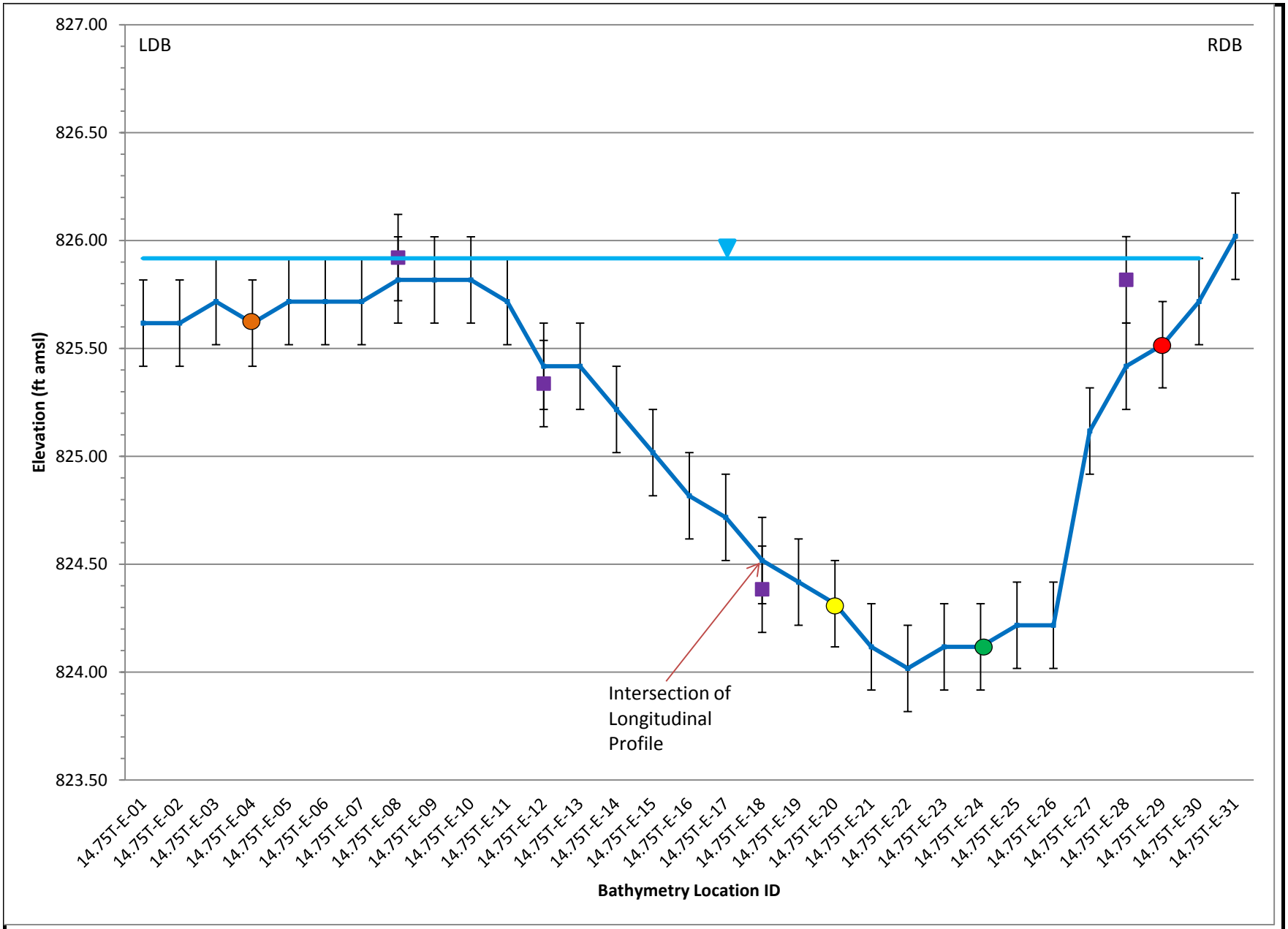
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-6
SEDIMENT TRAP BATHYMETRY DATA
MP 14.75 RDB TRANSECT D
SHEET 5 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-6
SEDIMENT TRAP BATHYMETRY DATA
MP 14.75 RDB TRANSECT E
SHEET 6 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

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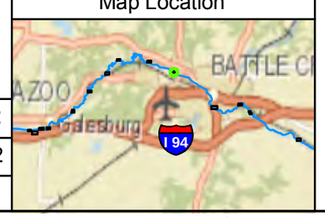
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 30 60 120

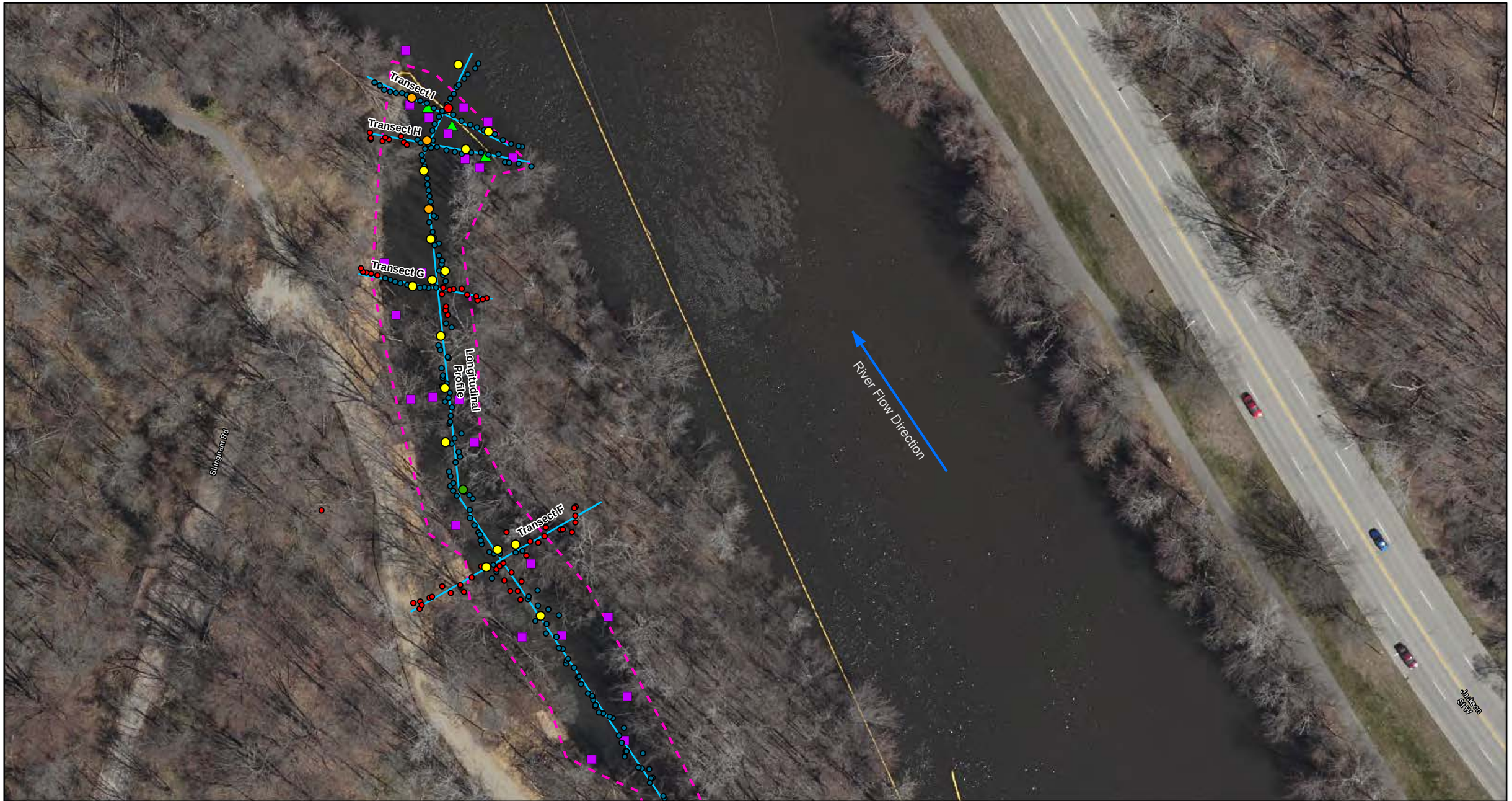
Scale in Feet

FIGURE 2i-7
PHASE I SEDIMENT TRAP BATHYMETRY
MP 19.25 LDB
SHEET 1 OF 2

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



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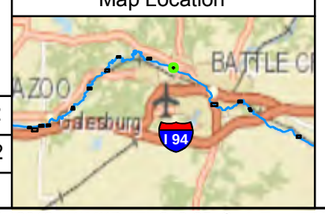
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 30 60 120

Scale in Feet

FIGURE 2i-7
PHASE I SEDIMENT TRAP BATHYMETRY
MP 19.25 LDB
SHEET 2 OF 2

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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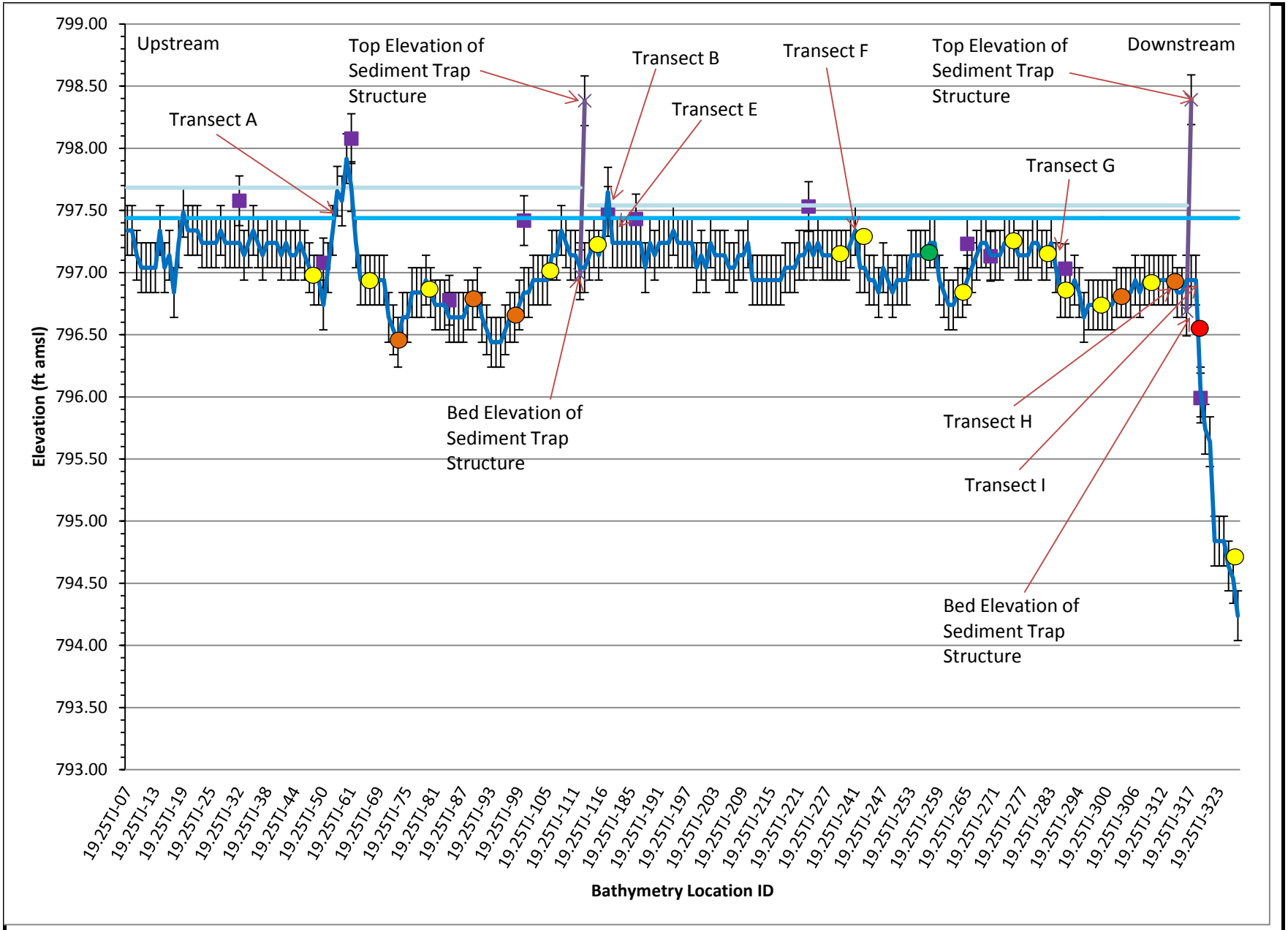


ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Sediment Trap 50% Capacity

Submerged Oil Category:

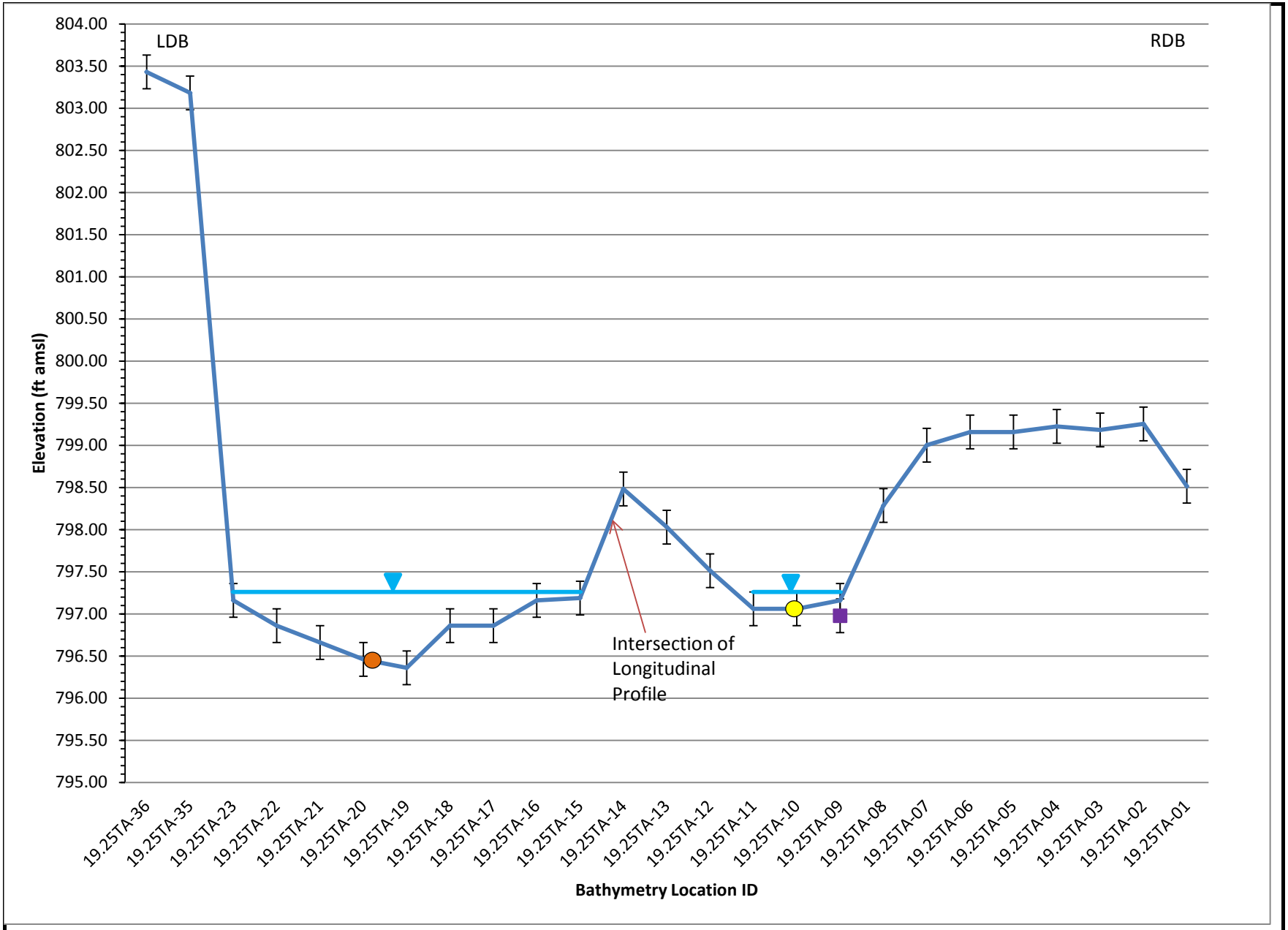
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

Sediment Trap Structure

ft amsl = feet above mean sea level

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB LONGITUDINAL
SHEET 1 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

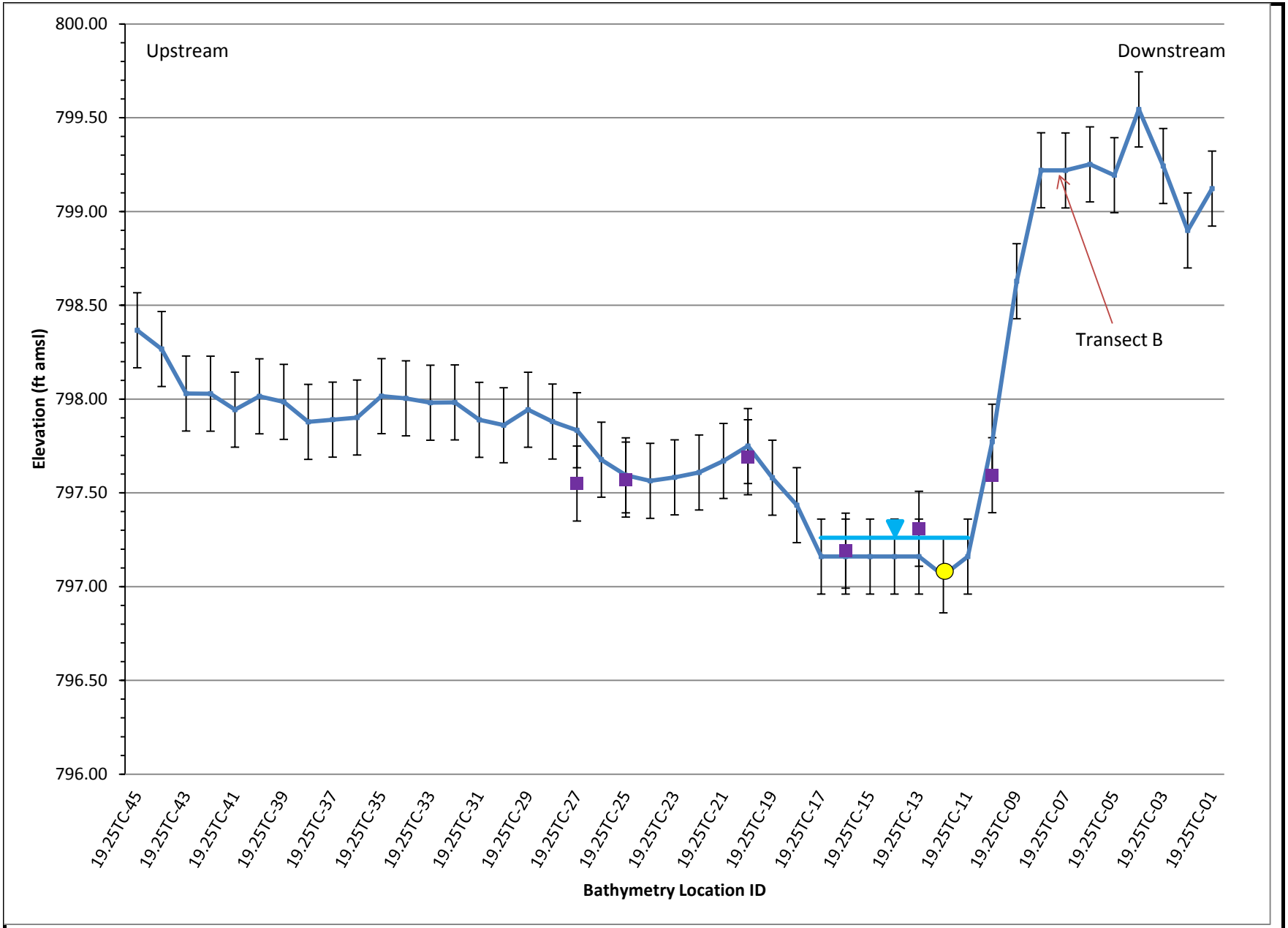
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB TRANSECT A
SHEET 2 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

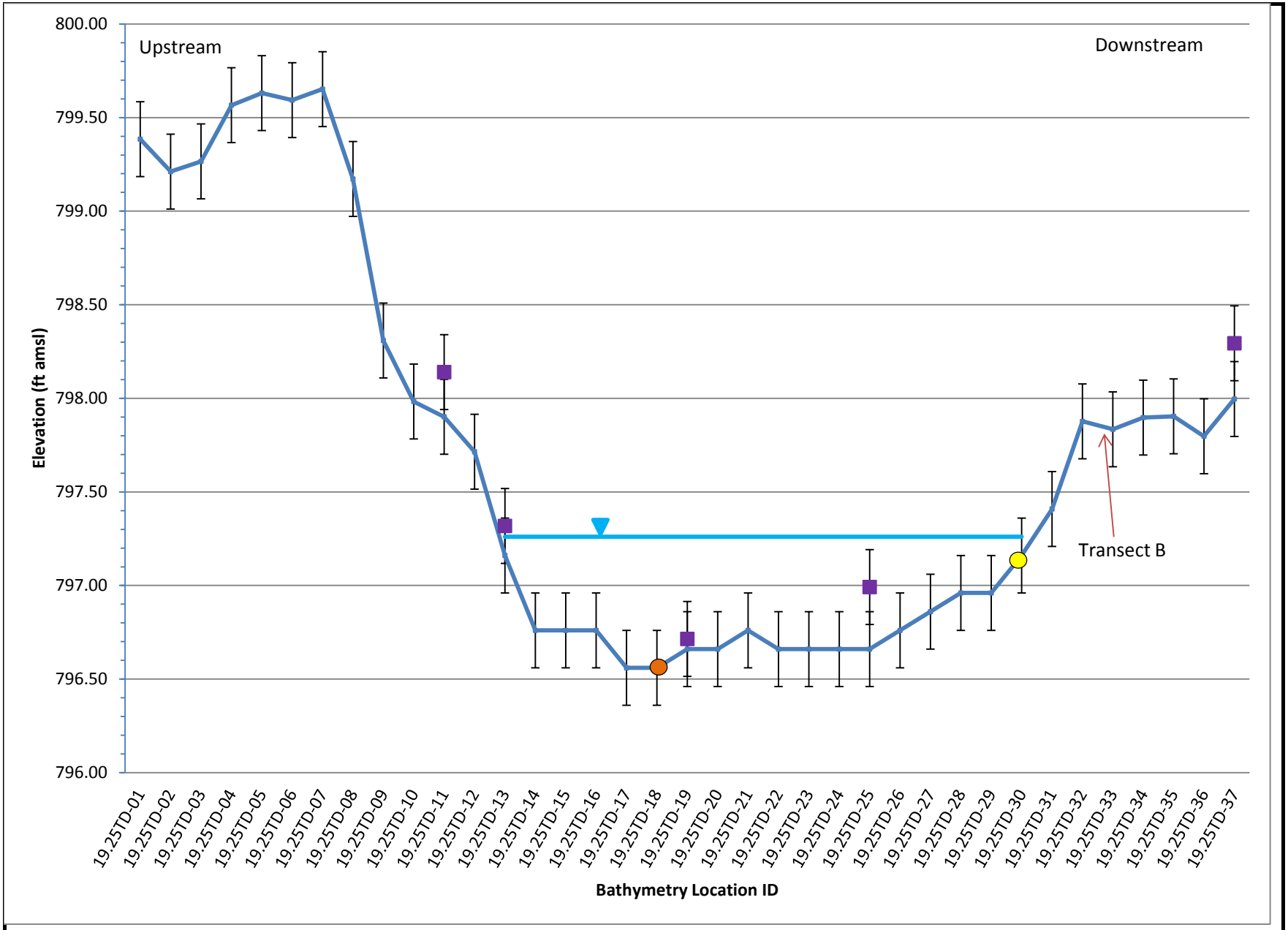
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB TRANSECT C
SHEET 3 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

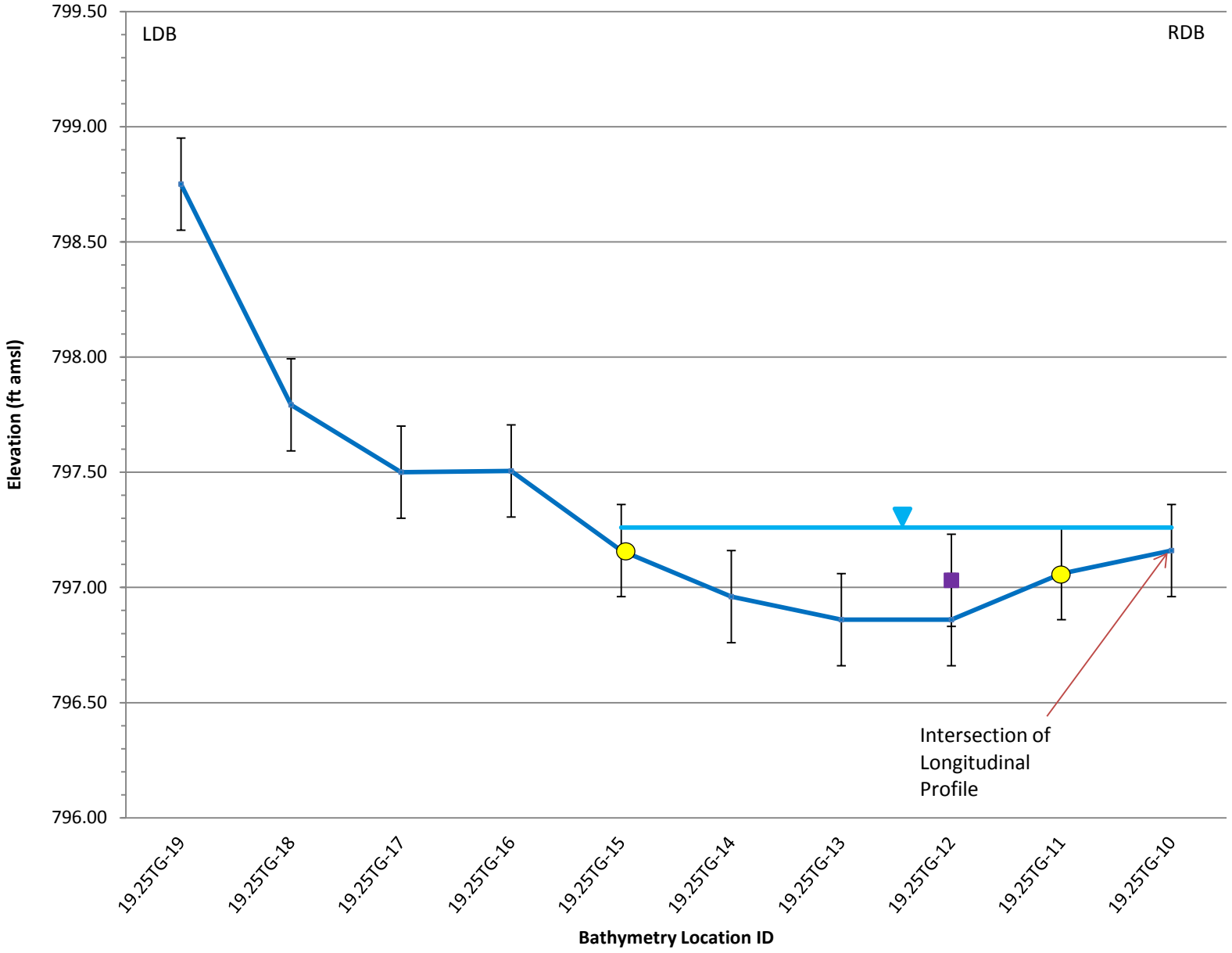
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB TRANSECT D
SHEET 4 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

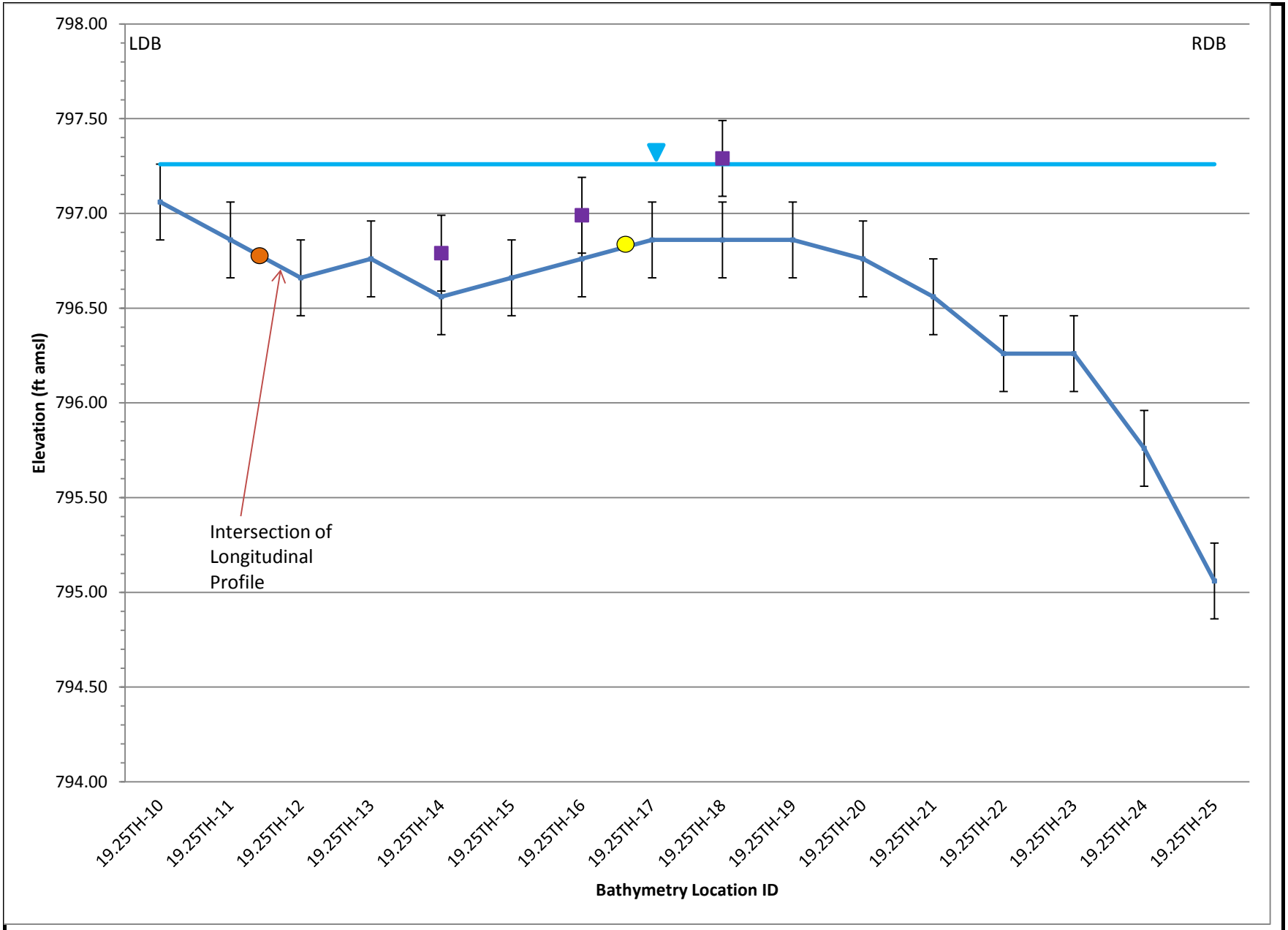
ft amsl = feet above mean sea level

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB TRANSECT G
SHEET 5 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

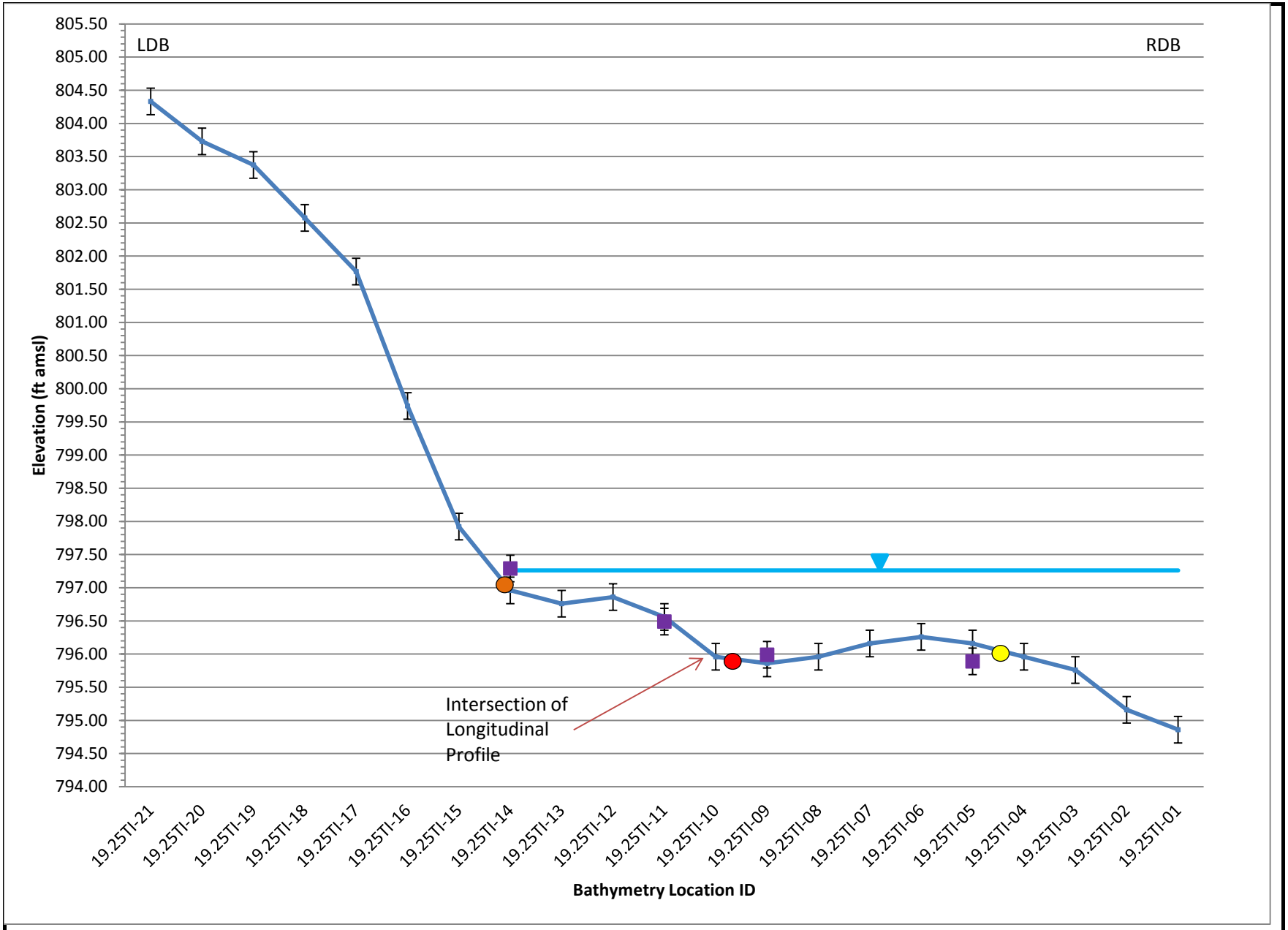
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB TRANSECT H
SHEET 6 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

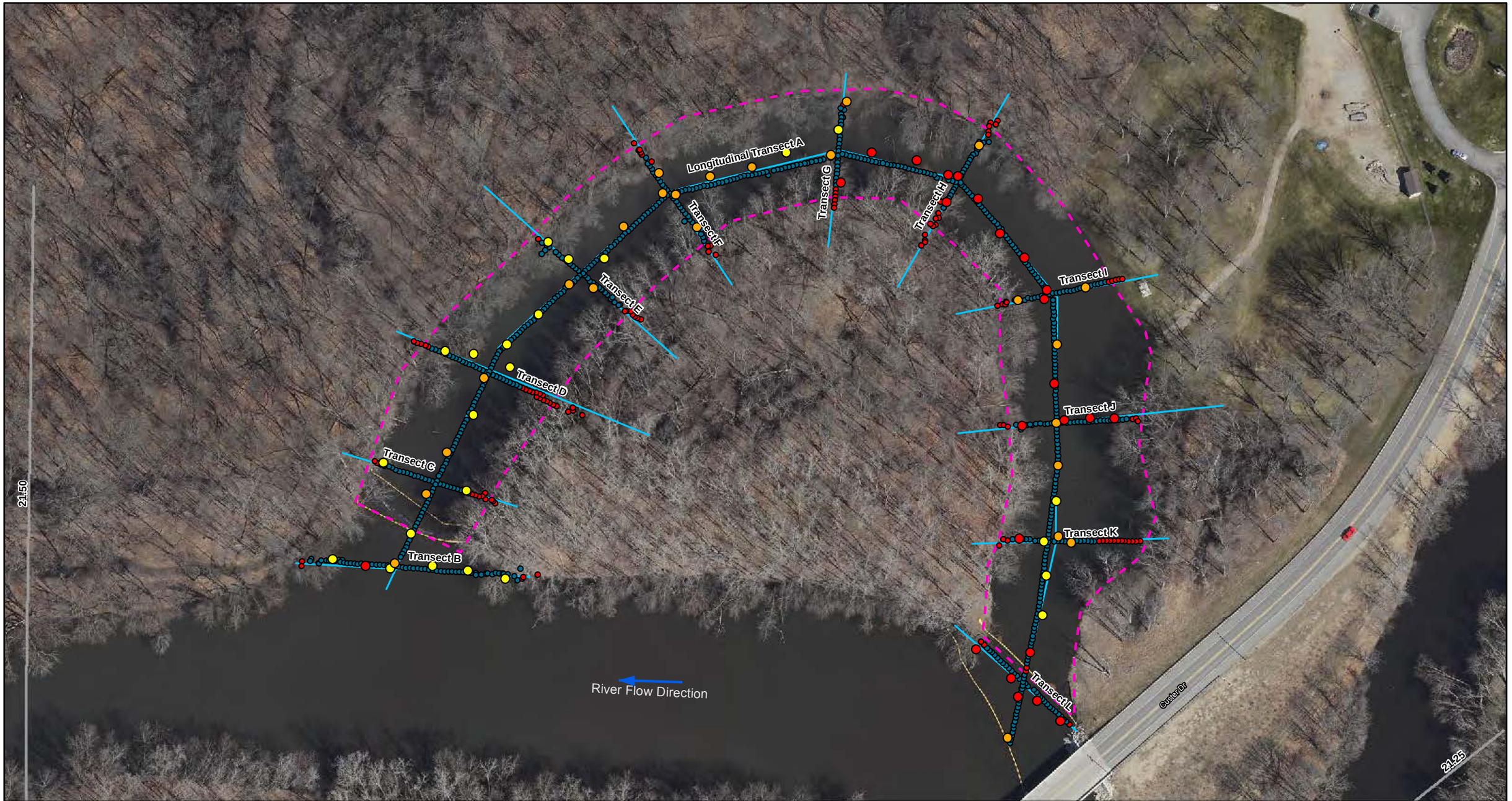
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

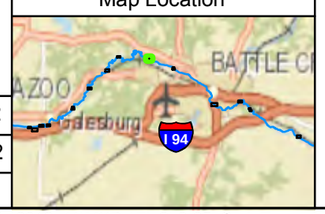
ft amsl = feet above mean sea level

FIGURE 2i-8
SEDIMENT TRAP BATHYMETRY DATA
MP 19.25 LDB TRANSECT I
SHEET 7 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 50 100 200

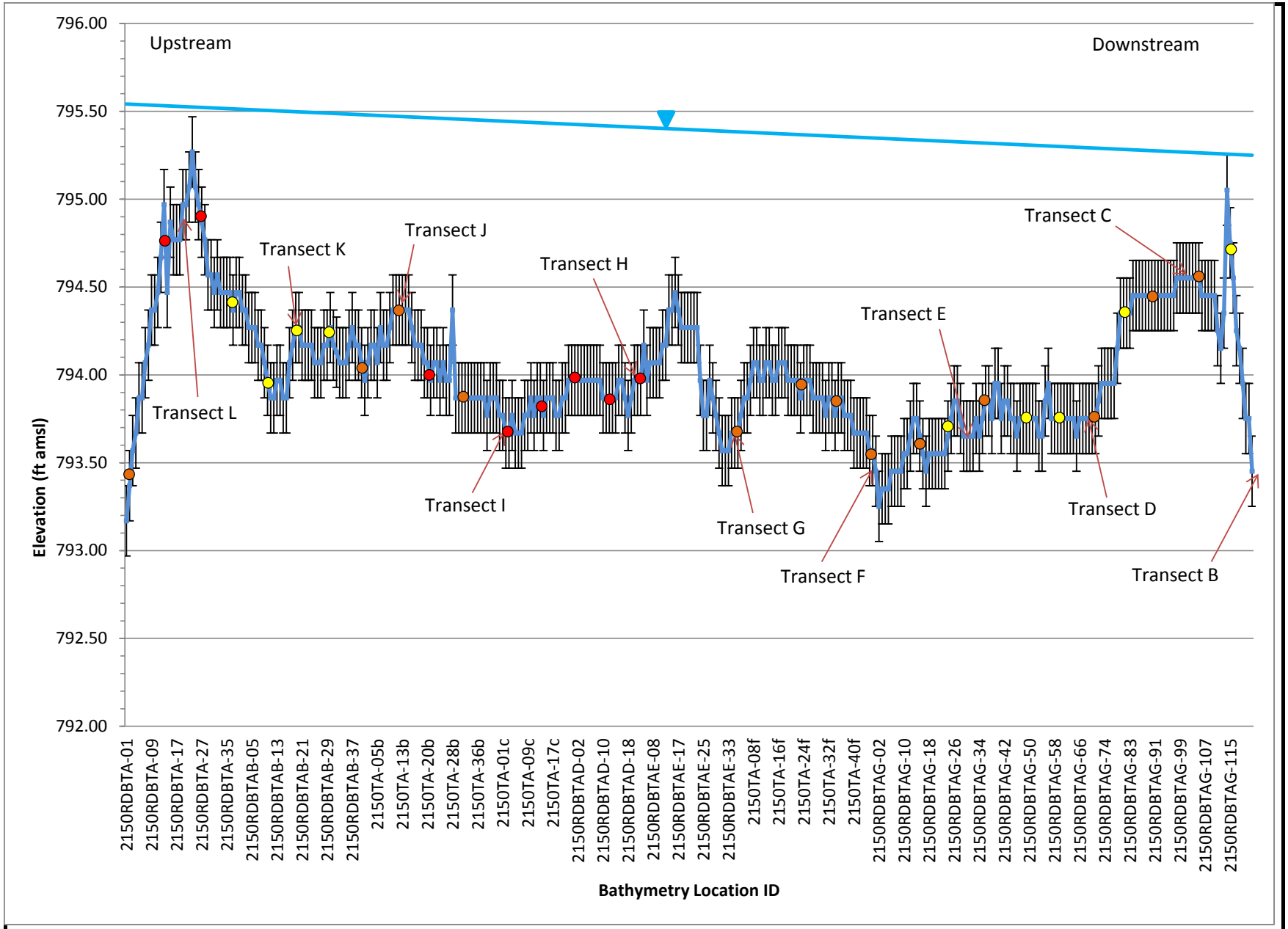
Scale in Feet

FIGURE 2i-9
PHASE I SEDIMENT TRAP BATHYMETRY
MP 21.50 RDB
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

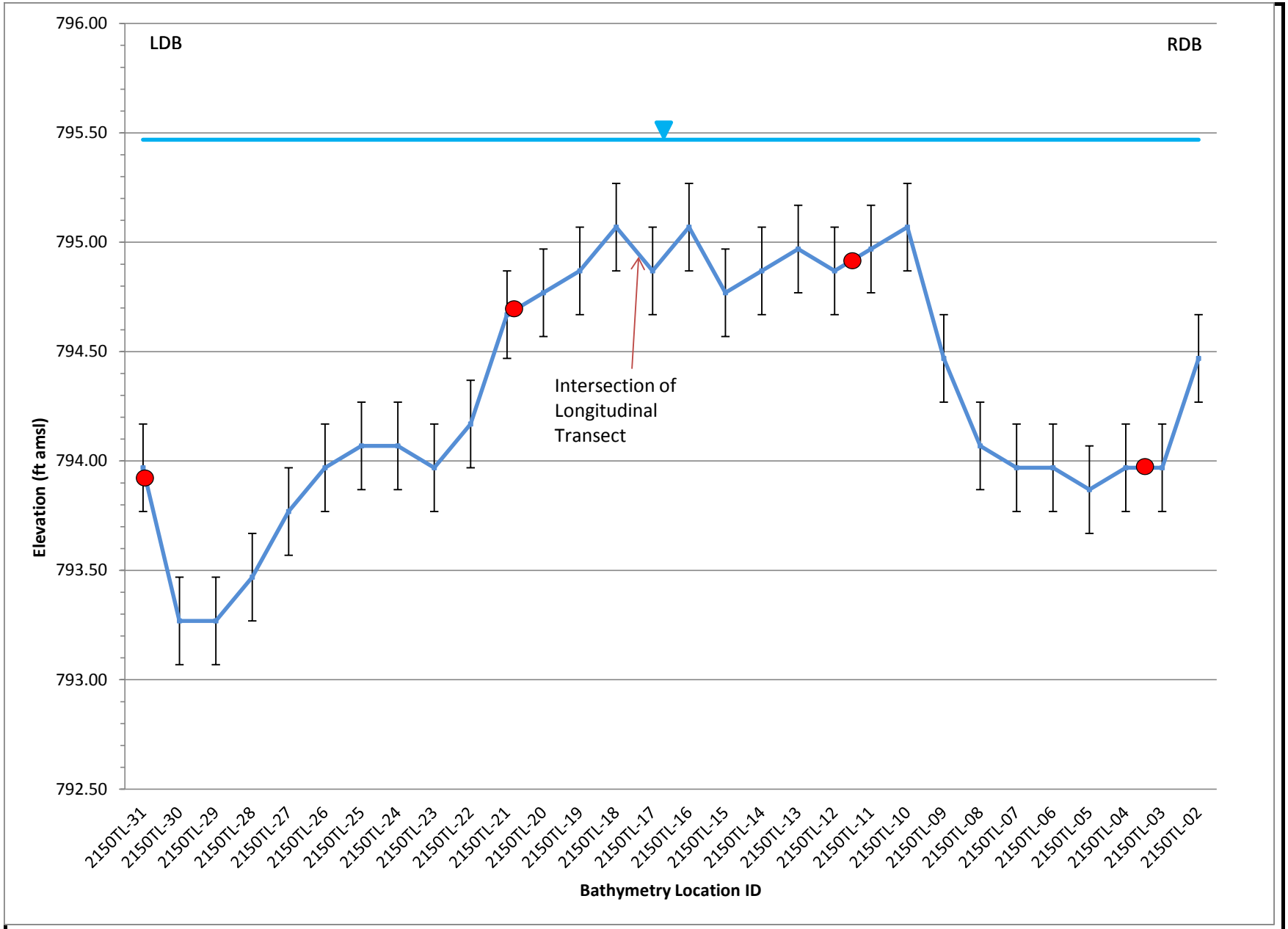
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB LONGITUDINAL
SHEET 1 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

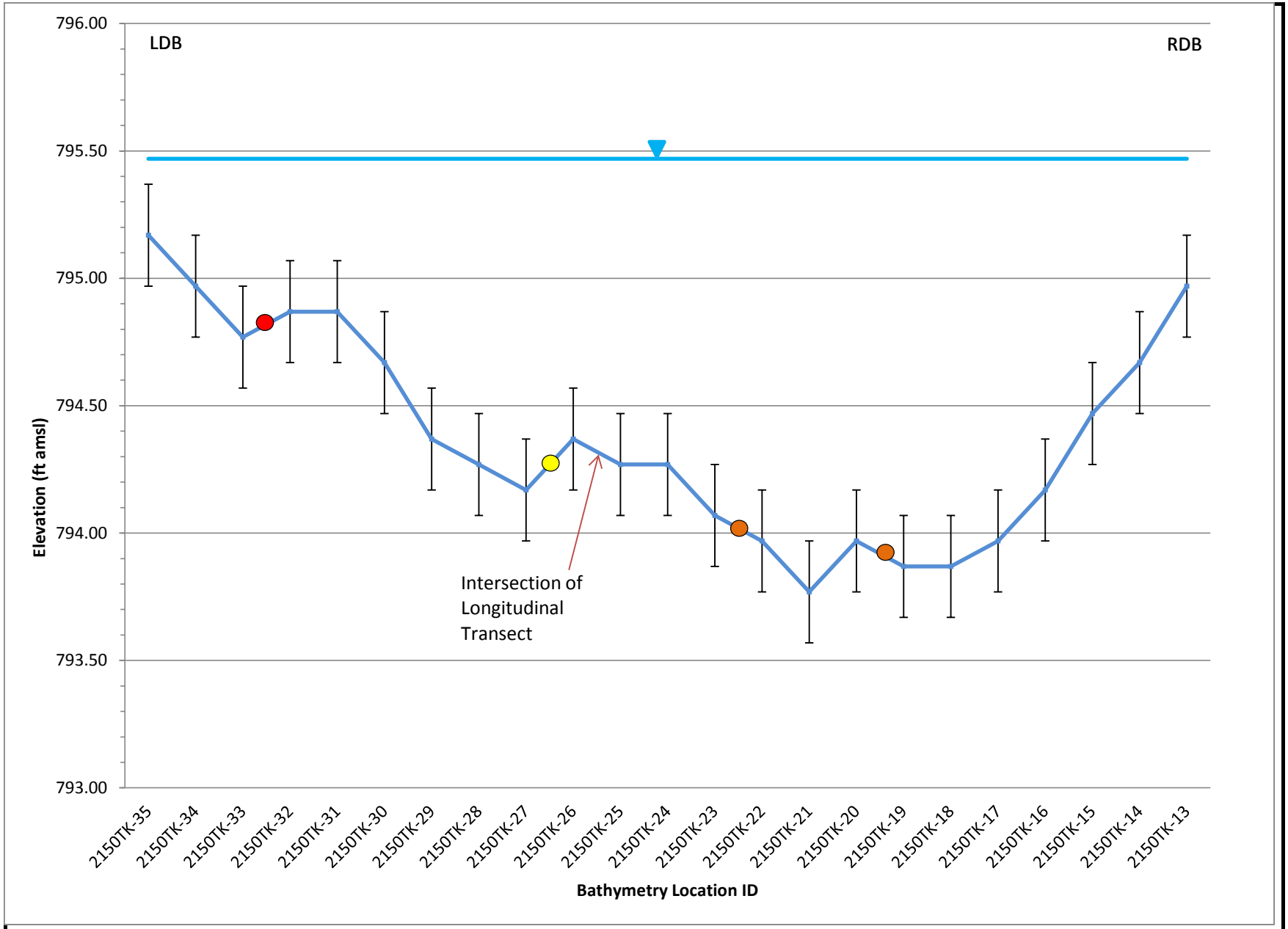
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT L
SHEET 2 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn:

Approved:

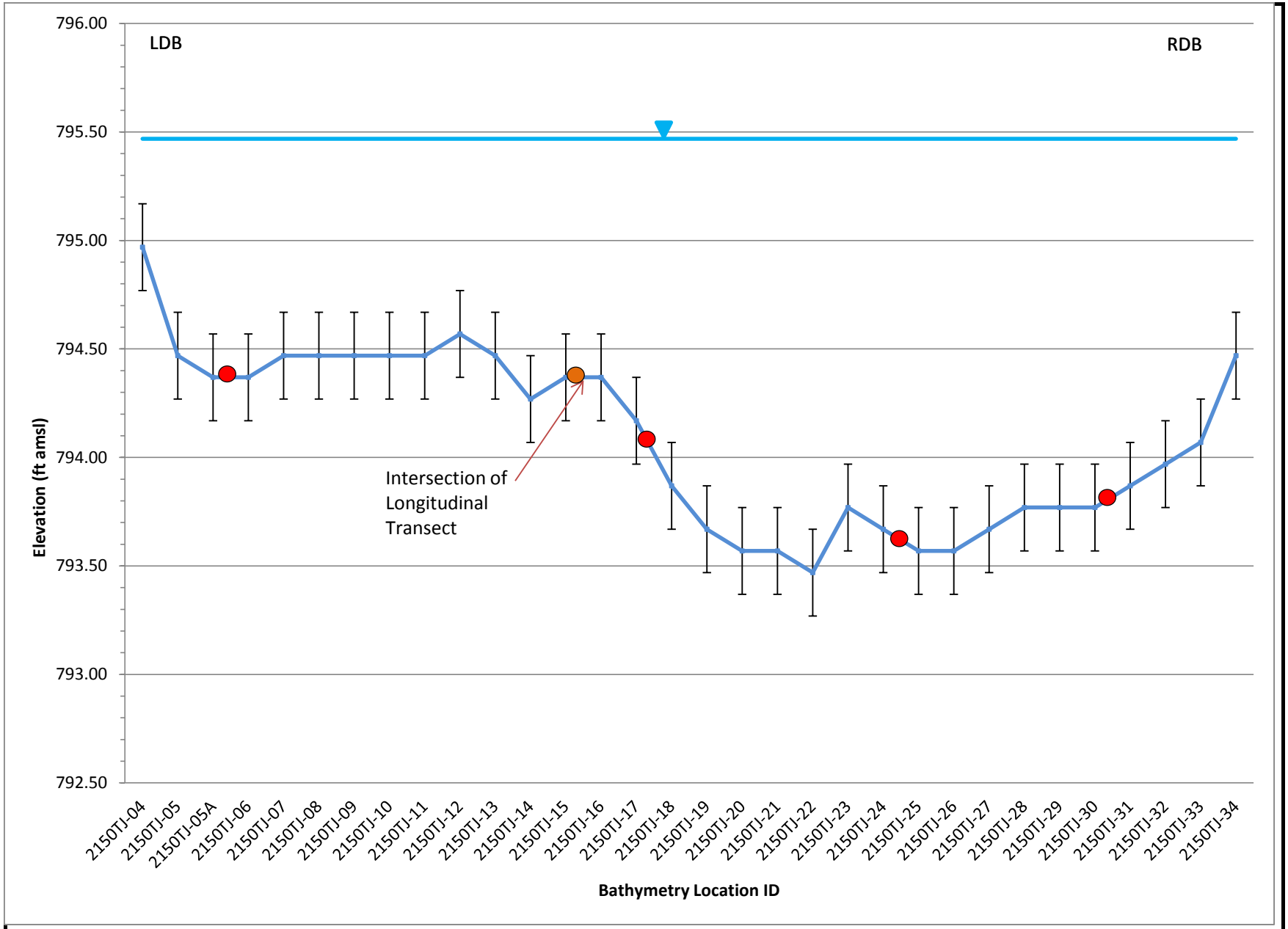
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT K
SHEET 3 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn:

Approved:

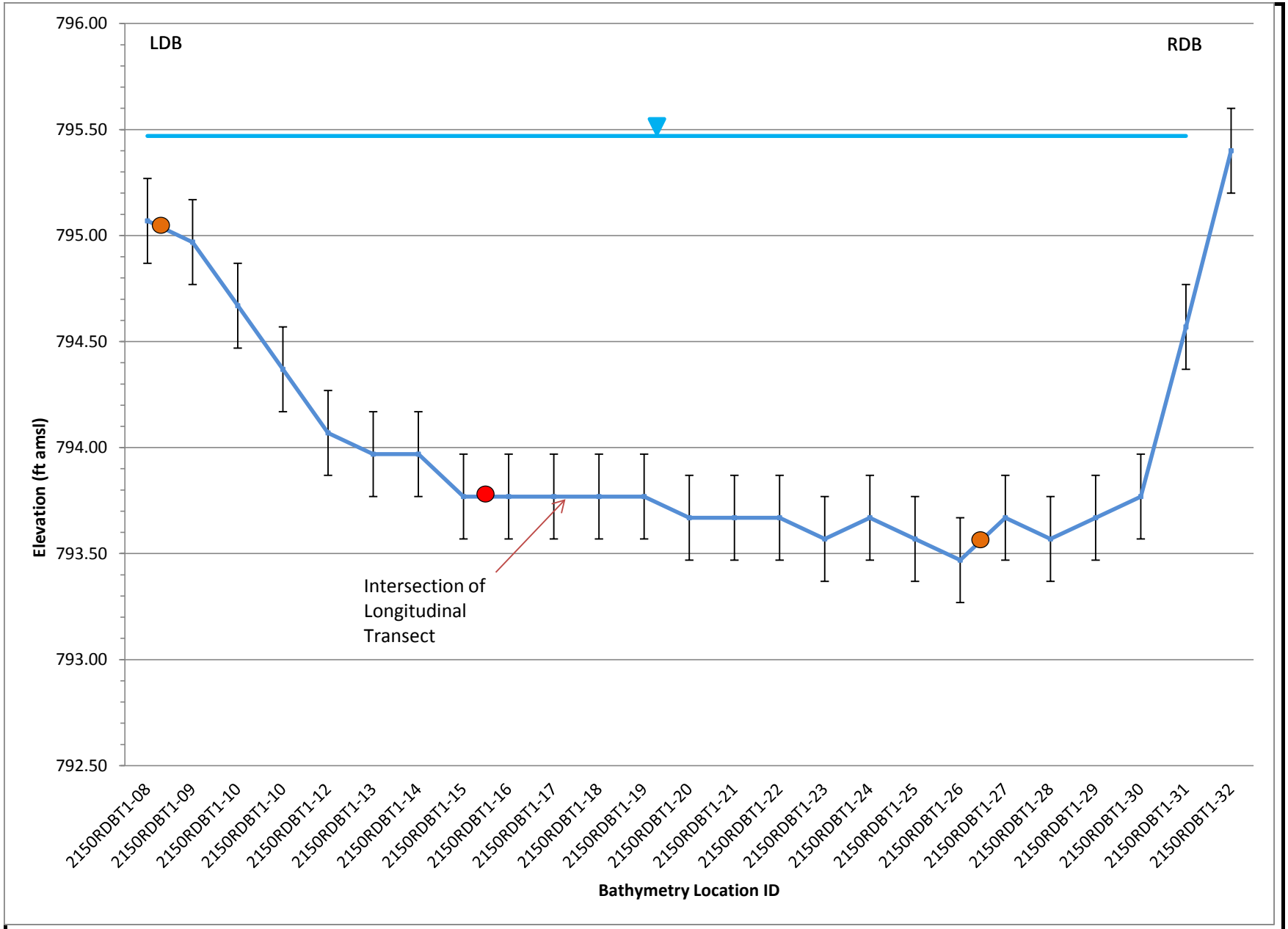
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT J
SHEET 4 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

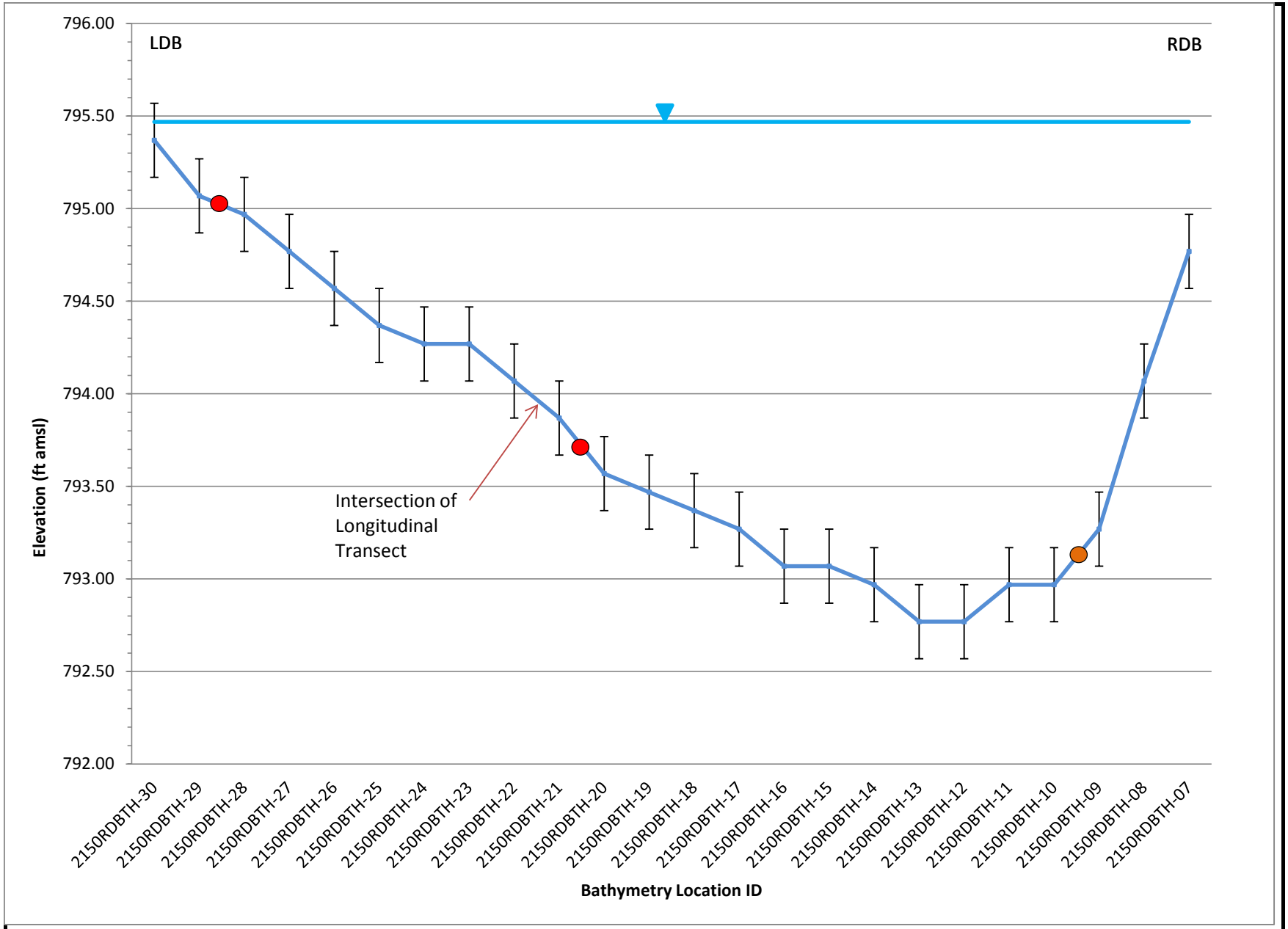
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT I
SHEET 5 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

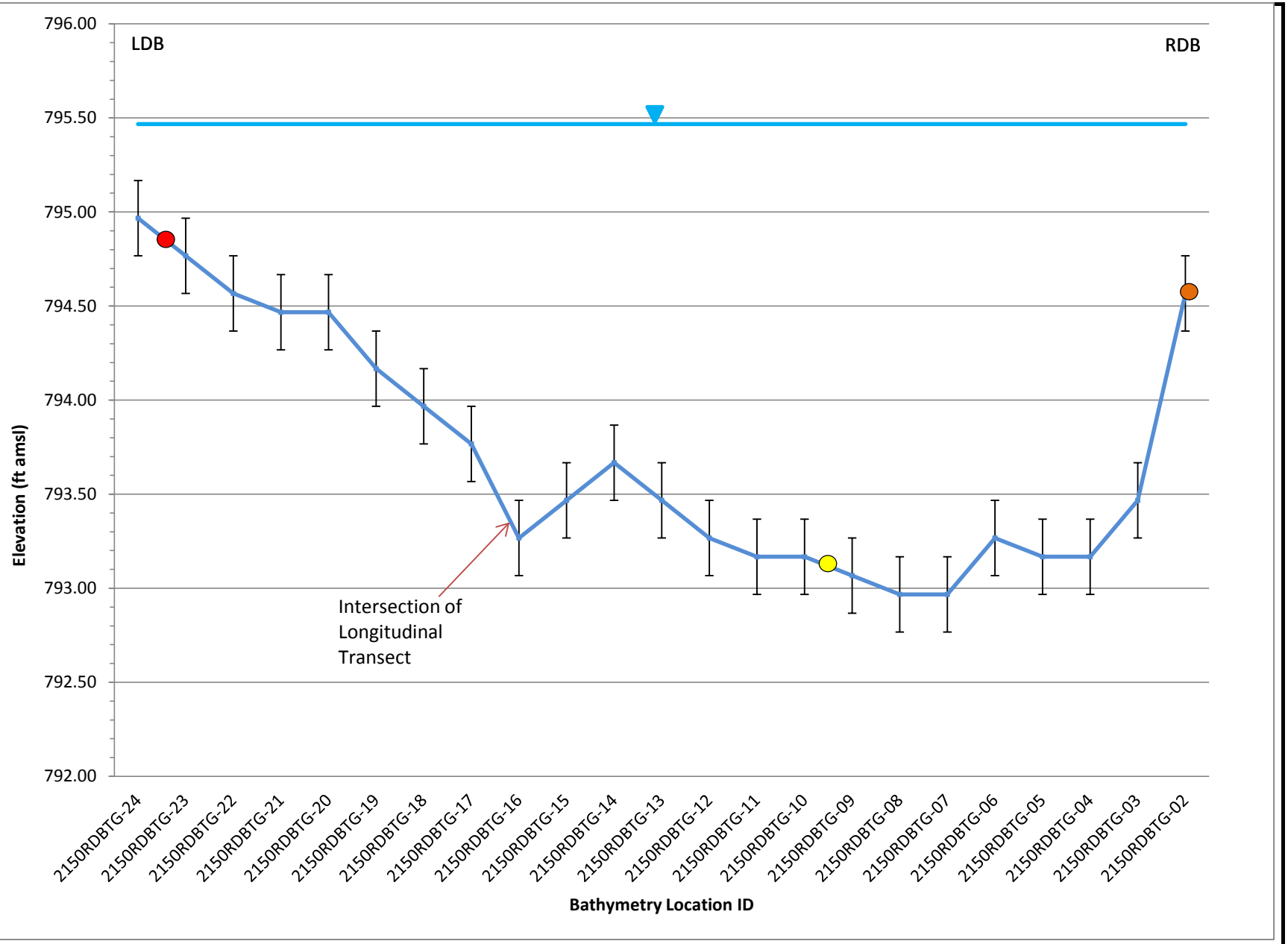
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT H
SHEET 6 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

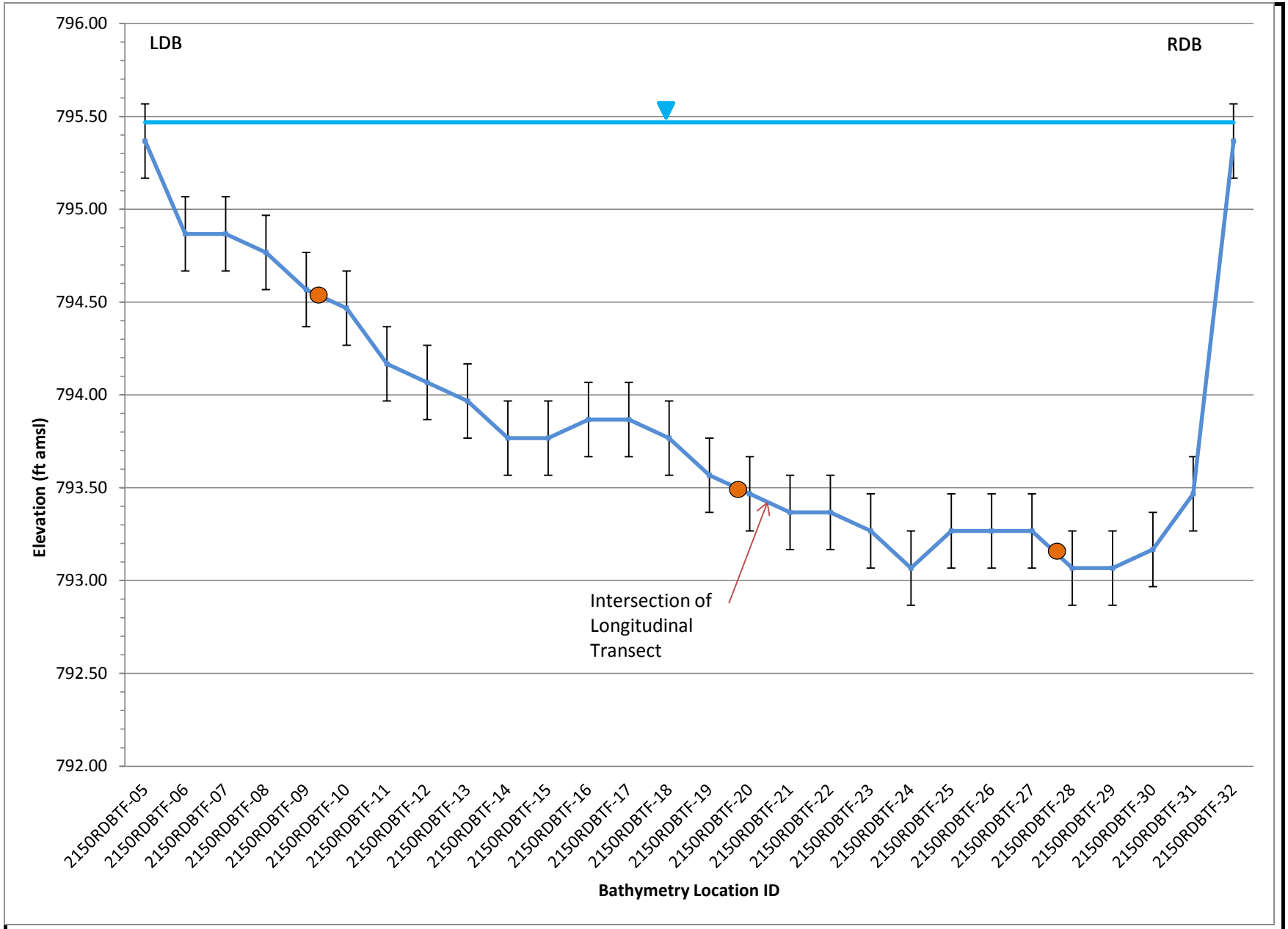
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT G
SHEET 7 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Approved: EE

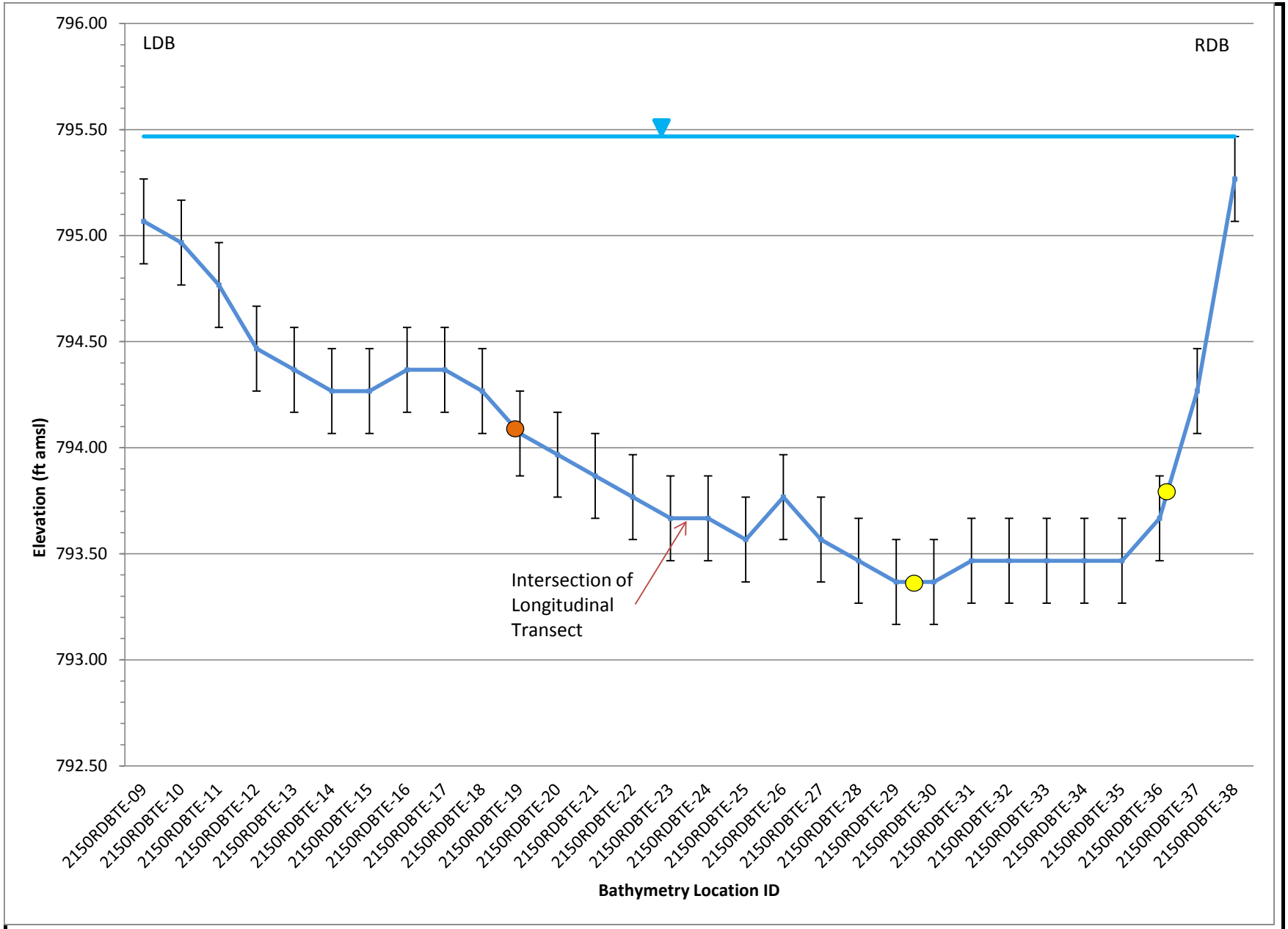
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT F
SHEET 8 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

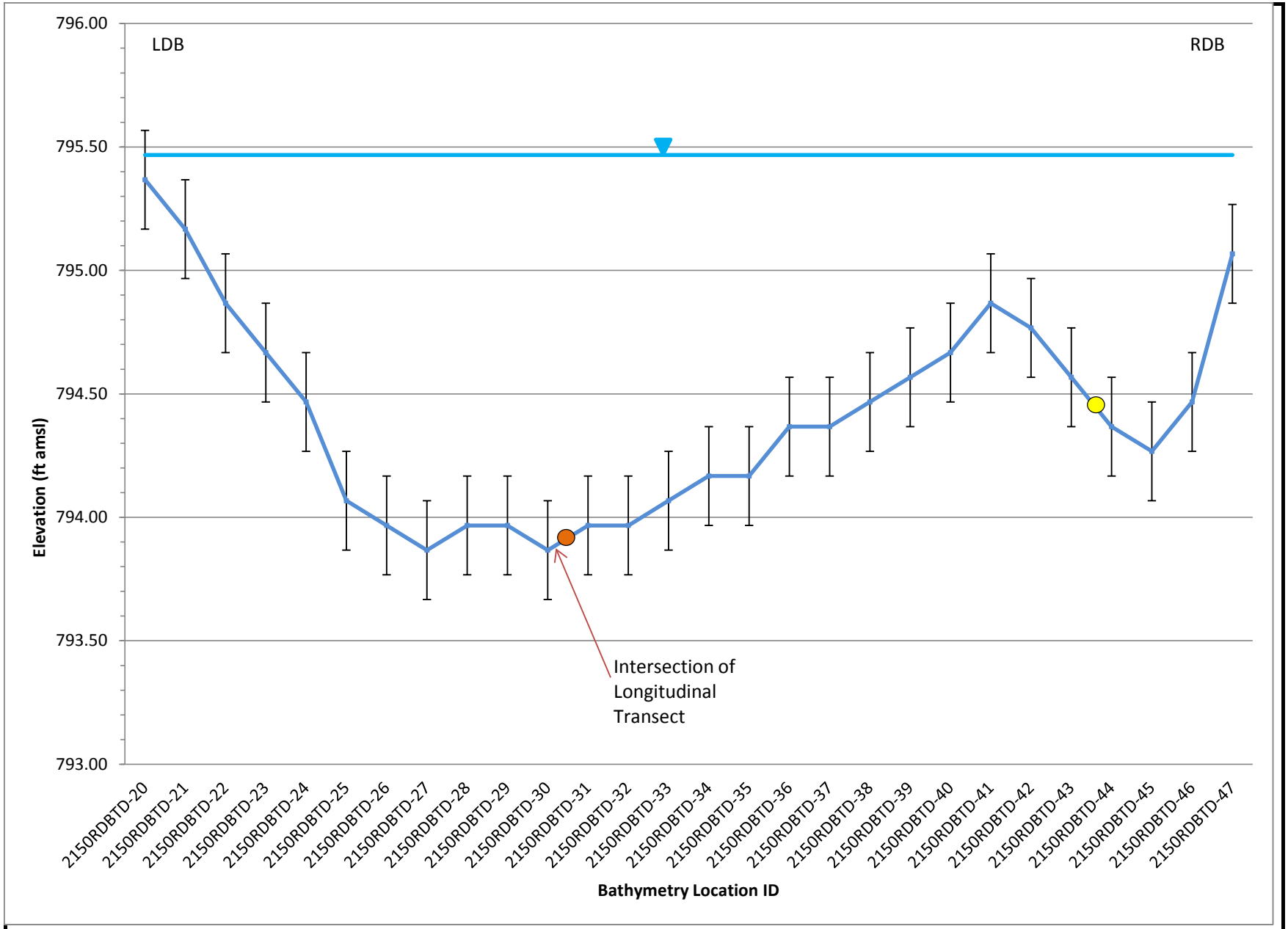
ft amsl = feet above mean sea level

Drawn: MF

Approved: EE

Project#: 60246209

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT E
SHEET 9 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Approved: EE

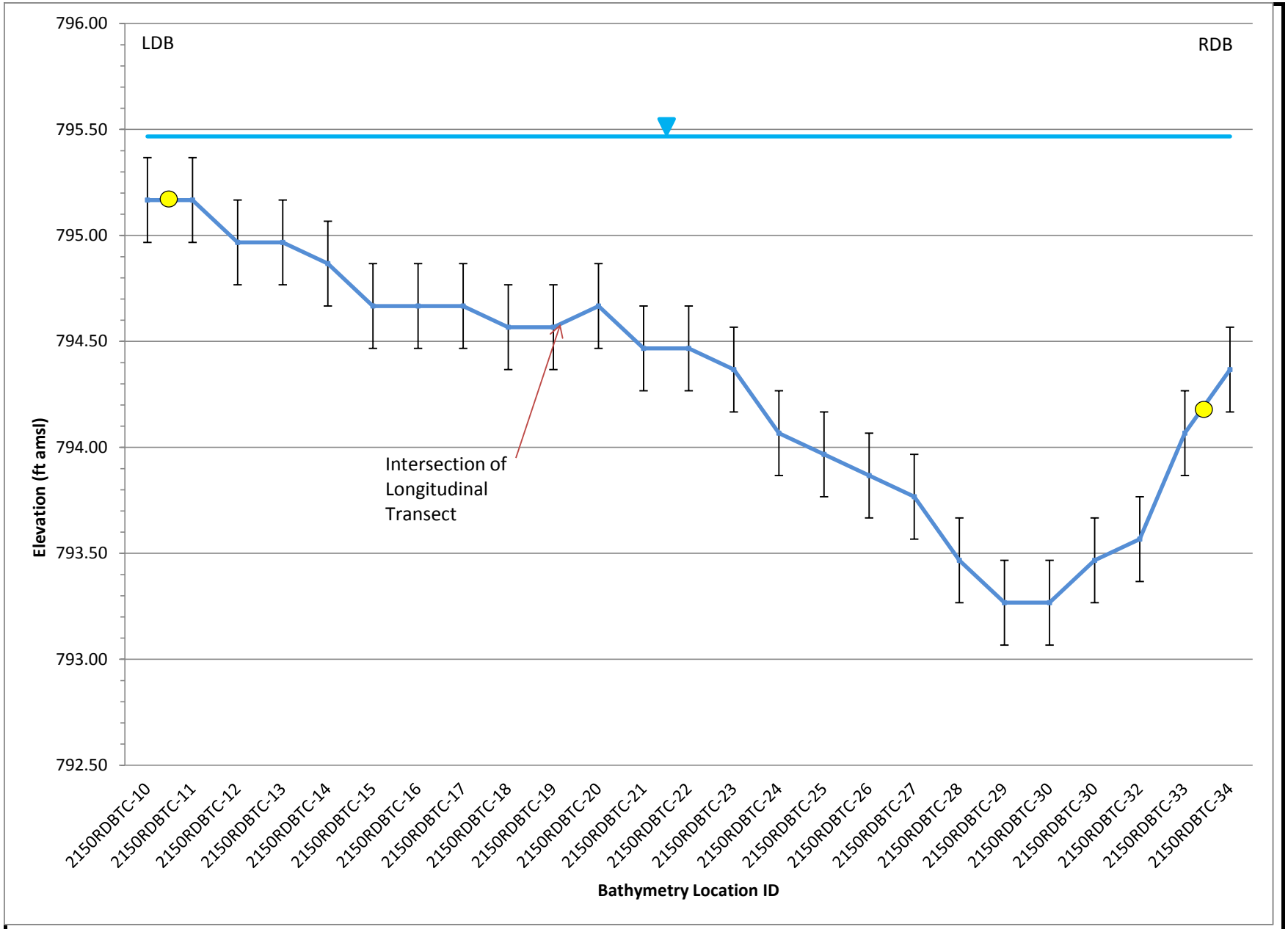
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT D
SHEET 10 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Drawn: MF

Approved: EE

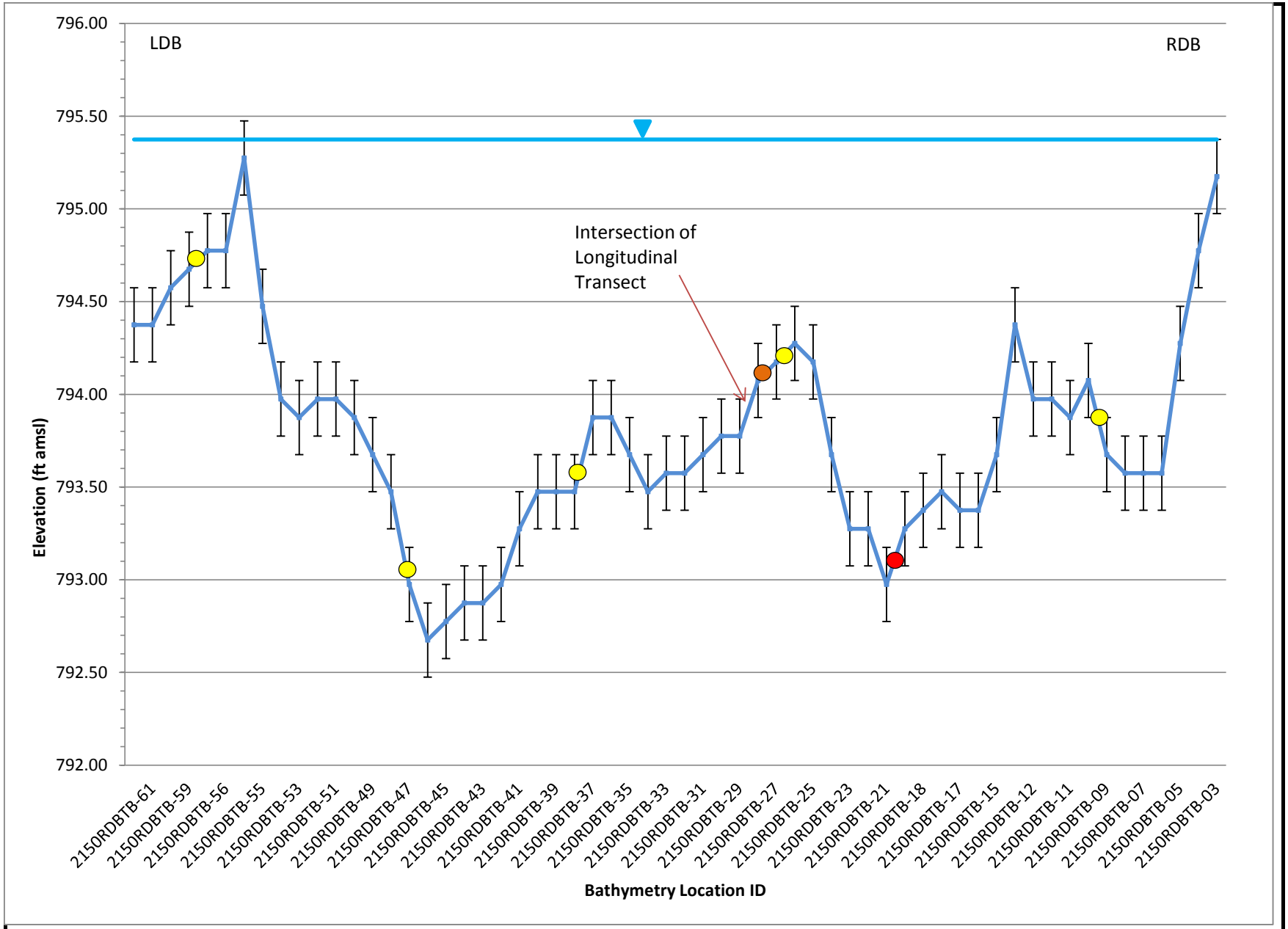
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT C
SHEET 11 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

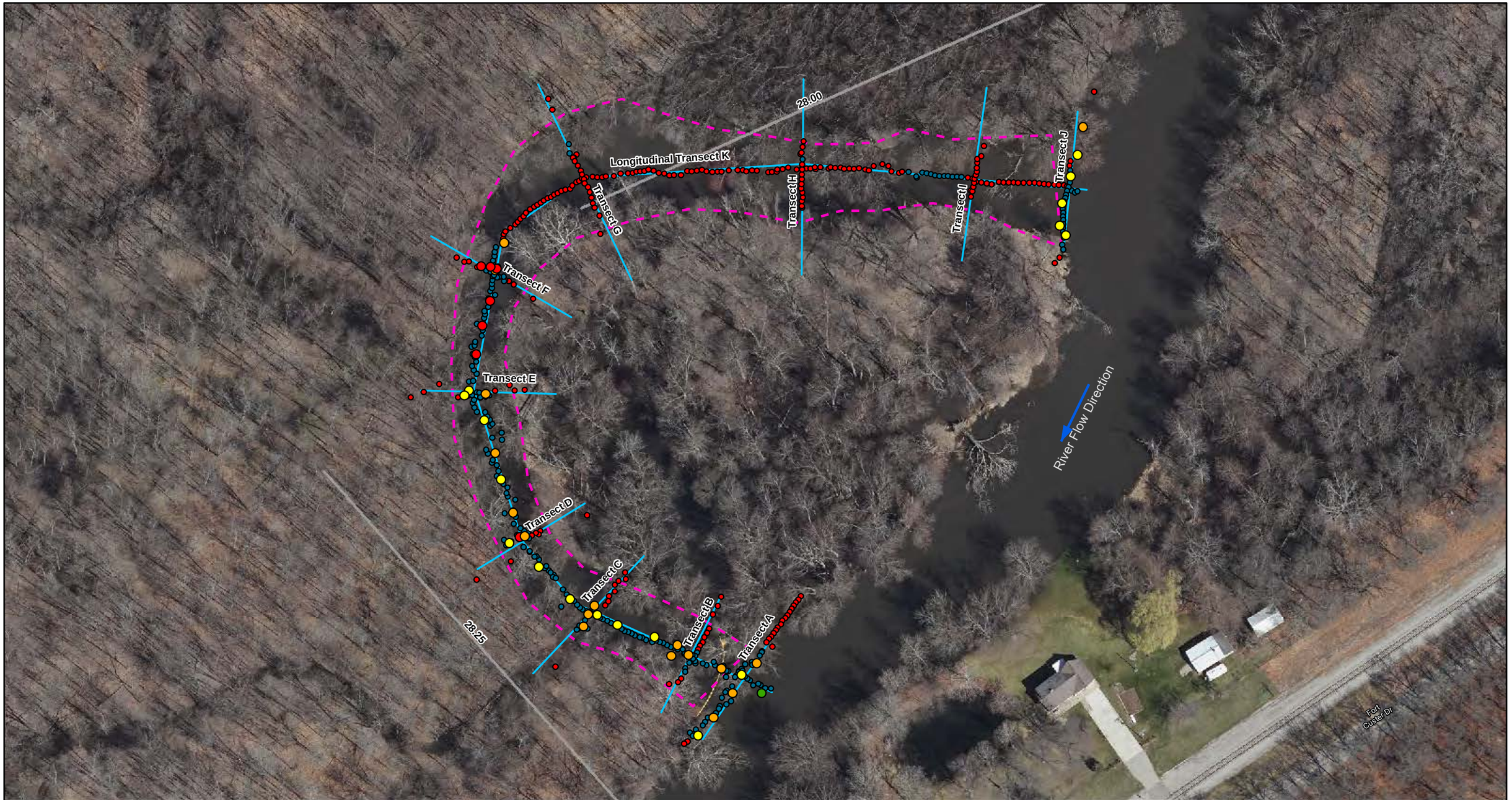
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

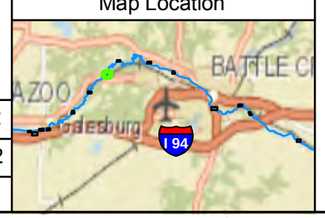
FIGURE 2i-10
SEDIMENT TRAP BATHYMETRY DATA
MP 21.50 RDB TRANSECT B
SHEET 12 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 50 100 200

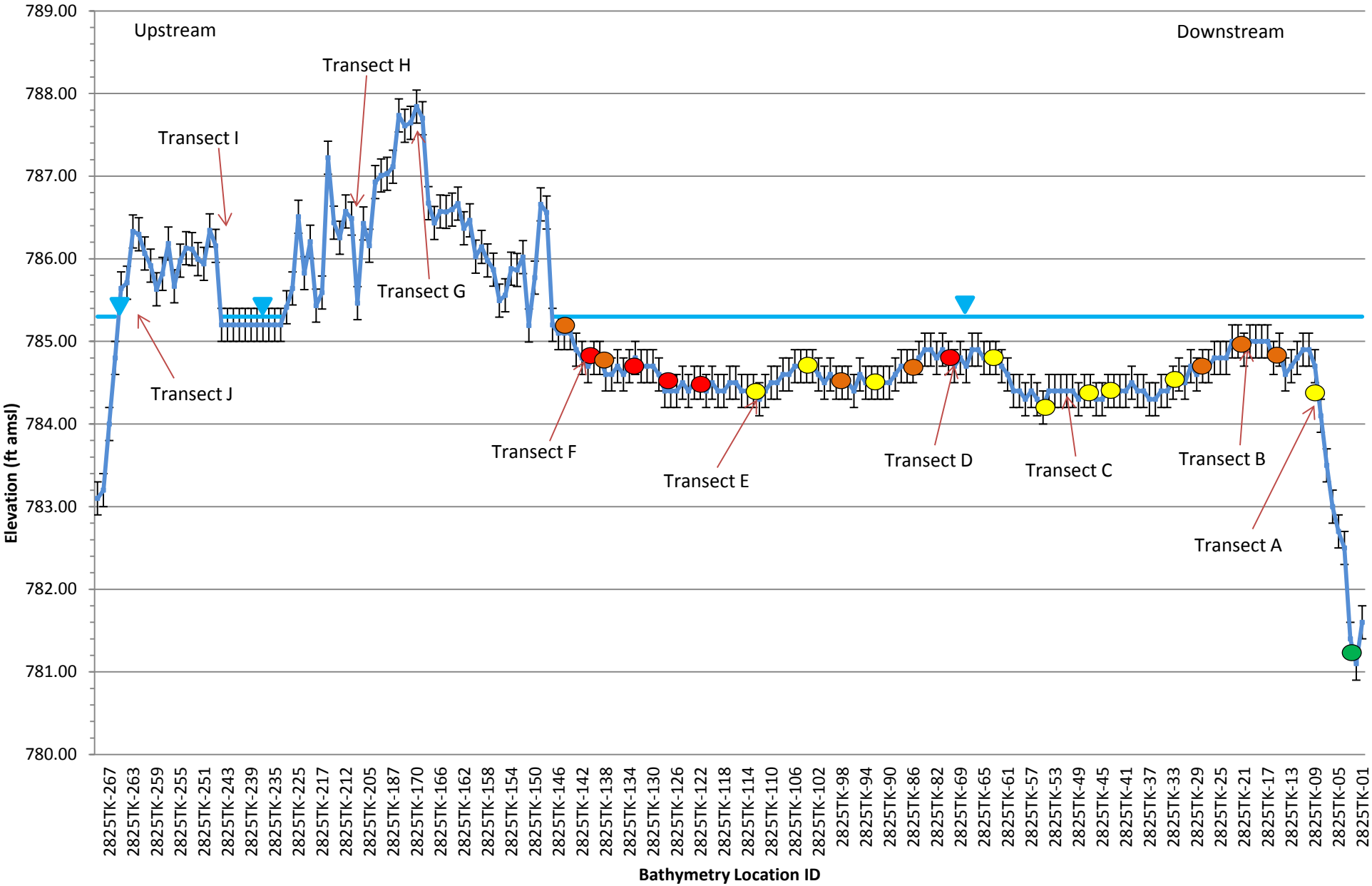
Scale in Feet

FIGURE 2i-11
PHASE I SEDIMENT TRAP BATHYMETRY
MP 28.25 RDB
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

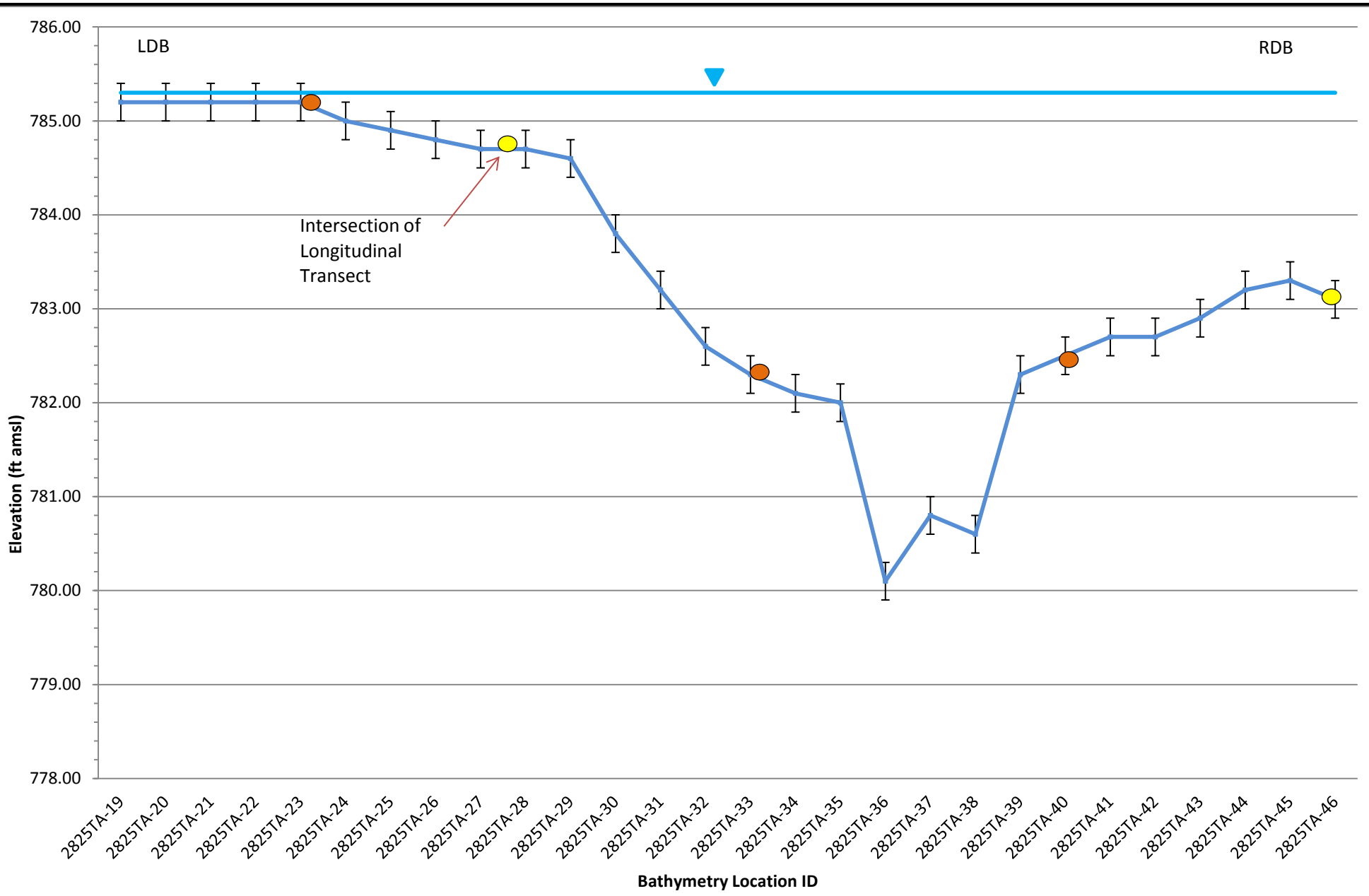
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB LONGITUDINAL
SHEET 1 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

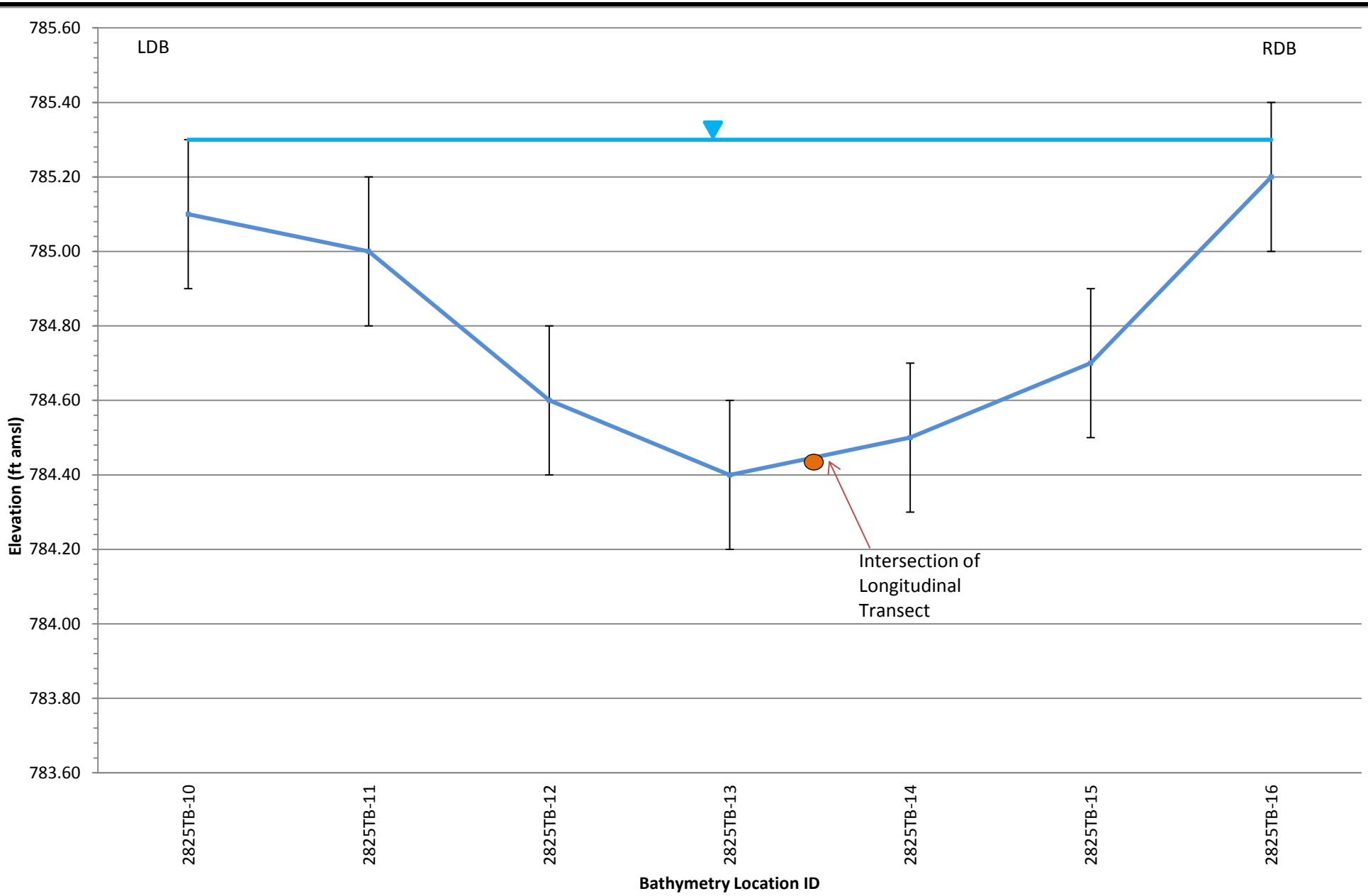
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT A
SHEET 2 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

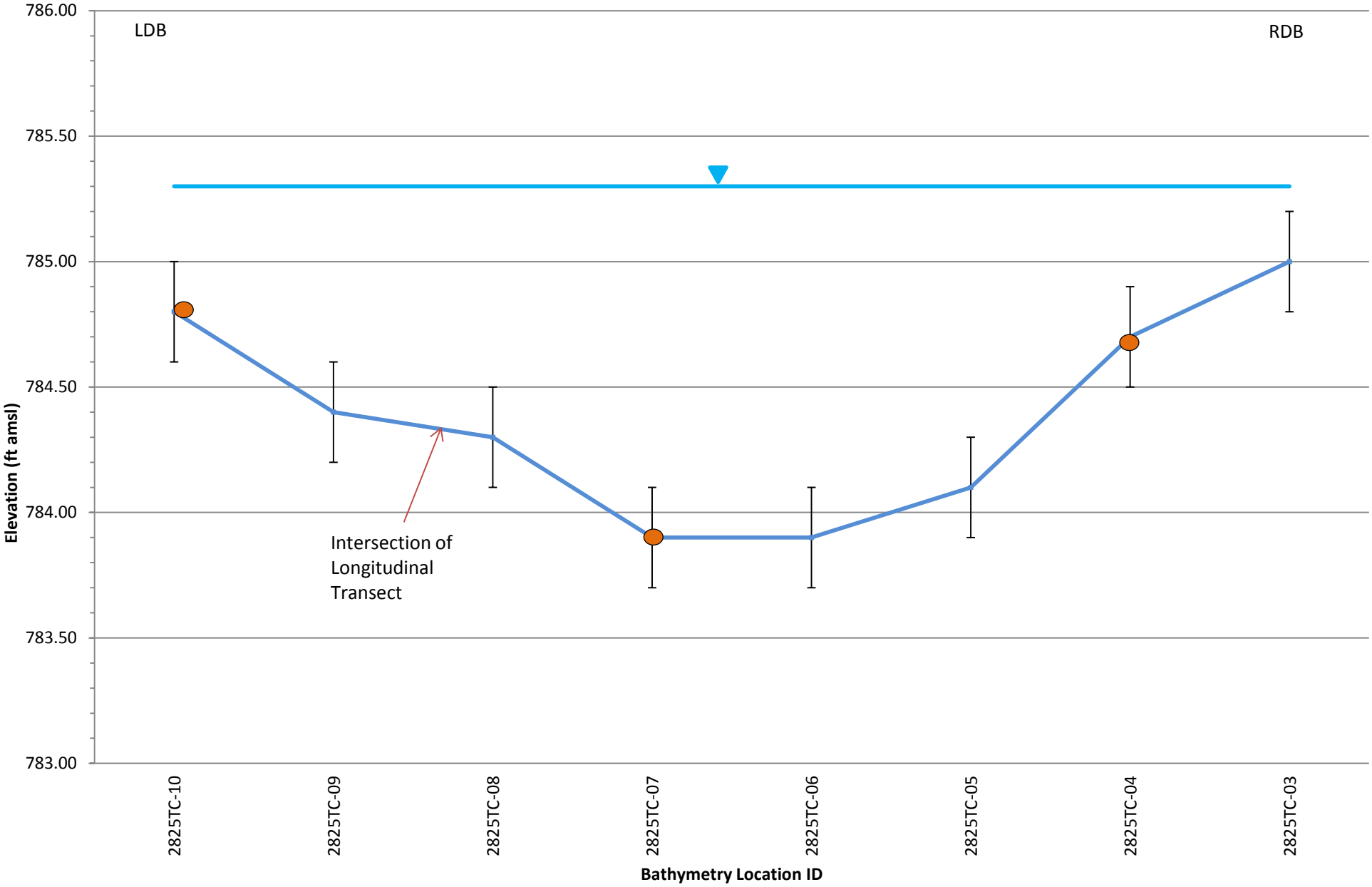
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT B
SHEET 3 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

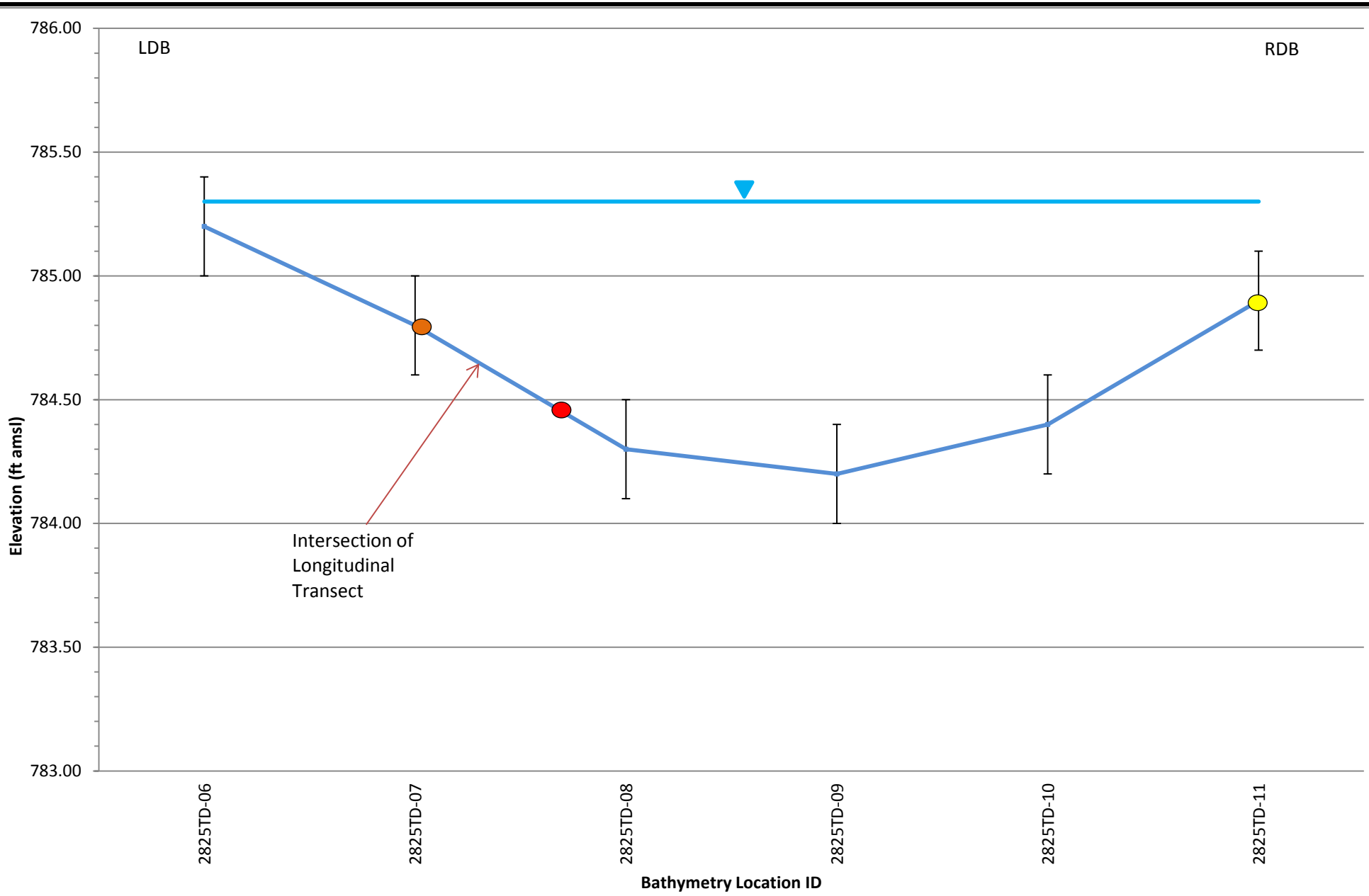
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT C
SHEET 4 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

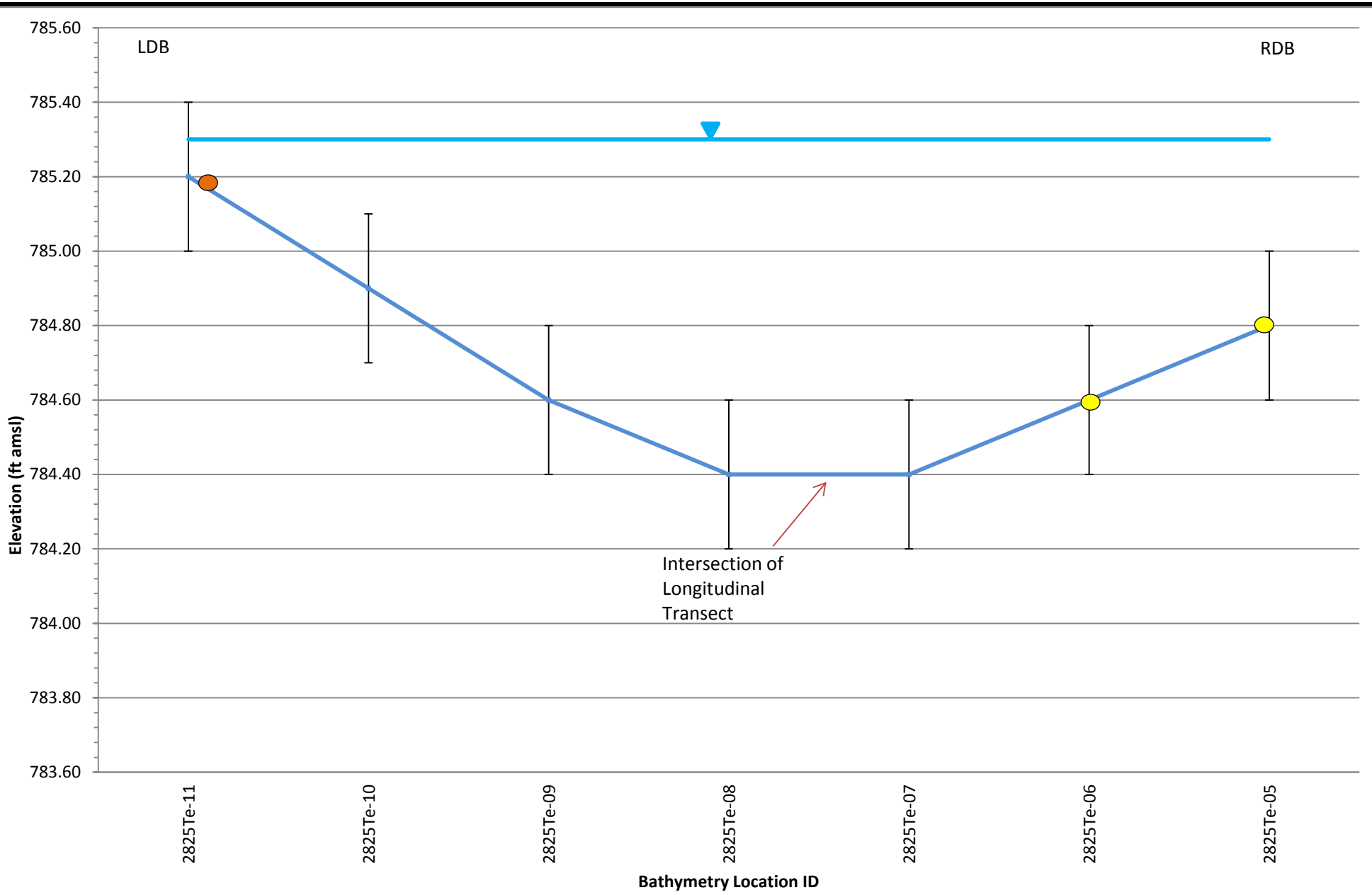
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT D
SHEET 5 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

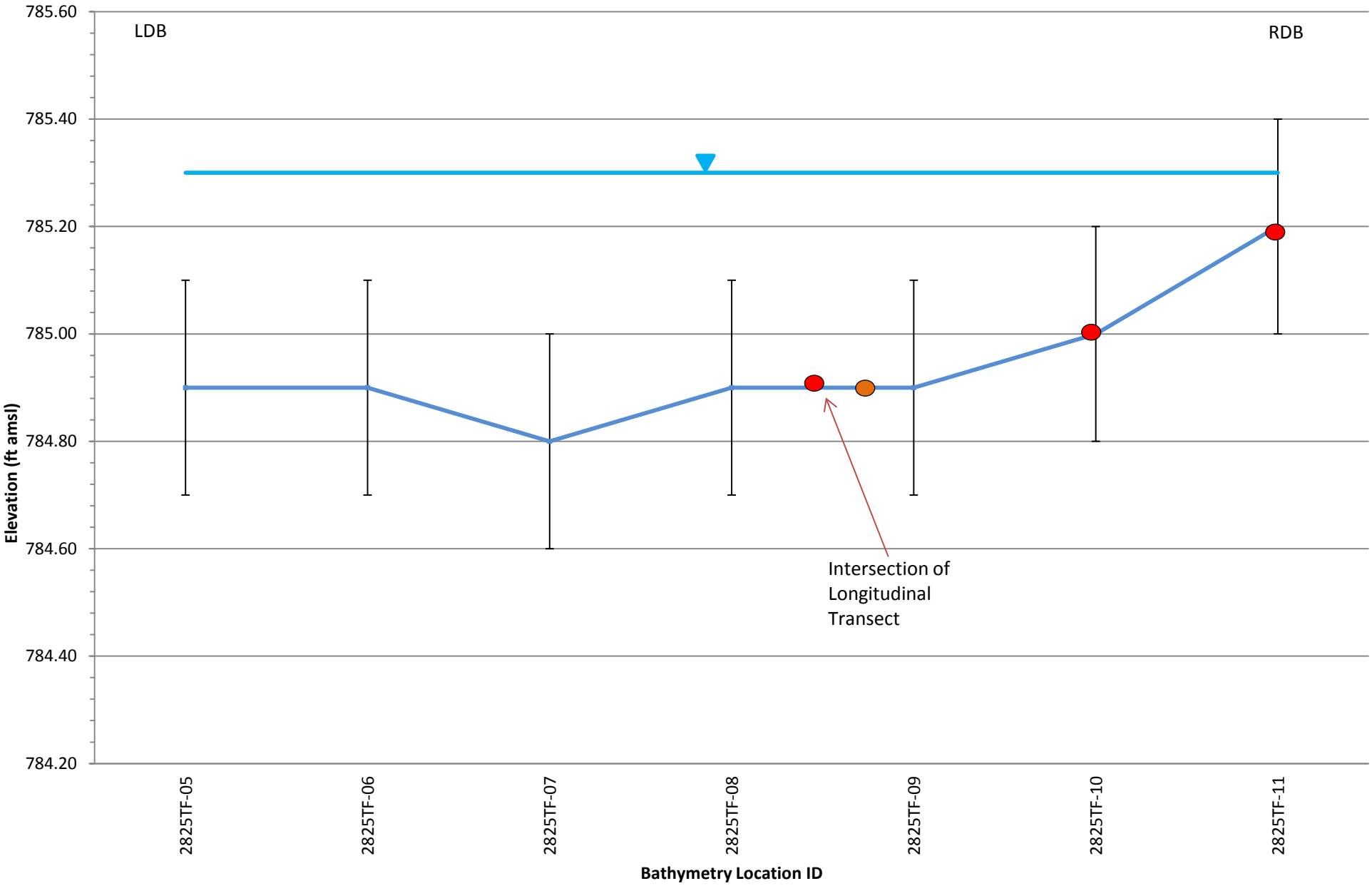
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT E
SHEET 6 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

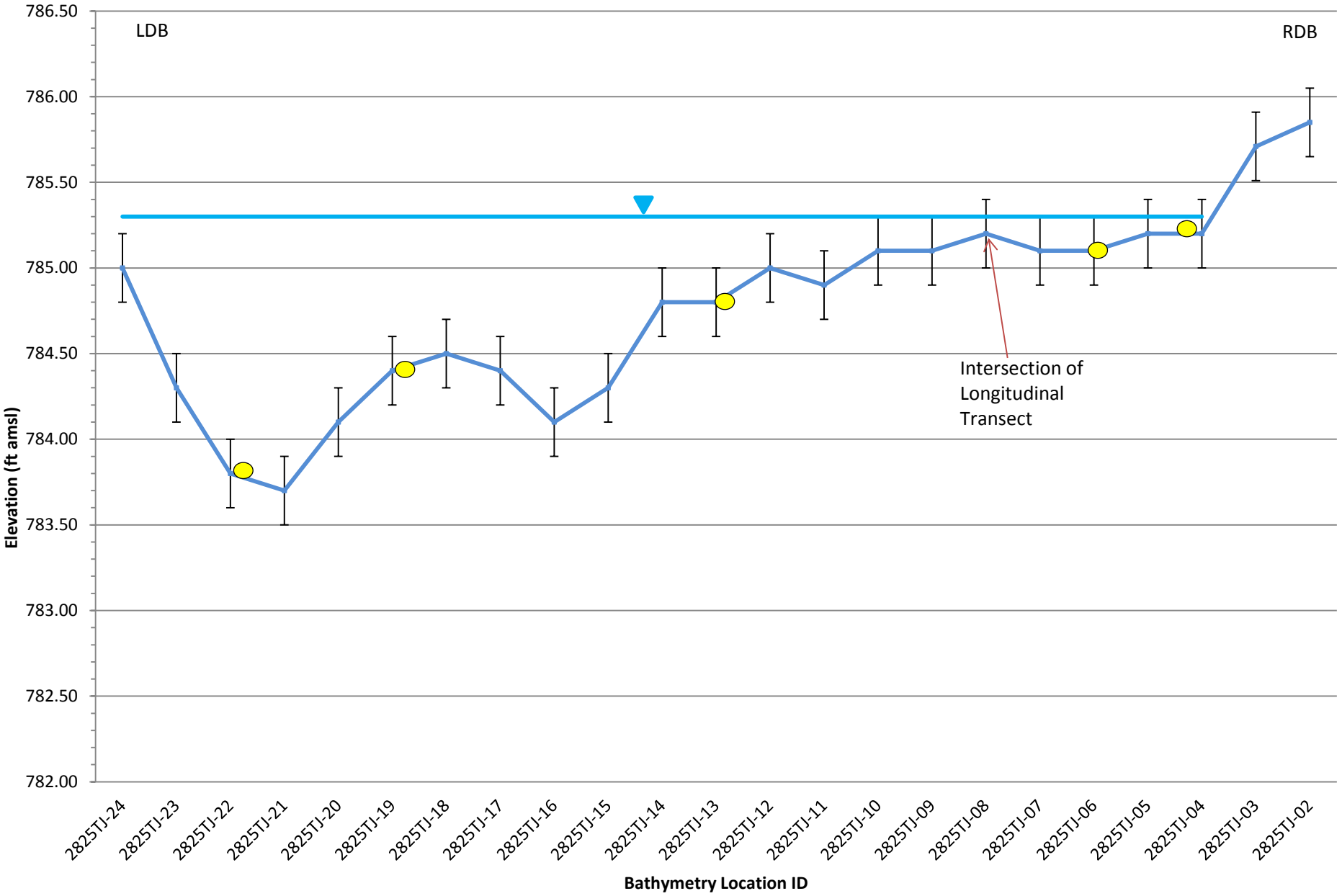
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT F
SHEET 7 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-12
SEDIMENT TRAP BATHYMETRY DATA
MP 28.25 RDB TRANSECT J
SHEET 8 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP

Transect A
Transect B
Transect C
Transect D
Transect E
Transect F
Transect G
Transect H
Longitudinal Transect I
36.00
River Flow Direction

ENBRIDGE		
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 30 60 120

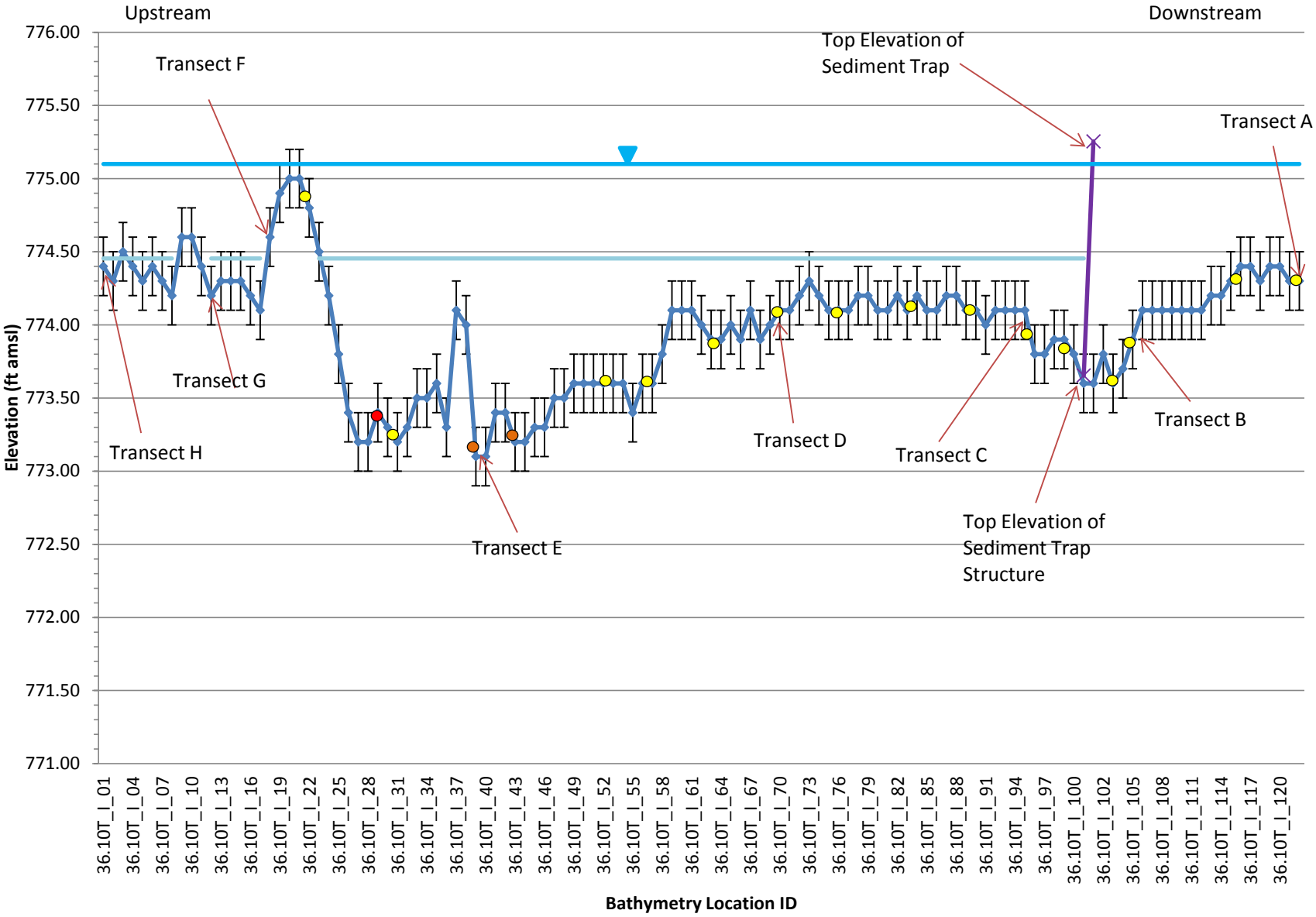
Scale in Feet

FIGURE 2i-13
PHASE I SEDIMENT TRAP BATHYMETRY
MP 36.10 NW
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

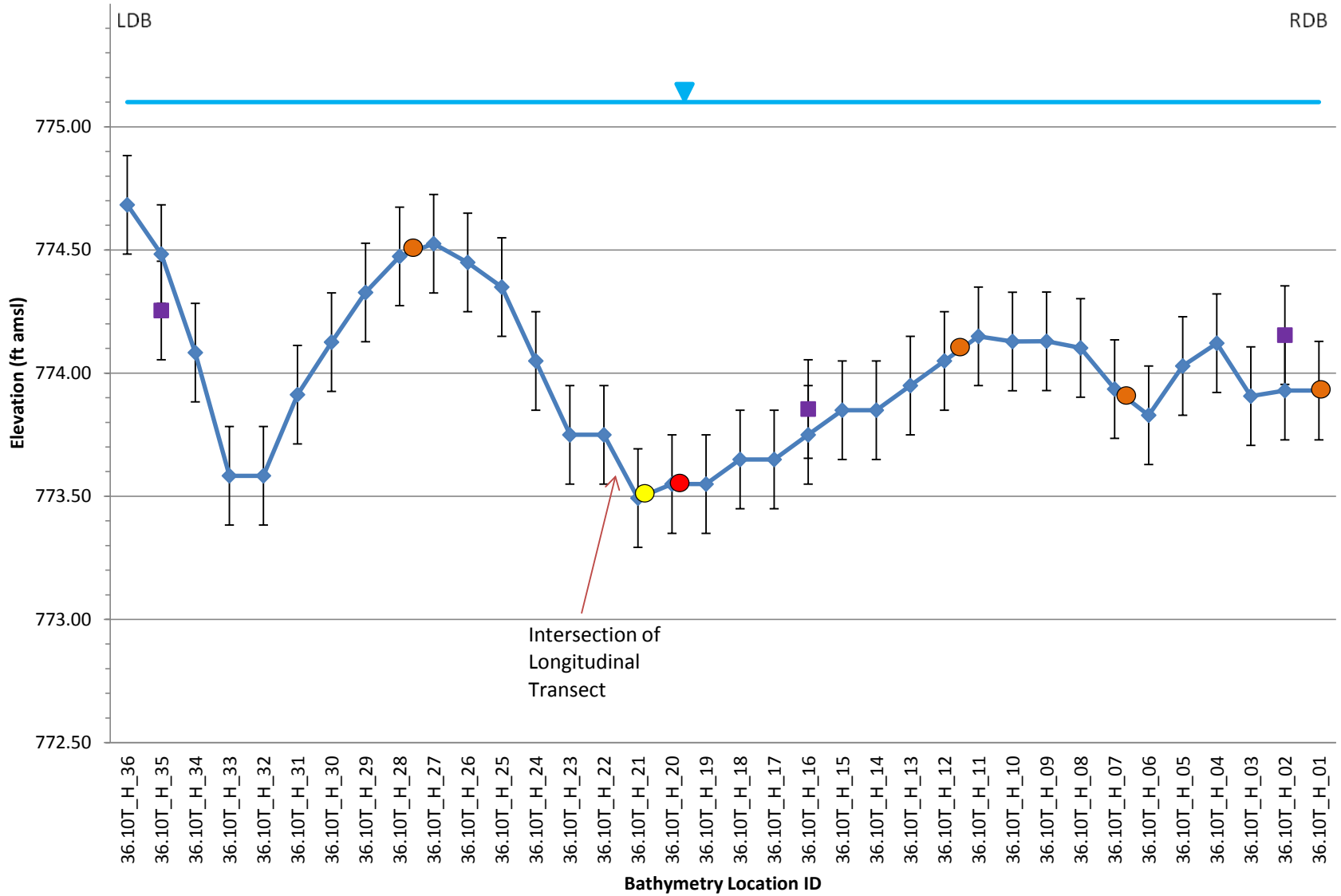
Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Sediment Trap 50% Capacity
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar
- Sediment Trap Structure

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW LONGITUDENAL
SHEET 1 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

36.10 NW Transect H



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

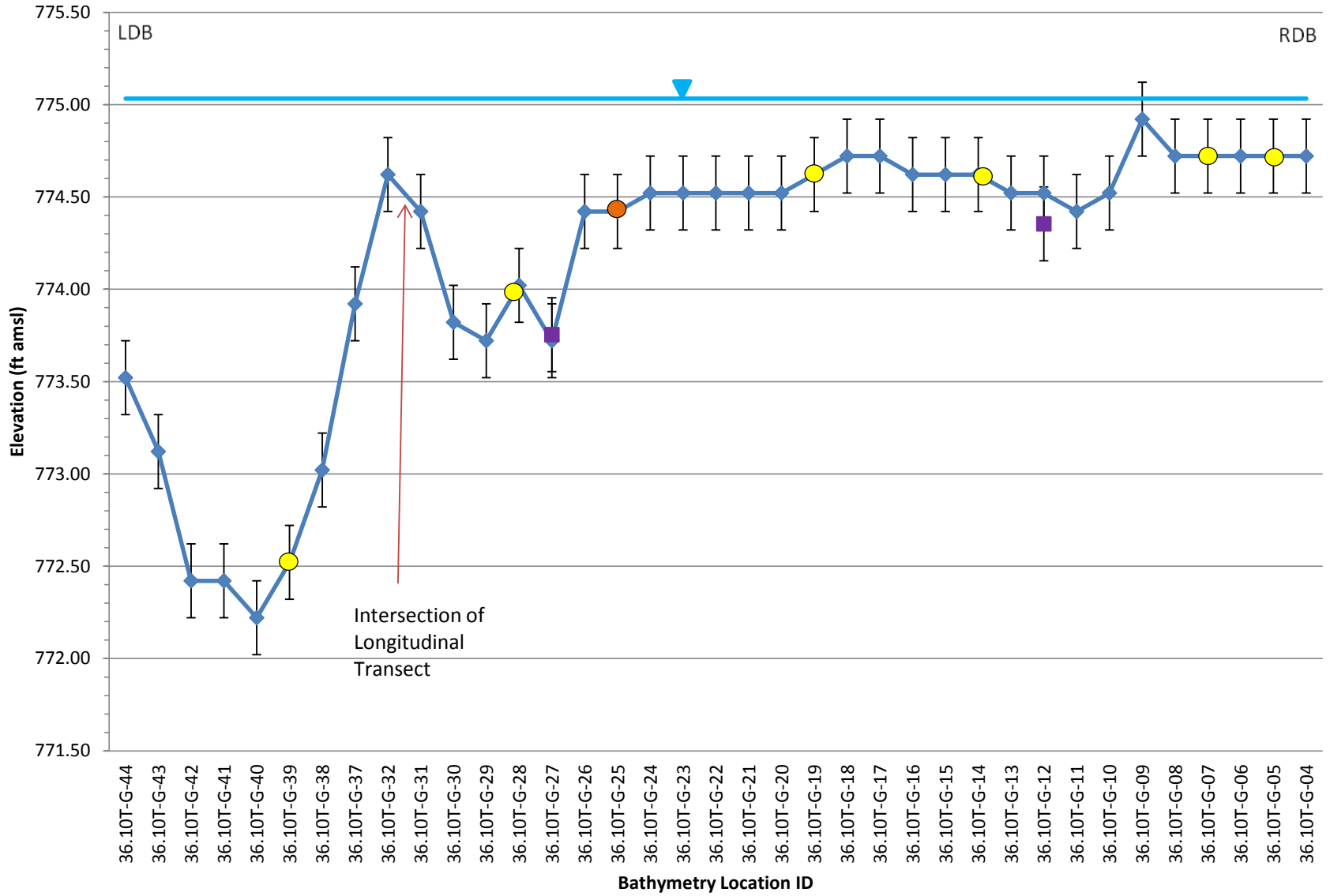
Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT H
SHEET 2 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

36.10 NW Transect G



ENBRIDGE

Drawn: MF

Approved: EE

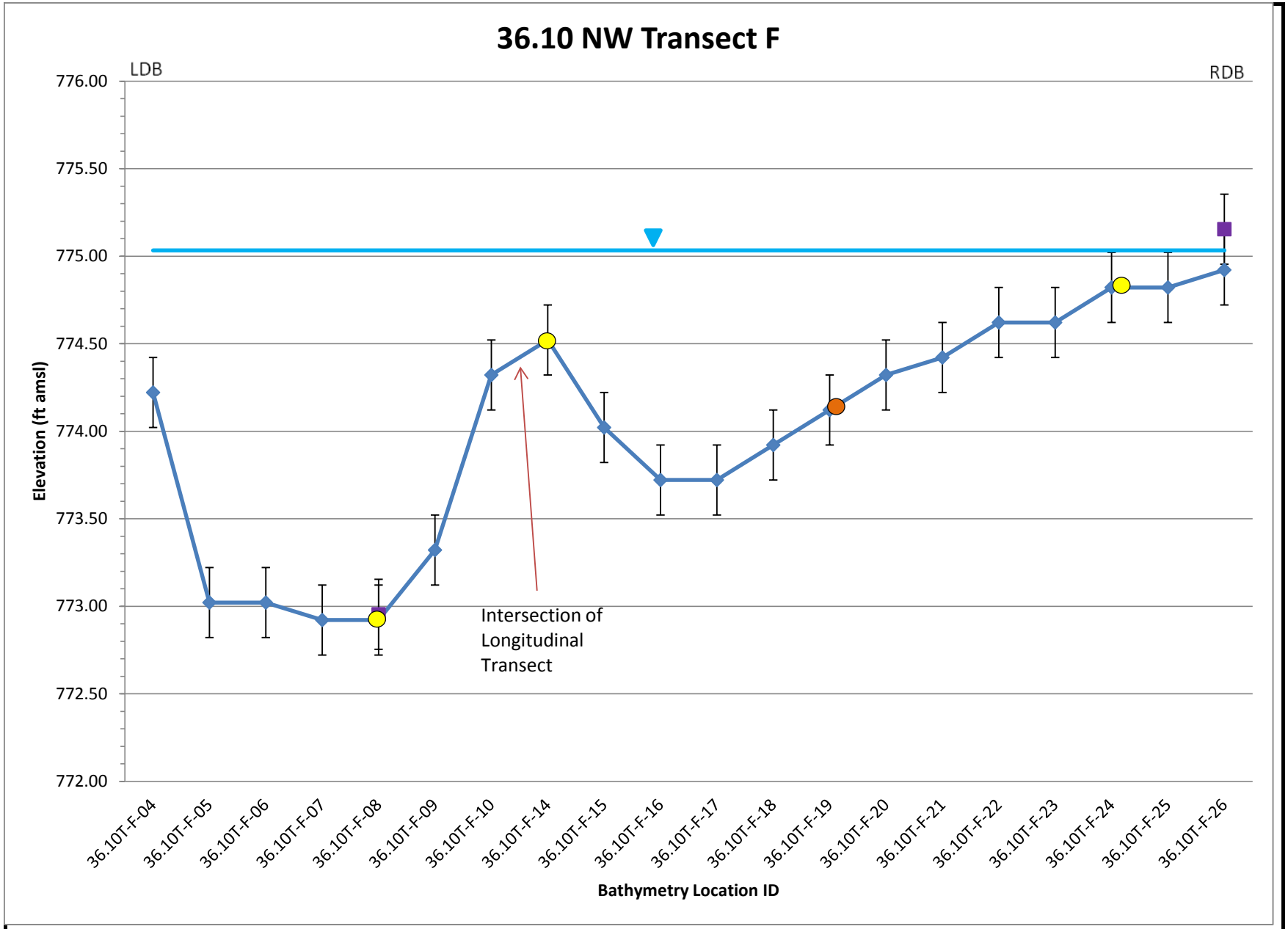
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT G
SHEET 3 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

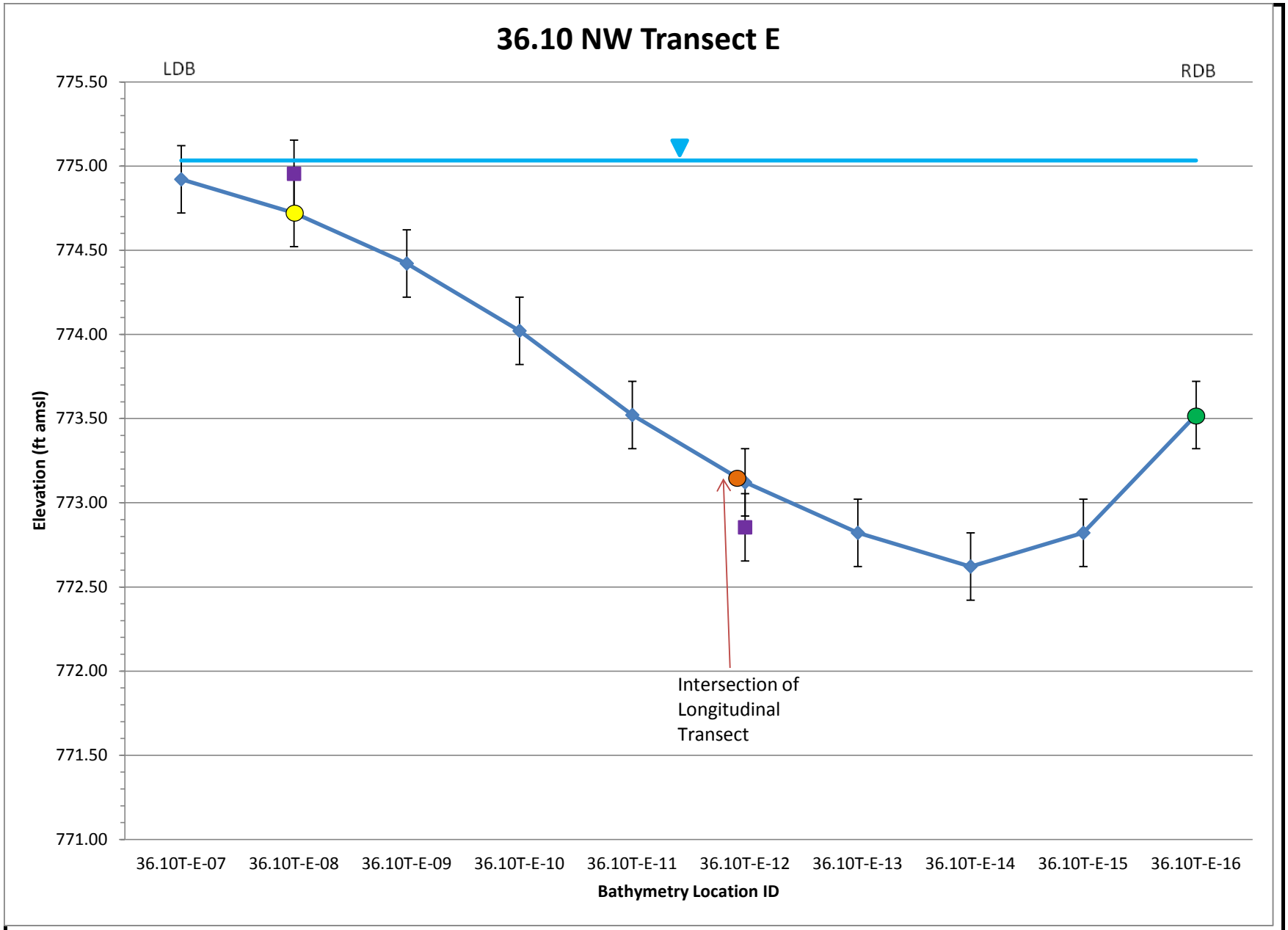
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT F
SHEET 4 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

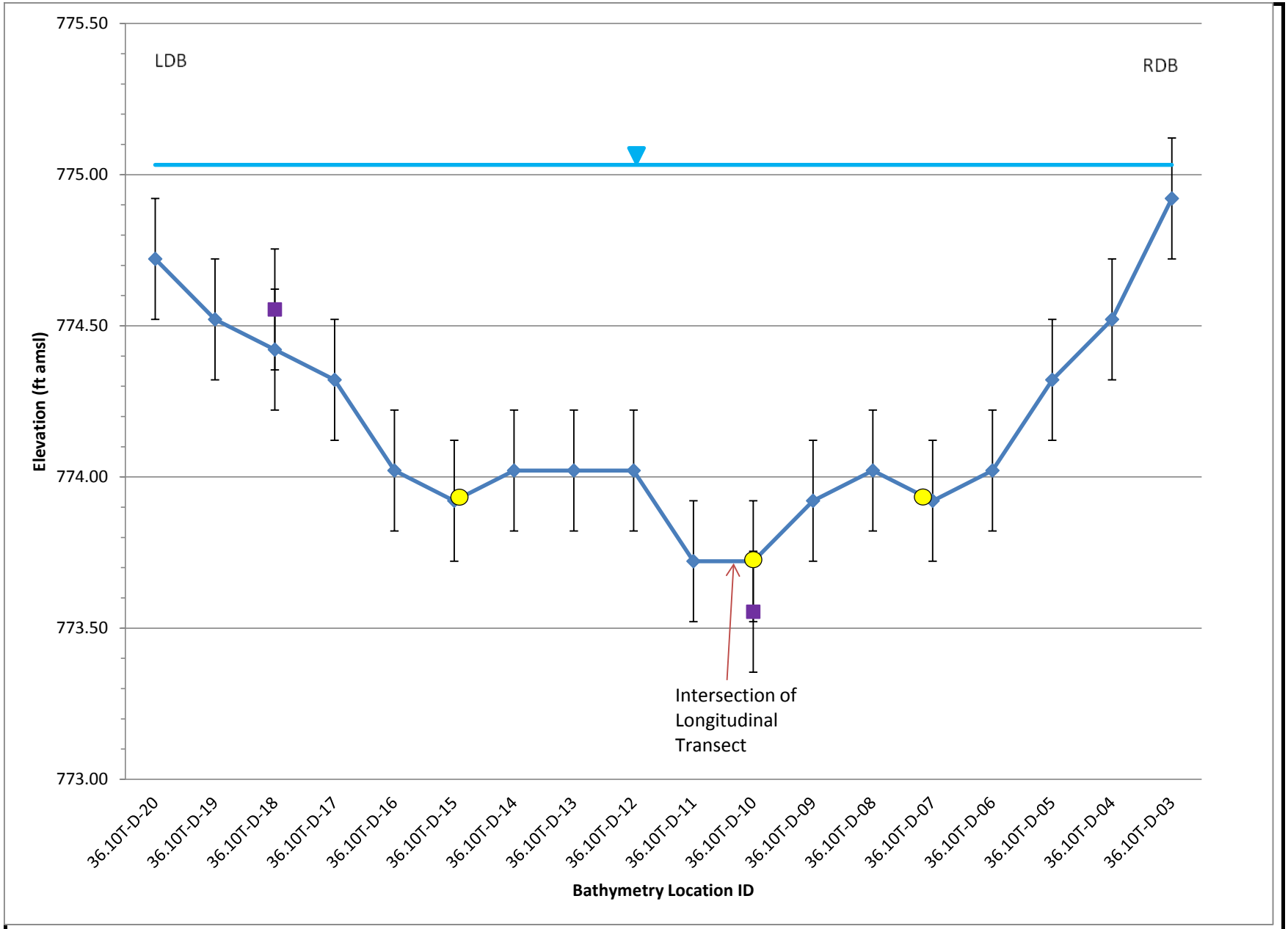
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT E
SHEET 5 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

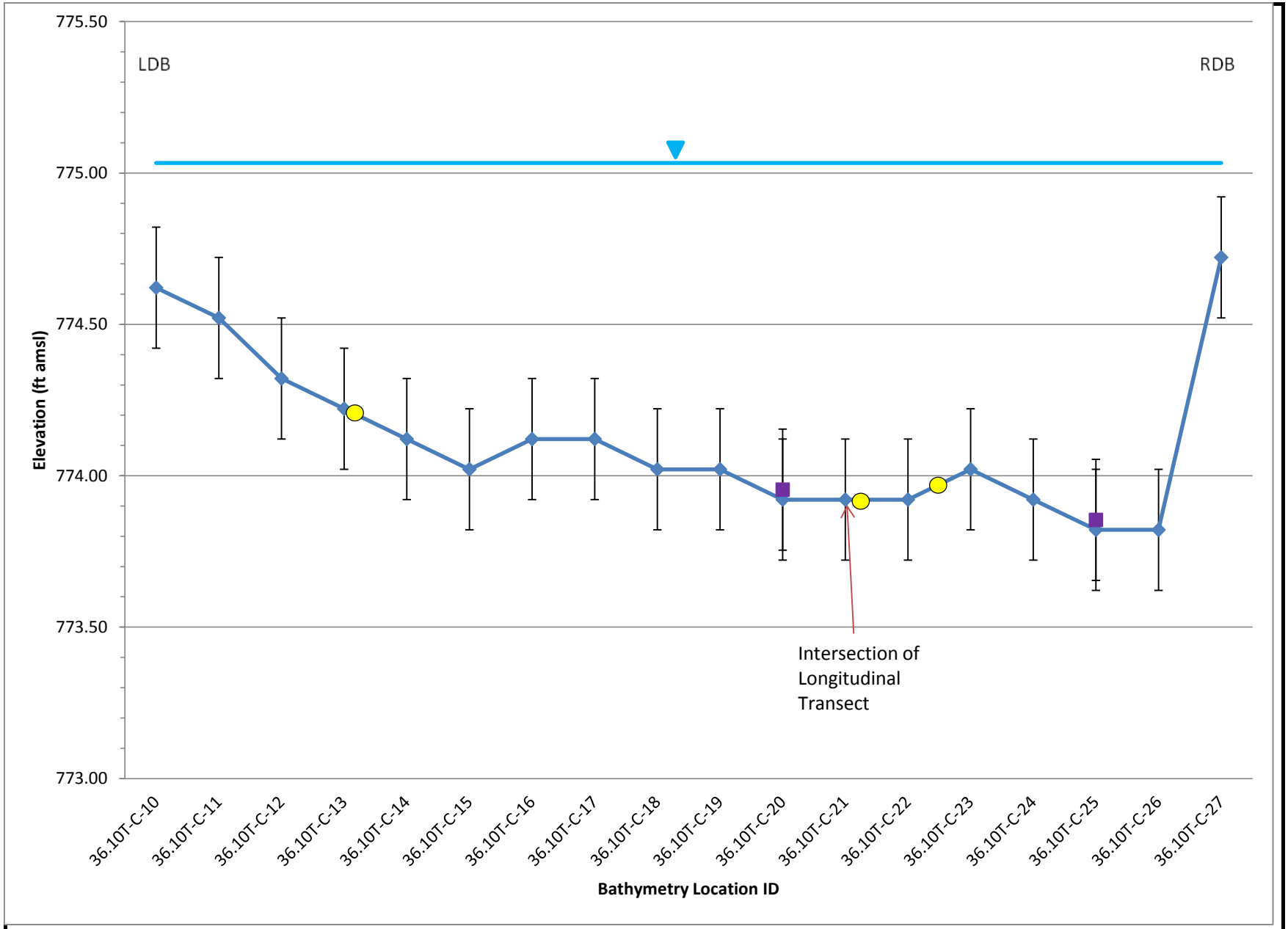
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT D
SHEET 6 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

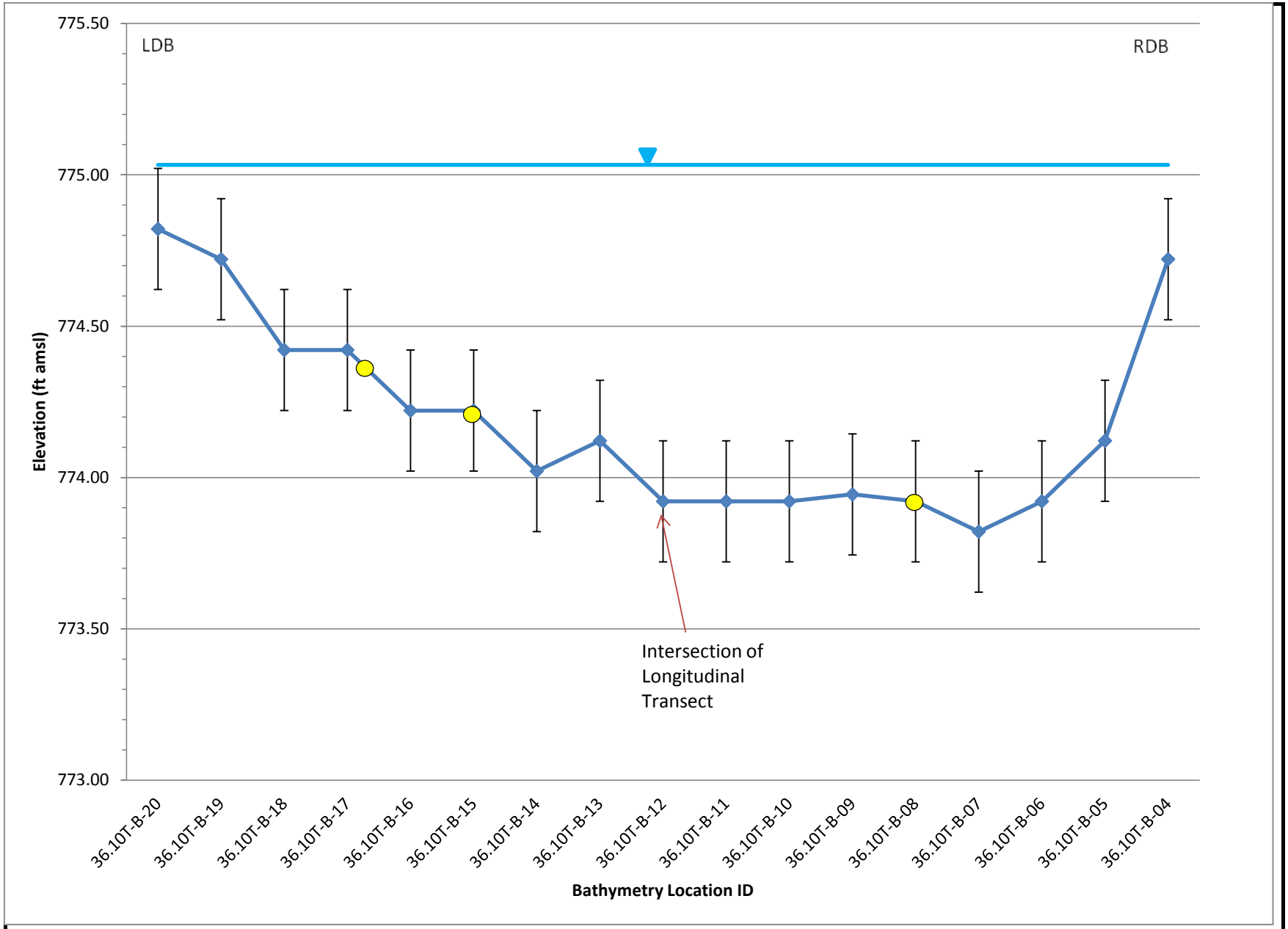
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT C
SHEET 7 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

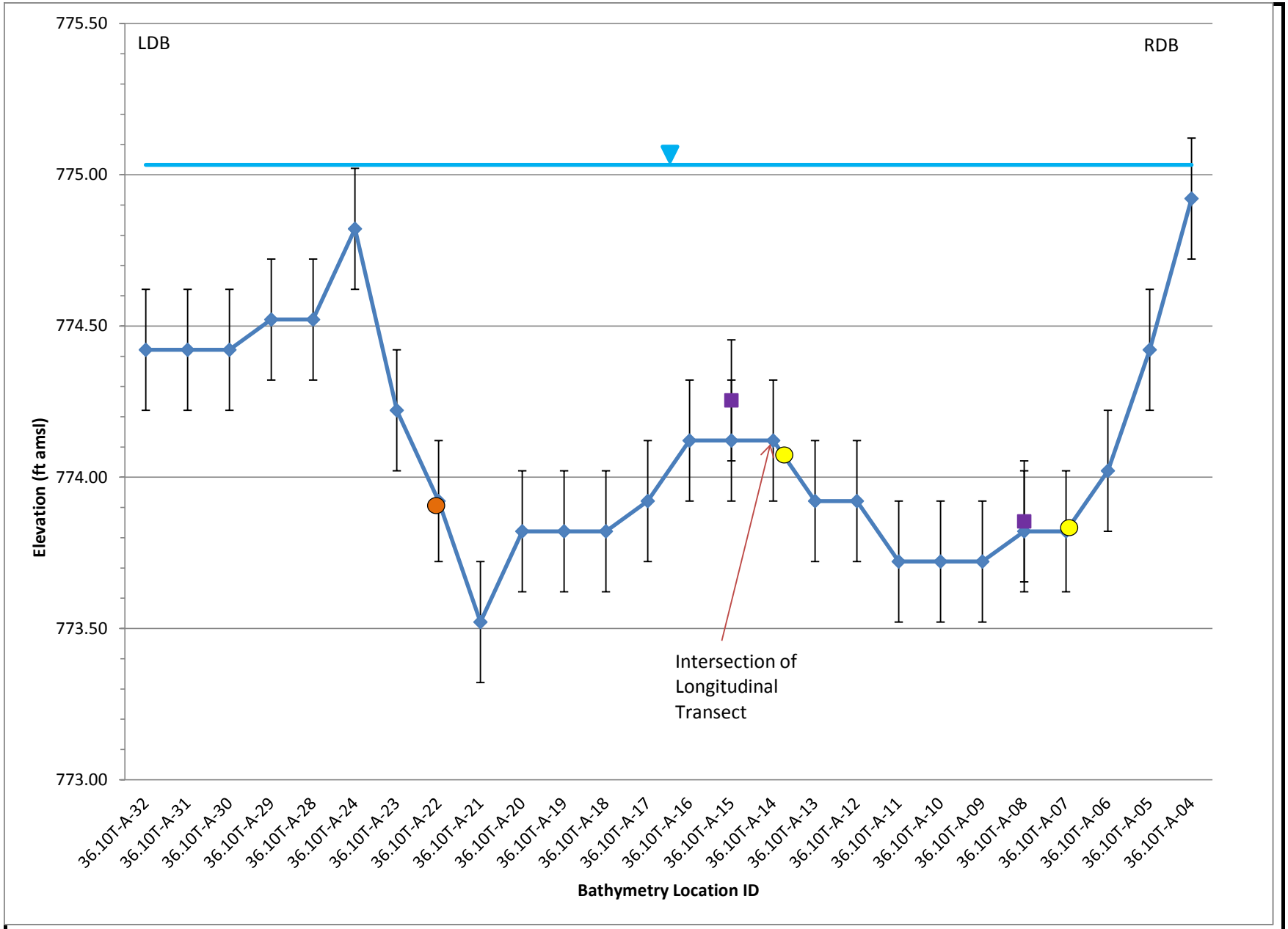
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT B
SHEET 8 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

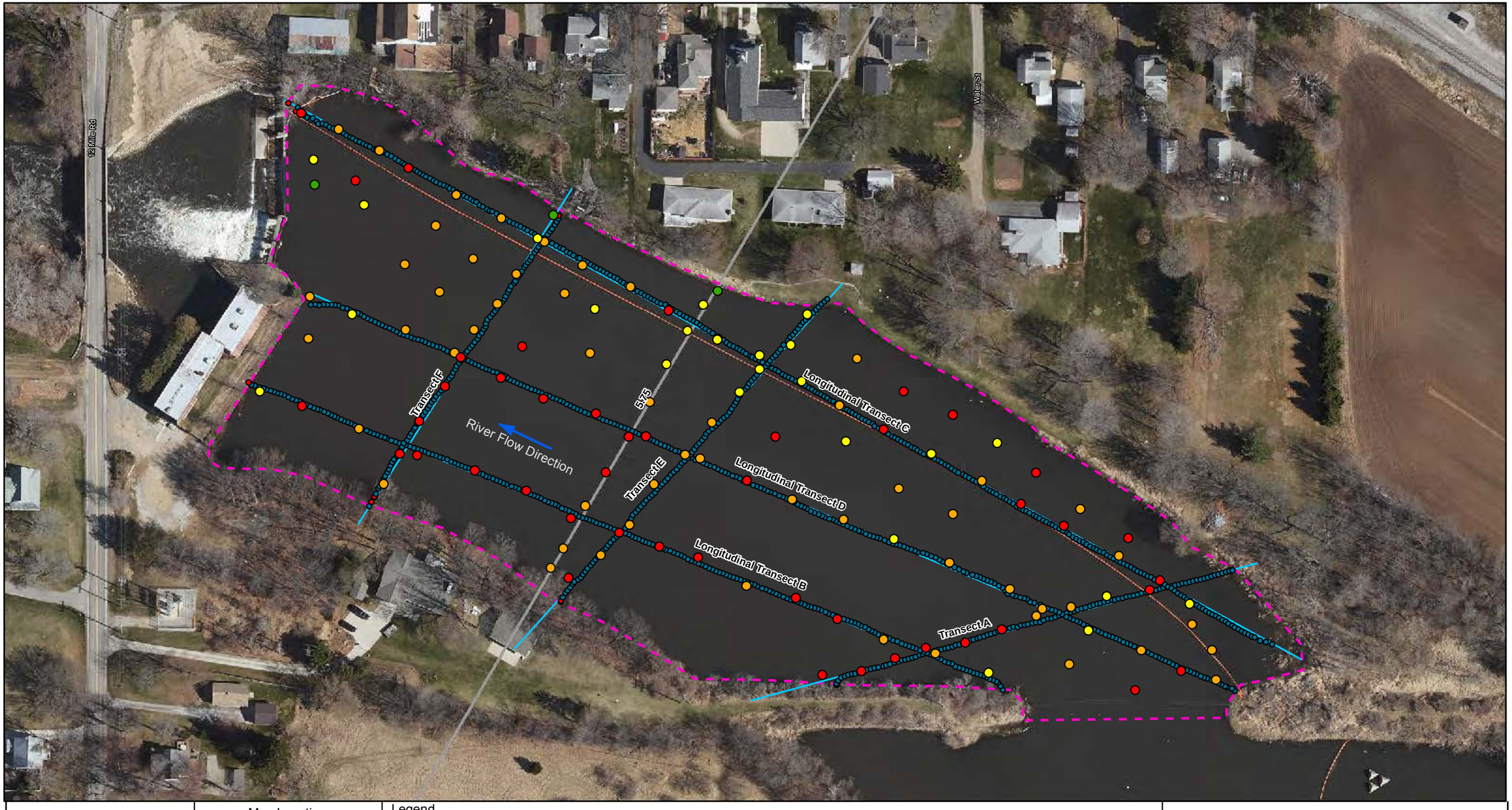
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-14
SEDIMENT TRAP BATHYMETRY DATA
MP 36.10 NW TRANSECT A
SHEET 9 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 50 100 200

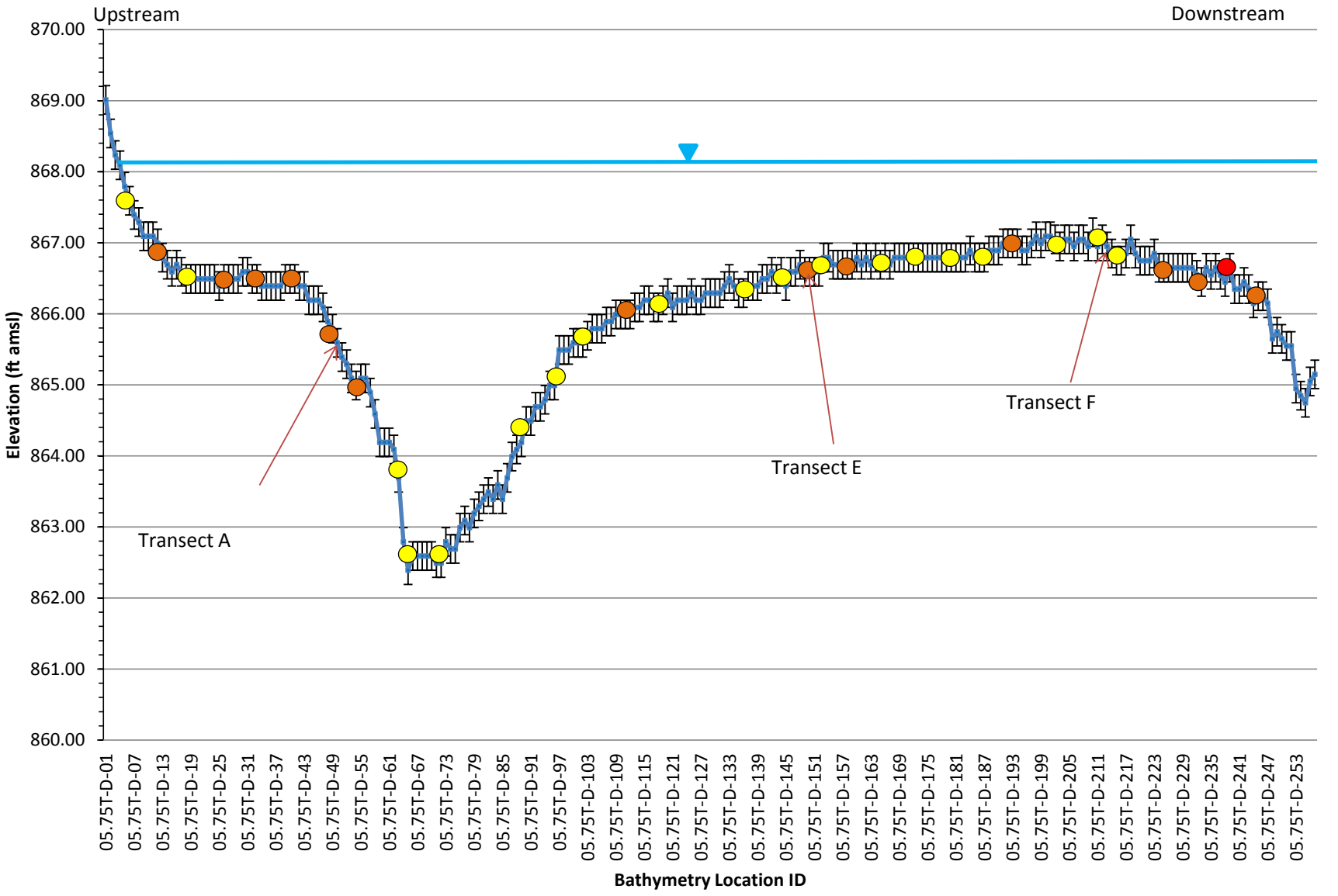
Scale in Feet

FIGURE 2i-15
PHASE II SEDIMENT TRAP BATHYMETRY
CERESCO/MP 5.75
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

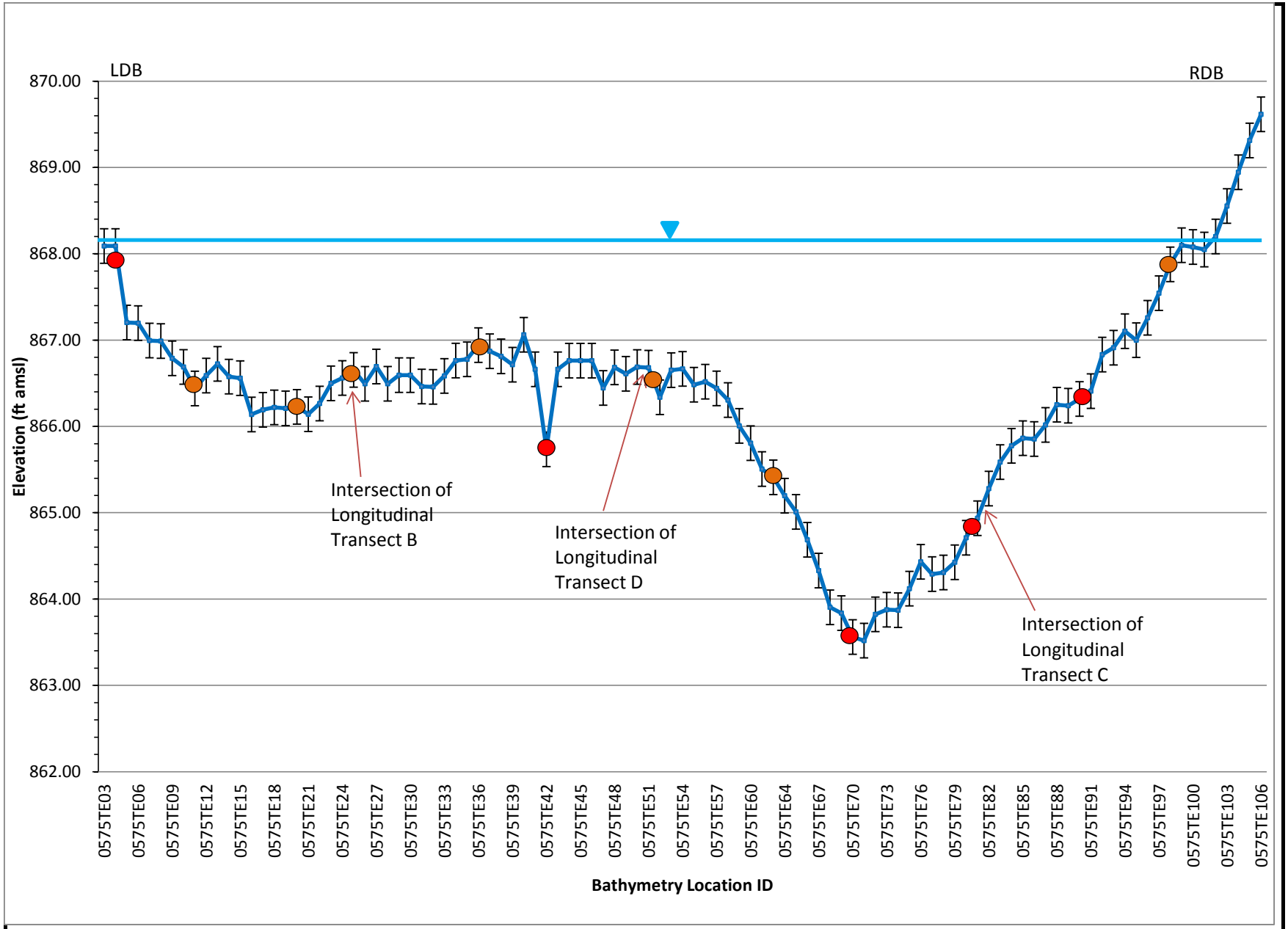
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-16
SEDIMENT TRAP BATHYMETRY DATA
CERESCO TRANSECT F
SHEET 1 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

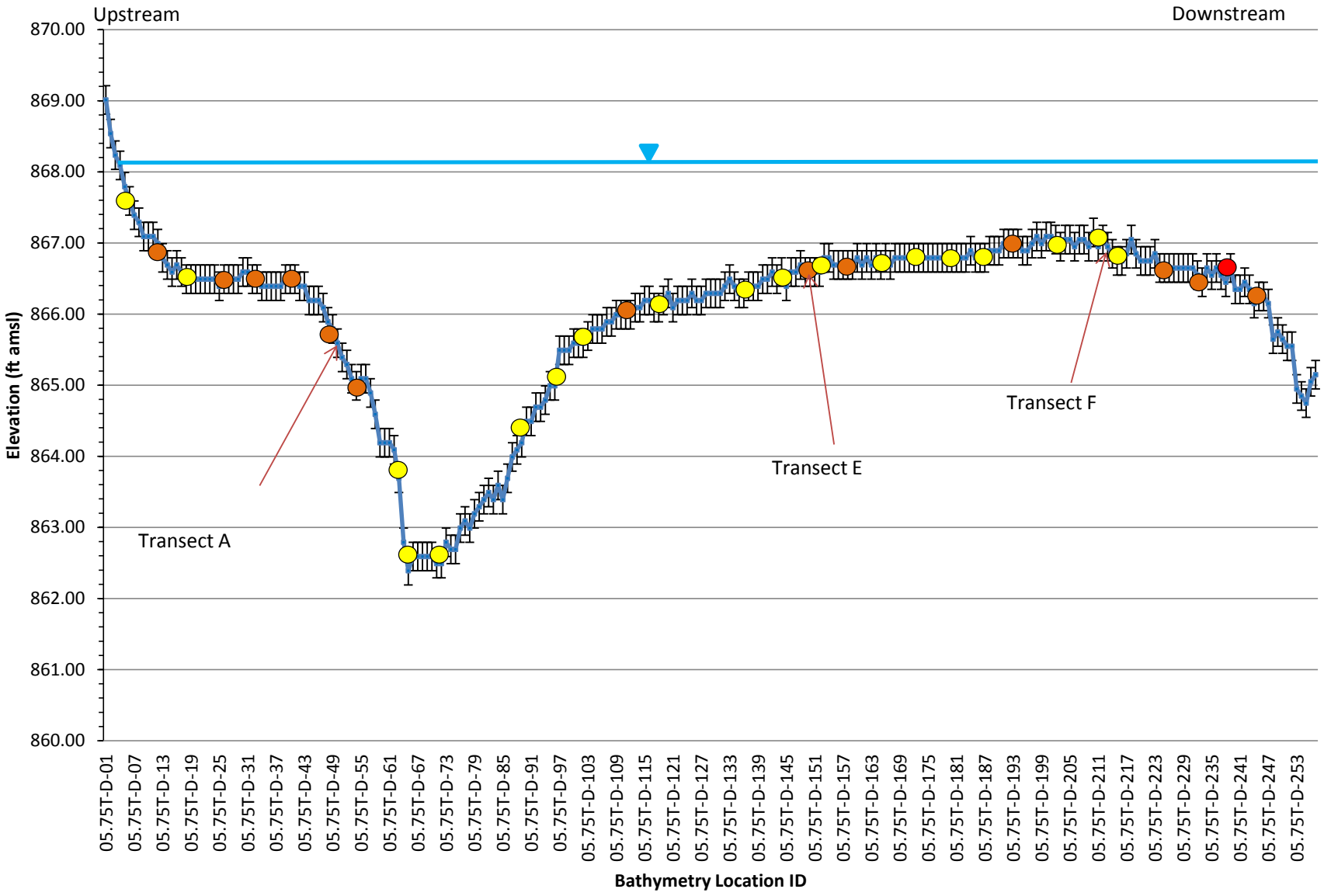
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-16
SEDIMENT TRAP BATHYMETRY DATA
CERESCO TRANSECT E
SHEET 2 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

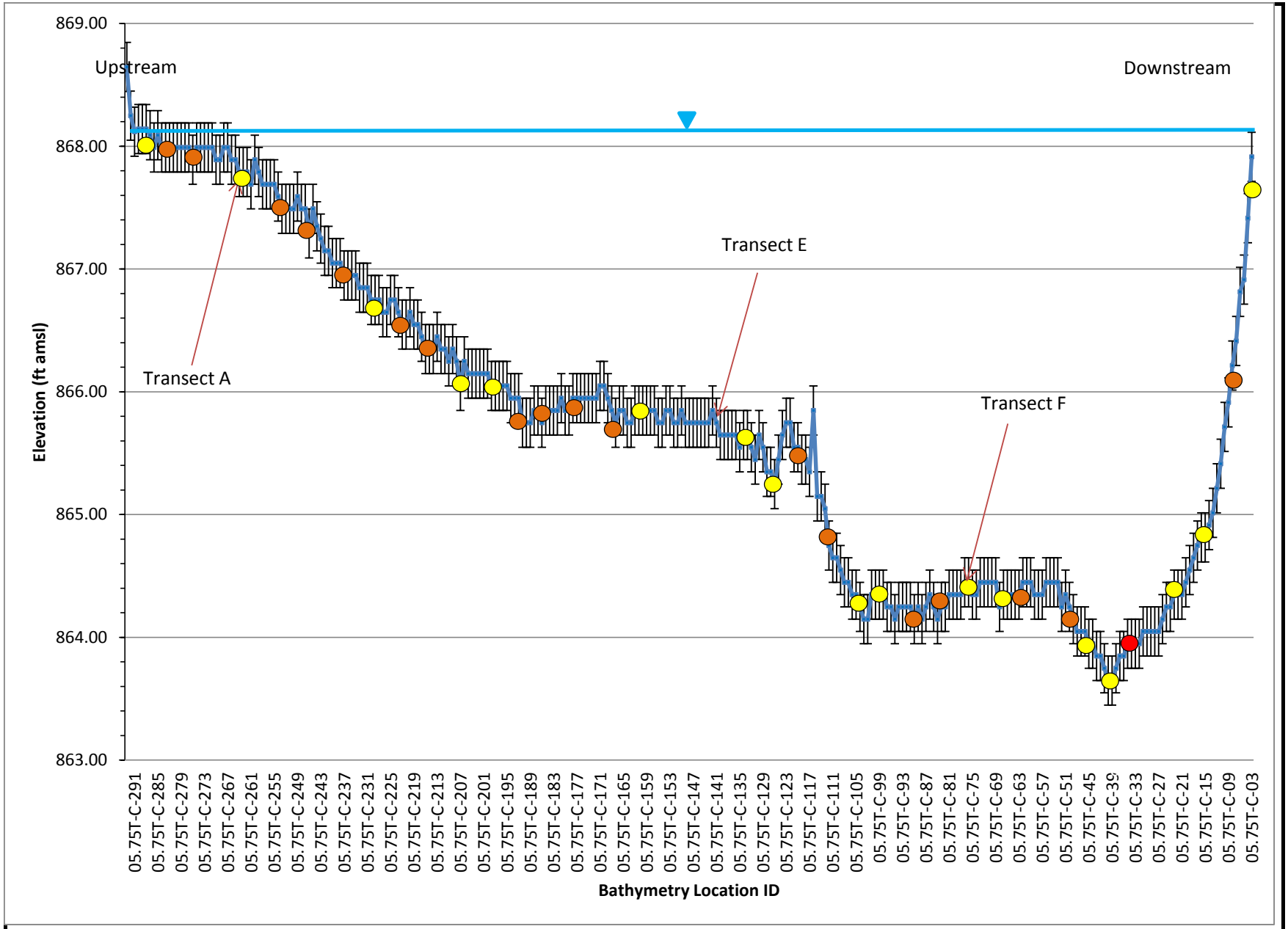
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-16
SEDIMENT TRAP BATHYMETRY DATA
CERESCO TRANSECT D
SHEET 3 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

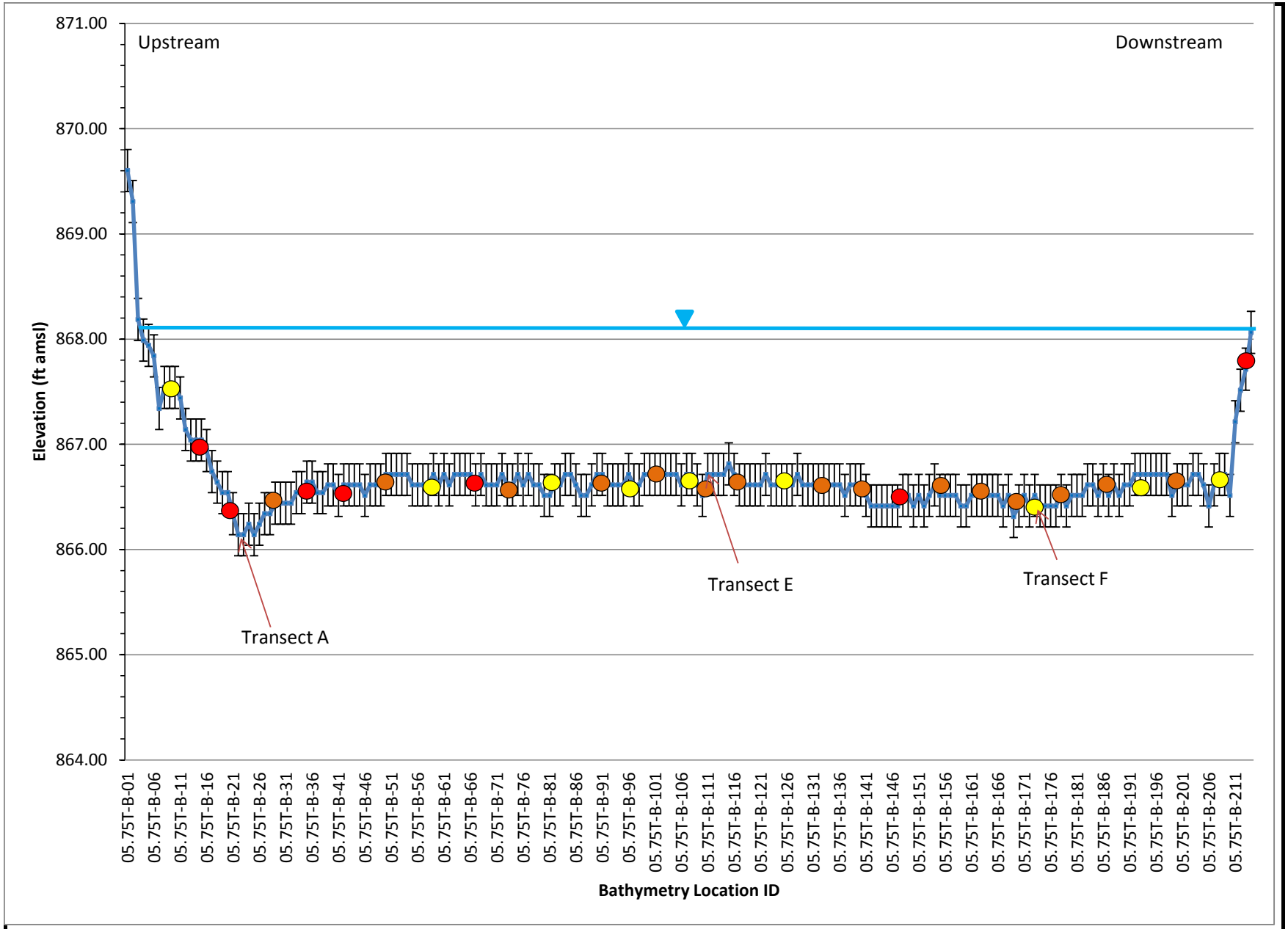
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-16
SEDIMENT TRAP BATHYMETRY DATA
CERESCO TRANSECT C
SHEET 4 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

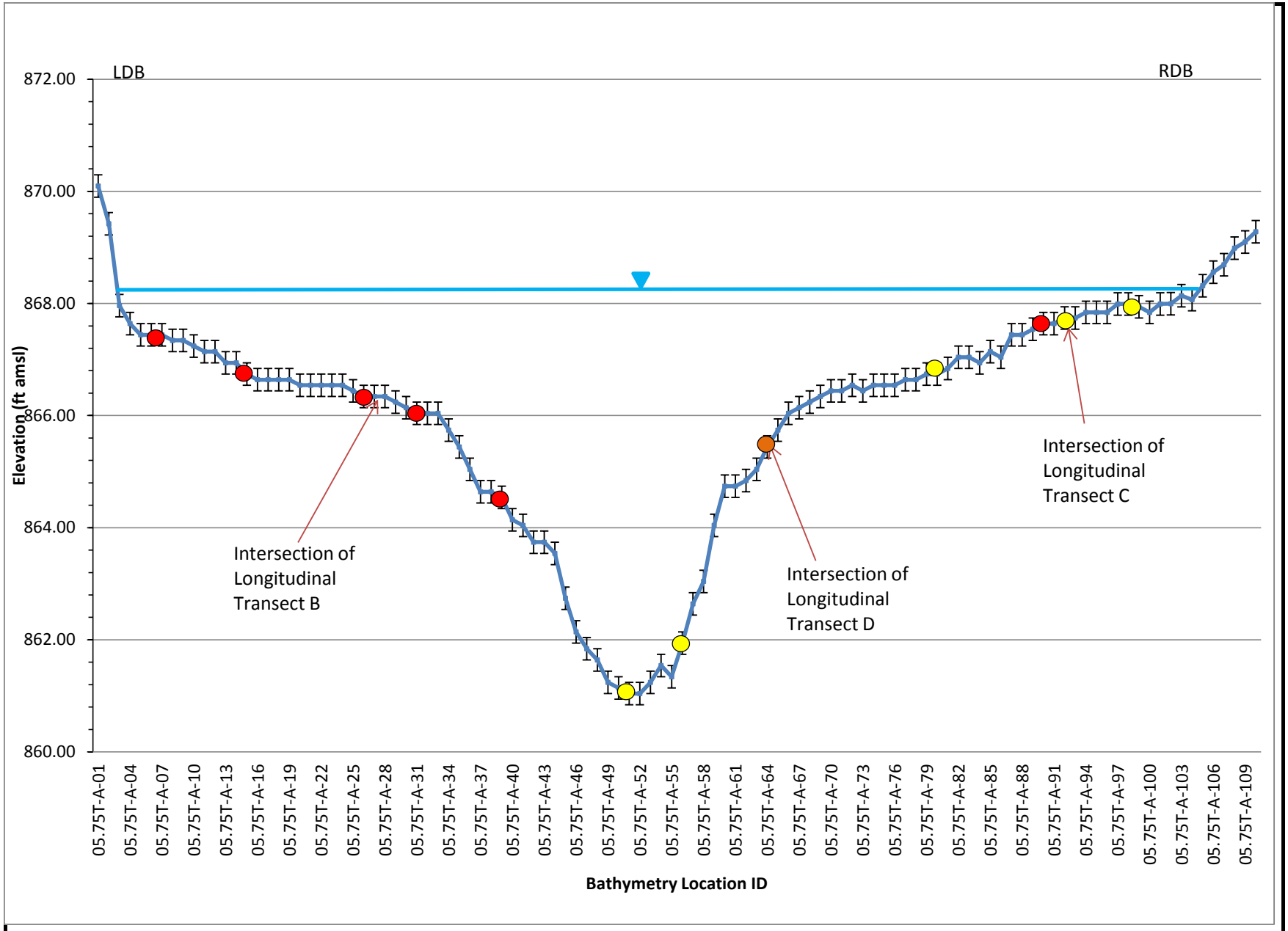
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-16
SEDIMENT TRAP BATHYMETRY DATA
CERESCO TRANSECT B
SHEET 5 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-16
SEDIMENT TRAP BATHYMETRY DATA
CERESCO TRANSECT A
SHEET 6 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Transect D
Transect E
Longitudinal Transect G
Transect F
Longitudinal Transect C
Transect A
Transect B
Transect H
River Flow Direction

ENBRIDGE		
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 25 50 100

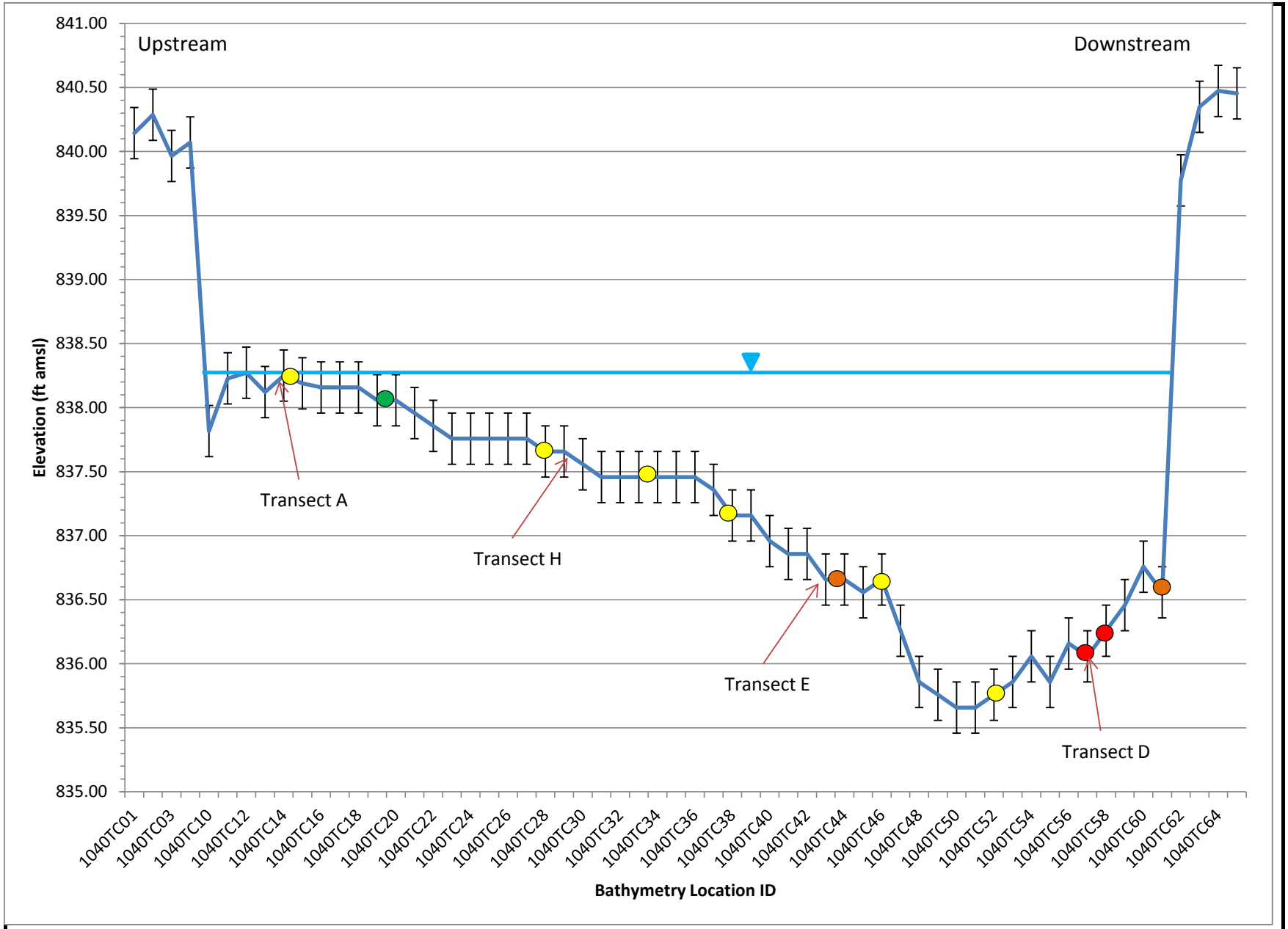
Scale in Feet

FIGURE 2I-17
PHASE II SEDIMENT TRAP BATHYMETRY
MP 10.40 N
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-17_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

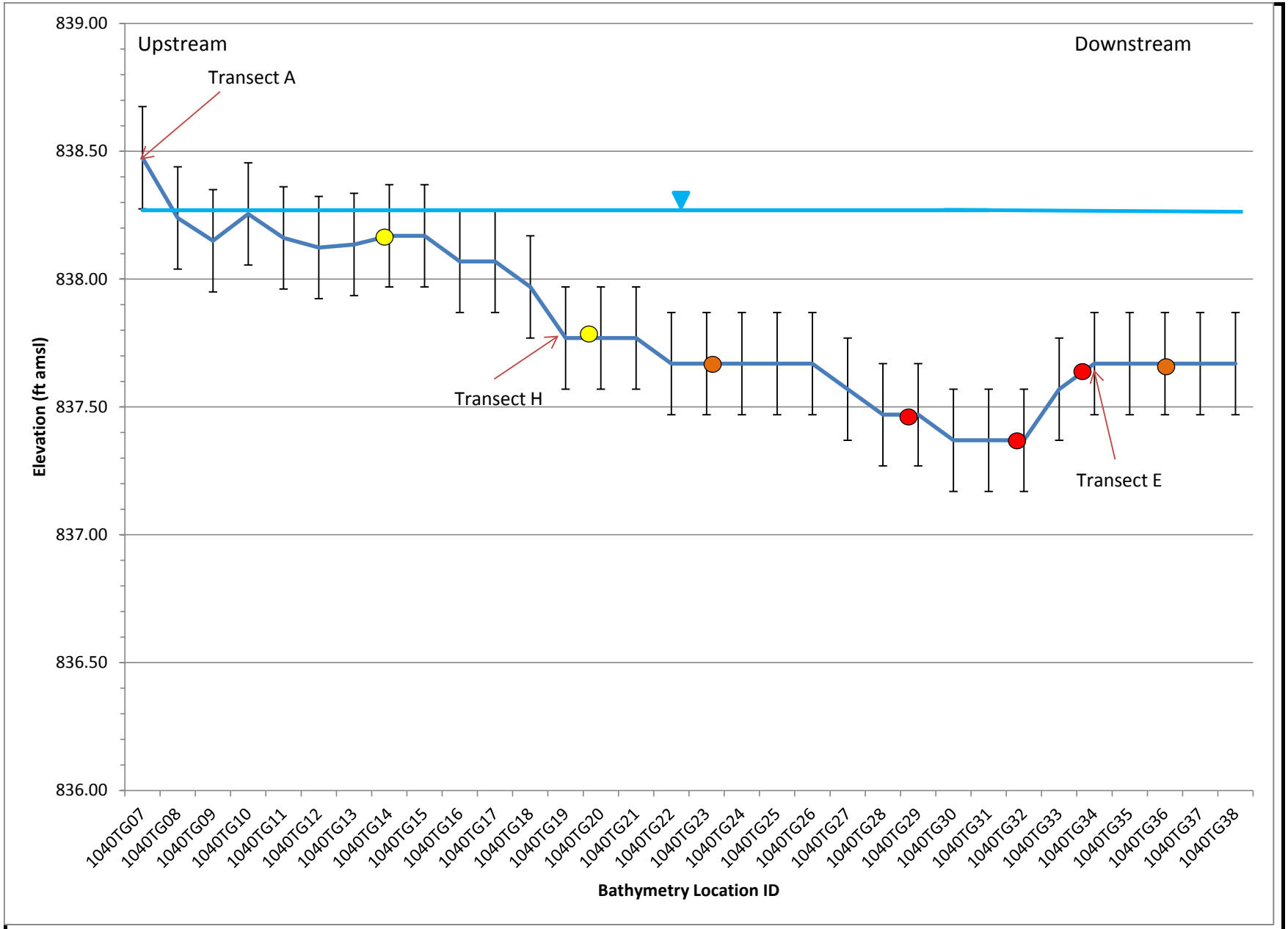
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT C
SHEET 1 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

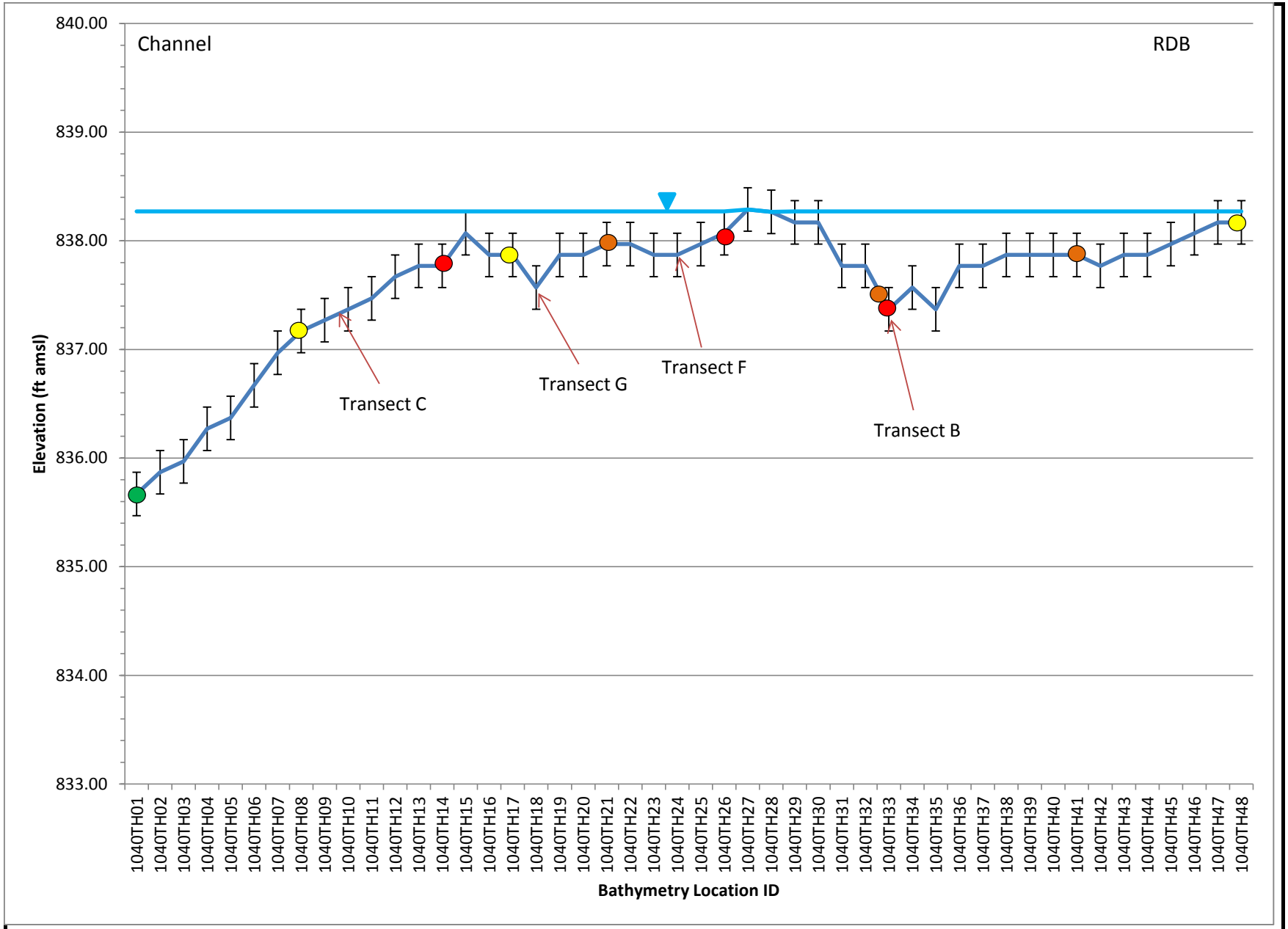
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT G
SHEET 2 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

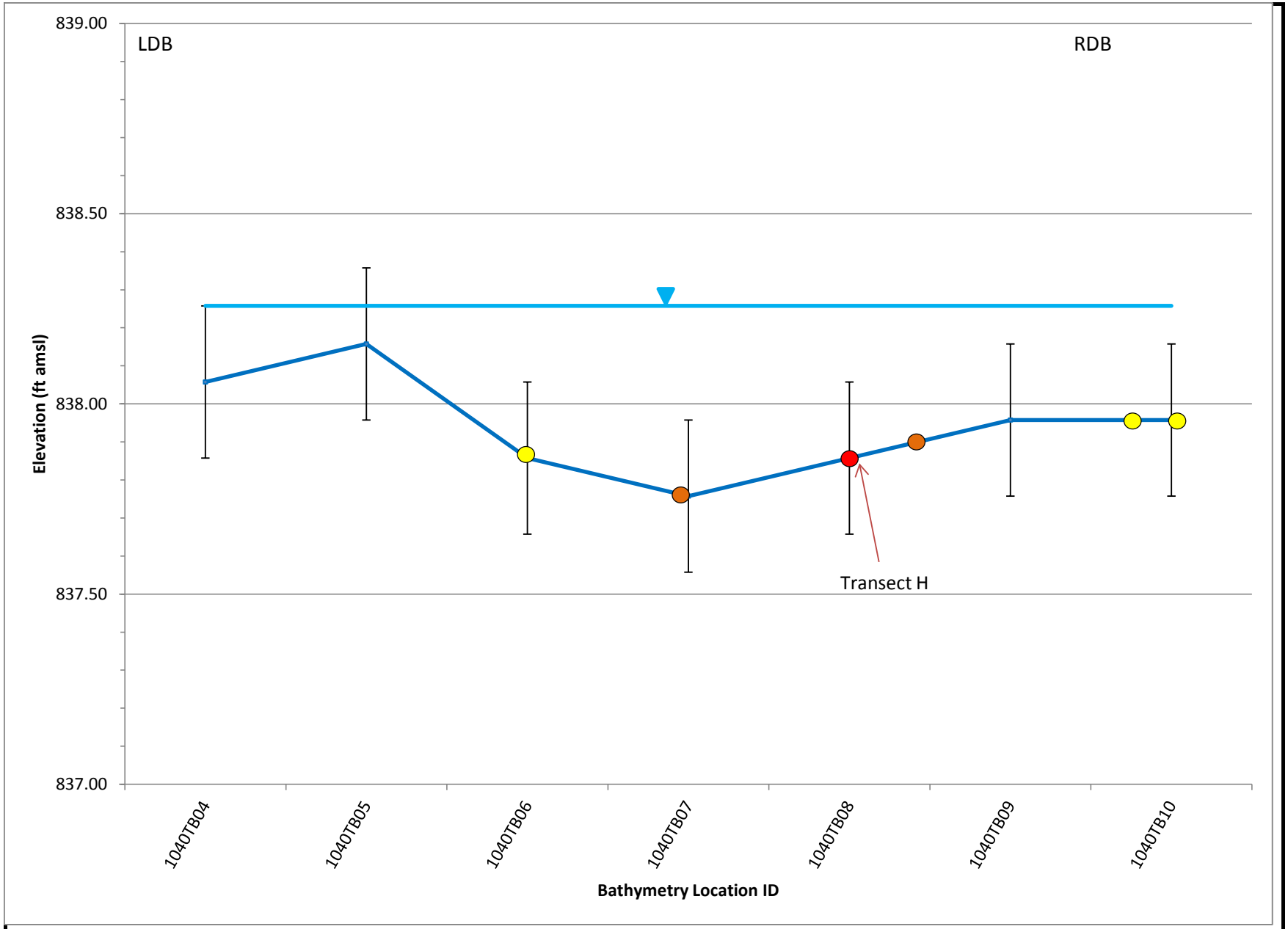
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT H
SHEET 3 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

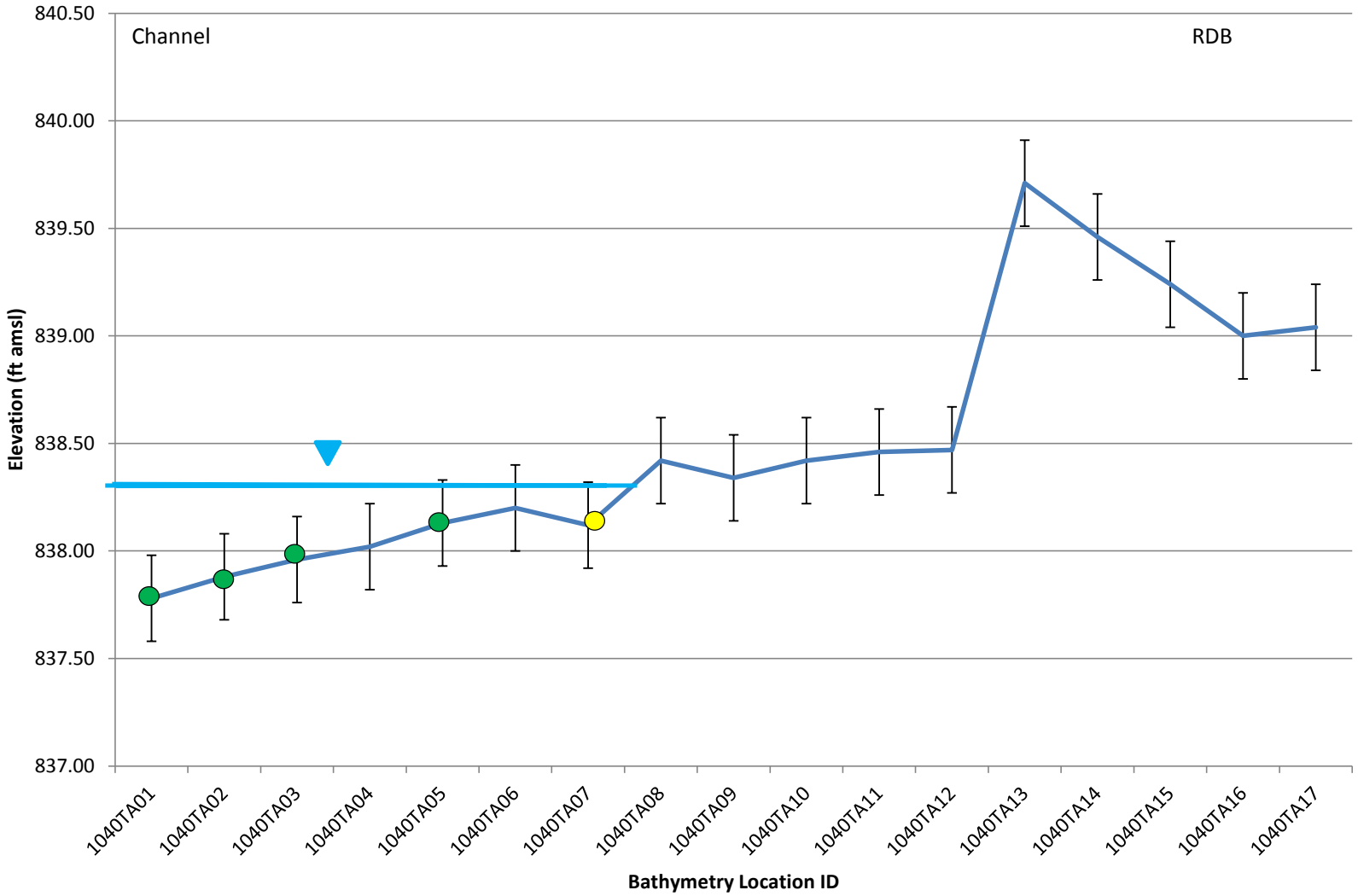
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT B
SHEET 4 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

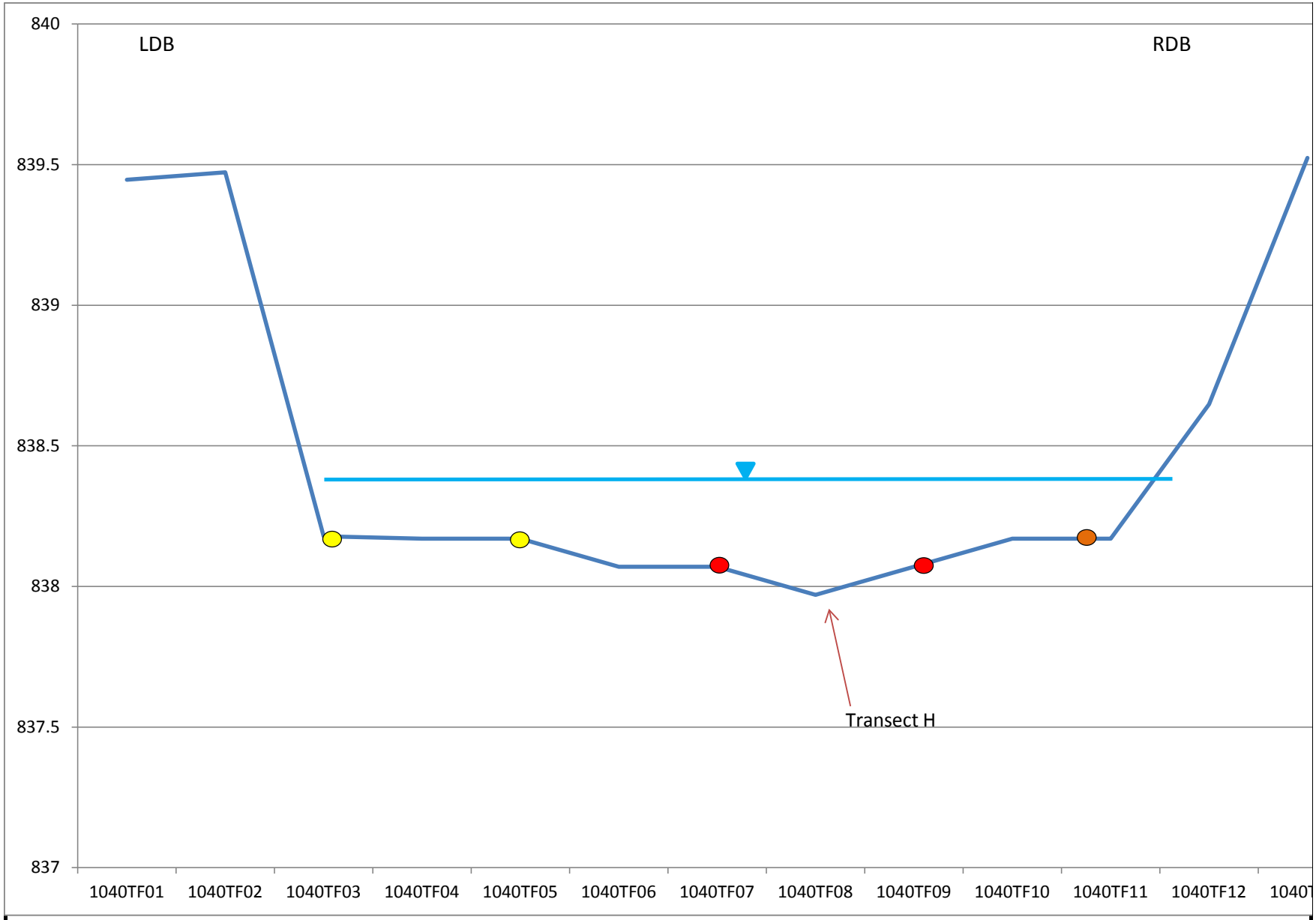
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT A
SHEET 5 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

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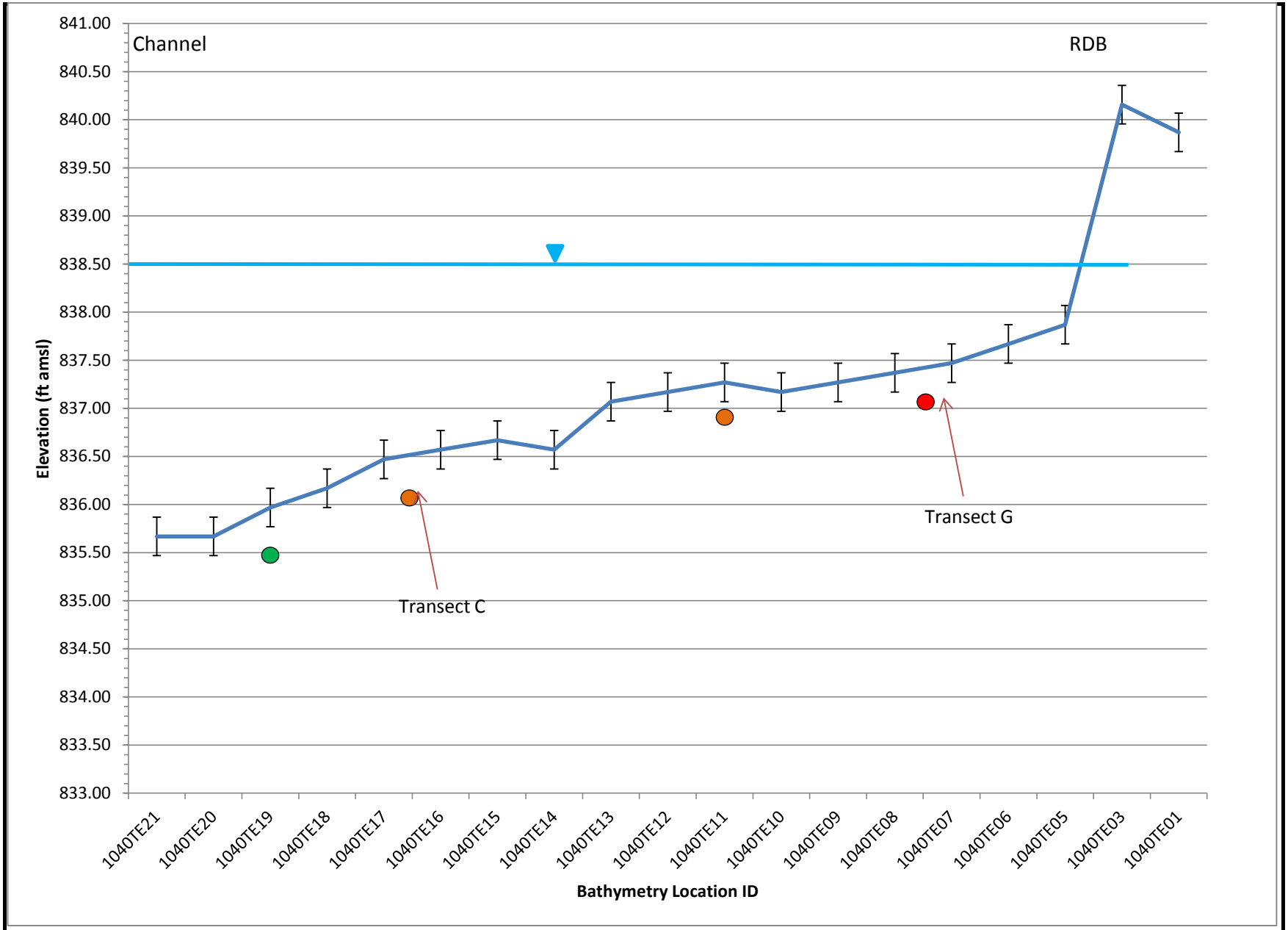
- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT F
SHEET 6 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

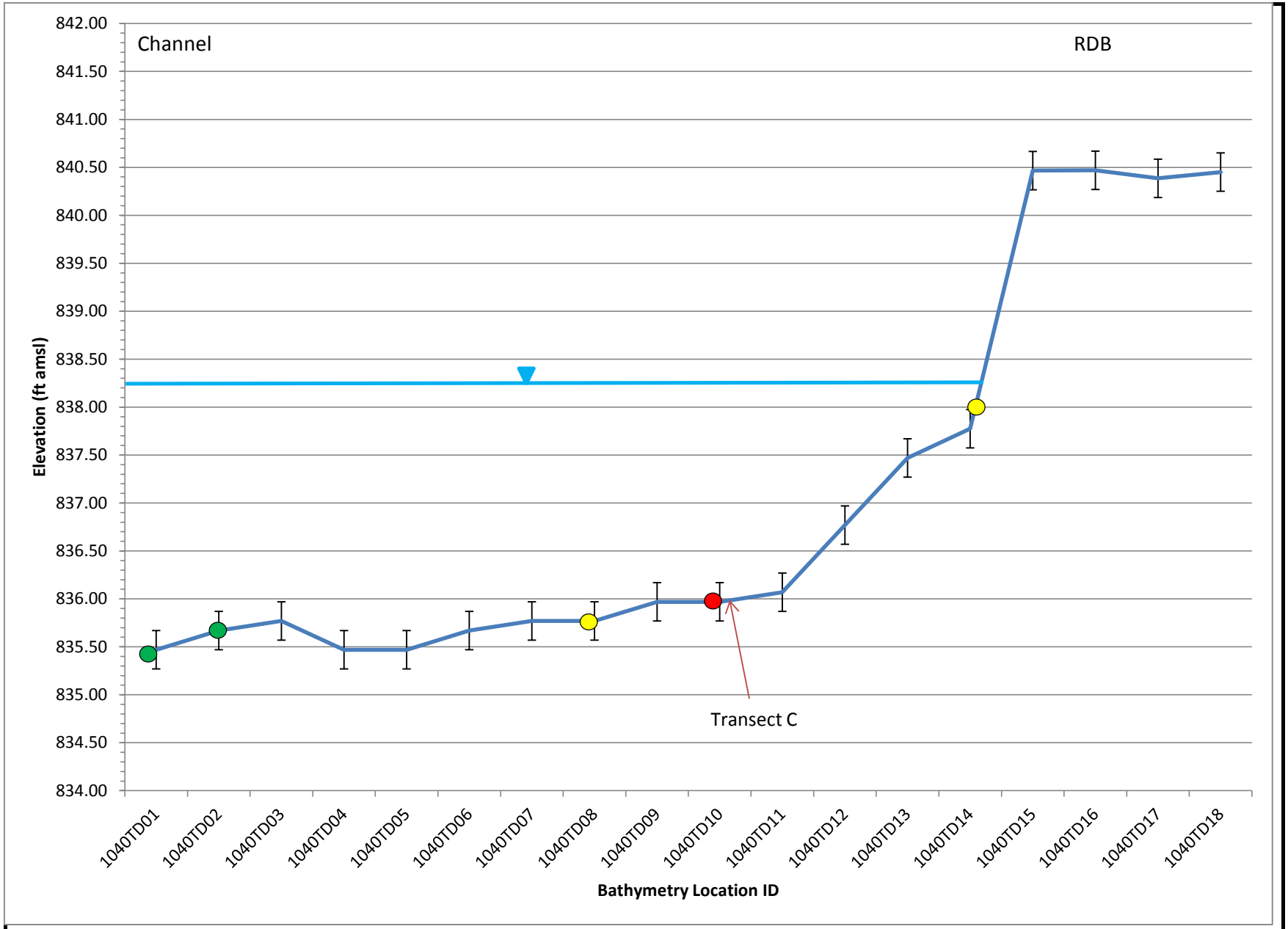
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT E
SHEET 7 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-18
SEDIMENT TRAP BATHYMETRY DATA
MP 10.40 N TRANSECT D
SHEET 8 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

River Flow Direction

Transect A
Transect B
Transect C
Transect D
Transect E
Transect F
Longitudinal Transect G
Longitudinal Transect H

ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 25 50 100

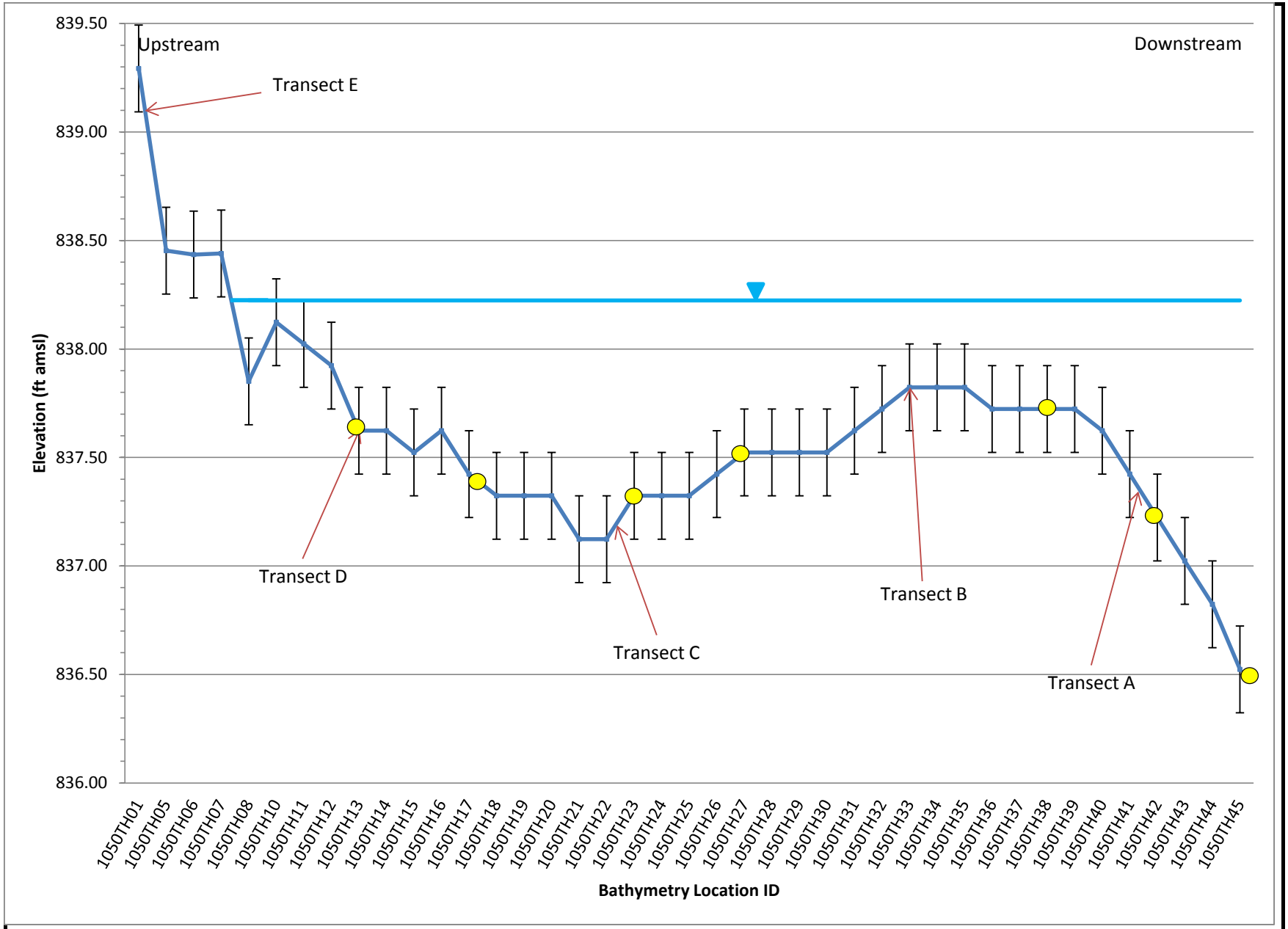
Scale in Feet

FIGURE 2i-19
PHASE II SEDIMENT TRAP BATHYMETRY
MP 10.50 L2
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-19_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

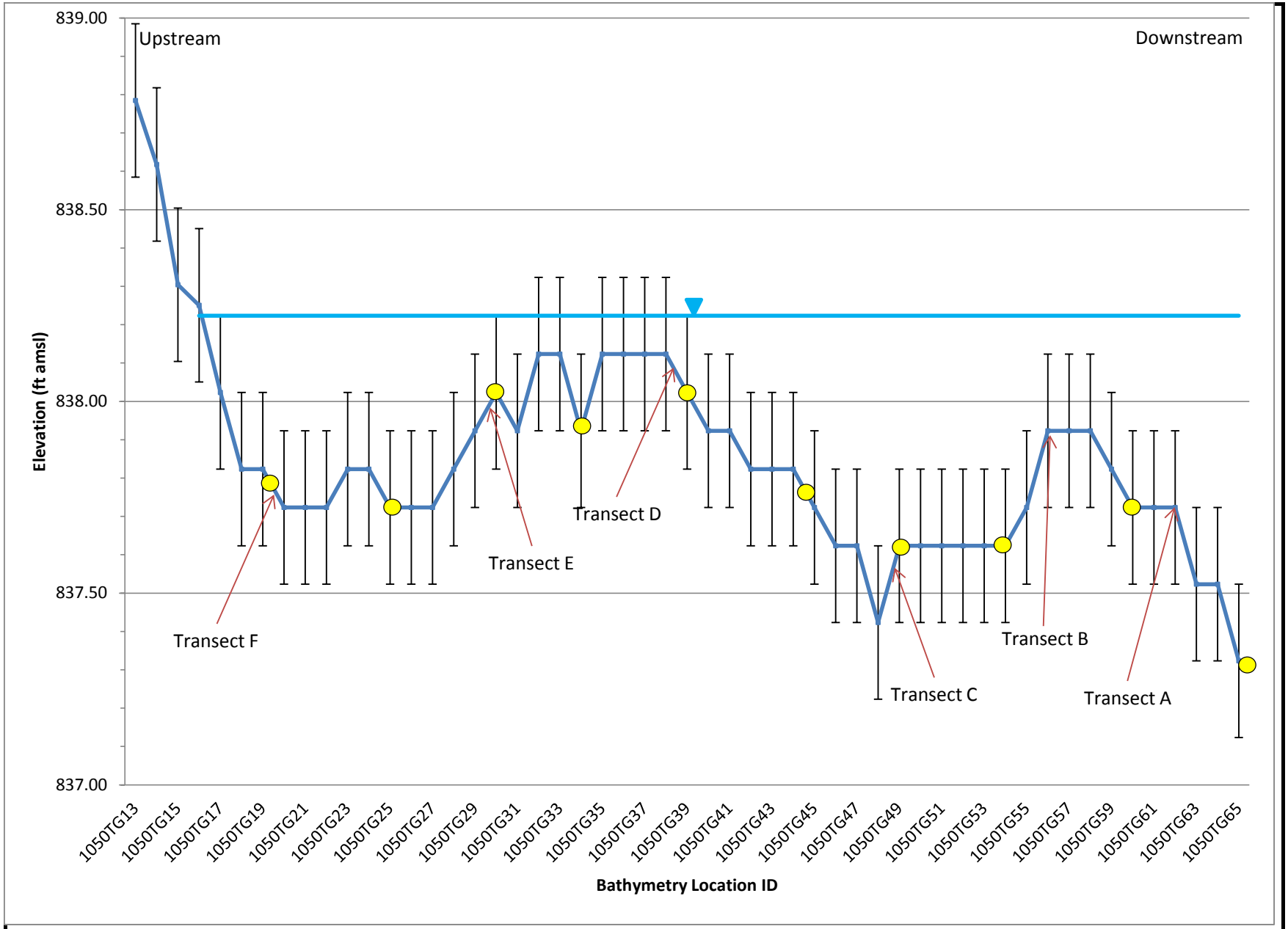
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 LONGITUDINAL H
SHEET 1 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

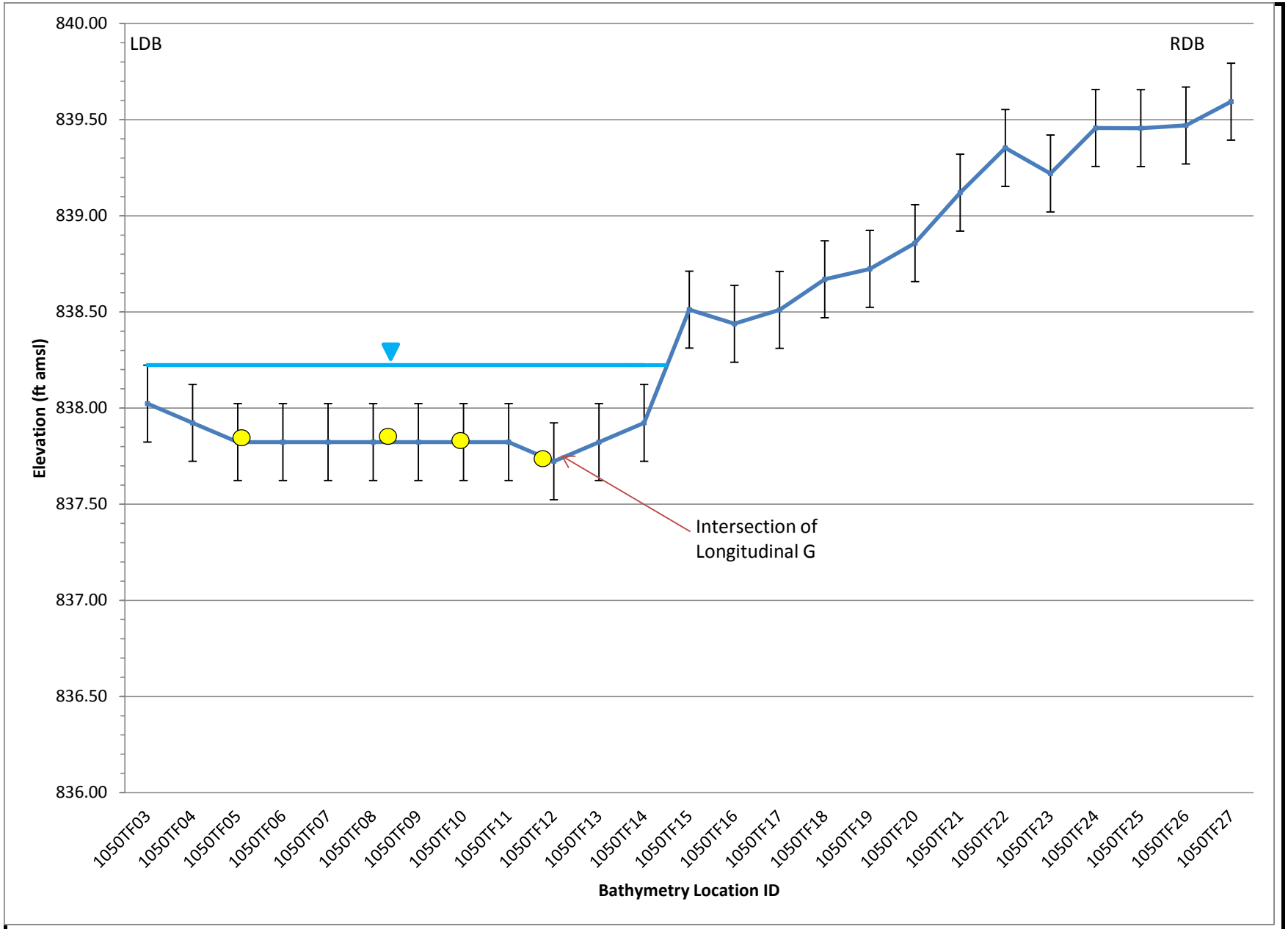
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 LONGITUDINAL G
SHEET 2 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

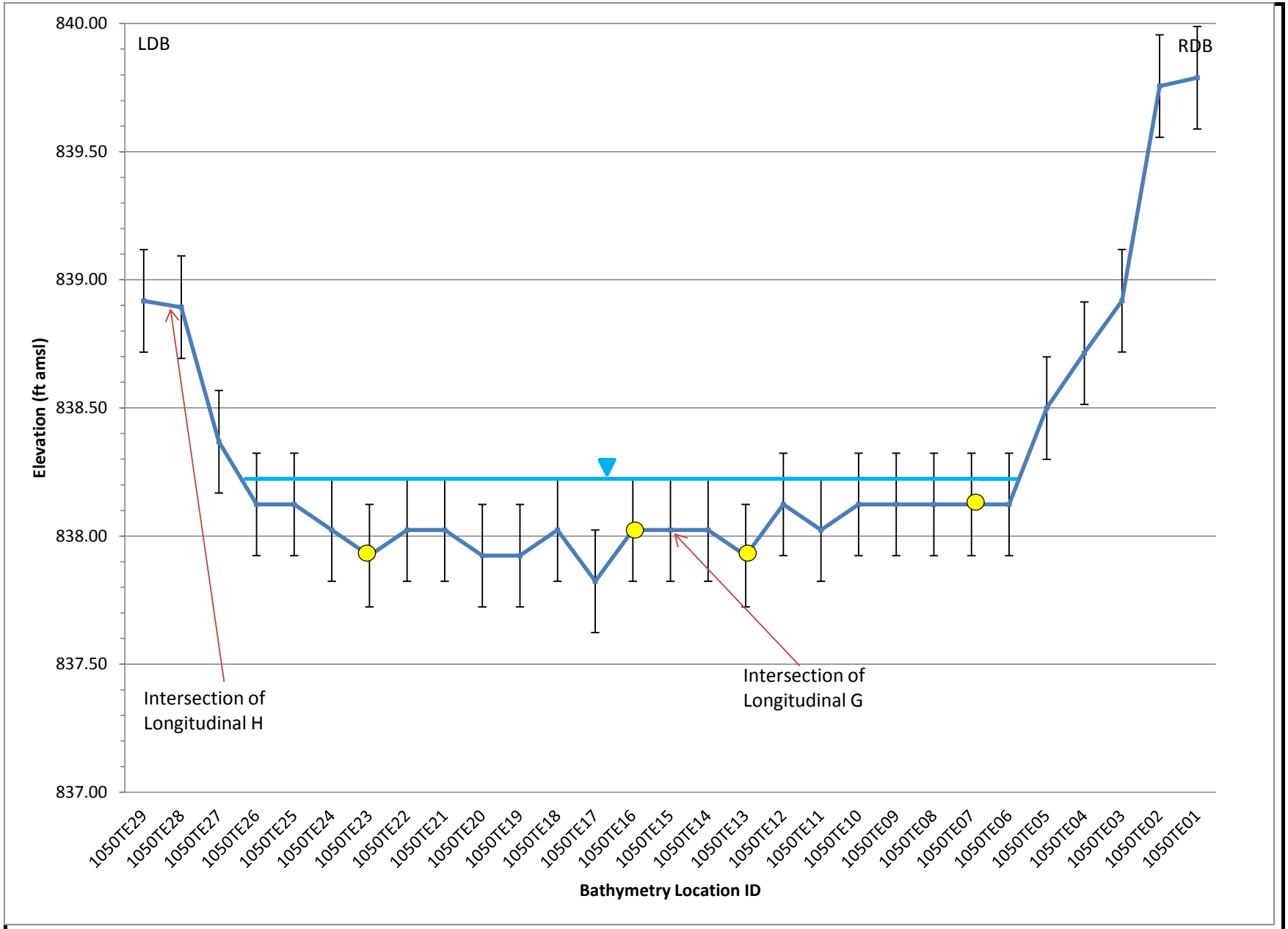
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 TRANSECT F
SHEET 3 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

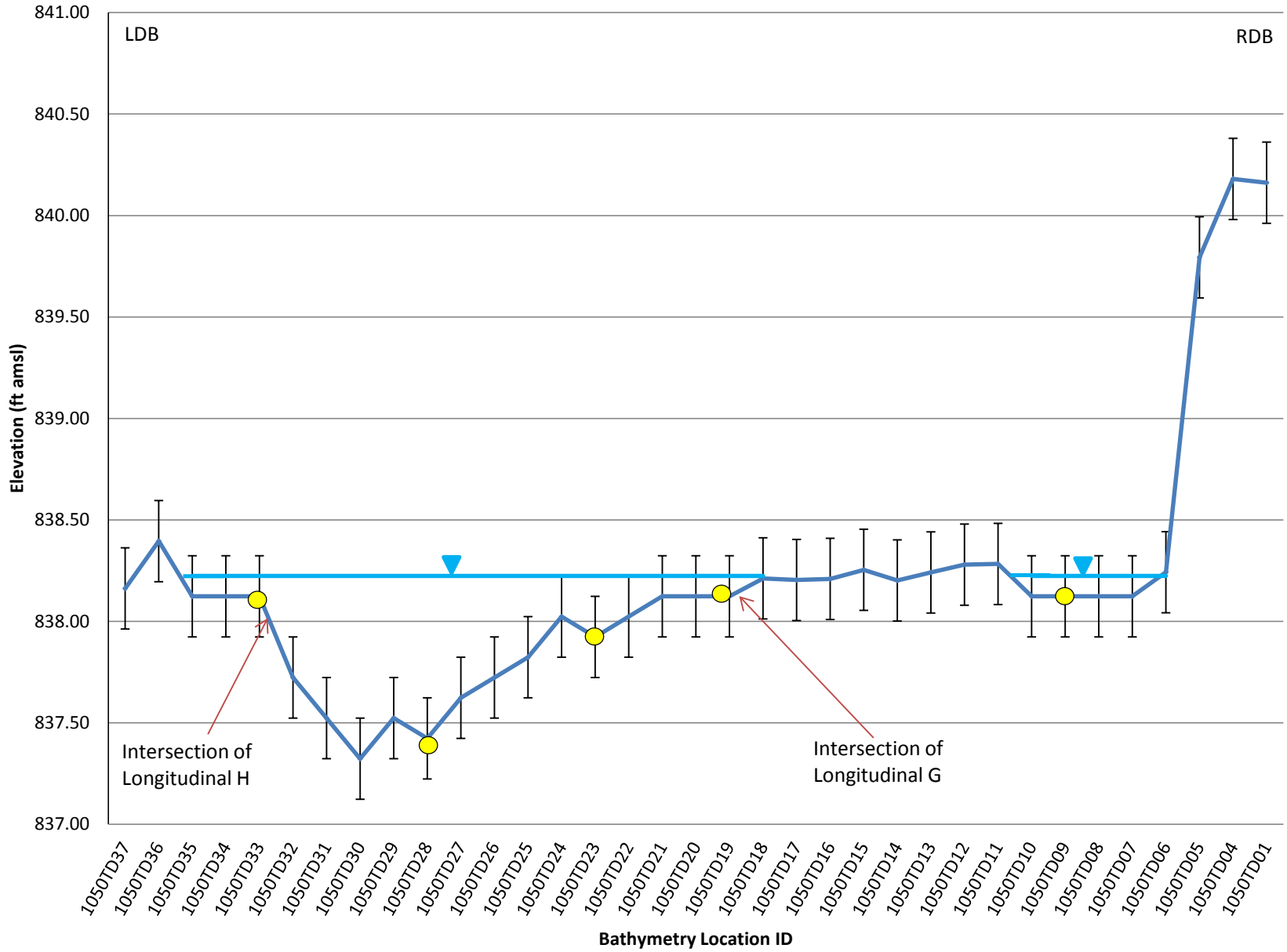
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 TRANSECT E
SHEET 4 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

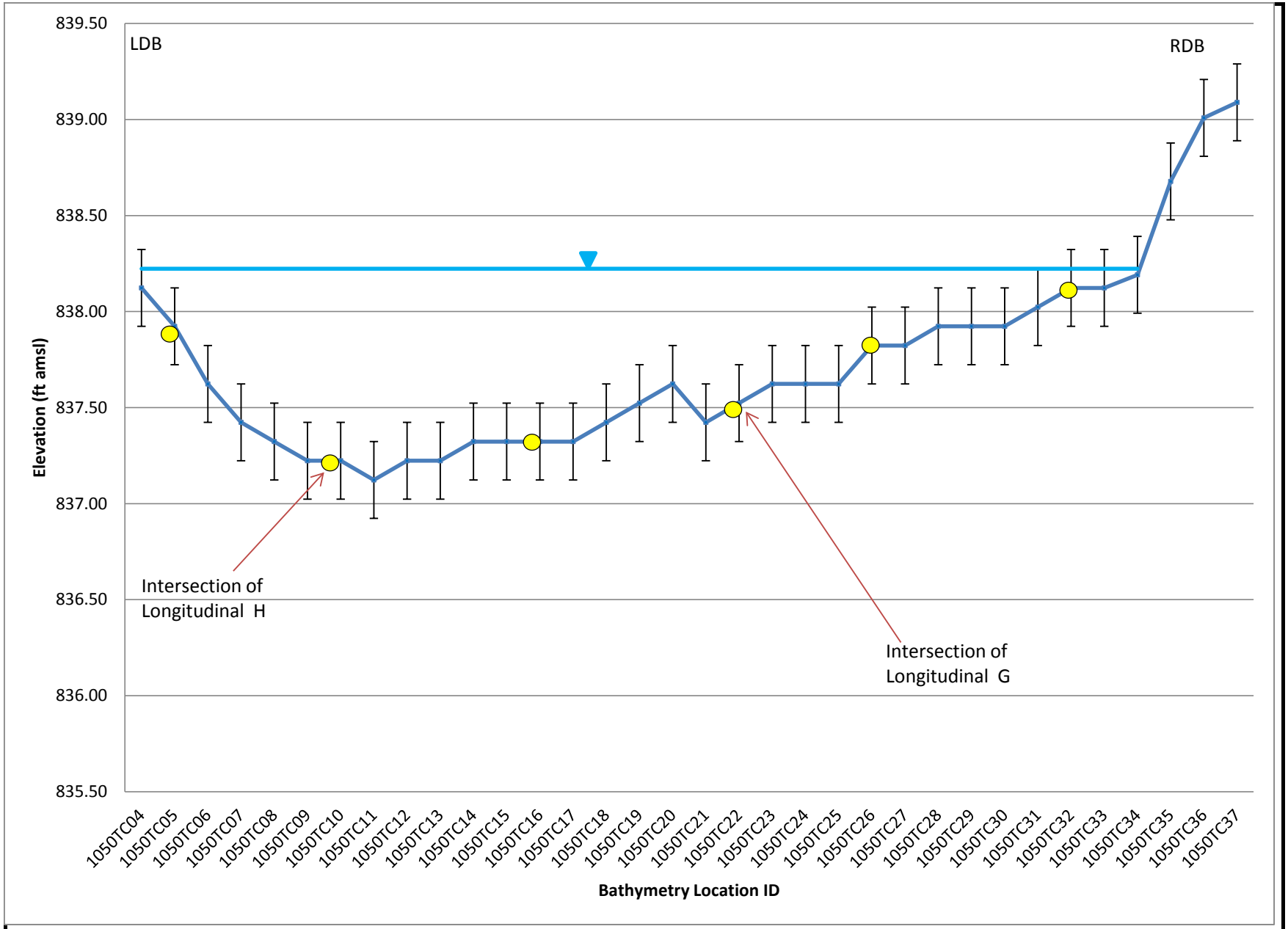
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 TRANSECT D
SHEET 5 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

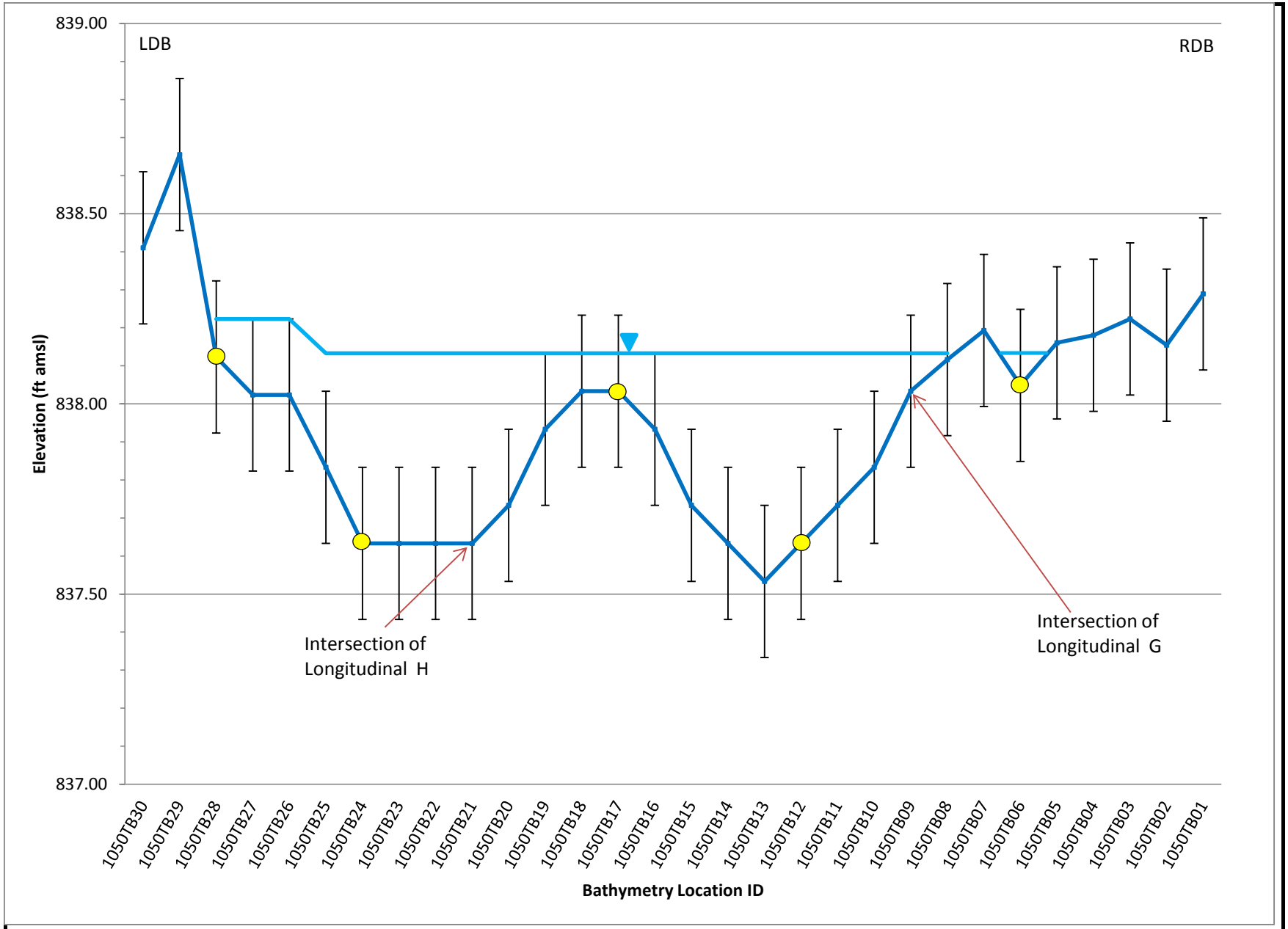
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 TRANSECT C
SHEET 6 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

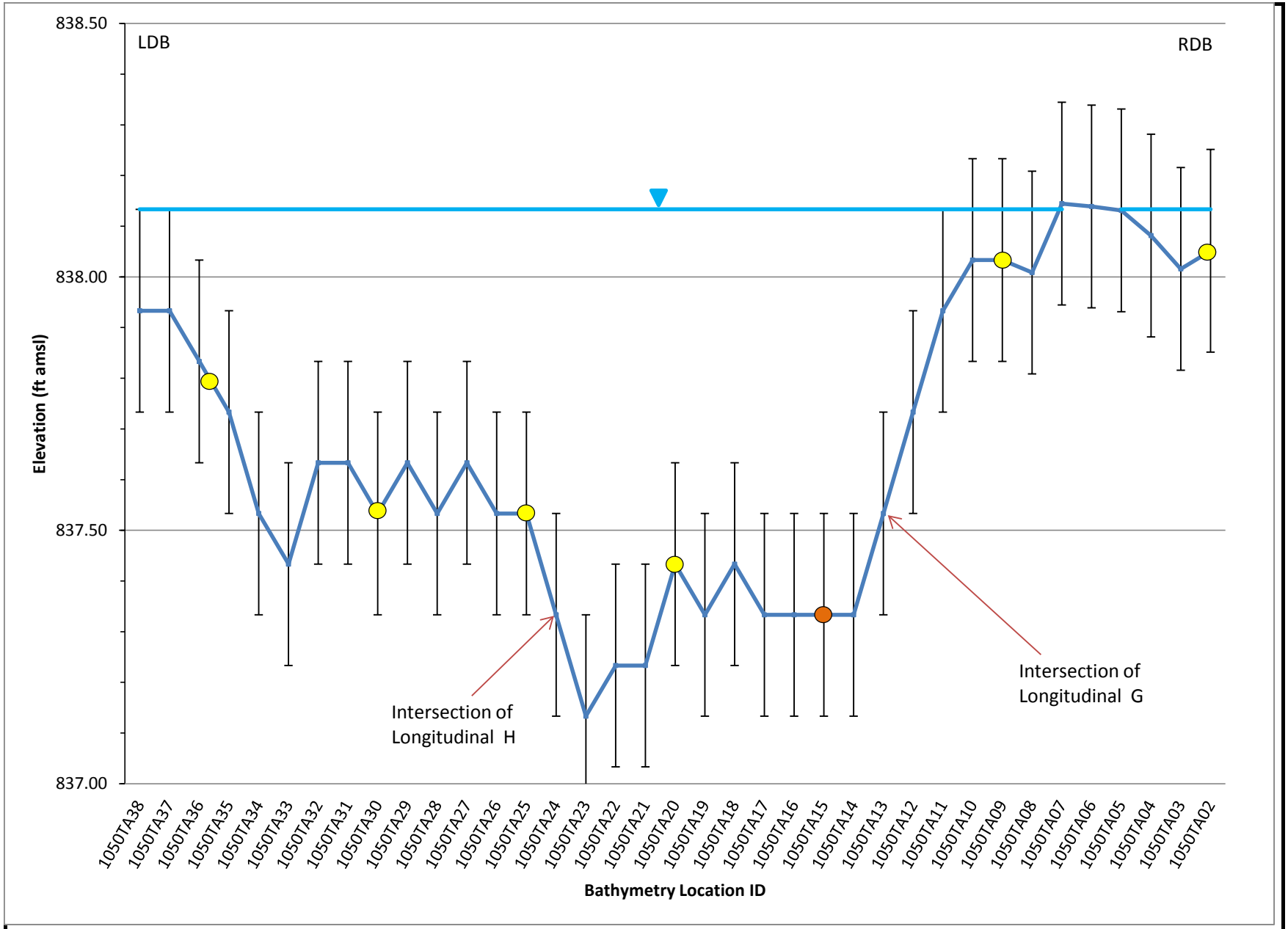
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 TRANSECT B
SHEET 7 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

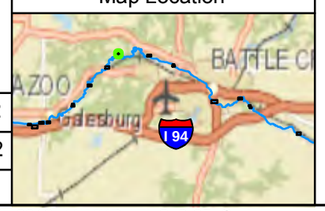
ft amsl = feet above mean sea level

FIGURE 2i-20
SEDIMENT TRAP BATHYMETRY DATA
MP 10.50 L2 TRANSECT A
SHEET 8 OF 8
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Transect F
Transect E
Transect B
Transect C
Transect D
26.00
Transect A
River Flow Direction

ENBRIDGE		
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 25 50 100

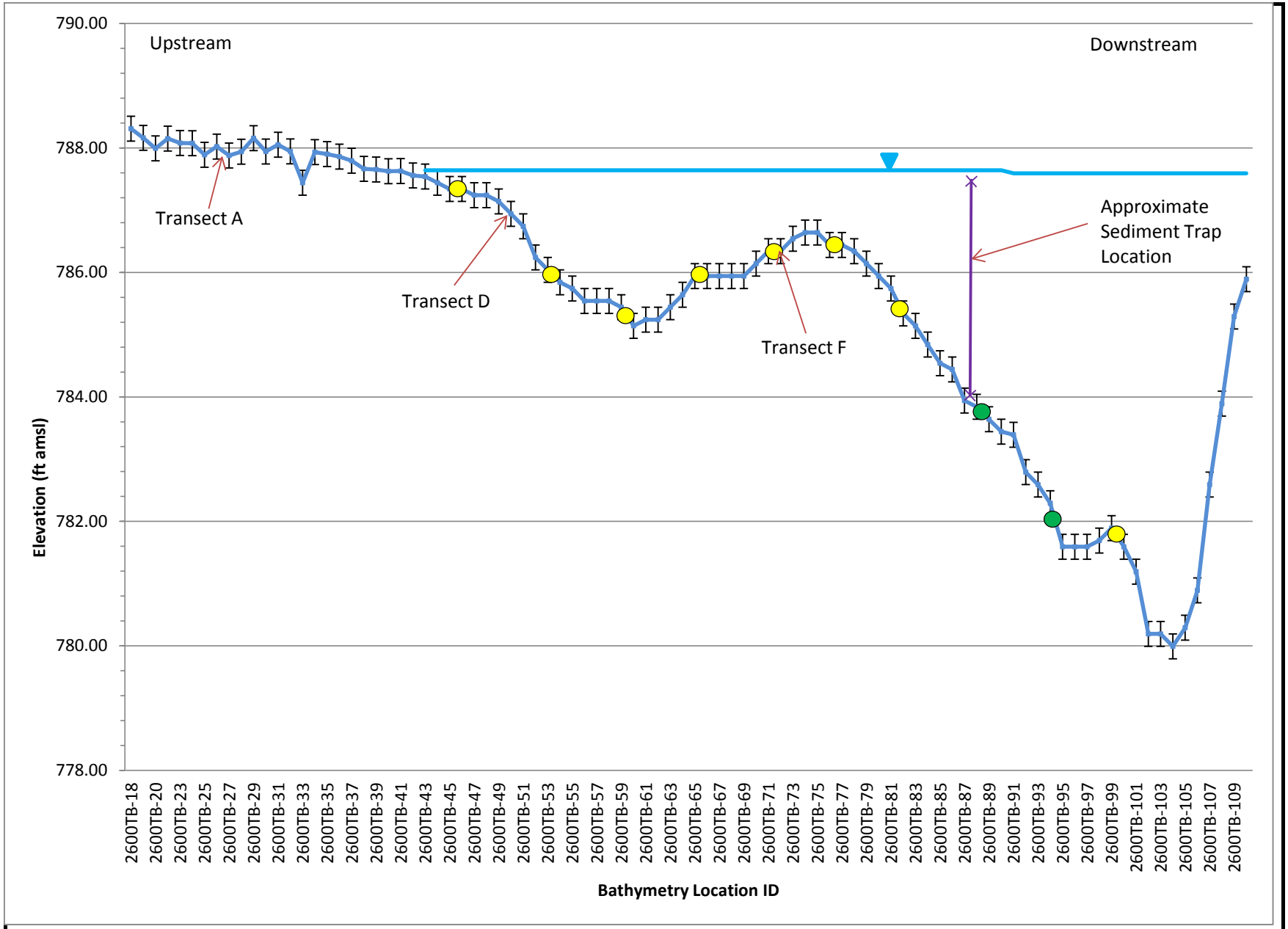
Scale in Feet

FIGURE 2i-21
PHASE II SEDIMENT TRAP BATHYMETRY
MP 26.00 RDB
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

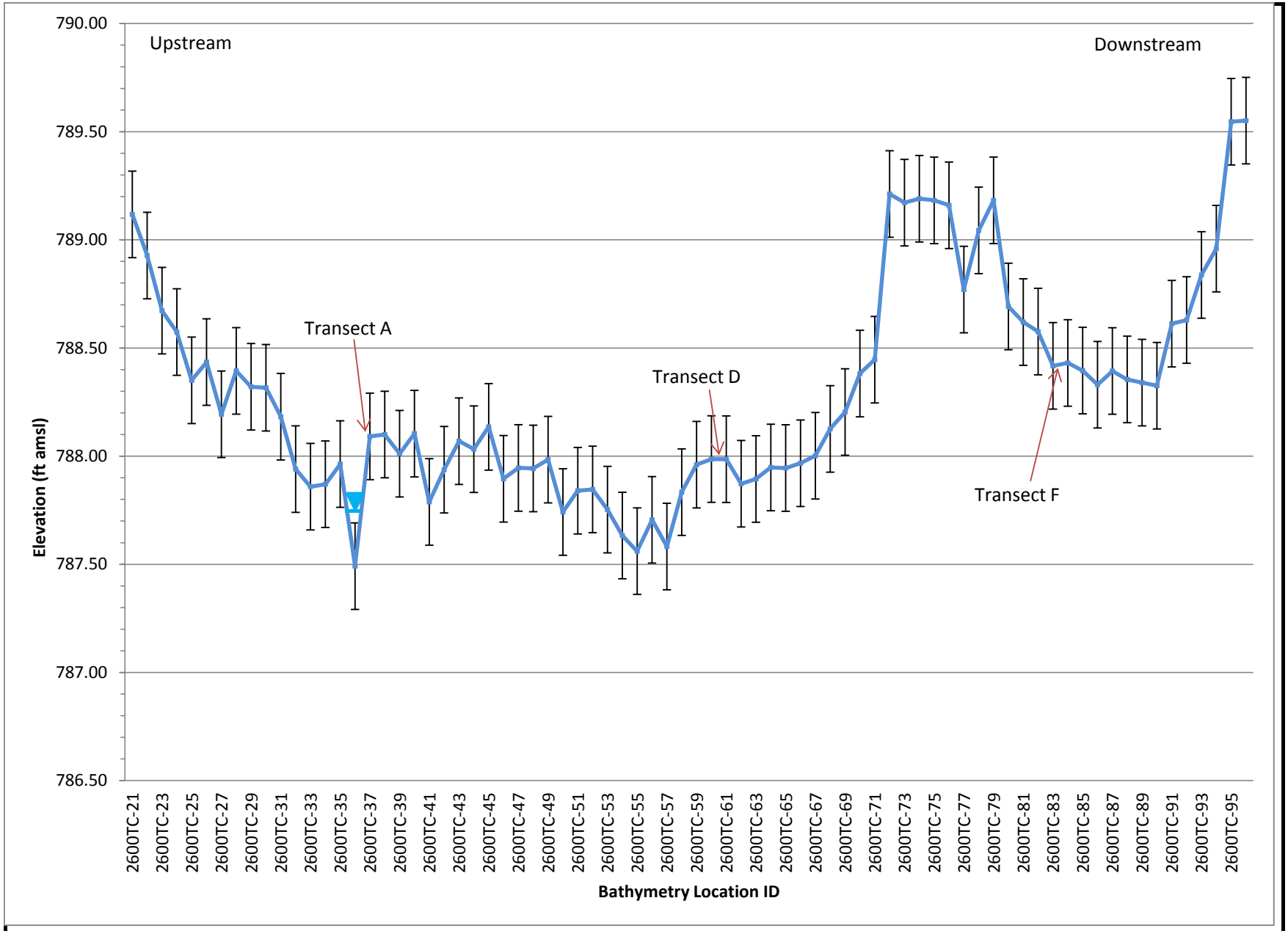
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-22
SEDIMENT TRAP BATHYMETRY DATA
MP 26.00 RDB TRANSECT B
SHEET 1 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

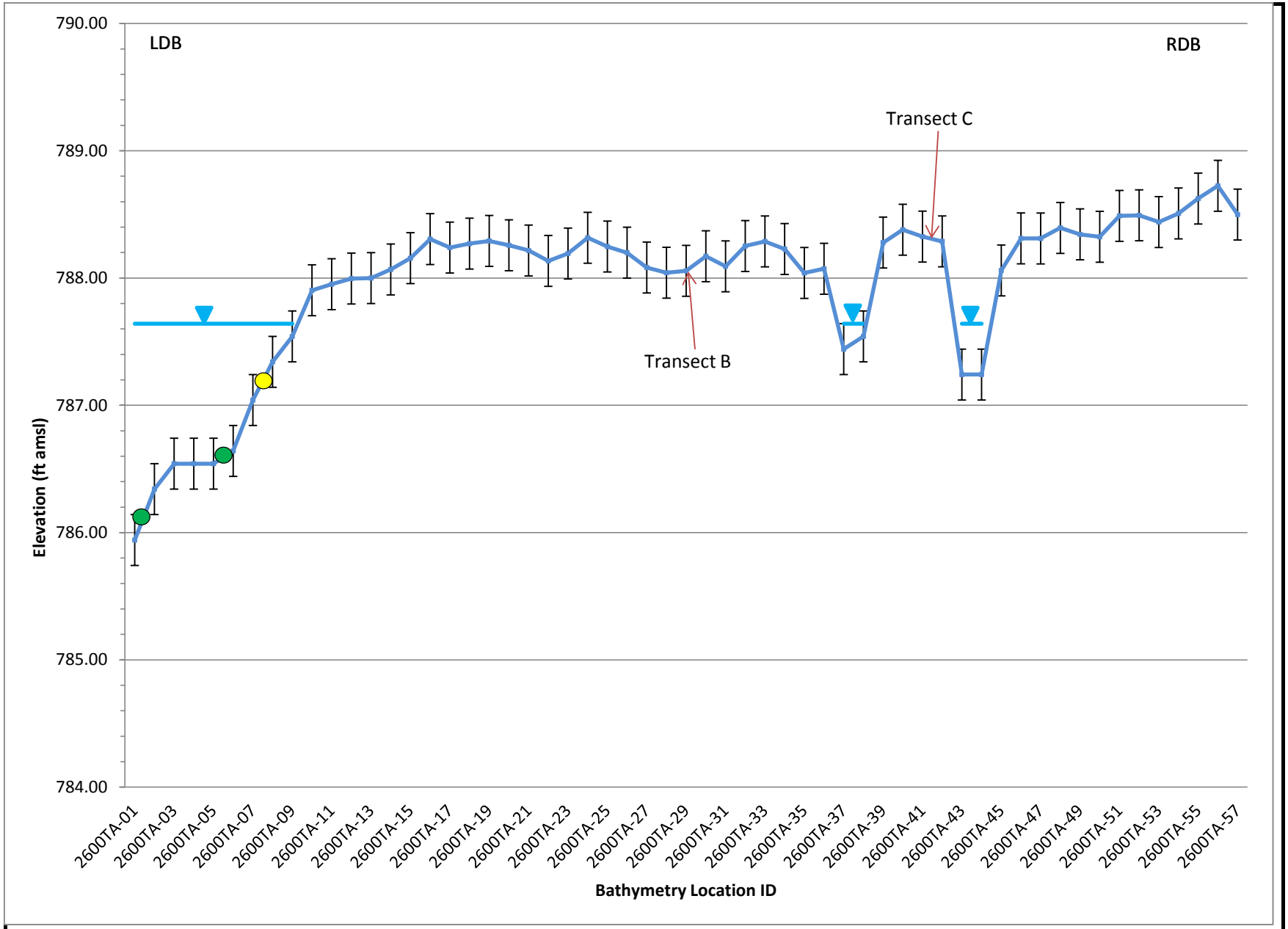
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-22
SEDIMENT TRAP BATHYMETRY DATA
MP 26.00 RDB TRANSECT C
SHEET 2 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

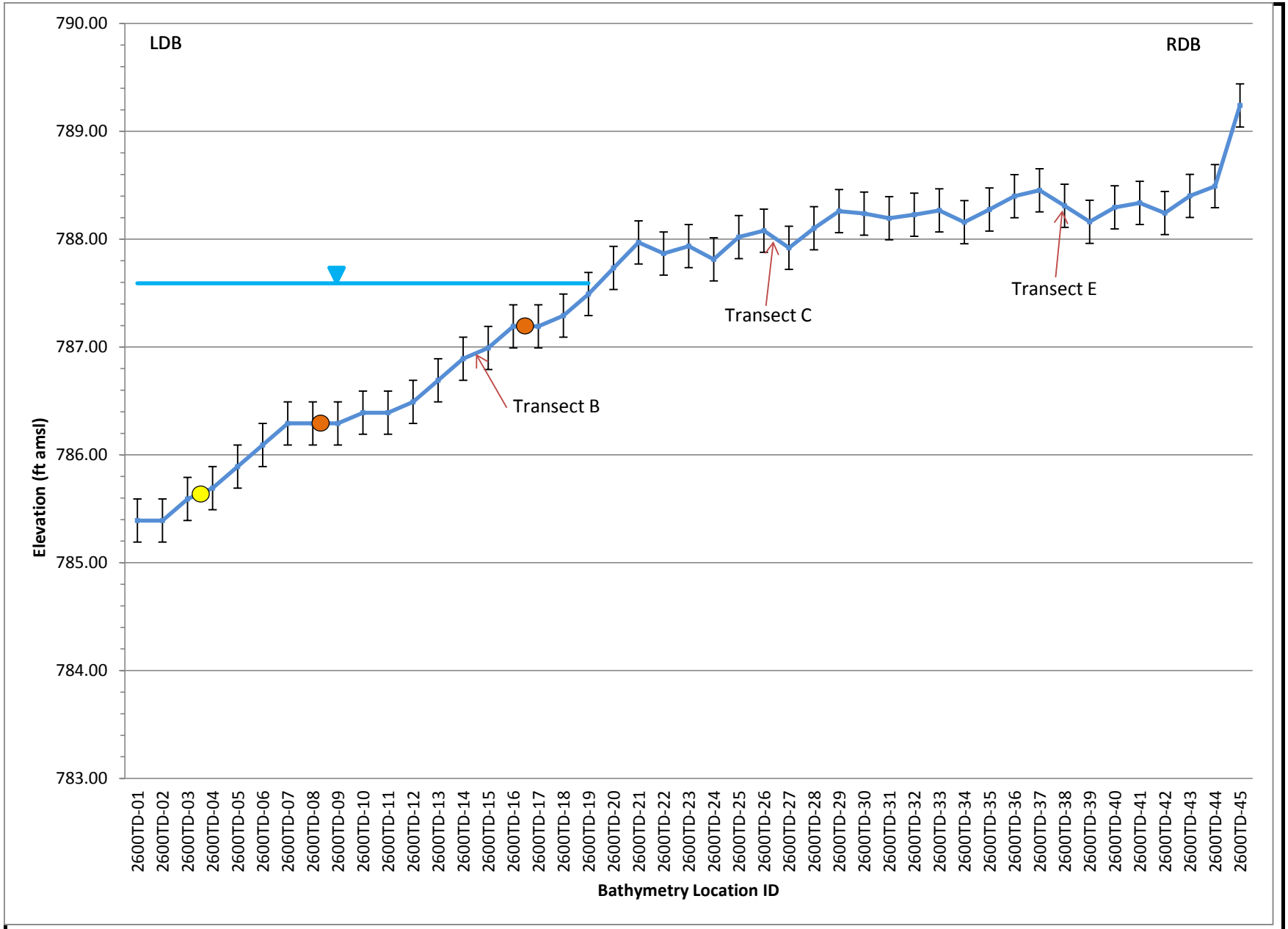
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-22
SEDIMENT TRAP BATHYMETRY DATA
MP 26.00 RDB TRANSECT A
SHEET 3 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

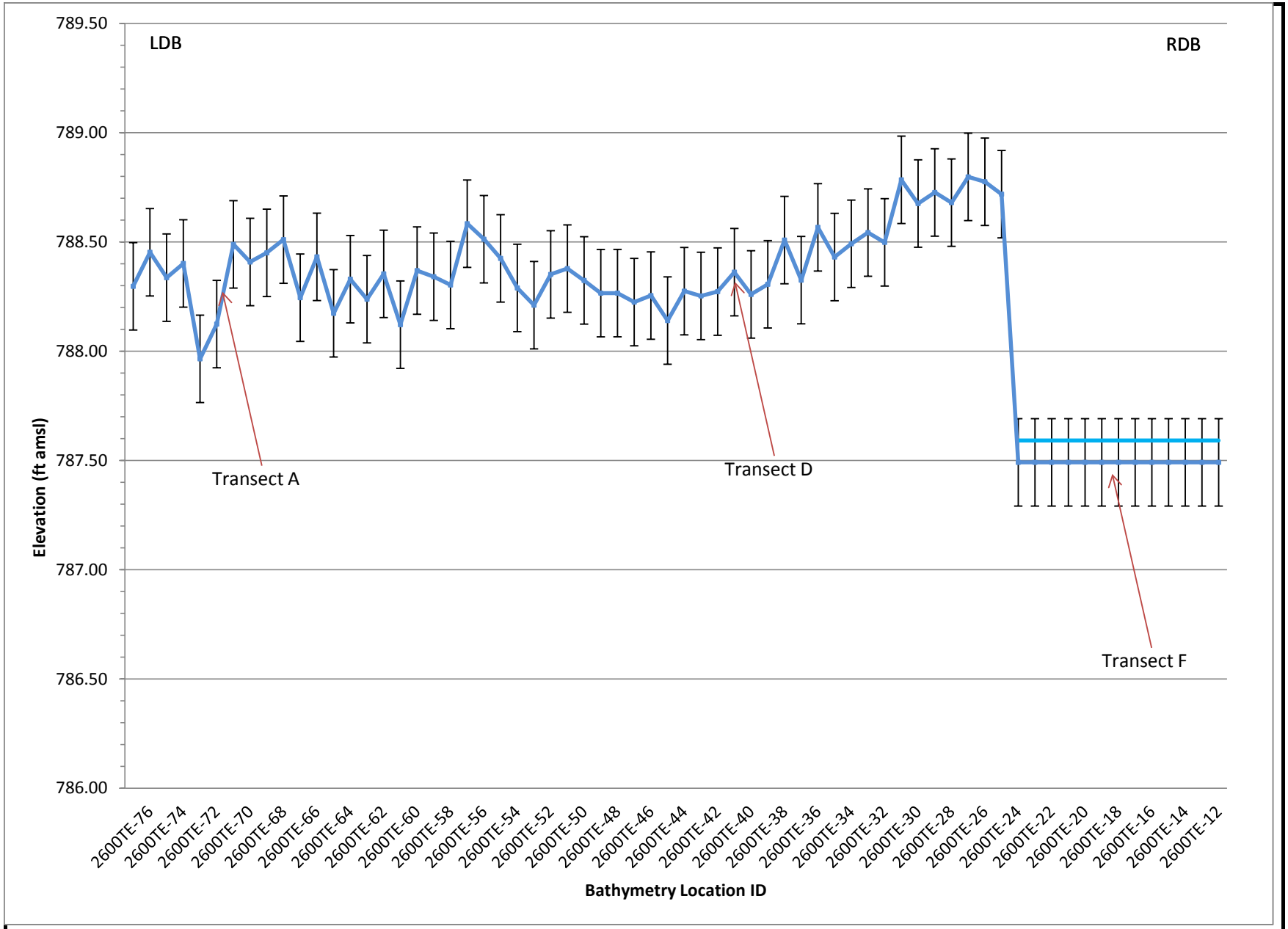
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-22
SEDIMENT TRAP BATHYMETRY DATA
MP 26.00 RDB TRANSECT D
SHEET 4 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE
RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

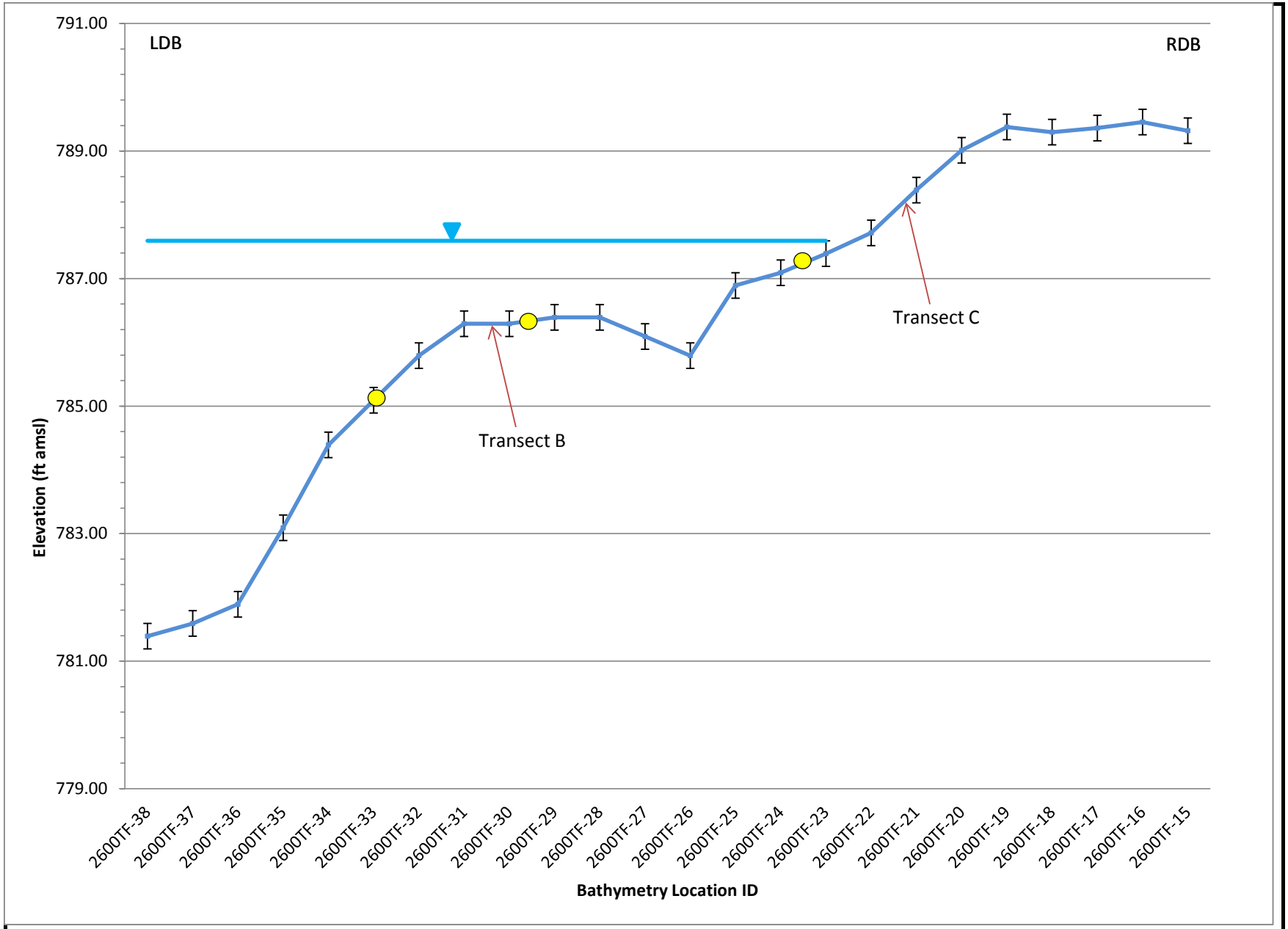
Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-22
SEDIMENT TRAP BATHYMETRY DATA
MP 26.00 RDB TRANSECT E
SHEET 5 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface
- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy
- ± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-22
SEDIMENT TRAP BATHYMETRY DATA
MP 26.00 RDB TRANSECT F
SHEET 6 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

30.75

Transect C

Transect A

Transect B

Transect F

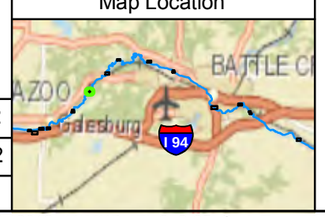
Transect E

Transect D

River Flow Direction

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 35 70 140

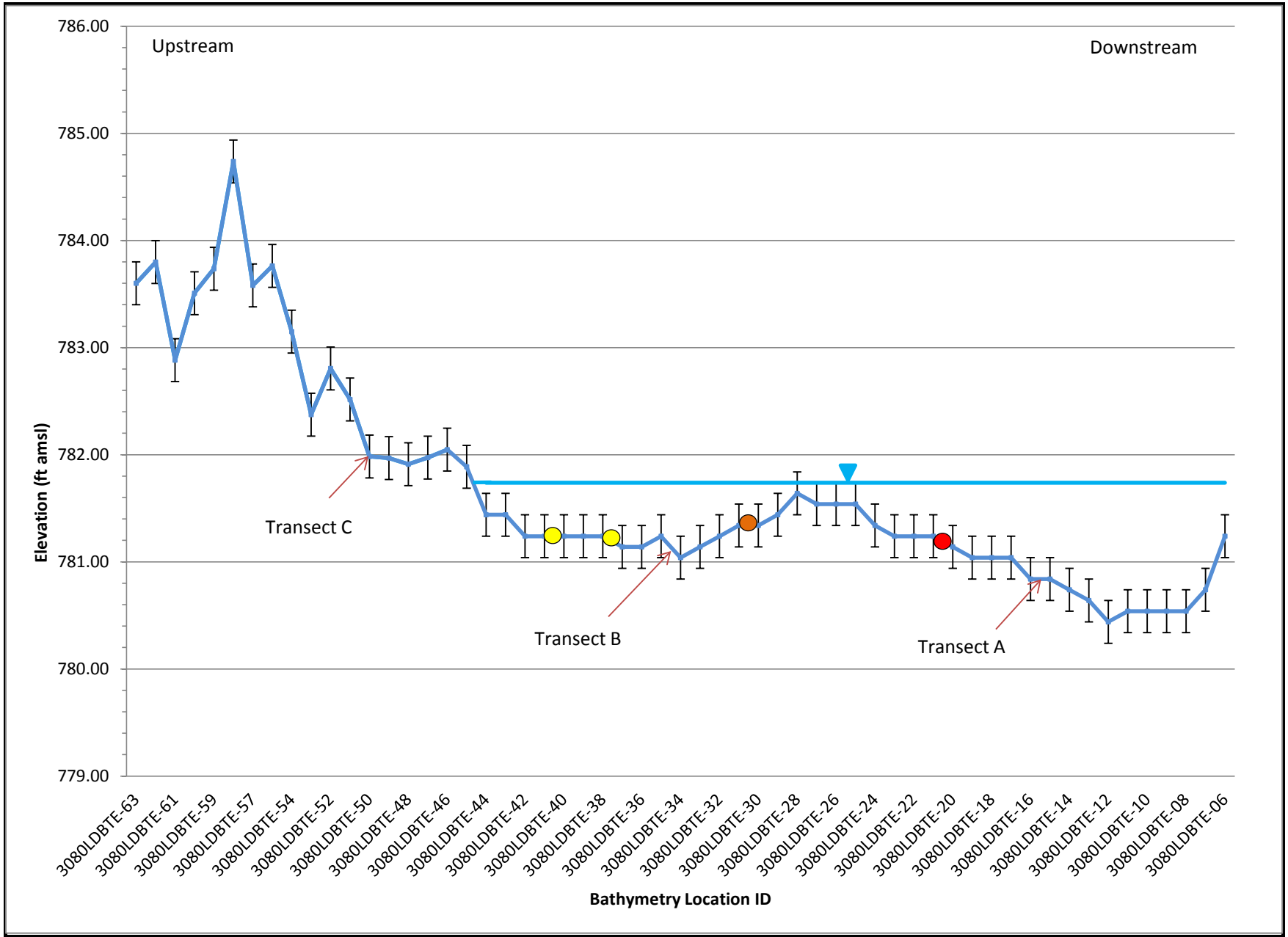
Scale in Feet

FIGURE 2i-23
PHASE II SEDIMENT TRAP BATHYMETRY
MP 30.80 LDB
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

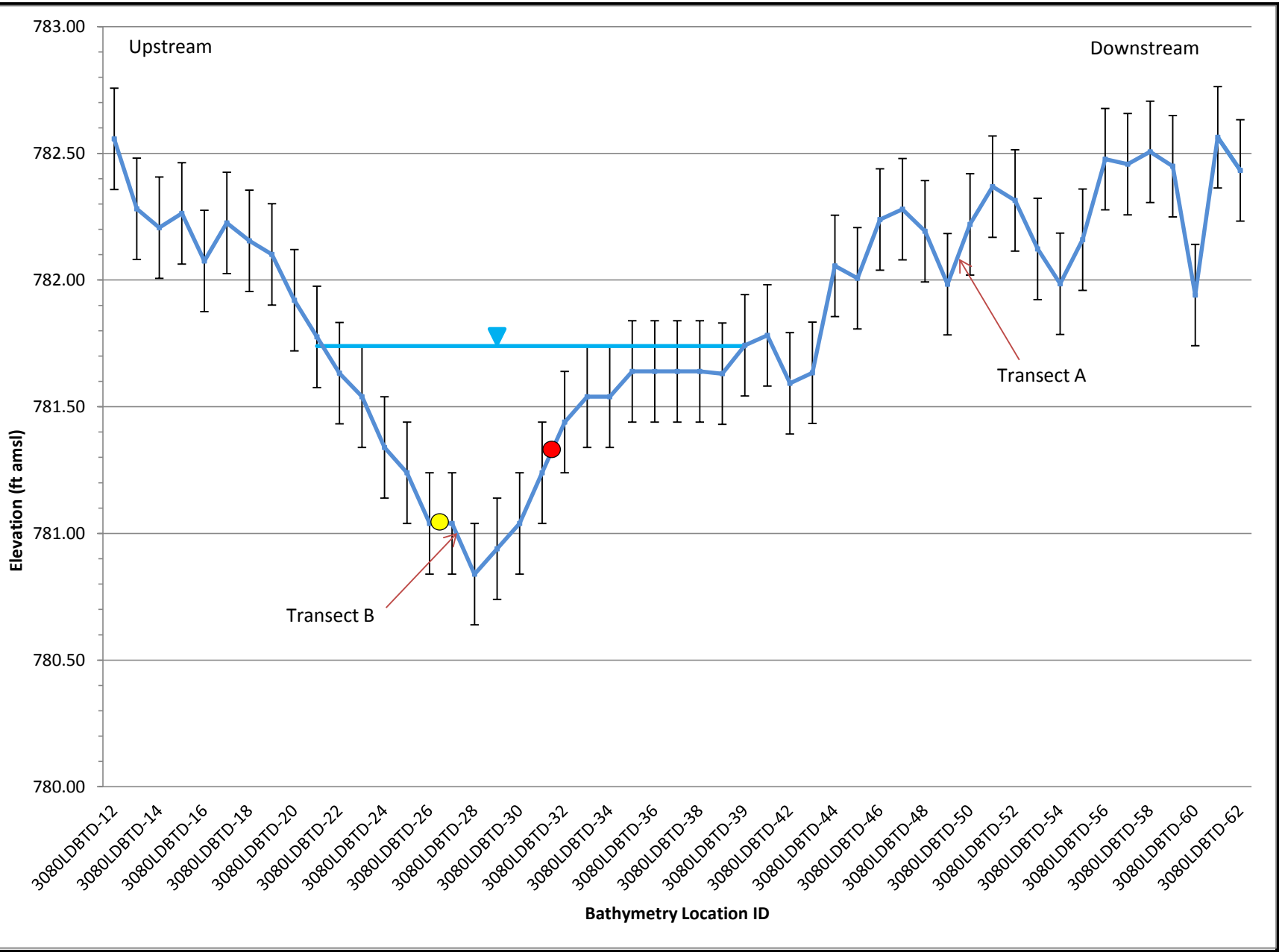
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-24
SEDIMENT TRAP BATHYMETRY DATA
MP 30.80 LDB TRANSECT E
SHEET 1 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



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Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

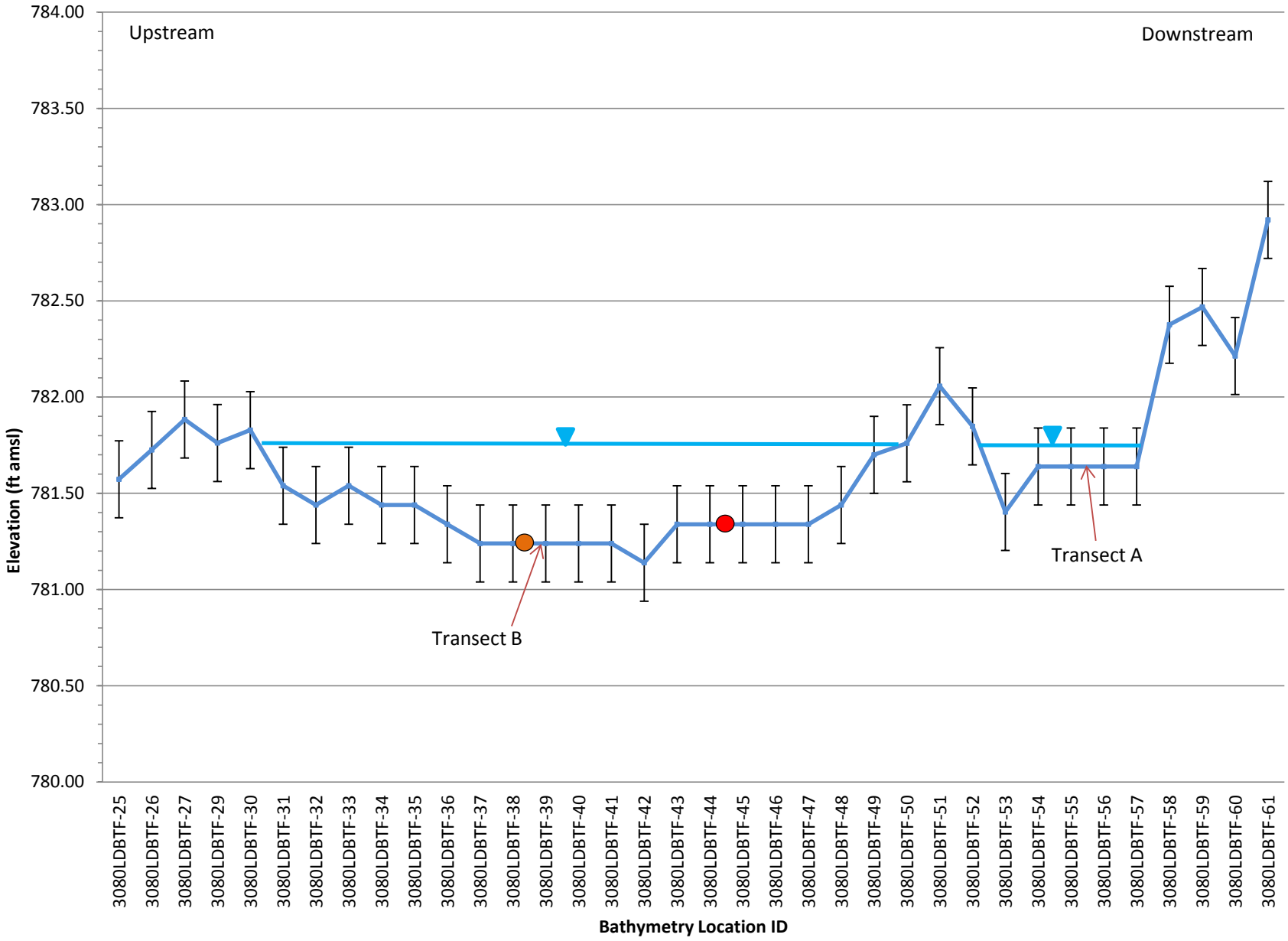
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-24
SEDIMENT TRAP BATHYMETRY DATA
MP 30.80 LDB TRANSECT D
SHEET 2 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

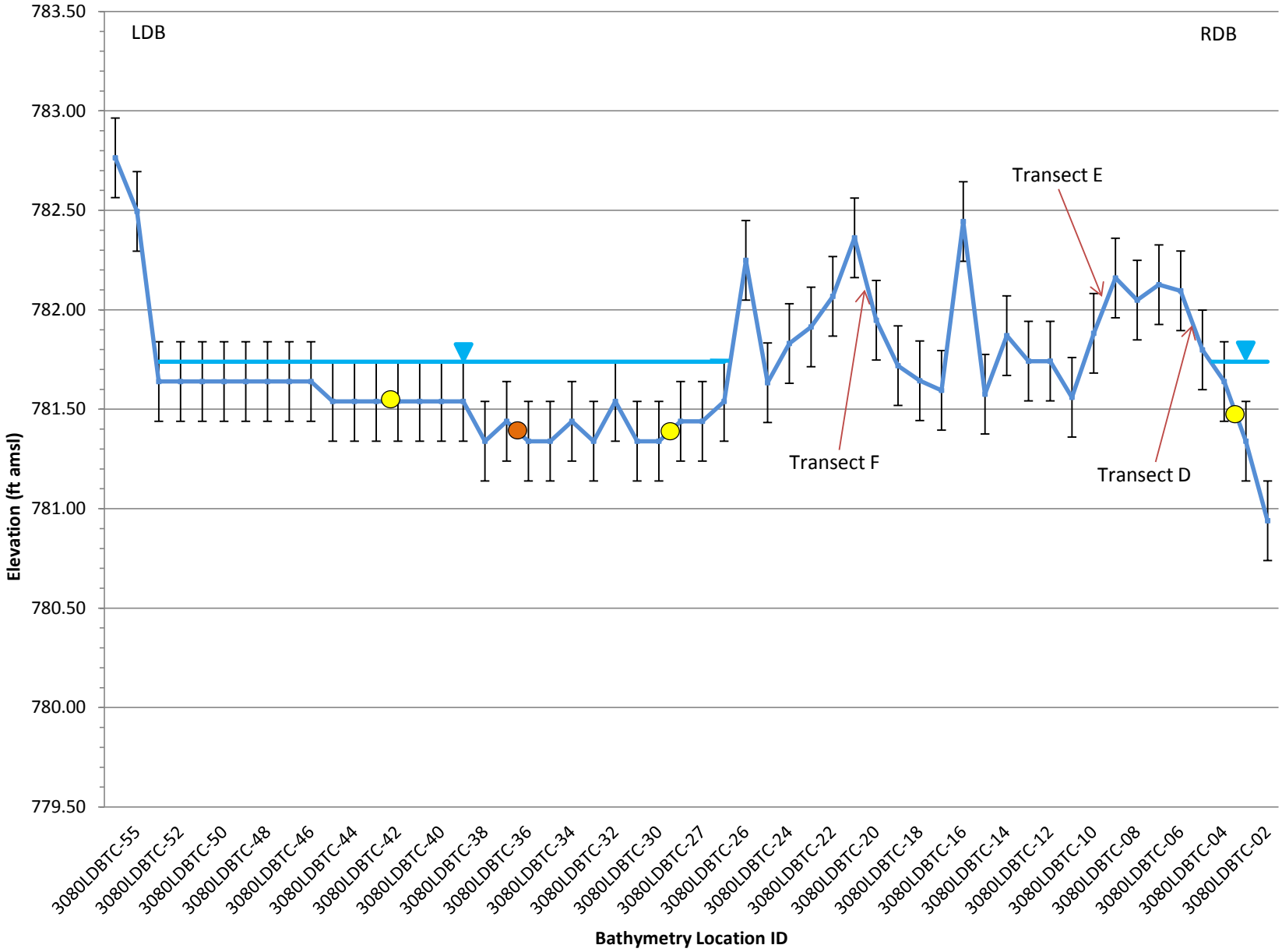
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-24
SEDIMENT TRAP BATHYMETRY DATA
MP 30.80 LDB TRANSECT F
SHEET 3 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

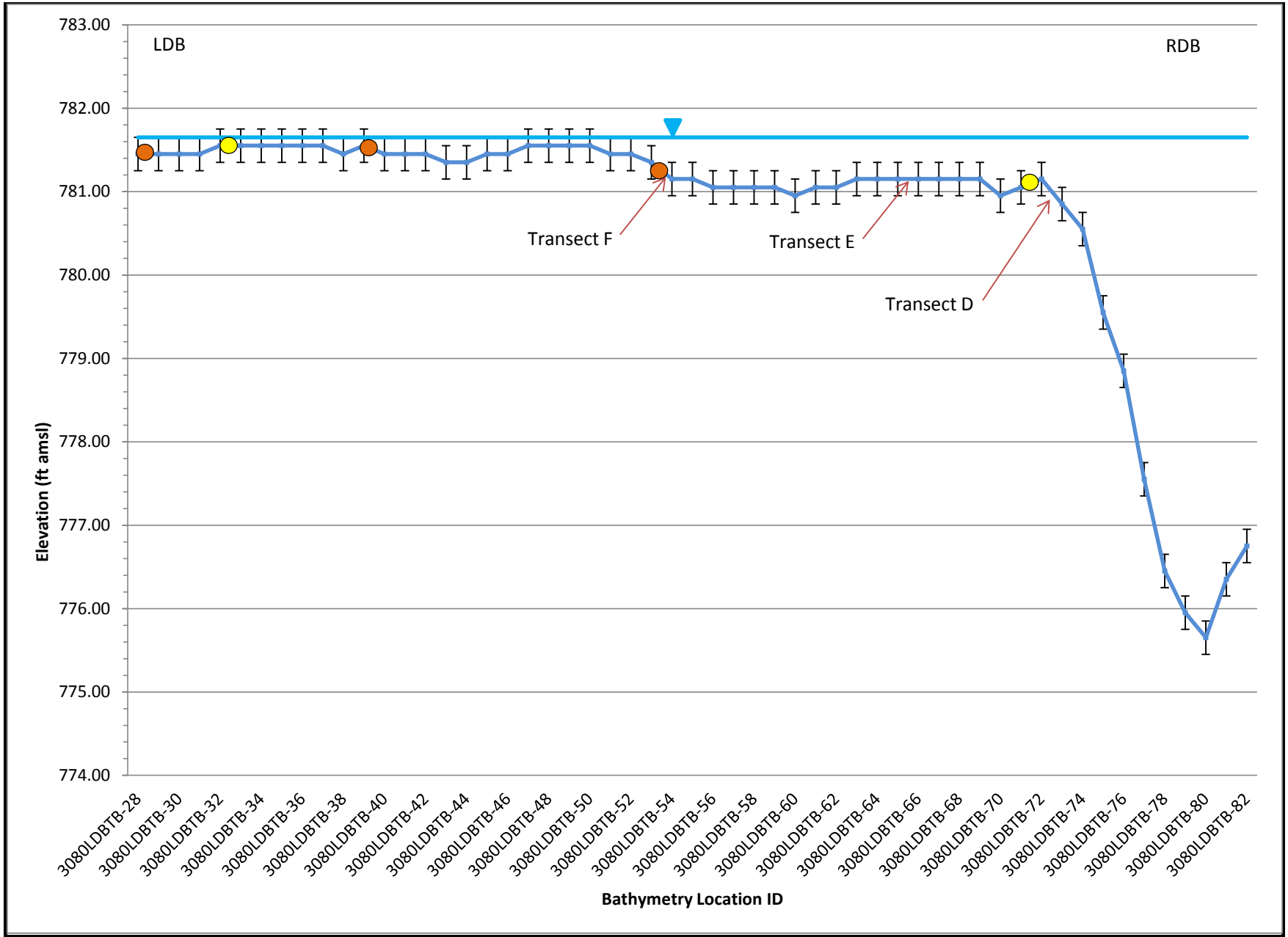
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-24
SEDIMENT TRAP BATHYMETRY DATA
MP 30.80 LDB TRANSECT C
SHEET 4 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

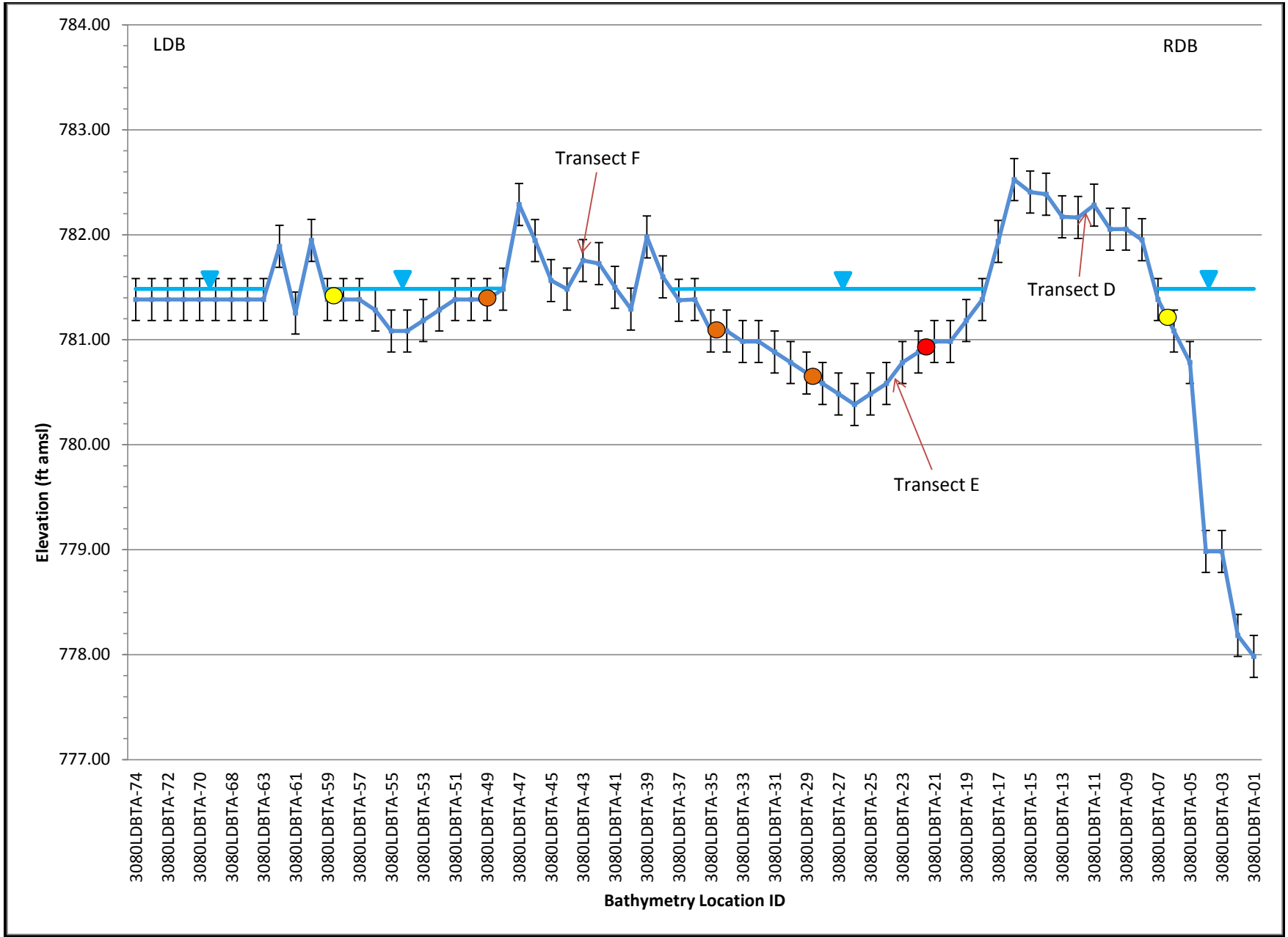
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-24
SEDIMENT TRAP BATHYMETRY DATA
MP 30.80 LDB TRANSECT B
SHEET 5 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

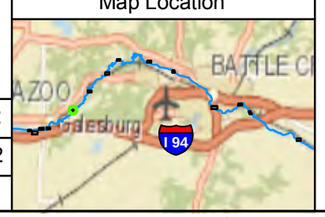
FIGURE 2i-24
SEDIMENT TRAP BATHYMETRY DATA
MP 30.80 LDB TRANSECT A
SHEET 6 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 20 40 80

Scale in Feet

FIGURE 2i-25
PHASE II SEDIMENT TRAP BATHYMETRY
MP 33.00 A
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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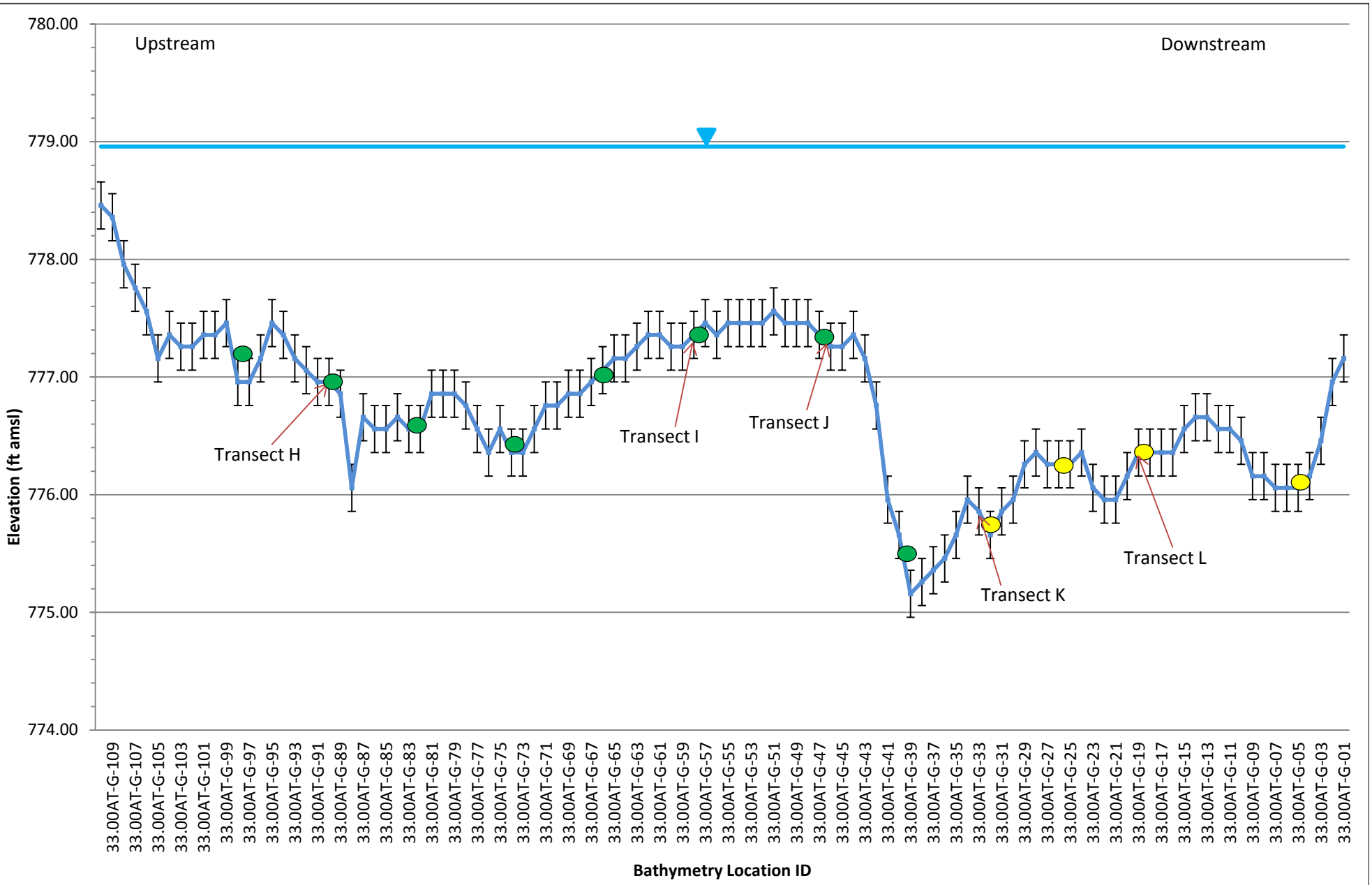
Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

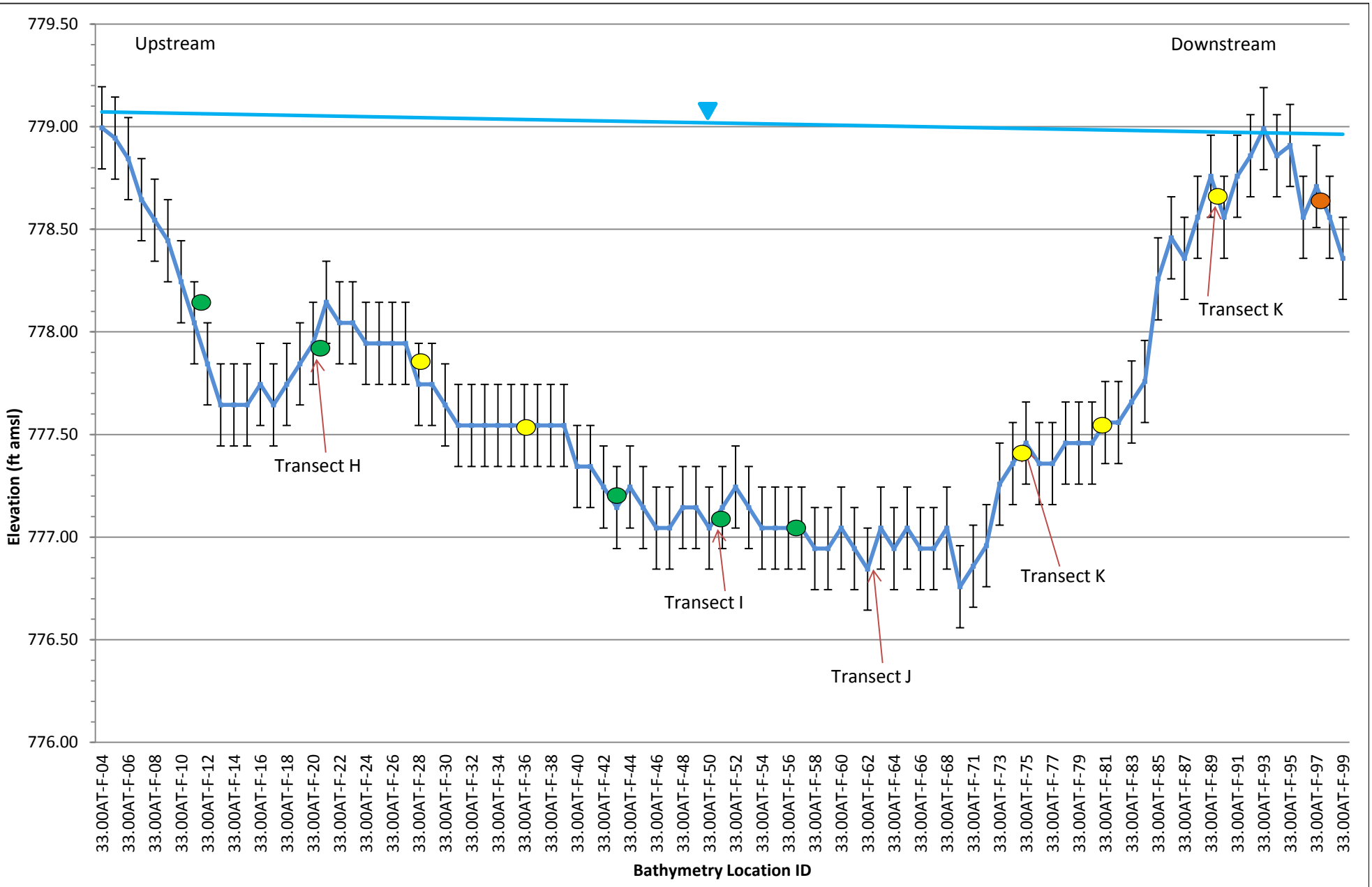
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT G
SHEET 1 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

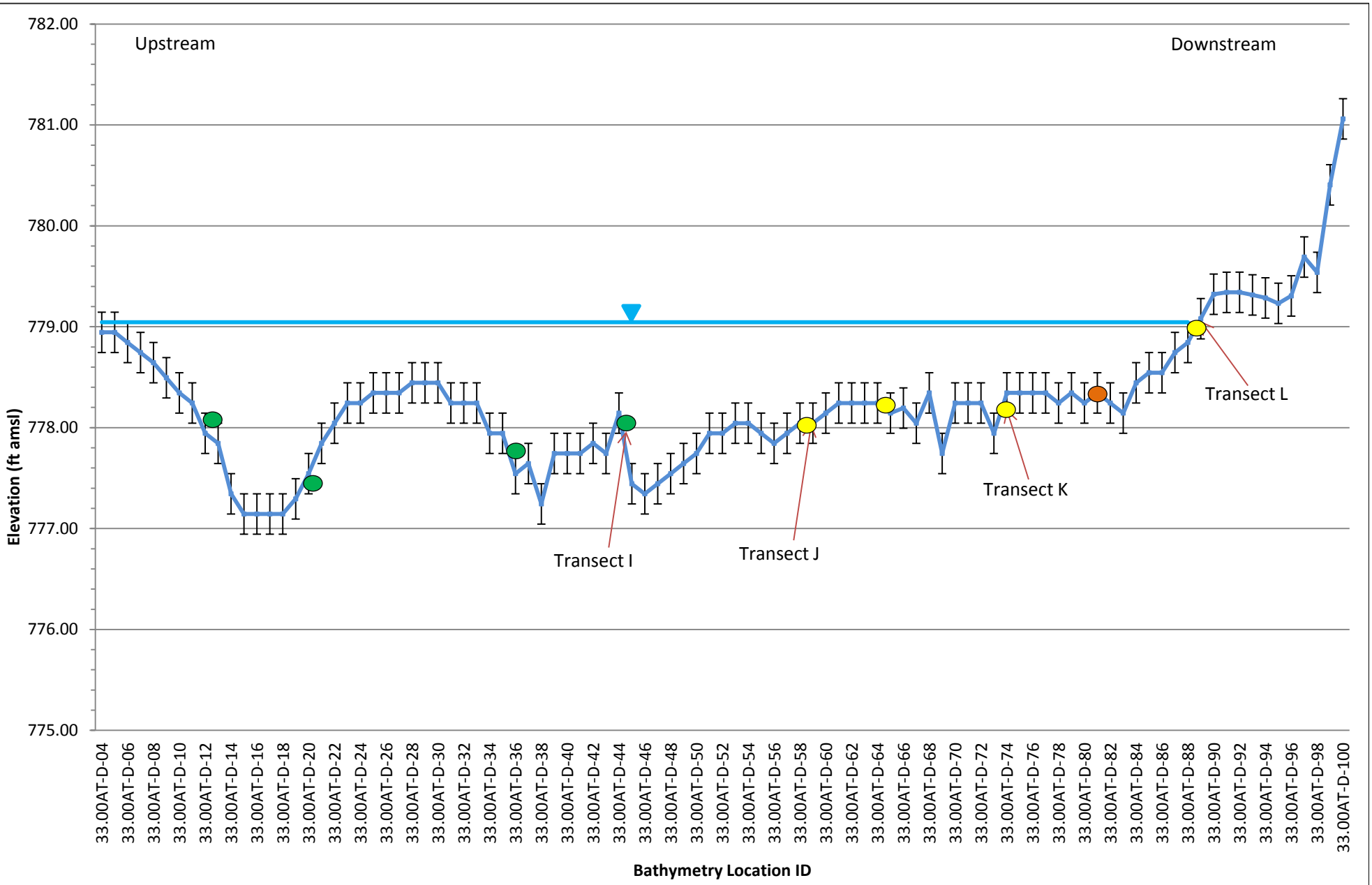
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT F
SHEET 2 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

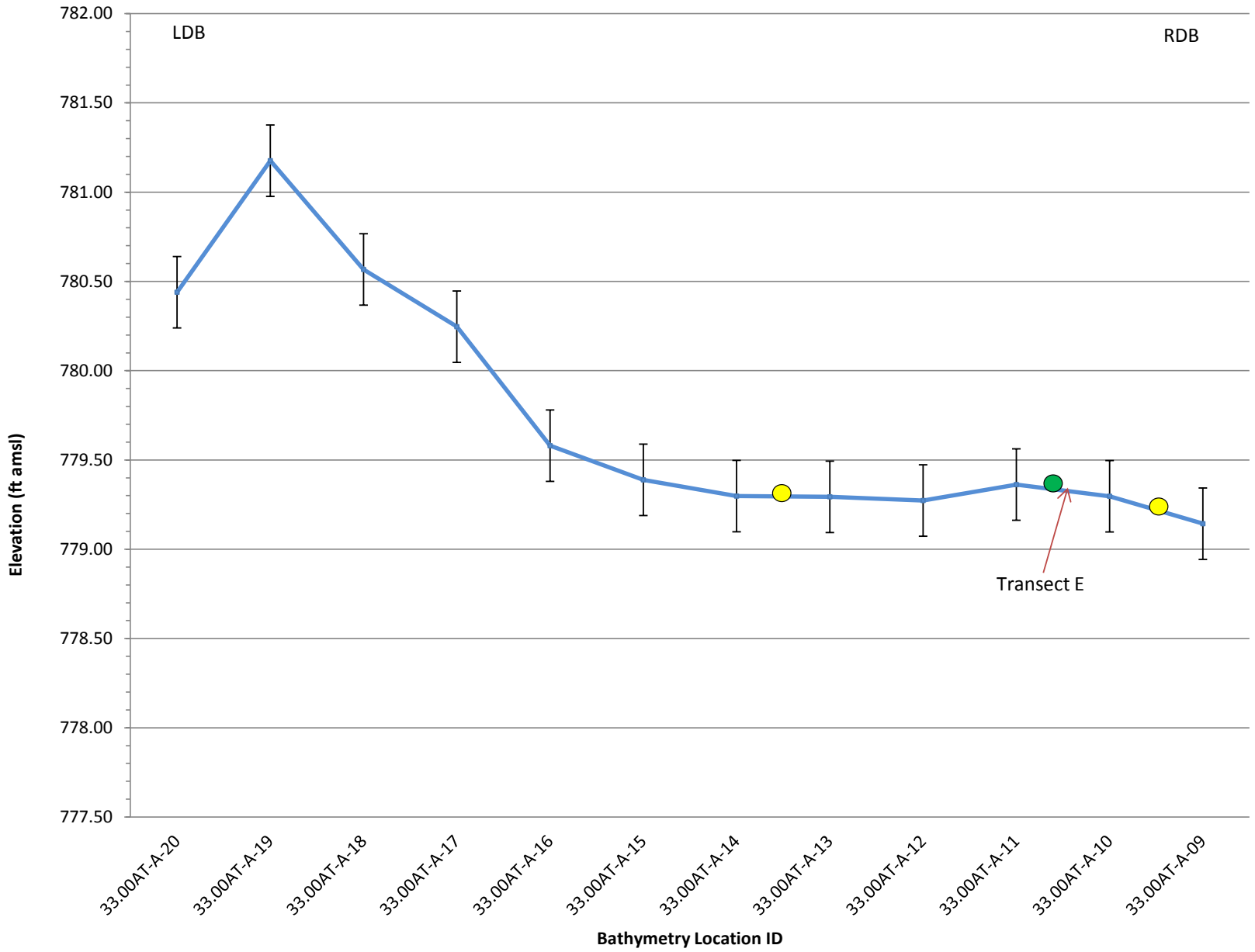
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT D
SHEET 3 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

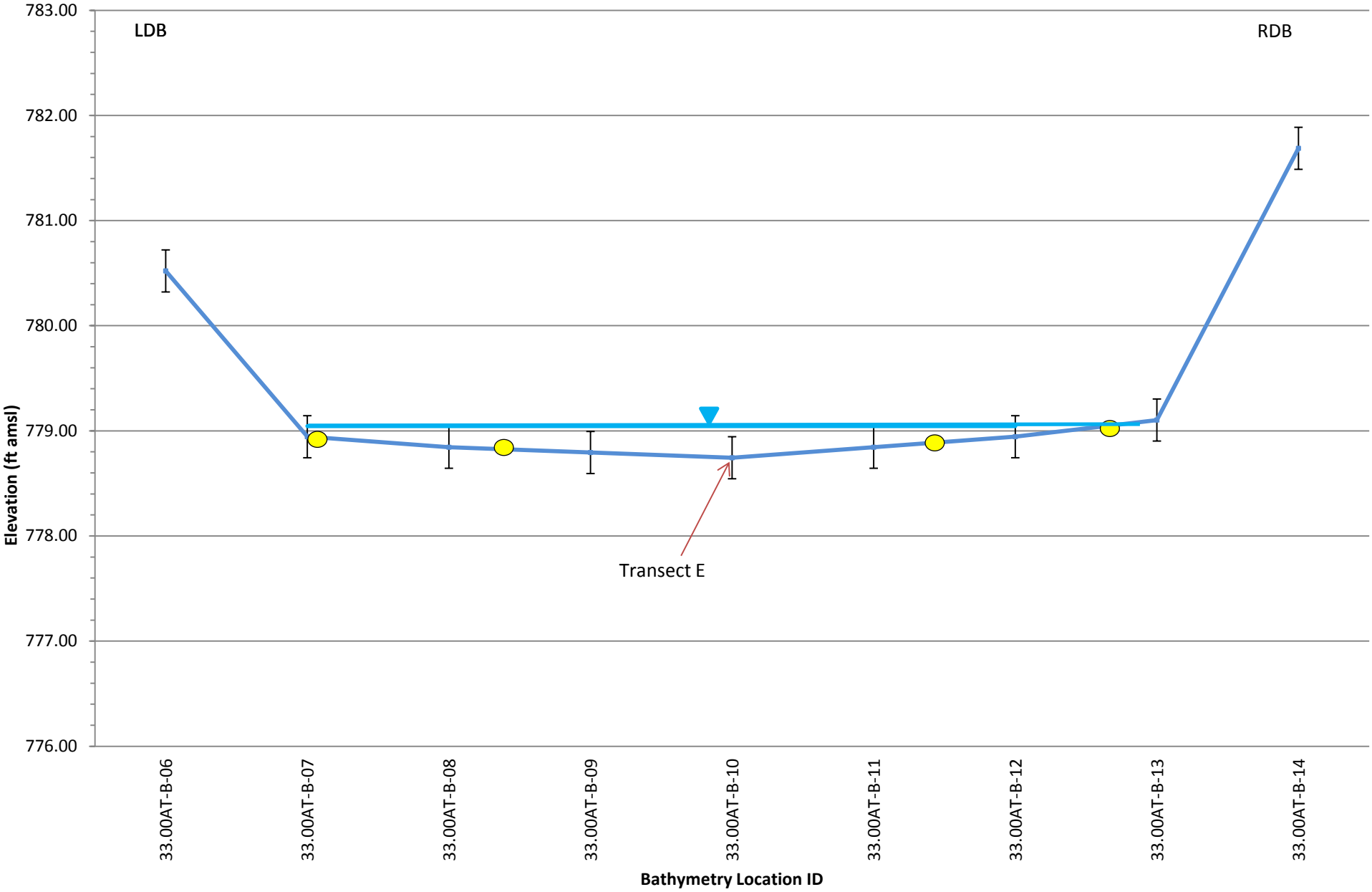
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT A
SHEET 4 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

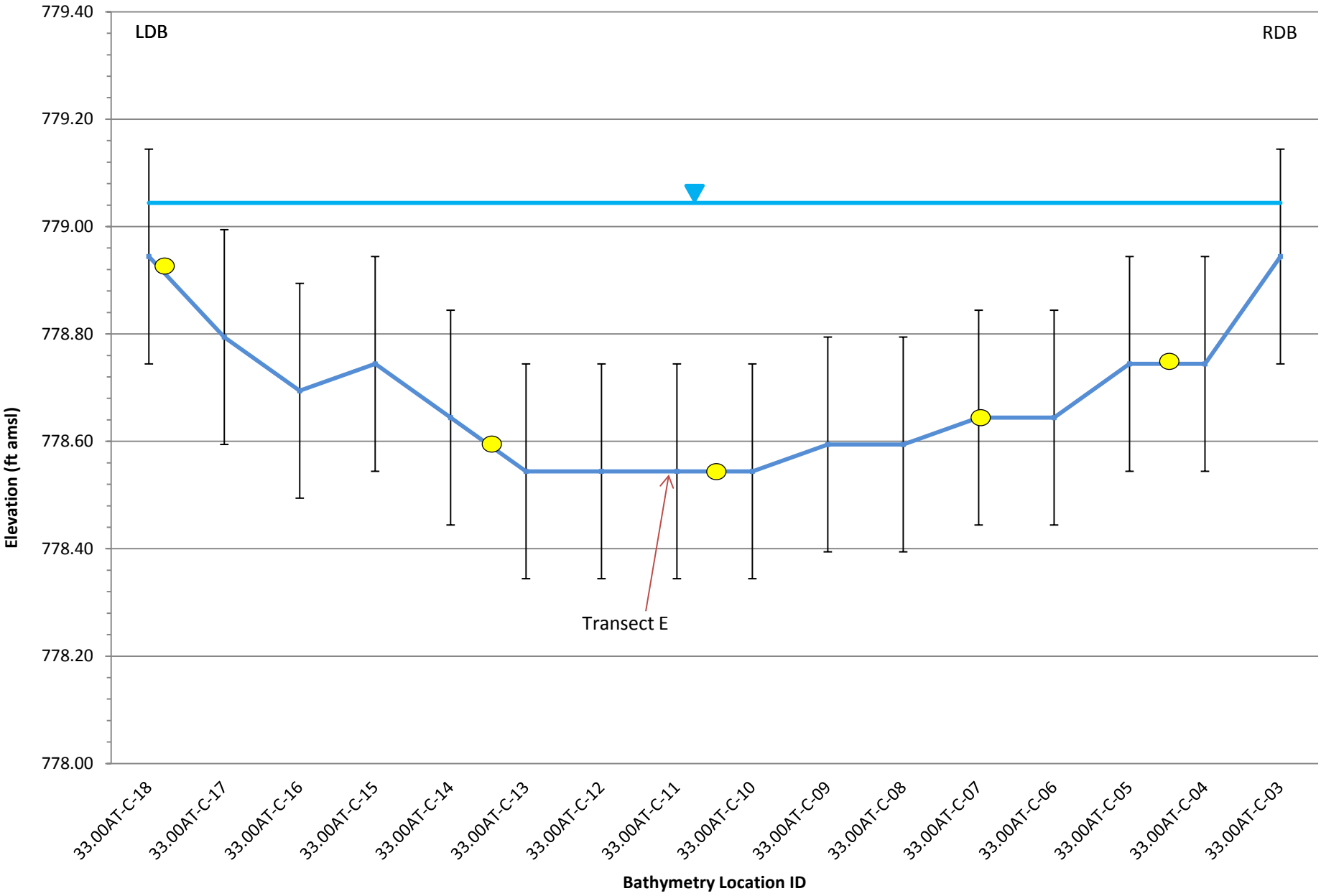
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT B
SHEET 5 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

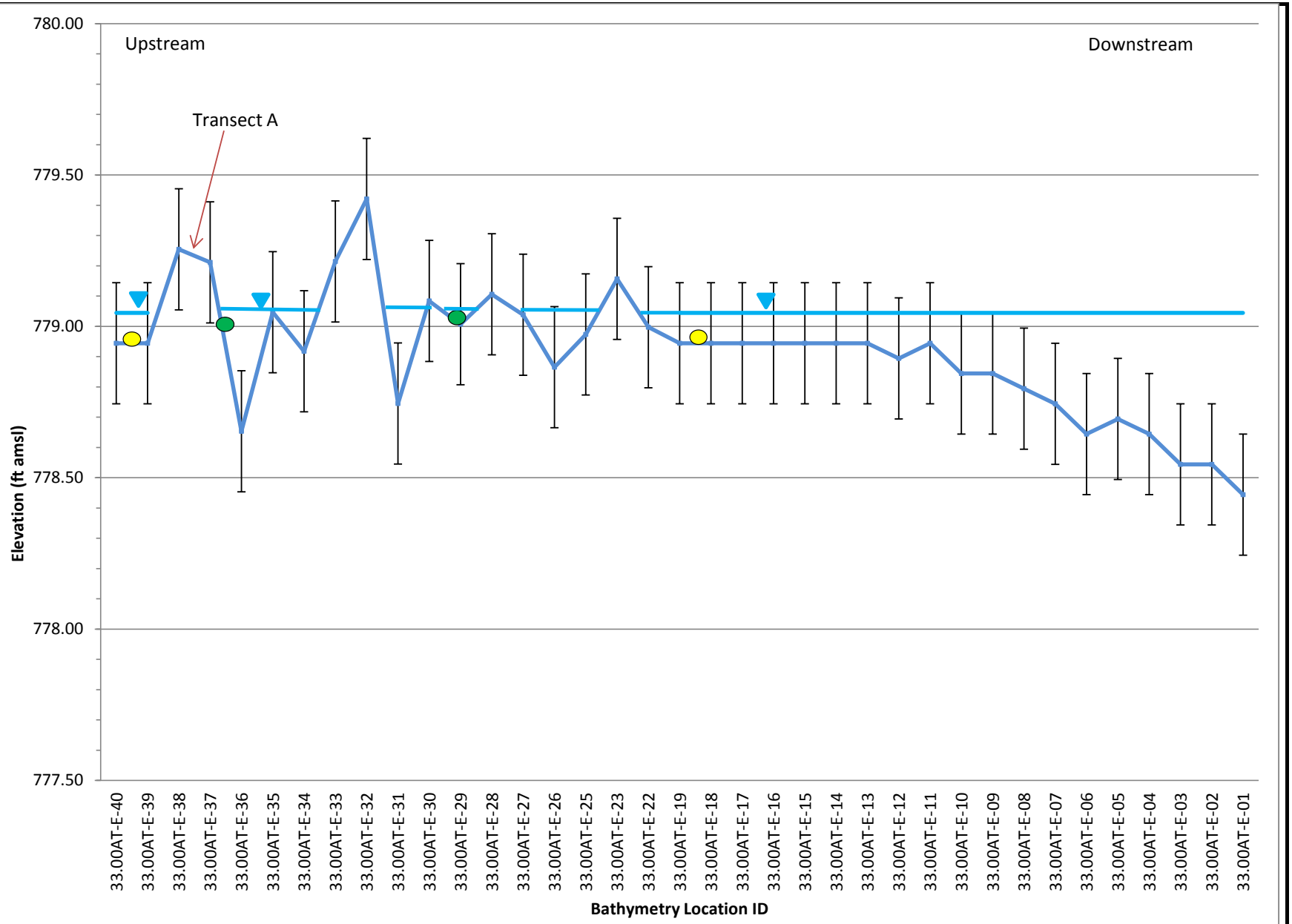
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT C
SHEET 6 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

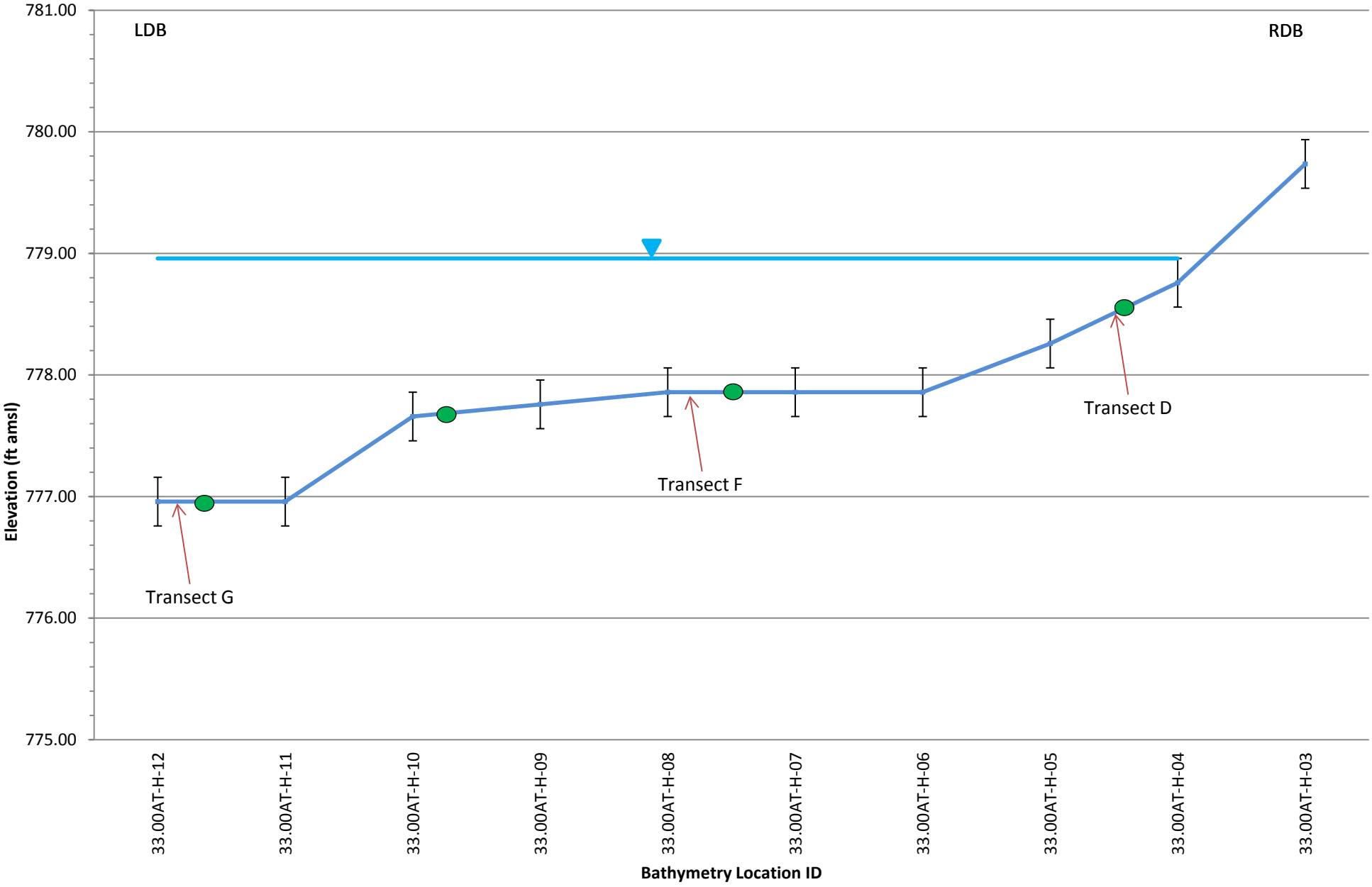
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT E
SHEET 7 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

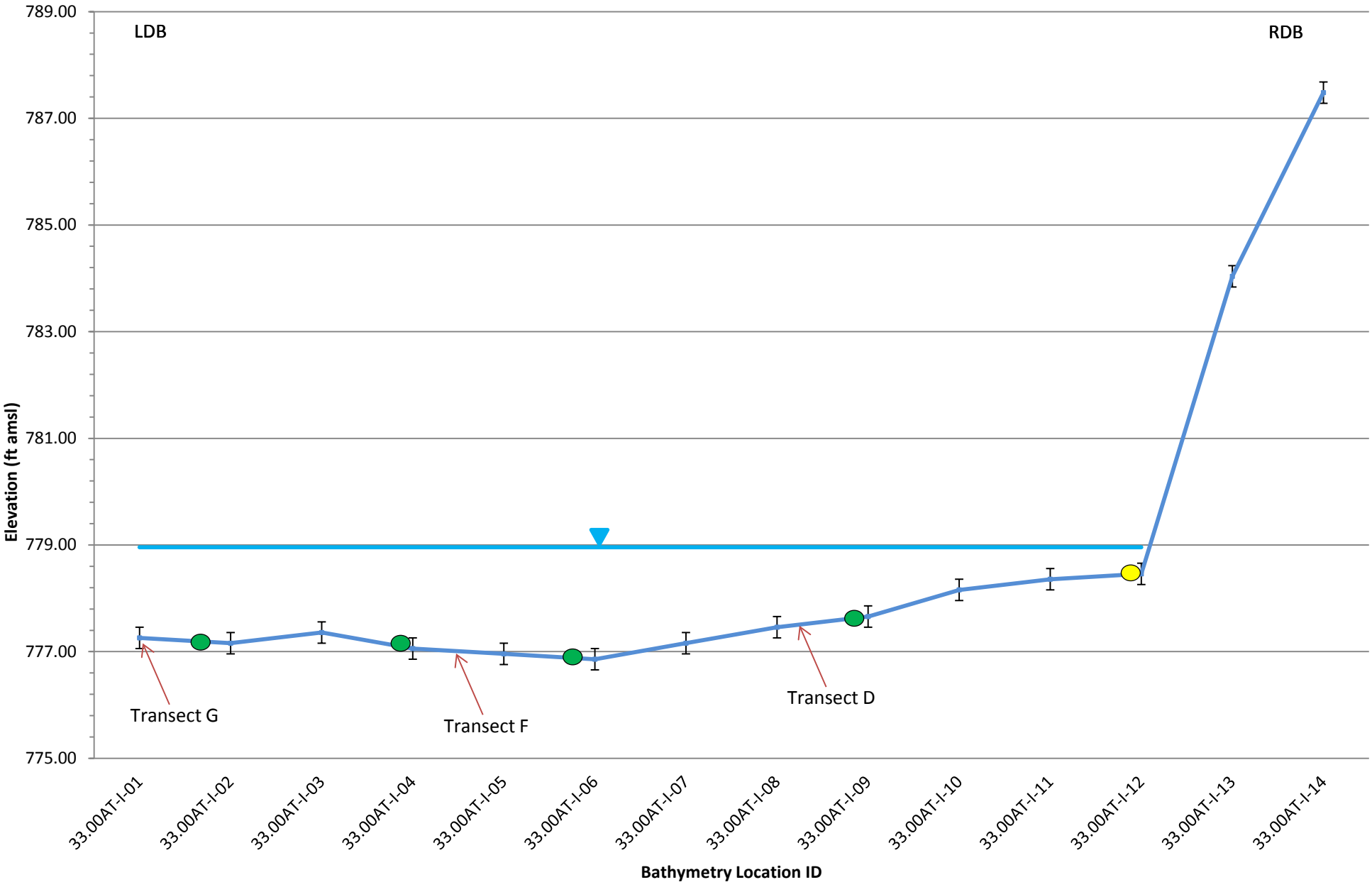
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT H
SHEET 8 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

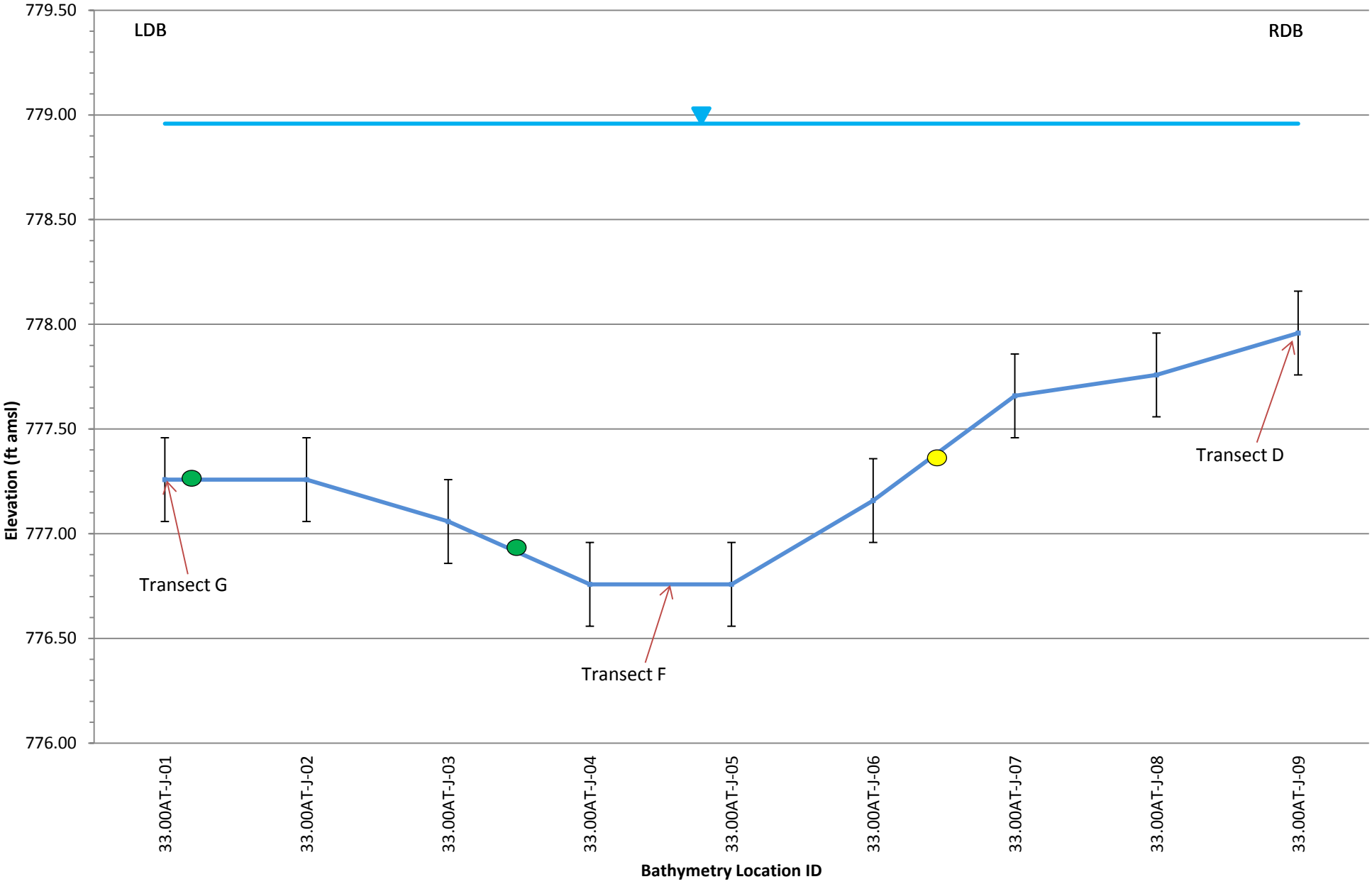
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT I
SHEET 9 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

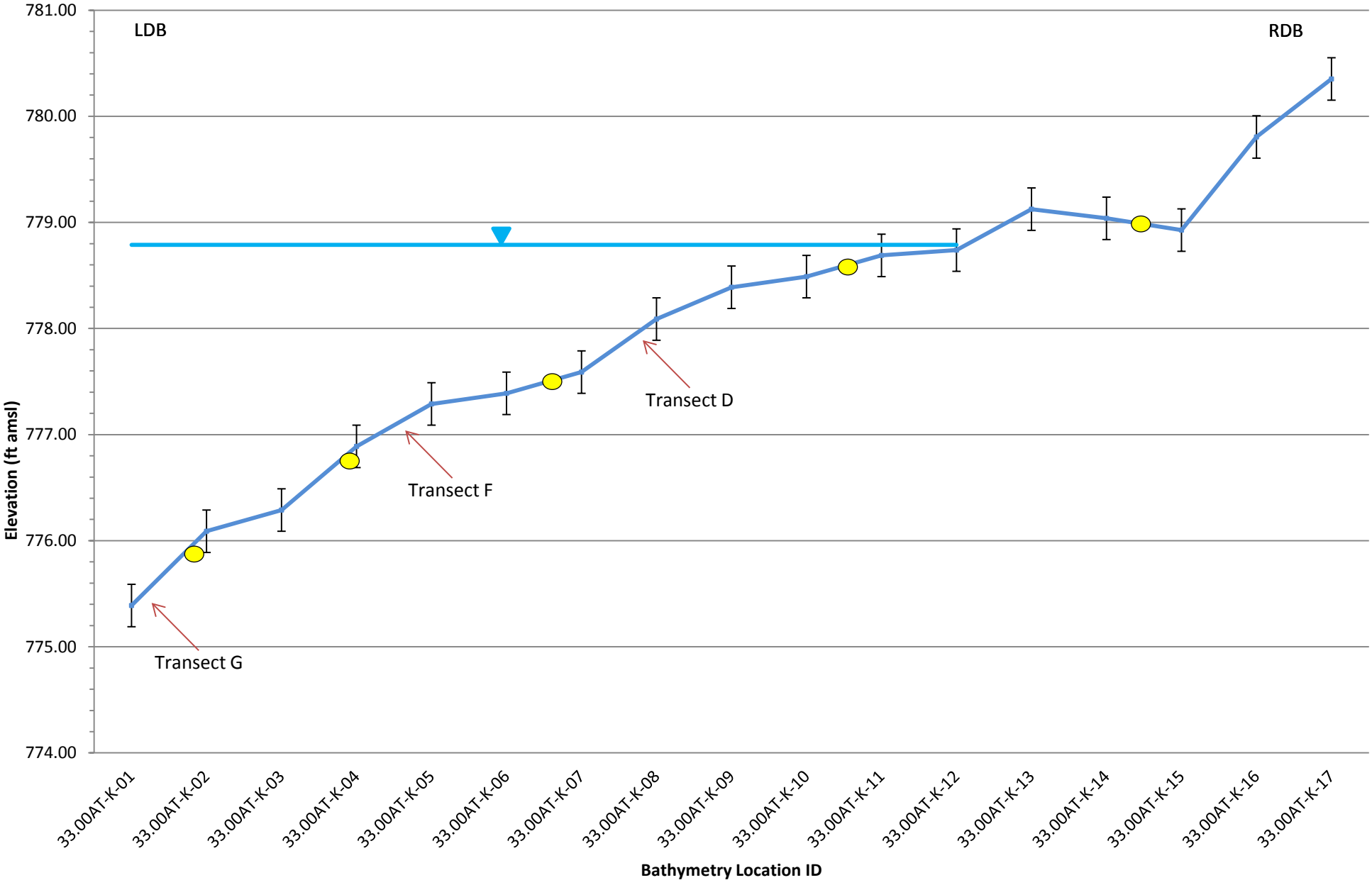
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT J
SHEET 10 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

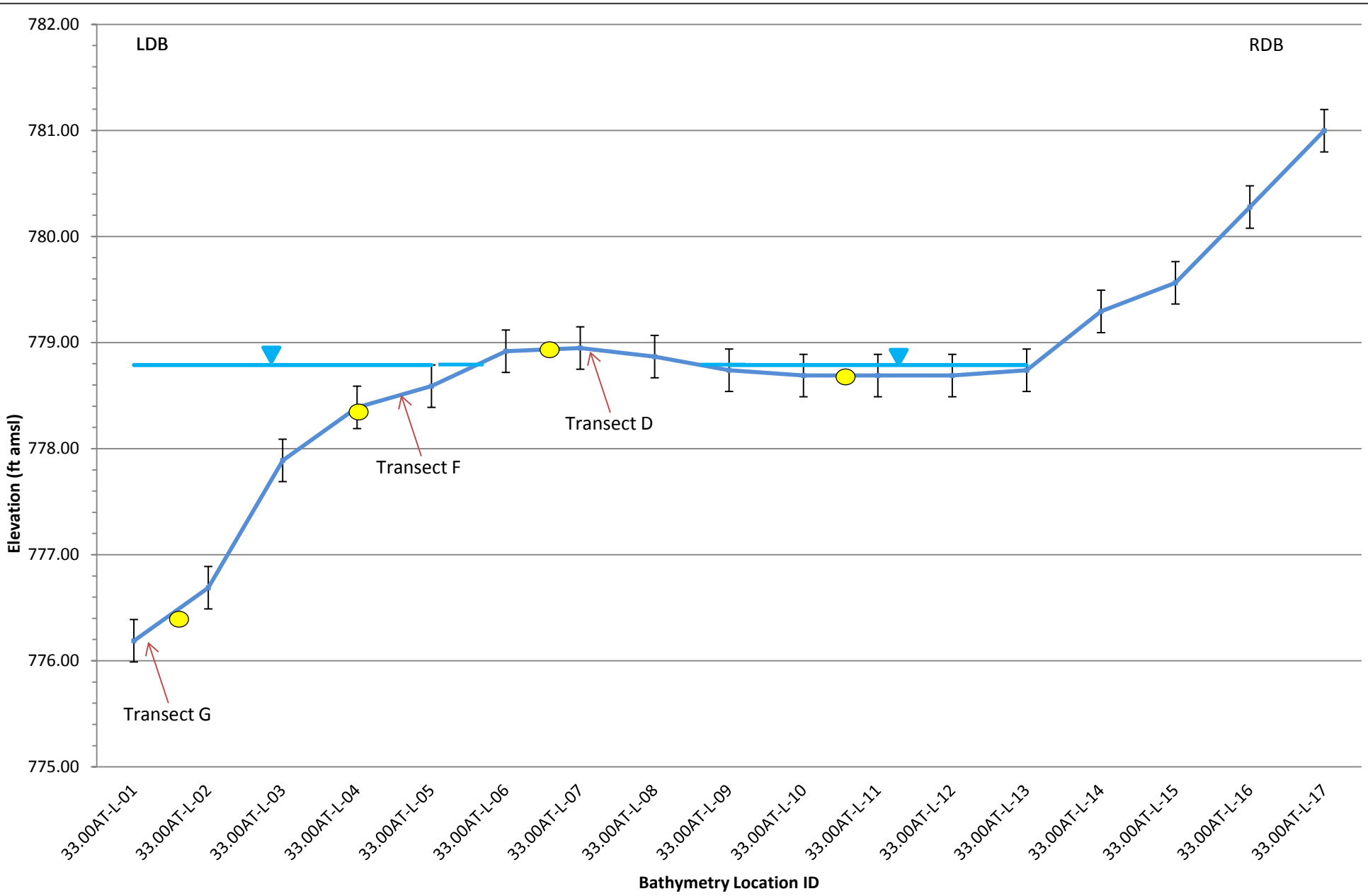
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT K
SHEET 11 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-26
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 A TRANSECT L
SHEET 12 OF 12
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP

Transect I
Transect D
Transect J
Transect E
Transect F
Transect H
Transect C
Transect K
Transect A
Transect B
Transect G
33.00
River Flow Direction

ENBRIDGE		
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 35 70 140

Scale in Feet

FIGURE 2i-27
PHASE II SEDIMENT TRAP BATHYMETRY
MP 33.00 B
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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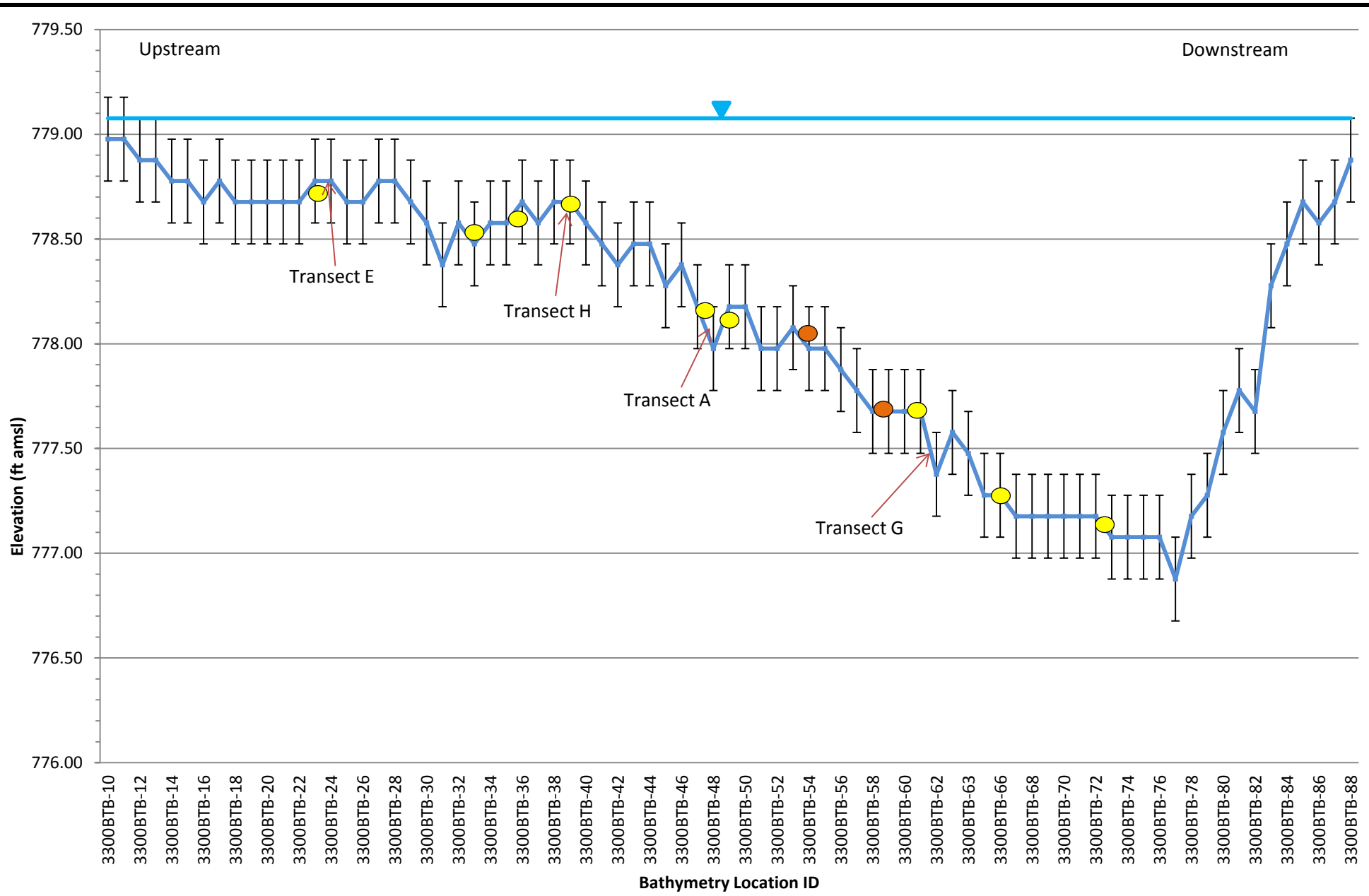
Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

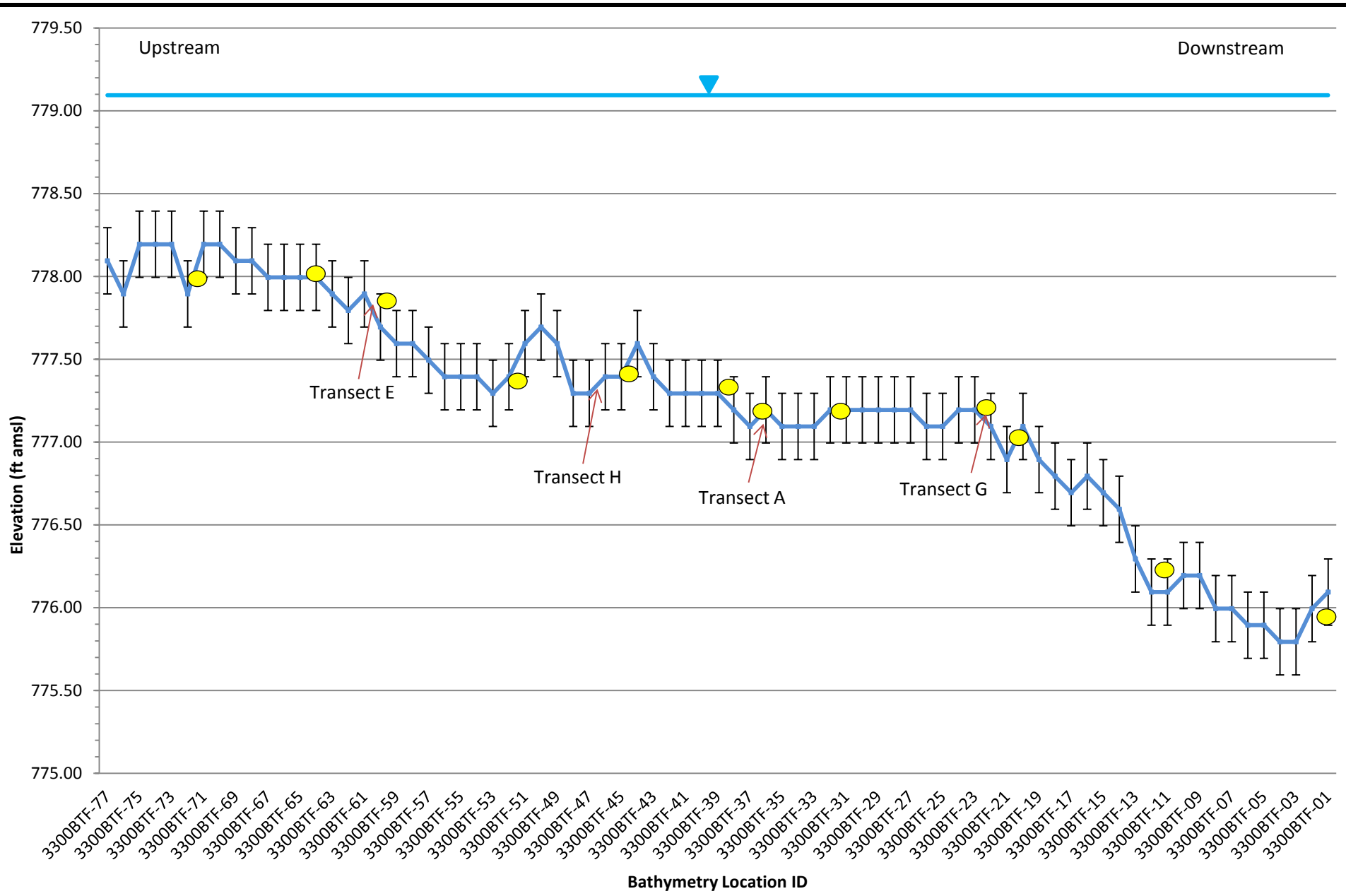
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-28
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 B TRANSECT B
SHEET 1 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

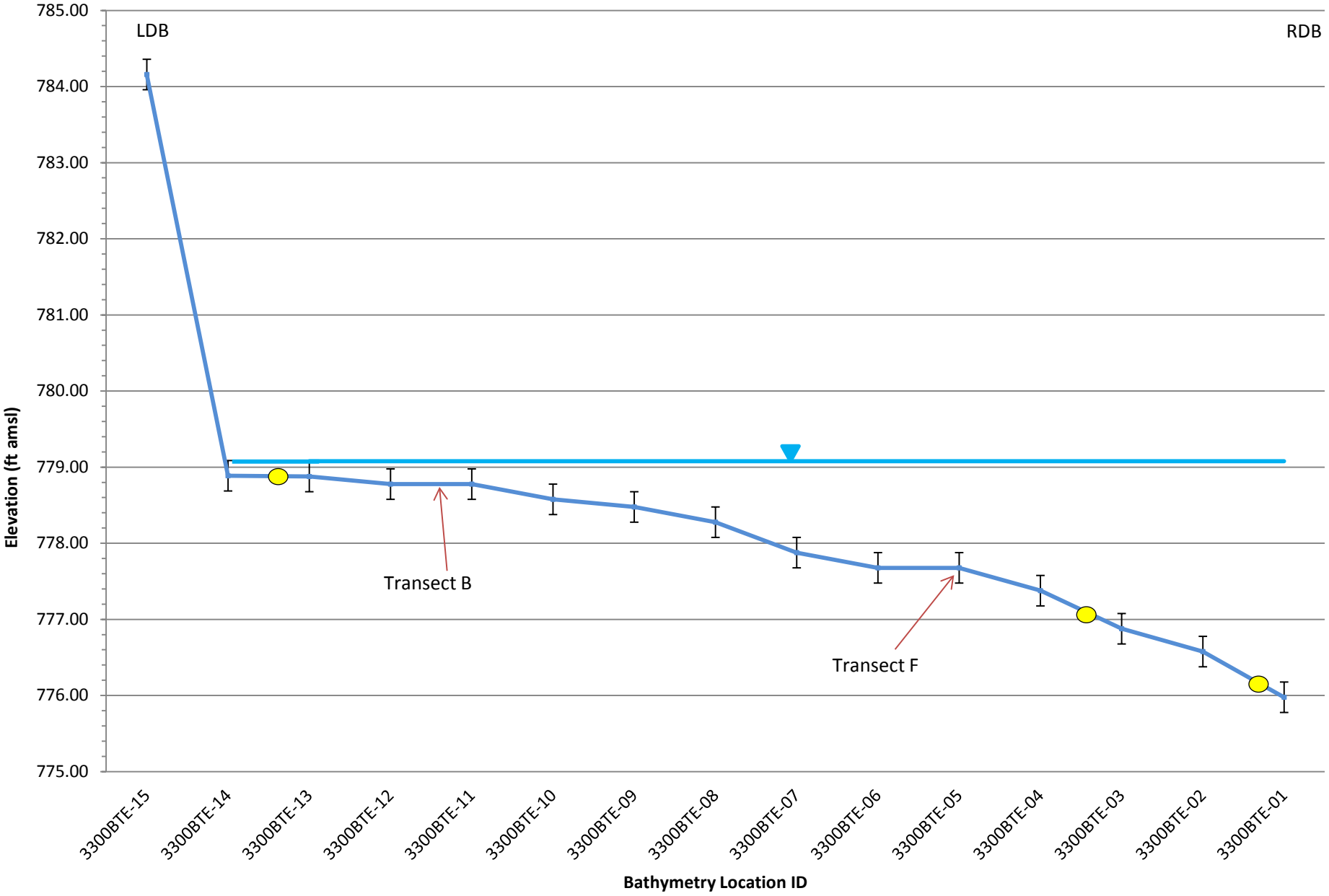
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-28
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 B TRANSECT F
SHEET 2 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

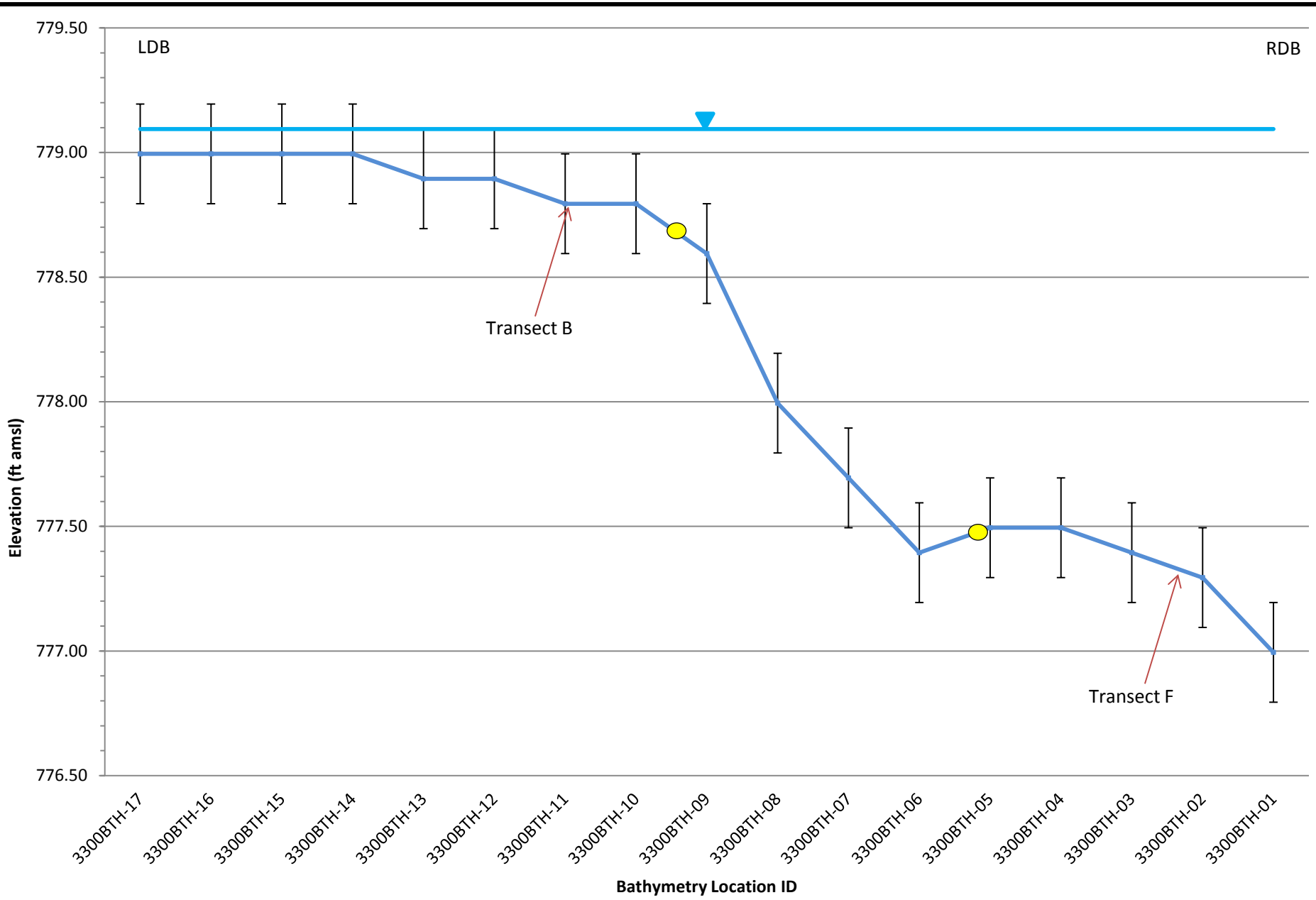
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-28
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 B TRANSECT E
SHEET 3 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

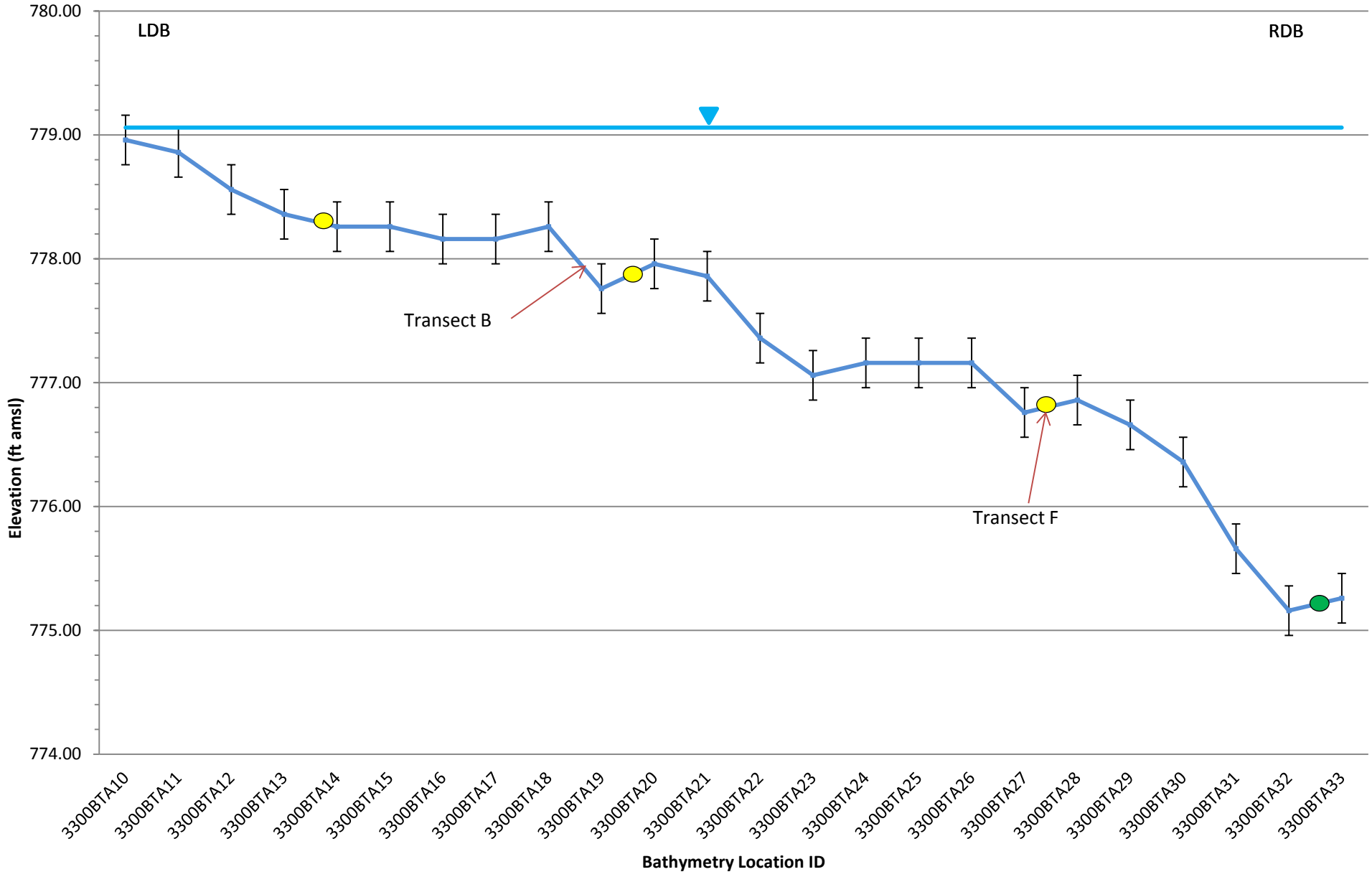
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-28
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 B TRANSECT H
SHEET 4 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

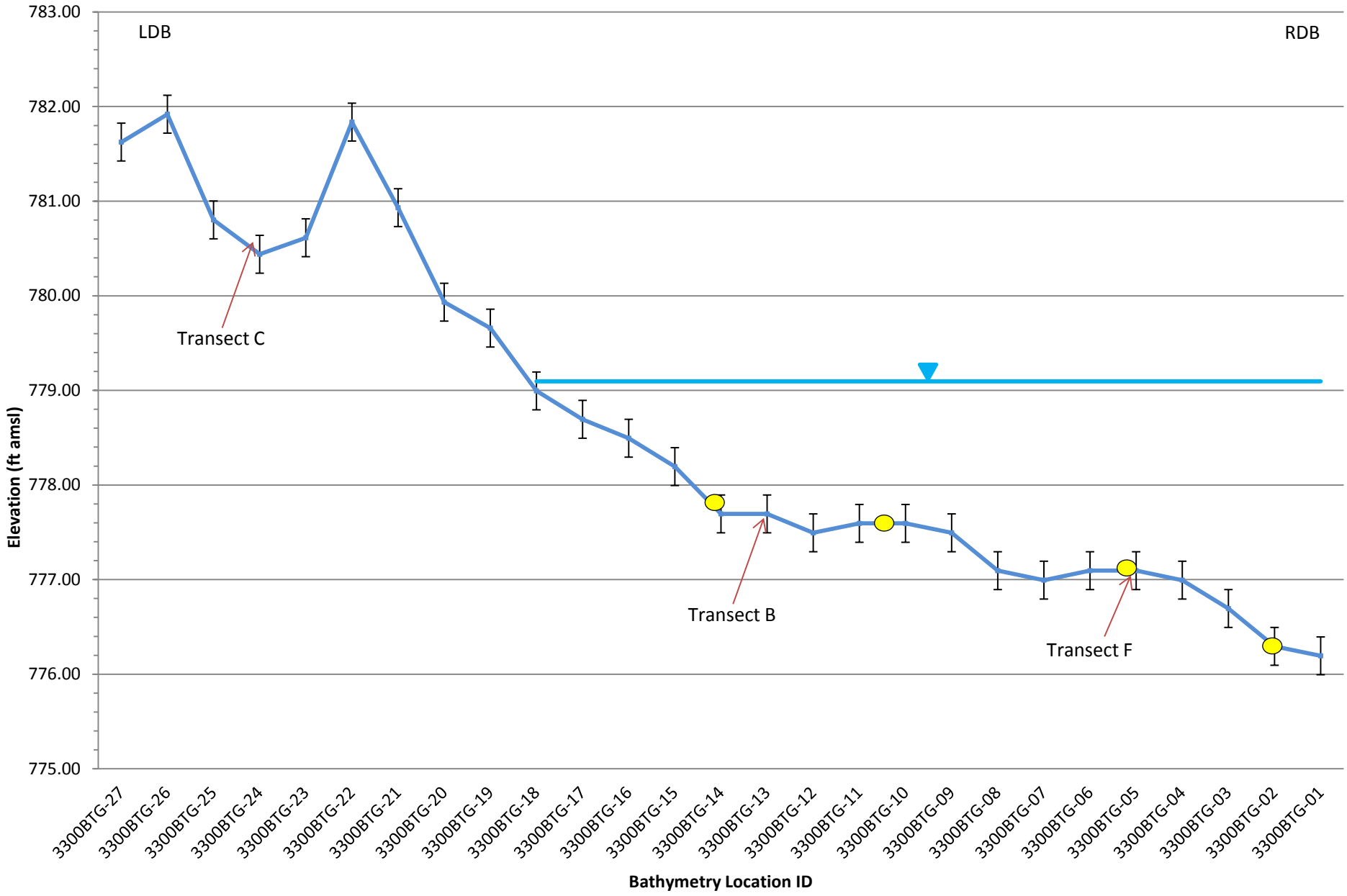
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-28
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 B TRANSECT A
SHEET 5 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



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Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-28
SEDIMENT TRAP BATHYMETRY DATA
MP 33.00 B TRANSECT G
SHEET 6 OF 6
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 50 100 200

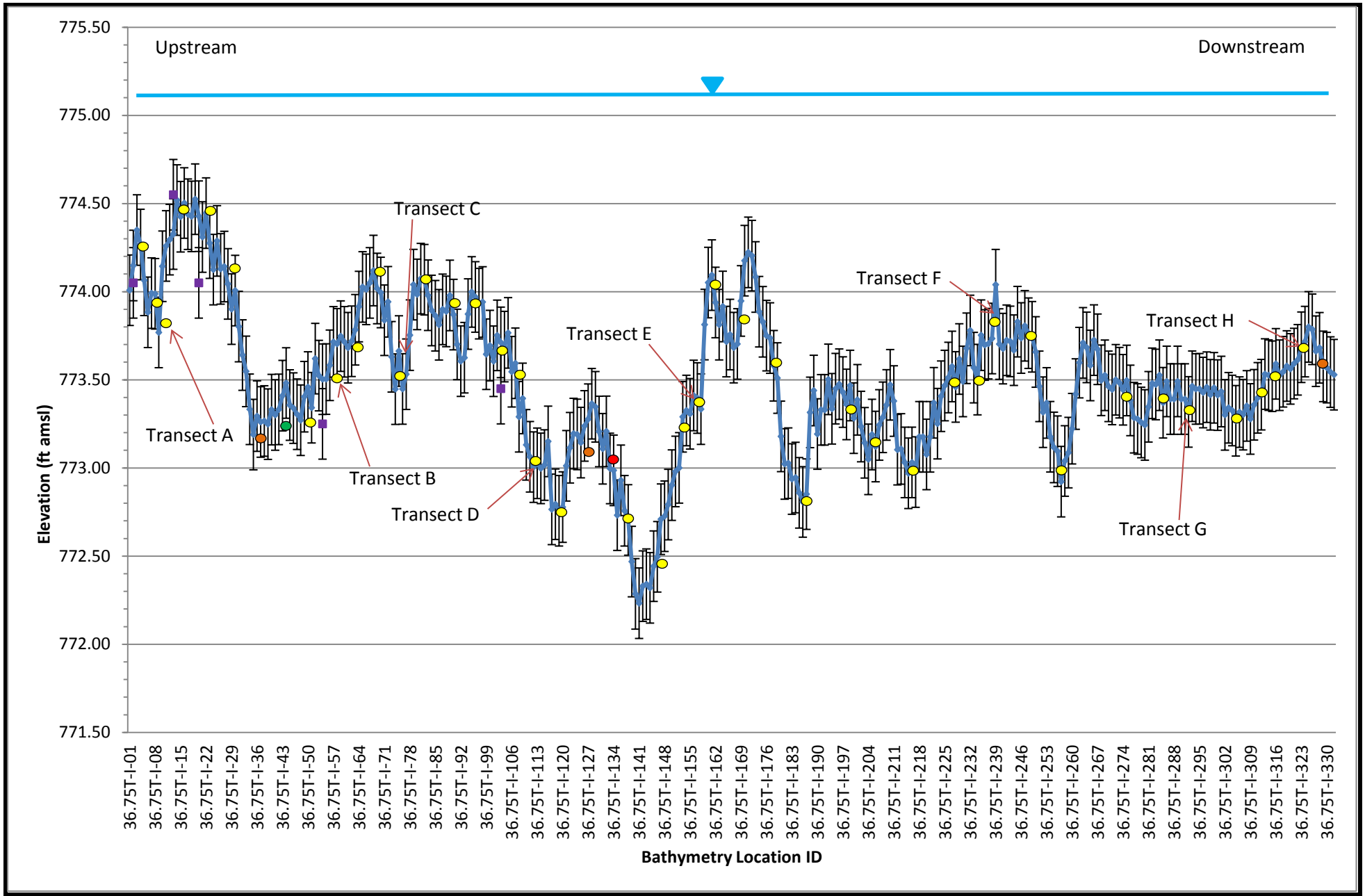
Scale in Feet

FIGURE 2i-29
PHASE II SEDIMENT TRAP BATHYMETRY
DELTA A/MP 36.75
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

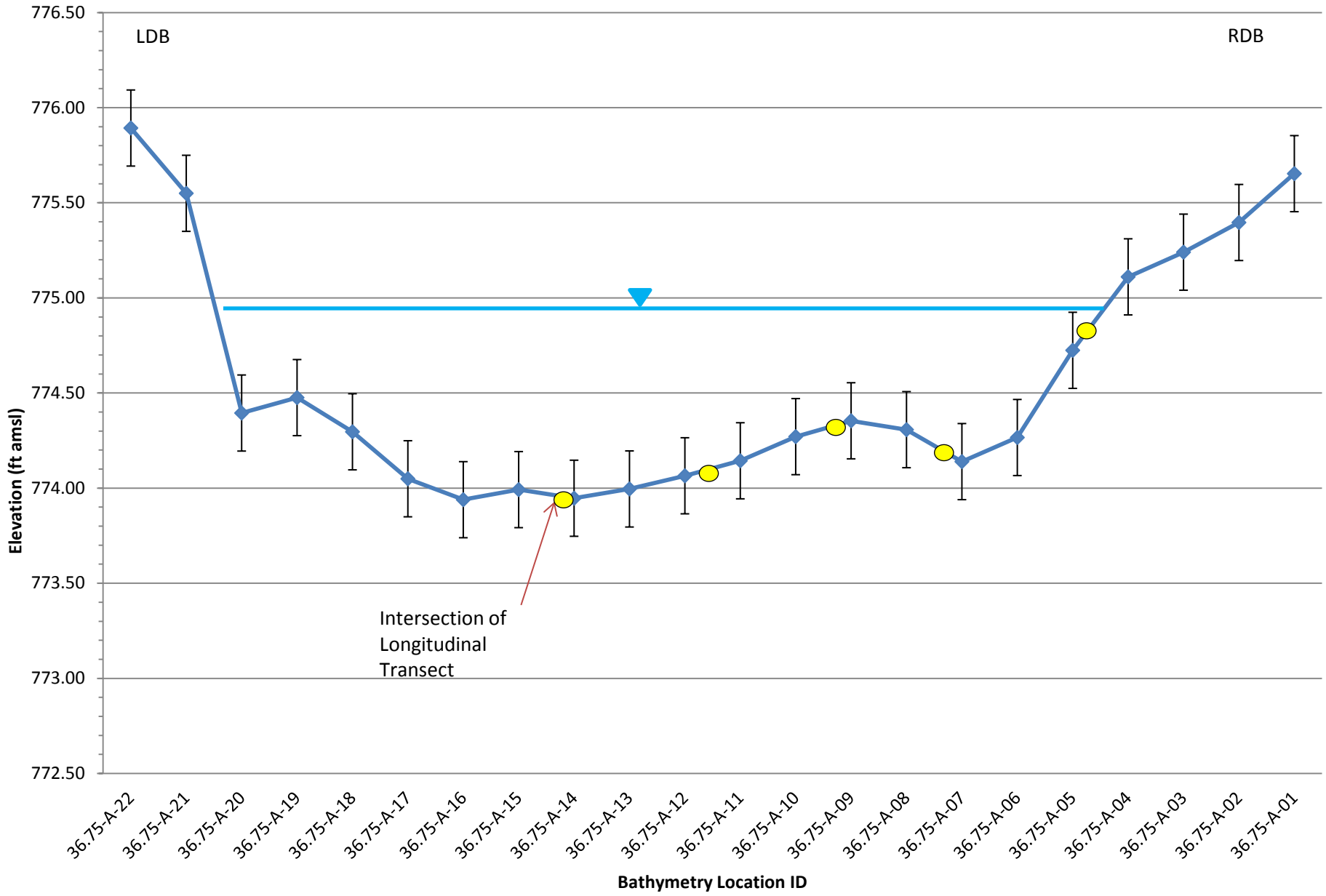
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A LONGITUDINAL
SHEET 1 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

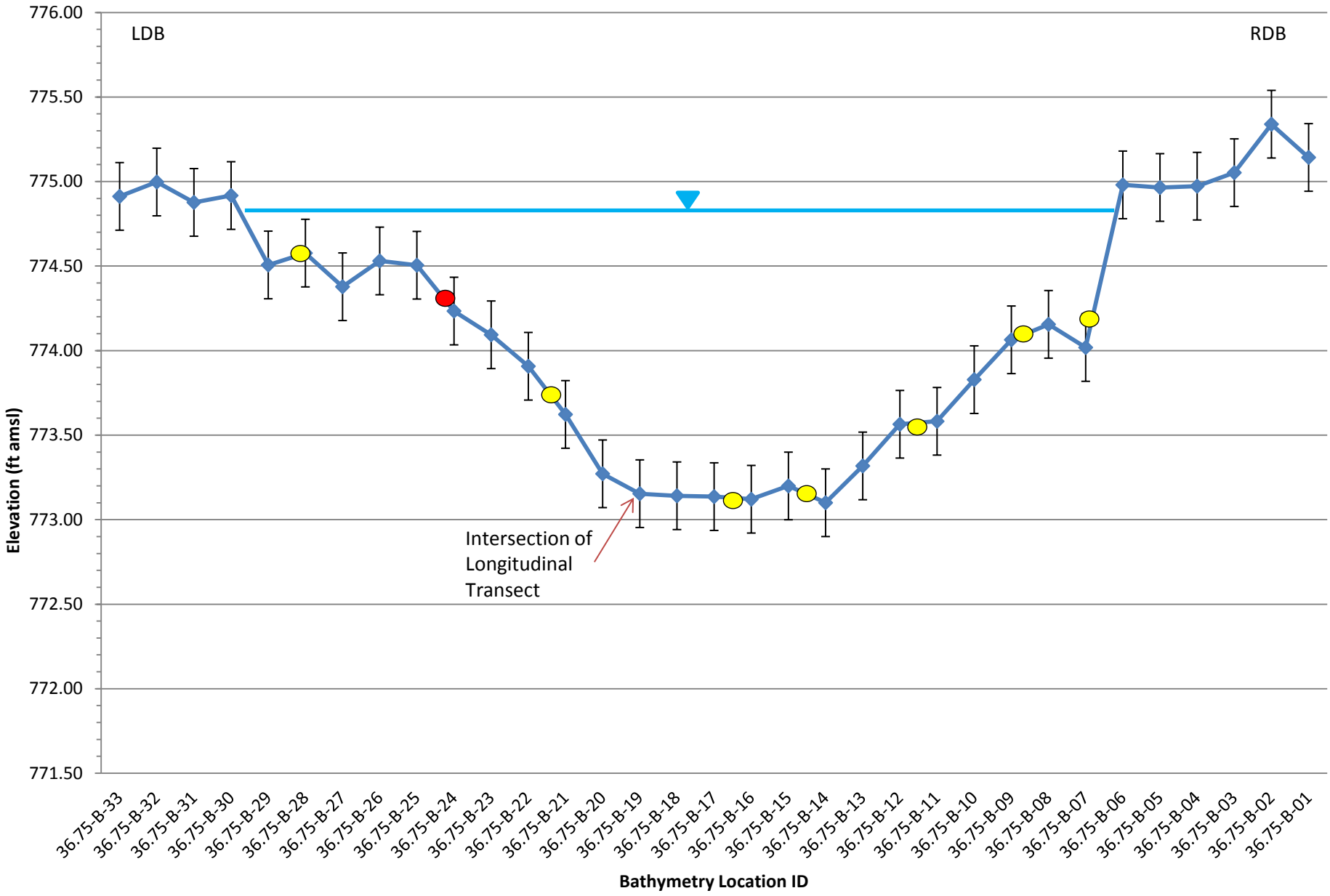
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT A
SHEET 2 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

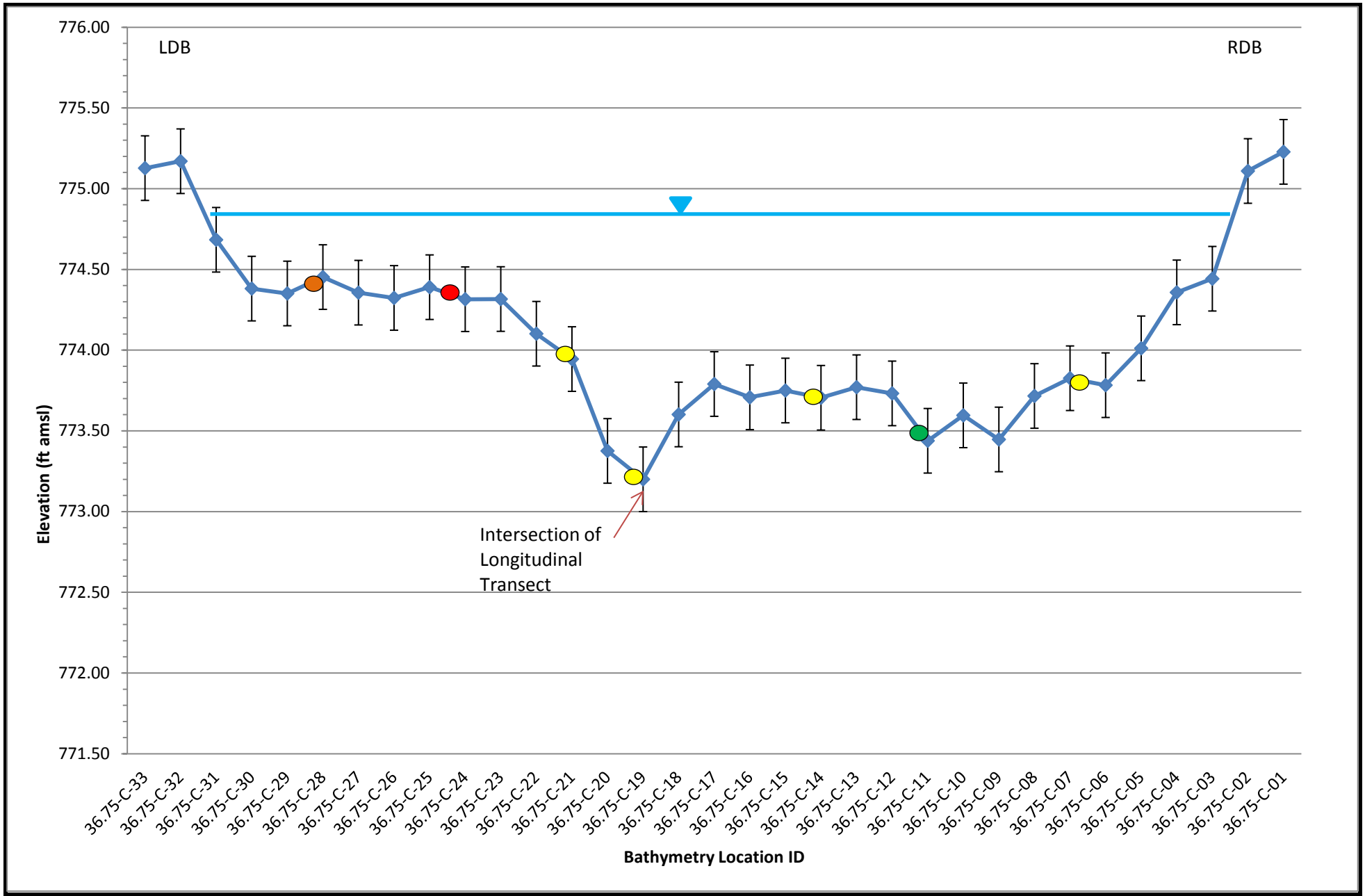
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT B
SHEET 3 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

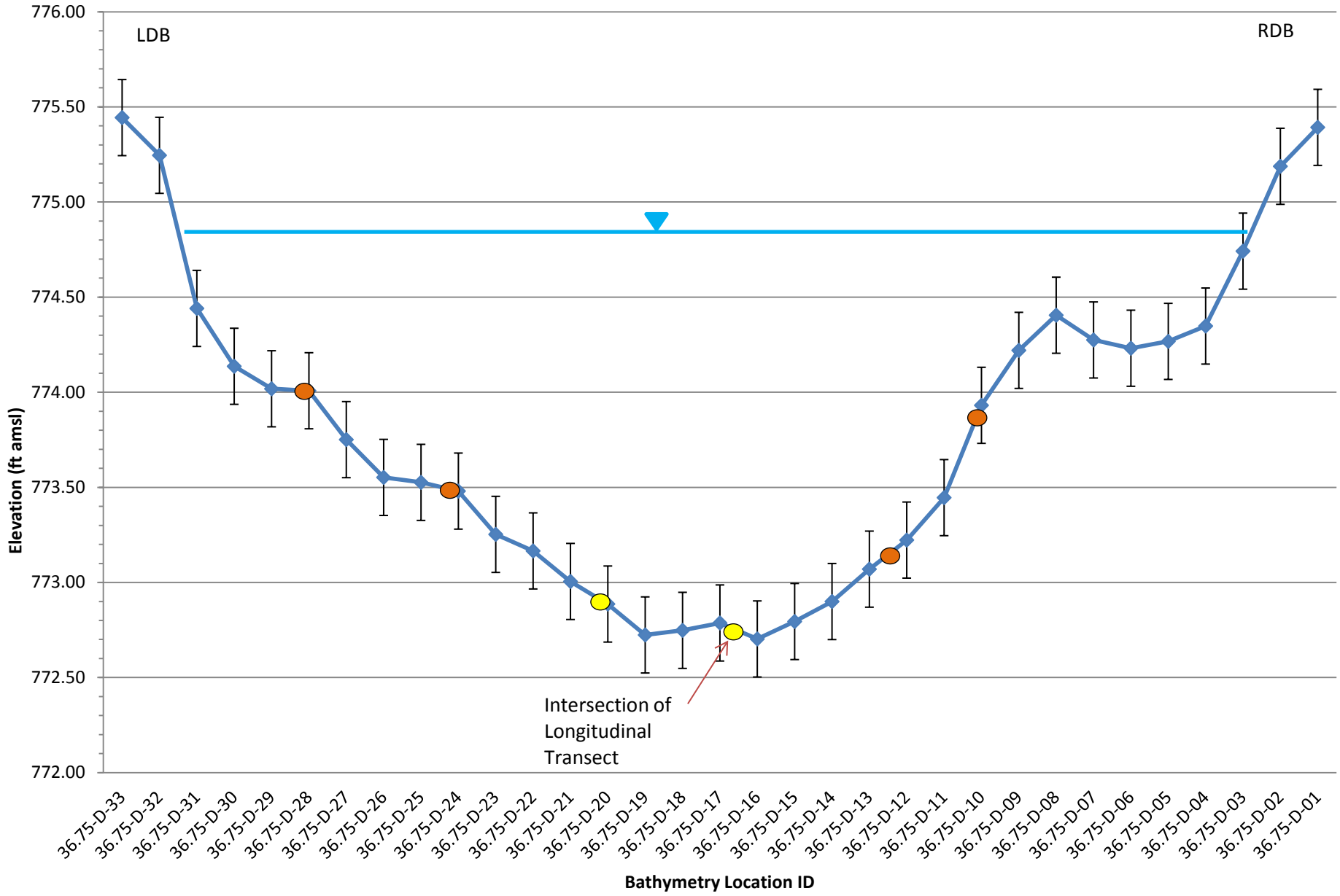
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT C
SHEET 4 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

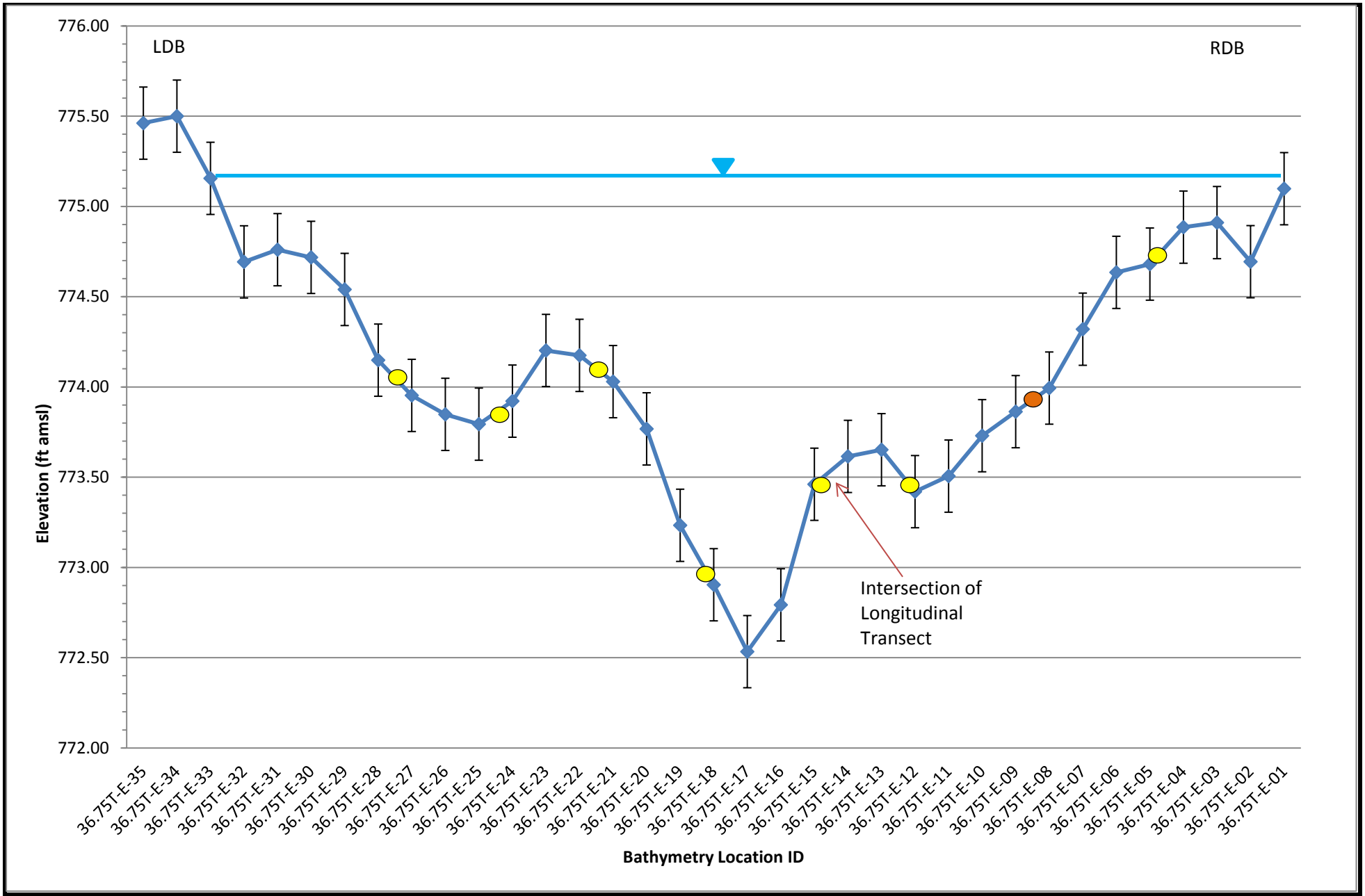
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT D
SHEET 5 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

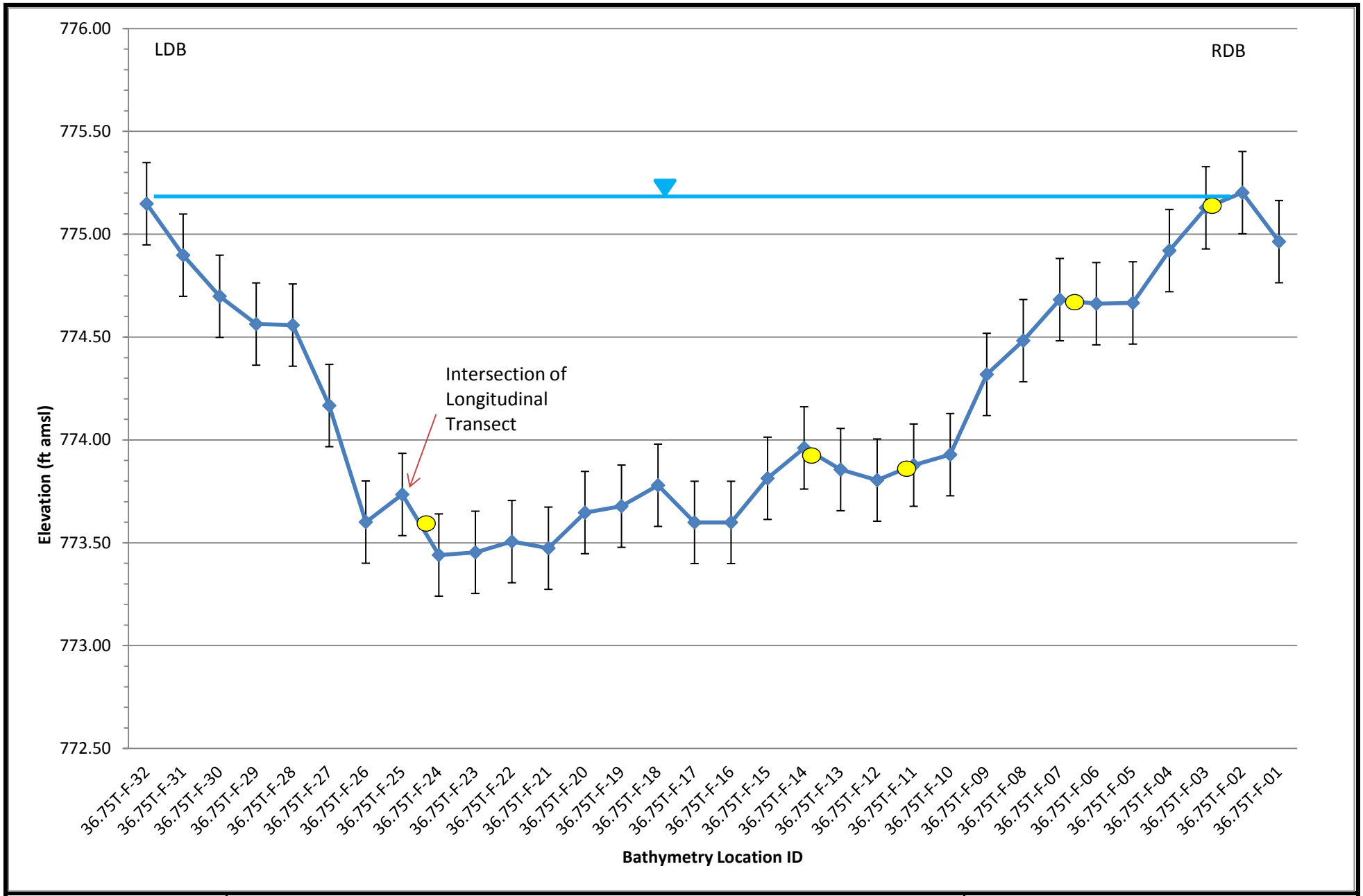
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT E
SHEET 6 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

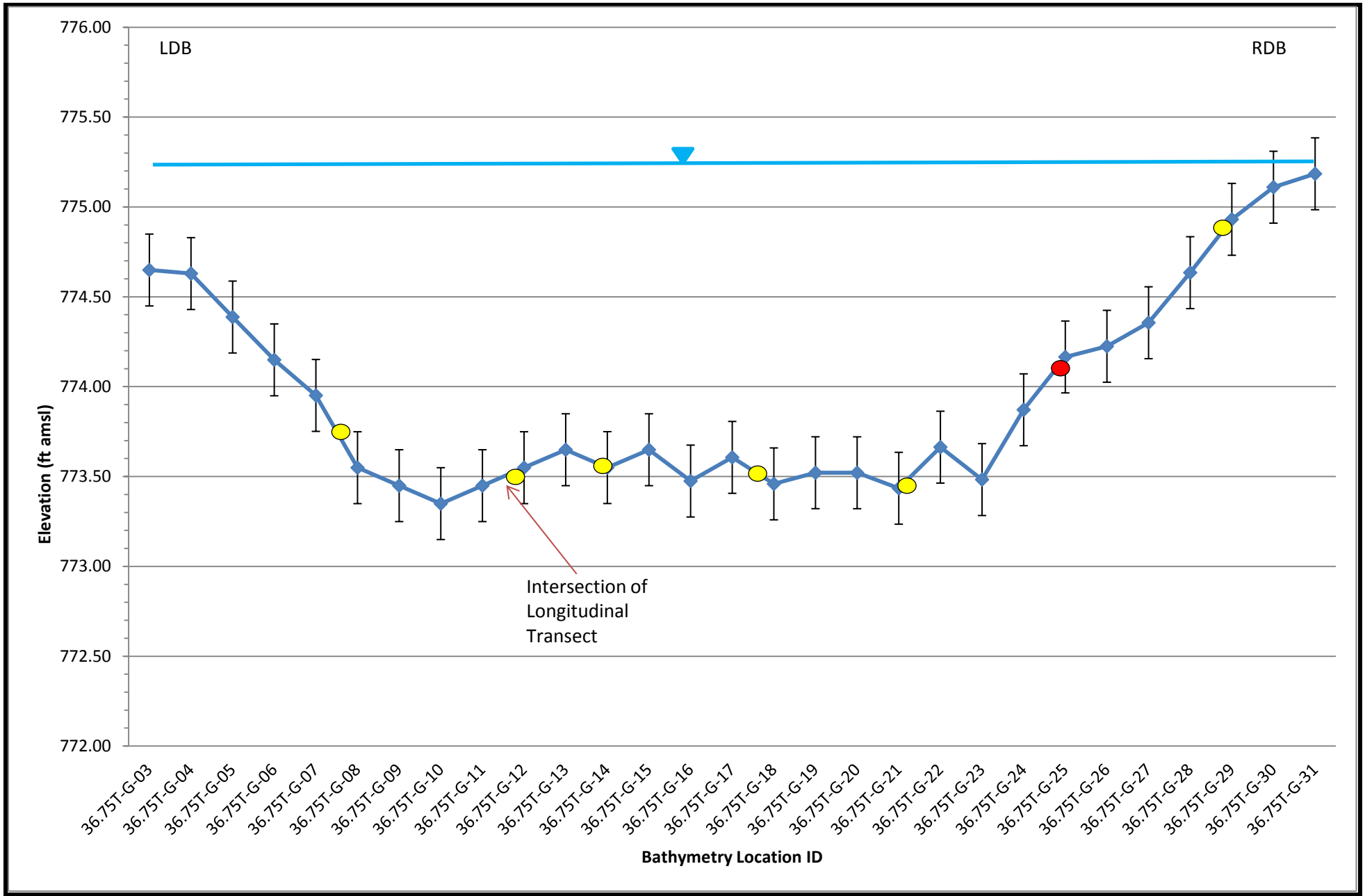
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT F
SHEET 7 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

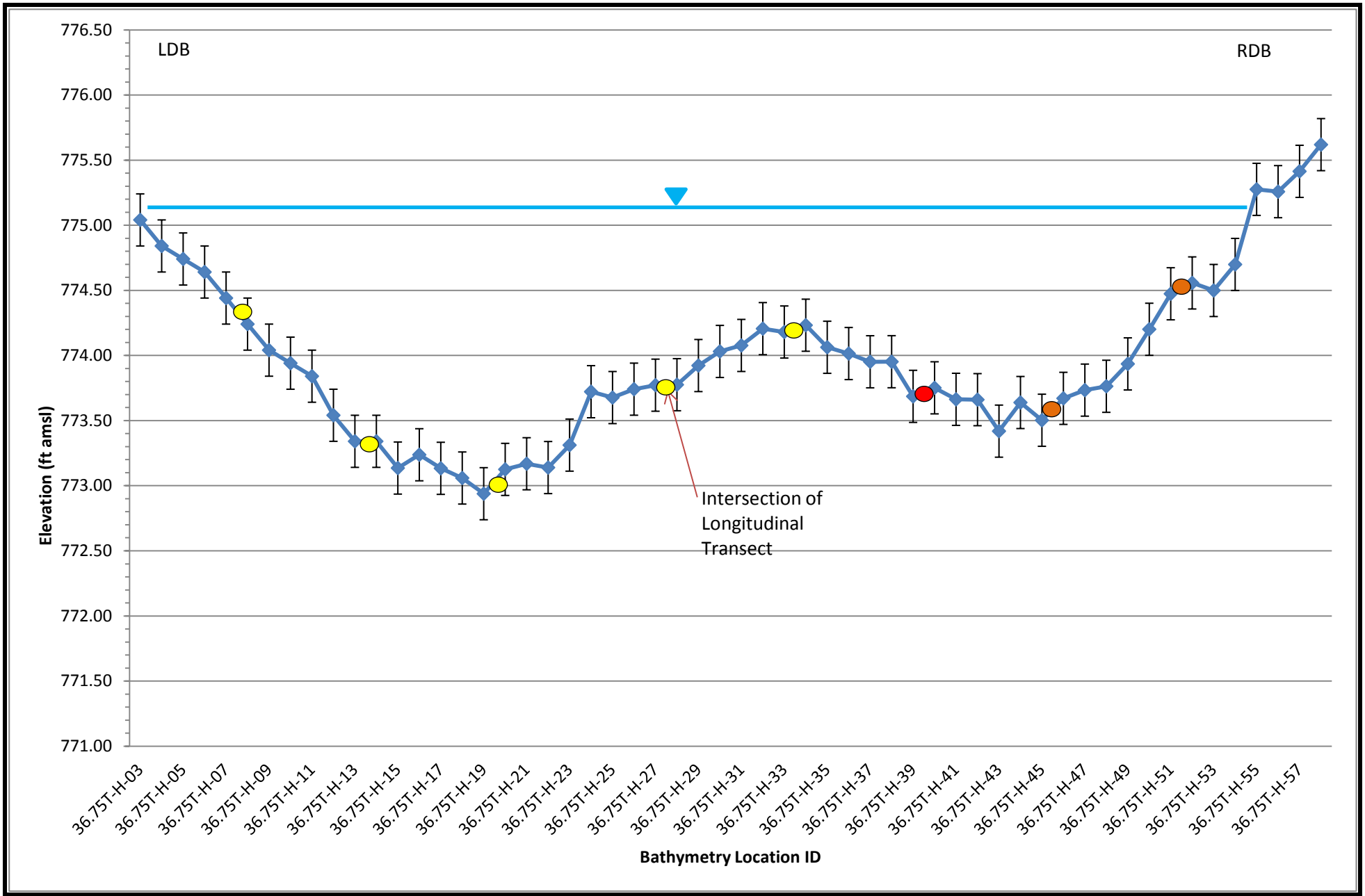
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT G
SHEET 8 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

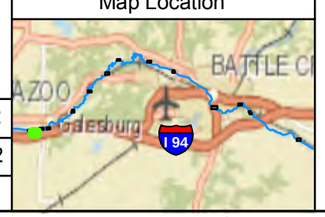
FIGURE 2i-30
SEDIMENT TRAP BATHYMETRY DATA
DELTA A TRANSECT H
SHEET 9 OF 9
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP

River Flow Direction

Transect C
Transect D
Transect B
Transect E
Transect F
Transect G
Transect H
37+25
Transect A
Transect I
Transect J
Transect K
Transect L
Miller Dr

ENBRIDGE		
Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 70 140 280

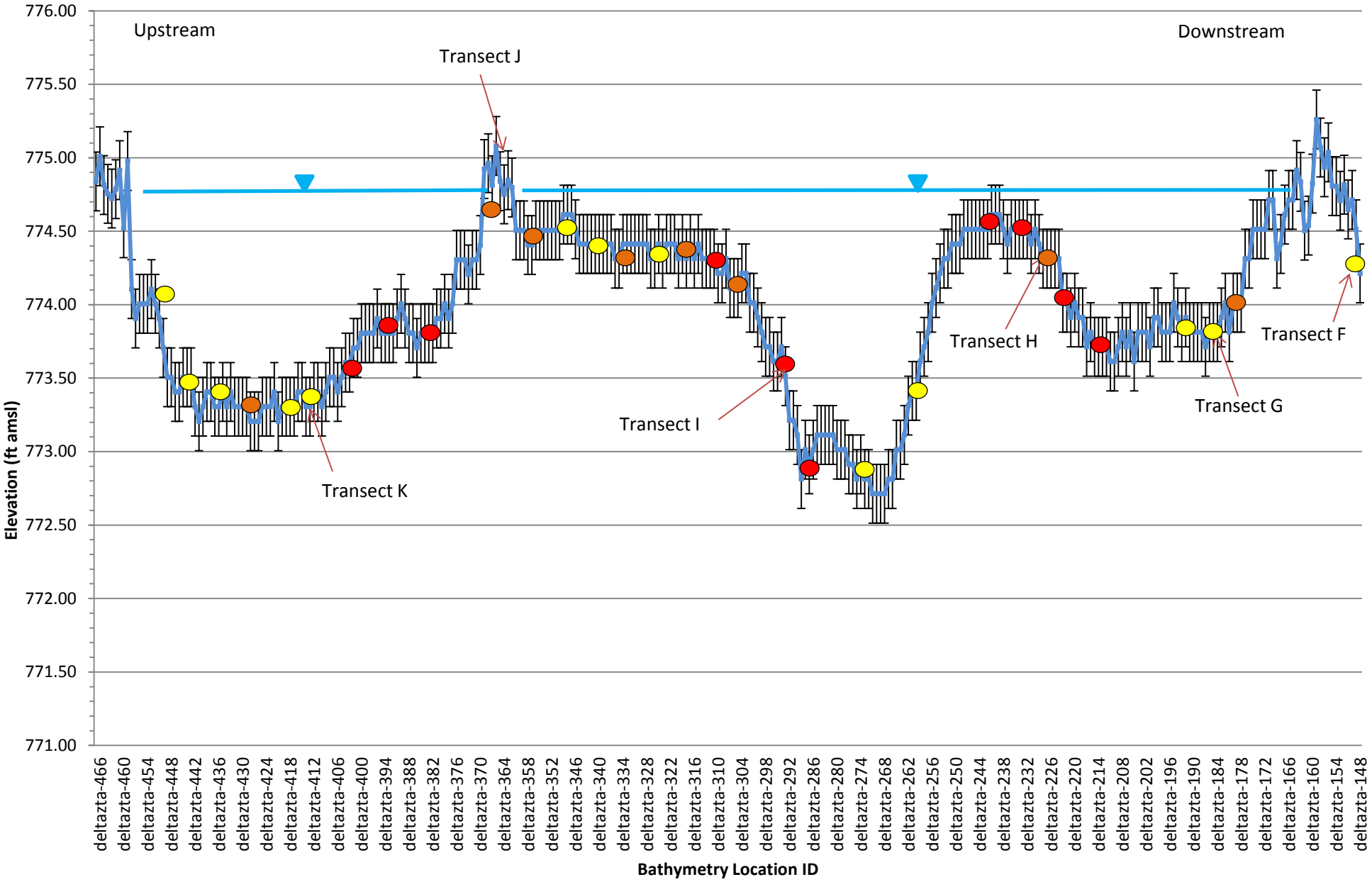
Scale in Feet

FIGURE 2i-31
PHASE II SEDIMENT TRAP BATHYMETRY
DELTA Z/MP 37.50
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

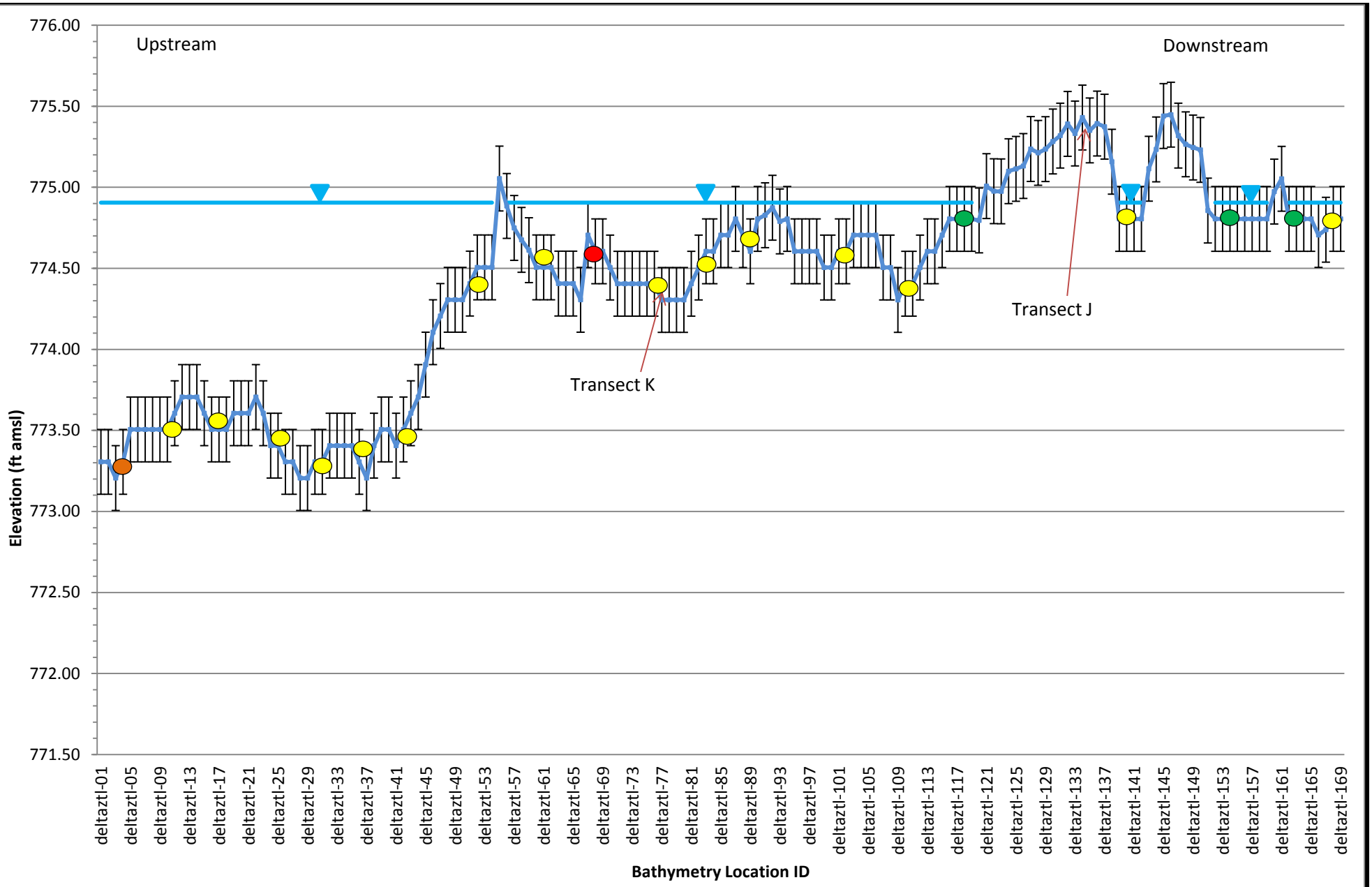
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT A
SHEET 1 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

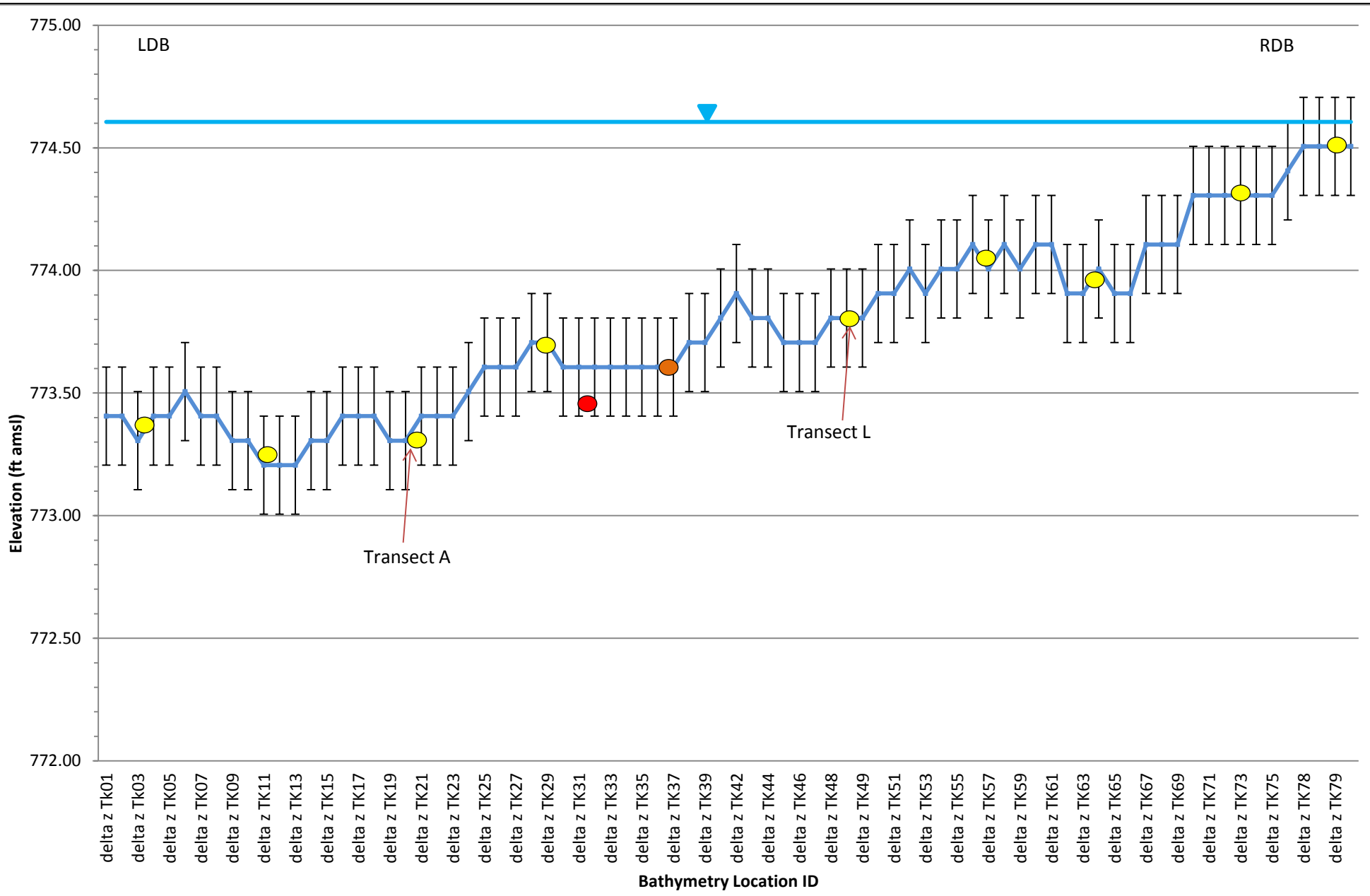
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT L
SHEET 2 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

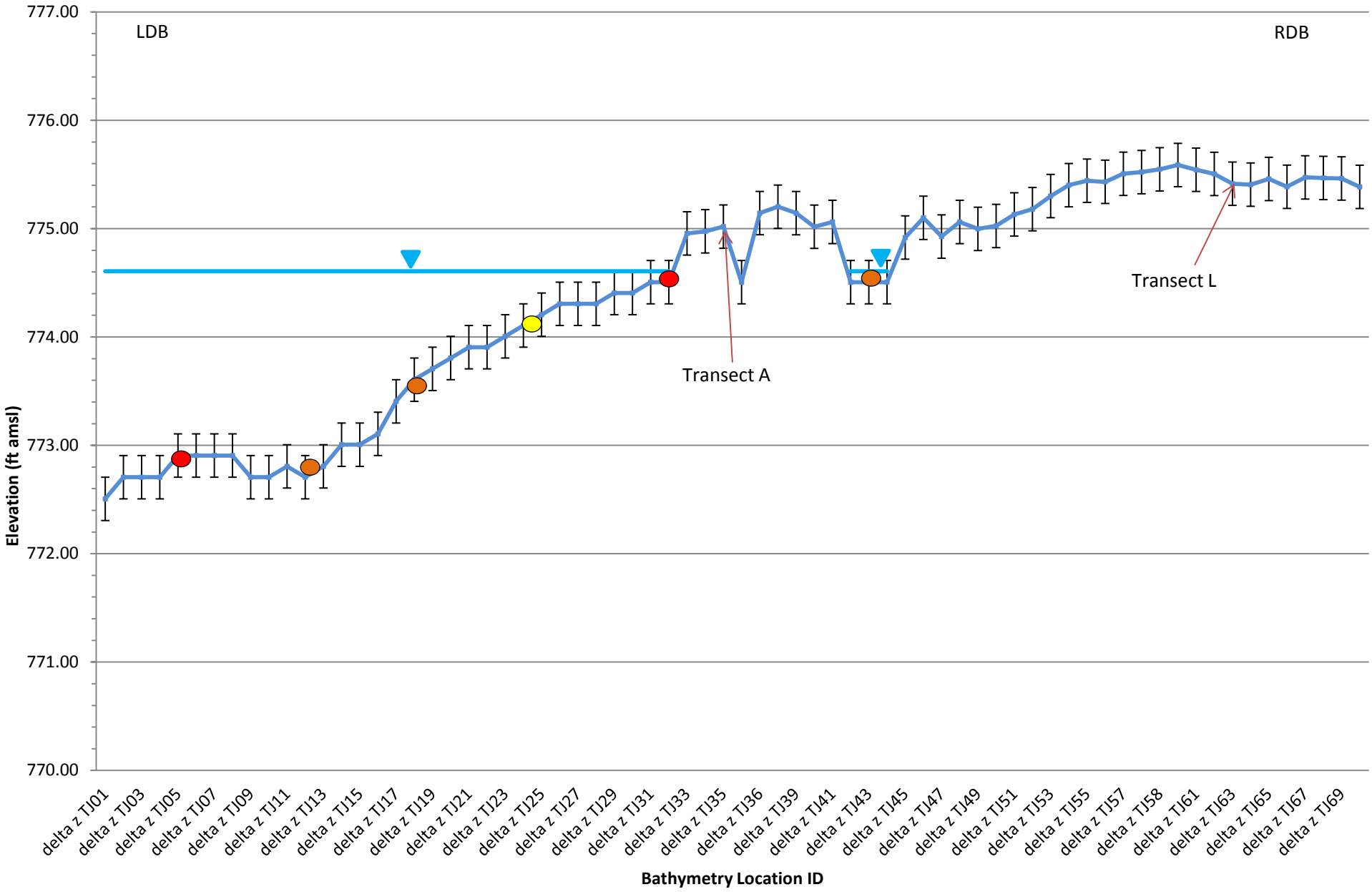
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT K
SHEET 3 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

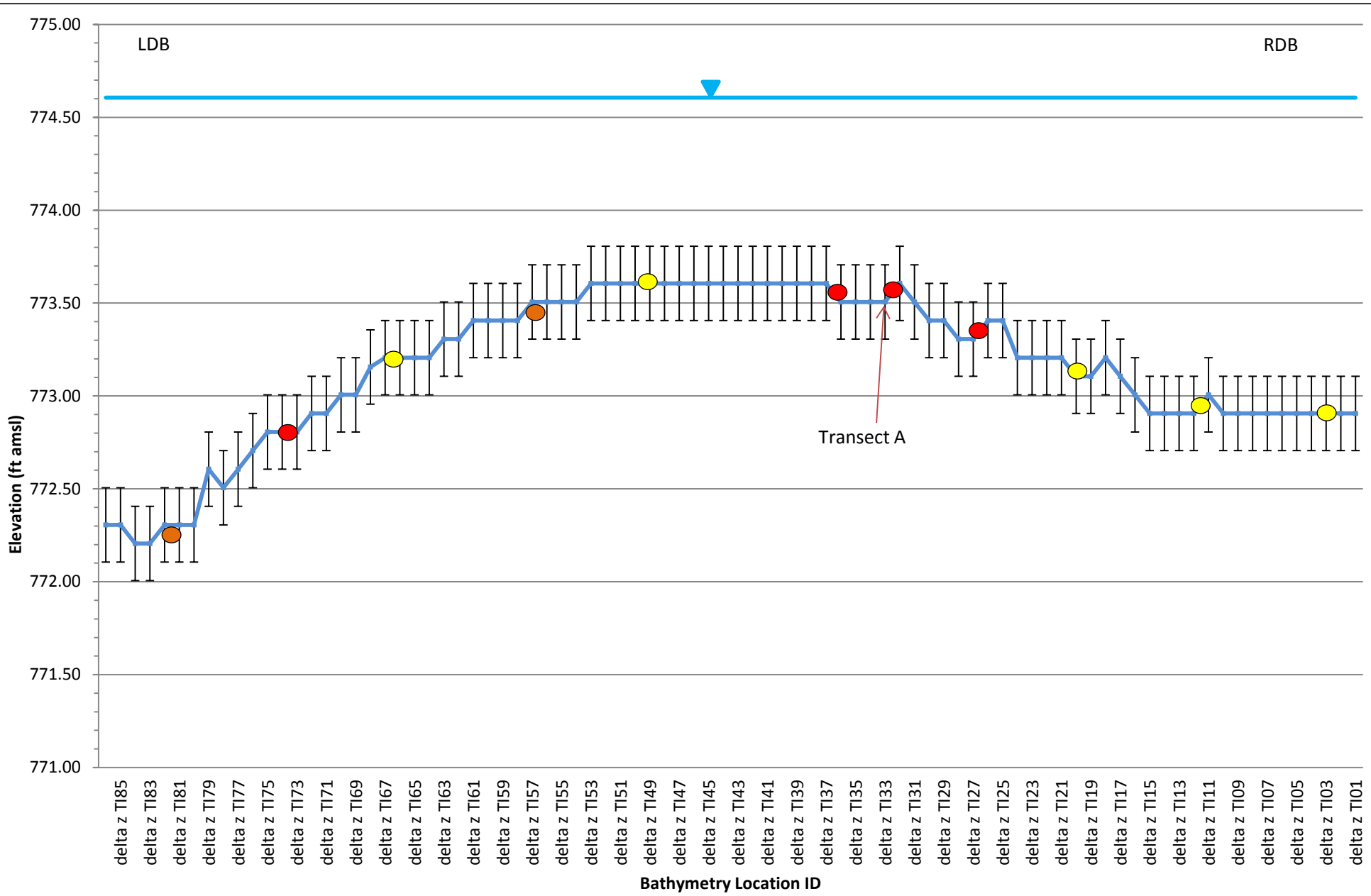
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT J
SHEET 4 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

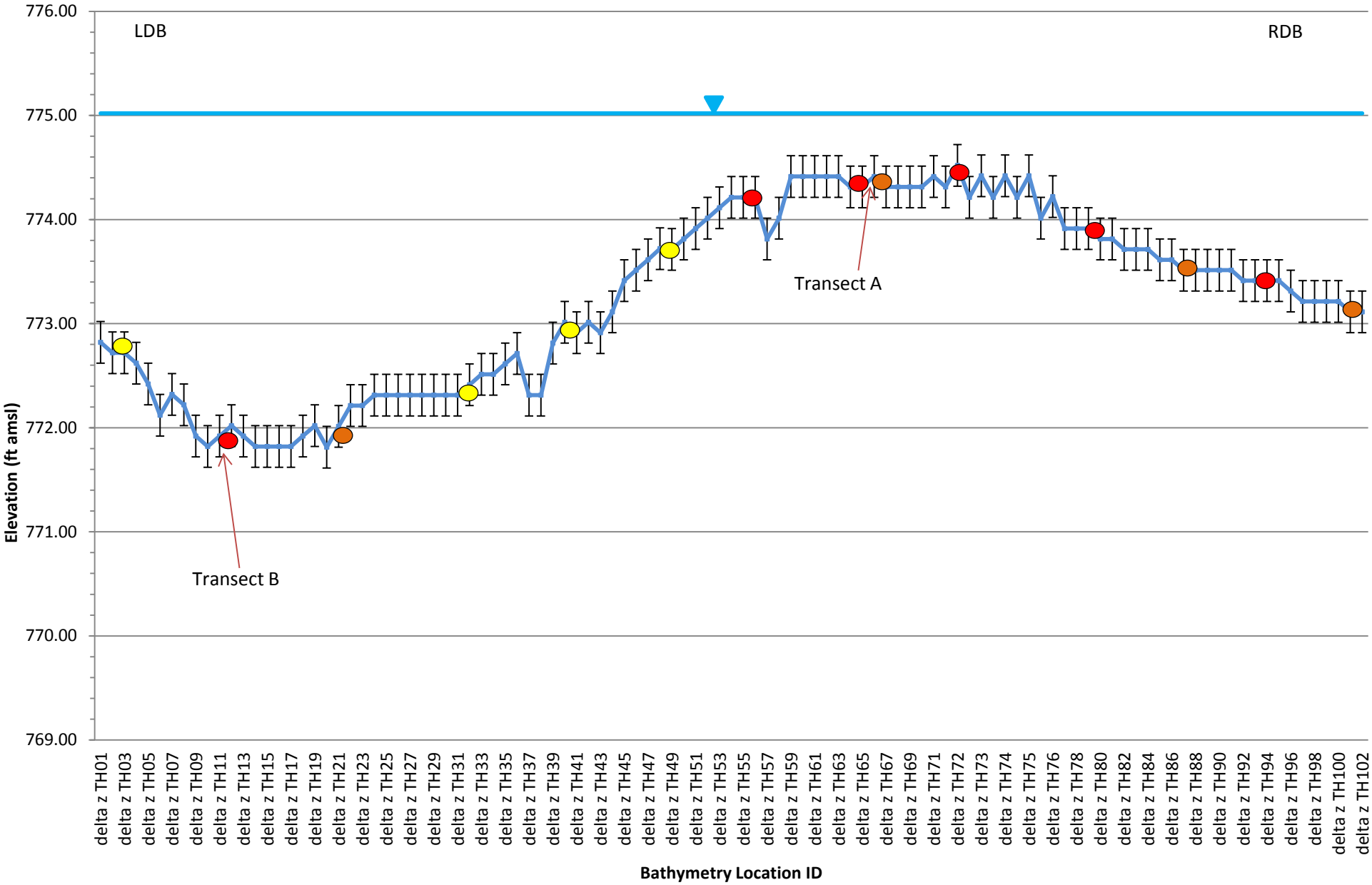
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT I
SHEET 5 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

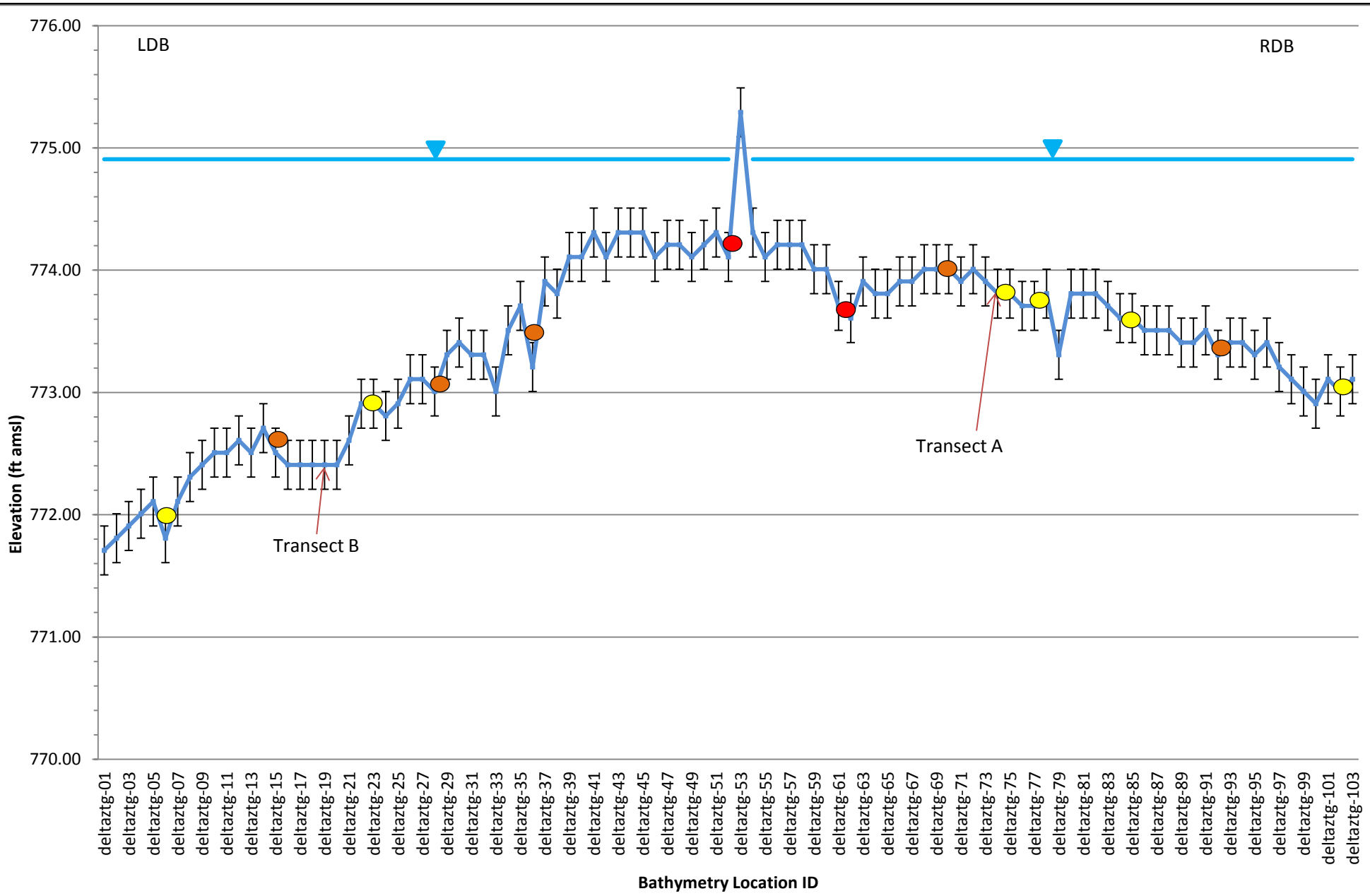
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT H
SHEET 6 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

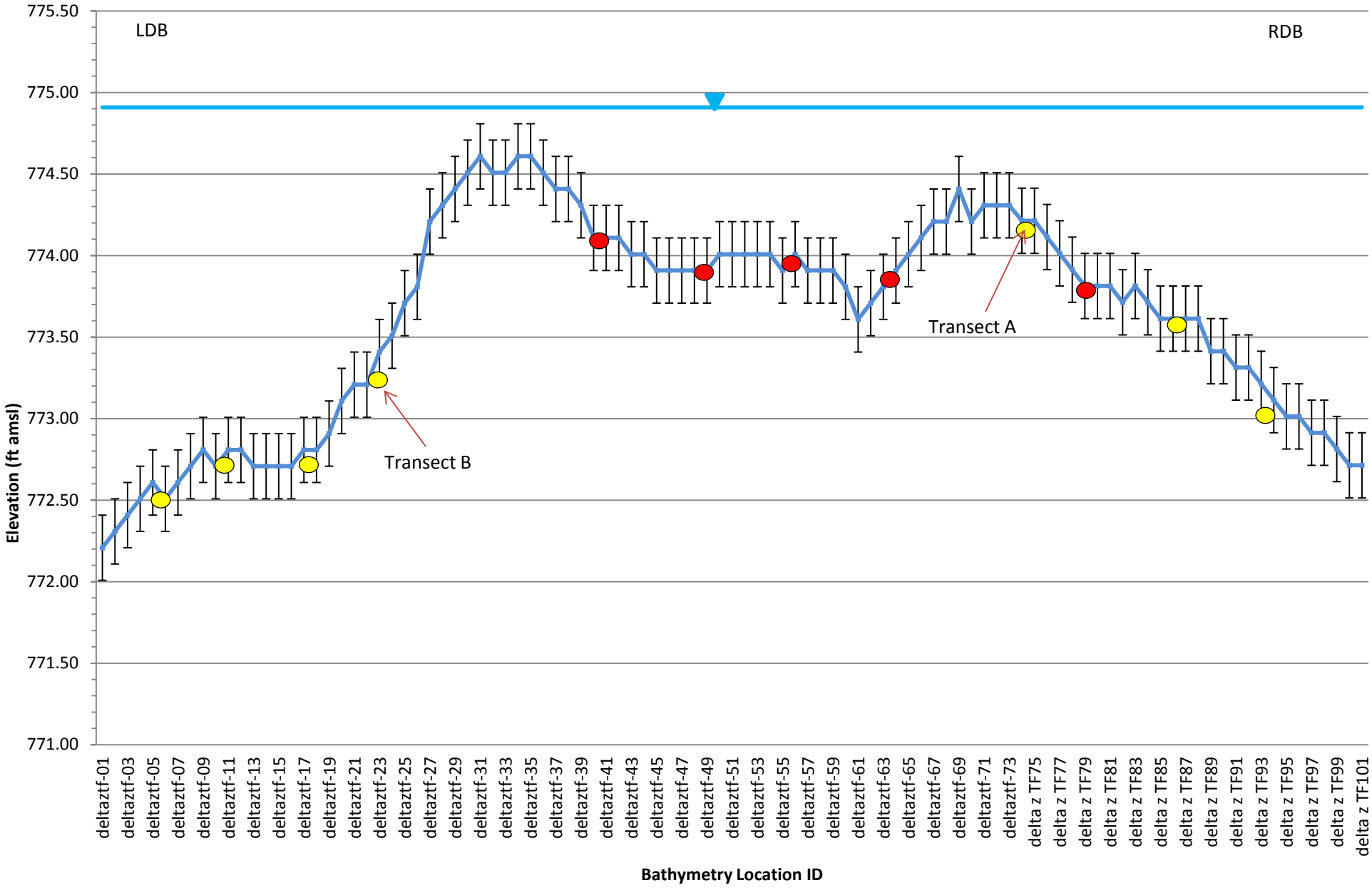
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT G
SHEET 7 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

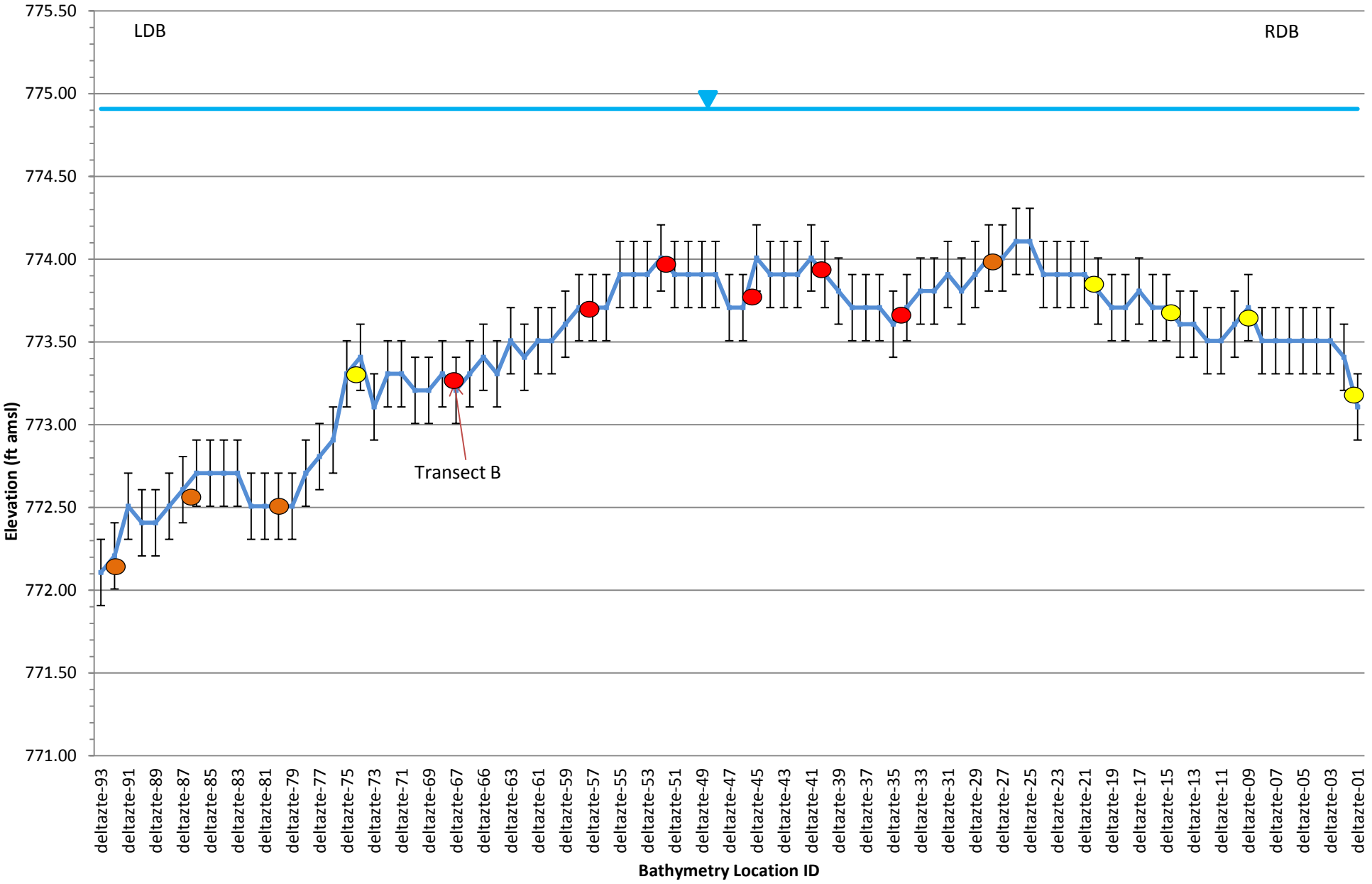
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT F
SHEET 8 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

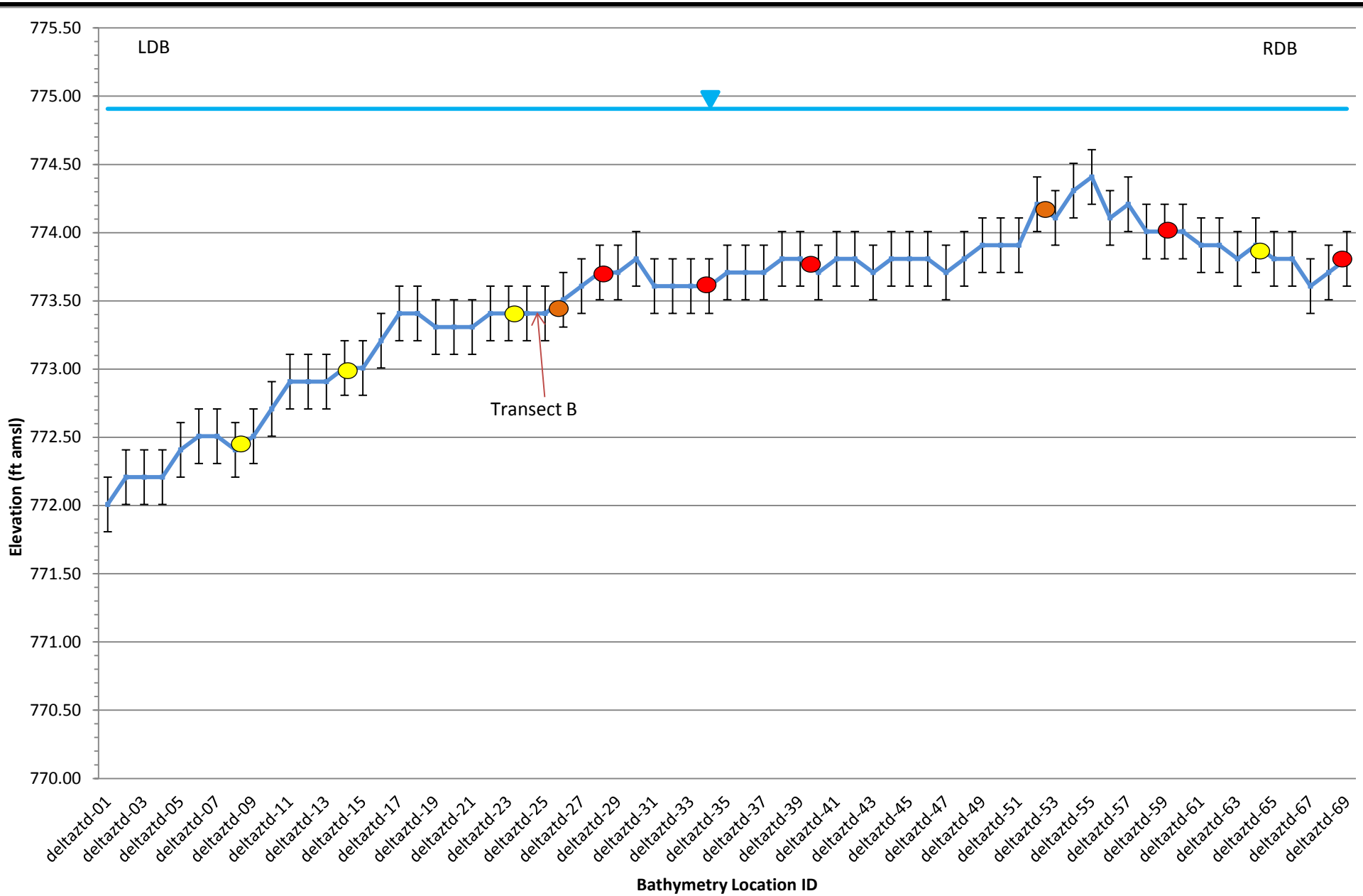
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT E
SHEET 9 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

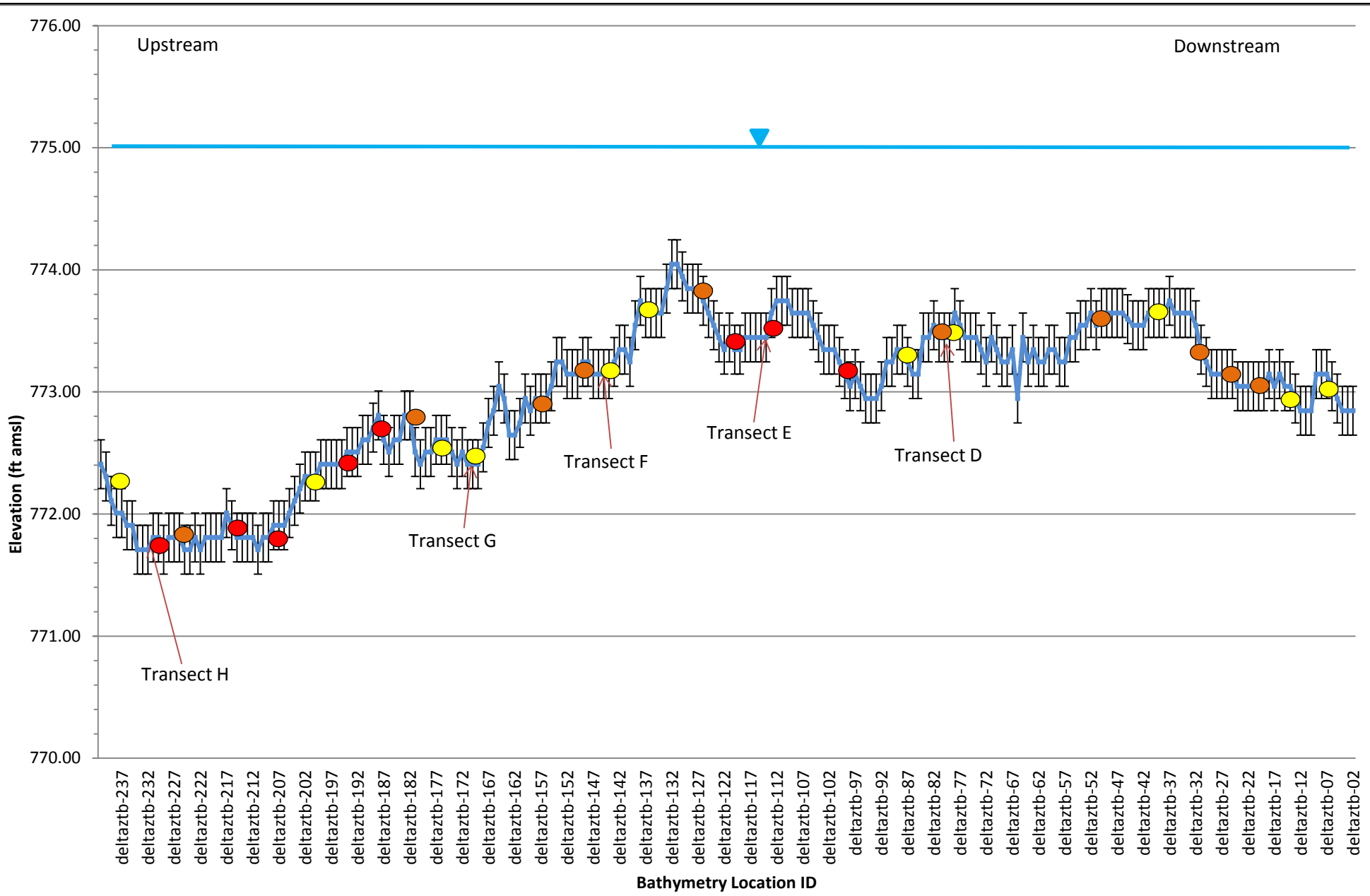
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT D
SHEET 10 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

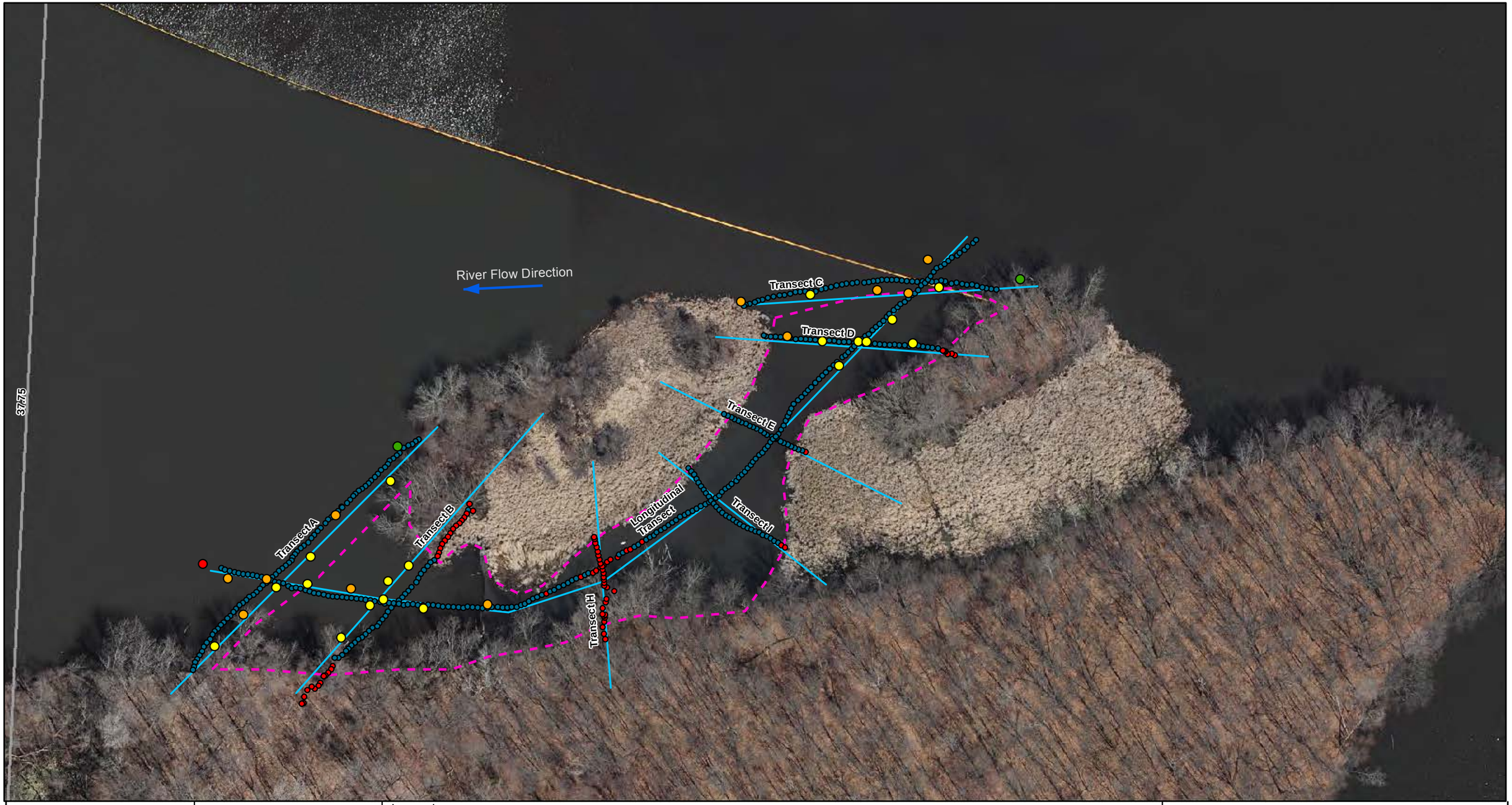
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-32
SEDIMENT TRAP BATHYMETRY DATA
DELTA Z TRANSECT B
SHEET 11 OF 11
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



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Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 40 80 160

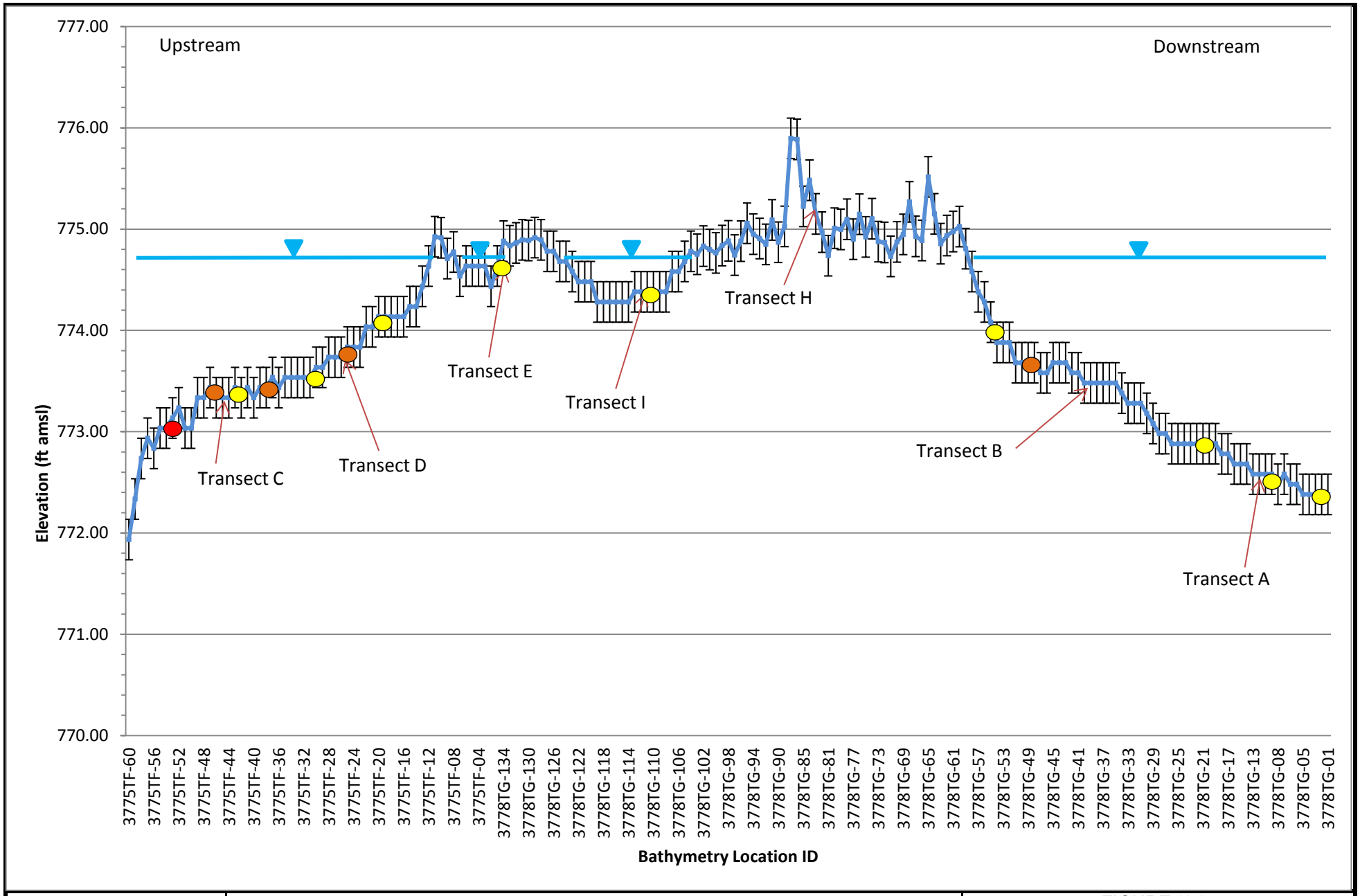
Scale in Feet

FIGURE 2i-33
PHASE II SEDIMENT TRAP BATHYMETRY
MP 37.75 ISLANDS
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

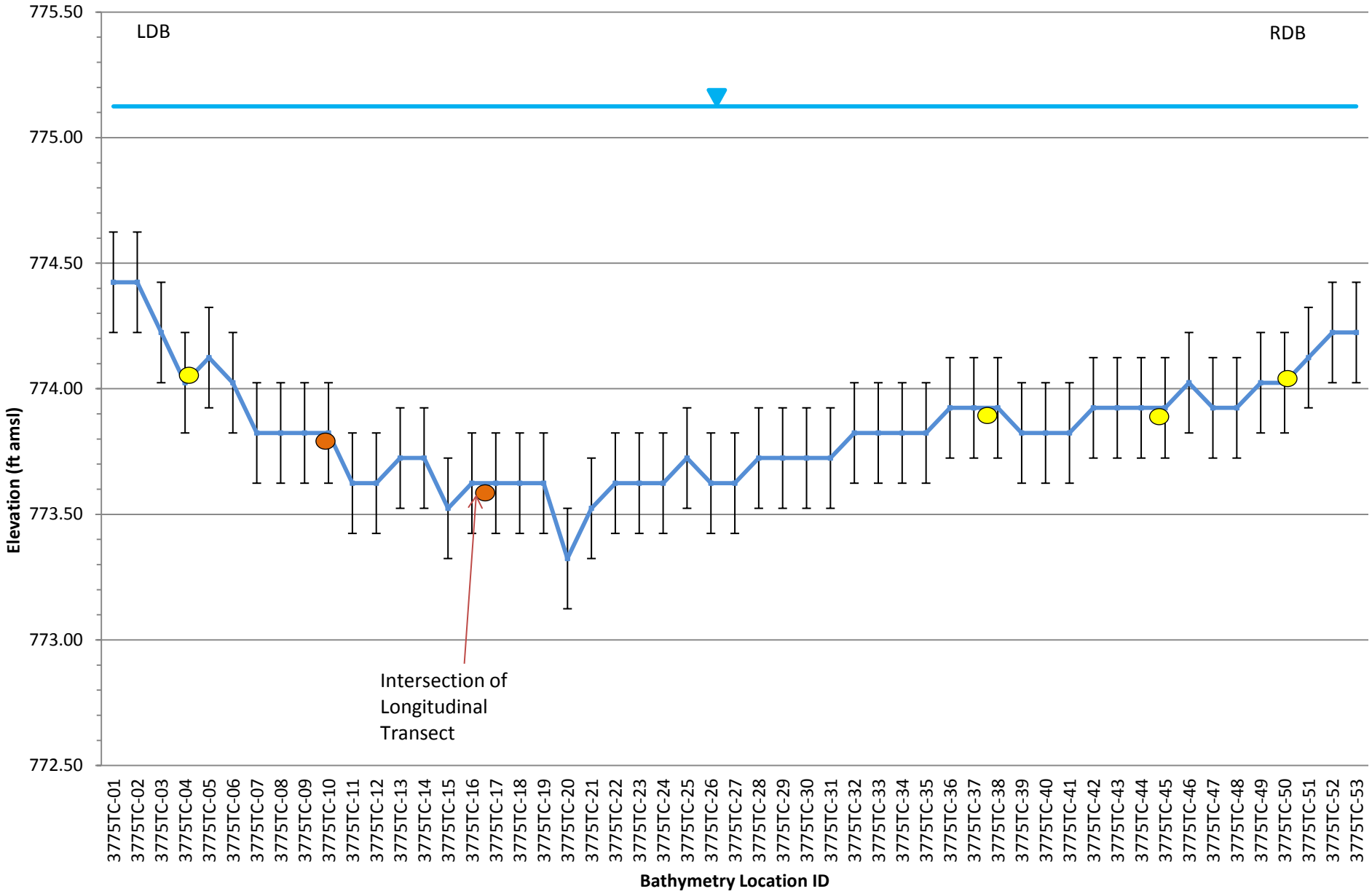
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 2i-34
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS LONGITUDINAL
SHEET 1 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

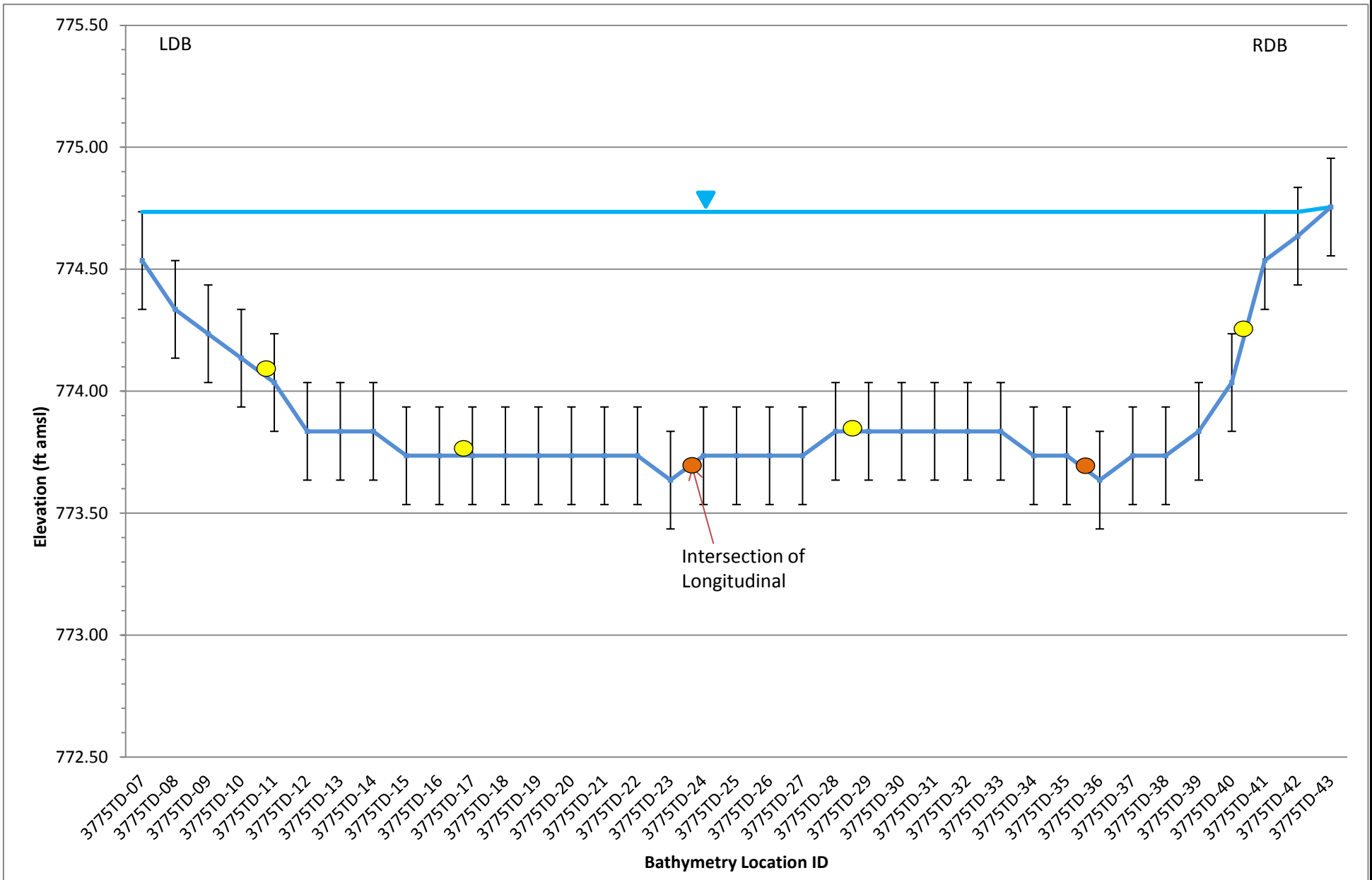
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 32
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS TRANSECT C
SHEET 2 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

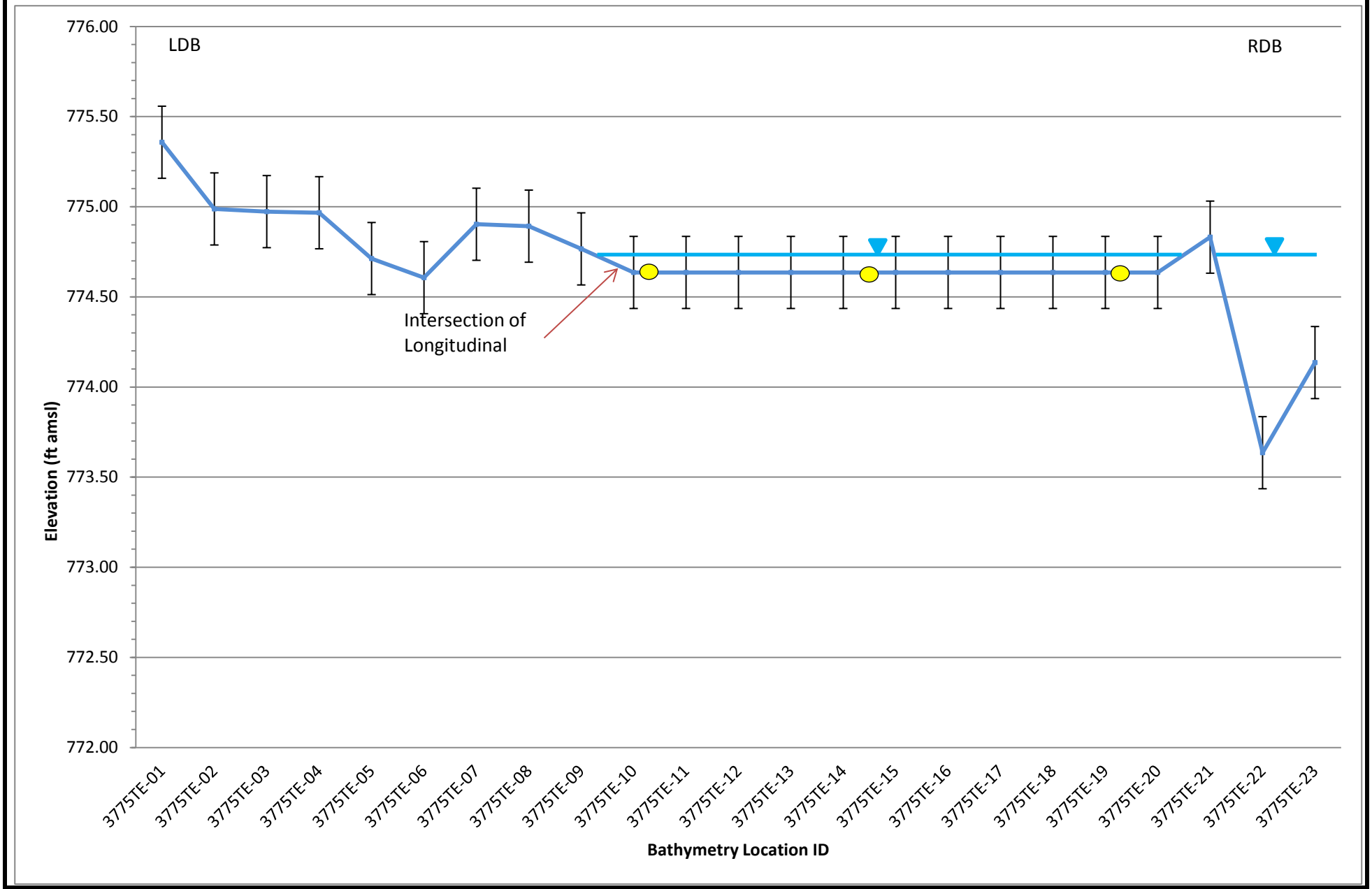
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 32
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS TRANSECT D
SHEET 3 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

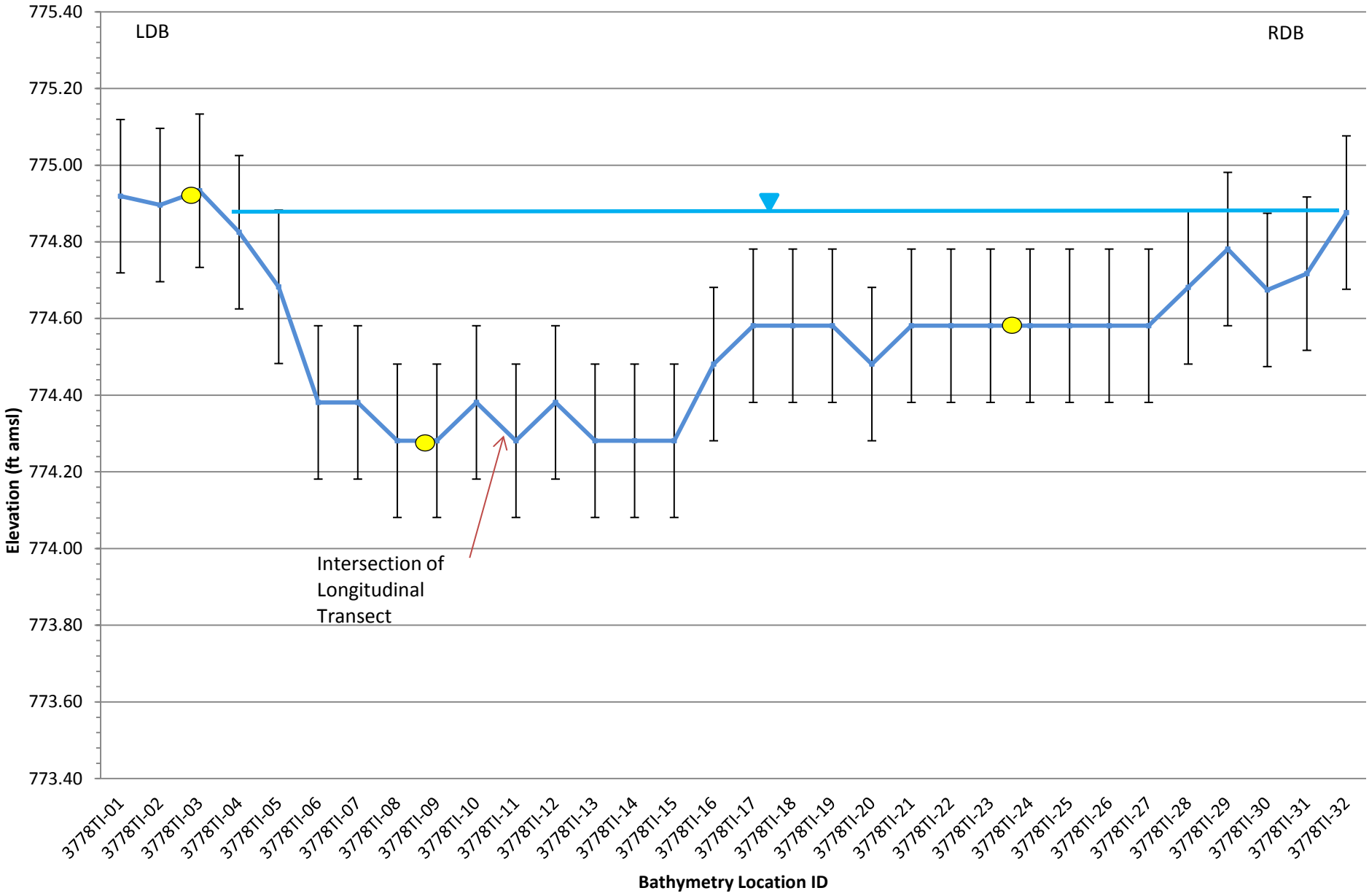
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 32
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS TRANSECT E
SHEET 4 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

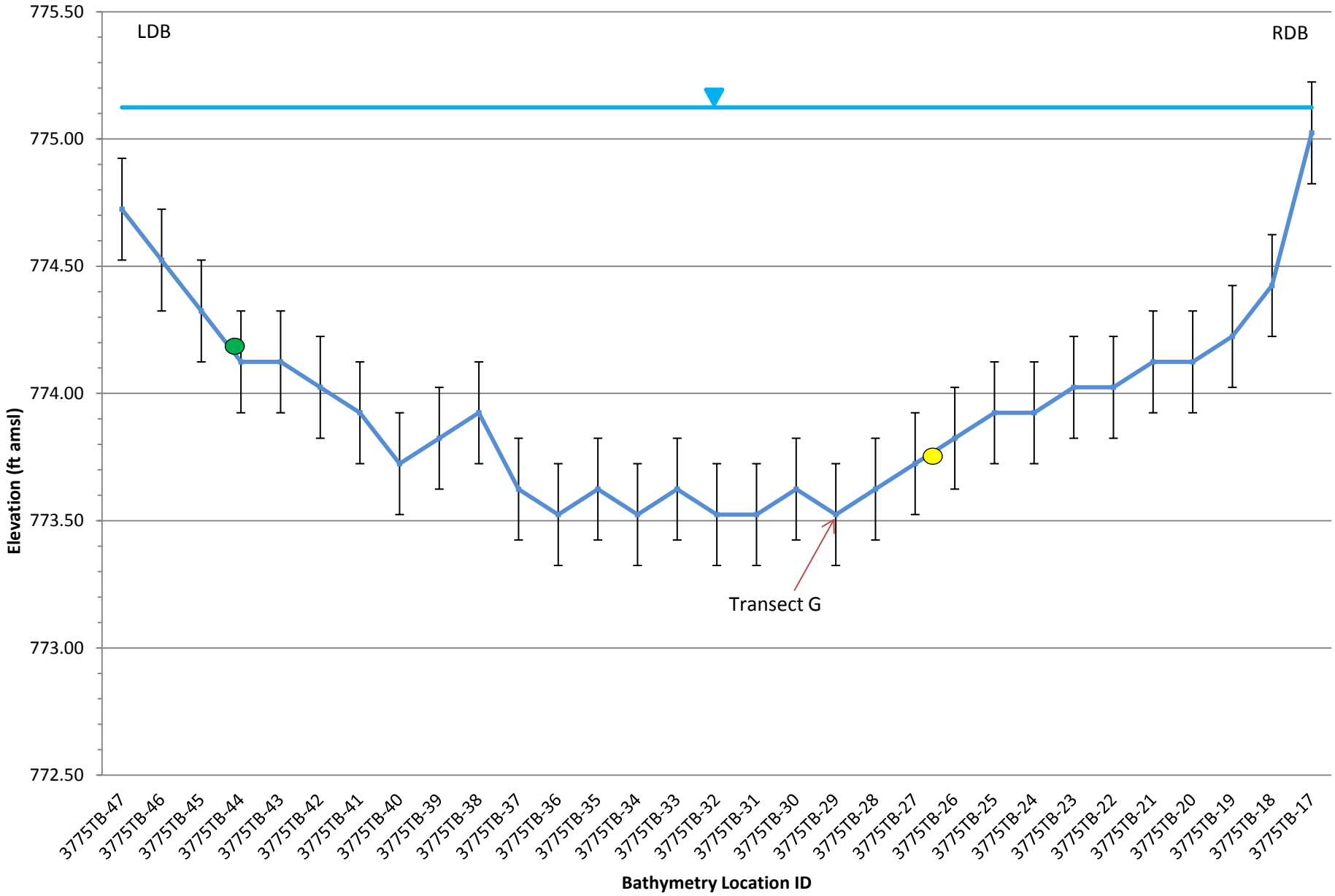
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 32
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS TRANSECT I
SHEET 5 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

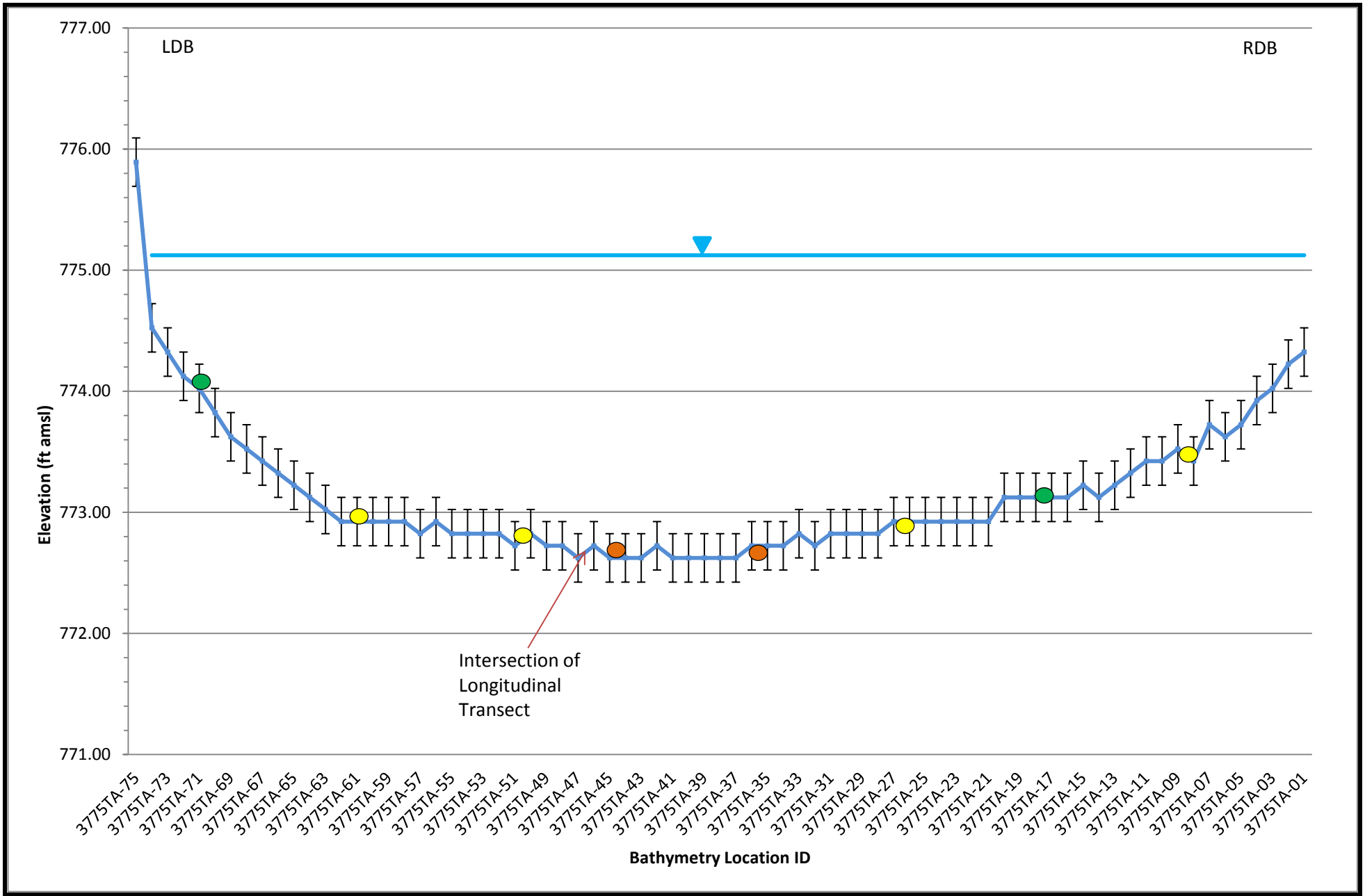
Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

ft amsl = feet above mean sea level

FIGURE 32
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS TRANSECT B
SHEET 6 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



ENBRIDGE

Drawn: MF

Approved: EE

Project#: 60246209

Legend:

- September 2012 Bed Elevations
- May 2012 Bed Elevations
- Water Surface

Submerged Oil Category:

- Poling - None
- Poling - Light
- Poling - Moderate
- Poling - Heavy

± 0.2 ft. Error Bar

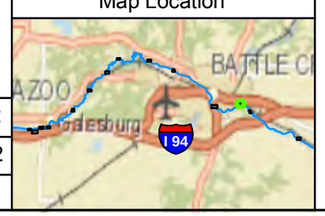
ft amsl = feet above mean sea level

FIGURE 32
SEDIMENT TRAP BATHYMETRY DATA
MP 37.75 ISLANDS TRANSECT A
SHEET 7 OF 7
ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY,
LIMITED PARTNERSHIP



Drawn:	NS	12/11/2012
Approved:	EE	12/11/2012
Project #:	60246209	

Map Location



Legend

Sediment Trap Baseline Survey

Submerged Oil Category

- Dry
- Heavy
- Moderate
- Light
- None

- Bathymetry Point (May 2012)
- Target Transect
- Conifer Tree Structure
- Coir Log
- Sediment Trap
- Quarter Mile Grid Segments

Bathymetry Point (September 2012)

- Acceptable Data Quality
- Poor Data Quality - Location not Included in Cross Sections

N

0 40 80 160

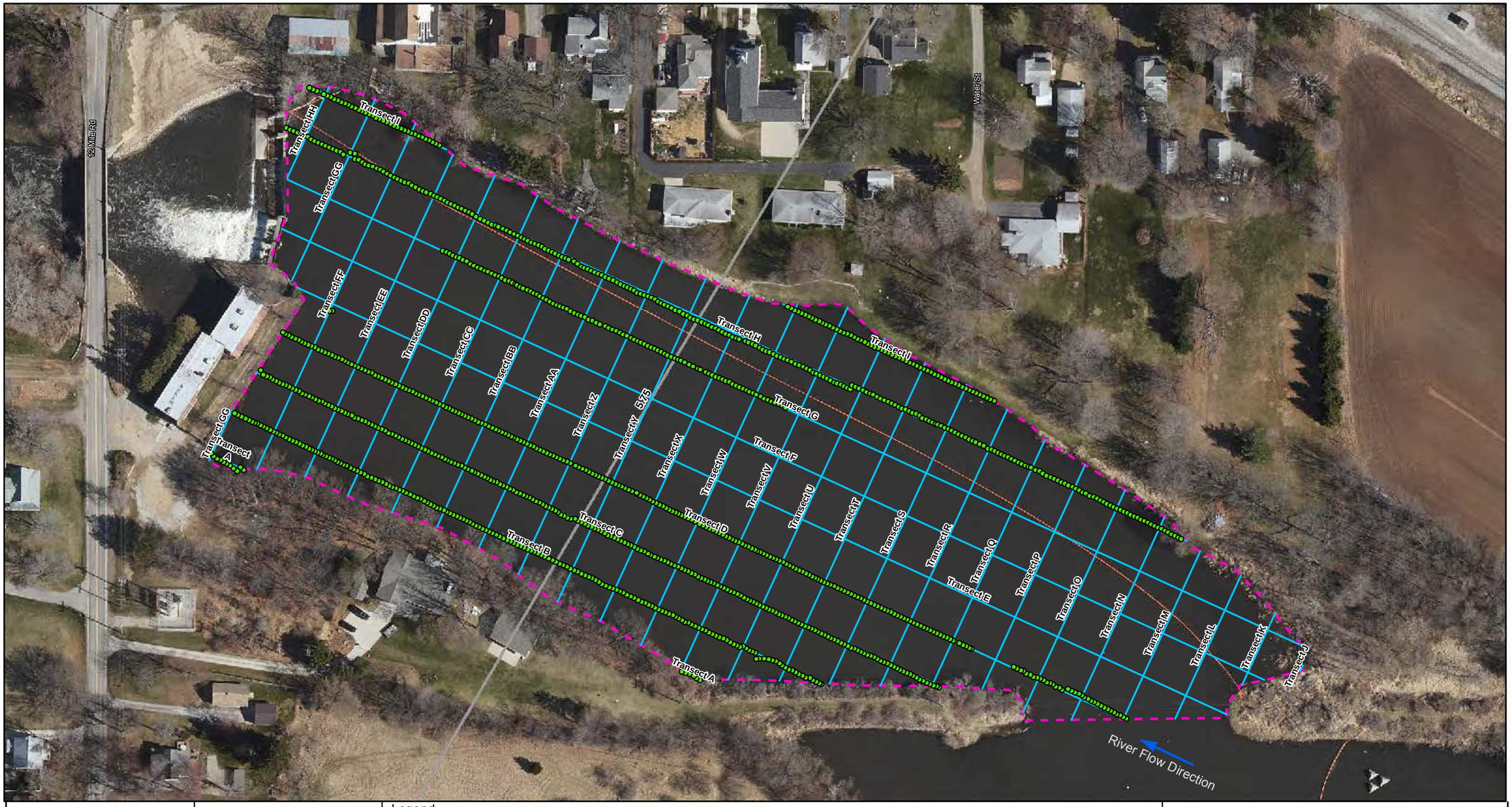
Scale in Feet

FIGURE 2i-35
PHASE II SEDIMENT TRAP BATHYMETRY
OB 11.79
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-3-35_Sed_Traps_May_Sept_2012_Baseline_Bathymetry.mxd

Aerial Photography Date: April 2011



ENBRIDGE

Drawn:	NS	12/12/2012
Approved:	EE	12/12/2012
Project #:	60246209	

Map Location



Legend

- Bathymetry Point (November 2012)
- Target Bathymetry Transect
- Sediment Trap
- Quarter Mile Grid Segments

N

0 50 100 200

Scale in Feet

FIGURE 2i-36
SEDIMENT TRAP BATHYMETRY
CERESCO/MP 5.75
NOVEMBER 2012
SHEET 1 OF 1

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Monthly_Progress_Reports\2012_11\MXDs\Fig2i-36_Sed_Traps_Nov_2012_Baseline_Bathymetry_Ceresco.mxd

Aerial Photography Date: April 2011

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix A

Planning Resources

Form 214's

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

1. Incident Name	2. Date Prepared	3. Time Prepared	UNIT LOG ICS 214	
Kalamazoo River/Enbridge Spill Response	11/02/2012	12:00		
4. Unit Name/Designators	**5. Unit Leader**		**6. Operational Period : DATE/TIME**	
Enbridge Operations	**Name:**	John Sobojinski	**From:**	**October 25, 2012;0700**
	Position:	Incident Commander	**To:**	**November 04, 2012;0700**

7. Personnel Roster Assigned

Name	ICS Position
John Sobojinski	Enbridge Incident Commander
Dave Bareham	Environment
Dave Bareham	Operations
Jason Manshum	Public Information
Dale Gross	Safety & Security
John Wallace	Waste Management
David Bareham	Submerged Oil
Dean Sahara	Containment
Bryan Stiemsma	Kalamazoo River

[redacted]

8. Activity Log

Activity Areas	**Safety & Security, Air Operations, Waste Management, Overbank, Submerged Oil, Containment, Talmadge Creek, Kalamazoo River**
Health and Safety Issues	**Safety & Security (Dale Gross)** **General Safety Message:** **10-25-12: Life Saving Rule #4 – Ground Disturbance** Dig Safely. Always follow procedures for locating, positively identifying and excavating buried facilities. Protect yourself, your community and the environment by protecting our pipelines – ensure that all buried facilities are identified and marked prior to excavation. By building a strong foundation of safe practices we can protect our most valuable resource – our people. **** Make certain you know and obey the Enbridge 10-2-1 Rule **** **Safety Items for October 25th, 2012:** No issues to report. **10-26-12: Dehydration in Cold Weather** Remember you continue to lose fluids even during cold weather. It is important to replace those lost fluids in order to stay healthy. Cold weather can increase your risk for dehydration due to the fact that you do not feel as thirsty as during hot weather. Make sure to: ➢ Drink plenty of water in small quantities. ➢ Replace lost electrolytes which can be found in drinks such as "PowerAde". ➢ For severe dehydration – seek medical attention immediately. **Safety Items for October 26th, 2012:** No issues to report. **10-27-12 and 10-28-12: Cold Weather Hazard - Frostbite** One of the most common hazards in cold weather is frostbite. Frostbite can affect any part of the body, but the tip of the nose, ears, fingertips, and toes are the most likely areas to be affected. Symptoms of frostbite include: ➢ Progressive numbness and loss of sensitivity to touch. ➢ Affected area may tingle or have a burning sensation. ➢ If the condition worsens, the pain will begin to fade or eventually disappear. First aid for frostbite includes: ➢ Get the person to a warm place. ➢ Unless absolutely necessary, the person should not walk on frostbitten toes or feet. ➢ Do not rewarm the skin until you can keep it warm. Warming and then re-exposing the frostbitten area to cold air can cause worse damage. ➢ Gently warm the area in warm water or with wet heat until the skin appears red and warm.

Health and Safety Issues (Cont.)	➢ Do not use direct heat from heating pads, radiator, or fires. ➢ Do not rub or massage the skin or break blisters. ➢ Loosely bandage affected area. ➢ Seek medical attention. **Safety Items for October 27th, 2012 and October 28th, 2012:** No issues to report. **10-29-12: Preventing Slips, Trips, and Falls** Use the following tips to prevent slips, trips, and falls at work and home in the changing weather conditions: ➢ Don't hurry when conditions are likely to be slippery. ➢ Practice good housekeeping habits. ➢ Prevent indoor puddles by keeping skid resistant mats near building entrances. ➢ Anticipate hazards as you are walking. ➢ Plan lifts carefully. ➢ Take extra cautions with ladders in cold weather. ➢ Keep walkways clear of ice and snow. ➢ Wear slip resistant footwear. **Safety Items for October 29th, 2012:** Issued a Call Em All alert to advise field teams of high winds. **10-30-12: Cold Weather Attire** Dress in layers that can be adjusted as the temperatures fluctuate ➢ Bottom layer – material that pulls moisture from skin ➢ Center layer – insulates well ➢ Outer layer – shell that protects from elements Keep hats/gloves/socks dry and have backups in the event they become wet. **Safety Items for October 30th, 2012:** River operations were suspended for the day because of high winds. **10-31-12:** At a glance: Help protect trick-or-treaters by following these driving safety tips on Halloween, or on the night of Halloween activities. Be especially careful between 4 p.m. and 8 p.m., when most severe vehicle/young pedestrian collisions happen. ➢ Drive slowly, and don't pass stopped vehicles. The driver might be dropping off children. ➢ Park your mobile phone. Avoid distractions by waiting until you've stopped to call, text, or surf. ➢ Watch for children darting into the street. Kids can cross the street anywhere, and most young pedestrian deaths happen at spots other than intersections. ➢ Yield to young pedestrians. Children might not stop, either because they don't see your vehicle approaching or don't know how to safely cross the street. ➢ Communicate with other drivers. Always use your turn signals. And if you have to pull over to drop off or pick up your kids, turn on flashers. **Safety Items for October 31st, 2012:** No issues to report. **11-01-12:: Hypothermia** Constant shivering is a key sign of hypothermia. Other symptoms of moderate to severe hypothermia include: ➢ Shivering ➢ Clumsiness or lack of coordination ➢ Slurred speech or mumbling ➢ Stumbling ➢ Confusion or difficulty thinking ➢ Poor decision making, such as trying to remove warm clothes ➢ Drowsiness or very low energy ➢ Apathy or lack of concern about one's condition ➢ Progressive loss of consciousness ➢ Weak pulse ➢ Slow, shallow breathing A person with hypothermia usually isn't aware of his or her condition, because the symptoms often begin gradually and due to the confused thinking associated with hypothermia, this prevents self-awareness

Health and Safety Issues (Cont.)	Call 911 if you see someone with signs of hypothermia or if you suspect a person has had unprotected or prolonged exposure to cold weather or water. If possible, take the person inside, remove wet clothing, and cover him or her in layers of blankets. **Safety Items for November 01st, 2012:** No issues to report. **11-02-12: Circle Checks** 360° Walk Around Circle for Safety. The order in which you do things can change the desired outcome. Why? Because time and circumstances around you are always changing. Take a moment to perform a circle check of your vehicle or equipment for safety. ➢ Eliminate the potential for injury, damage and/ or death by conducting a circle check. ➢ Make circle checks of your vehicle a habit each time you drive at home and at work. A 360° Walk Around Circle for Safety should always be performed just prior to moving your vehicle or equipment. It only takes 30 seconds, but it is worth your time in order to prevent a tragedy. **Safety Items for November 02nd, 2012:** No issues to report. **11-3-12 and 11-4-12: Foot Care** Proper foot care is essential to avoid common and potentially serious foot ailments. To avoid discomfort, keep your feet healthy by following a few simple rules; ➢ Choose well-fitted foot wear in good repair. ➢ Wear clean, dry sock everyday – pack extra socks. ➢ Choose socks made of materials designed to wick moisture away from skin. ➢ Dry feet thoroughly after bathing. ➢ Do not wear socks while sleeping or resting. ➢ If blisters or abrasions develop, keep the area clean and dry with a dressing. **Safety Items for November 03rd, 2012 and November 04th, 2012:** No issues to report.
Activities / Comments	**Waste Management (John Wallace):** **10-25-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **10-26-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. Collected one (1) waste water sample from sump A/B at FTC. **10-27-12 and 10-28-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: No activities. **10-29-12:** Decon: No activities. T&D: Water was hauled out of FTC A/B sump by Valley City and disposed of at Plummer's Environmental. Waste Management Characterization: Continuing waste management characterization, documentation and coordination.

Activities / Comments (Cont.)	**10-30-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **10-31-12:** Decon: No activities. T&D: A roll off box MSW and a roll off box of oily vegetation were hauled to C&C landfill for disposal. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-01-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-02-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-03-12 and 11-04-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: No activities. **Submerged Oil (David Bareham):** **10-25-12, and 10-26-12:** Science: No activities. Compliance: Morrow Lake monitoring. **10-27-12 and 10-28-12:** Science: No activities. Compliance: No activities. **10-29-12, 10-30-12 and 10-31-12:** Science: No activities. Compliance: Morrow Lake monitoring. **11-01-12:** Science: No activities. Compliance: Conducted sediment trap monitoring. Collected three (3) sediment samples from sediment traps. Conducted turbidity monitoring during sediment trap removal at MP 36.10.

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Activities / Comments (Cont.)	**11-02-12:** Science: No activities. Compliance: Conducted sediment trap monitoring. Conducted turbidity monitoring during sediment trap removal at MP 36.10. Removed sediment trap at MP 36.10 **11-03-12 and 11-04-12:** Science: No activities. Compliance: No activities. **Containment (Dean Sahara) :** **10-25-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 2 Boats for RI. Provided 1 Boat for MLD Poling. Boom: Nothing to Report. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 195'. Ceresco: Recovered 129 bags of debris. Configuration B: Recovered 75 bags of debris. E4 Boat Launch: Recovered 83 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **10-26-12:** Completed River Inspections: Provided 2 Boats for Situational Awareness. Provided 1 Boat for Safety. Provided 2 Boats for RI. Provided 1 Boat for MLD Poling. Boom: Configuration E North: Monitored 500', and adjusted 75'. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 195'. Ceresco: Recovered 134 bags of debris. Configuration B: Recovered 20 bags of debris. E4 Boat Launch: Recovered 38 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **10-27-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Boom: Nothing to Report. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. Total Footage Snare used: 120'. Ceresco: Recovered 46 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **10-28-12:** No activities. **10-29-12:** Completed River Inspections: Provided 2 boats for situational awareness. Provided 1 boat for safety. Provided 1 boat for MLD poling. Provided 2 boats for RI. Boom: Configuration F South: Monitored 575'. Configuration A: Monitored 400'. Configuration B: Monitored 150'. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 195'. Ceresco: Recovered 36 bags of debris. E4 Boat launch: Recovered 37 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **10-30-12:** Issued work permit and completed a detailed tailgate meeting. Crews then mobilized the required resources to the work areas. Work cancelled at 0900, due to adverse weather conditions. **10-31-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 1 boat for MLD poling. Provided 2 boats for RI. Boom: Configuration C East: Monitored 100'. Configuration C West: Monitored 625'. Configuration D: Monitored 225', Adjusted 25'. Buoys: Completed Buoy Inspections. Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Total Footage Snare used: 145'. Ceresco: Recovered 36 bags of debris. E4 Boat launch: Recovered 30 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required.

Activities / Comments (Cont.)	**11-01-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Boom: Configuration E South: Monitored 550', adjusted 50'. Configuration E North: Monitored 500', Adjusted 50'. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Total Footage Snare used: 145'. Configuration C: Recovered 1 bags of debris. E4 Boat launch: Recovered 8 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. Removed sediment trap at MP 36.10. **11-02-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Boom: Configuration F South: Monitored 575'. Configuration F North: Monitored 500', adjusted 50'. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Total Footage Snare used: 145'. Configuration C: Recovered 22 bags of debris. E4 Boat launch: Recovered 8 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-03-12:** Completed River Inspections: Provided 1 boat for Situational Awareness. Boom: Nothing to Report. Buoys: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 120' of snare used. Total Footage Snare used: 120'. Debris: Ceresco: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-04-12:** No activities. **<u>Kalamazoo River (Bryan Stiemsma):</u>** **10-25-12:** <u>Remedial Investigation</u>: Collected one (1) groundwater sample from MP 7.75I. Collected one (1) groundwater sample from MP 8.00I. Collected one (1) groundwater sample from MP 8.25I. Collected one (1) groundwater sample from MP 9.00R. Collected seven (7) soil samples from MP 9.50L. Collected three (3) soil samples from MP 9.75L. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: Conducted weekly SESC inspection for source area. Compliance: No activities. **10-26-12:** <u>Remedial Investigation</u>: Collected three (3) soil samples from MP 9.75L. Collected two (2) sediment samples from MP 9.75L. Collected three (3) soil samples from MP 10.00L. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: Mailed potable results letters from September 2012 sampling event. <u>Compliance:</u> No activities. **10-27-12 and 10-28-12:** <u>Remedial Investigation</u>: No activities. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: No activities. <u>Compliance:</u> No activities. **10-29-12:**

Activities / Comments (Cont.)	Remedial Investigation: Collected four (4) soil samples from MP 9.75I. Collected three (3) soil samples from MP 9.50R. Collected one (1) sediment sample for MP 9.50R. Collected four (4) soil samples from MP 9.75R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **10-30-12:** Remedial Investigation: Collected four (4) soil samples for MP 9.75R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **10-31-12:** Remedial Investigation: Collected seven (7) soil samples from MP 10.00R. Collected two (2) sediment samples from MP 10.00R. Remedial Action: No activities. Monitoring: Conducted the final weekly S.E.S.C. inspection at the source area. Compliance: No activities. **11-01-12:** Remedial Investigation: Collected two (2) soil samples from MP 10.00R. Collected one (1) sediment sample from MP 10.75R. Collected five (5) soil samples from MP 10.75R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-02-12:** Remedial Investigation: Collected five (5) soil samples from MP 11.00R. Collected two (2) sediment samples from MP 11.00R. Collected one (1) soil sample from MP 10.75R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-03-12 and 11-04-12:** Remedial Investigation: No activities. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities.

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1. Incident Name	2. Date Prepared	3. Time Prepared	UNIT LOG ICS 214	
Kalamazoo River/Enbridge Spill Response	11/26/2012	12:00		
4. Unit Name/Designators	**5. Unit Leader**		**6. Operational Period : DATE/TIME**	
Enbridge Operations	**Name:**	John Sobojinski	**From:**	**November 05, 2012;0700**
	Position:	Incident Commander	**To:**	**November 27, 2012;0700**

7. Personnel Roster Assigned

Name	ICS Position	DUTY CELL
John Sobojinski	Enbridge Incident Commander	[redacted]
Dave Bareham	Environment	
Dave Bareham	Operations	
Jason Manshum	Public Information	
Dale Gross	Safety & Security	
John Wallace	Waste Management	
David Bareham	Submerged Oil	
Dean Sahara	Containment	
Bryan Stiemsma	Kalamazoo River	

8. Activity Log

Activity Areas	Safety & Security, Air Operations, Waste Management, Overbank, Submerged Oil, Containment, Talmadge Creek, Kalamazoo River

Health and Safety Issues

Safety & Security (Dale Gross)

General Safety Message:

11-05-12: Life Saving Rule #5 – Isolate Energized Systems

Always follow procedures for lockout/ tag-out. Equipment, facilities and piping systems could have stored or residual energy that poses a danger.

Each and every one of us must do everything in our power to protect ourselves, and to protect those around us.

You are the power behind lifesaving rules

Safety Items for November 05th, 2012: Near Miss – A SET Environmental worker was driving a truck with a boat trailer at the E4.0 launch to park in a parking spot. The SET Environmental drove around a corner and while he was turning, the boat trailer tire rubbed a SWAT truck bumper. No property damage occurred. A small black mark was left on SWAT truck bumper.

11-06-12: Michigan Winter Hazards Awareness Week

This week is Michigan Winter Hazards Awareness Week. Each year residents within Michigan encounter winter hazards including icy roads, frostbite, and over-exertion from snow removal. Citizens may become injured or suffer property damage as a direct result of winter storms that bring extreme cold, wind, heavy ice and large amounts of snow. Drivers must take extra precautions to ensure traveling safety. When outside follow these tips:

- Avoid overexertion. Sweating could lead to chill and hypothermia, and abnormally low body temperatures. Cold weather also puts extra strain on the heart, so the elderly and those with heart conditions should be especially cautious when out in the cold.
- Walk carefully on snowy, icy sidewalks.
- Wear loose-fitting, lightweight warm clothing in layers, with a waterproof outer layer. Wear a wool hat and mittens.
- Keep your clothes dry. Change wet socks and clothing quickly to prevent loss of body heat.
- Understand the hazards of wind chill. As wind speed increases, heat is carried away from a person's body more rapidly which could lead to severe hypothermia.

Safety Items for November 06th, 2012: No issues to report.

11-07-12: Managing Change at the Job Site

Maintaining safety over the life of a project requires having a system in place that allows for successfully managing change, this includes;

- Operations

Health and Safety Issues (Cont.)	➢ Procedures ➢ Standards ➢ Equipment ➢ Personnel Changes need to be evaluated to ensure risks are addressed. Projects go through changes on a regular basis, including moving resources from location to another. Make certain that: ➢ Equipment is approved and certified as required. ➢ If equipment has been modified, appropriately communicate and complete training. ➢ A hazard assessment of work activities on the worksite is completed. ➢ Changes have been communicated and all employees are appropriately trained in the tasks. **Safety Items for November 07th, 2012:** No issues to report. **11-08-12: Ice Jams** **What is an ice jam?** Pieces of floating ice carried with a stream's current can accumulate at any obstruction to the stream flow developing an ice jam. The water held back can cause flooding upstream, and if the obstruction suddenly breaks, flash flooding can occur downstream. **When was the last time ice jam flooding occurred in Michigan?** Ice jams occur every year in Michigan. Historically, ice jams have caused flooding on the Kalamazoo River. **What time of year is an ice jam likely to occur? I**n Michigan, the most likely times are in early winter before the surfaces are completely frozen and in early spring when the ice cover begins to break up due to melting. **Safety Items for November 08th, 2012:** No issues to report. **11-09-12: Manual Lifting – Back Care** Manual lifting hazards should be assessed before any lifting is done. Hazards may include; ➢ High lifting frequency; Large number of lifts ➢ Lifting unstable objects; Top heavy loads ➢ Difficult to hold loads ➢ Unstable footing and slippery walking surfaces ➢ Heavy object weight ➢ Blocked vision by the objects being lifted Follow the Eight Commandments of Safe Lifting; 1) Plan your lift and test your load 2) Ask for help 3) Get a firm footing 4) Bend your knees 5) Tighten your stomach muscles 6) Lift with your legs 7) Keep the load close 8) Keep your back upright Avoid twisting whether lifting or putting down a load. **Safety Items for November 09th, 2012:** No issues to report. **11-10-12 and 11-11-12: Winter Weather Awareness – Watches, Warnings and Advisories** A weather warning is issued when a hazardous weather is occurring, imminent or likely. A warning means weather conditions pose a threat to life or property. People in the path of the storm need to take protective action. A weather watch is used when the risk of a hazardous weather event has increased significantly, but its occurrence, location or timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so.

Health and Safety Issues (Cont.)	A watch means that hazardous weather is possible. People should have a plan of action in case a storm threatens and they should listen for later information and possible warnings especially when planning travel or outdoor activities. A weather advisory is issued when a hazardous weather event is occurring, imminent or likely. Advisories are for less serious conditions than warnings that cause significant inconvenience and if caution is not exercised, could lead to situations that may threaten life or property. **Safety Items for November 10th, 2012 and November 11th, 2012:** No issues to report. **11-12-12: Life Saving Rule #6 – Report Incidents** Always report significant safety related incidents. We believe all injuries and incidents are preventable. Reporting incidents allows us to understand what happened and prevent it from happening again. ***When you speak up for safety, everyone benefits. You are the voice of lifesaving rules***. **Safety Items for November 12th, 2012:** No issues to report. **11-13-12: Call Em All Broadcast System** If you are not currently enrolled in the Call Em All system, please contact Enbridge Safety. This is a radio broadcast system for any weather related updates, potential work delays and/or emergency situations. **Safety Items for November 13th, 2012:** No issues to report. **11-14-12: Hunting Update - Firearm Deer** Tomorrow, November 15th, marks the start of regular firearm use in the state of Michigan for deer. Hunting activity for deer is expected to increase from last year as the river is now open to the public. While we cannot prevent hunting activities from occurring, there are a number of best practices we can utilize to work safely during hunting season. ➢ Be alert for hunters in your work area. ➢ Do not work alone. ➢ Wear high visibility orange hard hat covers and safety vests. Remember: If you feel threatened by any hunting activities, leave the area, call 911 and report the incident to the Enbridge Safety Office 269-753-9347. NOTE: No one is to hunt on Enbridge properties unless they are the tenant to that specific property and have approval from Enbridge Incident Commander. **Safety Items for November 14th, 2012:** No issues to report. **11-15-12: Hunting Reminder - Firearm Deer** Today, November 15th, marks the start of regular firearm use in the state of Michigan for deer. Hunting activity for deer is expected to increase from last year as the river is now open to the public. While we cannot prevent hunting activities from occurring, there are a number of best practices we can utilize to work safely during hunting season. ➢ Be alert for hunters in your work area. ➢ Do not work alone. ➢ Wear high visibility orange hard hat covers and safety vests. Remember: If you feel threatened by any hunting activities, leave the area, call 911 and report the incident to the Enbridge Safety Office 269-753-9347. NOTE: No one is to hunt on Enbridge properties unless they are the tenant to that specific property and have approval from Enbridge Incident Commander. **Safety Items for November 15th, 2012:** No issues to report.

Health and Safety Issues (Cont.)

11-16-12: Proper Eye Protection

There are various types of eye protection -- safety glasses, face shields, chemical goggles, welding hoods, burning goggles, etc. Each offers a particular level of protection.

Safety glasses are mandatory at all field work locations. Eyeglasses or sunglasses may not be used as a substitute. Remember, safety glasses are only good if you WEAR THEM! If you keep them in your pocket or on top of your hard hat they will not do you any good.

Wear your safety glasses – Save your sight! One unguarded moment could result in a lifetime of darkness!

Safety Items for November 16th, 2012: No issues to report.

11-17-12 and 11-18-12: Automotive Winter Emergency Kit

Your vehicle should always be equipped with emergency supplies. Keep the following items stored in a portable container:

- A small battery powered radio (AM is sufficient) and extra batteries.
- Flashlight with extra batteries.
- Cellular phone.
- Windshield scraper.
- Jumper cables.
- Fire extinguisher.
- Maps.
- Shovel.
- Blanket and extra clothes.
- Flares.
- Bottled water and non-perishable, high energy foods (granola bars, canned nuts, raisins, hard candy, trail mix, peanut butter and crackers).
- First aid kit.
- Tire repair kit and pump.
- Tow strap.
- Phone book and phone list.
- De-icer and extra antifreeze.
- "Call Police" or other "Help" sign.

Safety Items for November 17th, 2012 and November 18th, 2012: No issues to report.

11-19-12: Life Saving Rule #1 – Hazard Management

- Always ensure an analysis has been performed for any potential hazards that may arise.
- Proper authorization must be received prior to starting any work.
- Follow the guidance that is provided in the hazard identification documentation to ensure the safety and security of the workers and the work site.

Remember: When we use our heads and follow the rules, we can all get home safe.

Safety Items for November 19th, 2012: No issues to report.

11-20-12: Holiday Travel Awareness

Whether you're traveling across town or around the world, help ensure your trip is safe for the Thanksgiving Holiday. Please obey all traffic laws and:

- Have an adequate amount of rest prior to traveling.
- Inspect your vehicle tire pressure and make sure wind shield is clean.
- Inform a friend or family member of travel plans.
- If you become drowsy during your commute, be sure to pull over at a rest area. Do not take chances by pushing yourself to drive if you are tired.

To a safe and relaxing Thanksgiving Holiday!

Health and Safety Issues (Cont.)	**Safety Items for November 20th, 2012:** No issues to report. **11-21-12, 11-22-12, 11-23-12, 11-24-12, 11-25-12 and 11-26-12: Lifesaving Rule #2 – Driving Safety** Only drive a vehicle or operate equipment when not under the effect of alcohol or any substances that cause impairment. Driving a vehicle or operating equipment is a high-risk activity. Focus on the task. ***Remember: When it comes to safety – you are at the wheel. People are relying on your professional integrity to be safe in everything you do.*** **Safety Items for November 21st, 2012 thru November 26th, 2012:** No issues to report.
Activities / Comments	**Waste Management (John Wallace):** **11-05-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-06-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-07-12:** Decon: No activities. T&D: A roll off of oily vegetation was hauled to C&C landfill for disposal on 11-7-12. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-08-12:** Decon: No activities. T&D: SET crew hauled in water from the wildlife center and disposed of at the Cell A/B sump. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-09-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-10-12 and 11-11-12:** Decon: No activities. T&D: No activities.

Activities / Comments (Cont.)	Waste Management Characterization: No activities. **11-12-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-13-12, 11-14-12, 11-15-12 and 11-16-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-17-12:** Decon: No activities. T&D: Water was hauled from E4 removal to FTC for disposal Waste Management Characterization: No activities. **11-18-12:** Decon: No activities. T&D: Water from the E4 removal was hauled to FTC for disposal in cell A/B sump. Waste Management Characterization: No activities. **11-19-12:** Decon: No activities. T&D: Multiple roll offs of oily debris were hauled from the E4 removal and taken to C&C landfill for disposal. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-20-12:** Decon: No activities. T&D: Multiple roll offs of oily debris from the E4 removal were hauled to C&C landfill for disposal. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. Collected one (1) oily debris samples for O&G analysis. Disposal of E4 boom. **11-21-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Disposal of E4 boom. **11-22-12, 11-23-12, 11-24-12 and 11-25-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: No activities.

Activities / Comments (Cont.)	**11-26-12:** Decon: No activities. T&D: Multiple roll offs of oily debris were hauled to C&C landfill for disposal. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **Submerged Oil (David Bareham):** **11-05-12:** Science: No activities. Compliance: Began removal of buoys along the Kalamazoo River. Removed the buoys at 36.10 sediment trap. Conducted sediment trap monitoring. Walling Tube sampling. **11-06-12:** Science: No activities. Compliance: Continued removal of buoys along the Kalamazoo River. Conducted sediment trap monitoring. Collected six (6) sediment samples from sediment traps. Walling Tube sampling. **11-07-12:** Science: No activities. Compliance: Continued removal of buoys along the Kalamazoo River. Conducted sediment trap monitoring. Collected ten (10) sediment samples from sediment traps. Collected twenty-three (23) sediment samples from walling tubes. **11-08-12:** Science: No activities. Compliance: Continued removal of buoys along the Kalamazoo River. Conducted sediment trap monitoring. Collected nine (9) sediment samples from sediment traps. Collected fourteen (23) sediment samples from walling tubes. **11-09-12:** Science: No activities. Compliance: Conducted sediment trap monitoring. Bathymetry training. **11-10-12 and 11-11-12:** Science: No activities. Compliance: No activities. **11-12-12, 11-13-12, 11-14-12, 11-15-12, 11-16-12, 11-17-12, and 11-18-12:** Science: No activities. Compliance: Collected Bathymetry data at E4. **11-19-12:** Science: No activities. Compliance: Collected Bathymetry data at E4. Collected fourteen (14) sediment samples from sediment traps. **11-20-12, 11-21-12, 11-22-12, 11-23-12, 11-24-12, 11-25-12 and 11-26-12 :** Science: No activities. Compliance: No activities.

Activities / Comments (Cont.)	**Containment (Dean Sahara) :** **11-05-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Provided 2 boats for Walling. Provided 2 boats for Sediment Trap Poling. Boom: Configuration A: Monitored 400', adjusted 25'. Configuration B: Monitored 150'. Configuration D: Monitored 250'. Buoys: Removed (3 buoys each) from Walling samplers (20,19,17,16,15,14,13,12,11,10,9, and 8). Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 195'. Ceresco: Recovered 18 bags of debris. E4 Control Point: Recovered 10 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-06-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Provided 2 boats for Walling. Provided 2 boats for Sediment Trap Poling. Boom: Configuration C: Monitored 750', adjusted 750'. Buoys: Removed Buoys/Walling samplers (MP 15.75, D2 and C.04). Sheen Sweep: E4 to MP 38.75: 120' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 195'. Ceresco: Recovered 16 bags of debris. E4 Control Point: Recovered 1 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-07-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Provided 2 boats for Sediment Trap Poling. Boom: Configuration E: Monitored 1050', adjusted 75'. Buoys: Inspected, no reported issues. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 125'. Debris Recovered: Ceresco: Recovered 63 bags of debris. Configuration C: Recovered 1 bag of debris. E4 Control Point: Recovered 2 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-08-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Provided 2 boats for Sediment Trap Poling. Boom: Configuration F: Monitored 1075', adjusted 50'. Buoys: Nothing to Report. Survey Crew: Installed monuments 1 installed at MP 36.1 LDB, 2 installed at MP 37 RDB. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 125'. Debris Recovered: Ceresco: Recovered 12 bags of debris. Configuration C: Recovered 1 bag of debris. E4 Control Point: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-09-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for safety. Provided 2 boats for RI. Provided 2 boats for Sediment Trap Poling. Provided 1 boat for Survey Crew. Boom: Configuration A: Monitored 400'. Configuration B: Monitored 150'. Configuration D: Monitored 250'. Buoys: Nothing to Report. Survey Crew: Installed markers on monuments at MP 36.1 LDB, and MP 37 RDB. Installed monuments: 2 at MP 5.75, 1 at MP 37 and 2 at MP 10.5. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 125'. Debris Recovered: Ceresco: Recovered 48 bags of debris. Configuration B: Recovered 10 bag of debris. E4 Control Point: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-10-12:** Completed River Inspections: Provided 1 boat for Situational Awareness. Boom: Nothing to Report. Buoys: Nothing to Report. Survey Crew: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 100'. Debris recovered: Nothing to Report. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required.

Activities / Comments (Cont.)	**11-11-12:** Completed River Inspections: Provided 1 boat for Situational Awareness. Boom: Nothing to Report. Buoys: Nothing to Report. Survey Crew: Nothing to Report. Sheen Sweep: Nothing to Report. Total Footage Snare used: 0'. Debris Recovered: Nothing to Report. **11-12-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for Safety. Provided 2 boats for RI. Provided 4 boats Bathymetry. Provided 1 boat for Survey Crew. Boom: Nothing to report. Buoys: Inspected all Buoys. Survey Crew: Installed 2 monuments at MP 28.25 Oxbow, and surveyed monuments at MP 10.5. Sheen Sweep: MP 21.25 to MP 33.1: 24' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 74'. Debris Recovered: Ceresco: Recovered 8 bags of debris. E4 Control Point: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-13-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for Safety. Provided 2 boats for RI. Provided 4 boats Bathymetry. Provided 1 boat for Survey Crew. Provided 1 boat for Water Monitoring. Boom: Configuration C: Monitored 750', and Adjusted 50'. Buoys: Nothing to report. Survey Crew: Installed 2 monuments at MP 33 A/B, and 2 monuments at MP 11.25. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 21.25 to MP 33.1: 16' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 116'. Debris Recovered: Ceresco: Recovered 14 bags of debris. E4 Control Point: Recovered 5 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-14-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for Safety. Provided 2 boats for RI. Provided 4 boats Bathymetry. Provided 1 truck for Survey Crew. Provided 1 boat for Water Monitoring. Boom: Configuration E: Monitored 1050', and Adjusted 25'. Buoys: Nothing to report. Survey Crew: No monuments to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 124'. Debris Recovered: Ceresco: Recovered 18 bags of debris. E4 Control Point: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-15-12:** Completed River Inspections: Provided 1 boat for Situational Awareness. Provided 1 boat for Safety. Provided 4 boats Bathymetry. Boom: Configuration F: Monitored 1350', and Adjusted 75'. Buoys: Nothing to report. Survey Crew: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. Total Footage Snare used: 50'. Debris Recovered: Nothing to Report. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-16-12:** Completed River Inspections: Provided 1 boat for Situational Awareness. Provided 1 boat for Safety. Provided 4 boats Bathymetry. Provided 1 boat for Survey. Boom: Configuration B: Monitored 125'. Configuration D: Monitored 200'. Buoys: Nothing to report. Survey Crew: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. Total Footage Snare used: 50. Debris Recovered: Nothing to Report. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-17-12:** Completed River Inspections: Provided 1 boat for Situational Awareness/Safety. Provided 4 boats Bathymetry. Provided 1 boat for Turbidity. Provided 1 boat for Oversight. Boom: Configurations A: Completed removal of curtain 450'. Configurations B: Completed removal of curtain 200'. Configurations C: Completed removal of curtain 1100'. Buoys: Nothing to report. Survey Crew: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. Total Footage Snare used: 50'. Debris Recovered: E4 Control Point: Recovered 8 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required.

Activities / Comments (Cont.)	**11-18-12:** Completed River Inspections: Provided 1 boat for Situational Awareness/Safety. Provided 4 boats Bathymetry. Provided 1 boat for Turbidity. Provided 1 boat for Oversight. Boom: Configurations D: Completed removal of curtain 700'. Configurations E: Completed removal of curtain 1500'. Buoys: Nothing to report. Survey Crew: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. Total Footage Snare used: 50'. Debris Recovered: Nothing to report. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-19-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for Safety. Provided 4 boats Bathymetry. Provided 1 boat for Turbidity. Provided 1 boat for Oversight. Boom: Configurations F: Completed removal of curtain 1400'. Configurations A: Removed 100' of Boom. Configurations B: Removed 1950' of Boom. Buoys: Nothing to report. Survey Crew: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 75' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Total Footage Snare used: 99'. Debris Recovered: Ceresco: Recovered 38 bags of debris. E4 Control Point: Recovered 12 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-20-12:** Completed River Inspections: Provided 2 boats for Situational Awareness. Provided 1 boat for Safety. Provided 2 boats Bathymetry. Provided 1 boat for Oversight. Provided 1 boat for Survey Crew. Boom: Configurations C: Completed removal of curtain 1650'. Configurations D: Removed 800' of Boom. Configurations E: Removed 1500' of Boom. Buoys: Nothing to report. Survey Crew: Nothing to Report. Sheen Sweep: E4 to MP 38.75: 100' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 174'. Debris Recovered: Ceresco: Recovered 18 bags of debris. E4 Control Point: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-21-12:** Completed River Inspections: Provided 1 boat for Situational Awareness. Provided 1 boat for Safety. Provided 1 boat for Oversight. Boom: Configurations F: Completed removal of curtain 1400'. Buoys: Removed 18 Can Buoys and Anchors. Survey Crew: Nothing to Report. Sheen Sweep: MP 21.25 to MP 33.1: 24' of snare used. Total Footage Snare used: 24'. Debris Recovered: Ceresco: Recovered 26 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-22-12 and 12-23-12:** No activities. **11-24-12:** Completed River Inspections: Provided transportation for Situational Awareness. Boom: Nothing to report. Buoys: Nothing to report. Survey Crew: Nothing to report. Sheen Sweep: E4 to MP 38.75: 25' of snare used. Total Footage Snare used: 25'. Debris Recovered: Ceresco: Recovered 4 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-25-12:** No activities. **11-26-12:** Completed River Inspections: Provided transportation for Situational Awareness. Provided 1 Boat for Safety. E4 Configuration Removal: Removed 1 slider and 10' of steel piping. Boom: Nothing to report. Buoys: Nothing to report. Survey Crew: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 124'. Debris Recovered: Ceresco: Recovered 29 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required.

Activities / Comments (Cont.)	**Kalamazoo River (Bryan Stiemsma):** **11-05-12:** Remedial Investigation: Collected four (4) soil samples from MP 11.00R. Collected six (6) soil samples from MP 10.00R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-06-12:** Remedial Investigation: Collected nine (9) soil samples from MP 10.00R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-07-12:** Remedial Investigation: Collected eight (8) soil samples from MP 10.00R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-08-12:** Remedial Investigation: Collected four (4) soil samples from MP 10.00R. Collected one (1) surface water sample from MP 10.00R. Collected three (3) soil samples from MP 10.25R. Collected one (1) groundwater sample from MP 9.50L. Collected one (1) groundwater sample from MP 9.75I. Collected one (1) groundwater sample from MP 9.25R. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-09-12:** Remedial Investigation: Collected four (4) soil samples form MP 10.25R. Collected four (4) soil samples from MP10.50L. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-10-12 and 11-11-12:** Remedial Investigation: No activities. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-12-12:** Remedial Investigation: Collected four (4) soil samples from MP 10.00I. Collected two (2) soil samples from MP 10.25R. Collected one (1) soil samples from MP 10.50L. Collected two (2) soil samples from MP 11.00I. Collected two (2) soil samples from MP 11.00R. Installed 704 bare root shrubs and 24 bare root trees at the

Activities / Comments (Cont.)	Source Area to continue restoration of the previously graded site. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-13-12:** Remedial Investigation: Collected eight (8) soil samples from MP 10.25R. Installed 31 trees to complete the restoration of the previously graded Source Area south of the Line 6B pipeline corridor. Remedial Action: No activities. Monitoring: Collected ten (10) surface water samples along the Kalamazoo River. Collected five (5) surface water samples on Morrow Lake. Compliance: No activities. **11-14-12:** Remedial Investigation: Collected one (1) groundwater sample from MP 10.00I. Collected three (3) soil samples from MP 10.25R. Collected four (4) soil samples from MP 10.50R. Collected one (1) sediment sample from MP 10.50R. Collected one (1) groundwater sample from MP 11.00I. Remedial Action: No activities. Monitoring: Collected three (3) surface water samples on Morrow Lake. Compliance: No activities. **11-15-12:** Remedial Investigation: Collected two (2) soil samples from MP 11.25I. Collected one (1) soil sample from MP 11.25R. Collected one (1) soil sample from MP 10.50R. Collected one (1) soil sample from MP 10.50I. Collected one (1) sediment sample from MP 11.00L. Collected four (4) soils samples from MP 11.00L. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-16-12:** Remedial Investigation: Collected two (2) soil samples from MP 11.25I. Collected one (1) soil sample from MP 11.25R. Collected one (1) soil sample from MP 10.50R. Collected one (1) soil sample from MP 10.50I. Collected one (1) sediment sample from MP 11.00L. Collected four (4) soils samples from MP 11.00L. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities. **11-17-12 and 11-18-12:** Remedial Investigation: No activities. Remedial Action: No activities. Monitoring: Perform turbidity monitoring at Morrow Lake Delta during E4 Boom removal. Compliance: No activities. **11-19-12:** Remedial Investigation: No activities.

Activities / Comments (Cont.)	Remedial Action: No activities. Monitoring: Perform turbidity monitoring during E4 Boom removal. Compliance: No activities. **11-20-12, 11-21-12, 11-22-12, 11-23-12, 11-24-12, 11-25-12 and 11-26-12:** Remedial Investigation: No activities. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities.

1. Incident Name	2. Date Prepared	3. Time Prepared	UNIT LOG ICS 214	
Kalamazoo River/Enbridge Spill Response	12/09/2012	12:00		
4. Unit Name/Designators	**5. Unit Leader**		**6. Operational Period : DATE/TIME**	
Enbridge Operations	**Name:**	John Sobojinski	**From:**	**November 27, 2012;0700**
	Position:	Incident Commander	**To:**	**December 10, 2012;0700**

7. Personnel Roster Assigned

Name	ICS Position	DUTY CELL
John Sobojinski	Enbridge Incident Commander	[redacted]
Dave Bareham	Environment	
Dave Bareham	Operations	
Jason Manshum	Public Information	
Dale Gross	Safety & Security	
John Wallace	Waste Management	
David Bareham	Submerged Oil	
Dean Sahara	Containment	
Bryan Stiemsma	Kalamazoo River	

8. Activity Log

Activity Areas	Safety & Security, Air Operations, Waste Management, Overbank, Submerged Oil, Containment, Talmadge Creek, Kalamazoo River

Health and Safety Issues

Safety & Security (Dale Gross)

General Safety Message:

11-27-12: Safe Lighting

This time of the year is when the days have become shorter. Today sunrise is at 07:46 and sunset is at 17:09. Work after dusk (with the exception of security) generally is not permitted and, if necessary, will only be allowed if the following conditions are met:

- Prior approval.
- A minimum of two workers, or communications exist to outside areas to request assistance, if required.
- Adequate lighting is provided to illuminate the work area.

Safety Items for November 27th, 2012: No issues to report.

11-28-12: Black Ice

Winter driving isn't just about dealing with snow; ice on the road is a real threat. Black ice, in particular, is dangerous because it's invisible (the term "black ice" being somewhat of a misnomer, as the ice is transparent). Tips for driving safely in icy conditions include:

- Decrease your speed and leave yourself plenty of room to stop. You should allow at least three times more space than usual between you and the car in front of you.
- Brake gently to avoid skidding.
- Use low gears to keep traction, especially on hills.
- Don't use cruise control on icy roads.
- Be especially careful on bridges, overpasses and infrequently traveled roads, which will freeze first. Even at temperatures above freezing, if the conditions are wet, you might encounter ice in shady areas or on exposed roadways like bridges.

Don't pass snow plow trucks. The drivers have limited visibility, and you're likely to find the road in front of them worse than the road behind.

Safety Items for November 28th, 2012: No issues to report.

11-29-12: Walking in Icy/Slippery Conditions

Wintery conditions such as snow, ice, wind and other factors such as poor lighting can contribute to risk of slips,

Health and Safety Issues (Cont.)	trips, and falls. The following are some tips aimed at helping prevent slips, trips and falls: ➢ Wear proper footwear with good traction that is kept in good repair. Take a look at the soles of shoes regularly to check for excessive wear. ➢ Use handrails when available ➢ Take short steps and reduce walking speed to help maintain stability. ➢ Make sure all areas have adequate lighting to illuminate any potential hazards. **Safety Items for November 29th, 2012:** No issues to report. **11-30-12 and 12-01-12: Housekeeping before Snow** ➢ Organize a "sweep" of work areas and pick up any materials that could get covered by snow and could become a trip hazard. ➢ Prepare by having snow shovels, brooms, and ice melt on hand for use to clear steps and paths. ➢ Identify entrances, exits, curbs, as well as drop offs. ➢ Repair any loose steps and install non-skid tape where the need has been identified. **Safety Items for November 30th and December 1st:** No issues to report. **12-02-12: Life Saving Rule #3 – Confined Space Entry** Always follow procedures for Confined Space Entry; ➢ Always complete the required permit ➢ Receive proper authorization and ensure personnel are in place to perform the rescue plan before entering a confined space ***Remember: It is up to us to keep unsafe behavior out of the workplace*** **Safety Items for December 2nd:** No issues to report. **12-03-12: Jon Boat Winter Safety** During winter operations on the Kalamazoo River, jon boat operations may be suspended when border ice has formed or once there is free floating ice. Water/ice conditions will be monitored daily as part of the daily safe work permit/hazard assessment. **Safety Items for December 3rd, 2012:** No issues to report. **12-04-12: Vehicles and Carbon Monoxide** Carbon Monoxide poisoning can happen at any time of the year, but the danger is greater during the winter. Hundreds of people die from carbon monoxide poisoning every year, and thousands of others suffer dizziness, nausea, and convulsions. The gas is frightening because it's odorless and colorless. One of the most dangerous wintertime sources of carbon monoxide is vehicle exhaust. If you are in your vehicle and you keep the engine on in order to run your heater, make sure the exhaust pipe is clear. If the pipe is clogged with snow or other materials, the exhaust could back up into your vehicle. Signs of carbon monoxide poisoning include headache, mental confusion, and extreme tiredness. Get to fresh air and call for help immediately. **Safety Items for December 4th, 2012:** No issues to report. **12-05-12: Snow and Ice Removal** Snow removal contractors have been hired to remove snow from work sites. Sand and/or salt shall not be used on any boat ramp or watercraft. These products can cause additional slipping hazards on the ramps. Accumulated ice and snow may be removed by shoveling and scraping. **Safety Items for December 5th, 2012:** No issues to report. **12-06-12: Hunting Reminder – Muzzle loading Deer Season** Today is the beginning of muzzle loading deer season in the State of Michigan and the season will continue until December 23. Hunting activity for deer is expected to increase from last year as the river is now open to the

Health and Safety Issues (Cont.)	public. While we cannot prevent hunting activities from occurring, there are a number of best practices we can utilize to work safely during hunting season. ➢ Be alert for hunters in your work area. ➢ Do not work alone. ➢ Wear high visibility orange hard hat covers and safety vests. Remember: If you feel threatened by any hunting activities, leave the area, call 911 and report the incident to the Enbridge Safety Office 269-753-9347. NOTE: No one is to hunt on Enbridge properties unless they are the tenant to that specific property and have approval from Enbridge Incident Commander. **Safety Items for December 6th, 2012:** No issues to report. **12-07-12 and 12-08-12: Cold and Flu Prevention** Always wash your hands before: ➢ Preparing Food/ Eating/Treating Wounds/Giving Medicine/Touching a Sick or Injured Person Always wash your hands after: ➢ Preparing Food/Utilizing the Toilet/Touching Animals/Blowing Nose/Coughing or Sneezing in Hands/ Treating Wounds/Touching a Sick or Injured Person/ Handling Garbage, Etc. Proper Hand Washing: ➢ Wet hands with running water, add soap and lather well ➢ Rub hands vigorously for at least 20 seconds. Remember to scrub all surfaces; o Wrists/Between Fingers/Under Nails/Thumbs/Finger Tips/ Back of Hands ➢ Rinse hands off under running water ➢ Dry hands with a clean or disposable towel or air dryer ➢ If possible, use your towel or the back of your hand to turn off the faucet Alcohol Based Sanitizer: ➢ Apply enough of the product to the palm of your hand to wet completely ➢ Rub hands together, covering all surfaces up to 25 seconds or until dry **Safety Items for December 7th and December 8th:** No issues to report. **12-09-12: Life Saving Rule #4 – Ground Disturbance** Dig Safely. Always follow procedures for locating, positively identifying and excavating buried facilities. Protect yourself, your community and the environment by protecting our pipelines – ensure that all buried facilities are identified and marked prior to excavation. By building a strong foundation of safe practices we can protect our most valuable resource – our people. ***Make certain you know and obey the Enbridge 10-2-1 Rule.*** **Safety Items for December 9th:** No issues to report.
Activities / Comments	**Waste Management (John Wallace):** **11-27-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-28-12:** Decon: Multiple buoys were deconed and placed into storage in connex box behind metal barn in FTC. T&D: No activities.

Activities / Comments (Cont.)	Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-29-12:** Decon: Crew deconed buoys and anchors from the E4 removal. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **11-30-12:** Decon: Crew deconed various items such as hard boom and anchors. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **12-01-12 and 12-02-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: No activities. **12-03-12:** Decon: Crew deconed hard boom and buoys in their daily progress. T&D: A roll off of oily debris was hauled from E4 to C&C landfill for disposal. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **12-04-12:** Decon: Multiple can buoys were deconed along with ball buoys on 12-4-12. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **12-05-12:** Decon: Hard boom, concrete anchors and ball buoys were deconed. T&D: No activities. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. **12-06-12:** Decon: Vinyl sheet pile and ball buoys were deconed in the operational period. T&D: A roll off of MSW was hauled to C&C landfill as well as an oily debris roll off. Waste Management Characterization: Continuing waste management characterization, documentation and coordination.

Activities / Comments (Cont.)	**12-07-12:** Decon: Can buoys and anchors were deconed. T&D: Water was hauled out from the cell A/B sump by Valley city and taken to Plummer's Environmental for disposal. Waste Management Characterization: Continuing waste management characterization, documentation and coordination. Collected on (1) waste water sample from the FTC sump. **12-08-12 and 12-09-12:** Decon: No activities. T&D: No activities. Waste Management Characterization: No activities. **Submerged Oil (David Bareham):** **11-27-12:** Science: Logged remaining quantification cores. Compliance: Collected Bathymetry data at Ceresco Impoundment. **11-28-12:** Science: Logged remaining quantification cores. Collected eight (8) sediment samples (4held, 4analyzed) from MP 04.25. Collected five (5) sediment samples (1held, 4analyzed) from MP 05.00. Collected six (6) sediment samples (6analyzed) from MP 05.25. Collected six (6) sediment samples (6analyed) from MP 05.50. Collected five (5) sediment samples (2held, 3analyzed) from MP 10.75. Collected six (6) sediment samples (6analyzed) from MP 15.50. Collected five (5) sediment samples (2held, 3analyzed) from MP 15.75. Collected six (6) sediment samples (3held, 3Analyzed) from MP 28.75. Collected thirteen (13) sediment samples (4held, 9analyzed) from MP 37.25. Collected nineteen (19) sediment samples (5held, 14analyzed) from MP 37.50.Collected six (6) sediment samples (6analyzed) from MP 37.75. Compliance: Collected Bathymetry data at Ceresco Impoundment. **11-29-12:** Science: Logged remaining quantification cores. Collected three (3) sediment samples (3analyzed) from MP 05.00. Collected six (6) sediment samples (6analyzed) from MP 05.50. Collected four (4) sediment samples (4analyzed) from MP 09.00. Collected four (4) sediment samples (2held, 2analyzed) from MP 11.00. Collected three (3) sediment samples (3analyzed) from MP 21.50. Collected four (4) sediment samples (1held, 3analyzed) from MP 21.75. Collected three (3) sediment samples (3analyzed) from MP 25.25. Collected six (6) sediment samples (5analyzed) from MP 26.25. Collected four (4) sediment samples (4analyzed) from MP 27.50. Collected four (4) sediment samples (4analyzed) from MP 32.50. Collected eleven (11) sediment samples (5held, 6analyzed) from MP 37.25. Collected fifteen (15) sediment samples (2held, 13analyzed) from MP 37.50. Compliance: Collected Bathymetry data at Ceresco Impoundment. **11-30-12:** Science: Logged remaining quantification cores. Collected thirty-two (32) sediment samples (22analyzed, 10on hold) for submerged oil quantification study. Compliance: Collected Bathymetry data at Ceresco Impoundment. **12-01-12 and 12-02-12:** Science: No activities. Compliance: No activities. **12-03-12 and 12-04-12:** Science: No activities.

	Compliance: Collected Bathymetry data at Ceresco Impoundment. Morrow Lake monitoring. **12-05-12:** Science: Collected two (2) sediment samples from Agitation Study. Compliance: Collected Bathymetry data at Ceresco Impoundment. Morrow Lake monitoring. **12-06-12:** Science: Collected five (5) sediment samples from Agitation Study. Collected two (2) globule samples for the Agitation Study. Compliance: Collected Bathymetry data at multiple locations. Morrow Lake monitoring. **12-07-12:** Science: Collected four (4) sediment samples from Agitation Study. Collected two (2) globule samples for the Agitation Study. Collected eighteen (18) sediment samples for the Quantification Study. Compliance: Collected Bathymetry data at multiple locations. **12-08-12:** Science: No activities. Compliance: Collected Bathymetry data at multiple locations. **12-09-12:** Science: No activities. Compliance: No activities.
Activities / Comments (Cont.)	**Containment (Dean Sahara) :** **11-27-12:** Completed River Inspections: Provided 2 Boats for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for Survey Crew. Provided 4 Boats for Bathymetry. E4 Configuration Removal: Nothing to Report. Boom: Nothing to report. Buoys: Nothing to report. Survey Crew: Installed 1 monument at MP 19.25, MP 28.25, MP 26 and MP 10.25. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 25' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 149'. Debris Recovered: Ceresco: Recovered 51 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-28-12:** Completed River Inspections: Provided 2 Boats for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for Survey Crew. Provided 4 Boats for Bathymetry. E4 Configuration Removal: Removed 7 pipe anchors. Boom: Nothing to report. Buoys: Nothing to report. Survey Crew: 35th Street Bridge, installed 1 monument. MP 33 installed 1 monument. MP 11.79 installed 1 monument. Sheen Sweep: E4 to MP 38.75: 25' of snare used. MP 36.5 to MP 37.75: 25' of snare used. MP 21.25 to MP 33.1: 50' of snare used. Total Footage Snare used: 100'. Debris Recovered: Ceresco: Recovered 22 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **11-29-12:** Completed River Inspections: Provided 2 Boats for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for Survey Crew. Provided 4 Boats for Bathymetry. E4 Configuration Removal: Removed 16 pipe anchors. Boom: Nothing to report. Buoys: Nothing to report. Survey Crew: MP 21.5 installed 2 monuments. Sheen Sweep: E4 to MP 38.75: 25' of snare used. MP 36.5 to MP 37.75: 25' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Total Footage Snare used: 75'. Debris Recovered: Ceresco: Recovered 11 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required.

Activities / Comments (Cont.)	**11-30-12:** Completed River Inspections: Provided 2 Boats for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for Survey Crew. Provided 4 Boats for Bathymetry. E4 Configuration Removal: Removed final pipe anchors. Boom: Nothing to report. Buoys: Nothing to report. Survey Crew: MP 10.75 installed 3 monuments. MP 21.5 installed 1 monument. Sheen Sweep: E4 to MP 38.75: 100' of snare used. MP 36.5 to MP 37.75: 24' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Total Footage Snare used: 149'. Debris Recovered: Ceresco: Recovered 22 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-01-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 2 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 25' of snare used. Total Footage Snare used: 75'. Debris Recovered: Ceresco: Recovered 10 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-02-12:** No activities. **12-03-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for RI. Provided 1 Boat for MLD Poling. Provided 8 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 50' of snare used. MP 21.25 to MP 33.1: 25' of snare used. Total Footage Snare used: 125'. Debris Recovered: Ceresco: Recovered 0 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-04-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for RI. Provided 1 Boat for MLD Poling. Provided 8 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 50' of snare used. MP 21.25 to MP 33.1: 50' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 200'. Debris Recovered: Ceresco: Recovered 8 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-05-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for RI. Provided 1 Boat for MLD Poling. Provided 8 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 50' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 174'. Debris Recovered: Ceresco: Recovered 8 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-06-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for MLD Poling. Provided 8 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 50' of snare used. MP 21.25 to MP 33.1: 24' of snare used. Total Footage Snare used: 124'. Debris Recovered: Ceresco: Recovered 7 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-07-12:** Completed River Inspections: Provided 2 Boats for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for MLD Poling. Provided 8 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 50' of snare used. MP 36.5 to MP 37.75: 50' of snare used. MP 21.25 to MP 33.1: 50' of snare used. Ceresco: 50' of snare used. Total Footage Snare used: 200'. Debris Recovered: Ceresco: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken

Activities / Comments (Cont.)	to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-08-12:** Completed River Inspections: Provided 1 Boat for Situational Awareness. Provided 1 Boat for Safety. Provided 1 Boat for MLD Poling. Provided 6 Boats for Bathymetry. Boom: Nothing to report. Buoys: Nothing to report. Sheen Sweep: E4 to MP 38.75: 25' of snare used. Total Footage Snare used: 25'. Debris Recovered: Ceresco: Recovered 6 bags of debris. All vegetation debris taken to C 0.4 for temporary storage; oily waste taken to Frac Tank City, stored in the oily waste roll off for disposal at a later date. Inspected all containment on the river, completed adjustments as required. **12-09-12:** No activities. **<u>Kalamazoo River (Bryan Stiemsma):</u>** **11-27-12, 11-28-12, 11-29-12, 11-30-12, 12-01-12 and 12-02-12:** <u>Remedial Investigation</u>: No activities. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: No activities. <u>Compliance</u>: No activities. **12-03-12:** <u>Remedial Investigation</u>: Collected three (3) soil samples at MP 10.75L. Collected one (1) soils sample at MP 11.50R. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: Collected nine (9) potable samples. <u>Compliance</u>: No activities. **12-04-12:** <u>Remedial Investigation</u>: Collected seven (7) soil samples at MP 11.50R. Collected one (1) soil sample at MP 11.25R. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: Collected nine (9) potable samples. <u>Compliance</u>: No activities. **12-05-12:** <u>Remedial Investigation</u>: Collected three (3) soil samples at MP 11.50R. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: Collected ten (10) potable samples. <u>Compliance</u>: No activities. **12-06-12:** <u>Remedial Investigation</u>: No activities. <u>Remedial Action</u>: No activities. <u>Monitoring</u>: Collected ten (10) potable samples. <u>Compliance</u>: No activities.

Activities / Comments (Cont.)	**12-07-12:** Remedial Investigation: No activities. Remedial Action: No activities. Monitoring: Collected seven (7) potable samples. Compliance: No activities. **12-08-12 and 12-09-12:** Remedial Investigation: No activities. Remedial Action: No activities. Monitoring: No activities. Compliance: No activities.

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix A

Planning Resources

IAP's

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

1. Incident Name **Kalamazoo River/Enbridge Spill**	2. Operational Period (Date/Time) Starting: **October 25, 2012, 0700** End: **November 01, 2012, 0700**	**IAP Cover Sheet**

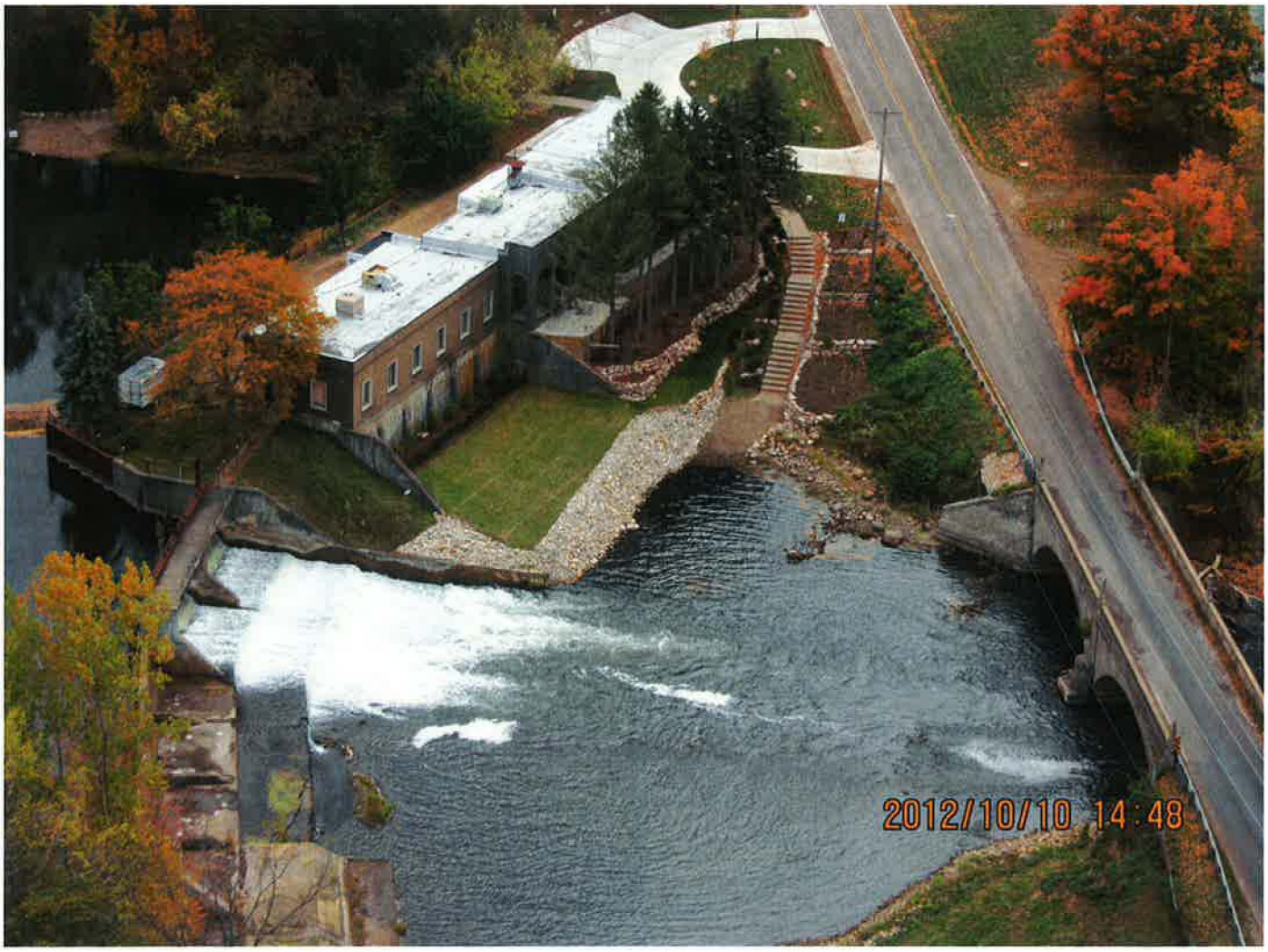
3. Approved by Incident Commander(s):

Michelle DeLong, Michigan Department Environmental Quality
Ralph Dollhopf, U.S. EPA
John Sobojinski, Enbridge

INCIDENT ACTION PLAN

The items below are included in this Incident Action Plan:

- ICS 202 (Response Objectives).....1
- ICS 207 (Organizational Chart & OPS Chart).....2
- ICS 204 (Assignment List).....5
- Meeting Locations and Traffic Plans.....11
- ICS 205 (Communication List).....21
- ICS 206 (Medical Plan).....23
- Safety Message/Evacuation Plan.....28
- Weather Forecast.....30
- ICS 230 Meeting Schedule.....31



4. Prepared By: Alex Olson, Avery/Enbridge	Date/Time 10/24/2012

1. Incident Name	2. Operational Period (Date/Time)	INCIDENT OBJECTIVES ICS 202-EPA
Kalamazoo River/Enbridge Spill	From: October 25, 2012 @ 0700 To: November 01, 2012 @ 0700	

3. Incident Objective(s)

1. Ensure health and safety of the public and response and recovery personnel.
2. Ensure absolute containment of submerged oil and oil-containing sediments within the Delta and the Fan of Morrow Lake.
3. Ensure effective transition of regulatory oversight from EPA to Michigan DEQ jurisdiction as appropriate.
4. Perform recovery and containment of oil from affected public and private areas of river and river system.
5. Perform remediation and restoration of affected public and private areas of river and river system.
6. Maintain effective communications with cooperating and assisting agencies, the public, including regular coordination with the Multi-Agency Coordination Group (MAC).
7. Provide protection of environmentally and culturally sensitive areas including wildlife and historic properties.
8. Collect, coordinate, manage and communicate environmental and public health data including maintenance of Joint Information Center function.

4. Operational Period Command Emphasis

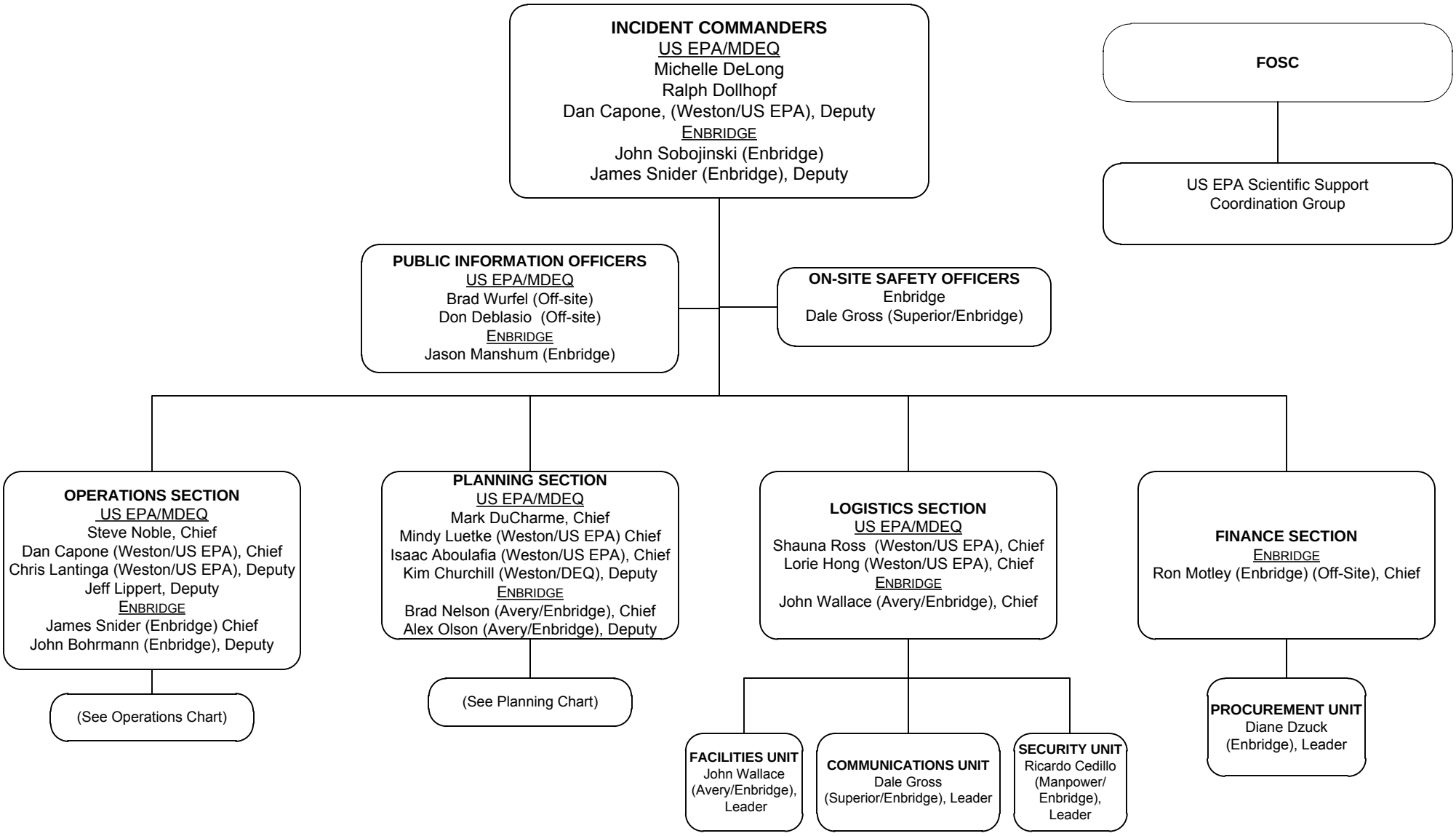
1. Respond to and document emerging oil throughout the Kalamazoo River system.
2. Implement path forward for submerged oil quantification cores.

5. Safety Objectives for the Operational Period

1. Assure effective integration of public safety and worker safety on the river. Focus on public and worker interaction.
2. Seasonal change awareness.

6. Prepared by Planning Section Chief (Enbridge): Brad Nelson	**Date/Time:** 10/24/2012 0900
7. Approved by Incident Commander (DEQ): Michelle DeLong	**Date/Time:** 10/24/2012 0942
8. Approved by Incident Commander (US EPA): Ralph Dollhopf for RD	**Date/Time:** 10/24/2012
10. Approved by Incident Commander (Enbridge): John Sobojinski	**Date/Time:** 10/24/2012 0940

Enbridge Pipelines Response Unified Command



ICS 207
3 10/25 – 11/1

OPERATIONS SECTION
US EPA/MDEQ
Steve Noble, Chief
Dan Capone (Weston/US EPA), Chief
Chris Lantinga (Weston/US EPA), Deputy
Jeff Lippert, Deputy
ENBRIDGE
James Snider (Enbridge), Chief
John Bohrmann (Enbridge), Deputy

Waste Management Branch
US EPA/MDEQ
Dan Zahner (Weston/US EPA), Director
ENBRIDGE
John Wallace (Avery/Enbridge), Director

Submerged Oil Branch
US EPA/MDEQ
Dan Zahner (Weston/ US EPA), Director
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Director

Submerged Oil Science Group
US EPA/MDEQ/USGS
Faith Fitzpatrick(Off-site), Supervisor
Ron Zelt (Off-site), Supervisor
ENBRIDGE
Dave Dryburgh (AECOM/Enbridge), Supervisor

Submerged Oil Compliance Group
ENBRIDGE
Mark Berninger
(Cardno JFNEW/Enbridge), Supervisor

Containment Branch
US EPA/MDEQ
Rex Johnson (Weston/US EPA), Director
ENBRIDGE
Dean Sahara (SWAT/Enbridge), Director
Mike Wekseth (SWAT/Enbridge), Deputy

Containment Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNEW/Enbridge), Supervisor

Containment Recovery Group
US EPA/MDEQ
Susan Jones, Supervisor
Chris Lantinga (Weston/US EPA), Supervisor
Sonny Rutkowski (Weston/US EPA)
Enbridge
Oliver Webb (SWAT/Enbridge), Supervisor

Kalamazoo River System Branch
MDEQ
Steve Noble, Director
ENBRIDGE
Bryan Stiemsma (AECOM/Enbridge), Director

Talmadge Creek/Kalamazoo River Remedial Investigation Group
MDEQ
Ben Schmitt
ENBRIDGE
Brian Albig
(AECOM/Enbridge), Supervisor

Kalamazoo River Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNew/Enbridge), Supervisor

Kalamazoo River Remedial Action Group
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Supervisor

Talmadge Creek/Kalamazoo River Monitoring Group
ENBRIDGE
Alison Schoeff (AECOM/Enbridge), Supervisor



PLANNING SECTION
US EPA/MDEQ
Mark DuCharme, Chief
Kim Churchill, Deputy
Mindy Luetke (Weston/US EPA), Chief
Isaac Aboulafia (Weston/US EPA), Chief
ENBRIDGE
Brad Nelson (Avery/Enbridge), Chief
Alex Olson (Avery/Enbridge), Deputy



SITUATION UNIT
US EPA/MDEQ
Matt Haak (Weston/ US EPA), Leader
Larry Rader (weston/US EPA), Leader
ENBRIDGE
Mark Fuller (AECOM/Enbridge), Leader

RESOURCE UNIT
US EPA/MDEQ
Shauna Ross (Weston/US EPA), Leader
Lorie Hong (Weston/US EPA), Leader
ENBRIDGE
Alex Olson (Avery/Enbridge), Leader

ENVIRONMENTAL UNIT
US EPA/MDEQ/USGS
Mike Alexander (Off-site)
Kim Churchill (Weston/DEQ), Leader
Isaac Aboulafia (Weston/US EPA), Leader
Elizabeth Wessling (Weston/US EPA)(Off-site), Leader
Faith Fitzpatrick (USGS)(Off-site), Leader
Ron Zelt (USGS)(Off-site), Assistant
Rex Johnson (Weston/US EPA), Assistant
Tom Graan (Weston/US EPA), Assistant
ENBRIDGE
John Bohrmann (Enbridge), Leader

DOCUMENTATION UNIT
US EPA/MDEQ
Crystal Laskey, Leader
Carolyn Giles-Smith (Weston/DEQ), Leader
Paul Moison (Weston/US EPA), Leader
ENBRIDGE
Brad Nelson (Avery/Enbridge), Leader

ENBRIDGE

ICS 207
5 10/25 – 11/1

1. Incident Name **Kalamazoo River/Enbridge Spill Response**	2. Operational Period (Date/Time) From: October 25, 2012, 0700 To: November 01, 2012, 0700	**Assignment List ICS 204- EPA**
3. Branch **Waste Management**	4. Division/Group/Staging	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	John Wallace	Avery/Enbridge	

6. Resources Assigned — **"X" indicates 204a attachment with additional instructions**

See Branch Directors

7. Work Assignments

1. Field decon operations for: personnel, hand equipment, and boats for preparation of transport shall be installed prior to work beginning at boat launches / staging areas for individual work sites.
2. Haul contaminated soil, water, media and debris to staging areas for waste characterization and oil recovery sampling prior to offsite disposal.
3. Waste shall be collected as needed for direct haul to the landfill or transported to Frac Tank City (FTC) for consolidation with similar waste streams as necessary.
4. Waste management characterization, manifesting, and coordination of transportation and disposal.

For US EPA/MDEQ/Weston:

1. Provide oversight of all waste management activities.
2. Ensure appropriate sampling, tracking and disposal is performed on oil impacted debris, water and soil.
3. Review manifests, weight tickets and bills of lading for correlation to waste stream analytical data.
4. Review weekly oil recovery and waste disposal report.

8. Special Instructions

Ensure all Best Management Practices (BMPs) are in place and utilized.

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

SAFETY INSTRUCTIONS:
For vacuum truck operation guidelines, please refer the HASP.

At Frac Tank City:

- The following procedure shall be used for initial opening of hatch or rear doors of liquid vacuum trucks and hatches of vacuum excavation units:
  - Approach the hatch to be opened with a calibrated five gas monitor and a benzene monitor.
  - Personnel performing this task must wear a full face respirator with organic vapor cartridge.
  - Slightly open the hatch and take VOC, H2S, LEL, Oxygen, CO and benzene readings.
  - If readings are greater than 10 ppm H2S, 10% LEL, 25 ppm CO or 25 ppm benzene then personnel shall close the hatch and utilize SCBA prior to opening the hatch.
- Operations - Respiratory protection may be required depending on periodic monitoring results. Wear a half-mask respirator equipped with an organic vapor cartridge when 0.5 ppm benzene is detected. Wear a full-face respirator equipped with an organic vapor/acid gas cartridge when benzene is at 5 ppm to 25 ppm.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	10/24/2012 0845	B. Nelson, Avery/Enbridge	10/24/2012 0900	J. Snider, Enbridge 0945	10/24/2012

1. Incident Name **Kalamazoo River/Enbridge Spill Response**	2. Operational Period (Date/Time) From: October 25, 2012, 0700 To: November 01, 2012, 0700	**Assignment List** **ICS 204 - EPA**
3. Branch **Submerged Oil**	4. Division/Group/Staging	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	Matt Sumner	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Submerged Oil Science	Faith Fitzpatrick (Off-site) Ron Zelt (Off Site) Dave Dryburgh (AECOM/Enbridge)	[redacted]	1 Weston/ US EPA 2 Contractors
Submerged Oil Compliance	Mark Berninger (Cardno JFNEW/Enbridge)		

7. Work Assignments

Submerged Oil Science

1. Conduct Morrow Lake Delta and Morrow Lake monitoring activities. (1 Team)

For US EPA/MDEQ/Weston:

1. Oversee and document Submerged Oil Science work activities.

Submerged Oil Compliance

1. Track previously submitted MDEQ permit applications for toolbox methods.

8. Special Instructions

NRDA Trustees will be conducting recreational use surveys along the Kalamazoo River at river access points.

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

SAFETY INSTRUCTIONS:
All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	10/24/2012 0845	B. Nelson, Avery/Enbridge	10/24/2012 0900	J. Snider, Enbridge	10/24/2012 0945

1. Incident Name5 **Kalamazoo River/Enbridge Spill Response**	2. Operational Period (Date/Time) From: October 25, 2012, 0700 To: November 01, 2012, 0700	**Assignment List ICS 204 - EPA**
3. Branch **Containment**	4. Division/Group/Staging	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Rex Johnson	Weston/US EPA	
	Dean Sahara	SWAT/Enbridge	
	Mike Wekseth, Deputy	SWAT/Enbridge	

6. Resources Assigned "X" indicates 204a attachment with additional instructions

Division Identifier	Leader	Contact Info. #	# of Persons
Containment Compliance	Mike Zambetis (Cardno JFNEW/Enbridge)	[redacted]	
Containment Recovery	Susan Jones (MDEQ) Chris Lantinga (Weston/US EPA) Sonny Rutkowski (Weston/US EPA) Oliver Webb (SWAT/Enbridge)		1 Weston/US EPA 14 Contractors

7. Work Assignments

Containment Compliance

1. Provide support as necessary.

Containment Recovery

1. Perform containment strategies along the Kalamazoo River including the following tasks:
   a. Deploy and maintain shoreline containment boom as required.
   b. Complete sheen management as required.
2. Monitor and maintain the E4.0 containment system.
3. Maintain Kalamazoo River Sediment Traps, including the cylindrical sampling devices.

For US EPA/MDEQ/Weston:

1. Oversee and document Containment Recovery activities.

8. Special Instructions

NRDA Trustees will be conducting recreational use surveys along the Kalamazoo River at river access points.

Rowe Island, MP 38.50-MP 38.75, is a No Go Zone – Environmental Sensitive Area.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	10/24/2012 0845	B. Nelson, Avery/Enbridge	10/24/2012 0900	J. Snider, Enbridge	10/24/2012 0945

1. Incident Name **Kalamazoo River/Enbridge Spill Response**	2. Operational Period (Date/Time) From: October 25, 2012, 0700 To: November 01, 2012, 0700	**Assignment List ICS 204 - EPA**
3. Branch **Kalamazoo River System Branch**	4. Division/Group/Staging	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Steve Noble	MDEQ	
	Bryan Stiemsma	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Talmadge Creek/Kalamazoo River Remedial Investigation	Ben Schmitt (MDEQ) Brian Albig (AECOM/Enbridge)	[redacted]	6 Contractors
Kalamazoo River Compliance	Mike Zambetis (JFNew/Enbridge)		
Talmadge Creek/Kalamazoo River Remedial Action	Matt Sumner (AECOM/Enbridge)		
Talmadge Creek/Kalamazoo River Monitoring	Alison Schoeff (AECOM/Enbridge)		3 Contractors

7. Work Assignments

Talmadge Creek/Kalamazoo River Remedial Investigation

1. Continue Kalamazoo River remedial investigation field work. (1 Team)

For DEQ:

1. Observe and document RI activities with emphasis on conformance with approved work plans and standard operating procedures.
2. Collect RI split samples at approved frequency for soil, sediment and groundwater.

Kalamazoo River Compliance

1. Provide support as necessary.

Talmadge Creek/Kalamazoo River Remedial Action

1. Execute tasks assigned by ERO as requested.

Talmadge Creek/Kalamazoo River Monitoring

1. Conduct daily monitoring of river conditions.
2. Conduct weekly monitoring of buoys and signage in the river.
3. Conduct weekly SESC inspections and gauge groundwater hydrology.

8. Special Instructions

NRDA Trustees will be conducting recreational use surveys along the Kalamazoo River at river access points.

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

SAFETY INSTRUCTIONS:
When operating or working in the vicinity of ultra violet testing equipment, wear approved safety glasses that provide protection from UV A rays and never look directly into the illuminator.

All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	10/24/2012 0845	B. Nelson, Avery/Enbridge	10/24/2012 0900	J. Snider, Enbridge 0945	10/24/2012

1. Incident Name **Kalamazoo River/Enbridge Spill Response**	2. Operational Period (Date/Time) From: October 25, 2012, 0700 To: November 01, 2012, 0700	**Assignment List ICS 204 - EPA**
3. Branch **Planning Section**	4. Division/Group/Staging	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Planning Section Chief:	Mark DuCharme	MDEQ	[redacted]
	Mindy Luetke	Weston/US EPA	
	Isaac Aboulafia	Weston/US EPA	
	Kim Churchill, Deputy	Weston/ DEQ	
	Brad Nelson	Avery/Enbridge	
	Alex Olson, Deputy	Avery/Enbridge	

6. Resources Assigned "X" indicates 204a attachment with additional instructions

Division Identifier	Leader	Contact Info. #	# of Persons
Situation Unit	Matt Haak (Weston/ US EPA) Larry Rader (Weston/ US EPA) Mark Fuller (AECOM/Enbridge)	[redacted]	1 Weston/EPA 1 Contractor
Resource Unit	Shauna Ross (Weston/US EPA) Lorie Hong (Weston/US EPA) Alex Olson (Avery/Enbridge), Assistant		1 Contractor
Environmental Unit	Mike Alexander (Off-site) Kim Churchill (Weston/MDEQ) Isaac Aboulafia (Weston/US EPA) Elizabeth Wessling (Weston/US EPA)(Off-site) Faith Fitzpatrick (USGS) Ron Zelt (Off-site) (USGS), Assistant Rex Johnson (Weston/US EPA), Assistant Tom Graan (Weston/US EPA) , Assistant John Bohrmann (Enbridge)		1 Weston/MDEQ 2 MDEQ 2 Contractors
Documentation Unit	Crystal Laskey Carolyn Giles-Smith (Weston/MDEQ) Paul Mosian (Weston/US EPA)		1 Contractors

7. Work Assignments

Situation Unit:

1. Record and document sheen observations in main channel and overbank areas, and conduct sheen testing, if necessary. Report sheen observations back to operations section chiefs for monitoring and response.
2. Conduct weekly overflights; photo-document areas of sheen from source area to Morrow Lake dam and report observations back to operations section chiefs for monitoring and response. Additional flights will be scheduled as needed.
3. Organize field metrics, prepare for and facilitate presentations, and monitor action tracking. Maintain situational awareness around operational activities and plan for operational needs.

For US EPA/MDEQ/Weston:

1. Maintain situational awareness around operational activities.
2. Communicate observations to the Operations Section Chief.
3. Provide daily situational photo log summaries.
4. Conduct daily monitoring of river conditions, recording observations of sheen and/or oil.
5. Record and document sheen observations in main channel and overbank areas, and conduct sheen testing, if necessary. Report sheen observations back to operations section chiefs for monitoring and response.

Resource Unit:

1. Produce an Incident Action Plan as required by the Incident Commanders.
2. Support the planning efforts of operations and provide information to Logistics in order to properly prepare and order resources.

Environmental Unit:

1. Conduct strategic assessment, modeling, and environmental monitoring.
2. Review sheen tracking information from the field.
3. Continue submerged oil quantification for Spring 2012 with emphasis on implementing the path forward for submerged oil quantification cores.
4. Refine subsurface containment strategies throughout the Kalamazoo River system to prevent recontamination of the Morrow Lake fan.
5. Review and track RI progress.
6. Continue discussions on NAPL.

7. Review of property parcels for MDEQ end points.

For US EPA/MDEQ/Weston:
1. Continue to coordinate efforts to calculate the quantity of submerged oil remaining as of Spring 2012.
2. Continue supporting the evaluation of the hydrogeomorphology of the Kalamazoo River, the Morrow Lake Delta, and Morrow Lake.
3. Interface with Enbridge and assist with the refinement of surface and subsurface containment strategies throughout the Kalamazoo River system to prevent the continued migration of oil, oil sheen, submerged oil, and oil-containing sediments into Morrow Lake.
4. Review and comment on RI progress submittals
5. Support development of NAPL CSM.
6. Review Enbridge submittals with emphasis on compliance with state endpoints.

Documentation Unit:
1. Maintain accurate, up-to-date incident files.
2. Store files for post-incident use.

8. Special Instructions

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

SAFETY INSTRUCTIONS:
Hexane is flammable and may be harmful in contact with skin. When handling hexane and sheen test samples containing hexane, wear approved safety glasses, disposable nitrile gloves and keep away from ignition sources. Properly dispose of sheen test samples containing hexane.

9. Communications (radio and/or phone contact numbers needed for this assignment)

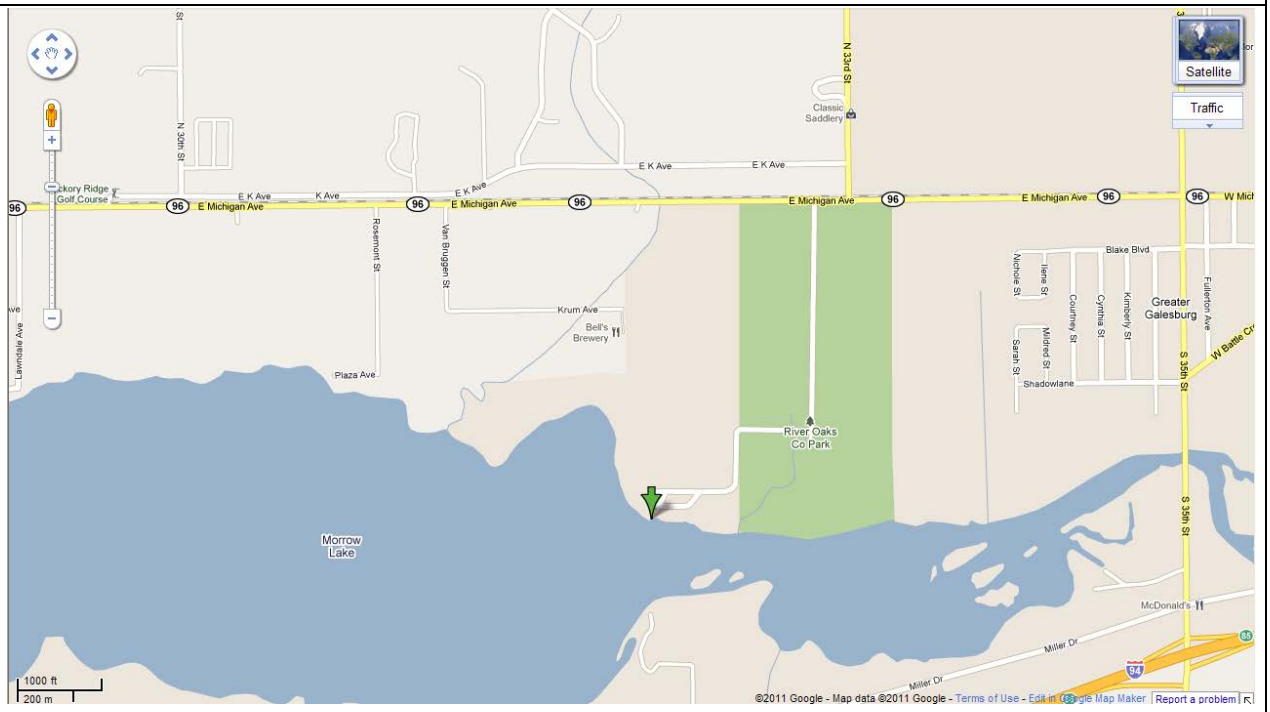
Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

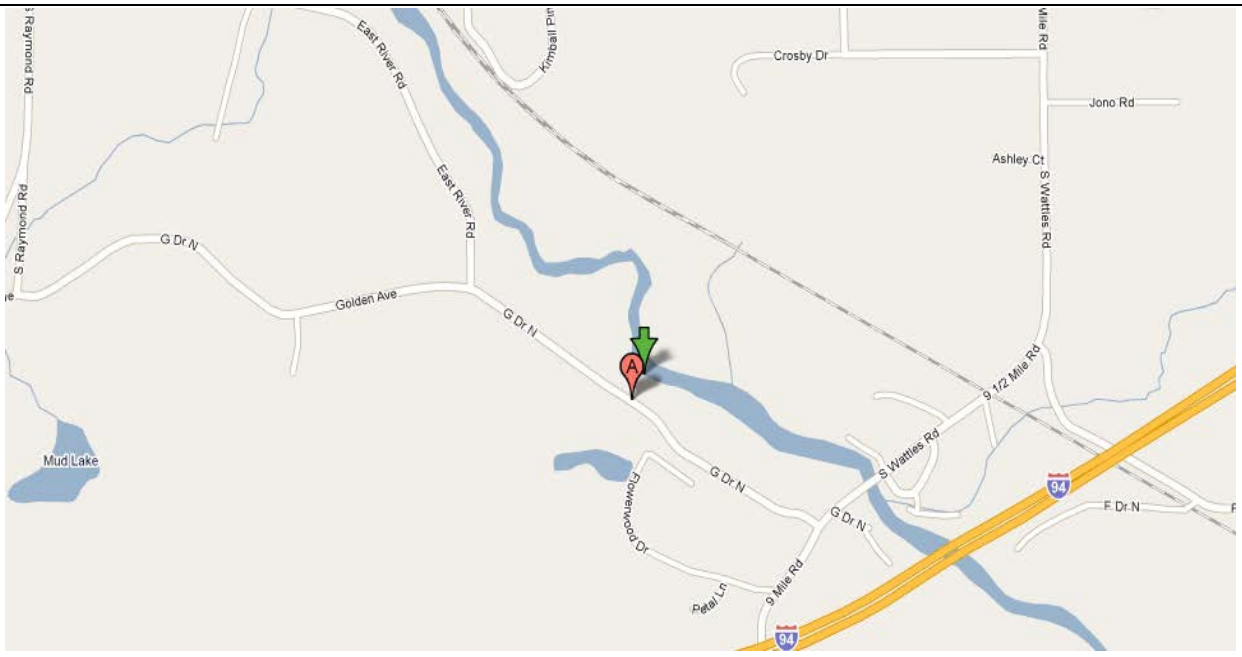
10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	10/24/2012 0845	B. Nelson, Avery/Enbridge	10/24/2012 0900	J. Snider, Enbridge 0945	10/24/2012

Toolbox Meeting Locations

E4 - [redacted] Galesburg, MI 49053 GPS Coordinates Lat: 42.278265 Long: -85.452295



C3.2 [redacted] Battle Creek, MI 49014 GPS Coordinates Lat: 42.293492 Long: -85.124479



Refer to traffic plan for detailed access instructions.

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: C 5



[redacted] Battle Creek, MI 49014

GPS Coordinates Lat: 42.304905 Long: -85.183463

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: C 0.4



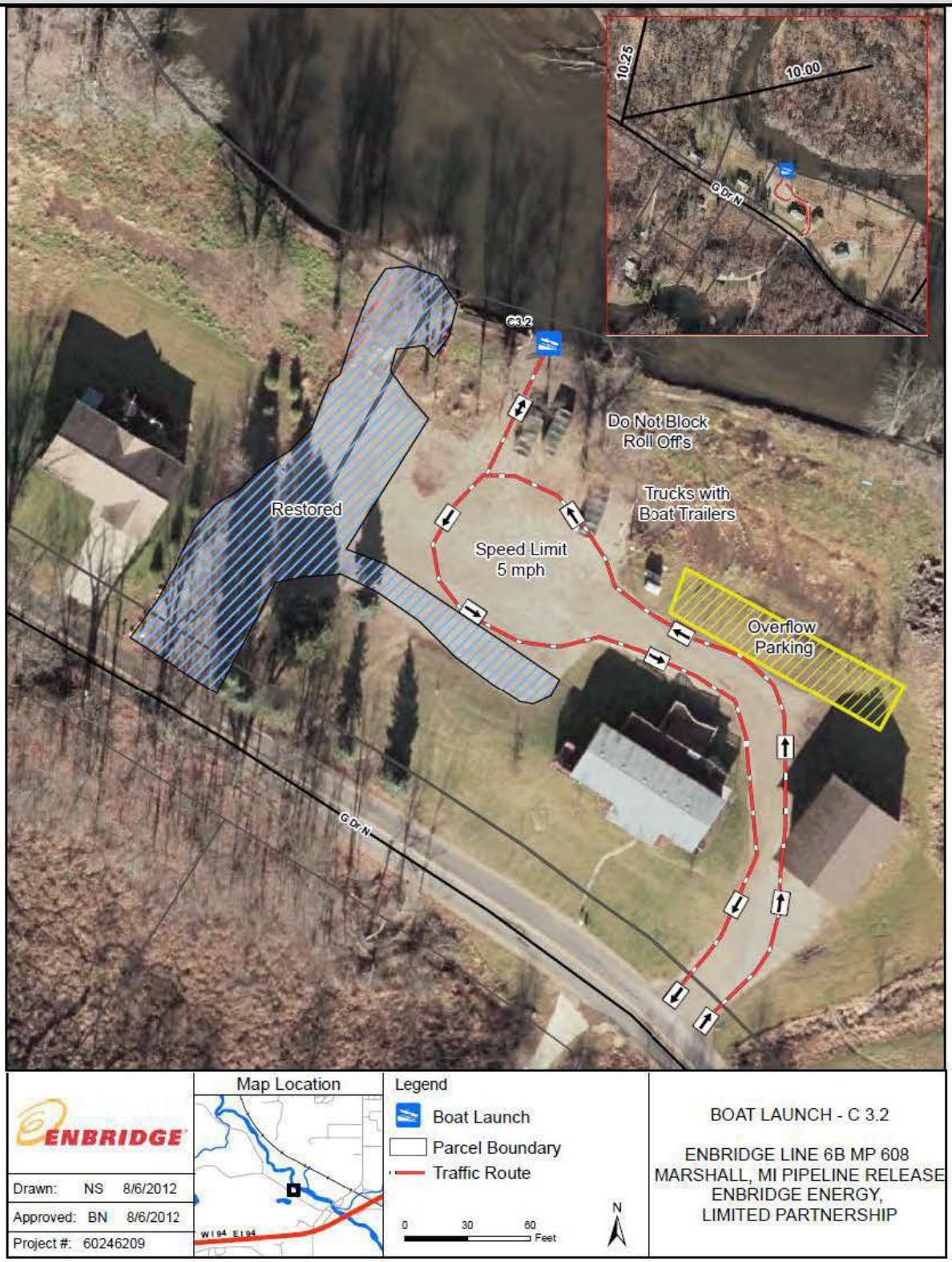
[redacted] Ceresco, MI 49033

GPS Coordinates: Lat: 42.265127, Long:-85.048364

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: C 3.2



[redacted] Battle Creek, MI 49014

GPS Coordinates: Lat: 42.293492 Long: -85.124479

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: Wildlife Center



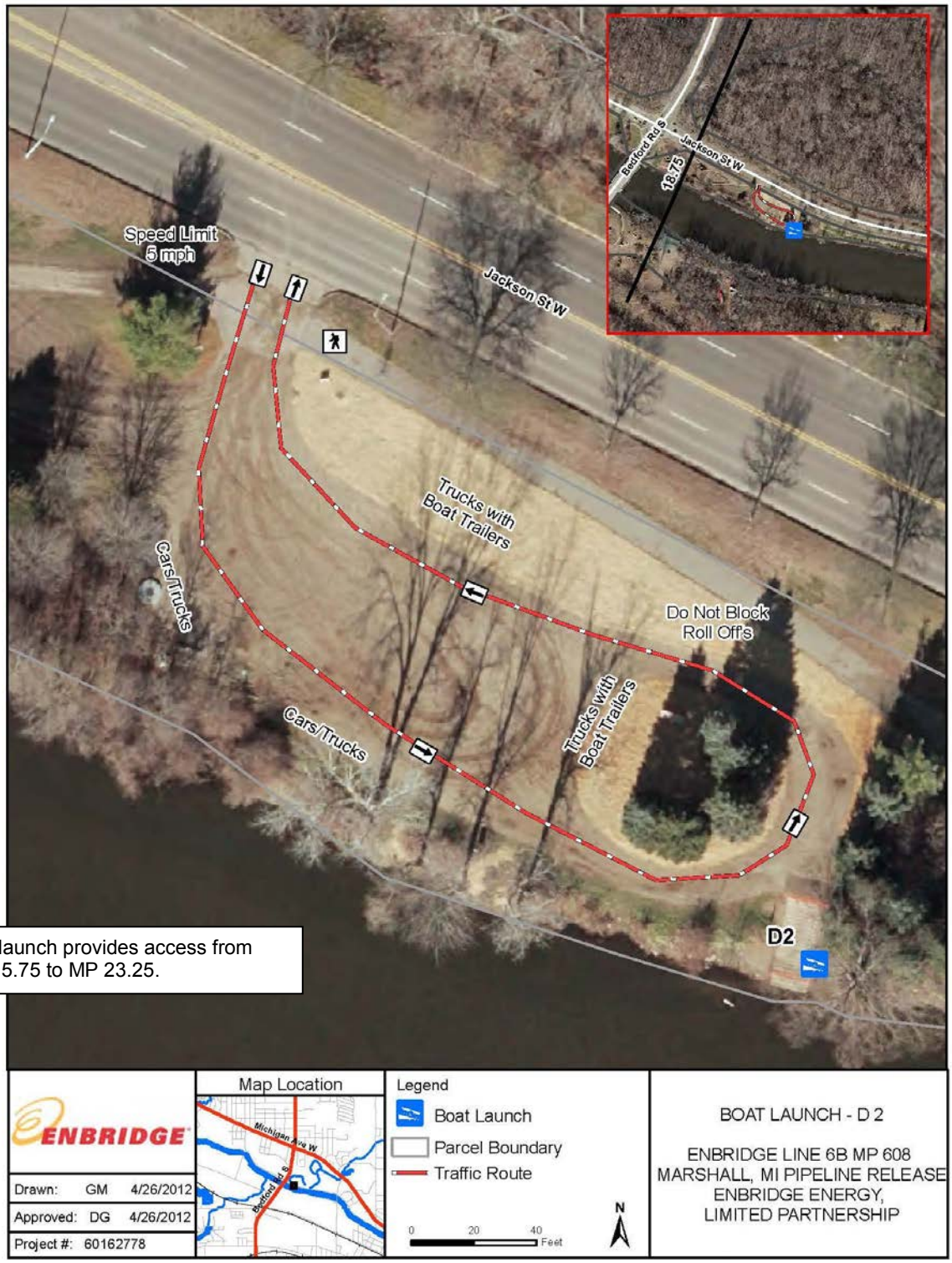
[redacted] Battle Creek, MI 49014

GPS Coordinates: Lat: 42.292173, Long: -85.123578

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: D2



This launch provides access from MP 15.75 to MP 23.25.

[redacted] Battle Creek, MI 49037

GPS Coordinates: Lat: 42.338427 Long:-85.232309

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: E 0.5



(Shady Bend Camp Ground), 15320 East Augusta Dr, Augusta, MI 49012
GPS Coordinates:Lat: 42.347408 Long: -85.3295

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: E 2



[redacted] Augusta, MI 49053

GPS Coordinates: Lat: 42.32412 Long: -85.358041

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: E 3



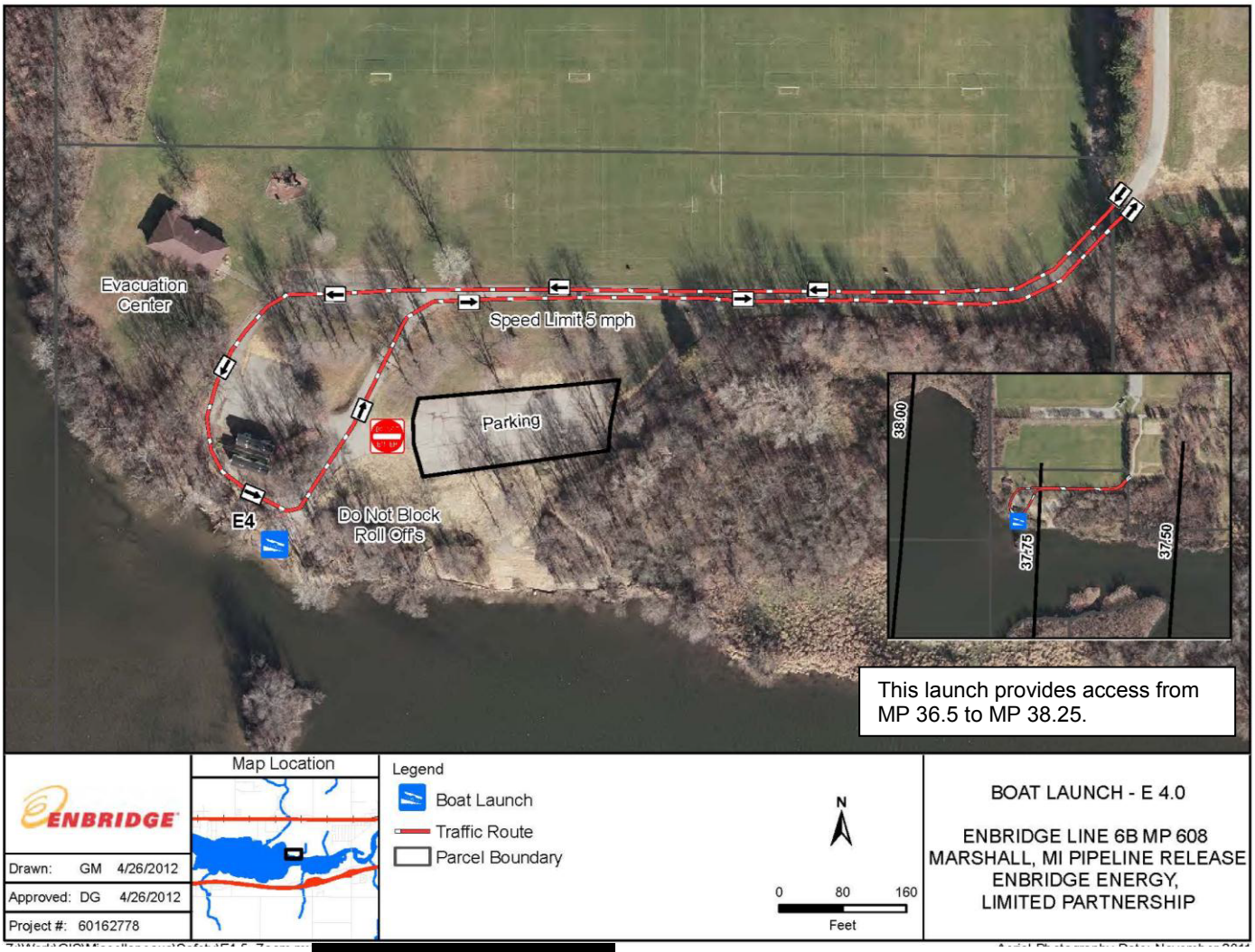
[redacted] Galesburg, MI 49053

GPS Coordinates: Lat: 42.284663 Long: -85.412855

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Incident Name	2. Operational Period (Date / Time)	TRAFFIC PLAN ICS - EPA
Kalamazoo River/Enbridge Spill	From: 10/18/2012 0700 To: 10/25/2012 0700	

3.TRAFFIC PLAN: E 4



[redacted] Galesburg, MI 49053

GPS Coordinates: Lat: 42.278265 Long: -85.452295

4. Prepared by:	Date/Time
Name/Position: Dale Gross, Safety Officer	10-17-2012

1. Kalamazoo River/ Enbridge Spill	2. Operational Period (Date / Time) From: 10/25/2012/ 0700 hrs To: 11/01/2012/ 0700 hrs	Operations Communications Plan

3. Communication Contact List

NAME	PHONE NUMBER	EMAIL ADDRESS	AGENCY / AFFILIATION	POSITION
Aboulafia, Isaac	[redacted]	[redacted]	START/US EPA	Planning
Adams, Rich			Enbridge	Operations
Albig, Brian			AECOM/Enbridge	Environment
Baker, Paul			Kalamazoo OEM	MAC
Bareham, Dave			Enbridge	Environment
Berecz, Karen			START/US EPA	O & M
Berninger, Mark			Cardno JFNEW/Enbridge	Restoration
Blackburn, Ted			START/US EPA	Safety Officer
Blanchard, Mark			START/US EPA	
Bohrmann, John			Enbridge	Environment
Brettmann, Gregg			DEQ	Environmental Unit Leader
Bretz, Ryan			Manpower/Enbridge	IT
Brown , Kevin			Weston/DEQ	GIS Support
Bukowski, Breanna			Weston/DEQ	Planning
Capone, Dan			START/US EPA	Operations
Cedillo, Ricardo			Manpower/Enbridge	Security Unit Leader
Churchill, Kim			Weston/DEQ	Environmental Unit
Cox, Renee			Manpower/Enbridge	Documentation
Daniel, Pat			Enbridge	MAC
Deblasio, Don			US EPA	Public Information
Dekker, Shaun			SET/Enbridge	Waste Management
DelloRusso, Vincent			Weston/DEQ	Operations
DeLong, Michelle			DEQ	Incident Commander
Dennis, Kate			Manpower/Enbridge	Admin Support
Doherty, Bob			Enbridge	Environment
Dollhopf, Ralph			US EPA	Incident Commander (FOSC)
Dryburgh, Dave			AECOM/Enbridge	Environment
DuCharme, Mark			DEQ	Incident Commander
Dunham, Durk			Calhoun County EMA	MAC
Eversole, Elijah			AECOM/Enbridge	Containment
Fitzpatrick, Faith			USGS	Tech Specialist
Fizzell, Chad			DEQ	GIS Support
Frost, Joe			Calhoun County Health	MAC
Fuller, Mark			AECOM/Enbridge	Environment
Giles-Smith, Carolyn			Weston/DEQ	Documentation
Good, Gena			START/US EPA	
Graan, Tom			START/US EPA	Submerged Oil Lead
Gross, Dale			Superior/Enbridge	Safety Officer
Haak, Matt			START/US EPA	Sit Unit Leader
Hackley, Richard			US EPA	Finance
Hehir, Nate			Superior/Enbridge	Environment
Hendrix, Kristen			START/US EPA	Operations
Hoard, Chris			USGS	USGS
Hong, Lorie			START/US EPA	Logistics
Hummel, Rebecca			Manpower/Enbridge	Finance
Johnson, Rex			START/US EPA	Operations
Jones, Susan			DEQ	Operations
Kaiser, Ken			AECOM/Enbridge	GIS Specialist
Kent, Norm			AECOM/Enbridge	Environment
Kerpash, Paul			SWAT/Enbridge	Control Point Management
Kidder, Steven			START/US EPA	Operations SOS
Kirby-Miles, Leslie			US EPA	Legal
Kogge, Stu			Cardno JFNEW/Enbridge	Operations
Kosmowski, Christine			City of Battle Creek	MAC
Lantinga, Chris			START/US EPA	Operations
Laquerre, Tim			START/US EPA	Operations
Laskey, Crystal			MDEQ	Planning
Lisabeth, Nicole			MSP	PIO
Luetke, Mindy			START/US EPA	PSC
Lundholm, Mark			Weston/DEQ	Operations
Makoski, Paul			Calhoun County Health	MAC
Manshum, Jason			Enbridge	Public Affairs
Massey, Dylan			LBG/Enbridge	Environmental Inspector
McKay, John			Enbridge	ROW
McKenzie, Michael			Battle Creek Emer. Srvs.	MAC
Mehl, Rick			START/US EPA	
Moisan, Paul			START/US EPA	Documentation
Muccianti, Marcus			START/US EPA	Operations
Nelson, Brad			Avery/Enbridge	PSC
Neumeier, Laura			Trimedia/Enbridge	Air Monitoring
Noble, Steve			DEQ	Water Resources Division
Oleschuk, Rick			Enbridge	Safety Officer
Olson, Alex			Avery/Enbridge	Planning
Periard, Debora			AECOM/Enbridge	GIS Support
Pesses, David			LBG/Enbridge	Environmental Inspector
Pierce, Brennan			START/US EPA	Documentation
Powell, Meredith			Hill & Knowlton/Enbridge	Public & Govt. Affairs
Pratt, Catherine			AECOM/Enbridge	Environment
Quiggle, Lisa			MDCH	
Rader, Larry			START/US EPA	Sit Unit Leader
Reber, Lt. Barry			MSP EMHSD	MAC
Reigner, Selma			Kelly Services/Enbridge	Admin. Assistant

Prepared by:
Brad Nelson

Email Corrections To
brad.nelson@enbridge.com

DATE /TIME
10/22/20123:39 PM

1. Kalamazoo River/ Enbridge Spill	2. Operational Period (Date / Time) From: 10/25/2012/ 0700 hrs To: 11/01/2012/ 0700 hrs	Operations Communications Plan

3. Communication Contact List

NAME	PHONE NUMBER	EMAIL ADDRESS	AGENCY / AFFILIATION	POSITION
Ross, Shauna	[redacted]	[redacted]	START/US EPA	
Roubik, Jonathan			START/US EPA	Operations
Rutherford, James			Calhoun County Health	MAC
Rutkowski, Sonny			START/US EPA	Technical Specialist
Sahara, Dean			SWAT/Enbridge	Operations
Sarkipato, Ernie			DEQ	
Saylor, Andy			SET/Enbridge	
Schmitt, Ben			DEQ	Operations
Schneider, Dave			Kalamazoo County	MAC
Schoeff, Alison			AECOM/Enbridge	Water Monitoring Supervisor
Shattuck, Terri			Weston/DEQ	Operations
Smith, Brian			Tulsa/ Enbridge	Overbank Excavation Field Inspector
Snider, Jim			Enbridge	Environment Director
Sobojinski, John			Enbridge	Incident Commander
Spruit, Jeff			DEQ	Environment
Standen, Joe			LBG/Enbridge	River Opening Implementation
Stiemsma, Bryan			AECOM/Enbridge	Environment Supervisor
Sumner, Matt			AECOM/Enbridge	Environment
Taft, Bill			DEQ	Wildlife Environmental NRDA Group
Thierry, Mike			START/US EPA	Operations
Thompson, Doug			DEQ	
Torres, Jason			START/US EPA	GIS Specialist
Vail, Linda			Kalamazoo County Health	MAC
Valenza, James			START/US EPA	GIS Specialist
Victory, Joe			START/US EPA	DOSC
Vilhauer, Eric			Enbridge	ROW Agent
Vosburg, Cheryl			City of Marshall	MAC
Wahrer, Marc			START/US EPA	Operations
Wallace, John			Avery/Enbridge	Operations Inspector
Webb, Oliver			SWAT/Enbridge	Control Point Management
Wekseth, Mike			SWAT/Enbridge	Operations Inspector
Wellman, John			START/US EPA	Operations
Wessling, Elizabeth			START/US EPA	PSC
Williams, Lisa			USFWS	
Wilson, Lee			Weston/DEQ	Operations
Wiswell, Amber			Kelly Services/Enbridge	Admin. Assistant
Wolf, Mike			AECOM/Enbridge	Monitoring
Wurfel, Brad			DEQ	Public Information
Yokom, Brett			Trimedia/Enbridge	Environment
Zahner, Dan			START/US EPA	Operations
Zambetis, Mike			Cardno JFNEW/Enbridge	Restoration
Zelt, Ron			USGS	Environmental Unit Leader Assistant

Enbridge Marshall Office
333 South Kalamazoo Ave
Marshall MI 49068

Prepared by:
Brad Nelson

Email Corrections To
brad.nelson@enbridge.com

DATE /TIME
10/22/20123:39 PM

MEDICAL PLAN ICS – 206	Kalamazoo River/Enbridge Spill	1. Date Prepared 10/24/2012	2. Time Prepared 0800	3. Operational Period 10/25/2012 0700 11/01/2012 0700

4. Transportation

Ambulance Services

Name	Address	Phone	Paramedics Yes	Paramedics No
Lifecare Ambulance	330 West Hamblin Avenue, Battle Creek, MI 49015	9-1-1	X	
City of Marshall Fire Dept	323 West Michigan Avenue, Marshall, MI 49068	9-1-1	X	

5. Hospitals

Name	Address	Travel Time Air	Travel Time Ground	Phone	Helipad Yes	Helipad No	Burn Center Yes	Burn Center No
Bronson Methodist Hospital	601 John Street Kalamazoo, MI	15 Min	50 min	269-341-7654	X		X	
Borgess Medical Center	1521 Gull Road Kalamazoo, MI	15 min	50 min	269-226-7000	X			X
Oaklawn Hospital	200 N. Madison Ave Marshall, MI		5 min	269-781-4271		X		X
Battle Creek Health System	300 North Avenue Battle Creek, MI		20 min	269-966-8000		X		X

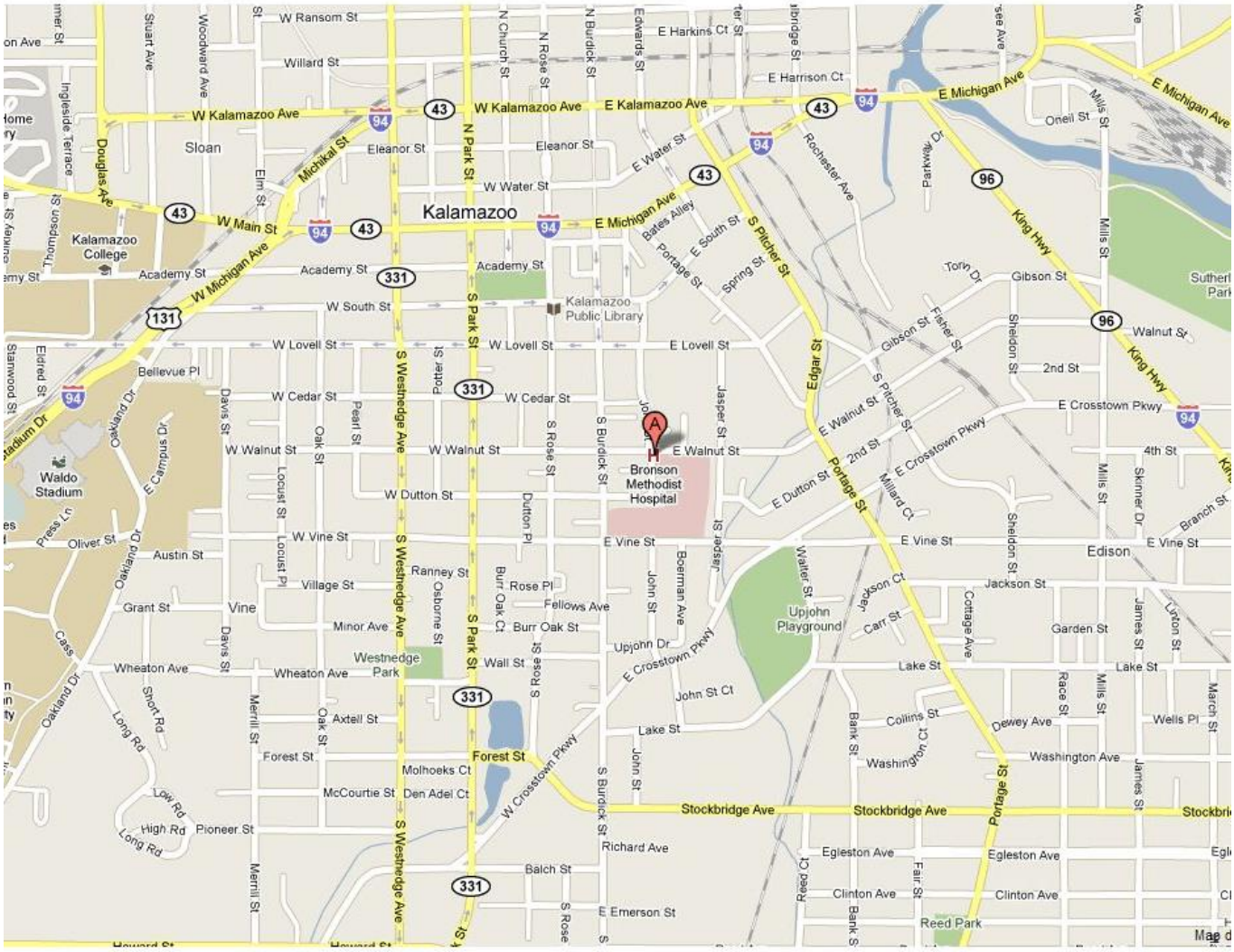
6. Medical Emergency Procedures

1. Dial 9-1-1 for all emergencies. Give 9-1-1 operators as much information as possible. Stay on the line and answer all questions – information may be radioed to responders. On-site personnel trained and certified in first aid should attempt to stabilize victim until fire department/EMS personnel arrive.
2. Report all incidents to the Project Safety Officer. Keep a log of events. Secure the area. Identify witnesses for later investigation.

NOTE: Suspend all operations during an actual emergency situation!

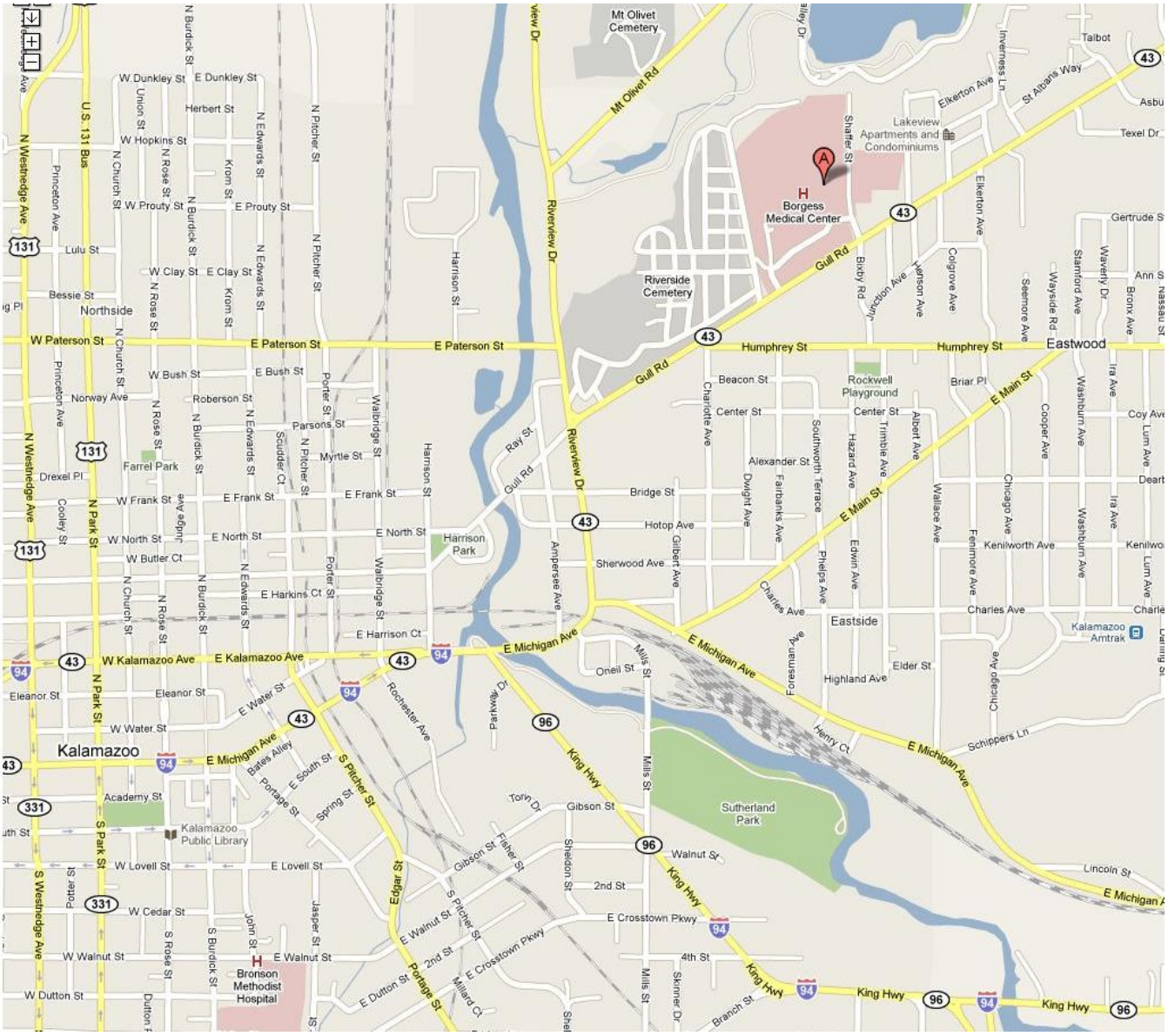
Prepared by	10. Reviewed by (Safety Officer)
Dale Gross 10/24/2012	Dale Gross 10/24/2012

Hospital Route Map – Bronson Methodist Hospital – Kalamazoo, MI

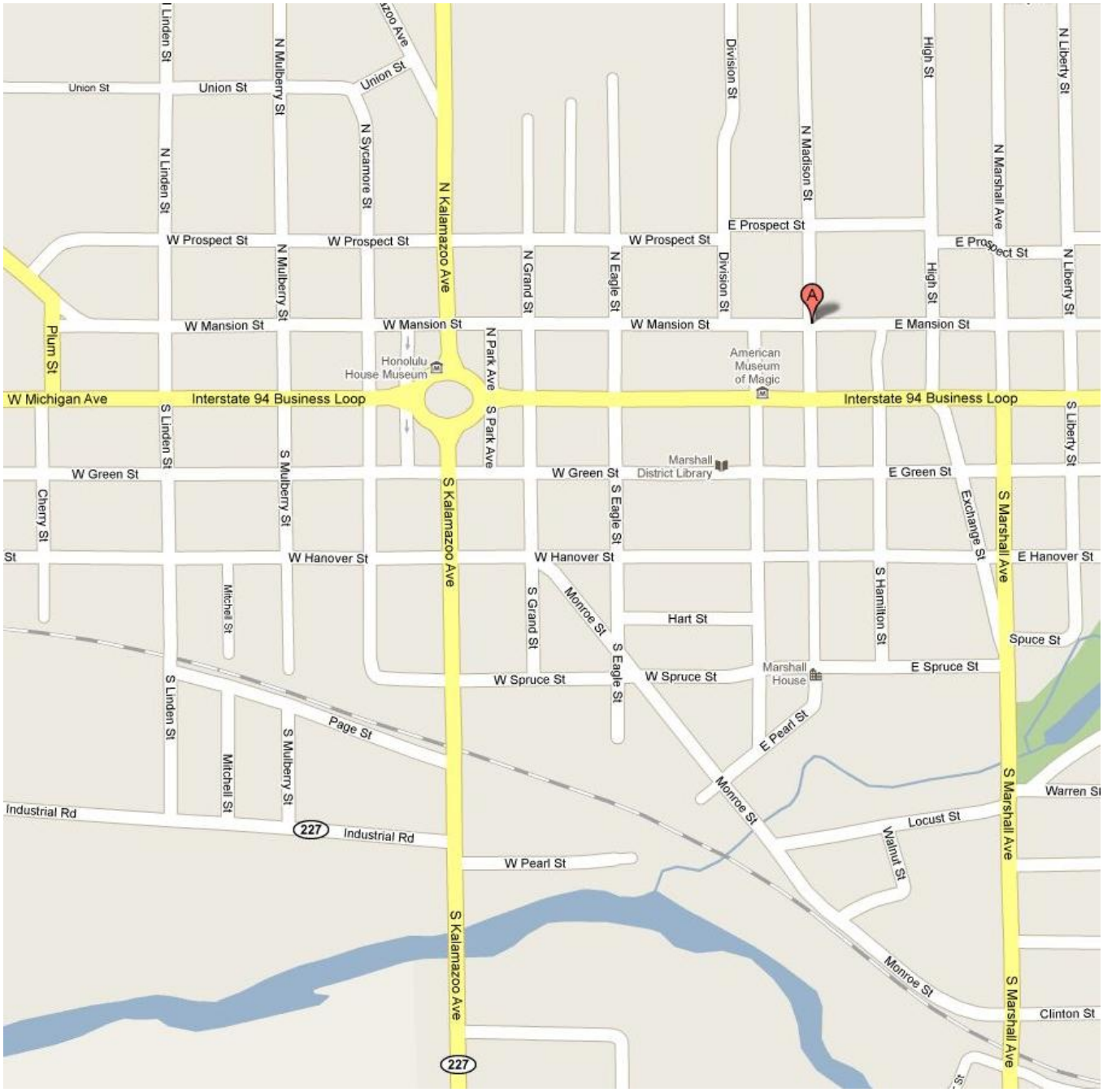


Bronson Methodist Hospital
601 John St
Kalamazoo, MI 49007
(269) 341 - 7979

Hospital Route Map – Borgess Medical Center – Kalamazoo, MI

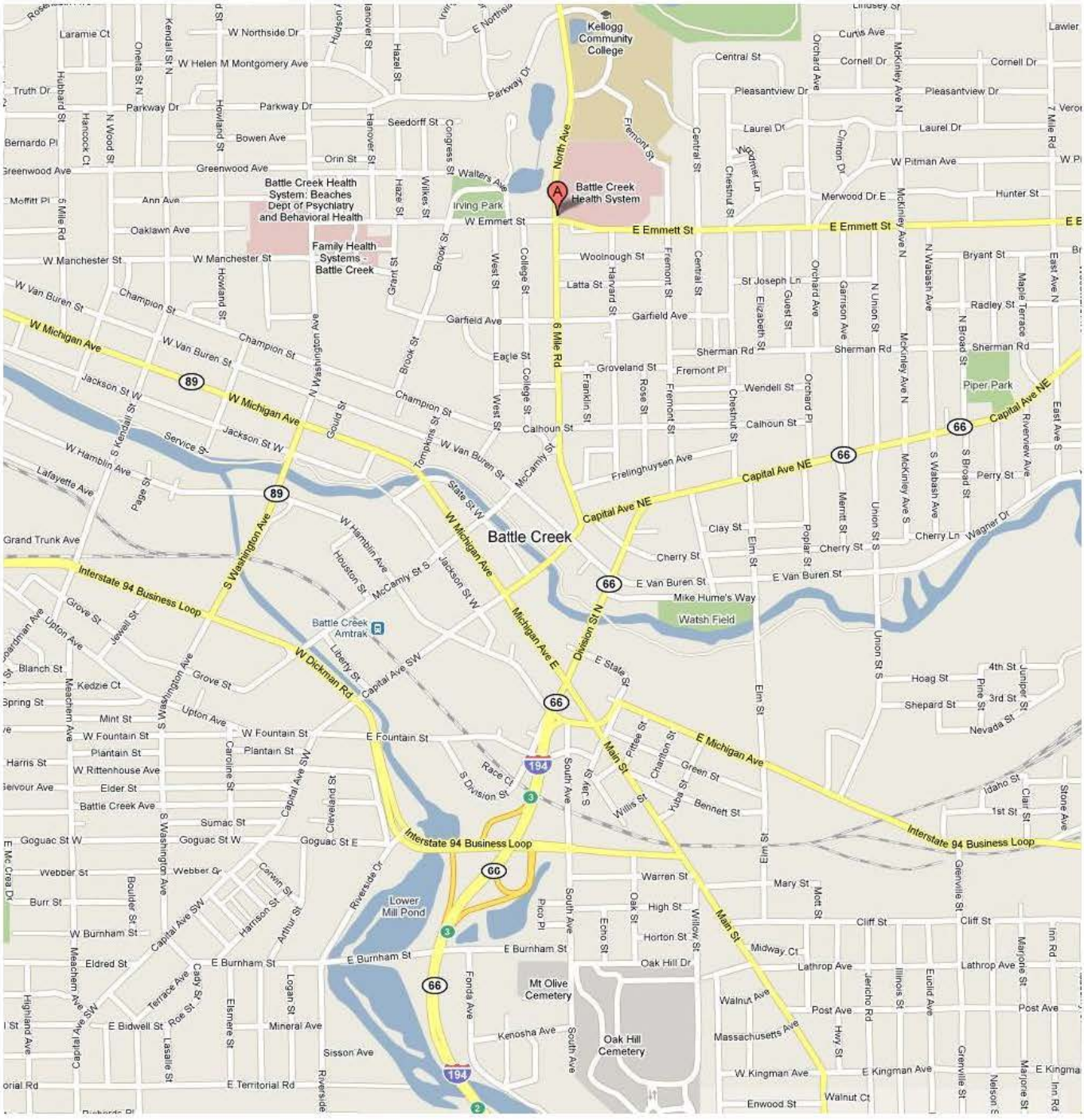

Mt Olivet Cemetery
Mt Olivet Rd
Riverview Dr
Borgess Medical Center
Lakeview Apartments and Condominiums
Riverside Cemetery
Gull Rd
Eastwood
Humphrey St
E Paterson St
W Paterson St
Northside
Farrel Park
Harrison Park
Rockwell Playground
Eastside
Kalamazoo
Kalamazoo Public Library
Bronson Methodist Hospital
Sutherland Park
E Michigan Ave
W Kalamazoo Ave
E Kalamazoo Ave
King Hwy
E Main St
Charles Ave
Kalamazoo Amtrak
W Dunkley St
E Dunkley St
W Hopkins St
W Prouty St
E Prouty St
W Clay St
E Clay St
Lulu St
Bessie St
Norway Ave
Roberson St
W Bush St
E Bush St
Parsons St
Myrtle St
Drexel Pl
W Frank St
E Frank St
W North St
E North St
W Butler Ct
E Harkins Ct
E Harrison Ct
Eleanor St
W Water St
E Water St
Academy St
W Lovell St
E Lovell St
W Cedar St
W Walnut St
E Walnut St
W Dutton St
Gibson St
Walnut St
2nd St
E Crosstown Pkwy
4th St
Beacon St
Center St
Alexander St
Bridge St
Hotop Ave
Sherwood Ave
Oneil St
Highland Ave
Elder St
Henry Ct
Schippers Ln
Kenilworth Ave
Lincoln St
Talbot
Texel Dr
Gertrude St
Ann St
Briar Pl
Coy Ave
Deart
Kenilwo
Charle
Charles Ave
Eleanor St
Academy St
Lovell St
Cedar St
Walnut St
Dutton St
Gibson St
Walnut St
2nd St
Crosstown Pkwy
4th St
Highland Ave
Elder St
Schippers Ln
Lincoln St

Hospital Route Map – Oaklawn Hospital – Marshall, MI



Oaklawn Hospital
200 North Madison St.
Marshall, MI
(269) 781-4271

Hospital Route Map – Battle Creek Health System – Battle Creek, MI


Kellogg Community College
Battle Creek Health System
Battle Creek Health System: Beaches Dept of Psychiatry and Behavioral Health
Family Health Systems - Battle Creek
Battle Creek
Battle Creek Amtrak
Watsh Field
Lower Mill Pond
Mt Olive Cemetery
Oak Hill Cemetery
Piper Park
North Ave
6 Mile Rd
W Michigan Ave
Capital Ave NE
Interstate 94 Business Loop
E Michigan Ave
W Dickman Rd
S Washington Ave
Main St
E Emmett St
W Emmett St
Division St N
Michigan Ave E
Capital Ave SW
Jackson St W
W Van Buren St
E Van Buren St
Mike Hume's Way
Irving Park
Laurel Dr
Pleasantview Dr
Parkway Dr
Greenwood Ave
Oaklawn Ave
W Manchester St
Garfield Ave
Sherman Rd
Calhoun St
Cherry St
Clay St
Wagner Dr
Perry St
Hoag St
Shepard St
Nevada St
Idaho St
1st St
Cliff St
Lathrop Ave
Post Ave
Walnut Ave
Massachusetts Ave
W Kingman Ave
E Kingman Ave
Enwood St
Walnut Ct
Midway Ct
Oak Hill Dr
Horton St
High St
Warren St
Mary St
E Burnham St
W Burnham St
Goguac St W
Goguac St E
Sumac St
Webber St
Burr St
Eldred St
E Bidwell St
Mineral Ave
Sisson Ave
Kenosha Ave
E Territorial Rd
Riverside Dr
Fonda Ave
Logan St
Elsmere St
Lasalle St
Rae St
Cady St
Terrace Ave
Meacham Ave SW
Cleveland St
Caroline St
Harrison St
Arthur St
Corwin St
Boulder St
Riverside Dr
Race Ct
S Division St
Pitt St
Charlton St
Green St
Willis St
Yuba St
Bennett St
Elm St
Union St S
Merritt St
Poplar St
Orchard Pl
Chestnut St
Fremont St
Rose St
Franklin St
Harvard St
Woolnough St
Latta St
Eagle St
Groveland St
Fremont Pl
Wendell St
St Joseph Ln
Elizabeth St
Guest St
Garrison Ave
N Union St
McKinley Ave N
McKinley Ave S
N Wabash Ave
S Wabash Ave
N Broad St
S Broad St
Riverview Ave
Maple Terrace
Radley St
Bryant St
East Ave N
East Ave S
Frelinghuysen Ave
Cornell Dr
Curtis Ave
Lindsey St
Lawler
Central St
Orchard Ave
Clinton Dr
Merwood Dr E
Hunter St
W Pitman Ave
Laurel Dr
Seedorff St
Orin St
Bowen Ave
Ann Ave
Moffitt Pl
Bernardo Pl
Truth Dr
Laramie Ct
W Northside Dr
W Helen M Montgomery Ave
Parkway Dr
Howard St
Hubbard St
Kendall St N
Oneita St N
N Wood St
Hancock Ct
5 Mile Rd
Hazel St
Hanover St
Congress St
Wilkes St
Brook St
Grant St
West St
College St
Champion St
W Van Buren St
W Michigan Ave
Jackson St W
Service St
W Hamblin Ave
Lafayette Ave
Page St
Gould St
Tompkins St
McCamly St
Houston St
McCamly St S
Jackson St W
State St W
Grand Trunk Ave
Grove St
Jewell St
Upton Ave
Kedzie Ct
Blanch St
Spring St
Meacham Ave
Mint St
W Fountain St
E Fountain St
Plantain St
Harris St
W Rittenhouse Ave
Elder St
Battle Creek Ave
Elmwood Ave
Caroline St
Capital Ave SW
Cleveland St
Race Ct
S Division St
South Ave
S Jay

KALAMAZOO RIVER/ENBRIDGE SPILL
General Safety Instructions
Operational Period: 10/25/12 (0700hrs) to 11/1/12 (0700hrs)

River Opening: Be advised that the Kalamazoo River has been opened to the public except for work areas marked by buoys. Public recreational activities are to be expected on the river. Be courteous and respectful to members of the public at all times. Be aware that members of the public may be present in work areas.

No Wake Zones: A no wake zone has been established in the Southern Delta and Neck area. The zone extends 100 feet from the new containment boom locations, as well as when traveling through the gates. An additional no wake zone has been established at Mile Post 22.65 and is demarcated upstream and downstream with no wake buoys.

Weather: Review weather information prior to commencing work each day. Be aware of changes in the weather conditions and ensure proper controls are implemented to address the weather hazards such as: Lightning, Rain, Fog, etc. Take actions in accordance with instructions provided by supervisory personnel and as received through the Call-Em-All system.

Sunscreen: Sunscreen should be applied to exposed skin, and not just if you are going to be in the sun. UVB rays cannot penetrate glass windows, but UVA rays can, leaving you prone to these damaging effects if unprotected.

PPE: Be prepared for changing weather conditions by wearing, and/or having available, appropriate rain gear and approved safety footwear with appropriate soles for use on slippery ground conditions. When PFDs are required you must ensure that they are United States Coast Guard approved and are the outermost layer, with reflective vest worn under the PFD.

Vehicles: Follow speed limits and adjust speed as necessary for road conditions. Make sure your vehicle is in proper working condition.

Process for Reporting Potentially Hazardous Materials: If you observe a potentially hazardous material which is not spill related, notify field safety officer and evacuate the area. Do not let anyone into the area unless it is Enbridge Safety and/or Operations Inspector. Immediately report all details to the Enbridge Safety Office at 269-753-9347. The Enbridge Safety Office will alert the Emergency Response Center or call (911). Notifications will go to Calhoun County EMS or Kalamazoo County EMS, EPA, DEQ and Pollution Emergencies.

SPECIAL NOTATION ON WEATHER and HAZARD ALERT MESSAGING:

(See daily updates for additional weather information).

Enbridge Safety will maintain consistent weather messages by compiling information and present through daily briefings. Weather forecast updates will be distributed to field safety staff for further communication in the field. Enbridge Safety is responsible for communicating weather alerts based on information received through the Weather TAP system and text messages received from the National Weather Service in Grand Rapids.

In the event of severe weather warnings and alerts, Enbridge Safety will be monitoring via the Weather TAP system. Enbridge Safety will initiate the notification process by using the Call-Em-All system to Field Safety Staff and Operations. Operations in turn will contact their Operation Field Inspectors. The Operation Field Inspector will communicate the necessary plan with their field work crews.

Severe Weather Alerts: Take appropriate shelter when the county activates their tornado warning sirens. Report to the designated tornado shelter rooms. Where appropriate shelter is not available, lie flat in a nearby ditch or depression and cover your head with your hands. Be aware of potential for flooding and flying debris.

Note: Emergency notification siren systems will be tested on the first (1st) Saturday of each month in Calhoun and Kalamazoo Counties. Typically a siren is sounded at 1200 hours; however, this could be delayed due to current circumstances in the county.

Fire/Building Evacuation Alert: In the event of a fire, utilize air horn to initiate series of three 1 second blasts. Must report to the designated evacuation point upon hearing a series of three 1 second air horn blasts. **Please close all doors, and turn lights out upon leaving your area.**

Call the Safety Office at 269-753-9347 if you have weather related concerns or other Safety related issues.

Safety Orientations: Held Monday - Friday at 0800 at the Enbridge Marshall Office (333 South Kalamazoo Ave)

Boat Safety Awareness Orientation: Available by appointment Monday – Friday, contact the Safety Office.

If you see wildlife (dead or alive) that is impacted by the oil, call Bob Doherty 414-688-4121.

Field Safety Staff	
Name	**Phone**
Barry Vavrina	[redacted]

Call-Em-All: Will be tested by Enbridge Safety office on Wednesday's at 1200 hours.

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KALAMAZOO RIVER/ENBRIDGE SPILL
General Safety Message
Operational Period: 10/25/12 (0700hrs) to 11/1/12 (0700hrs)

DAY 1:
Thursday, October 25, 2012

Life Saving Rule #4 – Ground Disturbance

Dig Safely. Always follow procedures for locating, positively identifying and excavating buried facilities. Protect yourself, your community and the environment by protecting our pipelines – ensure that all buried facilities are identified and marked prior to excavation.

By building a strong foundation of safe practices we can protect our most valuable resource – our people.

**** Make certain you know and obey the Enbridge 10-2-1 Rule ****

DAY 2:
Friday, October 26, 2012

Dehydration in Cold Weather

Remember you continue to lose fluids even during cold weather. It is important to replace those lost fluids in order to stay healthy. Cold weather can increase your risk for dehydration due to the fact that you do not feel as thirsty as during hot weather. Make sure to:

- Drink plenty of water in small quantities.
- Replace lost electrolytes which can be found in drinks such as "PowerAde".
- For severe dehydration – seek medical attention immediately.

DAY 3/ DAY 4:
Saturday, October 27– Sunday, October 28, 2012

Cold Weather Hazard - Frostbite

One of the most common hazards in cold weather is frostbite. Frostbite can affect any part of the body, but the tip of the nose, ears, fingertips, and toes are the most likely areas to be affected. Symptoms of frostbite include:

- Progressive numbness and loss of sensitivity to touch.
- Affected area may tingle or have a burning sensation.
- If the condition worsens, the pain will begin to fade or eventually disappear.

First aid for frostbite includes:

- Get the person to a warm place.
- Unless absolutely necessary, the person should not walk on frostbitten toes or feet.
- Do not rewarm the skin until you can keep it warm. Warming and then re-exposing the frostbitten area to cold air can cause worse damage.
- Gently warm the area in warm water or with wet heat until the skin appears red and warm.
- Do not use direct heat from heating pads, radiator, or fires.
- Do not rub or massage the skin or break blisters.
- Loosely bandage affected area.
- Seek medical attention.

DAY 5:
Monday, October 29, 2012

Preventing Slips, Trips, and Falls

Use the following tips to prevent slips, trips, and falls at work and home in the changing weather conditions:

- Don't hurry when conditions are likely to be slippery.
- Practice good housekeeping habits.
- Prevent indoor puddles by keeping skid resistant mats near building entrances.
- Anticipate hazards as you are walking.
- Plan lifts carefully.
- Take extra cautions with ladders in cold weather.
- Keep walkways clear of ice and snow.
- Wear slip resistant footwear.

DAY 6:
Tuesday, October 30, 2012

Cold Weather Attire

Dress in layers that can be adjusted as the temperatures fluctuate

- Bottom layer – material that pulls moisture from skin
- Center layer – insulates well
- Outer layer – shell that protects from elements

Keep hats/gloves/socks dry and have backups in the event they become wet.

DAY 7:
Wednesday, October 31, 2012

Hypothermia

Constant shivering is a key sign of hypothermia. Other symptoms of moderate to severe hypothermia include:

- Shivering
- Clumsiness or lack of coordination
- Slurred speech or mumbling
- Stumbling
- Confusion or difficulty thinking
- Poor decision making, such as trying to remove warm clothes
- Drowsiness or very low energy
- Apathy or lack of concern about one's condition
- Progressive loss of consciousness
- Weak pulse
- Slow, shallow breathing

A person with hypothermia usually isn't aware of his or her condition, because the symptoms often begin gradually and due to the confused thinking associated with hypothermia, this prevents self-awareness

Call 911 if you see someone with signs of hypothermia or if you suspect a person has had unprotected or prolonged exposure to cold weather or water. If possible, take the person inside, remove wet clothing, and cover him or her in layers of blankets

Weather Forecast



1. Incident Name	2. Operational Period (Date/Time)	DAILY MEETING SCHEDULE
KALAMAZOO RIVER / ENBRIDGE SPILL RESPONSE	From: October 25, 2012 0700	ICS-230
	To: Novemeber 01, 2012 0700	

3. Meeting Schedule (Commonly-held meetings are included)

Date/ Time	Meeting Name	Purpose	Attendees	Location
10/25/2012	**Thursday**			
0700 **0730**	Operations Briefing	Present IAP for the next Operational Period to Field Staff	Branch Directors and Field Staff	Field Locations
0900 **0945**	MAC Meeting	Update MAC with situation metrics and briefings of common interest.	UC, Command and General Staff, Multi-Agency Coordination Group,	EPA/DEQ Field Office
1400 **1600**	Kalamazoo River System Branch Special Purpose Meeting	Coordinate future Kalamazoo River System Branch activities	Kalamazoo River System Branch Directors and Group Supervisors	EPA/DEQ Field Office
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office
10/26/2012	**Friday**			
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office
10/27/2012	**Saturday**			
10/28/2012	**Sunday**			
10/29/2012	**Monday**			
0900 **0945**	Tactics (11/1 - 11/8)	Finalize primary and alternate tactics and strategies to achieve UC	Operations, Planning, Safety	EPA/DEQ Field Office
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office
10/30/2012	**Tuesday**			
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office
10/31/2012	**Wednesday**			
0900 **0930**	Command and General Staff Meeting	UC presents direction to Command and General Staff.	UC, Command and General Staff, SITL	EPA/DEQ Field Office
0930 **0945**	Planning Meeting (11/1-11/8)	Review tactics and assignments to meet the project Objectives for the	UC, Command and General Staff, Scribe	EPA/DEQ Field Office
0945 **1000**	Objectives Meeting (11/8-11/15)	Review current objectives and identify objectives for the next	UC, Operations, Safety, Planning, Scribe	EPA/DEQ Field Office
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office

4. Prepared by: Brad Nelson, Planning Section Chief **Date/Time 10/24/2012**



0900

1. Incident Name	2. Operational Period (Date/Time)	DAILY MEETING SCHEDULE
KALAMAZOO RIVER / ENBRIDGE SPILL RESPONSE	From: October 25, 2012 0700	ICS-230
	To: November 05, 2012 0700	

3. Meeting Schedule (Commonly-held meetings are included)

Date/ Time	Meeting Name	Purpose	Attendees	Location
10/25/2012	**Thursday**			
0700 **0730**	Operations Briefing	Present IAP for the next Operational Period to Field Staff	Branch Directors and Field Staff	Field Locations
0900 **0945**	MAC Meeting	Update MAC with situation metrics and briefings of common interest.	UC, Command and General Staff, Multi-Agency Coordination Group,	EPA/DEQ Field Office
1400 **1600**	Kalamazoo River System Branch Special Purpose Meeting	Coordinate future Kalamazoo River System Branch activities	Kalamazoo River System Branch Directors and Group Supervisors	EPA/DEQ Field Office
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office
10/26/2012	**Friday**			
1600 **1630**	Operations Meeting	Summary of daily activities	Operations Section Branch Directors	EPA/DEQ Field Office
10/27/2012	**Saturday**			
10/28/2012	**Sunday**			
10/29/2012	**Monday**			
10/30/2012	**Tuesday**			
10/31/2012	**Wednesday**			
1500 **1530**	Operations Brief / Command and General Staff Meeting	Ops Chiefs and field leaders present Weekly Sit Update. UC presents direction to Command and General Staff.	UC, Operations, Safety, Planning, Scribe	EPA/DEQ Field Office
1530 **1545**	Objectives Meeting (11/5-11/26)	Review and identify current objectives for the next Operational Period. Finalize tactics and strategies to achieve objectives for next Operational Period.	UC, Operations, Safety, Planning, Scribe	EPA/DEQ Field Office
11/1/2012	**Thursday**			
1100 **1300**	Forensic Chemistry Meeting	Review forensic chemistry results	Enbridge, EPA, DEQ	Enbridge Marshall Office
1400 **1600**	Kalamazoo River System Branch Special Purpose Meeting	Coordinate future Kalamazoo River System Branch activities	Kalamazoo River System Branch Directors and Group Supervisors	EPA/DEQ Field Office
11/2/2012	**Friday**			
11/3/2012	**Saturday**			
11/4/2012	**Sunday**			

4. Prepared by: Brad Nelson, Deputy Planning Section Chief **Date/Time 10/26/2012**

1100

REVISED 10/26/2012

1. Incident Name	2. Operational Period (Date/Time)	**IAP**
Kalamazoo River/Enbridge Spill	Starting**: November 05, 2012, 0700**	**Cover**
	End**: November 27, 2012, 0700**	**Sheet**

3. Approved by Incident Commander(s):

_____ Michelle DeLong, Michigan Department Environmental Quality

_____ Ralph Dollhopf, U.S. EPA

_____ John Sobojinski, Enbridge

INCIDENT ACTION PLAN

The items below are included in this Incident Action Plan:

- ICS 202 (Response Objectives).....1
- ICS 207 (Organizational Chart & OPS Chart).....2
- ICS 204 (Assignment List) 5
- Communications List.....11
- Project Schedule 13
- Meeting Locations and Traffic Plans.....14
- Medical Plan and hospital maps 23
- Meetings Schedule.....28



4. Prepared By: Date/Time

Brad Nelson, Avery/Enbridge 11/2/2012

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1. Incident Name	2. Operational Period (Date/Time)	INCIDENT OBJECTIVES
Kalamazoo River/Enbridge Spill	From: November 05, 2012 @ 0700 To: November 27, 2012 @ 0700	**ICS 202-EPA**

3. Incident Objective(s)

1. Ensure health and safety of the public and response and recovery personnel.
2. Ensure absolute containment of submerged oil and oil-containing sediments within the Delta and the Fan of Morrow Lake.
3. Ensure effective transition of regulatory oversight from EPA to Michigan DEQ jurisdiction as appropriate.
4. Perform recovery and containment of oil from affected public and private areas of river and river system.
5. Perform remediation and restoration of affected public and private areas of river and river system.
6. Maintain effective communications with cooperating and assisting agencies, the public, including regular coordination with the Multi-Agency Coordination Group (MAC).
7. Provide protection of environmentally and culturally sensitive areas including wildlife and historic properties.
8. Collect, coordinate, manage and communicate environmental and public health data including maintenance of Joint Information Center function.

4. Operational Period Command Emphasis

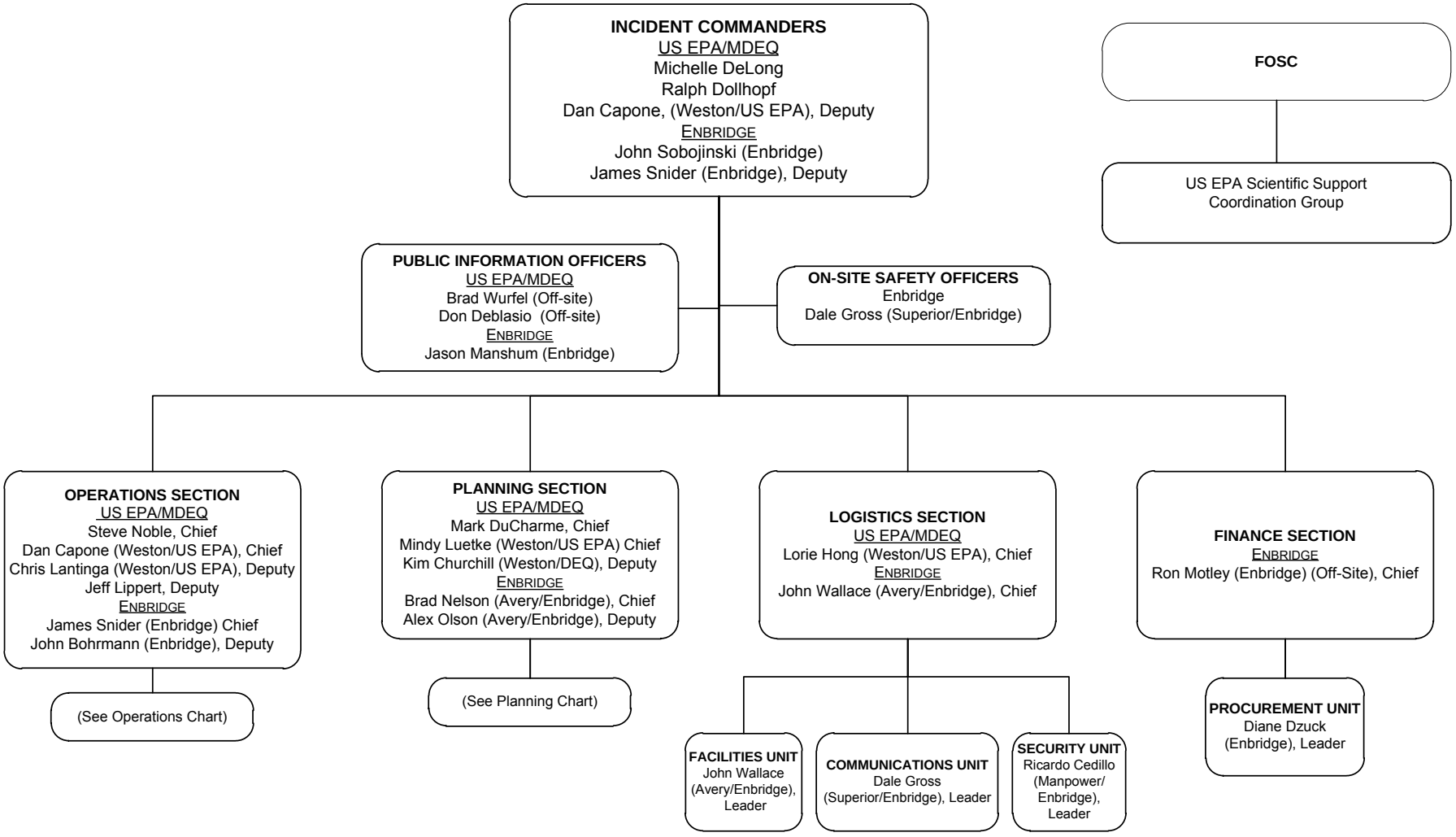
1. Respond to and document emerging oil throughout the Kalamazoo River system.
2. Implement path forward for submerged oil quantification cores.

5. Safety Objectives for the Operational Period

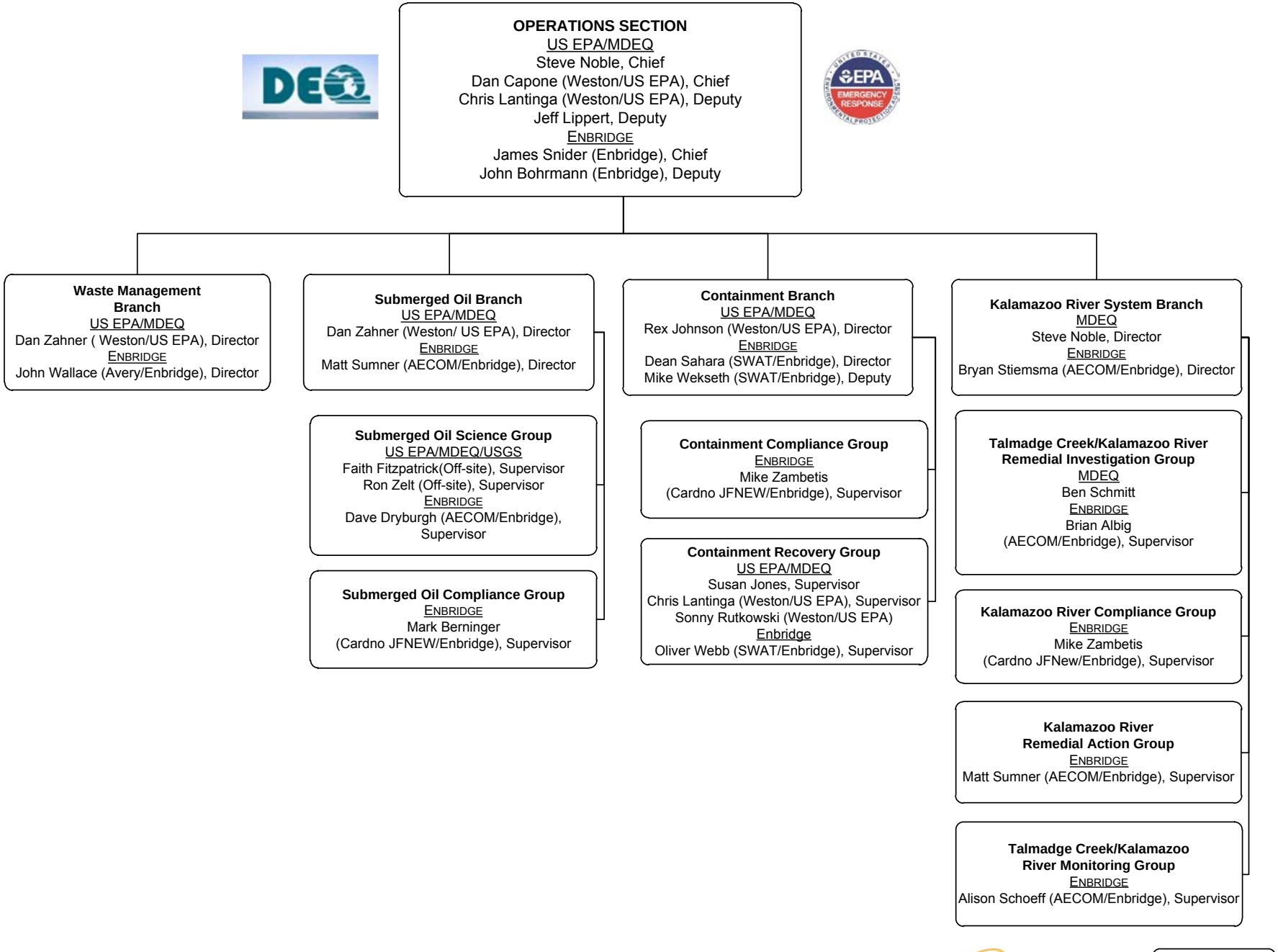
1. Focus on safe completion of sediment sampling, sampling equipment removal and trap removal.
2. Ensure the safe interaction between workers and the public, including hunters.

6. Prepared by Planning Section Chief (Enbridge):	**Date/Time:**
Brad Nelson	11/2/2012
7. Approved by Incident Commander (DEQ):	**Date/Time:**
Michelle DeLong	11/2/2012
8. Approved by Incident Commander (US EPA):	**Date/Time:**
Ralph Dollhopf	11/2/2012
10. Approved by Incident Commander (Enbridge):	**Date/Time:**
John Sobojinski	11/2/2012

Enbridge Pipelines Response Unified Command



ICS 207
11/5 – 11/27


OPERATIONS SECTION
US EPA/MDEQ
Steve Noble, Chief
Dan Capone (Weston/US EPA), Chief
Chris Lantinga (Weston/US EPA), Deputy
Jeff Lippert, Deputy
ENBRIDGE
James Snider (Enbridge), Chief
John Bohrmann (Enbridge), Deputy
Waste Management Branch
US EPA/MDEQ
Dan Zahner (Weston/US EPA), Director
ENBRIDGE
John Wallace (Avery/Enbridge), Director
Submerged Oil Branch
US EPA/MDEQ
Dan Zahner (Weston/ US EPA), Director
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Director
Submerged Oil Science Group
US EPA/MDEQ/USGS
Faith Fitzpatrick(Off-site), Supervisor
Ron Zelt (Off-site), Supervisor
ENBRIDGE
Dave Dryburgh (AECOM/Enbridge), Supervisor
Submerged Oil Compliance Group
ENBRIDGE
Mark Berninger
(Cardno JFNEW/Enbridge), Supervisor
Containment Branch
US EPA/MDEQ
Rex Johnson (Weston/US EPA), Director
ENBRIDGE
Dean Sahara (SWAT/Enbridge), Director
Mike Wekseth (SWAT/Enbridge), Deputy
Containment Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNEW/Enbridge), Supervisor
Containment Recovery Group
US EPA/MDEQ
Susan Jones, Supervisor
Chris Lantinga (Weston/US EPA), Supervisor
Sonny Rutkowski (Weston/US EPA)
Enbridge
Oliver Webb (SWAT/Enbridge), Supervisor
Kalamazoo River System Branch
MDEQ
Steve Noble, Director
ENBRIDGE
Bryan Stiemsma (AECOM/Enbridge), Director
Talmadge Creek/Kalamazoo River Remedial Investigation Group
MDEQ
Ben Schmitt
ENBRIDGE
Brian Albig
(AECOM/Enbridge), Supervisor
Kalamazoo River Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNew/Enbridge), Supervisor
Kalamazoo River Remedial Action Group
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Supervisor
Talmadge Creek/Kalamazoo River Monitoring Group
ENBRIDGE
Alison Schoeff (AECOM/Enbridge), Supervisor
ENBRIDGE
ICS 207
11/5 – 11/27



PLANNING SECTION
US EPA/MDEQ
Mark DuCharme, Chief
Kim Churchill, Deputy
Mindy Luetke (Weston/US EPA), Chief
ENBRIDGE
Brad Nelson (Avery/Enbridge), Chief
Alex Olson (Avery/Enbridge), Deputy



SITUATION UNIT
US EPA/MDEQ
Matt Haak (Weston/ US EPA), Leader
Larry Rader (weston/US EPA), Leader
ENBRIDGE
Alex Olson (Avery/Enbridge), Leader

RESOURCE UNIT
US EPA/MDEQ
Lorie Hong (Weston/US EPA), Leader
ENBRIDGE
Alex Olson (Avery/Enbridge), Leader

ENVIRONMENTAL UNIT
US EPA/MDEQ/USGS
Mike Alexander (Off-site)
Kim Churchill (Weston/DEQ), Leader
Isaac Aboulafia (Weston/US EPA), Leader
Elizabeth Wessling (Weston/US EPA)(Off-site), Leader
Faith Fitzpatrick (USGS)(Off-site), Leader
Ron Zelt (USGS)(Off-site), Assistant
Rex Johnson (Weston/US EPA), Assistant
Tom Graan (Weston/US EPA), Assistant
ENBRIDGE
John Bohrmann (Enbridge), Leader

DOCUMENTATION UNIT
US EPA/MDEQ
Crystal Laskey, Leader
Carolyn Giles-Smith (Weston/DEQ), Leader
Paul Moison (Weston/US EPA), Leader
Gena Good (Weston/US EPA), Leader
ENBRIDGE
Brad Nelson (Avery/Enbridge), Leader

ENBRIDGE

ICS 207
11/5 – 11/26

1. Incident Name	2. Operational Period (Date/Time)	Assignment List ICS 204- EPA
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	
3. Branch	**4. Division/Group/Staging**	
Waste Management		

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	John Wallace	Avery/Enbridge	

6. Resources Assigned

See Branch Directors			

7. Work Assignments

1. Field decon operations for: personnel, hand equipment, and boats for preparation of transport shall be installed prior to work beginning at boat launches / staging areas for individual work sites.
2. Haul contaminated soil, water, media and debris to staging areas for waste characterization and oil recovery sampling prior to offsite disposal.
3. Waste shall be collected as needed for direct haul to the landfill or transported to Frac Tank City (FTC) for consolidation with similar waste streams as necessary.
4. Waste management characterization, manifesting, and coordination of transportation and disposal.

For US EPA/MDEQ/Weston:

1. Provide oversight of all waste management activities.
2. Ensure appropriate sampling, tracking and disposal is performed on oil impacted debris, water and soil.
3. Review manifests, weight tickets and bills of lading for correlation to waste stream analytical data.
4. Review weekly oil recovery and waste disposal report.

8. Special Instructions

Ensure all Best Management Practices (BMPs) are in place and utilized.

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

SAFETY INSTRUCTIONS:
For vacuum truck operation guidelines, please refer the HASP.

At Frac Tank City:

- The following procedure shall be used for initial opening of hatch or rear doors of liquid vacuum trucks and hatches of vacuum excavation units:
  - Approach the hatch to be opened with a calibrated five gas monitor and a benzene monitor.
  - Personnel performing this task must wear a full face respirator with organic vapor cartridge.
  - Slightly open the hatch and take VOC, H2S, LEL, Oxygen, CO and benzene readings.
  - If readings are greater than 10 ppm H2S, 10% LEL, 25 ppm CO or 25 ppm benzene then personnel shall close the hatch and utilize SCBA prior to opening the hatch.
- Operations - Respiratory protection may be required depending on periodic monitoring results. Wear a half-mask respirator equipped with an organic vapor cartridge when 0.5 ppm benzene is detected. Wear a full-face respirator equipped with an organic vapor/acid gas cartridge when benzene is at 5 ppm to 25 ppm.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012	B. Nelson, Avery/Enbridge	11/2/2012	J. Snider, Enbridge	11/2/2012

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	**ICS 204 - EPA**
3. Branch **Submerged Oil**	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	Matt Sumner	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Submerged Oil Science	Faith Fitzpatrick (Off-site) Ron Zelt (Off Site) Dave Dryburgh (AECOM/Enbridge)	[redacted]	1 Weston/ US EPA 8 Contractors
Submerged Oil Compliance	Mark Berninger (Cardno JFNEW/Enbridge)		

7. Work Assignments

Submerged Oil Science

1. Conduct bathymetry on the E4 Containment System. (1 Team)
2. Conduct phase I &II sediment trap sampling and bathymetry. (2 Teams)
3. Conduct Walling sediment sampling and structure removal. (1 Team)

For US EPA/MDEQ/Weston:

1. Oversee and document Submerged Oil Science work activities.

Submerged Oil Compliance

1. Track previously submitted MDEQ permit applications for toolbox methods.

8. Special Instructions

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

SAFETY INSTRUCTIONS:
All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012	B. Nelson, Avery/Enbridge	11/2/2012	J. Snider, Enbridge	11/2/2012

1. Incident Name	2. Operational Period (Date/Time)	Assignment List ICS 204 - EPA
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	
3. Branch **Containment**	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Rex Johnson	Weston/US EPA	
	Dean Sahara	SWAT/Enbridge	
	Mike Wekseth, Deputy	SWAT/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Containment Compliance	Mike Zambetis (Cardno JFNEW/Enbridge)	[redacted]	
Containment Recovery	Susan Jones (MDEQ) Chris Lantinga (Weston/US EPA) Sonny Rutkowski (Weston/US EPA) Oliver Webb (SWAT/Enbridge)		1 Weston/US EPA 14 Contractors

7. Work Assignments

Containment Compliance

1. Provide support as necessary.

Containment Recovery

1. Perform containment strategies along the Kalamazoo River including the following tasks:
   a. Deploy and maintain shoreline containment boom as required.
   b. Complete sheen management as required.
2. Monitor and maintain the E4.0 containment system.
3. Maintain Kalamazoo River Sediment Traps, including the cylindrical sampling devices.

For US EPA/MDEQ/Weston:

1. Oversee and document Containment Recovery activities.

8. Special Instructions

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor. Only the Containment Recovery group will continue work activities during the Thanksgiving Break.

Rowe Island, MP 38.50-MP 38.75, is a No Go Zone – Environmental Sensitive Area.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012	B. Nelson, Avery/Enbridge	11/2/2012	J. Snider, Enbridge	11/2/2012

1. Incident Name	2. Operational Period (Date/Time)	Assignment List ICS 204 - EPA
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	
3. Branch	**4. Division/Group/Staging**	
Kalamazoo River System Branch		

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Steve Noble	MDEQ	
	Bryan Stiemsma	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Talmadge Creek/Kalamazoo River Remedial Investigation	Ben Schmitt (MDEQ) Brian Albig (AECOM/Enbridge)	[redacted]	6 Contractors
Kalamazoo River Compliance	Mike Zambetis (JFNew/Enbridge)		
Talmadge Creek/Kalamazoo River Remedial Action	Matt Sumner (AECOM/Enbridge)		
Talmadge Creek/Kalamazoo River Monitoring	Alison Schoeff (AECOM/Enbridge)		3 Contractors

7. Work Assignments

Talmadge Creek/Kalamazoo River Remedial Investigation

1. Continue Kalamazoo River remedial investigation field work. (1 Team)

For DEQ:

1. Observe and document RI activities with emphasis on conformance with approved work plans and standard operating procedures.
2. Collect RI split samples at approved frequency for soil, sediment and groundwater.

Kalamazoo River Compliance

1. Provide support as necessary.

Talmadge Creek/Kalamazoo River Remedial Action

1. Execute tasks assigned by ERO as requested.

Talmadge Creek/Kalamazoo River Monitoring

1. Conduct daily monitoring of river conditions.
2. Conduct weekly monitoring of buoys and signage in the river.
3. Conduct monthly surface water monitoring at 18 locations along the Kalamazoo River and Morrow Lake.

8. Special Instructions

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

SAFETY INSTRUCTIONS:

When operating or working in the vicinity of ultra violet testing equipment, wear approved safety glasses that provide protection from UV A rays and never look directly into the illuminator.

All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012	B. Nelson, Avery/Enbridge	11/2/2012	J. Snider, Enbridge	11/2/2012

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	**ICS 204 - EPA**
3. Branch **Planning Section**	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Planning Section Chief:	Mark DuCharme Mindy Luetke Kim Churchill, Deputy Brad Nelson Alex Olson, Deputy	MDEQ Weston/US EPA Weston/ DEQ Avery/Enbridge Avery/Enbridge	[redacted]

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Situation Unit	Matt Haak (Weston/ US EPA) Larry Rader (Weston/ US EPA) Mark Fuller (AECOM/Enbridge)	[redacted]	1 Weston/EPA 1 Contractor
Resource Unit	Lorie Hong (Weston/US EPA) Alex Olson (Avery/Enbridge), Assistant		1 Contractor
Environmental Unit	Mike Alexander (Off-site) Kim Churchill (Weston/MDEQ) Isaac Aboulafia (Weston/US EPA) Elizabeth Wessling (Weston/US EPA)(Off-site) Faith Fitzpatrick (USGS) Ron Zelt (Off-site) (USGS), Assistant Rex Johnson (Weston/US EPA), Assistant Tom Graan (Weston/US EPA) , Assistant John Bohrmann (Enbridge)		1 Weston/MDEQ 2 MDEQ 2 Contractors
Documentation Unit	Crystal Laskey Carolyn Giles-Smith (Weston/MDEQ) Paul Mosian (Weston/US EPA) Gena Good		1 Contractors

7. Work Assignments

Situation Unit:

1. Record and document sheen observations in main channel and overbank areas, and conduct sheen testing, if necessary. Report sheen observations back to operations section chiefs for monitoring and response.
2. Conduct weekly overflights; photo-document areas of sheen from source area to Morrow Lake dam and report observations back to operations section chiefs for monitoring and response. Additional flights will be scheduled as needed.
3. Organize field metrics, prepare for and facilitate presentations, and monitor action tracking. Maintain situational awareness around operational activities and plan for operational needs.

For US EPA/MDEQ/Weston:

1. Maintain situational awareness around operational activities.
2. Communicate observations to the Operations Section Chief.
3. Provide daily situational photo log summaries.
4. Conduct daily monitoring of river conditions, recording observations of sheen and/or oil.
5. Record and document sheen observations in main channel and overbank areas, and conduct sheen testing, if necessary. Report sheen observations back to operations section chiefs for monitoring and response.

Resource Unit:

1. Produce an Incident Action Plan as required by the Incident Commanders.
2. Support the planning efforts of operations and provide information to Logistics in order to properly prepare and order resources.

Environmental Unit:

1. Conduct strategic assessment, modeling, and environmental monitoring.
2. Review sheen tracking information from the field.
3. Continue submerged oil quantification for Spring 2012 with emphasis on implementing the path forward for submerged oil quantification cores.
4. Refine subsurface containment strategies throughout the Kalamazoo River system to prevent recontamination of the Morrow Lake fan.
5. Review and track RI progress.
6. Continue discussions on NAPL.
7. Review of property parcels for MDEQ end points.

For US EPA/MDEQ/Weston:

1. Continue to coordinate efforts to calculate the quantity of submerged oil remaining as of Spring 2012.
2. Continue supporting the evaluation of the hydrogeomorphology of the Kalamazoo River, the Morrow Lake Delta, and Morrow Lake.
3. Interface with Enbridge and assist with the refinement of surface and subsurface containment strategies throughout the Kalamazoo River system to prevent the continued migration of oil, oil sheen, submerged oil, and oil-containing sediments into Morrow Lake.
4. Review and comment on RI progress submittals
5. Support development of NAPL CSM.
6. Review Enbridge submittals with emphasis on compliance with state endpoints.

Documentation Unit:

1. Maintain accurate, up-to-date incident files.
2. Store files for post-incident use.

8. Special Instructions

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

SAFETY INSTRUCTIONS:

Hexane is flammable and may be harmful in contact with skin. When handling hexane and sheen test samples containing hexane, wear approved safety glasses, disposable nitrile gloves and keep away from ignition sources. Properly dispose of sheen test samples containing hexane.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	**Date/Time**	**11. Reviewed by (PSC)**,	**Date/Time**	**12. Reviewed by (OSC),**	**Date/Time**
A. Olson, Avery/Enbridge	11/2/2012	B. Nelson, Avery/Enbridge	11/2/2012	J. Snider, Enbridge	11/2/2012

NAME	PHONE NUMBER	EMAIL ADDRESS	AGENCY / AFFILIATION	POSITION
Enbridge and Contractors				
Enbridge Marshall Office: 333 South Kalamazoo Ave Marshall MI 49068				
Adams, Rich	[redacted]		Enbridge	Operations
Albig, Brian			AECOM/Enbridge	Environment
Bareham, Dave			Enbridge	Environment
Berninger, Mark			Cardno JFNEW/Enbridge	Restoration
Bohrmann, John			Enbridge	Environment
Bretz, Ryan			Manpower/Enbridge	IT
Cox, Renee			Manpower/Enbridge	Documentation
Daniel, Pat			Enbridge	
Dekker, Shaun			SET/Enbridge	Waste Management
Dennis, Kate			Manpower/Enbridge	Admin Support
Doherty, Bob			Enbridge	Environment
Dryburgh, Dave			AECOM/Enbridge	Environment
Dzuck, Diane			Enbridge	Contracts
Eversole, Elijah			AECOM/Enbridge	Containment
Fuller, Mark			AECOM/Enbridge	Environment
Gross, Dale			Superior/Enbridge	Safety Officer
Hehir, Nate			Superior/Enbridge	Environment
Hogan, Charlene			AECOM/Enbridge	Environment
Hummel, Rebecca			Manpower/Enbridge	Finance
Kaiser, Ken			AECOM/Enbridge	GIS Specialist
Kent, Norm			AECOM/Enbridge	Environment
Kerpash, Paul			SWAT/Enbridge	Control Point Management
Kogge, Stu			Cardno JFNEW/Enbridge	Operations
Manshum, Jason			Enbridge	Public Affairs
McKay, John			Enbridge	ROW
Nelson, Brad			Avery/Enbridge	Planning
Neumeier, Laura			Trimedia/Enbridge	Air Monitoring
Olson, Alex			Avery/Enbridge	Planning
Periard, Debora			AECOM/Enbridge	GIS Support
Pesses, David			LBG/Enbridge	Environmental Inspector
Powell, Meredith			Enbridge	Public & Govt. Affairs
Pratt, Catherine			AECOM/Enbridge	Environment
Sahara, Dean			SWAT/Enbridge	Operations
Saylor, Andy			SET/Enbridge	
Schoeff, Alison			AECOM/Enbridge	Water Monitoring Supervisor
Smith, Brian			Tulsa/ Enbridge	Project Controls
Snider, Jim			Enbridge	Environment Director
Sobojinski, John			Enbridge	Incident Commander
Standen, Joe			LBG/Enbridge	
Stiemsma, Bryan			AECOM/Enbridge	Environment Supervisor
Sumner, Matt			AECOM/Enbridge	Environment
Van Overmeiren, Rick			Enbridge	Purchasing
Wallace, John			Avery/Enbridge	Logistics / Facilities
Webb, Oliver			SWAT/Enbridge	Control Point Management
Wekseth, Mike			SWAT/Enbridge	Operations Inspector
Wiswell, Amber			Kelly Services/Enbridge	Admin. Assistant
Wolf, Mike			AECOM/Enbridge	Monitoring
Yokom, Brett			Trimedia/Enbridge	Environment
Zambetis, Mike			Cardno JFNEW/Enbridge	Restoration

AECOM Field Office
13464 Preston Drive
(Lower Level)
Marshall MI 49068

SWAT Field Office / Shop
12514 16 Mile Road
Marshall MI 49068

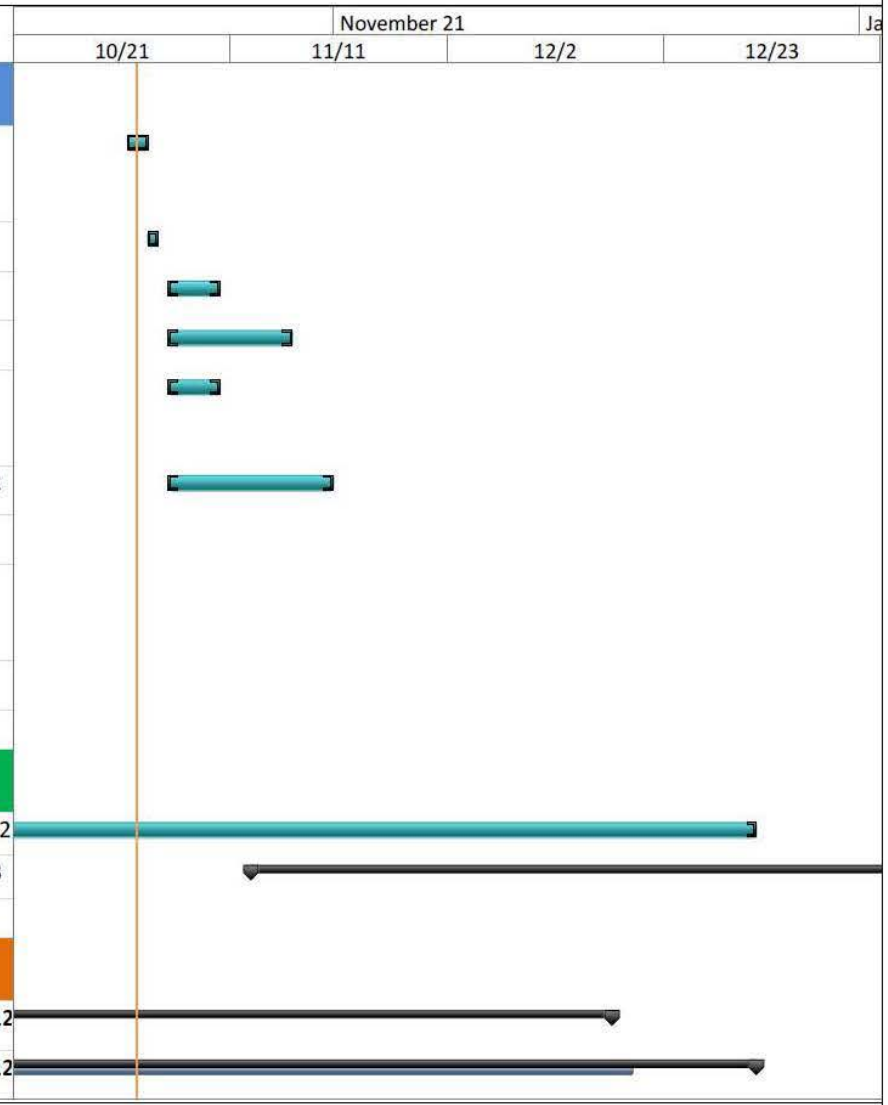
Superior Field Office
317 S Grand St
Marshall MI 49068

NAME	PHONE NUMBER	EMAIL ADDRESS	AGENCY / AFFILIATION	POSITION
Michigan DEQ and Contractors DEQ Field Office: 13444 Preston Drive Marshall MI 49068				
Alexander, Mike	[redacted]		DEQ	Environmental Unit
Brettmann, Gregg			DEQ	Environmental Unit Leader
Brown , Kevin			Weston/DEQ	GIS Support
Bukowski, Breanna			Weston/DEQ	Planning
Churchill, Kim			Weston/DEQ	Environmental Unit
DelloRusso, Vincent			Weston/DEQ	Operations
DeLong, Michelle			DEQ	Incident Commander
DuCharme, Mark			DEQ	Planning Section Chief
Fizzell, Chad			DEQ	GIS Support
Giles-Smith, Carolyn			Weston/DEQ	Documentation
Jones, Susan			DEQ	Operations
Laskey, Crystal			DEQ	Planning
Lisabeth, Nicole			MSP	PIO
Lundholm, Mark			Weston/DEQ	Operations
Noble, Steve			DEQ	Water Resources Division
Sarkipato, Ernie			DEQ	Environmental Unit
Schmitt, Ben			DEQ	Operations
Shattuck, Terri			Weston/DEQ	Operations
Spruit, Jeff			DEQ	Environment
Taft, Bill			DEQ	Wildlife Environmental NRDA Group
Thompson, Doug			DEQ	Operations
Wilson, Lee			Weston/DEQ	Operations
Wurfel, Brad			DEQ	Public Information
Zacharda, Nicole			DEQ	NRDA and Compliance
US Agencies and Contractors EPA Field Office: 13444 Preston Drive Marshall MI 49068				
Aboulafia, Isaac	[redacted]		START/US EPA	Planning
Berecz, Karen			START/US EPA	O & M
Blanchard, Mark			START/US EPA	
Capone, Dan			START/US EPA	Operations
Deblasio, Don			US EPA	Public Information
Dollhopf, Ralph			US EPA	Incident Commander (FOSC)
Fitzpatrick, Faith			USGS	Tech Specialist
Good, Gena			START/US EPA	
Graan, Tom			START/US EPA	Submerged Oil Lead
Haak, Matt			START/US EPA	Sit Unit Leader
Hackley, Richard			US EPA	Finance
Hendrix, Kristen			START/US EPA	Operations
Hoard, Chris			USGS	USGS
Hong, Lorie			START/US EPA	Logistics
Johnson, Rex			START/US EPA	Operations
Kidder, Steven			START/US EPA	Operations SOS
Kirby-Miles, Leslie			US EPA	Legal
Lantinga, Chris			START/US EPA	Operations
Laquerre, Tim			START/US EPA	Operations
Luetke, Mindy			START/US EPA	PSC
Mehl, Rick			START/US EPA	
Moisan, Paul			START/US EPA	Documentation
Muccianti, Marcus			START/US EPA	Operationsp
Pierce, Brennan			START/US EPA	Documentation
Rader, Larry			START/US EPA	Sit Unit Leader
Ross, Shauna			START/US EPA	
Roubik, Jonathan			START/US EPA	Operations
Rutkowski, Sonny			START/US EPA	Technical Specialist
Thierry, Mike			START/US EPA	Operations
Torres, Jason			START/US EPA	GIS Specialist
Valenza, James			START/US EPA	GIS Specialist
Wahrer, Marc			START/US EPA	Operations
Wellman, John			START/US EPA	Operations
Wessling, Elizabeth			START/US EPA	PSC
Williams, Lisa			USFWS	
Zahner, Dan			START/US EPA	Operations
Zelt, Ron			USGS	Environmental Unit Leader Assistant
Local Agencies / MAC members				
Baker, Paul	[redacted]		Kalamazoo OEM	MAC
Cardiff, Deb			Kalamazoo County - Env Health	MAC
Corbin, Scott			Allegan County Emerg Mgmt	MAC
Dunham, Durk			Calhoun County EMA	MAC
Dykema, Linda			Mich Dept of Community Health	MAC
Frost, Joe			Calhoun County Health	MAC
Kosmowski, Christine			City of Battle Creek	MAC
Makoski, Paul			Calhoun County Health	MAC
McKenzie, Michael			Battle Creek Emer. Srvs.	MAC
Quiggle, Lisa			MDCH	MAC
Reber, Lt. Barry			MSP EMHSD	MAC
Rutherford, James			Calhoun County Health	MAC
Schneider, Dave			Kalamazoo County	MAC
Vail, Linda			Kalamazoo County Health	MAC
Vosburg, Cheryl			City of Marshall	MAC

Line 6B Remediation
Marshall Michigan

Project Schedule

ID	Task Name	Duration	Start	Finish
1	**RIVER ACTIVITIES**			
2	Removal of 36.10 RDB Sediment Trap/Turbidity Mon.	2 days	Thu 11/1/12	Fri 11/2/12
3	Removal of Wash/Garbage Stations	1 day	Sat 11/3/12	Sat 11/3/12
4	Phase I Sediment Trap Sampling	5 days	Mon 11/5/12	Fri 11/9/12
5	Phase II Sediment Trap Sampling	10 days	Mon 11/5/12	Fri 11/16/12
6	Walling & Sediment Sampling/Structure removal	5 days	Mon 11/5/12	Fri 11/9/12
7	Removal of all Buoys	12 days	Mon 11/5/12	Tue 11/20/12
8	Removal of the boom at Ceresco		TBD	TBD
9	Removal of the E4 Boom Configuration/Turbidity Mon.		TBD	TBD
10	Removal of CSDs		TBD	TBD
11				
12	**OVERBANK ACTIVITIES**			
13	Remedial Investigation (2013 work not shown)	68 days	Thu 9/27/12	Mon 12/31/12
14	Surface Water Monitoring (Next 3 Monthly samples)	67 days	Tue 11/13/12	Wed 2/13/13
19				
20	**OTHER ACTIVITIES**			
21	Quantification of Oil	111 days?	Mon 7/16/12	Mon 12/17/12
32	Air Operations	71 days	Mon 9/24/12	Mon 12/31/12



Project: Project Schedule 9-24
Date: Fri 11/2/12

Task		External Milestone		Manual Summary Rollup	
Split		Inactive Task		Manual Summary	
Milestone		Inactive Milestone		Start-only	
Summary		Inactive Summary		Finish-only	
Project Summary		Manual Task		Deadline	
External Tasks		Duration-only		Progress	

TRAFFIC PLAN: C 5



[redacted] Battle Creek, MI 49014

GPS Coordinates Lat: 42.304905 Long: -85.183463

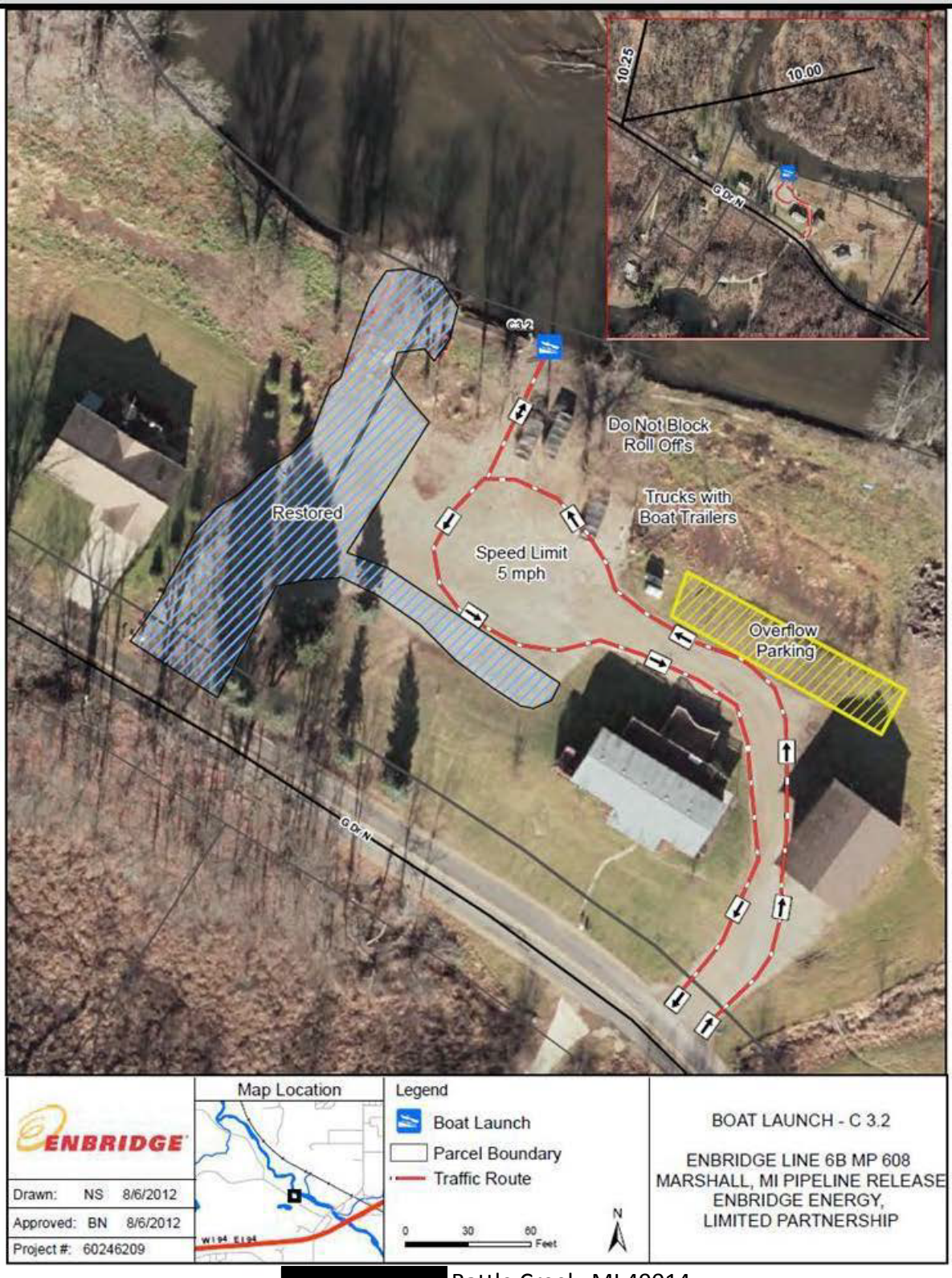
TRAFFIC PLAN: C 0.4



[redacted] Ceresco, MI 49033

GPS Coordinates: Lat: 42.265127, Long:-85.048364

TRAFFIC PLAN: C 3.2



[redacted] Battle Creek, MI 49014

GPS Coordinates: Lat: 42.293492 Long: -85.124479

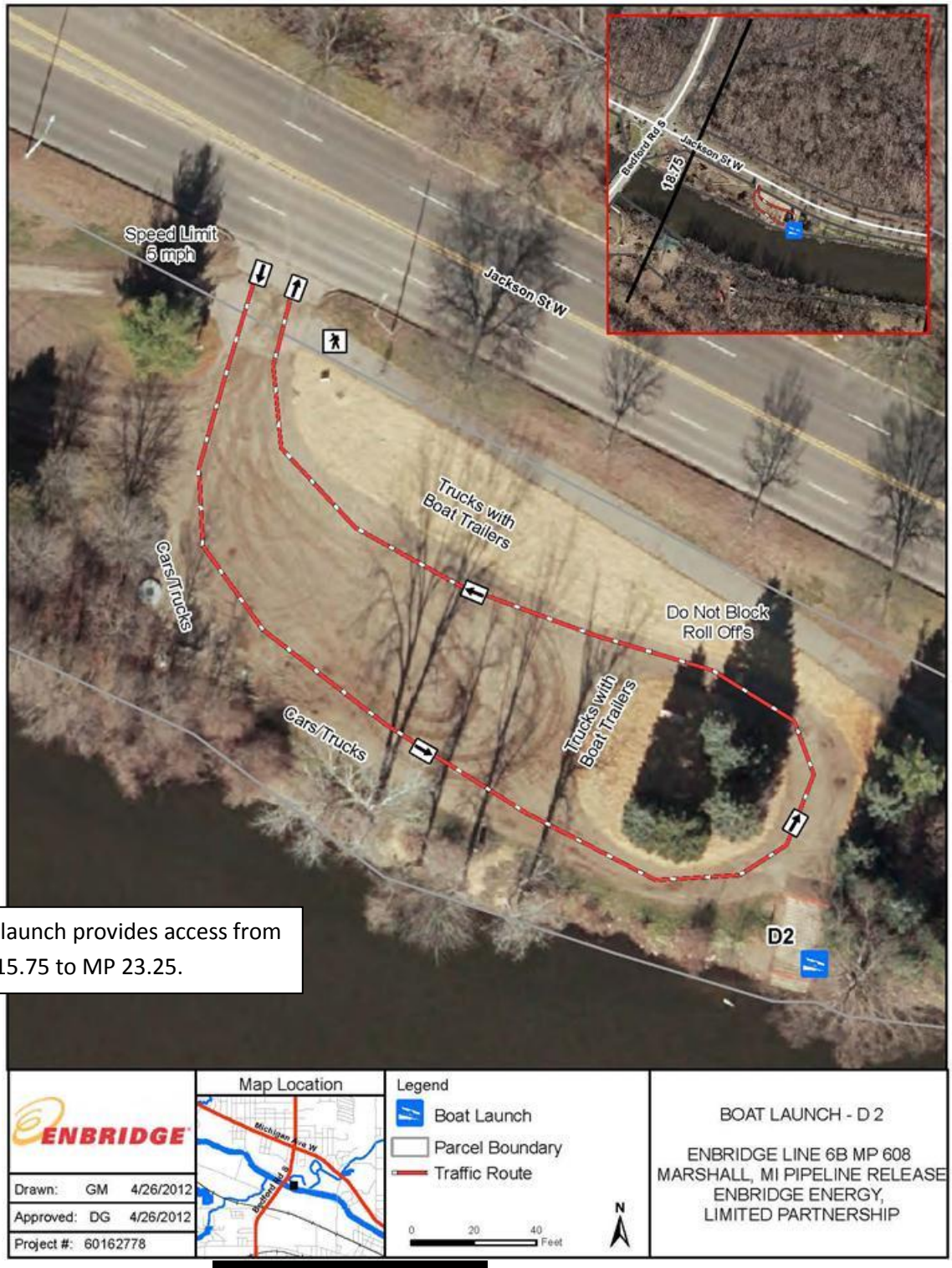
TRAFFIC PLAN: Wildlife Center



[redacted] Battle Creek, MI 49014

GPS Coordinates: Lat: 42.292173, Long: -85.123578

TRAFFIC PLAN: D2



This launch provides access from MP 15.75 to MP 23.25.

[redacted] Battle Creek, MI 49037

GPS Coordinates: Lat: 42.338427 Long:-85.232309

TRAFFIC PLAN: E 0.5



(Shady Bend Camp Ground), 15320 East Augusta Dr, Augusta, MI 49012
GPS Coordinates:Lat: 42.347408 Long: -85.3295

TRAFFIC PLAN: E 2



[redacted] Augusta, MI 49053

GPS Coordinates: Lat: 42.32412 Long: -85.358041

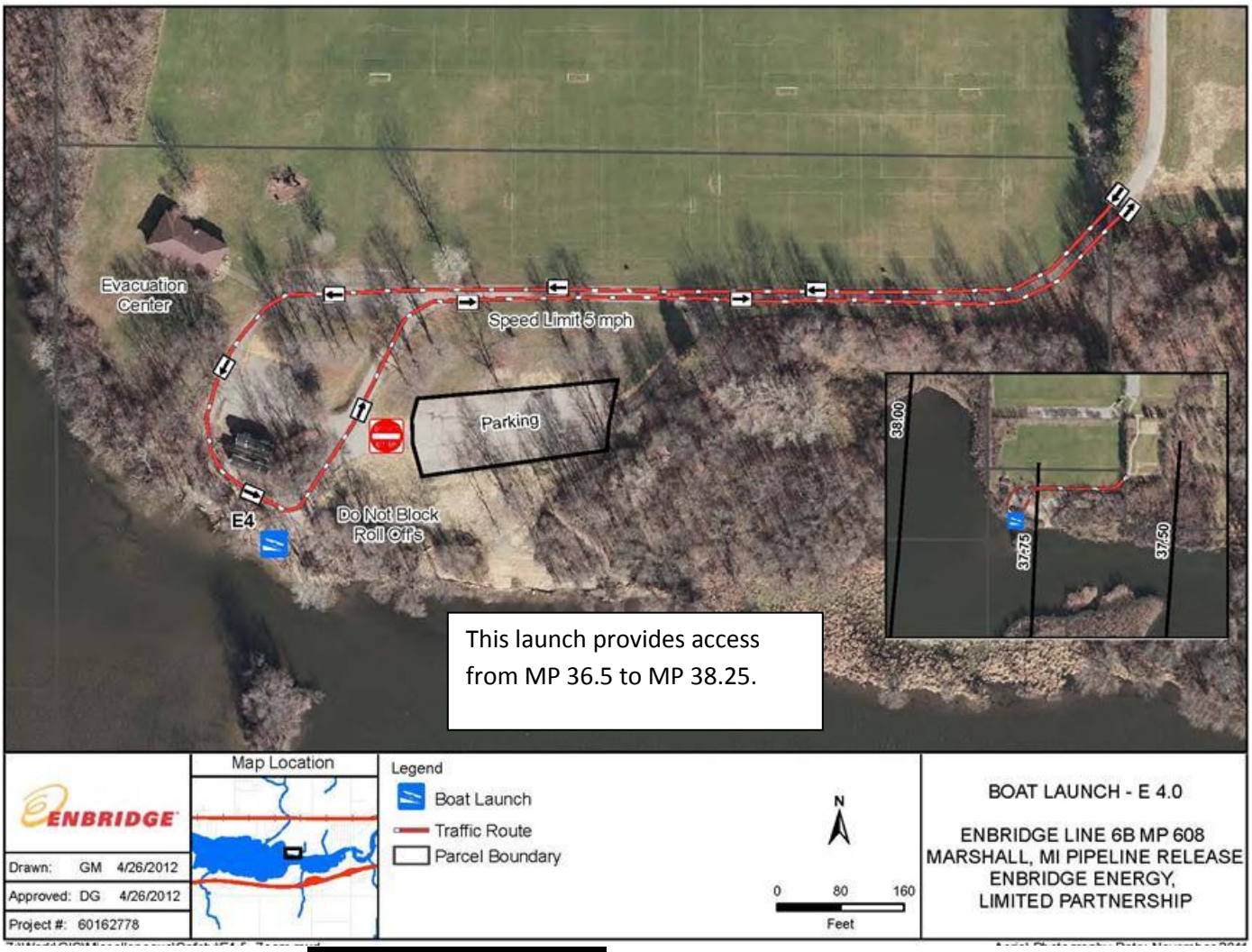
TRAFFIC PLAN: E 3



[redacted] Galesburg, MI 49053

GPS Coordinates: Lat: 42.284663 Long: -85.412855

TRAFFIC PLAN: E 4



[redacted] Galesburg, MI 49053

GPS Coordinates: Lat: 42.278265 Long: -85.452295

MEDICAL PLAN

Transportation								
Ambulance Services								
Name	Address			Phone			Paramedics Yes	No
Lifecare Ambulance	330 West Hamblin Avenue, Battle Creek, MI 49015			9-1-1			X	
City of Marshall Fire Dept	323 West Michigan Avenue, Marshall, MI 49068			9-1-1			X	
Hospitals								
Name	Address	Travel Time Air	Ground	Phone	Helipad Yes	No	Burn Center Yes	No
Bronson Methodist Hospital	601 John Street Kalamazoo, MI	15 Min	50 min	269-341-7654	X		X	
Borgess Medical Center	1521 Gull Road Kalamazoo, MI	15 min	50 min	269-226-7000	X			X
Oaklawn Hospital	200 N. Madison Ave Marshall, MI		5 min	269-781-4271		X		X
Battle Creek Health System	300 North Avenue Battle Creek, MI		20 min	269-966-8000		X		X

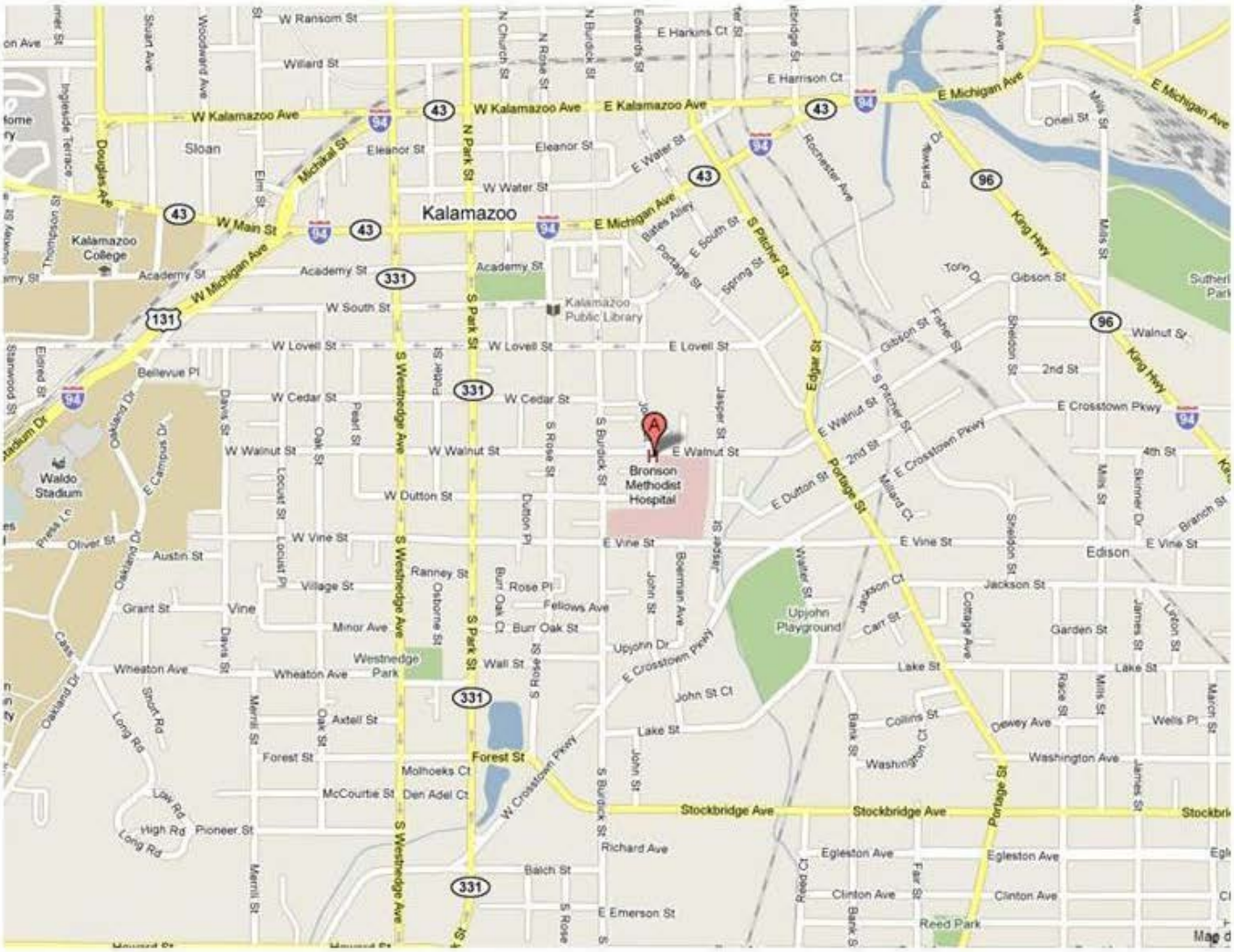
Medical Emergency Procedures

1. Dial 9-1-1 for all emergencies. Give 9-1-1 operators as much information as possible. Stay on the line and answer all questions – information may be radioed to responders. On-site personnel trained and certified in first aid should attempt to stabilize victim until fire department/EMS personnel arrive.
2. Report all incidents to the Project Safety Officer. Keep a log of events. Secure the area. Identify witnesses for later investigation.

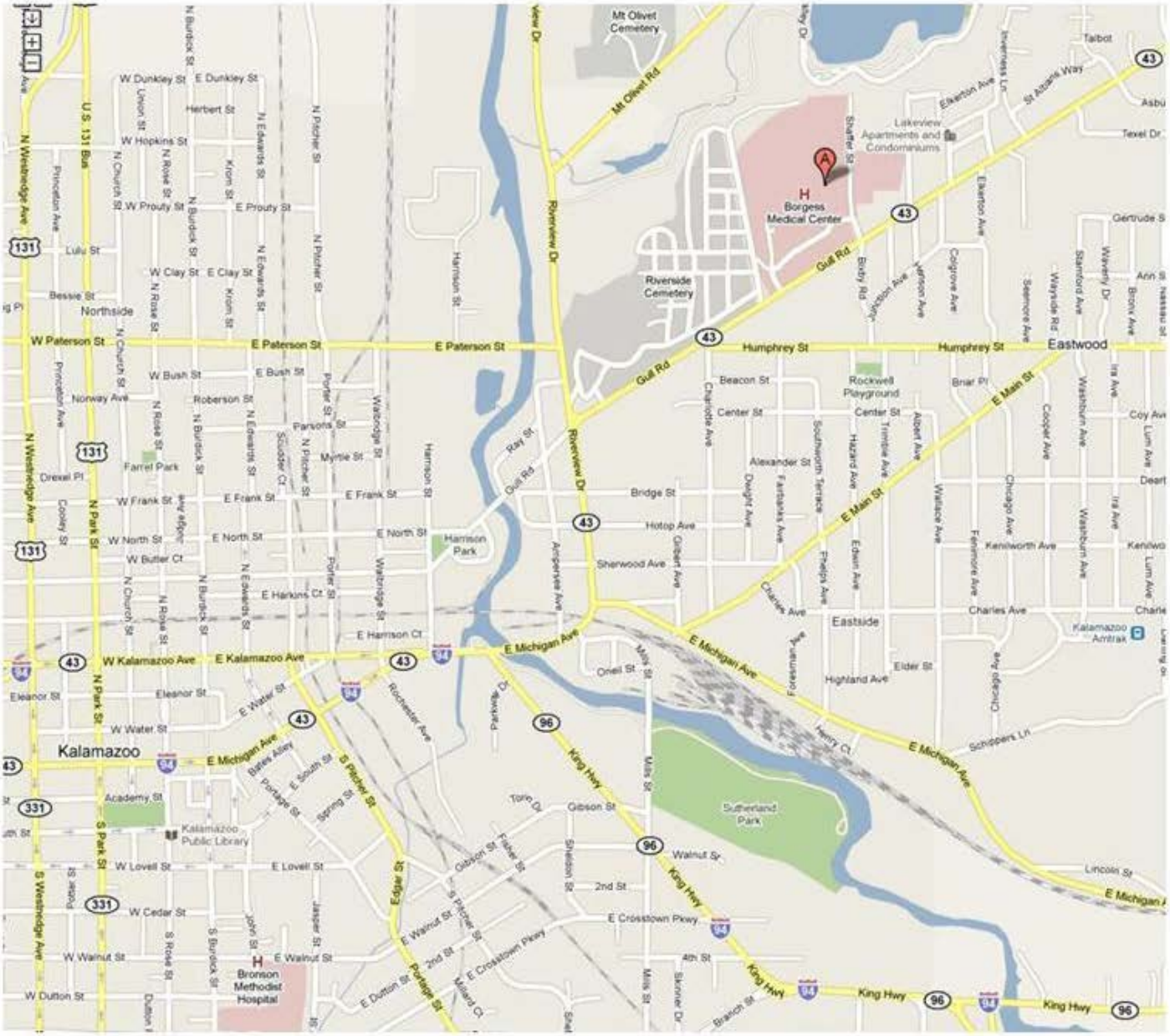
NOTE: Suspend all operations during an actual emergency situation!

Prepared by	Reviewed by (Safety Officer)
Dale Gross 10/31/2012	Dale Gross 10/31/2012

Hospital Route Map – Bronson Methodist Hospital – Kalamazoo, MI

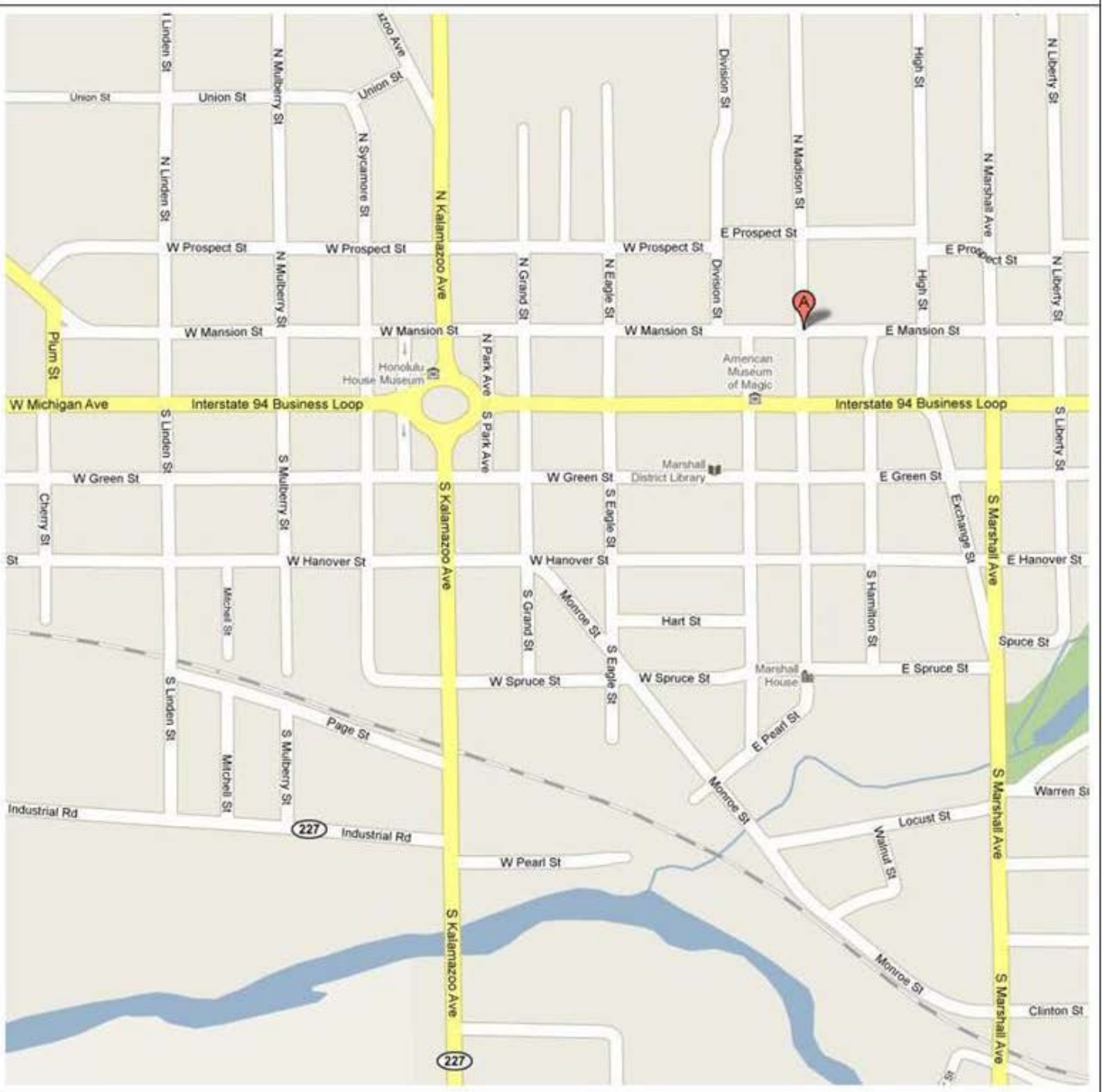

W Ransom St
Willard St
E Harkins Ct
E Harrison Ct
W Kalamazoo Ave
E Kalamazoo Ave
E Michigan Ave
Sloan
Eleanor St
W Water St
Kalamazoo
W Main St
Kalamazoo College
Academy St
W South St
Kalamazoo Public Library
W Lovell St
E Lovell St
Bellevue Pl
W Cedar St
W Walnut St
E Walnut St
Bronson Methodist Hospital
Waldo Stadium
W Dutton St
E Dutton St
W Vine St
E Vine St
Edison
Austin St
Grant St
Vine
Village St
Ranney St
Rose Pl
Fellows Ave
Minor Ave
Burr Oak St
Upjohn Dr
Upjohn Playground
Wheaton Ave
Westnedge Park
Wall St
John St Ct
Lake St
Axtell St
Forest St
Molhoeks Ct
McCourtie St
Den Adel Ct
W Crosstown Pkwy
Stockbridge Ave
Pioneer St
Richard Ave
Egleston Ave
Balch St
E Emerson St
Clinton Ave
Reed Park
Jackson St
Garden St
Collins St
Washington Ave
Dewey Ave
Wells Pl
Gibson St
Walnut St
2nd St
E Crosstown Pkwy
4th St
Branch St
Skinner Dr
Sheldon St
Mills St
Oneil St
Parkway Dr
Rochester Ave
Edgar St
S Pitcher St
Portage St
King Hwy
Michikal St
Douglas Ave
Ingleside Terrace
Woodward Ave
Stuart Ave
Elm St
Oakland Dr
E Campus Dr
Davis St
Pearl St
Oak St
Locust St
Locust Pl
Dutton Pl
Osborne St
Burr Oak Ct
Wall St
Merrill St
Stroft Rd
Long Rd
Law Rd
High Rd
Cass
Bates Alley
Spring St
Tom Ct
Shaw Ln
Millard Ct
Carr St
Cottage Ave
Lake St
Race St
Bank St
Reed Ct
Fair St
Lexington Ct
Wells St
March St
James St
Leon St
Skinner Dr
Branch St
Mag d
S Park St
S Westnedge Ave
S Burdick St
N Park St
N Church St
N Rose St
N Burdick St
Edwards St
Ridge St
Lake Ave
Ave
Academy St
Eleanor St
E Water St
E South St
Portage St
Spring St
Tom Ct
Gibson St
Walnut St
2nd St
E Crosstown Pkwy
4th St
Branch St
Skinner Dr
Sheldon St
Mills St
Oneil St
Parkway Dr
Rochester Ave
Edgar St
S Pitcher St
Portage St
King Hwy
Michikal St
Douglas Ave
Ingleside Terrace
Woodward Ave
Stuart Ave
Elm St
Oakland Dr
E Campus Dr
Davis St
Pearl St
Oak St
Locust St
Locust Pl
Dutton Pl
Osborne St
Burr Oak Ct
Wall St
Merrill St
Stroft Rd
Long Rd
Law Rd
High Rd
Cass
Bates Alley
Spring St
Tom Ct
Shaw Ln
Millard Ct
Carr St
Cottage Ave
Lake St
Race St
Bank St
Reed Ct
Fair St
Lexington Ct
Wells St
March St
James St
Leon St
Skinner Dr
Branch St

Hospital Route Map – Borgess Medical Center – Kalamazoo, MI



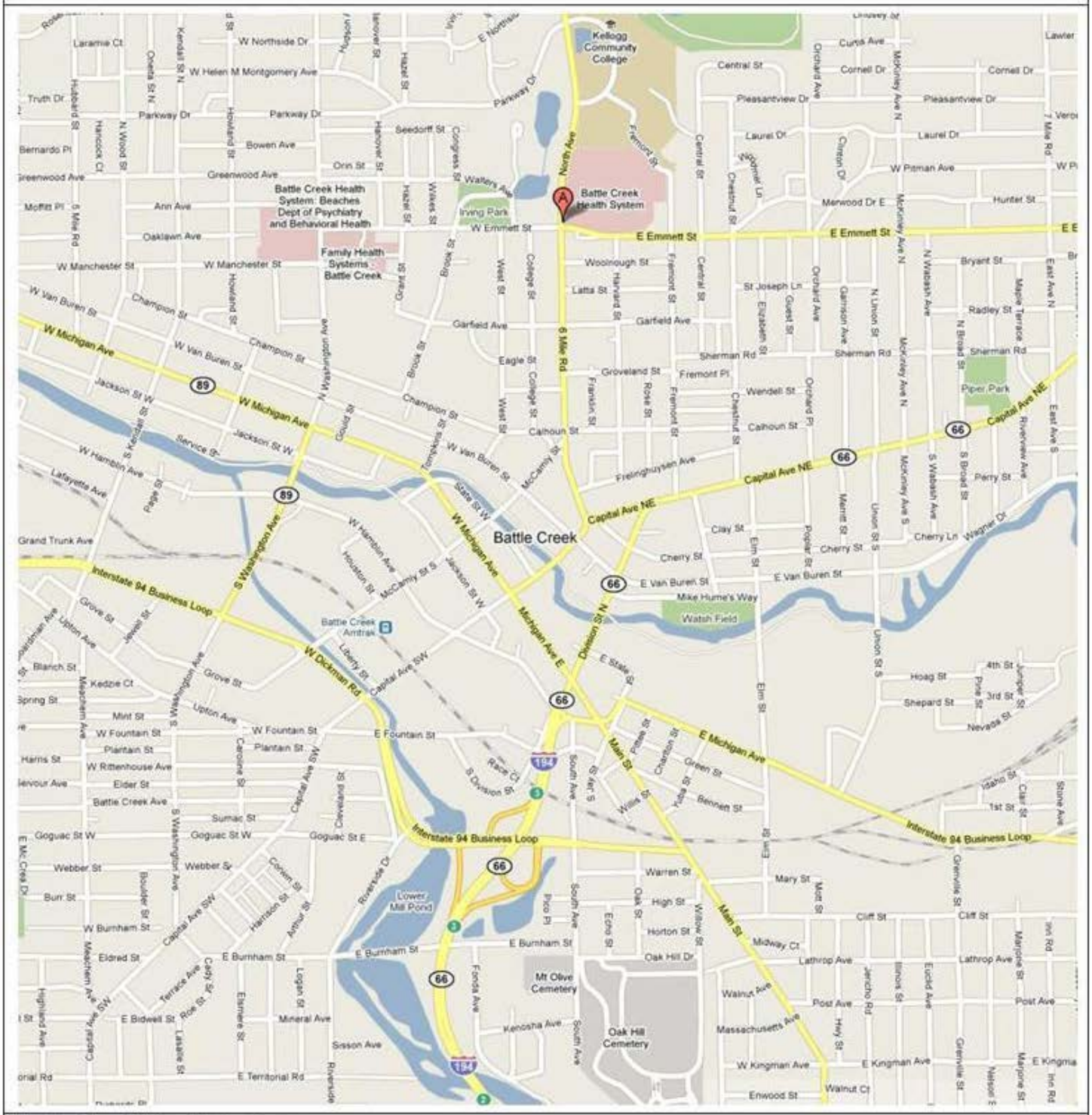
Borgess Medical Center
1521 Gull Road
Kalamazoo, MI 49048
(269) 226 - 7000

Hospital Route Map – Oaklawn Hospital – Marshall, MI



Oaklawn Hospital
200 North Madison St.
Marshall, MI
(269) 781-4271

Hospital Route Map – Battle Creek Health System – Battle Creek, MI



Battle Creek Health System
300 North Avenue
Battle Creek, MI
(269) 966-8000

PROJECT CALENDAR

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
11/4	**11/5** 0700 IAP Brief to field (11/5-11/27)	**11/6**	**11/7** 1500 Ops Brief	**11/8** 1100-1300 Forensic Chem 1400 Kzoo River	**11/9**	**11/10**
11/11	**11/12** 0900 Tactics	**11/13**	**11/14** 1500 Consolidated	**11/15** 0900 MAC Meeting 1100-1300 Forensic Chem 1400 Kzoo River	**11/16**	**11/17**
11/18	**11/19**	**11/20**	**11/21** Demob (travel day)	**11/22** Thanksgiving Day	**11/23**	**11/24**
11/25	**11/26** Remob (travel day)	11/27 0700 IAP Brief to field (11/27-12/10)	11/28 1500 Ops Brief	11/29 1100-1300 Forensic Chem 1400 Kzoo River	11/30	12/1

Color Code Key: ICS/Project Science Special RI Meetings Stand-down/holiday

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	ICS 204 - EPA
3. Branch Submerged Oil	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider	Enbridge	
	John Bohrmann, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	Matt Sumner	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Submerged Oil Science	Faith Fitzpatrick (Off-site) Ron Zelt (Off Site) Dave Dryburgh (AECOM/Enbridge)	[redacted]	1 Weston/ US EPA 8 Contractors
Submerged Oil Compliance	Mark Berninger (Cardno JFNEW/Enbridge)		

7. Work Assignments

Submerged Oil Science

1. Conduct bathymetry on the E4 Containment System. (1 Team)
2. Conduct phase I &II sediment trap sampling and bathymetry. (2 Teams)
3. Conduct Walling sediment sampling and structure removal. (1 Team)
4. SURVEY MONUMENTS AROUND THE E4 CONTAINMENT SYSTEM AND SEDIMENT TRAPS

For US EPA/MDEQ/Weston:

1. Oversee and document Submerged Oil Science work activities.

AMENDED 11/7/2012

Submerged Oil Compliance

1. Track previously submitted MDEQ permit applications for toolbox methods.

8. Special Instructions

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

SAFETY INSTRUCTIONS:

All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012 1255	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 1330

1. Incident Name	2. Operational Period (Date/Time)	INCIDENT OBJECTIVES
Kalamazoo River/Enbridge Spill	From: November 05, 2012 @ 0700 To: November 27, 2012 @ 0700	**ICS 202-EPA**

3. Incident Objective(s)

1. Ensure health and safety of the public and response and recovery personnel.
2. Ensure absolute containment of submerged oil and oil-containing sediments within the Delta and the Fan of Morrow Lake.
3. Ensure effective transition of regulatory oversight from EPA to Michigan DEQ jurisdiction as appropriate.
4. Perform recovery and containment of oil from affected public and private areas of river and river system.
5. Perform remediation and restoration of affected public and private areas of river and river system.
6. Maintain effective communications with cooperating and assisting agencies, the public, including regular coordination with the Multi-Agency Coordination Group (MAC).
7. Provide protection of environmentally and culturally sensitive areas including wildlife and historic properties.
8. Collect, coordinate, manage and communicate environmental and public health data including maintenance of Joint Information Center function.

4. Operational Period Command Emphasis

1. Respond to and document emerging oil throughout the Kalamazoo River system.
2. Implement path forward for submerged oil quantification cores.

3. IMPLEMENT SAFE AND EFFICIENT REMOVAL OF THE E4,0 CONTAINMENT SYSTEM. AMENDED 11/16/12

5. Safety Objectives for the Operational Period

1. Focus on safe completion of sediment sampling, sampling equipment removal and trap removal.
2. Ensure the safe interaction between workers and the public, including hunters.

6. Prepared by Planning Section Chief (Enbridge):	**Date/Time:**
Brad Nelson	11/2/2012 1300
7. Approved by Incident Commander (DEQ):	**Date/Time:**
Michelle DeLong Michelle DeLong	11/2/2012 1342
8. Approved by Incident Commander (US EPA):	**Date/Time:**
Ralph Dollhopf	11/2/2012 1350
10. Approved by Incident Commander (Enbridge):	**Date/Time:**
John Sobojinski	11/2/2012 1325

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	ICS 204 - EPA
3. Branch Containment	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider, DEPUTY	Enbridge	
	John Bohrmann, Deputy DAVE BAREHAM	Enbridge	
Branch Director:	Rex Johnson	Weston/US EPA	
	Dean Sahara AS OF 11/13/12	SWAT/Enbridge	
	Mike Wekseth, Deputy	SWAT/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Containment Compliance	Mike Zambetis (Cardno JFNEW/Enbridge)	[redacted]	
Containment Recovery	Susan Jones (MDEQ) Chris Lantinga (Weston/US EPA) Sonny Rutkowski (Weston/US EPA) Oliver Webb (SWAT/Enbridge)		1 Weston/US EPA 14 Contractors 6 ADDITIONAL CONTRACTORS FOR E4 REMOVAL

7. Work Assignments

Containment Compliance

1. Provide support as necessary.

Containment Recovery

1. Perform containment strategies along the Kalamazoo River including the following tasks: AMENDED 11/16/12
   a. Deploy and maintain shoreline containment boom as required.
   b. Complete sheen management as required.
2. Monitor and maintain the E4.0 containment system. IMPLEMENT REMOVAL OF E4.0 CONTAINMENT SYSTEM PER THE APPROVED REMOVAL PLAN
3. Maintain Kalamazoo River Sediment Traps, including the cylindrical sampling devices.

For US EPA/MDEQ/Weston: AMENDED 11/13/12

1. Oversee and document Containment Recovery activities.

All field and river activities except in Morrow Lake and Delta will be suspended on November 15th thru 18th to avoid possible hunter conflicts.

8. Special Instructions

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Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor. Only the Containment Recovery group will continue work activities during the Thanksgiving Break.

Rowe Island, MP 38.50-MP 38.75, is a No Go Zone – Environmental Sensitive Area.

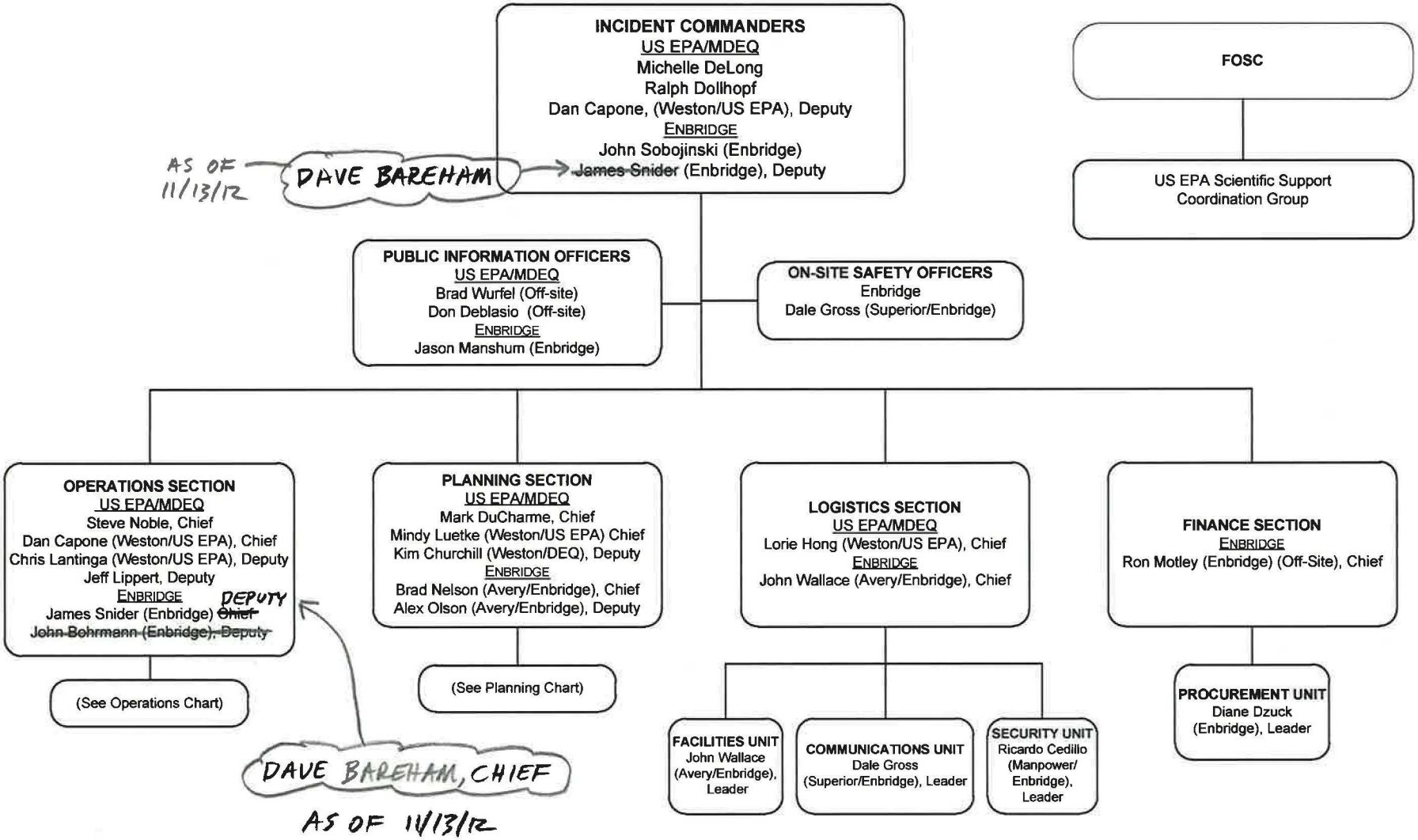
9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

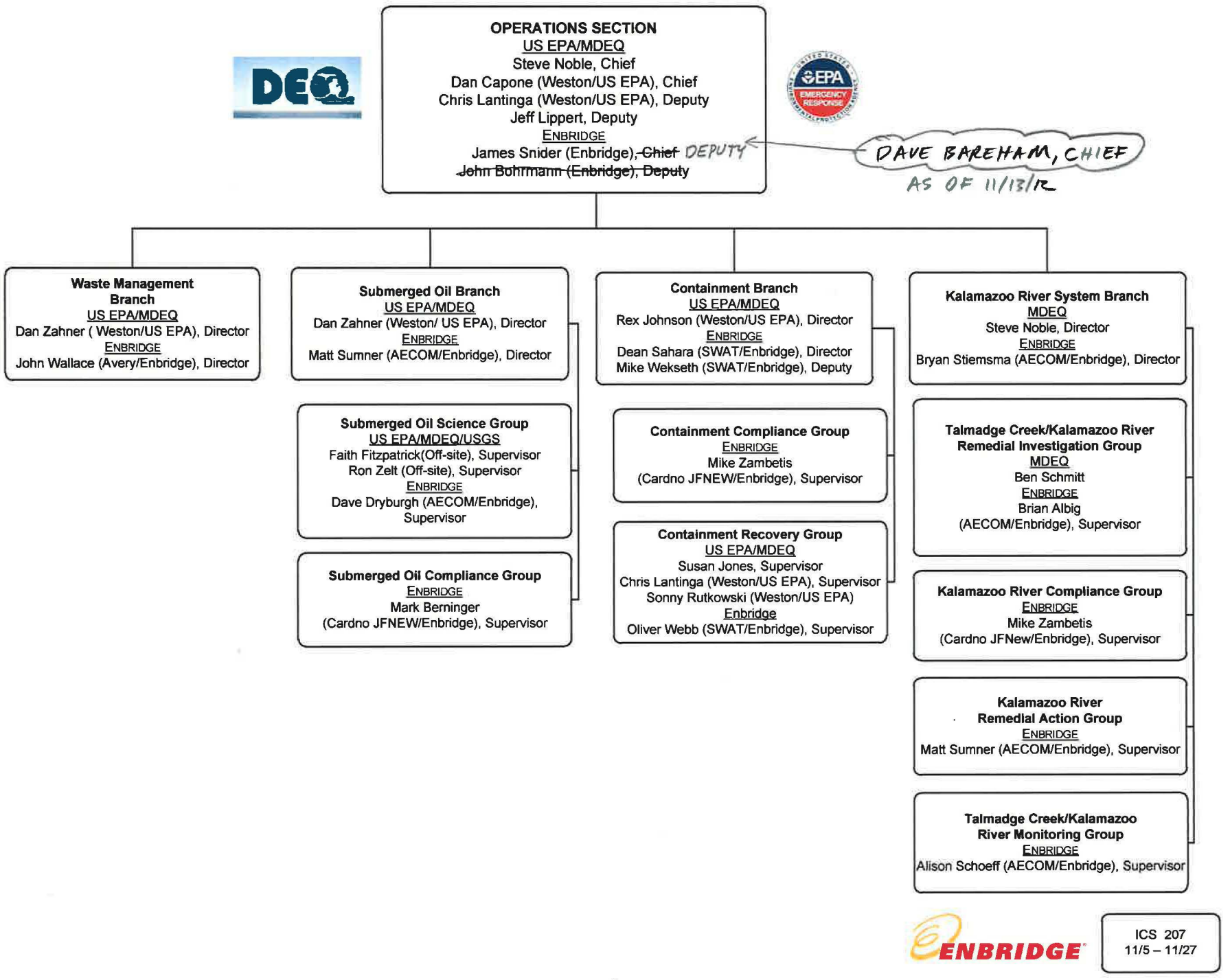
10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012 1755	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 1330

Enbridge Pipelines Response Unified Command



ENBRIDGE

ICS 207
11/5 – 11/27


OPERATIONS SECTION
US EPA/MDEQ
Steve Noble, Chief
Dan Capone (Weston/US EPA), Chief
Chris Lantinga (Weston/US EPA), Deputy
Jeff Lippert, Deputy
ENBRIDGE
James Snider (Enbridge), ~~Chief~~ DEPUTY
~~John Bohrmann (Enbridge), Deputy~~
DAVE BAREHAM, CHIEF
AS OF 11/13/12
Waste Management Branch
US EPA/MDEQ
Dan Zahner (Weston/US EPA), Director
ENBRIDGE
John Wallace (Avery/Enbridge), Director
Submerged Oil Branch
US EPA/MDEQ
Dan Zahner (Weston/ US EPA), Director
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Director
Submerged Oil Science Group
US EPA/MDEQ/USGS
Faith Fitzpatrick(Off-site), Supervisor
Ron Zelt (Off-site), Supervisor
ENBRIDGE
Dave Dryburgh (AECOM/Enbridge), Supervisor
Submerged Oil Compliance Group
ENBRIDGE
Mark Berninger
(Cardno JFNEW/Enbridge), Supervisor
Containment Branch
US EPA/MDEQ
Rex Johnson (Weston/US EPA), Director
ENBRIDGE
Dean Sahara (SWAT/Enbridge), Director
Mike Wekseth (SWAT/Enbridge), Deputy
Containment Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNEW/Enbridge), Supervisor
Containment Recovery Group
US EPA/MDEQ
Susan Jones, Supervisor
Chris Lantinga (Weston/US EPA), Supervisor
Sonny Rutkowski (Weston/US EPA)
Enbridge
Oliver Webb (SWAT/Enbridge), Supervisor
Kalamazoo River System Branch
MDEQ
Steve Noble, Director
ENBRIDGE
Bryan Stiemsma (AECOM/Enbridge), Director
Talmadge Creek/Kalamazoo River Remedial Investigation Group
MDEQ
Ben Schmitt
ENBRIDGE
Brian Albig
(AECOM/Enbridge), Supervisor
Kalamazoo River Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNew/Enbridge), Supervisor
Kalamazoo River Remedial Action Group
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Supervisor
Talmadge Creek/Kalamazoo River Monitoring Group
ENBRIDGE
Alison Schoeff (AECOM/Enbridge), Supervisor
ENBRIDGE
ICS 207
11/5 – 11/27

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	ICS 204- EPA
3. Branch Waste Management	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider, DEPUTY	Enbridge	
	~~John Bohrmann, Deputy~~ DAVE BAREHAM	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	John Wallace AS OF 11/13/12	Avery/Enbridge	

6. Resources Assigned

See Branch Directors			

7. Work Assignments

1. Field decon operations for: personnel, hand equipment, and boats for preparation of transport shall be installed prior to work beginning at boat launches / staging areas for individual work sites.
2. Haul contaminated soil, water, media and debris to staging areas for waste characterization and oil recovery sampling prior to offsite disposal.
3. Waste shall be collected as needed for direct haul to the landfill or transported to Frac Tank City (FTC) for consolidation with similar waste streams as necessary.
4. Waste management characterization, manifesting, and coordination of transportation and disposal.

For US EPA/MDEQ/Weston:

1. Provide oversight of all waste management activities.
2. Ensure appropriate sampling, tracking and disposal is performed on oil impacted debris, water and soil.
3. Review manifests, weight tickets and bills of lading for correlation to waste stream analytical data.
4. Review weekly oil recovery and waste disposal report.

8. Special Instructions

Ensure all Best Management Practices (BMPs) are in place and utilized.

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

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Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

All field and river activities except in Morrow Lake and Delta will be suspended on November 15th thru 18th to avoid possible hunter conflicts.

AMENDED 11/13/12

SAFETY INSTRUCTIONS:
For vacuum truck operation guidelines, please refer the HASP.

At Frac Tank City:

- The following procedure shall be used for initial opening of hatch or rear doors of liquid vacuum trucks and hatches of vacuum excavation units:
  - Approach the hatch to be opened with a calibrated five gas monitor and a benzene monitor.
  - Personnel performing this task must wear a full face respirator with organic vapor cartridge.
  - Slightly open the hatch and take VOC, H2S, LEL, Oxygen, CO and benzene readings.
  - If readings are greater than 10 ppm H2S, 10% LEL, 25 ppm CO or 25 ppm benzene then personnel shall close the hatch and utilize SCBA prior to opening the hatch.
- Operations - Respiratory protection may be required depending on periodic monitoring results. Wear a half-mask respirator equipped with an organic vapor cartridge when 0.5 ppm benzene is detected. Wear a full-face respirator equipped with an organic vapor/acid gas cartridge when benzene is at 5 ppm to 25 ppm.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012 1255	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 13.30

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	ICS 204 - EPA
3. Branch Submerged Oil	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider, DEPUTY	Enbridge	
	John Bohrmann, Deputy DAVE BARENAM AS OF 11/13/12	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	Matt Sumner	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Submerged Oil Science	Faith Fitzpatrick (Off-site) Ron Zelt (Off Site) Dave Dryburgh (AECOM/Enbridge)	[redacted]	1 Weston/ US EPA 8 Contractors
Submerged Oil Compliance	Mark Berninger (Cardno JFNEW/Enbridge)		

7. Work Assignments

Submerged Oil Science

1. Conduct bathymetry on the E4 Containment System. (1 Team)
2. Conduct phase I &II sediment trap sampling and bathymetry. (2 Teams)
3. Conduct Walling sediment sampling and structure removal. (1 Team)
4. SURVEY MONUMENTS AROUND THE E4 CONTAINMENT SYSTEM AND SEDIMENT TRAPS

For US EPA/MDEQ/Weston:

1. Oversee and document Submerged Oil Science work activities.

AMENDED 11/7/2012

Submerged Oil Compliance

1. Track previously submitted MDEQ permit applications for toolbox methods.

8. Special Instructions

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

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SAFETY INSTRUCTIONS: AMENDED 11/13/12.

All field and river activities except in Morrow Lake and Delta will be suspended on November 15th thru 18th to avoid possible hunter conflicts.

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9. Communications (radio and/or phone contact numbers needed for this assignment)

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A. Olson, Avery/Enbridge	11/2/2012 1255	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 1330

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	ICS 204 - EPA
3. Branch Containment	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider, DEPUTY	Enbridge	
	John Bohrmann, Deputy DAVE BARCHAM	Enbridge	
Branch Director:	Rex Johnson	Weston/US EPA	
	Dean Sahara AS OF 11/13/12	SWAT/Enbridge	
	Mike Wekseth, Deputy	SWAT/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Containment Compliance	Mike Zambetis (Cardno JFNEW/Enbridge)	[redacted]	
Containment Recovery	Susan Jones (MDEQ) Chris Lantinga (Weston/US EPA) Sonny Rutkowski (Weston/US EPA) Oliver Webb (SWAT/Enbridge)		1 Weston/US EPA 14 Contractors

7. Work Assignments

Containment Compliance

1. Provide support as necessary.

Containment Recovery

1. Perform containment strategies along the Kalamazoo River including the following tasks:
   a. Deploy and maintain shoreline containment boom as required.
   b. Complete sheen management as required.
2. Monitor and maintain the E4.0 containment system.
3. Maintain Kalamazoo River Sediment Traps, including the cylindrical sampling devices.

AMENDED 11/13/12

All field and river activities except in Morrow Lake and Delta will be suspended on November 15th thru 18th to avoid possible hunter conflicts.

For US EPA/MDEQ/Weston:

1. Oversee and document Containment Recovery activities.

8. Special Instructions

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

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Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

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A. Olson, Avery/Enbridge	11/2/2012 1255	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 1330

1. Incident Name	2. Operational Period (Date/Time)	Assignment List ICS 204 - EPA
Kalamazoo River/Enbridge Spill Response	From: November 05, 2012, 0700 To: November 26, 2012, 0700	
3. Branch **Kalamazoo River System Branch**	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	James Snider, DEPUTY	Enbridge	
	John Bohrmann, Deputy DAVE BAREHAM	Enbridge	
Branch Director:	Steve Noble	MDEQ	
	Bryan Stiemsma AS OF 11/13/12	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Talmadge Creek/Kalamazoo River Remedial Investigation	Ben Schmitt (MDEQ) Brian Albig (AECOM/Enbridge)	[redacted]	6 Contractors
Kalamazoo River Compliance	Mike Zambetis (JFNew/Enbridge)		
Talmadge Creek/Kalamazoo River Remedial Action	Matt Sumner (AECOM/Enbridge)		
Talmadge Creek/Kalamazoo River Monitoring	Alison Schoeff (AECOM/Enbridge)		3 Contractors

7. Work Assignments

Talmadge Creek/Kalamazoo River Remedial Investigation

1. Continue Kalamazoo River remedial investigation field work. (1 Team)

For DEQ:

1. Observe and document RI activities with emphasis on conformance with approved work plans and standard operating procedures.
2. Collect RI split samples at approved frequency for soil, sediment and groundwater.

Kalamazoo River Compliance

1. Provide support as necessary.

Talmadge Creek/Kalamazoo River Remedial Action

1. Execute tasks assigned by ERO as requested.

Talmadge Creek/Kalamazoo River Monitoring

1. Conduct daily monitoring of river conditions.
2. Conduct weekly monitoring of buoys and signage in the river.
3. Conduct monthly surface water monitoring at 18 locations along the Kalamazoo River and Morrow Lake.

AMENDED 11/13/12

All field and river activities except in Morrow Lake and Delta will be suspended on November 15th thru 18th to avoid possible hunter conflicts.

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SAFETY INSTRUCTIONS:

When operating or working in the vicinity of ultra violet testing equipment, wear approved safety glasses that provide protection from UV A rays and never look directly into the illuminator.

All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

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10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012 1255	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 1433 0

Environmental Unit:

1. Conduct strategic assessment, modeling, and environmental monitoring.
2. Review sheen tracking information from the field.
3. Continue submerged oil quantification for Spring 2012 with emphasis on implementing the path forward for submerged oil quantification cores.
4. Refine subsurface containment strategies throughout the Kalamazoo River system to prevent recontamination of the Morrow Lake fan.
5. Review and track RI progress.
6. Continue discussions on NAPL.
7. Review of property parcels for MDEQ end points.

For US EPA/MDEQ/Weston:

1. Continue to coordinate efforts to calculate the quantity of submerged oil remaining as of Spring 2012.
2. Continue supporting the evaluation of the hydrogeomorphology of the Kalamazoo River, the Morrow Lake Delta, and Morrow Lake.
3. Interface with Enbridge and assist with the refinement of surface and subsurface containment strategies throughout the Kalamazoo River system to prevent the continued migration of oil, oil sheen, submerged oil, and oil-containing sediments into Morrow Lake.
4. Review and comment on RI progress submittals
5. Support development of NAPL CSM.
6. Review Enbridge submittals with emphasis on compliance with state endpoints.

Documentation Unit:

1. Maintain accurate, up-to-date incident files.
2. Store files for post-incident use.

8. Special Instructions

November 15th marks the start of regular firearm use in the State of Michigan for deer. Do not work alone. Wear high visibility PPE at all times (hard hat covers, safety vests, etc.). If you feel threatened by any hunting activites, leave the area, call 911 and report the incident to the Enbridge Safety Office . (269) - 753- 9347

Thanksgiving Break stand down will begin on Sunday, November 20th. Report back to work at 0700 on Tuesday, November 27th or as directed by your supervisor.

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

AMENDED 11/13/12

SAFETY INSTRUCTIONS: All field and river activities except in Morrow Lake and Delta will be suspended on November 15th thru 18th to avoid possible hunter conflicts.

Hexane is flammable and may be harmful in contact with skin. When handling hexane and sheen test samples containing hexane, wear approved safety glasses, disposable nitrile gloves and keep away from ignition sources. Properly dispose of sheen test samples containing hexane.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/2/2012 1255	B. Nelson, Avery/Enbridge	11/2/2012 1300	J. Snider, Enbridge	11/2/2012 1330

1. Incident Name	2. Operational Period (Date/Time)	IAP
Kalamazoo River/Enbridge Spill	Starting: **November 27, 2012, 0700** End: **December 10, 2012, 0700**	**Cover Sheet**

3. Approved by Incident Commander(s):

M. DeLong Michelle DeLong, Michigan Department Environmental Quality

for Ralph Dollhopf, U.S. EPA

John Sobojinski, Enbridge

INCIDENT ACTION PLAN

The items below are included in this Incident Action Plan:

- ICS 202 (Response Objectives) 1
- ICS 207 (Organizational Chart & OPS Chart) 2
- ICS 204 (Assignment List) 5
- Communications List 11
- Project Schedule 13
- Meeting Locations and Traffic Plans 14
- Medical Plan and hospital maps 23
- Meetings Schedule 28



4. Prepared By:	Date/Time
Brad Nelson, Avery/Enbridge	11/16/2012

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1. Incident Name	2. Operational Period (Date/Time)	INCIDENT OBJECTIVES
Kalamazoo River/Enbridge Spill	From: November 27, 2012 @ 0700 To: December 10, 2012 @ 0700	**ICS 202-EPA**

3. Incident Objective(s)

1. Ensure health and safety of the public and response and recovery personnel.
2. Ensure absolute containment of submerged oil and oil-containing sediments within the Delta and the Fan of Morrow Lake.
3. Ensure effective transition of regulatory oversight from EPA to Michigan DEQ jurisdiction as appropriate.
4. Perform recovery and containment of oil from affected public and private areas of river and river system.
5. Perform remediation and restoration of affected public and private areas of river and river system.
6. Maintain effective communications with cooperating and assisting agencies, the public, including regular coordination with the Multi-Agency Coordination Group (MAC).
7. Provide protection of environmentally and culturally sensitive areas including wildlife and historic properties.
8. Collect, coordinate, manage and communicate environmental and public health data including maintenance of Joint Information Center function.

4. Operational Period Command Emphasis

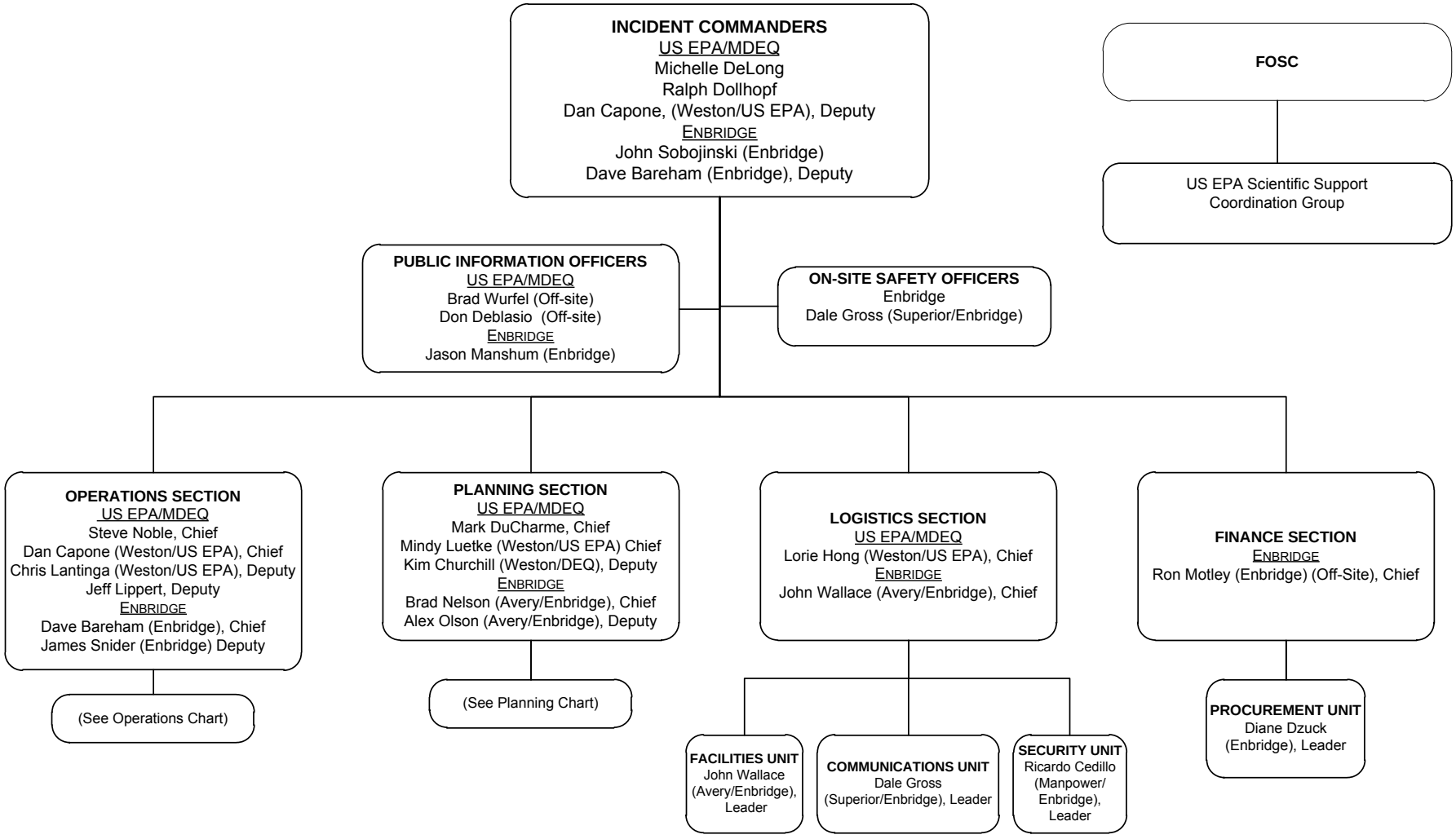
1. Respond to and document emerging oil throughout the Kalamazoo River system.
2. Implement path forward for submerged oil quantification cores.
3. Complete safe and efficient removal of the E4.0 containment system.

5. Safety Objectives for the Operational Period

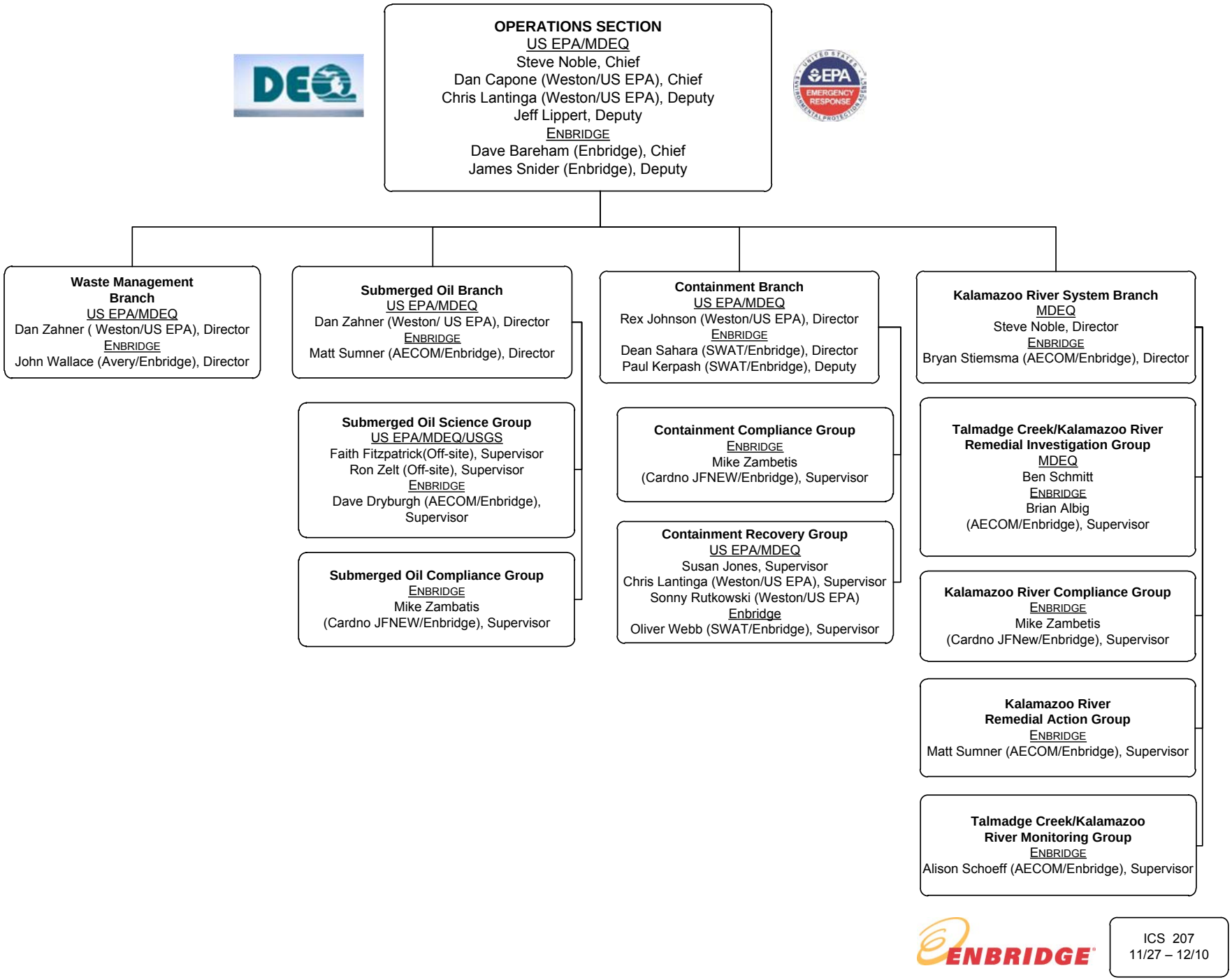
1. Focus on travel hazards as temperatures decrease.
2. Ensure the safe interaction between workers and the public, including hunters.

6. Prepared by Planning Section Chief (Enbridge):	**Date/Time:**	
Brad Nelson	11/16/2012	1145
7. Approved by Incident Commander (DEQ):	**Date/Time:**	
Michelle DeLong Michelle DeLong	11/16/2012	1416
8. Approved by Incident Commander (US EPA):	**Date/Time:**	
Ralph Dollhopf for Ralph Dollhopf	11/16/2012	1414
10. Approved by Incident Commander (Enbridge):	**Date/Time:**	
John Sobojinski	11/16/2012	1350

Enbridge Pipelines Response Unified Command



ICS 207
11/27 – 12/10


OPERATIONS SECTION
US EPA/MDEQ
Steve Noble, Chief
Dan Capone (Weston/US EPA), Chief
Chris Lantinga (Weston/US EPA), Deputy
Jeff Lippert, Deputy
ENBRIDGE
Dave Bareham (Enbridge), Chief
James Snider (Enbridge), Deputy
Waste Management Branch
US EPA/MDEQ
Dan Zahner (Weston/US EPA), Director
ENBRIDGE
John Wallace (Avery/Enbridge), Director
Submerged Oil Branch
US EPA/MDEQ
Dan Zahner (Weston/ US EPA), Director
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Director
Submerged Oil Science Group
US EPA/MDEQ/USGS
Faith Fitzpatrick(Off-site), Supervisor
Ron Zelt (Off-site), Supervisor
ENBRIDGE
Dave Dryburgh (AECOM/Enbridge), Supervisor
Submerged Oil Compliance Group
ENBRIDGE
Mike Zambatis
(Cardno JFNEW/Enbridge), Supervisor
Containment Branch
US EPA/MDEQ
Rex Johnson (Weston/US EPA), Director
ENBRIDGE
Dean Sahara (SWAT/Enbridge), Director
Paul Kerpash (SWAT/Enbridge), Deputy
Containment Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNEW/Enbridge), Supervisor
Containment Recovery Group
US EPA/MDEQ
Susan Jones, Supervisor
Chris Lantinga (Weston/US EPA), Supervisor
Sonny Rutkowski (Weston/US EPA)
Enbridge
Oliver Webb (SWAT/Enbridge), Supervisor
Kalamazoo River System Branch
MDEQ
Steve Noble, Director
ENBRIDGE
Bryan Stiemsma (AECOM/Enbridge), Director
Talmadge Creek/Kalamazoo River Remedial Investigation Group
MDEQ
Ben Schmitt
ENBRIDGE
Brian Albig
(AECOM/Enbridge), Supervisor
Kalamazoo River Compliance Group
ENBRIDGE
Mike Zambetis
(Cardno JFNew/Enbridge), Supervisor
Kalamazoo River Remedial Action Group
ENBRIDGE
Matt Sumner (AECOM/Enbridge), Supervisor
Talmadge Creek/Kalamazoo River Monitoring Group
ENBRIDGE
Alison Schoeff (AECOM/Enbridge), Supervisor
ENBRIDGE
ICS 207
11/27 – 12/10



PLANNING SECTION
US EPA/MDEQ
Mark DuCharme, Chief
Kim Churchill, Deputy
Mindy Luetke (Weston/US EPA), Chief
ENBRIDGE
Brad Nelson (Avery/Enbridge), Chief
Alex Olson (Avery/Enbridge), Deputy



SITUATION UNIT
US EPA/MDEQ
Matt Haak (Weston/ US EPA), Leader
Larry Rader (weston/US EPA), Leader
ENBRIDGE
Alex Olson (Avery/Enbridge), Leader

RESOURCE UNIT
US EPA/MDEQ
Lorie Hong (Weston/US EPA), Leader
ENBRIDGE
Alex Olson (Avery/Enbridge), Leader

ENVIRONMENTAL UNIT
US EPA/MDEQ/USGS
Mike Alexander (Off-site)
Kim Churchill (Weston/DEQ), Leader
Isaac Aboulafia (Weston/US EPA)(Off-site), Leader
Elizabeth Wessling (Weston/US EPA)(Off-site), Leader
Faith Fitzpatrick (USGS)(Off-site), Leader
Ron Zelt (USGS)(Off-site), Assistant
Rex Johnson (Weston/US EPA), Assistant
Tom Graan (Weston/US EPA), Assistant
ENBRIDGE
John Bohrmann (Enbridge), Leader

DOCUMENTATION UNIT
US EPA/MDEQ
Crystal Laskey, Leader
Carolyn Giles-Smith (Weston/DEQ), Leader
Paul Moison (Weston/US EPA), Leader
ENBRIDGE
Brad Nelson (Avery/Enbridge), Leader



1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 27, 2012, 0700 To: December 10, 2012, 0700	ICS 204- EPA
3. Branch Waste Management	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	Dave Bareham	Enbridge	
	James Snider, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	John Wallace	Avery/Enbridge	

6. Resources Assigned

See Branch Directors			

7. Work Assignments

1. Field decon operations for: personnel, hand equipment, and boats for preparation of transport shall be installed prior to work beginning at boat launches / staging areas for individual work sites.
2. Haul contaminated soil, water, media and debris to staging areas for waste characterization and oil recovery sampling prior to offsite disposal.
3. Waste shall be collected as needed for direct haul to the landfill or transported to Frac Tank City (FTC) for consolidation with similar waste streams as necessary.
4. Waste management characterization, manifesting, and coordination of transportation and disposal.

For US EPA/MDEQ/Weston:

1. Provide oversight of all waste management activities.
2. Ensure appropriate sampling, tracking and disposal is performed on oil impacted debris, water and soil.
3. Review manifests, weight tickets and bills of lading for correlation to waste stream analytical data.
4. Review weekly oil recovery and waste disposal report.

8. Special Instructions

Ensure all Best Management Practices (BMPs) are in place and utilized.

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

SAFETY INSTRUCTIONS:

For vacuum truck operation guidelines, please refer the HASP.

At Frac Tank City:

- The following procedure shall be used for initial opening of hatch or rear doors of liquid vacuum trucks and hatches of vacuum excavation units:
  - Approach the hatch to be opened with a calibrated five gas monitor and a benzene monitor.
  - Personnel performing this task must wear a full face respirator with organic vapor cartridge.
  - Slightly open the hatch and take VOC, H2S, LEL, Oxygen, CO and benzene readings.
  - If readings are greater than 10 ppm H2S, 10% LEL, 25 ppm CO or 25 ppm benzene then personnel shall close the hatch and utilize SCBA prior to opening the hatch.
- Operations - Respiratory protection may be required depending on periodic monitoring results. Wear a half-mask respirator equipped with an organic vapor cartridge when 0.5 ppm benzene is detected. Wear a full-face respirator equipped with an organic vapor/acid gas cartridge when benzene is at 5 ppm to 25 ppm.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/16/2012 1130	B. Nelson, Avery/Enbridge	11/16/2012 1145	D. Bareham, Enbridge	11/16/2012 1230

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 27, 2012, 0700 To: December 10, 2012, 0700	ICS 204 - EPA
3. Branch Submerged Oil	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	Dave Bareham	Enbridge	
	James Snider, Deputy	Enbridge	
Branch Director:	Dan Zahner	Weston/US EPA	
	Matt Sumner	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Submerged Oil Science	Faith Fitzpatrick (Off-site) Ron Zelt (Off Site) Dave Dryburgh (AECOM/Enbridge)	[redacted]	2 Weston/ US EPA 12 Contractors
Submerged Oil Compliance	Mike Zambatis (Cardno JFNEW/Enbridge)		

7. Work Assignments

Submerged Oil Science

1. Conduct bathymetry on the E4 Containment System. (1-2 Team)
2. Conduct phase I &II sediment trap sampling and bathymetry. (1-2 Team)
3. Survey monuments around the E4 containment system and sediment traps. (1 Team)
4. Complete core logging activities on the remaining quantification of oil cores (1 Team)

For US EPA/MDEQ/Weston:

1. Oversee and document Submerged Oil Science work activities.

Submerged Oil Compliance

1. Track previously submitted MDEQ permit applications for toolbox methods.

8. Special Instructions

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

SAFETY INSTRUCTIONS:

All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/16/2012 1130	B. Nelson, Avery/Enbridge	11/16/2012 1145	D. Bareham, Enbridge	11/16/2012 1230

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 27, 2012, 0700 To: December 10, 2012, 0700	ICS 204 - EPA
3. Branch Containment	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	Dave Bareham	Enbridge	
	James Snider, Deputy	Enbridge	
Branch Director:	Rex Johnson	Weston/US EPA	
	Dean Sahara	SWAT/Enbridge	
	Paul Kerpash, Deputy	SWAT/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Containment Compliance	Mike Zambetis (Cardno JFNEW/Enbridge)	[redacted]	
Containment Recovery	Susan Jones (MDEQ) Chris Lantinga (Weston/US EPA) Sonny Rutkowski (Weston/US EPA) Oliver Webb (SWAT/Enbridge)		1 Weston/US EPA 20 Contractors

7. Work Assignments

Containment Compliance

1. Provide support as necessary.

Containment Recovery

1. Perform containment strategies along the Kalamazoo River including the following tasks:
   a. Deploy and maintain shoreline containment boom as required.
   b. Complete sheen management as required.
2. Complete removal of E4.0 containment system per the Approved Removal Plan.
3. Maintain Kalamazoo River Sediment Traps, including any cylindrical sampling devices.

For US EPA/MDEQ/Weston:

1. Oversee and document Containment Recovery activities.

8. Special Instructions

Rowe Island, MP 38.50-MP 38.75, is a No Go Zone – Environmental Sensitive Area.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/16/2012 1130	B. Nelson, Avery/Enbridge	11/16/2012 1145	D. Bareham, Enbridge	11/16/2012 1230

1. Incident Name	2. Operational Period (Date/Time)	Assignment List ICS 204 - EPA
Kalamazoo River/Enbridge Spill Response	From: November 27, 2012, 0700 To: December 10, 2012, 0700	
3. Branch **Kalamazoo River System Branch**	4. Division/Group/Staging	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Operations Section Chief:	Steve Noble	MDEQ	[redacted]
	Dan Capone	Weston/US EPA	
	Chris Lantinga, Deputy	Weston/US EPA	
	Jeff Lippert, Deputy	EPA	
	Dave Bareham	Enbridge	
	James Snider, Deputy	Enbridge	
Branch Director:	Steve Noble	MDEQ	
	Bryan Stiemsma	AECOM/Enbridge	

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Talmadge Creek/Kalamazoo River Remedial Investigation	Ben Schmitt (MDEQ) Brian Albig (AECOM/Enbridge)	[redacted]	6 Contractors
Kalamazoo River Compliance	Mike Zambetis (JFNew/Enbridge)		
Talmadge Creek/Kalamazoo River Remedial Action	Matt Sumner (AECOM/Enbridge)		
Talmadge Creek/Kalamazoo River Monitoring	Alison Schoeff (AECOM/Enbridge)		1 Contractor

7. Work Assignments

Talmadge Creek/Kalamazoo River Remedial Investigation

1. Continue Kalamazoo River remedial investigation field work. (1 Team)

For DEQ:

1. Observe and document RI activities with emphasis on conformance with approved work plans and standard operating procedures.
2. Collect RI split samples at approved frequency for soil, sediment and groundwater.

Kalamazoo River Compliance

1. Provide support as necessary.
2. Conduct decommissioning activities as needed.

Talmadge Creek/Kalamazoo River Remedial Action

1. Execute tasks assigned by ERO as requested.

Talmadge Creek/Kalamazoo River Monitoring

1. Conduct daily monitoring of river conditions.
2. Conduct Quarterly and Semi Annual Drinking Water Sampling Event.

8. Special Instructions

Rowe Island, MP 38.50 to MP 38.75, is a No Go Zone – Environmental Sensitive Area.

SAFETY INSTRUCTIONS:
When operating or working in the vicinity of ultra violet testing equipment, wear approved safety glasses that provide protection from UV A rays and never look directly into the illuminator.
All in water activities of workers in water depths over fifty percent (50%) of thigh height will require tethering. Please refer to the HASP for further instructions.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/16/2012 1130	B. Nelson, Avery/Enbridge	11/16/2012 1145	D. Bareham, Enbridge	11/16/2012 1230

1. Incident Name	2. Operational Period (Date/Time)	Assignment List
Kalamazoo River/Enbridge Spill Response	From: November 27, 2012, 0700 To: December 10, 2012, 0700	**ICS 20**
3. Branch **Planning Section**	**4. Division/Group/Staging**	

5. Operations Personnel

	Name	Affiliation	Contact # (s)
Planning Section Chief:	Mark DuCharme Mindy Luetke Kim Churchill, Deputy Brad Nelson Alex Olson, Deputy	MDEQ Weston/US EPA Weston/ DEQ Avery/Enbridge Avery/Enbridge	[redacted]

6. Resources Assigned

Division Identifier	Leader	Contact Info. #	# of Persons
Situation Unit	Matt Haak (Weston/ US EPA) Larry Rader (Weston/ US EPA) Mark Fuller (AECOM/Enbridge)	[redacted]	1 Weston/EPA 1 Contractor
Resource Unit	Lorie Hong (Weston/US EPA) Alex Olson (Avery/Enbridge), Assistant		1 Contractor
Environmental Unit	Mike Alexander (Off-site) Kim Churchill (Weston/MDEQ) Isaac Aboulafia (Weston/US EPA) Elizabeth Wessling (Weston/US EPA)(Off-site) Faith Fitzpatrick (USGS) Ron Zelt (Off-site) (USGS), Assistant Rex Johnson (Weston/US EPA), Assistant Tom Graan (Weston/US EPA) , Assistant John Bohrmann (Enbridge)		1 Weston/MDEQ 2 MDEQ 2 Contractors
Documentation Unit	Crystal Laskey Carolyn Giles-Smith (Weston/MDEQ) Paul Moisan (Weston/US EPA)		1 Contractors

7. Work Assignments

Situation Unit:

1. Record and document sheen observations in main channel and overbank areas, and conduct sheen testing, if necessary. Report sheen observations back to operations section chiefs for monitoring and response.
2. Conduct weekly overflights; photo-document areas of sheen from source area to Morrow Lake dam and report observations back to operations section chiefs for monitoring and response. Additional flights will be scheduled as needed.
3. Organize field metrics, prepare for and facilitate presentations, and monitor action tracking. Maintain situational awareness around operational activities and plan for operational needs.

For US EPA/MDEQ/Weston:

1. Maintain situational awareness around operational activities.
2. Communicate observations to the Operations Section Chief.
3. Provide daily situational photo log summaries.
4. Conduct daily monitoring of river conditions, recording observations of sheen and/or oil.
5. Record and document sheen observations in main channel and overbank areas, and conduct sheen testing, if necessary. Report sheen observations back to operations section chiefs for monitoring and response.

Resource Unit:

1. Produce an Incident Action Plan as required by the Incident Commanders.
2. Support the planning efforts of operations and provide information to Logistics in order to properly prepare and order resources.

Environmental Unit:

1. Conduct strategic assessment, modeling, and environmental monitoring.
2. Review sheen tracking information from the field.
3. Continue submerged oil quantification for Spring 2012 with emphasis on implementing the path forward for submerged oil quantification cores.
4. Refine subsurface containment strategies throughout the Kalamazoo River system to prevent recontamination of the Morrow Lake fan.
5. Review and track RI progress.
6. Continue discussions on NAPL.
7. Review of property parcels for MDEQ end points.

For US EPA/MDEQ/Weston:

1. Continue to coordinate efforts to calculate the quantity of submerged oil remaining as of Spring 2012.
2. Continue supporting the evaluation of the hydrogeomorphology of the Kalamazoo River, the Morrow Lake Delta, and Morrow Lake.
3. Interface with Enbridge and assist with the refinement of surface and subsurface containment strategies throughout the Kalamazoo River system to prevent the continued migration of oil, oil sheen, submerged oil, and oil-containing sediments into Morrow Lake.
4. Review and comment on RI progress submittals
5. Support development of NAPL CSM.
6. Review Enbridge submittals with emphasis on compliance with state endpoints.

Documentation Unit:

1. Maintain accurate, up-to-date incident files.
2. Store files for post-incident use.

8. Special Instructions

In accordance with the Fatigue Management Plan, all work permit activities will be completed no later than 1900.

SAFETY INSTRUCTIONS:

Hexane is flammable and may be harmful in contact with skin. When handling hexane and sheen test samples containing hexane, wear approved safety glasses, disposable nitrile gloves and keep away from ignition sources. Properly dispose of sheen test samples containing hexane.

9. Communications (radio and/or phone contact numbers needed for this assignment)

Incident Command Safety Office: 269-753-9347

Emergency Communications: Use IAP Medical Plan/IAP Phone list. Dial 911 for Medical Emergency.

10. Prepared by	Date/Time	11. Reviewed by (PSC),	Date/Time	12. Reviewed by (OSC),	Date/Time
A. Olson, Avery/Enbridge	11/16/2012 1130	B. Nelson, Avery/Enbridge	11/16/2012 1145	D. Bareham, Enbridge	11/16/2012 1230

NAME	PHONE NUMBER	EMAIL ADDRESS	AGENCY / AFFILIATION	POSITION
Enbridge and Contractors				
Enbridge Marshall Office: 333 South Kalamazoo Ave Marshall MI 49068				
Adams, Rich	[redacted]		Enbridge	Operations
Albig, Brian			AECOM/Enbridge	Environment
Bareham, Dave			Enbridge	Environment
Bohrmann, John			Enbridge	Environment
Bretz, Ryan			Manpower/Enbridge	IT
Cox, Renee			Manpower/Enbridge	Documentation
Daniel, Pat			Enbridge	
Dekker, Shaun			SET/Enbridge	Waste Management
Dennis, Kate			Manpower/Enbridge	Admin Support
Doherty, Bob			Enbridge	Environment
Dryburgh, Dave			AECOM/Enbridge	Environment
Dzuck, Diane			Enbridge	Contracts
Eversole, Elijah			AECOM/Enbridge	Containment
Fuller, Mark			AECOM/Enbridge	Environment
Gross, Dale			Superior/Enbridge	Safety Officer
Hehir, Nate			Superior/Enbridge	Environment
Hummel, Rebecca			Manpower/Enbridge	Finance
Kaiser, Ken			AECOM/Enbridge	GIS Specialist
Kent, Norm			AECOM/Enbridge	Environment
Kerpash, Paul			SWAT/Enbridge	Control Point Management
Kogge, Stu			Cardno JFNEW/Enbridge	Operations
Manshum, Jason			Enbridge	Public Affairs
McKay, John			Enbridge	ROW
Nelson, Brad			Avery/Enbridge	Planning
Neumeier, Laura			Trimedia/Enbridge	Air Monitoring
Olson, Alex			Avery/Enbridge	Planning
Periard, Debora			AECOM/Enbridge	GIS Support
Pesses, David			LBG/Enbridge	Environmental Inspector
Powell, Meredith			Enbridge	Public & Govt. Affairs
Pratt, Catherine			AECOM/Enbridge	Environment
Sahara, Dean			SWAT/Enbridge	Operations
Saylor, Andy			SET/Enbridge	
Schoeff, Alison			AECOM/Enbridge	Water Monitoring Supervisor
Smith, Brian			Tulsa/ Enbridge	Project Controls
Snider, Jim			Enbridge	Environment Director
Sobojinski, John			Enbridge	Incident Commander
Standen, Joe			LBG/Enbridge	
Stiemsma, Bryan			AECOM/Enbridge	Environment Supervisor
Corrine Sullivan			Enbridge	ROW
Sumner, Matt			AECOM/Enbridge	Environment
Van Overmeiren, Rick			Enbridge	Purchasing
Wallace, John			Avery/Enbridge	Logistics / Facilities
Webb, Oliver			SWAT/Enbridge	Control Point Management
Wekseth, Mike			SWAT/Enbridge	Operations Inspector
Wiswell, Amber			Kelly Services/Enbridge	Admin. Assistant
Wolf, Mike			AECOM/Enbridge	Monitoring
Yokom, Brett			Trimedia/Enbridge	Environment
Zambetis, Mike			Cardno JFNEW/Enbridge	Restoration

AECOM Field Office
13464 Preston Drive
(Lower Level)
Marshall MI 49068

SWAT Field Office / Shop
12514 16 Mile Road
Marshall MI 49068

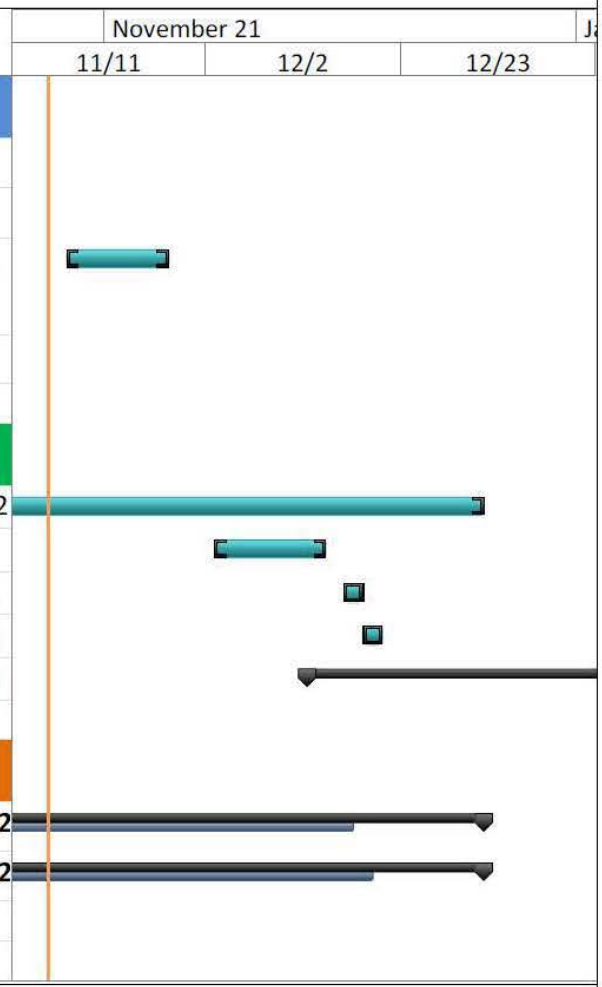
Superior Field Office
317 S Grand St
Marshall MI 49068

NAME	PHONE NUMBER	EMAIL ADDRESS	AGENCY / AFFILIATION	POSITION
Michigan DEQ and Contractors				
		Marshall MI 49068		
Alexander, Mike	[redacted]		DEQ	Environmental Unit
Brettmann, Gregg			DEQ	Environmental Unit Leader
Brown , Kevin			Weston/DEQ	GIS Support
Churchill, Kim			Weston/DEQ	Environmental Unit
DelloRusso, Vincent			Weston/DEQ	Operations
DeLong, Michelle			DEQ	Incident Commander
DuCharme, Mark			DEQ	Planning Section Chief
Fizzell, Chad			DEQ	GIS Support
Giles-Smith, Carolyn			Weston/DEQ	Documentation
Jones, Susan			DEQ	Operations
Laskey, Crystal			DEQ	Planning
Lisabeth, Nicole			MSP	PIO
Noble, Steve			DEQ	Water Resources Division
Sarkipato, Ernie			DEQ	Environmental Unit
Schmitt, Ben			DEQ	Operations
Spruit, Jeff			DEQ	Environment
Taft, Bill			DEQ	Wildlife Environmental NRDA Group
Thompson, Doug			DEQ	Operations
Wurfel, Brad			DEQ	Public Information
Zacharda, Nicole			DEQ	NRDA and Compliance
US Agencies and Contractors				
		EPA Field Office: 13444 Preston Drive Marshall MI 49068		
Aboulafia, Isaac	[redacted]		START/US EPA	Planning
Berecz, Karen			START/US EPA	O & M
Blanchard, Mark			START/US EPA	
Capone, Dan			START/US EPA	Operations
Deblasio, Don			US EPA	Public Information
Dollhopf, Ralph			US EPA	Incident Commander (FOSC)
Fitzpatrick, Faith			USGS	Tech Specialist
Good, Gena			START/US EPA	
Graan, Tom			START/US EPA	Submerged Oil Lead
Haak, Matt			START/US EPA	Sit Unit Leader
Hackley, Richard			US EPA	Finance
Hendrix, Kristen			START/US EPA	Operations
Hoard, Chris			USGS	USGS
Hong, Lorie			START/US EPA	Logistics
Johnson, Rex			START/US EPA	Operations
Kidder, Steven			START/US EPA	Operations SOS
Kirby-Miles, Leslie			US EPA	Legal
Lantinga, Chris			START/US EPA	Operations
Laquerre, Tim			START/US EPA	Operations
Luetke, Mindy			START/US EPA	PSC
Mehl, Rick			START/US EPA	
Moisan, Paul			START/US EPA	Documentation
Muccianti, Marcus			START/US EPA	Operationsp
Pierce, Brennan			START/US EPA	Documentation
Rader, Larry			START/US EPA	Sit Unit Leader
Ross, Shauna			START/US EPA	
Roubik, Jonathan			START/US EPA	Operations
Rutkowski, Sonny			START/US EPA	Technical Specialist
Thierry, Mike			START/US EPA	Operations
Torres, Jason			START/US EPA	GIS Specialist
Valenza, James			START/US EPA	GIS Specialist
Wahrer, Marc			START/US EPA	Operations
Wellman, John			START/US EPA	Operations
Wessling, Elizabeth			START/US EPA	PSC
Williams, Lisa			USFWS	
Zahner, Dan			START/US EPA	Operations
Zelt, Ron			USGS	Environmental Unit Leader Assistant
Local Agencies / MAC members				
Baker, Paul	[redacted]		Kalamazoo OEM	MAC
Cardiff, Deb			Kalamazoo County - Env Health	MAC
Corbin, Scott			Allegan County Emerg Mgmt	MAC
Dunham, Durk			Calhoun County EMA	MAC
Dykema, Linda			Mich Dept of Community Health	MAC
Frost, Joe			Calhoun County Health	MAC
Kosmowski, Christine			City of Battle Creek	MAC
Makoski, Paul			Calhoun County Health	MAC
McKenzie, Michael			Battle Creek Emer. Srvs.	MAC
Quiggle, Lisa			MDCH	MAC
Reber, Lt. Barry			MSP EMHSD	MAC
Rutherford, James			Calhoun County Health	MAC
Schneider, Dave			Kalamazoo County	MAC
Vail, Linda			Kalamazoo County Health	MAC
Vosburg, Cheryl			City of Marshall	MAC

Line 6B Remediation
Marshall Michigan

Project Schedule

ID	Task Name	Duration	Start	Finish
1	**RIVER ACTIVITIES**			
2	**Removal of all Buoys**		TBD	TBD
3	**Removal of the boom at Ceresco**		TBD	TBD
4	**Removal of the E4 Boom Configuration/Turbidity Mon.**	8 days	Sat 11/17/12	Tue 11/27/12
5	**Removal of CSDs**		TBD	TBD
6				
7	**OVERBANK ACTIVITIES**			
8	**Remedial Investigation (2013 work not shown)**	68 days	Thu 9/27/12	Mon 12/31/12
9	**Drinking Water Monitoring**	10 days	Mon 12/3/12	Fri 12/14/12
10	**HydroGeo 2 - August/Kzoo Muni Monitoring Wells**	2 days	Mon 12/17/12	Tue 12/18/12
11	**Sediment Monitoring (Qtrly)**	2 days	Wed 12/19/12	Thu 12/20/12
12	**Surface Water Monitoring (Monthly)**	**45 days**	**Thu 12/13/12**	**Wed 2/13/13**
16				
17	**OTHER ACTIVITIES**			
18	**Quantification of Oil**	**121 days**	**Mon 7/16/12**	**Mon 12/31/12**
29	**Air Operations**	**71 days**	**Mon 9/24/12**	**Mon 12/31/12**
42				
43				



Project: Project Schedule 9-24
Date: Thu 11/15/12

Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress

TRAFFIC PLAN: C 5



[redacted] Battle Creek, MI 49014

GPS Coordinates Lat: 42.304905 Long: -85.183463

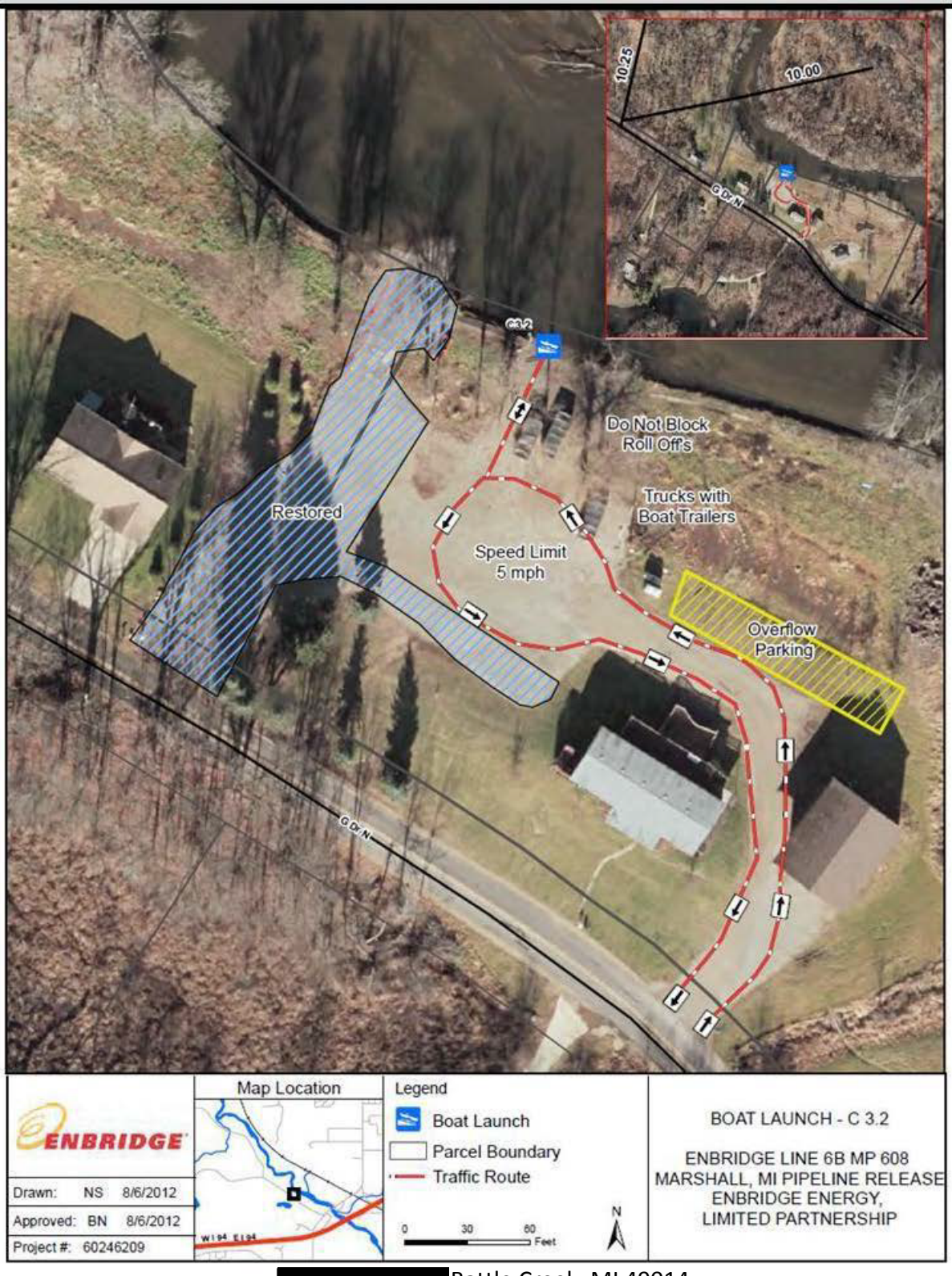
TRAFFIC PLAN: C 0.4



[redacted] Ceresco, MI 49033

GPS Coordinates: Lat: 42.265127, Long:-85.048364

TRAFFIC PLAN: C 3.2



[redacted] Battle Creek, MI 49014

GPS Coordinates: Lat: 42.293492 Long: -85.124479

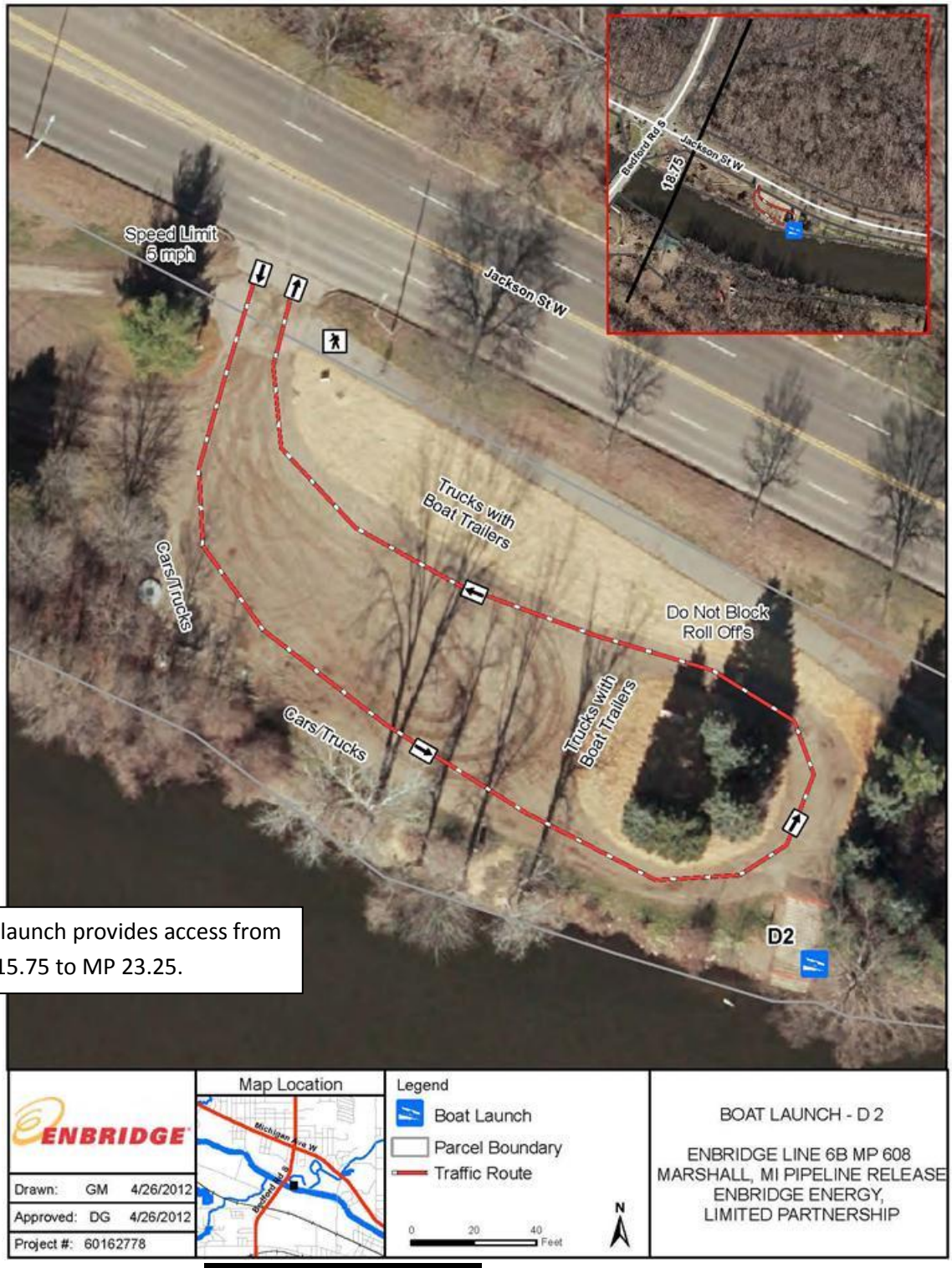
TRAFFIC PLAN: Wildlife Center



[redacted]Battle Creek, MI 49014

GPS Coordinates: Lat: 42.292173, Long: -85.123578

TRAFFIC PLAN: D2



This launch provides access from MP 15.75 to MP 23.25.

[redacted], Battle Creek, MI 49037

GPS Coordinates: Lat: 42.338427 Long:-85.232309

TRAFFIC PLAN: E 0.5



(Shady Bend Camp Ground), 15320 East Augusta Dr, Augusta, MI 49012
GPS Coordinates:Lat: 42.347408 Long: -85.3295

TRAFFIC PLAN: E 2



[redacted]Augusta, MI 49053

GPS Coordinates: Lat: 42.32412 Long: -85.358041

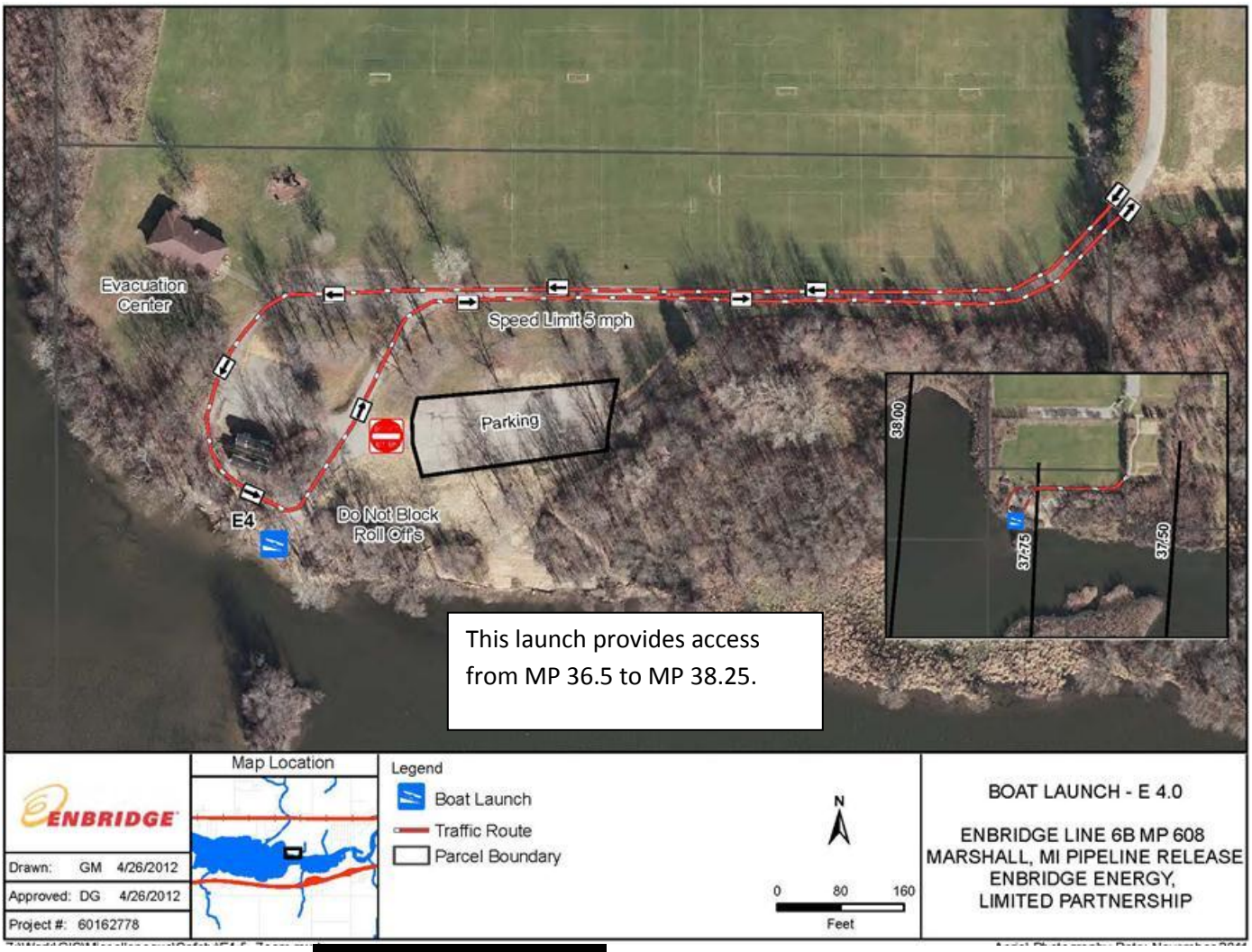
TRAFFIC PLAN: E 3



[redacted] Galesburg, MI 49053

GPS Coordinates: Lat: 42.284663 Long: -85.412855

TRAFFIC PLAN: E 4



[redacted] Galesburg, MI 49053

GPS Coordinates: Lat: 42.278265 Long: -85.452295

Transportation								
Ambulance Services								
Name	Address			Phone			Paramedics Yes	No
Lifecare Ambulance	330 West Hamblin Avenue, Battle Creek, MI 49015			9-1-1			X	
City of Marshall Fire Dept	323 West Michigan Avenue, Marshall, MI 49068			9-1-1			X	
Hospitals								
Name	Address	Travel Time Air	Ground	Phone	Helipad Yes	No	Burn Center Yes	No
Bronson Methodist Hospital	601 John Street Kalamazoo, MI	15 Min	50 min	269-341-7654	X		X	
Borgess Medical Center	1521 Gull Road Kalamazoo, MI	15 min	50 min	269-226-7000	X			X
Oaklawn Hospital	200 N. Madison Ave Marshall, MI		5 min	269-781-4271		X		X
Battle Creek Health System	300 North Avenue Battle Creek, MI		20 min	269-966-8000		X		X

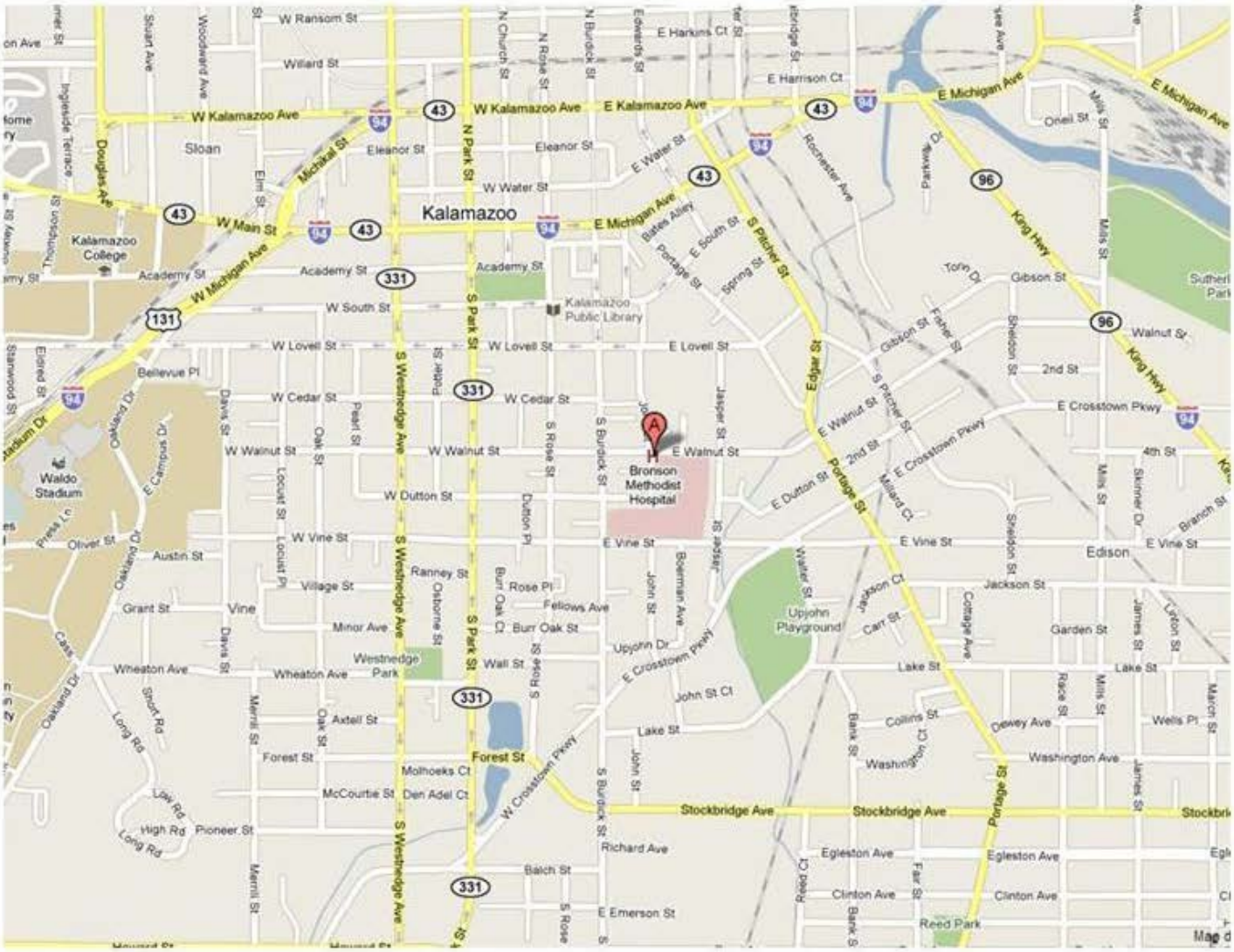
Medical Emergency Procedures

1. Dial 9-1-1 for all emergencies. Give 9-1-1 operators as much information as possible. Stay on the line and answer all questions – information may be radioed to responders. On-site personnel trained and certified in first aid should attempt to stabilize victim until fire department/EMS personnel arrive.
2. Report all incidents to the Project Safety Officer. Keep a log of events. Secure the area. Identify witnesses for later investigation.

NOTE: Suspend all operations during an actual emergency situation!

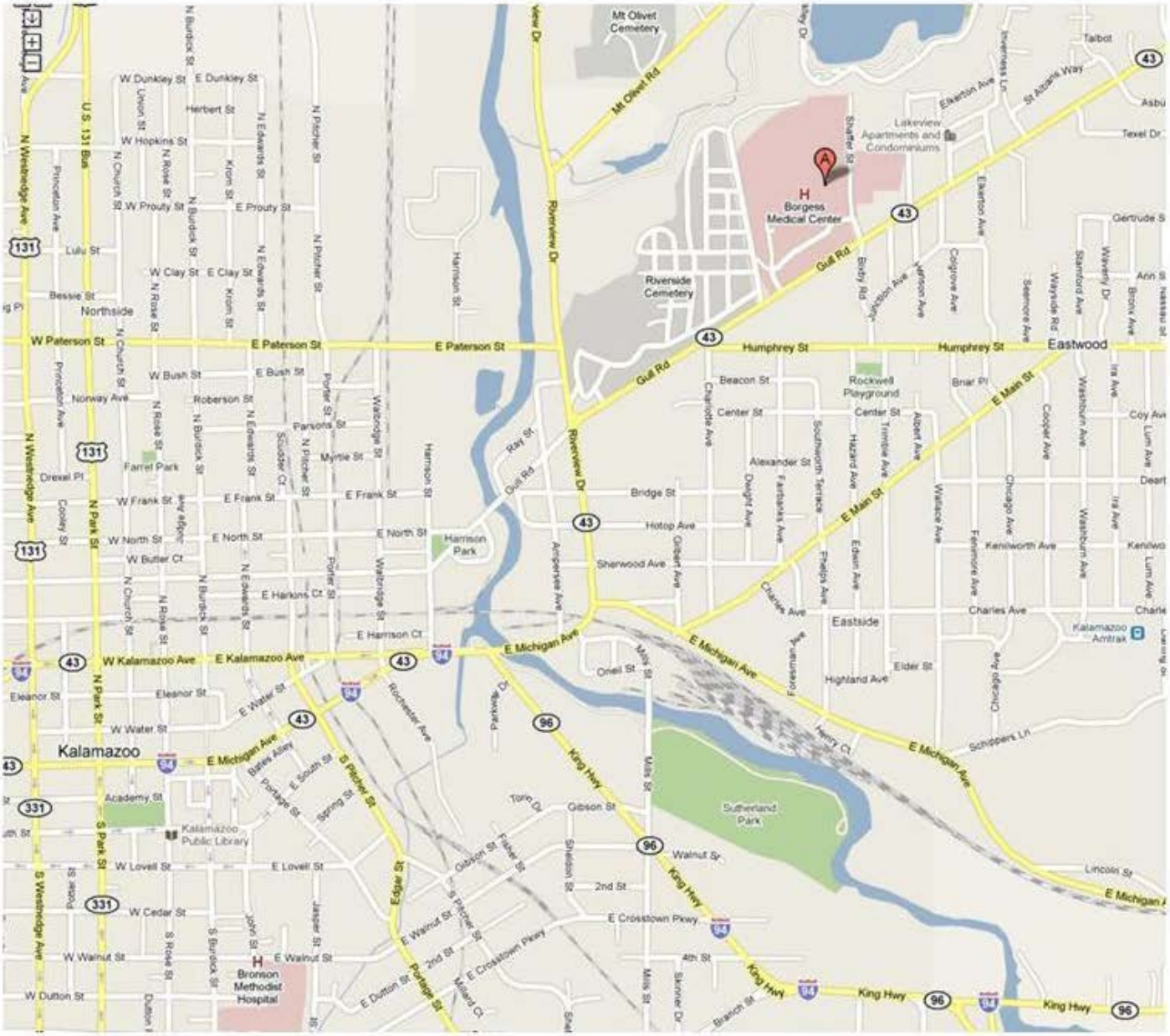
Prepared by	Reviewed by (Safety Officer)
Dale Gross 10/31/2012	Dale Gross 10/31/2012

Hospital Route Map – Bronson Methodist Hospital – Kalamazoo, MI



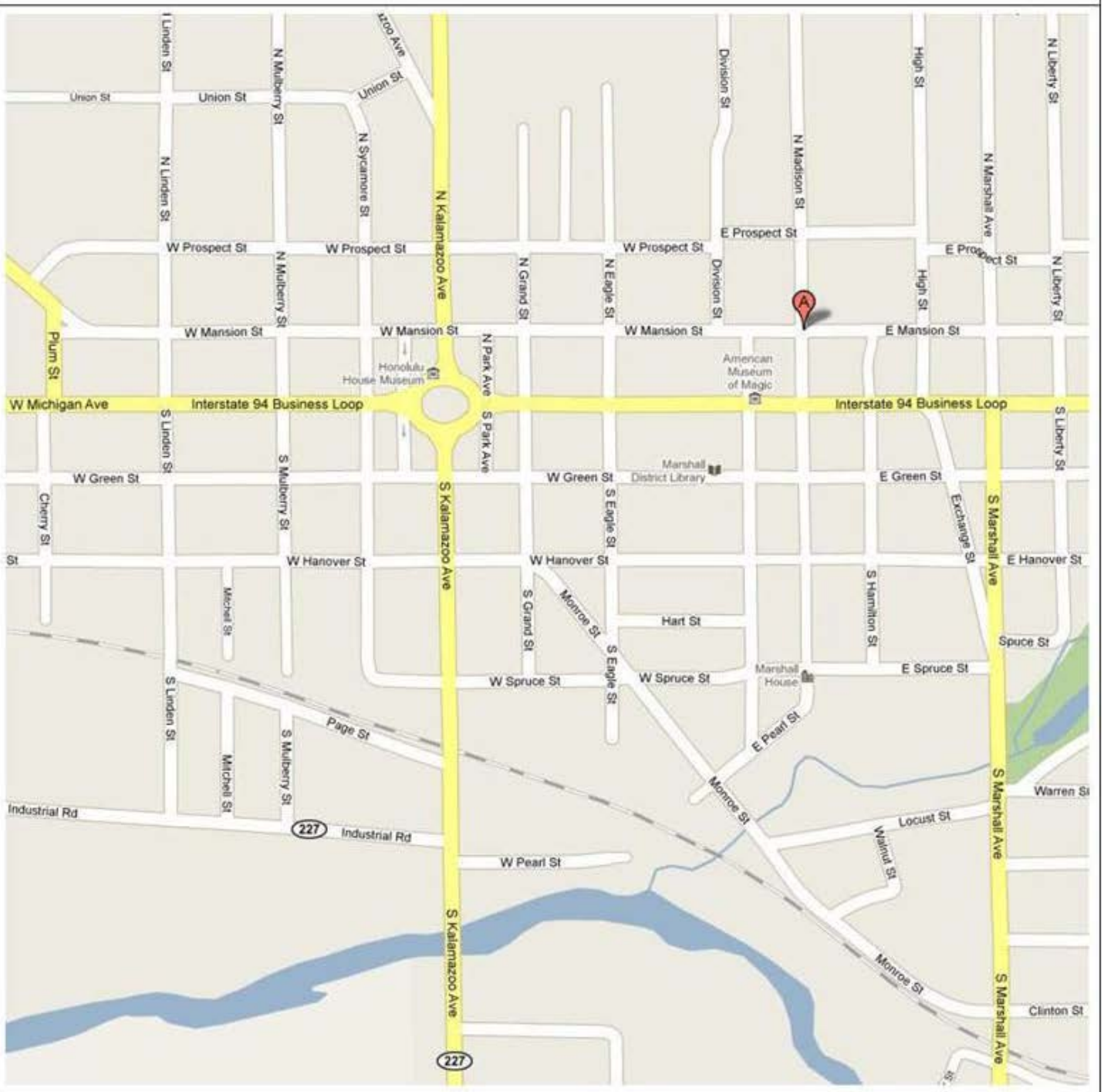
Bronson Methodist Hospital
601 John St
Kalamazoo, MI 49007
(269) 341 - 7979

Hospital Route Map – Borgess Medical Center – Kalamazoo, MI



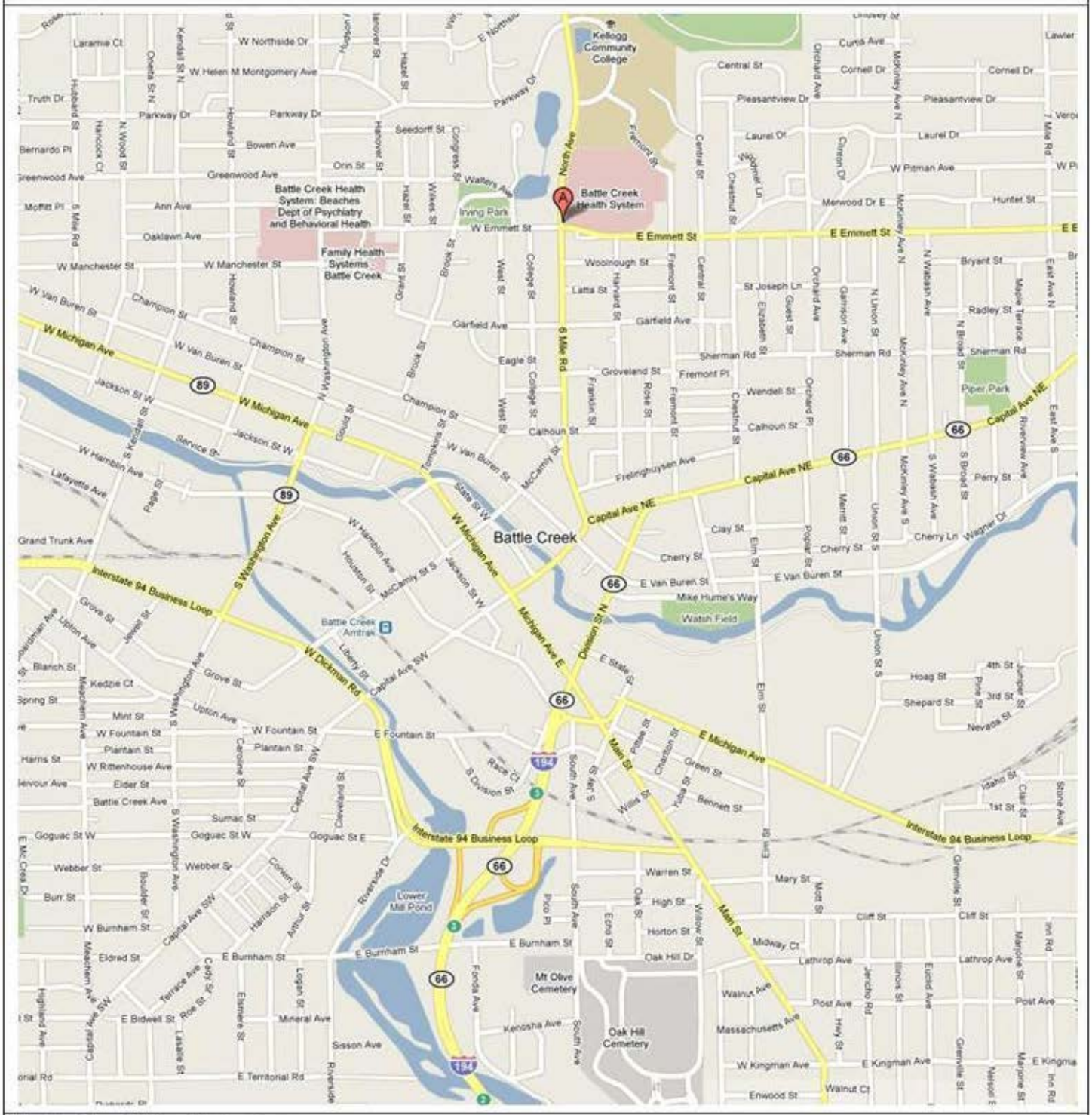
Borgess Medical Center
1521 Gull Road
Kalamazoo, MI 49048
(269) 226 - 7000

Hospital Route Map – Oaklawn Hospital – Marshall, MI



Oaklawn Hospital
200 North Madison St.
Marshall, MI
(269) 781-4271

Hospital Route Map – Battle Creek Health System – Battle Creek, MI


Battle Creek Health System
300 North Avenue
Battle Creek, MI
(269) 966-8000
Kellogg Community College
Battle Creek Health System: Beaches Dept of Psychiatry and Behavioral Health
Family Health Systems - Battle Creek
Battle Creek Health System
Battle Creek
Battle Creek Amtrak
Watsh Field
Piper Park
Irving Park
Lower Mill Pond
Mt Olive Cemetery
Oak Hill Cemetery
North Ave
E Emmett St
W Michigan Ave
Capital Ave NE
Interstate 94 Business Loop
W Dickman Rd
E Michigan Ave
Main St
8 Mile Rd
Parkway Dr
Central St
Pleasantview Dr
Laurel Dr
W Pitman Ave
Merwood Dr E
Hunter St
Bryant St
Radley St
Sherman Rd
Garfield Ave
Woolnough St
Latta St
St Joseph Ln
Eagle St
Groveland St
Fremont Pl
Wendell St
Calhoun St
Freinghuysen Ave
Clay St
Cherry St
E Van Buren St
Mike Hume's Way
E State St
Hoag St
4th St
3rd St
Shepard St
Nevada St
Idaho St
1st St
Bennen St
Green St
Warren St
Mary St
High St
Horton St
Oak Hill Dr
Midway Ct
Lathrop Ave
Cliff St
Post Ave
Walnut Ave
Massachusetts Ave
W Kingman Ave
E Kingman Ave
Enwood St
Walnut Ct
Sisson Ave
Kenosha Ave
E Territorial Rd
Mineral Ave
E Bidwell St
E Burnham St
W Burnham St
Eldred St
Webber St
Goguac St W
Goguac St E
Sumac St
Battle Creek Ave
Elder St
W Rittenhouse Ave
Plantain St
W Fountain St
E Fountain St
Mint St
Kedzie Ct
Blanch St
Spring St
Grove St
Upton Ave
Jewell St
Lafayette Ave
Grand Trunk Ave
W Hamblin Ave
Service St
Jackson St W
W Van Buren St
Champion St
W Manchester St
Oaklawn Ave
Ann Ave
Moffitt Pl
Greenwood Ave
Bernardo Pl
Truth Dr
Laramie Ct
W Northside Dr
W Helen M Montgomery Ave
Parkway Dr
Howland St
Bowen Ave
Orin St
Seedorff St
Walters Ave
Hazel St
Wakes St
Congress St
Hanover St
Woodward Ave
Brook St
West St
College St
Franklin St
Rose St
Fremont St
Chestnut St
Orchard Ave
Garrison Ave
Guest St
Elizabeth St
Union St N
McKinley Ave N
N Wabash Ave
N Broad St
Riverview Ave
East Ave N
East Ave S
S Broad St
S Wabash Ave
McKinley Ave S
Union St S
Merritt St
Poplar St
Elm St
Cherry Ln
Wagner Dr
Perry St
Division St N
Michigan Ave E
Main St
Jackson St W
McCamly St S
Houston St
Tompkins St
State St W
Gould St
Washington Ave N
Kendall St
Page St
S Washington Ave
Liberty St
Capital Ave SW
Cleveland St
Caroline St
Meachem Ave
Riverside Dr
Convent St
Harrison St
Arthur St
Boulder St
Terrace Ave
Cady St
Roe St
Lasalle St
Easmere St
Logan St
Fonda Ave
Pico Pl
South Ave
Echo St
Willow St
Oak St
Yuba St
Willis St
Race Ct
S Division St
Chandler St
Prairie St
Elm St
Union St S
Merritt St
Poplar St
Orchard Pl
Chestnut St
Fremont St
Rose St
Franklin St
College St
West St
Brook St
Woodward Ave
Gould St
Tompkins St
McCamly St
Jackson St W
Houston St
Page St
Kendall St
Lafayette Ave
Grand Trunk Ave
Dickman Rd
Upton Ave
Grove St
Jewell St
Blanch St
Spring St
Meachem Ave
Mint St
W Fountain St
Plantain St
Harris St
W Rittenhouse Ave
Elder St
Servour Ave
Battle Creek Ave
Sumac St
Goguac St W
Goguac St E
Webber St
Burr St
W Burnham St
Eldred St
E Burnham St
Terrace Ave
Cady St
Roe St
E Bidwell St
Highland Ave
Lasalle St
Easmere St
Logan St
Mineral Ave
Sisson Ave
E Territorial Rd
Riverside
Fonda Ave
Kenosha Ave
Mt Olive Cemetery
Oak Hill Cemetery
Oak Hill Dr
Midway Ct
Lathrop Ave
Post Ave
Walnut Ave
Massachusetts Ave
W Kingman Ave
E Kingman Ave
Enwood St
Walnut Ct
Cliff St
Mary St
Warren St
Green St
Bennen St
1st St
Idaho St
Stone Ave
Grenville St
Marjorie St
Inn Rd
Euclid Ave
Illinois St
Jericho Rd
Hwy St
Shepard St
Nevada St
4th St
3rd St
Hoag St
Union St S
Merritt St
Poplar St
Elm St
Cherry Ln
Wagner Dr
Perry St
Riverview Ave
East Ave S
S Broad St
S Wabash Ave
McKinley Ave S
Union St S
Cherry St
Clay St
E Van Buren St
Mike Hume's Way
Watsh Field
E State

Line 6B Remediation
Marshall Michigan

PROJECT CALENDAR

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Nov 25 - Dec 1	**11/25**	**11/26** Remob (travel day)	**11/27** **0700 IAP Brief to field (11/27-12/10)**	**11/28** **1500 UC Ops Brief**	**11/29** **1100-1300 Forensic Chem** **1400 Kzoo River**	**11/30**	**12/1**
Dec 2 - Dec 8	**12/2**	**12/3** **0900 Tactics**	**12/4**	**12/5** **1500 Consolidated ICS**	**12/6** **1100-1300 Forensic Chem** **1400 Kzoo River**	**12/7**	**12/8**
Dec 9 - Dec 15	**12/9**	**12/10** **0700 IAP Brief to field (12/10-1/7)**	**12/11**	**12/12** **1500 UC Ops Brief**	**12/13** **0900 MAC Meeting** **1100-1300 Forensic Chem** **1400 Kzoo River**	**12/14**	**12/15**

Color Code Key: **ICS/Project** **Science/Focus** **Special** **RI Meetings** Stand-down/holiday

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix A

Planning Resources

Work Orders

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

Weekly Work Orders

Line6b Remediation - Marshall MI

Monday October 29, 2012
thru
Friday November 2, 2012

Submerged Oil Branch

Team 1	Morrow Lake and Morrow Lake Delta Monitoring		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	10/29/2012	**Field Work Start Time**	0830
End Date	10/29/2012 or 10/30/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle
Task Lead	Matt Sumner		

Description of Work:
Proceed with step-out poling at locations in the Fan which poled moderate and heavy during last weeks montoring round. The team will also collect surface water, sediment and above sediment temperatures at the fixed locations.

Submerged Oil Branch

Team 2	36.10 Sediment Trap Removal		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/1/2012	**Field Work Start Time**	0830
End Date	11/2/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle
Task Lead	Matt Sumner		

Description of Work:
The team will sample the 36.10 sediment trap. Once the trap is sampled the tree structure and CSD's will be removed. Before removal of the structures, upstream and downstream siltation barriers will be installed to contain suspended sediment material from mobilizing while the work is being performed. Turbidity monitoring will also occur throughout the work activity upstream and downstream.

Kalamazoo River System Branch

Team 3	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	10/29/2012	**Field Work Start Time**	0830
End Date	11/2/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed.

Weekly Work Orders

Line6b Remediation - Marshall MI

Monday November 5, 2012
thru
Friday November 9, 2012

Submerged Oil Branch

Team 1	Walling Sediment Sampling and Structure Removal		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Ted Reckers
Task Lead	Matt Sumner		

Description of Work:
The team will conduct Walling sediment sampling. All 20 locations along the Kalamazoo River, Morrow Lake Delta and Morrow Lake will be sampled. Once the tubes are pulled for sampling the structures which hold the Walling tubes in place will also be removed for the winter months. Sampling of the Walling tubes will be conducted at the C3.2 building.

Submerged Oil Branch

Team 2	Phase I & II Sediment Trap Sampling and Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle
Task Lead	Matt Sumner		

Description of Work:
The team will conduct sediment trap sampling starting on the phase I & II sediment traps. Once an individual sediment trap has been sampled the the bathymetry will be conducted. All work will be conducted according to the Sediment Trap Monitoring and Maintenance Plan Approved July 10, 2012.

Submerged Oil Branch

Team 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Chad Khodl
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements along the E4 containment system upstream and downstream where half curtain is located.

Kalamazoo River System Branch

Team 4	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).

Submerged Oil Branch

Team 1 & 2	Phase I & II Sediment Trap Sampling and Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle Chad Khodl
Task Lead	Matt Sumner		

Description of Work:
The team will conduct sediment trap sampling starting on the phase I & II sediment traps. Once an individual sediment trap has been sampled the the bathymetry will be conducted. All work will be conducted according to the Sediment Trap Monitoring and Maintenance Plan Approved July 10, 2012.

Submerged Oil Branch

Team 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Luke Hodges
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements along the E4 containment system upstream and downstream where half curtain is located.

Kalamazoo River System Branch

Team 4	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).

Submerged Oil Branch

Team 1, 2 & 3	Phase I & II Sediment Trap Sampling and Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/19/2012	**Field Work Start Time**	0830
End Date	11/20/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle Chad Khodl Luke Hodges
Task Lead	Matt Sumner		

Description of Work:

The team will conduct sediment trap sampling starting on the phase I & II sediment traps. Once an individual sediment trap has been sampled the the bathymetry will be conducted. All work will be conducted according to the Sediment Trap Monitoring and Maintenance Plan Approved July 10, 2012.

Submerged Oil Branch

Team 1, 2 & 3	Phase I & II Sediment Trap Sampling and Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/26/2012	**Field Work Start Time**	0830
End Date	11/30/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle Chad Khodl Luke Hodges
Task Lead	Matt Sumner		

Description of Work:
The team will conduct sediment trap sampling starting on the phase I & II sediment traps. Once an individual sediment trap has been sampled the the bathymetry will be conducted. All work will be conducted according to the Sediment Trap Monitoring and Maintenance Plan Approved July 10, 2012.

Kalamazoo River System Branch

Team 4	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/26/2012	**Field Work Start Time**	0830
End Date	11/30/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).

Weekly Work Orders

Line6b Remediation - Marshall MI

Monday November 5, 2012
thru
Friday November 9, 2012

Submerged Oil Branch

Team 1	Walling Sediment Sampling and Structure Removal		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Ted Reckers
Task Lead	Matt Sumner		

Description of Work:
The team will conduct Walling sediment sampling. All 20 locations along the Kalamazoo River, Morrow Lake Delta and Morrow Lake will be sampled. Once the tubes are pulled for sampling the structures which hold the Walling tubes in place will also be removed for the winter months. Sampling of the Walling tubes will be conducted at the C3.2 building.

Submerged Oil Branch

Team 2	Phase I & II Sediment Trap Sampling ~~and Bathymetry~~		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDoulgle
Task Lead	Matt Sumner		

Description of Work:
The team will conduct sediment trap sampling starting on the phase I & II sediment traps. ~~Once an individual sediment trap has been sampled the the bathymetry will be conducted.~~ All work will be conducted according to the Sediment Trap Monitoring and Maintenance Plan Approved July 10, 2012.

Submerged Oil Branch

Team 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/7/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Chad Khodl
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements along the E4 containment system upstream and downstream where half curtain is located.

Submerged Oil Branch

Team 3	Survey Control Points around E4 Containment System and Sediment Traps		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/8/2012	**Field Work Start Time**	0830
End Date	11/10/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	
Task Lead	Matt Sumner		

Description of Work:
The survey team will start the process of installing control points around the E4 Containment System and Sediment Traps.

Kalamazoo River System Branch

Team 4	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/5/2012	**Field Work Start Time**	0830
End Date	11/9/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).

Weekly Work Orders

Line6b Remediation - Marshall MI

Monday November 12, 2012
thru
Friday November 16, 2012

Submerged Oil Branch

Team 1	Survey Control Points around E4 Containment System and Sediment Traps		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	
Task Lead	Matt Sumner		

Description of Work:
The survey team will install control points around the E4 Containment System and Sediment Traps.

Submerged Oil Branch

Team 2 & 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/14/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDougle Eric Celebreeze
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements along the E4 Containment System upstream and downstream where half curtain is located.

Kalamazoo River System Branch

Team 4	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).

Weekly Work Orders

Line6b Remediation - Marshall MI

Monday November 19, 2012
thru
Tuesday November 20, 2012

Submerged Oil Branch

Team 1	Survey Control Points around Sediment Traps		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/19/2012	**Field Work Start Time**	0830
End Date	11/20/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	
Task Lead	Matt Sumner		

Description of Work:

The survey team will install control points around the E4 Containment System and Sediment Traps.

Submerged Oil Branch

Team 2 & 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/19/2012	**Field Work Start Time**	0830
End Date	11/20/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDougle
Task Lead	Matt Sumner		Eric Celebreeze

Description of Work:

The team will collect bathymetry measurements along the E4 Containment System upstream and downstream where half curtain is located.

Submerged Oil Branch

Team 1	Survey Control Points around E4 Containment System and Sediment Traps		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	
Task Lead	Matt Sumner		

Description of Work:
The survey team will install control points around the E4 Containment System and Sediment Traps.

Submerged Oil Branch

Team 2 & 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/14/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDougle Eric Celebreeze
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements along the E4 Containment System upstream and downstream where half curtain is located.

Kalamazoo River System Branch

Team 4	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/14/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		

Description of Work:
The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).

Kalamazoo River System Branch

Team 5	Kalamazoo River Surface Water Monitoring		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/13/2012	**Field Work Start Time**	0830
End Date	11/14/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Jon Carveth
Task Lead	Alison Schoeff		

Description of Work:
The team will collect surface water samples from 18 predetermined locations along the Kalamazoo River and in Morrow Lake.

Submerged Oil Branch

Team 1	Survey Control Points around E4 Containment System and Sediment Traps		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/16/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Ted Reckers
Task Lead	Matt Sumner		
Description of Work: The survey team will install control points and backsite control points around the E4 Containment System and Sediment Traps.			

Submerged Oil Branch

Team 2 & 3	E4 Containment Bathymetry		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/18/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDougle Eric Celebreeze
Task Lead	Matt Sumner		
Description of Work: The team will collect bathymetry measurements along the E4 Containment System upstream and downstream where half curtain is located.			

Submerged Oil Branch

Team 4	E4 Containment System Removal Turbidity Monitoring		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	E4 Boat Launch
Start Date	11/17/2012	**Field Work Start Time**	0830
End Date	11/18/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Jon Carveth
Task Lead	Matt Sumner		
Description of Work: Turbidity monitoring during the removal of the E4 Containment System.			

Kalamazoo River System Branch

Team 5	Remedial Investigation		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/12/2012	**Field Work Start Time**	0830
End Date	11/14/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector
Task Lead	Brian Albig		
Description of Work: The team will collect, log, photograph, and sample cores collected in overbank areas along the Kalamazoo River. Cores will be collect using a Geoprobe slide hammer corer. All cores collected in the field will be transported to the C3.2 building to be logged, photographed and sampled. Cores will be kept in cold storage (not frozen) until they are ready to be processed. All work will be conducted according to the Remedial Investigation Work Plan for the Kalamazoo River (MP 5.80 to MP 11.00) and Remedial Investigation Work Plan for the Kalamazoo River (MP 11.00 to Morrow Lake Dam).			

Kalamazoo River System Branch

Team 6	Kalamazoo River Surface Water Monitoring		
Meeting Location	0730 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/13/2012	**Field Work Start Time**	0830
End Date	11/14/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Jon Carveth
Task Lead	Alison Schoeff		
Description of Work: The team will collect surface water samples from 18 predetermined locations along the Kalamazoo River and in Morrow Lake.			

Submerged Oil Branch

Team 1	Survey Control Points around the Sediment Traps		
Meeting Location	0730 at E4 Boat Launch	**Starting Field Area**	E4 Boat Launch
Start Date	11/19/2012	**Field Work Start Time**	0730
End Date	11/20/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Ted Reckers
Task Lead	Matt Sumner		

Description of Work:
The survey team will install control points and backsite control points around the Phase I & II Sediment Traps.

Submerged Oil Branch

Team 2 & 3	E4 Containment System and Sediment Trap Bathymetry		
Meeting Location	0730 at E4 Boat Launch	**Starting Field Area**	E4 Boat Launch
Start Date	11/19/2012	**Field Work Start Time**	0730
End Date	11/25/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDougle Eric Celebreeze
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements along the E4 Containment System and Phase I & II Sediment Traps.

Submerged Oil Branch

Team 4	E4 Containment Sytem Removal Turbidity Monitoring		
Meeting Location	0730 at E4 Boat Launch	**Starting Field Area**	E4 Boat Launch
Start Date	11/19/2012	**Field Work Start Time**	0730
End Date	11/25/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Jon Carveth
Task Lead	Matt Sumner		

Description of Work:
Turbidity monitoring during the removal of the E4 Containment System.

Weekly Work Orders

Line6b Remediation - Marshall MI

Tuesday November 27, 2012
thru
Friday November 30, 2012

Submerged Oil Branch

Team 1	Survey Control Points around the Sediment Traps		
Meeting Location	0700 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/27/2012	**Field Work Start Time**	0700
End Date	11/30/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Ted Reckers
Task Lead	Matt Sumner		

Description of Work:
The survey team will install control points and backsite control points around the Phase I & II Sediment Traps.

Submerged Oil Branch

Teams 2 & 3	Phase I & II Sediment Trap Bathymetry		
Meeting Location	0700 at C3.2 Building	**Starting Field Area**	TBD
Start Date	11/27/2012	**Field Work Start Time**	0700
End Date	11/30/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Amber McDougle Eric Celebreeze
Task Lead	Matt Sumner		

Description of Work:
The team will collect bathymetry measurements at Phase I & II Sediment Traps.

Submerged Oil Branch

Teams 4 & 5	Quantification Logging and Sampling		
Meeting Location	0700 at C3.2 Building	**Starting Field Area**	C3.2 Building
Start Date	11/27/2012	**Field Work Start Time**	0700
End Date	11/30/2012	**Field Work Stop Time**	1900
Work Site Name	Marshall, Line 6B Response	**Field Team Lead**	Reed Rector Jerry Kraemer
Task Lead	Matt Sumner		

Description of Work:
Photograph, log and sample the remaining Quantification cores. There will be two logging and sampling teams.

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix B

Surface Water Monitoring Activities

Analytical Data Reports

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

23-Nov-2012

Alison Schoeff
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall Surface Water 11/14/12** Work Order: **1211467**

Dear Alison,

ALS Environmental received 3 samples on 14-Nov-2012 05:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 14.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall Surface Water 11/14/12
Work Order: **1211467**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211467-01	WSE11140927JTC1	Surface Water		11/14/2012 09:27	11/14/2012 17:00	☐
1211467-02	WSE11140935JTC1	Surface Water		11/14/2012 09:35	11/14/2012 17:00	☐
1211467-03	WSE11140913JTC1	Surface Water		11/14/2012 09:13	11/14/2012 17:00	☐

Client: AECOM Environment
Project: Marshall Surface Water 11/14/12
Work Order: 1211467

Case Narrative

Batch 44820 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

Client: AECOM Environment
Project: Marshall Surface Water 11/14/12
WorkOrder: **1211467**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *23-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11140927JTC1
Work Order:	1211467	**Collection Date:**	11/14/2012 9:27:00 AM
Project:	Marshall Surface Water 11/14/12		
Lab ID:	1211467-01	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*58.8*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*86.4*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*66.3*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *23-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11140935JTC1
Work Order:	1211467	**Collection Date:**	11/14/2012 9:35:00 AM
Project:	Marshall Surface Water 11/14/12		
Lab ID:	1211467-02	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*55.8*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*84.7*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*62.7*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *23-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11140913JTC1
Work Order:	1211467	**Collection Date:**	11/14/2012 9:13:00 AM
Project:	Marshall Surface Water 11/14/12		
Lab ID:	1211467-03	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*56.5*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*85.5*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*62.0*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **44809** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44809-44809** Units: **mg/L** Analysis Date: **11/20/2012 03:31 PM**

Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146442** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Molybdenum	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44809-44809** Units: **mg/L** Analysis Date: **11/20/2012 03:37 PM**

Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146443** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09444	0.0020	0.1	0	94.4	80-120	0			
Molybdenum	0.08959	0.0050	0.1	0	89.6	80-120	0			
Vanadium	0.09255	0.0050	0.1	0	92.6	80-120	0			

MS Sample ID: **1211468-08AMS** Units: **mg/L** Analysis Date: **11/20/2012 05:57 PM**

Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146848** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.08386	0.0020	0.1	-0.00002158	83.9	75-125	0			
Molybdenum	0.0843	0.0050	0.1	0.001023	83.3	75-125	0			
Vanadium	0.08587	0.0050	0.1	0.0005769	85.3	75-125	0			

MSD Sample ID: **1211468-08AMSD** Units: **mg/L** Analysis Date: **11/20/2012 06:03 PM**

Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146849** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09166	0.0020	0.1	-0.00002158	91.7	75-125	0.08386	8.89	20	
Molybdenum	0.09276	0.0050	0.1	0.001023	91.7	75-125	0.0843	9.56	20	
Vanadium	0.09355	0.0050	0.1	0.0005769	93	75-125	0.08587	8.56	20	

The following samples were analyzed in this batch: 1211467-01B 1211467-02B 1211467-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211467
Project: Marshall Surface Water 11/14/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44820-44820** Units: **µg/L** Analysis Date: **11/19/2012 08:20 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146231** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2-Fluorobiphenyl	*28.61*	0	*50*	0	*57.2*	*32-100*	0			
Surr: 4-Terphenyl-d14	*38.2*	0	*50*	0	*76.4*	*23-112*	0			
Surr: Nitrobenzene-d5	*31.87*	0	*50*	0	*63.7*	*31-93*	0			

LCS Sample ID: **SLCSW1-44820-44820** Units: **µg/L** Analysis Date: **11/19/2012 08:53 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146233** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	14.08	5.0	20	0	70.4	45-110	0			
Acenaphthylene	14.63	5.0	20	0	73.2	50-105	0			
Anthracene	15.14	5.0	20	0	75.7	55-110	0			
Benzo(a)anthracene	15.36	5.0	20	0	76.8	55-110	0			
Benzo(a)pyrene	15.79	5.0	20	0	79	55-110	0			
Benzo(b)fluoranthene	18.22	5.0	20	0	91.1	45-120	0			
Benzo(g,h,i)perylene	15.72	5.0	20	0	78.6	40-125	0			
Benzo(k)fluoranthene	14.14	5.0	20	0	70.7	45-125	0			
Chrysene	15.69	5.0	20	0	78.4	55-110	0			
Dibenzo(a,h)anthracene	15.81	5.0	20	0	79	40-125	0			
Fluoranthene	16.64	5.0	20	0	83.2	55-115	0			
Fluorene	15.02	5.0	20	0	75.1	50-110	0			
Indeno(1,2,3-cd)pyrene	15.8	5.0	20	0	79	45-125	0			
Phenanthrene	14.74	5.0	20	0	73.7	50-115	0			
Pyrene	16.44	5.0	20	0	82.2	50-130	0			
Surr: 2-Fluorobiphenyl	*30.15*	0	*50*	0	*60.3*	*32-100*	0			
Surr: 4-Terphenyl-d14	*27.45*	0	*50*	0	*54.9*	*23-112*	0			
Surr: Nitrobenzene-d5	*32.18*	0	*50*	0	*64.4*	*31-93*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211467
Project: Marshall Surface Water 11/14/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MS Sample ID: **1211438-39B MS** Units: **µg/L** Analysis Date: **11/19/2012 09:25 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146235** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	126.3	50	200	0	63.2	45-110	0			
Acenaphthylene	133.4	50	200	0	66.7	50-105	0			
Anthracene	137	50	200	0	68.5	55-110	0			
Benzo(a)anthracene	141.1	50	200	0	70.6	55-110	0			
Benzo(a)pyrene	144.3	50	200	0	72.2	55-110	0			
Benzo(b)fluoranthene	153.1	50	200	0	76.6	45-120	0			
Benzo(g,h,i)perylene	145.6	50	200	0	72.8	40-125	0			
Benzo(k)fluoranthene	143.6	50	200	0	71.8	45-125	0			
Chrysene	142.1	50	200	0	71	55-110	0			
Dibenzo(a,h)anthracene	142.1	50	200	0	71	40-125	0			
Fluoranthene	150.1	50	200	0	75	55-115	0			
Fluorene	135.2	50	200	0	67.6	50-110	0			
Indeno(1,2,3-cd)pyrene	144.6	50	200	0	72.3	45-125	0			
Phenanthrene	133.7	50	200	0	66.8	50-115	0			
Pyrene	148.6	50	200	0	74.3	50-130	0			
Surr: 2-Fluorobiphenyl	*275.5*	0	*1000*	0	*27.6*	*32-100*	0			*S*
Surr: 4-Terphenyl-d14	*318.4*	0	*500*	0	*63.7*	*23-112*	0			
Surr: Nitrobenzene-d5	*297.5*	0	*500*	0	*59.5*	*31-93*	0			

MSD Sample ID: **1211438-39B MSD** Units: **µg/L** Analysis Date: **11/19/2012 09:58 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146236** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	125	50	200	0	62.5	45-110	126.3	1.03	30	
Acenaphthylene	130.2	50	200	0	65.1	50-105	133.4	2.43	30	
Anthracene	135	50	200	0	67.5	55-110	137	1.47	30	
Benzo(a)anthracene	138.6	50	200	0	69.3	55-110	141.1	1.79	30	
Benzo(a)pyrene	143.9	50	200	0	72	55-110	144.3	0.278	30	
Benzo(b)fluoranthene	150.5	50	200	0	75.2	45-120	153.1	1.71	30	
Benzo(g,h,i)perylene	141	50	200	0	70.5	40-125	145.6	3.21	30	
Benzo(k)fluoranthene	142.4	50	200	0	71.2	45-125	143.6	0.839	30	
Chrysene	139.5	50	200	0	69.8	55-110	142.1	1.85	30	
Dibenzo(a,h)anthracene	141.4	50	200	0	70.7	40-125	142.1	0.494	30	
Fluoranthene	148.3	50	200	0	74.2	55-115	150.1	1.21	30	
Fluorene	132.6	50	200	0	66.3	50-110	135.2	1.94	30	
Indeno(1,2,3-cd)pyrene	141.9	50	200	0	71	45-125	144.6	1.88	30	
Phenanthrene	131.2	50	200	0	65.6	50-115	133.7	1.89	30	
Pyrene	144.3	50	200	0	72.2	50-130	148.6	2.94	30	
Surr: 2-Fluorobiphenyl	*273.2*	0	*500*	0	*54.6*	*32-100*	275.5	*0.838*	*40*	
Surr: 4-Terphenyl-d14	*295.2*	0	*500*	0	*59*	*23-112*	318.4	*7.56*	*40*	
Surr: Nitrobenzene-d5	*293.7*	0	*500*	0	*58.7*	*31-93*	297.5	*1.29*	*40*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211467
Project: Marshall Surface Water 11/14/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

The following samples were analyzed in this batch:	1211467-01A	1211467-02A	1211467-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211467

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111412_JTC1	Task: SWMON
	Total # of Samples: 3	Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 7.00		

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email:	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #:	60162778
Site Address:	5555 Glenwood Parkway SE Suite 200
City:	Grand Rapids
State, Zip:	MI
Site PM Name:	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservation: HNO3 / Analysis: Be,Mo,V	Preservation: None / Analysis: PNAs by 8270
1	WSE11140927JTC1	ML-1	WS	G	11/14/2012 09:27	3		X	X
2	WSE11140935JTC1	SW-936	WS	G	11/14/2012 09:35	3		X	X
3	WSE11140913JTC1	SWKR3840C02	WS	G	11/14/2012 09:13	3		X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	11-14-12	1855		11-14-12	1055
	11-14-12	1920		11/14/12	1900

Sample Receipt Conditions

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?
32-4.2°c	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO.
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: JON CARVETH (JTC1), LORRI LEGO
SIGNATURE of SAMPLER:
DATE Signed:
Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 17:00**

Work Order: **1211467** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Surface Water
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2 C - 4.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:49:30 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

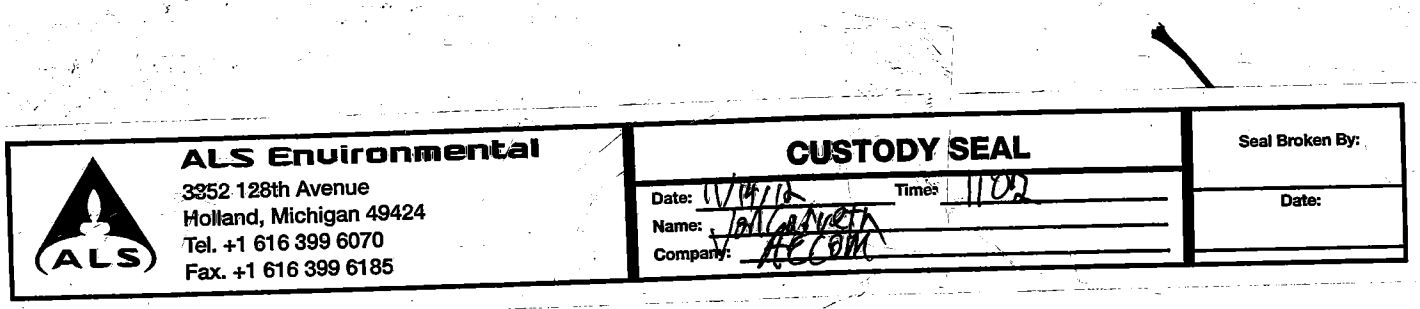
Client Contacted: Date Contacted: Person Contacted:

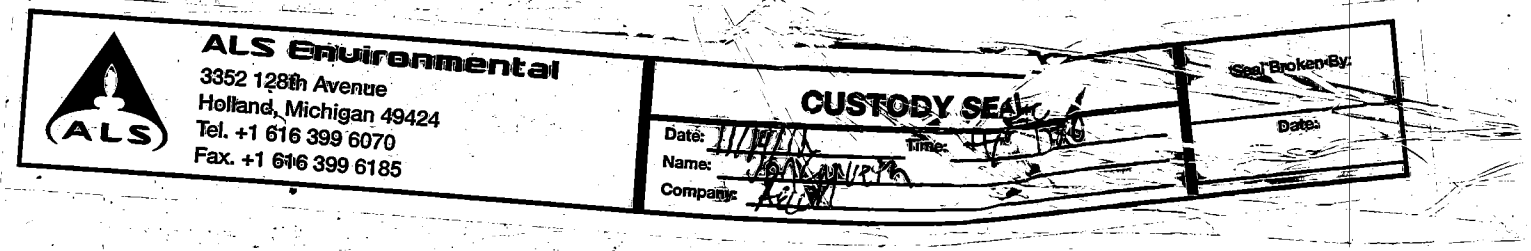
Contacted By: Regarding:

Comments:

CorrectiveAction:

SW


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date: 11/4/10
Time: 1102
Name:
Company: AECOM
Seal Broken By:
Date:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date: 11/4/10
Time:
Name:
Company:
Seal Broken By:
Date:

3.2°C

4.2°C

21-Nov-2012

Alison Schoeff
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall Surface Water 11/3/12** Work Order: **1211468**

Dear Alison,

ALS Environmental received 16 samples on 14-Nov-2012 05:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 31.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall Surface Water 11/3/12
Work Order: **1211468**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211468-01	WSE11131053JTC1	Surface Water		11/13/2012 10:53	11/14/2012 17:00	☐
1211468-02	WSE11131043JTC1	Surface Water		11/13/2012 10:43	11/14/2012 17:00	☐
1211468-03	WSB11131635JTC1	Surface Water		11/13/2012 16:35	11/14/2012 17:00	☐
1211468-04	WSE11131157JTC1	Surface Water		11/13/2012 11:57	11/14/2012 17:00	☐
1211468-05	WSF11130845JTC1	Surface Water		11/13/2012 08:45	11/14/2012 17:00	☐
1211468-06	WSE11131255JTC1	Surface Water		11/13/2012 12:55	11/14/2012 17:00	☐
1211468-07	WSE11131315JTC1	Surface Water		11/13/2012 13:15	11/14/2012 17:00	☐
1211468-08	WSE11131110JTC3	Surface Water		11/13/2012 11:10	11/14/2012 17:00	☐
1211468-09	WSE11131035JTC1	Surface Water		11/13/2012 10:35	11/14/2012 17:00	☐
1211468-10	WSC11131600JTC1	Surface Water		11/13/2012 16:00	11/14/2012 17:00	☐
1211468-11	WSC11131600JTC2	Surface Water		11/13/2012 16:00	11/14/2012 17:00	☐
1211468-12	WSC11131535JTC1	Surface Water		11/13/2012 15:35	11/14/2012 17:00	☐
1211468-13	WSC11131445JTC1	Surface Water		11/13/2012 14:45	11/14/2012 17:00	☐
1211468-14	WSC11131412JTC1	Surface Water		11/13/2012 14:12	11/14/2012 17:00	☐
1211468-15	WSE11131345JTC1	Surface Water		11/13/2012 13:45	11/14/2012 17:00	☐
1211468-16	WSE11130915JTC1	Surface Water		11/13/2012 09:15	11/14/2012 17:00	☐

Client: AECOM Environment
Project: Marshall Surface Water 11/3/12
Work Order: 1211468

Case Narrative

Batch 44821 sample WSE11131110JTC3 MS/MSD recoveries for Benzo(g,h,i)perylene were below control limits. The corresponding reporting limit in the parent sample may be biased low for this compound. A second set of MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

Batch 44820 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall Surface Water 11/3/12
WorkOrder: **1211468**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131053JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 10:53:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-01	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*58.9*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*82.4*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*64.5*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131043JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 10:43:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-02	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*59.2*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*76.6*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*65.1*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSB11131635JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 4:35:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-03	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*43.1*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*86.0*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*47.2*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131157JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 11:57:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-04	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/20/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/20/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/20/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/20/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/20/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/20/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/20/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/20/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/20/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/20/2012
Surr: 2-Fluorobiphenyl	*50.9*	*32-100*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*86.6*	*23-112*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*55.6*	*31-93*			*%REC*	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSF11130845JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 8:45:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-05	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **HL**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*41.8*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*77.6*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*48.9*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131255JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 12:55:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-06	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **HL**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*51.1*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*82.3*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*59.8*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131315JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 1:15:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-07	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*53.8*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*68.8*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*54.5*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131110JTC3
Work Order:	1211468	**Collection Date:**	11/13/2012 11:10:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-08	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **HL**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*53.9*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*82.3*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*61.9*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131035JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 10:35:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-09	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*57.2*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*65.7*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*58.2*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSC11131600JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 4:00:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-10	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*60.3*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*69.2*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*62.7*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSC11131600JTC2
Work Order:	1211468	**Collection Date:**	11/13/2012 4:00:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-11	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*59.3*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*69.5*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*62.3*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSC11131535JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 3:35:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-12	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*57.9*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*65.5*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*60.9*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSC11131445JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 2:45:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-13	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*61.6*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*68.6*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*55.5*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSC11131412JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 2:12:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-14	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*53.4*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*66.6*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*56.6*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11131345JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 1:45:00 PM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-15	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/21/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/21/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/21/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*54.9*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*67.3*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*57.3*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	WSE11130915JTC1
Work Order:	1211468	**Collection Date:**	11/13/2012 9:15:00 AM
Project:	Marshall Surface Water 11/3/12		
Lab ID:	1211468-16	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/21/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/21/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/21/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2-Fluorobiphenyl	*58.5*	*32-100*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*71.1*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*61.1*	*31-93*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44809** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44809-44809** Units: **mg/L** Analysis Date: **11/20/2012 03:31 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146442** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Molybdenum	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44809-44809** Units: **mg/L** Analysis Date: **11/20/2012 03:37 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146443** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09444	0.0020	0.1	0	94.4	80-120	0			
Molybdenum	0.08959	0.0050	0.1	0	89.6	80-120	0			
Vanadium	0.09255	0.0050	0.1	0	92.6	80-120	0			

MS Sample ID: **1211468-08AMS** Units: **mg/L** Analysis Date: **11/20/2012 05:57 PM**
Client ID: **WSE11131110JTC3** Run ID: **ICPMS1_121120A** SeqNo: **2146848** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.08386	0.0020	0.1	-0.00002158	83.9	75-125	0			
Molybdenum	0.0843	0.0050	0.1	0.001023	83.3	75-125	0			
Vanadium	0.08587	0.0050	0.1	0.0005769	85.3	75-125	0			

MSD Sample ID: **1211468-08AMSD** Units: **mg/L** Analysis Date: **11/20/2012 06:03 PM**
Client ID: **WSE11131110JTC3** Run ID: **ICPMS1_121120A** SeqNo: **2146849** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09166	0.0020	0.1	-0.00002158	91.7	75-125	0.08386	8.89	20	
Molybdenum	0.09276	0.0050	0.1	0.001023	91.7	75-125	0.0843	9.56	20	
Vanadium	0.09355	0.0050	0.1	0.0005769	93	75-125	0.08587	8.56	20	

The following samples were analyzed in this batch:

1211468-01A	1211468-02A	1211468-03A
1211468-04A	1211468-05A	1211468-06A
1211468-07A	1211468-08A	1211468-09A
1211468-10A	1211468-11A	1211468-12A
1211468-13A	1211468-14A	1211468-15A
1211468-16A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44820-44820** Units: **µg/L** Analysis Date: **11/19/2012 08:20 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146231** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2-Fluorobiphenyl	*28.61*	0	*50*	0	*57.2*	*32-100*	0			
Surr: 4-Terphenyl-d14	*38.2*	0	*50*	0	*76.4*	*23-112*	0			
Surr: Nitrobenzene-d5	*31.87*	0	*50*	0	*63.7*	*31-93*	0			

LCS Sample ID: **SLCSW1-44820-44820** Units: **µg/L** Analysis Date: **11/19/2012 08:53 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146233** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	14.08	5.0	20	0	70.4	45-110	0			
Acenaphthylene	14.63	5.0	20	0	73.2	50-105	0			
Anthracene	15.14	5.0	20	0	75.7	55-110	0			
Benzo(a)anthracene	15.36	5.0	20	0	76.8	55-110	0			
Benzo(a)pyrene	15.79	5.0	20	0	79	55-110	0			
Benzo(b)fluoranthene	18.22	5.0	20	0	91.1	45-120	0			
Benzo(g,h,i)perylene	15.72	5.0	20	0	78.6	40-125	0			
Benzo(k)fluoranthene	14.14	5.0	20	0	70.7	45-125	0			
Chrysene	15.69	5.0	20	0	78.4	55-110	0			
Dibenzo(a,h)anthracene	15.81	5.0	20	0	79	40-125	0			
Fluoranthene	16.64	5.0	20	0	83.2	55-115	0			
Fluorene	15.02	5.0	20	0	75.1	50-110	0			
Indeno(1,2,3-cd)pyrene	15.8	5.0	20	0	79	45-125	0			
Phenanthrene	14.74	5.0	20	0	73.7	50-115	0			
Pyrene	16.44	5.0	20	0	82.2	50-130	0			
Surr: 2-Fluorobiphenyl	*30.15*	0	*50*	0	*60.3*	*32-100*	0			
Surr: 4-Terphenyl-d14	*27.45*	0	*50*	0	*54.9*	*23-112*	0			
Surr: Nitrobenzene-d5	*32.18*	0	*50*	0	*64.4*	*31-93*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MS Sample ID: **1211438-39B MS** Units: **µg/L** Analysis Date: **11/19/2012 09:25 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146235** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	126.3	50	200	0	63.2	45-110	0			
Acenaphthylene	133.4	50	200	0	66.7	50-105	0			
Anthracene	137	50	200	0	68.5	55-110	0			
Benzo(a)anthracene	141.1	50	200	0	70.6	55-110	0			
Benzo(a)pyrene	144.3	50	200	0	72.2	55-110	0			
Benzo(b)fluoranthene	153.1	50	200	0	76.6	45-120	0			
Benzo(g,h,i)perylene	145.6	50	200	0	72.8	40-125	0			
Benzo(k)fluoranthene	143.6	50	200	0	71.8	45-125	0			
Chrysene	142.1	50	200	0	71	55-110	0			
Dibenzo(a,h)anthracene	142.1	50	200	0	71	40-125	0			
Fluoranthene	150.1	50	200	0	75	55-115	0			
Fluorene	135.2	50	200	0	67.6	50-110	0			
Indeno(1,2,3-cd)pyrene	144.6	50	200	0	72.3	45-125	0			
Phenanthrene	133.7	50	200	0	66.8	50-115	0			
Pyrene	148.6	50	200	0	74.3	50-130	0			
Surr: 2-Fluorobiphenyl	*275.5*	0	*1000*	0	*27.6*	*32-100*	0			*S*
Surr: 4-Terphenyl-d14	*318.4*	0	*500*	0	*63.7*	*23-112*	0			
Surr: Nitrobenzene-d5	*297.5*	0	*500*	0	*59.5*	*31-93*	0			

MSD Sample ID: **1211438-39B MSD** Units: **µg/L** Analysis Date: **11/19/2012 09:58 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146236** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	125	50	200	0	62.5	45-110	126.3	1.03	30	
Acenaphthylene	130.2	50	200	0	65.1	50-105	133.4	2.43	30	
Anthracene	135	50	200	0	67.5	55-110	137	1.47	30	
Benzo(a)anthracene	138.6	50	200	0	69.3	55-110	141.1	1.79	30	
Benzo(a)pyrene	143.9	50	200	0	72	55-110	144.3	0.278	30	
Benzo(b)fluoranthene	150.5	50	200	0	75.2	45-120	153.1	1.71	30	
Benzo(g,h,i)perylene	141	50	200	0	70.5	40-125	145.6	3.21	30	
Benzo(k)fluoranthene	142.4	50	200	0	71.2	45-125	143.6	0.839	30	
Chrysene	139.5	50	200	0	69.8	55-110	142.1	1.85	30	
Dibenzo(a,h)anthracene	141.4	50	200	0	70.7	40-125	142.1	0.494	30	
Fluoranthene	148.3	50	200	0	74.2	55-115	150.1	1.21	30	
Fluorene	132.6	50	200	0	66.3	50-110	135.2	1.94	30	
Indeno(1,2,3-cd)pyrene	141.9	50	200	0	71	45-125	144.6	1.88	30	
Phenanthrene	131.2	50	200	0	65.6	50-115	133.7	1.89	30	
Pyrene	144.3	50	200	0	72.2	50-130	148.6	2.94	30	
Surr: 2-Fluorobiphenyl	*273.2*	0	*500*	0	*54.6*	*32-100*	275.5	*0.838*	*40*	
Surr: 4-Terphenyl-d14	*295.2*	0	*500*	0	*59*	*23-112*	318.4	*7.56*	*40*	
Surr: Nitrobenzene-d5	*293.7*	0	*500*	0	*58.7*	*31-93*	297.5	*1.29*	*40*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

The following samples were analyzed in this batch:	1211468-01B	1211468-02B	1211468-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44821** Instrument ID **SVMS5** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44821-44821** Units: **µg/L** Analysis Date: **11/19/2012 05:37 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146224** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2-Fluorobiphenyl	*30.56*	0	*50*	0	*61.1*	*32-100*	0			
Surr: 4-Terphenyl-d14	*34.08*	0	*50*	0	*68.2*	*23-112*	0			
Surr: Nitrobenzene-d5	*33.64*	0	*50*	0	*67.3*	*31-93*	0			

LCS Sample ID: **SLCSW1-44821-44821** Units: **µg/L** Analysis Date: **11/19/2012 06:10 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146225** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	12.6	5.0	20	0	63	45-110	0			
Acenaphthylene	12.89	5.0	20	0	64.4	50-105	0			
Anthracene	13.15	5.0	20	0	65.8	55-110	0			
Benzo(a)anthracene	13.39	5.0	20	0	67	55-110	0			
Benzo(a)pyrene	14.04	5.0	20	0	70.2	55-110	0			
Benzo(b)fluoranthene	16.12	5.0	20	0	80.6	45-120	0			
Benzo(g,h,i)perylene	13.69	5.0	20	0	68.4	40-125	0			
Benzo(k)fluoranthene	12.98	5.0	20	0	64.9	45-125	0			
Chrysene	14.26	5.0	20	0	71.3	55-110	0			
Dibenzo(a,h)anthracene	13.81	5.0	20	0	69	40-125	0			
Fluoranthene	14.52	5.0	20	0	72.6	55-115	0			
Fluorene	12.93	5.0	20	0	64.6	50-110	0			
Indeno(1,2,3-cd)pyrene	13.98	5.0	20	0	69.9	45-125	0			
Phenanthrene	12.84	5.0	20	0	64.2	50-115	0			
Pyrene	14.55	5.0	20	0	72.8	50-130	0			
Surr: 2-Fluorobiphenyl	*28.83*	0	*50*	0	*57.7*	*32-100*	0			
Surr: 4-Terphenyl-d14	*29.01*	0	*50*	0	*58*	*23-112*	0			
Surr: Nitrobenzene-d5	*30.78*	0	*50*	0	*61.6*	*31-93*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44821** Instrument ID **SVMS5** Method: **SW8270**

MS Sample ID: **1211468-08B MS** Units: **µg/L** Analysis Date: **11/19/2012 05:57 PM**
Client ID: **WSE11131110JTC3** Run ID: **SVMS6_121119A** SeqNo: **2146005** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	129.2	50	200	0	64.6	45-110	0			
Acenaphthylene	132.9	50	200	0	66.4	50-105	0			
Anthracene	141.5	50	200	0	70.8	55-110	0			
Benzo(a)anthracene	150	50	200	0	75	55-110	0			
Benzo(a)pyrene	154.2	50	200	0	77.1	55-110	0			
Benzo(b)fluoranthene	158.7	50	200	0	79.4	45-120	0			
Benzo(g,h,i)perylene	65.7	50	200	0	32.8	40-125	0			S
Benzo(k)fluoranthene	186.8	50	200	0	93.4	45-125	0			
Chrysene	145.8	50	200	0	72.9	55-110	0			
Dibenzo(a,h)anthracene	85.7	50	200	0	42.8	40-125	0			
Fluoranthene	147.8	50	200	0	73.9	55-115	0			
Fluorene	140.9	50	200	0	70.4	50-110	0			
Indeno(1,2,3-cd)pyrene	101.9	50	200	0	51	45-125	0			
Phenanthrene	136.1	50	200	0	68	50-115	0			
Pyrene	148.3	50	200	0	74.2	50-130	0			
Surr: 2-Fluorobiphenyl	*278.3*	0	*500*	0	*55.7*	*32-100*	0			
Surr: 4-Terphenyl-d14	*360.4*	0	*500*	0	*72.1*	*23-112*	0			
Surr: Nitrobenzene-d5	*313.1*	0	*500*	0	*62.6*	*31-93*	0			

MS Sample ID: **1211438-63B MS** Units: **µg/L** Analysis Date: **11/19/2012 06:42 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146227** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	260.8	50	400	0	65.2	45-110	0			
Acenaphthylene	277.3	50	400	0	69.3	50-105	0			
Anthracene	297.3	50	400	0	74.3	55-110	0			
Benzo(a)anthracene	288.3	50	400	0	72.1	55-110	0			
Benzo(a)pyrene	291.4	50	400	0	72.8	55-110	0			
Benzo(b)fluoranthene	355.2	50	400	0	88.8	45-120	0			
Benzo(g,h,i)perylene	276.3	50	400	0	69.1	40-125	0			
Benzo(k)fluoranthene	273.4	50	400	0	68.4	45-125	0			
Chrysene	288.4	50	400	0	72.1	55-110	0			
Dibenzo(a,h)anthracene	286.5	50	400	0	71.6	40-125	0			
Fluoranthene	320.2	50	400	0	80	55-115	0			
Fluorene	285.1	50	400	0	71.3	50-110	0			
Indeno(1,2,3-cd)pyrene	281.4	50	400	0	70.4	45-125	0			
Phenanthrene	288.6	50	400	0	72.2	50-115	0			
Pyrene	308.9	50	400	0	77.2	50-130	0			
Surr: 2-Fluorobiphenyl	*301.5*	0	*500*	0	*60.3*	*32-100*	0			
Surr: 4-Terphenyl-d14	*194.4*	0	*500*	0	*38.9*	*23-112*	0			
Surr: Nitrobenzene-d5	*325.2*	0	*500*	0	*65*	*31-93*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44821** Instrument ID **SVMS5** Method: **SW8270**

MSD Sample ID: **1211468-08B MSD** Units: **µg/L** Analysis Date: **11/19/2012 06:22 PM**
Client ID: **WSE11131110JTC3** Run ID: **SVMS6_121119A** SeqNo: **2146006** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	131.3	50	200	0	65.6	45-110	129.2	1.61	30	
Acenaphthylene	136.2	50	200	0	68.1	50-105	132.9	2.45	30	
Anthracene	141.5	50	200	0	70.8	55-110	141.5	0	30	
Benzo(a)anthracene	150.2	50	200	0	75.1	55-110	150	0.133	30	
Benzo(a)pyrene	153.2	50	200	0	76.6	55-110	154.2	0.651	30	
Benzo(b)fluoranthene	153.1	50	200	0	76.6	45-120	158.7	3.59	30	
Benzo(g,h,i)perylene	72.1	50	200	0	36	40-125	65.7	9.29	30	S
Benzo(k)fluoranthene	183	50	200	0	91.5	45-125	186.8	2.06	30	
Chrysene	145.2	50	200	0	72.6	55-110	145.8	0.412	30	
Dibenzo(a,h)anthracene	92.6	50	200	0	46.3	40-125	85.7	7.74	30	
Fluoranthene	147	50	200	0	73.5	55-115	147.8	0.543	30	
Fluorene	142.9	50	200	0	71.4	50-110	140.9	1.41	30	
Indeno(1,2,3-cd)pyrene	109.8	50	200	0	54.9	45-125	101.9	7.46	30	
Phenanthrene	137.2	50	200	0	68.6	50-115	136.1	0.805	30	
Pyrene	148.1	50	200	0	74	50-130	148.3	0.135	30	
Surr: 2-Fluorobiphenyl	*284.4*	0	*500*	0	*56.9*	*32-100*	278.3	*2.17*	*40*	
Surr: 4-Terphenyl-d14	*311.5*	0	*500*	0	*62.3*	*23-112*	360.4	*14.6*	*40*	
Surr: Nitrobenzene-d5	*324*	0	*500*	0	*64.8*	*31-93*	313.1	*3.42*	*40*	

MSD Sample ID: **1211438-63B MSD** Units: **µg/L** Analysis Date: **11/19/2012 07:15 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146228** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	129.4	50	200	0	64.7	45-110	260.8	67.4	30	R
Acenaphthylene	135.7	50	200	0	67.8	50-105	277.3	68.6	30	R
Anthracene	138.2	50	200	0	69.1	55-110	297.3	73.1	30	R
Benzo(a)anthracene	141.9	50	200	0	71	55-110	288.3	68.1	30	R
Benzo(a)pyrene	142.9	50	200	0	71.4	55-110	291.4	68.4	30	R
Benzo(b)fluoranthene	150.7	50	200	0	75.4	45-120	355.2	80.8	30	R
Benzo(g,h,i)perylene	145.6	50	200	0	72.8	40-125	276.3	62	30	R
Benzo(k)fluoranthene	142.8	50	200	0	71.4	45-125	273.4	62.8	30	R
Chrysene	144.4	50	200	0	72.2	55-110	288.4	66.5	30	R
Dibenzo(a,h)anthracene	141.9	50	200	0	71	40-125	286.5	67.5	30	R
Fluoranthene	151.4	50	200	0	75.7	55-115	320.2	71.6	30	R
Fluorene	136	50	200	0	68	50-110	285.1	70.8	30	R
Indeno(1,2,3-cd)pyrene	142.6	50	200	0	71.3	45-125	281.4	65.5	30	R
Phenanthrene	135.9	50	200	0	68	50-115	288.6	71.9	30	R
Pyrene	148.2	50	200	0	74.1	50-130	308.9	70.3	30	R
Surr: 2-Fluorobiphenyl	*298.2*	0	*500*	0	*59.6*	*32-100*	301.5	*1.1*	*40*	
Surr: 4-Terphenyl-d14	*275.9*	0	*500*	0	*55.2*	*23-112*	194.4	*34.7*	*40*	
Surr: Nitrobenzene-d5	*316.8*	0	*500*	0	*63.4*	*31-93*	325.2	*2.62*	*40*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211468
Project: Marshall Surface Water 11/3/12

QC BATCH REPORT

Batch ID: **44821** Instrument ID **SVMS5** Method: **SW8270**

The following samples were analyzed in this batch:

1211468-04B	1211468-05B	1211468-06B
1211468-07B	1211468-08B	1211468-09B
1211468-10B	1211468-11B	1211468-12B
1211468-13B	1211468-14B	1211468-15B
1211468-16B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211468

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111312_JTC1	Task: SWMON
Total # of Samples: 16		Event Complete?

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State,	Houson, TX Phone #: 713-821-2000
Lab PM:	Ann Preston	City	Grand Rapids State, Zip MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

Turn Around Time	5 Day	Rush	No	

BILLING CODE: 7.00

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative: HNO3	Preservative: None	Analysis: Be,Mo,V	Analysis: PNAs by 8270
1	WSE11131053JTC1	ML-10	WS	G	11/13/2012 10:53	3				X	X
2	WSE11131043JTC1	ML-7	WS	G	11/13/2012 10:43	3				X	X
3	WSB11131635JTC1	SW-105	WS	G	11/13/2012 16:35	3				X	X
4	WSE11131157JTC1	SW-110	WS	G	11/13/2012 11:57	3				X	X
5	WSF11130845JTC1	SW-112	WS	G	11/13/2012 08:45	3				X	X
6	WSE11131255JTC1	SW-115	WS	G	11/13/2012 12:55	3				X	X
7	WSE11131315JTC1	SW-120	WS	G	11/13/2012 13:15	3				X	X
8	WSE11131110JTC3	SW-935	WS	G	11/13/2012 11:10	9	MS/MSD			X	X
9	WSE11131035JTC1	SW-937	WS	G	11/13/2012 10:35	3				X	X
10	WSC11131600JTC1	SWKR0510C01	WS	G	11/13/2012 16:00	3				X	X
11	WSC11131600JTC2	SWKR0510C01	WS	G	11/13/2012 16:00	3	DUPLICATE			X	X
12	WSC11131535JTC1	SWKR0600C01	WS	G	11/13/2012 15:35	3				X	X
13	WSC11131445JTC1	SWKR1480C01	WS	G	11/13/2012 14:45	3				X	X
14	WSC11131412JTC1	SWKR1565C01	WS	G	11/13/2012 14:12	3				X	X
15	WSE11131345JTC1	SWKR1948C01	WS	G	11/13/2012 13:45	3				X	X
16	WSE11130915JTC1	SWKR3980C01	WS	G	11/13/2012 09:15	3				X	X

Additional Comments/Special Instructions:

3.2 5.0°C

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	11-14-12	1045		11-14-12	1045
	11-14-12	1500		11/14/12	1700

SHIPPING INFO:	SAMPLER NAME AND SIGNATURE			
Company:	PRINT Name of SAMPLER:	JON CARVETH (JTC1), LORRI LEGO		
Tracking #:	SIGNATURE of SAMPLER:	DATE Signed	Time:	

Sample Receipt Conditions				
	Y/N	Y/N	Y/N	
32-5.0°C	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	
Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?	

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 17:00**

Work Order: **1211468** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Surface Water
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2 - 5.0 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:54:54 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

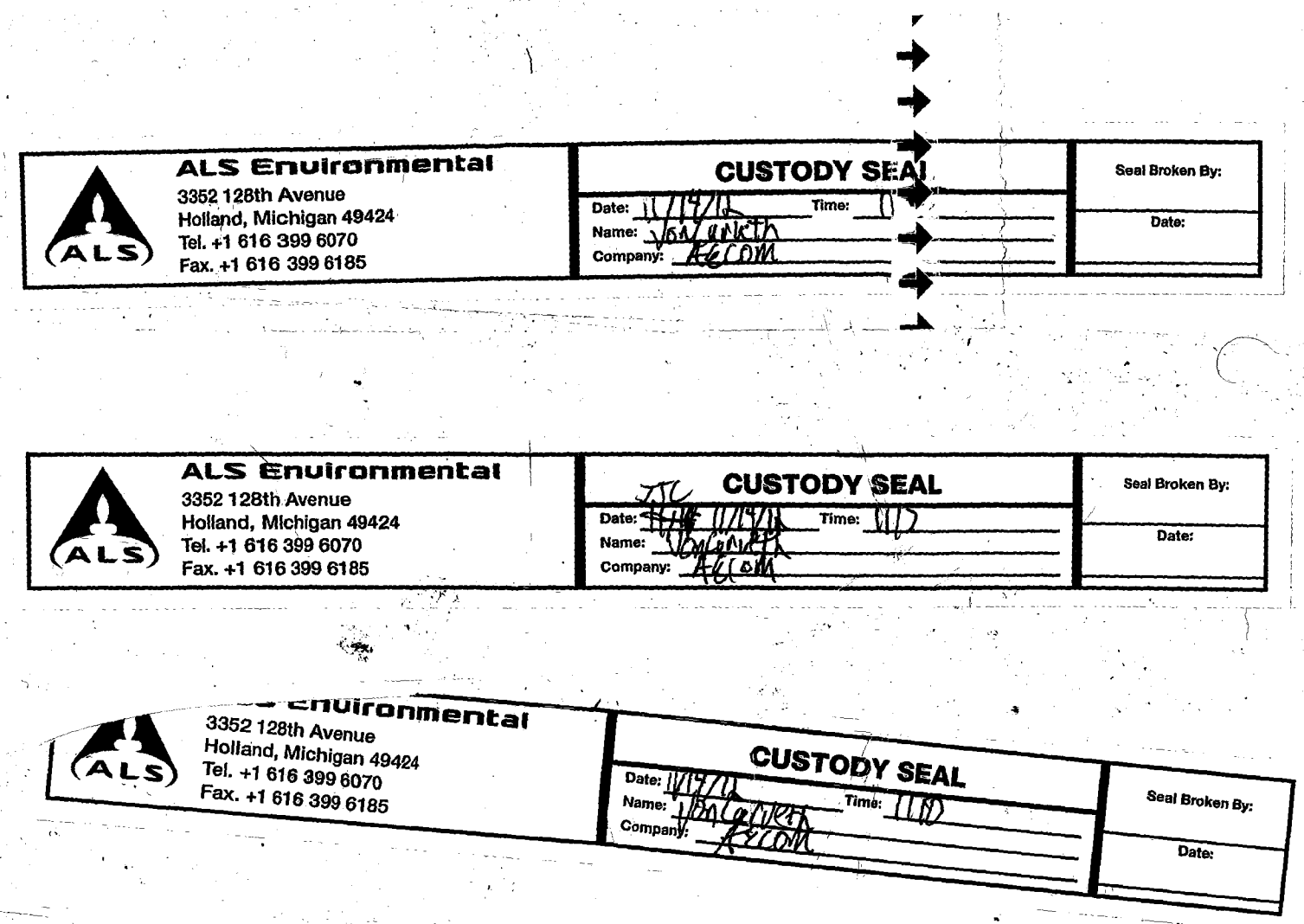
Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

SW



ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: 11/14/12 Time: 11
Name: Von Lunketh
Company: AECOM

Seal Broken By:
Date:

5.0

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: ~~11/14~~ JJC 11/14/12 Time: 1115
Name: Von Lunketh
Company: AECOM

Seal Broken By:
Date:

4.80

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
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CUSTODY SEAL
Date: 11/14/12 Time: 1110
Name: Von Lunketh
Company: AECOM

Seal Broken By:
Date:

3.2

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix B

Remedial Investigation Activities

Analytical Data Reports

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

13-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1075, 1100 11/2/12** Work Order: **1211096**

Dear Bryan,

ALS Environmental received 8 samples on 02-Nov-2012 04:30 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 71.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 13-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1075, 1100 11/2/12
Work Order: **1211096**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211096-01	SBKR1075R507S110212S004	Soil		11/2/2012 08:40	11/2/2012 16:30	☐
1211096-02	SBKR1100R502S110212S007	Soil		11/2/2012 09:28	11/2/2012 16:30	☐
1211096-03	SBKR1100R502D110212S007	Soil		11/2/2012 09:28	11/2/2012 16:30	☐
1211096-04	SBKR1100R503S110212S007	Soil		11/2/2012 10:55	11/2/2012 16:30	☐
1211096-05	SBKR1100R504S110212S006	Soil		11/2/2012 13:48	11/2/2012 16:30	☐
1211096-06	SBKR1100R505S110212S004	Soil		11/2/2012 14:52	11/2/2012 16:30	☐
1211096-07	SBKR1100R506S110212S005	Soil		11/2/2012 15:49	11/2/2012 16:30	☐
1211096-08	SBKR1100R506T110212MX	Soil		11/2/2012	11/2/2012 16:30	☐

Client: AECOM Environment
Project: Marshall KRRI 1075, 1100 11/2/12
Work Order: 1211096

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44561 sample 1211096-05 acid surrogate recovery was low. None of the reported PAH compounds are associated with this surrogate. No data requires qualification for this compound. Sample SBKR1100R504S110212S006 MS/MSD recoveries for Benzo(g,h,i)perylene were below control limits. The corresponding result in the parent sample may be biased low for this PAH compound. The MSD recovery for Indeno(1,2,3-cd)pyrene was below control limits. Both the MS recovery and RPD met quality control criteria. No data requires qualification. The RPD between the MS/MSD recoveries for Benzo (k)fluoranthen was above control limits. The individual MS/MSD recoveries met quality control criteria. No data requires qualification for this compound.

Batch 44561 sample 1211096-06 PAH internal standard recovery was below the lower control limit, but >20%. Per the client's request, the results associated with the IS are being reported and should be considered as estimated for the compounds marked with an asterisk.

Batch 44562 sample SBKR1100R504S110212S006 MS/MSD recoveries for DRO/ORO were below control limits. The corresponding results in the parent sample may be biased low for DRO/ORO.

Batch 44564 LCS recovery for trans-1,4-dichloro-2-butene was below the lower control limit, but within the Sporadic Marginal Exceedence limit for an analyte that is not a project-specific analyte of concern. No qualification is necessary for this analyte. The MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification. The sample SBKR1100R504S110212S006 MSD recovery for p-Isopropyltoluene was below control limits. Both the MS recovery and RPD met quality control criteria. No data requires qualification.

Batch 44573 sample SBKR1100R504S110212S006 MS/MSD recoveries for Vanadium were above control limits. The corresponding result in the parent sample may be biased high for Vanadium.

Batch R112165 Duplicate data for % Moisture is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 13-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1075, 1100 11/2/12
WorkOrder: **1211096**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R507S110212S004
Work Order:	1211096	**Collection Date:**	11/2/2012 8:40:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**70**	**12**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**180**	**24**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.0*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **RH**
Beryllium	ND	0.66	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/8/2012
Nickel	**5.6**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/8/2012
Vanadium	**17**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/8/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*83.5*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*71.2*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*78.3*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*109*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*68.7*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*67.1*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R507S110212S004
Work Order:	1211096	**Collection Date:**	11/2/2012 8:40:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	37	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	37	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R507S110212S004
Work Order:	1211096	**Collection Date:**	11/2/2012 8:40:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*97.1*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*97.2*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*100*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**19**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R502S110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 9:28:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**77**	**13**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**220**	**27**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.9*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **RH**
Beryllium	ND	0.81	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	2.0	1.0		mg/Kg-dry	4	11/8/2012
Nickel	**13**	**2.0**	**1.0**		**mg/Kg-dry**	4	11/8/2012
Vanadium	**25**	**2.0**	**1.0**		**mg/Kg-dry**	4	11/8/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*76.7*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*66.7*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*71.9*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*101*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*65.3*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*62.6*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R502S110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 9:28:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	43	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	43	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R502S110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 9:28:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	43	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*98.9*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*96.2*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*95.6*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*98.2*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**30**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R502D110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 9:28:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**88**	**14**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**250**	**29**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*77.4*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **RH**
Beryllium	ND	0.86	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	2.1	1.0		mg/Kg-dry	4	11/8/2012
Nickel	**14**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/8/2012
Vanadium	**26**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/8/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*87.7*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*71.0*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*78.7*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*111*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*70.0*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*68.6*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R502D110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 9:28:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	44	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	44	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R502D110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 9:28:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	44	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*99.8*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*95.3*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*98.4*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*98.0*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**31**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R503S110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 10:55:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**21**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**500**	**43**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.0*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**29**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**25**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	**560**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(a)pyrene	**690**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(b)fluoranthene	**1,300**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	**550**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Chrysene	**550**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	**870**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	**810**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*80.8*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*63.3*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*67.0*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*100*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*60.0*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*54.6*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	68	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	68	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	68	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	68	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R503S110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 10:55:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	68	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	68	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	68	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	68	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	68	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	68	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	68	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	68	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	68	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	68	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	68	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R503S110212S007
Work Order:	1211096	**Collection Date:**	11/2/2012 10:55:00 AM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	68	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	68	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	68	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	68	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	68	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	68	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	68	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	68	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	68	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	68	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	68	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	68	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*98.8*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*96.8*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*95.4*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*99.8*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**56**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R504S110212S006
Work Order:	1211096	**Collection Date:**	11/2/2012 1:48:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**220**	**19**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**1,600**	**37**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.2*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**21**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**22**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(a)pyrene	**570**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(b)fluoranthene	**820**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Chrysene	**690**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	**630**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*69.2*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*61.8*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*57.5*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*84.8*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*53.1*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*29.0*	*40-106*		S	*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	160	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	160	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	160	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	160	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	160	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R504S110212S006
Work Order:	1211096	**Collection Date:**	11/2/2012 1:48:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	160	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	160	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	160	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	160	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	160	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	550	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,400	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	160	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	160	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	160	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	160	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	160	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	160	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	160	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	550	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	160	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	160	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R504S110212S006
Work Order:	1211096	**Collection Date:**	11/2/2012 1:48:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	160	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	330	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	160	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	160	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	550	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	160	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	160	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	160	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	160	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	160	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	160	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	160	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	160	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	160	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	160	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*99.4*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*96.6*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*98.4*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R505S110212S004
Work Order:	1211096	**Collection Date:**	11/2/2012 2:52:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**1,800**	**200**	**4.0**		**mg/Kg-dry**	10	11/6/2012
ORO (C20-C34)	**7,000**	**400**	**4.0**		**mg/Kg-dry**	10	11/6/2012
Surr: 4-Terphenyl-d14	*98.0*	*39-115*			*%REC*	10	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**26**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**25**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(a)pyrene	**1,000**	**330**	**330**	*	**µg/Kg-dry**	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330	*	µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330	*	µg/Kg-dry	1	11/6/2012
Chrysene	**1,600**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	11/6/2012
Fluoranthene	**970**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	**400**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Pyrene	**1,400**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*69.5*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*71.4*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*80.8*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*136*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*75.1*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*67.1*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	62	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	62	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	62	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	62	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R505S110212S004
Work Order:	1211096	**Collection Date:**	11/2/2012 2:52:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	62	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	62	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	62	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	62	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	62	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	62	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	62	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	62	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	62	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R505S110212S004
Work Order:	1211096	**Collection Date:**	11/2/2012 2:52:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	62	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	62	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	62	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	62	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	62	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	62	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	62	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	62	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*99.2*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*97.6*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*101*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**52**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R506S110212S005
Work Order:	1211096	**Collection Date:**	11/2/2012 3:49:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**20**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**280**	**41**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.1*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	3.2	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**20**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**19**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*76.8*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*67.8*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*72.2*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*100*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*66.0*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*62.3*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	65	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	65	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	65	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	65	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R506S110212S005
Work Order:	1211096	**Collection Date:**	11/2/2012 3:49:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	65	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	65	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	65	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	65	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	65	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	65	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	65	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	65	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	65	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	65	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	65	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R506S110212S005
Work Order:	1211096	**Collection Date:**	11/2/2012 3:49:00 PM
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	65	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	130	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	65	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	65	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	65	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	65	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	65	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	65	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	65	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	65	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	65	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	65	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	65	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*98.5*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*95.0*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*96.2*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*99.1*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**53**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R506T110212MX
Work Order:	1211096	**Collection Date:**	11/2/2012
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/6/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/6/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/6/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/6/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/6/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/6/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/6/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/6/2012
Benzene	ND	50	50		µg/Kg	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/6/2012
Bromoform	ND	100	100		µg/Kg	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/6/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/6/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg	1	11/6/2012
Chloroform	ND	50	50		µg/Kg	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg	1	11/6/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/6/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R506T110212MX
Work Order:	1211096	**Collection Date:**	11/2/2012
Project:	Marshall KRRI 1075, 1100 11/2/12		
Lab ID:	1211096-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/6/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/6/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg	1	11/6/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/6/2012
o-Xylene	ND	50	50		µg/Kg	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/6/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/6/2012
Styrene	ND	50	50		µg/Kg	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/6/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/6/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/6/2012
Toluene	ND	100	100		µg/Kg	1	11/6/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/6/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/6/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/6/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*99.6*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*103*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*95.4*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*98.2*	*70-130*			*%REC*	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44562** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44562-44562** Units: **mg/Kg** Analysis Date: **11/6/2012 02:30 PM**

Client ID: Run ID: **GC8_121106A** SeqNo: **2132560** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.376*	0	*5*	0	*67.5*	*39-115*	0			

LCS Sample ID: **DLCSS1-44562-44562** Units: **mg/Kg** Analysis Date: **11/6/2012 02:57 PM**

Client ID: Run ID: **GC8_121106A** SeqNo: **2132561** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	331	10	500	0	66.2	49-124	0			
ORO (C20-C34)	392.8	20	500	0	78.6	60-130	0			
Surr: 4-Terphenyl-d14	*4.308*	0	*5*	0	*86.2*	*39-115*	0			

MS Sample ID: **1211096-05B MS** Units: **mg/Kg** Analysis Date: **11/6/2012 03:24 PM**

Client ID: **SBKR1100R504S110212S006** Run ID: **GC8_121106A** SeqNo: **2132562** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	326.1	9.9	494.4	113	43.1	60-130	0			S
ORO (C20-C34)	666.8	20	494.4	851.4	-37.3	60-130	0			S
Surr: 4-Terphenyl-d14	*4.013*	0	*4.944*	0	*81.2*	*39-115*	0			

MSD Sample ID: **1211096-05B MSD** Units: **mg/Kg** Analysis Date: **11/6/2012 03:51 PM**

Client ID: **SBKR1100R504S110212S006** Run ID: **GC8_121106A** SeqNo: **2132563** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	327.3	9.2	459.4	113	46.7	60-130	326.1	0.357	30	S
ORO (C20-C34)	801.6	18	459.4	851.4	-10.8	60-130	666.8	18.3	30	S
Surr: 4-Terphenyl-d14	*4.265*	0	*4.594*	0	*92.8*	*39-115*	4.013	*6.09*	*30*	

The following samples were analyzed in this batch:

1211096-01B	1211096-02B	1211096-03B
1211096-04B	1211096-05B	1211096-06B
1211096-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44560** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44560-44560** Units: **mg/Kg** Analysis Date: **11/7/2012 03:38 PM**
Client ID: Run ID: **ICPMS2_121107A** SeqNo: **2133305** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01127	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44560-44560** Units: **mg/Kg** Analysis Date: **11/7/2012 03:43 PM**
Client ID: Run ID: **ICPMS2_121107A** SeqNo: **2133306** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.879	0.10	5	0	97.6	80-120	0			
Molybdenum	4.808	0.25	5	0	96.2	80-120	0			
Nickel	4.674	0.25	5	0	93.5	80-120	0			
Vanadium	4.77	0.25	5	0	95.4	80-120	0			

MS Sample ID: **1211016-34CMS** Units: **mg/Kg** Analysis Date: **11/7/2012 04:18 PM**
Client ID: Run ID: **ICPMS2_121107A** SeqNo: **2133312** Prep Date: **11/6/2012** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.625	1.4	6.849	0.08852	95.4	75-125	0			
Molybdenum	7.37	3.4	6.849	1.145	90.9	75-125	0			
Nickel	12.42	3.4	6.849	6.364	88.5	75-125	0			
Vanadium	14.52	3.4	6.849	6.389	119	75-125	0			

MSD Sample ID: **1211016-34CMSD** Units: **mg/Kg** Analysis Date: **11/7/2012 04:25 PM**
Client ID: Run ID: **ICPMS2_121107A** SeqNo: **2133313** Prep Date: **11/6/2012** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.983	1.4	6.983	0.08852	98.7	75-125	6.625	5.27	25	
Molybdenum	7.765	3.5	6.983	1.145	94.8	75-125	7.37	5.23	25	
Nickel	13.27	3.5	6.983	6.364	98.9	75-125	12.42	6.57	25	
Vanadium	14.78	3.5	6.983	6.389	120	75-125	14.52	1.79	25	

The following samples were analyzed in this batch: 1211096-01B 1211096-02B 1211096-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44573** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:17 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132963** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:22 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132964** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.746	0.10	5	0	94.9	80-120	0			
Molybdenum	5.02	0.25	5	0	100	80-120	0			
Nickel	4.94	0.25	5	0	98.8	80-120	0			
Vanadium	4.989	0.25	5	0	99.8	80-120	0			

MS Sample ID: **1211096-05BMS** Units: **mg/Kg** Analysis Date: **11/7/2012 01:39 PM**
Client ID: **SBKR1100R504S110212S006** Run ID: **ICPMS1_121107A** SeqNo: **2132967** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.532	0.55	6.849	0.2574	91.6	75-125	0			
Molybdenum	7.485	1.4	6.849	0.6642	99.6	75-125	0			
Nickel	18.39	1.4	6.849	10.97	108	75-125	0			
Vanadium	21.12	1.4	6.849	11.33	143	75-125	0			S

MSD Sample ID: **1211096-05BMSD** Units: **mg/Kg** Analysis Date: **11/7/2012 01:44 PM**
Client ID: **SBKR1100R504S110212S006** Run ID: **ICPMS1_121107A** SeqNo: **2132968** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.744	0.57	7.184	0.2574	90.3	75-125	6.532	3.21	25	
Molybdenum	7.718	1.4	7.184	0.6642	98.2	75-125	7.485	3.07	25	
Nickel	18.16	1.4	7.184	10.97	100	75-125	18.39	1.26	25	
Vanadium	20.89	1.4	7.184	11.33	133	75-125	21.12	1.05	25	S

The following samples were analyzed in this batch: 1211096-04B 1211096-05B 1211096-06B 1211096-07B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44561-44561** Units: **µg/Kg** Analysis Date: **11/6/2012 04:01 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132702** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3428*	0	*5000*	0	*68.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3641*	0	*5000*	0	*72.8*	*12-100*	0			
Surr: 2-Fluorophenol	*3882*	0	*5000*	0	*77.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5398*	0	*5000*	0	*108*	*25-137*	0			
Surr: Nitrobenzene-d5	*3528*	0	*5000*	0	*70.6*	*37-107*	0			
Surr: Phenol-d6	*3223*	0	*5000*	0	*64.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44561-44561** Units: **µg/Kg** Analysis Date: **11/6/2012 01:56 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132698** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1457	50	2000	0	72.8	45-105	0			
Acenaphthene	1433	50	2000	0	71.6	45-110	0			
Acenaphthylene	1583	50	2000	0	79.2	45-105	0			
Anthracene	1582	50	2000	0	79.1	55-105	0			
Benzo(a)anthracene	1548	50	2000	0	77.4	50-110	0			
Benzo(a)pyrene	1672	50	2000	0	83.6	50-110	0			
Benzo(b)fluoranthene	1685	50	2000	0	84.2	45-115	0			
Benzo(g,h,i)perylene	1824	50	2000	0	91.2	40-125	0			
Benzo(k)fluoranthene	1717	50	2000	0	85.8	45-115	0			
Chrysene	1563	50	2000	0	78.2	55-110	0			
Dibenzo(a,h)anthracene	1637	50	2000	0	81.8	40-125	0			
Fluoranthene	1651	50	2000	0	82.6	55-115	0			
Fluorene	1371	50	2000	0	68.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1635	50	2000	0	81.8	40-120	0			
Naphthalene	1407	50	2000	0	70.4	40-105	0			
Phenanthrene	1580	50	2000	0	79	50-110	0			
Pyrene	1689	50	2000	0	84.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*3886*	0	*5000*	0	*77.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3624*	0	*5000*	0	*72.5*	*12-100*	0			
Surr: 2-Fluorophenol	*3831*	0	*5000*	0	*76.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5628*	0	*5000*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*3658*	0	*5000*	0	*73.2*	*37-107*	0			
Surr: Phenol-d6	*3415*	0	*5000*	0	*68.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1211096-05B MS** Units: **µg/Kg** Analysis Date: **11/6/2012 02:28 PM**
Client ID: **SBKR1100R504S110212S006** Run ID: **SVMS4_121106A** SeqNo: **2132699** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1351	49	1943	0	69.6	45-105	0			
Acenaphthene	1417	49	1943	0	73	45-110	0			
Acenaphthylene	1556	49	1943	0	80.1	45-105	0			
Anthracene	1534	49	1943	0	79	55-105	0			
Benzo(a)anthracene	1823	49	1943	257.5	80.6	50-110	0			
Benzo(a)pyrene	1955	49	1943	296.3	85.4	50-110	0			
Benzo(b)fluoranthene	2342	49	1943	425	98.7	45-115	0			
Benzo(g,h,i)perylene	872.2	49	1943	123	38.6	40-125	0			S
Benzo(k)fluoranthene	2443	49	1943	300.1	110	45-115	0			
Chrysene	2010	49	1943	357.2	85.1	55-110	0			
Dibenzo(a,h)anthracene	940.2	49	1943	0	48.4	40-125	0			
Fluoranthene	2065	49	1943	320.5	89.8	55-115	0			
Fluorene	1363	49	1943	0	70.2	50-110	0			
Indeno(1,2,3-cd)pyrene	919.8	49	1943	123.9	41	40-120	0			
Naphthalene	1186	49	1943	0	61	40-105	0			
Phenanthrene	1612	49	1943	118.1	76.9	50-110	0			
Pyrene	1741	49	1943	325.3	72.9	45-125	0			
Surr: 2,4,6-Tribromophenol	*4082*	0	*4856*	0	*84.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3412*	0	*4856*	0	*70.3*	*12-100*	0			
Surr: 2-Fluorophenol	*2962*	0	*4856*	0	*61*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4563*	0	*4856*	0	*94*	*25-137*	0			
Surr: Nitrobenzene-d5	*2902*	0	*4856*	0	*59.8*	*37-107*	0			
Surr: Phenol-d6	*2918*	0	*4856*	0	*60.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1211096-05B MSD** Units: **µg/Kg** Analysis Date: **11/6/2012 02:59 PM**
Client ID: **SBKR1100R504S110212S006** Run ID: **SVMS4_121106A** SeqNo: **2132700** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1119	48	1916	0	58.4	45-105	1351	18.8	30	
Acenaphthene	1232	48	1916	0	64.3	45-110	1417	14	30	
Acenaphthylene	1373	48	1916	0	71.6	45-105	1556	12.5	30	
Anthracene	1364	48	1916	0	71.2	55-105	1534	11.7	30	
Benzo(a)anthracene	1643	48	1916	257.5	72.3	50-110	1823	10.4	30	
Benzo(a)pyrene	1671	48	1916	296.3	71.8	50-110	1955	15.6	30	
Benzo(b)fluoranthene	2012	48	1916	425	82.9	45-115	2342	15.1	30	
Benzo(g,h,i)perylene	816.1	48	1916	123	36.2	40-125	872.2	6.64	30	S
Benzo(k)fluoranthene	1794	48	1916	300.1	78	45-115	2443	30.6	30	R
Chrysene	1812	48	1916	357.2	76	55-110	2010	10.4	30	
Dibenzo(a,h)anthracene	866.9	48	1916	0	45.2	40-125	940.2	8.11	30	
Fluoranthene	1666	48	1916	320.5	70.2	55-115	2065	21.4	30	
Fluorene	1168	48	1916	0	61	50-110	1363	15.4	30	
Indeno(1,2,3-cd)pyrene	836.2	48	1916	123.9	37.2	40-120	919.8	9.52	30	S
Naphthalene	1059	48	1916	0	55.3	40-105	1186	11.3	30	
Phenanthrene	1456	48	1916	118.1	69.8	50-110	1612	10.2	30	
Pyrene	1471	48	1916	325.3	59.8	45-125	1741	16.8	30	
Surr: 2,4,6-Tribromophenol	*3557*	0	*4789*	0	*74.3*	*34-140*	4082	*13.8*	*40*	
Surr: 2-Fluorobiphenyl	*2946*	0	*4789*	0	*61.5*	*12-100*	3412	*14.6*	*40*	
Surr: 2-Fluorophenol	*2886*	0	*4789*	0	*60.3*	*33-117*	2962	*2.61*	*40*	
Surr: 4-Terphenyl-d14	*3850*	0	*4789*	0	*80.4*	*25-137*	4563	*17*	*40*	
Surr: Nitrobenzene-d5	*2687*	0	*4789*	0	*56.1*	*37-107*	2902	*7.71*	*40*	
Surr: Phenol-d6	*2589*	0	*4789*	0	*54.1*	*40-106*	2918	*11.9*	*40*	

The following samples were analyzed in this batch:

1211096-01B	1211096-02B	1211096-03B
1211096-04B	1211096-05B	1211096-06B
1211096-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/5/2012 05:01 PM**
Client ID: Run ID: **VMS6_121105A** SeqNo: **2131837** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	296	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*973.5*	0	*1000*	0	*97.4*	*70-130*	0
Surr: Dibromofluoromethane	*1018*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1010*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 04:43 AM**
Client ID: Run ID: **VMS6_121105B** SeqNo: **2132026** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*956.5*	0	*1000*	0	*95.6*	*70-130*	0
Surr: Dibromofluoromethane	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*996*	0	*1000*	0	*99.6*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 01:00 PM**
Client ID: Run ID: **VMS8_121106A** SeqNo: **2132777** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	85.5	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	117	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	34	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1004*	0	*1000*	0	*100*	*70-130*	0	
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*70-130*	0	
Surr: Toluene-d8	*968.5*	0	*1000*	0	*96.8*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/7/2012 12:31 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133090** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	72	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	81	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	32	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/L** Analysis Date: **11/8/2012 02:37 PM**
Client ID: Run ID: **VMS5_121108A** SeqNo: **2134602** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1021*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Dibromofluoromethane	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: Toluene-d8	*991.5*	0	*1000*	0	*99.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/9/2012 04:53 PM**
Client ID: Run ID: **VMS5_121109A** SeqNo: **2135683** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	103	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*993*	0	*1000*	0	*99.3*	*70-130*	0
Surr: Dibromofluoromethane	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Toluene-d8	*981*	0	*1000*	0	*98.1*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/5/2012 03:48 PM**
Client ID: Run ID: **VMS6_121105A** SeqNo: **2131836** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	867	30	1000	0	86.7	75-125	0			
1,1,1-Trichloroethane	891.5	30	1000	0	89.2	70-135	0			
1,1,2,2-Tetrachloroethane	838.5	30	1000	0	83.8	55-130	0			
1,1,2-Trichloroethane	890	30	1000	0	89	60-125	0			
1,1-Dichloroethane	881	30	1000	0	88.1	75-125	0			
1,1-Dichloroethene	991	30	1000	0	99.1	65-135	0			
1,2,3-Trichlorobenzene	886.5	30	1000	0	88.6	60-135	0			
1,2,3-Trichloropropane	916	30	1000	0	91.6	65-130	0			
1,2,3-Trimethylbenzene	887.5	30	1000	0	88.8	65-135	0			
1,2,4-Trichlorobenzene	920.5	30	1000	0	92	65-130	0			
1,2,4-Trimethylbenzene	883.5	30	1000	0	88.4	65-135	0			
1,2-Dibromo-3-chloropropane	915.5	30	1000	0	91.6	40-135	0			
1,2-Dibromoethane	887.5	30	1000	0	88.8	70-125	0			
1,2-Dichlorobenzene	862	30	1000	0	86.2	75-120	0			
1,2-Dichloroethane	858.5	30	1000	0	85.8	70-135	0			
1,2-Dichloropropane	876	30	1000	0	87.6	70-120	0			
1,3,5-Trimethylbenzene	855.5	30	1000	0	85.6	65-135	0			
1,3-Dichlorobenzene	881	30	1000	0	88.1	70-125	0			
1,4-Dichlorobenzene	878	30	1000	0	87.8	70-125	0			
2-Butanone	1012	200	1000	0	101	30-160	0			
2-Hexanone	892	30	1000	0	89.2	45-145	0			
4-Methyl-2-pentanone	1194	30	1000	0	119	45-145	0			
Acetone	989	100	1000	0	98.9	20-160	0			B
Acrylonitrile	949	100	1000	0	94.9	70-135	0			
Benzene	913.5	30	1000	0	91.4	75-125	0			
Bromobenzene	900	30	1000	0	90	65-120	0			
Bromochloromethane	878.5	30	1000	0	87.8	70-125	0			
Bromodichloromethane	859.5	30	1000	0	86	70-130	0			
Bromoform	911.5	30	1000	0	91.2	55-135	0			
Bromomethane	1076	75	1000	0	108	30-160	0			
Carbon disulfide	1333	30	1000	0	133	45-160	0			
Carbon tetrachloride	913.5	30	1000	0	91.4	65-135	0			
Chlorobenzene	929	30	1000	0	92.9	75-125	0			
Chloroethane	894.5	100	1000	0	89.4	40-155	0			
Chloroform	887.5	30	1000	0	88.8	70-125	0			
Chloromethane	830	100	1000	0	83	50-130	0			
cis-1,2-Dichloroethene	924	30	1000	0	92.4	65-125	0			
cis-1,3-Dichloropropene	848.5	30	1000	0	84.8	70-125	0			
Dibromochloromethane	857	30	1000	0	85.7	65-135	0			
Dibromomethane	908.5	30	1000	0	90.8	75-130	0			
Dichlorodifluoromethane	833	30	1000	0	83.3	35-135	0			
Ethylbenzene	908	30	1000	0	90.8	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	872	30	1000	0	87.2	70-135	0
Isopropylbenzene	834	30	1000	0	83.4	75-130	0
m,p-Xylene	1813	60	2000	0	90.6	80-125	0
Methyl tert-butyl ether	956	30	1000	0	95.6	75-125	0
Methylene chloride	970.5	30	1000	0	97	55-145	0
Naphthalene	919.5	100	1000	0	92	40-140	0
n-Butylbenzene	845.5	30	1000	0	84.6	65-140	0
n-Propylbenzene	809	30	1000	0	80.9	65-135	0
o-Xylene	912	30	1000	0	91.2	75-125	0
p-Isopropyltoluene	841.5	30	1000	0	84.2	75-135	0
sec-Butylbenzene	857.5	30	1000	0	85.8	65-130	0
Styrene	920.5	30	1000	0	92	75-125	0
tert-Butylbenzene	902	30	1000	0	90.2	65-130	0
Tetrachloroethene	843.5	30	1000	0	84.4	64-140	0
Tetrahydrofuran	1006	200	1000	0	101	70-135	0
Toluene	910.5	30	1000	0	91	70-125	0
trans-1,2-Dichloroethene	952.5	30	1000	0	95.2	65-135	0
trans-1,3-Dichloropropene	883	30	1000	0	88.3	65-125	0
trans-1,4-Dichloro-2-butene	975.5	30	1000	0	97.6	70-135	0
Trichloroethene	893	30	1000	0	89.3	75-125	0
Trichlorofluoromethane	902.5	30	1000	0	90.2	25-185	0
Vinyl chloride	886	30	1000	0	88.6	60-125	0
Surr: 1,2-Dichloroethane-d4	*965*	0	*1000*	0	*96.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*972*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Dibromofluoromethane	*985.5*	0	*1000*	0	*98.6*	*70-130*	0
Surr: Toluene-d8	*1006*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 03:31 AM**
Client ID: Run ID: **VMS6_121105B** SeqNo: **2132025** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	917.5	30	1000	0	91.8	75-125	0			
1,1,1-Trichloroethane	964.5	30	1000	0	96.4	70-135	0			
1,1,2,2-Tetrachloroethane	925	30	1000	0	92.5	55-130	0			
1,1,2-Trichloroethane	952.5	30	1000	0	95.2	60-125	0			
1,1-Dichloroethane	961.5	30	1000	0	96.2	75-125	0			
1,1-Dichloroethene	1054	30	1000	0	105	65-135	0			
1,2,3-Trichlorobenzene	954.5	30	1000	0	95.4	60-135	0			
1,2,3-Trichloropropane	1032	30	1000	0	103	65-130	0			
1,2,3-Trimethylbenzene	948.5	30	1000	0	94.8	65-135	0			
1,2,4-Trichlorobenzene	967.5	30	1000	0	96.8	65-130	0			
1,2,4-Trimethylbenzene	968	30	1000	0	96.8	65-135	0			
1,2-Dibromo-3-chloropropane	969	30	1000	0	96.9	40-135	0			
1,2-Dibromoethane	948	30	1000	0	94.8	70-125	0			
1,2-Dichlorobenzene	939	30	1000	0	93.9	75-120	0			
1,2-Dichloroethane	925	30	1000	0	92.5	70-135	0			
1,2-Dichloropropane	941.5	30	1000	0	94.2	70-120	0			
1,3,5-Trimethylbenzene	928	30	1000	0	92.8	65-135	0			
1,3-Dichlorobenzene	932	30	1000	0	93.2	70-125	0			
1,4-Dichlorobenzene	936	30	1000	0	93.6	70-125	0			
2-Butanone	1208	200	1000	0	121	30-160	0			
2-Hexanone	1042	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1376	30	1000	0	138	45-145	0			
Acetone	1232	100	1000	0	123	20-160	0			
Acrylonitrile	1076	100	1000	0	108	70-135	0			
Benzene	998.5	30	1000	0	99.8	75-125	0			
Bromobenzene	957.5	30	1000	0	95.8	65-120	0			
Bromochloromethane	945	30	1000	0	94.5	70-125	0			
Bromodichloromethane	910	30	1000	0	91	70-130	0			
Bromoform	946	30	1000	0	94.6	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1374	30	1000	0	137	45-160	0			
Carbon tetrachloride	963	30	1000	0	96.3	65-135	0			
Chlorobenzene	993	30	1000	0	99.3	75-125	0			
Chloroethane	992.5	100	1000	0	99.2	40-155	0			
Chloroform	979.5	30	1000	0	98	70-125	0			
Chloromethane	881.5	100	1000	0	88.2	50-130	0			
cis-1,2-Dichloroethene	990.5	30	1000	0	99	65-125	0			
cis-1,3-Dichloropropene	887	30	1000	0	88.7	70-125	0			
Dibromochloromethane	890.5	30	1000	0	89	65-135	0			
Dibromomethane	976.5	30	1000	0	97.6	75-130	0			
Dichlorodifluoromethane	890.5	30	1000	0	89	35-135	0			
Ethylbenzene	983	30	1000	0	98.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	885.5	30	1000	0	88.6	70-135	0
Isopropylbenzene	921	30	1000	0	92.1	75-130	0
m,p-Xylene	1980	60	2000	0	99	80-125	0
Methyl tert-butyl ether	1088	30	1000	0	109	75-125	0
Methylene chloride	1005	30	1000	0	100	55-145	0
Naphthalene	1011	100	1000	0	101	40-140	0
n-Butylbenzene	887	30	1000	0	88.7	65-140	0
n-Propylbenzene	899	30	1000	0	89.9	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	898.5	30	1000	0	89.8	75-135	0
sec-Butylbenzene	935	30	1000	0	93.5	65-130	0
Styrene	983.5	30	1000	0	98.4	75-125	0
tert-Butylbenzene	970.5	30	1000	0	97	65-130	0
Tetrachloroethene	912	30	1000	0	91.2	64-140	0
Tetrahydrofuran	1152	200	1000	0	115	70-135	0
Toluene	980	30	1000	0	98	70-125	0
trans-1,2-Dichloroethene	1028	30	1000	0	103	65-135	0
trans-1,3-Dichloropropene	888	30	1000	0	88.8	65-125	0
trans-1,4-Dichloro-2-butene	875	30	1000	0	87.5	70-135	0
Trichloroethene	977	30	1000	0	97.7	75-125	0
Trichlorofluoromethane	1020	30	1000	0	102	25-185	0
Vinyl chloride	973	30	1000	0	97.3	60-125	0
Surr: 1,2-Dichloroethane-d4	*1029*	0	*1000*	0	*103*	*70-130*	0
Surr: 4-Bromofluorobenzene	*995.5*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Dibromofluoromethane	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*992*	0	*1000*	0	*99.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 11:48 AM**
Client ID: Run ID: **VMS8_121106A** SeqNo: **2132776** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	965	30	1000	0	96.5	75-125	0			
1,1,1-Trichloroethane	965.5	30	1000	0	96.6	70-135	0			
1,1,2,2-Tetrachloroethane	877	30	1000	0	87.7	55-130	0			
1,1,2-Trichloroethane	864.5	30	1000	0	86.4	60-125	0			
1,1-Dichloroethane	959	30	1000	0	95.9	75-125	0			
1,1-Dichloroethene	961.5	30	1000	0	96.2	65-135	0			
1,2,3-Trichlorobenzene	989	30	1000	0	98.9	60-135	0			
1,2,3-Trichloropropane	939.5	30	1000	0	94	65-130	0			
1,2,3-Trimethylbenzene	945	30	1000	0	94.5	65-135	0			
1,2,4-Trichlorobenzene	1068	30	1000	0	107	65-130	0			
1,2,4-Trimethylbenzene	952.5	30	1000	0	95.2	65-135	0			
1,2-Dibromo-3-chloropropane	942.5	30	1000	0	94.2	40-135	0			
1,2-Dibromoethane	963	30	1000	0	96.3	70-125	0			
1,2-Dichlorobenzene	935.5	30	1000	0	93.6	75-120	0			
1,2-Dichloroethane	922	30	1000	0	92.2	70-135	0			
1,2-Dichloropropane	923.5	30	1000	0	92.4	70-120	0			
1,3,5-Trimethylbenzene	987.5	30	1000	0	98.8	65-135	0			
1,3-Dichlorobenzene	975	30	1000	0	97.5	70-125	0			
1,4-Dichlorobenzene	918	30	1000	0	91.8	70-125	0			
2-Butanone	978	200	1000	0	97.8	30-160	0			
2-Hexanone	993	30	1000	0	99.3	45-145	0			
4-Methyl-2-pentanone	1220	30	1000	0	122	45-145	0			
Acetone	1052	100	1000	0	105	20-160	0			B
Acrylonitrile	877	100	1000	0	87.7	70-135	0			
Benzene	935.5	30	1000	0	93.6	75-125	0			
Bromobenzene	989	30	1000	0	98.9	65-120	0			
Bromochloromethane	961.5	30	1000	0	96.2	70-125	0			
Bromodichloromethane	971.5	30	1000	0	97.2	70-130	0			
Bromoform	982.5	30	1000	0	98.2	55-135	0			
Bromomethane	1224	75	1000	0	122	30-160	0			
Carbon disulfide	1041	30	1000	0	104	45-160	0			
Carbon tetrachloride	1034	30	1000	0	103	65-135	0			
Chlorobenzene	980	30	1000	0	98	75-125	0			
Chloroethane	1338	100	1000	0	134	40-155	0			
Chloroform	944.5	30	1000	0	94.4	70-125	0			
Chloromethane	878	100	1000	0	87.8	50-130	0			
cis-1,2-Dichloroethene	970.5	30	1000	0	97	65-125	0			
cis-1,3-Dichloropropene	981	30	1000	0	98.1	70-125	0			
Dibromochloromethane	1037	30	1000	0	104	65-135	0			
Dibromomethane	875	30	1000	0	87.5	75-130	0			
Dichlorodifluoromethane	747.5	30	1000	0	74.8	35-135	0			
Ethylbenzene	972	30	1000	0	97.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	1146	30	1000	0	115	70-135	0
Isopropylbenzene	958	30	1000	0	95.8	75-130	0
m,p-Xylene	1960	60	2000	0	98	80-125	0
Methyl tert-butyl ether	1044	30	1000	0	104	75-125	0
Methylene chloride	968	30	1000	0	96.8	55-145	0
Naphthalene	1027	100	1000	0	103	40-140	0
n-Butylbenzene	1140	30	1000	0	114	65-140	0
n-Propylbenzene	943	30	1000	0	94.3	65-135	0
o-Xylene	962	30	1000	0	96.2	75-125	0
p-Isopropyltoluene	963.5	30	1000	0	96.4	75-135	0
sec-Butylbenzene	976.5	30	1000	0	97.6	65-130	0
Styrene	964	30	1000	0	96.4	75-125	0
tert-Butylbenzene	955.5	30	1000	0	95.6	65-130	0
Tetrachloroethene	943.5	30	1000	0	94.4	64-140	0
Tetrahydrofuran	900	200	1000	0	90	70-135	0
Toluene	937.5	30	1000	0	93.8	70-125	0
trans-1,2-Dichloroethene	990.5	30	1000	0	99	65-135	0
trans-1,3-Dichloropropene	997	30	1000	0	99.7	65-125	0
trans-1,4-Dichloro-2-butene	970.5	30	1000	0	97	70-135	0
Trichloroethene	952.5	30	1000	0	95.2	75-125	0
Trichlorofluoromethane	904.5	30	1000	0	90.4	25-185	0
Vinyl chloride	960.5	30	1000	0	96	60-125	0
Surr: 1,2-Dichloroethane-d4	*991*	0	*1000*	0	*99.1*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*979*	0	*1000*	0	*97.9*	*70-130*	0
Surr: Toluene-d8	*1012*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 11:20 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133089** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	911.5	30	1000	0	91.2	75-125	0			
1,1,1-Trichloroethane	906.5	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	848	30	1000	0	84.8	55-130	0			
1,1,2-Trichloroethane	843.5	30	1000	0	84.4	60-125	0			
1,1-Dichloroethane	861.5	30	1000	0	86.2	75-125	0			
1,1-Dichloroethene	856.5	30	1000	0	85.6	65-135	0			
1,2,3-Trichlorobenzene	982	30	1000	0	98.2	60-135	0			
1,2,3-Trichloropropane	927	30	1000	0	92.7	65-130	0			
1,2,3-Trimethylbenzene	919.5	30	1000	0	92	65-135	0			
1,2,4-Trichlorobenzene	1042	30	1000	0	104	65-130	0			
1,2,4-Trimethylbenzene	925	30	1000	0	92.5	65-135	0			
1,2-Dibromo-3-chloropropane	905.5	30	1000	0	90.6	40-135	0			
1,2-Dibromoethane	940.5	30	1000	0	94	70-125	0			
1,2-Dichlorobenzene	933.5	30	1000	0	93.4	75-120	0			
1,2-Dichloroethane	889	30	1000	0	88.9	70-135	0			
1,2-Dichloropropane	886.5	30	1000	0	88.6	70-120	0			
1,3,5-Trimethylbenzene	923.5	30	1000	0	92.4	65-135	0			
1,3-Dichlorobenzene	934	30	1000	0	93.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	929	200	1000	0	92.9	30-160	0			
2-Hexanone	986	30	1000	0	98.6	45-145	0			
4-Methyl-2-pentanone	1223	30	1000	0	122	45-145	0			
Acetone	977	100	1000	0	97.7	20-160	0			
Acrylonitrile	852.5	100	1000	0	85.2	70-135	0			
Benzene	884	30	1000	0	88.4	75-125	0			
Bromobenzene	906.5	30	1000	0	90.6	65-120	0			
Bromochloromethane	891	30	1000	0	89.1	70-125	0			
Bromodichloromethane	916	30	1000	0	91.6	70-130	0			
Bromoform	945	30	1000	0	94.5	55-135	0			
Bromomethane	1029	75	1000	0	103	30-160	0			
Carbon disulfide	926.5	30	1000	0	92.6	45-160	0			
Carbon tetrachloride	937.5	30	1000	0	93.8	65-135	0			
Chlorobenzene	943.5	30	1000	0	94.4	75-125	0			
Chloroethane	1206	100	1000	0	121	40-155	0			
Chloroform	880	30	1000	0	88	70-125	0			
Chloromethane	784.5	100	1000	0	78.4	50-130	0			
cis-1,2-Dichloroethene	883.5	30	1000	0	88.4	65-125	0			
cis-1,3-Dichloropropene	928	30	1000	0	92.8	70-125	0			
Dibromochloromethane	936.5	30	1000	0	93.6	65-135	0			
Dibromomethane	891	30	1000	0	89.1	75-130	0			
Dichlorodifluoromethane	654.5	30	1000	0	65.4	35-135	0			
Ethylbenzene	932	30	1000	0	93.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	939.5	30	1000	0	94	70-135	0
Isopropylbenzene	909	30	1000	0	90.9	75-130	0
m,p-Xylene	1901	60	2000	0	95	80-125	0
Methyl tert-butyl ether	996.5	30	1000	0	99.6	75-125	0
Methylene chloride	870	30	1000	0	87	55-145	0
Naphthalene	1144	100	1000	0	114	40-140	0
n-Butylbenzene	1028	30	1000	0	103	65-140	0
n-Propylbenzene	875.5	30	1000	0	87.6	65-135	0
o-Xylene	943	30	1000	0	94.3	75-125	0
p-Isopropyltoluene	871.5	30	1000	0	87.2	75-135	0
sec-Butylbenzene	876.5	30	1000	0	87.6	65-130	0
Styrene	945.5	30	1000	0	94.6	75-125	0
tert-Butylbenzene	881.5	30	1000	0	88.2	65-130	0
Tetrachloroethene	921.5	30	1000	0	92.2	64-140	0
Tetrahydrofuran	900	200	1000	0	90	70-135	0
Toluene	905.5	30	1000	0	90.6	70-125	0
trans-1,2-Dichloroethene	895.5	30	1000	0	89.6	65-135	0
trans-1,3-Dichloropropene	933	30	1000	0	93.3	65-125	0
trans-1,4-Dichloro-2-butene	861.5	30	1000	0	86.2	70-135	0
Trichloroethene	919.5	30	1000	0	92	75-125	0
Trichlorofluoromethane	852.5	30	1000	0	85.2	25-185	0
Vinyl chloride	872.5	30	1000	0	87.2	60-125	0
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*994.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Dibromofluoromethane	*1008*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/L** Analysis Date: **11/8/2012 01:00 PM**
Client ID: Run ID: **VMS5_121108A** SeqNo: **2134601** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	958.5	30	1000	0	95.8	75-125	0			
1,1,1-Trichloroethane	1026	30	1000	0	103	70-135	0			
1,1,2,2-Tetrachloroethane	836	30	1000	0	83.6	55-130	0			
1,1,2-Trichloroethane	915.5	30	1000	0	91.6	60-125	0			
1,1-Dichloroethane	952.5	30	1000	0	95.2	75-125	0			
1,1-Dichloroethene	1048	30	1000	0	105	65-135	0			
1,2,3-Trichlorobenzene	914.5	30	1000	0	91.4	60-135	0			
1,2,3-Trichloropropane	854	30	1000	0	85.4	65-130	0			
1,2,3-Trimethylbenzene	930.5	30	1000	0	93	65-135	0			
1,2,4-Trichlorobenzene	986	30	1000	0	98.6	65-130	0			
1,2,4-Trimethylbenzene	959	30	1000	0	95.9	65-135	0			
1,2-Dibromo-3-chloropropane	735	30	1000	0	73.5	40-135	0			
1,2-Dibromoethane	917	30	1000	0	91.7	70-125	0			
1,2-Dichlorobenzene	946.5	30	1000	0	94.6	75-120	0			
1,2-Dichloroethane	910	30	1000	0	91	70-135	0			
1,2-Dichloropropane	946.5	30	1000	0	94.6	70-120	0			
1,3,5-Trimethylbenzene	983	30	1000	0	98.3	65-135	0			
1,3-Dichlorobenzene	964.5	30	1000	0	96.4	70-125	0			
1,4-Dichlorobenzene	964	30	1000	0	96.4	70-125	0			
2-Butanone	827	200	1000	0	82.7	30-160	0			
2-Hexanone	809.5	30	1000	0	81	45-145	0			
4-Methyl-2-pentanone	862	30	1000	0	86.2	45-145	0			
Acetone	810	100	1000	0	81	20-160	0			
Acrylonitrile	886	100	1000	0	88.6	70-135	0			
Benzene	989	30	1000	0	98.9	75-125	0			
Bromobenzene	923.5	30	1000	0	92.4	65-120	0			
Bromochloromethane	982	30	1000	0	98.2	70-125	0			
Bromodichloromethane	945.5	30	1000	0	94.6	70-130	0			
Bromoform	901	30	1000	0	90.1	55-135	0			
Bromomethane	1398	75	1000	0	140	30-160	0			
Carbon disulfide	1148	30	1000	0	115	45-160	0			
Carbon tetrachloride	1034	30	1000	0	103	65-135	0			
Chlorobenzene	960.5	30	1000	0	96	75-125	0			
Chloroethane	1008	100	1000	0	101	40-155	0			
Chloroform	953.5	30	1000	0	95.4	70-125	0			
Chloromethane	913	100	1000	0	91.3	50-130	0			
cis-1,2-Dichloroethene	1000	30	1000	0	100	65-125	0			
cis-1,3-Dichloropropene	964	30	1000	0	96.4	70-125	0			
Dibromochloromethane	918.5	30	1000	0	91.8	65-135	0			
Dibromomethane	878	30	1000	0	87.8	75-130	0			
Dichlorodifluoromethane	895.5	30	1000	0	89.6	35-135	0			
Ethylbenzene	976.5	30	1000	0	97.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	1014	30	1000	0	101	70-135	0
Isopropylbenzene	985	30	1000	0	98.5	75-130	0
m,p-Xylene	1950	60	2000	0	97.5	80-125	0
Methyl tert-butyl ether	1002	30	1000	0	100	75-125	0
Methylene chloride	963.5	30	1000	0	96.4	55-145	0
Naphthalene	830	100	1000	0	83	40-140	0
n-Butylbenzene	1034	30	1000	0	103	65-140	0
n-Propylbenzene	960.5	30	1000	0	96	65-135	0
o-Xylene	951.5	30	1000	0	95.2	75-125	0
p-Isopropyltoluene	992.5	30	1000	0	99.2	75-135	0
sec-Butylbenzene	1025	30	1000	0	102	65-130	0
Styrene	977	30	1000	0	97.7	75-125	0
tert-Butylbenzene	978	30	1000	0	97.8	65-130	0
Tetrachloroethene	968	30	1000	0	96.8	64-140	0
Tetrahydrofuran	802.5	200	1000	0	80.2	70-135	0
Toluene	984	30	1000	0	98.4	70-125	0
trans-1,2-Dichloroethene	1002	30	1000	0	100	65-135	0
trans-1,3-Dichloropropene	941.5	30	1000	0	94.2	65-125	0
trans-1,4-Dichloro-2-butene	814	30	1000	0	81.4	70-135	0
Trichloroethene	976	30	1000	0	97.6	75-125	0
Trichlorofluoromethane	1000	30	1000	0	100	25-185	0
Vinyl chloride	988.5	30	1000	0	98.8	60-125	0
Surr: 1,2-Dichloroethane-d4	*985*	0	*1000*	0	*98.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*987.5*	0	*1000*	0	*98.8*	*70-130*	0
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*70-130*	0
Surr: Toluene-d8	*1016*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/9/2012 03:17 PM**
Client ID: Run ID: **VMS5_121109A** SeqNo: **2135679** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	994.5	30	1000	0	99.4	75-125	0			
1,1,1-Trichloroethane	1080	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	954.5	30	1000	0	95.4	55-130	0			
1,1,2-Trichloroethane	969	30	1000	0	96.9	60-125	0			
1,1-Dichloroethane	1038	30	1000	0	104	75-125	0			
1,1-Dichloroethene	1130	30	1000	0	113	65-135	0			
1,2,3-Trichlorobenzene	1006	30	1000	0	101	60-135	0			
1,2,3-Trichloropropane	987.5	30	1000	0	98.8	65-130	0			
1,2,3-Trimethylbenzene	975	30	1000	0	97.5	65-135	0			
1,2,4-Trichlorobenzene	1016	30	1000	0	102	65-130	0			
1,2,4-Trimethylbenzene	1020	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	908	30	1000	0	90.8	40-135	0			
1,2-Dibromoethane	962	30	1000	0	96.2	70-125	0			
1,2-Dichlorobenzene	994.5	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	1014	30	1000	0	101	70-135	0			
1,2-Dichloropropane	1040	30	1000	0	104	70-120	0			
1,3,5-Trimethylbenzene	1052	30	1000	0	105	65-135	0			
1,3-Dichlorobenzene	999.5	30	1000	0	100	70-125	0			
1,4-Dichlorobenzene	1000	30	1000	0	100	70-125	0			
2-Butanone	1260	200	1000	0	126	30-160	0			
2-Hexanone	1051	30	1000	0	105	45-145	0			
4-Methyl-2-pentanone	1085	30	1000	0	108	45-145	0			
Acetone	1240	100	1000	0	124	20-160	0			B
Acrylonitrile	1066	100	1000	0	107	70-135	0			
Benzene	1058	30	1000	0	106	75-125	0			
Bromobenzene	954	30	1000	0	95.4	65-120	0			
Bromochloromethane	1064	30	1000	0	106	70-125	0			
Bromodichloromethane	995.5	30	1000	0	99.6	70-130	0			
Bromoform	899.5	30	1000	0	90	55-135	0			
Bromomethane	1442	75	1000	0	144	30-160	0			
Carbon disulfide	1272	30	1000	0	127	45-160	0			
Carbon tetrachloride	1094	30	1000	0	109	65-135	0			
Chlorobenzene	1027	30	1000	0	103	75-125	0			
Chloroethane	1098	100	1000	0	110	40-155	0			
Chloroform	1072	30	1000	0	107	70-125	0			
Chloromethane	1072	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	1003	30	1000	0	100	70-125	0			
Dibromochloromethane	928	30	1000	0	92.8	65-135	0			
Dibromomethane	940.5	30	1000	0	94	75-130	0			
Dichlorodifluoromethane	911	30	1000	0	91.1	35-135	0			
Ethylbenzene	1048	30	1000	0	105	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	941	30	1000	0	94.1	70-135	0	
Isopropylbenzene	1065	30	1000	0	106	75-130	0	
m,p-Xylene	2078	60	2000	0	104	80-125	0	
Methyl tert-butyl ether	1208	30	1000	0	121	75-125	0	
Methylene chloride	1071	30	1000	0	107	55-145	0	
Naphthalene	1004	100	1000	0	100	40-140	0	
n-Butylbenzene	1032	30	1000	0	103	65-140	0	
n-Propylbenzene	1034	30	1000	0	103	65-135	0	
o-Xylene	1026	30	1000	0	103	75-125	0	
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0	
sec-Butylbenzene	1092	30	1000	0	109	65-130	0	
Styrene	1048	30	1000	0	105	75-125	0	
tert-Butylbenzene	1033	30	1000	0	103	65-130	0	
Tetrachloroethene	1032	30	1000	0	103	64-140	0	
Tetrahydrofuran	1044	200	1000	0	104	70-135	0	
Toluene	1032	30	1000	0	103	70-125	0	
trans-1,2-Dichloroethene	1128	30	1000	0	113	65-135	0	
trans-1,3-Dichloropropene	927.5	30	1000	0	92.8	65-125	0	
trans-1,4-Dichloro-2-butene	525.5	30	1000	0	52.6	70-135	0	S
Trichloroethene	1044	30	1000	0	104	75-125	0	
Trichlorofluoromethane	1046	30	1000	0	105	25-185	0	
Vinyl chloride	1088	30	1000	0	109	60-125	0	
Surr: 1,2-Dichloroethane-d4	*997.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*988.5*	0	*1000*	0	*98.8*	*70-130*	0	
Surr: Dibromofluoromethane	*994.5*	0	*1000*	0	*99.4*	*70-130*	0	
Surr: Toluene-d8	*983.5*	0	*1000*	0	*98.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1211096-05A MS** Units: **µg/Kg** Analysis Date: **11/7/2012 08:44 AM**
Client ID: **SBKR1100R504S110212S006** Run ID: **VMS8_121106B** SeqNo: **2133075** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2550	85	2846	0	89.6	75-125	0			
1,1,1-Trichloroethane	2473	85	2846	0	86.9	70-135	0			
1,1,2,2-Tetrachloroethane	2671	85	2846	0	93.8	55-130	0			
1,1,2-Trichloroethane	2411	85	2846	0	84.7	60-125	0			
1,1-Dichloroethane	2396	85	2846	0	84.2	75-125	0			
1,1-Dichloroethene	2375	85	2846	0	83.4	65-135	0			
1,2,3-Trichlorobenzene	2122	85	2846	0	74.6	60-135	0			
1,2,3-Trichloropropane	2882	85	2846	0	101	65-130	0			
1,2,3-Trimethylbenzene	2352	85	2846	0	82.6	65-135	0			
1,2,4-Trichlorobenzene	2270	85	2846	0	79.8	65-130	0			
1,2,4-Trimethylbenzene	2520	85	2846	0	88.6	65-135	0			
1,2-Dibromo-3-chloropropane	2324	85	2846	0	81.6	40-135	0			
1,2-Dibromoethane	2607	85	2846	0	91.6	70-125	0			
1,2-Dichlorobenzene	2401	85	2846	0	84.4	75-120	0			
1,2-Dichloroethane	2455	85	2846	0	86.2	70-135	0			
1,2-Dichloropropane	2463	85	2846	0	86.6	70-120	0			
1,3,5-Trimethylbenzene	2600	85	2846	0	91.4	65-135	0			
1,3-Dichlorobenzene	2449	85	2846	0	86	70-125	0			
1,4-Dichlorobenzene	2361	85	2846	0	83	70-125	0			
2-Butanone	2942	280	2846	0	103	30-160	0			
2-Hexanone	3078	85	2846	0	108	45-145	0			
4-Methyl-2-pentanone	3906	85	2846	0	137	45-145	0			
Acetone	3401	280	2846	22.77	119	20-160	0			
Acrylonitrile	2694	85	2846	0	94.6	70-135	0			
Benzene	2405	85	2846	0	84.5	75-125	0			
Bromobenzene	2591	85	2846	0	91	65-120	0			
Bromochloromethane	2466	85	2846	0	86.6	70-125	0			
Bromodichloromethane	2425	85	2846	0	85.2	70-130	0			
Bromoform	2525	85	2846	0	88.7	55-135	0			
Bromomethane	2435	85	2846	0	85.6	30-160	0			
Carbon disulfide	2267	85	2846	0	79.6	45-160	0			
Carbon tetrachloride	2480	85	2846	0	87.2	65-135	0			
Chlorobenzene	2569	85	2846	0	90.2	75-125	0			
Chloroethane	1598	280	2846	0	56.2	40-155	0			
Chloroform	2536	85	2846	0	89.1	70-125	0			
Chloromethane	2075	85	2846	0	72.9	50-130	0			
cis-1,2-Dichloroethene	2429	85	2846	0	85.4	65-125	0			
cis-1,3-Dichloropropene	2563	85	2846	0	90	70-125	0			
Dibromochloromethane	2478	85	2846	0	87	65-135	0			
Dibromomethane	2570	85	2846	0	90.3	75-130	0			
Dichlorodifluoromethane	1992	85	2846	0	70	35-135	0			
Ethylbenzene	2516	85	2846	0	88.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	2375	85	2846	0	83.4	70-135	0
Isopropylbenzene	2533	85	2846	0	89	75-130	0
m,p-Xylene	5164	170	5692	0	90.7	80-125	0
Methyl tert-butyl ether	2922	85	2846	0	103	75-125	0
Methylene chloride	2418	85	2846	0	85	55-145	0
Naphthalene	2257	280	2846	68.31	76.9	40-140	0
n-Butylbenzene	2418	85	2846	0	85	65-140	0
n-Propylbenzene	2443	85	2846	0	85.8	65-135	0
o-Xylene	2587	85	2846	0	90.9	75-125	0
p-Isopropyltoluene	2209	85	2846	0	77.6	75-135	0
sec-Butylbenzene	2446	85	2846	0	86	65-130	0
Styrene	2530	85	2846	0	88.9	75-125	0
tert-Butylbenzene	2515	85	2846	0	88.4	65-130	0
Tetrachloroethene	2335	85	2846	0	82	64-140	0
Tetrahydrofuran	2960	280	2846	0	104	70-135	0
Toluene	2368	85	2846	0	83.2	70-125	0
trans-1,2-Dichloroethene	2433	85	2846	0	85.5	65-135	0
trans-1,3-Dichloropropene	2442	85	2846	0	85.8	65-125	0
trans-1,4-Dichloro-2-butene	2297	85	2846	0	80.7	70-135	0
Trichloroethene	2441	85	2846	0	85.8	75-125	0
Trichlorofluoromethane	2371	85	2846	0	83.3	25-185	0
Vinyl chloride	2241	85	2846	0	78.8	60-125	0
Surr: 1,2-Dichloroethane-d4	*2795*	0	*2846*	0	*98.2*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2937*	0	*2846*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*2752*	0	*2846*	0	*96.7*	*70-130*	0
Surr: Toluene-d8	*2694*	0	*2846*	0	*94.6*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1211109-02A MS** Units: **µg/Kg** Analysis Date: **11/8/2012 08:45 PM**
Client ID: Run ID: **VMS5_121108A** SeqNo: **2134599** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	930.5	5.0	1000	0	93	75-125	0			
1,1,1-Trichloroethane	987	5.0	1000	0	98.7	70-135	0			
1,1,2,2-Tetrachloroethane	876	5.0	1000	0	87.6	55-130	0			
1,1,2-Trichloroethane	903.5	5.0	1000	0	90.4	60-125	0			
1,1-Dichloroethane	954.5	5.0	1000	0	95.4	75-125	0			
1,1-Dichloroethene	1064	5.0	1000	0	106	65-135	0			
1,2,3-Trichlorobenzene	936.5	5.0	1000	0	93.6	60-135	0			
1,2,3-Trichloropropane	918	5.0	1000	0	91.8	65-130	0			
1,2,4-Trichlorobenzene	991.5	5.0	1000	0	99.2	65-130	0			
1,2,4-Trimethylbenzene	960	5.0	1000	0	96	65-135	0			
1,2-Dibromo-3-chloropropane	825.5	5.0	1000	0	82.6	40-135	0			
1,2-Dibromoethane	904.5	5.0	1000	0	90.4	70-125	0			
1,2-Dichlorobenzene	960	5.0	1000	0	96	75-120	0			
1,2-Dichloroethane	926.5	5.0	1000	0	92.6	70-135	0			
1,2-Dichloropropane	955.5	5.0	1000	0	95.6	70-120	0			
1,3,5-Trimethylbenzene	988	5.0	1000	0	98.8	65-135	0			
1,3-Dichlorobenzene	954	5.0	1000	0	95.4	70-125	0			
1,4-Dichlorobenzene	963	5.0	1000	0	96.3	70-125	0			
2-Butanone	972.5	10	1000	0	97.2	30-160	0			
2-Hexanone	857.5	5.0	1000	0	85.8	45-145	0			
4-Methyl-2-pentanone	894.5	5.0	1000	0	89.4	45-145	0			
Acetone	954.5	10	1000	32.5	92.2	20-160	0			B
Acrylonitrile	974.5	5.0	1000	0	97.4	70-135	0			
Benzene	951	5.0	1000	0	95.1	75-125	0			
Bromobenzene	935.5	10	1000	0	93.6	65-120	0			
Bromochloromethane	1017	5.0	1000	0	102	70-125	0			
Bromodichloromethane	915.5	5.0	1000	0	91.6	70-130	0			
Bromoform	864	5.0	1000	0	86.4	55-135	0			
Bromomethane	1037	10	1000	0	104	30-160	0			
Carbon disulfide	1145	5.0	1000	0	114	45-160	0			
Carbon tetrachloride	984.5	5.0	1000	0	98.4	65-135	0			
Chlorobenzene	951	5.0	1000	0	95.1	75-125	0			
Chloroethane	981.5	5.0	1000	0	98.2	40-155	0			
Chloroform	965.5	5.0	1000	0	96.6	70-125	0			
Chloromethane	960	10	1000	0	96	50-130	0			
cis-1,2-Dichloroethene	1013	5.0	1000	0	101	65-125	0			
cis-1,3-Dichloropropene	926.5	5.0	1000	0	92.6	70-125	0			
Dibromochloromethane	881.5	5.0	1000	0	88.2	65-135	0			
Dibromomethane	911.5	5.0	1000	0	91.2	75-130	0			
Dichlorodifluoromethane	887	10	1000	0	88.7	35-135	0			
Ethylbenzene	953	5.0	1000	0	95.3	75-125	0			
Hexachloroethane	944	5.0	1000	0	94.4	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Isopropylbenzene	989	5.0	1000	0	98.9	75-130	0
m,p-Xylene	1915	2.5	2000	7	95.4	80-125	0
Methyl tert-butyl ether	1042	5.0	1000	0	104	75-125	0
Methylene chloride	1010	5.0	1000	19.5	99	55-140	0
Naphthalene	868.5	5.0	1000	0	86.8	40-140	0
n-Butylbenzene	1034	5.0	1000	0	103	65-140	0
n-Propylbenzene	964.5	5.0	1000	0	96.4	65-135	0
o-Xylene	951.5	2.5	1000	0	95.2	75-125	0
p-Isopropyltoluene	991.5	5.0	1000	23.5	96.8	75-135	0
sec-Butylbenzene	1024	5.0	1000	0	102	65-130	0
Styrene	967	5.0	1000	0	96.7	75-125	0
tert-Butylbenzene	962	5.0	1000	0	96.2	65-130	0
Tetrachloroethene	940	5.0	1000	0	94	65-140	0
Tetrahydrofuran	897	20	1000	0	89.7	70-135	0
Toluene	942	5.0	1000	7.5	93.4	70-125	0
trans-1,2-Dichloroethene	1000	5.0	1000	0	100	65-135	0
trans-1,3-Dichloropropene	910.5	10	1000	0	91	65-125	0
trans-1,4-Dichloro-2-butene	874	5.0	1000	0	87.4	70-135	0
Trichloroethene	914	5.0	1000	0	91.4	75-125	0
Trichlorofluoromethane	965	5.0	1000	0	96.5	25-185	0
Vinyl chloride	985	5.0	1000	0	98.5	60-125	0
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-120*	0
Surr: 4-Bromofluorobenzene	*997*	0	*1000*	0	*99.7*	*75-120*	0
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*85-115*	0
Surr: Toluene-d8	*982.5*	0	*1000*	0	*98.2*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MSD Sample ID: **1211096-05A MSD** Units: **µg/Kg** Analysis Date: **11/7/2012 09:08 AM**
Client ID: **SBKR1100R504S110212S006** Run ID: **VMS8_121106B** SeqNo: **2133076** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2488	85	2846	0	87.4	75-125	2550	2.49	30	
1,1,1-Trichloroethane	2320	85	2846	0	81.5	70-135	2473	6.41	30	
1,1,2,2-Tetrachloroethane	2633	85	2846	0	92.5	55-130	2671	1.45	30	
1,1,2-Trichloroethane	2352	85	2846	0	82.6	60-125	2411	2.45	30	
1,1-Dichloroethane	2283	85	2846	0	80.2	75-125	2396	4.87	30	
1,1-Dichloroethene	2320	85	2846	0	81.5	65-135	2375	2.36	30	
1,2,3-Trichlorobenzene	2246	85	2846	0	78.9	60-135	2122	5.67	30	
1,2,3-Trichloropropane	2927	85	2846	0	103	65-130	2882	1.57	30	
1,2,3-Trimethylbenzene	2314	85	2846	0	81.3	65-135	2352	1.65	30	
1,2,4-Trichlorobenzene	2448	85	2846	0	86	65-130	2270	7.54	30	
1,2,4-Trimethylbenzene	2490	85	2846	0	87.5	65-135	2520	1.19	30	
1,2-Dibromo-3-chloropropane	2194	85	2846	0	77.1	40-135	2324	5.73	30	
1,2-Dibromoethane	2600	85	2846	0	91.4	70-125	2607	0.273	30	
1,2-Dichlorobenzene	2377	85	2846	0	83.5	75-120	2401	1.01	30	
1,2-Dichloroethane	2425	85	2846	0	85.2	70-135	2455	1.22	30	
1,2-Dichloropropane	2470	85	2846	0	86.8	70-120	2463	0.288	30	
1,3,5-Trimethylbenzene	2563	85	2846	0	90	65-135	2600	1.43	30	
1,3-Dichlorobenzene	2371	85	2846	0	83.3	70-125	2449	3.25	30	
1,4-Dichlorobenzene	2318	85	2846	0	81.4	70-125	2361	1.82	30	
2-Butanone	2796	280	2846	0	98.2	30-160	2942	5.06	30	
2-Hexanone	3253	85	2846	0	114	45-145	3078	5.53	30	
4-Methyl-2-pentanone	3881	85	2846	0	136	45-145	3906	0.658	30	
Acetone	3478	280	2846	22.77	121	20-160	3401	2.23	30	
Acrylonitrile	2765	85	2846	0	97.2	70-135	2694	2.61	30	
Benzene	2345	85	2846	0	82.4	75-125	2405	2.52	30	
Bromobenzene	2580	85	2846	0	90.6	65-120	2591	0.44	30	
Bromochloromethane	2460	85	2846	0	86.4	70-125	2466	0.231	30	
Bromodichloromethane	2392	85	2846	0	84	70-130	2425	1.36	30	
Bromoform	2520	85	2846	0	88.6	55-135	2525	0.169	30	
Bromomethane	2219	85	2846	0	78	30-160	2435	9.3	30	
Carbon disulfide	2125	85	2846	0	74.6	45-160	2267	6.48	30	
Carbon tetrachloride	2304	85	2846	0	81	65-135	2480	7.38	30	
Chlorobenzene	2581	85	2846	0	90.7	75-125	2569	0.497	30	
Chloroethane	1459	280	2846	0	51.2	40-155	1598	9.12	30	
Chloroform	2396	85	2846	0	84.2	70-125	2536	5.65	30	
Chloromethane	2090	85	2846	0	73.4	50-130	2075	0.752	30	
cis-1,2-Dichloroethene	2435	85	2846	0	85.6	65-125	2429	0.234	30	
cis-1,3-Dichloropropene	2525	85	2846	0	88.7	70-125	2563	1.51	30	
Dibromochloromethane	2479	85	2846	0	87.1	65-135	2478	0.0574	30	
Dibromomethane	2456	85	2846	0	86.3	75-130	2570	4.53	30	
Dichlorodifluoromethane	1935	85	2846	0	68	35-135	1992	2.9	30	
Ethylbenzene	2479	85	2846	0	87.1	75-125	2516	1.48	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	2237	85	2846	0	78.6	70-135	2375	5.99	30	
Isopropylbenzene	2502	85	2846	0	87.9	75-130	2533	1.24	30	
m,p-Xylene	5023	170	5692	0	88.2	80-125	5164	2.77	30	
Methyl tert-butyl ether	2853	85	2846	0	100	75-125	2922	2.37	30	
Methylene chloride	2322	85	2846	0	81.6	55-145	2418	4.02	30	
Naphthalene	2495	280	2846	68.31	85.2	40-140	2257	10	30	
n-Butylbenzene	2485	85	2846	0	87.3	65-140	2418	2.73	30	
n-Propylbenzene	2408	85	2846	0	84.6	65-135	2443	1.47	30	
o-Xylene	2537	85	2846	0	89.2	75-125	2587	1.94	30	
p-Isopropyltoluene	2110	85	2846	0	74.2	75-135	2209	4.55	30	S
sec-Butylbenzene	2506	85	2846	0	88	65-130	2446	2.41	30	
Styrene	2523	85	2846	0	88.6	75-125	2530	0.282	30	
tert-Butylbenzene	2486	85	2846	0	87.4	65-130	2515	1.14	30	
Tetrachloroethene	2251	85	2846	0	79.1	64-140	2335	3.66	30	
Tetrahydrofuran	2856	280	2846	0	100	70-135	2960	3.57	30	
Toluene	2300	85	2846	0	80.8	70-125	2368	2.93	30	
trans-1,2-Dichloroethene	2341	85	2846	0	82.2	65-135	2433	3.87	30	
trans-1,3-Dichloropropene	2416	85	2846	0	84.9	65-125	2442	1.05	30	
trans-1,4-Dichloro-2-butene	2224	85	2846	0	78.2	70-135	2297	3.21	30	
Trichloroethene	2312	85	2846	0	81.2	75-125	2441	5.39	30	
Trichlorofluoromethane	2226	85	2846	0	78.2	25-185	2371	6.32	30	
Vinyl chloride	2209	85	2846	0	77.6	60-125	2241	1.47	30	
Surr: 1,2-Dichloroethane-d4	*2803*	0	*2846*	0	*98.5*	*70-130*	2795	*0.305*	*30*	
Surr: 4-Bromofluorobenzene	*2986*	0	*2846*	0	*105*	*70-130*	2937	*1.63*	*30*	
Surr: Dibromofluoromethane	*2700*	0	*2846*	0	*94.8*	*70-130*	2752	*1.93*	*30*	
Surr: Toluene-d8	*2729*	0	*2846*	0	*95.9*	*70-130*	2694	*1.31*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MSD	Sample ID: **1211109-02A MSD**				Units: **µg/Kg**			Analysis Date: **11/8/2012 09:10 PM**			
Client ID:		Run ID: **VMS5_121108A**			SeqNo: **2134600**		Prep Date: **11/5/2012**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	914.5	5.0	1000	0	91.4	75-125	930.5	1.73	30	
1,1,1-Trichloroethane	923.5	5.0	1000	0	92.4	70-135	987	6.65	30	
1,1,2,2-Tetrachloroethane	891	5.0	1000	0	89.1	55-130	876	1.7	30	
1,1,2-Trichloroethane	908.5	5.0	1000	0	90.8	60-125	903.5	0.552	30	
1,1-Dichloroethane	929.5	5.0	1000	0	93	75-125	954.5	2.65	30	
1,1-Dichloroethene	1026	5.0	1000	0	103	65-135	1064	3.73	30	
1,2,3-Trichlorobenzene	984	5.0	1000	0	98.4	60-135	936.5	4.95	30	
1,2,3-Trichloropropane	950	5.0	1000	0	95	65-130	918	3.43	30	
1,2,4-Trichlorobenzene	1044	5.0	1000	0	104	65-130	991.5	5.16	30	
1,2,4-Trimethylbenzene	977	5.0	1000	0	97.7	65-135	960	1.76	30	
1,2-Dibromo-3-chloropropane	834	5.0	1000	0	83.4	40-135	825.5	1.02	30	
1,2-Dibromoethane	908	5.0	1000	0	90.8	70-125	904.5	0.386	30	
1,2-Dichlorobenzene	980	5.0	1000	0	98	75-120	960	2.06	30	
1,2-Dichloroethane	932	5.0	1000	0	93.2	70-135	926.5	0.592	30	
1,2-Dichloropropane	935	5.0	1000	0	93.5	70-120	955.5	2.17	30	
1,3,5-Trimethylbenzene	995.5	5.0	1000	0	99.6	65-135	988	0.756	30	
1,3-Dichlorobenzene	979	5.0	1000	0	97.9	70-125	954	2.59	30	
1,4-Dichlorobenzene	975.5	5.0	1000	0	97.6	70-125	963	1.29	30	
2-Butanone	972	10	1000	0	97.2	30-160	972.5	0.0514	30	
2-Hexanone	879	5.0	1000	0	87.9	45-145	857.5	2.48	30	
4-Methyl-2-pentanone	911	5.0	1000	0	91.1	45-145	894.5	1.83	30	
Acetone	988	10	1000	32.5	95.6	20-160	954.5	3.45	30	B
Acrylonitrile	1012	5.0	1000	0	101	70-135	974.5	3.73	30	
Benzene	938	5.0	1000	0	93.8	75-125	951	1.38	30	
Bromobenzene	944.5	10	1000	0	94.4	65-120	935.5	0.957	30	
Bromochloromethane	993	5.0	1000	0	99.3	70-125	1017	2.39	30	
Bromodichloromethane	901	5.0	1000	0	90.1	70-130	915.5	1.6	30	
Bromoform	874	5.0	1000	0	87.4	55-135	864	1.15	30	
Bromomethane	1034	10	1000	0	103	30-160	1037	0.29	30	
Carbon disulfide	1112	5.0	1000	0	111	45-160	1145	2.92	30	
Carbon tetrachloride	966	5.0	1000	0	96.6	65-135	984.5	1.9	30	
Chlorobenzene	946	5.0	1000	0	94.6	75-125	951	0.527	30	
Chloroethane	943.5	5.0	1000	0	94.4	40-155	981.5	3.95	30	
Chloroform	952	5.0	1000	0	95.2	70-125	965.5	1.41	30	
Chloromethane	926	10	1000	0	92.6	50-130	960	3.61	30	
cis-1,2-Dichloroethene	955.5	5.0	1000	0	95.6	65-125	1013	5.84	30	
cis-1,3-Dichloropropene	935.5	5.0	1000	0	93.6	70-125	926.5	0.967	30	
Dibromochloromethane	903	5.0	1000	0	90.3	65-135	881.5	2.41	30	
Dibromomethane	921.5	5.0	1000	0	92.2	75-130	911.5	1.09	30	
Dichlorodifluoromethane	861	10	1000	0	86.1	35-135	887	2.97	30	
Ethylbenzene	950	5.0	1000	0	95	75-125	953	0.315	30	
Hexachloroethane	962	5.0	1000	0	96.2	70-135	944	1.89	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Isopropylbenzene	999	5.0	1000	0	99.9	75-130	989	1.01	30
m,p-Xylene	1906	2.5	2000	7	95	80-125	1915	0.471	30
Methyl tert-butyl ether	1049	5.0	1000	0	105	75-125	1042	0.622	30
Methylene chloride	997.5	5.0	1000	19.5	97.8	55-140	1010	1.2	30
Naphthalene	932.5	5.0	1000	0	93.2	40-140	868.5	7.11	30
n-Butylbenzene	1022	5.0	1000	0	102	65-140	1034	1.17	30
n-Propylbenzene	983.5	5.0	1000	0	98.4	65-135	964.5	1.95	30
o-Xylene	949	2.5	1000	0	94.9	75-125	951.5	0.263	30
p-Isopropyltoluene	999	5.0	1000	23.5	97.6	75-135	991.5	0.754	30
sec-Butylbenzene	1063	5.0	1000	0	106	65-130	1024	3.74	30
Styrene	961	5.0	1000	0	96.1	75-125	967	0.622	30
tert-Butylbenzene	992	5.0	1000	0	99.2	65-130	962	3.07	30
Tetrachloroethene	925	5.0	1000	0	92.5	65-140	940	1.61	30
Tetrahydrofuran	892	20	1000	0	89.2	70-135	897	0.559	30
Toluene	927	5.0	1000	7.5	92	70-125	942	1.61	30
trans-1,2-Dichloroethene	970	5.0	1000	0	97	65-135	1000	3.05	30
trans-1,3-Dichloropropene	905	10	1000	0	90.5	65-125	910.5	0.606	30
trans-1,4-Dichloro-2-butene	877.5	5.0	1000	0	87.8	70-135	874	0.4	30
Trichloroethene	907	5.0	1000	0	90.7	75-125	914	0.769	30
Trichlorofluoromethane	948.5	5.0	1000	0	94.8	25-185	965	1.72	30
Vinyl chloride	955	5.0	1000	0	95.5	60-125	985	3.09	30
Surr: 1,2-Dichloroethane-d4	*986.5*	0	*1000*	0	*98.6*	*70-120*	1010	*2.35*	*30*
Surr: 4-Bromofluorobenzene	*1013*	0	*1000*	0	*101*	*75-120*	997	*1.59*	*30*
Surr: Dibromofluoromethane	*1001*	0	*1000*	0	*100*	*85-115*	982.5	*1.87*	*30*
Surr: Toluene-d8	*990*	0	*1000*	0	*99*	*85-120*	982.5	*0.76*	*30*

The following samples were analyzed in this batch:

1211096-01A	1211096-02A	1211096-03A
1211096-04A	1211096-05A	1211096-06A
1211096-07A	1211096-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **R112165** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-121105-R112165** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132090** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **WLCSS1-121105-R112165** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132091** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211072-04A DUP** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132095** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	45.86	0.050	0	0	0	0-0	58.86	24.8	20	R

DUP Sample ID: **1211098-09B DUP** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132113** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	43.9	0.050	0	0	0	0-0	42.18	4	20	

The following samples were analyzed in this batch:

1211096-01B	1211096-02B	1211096-03B
1211096-04B	1211096-06B	1211096-07B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211096
Project: Marshall KRRI 1075, 1100 11/2/12

QC BATCH REPORT

Batch ID: **R112167** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-121105-R112167** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132119** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **WLCSS1-121105-R112167** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132120** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211096-05B DUP1** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: **SBKR1100R504S110212S006** Run ID: **MOIST_121105B** SeqNo: **2132122** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	47.38	0.050	0	0	0	0-0	48.24	1.8	20	

DUP Sample ID: **1211096-05B DUP2** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: **SBKR1100R504S110212S006** Run ID: **MOIST_121105B** SeqNo: **2132123** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	47.3	0.050	0	0	0	0-0	48.24	1.97	20	

DUP Sample ID: **1211110-05A DUP** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132135** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	73.32	0.050	0	0	0	0-0	74.43	1.5	20	

The following samples were analyzed in this batch: 1211096-05B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211096

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110212_GMK1	Task: KRRI_1075,1100
Total # of Samples: 8		Event Complete?
Turn Around Time	5 Day	Rush: No

BILLING CODE: 6.00

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
Lab PM:	Ann Preston	City: Grand Rapids	State, Zip: MI	PO #	Phone #: 713-821-2000
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Sliemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Sliemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR1075R507S110212S004	SBKR1075R507	SO	G	11/02/2012 08:40	3			X	X	X	X	X										
2	SBKR1100R502S110212S007	SBKR1100R502	SO	G	11/02/2012 09:28	3			X	X	X	X	X										
3	SBKR1100R502D110212S007	SBKR1100R502	SO	G	11/02/2012 09:28	3	DUPLICATE		X	X	X	X	X										
4	SBKR1100R503S110212S007	SBKR1100R503	SO	G	11/02/2012 10:55	3			X	X	X	X	X										
5	SBKR1100R504S110212S006	SBKR1100R504	SO	G	11/02/2012 13:48	6	MS/MSD		X	X	X	X	X										
6	SBKR1100R505S110212S004	SBKR1100R505	SO	G	11/02/2012 14:52	3			X	X	X	X	X										
7	SBKR1100R506S110212S005	SBKR1100R506	SO	G	11/02/2012 15:49	3			X	X	X	X	X										
8	SBKR1100R506T110212MX	SBKR1100R506	SQ	G	11/02/2012 00:00	1	TRIP BLANK						X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11-2-12	1626	[signature]	11-2-12	1626
[signature]	11/2/12	1638	[signature]	11/2/12	1630

Sample Receipt Conditions

Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?
5.0°C	(Y)/N	(Y)/N	(Y)/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: GERRY KRAMER (GMK1); SIGNATURE of SAMPLER: [signature]; DATE Signed: Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **02-Nov-12 16:30**

Work Order: **1211096** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 03-Nov-12 (Date) Reviewed by: Alex Csaszar (eSignature) 04-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.0 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/3/2012 9:44:54 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

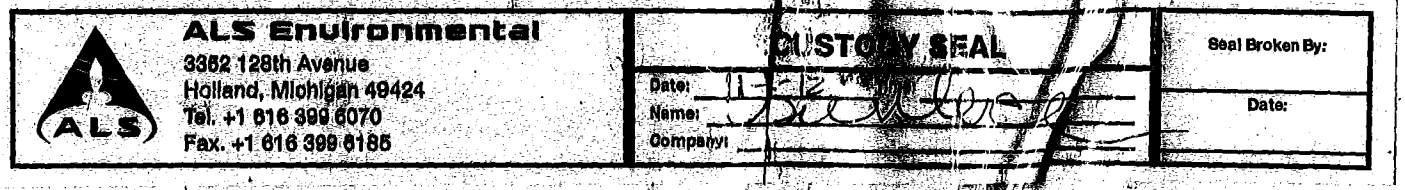
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
ALS
CUSTODY SEAL
Date:
Name:
Company:
Seal Broken By:
Date:

13-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000,1075 11/1/12** Work Order: **1211097**

Dear Bryan,

ALS Environmental received 8 samples on 02-Nov-2012 04:30 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 82.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 13-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000,1075 11/1/12
Work Order: **1211097**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211097-01	SBKR1000R508S110112S006	Soil		11/1/2012 08:35	11/2/2012 16:30	☐
1211097-02	SBKR1000R509S110112S006	Soil		11/1/2012 09:18	11/2/2012 16:30	☐
1211097-03	SBKR1075R502S110112S007	Soil		11/1/2012 13:27	11/2/2012 16:30	☐
1211097-04	SBKR1075R503S110112S007	Soil		11/1/2012 14:03	11/2/2012 16:30	☐
1211097-05	SBKR1075R504S110112S006	Soil		11/1/2012 15:05	11/2/2012 16:30	☐
1211097-06	SBKR1075R505S110112S007	Soil		11/1/2012 15:55	11/2/2012 16:30	☐
1211097-07	SBKR1075R506S110112S006	Soil		11/1/2012 16:21	11/2/2012 16:30	☐
1211097-08	SBKR1075R506T110112MX	Soil		11/1/2012	11/2/2012 16:30	☐

Client: AECOM Environment
Project: Marshall KRRI 1000,1075 11/1/12
Work Order: 1211097

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44562 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batch 44573 MS/MSD data for Vanadium is not related to this project's samples. No data requires qualification.

Batch 44561 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

Batches 44564 and 44565 MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

Batch 44564 LCS recovery for trans-1,4-dichloro-2-butene was outside of the upper control limit but within the Sporadic Marginal Exceedence limit for an analyte that is not a project-specific analyte of concern. No qualification is necessary for this analyte.

Batch R112165 Duplicate data for % Moisture is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 13-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000,1075 11/1/12
WorkOrder: **1211097**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R508S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 8:35:00 AM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**88**	**17**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**230**	**34**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*68.8*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.91	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.3	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**8.6**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**16**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*75.2*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*61.1*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*67.2*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*95.4*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*60.5*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*57.7*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	54	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	54	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	54	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	54	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R508S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 8:35:00 AM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	54	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	54	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	54	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	54	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	54	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	54	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	54	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	54	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	54	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	54	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	54	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R508S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 8:35:00 AM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	54	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	54	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	54	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	54	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	54	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	54	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	54	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	54	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	54	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	54	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	54	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	54	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*98.7*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**44**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R509S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 9:18:00 AM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**86**	**17**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**220**	**34**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*73.3*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**8.3**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**15**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*79.9*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*67.8*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*72.2*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*107*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*65.8*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*62.2*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	52	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	52	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	52	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	52	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R509S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 9:18:00 AM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	52	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	52	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	52	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	52	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	52	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	52	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	52	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	52	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	52	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	52	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	52	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R509S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 9:18:00 AM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	52	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	52	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	52	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	52	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	52	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	52	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	52	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	52	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	52	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	52	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	52	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	52	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*99.4*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*92.6*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*97.9*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**43**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R502S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 1:27:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**71**	**14**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**190**	**28**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*68.8*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.91	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.3	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**16**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**49**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*75.3*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*60.3*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*63.9*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*97.1*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*57.5*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*55.4*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/5/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R502S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 1:27:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2-Dibromo-3-chloropropane	ND	45	10		µg/Kg-dry	1	11/5/2012
1,2-Dibromoethane	ND	45	20		µg/Kg-dry	1	11/5/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/5/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/5/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/5/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/5/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/5/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/5/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/5/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/5/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/5/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/5/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/5/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R502S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 1:27:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/5/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/5/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/5/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/5/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/5/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/5/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/5/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/5/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/5/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/5/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/5/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Vinyl chloride	ND	45	40		µg/Kg-dry	1	11/5/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/5/2012
Surr: 4-Bromofluorobenzene	*95.4*	*70-130*			*%REC*	1	11/5/2012
Surr: Dibromofluoromethane	*100*	*70-130*			*%REC*	1	11/5/2012
Surr: Toluene-d8	*98.6*	*70-130*			*%REC*	1	11/5/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**33**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R503S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 2:03:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**94**	**16**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**330**	**32**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.9*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.93	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.3	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**16**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**41**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(b)fluoranthene	**660**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	**510**	**330**	**330**		**µg/Kg-dry**	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*80.0*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*64.7*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*70.8*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*104*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*63.3*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*60.9*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/5/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R503S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 2:03:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2-Dibromo-3-chloropropane	ND	48	10		µg/Kg-dry	1	11/5/2012
1,2-Dibromoethane	ND	48	20		µg/Kg-dry	1	11/5/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/5/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/5/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/5/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/5/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/5/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/5/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/5/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/5/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/5/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/5/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/5/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R503S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 2:03:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/5/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/5/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/5/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/5/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/5/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/5/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/5/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/5/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/5/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/5/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/5/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Vinyl chloride	ND	48	40		µg/Kg-dry	1	11/5/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/5/2012
Surr: 4-Bromofluorobenzene	*97.8*	*70-130*			*%REC*	1	11/5/2012
Surr: Dibromofluoromethane	*100*	*70-130*			*%REC*	1	11/5/2012
Surr: Toluene-d8	*98.4*	*70-130*			*%REC*	1	11/5/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**37**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R504S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 3:05:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**52**	**11**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**140**	**23**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*67.5*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.66	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**7.0**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**15**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*70.0*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*59.4*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*64.5*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*99.4*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*58.0*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*55.7*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/5/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R504S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 3:05:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2-Dibromo-3-chloropropane	ND	35	10		µg/Kg-dry	1	11/5/2012
1,2-Dibromoethane	ND	35	20		µg/Kg-dry	1	11/5/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/5/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/5/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/5/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/5/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/5/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/5/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/5/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/5/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/5/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/5/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/5/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/5/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/5/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/5/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R504S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 3:05:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/5/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/5/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/5/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/5/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/5/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/5/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/5/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/5/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/5/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/5/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/5/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/5/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/5/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/5/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/5/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/5/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/5/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/5/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/5/2012
Surr: 1,2-Dichloroethane-d4	*99.6*	*70-130*			*%REC*	1	11/5/2012
Surr: 4-Bromofluorobenzene	*96.3*	*70-130*			*%REC*	1	11/5/2012
Surr: Dibromofluoromethane	*100*	*70-130*			*%REC*	1	11/5/2012
Surr: Toluene-d8	*99.6*	*70-130*			*%REC*	1	11/5/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**14**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R505S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 3:55:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**59**	**12**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**150**	**24**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*72.6*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.68	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**8.7**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**14**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*79.8*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*66.8*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*73.5*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*112*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*65.0*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*63.0*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R505S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 3:55:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dibromo-3-chloropropane	ND	37	10		µg/Kg-dry	1	11/6/2012
1,2-Dibromoethane	ND	37	20		µg/Kg-dry	1	11/6/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/6/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/6/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/6/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/6/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/6/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/6/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/6/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/6/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/6/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/6/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/6/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R505S110112S007
Work Order:	1211097	**Collection Date:**	11/1/2012 3:55:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/6/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/6/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/6/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/6/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/6/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/6/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/6/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/6/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/6/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/6/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/6/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/6/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/6/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/6/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/6/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/6/2012
Surr: 1,2-Dichloroethane-d4	*98.6*	*70-130*			*%REC*	1	11/6/2012
Surr: 4-Bromofluorobenzene	*96.4*	*70-130*			*%REC*	1	11/6/2012
Surr: Dibromofluoromethane	*96.1*	*70-130*			*%REC*	1	11/6/2012
Surr: Toluene-d8	*98.0*	*70-130*			*%REC*	1	11/6/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**19**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R506S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 4:21:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**48**	**11**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**72**	**23**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*73.7*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.60	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	1.5	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**13**	**1.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**32**	**1.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*71.7*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*63.6*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*68.7*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*111*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*61.9*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*58.2*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R506S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 4:21:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	44	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	44	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R506S110112S006
Work Order:	1211097	**Collection Date:**	11/1/2012 4:21:00 PM
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	44	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*93.8*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*98.6*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**12**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R506T110112MX
Work Order:	1211097	**Collection Date:**	11/1/2012
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/7/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/7/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/7/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/7/2012
Benzene	ND	50	50		µg/Kg	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/7/2012
Bromoform	ND	100	100		µg/Kg	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/7/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/7/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/7/2012
Chloroethane	ND	250	250		µg/Kg	1	11/7/2012
Chloroform	ND	50	50		µg/Kg	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg	1	11/7/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/7/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *13-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1075R506T110112MX
Work Order:	1211097	**Collection Date:**	11/1/2012
Project:	Marshall KRRI 1000,1075 11/1/12		
Lab ID:	1211097-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/7/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/7/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg	1	11/7/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/7/2012
o-Xylene	ND	50	50		µg/Kg	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/7/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/7/2012
Styrene	ND	50	50		µg/Kg	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/7/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/7/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/7/2012
Toluene	ND	100	100		µg/Kg	1	11/7/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/7/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/7/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/7/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*97.6*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*92.5*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*97.0*	*70-130*			*%REC*	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44562** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44562-44562** Units: **mg/Kg** Analysis Date: **11/6/2012 02:30 PM**
Client ID: Run ID: **GC8_121106A** SeqNo: **2132560** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.376*	0	*5*	0	*67.5*	*39-115*	0			

LCS Sample ID: **DLCSS1-44562-44562** Units: **mg/Kg** Analysis Date: **11/6/2012 02:57 PM**
Client ID: Run ID: **GC8_121106A** SeqNo: **2132561** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	331	10	500	0	66.2	49-124	0			
ORO (C20-C34)	392.8	20	500	0	78.6	60-130	0			
Surr: 4-Terphenyl-d14	*4.308*	0	*5*	0	*86.2*	*39-115*	0			

MS Sample ID: **1211096-05B MS** Units: **mg/Kg** Analysis Date: **11/6/2012 03:24 PM**
Client ID: Run ID: **GC8_121106A** SeqNo: **2132562** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	326.1	9.9	494.4	113	43.1	60-130	0			S
ORO (C20-C34)	666.8	20	494.4	851.4	-37.3	60-130	0			S
Surr: 4-Terphenyl-d14	*4.013*	0	*4.944*	0	*81.2*	*39-115*	0			

MSD Sample ID: **1211096-05B MSD** Units: **mg/Kg** Analysis Date: **11/6/2012 03:51 PM**
Client ID: Run ID: **GC8_121106A** SeqNo: **2132563** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	327.3	9.2	459.4	113	46.7	60-130	326.1	0.357	30	S
ORO (C20-C34)	801.6	18	459.4	851.4	-10.8	60-130	666.8	18.3	30	S
Surr: 4-Terphenyl-d14	*4.265*	0	*4.594*	0	*92.8*	*39-115*	4.013	*6.09*	*30*	

The following samples were analyzed in this batch:

1211097-01B	1211097-02B	1211097-03B
1211097-04B	1211097-05B	1211097-06B
1211097-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44573** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:17 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132963** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:22 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132964** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.746	0.10	5	0	94.9	80-120	0			
Molybdenum	5.02	0.25	5	0	100	80-120	0			
Nickel	4.94	0.25	5	0	98.8	80-120	0			
Vanadium	4.989	0.25	5	0	99.8	80-120	0			

MS Sample ID: **1211096-05BMS** Units: **mg/Kg** Analysis Date: **11/7/2012 01:39 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132967** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.532	0.55	6.849	0.2574	91.6	75-125	0			
Molybdenum	7.485	1.4	6.849	0.6642	99.6	75-125	0			
Nickel	18.39	1.4	6.849	10.97	108	75-125	0			
Vanadium	21.12	1.4	6.849	11.33	143	75-125	0			S

MSD Sample ID: **1211096-05BMSD** Units: **mg/Kg** Analysis Date: **11/7/2012 01:44 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132968** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.744	0.57	7.184	0.2574	90.3	75-125	6.532	3.21	25	
Molybdenum	7.718	1.4	7.184	0.6642	98.2	75-125	7.485	3.07	25	
Nickel	18.16	1.4	7.184	10.97	100	75-125	18.39	1.26	25	
Vanadium	20.89	1.4	7.184	11.33	133	75-125	21.12	1.05	25	S

The following samples were analyzed in this batch:

1211097-01B	1211097-02B	1211097-03B
1211097-04B	1211097-05B	1211097-06B
1211097-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44561-44561** Units: **µg/Kg** Analysis Date: **11/6/2012 04:01 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132702** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3428*	0	*5000*	0	*68.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3641*	0	*5000*	0	*72.8*	*12-100*	0			
Surr: 2-Fluorophenol	*3882*	0	*5000*	0	*77.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5398*	0	*5000*	0	*108*	*25-137*	0			
Surr: Nitrobenzene-d5	*3528*	0	*5000*	0	*70.6*	*37-107*	0			
Surr: Phenol-d6	*3223*	0	*5000*	0	*64.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44561-44561** Units: **µg/Kg** Analysis Date: **11/6/2012 01:56 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132698** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1457	50	2000	0	72.8	45-105	0			
Acenaphthene	1433	50	2000	0	71.6	45-110	0			
Acenaphthylene	1583	50	2000	0	79.2	45-105	0			
Anthracene	1582	50	2000	0	79.1	55-105	0			
Benzo(a)anthracene	1548	50	2000	0	77.4	50-110	0			
Benzo(a)pyrene	1672	50	2000	0	83.6	50-110	0			
Benzo(b)fluoranthene	1685	50	2000	0	84.2	45-115	0			
Benzo(g,h,i)perylene	1824	50	2000	0	91.2	40-125	0			
Benzo(k)fluoranthene	1717	50	2000	0	85.8	45-115	0			
Chrysene	1563	50	2000	0	78.2	55-110	0			
Dibenzo(a,h)anthracene	1637	50	2000	0	81.8	40-125	0			
Fluoranthene	1651	50	2000	0	82.6	55-115	0			
Fluorene	1371	50	2000	0	68.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1635	50	2000	0	81.8	40-120	0			
Naphthalene	1407	50	2000	0	70.4	40-105	0			
Phenanthrene	1580	50	2000	0	79	50-110	0			
Pyrene	1689	50	2000	0	84.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*3886*	0	*5000*	0	*77.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3624*	0	*5000*	0	*72.5*	*12-100*	0			
Surr: 2-Fluorophenol	*3831*	0	*5000*	0	*76.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5628*	0	*5000*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*3658*	0	*5000*	0	*73.2*	*37-107*	0			
Surr: Phenol-d6	*3415*	0	*5000*	0	*68.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1211096-05B MS** Units: **µg/Kg** Analysis Date: **11/6/2012 02:28 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132699** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1351	49	1943	0	69.6	45-105	0			
Acenaphthene	1417	49	1943	0	73	45-110	0			
Acenaphthylene	1556	49	1943	0	80.1	45-105	0			
Anthracene	1534	49	1943	0	79	55-105	0			
Benzo(a)anthracene	1823	49	1943	257.5	80.6	50-110	0			
Benzo(a)pyrene	1955	49	1943	296.3	85.4	50-110	0			
Benzo(b)fluoranthene	2342	49	1943	425	98.7	45-115	0			
Benzo(g,h,i)perylene	872.2	49	1943	123	38.6	40-125	0			S
Benzo(k)fluoranthene	2443	49	1943	300.1	110	45-115	0			
Chrysene	2010	49	1943	357.2	85.1	55-110	0			
Dibenzo(a,h)anthracene	940.2	49	1943	0	48.4	40-125	0			
Fluoranthene	2065	49	1943	320.5	89.8	55-115	0			
Fluorene	1363	49	1943	0	70.2	50-110	0			
Indeno(1,2,3-cd)pyrene	919.8	49	1943	123.9	41	40-120	0			
Naphthalene	1186	49	1943	0	61	40-105	0			
Phenanthrene	1612	49	1943	118.1	76.9	50-110	0			
Pyrene	1741	49	1943	325.3	72.9	45-125	0			
Surr: 2,4,6-Tribromophenol	*4082*	0	*4856*	0	*84.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3412*	0	*4856*	0	*70.3*	*12-100*	0			
Surr: 2-Fluorophenol	*2962*	0	*4856*	0	*61*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4563*	0	*4856*	0	*94*	*25-137*	0			
Surr: Nitrobenzene-d5	*2902*	0	*4856*	0	*59.8*	*37-107*	0			
Surr: Phenol-d6	*2918*	0	*4856*	0	*60.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1211096-05B MSD** Units: **µg/Kg** Analysis Date: **11/6/2012 02:59 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132700** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1119	48	1916	0	58.4	45-105	1351	18.8	30	
Acenaphthene	1232	48	1916	0	64.3	45-110	1417	14	30	
Acenaphthylene	1373	48	1916	0	71.6	45-105	1556	12.5	30	
Anthracene	1364	48	1916	0	71.2	55-105	1534	11.7	30	
Benzo(a)anthracene	1643	48	1916	257.5	72.3	50-110	1823	10.4	30	
Benzo(a)pyrene	1671	48	1916	296.3	71.8	50-110	1955	15.6	30	
Benzo(b)fluoranthene	2012	48	1916	425	82.9	45-115	2342	15.1	30	
Benzo(g,h,i)perylene	816.1	48	1916	123	36.2	40-125	872.2	6.64	30	S
Benzo(k)fluoranthene	1794	48	1916	300.1	78	45-115	2443	30.6	30	R
Chrysene	1812	48	1916	357.2	76	55-110	2010	10.4	30	
Dibenzo(a,h)anthracene	866.9	48	1916	0	45.2	40-125	940.2	8.11	30	
Fluoranthene	1666	48	1916	320.5	70.2	55-115	2065	21.4	30	
Fluorene	1168	48	1916	0	61	50-110	1363	15.4	30	
Indeno(1,2,3-cd)pyrene	836.2	48	1916	123.9	37.2	40-120	919.8	9.52	30	S
Naphthalene	1059	48	1916	0	55.3	40-105	1186	11.3	30	
Phenanthrene	1456	48	1916	118.1	69.8	50-110	1612	10.2	30	
Pyrene	1471	48	1916	325.3	59.8	45-125	1741	16.8	30	
Surr: 2,4,6-Tribromophenol	*3557*	0	*4789*	0	*74.3*	*34-140*	4082	*13.8*	*40*	
Surr: 2-Fluorobiphenyl	*2946*	0	*4789*	0	*61.5*	*12-100*	3412	*14.6*	*40*	
Surr: 2-Fluorophenol	*2886*	0	*4789*	0	*60.3*	*33-117*	2962	*2.61*	*40*	
Surr: 4-Terphenyl-d14	*3850*	0	*4789*	0	*80.4*	*25-137*	4563	*17*	*40*	
Surr: Nitrobenzene-d5	*2687*	0	*4789*	0	*56.1*	*37-107*	2902	*7.71*	*40*	
Surr: Phenol-d6	*2589*	0	*4789*	0	*54.1*	*40-106*	2918	*11.9*	*40*	

The following samples were analyzed in this batch:

1211097-01B	1211097-02B	1211097-03B
1211097-04B	1211097-05B	1211097-06B
1211097-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/5/2012 05:01 PM**
Client ID: Run ID: **VMS6_121105A** SeqNo: **2131837** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	296	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*973.5*	0	*1000*	0	*97.4*	*70-130*	0
Surr: Dibromofluoromethane	*1018*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1010*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 04:43 AM**
Client ID: Run ID: **VMS6_121105B** SeqNo: **2132026** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*956.5*	0	*1000*	0	*95.6*	*70-130*	0
Surr: Dibromofluoromethane	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*996*	0	*1000*	0	*99.6*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 01:00 PM**
Client ID: Run ID: **VMS8_121106A** SeqNo: **2132777** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	85.5	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	117	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	34	100					J
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*70-130*	0
Surr: Toluene-d8	*968.5*	0	*1000*	0	*96.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/7/2012 12:31 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133090** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	72	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	81	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	32	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/L** Analysis Date: **11/8/2012 02:37 PM**
Client ID: Run ID: **VMS5_121108A** SeqNo: **2134602** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1021*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Dibromofluoromethane	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: Toluene-d8	*991.5*	0	*1000*	0	*99.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MBLK Sample ID: **MBLK-44564-44564** Units: **µg/Kg** Analysis Date: **11/9/2012 04:53 PM**
Client ID: Run ID: **VMS5_121109A** SeqNo: **2135683** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	103	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*993*	0	*1000*	0	*99.3*	*70-130*	0
Surr: Dibromofluoromethane	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Toluene-d8	*981*	0	*1000*	0	*98.1*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/5/2012 03:48 PM**
Client ID: Run ID: **VMS6_121105A** SeqNo: **2131836** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	867	30	1000	0	86.7	75-125	0			
1,1,1-Trichloroethane	891.5	30	1000	0	89.2	70-135	0			
1,1,2,2-Tetrachloroethane	838.5	30	1000	0	83.8	55-130	0			
1,1,2-Trichloroethane	890	30	1000	0	89	60-125	0			
1,1-Dichloroethane	881	30	1000	0	88.1	75-125	0			
1,1-Dichloroethene	991	30	1000	0	99.1	65-135	0			
1,2,3-Trichlorobenzene	886.5	30	1000	0	88.6	60-135	0			
1,2,3-Trichloropropane	916	30	1000	0	91.6	65-130	0			
1,2,3-Trimethylbenzene	887.5	30	1000	0	88.8	65-135	0			
1,2,4-Trichlorobenzene	920.5	30	1000	0	92	65-130	0			
1,2,4-Trimethylbenzene	883.5	30	1000	0	88.4	65-135	0			
1,2-Dibromo-3-chloropropane	915.5	30	1000	0	91.6	40-135	0			
1,2-Dibromoethane	887.5	30	1000	0	88.8	70-125	0			
1,2-Dichlorobenzene	862	30	1000	0	86.2	75-120	0			
1,2-Dichloroethane	858.5	30	1000	0	85.8	70-135	0			
1,2-Dichloropropane	876	30	1000	0	87.6	70-120	0			
1,3,5-Trimethylbenzene	855.5	30	1000	0	85.6	65-135	0			
1,3-Dichlorobenzene	881	30	1000	0	88.1	70-125	0			
1,4-Dichlorobenzene	878	30	1000	0	87.8	70-125	0			
2-Butanone	1012	200	1000	0	101	30-160	0			
2-Hexanone	892	30	1000	0	89.2	45-145	0			
4-Methyl-2-pentanone	1194	30	1000	0	119	45-145	0			
Acetone	989	100	1000	0	98.9	20-160	0			B
Acrylonitrile	949	100	1000	0	94.9	70-135	0			
Benzene	913.5	30	1000	0	91.4	75-125	0			
Bromobenzene	900	30	1000	0	90	65-120	0			
Bromochloromethane	878.5	30	1000	0	87.8	70-125	0			
Bromodichloromethane	859.5	30	1000	0	86	70-130	0			
Bromoform	911.5	30	1000	0	91.2	55-135	0			
Bromomethane	1076	75	1000	0	108	30-160	0			
Carbon disulfide	1333	30	1000	0	133	45-160	0			
Carbon tetrachloride	913.5	30	1000	0	91.4	65-135	0			
Chlorobenzene	929	30	1000	0	92.9	75-125	0			
Chloroethane	894.5	100	1000	0	89.4	40-155	0			
Chloroform	887.5	30	1000	0	88.8	70-125	0			
Chloromethane	830	100	1000	0	83	50-130	0			
cis-1,2-Dichloroethene	924	30	1000	0	92.4	65-125	0			
cis-1,3-Dichloropropene	848.5	30	1000	0	84.8	70-125	0			
Dibromochloromethane	857	30	1000	0	85.7	65-135	0			
Dibromomethane	908.5	30	1000	0	90.8	75-130	0			
Dichlorodifluoromethane	833	30	1000	0	83.3	35-135	0			
Ethylbenzene	908	30	1000	0	90.8	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	872	30	1000	0	87.2	70-135	0
Isopropylbenzene	834	30	1000	0	83.4	75-130	0
m,p-Xylene	1813	60	2000	0	90.6	80-125	0
Methyl tert-butyl ether	956	30	1000	0	95.6	75-125	0
Methylene chloride	970.5	30	1000	0	97	55-145	0
Naphthalene	919.5	100	1000	0	92	40-140	0
n-Butylbenzene	845.5	30	1000	0	84.6	65-140	0
n-Propylbenzene	809	30	1000	0	80.9	65-135	0
o-Xylene	912	30	1000	0	91.2	75-125	0
p-Isopropyltoluene	841.5	30	1000	0	84.2	75-135	0
sec-Butylbenzene	857.5	30	1000	0	85.8	65-130	0
Styrene	920.5	30	1000	0	92	75-125	0
tert-Butylbenzene	902	30	1000	0	90.2	65-130	0
Tetrachloroethene	843.5	30	1000	0	84.4	64-140	0
Tetrahydrofuran	1006	200	1000	0	101	70-135	0
Toluene	910.5	30	1000	0	91	70-125	0
trans-1,2-Dichloroethene	952.5	30	1000	0	95.2	65-135	0
trans-1,3-Dichloropropene	883	30	1000	0	88.3	65-125	0
trans-1,4-Dichloro-2-butene	975.5	30	1000	0	97.6	70-135	0
Trichloroethene	893	30	1000	0	89.3	75-125	0
Trichlorofluoromethane	902.5	30	1000	0	90.2	25-185	0
Vinyl chloride	886	30	1000	0	88.6	60-125	0
Surr: 1,2-Dichloroethane-d4	*965*	0	*1000*	0	*96.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*972*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Dibromofluoromethane	*985.5*	0	*1000*	0	*98.6*	*70-130*	0
Surr: Toluene-d8	*1006*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS	Sample ID: **LCS-44564-44564**				Units: **µg/Kg**		Analysis Date: **11/6/2012 03:31 AM**			
Client ID:		Run ID: **VMS6_121105B**			SeqNo: **2132025**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	917.5	30	1000	0	91.8	75-125	0			
1,1,1-Trichloroethane	964.5	30	1000	0	96.4	70-135	0			
1,1,2,2-Tetrachloroethane	925	30	1000	0	92.5	55-130	0			
1,1,2-Trichloroethane	952.5	30	1000	0	95.2	60-125	0			
1,1-Dichloroethane	961.5	30	1000	0	96.2	75-125	0			
1,1-Dichloroethene	1054	30	1000	0	105	65-135	0			
1,2,3-Trichlorobenzene	954.5	30	1000	0	95.4	60-135	0			
1,2,3-Trichloropropane	1032	30	1000	0	103	65-130	0			
1,2,3-Trimethylbenzene	948.5	30	1000	0	94.8	65-135	0			
1,2,4-Trichlorobenzene	967.5	30	1000	0	96.8	65-130	0			
1,2,4-Trimethylbenzene	968	30	1000	0	96.8	65-135	0			
1,2-Dibromo-3-chloropropane	969	30	1000	0	96.9	40-135	0			
1,2-Dibromoethane	948	30	1000	0	94.8	70-125	0			
1,2-Dichlorobenzene	939	30	1000	0	93.9	75-120	0			
1,2-Dichloroethane	925	30	1000	0	92.5	70-135	0			
1,2-Dichloropropane	941.5	30	1000	0	94.2	70-120	0			
1,3,5-Trimethylbenzene	928	30	1000	0	92.8	65-135	0			
1,3-Dichlorobenzene	932	30	1000	0	93.2	70-125	0			
1,4-Dichlorobenzene	936	30	1000	0	93.6	70-125	0			
2-Butanone	1208	200	1000	0	121	30-160	0			
2-Hexanone	1042	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1376	30	1000	0	138	45-145	0			
Acetone	1232	100	1000	0	123	20-160	0			
Acrylonitrile	1076	100	1000	0	108	70-135	0			
Benzene	998.5	30	1000	0	99.8	75-125	0			
Bromobenzene	957.5	30	1000	0	95.8	65-120	0			
Bromochloromethane	945	30	1000	0	94.5	70-125	0			
Bromodichloromethane	910	30	1000	0	91	70-130	0			
Bromoform	946	30	1000	0	94.6	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1374	30	1000	0	137	45-160	0			
Carbon tetrachloride	963	30	1000	0	96.3	65-135	0			
Chlorobenzene	993	30	1000	0	99.3	75-125	0			
Chloroethane	992.5	100	1000	0	99.2	40-155	0			
Chloroform	979.5	30	1000	0	98	70-125	0			
Chloromethane	881.5	100	1000	0	88.2	50-130	0			
cis-1,2-Dichloroethene	990.5	30	1000	0	99	65-125	0			
cis-1,3-Dichloropropene	887	30	1000	0	88.7	70-125	0			
Dibromochloromethane	890.5	30	1000	0	89	65-135	0			
Dibromomethane	976.5	30	1000	0	97.6	75-130	0			
Dichlorodifluoromethane	890.5	30	1000	0	89	35-135	0			
Ethylbenzene	983	30	1000	0	98.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564**	Instrument ID **VMS6**		Method: **SW8260**				
Hexachloroethane	885.5	30	1000	0	88.6	70-135	0
Isopropylbenzene	921	30	1000	0	92.1	75-130	0
m,p-Xylene	1980	60	2000	0	99	80-125	0
Methyl tert-butyl ether	1088	30	1000	0	109	75-125	0
Methylene chloride	1005	30	1000	0	100	55-145	0
Naphthalene	1011	100	1000	0	101	40-140	0
n-Butylbenzene	887	30	1000	0	88.7	65-140	0
n-Propylbenzene	899	30	1000	0	89.9	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	898.5	30	1000	0	89.8	75-135	0
sec-Butylbenzene	935	30	1000	0	93.5	65-130	0
Styrene	983.5	30	1000	0	98.4	75-125	0
tert-Butylbenzene	970.5	30	1000	0	97	65-130	0
Tetrachloroethene	912	30	1000	0	91.2	64-140	0
Tetrahydrofuran	1152	200	1000	0	115	70-135	0
Toluene	980	30	1000	0	98	70-125	0
trans-1,2-Dichloroethene	1028	30	1000	0	103	65-135	0
trans-1,3-Dichloropropene	888	30	1000	0	88.8	65-125	0
trans-1,4-Dichloro-2-butene	875	30	1000	0	87.5	70-135	0
Trichloroethene	977	30	1000	0	97.7	75-125	0
Trichlorofluoromethane	1020	30	1000	0	102	25-185	0
Vinyl chloride	973	30	1000	0	97.3	60-125	0
Surr: 1,2-Dichloroethane-d4	*1029*	0	*1000*	0	*103*	*70-130*	0
Surr: 4-Bromofluorobenzene	*995.5*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Dibromofluoromethane	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*992*	0	*1000*	0	*99.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 11:48 AM**
Client ID: Run ID: **VMS8_121106A** SeqNo: **2132776** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	965	30	1000	0	96.5	75-125	0			
1,1,1-Trichloroethane	965.5	30	1000	0	96.6	70-135	0			
1,1,2,2-Tetrachloroethane	877	30	1000	0	87.7	55-130	0			
1,1,2-Trichloroethane	864.5	30	1000	0	86.4	60-125	0			
1,1-Dichloroethane	959	30	1000	0	95.9	75-125	0			
1,1-Dichloroethene	961.5	30	1000	0	96.2	65-135	0			
1,2,3-Trichlorobenzene	989	30	1000	0	98.9	60-135	0			
1,2,3-Trichloropropane	939.5	30	1000	0	94	65-130	0			
1,2,3-Trimethylbenzene	945	30	1000	0	94.5	65-135	0			
1,2,4-Trichlorobenzene	1068	30	1000	0	107	65-130	0			
1,2,4-Trimethylbenzene	952.5	30	1000	0	95.2	65-135	0			
1,2-Dibromo-3-chloropropane	942.5	30	1000	0	94.2	40-135	0			
1,2-Dibromoethane	963	30	1000	0	96.3	70-125	0			
1,2-Dichlorobenzene	935.5	30	1000	0	93.6	75-120	0			
1,2-Dichloroethane	922	30	1000	0	92.2	70-135	0			
1,2-Dichloropropane	923.5	30	1000	0	92.4	70-120	0			
1,3,5-Trimethylbenzene	987.5	30	1000	0	98.8	65-135	0			
1,3-Dichlorobenzene	975	30	1000	0	97.5	70-125	0			
1,4-Dichlorobenzene	918	30	1000	0	91.8	70-125	0			
2-Butanone	978	200	1000	0	97.8	30-160	0			
2-Hexanone	993	30	1000	0	99.3	45-145	0			
4-Methyl-2-pentanone	1220	30	1000	0	122	45-145	0			
Acetone	1052	100	1000	0	105	20-160	0			B
Acrylonitrile	877	100	1000	0	87.7	70-135	0			
Benzene	935.5	30	1000	0	93.6	75-125	0			
Bromobenzene	989	30	1000	0	98.9	65-120	0			
Bromochloromethane	961.5	30	1000	0	96.2	70-125	0			
Bromodichloromethane	971.5	30	1000	0	97.2	70-130	0			
Bromoform	982.5	30	1000	0	98.2	55-135	0			
Bromomethane	1224	75	1000	0	122	30-160	0			
Carbon disulfide	1041	30	1000	0	104	45-160	0			
Carbon tetrachloride	1034	30	1000	0	103	65-135	0			
Chlorobenzene	980	30	1000	0	98	75-125	0			
Chloroethane	1338	100	1000	0	134	40-155	0			
Chloroform	944.5	30	1000	0	94.4	70-125	0			
Chloromethane	878	100	1000	0	87.8	50-130	0			
cis-1,2-Dichloroethene	970.5	30	1000	0	97	65-125	0			
cis-1,3-Dichloropropene	981	30	1000	0	98.1	70-125	0			
Dibromochloromethane	1037	30	1000	0	104	65-135	0			
Dibromomethane	875	30	1000	0	87.5	75-130	0			
Dichlorodifluoromethane	747.5	30	1000	0	74.8	35-135	0			
Ethylbenzene	972	30	1000	0	97.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	1146	30	1000	0	115	70-135	0
Isopropylbenzene	958	30	1000	0	95.8	75-130	0
m,p-Xylene	1960	60	2000	0	98	80-125	0
Methyl tert-butyl ether	1044	30	1000	0	104	75-125	0
Methylene chloride	968	30	1000	0	96.8	55-145	0
Naphthalene	1027	100	1000	0	103	40-140	0
n-Butylbenzene	1140	30	1000	0	114	65-140	0
n-Propylbenzene	943	30	1000	0	94.3	65-135	0
o-Xylene	962	30	1000	0	96.2	75-125	0
p-Isopropyltoluene	963.5	30	1000	0	96.4	75-135	0
sec-Butylbenzene	976.5	30	1000	0	97.6	65-130	0
Styrene	964	30	1000	0	96.4	75-125	0
tert-Butylbenzene	955.5	30	1000	0	95.6	65-130	0
Tetrachloroethene	943.5	30	1000	0	94.4	64-140	0
Tetrahydrofuran	900	200	1000	0	90	70-135	0
Toluene	937.5	30	1000	0	93.8	70-125	0
trans-1,2-Dichloroethene	990.5	30	1000	0	99	65-135	0
trans-1,3-Dichloropropene	997	30	1000	0	99.7	65-125	0
trans-1,4-Dichloro-2-butene	970.5	30	1000	0	97	70-135	0
Trichloroethene	952.5	30	1000	0	95.2	75-125	0
Trichlorofluoromethane	904.5	30	1000	0	90.4	25-185	0
Vinyl chloride	960.5	30	1000	0	96	60-125	0
Surr: 1,2-Dichloroethane-d4	*991*	0	*1000*	0	*99.1*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*979*	0	*1000*	0	*97.9*	*70-130*	0
Surr: Toluene-d8	*1012*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/Kg** Analysis Date: **11/6/2012 11:20 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133089** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	911.5	30	1000	0	91.2	75-125	0			
1,1,1-Trichloroethane	906.5	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	848	30	1000	0	84.8	55-130	0			
1,1,2-Trichloroethane	843.5	30	1000	0	84.4	60-125	0			
1,1-Dichloroethane	861.5	30	1000	0	86.2	75-125	0			
1,1-Dichloroethene	856.5	30	1000	0	85.6	65-135	0			
1,2,3-Trichlorobenzene	982	30	1000	0	98.2	60-135	0			
1,2,3-Trichloropropane	927	30	1000	0	92.7	65-130	0			
1,2,3-Trimethylbenzene	919.5	30	1000	0	92	65-135	0			
1,2,4-Trichlorobenzene	1042	30	1000	0	104	65-130	0			
1,2,4-Trimethylbenzene	925	30	1000	0	92.5	65-135	0			
1,2-Dibromo-3-chloropropane	905.5	30	1000	0	90.6	40-135	0			
1,2-Dibromoethane	940.5	30	1000	0	94	70-125	0			
1,2-Dichlorobenzene	933.5	30	1000	0	93.4	75-120	0			
1,2-Dichloroethane	889	30	1000	0	88.9	70-135	0			
1,2-Dichloropropane	886.5	30	1000	0	88.6	70-120	0			
1,3,5-Trimethylbenzene	923.5	30	1000	0	92.4	65-135	0			
1,3-Dichlorobenzene	934	30	1000	0	93.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	929	200	1000	0	92.9	30-160	0			
2-Hexanone	986	30	1000	0	98.6	45-145	0			
4-Methyl-2-pentanone	1223	30	1000	0	122	45-145	0			
Acetone	977	100	1000	0	97.7	20-160	0			
Acrylonitrile	852.5	100	1000	0	85.2	70-135	0			
Benzene	884	30	1000	0	88.4	75-125	0			
Bromobenzene	906.5	30	1000	0	90.6	65-120	0			
Bromochloromethane	891	30	1000	0	89.1	70-125	0			
Bromodichloromethane	916	30	1000	0	91.6	70-130	0			
Bromoform	945	30	1000	0	94.5	55-135	0			
Bromomethane	1029	75	1000	0	103	30-160	0			
Carbon disulfide	926.5	30	1000	0	92.6	45-160	0			
Carbon tetrachloride	937.5	30	1000	0	93.8	65-135	0			
Chlorobenzene	943.5	30	1000	0	94.4	75-125	0			
Chloroethane	1206	100	1000	0	121	40-155	0			
Chloroform	880	30	1000	0	88	70-125	0			
Chloromethane	784.5	100	1000	0	78.4	50-130	0			
cis-1,2-Dichloroethene	883.5	30	1000	0	88.4	65-125	0			
cis-1,3-Dichloropropene	928	30	1000	0	92.8	70-125	0			
Dibromochloromethane	936.5	30	1000	0	93.6	65-135	0			
Dibromomethane	891	30	1000	0	89.1	75-130	0			
Dichlorodifluoromethane	654.5	30	1000	0	65.4	35-135	0			
Ethylbenzene	932	30	1000	0	93.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	939.5	30	1000	0	94	70-135	0
Isopropylbenzene	909	30	1000	0	90.9	75-130	0
m,p-Xylene	1901	60	2000	0	95	80-125	0
Methyl tert-butyl ether	996.5	30	1000	0	99.6	75-125	0
Methylene chloride	870	30	1000	0	87	55-145	0
Naphthalene	1144	100	1000	0	114	40-140	0
n-Butylbenzene	1028	30	1000	0	103	65-140	0
n-Propylbenzene	875.5	30	1000	0	87.6	65-135	0
o-Xylene	943	30	1000	0	94.3	75-125	0
p-Isopropyltoluene	871.5	30	1000	0	87.2	75-135	0
sec-Butylbenzene	876.5	30	1000	0	87.6	65-130	0
Styrene	945.5	30	1000	0	94.6	75-125	0
tert-Butylbenzene	881.5	30	1000	0	88.2	65-130	0
Tetrachloroethene	921.5	30	1000	0	92.2	64-140	0
Tetrahydrofuran	900	200	1000	0	90	70-135	0
Toluene	905.5	30	1000	0	90.6	70-125	0
trans-1,2-Dichloroethene	895.5	30	1000	0	89.6	65-135	0
trans-1,3-Dichloropropene	933	30	1000	0	93.3	65-125	0
trans-1,4-Dichloro-2-butene	861.5	30	1000	0	86.2	70-135	0
Trichloroethene	919.5	30	1000	0	92	75-125	0
Trichlorofluoromethane	852.5	30	1000	0	85.2	25-185	0
Vinyl chloride	872.5	30	1000	0	87.2	60-125	0
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*994.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Dibromofluoromethane	*1008*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **LCS-44564-44564** Units: **µg/L** Analysis Date: **11/8/2012 01:00 PM**
Client ID: Run ID: **VMS5_121108A** SeqNo: **2134601** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	958.5	30	1000	0	95.8	75-125	0			
1,1,1-Trichloroethane	1026	30	1000	0	103	70-135	0			
1,1,2,2-Tetrachloroethane	836	30	1000	0	83.6	55-130	0			
1,1,2-Trichloroethane	915.5	30	1000	0	91.6	60-125	0			
1,1-Dichloroethane	952.5	30	1000	0	95.2	75-125	0			
1,1-Dichloroethene	1048	30	1000	0	105	65-135	0			
1,2,3-Trichlorobenzene	914.5	30	1000	0	91.4	60-135	0			
1,2,3-Trichloropropane	854	30	1000	0	85.4	65-130	0			
1,2,3-Trimethylbenzene	930.5	30	1000	0	93	65-135	0			
1,2,4-Trichlorobenzene	986	30	1000	0	98.6	65-130	0			
1,2,4-Trimethylbenzene	959	30	1000	0	95.9	65-135	0			
1,2-Dibromo-3-chloropropane	735	30	1000	0	73.5	40-135	0			
1,2-Dibromoethane	917	30	1000	0	91.7	70-125	0			
1,2-Dichlorobenzene	946.5	30	1000	0	94.6	75-120	0			
1,2-Dichloroethane	910	30	1000	0	91	70-135	0			
1,2-Dichloropropane	946.5	30	1000	0	94.6	70-120	0			
1,3,5-Trimethylbenzene	983	30	1000	0	98.3	65-135	0			
1,3-Dichlorobenzene	964.5	30	1000	0	96.4	70-125	0			
1,4-Dichlorobenzene	964	30	1000	0	96.4	70-125	0			
2-Butanone	827	200	1000	0	82.7	30-160	0			
2-Hexanone	809.5	30	1000	0	81	45-145	0			
4-Methyl-2-pentanone	862	30	1000	0	86.2	45-145	0			
Acetone	810	100	1000	0	81	20-160	0			
Acrylonitrile	886	100	1000	0	88.6	70-135	0			
Benzene	989	30	1000	0	98.9	75-125	0			
Bromobenzene	923.5	30	1000	0	92.4	65-120	0			
Bromochloromethane	982	30	1000	0	98.2	70-125	0			
Bromodichloromethane	945.5	30	1000	0	94.6	70-130	0			
Bromoform	901	30	1000	0	90.1	55-135	0			
Bromomethane	1398	75	1000	0	140	30-160	0			
Carbon disulfide	1148	30	1000	0	115	45-160	0			
Carbon tetrachloride	1034	30	1000	0	103	65-135	0			
Chlorobenzene	960.5	30	1000	0	96	75-125	0			
Chloroethane	1008	100	1000	0	101	40-155	0			
Chloroform	953.5	30	1000	0	95.4	70-125	0			
Chloromethane	913	100	1000	0	91.3	50-130	0			
cis-1,2-Dichloroethene	1000	30	1000	0	100	65-125	0			
cis-1,3-Dichloropropene	964	30	1000	0	96.4	70-125	0			
Dibromochloromethane	918.5	30	1000	0	91.8	65-135	0			
Dibromomethane	878	30	1000	0	87.8	75-130	0			
Dichlorodifluoromethane	895.5	30	1000	0	89.6	35-135	0			
Ethylbenzene	976.5	30	1000	0	97.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	1014	30	1000	0	101	70-135	0
Isopropylbenzene	985	30	1000	0	98.5	75-130	0
m,p-Xylene	1950	60	2000	0	97.5	80-125	0
Methyl tert-butyl ether	1002	30	1000	0	100	75-125	0
Methylene chloride	963.5	30	1000	0	96.4	55-145	0
Naphthalene	830	100	1000	0	83	40-140	0
n-Butylbenzene	1034	30	1000	0	103	65-140	0
n-Propylbenzene	960.5	30	1000	0	96	65-135	0
o-Xylene	951.5	30	1000	0	95.2	75-125	0
p-Isopropyltoluene	992.5	30	1000	0	99.2	75-135	0
sec-Butylbenzene	1025	30	1000	0	102	65-130	0
Styrene	977	30	1000	0	97.7	75-125	0
tert-Butylbenzene	978	30	1000	0	97.8	65-130	0
Tetrachloroethene	968	30	1000	0	96.8	64-140	0
Tetrahydrofuran	802.5	200	1000	0	80.2	70-135	0
Toluene	984	30	1000	0	98.4	70-125	0
trans-1,2-Dichloroethene	1002	30	1000	0	100	65-135	0
trans-1,3-Dichloropropene	941.5	30	1000	0	94.2	65-125	0
trans-1,4-Dichloro-2-butene	814	30	1000	0	81.4	70-135	0
Trichloroethene	976	30	1000	0	97.6	75-125	0
Trichlorofluoromethane	1000	30	1000	0	100	25-185	0
Vinyl chloride	988.5	30	1000	0	98.8	60-125	0
Surr: 1,2-Dichloroethane-d4	*985*	0	*1000*	0	*98.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*987.5*	0	*1000*	0	*98.8*	*70-130*	0
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*70-130*	0
Surr: Toluene-d8	*1016*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

LCS	Sample ID: **LCS-44564-44564**				Units: **µg/Kg**		Analysis Date: **11/9/2012 03:17 PM**			
Client ID:		Run ID: **VMS5_121109A**			SeqNo: **2135679**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	994.5	30	1000	0	99.4	75-125	0			
1,1,1-Trichloroethane	1080	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	954.5	30	1000	0	95.4	55-130	0			
1,1,2-Trichloroethane	969	30	1000	0	96.9	60-125	0			
1,1-Dichloroethane	1038	30	1000	0	104	75-125	0			
1,1-Dichloroethene	1130	30	1000	0	113	65-135	0			
1,2,3-Trichlorobenzene	1006	30	1000	0	101	60-135	0			
1,2,3-Trichloropropane	987.5	30	1000	0	98.8	65-130	0			
1,2,3-Trimethylbenzene	975	30	1000	0	97.5	65-135	0			
1,2,4-Trichlorobenzene	1016	30	1000	0	102	65-130	0			
1,2,4-Trimethylbenzene	1020	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	908	30	1000	0	90.8	40-135	0			
1,2-Dibromoethane	962	30	1000	0	96.2	70-125	0			
1,2-Dichlorobenzene	994.5	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	1014	30	1000	0	101	70-135	0			
1,2-Dichloropropane	1040	30	1000	0	104	70-120	0			
1,3,5-Trimethylbenzene	1052	30	1000	0	105	65-135	0			
1,3-Dichlorobenzene	999.5	30	1000	0	100	70-125	0			
1,4-Dichlorobenzene	1000	30	1000	0	100	70-125	0			
2-Butanone	1260	200	1000	0	126	30-160	0			
2-Hexanone	1051	30	1000	0	105	45-145	0			
4-Methyl-2-pentanone	1085	30	1000	0	108	45-145	0			
Acetone	1240	100	1000	0	124	20-160	0			B
Acrylonitrile	1066	100	1000	0	107	70-135	0			
Benzene	1058	30	1000	0	106	75-125	0			
Bromobenzene	954	30	1000	0	95.4	65-120	0			
Bromochloromethane	1064	30	1000	0	106	70-125	0			
Bromodichloromethane	995.5	30	1000	0	99.6	70-130	0			
Bromoform	899.5	30	1000	0	90	55-135	0			
Bromomethane	1442	75	1000	0	144	30-160	0			
Carbon disulfide	1272	30	1000	0	127	45-160	0			
Carbon tetrachloride	1094	30	1000	0	109	65-135	0			
Chlorobenzene	1027	30	1000	0	103	75-125	0			
Chloroethane	1098	100	1000	0	110	40-155	0			
Chloroform	1072	30	1000	0	107	70-125	0			
Chloromethane	1072	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	1003	30	1000	0	100	70-125	0			
Dibromochloromethane	928	30	1000	0	92.8	65-135	0			
Dibromomethane	940.5	30	1000	0	94	75-130	0			
Dichlorodifluoromethane	911	30	1000	0	91.1	35-135	0			
Ethylbenzene	1048	30	1000	0	105	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	941	30	1000	0	94.1	70-135	0	
Isopropylbenzene	1065	30	1000	0	106	75-130	0	
m,p-Xylene	2078	60	2000	0	104	80-125	0	
Methyl tert-butyl ether	1208	30	1000	0	121	75-125	0	
Methylene chloride	1071	30	1000	0	107	55-145	0	
Naphthalene	1004	100	1000	0	100	40-140	0	
n-Butylbenzene	1032	30	1000	0	103	65-140	0	
n-Propylbenzene	1034	30	1000	0	103	65-135	0	
o-Xylene	1026	30	1000	0	103	75-125	0	
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0	
sec-Butylbenzene	1092	30	1000	0	109	65-130	0	
Styrene	1048	30	1000	0	105	75-125	0	
tert-Butylbenzene	1033	30	1000	0	103	65-130	0	
Tetrachloroethene	1032	30	1000	0	103	64-140	0	
Tetrahydrofuran	1044	200	1000	0	104	70-135	0	
Toluene	1032	30	1000	0	103	70-125	0	
trans-1,2-Dichloroethene	1128	30	1000	0	113	65-135	0	
trans-1,3-Dichloropropene	927.5	30	1000	0	92.8	65-125	0	
trans-1,4-Dichloro-2-butene	525.5	30	1000	0	52.6	70-135	0	S
Trichloroethene	1044	30	1000	0	104	75-125	0	
Trichlorofluoromethane	1046	30	1000	0	105	25-185	0	
Vinyl chloride	1088	30	1000	0	109	60-125	0	
Surr: 1,2-Dichloroethane-d4	*997.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*988.5*	0	*1000*	0	*98.8*	*70-130*	0	
Surr: Dibromofluoromethane	*994.5*	0	*1000*	0	*99.4*	*70-130*	0	
Surr: Toluene-d8	*983.5*	0	*1000*	0	*98.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1211096-05A MS** Units: **µg/Kg** Analysis Date: **11/7/2012 08:44 AM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133075** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2550	85	2846	0	89.6	75-125	0			
1,1,1-Trichloroethane	2473	85	2846	0	86.9	70-135	0			
1,1,2,2-Tetrachloroethane	2671	85	2846	0	93.8	55-130	0			
1,1,2-Trichloroethane	2411	85	2846	0	84.7	60-125	0			
1,1-Dichloroethane	2396	85	2846	0	84.2	75-125	0			
1,1-Dichloroethene	2375	85	2846	0	83.4	65-135	0			
1,2,3-Trichlorobenzene	2122	85	2846	0	74.6	60-135	0			
1,2,3-Trichloropropane	2882	85	2846	0	101	65-130	0			
1,2,3-Trimethylbenzene	2352	85	2846	0	82.6	65-135	0			
1,2,4-Trichlorobenzene	2270	85	2846	0	79.8	65-130	0			
1,2,4-Trimethylbenzene	2520	85	2846	0	88.6	65-135	0			
1,2-Dibromo-3-chloropropane	2324	85	2846	0	81.6	40-135	0			
1,2-Dibromoethane	2607	85	2846	0	91.6	70-125	0			
1,2-Dichlorobenzene	2401	85	2846	0	84.4	75-120	0			
1,2-Dichloroethane	2455	85	2846	0	86.2	70-135	0			
1,2-Dichloropropane	2463	85	2846	0	86.6	70-120	0			
1,3,5-Trimethylbenzene	2600	85	2846	0	91.4	65-135	0			
1,3-Dichlorobenzene	2449	85	2846	0	86	70-125	0			
1,4-Dichlorobenzene	2361	85	2846	0	83	70-125	0			
2-Butanone	2942	280	2846	0	103	30-160	0			
2-Hexanone	3078	85	2846	0	108	45-145	0			
4-Methyl-2-pentanone	3906	85	2846	0	137	45-145	0			
Acetone	3401	280	2846	22.77	119	20-160	0			
Acrylonitrile	2694	85	2846	0	94.6	70-135	0			
Benzene	2405	85	2846	0	84.5	75-125	0			
Bromobenzene	2591	85	2846	0	91	65-120	0			
Bromochloromethane	2466	85	2846	0	86.6	70-125	0			
Bromodichloromethane	2425	85	2846	0	85.2	70-130	0			
Bromoform	2525	85	2846	0	88.7	55-135	0			
Bromomethane	2435	85	2846	0	85.6	30-160	0			
Carbon disulfide	2267	85	2846	0	79.6	45-160	0			
Carbon tetrachloride	2480	85	2846	0	87.2	65-135	0			
Chlorobenzene	2569	85	2846	0	90.2	75-125	0			
Chloroethane	1598	280	2846	0	56.2	40-155	0			
Chloroform	2536	85	2846	0	89.1	70-125	0			
Chloromethane	2075	85	2846	0	72.9	50-130	0			
cis-1,2-Dichloroethene	2429	85	2846	0	85.4	65-125	0			
cis-1,3-Dichloropropene	2563	85	2846	0	90	70-125	0			
Dibromochloromethane	2478	85	2846	0	87	65-135	0			
Dibromomethane	2570	85	2846	0	90.3	75-130	0			
Dichlorodifluoromethane	1992	85	2846	0	70	35-135	0			
Ethylbenzene	2516	85	2846	0	88.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	2375	85	2846	0	83.4	70-135	0
Isopropylbenzene	2533	85	2846	0	89	75-130	0
m,p-Xylene	5164	170	5692	0	90.7	80-125	0
Methyl tert-butyl ether	2922	85	2846	0	103	75-125	0
Methylene chloride	2418	85	2846	0	85	55-145	0
Naphthalene	2257	280	2846	68.31	76.9	40-140	0
n-Butylbenzene	2418	85	2846	0	85	65-140	0
n-Propylbenzene	2443	85	2846	0	85.8	65-135	0
o-Xylene	2587	85	2846	0	90.9	75-125	0
p-Isopropyltoluene	2209	85	2846	0	77.6	75-135	0
sec-Butylbenzene	2446	85	2846	0	86	65-130	0
Styrene	2530	85	2846	0	88.9	75-125	0
tert-Butylbenzene	2515	85	2846	0	88.4	65-130	0
Tetrachloroethene	2335	85	2846	0	82	64-140	0
Tetrahydrofuran	2960	280	2846	0	104	70-135	0
Toluene	2368	85	2846	0	83.2	70-125	0
trans-1,2-Dichloroethene	2433	85	2846	0	85.5	65-135	0
trans-1,3-Dichloropropene	2442	85	2846	0	85.8	65-125	0
trans-1,4-Dichloro-2-butene	2297	85	2846	0	80.7	70-135	0
Trichloroethene	2441	85	2846	0	85.8	75-125	0
Trichlorofluoromethane	2371	85	2846	0	83.3	25-185	0
Vinyl chloride	2241	85	2846	0	78.8	60-125	0
Surr: 1,2-Dichloroethane-d4	*2795*	0	*2846*	0	*98.2*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2937*	0	*2846*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*2752*	0	*2846*	0	*96.7*	*70-130*	0
Surr: Toluene-d8	*2694*	0	*2846*	0	*94.6*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1211109-02A MS** Units: **µg/Kg** Analysis Date: **11/8/2012 08:45 PM**
Client ID: Run ID: **VMS5_121108A** SeqNo: **2134599** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	930.5	5.0	1000	0	93	75-125	0			
1,1,1-Trichloroethane	987	5.0	1000	0	98.7	70-135	0			
1,1,2,2-Tetrachloroethane	876	5.0	1000	0	87.6	55-130	0			
1,1,2-Trichloroethane	903.5	5.0	1000	0	90.4	60-125	0			
1,1-Dichloroethane	954.5	5.0	1000	0	95.4	75-125	0			
1,1-Dichloroethene	1064	5.0	1000	0	106	65-135	0			
1,2,3-Trichlorobenzene	936.5	5.0	1000	0	93.6	60-135	0			
1,2,3-Trichloropropane	918	5.0	1000	0	91.8	65-130	0			
1,2,4-Trichlorobenzene	991.5	5.0	1000	0	99.2	65-130	0			
1,2,4-Trimethylbenzene	960	5.0	1000	0	96	65-135	0			
1,2-Dibromo-3-chloropropane	825.5	5.0	1000	0	82.6	40-135	0			
1,2-Dibromoethane	904.5	5.0	1000	0	90.4	70-125	0			
1,2-Dichlorobenzene	960	5.0	1000	0	96	75-120	0			
1,2-Dichloroethane	926.5	5.0	1000	0	92.6	70-135	0			
1,2-Dichloropropane	955.5	5.0	1000	0	95.6	70-120	0			
1,3,5-Trimethylbenzene	988	5.0	1000	0	98.8	65-135	0			
1,3-Dichlorobenzene	954	5.0	1000	0	95.4	70-125	0			
1,4-Dichlorobenzene	963	5.0	1000	0	96.3	70-125	0			
2-Butanone	972.5	10	1000	0	97.2	30-160	0			
2-Hexanone	857.5	5.0	1000	0	85.8	45-145	0			
4-Methyl-2-pentanone	894.5	5.0	1000	0	89.4	45-145	0			
Acetone	954.5	10	1000	32.5	92.2	20-160	0			B
Acrylonitrile	974.5	5.0	1000	0	97.4	70-135	0			
Benzene	951	5.0	1000	0	95.1	75-125	0			
Bromobenzene	935.5	10	1000	0	93.6	65-120	0			
Bromochloromethane	1017	5.0	1000	0	102	70-125	0			
Bromodichloromethane	915.5	5.0	1000	0	91.6	70-130	0			
Bromoform	864	5.0	1000	0	86.4	55-135	0			
Bromomethane	1037	10	1000	0	104	30-160	0			
Carbon disulfide	1145	5.0	1000	0	114	45-160	0			
Carbon tetrachloride	984.5	5.0	1000	0	98.4	65-135	0			
Chlorobenzene	951	5.0	1000	0	95.1	75-125	0			
Chloroethane	981.5	5.0	1000	0	98.2	40-155	0			
Chloroform	965.5	5.0	1000	0	96.6	70-125	0			
Chloromethane	960	10	1000	0	96	50-130	0			
cis-1,2-Dichloroethene	1013	5.0	1000	0	101	65-125	0			
cis-1,3-Dichloropropene	926.5	5.0	1000	0	92.6	70-125	0			
Dibromochloromethane	881.5	5.0	1000	0	88.2	65-135	0			
Dibromomethane	911.5	5.0	1000	0	91.2	75-130	0			
Dichlorodifluoromethane	887	10	1000	0	88.7	35-135	0			
Ethylbenzene	953	5.0	1000	0	95.3	75-125	0			
Hexachloroethane	944	5.0	1000	0	94.4	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Isopropylbenzene	989	5.0	1000	0	98.9	75-130	0
m,p-Xylene	1915	2.5	2000	7	95.4	80-125	0
Methyl tert-butyl ether	1042	5.0	1000	0	104	75-125	0
Methylene chloride	1010	5.0	1000	19.5	99	55-140	0
Naphthalene	868.5	5.0	1000	0	86.8	40-140	0
n-Butylbenzene	1034	5.0	1000	0	103	65-140	0
n-Propylbenzene	964.5	5.0	1000	0	96.4	65-135	0
o-Xylene	951.5	2.5	1000	0	95.2	75-125	0
p-Isopropyltoluene	991.5	5.0	1000	23.5	96.8	75-135	0
sec-Butylbenzene	1024	5.0	1000	0	102	65-130	0
Styrene	967	5.0	1000	0	96.7	75-125	0
tert-Butylbenzene	962	5.0	1000	0	96.2	65-130	0
Tetrachloroethene	940	5.0	1000	0	94	65-140	0
Tetrahydrofuran	897	20	1000	0	89.7	70-135	0
Toluene	942	5.0	1000	7.5	93.4	70-125	0
trans-1,2-Dichloroethene	1000	5.0	1000	0	100	65-135	0
trans-1,3-Dichloropropene	910.5	10	1000	0	91	65-125	0
trans-1,4-Dichloro-2-butene	874	5.0	1000	0	87.4	70-135	0
Trichloroethene	914	5.0	1000	0	91.4	75-125	0
Trichlorofluoromethane	965	5.0	1000	0	96.5	25-185	0
Vinyl chloride	985	5.0	1000	0	98.5	60-125	0
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-120*	0
Surr: 4-Bromofluorobenzene	*997*	0	*1000*	0	*99.7*	*75-120*	0
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*85-115*	0
Surr: Toluene-d8	*982.5*	0	*1000*	0	*98.2*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MSD	Sample ID: **1211096-05A MSD**				Units: **µg/Kg**			Analysis Date: **11/7/2012 09:08 AM**		
Client ID:		Run ID: **VMS8_121106B**			SeqNo: **2133076**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2488	85	2846	0	87.4	75-125	2550	2.49	30	
1,1,1-Trichloroethane	2320	85	2846	0	81.5	70-135	2473	6.41	30	
1,1,2,2-Tetrachloroethane	2633	85	2846	0	92.5	55-130	2671	1.45	30	
1,1,2-Trichloroethane	2352	85	2846	0	82.6	60-125	2411	2.45	30	
1,1-Dichloroethane	2283	85	2846	0	80.2	75-125	2396	4.87	30	
1,1-Dichloroethene	2320	85	2846	0	81.5	65-135	2375	2.36	30	
1,2,3-Trichlorobenzene	2246	85	2846	0	78.9	60-135	2122	5.67	30	
1,2,3-Trichloropropane	2927	85	2846	0	103	65-130	2882	1.57	30	
1,2,3-Trimethylbenzene	2314	85	2846	0	81.3	65-135	2352	1.65	30	
1,2,4-Trichlorobenzene	2448	85	2846	0	86	65-130	2270	7.54	30	
1,2,4-Trimethylbenzene	2490	85	2846	0	87.5	65-135	2520	1.19	30	
1,2-Dibromo-3-chloropropane	2194	85	2846	0	77.1	40-135	2324	5.73	30	
1,2-Dibromoethane	2600	85	2846	0	91.4	70-125	2607	0.273	30	
1,2-Dichlorobenzene	2377	85	2846	0	83.5	75-120	2401	1.01	30	
1,2-Dichloroethane	2425	85	2846	0	85.2	70-135	2455	1.22	30	
1,2-Dichloropropane	2470	85	2846	0	86.8	70-120	2463	0.288	30	
1,3,5-Trimethylbenzene	2563	85	2846	0	90	65-135	2600	1.43	30	
1,3-Dichlorobenzene	2371	85	2846	0	83.3	70-125	2449	3.25	30	
1,4-Dichlorobenzene	2318	85	2846	0	81.4	70-125	2361	1.82	30	
2-Butanone	2796	280	2846	0	98.2	30-160	2942	5.06	30	
2-Hexanone	3253	85	2846	0	114	45-145	3078	5.53	30	
4-Methyl-2-pentanone	3881	85	2846	0	136	45-145	3906	0.658	30	
Acetone	3478	280	2846	22.77	121	20-160	3401	2.23	30	
Acrylonitrile	2765	85	2846	0	97.2	70-135	2694	2.61	30	
Benzene	2345	85	2846	0	82.4	75-125	2405	2.52	30	
Bromobenzene	2580	85	2846	0	90.6	65-120	2591	0.44	30	
Bromochloromethane	2460	85	2846	0	86.4	70-125	2466	0.231	30	
Bromodichloromethane	2392	85	2846	0	84	70-130	2425	1.36	30	
Bromoform	2520	85	2846	0	88.6	55-135	2525	0.169	30	
Bromomethane	2219	85	2846	0	78	30-160	2435	9.3	30	
Carbon disulfide	2125	85	2846	0	74.6	45-160	2267	6.48	30	
Carbon tetrachloride	2304	85	2846	0	81	65-135	2480	7.38	30	
Chlorobenzene	2581	85	2846	0	90.7	75-125	2569	0.497	30	
Chloroethane	1459	280	2846	0	51.2	40-155	1598	9.12	30	
Chloroform	2396	85	2846	0	84.2	70-125	2536	5.65	30	
Chloromethane	2090	85	2846	0	73.4	50-130	2075	0.752	30	
cis-1,2-Dichloroethene	2435	85	2846	0	85.6	65-125	2429	0.234	30	
cis-1,3-Dichloropropene	2525	85	2846	0	88.7	70-125	2563	1.51	30	
Dibromochloromethane	2479	85	2846	0	87.1	65-135	2478	0.0574	30	
Dibromomethane	2456	85	2846	0	86.3	75-130	2570	4.53	30	
Dichlorodifluoromethane	1935	85	2846	0	68	35-135	1992	2.9	30	
Ethylbenzene	2479	85	2846	0	87.1	75-125	2516	1.48	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Hexachloroethane	2237	85	2846	0	78.6	70-135	2375	5.99	30	
Isopropylbenzene	2502	85	2846	0	87.9	75-130	2533	1.24	30	
m,p-Xylene	5023	170	5692	0	88.2	80-125	5164	2.77	30	
Methyl tert-butyl ether	2853	85	2846	0	100	75-125	2922	2.37	30	
Methylene chloride	2322	85	2846	0	81.6	55-145	2418	4.02	30	
Naphthalene	2495	280	2846	68.31	85.2	40-140	2257	10	30	
n-Butylbenzene	2485	85	2846	0	87.3	65-140	2418	2.73	30	
n-Propylbenzene	2408	85	2846	0	84.6	65-135	2443	1.47	30	
o-Xylene	2537	85	2846	0	89.2	75-125	2587	1.94	30	
p-Isopropyltoluene	2110	85	2846	0	74.2	75-135	2209	4.55	30	S
sec-Butylbenzene	2506	85	2846	0	88	65-130	2446	2.41	30	
Styrene	2523	85	2846	0	88.6	75-125	2530	0.282	30	
tert-Butylbenzene	2486	85	2846	0	87.4	65-130	2515	1.14	30	
Tetrachloroethene	2251	85	2846	0	79.1	64-140	2335	3.66	30	
Tetrahydrofuran	2856	280	2846	0	100	70-135	2960	3.57	30	
Toluene	2300	85	2846	0	80.8	70-125	2368	2.93	30	
trans-1,2-Dichloroethene	2341	85	2846	0	82.2	65-135	2433	3.87	30	
trans-1,3-Dichloropropene	2416	85	2846	0	84.9	65-125	2442	1.05	30	
trans-1,4-Dichloro-2-butene	2224	85	2846	0	78.2	70-135	2297	3.21	30	
Trichloroethene	2312	85	2846	0	81.2	75-125	2441	5.39	30	
Trichlorofluoromethane	2226	85	2846	0	78.2	25-185	2371	6.32	30	
Vinyl chloride	2209	85	2846	0	77.6	60-125	2241	1.47	30	
Surr: 1,2-Dichloroethane-d4	*2803*	0	*2846*	0	*98.5*	*70-130*	2795	*0.305*	*30*	
Surr: 4-Bromofluorobenzene	*2986*	0	*2846*	0	*105*	*70-130*	2937	*1.63*	*30*	
Surr: Dibromofluoromethane	*2700*	0	*2846*	0	*94.8*	*70-130*	2752	*1.93*	*30*	
Surr: Toluene-d8	*2729*	0	*2846*	0	*95.9*	*70-130*	2694	*1.31*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

MSD	Sample ID: **1211109-02A MSD**				Units: **µg/Kg**		Analysis Date: **11/8/2012 09:10 PM**			
Client ID:		Run ID: **VMS5_121108A**			SeqNo: **2134600**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	914.5	5.0	1000	0	91.4	75-125	930.5	1.73	30	
1,1,1-Trichloroethane	923.5	5.0	1000	0	92.4	70-135	987	6.65	30	
1,1,2,2-Tetrachloroethane	891	5.0	1000	0	89.1	55-130	876	1.7	30	
1,1,2-Trichloroethane	908.5	5.0	1000	0	90.8	60-125	903.5	0.552	30	
1,1-Dichloroethane	929.5	5.0	1000	0	93	75-125	954.5	2.65	30	
1,1-Dichloroethene	1026	5.0	1000	0	103	65-135	1064	3.73	30	
1,2,3-Trichlorobenzene	984	5.0	1000	0	98.4	60-135	936.5	4.95	30	
1,2,3-Trichloropropane	950	5.0	1000	0	95	65-130	918	3.43	30	
1,2,4-Trichlorobenzene	1044	5.0	1000	0	104	65-130	991.5	5.16	30	
1,2,4-Trimethylbenzene	977	5.0	1000	0	97.7	65-135	960	1.76	30	
1,2-Dibromo-3-chloropropane	834	5.0	1000	0	83.4	40-135	825.5	1.02	30	
1,2-Dibromoethane	908	5.0	1000	0	90.8	70-125	904.5	0.386	30	
1,2-Dichlorobenzene	980	5.0	1000	0	98	75-120	960	2.06	30	
1,2-Dichloroethane	932	5.0	1000	0	93.2	70-135	926.5	0.592	30	
1,2-Dichloropropane	935	5.0	1000	0	93.5	70-120	955.5	2.17	30	
1,3,5-Trimethylbenzene	995.5	5.0	1000	0	99.6	65-135	988	0.756	30	
1,3-Dichlorobenzene	979	5.0	1000	0	97.9	70-125	954	2.59	30	
1,4-Dichlorobenzene	975.5	5.0	1000	0	97.6	70-125	963	1.29	30	
2-Butanone	972	10	1000	0	97.2	30-160	972.5	0.0514	30	
2-Hexanone	879	5.0	1000	0	87.9	45-145	857.5	2.48	30	
4-Methyl-2-pentanone	911	5.0	1000	0	91.1	45-145	894.5	1.83	30	
Acetone	988	10	1000	32.5	95.6	20-160	954.5	3.45	30	B
Acrylonitrile	1012	5.0	1000	0	101	70-135	974.5	3.73	30	
Benzene	938	5.0	1000	0	93.8	75-125	951	1.38	30	
Bromobenzene	944.5	10	1000	0	94.4	65-120	935.5	0.957	30	
Bromochloromethane	993	5.0	1000	0	99.3	70-125	1017	2.39	30	
Bromodichloromethane	901	5.0	1000	0	90.1	70-130	915.5	1.6	30	
Bromoform	874	5.0	1000	0	87.4	55-135	864	1.15	30	
Bromomethane	1034	10	1000	0	103	30-160	1037	0.29	30	
Carbon disulfide	1112	5.0	1000	0	111	45-160	1145	2.92	30	
Carbon tetrachloride	966	5.0	1000	0	96.6	65-135	984.5	1.9	30	
Chlorobenzene	946	5.0	1000	0	94.6	75-125	951	0.527	30	
Chloroethane	943.5	5.0	1000	0	94.4	40-155	981.5	3.95	30	
Chloroform	952	5.0	1000	0	95.2	70-125	965.5	1.41	30	
Chloromethane	926	10	1000	0	92.6	50-130	960	3.61	30	
cis-1,2-Dichloroethene	955.5	5.0	1000	0	95.6	65-125	1013	5.84	30	
cis-1,3-Dichloropropene	935.5	5.0	1000	0	93.6	70-125	926.5	0.967	30	
Dibromochloromethane	903	5.0	1000	0	90.3	65-135	881.5	2.41	30	
Dibromomethane	921.5	5.0	1000	0	92.2	75-130	911.5	1.09	30	
Dichlorodifluoromethane	861	10	1000	0	86.1	35-135	887	2.97	30	
Ethylbenzene	950	5.0	1000	0	95	75-125	953	0.315	30	
Hexachloroethane	962	5.0	1000	0	96.2	70-135	944	1.89	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44564** Instrument ID **VMS6** Method: **SW8260**

Isopropylbenzene	999	5.0	1000	0	99.9	75-130	989	1.01	30
m,p-Xylene	1906	2.5	2000	7	95	80-125	1915	0.471	30
Methyl tert-butyl ether	1049	5.0	1000	0	105	75-125	1042	0.622	30
Methylene chloride	997.5	5.0	1000	19.5	97.8	55-140	1010	1.2	30
Naphthalene	932.5	5.0	1000	0	93.2	40-140	868.5	7.11	30
n-Butylbenzene	1022	5.0	1000	0	102	65-140	1034	1.17	30
n-Propylbenzene	983.5	5.0	1000	0	98.4	65-135	964.5	1.95	30
o-Xylene	949	2.5	1000	0	94.9	75-125	951.5	0.263	30
p-Isopropyltoluene	999	5.0	1000	23.5	97.6	75-135	991.5	0.754	30
sec-Butylbenzene	1063	5.0	1000	0	106	65-130	1024	3.74	30
Styrene	961	5.0	1000	0	96.1	75-125	967	0.622	30
tert-Butylbenzene	992	5.0	1000	0	99.2	65-130	962	3.07	30
Tetrachloroethene	925	5.0	1000	0	92.5	65-140	940	1.61	30
Tetrahydrofuran	892	20	1000	0	89.2	70-135	897	0.559	30
Toluene	927	5.0	1000	7.5	92	70-125	942	1.61	30
trans-1,2-Dichloroethene	970	5.0	1000	0	97	65-135	1000	3.05	30
trans-1,3-Dichloropropene	905	10	1000	0	90.5	65-125	910.5	0.606	30
trans-1,4-Dichloro-2-butene	877.5	5.0	1000	0	87.8	70-135	874	0.4	30
Trichloroethene	907	5.0	1000	0	90.7	75-125	914	0.769	30
Trichlorofluoromethane	948.5	5.0	1000	0	94.8	25-185	965	1.72	30
Vinyl chloride	955	5.0	1000	0	95.5	60-125	985	3.09	30
Surr: 1,2-Dichloroethane-d4	*986.5*	0	*1000*	0	*98.6*	*70-120*	1010	*2.35*	*30*
Surr: 4-Bromofluorobenzene	*1013*	0	*1000*	0	*101*	*75-120*	997	*1.59*	*30*
Surr: Dibromofluoromethane	*1001*	0	*1000*	0	*100*	*85-115*	982.5	*1.87*	*30*
Surr: Toluene-d8	*990*	0	*1000*	0	*99*	*85-120*	982.5	*0.76*	*30*

The following samples were analyzed in this batch:

1211097-01A	1211097-02A	1211097-03A
1211097-04A	1211097-05A	1211097-06A
1211097-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44565-44565** Units: **µg/Kg** Analysis Date: **11/7/2012 12:31 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133041** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	72	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	81	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	32	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44565-44565** Units: **µg/Kg** Analysis Date: **11/8/2012 02:23 AM**
Client ID: Run ID: **VMS8_121107B** SeqNo: **2134061** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	70	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	75	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	33	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*994.5*	0	*1000*	0	*99.4*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*949.5*	0	*1000*	0	*95*	*70-130*	0	
Surr: Toluene-d8	*958.5*	0	*1000*	0	*95.8*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44565-44565** Units: **µg/Kg** Analysis Date: **11/6/2012 11:20 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133040** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	911.5	30	1000	0	91.2	75-125	0			
1,1,1-Trichloroethane	906.5	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	848	30	1000	0	84.8	55-130	0			
1,1,2-Trichloroethane	843.5	30	1000	0	84.4	60-125	0			
1,1-Dichloroethane	861.5	30	1000	0	86.2	75-125	0			
1,1-Dichloroethene	856.5	30	1000	0	85.6	65-135	0			
1,2,3-Trichlorobenzene	982	30	1000	0	98.2	60-135	0			
1,2,3-Trichloropropane	927	30	1000	0	92.7	65-130	0			
1,2,3-Trimethylbenzene	919.5	30	1000	0	92	65-135	0			
1,2,4-Trichlorobenzene	1042	30	1000	0	104	65-130	0			
1,2,4-Trimethylbenzene	925	30	1000	0	92.5	65-135	0			
1,2-Dibromo-3-chloropropane	905.5	30	1000	0	90.6	40-135	0			
1,2-Dibromoethane	940.5	30	1000	0	94	70-125	0			
1,2-Dichlorobenzene	933.5	30	1000	0	93.4	75-120	0			
1,2-Dichloroethane	889	30	1000	0	88.9	70-135	0			
1,2-Dichloropropane	886.5	30	1000	0	88.6	70-120	0			
1,3,5-Trimethylbenzene	923.5	30	1000	0	92.4	65-135	0			
1,3-Dichlorobenzene	934	30	1000	0	93.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	929	200	1000	0	92.9	30-160	0			
2-Hexanone	986	30	1000	0	98.6	45-145	0			
4-Methyl-2-pentanone	1223	30	1000	0	122	45-145	0			
Acetone	977	100	1000	0	97.7	20-160	0			
Acrylonitrile	852.5	100	1000	0	85.2	70-135	0			
Benzene	884	30	1000	0	88.4	75-125	0			
Bromobenzene	906.5	30	1000	0	90.6	65-120	0			
Bromochloromethane	891	30	1000	0	89.1	70-125	0			
Bromodichloromethane	916	30	1000	0	91.6	70-130	0			
Bromoform	945	30	1000	0	94.5	55-135	0			
Bromomethane	1029	75	1000	0	103	30-160	0			
Carbon disulfide	926.5	30	1000	0	92.6	45-160	0			
Carbon tetrachloride	937.5	30	1000	0	93.8	65-135	0			
Chlorobenzene	943.5	30	1000	0	94.4	75-125	0			
Chloroethane	1206	100	1000	0	121	40-155	0			
Chloroform	880	30	1000	0	88	70-125	0			
Chloromethane	784.5	100	1000	0	78.4	50-130	0			
cis-1,2-Dichloroethene	883.5	30	1000	0	88.4	65-125	0			
cis-1,3-Dichloropropene	928	30	1000	0	92.8	70-125	0			
Dibromochloromethane	936.5	30	1000	0	93.6	65-135	0			
Dibromomethane	891	30	1000	0	89.1	75-130	0			
Dichlorodifluoromethane	654.5	30	1000	0	65.4	35-135	0			
Ethylbenzene	932	30	1000	0	93.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	939.5	30	1000	0	94	70-135	0
Isopropylbenzene	909	30	1000	0	90.9	75-130	0
m,p-Xylene	1901	60	2000	0	95	80-125	0
Methyl tert-butyl ether	996.5	30	1000	0	99.6	75-125	0
Methylene chloride	870	30	1000	0	87	55-145	0
Naphthalene	1144	100	1000	0	114	40-140	0
n-Butylbenzene	1028	30	1000	0	103	65-140	0
n-Propylbenzene	875.5	30	1000	0	87.6	65-135	0
o-Xylene	943	30	1000	0	94.3	75-125	0
p-Isopropyltoluene	871.5	30	1000	0	87.2	75-135	0
sec-Butylbenzene	876.5	30	1000	0	87.6	65-130	0
Styrene	945.5	30	1000	0	94.6	75-125	0
tert-Butylbenzene	881.5	30	1000	0	88.2	65-130	0
Tetrachloroethene	921.5	30	1000	0	92.2	64-140	0
Tetrahydrofuran	900	200	1000	0	90	70-135	0
Toluene	905.5	30	1000	0	90.6	70-125	0
trans-1,2-Dichloroethene	895.5	30	1000	0	89.6	65-135	0
trans-1,3-Dichloropropene	933	30	1000	0	93.3	65-125	0
trans-1,4-Dichloro-2-butene	861.5	30	1000	0	86.2	70-135	0
Trichloroethene	919.5	30	1000	0	92	75-125	0
Trichlorofluoromethane	852.5	30	1000	0	85.2	25-185	0
Vinyl chloride	872.5	30	1000	0	87.2	60-125	0
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*994.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Dibromofluoromethane	*1008*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44565-44565**				Units: **µg/Kg**			Analysis Date: **11/8/2012 01:12 AM**		
Client ID:		Run ID: **VMS8_121107B**			SeqNo: **2134060**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	904	30	1000	0	90.4	75-125	0			
1,1,1-Trichloroethane	888	30	1000	0	88.8	70-135	0			
1,1,2,2-Tetrachloroethane	923.5	30	1000	0	92.4	55-130	0			
1,1,2-Trichloroethane	824.5	30	1000	0	82.4	60-125	0			
1,1-Dichloroethane	824	30	1000	0	82.4	75-125	0			
1,1-Dichloroethene	863	30	1000	0	86.3	65-135	0			
1,2,3-Trichlorobenzene	905.5	30	1000	0	90.6	60-135	0			
1,2,3-Trichloropropane	986.5	30	1000	0	98.6	65-130	0			
1,2,3-Trimethylbenzene	824.5	30	1000	0	82.4	65-135	0			
1,2,4-Trichlorobenzene	959.5	30	1000	0	96	65-130	0			
1,2,4-Trimethylbenzene	914.5	30	1000	0	91.4	65-135	0			
1,2-Dibromo-3-chloropropane	925.5	30	1000	0	92.6	40-135	0			
1,2-Dibromoethane	958.5	30	1000	0	95.8	70-125	0			
1,2-Dichlorobenzene	868.5	30	1000	0	86.8	75-120	0			
1,2-Dichloroethane	867.5	30	1000	0	86.8	70-135	0			
1,2-Dichloropropane	831	30	1000	0	83.1	70-120	0			
1,3,5-Trimethylbenzene	900	30	1000	0	90	65-135	0			
1,3-Dichlorobenzene	855	30	1000	0	85.5	70-125	0			
1,4-Dichlorobenzene	858	30	1000	0	85.8	70-125	0			
2-Butanone	952.5	200	1000	0	95.2	30-160	0			
2-Hexanone	1114	30	1000	0	111	45-145	0			
4-Methyl-2-pentanone	1305	30	1000	0	130	45-145	0			
Acetone	1021	100	1000	0	102	20-160	0			
Acrylonitrile	873.5	100	1000	0	87.4	70-135	0			
Benzene	846.5	30	1000	0	84.6	75-125	0			
Bromobenzene	917.5	30	1000	0	91.8	65-120	0			
Bromochloromethane	836	30	1000	0	83.6	70-125	0			
Bromodichloromethane	838	30	1000	0	83.8	70-130	0			
Bromoform	953.5	30	1000	0	95.4	55-135	0			
Bromomethane	1052	75	1000	0	105	30-160	0			
Carbon disulfide	969	30	1000	0	96.9	45-160	0			
Carbon tetrachloride	902.5	30	1000	0	90.2	65-135	0			
Chlorobenzene	921	30	1000	0	92.1	75-125	0			
Chloroethane	798	100	1000	0	79.8	40-155	0			
Chloroform	829	30	1000	0	82.9	70-125	0			
Chloromethane	808.5	100	1000	0	80.8	50-130	0			
cis-1,2-Dichloroethene	856.5	30	1000	0	85.6	65-125	0			
cis-1,3-Dichloropropene	891	30	1000	0	89.1	70-125	0			
Dibromochloromethane	938.5	30	1000	0	93.8	65-135	0			
Dibromomethane	867.5	30	1000	0	86.8	75-130	0			
Dichlorodifluoromethane	810	30	1000	0	81	35-135	0			
Ethylbenzene	889	30	1000	0	88.9	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	872.5	30	1000	0	87.2	70-135	0
Isopropylbenzene	906	30	1000	0	90.6	75-130	0
m,p-Xylene	1842	60	2000	0	92.1	80-125	0
Methyl tert-butyl ether	967.5	30	1000	0	96.8	75-125	0
Methylene chloride	847	30	1000	0	84.7	55-145	0
Naphthalene	1068	100	1000	0	107	40-140	0
n-Butylbenzene	963	30	1000	0	96.3	65-140	0
n-Propylbenzene	858	30	1000	0	85.8	65-135	0
o-Xylene	918	30	1000	0	91.8	75-125	0
p-Isopropyltoluene	795	30	1000	0	79.5	75-135	0
sec-Butylbenzene	885	30	1000	0	88.5	65-130	0
Styrene	917	30	1000	0	91.7	75-125	0
tert-Butylbenzene	888	30	1000	0	88.8	65-130	0
Tetrachloroethene	869	30	1000	0	86.9	64-140	0
Tetrahydrofuran	916	200	1000	0	91.6	70-135	0
Toluene	863	30	1000	0	86.3	70-125	0
trans-1,2-Dichloroethene	867.5	30	1000	0	86.8	65-135	0
trans-1,3-Dichloropropene	898	30	1000	0	89.8	65-125	0
trans-1,4-Dichloro-2-butene	916	30	1000	0	91.6	70-135	0
Trichloroethene	887.5	30	1000	0	88.8	75-125	0
Trichlorofluoromethane	884.5	30	1000	0	88.4	25-185	0
Vinyl chloride	918	30	1000	0	91.8	60-125	0
Surr: 1,2-Dichloroethane-d4	*957*	0	*1000*	0	*95.7*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: Dibromofluoromethane	*969.5*	0	*1000*	0	*97*	*70-130*	0
Surr: Toluene-d8	*1020*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MS	Sample ID: **1211098-09A MS**				Units: **µg/Kg**		Analysis Date: **11/8/2012 10:19 AM**			
Client ID:		Run ID: **VMS8_121107B**			SeqNo: **2134062**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2097	73	2448	0	85.6	75-125	0			
1,1,1-Trichloroethane	2080	73	2448	0	85	70-135	0			
1,1,2,2-Tetrachloroethane	2028	73	2448	0	82.8	55-130	0			
1,1,2-Trichloroethane	1976	73	2448	0	80.7	60-125	0			
1,1-Dichloroethane	1997	73	2448	0	81.6	75-125	0			
1,1-Dichloroethene	2008	73	2448	0	82	65-135	0			
1,2,3-Trichlorobenzene	1770	73	2448	0	72.3	60-135	0			
1,2,3-Trichloropropane	2284	73	2448	0	93.3	65-130	0			
1,2,3-Trimethylbenzene	1928	73	2448	0	78.8	65-135	0			
1,2,4-Trichlorobenzene	1904	73	2448	0	77.8	65-130	0			
1,2,4-Trimethylbenzene	2120	73	2448	0	86.6	65-135	0			
1,2-Dibromo-3-chloropropane	1735	73	2448	0	70.8	40-135	0			
1,2-Dibromoethane	2123	73	2448	0	86.7	70-125	0			
1,2-Dichlorobenzene	2015	73	2448	0	82.3	75-120	0			
1,2-Dichloroethane	2050	73	2448	0	83.8	70-135	0			
1,2-Dichloropropane	2026	73	2448	0	82.8	70-120	0			
1,3,5-Trimethylbenzene	2197	73	2448	0	89.8	65-135	0			
1,3-Dichlorobenzene	2016	73	2448	0	82.4	70-125	0			
1,4-Dichlorobenzene	1994	73	2448	0	81.4	70-125	0			
2-Butanone	1768	490	2448	0	72.2	30-160	0			
2-Hexanone	2342	73	2448	0	95.6	45-145	0			
4-Methyl-2-pentanone	2768	73	2448	0	113	45-145	0			
Acetone	2503	240	2448	0	102	20-160	0			
Acrylonitrile	2033	240	2448	0	83	70-135	0			
Benzene	2038	73	2448	0	83.2	75-125	0			
Bromobenzene	2188	73	2448	0	89.4	65-120	0			
Bromochloromethane	2042	73	2448	0	83.4	70-125	0			
Bromodichloromethane	2053	73	2448	0	83.8	70-130	0			
Bromoform	2168	73	2448	0	88.6	55-135	0			
Bromomethane	2086	180	2448	0	85.2	30-160	0			
Carbon disulfide	1937	73	2448	0	79.1	45-160	0			
Carbon tetrachloride	2136	73	2448	0	87.2	65-135	0			
Chlorobenzene	2203	73	2448	0	90	75-125	0			
Chloroethane	1418	240	2448	0	57.9	40-155	0			
Chloroform	2106	73	2448	0	86	70-125	0			
Chloromethane	1710	240	2448	0	69.8	50-130	0			
cis-1,2-Dichloroethene	1981	73	2448	0	80.9	65-125	0			
cis-1,3-Dichloropropene	1956	73	2448	0	79.9	70-125	0			
Dibromochloromethane	2180	73	2448	0	89	65-135	0			
Dibromomethane	2068	73	2448	0	84.4	75-130	0			
Dichlorodifluoromethane	1659	73	2448	0	67.8	35-135	0			
Ethylbenzene	2119	73	2448	0	86.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	2054	73	2448	0	83.9	70-135	0	
Isopropylbenzene	2125	73	2448	0	86.8	75-130	0	
m,p-Xylene	4270	150	4897	0	87.2	80-125	0	
Methyl tert-butyl ether	2353	73	2448	0	96.1	75-125	0	
Methylene chloride	1994	73	2448	0	81.4	55-145	0	
Naphthalene	1776	240	2448	0	72.6	40-140	0	
n-Butylbenzene	1917	73	2448	0	78.3	65-140	0	
n-Propylbenzene	2064	73	2448	0	84.3	65-135	0	
o-Xylene	2154	73	2448	0	88	75-125	0	
p-Isopropyltoluene	1796	73	2448	0	73.4	75-135	0	S
sec-Butylbenzene	2075	73	2448	0	84.8	65-130	0	
Styrene	2071	73	2448	0	84.6	75-125	0	
tert-Butylbenzene	2110	73	2448	0	86.2	65-130	0	
Tetrachloroethene	2054	73	2448	0	83.9	64-140	0	
Tetrahydrofuran	1978	490	2448	0	80.8	70-135	0	
Toluene	1998	73	2448	0	81.6	70-125	0	
trans-1,2-Dichloroethene	2026	73	2448	0	82.8	65-135	0	
trans-1,3-Dichloropropene	1874	73	2448	0	76.6	65-125	0	
trans-1,4-Dichloro-2-butene	1487	73	2448	0	60.8	70-135	0	S
Trichloroethene	2053	73	2448	0	83.8	75-125	0	
Trichlorofluoromethane	1982	73	2448	0	81	25-185	0	
Vinyl chloride	1853	73	2448	0	75.7	60-125	0	
Surr: 1,2-Dichloroethane-d4	*2292*	0	*2448*	0	*93.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*2448*	0	*2448*	0	*100*	*70-130*	0	
Surr: Dibromofluoromethane	*2308*	0	*2448*	0	*94.2*	*70-130*	0	
Surr: Toluene-d8	*2245*	0	*2448*	0	*91.7*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MSD	Sample ID: **1211098-09A MSD**				Units: **µg/Kg**			Analysis Date: **11/8/2012 10:43 AM**		
Client ID:		Run ID: **VMS8_121107B**			SeqNo: **2134063**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2114	73	2448	0	86.4	75-125	2097	0.814	30	
1,1,1-Trichloroethane	2027	73	2448	0	82.8	70-135	2080	2.56	30	
1,1,2,2-Tetrachloroethane	2129	73	2448	0	87	55-130	2028	4.83	30	
1,1,2-Trichloroethane	2008	73	2448	0	82	60-125	1976	1.6	30	
1,1-Dichloroethane	1989	73	2448	0	81.2	75-125	1997	0.369	30	
1,1-Dichloroethene	2022	73	2448	0	82.6	65-135	2008	0.729	30	
1,2,3-Trichlorobenzene	1795	73	2448	0	73.3	60-135	1770	1.37	30	
1,2,3-Trichloropropane	2331	73	2448	0	95.2	65-130	2284	2.02	30	
1,2,3-Trimethylbenzene	1932	73	2448	0	78.9	65-135	1928	0.19	30	
1,2,4-Trichlorobenzene	2020	73	2448	0	82.5	65-130	1904	5.93	30	
1,2,4-Trimethylbenzene	2156	73	2448	0	88	65-135	2120	1.66	30	
1,2-Dibromo-3-chloropropane	1857	73	2448	0	75.8	40-135	1735	6.82	30	
1,2-Dibromoethane	2081	73	2448	0	85	70-125	2123	1.98	30	
1,2-Dichlorobenzene	1977	73	2448	0	80.8	75-120	2015	1.9	30	
1,2-Dichloroethane	2099	73	2448	0	85.8	70-135	2050	2.36	30	
1,2-Dichloropropane	2090	73	2448	0	85.4	70-120	2026	3.09	30	
1,3,5-Trimethylbenzene	2154	73	2448	0	88	65-135	2197	1.97	30	
1,3-Dichlorobenzene	2014	73	2448	0	82.2	70-125	2016	0.122	30	
1,4-Dichlorobenzene	1998	73	2448	0	81.6	70-125	1994	0.184	30	
2-Butanone	1631	490	2448	0	66.6	30-160	1768	8.07	30	
2-Hexanone	2410	73	2448	0	98.4	45-145	2342	2.89	30	
4-Methyl-2-pentanone	2949	73	2448	0	120	45-145	2768	6.34	30	
Acetone	2773	240	2448	0	113	20-160	2503	10.2	30	
Acrylonitrile	2147	240	2448	0	87.7	70-135	2033	5.45	30	
Benzene	2026	73	2448	0	82.8	75-125	2038	0.602	30	
Bromobenzene	2180	73	2448	0	89	65-120	2188	0.336	30	
Bromochloromethane	2060	73	2448	0	84.2	70-125	2042	0.895	30	
Bromodichloromethane	2070	73	2448	0	84.6	70-130	2053	0.831	30	
Bromoform	2211	73	2448	0	90.3	55-135	2168	1.96	30	
Bromomethane	2044	180	2448	0	83.5	30-160	2086	2.02	30	
Carbon disulfide	1926	73	2448	0	78.6	45-160	1937	0.571	30	
Carbon tetrachloride	2164	73	2448	0	88.4	65-135	2136	1.31	30	
Chlorobenzene	2173	73	2448	0	88.8	75-125	2203	1.4	30	
Chloroethane	1391	240	2448	0	56.8	40-155	1418	1.92	30	
Chloroform	2039	73	2448	0	83.3	70-125	2106	3.19	30	
Chloromethane	1774	240	2448	0	72.4	50-130	1710	3.65	30	
cis-1,2-Dichloroethene	2015	73	2448	0	82.3	65-125	1981	1.72	30	
cis-1,3-Dichloropropene	1972	73	2448	0	80.6	70-125	1956	0.81	30	
Dibromochloromethane	2184	73	2448	0	89.2	65-135	2180	0.168	30	
Dibromomethane	2093	73	2448	0	85.5	75-130	2068	1.24	30	
Dichlorodifluoromethane	1662	73	2448	0	67.9	35-135	1659	0.221	30	
Ethylbenzene	2082	73	2448	0	85	75-125	2119	1.75	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1911	73	2448	0	78	70-135	2054	7.22	30	
Isopropylbenzene	2097	73	2448	0	85.6	75-130	2125	1.33	30	
m,p-Xylene	4245	150	4897	0	86.7	80-125	4270	0.575	30	
Methyl tert-butyl ether	2401	73	2448	0	98	75-125	2353	2.01	30	
Methylene chloride	2025	73	2448	0	82.7	55-145	1994	1.52	30	
Naphthalene	1908	240	2448	0	78	40-140	1776	7.18	30	
n-Butylbenzene	1986	73	2448	0	81.1	65-140	1917	3.51	30	
n-Propylbenzene	2050	73	2448	0	83.8	65-135	2064	0.655	30	
o-Xylene	2130	73	2448	0	87	75-125	2154	1.14	30	
p-Isopropyltoluene	1798	73	2448	0	73.4	75-135	1796	0.136	30	S
sec-Butylbenzene	2109	73	2448	0	86.2	65-130	2075	1.64	30	
Styrene	2125	73	2448	0	86.8	75-125	2071	2.57	30	
tert-Butylbenzene	2140	73	2448	0	87.4	65-130	2110	1.38	30	
Tetrachloroethene	1968	73	2448	0	80.4	64-140	2054	4.26	30	
Tetrahydrofuran	2387	490	2448	0	97.5	70-135	1978	18.7	30	
Toluene	1994	73	2448	0	81.4	70-125	1998	0.184	30	
trans-1,2-Dichloroethene	2041	73	2448	0	83.4	65-135	2026	0.722	30	
trans-1,3-Dichloropropene	1878	73	2448	0	76.7	65-125	1874	0.196	30	
trans-1,4-Dichloro-2-butene	1639	73	2448	0	67	70-135	1487	9.71	30	S
Trichloroethene	2097	73	2448	0	85.6	75-125	2053	2.12	30	
Trichlorofluoromethane	1954	73	2448	0	79.8	25-185	1982	1.43	30	
Vinyl chloride	1841	73	2448	0	75.2	60-125	1853	0.663	30	
Surr: 1,2-Dichloroethane-d4	*2290*	0	*2448*	0	*93.6*	*70-130*	2292	*0.0534*	*30*	
Surr: 4-Bromofluorobenzene	*2429*	0	*2448*	0	*99.2*	*70-130*	2448	*0.803*	*30*	
Surr: Dibromofluoromethane	*2341*	0	*2448*	0	*95.6*	*70-130*	2308	*1.42*	*30*	
Surr: Toluene-d8	*2256*	0	*2448*	0	*92.2*	*70-130*	2245	*0.49*	*30*	

The following samples were analyzed in this batch: 1211097-08A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **R112165** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-121105-R112165** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132090** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **WLCSS1-121105-R112165** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132091** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211072-04A DUP** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132095** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	45.86	0.050	0	0	0	0-0	58.86	24.8	20	R

DUP Sample ID: **1211098-09B DUP** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132113** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	43.9	0.050	0	0	0	0-0	42.18	4	20	

The following samples were analyzed in this batch: 1211097-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211097
Project: Marshall KRRI 1000,1075 11/1/12

QC BATCH REPORT

Batch ID: **R112167** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-121105-R112167** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132119** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **WLCSS1-121105-R112167** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132120** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211096-05B DUP1** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132122** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	47.38	0.050	0	0	0	0-0	48.24	1.8	20	

DUP Sample ID: **1211096-05B DUP2** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132123** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	47.3	0.050	0	0	0	0-0	48.24	1.97	20	

DUP Sample ID: **1211110-05A DUP** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132135** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	73.32	0.050	0	0	0	0-0	74.43	1.5	20	

The following samples were analyzed in this batch:

1211097-02B	1211097-03B	1211097-04B
1211097-05B	1211097-06B	1211097-07B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211097

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110112_GMK1	Task: KRRI_1000,1075
Total # of Samples: 8		Event Complete?
Turn Around Time	5 Day	Rush: No

BILLING CODE: 6.00

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 5555 Glenwood Parkway SE Suite 200
City: Grand Rapids State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX Phone #: 713-821-2000
PO #:
Send EDD to:
CC Hardcopy report:
CC Hardcopy report:

ITEM #	SAMPLE ID (Samples IDs MUST BE UNIQUE)	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260
1	SBKR1000R508S110112S006	SBKR1000R508	SO	G	11/01/2012 08:35	3			X	X	X	X	X
2	SBKR1000R509S110112S006	SBKR1000R509	SO	G	11/01/2012 09:18	3			X	X	X	X	X
3	SBKR1075R502S110112S007	SBKR1075R502	SO	G	11/01/2012 13:27	3			X	X	X	X	X
4	SBKR1075R503S110112S007	SBKR1075R503	SO	G	11/01/2012 14:03	3			X	X	X	X	X
5	SBKR1075R504S110112S006	SBKR1075R504	SO	G	11/01/2012 15:05	3			X	X	X	X	X
6	SBKR1075R505S110112S007	SBKR1075R505	SO	G	11/01/2012 15:55	3			X	X	X	X	X
7	SBKR1075R506S110112S006	SBKR1075R506	SO	G	11/01/2012 16:21	3			X	X	X	X	X
8	SBKR1075R506T110112MX	SBKR1075R506	SQ	G	11/01/2012 00:00	1	TRIP BLANK						X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11-2-12	1623	[signature]	11-2-12	1623
[signature]	11/2/12	1630	[signature]	11/2/12	1630

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: GERRY KRAMER (GMK1); SIGNATURE of SAMPLER: [signature]; DATE Signed: [signature]; Time:

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample Intact?	Trip Blank?
5.0'C	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **02-Nov-12 16:30**

Work Order: **1211097** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 03-Nov-12 (Date) Reviewed by: Alex Csaszar (eSignature) 04-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.0 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/3/2012 9:50:00 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

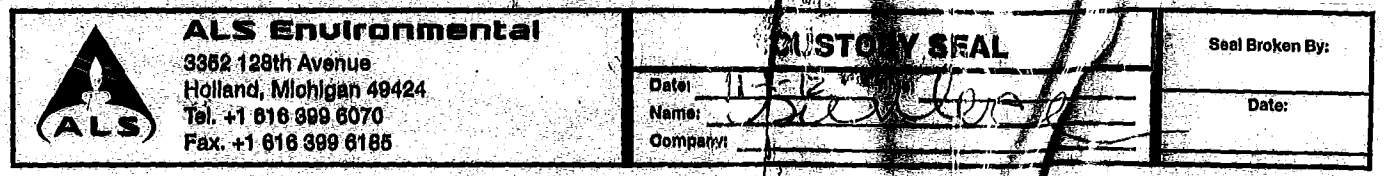
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
ALS
CUSTODY SEAL
Date:
Name:
Company:
Seal Broken By:
Date:

09-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000R 10/31/12** Work Order: **1211098**

Dear Bryan,

ALS Environmental received 9 samples on 02-Nov-2012 04:30 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 57.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 09-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 10/31/12
Work Order: **1211098**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211098-01	SBKR1000R502S103112S008	Soil		10/31/2012 11:38	11/2/2012 16:30	☐
1211098-02	SBKR1000R503S103112S005	Soil		10/31/2012 13:25	11/2/2012 16:30	☐
1211098-03	SBKR1000R504S103112S005	Soil		10/31/2012 14:00	11/2/2012 16:30	☐
1211098-04	SBKR1000R505S103112S007	Soil		10/31/2012 14:40	11/2/2012 16:30	☐
1211098-05	SBKR1000R506D103112S006	Soil		10/31/2012 15:40	11/2/2012 16:30	☐
1211098-06	SBKR1000R506S103112S006	Soil		10/31/2012 15:40	11/2/2012 16:30	☐
1211098-07	SBKR1000R507S103112S006	Soil		10/31/2012 16:19	11/2/2012 16:30	☐
1211098-08	SBKR1000R507T103112MX	Soil		10/31/2012	11/2/2012 16:30	☐
1211098-09	SBKR1000R501S103112S007	Soil		10/31/2012 10:20	11/2/2012 16:30	☐

ALS Group USA, Corp

Date: 09-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 10/31/12
Work Order: 1211098

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44562 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batch 44577 sample SBKR1000R501S103112S007 MS recovery for ORO was below control limits. Both the MSD recovery and RPD met quality control criteria. No data requires qualification. The MS/MSD recovery for DRO was below control limits. The corresponding result in the parent sample may be biased low DRO.

Batch 44573 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44561 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

Batch 44565 sample SBKR1000R501S103112S007 MS/MSD recovery for p-Isopropyltoluene and
trans-1,4-Dichloro-2-butene were below control limits. The corresponding reporting limits in the parent sample may be biased low for these two compounds.

Batch R112165 Duplicate data for %Moisture is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 09-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 10/31/12
WorkOrder: **1211098**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R502S103112S008
Work Order:	1211098	**Collection Date:**	10/31/2012 11:38:00 AM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/6/2012**		Analyst: **CW**
DRO (C10-C20)	**86**	**17**	**4.0**		**mg/Kg-dry**	1	11/6/2012
ORO (C20-C34)	**210**	**35**	**4.0**		**mg/Kg-dry**	1	11/6/2012
Surr: 4-Terphenyl-d14	*73.9*	*39-115*			*%REC*	1	11/6/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**10**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**21**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/6/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/6/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/6/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/6/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/6/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/6/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/6/2012
Surr: 2,4,6-Tribromophenol	*81.2*	*34-140*			*%REC*	1	11/6/2012
Surr: 2-Fluorobiphenyl	*67.2*	*12-100*			*%REC*	1	11/6/2012
Surr: 2-Fluorophenol	*72.9*	*33-117*			*%REC*	1	11/6/2012
Surr: 4-Terphenyl-d14	*117*	*25-137*			*%REC*	1	11/6/2012
Surr: Nitrobenzene-d5	*64.5*	*37-107*			*%REC*	1	11/6/2012
Surr: Phenol-d6	*62.2*	*40-106*			*%REC*	1	11/6/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R502S103112S008
Work Order:	1211098	**Collection Date:**	10/31/2012 11:38:00 AM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	440	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	440	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R502S103112S008
Work Order:	1211098	**Collection Date:**	10/31/2012 11:38:00 AM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	260	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	440	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	**200**	**130**	**100**		**µg/Kg-dry**	1	11/7/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*99.0*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*99.4*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*94.2*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*94.2*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**43**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R503S103112S005
Work Order:	1211098	**Collection Date:**	10/31/2012 1:25:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**83**	**16**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**240**	**32**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*69.4*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**13**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**18**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	**390**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(a)pyrene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(b)fluoranthene	**660**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	**470**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*93.0*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*77.2*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*80.1*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*116*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*74.9*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*66.1*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R503S103112S005
Work Order:	1211098	**Collection Date:**	10/31/2012 1:25:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	440	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	440	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R503S103112S005
Work Order:	1211098	**Collection Date:**	10/31/2012 1:25:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	260	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	440	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*97.8*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*99.4*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*93.2*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*94.8*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**43**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R504S103112S005
Work Order:	1211098	**Collection Date:**	10/31/2012 2:00:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**80**	**14**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**200**	**28**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*71.7*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.95	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.4	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**10**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**19**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*100*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*79.2*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*83.4*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*120*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*78.0*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*70.0*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	86	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	86	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	86	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	86	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R504S103112S005
Work Order:	1211098	**Collection Date:**	10/31/2012 2:00:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	86	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	86	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	86	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	86	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	86	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	86	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	86	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	86	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	290	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	86	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	86	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	86	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R504S103112S005
Work Order:	1211098	**Collection Date:**	10/31/2012 2:00:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	86	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	170	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	86	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	86	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	86	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	86	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	86	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	86	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	86	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	86	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	86	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	86	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	86	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*94.5*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*101*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**32**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R505S103112S007
Work Order:	1211098	**Collection Date:**	10/31/2012 2:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**81**	**15**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**210**	**30**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*72.1*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.84	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.1	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**8.9**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**21**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*102*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*79.2*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*82.9*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*127*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*78.5*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*60.7*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R505S103112S007
Work Order:	1211098	**Collection Date:**	10/31/2012 2:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	340	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	340	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R505S103112S007
Work Order:	1211098	**Collection Date:**	10/31/2012 2:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	340	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*100*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*95.4*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*99.4*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**37**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R506D103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 3:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**64**	**11**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**180**	**23**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*70.2*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.66	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**7.8**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**11**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*99.0*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*76.0*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*78.5*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*116*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*74.4*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*66.7*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R506D103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 3:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	46	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	46	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R506D103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 3:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	46	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*99.6*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*99.1*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*92.7*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*99.0*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**14**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R506S103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 3:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**67**	**12**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**230**	**23**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*71.3*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.65	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	1.6	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**7.1**	**1.6**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**9.5**	**1.6**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*97.4*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*77.2*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*74.8*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*119*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*70.6*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*66.6*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	55	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	55	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	55	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	55	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R506S103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 3:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	55	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	55	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	55	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	55	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	55	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	55	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	55	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	55	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	55	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	55	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	55	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R506S103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 3:40:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	55	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	55	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	55	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	55	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	55	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	55	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	55	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	55	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	55	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	55	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	55	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	55	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*97.6*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*99.8*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*92.8*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*94.8*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**19**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R507S103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 4:19:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**70**	**11**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**290**	**22**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*68.8*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	0.72	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	1.8	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**5.8**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**6.9**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*92.6*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*73.0*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*69.1*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*110*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*64.0*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*61.7*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R507S103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 4:19:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	42	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	42	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R507S103112S006
Work Order:	1211098	**Collection Date:**	10/31/2012 4:19:00 PM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	42	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*98.0*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*96.1*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*93.8*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*97.1*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**11**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R507T103112MX
Work Order:	1211098	**Collection Date:**	10/31/2012
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/7/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/7/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/7/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/7/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/7/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/7/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/7/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/7/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/7/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/7/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/7/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/7/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/7/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/7/2012
Benzene	ND	50	50		µg/Kg	1	11/7/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/7/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/7/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/7/2012
Bromoform	ND	100	100		µg/Kg	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/7/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/7/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/7/2012
Chloroethane	ND	250	250		µg/Kg	1	11/7/2012
Chloroform	ND	50	50		µg/Kg	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg	1	11/7/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/7/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R507T103112MX
Work Order:	1211098	**Collection Date:**	10/31/2012
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/7/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/7/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/7/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/7/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/7/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg	1	11/7/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/7/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/7/2012
o-Xylene	ND	50	50		µg/Kg	1	11/7/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/7/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/7/2012
Styrene	ND	50	50		µg/Kg	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/7/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/7/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/7/2012
Toluene	ND	100	100		µg/Kg	1	11/7/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/7/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/7/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/7/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/7/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*99.2*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*100*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*93.8*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*96.8*	*70-130*			*%REC*	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R501S103112S007
Work Order:	1211098	**Collection Date:**	10/31/2012 10:20:00 AM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**17**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**630**	**34**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*69.8*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	2.6	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**20**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**25**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(a)pyrene	**560**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(b)fluoranthene	**940**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Chrysene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	**660**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*91.2*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*73.5*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*69.3*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*114*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*65.1*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*51.9*	*40-106*			*%REC*	1	11/7/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/5/2012**		Analyst: **AK**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/7/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R501S103112S007
Work Order:	1211098	**Collection Date:**	10/31/2012 10:20:00 AM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/7/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/7/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/7/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/7/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
2-Methylnaphthalene	ND	420	330		µg/Kg-dry	1	11/7/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/7/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/7/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/7/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/7/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/7/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/7/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Chloroethane	ND	420	250		µg/Kg-dry	1	11/7/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/7/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/7/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/7/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/7/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/7/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R501S103112S007
Work Order:	1211098	**Collection Date:**	10/31/2012 10:20:00 AM
Project:	Marshall KRRI 1000R 10/31/12		
Lab ID:	1211098-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/7/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/7/2012
m,p-Xylene	ND	250	100		µg/Kg-dry	1	11/7/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/7/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/7/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	420	330		µg/Kg-dry	1	11/7/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/7/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/7/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	11/7/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/7/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/7/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/7/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/7/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/7/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/7/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/7/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/7/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/7/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/7/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/7/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/7/2012
Surr: 4-Bromofluorobenzene	*104*	*70-130*			*%REC*	1	11/7/2012
Surr: Dibromofluoromethane	*96.3*	*70-130*			*%REC*	1	11/7/2012
Surr: Toluene-d8	*97.6*	*70-130*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**42**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44562** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44562-44562** Units: **mg/Kg** Analysis Date: **11/6/2012 02:30 PM**

Client ID: Run ID: **GC8_121106A** SeqNo: **2132560** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.376*	0	*5*	0	*67.5*	*39-115*	0			

LCS Sample ID: **DLCSS1-44562-44562** Units: **mg/Kg** Analysis Date: **11/6/2012 02:57 PM**

Client ID: Run ID: **GC8_121106A** SeqNo: **2132561** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	331	10	500	0	66.2	49-124	0			
ORO (C20-C34)	392.8	20	500	0	78.6	60-130	0			
Surr: 4-Terphenyl-d14	*4.308*	0	*5*	0	*86.2*	*39-115*	0			

MS Sample ID: **1211096-05B MS** Units: **mg/Kg** Analysis Date: **11/6/2012 03:24 PM**

Client ID: Run ID: **GC8_121106A** SeqNo: **2132562** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	326.1	9.9	494.4	113	43.1	60-130	0			S
ORO (C20-C34)	666.8	20	494.4	851.4	-37.3	60-130	0			S
Surr: 4-Terphenyl-d14	*4.013*	0	*4.944*	0	*81.2*	*39-115*	0			

MSD Sample ID: **1211096-05B MSD** Units: **mg/Kg** Analysis Date: **11/6/2012 03:51 PM**

Client ID: Run ID: **GC8_121106A** SeqNo: **2132563** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	327.3	9.2	459.4	113	46.7	60-130	326.1	0.357	30	S
ORO (C20-C34)	801.6	18	459.4	851.4	-10.8	60-130	666.8	18.3	30	S
Surr: 4-Terphenyl-d14	*4.265*	0	*4.594*	0	*92.8*	*39-115*	4.013	*6.09*	*30*	

The following samples were analyzed in this batch: 1211098-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44577** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44577-44577** Units: **mg/Kg** Analysis Date: **11/7/2012 06:16 PM**
Client ID: Run ID: **GC8_121107A** SeqNo: **2134004** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.521*	0	*5*	0	*70.4*	*39-115*	0			

LCS Sample ID: **DLCSS1-44577-44577** Units: **mg/Kg** Analysis Date: **11/7/2012 06:43 PM**
Client ID: Run ID: **GC8_121107A** SeqNo: **2134005** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	349.3	10	500	0	69.9	49-124	0			
ORO (C20-C34)	404.3	20	500	0	80.9	60-130	0			
Surr: 4-Terphenyl-d14	*4.441*	0	*5*	0	*88.8*	*39-115*	0			

MS Sample ID: **1211098-09B MS** Units: **mg/Kg** Analysis Date: **11/7/2012 07:10 PM**
Client ID: **SBKR1000R501S103112S007** Run ID: **GC8_121107A** SeqNo: **2134006** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	326.5	9.7	487.2	67.59	53.1	60-130	0			S
ORO (C20-C34)	620.9	19	487.2	364.6	52.6	60-130	0			S
Surr: 4-Terphenyl-d14	*4.096*	0	*4.872*	0	*84.1*	*39-115*	0			

MSD Sample ID: **1211098-09B MSD** Units: **mg/Kg** Analysis Date: **11/7/2012 07:36 PM**
Client ID: **SBKR1000R501S103112S007** Run ID: **GC8_121107A** SeqNo: **2134007** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	346.9	9.5	476.6	67.59	58.6	60-130	326.5	6.05	30	S
ORO (C20-C34)	812.6	19	476.6	364.6	94	60-130	620.9	26.7	30	
Surr: 4-Terphenyl-d14	*4.332*	0	*4.766*	0	*90.9*	*39-115*	4.096	*5.59*	*30*	

The following samples were analyzed in this batch:

1211098-02B	1211098-03B	1211098-04B
1211098-05B	1211098-06B	1211098-07B
1211098-09B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44573** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:17 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132963** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:22 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132964** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.746	0.10	5	0	94.9	80-120	0			
Molybdenum	5.02	0.25	5	0	100	80-120	0			
Nickel	4.94	0.25	5	0	98.8	80-120	0			
Vanadium	4.989	0.25	5	0	99.8	80-120	0			

MS Sample ID: **1211096-05BMS** Units: **mg/Kg** Analysis Date: **11/7/2012 01:39 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132967** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.532	0.55	6.849	0.2574	91.6	75-125	0			
Molybdenum	7.485	1.4	6.849	0.6642	99.6	75-125	0			
Nickel	18.39	1.4	6.849	10.97	108	75-125	0			
Vanadium	21.12	1.4	6.849	11.33	143	75-125	0			S

MSD Sample ID: **1211096-05BMSD** Units: **mg/Kg** Analysis Date: **11/7/2012 01:44 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132968** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.744	0.57	7.184	0.2574	90.3	75-125	6.532	3.21	25	
Molybdenum	7.718	1.4	7.184	0.6642	98.2	75-125	7.485	3.07	25	
Nickel	18.16	1.4	7.184	10.97	100	75-125	18.39	1.26	25	
Vanadium	20.89	1.4	7.184	11.33	133	75-125	21.12	1.05	25	S

The following samples were analyzed in this batch:

1211098-01B	1211098-02B	1211098-03B
1211098-04B	1211098-05B	1211098-06B
1211098-07B	1211098-09B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44561-44561** Units: **µg/Kg** Analysis Date: **11/6/2012 04:01 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132702** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3428*	0	*5000*	0	*68.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3641*	0	*5000*	0	*72.8*	*12-100*	0			
Surr: 2-Fluorophenol	*3882*	0	*5000*	0	*77.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5398*	0	*5000*	0	*108*	*25-137*	0			
Surr: Nitrobenzene-d5	*3528*	0	*5000*	0	*70.6*	*37-107*	0			
Surr: Phenol-d6	*3223*	0	*5000*	0	*64.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44561-44561** Units: **µg/Kg** Analysis Date: **11/6/2012 01:56 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132698** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1457	50	2000	0	72.8	45-105	0			
Acenaphthene	1433	50	2000	0	71.6	45-110	0			
Acenaphthylene	1583	50	2000	0	79.2	45-105	0			
Anthracene	1582	50	2000	0	79.1	55-105	0			
Benzo(a)anthracene	1548	50	2000	0	77.4	50-110	0			
Benzo(a)pyrene	1672	50	2000	0	83.6	50-110	0			
Benzo(b)fluoranthene	1685	50	2000	0	84.2	45-115	0			
Benzo(g,h,i)perylene	1824	50	2000	0	91.2	40-125	0			
Benzo(k)fluoranthene	1717	50	2000	0	85.8	45-115	0			
Chrysene	1563	50	2000	0	78.2	55-110	0			
Dibenzo(a,h)anthracene	1637	50	2000	0	81.8	40-125	0			
Fluoranthene	1651	50	2000	0	82.6	55-115	0			
Fluorene	1371	50	2000	0	68.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1635	50	2000	0	81.8	40-120	0			
Naphthalene	1407	50	2000	0	70.4	40-105	0			
Phenanthrene	1580	50	2000	0	79	50-110	0			
Pyrene	1689	50	2000	0	84.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*3886*	0	*5000*	0	*77.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3624*	0	*5000*	0	*72.5*	*12-100*	0			
Surr: 2-Fluorophenol	*3831*	0	*5000*	0	*76.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5628*	0	*5000*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*3658*	0	*5000*	0	*73.2*	*37-107*	0			
Surr: Phenol-d6	*3415*	0	*5000*	0	*68.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1211096-05B MS** Units: **µg/Kg** Analysis Date: **11/6/2012 02:28 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132699** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1351	49	1943	0	69.6	45-105	0			
Acenaphthene	1417	49	1943	0	73	45-110	0			
Acenaphthylene	1556	49	1943	0	80.1	45-105	0			
Anthracene	1534	49	1943	0	79	55-105	0			
Benzo(a)anthracene	1823	49	1943	257.5	80.6	50-110	0			
Benzo(a)pyrene	1955	49	1943	296.3	85.4	50-110	0			
Benzo(b)fluoranthene	2342	49	1943	425	98.7	45-115	0			
Benzo(g,h,i)perylene	872.2	49	1943	123	38.6	40-125	0			S
Benzo(k)fluoranthene	2443	49	1943	300.1	110	45-115	0			
Chrysene	2010	49	1943	357.2	85.1	55-110	0			
Dibenzo(a,h)anthracene	940.2	49	1943	0	48.4	40-125	0			
Fluoranthene	2065	49	1943	320.5	89.8	55-115	0			
Fluorene	1363	49	1943	0	70.2	50-110	0			
Indeno(1,2,3-cd)pyrene	919.8	49	1943	123.9	41	40-120	0			
Naphthalene	1186	49	1943	0	61	40-105	0			
Phenanthrene	1612	49	1943	118.1	76.9	50-110	0			
Pyrene	1741	49	1943	325.3	72.9	45-125	0			
Surr: 2,4,6-Tribromophenol	*4082*	0	*4856*	0	*84.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3412*	0	*4856*	0	*70.3*	*12-100*	0			
Surr: 2-Fluorophenol	*2962*	0	*4856*	0	*61*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4563*	0	*4856*	0	*94*	*25-137*	0			
Surr: Nitrobenzene-d5	*2902*	0	*4856*	0	*59.8*	*37-107*	0			
Surr: Phenol-d6	*2918*	0	*4856*	0	*60.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44561** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1211096-05B MSD** Units: **µg/Kg** Analysis Date: **11/6/2012 02:59 PM**
Client ID: Run ID: **SVMS4_121106A** SeqNo: **2132700** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1119	48	1916	0	58.4	45-105	1351	18.8	30	
Acenaphthene	1232	48	1916	0	64.3	45-110	1417	14	30	
Acenaphthylene	1373	48	1916	0	71.6	45-105	1556	12.5	30	
Anthracene	1364	48	1916	0	71.2	55-105	1534	11.7	30	
Benzo(a)anthracene	1643	48	1916	257.5	72.3	50-110	1823	10.4	30	
Benzo(a)pyrene	1671	48	1916	296.3	71.8	50-110	1955	15.6	30	
Benzo(b)fluoranthene	2012	48	1916	425	82.9	45-115	2342	15.1	30	
Benzo(g,h,i)perylene	816.1	48	1916	123	36.2	40-125	872.2	6.64	30	S
Benzo(k)fluoranthene	1794	48	1916	300.1	78	45-115	2443	30.6	30	R
Chrysene	1812	48	1916	357.2	76	55-110	2010	10.4	30	
Dibenzo(a,h)anthracene	866.9	48	1916	0	45.2	40-125	940.2	8.11	30	
Fluoranthene	1666	48	1916	320.5	70.2	55-115	2065	21.4	30	
Fluorene	1168	48	1916	0	61	50-110	1363	15.4	30	
Indeno(1,2,3-cd)pyrene	836.2	48	1916	123.9	37.2	40-120	919.8	9.52	30	S
Naphthalene	1059	48	1916	0	55.3	40-105	1186	11.3	30	
Phenanthrene	1456	48	1916	118.1	69.8	50-110	1612	10.2	30	
Pyrene	1471	48	1916	325.3	59.8	45-125	1741	16.8	30	
Surr: 2,4,6-Tribromophenol	*3557*	0	*4789*	0	*74.3*	*34-140*	4082	*13.8*	*40*	
Surr: 2-Fluorobiphenyl	*2946*	0	*4789*	0	*61.5*	*12-100*	3412	*14.6*	*40*	
Surr: 2-Fluorophenol	*2886*	0	*4789*	0	*60.3*	*33-117*	2962	*2.61*	*40*	
Surr: 4-Terphenyl-d14	*3850*	0	*4789*	0	*80.4*	*25-137*	4563	*17*	*40*	
Surr: Nitrobenzene-d5	*2687*	0	*4789*	0	*56.1*	*37-107*	2902	*7.71*	*40*	
Surr: Phenol-d6	*2589*	0	*4789*	0	*54.1*	*40-106*	2918	*11.9*	*40*	

The following samples were analyzed in this batch: 1211098-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44576-44576** Units: **µg/Kg** Analysis Date: **11/8/2012 12:05 PM**
Client ID: Run ID: **SVMS7_121108A** SeqNo: **2133895** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3946*	0	*5000*	0	*78.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3687*	0	*5000*	0	*73.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3749*	0	*5000*	0	*75*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4000*	0	*5000*	0	*80*	*25-137*	0			
Surr: Nitrobenzene-d5	*3665*	0	*5000*	0	*73.3*	*37-107*	0			
Surr: Phenol-d6	*4058*	0	*5000*	0	*81.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44576-44576** Units: **µg/Kg** Analysis Date: **11/8/2012 10:14 AM**
Client ID: Run ID: **SVMS7_121108A** SeqNo: **2133894** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1774	50	2000	0	88.7	45-105	0			
Acenaphthene	1773	50	2000	0	88.6	45-110	0			
Acenaphthylene	1803	50	2000	0	90.2	45-105	0			
Anthracene	1887	50	2000	0	94.4	55-105	0			
Benzo(a)anthracene	2077	50	2000	0	104	50-110	0			
Benzo(a)pyrene	1991	50	2000	0	99.6	50-110	0			
Benzo(b)fluoranthene	1877	50	2000	0	93.8	45-115	0			
Benzo(g,h,i)perylene	2031	50	2000	0	102	40-125	0			
Benzo(k)fluoranthene	1881	50	2000	0	94	45-115	0			
Chrysene	2179	50	2000	0	109	55-110	0			
Dibenzo(a,h)anthracene	1998	50	2000	0	99.9	40-125	0			
Fluoranthene	1973	50	2000	0	98.6	55-115	0			
Fluorene	1867	50	2000	0	93.4	50-110	0			
Indeno(1,2,3-cd)pyrene	2014	50	2000	0	101	40-120	0			
Naphthalene	1752	50	2000	0	87.6	40-105	0			
Phenanthrene	1910	50	2000	0	95.5	50-110	0			
Pyrene	2114	50	2000	0	106	45-125	0			
Surr: 2,4,6-Tribromophenol	*4536*	0	*5000*	0	*90.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3656*	0	*5000*	0	*73.1*	*12-100*	0			
Surr: 2-Fluorophenol	*3785*	0	*5000*	0	*75.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4239*	0	*5000*	0	*84.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3717*	0	*5000*	0	*74.3*	*37-107*	0			
Surr: Phenol-d6	*3984*	0	*5000*	0	*79.7*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211098-09B MS** Units: **µg/Kg** Analysis Date: **11/8/2012 02:52 PM**
Client ID: **SBKR1000R501S103112S007** Run ID: **SVMS7_121108A** SeqNo: **2134538** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1503	47	1878	0	80	45-105	0			
Acenaphthene	1600	47	1878	0	85.2	45-110	0			
Acenaphthylene	1638	47	1878	0	87.2	45-105	0			
Anthracene	1721	47	1878	0	91.6	55-105	0			
Benzo(a)anthracene	1953	47	1878	166.1	95.2	50-110	0			
Benzo(a)pyrene	1894	47	1878	358.4	81.8	50-110	0			
Benzo(b)fluoranthene	2032	47	1878	313.7	91.5	45-115	0			
Benzo(g,h,i)perylene	1448	47	1878	171.9	67.9	40-125	0			
Benzo(k)fluoranthene	1682	47	1878	189.4	79.5	45-115	0			
Chrysene	2035	47	1878	194.3	98.1	55-110	0			
Dibenzo(a,h)anthracene	1500	47	1878	64.1	76.5	40-125	0			
Fluoranthene	1933	47	1878	414.7	80.9	55-115	0			
Fluorene	1710	47	1878	0	91	50-110	0			
Indeno(1,2,3-cd)pyrene	1557	47	1878	154.4	74.7	40-120	0			
Naphthalene	1434	47	1878	0	76.4	40-105	0			
Phenanthrene	1813	47	1878	121.4	90.1	50-110	0			
Pyrene	2125	47	1878	397.2	92	45-125	0			
Surr: 2,4,6-Tribromophenol	*4370*	0	*4694*	0	*93.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3207*	0	*4694*	0	*68.3*	*12-100*	0			
Surr: 2-Fluorophenol	*3111*	0	*4694*	0	*66.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3844*	0	*4694*	0	*81.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*2909*	0	*4694*	0	*62*	*37-107*	0			
Surr: Phenol-d6	*3452*	0	*4694*	0	*73.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211098-09B MSD** Units: **µg/Kg** Analysis Date: **11/8/2012 03:20 PM**
Client ID: **SBKR1000R501S103112S007** Run ID: **SVMS7_121108A** SeqNo: **2134539** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1500	46	1854	0	80.9	45-105	1503	0.231	30	
Acenaphthene	1588	46	1854	0	85.6	45-110	1600	0.76	30	
Acenaphthylene	1622	46	1854	0	87.5	45-105	1638	1	30	
Anthracene	1683	46	1854	0	90.8	55-105	1721	2.22	30	
Benzo(a)anthracene	1946	46	1854	166.1	96	50-110	1953	0.33	30	
Benzo(a)pyrene	1891	46	1854	358.4	82.7	50-110	1894	0.153	30	
Benzo(b)fluoranthene	2142	46	1854	313.7	98.6	45-115	2032	5.28	30	
Benzo(g,h,i)perylene	1228	46	1854	171.9	57	40-125	1448	16.4	30	
Benzo(k)fluoranthene	1631	46	1854	189.4	77.8	45-115	1682	3.09	30	
Chrysene	1957	46	1854	194.3	95.1	55-110	2035	3.9	30	
Dibenzo(a,h)anthracene	1335	46	1854	64.1	68.6	40-125	1500	11.6	30	
Fluoranthene	1931	46	1854	414.7	81.8	55-115	1933	0.0803	30	
Fluorene	1662	46	1854	0	89.6	50-110	1710	2.84	30	
Indeno(1,2,3-cd)pyrene	1361	46	1854	154.4	65.1	40-120	1557	13.5	30	
Naphthalene	1405	46	1854	0	75.8	40-105	1434	2.01	30	
Phenanthrene	1792	46	1854	121.4	90.2	50-110	1813	1.13	30	
Pyrene	2143	46	1854	397.2	94.2	45-125	2125	0.811	30	
Surr: 2,4,6-Tribromophenol	*4381*	0	*4634*	0	*94.5*	*34-140*	4370	*0.248*	*40*	
Surr: 2-Fluorobiphenyl	*3110*	0	*4634*	0	*67.1*	*12-100*	3207	*3.06*	*40*	
Surr: 2-Fluorophenol	*3052*	0	*4634*	0	*65.9*	*33-117*	3111	*1.92*	*40*	
Surr: 4-Terphenyl-d14	*3816*	0	*4634*	0	*82.3*	*25-137*	3844	*0.751*	*40*	
Surr: Nitrobenzene-d5	*2879*	0	*4634*	0	*62.1*	*37-107*	2909	*1.06*	*40*	
Surr: Phenol-d6	*3399*	0	*4634*	0	*73.4*	*40-106*	3452	*1.53*	*40*	

The following samples were analyzed in this batch:

1211098-02B	1211098-03B	1211098-04B
1211098-05B	1211098-06B	1211098-07B
1211098-09B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44565-44565** Units: **µg/Kg** Analysis Date: **11/7/2012 12:31 PM**
Client ID: Run ID: **VMS8_121106B** SeqNo: **2133041** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	72	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	81	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	32	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44565-44565** Units: **µg/Kg** Analysis Date: **11/8/2012 02:23 AM**
Client ID: Run ID: **VMS8_121107B** SeqNo: **2134061** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	70	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	75	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	33	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*994.5*	0	*1000*	0	*99.4*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*949.5*	0	*1000*	0	*95*	*70-130*	0	
Surr: Toluene-d8	*958.5*	0	*1000*	0	*95.8*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44565-44565**				Units: **µg/Kg**		Analysis Date: **11/6/2012 11:20 PM**			
Client ID:		Run ID: **VMS8_121106B**			SeqNo: **2133040**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	911.5	30	1000	0	91.2	75-125	0			
1,1,1-Trichloroethane	906.5	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	848	30	1000	0	84.8	55-130	0			
1,1,2-Trichloroethane	843.5	30	1000	0	84.4	60-125	0			
1,1-Dichloroethane	861.5	30	1000	0	86.2	75-125	0			
1,1-Dichloroethene	856.5	30	1000	0	85.6	65-135	0			
1,2,3-Trichlorobenzene	982	30	1000	0	98.2	60-135	0			
1,2,3-Trichloropropane	927	30	1000	0	92.7	65-130	0			
1,2,3-Trimethylbenzene	919.5	30	1000	0	92	65-135	0			
1,2,4-Trichlorobenzene	1042	30	1000	0	104	65-130	0			
1,2,4-Trimethylbenzene	925	30	1000	0	92.5	65-135	0			
1,2-Dibromo-3-chloropropane	905.5	30	1000	0	90.6	40-135	0			
1,2-Dibromoethane	940.5	30	1000	0	94	70-125	0			
1,2-Dichlorobenzene	933.5	30	1000	0	93.4	75-120	0			
1,2-Dichloroethane	889	30	1000	0	88.9	70-135	0			
1,2-Dichloropropane	886.5	30	1000	0	88.6	70-120	0			
1,3,5-Trimethylbenzene	923.5	30	1000	0	92.4	65-135	0			
1,3-Dichlorobenzene	934	30	1000	0	93.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	929	200	1000	0	92.9	30-160	0			
2-Hexanone	986	30	1000	0	98.6	45-145	0			
4-Methyl-2-pentanone	1223	30	1000	0	122	45-145	0			
Acetone	977	100	1000	0	97.7	20-160	0			
Acrylonitrile	852.5	100	1000	0	85.2	70-135	0			
Benzene	884	30	1000	0	88.4	75-125	0			
Bromobenzene	906.5	30	1000	0	90.6	65-120	0			
Bromochloromethane	891	30	1000	0	89.1	70-125	0			
Bromodichloromethane	916	30	1000	0	91.6	70-130	0			
Bromoform	945	30	1000	0	94.5	55-135	0			
Bromomethane	1029	75	1000	0	103	30-160	0			
Carbon disulfide	926.5	30	1000	0	92.6	45-160	0			
Carbon tetrachloride	937.5	30	1000	0	93.8	65-135	0			
Chlorobenzene	943.5	30	1000	0	94.4	75-125	0			
Chloroethane	1206	100	1000	0	121	40-155	0			
Chloroform	880	30	1000	0	88	70-125	0			
Chloromethane	784.5	100	1000	0	78.4	50-130	0			
cis-1,2-Dichloroethene	883.5	30	1000	0	88.4	65-125	0			
cis-1,3-Dichloropropene	928	30	1000	0	92.8	70-125	0			
Dibromochloromethane	936.5	30	1000	0	93.6	65-135	0			
Dibromomethane	891	30	1000	0	89.1	75-130	0			
Dichlorodifluoromethane	654.5	30	1000	0	65.4	35-135	0			
Ethylbenzene	932	30	1000	0	93.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	939.5	30	1000	0	94	70-135	0
Isopropylbenzene	909	30	1000	0	90.9	75-130	0
m,p-Xylene	1901	60	2000	0	95	80-125	0
Methyl tert-butyl ether	996.5	30	1000	0	99.6	75-125	0
Methylene chloride	870	30	1000	0	87	55-145	0
Naphthalene	1144	100	1000	0	114	40-140	0
n-Butylbenzene	1028	30	1000	0	103	65-140	0
n-Propylbenzene	875.5	30	1000	0	87.6	65-135	0
o-Xylene	943	30	1000	0	94.3	75-125	0
p-Isopropyltoluene	871.5	30	1000	0	87.2	75-135	0
sec-Butylbenzene	876.5	30	1000	0	87.6	65-130	0
Styrene	945.5	30	1000	0	94.6	75-125	0
tert-Butylbenzene	881.5	30	1000	0	88.2	65-130	0
Tetrachloroethene	921.5	30	1000	0	92.2	64-140	0
Tetrahydrofuran	900	200	1000	0	90	70-135	0
Toluene	905.5	30	1000	0	90.6	70-125	0
trans-1,2-Dichloroethene	895.5	30	1000	0	89.6	65-135	0
trans-1,3-Dichloropropene	933	30	1000	0	93.3	65-125	0
trans-1,4-Dichloro-2-butene	861.5	30	1000	0	86.2	70-135	0
Trichloroethene	919.5	30	1000	0	92	75-125	0
Trichlorofluoromethane	852.5	30	1000	0	85.2	25-185	0
Vinyl chloride	872.5	30	1000	0	87.2	60-125	0
Surr: 1,2-Dichloroethane-d4	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*994.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Dibromofluoromethane	*1008*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44565-44565** Units: **µg/Kg** Analysis Date: **11/8/2012 01:12 AM**
Client ID: Run ID: **VMS8_121107B** SeqNo: **2134060** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	904	30	1000	0	90.4	75-125	0			
1,1,1-Trichloroethane	888	30	1000	0	88.8	70-135	0			
1,1,2,2-Tetrachloroethane	923.5	30	1000	0	92.4	55-130	0			
1,1,2-Trichloroethane	824.5	30	1000	0	82.4	60-125	0			
1,1-Dichloroethane	824	30	1000	0	82.4	75-125	0			
1,1-Dichloroethene	863	30	1000	0	86.3	65-135	0			
1,2,3-Trichlorobenzene	905.5	30	1000	0	90.6	60-135	0			
1,2,3-Trichloropropane	986.5	30	1000	0	98.6	65-130	0			
1,2,3-Trimethylbenzene	824.5	30	1000	0	82.4	65-135	0			
1,2,4-Trichlorobenzene	959.5	30	1000	0	96	65-130	0			
1,2,4-Trimethylbenzene	914.5	30	1000	0	91.4	65-135	0			
1,2-Dibromo-3-chloropropane	925.5	30	1000	0	92.6	40-135	0			
1,2-Dibromoethane	958.5	30	1000	0	95.8	70-125	0			
1,2-Dichlorobenzene	868.5	30	1000	0	86.8	75-120	0			
1,2-Dichloroethane	867.5	30	1000	0	86.8	70-135	0			
1,2-Dichloropropane	831	30	1000	0	83.1	70-120	0			
1,3,5-Trimethylbenzene	900	30	1000	0	90	65-135	0			
1,3-Dichlorobenzene	855	30	1000	0	85.5	70-125	0			
1,4-Dichlorobenzene	858	30	1000	0	85.8	70-125	0			
2-Butanone	952.5	200	1000	0	95.2	30-160	0			
2-Hexanone	1114	30	1000	0	111	45-145	0			
4-Methyl-2-pentanone	1305	30	1000	0	130	45-145	0			
Acetone	1021	100	1000	0	102	20-160	0			
Acrylonitrile	873.5	100	1000	0	87.4	70-135	0			
Benzene	846.5	30	1000	0	84.6	75-125	0			
Bromobenzene	917.5	30	1000	0	91.8	65-120	0			
Bromochloromethane	836	30	1000	0	83.6	70-125	0			
Bromodichloromethane	838	30	1000	0	83.8	70-130	0			
Bromoform	953.5	30	1000	0	95.4	55-135	0			
Bromomethane	1052	75	1000	0	105	30-160	0			
Carbon disulfide	969	30	1000	0	96.9	45-160	0			
Carbon tetrachloride	902.5	30	1000	0	90.2	65-135	0			
Chlorobenzene	921	30	1000	0	92.1	75-125	0			
Chloroethane	798	100	1000	0	79.8	40-155	0			
Chloroform	829	30	1000	0	82.9	70-125	0			
Chloromethane	808.5	100	1000	0	80.8	50-130	0			
cis-1,2-Dichloroethene	856.5	30	1000	0	85.6	65-125	0			
cis-1,3-Dichloropropene	891	30	1000	0	89.1	70-125	0			
Dibromochloromethane	938.5	30	1000	0	93.8	65-135	0			
Dibromomethane	867.5	30	1000	0	86.8	75-130	0			
Dichlorodifluoromethane	810	30	1000	0	81	35-135	0			
Ethylbenzene	889	30	1000	0	88.9	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565**	Instrument ID **VMS8**		Method: **SW8260**				
Hexachloroethane	872.5	30	1000	0	87.2	70-135	0
Isopropylbenzene	906	30	1000	0	90.6	75-130	0
m,p-Xylene	1842	60	2000	0	92.1	80-125	0
Methyl tert-butyl ether	967.5	30	1000	0	96.8	75-125	0
Methylene chloride	847	30	1000	0	84.7	55-145	0
Naphthalene	1068	100	1000	0	107	40-140	0
n-Butylbenzene	963	30	1000	0	96.3	65-140	0
n-Propylbenzene	858	30	1000	0	85.8	65-135	0
o-Xylene	918	30	1000	0	91.8	75-125	0
p-Isopropyltoluene	795	30	1000	0	79.5	75-135	0
sec-Butylbenzene	885	30	1000	0	88.5	65-130	0
Styrene	917	30	1000	0	91.7	75-125	0
tert-Butylbenzene	888	30	1000	0	88.8	65-130	0
Tetrachloroethene	869	30	1000	0	86.9	64-140	0
Tetrahydrofuran	916	200	1000	0	91.6	70-135	0
Toluene	863	30	1000	0	86.3	70-125	0
trans-1,2-Dichloroethene	867.5	30	1000	0	86.8	65-135	0
trans-1,3-Dichloropropene	898	30	1000	0	89.8	65-125	0
trans-1,4-Dichloro-2-butene	916	30	1000	0	91.6	70-135	0
Trichloroethene	887.5	30	1000	0	88.8	75-125	0
Trichlorofluoromethane	884.5	30	1000	0	88.4	25-185	0
Vinyl chloride	918	30	1000	0	91.8	60-125	0
Surr: 1,2-Dichloroethane-d4	*957*	0	*1000*	0	*95.7*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: Dibromofluoromethane	*969.5*	0	*1000*	0	*97*	*70-130*	0
Surr: Toluene-d8	*1020*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1211098-09A MS** Units: **µg/Kg** Analysis Date: **11/8/2012 10:19 AM**
Client ID: **SBKR1000R501S103112S007** Run ID: **VMS8_121107B** SeqNo: **2134062** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2097	73	2448	0	85.6	75-125	0			
1,1,1-Trichloroethane	2080	73	2448	0	85	70-135	0			
1,1,2,2-Tetrachloroethane	2028	73	2448	0	82.8	55-130	0			
1,1,2-Trichloroethane	1976	73	2448	0	80.7	60-125	0			
1,1-Dichloroethane	1997	73	2448	0	81.6	75-125	0			
1,1-Dichloroethene	2008	73	2448	0	82	65-135	0			
1,2,3-Trichlorobenzene	1770	73	2448	0	72.3	60-135	0			
1,2,3-Trichloropropane	2284	73	2448	0	93.3	65-130	0			
1,2,3-Trimethylbenzene	1928	73	2448	0	78.8	65-135	0			
1,2,4-Trichlorobenzene	1904	73	2448	0	77.8	65-130	0			
1,2,4-Trimethylbenzene	2120	73	2448	0	86.6	65-135	0			
1,2-Dibromo-3-chloropropane	1735	73	2448	0	70.8	40-135	0			
1,2-Dibromoethane	2123	73	2448	0	86.7	70-125	0			
1,2-Dichlorobenzene	2015	73	2448	0	82.3	75-120	0			
1,2-Dichloroethane	2050	73	2448	0	83.8	70-135	0			
1,2-Dichloropropane	2026	73	2448	0	82.8	70-120	0			
1,3,5-Trimethylbenzene	2197	73	2448	0	89.8	65-135	0			
1,3-Dichlorobenzene	2016	73	2448	0	82.4	70-125	0			
1,4-Dichlorobenzene	1994	73	2448	0	81.4	70-125	0			
2-Butanone	1768	490	2448	0	72.2	30-160	0			
2-Hexanone	2342	73	2448	0	95.6	45-145	0			
4-Methyl-2-pentanone	2768	73	2448	0	113	45-145	0			
Acetone	2503	240	2448	0	102	20-160	0			
Acrylonitrile	2033	240	2448	0	83	70-135	0			
Benzene	2038	73	2448	0	83.2	75-125	0			
Bromobenzene	2188	73	2448	0	89.4	65-120	0			
Bromochloromethane	2042	73	2448	0	83.4	70-125	0			
Bromodichloromethane	2053	73	2448	0	83.8	70-130	0			
Bromoform	2168	73	2448	0	88.6	55-135	0			
Bromomethane	2086	180	2448	0	85.2	30-160	0			
Carbon disulfide	1937	73	2448	0	79.1	45-160	0			
Carbon tetrachloride	2136	73	2448	0	87.2	65-135	0			
Chlorobenzene	2203	73	2448	0	90	75-125	0			
Chloroethane	1418	240	2448	0	57.9	40-155	0			
Chloroform	2106	73	2448	0	86	70-125	0			
Chloromethane	1710	240	2448	0	69.8	50-130	0			
cis-1,2-Dichloroethene	1981	73	2448	0	80.9	65-125	0			
cis-1,3-Dichloropropene	1956	73	2448	0	79.9	70-125	0			
Dibromochloromethane	2180	73	2448	0	89	65-135	0			
Dibromomethane	2068	73	2448	0	84.4	75-130	0			
Dichlorodifluoromethane	1659	73	2448	0	67.8	35-135	0			
Ethylbenzene	2119	73	2448	0	86.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	2054	73	2448	0	83.9	70-135	0	
Isopropylbenzene	2125	73	2448	0	86.8	75-130	0	
m,p-Xylene	4270	150	4897	0	87.2	80-125	0	
Methyl tert-butyl ether	2353	73	2448	0	96.1	75-125	0	
Methylene chloride	1994	73	2448	0	81.4	55-145	0	
Naphthalene	1776	240	2448	0	72.6	40-140	0	
n-Butylbenzene	1917	73	2448	0	78.3	65-140	0	
n-Propylbenzene	2064	73	2448	0	84.3	65-135	0	
o-Xylene	2154	73	2448	0	88	75-125	0	
p-Isopropyltoluene	1796	73	2448	0	73.4	75-135	0	S
sec-Butylbenzene	2075	73	2448	0	84.8	65-130	0	
Styrene	2071	73	2448	0	84.6	75-125	0	
tert-Butylbenzene	2110	73	2448	0	86.2	65-130	0	
Tetrachloroethene	2054	73	2448	0	83.9	64-140	0	
Tetrahydrofuran	1978	490	2448	0	80.8	70-135	0	
Toluene	1998	73	2448	0	81.6	70-125	0	
trans-1,2-Dichloroethene	2026	73	2448	0	82.8	65-135	0	
trans-1,3-Dichloropropene	1874	73	2448	0	76.6	65-125	0	
trans-1,4-Dichloro-2-butene	1487	73	2448	0	60.8	70-135	0	S
Trichloroethene	2053	73	2448	0	83.8	75-125	0	
Trichlorofluoromethane	1982	73	2448	0	81	25-185	0	
Vinyl chloride	1853	73	2448	0	75.7	60-125	0	
Surr: 1,2-Dichloroethane-d4	*2292*	0	*2448*	0	*93.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*2448*	0	*2448*	0	*100*	*70-130*	0	
Surr: Dibromofluoromethane	*2308*	0	*2448*	0	*94.2*	*70-130*	0	
Surr: Toluene-d8	*2245*	0	*2448*	0	*91.7*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

MSD	Sample ID: **1211098-09A MSD**				Units: **µg/Kg**		Analysis Date: **11/8/2012 10:43 AM**			
Client ID: **SBKR1000R501S103112S007**		Run ID: **VMS8_121107B**			SeqNo: **2134063**		Prep Date: **11/5/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2114	73	2448	0	86.4	75-125	0	0	30	
1,1,1-Trichloroethane	2027	73	2448	0	82.8	70-135	0	0	30	
1,1,2,2-Tetrachloroethane	2129	73	2448	0	87	55-130	0	0	30	
1,1,2-Trichloroethane	2008	73	2448	0	82	60-125	0	0	30	
1,1-Dichloroethane	1989	73	2448	0	81.2	75-125	0	0	30	
1,1-Dichloroethene	2022	73	2448	0	82.6	65-135	0	0	30	
1,2,3-Trichlorobenzene	1795	73	2448	0	73.3	60-135	0	0	30	
1,2,3-Trichloropropane	2331	73	2448	0	95.2	65-130	0	0	30	
1,2,3-Trimethylbenzene	1932	73	2448	0	78.9	65-135	0	0	30	
1,2,4-Trichlorobenzene	2020	73	2448	0	82.5	65-130	0	0	30	
1,2,4-Trimethylbenzene	2156	73	2448	0	88	65-135	0	0	30	
1,2-Dibromo-3-chloropropane	1857	73	2448	0	75.8	40-135	0	0	30	
1,2-Dibromoethane	2081	73	2448	0	85	70-125	0	0	30	
1,2-Dichlorobenzene	1977	73	2448	0	80.8	75-120	0	0	30	
1,2-Dichloroethane	2099	73	2448	0	85.8	70-135	0	0	30	
1,2-Dichloropropane	2090	73	2448	0	85.4	70-120	0	0	30	
1,3,5-Trimethylbenzene	2154	73	2448	0	88	65-135	0	0	30	
1,3-Dichlorobenzene	2014	73	2448	0	82.2	70-125	0	0	30	
1,4-Dichlorobenzene	1998	73	2448	0	81.6	70-125	0	0	30	
2-Butanone	1631	490	2448	0	66.6	30-160	0	0	30	
2-Hexanone	2410	73	2448	0	98.4	45-145	0	0	30	
4-Methyl-2-pentanone	2949	73	2448	0	120	45-145	0	0	30	
Acetone	2773	240	2448	0	113	20-160	0	0	30	
Acrylonitrile	2147	240	2448	0	87.7	70-135	0	0	30	
Benzene	2026	73	2448	0	82.8	75-125	0	0	30	
Bromobenzene	2180	73	2448	0	89	65-120	0	0	30	
Bromochloromethane	2060	73	2448	0	84.2	70-125	0	0	30	
Bromodichloromethane	2070	73	2448	0	84.6	70-130	0	0	30	
Bromoform	2211	73	2448	0	90.3	55-135	0	0	30	
Bromomethane	2044	180	2448	0	83.5	30-160	0	0	30	
Carbon disulfide	1926	73	2448	0	78.6	45-160	0	0	30	
Carbon tetrachloride	2164	73	2448	0	88.4	65-135	0	0	30	
Chlorobenzene	2173	73	2448	0	88.8	75-125	0	0	30	
Chloroethane	1391	240	2448	0	56.8	40-155	0	0	30	
Chloroform	2039	73	2448	0	83.3	70-125	0	0	30	
Chloromethane	1774	240	2448	0	72.4	50-130	0	0	30	
cis-1,2-Dichloroethene	2015	73	2448	0	82.3	65-125	0	0	30	
cis-1,3-Dichloropropene	1972	73	2448	0	80.6	70-125	0	0	30	
Dibromochloromethane	2184	73	2448	0	89.2	65-135	0	0	30	
Dibromomethane	2093	73	2448	0	85.5	75-130	0	0	30	
Dichlorodifluoromethane	1662	73	2448	0	67.9	35-135	0	0	30	
Ethylbenzene	2082	73	2448	0	85	75-125	0	0	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44565** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1911	73	2448	0	78	70-135	0	0	30	
Isopropylbenzene	2097	73	2448	0	85.6	75-130	0	0	30	
m,p-Xylene	4245	150	4897	0	86.7	80-125	0	0	30	
Methyl tert-butyl ether	2401	73	2448	0	98	75-125	0	0	30	
Methylene chloride	2025	73	2448	0	82.7	55-145	0	0	30	
Naphthalene	1908	240	2448	0	78	40-140	0	0	30	
n-Butylbenzene	1986	73	2448	0	81.1	65-140	0	0	30	
n-Propylbenzene	2050	73	2448	0	83.8	65-135	0	0	30	
o-Xylene	2130	73	2448	0	87	75-125	0	0	30	
p-Isopropyltoluene	1798	73	2448	0	73.4	75-135	0	0	30	S
sec-Butylbenzene	2109	73	2448	0	86.2	65-130	0	0	30	
Styrene	2125	73	2448	0	86.8	75-125	0	0	30	
tert-Butylbenzene	2140	73	2448	0	87.4	65-130	0	0	30	
Tetrachloroethene	1968	73	2448	0	80.4	64-140	0	0	30	
Tetrahydrofuran	2387	490	2448	0	97.5	70-135	0	0	30	
Toluene	1994	73	2448	0	81.4	70-125	0	0	30	
trans-1,2-Dichloroethene	2041	73	2448	0	83.4	65-135	0	0	30	
trans-1,3-Dichloropropene	1878	73	2448	0	76.7	65-125	0	0	30	
trans-1,4-Dichloro-2-butene	1639	73	2448	0	67	70-135	0	0	30	S
Trichloroethene	2097	73	2448	0	85.6	75-125	0	0	30	
Trichlorofluoromethane	1954	73	2448	0	79.8	25-185	0	0	30	
Vinyl chloride	1841	73	2448	0	75.2	60-125	0	0	30	
Surr: 1,2-Dichloroethane-d4	*2290*	0	*2448*	0	*93.6*	*70-130*	0	*0*	*30*	
Surr: 4-Bromofluorobenzene	*2429*	0	*2448*	0	*99.2*	*70-130*	0	*0*	*30*	
Surr: Dibromofluoromethane	*2341*	0	*2448*	0	*95.6*	*70-130*	0	*0*	*30*	
Surr: Toluene-d8	*2256*	0	*2448*	0	*92.2*	*70-130*	0	*0*	*30*	

The following samples were analyzed in this batch:

1211098-01A	1211098-02A	1211098-03A
1211098-04A	1211098-05A	1211098-06A
1211098-07A	1211098-08A	1211098-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211098
Project: Marshall KRRI 1000R 10/31/12

QC BATCH REPORT

Batch ID: **R112165** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-121105-R112165** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132090** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **WLCSS1-121105-R112165** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132091** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211072-04A DUP** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: Run ID: **MOIST_121105D** SeqNo: **2132095** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	45.86	0.050	0	0	0	0-0	58.86	24.8	20	R

DUP Sample ID: **1211098-09B DUP** Units: **% of sample** Analysis Date: **11/5/2012 04:30 PM**
Client ID: **SBKR1000R501S103112S007** Run ID: **MOIST_121105D** SeqNo: **2132113** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	43.9	0.050	0	0	0	0-0	42.18	4	20	

The following samples were analyzed in this batch:

1211098-01B	1211098-02B	1211098-03B
1211098-04B	1211098-05B	1211098-06B
1211098-07B	1211098-09B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211098

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_103112_GMK1	Task: KRRI_1000
	Total # of Samples: 9	Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State,	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Analysis / Preservative: % Moisture (None)	Be,Mo,V,Ni by 6020 (None)	ORO,DRO (None)	PNAs by 8270 (None)	VOC by 5035/8260 (MeOH)
1	SBKR1000R502S103112S008	SBKR1000R502	SO	G	10/31/2012 11:38	3		X	X	X	X	X
2	SBKR1000R503S103112S005	SBKR1000R503	SO	G	10/31/2012 13:25	3		X	X	X	X	X
3	SBKR1000R504S103112S005	SBKR1000R504	SO	G	10/31/2012 14:00	3		X	X	X	X	X
4	SBKR1000R505S103112S007	SBKR1000R505	SO	G	10/31/2012 14:40	3		X	X	X	X	X
5	SBKR1000R506D103112S006	SBKR1000R506	SO	G	10/31/2012 15:40	3	DUPLICATE	X	X	X	X	X
6	SBKR1000R506S103112S006	SBKR1000R506	SO	G	10/31/2012 15:40	3		X	X	X	X	X
7	SBKR1000R507S103112S006	SBKR1000R507	SO	G	10/31/2012 16:19	3		X	X	X	X	X
8	SBKR1000R507T103112MX	SBKR1000R507	SQ	G	10/31/2012 00:00	1	TRIP BLANK					X
9	SBKR1000R501S103112S007	SBKR1000R501	SO	G	10/31/2012 10:20	3		X	X	X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G. Kramer	11-2-12	1620	[signature]	11-2-12	1620
[signature]	11-2-12	1630	[signature]	11-2-12	1630

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
5.0°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **02-Nov-12 16:30**

Work Order: **1211098** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 03-Nov-12 (Date) Reviewed by: Alex Csaszar (eSignature) 04-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.0 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/3/2012 9:55:14 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

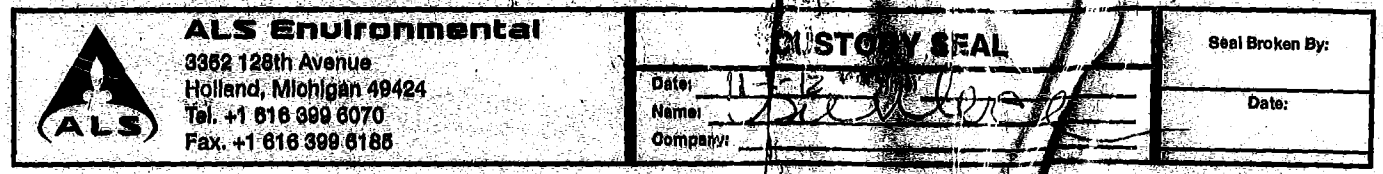
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
ALS
CUSTODY SEAL
Date:
Name:
Company:
Seal Broken By:
Date:

09-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000-1100R Sediment 10/31-11/2/12** Work Order: **1211110**

Dear Bryan,

ALS Environmental received 5 samples on 02-Nov-2012 10:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 20.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 09-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/12
Work Order: **1211110**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211110-01	SEKR1075R501S110112D008	Sediment		11/1/2012 14:44	11/2/2012 10:30	☐
1211110-02	SEKR1100R501S110212D008	Sediment		11/2/2012 12:02	11/2/2012 10:30	☐
1211110-03	SEKR1100R501S110212D016	Sediment		11/2/2012 12:05	11/2/2012 10:30	☐
1211110-04	SEKR1000R501S103112D004	Sediment		10/31/2012 11:06	11/2/2012 10:30	☐
1211110-05	SEKR1000R502S103112D008	Sediment		10/31/2012 15:17	11/2/2012 10:30	☐

ALS Group USA, Corp

Date: 09-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/12
Work Order: 1211110

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44577 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batches 44573 and 44591 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44576 sample 1211110-03 PAH surrogate recovery was above control limits, but all PAH compounds were ND. No qualification is necessary.

Batch 44576 samples 1211110-04 and 1211110-05 PAH internal standard recoveries were below the lower control limit, but >20%. Per the client's request, the results associated with the IS are being reported and should be considered as estimated for the compounds marked with an asterisk. Sample 1211110-04 had a low surrogate recovery, but none of the reported PAH compounds were associated with this surrogate. No qualification is necessary.

ALS Group USA, Corp

Date: 09-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/12
WorkOrder: **1211110**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1075R501S110112D008
Work Order:	1211110	**Collection Date:**	11/1/2012 2:44:00 PM
Project:	Marshall KRRI 1000-1100R Sediment 10/31-11/2/12		
Lab ID:	1211110-01	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**260**	**40**	**4.0**		**mg/Kg-dry**	1	11/7/2012
ORO (C20-C34)	**940**	**80**	**4.0**		**mg/Kg-dry**	1	11/7/2012
Surr: 4-Terphenyl-d14	*71.7*	*39-115*			*%REC*	1	11/7/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/6/2012**		Analyst: **CES**
Beryllium	ND	2.5	0.50		mg/Kg-dry	4	11/7/2012
Molybdenum	ND	6.1	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**13**	**6.1**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**14**	**6.1**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(a)pyrene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(b)fluoranthene	**730**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	**680**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Chrysene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	**720**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	**710**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*98.1*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*71.5*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*71.4*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*122*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*64.4*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*54.2*	*40-106*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**77**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1100R501S110212D008
Work Order:	1211110	**Collection Date:**	11/2/2012 12:02:00 PM
Project:	Marshall KRRI 1000-1100R Sediment 10/31-11/2/12		
Lab ID:	1211110-02	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**19**	**4.0**		**mg/Kg-dry**	1	11/8/2012
ORO (C20-C34)	**550**	**37**	**4.0**		**mg/Kg-dry**	1	11/8/2012
Surr: 4-Terphenyl-d14	*73.1*	*39-115*			*%REC*	1	11/8/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/7/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**15**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**18**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	**450**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	**400**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*94.3*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*74.5*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*79.0*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*124*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*72.1*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*67.0*	*40-106*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**47**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1100R501S110212D016
Work Order:	1211110	**Collection Date:**	11/2/2012 12:05:00 PM
Project:	Marshall KRRI 1000-1100R Sediment 10/31-11/2/12		
Lab ID:	1211110-03	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**60**	**11**	**4.0**		**mg/Kg-dry**	1	11/8/2012
ORO (C20-C34)	**170**	**22**	**4.0**		**mg/Kg-dry**	1	11/8/2012
Surr: 4-Terphenyl-d14	*74.1*	*39-115*			*%REC*	1	11/8/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/7/2012**		Analyst: **CES**
Beryllium	ND	0.72	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	1.8	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**9.2**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**16**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*101*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*84.3*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*87.1*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*138*	*25-137*		S	*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*81.9*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*73.5*	*40-106*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**19**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1000R501S103112D004
Work Order:	1211110	**Collection Date:**	10/31/2012 11:06:00 AM
Project:	Marshall KRRI 1000-1100R Sediment 10/31-11/2/12		
Lab ID:	1211110-04	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**220**	**36**	**4.0**		**mg/Kg-dry**	1	11/8/2012
ORO (C20-C34)	**680**	**73**	**4.0**		**mg/Kg-dry**	1	11/8/2012
Surr: 4-Terphenyl-d14	*71.6*	*39-115*			*%REC*	1	11/8/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/7/2012**		Analyst: **CES**
Beryllium	ND	2.2	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	5.5	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**9.7**	**5.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**10**	**5.5**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	**560**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Benzo(a)pyrene	**530**	**330**	**330**	*	**µg/Kg-dry**	1	11/7/2012
Benzo(b)fluoranthene	**920**	**330**	**330**	*	**µg/Kg-dry**	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	**640**	**330**	**330**	*	**µg/Kg-dry**	1	11/7/2012
Chrysene	**570**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Fluoranthene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	**880**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Pyrene	**900**	**330**	**330**		**µg/Kg-dry**	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*95.0*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*76.1*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*70.8*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*126*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*75.4*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*37.7*	*40-106*		S	*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**73**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1000R502S103112D008
Work Order:	1211110	**Collection Date:**	10/31/2012 3:17:00 PM
Project:	Marshall KRRI 1000-1100R Sediment 10/31-11/2/12		
Lab ID:	1211110-05	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/7/2012**		Analyst: **CW**
DRO (C10-C20)	**210**	**36**	**4.0**		**mg/Kg-dry**	1	11/8/2012
ORO (C20-C34)	**630**	**73**	**4.0**		**mg/Kg-dry**	1	11/8/2012
Surr: 4-Terphenyl-d14	*68.5*	*39-115*			*%REC*	1	11/8/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/7/2012**		Analyst: **CES**
Beryllium	ND	2.2	0.50		mg/Kg-dry	4	11/8/2012
Molybdenum	ND	5.4	1.0		mg/Kg-dry	4	11/7/2012
Nickel	**20**	**5.4**	**1.0**		**mg/Kg-dry**	4	11/7/2012
Vanadium	**33**	**5.4**	**1.0**		**mg/Kg-dry**	4	11/7/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/7/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/7/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/7/2012
Benzo(a)pyrene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Benzo(b)fluoranthene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Benzo(k)fluoranthene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/7/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/7/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/7/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	11/7/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/7/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/7/2012
Surr: 2,4,6-Tribromophenol	*93.7*	*34-140*			*%REC*	1	11/7/2012
Surr: 2-Fluorobiphenyl	*75.8*	*12-100*			*%REC*	1	11/7/2012
Surr: 2-Fluorophenol	*64.6*	*33-117*			*%REC*	1	11/7/2012
Surr: 4-Terphenyl-d14	*126*	*25-137*			*%REC*	1	11/7/2012
Surr: Nitrobenzene-d5	*73.0*	*37-107*			*%REC*	1	11/7/2012
Surr: Phenol-d6	*59.8*	*40-106*			*%REC*	1	11/7/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**74**	**0.050**	**0**		**% of sample**	1	11/5/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44577** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44577-44577** Units: **mg/Kg** Analysis Date: **11/7/2012 06:16 PM**

Client ID: Run ID: **GC8_121107A** SeqNo: **2134004** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.521*	0	*5*	0	*70.4*	*39-115*	0			

LCS Sample ID: **DLCSS1-44577-44577** Units: **mg/Kg** Analysis Date: **11/7/2012 06:43 PM**

Client ID: Run ID: **GC8_121107A** SeqNo: **2134005** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	349.3	10	500	0	69.9	49-124	0			
ORO (C20-C34)	404.3	20	500	0	80.9	60-130	0			
Surr: 4-Terphenyl-d14	*4.441*	0	*5*	0	*88.8*	*39-115*	0			

MS Sample ID: **1211098-09B MS** Units: **mg/Kg** Analysis Date: **11/7/2012 07:10 PM**

Client ID: Run ID: **GC8_121107A** SeqNo: **2134006** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	326.5	9.7	487.2	67.59	53.1	60-130	0			S
ORO (C20-C34)	620.9	19	487.2	364.6	52.6	60-130	0			S
Surr: 4-Terphenyl-d14	*4.096*	0	*4.872*	0	*84.1*	*39-115*	0			

MSD Sample ID: **1211098-09B MSD** Units: **mg/Kg** Analysis Date: **11/7/2012 07:36 PM**

Client ID: Run ID: **GC8_121107A** SeqNo: **2134007** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	346.9	9.5	476.6	67.59	58.6	60-130	326.5	6.05	30	S
ORO (C20-C34)	812.6	19	476.6	364.6	94	60-130	620.9	26.7	30	
Surr: 4-Terphenyl-d14	*4.332*	0	*4.766*	0	*90.9*	*39-115*	4.096	*5.59*	*30*	

The following samples were analyzed in this batch:

1211110-01A	1211110-02A	1211110-03A
1211110-04A	1211110-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211110
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/1

QC BATCH REPORT

Batch ID: **44573** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:17 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132963** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44573-44573** Units: **mg/Kg** Analysis Date: **11/7/2012 01:22 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132964** Prep Date: **11/6/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.746	0.10	5	0	94.9	80-120	0			
Molybdenum	5.02	0.25	5	0	100	80-120	0			
Nickel	4.94	0.25	5	0	98.8	80-120	0			
Vanadium	4.989	0.25	5	0	99.8	80-120	0			

MS Sample ID: **1211096-05BMS** Units: **mg/Kg** Analysis Date: **11/7/2012 01:39 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132967** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.532	0.55	6.849	0.2574	91.6	75-125	0			
Molybdenum	7.485	1.4	6.849	0.6642	99.6	75-125	0			
Nickel	18.39	1.4	6.849	10.97	108	75-125	0			
Vanadium	21.12	1.4	6.849	11.33	143	75-125	0			S

MSD Sample ID: **1211096-05BMSD** Units: **mg/Kg** Analysis Date: **11/7/2012 01:44 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2132968** Prep Date: **11/6/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.744	0.57	7.184	0.2574	90.3	75-125	6.532	3.21	25	
Molybdenum	7.718	1.4	7.184	0.6642	98.2	75-125	7.485	3.07	25	
Nickel	18.16	1.4	7.184	10.97	100	75-125	18.39	1.26	25	
Vanadium	20.89	1.4	7.184	11.33	133	75-125	21.12	1.05	25	S

The following samples were analyzed in this batch: 1211110-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211110
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/1

QC BATCH REPORT

Batch ID: **44591** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44591-44591** Units: **mg/Kg** Analysis Date: **11/7/2012 05:49 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2133599** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01188	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44591-44591** Units: **mg/Kg** Analysis Date: **11/7/2012 07:23 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2133614** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.928	0.10	5	0	98.6	80-120	0			
Molybdenum	4.99	0.25	5	0	99.8	80-120	0			
Nickel	5.005	0.25	5	0	100	80-120	0			
Vanadium	4.946	0.25	5	0	98.9	80-120	0			

MS Sample ID: **1211109-02CMS** Units: **mg/Kg** Analysis Date: **11/7/2012 08:13 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2133623** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	3.965	0.13	6.477	0.3019	56.6	75-125	0			S
Molybdenum	6.755	0.32	6.477	1.027	88.4	75-125	0			
Nickel	15.79	0.32	6.477	10.45	82.4	75-125	0			
Vanadium	36.17	0.32	6.477	21.33	229	75-125	0			S

MSD Sample ID: **1211109-02CMSD** Units: **mg/Kg** Analysis Date: **11/7/2012 08:36 PM**
Client ID: Run ID: **ICPMS1_121107A** SeqNo: **2133637** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	6.552	0.31	6.281	1.027	87.9	75-125	6.755	3.06	25	
Nickel	15.03	0.31	6.281	10.45	72.9	75-125	15.79	4.92	25	S
Vanadium	33.26	0.31	6.281	21.33	190	75-125	36.17	8.37	25	S

MSD Sample ID: **1211109-02CMSD** Units: **mg/Kg** Analysis Date: **11/8/2012 12:52 PM**
Client ID: Run ID: **ICPMS1_121108A** SeqNo: **2134182** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	3.964	0.13	6.281	0.3019	58.3	75-125	3.965	0.0209	25	S

The following samples were analyzed in this batch: 1211110-02A 1211110-03A 1211110-04A 1211110-05A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44576-44576** Units: **µg/Kg** Analysis Date: **11/8/2012 12:05 PM**
Client ID: Run ID: **SVMS7_121108A** SeqNo: **2133895** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3946*	0	*5000*	0	*78.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3687*	0	*5000*	0	*73.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3749*	0	*5000*	0	*75*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4000*	0	*5000*	0	*80*	*25-137*	0			
Surr: Nitrobenzene-d5	*3665*	0	*5000*	0	*73.3*	*37-107*	0			
Surr: Phenol-d6	*4058*	0	*5000*	0	*81.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44576-44576** Units: **µg/Kg** Analysis Date: **11/8/2012 10:14 AM**
Client ID: Run ID: **SVMS7_121108A** SeqNo: **2133894** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1774	50	2000	0	88.7	45-105	0			
Acenaphthene	1773	50	2000	0	88.6	45-110	0			
Acenaphthylene	1803	50	2000	0	90.2	45-105	0			
Anthracene	1887	50	2000	0	94.4	55-105	0			
Benzo(a)anthracene	2077	50	2000	0	104	50-110	0			
Benzo(a)pyrene	1991	50	2000	0	99.6	50-110	0			
Benzo(b)fluoranthene	1877	50	2000	0	93.8	45-115	0			
Benzo(g,h,i)perylene	2031	50	2000	0	102	40-125	0			
Benzo(k)fluoranthene	1881	50	2000	0	94	45-115	0			
Chrysene	2179	50	2000	0	109	55-110	0			
Dibenzo(a,h)anthracene	1998	50	2000	0	99.9	40-125	0			
Fluoranthene	1973	50	2000	0	98.6	55-115	0			
Fluorene	1867	50	2000	0	93.4	50-110	0			
Indeno(1,2,3-cd)pyrene	2014	50	2000	0	101	40-120	0			
Naphthalene	1752	50	2000	0	87.6	40-105	0			
Phenanthrene	1910	50	2000	0	95.5	50-110	0			
Pyrene	2114	50	2000	0	106	45-125	0			
Surr: 2,4,6-Tribromophenol	*4536*	0	*5000*	0	*90.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3656*	0	*5000*	0	*73.1*	*12-100*	0			
Surr: 2-Fluorophenol	*3785*	0	*5000*	0	*75.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4239*	0	*5000*	0	*84.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3717*	0	*5000*	0	*74.3*	*37-107*	0			
Surr: Phenol-d6	*3984*	0	*5000*	0	*79.7*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211110
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/1

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211098-09B MS** Units: **µg/Kg** Analysis Date: **11/8/2012 02:52 PM**
Client ID: Run ID: **SVMS7_121108A** SeqNo: **2134538** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1503	47	1878	0	80	45-105	0			
Acenaphthene	1600	47	1878	0	85.2	45-110	0			
Acenaphthylene	1638	47	1878	0	87.2	45-105	0			
Anthracene	1721	47	1878	0	91.6	55-105	0			
Benzo(a)anthracene	1953	47	1878	166.1	95.2	50-110	0			
Benzo(a)pyrene	1894	47	1878	358.4	81.8	50-110	0			
Benzo(b)fluoranthene	2032	47	1878	313.7	91.5	45-115	0			
Benzo(g,h,i)perylene	1448	47	1878	171.9	67.9	40-125	0			
Benzo(k)fluoranthene	1682	47	1878	189.4	79.5	45-115	0			
Chrysene	2035	47	1878	194.3	98.1	55-110	0			
Dibenzo(a,h)anthracene	1500	47	1878	64.1	76.5	40-125	0			
Fluoranthene	1933	47	1878	414.7	80.9	55-115	0			
Fluorene	1710	47	1878	0	91	50-110	0			
Indeno(1,2,3-cd)pyrene	1557	47	1878	154.4	74.7	40-120	0			
Naphthalene	1434	47	1878	0	76.4	40-105	0			
Phenanthrene	1813	47	1878	121.4	90.1	50-110	0			
Pyrene	2125	47	1878	397.2	92	45-125	0			
Surr: 2,4,6-Tribromophenol	*4370*	0	*4694*	0	*93.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3207*	0	*4694*	0	*68.3*	*12-100*	0			
Surr: 2-Fluorophenol	*3111*	0	*4694*	0	*66.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3844*	0	*4694*	0	*81.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*2909*	0	*4694*	0	*62*	*37-107*	0			
Surr: Phenol-d6	*3452*	0	*4694*	0	*73.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211110
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/1

QC BATCH REPORT

Batch ID: **44576** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211098-09B MSD** Units: **µg/Kg** Analysis Date: **11/8/2012 03:20 PM**
Client ID: Run ID: **SVMS7_121108A** SeqNo: **2134539** Prep Date: **11/7/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1500	46	1854	0	80.9	45-105	1503	0.231	30	
Acenaphthene	1588	46	1854	0	85.6	45-110	1600	0.76	30	
Acenaphthylene	1622	46	1854	0	87.5	45-105	1638	1	30	
Anthracene	1683	46	1854	0	90.8	55-105	1721	2.22	30	
Benzo(a)anthracene	1946	46	1854	166.1	96	50-110	1953	0.33	30	
Benzo(a)pyrene	1891	46	1854	358.4	82.7	50-110	1894	0.153	30	
Benzo(b)fluoranthene	2142	46	1854	313.7	98.6	45-115	2032	5.28	30	
Benzo(g,h,i)perylene	1228	46	1854	171.9	57	40-125	1448	16.4	30	
Benzo(k)fluoranthene	1631	46	1854	189.4	77.8	45-115	1682	3.09	30	
Chrysene	1957	46	1854	194.3	95.1	55-110	2035	3.9	30	
Dibenzo(a,h)anthracene	1335	46	1854	64.1	68.6	40-125	1500	11.6	30	
Fluoranthene	1931	46	1854	414.7	81.8	55-115	1933	0.0803	30	
Fluorene	1662	46	1854	0	89.6	50-110	1710	2.84	30	
Indeno(1,2,3-cd)pyrene	1361	46	1854	154.4	65.1	40-120	1557	13.5	30	
Naphthalene	1405	46	1854	0	75.8	40-105	1434	2.01	30	
Phenanthrene	1792	46	1854	121.4	90.2	50-110	1813	1.13	30	
Pyrene	2143	46	1854	397.2	94.2	45-125	2125	0.811	30	
Surr: 2,4,6-Tribromophenol	*4381*	0	*4634*	0	*94.5*	*34-140*	4370	*0.248*	*40*	
Surr: 2-Fluorobiphenyl	*3110*	0	*4634*	0	*67.1*	*12-100*	3207	*3.06*	*40*	
Surr: 2-Fluorophenol	*3052*	0	*4634*	0	*65.9*	*33-117*	3111	*1.92*	*40*	
Surr: 4-Terphenyl-d14	*3816*	0	*4634*	0	*82.3*	*25-137*	3844	*0.751*	*40*	
Surr: Nitrobenzene-d5	*2879*	0	*4634*	0	*62.1*	*37-107*	2909	*1.06*	*40*	
Surr: Phenol-d6	*3399*	0	*4634*	0	*73.4*	*40-106*	3452	*1.53*	*40*	

The following samples were analyzed in this batch:

1211110-01A	1211110-02A	1211110-03A
1211110-04A	1211110-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211110
Project: Marshall KRRI 1000-1100R Sediment 10/31-11/2/1

QC BATCH REPORT

Batch ID: **R112167** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-121105-R112167** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132119** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **WLCSS1-121105-R112167** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132120** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211096-05B DUP1** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132122** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	47.38	0.050	0	0	0	0-0	48.24	1.8	20	

DUP Sample ID: **1211096-05B DUP2** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: Run ID: **MOIST_121105B** SeqNo: **2132123** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	47.3	0.050	0	0	0	0-0	48.24	1.97	20	

DUP Sample ID: **1211110-05A DUP** Units: **% of sample** Analysis Date: **11/5/2012 05:15 PM**
Client ID: **SEKR1000R502S103112D008** Run ID: **MOIST_121105B** SeqNo: **2132135** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	73.32	0.050	0	0	0	0-0	74.43	1.5	20	

The following samples were analyzed in this batch:

1211110-01A	1211110-02A	1211110-03A
1211110-04A	1211110-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211110

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110112_GMK2	Task: KRRI_SED1000-1100
Total # of Samples: 5		Event Complete?
Turn Around Time	5 Day	Rush: No

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	Analysis: % Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260
									None	None	None	None	MeOH
1	SEKR1075R501S110112D008	SEKR1075R501	SE	G	11/01/2012 14:44	1			X	X	X	X	X
2	SEKR1100R501S110212D008	SEKR1100R501	SE	G	11/02/2012 12:02	1			X	X	X	X	X
3	SEKR1100R501S110212D016	SEKR1100R501	SE	G	11/02/2012 12:05	1			X	X	X	X	X
4	SEKR1000R501S103112D004	SEKR1000R501	SE	G	10/31/2012 11:06	1			X	X	X	X	X
5	SEKR1000R502S103112D008	SEKR1000R502	SE	G	10/31/2012 15:17	1			X	X	X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G. Kramer	11-2-12	1605	[signature]	11-2-12	1605
[signature]	11/2/12	1630	[signature]	11/2/12	1630

Sample Receipt Conditions

Temp in OC	Samples on Ice?	Sample intact?	Trip Blank?
4.6 c	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER: DATE Signed: Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **02-Nov-12 10:30**

Work Order: **1211110** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 05-Nov-12 (Date) Reviewed by: Alex Csaszar (eSignature) 05-Nov-12 (Date)

Matrices: Sediment
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.6 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/5/2012 9:50:11 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

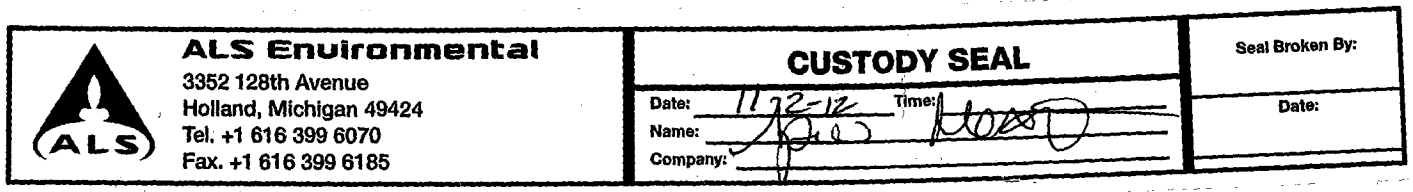
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 11-12-12 Time:
Name:
Company:

Seal Broken By:

Date:

15-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000R 11/6/12** Work Order: **1211226**

Dear Bryan,

ALS Environmental received 11 samples on 07-Nov-2012 01:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 69.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 15-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 11/6/12
Work Order: **1211226**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211226-01	SBKR1000R516S110612S007	Soil		11/6/2012 08:53	11/7/2012 13:00	☐
1211226-02	SBKR1000R517S110612S006	Soil		11/6/2012 09:28	11/7/2012 13:00	☐
1211226-03	SBKR1000R518S110612S004	Soil		11/6/2012 10:12	11/7/2012 13:00	☐
1211226-04	SBKR1000R519S110612S006	Soil		11/6/2012 10:55	11/7/2012 13:00	☐
1211226-05	SBKR1000R520S110612S006	Soil		11/6/2012 13:30	11/7/2012 13:00	☐
1211226-06	SBKR1000R521S110612S005	Soil		11/6/2012 14:12	11/7/2012 13:00	☐
1211226-07	SBKR1000R522S110612S004	Soil		11/6/2012 14:46	11/7/2012 13:00	☐
1211226-08	SBKR1000R522D110612S004	Soil		11/6/2012 14:46	11/7/2012 13:00	☐
1211226-09	SBKR1000R523S110612S004	Soil		11/6/2012 15:41	11/7/2012 13:00	☐
1211226-10	SBKR1000R524S110612S004	Soil		11/6/2012 16:15	11/7/2012 13:00	☐
1211226-11	SBKR1000R524T110612MX	Soil		11/6/2012	11/7/2012 13:00	☐

Client: AECOM Environment
Project: Marshall KRRI 1000R 11/6/12
Work Order: 1211226

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44632 sample SBKR1000R523S110612S004 MS/MSD recoveries for many Volatile compounds were above control limits. The corresponding results in the parent sample were non-detect. No qualification is required for these compounds.

Batch 44679 sample SBKR1000R523S110612S004 MS/MSD recoveries for Benzo(b)fluoranthene were above the upper control limit. The corresponding result in the parent sample may be biased high for this analyte. The RPDs between the MS/MSD recoveries for Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene were above control limits. The individual MS/MSD recoveries met quality control criteria. No data requires qualification.

Batch 44680 sample SBKR1000R523S110612S004 MS/MSD recoveries for DRO and MSD recovery for ORO were below the upper control limit. The corresponding result in the parent sample may be biased low for DRO. Both the MS recovery and RPD met quality control criteria for ORO. No data requires qualification.

Batch 44627 sample SBKR1000R519S110612S006 MS/MSD recoveries for DRO/ORO were below the upper control limit. The corresponding results in the parent sample may be biased high for DRO and ORO

ALS Group USA, Corp

Date: 15-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 11/6/12
WorkOrder: **1211226**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R516S110612S007
Work Order:	1211226	**Collection Date:**	11/6/2012 8:53:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**25**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**360**	**49**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*70.1*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.6	0.50		mg/Kg-dry	4	11/9/2012
Molybdenum	ND	4.1	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**16**	**4.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**28**	**4.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*67.3*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*70.0*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*80.6*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*94.9*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*78.6*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*83.2*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	77	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	77	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	77	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	77	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R516S110612S007
Work Order:	1211226	**Collection Date:**	11/6/2012 8:53:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	77	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	77	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	77	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	77	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	77	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	77	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	77	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	77	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	260	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	77	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	77	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	77	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R516S110612S007
Work Order:	1211226	**Collection Date:**	11/6/2012 8:53:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	77	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	**270**	**150**	**100**		**µg/Kg-dry**	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	77	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	77	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	77	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	77	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	77	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	77	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	77	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	77	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	77	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	77	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	77	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*95.8*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*94.2*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*98.2*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**61**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R517S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 9:28:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**180**	**32**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**480**	**65**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*62.5*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	11/9/2012
Molybdenum	ND	4.6	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**15**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**23**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	**420**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Pyrene	**400**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*63.8*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*61.5*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*71.1*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*87.9*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*68.6*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*73.8*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	99	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	99	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	99	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	99	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R517S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 9:28:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	99	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	99	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	99	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	99	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	99	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	99	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	99	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	99	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	330	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	99	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	99	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	99	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R517S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 9:28:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	99	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	200	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	99	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	99	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	99	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	99	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	99	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	99	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	99	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	99	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	99	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	99	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	99	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*95.3*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*92.6*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*96.8*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**70**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R518S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 10:12:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**21**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**470**	**43**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*60.5*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/9/2012
Molybdenum	ND	3.4	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**17**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**15**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	**1,500**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(a)pyrene	**1,600**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(b)fluoranthene	**1,700**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(g,h,i)perylene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(k)fluoranthene	**960**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Chrysene	**1,500**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	**2,600**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	**910**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Pyrene	**2,600**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*59.7*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*60.0*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*66.5*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*83.4*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*64.2*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*68.8*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	67	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	67	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	67	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	67	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R518S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 10:12:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	67	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	67	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	67	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	67	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	67	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	67	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	67	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	67	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	67	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	67	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	67	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R518S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 10:12:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	67	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	130	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	67	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	67	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	67	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	67	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	67	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	67	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	67	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	67	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	67	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	67	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	67	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*99.0*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*93.8*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*90.3*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*98.3*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**55**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R519S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 10:55:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**87**	**16**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**280**	**33**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*62.4*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/9/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**11**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**17**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)pyrene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(b)fluoranthene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Chrysene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Pyrene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*67.5*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*67.5*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*82.6*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*89.5*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*80.7*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*83.0*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R519S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 10:55:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	50	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	50	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R519S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 10:55:00 AM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	50	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*97.7*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*94.8*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*88.4*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*98.4*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**41**	**0.050**	**0**		**% of sample**	1	11/12/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R520S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 1:30:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**20**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**440**	**40**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*70.4*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	2.9	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**18**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**21**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(a)pyrene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(b)fluoranthene	**680**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Chrysene	**570**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	**770**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Pyrene	**780**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*67.5*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*70.0*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*80.0*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*93.2*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*77.5*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*82.7*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	62	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	62	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	62	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	62	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R520S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 1:30:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	62	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	62	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	62	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	62	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	62	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	62	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	62	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	62	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	62	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R520S110612S006
Work Order:	1211226	**Collection Date:**	11/6/2012 1:30:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	62	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	62	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	62	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	62	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	62	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	62	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	62	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	62	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*98.8*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*94.4*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*90.4*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*96.6*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**52**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R521S110612S005
Work Order:	1211226	**Collection Date:**	11/6/2012 2:12:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**97**	**18**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**330**	**35**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*66.3*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**11**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**18**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(b)fluoranthene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Pyrene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*64.8*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*61.0*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*68.4*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*89.8*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*66.2*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*71.9*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	55	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	55	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	55	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	55	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R521S110612S005
Work Order:	1211226	**Collection Date:**	11/6/2012 2:12:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	55	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	55	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	55	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	55	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	55	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	55	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	55	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	55	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	55	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	55	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	55	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R521S110612S005
Work Order:	1211226	**Collection Date:**	11/6/2012 2:12:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	55	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	55	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	55	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	55	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	55	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	55	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	55	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	55	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	55	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	55	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	55	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	55	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*97.8*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*97.0*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*90.0*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*97.9*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**45**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R522S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 2:46:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**290**	**42**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**1,100**	**84**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*60.7*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	2.4	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	6.0	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**20**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**19**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	**520**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(a)pyrene	**550**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(b)fluoranthene	**820**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Chrysene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	**870**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Pyrene	**840**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*61.6*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*60.0*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*71.4*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*85.7*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*67.6*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*74.0*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R522S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 2:46:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	450	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	450	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R522S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 2:46:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	270	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	450	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*96.6*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*91.0*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*97.8*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**78**	**0.050**	**0**		**% of sample**	1	11/12/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R522D110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 2:46:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/9/2012**		Analyst: **CW**
DRO (C10-C20)	**370**	**39**	**4.0**		**mg/Kg-dry**	1	11/9/2012
ORO (C20-C34)	**1,800**	**78**	**4.0**		**mg/Kg-dry**	1	11/9/2012
Surr: 4-Terphenyl-d14	*65.0*	*39-115*			*%REC*	1	11/9/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	2.6	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	6.6	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**22**	**6.6**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**21**	**6.6**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/9/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/12/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(a)anthracene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(a)pyrene	**510**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(b)fluoranthene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/12/2012
Benzo(k)fluoranthene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Chrysene	**570**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/12/2012
Fluoranthene	**780**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/12/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/12/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/12/2012
Pyrene	**770**	**330**	**330**		**µg/Kg-dry**	1	11/12/2012
Surr: 2,4,6-Tribromophenol	*61.6*	*34-140*			*%REC*	1	11/12/2012
Surr: 2-Fluorobiphenyl	*62.0*	*12-100*			*%REC*	1	11/12/2012
Surr: 2-Fluorophenol	*70.1*	*33-117*			*%REC*	1	11/12/2012
Surr: 4-Terphenyl-d14	*86.7*	*25-137*			*%REC*	1	11/12/2012
Surr: Nitrobenzene-d5	*66.4*	*37-107*			*%REC*	1	11/12/2012
Surr: Phenol-d6	*72.2*	*40-106*			*%REC*	1	11/12/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	120	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	120	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R522D110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 2:46:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	120	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	120	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	120	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	120	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	410	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	120	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	120	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	120	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	120	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	120	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	120	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	120	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	410	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	120	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	120	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R522D110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 2:46:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	120	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	250	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	120	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	120	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	410	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	120	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	120	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	120	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	120	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	120	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	120	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	120	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	120	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	120	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	120	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*99.3*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*94.2*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*87.8*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*98.4*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**76**	**0.050**	**0**		**% of sample**	1	11/12/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R523S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 3:41:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**220**	**33**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**790**	**66**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*74.8*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	2.0	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	5.1	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**16**	**5.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**20**	**5.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**830**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**680**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	**790**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*73.7*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*73.0*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*80.6*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*98.6*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*76.5*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*85.4*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R523S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 3:41:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	340	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	340	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R523S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 3:41:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	340	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*99.5*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*95.2*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*89.3*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*97.0*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**71**	**0.050**	**0**		**% of sample**	1	11/12/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R524S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 4:15:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**97**	**20**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**240**	**39**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*73.4*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	3.1	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**11**	**3.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**22**	**3.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*66.2*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*61.5*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*69.3*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*96.4*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*68.0*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*73.0*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	64	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	64	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	64	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	64	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R524S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 4:15:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	64	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	64	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	64	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	64	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	64	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	64	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	64	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	64	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	64	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R524S110612S004
Work Order:	1211226	**Collection Date:**	11/6/2012 4:15:00 PM
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	64	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	130	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	64	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	64	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	64	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	64	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	64	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	64	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	64	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*92.4*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*88.8*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*97.5*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**53**	**0.050**	**0**		**% of sample**	1	11/12/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R524T110612MX
Work Order:	1211226	**Collection Date:**	11/6/2012
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/9/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/9/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/9/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/9/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/9/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/9/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/9/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/9/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/9/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/9/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/9/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/9/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/9/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/9/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/9/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/9/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/9/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/9/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/9/2012
2-Butanone	ND	750	750		µg/Kg	1	11/9/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/9/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/9/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/9/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/9/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/9/2012
Benzene	ND	50	50		µg/Kg	1	11/9/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/9/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/9/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/9/2012
Bromoform	ND	100	100		µg/Kg	1	11/9/2012
Bromomethane	ND	200	200		µg/Kg	1	11/9/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/9/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/9/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/9/2012
Chloroethane	ND	250	250		µg/Kg	1	11/9/2012
Chloroform	ND	50	50		µg/Kg	1	11/9/2012
Chloromethane	ND	250	250		µg/Kg	1	11/9/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/9/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/9/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R524T110612MX
Work Order:	1211226	**Collection Date:**	11/6/2012
Project:	Marshall KRRI 1000R 11/6/12		
Lab ID:	1211226-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/9/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/9/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/9/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/9/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/9/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/9/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/9/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/9/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/9/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/9/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/9/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/9/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/9/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/9/2012
Naphthalene	ND	330	330		µg/Kg	1	11/9/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/9/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/9/2012
o-Xylene	ND	50	50		µg/Kg	1	11/9/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/9/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/9/2012
Styrene	ND	50	50		µg/Kg	1	11/9/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/9/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/9/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/9/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/9/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/9/2012
Toluene	ND	100	100		µg/Kg	1	11/9/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/9/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/9/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/9/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/9/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/9/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/9/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/9/2012
Surr: 4-Bromofluorobenzene	*96.8*	*70-130*			*%REC*	1	11/9/2012
Surr: Dibromofluoromethane	*91.6*	*70-130*			*%REC*	1	11/9/2012
Surr: Toluene-d8	*99.0*	*70-130*			*%REC*	1	11/9/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44627** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44627-44627** Units: **mg/Kg** Analysis Date: **11/9/2012 03:26 PM**

Client ID: Run ID: **GC8_121109A** SeqNo: **2137896** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*2.858*	0	*5*	0	*57.2*	*39-115*	0			

LCS Sample ID: **DLCSS1-44627-44627** Units: **mg/Kg** Analysis Date: **11/9/2012 03:52 PM**

Client ID: Run ID: **GC8_121109A** SeqNo: **2137897** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	335	10	500	0	67	49-124	0			
ORO (C20-C34)	379.1	20	500	0	75.8	60-130	0			
Surr: 4-Terphenyl-d14	*3.396*	0	*5*	0	*67.9*	*39-115*	0			

MS Sample ID: **1211226-04A MS** Units: **mg/Kg** Analysis Date: **11/9/2012 04:19 PM**

Client ID: **SBKR1000R519S110612S006** Run ID: **GC8_121109A** SeqNo: **2137898** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	288.8	9.8	491.6	51.41	48.3	60-130	0			S
ORO (C20-C34)	430.9	20	491.6	164.6	54.2	60-130	0			S
Surr: 4-Terphenyl-d14	*3.667*	0	*4.916*	0	*74.6*	*39-115*	0			

MSD Sample ID: **1211226-04A MSD** Units: **mg/Kg** Analysis Date: **11/9/2012 04:46 PM**

Client ID: **SBKR1000R519S110612S006** Run ID: **GC8_121109A** SeqNo: **2137899** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	299	9.7	485.2	51.41	51	60-130	288.8	3.47	30	S
ORO (C20-C34)	450.2	19	485.2	164.6	58.9	60-130	430.9	4.38	30	S
Surr: 4-Terphenyl-d14	*3.918*	0	*4.852*	0	*80.7*	*39-115*	3.667	*6.62*	*30*	

The following samples were analyzed in this batch:

1211226-01A	1211226-02A	1211226-03A
1211226-04A	1211226-05A	1211226-06A
1211226-07A	1211226-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44680** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44680-44680** Units: **mg/Kg** Analysis Date: **11/13/2012 05:39 PM**
Client ID: Run ID: **GC8_121113A** SeqNo: **2138646** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.832*	0	*5*	0	*76.6*	*39-115*	0			

LCS Sample ID: **DLCSS1-44680-44680** Units: **mg/Kg** Analysis Date: **11/13/2012 06:06 PM**
Client ID: Run ID: **GC8_121113A** SeqNo: **2138647** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	309.7	10	500	0	61.9	49-124	0			
ORO (C20-C34)	324.8	20	500	0	65	60-130	0			
Surr: 4-Terphenyl-d14	*4.54*	0	*5*	0	*90.8*	*39-115*	0			

MS Sample ID: **1211226-09A MS** Units: **mg/Kg** Analysis Date: **11/13/2012 06:33 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **GC8_121113A** SeqNo: **2138648** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	341.4	9.9	495.1	65.16	55.8	60-130	0			S
ORO (C20-C34)	614	20	495.1	229.9	77.6	60-130	0			
Surr: 4-Terphenyl-d14	*4.487*	0	*4.951*	0	*90.6*	*39-115*	0			

MSD Sample ID: **1211226-09A MSD** Units: **mg/Kg** Analysis Date: **11/13/2012 07:00 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **GC8_121113A** SeqNo: **2138649** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	315.3	9.8	488.2	65.16	51.2	60-130	341.4	7.94	30	S
ORO (C20-C34)	462	20	488.2	229.9	47.5	60-130	614	28.2	30	S
Surr: 4-Terphenyl-d14	*4.304*	0	*4.882*	0	*88.2*	*39-115*	4.487	*4.17*	*30*	

The following samples were analyzed in this batch: 1211226-09A 1211226-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44655** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44655-44655** Units: **mg/Kg** Analysis Date: **11/9/2012 05:36 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2136262** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44655-44655** Units: **mg/Kg** Analysis Date: **11/9/2012 05:42 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2136265** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.658	0.10	5	0	93.2	80-120	0			
Molybdenum	4.76	0.25	5	0	95.2	80-120	0			
Nickel	4.47	0.25	5	0	89.4	80-120	0			
Vanadium	4.514	0.25	5	0	90.3	80-120	0			

MS Sample ID: **1211226-09AMS** Units: **mg/Kg** Analysis Date: **11/9/2012 07:08 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **ICPMS1_121109A** SeqNo: **2136290** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.057	1.5	7.364	0.2999	91.8	75-125	0			
Nickel	11.95	1.5	7.364	4.665	99	75-125	0			
Vanadium	14.55	1.5	7.364	5.824	118	75-125	0			

MS Sample ID: **1211226-09AMS** Units: **mg/Kg** Analysis Date: **11/12/2012 02:37 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **ICPMS1_121112A** SeqNo: **2136870** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.261	0.59	7.364	0.1671	96.3	75-125	0			

MSD Sample ID: **1211226-09AMSD** Units: **mg/Kg** Analysis Date: **11/9/2012 07:14 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **ICPMS1_121109A** SeqNo: **2136291** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.656	1.5	7.61	0.2999	96.7	75-125	7.057	8.14	25	
Nickel	12.81	1.5	7.61	4.665	107	75-125	11.95	6.92	25	
Vanadium	15.04	1.5	7.61	5.824	121	75-125	14.55	3.29	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44655** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **1211226-09AMSD** Units: **mg/Kg** Analysis Date: **11/12/2012 02:43 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **ICPMS1_121112A** SeqNo: **2136873** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.601	0.61	7.61	0.1671	97.7	75-125	7.261	4.58	25	

The following samples were analyzed in this batch:

1211226-01A	1211226-02A	1211226-03A
1211226-04A	1211226-05A	1211226-06A
1211226-07A	1211226-08A	1211226-09A
1211226-10A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44626** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44626-44626** Units: **µg/Kg** Analysis Date: **11/12/2012 12:21 PM**
Client ID: Run ID: **SVMS6_121112A** SeqNo: **2137912** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*2745*	0	*5000*	0	*54.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3436*	0	*5000*	0	*68.7*	*12-100*	0			
Surr: 2-Fluorophenol	*4023*	0	*5000*	0	*80.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4820*	0	*5000*	0	*96.4*	*25-137*	0			
Surr: Nitrobenzene-d5	*4085*	0	*5000*	0	*81.7*	*37-107*	0			
Surr: Phenol-d6	*4111*	0	*5000*	0	*82.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44626** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSS1-44626-44626** Units: **µg/Kg** Analysis Date: **11/12/2012 10:42 AM**
Client ID: Run ID: **SVMS6_121112A** SeqNo: **2137908** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1668	50	2000	0	83.4	45-105	0			
Acenaphthene	1702	50	2000	0	85.1	45-110	0			
Acenaphthylene	1767	50	2000	0	88.4	45-105	0			
Anthracene	1838	50	2000	0	91.9	55-105	0			
Benzo(a)anthracene	1890	50	2000	0	94.5	50-110	0			
Benzo(a)pyrene	1949	50	2000	0	97.4	50-110	0			
Benzo(b)fluoranthene	1704	50	2000	0	85.2	45-115	0			
Benzo(g,h,i)perylene	1934	50	2000	0	96.7	40-125	0			
Benzo(k)fluoranthene	2028	50	2000	0	101	45-115	0			
Chrysene	1874	50	2000	0	93.7	55-110	0			
Dibenzo(a,h)anthracene	2069	50	2000	0	103	40-125	0			
Fluoranthene	1861	50	2000	0	93	55-115	0			
Fluorene	1874	50	2000	0	93.7	50-110	0			
Indeno(1,2,3-cd)pyrene	1934	50	2000	0	96.7	40-120	0			
Naphthalene	1669	50	2000	0	83.4	40-105	0			
Phenanthrene	1816	50	2000	0	90.8	50-110	0			
Pyrene	1930	50	2000	0	96.5	45-125	0			
Surr: 2,4,6-Tribromophenol	*3177*	0	*5000*	0	*63.5*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3533*	0	*5000*	0	*70.7*	*12-100*	0			
Surr: 2-Fluorophenol	*4086*	0	*5000*	0	*81.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4739*	0	*5000*	0	*94.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*4173*	0	*5000*	0	*83.5*	*37-107*	0			
Surr: Phenol-d6	*4109*	0	*5000*	0	*82.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44626** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1211226-04A MS** Units: **µg/Kg** Analysis Date: **11/12/2012 11:07 AM**
Client ID: **SBKR1000R519S110612S006** Run ID: **SVMS6_121112A** SeqNo: **2137909** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1572	48	1927	0	81.6	45-105	0			
Acenaphthene	1608	48	1927	0	83.4	45-110	0			
Acenaphthylene	1675	48	1927	0	87	45-105	0			
Anthracene	1772	48	1927	0	92	55-105	0			
Benzo(a)anthracene	1940	48	1927	171	91.8	50-110	0			
Benzo(a)pyrene	1968	48	1927	206.2	91.4	50-110	0			
Benzo(b)fluoranthene	2054	48	1927	204.2	96	45-115	0			
Benzo(g,h,i)perylene	1895	48	1927	148.5	90.6	40-125	0			
Benzo(k)fluoranthene	1684	48	1927	113.3	81.5	45-115	0			
Chrysene	1865	48	1927	200.3	86.4	55-110	0			
Dibenzo(a,h)anthracene	1832	48	1927	0	95.1	40-125	0			
Fluoranthene	1987	48	1927	191.5	93.2	55-115	0			
Fluorene	1785	48	1927	0	92.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1895	48	1927	148.5	90.6	40-120	0			
Naphthalene	1563	48	1927	0	81.1	40-105	0			
Phenanthrene	1820	48	1927	67.42	91	50-110	0			
Pyrene	2003	48	1927	241.4	91.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*3184*	0	*4817*	0	*66.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3263*	0	*4817*	0	*67.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3806*	0	*4817*	0	*79*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4291*	0	*4817*	0	*89.1*	*25-137*	0			
Surr: Nitrobenzene-d5	*3835*	0	*4817*	0	*79.6*	*37-107*	0			
Surr: Phenol-d6	*3847*	0	*4817*	0	*79.9*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44626** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1211226-04A MSD** Units: **µg/Kg** Analysis Date: **11/12/2012 11:32 AM**
Client ID: **SBKR1000R519S110612S006** Run ID: **SVMS6_121112A** SeqNo: **2137910** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1518	47	1896	0	80	45-105	1572	3.53	30	
Acenaphthene	1578	47	1896	0	83.2	45-110	1608	1.85	30	
Acenaphthylene	1655	47	1896	0	87.3	45-105	1675	1.21	30	
Anthracene	1735	47	1896	0	91.5	55-105	1772	2.11	30	
Benzo(a)anthracene	1880	47	1896	171	90.1	50-110	1940	3.17	30	
Benzo(a)pyrene	1926	47	1896	206.2	90.7	50-110	1968	2.15	30	
Benzo(b)fluoranthene	2024	47	1896	204.2	96	45-115	2054	1.47	30	
Benzo(g,h,i)perylene	1728	47	1896	148.5	83.3	40-125	1895	9.21	30	
Benzo(k)fluoranthene	1614	47	1896	113.3	79.2	45-115	1684	4.22	30	
Chrysene	1858	47	1896	200.3	87.4	55-110	1865	0.383	30	
Dibenzo(a,h)anthracene	1720	47	1896	0	90.7	40-125	1832	6.35	30	
Fluoranthene	1922	47	1896	191.5	91.3	55-115	1987	3.28	30	
Fluorene	1744	47	1896	0	92	50-110	1785	2.32	30	
Indeno(1,2,3-cd)pyrene	1728	47	1896	148.5	83.3	40-120	1895	9.21	30	
Naphthalene	1496	47	1896	0	78.9	40-105	1563	4.36	30	
Phenanthrene	1774	47	1896	67.42	90	50-110	1820	2.57	30	
Pyrene	1957	47	1896	241.4	90.5	45-125	2003	2.34	30	
Surr: 2,4,6-Tribromophenol	*3336*	0	*4740*	0	*70.4*	*34-140*	3184	*4.66*	*40*	
Surr: 2-Fluorobiphenyl	*3246*	0	*4740*	0	*68.5*	*12-100*	3263	*0.529*	*40*	
Surr: 2-Fluorophenol	*3744*	0	*4740*	0	*79*	*33-117*	3806	*1.64*	*40*	
Surr: 4-Terphenyl-d14	*4316*	0	*4740*	0	*91.1*	*25-137*	4291	*0.583*	*40*	
Surr: Nitrobenzene-d5	*3752*	0	*4740*	0	*79.2*	*37-107*	3835	*2.19*	*40*	
Surr: Phenol-d6	*3817*	0	*4740*	0	*80.5*	*40-106*	3847	*0.767*	*40*	

The following samples were analyzed in this batch:

1211226-01A	1211226-02A	1211226-03A
1211226-04A	1211226-05A	1211226-06A
1211226-07A	1211226-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44679-44679** Units: **µg/Kg** Analysis Date: **11/13/2012 12:41 PM**
Client ID: Run ID: **SVMS6_121113A** SeqNo: **2139071** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3303*	0	*5000*	0	*66.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3559*	0	*5000*	0	*71.2*	*12-100*	0			
Surr: 2-Fluorophenol	*4307*	0	*5000*	0	*86.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5109*	0	*5000*	0	*102*	*25-137*	0			
Surr: Nitrobenzene-d5	*4137*	0	*5000*	0	*82.7*	*37-107*	0			
Surr: Phenol-d6	*4352*	0	*5000*	0	*87*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSS1-44679-44679** Units: **µg/Kg** Analysis Date: **11/13/2012 11:01 AM**
Client ID: Run ID: **SVMS6_121113A** SeqNo: **2139067** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1717	50	2000	0	85.8	45-105	0			
Acenaphthene	1729	50	2000	0	86.4	45-110	0			
Acenaphthylene	1794	50	2000	0	89.7	45-105	0			
Anthracene	1908	50	2000	0	95.4	55-105	0			
Benzo(a)anthracene	2007	50	2000	0	100	50-110	0			
Benzo(a)pyrene	2142	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	2046	50	2000	0	102	45-115	0			
Benzo(g,h,i)perylene	1974	50	2000	0	98.7	40-125	0			
Benzo(k)fluoranthene	2067	50	2000	0	103	45-115	0			
Chrysene	1948	50	2000	0	97.4	55-110	0			
Dibenzo(a,h)anthracene	2144	50	2000	0	107	40-125	0			
Fluoranthene	1960	50	2000	0	98	55-115	0			
Fluorene	1878	50	2000	0	93.9	50-110	0			
Indeno(1,2,3-cd)pyrene	1974	50	2000	0	98.7	40-120	0			
Naphthalene	1714	50	2000	0	85.7	40-105	0			
Phenanthrene	1889	50	2000	0	94.4	50-110	0			
Pyrene	2026	50	2000	0	101	45-125	0			
Surr: 2,4,6-Tribromophenol	*3357*	0	*5000*	0	*67.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3602*	0	*5000*	0	*72*	*12-100*	0			
Surr: 2-Fluorophenol	*4253*	0	*5000*	0	*85.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4929*	0	*5000*	0	*98.6*	*25-137*	0			
Surr: Nitrobenzene-d5	*4282*	0	*5000*	0	*85.6*	*37-107*	0			
Surr: Phenol-d6	*4217*	0	*5000*	0	*84.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1211226-09A MS** Units: **µg/Kg** Analysis Date: **11/13/2012 11:26 AM**
Client ID: **SBKR1000R523S110612S004** Run ID: **SVMS6_121113A** SeqNo: **2139068** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1514	48	1929	0	78.4	45-105	0			
Acenaphthene	1745	48	1929	0	90.4	45-110	0			
Acenaphthylene	1800	48	1929	0	93.3	45-105	0			
Anthracene	1965	48	1929	0	102	55-105	0			
Benzo(a)anthracene	2082	48	1929	146.7	100	50-110	0			
Benzo(a)pyrene	2304	48	1929	193.6	109	50-110	0			
Benzo(b)fluoranthene	2541	48	1929	242.5	119	45-115	0			S
Benzo(g,h,i)perylene	1643	48	1929	80.52	81	40-125	0			
Benzo(k)fluoranthene	1913	48	1929	110.2	93.4	45-115	0			
Chrysene	2111	48	1929	172.5	100	55-110	0			
Dibenzo(a,h)anthracene	1700	48	1929	0	88.1	40-125	0			
Fluoranthene	2150	48	1929	197.5	101	55-115	0			
Fluorene	1951	48	1929	0	101	50-110	0			
Indeno(1,2,3-cd)pyrene	1643	48	1929	78.6	81.1	40-120	0			
Naphthalene	1316	48	1929	0	68.2	40-105	0			
Phenanthrene	1980	48	1929	76.69	98.6	50-110	0			
Pyrene	2199	48	1929	230.1	102	45-125	0			
Surr: 2,4,6-Tribromophenol	*3522*	0	*4823*	0	*73*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3362*	0	*4823*	0	*69.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3151*	0	*4823*	0	*65.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4615*	0	*4823*	0	*95.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*3036*	0	*4823*	0	*62.9*	*37-107*	0			
Surr: Phenol-d6	*3620*	0	*4823*	0	*75*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1211226-09A MSD** Units: **µg/Kg** Analysis Date: **11/13/2012 11:51 AM**
Client ID: **SBKR1000R523S110612S004** Run ID: **SVMS6_121113A** SeqNo: **2139069** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1678	49	1943	0	86.4	45-105	1514	10.3	30	
Acenaphthene	1844	49	1943	0	94.9	45-110	1745	5.51	30	
Acenaphthylene	1906	49	1943	0	98.1	45-105	1800	5.72	30	
Anthracene	2018	49	1943	0	104	55-105	1965	2.65	30	
Benzo(a)anthracene	2063	49	1943	146.7	98.6	50-110	2082	0.928	30	
Benzo(a)pyrene	2331	49	1943	193.6	110	50-110	2304	1.17	30	
Benzo(b)fluoranthene	2688	49	1943	242.5	126	45-115	2541	5.63	30	S
Benzo(g,h,i)perylene	1143	49	1943	80.52	54.7	40-125	1643	35.8	30	R
Benzo(k)fluoranthene	2288	49	1943	110.2	112	45-115	1913	17.9	30	
Chrysene	2187	49	1943	172.5	104	55-110	2111	3.55	30	
Dibenzo(a,h)anthracene	1322	49	1943	0	68	40-125	1700	25	30	
Fluoranthene	2240	49	1943	197.5	105	55-115	2150	4.1	30	
Fluorene	2031	49	1943	0	105	50-110	1951	4.06	30	
Indeno(1,2,3-cd)pyrene	1140	49	1943	78.6	54.6	40-120	1643	36.2	30	R
Naphthalene	1490	49	1943	0	76.7	40-105	1316	12.4	30	
Phenanthrene	2026	49	1943	76.69	100	50-110	1980	2.3	30	
Pyrene	2297	49	1943	230.1	106	45-125	2199	4.37	30	
Surr: 2,4,6-Tribromophenol	*3705*	0	*4858*	0	*76.3*	*34-140*	3522	*5.07*	*40*	
Surr: 2-Fluorobiphenyl	*3633*	0	*4858*	0	*74.8*	*12-100*	3362	*7.74*	*40*	
Surr: 2-Fluorophenol	*3527*	0	*4858*	0	*72.6*	*33-117*	3151	*11.3*	*40*	
Surr: 4-Terphenyl-d14	*4764*	0	*4858*	0	*98.1*	*25-137*	4615	*3.18*	*40*	
Surr: Nitrobenzene-d5	*3474*	0	*4858*	0	*71.5*	*37-107*	3036	*13.5*	*40*	
Surr: Phenol-d6	*3960*	0	*4858*	0	*81.5*	*40-106*	3620	*8.98*	*40*	

The following samples were analyzed in this batch: 1211226-09A 1211226-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44632-44632** Units: **µg/Kg** Analysis Date: **11/8/2012 05:19 PM**
Client ID: Run ID: **VMS8_121108A** SeqNo: **2134537** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	48.5	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	46	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	109	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	61	100						J
n-Butylbenzene	45	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*972.5*	0	*1000*	0	*97.2*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*958.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*949*	0	*1000*	0	*94.9*	*70-130*	0	
Surr: Toluene-d8	*1003*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44632-44632** Units: **µg/Kg** Analysis Date: **11/9/2012 11:11 PM**
Client ID: Run ID: **VMS9_121109A** SeqNo: **2135961** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	83.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	42	100					J
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*998.5*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*945.5*	0	*1000*	0	*94.6*	*70-130*	0
Surr: Dibromofluoromethane	*940*	0	*1000*	0	*94*	*70-130*	0
Surr: Toluene-d8	*1011*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44632-44632** Units: **µg/Kg** Analysis Date: **11/10/2012 10:38 PM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136601** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	87.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	26	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	30	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1000*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*943*	0	*1000*	0	*94.3*	*70-130*	0	
Surr: Dibromofluoromethane	*923.5*	0	*1000*	0	*92.4*	*70-130*	0	
Surr: Toluene-d8	*974*	0	*1000*	0	*97.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44632-44632**				Units: **µg/Kg**		Analysis Date: **11/8/2012 04:31 PM**			
Client ID:		Run ID: **VMS8_121108A**			SeqNo: **2134536**		Prep Date: **11/8/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	955	30	1000	0	95.5	75-125	0			
1,1,1-Trichloroethane	956	30	1000	0	95.6	70-135	0			
1,1,2,2-Tetrachloroethane	835.5	30	1000	0	83.6	55-130	0			
1,1,2-Trichloroethane	835	30	1000	0	83.5	60-125	0			
1,1-Dichloroethane	899.5	30	1000	0	90	75-125	0			
1,1-Dichloroethene	931.5	30	1000	0	93.2	65-135	0			
1,2,3-Trichlorobenzene	1030	30	1000	0	103	60-135	0			B
1,2,3-Trichloropropane	893	30	1000	0	89.3	65-130	0			
1,2,3-Trimethylbenzene	951	30	1000	0	95.1	65-135	0			
1,2,4-Trichlorobenzene	1110	30	1000	0	111	65-130	0			B
1,2,4-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,2-Dibromo-3-chloropropane	901	30	1000	0	90.1	40-135	0			
1,2-Dibromoethane	937.5	30	1000	0	93.8	70-125	0			
1,2-Dichlorobenzene	939	30	1000	0	93.9	75-120	0			
1,2-Dichloroethane	905	30	1000	0	90.5	70-135	0			
1,2-Dichloropropane	933	30	1000	0	93.3	70-120	0			
1,3,5-Trimethylbenzene	973	30	1000	0	97.3	65-135	0			
1,3-Dichlorobenzene	970	30	1000	0	97	70-125	0			
1,4-Dichlorobenzene	939.5	30	1000	0	94	70-125	0			
2-Butanone	1009	200	1000	0	101	30-160	0			
2-Hexanone	921	30	1000	0	92.1	45-145	0			
4-Methyl-2-pentanone	1168	30	1000	0	117	45-145	0			
Acetone	880.5	100	1000	0	88	20-160	0			
Acrylonitrile	827	100	1000	0	82.7	70-135	0			
Benzene	929.5	30	1000	0	93	75-125	0			
Bromobenzene	925.5	30	1000	0	92.6	65-120	0			
Bromochloromethane	918	30	1000	0	91.8	70-125	0			
Bromodichloromethane	924	30	1000	0	92.4	70-130	0			
Bromoform	941	30	1000	0	94.1	55-135	0			
Bromomethane	1164	75	1000	0	116	30-160	0			
Carbon disulfide	1052	30	1000	0	105	45-160	0			
Carbon tetrachloride	998	30	1000	0	99.8	65-135	0			
Chlorobenzene	972	30	1000	0	97.2	75-125	0			
Chloroethane	1238	100	1000	0	124	40-155	0			
Chloroform	897.5	30	1000	0	89.8	70-125	0			
Chloromethane	895.5	100	1000	0	89.6	50-130	0			
cis-1,2-Dichloroethene	920.5	30	1000	0	92	65-125	0			
cis-1,3-Dichloropropene	974	30	1000	0	97.4	70-125	0			
Dibromochloromethane	973	30	1000	0	97.3	65-135	0			
Dibromomethane	883	30	1000	0	88.3	75-130	0			
Dichlorodifluoromethane	882	30	1000	0	88.2	35-135	0			
Ethylbenzene	964	30	1000	0	96.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1120	30	1000	0	112	70-135	0	
Isopropylbenzene	943.5	30	1000	0	94.4	75-130	0	
m,p-Xylene	1947	60	2000	0	97.4	80-125	0	
Methyl tert-butyl ether	998.5	30	1000	0	99.8	75-125	0	
Methylene chloride	886.5	30	1000	0	88.6	55-145	0	
Naphthalene	1116	100	1000	0	112	40-140	0	
n-Butylbenzene	1178	30	1000	0	118	65-140	0	B
n-Propylbenzene	921.5	30	1000	0	92.2	65-135	0	
o-Xylene	955.5	30	1000	0	95.6	75-125	0	
p-Isopropyltoluene	975.5	30	1000	0	97.6	75-135	0	
sec-Butylbenzene	951.5	30	1000	0	95.2	65-130	0	
Styrene	969	30	1000	0	96.9	75-125	0	
tert-Butylbenzene	959.5	30	1000	0	96	65-130	0	
Tetrachloroethene	941.5	30	1000	0	94.2	64-140	0	
Tetrahydrofuran	838	200	1000	0	83.8	70-135	0	
Toluene	943	30	1000	0	94.3	70-125	0	
trans-1,2-Dichloroethene	948.5	30	1000	0	94.8	65-135	0	
trans-1,3-Dichloropropene	982	30	1000	0	98.2	65-125	0	
trans-1,4-Dichloro-2-butene	887.5	30	1000	0	88.8	70-135	0	
Trichloroethene	973	30	1000	0	97.3	75-125	0	
Trichlorofluoromethane	933.5	30	1000	0	93.4	25-185	0	
Vinyl chloride	991	30	1000	0	99.1	60-125	0	
Surr: 1,2-Dichloroethane-d4	*926.5*	0	*1000*	0	*92.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*954.5*	0	*1000*	0	*95.4*	*70-130*	0	
Surr: Dibromofluoromethane	*967.5*	0	*1000*	0	*96.8*	*70-130*	0	
Surr: Toluene-d8	*986.5*	0	*1000*	0	*98.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44632-44632**				Units: **µg/Kg**		Analysis Date: **11/9/2012 09:54 PM**			
Client ID:		Run ID: **VMS9_121109A**			SeqNo: **2135960**		Prep Date: **11/8/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1004	30	1000	0	100	75-125	0			
1,1,1-Trichloroethane	1097	30	1000	0	110	70-135	0			
1,1,2,2-Tetrachloroethane	1015	30	1000	0	102	55-130	0			
1,1,2-Trichloroethane	1068	30	1000	0	107	60-125	0			
1,1-Dichloroethane	1078	30	1000	0	108	75-125	0			
1,1-Dichloroethene	1099	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1016	30	1000	0	102	60-135	0			
1,2,3-Trichloropropane	1057	30	1000	0	106	65-130	0			
1,2,3-Trimethylbenzene	986.5	30	1000	0	98.6	65-135	0			
1,2,4-Trichlorobenzene	1038	30	1000	0	104	65-130	0			
1,2,4-Trimethylbenzene	1064	30	1000	0	106	65-135	0			
1,2-Dibromo-3-chloropropane	924	30	1000	0	92.4	40-135	0			
1,2-Dibromoethane	1008	30	1000	0	101	70-125	0			
1,2-Dichlorobenzene	1092	30	1000	0	109	75-120	0			
1,2-Dichloroethane	1064	30	1000	0	106	70-135	0			
1,2-Dichloropropane	1074	30	1000	0	107	70-120	0			
1,3,5-Trimethylbenzene	1018	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	1064	30	1000	0	106	70-125	0			
1,4-Dichlorobenzene	1100	30	1000	0	110	70-125	0			
2-Butanone	1174	200	1000	0	117	30-160	0			
2-Hexanone	1033	30	1000	0	103	45-145	0			
4-Methyl-2-pentanone	1354	30	1000	0	135	45-145	0			
Acetone	1244	100	1000	0	124	20-160	0			
Acrylonitrile	1038	100	1000	0	104	70-135	0			
Benzene	1091	30	1000	0	109	75-125	0			
Bromobenzene	1080	30	1000	0	108	65-120	0			
Bromochloromethane	1092	30	1000	0	109	70-125	0			
Bromodichloromethane	986.5	30	1000	0	98.6	70-130	0			
Bromoform	968.5	30	1000	0	96.8	55-135	0			
Bromomethane	1578	75	1000	0	158	30-160	0			
Carbon disulfide	1224	30	1000	0	122	45-160	0			
Carbon tetrachloride	966	30	1000	0	96.6	65-135	0			
Chlorobenzene	1100	30	1000	0	110	75-125	0			
Chloroethane	1064	100	1000	0	106	40-155	0			
Chloroform	1063	30	1000	0	106	70-125	0			
Chloromethane	928	100	1000	0	92.8	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	1024	30	1000	0	102	70-125	0			
Dibromochloromethane	985.5	30	1000	0	98.6	65-135	0			
Dibromomethane	985	30	1000	0	98.5	75-130	0			
Dichlorodifluoromethane	1018	30	1000	0	102	35-135	0			
Ethylbenzene	1024	30	1000	0	102	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1016	30	1000	0	102	70-135	0
Isopropylbenzene	1028	30	1000	0	103	75-130	0
m,p-Xylene	2041	60	2000	0	102	80-125	0
Methyl tert-butyl ether	1032	30	1000	0	103	75-125	0
Methylene chloride	1051	30	1000	0	105	55-145	0
Naphthalene	1088	100	1000	0	109	40-140	0
n-Butylbenzene	1017	30	1000	0	102	65-140	0
n-Propylbenzene	1008	30	1000	0	101	65-135	0
o-Xylene	1002	30	1000	0	100	75-125	0
p-Isopropyltoluene	1089	30	1000	0	109	75-135	0
sec-Butylbenzene	1035	30	1000	0	104	65-130	0
Styrene	992.5	30	1000	0	99.2	75-125	0
tert-Butylbenzene	1102	30	1000	0	110	65-130	0
Tetrachloroethene	1124	30	1000	0	112	64-140	0
Tetrahydrofuran	1018	200	1000	0	102	70-135	0
Toluene	1110	30	1000	0	111	70-125	0
trans-1,2-Dichloroethene	1110	30	1000	0	111	65-135	0
trans-1,3-Dichloropropene	1058	30	1000	0	106	65-125	0
trans-1,4-Dichloro-2-butene	981	30	1000	0	98.1	70-135	0
Trichloroethene	1070	30	1000	0	107	75-125	0
Trichlorofluoromethane	1055	30	1000	0	106	25-185	0
Vinyl chloride	1095	30	1000	0	110	60-125	0
Surr: 1,2-Dichloroethane-d4	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: Dibromofluoromethane	*981*	0	*1000*	0	*98.1*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44632-44632**				Units: **µg/Kg**		Analysis Date: **11/10/2012 09:21 PM**			
Client ID:		Run ID: **VMS9_121110A**			SeqNo: **2136600**		Prep Date: **11/8/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	991.5	30	1000	0	99.2	75-125	0			
1,1,1-Trichloroethane	1052	30	1000	0	105	70-135	0			
1,1,2,2-Tetrachloroethane	1038	30	1000	0	104	55-130	0			
1,1,2-Trichloroethane	993.5	30	1000	0	99.4	60-125	0			
1,1-Dichloroethane	1020	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1102	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1032	30	1000	0	103	60-135	0			
1,2,3-Trichloropropane	1034	30	1000	0	103	65-130	0			
1,2,3-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,2,4-Trichlorobenzene	1054	30	1000	0	105	65-130	0			
1,2,4-Trimethylbenzene	1078	30	1000	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	997	30	1000	0	99.7	40-135	0			
1,2-Dibromoethane	1048	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	992.5	30	1000	0	99.2	75-120	0			
1,2-Dichloroethane	996.5	30	1000	0	99.6	70-135	0			
1,2-Dichloropropane	1018	30	1000	0	102	70-120	0			
1,3,5-Trimethylbenzene	1086	30	1000	0	109	65-135	0			
1,3-Dichlorobenzene	987	30	1000	0	98.7	70-125	0			
1,4-Dichlorobenzene	1004	30	1000	0	100	70-125	0			
2-Butanone	1060	200	1000	0	106	30-160	0			
2-Hexanone	1039	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1280	30	1000	0	128	45-145	0			
Acetone	1104	100	1000	0	110	20-160	0			
Acrylonitrile	986.5	100	1000	0	98.6	70-135	0			
Benzene	1008	30	1000	0	101	75-125	0			
Bromobenzene	1012	30	1000	0	101	65-120	0			
Bromochloromethane	1058	30	1000	0	106	70-125	0			
Bromodichloromethane	978.5	30	1000	0	97.8	70-130	0			
Bromoform	1026	30	1000	0	103	55-135	0			
Bromomethane	1402	75	1000	0	140	30-160	0			
Carbon disulfide	1310	30	1000	0	131	45-160	0			
Carbon tetrachloride	1042	30	1000	0	104	65-135	0			
Chlorobenzene	997.5	30	1000	0	99.8	75-125	0			
Chloroethane	1076	100	1000	0	108	40-155	0			
Chloroform	1055	30	1000	0	106	70-125	0			
Chloromethane	976	100	1000	0	97.6	50-130	0			
cis-1,2-Dichloroethene	1041	30	1000	0	104	65-125	0			
cis-1,3-Dichloropropene	958	30	1000	0	95.8	70-125	0			
Dibromochloromethane	962.5	30	1000	0	96.2	65-135	0			
Dibromomethane	1042	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	923.5	30	1000	0	92.4	35-135	0			
Ethylbenzene	1038	30	1000	0	104	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1060	30	1000	0	106	70-135	0
Isopropylbenzene	1072	30	1000	0	107	75-130	0
m,p-Xylene	2068	60	2000	0	103	80-125	0
Methyl tert-butyl ether	1039	30	1000	0	104	75-125	0
Methylene chloride	978.5	30	1000	0	97.8	55-145	0
Naphthalene	1076	100	1000	0	108	40-140	0
n-Butylbenzene	1099	30	1000	0	110	65-140	0
n-Propylbenzene	1042	30	1000	0	104	65-135	0
o-Xylene	1036	30	1000	0	104	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1086	30	1000	0	109	65-130	0
Styrene	1068	30	1000	0	107	75-125	0
tert-Butylbenzene	1034	30	1000	0	103	65-130	0
Tetrachloroethene	989	30	1000	0	98.9	64-140	0
Tetrahydrofuran	976.5	200	1000	0	97.6	70-135	0
Toluene	1011	30	1000	0	101	70-125	0
trans-1,2-Dichloroethene	1056	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	967	30	1000	0	96.7	65-125	0
trans-1,4-Dichloro-2-butene	943.5	30	1000	0	94.4	70-135	0
Trichloroethene	1006	30	1000	0	101	75-125	0
Trichlorofluoromethane	981.5	30	1000	0	98.2	25-185	0
Vinyl chloride	1032	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*1013*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1001*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1034*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*999*	0	*1000*	0	*99.9*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1211226-09B MS** Units: **µg/Kg** Analysis Date: **11/10/2012 08:09 AM**
Client ID: **SBKR1000R523S110612S004** Run ID: **VMS9_121109A** SeqNo: **2135958** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1020	30	1000	0	102	75-125	0			
1,1,1-Trichloroethane	1161	30	1000	0	116	70-135	0			
1,1,2,2-Tetrachloroethane	1120	30	1000	0	112	55-130	0			
1,1,2-Trichloroethane	1205	30	1000	0	120	60-125	0			
1,1-Dichloroethane	1247	30	1000	0	125	75-125	0			
1,1-Dichloroethene	1242	30	1000	0	124	65-135	0			
1,2,3-Trichlorobenzene	1027	30	1000	0	103	60-135	0			
1,2,3-Trichloropropane	1212	30	1000	0	121	65-130	0			
1,2,3-Trimethylbenzene	1106	30	1000	0	111	65-135	0			
1,2,4-Trichlorobenzene	1102	30	1000	0	110	65-130	0			
1,2,4-Trimethylbenzene	1222	30	1000	0	122	65-135	0			
1,2-Dibromo-3-chloropropane	788.5	30	1000	0	78.8	40-135	0			
1,2-Dibromoethane	1109	30	1000	0	111	70-125	0			
1,2-Dichlorobenzene	1248	30	1000	0	125	75-120	0			S
1,2-Dichloroethane	1258	30	1000	0	126	70-135	0			
1,2-Dichloropropane	1248	30	1000	0	125	70-120	0			S
1,3,5-Trimethylbenzene	1186	30	1000	0	119	65-135	0			
1,3-Dichlorobenzene	1210	30	1000	0	121	70-125	0			
1,4-Dichlorobenzene	1242	30	1000	0	124	70-125	0			
2-Butanone	1240	200	1000	85.5	115	30-160	0			
2-Hexanone	1214	30	1000	0	121	45-145	0			
4-Methyl-2-pentanone	1482	30	1000	0	148	45-145	0			S
Acetone	1636	100	1000	44	159	20-160	0			
Acrylonitrile	1355	100	1000	0	136	70-135	0			S
Benzene	1284	30	1000	0	128	75-125	0			S
Bromobenzene	1246	30	1000	0	125	65-120	0			S
Bromochloromethane	1276	30	1000	0	128	70-125	0			S
Bromodichloromethane	952	30	1000	0	95.2	70-130	0			
Bromoform	818	30	1000	0	81.8	55-135	0			
Bromomethane	921.5	75	1000	0	92.2	30-160	0			
Carbon disulfide	1064	30	1000	0	106	45-160	0			
Carbon tetrachloride	953.5	30	1000	0	95.4	65-135	0			
Chlorobenzene	1295	30	1000	0	130	75-125	0			S
Chloroethane	557.5	100	1000	0	55.8	40-155	0			
Chloroform	1228	30	1000	0	123	70-125	0			
Chloromethane	1422	100	1000	42.5	138	50-130	0			S
cis-1,2-Dichloroethene	1222	30	1000	0	122	65-125	0			
cis-1,3-Dichloropropene	1034	30	1000	0	103	70-125	0			
Dibromochloromethane	890	30	1000	0	89	65-135	0			
Dibromomethane	1081	30	1000	0	108	75-130	0			
Dichlorodifluoromethane	1311	30	1000	0	131	35-135	0			
Ethylbenzene	1173	30	1000	0	117	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632**	Instrument ID **VMS8**		Method: **SW8260**					
Hexachloroethane	849.5	30	1000	0	85	70-135	0	
Isopropylbenzene	1188	30	1000	0	119	75-130	0	
m,p-Xylene	2374	60	2000	0	119	80-125	0	
Methyl tert-butyl ether	1228	30	1000	0	123	75-125	0	
Methylene chloride	1312	30	1000	0	131	55-145	0	
Naphthalene	1060	100	1000	0	106	40-140	0	
n-Butylbenzene	1103	30	1000	0	110	65-140	0	
n-Propylbenzene	1156	30	1000	0	116	65-135	0	
o-Xylene	1172	30	1000	0	117	75-125	0	
p-Isopropyltoluene	1212	30	1000	0	121	75-135	0	
sec-Butylbenzene	1175	30	1000	0	118	65-130	0	
Styrene	1109	30	1000	0	111	75-125	0	
tert-Butylbenzene	1282	30	1000	0	128	65-130	0	
Tetrachloroethene	1262	30	1000	0	126	64-140	0	
Tetrahydrofuran	1294	200	1000	0	129	70-135	0	
Toluene	1260	30	1000	0	126	70-125	0	S
trans-1,2-Dichloroethene	1278	30	1000	0	128	65-135	0	
trans-1,3-Dichloropropene	1014	30	1000	0	101	65-125	0	
trans-1,4-Dichloro-2-butene	891.5	30	1000	0	89.2	70-135	0	
Trichloroethene	1230	30	1000	0	123	75-125	0	
Trichlorofluoromethane	1180	30	1000	0	118	25-185	0	
Vinyl chloride	1300	30	1000	0	130	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: Dibromofluoromethane	*945*	0	*1000*	0	*94.5*	*70-130*	0	
Surr: Toluene-d8	*985*	0	*1000*	0	*98.5*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MSD Sample ID: **1211226-09B MSD** Units: **µg/Kg** Analysis Date: **11/10/2012 08:35 AM**
Client ID: **SBKR1000R523S110612S004** Run ID: **VMS9_121109A** SeqNo: **2135959** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1058	30	1000	0	106	75-125	1020	3.61	30	
1,1,1-Trichloroethane	1194	30	1000	0	119	70-135	1161	2.8	30	
1,1,2,2-Tetrachloroethane	1147	30	1000	0	115	55-130	1120	2.34	30	
1,1,2-Trichloroethane	1255	30	1000	0	126	60-125	1205	4.07	30	S
1,1-Dichloroethane	1267	30	1000	0	127	75-125	1247	1.59	30	S
1,1-Dichloroethene	1272	30	1000	0	127	65-135	1242	2.43	30	
1,2,3-Trichlorobenzene	1102	30	1000	0	110	60-135	1027	7.09	30	
1,2,3-Trichloropropane	1232	30	1000	0	123	65-130	1212	1.68	30	
1,2,3-Trimethylbenzene	1176	30	1000	0	118	65-135	1106	6.13	30	
1,2,4-Trichlorobenzene	1142	30	1000	0	114	65-130	1102	3.52	30	
1,2,4-Trimethylbenzene	1231	30	1000	0	123	65-135	1222	0.775	30	
1,2-Dibromo-3-chloropropane	829.5	30	1000	0	83	40-135	788.5	5.07	30	
1,2-Dibromoethane	1140	30	1000	0	114	70-125	1109	2.8	30	
1,2-Dichlorobenzene	1320	30	1000	0	132	75-120	1248	5.65	30	S
1,2-Dichloroethane	1294	30	1000	0	129	70-135	1258	2.82	30	
1,2-Dichloropropane	1274	30	1000	0	127	70-120	1248	2.02	30	S
1,3,5-Trimethylbenzene	1179	30	1000	0	118	65-135	1186	0.55	30	
1,3-Dichlorobenzene	1274	30	1000	0	127	70-125	1210	5.11	30	S
1,4-Dichlorobenzene	1310	30	1000	0	131	70-125	1242	5.37	30	S
2-Butanone	1273	200	1000	85.5	119	30-160	1240	2.67	30	
2-Hexanone	1212	30	1000	0	121	45-145	1214	0.165	30	
4-Methyl-2-pentanone	1504	30	1000	0	150	45-145	1482	1.47	30	S
Acetone	1730	100	1000	44	169	20-160	1636	5.53	30	S
Acrylonitrile	1389	100	1000	0	139	70-135	1355	2.48	30	S
Benzene	1300	30	1000	0	130	75-125	1284	1.28	30	S
Bromobenzene	1274	30	1000	0	127	65-120	1246	2.3	30	S
Bromochloromethane	1320	30	1000	0	132	70-125	1276	3.43	30	S
Bromodichloromethane	981	30	1000	0	98.1	70-130	952	3	30	
Bromoform	855.5	30	1000	0	85.6	55-135	818	4.48	30	
Bromomethane	980	75	1000	0	98	30-160	921.5	6.15	30	
Carbon disulfide	1120	30	1000	0	112	45-160	1064	5.13	30	
Carbon tetrachloride	1016	30	1000	0	102	65-135	953.5	6.35	30	
Chlorobenzene	1322	30	1000	0	132	75-125	1295	2.03	30	S
Chloroethane	589.5	100	1000	0	59	40-155	557.5	5.58	30	
Chloroform	1270	30	1000	0	127	70-125	1228	3.36	30	S
Chloromethane	1434	100	1000	42.5	139	50-130	1422	0.84	30	S
cis-1,2-Dichloroethene	1262	30	1000	0	126	65-125	1222	3.18	30	S
cis-1,3-Dichloropropene	1060	30	1000	0	106	70-125	1034	2.43	30	
Dibromochloromethane	927	30	1000	0	92.7	65-135	890	4.07	30	
Dibromomethane	1110	30	1000	0	111	75-130	1081	2.6	30	
Dichlorodifluoromethane	1286	30	1000	0	129	35-135	1311	1.96	30	
Ethylbenzene	1194	30	1000	0	119	75-125	1173	1.73	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	912.5	30	1000	0	91.2	70-135	849.5	7.15	30	
Isopropylbenzene	1209	30	1000	0	121	75-130	1188	1.75	30	
m,p-Xylene	2404	60	2000	0	120	80-125	2374	1.26	30	
Methyl tert-butyl ether	1283	30	1000	0	128	75-125	1228	4.38	30	S
Methylene chloride	1350	30	1000	0	135	55-145	1312	2.89	30	
Naphthalene	1123	100	1000	0	112	40-140	1060	5.72	30	
n-Butylbenzene	1108	30	1000	0	111	65-140	1103	0.497	30	
n-Propylbenzene	1162	30	1000	0	116	65-135	1156	0.475	30	
o-Xylene	1199	30	1000	0	120	75-125	1172	2.23	30	
p-Isopropyltoluene	1277	30	1000	0	128	75-135	1212	5.22	30	
sec-Butylbenzene	1183	30	1000	0	118	65-130	1175	0.679	30	
Styrene	1155	30	1000	0	116	75-125	1109	4.06	30	
tert-Butylbenzene	1304	30	1000	0	130	65-130	1282	1.7	30	S
Tetrachloroethene	1257	30	1000	0	126	64-140	1262	0.357	30	
Tetrahydrofuran	1398	200	1000	0	140	70-135	1294	7.72	30	S
Toluene	1296	30	1000	0	130	70-125	1260	2.82	30	S
trans-1,2-Dichloroethene	1317	30	1000	0	132	65-135	1278	3.01	30	
trans-1,3-Dichloropropene	1076	30	1000	0	108	65-125	1014	5.93	30	
trans-1,4-Dichloro-2-butene	925	30	1000	0	92.5	70-135	891.5	3.69	30	
Trichloroethene	1236	30	1000	0	124	75-125	1230	0.527	30	
Trichlorofluoromethane	1178	30	1000	0	118	25-185	1180	0.212	30	
Vinyl chloride	1304	30	1000	0	130	60-125	1300	0.307	30	S
Surr: 1,2-Dichloroethane-d4	*984.5*	0	*1000*	0	*98.4*	*70-130*	1012	*2.8*	*30*	
Surr: 4-Bromofluorobenzene	*987.5*	0	*1000*	0	*98.8*	*70-130*	998.5	*1.11*	*30*	
Surr: Dibromofluoromethane	*934.5*	0	*1000*	0	*93.4*	*70-130*	945	*1.12*	*30*	
Surr: Toluene-d8	*982*	0	*1000*	0	*98.2*	*70-130*	985	*0.305*	*30*	

The following samples were analyzed in this batch:

1211226-01B	1211226-02B	1211226-03B
1211226-04B	1211226-05B	1211226-06B
1211226-07B	1211226-08B	1211226-09B
1211226-10B	1211226-11A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **R112357** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112357** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135500** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112357** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135496** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211227-05A DUP** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135486** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	71.49	0.050	0	0	0	0-0	70.83	0.927	20	

DUP Sample ID: **1211246-01A DUP** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135494** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.03	0.050	0	0	0	0-0	13.06	16.9	20	

The following samples were analyzed in this batch:

1211226-01A	1211226-02A	1211226-03A
1211226-05A	1211226-06A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211226
Project: Marshall KRRI 1000R 11/6/12

QC BATCH REPORT

Batch ID: **R112450** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112450** Units: **% of sample** Analysis Date: **11/12/2012 03:27 PM**
Client ID: Run ID: **MOIST_121112A** SeqNo: **2137319** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112450** Units: **% of sample** Analysis Date: **11/12/2012 03:27 PM**
Client ID: Run ID: **MOIST_121112A** SeqNo: **2137315** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211222-03A DUP** Units: **% of sample** Analysis Date: **11/12/2012 03:27 PM**
Client ID: Run ID: **MOIST_121112A** SeqNo: **2137295** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.04	0.050	0	0	0	0-0	12.12	9.33	20	

DUP Sample ID: **1211226-09A DUP1** Units: **% of sample** Analysis Date: **11/12/2012 03:27 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **MOIST_121112A** SeqNo: **2137300** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	69.09	0.050	0	0	0	0-0	70.91	2.6	20	

DUP Sample ID: **1211226-09A DUP2** Units: **% of sample** Analysis Date: **11/12/2012 03:27 PM**
Client ID: **SBKR1000R523S110612S004** Run ID: **MOIST_121112A** SeqNo: **2137301** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	70.33	0.050	0	0	0	0-0	70.91	0.821	20	

The following samples were analyzed in this batch:

1211226-04A	1211226-07A	1211226-08A
1211226-09A	1211226-10A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211226

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110612_GMK1	Task: KRRI_1000	
	Total # of Samples: 11		Event Complete?
Turn Around Time	5 Day	Rush	No
BILLING CODE: 6.00			

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 5555 Glenwood Parkway SE Suite 200
City: Grand Rapids State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX Phone #: 713-821-2000
PO #
Send EDD to
CC Hardcopy report
CC Hardcopy report

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR1000R516S110612S007	SBKR1000R516	SO	G	11/06/2012 08:53	3			X	X	X	X	X										
2	SBKR1000R517S110612S006	SBKR1000R517	SO	G	11/06/2012 09:28	3			X	X	X	X	X										
3	SBKR1000R518S110612S004	SBKR1000R518	SO	G	11/06/2012 10:12	3			X	X	X	X	X										
4	SBKR1000R519S110612S006	SBKR1000R519	SO	G	11/06/2012 10:55	3			X	X	X	X	X										
5	SBKR1000R520S110612S006	SBKR1000R520	SO	G	11/06/2012 13:30	3			X	X	X	X	X										
6	SBKR1000R521S110612S005	SBKR1000R521	SO	G	11/06/2012 14:12	3			X	X	X	X	X										
7	SBKR1000R522S110612S004	SBKR1000R522	SO	G	11/06/2012 14:46	3			X	X	X	X	X										
8	SBKR1000R522D110612S004	SBKR1000R522	SO	G	11/06/2012 14:46	3	DUPLICATE		X	X	X	X	X										
9	SBKR1000R523S110612S004	SBKR1000R523	SO	G	11/06/2012 15:41	6	MS/MSD		X	X	X	X	X										
10	SBKR1000R524S110612S004	SBKR1000R524	SO	G	11/06/2012 16:15	3			X	X	X	X	X										
11	SBKR1000R524T110612MX	SBKR1000R524	SQ	G	11/06/2012 00:00	1	TRIP BLANK						X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G. Kramer	11-7-12	0950	[illegible]	11-7-12	0950
[illegible]	11-7-12	1300	[illegible]	11/7/12	1300

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
	Y/N	Y/N	Y/N
3.0°C	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER: DATE Signed: Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **07-Nov-12 13:00**

Work Order: **1211226** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 08-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 11-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/8/2012 9:38:50 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

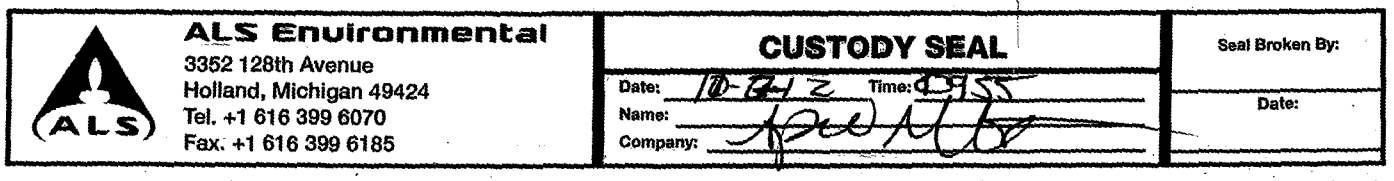
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date: 10-24-12 Time: 0955
Name:
Company:
Seal Broken By:
Date:

15-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000-1100R 11/5/12** Work Order: **1211227**

Dear Bryan,

ALS Environmental received 12 samples on 07-Nov-2012 01:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 95.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 15-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100R 11/5/12
Work Order: **1211227**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211227-01	SBKR1000R510S110512S005	Soil		11/5/2012 10:58	11/7/2012 13:00	☐
1211227-02	SBKR1000R511S110512S003	Soil		11/5/2012 11:31	11/7/2012 13:00	☐
1211227-03	SBKR1000R512S110512S005	Soil		11/5/2012 13:16	11/7/2012 13:00	☐
1211227-04	SBKR1000R513S110512S008	Soil		11/5/2012 13:55	11/7/2012 13:00	☐
1211227-05	SBKR1000R514S110512S004	Soil		11/5/2012 14:35	11/7/2012 13:00	☐
1211227-06	SBKR1000R515S110512S004	Soil		11/5/2012 15:56	11/7/2012 13:00	☐
1211227-07	SBKR1000R515T110512MX	Soil		11/5/2012	11/7/2012 13:00	☐
1211227-08	SBKR1100R507S110512S005	Soil		11/5/2012 08:31	11/7/2012 13:00	☐
1211227-09	SBKR1100R508S110512S004	Soil		11/5/2012 09:06	11/7/2012 13:00	☐
1211227-10	SBKR1100R509S110512S004	Soil		11/5/2012 09:36	11/7/2012 13:00	☐
1211227-11	SBKR1100R510S110512S007	Soil		11/5/2012 10:10	11/7/2012 13:00	☐
1211227-12	SBKR1000R512D110512S005	Soil		11/5/2012 13:16	11/7/2012 13:00	☐

ALS Group USA, Corp

Date: 15-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100R 11/5/12
Work Order: 1211227

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44680 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batch 44630 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44631 MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification. The LCS recovery for trans-1,4-dichloro-2-butene was outside of the upper control limit but within the Sporadic Marginal Exceedence limit for an analyte that is not a project-specific analyte of concern. No qualification is necessary for this analyte.

Batches 44632 and 44646 MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

Batch 44679 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 15-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100R 11/5/12
WorkOrder: **1211227**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R510S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 10:58:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**78**	**15**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**220**	**31**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*73.5*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	0.98	0.50		mg/Kg-dry	4	11/9/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**12**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**18**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Chrysene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	**550**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*69.2*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*70.9*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*83.3*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*97.6*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*79.8*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*86.8*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R510S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 10:58:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	47	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	47	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R510S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 10:58:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	47	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*93.9*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*91.6*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*98.0*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**36**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R511S110512S003
Work Order:	1211227	**Collection Date:**	11/5/2012 11:31:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**75**	**15**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**260**	**29**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*69.8*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	0.87	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	2.2	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**10**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**14**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*65.4*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*65.9*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*74.6*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*94.4*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*69.3*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*78.7*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R511S110512S003
Work Order:	1211227	**Collection Date:**	11/5/2012 11:31:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dibromo-3-chloropropane	ND	47	10		µg/Kg-dry	1	11/10/2012
1,2-Dibromoethane	ND	47	20		µg/Kg-dry	1	11/10/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/10/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/10/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/10/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/10/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/10/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/10/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/10/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/10/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/10/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/10/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/10/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/10/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R511S110512S003
Work Order:	1211227	**Collection Date:**	11/5/2012 11:31:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/10/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/10/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/10/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/10/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/10/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/10/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/10/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/10/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/10/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/10/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/10/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/10/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/10/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/10/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/10/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/10/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/10/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/10/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/10/2012
Vinyl chloride	ND	47	40		µg/Kg-dry	1	11/10/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/10/2012
Surr: 4-Bromofluorobenzene	*95.8*	*70-130*			*%REC*	1	11/10/2012
Surr: Dibromofluoromethane	*90.5*	*70-130*			*%REC*	1	11/10/2012
Surr: Toluene-d8	*98.6*	*70-130*			*%REC*	1	11/10/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**36**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R512S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 1:16:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**140**	**24**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**540**	**47**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*75.8*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	4.1	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**16**	**4.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**18**	**4.1**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**780**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**750**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	**800**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*70.7*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*67.8*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*81.4*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*94.5*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*77.9*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*85.3*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	77	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	77	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	77	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	77	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R512S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 1:16:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	77	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	77	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	77	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	77	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	77	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	77	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	77	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	77	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	260	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	77	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	77	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	77	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R512S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 1:16:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	77	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	150	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	77	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	77	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	77	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	77	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	77	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	77	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	77	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	77	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	77	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	77	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	77	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*95.7*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*92.0*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*98.2*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**61**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R513S110512S008
Work Order:	1211227	**Collection Date:**	11/5/2012 1:55:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**59**	**13**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**120**	**26**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*76.7*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	0.88	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	2.2	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**7.3**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**14**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*68.8*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*72.4*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*84.6*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*81.5*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*88.0*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R513S110512S008
Work Order:	1211227	**Collection Date:**	11/5/2012 1:55:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	42	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	42	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R513S110512S008
Work Order:	1211227	**Collection Date:**	11/5/2012 1:55:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	42	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*93.6*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*89.4*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*97.8*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**29**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R514S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 2:35:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**34**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**400**	**68**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*75.0*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	4.3	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**16**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**28**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*70.1*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*69.8*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*84.6*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*83.4*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*89.3*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R514S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 2:35:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	340	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	340	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R514S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 2:35:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	340	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*93.5*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*90.6*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*99.3*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**71**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R515S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 3:56:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**210**	**34**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**460**	**68**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*74.5*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	2.2	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	5.5	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**13**	**5.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**21**	**5.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*71.8*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*72.6*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*86.0*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*99.1*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*82.5*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*88.9*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R515S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 3:56:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	350	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	350	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R515S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 3:56:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	350	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*92.8*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*89.5*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*99.6*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**71**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R515T110512MX
Work Order:	1211227	**Collection Date:**	11/5/2012
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/9/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/11/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/11/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/11/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/11/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/11/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/11/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/11/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/11/2012
Benzene	ND	50	50		µg/Kg	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/11/2012
Bromoform	ND	100	100		µg/Kg	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/11/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/11/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/11/2012
Chloroethane	ND	250	250		µg/Kg	1	11/11/2012
Chloroform	ND	50	50		µg/Kg	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg	1	11/11/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/11/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R515T110512MX
Work Order:	1211227	**Collection Date:**	11/5/2012
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/11/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/11/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg	1	11/11/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/11/2012
o-Xylene	ND	50	50		µg/Kg	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/11/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/11/2012
Styrene	ND	50	50		µg/Kg	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/11/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/11/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/11/2012
Toluene	ND	100	100		µg/Kg	1	11/11/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/11/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/11/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/11/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*94.1*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*89.8*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*98.5*	*70-130*			*%REC*	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

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Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R507S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 8:31:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**100**	**19**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**330**	**39**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*76.3*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**25**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**19**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**790**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**930**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	**630**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**770**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Pyrene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*71.1*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*67.4*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*79.7*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*78.6*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*81.9*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/9/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	60	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	60	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	60	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	60	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R507S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 8:31:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	60	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	60	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	60	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	60	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	60	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	60	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	60	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	60	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	60	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R507S110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 8:31:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	60	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	60	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	60	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	60	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	60	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	60	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	60	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	60	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*92.4*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*89.8*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*97.8*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**50**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R508S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 9:06:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**270**	**44**	**4.0**		**mg/Kg-dry**	1	11/13/2012
ORO (C20-C34)	**870**	**87**	**4.0**		**mg/Kg-dry**	1	11/13/2012
Surr: 4-Terphenyl-d14	*75.0*	*39-115*			*%REC*	1	11/13/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	2.6	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	6.5	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**24**	**6.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**21**	**6.5**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**690**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**480**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Pyrene	**680**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*72.3*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*71.2*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*79.3*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*76.4*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*84.5*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/9/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R508S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 9:06:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	450	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	450	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R508S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 9:06:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	270	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	450	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*93.3*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*91.8*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*99.2*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**78**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R509S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 9:36:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**140**	**23**	**4.0**		**mg/Kg-dry**	1	11/14/2012
ORO (C20-C34)	**530**	**47**	**4.0**		**mg/Kg-dry**	1	11/14/2012
Surr: 4-Terphenyl-d14	*74.6*	*39-115*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	3.6	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**23**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**17**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**800**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**920**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**1,300**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	**660**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**1,000**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**1,500**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Pyrene	**1,600**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*69.9*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*69.7*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*74.9*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*111*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*72.6*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*81.3*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	75	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	75	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	75	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	75	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R509S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 9:36:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	75	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	75	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	75	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	75	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	75	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	75	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	75	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	75	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	75	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	75	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	75	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R509S110512S004
Work Order:	1211227	**Collection Date:**	11/5/2012 9:36:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	75	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	150	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	75	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	75	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	75	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	75	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	75	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	75	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	75	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	75	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	75	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	75	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	75	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*94.8*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*89.1*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*99.4*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**60**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R510S110512S007
Work Order:	1211227	**Collection Date:**	11/5/2012 10:10:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**18**	**4.0**		**mg/Kg-dry**	1	11/14/2012
ORO (C20-C34)	**550**	**36**	**4.0**		**mg/Kg-dry**	1	11/14/2012
Surr: 4-Terphenyl-d14	*78.9*	*39-115*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	2.8	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**23**	**2.8**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**17**	**2.8**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**1,000**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**1,300**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**1,700**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(k)fluoranthene	**930**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**1,900**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	**600**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Pyrene	**1,800**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*69.6*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*71.2*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*80.5*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*75.8*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*85.3*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	58	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	58	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	58	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	58	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R510S110512S007
Work Order:	1211227	**Collection Date:**	11/5/2012 10:10:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	58	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	58	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	58	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	58	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	58	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	58	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	58	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	58	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	58	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	58	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	58	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R510S110512S007
Work Order:	1211227	**Collection Date:**	11/5/2012 10:10:00 AM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	58	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	58	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	58	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	58	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	58	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	58	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	58	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	58	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	58	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	58	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	58	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	58	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*93.8*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*87.6*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*98.7*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R512D110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 1:16:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/12/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**26**	**4.0**		**mg/Kg-dry**	1	11/14/2012
ORO (C20-C34)	**460**	**51**	**4.0**		**mg/Kg-dry**	1	11/14/2012
Surr: 4-Terphenyl-d14	*76.1*	*39-115*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/9/2012**		Analyst: **CES**
Beryllium	ND	1.5	0.50		mg/Kg-dry	4	11/12/2012
Molybdenum	ND	3.9	1.0		mg/Kg-dry	4	11/9/2012
Nickel	**20**	**3.9**	**1.0**		**mg/Kg-dry**	4	11/9/2012
Vanadium	**19**	**3.9**	**1.0**		**mg/Kg-dry**	4	11/9/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/12/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/13/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(a)anthracene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(a)pyrene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(b)fluoranthene	**730**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/13/2012
Benzo(k)fluoranthene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Chrysene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/13/2012
Fluoranthene	**800**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/13/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
Phenanthrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Pyrene	**880**	**330**	**330**		**µg/Kg-dry**	1	11/13/2012
Surr: 2,4,6-Tribromophenol	*71.2*	*34-140*			*%REC*	1	11/13/2012
Surr: 2-Fluorobiphenyl	*72.3*	*12-100*			*%REC*	1	11/13/2012
Surr: 2-Fluorophenol	*83.4*	*33-117*			*%REC*	1	11/13/2012
Surr: 4-Terphenyl-d14	*104*	*25-137*			*%REC*	1	11/13/2012
Surr: Nitrobenzene-d5	*79.9*	*37-107*			*%REC*	1	11/13/2012
Surr: Phenol-d6	*86.3*	*40-106*			*%REC*	1	11/13/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/8/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,1,1-Trichloroethane	ND	80	50		µg/Kg-dry	1	11/11/2012
1,1,2,2-Tetrachloroethane	ND	80	50		µg/Kg-dry	1	11/11/2012
1,1,2-Trichloroethane	ND	80	50		µg/Kg-dry	1	11/11/2012
1,1-Dichloroethane	ND	80	50		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R512D110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 1:16:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	80	50		µg/Kg-dry	1	11/11/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dibromo-3-chloropropane	ND	80	10		µg/Kg-dry	1	11/11/2012
1,2-Dibromoethane	ND	80	20		µg/Kg-dry	1	11/11/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,2-Dichloroethane	ND	80	50		µg/Kg-dry	1	11/11/2012
1,2-Dichloropropane	ND	80	50		µg/Kg-dry	1	11/11/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/11/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/11/2012
Benzene	ND	80	50		µg/Kg-dry	1	11/11/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/11/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/11/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/11/2012
Carbon tetrachloride	ND	80	50		µg/Kg-dry	1	11/11/2012
Chlorobenzene	ND	80	50		µg/Kg-dry	1	11/11/2012
Chloroethane	ND	270	250		µg/Kg-dry	1	11/11/2012
Chloroform	ND	80	50		µg/Kg-dry	1	11/11/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
cis-1,2-Dichloroethene	ND	80	50		µg/Kg-dry	1	11/11/2012
cis-1,3-Dichloropropene	ND	80	50		µg/Kg-dry	1	11/11/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/11/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/11/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/11/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *15-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R512D110512S005
Work Order:	1211227	**Collection Date:**	11/5/2012 1:16:00 PM
Project:	Marshall KRRI 1000-1100R 11/5/12		
Lab ID:	1211227-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	80	50		µg/Kg-dry	1	11/11/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/11/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/11/2012
m,p-Xylene	ND	160	100		µg/Kg-dry	1	11/11/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/11/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/11/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/11/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/11/2012
n-Butylbenzene	ND	80	50		µg/Kg-dry	1	11/11/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/11/2012
o-Xylene	ND	80	50		µg/Kg-dry	1	11/11/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/11/2012
sec-Butylbenzene	ND	80	50		µg/Kg-dry	1	11/11/2012
Styrene	ND	80	50		µg/Kg-dry	1	11/11/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/11/2012
tert-Butylbenzene	ND	80	50		µg/Kg-dry	1	11/11/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/11/2012
Tetrachloroethene	ND	80	50		µg/Kg-dry	1	11/11/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/11/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/11/2012
trans-1,2-Dichloroethene	ND	80	50		µg/Kg-dry	1	11/11/2012
trans-1,3-Dichloropropene	ND	80	50		µg/Kg-dry	1	11/11/2012
trans-1,4-Dichloro-2-butene	ND	80	50		µg/Kg-dry	1	11/11/2012
Trichloroethene	ND	80	50		µg/Kg-dry	1	11/11/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/11/2012
Vinyl chloride	ND	80	40		µg/Kg-dry	1	11/11/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/11/2012
Surr: 4-Bromofluorobenzene	*93.0*	*70-130*			*%REC*	1	11/11/2012
Surr: Dibromofluoromethane	*90.1*	*70-130*			*%REC*	1	11/11/2012
Surr: Toluene-d8	*97.5*	*70-130*			*%REC*	1	11/11/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**63**	**0.050**	**0**		**% of sample**	1	11/8/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44680** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44680-44680** Units: **mg/Kg** Analysis Date: **11/13/2012 05:39 PM**
Client ID: Run ID: **GC8_121113A** SeqNo: **2138646** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.832*	0	*5*	0	*76.6*	*39-115*	0			

LCS Sample ID: **DLCSS1-44680-44680** Units: **mg/Kg** Analysis Date: **11/13/2012 06:06 PM**
Client ID: Run ID: **GC8_121113A** SeqNo: **2138647** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	309.7	10	500	0	61.9	49-124	0			
ORO (C20-C34)	324.8	20	500	0	65	60-130	0			
Surr: 4-Terphenyl-d14	*4.54*	0	*5*	0	*90.8*	*39-115*	0			

MS Sample ID: **1211226-09A MS** Units: **mg/Kg** Analysis Date: **11/13/2012 06:33 PM**
Client ID: Run ID: **GC8_121113A** SeqNo: **2138648** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	341.4	9.9	495.1	65.16	55.8	60-130	0			S
ORO (C20-C34)	614	20	495.1	229.9	77.6	60-130	0			
Surr: 4-Terphenyl-d14	*4.487*	0	*4.951*	0	*90.6*	*39-115*	0			

MSD Sample ID: **1211226-09A MSD** Units: **mg/Kg** Analysis Date: **11/13/2012 07:00 PM**
Client ID: Run ID: **GC8_121113A** SeqNo: **2138649** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	315.3	9.8	488.2	65.16	51.2	60-130	341.4	7.94	30	S
ORO (C20-C34)	462	20	488.2	229.9	47.5	60-130	614	28.2	30	S
Surr: 4-Terphenyl-d14	*4.304*	0	*4.882*	0	*88.2*	*39-115*	4.487	*4.17*	*30*	

The following samples were analyzed in this batch:

1211227-01A	1211227-02A	1211227-03A
1211227-04A	1211227-05A	1211227-06A
1211227-08A	1211227-09A	1211227-10A
1211227-11A	1211227-12A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44630** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44630-44630** Units: **mg/Kg** Analysis Date: **11/9/2012 01:27 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2135299** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.04584	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44630-44630** Units: **mg/Kg** Analysis Date: **11/9/2012 01:33 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2135300** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.622	0.10	5	0	92.4	80-120	0			
Molybdenum	4.744	0.25	5	0	94.9	80-120	0			
Nickel	4.595	0.25	5	0	91.9	80-120	0			
Vanadium	4.602	0.25	5	0	92	80-120	0			

MS Sample ID: **1211165-03AMS** Units: **mg/Kg** Analysis Date: **11/9/2012 01:56 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2135302** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.141	0.15	7.257	0.06813	69.9	75-125	0			S
Molybdenum	6.867	0.36	7.257	0.2242	91.5	75-125	0			
Nickel	9.985	0.36	7.257	3.668	87.1	75-125	0			
Vanadium	13.55	0.36	7.257	4.974	118	75-125	0			

MSD Sample ID: **1211165-03AMSD** Units: **mg/Kg** Analysis Date: **11/9/2012 02:02 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2135303** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.576	0.14	7.072	0.06813	63.7	75-125	5.141	11.6	25	S
Molybdenum	8.161	0.35	7.072	0.2242	112	75-125	6.867	17.2	25	

MSD Sample ID: **1211165-03AMSD** Units: **mg/Kg** Analysis Date: **11/9/2012 03:05 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2135410** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nickel	9.526	0.35	7.072	3.668	82.8	75-125	9.985	4.71	25	
Vanadium	12.94	0.35	7.072	4.974	113	75-125	13.55	4.58	25	

The following samples were analyzed in this batch: 1211227-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44655** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44655-44655** Units: **mg/Kg** Analysis Date: **11/9/2012 05:36 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2136262** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44655-44655** Units: **mg/Kg** Analysis Date: **11/9/2012 05:42 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2136265** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.658	0.10	5	0	93.2	80-120	0			
Molybdenum	4.76	0.25	5	0	95.2	80-120	0			
Nickel	4.47	0.25	5	0	89.4	80-120	0			
Vanadium	4.514	0.25	5	0	90.3	80-120	0			

MS Sample ID: **1211226-09AMS** Units: **mg/Kg** Analysis Date: **11/9/2012 07:08 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2136290** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.057	1.5	7.364	0.2999	91.8	75-125	0			
Nickel	11.95	1.5	7.364	4.665	99	75-125	0			
Vanadium	14.55	1.5	7.364	5.824	118	75-125	0			

MS Sample ID: **1211226-09AMS** Units: **mg/Kg** Analysis Date: **11/12/2012 02:37 PM**
Client ID: Run ID: **ICPMS1_121112A** SeqNo: **2136870** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.261	0.59	7.364	0.1671	96.3	75-125	0			

MSD Sample ID: **1211226-09AMSD** Units: **mg/Kg** Analysis Date: **11/9/2012 07:14 PM**
Client ID: Run ID: **ICPMS1_121109A** SeqNo: **2136291** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.656	1.5	7.61	0.2999	96.7	75-125	7.057	8.14	25	
Nickel	12.81	1.5	7.61	4.665	107	75-125	11.95	6.92	25	
Vanadium	15.04	1.5	7.61	5.824	121	75-125	14.55	3.29	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44655** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **1211226-09AMSD** Units: **mg/Kg** Analysis Date: **11/12/2012 02:43 PM**
Client ID: Run ID: **ICPMS1_121112A** SeqNo: **2136873** Prep Date: **11/9/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.601	0.61	7.61	0.1671	97.7	75-125	7.261	4.58	25	

The following samples were analyzed in this batch:

1211227-02A	1211227-03A	1211227-04A
1211227-05A	1211227-06A	1211227-08A
1211227-09A	1211227-10A	1211227-11A
1211227-12A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44679-44679** Units: **µg/Kg** Analysis Date: **11/13/2012 12:41 PM**
Client ID: Run ID: **SVMS6_121113A** SeqNo: **2139071** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3303*	0	*5000*	0	*66.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3559*	0	*5000*	0	*71.2*	*12-100*	0			
Surr: 2-Fluorophenol	*4307*	0	*5000*	0	*86.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5109*	0	*5000*	0	*102*	*25-137*	0			
Surr: Nitrobenzene-d5	*4137*	0	*5000*	0	*82.7*	*37-107*	0			
Surr: Phenol-d6	*4352*	0	*5000*	0	*87*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSS1-44679-44679** Units: **µg/Kg** Analysis Date: **11/13/2012 11:01 AM**
Client ID: Run ID: **SVMS6_121113A** SeqNo: **2139067** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1717	50	2000	0	85.8	45-105	0			
Acenaphthene	1729	50	2000	0	86.4	45-110	0			
Acenaphthylene	1794	50	2000	0	89.7	45-105	0			
Anthracene	1908	50	2000	0	95.4	55-105	0			
Benzo(a)anthracene	2007	50	2000	0	100	50-110	0			
Benzo(a)pyrene	2142	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	2046	50	2000	0	102	45-115	0			
Benzo(g,h,i)perylene	1974	50	2000	0	98.7	40-125	0			
Benzo(k)fluoranthene	2067	50	2000	0	103	45-115	0			
Chrysene	1948	50	2000	0	97.4	55-110	0			
Dibenzo(a,h)anthracene	2144	50	2000	0	107	40-125	0			
Fluoranthene	1960	50	2000	0	98	55-115	0			
Fluorene	1878	50	2000	0	93.9	50-110	0			
Indeno(1,2,3-cd)pyrene	1974	50	2000	0	98.7	40-120	0			
Naphthalene	1714	50	2000	0	85.7	40-105	0			
Phenanthrene	1889	50	2000	0	94.4	50-110	0			
Pyrene	2026	50	2000	0	101	45-125	0			
Surr: 2,4,6-Tribromophenol	*3357*	0	*5000*	0	*67.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3602*	0	*5000*	0	*72*	*12-100*	0			
Surr: 2-Fluorophenol	*4253*	0	*5000*	0	*85.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4929*	0	*5000*	0	*98.6*	*25-137*	0			
Surr: Nitrobenzene-d5	*4282*	0	*5000*	0	*85.6*	*37-107*	0			
Surr: Phenol-d6	*4217*	0	*5000*	0	*84.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1211226-09A MS** Units: **µg/Kg** Analysis Date: **11/13/2012 11:26 AM**
Client ID: Run ID: **SVMS6_121113A** SeqNo: **2139068** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1514	48	1929	0	78.4	45-105	0			
Acenaphthene	1745	48	1929	0	90.4	45-110	0			
Acenaphthylene	1800	48	1929	0	93.3	45-105	0			
Anthracene	1965	48	1929	0	102	55-105	0			
Benzo(a)anthracene	2082	48	1929	146.7	100	50-110	0			
Benzo(a)pyrene	2304	48	1929	193.6	109	50-110	0			
Benzo(b)fluoranthene	2541	48	1929	242.5	119	45-115	0			S
Benzo(g,h,i)perylene	1643	48	1929	80.52	81	40-125	0			
Benzo(k)fluoranthene	1913	48	1929	110.2	93.4	45-115	0			
Chrysene	2111	48	1929	172.5	100	55-110	0			
Dibenzo(a,h)anthracene	1700	48	1929	0	88.1	40-125	0			
Fluoranthene	2150	48	1929	197.5	101	55-115	0			
Fluorene	1951	48	1929	0	101	50-110	0			
Indeno(1,2,3-cd)pyrene	1643	48	1929	78.6	81.1	40-120	0			
Naphthalene	1316	48	1929	0	68.2	40-105	0			
Phenanthrene	1980	48	1929	76.69	98.6	50-110	0			
Pyrene	2199	48	1929	230.1	102	45-125	0			
Surr: 2,4,6-Tribromophenol	*3522*	0	*4823*	0	*73*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3362*	0	*4823*	0	*69.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3151*	0	*4823*	0	*65.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4615*	0	*4823*	0	*95.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*3036*	0	*4823*	0	*62.9*	*37-107*	0			
Surr: Phenol-d6	*3620*	0	*4823*	0	*75*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44679** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1211226-09A MSD** Units: **µg/Kg** Analysis Date: **11/13/2012 11:51 AM**
Client ID: Run ID: **SVMS6_121113A** SeqNo: **2139069** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1678	49	1943	0	86.4	45-105	1514	10.3	30	
Acenaphthene	1844	49	1943	0	94.9	45-110	1745	5.51	30	
Acenaphthylene	1906	49	1943	0	98.1	45-105	1800	5.72	30	
Anthracene	2018	49	1943	0	104	55-105	1965	2.65	30	
Benzo(a)anthracene	2063	49	1943	146.7	98.6	50-110	2082	0.928	30	
Benzo(a)pyrene	2331	49	1943	193.6	110	50-110	2304	1.17	30	
Benzo(b)fluoranthene	2688	49	1943	242.5	126	45-115	2541	5.63	30	S
Benzo(g,h,i)perylene	1143	49	1943	80.52	54.7	40-125	1643	35.8	30	R
Benzo(k)fluoranthene	2288	49	1943	110.2	112	45-115	1913	17.9	30	
Chrysene	2187	49	1943	172.5	104	55-110	2111	3.55	30	
Dibenzo(a,h)anthracene	1322	49	1943	0	68	40-125	1700	25	30	
Fluoranthene	2240	49	1943	197.5	105	55-115	2150	4.1	30	
Fluorene	2031	49	1943	0	105	50-110	1951	4.06	30	
Indeno(1,2,3-cd)pyrene	1140	49	1943	78.6	54.6	40-120	1643	36.2	30	R
Naphthalene	1490	49	1943	0	76.7	40-105	1316	12.4	30	
Phenanthrene	2026	49	1943	76.69	100	50-110	1980	2.3	30	
Pyrene	2297	49	1943	230.1	106	45-125	2199	4.37	30	
Surr: 2,4,6-Tribromophenol	*3705*	0	*4858*	0	*76.3*	*34-140*	3522	*5.07*	*40*	
Surr: 2-Fluorobiphenyl	*3633*	0	*4858*	0	*74.8*	*12-100*	3362	*7.74*	*40*	
Surr: 2-Fluorophenol	*3527*	0	*4858*	0	*72.6*	*33-117*	3151	*11.3*	*40*	
Surr: 4-Terphenyl-d14	*4764*	0	*4858*	0	*98.1*	*25-137*	4615	*3.18*	*40*	
Surr: Nitrobenzene-d5	*3474*	0	*4858*	0	*71.5*	*37-107*	3036	*13.5*	*40*	
Surr: Phenol-d6	*3960*	0	*4858*	0	*81.5*	*40-106*	3620	*8.98*	*40*	

The following samples were analyzed in this batch:

1211227-01A	1211227-02A	1211227-03A
1211227-04A	1211227-05A	1211227-06A
1211227-08A	1211227-09A	1211227-10A
1211227-11A	1211227-12A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44631-44631** Units: **µg/Kg** Analysis Date: **11/8/2012 05:19 PM**
Client ID: Run ID: **VMS8_121108A** SeqNo: **2134535** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	48.5	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	46	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	109	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	61	100						J
n-Butylbenzene	45	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*972.5*	0	*1000*	0	*97.2*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*958.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*949*	0	*1000*	0	*94.9*	*70-130*	0	
Surr: Toluene-d8	*1003*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44631-44631** Units: **µg/Kg** Analysis Date: **11/9/2012 04:53 PM**
Client ID: Run ID: **VMS5_121109A** SeqNo: **2135642** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	103	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1010*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*993*	0	*1000*	0	*99.3*	*70-130*	0
Surr: Dibromofluoromethane	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Toluene-d8	*981*	0	*1000*	0	*98.1*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44631-44631** Units: **µg/Kg** Analysis Date: **11/10/2012 10:38 PM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136626** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	87.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	26	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	30	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1000*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*943*	0	*1000*	0	*94.3*	*70-130*	0	
Surr: Dibromofluoromethane	*923.5*	0	*1000*	0	*92.4*	*70-130*	0	
Surr: Toluene-d8	*974*	0	*1000*	0	*97.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44631-44631**				Units: **µg/Kg**			Analysis Date: **11/8/2012 04:31 PM**			
Client ID:		Run ID: **VMS8_121108A**			SeqNo: **2134534**		Prep Date: **11/8/2012**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	955	30	1000	0	95.5	75-125	0			
1,1,1-Trichloroethane	956	30	1000	0	95.6	70-135	0			
1,1,2,2-Tetrachloroethane	835.5	30	1000	0	83.6	55-130	0			
1,1,2-Trichloroethane	835	30	1000	0	83.5	60-125	0			
1,1-Dichloroethane	899.5	30	1000	0	90	75-125	0			
1,1-Dichloroethene	931.5	30	1000	0	93.2	65-135	0			
1,2,3-Trichlorobenzene	1030	30	1000	0	103	60-135	0			B
1,2,3-Trichloropropane	893	30	1000	0	89.3	65-130	0			
1,2,3-Trimethylbenzene	951	30	1000	0	95.1	65-135	0			
1,2,4-Trichlorobenzene	1110	30	1000	0	111	65-130	0			B
1,2,4-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,2-Dibromo-3-chloropropane	901	30	1000	0	90.1	40-135	0			
1,2-Dibromoethane	937.5	30	1000	0	93.8	70-125	0			
1,2-Dichlorobenzene	939	30	1000	0	93.9	75-120	0			
1,2-Dichloroethane	905	30	1000	0	90.5	70-135	0			
1,2-Dichloropropane	933	30	1000	0	93.3	70-120	0			
1,3,5-Trimethylbenzene	973	30	1000	0	97.3	65-135	0			
1,3-Dichlorobenzene	970	30	1000	0	97	70-125	0			
1,4-Dichlorobenzene	939.5	30	1000	0	94	70-125	0			
2-Butanone	1009	200	1000	0	101	30-160	0			
2-Hexanone	921	30	1000	0	92.1	45-145	0			
4-Methyl-2-pentanone	1168	30	1000	0	117	45-145	0			
Acetone	880.5	100	1000	0	88	20-160	0			
Acrylonitrile	827	100	1000	0	82.7	70-135	0			
Benzene	929.5	30	1000	0	93	75-125	0			
Bromobenzene	925.5	30	1000	0	92.6	65-120	0			
Bromochloromethane	918	30	1000	0	91.8	70-125	0			
Bromodichloromethane	924	30	1000	0	92.4	70-130	0			
Bromoform	941	30	1000	0	94.1	55-135	0			
Bromomethane	1164	75	1000	0	116	30-160	0			
Carbon disulfide	1052	30	1000	0	105	45-160	0			
Carbon tetrachloride	998	30	1000	0	99.8	65-135	0			
Chlorobenzene	972	30	1000	0	97.2	75-125	0			
Chloroethane	1238	100	1000	0	124	40-155	0			
Chloroform	897.5	30	1000	0	89.8	70-125	0			
Chloromethane	895.5	100	1000	0	89.6	50-130	0			
cis-1,2-Dichloroethene	920.5	30	1000	0	92	65-125	0			
cis-1,3-Dichloropropene	974	30	1000	0	97.4	70-125	0			
Dibromochloromethane	973	30	1000	0	97.3	65-135	0			
Dibromomethane	883	30	1000	0	88.3	75-130	0			
Dichlorodifluoromethane	882	30	1000	0	88.2	35-135	0			
Ethylbenzene	964	30	1000	0	96.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1120	30	1000	0	112	70-135	0	
Isopropylbenzene	943.5	30	1000	0	94.4	75-130	0	
m,p-Xylene	1947	60	2000	0	97.4	80-125	0	
Methyl tert-butyl ether	998.5	30	1000	0	99.8	75-125	0	
Methylene chloride	886.5	30	1000	0	88.6	55-145	0	
Naphthalene	1116	100	1000	0	112	40-140	0	
n-Butylbenzene	1178	30	1000	0	118	65-140	0	B
n-Propylbenzene	921.5	30	1000	0	92.2	65-135	0	
o-Xylene	955.5	30	1000	0	95.6	75-125	0	
p-Isopropyltoluene	975.5	30	1000	0	97.6	75-135	0	
sec-Butylbenzene	951.5	30	1000	0	95.2	65-130	0	
Styrene	969	30	1000	0	96.9	75-125	0	
tert-Butylbenzene	959.5	30	1000	0	96	65-130	0	
Tetrachloroethene	941.5	30	1000	0	94.2	64-140	0	
Tetrahydrofuran	838	200	1000	0	83.8	70-135	0	
Toluene	943	30	1000	0	94.3	70-125	0	
trans-1,2-Dichloroethene	948.5	30	1000	0	94.8	65-135	0	
trans-1,3-Dichloropropene	982	30	1000	0	98.2	65-125	0	
trans-1,4-Dichloro-2-butene	887.5	30	1000	0	88.8	70-135	0	
Trichloroethene	973	30	1000	0	97.3	75-125	0	
Trichlorofluoromethane	933.5	30	1000	0	93.4	25-185	0	
Vinyl chloride	991	30	1000	0	99.1	60-125	0	
Surr: 1,2-Dichloroethane-d4	*926.5*	0	*1000*	0	*92.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*954.5*	0	*1000*	0	*95.4*	*70-130*	0	
Surr: Dibromofluoromethane	*967.5*	0	*1000*	0	*96.8*	*70-130*	0	
Surr: Toluene-d8	*986.5*	0	*1000*	0	*98.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44631-44631** Units: **µg/Kg** Analysis Date: **11/9/2012 03:17 PM**
Client ID: Run ID: **VMS5_121109A** SeqNo: **2135641** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	994.5	30	1000	0	99.4	75-125	0			
1,1,1-Trichloroethane	1080	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	954.5	30	1000	0	95.4	55-130	0			
1,1,2-Trichloroethane	969	30	1000	0	96.9	60-125	0			
1,1-Dichloroethane	1038	30	1000	0	104	75-125	0			
1,1-Dichloroethene	1130	30	1000	0	113	65-135	0			
1,2,3-Trichlorobenzene	1006	30	1000	0	101	60-135	0			
1,2,3-Trichloropropane	987.5	30	1000	0	98.8	65-130	0			
1,2,3-Trimethylbenzene	975	30	1000	0	97.5	65-135	0			
1,2,4-Trichlorobenzene	1016	30	1000	0	102	65-130	0			
1,2,4-Trimethylbenzene	1020	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	908	30	1000	0	90.8	40-135	0			
1,2-Dibromoethane	962	30	1000	0	96.2	70-125	0			
1,2-Dichlorobenzene	994.5	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	1014	30	1000	0	101	70-135	0			
1,2-Dichloropropane	1040	30	1000	0	104	70-120	0			
1,3,5-Trimethylbenzene	1052	30	1000	0	105	65-135	0			
1,3-Dichlorobenzene	999.5	30	1000	0	100	70-125	0			
1,4-Dichlorobenzene	1000	30	1000	0	100	70-125	0			
2-Butanone	1260	200	1000	0	126	30-160	0			
2-Hexanone	1051	30	1000	0	105	45-145	0			
4-Methyl-2-pentanone	1085	30	1000	0	108	45-145	0			
Acetone	1240	100	1000	0	124	20-160	0			B
Acrylonitrile	1066	100	1000	0	107	70-135	0			
Benzene	1058	30	1000	0	106	75-125	0			
Bromobenzene	954	30	1000	0	95.4	65-120	0			
Bromochloromethane	1064	30	1000	0	106	70-125	0			
Bromodichloromethane	995.5	30	1000	0	99.6	70-130	0			
Bromoform	899.5	30	1000	0	90	55-135	0			
Bromomethane	1442	75	1000	0	144	30-160	0			
Carbon disulfide	1272	30	1000	0	127	45-160	0			
Carbon tetrachloride	1094	30	1000	0	109	65-135	0			
Chlorobenzene	1027	30	1000	0	103	75-125	0			
Chloroethane	1098	100	1000	0	110	40-155	0			
Chloroform	1072	30	1000	0	107	70-125	0			
Chloromethane	1072	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	1003	30	1000	0	100	70-125	0			
Dibromochloromethane	928	30	1000	0	92.8	65-135	0			
Dibromomethane	940.5	30	1000	0	94	75-130	0			
Dichlorodifluoromethane	911	30	1000	0	91.1	35-135	0			
Ethylbenzene	1048	30	1000	0	105	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	941	30	1000	0	94.1	70-135	0	
Isopropylbenzene	1065	30	1000	0	106	75-130	0	
m,p-Xylene	2078	60	2000	0	104	80-125	0	
Methyl tert-butyl ether	1208	30	1000	0	121	75-125	0	
Methylene chloride	1071	30	1000	0	107	55-145	0	
Naphthalene	1004	100	1000	0	100	40-140	0	
n-Butylbenzene	1032	30	1000	0	103	65-140	0	
n-Propylbenzene	1034	30	1000	0	103	65-135	0	
o-Xylene	1026	30	1000	0	103	75-125	0	
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0	
sec-Butylbenzene	1092	30	1000	0	109	65-130	0	
Styrene	1048	30	1000	0	105	75-125	0	
tert-Butylbenzene	1033	30	1000	0	103	65-130	0	
Tetrachloroethene	1032	30	1000	0	103	64-140	0	
Tetrahydrofuran	1044	200	1000	0	104	70-135	0	
Toluene	1032	30	1000	0	103	70-125	0	
trans-1,2-Dichloroethene	1128	30	1000	0	113	65-135	0	
trans-1,3-Dichloropropene	927.5	30	1000	0	92.8	65-125	0	
trans-1,4-Dichloro-2-butene	525.5	30	1000	0	52.6	70-135	0	S
Trichloroethene	1044	30	1000	0	104	75-125	0	
Trichlorofluoromethane	1046	30	1000	0	105	25-185	0	
Vinyl chloride	1088	30	1000	0	109	60-125	0	
Surr: 1,2-Dichloroethane-d4	*997.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*988.5*	0	*1000*	0	*98.8*	*70-130*	0	
Surr: Dibromofluoromethane	*994.5*	0	*1000*	0	*99.4*	*70-130*	0	
Surr: Toluene-d8	*983.5*	0	*1000*	0	*98.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44631-44631** Units: **µg/Kg** Analysis Date: **11/10/2012 09:21 PM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136625** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	991.5	30	1000	0	99.2	75-125	0			
1,1,1-Trichloroethane	1052	30	1000	0	105	70-135	0			
1,1,2,2-Tetrachloroethane	1038	30	1000	0	104	55-130	0			
1,1,2-Trichloroethane	993.5	30	1000	0	99.4	60-125	0			
1,1-Dichloroethane	1020	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1102	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1032	30	1000	0	103	60-135	0			
1,2,3-Trichloropropane	1034	30	1000	0	103	65-130	0			
1,2,3-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,2,4-Trichlorobenzene	1054	30	1000	0	105	65-130	0			
1,2,4-Trimethylbenzene	1078	30	1000	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	997	30	1000	0	99.7	40-135	0			
1,2-Dibromoethane	1048	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	992.5	30	1000	0	99.2	75-120	0			
1,2-Dichloroethane	996.5	30	1000	0	99.6	70-135	0			
1,2-Dichloropropane	1018	30	1000	0	102	70-120	0			
1,3,5-Trimethylbenzene	1086	30	1000	0	109	65-135	0			
1,3-Dichlorobenzene	987	30	1000	0	98.7	70-125	0			
1,4-Dichlorobenzene	1004	30	1000	0	100	70-125	0			
2-Butanone	1060	200	1000	0	106	30-160	0			
2-Hexanone	1039	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1280	30	1000	0	128	45-145	0			
Acetone	1104	100	1000	0	110	20-160	0			
Acrylonitrile	986.5	100	1000	0	98.6	70-135	0			
Benzene	1008	30	1000	0	101	75-125	0			
Bromobenzene	1012	30	1000	0	101	65-120	0			
Bromochloromethane	1058	30	1000	0	106	70-125	0			
Bromodichloromethane	978.5	30	1000	0	97.8	70-130	0			
Bromoform	1026	30	1000	0	103	55-135	0			
Bromomethane	1402	75	1000	0	140	30-160	0			
Carbon disulfide	1310	30	1000	0	131	45-160	0			
Carbon tetrachloride	1042	30	1000	0	104	65-135	0			
Chlorobenzene	997.5	30	1000	0	99.8	75-125	0			
Chloroethane	1076	100	1000	0	108	40-155	0			
Chloroform	1055	30	1000	0	106	70-125	0			
Chloromethane	976	100	1000	0	97.6	50-130	0			
cis-1,2-Dichloroethene	1041	30	1000	0	104	65-125	0			
cis-1,3-Dichloropropene	958	30	1000	0	95.8	70-125	0			
Dibromochloromethane	962.5	30	1000	0	96.2	65-135	0			
Dibromomethane	1042	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	923.5	30	1000	0	92.4	35-135	0			
Ethylbenzene	1038	30	1000	0	104	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1060	30	1000	0	106	70-135	0
Isopropylbenzene	1072	30	1000	0	107	75-130	0
m,p-Xylene	2068	60	2000	0	103	80-125	0
Methyl tert-butyl ether	1039	30	1000	0	104	75-125	0
Methylene chloride	978.5	30	1000	0	97.8	55-145	0
Naphthalene	1076	100	1000	0	108	40-140	0
n-Butylbenzene	1099	30	1000	0	110	65-140	0
n-Propylbenzene	1042	30	1000	0	104	65-135	0
o-Xylene	1036	30	1000	0	104	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1086	30	1000	0	109	65-130	0
Styrene	1068	30	1000	0	107	75-125	0
tert-Butylbenzene	1034	30	1000	0	103	65-130	0
Tetrachloroethene	989	30	1000	0	98.9	64-140	0
Tetrahydrofuran	976.5	200	1000	0	97.6	70-135	0
Toluene	1011	30	1000	0	101	70-125	0
trans-1,2-Dichloroethene	1056	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	967	30	1000	0	96.7	65-125	0
trans-1,4-Dichloro-2-butene	943.5	30	1000	0	94.4	70-135	0
Trichloroethene	1006	30	1000	0	101	75-125	0
Trichlorofluoromethane	981.5	30	1000	0	98.2	25-185	0
Vinyl chloride	1032	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*1013*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1001*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1034*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*999*	0	*1000*	0	*99.9*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1211206-02A MS** Units: **µg/Kg** Analysis Date: **11/10/2012 12:07 PM**
Client ID: Run ID: **VMS5_121109A** SeqNo: **2135653** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1344	44	1458	0	92.2	75-125	0			
1,1,1-Trichloroethane	1348	44	1458	0	92.5	70-135	0			
1,1,2,2-Tetrachloroethane	1307	44	1458	0	89.6	55-130	0			
1,1,2-Trichloroethane	1314	44	1458	0	90.2	60-125	0			
1,1-Dichloroethane	1356	44	1458	0	93	75-125	0			
1,1-Dichloroethene	1394	44	1458	0	95.6	65-135	0			
1,2,3-Trichlorobenzene	1163	44	1458	0	79.8	60-135	0			
1,2,3-Trichloropropane	1348	44	1458	0	92.4	65-130	0			
1,2,3-Trimethylbenzene	1276	44	1458	0	87.6	65-135	0			
1,2,4-Trichlorobenzene	1183	44	1458	0	81.2	65-130	0			
1,2,4-Trimethylbenzene	1313	44	1458	0	90.1	65-135	0			
1,2-Dibromo-3-chloropropane	1181	44	1458	0	81	40-135	0			
1,2-Dibromoethane	1321	44	1458	0	90.6	70-125	0			
1,2-Dichlorobenzene	1324	44	1458	0	90.8	75-120	0			
1,2-Dichloroethane	1343	44	1458	0	92.2	70-135	0			
1,2-Dichloropropane	1397	44	1458	0	95.8	70-120	0			
1,3,5-Trimethylbenzene	1347	44	1458	0	92.4	65-135	0			
1,3-Dichlorobenzene	1294	44	1458	0	88.8	70-125	0			
1,4-Dichlorobenzene	1286	44	1458	0	88.2	70-125	0			
2-Butanone	1513	290	1458	0	104	30-160	0			
2-Hexanone	1318	44	1458	0	90.4	45-145	0			
4-Methyl-2-pentanone	1380	44	1458	0	94.7	45-145	0			
Acetone	1496	150	1458	27.7	101	20-160	0			B
Acrylonitrile	1449	150	1458	0	99.4	70-135	0			
Benzene	1377	44	1458	0	94.4	75-125	0			
Bromobenzene	1305	44	1458	0	89.5	65-120	0			
Bromochloromethane	1481	44	1458	0	102	70-125	0			
Bromodichloromethane	1327	44	1458	0	91	70-130	0			
Bromoform	1176	44	1458	0	80.7	55-135	0			
Bromomethane	1778	110	1458	0	122	30-160	0			
Carbon disulfide	1523	44	1458	0	104	45-160	0			
Carbon tetrachloride	1270	44	1458	0	87.1	65-135	0			
Chlorobenzene	1385	44	1458	0	95	75-125	0			
Chloroethane	1394	150	1458	0	95.6	40-155	0			
Chloroform	1371	44	1458	0	94	70-125	0			
Chloromethane	1399	150	1458	0	96	50-130	0			
cis-1,2-Dichloroethene	1410	44	1458	0	96.7	65-125	0			
cis-1,3-Dichloropropene	1329	44	1458	0	91.2	70-125	0			
Dibromochloromethane	1232	44	1458	0	84.5	65-135	0			
Dibromomethane	1392	44	1458	0	95.5	75-130	0			
Dichlorodifluoromethane	1048	44	1458	0	71.9	35-135	0			
Ethylbenzene	1360	44	1458	0	93.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1155	44	1458	0	79.2	70-135	0
Isopropylbenzene	1354	44	1458	0	92.9	75-130	0
m,p-Xylene	2720	87	2915	0	93.3	80-125	0
Methyl tert-butyl ether	1539	44	1458	0	106	75-125	0
Methylene chloride	1440	44	1458	29.88	96.8	55-145	0
Naphthalene	1206	150	1458	0	82.8	40-140	0
n-Butylbenzene	1216	44	1458	0	83.4	65-140	0
n-Propylbenzene	1310	44	1458	0	89.9	65-135	0
o-Xylene	1343	44	1458	0	92.1	75-125	0
p-Isopropyltoluene	1277	44	1458	0	87.6	75-135	0
sec-Butylbenzene	1309	44	1458	0	89.8	65-130	0
Styrene	1237	44	1458	0	84.8	75-125	0
tert-Butylbenzene	1299	44	1458	0	89.1	65-130	0
Tetrachloroethene	1299	44	1458	0	89.1	64-140	0
Tetrahydrofuran	1324	290	1458	0	90.8	70-135	0
Toluene	1374	44	1458	6.56	93.8	70-125	0
trans-1,2-Dichloroethene	1438	44	1458	0	98.6	65-135	0
trans-1,3-Dichloropropene	1288	44	1458	0	88.4	65-125	0
trans-1,4-Dichloro-2-butene	1120	44	1458	0	76.8	70-135	0
Trichloroethene	1375	44	1458	0	94.3	75-125	0
Trichlorofluoromethane	1182	44	1458	0	81.1	25-185	0
Vinyl chloride	1331	44	1458	0	91.3	60-125	0
Surr: 1,2-Dichloroethane-d4	*1445*	0	*1458*	0	*99.2*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1459*	0	*1458*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1387*	0	*1458*	0	*95.2*	*70-130*	0
Surr: Toluene-d8	*1433*	0	*1458*	0	*98.3*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

MSD Sample ID: **1211206-02A MSD** Units: **µg/Kg** Analysis Date: **11/10/2012 12:31 PM**

Client ID: Run ID: **VMS5_121109A** SeqNo: **2135654** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1300	44	1458	0	89.2	75-125	1344	3.36	30	
1,1,1-Trichloroethane	1261	44	1458	0	86.5	70-135	1348	6.7	30	
1,1,2,2-Tetrachloroethane	1270	44	1458	0	87.2	55-130	1307	2.83	30	
1,1,2-Trichloroethane	1329	44	1458	0	91.2	60-125	1314	1.1	30	
1,1-Dichloroethane	1304	44	1458	0	89.4	75-125	1356	3.95	30	
1,1-Dichloroethene	1302	44	1458	0	89.3	65-135	1394	6.87	30	
1,2,3-Trichlorobenzene	1232	44	1458	0	84.5	60-135	1163	5.72	30	
1,2,3-Trichloropropane	1301	44	1458	0	89.2	65-130	1348	3.52	30	
1,2,3-Trimethylbenzene	1293	44	1458	0	88.7	65-135	1276	1.3	30	
1,2,4-Trichlorobenzene	1238	44	1458	0	85	65-130	1183	4.58	30	
1,2,4-Trimethylbenzene	1302	44	1458	0	89.3	65-135	1313	0.892	30	
1,2-Dibromo-3-chloropropane	1176	44	1458	0	80.6	40-135	1181	0.495	30	
1,2-Dibromoethane	1297	44	1458	0	89	70-125	1321	1.89	30	
1,2-Dichlorobenzene	1334	44	1458	0	91.5	75-120	1324	0.713	30	
1,2-Dichloroethane	1329	44	1458	0	91.2	70-135	1343	1.04	30	
1,2-Dichloropropane	1339	44	1458	0	91.8	70-120	1397	4.21	30	
1,3,5-Trimethylbenzene	1327	44	1458	0	91	65-135	1347	1.47	30	
1,3-Dichlorobenzene	1312	44	1458	0	90	70-125	1294	1.4	30	
1,4-Dichlorobenzene	1307	44	1458	0	89.6	70-125	1286	1.57	30	
2-Butanone	1507	290	1458	0	103	30-160	1513	0.386	30	
2-Hexanone	1262	44	1458	0	86.6	45-145	1318	4.29	30	
4-Methyl-2-pentanone	1340	44	1458	0	92	45-145	1380	2.95	30	
Acetone	1452	150	1458	27.7	97.7	20-160	1496	3.02	30	B
Acrylonitrile	1425	150	1458	0	97.8	70-135	1449	1.67	30	
Benzene	1327	44	1458	0	91	75-125	1377	3.72	30	
Bromobenzene	1263	44	1458	0	86.6	65-120	1305	3.24	30	
Bromochloromethane	1421	44	1458	0	97.4	70-125	1481	4.17	30	
Bromodichloromethane	1267	44	1458	0	87	70-130	1327	4.55	30	
Bromoform	1115	44	1458	0	76.5	55-135	1176	5.34	30	
Bromomethane	1755	110	1458	0	120	30-160	1778	1.32	30	
Carbon disulfide	1443	44	1458	0	99	45-160	1523	5.36	30	
Carbon tetrachloride	1189	44	1458	0	81.6	65-135	1270	6.58	30	
Chlorobenzene	1321	44	1458	0	90.6	75-125	1385	4.69	30	
Chloroethane	1328	150	1458	0	91.1	40-155	1394	4.82	30	
Chloroform	1351	44	1458	0	92.6	70-125	1371	1.5	30	
Chloromethane	1307	150	1458	0	89.6	50-130	1399	6.79	30	
cis-1,2-Dichloroethene	1378	44	1458	0	94.5	65-125	1410	2.3	30	
cis-1,3-Dichloropropene	1291	44	1458	0	88.6	70-125	1329	2.95	30	
Dibromochloromethane	1192	44	1458	0	81.8	65-135	1232	3.25	30	
Dibromomethane	1331	44	1458	0	91.3	75-130	1392	4.5	30	
Dichlorodifluoromethane	1000	44	1458	0	68.6	35-135	1048	4.7	30	
Ethylbenzene	1320	44	1458	0	90.6	75-125	1360	2.99	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44631** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1149	44	1458	0	78.8	70-135	1155	0.506	30
Isopropylbenzene	1327	44	1458	0	91	75-130	1354	2.01	30
m,p-Xylene	2633	87	2915	0	90.3	80-125	2720	3.27	30
Methyl tert-butyl ether	1495	44	1458	0	103	75-125	1539	2.88	30
Methylene chloride	1392	44	1458	29.88	93.4	55-145	1440	3.4	30
Naphthalene	1276	150	1458	0	87.5	40-140	1206	5.58	30
n-Butylbenzene	1220	44	1458	0	83.7	65-140	1216	0.299	30
n-Propylbenzene	1291	44	1458	0	88.6	65-135	1310	1.51	30
o-Xylene	1304	44	1458	0	89.4	75-125	1343	2.92	30
p-Isopropyltoluene	1261	44	1458	0	86.5	75-135	1277	1.26	30
sec-Butylbenzene	1307	44	1458	0	89.6	65-130	1309	0.167	30
Styrene	1274	44	1458	0	87.4	75-125	1237	2.96	30
tert-Butylbenzene	1279	44	1458	0	87.8	65-130	1299	1.53	30
Tetrachloroethene	1233	44	1458	0	84.6	64-140	1299	5.24	30
Tetrahydrofuran	1270	290	1458	0	87.2	70-135	1324	4.16	30
Toluene	1320	44	1458	6.56	90.1	70-125	1374	4	30
trans-1,2-Dichloroethene	1379	44	1458	0	94.6	65-135	1438	4.19	30
trans-1,3-Dichloropropene	1248	44	1458	0	85.6	65-125	1288	3.16	30
trans-1,4-Dichloro-2-butene	1101	44	1458	0	75.6	70-135	1120	1.64	30
Trichloroethene	1246	44	1458	0	85.4	75-125	1375	9.85	30
Trichlorofluoromethane	1142	44	1458	0	78.4	25-185	1182	3.45	30
Vinyl chloride	1268	44	1458	0	87	60-125	1331	4.82	30
Surr: 1,2-Dichloroethane-d4	*1426*	0	*1458*	0	*97.8*	*70-130*	1445	*1.37*	*30*
Surr: 4-Bromofluorobenzene	*1445*	0	*1458*	0	*99.2*	*70-130*	1459	*0.954*	*30*
Surr: Dibromofluoromethane	*1434*	0	*1458*	0	*98.4*	*70-130*	1387	*3.36*	*30*
Surr: Toluene-d8	*1442*	0	*1458*	0	*99*	*70-130*	1433	*0.659*	*30*

The following samples were analyzed in this batch: 1211227-10B 1211227-11B 1211227-12B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44632-44632** Units: **µg/Kg** Analysis Date: **11/8/2012 05:19 PM**
Client ID: Run ID: **VMS8_121108A** SeqNo: **2134537** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	48.5	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	46	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	109	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	61	100						J
n-Butylbenzene	45	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*972.5*	0	*1000*	0	*97.2*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*958.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*949*	0	*1000*	0	*94.9*	*70-130*	0	
Surr: Toluene-d8	*1003*	0	*1000*	0	*100*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44632-44632** Units: **µg/Kg** Analysis Date: **11/9/2012 11:11 PM**
Client ID: Run ID: **VMS9_121109A** SeqNo: **2135961** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	83.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	42	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*945.5*	0	*1000*	0	*94.6*	*70-130*	0	
Surr: Dibromofluoromethane	*940*	0	*1000*	0	*94*	*70-130*	0	
Surr: Toluene-d8	*1011*	0	*1000*	0	*101*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44632-44632** Units: **µg/Kg** Analysis Date: **11/10/2012 10:38 PM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136601** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	87.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	26	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	30	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1000*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*943*	0	*1000*	0	*94.3*	*70-130*	0	
Surr: Dibromofluoromethane	*923.5*	0	*1000*	0	*92.4*	*70-130*	0	
Surr: Toluene-d8	*974*	0	*1000*	0	*97.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44632-44632** Units: **µg/Kg** Analysis Date: **11/8/2012 04:31 PM**
Client ID: Run ID: **VMS8_121108A** SeqNo: **2134536** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	955	30	1000	0	95.5	75-125	0			
1,1,1-Trichloroethane	956	30	1000	0	95.6	70-135	0			
1,1,2,2-Tetrachloroethane	835.5	30	1000	0	83.6	55-130	0			
1,1,2-Trichloroethane	835	30	1000	0	83.5	60-125	0			
1,1-Dichloroethane	899.5	30	1000	0	90	75-125	0			
1,1-Dichloroethene	931.5	30	1000	0	93.2	65-135	0			
1,2,3-Trichlorobenzene	1030	30	1000	0	103	60-135	0			B
1,2,3-Trichloropropane	893	30	1000	0	89.3	65-130	0			
1,2,3-Trimethylbenzene	951	30	1000	0	95.1	65-135	0			
1,2,4-Trichlorobenzene	1110	30	1000	0	111	65-130	0			B
1,2,4-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,2-Dibromo-3-chloropropane	901	30	1000	0	90.1	40-135	0			
1,2-Dibromoethane	937.5	30	1000	0	93.8	70-125	0			
1,2-Dichlorobenzene	939	30	1000	0	93.9	75-120	0			
1,2-Dichloroethane	905	30	1000	0	90.5	70-135	0			
1,2-Dichloropropane	933	30	1000	0	93.3	70-120	0			
1,3,5-Trimethylbenzene	973	30	1000	0	97.3	65-135	0			
1,3-Dichlorobenzene	970	30	1000	0	97	70-125	0			
1,4-Dichlorobenzene	939.5	30	1000	0	94	70-125	0			
2-Butanone	1009	200	1000	0	101	30-160	0			
2-Hexanone	921	30	1000	0	92.1	45-145	0			
4-Methyl-2-pentanone	1168	30	1000	0	117	45-145	0			
Acetone	880.5	100	1000	0	88	20-160	0			
Acrylonitrile	827	100	1000	0	82.7	70-135	0			
Benzene	929.5	30	1000	0	93	75-125	0			
Bromobenzene	925.5	30	1000	0	92.6	65-120	0			
Bromochloromethane	918	30	1000	0	91.8	70-125	0			
Bromodichloromethane	924	30	1000	0	92.4	70-130	0			
Bromoform	941	30	1000	0	94.1	55-135	0			
Bromomethane	1164	75	1000	0	116	30-160	0			
Carbon disulfide	1052	30	1000	0	105	45-160	0			
Carbon tetrachloride	998	30	1000	0	99.8	65-135	0			
Chlorobenzene	972	30	1000	0	97.2	75-125	0			
Chloroethane	1238	100	1000	0	124	40-155	0			
Chloroform	897.5	30	1000	0	89.8	70-125	0			
Chloromethane	895.5	100	1000	0	89.6	50-130	0			
cis-1,2-Dichloroethene	920.5	30	1000	0	92	65-125	0			
cis-1,3-Dichloropropene	974	30	1000	0	97.4	70-125	0			
Dibromochloromethane	973	30	1000	0	97.3	65-135	0			
Dibromomethane	883	30	1000	0	88.3	75-130	0			
Dichlorodifluoromethane	882	30	1000	0	88.2	35-135	0			
Ethylbenzene	964	30	1000	0	96.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1120	30	1000	0	112	70-135	0	
Isopropylbenzene	943.5	30	1000	0	94.4	75-130	0	
m,p-Xylene	1947	60	2000	0	97.4	80-125	0	
Methyl tert-butyl ether	998.5	30	1000	0	99.8	75-125	0	
Methylene chloride	886.5	30	1000	0	88.6	55-145	0	
Naphthalene	1116	100	1000	0	112	40-140	0	
n-Butylbenzene	1178	30	1000	0	118	65-140	0	B
n-Propylbenzene	921.5	30	1000	0	92.2	65-135	0	
o-Xylene	955.5	30	1000	0	95.6	75-125	0	
p-Isopropyltoluene	975.5	30	1000	0	97.6	75-135	0	
sec-Butylbenzene	951.5	30	1000	0	95.2	65-130	0	
Styrene	969	30	1000	0	96.9	75-125	0	
tert-Butylbenzene	959.5	30	1000	0	96	65-130	0	
Tetrachloroethene	941.5	30	1000	0	94.2	64-140	0	
Tetrahydrofuran	838	200	1000	0	83.8	70-135	0	
Toluene	943	30	1000	0	94.3	70-125	0	
trans-1,2-Dichloroethene	948.5	30	1000	0	94.8	65-135	0	
trans-1,3-Dichloropropene	982	30	1000	0	98.2	65-125	0	
trans-1,4-Dichloro-2-butene	887.5	30	1000	0	88.8	70-135	0	
Trichloroethene	973	30	1000	0	97.3	75-125	0	
Trichlorofluoromethane	933.5	30	1000	0	93.4	25-185	0	
Vinyl chloride	991	30	1000	0	99.1	60-125	0	
Surr: 1,2-Dichloroethane-d4	*926.5*	0	*1000*	0	*92.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*954.5*	0	*1000*	0	*95.4*	*70-130*	0	
Surr: Dibromofluoromethane	*967.5*	0	*1000*	0	*96.8*	*70-130*	0	
Surr: Toluene-d8	*986.5*	0	*1000*	0	*98.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44632-44632**				Units: **µg/Kg**		Analysis Date: **11/9/2012 09:54 PM**			
Client ID:		Run ID: **VMS9_121109A**			SeqNo: **2135960**		Prep Date: **11/8/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1004	30	1000	0	100	75-125	0			
1,1,1-Trichloroethane	1097	30	1000	0	110	70-135	0			
1,1,2,2-Tetrachloroethane	1015	30	1000	0	102	55-130	0			
1,1,2-Trichloroethane	1068	30	1000	0	107	60-125	0			
1,1-Dichloroethane	1078	30	1000	0	108	75-125	0			
1,1-Dichloroethene	1099	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1016	30	1000	0	102	60-135	0			
1,2,3-Trichloropropane	1057	30	1000	0	106	65-130	0			
1,2,3-Trimethylbenzene	986.5	30	1000	0	98.6	65-135	0			
1,2,4-Trichlorobenzene	1038	30	1000	0	104	65-130	0			
1,2,4-Trimethylbenzene	1064	30	1000	0	106	65-135	0			
1,2-Dibromo-3-chloropropane	924	30	1000	0	92.4	40-135	0			
1,2-Dibromoethane	1008	30	1000	0	101	70-125	0			
1,2-Dichlorobenzene	1092	30	1000	0	109	75-120	0			
1,2-Dichloroethane	1064	30	1000	0	106	70-135	0			
1,2-Dichloropropane	1074	30	1000	0	107	70-120	0			
1,3,5-Trimethylbenzene	1018	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	1064	30	1000	0	106	70-125	0			
1,4-Dichlorobenzene	1100	30	1000	0	110	70-125	0			
2-Butanone	1174	200	1000	0	117	30-160	0			
2-Hexanone	1033	30	1000	0	103	45-145	0			
4-Methyl-2-pentanone	1354	30	1000	0	135	45-145	0			
Acetone	1244	100	1000	0	124	20-160	0			
Acrylonitrile	1038	100	1000	0	104	70-135	0			
Benzene	1091	30	1000	0	109	75-125	0			
Bromobenzene	1080	30	1000	0	108	65-120	0			
Bromochloromethane	1092	30	1000	0	109	70-125	0			
Bromodichloromethane	986.5	30	1000	0	98.6	70-130	0			
Bromoform	968.5	30	1000	0	96.8	55-135	0			
Bromomethane	1578	75	1000	0	158	30-160	0			
Carbon disulfide	1224	30	1000	0	122	45-160	0			
Carbon tetrachloride	966	30	1000	0	96.6	65-135	0			
Chlorobenzene	1100	30	1000	0	110	75-125	0			
Chloroethane	1064	100	1000	0	106	40-155	0			
Chloroform	1063	30	1000	0	106	70-125	0			
Chloromethane	928	100	1000	0	92.8	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	1024	30	1000	0	102	70-125	0			
Dibromochloromethane	985.5	30	1000	0	98.6	65-135	0			
Dibromomethane	985	30	1000	0	98.5	75-130	0			
Dichlorodifluoromethane	1018	30	1000	0	102	35-135	0			
Ethylbenzene	1024	30	1000	0	102	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1016	30	1000	0	102	70-135	0
Isopropylbenzene	1028	30	1000	0	103	75-130	0
m,p-Xylene	2041	60	2000	0	102	80-125	0
Methyl tert-butyl ether	1032	30	1000	0	103	75-125	0
Methylene chloride	1051	30	1000	0	105	55-145	0
Naphthalene	1088	100	1000	0	109	40-140	0
n-Butylbenzene	1017	30	1000	0	102	65-140	0
n-Propylbenzene	1008	30	1000	0	101	65-135	0
o-Xylene	1002	30	1000	0	100	75-125	0
p-Isopropyltoluene	1089	30	1000	0	109	75-135	0
sec-Butylbenzene	1035	30	1000	0	104	65-130	0
Styrene	992.5	30	1000	0	99.2	75-125	0
tert-Butylbenzene	1102	30	1000	0	110	65-130	0
Tetrachloroethene	1124	30	1000	0	112	64-140	0
Tetrahydrofuran	1018	200	1000	0	102	70-135	0
Toluene	1110	30	1000	0	111	70-125	0
trans-1,2-Dichloroethene	1110	30	1000	0	111	65-135	0
trans-1,3-Dichloropropene	1058	30	1000	0	106	65-125	0
trans-1,4-Dichloro-2-butene	981	30	1000	0	98.1	70-135	0
Trichloroethene	1070	30	1000	0	107	75-125	0
Trichlorofluoromethane	1055	30	1000	0	106	25-185	0
Vinyl chloride	1095	30	1000	0	110	60-125	0
Surr: 1,2-Dichloroethane-d4	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: Dibromofluoromethane	*981*	0	*1000*	0	*98.1*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44632-44632**				Units: **µg/Kg**		Analysis Date: **11/10/2012 09:21 PM**			
Client ID:		Run ID: **VMS9_121110A**			SeqNo: **2136600**		Prep Date: **11/8/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	991.5	30	1000	0	99.2	75-125	0			
1,1,1-Trichloroethane	1052	30	1000	0	105	70-135	0			
1,1,2,2-Tetrachloroethane	1038	30	1000	0	104	55-130	0			
1,1,2-Trichloroethane	993.5	30	1000	0	99.4	60-125	0			
1,1-Dichloroethane	1020	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1102	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1032	30	1000	0	103	60-135	0			
1,2,3-Trichloropropane	1034	30	1000	0	103	65-130	0			
1,2,3-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,2,4-Trichlorobenzene	1054	30	1000	0	105	65-130	0			
1,2,4-Trimethylbenzene	1078	30	1000	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	997	30	1000	0	99.7	40-135	0			
1,2-Dibromoethane	1048	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	992.5	30	1000	0	99.2	75-120	0			
1,2-Dichloroethane	996.5	30	1000	0	99.6	70-135	0			
1,2-Dichloropropane	1018	30	1000	0	102	70-120	0			
1,3,5-Trimethylbenzene	1086	30	1000	0	109	65-135	0			
1,3-Dichlorobenzene	987	30	1000	0	98.7	70-125	0			
1,4-Dichlorobenzene	1004	30	1000	0	100	70-125	0			
2-Butanone	1060	200	1000	0	106	30-160	0			
2-Hexanone	1039	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1280	30	1000	0	128	45-145	0			
Acetone	1104	100	1000	0	110	20-160	0			
Acrylonitrile	986.5	100	1000	0	98.6	70-135	0			
Benzene	1008	30	1000	0	101	75-125	0			
Bromobenzene	1012	30	1000	0	101	65-120	0			
Bromochloromethane	1058	30	1000	0	106	70-125	0			
Bromodichloromethane	978.5	30	1000	0	97.8	70-130	0			
Bromoform	1026	30	1000	0	103	55-135	0			
Bromomethane	1402	75	1000	0	140	30-160	0			
Carbon disulfide	1310	30	1000	0	131	45-160	0			
Carbon tetrachloride	1042	30	1000	0	104	65-135	0			
Chlorobenzene	997.5	30	1000	0	99.8	75-125	0			
Chloroethane	1076	100	1000	0	108	40-155	0			
Chloroform	1055	30	1000	0	106	70-125	0			
Chloromethane	976	100	1000	0	97.6	50-130	0			
cis-1,2-Dichloroethene	1041	30	1000	0	104	65-125	0			
cis-1,3-Dichloropropene	958	30	1000	0	95.8	70-125	0			
Dibromochloromethane	962.5	30	1000	0	96.2	65-135	0			
Dibromomethane	1042	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	923.5	30	1000	0	92.4	35-135	0			
Ethylbenzene	1038	30	1000	0	104	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1060	30	1000	0	106	70-135	0
Isopropylbenzene	1072	30	1000	0	107	75-130	0
m,p-Xylene	2068	60	2000	0	103	80-125	0
Methyl tert-butyl ether	1039	30	1000	0	104	75-125	0
Methylene chloride	978.5	30	1000	0	97.8	55-145	0
Naphthalene	1076	100	1000	0	108	40-140	0
n-Butylbenzene	1099	30	1000	0	110	65-140	0
n-Propylbenzene	1042	30	1000	0	104	65-135	0
o-Xylene	1036	30	1000	0	104	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1086	30	1000	0	109	65-130	0
Styrene	1068	30	1000	0	107	75-125	0
tert-Butylbenzene	1034	30	1000	0	103	65-130	0
Tetrachloroethene	989	30	1000	0	98.9	64-140	0
Tetrahydrofuran	976.5	200	1000	0	97.6	70-135	0
Toluene	1011	30	1000	0	101	70-125	0
trans-1,2-Dichloroethene	1056	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	967	30	1000	0	96.7	65-125	0
trans-1,4-Dichloro-2-butene	943.5	30	1000	0	94.4	70-135	0
Trichloroethene	1006	30	1000	0	101	75-125	0
Trichlorofluoromethane	981.5	30	1000	0	98.2	25-185	0
Vinyl chloride	1032	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*1013*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1001*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1034*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*999*	0	*1000*	0	*99.9*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1211226-09B MS** Units: **µg/Kg** Analysis Date: **11/10/2012 08:09 AM**
Client ID: Run ID: **VMS9_121109A** SeqNo: **2135958** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1020	30	1000	0	102	75-125	0			
1,1,1-Trichloroethane	1161	30	1000	0	116	70-135	0			
1,1,2,2-Tetrachloroethane	1120	30	1000	0	112	55-130	0			
1,1,2-Trichloroethane	1205	30	1000	0	120	60-125	0			
1,1-Dichloroethane	1247	30	1000	0	125	75-125	0			
1,1-Dichloroethene	1242	30	1000	0	124	65-135	0			
1,2,3-Trichlorobenzene	1027	30	1000	0	103	60-135	0			
1,2,3-Trichloropropane	1212	30	1000	0	121	65-130	0			
1,2,3-Trimethylbenzene	1106	30	1000	0	111	65-135	0			
1,2,4-Trichlorobenzene	1102	30	1000	0	110	65-130	0			
1,2,4-Trimethylbenzene	1222	30	1000	0	122	65-135	0			
1,2-Dibromo-3-chloropropane	788.5	30	1000	0	78.8	40-135	0			
1,2-Dibromoethane	1109	30	1000	0	111	70-125	0			
1,2-Dichlorobenzene	1248	30	1000	0	125	75-120	0			S
1,2-Dichloroethane	1258	30	1000	0	126	70-135	0			
1,2-Dichloropropane	1248	30	1000	0	125	70-120	0			S
1,3,5-Trimethylbenzene	1186	30	1000	0	119	65-135	0			
1,3-Dichlorobenzene	1210	30	1000	0	121	70-125	0			
1,4-Dichlorobenzene	1242	30	1000	0	124	70-125	0			
2-Butanone	1240	200	1000	85.5	115	30-160	0			
2-Hexanone	1214	30	1000	0	121	45-145	0			
4-Methyl-2-pentanone	1482	30	1000	0	148	45-145	0			S
Acetone	1636	100	1000	44	159	20-160	0			
Acrylonitrile	1355	100	1000	0	136	70-135	0			S
Benzene	1284	30	1000	0	128	75-125	0			S
Bromobenzene	1246	30	1000	0	125	65-120	0			S
Bromochloromethane	1276	30	1000	0	128	70-125	0			S
Bromodichloromethane	952	30	1000	0	95.2	70-130	0			
Bromoform	818	30	1000	0	81.8	55-135	0			
Bromomethane	921.5	75	1000	0	92.2	30-160	0			
Carbon disulfide	1064	30	1000	0	106	45-160	0			
Carbon tetrachloride	953.5	30	1000	0	95.4	65-135	0			
Chlorobenzene	1295	30	1000	0	130	75-125	0			S
Chloroethane	557.5	100	1000	0	55.8	40-155	0			
Chloroform	1228	30	1000	0	123	70-125	0			
Chloromethane	1422	100	1000	42.5	138	50-130	0			S
cis-1,2-Dichloroethene	1222	30	1000	0	122	65-125	0			
cis-1,3-Dichloropropene	1034	30	1000	0	103	70-125	0			
Dibromochloromethane	890	30	1000	0	89	65-135	0			
Dibromomethane	1081	30	1000	0	108	75-130	0			
Dichlorodifluoromethane	1311	30	1000	0	131	35-135	0			
Ethylbenzene	1173	30	1000	0	117	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	849.5	30	1000	0	85	70-135	0	
Isopropylbenzene	1188	30	1000	0	119	75-130	0	
m,p-Xylene	2374	60	2000	0	119	80-125	0	
Methyl tert-butyl ether	1228	30	1000	0	123	75-125	0	
Methylene chloride	1312	30	1000	0	131	55-145	0	
Naphthalene	1060	100	1000	0	106	40-140	0	
n-Butylbenzene	1103	30	1000	0	110	65-140	0	
n-Propylbenzene	1156	30	1000	0	116	65-135	0	
o-Xylene	1172	30	1000	0	117	75-125	0	
p-Isopropyltoluene	1212	30	1000	0	121	75-135	0	
sec-Butylbenzene	1175	30	1000	0	118	65-130	0	
Styrene	1109	30	1000	0	111	75-125	0	
tert-Butylbenzene	1282	30	1000	0	128	65-130	0	
Tetrachloroethene	1262	30	1000	0	126	64-140	0	
Tetrahydrofuran	1294	200	1000	0	129	70-135	0	
Toluene	1260	30	1000	0	126	70-125	0	S
trans-1,2-Dichloroethene	1278	30	1000	0	128	65-135	0	
trans-1,3-Dichloropropene	1014	30	1000	0	101	65-125	0	
trans-1,4-Dichloro-2-butene	891.5	30	1000	0	89.2	70-135	0	
Trichloroethene	1230	30	1000	0	123	75-125	0	
Trichlorofluoromethane	1180	30	1000	0	118	25-185	0	
Vinyl chloride	1300	30	1000	0	130	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*998.5*	0	*1000*	0	*99.8*	*70-130*	0	
Surr: Dibromofluoromethane	*945*	0	*1000*	0	*94.5*	*70-130*	0	
Surr: Toluene-d8	*985*	0	*1000*	0	*98.5*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

MSD Sample ID: **1211226-09B MSD** Units: **µg/Kg** Analysis Date: **11/10/2012 08:35 AM**
Client ID: Run ID: **VMS9_121109A** SeqNo: **2135959** Prep Date: **11/8/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1058	30	1000	0	106	75-125	1020	3.61	30	
1,1,1-Trichloroethane	1194	30	1000	0	119	70-135	1161	2.8	30	
1,1,2,2-Tetrachloroethane	1147	30	1000	0	115	55-130	1120	2.34	30	
1,1,2-Trichloroethane	1255	30	1000	0	126	60-125	1205	4.07	30	S
1,1-Dichloroethane	1267	30	1000	0	127	75-125	1247	1.59	30	S
1,1-Dichloroethene	1272	30	1000	0	127	65-135	1242	2.43	30	
1,2,3-Trichlorobenzene	1102	30	1000	0	110	60-135	1027	7.09	30	
1,2,3-Trichloropropane	1232	30	1000	0	123	65-130	1212	1.68	30	
1,2,3-Trimethylbenzene	1176	30	1000	0	118	65-135	1106	6.13	30	
1,2,4-Trichlorobenzene	1142	30	1000	0	114	65-130	1102	3.52	30	
1,2,4-Trimethylbenzene	1231	30	1000	0	123	65-135	1222	0.775	30	
1,2-Dibromo-3-chloropropane	829.5	30	1000	0	83	40-135	788.5	5.07	30	
1,2-Dibromoethane	1140	30	1000	0	114	70-125	1109	2.8	30	
1,2-Dichlorobenzene	1320	30	1000	0	132	75-120	1248	5.65	30	S
1,2-Dichloroethane	1294	30	1000	0	129	70-135	1258	2.82	30	
1,2-Dichloropropane	1274	30	1000	0	127	70-120	1248	2.02	30	S
1,3,5-Trimethylbenzene	1179	30	1000	0	118	65-135	1186	0.55	30	
1,3-Dichlorobenzene	1274	30	1000	0	127	70-125	1210	5.11	30	S
1,4-Dichlorobenzene	1310	30	1000	0	131	70-125	1242	5.37	30	S
2-Butanone	1273	200	1000	85.5	119	30-160	1240	2.67	30	
2-Hexanone	1212	30	1000	0	121	45-145	1214	0.165	30	
4-Methyl-2-pentanone	1504	30	1000	0	150	45-145	1482	1.47	30	S
Acetone	1730	100	1000	44	169	20-160	1636	5.53	30	S
Acrylonitrile	1389	100	1000	0	139	70-135	1355	2.48	30	S
Benzene	1300	30	1000	0	130	75-125	1284	1.28	30	S
Bromobenzene	1274	30	1000	0	127	65-120	1246	2.3	30	S
Bromochloromethane	1320	30	1000	0	132	70-125	1276	3.43	30	S
Bromodichloromethane	981	30	1000	0	98.1	70-130	952	3	30	
Bromoform	855.5	30	1000	0	85.6	55-135	818	4.48	30	
Bromomethane	980	75	1000	0	98	30-160	921.5	6.15	30	
Carbon disulfide	1120	30	1000	0	112	45-160	1064	5.13	30	
Carbon tetrachloride	1016	30	1000	0	102	65-135	953.5	6.35	30	
Chlorobenzene	1322	30	1000	0	132	75-125	1295	2.03	30	S
Chloroethane	589.5	100	1000	0	59	40-155	557.5	5.58	30	
Chloroform	1270	30	1000	0	127	70-125	1228	3.36	30	S
Chloromethane	1434	100	1000	42.5	139	50-130	1422	0.84	30	S
cis-1,2-Dichloroethene	1262	30	1000	0	126	65-125	1222	3.18	30	S
cis-1,3-Dichloropropene	1060	30	1000	0	106	70-125	1034	2.43	30	
Dibromochloromethane	927	30	1000	0	92.7	65-135	890	4.07	30	
Dibromomethane	1110	30	1000	0	111	75-130	1081	2.6	30	
Dichlorodifluoromethane	1286	30	1000	0	129	35-135	1311	1.96	30	
Ethylbenzene	1194	30	1000	0	119	75-125	1173	1.73	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44632** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	912.5	30	1000	0	91.2	70-135	849.5	7.15	30	
Isopropylbenzene	1209	30	1000	0	121	75-130	1188	1.75	30	
m,p-Xylene	2404	60	2000	0	120	80-125	2374	1.26	30	
Methyl tert-butyl ether	1283	30	1000	0	128	75-125	1228	4.38	30	S
Methylene chloride	1350	30	1000	0	135	55-145	1312	2.89	30	
Naphthalene	1123	100	1000	0	112	40-140	1060	5.72	30	
n-Butylbenzene	1108	30	1000	0	111	65-140	1103	0.497	30	
n-Propylbenzene	1162	30	1000	0	116	65-135	1156	0.475	30	
o-Xylene	1199	30	1000	0	120	75-125	1172	2.23	30	
p-Isopropyltoluene	1277	30	1000	0	128	75-135	1212	5.22	30	
sec-Butylbenzene	1183	30	1000	0	118	65-130	1175	0.679	30	
Styrene	1155	30	1000	0	116	75-125	1109	4.06	30	
tert-Butylbenzene	1304	30	1000	0	130	65-130	1282	1.7	30	S
Tetrachloroethene	1257	30	1000	0	126	64-140	1262	0.357	30	
Tetrahydrofuran	1398	200	1000	0	140	70-135	1294	7.72	30	S
Toluene	1296	30	1000	0	130	70-125	1260	2.82	30	S
trans-1,2-Dichloroethene	1317	30	1000	0	132	65-135	1278	3.01	30	
trans-1,3-Dichloropropene	1076	30	1000	0	108	65-125	1014	5.93	30	
trans-1,4-Dichloro-2-butene	925	30	1000	0	92.5	70-135	891.5	3.69	30	
Trichloroethene	1236	30	1000	0	124	75-125	1230	0.527	30	
Trichlorofluoromethane	1178	30	1000	0	118	25-185	1180	0.212	30	
Vinyl chloride	1304	30	1000	0	130	60-125	1300	0.307	30	S
Surr: 1,2-Dichloroethane-d4	*984.5*	0	*1000*	0	*98.4*	*70-130*	1012	*2.8*	*30*	
Surr: 4-Bromofluorobenzene	*987.5*	0	*1000*	0	*98.8*	*70-130*	998.5	*1.11*	*30*	
Surr: Dibromofluoromethane	*934.5*	0	*1000*	0	*93.4*	*70-130*	945	*1.12*	*30*	
Surr: Toluene-d8	*982*	0	*1000*	0	*98.2*	*70-130*	985	*0.305*	*30*	

The following samples were analyzed in this batch:

1211227-01B	1211227-02B	1211227-03B
1211227-04B	1211227-05B	1211227-06B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44646-44646** Units: **µg/Kg** Analysis Date: **11/10/2012 10:38 PM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136633** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	87.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	26	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	30	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1000*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*943*	0	*1000*	0	*94.3*	*70-130*	0	
Surr: Dibromofluoromethane	*923.5*	0	*1000*	0	*92.4*	*70-130*	0	
Surr: Toluene-d8	*974*	0	*1000*	0	*97.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44646-44646** Units: **µg/Kg** Analysis Date: **11/12/2012 12:52 PM**
Client ID: Run ID: **VMS9_121112A** SeqNo: **2137406** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	69.5	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	24.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1047*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*916*	0	*1000*	0	*91.6*	*70-130*	0
Surr: Dibromofluoromethane	*944.5*	0	*1000*	0	*94.4*	*70-130*	0
Surr: Toluene-d8	*979.5*	0	*1000*	0	*98*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44646-44646** Units: **µg/Kg** Analysis Date: **11/10/2012 09:21 PM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136632** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	991.5	30	1000	0	99.2	75-125	0			
1,1,1-Trichloroethane	1052	30	1000	0	105	70-135	0			
1,1,2,2-Tetrachloroethane	1038	30	1000	0	104	55-130	0			
1,1,2-Trichloroethane	993.5	30	1000	0	99.4	60-125	0			
1,1-Dichloroethane	1020	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1102	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1032	30	1000	0	103	60-135	0			
1,2,3-Trichloropropane	1034	30	1000	0	103	65-130	0			
1,2,3-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,2,4-Trichlorobenzene	1054	30	1000	0	105	65-130	0			
1,2,4-Trimethylbenzene	1078	30	1000	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	997	30	1000	0	99.7	40-135	0			
1,2-Dibromoethane	1048	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	992.5	30	1000	0	99.2	75-120	0			
1,2-Dichloroethane	996.5	30	1000	0	99.6	70-135	0			
1,2-Dichloropropane	1018	30	1000	0	102	70-120	0			
1,3,5-Trimethylbenzene	1086	30	1000	0	109	65-135	0			
1,3-Dichlorobenzene	987	30	1000	0	98.7	70-125	0			
1,4-Dichlorobenzene	1004	30	1000	0	100	70-125	0			
2-Butanone	1060	200	1000	0	106	30-160	0			
2-Hexanone	1039	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1280	30	1000	0	128	45-145	0			
Acetone	1104	100	1000	0	110	20-160	0			
Acrylonitrile	986.5	100	1000	0	98.6	70-135	0			
Benzene	1008	30	1000	0	101	75-125	0			
Bromobenzene	1012	30	1000	0	101	65-120	0			
Bromochloromethane	1058	30	1000	0	106	70-125	0			
Bromodichloromethane	978.5	30	1000	0	97.8	70-130	0			
Bromoform	1026	30	1000	0	103	55-135	0			
Bromomethane	1402	75	1000	0	140	30-160	0			
Carbon disulfide	1310	30	1000	0	131	45-160	0			
Carbon tetrachloride	1042	30	1000	0	104	65-135	0			
Chlorobenzene	997.5	30	1000	0	99.8	75-125	0			
Chloroethane	1076	100	1000	0	108	40-155	0			
Chloroform	1055	30	1000	0	106	70-125	0			
Chloromethane	976	100	1000	0	97.6	50-130	0			
cis-1,2-Dichloroethene	1041	30	1000	0	104	65-125	0			
cis-1,3-Dichloropropene	958	30	1000	0	95.8	70-125	0			
Dibromochloromethane	962.5	30	1000	0	96.2	65-135	0			
Dibromomethane	1042	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	923.5	30	1000	0	92.4	35-135	0			
Ethylbenzene	1038	30	1000	0	104	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	1060	30	1000	0	106	70-135	0
Isopropylbenzene	1072	30	1000	0	107	75-130	0
m,p-Xylene	2068	60	2000	0	103	80-125	0
Methyl tert-butyl ether	1039	30	1000	0	104	75-125	0
Methylene chloride	978.5	30	1000	0	97.8	55-145	0
Naphthalene	1076	100	1000	0	108	40-140	0
n-Butylbenzene	1099	30	1000	0	110	65-140	0
n-Propylbenzene	1042	30	1000	0	104	65-135	0
o-Xylene	1036	30	1000	0	104	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1086	30	1000	0	109	65-130	0
Styrene	1068	30	1000	0	107	75-125	0
tert-Butylbenzene	1034	30	1000	0	103	65-130	0
Tetrachloroethene	989	30	1000	0	98.9	64-140	0
Tetrahydrofuran	976.5	200	1000	0	97.6	70-135	0
Toluene	1011	30	1000	0	101	70-125	0
trans-1,2-Dichloroethene	1056	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	967	30	1000	0	96.7	65-125	0
trans-1,4-Dichloro-2-butene	943.5	30	1000	0	94.4	70-135	0
Trichloroethene	1006	30	1000	0	101	75-125	0
Trichlorofluoromethane	981.5	30	1000	0	98.2	25-185	0
Vinyl chloride	1032	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*1013*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1001*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1034*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*999*	0	*1000*	0	*99.9*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

LCS	Sample ID: **LCS-44646-44646**				Units: **µg/Kg**		Analysis Date: **11/12/2012 11:35 AM**			
Client ID:		Run ID: **VMS9_121112A**			SeqNo: **2137405**		Prep Date: **11/9/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	865.5	30	1000	0	86.6	75-125	0			
1,1,1-Trichloroethane	933	30	1000	0	93.3	70-135	0			
1,1,2,2-Tetrachloroethane	901	30	1000	0	90.1	55-130	0			
1,1,2-Trichloroethane	878	30	1000	0	87.8	60-125	0			
1,1-Dichloroethane	944	30	1000	0	94.4	75-125	0			
1,1-Dichloroethene	1030	30	1000	0	103	65-135	0			
1,2,3-Trichlorobenzene	935.5	30	1000	0	93.6	60-135	0			
1,2,3-Trichloropropane	853	30	1000	0	85.3	65-130	0			
1,2,3-Trimethylbenzene	925	30	1000	0	92.5	65-135	0			
1,2,4-Trichlorobenzene	986	30	1000	0	98.6	65-130	0			
1,2,4-Trimethylbenzene	974.5	30	1000	0	97.4	65-135	0			
1,2-Dibromo-3-chloropropane	866.5	30	1000	0	86.6	40-135	0			
1,2-Dibromoethane	909	30	1000	0	90.9	70-125	0			
1,2-Dichlorobenzene	897	30	1000	0	89.7	75-120	0			
1,2-Dichloroethane	886	30	1000	0	88.6	70-135	0			
1,2-Dichloropropane	910.5	30	1000	0	91	70-120	0			
1,3,5-Trimethylbenzene	966.5	30	1000	0	96.6	65-135	0			
1,3-Dichlorobenzene	894	30	1000	0	89.4	70-125	0			
1,4-Dichlorobenzene	907.5	30	1000	0	90.8	70-125	0			
2-Butanone	834.5	200	1000	0	83.4	30-160	0			
2-Hexanone	904	30	1000	0	90.4	45-145	0			
4-Methyl-2-pentanone	1082	30	1000	0	108	45-145	0			
Acetone	956.5	100	1000	0	95.6	20-160	0			
Acrylonitrile	921	100	1000	0	92.1	70-135	0			
Benzene	902.5	30	1000	0	90.2	75-125	0			
Bromobenzene	893.5	30	1000	0	89.4	65-120	0			
Bromochloromethane	1002	30	1000	0	100	70-125	0			
Bromodichloromethane	861.5	30	1000	0	86.2	70-130	0			
Bromoform	861	30	1000	0	86.1	55-135	0			
Bromomethane	998.5	75	1000	0	99.8	30-160	0			
Carbon disulfide	1200	30	1000	0	120	45-160	0			
Carbon tetrachloride	941	30	1000	0	94.1	65-135	0			
Chlorobenzene	890	30	1000	0	89	75-125	0			
Chloroethane	988.5	100	1000	0	98.8	40-155	0			
Chloroform	963.5	30	1000	0	96.4	70-125	0			
Chloromethane	927.5	100	1000	0	92.8	50-130	0			
cis-1,2-Dichloroethene	985	30	1000	0	98.5	65-125	0			
cis-1,3-Dichloropropene	864	30	1000	0	86.4	70-125	0			
Dibromochloromethane	841.5	30	1000	0	84.2	65-135	0			
Dibromomethane	912.5	30	1000	0	91.2	75-130	0			
Dichlorodifluoromethane	814	30	1000	0	81.4	35-135	0			
Ethylbenzene	921.5	30	1000	0	92.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	975.5	30	1000	0	97.6	70-135	0
Isopropylbenzene	949.5	30	1000	0	95	75-130	0
m,p-Xylene	1844	60	2000	0	92.2	80-125	0
Methyl tert-butyl ether	925.5	30	1000	0	92.6	75-125	0
Methylene chloride	923.5	30	1000	0	92.4	55-145	0
Naphthalene	944	100	1000	0	94.4	40-140	0
n-Butylbenzene	1102	30	1000	0	110	65-140	0
n-Propylbenzene	951.5	30	1000	0	95.2	65-135	0
o-Xylene	912.5	30	1000	0	91.2	75-125	0
p-Isopropyltoluene	952	30	1000	0	95.2	75-135	0
sec-Butylbenzene	1021	30	1000	0	102	65-130	0
Styrene	939	30	1000	0	93.9	75-125	0
tert-Butylbenzene	942.5	30	1000	0	94.2	65-130	0
Tetrachloroethene	926.5	30	1000	0	92.6	64-140	0
Tetrahydrofuran	916.5	200	1000	0	91.6	70-135	0
Toluene	905	30	1000	0	90.5	70-125	0
trans-1,2-Dichloroethene	998	30	1000	0	99.8	65-135	0
trans-1,3-Dichloropropene	867.5	30	1000	0	86.8	65-125	0
trans-1,4-Dichloro-2-butene	851.5	30	1000	0	85.2	70-135	0
Trichloroethene	904.5	30	1000	0	90.4	75-125	0
Trichlorofluoromethane	927	30	1000	0	92.7	25-185	0
Vinyl chloride	940.5	30	1000	0	94	60-125	0
Surr: 1,2-Dichloroethane-d4	*1039*	0	*1000*	0	*104*	*70-130*	0
Surr: 4-Bromofluorobenzene	*999.5*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1040*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*1019*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211266-09A MS** Units: **µg/Kg** Analysis Date: **11/11/2012 07:36 AM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136610** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1159	42	1395	0	83.1	75-125	0			
1,1,1-Trichloroethane	1261	42	1395	0	90.4	70-135	0			
1,1,2,2-Tetrachloroethane	1310	42	1395	0	94	55-130	0			
1,1,2-Trichloroethane	1296	42	1395	0	93	60-125	0			
1,1-Dichloroethane	1363	42	1395	0	97.8	75-125	0			
1,1-Dichloroethene	1417	42	1395	0	102	65-135	0			
1,2,3-Trichlorobenzene	1238	42	1395	0	88.8	60-135	0			
1,2,3-Trichloropropane	1293	42	1395	0	92.7	65-130	0			
1,2,3-Trimethylbenzene	1333	42	1395	0	95.6	65-135	0			
1,2,4-Trichlorobenzene	1243	42	1395	0	89.2	65-130	0			
1,2,4-Trimethylbenzene	1376	42	1395	0	98.6	65-135	0			
1,2-Dibromo-3-chloropropane	1074	42	1395	0	77	40-135	0			
1,2-Dibromoethane	1307	42	1395	0	93.7	70-125	0			
1,2-Dichlorobenzene	1291	42	1395	0	92.6	75-120	0			
1,2-Dichloroethane	1349	42	1395	0	96.8	70-135	0			
1,2-Dichloropropane	1308	42	1395	0	93.8	70-120	0			
1,3,5-Trimethylbenzene	1407	42	1395	0	101	65-135	0			
1,3-Dichlorobenzene	1250	42	1395	0	89.6	70-125	0			
1,4-Dichlorobenzene	1289	42	1395	0	92.4	70-125	0			
2-Butanone	1198	280	1395	0	85.9	30-160	0			
2-Hexanone	1383	42	1395	0	99.2	45-145	0			
4-Methyl-2-pentanone	1623	42	1395	0	116	45-145	0			
Acetone	1738	140	1395	0	125	20-160	0			
Acrylonitrile	1411	140	1395	0	101	70-135	0			
Benzene	1335	42	1395	0	95.8	75-125	0			
Bromobenzene	1318	42	1395	0	94.5	65-120	0			
Bromochloromethane	1460	42	1395	0	105	70-125	0			
Bromodichloromethane	1109	42	1395	0	79.6	70-130	0			
Bromoform	1093	42	1395	0	78.4	55-135	0			
Bromomethane	949.1	100	1395	0	68	30-160	0			
Carbon disulfide	1310	42	1395	0	93.9	45-160	0			
Carbon tetrachloride	1213	42	1395	0	87	65-135	0			
Chlorobenzene	1308	42	1395	0	93.8	75-125	0			
Chloroethane	498.6	140	1395	0	35.8	40-155	0			S
Chloroform	1394	42	1395	0	100	70-125	0			
Chloromethane	1678	140	1395	40	117	50-130	0			
cis-1,2-Dichloroethene	1331	42	1395	0	95.4	65-125	0			
cis-1,3-Dichloropropene	1097	42	1395	0	78.6	70-125	0			
Dibromochloromethane	1060	42	1395	0	76	65-135	0			
Dibromomethane	1291	42	1395	0	92.6	75-130	0			
Dichlorodifluoromethane	1366	42	1395	0	98	35-135	0			
Ethylbenzene	1343	42	1395	0	96.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	1174	42	1395	0	84.2	70-135	0
Isopropylbenzene	1388	42	1395	0	99.5	75-130	0
m,p-Xylene	2708	84	2789	0	97.1	80-125	0
Methyl tert-butyl ether	1388	42	1395	0	99.6	75-125	0
Methylene chloride	1369	42	1395	0	98.2	55-145	0
Naphthalene	1255	140	1395	0	90	40-140	0
n-Butylbenzene	1405	42	1395	0	101	65-140	0
n-Propylbenzene	1347	42	1395	0	96.6	65-135	0
o-Xylene	1358	42	1395	0	97.4	75-125	0
p-Isopropyltoluene	1354	42	1395	0	97	75-135	0
sec-Butylbenzene	1400	42	1395	0	100	65-130	0
Styrene	1375	42	1395	0	98.6	75-125	0
tert-Butylbenzene	1335	42	1395	0	95.7	65-130	0
Tetrachloroethene	1262	42	1395	0	90.4	64-140	0
Tetrahydrofuran	1442	280	1395	0	103	70-135	0
Toluene	1291	42	1395	0	92.6	70-125	0
trans-1,2-Dichloroethene	1350	42	1395	0	96.8	65-135	0
trans-1,3-Dichloropropene	1066	42	1395	0	76.4	65-125	0
trans-1,4-Dichloro-2-butene	1047	42	1395	0	75.1	70-135	0
Trichloroethene	1262	42	1395	0	90.5	75-125	0
Trichlorofluoromethane	1284	42	1395	0	92	25-185	0
Vinyl chloride	1418	42	1395	0	102	60-125	0
Surr: 1,2-Dichloroethane-d4	*1442*	0	*1395*	0	*103*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1407*	0	*1395*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*1380*	0	*1395*	0	*99*	*70-130*	0
Surr: Toluene-d8	*1368*	0	*1395*	0	*98*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211266-09A MSD** Units: **µg/Kg** Analysis Date: **11/11/2012 08:01 AM**
Client ID: Run ID: **VMS9_121110A** SeqNo: **2136611** Prep Date: **11/9/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1128	42	1395	0	80.9	75-125	1159	2.68	30	
1,1,1-Trichloroethane	1201	42	1395	0	86.1	70-135	1261	4.87	30	
1,1,2,2-Tetrachloroethane	1292	42	1395	0	92.6	55-130	1310	1.39	30	
1,1,2-Trichloroethane	1252	42	1395	0	89.8	60-125	1296	3.5	30	
1,1-Dichloroethane	1306	42	1395	0	93.6	75-125	1363	4.28	30	
1,1-Dichloroethene	1356	42	1395	0	97.2	65-135	1417	4.38	30	
1,2,3-Trichlorobenzene	1236	42	1395	0	88.6	60-135	1238	0.113	30	
1,2,3-Trichloropropane	1296	42	1395	0	93	65-130	1293	0.269	30	
1,2,3-Trimethylbenzene	1300	42	1395	0	93.2	65-135	1333	2.54	30	
1,2,4-Trichlorobenzene	1243	42	1395	0	89.2	65-130	1243	0	30	
1,2,4-Trimethylbenzene	1337	42	1395	0	95.8	65-135	1376	2.88	30	
1,2-Dibromo-3-chloropropane	1071	42	1395	0	76.8	40-135	1074	0.26	30	
1,2-Dibromoethane	1286	42	1395	0	92.2	70-125	1307	1.61	30	
1,2-Dichlorobenzene	1250	42	1395	0	89.6	75-120	1291	3.18	30	
1,2-Dichloroethane	1273	42	1395	0	91.2	70-135	1349	5.85	30	
1,2-Dichloropropane	1278	42	1395	0	91.6	70-120	1308	2.32	30	
1,3,5-Trimethylbenzene	1360	42	1395	0	97.5	65-135	1407	3.43	30	
1,3-Dichlorobenzene	1227	42	1395	0	88	70-125	1250	1.86	30	
1,4-Dichlorobenzene	1245	42	1395	0	89.3	70-125	1289	3.41	30	
2-Butanone	1281	280	1395	0	91.8	30-160	1198	6.69	30	
2-Hexanone	1378	42	1395	0	98.8	45-145	1383	0.354	30	
4-Methyl-2-pentanone	1674	42	1395	0	120	45-145	1623	3.09	30	
Acetone	1805	140	1395	0	129	20-160	1738	3.74	30	
Acrylonitrile	1414	140	1395	0	101	70-135	1411	0.247	30	
Benzene	1267	42	1395	0	90.8	75-125	1335	5.25	30	
Bromobenzene	1286	42	1395	0	92.2	65-120	1318	2.46	30	
Bromochloromethane	1429	42	1395	0	102	70-125	1460	2.12	30	
Bromodichloromethane	1110	42	1395	0	79.6	70-130	1109	0.0628	30	
Bromoform	1105	42	1395	0	79.2	55-135	1093	1.02	30	
Bromomethane	891.2	100	1395	0	63.9	30-160	949.1	6.29	30	
Carbon disulfide	1307	42	1395	0	93.7	45-160	1310	0.213	30	
Carbon tetrachloride	1158	42	1395	0	83	65-135	1213	4.59	30	
Chlorobenzene	1260	42	1395	0	90.4	75-125	1308	3.69	30	
Chloroethane	463.7	140	1395	0	33.2	40-155	498.6	7.25	30	S
Chloroform	1348	42	1395	0	96.6	70-125	1394	3.36	30	
Chloromethane	1623	140	1395	40	114	50-130	1678	3.3	30	
cis-1,2-Dichloroethene	1298	42	1395	0	93.1	65-125	1331	2.49	30	
cis-1,3-Dichloropropene	1069	42	1395	0	76.6	70-125	1097	2.58	30	
Dibromochloromethane	1038	42	1395	0	74.4	65-135	1060	2.13	30	
Dibromomethane	1290	42	1395	0	92.5	75-130	1291	0.108	30	
Dichlorodifluoromethane	1282	42	1395	0	92	35-135	1366	6.32	30	
Ethylbenzene	1282	42	1395	0	91.9	75-125	1343	4.68	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44646** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	1132	42	1395	0	81.2	70-135	1174	3.63	30
Isopropylbenzene	1336	42	1395	0	95.8	75-130	1388	3.79	30
m,p-Xylene	2602	84	2789	0	93.3	80-125	2708	3.99	30
Methyl tert-butyl ether	1376	42	1395	0	98.6	75-125	1388	0.908	30
Methylene chloride	1356	42	1395	0	97.2	55-145	1369	0.921	30
Naphthalene	1340	140	1395	0	96	40-140	1255	6.56	30
n-Butylbenzene	1372	42	1395	0	98.4	65-140	1405	2.36	30
n-Propylbenzene	1303	42	1395	0	93.4	65-135	1347	3.37	30
o-Xylene	1299	42	1395	0	93.2	75-125	1358	4.46	30
p-Isopropyltoluene	1307	42	1395	0	93.7	75-135	1354	3.51	30
sec-Butylbenzene	1342	42	1395	0	96.2	65-130	1400	4.22	30
Styrene	1340	42	1395	0	96	75-125	1375	2.62	30
tert-Butylbenzene	1293	42	1395	0	92.7	65-130	1335	3.18	30
Tetrachloroethene	1194	42	1395	0	85.6	64-140	1262	5.51	30
Tetrahydrofuran	1418	280	1395	0	102	70-135	1442	1.71	30
Toluene	1237	42	1395	0	88.7	70-125	1291	4.25	30
trans-1,2-Dichloroethene	1318	42	1395	0	94.5	65-135	1350	2.4	30
trans-1,3-Dichloropropene	1065	42	1395	0	76.4	65-125	1066	0.0655	30
trans-1,4-Dichloro-2-butene	1057	42	1395	0	75.8	70-135	1047	0.928	30
Trichloroethene	1213	42	1395	0	87	75-125	1262	4	30
Trichlorofluoromethane	1234	42	1395	0	88.4	25-185	1284	3.99	30
Vinyl chloride	1386	42	1395	0	99.4	60-125	1418	2.24	30
Surr: 1,2-Dichloroethane-d4	*1427*	0	*1395*	0	*102*	*70-130*	1442	*1.02*	*30*
Surr: 4-Bromofluorobenzene	*1392*	0	*1395*	0	*99.8*	*70-130*	1407	*1.1*	*30*
Surr: Dibromofluoromethane	*1407*	0	*1395*	0	*101*	*70-130*	1380	*1.9*	*30*
Surr: Toluene-d8	*1364*	0	*1395*	0	*97.8*	*70-130*	1368	*0.255*	*30*

The following samples were analyzed in this batch: 1211227-07A 1211227-08B 1211227-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211227
Project: Marshall KRRI 1000-1100R 11/5/12

QC BATCH REPORT

Batch ID: **R112357** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112357** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135500** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112357** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135496** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211227-05A DUP** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: **SBKR1000R514S110512S004** Run ID: **MOIST_121108B** SeqNo: **2135486** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	71.49	0.050	0	0	0	0-0	70.83	0.927	20	

DUP Sample ID: **1211246-01A DUP** Units: **% of sample** Analysis Date: **11/8/2012 03:00 PM**
Client ID: Run ID: **MOIST_121108B** SeqNo: **2135494** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.03	0.050	0	0	0	0-0	13.06	16.9	20	

The following samples were analyzed in this batch:

1211227-01A	1211227-02A	1211227-03A
1211227-04A	1211227-05A	1211227-06A
1211227-08A	1211227-09A	1211227-10A
1211227-11A	1211227-12A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211227

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110512_GMK1	Task: KRRI_1000-1100
	Total # of Samples: 12	Event Complete?

Turn Around Time	5 Day	Rush	No	

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-8263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email:	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:			
Project #	60162778		
Site Address	5555 Glenwood Parkway SE Suite 200		
City	Grand Rapids	State, Zip	MI
Site PM Name	Bryan Stiemsma		
Phone/Fax:	[redacted]		
Site PM Email:	Bryan.Stiemsma@aecom.com		

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable		
Address:	1100 Louisiana Suite 1100		
City/State,	Houson, TX	Phone #:	713-821-2000
PO #			
Send EDD to			
CC Hardcopy report			
CC Hardcopy report			

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.
	Preservative						
	Analysis						
1	SBKR1000R510S110512S005	SBKR1000R510	SO	G	11/05/2012 10:58	3	
2	SBKR1000R511S110512S003	SBKR1000R511	SO	G	11/05/2012 11:31	3	
3	SBKR1000R512S110512S005	SBKR1000R512	SO	G	11/05/2012 13:16	6	
4	SBKR1000R513S110512S008	SBKR1000R513	SO	G	11/05/2012 13:55	3	
5	SBKR1000R514S110512S004	SBKR1000R514	SO	G	11/05/2012 14:35	3	
6	SBKR1000R515S110512S004	SBKR1000R515	SO	G	11/05/2012 15:56	3	
7	SBKR1000R515T110512MX	SBKR1000R515	SQ	G	11/05/2012 00:00	1	TRIP BLANK
8	SBKR1100R507S110512S005	SBKR1100R507	SO	G	11/05/2012 08:31	3	
9	SBKR1100R508S110512S004	SBKR1100R508	SO	G	11/05/2012 09:06	3	
10	SBKR1100R509S110512S004	SBKR1100R509	SO	G	11/05/2012 09:36	3	
11	SBKR1100R510S110512S007	SBKR1100R510	SO	G	11/05/2012 10:10	3	
12	SBKR1000R512D110512S005	SBKR1000R512	SO	G	11/05/2012 13:16	3	DUPLICATE

Preservative	None	None	None	None	MeOH											
Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260											
1	X	X	X	X	X											
2	X	X	X	X	X											
3	X	X	X	X	X											
4	X	X	X	X	X											
5	X	X	X	X	X											
6	X	X	X	X	X											
7					X											
8	X	X	X	X	X											
9	X	X	X	X	X											
10	X	X	X	X	X											
11	X	X	X	X	X											
12	X	X	X	X	X											

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
A. Kramer	11.7.12	0930	[signature]	11-7-12	0930
[signature]	11-7-12	1300	[signature]	11/7/12	1306

Sample Receipt Conditions

Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?
3.0°c	Y/N	Y/N	Y/N
	(Y)/N	(Y)/N	(Y)/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO: SAMPLER NAME AND SIGNATURE

Company:
Tracking #:
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed
Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **07-Nov-12 13:00**

Work Order: **1211227** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 08-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 11-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/8/2012 9:49:21 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

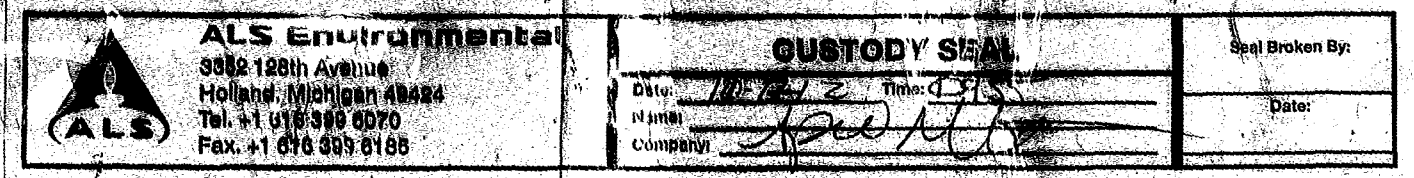
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
ALS
CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
Date:

20-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000R 11/7/12** Work Order: **1211292**

Dear Bryan,

ALS Environmental received 10 samples on 09-Nov-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 55.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 11/7/12
Work Order: **1211292**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211292-01	SBKR1000R525S110712S004	Soil		11/7/2012 08:30	11/9/2012 16:43	☐
1211292-02	SBKR1000R526S110712S005	Soil		11/7/2012 09:20	11/9/2012 16:43	☐
1211292-03	SBKR1000R527S110712S006	Soil		11/7/2012 10:34	11/9/2012 16:43	☐
1211292-04	SBKR1000R528S110712S006	Soil		11/7/2012 11:24	11/9/2012 16:43	☐
1211292-05	SBKR1000R529S110712S004	Soil		11/7/2012 13:04	11/9/2012 16:43	☐
1211292-06	SBKR1000R530S110712S004	Soil		11/7/2012 13:56	11/9/2012 16:43	☐
1211292-07	SBKR1000R531S110712S004	Soil		11/7/2012 14:49	11/9/2012 16:43	☐
1211292-08	SBKR1000R532S110712S006	Soil		11/7/2012 15:53	11/9/2012 16:43	☐
1211292-09	SBKR1000R532D110712S006	Soil		11/7/2012 15:53	11/9/2012 16:43	☐
1211292-10	SBKR1000R532T110712MX	Soil		11/7/2012	11/9/2012 16:43	☐

Client: AECOM Environment
Project: Marshall KRRI 1000R 11/7/12
Work Order: 1211292

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44741 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44689 LCS recovery for Chloromethane was above control limits, but all samples in this quality control batch were ND for this compound. No data requires qualification. Sample SBKR1000R525S110712S004 MS/MSD recoveries for Bromochloromethane and MS recoveries for THF and Vinyl Chloride were above control limits. The parent sample was ND for these compounds. No data requires qualification. The MS/MSD recoveries for trans-1,4-Dichloro-2-butene were below control limits. The corresponding reporting limit in the parent sample may be biased low for this compound. The RPD between the MS and MSD was outside of the control limits for Chloromethane. The individual MS/ MSD recoveries met quality control criteria. No data requires qualification.

Batch 44730 sample SBKR1000R531S110712S004 MS/MSD recoveries for DRO/ORO were below control limits. The corresponding results in the parent sample may be biased low for DRO/ORO.

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R 11/7/12
WorkOrder: **1211292**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R525S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 8:30:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**93**	**19**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**230**	**38**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*71.2*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	2.6	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**12**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**24**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*64.5*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*72.7*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*83.6*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*96.6*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*81.5*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*84.7*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	61	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	61	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	61	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	61	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R525S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 8:30:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	61	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	61	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	61	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	61	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	61	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	61	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	61	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	61	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	61	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	61	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	61	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

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Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R525S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 8:30:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	61	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	61	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	61	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	61	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	61	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	61	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	61	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	61	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	61	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	61	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	61	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	61	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*89.1*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*93.2*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*95.2*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**51**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R526S110712S005
Work Order:	1211292	**Collection Date:**	11/7/2012 9:20:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**35**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**400**	**69**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*64.4*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	2.2	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	5.6	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**14**	**5.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**28**	**5.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*58.5*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*65.8*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*77.3*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*88.6*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*73.8*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*77.4*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	110	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R526S110712S005
Work Order:	1211292	**Collection Date:**	11/7/2012 9:20:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	110	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	110	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	110	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	380	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	110	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	110	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	380	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	110	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	110	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R526S110712S005
Work Order:	1211292	**Collection Date:**	11/7/2012 9:20:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	230	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	110	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	110	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	380	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	110	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	110	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	110	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	110	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	110	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	110	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	110	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*92.6*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*91.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*98.0*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**73**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R527S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 10:34:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**160**	**23**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**420**	**46**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*69.8*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	3.6	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**14**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**27**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*60.7*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*64.7*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*73.1*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*90.2*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*71.2*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*76.3*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	73	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	73	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	73	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	73	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R527S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 10:34:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	73	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	73	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	73	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	73	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	73	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	73	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	73	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	73	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	73	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R527S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 10:34:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	73	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	150	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	73	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	73	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	73	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	73	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	73	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	73	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	73	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*92.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*97.6*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**59**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R528S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 11:24:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**83**	**18**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**160**	**37**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*67.4*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**11**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**22**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*58.8*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*67.9*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*77.4*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*89.2*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*75.7*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*78.8*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	60	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	60	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	60	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	60	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R528S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 11:24:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	60	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	60	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	60	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	60	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	60	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	60	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	60	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	60	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	60	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R528S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 11:24:00 AM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	60	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	60	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	60	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	60	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	60	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	60	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	60	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	60	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*92.5*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*89.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*96.8*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**50**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R529S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 1:04:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**25**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**280**	**51**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*71.1*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.6	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	4.0	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**13**	**4.0**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**24**	**4.0**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*62.5*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*67.8*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*80.2*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*93.6*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*78.2*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*81.0*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	81	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	81	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	81	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	81	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R529S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 1:04:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	81	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	81	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	81	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	81	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	81	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	81	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	81	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	81	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	270	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	81	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	81	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	81	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R529S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 1:04:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	81	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	160	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	81	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	81	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	81	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	81	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	81	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	81	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	81	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	81	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	81	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	81	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	81	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.6*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*90.9*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*96.4*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**63**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R530S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 1:56:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**84**	**18**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**140**	**36**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*66.7*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	2.8	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**8.1**	**2.8**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**16**	**2.8**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*57.5*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*67.1*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*77.3*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*91.0*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*76.5*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*78.7*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	58	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	58	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	58	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	58	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R530S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 1:56:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	58	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	58	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	58	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	58	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	58	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	58	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	58	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	58	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	58	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	58	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	58	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R530S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 1:56:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	58	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	58	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	58	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	58	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	58	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	58	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	58	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	58	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	58	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	58	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	58	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	58	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.8*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*89.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.9*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R531S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 2:49:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**71**	**15**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**160**	**30**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*68.7*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	0.84	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	2.1	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**10**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**21**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*58.7*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*66.2*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*75.7*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*91.7*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*75.7*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*77.4*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R531S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 2:49:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	46	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	46	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R531S110712S004
Work Order:	1211292	**Collection Date:**	11/7/2012 2:49:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	46	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.8*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*90.5*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*97.4*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**35**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 3:53:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**180**	**37**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**380**	**74**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*67.5*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	2.4	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	6.0	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**21**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**28**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(b)fluoranthene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	**390**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*63.9*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*66.4*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*80.6*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*90.2*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*77.1*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*75.0*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	120	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	120	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 3:53:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	120	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	120	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	120	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	120	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	380	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	120	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	120	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	120	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	120	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	120	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	120	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	120	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	380	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	120	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	120	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532S110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 3:53:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	120	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	230	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	120	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	120	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	380	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	120	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	120	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	120	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	120	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	120	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	120	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	120	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	120	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	120	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	120	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.5*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*87.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.9*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**74**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532D110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 3:53:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**35**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**570**	**69**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*77.8*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.9	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	4.7	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**20**	**4.7**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**27**	**4.7**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	**520**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(a)pyrene	**630**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(b)fluoranthene	**770**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	**750**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*64.2*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*68.8*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*82.1*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*94.6*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*78.5*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*77.9*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	110	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532D110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 3:53:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	110	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	110	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	110	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	110	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	370	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	110	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	110	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	110	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	370	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	110	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	110	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532D110712S006
Work Order:	1211292	**Collection Date:**	11/7/2012 3:53:00 PM
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	220	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	110	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	110	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	370	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	110	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	110	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	110	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	110	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	110	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	110	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	110	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	110	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	110	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	110	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*92.6*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*92.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.2*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**73**	**0.050**	**0**		**% of sample**	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532T110712MX
Work Order:	1211292	**Collection Date:**	11/7/2012
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/13/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/13/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/13/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/13/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/13/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/13/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/13/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/13/2012
Benzene	ND	50	50		µg/Kg	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/13/2012
Bromoform	ND	100	100		µg/Kg	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/13/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/13/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg	1	11/13/2012
Chloroform	ND	50	50		µg/Kg	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg	1	11/13/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/13/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R532T110712MX
Work Order:	1211292	**Collection Date:**	11/7/2012
Project:	Marshall KRRI 1000R 11/7/12		
Lab ID:	1211292-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/13/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/13/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg	1	11/13/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/13/2012
o-Xylene	ND	50	50		µg/Kg	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/13/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/13/2012
Styrene	ND	50	50		µg/Kg	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/13/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/13/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/13/2012
Toluene	ND	100	100		µg/Kg	1	11/13/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/13/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/13/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/13/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*94.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*91.0*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*96.1*	*70-130*			*%REC*	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211292

Project: Marshall KRRI 1000R 11/7/12

Batch ID: **44730** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44730-44730** Units: **mg/Kg** Analysis Date: **11/15/2012 08:48 AM**

Client ID: Run ID: **GC8_121115A** SeqNo: **2140904** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.415*	0	*5*	0	*68.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44730-44730** Units: **mg/Kg** Analysis Date: **11/15/2012 09:15 AM**

Client ID: Run ID: **GC8_121115A** SeqNo: **2140905** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	313.8	10	500	0	62.8	49-124	0			
ORO (C20-C34)	328.6	20	500	0	65.7	60-130	0			
Surr: 4-Terphenyl-d14	*4.104*	0	*5*	0	*82.1*	*39-115*	0			

MS Sample ID: **1211292-07A MS** Units: **mg/Kg** Analysis Date: **11/15/2012 09:42 AM**

Client ID: **SBKR1000R531S110712S004** Run ID: **GC8_121115A** SeqNo: **2140906** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	293	9.5	476.6	47	51.6	60-130	0			S
ORO (C20-C34)	352.8	19	476.6	98.63	53.3	60-130	0			S
Surr: 4-Terphenyl-d14	*3.854*	0	*4.766*	0	*80.9*	*39-115*	0			

MSD Sample ID: **1211292-07A MSD** Units: **mg/Kg** Analysis Date: **11/15/2012 10:09 AM**

Client ID: **SBKR1000R531S110712S004** Run ID: **GC8_121115A** SeqNo: **2140907** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	299	9.8	491.1	47	51.3	60-130	293	2.03	30	S
ORO (C20-C34)	374.9	20	491.1	98.63	56.2	60-130	352.8	6.05	30	S
Surr: 4-Terphenyl-d14	*4.017*	0	*4.911*	0	*81.8*	*39-115*	3.854	*4.15*	*30*	

The following samples were analyzed in this batch:

1211292-01A	1211292-02A	1211292-03A
1211292-04A	1211292-05A	1211292-06A
1211292-07A	1211292-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44773** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:11 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143011** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
Surr: 4-Terphenyl-d14	*3.464*	0	*5*	0	*69.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:37 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143012** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	321.2	10	500	0	64.2	49-124	0			
ORO (C20-C34)	327.7	20	500	0	65.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.557*	0	*5*	0	*91.1*	*39-115*	0			

MS Sample ID: **1211465-03A MS** Units: **mg/Kg** Analysis Date: **11/16/2012 06:04 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143014** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	316.1	9.7	485.9	0	65.1	60-130	0			
ORO (C20-C34)	343.8	19	485.9	0	70.8	60-130	0			
Surr: 4-Terphenyl-d14	*4.416*	0	*4.859*	0	*90.9*	*39-115*	0			

MSD Sample ID: **1211465-03A MSD** Units: **mg/Kg** Analysis Date: **11/16/2012 06:31 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143015** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	307.4	9.7	484.1	0	63.5	60-130	316.1	2.8	30	
ORO (C20-C34)	328.5	19	484.1	0	67.9	60-130	343.8	4.57	30	
Surr: 4-Terphenyl-d14	*3.58*	0	*4.841*	0	*74*	*39-115*	4.416	*20.9*	*30*	

The following samples were analyzed in this batch: 1211292-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44741** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44741-44741** Units: **mg/Kg** Analysis Date: **11/14/2012 03:00 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139487** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

MBLK Sample ID: **MBLK-44741-44741** Units: **mg/Kg** Analysis Date: **11/16/2012 06:59 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143062** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								

LCS Sample ID: **LCS-44741-44741** Units: **mg/Kg** Analysis Date: **11/14/2012 03:06 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139488** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	4.492	0.25	5	0	89.8	80-120	0			
Nickel	4.366	0.25	5	0	87.3	80-120	0			
Vanadium	4.652	0.25	5	0	93	80-120	0			

LCS Sample ID: **LCS-44741-44741** Units: **mg/Kg** Analysis Date: **11/16/2012 07:05 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143063** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.87	0.10	5	0	97.4	80-120	0			

MS Sample ID: **1211284-10BMS** Units: **mg/Kg** Analysis Date: **11/14/2012 03:18 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139490** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	6.67	0.38	7.576	0.4205	82.5	75-125	0			
Nickel	14.36	0.38	7.576	9.631	62.4	75-125	0			S
Vanadium	19.08	0.38	7.576	10.97	107	75-125	0			

MS Sample ID: **1211284-10BMS** Units: **mg/Kg** Analysis Date: **11/16/2012 07:16 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143065** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.398	0.15	7.576	0.4118	65.8	75-125	0			S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44741** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **1211284-10BMSD** Units: **mg/Kg** Analysis Date: **11/14/2012 03:24 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139491** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	6.215	0.36	7.205	0.4205	80.4	75-125	6.67	7.06	25	
Nickel	13.77	0.36	7.205	9.631	57.4	75-125	14.36	4.18	25	S
Vanadium	18.5	0.36	7.205	10.97	104	75-125	19.08	3.1	25	

MSD Sample ID: **1211284-10BMSD** Units: **mg/Kg** Analysis Date: **11/16/2012 07:22 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143066** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.988	0.14	7.205	0.4118	63.5	75-125	5.398	7.9	25	S

The following samples were analyzed in this batch:

1211292-01A	1211292-02A	1211292-03A
1211292-04A	1211292-05A	1211292-06A
1211292-07A	1211292-08A	1211292-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44729** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44729-44729** Units: **µg/Kg** Analysis Date: **11/16/2012 01:57 PM**
Client ID: Run ID: **SVMS4_121116A** SeqNo: **2141686** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*4021*	0	*5000*	0	*80.4*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3591*	0	*5000*	0	*71.8*	*12-100*	0			
Surr: 2-Fluorophenol	*4614*	0	*5000*	0	*92.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6428*	0	*5000*	0	*129*	*25-137*	0			
Surr: Nitrobenzene-d5	*3996*	0	*5000*	0	*79.9*	*37-107*	0			
Surr: Phenol-d6	*4136*	0	*5000*	0	*82.7*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44729** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44729-44729** Units: **µg/Kg** Analysis Date: **11/16/2012 01:26 PM**
Client ID: Run ID: **SVMS4_121116A** SeqNo: **2141685** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1481	50	2000	0	74	45-105	0			
Acenaphthene	1603	50	2000	0	80.2	45-110	0			
Acenaphthylene	1522	50	2000	0	76.1	45-105	0			
Anthracene	1740	50	2000	0	87	55-105	0			
Benzo(a)anthracene	1736	50	2000	0	86.8	50-110	0			
Benzo(a)pyrene	1691	50	2000	0	84.6	50-110	0			
Benzo(b)fluoranthene	1827	50	2000	0	91.4	45-115	0			
Benzo(g,h,i)perylene	2102	50	2000	0	105	40-125	0			
Benzo(k)fluoranthene	1906	50	2000	0	95.3	45-115	0			
Chrysene	1800	50	2000	0	90	55-110	0			
Dibenzo(a,h)anthracene	1834	50	2000	0	91.7	40-125	0			
Fluoranthene	1582	50	2000	0	79.1	55-115	0			
Fluorene	1654	50	2000	0	82.7	50-110	0			
Indeno(1,2,3-cd)pyrene	1833	50	2000	0	91.6	40-120	0			
Naphthalene	1477	50	2000	0	73.8	40-105	0			
Phenanthrene	1679	50	2000	0	84	50-110	0			
Pyrene	1836	50	2000	0	91.8	45-125	0			
Surr: 2,4,6-Tribromophenol	*4404*	0	*5000*	0	*88.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3596*	0	*5000*	0	*71.9*	*12-100*	0			
Surr: 2-Fluorophenol	*4324*	0	*5000*	0	*86.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6234*	0	*5000*	0	*125*	*25-137*	0			
Surr: Nitrobenzene-d5	*3853*	0	*5000*	0	*77.1*	*37-107*	0			
Surr: Phenol-d6	*4046*	0	*5000*	0	*80.9*	*40-106*	0			

The following samples were analyzed in this batch:

1211292-01A	1211292-02A	1211292-03A
1211292-04A	1211292-05A	1211292-06A
1211292-07A	1211292-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44689-44689** Units: **µg/Kg** Analysis Date: **11/13/2012 04:21 PM**
Client ID: Run ID: **VMS9_121113A** SeqNo: **2138688** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	236	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	32.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1063*	0	*1000*	0	*106*	*70-130*	0
Surr: 4-Bromofluorobenzene	*922*	0	*1000*	0	*92.2*	*70-130*	0
Surr: Dibromofluoromethane	*935*	0	*1000*	0	*93.5*	*70-130*	0
Surr: Toluene-d8	*964*	0	*1000*	0	*96.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44689-44689** Units: **µg/Kg** Analysis Date: **11/14/2012 01:47 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139684** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	223.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	42.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1061*	0	*1000*	0	*106*	*70-130*	0
Surr: 4-Bromofluorobenzene	*907.5*	0	*1000*	0	*90.8*	*70-130*	0
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*70-130*	0
Surr: Toluene-d8	*954.5*	0	*1000*	0	*95.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44689-44689** Units: **µg/Kg** Analysis Date: **11/13/2012 03:04 PM**
Client ID: Run ID: **VMS9_121113A** SeqNo: **2138687** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	844.5	30	1000	0	84.4	75-125	0			
1,1,1-Trichloroethane	924.5	30	1000	0	92.4	70-135	0			
1,1,2,2-Tetrachloroethane	921	30	1000	0	92.1	55-130	0			
1,1,2-Trichloroethane	911.5	30	1000	0	91.2	60-125	0			
1,1-Dichloroethane	1092	30	1000	0	109	75-125	0			
1,1-Dichloroethene	1158	30	1000	0	116	65-135	0			
1,2,3-Trichlorobenzene	882	30	1000	0	88.2	60-135	0			
1,2,3-Trichloropropane	902	30	1000	0	90.2	65-130	0			
1,2,4-Trichlorobenzene	934	30	1000	0	93.4	65-130	0			
1,2,4-Trimethylbenzene	971	30	1000	0	97.1	65-135	0			
1,2-Dibromo-3-chloropropane	724	30	1000	0	72.4	40-135	0			
1,2-Dibromoethane	932	30	1000	0	93.2	70-125	0			
1,2-Dichlorobenzene	917.5	30	1000	0	91.8	75-120	0			
1,2-Dichloroethane	975	30	1000	0	97.5	70-135	0			
1,2-Dichloropropane	985.5	30	1000	0	98.6	70-120	0			
1,3,5-Trimethylbenzene	980	30	1000	0	98	65-135	0			
1,3-Dichlorobenzene	905.5	30	1000	0	90.6	70-125	0			
1,4-Dichlorobenzene	927	30	1000	0	92.7	70-125	0			
2-Butanone	1138	200	1000	0	114	30-160	0			
2-Hexanone	882.5	30	1000	0	88.2	45-145	0			
4-Methyl-2-pentanone	1042	30	1000	0	104	45-145	0			
Acetone	1170	250	1000	0	117	20-160	0			
Acrylonitrile	1042	100	1000	0	104	70-135	0			
Benzene	975.5	30	1000	0	97.6	75-125	0			
Bromobenzene	935	30	1000	0	93.5	65-120	0			
Bromochloromethane	1162	30	1000	0	116	70-125	0			
Bromodichloromethane	887.5	30	1000	0	88.8	70-130	0			
Bromoform	812.5	30	1000	0	81.2	55-135	0			
Bromomethane	1018	75	1000	0	102	30-160	0			
Carbon disulfide	1188	30	1000	0	119	45-160	0			
Carbon tetrachloride	907	30	1000	0	90.7	65-135	0			
Chlorobenzene	928	30	1000	0	92.8	75-125	0			
Chloroethane	1229	100	1000	0	123	40-155	0			
Chloroform	1124	30	1000	0	112	70-125	0			
Chloromethane	1270	100	1000	0	127	50-130	0			
cis-1,2-Dichloroethene	1118	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	870	30	1000	0	87	70-125	0			
Dibromochloromethane	810	30	1000	0	81	65-135	0			
Dibromomethane	993.5	30	1000	0	99.4	75-130	0			
Dichlorodifluoromethane	1061	30	1000	0	106	35-135	0			
Ethylbenzene	944	30	1000	0	94.4	75-125	0			
Hexachloroethane	873	30	1000	0	87.3	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	951	30	1000	0	95.1	75-130	0
m,p-Xylene	1885	60	2000	0	94.2	80-125	0
Methyl tert-butyl ether	1086	30	1000	0	109	75-125	0
Methylene chloride	1100	30	1000	0	110	55-145	0
Naphthalene	862.5	100	1000	0	86.2	40-140	0
n-Butylbenzene	1047	30	1000	0	105	65-140	0
n-Propylbenzene	946.5	30	1000	0	94.6	65-135	0
o-Xylene	929.5	30	1000	0	93	75-125	0
p-Isopropyltoluene	955.5	30	1000	0	95.6	75-135	0
sec-Butylbenzene	1010	30	1000	0	101	65-130	0
Styrene	971.5	30	1000	0	97.2	75-125	0
tert-Butylbenzene	945	30	1000	0	94.5	65-130	0
Tetrachloroethene	907.5	30	1000	0	90.8	64-140	0
Tetrahydrofuran	1021	200	1000	0	102	70-135	0
Toluene	925.5	30	1000	0	92.6	70-125	0
trans-1,2-Dichloroethene	1130	30	1000	0	113	65-135	0
trans-1,3-Dichloropropene	821.5	30	1000	0	82.2	65-125	0
trans-1,4-Dichloro-2-butene	841	30	1000	0	84.1	70-135	0
Trichloroethene	922	30	1000	0	92.2	75-125	0
Trichlorofluoromethane	1062	30	1000	0	106	25-185	0
Vinyl chloride	1130	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*1048*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: Dibromofluoromethane	*1076*	0	*1000*	0	*108*	*70-130*	0
Surr: Toluene-d8	*994.5*	0	*1000*	0	*99.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

LCS	Sample ID: **LCS-44689-44689**				Units: **µg/Kg**		Analysis Date: **11/14/2012 12:31 PM**			
Client ID:		Run ID: **VMS9_121114A**			SeqNo: **2139683**		Prep Date: **11/12/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	817.5	30	1000	0	81.8	75-125	0			
1,1,1-Trichloroethane	906	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	874	30	1000	0	87.4	55-130	0			
1,1,2-Trichloroethane	862.5	30	1000	0	86.2	60-125	0			
1,1-Dichloroethane	1102	30	1000	0	110	75-125	0			
1,1-Dichloroethene	1172	30	1000	0	117	65-135	0			
1,2,3-Trichlorobenzene	845.5	30	1000	0	84.6	60-135	0			
1,2,3-Trichloropropane	810.5	30	1000	0	81	65-130	0			
1,2,4-Trichlorobenzene	870.5	30	1000	0	87	65-130	0			
1,2,4-Trimethylbenzene	913	30	1000	0	91.3	65-135	0			
1,2-Dibromo-3-chloropropane	692.5	30	1000	0	69.2	40-135	0			
1,2-Dibromoethane	876.5	30	1000	0	87.6	70-125	0			
1,2-Dichlorobenzene	863.5	30	1000	0	86.4	75-120	0			
1,2-Dichloroethane	968.5	30	1000	0	96.8	70-135	0			
1,2-Dichloropropane	977.5	30	1000	0	97.8	70-120	0			
1,3,5-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,3-Dichlorobenzene	862.5	30	1000	0	86.2	70-125	0			
1,4-Dichlorobenzene	877	30	1000	0	87.7	70-125	0			
2-Butanone	1154	200	1000	0	115	30-160	0			
2-Hexanone	823.5	30	1000	0	82.4	45-145	0			
4-Methyl-2-pentanone	968.5	30	1000	0	96.8	45-145	0			
Acetone	1148	100	1000	0	115	20-160	0			B
Acrylonitrile	999.5	100	1000	0	100	70-135	0			
Benzene	970.5	30	1000	0	97	75-125	0			
Bromobenzene	885	30	1000	0	88.5	65-120	0			
Bromochloromethane	1163	30	1000	0	116	70-125	0			
Bromodichloromethane	884	30	1000	0	88.4	70-130	0			
Bromoform	784.5	30	1000	0	78.4	55-135	0			
Bromomethane	959.5	75	1000	0	96	30-160	0			
Carbon disulfide	1178	30	1000	0	118	45-160	0			
Carbon tetrachloride	908.5	30	1000	0	90.8	65-135	0			
Chlorobenzene	884	30	1000	0	88.4	75-125	0			
Chloroethane	1230	100	1000	0	123	40-155	0			
Chloroform	1110	30	1000	0	111	70-125	0			
Chloromethane	1308	100	1000	0	131	50-130	0			S
cis-1,2-Dichloroethene	1116	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	852	30	1000	0	85.2	70-125	0			
Dibromochloromethane	780	30	1000	0	78	65-135	0			
Dibromomethane	960.5	30	1000	0	96	75-130	0			
Dichlorodifluoromethane	959.5	30	1000	0	96	35-135	0			
Ethylbenzene	905	30	1000	0	90.5	75-125	0			
Hexachloroethane	866.5	30	1000	0	86.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	920.5	30	1000	0	92	75-130	0
m,p-Xylene	1816	60	2000	0	90.8	80-125	0
Methyl tert-butyl ether	1049	30	1000	0	105	75-125	0
Methylene chloride	1127	30	1000	0	113	55-145	0
Naphthalene	806.5	100	1000	0	80.6	40-140	0
n-Butylbenzene	975	30	1000	0	97.5	65-140	0
n-Propylbenzene	913	30	1000	0	91.3	65-135	0
o-Xylene	899	30	1000	0	89.9	75-125	0
p-Isopropyltoluene	918.5	30	1000	0	91.8	75-135	0
sec-Butylbenzene	953.5	30	1000	0	95.4	65-130	0
Styrene	931	30	1000	0	93.1	75-125	0
tert-Butylbenzene	903.5	30	1000	0	90.4	65-130	0
Tetrachloroethene	830.5	30	1000	0	83	64-140	0
Tetrahydrofuran	979	200	1000	0	97.9	70-135	0
Toluene	892.5	30	1000	0	89.2	70-125	0
trans-1,2-Dichloroethene	1145	30	1000	0	114	65-135	0
trans-1,3-Dichloropropene	772.5	30	1000	0	77.2	65-125	0
trans-1,4-Dichloro-2-butene	769.5	30	1000	0	77	70-135	0
Trichloroethene	927	30	1000	0	92.7	75-125	0
Trichlorofluoromethane	1026	30	1000	0	103	25-185	0
Vinyl chloride	1130	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*1050*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*996*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Dibromofluoromethane	*1070*	0	*1000*	0	*107*	*70-130*	0
Surr: Toluene-d8	*972*	0	*1000*	0	*97.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211292-01B MS** Units: **µg/Kg** Analysis Date: **11/14/2012 09:28 PM**
Client ID: **SBKR1000R525S110712S004** Run ID: **VMS9_121114A** SeqNo: **2139647** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	813	30	1000	0	81.3	75-125	0			
1,1,1-Trichloroethane	955	30	1000	0	95.5	70-135	0			
1,1,2,2-Tetrachloroethane	1008	30	1000	0	101	55-130	0			
1,1,2-Trichloroethane	972.5	30	1000	0	97.2	60-125	0			
1,1-Dichloroethane	1247	30	1000	0	125	75-125	0			
1,1-Dichloroethene	1298	30	1000	0	130	65-135	0			
1,2,3-Trichlorobenzene	858	30	1000	0	85.8	60-135	0			
1,2,3-Trichloropropane	968.5	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	863	30	1000	0	86.3	65-130	0			
1,2,4-Trimethylbenzene	1012	30	1000	0	101	65-135	0			
1,2-Dibromo-3-chloropropane	718.5	30	1000	0	71.8	40-135	0			
1,2-Dibromoethane	977	30	1000	0	97.7	70-125	0			
1,2-Dichlorobenzene	912	30	1000	0	91.2	75-120	0			
1,2-Dichloroethane	1094	30	1000	0	109	70-135	0			
1,2-Dichloropropane	1096	30	1000	0	110	70-120	0			
1,3,5-Trimethylbenzene	1024	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	884	30	1000	0	88.4	70-125	0			
1,4-Dichlorobenzene	921.5	30	1000	0	92.2	70-125	0			
2-Butanone	1198	200	1000	0	120	30-160	0			
2-Hexanone	1058	30	1000	0	106	45-145	0			
4-Methyl-2-pentanone	1240	30	1000	0	124	45-145	0			
Acetone	1666	100	1000	65	160	20-160	0			BS
Acrylonitrile	1304	100	1000	0	130	70-135	0			
Benzene	1079	30	1000	0	108	75-125	0			
Bromobenzene	994	30	1000	0	99.4	65-120	0			
Bromochloromethane	1386	30	1000	0	139	70-125	0			S
Bromodichloromethane	880.5	30	1000	0	88	70-130	0			
Bromoform	785	30	1000	0	78.5	55-135	0			
Bromomethane	408	75	1000	0	40.8	30-160	0			
Carbon disulfide	1108	30	1000	0	111	45-160	0			
Carbon tetrachloride	943	30	1000	0	94.3	65-135	0			
Chlorobenzene	967.5	30	1000	0	96.8	75-125	0			
Chloroethane	946	100	1000	0	94.6	40-155	0			
Chloroform	1237	30	1000	0	124	70-125	0			
Chloromethane	1126	100	1000	49	108	50-130	0			
cis-1,2-Dichloroethene	1244	30	1000	0	124	65-125	0			
cis-1,3-Dichloropropene	838.5	30	1000	0	83.8	70-125	0			
Dibromochloromethane	763	30	1000	0	76.3	65-135	0			
Dibromomethane	1072	30	1000	0	107	75-130	0			
Dichlorodifluoromethane	1174	30	1000	0	117	35-135	0			
Ethylbenzene	987.5	30	1000	0	98.8	75-125	0			
Hexachloroethane	745.5	30	1000	0	74.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1016	30	1000	0	102	75-130	0	
m,p-Xylene	2003	60	2000	0	100	80-125	0	
Methyl tert-butyl ether	1239	30	1000	0	124	75-125	0	
Methylene chloride	1296	30	1000	0	130	55-145	0	
Naphthalene	941.5	100	1000	0	94.2	40-140	0	
n-Butylbenzene	982.5	30	1000	0	98.2	65-140	0	
n-Propylbenzene	993.5	30	1000	0	99.4	65-135	0	
o-Xylene	997	30	1000	0	99.7	75-125	0	
p-Isopropyltoluene	955	30	1000	0	95.5	75-135	0	
sec-Butylbenzene	1014	30	1000	0	101	65-130	0	
Styrene	994.5	30	1000	0	99.4	75-125	0	
tert-Butylbenzene	972.5	30	1000	0	97.2	65-130	0	
Tetrachloroethene	874.5	30	1000	0	87.4	64-140	0	
Tetrahydrofuran	1386	200	1000	0	139	70-135	0	S
Toluene	969	30	1000	0	96.9	70-125	0	
trans-1,2-Dichloroethene	1240	30	1000	0	124	65-135	0	
trans-1,3-Dichloropropene	740	30	1000	0	74	65-125	0	
trans-1,4-Dichloro-2-butene	501	30	1000	0	50.1	70-135	0	S
Trichloroethene	983	30	1000	0	98.3	75-125	0	
Trichlorofluoromethane	1155	30	1000	0	116	25-185	0	
Vinyl chloride	1264	30	1000	0	126	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1048*	0	*1000*	0	*105*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1024*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0	
Surr: Toluene-d8	*945.5*	0	*1000*	0	*94.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211292-01B MSD** Units: **µg/Kg** Analysis Date: **11/14/2012 09:54 PM**
Client ID: **SBKR1000R525S110712S004** Run ID: **VMS9_121114A** SeqNo: **2139648** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	810.5	30	1000	0	81	75-125	813	0.308	30	
1,1,1-Trichloroethane	936.5	30	1000	0	93.6	70-135	955	1.96	30	
1,1,2,2-Tetrachloroethane	972.5	30	1000	0	97.2	55-130	1008	3.54	30	
1,1,2-Trichloroethane	929.5	30	1000	0	93	60-125	972.5	4.52	30	
1,1-Dichloroethane	1199	30	1000	0	120	75-125	1247	3.92	30	
1,1-Dichloroethene	1235	30	1000	0	124	65-135	1298	5.01	30	
1,2,3-Trichlorobenzene	832	30	1000	0	83.2	60-135	858	3.08	30	
1,2,3-Trichloropropane	935.5	30	1000	0	93.6	65-130	968.5	3.47	30	
1,2,4-Trichlorobenzene	836.5	30	1000	0	83.6	65-130	863	3.12	30	
1,2,4-Trimethylbenzene	964.5	30	1000	0	96.4	65-135	1012	4.81	30	
1,2-Dibromo-3-chloropropane	694.5	30	1000	0	69.4	40-135	718.5	3.4	30	
1,2-Dibromoethane	946.5	30	1000	0	94.6	70-125	977	3.17	30	
1,2-Dichlorobenzene	885.5	30	1000	0	88.6	75-120	912	2.95	30	
1,2-Dichloroethane	1054	30	1000	0	105	70-135	1094	3.72	30	
1,2-Dichloropropane	1061	30	1000	0	106	70-120	1096	3.2	30	
1,3,5-Trimethylbenzene	982	30	1000	0	98.2	65-135	1024	4.19	30	
1,3-Dichlorobenzene	875.5	30	1000	0	87.6	70-125	884	0.966	30	
1,4-Dichlorobenzene	892.5	30	1000	0	89.2	70-125	921.5	3.2	30	
2-Butanone	1090	200	1000	0	109	30-160	1198	9.48	30	
2-Hexanone	1004	30	1000	0	100	45-145	1058	5.19	30	
4-Methyl-2-pentanone	1181	30	1000	0	118	45-145	1240	4.83	30	
Acetone	1563	100	1000	65	150	20-160	1666	6.38	30	B
Acrylonitrile	1233	100	1000	0	123	70-135	1304	5.6	30	
Benzene	1024	30	1000	0	102	75-125	1079	5.28	30	
Bromobenzene	946	30	1000	0	94.6	65-120	994	4.95	30	
Bromochloromethane	1324	30	1000	0	132	70-125	1386	4.57	30	S
Bromodichloromethane	889	30	1000	0	88.9	70-130	880.5	0.961	30	
Bromoform	767.5	30	1000	0	76.8	55-135	785	2.25	30	
Bromomethane	458	75	1000	0	45.8	30-160	408	11.5	30	
Carbon disulfide	1074	30	1000	0	107	45-160	1108	3.16	30	
Carbon tetrachloride	1014	30	1000	0	101	65-135	943	7.26	30	
Chlorobenzene	925	30	1000	0	92.5	75-125	967.5	4.49	30	
Chloroethane	1354	100	1000	0	135	40-155	946	35.4	30	R
Chloroform	1195	30	1000	0	120	70-125	1237	3.45	30	
Chloromethane	1086	100	1000	49	104	50-130	1126	3.62	30	
cis-1,2-Dichloroethene	1170	30	1000	0	117	65-125	1244	6.05	30	
cis-1,3-Dichloropropene	823.5	30	1000	0	82.4	70-125	838.5	1.81	30	
Dibromochloromethane	763	30	1000	0	76.3	65-135	763	0	30	
Dibromomethane	1044	30	1000	0	104	75-130	1072	2.65	30	
Dichlorodifluoromethane	1116	30	1000	0	112	35-135	1174	4.98	30	
Ethylbenzene	943.5	30	1000	0	94.4	75-125	987.5	4.56	30	
Hexachloroethane	733	30	1000	0	73.3	70-135	745.5	1.69	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	974.5	30	1000	0	97.4	75-130	1016	4.22	30	
m,p-Xylene	1916	60	2000	0	95.8	80-125	2003	4.47	30	
Methyl tert-butyl ether	1189	30	1000	0	119	75-125	1239	4.12	30	
Methylene chloride	1240	30	1000	0	124	55-145	1296	4.45	30	
Naphthalene	912.5	100	1000	0	91.2	40-140	941.5	3.13	30	
n-Butylbenzene	956	30	1000	0	95.6	65-140	982.5	2.73	30	
n-Propylbenzene	945	30	1000	0	94.5	65-135	993.5	5	30	
o-Xylene	952.5	30	1000	0	95.2	75-125	997	4.57	30	
p-Isopropyltoluene	932	30	1000	0	93.2	75-135	955	2.44	30	
sec-Butylbenzene	969	30	1000	0	96.9	65-130	1014	4.49	30	
Styrene	958	30	1000	0	95.8	75-125	994.5	3.74	30	
tert-Butylbenzene	937.5	30	1000	0	93.8	65-130	972.5	3.66	30	
Tetrachloroethene	829	30	1000	0	82.9	64-140	874.5	5.34	30	
Tetrahydrofuran	1240	200	1000	0	124	70-135	1386	11.1	30	
Toluene	920.5	30	1000	0	92	70-125	969	5.13	30	
trans-1,2-Dichloroethene	1192	30	1000	0	119	65-135	1240	3.87	30	
trans-1,3-Dichloropropene	738.5	30	1000	0	73.8	65-125	740	0.203	30	
trans-1,4-Dichloro-2-butene	544	30	1000	0	54.4	70-135	501	8.23	30	S
Trichloroethene	955	30	1000	0	95.5	75-125	983	2.89	30	
Trichlorofluoromethane	1106	30	1000	0	111	25-185	1155	4.33	30	
Vinyl chloride	1206	30	1000	0	121	60-125	1264	4.7	30	
Surr: 1,2-Dichloroethane-d4	*1028*	0	*1000*	0	*103*	*70-130*	1048	*1.93*	*30*	
Surr: 4-Bromofluorobenzene	*1028*	0	*1000*	0	*103*	*70-130*	1024	*0.292*	*30*	
Surr: Dibromofluoromethane	*1026*	0	*1000*	0	*103*	*70-130*	1016	*0.93*	*30*	
Surr: Toluene-d8	*927*	0	*1000*	0	*92.7*	*70-130*	945.5	*1.98*	*30*	

The following samples were analyzed in this batch:

1211292-01B	1211292-02B	1211292-03B
1211292-04B	1211292-05B	1211292-06B
1211292-07B	1211292-08B	1211292-09B
1211292-10A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **R112537** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112537** Units: **% of sample** Analysis Date: **11/13/2012 04:15 PM**
Client ID: Run ID: **MOIST_121113C** SeqNo: **2139138** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112537** Units: **% of sample** Analysis Date: **11/13/2012 04:15 PM**
Client ID: Run ID: **MOIST_121113C** SeqNo: **2139134** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211292-02A DUP** Units: **% of sample** Analysis Date: **11/13/2012 04:15 PM**
Client ID: **SBKR1000R526S110712S005** Run ID: **MOIST_121113C** SeqNo: **2139113** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	71.88	0.050	0	0	0	0-0	73.38	2.07	20	

DUP Sample ID: **1211338-10A DUP1** Units: **% of sample** Analysis Date: **11/13/2012 04:15 PM**
Client ID: Run ID: **MOIST_121113C** SeqNo: **2139124** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	56.44	0.050	0	0	0	0-0	53.76	4.86	20	

DUP Sample ID: **1211338-10A DUP2** Units: **% of sample** Analysis Date: **11/13/2012 04:15 PM**
Client ID: Run ID: **MOIST_121113C** SeqNo: **2139125** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	54.48	0.050	0	0	0	0-0	53.76	1.33	20	

The following samples were analyzed in this batch: 1211292-01A 1211292-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211292
Project: Marshall KRRI 1000R 11/7/12

QC BATCH REPORT

Batch ID: **R112541** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112541** Units: **% of sample** Analysis Date: **11/13/2012 06:00 PM**
Client ID: Run ID: **MOIST_121113D** SeqNo: **2139199** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112541** Units: **% of sample** Analysis Date: **11/13/2012 06:00 PM**
Client ID: Run ID: **MOIST_121113D** SeqNo: **2139195** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211292-09A DUP** Units: **% of sample** Analysis Date: **11/13/2012 06:00 PM**
Client ID: **SBKR1000R532D110712S006** Run ID: **MOIST_121113D** SeqNo: **2139179** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	73.06	0.050	0	0	0	0-0	72.92	0.192	20	

DUP Sample ID: **1211343-25A DUP** Units: **% of sample** Analysis Date: **11/13/2012 06:00 PM**
Client ID: Run ID: **MOIST_121113D** SeqNo: **2139192** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.09	0.050	0	0	0	0-0	3.92	4.24	20	

The following samples were analyzed in this batch:

1211292-03A	1211292-04A	1211292-05A
1211292-06A	1211292-07A	1211292-08A
1211292-09A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211292

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110712_GMK1	Task: KRRI_1000R
	Total # of Samples: 10	Event Complete?

Turn Around Time	5 Day	Rush	No

BILLING CODE: 6.00

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-0263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis:	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR1000R525S110712S004	SBKR1000R525	SO	G	11/07/2012 08:30	3			X	X	X	X	X										
2	SBKR1000R526S110712S005	SBKR1000R526	SO	G	11/07/2012 09:20	3			X	X	X	X	X										
3	SBKR1000R527S110712S006	SBKR1000R527	SO	G	11/07/2012 10:34	3			X	X	X	X	X										
4	SBKR1000R528S110712S006	SBKR1000R528	SO	G	11/07/2012 11:24	3			X	X	X	X	X										
5	SBKR1000R529S110712S004	SBKR1000R529	SO	G	11/07/2012 13:04	3			X	X	X	X	X										
6	SBKR1000R530S110712S004	SBKR1000R530	SO	G	11/07/2012 13:56	3			X	X	X	X	X										
7	SBKR1000R531S110712S004	SBKR1000R531	SO	G	11/07/2012 14:49	3			X	X	X	X	X										
8	SBKR1000R532S110712S006	SBKR1000R532	SO	G	11/07/2012 15:53	3			X	X	X	X	X										
9	SBKR1000R532D110712S006	SBKR1000R532	SO	G	11/07/2012 15:53	3	DUPLICATE		X	X	X	X	X										
10	SBKR1000R532T110712MX	SBKR1000R532	SQ	G	11/07/2012 00:00	1	TRIP BLANK						X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
S. Kramer	11-9-12	1643		11/9/12	1643

SHIPPING INFO:	SAMPLER NAME AND SIGNATURE			
Company:	PRINT Name of SAMPLER:	GERRY KRAMER (GMK1)		
Tracking #:	SIGNATURE of SAMPLER:	DATE Signed	Time:	

Sample Receipt Conditions	Temp in °C	Samples on Ice?	Sample Intact?	Trip Blank?
	2.8°C	(Y)N	(Y)N	(Y)N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **09-Nov-12 00:00**

Work Order: **1211292** Received by: **MA**

Checklist completed by Keith Wierenga (eSignature) 10-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 12-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.8 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/10/2012 10:38:33 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

20-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000-1025R 11/8/12** Work Order: **1211293**

Dear Bryan,

ALS Environmental received 8 samples on 09-Nov-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 57.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1025R 11/8/12
Work Order: **1211293**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211293-01	SBKR1000R533S110812S006	Soil		11/8/2012 11:20	11/9/2012 16:43	☐
1211293-02	SBKR1000R534S110812S005	Soil		11/8/2012 12:09	11/9/2012 16:43	☐
1211293-03	SBKR1000R535S110812S006	Soil		11/8/2012 13:04	11/9/2012 16:43	☐
1211293-04	SBKR1000R536S110812S008	Soil		11/8/2012 13:45	11/9/2012 16:43	☐
1211293-05	SBKR1025R503S110812S008	Soil		11/8/2012 14:35	11/9/2012 16:43	☐
1211293-06	SBKR1025R504S110812S005	Soil		11/8/2012 15:41	11/9/2012 16:43	☐
1211293-07	SBKR1025R505S110812S005	Soil		11/8/2012 16:33	11/9/2012 16:43	☐
1211293-08	SBKR1025R505T110812MX	Soil		11/8/2012	11/9/2012 16:43	☐

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1025R 11/8/12
Work Order: 1211293

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44730 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batches 44741 and 44745 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batches 44689 and 44749 LCS recoveries for Chloromethane were above control limits, but all samples in these quality control batches were ND for this compound. The MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1025R 11/8/12
WorkOrder: **1211293**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R533S110812S006
Work Order:	1211293	**Collection Date:**	11/8/2012 11:20:00 AM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**98**	**18**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**240**	**37**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*68.3*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	3.2	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**17**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**21**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(a)pyrene	**450**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(b)fluoranthene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(g,h,i)perylene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	**470**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	**550**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*56.6*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*66.5*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*74.3*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*86.5*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*73.7*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*76.2*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R533S110812S006
Work Order:	1211293	**Collection Date:**	11/8/2012 11:20:00 AM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	59	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	59	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	59	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	59	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R533S110812S006
Work Order:	1211293	**Collection Date:**	11/8/2012 11:20:00 AM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	59	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	59	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	59	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	59	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*92.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*87.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*96.3*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**49**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R534S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 12:09:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**93**	**19**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**270**	**38**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*69.2*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	2.6	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**20**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**25**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(a)pyrene	**790**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(b)fluoranthene	**890**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Chrysene	**710**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	**910**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	**970**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*61.6*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*70.2*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*82.5*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*91.9*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*81.2*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*82.4*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R534S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 12:09:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	59	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	59	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	59	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	59	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	59	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R534S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 12:09:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	59	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	59	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	59	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	59	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	59	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.9*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*86.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*96.2*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**49**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R535S110812S006
Work Order:	1211293	**Collection Date:**	11/8/2012 1:04:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**96**	**21**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**210**	**41**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*69.1*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	3.2	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**12**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**23**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(a)pyrene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(b)fluoranthene	**660**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	**520**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	**730**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*61.0*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*68.6*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*81.4*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*92.1*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*78.2*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*80.9*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	64	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	64	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	64	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	64	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R535S110812S006
Work Order:	1211293	**Collection Date:**	11/8/2012 1:04:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	64	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	64	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	64	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	64	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	64	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	64	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	64	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	64	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	64	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R535S110812S006
Work Order:	1211293	**Collection Date:**	11/8/2012 1:04:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	64	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	130	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	64	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	64	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	64	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	64	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	64	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	64	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	64	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*92.7*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*88.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.4*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**53**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R536S110812S008
Work Order:	1211293	**Collection Date:**	11/8/2012 1:45:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**75**	**15**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**180**	**30**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*69.1*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	0.97	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	2.4	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**11**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**21**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	**330**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*62.1*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*71.5*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*84.4*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*94.3*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*80.8*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*84.9*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R536S110812S008
Work Order:	1211293	**Collection Date:**	11/8/2012 1:45:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	47	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	47	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000R536S110812S008
Work Order:	1211293	**Collection Date:**	11/8/2012 1:45:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	47	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*93.2*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*88.2*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**36**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R503S110812S008
Work Order:	1211293	**Collection Date:**	11/8/2012 2:35:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**210**	**44**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**400**	**88**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*71.4*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	2.6	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	6.6	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**17**	**6.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**19**	**6.6**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	**330**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(a)pyrene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(b)fluoranthene	**470**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	**400**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	**480**	**330**	**330**		**µg/Kg-dry**	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*60.6*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*70.9*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*81.7*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*97.0*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*81.4*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*83.0*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	140	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	140	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	140	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	140	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	140	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R503S110812S008
Work Order:	1211293	**Collection Date:**	11/8/2012 2:35:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	140	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	140	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	140	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	140	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	140	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	140	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	460	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,200	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	140	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	140	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	140	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	140	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	140	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	140	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	140	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	460	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	140	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	280	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	140	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R503S110812S008
Work Order:	1211293	**Collection Date:**	11/8/2012 2:35:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	140	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	280	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	140	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	140	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	460	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	140	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	140	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	140	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	140	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	140	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	140	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	140	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	140	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	140	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	140	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	140	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	140	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	140	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*89.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*89.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.8*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**78**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R504S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 3:41:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**93**	**18**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**240**	**35**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*70.6*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	0.98	0.50		mg/Kg-dry	4	11/14/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/14/2012
Nickel	**10**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/14/2012
Vanadium	**21**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/14/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*64.9*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*69.2*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*80.4*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*93.7*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*76.8*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*81.1*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	57	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	57	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	57	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	57	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R504S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 3:41:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	57	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	57	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	57	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	57	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	57	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	57	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	57	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	57	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	57	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	57	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	57	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R504S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 3:41:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	57	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	57	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	57	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	57	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	57	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	57	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	57	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	57	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	57	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	57	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	57	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	57	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*90.2*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*87.2*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*96.2*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**47**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R505S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 4:33:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**24**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**410**	**47**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*73.5*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.5	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	3.8	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**8.1**	**3.8**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**12**	**3.8**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/15/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/15/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/15/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/15/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/15/2012
Surr: 2,4,6-Tribromophenol	*67.4*	*34-140*			*%REC*	1	11/15/2012
Surr: 2-Fluorobiphenyl	*74.1*	*12-100*			*%REC*	1	11/15/2012
Surr: 2-Fluorophenol	*81.3*	*33-117*			*%REC*	1	11/15/2012
Surr: 4-Terphenyl-d14	*96.9*	*25-137*			*%REC*	1	11/15/2012
Surr: Nitrobenzene-d5	*79.5*	*37-107*			*%REC*	1	11/15/2012
Surr: Phenol-d6	*83.1*	*40-106*			*%REC*	1	11/15/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/12/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,1,1-Trichloroethane	ND	72	50		µg/Kg-dry	1	11/13/2012
1,1,2,2-Tetrachloroethane	ND	72	50		µg/Kg-dry	1	11/13/2012
1,1,2-Trichloroethane	ND	72	50		µg/Kg-dry	1	11/13/2012
1,1-Dichloroethane	ND	72	50		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R505S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 4:33:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	72	50		µg/Kg-dry	1	11/13/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dibromo-3-chloropropane	ND	72	10		µg/Kg-dry	1	11/13/2012
1,2-Dibromoethane	ND	72	20		µg/Kg-dry	1	11/13/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,2-Dichloroethane	ND	72	50		µg/Kg-dry	1	11/13/2012
1,2-Dichloropropane	ND	72	50		µg/Kg-dry	1	11/13/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/13/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/13/2012
Benzene	ND	72	50		µg/Kg-dry	1	11/13/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/13/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/13/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/13/2012
Carbon tetrachloride	ND	72	50		µg/Kg-dry	1	11/13/2012
Chlorobenzene	ND	72	50		µg/Kg-dry	1	11/13/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Chloroform	ND	72	50		µg/Kg-dry	1	11/13/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
cis-1,2-Dichloroethene	ND	72	50		µg/Kg-dry	1	11/13/2012
cis-1,3-Dichloropropene	ND	72	50		µg/Kg-dry	1	11/13/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/13/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/13/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/13/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R505S110812S005
Work Order:	1211293	**Collection Date:**	11/8/2012 4:33:00 PM
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	72	50		µg/Kg-dry	1	11/13/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/13/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/13/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	11/13/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/13/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/13/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/13/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/13/2012
n-Butylbenzene	ND	72	50		µg/Kg-dry	1	11/13/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/13/2012
o-Xylene	ND	72	50		µg/Kg-dry	1	11/13/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/13/2012
sec-Butylbenzene	ND	72	50		µg/Kg-dry	1	11/13/2012
Styrene	ND	72	50		µg/Kg-dry	1	11/13/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/13/2012
tert-Butylbenzene	ND	72	50		µg/Kg-dry	1	11/13/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/13/2012
Tetrachloroethene	ND	72	50		µg/Kg-dry	1	11/13/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/13/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/13/2012
trans-1,2-Dichloroethene	ND	72	50		µg/Kg-dry	1	11/13/2012
trans-1,3-Dichloropropene	ND	72	50		µg/Kg-dry	1	11/13/2012
trans-1,4-Dichloro-2-butene	ND	72	50		µg/Kg-dry	1	11/13/2012
Trichloroethene	ND	72	50		µg/Kg-dry	1	11/13/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/13/2012
Vinyl chloride	ND	72	40		µg/Kg-dry	1	11/13/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/13/2012
Surr: 4-Bromofluorobenzene	*91.6*	*70-130*			*%REC*	1	11/13/2012
Surr: Dibromofluoromethane	*89.4*	*70-130*			*%REC*	1	11/13/2012
Surr: Toluene-d8	*95.7*	*70-130*			*%REC*	1	11/13/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**58**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R505T110812MX
Work Order:	1211293	**Collection Date:**	11/8/2012
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/14/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/14/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/14/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/14/2012
Benzene	ND	50	50		µg/Kg	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/14/2012
Bromoform	ND	100	100		µg/Kg	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/14/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/14/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg	1	11/14/2012
Chloroform	ND	50	50		µg/Kg	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg	1	11/14/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/14/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R505T110812MX
Work Order:	1211293	**Collection Date:**	11/8/2012
Project:	Marshall KRRI 1000-1025R 11/8/12		
Lab ID:	1211293-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/14/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/14/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg	1	11/14/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/14/2012
o-Xylene	ND	50	50		µg/Kg	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/14/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/14/2012
Styrene	ND	50	50		µg/Kg	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/14/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/14/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/14/2012
Toluene	ND	100	100		µg/Kg	1	11/14/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/14/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/14/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/14/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*93.2*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*91.4*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.2*	*70-130*			*%REC*	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44730** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44730-44730** Units: **mg/Kg** Analysis Date: **11/15/2012 08:48 AM**

Client ID: Run ID: **GC8_121115A** SeqNo: **2140904** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.415*	0	*5*	0	*68.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44730-44730** Units: **mg/Kg** Analysis Date: **11/15/2012 09:15 AM**

Client ID: Run ID: **GC8_121115A** SeqNo: **2140905** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	313.8	10	500	0	62.8	49-124	0			
ORO (C20-C34)	328.6	20	500	0	65.7	60-130	0			
Surr: 4-Terphenyl-d14	*4.104*	0	*5*	0	*82.1*	*39-115*	0			

MS Sample ID: **1211292-07A MS** Units: **mg/Kg** Analysis Date: **11/15/2012 09:42 AM**

Client ID: Run ID: **GC8_121115A** SeqNo: **2140906** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	293	9.5	476.6	47	51.6	60-130	0			S
ORO (C20-C34)	352.8	19	476.6	98.63	53.3	60-130	0			S
Surr: 4-Terphenyl-d14	*3.854*	0	*4.766*	0	*80.9*	*39-115*	0			

MSD Sample ID: **1211292-07A MSD** Units: **mg/Kg** Analysis Date: **11/15/2012 10:09 AM**

Client ID: Run ID: **GC8_121115A** SeqNo: **2140907** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	299	9.8	491.1	47	51.3	60-130	293	2.03	30	S
ORO (C20-C34)	374.9	20	491.1	98.63	56.2	60-130	352.8	6.05	30	S
Surr: 4-Terphenyl-d14	*4.017*	0	*4.911*	0	*81.8*	*39-115*	3.854	*4.15*	*30*	

The following samples were analyzed in this batch:

1211293-02A	1211293-03A	1211293-04A
1211293-05A	1211293-06A	1211293-07A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44773** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:11 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143011** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
Surr: 4-Terphenyl-d14	*3.464*	0	*5*	0	*69.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:37 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143012** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	321.2	10	500	0	64.2	49-124	0			
ORO (C20-C34)	327.7	20	500	0	65.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.557*	0	*5*	0	*91.1*	*39-115*	0			

MS Sample ID: **1211465-03A MS** Units: **mg/Kg** Analysis Date: **11/16/2012 06:04 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143014** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	316.1	9.7	485.9	0	65.1	60-130	0			
ORO (C20-C34)	343.8	19	485.9	0	70.8	60-130	0			
Surr: 4-Terphenyl-d14	*4.416*	0	*4.859*	0	*90.9*	*39-115*	0			

MSD Sample ID: **1211465-03A MSD** Units: **mg/Kg** Analysis Date: **11/16/2012 06:31 PM**
Client ID: Run ID: **GC8_121116A** SeqNo: **2143015** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	307.4	9.7	484.1	0	63.5	60-130	316.1	2.8	30	
ORO (C20-C34)	328.5	19	484.1	0	67.9	60-130	343.8	4.57	30	
Surr: 4-Terphenyl-d14	*3.58*	0	*4.841*	0	*74*	*39-115*	4.416	*20.9*	*30*	

The following samples were analyzed in this batch: 1211293-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44741** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44741-44741** Units: **mg/Kg** Analysis Date: **11/14/2012 03:00 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139487** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

MBLK Sample ID: **MBLK-44741-44741** Units: **mg/Kg** Analysis Date: **11/16/2012 06:59 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143062** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								

LCS Sample ID: **LCS-44741-44741** Units: **mg/Kg** Analysis Date: **11/14/2012 03:06 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139488** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	4.492	0.25	5	0	89.8	80-120	0			
Nickel	4.366	0.25	5	0	87.3	80-120	0			
Vanadium	4.652	0.25	5	0	93	80-120	0			

LCS Sample ID: **LCS-44741-44741** Units: **mg/Kg** Analysis Date: **11/16/2012 07:05 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143063** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.87	0.10	5	0	97.4	80-120	0			

MS Sample ID: **1211284-10BMS** Units: **mg/Kg** Analysis Date: **11/14/2012 03:18 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139490** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	6.67	0.38	7.576	0.4205	82.5	75-125	0			
Nickel	14.36	0.38	7.576	9.631	62.4	75-125	0			S
Vanadium	19.08	0.38	7.576	10.97	107	75-125	0			

MS Sample ID: **1211284-10BMS** Units: **mg/Kg** Analysis Date: **11/16/2012 07:16 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143065** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.398	0.15	7.576	0.4118	65.8	75-125	0			S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44741** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **1211284-10BMSD** Units: **mg/Kg** Analysis Date: **11/14/2012 03:24 PM**
Client ID: Run ID: **ICPMS1_121114A** SeqNo: **2139491** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	6.215	0.36	7.205	0.4205	80.4	75-125	6.67	7.06	25	
Nickel	13.77	0.36	7.205	9.631	57.4	75-125	14.36	4.18	25	S
Vanadium	18.5	0.36	7.205	10.97	104	75-125	19.08	3.1	25	

MSD Sample ID: **1211284-10BMSD** Units: **mg/Kg** Analysis Date: **11/16/2012 07:22 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143066** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.988	0.14	7.205	0.4118	63.5	75-125	5.398	7.9	25	S

The following samples were analyzed in this batch:
1211293-02A 1211293-03A 1211293-04A
1211293-05A 1211293-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44745** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44745-44745** Units: **mg/Kg** Analysis Date: **11/15/2012 01:31 PM**
Client ID: Run ID: **ICPMS1_121115A** SeqNo: **2140878** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.0068	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44745-44745** Units: **mg/Kg** Analysis Date: **11/15/2012 01:37 PM**
Client ID: Run ID: **ICPMS1_121115A** SeqNo: **2140879** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.464	0.10	5	0	89.3	80-120	0			
Molybdenum	4.534	0.25	5	0	90.7	80-120	0			
Nickel	4.508	0.25	5	0	90.2	80-120	0			
Vanadium	4.716	0.25	5	0	94.3	80-120	0			

MS Sample ID: **1211351-05BMS** Units: **mg/Kg** Analysis Date: **11/15/2012 02:17 PM**
Client ID: Run ID: **ICPMS1_121115A** SeqNo: **2140886** Prep Date: **11/14/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.625	0.67	8.361	0.2494	88.2	75-125	0			
Molybdenum	8.234	1.7	8.361	0.5682	91.7	75-125	0			
Nickel	15.07	1.7	8.361	6.527	102	75-125	0			
Vanadium	22.4	1.7	8.361	11.41	132	75-125	0			S

MSD Sample ID: **1211351-05BMSD** Units: **mg/Kg** Analysis Date: **11/15/2012 02:23 PM**
Client ID: Run ID: **ICPMS1_121115A** SeqNo: **2140887** Prep Date: **11/14/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.861	0.68	8.503	0.2494	89.5	75-125	7.625	3.04	25	
Molybdenum	8.265	1.7	8.503	0.5682	90.5	75-125	8.234	0.378	25	
Nickel	15.27	1.7	8.503	6.527	103	75-125	15.07	1.31	25	
Vanadium	22.77	1.7	8.503	11.41	134	75-125	22.4	1.61	25	S

The following samples were analyzed in this batch: 1211293-01A 1211293-07A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44729** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44729-44729** Units: **µg/Kg** Analysis Date: **11/16/2012 01:57 PM**

Client ID: Run ID: **SVMS4_121116A** SeqNo: **2141686** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*4021*	0	*5000*	0	*80.4*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3591*	0	*5000*	0	*71.8*	*12-100*	0			
Surr: 2-Fluorophenol	*4614*	0	*5000*	0	*92.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6428*	0	*5000*	0	*129*	*25-137*	0			
Surr: Nitrobenzene-d5	*3996*	0	*5000*	0	*79.9*	*37-107*	0			
Surr: Phenol-d6	*4136*	0	*5000*	0	*82.7*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44729** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44729-44729** Units: **µg/Kg** Analysis Date: **11/16/2012 01:26 PM**
Client ID: Run ID: **SVMS4_121116A** SeqNo: **2141685** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1481	50	2000	0	74	45-105	0			
Acenaphthene	1603	50	2000	0	80.2	45-110	0			
Acenaphthylene	1522	50	2000	0	76.1	45-105	0			
Anthracene	1740	50	2000	0	87	55-105	0			
Benzo(a)anthracene	1736	50	2000	0	86.8	50-110	0			
Benzo(a)pyrene	1691	50	2000	0	84.6	50-110	0			
Benzo(b)fluoranthene	1827	50	2000	0	91.4	45-115	0			
Benzo(g,h,i)perylene	2102	50	2000	0	105	40-125	0			
Benzo(k)fluoranthene	1906	50	2000	0	95.3	45-115	0			
Chrysene	1800	50	2000	0	90	55-110	0			
Dibenzo(a,h)anthracene	1834	50	2000	0	91.7	40-125	0			
Fluoranthene	1582	50	2000	0	79.1	55-115	0			
Fluorene	1654	50	2000	0	82.7	50-110	0			
Indeno(1,2,3-cd)pyrene	1833	50	2000	0	91.6	40-120	0			
Naphthalene	1477	50	2000	0	73.8	40-105	0			
Phenanthrene	1679	50	2000	0	84	50-110	0			
Pyrene	1836	50	2000	0	91.8	45-125	0			
Surr: 2,4,6-Tribromophenol	*4404*	0	*5000*	0	*88.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3596*	0	*5000*	0	*71.9*	*12-100*	0			
Surr: 2-Fluorophenol	*4324*	0	*5000*	0	*86.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6234*	0	*5000*	0	*125*	*25-137*	0			
Surr: Nitrobenzene-d5	*3853*	0	*5000*	0	*77.1*	*37-107*	0			
Surr: Phenol-d6	*4046*	0	*5000*	0	*80.9*	*40-106*	0			

The following samples were analyzed in this batch:

1211293-02A	1211293-03A	1211293-04A
1211293-05A	1211293-06A	1211293-07A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44689-44689** Units: **µg/Kg** Analysis Date: **11/13/2012 04:21 PM**
Client ID: Run ID: **VMS9_121113A** SeqNo: **2138688** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	236	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	32.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1063*	0	*1000*	0	*106*	*70-130*	0
Surr: 4-Bromofluorobenzene	*922*	0	*1000*	0	*92.2*	*70-130*	0
Surr: Dibromofluoromethane	*935*	0	*1000*	0	*93.5*	*70-130*	0
Surr: Toluene-d8	*964*	0	*1000*	0	*96.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44689-44689** Units: **µg/Kg** Analysis Date: **11/14/2012 01:47 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139684** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	223.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	42.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1061*	0	*1000*	0	*106*	*70-130*	0
Surr: 4-Bromofluorobenzene	*907.5*	0	*1000*	0	*90.8*	*70-130*	0
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*70-130*	0
Surr: Toluene-d8	*954.5*	0	*1000*	0	*95.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44689-44689** Units: **µg/Kg** Analysis Date: **11/13/2012 03:04 PM**
Client ID: Run ID: **VMS9_121113A** SeqNo: **2138687** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	844.5	30	1000	0	84.4	75-125	0			
1,1,1-Trichloroethane	924.5	30	1000	0	92.4	70-135	0			
1,1,2,2-Tetrachloroethane	921	30	1000	0	92.1	55-130	0			
1,1,2-Trichloroethane	911.5	30	1000	0	91.2	60-125	0			
1,1-Dichloroethane	1092	30	1000	0	109	75-125	0			
1,1-Dichloroethene	1158	30	1000	0	116	65-135	0			
1,2,3-Trichlorobenzene	882	30	1000	0	88.2	60-135	0			
1,2,3-Trichloropropane	902	30	1000	0	90.2	65-130	0			
1,2,4-Trichlorobenzene	934	30	1000	0	93.4	65-130	0			
1,2,4-Trimethylbenzene	971	30	1000	0	97.1	65-135	0			
1,2-Dibromo-3-chloropropane	724	30	1000	0	72.4	40-135	0			
1,2-Dibromoethane	932	30	1000	0	93.2	70-125	0			
1,2-Dichlorobenzene	917.5	30	1000	0	91.8	75-120	0			
1,2-Dichloroethane	975	30	1000	0	97.5	70-135	0			
1,2-Dichloropropane	985.5	30	1000	0	98.6	70-120	0			
1,3,5-Trimethylbenzene	980	30	1000	0	98	65-135	0			
1,3-Dichlorobenzene	905.5	30	1000	0	90.6	70-125	0			
1,4-Dichlorobenzene	927	30	1000	0	92.7	70-125	0			
2-Butanone	1138	200	1000	0	114	30-160	0			
2-Hexanone	882.5	30	1000	0	88.2	45-145	0			
4-Methyl-2-pentanone	1042	30	1000	0	104	45-145	0			
Acetone	1170	250	1000	0	117	20-160	0			
Acrylonitrile	1042	100	1000	0	104	70-135	0			
Benzene	975.5	30	1000	0	97.6	75-125	0			
Bromobenzene	935	30	1000	0	93.5	65-120	0			
Bromochloromethane	1162	30	1000	0	116	70-125	0			
Bromodichloromethane	887.5	30	1000	0	88.8	70-130	0			
Bromoform	812.5	30	1000	0	81.2	55-135	0			
Bromomethane	1018	75	1000	0	102	30-160	0			
Carbon disulfide	1188	30	1000	0	119	45-160	0			
Carbon tetrachloride	907	30	1000	0	90.7	65-135	0			
Chlorobenzene	928	30	1000	0	92.8	75-125	0			
Chloroethane	1229	100	1000	0	123	40-155	0			
Chloroform	1124	30	1000	0	112	70-125	0			
Chloromethane	1270	100	1000	0	127	50-130	0			
cis-1,2-Dichloroethene	1118	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	870	30	1000	0	87	70-125	0			
Dibromochloromethane	810	30	1000	0	81	65-135	0			
Dibromomethane	993.5	30	1000	0	99.4	75-130	0			
Dichlorodifluoromethane	1061	30	1000	0	106	35-135	0			
Ethylbenzene	944	30	1000	0	94.4	75-125	0			
Hexachloroethane	873	30	1000	0	87.3	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	951	30	1000	0	95.1	75-130	0
m,p-Xylene	1885	60	2000	0	94.2	80-125	0
Methyl tert-butyl ether	1086	30	1000	0	109	75-125	0
Methylene chloride	1100	30	1000	0	110	55-145	0
Naphthalene	862.5	100	1000	0	86.2	40-140	0
n-Butylbenzene	1047	30	1000	0	105	65-140	0
n-Propylbenzene	946.5	30	1000	0	94.6	65-135	0
o-Xylene	929.5	30	1000	0	93	75-125	0
p-Isopropyltoluene	955.5	30	1000	0	95.6	75-135	0
sec-Butylbenzene	1010	30	1000	0	101	65-130	0
Styrene	971.5	30	1000	0	97.2	75-125	0
tert-Butylbenzene	945	30	1000	0	94.5	65-130	0
Tetrachloroethene	907.5	30	1000	0	90.8	64-140	0
Tetrahydrofuran	1021	200	1000	0	102	70-135	0
Toluene	925.5	30	1000	0	92.6	70-125	0
trans-1,2-Dichloroethene	1130	30	1000	0	113	65-135	0
trans-1,3-Dichloropropene	821.5	30	1000	0	82.2	65-125	0
trans-1,4-Dichloro-2-butene	841	30	1000	0	84.1	70-135	0
Trichloroethene	922	30	1000	0	92.2	75-125	0
Trichlorofluoromethane	1062	30	1000	0	106	25-185	0
Vinyl chloride	1130	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*1048*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: Dibromofluoromethane	*1076*	0	*1000*	0	*108*	*70-130*	0
Surr: Toluene-d8	*994.5*	0	*1000*	0	*99.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44689-44689** Units: **µg/Kg** Analysis Date: **11/14/2012 12:31 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139683** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	817.5	30	1000	0	81.8	75-125	0			
1,1,1-Trichloroethane	906	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	874	30	1000	0	87.4	55-130	0			
1,1,2-Trichloroethane	862.5	30	1000	0	86.2	60-125	0			
1,1-Dichloroethane	1102	30	1000	0	110	75-125	0			
1,1-Dichloroethene	1172	30	1000	0	117	65-135	0			
1,2,3-Trichlorobenzene	845.5	30	1000	0	84.6	60-135	0			
1,2,3-Trichloropropane	810.5	30	1000	0	81	65-130	0			
1,2,4-Trichlorobenzene	870.5	30	1000	0	87	65-130	0			
1,2,4-Trimethylbenzene	913	30	1000	0	91.3	65-135	0			
1,2-Dibromo-3-chloropropane	692.5	30	1000	0	69.2	40-135	0			
1,2-Dibromoethane	876.5	30	1000	0	87.6	70-125	0			
1,2-Dichlorobenzene	863.5	30	1000	0	86.4	75-120	0			
1,2-Dichloroethane	968.5	30	1000	0	96.8	70-135	0			
1,2-Dichloropropane	977.5	30	1000	0	97.8	70-120	0			
1,3,5-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,3-Dichlorobenzene	862.5	30	1000	0	86.2	70-125	0			
1,4-Dichlorobenzene	877	30	1000	0	87.7	70-125	0			
2-Butanone	1154	200	1000	0	115	30-160	0			
2-Hexanone	823.5	30	1000	0	82.4	45-145	0			
4-Methyl-2-pentanone	968.5	30	1000	0	96.8	45-145	0			
Acetone	1148	100	1000	0	115	20-160	0			B
Acrylonitrile	999.5	100	1000	0	100	70-135	0			
Benzene	970.5	30	1000	0	97	75-125	0			
Bromobenzene	885	30	1000	0	88.5	65-120	0			
Bromochloromethane	1163	30	1000	0	116	70-125	0			
Bromodichloromethane	884	30	1000	0	88.4	70-130	0			
Bromoform	784.5	30	1000	0	78.4	55-135	0			
Bromomethane	959.5	75	1000	0	96	30-160	0			
Carbon disulfide	1178	30	1000	0	118	45-160	0			
Carbon tetrachloride	908.5	30	1000	0	90.8	65-135	0			
Chlorobenzene	884	30	1000	0	88.4	75-125	0			
Chloroethane	1230	100	1000	0	123	40-155	0			
Chloroform	1110	30	1000	0	111	70-125	0			
Chloromethane	1308	100	1000	0	131	50-130	0			S
cis-1,2-Dichloroethene	1116	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	852	30	1000	0	85.2	70-125	0			
Dibromochloromethane	780	30	1000	0	78	65-135	0			
Dibromomethane	960.5	30	1000	0	96	75-130	0			
Dichlorodifluoromethane	959.5	30	1000	0	96	35-135	0			
Ethylbenzene	905	30	1000	0	90.5	75-125	0			
Hexachloroethane	866.5	30	1000	0	86.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689**	Instrument ID **VMS9**		Method: **SW8260**				
Isopropylbenzene	920.5	30	1000	0	92	75-130	0
m,p-Xylene	1816	60	2000	0	90.8	80-125	0
Methyl tert-butyl ether	1049	30	1000	0	105	75-125	0
Methylene chloride	1127	30	1000	0	113	55-145	0
Naphthalene	806.5	100	1000	0	80.6	40-140	0
n-Butylbenzene	975	30	1000	0	97.5	65-140	0
n-Propylbenzene	913	30	1000	0	91.3	65-135	0
o-Xylene	899	30	1000	0	89.9	75-125	0
p-Isopropyltoluene	918.5	30	1000	0	91.8	75-135	0
sec-Butylbenzene	953.5	30	1000	0	95.4	65-130	0
Styrene	931	30	1000	0	93.1	75-125	0
tert-Butylbenzene	903.5	30	1000	0	90.4	65-130	0
Tetrachloroethene	830.5	30	1000	0	83	64-140	0
Tetrahydrofuran	979	200	1000	0	97.9	70-135	0
Toluene	892.5	30	1000	0	89.2	70-125	0
trans-1,2-Dichloroethene	1145	30	1000	0	114	65-135	0
trans-1,3-Dichloropropene	772.5	30	1000	0	77.2	65-125	0
trans-1,4-Dichloro-2-butene	769.5	30	1000	0	77	70-135	0
Trichloroethene	927	30	1000	0	92.7	75-125	0
Trichlorofluoromethane	1026	30	1000	0	103	25-185	0
Vinyl chloride	1130	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*1050*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*996*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Dibromofluoromethane	*1070*	0	*1000*	0	*107*	*70-130*	0
Surr: Toluene-d8	*972*	0	*1000*	0	*97.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211292-01B MS** Units: **µg/Kg** Analysis Date: **11/14/2012 09:28 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139647** Prep Date: **11/12/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	813	30	1000	0	81.3	75-125	0			
1,1,1-Trichloroethane	955	30	1000	0	95.5	70-135	0			
1,1,2,2-Tetrachloroethane	1008	30	1000	0	101	55-130	0			
1,1,2-Trichloroethane	972.5	30	1000	0	97.2	60-125	0			
1,1-Dichloroethane	1247	30	1000	0	125	75-125	0			
1,1-Dichloroethene	1298	30	1000	0	130	65-135	0			
1,2,3-Trichlorobenzene	858	30	1000	0	85.8	60-135	0			
1,2,3-Trichloropropane	968.5	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	863	30	1000	0	86.3	65-130	0			
1,2,4-Trimethylbenzene	1012	30	1000	0	101	65-135	0			
1,2-Dibromo-3-chloropropane	718.5	30	1000	0	71.8	40-135	0			
1,2-Dibromoethane	977	30	1000	0	97.7	70-125	0			
1,2-Dichlorobenzene	912	30	1000	0	91.2	75-120	0			
1,2-Dichloroethane	1094	30	1000	0	109	70-135	0			
1,2-Dichloropropane	1096	30	1000	0	110	70-120	0			
1,3,5-Trimethylbenzene	1024	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	884	30	1000	0	88.4	70-125	0			
1,4-Dichlorobenzene	921.5	30	1000	0	92.2	70-125	0			
2-Butanone	1198	200	1000	0	120	30-160	0			
2-Hexanone	1058	30	1000	0	106	45-145	0			
4-Methyl-2-pentanone	1240	30	1000	0	124	45-145	0			
Acetone	1666	100	1000	65	160	20-160	0			BS
Acrylonitrile	1304	100	1000	0	130	70-135	0			
Benzene	1079	30	1000	0	108	75-125	0			
Bromobenzene	994	30	1000	0	99.4	65-120	0			
Bromochloromethane	1386	30	1000	0	139	70-125	0			S
Bromodichloromethane	880.5	30	1000	0	88	70-130	0			
Bromoform	785	30	1000	0	78.5	55-135	0			
Bromomethane	408	75	1000	0	40.8	30-160	0			
Carbon disulfide	1108	30	1000	0	111	45-160	0			
Carbon tetrachloride	943	30	1000	0	94.3	65-135	0			
Chlorobenzene	967.5	30	1000	0	96.8	75-125	0			
Chloroethane	946	100	1000	0	94.6	40-155	0			
Chloroform	1237	30	1000	0	124	70-125	0			
Chloromethane	1126	100	1000	49	108	50-130	0			
cis-1,2-Dichloroethene	1244	30	1000	0	124	65-125	0			
cis-1,3-Dichloropropene	838.5	30	1000	0	83.8	70-125	0			
Dibromochloromethane	763	30	1000	0	76.3	65-135	0			
Dibromomethane	1072	30	1000	0	107	75-130	0			
Dichlorodifluoromethane	1174	30	1000	0	117	35-135	0			
Ethylbenzene	987.5	30	1000	0	98.8	75-125	0			
Hexachloroethane	745.5	30	1000	0	74.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1016	30	1000	0	102	75-130	0	
m,p-Xylene	2003	60	2000	0	100	80-125	0	
Methyl tert-butyl ether	1239	30	1000	0	124	75-125	0	
Methylene chloride	1296	30	1000	0	130	55-145	0	
Naphthalene	941.5	100	1000	0	94.2	40-140	0	
n-Butylbenzene	982.5	30	1000	0	98.2	65-140	0	
n-Propylbenzene	993.5	30	1000	0	99.4	65-135	0	
o-Xylene	997	30	1000	0	99.7	75-125	0	
p-Isopropyltoluene	955	30	1000	0	95.5	75-135	0	
sec-Butylbenzene	1014	30	1000	0	101	65-130	0	
Styrene	994.5	30	1000	0	99.4	75-125	0	
tert-Butylbenzene	972.5	30	1000	0	97.2	65-130	0	
Tetrachloroethene	874.5	30	1000	0	87.4	64-140	0	
Tetrahydrofuran	1386	200	1000	0	139	70-135	0	S
Toluene	969	30	1000	0	96.9	70-125	0	
trans-1,2-Dichloroethene	1240	30	1000	0	124	65-135	0	
trans-1,3-Dichloropropene	740	30	1000	0	74	65-125	0	
trans-1,4-Dichloro-2-butene	501	30	1000	0	50.1	70-135	0	S
Trichloroethene	983	30	1000	0	98.3	75-125	0	
Trichlorofluoromethane	1155	30	1000	0	116	25-185	0	
Vinyl chloride	1264	30	1000	0	126	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1048*	0	*1000*	0	*105*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1024*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0	
Surr: Toluene-d8	*945.5*	0	*1000*	0	*94.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

MSD	Sample ID: **1211292-01B MSD**				Units: **µg/Kg**		Analysis Date: **11/14/2012 09:54 PM**			
Client ID:		Run ID: **VMS9_121114A**			SeqNo: **2139648**		Prep Date: **11/12/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	810.5	30	1000	0	81	75-125	813	0.308	30	
1,1,1-Trichloroethane	936.5	30	1000	0	93.6	70-135	955	1.96	30	
1,1,2,2-Tetrachloroethane	972.5	30	1000	0	97.2	55-130	1008	3.54	30	
1,1,2-Trichloroethane	929.5	30	1000	0	93	60-125	972.5	4.52	30	
1,1-Dichloroethane	1199	30	1000	0	120	75-125	1247	3.92	30	
1,1-Dichloroethene	1235	30	1000	0	124	65-135	1298	5.01	30	
1,2,3-Trichlorobenzene	832	30	1000	0	83.2	60-135	858	3.08	30	
1,2,3-Trichloropropane	935.5	30	1000	0	93.6	65-130	968.5	3.47	30	
1,2,4-Trichlorobenzene	836.5	30	1000	0	83.6	65-130	863	3.12	30	
1,2,4-Trimethylbenzene	964.5	30	1000	0	96.4	65-135	1012	4.81	30	
1,2-Dibromo-3-chloropropane	694.5	30	1000	0	69.4	40-135	718.5	3.4	30	
1,2-Dibromoethane	946.5	30	1000	0	94.6	70-125	977	3.17	30	
1,2-Dichlorobenzene	885.5	30	1000	0	88.6	75-120	912	2.95	30	
1,2-Dichloroethane	1054	30	1000	0	105	70-135	1094	3.72	30	
1,2-Dichloropropane	1061	30	1000	0	106	70-120	1096	3.2	30	
1,3,5-Trimethylbenzene	982	30	1000	0	98.2	65-135	1024	4.19	30	
1,3-Dichlorobenzene	875.5	30	1000	0	87.6	70-125	884	0.966	30	
1,4-Dichlorobenzene	892.5	30	1000	0	89.2	70-125	921.5	3.2	30	
2-Butanone	1090	200	1000	0	109	30-160	1198	9.48	30	
2-Hexanone	1004	30	1000	0	100	45-145	1058	5.19	30	
4-Methyl-2-pentanone	1181	30	1000	0	118	45-145	1240	4.83	30	
Acetone	1563	100	1000	65	150	20-160	1666	6.38	30	B
Acrylonitrile	1233	100	1000	0	123	70-135	1304	5.6	30	
Benzene	1024	30	1000	0	102	75-125	1079	5.28	30	
Bromobenzene	946	30	1000	0	94.6	65-120	994	4.95	30	
Bromochloromethane	1324	30	1000	0	132	70-125	1386	4.57	30	S
Bromodichloromethane	889	30	1000	0	88.9	70-130	880.5	0.961	30	
Bromoform	767.5	30	1000	0	76.8	55-135	785	2.25	30	
Bromomethane	458	75	1000	0	45.8	30-160	408	11.5	30	
Carbon disulfide	1074	30	1000	0	107	45-160	1108	3.16	30	
Carbon tetrachloride	1014	30	1000	0	101	65-135	943	7.26	30	
Chlorobenzene	925	30	1000	0	92.5	75-125	967.5	4.49	30	
Chloroethane	1354	100	1000	0	135	40-155	946	35.4	30	R
Chloroform	1195	30	1000	0	120	70-125	1237	3.45	30	
Chloromethane	1086	100	1000	49	104	50-130	1126	3.62	30	
cis-1,2-Dichloroethene	1170	30	1000	0	117	65-125	1244	6.05	30	
cis-1,3-Dichloropropene	823.5	30	1000	0	82.4	70-125	838.5	1.81	30	
Dibromochloromethane	763	30	1000	0	76.3	65-135	763	0	30	
Dibromomethane	1044	30	1000	0	104	75-130	1072	2.65	30	
Dichlorodifluoromethane	1116	30	1000	0	112	35-135	1174	4.98	30	
Ethylbenzene	943.5	30	1000	0	94.4	75-125	987.5	4.56	30	
Hexachloroethane	733	30	1000	0	73.3	70-135	745.5	1.69	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44689** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	974.5	30	1000	0	97.4	75-130	1016	4.22	30	
m,p-Xylene	1916	60	2000	0	95.8	80-125	2003	4.47	30	
Methyl tert-butyl ether	1189	30	1000	0	119	75-125	1239	4.12	30	
Methylene chloride	1240	30	1000	0	124	55-145	1296	4.45	30	
Naphthalene	912.5	100	1000	0	91.2	40-140	941.5	3.13	30	
n-Butylbenzene	956	30	1000	0	95.6	65-140	982.5	2.73	30	
n-Propylbenzene	945	30	1000	0	94.5	65-135	993.5	5	30	
o-Xylene	952.5	30	1000	0	95.2	75-125	997	4.57	30	
p-Isopropyltoluene	932	30	1000	0	93.2	75-135	955	2.44	30	
sec-Butylbenzene	969	30	1000	0	96.9	65-130	1014	4.49	30	
Styrene	958	30	1000	0	95.8	75-125	994.5	3.74	30	
tert-Butylbenzene	937.5	30	1000	0	93.8	65-130	972.5	3.66	30	
Tetrachloroethene	829	30	1000	0	82.9	64-140	874.5	5.34	30	
Tetrahydrofuran	1240	200	1000	0	124	70-135	1386	11.1	30	
Toluene	920.5	30	1000	0	92	70-125	969	5.13	30	
trans-1,2-Dichloroethene	1192	30	1000	0	119	65-135	1240	3.87	30	
trans-1,3-Dichloropropene	738.5	30	1000	0	73.8	65-125	740	0.203	30	
trans-1,4-Dichloro-2-butene	544	30	1000	0	54.4	70-135	501	8.23	30	S
Trichloroethene	955	30	1000	0	95.5	75-125	983	2.89	30	
Trichlorofluoromethane	1106	30	1000	0	111	25-185	1155	4.33	30	
Vinyl chloride	1206	30	1000	0	121	60-125	1264	4.7	30	
Surr: 1,2-Dichloroethane-d4	*1028*	0	*1000*	0	*103*	*70-130*	1048	*1.93*	*30*	
Surr: 4-Bromofluorobenzene	*1028*	0	*1000*	0	*103*	*70-130*	1024	*0.292*	*30*	
Surr: Dibromofluoromethane	*1026*	0	*1000*	0	*103*	*70-130*	1016	*0.93*	*30*	
Surr: Toluene-d8	*927*	0	*1000*	0	*92.7*	*70-130*	945.5	*1.98*	*30*	

The following samples were analyzed in this batch:

1211293-01B	1211293-02B	1211293-03B
1211293-04B	1211293-05B	1211293-06B
1211293-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44749-44749** Units: **µg/Kg** Analysis Date: **11/14/2012 01:47 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139644** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	223.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	42.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1061*	0	*1000*	0	*106*	*70-130*	0
Surr: 4-Bromofluorobenzene	*907.5*	0	*1000*	0	*90.8*	*70-130*	0
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*70-130*	0
Surr: Toluene-d8	*954.5*	0	*1000*	0	*95.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44749-44749** Units: **µg/Kg** Analysis Date: **11/14/2012 12:31 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139643** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	817.5	30	1000	0	81.8	75-125	0			
1,1,1-Trichloroethane	906	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	874	30	1000	0	87.4	55-130	0			
1,1,2-Trichloroethane	862.5	30	1000	0	86.2	60-125	0			
1,1-Dichloroethane	1102	30	1000	0	110	75-125	0			
1,1-Dichloroethene	1172	30	1000	0	117	65-135	0			
1,2,3-Trichlorobenzene	845.5	30	1000	0	84.6	60-135	0			
1,2,3-Trichloropropane	810.5	30	1000	0	81	65-130	0			
1,2,4-Trichlorobenzene	870.5	30	1000	0	87	65-130	0			
1,2,4-Trimethylbenzene	913	30	1000	0	91.3	65-135	0			
1,2-Dibromo-3-chloropropane	692.5	30	1000	0	69.2	40-135	0			
1,2-Dibromoethane	876.5	30	1000	0	87.6	70-125	0			
1,2-Dichlorobenzene	863.5	30	1000	0	86.4	75-120	0			
1,2-Dichloroethane	968.5	30	1000	0	96.8	70-135	0			
1,2-Dichloropropane	977.5	30	1000	0	97.8	70-120	0			
1,3,5-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,3-Dichlorobenzene	862.5	30	1000	0	86.2	70-125	0			
1,4-Dichlorobenzene	877	30	1000	0	87.7	70-125	0			
2-Butanone	1154	200	1000	0	115	30-160	0			
2-Hexanone	823.5	30	1000	0	82.4	45-145	0			
4-Methyl-2-pentanone	968.5	30	1000	0	96.8	45-145	0			
Acetone	1148	100	1000	0	115	20-160	0			B
Acrylonitrile	999.5	100	1000	0	100	70-135	0			
Benzene	970.5	30	1000	0	97	75-125	0			
Bromobenzene	885	30	1000	0	88.5	65-120	0			
Bromochloromethane	1163	30	1000	0	116	70-125	0			
Bromodichloromethane	884	30	1000	0	88.4	70-130	0			
Bromoform	784.5	30	1000	0	78.4	55-135	0			
Bromomethane	959.5	75	1000	0	96	30-160	0			
Carbon disulfide	1178	30	1000	0	118	45-160	0			
Carbon tetrachloride	908.5	30	1000	0	90.8	65-135	0			
Chlorobenzene	884	30	1000	0	88.4	75-125	0			
Chloroethane	1230	100	1000	0	123	40-155	0			
Chloroform	1110	30	1000	0	111	70-125	0			
Chloromethane	1308	100	1000	0	131	50-130	0			S
cis-1,2-Dichloroethene	1116	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	852	30	1000	0	85.2	70-125	0			
Dibromochloromethane	780	30	1000	0	78	65-135	0			
Dibromomethane	960.5	30	1000	0	96	75-130	0			
Dichlorodifluoromethane	959.5	30	1000	0	96	35-135	0			
Ethylbenzene	905	30	1000	0	90.5	75-125	0			
Hexachloroethane	866.5	30	1000	0	86.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	920.5	30	1000	0	92	75-130	0
m,p-Xylene	1816	60	2000	0	90.8	80-125	0
Methyl tert-butyl ether	1049	30	1000	0	105	75-125	0
Methylene chloride	1127	30	1000	0	113	55-145	0
Naphthalene	806.5	100	1000	0	80.6	40-140	0
n-Butylbenzene	975	30	1000	0	97.5	65-140	0
n-Propylbenzene	913	30	1000	0	91.3	65-135	0
o-Xylene	899	30	1000	0	89.9	75-125	0
p-Isopropyltoluene	918.5	30	1000	0	91.8	75-135	0
sec-Butylbenzene	953.5	30	1000	0	95.4	65-130	0
Styrene	931	30	1000	0	93.1	75-125	0
tert-Butylbenzene	903.5	30	1000	0	90.4	65-130	0
Tetrachloroethene	830.5	30	1000	0	83	64-140	0
Tetrahydrofuran	979	200	1000	0	97.9	70-135	0
Toluene	892.5	30	1000	0	89.2	70-125	0
trans-1,2-Dichloroethene	1145	30	1000	0	114	65-135	0
trans-1,3-Dichloropropene	772.5	30	1000	0	77.2	65-125	0
trans-1,4-Dichloro-2-butene	769.5	30	1000	0	77	70-135	0
Trichloroethene	927	30	1000	0	92.7	75-125	0
Trichlorofluoromethane	1026	30	1000	0	103	25-185	0
Vinyl chloride	1130	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*1050*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*996*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Dibromofluoromethane	*1070*	0	*1000*	0	*107*	*70-130*	0
Surr: Toluene-d8	*972*	0	*1000*	0	*97.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211351-05A MS** Units: **µg/Kg** Analysis Date: **11/14/2012 10:19 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139649** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	821.5	30	1000	0	82.2	75-125	0			
1,1,1-Trichloroethane	944	30	1000	0	94.4	70-135	0			
1,1,2,2-Tetrachloroethane	976.5	30	1000	0	97.6	55-130	0			
1,1,2-Trichloroethane	917.5	30	1000	0	91.8	60-125	0			
1,1-Dichloroethane	1212	30	1000	0	121	75-125	0			
1,1-Dichloroethene	1266	30	1000	0	127	65-135	0			
1,2,3-Trichlorobenzene	863	30	1000	0	86.3	60-135	0			
1,2,3-Trichloropropane	918	30	1000	0	91.8	65-130	0			
1,2,4-Trichlorobenzene	864.5	30	1000	0	86.4	65-130	0			
1,2,4-Trimethylbenzene	968	30	1000	0	96.8	65-135	0			
1,2-Dibromo-3-chloropropane	724	30	1000	0	72.4	40-135	0			
1,2-Dibromoethane	961.5	30	1000	0	96.2	70-125	0			
1,2-Dichlorobenzene	902	30	1000	0	90.2	75-120	0			
1,2-Dichloroethane	1073	30	1000	0	107	70-135	0			
1,2-Dichloropropane	1060	30	1000	0	106	70-120	0			
1,3,5-Trimethylbenzene	998.5	30	1000	0	99.8	65-135	0			
1,3-Dichlorobenzene	884.5	30	1000	0	88.4	70-125	0			
1,4-Dichlorobenzene	903	30	1000	0	90.3	70-125	0			
2-Butanone	1064	200	1000	0	106	30-160	0			
2-Hexanone	1021	30	1000	0	102	45-145	0			
4-Methyl-2-pentanone	1234	30	1000	0	123	45-145	0			
Acetone	1742	100	1000	57.5	168	20-160	0			BS
Acrylonitrile	1328	100	1000	0	133	70-135	0			
Benzene	1042	30	1000	0	104	75-125	0			
Bromobenzene	949	30	1000	0	94.9	65-120	0			
Bromochloromethane	1350	30	1000	0	135	70-125	0			S
Bromodichloromethane	897	30	1000	0	89.7	70-130	0			
Bromoform	786	30	1000	0	78.6	55-135	0			
Bromomethane	498.5	75	1000	0	49.8	30-160	0			
Carbon disulfide	1124	30	1000	0	112	45-160	0			
Carbon tetrachloride	940	30	1000	0	94	65-135	0			
Chlorobenzene	934.5	30	1000	0	93.4	75-125	0			
Chloroethane	1046	100	1000	0	105	40-155	0			
Chloroform	1211	30	1000	0	121	70-125	0			
Chloromethane	1149	100	1000	41.5	111	50-130	0			
cis-1,2-Dichloroethene	1203	30	1000	0	120	65-125	0			
cis-1,3-Dichloropropene	853.5	30	1000	0	85.4	70-125	0			
Dibromochloromethane	768	30	1000	0	76.8	65-135	0			
Dibromomethane	1068	30	1000	0	107	75-130	0			
Dichlorodifluoromethane	1155	30	1000	0	116	35-135	0			
Ethylbenzene	963.5	30	1000	0	96.4	75-125	0			
Hexachloroethane	785.5	30	1000	0	78.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	987	30	1000	0	98.7	75-130	0	
m,p-Xylene	1947	60	2000	0	97.4	80-125	0	
Methyl tert-butyl ether	1216	30	1000	0	122	75-125	0	
Methylene chloride	1278	30	1000	0	128	55-145	0	
Naphthalene	930.5	100	1000	0	93	40-140	0	
n-Butylbenzene	985.5	30	1000	0	98.6	65-140	0	
n-Propylbenzene	968.5	30	1000	0	96.8	65-135	0	
o-Xylene	969.5	30	1000	0	97	75-125	0	
p-Isopropyltoluene	962.5	30	1000	0	96.2	75-135	0	
sec-Butylbenzene	978.5	30	1000	0	97.8	65-130	0	
Styrene	959.5	30	1000	0	96	75-125	0	
tert-Butylbenzene	958	30	1000	0	95.8	65-130	0	
Tetrachloroethene	842.5	30	1000	0	84.2	64-140	0	
Tetrahydrofuran	1292	200	1000	0	129	70-135	0	
Toluene	936	30	1000	0	93.6	70-125	0	
trans-1,2-Dichloroethene	1222	30	1000	0	122	65-135	0	
trans-1,3-Dichloropropene	746.5	30	1000	0	74.6	65-125	0	
trans-1,4-Dichloro-2-butene	554.5	30	1000	0	55.4	70-135	0	S
Trichloroethene	974	30	1000	0	97.4	75-125	0	
Trichlorofluoromethane	1154	30	1000	0	115	25-185	0	
Vinyl chloride	1230	30	1000	0	123	60-125	0	
Surr: 1,2-Dichloroethane-d4	*1064*	0	*1000*	0	*106*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1018*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1046*	0	*1000*	0	*105*	*70-130*	0	
Surr: Toluene-d8	*931.5*	0	*1000*	0	*93.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

MSD	Sample ID: **1211351-05A MSD**				Units: **µg/Kg**		Analysis Date: **11/14/2012 10:45 PM**			
Client ID:		Run ID: **VMS9_121114A**			SeqNo: **2139650**		Prep Date: **11/14/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	821	30	1000	0	82.1	75-125	821.5	0.0609	30	
1,1,1-Trichloroethane	947.5	30	1000	0	94.8	70-135	944	0.37	30	
1,1,2,2-Tetrachloroethane	980	30	1000	0	98	55-130	976.5	0.358	30	
1,1,2-Trichloroethane	941.5	30	1000	0	94.2	60-125	917.5	2.58	30	
1,1-Dichloroethane	1212	30	1000	0	121	75-125	1212	0	30	
1,1-Dichloroethene	1254	30	1000	0	125	65-135	1266	0.952	30	
1,2,3-Trichlorobenzene	864	30	1000	0	86.4	60-135	863	0.116	30	
1,2,3-Trichloropropane	924.5	30	1000	0	92.4	65-130	918	0.706	30	
1,2,4-Trichlorobenzene	859	30	1000	0	85.9	65-130	864.5	0.638	30	
1,2,4-Trimethylbenzene	973.5	30	1000	0	97.4	65-135	968	0.567	30	
1,2-Dibromo-3-chloropropane	721.5	30	1000	0	72.2	40-135	724	0.346	30	
1,2-Dibromoethane	960	30	1000	0	96	70-125	961.5	0.156	30	
1,2-Dichlorobenzene	907	30	1000	0	90.7	75-120	902	0.553	30	
1,2-Dichloroethane	1070	30	1000	0	107	70-135	1073	0.327	30	
1,2-Dichloropropane	1064	30	1000	0	106	70-120	1060	0.377	30	
1,3,5-Trimethylbenzene	997	30	1000	0	99.7	65-135	998.5	0.15	30	
1,3-Dichlorobenzene	884	30	1000	0	88.4	70-125	884.5	0.0565	30	
1,4-Dichlorobenzene	905.5	30	1000	0	90.6	70-125	903	0.276	30	
2-Butanone	1062	200	1000	0	106	30-160	1064	0.235	30	
2-Hexanone	1010	30	1000	0	101	45-145	1021	1.08	30	
4-Methyl-2-pentanone	1203	30	1000	0	120	45-145	1234	2.5	30	
Acetone	1696	100	1000	57.5	164	20-160	1742	2.62	30	BS
Acrylonitrile	1278	100	1000	0	128	70-135	1328	3.8	30	
Benzene	1040	30	1000	0	104	75-125	1042	0.192	30	
Bromobenzene	962.5	30	1000	0	96.2	65-120	949	1.41	30	
Bromochloromethane	1356	30	1000	0	136	70-125	1350	0.407	30	S
Bromodichloromethane	896.5	30	1000	0	89.6	70-130	897	0.0558	30	
Bromoform	794.5	30	1000	0	79.4	55-135	786	1.08	30	
Bromomethane	561.5	75	1000	0	56.2	30-160	498.5	11.9	30	
Carbon disulfide	1125	30	1000	0	112	45-160	1124	0.0889	30	
Carbon tetrachloride	934	30	1000	0	93.4	65-135	940	0.64	30	
Chlorobenzene	942	30	1000	0	94.2	75-125	934.5	0.799	30	
Chloroethane	974.5	100	1000	0	97.4	40-155	1046	7.08	30	
Chloroform	1212	30	1000	0	121	70-125	1211	0.124	30	
Chloromethane	1123	100	1000	41.5	108	50-130	1149	2.29	30	
cis-1,2-Dichloroethene	1217	30	1000	0	122	65-125	1203	1.16	30	
cis-1,3-Dichloropropene	861	30	1000	0	86.1	70-125	853.5	0.875	30	
Dibromochloromethane	788	30	1000	0	78.8	65-135	768	2.57	30	
Dibromomethane	1076	30	1000	0	108	75-130	1068	0.699	30	
Dichlorodifluoromethane	1142	30	1000	0	114	35-135	1155	1.13	30	
Ethylbenzene	962.5	30	1000	0	96.2	75-125	963.5	0.104	30	
Hexachloroethane	764	30	1000	0	76.4	70-135	785.5	2.78	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	994.5	30	1000	0	99.4	75-130	987	0.757	30	
m,p-Xylene	1948	60	2000	0	97.4	80-125	1947	0.0513	30	
Methyl tert-butyl ether	1208	30	1000	0	121	75-125	1216	0.66	30	
Methylene chloride	1246	30	1000	0	125	55-145	1278	2.5	30	
Naphthalene	930.5	100	1000	0	93	40-140	930.5	0	30	
n-Butylbenzene	981.5	30	1000	0	98.2	65-140	985.5	0.407	30	
n-Propylbenzene	967.5	30	1000	0	96.8	65-135	968.5	0.103	30	
o-Xylene	971	30	1000	0	97.1	75-125	969.5	0.155	30	
p-Isopropyltoluene	951	30	1000	0	95.1	75-135	962.5	1.2	30	
sec-Butylbenzene	978.5	30	1000	0	97.8	65-130	978.5	0	30	
Styrene	975.5	30	1000	0	97.6	75-125	959.5	1.65	30	
tert-Butylbenzene	958.5	30	1000	0	95.8	65-130	958	0.0522	30	
Tetrachloroethene	848.5	30	1000	0	84.8	64-140	842.5	0.71	30	
Tetrahydrofuran	1276	200	1000	0	128	70-135	1292	1.29	30	
Toluene	929.5	30	1000	0	93	70-125	936	0.697	30	
trans-1,2-Dichloroethene	1212	30	1000	0	121	65-135	1222	0.822	30	
trans-1,3-Dichloropropene	757.5	30	1000	0	75.8	65-125	746.5	1.46	30	
trans-1,4-Dichloro-2-butene	603.5	30	1000	0	60.4	70-135	554.5	8.46	30	S
Trichloroethene	976	30	1000	0	97.6	75-125	974	0.205	30	
Trichlorofluoromethane	1144	30	1000	0	114	25-185	1154	0.87	30	
Vinyl chloride	1197	30	1000	0	120	60-125	1230	2.72	30	
Surr: 1,2-Dichloroethane-d4	*1033*	0	*1000*	0	*103*	*70-130*	1064	*3*	*30*	
Surr: 4-Bromofluorobenzene	*1028*	0	*1000*	0	*103*	*70-130*	1018	*0.977*	*30*	
Surr: Dibromofluoromethane	*1030*	0	*1000*	0	*103*	*70-130*	1046	*1.59*	*30*	
Surr: Toluene-d8	*950.5*	0	*1000*	0	*95*	*70-130*	931.5	*2.02*	*30*	

The following samples were analyzed in this batch: 1211293-08A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211293
Project: Marshall KRRI 1000-1025R 11/8/12

QC BATCH REPORT

Batch ID: **R112575** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112575** Units: **% of sample** Analysis Date: **11/14/2012 03:30 PM**
Client ID: Run ID: **MOIST_121114A** SeqNo: **2140097** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112575** Units: **% of sample** Analysis Date: **11/14/2012 03:30 PM**
Client ID: Run ID: **MOIST_121114A** SeqNo: **2140093** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211293-07A DUP** Units: **% of sample** Analysis Date: **11/14/2012 03:30 PM**
Client ID: **SBKR1025R505S110812S005** Run ID: **MOIST_121114A** SeqNo: **2140081** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	55.06	0.050	0	0	0	0-0	58.12	5.41	20	

DUP Sample ID: **1211314-03A DUP** Units: **% of sample** Analysis Date: **11/14/2012 03:30 PM**
Client ID: Run ID: **MOIST_121114A** SeqNo: **2140087** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.16	0.050	0	0	0	0-0	14.43	4.93	20	

The following samples were analyzed in this batch:

1211293-01A	1211293-02A	1211293-03A
1211293-04A	1211293-05A	1211293-06A
1211293-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211293

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_110812_GMK1 | Task: KRRI_1000,1025
Total # of Samples: 8 | Event Complete?
Turn Around Time: 5 Day | Rush: No
BILLING CODE: 6.00

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 5555 Glenwood Parkway SE Suite 200
City: Grand Rapids | State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX | Phone #: 713-821-2000
PO #
Send EDD to
CC Hardcopy report
CC Hardcopy report

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR1000R533S110812S006	SBKR1000R533	SO	G	11/08/2012 11:20	3			X	X	X	X	X										
2	SBKR1000R534S110812S005	SBKR1000R534	SO	G	11/08/2012 12:09	3			X	X	X	X	X										
3	SBKR1000R535S110812S006	SBKR1000R535	SO	G	11/08/2012 13:04	3			X	X	X	X	X										
4	SBKR1000R536S110812S008	SBKR1000R536	SO	G	11/08/2012 13:45	3			X	X	X	X	X										
5	SBKR1025R503S110812S008	SBKR1025R503	SO	G	11/08/2012 14:35	3			X	X	X	X	X										
6	SBKR1025R504S110812S005	SBKR1025R504	SO	G	11/08/2012 15:41	3			X	X	X	X	X										
7	SBKR1025R505S110812S005	SBKR1025R505	SO	G	11/08/2012 16:33	3			X	X	X	X	X										
8	SBKR1025R505T110812MX	SBKR1025R505	SQ	G	11/08/2012 00:00	1	TRIP BLANK						X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G. Kramer	11/9/12	1643	M	11/9/12	1643

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

Sample Receipt Conditions

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?
2.8°C	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **09-Nov-12 00:00**

Work Order: **1211293** Received by: **MA**

Checklist completed by Keith Wierenga (eSignature) 10-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 12-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.8 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/10/2012 10:40:48 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

16-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0950L,0975I,0925R GW 11/8/12** Work Order: **1211339**

Dear Bryan,

ALS Environmental received 3 samples on 09-Nov-2012 04:43 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 16-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12
Work Order: **1211339**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211339-01	SBKR0950L510S110812G038	Groundwater		11/8/2012 10:00	11/9/2012 16:43	☐
1211339-02	SBKR0975I502S110812G020	Groundwater		11/8/2012 11:30	11/9/2012 16:43	☐
1211339-03	SBKR0925R505S110812G020	Groundwater		11/8/2012 15:00	11/9/2012 16:43	☐

ALS Group USA, Corp

Date: 16-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12
WorkOrder: **1211339**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *16-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510S110812G038
Work Order:	1211339	**Collection Date:**	11/8/2012 10:00:00 AM
Project:	Marshall KRRI 0950L,0975I,0925R GW 11/8/12		
Lab ID:	1211339-01	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/14/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/14/2012
Surr: 4-Terphenyl-d14	*45.7*	*21-90*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/15/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/15/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/15/2012
Nickel	ND	0.020	0.020		mg/L	1	11/15/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/14/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/14/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/14/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/14/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/14/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/14/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/14/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/14/2012
Surr: 2,4,6-Tribromophenol	*42.0*	*32-115*			*%REC*	1	11/14/2012
Surr: 2-Fluorobiphenyl	*61.2*	*32-100*			*%REC*	1	11/14/2012
Surr: 2-Fluorophenol	*37.4*	*22-59*			*%REC*	1	11/14/2012
Surr: 4-Terphenyl-d14	*67.5*	*23-112*			*%REC*	1	11/14/2012
Surr: Nitrobenzene-d5	*72.5*	*31-93*			*%REC*	1	11/14/2012
Surr: Phenol-d6	*25.6*	*13-36*			*%REC*	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *16-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S110812G020
Work Order:	1211339	**Collection Date:**	11/8/2012 11:30:00 AM
Project:	Marshall KRRI 0950L,0975I,0925R GW 11/8/12		
Lab ID:	1211339-02	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/14/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/14/2012
Surr: 4-Terphenyl-d14	*52.3*	*21-90*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/15/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/15/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/15/2012
Nickel	ND	0.020	0.020		mg/L	1	11/15/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/14/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/14/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/14/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/14/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/14/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/14/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/14/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/14/2012
Surr: 2,4,6-Tribromophenol	*36.4*	*32-115*			*%REC*	1	11/14/2012
Surr: 2-Fluorobiphenyl	*47.7*	*32-100*			*%REC*	1	11/14/2012
Surr: 2-Fluorophenol	*32.4*	*22-59*			*%REC*	1	11/14/2012
Surr: 4-Terphenyl-d14	*78.5*	*23-112*			*%REC*	1	11/14/2012
Surr: Nitrobenzene-d5	*56.8*	*31-93*			*%REC*	1	11/14/2012
Surr: Phenol-d6	*22.4*	*13-36*			*%REC*	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *16-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0925R505S110812G020
Work Order:	1211339	**Collection Date:**	11/8/2012 3:00:00 PM
Project:	Marshall KRRI 0950L,0975I,0925R GW 11/8/12		
Lab ID:	1211339-03	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/14/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/14/2012
Surr: 4-Terphenyl-d14	*57.9*	*21-90*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/15/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/15/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/15/2012
Nickel	ND	0.020	0.020		mg/L	1	11/15/2012
Vanadium	**0.0045**	**0.0040**	**0.0040**		**mg/L**	1	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/14/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/14/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/14/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/14/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/14/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/14/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/14/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/14/2012
Surr: 2,4,6-Tribromophenol	*45.7*	*32-115*			*%REC*	1	11/14/2012
Surr: 2-Fluorobiphenyl	*62.5*	*32-100*			*%REC*	1	11/14/2012
Surr: 2-Fluorophenol	*43.8*	*22-59*			*%REC*	1	11/14/2012
Surr: 4-Terphenyl-d14	*85.0*	*23-112*			*%REC*	1	11/14/2012
Surr: Nitrobenzene-d5	*73.3*	*31-93*			*%REC*	1	11/14/2012
Surr: Phenol-d6	*28.2*	*13-36*			*%REC*	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 19-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211339

Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12

Batch ID: **44732** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKW1-44732-44732** Units: **mg/L** Analysis Date: **11/14/2012 06:10 PM**

Client ID: Run ID: **GC8_121114A** SeqNo: **2139606** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	0.10								
ORO (C20-C34)	ND	0.10								
Surr: 4-Terphenyl-d14	*0.02854*	0	*0.05*	0	*57.1*	*21-90*	0			

LCS Sample ID: **DLCSW1-44732-44732** Units: **mg/L** Analysis Date: **11/14/2012 06:37 PM**

Client ID: Run ID: **GC8_121114A** SeqNo: **2139607** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	2.676	0.10	5	0	53.5	44-116	0			
ORO (C20-C34)	2.805	0.10	5	0	56.1	44-116	0			
Surr: 4-Terphenyl-d14	*0.03679*	0	*0.05*	0	*73.6*	*21-90*	0			

MS Sample ID: **1211339-01B MS** Units: **mg/L** Analysis Date: **11/14/2012 07:04 PM**

Client ID: **SBKR0950L510S110812G038** Run ID: **GC8_121114A** SeqNo: **2139627** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	27.1	1.0	50	0	54.2	44-116	0			
ORO (C20-C34)	28.34	1.0	50	0	56.7	44-116	0			
Surr: 4-Terphenyl-d14	*0.3978*	0	*0.5*	0	*79.6*	*21-90*	0			

MSD Sample ID: **1211339-01B MSD** Units: **mg/L** Analysis Date: **11/14/2012 07:31 PM**

Client ID: **SBKR0950L510S110812G038** Run ID: **GC8_121114A** SeqNo: **2139628** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	27.49	1.0	50	0	55	44-116	27.1	1.4	30	
ORO (C20-C34)	28.79	1.0	50	0	57.6	44-116	28.34	1.6	30	
Surr: 4-Terphenyl-d14	*0.4114*	0	*0.5*	0	*82.3*	*21-90*	0.3978	*3.36*	*30*	

The following samples were analyzed in this batch: 1211339-01B 1211339-02B 1211339-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211339
Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12

QC BATCH REPORT

Batch ID: **44750** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44750-44750** Units: **mg/L** Analysis Date: **11/15/2012 12:57 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140477** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Molybdenum	ND	0.0050								
Nickel	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44750-44750** Units: **mg/L** Analysis Date: **11/15/2012 02:22 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140786** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09233	0.0020	0.1	0	92.3	80-120	0			
Molybdenum	0.08919	0.0050	0.1	0	89.2	80-120	0			
Nickel	0.08985	0.0050	0.1	0	89.8	80-120	0			
Vanadium	0.09139	0.0050	0.1	0	91.4	80-120	0			

MS Sample ID: **1211280-08BMS** Units: **mg/L** Analysis Date: **11/15/2012 02:37 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140789** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09447	0.0020	0.1	0.000007415	94.5	75-125	0			
Molybdenum	0.0949	0.0050	0.1	0.0003867	94.5	75-125	0			
Nickel	0.09466	0.0050	0.1	0.004295	90.4	75-125	0			
Vanadium	0.09809	0.0050	0.1	0.0002877	97.8	75-125	0			

MSD Sample ID: **1211280-08BMSD** Units: **mg/L** Analysis Date: **11/15/2012 02:42 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140790** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09167	0.0020	0.1	0.000007415	91.7	75-125	0.09447	3.01	20	
Molybdenum	0.0914	0.0050	0.1	0.0003867	91	75-125	0.0949	3.76	20	
Nickel	0.09309	0.0050	0.1	0.004295	88.8	75-125	0.09466	1.67	20	
Vanadium	0.09369	0.0050	0.1	0.0002877	93.4	75-125	0.09809	4.59	20	

The following samples were analyzed in this batch: 1211339-01A 1211339-02A 1211339-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44731-44731** Units: **µg/L** Analysis Date: **11/15/2012 10:58 AM**
Client ID: Run ID: **SVMS6_121115A** SeqNo: **2143158** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Naphthalene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2,4,6-Tribromophenol	*20.32*	0	*50*	0	*40.6*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*31.07*	0	*50*	0	*62.1*	*32-100*	0			
Surr: 2-Fluorophenol	*23.11*	0	*50*	0	*46.2*	*22-59*	0			
Surr: 4-Terphenyl-d14	*38.73*	0	*50*	0	*77.5*	*23-112*	0			
Surr: Nitrobenzene-d5	*37.14*	0	*50*	0	*74.3*	*31-93*	0			
Surr: Phenol-d6	*14.14*	0	*50*	0	*28.3*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211339
Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSW1-44731-44731** Units: **µg/L** Analysis Date: **11/15/2012 12:13 PM**
Client ID: Run ID: **SVMS6_121115A** SeqNo: **2143160** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	14.21	5.0	20	0	71	45-105	0			
Acenaphthene	14.58	5.0	20	0	72.9	45-110	0			
Acenaphthylene	14.96	5.0	20	0	74.8	50-105	0			
Anthracene	16.05	5.0	20	0	80.2	55-110	0			
Benzo(a)anthracene	17.31	5.0	20	0	86.6	55-110	0			
Benzo(a)pyrene	16.57	5.0	20	0	82.8	55-110	0			
Benzo(b)fluoranthene	15.16	5.0	20	0	75.8	45-120	0			
Benzo(g,h,i)perylene	16.93	5.0	20	0	84.6	40-125	0			
Benzo(k)fluoranthene	17.45	5.0	20	0	87.2	45-125	0			
Chrysene	16.09	5.0	20	0	80.4	55-110	0			
Dibenzo(a,h)anthracene	18.19	5.0	20	0	91	40-125	0			
Fluoranthene	16.15	5.0	20	0	80.8	55-115	0			
Fluorene	16.26	5.0	20	0	81.3	50-110	0			
Indeno(1,2,3-cd)pyrene	16.93	5.0	20	0	84.6	45-125	0			
Naphthalene	14.01	5.0	20	0	70	40-100	0			
Phenanthrene	15.77	5.0	20	0	78.8	50-115	0			
Pyrene	17.16	5.0	20	0	85.8	50-130	0			
Surr: 2,4,6-Tribromophenol	*25.13*	0	*50*	0	*50.3*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*30.3*	0	*50*	0	*60.6*	*32-100*	0			
Surr: 2-Fluorophenol	*19.82*	0	*50*	0	*39.6*	*22-59*	0			
Surr: 4-Terphenyl-d14	*28.18*	0	*50*	0	*56.4*	*23-112*	0			
Surr: Nitrobenzene-d5	*35.87*	0	*50*	0	*71.7*	*31-93*	0			
Surr: Phenol-d6	*12.88*	0	*50*	0	*25.8*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211339
Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1211339-01B MS** Units: **µg/L** Analysis Date: **11/15/2012 12:38 PM**
Client ID: **SBKR0950L510S110812G038** Run ID: **SVMS6_121115A** SeqNo: **2143163** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	135	50	200	0	67.5	45-105	0			
Acenaphthene	136.8	50	200	0	68.4	45-110	0			
Acenaphthylene	139.9	50	200	0	70	50-105	0			
Anthracene	151.9	50	200	0	76	55-110	0			
Benzo(a)anthracene	161.5	50	200	0	80.8	55-110	0			
Benzo(a)pyrene	156.9	50	200	0	78.4	55-110	0			
Benzo(b)fluoranthene	143.5	50	200	0	71.8	45-120	0			
Benzo(g,h,i)perylene	159	50	200	0	79.5	40-125	0			
Benzo(k)fluoranthene	166.2	50	200	0	83.1	45-125	0			
Chrysene	152.8	50	200	0	76.4	55-110	0			
Dibenzo(a,h)anthracene	171.9	50	200	0	86	40-125	0			
Fluoranthene	154.1	50	200	0	77	55-115	0			
Fluorene	150.8	50	200	0	75.4	50-110	0			
Indeno(1,2,3-cd)pyrene	159	50	200	0	79.5	45-125	0			
Naphthalene	135.1	50	200	0	67.6	40-100	0			
Phenanthrene	149.4	50	200	0	74.7	50-115	0			
Pyrene	163.3	50	200	0	81.6	50-130	0			
Surr: 2,4,6-Tribromophenol	*229*	0	*500*	0	*45.8*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*282.1*	0	*500*	0	*56.4*	*32-100*	0			
Surr: 2-Fluorophenol	*179.1*	0	*500*	0	*35.8*	*22-59*	0			
Surr: 4-Terphenyl-d14	*384.7*	0	*500*	0	*76.9*	*23-112*	0			
Surr: Nitrobenzene-d5	*340.9*	0	*500*	0	*68.2*	*31-93*	0			
Surr: Phenol-d6	*116.3*	0	*500*	0	*23.3*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211339
Project: Marshall KRRI 0950L,0975I,0925R GW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1211339-01B MSD** Units: **µg/L** Analysis Date: **11/15/2012 01:03 PM**
Client ID: **SBKR0950L510S110812G038** Run ID: **SVMS6_121115A** SeqNo: **2143166** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	142.2	50	200	0	71.1	45-105	135	5.19	30	
Acenaphthene	145.1	50	200	0	72.6	45-110	136.8	5.89	30	
Acenaphthylene	149.1	50	200	0	74.6	50-105	139.9	6.37	30	
Anthracene	160.6	50	200	0	80.3	55-110	151.9	5.57	30	
Benzo(a)anthracene	170.8	50	200	0	85.4	55-110	161.5	5.6	30	
Benzo(a)pyrene	169.3	50	200	0	84.6	55-110	156.9	7.6	30	
Benzo(b)fluoranthene	149.4	50	200	0	74.7	45-120	143.5	4.03	30	
Benzo(g,h,i)perylene	168.9	50	200	0	84.4	40-125	159	6.04	30	
Benzo(k)fluoranthene	176.8	50	200	0	88.4	45-125	166.2	6.18	30	
Chrysene	161.1	50	200	0	80.6	55-110	152.8	5.29	30	
Dibenzo(a,h)anthracene	181.6	50	200	0	90.8	40-125	171.9	5.49	30	
Fluoranthene	162.2	50	200	0	81.1	55-115	154.1	5.12	30	
Fluorene	162.5	50	200	0	81.2	50-110	150.8	7.47	30	
Indeno(1,2,3-cd)pyrene	168.9	50	200	0	84.4	45-125	159	6.04	30	
Naphthalene	141	50	200	0	70.5	40-100	135.1	4.27	30	
Phenanthrene	158.7	50	200	0	79.4	50-115	149.4	6.04	30	
Pyrene	172.4	50	200	0	86.2	50-130	163.3	5.42	30	
Surr: 2,4,6-Tribromophenol	*247.8*	0	*500*	0	*49.6*	*38-115*	229	*7.89*	*40*	
Surr: 2-Fluorobiphenyl	*301.9*	0	*500*	0	*60.4*	*32-100*	282.1	*6.78*	*40*	
Surr: 2-Fluorophenol	*202.6*	0	*500*	0	*40.5*	*22-59*	179.1	*12.3*	*40*	
Surr: 4-Terphenyl-d14	*405.2*	0	*500*	0	*81*	*23-112*	384.7	*5.19*	*40*	
Surr: Nitrobenzene-d5	*361*	0	*500*	0	*72.2*	*31-93*	340.9	*5.73*	*40*	
Surr: Phenol-d6	*138.3*	0	*500*	0	*27.7*	*13-36*	116.3	*17.3*	*40*	

The following samples were analyzed in this batch: 1211339-01B 1211339-02B 1211339-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

☐ ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Chain of Custody Form

Page _____ of _____

COC ID: 20096

☐ ALS Environmental
3352 128th Ave.
Holland, MI 49424-9263
Tel: +1 616 399 6070
Fax: +1 616 399 6185

ALS Project Manager: | ALS Work Order #: 1211339

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	TASK 6.00	Project Name	KRR1 - SW/GW	A	METALS
Work Order		Project Number		B	PNA's
Company Name	AECOM Environment	Bill To Company	Enbridge Energy	C	
Send Report To		Invoice Attn	Accounts Payable	D	
Address	5555 Glenwood Parkway SE	Address	1100 Louisiana Suite 1100	E	
				F	
City/State/Zip	Grand Rapids, MI 49512	City/State/Zip	Houston, TX 77002	G	
Phone	(616) 942-9600	Phone		H	
Fax		Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SBKR0950L510511081260038	11-8-12	1000	GW		3											
2	SBKR0975I502511081260020	11-8-12	1130	GW		3											
3	SBKR0925R505511081260220	11-8-12	1500	GW		3											
4	~~SWKR1000R502511081260FX~~	~~11-6-12~~	~~1555~~	~~SW~~		~~3~~	See WO# 1211363										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: APRIL MOORE / [signature]

Shipment Method:

Required Turnaround Time: (Check Box) ☐ Std 10 WK Days ☒ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
[signature]	11/11/12	1643	[signature]
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp.
	3.0°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other _____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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1211339

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_110812_AKM2 | Task: KRRI_GW 0925-0975
Total # of Samples: 3 | Event Complete?

Lab Information		Project Information		Other Information	
Lab Name:	ALS Laboratory Group	Site ID #		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-8263	Project #	80162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Grenwood Parkway SE Suite 200	City/State:	Houson, TX
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	[redacted]	Send EDD to	
Lab PM email:	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

Phone #: 713-821-2000
PO #:

Turn Around Time: 5 Day | Rush: No |
BILLING CODE: 8.00

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	HNO3	None	None												
								Analysis	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270												
1	SBKR0925R505S110812G020	SBKR0925R505	WG	G	11/08/2012 15:00	3			X	X	X												
2	SBKR0950L510S110812G038	SBKR0950L510	WG	G	11/08/2012 10:00	3			X	X	X												
3	SBKR09751502S110812G020	SBKR09751502	WG	G	11/08/2012 11:30	3			X	X	X												

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

Sample Receipt Conditions

	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N

SHIPMENT INFO	SAMPLER NAME AND SIGNATURE				
Company:	PRINT Name of SAMPLER:	APRIL MOLERT (AKM1)			
Tracking #:	SIGNATURE of SAMPLER:		DATE Signed:		Time:

Temp in QC | Samples on Ice? | Sample Intact? | Trip Blank?

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **09-Nov-12 16:43**

Work Order: **1211339** Received by: **MA**

Checklist completed by Keith Wierenga (eSignature) 12-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 12-Nov-12 (Date)

Matrices: Groundwater
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/12/2012 9:56:41 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

21-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1025R,1050L 11/9/12** Work Order: **1211351**

Dear Bryan,

ALS Environmental received 10 samples on 12-Nov-2012 10:50 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 53.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025R,1050L 11/9/12
Work Order: **1211351**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211351-01	SBKR1025R506S110912S006	Soil		11/9/2012 08:21	11/12/2012 10:50	☐
1211351-02	SBKR1025R507S110912S009	Soil		11/9/2012 09:05	11/12/2012 10:50	☐
1211351-03	SBKR1025R508D110912S007	Soil		11/9/2012 10:10	11/12/2012 10:50	☐
1211351-04	SBKR1025R508S110912S007	Soil		11/9/2012 10:10	11/12/2012 10:50	☐
1211351-05	SBKR1025R509S110912S006	Soil		11/9/2012 11:08	11/12/2012 10:50	☐
1211351-06	SBKR1050L522S110912S004	Soil		11/9/2012 14:05	11/12/2012 10:50	☐
1211351-07	SBKR1050L523S110912S004	Soil		11/9/2012 14:59	11/12/2012 10:50	☐
1211351-08	SBKR1050L524S110912S004	Soil		11/9/2012 16:01	11/12/2012 10:50	☐
1211351-09	SBKR1050L524T110912MX	Soil		11/9/2012	11/12/2012 10:50	☐
1211351-10	SBKR1050L526S110912S007	Soil		11/9/2012 13:23	11/12/2012 10:50	☐

Client: AECOM Environment
Project: Marshall KRRI 1025R,1050L 11/9/12
Work Order: 1211351

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44759 sample SBKR1025R509S110912S006 RPDs between the MS/MSD recoveries for a few PAHs were above control limits. The individual MS/MSD recoveries met quality control criteria. No data requires qualification.

Batch 44749 LCS recovery for Chloromethane was above control limits, but all samples in this quality control batch were ND for this compound. No data requires qualification. Sample SBKR1025R509S110912S006 MS/MSD recoveries for Acetone and Bromochloromethane were above control limits. The parent sample was ND for these compounds. No data requires qualification. The MS/MSD recoveries for trans-1,4-Dichloro-2-butene were below the control limit. The corresponding reporting limit in the parent sample may be biased low.

Batch 44760 sample SBKR1025R509S110912S006 MS/MSD recoveries for DRO/ORO were below control limits. The corresponding results in the parent sample may be biased low for DRO/ORO.

Batch 44745 sample SBKR1025R509S110912S006 MS/MSD recoveries for Vanadium were below control limits. The corresponding result in the parent sample may be biased low for Vanadium.

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025R,1050L 11/9/12
WorkOrder: **1211351**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R506S110912S006
Work Order:	1211351	**Collection Date:**	11/9/2012 8:21:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**220**	**43**	**4.0**		**mg/Kg-dry**	1	11/19/2012
ORO (C20-C34)	**480**	**85**	**4.0**		**mg/Kg-dry**	1	11/19/2012
Surr: 4-Terphenyl-d14	*67.5*	*39-115*			*%REC*	1	11/19/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	2.8	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	7.1	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**13**	**7.1**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**22**	**7.1**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*82.4*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*66.3*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*68.5*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*72.3*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*65.2*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*71.8*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R506S110912S006
Work Order:	1211351	**Collection Date:**	11/9/2012 8:21:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	430	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,300	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	430	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R506S110912S006
Work Order:	1211351	**Collection Date:**	11/9/2012 8:21:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	260	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	430	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*92.2*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*93.0*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*96.6*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**77**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R507S110912S009
Work Order:	1211351	**Collection Date:**	11/9/2012 9:05:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**86**	**19**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**180**	**37**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*53.9*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	**7.4**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/15/2012
Nickel	**13**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**32**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*46.8*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*44.4*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*46.4*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*74.7*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*45.1*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*49.8*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	57	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	57	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	57	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	57	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R507S110912S009
Work Order:	1211351	**Collection Date:**	11/9/2012 9:05:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	57	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	57	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	57	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	57	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	57	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	57	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	57	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	57	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	57	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	57	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	57	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R507S110912S009
Work Order:	1211351	**Collection Date:**	11/9/2012 9:05:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	57	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	57	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	57	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	57	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	57	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	57	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	57	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	57	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	57	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	57	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	57	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	57	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*92.6*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*90.6*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.5*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R508D110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 10:10:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**31**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**350**	**62**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*60.2*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	2.0	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	4.9	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**18**	**4.9**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**21**	**4.9**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*52.7*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*61.2*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*68.6*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*82.5*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*66.5*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*69.3*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	94	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	94	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	94	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	94	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R508D110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 10:10:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	94	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	94	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	94	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	94	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	94	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	94	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	94	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	94	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	310	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	94	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	94	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	94	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R508D110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 10:10:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	94	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	190	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	94	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	94	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	94	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	94	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	94	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	94	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	94	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	94	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	94	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	94	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	94	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*91.3*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*90.0*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.6*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**68**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R508S110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 10:10:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**28**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**300**	**56**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*48.4*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	4.6	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**24**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**29**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*41.0*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*41.7*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*43.2*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*67.9*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*41.8*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*46.2*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	85	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	85	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	85	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	85	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R508S110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 10:10:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	85	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	85	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	85	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	85	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	85	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	85	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	85	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	85	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	280	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	85	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	85	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	85	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R508S110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 10:10:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	85	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	170	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	85	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	85	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	85	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	85	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	85	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	85	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	85	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	85	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	85	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	85	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	85	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*90.3*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*90.2*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.0*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**65**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R509S110912S006
Work Order:	1211351	**Collection Date:**	11/9/2012 11:08:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**22**	**4.0**		**mg/Kg-dry**	1	11/15/2012
ORO (C20-C34)	**300**	**45**	**4.0**		**mg/Kg-dry**	1	11/15/2012
Surr: 4-Terphenyl-d14	*64.3*	*39-115*			*%REC*	1	11/15/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	1.6	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	4.1	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**16**	**4.1**	**1.0**		**mg/Kg-dry**	4	11/15/2012
Vanadium	**28**	**4.1**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*59.2*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*62.2*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*69.9*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*88.0*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*66.9*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*69.8*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	73	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	73	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	73	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	73	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R509S110912S006
Work Order:	1211351	**Collection Date:**	11/9/2012 11:08:00 AM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	73	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	73	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	73	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	73	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	73	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	73	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	73	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	73	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	73	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: AECOM Environment **Client Sample ID:** SBKR1025R509S110912S006
Work Order: 1211351 **Collection Date:** 11/9/2012 11:08:00 AM
Project: Marshall KRRI 1025R,1050L 11/9/12
Lab ID: 1211351-05 **Matrix:** SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	73	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	150	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	73	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	73	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	73	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	73	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	73	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	73	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	73	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*90.4*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*90.1*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.3*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**59**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L522S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 2:05:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**52**	**13**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**96**	**26**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*55.9*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	0.76	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	1.9	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**13**	**1.9**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**29**	**1.9**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*47.1*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*54.2*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*62.4*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*79.5*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*59.1*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*61.9*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L522S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 2:05:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	40	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	40	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L522S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 2:05:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*91.6*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*90.0*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.5*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**25**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L523S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 2:59:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**54**	**11**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**160**	**22**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*64.6*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/14/2012**		Analyst: **CES**
Beryllium	ND	0.69	0.50		mg/Kg-dry	4	11/16/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/15/2012
Nickel	**7.0**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**6.7**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*59.0*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*63.3*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*73.7*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*89.2*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*70.1*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*69.6*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L523S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 2:59:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	33	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	33	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L523S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 2:59:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*92.8*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*91.2*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*92.6*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**9.2**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L524S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 4:01:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**200**	**34**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**790**	**68**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*56.7*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	2.0	0.50		mg/Kg-dry	4	11/19/2012
Molybdenum	ND	5.1	1.0		mg/Kg-dry	4	11/16/2012
Nickel	**23**	**5.1**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**23**	**5.1**	**1.0**		**mg/Kg-dry**	4	11/16/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	**900**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Benzo(a)pyrene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Benzo(b)fluoranthene	**1,400**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Benzo(g,h,i)perylene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Benzo(k)fluoranthene	**630**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Chrysene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	**1,600**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Pyrene	**1,500**	**330**	**330**		**µg/Kg-dry**	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*49.6*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*56.6*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*64.1*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*75.6*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*61.8*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*57.1*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L524S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 4:01:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	350	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	350	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L524S110912S004
Work Order:	1211351	**Collection Date:**	11/9/2012 4:01:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	350	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*108*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*94.3*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*89.0*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.0*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**71**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L524T110912MX
Work Order:	1211351	**Collection Date:**	11/9/2012
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/14/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/14/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/14/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/14/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/14/2012
Benzene	ND	50	50		µg/Kg	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/14/2012
Bromoform	ND	100	100		µg/Kg	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/14/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/14/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg	1	11/14/2012
Chloroform	ND	50	50		µg/Kg	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg	1	11/14/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/14/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L524T110912MX
Work Order:	1211351	**Collection Date:**	11/9/2012
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/14/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/14/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg	1	11/14/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/14/2012
o-Xylene	ND	50	50		µg/Kg	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/14/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/14/2012
Styrene	ND	50	50		µg/Kg	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/14/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/14/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/14/2012
Toluene	ND	100	100		µg/Kg	1	11/14/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/14/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/14/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/14/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*94.1*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*89.5*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*93.8*	*70-130*			*%REC*	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L526S110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 1:23:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/15/2012**		Analyst: **CW**
DRO (C10-C20)	**52**	**12**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**110**	**24**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*59.7*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.71	0.50		mg/Kg-dry	4	11/19/2012
Molybdenum	ND	1.8	1.0		mg/Kg-dry	4	11/16/2012
Nickel	**13**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/16/2012
Vanadium	**29**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/16/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/15/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*55.0*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*61.6*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*71.7*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*85.4*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*68.7*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*70.8*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/14/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L526S110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 1:23:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dibromo-3-chloropropane	ND	37	10		µg/Kg-dry	1	11/14/2012
1,2-Dibromoethane	ND	37	20		µg/Kg-dry	1	11/14/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/14/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/14/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/14/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/14/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/14/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/14/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/14/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/14/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/14/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/14/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/14/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/14/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L526S110912S007
Work Order:	1211351	**Collection Date:**	11/9/2012 1:23:00 PM
Project:	Marshall KRRI 1025R,1050L 11/9/12		
Lab ID:	1211351-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/14/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/14/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/14/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/14/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/14/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/14/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/14/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/14/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/14/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/14/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/14/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/14/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/14/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/14/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/14/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/14/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/14/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/14/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/14/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/14/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/14/2012
Surr: 4-Bromofluorobenzene	*91.4*	*70-130*			*%REC*	1	11/14/2012
Surr: Dibromofluoromethane	*87.4*	*70-130*			*%REC*	1	11/14/2012
Surr: Toluene-d8	*94.4*	*70-130*			*%REC*	1	11/14/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**18**	**0.050**	**0**		**% of sample**	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211351

Project: Marshall KRRI 1025R,1050L 11/9/12

Batch ID: **44760** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44760-44760** Units: **mg/Kg** Analysis Date: **11/15/2012 07:33 PM**

Client ID: Run ID: **GC8_121115B** SeqNo: **2142258** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.527*	0	*5*	0	*70.5*	*39-115*	0			

LCS Sample ID: **DLCSS1-44760-44760** Units: **mg/Kg** Analysis Date: **11/15/2012 08:00 PM**

Client ID: Run ID: **GC8_121115B** SeqNo: **2142259** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	301.3	10	500	0	60.3	49-124	0			
ORO (C20-C34)	324.1	20	500	0	64.8	60-130	0			
Surr: 4-Terphenyl-d14	*4.318*	0	*5*	0	*86.4*	*39-115*	0			

MS Sample ID: **1211351-05B MS** Units: **mg/Kg** Analysis Date: **11/15/2012 08:27 PM**

Client ID: **SBKR1025R509S110912S006** Run ID: **GC8_121115B** SeqNo: **2142260** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	289.7	9.6	478.2	47.37	50.7	60-130	0			S
ORO (C20-C34)	344.3	19	478.2	124.2	46	60-130	0			S
Surr: 4-Terphenyl-d14	*3.708*	0	*4.782*	0	*77.5*	*39-115*	0			

MSD Sample ID: **1211351-05B MSD** Units: **mg/Kg** Analysis Date: **11/15/2012 08:54 PM**

Client ID: **SBKR1025R509S110912S006** Run ID: **GC8_121115B** SeqNo: **2142261** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	286	9.3	465.5	47.37	51.3	60-130	289.7	1.29	30	S
ORO (C20-C34)	384.3	19	465.5	124.2	55.9	60-130	344.3	11	30	S
Surr: 4-Terphenyl-d14	*3.651*	0	*4.655*	0	*78.4*	*39-115*	3.708	*1.55*	*30*	

The following samples were analyzed in this batch:

1211351-01B	1211351-02B	1211351-03B
1211351-04B	1211351-05B	1211351-06B
1211351-07B	1211351-08B	1211351-10B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44745** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44745-44745** Units: **mg/Kg** Analysis Date: **11/15/2012 01:31 PM**
Client ID: Run ID: **ICPMS1_121115A** SeqNo: **2140878** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.0068	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44745-44745** Units: **mg/Kg** Analysis Date: **11/15/2012 01:37 PM**
Client ID: Run ID: **ICPMS1_121115A** SeqNo: **2140879** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.464	0.10	5	0	89.3	80-120	0			
Molybdenum	4.534	0.25	5	0	90.7	80-120	0			
Nickel	4.508	0.25	5	0	90.2	80-120	0			
Vanadium	4.716	0.25	5	0	94.3	80-120	0			

MS Sample ID: **1211351-05BMS** Units: **mg/Kg** Analysis Date: **11/15/2012 02:17 PM**
Client ID: **SBKR1025R509S110912S006** Run ID: **ICPMS1_121115A** SeqNo: **2140886** Prep Date: **11/14/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.625	0.67	8.361	0.2494	88.2	75-125	0			
Molybdenum	8.234	1.7	8.361	0.5682	91.7	75-125	0			
Nickel	15.07	1.7	8.361	6.527	102	75-125	0			
Vanadium	22.4	1.7	8.361	11.41	132	75-125	0			S

MSD Sample ID: **1211351-05BMSD** Units: **mg/Kg** Analysis Date: **11/15/2012 02:23 PM**
Client ID: **SBKR1025R509S110912S006** Run ID: **ICPMS1_121115A** SeqNo: **2140887** Prep Date: **11/14/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.861	0.68	8.503	0.2494	89.5	75-125	7.625	3.04	25	
Molybdenum	8.265	1.7	8.503	0.5682	90.5	75-125	8.234	0.378	25	
Nickel	15.27	1.7	8.503	6.527	103	75-125	15.07	1.31	25	
Vanadium	22.77	1.7	8.503	11.41	134	75-125	22.4	1.61	25	S

The following samples were analyzed in this batch:

1211351-01B	1211351-02B	1211351-03B
1211351-04B	1211351-05B	1211351-06B
1211351-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44786** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44786-44786** Units: **mg/Kg** Analysis Date: **11/16/2012 08:15 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143075** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

MBLK Sample ID: **MBLK-44786-44786** Units: **mg/Kg** Analysis Date: **11/19/2012 12:47 PM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2143923** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								

LCS Sample ID: **LCS-44786-44786** Units: **mg/Kg** Analysis Date: **11/16/2012 08:21 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143076** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	5.08	0.25	5	0	102	80-120	0			
Nickel	4.828	0.25	5	0	96.6	80-120	0			
Vanadium	4.927	0.25	5	0	98.5	80-120	0			

LCS Sample ID: **LCS-44786-44786** Units: **mg/Kg** Analysis Date: **11/19/2012 12:53 PM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2143924** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.62	0.10	5	0	112	80-120	0			

MS Sample ID: **1211343-11BMS** Units: **mg/Kg** Analysis Date: **11/16/2012 08:33 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143078** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.383	0.36	7.112	0.2603	100	75-125	0			
Nickel	9.651	0.36	7.112	2.606	99.1	75-125	0			
Vanadium	13.96	0.36	7.112	6.415	106	75-125	0			

MS Sample ID: **1211343-11BMS** Units: **mg/Kg** Analysis Date: **11/19/2012 01:28 PM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2143940** Prep Date: **11/16/2012** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.696	1.4	7.112	0.02698	108	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44786** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **1211343-11BMSD** Units: **mg/Kg** Analysis Date: **11/16/2012 08:38 PM**
Client ID: Run ID: **ICPMS1_121116A** SeqNo: **2143079** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.311	0.36	7.133	0.2603	98.8	75-125	7.383	0.975	25	
Nickel	10.07	0.36	7.133	2.606	105	75-125	9.651	4.26	25	
Vanadium	14.96	0.36	7.133	6.415	120	75-125	13.96	6.89	25	

MSD Sample ID: **1211343-11BMSD** Units: **mg/Kg** Analysis Date: **11/19/2012 01:33 PM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2143943** Prep Date: **11/16/2012** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	8.031	1.4	7.133	0.02698	112	75-125	7.696	4.27	25	

The following samples were analyzed in this batch: 1211351-08B 1211351-10B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44759** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44759-44759** Units: **µg/Kg** Analysis Date: **11/16/2012 10:47 AM**
Client ID: Run ID: **SVMS6_121116A** SeqNo: **2141578** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*2443*	0	*5000*	0	*48.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3646*	0	*5000*	0	*72.9*	*12-100*	0			
Surr: 2-Fluorophenol	*4238*	0	*5000*	0	*84.8*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5016*	0	*5000*	0	*100*	*25-137*	0			
Surr: Nitrobenzene-d5	*4224*	0	*5000*	0	*84.5*	*37-107*	0			
Surr: Phenol-d6	*4176*	0	*5000*	0	*83.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44759** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSS1-44759-44759** Units: **µg/Kg** Analysis Date: **11/16/2012 08:22 AM**
Client ID: Run ID: **SVMS6_121116A** SeqNo: **2141575** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1598	50	2000	0	79.9	45-105	0			
Acenaphthene	1606	50	2000	0	80.3	45-110	0			
Acenaphthylene	1670	50	2000	0	83.5	45-105	0			
Anthracene	1852	50	2000	0	92.6	55-105	0			
Benzo(a)anthracene	1928	50	2000	0	96.4	50-110	0			
Benzo(a)pyrene	1945	50	2000	0	97.2	50-110	0			
Benzo(b)fluoranthene	1709	50	2000	0	85.4	45-115	0			
Benzo(g,h,i)perylene	1964	50	2000	0	98.2	40-125	0			
Benzo(k)fluoranthene	2026	50	2000	0	101	45-115	0			
Chrysene	1808	50	2000	0	90.4	55-110	0			
Dibenzo(a,h)anthracene	2108	50	2000	0	105	40-125	0			
Fluoranthene	1855	50	2000	0	92.8	55-115	0			
Fluorene	1823	50	2000	0	91.2	50-110	0			
Indeno(1,2,3-cd)pyrene	1964	50	2000	0	98.2	40-120	0			
Naphthalene	1603	50	2000	0	80.2	40-105	0			
Phenanthrene	1796	50	2000	0	89.8	50-110	0			
Pyrene	1918	50	2000	0	95.9	45-125	0			
Surr: 2,4,6-Tribromophenol	*2943*	0	*5000*	0	*58.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3381*	0	*5000*	0	*67.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3929*	0	*5000*	0	*78.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4793*	0	*5000*	0	*95.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*4003*	0	*5000*	0	*80.1*	*37-107*	0			
Surr: Phenol-d6	*3851*	0	*5000*	0	*77*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44759** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1211351-05B MS** Units: **µg/Kg** Analysis Date: **11/16/2012 11:47 AM**
Client ID: **SBKR1025R509S110912S006** Run ID: **SVMS6_121116A** SeqNo: **2141937** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1354	50	1985	0	68.2	45-105	0			
Acenaphthene	968.5	50	1985	0	48.8	45-110	0			
Acenaphthylene	991.4	50	1985	0	50	45-105	0			
Anthracene	1780	50	1985	0	89.7	55-105	0			
Benzo(a)anthracene	1864	50	1985	90.17	89.4	50-110	0			
Benzo(a)pyrene	1872	50	1985	114.8	88.5	50-110	0			
Benzo(b)fluoranthene	1717	50	1985	128.4	80	45-115	0			
Benzo(g,h,i)perylene	1904	50	1985	77.42	92	40-125	0			
Benzo(k)fluoranthene	1896	50	1985	48.27	93.1	45-115	0			
Chrysene	1791	50	1985	109.3	84.7	55-110	0			
Dibenzo(a,h)anthracene	1854	50	1985	0	93.4	40-125	0			
Fluoranthene	1834	50	1985	112	86.8	55-115	0			
Fluorene	1106	50	1985	0	55.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1904	50	1985	77.42	92	40-120	0			
Naphthalene	1295	50	1985	0	65.2	40-105	0			
Phenanthrene	1787	50	1985	0	90	50-110	0			
Pyrene	1852	50	1985	137.5	86.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*3046*	0	*4962*	0	*61.4*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*1874*	0	*4962*	0	*37.8*	*12-100*	0			
Surr: 2-Fluorophenol	*3239*	0	*4962*	0	*65.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4315*	0	*4962*	0	*87*	*25-137*	0			
Surr: Nitrobenzene-d5	*3182*	0	*4962*	0	*64.1*	*37-107*	0			
Surr: Phenol-d6	*3382*	0	*4962*	0	*68.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44759** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1211351-05B MSD** Units: **µg/Kg** Analysis Date: **11/16/2012 12:12 PM**
Client ID: **SBKR1025R509S110912S006** Run ID: **SVMS6_121116A** SeqNo: **2141938** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1231	46	1843	0	66.8	45-105	1354	9.49	30	
Acenaphthene	1332	46	1843	0	72.3	45-110	968.5	31.6	30	R
Acenaphthylene	1385	46	1843	0	75.2	45-105	991.4	33.1	30	R
Anthracene	1530	46	1843	0	83	55-105	1780	15.2	30	
Benzo(a)anthracene	1651	46	1843	90.17	84.7	50-110	1864	12.1	30	
Benzo(a)pyrene	1650	46	1843	114.8	83.3	50-110	1872	12.6	30	
Benzo(b)fluoranthene	1714	46	1843	128.4	86	45-115	1717	0.173	30	
Benzo(g,h,i)perylene	1530	46	1843	77.42	78.8	40-125	1904	21.8	30	
Benzo(k)fluoranthene	1459	46	1843	48.27	76.5	45-115	1896	26.1	30	
Chrysene	1589	46	1843	109.3	80.3	55-110	1791	12	30	
Dibenzo(a,h)anthracene	1512	46	1843	0	82	40-125	1854	20.3	30	
Fluoranthene	1634	46	1843	112	82.6	55-115	1834	11.5	30	
Fluorene	1526	46	1843	0	82.8	50-110	1106	31.9	30	R
Indeno(1,2,3-cd)pyrene	1530	46	1843	77.42	78.8	40-120	1904	21.8	30	
Naphthalene	1177	46	1843	0	63.8	40-105	1295	9.58	30	
Phenanthrene	1533	46	1843	0	83.2	50-110	1787	15.3	30	
Pyrene	1638	46	1843	137.5	81.4	45-125	1852	12.2	30	
Surr: 2,4,6-Tribromophenol	*2667*	0	*4607*	0	*57.9*	*34-140*	3046	*13.2*	*40*	
Surr: 2-Fluorobiphenyl	*2702*	0	*4607*	0	*58.6*	*12-100*	1874	*36.2*	*40*	
Surr: 2-Fluorophenol	*2957*	0	*4607*	0	*64.2*	*33-117*	3239	*9.11*	*40*	
Surr: 4-Terphenyl-d14	*3780*	0	*4607*	0	*82*	*25-137*	4315	*13.2*	*40*	
Surr: Nitrobenzene-d5	*2913*	0	*4607*	0	*63.2*	*37-107*	3182	*8.83*	*40*	
Surr: Phenol-d6	*3049*	0	*4607*	0	*66.2*	*40-106*	3382	*10.4*	*40*	

The following samples were analyzed in this batch:

1211351-01B	1211351-02B	1211351-03B
1211351-04B	1211351-05B	1211351-06B
1211351-07B	1211351-08B	1211351-10B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44749-44749** Units: **µg/Kg** Analysis Date: **11/14/2012 01:47 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139644** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	223.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	42.5	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1061*	0	*1000*	0	*106*	*70-130*	0
Surr: 4-Bromofluorobenzene	*907.5*	0	*1000*	0	*90.8*	*70-130*	0
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*70-130*	0
Surr: Toluene-d8	*954.5*	0	*1000*	0	*95.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44749-44749** Units: **µg/Kg** Analysis Date: **11/14/2012 12:31 PM**
Client ID: Run ID: **VMS9_121114A** SeqNo: **2139643** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	817.5	30	1000	0	81.8	75-125	0			
1,1,1-Trichloroethane	906	30	1000	0	90.6	70-135	0			
1,1,2,2-Tetrachloroethane	874	30	1000	0	87.4	55-130	0			
1,1,2-Trichloroethane	862.5	30	1000	0	86.2	60-125	0			
1,1-Dichloroethane	1102	30	1000	0	110	75-125	0			
1,1-Dichloroethene	1172	30	1000	0	117	65-135	0			
1,2,3-Trichlorobenzene	845.5	30	1000	0	84.6	60-135	0			
1,2,3-Trichloropropane	810.5	30	1000	0	81	65-130	0			
1,2,4-Trichlorobenzene	870.5	30	1000	0	87	65-130	0			
1,2,4-Trimethylbenzene	913	30	1000	0	91.3	65-135	0			
1,2-Dibromo-3-chloropropane	692.5	30	1000	0	69.2	40-135	0			
1,2-Dibromoethane	876.5	30	1000	0	87.6	70-125	0			
1,2-Dichlorobenzene	863.5	30	1000	0	86.4	75-120	0			
1,2-Dichloroethane	968.5	30	1000	0	96.8	70-135	0			
1,2-Dichloropropane	977.5	30	1000	0	97.8	70-120	0			
1,3,5-Trimethylbenzene	955.5	30	1000	0	95.6	65-135	0			
1,3-Dichlorobenzene	862.5	30	1000	0	86.2	70-125	0			
1,4-Dichlorobenzene	877	30	1000	0	87.7	70-125	0			
2-Butanone	1154	200	1000	0	115	30-160	0			
2-Hexanone	823.5	30	1000	0	82.4	45-145	0			
4-Methyl-2-pentanone	968.5	30	1000	0	96.8	45-145	0			
Acetone	1148	100	1000	0	115	20-160	0			B
Acrylonitrile	999.5	100	1000	0	100	70-135	0			
Benzene	970.5	30	1000	0	97	75-125	0			
Bromobenzene	885	30	1000	0	88.5	65-120	0			
Bromochloromethane	1163	30	1000	0	116	70-125	0			
Bromodichloromethane	884	30	1000	0	88.4	70-130	0			
Bromoform	784.5	30	1000	0	78.4	55-135	0			
Bromomethane	959.5	75	1000	0	96	30-160	0			
Carbon disulfide	1178	30	1000	0	118	45-160	0			
Carbon tetrachloride	908.5	30	1000	0	90.8	65-135	0			
Chlorobenzene	884	30	1000	0	88.4	75-125	0			
Chloroethane	1230	100	1000	0	123	40-155	0			
Chloroform	1110	30	1000	0	111	70-125	0			
Chloromethane	1308	100	1000	0	131	50-130	0			S
cis-1,2-Dichloroethene	1116	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	852	30	1000	0	85.2	70-125	0			
Dibromochloromethane	780	30	1000	0	78	65-135	0			
Dibromomethane	960.5	30	1000	0	96	75-130	0			
Dichlorodifluoromethane	959.5	30	1000	0	96	35-135	0			
Ethylbenzene	905	30	1000	0	90.5	75-125	0			
Hexachloroethane	866.5	30	1000	0	86.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	920.5	30	1000	0	92	75-130	0
m,p-Xylene	1816	60	2000	0	90.8	80-125	0
Methyl tert-butyl ether	1049	30	1000	0	105	75-125	0
Methylene chloride	1127	30	1000	0	113	55-145	0
Naphthalene	806.5	100	1000	0	80.6	40-140	0
n-Butylbenzene	975	30	1000	0	97.5	65-140	0
n-Propylbenzene	913	30	1000	0	91.3	65-135	0
o-Xylene	899	30	1000	0	89.9	75-125	0
p-Isopropyltoluene	918.5	30	1000	0	91.8	75-135	0
sec-Butylbenzene	953.5	30	1000	0	95.4	65-130	0
Styrene	931	30	1000	0	93.1	75-125	0
tert-Butylbenzene	903.5	30	1000	0	90.4	65-130	0
Tetrachloroethene	830.5	30	1000	0	83	64-140	0
Tetrahydrofuran	979	200	1000	0	97.9	70-135	0
Toluene	892.5	30	1000	0	89.2	70-125	0
trans-1,2-Dichloroethene	1145	30	1000	0	114	65-135	0
trans-1,3-Dichloropropene	772.5	30	1000	0	77.2	65-125	0
trans-1,4-Dichloro-2-butene	769.5	30	1000	0	77	70-135	0
Trichloroethene	927	30	1000	0	92.7	75-125	0
Trichlorofluoromethane	1026	30	1000	0	103	25-185	0
Vinyl chloride	1130	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*1050*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*996*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Dibromofluoromethane	*1070*	0	*1000*	0	*107*	*70-130*	0
Surr: Toluene-d8	*972*	0	*1000*	0	*97.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211351-05A MS** Units: **µg/Kg** Analysis Date: **11/14/2012 10:19 PM**
Client ID: **SBKR1025R509S110912S006** Run ID: **VMS9_121114A** SeqNo: **2139649** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	821.5	30	1000	0	82.2	75-125	0			
1,1,1-Trichloroethane	944	30	1000	0	94.4	70-135	0			
1,1,2,2-Tetrachloroethane	976.5	30	1000	0	97.6	55-130	0			
1,1,2-Trichloroethane	917.5	30	1000	0	91.8	60-125	0			
1,1-Dichloroethane	1212	30	1000	0	121	75-125	0			
1,1-Dichloroethene	1266	30	1000	0	127	65-135	0			
1,2,3-Trichlorobenzene	863	30	1000	0	86.3	60-135	0			
1,2,3-Trichloropropane	918	30	1000	0	91.8	65-130	0			
1,2,4-Trichlorobenzene	864.5	30	1000	0	86.4	65-130	0			
1,2,4-Trimethylbenzene	968	30	1000	0	96.8	65-135	0			
1,2-Dibromo-3-chloropropane	724	30	1000	0	72.4	40-135	0			
1,2-Dibromoethane	961.5	30	1000	0	96.2	70-125	0			
1,2-Dichlorobenzene	902	30	1000	0	90.2	75-120	0			
1,2-Dichloroethane	1073	30	1000	0	107	70-135	0			
1,2-Dichloropropane	1060	30	1000	0	106	70-120	0			
1,3,5-Trimethylbenzene	998.5	30	1000	0	99.8	65-135	0			
1,3-Dichlorobenzene	884.5	30	1000	0	88.4	70-125	0			
1,4-Dichlorobenzene	903	30	1000	0	90.3	70-125	0			
2-Butanone	1064	200	1000	0	106	30-160	0			
2-Hexanone	1021	30	1000	0	102	45-145	0			
4-Methyl-2-pentanone	1234	30	1000	0	123	45-145	0			
Acetone	1742	100	1000	57.5	168	20-160	0			BS
Acrylonitrile	1328	100	1000	0	133	70-135	0			
Benzene	1042	30	1000	0	104	75-125	0			
Bromobenzene	949	30	1000	0	94.9	65-120	0			
Bromochloromethane	1350	30	1000	0	135	70-125	0			S
Bromodichloromethane	897	30	1000	0	89.7	70-130	0			
Bromoform	786	30	1000	0	78.6	55-135	0			
Bromomethane	498.5	75	1000	0	49.8	30-160	0			
Carbon disulfide	1124	30	1000	0	112	45-160	0			
Carbon tetrachloride	940	30	1000	0	94	65-135	0			
Chlorobenzene	934.5	30	1000	0	93.4	75-125	0			
Chloroethane	1046	100	1000	0	105	40-155	0			
Chloroform	1211	30	1000	0	121	70-125	0			
Chloromethane	1149	100	1000	41.5	111	50-130	0			
cis-1,2-Dichloroethene	1203	30	1000	0	120	65-125	0			
cis-1,3-Dichloropropene	853.5	30	1000	0	85.4	70-125	0			
Dibromochloromethane	768	30	1000	0	76.8	65-135	0			
Dibromomethane	1068	30	1000	0	107	75-130	0			
Dichlorodifluoromethane	1155	30	1000	0	116	35-135	0			
Ethylbenzene	963.5	30	1000	0	96.4	75-125	0			
Hexachloroethane	785.5	30	1000	0	78.6	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	987	30	1000	0	98.7	75-130	0	
m,p-Xylene	1947	60	2000	0	97.4	80-125	0	
Methyl tert-butyl ether	1216	30	1000	0	122	75-125	0	
Methylene chloride	1278	30	1000	0	128	55-145	0	
Naphthalene	930.5	100	1000	0	93	40-140	0	
n-Butylbenzene	985.5	30	1000	0	98.6	65-140	0	
n-Propylbenzene	968.5	30	1000	0	96.8	65-135	0	
o-Xylene	969.5	30	1000	0	97	75-125	0	
p-Isopropyltoluene	962.5	30	1000	0	96.2	75-135	0	
sec-Butylbenzene	978.5	30	1000	0	97.8	65-130	0	
Styrene	959.5	30	1000	0	96	75-125	0	
tert-Butylbenzene	958	30	1000	0	95.8	65-130	0	
Tetrachloroethene	842.5	30	1000	0	84.2	64-140	0	
Tetrahydrofuran	1292	200	1000	0	129	70-135	0	
Toluene	936	30	1000	0	93.6	70-125	0	
trans-1,2-Dichloroethene	1222	30	1000	0	122	65-135	0	
trans-1,3-Dichloropropene	746.5	30	1000	0	74.6	65-125	0	
trans-1,4-Dichloro-2-butene	554.5	30	1000	0	55.4	70-135	0	S
Trichloroethene	974	30	1000	0	97.4	75-125	0	
Trichlorofluoromethane	1154	30	1000	0	115	25-185	0	
Vinyl chloride	1230	30	1000	0	123	60-125	0	
Surr: 1,2-Dichloroethane-d4	*1064*	0	*1000*	0	*106*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1018*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1046*	0	*1000*	0	*105*	*70-130*	0	
Surr: Toluene-d8	*931.5*	0	*1000*	0	*93.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211351-05A MSD** Units: **µg/Kg** Analysis Date: **11/14/2012 10:45 PM**

Client ID: **SBKR1025R509S110912S006** Run ID: **VMS9_121114A** SeqNo: **2139650** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	821	30	1000	0	82.1	75-125	821.5	0.0609	30	
1,1,1-Trichloroethane	947.5	30	1000	0	94.8	70-135	944	0.37	30	
1,1,2,2-Tetrachloroethane	980	30	1000	0	98	55-130	976.5	0.358	30	
1,1,2-Trichloroethane	941.5	30	1000	0	94.2	60-125	917.5	2.58	30	
1,1-Dichloroethane	1212	30	1000	0	121	75-125	1212	0	30	
1,1-Dichloroethene	1254	30	1000	0	125	65-135	1266	0.952	30	
1,2,3-Trichlorobenzene	864	30	1000	0	86.4	60-135	863	0.116	30	
1,2,3-Trichloropropane	924.5	30	1000	0	92.4	65-130	918	0.706	30	
1,2,4-Trichlorobenzene	859	30	1000	0	85.9	65-130	864.5	0.638	30	
1,2,4-Trimethylbenzene	973.5	30	1000	0	97.4	65-135	968	0.567	30	
1,2-Dibromo-3-chloropropane	721.5	30	1000	0	72.2	40-135	724	0.346	30	
1,2-Dibromoethane	960	30	1000	0	96	70-125	961.5	0.156	30	
1,2-Dichlorobenzene	907	30	1000	0	90.7	75-120	902	0.553	30	
1,2-Dichloroethane	1070	30	1000	0	107	70-135	1073	0.327	30	
1,2-Dichloropropane	1064	30	1000	0	106	70-120	1060	0.377	30	
1,3,5-Trimethylbenzene	997	30	1000	0	99.7	65-135	998.5	0.15	30	
1,3-Dichlorobenzene	884	30	1000	0	88.4	70-125	884.5	0.0565	30	
1,4-Dichlorobenzene	905.5	30	1000	0	90.6	70-125	903	0.276	30	
2-Butanone	1062	200	1000	0	106	30-160	1064	0.235	30	
2-Hexanone	1010	30	1000	0	101	45-145	1021	1.08	30	
4-Methyl-2-pentanone	1203	30	1000	0	120	45-145	1234	2.5	30	
Acetone	1696	100	1000	57.5	164	20-160	1742	2.62	30	BS
Acrylonitrile	1278	100	1000	0	128	70-135	1328	3.8	30	
Benzene	1040	30	1000	0	104	75-125	1042	0.192	30	
Bromobenzene	962.5	30	1000	0	96.2	65-120	949	1.41	30	
Bromochloromethane	1356	30	1000	0	136	70-125	1350	0.407	30	S
Bromodichloromethane	896.5	30	1000	0	89.6	70-130	897	0.0558	30	
Bromoform	794.5	30	1000	0	79.4	55-135	786	1.08	30	
Bromomethane	561.5	75	1000	0	56.2	30-160	498.5	11.9	30	
Carbon disulfide	1125	30	1000	0	112	45-160	1124	0.0889	30	
Carbon tetrachloride	934	30	1000	0	93.4	65-135	940	0.64	30	
Chlorobenzene	942	30	1000	0	94.2	75-125	934.5	0.799	30	
Chloroethane	974.5	100	1000	0	97.4	40-155	1046	7.08	30	
Chloroform	1212	30	1000	0	121	70-125	1211	0.124	30	
Chloromethane	1123	100	1000	41.5	108	50-130	1149	2.29	30	
cis-1,2-Dichloroethene	1217	30	1000	0	122	65-125	1203	1.16	30	
cis-1,3-Dichloropropene	861	30	1000	0	86.1	70-125	853.5	0.875	30	
Dibromochloromethane	788	30	1000	0	78.8	65-135	768	2.57	30	
Dibromomethane	1076	30	1000	0	108	75-130	1068	0.699	30	
Dichlorodifluoromethane	1142	30	1000	0	114	35-135	1155	1.13	30	
Ethylbenzene	962.5	30	1000	0	96.2	75-125	963.5	0.104	30	
Hexachloroethane	764	30	1000	0	76.4	70-135	785.5	2.78	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44749** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	994.5	30	1000	0	99.4	75-130	987	0.757	30	
m,p-Xylene	1948	60	2000	0	97.4	80-125	1947	0.0513	30	
Methyl tert-butyl ether	1208	30	1000	0	121	75-125	1216	0.66	30	
Methylene chloride	1246	30	1000	0	125	55-145	1278	2.5	30	
Naphthalene	930.5	100	1000	0	93	40-140	930.5	0	30	
n-Butylbenzene	981.5	30	1000	0	98.2	65-140	985.5	0.407	30	
n-Propylbenzene	967.5	30	1000	0	96.8	65-135	968.5	0.103	30	
o-Xylene	971	30	1000	0	97.1	75-125	969.5	0.155	30	
p-Isopropyltoluene	951	30	1000	0	95.1	75-135	962.5	1.2	30	
sec-Butylbenzene	978.5	30	1000	0	97.8	65-130	978.5	0	30	
Styrene	975.5	30	1000	0	97.6	75-125	959.5	1.65	30	
tert-Butylbenzene	958.5	30	1000	0	95.8	65-130	958	0.0522	30	
Tetrachloroethene	848.5	30	1000	0	84.8	64-140	842.5	0.71	30	
Tetrahydrofuran	1276	200	1000	0	128	70-135	1292	1.29	30	
Toluene	929.5	30	1000	0	93	70-125	936	0.697	30	
trans-1,2-Dichloroethene	1212	30	1000	0	121	65-135	1222	0.822	30	
trans-1,3-Dichloropropene	757.5	30	1000	0	75.8	65-125	746.5	1.46	30	
trans-1,4-Dichloro-2-butene	603.5	30	1000	0	60.4	70-135	554.5	8.46	30	S
Trichloroethene	976	30	1000	0	97.6	75-125	974	0.205	30	
Trichlorofluoromethane	1144	30	1000	0	114	25-185	1154	0.87	30	
Vinyl chloride	1197	30	1000	0	120	60-125	1230	2.72	30	
Surr: 1,2-Dichloroethane-d4	*1033*	0	*1000*	0	*103*	*70-130*	1064	*3*	*30*	
Surr: 4-Bromofluorobenzene	*1028*	0	*1000*	0	*103*	*70-130*	1018	*0.977*	*30*	
Surr: Dibromofluoromethane	*1030*	0	*1000*	0	*103*	*70-130*	1046	*1.59*	*30*	
Surr: Toluene-d8	*950.5*	0	*1000*	0	*95*	*70-130*	931.5	*2.02*	*30*	

The following samples were analyzed in this batch:

1211351-01A	1211351-02A	1211351-03A
1211351-04A	1211351-05A	1211351-06A
1211351-07A	1211351-08A	1211351-09A
1211351-10A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211351
Project: Marshall KRRI 1025R,1050L 11/9/12

QC BATCH REPORT

Batch ID: **R112576** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112576** Units: **% of sample** Analysis Date: **11/14/2012 04:15 PM**
Client ID: Run ID: **MOIST_121114B** SeqNo: **2140131** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112576** Units: **% of sample** Analysis Date: **11/14/2012 04:15 PM**
Client ID: Run ID: **MOIST_121114B** SeqNo: **2140127** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211411-01A DUP** Units: **% of sample** Analysis Date: **11/14/2012 04:15 PM**
Client ID: Run ID: **MOIST_121114B** SeqNo: **2140122** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.13	0.050	0	0	0	0-0	3.82	7.8	20	

The following samples were analyzed in this batch:

1211351-01B	1211351-02B	1211351-03B
1211351-04B	1211351-05B	1211351-06B
1211351-07B	1211351-08B	1211351-10B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211351

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_110912_GMK1	Task: KRRI_1025-1050	
	Total # of Samples: 10		Event Complete?
Turn Around Time	5 Day	Rush	No
BILLING CODE: 6.00			

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 5555 Glenwood Parkway SE Suite 200
City: Grand Rapids State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX Phone #: 713-821-2000
PO #
Send EDD to
CC Hardcopy report
CC Hardcopy report

ITEM #	SAMPLE ID (Samples IDs MUST BE UNIQUE)	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR1025R506S110912S006	SBKR1025R506	SO	G	11/09/2012 08:21	3			X	X	X	X	X										
2	SBKR1025R507S110912S009	SBKR1025R507	SO	G	11/09/2012 09:05	3			X	X	X	X	X										
3	SBKR1025R508D110912S007	SBKR1025R508	SO	G	11/09/2012 10:10	3	DUPLICATE		X	X	X	X	X										
4	SBKR1025R508S110912S007	SBKR1025R508	SO	G	11/09/2012 10:10	3			X	X	X	X	X										
5	SBKR1025R509S110912S006	SBKR1025R509	SO	G	11/09/2012 11:08	6	MS/MSD		X	X	X	X	X										
6	SBKR1050L522S110912S004	SBKR1050L522	SO	G	11/09/2012 14:05	3			X	X	X	X	X										
7	SBKR1050L523S110912S004	SBKR1050L523	SO	G	11/09/2012 14:59	3			X	X	X	X	X										
8	SBKR1050L524S110912S004	SBKR1050L524	SO	G	11/09/2012 16:01	3			X	X	X	X	X										
9	SBKR1050L524T110912MX	SBKR1050L524	SQ	G	11/09/2012 00:00	1	TRIP BLANK						X										
10	SBKR1050L526S110912S007	SBKR1050L526	SO	G	11/09/2012 13:23	3			X	X	X	X	X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11-12-12	1035	[signature]	11-12-12	1035
[signature]	11-12-12	1050	[signature]	11-12-12	1050

Sample Receipt Conditions

Temp in °C	Samples on Ice?	Sample Intact?	Trip Blank?
3.6 °C	(Y)/N	(Y)/N	(Y)/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO:
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER: DATE Signed: Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **12-Nov-12 10:50**

Work Order: **1211351** Received by: **DS**

Checklist completed by Diane Shaw eSignature 12-Nov-12 Date Reviewed by: Ann Preston eSignature 13-Nov-12 Date

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.6 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/12/2012 2:55:23 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

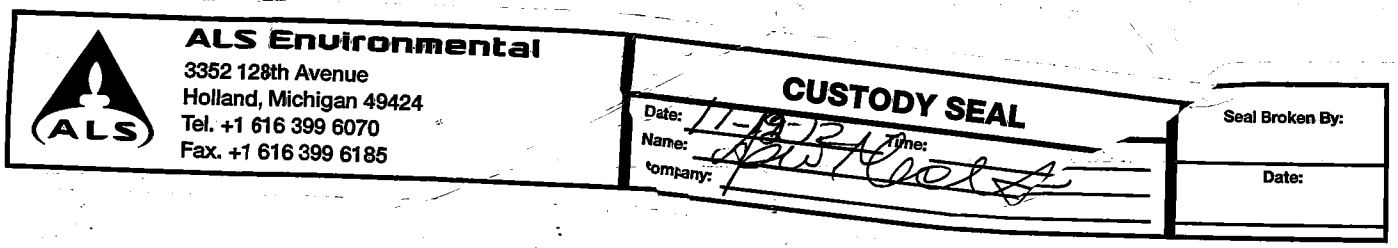
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
Date:

16-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000R SW 11/8/12** Work Order: **1211363**

Dear Bryan,

ALS Environmental received 1 sample on 09-Nov-2012 04:43 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 16-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R SW 11/8/12
Work Order: **1211363**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211363-01	SWKR1000R502S110812FX	Surface Water		11/8/2012 15:55	11/9/2012 16:43	☐

ALS Group USA, Corp

Date: 16-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000R SW 11/8/12
WorkOrder: **1211363**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *16-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SWKR1000R502S110812FX
Work Order:	1211363	**Collection Date:**	11/8/2012 3:55:00 PM
Project:	Marshall KRRI 1000R SW 11/8/12		
Lab ID:	1211363-01	**Matrix:**	SURFACE WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/14/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/14/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/14/2012
Surr: 4-Terphenyl-d14	*61.6*	*21-90*			*%REC*	1	11/14/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/15/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/15/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/15/2012
Nickel	ND	0.020	0.020		mg/L	1	11/15/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/15/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/14/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/14/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/14/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/14/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/14/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/14/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/14/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/14/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/14/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/14/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/14/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/14/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/14/2012
Surr: 2,4,6-Tribromophenol	*53.5*	*32-115*			*%REC*	1	11/14/2012
Surr: 2-Fluorobiphenyl	*66.1*	*32-100*			*%REC*	1	11/14/2012
Surr: 2-Fluorophenol	*45.1*	*22-59*			*%REC*	1	11/14/2012
Surr: 4-Terphenyl-d14	*95.6*	*23-112*			*%REC*	1	11/14/2012
Surr: Nitrobenzene-d5	*76.6*	*31-93*			*%REC*	1	11/14/2012
Surr: Phenol-d6	*30.4*	*13-36*			*%REC*	1	11/14/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: AECOM Environment
Work Order: 1211363
Project: Marshall KRRI 1000R SW 11/8/12

QC BATCH REPORT

Batch ID: **44732** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKW1-44732-44732** Units: **mg/L** Analysis Date: **11/14/2012 06:10 PM**
Client ID: Run ID: **GC8_121114A** SeqNo: **2139606** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	0.10								
ORO (C20-C34)	ND	0.10								
Surr: 4-Terphenyl-d14	*0.02854*	0	*0.05*	0	*57.1*	*21-90*	0			

LCS Sample ID: **DLCSW1-44732-44732** Units: **mg/L** Analysis Date: **11/14/2012 06:37 PM**
Client ID: Run ID: **GC8_121114A** SeqNo: **2139607** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	2.676	0.10	5	0	53.5	44-116	0			
ORO (C20-C34)	2.805	0.10	5	0	56.1	44-116	0			
Surr: 4-Terphenyl-d14	*0.03679*	0	*0.05*	0	*73.6*	*21-90*	0			

MS Sample ID: **1211339-01B MS** Units: **mg/L** Analysis Date: **11/14/2012 07:04 PM**
Client ID: Run ID: **GC8_121114A** SeqNo: **2139627** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	27.1	1.0	50	0	54.2	44-116	0			
ORO (C20-C34)	28.34	1.0	50	0	56.7	44-116	0			
Surr: 4-Terphenyl-d14	*0.3978*	0	*0.5*	0	*79.6*	*21-90*	0			

MSD Sample ID: **1211339-01B MSD** Units: **mg/L** Analysis Date: **11/14/2012 07:31 PM**
Client ID: Run ID: **GC8_121114A** SeqNo: **2139628** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	27.49	1.0	50	0	55	44-116	27.1	1.4	30	
ORO (C20-C34)	28.79	1.0	50	0	57.6	44-116	28.34	1.6	30	
Surr: 4-Terphenyl-d14	*0.4114*	0	*0.5*	0	*82.3*	*21-90*	0.3978	*3.36*	*30*	

The following samples were analyzed in this batch: 1211363-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211363
Project: Marshall KRRI 1000R SW 11/8/12

QC BATCH REPORT

Batch ID: **44750** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44750-44750** Units: **mg/L** Analysis Date: **11/15/2012 12:57 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140477** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Molybdenum	ND	0.0050								
Nickel	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44750-44750** Units: **mg/L** Analysis Date: **11/15/2012 02:22 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140786** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09233	0.0020	0.1	0	92.3	80-120	0			
Molybdenum	0.08919	0.0050	0.1	0	89.2	80-120	0			
Nickel	0.08985	0.0050	0.1	0	89.8	80-120	0			
Vanadium	0.09139	0.0050	0.1	0	91.4	80-120	0			

MS Sample ID: **1211280-08BMS** Units: **mg/L** Analysis Date: **11/15/2012 02:37 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140789** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09447	0.0020	0.1	0.000007415	94.5	75-125	0			
Molybdenum	0.0949	0.0050	0.1	0.0003867	94.5	75-125	0			
Nickel	0.09466	0.0050	0.1	0.004295	90.4	75-125	0			
Vanadium	0.09809	0.0050	0.1	0.0002877	97.8	75-125	0			

MSD Sample ID: **1211280-08BMSD** Units: **mg/L** Analysis Date: **11/15/2012 02:42 PM**
Client ID: Run ID: **ICPMS2_121115A** SeqNo: **2140790** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09167	0.0020	0.1	0.000007415	91.7	75-125	0.09447	3.01	20	
Molybdenum	0.0914	0.0050	0.1	0.0003867	91	75-125	0.0949	3.76	20	
Nickel	0.09309	0.0050	0.1	0.004295	88.8	75-125	0.09466	1.67	20	
Vanadium	0.09369	0.0050	0.1	0.0002877	93.4	75-125	0.09809	4.59	20	

The following samples were analyzed in this batch: 1211363-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211363
Project: Marshall KRRI 1000R SW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44731-44731** Units: **µg/L** Analysis Date: **11/15/2012 10:58 AM**
Client ID: Run ID: **SVMS6_121115A** SeqNo: **2143158** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Naphthalene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2,4,6-Tribromophenol	*20.32*	0	*50*	0	*40.6*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*31.07*	0	*50*	0	*62.1*	*32-100*	0			
Surr: 2-Fluorophenol	*23.11*	0	*50*	0	*46.2*	*22-59*	0			
Surr: 4-Terphenyl-d14	*38.73*	0	*50*	0	*77.5*	*23-112*	0			
Surr: Nitrobenzene-d5	*37.14*	0	*50*	0	*74.3*	*31-93*	0			
Surr: Phenol-d6	*14.14*	0	*50*	0	*28.3*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211363
Project: Marshall KRRI 1000R SW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSW1-44731-44731** Units: **µg/L** Analysis Date: **11/15/2012 12:13 PM**
Client ID: Run ID: **SVMS6_121115A** SeqNo: **2143160** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	14.21	5.0	20	0	71	45-105	0			
Acenaphthene	14.58	5.0	20	0	72.9	45-110	0			
Acenaphthylene	14.96	5.0	20	0	74.8	50-105	0			
Anthracene	16.05	5.0	20	0	80.2	55-110	0			
Benzo(a)anthracene	17.31	5.0	20	0	86.6	55-110	0			
Benzo(a)pyrene	16.57	5.0	20	0	82.8	55-110	0			
Benzo(b)fluoranthene	15.16	5.0	20	0	75.8	45-120	0			
Benzo(g,h,i)perylene	16.93	5.0	20	0	84.6	40-125	0			
Benzo(k)fluoranthene	17.45	5.0	20	0	87.2	45-125	0			
Chrysene	16.09	5.0	20	0	80.4	55-110	0			
Dibenzo(a,h)anthracene	18.19	5.0	20	0	91	40-125	0			
Fluoranthene	16.15	5.0	20	0	80.8	55-115	0			
Fluorene	16.26	5.0	20	0	81.3	50-110	0			
Indeno(1,2,3-cd)pyrene	16.93	5.0	20	0	84.6	45-125	0			
Naphthalene	14.01	5.0	20	0	70	40-100	0			
Phenanthrene	15.77	5.0	20	0	78.8	50-115	0			
Pyrene	17.16	5.0	20	0	85.8	50-130	0			
Surr: 2,4,6-Tribromophenol	*25.13*	0	*50*	0	*50.3*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*30.3*	0	*50*	0	*60.6*	*32-100*	0			
Surr: 2-Fluorophenol	*19.82*	0	*50*	0	*39.6*	*22-59*	0			
Surr: 4-Terphenyl-d14	*28.18*	0	*50*	0	*56.4*	*23-112*	0			
Surr: Nitrobenzene-d5	*35.87*	0	*50*	0	*71.7*	*31-93*	0			
Surr: Phenol-d6	*12.88*	0	*50*	0	*25.8*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211363
Project: Marshall KRRI 1000R SW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1211339-01B MS** Units: **µg/L** Analysis Date: **11/15/2012 12:38 PM**
Client ID: Run ID: **SVMS6_121115A** SeqNo: **2143163** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	135	50	200	0	67.5	45-105	0			
Acenaphthene	136.8	50	200	0	68.4	45-110	0			
Acenaphthylene	139.9	50	200	0	70	50-105	0			
Anthracene	151.9	50	200	0	76	55-110	0			
Benzo(a)anthracene	161.5	50	200	0	80.8	55-110	0			
Benzo(a)pyrene	156.9	50	200	0	78.4	55-110	0			
Benzo(b)fluoranthene	143.5	50	200	0	71.8	45-120	0			
Benzo(g,h,i)perylene	159	50	200	0	79.5	40-125	0			
Benzo(k)fluoranthene	166.2	50	200	0	83.1	45-125	0			
Chrysene	152.8	50	200	0	76.4	55-110	0			
Dibenzo(a,h)anthracene	171.9	50	200	0	86	40-125	0			
Fluoranthene	154.1	50	200	0	77	55-115	0			
Fluorene	150.8	50	200	0	75.4	50-110	0			
Indeno(1,2,3-cd)pyrene	159	50	200	0	79.5	45-125	0			
Naphthalene	135.1	50	200	0	67.6	40-100	0			
Phenanthrene	149.4	50	200	0	74.7	50-115	0			
Pyrene	163.3	50	200	0	81.6	50-130	0			
Surr: 2,4,6-Tribromophenol	*229*	0	*500*	0	*45.8*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*282.1*	0	*500*	0	*56.4*	*32-100*	0			
Surr: 2-Fluorophenol	*179.1*	0	*500*	0	*35.8*	*22-59*	0			
Surr: 4-Terphenyl-d14	*384.7*	0	*500*	0	*76.9*	*23-112*	0			
Surr: Nitrobenzene-d5	*340.9*	0	*500*	0	*68.2*	*31-93*	0			
Surr: Phenol-d6	*116.3*	0	*500*	0	*23.3*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211363
Project: Marshall KRRI 1000R SW 11/8/12

QC BATCH REPORT

Batch ID: **44731** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1211339-01B MSD** Units: **µg/L** Analysis Date: **11/15/2012 01:03 PM**
Client ID: Run ID: **SVMS6_121115A** SeqNo: **2143166** Prep Date: **11/14/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	142.2	50	200	0	71.1	45-105	135	5.19	30	
Acenaphthene	145.1	50	200	0	72.6	45-110	136.8	5.89	30	
Acenaphthylene	149.1	50	200	0	74.6	50-105	139.9	6.37	30	
Anthracene	160.6	50	200	0	80.3	55-110	151.9	5.57	30	
Benzo(a)anthracene	170.8	50	200	0	85.4	55-110	161.5	5.6	30	
Benzo(a)pyrene	169.3	50	200	0	84.6	55-110	156.9	7.6	30	
Benzo(b)fluoranthene	149.4	50	200	0	74.7	45-120	143.5	4.03	30	
Benzo(g,h,i)perylene	168.9	50	200	0	84.4	40-125	159	6.04	30	
Benzo(k)fluoranthene	176.8	50	200	0	88.4	45-125	166.2	6.18	30	
Chrysene	161.1	50	200	0	80.6	55-110	152.8	5.29	30	
Dibenzo(a,h)anthracene	181.6	50	200	0	90.8	40-125	171.9	5.49	30	
Fluoranthene	162.2	50	200	0	81.1	55-115	154.1	5.12	30	
Fluorene	162.5	50	200	0	81.2	50-110	150.8	7.47	30	
Indeno(1,2,3-cd)pyrene	168.9	50	200	0	84.4	45-125	159	6.04	30	
Naphthalene	141	50	200	0	70.5	40-100	135.1	4.27	30	
Phenanthrene	158.7	50	200	0	79.4	50-115	149.4	6.04	30	
Pyrene	172.4	50	200	0	86.2	50-130	163.3	5.42	30	
Surr: 2,4,6-Tribromophenol	*247.8*	0	*500*	0	*49.6*	*38-115*	229	*7.89*	*40*	
Surr: 2-Fluorobiphenyl	*301.9*	0	*500*	0	*60.4*	*32-100*	282.1	*6.78*	*40*	
Surr: 2-Fluorophenol	*202.6*	0	*500*	0	*40.5*	*22-59*	179.1	*12.3*	*40*	
Surr: 4-Terphenyl-d14	*405.2*	0	*500*	0	*81*	*23-112*	384.7	*5.19*	*40*	
Surr: Nitrobenzene-d5	*361*	0	*500*	0	*72.2*	*31-93*	340.9	*5.73*	*40*	
Surr: Phenol-d6	*138.3*	0	*500*	0	*27.7*	*13-36*	116.3	*17.3*	*40*	

The following samples were analyzed in this batch: 1211363-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211363

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_110812_AKM1 | Task: KRRI_SW1000
Total # of Samples: 1 | Event Complete?

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
				Phone #:	713-821-2000
Lab PM:	Ann Preston	City:	Grand Rapids	State, Zip:	MI
				PO #:	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name:	Bryan Stilemana	Send EDD to:	
Lab PM email:	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report:	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stilemsma@aecom.com	CC Hardcopy report:	

Turn Around Time: 5 Day | Rush: No

BILLING CODE: 6.00

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	HNO3	None	None										
								Analysis	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270										
1	SWKR1000R502S110812FX	SWKR1000R502	WS	G	11/08/2012 15:55	3			X	X	X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Sample Receipt Conditions			
APRIL MODERT	11/9/12	1643	MIKE ARNOLD	11/9/12	1643	3.0°C	Y/N	Y/N	Y/N
							Y/N	Y/N	Y/N
							Y/N	Y/N	Y/N
							Y/N	Y/N	Y/N

SHIPPING INFO: Company: | Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: APRIL MODERT | SIGNATURE of SAMPLER: | DATE Signed: | Time:

Temp in OC | Samples on Ice? | Sample Intact? | Trip Blank?

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **09-Nov-12 16:43**

Work Order: **1211363** Received by: **MA**

Checklist completed by Keith Wierenga (eSignature) 13-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 13-Nov-12 (Date)

Matrices: Surface Water
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/13/2012 9:23:05 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

20-Nov-2012

Mike Wolf
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0975R SPLP Nov. 2012** Work Order: **1211381**

Dear Mike,

ALS Environmental received 5 samples on 13-Nov-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012
Work Order: **1211381**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211381-01	SBKR0975R508S103012S006	Splp Extract		10/30/2012 09:21	11/13/2012	☐
1211381-02	SBKR0975R510S103012S005	Splp Extract		10/30/2012 11:03	11/13/2012	☐
1211381-03	SBKR0975R505S102912S007	Splp Extract		10/29/2012 15:32	11/13/2012	☐
1211381-04	SBKR0975R506S102912S005	Splp Extract		10/29/2012 16:16	11/13/2012	☐
1211381-05	SBKR0975R506D102912S005	Splp Extract		10/29/2012 16:16	11/13/2012	☐

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012
WorkOrder: **1211381**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *20-Nov-12*

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012
Work Order: 1211381
Sample ID: SBKR0975R508S103012S006
Lab ID: 1211381-01
Collection Date: 10/30/2012 09:21 AM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/17/2012 09:58 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012
Work Order: 1211381
Sample ID: SBKR0975R510S103012S005
Lab ID: 1211381-02
Collection Date: 10/30/2012 11:03 AM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/17/2012 10:03 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012
Work Order: 1211381
Sample ID: SBKR0975R505S102912S007
Lab ID: 1211381-03
Collection Date: 10/29/2012 03:32 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/17/2012 10:08 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012 **Work Order:** 1211381
Sample ID: SBKR0975R506S102912S005 **Lab ID:** 1211381-04
Collection Date: 10/29/2012 04:16 PM **Matrix:** SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/17/2012 10:14 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *20-Nov-12*

Client: AECOM Environment
Project: Marshall KRRI 0975R SPLP Nov. 2012
Work Order: 1211381
Sample ID: SBKR0975R506D102912S005
Lab ID: 1211381-05
Collection Date: 10/29/2012 04:16 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/17/2012 10:19 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 20-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211381

Project: Marshall KRRI 0975R SPLP Nov. 2012

Batch ID: **44780** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44780-44780** Units: **mg/L** Analysis Date: **11/16/2012 03:05 PM**

Client ID: Run ID: **ICPMS2_121116A** SeqNo: **2142158** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.0050								

LCS Sample ID: **LCS-44780-44780** Units: **mg/L** Analysis Date: **11/16/2012 03:14 PM**

Client ID: Run ID: **ICPMS2_121116A** SeqNo: **2142171** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.08904	0.0050	0.1	0	89	80-120	0			

MS Sample ID: **1211343-08CMS** Units: **mg/L** Analysis Date: **11/16/2012 04:19 PM**

Client ID: Run ID: **ICPMS2_121116A** SeqNo: **2142646** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.0893	0.0050	0.1	0.0004585	88.8	75-125	0			

MSD Sample ID: **1211343-08CMSD** Units: **mg/L** Analysis Date: **11/16/2012 04:26 PM**

Client ID: Run ID: **ICPMS2_121116A** SeqNo: **2142647** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.0921	0.0050	0.1	0.0004585	91.6	75-125	0.0893	3.09	20	

The following samples were analyzed in this batch:

1211381-01A	1211381-02A	1211381-03A
1211381-04A	1211381-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

121381
~~1210105~~

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_103012_GMK1	Task: KRRI_0975
Total # of Samples: 5		Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 6555 Glenwood Parkway SE Suite 200
City: Grand Rapids State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX Phone#: 713-821-2000
PO #:
Send EDD to:
CC Hardcopy report:
CC Hardcopy report:

ITEM #	SAMPLE ID (Samples IDs MUST BE UNIQUE)	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH												
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260												
1	~~SBKR0975R507S103012S005~~	SBKR0975R507	SO	G	10/30/2012 08:31	3			X	X	X	X	X												
2	SBKR0975R508S103012S006	SBKR0975R508	SO	G	10/30/2012 09:21	6	MS/MSD		X	X	X	X	X												
3	~~SBKR0975R509S103012S008~~	SBKR0975R509	SO	G	10/30/2012 10:21	3			X	X	X	X	X												
4	SBKR0975R510S103012S005	SBKR0975R510	SO	G	10/30/2012 11:03	3			X	X	X	X	X												
5	~~SBKR0975R510T103012MX~~	SBKR0975R510	SQ	G	10/30/2012 00:00	1	TRIP BLANK						X												

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	10-31-12	1255		10-31-12	1255
	10-31-12	1300		10-31-12	1300

Sample Receipt Conditions

Temp in °C	Samples on Ice?	Sample Intact?	Trip Blank?
3.8 °C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

1211381
~~1210052~~

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_102912_GMK1	Task: KRRI_0950-0975
	Total # of Samples: 14	Event Complete?

Turn Around Time	5 Day	Rush	No	

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162776
Site Address	6555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to	Enbridge Energy - ATTN Accounts Payable
Address	1100 Louisiana Suite 1100
City/State	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH												
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260												
1	SBKR0950R504S102912S008	SBKR0950R504	SO	G	10/29/2012 10:45	3			X	X	X	X	X												
2	SBKR0950R505S102912S005	SBKR0950R505	SO	G	10/29/2012 11:12	3			X	X	X	X	X												
3	SBKR0950R506S102912S005	SBKR0950R506	SO	G	10/29/2012 11:45	3			X	X	X	X	X												
4	SBKR0975I501S102912S003	SBKR0975I501	SO	G	10/29/2012 13:50	3			X	X	X	X	X												
5	SBKR0975I501S102912S010	SBKR0975I501	SO	G	10/29/2012 13:55	3			X	X	X	X	X												
6	SBKR0975I502S102912S004	SBKR0975I502	SO	G	10/29/2012 14:50	3			X	X	X	X	X												
7	SBKR0975I502S102912S013	SBKR0975I502	SO	G	10/29/2012 14:55	3			X	X	X	X	X												
8	SBKR0975R503S102912S005	SBKR0975R503	SO	G	10/29/2012 08:57	3			X	X	X	X	X												
9	SBKR0975R503D102912S005	SBKR0975R503	SO	G	10/29/2012 08:57	3	DUPLICATE		X	X	X	X	X												
10	~~SBKR0975R504S102912S006~~	SBKR0975R504	SO	G	10/29/2012 09:46	3			X	X	X	X	X												
11	SBKR0975R505S102912S007	SBKR0975R505	SO	G	10/29/2012 15:32	3			X	X	X	X	X												
12	SBKR0975R506S102912S005	SBKR0975R506	SO	G	10/29/2012 16:16	3			X	X	X	X	X												
13	SBKR0975R506D102912S005	SBKR0975R506	SO	G	10/29/2012 16:16	3	DUPLICATE		X	X	X	X	X												
14	~~SBKR0975R506T102912MX~~	SBKR0975R506	SQ	G	10/29/2012 00:00	1	TRIP BLANK						X												

03-
04-
05-

SPLP Me
Hg 11/3/12

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	10.31.12	1245		10.31.12	1245
	10/31/12	1245		10/31/12	1245

Sample Receipt Conditions

Temp in oC	Samples on Ice?	Sample Intact?	Trip Blank?
3.0 C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

Ann Preston 1211381

From: Wolf, Michael G. [Michael.Wolf@aecom.com]
Sent: Monday, November 12, 2012 8:36 AM
To: Ann Preston
Subject: Enbridge SPLP

Here are the latest MO SPLP
12101051-02, 04 1211381-01, 02
12101052-11, 12, 13 1211381-03, 04, 05

Thanks

Mike

Mike Wolf, CPG
Sr. Hydrogeologist
AECOM Environment
D (616)-940-4408 C [redacted]
michael.wolf@aecom.com

AECOM
5555 Glenwood Hills Pkwy SE, Ste 300
Grand Rapids, MI 49512
Telephone (616)-942-9600 Fax (616)-940-4396

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ALS Group: Click here to report this email as spam.

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **13-Nov-12 00:00**

Work Order: **1211381** Received by: **AP**

Checklist completed by Ann Preston (eSignature) 13-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 13-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

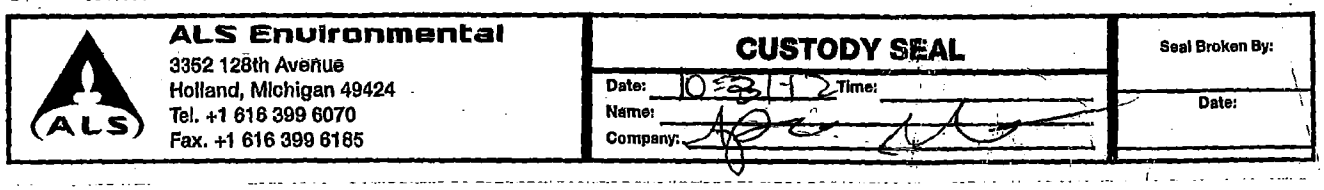
Login Notes: Samples reactivated from refrigerated storage

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



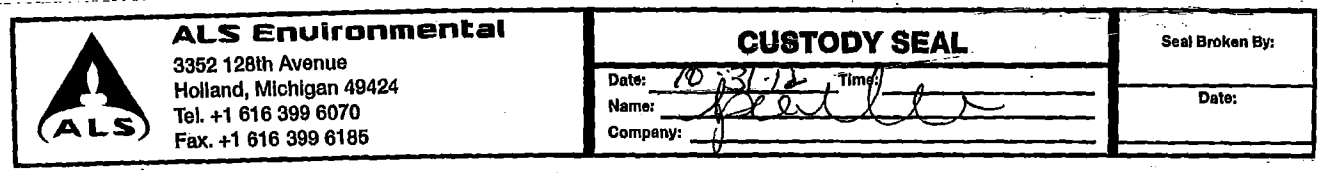
ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6165

CUSTODY SEAL

Date: 10/31/12 Time:
Name:
Company:

Seal Broken By:

Date:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date: 10/31/12 Time:
Name:
Company:
Seal Broken By:
Date:

21-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1025-1050R 11/14/12** Work Order: **1211454**

Dear Bryan,

ALS Environmental received 8 samples on 14-Nov-2012 05:15 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 73.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025-1050R 11/14/12
Work Order: **1211454**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211454-01	SBKR1025R519S111412S005	Soil		11/14/2012 08:20	11/14/2012 17:15	☐
1211454-02	SBKR1025R520S111412S005	Soil		11/14/2012 09:15	11/14/2012 17:15	☐
1211454-03	SBKR1025R521S111412S005	Soil		11/14/2012 10:18	11/14/2012 17:15	☐
1211454-04	SBKR1050R501S111412S004	Soil		11/14/2012 11:15	11/14/2012 17:15	☐
1211454-05	SBKR1050R502S111412S006	Soil		11/14/2012 13:13	11/14/2012 17:15	☐
1211454-06	SBKR1050R503S111412S003	Soil		11/14/2012 15:09	11/14/2012 17:15	☐
1211454-07	SBKR1050R504S111412S004	Soil		11/14/2012 16:07	11/14/2012 17:15	☐
1211454-08	SBKR1050R504T111412MX	Soil		11/14/2012	11/14/2012 17:15	☐

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025-1050R 11/14/12
Work Order: 1211454

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44800 sample SBKR1025R519S111412S005 MS/MSD recoveries for Vanadium were above control limits. The corresponding result in the parent sample may be biased high for Vanadium.

Batches 44795 and 44796 MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025-1050R 11/14/12
WorkOrder: **1211454**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R519S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 8:20:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**260**	**45**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**600**	**90**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*65.8*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	2.3	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	5.9	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**11**	**5.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**11**	**5.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	**330**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(a)pyrene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(b)fluoranthene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	**540**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*54.6*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*60.9*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*71.0*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*80.7*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*66.8*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*72.3*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/15/2012
1,1,1-Trichloroethane	ND	69	50		µg/Kg-dry	1	11/15/2012
1,1,2,2-Tetrachloroethane	ND	69	50		µg/Kg-dry	1	11/15/2012
1,1,2-Trichloroethane	ND	69	50		µg/Kg-dry	1	11/15/2012
1,1-Dichloroethane	ND	69	50		µg/Kg-dry	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R519S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 8:20:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	69	50		µg/Kg-dry	1	11/15/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/15/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/15/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/15/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/15/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
1,2-Dibromo-3-chloropropane	ND	69	10		µg/Kg-dry	1	11/15/2012
1,2-Dibromoethane	ND	69	20		µg/Kg-dry	1	11/15/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
1,2-Dichloroethane	ND	69	50		µg/Kg-dry	1	11/15/2012
1,2-Dichloropropane	ND	69	50		µg/Kg-dry	1	11/15/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/15/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/15/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/15/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/15/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/15/2012
Benzene	ND	69	50		µg/Kg-dry	1	11/15/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/15/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/15/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/15/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/15/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/15/2012
Carbon tetrachloride	ND	69	50		µg/Kg-dry	1	11/15/2012
Chlorobenzene	ND	69	50		µg/Kg-dry	1	11/15/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/15/2012
Chloroform	ND	69	50		µg/Kg-dry	1	11/15/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/15/2012
cis-1,2-Dichloroethene	ND	69	50		µg/Kg-dry	1	11/15/2012
cis-1,3-Dichloropropene	ND	69	50		µg/Kg-dry	1	11/15/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/15/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/15/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/15/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/15/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/15/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/15/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R519S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 8:20:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	69	50		µg/Kg-dry	1	11/15/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/15/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/15/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	11/15/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/15/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/15/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/15/2012
n-Butylbenzene	ND	69	50		µg/Kg-dry	1	11/15/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/15/2012
o-Xylene	ND	69	50		µg/Kg-dry	1	11/15/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/15/2012
sec-Butylbenzene	ND	69	50		µg/Kg-dry	1	11/15/2012
Styrene	ND	69	50		µg/Kg-dry	1	11/15/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/15/2012
tert-Butylbenzene	ND	69	50		µg/Kg-dry	1	11/15/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/15/2012
Tetrachloroethene	ND	69	50		µg/Kg-dry	1	11/15/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/15/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/15/2012
trans-1,2-Dichloroethene	ND	69	50		µg/Kg-dry	1	11/15/2012
trans-1,3-Dichloropropene	ND	69	50		µg/Kg-dry	1	11/15/2012
trans-1,4-Dichloro-2-butene	ND	69	50		µg/Kg-dry	1	11/15/2012
Trichloroethene	ND	69	50		µg/Kg-dry	1	11/15/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/15/2012
Vinyl chloride	ND	69	40		µg/Kg-dry	1	11/15/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/15/2012
Surr: 4-Bromofluorobenzene	*93.8*	*70-130*			*%REC*	1	11/15/2012
Surr: Dibromofluoromethane	*95.1*	*70-130*			*%REC*	1	11/15/2012
Surr: Toluene-d8	*98.0*	*70-130*			*%REC*	1	11/15/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**78**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R520S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 9:15:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**24**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**540**	**48**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*66.3*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	3.1	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**23**	**3.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**26**	**3.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(a)pyrene	**480**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(b)fluoranthene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	**470**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*53.3*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*59.6*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*65.3*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*82.3*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*61.5*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*69.7*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R520S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 9:15:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	37	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	37	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R520S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 9:15:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*94.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*93.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*97.2*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**59**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R521S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 10:18:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**24**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**840**	**48**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*61.8*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.5	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	3.9	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**22**	**3.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**19**	**3.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(a)pyrene	**1,300**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(b)fluoranthene	**1,900**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(g,h,i)perylene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(k)fluoranthene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Chrysene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	**1,900**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Pyrene	**1,900**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*50.5*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*59.9*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*62.9*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*79.4*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*58.2*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*67.9*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R521S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 10:18:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	37	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	37	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R521S111412S005
Work Order:	1211454	**Collection Date:**	11/14/2012 10:18:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*94.7*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*91.3*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*96.2*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**59**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R501S111412S004
Work Order:	1211454	**Collection Date:**	11/14/2012 11:15:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**160**	**26**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**400**	**51**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*63.7*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	3.4	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**16**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**28**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*48.6*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*49.5*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*52.4*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*71.7*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*49.9*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*56.8*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	82	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	82	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	82	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	82	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R501S111412S004
Work Order:	1211454	**Collection Date:**	11/14/2012 11:15:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	82	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	82	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	82	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	82	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	82	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	82	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	82	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	82	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	270	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	82	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	82	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	82	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R501S111412S004
Work Order:	1211454	**Collection Date:**	11/14/2012 11:15:00 AM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	82	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	160	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	82	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	82	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	82	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	82	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	82	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	82	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	82	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	82	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	82	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	82	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	82	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*94.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*93.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*97.6*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**63**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R502S111412S006
Work Order:	1211454	**Collection Date:**	11/14/2012 1:13:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**22**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**340**	**44**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*59.3*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	3.4	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**15**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**31**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*44.2*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*48.0*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*53.8*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*66.6*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*51.0*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*56.3*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	71	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	71	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	71	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	71	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R502S111412S006
Work Order:	1211454	**Collection Date:**	11/14/2012 1:13:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	71	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	71	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	71	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	71	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	71	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	71	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	71	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	71	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	71	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	71	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	71	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R502S111412S006
Work Order:	1211454	**Collection Date:**	11/14/2012 1:13:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	71	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	71	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	71	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	71	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	71	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	71	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	71	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	71	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	71	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	71	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	71	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	71	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*92.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*93.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*96.6*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**58**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R503S111412S003
Work Order:	1211454	**Collection Date:**	11/14/2012 3:09:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**87**	**18**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**200**	**35**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*63.7*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**14**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**31**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*47.0*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*50.3*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*53.2*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*71.4*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*49.9*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*58.5*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	56	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	56	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	56	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	56	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R503S111412S003
Work Order:	1211454	**Collection Date:**	11/14/2012 3:09:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	56	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	56	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	56	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	56	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	56	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	56	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	56	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	56	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	56	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	56	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	56	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R503S111412S003
Work Order:	1211454	**Collection Date:**	11/14/2012 3:09:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	56	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	56	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	56	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	56	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	56	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	56	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	56	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	56	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	56	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	56	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	56	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	56	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*96.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*89.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*94.8*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**47**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R504S111412S004
Work Order:	1211454	**Collection Date:**	11/14/2012 4:07:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**84**	**16**	**4.0**		**mg/Kg-dry**	1	11/16/2012
ORO (C20-C34)	**260**	**32**	**4.0**		**mg/Kg-dry**	1	11/16/2012
Surr: 4-Terphenyl-d14	*60.7*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.87	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.2	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**12**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**17**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(a)pyrene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(b)fluoranthene	**540**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Chrysene	**450**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Pyrene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*43.1*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*50.0*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*54.3*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*69.5*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*53.3*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*57.5*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R504S111412S004
Work Order:	1211454	**Collection Date:**	11/14/2012 4:07:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	50	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	50	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R504S111412S004
Work Order:	1211454	**Collection Date:**	11/14/2012 4:07:00 PM
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	50	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.8*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*95.8*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**40**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R504T111412MX
Work Order:	1211454	**Collection Date:**	11/14/2012
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/15/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/15/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/15/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/15/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/15/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/15/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/15/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/15/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/15/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/15/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/15/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/15/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/15/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/15/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/15/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/15/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/15/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/15/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/15/2012
2-Butanone	ND	750	750		µg/Kg	1	11/15/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/15/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/15/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/15/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/15/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/15/2012
Benzene	ND	50	50		µg/Kg	1	11/15/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/15/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/15/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/15/2012
Bromoform	ND	100	100		µg/Kg	1	11/15/2012
Bromomethane	ND	200	200		µg/Kg	1	11/15/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/15/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/15/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/15/2012
Chloroethane	ND	250	250		µg/Kg	1	11/15/2012
Chloroform	ND	50	50		µg/Kg	1	11/15/2012
Chloromethane	ND	250	250		µg/Kg	1	11/15/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/15/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R504T111412MX
Work Order:	1211454	**Collection Date:**	11/14/2012
Project:	Marshall KRRI 1025-1050R 11/14/12		
Lab ID:	1211454-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/15/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/15/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/15/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/15/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/15/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/15/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/15/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/15/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/15/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/15/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/15/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/15/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/15/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/15/2012
Naphthalene	ND	330	330		µg/Kg	1	11/15/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/15/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/15/2012
o-Xylene	ND	50	50		µg/Kg	1	11/15/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/15/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/15/2012
Styrene	ND	50	50		µg/Kg	1	11/15/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/15/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/15/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/15/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/15/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/15/2012
Toluene	ND	100	100		µg/Kg	1	11/15/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/15/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/15/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/15/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/15/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/15/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/15/2012
Surr: 1,2-Dichloroethane-d4	*99.7*	*70-130*			*%REC*	1	11/15/2012
Surr: 4-Bromofluorobenzene	*94.1*	*70-130*			*%REC*	1	11/15/2012
Surr: Dibromofluoromethane	*94.2*	*70-130*			*%REC*	1	11/15/2012
Surr: Toluene-d8	*97.2*	*70-130*			*%REC*	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **44773** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:11 PM**

Client ID: Run ID: **GC8_121116A** SeqNo: **2143011** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
Surr: 4-Terphenyl-d14	*3.464*	0	*5*	0	*69.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:37 PM**

Client ID: Run ID: **GC8_121116A** SeqNo: **2143012** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	321.2	10	500	0	64.2	49-124	0			
ORO (C20-C34)	327.7	20	500	0	65.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.557*	0	*5*	0	*91.1*	*39-115*	0			

MS Sample ID: **1211465-03A MS** Units: **mg/Kg** Analysis Date: **11/16/2012 06:04 PM**

Client ID: Run ID: **GC8_121116A** SeqNo: **2143014** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	316.1	9.7	485.9	0	65.1	60-130	0			
ORO (C20-C34)	343.8	19	485.9	0	70.8	60-130	0			
Surr: 4-Terphenyl-d14	*4.416*	0	*4.859*	0	*90.9*	*39-115*	0			

MSD Sample ID: **1211465-03A MSD** Units: **mg/Kg** Analysis Date: **11/16/2012 06:31 PM**

Client ID: Run ID: **GC8_121116A** SeqNo: **2143015** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	307.4	9.7	484.1	0	63.5	60-130	316.1	2.8	30	
ORO (C20-C34)	328.5	19	484.1	0	67.9	60-130	343.8	4.57	30	
Surr: 4-Terphenyl-d14	*3.58*	0	*4.841*	0	*74*	*39-115*	4.416	*20.9*	*30*	

The following samples were analyzed in this batch:

1211454-01A	1211454-02A	1211454-03A
1211454-04A	1211454-05A	1211454-06A
1211454-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44800** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44800-44800** Units: **mg/Kg** Analysis Date: **11/20/2012 01:42 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146409** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.25								
Nickel	0.004245	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44800-44800** Units: **mg/Kg** Analysis Date: **11/20/2012 12:21 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145146** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.494	0.10	5	0	89.9	80-120	0			
Molybdenum	4.55	0.25	5	0	91	80-120	0			
Nickel	4.364	0.25	5	0	87.3	80-120	0			
Vanadium	4.512	0.25	5	0	90.2	80-120	0			

MS Sample ID: **1211454-01AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 12:33 AM**
Client ID: **SBKR1025R519S111412S005** Run ID: **ICPMS1_121119A** SeqNo: **2145154** Prep Date: **11/16/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.981	0.54	6.729	0.06859	87.9	75-125	0			
Molybdenum	6.18	1.3	6.729	0.3245	87	75-125	0			
Nickel	9.429	1.3	6.729	2.273	106	75-125	0			
Vanadium	11.2	1.3	6.729	2.348	132	75-125	0			S

MSD Sample ID: **1211454-01AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 01:04 AM**
Client ID: **SBKR1025R519S111412S005** Run ID: **ICPMS1_121119A** SeqNo: **2145157** Prep Date: **11/16/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.084	0.65	8.117	0.06859	86.4	75-125	5.981	16.9	25	
Molybdenum	7.675	1.6	8.117	0.3245	90.6	75-125	6.18	21.6	25	
Nickel	10.91	1.6	8.117	2.273	106	75-125	9.429	14.6	25	
Vanadium	12.81	1.6	8.117	2.348	129	75-125	11.2	13.4	25	S

The following samples were analyzed in this batch:

1211454-01A	1211454-02A	1211454-03A
1211454-04A	1211454-05A	1211454-06A
1211454-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44772-44772** Units: **µg/Kg** Analysis Date: **11/16/2012 05:50 PM**
Client ID: Run ID: **SVMS7_121116A** SeqNo: **2143582** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*7892*	0	*10000*	0	*78.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3319*	0	*5000*	0	*66.4*	*12-100*	0			
Surr: 2-Fluorophenol	*7349*	0	*10000*	0	*73.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3939*	0	*5000*	0	*78.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3793*	0	*5000*	0	*75.9*	*37-107*	0			
Surr: Phenol-d6	*7521*	0	*10000*	0	*75.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44772-44772** Units: **µg/Kg** Analysis Date: **11/16/2012 05:23 PM**
Client ID: Run ID: **SVMS7_121116A** SeqNo: **2143581** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1719	50	2000	0	86	45-105	0			
Acenaphthene	1713	50	2000	0	85.6	45-110	0			
Acenaphthylene	1736	50	2000	0	86.8	45-105	0			
Anthracene	1810	50	2000	0	90.5	55-105	0			
Benzo(a)anthracene	1894	50	2000	0	94.7	50-110	0			
Benzo(a)pyrene	1996	50	2000	0	99.8	50-110	0			
Benzo(b)fluoranthene	2003	50	2000	0	100	45-115	0			
Benzo(g,h,i)perylene	1979	50	2000	0	99	40-125	0			
Benzo(k)fluoranthene	1699	50	2000	0	85	45-115	0			
Chrysene	1957	50	2000	0	97.8	55-110	0			
Dibenzo(a,h)anthracene	1987	50	2000	0	99.4	40-125	0			
Fluoranthene	1919	50	2000	0	96	55-115	0			
Fluorene	1762	50	2000	0	88.1	50-110	0			
Indeno(1,2,3-cd)pyrene	1981	50	2000	0	99	40-120	0			
Naphthalene	1767	50	2000	0	88.4	40-105	0			
Phenanthrene	1829	50	2000	0	91.4	50-110	0			
Pyrene	1972	50	2000	0	98.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*7859*	0	*10000*	0	*78.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3281*	0	*5000*	0	*65.6*	*12-100*	0			
Surr: 2-Fluorophenol	*7148*	0	*10000*	0	*71.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4171*	0	*5000*	0	*83.4*	*25-137*	0			
Surr: Nitrobenzene-d5	*3836*	0	*5000*	0	*76.7*	*37-107*	0			
Surr: Phenol-d6	*7027*	0	*10000*	0	*70.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211465-03A MS** Units: **µg/Kg** Analysis Date: **11/16/2012 07:14 PM**
Client ID: Run ID: **SVMS7_121116A** SeqNo: **2143583** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1511	47	1873	0	80.7	45-105	0			
Acenaphthene	1522	47	1873	0	81.2	45-110	0			
Acenaphthylene	1539	47	1873	0	82.2	45-105	0			
Anthracene	1697	47	1873	0	90.6	55-105	0			
Benzo(a)anthracene	1731	47	1873	0	92.4	50-110	0			
Benzo(a)pyrene	1843	47	1873	0	98.4	50-110	0			
Benzo(b)fluoranthene	1760	47	1873	0	94	45-115	0			
Benzo(g,h,i)perylene	1878	47	1873	0	100	40-125	0			
Benzo(k)fluoranthene	1659	47	1873	0	88.6	45-115	0			
Chrysene	1789	47	1873	0	95.6	55-110	0			
Dibenzo(a,h)anthracene	1863	47	1873	0	99.5	40-125	0			
Fluoranthene	1755	47	1873	0	93.7	55-115	0			
Fluorene	1605	47	1873	0	85.7	50-110	0			
Indeno(1,2,3-cd)pyrene	1863	47	1873	0	99.4	40-120	0			
Naphthalene	1542	47	1873	0	82.4	40-105	0			
Phenanthrene	1698	47	1873	0	90.6	50-110	0			
Pyrene	1820	47	1873	0	97.2	45-125	0			
Surr: 2,4,6-Tribromophenol	*7420*	0	*9364*	0	*79.2*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*2917*	0	*4682*	0	*62.3*	*12-100*	0			
Surr: 2-Fluorophenol	*6200*	0	*9364*	0	*66.2*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3818*	0	*4682*	0	*81.5*	*25-137*	0			
Surr: Nitrobenzene-d5	*3277*	0	*4682*	0	*70*	*37-107*	0			
Surr: Phenol-d6	*6191*	0	*9364*	0	*66.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211465-03A MSD** Units: **µg/Kg** Analysis Date: **11/16/2012 07:42 PM**
Client ID: Run ID: **SVMS7_121116A** SeqNo: **2143584** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1464	47	1877	0	78	45-105	1511	3.19	30	
Acenaphthene	1513	47	1877	0	80.6	45-110	1522	0.588	30	
Acenaphthylene	1530	47	1877	0	81.5	45-105	1539	0.64	30	
Anthracene	1715	47	1877	0	91.4	55-105	1697	1.09	30	
Benzo(a)anthracene	1724	47	1877	0	91.8	50-110	1731	0.436	30	
Benzo(a)pyrene	1825	47	1877	0	97.2	50-110	1843	0.96	30	
Benzo(b)fluoranthene	1776	47	1877	0	94.6	45-115	1760	0.905	30	
Benzo(g,h,i)perylene	1833	47	1877	0	97.6	40-125	1878	2.46	30	
Benzo(k)fluoranthene	1619	47	1877	0	86.2	45-115	1659	2.47	30	
Chrysene	1798	47	1877	0	95.8	55-110	1789	0.477	30	
Dibenzo(a,h)anthracene	1815	47	1877	0	96.7	40-125	1863	2.64	30	
Fluoranthene	1770	47	1877	0	94.3	55-115	1755	0.854	30	
Fluorene	1599	47	1877	0	85.2	50-110	1605	0.37	30	
Indeno(1,2,3-cd)pyrene	1806	47	1877	0	96.2	40-120	1863	3.05	30	
Naphthalene	1519	47	1877	0	81	40-105	1542	1.5	30	
Phenanthrene	1694	47	1877	0	90.2	50-110	1698	0.227	30	
Pyrene	1810	47	1877	0	96.4	45-125	1820	0.559	30	
Surr: 2,4,6-Tribromophenol	*7522*	0	*9384*	0	*80.2*	*34-140*	7420	*1.36*	*40*	
Surr: 2-Fluorobiphenyl	*2922*	0	*4692*	0	*62.3*	*12-100*	2917	*0.184*	*40*	
Surr: 2-Fluorophenol	*6176*	0	*9384*	0	*65.8*	*33-117*	6200	*0.39*	*40*	
Surr: 4-Terphenyl-d14	*3851*	0	*4692*	0	*82.1*	*25-137*	3818	*0.876*	*40*	
Surr: Nitrobenzene-d5	*3216*	0	*4692*	0	*68.5*	*37-107*	3277	*1.89*	*40*	
Surr: Phenol-d6	*6166*	0	*9384*	0	*65.7*	*40-106*	6191	*0.391*	*40*	

The following samples were analyzed in this batch:

1211454-01A	1211454-02A	1211454-03A
1211454-04A	1211454-05A	1211454-06A
1211454-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44795-44795** Units: **µg/Kg** Analysis Date: **11/15/2012 11:06 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141459** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	112.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*957.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*957*	0	*1000*	0	*95.7*	*70-130*	0	
Surr: Toluene-d8	*971.5*	0	*1000*	0	*97.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44795-44795** Units: **µg/Kg** Analysis Date: **11/16/2012 12:11 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143195** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	151.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	17	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*964*	0	*1000*	0	*96.4*	*70-130*	0
Surr: Dibromofluoromethane	*930.5*	0	*1000*	0	*93*	*70-130*	0
Surr: Toluene-d8	*947.5*	0	*1000*	0	*94.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44795-44795** Units: **µg/Kg** Analysis Date: **11/16/2012 06:55 PM**
Client ID: Run ID: **VMS5_121116B** SeqNo: **2143376** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1034*	0	*1000*	0	*103*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*993.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Toluene-d8	*1014*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44795-44795** Units: **µg/Kg** Analysis Date: **11/17/2012 06:32 AM**
Client ID: Run ID: **VMS5_121116C** SeqNo: **2143938** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1015*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1002*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: Toluene-d8	*1026*	0	*1000*	0	*103*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

LCS	Sample ID: **LCS-44795-44795**				Units: **µg/Kg**		Analysis Date: **11/15/2012 09:49 PM**			
Client ID:		Run ID: **VMS9_121115A**			SeqNo: **2141458**		Prep Date: **11/15/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1038	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1062	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	1022	30	1000	0	102	55-130	0			
1,1,2-Trichloroethane	932.5	30	1000	0	93.2	60-125	0			
1,1-Dichloroethane	996.5	30	1000	0	99.6	75-125	0			
1,1-Dichloroethene	1078	30	1000	0	108	65-135	0			
1,2,3-Trichlorobenzene	993	30	1000	0	99.3	60-135	0			
1,2,3-Trichloropropane	1012	30	1000	0	101	65-130	0			
1,2,4-Trichlorobenzene	997.5	30	1000	0	99.8	65-130	0			
1,2,4-Trimethylbenzene	1037	30	1000	0	104	65-135	0			
1,2-Dibromo-3-chloropropane	1038	30	1000	0	104	40-135	0			
1,2-Dibromoethane	1019	30	1000	0	102	70-125	0			
1,2-Dichlorobenzene	940	30	1000	0	94	75-120	0			
1,2-Dichloroethane	937.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	993	30	1000	0	99.3	70-120	0			
1,3,5-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,3-Dichlorobenzene	951.5	30	1000	0	95.2	70-125	0			
1,4-Dichlorobenzene	963	30	1000	0	96.3	70-125	0			
2-Butanone	1174	200	1000	0	117	30-160	0			
2-Hexanone	1038	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1240	30	1000	0	124	45-145	0			
Acetone	1160	100	1000	0	116	20-160	0			B
Acrylonitrile	1031	100	1000	0	103	70-135	0			
Benzene	974	30	1000	0	97.4	75-125	0			
Bromobenzene	970	30	1000	0	97	65-120	0			
Bromochloromethane	1012	30	1000	0	101	70-125	0			
Bromodichloromethane	1048	30	1000	0	105	70-130	0			
Bromoform	1094	30	1000	0	109	55-135	0			
Bromomethane	1438	75	1000	0	144	30-160	0			
Carbon disulfide	1382	30	1000	0	138	45-160	0			
Carbon tetrachloride	1114	30	1000	0	111	65-135	0			
Chlorobenzene	953.5	30	1000	0	95.4	75-125	0			
Chloroethane	981.5	100	1000	0	98.2	40-155	0			
Chloroform	1026	30	1000	0	103	70-125	0			
Chloromethane	994	100	1000	0	99.4	50-130	0			
cis-1,2-Dichloroethene	1034	30	1000	0	103	65-125	0			
cis-1,3-Dichloropropene	978	30	1000	0	97.8	70-125	0			
Dibromochloromethane	1046	30	1000	0	105	65-135	0			
Dibromomethane	1010	30	1000	0	101	75-130	0			
Dichlorodifluoromethane	792	30	1000	0	79.2	35-135	0			
Ethylbenzene	990.5	30	1000	0	99	75-125	0			
Hexachloroethane	1104	30	1000	0	110	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795**	Instrument ID **VMS9**		Method: **SW8260**				
Isopropylbenzene	1044	30	1000	0	104	75-130	0
m,p-Xylene	1960	60	2000	0	98	80-125	0
Methyl tert-butyl ether	1008	30	1000	0	101	75-125	0
Methylene chloride	971	30	1000	0	97.1	55-145	0
Naphthalene	1013	100	1000	0	101	40-140	0
n-Butylbenzene	1038	30	1000	0	104	65-140	0
n-Propylbenzene	1023	30	1000	0	102	65-135	0
o-Xylene	990.5	30	1000	0	99	75-125	0
p-Isopropyltoluene	1044	30	1000	0	104	75-135	0
sec-Butylbenzene	1071	30	1000	0	107	65-130	0
Styrene	1053	30	1000	0	105	75-125	0
tert-Butylbenzene	1026	30	1000	0	103	65-130	0
Tetrachloroethene	969	30	1000	0	96.9	64-140	0
Tetrahydrofuran	930.5	200	1000	0	93	70-135	0
Toluene	931	30	1000	0	93.1	70-125	0
trans-1,2-Dichloroethene	1065	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	984.5	30	1000	0	98.4	65-125	0
trans-1,4-Dichloro-2-butene	943	30	1000	0	94.3	70-135	0
Trichloroethene	981.5	30	1000	0	98.2	75-125	0
Trichlorofluoromethane	1064	30	1000	0	106	25-185	0
Vinyl chloride	1075	30	1000	0	108	60-125	0
Surr: 1,2-Dichloroethane-d4	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: Dibromofluoromethane	*1043*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*987*	0	*1000*	0	*98.7*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44795-44795** Units: **µg/Kg** Analysis Date: **11/16/2012 10:54 AM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143194** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	980.5	30	1000	0	98	75-125	0			
1,1,1-Trichloroethane	1063	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	939	30	1000	0	93.9	55-130	0			
1,1,2-Trichloroethane	892	30	1000	0	89.2	60-125	0			
1,1-Dichloroethane	1016	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1136	30	1000	0	114	65-135	0			
1,2,3-Trichlorobenzene	942	30	1000	0	94.2	60-135	0			
1,2,3-Trichloropropane	968	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	978.5	30	1000	0	97.8	65-130	0			
1,2,4-Trimethylbenzene	1031	30	1000	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	910.5	30	1000	0	91	40-135	0			
1,2-Dibromoethane	971.5	30	1000	0	97.2	70-125	0			
1,2-Dichlorobenzene	903.5	30	1000	0	90.4	75-120	0			
1,2-Dichloroethane	960.5	30	1000	0	96	70-135	0			
1,2-Dichloropropane	1006	30	1000	0	101	70-120	0			
1,3,5-Trimethylbenzene	1034	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	914	30	1000	0	91.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	1002	200	1000	0	100	30-160	0			
2-Hexanone	961.5	30	1000	0	96.2	45-145	0			
4-Methyl-2-pentanone	1114	30	1000	0	111	45-145	0			
Acetone	1198	100	1000	0	120	20-160	0			B
Acrylonitrile	1018	100	1000	0	102	70-135	0			
Benzene	1006	30	1000	0	101	75-125	0			
Bromobenzene	941.5	30	1000	0	94.2	65-120	0			
Bromochloromethane	1033	30	1000	0	103	70-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	968	30	1000	0	96.8	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1370	30	1000	0	137	45-160	0			
Carbon tetrachloride	1109	30	1000	0	111	65-135	0			
Chlorobenzene	944	30	1000	0	94.4	75-125	0			
Chloroethane	998.5	100	1000	0	99.8	40-155	0			
Chloroform	1044	30	1000	0	104	70-125	0			
Chloromethane	1074	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	969.5	30	1000	0	97	70-125	0			
Dibromochloromethane	941	30	1000	0	94.1	65-135	0			
Dibromomethane	1001	30	1000	0	100	75-130	0			
Dichlorodifluoromethane	861	30	1000	0	86.1	35-135	0			
Ethylbenzene	985.5	30	1000	0	98.6	75-125	0			
Hexachloroethane	1048	30	1000	0	105	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1040	30	1000	0	104	75-130	0
m,p-Xylene	1952	60	2000	0	97.6	80-125	0
Methyl tert-butyl ether	1022	30	1000	0	102	75-125	0
Methylene chloride	1004	30	1000	0	100	55-145	0
Naphthalene	925	100	1000	0	92.5	40-140	0
n-Butylbenzene	1088	30	1000	0	109	65-140	0
n-Propylbenzene	1024	30	1000	0	102	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0
sec-Butylbenzene	1090	30	1000	0	109	65-130	0
Styrene	1027	30	1000	0	103	75-125	0
tert-Butylbenzene	1028	30	1000	0	103	65-130	0
Tetrachloroethene	994.5	30	1000	0	99.4	64-140	0
Tetrahydrofuran	901	200	1000	0	90.1	70-135	0
Toluene	921.5	30	1000	0	92.2	70-125	0
trans-1,2-Dichloroethene	1096	30	1000	0	110	65-135	0
trans-1,3-Dichloropropene	947	30	1000	0	94.7	65-125	0
trans-1,4-Dichloro-2-butene	932.5	30	1000	0	93.2	70-135	0
Trichloroethene	1026	30	1000	0	103	75-125	0
Trichlorofluoromethane	1070	30	1000	0	107	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1033*	0	*1000*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*1042*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*961.5*	0	*1000*	0	*96.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44795-44795** Units: **µg/Kg** Analysis Date: **11/16/2012 05:44 PM**
Client ID: Run ID: **VMS5_121116B** SeqNo: **2143375** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1002	30	1000	0	100	75-125	0			
1,1,1-Trichloroethane	1074	30	1000	0	107	70-135	0			
1,1,2,2-Tetrachloroethane	900.5	30	1000	0	90	55-130	0			
1,1,2-Trichloroethane	962.5	30	1000	0	96.2	60-125	0			
1,1-Dichloroethane	1017	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1183	30	1000	0	118	65-135	0			
1,2,3-Trichlorobenzene	1046	30	1000	0	105	60-135	0			
1,2,3-Trichloropropane	935.5	30	1000	0	93.6	65-130	0			
1,2,4-Trichlorobenzene	1152	30	1000	0	115	65-130	0			
1,2,4-Trimethylbenzene	1072	30	1000	0	107	65-135	0			
1,2-Dibromo-3-chloropropane	878	30	1000	0	87.8	40-135	0			
1,2-Dibromoethane	955.5	30	1000	0	95.6	70-125	0			
1,2-Dichlorobenzene	1049	30	1000	0	105	75-120	0			
1,2-Dichloroethane	1030	30	1000	0	103	70-135	0			
1,2-Dichloropropane	1028	30	1000	0	103	70-120	0			
1,3,5-Trimethylbenzene	1106	30	1000	0	111	65-135	0			
1,3-Dichlorobenzene	1062	30	1000	0	106	70-125	0			
1,4-Dichlorobenzene	1060	30	1000	0	106	70-125	0			
2-Butanone	794.5	200	1000	0	79.4	30-160	0			
2-Hexanone	745	30	1000	0	74.5	45-145	0			
4-Methyl-2-pentanone	863.5	30	1000	0	86.4	45-145	0			
Acetone	788	100	1000	0	78.8	20-160	0			
Acrylonitrile	881.5	100	1000	0	88.2	70-135	0			
Benzene	1042	30	1000	0	104	75-125	0			
Bromobenzene	1048	30	1000	0	105	65-120	0			
Bromochloromethane	1063	30	1000	0	106	70-125	0			
Bromodichloromethane	1012	30	1000	0	101	70-130	0			
Bromoform	879	30	1000	0	87.9	55-135	0			
Bromomethane	1402	75	1000	0	140	30-160	0			
Carbon disulfide	1212	30	1000	0	121	45-160	0			
Carbon tetrachloride	1112	30	1000	0	111	65-135	0			
Chlorobenzene	1032	30	1000	0	103	75-125	0			
Chloroethane	1058	100	1000	0	106	40-155	0			
Chloroform	1040	30	1000	0	104	70-125	0			
Chloromethane	1018	100	1000	0	102	50-130	0			
cis-1,2-Dichloroethene	1045	30	1000	0	104	65-125	0			
cis-1,3-Dichloropropene	990.5	30	1000	0	99	70-125	0			
Dibromochloromethane	1005	30	1000	0	100	65-135	0			
Dibromomethane	995.5	30	1000	0	99.6	75-130	0			
Dichlorodifluoromethane	990	30	1000	0	99	35-135	0			
Ethylbenzene	1041	30	1000	0	104	75-125	0			
Hexachloroethane	1154	30	1000	0	115	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1108	30	1000	0	111	75-130	0
m,p-Xylene	2114	60	2000	0	106	80-125	0
Methyl tert-butyl ether	982.5	30	1000	0	98.2	75-125	0
Methylene chloride	1063	30	1000	0	106	55-145	0
Naphthalene	967	100	1000	0	96.7	40-140	0
n-Butylbenzene	1224	30	1000	0	122	65-140	0
n-Propylbenzene	1092	30	1000	0	109	65-135	0
o-Xylene	1060	30	1000	0	106	75-125	0
p-Isopropyltoluene	1150	30	1000	0	115	75-135	0
sec-Butylbenzene	1179	30	1000	0	118	65-130	0
Styrene	1045	30	1000	0	104	75-125	0
tert-Butylbenzene	1140	30	1000	0	114	65-130	0
Tetrachloroethene	1084	30	1000	0	108	64-140	0
Tetrahydrofuran	720	200	1000	0	72	70-135	0
Toluene	1054	30	1000	0	105	70-125	0
trans-1,2-Dichloroethene	1074	30	1000	0	107	65-135	0
trans-1,3-Dichloropropene	1012	30	1000	0	101	65-125	0
trans-1,4-Dichloro-2-butene	923.5	30	1000	0	92.4	70-135	0
Trichloroethene	1052	30	1000	0	105	75-125	0
Trichlorofluoromethane	1081	30	1000	0	108	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*977.5*	0	*1000*	0	*97.8*	*70-130*	0
Surr: Dibromofluoromethane	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1011*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

LCS	Sample ID: **LCS-44795-44795**				Units: **µg/Kg**		Analysis Date: **11/17/2012 05:43 AM**			
Client ID:		Run ID: **VMS5_121116C**			SeqNo: **2143936**		Prep Date: **11/15/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1050	30	1000	0	105	75-125	0			
1,1,1-Trichloroethane	1081	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	1050	30	1000	0	105	55-130	0			
1,1,2-Trichloroethane	1026	30	1000	0	103	60-125	0			
1,1-Dichloroethane	1072	30	1000	0	107	75-125	0			
1,1-Dichloroethene	1198	30	1000	0	120	65-135	0			
1,2,3-Trichlorobenzene	1128	30	1000	0	113	60-135	0			
1,2,3-Trichloropropane	1090	30	1000	0	109	65-130	0			
1,2,4-Trichlorobenzene	1168	30	1000	0	117	65-130	0			
1,2,4-Trimethylbenzene	1084	30	1000	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	1106	30	1000	0	111	40-135	0			
1,2-Dibromoethane	1032	30	1000	0	103	70-125	0			
1,2-Dichlorobenzene	1089	30	1000	0	109	75-120	0			
1,2-Dichloroethane	1078	30	1000	0	108	70-135	0			
1,2-Dichloropropane	1064	30	1000	0	106	70-120	0			
1,3,5-Trimethylbenzene	1105	30	1000	0	110	65-135	0			
1,3-Dichlorobenzene	1086	30	1000	0	109	70-125	0			
1,4-Dichlorobenzene	1067	30	1000	0	107	70-125	0			
2-Butanone	1184	200	1000	0	118	30-160	0			
2-Hexanone	1030	30	1000	0	103	45-145	0			
4-Methyl-2-pentanone	1092	30	1000	0	109	45-145	0			
Acetone	1288	100	1000	0	129	20-160	0			
Acrylonitrile	1082	100	1000	0	108	70-135	0			
Benzene	1066	30	1000	0	107	75-125	0			
Bromobenzene	1057	30	1000	0	106	65-120	0			
Bromochloromethane	1164	30	1000	0	116	70-125	0			
Bromodichloromethane	994.5	30	1000	0	99.4	70-130	0			
Bromoform	900	30	1000	0	90	55-135	0			
Bromomethane	1360	75	1000	0	136	30-160	0			
Carbon disulfide	1242	30	1000	0	124	45-160	0			
Carbon tetrachloride	1120	30	1000	0	112	65-135	0			
Chlorobenzene	1073	30	1000	0	107	75-125	0			
Chloroethane	1106	100	1000	0	111	40-155	0			
Chloroform	1118	30	1000	0	112	70-125	0			
Chloromethane	1032	100	1000	0	103	50-130	0			
cis-1,2-Dichloroethene	1090	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	982	30	1000	0	98.2	70-125	0			
Dibromochloromethane	993	30	1000	0	99.3	65-135	0			
Dibromomethane	1044	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	950.5	30	1000	0	95	35-135	0			
Ethylbenzene	1082	30	1000	0	108	75-125	0			
Hexachloroethane	1118	30	1000	0	112	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1104	30	1000	0	110	75-130	0
m,p-Xylene	2164	60	2000	0	108	80-125	0
Methyl tert-butyl ether	1121	30	1000	0	112	75-125	0
Methylene chloride	1042	30	1000	0	104	55-145	0
Naphthalene	1178	100	1000	0	118	40-140	0
n-Butylbenzene	1142	30	1000	0	114	65-140	0
n-Propylbenzene	1078	30	1000	0	108	65-135	0
o-Xylene	1086	30	1000	0	109	75-125	0
p-Isopropyltoluene	1112	30	1000	0	111	75-135	0
sec-Butylbenzene	1126	30	1000	0	113	65-130	0
Styrene	1093	30	1000	0	109	75-125	0
tert-Butylbenzene	1150	30	1000	0	115	65-130	0
Tetrachloroethene	1108	30	1000	0	111	64-140	0
Tetrahydrofuran	1073	200	1000	0	107	70-135	0
Toluene	1068	30	1000	0	107	70-125	0
trans-1,2-Dichloroethene	1116	30	1000	0	112	65-135	0
trans-1,3-Dichloropropene	1000	30	1000	0	100	65-125	0
trans-1,4-Dichloro-2-butene	772	30	1000	0	77.2	70-135	0
Trichloroethene	1054	30	1000	0	105	75-125	0
Trichlorofluoromethane	1004	30	1000	0	100	25-185	0
Vinyl chloride	1053	30	1000	0	105	60-125	0
Surr: 1,2-Dichloroethane-d4	*1024*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*983.5*	0	*1000*	0	*98.4*	*70-130*	0
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211430-02A MS** Units: **µg/Kg** Analysis Date: **11/16/2012 08:05 AM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141466** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	881.5	30	1000	0	88.2	75-125	0			
1,1,1-Trichloroethane	944.5	30	1000	0	94.4	70-135	0			
1,1,2,2-Tetrachloroethane	949	30	1000	0	94.9	55-130	0			
1,1,2-Trichloroethane	891	30	1000	0	89.1	60-125	0			
1,1-Dichloroethane	980	30	1000	0	98	75-125	0			
1,1-Dichloroethene	998	30	1000	0	99.8	65-135	0			
1,2,3-Trichlorobenzene	855	30	1000	0	85.5	60-135	0			
1,2,3-Trichloropropane	1012	30	1000	0	101	65-130	0			
1,2,4-Trichlorobenzene	850.5	30	1000	0	85	65-130	0			
1,2,4-Trimethylbenzene	1199	30	1000	290	90.9	65-135	0			
1,2-Dibromo-3-chloropropane	836.5	30	1000	0	83.6	40-135	0			
1,2-Dibromoethane	956	30	1000	0	95.6	70-125	0			
1,2-Dichlorobenzene	867.5	30	1000	0	86.8	75-120	0			
1,2-Dichloroethane	957.5	30	1000	0	95.8	70-135	0			
1,2-Dichloropropane	963.5	30	1000	0	96.4	70-120	0			
1,3,5-Trimethylbenzene	1574	30	1000	668.5	90.6	65-135	0			
1,3-Dichlorobenzene	857	30	1000	0	85.7	70-125	0			
1,4-Dichlorobenzene	860.5	30	1000	0	86	70-125	0			
2-Butanone	951	200	1000	0	95.1	30-160	0			
2-Hexanone	965	30	1000	0	96.5	45-145	0			
4-Methyl-2-pentanone	1184	30	1000	71.5	111	45-145	0			
Acetone	1386	100	1000	0	139	20-160	0			B
Acrylonitrile	1124	100	1000	0	112	70-135	0			
Benzene	1078	30	1000	121.5	95.6	75-125	0			
Bromobenzene	935	30	1000	0	93.5	65-120	0			
Bromochloromethane	1048	30	1000	0	105	70-125	0			
Bromodichloromethane	912.5	30	1000	0	91.2	70-130	0			
Bromoform	890.5	30	1000	0	89	55-135	0			
Bromomethane	776.5	75	1000	0	77.6	30-160	0			
Carbon disulfide	1026	30	1000	0	103	45-160	0			
Carbon tetrachloride	1026	30	1000	0	103	65-135	0			
Chlorobenzene	908	30	1000	0	90.8	75-125	0			
Chloroethane	307.5	100	1000	0	30.8	40-155	0			S
Chloroform	994.5	30	1000	0	99.4	70-125	0			
Chloromethane	1110	100	1000	22	109	50-130	0			
cis-1,2-Dichloroethene	984	30	1000	0	98.4	65-125	0			
cis-1,3-Dichloropropene	833.5	30	1000	0	83.4	70-125	0			
Dibromochloromethane	858.5	30	1000	0	85.8	65-135	0			
Dibromomethane	964	30	1000	0	96.4	75-130	0			
Dichlorodifluoromethane	820	30	1000	0	82	35-135	0			
Ethylbenzene	1152	30	1000	228	92.4	75-125	0			
Hexachloroethane	927.5	30	1000	0	92.8	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44795**	Instrument ID **VMS9**		Method: **SW8260**					
Isopropylbenzene	1060	30	1000	66.5	99.4	75-130	0	
m,p-Xylene	3576	60	2000	2176	70	80-125	0	S
Methyl tert-butyl ether	1030	30	1000	0	103	75-125	0	
Methylene chloride	1026	30	1000	0	103	55-145	0	
Naphthalene	906	100	1000	15	89.1	40-140	0	
n-Butylbenzene	982.5	30	1000	0	98.2	65-140	0	
n-Propylbenzene	1044	30	1000	76.5	96.7	65-135	0	
o-Xylene	1648	30	1000	744.5	90.4	75-125	0	
p-Isopropyltoluene	957	30	1000	0	95.7	75-135	0	
sec-Butylbenzene	1023	30	1000	18.5	100	65-130	0	
Styrene	1045	30	1000	0	104	75-125	0	
tert-Butylbenzene	988	30	1000	0	98.8	65-130	0	
Tetrachloroethene	881.5	30	1000	0	88.2	64-140	0	
Tetrahydrofuran	972.5	200	1000	0	97.2	70-135	0	
Toluene	1888	30	1000	1230	65.7	70-125	0	S
trans-1,2-Dichloroethene	990	30	1000	0	99	65-135	0	
trans-1,3-Dichloropropene	821.5	30	1000	0	82.2	65-125	0	
trans-1,4-Dichloro-2-butene	827.5	30	1000	0	82.8	70-135	0	
Trichloroethene	941.5	30	1000	0	94.2	75-125	0	
Trichlorofluoromethane	965.5	30	1000	0	96.6	25-185	0	
Vinyl chloride	1021	30	1000	0	102	60-125	0	
Surr: 1,2-Dichloroethane-d4	*982.5*	0	*1000*	0	*98.2*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1012*	0	*1000*	0	*101*	*70-130*	0	
Surr: Dibromofluoromethane	*1001*	0	*1000*	0	*100*	*70-130*	0	
Surr: Toluene-d8	*985.5*	0	*1000*	0	*98.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211430-02A MSD** Units: **µg/Kg** Analysis Date: **11/16/2012 08:30 AM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141467** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	942.5	30	1000	0	94.2	75-125	881.5	6.69	30	
1,1,1-Trichloroethane	994	30	1000	0	99.4	70-135	944.5	5.11	30	
1,1,2,2-Tetrachloroethane	983	30	1000	0	98.3	55-130	949	3.52	30	
1,1,2-Trichloroethane	933.5	30	1000	0	93.4	60-125	891	4.66	30	
1,1-Dichloroethane	1024	30	1000	0	102	75-125	980	4.34	30	
1,1-Dichloroethene	1052	30	1000	0	105	65-135	998	5.22	30	
1,2,3-Trichlorobenzene	937.5	30	1000	0	93.8	60-135	855	9.21	30	
1,2,3-Trichloropropane	1040	30	1000	0	104	65-130	1012	2.83	30	
1,2,4-Trichlorobenzene	946.5	30	1000	0	94.6	65-130	850.5	10.7	30	
1,2,4-Trimethylbenzene	1281	30	1000	290	99.1	65-135	1199	6.61	30	
1,2-Dibromo-3-chloropropane	814.5	30	1000	0	81.4	40-135	836.5	2.67	30	
1,2-Dibromoethane	1006	30	1000	0	101	70-125	956	5.05	30	
1,2-Dichlorobenzene	915.5	30	1000	0	91.6	75-120	867.5	5.38	30	
1,2-Dichloroethane	1024	30	1000	0	102	70-135	957.5	6.66	30	
1,2-Dichloropropane	1034	30	1000	0	103	70-120	963.5	7.01	30	
1,3,5-Trimethylbenzene	1683	30	1000	668.5	101	65-135	1574	6.69	30	
1,3-Dichlorobenzene	894.5	30	1000	0	89.4	70-125	857	4.28	30	
1,4-Dichlorobenzene	915	30	1000	0	91.5	70-125	860.5	6.14	30	
2-Butanone	1030	200	1000	0	103	30-160	951	7.93	30	
2-Hexanone	1006	30	1000	0	101	45-145	965	4.21	30	
4-Methyl-2-pentanone	1212	30	1000	71.5	114	45-145	1184	2.3	30	
Acetone	1424	100	1000	0	142	20-160	1386	2.7	30	B
Acrylonitrile	1118	100	1000	0	112	70-135	1124	0.58	30	
Benzene	1141	30	1000	121.5	102	75-125	1078	5.72	30	
Bromobenzene	992.5	30	1000	0	99.2	65-120	935	5.97	30	
Bromochloromethane	1110	30	1000	0	111	70-125	1048	5.65	30	
Bromodichloromethane	977.5	30	1000	0	97.8	70-130	912.5	6.88	30	
Bromoform	942.5	30	1000	0	94.2	55-135	890.5	5.67	30	
Bromomethane	813.5	75	1000	0	81.4	30-160	776.5	4.65	30	
Carbon disulfide	1104	30	1000	0	110	45-160	1026	7.37	30	
Carbon tetrachloride	998.5	30	1000	0	99.8	65-135	1026	2.72	30	
Chlorobenzene	968.5	30	1000	0	96.8	75-125	908	6.45	30	
Chloroethane	328	100	1000	0	32.8	40-155	307.5	6.45	30	S
Chloroform	1063	30	1000	0	106	70-125	994.5	6.66	30	
Chloromethane	1223	100	1000	22	120	50-130	1110	9.69	30	
cis-1,2-Dichloroethene	1055	30	1000	0	106	65-125	984	6.96	30	
cis-1,3-Dichloropropene	904.5	30	1000	0	90.4	70-125	833.5	8.17	30	
Dibromochloromethane	900	30	1000	0	90	65-135	858.5	4.72	30	
Dibromomethane	1034	30	1000	0	103	75-130	964	7.06	30	
Dichlorodifluoromethane	850	30	1000	0	85	35-135	820	3.59	30	
Ethylbenzene	1206	30	1000	228	97.8	75-125	1152	4.58	30	
Hexachloroethane	944	30	1000	0	94.4	70-135	927.5	1.76	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44795** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1122	30	1000	66.5	106	75-130	1060	5.68	30	
m,p-Xylene	3737	60	2000	2176	78	80-125	3576	4.39	30	S
Methyl tert-butyl ether	1093	30	1000	0	109	75-125	1030	5.98	30	
Methylene chloride	1068	30	1000	0	107	55-145	1026	4.01	30	
Naphthalene	997	100	1000	15	98.2	40-140	906	9.56	30	
n-Butylbenzene	1062	30	1000	0	106	65-140	982.5	7.73	30	
n-Propylbenzene	1106	30	1000	76.5	103	65-135	1044	5.86	30	
o-Xylene	1722	30	1000	744.5	97.7	75-125	1648	4.33	30	
p-Isopropyltoluene	1004	30	1000	0	100	75-135	957	4.84	30	
sec-Butylbenzene	1096	30	1000	18.5	108	65-130	1023	6.89	30	
Styrene	1112	30	1000	0	111	75-125	1045	6.17	30	
tert-Butylbenzene	1064	30	1000	0	106	65-130	988	7.45	30	
Tetrachloroethene	927	30	1000	0	92.7	64-140	881.5	5.03	30	
Tetrahydrofuran	1036	200	1000	0	104	70-135	972.5	6.32	30	
Toluene	1964	30	1000	1230	73.3	70-125	1888	3.95	30	
trans-1,2-Dichloroethene	1047	30	1000	0	105	65-135	990	5.6	30	
trans-1,3-Dichloropropene	861	30	1000	0	86.1	65-125	821.5	4.7	30	
trans-1,4-Dichloro-2-butene	842.5	30	1000	0	84.2	70-135	827.5	1.8	30	
Trichloroethene	991	30	1000	0	99.1	75-125	941.5	5.12	30	
Trichlorofluoromethane	1007	30	1000	0	101	25-185	965.5	4.21	30	
Vinyl chloride	1080	30	1000	0	108	60-125	1021	5.62	30	
Surr: 1,2-Dichloroethane-d4	*991.5*	0	*1000*	0	*99.2*	*70-130*	982.5	*0.912*	*30*	
Surr: 4-Bromofluorobenzene	*1008*	0	*1000*	0	*101*	*70-130*	1012	*0.297*	*30*	
Surr: Dibromofluoromethane	*1010*	0	*1000*	0	*101*	*70-130*	1001	*0.846*	*30*	
Surr: Toluene-d8	*970*	0	*1000*	0	*97*	*70-130*	985.5	*1.59*	*30*	

The following samples were analyzed in this batch: 1211454-01B 1211454-02B 1211454-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/15/2012 11:06 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141502** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	112.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*957.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*957*	0	*1000*	0	*95.7*	*70-130*	0	
Surr: Toluene-d8	*971.5*	0	*1000*	0	*97.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/16/2012 12:11 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143201** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	151.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	17	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*964*	0	*1000*	0	*96.4*	*70-130*	0
Surr: Dibromofluoromethane	*930.5*	0	*1000*	0	*93*	*70-130*	0
Surr: Toluene-d8	*947.5*	0	*1000*	0	*94.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/20/2012 01:03 AM**
Client ID: Run ID: **VMS9_121119A** SeqNo: **2146057** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	109.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1016*	0	*1000*	0	*102*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*961*	0	*1000*	0	*96.1*	*70-130*	0	
Surr: Dibromofluoromethane	*954.5*	0	*1000*	0	*95.4*	*70-130*	0	
Surr: Toluene-d8	*950.5*	0	*1000*	0	*95*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/15/2012 09:49 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141501** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1038	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1062	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	1022	30	1000	0	102	55-130	0			
1,1,2-Trichloroethane	932.5	30	1000	0	93.2	60-125	0			
1,1-Dichloroethane	996.5	30	1000	0	99.6	75-125	0			
1,1-Dichloroethene	1078	30	1000	0	108	65-135	0			
1,2,3-Trichlorobenzene	993	30	1000	0	99.3	60-135	0			
1,2,3-Trichloropropane	1012	30	1000	0	101	65-130	0			
1,2,4-Trichlorobenzene	997.5	30	1000	0	99.8	65-130	0			
1,2,4-Trimethylbenzene	1037	30	1000	0	104	65-135	0			
1,2-Dibromo-3-chloropropane	1038	30	1000	0	104	40-135	0			
1,2-Dibromoethane	1019	30	1000	0	102	70-125	0			
1,2-Dichlorobenzene	940	30	1000	0	94	75-120	0			
1,2-Dichloroethane	937.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	993	30	1000	0	99.3	70-120	0			
1,3,5-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,3-Dichlorobenzene	951.5	30	1000	0	95.2	70-125	0			
1,4-Dichlorobenzene	963	30	1000	0	96.3	70-125	0			
2-Butanone	1174	200	1000	0	117	30-160	0			
2-Hexanone	1038	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1240	30	1000	0	124	45-145	0			
Acetone	1160	100	1000	0	116	20-160	0			B
Acrylonitrile	1031	100	1000	0	103	70-135	0			
Benzene	974	30	1000	0	97.4	75-125	0			
Bromobenzene	970	30	1000	0	97	65-120	0			
Bromochloromethane	1012	30	1000	0	101	70-125	0			
Bromodichloromethane	1048	30	1000	0	105	70-130	0			
Bromoform	1094	30	1000	0	109	55-135	0			
Bromomethane	1438	75	1000	0	144	30-160	0			
Carbon disulfide	1382	30	1000	0	138	45-160	0			
Carbon tetrachloride	1114	30	1000	0	111	65-135	0			
Chlorobenzene	953.5	30	1000	0	95.4	75-125	0			
Chloroethane	981.5	100	1000	0	98.2	40-155	0			
Chloroform	1026	30	1000	0	103	70-125	0			
Chloromethane	994	100	1000	0	99.4	50-130	0			
cis-1,2-Dichloroethene	1034	30	1000	0	103	65-125	0			
cis-1,3-Dichloropropene	978	30	1000	0	97.8	70-125	0			
Dibromochloromethane	1046	30	1000	0	105	65-135	0			
Dibromomethane	1010	30	1000	0	101	75-130	0			
Dichlorodifluoromethane	792	30	1000	0	79.2	35-135	0			
Ethylbenzene	990.5	30	1000	0	99	75-125	0			
Hexachloroethane	1104	30	1000	0	110	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1044	30	1000	0	104	75-130	0
m,p-Xylene	1960	60	2000	0	98	80-125	0
Methyl tert-butyl ether	1008	30	1000	0	101	75-125	0
Methylene chloride	971	30	1000	0	97.1	55-145	0
Naphthalene	1013	100	1000	0	101	40-140	0
n-Butylbenzene	1038	30	1000	0	104	65-140	0
n-Propylbenzene	1023	30	1000	0	102	65-135	0
o-Xylene	990.5	30	1000	0	99	75-125	0
p-Isopropyltoluene	1044	30	1000	0	104	75-135	0
sec-Butylbenzene	1071	30	1000	0	107	65-130	0
Styrene	1053	30	1000	0	105	75-125	0
tert-Butylbenzene	1026	30	1000	0	103	65-130	0
Tetrachloroethene	969	30	1000	0	96.9	64-140	0
Tetrahydrofuran	930.5	200	1000	0	93	70-135	0
Toluene	931	30	1000	0	93.1	70-125	0
trans-1,2-Dichloroethene	1065	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	984.5	30	1000	0	98.4	65-125	0
trans-1,4-Dichloro-2-butene	943	30	1000	0	94.3	70-135	0
Trichloroethene	981.5	30	1000	0	98.2	75-125	0
Trichlorofluoromethane	1064	30	1000	0	106	25-185	0
Vinyl chloride	1075	30	1000	0	108	60-125	0
Surr: 1,2-Dichloroethane-d4	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: Dibromofluoromethane	*1043*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*987*	0	*1000*	0	*98.7*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS	Sample ID: **LCS-44796-44796**				Units: **µg/Kg**		Analysis Date: **11/16/2012 10:54 AM**			
Client ID:		Run ID: **VMS9_121116A**			SeqNo: **2143199**		Prep Date: **11/15/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	980.5	30	1000	0	98	75-125	0			
1,1,1-Trichloroethane	1063	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	939	30	1000	0	93.9	55-130	0			
1,1,2-Trichloroethane	892	30	1000	0	89.2	60-125	0			
1,1-Dichloroethane	1016	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1136	30	1000	0	114	65-135	0			
1,2,3-Trichlorobenzene	942	30	1000	0	94.2	60-135	0			
1,2,3-Trichloropropane	968	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	978.5	30	1000	0	97.8	65-130	0			
1,2,4-Trimethylbenzene	1031	30	1000	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	910.5	30	1000	0	91	40-135	0			
1,2-Dibromoethane	971.5	30	1000	0	97.2	70-125	0			
1,2-Dichlorobenzene	903.5	30	1000	0	90.4	75-120	0			
1,2-Dichloroethane	960.5	30	1000	0	96	70-135	0			
1,2-Dichloropropane	1006	30	1000	0	101	70-120	0			
1,3,5-Trimethylbenzene	1034	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	914	30	1000	0	91.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	1002	200	1000	0	100	30-160	0			
2-Hexanone	961.5	30	1000	0	96.2	45-145	0			
4-Methyl-2-pentanone	1114	30	1000	0	111	45-145	0			
Acetone	1198	100	1000	0	120	20-160	0			B
Acrylonitrile	1018	100	1000	0	102	70-135	0			
Benzene	1006	30	1000	0	101	75-125	0			
Bromobenzene	941.5	30	1000	0	94.2	65-120	0			
Bromochloromethane	1033	30	1000	0	103	70-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	968	30	1000	0	96.8	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1370	30	1000	0	137	45-160	0			
Carbon tetrachloride	1109	30	1000	0	111	65-135	0			
Chlorobenzene	944	30	1000	0	94.4	75-125	0			
Chloroethane	998.5	100	1000	0	99.8	40-155	0			
Chloroform	1044	30	1000	0	104	70-125	0			
Chloromethane	1074	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	969.5	30	1000	0	97	70-125	0			
Dibromochloromethane	941	30	1000	0	94.1	65-135	0			
Dibromomethane	1001	30	1000	0	100	75-130	0			
Dichlorodifluoromethane	861	30	1000	0	86.1	35-135	0			
Ethylbenzene	985.5	30	1000	0	98.6	75-125	0			
Hexachloroethane	1048	30	1000	0	105	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796**	Instrument ID **VMS9**		Method: **SW8260**				
Isopropylbenzene	1040	30	1000	0	104	75-130	0
m,p-Xylene	1952	60	2000	0	97.6	80-125	0
Methyl tert-butyl ether	1022	30	1000	0	102	75-125	0
Methylene chloride	1004	30	1000	0	100	55-145	0
Naphthalene	925	100	1000	0	92.5	40-140	0
n-Butylbenzene	1088	30	1000	0	109	65-140	0
n-Propylbenzene	1024	30	1000	0	102	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0
sec-Butylbenzene	1090	30	1000	0	109	65-130	0
Styrene	1027	30	1000	0	103	75-125	0
tert-Butylbenzene	1028	30	1000	0	103	65-130	0
Tetrachloroethene	994.5	30	1000	0	99.4	64-140	0
Tetrahydrofuran	901	200	1000	0	90.1	70-135	0
Toluene	921.5	30	1000	0	92.2	70-125	0
trans-1,2-Dichloroethene	1096	30	1000	0	110	65-135	0
trans-1,3-Dichloropropene	947	30	1000	0	94.7	65-125	0
trans-1,4-Dichloro-2-butene	932.5	30	1000	0	93.2	70-135	0
Trichloroethene	1026	30	1000	0	103	75-125	0
Trichlorofluoromethane	1070	30	1000	0	107	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1033*	0	*1000*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*1042*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*961.5*	0	*1000*	0	*96.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/19/2012 11:46 PM**
Client ID: Run ID: **VMS9_121119A** SeqNo: **2146056** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1031	30	1000	0	103	75-125	0			
1,1,1-Trichloroethane	1016	30	1000	0	102	70-135	0			
1,1,2,2-Tetrachloroethane	998	30	1000	0	99.8	55-130	0			
1,1,2-Trichloroethane	905	30	1000	0	90.5	60-125	0			
1,1-Dichloroethane	980.5	30	1000	0	98	75-125	0			
1,1-Dichloroethene	1062	30	1000	0	106	65-135	0			
1,2,3-Trichlorobenzene	956.5	30	1000	0	95.6	60-135	0			
1,2,3-Trichloropropane	1004	30	1000	0	100	65-130	0			
1,2,4-Trichlorobenzene	963.5	30	1000	0	96.4	65-130	0			
1,2,4-Trimethylbenzene	1017	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	1084	30	1000	0	108	40-135	0			
1,2-Dibromoethane	1046	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	914.5	30	1000	0	91.4	75-120	0			
1,2-Dichloroethane	938.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	959	30	1000	0	95.9	70-120	0			
1,3,5-Trimethylbenzene	1026	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	917.5	30	1000	0	91.8	70-125	0			
1,4-Dichlorobenzene	926.5	30	1000	0	92.6	70-125	0			
2-Butanone	1206	200	1000	0	121	30-160	0			
2-Hexanone	1186	30	1000	0	119	45-145	0			
4-Methyl-2-pentanone	1254	30	1000	0	125	45-145	0			
Acetone	1257	100	1000	0	126	20-160	0			B
Acrylonitrile	1027	100	1000	0	103	70-135	0			
Benzene	958.5	30	1000	0	95.8	75-125	0			
Bromobenzene	947.5	30	1000	0	94.8	65-120	0			
Bromochloromethane	1032	30	1000	0	103	70-125	0			
Bromodichloromethane	1040	30	1000	0	104	70-130	0			
Bromoform	1092	30	1000	0	109	55-135	0			
Bromomethane	1218	75	1000	0	122	30-160	0			
Carbon disulfide	1337	30	1000	0	134	45-160	0			
Carbon tetrachloride	1101	30	1000	0	110	65-135	0			
Chlorobenzene	951	30	1000	0	95.1	75-125	0			
Chloroethane	1022	100	1000	0	102	40-155	0			
Chloroform	975	30	1000	0	97.5	70-125	0			
Chloromethane	936.5	100	1000	0	93.6	50-130	0			
cis-1,2-Dichloroethene	1006	30	1000	0	101	65-125	0			
cis-1,3-Dichloropropene	992	30	1000	0	99.2	70-125	0			
Dibromochloromethane	1054	30	1000	0	105	65-135	0			
Dibromomethane	974	30	1000	0	97.4	75-130	0			
Dichlorodifluoromethane	896	30	1000	0	89.6	35-135	0			
Ethylbenzene	987	30	1000	0	98.7	75-125	0			
Hexachloroethane	984.5	30	1000	0	98.4	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1005	30	1000	0	100	75-130	0
m,p-Xylene	2019	60	2000	0	101	80-125	0
Methyl tert-butyl ether	1104	30	1000	0	110	75-125	0
Methylene chloride	1054	30	1000	0	105	55-145	0
Naphthalene	1016	100	1000	0	102	40-140	0
n-Butylbenzene	1000	30	1000	0	100	65-140	0
n-Propylbenzene	981.5	30	1000	0	98.2	65-135	0
o-Xylene	997	30	1000	0	99.7	75-125	0
p-Isopropyltoluene	987	30	1000	0	98.7	75-135	0
sec-Butylbenzene	1020	30	1000	0	102	65-130	0
Styrene	1041	30	1000	0	104	75-125	0
tert-Butylbenzene	1010	30	1000	0	101	65-130	0
Tetrachloroethene	966	30	1000	0	96.6	64-140	0
Tetrahydrofuran	1244	200	1000	0	124	70-135	0
Toluene	961	30	1000	0	96.1	70-125	0
trans-1,2-Dichloroethene	1016	30	1000	0	102	65-135	0
trans-1,3-Dichloropropene	1004	30	1000	0	100	65-125	0
trans-1,4-Dichloro-2-butene	925.5	30	1000	0	92.6	70-135	0
Trichloroethene	950.5	30	1000	0	95	75-125	0
Trichlorofluoromethane	998	30	1000	0	99.8	25-185	0
Vinyl chloride	1034	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*975*	0	*1000*	0	*97.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*1027*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*989.5*	0	*1000*	0	*99*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211465-01B MS** Units: **µg/Kg** Analysis Date: **11/16/2012 09:08 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143238** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2244	77	2571	0	87.2	75-125	0			
1,1,1-Trichloroethane	2485	77	2571	0	96.6	70-135	0			
1,1,2,2-Tetrachloroethane	2498	77	2571	0	97.2	55-130	0			
1,1,2-Trichloroethane	2235	77	2571	0	86.9	60-125	0			
1,1-Dichloroethane	2667	77	2571	0	104	75-125	0			
1,1-Dichloroethene	2820	77	2571	0	110	65-135	0			
1,2,3-Trichlorobenzene	2127	77	2571	0	82.7	60-135	0			
1,2,3-Trichloropropane	2598	77	2571	0	101	65-130	0			
1,2,4-Trichlorobenzene	2181	77	2571	0	84.8	65-130	0			
1,2,4-Trimethylbenzene	2659	77	2571	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	2058	77	2571	0	80	40-135	0			
1,2-Dibromoethane	2445	77	2571	0	95.1	70-125	0			
1,2-Dichlorobenzene	2128	77	2571	0	82.8	75-120	0			
1,2-Dichloroethane	2555	77	2571	0	99.4	70-135	0			
1,2-Dichloropropane	2624	77	2571	0	102	70-120	0			
1,3,5-Trimethylbenzene	2664	77	2571	0	104	65-135	0			
1,3-Dichlorobenzene	2145	77	2571	0	83.4	70-125	0			
1,4-Dichlorobenzene	2157	77	2571	0	83.9	70-125	0			
2-Butanone	2992	510	2571	0	116	30-160	0			
2-Hexanone	2697	77	2571	0	105	45-145	0			
4-Methyl-2-pentanone	3223	77	2571	0	125	45-145	0			
Acetone	4031	260	2571	257.1	147	20-160	0			B
Acrylonitrile	3018	260	2571	0	117	70-135	0			
Benzene	2625	77	2571	0	102	75-125	0			
Bromobenzene	2467	77	2571	0	96	65-120	0			
Bromochloromethane	2750	77	2571	0	107	70-125	0			
Bromodichloromethane	2424	77	2571	0	94.2	70-130	0			
Bromoform	2262	77	2571	0	88	55-135	0			
Bromomethane	2445	190	2571	0	95.1	30-160	0			
Carbon disulfide	2822	77	2571	0	110	45-160	0			
Carbon tetrachloride	2790	77	2571	0	108	65-135	0			
Chlorobenzene	2334	77	2571	0	90.8	75-125	0			
Chloroethane	766.3	260	2571	0	29.8	40-155	0			S
Chloroform	2687	77	2571	0	104	70-125	0			
Chloromethane	2940	260	2571	24.43	113	50-130	0			
cis-1,2-Dichloroethene	2650	77	2571	0	103	65-125	0			
cis-1,3-Dichloropropene	2292	77	2571	0	89.2	70-125	0			
Dibromochloromethane	2150	77	2571	0	83.6	65-135	0			
Dibromomethane	2614	77	2571	0	102	75-130	0			
Dichlorodifluoromethane	2370	77	2571	0	92.2	35-135	0			
Ethylbenzene	2449	77	2571	0	95.2	75-125	0			
Hexachloroethane	2157	77	2571	0	83.9	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	2616	77	2571	0	102	75-130	0
m,p-Xylene	4890	150	5143	0	95.1	80-125	0
Methyl tert-butyl ether	2793	77	2571	0	109	75-125	0
Methylene chloride	2802	77	2571	0	109	55-145	0
Naphthalene	2375	260	2571	0	92.4	40-140	0
n-Butylbenzene	2523	77	2571	0	98.1	65-140	0
n-Propylbenzene	2592	77	2571	0	101	65-135	0
o-Xylene	2481	77	2571	0	96.5	75-125	0
p-Isopropyltoluene	2334	77	2571	0	90.8	75-135	0
sec-Butylbenzene	2737	77	2571	0	106	65-130	0
Styrene	2632	77	2571	0	102	75-125	0
tert-Butylbenzene	2642	77	2571	0	103	65-130	0
Tetrachloroethene	2343	77	2571	0	91.1	64-140	0
Tetrahydrofuran	3003	510	2571	0	117	70-135	0
Toluene	2237	77	2571	0	87	70-125	0
trans-1,2-Dichloroethene	2749	77	2571	0	107	65-135	0
trans-1,3-Dichloropropene	2070	77	2571	0	80.5	65-125	0
trans-1,4-Dichloro-2-butene	2381	77	2571	0	92.6	70-135	0
Trichloroethene	2559	77	2571	0	99.5	75-125	0
Trichlorofluoromethane	2721	77	2571	0	106	25-185	0
Vinyl chloride	2907	77	2571	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*2605*	0	*2571*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2715*	0	*2571*	0	*106*	*70-130*	0
Surr: Dibromofluoromethane	*2515*	0	*2571*	0	*97.8*	*70-130*	0
Surr: Toluene-d8	*2345*	0	*2571*	0	*91.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211465-01B MSD** Units: **µg/Kg** Analysis Date: **11/16/2012 09:33 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143240** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2357	77	2571	0	91.6	75-125	2244	4.92	30	
1,1,1-Trichloroethane	2530	77	2571	0	98.4	70-135	2485	1.79	30	
1,1,2,2-Tetrachloroethane	2559	77	2571	0	99.5	55-130	2498	2.39	30	
1,1,2-Trichloroethane	2321	77	2571	0	90.2	60-125	2235	3.78	30	
1,1-Dichloroethane	2705	77	2571	0	105	75-125	2667	1.44	30	
1,1-Dichloroethene	2904	77	2571	0	113	65-135	2820	2.96	30	
1,2,3-Trichlorobenzene	2364	77	2571	0	92	60-135	2127	10.6	30	
1,2,3-Trichloropropane	2694	77	2571	0	105	65-130	2598	3.6	30	
1,2,4-Trichlorobenzene	2398	77	2571	0	93.2	65-130	2181	9.49	30	
1,2,4-Trimethylbenzene	2687	77	2571	0	104	65-135	2659	1.06	30	
1,2-Dibromo-3-chloropropane	2211	77	2571	0	86	40-135	2058	7.17	30	
1,2-Dibromoethane	2552	77	2571	0	99.2	70-125	2445	4.27	30	
1,2-Dichlorobenzene	2247	77	2571	0	87.4	75-120	2128	5.47	30	
1,2-Dichloroethane	2607	77	2571	0	101	70-135	2555	2.04	30	
1,2-Dichloropropane	2654	77	2571	0	103	70-120	2624	1.12	30	
1,3,5-Trimethylbenzene	2652	77	2571	0	103	65-135	2664	0.435	30	
1,3-Dichlorobenzene	2280	77	2571	0	88.6	70-125	2145	6.1	30	
1,4-Dichlorobenzene	2282	77	2571	0	88.8	70-125	2157	5.62	30	
2-Butanone	3131	510	2571	0	122	30-160	2992	4.54	30	
2-Hexanone	2848	77	2571	0	111	45-145	2697	5.43	30	
4-Methyl-2-pentanone	3396	77	2571	0	132	45-145	3223	5.21	30	
Acetone	4074	260	2571	257.1	148	20-160	4031	1.08	30	B
Acrylonitrile	3145	260	2571	0	122	70-135	3018	4.13	30	
Benzene	2632	77	2571	0	102	75-125	2625	0.245	30	
Bromobenzene	2458	77	2571	0	95.6	65-120	2467	0.365	30	
Bromochloromethane	2852	77	2571	0	111	70-125	2750	3.63	30	
Bromodichloromethane	2480	77	2571	0	96.4	70-130	2424	2.31	30	
Bromoform	2358	77	2571	0	91.7	55-135	2262	4.17	30	
Bromomethane	2579	190	2571	0	100	30-160	2445	5.32	30	
Carbon disulfide	2973	77	2571	0	116	45-160	2822	5.19	30	
Carbon tetrachloride	2844	77	2571	0	111	65-135	2790	1.92	30	
Chlorobenzene	2377	77	2571	0	92.4	75-125	2334	1.86	30	
Chloroethane	612	260	2571	0	23.8	40-155	766.3	22.4	30	S
Chloroform	2741	77	2571	0	107	70-125	2687	1.99	30	
Chloromethane	2962	260	2571	24.43	114	50-130	2940	0.741	30	
cis-1,2-Dichloroethene	2746	77	2571	0	107	65-125	2650	3.57	30	
cis-1,3-Dichloropropene	2330	77	2571	0	90.6	70-125	2292	1.61	30	
Dibromochloromethane	2245	77	2571	0	87.3	65-135	2150	4.33	30	
Dibromomethane	2670	77	2571	0	104	75-130	2614	2.14	30	
Dichlorodifluoromethane	2303	77	2571	0	89.6	35-135	2370	2.86	30	
Ethylbenzene	2503	77	2571	0	97.4	75-125	2449	2.18	30	
Hexachloroethane	2254	77	2571	0	87.6	70-135	2157	4.37	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	2679	77	2571	0	104	75-130	2616	2.38	30
m,p-Xylene	4987	150	5143	0	97	80-125	4890	1.98	30
Methyl tert-butyl ether	2871	77	2571	0	112	75-125	2793	2.77	30
Methylene chloride	2809	77	2571	0	109	55-145	2802	0.275	30
Naphthalene	2703	260	2571	0	105	40-140	2375	12.9	30
n-Butylbenzene	2694	77	2571	0	105	65-140	2523	6.56	30
n-Propylbenzene	2624	77	2571	0	102	65-135	2592	1.23	30
o-Xylene	2517	77	2571	0	97.9	75-125	2481	1.44	30
p-Isopropyltoluene	2478	77	2571	0	96.4	75-135	2334	5.99	30
sec-Butylbenzene	2750	77	2571	0	107	65-130	2737	0.469	30
Styrene	2659	77	2571	0	103	75-125	2632	1.02	30
tert-Butylbenzene	2633	77	2571	0	102	65-130	2642	0.341	30
Tetrachloroethene	2427	77	2571	0	94.4	64-140	2343	3.56	30
Tetrahydrofuran	2974	510	2571	0	116	70-135	3003	0.989	30
Toluene	2319	77	2571	0	90.2	70-125	2237	3.61	30
trans-1,2-Dichloroethene	2778	77	2571	0	108	65-135	2749	1.07	30
trans-1,3-Dichloropropene	2181	77	2571	0	84.8	65-125	2070	5.2	30
trans-1,4-Dichloro-2-butene	2443	77	2571	0	95	70-135	2381	2.56	30
Trichloroethene	2593	77	2571	0	101	75-125	2559	1.35	30
Trichlorofluoromethane	2787	77	2571	0	108	25-185	2721	2.43	30
Vinyl chloride	2915	77	2571	0	113	60-125	2907	0.265	30
Surr: 1,2-Dichloroethane-d4	*2525*	0	*2571*	0	*98.2*	*70-130*	2605	*3.11*	*30*
Surr: 4-Bromofluorobenzene	*2728*	0	*2571*	0	*106*	*70-130*	2715	*0.472*	*30*
Surr: Dibromofluoromethane	*2592*	0	*2571*	0	*101*	*70-130*	2515	*3.02*	*30*
Surr: Toluene-d8	*2407*	0	*2571*	0	*93.6*	*70-130*	2345	*2.6*	*30*

The following samples were analyzed in this batch:

1211454-04B	1211454-05B	1211454-06B
1211454-07B	1211454-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211454
Project: Marshall KRRI 1025-1050R 11/14/12

QC BATCH REPORT

Batch ID: **R112655** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112655** Units: **% of sample** Analysis Date: **11/15/2012 01:00 PM**
Client ID: Run ID: **MOIST_121115A** SeqNo: **2141760** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112655** Units: **% of sample** Analysis Date: **11/15/2012 01:00 PM**
Client ID: Run ID: **MOIST_121115A** SeqNo: **2141755** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211429-01A DUP** Units: **% of sample** Analysis Date: **11/15/2012 01:00 PM**
Client ID: Run ID: **MOIST_121115A** SeqNo: **2141716** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.29	0.050	0	0	0	0-0	4.5	4.78	20	

The following samples were analyzed in this batch:

1211454-01A	1211454-02A	1211454-03A
1211454-04A	1211454-05A	1211454-06A
1211454-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211454

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC # ENBRIDGE_111412_GMK1 | Task: KRRI_1025-1050
Total # of Samples: 8 | Event Complete?
Turn Around Time: 5 Day | Rush: No

BILLING CODE: 6.00

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 5555 Glenwood Parkway SE Suite 200
City: Grand Rapids | State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX | Phone #: 713-821-2000
PO #:
Send EDD to:
CC Hardcopy report:
CC Hardcopy report:

ITEM #	SAMPLE ID (Samples IDs MUST BE UNIQUE)	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH									
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260									
1	SBKR1025R519S111412S005	SBKR1025R519	SO	G	11/14/2012 08:20	3			X	X	X	X	X									
2	SBKR1025R520S111412S005	SBKR1025R520	SO	G	11/14/2012 09:15	3			X	X	X	X	X									
3	SBKR1025R521S111412S005	SBKR1025R521	SO	G	11/14/2012 10:18	3			X	X	X	X	X									
4	SBKR1050R501S111412S004	SBKR1050R501	SO	G	11/14/2012 11:15	3			X	X	X	X	X									
5	SBKR1050R502S111412S006	SBKR1050R502	SO	G	11/14/2012 13:13	3			X	X	X	X	X									
6	SBKR1050R503S111412S003	SBKR1050R503	SO	G	11/14/2012 15:09	3			X	X	X	X	X									
7	SBKR1050R504S111412S004	SBKR1050R504	SO	G	11/14/2012 16:07	3			X	X	X	X	X									
8	SBKR1050R504T111412MX	SBKR1050R504	SQ	G	11/14/2012 00:00	1	TRIP BLANK						X									

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G Kramer	11/14/12	1710	[signature]	11-14-12	1710
[signature]	11/14/12	1715	[signature]	11/14/12	1715

Sample Receipt Conditions

Temp in °C	Samples on Ice?	Sample Intact?	Trip Blank?
5.4°C	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO: Company: | Tracking #:
SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: GERRY KRAMER (GMK1) | SIGNATURE of SAMPLER: | DATE Signed: | Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 17:15**

Work Order: **1211454** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.4 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:15:16 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 11-14-12 Time:
Name:
Company:

Seal Broken By:

Date:

23-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000-1100I GW 11/14/12** Work Order: **1211455**

Dear Bryan,

ALS Environmental received 2 samples on 14-Nov-2012 05:50 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 17.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100I GW 11/14/12
Work Order: **1211455**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211455-01	SBKR1000I501S111412G025	Groundwater		11/14/2012 16:35	11/14/2012 17:50	☐
1211455-02	SBKR1100I501S111412G042	Groundwater		11/14/2012 15:07	11/14/2012 17:50	☐

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100I GW 11/14/12
Work Order: 1211455

Case Narrative

Batch 44820 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100I GW 11/14/12
WorkOrder: **1211455**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *23-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111412G025
Work Order:	1211455	**Collection Date:**	11/14/2012 4:35:00 PM
Project:	Marshall KRRI 1000-1100I GW 11/14/12		
Lab ID:	1211455-01	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/19/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/19/2012
Surr: 4-Terphenyl-d14	*51.0*	*21-90*			*%REC*	1	11/19/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/20/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/20/2012
Nickel	ND	0.020	0.020		mg/L	1	11/20/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*81.9*	*32-115*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*62.6*	*32-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*33.4*	*22-59*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*84.7*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*69.5*	*31-93*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*22.5*	*13-36*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *23-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111412G042
Work Order:	1211455	**Collection Date:**	11/14/2012 3:07:00 PM
Project:	Marshall KRRI 1000-1100I GW 11/14/12		
Lab ID:	1211455-02	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/19/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/19/2012
Surr: 4-Terphenyl-d14	*55.2*	*21-90*			*%REC*	1	11/19/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/17/2012**		Analyst: **RH**
Beryllium	ND	0.0010	0.0010		mg/L	1	11/19/2012
Molybdenum	ND	0.050	0.050		mg/L	1	11/21/2012
Nickel	ND	0.020	0.020		mg/L	1	11/19/2012
Vanadium	ND	0.0040	0.0040		mg/L	1	11/19/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/19/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/19/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/19/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/19/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/19/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/19/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/19/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/19/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/19/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/19/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*72.1*	*32-115*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*59.9*	*32-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*30.5*	*22-59*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*85.6*	*23-112*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*65.5*	*31-93*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*21.4*	*13-36*			*%REC*	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211455

Project: Marshall KRRI 1000-1100I GW 11/14/12

Batch ID: **44822** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKW1-44822-44822** Units: **mg/L** Analysis Date: **11/19/2012 01:14 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144876** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	0.10								
ORO (C20-C34)	ND	0.10								
Surr: 4-Terphenyl-d14	*0.02759*	0	*0.05*	0	*55.2*	*21-90*	0			

LCS Sample ID: **DLCSW1-44822-44822** Units: **mg/L** Analysis Date: **11/19/2012 01:41 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144877** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	2.717	0.10	5	0	54.3	44-116	0			
ORO (C20-C34)	2.659	0.10	5	0	53.2	44-116	0			
Surr: 4-Terphenyl-d14	*0.03665*	0	*0.05*	0	*73.3*	*21-90*	0			

MS Sample ID: **1211455-01A MS** Units: **mg/L** Analysis Date: **11/19/2012 02:09 PM**

Client ID: **SBKR1000I501S111412G025** Run ID: **GC8_121119A** SeqNo: **2144878** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	26.76	1.0	50	0	53.5	44-116	0			
ORO (C20-C34)	26.13	1.0	50	0	52.3	44-116	0			
Surr: 4-Terphenyl-d14	*0.2963*	0	*0.5*	0	*59.3*	*21-90*	0			

MSD Sample ID: **1211455-01A MSD** Units: **mg/L** Analysis Date: **11/19/2012 02:36 PM**

Client ID: **SBKR1000I501S111412G025** Run ID: **GC8_121119A** SeqNo: **2144879** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	26.31	1.0	50	0	52.6	44-116	26.76	1.69	30	
ORO (C20-C34)	25.35	1.0	50	0	50.7	44-116	26.13	3.04	30	
Surr: 4-Terphenyl-d14	*0.3519*	0	*0.5*	0	*70.4*	*21-90*	0.2963	*17.2*	*30*	

The following samples were analyzed in this batch: 1211455-01A 1211455-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211455
Project: Marshall KRRI 1000-1100I GW 11/14/12

QC BATCH REPORT

Batch ID: **44807** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44807-44807** Units: **mg/L** Analysis Date: **11/19/2012 04:07 PM**
Client ID: Run ID: **ICPMS2_121119A** SeqNo: **2144514** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Nickel	ND	0.0050								
Vanadium	ND	0.0050								

MBLK Sample ID: **MBLK-44807-44807** Units: **mg/L** Analysis Date: **11/21/2012 10:31 AM**
Client ID: Run ID: **ICPMS2_121121A** SeqNo: **2147366** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.0002708	0.0050								J

LCS Sample ID: **LCS-44807-44807** Units: **mg/L** Analysis Date: **11/19/2012 04:12 PM**
Client ID: Run ID: **ICPMS2_121119A** SeqNo: **2144515** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09064	0.0020	0.1	0	90.6	80-120	0			
Nickel	0.08616	0.0050	0.1	0	86.2	80-120	0			
Vanadium	0.08843	0.0050	0.1	0	88.4	80-120	0			

LCS Sample ID: **LCS-44807-44807** Units: **mg/L** Analysis Date: **11/21/2012 10:36 AM**
Client ID: Run ID: **ICPMS2_121121A** SeqNo: **2147367** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.1027	0.0050	0.1	0	103	80-120	0			

MS Sample ID: **1211455-02BMS** Units: **mg/L** Analysis Date: **11/19/2012 04:37 PM**
Client ID: **SBKR1100I501S111412G042** Run ID: **ICPMS2_121119A** SeqNo: **2144520** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09908	0.0020	0.1	0.00002179	99.1	75-125	0			
Nickel	0.09313	0.0050	0.1	0.001984	91.1	75-125	0			
Vanadium	0.09931	0.0050	0.1	0.00006582	99.2	75-125	0			

MS Sample ID: **1211455-02BMS** Units: **mg/L** Analysis Date: **11/21/2012 10:51 AM**
Client ID: **SBKR1100I501S111412G042** Run ID: **ICPMS2_121121A** SeqNo: **2147370** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.103	0.0050	0.1	0.001421	102	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211455
Project: Marshall KRRI 1000-1100I GW 11/14/12

QC BATCH REPORT

Batch ID: **44807** Instrument ID **ICPMS2** Method: **SW6020A**

MSD Sample ID: **1211455-02BMSD** Units: **mg/L** Analysis Date: **11/19/2012 04:42 PM**
Client ID: **SBKR1100I501S111412G042** Run ID: **ICPMS2_121119A** SeqNo: **2144521** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09581	0.0020	0.1	0.00002179	95.8	75-125	0.09908	3.36	20	
Nickel	0.09199	0.0050	0.1	0.001984	90	75-125	0.09313	1.23	20	
Vanadium	0.09906	0.0050	0.1	0.00006582	99	75-125	0.09931	0.252	20	

MSD Sample ID: **1211455-02BMSD** Units: **mg/L** Analysis Date: **11/21/2012 10:56 AM**
Client ID: **SBKR1100I501S111412G042** Run ID: **ICPMS2_121121A** SeqNo: **2147371** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.1041	0.0050	0.1	0.001421	103	75-125	0.103	1.06	20	

The following samples were analyzed in this batch: 1211455-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211455
Project: Marshall KRRI 1000-1100I GW 11/14/12

QC BATCH REPORT

Batch ID: **44809** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44809-44809** Units: **mg/L** Analysis Date: **11/20/2012 03:31 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146442** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Molybdenum	ND	0.0050								
Nickel	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44809-44809** Units: **mg/L** Analysis Date: **11/20/2012 03:37 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146443** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09444	0.0020	0.1	0	94.4	80-120	0			
Molybdenum	0.08959	0.0050	0.1	0	89.6	80-120	0			
Nickel	0.08979	0.0050	0.1	0	89.8	80-120	0			
Vanadium	0.09255	0.0050	0.1	0	92.6	80-120	0			

MS Sample ID: **1211468-08AMS** Units: **mg/L** Analysis Date: **11/20/2012 05:57 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146848** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.08386	0.0020	0.1	-0.00002158	83.9	75-125	0			
Molybdenum	0.0843	0.0050	0.1	0.001023	83.3	75-125	0			
Nickel	0.08066	0.0050	0.1	0.001032	79.6	75-125	0			
Vanadium	0.08587	0.0050	0.1	0.0005769	85.3	75-125	0			

MSD Sample ID: **1211468-08AMSD** Units: **mg/L** Analysis Date: **11/20/2012 06:03 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146849** Prep Date: **11/17/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09166	0.0020	0.1	-0.00002158	91.7	75-125	0.08386	8.89	20	
Molybdenum	0.09276	0.0050	0.1	0.001023	91.7	75-125	0.0843	9.56	20	
Nickel	0.08779	0.0050	0.1	0.001032	86.8	75-125	0.08066	8.47	20	
Vanadium	0.09355	0.0050	0.1	0.0005769	93	75-125	0.08587	8.56	20	

The following samples were analyzed in this batch: 1211455-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211455
Project: Marshall KRRI 1000-1100I GW 11/14/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44820-44820** Units: **µg/L** Analysis Date: **11/19/2012 08:20 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146231** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Naphthalene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2,4,6-Tribromophenol	*36.09*	0	*50*	0	*72.2*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*28.61*	0	*50*	0	*57.2*	*32-100*	0			
Surr: 2-Fluorophenol	*15.45*	0	*50*	0	*30.9*	*22-59*	0			
Surr: 4-Terphenyl-d14	*38.2*	0	*50*	0	*76.4*	*23-112*	0			
Surr: Nitrobenzene-d5	*31.87*	0	*50*	0	*63.7*	*31-93*	0			
Surr: Phenol-d6	*9.47*	0	*50*	0	*18.9*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

LCS Sample ID: **SLCSW1-44820-44820** Units: **µg/L** Analysis Date: **11/19/2012 08:53 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146233** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	14.13	5.0	20	0	70.6	45-105	0			
Acenaphthene	14.08	5.0	20	0	70.4	45-110	0			
Acenaphthylene	14.63	5.0	20	0	73.2	50-105	0			
Anthracene	15.14	5.0	20	0	75.7	55-110	0			
Benzo(a)anthracene	15.36	5.0	20	0	76.8	55-110	0			
Benzo(a)pyrene	15.79	5.0	20	0	79	55-110	0			
Benzo(b)fluoranthene	18.22	5.0	20	0	91.1	45-120	0			
Benzo(g,h,i)perylene	15.72	5.0	20	0	78.6	40-125	0			
Benzo(k)fluoranthene	14.14	5.0	20	0	70.7	45-125	0			
Chrysene	15.69	5.0	20	0	78.4	55-110	0			
Dibenzo(a,h)anthracene	15.81	5.0	20	0	79	40-125	0			
Fluoranthene	16.64	5.0	20	0	83.2	55-115	0			
Fluorene	15.02	5.0	20	0	75.1	50-110	0			
Indeno(1,2,3-cd)pyrene	15.8	5.0	20	0	79	45-125	0			
Naphthalene	13.47	5.0	20	0	67.4	40-100	0			
Phenanthrene	14.74	5.0	20	0	73.7	50-115	0			
Pyrene	16.44	5.0	20	0	82.2	50-130	0			
Surr: 2,4,6-Tribromophenol	*67.27*	0	*100*	0	*67.3*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*30.15*	0	*50*	0	*60.3*	*32-100*	0			
Surr: 2-Fluorophenol	*32.45*	0	*100*	0	*32.4*	*22-59*	0			
Surr: 4-Terphenyl-d14	*27.45*	0	*50*	0	*54.9*	*23-112*	0			
Surr: Nitrobenzene-d5	*32.18*	0	*50*	0	*64.4*	*31-93*	0			
Surr: Phenol-d6	*20.42*	0	*100*	0	*20.4*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MS Sample ID: **1211438-39B MS** Units: **µg/L** Analysis Date: **11/19/2012 09:25 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146235** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	127.6	50	200	0	63.8	45-105	0			
Acenaphthene	126.3	50	200	0	63.2	45-110	0			
Acenaphthylene	133.4	50	200	0	66.7	50-105	0			
Anthracene	137	50	200	0	68.5	55-110	0			
Benzo(a)anthracene	141.1	50	200	0	70.6	55-110	0			
Benzo(a)pyrene	144.3	50	200	0	72.2	55-110	0			
Benzo(b)fluoranthene	153.1	50	200	0	76.6	45-120	0			
Benzo(g,h,i)perylene	145.6	50	200	0	72.8	40-125	0			
Benzo(k)fluoranthene	143.6	50	200	0	71.8	45-125	0			
Chrysene	142.1	50	200	0	71	55-110	0			
Dibenzo(a,h)anthracene	142.1	50	200	0	71	40-125	0			
Fluoranthene	150.1	50	200	0	75	55-115	0			
Fluorene	135.2	50	200	0	67.6	50-110	0			
Indeno(1,2,3-cd)pyrene	144.6	50	200	0	72.3	45-125	0			
Naphthalene	123.1	50	200	0	61.6	40-100	0			
Phenanthrene	133.7	50	200	0	66.8	50-115	0			
Pyrene	148.6	50	200	0	74.3	50-130	0			
Surr: 2,4,6-Tribromophenol	*631.5*	0	*1000*	0	*63.2*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*275.5*	0	*1000*	0	*27.6*	*32-100*	0			*S*
Surr: 2-Fluorophenol	*284.5*	0	*1000*	0	*28.4*	*22-59*	0			
Surr: 4-Terphenyl-d14	*318.4*	0	*500*	0	*63.7*	*23-112*	0			
Surr: Nitrobenzene-d5	*297.5*	0	*500*	0	*59.5*	*31-93*	0			
Surr: Phenol-d6	*178.3*	0	*1000*	0	*17.8*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211455
Project: Marshall KRRI 1000-1100I GW 11/14/12

QC BATCH REPORT

Batch ID: **44820** Instrument ID **SVMS5** Method: **SW8270**

MSD Sample ID: **1211438-39B MSD** Units: **µg/L** Analysis Date: **11/19/2012 09:58 PM**
Client ID: Run ID: **SVMS5_121119A** SeqNo: **2146236** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	127.3	50	200	0	63.6	45-105	127.6	0.235	30	
Acenaphthene	125	50	200	0	62.5	45-110	126.3	1.03	30	
Acenaphthylene	130.2	50	200	0	65.1	50-105	133.4	2.43	30	
Anthracene	135	50	200	0	67.5	55-110	137	1.47	30	
Benzo(a)anthracene	138.6	50	200	0	69.3	55-110	141.1	1.79	30	
Benzo(a)pyrene	143.9	50	200	0	72	55-110	144.3	0.278	30	
Benzo(b)fluoranthene	150.5	50	200	0	75.2	45-120	153.1	1.71	30	
Benzo(g,h,i)perylene	141	50	200	0	70.5	40-125	145.6	3.21	30	
Benzo(k)fluoranthene	142.4	50	200	0	71.2	45-125	143.6	0.839	30	
Chrysene	139.5	50	200	0	69.8	55-110	142.1	1.85	30	
Dibenzo(a,h)anthracene	141.4	50	200	0	70.7	40-125	142.1	0.494	30	
Fluoranthene	148.3	50	200	0	74.2	55-115	150.1	1.21	30	
Fluorene	132.6	50	200	0	66.3	50-110	135.2	1.94	30	
Indeno(1,2,3-cd)pyrene	141.9	50	200	0	71	45-125	144.6	1.88	30	
Naphthalene	122.5	50	200	0	61.2	40-100	123.1	0.489	30	
Phenanthrene	131.2	50	200	0	65.6	50-115	133.7	1.89	30	
Pyrene	144.3	50	200	0	72.2	50-130	148.6	2.94	30	
Surr: 2,4,6-Tribromophenol	*623.9*	0	*1000*	0	*62.4*	*38-115*	631.5	*1.21*	*40*	
Surr: 2-Fluorobiphenyl	*273.2*	0	*500*	0	*54.6*	*32-100*	275.5	*0.838*	*40*	
Surr: 2-Fluorophenol	*286.6*	0	*1000*	0	*28.7*	*22-59*	284.5	*0.735*	*40*	
Surr: 4-Terphenyl-d14	*295.2*	0	*500*	0	*59*	*23-112*	318.4	*7.56*	*40*	
Surr: Nitrobenzene-d5	*293.7*	0	*500*	0	*58.7*	*31-93*	297.5	*1.29*	*40*	
Surr: Phenol-d6	*184*	0	*1000*	0	*18.4*	*13-36*	178.3	*3.15*	*40*	

The following samples were analyzed in this batch: 1211455-01A 1211455-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211455
1211455

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111412_LJL1	Task: KRRI_SW1000,1100
	Total # of Samples: 2	Event Complete?
Turn Around Time	5 Day	Rush: No

BILLING CODE: 6.00

Lab Information		Project Information		Other Information	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX — Phone #: 713-821-2000
Lab PM:	Ann Preston	City: Grand Rapids	State, Zip: MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	Analysis: ORO,DRO	PNAs by 8270	Be,Mo,V,Ni by 6020
								None		None	MeOH
1	SBKR1000I501S111412G025	SBKR1000I501	WG	G	11/14/2012 16:35	3	MDEQ SPLIT		X	X	X
2	SBKR1100I501S111412G042	SBKR1100I501	WG	G	11/14/2012 15:07	3			X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11-14-12	1752	[signature]	11-14-12	1750
[signature]	11-14-12	1750	[signature]	11-14-12	1750

Sample Receipt Conditions				
Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?	
4.2°C	(Y) N	(Y) N	(Y) N	
	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: LORRI LEGO (LJL1) — SIGNATURE of SAMPLER: — DATE Signed: — Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 17:50**

Work Order: **1211455** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Groundwater
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:22:55 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 11-14-12 Time:
Name: Lori Lee
Company:

Seal Broken By:

Date:

21-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1050R Sediment 11/14/12** Work Order: **1211456**

Dear Bryan,

ALS Environmental received 1 sample on 14-Nov-2012 03:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1050R Sediment 11/14/12
Work Order: **1211456**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211456-01	SEKR1050R501S111412D008	Sediment		11/14/2012 14:05	11/14/2012 15:00	☐

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1050R Sediment 11/14/12
Work Order: 1211456

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44824 MS/MSD data for ORO is not related to this project's samples. No data requires qualification.

Batch 44800 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44823 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1050R Sediment 11/14/12
WorkOrder: **1211456**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *21-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1050R501S111412D008
Work Order:	1211456	**Collection Date:**	11/14/2012 2:05:00 PM
Project:	Marshall KRRI 1050R Sediment 11/14/12		
Lab ID:	1211456-01	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**200**	**41**	**4.0**		**mg/Kg-dry**	1	11/19/2012
ORO (C20-C34)	**350**	**83**	**4.0**		**mg/Kg-dry**	1	11/19/2012
Surr: 4-Terphenyl-d14	*75.6*	*39-115*			*%REC*	1	11/19/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	2.3	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	5.8	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**8.3**	**5.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**18**	**5.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*91.3*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*73.7*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*74.0*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*79.5*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*71.5*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*77.8*	*40-106*			*%REC*	1	11/20/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**76**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 21-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211456

Project: Marshall KRRI 1050R Sediment 11/14/12

Batch ID: **44824** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:30 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144882** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.505*	0	*5*	0	*70.1*	*39-115*	0			

LCS Sample ID: **DLCSS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:57 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144883** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	318.5	10	500	0	63.7	49-124	0			
ORO (C20-C34)	322.3	20	500	0	64.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.175*	0	*5*	0	*83.5*	*39-115*	0			

MS Sample ID: **1211466-07A MS** Units: **mg/Kg** Analysis Date: **11/20/2012 10:41 AM**

Client ID: Run ID: **GC8_121120A** SeqNo: **2147094** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.3	9.7	484.3	0	61	60-130	0			
ORO (C20-C34)	380	19	484.3	132.6	51.1	60-130	0			S
Surr: 4-Terphenyl-d14	*3.706*	0	*4.843*	0	*76.5*	*39-115*	0			

MSD Sample ID: **1211466-07A MSD** Units: **mg/Kg** Analysis Date: **11/20/2012 11:08 AM**

Client ID: Run ID: **GC8_121120A** SeqNo: **2147095** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.5	9.4	469.5	0	62.9	60-130	295.3	0.062	30	
ORO (C20-C34)	414.7	19	469.5	132.6	60.1	60-130	380	8.74	30	
Surr: 4-Terphenyl-d14	*4.16*	0	*4.695*	0	*88.6*	*39-115*	3.706	*11.6*	*30*	

The following samples were analyzed in this batch: 1211456-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211456
Project: Marshall KRRI 1050R Sediment 11/14/12

QC BATCH REPORT

Batch ID: **44800** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44800-44800** Units: **mg/Kg** Analysis Date: **11/20/2012 01:42 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146409** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.25								
Nickel	0.004245	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44800-44800** Units: **mg/Kg** Analysis Date: **11/20/2012 12:21 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145146** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.494	0.10	5	0	89.9	80-120	0			
Molybdenum	4.55	0.25	5	0	91	80-120	0			
Nickel	4.364	0.25	5	0	87.3	80-120	0			
Vanadium	4.512	0.25	5	0	90.2	80-120	0			

MS Sample ID: **1211454-01AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 12:33 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145154** Prep Date: **11/16/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.981	0.54	6.729	0.06859	87.9	75-125	0			
Molybdenum	6.18	1.3	6.729	0.3245	87	75-125	0			
Nickel	9.429	1.3	6.729	2.273	106	75-125	0			
Vanadium	11.2	1.3	6.729	2.348	132	75-125	0			S

MSD Sample ID: **1211454-01AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 01:04 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145157** Prep Date: **11/16/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.084	0.65	8.117	0.06859	86.4	75-125	5.981	16.9	25	
Molybdenum	7.675	1.6	8.117	0.3245	90.6	75-125	6.18	21.6	25	
Nickel	10.91	1.6	8.117	2.273	106	75-125	9.429	14.6	25	
Vanadium	12.81	1.6	8.117	2.348	129	75-125	11.2	13.4	25	S

The following samples were analyzed in this batch: 1211456-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211456
Project: Marshall KRRI 1050R Sediment 11/14/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:02 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146576** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*9112*	0	*10000*	0	*91.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3866*	0	*5000*	0	*77.3*	*12-100*	0			
Surr: 2-Fluorophenol	*7869*	0	*10000*	0	*78.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4085*	0	*5000*	0	*81.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*3879*	0	*5000*	0	*77.6*	*37-107*	0			
Surr: Phenol-d6	*8126*	0	*10000*	0	*81.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:30 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146577** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1792	50	2000	0	89.6	45-105	0			
Acenaphthene	1846	50	2000	0	92.3	45-110	0			
Acenaphthylene	1876	50	2000	0	93.8	45-105	0			
Anthracene	1932	50	2000	0	96.6	55-105	0			
Benzo(a)anthracene	1900	50	2000	0	95	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	1990	50	2000	0	99.5	45-115	0			
Benzo(g,h,i)perylene	2105	50	2000	0	105	40-125	0			
Benzo(k)fluoranthene	2276	50	2000	0	114	45-115	0			
Chrysene	2095	50	2000	0	105	55-110	0			
Dibenzo(a,h)anthracene	2080	50	2000	0	104	40-125	0			
Fluoranthene	1809	50	2000	0	90.4	55-115	0			
Fluorene	1915	50	2000	0	95.8	50-110	0			
Indeno(1,2,3-cd)pyrene	2115	50	2000	0	106	40-120	0			
Naphthalene	1770	50	2000	0	88.5	40-105	0			
Phenanthrene	1933	50	2000	0	96.6	50-110	0			
Pyrene	1883	50	2000	0	94.2	45-125	0			
Surr: 2,4,6-Tribromophenol	*8281*	0	*10000*	0	*82.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3719*	0	*5000*	0	*74.4*	*12-100*	0			
Surr: 2-Fluorophenol	*7282*	0	*10000*	0	*72.8*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4017*	0	*5000*	0	*80.3*	*25-137*	0			
Surr: Nitrobenzene-d5	*3677*	0	*5000*	0	*73.5*	*37-107*	0			
Surr: Phenol-d6	*7246*	0	*10000*	0	*72.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211456
Project: Marshall KRRI 1050R Sediment 11/14/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211466-07A MS** Units: **µg/Kg** Analysis Date: **11/19/2012 11:36 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146641** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1510	48	1903	0	79.4	45-105	0			
Acenaphthene	1578	48	1903	0	83	45-110	0			
Acenaphthylene	1644	48	1903	0	86.4	45-105	0			
Anthracene	1758	48	1903	0	92.4	55-105	0			
Benzo(a)anthracene	1820	48	1903	152.4	87.6	50-110	0			
Benzo(a)pyrene	2027	48	1903	210.6	95.5	50-110	0			
Benzo(b)fluoranthene	2068	48	1903	275.6	94.2	45-115	0			
Benzo(g,h,i)perylene	1760	48	1903	131	85.6	40-125	0			
Benzo(k)fluoranthene	1910	48	1903	66.96	96.9	45-115	0			
Chrysene	1846	48	1903	191.2	87	55-110	0			
Dibenzo(a,h)anthracene	1698	48	1903	0	89.2	40-125	0			
Fluoranthene	2039	48	1903	263	93.3	55-115	0			
Fluorene	1708	48	1903	0	89.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1784	48	1903	115.5	87.7	40-120	0			
Naphthalene	1427	48	1903	0	75	40-105	0			
Phenanthrene	1859	48	1903	64.05	94.3	50-110	0			
Pyrene	1979	48	1903	273.7	89.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*4319*	0	*4757*	0	*90.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3269*	0	*4757*	0	*68.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3439*	0	*4757*	0	*72.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3976*	0	*4757*	0	*83.6*	*25-137*	0			
Surr: Nitrobenzene-d5	*3179*	0	*4757*	0	*66.8*	*37-107*	0			
Surr: Phenol-d6	*3701*	0	*4757*	0	*77.8*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211456
Project: Marshall KRRI 1050R Sediment 11/14/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211466-07A MSD** Units: **µg/Kg** Analysis Date: **11/20/2012 12:03 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146648** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1434	47	1861	0	77	45-105	1510	5.17	30	
Acenaphthene	1563	47	1861	0	84	45-110	1578	0.972	30	
Acenaphthylene	1595	47	1861	0	85.7	45-105	1644	3.04	30	
Anthracene	1701	47	1861	0	91.4	55-105	1758	3.32	30	
Benzo(a)anthracene	1696	47	1861	152.4	83	50-110	1820	7.05	30	
Benzo(a)pyrene	1914	47	1861	210.6	91.5	50-110	2027	5.76	30	
Benzo(b)fluoranthene	2226	47	1861	275.6	105	45-115	2068	7.36	30	
Benzo(g,h,i)perylene	1472	47	1861	131	72.1	40-125	1760	17.8	30	
Benzo(k)fluoranthene	1382	47	1861	66.96	70.7	45-115	1910	32.1	30	R
Chrysene	1777	47	1861	191.2	85.2	55-110	1846	3.79	30	
Dibenzo(a,h)anthracene	1451	47	1861	0	78	40-125	1698	15.7	30	
Fluoranthene	1992	47	1861	263	92.9	55-115	2039	2.32	30	
Fluorene	1649	47	1861	0	88.6	50-110	1708	3.52	30	
Indeno(1,2,3-cd)pyrene	1515	47	1861	115.5	75.2	40-120	1784	16.3	30	
Naphthalene	1331	47	1861	0	71.6	40-105	1427	6.94	30	
Phenanthrene	1792	47	1861	64.05	92.9	50-110	1859	3.67	30	
Pyrene	1885	47	1861	273.7	86.6	45-125	1979	4.86	30	
Surr: 2,4,6-Tribromophenol	*4024*	0	*4652*	0	*86.5*	*34-140*	4319	*7.08*	*40*	
Surr: 2-Fluorobiphenyl	*3085*	0	*4652*	0	*66.3*	*12-100*	3269	*5.78*	*40*	
Surr: 2-Fluorophenol	*3137*	0	*4652*	0	*67.4*	*33-117*	3439	*9.18*	*40*	
Surr: 4-Terphenyl-d14	*3665*	0	*4652*	0	*78.8*	*25-137*	3976	*8.14*	*40*	
Surr: Nitrobenzene-d5	*2896*	0	*4652*	0	*62.3*	*37-107*	3179	*9.29*	*40*	
Surr: Phenol-d6	*3428*	0	*4652*	0	*73.7*	*40-106*	3701	*7.67*	*40*	

The following samples were analyzed in this batch: 1211456-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211456
Project: Marshall KRRI 1050R Sediment 11/14/12

QC BATCH REPORT

Batch ID: **R112693** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112693** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142496** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112693** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142492** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211465-13A DUP** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142481** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.49	0.050	0	0	0	0-0	21.81	6.24	20	

DUP Sample ID: **1211466-02A DUP** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142484** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	50.66	0.050	0	0	0	0-0	50.9	0.473	20	

The following samples were analyzed in this batch: 1211456-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211456

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111412_GMK2	Task: KRRI_SE1050
	Total # of Samples: 1	Event Complete?

Turn Around Time	5 Day	Rush	No	

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	Analysis: % Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270
								None		None	None	None
1	SEKR1050R501S111412D008	SEKR1050R501	SE	G	11/14/2012 14:05	1	MDEQ SPLIT		X	X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11-14-12	1635	[signature]	11-14-12	1655
[signature]	11-14-12	1800	[signature]	11/14/12	1800

SHIPPING INFO	SAMPLER NAME AND SIGNATURE			
Company:	PRINT Name of SAMPLER:	GERRY KRAMER (GMK2)		
Tracking #:	SIGNATURE of SAMPLER:	DATE Signed	Time:	

Sample Receipt Conditions

Temp in oC	Samples on Ice?	Sample Intact?	Trip Blank?
3.2°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 15:00**

Work Order: **1211456** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Sediment
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:18:23 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

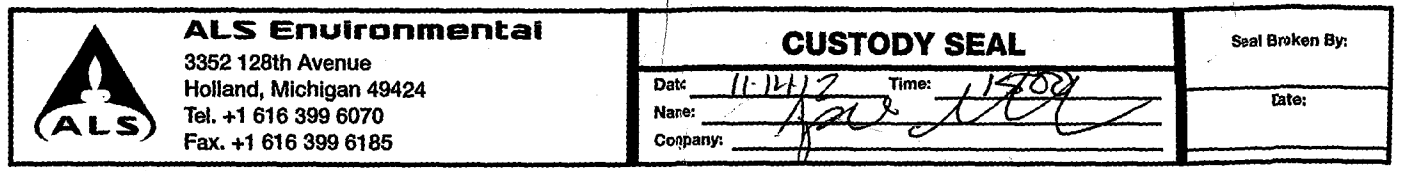
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date: 11-14-17 Time: 1400
Name:
Company:
Seal Broken By:
Date:

22-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12** Work Order: **1211465**

Dear Bryan,

ALS Environmental received 13 samples on 14-Nov-2012 05:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 74.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 22-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12
Work Order: **1211465**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211465-01	SBKR1000I501S111212S004	Soil		11/12/2012 11:10	11/14/2012 17:00	☐
1211465-02	SBKR1000I501S111212S026	Soil		11/12/2012 11:15	11/14/2012 17:00	☐
1211465-03	SBKR1000I501S111212S031	Soil		11/12/2012 11:20	11/14/2012 17:00	☐
1211465-04	SBKR1000I502S111212S006	Soil		11/12/2012 15:05	11/14/2012 17:00	☐
1211465-05	SBKR1025R510S111212S004	Soil		11/12/2012 16:10	11/14/2012 17:00	☐
1211465-06	SBKR1025R510S111212S013	Soil		11/12/2012 16:15	11/14/2012 17:00	☐
1211465-07	SBKR1025R510T111212MX	Soil		11/12/2012	11/14/2012 17:00	☐
1211465-08	SBKR1050L525S111212S004	Soil		11/12/2012 08:35	11/14/2012 17:00	☐
1211465-09	SBKR1100I501S111212S003	Soil		11/12/2012 09:20	11/14/2012 17:00	☐
1211465-10	SBKR1100I501S111212S015	Soil		11/12/2012 09:25	11/14/2012 17:00	☐
1211465-11	SBKR1100R511S111212S007	Soil		11/12/2012 13:22	11/14/2012 17:00	☐
1211465-12	SBKR1100R511D111212S007	Soil		11/12/2012 13:22	11/14/2012 17:00	☐
1211465-13	SBKR1100R512S111212S008	Soil		11/12/2012 14:12	11/14/2012 17:00	☐

ALS Group USA, Corp

Date: 22-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12
Work Order: 1211465

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44824 MS/MSD data for ORO is not related to this project's samples. No data requires qualification.

Batch 44800 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44823 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

Batch 44772 sample 1211465-01 and 1211465-02 PAH internal standard recoveries were below the lower control limit, but >20%. Per the client’s request, the results associated with the IS are being reported and should be considered as estimated for the compounds marked with an asterisk. Sample 1211465-02 had two high acid surrogate recoveries. None of the reported PAHs are associated with these surrogates. No data requires qualification.

Batch 44796 sample SBKR1000I501S111212S004 MS/MSD recoveries for Chloromethane were below the control limit. The corresponding reporting limit in the parent sample may be biased low.

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Date: 22-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12
WorkOrder: **1211465**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 11:10:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**2,400**	**340**	**4.0**		**mg/Kg-dry**	20	11/16/2012
ORO (C20-C34)	**12,000**	**670**	**4.0**		**mg/Kg-dry**	20	11/16/2012
Surr: 4-Terphenyl-d14	*96.8*	*39-115*			*%REC*	20	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.98	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.4	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**28**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**37**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Acenaphthene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Acenaphthylene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Anthracene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Benzo(a)anthracene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Benzo(a)pyrene	ND	1,700	330	*	µg/Kg-dry	20	11/19/2012
Benzo(b)fluoranthene	ND	1,700	330	*	µg/Kg-dry	20	11/19/2012
Benzo(g,h,i)perylene	ND	1,700	330	*	µg/Kg-dry	20	11/19/2012
Benzo(k)fluoranthene	ND	1,700	330	*	µg/Kg-dry	20	11/19/2012
Chrysene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Dibenzo(a,h)anthracene	ND	1,700	330	*	µg/Kg-dry	20	11/19/2012
Fluoranthene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Fluorene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	1,700	330	*	µg/Kg-dry	20	11/19/2012
Naphthalene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Phenanthrene	ND	1,700	330		µg/Kg-dry	20	11/19/2012
Pyrene	**2,100**	**1,700**	**330**		**µg/Kg-dry**	20	11/19/2012
Surr: 2,4,6-Tribromophenol	*82.0*	*34-140*			*%REC*	20	11/19/2012
Surr: 2-Fluorobiphenyl	*68.8*	*12-100*			*%REC*	20	11/19/2012
Surr: 2-Fluorophenol	*75.6*	*33-117*			*%REC*	20	11/19/2012
Surr: 4-Terphenyl-d14	*98.4*	*25-137*			*%REC*	20	11/19/2012
Surr: Nitrobenzene-d5	*80.8*	*37-107*			*%REC*	20	11/19/2012
Surr: Phenol-d6	*67.6*	*40-106*			*%REC*	20	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	140	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	140	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	140	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	140	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	140	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 11:10:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	140	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	140	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	140	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	140	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	140	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	140	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	460	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	140	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	140	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	140	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	140	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	140	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	140	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	140	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	460	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	140	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	140	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 11:10:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	140	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	270	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	140	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	140	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	460	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	140	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	140	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	140	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	140	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	140	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	140	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	140	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	140	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	140	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	140	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	140	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	140	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	140	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*98.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*87.6*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*95.4*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**44**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

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Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S026
Work Order:	1211465	**Collection Date:**	11/12/2012 11:15:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**5,900**	**240**	**4.0**		**mg/Kg-dry**	20	11/16/2012
ORO (C20-C34)	**20,000**	**470**	**4.0**		**mg/Kg-dry**	20	11/16/2012
Surr: 4-Terphenyl-d14	*109*	*39-115*			*%REC*	20	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.70	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**16**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**14**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	**1,700**	**1,200**	**330**		**µg/Kg-dry**	20	11/19/2012
Acenaphthene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Acenaphthylene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Anthracene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Benzo(a)anthracene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Benzo(a)pyrene	ND	1,200	330	*	µg/Kg-dry	20	11/19/2012
Benzo(b)fluoranthene	ND	1,200	330	*	µg/Kg-dry	20	11/19/2012
Benzo(g,h,i)perylene	ND	1,200	330	*	µg/Kg-dry	20	11/19/2012
Benzo(k)fluoranthene	ND	1,200	330	*	µg/Kg-dry	20	11/19/2012
Chrysene	**2,100**	**1,200**	**330**		**µg/Kg-dry**	20	11/19/2012
Dibenzo(a,h)anthracene	ND	1,200	330	*	µg/Kg-dry	20	11/19/2012
Fluoranthene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Fluorene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	1,200	330	*	µg/Kg-dry	20	11/19/2012
Naphthalene	ND	1,200	330		µg/Kg-dry	20	11/19/2012
Phenanthrene	**3,200**	**1,200**	**330**		**µg/Kg-dry**	20	11/19/2012
Pyrene	**1,300**	**1,200**	**330**		**µg/Kg-dry**	20	11/19/2012
Surr: 2,4,6-Tribromophenol	*139*	*34-140*			*%REC*	20	11/19/2012
Surr: 2-Fluorobiphenyl	*66.8*	*12-100*			*%REC*	20	11/19/2012
Surr: 2-Fluorophenol	*136*	*33-117*		S	*%REC*	20	11/19/2012
Surr: 4-Terphenyl-d14	*103*	*25-137*			*%REC*	20	11/19/2012
Surr: Nitrobenzene-d5	*78.0*	*37-107*			*%REC*	20	11/19/2012
Surr: Phenol-d6	*122*	*40-106*		S	*%REC*	20	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/20/2012
1,1,1-Trichloroethane	ND	62	50		µg/Kg-dry	1	11/20/2012
1,1,2,2-Tetrachloroethane	ND	62	50		µg/Kg-dry	1	11/20/2012
1,1,2-Trichloroethane	ND	62	50		µg/Kg-dry	1	11/20/2012
1,1-Dichloroethane	ND	62	50		µg/Kg-dry	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S026
Work Order:	1211465	**Collection Date:**	11/12/2012 11:15:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/20/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/20/2012
1,2,3-Trimethylbenzene	**320**	**250**	**250**		**µg/Kg-dry**	1	11/20/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
1,2,4-Trimethylbenzene	**490**	**100**	**100**		**µg/Kg-dry**	1	11/20/2012
1,2-Dibromo-3-chloropropane	ND	62	10		µg/Kg-dry	1	11/20/2012
1,2-Dibromoethane	ND	62	20		µg/Kg-dry	1	11/20/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/20/2012
1,2-Dichloroethane	ND	62	50		µg/Kg-dry	1	11/20/2012
1,2-Dichloropropane	ND	62	50		µg/Kg-dry	1	11/20/2012
1,3,5-Trimethylbenzene	**160**	**100**	**100**		**µg/Kg-dry**	1	11/20/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/20/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/20/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/20/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/20/2012
2-Methylnaphthalene	**5,400**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/20/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/20/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/20/2012
Benzene	ND	62	50		µg/Kg-dry	1	11/20/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/20/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/20/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/20/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/20/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/20/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/20/2012
Carbon tetrachloride	ND	62	50		µg/Kg-dry	1	11/20/2012
Chlorobenzene	ND	62	50		µg/Kg-dry	1	11/20/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/20/2012
Chloroform	ND	62	50		µg/Kg-dry	1	11/20/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/20/2012
cis-1,2-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/20/2012
cis-1,3-Dichloropropene	ND	62	50		µg/Kg-dry	1	11/20/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/20/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/20/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/20/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/20/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/20/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/20/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S026
Work Order:	1211465	**Collection Date:**	11/12/2012 11:15:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	62	50		µg/Kg-dry	1	11/20/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/20/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/20/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/20/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/20/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/20/2012
Naphthalene	**820**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
n-Butylbenzene	**150**	**62**	**50**		**µg/Kg-dry**	1	11/20/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/20/2012
o-Xylene	ND	62	50		µg/Kg-dry	1	11/20/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/20/2012
sec-Butylbenzene	**64**	**62**	**50**		**µg/Kg-dry**	1	11/20/2012
Styrene	ND	62	50		µg/Kg-dry	1	11/20/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/20/2012
tert-Butylbenzene	ND	62	50		µg/Kg-dry	1	11/20/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/20/2012
Tetrachloroethene	ND	62	50		µg/Kg-dry	1	11/20/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/20/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/20/2012
trans-1,2-Dichloroethene	ND	62	50		µg/Kg-dry	1	11/20/2012
trans-1,3-Dichloropropene	ND	62	50		µg/Kg-dry	1	11/20/2012
trans-1,4-Dichloro-2-butene	ND	62	50		µg/Kg-dry	1	11/20/2012
Trichloroethene	ND	62	50		µg/Kg-dry	1	11/20/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/20/2012
Vinyl chloride	ND	62	40		µg/Kg-dry	1	11/20/2012
Surr: 1,2-Dichloroethane-d4	*99.3*	*70-130*			*%REC*	1	11/20/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	11/20/2012
Surr: Dibromofluoromethane	*92.2*	*70-130*			*%REC*	1	11/20/2012
Surr: Toluene-d8	*94.4*	*70-130*			*%REC*	1	11/20/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**23**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S031
Work Order:	1211465	**Collection Date:**	11/12/2012 11:20:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	ND	13	4.0		mg/Kg-dry	1	11/16/2012
ORO (C20-C34)	ND	25	4.0		mg/Kg-dry	1	11/16/2012
Surr: 4-Terphenyl-d14	*71.9*	*39-115*			*%REC*	1	11/16/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.68	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**2.9**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**3.9**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/16/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/16/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/16/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/16/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/16/2012
Surr: 2,4,6-Tribromophenol	*81.7*	*34-140*			*%REC*	1	11/16/2012
Surr: 2-Fluorobiphenyl	*63.2*	*12-100*			*%REC*	1	11/16/2012
Surr: 2-Fluorophenol	*69.8*	*33-117*			*%REC*	1	11/16/2012
Surr: 4-Terphenyl-d14	*76.2*	*25-137*			*%REC*	1	11/16/2012
Surr: Nitrobenzene-d5	*70.5*	*37-107*			*%REC*	1	11/16/2012
Surr: Phenol-d6	*72.2*	*40-106*			*%REC*	1	11/16/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S031
Work Order:	1211465	**Collection Date:**	11/12/2012 11:20:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	39	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	39	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I501S111212S031
Work Order:	1211465	**Collection Date:**	11/12/2012 11:20:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	40	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*97.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*92.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*96.6*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**24**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

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Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I502S111212S006
Work Order:	1211465	**Collection Date:**	11/12/2012 3:05:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/16/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**20**	**4.0**		**mg/Kg-dry**	1	11/17/2012
ORO (C20-C34)	**410**	**39**	**4.0**		**mg/Kg-dry**	1	11/17/2012
Surr: 4-Terphenyl-d14	*74.1*	*39-115*			*%REC*	1	11/17/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**19**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**17**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/16/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/19/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(a)anthracene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(a)pyrene	**770**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(b)fluoranthene	**980**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/19/2012
Benzo(k)fluoranthene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Chrysene	**740**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/19/2012
Fluoranthene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/19/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/19/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/19/2012
Phenanthrene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Pyrene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/19/2012
Surr: 2,4,6-Tribromophenol	*52.0*	*34-140*			*%REC*	1	11/19/2012
Surr: 2-Fluorobiphenyl	*57.5*	*12-100*			*%REC*	1	11/19/2012
Surr: 2-Fluorophenol	*64.4*	*33-117*			*%REC*	1	11/19/2012
Surr: 4-Terphenyl-d14	*77.8*	*25-137*			*%REC*	1	11/19/2012
Surr: Nitrobenzene-d5	*63.2*	*37-107*			*%REC*	1	11/19/2012
Surr: Phenol-d6	*65.7*	*40-106*			*%REC*	1	11/19/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	59	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I502S111212S006
Work Order:	1211465	**Collection Date:**	11/12/2012 3:05:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	59	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	59	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	59	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	59	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	59	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	59	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	59	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000I502S111212S006
Work Order:	1211465	**Collection Date:**	11/12/2012 3:05:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	59	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	59	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	59	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	59	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	59	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	59	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	59	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*95.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*94.4*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**49**	**0.050**	**0**		**% of sample**	1	11/15/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 4:10:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**260**	**38**	**4.0**		**mg/Kg-dry**	1	11/20/2012
ORO (C20-C34)	**930**	**76**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*72.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	2.1	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	5.2	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**21**	**5.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**22**	**5.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(a)pyrene	**540**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(b)fluoranthene	**670**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	**520**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	**570**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	**700**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*90.8*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*72.9*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*67.1*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*76.7*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*64.5*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*70.7*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	120	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	120	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 4:10:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	120	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	120	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	120	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	120	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	390	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	120	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	120	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	120	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	120	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	120	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	120	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	120	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	390	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	120	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	120	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 4:10:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	120	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	230	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	120	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	120	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	390	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	120	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	120	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	120	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	120	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	120	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	120	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	120	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	120	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	120	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	120	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*92.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*95.4*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**74**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510S111212S013
Work Order:	1211465	**Collection Date:**	11/12/2012 4:15:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	23	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**210**	**45**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*76.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.9	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**16**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**23**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(b)fluoranthene	**390**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	**390**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*90.4*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*67.9*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*67.5*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*77.7*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*65.0*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*71.0*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	69	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	69	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	69	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	69	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510S111212S013
Work Order:	1211465	**Collection Date:**	11/12/2012 4:15:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	69	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	69	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	69	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	69	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	69	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	69	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	69	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	69	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	69	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	69	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	69	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510S111212S013
Work Order:	1211465	**Collection Date:**	11/12/2012 4:15:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	69	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	160	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	69	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	69	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	69	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	69	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	69	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	69	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	69	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	69	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	69	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	69	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	69	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*95.7*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**56**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510T111212MX
Work Order:	1211465	**Collection Date:**	11/12/2012
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/16/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/16/2012
Benzene	ND	50	50		µg/Kg	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/16/2012
Bromoform	ND	100	100		µg/Kg	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg	1	11/16/2012
Chloroform	ND	50	50		µg/Kg	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R510T111212MX
Work Order:	1211465	**Collection Date:**	11/12/2012
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/16/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/16/2012
Styrene	ND	50	50		µg/Kg	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/16/2012
Toluene	ND	100	100		µg/Kg	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/16/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*99.6*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*97.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*89.8*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*96.2*	*70-130*			*%REC*	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L525S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 8:35:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	31	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**330**	**61**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*69.8*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	4.5	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**18**	**4.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**18**	**4.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(a)pyrene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(b)fluoranthene	**760**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(g,h,i)perylene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	**570**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	**560**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	**730**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*87.7*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*73.7*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*74.5*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*74.6*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*70.0*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*78.3*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	530	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	530	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	530	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	530	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	530	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L525S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 8:35:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	530	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	530	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	530	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	530	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	530	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	530	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	530	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	530	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	530	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	1,800	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	1,800	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	4,400	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	530	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	530	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	530	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	530	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	530	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	530	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	530	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	530	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	530	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	1,800	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	530	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	530	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	530	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	530	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	530	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	530	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	530	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	530	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	530	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	530	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	530	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050L525S111212S004
Work Order:	1211465	**Collection Date:**	11/12/2012 8:35:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	530	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	530	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	530	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	1,100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	530	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	530	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	530	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	1,800	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	530	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	530	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	530	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	530	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	530	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	530	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	530	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	530	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	530	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,800	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	530	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	530	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	530	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	530	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	530	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	530	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	530	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.8*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*91.7*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*92.4*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**69**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111212S003
Work Order:	1211465	**Collection Date:**	11/12/2012 9:20:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**1,900**	**280**	**4.0**		**mg/Kg-dry**	20	11/21/2012
ORO (C20-C34)	**8,900**	**560**	**4.0**		**mg/Kg-dry**	20	11/21/2012
Surr: 4-Terphenyl-d14	*82.0*	*39-115*			*%REC*	20	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.83	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.1	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**19**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**25**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Acenaphthene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Acenaphthylene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Anthracene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Benzo(a)anthracene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Benzo(a)pyrene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Benzo(b)fluoranthene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Benzo(g,h,i)perylene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Benzo(k)fluoranthene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Chrysene	**1,400**	**1,400**	**330**		**µg/Kg-dry**	20	11/20/2012
Dibenzo(a,h)anthracene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Fluoranthene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Fluorene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Naphthalene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Phenanthrene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Pyrene	ND	1,400	330		µg/Kg-dry	20	11/20/2012
Surr: 2,4,6-Tribromophenol	*62.0*	*34-140*			*%REC*	20	11/20/2012
Surr: 2-Fluorobiphenyl	*68.0*	*12-100*			*%REC*	20	11/20/2012
Surr: 2-Fluorophenol	*82.2*	*33-117*			*%REC*	20	11/20/2012
Surr: 4-Terphenyl-d14	*87.2*	*25-137*			*%REC*	20	11/20/2012
Surr: Nitrobenzene-d5	*82.0*	*37-107*			*%REC*	20	11/20/2012
Surr: Phenol-d6	*60.6*	*40-106*			*%REC*	20	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	79	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	79	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	79	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	79	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111212S003
Work Order:	1211465	**Collection Date:**	11/12/2012 9:20:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	79	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	79	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	79	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	79	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	79	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	79	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	79	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	79	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	260	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	79	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	79	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	79	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111212S003
Work Order:	1211465	**Collection Date:**	11/12/2012 9:20:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	79	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	160	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	79	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	79	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	79	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	79	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	79	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	79	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	79	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	79	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	79	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	79	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	79	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*96.9*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*87.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.4*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**30**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111212S015
Work Order:	1211465	**Collection Date:**	11/12/2012 9:25:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	19	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**180**	**38**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*72.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.8	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**6.9**	**2.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**11**	**2.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*84.8*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*68.3*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*69.3*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*74.9*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*66.3*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*72.6*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	190	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111212S015
Work Order:	1211465	**Collection Date:**	11/12/2012 9:25:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	190	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	190	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	190	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	630	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,600	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	190	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	190	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	630	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	190	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	190	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100I501S111212S015
Work Order:	1211465	**Collection Date:**	11/12/2012 9:25:00 AM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	380	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	190	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	190	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	630	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	190	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	190	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	190	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	190	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	190	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	190	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	190	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*95.8*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*89.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.1*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**51**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R511S111212S007
Work Order:	1211465	**Collection Date:**	11/12/2012 1:22:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	11	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**78**	**23**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*66.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.72	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	1.8	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**8.8**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**18**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*80.4*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*60.2*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*59.6*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*72.0*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*58.5*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*63.5*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R511S111212S007
Work Order:	1211465	**Collection Date:**	11/12/2012 1:22:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	49	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	49	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R511S111212S007
Work Order:	1211465	**Collection Date:**	11/12/2012 1:22:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	49	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*96.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.9*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*91.8*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**16**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R511D111212S007
Work Order:	1211465	**Collection Date:**	11/12/2012 1:22:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	12	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**84**	**24**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*72.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.69	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	1.7	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**8.5**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**18**	**1.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*85.0*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*67.0*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*68.8*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*80.2*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*67.2*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*71.5*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R511D111212S007
Work Order:	1211465	**Collection Date:**	11/12/2012 1:22:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	48	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	48	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R511D111212S007
Work Order:	1211465	**Collection Date:**	11/12/2012 1:22:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	48	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*98.2*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.8*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*89.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*92.0*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**15**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R512S111212S008
Work Order:	1211465	**Collection Date:**	11/12/2012 2:12:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	12	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**110**	**25**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*71.7*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/16/2012**		Analyst: **RH**
Beryllium	ND	0.73	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	1.8	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**12**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**20**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*85.0*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*70.1*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*73.7*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*73.7*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*75.0*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	60	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	60	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	60	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	60	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R512S111212S008
Work Order:	1211465	**Collection Date:**	11/12/2012 2:12:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	60	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	60	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	60	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	60	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	60	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	60	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	60	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	60	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	60	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100R512S111212S008
Work Order:	1211465	**Collection Date:**	11/12/2012 2:12:00 PM
Project:	Marshall KRRI 1000-1100I,1050L,1025-1100R 11/12/12		
Lab ID:	1211465-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	60	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	60	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	60	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	60	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	60	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	60	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	60	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	60	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	60	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	60	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*95.5*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*88.6*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.2*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**22**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44773** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:11 PM**

Client ID: Run ID: **GC8_121116A** SeqNo: **2143011** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
Surr: 4-Terphenyl-d14	*3.464*	0	*5*	0	*69.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44773-44773** Units: **mg/Kg** Analysis Date: **11/16/2012 05:37 PM**

Client ID: Run ID: **GC8_121116A** SeqNo: **2143012** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	321.2	10	500	0	64.2	49-124	0			
ORO (C20-C34)	327.7	20	500	0	65.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.557*	0	*5*	0	*91.1*	*39-115*	0			

MS Sample ID: **1211465-03A MS** Units: **mg/Kg** Analysis Date: **11/16/2012 06:04 PM**

Client ID: **SBKR1000I501S111212S031** Run ID: **GC8_121116A** SeqNo: **2143014** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	316.1	9.7	485.9	0	65.1	60-130	0			
ORO (C20-C34)	343.8	19	485.9	0	70.8	60-130	0			
Surr: 4-Terphenyl-d14	*4.416*	0	*4.859*	0	*90.9*	*39-115*	0			

MSD Sample ID: **1211465-03A MSD** Units: **mg/Kg** Analysis Date: **11/16/2012 06:31 PM**

Client ID: **SBKR1000I501S111212S031** Run ID: **GC8_121116A** SeqNo: **2143015** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	307.4	9.7	484.1	0	63.5	60-130	316.1	2.8	30	
ORO (C20-C34)	328.5	19	484.1	0	67.9	60-130	343.8	4.57	30	
Surr: 4-Terphenyl-d14	*3.58*	0	*4.841*	0	*74*	*39-115*	4.416	*20.9*	*30*	

The following samples were analyzed in this batch:

1211465-01A 1211465-02A 1211465-03A
1211465-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44824** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:30 PM**
Client ID: Run ID: **GC8_121119A** SeqNo: **2144882** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.505*	0	*5*	0	*70.1*	*39-115*	0			

LCS Sample ID: **DLCSS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:57 PM**
Client ID: Run ID: **GC8_121119A** SeqNo: **2144883** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	318.5	10	500	0	63.7	49-124	0			
ORO (C20-C34)	322.3	20	500	0	64.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.175*	0	*5*	0	*83.5*	*39-115*	0			

MS Sample ID: **1211466-07A MS** Units: **mg/Kg** Analysis Date: **11/20/2012 10:41 AM**
Client ID: Run ID: **GC8_121120A** SeqNo: **2147094** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.3	9.7	484.3	0	61	60-130	0			
ORO (C20-C34)	380	19	484.3	132.6	51.1	60-130	0			S
Surr: 4-Terphenyl-d14	*3.706*	0	*4.843*	0	*76.5*	*39-115*	0			

MSD Sample ID: **1211466-07A MSD** Units: **mg/Kg** Analysis Date: **11/20/2012 11:08 AM**
Client ID: Run ID: **GC8_121120A** SeqNo: **2147095** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.5	9.4	469.5	0	62.9	60-130	295.3	0.062	30	
ORO (C20-C34)	414.7	19	469.5	132.6	60.1	60-130	380	8.74	30	
Surr: 4-Terphenyl-d14	*4.16*	0	*4.695*	0	*88.6*	*39-115*	3.706	*11.6*	*30*	

The following samples were analyzed in this batch:

1211465-05A	1211465-06A	1211465-08A
1211465-09A	1211465-10A	1211465-11A
1211465-12A	1211465-13A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44800** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44800-44800** Units: **mg/Kg** Analysis Date: **11/20/2012 01:42 PM**
Client ID: Run ID: **ICPMS1_121120A** SeqNo: **2146409** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.25								
Nickel	0.004245	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44800-44800** Units: **mg/Kg** Analysis Date: **11/20/2012 12:21 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145146** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.494	0.10	5	0	89.9	80-120	0			
Molybdenum	4.55	0.25	5	0	91	80-120	0			
Nickel	4.364	0.25	5	0	87.3	80-120	0			
Vanadium	4.512	0.25	5	0	90.2	80-120	0			

MS Sample ID: **1211454-01AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 12:33 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145154** Prep Date: **11/16/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.981	0.54	6.729	0.06859	87.9	75-125	0			
Molybdenum	6.18	1.3	6.729	0.3245	87	75-125	0			
Nickel	9.429	1.3	6.729	2.273	106	75-125	0			
Vanadium	11.2	1.3	6.729	2.348	132	75-125	0			S

MSD Sample ID: **1211454-01AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 01:04 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145157** Prep Date: **11/16/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.084	0.65	8.117	0.06859	86.4	75-125	5.981	16.9	25	
Molybdenum	7.675	1.6	8.117	0.3245	90.6	75-125	6.18	21.6	25	
Nickel	10.91	1.6	8.117	2.273	106	75-125	9.429	14.6	25	
Vanadium	12.81	1.6	8.117	2.348	129	75-125	11.2	13.4	25	S

The following samples were analyzed in this batch:

1211465-01A	1211465-02A	1211465-03A
1211465-04A	1211465-05A	1211465-06A
1211465-08A	1211465-09A	1211465-10A
1211465-11A	1211465-12A	1211465-13A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44772-44772** Units: **µg/Kg** Analysis Date: **11/16/2012 05:50 PM**
Client ID: Run ID: **SVMS7_121116A** SeqNo: **2143582** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*7892*	0	*10000*	0	*78.9*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3319*	0	*5000*	0	*66.4*	*12-100*	0			
Surr: 2-Fluorophenol	*7349*	0	*10000*	0	*73.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3939*	0	*5000*	0	*78.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3793*	0	*5000*	0	*75.9*	*37-107*	0			
Surr: Phenol-d6	*7521*	0	*10000*	0	*75.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44772-44772** Units: **µg/Kg** Analysis Date: **11/16/2012 05:23 PM**
Client ID: Run ID: **SVMS7_121116A** SeqNo: **2143581** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1719	50	2000	0	86	45-105	0			
Acenaphthene	1713	50	2000	0	85.6	45-110	0			
Acenaphthylene	1736	50	2000	0	86.8	45-105	0			
Anthracene	1810	50	2000	0	90.5	55-105	0			
Benzo(a)anthracene	1894	50	2000	0	94.7	50-110	0			
Benzo(a)pyrene	1996	50	2000	0	99.8	50-110	0			
Benzo(b)fluoranthene	2003	50	2000	0	100	45-115	0			
Benzo(g,h,i)perylene	1979	50	2000	0	99	40-125	0			
Benzo(k)fluoranthene	1699	50	2000	0	85	45-115	0			
Chrysene	1957	50	2000	0	97.8	55-110	0			
Dibenzo(a,h)anthracene	1987	50	2000	0	99.4	40-125	0			
Fluoranthene	1919	50	2000	0	96	55-115	0			
Fluorene	1762	50	2000	0	88.1	50-110	0			
Indeno(1,2,3-cd)pyrene	1981	50	2000	0	99	40-120	0			
Naphthalene	1767	50	2000	0	88.4	40-105	0			
Phenanthrene	1829	50	2000	0	91.4	50-110	0			
Pyrene	1972	50	2000	0	98.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*7859*	0	*10000*	0	*78.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3281*	0	*5000*	0	*65.6*	*12-100*	0			
Surr: 2-Fluorophenol	*7148*	0	*10000*	0	*71.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4171*	0	*5000*	0	*83.4*	*25-137*	0			
Surr: Nitrobenzene-d5	*3836*	0	*5000*	0	*76.7*	*37-107*	0			
Surr: Phenol-d6	*7027*	0	*10000*	0	*70.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211465-03A MS** Units: **µg/Kg** Analysis Date: **11/16/2012 07:14 PM**
Client ID: **SBKR1000I501S111212S031** Run ID: **SVMS7_121116A** SeqNo: **2143583** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1511	47	1873	0	80.7	45-105	0			
Acenaphthene	1522	47	1873	0	81.2	45-110	0			
Acenaphthylene	1539	47	1873	0	82.2	45-105	0			
Anthracene	1697	47	1873	0	90.6	55-105	0			
Benzo(a)anthracene	1731	47	1873	0	92.4	50-110	0			
Benzo(a)pyrene	1843	47	1873	0	98.4	50-110	0			
Benzo(b)fluoranthene	1760	47	1873	0	94	45-115	0			
Benzo(g,h,i)perylene	1878	47	1873	0	100	40-125	0			
Benzo(k)fluoranthene	1659	47	1873	0	88.6	45-115	0			
Chrysene	1789	47	1873	0	95.6	55-110	0			
Dibenzo(a,h)anthracene	1863	47	1873	0	99.5	40-125	0			
Fluoranthene	1755	47	1873	0	93.7	55-115	0			
Fluorene	1605	47	1873	0	85.7	50-110	0			
Indeno(1,2,3-cd)pyrene	1863	47	1873	0	99.4	40-120	0			
Naphthalene	1542	47	1873	0	82.4	40-105	0			
Phenanthrene	1698	47	1873	0	90.6	50-110	0			
Pyrene	1820	47	1873	0	97.2	45-125	0			
Surr: 2,4,6-Tribromophenol	*7420*	0	*9364*	0	*79.2*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*2917*	0	*4682*	0	*62.3*	*12-100*	0			
Surr: 2-Fluorophenol	*6200*	0	*9364*	0	*66.2*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3818*	0	*4682*	0	*81.5*	*25-137*	0			
Surr: Nitrobenzene-d5	*3277*	0	*4682*	0	*70*	*37-107*	0			
Surr: Phenol-d6	*6191*	0	*9364*	0	*66.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44772** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211465-03A MSD** Units: **µg/Kg** Analysis Date: **11/16/2012 07:42 PM**
Client ID: **SBKR1000I501S111212S031** Run ID: **SVMS7_121116A** SeqNo: **2143584** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1464	47	1877	0	78	45-105	1511	3.19	30	
Acenaphthene	1513	47	1877	0	80.6	45-110	1522	0.588	30	
Acenaphthylene	1530	47	1877	0	81.5	45-105	1539	0.64	30	
Anthracene	1715	47	1877	0	91.4	55-105	1697	1.09	30	
Benzo(a)anthracene	1724	47	1877	0	91.8	50-110	1731	0.436	30	
Benzo(a)pyrene	1825	47	1877	0	97.2	50-110	1843	0.96	30	
Benzo(b)fluoranthene	1776	47	1877	0	94.6	45-115	1760	0.905	30	
Benzo(g,h,i)perylene	1833	47	1877	0	97.6	40-125	1878	2.46	30	
Benzo(k)fluoranthene	1619	47	1877	0	86.2	45-115	1659	2.47	30	
Chrysene	1798	47	1877	0	95.8	55-110	1789	0.477	30	
Dibenzo(a,h)anthracene	1815	47	1877	0	96.7	40-125	1863	2.64	30	
Fluoranthene	1770	47	1877	0	94.3	55-115	1755	0.854	30	
Fluorene	1599	47	1877	0	85.2	50-110	1605	0.37	30	
Indeno(1,2,3-cd)pyrene	1806	47	1877	0	96.2	40-120	1863	3.05	30	
Naphthalene	1519	47	1877	0	81	40-105	1542	1.5	30	
Phenanthrene	1694	47	1877	0	90.2	50-110	1698	0.227	30	
Pyrene	1810	47	1877	0	96.4	45-125	1820	0.559	30	
Surr: 2,4,6-Tribromophenol	*7522*	0	*9384*	0	*80.2*	*34-140*	7420	*1.36*	*40*	
Surr: 2-Fluorobiphenyl	*2922*	0	*4692*	0	*62.3*	*12-100*	2917	*0.184*	*40*	
Surr: 2-Fluorophenol	*6176*	0	*9384*	0	*65.8*	*33-117*	6200	*0.39*	*40*	
Surr: 4-Terphenyl-d14	*3851*	0	*4692*	0	*82.1*	*25-137*	3818	*0.876*	*40*	
Surr: Nitrobenzene-d5	*3216*	0	*4692*	0	*68.5*	*37-107*	3277	*1.89*	*40*	
Surr: Phenol-d6	*6166*	0	*9384*	0	*65.7*	*40-106*	6191	*0.391*	*40*	

The following samples were analyzed in this batch: 1211465-01A 1211465-02A 1211465-03A 1211465-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:02 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146576** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*9112*	0	*10000*	0	*91.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3866*	0	*5000*	0	*77.3*	*12-100*	0			
Surr: 2-Fluorophenol	*7869*	0	*10000*	0	*78.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4085*	0	*5000*	0	*81.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*3879*	0	*5000*	0	*77.6*	*37-107*	0			
Surr: Phenol-d6	*8126*	0	*10000*	0	*81.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:30 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146577** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1792	50	2000	0	89.6	45-105	0			
Acenaphthene	1846	50	2000	0	92.3	45-110	0			
Acenaphthylene	1876	50	2000	0	93.8	45-105	0			
Anthracene	1932	50	2000	0	96.6	55-105	0			
Benzo(a)anthracene	1900	50	2000	0	95	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	1990	50	2000	0	99.5	45-115	0			
Benzo(g,h,i)perylene	2105	50	2000	0	105	40-125	0			
Benzo(k)fluoranthene	2276	50	2000	0	114	45-115	0			
Chrysene	2095	50	2000	0	105	55-110	0			
Dibenzo(a,h)anthracene	2080	50	2000	0	104	40-125	0			
Fluoranthene	1809	50	2000	0	90.4	55-115	0			
Fluorene	1915	50	2000	0	95.8	50-110	0			
Indeno(1,2,3-cd)pyrene	2115	50	2000	0	106	40-120	0			
Naphthalene	1770	50	2000	0	88.5	40-105	0			
Phenanthrene	1933	50	2000	0	96.6	50-110	0			
Pyrene	1883	50	2000	0	94.2	45-125	0			
Surr: 2,4,6-Tribromophenol	*8281*	0	*10000*	0	*82.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3719*	0	*5000*	0	*74.4*	*12-100*	0			
Surr: 2-Fluorophenol	*7282*	0	*10000*	0	*72.8*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4017*	0	*5000*	0	*80.3*	*25-137*	0			
Surr: Nitrobenzene-d5	*3677*	0	*5000*	0	*73.5*	*37-107*	0			
Surr: Phenol-d6	*7246*	0	*10000*	0	*72.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211466-07A MS** Units: **µg/Kg** Analysis Date: **11/19/2012 11:36 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146641** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1510	48	1903	0	79.4	45-105	0			
Acenaphthene	1578	48	1903	0	83	45-110	0			
Acenaphthylene	1644	48	1903	0	86.4	45-105	0			
Anthracene	1758	48	1903	0	92.4	55-105	0			
Benzo(a)anthracene	1820	48	1903	152.4	87.6	50-110	0			
Benzo(a)pyrene	2027	48	1903	210.6	95.5	50-110	0			
Benzo(b)fluoranthene	2068	48	1903	275.6	94.2	45-115	0			
Benzo(g,h,i)perylene	1760	48	1903	131	85.6	40-125	0			
Benzo(k)fluoranthene	1910	48	1903	66.96	96.9	45-115	0			
Chrysene	1846	48	1903	191.2	87	55-110	0			
Dibenzo(a,h)anthracene	1698	48	1903	0	89.2	40-125	0			
Fluoranthene	2039	48	1903	263	93.3	55-115	0			
Fluorene	1708	48	1903	0	89.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1784	48	1903	115.5	87.7	40-120	0			
Naphthalene	1427	48	1903	0	75	40-105	0			
Phenanthrene	1859	48	1903	64.05	94.3	50-110	0			
Pyrene	1979	48	1903	273.7	89.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*4319*	0	*4757*	0	*90.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3269*	0	*4757*	0	*68.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3439*	0	*4757*	0	*72.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3976*	0	*4757*	0	*83.6*	*25-137*	0			
Surr: Nitrobenzene-d5	*3179*	0	*4757*	0	*66.8*	*37-107*	0			
Surr: Phenol-d6	*3701*	0	*4757*	0	*77.8*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211466-07A MSD** Units: **µg/Kg** Analysis Date: **11/20/2012 12:03 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146648** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1434	47	1861	0	77	45-105	1510	5.17	30	
Acenaphthene	1563	47	1861	0	84	45-110	1578	0.972	30	
Acenaphthylene	1595	47	1861	0	85.7	45-105	1644	3.04	30	
Anthracene	1701	47	1861	0	91.4	55-105	1758	3.32	30	
Benzo(a)anthracene	1696	47	1861	152.4	83	50-110	1820	7.05	30	
Benzo(a)pyrene	1914	47	1861	210.6	91.5	50-110	2027	5.76	30	
Benzo(b)fluoranthene	2226	47	1861	275.6	105	45-115	2068	7.36	30	
Benzo(g,h,i)perylene	1472	47	1861	131	72.1	40-125	1760	17.8	30	
Benzo(k)fluoranthene	1382	47	1861	66.96	70.7	45-115	1910	32.1	30	R
Chrysene	1777	47	1861	191.2	85.2	55-110	1846	3.79	30	
Dibenzo(a,h)anthracene	1451	47	1861	0	78	40-125	1698	15.7	30	
Fluoranthene	1992	47	1861	263	92.9	55-115	2039	2.32	30	
Fluorene	1649	47	1861	0	88.6	50-110	1708	3.52	30	
Indeno(1,2,3-cd)pyrene	1515	47	1861	115.5	75.2	40-120	1784	16.3	30	
Naphthalene	1331	47	1861	0	71.6	40-105	1427	6.94	30	
Phenanthrene	1792	47	1861	64.05	92.9	50-110	1859	3.67	30	
Pyrene	1885	47	1861	273.7	86.6	45-125	1979	4.86	30	
Surr: 2,4,6-Tribromophenol	*4024*	0	*4652*	0	*86.5*	*34-140*	4319	*7.08*	*40*	
Surr: 2-Fluorobiphenyl	*3085*	0	*4652*	0	*66.3*	*12-100*	3269	*5.78*	*40*	
Surr: 2-Fluorophenol	*3137*	0	*4652*	0	*67.4*	*33-117*	3439	*9.18*	*40*	
Surr: 4-Terphenyl-d14	*3665*	0	*4652*	0	*78.8*	*25-137*	3976	*8.14*	*40*	
Surr: Nitrobenzene-d5	*2896*	0	*4652*	0	*62.3*	*37-107*	3179	*9.29*	*40*	
Surr: Phenol-d6	*3428*	0	*4652*	0	*73.7*	*40-106*	3701	*7.67*	*40*	

The following samples were analyzed in this batch:

1211465-05A	1211465-06A	1211465-08A
1211465-09A	1211465-10A	1211465-11A
1211465-12A	1211465-13A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/15/2012 11:06 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141502** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	112.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*957.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*957*	0	*1000*	0	*95.7*	*70-130*	0	
Surr: Toluene-d8	*971.5*	0	*1000*	0	*97.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/16/2012 12:11 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143201** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	151.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	17	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*964*	0	*1000*	0	*96.4*	*70-130*	0
Surr: Dibromofluoromethane	*930.5*	0	*1000*	0	*93*	*70-130*	0
Surr: Toluene-d8	*947.5*	0	*1000*	0	*94.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/20/2012 01:03 AM**
Client ID: Run ID: **VMS9_121119A** SeqNo: **2146057** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	109.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1016*	0	*1000*	0	*102*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*961*	0	*1000*	0	*96.1*	*70-130*	0	
Surr: Dibromofluoromethane	*954.5*	0	*1000*	0	*95.4*	*70-130*	0	
Surr: Toluene-d8	*950.5*	0	*1000*	0	*95*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/15/2012 09:49 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141501** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1038	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1062	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	1022	30	1000	0	102	55-130	0			
1,1,2-Trichloroethane	932.5	30	1000	0	93.2	60-125	0			
1,1-Dichloroethane	996.5	30	1000	0	99.6	75-125	0			
1,1-Dichloroethene	1078	30	1000	0	108	65-135	0			
1,2,3-Trichlorobenzene	993	30	1000	0	99.3	60-135	0			
1,2,3-Trichloropropane	1012	30	1000	0	101	65-130	0			
1,2,4-Trichlorobenzene	997.5	30	1000	0	99.8	65-130	0			
1,2,4-Trimethylbenzene	1037	30	1000	0	104	65-135	0			
1,2-Dibromo-3-chloropropane	1038	30	1000	0	104	40-135	0			
1,2-Dibromoethane	1019	30	1000	0	102	70-125	0			
1,2-Dichlorobenzene	940	30	1000	0	94	75-120	0			
1,2-Dichloroethane	937.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	993	30	1000	0	99.3	70-120	0			
1,3,5-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,3-Dichlorobenzene	951.5	30	1000	0	95.2	70-125	0			
1,4-Dichlorobenzene	963	30	1000	0	96.3	70-125	0			
2-Butanone	1174	200	1000	0	117	30-160	0			
2-Hexanone	1038	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1240	30	1000	0	124	45-145	0			
Acetone	1160	100	1000	0	116	20-160	0			B
Acrylonitrile	1031	100	1000	0	103	70-135	0			
Benzene	974	30	1000	0	97.4	75-125	0			
Bromobenzene	970	30	1000	0	97	65-120	0			
Bromochloromethane	1012	30	1000	0	101	70-125	0			
Bromodichloromethane	1048	30	1000	0	105	70-130	0			
Bromoform	1094	30	1000	0	109	55-135	0			
Bromomethane	1438	75	1000	0	144	30-160	0			
Carbon disulfide	1382	30	1000	0	138	45-160	0			
Carbon tetrachloride	1114	30	1000	0	111	65-135	0			
Chlorobenzene	953.5	30	1000	0	95.4	75-125	0			
Chloroethane	981.5	100	1000	0	98.2	40-155	0			
Chloroform	1026	30	1000	0	103	70-125	0			
Chloromethane	994	100	1000	0	99.4	50-130	0			
cis-1,2-Dichloroethene	1034	30	1000	0	103	65-125	0			
cis-1,3-Dichloropropene	978	30	1000	0	97.8	70-125	0			
Dibromochloromethane	1046	30	1000	0	105	65-135	0			
Dibromomethane	1010	30	1000	0	101	75-130	0			
Dichlorodifluoromethane	792	30	1000	0	79.2	35-135	0			
Ethylbenzene	990.5	30	1000	0	99	75-125	0			
Hexachloroethane	1104	30	1000	0	110	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1044	30	1000	0	104	75-130	0
m,p-Xylene	1960	60	2000	0	98	80-125	0
Methyl tert-butyl ether	1008	30	1000	0	101	75-125	0
Methylene chloride	971	30	1000	0	97.1	55-145	0
Naphthalene	1013	100	1000	0	101	40-140	0
n-Butylbenzene	1038	30	1000	0	104	65-140	0
n-Propylbenzene	1023	30	1000	0	102	65-135	0
o-Xylene	990.5	30	1000	0	99	75-125	0
p-Isopropyltoluene	1044	30	1000	0	104	75-135	0
sec-Butylbenzene	1071	30	1000	0	107	65-130	0
Styrene	1053	30	1000	0	105	75-125	0
tert-Butylbenzene	1026	30	1000	0	103	65-130	0
Tetrachloroethene	969	30	1000	0	96.9	64-140	0
Tetrahydrofuran	930.5	200	1000	0	93	70-135	0
Toluene	931	30	1000	0	93.1	70-125	0
trans-1,2-Dichloroethene	1065	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	984.5	30	1000	0	98.4	65-125	0
trans-1,4-Dichloro-2-butene	943	30	1000	0	94.3	70-135	0
Trichloroethene	981.5	30	1000	0	98.2	75-125	0
Trichlorofluoromethane	1064	30	1000	0	106	25-185	0
Vinyl chloride	1075	30	1000	0	108	60-125	0
Surr: 1,2-Dichloroethane-d4	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: Dibromofluoromethane	*1043*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*987*	0	*1000*	0	*98.7*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS	Sample ID: **LCS-44796-44796**				Units: **µg/Kg**		Analysis Date: **11/16/2012 10:54 AM**			
Client ID:		Run ID: **VMS9_121116A**			SeqNo: **2143199**		Prep Date: **11/15/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	980.5	30	1000	0	98	75-125	0			
1,1,1-Trichloroethane	1063	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	939	30	1000	0	93.9	55-130	0			
1,1,2-Trichloroethane	892	30	1000	0	89.2	60-125	0			
1,1-Dichloroethane	1016	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1136	30	1000	0	114	65-135	0			
1,2,3-Trichlorobenzene	942	30	1000	0	94.2	60-135	0			
1,2,3-Trichloropropane	968	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	978.5	30	1000	0	97.8	65-130	0			
1,2,4-Trimethylbenzene	1031	30	1000	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	910.5	30	1000	0	91	40-135	0			
1,2-Dibromoethane	971.5	30	1000	0	97.2	70-125	0			
1,2-Dichlorobenzene	903.5	30	1000	0	90.4	75-120	0			
1,2-Dichloroethane	960.5	30	1000	0	96	70-135	0			
1,2-Dichloropropane	1006	30	1000	0	101	70-120	0			
1,3,5-Trimethylbenzene	1034	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	914	30	1000	0	91.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	1002	200	1000	0	100	30-160	0			
2-Hexanone	961.5	30	1000	0	96.2	45-145	0			
4-Methyl-2-pentanone	1114	30	1000	0	111	45-145	0			
Acetone	1198	100	1000	0	120	20-160	0			B
Acrylonitrile	1018	100	1000	0	102	70-135	0			
Benzene	1006	30	1000	0	101	75-125	0			
Bromobenzene	941.5	30	1000	0	94.2	65-120	0			
Bromochloromethane	1033	30	1000	0	103	70-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	968	30	1000	0	96.8	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1370	30	1000	0	137	45-160	0			
Carbon tetrachloride	1109	30	1000	0	111	65-135	0			
Chlorobenzene	944	30	1000	0	94.4	75-125	0			
Chloroethane	998.5	100	1000	0	99.8	40-155	0			
Chloroform	1044	30	1000	0	104	70-125	0			
Chloromethane	1074	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	969.5	30	1000	0	97	70-125	0			
Dibromochloromethane	941	30	1000	0	94.1	65-135	0			
Dibromomethane	1001	30	1000	0	100	75-130	0			
Dichlorodifluoromethane	861	30	1000	0	86.1	35-135	0			
Ethylbenzene	985.5	30	1000	0	98.6	75-125	0			
Hexachloroethane	1048	30	1000	0	105	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1040	30	1000	0	104	75-130	0
m,p-Xylene	1952	60	2000	0	97.6	80-125	0
Methyl tert-butyl ether	1022	30	1000	0	102	75-125	0
Methylene chloride	1004	30	1000	0	100	55-145	0
Naphthalene	925	100	1000	0	92.5	40-140	0
n-Butylbenzene	1088	30	1000	0	109	65-140	0
n-Propylbenzene	1024	30	1000	0	102	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0
sec-Butylbenzene	1090	30	1000	0	109	65-130	0
Styrene	1027	30	1000	0	103	75-125	0
tert-Butylbenzene	1028	30	1000	0	103	65-130	0
Tetrachloroethene	994.5	30	1000	0	99.4	64-140	0
Tetrahydrofuran	901	200	1000	0	90.1	70-135	0
Toluene	921.5	30	1000	0	92.2	70-125	0
trans-1,2-Dichloroethene	1096	30	1000	0	110	65-135	0
trans-1,3-Dichloropropene	947	30	1000	0	94.7	65-125	0
trans-1,4-Dichloro-2-butene	932.5	30	1000	0	93.2	70-135	0
Trichloroethene	1026	30	1000	0	103	75-125	0
Trichlorofluoromethane	1070	30	1000	0	107	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1033*	0	*1000*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*1042*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*961.5*	0	*1000*	0	*96.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/19/2012 11:46 PM**
Client ID: Run ID: **VMS9_121119A** SeqNo: **2146056** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1031	30	1000	0	103	75-125	0			
1,1,1-Trichloroethane	1016	30	1000	0	102	70-135	0			
1,1,2,2-Tetrachloroethane	998	30	1000	0	99.8	55-130	0			
1,1,2-Trichloroethane	905	30	1000	0	90.5	60-125	0			
1,1-Dichloroethane	980.5	30	1000	0	98	75-125	0			
1,1-Dichloroethene	1062	30	1000	0	106	65-135	0			
1,2,3-Trichlorobenzene	956.5	30	1000	0	95.6	60-135	0			
1,2,3-Trichloropropane	1004	30	1000	0	100	65-130	0			
1,2,4-Trichlorobenzene	963.5	30	1000	0	96.4	65-130	0			
1,2,4-Trimethylbenzene	1017	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	1084	30	1000	0	108	40-135	0			
1,2-Dibromoethane	1046	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	914.5	30	1000	0	91.4	75-120	0			
1,2-Dichloroethane	938.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	959	30	1000	0	95.9	70-120	0			
1,3,5-Trimethylbenzene	1026	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	917.5	30	1000	0	91.8	70-125	0			
1,4-Dichlorobenzene	926.5	30	1000	0	92.6	70-125	0			
2-Butanone	1206	200	1000	0	121	30-160	0			
2-Hexanone	1186	30	1000	0	119	45-145	0			
4-Methyl-2-pentanone	1254	30	1000	0	125	45-145	0			
Acetone	1257	100	1000	0	126	20-160	0			B
Acrylonitrile	1027	100	1000	0	103	70-135	0			
Benzene	958.5	30	1000	0	95.8	75-125	0			
Bromobenzene	947.5	30	1000	0	94.8	65-120	0			
Bromochloromethane	1032	30	1000	0	103	70-125	0			
Bromodichloromethane	1040	30	1000	0	104	70-130	0			
Bromoform	1092	30	1000	0	109	55-135	0			
Bromomethane	1218	75	1000	0	122	30-160	0			
Carbon disulfide	1337	30	1000	0	134	45-160	0			
Carbon tetrachloride	1101	30	1000	0	110	65-135	0			
Chlorobenzene	951	30	1000	0	95.1	75-125	0			
Chloroethane	1022	100	1000	0	102	40-155	0			
Chloroform	975	30	1000	0	97.5	70-125	0			
Chloromethane	936.5	100	1000	0	93.6	50-130	0			
cis-1,2-Dichloroethene	1006	30	1000	0	101	65-125	0			
cis-1,3-Dichloropropene	992	30	1000	0	99.2	70-125	0			
Dibromochloromethane	1054	30	1000	0	105	65-135	0			
Dibromomethane	974	30	1000	0	97.4	75-130	0			
Dichlorodifluoromethane	896	30	1000	0	89.6	35-135	0			
Ethylbenzene	987	30	1000	0	98.7	75-125	0			
Hexachloroethane	984.5	30	1000	0	98.4	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1005	30	1000	0	100	75-130	0
m,p-Xylene	2019	60	2000	0	101	80-125	0
Methyl tert-butyl ether	1104	30	1000	0	110	75-125	0
Methylene chloride	1054	30	1000	0	105	55-145	0
Naphthalene	1016	100	1000	0	102	40-140	0
n-Butylbenzene	1000	30	1000	0	100	65-140	0
n-Propylbenzene	981.5	30	1000	0	98.2	65-135	0
o-Xylene	997	30	1000	0	99.7	75-125	0
p-Isopropyltoluene	987	30	1000	0	98.7	75-135	0
sec-Butylbenzene	1020	30	1000	0	102	65-130	0
Styrene	1041	30	1000	0	104	75-125	0
tert-Butylbenzene	1010	30	1000	0	101	65-130	0
Tetrachloroethene	966	30	1000	0	96.6	64-140	0
Tetrahydrofuran	1244	200	1000	0	124	70-135	0
Toluene	961	30	1000	0	96.1	70-125	0
trans-1,2-Dichloroethene	1016	30	1000	0	102	65-135	0
trans-1,3-Dichloropropene	1004	30	1000	0	100	65-125	0
trans-1,4-Dichloro-2-butene	925.5	30	1000	0	92.6	70-135	0
Trichloroethene	950.5	30	1000	0	95	75-125	0
Trichlorofluoromethane	998	30	1000	0	99.8	25-185	0
Vinyl chloride	1034	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*975*	0	*1000*	0	*97.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*1027*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*989.5*	0	*1000*	0	*99*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211465-01B MS** Units: **µg/Kg** Analysis Date: **11/16/2012 09:08 PM**
Client ID: **SBKR1000I501S111212S004** Run ID: **VMS9_121116A** SeqNo: **2143238** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2244	77	2571	0	87.2	75-125	0			
1,1,1-Trichloroethane	2485	77	2571	0	96.6	70-135	0			
1,1,2,2-Tetrachloroethane	2498	77	2571	0	97.2	55-130	0			
1,1,2-Trichloroethane	2235	77	2571	0	86.9	60-125	0			
1,1-Dichloroethane	2667	77	2571	0	104	75-125	0			
1,1-Dichloroethene	2820	77	2571	0	110	65-135	0			
1,2,3-Trichlorobenzene	2127	77	2571	0	82.7	60-135	0			
1,2,3-Trichloropropane	2598	77	2571	0	101	65-130	0			
1,2,4-Trichlorobenzene	2181	77	2571	0	84.8	65-130	0			
1,2,4-Trimethylbenzene	2659	77	2571	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	2058	77	2571	0	80	40-135	0			
1,2-Dibromoethane	2445	77	2571	0	95.1	70-125	0			
1,2-Dichlorobenzene	2128	77	2571	0	82.8	75-120	0			
1,2-Dichloroethane	2555	77	2571	0	99.4	70-135	0			
1,2-Dichloropropane	2624	77	2571	0	102	70-120	0			
1,3,5-Trimethylbenzene	2664	77	2571	0	104	65-135	0			
1,3-Dichlorobenzene	2145	77	2571	0	83.4	70-125	0			
1,4-Dichlorobenzene	2157	77	2571	0	83.9	70-125	0			
2-Butanone	2992	510	2571	0	116	30-160	0			
2-Hexanone	2697	77	2571	0	105	45-145	0			
4-Methyl-2-pentanone	3223	77	2571	0	125	45-145	0			
Acetone	4031	260	2571	257.1	147	20-160	0			B
Acrylonitrile	3018	260	2571	0	117	70-135	0			
Benzene	2625	77	2571	0	102	75-125	0			
Bromobenzene	2467	77	2571	0	96	65-120	0			
Bromochloromethane	2750	77	2571	0	107	70-125	0			
Bromodichloromethane	2424	77	2571	0	94.2	70-130	0			
Bromoform	2262	77	2571	0	88	55-135	0			
Bromomethane	2445	190	2571	0	95.1	30-160	0			
Carbon disulfide	2822	77	2571	0	110	45-160	0			
Carbon tetrachloride	2790	77	2571	0	108	65-135	0			
Chlorobenzene	2334	77	2571	0	90.8	75-125	0			
Chloroethane	766.3	260	2571	0	29.8	40-155	0			S
Chloroform	2687	77	2571	0	104	70-125	0			
Chloromethane	2940	260	2571	24.43	113	50-130	0			
cis-1,2-Dichloroethene	2650	77	2571	0	103	65-125	0			
cis-1,3-Dichloropropene	2292	77	2571	0	89.2	70-125	0			
Dibromochloromethane	2150	77	2571	0	83.6	65-135	0			
Dibromomethane	2614	77	2571	0	102	75-130	0			
Dichlorodifluoromethane	2370	77	2571	0	92.2	35-135	0			
Ethylbenzene	2449	77	2571	0	95.2	75-125	0			
Hexachloroethane	2157	77	2571	0	83.9	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	2616	77	2571	0	102	75-130	0
m,p-Xylene	4890	150	5143	0	95.1	80-125	0
Methyl tert-butyl ether	2793	77	2571	0	109	75-125	0
Methylene chloride	2802	77	2571	0	109	55-145	0
Naphthalene	2375	260	2571	0	92.4	40-140	0
n-Butylbenzene	2523	77	2571	0	98.1	65-140	0
n-Propylbenzene	2592	77	2571	0	101	65-135	0
o-Xylene	2481	77	2571	0	96.5	75-125	0
p-Isopropyltoluene	2334	77	2571	0	90.8	75-135	0
sec-Butylbenzene	2737	77	2571	0	106	65-130	0
Styrene	2632	77	2571	0	102	75-125	0
tert-Butylbenzene	2642	77	2571	0	103	65-130	0
Tetrachloroethene	2343	77	2571	0	91.1	64-140	0
Tetrahydrofuran	3003	510	2571	0	117	70-135	0
Toluene	2237	77	2571	0	87	70-125	0
trans-1,2-Dichloroethene	2749	77	2571	0	107	65-135	0
trans-1,3-Dichloropropene	2070	77	2571	0	80.5	65-125	0
trans-1,4-Dichloro-2-butene	2381	77	2571	0	92.6	70-135	0
Trichloroethene	2559	77	2571	0	99.5	75-125	0
Trichlorofluoromethane	2721	77	2571	0	106	25-185	0
Vinyl chloride	2907	77	2571	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*2605*	0	*2571*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2715*	0	*2571*	0	*106*	*70-130*	0
Surr: Dibromofluoromethane	*2515*	0	*2571*	0	*97.8*	*70-130*	0
Surr: Toluene-d8	*2345*	0	*2571*	0	*91.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211465-01B MSD** Units: **µg/Kg** Analysis Date: **11/16/2012 09:33 PM**
Client ID: **SBKR1000I501S111212S004** Run ID: **VMS9_121116A** SeqNo: **2143240** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2357	77	2571	0	91.6	75-125	2244	4.92	30	
1,1,1-Trichloroethane	2530	77	2571	0	98.4	70-135	2485	1.79	30	
1,1,2,2-Tetrachloroethane	2559	77	2571	0	99.5	55-130	2498	2.39	30	
1,1,2-Trichloroethane	2321	77	2571	0	90.2	60-125	2235	3.78	30	
1,1-Dichloroethane	2705	77	2571	0	105	75-125	2667	1.44	30	
1,1-Dichloroethene	2904	77	2571	0	113	65-135	2820	2.96	30	
1,2,3-Trichlorobenzene	2364	77	2571	0	92	60-135	2127	10.6	30	
1,2,3-Trichloropropane	2694	77	2571	0	105	65-130	2598	3.6	30	
1,2,4-Trichlorobenzene	2398	77	2571	0	93.2	65-130	2181	9.49	30	
1,2,4-Trimethylbenzene	2687	77	2571	0	104	65-135	2659	1.06	30	
1,2-Dibromo-3-chloropropane	2211	77	2571	0	86	40-135	2058	7.17	30	
1,2-Dibromoethane	2552	77	2571	0	99.2	70-125	2445	4.27	30	
1,2-Dichlorobenzene	2247	77	2571	0	87.4	75-120	2128	5.47	30	
1,2-Dichloroethane	2607	77	2571	0	101	70-135	2555	2.04	30	
1,2-Dichloropropane	2654	77	2571	0	103	70-120	2624	1.12	30	
1,3,5-Trimethylbenzene	2652	77	2571	0	103	65-135	2664	0.435	30	
1,3-Dichlorobenzene	2280	77	2571	0	88.6	70-125	2145	6.1	30	
1,4-Dichlorobenzene	2282	77	2571	0	88.8	70-125	2157	5.62	30	
2-Butanone	3131	510	2571	0	122	30-160	2992	4.54	30	
2-Hexanone	2848	77	2571	0	111	45-145	2697	5.43	30	
4-Methyl-2-pentanone	3396	77	2571	0	132	45-145	3223	5.21	30	
Acetone	4074	260	2571	257.1	148	20-160	4031	1.08	30	B
Acrylonitrile	3145	260	2571	0	122	70-135	3018	4.13	30	
Benzene	2632	77	2571	0	102	75-125	2625	0.245	30	
Bromobenzene	2458	77	2571	0	95.6	65-120	2467	0.365	30	
Bromochloromethane	2852	77	2571	0	111	70-125	2750	3.63	30	
Bromodichloromethane	2480	77	2571	0	96.4	70-130	2424	2.31	30	
Bromoform	2358	77	2571	0	91.7	55-135	2262	4.17	30	
Bromomethane	2579	190	2571	0	100	30-160	2445	5.32	30	
Carbon disulfide	2973	77	2571	0	116	45-160	2822	5.19	30	
Carbon tetrachloride	2844	77	2571	0	111	65-135	2790	1.92	30	
Chlorobenzene	2377	77	2571	0	92.4	75-125	2334	1.86	30	
Chloroethane	612	260	2571	0	23.8	40-155	766.3	22.4	30	S
Chloroform	2741	77	2571	0	107	70-125	2687	1.99	30	
Chloromethane	2962	260	2571	24.43	114	50-130	2940	0.741	30	
cis-1,2-Dichloroethene	2746	77	2571	0	107	65-125	2650	3.57	30	
cis-1,3-Dichloropropene	2330	77	2571	0	90.6	70-125	2292	1.61	30	
Dibromochloromethane	2245	77	2571	0	87.3	65-135	2150	4.33	30	
Dibromomethane	2670	77	2571	0	104	75-130	2614	2.14	30	
Dichlorodifluoromethane	2303	77	2571	0	89.6	35-135	2370	2.86	30	
Ethylbenzene	2503	77	2571	0	97.4	75-125	2449	2.18	30	
Hexachloroethane	2254	77	2571	0	87.6	70-135	2157	4.37	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	2679	77	2571	0	104	75-130	2616	2.38	30
m,p-Xylene	4987	150	5143	0	97	80-125	4890	1.98	30
Methyl tert-butyl ether	2871	77	2571	0	112	75-125	2793	2.77	30
Methylene chloride	2809	77	2571	0	109	55-145	2802	0.275	30
Naphthalene	2703	260	2571	0	105	40-140	2375	12.9	30
n-Butylbenzene	2694	77	2571	0	105	65-140	2523	6.56	30
n-Propylbenzene	2624	77	2571	0	102	65-135	2592	1.23	30
o-Xylene	2517	77	2571	0	97.9	75-125	2481	1.44	30
p-Isopropyltoluene	2478	77	2571	0	96.4	75-135	2334	5.99	30
sec-Butylbenzene	2750	77	2571	0	107	65-130	2737	0.469	30
Styrene	2659	77	2571	0	103	75-125	2632	1.02	30
tert-Butylbenzene	2633	77	2571	0	102	65-130	2642	0.341	30
Tetrachloroethene	2427	77	2571	0	94.4	64-140	2343	3.56	30
Tetrahydrofuran	2974	510	2571	0	116	70-135	3003	0.989	30
Toluene	2319	77	2571	0	90.2	70-125	2237	3.61	30
trans-1,2-Dichloroethene	2778	77	2571	0	108	65-135	2749	1.07	30
trans-1,3-Dichloropropene	2181	77	2571	0	84.8	65-125	2070	5.2	30
trans-1,4-Dichloro-2-butene	2443	77	2571	0	95	70-135	2381	2.56	30
Trichloroethene	2593	77	2571	0	101	75-125	2559	1.35	30
Trichlorofluoromethane	2787	77	2571	0	108	25-185	2721	2.43	30
Vinyl chloride	2915	77	2571	0	113	60-125	2907	0.265	30
Surr: 1,2-Dichloroethane-d4	*2525*	0	*2571*	0	*98.2*	*70-130*	2605	*3.11*	*30*
Surr: 4-Bromofluorobenzene	*2728*	0	*2571*	0	*106*	*70-130*	2715	*0.472*	*30*
Surr: Dibromofluoromethane	*2592*	0	*2571*	0	*101*	*70-130*	2515	*3.02*	*30*
Surr: Toluene-d8	*2407*	0	*2571*	0	*93.6*	*70-130*	2345	*2.6*	*30*

The following samples were analyzed in this batch:

1211465-01B	1211465-02B	1211465-03B
1211465-04B	1211465-05B	1211465-06B
1211465-07A	1211465-08B	1211465-09B
1211465-10B	1211465-11B	1211465-12B
1211465-13B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **R112655** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112655** Units: **% of sample** Analysis Date: **11/15/2012 01:00 PM**
Client ID: Run ID: **MOIST_121115A** SeqNo: **2141760** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112655** Units: **% of sample** Analysis Date: **11/15/2012 01:00 PM**
Client ID: Run ID: **MOIST_121115A** SeqNo: **2141755** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211429-01A DUP** Units: **% of sample** Analysis Date: **11/15/2012 01:00 PM**
Client ID: Run ID: **MOIST_121115A** SeqNo: **2141716** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.29	0.050	0	0	0	0-0	4.5	4.78	20	

The following samples were analyzed in this batch:

1211465-01A 1211465-02A 1211465-03A
1211465-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211465
Project: Marshall KRRI 1000-1100I,1050L,1025-1100R 11/

QC BATCH REPORT

Batch ID: **R112693** Instrument ID **MOIST** Method: **A2540 G**

MBLK	Sample ID: **WBLKS1-R112693**				Units: **% of sample**		Analysis Date: **11/16/2012 04:30 PM**			
Client ID:		Run ID: **MOIST_121116A**			SeqNo: **2142496**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS	Sample ID: **LCS-R112693**				Units: **% of sample**		Analysis Date: **11/16/2012 04:30 PM**			
Client ID:		Run ID: **MOIST_121116A**			SeqNo: **2142492**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP	Sample ID: **1211465-13A DUP**				Units: **% of sample**		Analysis Date: **11/16/2012 04:30 PM**			
Client ID: **SBKR1100R512S111212S008**		Run ID: **MOIST_121116A**			SeqNo: **2142481**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.49	0.050	0	0	0	0-0	21.81	6.24	20	

DUP	Sample ID: **1211466-02A DUP**				Units: **% of sample**		Analysis Date: **11/16/2012 04:30 PM**			
Client ID:		Run ID: **MOIST_121116A**			SeqNo: **2142484**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	50.66	0.050	0	0	0	0-0	50.9	0.473	20	

The following samples were analyzed in this batch:

1211465-05A	1211465-06A	1211465-08A
1211465-09A	1211465-10A	1211465-11A
1211465-12A	1211465-13A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211465

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ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111212_GMK1	Task: KRRI_1000-1100
Total # of Samples: 13		Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH											
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260											
1	SBKR1000I501S111212S004	SBKR1000I501	SO	G	11/12/2012 11:10	3			X	X	X	X	X											
2	SBKR1000I501S111212S026	SBKR1000I501	SO	G	11/12/2012 11:15	3			X	X	X	X	X											
3	SBKR1000I501S111212S031	SBKR1000I501	SO	G	11/12/2012 11:20	3			X	X	X	X	X											
4	SBKR1000I502S111212S006	SBKR1000I502	SO	G	11/12/2012 15:05	3			X	X	X	X	X											
5	SBKR1025R510S111212S004	SBKR1025R510	SO	G	11/12/2012 16:10	3			X	X	X	X	X											
6	SBKR1025R510S111212S013	SBKR1025R510	SO	G	11/12/2012 16:15	3			X	X	X	X	X											
7	SBKR1025R510T111212MX	SBKR1025R510	SQ	G	11/12/2012 00:00	1	TRIP BLANK						X											
8	SBKR1050L525S111212S004	SBKR1050L525	SO	G	11/12/2012 08:35	3			X	X	X	X	X											
9	SBKR1100I501S111212S003	SBKR1100I501	SO	G	11/12/2012 09:20	3			X	X	X	X	X											
10	SBKR1100I501S111212S015	SBKR1100I501	SO	G	11/12/2012 09:25	3			X	X	X	X	X											
11	SBKR1100R511S111212S007	SBKR1100R511	SO	G	11/12/2012 13:22	3			X	X	X	X	X											
12	SBKR1100R511D111212S007	SBKR1100R511	SO	G	11/12/2012 13:22	3	DUPLICATE		X	X	X	X	X											
13	SBKR1100R512S111212S008	SBKR1100R512	SO	G	11/12/2012 14:12	3			X	X	X	X	X											

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11-13-12	1535	[signature]	11-13-12	1535
[signature]	11/14/12	1500	[signature]	11/14/12	1700

SHIPPING INFO:	SAMPLER NAME AND SIGNATURE			
Company:	PRINT Name of SAMPLER:	GERRY KRAMER (GMK1)		
Tracking #:	SIGNATURE of SAMPLER:	DATE Signed	Time:	

Sample Receipt Conditions	Temp in °C	Samples on Ice?	Sample Intact?	Trip Blank?
	4.2°C	Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 17:00**

Work Order: **1211465** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:40:54 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 11-14-12 Time: 1115
Name: [signature]
Company:

Seal Broken By:

Date:

Soil

4.2°C

22-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1025R 11/13/12** Work Order: **1211466**

Dear Bryan,

ALS Environmental received 10 samples on 14-Nov-2012 05:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 72.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 22-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025R 11/13/12
Work Order: **1211466**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211466-01	SBKR1025R511S111312S007	Soil		11/13/2012 08:25	11/14/2012 17:00	☐
1211466-02	SBKR1025R512S111312S007	Soil		11/13/2012 09:30	11/14/2012 17:00	☐
1211466-03	SBKR1025R513S111312S006	Soil		11/13/2012 10:25	11/14/2012 17:00	☐
1211466-04	SBKR1025R514S111312S004	Soil		11/13/2012 11:24	11/14/2012 17:00	☐
1211466-05	SBKR1025R516D111312S005	Soil		11/13/2012 14:01	11/14/2012 17:00	☐
1211466-06	SBKR1025R516S111312S005	Soil		11/13/2012 14:01	11/14/2012 17:00	☐
1211466-07	SBKR1025R517S111312S006	Soil		11/13/2012 15:08	11/14/2012 17:00	☐
1211466-08	SBKR1025R518S111312S005	Soil		11/13/2012 16:06	11/14/2012 17:00	☐
1211466-09	SBKR1025R518T111312MX	Soil		11/13/2012	11/14/2012 17:00	☐
1211466-10	SBKR1025R515S111312S003	Soil		11/13/2012 13:14	11/14/2012 17:00	☐

ALS Group USA, Corp

Date: 22-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025R 11/13/12
Work Order: 1211466

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44824 sample SBKR1025R517S111312S006 MS recovery for ORO was below control limits. Both the MSD recovery and RPD met quality control criteria. No data requires qualification.

Batch 44830 sample SBKR1025R517S111312S006 MSD recovery for Vanadium was above control limits. Both the MS recovery and RPD met quality control criteria. No data requires qualification.

Batch 44823 sample SBKR1025R517S111312S006 RPD between the MS/MSD recoveries for Benzo(k)fluoranthene was above control limits. Both the MS and MSD recoveries met quality control criteria. No data requires qualification.

Batch 44796 MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

Batch 44801 LCS recoveries for several Volatile compounds were above control limits, but all samples in this quality control batch were ND for these compounds. No data requires qualification. Sample SBKR1025R517S111312S006 MS?MSD recoveries for several compounds were above control limits. The parent sample was ND for these compounds. No data requires qualification. The MS/MSD recoveries for Chloromethane were below control limits. The corresponding reporting limit in the parent sample may be biased low.

ALS Group USA, Corp

Date: 22-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1025R 11/13/12
WorkOrder: **1211466**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R511S111312S007
Work Order:	1211466	**Collection Date:**	11/13/2012 8:25:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**20**	**4.0**		**mg/Kg-dry**	1	11/20/2012
ORO (C20-C34)	**200**	**39**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*68.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**13**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**24**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*85.9*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*73.4*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*72.4*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*92.2*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*73.2*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*74.3*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	190	100		µg/Kg-dry	1	11/20/2012
1,1,1-Trichloroethane	ND	190	50		µg/Kg-dry	1	11/20/2012
1,1,2,2-Tetrachloroethane	ND	190	50		µg/Kg-dry	1	11/20/2012
1,1,2-Trichloroethane	ND	190	50		µg/Kg-dry	1	11/20/2012
1,1-Dichloroethane	ND	190	50		µg/Kg-dry	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R511S111312S007
Work Order:	1211466	**Collection Date:**	11/13/2012 8:25:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/20/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
1,2,3-Trichloropropane	ND	190	100		µg/Kg-dry	1	11/20/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
1,2,4-Trimethylbenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
1,2-Dibromo-3-chloropropane	ND	190	10		µg/Kg-dry	1	11/20/2012
1,2-Dibromoethane	ND	190	20		µg/Kg-dry	1	11/20/2012
1,2-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
1,2-Dichloroethane	ND	190	50		µg/Kg-dry	1	11/20/2012
1,2-Dichloropropane	ND	190	50		µg/Kg-dry	1	11/20/2012
1,3,5-Trimethylbenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
1,3-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
1,4-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/20/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/20/2012
2-Methylnaphthalene	ND	620	330		µg/Kg-dry	1	11/20/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/20/2012
Acetone	ND	1,600	1,000		µg/Kg-dry	1	11/20/2012
Acrylonitrile	ND	190	100		µg/Kg-dry	1	11/20/2012
Benzene	ND	190	50		µg/Kg-dry	1	11/20/2012
Bromobenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
Bromochloromethane	ND	190	100		µg/Kg-dry	1	11/20/2012
Bromodichloromethane	ND	190	100		µg/Kg-dry	1	11/20/2012
Bromoform	ND	190	100		µg/Kg-dry	1	11/20/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/20/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/20/2012
Carbon tetrachloride	ND	190	50		µg/Kg-dry	1	11/20/2012
Chlorobenzene	ND	190	50		µg/Kg-dry	1	11/20/2012
Chloroethane	ND	620	250		µg/Kg-dry	1	11/20/2012
Chloroform	ND	190	50		µg/Kg-dry	1	11/20/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/20/2012
cis-1,2-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/20/2012
cis-1,3-Dichloropropene	ND	190	50		µg/Kg-dry	1	11/20/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/20/2012
Dibromochloromethane	ND	190	100		µg/Kg-dry	1	11/20/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/20/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/20/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/20/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/20/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R511S111312S007
Work Order:	1211466	**Collection Date:**	11/13/2012 8:25:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	190	50		µg/Kg-dry	1	11/20/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/20/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/20/2012
m,p-Xylene	ND	370	100		µg/Kg-dry	1	11/20/2012
Methyl iodide	ND	190	100		µg/Kg-dry	1	11/20/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/20/2012
Methylene chloride	ND	190	100		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	620	330		µg/Kg-dry	1	11/20/2012
n-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/20/2012
n-Propylbenzene	ND	190	100		µg/Kg-dry	1	11/20/2012
o-Xylene	ND	190	50		µg/Kg-dry	1	11/20/2012
p-Isopropyltoluene	ND	190	100		µg/Kg-dry	1	11/20/2012
sec-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/20/2012
Styrene	ND	190	50		µg/Kg-dry	1	11/20/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/20/2012
tert-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/20/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/20/2012
Tetrachloroethene	ND	190	50		µg/Kg-dry	1	11/20/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/20/2012
Toluene	ND	190	100		µg/Kg-dry	1	11/20/2012
trans-1,2-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/20/2012
trans-1,3-Dichloropropene	ND	190	50		µg/Kg-dry	1	11/20/2012
trans-1,4-Dichloro-2-butene	ND	190	50		µg/Kg-dry	1	11/20/2012
Trichloroethene	ND	190	50		µg/Kg-dry	1	11/20/2012
Trichlorofluoromethane	ND	190	100		µg/Kg-dry	1	11/20/2012
Vinyl chloride	ND	190	40		µg/Kg-dry	1	11/20/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/20/2012
Surr: 4-Bromofluorobenzene	*94.6*	*70-130*			*%REC*	1	11/20/2012
Surr: Dibromofluoromethane	*93.3*	*70-130*			*%REC*	1	11/20/2012
Surr: Toluene-d8	*94.2*	*70-130*			*%REC*	1	11/20/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**51**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R512S111312S007
Work Order:	1211466	**Collection Date:**	11/13/2012 9:30:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**20**	**4.0**		**mg/Kg-dry**	1	11/20/2012
ORO (C20-C34)	**250**	**40**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*70.6*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	**32**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Nickel	**9.6**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**22**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*101*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*79.0*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*78.2*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*101*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*80.9*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*85.2*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/15/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	190	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R512S111312S007
Work Order:	1211466	**Collection Date:**	11/13/2012 9:30:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	190	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	190	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	190	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	190	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	630	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	1,600	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	190	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	190	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	190	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	630	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	190	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	190	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R512S111312S007
Work Order:	1211466	**Collection Date:**	11/13/2012 9:30:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	380	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	190	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	190	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	630	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	190	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	190	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	190	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	190	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	190	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	190	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	190	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	190	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	190	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	190	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	190	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*98.2*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*95.9*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.2*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**51**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R513S111312S006
Work Order:	1211466	**Collection Date:**	11/13/2012 10:25:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**230**	**41**	**4.0**		**mg/Kg-dry**	1	11/20/2012
ORO (C20-C34)	**700**	**82**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*67.4*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	2.5	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	6.1	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**17**	**6.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**18**	**6.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(a)pyrene	**910**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(b)fluoranthene	**1,300**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(k)fluoranthene	**480**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Chrysene	**850**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluoranthene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	**420**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Pyrene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*92.7*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*70.4*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*72.1*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*95.6*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*72.4*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*76.0*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R513S111312S006
Work Order:	1211466	**Collection Date:**	11/13/2012 10:25:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	1,000	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	1,000	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	3,300	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	3,300	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	8,300	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	1,000	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	3,300	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	1,000	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	1,000	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	1,000	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	1,000	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R513S111312S006
Work Order:	1211466	**Collection Date:**	11/13/2012 10:25:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	1,000	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	2,000	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	2,000	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	3,300	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	3,300	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	3,300	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	1,000	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.6*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.7*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*92.2*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**77**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R514S111312S004
Work Order:	1211466	**Collection Date:**	11/13/2012 11:24:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**170**	**32**	**4.0**		**mg/Kg-dry**	1	11/20/2012
ORO (C20-C34)	**460**	**63**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*61.0*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	**19**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Nickel	**12**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**20**	**4.6**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*56.6*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*68.6*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*77.6*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*82.4*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*72.0*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*71.3*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	540	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	540	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	540	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	540	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	540	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R514S111312S004
Work Order:	1211466	**Collection Date:**	11/13/2012 11:24:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	540	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	540	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	540	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	540	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	540	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	540	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	540	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	540	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	540	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	1,800	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	1,800	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	4,500	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	540	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	540	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	540	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	540	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	540	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	540	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	540	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	540	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	540	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	1,800	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	540	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	540	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	540	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	540	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	540	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	540	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	540	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	540	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	540	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	540	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	540	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R514S111312S004
Work Order:	1211466	**Collection Date:**	11/13/2012 11:24:00 AM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	540	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	540	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	540	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	1,100	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	540	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	540	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	540	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	1,800	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	540	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	540	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	540	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	540	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	540	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	540	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	540	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	540	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	540	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,800	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	540	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	540	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	540	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	540	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	540	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	540	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	540	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.3*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.6*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.4*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**69**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R516D111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 2:01:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**220**	**42**	**4.0**		**mg/Kg-dry**	1	11/20/2012
ORO (C20-C34)	**680**	**83**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*66.5*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	2.6	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	**13**	**6.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Nickel	**9.7**	**6.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**21**	**6.5**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*60.2*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*66.5*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*73.1*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*88.0*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*66.5*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*73.6*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R516D111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 2:01:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	1,000	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	1,000	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	1,000	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	3,400	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	3,400	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	8,400	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	1,000	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	3,400	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	1,000	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	1,000	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	1,000	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	1,000	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R516D111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 2:01:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	1,000	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	1,000	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	2,000	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	3,400	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	3,400	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	1,000	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	3,400	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	1,000	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	1,000	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	1,000	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	1,000	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*99.2*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*92.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*89.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*94.1*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**77**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R516S111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 2:01:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	40	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**360**	**81**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*65.9*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	2.4	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	**11**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Nickel	**10**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**22**	**6.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*62.4*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*71.4*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*85.2*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*88.6*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*80.4*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*82.0*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	910	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	910	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	910	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	910	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	910	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R516S111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 2:01:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	910	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	910	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	910	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	910	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	910	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	910	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	910	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	910	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	910	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	3,000	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	3,000	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	7,600	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	910	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	910	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	910	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	910	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	910	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	910	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	910	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	910	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	910	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	3,000	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	910	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	910	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	910	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	910	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	910	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	910	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	910	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	910	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	910	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	910	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	910	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R516S111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 2:01:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	910	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	910	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	910	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	1,800	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	910	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	910	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	910	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	3,000	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	910	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	910	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	910	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	910	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	910	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	910	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	3,000	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	910	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	910	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	910	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	3,000	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	910	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	910	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	910	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	910	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	910	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	910	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	910	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*98.4*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*92.9*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*89.8*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*92.8*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**76**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R517S111312S006
Work Order:	1211466	**Collection Date:**	11/13/2012 3:08:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	23	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**310**	**45**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*72.1*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	3.1	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**15**	**3.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**14**	**3.1**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(a)pyrene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(b)fluoranthene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	**450**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	**640**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*96.8*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*71.4*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*79.5*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*76.9*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*70.7*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*88.1*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	260	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	260	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	260	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	260	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	260	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R517S111312S006
Work Order:	1211466	**Collection Date:**	11/13/2012 3:08:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	260	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	260	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	260	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	260	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	260	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	260	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	260	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	260	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	260	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	850	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	850	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	2,100	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	260	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	260	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	260	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	260	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	260	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	260	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	260	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	260	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	260	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	850	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	260	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	260	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	260	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	260	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	260	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	260	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	260	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	260	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	260	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	260	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R517S111312S006
Work Order:	1211466	**Collection Date:**	11/13/2012 3:08:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	260	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	260	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	510	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	260	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	260	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	260	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	850	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	260	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	260	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	260	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	260	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	260	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	260	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	260	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	260	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	260	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	260	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	260	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	260	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	260	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	260	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	260	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	260	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*96.6*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*89.8*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.2*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**57**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R518S111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 4:06:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	ND	27	4.0		mg/Kg-dry	1	11/20/2012
ORO (C20-C34)	**350**	**55**	**4.0**		**mg/Kg-dry**	1	11/20/2012
Surr: 4-Terphenyl-d14	*69.8*	*39-115*			*%REC*	1	11/20/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	4.4	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**14**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**16**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*64.1*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*67.8*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*76.4*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*93.9*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*72.0*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*77.9*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	380	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	380	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	380	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	380	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	380	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R518S111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 4:06:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	380	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	380	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	380	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	380	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	380	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	380	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	380	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	380	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	380	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	1,300	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	1,300	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	3,200	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	380	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	380	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	380	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	380	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	380	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	380	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	380	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	380	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	380	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	1,300	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	380	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	380	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	380	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	380	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	380	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	380	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	380	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	380	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	380	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	380	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R518S111312S005
Work Order:	1211466	**Collection Date:**	11/13/2012 4:06:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	380	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	380	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	380	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	770	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	380	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	380	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	380	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	1,300	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	380	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	380	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	380	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	380	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	380	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	380	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	380	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	380	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	380	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	1,300	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	380	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	380	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	380	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	380	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	380	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	380	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	380	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*98.7*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*92.6*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**64**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R518T111312MX
Work Order:	1211466	**Collection Date:**	11/13/2012
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/16/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/16/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/16/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/16/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/16/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/16/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/16/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/16/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/16/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/16/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/16/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/16/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/16/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/16/2012
2-Butanone	ND	750	750		µg/Kg	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/16/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/16/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/16/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/16/2012
Benzene	ND	50	50		µg/Kg	1	11/16/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/16/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/16/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/16/2012
Bromoform	ND	100	100		µg/Kg	1	11/16/2012
Bromomethane	ND	200	200		µg/Kg	1	11/16/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/16/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/16/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/16/2012
Chloroethane	ND	250	250		µg/Kg	1	11/16/2012
Chloroform	ND	50	50		µg/Kg	1	11/16/2012
Chloromethane	ND	250	250		µg/Kg	1	11/16/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/16/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R518T111312MX
Work Order:	1211466	**Collection Date:**	11/13/2012
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/16/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/16/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/16/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/16/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/16/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/16/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/16/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/16/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/16/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/16/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/16/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/16/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/16/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/16/2012
Naphthalene	ND	330	330		µg/Kg	1	11/16/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/16/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/16/2012
o-Xylene	ND	50	50		µg/Kg	1	11/16/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/16/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/16/2012
Styrene	ND	50	50		µg/Kg	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/16/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/16/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/16/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/16/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/16/2012
Toluene	ND	100	100		µg/Kg	1	11/16/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/16/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/16/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/16/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/16/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*96.2*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*88.0*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.0*	*70-130*			*%REC*	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R515S111312S003
Work Order:	1211466	**Collection Date:**	11/13/2012 1:14:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**210**	**37**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**730**	**75**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*64.3*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	2.1	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	5.3	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**17**	**5.3**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**16**	**5.3**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	**550**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(a)pyrene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(b)fluoranthene	**780**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Chrysene	**610**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	**930**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	**380**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Pyrene	**870**	**330**	**330**		**µg/Kg-dry**	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*59.3*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*65.5*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*71.0*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*88.1*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*67.3*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*69.9*	*40-106*			*%REC*	1	11/20/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	760	100		µg/Kg-dry	1	11/16/2012
1,1,1-Trichloroethane	ND	760	50		µg/Kg-dry	1	11/16/2012
1,1,2,2-Tetrachloroethane	ND	760	50		µg/Kg-dry	1	11/16/2012
1,1,2-Trichloroethane	ND	760	50		µg/Kg-dry	1	11/16/2012
1,1-Dichloroethane	ND	760	50		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R515S111312S003
Work Order:	1211466	**Collection Date:**	11/13/2012 1:14:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	760	50		µg/Kg-dry	1	11/16/2012
1,2,3-Trichlorobenzene	ND	760	250		µg/Kg-dry	1	11/16/2012
1,2,3-Trichloropropane	ND	760	100		µg/Kg-dry	1	11/16/2012
1,2,3-Trimethylbenzene	ND	760	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trichlorobenzene	ND	760	250		µg/Kg-dry	1	11/16/2012
1,2,4-Trimethylbenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
1,2-Dibromo-3-chloropropane	ND	760	10		µg/Kg-dry	1	11/16/2012
1,2-Dibromoethane	ND	760	20		µg/Kg-dry	1	11/16/2012
1,2-Dichlorobenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
1,2-Dichloroethane	ND	760	50		µg/Kg-dry	1	11/16/2012
1,2-Dichloropropane	ND	760	50		µg/Kg-dry	1	11/16/2012
1,3,5-Trimethylbenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
1,3-Dichlorobenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
1,4-Dichlorobenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
2-Butanone	ND	2,500	750		µg/Kg-dry	1	11/16/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
2-Methylnaphthalene	ND	2,500	330		µg/Kg-dry	1	11/16/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
Acetone	ND	6,300	1,000		µg/Kg-dry	1	11/16/2012
Acrylonitrile	ND	760	100		µg/Kg-dry	1	11/16/2012
Benzene	ND	760	50		µg/Kg-dry	1	11/16/2012
Bromobenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
Bromochloromethane	ND	760	100		µg/Kg-dry	1	11/16/2012
Bromodichloromethane	ND	760	100		µg/Kg-dry	1	11/16/2012
Bromoform	ND	760	100		µg/Kg-dry	1	11/16/2012
Bromomethane	ND	760	200		µg/Kg-dry	1	11/16/2012
Carbon disulfide	ND	760	250		µg/Kg-dry	1	11/16/2012
Carbon tetrachloride	ND	760	50		µg/Kg-dry	1	11/16/2012
Chlorobenzene	ND	760	50		µg/Kg-dry	1	11/16/2012
Chloroethane	ND	2,500	250		µg/Kg-dry	1	11/16/2012
Chloroform	ND	760	50		µg/Kg-dry	1	11/16/2012
Chloromethane	ND	760	250		µg/Kg-dry	1	11/16/2012
cis-1,2-Dichloroethene	ND	760	50		µg/Kg-dry	1	11/16/2012
cis-1,3-Dichloropropene	ND	760	50		µg/Kg-dry	1	11/16/2012
Cyclohexane	ND	760	500		µg/Kg-dry	1	11/16/2012
Dibromochloromethane	ND	760	100		µg/Kg-dry	1	11/16/2012
Dibromomethane	ND	760	250		µg/Kg-dry	1	11/16/2012
Dichlorodifluoromethane	ND	760	250		µg/Kg-dry	1	11/16/2012
Diethyl ether	ND	760	200		µg/Kg-dry	1	11/16/2012
Diisopropyl ether	ND	760	250		µg/Kg-dry	1	11/16/2012
Ethyl tert butyl ether	ND	760	250		µg/Kg-dry	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *22-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1025R515S111312S003
Work Order:	1211466	**Collection Date:**	11/13/2012 1:14:00 PM
Project:	Marshall KRRI 1025R 11/13/12		
Lab ID:	1211466-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	760	50		µg/Kg-dry	1	11/16/2012
Hexachloroethane	ND	760	300		µg/Kg-dry	1	11/16/2012
Isopropylbenzene	ND	760	250		µg/Kg-dry	1	11/16/2012
m,p-Xylene	ND	1,500	100		µg/Kg-dry	1	11/16/2012
Methyl iodide	ND	760	100		µg/Kg-dry	1	11/16/2012
Methyl tert-butyl ether	ND	760	250		µg/Kg-dry	1	11/16/2012
Methylene chloride	ND	760	100		µg/Kg-dry	1	11/16/2012
Naphthalene	ND	2,500	330		µg/Kg-dry	1	11/16/2012
n-Butylbenzene	ND	760	50		µg/Kg-dry	1	11/16/2012
n-Propylbenzene	ND	760	100		µg/Kg-dry	1	11/16/2012
o-Xylene	ND	760	50		µg/Kg-dry	1	11/16/2012
p-Isopropyltoluene	ND	760	100		µg/Kg-dry	1	11/16/2012
sec-Butylbenzene	ND	760	50		µg/Kg-dry	1	11/16/2012
Styrene	ND	760	50		µg/Kg-dry	1	11/16/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/16/2012
tert-Butylbenzene	ND	760	50		µg/Kg-dry	1	11/16/2012
Tertiaryamylmethylether	ND	760	250		µg/Kg-dry	1	11/16/2012
Tetrachloroethene	ND	760	50		µg/Kg-dry	1	11/16/2012
Tetrahydrofuran	ND	2,500	1,000		µg/Kg-dry	1	11/16/2012
Toluene	ND	760	100		µg/Kg-dry	1	11/16/2012
trans-1,2-Dichloroethene	ND	760	50		µg/Kg-dry	1	11/16/2012
trans-1,3-Dichloropropene	ND	760	50		µg/Kg-dry	1	11/16/2012
trans-1,4-Dichloro-2-butene	ND	760	50		µg/Kg-dry	1	11/16/2012
Trichloroethene	ND	760	50		µg/Kg-dry	1	11/16/2012
Trichlorofluoromethane	ND	760	100		µg/Kg-dry	1	11/16/2012
Vinyl chloride	ND	760	40		µg/Kg-dry	1	11/16/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/16/2012
Surr: 4-Bromofluorobenzene	*93.4*	*70-130*			*%REC*	1	11/16/2012
Surr: Dibromofluoromethane	*90.9*	*70-130*			*%REC*	1	11/16/2012
Surr: Toluene-d8	*93.0*	*70-130*			*%REC*	1	11/16/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**74**	**0.050**	**0**		**% of sample**	1	11/16/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211466

Project: Marshall KRRI 1025R 11/13/12

Batch ID: **44824** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:30 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144882** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.505*	0	*5*	0	*70.1*	*39-115*	0			

LCS Sample ID: **DLCSS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:57 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144883** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	318.5	10	500	0	63.7	49-124	0			
ORO (C20-C34)	322.3	20	500	0	64.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.175*	0	*5*	0	*83.5*	*39-115*	0			

MS Sample ID: **1211466-07A MS** Units: **mg/Kg** Analysis Date: **11/20/2012 10:41 AM**

Client ID: **SBKR1025R517S111312S006** Run ID: **GC8_121120A** SeqNo: **2147094** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.3	9.7	484.3	0	61	60-130	0			
ORO (C20-C34)	380	19	484.3	132.6	51.1	60-130	0			S
Surr: 4-Terphenyl-d14	*3.706*	0	*4.843*	0	*76.5*	*39-115*	0			

MSD Sample ID: **1211466-07A MSD** Units: **mg/Kg** Analysis Date: **11/20/2012 11:08 AM**

Client ID: **SBKR1025R517S111312S006** Run ID: **GC8_121120A** SeqNo: **2147095** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.5	9.4	469.5	0	62.9	60-130	295.3	0.062	30	
ORO (C20-C34)	414.7	19	469.5	132.6	60.1	60-130	380	8.74	30	
Surr: 4-Terphenyl-d14	*4.16*	0	*4.695*	0	*88.6*	*39-115*	3.706	*11.6*	*30*	

The following samples were analyzed in this batch:

1211466-01A	1211466-02A	1211466-03A
1211466-04A	1211466-05A	1211466-06A
1211466-07A	1211466-08A	1211466-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44830** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44830-44830** Units: **mg/Kg** Analysis Date: **11/20/2012 03:42 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145204** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01105	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44830-44830** Units: **mg/Kg** Analysis Date: **11/20/2012 03:48 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145205** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.444	0.10	5	0	88.9	80-120	0			
Molybdenum	4.716	0.25	5	0	94.3	80-120	0			
Nickel	4.605	0.25	5	0	92.1	80-120	0			
Vanadium	4.79	0.25	5	0	95.8	80-120	0			

MS Sample ID: **1211466-07AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 04:56 AM**
Client ID: **SBKR1025R517S111312S006** Run ID: **ICPMS1_121119A** SeqNo: **2145233** Prep Date: **11/19/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.997	0.56	7.022	0.1503	83.3	75-125	0			
Molybdenum	6.469	1.4	7.022	0.6183	83.3	75-125	0			
Nickel	13.13	1.4	7.022	6.514	94.3	75-125	0			
Vanadium	14.2	1.4	7.022	5.917	118	75-125	0			

MSD Sample ID: **1211466-07AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 05:02 AM**
Client ID: **SBKR1025R517S111312S006** Run ID: **ICPMS1_121119A** SeqNo: **2145237** Prep Date: **11/19/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.04	0.53	6.64	0.1503	88.7	75-125	5.997	0.709	25	
Molybdenum	6.842	1.3	6.64	0.6183	93.7	75-125	6.469	5.6	25	
Nickel	13.31	1.3	6.64	6.514	102	75-125	13.13	1.3	25	
Vanadium	14.88	1.3	6.64	5.917	135	75-125	14.2	4.68	25	S

The following samples were analyzed in this batch:

1211466-01A	1211466-02A	1211466-03A
1211466-04A	1211466-05A	1211466-06A
1211466-07A	1211466-08A	1211466-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:02 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146576** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*9112*	0	*10000*	0	*91.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3866*	0	*5000*	0	*77.3*	*12-100*	0			
Surr: 2-Fluorophenol	*7869*	0	*10000*	0	*78.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4085*	0	*5000*	0	*81.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*3879*	0	*5000*	0	*77.6*	*37-107*	0			
Surr: Phenol-d6	*8126*	0	*10000*	0	*81.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:30 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146577** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1792	50	2000	0	89.6	45-105	0			
Acenaphthene	1846	50	2000	0	92.3	45-110	0			
Acenaphthylene	1876	50	2000	0	93.8	45-105	0			
Anthracene	1932	50	2000	0	96.6	55-105	0			
Benzo(a)anthracene	1900	50	2000	0	95	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	1990	50	2000	0	99.5	45-115	0			
Benzo(g,h,i)perylene	2105	50	2000	0	105	40-125	0			
Benzo(k)fluoranthene	2276	50	2000	0	114	45-115	0			
Chrysene	2095	50	2000	0	105	55-110	0			
Dibenzo(a,h)anthracene	2080	50	2000	0	104	40-125	0			
Fluoranthene	1809	50	2000	0	90.4	55-115	0			
Fluorene	1915	50	2000	0	95.8	50-110	0			
Indeno(1,2,3-cd)pyrene	2115	50	2000	0	106	40-120	0			
Naphthalene	1770	50	2000	0	88.5	40-105	0			
Phenanthrene	1933	50	2000	0	96.6	50-110	0			
Pyrene	1883	50	2000	0	94.2	45-125	0			
Surr: 2,4,6-Tribromophenol	*8281*	0	*10000*	0	*82.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3719*	0	*5000*	0	*74.4*	*12-100*	0			
Surr: 2-Fluorophenol	*7282*	0	*10000*	0	*72.8*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4017*	0	*5000*	0	*80.3*	*25-137*	0			
Surr: Nitrobenzene-d5	*3677*	0	*5000*	0	*73.5*	*37-107*	0			
Surr: Phenol-d6	*7246*	0	*10000*	0	*72.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211466-07A MS** Units: **µg/Kg** Analysis Date: **11/19/2012 11:36 PM**
Client ID: **SBKR1025R517S111312S006** Run ID: **SVMS7_121119A** SeqNo: **2146641** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1510	48	1903	0	79.4	45-105	0			
Acenaphthene	1578	48	1903	0	83	45-110	0			
Acenaphthylene	1644	48	1903	0	86.4	45-105	0			
Anthracene	1758	48	1903	0	92.4	55-105	0			
Benzo(a)anthracene	1820	48	1903	152.4	87.6	50-110	0			
Benzo(a)pyrene	2027	48	1903	210.6	95.5	50-110	0			
Benzo(b)fluoranthene	2068	48	1903	275.6	94.2	45-115	0			
Benzo(g,h,i)perylene	1760	48	1903	131	85.6	40-125	0			
Benzo(k)fluoranthene	1910	48	1903	66.96	96.9	45-115	0			
Chrysene	1846	48	1903	191.2	87	55-110	0			
Dibenzo(a,h)anthracene	1698	48	1903	0	89.2	40-125	0			
Fluoranthene	2039	48	1903	263	93.3	55-115	0			
Fluorene	1708	48	1903	0	89.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1784	48	1903	115.5	87.7	40-120	0			
Naphthalene	1427	48	1903	0	75	40-105	0			
Phenanthrene	1859	48	1903	64.05	94.3	50-110	0			
Pyrene	1979	48	1903	273.7	89.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*4319*	0	*4757*	0	*90.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3269*	0	*4757*	0	*68.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3439*	0	*4757*	0	*72.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3976*	0	*4757*	0	*83.6*	*25-137*	0			
Surr: Nitrobenzene-d5	*3179*	0	*4757*	0	*66.8*	*37-107*	0			
Surr: Phenol-d6	*3701*	0	*4757*	0	*77.8*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211466-07A MSD** Units: **µg/Kg** Analysis Date: **11/20/2012 12:03 PM**
Client ID: **SBKR1025R517S111312S006** Run ID: **SVMS7_121119A** SeqNo: **2146648** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1434	47	1861	0	77	45-105	1510	5.17	30	
Acenaphthene	1563	47	1861	0	84	45-110	1578	0.972	30	
Acenaphthylene	1595	47	1861	0	85.7	45-105	1644	3.04	30	
Anthracene	1701	47	1861	0	91.4	55-105	1758	3.32	30	
Benzo(a)anthracene	1696	47	1861	152.4	83	50-110	1820	7.05	30	
Benzo(a)pyrene	1914	47	1861	210.6	91.5	50-110	2027	5.76	30	
Benzo(b)fluoranthene	2226	47	1861	275.6	105	45-115	2068	7.36	30	
Benzo(g,h,i)perylene	1472	47	1861	131	72.1	40-125	1760	17.8	30	
Benzo(k)fluoranthene	1382	47	1861	66.96	70.7	45-115	1910	32.1	30	R
Chrysene	1777	47	1861	191.2	85.2	55-110	1846	3.79	30	
Dibenzo(a,h)anthracene	1451	47	1861	0	78	40-125	1698	15.7	30	
Fluoranthene	1992	47	1861	263	92.9	55-115	2039	2.32	30	
Fluorene	1649	47	1861	0	88.6	50-110	1708	3.52	30	
Indeno(1,2,3-cd)pyrene	1515	47	1861	115.5	75.2	40-120	1784	16.3	30	
Naphthalene	1331	47	1861	0	71.6	40-105	1427	6.94	30	
Phenanthrene	1792	47	1861	64.05	92.9	50-110	1859	3.67	30	
Pyrene	1885	47	1861	273.7	86.6	45-125	1979	4.86	30	
Surr: 2,4,6-Tribromophenol	*4024*	0	*4652*	0	*86.5*	*34-140*	4319	*7.08*	*40*	
Surr: 2-Fluorobiphenyl	*3085*	0	*4652*	0	*66.3*	*12-100*	3269	*5.78*	*40*	
Surr: 2-Fluorophenol	*3137*	0	*4652*	0	*67.4*	*33-117*	3439	*9.18*	*40*	
Surr: 4-Terphenyl-d14	*3665*	0	*4652*	0	*78.8*	*25-137*	3976	*8.14*	*40*	
Surr: Nitrobenzene-d5	*2896*	0	*4652*	0	*62.3*	*37-107*	3179	*9.29*	*40*	
Surr: Phenol-d6	*3428*	0	*4652*	0	*73.7*	*40-106*	3701	*7.67*	*40*	

The following samples were analyzed in this batch:

1211466-01A	1211466-02A	1211466-03A
1211466-04A	1211466-05A	1211466-06A
1211466-07A	1211466-08A	1211466-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/15/2012 11:06 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141502** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	112.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*957.5*	0	*1000*	0	*95.8*	*70-130*	0	
Surr: Dibromofluoromethane	*957*	0	*1000*	0	*95.7*	*70-130*	0	
Surr: Toluene-d8	*971.5*	0	*1000*	0	*97.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/16/2012 12:11 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143201** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	151.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	17	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*964*	0	*1000*	0	*96.4*	*70-130*	0
Surr: Dibromofluoromethane	*930.5*	0	*1000*	0	*93*	*70-130*	0
Surr: Toluene-d8	*947.5*	0	*1000*	0	*94.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44796-44796** Units: **µg/Kg** Analysis Date: **11/20/2012 01:03 AM**
Client ID: Run ID: **VMS9_121119A** SeqNo: **2146057** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	109.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	ND	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	16.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	ND	30						
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	ND	30						
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1016*	0	*1000*	0	*102*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*961*	0	*1000*	0	*96.1*	*70-130*	0	
Surr: Dibromofluoromethane	*954.5*	0	*1000*	0	*95.4*	*70-130*	0	
Surr: Toluene-d8	*950.5*	0	*1000*	0	*95*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/15/2012 09:49 PM**
Client ID: Run ID: **VMS9_121115A** SeqNo: **2141501** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1038	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1062	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	1022	30	1000	0	102	55-130	0			
1,1,2-Trichloroethane	932.5	30	1000	0	93.2	60-125	0			
1,1-Dichloroethane	996.5	30	1000	0	99.6	75-125	0			
1,1-Dichloroethene	1078	30	1000	0	108	65-135	0			
1,2,3-Trichlorobenzene	993	30	1000	0	99.3	60-135	0			
1,2,3-Trichloropropane	1012	30	1000	0	101	65-130	0			
1,2,4-Trichlorobenzene	997.5	30	1000	0	99.8	65-130	0			
1,2,4-Trimethylbenzene	1037	30	1000	0	104	65-135	0			
1,2-Dibromo-3-chloropropane	1038	30	1000	0	104	40-135	0			
1,2-Dibromoethane	1019	30	1000	0	102	70-125	0			
1,2-Dichlorobenzene	940	30	1000	0	94	75-120	0			
1,2-Dichloroethane	937.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	993	30	1000	0	99.3	70-120	0			
1,3,5-Trimethylbenzene	1036	30	1000	0	104	65-135	0			
1,3-Dichlorobenzene	951.5	30	1000	0	95.2	70-125	0			
1,4-Dichlorobenzene	963	30	1000	0	96.3	70-125	0			
2-Butanone	1174	200	1000	0	117	30-160	0			
2-Hexanone	1038	30	1000	0	104	45-145	0			
4-Methyl-2-pentanone	1240	30	1000	0	124	45-145	0			
Acetone	1160	100	1000	0	116	20-160	0			B
Acrylonitrile	1031	100	1000	0	103	70-135	0			
Benzene	974	30	1000	0	97.4	75-125	0			
Bromobenzene	970	30	1000	0	97	65-120	0			
Bromochloromethane	1012	30	1000	0	101	70-125	0			
Bromodichloromethane	1048	30	1000	0	105	70-130	0			
Bromoform	1094	30	1000	0	109	55-135	0			
Bromomethane	1438	75	1000	0	144	30-160	0			
Carbon disulfide	1382	30	1000	0	138	45-160	0			
Carbon tetrachloride	1114	30	1000	0	111	65-135	0			
Chlorobenzene	953.5	30	1000	0	95.4	75-125	0			
Chloroethane	981.5	100	1000	0	98.2	40-155	0			
Chloroform	1026	30	1000	0	103	70-125	0			
Chloromethane	994	100	1000	0	99.4	50-130	0			
cis-1,2-Dichloroethene	1034	30	1000	0	103	65-125	0			
cis-1,3-Dichloropropene	978	30	1000	0	97.8	70-125	0			
Dibromochloromethane	1046	30	1000	0	105	65-135	0			
Dibromomethane	1010	30	1000	0	101	75-130	0			
Dichlorodifluoromethane	792	30	1000	0	79.2	35-135	0			
Ethylbenzene	990.5	30	1000	0	99	75-125	0			
Hexachloroethane	1104	30	1000	0	110	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796**	Instrument ID **VMS9**		Method: **SW8260**				
Isopropylbenzene	1044	30	1000	0	104	75-130	0
m,p-Xylene	1960	60	2000	0	98	80-125	0
Methyl tert-butyl ether	1008	30	1000	0	101	75-125	0
Methylene chloride	971	30	1000	0	97.1	55-145	0
Naphthalene	1013	100	1000	0	101	40-140	0
n-Butylbenzene	1038	30	1000	0	104	65-140	0
n-Propylbenzene	1023	30	1000	0	102	65-135	0
o-Xylene	990.5	30	1000	0	99	75-125	0
p-Isopropyltoluene	1044	30	1000	0	104	75-135	0
sec-Butylbenzene	1071	30	1000	0	107	65-130	0
Styrene	1053	30	1000	0	105	75-125	0
tert-Butylbenzene	1026	30	1000	0	103	65-130	0
Tetrachloroethene	969	30	1000	0	96.9	64-140	0
Tetrahydrofuran	930.5	200	1000	0	93	70-135	0
Toluene	931	30	1000	0	93.1	70-125	0
trans-1,2-Dichloroethene	1065	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	984.5	30	1000	0	98.4	65-125	0
trans-1,4-Dichloro-2-butene	943	30	1000	0	94.3	70-135	0
Trichloroethene	981.5	30	1000	0	98.2	75-125	0
Trichlorofluoromethane	1064	30	1000	0	106	25-185	0
Vinyl chloride	1075	30	1000	0	108	60-125	0
Surr: 1,2-Dichloroethane-d4	*998*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*995*	0	*1000*	0	*99.5*	*70-130*	0
Surr: Dibromofluoromethane	*1043*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*987*	0	*1000*	0	*98.7*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/16/2012 10:54 AM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143199** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	980.5	30	1000	0	98	75-125	0			
1,1,1-Trichloroethane	1063	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	939	30	1000	0	93.9	55-130	0			
1,1,2-Trichloroethane	892	30	1000	0	89.2	60-125	0			
1,1-Dichloroethane	1016	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1136	30	1000	0	114	65-135	0			
1,2,3-Trichlorobenzene	942	30	1000	0	94.2	60-135	0			
1,2,3-Trichloropropane	968	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	978.5	30	1000	0	97.8	65-130	0			
1,2,4-Trimethylbenzene	1031	30	1000	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	910.5	30	1000	0	91	40-135	0			
1,2-Dibromoethane	971.5	30	1000	0	97.2	70-125	0			
1,2-Dichlorobenzene	903.5	30	1000	0	90.4	75-120	0			
1,2-Dichloroethane	960.5	30	1000	0	96	70-135	0			
1,2-Dichloropropane	1006	30	1000	0	101	70-120	0			
1,3,5-Trimethylbenzene	1034	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	914	30	1000	0	91.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	1002	200	1000	0	100	30-160	0			
2-Hexanone	961.5	30	1000	0	96.2	45-145	0			
4-Methyl-2-pentanone	1114	30	1000	0	111	45-145	0			
Acetone	1198	100	1000	0	120	20-160	0			B
Acrylonitrile	1018	100	1000	0	102	70-135	0			
Benzene	1006	30	1000	0	101	75-125	0			
Bromobenzene	941.5	30	1000	0	94.2	65-120	0			
Bromochloromethane	1033	30	1000	0	103	70-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	968	30	1000	0	96.8	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1370	30	1000	0	137	45-160	0			
Carbon tetrachloride	1109	30	1000	0	111	65-135	0			
Chlorobenzene	944	30	1000	0	94.4	75-125	0			
Chloroethane	998.5	100	1000	0	99.8	40-155	0			
Chloroform	1044	30	1000	0	104	70-125	0			
Chloromethane	1074	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	969.5	30	1000	0	97	70-125	0			
Dibromochloromethane	941	30	1000	0	94.1	65-135	0			
Dibromomethane	1001	30	1000	0	100	75-130	0			
Dichlorodifluoromethane	861	30	1000	0	86.1	35-135	0			
Ethylbenzene	985.5	30	1000	0	98.6	75-125	0			
Hexachloroethane	1048	30	1000	0	105	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1040	30	1000	0	104	75-130	0
m,p-Xylene	1952	60	2000	0	97.6	80-125	0
Methyl tert-butyl ether	1022	30	1000	0	102	75-125	0
Methylene chloride	1004	30	1000	0	100	55-145	0
Naphthalene	925	100	1000	0	92.5	40-140	0
n-Butylbenzene	1088	30	1000	0	109	65-140	0
n-Propylbenzene	1024	30	1000	0	102	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0
sec-Butylbenzene	1090	30	1000	0	109	65-130	0
Styrene	1027	30	1000	0	103	75-125	0
tert-Butylbenzene	1028	30	1000	0	103	65-130	0
Tetrachloroethene	994.5	30	1000	0	99.4	64-140	0
Tetrahydrofuran	901	200	1000	0	90.1	70-135	0
Toluene	921.5	30	1000	0	92.2	70-125	0
trans-1,2-Dichloroethene	1096	30	1000	0	110	65-135	0
trans-1,3-Dichloropropene	947	30	1000	0	94.7	65-125	0
trans-1,4-Dichloro-2-butene	932.5	30	1000	0	93.2	70-135	0
Trichloroethene	1026	30	1000	0	103	75-125	0
Trichlorofluoromethane	1070	30	1000	0	107	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1033*	0	*1000*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*1042*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*961.5*	0	*1000*	0	*96.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44796-44796** Units: **µg/Kg** Analysis Date: **11/19/2012 11:46 PM**
Client ID: Run ID: **VMS9_121119A** SeqNo: **2146056** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1031	30	1000	0	103	75-125	0			
1,1,1-Trichloroethane	1016	30	1000	0	102	70-135	0			
1,1,2,2-Tetrachloroethane	998	30	1000	0	99.8	55-130	0			
1,1,2-Trichloroethane	905	30	1000	0	90.5	60-125	0			
1,1-Dichloroethane	980.5	30	1000	0	98	75-125	0			
1,1-Dichloroethene	1062	30	1000	0	106	65-135	0			
1,2,3-Trichlorobenzene	956.5	30	1000	0	95.6	60-135	0			
1,2,3-Trichloropropane	1004	30	1000	0	100	65-130	0			
1,2,4-Trichlorobenzene	963.5	30	1000	0	96.4	65-130	0			
1,2,4-Trimethylbenzene	1017	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	1084	30	1000	0	108	40-135	0			
1,2-Dibromoethane	1046	30	1000	0	105	70-125	0			
1,2-Dichlorobenzene	914.5	30	1000	0	91.4	75-120	0			
1,2-Dichloroethane	938.5	30	1000	0	93.8	70-135	0			
1,2-Dichloropropane	959	30	1000	0	95.9	70-120	0			
1,3,5-Trimethylbenzene	1026	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	917.5	30	1000	0	91.8	70-125	0			
1,4-Dichlorobenzene	926.5	30	1000	0	92.6	70-125	0			
2-Butanone	1206	200	1000	0	121	30-160	0			
2-Hexanone	1186	30	1000	0	119	45-145	0			
4-Methyl-2-pentanone	1254	30	1000	0	125	45-145	0			
Acetone	1257	100	1000	0	126	20-160	0			B
Acrylonitrile	1027	100	1000	0	103	70-135	0			
Benzene	958.5	30	1000	0	95.8	75-125	0			
Bromobenzene	947.5	30	1000	0	94.8	65-120	0			
Bromochloromethane	1032	30	1000	0	103	70-125	0			
Bromodichloromethane	1040	30	1000	0	104	70-130	0			
Bromoform	1092	30	1000	0	109	55-135	0			
Bromomethane	1218	75	1000	0	122	30-160	0			
Carbon disulfide	1337	30	1000	0	134	45-160	0			
Carbon tetrachloride	1101	30	1000	0	110	65-135	0			
Chlorobenzene	951	30	1000	0	95.1	75-125	0			
Chloroethane	1022	100	1000	0	102	40-155	0			
Chloroform	975	30	1000	0	97.5	70-125	0			
Chloromethane	936.5	100	1000	0	93.6	50-130	0			
cis-1,2-Dichloroethene	1006	30	1000	0	101	65-125	0			
cis-1,3-Dichloropropene	992	30	1000	0	99.2	70-125	0			
Dibromochloromethane	1054	30	1000	0	105	65-135	0			
Dibromomethane	974	30	1000	0	97.4	75-130	0			
Dichlorodifluoromethane	896	30	1000	0	89.6	35-135	0			
Ethylbenzene	987	30	1000	0	98.7	75-125	0			
Hexachloroethane	984.5	30	1000	0	98.4	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796**	Instrument ID **VMS9**		Method: **SW8260**				
Isopropylbenzene	1005	30	1000	0	100	75-130	0
m,p-Xylene	2019	60	2000	0	101	80-125	0
Methyl tert-butyl ether	1104	30	1000	0	110	75-125	0
Methylene chloride	1054	30	1000	0	105	55-145	0
Naphthalene	1016	100	1000	0	102	40-140	0
n-Butylbenzene	1000	30	1000	0	100	65-140	0
n-Propylbenzene	981.5	30	1000	0	98.2	65-135	0
o-Xylene	997	30	1000	0	99.7	75-125	0
p-Isopropyltoluene	987	30	1000	0	98.7	75-135	0
sec-Butylbenzene	1020	30	1000	0	102	65-130	0
Styrene	1041	30	1000	0	104	75-125	0
tert-Butylbenzene	1010	30	1000	0	101	65-130	0
Tetrachloroethene	966	30	1000	0	96.6	64-140	0
Tetrahydrofuran	1244	200	1000	0	124	70-135	0
Toluene	961	30	1000	0	96.1	70-125	0
trans-1,2-Dichloroethene	1016	30	1000	0	102	65-135	0
trans-1,3-Dichloropropene	1004	30	1000	0	100	65-125	0
trans-1,4-Dichloro-2-butene	925.5	30	1000	0	92.6	70-135	0
Trichloroethene	950.5	30	1000	0	95	75-125	0
Trichlorofluoromethane	998	30	1000	0	99.8	25-185	0
Vinyl chloride	1034	30	1000	0	103	60-125	0
Surr: 1,2-Dichloroethane-d4	*975*	0	*1000*	0	*97.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*1027*	0	*1000*	0	*103*	*70-130*	0
Surr: Toluene-d8	*989.5*	0	*1000*	0	*99*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211465-01B MS** Units: **µg/Kg** Analysis Date: **11/16/2012 09:08 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143238** Prep Date: **11/15/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2244	77	2571	0	87.2	75-125	0			
1,1,1-Trichloroethane	2485	77	2571	0	96.6	70-135	0			
1,1,2,2-Tetrachloroethane	2498	77	2571	0	97.2	55-130	0			
1,1,2-Trichloroethane	2235	77	2571	0	86.9	60-125	0			
1,1-Dichloroethane	2667	77	2571	0	104	75-125	0			
1,1-Dichloroethene	2820	77	2571	0	110	65-135	0			
1,2,3-Trichlorobenzene	2127	77	2571	0	82.7	60-135	0			
1,2,3-Trichloropropane	2598	77	2571	0	101	65-130	0			
1,2,4-Trichlorobenzene	2181	77	2571	0	84.8	65-130	0			
1,2,4-Trimethylbenzene	2659	77	2571	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	2058	77	2571	0	80	40-135	0			
1,2-Dibromoethane	2445	77	2571	0	95.1	70-125	0			
1,2-Dichlorobenzene	2128	77	2571	0	82.8	75-120	0			
1,2-Dichloroethane	2555	77	2571	0	99.4	70-135	0			
1,2-Dichloropropane	2624	77	2571	0	102	70-120	0			
1,3,5-Trimethylbenzene	2664	77	2571	0	104	65-135	0			
1,3-Dichlorobenzene	2145	77	2571	0	83.4	70-125	0			
1,4-Dichlorobenzene	2157	77	2571	0	83.9	70-125	0			
2-Butanone	2992	510	2571	0	116	30-160	0			
2-Hexanone	2697	77	2571	0	105	45-145	0			
4-Methyl-2-pentanone	3223	77	2571	0	125	45-145	0			
Acetone	4031	260	2571	257.1	147	20-160	0			B
Acrylonitrile	3018	260	2571	0	117	70-135	0			
Benzene	2625	77	2571	0	102	75-125	0			
Bromobenzene	2467	77	2571	0	96	65-120	0			
Bromochloromethane	2750	77	2571	0	107	70-125	0			
Bromodichloromethane	2424	77	2571	0	94.2	70-130	0			
Bromoform	2262	77	2571	0	88	55-135	0			
Bromomethane	2445	190	2571	0	95.1	30-160	0			
Carbon disulfide	2822	77	2571	0	110	45-160	0			
Carbon tetrachloride	2790	77	2571	0	108	65-135	0			
Chlorobenzene	2334	77	2571	0	90.8	75-125	0			
Chloroethane	766.3	260	2571	0	29.8	40-155	0			S
Chloroform	2687	77	2571	0	104	70-125	0			
Chloromethane	2940	260	2571	24.43	113	50-130	0			
cis-1,2-Dichloroethene	2650	77	2571	0	103	65-125	0			
cis-1,3-Dichloropropene	2292	77	2571	0	89.2	70-125	0			
Dibromochloromethane	2150	77	2571	0	83.6	65-135	0			
Dibromomethane	2614	77	2571	0	102	75-130	0			
Dichlorodifluoromethane	2370	77	2571	0	92.2	35-135	0			
Ethylbenzene	2449	77	2571	0	95.2	75-125	0			
Hexachloroethane	2157	77	2571	0	83.9	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	2616	77	2571	0	102	75-130	0
m,p-Xylene	4890	150	5143	0	95.1	80-125	0
Methyl tert-butyl ether	2793	77	2571	0	109	75-125	0
Methylene chloride	2802	77	2571	0	109	55-145	0
Naphthalene	2375	260	2571	0	92.4	40-140	0
n-Butylbenzene	2523	77	2571	0	98.1	65-140	0
n-Propylbenzene	2592	77	2571	0	101	65-135	0
o-Xylene	2481	77	2571	0	96.5	75-125	0
p-Isopropyltoluene	2334	77	2571	0	90.8	75-135	0
sec-Butylbenzene	2737	77	2571	0	106	65-130	0
Styrene	2632	77	2571	0	102	75-125	0
tert-Butylbenzene	2642	77	2571	0	103	65-130	0
Tetrachloroethene	2343	77	2571	0	91.1	64-140	0
Tetrahydrofuran	3003	510	2571	0	117	70-135	0
Toluene	2237	77	2571	0	87	70-125	0
trans-1,2-Dichloroethene	2749	77	2571	0	107	65-135	0
trans-1,3-Dichloropropene	2070	77	2571	0	80.5	65-125	0
trans-1,4-Dichloro-2-butene	2381	77	2571	0	92.6	70-135	0
Trichloroethene	2559	77	2571	0	99.5	75-125	0
Trichlorofluoromethane	2721	77	2571	0	106	25-185	0
Vinyl chloride	2907	77	2571	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*2605*	0	*2571*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2715*	0	*2571*	0	*106*	*70-130*	0
Surr: Dibromofluoromethane	*2515*	0	*2571*	0	*97.8*	*70-130*	0
Surr: Toluene-d8	*2345*	0	*2571*	0	*91.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

MSD	Sample ID: **1211465-01B MSD**				Units: **µg/Kg**			Analysis Date: **11/16/2012 09:33 PM**		
Client ID:		Run ID: **VMS9_121116A**			SeqNo: **2143240**		Prep Date: **11/15/2012**		DF: **1**	

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2357	77	2571	0	91.6	75-125	2244	4.92	30	
1,1,1-Trichloroethane	2530	77	2571	0	98.4	70-135	2485	1.79	30	
1,1,2,2-Tetrachloroethane	2559	77	2571	0	99.5	55-130	2498	2.39	30	
1,1,2-Trichloroethane	2321	77	2571	0	90.2	60-125	2235	3.78	30	
1,1-Dichloroethane	2705	77	2571	0	105	75-125	2667	1.44	30	
1,1-Dichloroethene	2904	77	2571	0	113	65-135	2820	2.96	30	
1,2,3-Trichlorobenzene	2364	77	2571	0	92	60-135	2127	10.6	30	
1,2,3-Trichloropropane	2694	77	2571	0	105	65-130	2598	3.6	30	
1,2,4-Trichlorobenzene	2398	77	2571	0	93.2	65-130	2181	9.49	30	
1,2,4-Trimethylbenzene	2687	77	2571	0	104	65-135	2659	1.06	30	
1,2-Dibromo-3-chloropropane	2211	77	2571	0	86	40-135	2058	7.17	30	
1,2-Dibromoethane	2552	77	2571	0	99.2	70-125	2445	4.27	30	
1,2-Dichlorobenzene	2247	77	2571	0	87.4	75-120	2128	5.47	30	
1,2-Dichloroethane	2607	77	2571	0	101	70-135	2555	2.04	30	
1,2-Dichloropropane	2654	77	2571	0	103	70-120	2624	1.12	30	
1,3,5-Trimethylbenzene	2652	77	2571	0	103	65-135	2664	0.435	30	
1,3-Dichlorobenzene	2280	77	2571	0	88.6	70-125	2145	6.1	30	
1,4-Dichlorobenzene	2282	77	2571	0	88.8	70-125	2157	5.62	30	
2-Butanone	3131	510	2571	0	122	30-160	2992	4.54	30	
2-Hexanone	2848	77	2571	0	111	45-145	2697	5.43	30	
4-Methyl-2-pentanone	3396	77	2571	0	132	45-145	3223	5.21	30	
Acetone	4074	260	2571	257.1	148	20-160	4031	1.08	30	B
Acrylonitrile	3145	260	2571	0	122	70-135	3018	4.13	30	
Benzene	2632	77	2571	0	102	75-125	2625	0.245	30	
Bromobenzene	2458	77	2571	0	95.6	65-120	2467	0.365	30	
Bromochloromethane	2852	77	2571	0	111	70-125	2750	3.63	30	
Bromodichloromethane	2480	77	2571	0	96.4	70-130	2424	2.31	30	
Bromoform	2358	77	2571	0	91.7	55-135	2262	4.17	30	
Bromomethane	2579	190	2571	0	100	30-160	2445	5.32	30	
Carbon disulfide	2973	77	2571	0	116	45-160	2822	5.19	30	
Carbon tetrachloride	2844	77	2571	0	111	65-135	2790	1.92	30	
Chlorobenzene	2377	77	2571	0	92.4	75-125	2334	1.86	30	
Chloroethane	612	260	2571	0	23.8	40-155	766.3	22.4	30	S
Chloroform	2741	77	2571	0	107	70-125	2687	1.99	30	
Chloromethane	2962	260	2571	24.43	114	50-130	2940	0.741	30	
cis-1,2-Dichloroethene	2746	77	2571	0	107	65-125	2650	3.57	30	
cis-1,3-Dichloropropene	2330	77	2571	0	90.6	70-125	2292	1.61	30	
Dibromochloromethane	2245	77	2571	0	87.3	65-135	2150	4.33	30	
Dibromomethane	2670	77	2571	0	104	75-130	2614	2.14	30	
Dichlorodifluoromethane	2303	77	2571	0	89.6	35-135	2370	2.86	30	
Ethylbenzene	2503	77	2571	0	97.4	75-125	2449	2.18	30	
Hexachloroethane	2254	77	2571	0	87.6	70-135	2157	4.37	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44796** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	2679	77	2571	0	104	75-130	2616	2.38	30
m,p-Xylene	4987	150	5143	0	97	80-125	4890	1.98	30
Methyl tert-butyl ether	2871	77	2571	0	112	75-125	2793	2.77	30
Methylene chloride	2809	77	2571	0	109	55-145	2802	0.275	30
Naphthalene	2703	260	2571	0	105	40-140	2375	12.9	30
n-Butylbenzene	2694	77	2571	0	105	65-140	2523	6.56	30
n-Propylbenzene	2624	77	2571	0	102	65-135	2592	1.23	30
o-Xylene	2517	77	2571	0	97.9	75-125	2481	1.44	30
p-Isopropyltoluene	2478	77	2571	0	96.4	75-135	2334	5.99	30
sec-Butylbenzene	2750	77	2571	0	107	65-130	2737	0.469	30
Styrene	2659	77	2571	0	103	75-125	2632	1.02	30
tert-Butylbenzene	2633	77	2571	0	102	65-130	2642	0.341	30
Tetrachloroethene	2427	77	2571	0	94.4	64-140	2343	3.56	30
Tetrahydrofuran	2974	510	2571	0	116	70-135	3003	0.989	30
Toluene	2319	77	2571	0	90.2	70-125	2237	3.61	30
trans-1,2-Dichloroethene	2778	77	2571	0	108	65-135	2749	1.07	30
trans-1,3-Dichloropropene	2181	77	2571	0	84.8	65-125	2070	5.2	30
trans-1,4-Dichloro-2-butene	2443	77	2571	0	95	70-135	2381	2.56	30
Trichloroethene	2593	77	2571	0	101	75-125	2559	1.35	30
Trichlorofluoromethane	2787	77	2571	0	108	25-185	2721	2.43	30
Vinyl chloride	2915	77	2571	0	113	60-125	2907	0.265	30
Surr: 1,2-Dichloroethane-d4	*2525*	0	*2571*	0	*98.2*	*70-130*	2605	*3.11*	*30*
Surr: 4-Bromofluorobenzene	*2728*	0	*2571*	0	*106*	*70-130*	2715	*0.472*	*30*
Surr: Dibromofluoromethane	*2592*	0	*2571*	0	*101*	*70-130*	2515	*3.02*	*30*
Surr: Toluene-d8	*2407*	0	*2571*	0	*93.6*	*70-130*	2345	*2.6*	*30*

The following samples were analyzed in this batch: 1211466-01B 1211466-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44801-44801** Units: **µg/Kg** Analysis Date: **11/16/2012 12:11 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143248** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	151.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	17	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*964*	0	*1000*	0	*96.4*	*70-130*	0
Surr: Dibromofluoromethane	*930.5*	0	*1000*	0	*93*	*70-130*	0
Surr: Toluene-d8	*947.5*	0	*1000*	0	*94.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44801-44801** Units: **µg/Kg** Analysis Date: **11/17/2012 12:58 PM**
Client ID: Run ID: **VMS9_121116B** SeqNo: **2143418** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	128	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	17.5	100					J
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*997.5*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*955.5*	0	*1000*	0	*95.6*	*70-130*	0
Surr: Dibromofluoromethane	*910.5*	0	*1000*	0	*91*	*70-130*	0
Surr: Toluene-d8	*922.5*	0	*1000*	0	*92.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44801-44801** Units: **µg/Kg** Analysis Date: **11/16/2012 10:54 AM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143247** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	980.5	30	1000	0	98	75-125	0			
1,1,1-Trichloroethane	1063	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	939	30	1000	0	93.9	55-130	0			
1,1,2-Trichloroethane	892	30	1000	0	89.2	60-125	0			
1,1-Dichloroethane	1016	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1136	30	1000	0	114	65-135	0			
1,2,3-Trichlorobenzene	942	30	1000	0	94.2	60-135	0			
1,2,3-Trichloropropane	968	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	978.5	30	1000	0	97.8	65-130	0			
1,2,4-Trimethylbenzene	1031	30	1000	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	910.5	30	1000	0	91	40-135	0			
1,2-Dibromoethane	971.5	30	1000	0	97.2	70-125	0			
1,2-Dichlorobenzene	903.5	30	1000	0	90.4	75-120	0			
1,2-Dichloroethane	960.5	30	1000	0	96	70-135	0			
1,2-Dichloropropane	1006	30	1000	0	101	70-120	0			
1,3,5-Trimethylbenzene	1034	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	914	30	1000	0	91.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	1002	200	1000	0	100	30-160	0			
2-Hexanone	961.5	30	1000	0	96.2	45-145	0			
4-Methyl-2-pentanone	1114	30	1000	0	111	45-145	0			
Acetone	1198	100	1000	0	120	20-160	0			B
Acrylonitrile	1018	100	1000	0	102	70-135	0			
Benzene	1006	30	1000	0	101	75-125	0			
Bromobenzene	941.5	30	1000	0	94.2	65-120	0			
Bromochloromethane	1033	30	1000	0	103	70-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	968	30	1000	0	96.8	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1370	30	1000	0	137	45-160	0			
Carbon tetrachloride	1109	30	1000	0	111	65-135	0			
Chlorobenzene	944	30	1000	0	94.4	75-125	0			
Chloroethane	998.5	100	1000	0	99.8	40-155	0			
Chloroform	1044	30	1000	0	104	70-125	0			
Chloromethane	1074	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	969.5	30	1000	0	97	70-125	0			
Dibromochloromethane	941	30	1000	0	94.1	65-135	0			
Dibromomethane	1001	30	1000	0	100	75-130	0			
Dichlorodifluoromethane	861	30	1000	0	86.1	35-135	0			
Ethylbenzene	985.5	30	1000	0	98.6	75-125	0			
Hexachloroethane	1048	30	1000	0	105	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1040	30	1000	0	104	75-130	0
m,p-Xylene	1952	60	2000	0	97.6	80-125	0
Methyl tert-butyl ether	1022	30	1000	0	102	75-125	0
Methylene chloride	1004	30	1000	0	100	55-145	0
Naphthalene	925	100	1000	0	92.5	40-140	0
n-Butylbenzene	1088	30	1000	0	109	65-140	0
n-Propylbenzene	1024	30	1000	0	102	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0
sec-Butylbenzene	1090	30	1000	0	109	65-130	0
Styrene	1027	30	1000	0	103	75-125	0
tert-Butylbenzene	1028	30	1000	0	103	65-130	0
Tetrachloroethene	994.5	30	1000	0	99.4	64-140	0
Tetrahydrofuran	901	200	1000	0	90.1	70-135	0
Toluene	921.5	30	1000	0	92.2	70-125	0
trans-1,2-Dichloroethene	1096	30	1000	0	110	65-135	0
trans-1,3-Dichloropropene	947	30	1000	0	94.7	65-125	0
trans-1,4-Dichloro-2-butene	932.5	30	1000	0	93.2	70-135	0
Trichloroethene	1026	30	1000	0	103	75-125	0
Trichlorofluoromethane	1070	30	1000	0	107	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1033*	0	*1000*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*1042*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*961.5*	0	*1000*	0	*96.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44801-44801** Units: **µg/Kg** Analysis Date: **11/16/2012 11:41 PM**
Client ID: Run ID: **VMS9_121116B** SeqNo: **2143417** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1091	30	1000	0	109	75-125	0			
1,1,1-Trichloroethane	1239	30	1000	0	124	70-135	0			
1,1,2,2-Tetrachloroethane	1055	30	1000	0	106	55-130	0			
1,1,2-Trichloroethane	997.5	30	1000	0	99.8	60-125	0			
1,1-Dichloroethane	1230	30	1000	0	123	75-125	0			
1,1-Dichloroethene	1321	30	1000	0	132	65-135	0			
1,2,3-Trichlorobenzene	993	30	1000	0	99.3	60-135	0			
1,2,3-Trichloropropane	1061	30	1000	0	106	65-130	0			
1,2,4-Trichlorobenzene	997.5	30	1000	0	99.8	65-130	0			
1,2,4-Trimethylbenzene	1106	30	1000	0	111	65-135	0			
1,2-Dibromo-3-chloropropane	1036	30	1000	0	104	40-135	0			
1,2-Dibromoethane	1097	30	1000	0	110	70-125	0			
1,2-Dichlorobenzene	981	30	1000	0	98.1	75-120	0			
1,2-Dichloroethane	1116	30	1000	0	112	70-135	0			
1,2-Dichloropropane	1180	30	1000	0	118	70-120	0			
1,3,5-Trimethylbenzene	1098	30	1000	0	110	65-135	0			
1,3-Dichlorobenzene	989.5	30	1000	0	99	70-125	0			
1,4-Dichlorobenzene	1002	30	1000	0	100	70-125	0			
2-Butanone	1435	200	1000	0	144	30-160	0			
2-Hexanone	1130	30	1000	0	113	45-145	0			
4-Methyl-2-pentanone	1328	30	1000	0	133	45-145	0			
Acetone	1584	100	1000	0	158	20-160	0			B
Acrylonitrile	1258	100	1000	0	126	70-135	0			
Benzene	1164	30	1000	0	116	75-125	0			
Bromobenzene	1028	30	1000	0	103	65-120	0			
Bromochloromethane	1258	30	1000	0	126	70-125	0			S
Bromodichloromethane	1212	30	1000	0	121	70-130	0			
Bromoform	1078	30	1000	0	108	55-135	0			
Bromomethane	1462	75	1000	0	146	30-160	0			
Carbon disulfide	1594	30	1000	0	159	45-160	0			
Carbon tetrachloride	1266	30	1000	0	127	65-135	0			
Chlorobenzene	1035	30	1000	0	104	75-125	0			
Chloroethane	1188	100	1000	0	119	40-155	0			
Chloroform	1256	30	1000	0	126	70-125	0			S
Chloromethane	1300	100	1000	0	130	50-130	0			S
cis-1,2-Dichloroethene	1284	30	1000	0	128	65-125	0			S
cis-1,3-Dichloropropene	1130	30	1000	0	113	70-125	0			
Dibromochloromethane	1073	30	1000	0	107	65-135	0			
Dibromomethane	1178	30	1000	0	118	75-130	0			
Dichlorodifluoromethane	949.5	30	1000	0	95	35-135	0			
Ethylbenzene	1088	30	1000	0	109	75-125	0			
Hexachloroethane	1114	30	1000	0	111	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1121	30	1000	0	112	75-130	0	
m,p-Xylene	2137	60	2000	0	107	80-125	0	
Methyl tert-butyl ether	1225	30	1000	0	122	75-125	0	
Methylene chloride	1283	30	1000	0	128	55-145	0	
Naphthalene	1038	100	1000	0	104	40-140	0	
n-Butylbenzene	1072	30	1000	0	107	65-140	0	
n-Propylbenzene	1090	30	1000	0	109	65-135	0	
o-Xylene	1074	30	1000	0	107	75-125	0	
p-Isopropyltoluene	1090	30	1000	0	109	75-135	0	
sec-Butylbenzene	1122	30	1000	0	112	65-130	0	
Styrene	1134	30	1000	0	113	75-125	0	
tert-Butylbenzene	1084	30	1000	0	108	65-130	0	
Tetrachloroethene	1026	30	1000	0	103	64-140	0	
Tetrahydrofuran	1192	200	1000	0	119	70-135	0	
Toluene	1018	30	1000	0	102	70-125	0	
trans-1,2-Dichloroethene	1290	30	1000	0	129	65-135	0	
trans-1,3-Dichloropropene	1046	30	1000	0	105	65-125	0	
trans-1,4-Dichloro-2-butene	1022	30	1000	0	102	70-135	0	
Trichloroethene	1176	30	1000	0	118	75-125	0	
Trichlorofluoromethane	1246	30	1000	0	125	25-185	0	
Vinyl chloride	1261	30	1000	0	126	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1002*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1020*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1056*	0	*1000*	0	*106*	*70-130*	0	
Surr: Toluene-d8	*939*	0	*1000*	0	*93.9*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211466-07B MS** Units: **µg/Kg** Analysis Date: **11/17/2012 09:57 AM**
Client ID: **SBKR1025R517S111312S006** Run ID: **VMS9_121116B** SeqNo: **2143399** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	3412	110	3651	0	93.4	75-125	0			
1,1,1-Trichloroethane	3940	110	3651	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	3764	110	3651	0	103	55-130	0			
1,1,2-Trichloroethane	3505	110	3651	0	96	60-125	0			
1,1-Dichloroethane	4363	110	3651	0	120	75-125	0			
1,1-Dichloroethene	4617	110	3651	0	126	65-135	0			
1,2,3-Trichlorobenzene	3156	110	3651	0	86.4	60-135	0			
1,2,3-Trichloropropane	3830	110	3651	0	105	65-130	0			
1,2,4-Trichlorobenzene	3235	110	3651	0	88.6	65-130	0			
1,2,4-Trimethylbenzene	3941	110	3651	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	3089	110	3651	0	84.6	40-135	0			
1,2-Dibromoethane	3750	110	3651	0	103	70-125	0			
1,2-Dichlorobenzene	3301	110	3651	0	90.4	75-120	0			
1,2-Dichloroethane	4117	110	3651	0	113	70-135	0			
1,2-Dichloropropane	4108	110	3651	0	112	70-120	0			
1,3,5-Trimethylbenzene	3903	110	3651	0	107	65-135	0			
1,3-Dichlorobenzene	3293	110	3651	0	90.2	70-125	0			
1,4-Dichlorobenzene	3350	110	3651	0	91.8	70-125	0			
2-Butanone	4946	730	3651	0	135	30-160	0			
2-Hexanone	4093	110	3651	0	112	45-145	0			
4-Methyl-2-pentanone	4714	110	3651	0	129	45-145	0			
Acetone	6632	370	3651	0	182	20-160	0			BS
Acrylonitrile	4977	370	3651	0	136	70-135	0			S
Benzene	4111	110	3651	0	113	75-125	0			
Bromobenzene	3699	110	3651	0	101	65-120	0			
Bromochloromethane	4675	110	3651	0	128	70-125	0			S
Bromodichloromethane	3794	110	3651	0	104	70-130	0			
Bromoform	3454	110	3651	0	94.6	55-135	0			
Bromomethane	4197	270	3651	0	115	30-160	0			
Carbon disulfide	4484	110	3651	0	123	45-160	0			
Carbon tetrachloride	4234	110	3651	0	116	65-135	0			
Chlorobenzene	3582	110	3651	0	98.1	75-125	0			
Chloroethane	1366	370	3651	0	37.4	40-155	0			S
Chloroform	4414	110	3651	0	121	70-125	0			
Chloromethane	5126	370	3651	82.15	138	50-130	0			S
cis-1,2-Dichloroethene	4440	110	3651	0	122	65-125	0			
cis-1,3-Dichloropropene	3443	110	3651	0	94.3	70-125	0			
Dibromochloromethane	3337	110	3651	0	91.4	65-135	0			
Dibromomethane	4226	110	3651	0	116	75-130	0			
Dichlorodifluoromethane	3726	110	3651	0	102	35-135	0			
Ethylbenzene	3733	110	3651	0	102	75-125	0			
Hexachloroethane	3315	110	3651	0	90.8	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	3938	110	3651	0	108	75-130	0	
m,p-Xylene	7445	220	7302	0	102	80-125	0	
Methyl tert-butyl ether	4621	110	3651	0	127	75-125	0	S
Methylene chloride	4681	110	3651	0	128	55-145	0	
Naphthalene	3459	370	3651	0	94.8	40-140	0	
n-Butylbenzene	3627	110	3651	0	99.4	65-140	0	
n-Propylbenzene	3879	110	3651	0	106	65-135	0	
o-Xylene	3741	110	3651	0	102	75-125	0	
p-Isopropyltoluene	3556	110	3651	0	97.4	75-135	0	
sec-Butylbenzene	3956	110	3651	0	108	65-130	0	
Styrene	3980	110	3651	0	109	75-125	0	
tert-Butylbenzene	3878	110	3651	0	106	65-130	0	
Tetrachloroethene	3487	110	3651	0	95.5	64-140	0	
Tetrahydrofuran	4454	730	3651	0	122	70-135	0	
Toluene	3441	110	3651	0	94.2	70-125	0	
trans-1,2-Dichloroethene	4480	110	3651	0	123	65-135	0	
trans-1,3-Dichloropropene	3100	110	3651	0	84.9	65-125	0	
trans-1,4-Dichloro-2-butene	3414	110	3651	0	93.5	70-135	0	
Trichloroethene	3910	110	3651	0	107	75-125	0	
Trichlorofluoromethane	4387	110	3651	0	120	25-185	0	
Vinyl chloride	4579	110	3651	0	125	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*3638*	0	*3651*	0	*99.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*3856*	0	*3651*	0	*106*	*70-130*	0	
Surr: Dibromofluoromethane	*3637*	0	*3651*	0	*99.6*	*70-130*	0	
Surr: Toluene-d8	*3259*	0	*3651*	0	*89.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **1211466-07B MSD** Units: **µg/Kg** Analysis Date: **11/17/2012 10:23 AM**
Client ID: **SBKR1025R517S111312S006** Run ID: **VMS9_121116B** SeqNo: **2143400** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	3478	110	3651	0	95.2	75-125	3412	1.91	30	
1,1,1-Trichloroethane	4077	110	3651	0	112	70-135	3940	3.42	30	
1,1,2,2-Tetrachloroethane	3706	110	3651	0	102	55-130	3764	1.56	30	
1,1,2-Trichloroethane	3470	110	3651	0	95	60-125	3505	0.995	30	
1,1-Dichloroethane	4416	110	3651	0	121	75-125	4363	1.21	30	
1,1-Dichloroethene	4655	110	3651	0	128	65-135	4617	0.827	30	
1,2,3-Trichlorobenzene	3187	110	3651	0	87.3	60-135	3156	0.978	30	
1,2,3-Trichloropropane	3790	110	3651	0	104	65-130	3830	1.05	30	
1,2,4-Trichlorobenzene	3240	110	3651	0	88.8	65-130	3235	0.169	30	
1,2,4-Trimethylbenzene	3850	110	3651	0	105	65-135	3941	2.34	30	
1,2-Dibromo-3-chloropropane	3014	110	3651	0	82.6	40-135	3089	2.45	30	
1,2-Dibromoethane	3741	110	3651	0	102	70-125	3750	0.244	30	
1,2-Dichlorobenzene	3293	110	3651	0	90.2	75-120	3301	0.221	30	
1,2-Dichloroethane	4239	110	3651	0	116	70-135	4117	2.93	30	
1,2-Dichloropropane	4246	110	3651	0	116	70-120	4108	3.32	30	
1,3,5-Trimethylbenzene	3896	110	3651	0	107	65-135	3903	0.187	30	
1,3-Dichlorobenzene	3290	110	3651	0	90.1	70-125	3293	0.111	30	
1,4-Dichlorobenzene	3350	110	3651	0	91.8	70-125	3350	0	30	
2-Butanone	4661	730	3651	0	128	30-160	4946	5.93	30	
2-Hexanone	3985	110	3651	0	109	45-145	4093	2.67	30	
4-Methyl-2-pentanone	4772	110	3651	0	131	45-145	4714	1.23	30	
Acetone	7028	370	3651	0	192	20-160	6632	5.8	30	BS
Acrylonitrile	4966	370	3651	0	136	70-135	4977	0.22	30	S
Benzene	4219	110	3651	0	116	75-125	4111	2.59	30	
Bromobenzene	3664	110	3651	0	100	65-120	3699	0.942	30	
Bromochloromethane	4827	110	3651	0	132	70-125	4675	3.19	30	S
Bromodichloromethane	3960	110	3651	0	108	70-130	3794	4.29	30	
Bromoform	3441	110	3651	0	94.2	55-135	3454	0.371	30	
Bromomethane	3817	270	3651	0	105	30-160	4197	9.48	30	
Carbon disulfide	4659	110	3651	0	128	45-160	4484	3.83	30	
Carbon tetrachloride	4128	110	3651	0	113	65-135	4234	2.53	30	
Chlorobenzene	3589	110	3651	0	98.3	75-125	3582	0.204	30	
Chloroethane	1360	370	3651	0	37.2	40-155	1366	0.402	30	S
Chloroform	4506	110	3651	0	123	70-125	4414	2.05	30	
Chloromethane	5230	370	3651	82.15	141	50-130	5126	2.01	30	S
cis-1,2-Dichloroethene	4564	110	3651	0	125	65-125	4440	2.76	30	
cis-1,3-Dichloropropene	3620	110	3651	0	99.2	70-125	3443	5.01	30	
Dibromochloromethane	3359	110	3651	0	92	65-135	3337	0.654	30	
Dibromomethane	4261	110	3651	0	117	75-130	4226	0.817	30	
Dichlorodifluoromethane	3591	110	3651	0	98.4	35-135	3726	3.69	30	
Ethylbenzene	3700	110	3651	0	101	75-125	3733	0.884	30	
Hexachloroethane	3348	110	3651	0	91.7	70-135	3315	0.986	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	3878	110	3651	0	106	75-130	3938	1.54	30	
m,p-Xylene	7375	220	7302	0	101	80-125	7445	0.936	30	
Methyl tert-butyl ether	4624	110	3651	0	127	75-125	4621	0.079	30	S
Methylene chloride	4734	110	3651	0	130	55-145	4681	1.12	30	
Naphthalene	3465	370	3651	0	94.9	40-140	3459	0.158	30	
n-Butylbenzene	3580	110	3651	0	98	65-140	3627	1.32	30	
n-Propylbenzene	3819	110	3651	0	105	65-135	3879	1.57	30	
o-Xylene	3728	110	3651	0	102	75-125	3741	0.342	30	
p-Isopropyltoluene	3593	110	3651	0	98.4	75-135	3556	1.02	30	
sec-Butylbenzene	3870	110	3651	0	106	65-130	3956	2.19	30	
Styrene	3910	110	3651	0	107	75-125	3980	1.76	30	
tert-Butylbenzene	3783	110	3651	0	104	65-130	3878	2.48	30	
Tetrachloroethene	3474	110	3651	0	95.2	64-140	3487	0.367	30	
Tetrahydrofuran	4675	730	3651	0	128	70-135	4454	4.84	30	
Toluene	3450	110	3651	0	94.5	70-125	3441	0.265	30	
trans-1,2-Dichloroethene	4495	110	3651	0	123	65-135	4480	0.325	30	
trans-1,3-Dichloropropene	3167	110	3651	0	86.8	65-125	3100	2.16	30	
trans-1,4-Dichloro-2-butene	3239	110	3651	0	88.7	70-135	3414	5.27	30	
Trichloroethene	4044	110	3651	0	111	75-125	3910	3.35	30	
Trichlorofluoromethane	4369	110	3651	0	120	25-185	4387	0.417	30	
Vinyl chloride	4635	110	3651	0	127	60-125	4579	1.23	30	S
Surr: 1,2-Dichloroethane-d4	*3702*	0	*3651*	0	*101*	*70-130*	3638	*1.74*	*30*	
Surr: 4-Bromofluorobenzene	*3852*	0	*3651*	0	*106*	*70-130*	3856	*0.0947*	*30*	
Surr: Dibromofluoromethane	*3735*	0	*3651*	0	*102*	*70-130*	3637	*2.67*	*30*	
Surr: Toluene-d8	*3266*	0	*3651*	0	*89.4*	*70-130*	3259	*0.224*	*30*	

The following samples were analyzed in this batch:

1211466-03B	1211466-04B	1211466-05B
1211466-06B	1211466-07B	1211466-08B
1211466-09A	1211466-10B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **R112693** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112693** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142496** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112693** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142492** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211465-13A DUP** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: Run ID: **MOIST_121116A** SeqNo: **2142481** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.49	0.050	0	0	0	0-0	21.81	6.24	20	

DUP Sample ID: **1211466-02A DUP** Units: **% of sample** Analysis Date: **11/16/2012 04:30 PM**
Client ID: **SBKR1025R512S111312S007** Run ID: **MOIST_121116A** SeqNo: **2142484** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	50.66	0.050	0	0	0	0-0	50.9	0.473	20	

The following samples were analyzed in this batch: 1211466-01A 1211466-02A 1211466-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211466
Project: Marshall KRRI 1025R 11/13/12

QC BATCH REPORT

Batch ID: **R112694** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112694** Units: **% of sample** Analysis Date: **11/16/2012 05:45 PM**
Client ID: Run ID: **MOIST_121116B** SeqNo: **2142454** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112694** Units: **% of sample** Analysis Date: **11/16/2012 05:45 PM**
Client ID: Run ID: **MOIST_121116B** SeqNo: **2142450** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211466-07A DUP1** Units: **% of sample** Analysis Date: **11/16/2012 05:45 PM**
Client ID: **SBKR1025R517S111312S006** Run ID: **MOIST_121116B** SeqNo: **2142433** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	57.66	0.050	0	0	0	0-0	57.07	1.03	20	

DUP Sample ID: **1211466-07A DUP2** Units: **% of sample** Analysis Date: **11/16/2012 05:45 PM**
Client ID: **SBKR1025R517S111312S006** Run ID: **MOIST_121116B** SeqNo: **2142434** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	57.42	0.050	0	0	0	0-0	57.07	0.611	20	

DUP Sample ID: **1211523-10B DUP** Units: **% of sample** Analysis Date: **11/16/2012 05:45 PM**
Client ID: Run ID: **MOIST_121116B** SeqNo: **2142448** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	31.9	0.050	0	0	0	0-0	33.58	5.13	20	

The following samples were analyzed in this batch:

1211466-04A	1211466-05A	1211466-06A
1211466-07A	1211466-08A	1211466-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

12114606

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_111312_GMK1 | Task: KRRI_1025R
Total # of Samples: 10 | Event Complete?

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX — Phone #: 713-821-2000
Lab PM:	Ann Preston	City: Grand Rapids	State, Zip: MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Sliemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Sliemsma@aecom.com	CC Hardcopy report	

Turn Around Time: 5 Day | Rush: No

BILLING CODE: 6.00

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH											
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260											
1	SBKR1025R511S111312S007	SBKR1025R511	SO	G	11/13/2012 08:25	3			X	X	X	X	X											
2	SBKR1025R512S111312S007	SBKR1025R512	SO	G	11/13/2012 09:30	3			X	X	X	X	X											
3	SBKR1025R513S111312S006	SBKR1025R513	SO	G	11/13/2012 10:25	3			X	X	X	X	X											
4	SBKR1025R514S111312S004	SBKR1025R514	SO	G	11/13/2012 11:24	3			X	X	X	X	X											
5	SBKR1025R516D111312S005	SBKR1025R516	SO	G	11/13/2012 14:01	3	DUPLICATE		X	X	X	X	X											
6	SBKR1025R516S111312S005	SBKR1025R516	SO	G	11/13/2012 14:01	3			X	X	X	X	X											
7	SBKR1025R517S111312S006	SBKR1025R517	SO	G	11/13/2012 15:08	6	MS/MSD		X	X	X	X	X											
8	SBKR1025R518S111312S005	SBKR1025R518	SO	G	11/13/2012 16:06	3			X	X	X	X	X											
9	SBKR1025R518T111312MX	SBKR1025R518	SQ	G	11/13/2012 00:00	1	TRIP BLANK						X											
10	SBKR1025R515S111312S003	SBKR1025R515	SO	G	11/13/2012 13:14	3			X	X	X	X	X											

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G. Kramer	11-14-12	1115	[illegible]	11-14-12	1115
[illegible]	11-14-12	1500	[illegible]	11/14/12	1700

Sample Receipt Conditions

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?
	Y/N	Y/N	Y/N
4.2°C	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER: DATE Signed: Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **14-Nov-12 17:00**

Work Order: **1211466** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 15-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☐	No ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/15/2012 10:46:26 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 11-14-12 Time: 1115
Name: [signature]
Company:

Seal Broken By:

Date:

Soil

4.2°C

23-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1100L Sediment 11/15/12** Work Order: **1211517**

Dear Bryan,

ALS Environmental received 1 sample on 16-Nov-2012 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1100L Sediment 11/15/12
Work Order: **1211517**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211517-01	SEKR1100L505S111512D006	Sediment		11/15/2012 16:05	11/16/2012 10:00	☐

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1100L Sediment 11/15/12
Work Order: 1211517

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44824 MS/MSD data for ORO is not related to this project's samples. No data requires qualification.

Batch 44830 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44820 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1100L Sediment 11/15/12
WorkOrder: **1211517**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *23-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR1100L505S111512D006
Work Order:	1211517	**Collection Date:**	11/15/2012 4:05:00 PM
Project:	Marshall KRRI 1100L Sediment 11/15/12		
Lab ID:	1211517-01	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/19/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**26**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**330**	**51**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*72.8*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	3.6	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**11**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**14**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/19/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/20/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/20/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/20/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/20/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/20/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/20/2012
Surr: 2,4,6-Tribromophenol	*66.5*	*34-140*			*%REC*	1	11/20/2012
Surr: 2-Fluorobiphenyl	*74.8*	*12-100*			*%REC*	1	11/20/2012
Surr: 2-Fluorophenol	*88.1*	*33-117*			*%REC*	1	11/20/2012
Surr: 4-Terphenyl-d14	*96.5*	*25-137*			*%REC*	1	11/20/2012
Surr: Nitrobenzene-d5	*83.1*	*37-107*			*%REC*	1	11/20/2012
Surr: Phenol-d6	*84.9*	*40-106*			*%REC*	1	11/20/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**63**	**0.050**	**0**		**% of sample**	1	11/19/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 23-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211517

Project: Marshall KRRI 1100L Sediment 11/15/12

Batch ID: **44824** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:30 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144882** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.505*	0	*5*	0	*70.1*	*39-115*	0			

LCS Sample ID: **DLCSS1-44824-44824** Units: **mg/Kg** Analysis Date: **11/19/2012 03:57 PM**

Client ID: Run ID: **GC8_121119A** SeqNo: **2144883** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	318.5	10	500	0	63.7	49-124	0			
ORO (C20-C34)	322.3	20	500	0	64.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.175*	0	*5*	0	*83.5*	*39-115*	0			

MS Sample ID: **1211466-07A MS** Units: **mg/Kg** Analysis Date: **11/20/2012 10:41 AM**

Client ID: Run ID: **GC8_121120A** SeqNo: **2147094** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.3	9.7	484.3	0	61	60-130	0			
ORO (C20-C34)	380	19	484.3	132.6	51.1	60-130	0			S
Surr: 4-Terphenyl-d14	*3.706*	0	*4.843*	0	*76.5*	*39-115*	0			

MSD Sample ID: **1211466-07A MSD** Units: **mg/Kg** Analysis Date: **11/20/2012 11:08 AM**

Client ID: Run ID: **GC8_121120A** SeqNo: **2147095** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	295.5	9.4	469.5	0	62.9	60-130	295.3	0.062	30	
ORO (C20-C34)	414.7	19	469.5	132.6	60.1	60-130	380	8.74	30	
Surr: 4-Terphenyl-d14	*4.16*	0	*4.695*	0	*88.6*	*39-115*	3.706	*11.6*	*30*	

The following samples were analyzed in this batch: 1211517-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211517
Project: Marshall KRRI 1100L Sediment 11/15/12

QC BATCH REPORT

Batch ID: **44830** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44830-44830** Units: **mg/Kg** Analysis Date: **11/20/2012 03:42 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145204** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01105	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44830-44830** Units: **mg/Kg** Analysis Date: **11/20/2012 03:48 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145205** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.444	0.10	5	0	88.9	80-120	0			
Molybdenum	4.716	0.25	5	0	94.3	80-120	0			
Nickel	4.605	0.25	5	0	92.1	80-120	0			
Vanadium	4.79	0.25	5	0	95.8	80-120	0			

MS Sample ID: **1211466-07AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 04:56 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145233** Prep Date: **11/19/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.997	0.56	7.022	0.1503	83.3	75-125	0			
Molybdenum	6.469	1.4	7.022	0.6183	83.3	75-125	0			
Nickel	13.13	1.4	7.022	6.514	94.3	75-125	0			
Vanadium	14.2	1.4	7.022	5.917	118	75-125	0			

MSD Sample ID: **1211466-07AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 05:02 AM**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145237** Prep Date: **11/19/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.04	0.53	6.64	0.1503	88.7	75-125	5.997	0.709	25	
Molybdenum	6.842	1.3	6.64	0.6183	93.7	75-125	6.469	5.6	25	
Nickel	13.31	1.3	6.64	6.514	102	75-125	13.13	1.3	25	
Vanadium	14.88	1.3	6.64	5.917	135	75-125	14.2	4.68	25	S

The following samples were analyzed in this batch: 1211517-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:02 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146576** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*9112*	0	*10000*	0	*91.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3866*	0	*5000*	0	*77.3*	*12-100*	0			
Surr: 2-Fluorophenol	*7869*	0	*10000*	0	*78.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4085*	0	*5000*	0	*81.7*	*25-137*	0			
Surr: Nitrobenzene-d5	*3879*	0	*5000*	0	*77.6*	*37-107*	0			
Surr: Phenol-d6	*8126*	0	*10000*	0	*81.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44823-44823** Units: **µg/Kg** Analysis Date: **11/19/2012 06:30 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146577** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1792	50	2000	0	89.6	45-105	0			
Acenaphthene	1846	50	2000	0	92.3	45-110	0			
Acenaphthylene	1876	50	2000	0	93.8	45-105	0			
Anthracene	1932	50	2000	0	96.6	55-105	0			
Benzo(a)anthracene	1900	50	2000	0	95	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	1990	50	2000	0	99.5	45-115	0			
Benzo(g,h,i)perylene	2105	50	2000	0	105	40-125	0			
Benzo(k)fluoranthene	2276	50	2000	0	114	45-115	0			
Chrysene	2095	50	2000	0	105	55-110	0			
Dibenzo(a,h)anthracene	2080	50	2000	0	104	40-125	0			
Fluoranthene	1809	50	2000	0	90.4	55-115	0			
Fluorene	1915	50	2000	0	95.8	50-110	0			
Indeno(1,2,3-cd)pyrene	2115	50	2000	0	106	40-120	0			
Naphthalene	1770	50	2000	0	88.5	40-105	0			
Phenanthrene	1933	50	2000	0	96.6	50-110	0			
Pyrene	1883	50	2000	0	94.2	45-125	0			
Surr: 2,4,6-Tribromophenol	*8281*	0	*10000*	0	*82.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3719*	0	*5000*	0	*74.4*	*12-100*	0			
Surr: 2-Fluorophenol	*7282*	0	*10000*	0	*72.8*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4017*	0	*5000*	0	*80.3*	*25-137*	0			
Surr: Nitrobenzene-d5	*3677*	0	*5000*	0	*73.5*	*37-107*	0			
Surr: Phenol-d6	*7246*	0	*10000*	0	*72.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211517
Project: Marshall KRRI 1100L Sediment 11/15/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211466-07A MS** Units: **µg/Kg** Analysis Date: **11/19/2012 11:36 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146641** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1510	48	1903	0	79.4	45-105	0			
Acenaphthene	1578	48	1903	0	83	45-110	0			
Acenaphthylene	1644	48	1903	0	86.4	45-105	0			
Anthracene	1758	48	1903	0	92.4	55-105	0			
Benzo(a)anthracene	1820	48	1903	152.4	87.6	50-110	0			
Benzo(a)pyrene	2027	48	1903	210.6	95.5	50-110	0			
Benzo(b)fluoranthene	2068	48	1903	275.6	94.2	45-115	0			
Benzo(g,h,i)perylene	1760	48	1903	131	85.6	40-125	0			
Benzo(k)fluoranthene	1910	48	1903	66.96	96.9	45-115	0			
Chrysene	1846	48	1903	191.2	87	55-110	0			
Dibenzo(a,h)anthracene	1698	48	1903	0	89.2	40-125	0			
Fluoranthene	2039	48	1903	263	93.3	55-115	0			
Fluorene	1708	48	1903	0	89.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1784	48	1903	115.5	87.7	40-120	0			
Naphthalene	1427	48	1903	0	75	40-105	0			
Phenanthrene	1859	48	1903	64.05	94.3	50-110	0			
Pyrene	1979	48	1903	273.7	89.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*4319*	0	*4757*	0	*90.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3269*	0	*4757*	0	*68.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3439*	0	*4757*	0	*72.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3976*	0	*4757*	0	*83.6*	*25-137*	0			
Surr: Nitrobenzene-d5	*3179*	0	*4757*	0	*66.8*	*37-107*	0			
Surr: Phenol-d6	*3701*	0	*4757*	0	*77.8*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211517
Project: Marshall KRRI 1100L Sediment 11/15/12

QC BATCH REPORT

Batch ID: **44823** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211466-07A MSD** Units: **µg/Kg** Analysis Date: **11/20/2012 12:03 PM**
Client ID: Run ID: **SVMS7_121119A** SeqNo: **2146648** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1434	47	1861	0	77	45-105	1510	5.17	30	
Acenaphthene	1563	47	1861	0	84	45-110	1578	0.972	30	
Acenaphthylene	1595	47	1861	0	85.7	45-105	1644	3.04	30	
Anthracene	1701	47	1861	0	91.4	55-105	1758	3.32	30	
Benzo(a)anthracene	1696	47	1861	152.4	83	50-110	1820	7.05	30	
Benzo(a)pyrene	1914	47	1861	210.6	91.5	50-110	2027	5.76	30	
Benzo(b)fluoranthene	2226	47	1861	275.6	105	45-115	2068	7.36	30	
Benzo(g,h,i)perylene	1472	47	1861	131	72.1	40-125	1760	17.8	30	
Benzo(k)fluoranthene	1382	47	1861	66.96	70.7	45-115	1910	32.1	30	R
Chrysene	1777	47	1861	191.2	85.2	55-110	1846	3.79	30	
Dibenzo(a,h)anthracene	1451	47	1861	0	78	40-125	1698	15.7	30	
Fluoranthene	1992	47	1861	263	92.9	55-115	2039	2.32	30	
Fluorene	1649	47	1861	0	88.6	50-110	1708	3.52	30	
Indeno(1,2,3-cd)pyrene	1515	47	1861	115.5	75.2	40-120	1784	16.3	30	
Naphthalene	1331	47	1861	0	71.6	40-105	1427	6.94	30	
Phenanthrene	1792	47	1861	64.05	92.9	50-110	1859	3.67	30	
Pyrene	1885	47	1861	273.7	86.6	45-125	1979	4.86	30	
Surr: 2,4,6-Tribromophenol	*4024*	0	*4652*	0	*86.5*	*34-140*	4319	*7.08*	*40*	
Surr: 2-Fluorobiphenyl	*3085*	0	*4652*	0	*66.3*	*12-100*	3269	*5.78*	*40*	
Surr: 2-Fluorophenol	*3137*	0	*4652*	0	*67.4*	*33-117*	3439	*9.18*	*40*	
Surr: 4-Terphenyl-d14	*3665*	0	*4652*	0	*78.8*	*25-137*	3976	*8.14*	*40*	
Surr: Nitrobenzene-d5	*2896*	0	*4652*	0	*62.3*	*37-107*	3179	*9.29*	*40*	
Surr: Phenol-d6	*3428*	0	*4652*	0	*73.7*	*40-106*	3701	*7.67*	*40*	

The following samples were analyzed in this batch: 1211517-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211517
Project: Marshall KRRI 1100L Sediment 11/15/12

QC BATCH REPORT

Batch ID: **R112799** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112799** Units: **% of sample** Analysis Date: **11/19/2012 05:00 PM**
Client ID: Run ID: **MOIST_121119A** SeqNo: **2145097** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112799** Units: **% of sample** Analysis Date: **11/19/2012 05:00 PM**
Client ID: Run ID: **MOIST_121119A** SeqNo: **2145081** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211517-01A DUP** Units: **% of sample** Analysis Date: **11/19/2012 05:00 PM**
Client ID: **SEKR1100L505S111512D006** Run ID: **MOIST_121119A** SeqNo: **2145028** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	66.55	0.050	0	0	0	0-0	62.51	6.26	20	

DUP Sample ID: **1211586-04B DUP** Units: **% of sample** Analysis Date: **11/19/2012 05:00 PM**
Client ID: Run ID: **MOIST_121119A** SeqNo: **2145057** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.1	0.050	0	0	0	0-0	10.74	3.3	20	

The following samples were analyzed in this batch: 1211517-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211517

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111512_GMK2	Task: KRRI_SE1100
Total # of Samples: 1		Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email:	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City / State, Zip	Grand Rapids, MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State, Phone #:	Houson, TX 713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative: None	None	None	None	Analysis: % Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270
1	SEKR1100L505S111512D006	SEKR1100L505	SE	G	11/15/2012 16:05	1						X	X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	11.15.12	1609	[signature]	11.15.12	1609
[signature]	11.15.12	1610 FedEx	[signature]	11/16/12	1000

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
4.2°C	Y/N (Y)	Y/N (Y)	Y/N (N)
	Y/N	Y/N	Y/N

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: GERRY KRAMER (GMK1); SIGNATURE of SAMPLER: [signature]; DATE Signed; Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **16-Nov-12 10:00**

Work Order: **1211517** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 16-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: Sediment
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/16/2012 1:11:56 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: 11-15-12 Time: 1618
Name:
Company:

Seal Broken By:
Date:

FedEx US Airbill

FedEx Express

FedEx Tracking Number 8741 9029 5467

0200 Form ID No.

FedEx Retrieval Copy

1 From
Date 11-15-12 Sender's FedEx Account Number 2138-5929-3
Sender's Name April Mocert Phone [redacted]
Company Superior Environmental Corp
Address 1680 Marquette Ave Street Dept/Floor/Suite/Room
City Bay City State MI ZIP 48706-4178

2 Your Internal Billing Reference BC3279.00 Task 6.00

3 To
Recipient's Name LABORATORY Phone 616 738-7346
Company ALS ENVIRONMENTAL
Address 3352 128th AVE
We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept/Floor/Suite/Room
Address
Use this line for the HOLD location address or for continuation of your shipping address.
City Holland State MI ZIP 49424

01 ☐ HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.
31 ☐ HOLD Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

4a Express Package Service * To most locations. *Packages up to 150 lbs.*
01 ☑ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
05 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.
06 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.*
03 ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

4b Express Freight Service ** To most locations. *Packages over 150 lbs.*
70 ☐ FedEx 1Day Freight — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected. FedEx 1Day Freight Booking No.
80 ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
83 ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.
06 ☐ FedEx Envelope* 02 ☐ FedEx Pak* — Includes FedEx Small Pak and FedEx Large Pak. 03 ☐ FedEx Box 04 ☐ FedEx Tube 01 ☒ Other

6 Special Handling and Delivery Signature Options
03 ☐ **SATURDAY DELIVERY**

☑ No Signature Required — Package may be left without obtaining a signature for delivery.
10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. *Fee applies.*
34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. *Fee applies.*

Does this shipment contain dangerous goods? One box must be checked.
☑ No 04 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 06 ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐
1 ☑ Sender — Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check
[redacted]
Total Packages 1 Total Weight ____ lbs. [redacted] Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

606

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27-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12** Work Order: **1211518**

Dear Bryan,

ALS Environmental received 11 samples on 16-Nov-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 64.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Alex Csaszar

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 27-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12
Work Order: **1211518**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211518-01	SBKR1125I502T111512MX	Soil		11/15/2012	11/16/2012 10:00	☐
1211518-02	SBKR1050R506S111512S006	Soil		11/15/2012 08:35	11/16/2012 10:00	☐
1211518-03	SBKR1050R506D111512S006	Soil		11/15/2012 08:35	11/16/2012 10:00	☐
1211518-04	SBKR1050I501S111512S006	Soil		11/15/2012 09:19	11/16/2012 10:00	☐
1211518-05	SBKR1100L518S111512S005	Soil		11/15/2012 10:03	11/16/2012 10:00	☐
1211518-06	SBKR1100L519S111512S005	Soil		11/15/2012 10:53	11/16/2012 10:00	☐
1211518-07	SBKR1100L520S111512S005	Soil		11/15/2012 11:35	11/16/2012 10:00	☐
1211518-08	SBKR1100L521S111512S007	Soil		11/15/2012 13:55	11/16/2012 10:00	☐
1211518-09	SBKR1125R501S111512S009	Soil		11/15/2012 14:36	11/16/2012 10:00	☐
1211518-10	SBKR1125I502S111512S005	Soil		11/15/2012 15:25	11/16/2012 10:00	☐
1211518-11	SBKR1125I502S111512S013	Soil		11/15/2012 15:30	11/16/2012 10:00	☐

ALS Group USA, Corp

Date: 27-Nov-12

Client:	AECOM Environment
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12
Work Order:	1211518

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44801, MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

Batch 44801, Method VOC_8260_S, Sample LCS-44801: The LCS recoveryies were outside of the upper control limits but within the Sporadic Marginal Exceedence limits for multiple analytes that are not project-specific analytes of concern. No qualification is necessary for these analytes.

Batch 44830, MS/MSD data for MEtals is not related to this project's samples. No data requires qualification.

Batch 44853, Method SVO_8270M_S, Sample 1211518-10A: The internal standard recovery was below the lower control limits, but >20%. The results associated with the IS are being reported and should be considered as estimated for these analytes.

Batch 44854, Method DRO_8015M_S, Sample 1211518-05A MS: The MS recovery was below the control limits for DRO/ORO. The reported result in the parent sample may be biased low.

Batch 44854, Method DRO_8015M_S, Sample 1211518-05A MSD: The MSD recovery was below the control limits for DRO/ORO. The reported result in the parent sample may be biased low.

Batch 44932, MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Update III, June 13, 1997.

ALS Group USA, Corp

Date: 27-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12
WorkOrder: **1211518**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502T111512MX
Work Order:	1211518	**Collection Date:**	11/15/2012
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/17/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/17/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/17/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/17/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/17/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/17/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/17/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/17/2012
Benzene	ND	50	50		µg/Kg	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/17/2012
Bromoform	ND	100	100		µg/Kg	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/17/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/17/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg	1	11/17/2012
Chloroform	ND	50	50		µg/Kg	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg	1	11/17/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/17/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502T111512MX
Work Order:	1211518	**Collection Date:**	11/15/2012
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/17/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/17/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg	1	11/17/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/17/2012
o-Xylene	ND	50	50		µg/Kg	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/17/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/17/2012
Styrene	ND	50	50		µg/Kg	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/17/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/17/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/17/2012
Toluene	ND	100	100		µg/Kg	1	11/17/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/17/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/17/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/17/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*97.0*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*91.2*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*91.6*	*70-130*			*%REC*	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R506S111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 8:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**30**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**360**	**59**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*67.1*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	4.2	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**31**	**4.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**25**	**4.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(a)pyrene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(b)fluoranthene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	**810**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Pyrene	**750**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*70.8*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*72.8*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*78.9*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*95.3*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*71.8*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*81.6*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	91	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	91	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	91	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	91	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R506S111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 8:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	91	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	91	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	91	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	91	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	91	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	91	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	91	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	91	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	300	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	91	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	91	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	91	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R506S111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 8:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	91	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	180	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	91	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	91	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	91	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	91	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	91	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	91	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	91	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	91	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	91	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	91	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	91	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*95.9*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*93.0*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*91.8*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**67**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R506D111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 8:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**28**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**230**	**57**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*44.8*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	4.2	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**25**	**4.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**19**	**4.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	**330**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*44.4*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*49.0*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*55.7*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*67.4*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*51.9*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*54.7*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	92	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	92	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	92	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	92	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R506D111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 8:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	92	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	92	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	92	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	92	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	92	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	92	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	92	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	92	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	310	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	92	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	92	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	92	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050R506D111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 8:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	92	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	180	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	92	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	92	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	92	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	92	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	92	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	92	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	92	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	92	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	92	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	92	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	92	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*98.7*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*94.4*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*91.4*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*92.4*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**68**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050I501S111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 9:19:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**17**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**380**	**34**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*73.5*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	0.97	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	2.4	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**12**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**10**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Anthracene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(a)anthracene	**2,800**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(a)pyrene	**3,000**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(b)fluoranthene	**3,200**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	**1,000**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(k)fluoranthene	**1,500**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Chrysene	**3,100**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	**330**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluoranthene	**4,000**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	**900**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Pyrene	**4,100**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*72.7*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*67.5*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*75.2*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*91.0*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*65.7*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*75.7*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	54	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	54	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	54	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	54	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050I501S111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 9:19:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	54	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	54	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	54	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	54	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	54	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	54	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	54	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	54	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	54	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	54	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	54	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1050I501S111512S006
Work Order:	1211518	**Collection Date:**	11/15/2012 9:19:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	54	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	110	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	54	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	54	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	54	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	54	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	54	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	54	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	54	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	54	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	54	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	54	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	54	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*98.6*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*96.7*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*90.6*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.5*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**45**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L518S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 10:03:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**21**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**290**	**42**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*66.7*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	2.9	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**15**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**19**	**2.9**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	**350**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(a)pyrene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(b)fluoranthene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	**450**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Chrysene	**410**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	**520**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*86.5*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*65.4*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*82.1*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*109*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*69.0*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*75.7*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	64	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	64	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	64	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	64	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L518S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 10:03:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	64	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	64	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	64	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	64	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	64	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	64	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	64	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	64	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	64	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L518S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 10:03:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	64	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	130	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	64	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	64	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	64	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	64	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	64	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	64	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	64	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	64	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	64	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*95.9*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*91.3*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.5*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**53**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L519S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 10:53:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**100**	**22**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**250**	**43**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*56.8*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	3.2	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**18**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**18**	**3.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(b)fluoranthene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	**390**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*61.2*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*61.8*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*69.5*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*83.4*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*63.0*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*68.9*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	68	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	68	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	68	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	68	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L519S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 10:53:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	68	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	68	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	68	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	68	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	68	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	68	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	68	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	68	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	68	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	68	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	68	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L519S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 10:53:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	68	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	68	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	68	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	68	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	68	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	68	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	68	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	68	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	68	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	68	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	68	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	68	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*96.6*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*93.0*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.5*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**56**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L520S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 11:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**250**	**32**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**750**	**64**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*73.0*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	4.3	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**19**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**24**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(b)fluoranthene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	**490**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	**620**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*83.7*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*66.5*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*62.7*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*103*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*60.3*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*73.1*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	110	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	110	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	110	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	110	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	110	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L520S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 11:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	110	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	110	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	110	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	110	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	110	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	350	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	**1,000**	**1,000**	**1,000**		**µg/Kg-dry**	1	11/17/2012
Acrylonitrile	ND	110	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	110	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	110	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	110	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	110	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	110	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	110	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	350	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	110	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	110	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	110	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L520S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 11:35:00 AM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	110	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	110	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	110	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	350	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	110	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	110	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	110	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	110	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	110	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	110	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	110	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	110	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	110	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	110	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	110	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	110	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	110	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*99.9*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*96.2*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*91.8*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.0*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**70**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L521S111512S007
Work Order:	1211518	**Collection Date:**	11/15/2012 1:55:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**75**	**14**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**160**	**29**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*69.6*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	0.89	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	2.2	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**19**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**39**	**2.2**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*74.2*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*66.8*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*74.3*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*66.4*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*76.1*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L521S111512S007
Work Order:	1211518	**Collection Date:**	11/15/2012 1:55:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	46	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	46	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1100L521S111512S007
Work Order:	1211518	**Collection Date:**	11/15/2012 1:55:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	46	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*96.4*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*90.0*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.0*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**35**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125R501S111512S009
Work Order:	1211518	**Collection Date:**	11/15/2012 2:36:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**22**	**4.0**		**mg/Kg-dry**	1	11/21/2012
ORO (C20-C34)	**430**	**43**	**4.0**		**mg/Kg-dry**	1	11/21/2012
Surr: 4-Terphenyl-d14	*72.8*	*39-115*			*%REC*	1	11/21/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	**7.7**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Nickel	**17**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**24**	**3.4**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*85.1*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*73.2*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*81.8*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*99.2*	*25-137*			*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*71.3*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*83.1*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	73	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	73	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	73	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	73	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125R501S111512S009
Work Order:	1211518	**Collection Date:**	11/15/2012 2:36:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	73	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	73	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	73	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	73	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	73	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	73	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	73	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	73	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	73	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125R501S111512S009
Work Order:	1211518	**Collection Date:**	11/15/2012 2:36:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	73	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	150	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	73	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	73	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	73	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	73	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	73	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	73	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	73	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	73	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	73	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*96.8*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*88.4*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*89.8*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**55**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 3:25:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/20/2012**		Analyst: **CW**
DRO (C10-C20)	**3,100**	**610**	**4.0**		**mg/Kg-dry**	10	11/22/2012
ORO (C20-C34)	**15,000**	**1,200**	**4.0**		**mg/Kg-dry**	10	11/22/2012
Surr: 4-Terphenyl-d14	*106*	*39-115*			*%REC*	10	11/22/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	0.82	0.50		mg/Kg-dry	4	11/21/2012
Molybdenum	ND	2.0	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**20**	**2.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**23**	**2.0**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/20/2012**		Analyst: **CW**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/21/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/21/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/21/2012
Benzo(a)anthracene	**740**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Benzo(a)pyrene	ND	330	330	*	µg/Kg-dry	1	11/21/2012
Benzo(b)fluoranthene	ND	330	330	*	µg/Kg-dry	1	11/21/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	11/21/2012
Benzo(k)fluoranthene	ND	330	330	*	µg/Kg-dry	1	11/21/2012
Chrysene	**2,100**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	11/21/2012
Fluoranthene	**1,500**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/21/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	11/21/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/21/2012
Phenanthrene	**590**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Pyrene	**3,200**	**330**	**330**		**µg/Kg-dry**	1	11/21/2012
Surr: 2,4,6-Tribromophenol	*92.3*	*34-140*			*%REC*	1	11/21/2012
Surr: 2-Fluorobiphenyl	*79.7*	*12-100*			*%REC*	1	11/21/2012
Surr: 2-Fluorophenol	*89.9*	*33-117*			*%REC*	1	11/21/2012
Surr: 4-Terphenyl-d14	*203*	*25-137*		S	*%REC*	1	11/21/2012
Surr: Nitrobenzene-d5	*88.1*	*37-107*			*%REC*	1	11/21/2012
Surr: Phenol-d6	*56.0*	*40-106*			*%REC*	1	11/21/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	51	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	51	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	51	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	51	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 3:25:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	51	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	51	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	51	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	51	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	51	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	51	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	51	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	51	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	51	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	51	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	51	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502S111512S005
Work Order:	1211518	**Collection Date:**	11/15/2012 3:25:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	51	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	51	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	51	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	51	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	51	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	51	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	51	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	51	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	51	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	51	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	51	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	51	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*97.4*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*90.1*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*90.6*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**37**	**0.050**	**0**		**% of sample**	1	11/21/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502S111512S013
Work Order:	1211518	**Collection Date:**	11/15/2012 3:30:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/26/2012**		Analyst: **CW**
DRO (C10-C20)	**91**	**19**	**4.0**		**mg/Kg-dry**	1	11/26/2012
ORO (C20-C34)	**260**	**37**	**4.0**		**mg/Kg-dry**	1	11/26/2012
Surr: 4-Terphenyl-d14	*67.4*	*39-115*			*%REC*	1	11/26/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/19/2012**		Analyst: **RH**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/20/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/20/2012
Nickel	**18**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
Vanadium	**21**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/20/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/26/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/26/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/26/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/26/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/26/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/26/2012
Benzo(a)pyrene	**360**	**330**	**330**		**µg/Kg-dry**	1	11/26/2012
Benzo(b)fluoranthene	**370**	**330**	**330**		**µg/Kg-dry**	1	11/26/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/26/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/26/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/26/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/26/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/26/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/26/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/26/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/26/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/26/2012
Pyrene	**460**	**330**	**330**		**µg/Kg-dry**	1	11/26/2012
Surr: 2,4,6-Tribromophenol	*86.4*	*34-140*			*%REC*	1	11/26/2012
Surr: 2-Fluorobiphenyl	*70.1*	*12-100*			*%REC*	1	11/26/2012
Surr: 2-Fluorophenol	*75.6*	*33-117*			*%REC*	1	11/26/2012
Surr: 4-Terphenyl-d14	*74.8*	*25-137*			*%REC*	1	11/26/2012
Surr: Nitrobenzene-d5	*69.9*	*37-107*			*%REC*	1	11/26/2012
Surr: Phenol-d6	*78.9*	*40-106*			*%REC*	1	11/26/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/16/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,1,1-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/17/2012
1,1,2,2-Tetrachloroethane	ND	59	50		µg/Kg-dry	1	11/17/2012
1,1,2-Trichloroethane	ND	59	50		µg/Kg-dry	1	11/17/2012
1,1-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502S111512S013
Work Order:	1211518	**Collection Date:**	11/15/2012 3:30:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/17/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dibromo-3-chloropropane	ND	59	10		µg/Kg-dry	1	11/17/2012
1,2-Dibromoethane	ND	59	20		µg/Kg-dry	1	11/17/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,2-Dichloroethane	ND	59	50		µg/Kg-dry	1	11/17/2012
1,2-Dichloropropane	ND	59	50		µg/Kg-dry	1	11/17/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/17/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/17/2012
Benzene	ND	59	50		µg/Kg-dry	1	11/17/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/17/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/17/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/17/2012
Carbon tetrachloride	ND	59	50		µg/Kg-dry	1	11/17/2012
Chlorobenzene	ND	59	50		µg/Kg-dry	1	11/17/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Chloroform	ND	59	50		µg/Kg-dry	1	11/17/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
cis-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/17/2012
cis-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/17/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/17/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/17/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/17/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *27-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1125I502S111512S013
Work Order:	1211518	**Collection Date:**	11/15/2012 3:30:00 PM
Project:	Marshall KRRI 1050-1125R,1050-1125I,1100L 11/15/12		
Lab ID:	1211518-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	59	50		µg/Kg-dry	1	11/17/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/17/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/17/2012
m,p-Xylene	ND	120	100		µg/Kg-dry	1	11/17/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/17/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/17/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/17/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/17/2012
n-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/17/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/17/2012
o-Xylene	ND	59	50		µg/Kg-dry	1	11/17/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/17/2012
sec-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/17/2012
Styrene	ND	59	50		µg/Kg-dry	1	11/17/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/17/2012
tert-Butylbenzene	ND	59	50		µg/Kg-dry	1	11/17/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/17/2012
Tetrachloroethene	ND	59	50		µg/Kg-dry	1	11/17/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/17/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/17/2012
trans-1,2-Dichloroethene	ND	59	50		µg/Kg-dry	1	11/17/2012
trans-1,3-Dichloropropene	ND	59	50		µg/Kg-dry	1	11/17/2012
trans-1,4-Dichloro-2-butene	ND	59	50		µg/Kg-dry	1	11/17/2012
Trichloroethene	ND	59	50		µg/Kg-dry	1	11/17/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/17/2012
Vinyl chloride	ND	59	40		µg/Kg-dry	1	11/17/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/17/2012
Surr: 4-Bromofluorobenzene	*95.2*	*70-130*			*%REC*	1	11/17/2012
Surr: Dibromofluoromethane	*91.2*	*70-130*			*%REC*	1	11/17/2012
Surr: Toluene-d8	*89.2*	*70-130*			*%REC*	1	11/17/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/20/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44854** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44854-44854** Units: **mg/Kg** Analysis Date: **11/21/2012 08:10 A**

Client ID: Run ID: **GC8_121120B** SeqNo: **2148237** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.206*	0	*5*	0	*64.1*	*39-115*	0			

LCS Sample ID: **DLCSS1-44854-44854** Units: **mg/Kg** Analysis Date: **11/21/2012 08:37 A**

Client ID: Run ID: **GC8_121120B** SeqNo: **2148238** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	309.8	10	500	0	62	49-124	0			
ORO (C20-C34)	321.4	20	500	0	64.3	60-130	0			
Surr: 4-Terphenyl-d14	*4.277*	0	*5*	0	*85.5*	*39-115*	0			

MS Sample ID: **1211518-05A MS** Units: **mg/Kg** Analysis Date: **11/21/2012 09:04 A**

Client ID: **SBKR1100L518S111512S005** Run ID: **GC8_121120B** SeqNo: **2148239** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.1	9.9	494.2	54.09	51.8	60-130	0			S
ORO (C20-C34)	341.6	20	494.2	134.6	41.9	60-130	0			S
Surr: 4-Terphenyl-d14	*4.007*	0	*4.942*	0	*81.1*	*39-115*	0			

MSD Sample ID: **1211518-05A MSD** Units: **mg/Kg** Analysis Date: **11/21/2012 09:30 A**

Client ID: **SBKR1100L518S111512S005** Run ID: **GC8_121120B** SeqNo: **2148240** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	321.7	9.5	474.2	54.09	56.4	60-130	310.1	3.66	30	S
ORO (C20-C34)	381	19	474.2	134.6	52	60-130	341.6	10.9	30	S
Surr: 4-Terphenyl-d14	*4.014*	0	*4.742*	0	*84.6*	*39-115*	4.007	*0.163*	*30*	

The following samples were analyzed in this batch:

1211518-02A	1211518-03A	1211518-04A
1211518-05A	1211518-06A	1211518-07A
1211518-08A	1211518-09A	1211518-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **44932** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44932-44932** Units: **mg/Kg** Analysis Date: **11/26/2012 05:05 PM**
Client ID: Run ID: **GC8_121126A** SeqNo: **2150299** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.102*	0	*5*	0	*62*	*39-115*	0			

LCS Sample ID: **DLCSS1-44932-44932** Units: **mg/Kg** Analysis Date: **11/26/2012 05:32 PM**
Client ID: Run ID: **GC8_121126A** SeqNo: **2150300** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.3	10	500	0	62.1	49-124	0			
ORO (C20-C34)	345.1	20	500	0	69	60-130	0			
Surr: 4-Terphenyl-d14	*3.848*	0	*5*	0	*77*	*39-115*	0			

MS Sample ID: **1211707-04C MS** Units: **mg/Kg** Analysis Date: **11/26/2012 05:59 PM**
Client ID: Run ID: **GC8_121126A** SeqNo: **2150301** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	152	6.4	320.5	19.58	41.3	60-130	0			S
ORO (C20-C34)	231.9	13	320.5	61.52	53.2	60-130	0			S
Surr: 4-Terphenyl-d14	*2.011*	0	*3.205*	0	*62.7*	*39-115*	0			

MSD Sample ID: **1211707-04C MSD** Units: **mg/Kg** Analysis Date: **11/26/2012 06:26 PM**
Client ID: Run ID: **GC8_121126A** SeqNo: **2150302** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	183.8	6.6	331	19.58	49.6	60-130	152	18.9	30	S
ORO (C20-C34)	274.4	13	331	61.52	64.3	60-130	231.9	16.8	30	
Surr: 4-Terphenyl-d14	*2.63*	0	*3.31*	0	*79.4*	*39-115*	2.011	*26.7*	*30*	

The following samples were analyzed in this batch: 1211518-11A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **44830** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44830-44830** Units: **mg/Kg** Analysis Date: **11/20/2012 03:42 A**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145204** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01105	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44830-44830** Units: **mg/Kg** Analysis Date: **11/20/2012 03:48 A**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145205** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.444	0.10	5	0	88.9	80-120	0			
Molybdenum	4.716	0.25	5	0	94.3	80-120	0			
Nickel	4.605	0.25	5	0	92.1	80-120	0			
Vanadium	4.79	0.25	5	0	95.8	80-120	0			

MS Sample ID: **1211466-07AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 04:56 A**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145233** Prep Date: **11/19/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.997	0.56	7.022	0.1503	83.3	75-125	0			
Molybdenum	6.469	1.4	7.022	0.6183	83.3	75-125	0			
Nickel	13.13	1.4	7.022	6.514	94.3	75-125	0			
Vanadium	14.2	1.4	7.022	5.917	118	75-125	0			

MSD Sample ID: **1211466-07AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 05:02 A**
Client ID: Run ID: **ICPMS1_121119A** SeqNo: **2145237** Prep Date: **11/19/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.04	0.53	6.64	0.1503	88.7	75-125	5.997	0.709	25	
Molybdenum	6.842	1.3	6.64	0.6183	93.7	75-125	6.469	5.6	25	
Nickel	13.31	1.3	6.64	6.514	102	75-125	13.13	1.3	25	
Vanadium	14.88	1.3	6.64	5.917	135	75-125	14.2	4.68	25	S

The following samples were analyzed in this batch:

1211518-02A	1211518-03A	1211518-04A
1211518-05A	1211518-06A	1211518-07A
1211518-08A	1211518-09A	1211518-10A
1211518-11A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44853** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44853-44853** Units: **µg/Kg** Analysis Date: **11/21/2012 04:35 PM**
Client ID: Run ID: **SVMS4_121121A** SeqNo: **2149282** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3512*	0	*5000*	0	*70.2*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3728*	0	*5000*	0	*74.6*	*12-100*	0			
Surr: 2-Fluorophenol	*4932*	0	*5000*	0	*98.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6701*	0	*5000*	0	*134*	*25-137*	0			
Surr: Nitrobenzene-d5	*4069*	0	*5000*	0	*81.4*	*37-107*	0			
Surr: Phenol-d6	*4473*	0	*5000*	0	*89.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **44853** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44853-44853** Units: **µg/Kg** Analysis Date: **11/21/2012 05:07 PM**
Client ID: Run ID: **SVMS4_121121A** SeqNo: **2149284** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1585	50	2000	0	79.2	45-105	0			
Acenaphthene	1586	50	2000	0	79.3	45-110	0			
Acenaphthylene	1473	50	2000	0	73.6	45-105	0			
Anthracene	1648	50	2000	0	82.4	55-105	0			
Benzo(a)anthracene	1595	50	2000	0	79.8	50-110	0			
Benzo(a)pyrene	1550	50	2000	0	77.5	50-110	0			
Benzo(b)fluoranthene	1890	50	2000	0	94.5	45-115	0			
Benzo(g,h,i)perylene	1754	50	2000	0	87.7	40-125	0			
Benzo(k)fluoranthene	1516	50	2000	0	75.8	45-115	0			
Chrysene	1764	50	2000	0	88.2	55-110	0			
Dibenzo(a,h)anthracene	1587	50	2000	0	79.4	40-125	0			
Fluoranthene	1649	50	2000	0	82.4	55-115	0			
Fluorene	1573	50	2000	0	78.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1748	50	2000	0	87.4	40-120	0			
Naphthalene	1403	50	2000	0	70.2	40-105	0			
Phenanthrene	1621	50	2000	0	81	50-110	0			
Pyrene	1851	50	2000	0	92.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*3772*	0	*5000*	0	*75.4*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3562*	0	*5000*	0	*71.2*	*12-100*	0			
Surr: 2-Fluorophenol	*4432*	0	*5000*	0	*88.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5712*	0	*5000*	0	*114*	*25-137*	0			
Surr: Nitrobenzene-d5	*3877*	0	*5000*	0	*77.5*	*37-107*	0			
Surr: Phenol-d6	*4197*	0	*5000*	0	*83.9*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44853** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1211518-05A MS** Units: **µg/Kg** Analysis Date: **11/21/2012 05:38 PM**
Client ID: **SBKR1100L518S111512S005** Run ID: **SVMS4_121121A** SeqNo: **2149285** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1340	47	1885	0	71.1	45-105	0			
Acenaphthene	1382	47	1885	0	73.3	45-110	0			
Acenaphthylene	1285	47	1885	146.5	60.4	45-105	0			
Anthracene	1460	47	1885	0	77.4	55-105	0			
Benzo(a)anthracene	1566	47	1885	166.2	74.3	50-110	0			
Benzo(a)pyrene	1526	47	1885	304.8	64.8	50-110	0			
Benzo(b)fluoranthene	2003	47	1885	215.4	94.8	45-115	0			
Benzo(g,h,i)perylene	1466	47	1885	120	71.4	40-125	0			
Benzo(k)fluoranthene	1470	47	1885	210.4	66.8	45-115	0			
Chrysene	1695	47	1885	194.7	79.6	55-110	0			
Dibenzo(a,h)anthracene	1316	47	1885	127.8	63	40-125	0			
Fluoranthene	1590	47	1885	275.3	69.7	55-115	0			
Fluorene	1412	47	1885	0	74.9	50-110	0			
Indeno(1,2,3-cd)pyrene	1484	47	1885	102.3	73.3	40-120	0			
Naphthalene	1176	47	1885	0	62.4	40-105	0			
Phenanthrene	1530	47	1885	118	74.9	50-110	0			
Pyrene	1604	47	1885	244.9	72.1	45-125	0			
Surr: 2,4,6-Tribromophenol	*3950*	0	*4713*	0	*83.8*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3100*	0	*4713*	0	*65.8*	*12-100*	0			
Surr: 2-Fluorophenol	*3664*	0	*4713*	0	*77.7*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4518*	0	*4713*	0	*95.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*3191*	0	*4713*	0	*67.7*	*37-107*	0			
Surr: Phenol-d6	*3443*	0	*4713*	0	*73.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44853** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1211518-05A MSD** Units: **µg/Kg** Analysis Date: **11/21/2012 06:10 PM**
Client ID: **SBKR1100L518S111512S005** Run ID: **SVMS4_121121A** SeqNo: **2149286** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1328	48	1911	0	69.5	45-105	1340	0.881	30	
Acenaphthene	1379	48	1911	0	72.2	45-110	1382	0.186	30	
Acenaphthylene	1298	48	1911	146.5	60.2	45-105	1285	1.03	30	
Anthracene	1457	48	1911	0	76.2	55-105	1460	0.232	30	
Benzo(a)anthracene	1604	48	1911	166.2	75.2	50-110	1566	2.35	30	
Benzo(a)pyrene	1536	48	1911	304.8	64.4	50-110	1526	0.651	30	
Benzo(b)fluoranthene	2011	48	1911	215.4	93.9	45-115	2003	0.402	30	
Benzo(g,h,i)perylene	1264	48	1911	120	59.9	40-125	1466	14.7	30	
Benzo(k)fluoranthene	1587	48	1911	210.4	72	45-115	1470	7.66	30	
Chrysene	1611	48	1911	194.7	74.1	55-110	1695	5.04	30	
Dibenzo(a,h)anthracene	1185	48	1911	127.8	55.3	40-125	1316	10.4	30	
Fluoranthene	1675	48	1911	275.3	73.2	55-115	1590	5.23	30	
Fluorene	1409	48	1911	0	73.7	50-110	1412	0.22	30	
Indeno(1,2,3-cd)pyrene	1305	48	1911	102.3	62.9	40-120	1484	12.8	30	
Naphthalene	1178	48	1911	0	61.6	40-105	1176	0.186	30	
Phenanthrene	1507	48	1911	118	72.7	50-110	1530	1.48	30	
Pyrene	1673	48	1911	244.9	74.7	45-125	1604	4.18	30	
Surr: 2,4,6-Tribromophenol	*4037*	0	*4779*	0	*84.5*	*34-140*	3950	*2.18*	*40*	
Surr: 2-Fluorobiphenyl	*3148*	0	*4779*	0	*65.9*	*12-100*	3100	*1.55*	*40*	
Surr: 2-Fluorophenol	*3708*	0	*4779*	0	*77.6*	*33-117*	3664	*1.21*	*40*	
Surr: 4-Terphenyl-d14	*4540*	0	*4779*	0	*95*	*25-137*	4518	*0.473*	*40*	
Surr: Nitrobenzene-d5	*3156*	0	*4779*	0	*66*	*37-107*	3191	*1.12*	*40*	
Surr: Phenol-d6	*3508*	0	*4779*	0	*73.4*	*40-106*	3443	*1.86*	*40*	

The following samples were analyzed in this batch:

1211518-02A	1211518-03A	1211518-04A
1211518-05A	1211518-06A	1211518-07A
1211518-08A	1211518-09A	1211518-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44933** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44933-44933** Units: **µg/Kg** Analysis Date: **11/26/2012 05:00 PM**
Client ID: Run ID: **SVMS7_121126A** SeqNo: **2149538** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3865*	0	*5000*	0	*77.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3615*	0	*5000*	0	*72.3*	*12-100*	0			
Surr: 2-Fluorophenol	*3807*	0	*5000*	0	*76.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3802*	0	*5000*	0	*76*	*25-137*	0			
Surr: Nitrobenzene-d5	*3611*	0	*5000*	0	*72.2*	*37-107*	0			
Surr: Phenol-d6	*4215*	0	*5000*	0	*84.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44933** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44933-44933** Units: **µg/Kg** Analysis Date: **11/26/2012 05:28 PM**
Client ID: Run ID: **SVMS7_121126A** SeqNo: **2149539** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1708	50	2000	0	85.4	45-105	0			
Acenaphthene	1745	50	2000	0	87.2	45-110	0			
Acenaphthylene	1799	50	2000	0	90	45-105	0			
Anthracene	1796	50	2000	0	89.8	55-105	0			
Benzo(a)anthracene	1824	50	2000	0	91.2	50-110	0			
Benzo(a)pyrene	1853	50	2000	0	92.6	50-110	0			
Benzo(b)fluoranthene	1772	50	2000	0	88.6	45-115	0			
Benzo(g,h,i)perylene	1670	50	2000	0	83.5	40-125	0			
Benzo(k)fluoranthene	1925	50	2000	0	96.2	45-115	0			
Chrysene	1792	50	2000	0	89.6	55-110	0			
Dibenzo(a,h)anthracene	1715	50	2000	0	85.8	40-125	0			
Fluoranthene	1808	50	2000	0	90.4	55-115	0			
Fluorene	1792	50	2000	0	89.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1722	50	2000	0	86.1	40-120	0			
Naphthalene	1701	50	2000	0	85	40-105	0			
Phenanthrene	1814	50	2000	0	90.7	50-110	0			
Pyrene	1837	50	2000	0	91.8	45-125	0			
Surr: 2,4,6-Tribromophenol	*4204*	0	*5000*	0	*84.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3754*	0	*5000*	0	*75.1*	*12-100*	0			
Surr: 2-Fluorophenol	*3950*	0	*5000*	0	*79*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4046*	0	*5000*	0	*80.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*3812*	0	*5000*	0	*76.2*	*37-107*	0			
Surr: Phenol-d6	*4079*	0	*5000*	0	*81.6*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44933** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1211518-11A MS** Units: **µg/Kg** Analysis Date: **11/26/2012 06:52 PM**
Client ID: **SBKR1125I502S111512S013** Run ID: **SVMS7_121126A** SeqNo: **2149599** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1602	50	1981	0	80.9	45-105	0			
Acenaphthene	1640	50	1981	0	82.8	45-110	0			
Acenaphthylene	1717	50	1981	0	86.7	45-105	0			
Anthracene	1866	50	1981	0	94.2	55-105	0			
Benzo(a)anthracene	1968	50	1981	106	94	50-110	0			
Benzo(a)pyrene	1924	50	1981	187	87.7	50-110	0			
Benzo(b)fluoranthene	2083	50	1981	192.8	95.4	45-115	0			
Benzo(g,h,i)perylene	1602	50	1981	101.2	75.8	40-125	0			
Benzo(k)fluoranthene	1614	50	1981	108	76	45-115	0			
Chrysene	1937	50	1981	154.2	90	55-110	0			
Dibenzo(a,h)anthracene	1631	50	1981	0	82.4	40-125	0			
Fluoranthene	2020	50	1981	150.4	94.4	55-115	0			
Fluorene	1740	50	1981	0	87.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1697	50	1981	84.84	81.4	40-120	0			
Naphthalene	1586	50	1981	0	80.1	40-105	0			
Phenanthrene	1925	50	1981	0	97.2	50-110	0			
Pyrene	2128	50	1981	240	95.3	45-125	0			
Surr: 2,4,6-Tribromophenol	*4427*	0	*4951*	0	*89.4*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3449*	0	*4951*	0	*69.7*	*12-100*	0			
Surr: 2-Fluorophenol	*3776*	0	*4951*	0	*76.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4272*	0	*4951*	0	*86.3*	*25-137*	0			
Surr: Nitrobenzene-d5	*3610*	0	*4951*	0	*72.9*	*37-107*	0			
Surr: Phenol-d6	*3927*	0	*4951*	0	*79.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **44933** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1211518-11A MSD** Units: **µg/Kg** Analysis Date: **11/26/2012 07:21 PM**
Client ID: **SBKR1125I502S111512S013** Run ID: **SVMS7_121126A** SeqNo: **2149600** Prep Date: **11/26/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1474	46	1853	0	79.6	45-105	1602	8.33	30	
Acenaphthene	1526	46	1853	0	82.4	45-110	1640	7.2	30	
Acenaphthylene	1618	46	1853	0	87.3	45-105	1717	5.96	30	
Anthracene	1642	46	1853	0	88.6	55-105	1866	12.8	30	
Benzo(a)anthracene	1694	46	1853	106	85.7	50-110	1968	15	30	
Benzo(a)pyrene	1794	46	1853	187	86.7	50-110	1924	7.01	30	
Benzo(b)fluoranthene	1816	46	1853	192.8	87.6	45-115	2083	13.7	30	
Benzo(g,h,i)perylene	1370	46	1853	101.2	68.5	40-125	1602	15.6	30	
Benzo(k)fluoranthene	1603	46	1853	108	80.7	45-115	1614	0.702	30	
Chrysene	1747	46	1853	154.2	86	55-110	1937	10.3	30	
Dibenzo(a,h)anthracene	1438	46	1853	0	77.6	40-125	1631	12.6	30	
Fluoranthene	1819	46	1853	150.4	90	55-115	2020	10.5	30	
Fluorene	1627	46	1853	0	87.8	50-110	1740	6.71	30	
Indeno(1,2,3-cd)pyrene	1492	46	1853	84.84	75.9	40-120	1697	12.9	30	
Naphthalene	1480	46	1853	0	79.8	40-105	1586	6.97	30	
Phenanthrene	1711	46	1853	0	92.4	50-110	1925	11.8	30	
Pyrene	1868	46	1853	240	87.8	45-125	2128	13	30	
Surr: 2,4,6-Tribromophenol	*3841*	0	*4633*	0	*82.9*	*34-140*	4427	*14.2*	*40*	
Surr: 2-Fluorobiphenyl	*3274*	0	*4633*	0	*70.7*	*12-100*	3449	*5.2*	*40*	
Surr: 2-Fluorophenol	*3448*	0	*4633*	0	*74.4*	*33-117*	3776	*9.09*	*40*	
Surr: 4-Terphenyl-d14	*3669*	0	*4633*	0	*79.2*	*25-137*	4272	*15.2*	*40*	
Surr: Nitrobenzene-d5	*3376*	0	*4633*	0	*72.9*	*37-107*	3610	*6.68*	*40*	
Surr: Phenol-d6	*3657*	0	*4633*	0	*78.9*	*40-106*	3927	*7.11*	*40*	

The following samples were analyzed in this batch: 1211518-11A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44801-44801** Units: **µg/Kg** Analysis Date: **11/16/2012 12:11 PM**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143248** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	151.5	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	17	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1022*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*964*	0	*1000*	0	*96.4*	*70-130*	0
Surr: Dibromofluoromethane	*930.5*	0	*1000*	0	*93*	*70-130*	0
Surr: Toluene-d8	*947.5*	0	*1000*	0	*94.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44801-44801** Units: **µg/Kg** Analysis Date: **11/17/2012 12:58 PM**
Client ID: Run ID: **VMS9_121116B** SeqNo: **2143418** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	128	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	17.5	100					J
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*997.5*	0	*1000*	0	*99.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*955.5*	0	*1000*	0	*95.6*	*70-130*	0
Surr: Dibromofluoromethane	*910.5*	0	*1000*	0	*91*	*70-130*	0
Surr: Toluene-d8	*922.5*	0	*1000*	0	*92.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44801-44801** Units: **µg/Kg** Analysis Date: **11/16/2012 10:54 A**
Client ID: Run ID: **VMS9_121116A** SeqNo: **2143247** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	980.5	30	1000	0	98	75-125	0			
1,1,1-Trichloroethane	1063	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	939	30	1000	0	93.9	55-130	0			
1,1,2-Trichloroethane	892	30	1000	0	89.2	60-125	0			
1,1-Dichloroethane	1016	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1136	30	1000	0	114	65-135	0			
1,2,3-Trichlorobenzene	942	30	1000	0	94.2	60-135	0			
1,2,3-Trichloropropane	968	30	1000	0	96.8	65-130	0			
1,2,4-Trichlorobenzene	978.5	30	1000	0	97.8	65-130	0			
1,2,4-Trimethylbenzene	1031	30	1000	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	910.5	30	1000	0	91	40-135	0			
1,2-Dibromoethane	971.5	30	1000	0	97.2	70-125	0			
1,2-Dichlorobenzene	903.5	30	1000	0	90.4	75-120	0			
1,2-Dichloroethane	960.5	30	1000	0	96	70-135	0			
1,2-Dichloropropane	1006	30	1000	0	101	70-120	0			
1,3,5-Trimethylbenzene	1034	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	914	30	1000	0	91.4	70-125	0			
1,4-Dichlorobenzene	927.5	30	1000	0	92.8	70-125	0			
2-Butanone	1002	200	1000	0	100	30-160	0			
2-Hexanone	961.5	30	1000	0	96.2	45-145	0			
4-Methyl-2-pentanone	1114	30	1000	0	111	45-145	0			
Acetone	1198	100	1000	0	120	20-160	0			B
Acrylonitrile	1018	100	1000	0	102	70-135	0			
Benzene	1006	30	1000	0	101	75-125	0			
Bromobenzene	941.5	30	1000	0	94.2	65-120	0			
Bromochloromethane	1033	30	1000	0	103	70-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	968	30	1000	0	96.8	55-135	0			
Bromomethane	1169	75	1000	0	117	30-160	0			
Carbon disulfide	1370	30	1000	0	137	45-160	0			
Carbon tetrachloride	1109	30	1000	0	111	65-135	0			
Chlorobenzene	944	30	1000	0	94.4	75-125	0			
Chloroethane	998.5	100	1000	0	99.8	40-155	0			
Chloroform	1044	30	1000	0	104	70-125	0			
Chloromethane	1074	100	1000	0	107	50-130	0			
cis-1,2-Dichloroethene	1088	30	1000	0	109	65-125	0			
cis-1,3-Dichloropropene	969.5	30	1000	0	97	70-125	0			
Dibromochloromethane	941	30	1000	0	94.1	65-135	0			
Dibromomethane	1001	30	1000	0	100	75-130	0			
Dichlorodifluoromethane	861	30	1000	0	86.1	35-135	0			
Ethylbenzene	985.5	30	1000	0	98.6	75-125	0			
Hexachloroethane	1048	30	1000	0	105	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1040	30	1000	0	104	75-130	0
m,p-Xylene	1952	60	2000	0	97.6	80-125	0
Methyl tert-butyl ether	1022	30	1000	0	102	75-125	0
Methylene chloride	1004	30	1000	0	100	55-145	0
Naphthalene	925	100	1000	0	92.5	40-140	0
n-Butylbenzene	1088	30	1000	0	109	65-140	0
n-Propylbenzene	1024	30	1000	0	102	65-135	0
o-Xylene	975	30	1000	0	97.5	75-125	0
p-Isopropyltoluene	1018	30	1000	0	102	75-135	0
sec-Butylbenzene	1090	30	1000	0	109	65-130	0
Styrene	1027	30	1000	0	103	75-125	0
tert-Butylbenzene	1028	30	1000	0	103	65-130	0
Tetrachloroethene	994.5	30	1000	0	99.4	64-140	0
Tetrahydrofuran	901	200	1000	0	90.1	70-135	0
Toluene	921.5	30	1000	0	92.2	70-125	0
trans-1,2-Dichloroethene	1096	30	1000	0	110	65-135	0
trans-1,3-Dichloropropene	947	30	1000	0	94.7	65-125	0
trans-1,4-Dichloro-2-butene	932.5	30	1000	0	93.2	70-135	0
Trichloroethene	1026	30	1000	0	103	75-125	0
Trichlorofluoromethane	1070	30	1000	0	107	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1033*	0	*1000*	0	*103*	*70-130*	0
Surr: Dibromofluoromethane	*1042*	0	*1000*	0	*104*	*70-130*	0
Surr: Toluene-d8	*961.5*	0	*1000*	0	*96.2*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44801-44801** Units: **µg/Kg** Analysis Date: **11/16/2012 11:41 PM**
Client ID: Run ID: **VMS9_121116B** SeqNo: **2143417** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1091	30	1000	0	109	75-125	0			
1,1,1-Trichloroethane	1239	30	1000	0	124	70-135	0			
1,1,2,2-Tetrachloroethane	1055	30	1000	0	106	55-130	0			
1,1,2-Trichloroethane	997.5	30	1000	0	99.8	60-125	0			
1,1-Dichloroethane	1230	30	1000	0	123	75-125	0			
1,1-Dichloroethene	1321	30	1000	0	132	65-135	0			
1,2,3-Trichlorobenzene	993	30	1000	0	99.3	60-135	0			
1,2,3-Trichloropropane	1061	30	1000	0	106	65-130	0			
1,2,4-Trichlorobenzene	997.5	30	1000	0	99.8	65-130	0			
1,2,4-Trimethylbenzene	1106	30	1000	0	111	65-135	0			
1,2-Dibromo-3-chloropropane	1036	30	1000	0	104	40-135	0			
1,2-Dibromoethane	1097	30	1000	0	110	70-125	0			
1,2-Dichlorobenzene	981	30	1000	0	98.1	75-120	0			
1,2-Dichloroethane	1116	30	1000	0	112	70-135	0			
1,2-Dichloropropane	1180	30	1000	0	118	70-120	0			
1,3,5-Trimethylbenzene	1098	30	1000	0	110	65-135	0			
1,3-Dichlorobenzene	989.5	30	1000	0	99	70-125	0			
1,4-Dichlorobenzene	1002	30	1000	0	100	70-125	0			
2-Butanone	1435	200	1000	0	144	30-160	0			
2-Hexanone	1130	30	1000	0	113	45-145	0			
4-Methyl-2-pentanone	1328	30	1000	0	133	45-145	0			
Acetone	1584	100	1000	0	158	20-160	0			B
Acrylonitrile	1258	100	1000	0	126	70-135	0			
Benzene	1164	30	1000	0	116	75-125	0			
Bromobenzene	1028	30	1000	0	103	65-120	0			
Bromochloromethane	1258	30	1000	0	126	70-125	0			S
Bromodichloromethane	1212	30	1000	0	121	70-130	0			
Bromoform	1078	30	1000	0	108	55-135	0			
Bromomethane	1462	75	1000	0	146	30-160	0			
Carbon disulfide	1594	30	1000	0	159	45-160	0			
Carbon tetrachloride	1266	30	1000	0	127	65-135	0			
Chlorobenzene	1035	30	1000	0	104	75-125	0			
Chloroethane	1188	100	1000	0	119	40-155	0			
Chloroform	1256	30	1000	0	126	70-125	0			S
Chloromethane	1300	100	1000	0	130	50-130	0			S
cis-1,2-Dichloroethene	1284	30	1000	0	128	65-125	0			S
cis-1,3-Dichloropropene	1130	30	1000	0	113	70-125	0			
Dibromochloromethane	1073	30	1000	0	107	65-135	0			
Dibromomethane	1178	30	1000	0	118	75-130	0			
Dichlorodifluoromethane	949.5	30	1000	0	95	35-135	0			
Ethylbenzene	1088	30	1000	0	109	75-125	0			
Hexachloroethane	1114	30	1000	0	111	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	1121	30	1000	0	112	75-130	0	
m,p-Xylene	2137	60	2000	0	107	80-125	0	
Methyl tert-butyl ether	1225	30	1000	0	122	75-125	0	
Methylene chloride	1283	30	1000	0	128	55-145	0	
Naphthalene	1038	100	1000	0	104	40-140	0	
n-Butylbenzene	1072	30	1000	0	107	65-140	0	
n-Propylbenzene	1090	30	1000	0	109	65-135	0	
o-Xylene	1074	30	1000	0	107	75-125	0	
p-Isopropyltoluene	1090	30	1000	0	109	75-135	0	
sec-Butylbenzene	1122	30	1000	0	112	65-130	0	
Styrene	1134	30	1000	0	113	75-125	0	
tert-Butylbenzene	1084	30	1000	0	108	65-130	0	
Tetrachloroethene	1026	30	1000	0	103	64-140	0	
Tetrahydrofuran	1192	200	1000	0	119	70-135	0	
Toluene	1018	30	1000	0	102	70-125	0	
trans-1,2-Dichloroethene	1290	30	1000	0	129	65-135	0	
trans-1,3-Dichloropropene	1046	30	1000	0	105	65-125	0	
trans-1,4-Dichloro-2-butene	1022	30	1000	0	102	70-135	0	
Trichloroethene	1176	30	1000	0	118	75-125	0	
Trichlorofluoromethane	1246	30	1000	0	125	25-185	0	
Vinyl chloride	1261	30	1000	0	126	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1002*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1020*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1056*	0	*1000*	0	*106*	*70-130*	0	
Surr: Toluene-d8	*939*	0	*1000*	0	*93.9*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **1211466-07B MS** Units: **µg/Kg** Analysis Date: **11/17/2012 09:57 A**

Client ID: Run ID: **VMS9_121116B** SeqNo: **2143399** Prep Date: **11/16/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	3412	110	3651	0	93.4	75-125	0			
1,1,1-Trichloroethane	3940	110	3651	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	3764	110	3651	0	103	55-130	0			
1,1,2-Trichloroethane	3505	110	3651	0	96	60-125	0			
1,1-Dichloroethane	4363	110	3651	0	120	75-125	0			
1,1-Dichloroethene	4617	110	3651	0	126	65-135	0			
1,2,3-Trichlorobenzene	3156	110	3651	0	86.4	60-135	0			
1,2,3-Trichloropropane	3830	110	3651	0	105	65-130	0			
1,2,4-Trichlorobenzene	3235	110	3651	0	88.6	65-130	0			
1,2,4-Trimethylbenzene	3941	110	3651	0	108	65-135	0			
1,2-Dibromo-3-chloropropane	3089	110	3651	0	84.6	40-135	0			
1,2-Dibromoethane	3750	110	3651	0	103	70-125	0			
1,2-Dichlorobenzene	3301	110	3651	0	90.4	75-120	0			
1,2-Dichloroethane	4117	110	3651	0	113	70-135	0			
1,2-Dichloropropane	4108	110	3651	0	112	70-120	0			
1,3,5-Trimethylbenzene	3903	110	3651	0	107	65-135	0			
1,3-Dichlorobenzene	3293	110	3651	0	90.2	70-125	0			
1,4-Dichlorobenzene	3350	110	3651	0	91.8	70-125	0			
2-Butanone	4946	730	3651	0	135	30-160	0			
2-Hexanone	4093	110	3651	0	112	45-145	0			
4-Methyl-2-pentanone	4714	110	3651	0	129	45-145	0			
Acetone	6632	370	3651	0	182	20-160	0			BS
Acrylonitrile	4977	370	3651	0	136	70-135	0			S
Benzene	4111	110	3651	0	113	75-125	0			
Bromobenzene	3699	110	3651	0	101	65-120	0			
Bromochloromethane	4675	110	3651	0	128	70-125	0			S
Bromodichloromethane	3794	110	3651	0	104	70-130	0			
Bromoform	3454	110	3651	0	94.6	55-135	0			
Bromomethane	4197	270	3651	0	115	30-160	0			
Carbon disulfide	4484	110	3651	0	123	45-160	0			
Carbon tetrachloride	4234	110	3651	0	116	65-135	0			
Chlorobenzene	3582	110	3651	0	98.1	75-125	0			
Chloroethane	1366	370	3651	0	37.4	40-155	0			S
Chloroform	4414	110	3651	0	121	70-125	0			
Chloromethane	5126	370	3651	82.15	138	50-130	0			S
cis-1,2-Dichloroethene	4440	110	3651	0	122	65-125	0			
cis-1,3-Dichloropropene	3443	110	3651	0	94.3	70-125	0			
Dibromochloromethane	3337	110	3651	0	91.4	65-135	0			
Dibromomethane	4226	110	3651	0	116	75-130	0			
Dichlorodifluoromethane	3726	110	3651	0	102	35-135	0			
Ethylbenzene	3733	110	3651	0	102	75-125	0			
Hexachloroethane	3315	110	3651	0	90.8	70-135	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	3938	110	3651	0	108	75-130	0	
m,p-Xylene	7445	220	7302	0	102	80-125	0	
Methyl tert-butyl ether	4621	110	3651	0	127	75-125	0	S
Methylene chloride	4681	110	3651	0	128	55-145	0	
Naphthalene	3459	370	3651	0	94.8	40-140	0	
n-Butylbenzene	3627	110	3651	0	99.4	65-140	0	
n-Propylbenzene	3879	110	3651	0	106	65-135	0	
o-Xylene	3741	110	3651	0	102	75-125	0	
p-Isopropyltoluene	3556	110	3651	0	97.4	75-135	0	
sec-Butylbenzene	3956	110	3651	0	108	65-130	0	
Styrene	3980	110	3651	0	109	75-125	0	
tert-Butylbenzene	3878	110	3651	0	106	65-130	0	
Tetrachloroethene	3487	110	3651	0	95.5	64-140	0	
Tetrahydrofuran	4454	730	3651	0	122	70-135	0	
Toluene	3441	110	3651	0	94.2	70-125	0	
trans-1,2-Dichloroethene	4480	110	3651	0	123	65-135	0	
trans-1,3-Dichloropropene	3100	110	3651	0	84.9	65-125	0	
trans-1,4-Dichloro-2-butene	3414	110	3651	0	93.5	70-135	0	
Trichloroethene	3910	110	3651	0	107	75-125	0	
Trichlorofluoromethane	4387	110	3651	0	120	25-185	0	
Vinyl chloride	4579	110	3651	0	125	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*3638*	0	*3651*	0	*99.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*3856*	0	*3651*	0	*106*	*70-130*	0	
Surr: Dibromofluoromethane	*3637*	0	*3651*	0	*99.6*	*70-130*	0	
Surr: Toluene-d8	*3259*	0	*3651*	0	*89.2*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

MSD	Sample ID: **1211466-07B MSD**				Units: **µg/Kg**			Analysis Date: **11/17/2012 10:23 A**		
Client ID:		Run ID: **VMS9_121116B**			SeqNo: **2143400**		Prep Date: **11/16/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	3478	110	3651	0	95.2	75-125	3412	1.91	30	
1,1,1-Trichloroethane	4077	110	3651	0	112	70-135	3940	3.42	30	
1,1,2,2-Tetrachloroethane	3706	110	3651	0	102	55-130	3764	1.56	30	
1,1,2-Trichloroethane	3470	110	3651	0	95	60-125	3505	0.995	30	
1,1-Dichloroethane	4416	110	3651	0	121	75-125	4363	1.21	30	
1,1-Dichloroethene	4655	110	3651	0	128	65-135	4617	0.827	30	
1,2,3-Trichlorobenzene	3187	110	3651	0	87.3	60-135	3156	0.978	30	
1,2,3-Trichloropropane	3790	110	3651	0	104	65-130	3830	1.05	30	
1,2,4-Trichlorobenzene	3240	110	3651	0	88.8	65-130	3235	0.169	30	
1,2,4-Trimethylbenzene	3850	110	3651	0	105	65-135	3941	2.34	30	
1,2-Dibromo-3-chloropropane	3014	110	3651	0	82.6	40-135	3089	2.45	30	
1,2-Dibromoethane	3741	110	3651	0	102	70-125	3750	0.244	30	
1,2-Dichlorobenzene	3293	110	3651	0	90.2	75-120	3301	0.221	30	
1,2-Dichloroethane	4239	110	3651	0	116	70-135	4117	2.93	30	
1,2-Dichloropropane	4246	110	3651	0	116	70-120	4108	3.32	30	
1,3,5-Trimethylbenzene	3896	110	3651	0	107	65-135	3903	0.187	30	
1,3-Dichlorobenzene	3290	110	3651	0	90.1	70-125	3293	0.111	30	
1,4-Dichlorobenzene	3350	110	3651	0	91.8	70-125	3350	0	30	
2-Butanone	4661	730	3651	0	128	30-160	4946	5.93	30	
2-Hexanone	3985	110	3651	0	109	45-145	4093	2.67	30	
4-Methyl-2-pentanone	4772	110	3651	0	131	45-145	4714	1.23	30	
Acetone	7028	370	3651	0	192	20-160	6632	5.8	30	BS
Acrylonitrile	4966	370	3651	0	136	70-135	4977	0.22	30	S
Benzene	4219	110	3651	0	116	75-125	4111	2.59	30	
Bromobenzene	3664	110	3651	0	100	65-120	3699	0.942	30	
Bromochloromethane	4827	110	3651	0	132	70-125	4675	3.19	30	S
Bromodichloromethane	3960	110	3651	0	108	70-130	3794	4.29	30	
Bromoform	3441	110	3651	0	94.2	55-135	3454	0.371	30	
Bromomethane	3817	270	3651	0	105	30-160	4197	9.48	30	
Carbon disulfide	4659	110	3651	0	128	45-160	4484	3.83	30	
Carbon tetrachloride	4128	110	3651	0	113	65-135	4234	2.53	30	
Chlorobenzene	3589	110	3651	0	98.3	75-125	3582	0.204	30	
Chloroethane	1360	370	3651	0	37.2	40-155	1366	0.402	30	S
Chloroform	4506	110	3651	0	123	70-125	4414	2.05	30	
Chloromethane	5230	370	3651	82.15	141	50-130	5126	2.01	30	S
cis-1,2-Dichloroethene	4564	110	3651	0	125	65-125	4440	2.76	30	
cis-1,3-Dichloropropene	3620	110	3651	0	99.2	70-125	3443	5.01	30	
Dibromochloromethane	3359	110	3651	0	92	65-135	3337	0.654	30	
Dibromomethane	4261	110	3651	0	117	75-130	4226	0.817	30	
Dichlorodifluoromethane	3591	110	3651	0	98.4	35-135	3726	3.69	30	
Ethylbenzene	3700	110	3651	0	101	75-125	3733	0.884	30	
Hexachloroethane	3348	110	3651	0	91.7	70-135	3315	0.986	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44801** Instrument ID **VMS9** Method: **SW8260**

Isopropylbenzene	3878	110	3651	0	106	75-130	3938	1.54	30	
m,p-Xylene	7375	220	7302	0	101	80-125	7445	0.936	30	
Methyl tert-butyl ether	4624	110	3651	0	127	75-125	4621	0.079	30	S
Methylene chloride	4734	110	3651	0	130	55-145	4681	1.12	30	
Naphthalene	3465	370	3651	0	94.9	40-140	3459	0.158	30	
n-Butylbenzene	3580	110	3651	0	98	65-140	3627	1.32	30	
n-Propylbenzene	3819	110	3651	0	105	65-135	3879	1.57	30	
o-Xylene	3728	110	3651	0	102	75-125	3741	0.342	30	
p-Isopropyltoluene	3593	110	3651	0	98.4	75-135	3556	1.02	30	
sec-Butylbenzene	3870	110	3651	0	106	65-130	3956	2.19	30	
Styrene	3910	110	3651	0	107	75-125	3980	1.76	30	
tert-Butylbenzene	3783	110	3651	0	104	65-130	3878	2.48	30	
Tetrachloroethene	3474	110	3651	0	95.2	64-140	3487	0.367	30	
Tetrahydrofuran	4675	730	3651	0	128	70-135	4454	4.84	30	
Toluene	3450	110	3651	0	94.5	70-125	3441	0.265	30	
trans-1,2-Dichloroethene	4495	110	3651	0	123	65-135	4480	0.325	30	
trans-1,3-Dichloropropene	3167	110	3651	0	86.8	65-125	3100	2.16	30	
trans-1,4-Dichloro-2-butene	3239	110	3651	0	88.7	70-135	3414	5.27	30	
Trichloroethene	4044	110	3651	0	111	75-125	3910	3.35	30	
Trichlorofluoromethane	4369	110	3651	0	120	25-185	4387	0.417	30	
Vinyl chloride	4635	110	3651	0	127	60-125	4579	1.23	30	S
Surr: 1,2-Dichloroethane-d4	*3702*	0	*3651*	0	*101*	*70-130*	3638	*1.74*	*30*	
Surr: 4-Bromofluorobenzene	*3852*	0	*3651*	0	*106*	*70-130*	3856	*0.0947*	*30*	
Surr: Dibromofluoromethane	*3735*	0	*3651*	0	*102*	*70-130*	3637	*2.67*	*30*	
Surr: Toluene-d8	*3266*	0	*3651*	0	*89.4*	*70-130*	3259	*0.224*	*30*	

The following samples were analyzed in this batch:

1211518-01A	1211518-02B	1211518-03B
1211518-04B	1211518-05B	1211518-06B
1211518-07B	1211518-08B	1211518-09B
1211518-10B	1211518-11B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **R112907** Instrument ID **MOIST** Method: **A2540 G**

MBLK	Sample ID: **WBLKS1-R112907**				Units: **% of sample**		Analysis Date: **11/20/2012 09:00 A**			
Client ID:		Run ID: **MOIST_121120A**			SeqNo: **2147907**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS	Sample ID: **LCS-R112907**				Units: **% of sample**		Analysis Date: **11/20/2012 09:00 A**			
Client ID:		Run ID: **MOIST_121120A**			SeqNo: **2147903**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP	Sample ID: **1211518-08A DUP**				Units: **% of sample**		Analysis Date: **11/20/2012 09:00 A**			
Client ID: **SBKR1100L521S111512S007**		Run ID: **MOIST_121120A**			SeqNo: **2147893**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	35.36	0.050	0	0	0	-0 0	35.02	0.966	20	

DUP	Sample ID: **1211593-05A DUP**				Units: **% of sample**		Analysis Date: **11/20/2012 09:00 A**			
Client ID:		Run ID: **MOIST_121120A**			SeqNo: **2147901**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	36.92	0.050	0	0	0	-0 0	30.29	19.7	20	

The following samples were analyzed in this batch:

1211518-02A	1211518-03A	1211518-04A
1211518-05A	1211518-06A	1211518-07A
1211518-08A	1211518-09A	1211518-11A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211518
Project: Marshall KRRI 1050-1125R,1050-1125I,1100L 11/

QC BATCH REPORT

Batch ID: **R112939** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112939** Units: **% of sample** Analysis Date: **11/21/2012 04:30 PM**
Client ID: Run ID: **MOIST_121121A** SeqNo: **2148563** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112939** Units: **% of sample** Analysis Date: **11/21/2012 04:30 PM**
Client ID: Run ID: **MOIST_121121A** SeqNo: **2148559** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1211615-07B DUP** Units: **% of sample** Analysis Date: **11/21/2012 04:30 PM**
Client ID: Run ID: **MOIST_121121A** SeqNo: **2148544** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.54	0.050	0	0	0	-0 0	13.41	6.71	20	

DUP Sample ID: **1211623-02A DUP** Units: **% of sample** Analysis Date: **11/21/2012 04:30 PM**
Client ID: Run ID: **MOIST_121121A** SeqNo: **2148549** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	13.63	0.050	0	0	0	-0 0	13.5	0.958	20	

DUP Sample ID: **1211640-07B DUP** Units: **% of sample** Analysis Date: **11/21/2012 04:30 PM**
Client ID: Run ID: **MOIST_121121A** SeqNo: **2148557** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	8.98	0.050	0	0	0	-0 0	8.96	0.223	20	

The following samples were analyzed in this batch: 1211518-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1211518

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_111512_GMK1	Task: KRRI_1050-1125
Total # of Samples: 11		Event Complete?

Turn Around Time	5 Day	Rush	No	

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State,	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR1125I502T111512MX	SBKR1125I502	SQ	G	11/15/2012 00:00	1	TRIP BLANK						X										
2	SBKR1050R506S111512S006	SBKR1050R506	SO	G	11/15/2012 08:35	3			X	X	X	X	X										
3	SBKR1050R506D111512S006	SBKR1050R506	SO	G	11/15/2012 08:35	3	DUPLICATE		X	X	X	X	X										
4	SBKR1050I501S111512S006	SBKR1050I501	SO	G	11/15/2012 09:19	3			X	X	X	X	X										
5	SBKR1100L518S111512S005	SBKR1100L518	SO	G	11/15/2012 10:03	3			X	X	X	X	X										
6	SBKR1100L519S111512S005	SBKR1100L519	SO	G	11/15/2012 10:53	3			X	X	X	X	X										
7	SBKR1100L520S111512S005	SBKR1100L520	SO	G	11/15/2012 11:35	3			X	X	X	X	X										
8	SBKR1100L521S111512S007	SBKR1100L521	SO	G	11/15/2012 13:55	3			X	X	X	X	X										
9	SBKR1125R501S111512S009	SBKR1125R501	SO	G	11/15/2012 14:36	3			X	X	X	X	X										
10	SBKR1125I502S111512S005	SBKR1125I502	SO	G	11/15/2012 15:25	3			X	X	X	X	X										
11	SBKR1125I502S111512S013	SBKR1125I502	SO	G	11/15/2012 15:30	3			X	X	X	X	X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
A. Kramer	11-15-12	1600		11-15-12	1600
	11-15-12	1610	FEDEX	11/16/12	1000

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample Intact?	Trip Blank?
4.2°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: 11/15/12 Time: 1610
Name:
Company: [illegible]

Seal Broken By:
Date:

fedex.com 1.800.GoFedEx 1.800.463.3339

FedEx Express US Airbill

FedEx Tracking Number: 8741 9029 5467 0200 Form ID No.

FedEx Retrieval Copy

1 From
Date: 11/15/12 Sender's FedEx Account Number: 2138-5929-3
Sender's Name: April Modert Phone: [redacted]
Company: Superior Environmental Corp
Address: 1680 Marquette Ave Street Dept./Floor/Suite/Room
City: Bay City State: MI ZIP: 48706-4178

2 Your Internal Billing Reference BC3279.00 Task 6.00

3 To
Recipient's Name: LABORATORY Phone: 616-738-7346
Company: ALS ENVIRONMENTAL
Address: 3352 128th AVE Dept./Floor/Suite/Room
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address: Use this line for the HOLD location address or for continuation of your shipping address.
City: Holland State: MI ZIP: 49424

01 ☐ HOLD Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.
31 ☐ HOLD Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8741 9029 5467

4a Express Package Service * To most locations. *Packages up to 150 lbs.*
01 ☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
05 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.
06 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.*
03 ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

4b Express Freight Service ** To most locations. *Packages over 150 lbs.*
70 ☐ FedEx 1Day Freight — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected. FedEx 1Day Freight Booking No.
80 ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
83 ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.
06 ☐ FedEx Envelope*
02 ☐ FedEx Pak* — Includes FedEx Small Pak and FedEx Large Pak.
03 ☐ FedEx Box
04 ☐ FedEx Tube
01 ☒ Other

6 Special Handling and Delivery Signature Options
03 ☐ **SATURDAY DELIVERY**
☐ No Signature Required — Package may be left without obtaining a signature for delivery.
10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. *Fee applies.*
34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. *Fee applies.*

Does this shipment contain dangerous goods?
One box must be checked.
☒ No 04 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 06 ☐ Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg
Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.
☐ Cargo Aircraft Only

7 Payment *Bill to:*
Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐
1 ☒ Sender — Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check
[redacted]
Total Packages ____ Total Weight ____ lbs. [redacted] Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

606

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fedex.com 1.800.GoFedEx 1.800.463.3339

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **16-Nov-12 10:00**

Work Order: **1211518** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 16-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 18-Nov-12 (Date)

Matrices: soil
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/16/2012 1:19:09 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix B

Waste Management Activities

Analytical Data Reports

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

29-Nov-2012

Alison Schoeff
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall Roll-Off 2047 11/20/12** Work Order: **1211664**

Dear Alison,

ALS Environmental received 1 sample on 21-Nov-2012 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 29-Nov-12

Client: AECOM Environment
Project: Marshall Roll-Off 2047 11/20/12
Work Order: **1211664**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211664-01	112012-RB2047	Solid		11/20/2012 08:40	11/21/2012 10:00	☐

Client: AECOM Environment
Project: Marshall Roll-Off 2047 11/20/12
Work Order: 1211664

Case Narrative

Sample112012-RB2047 matrix is an oily debris.

Crude oil received from Intertek was used for the QC sample spikes.

Sample 1211664-01 is reported on a wet weight basis.

Client: AECOM Environment
Project: Marshall Roll-Off 2047 11/20/12
WorkOrder: **1211664**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
mg/Kg	Milligrams per Kilogram

ALS Group USA, Corp

Date: *29-Nov-12*

Client:	AECOM Environment		
Project:	Marshall Roll-Off 2047 11/20/12	**Work Order:**	1211664
Sample ID:	112012-RB2047	**Lab ID:**	1211664-01
Collection Date:	11/20/2012 08:40 AM	**Matrix:**	SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
OIL AND GREASE			**E1664MM**			Analyst: **BAS**
Oil and Grease	**7,000**		**50**	**mg/Kg**	1	11/27/2012 11:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 29-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 1211664

Project: Marshall Roll-Off 2047 11/20/12

Batch ID: **R113144** Instrument ID **O&GMOD** Method: **E1664MM**

MBLK Sample ID: **MB-R113144-R113144** Units: **mg/Kg** Analysis Date: **11/27/2012 11:30 AM**

Client ID: Run ID: **O&GMOD_121127A** SeqNo: **2152975** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	ND	50								

LCS Sample ID: **LCS-R113144-R113144** Units: **mg/Kg** Analysis Date: **11/27/2012 11:30 AM**

Client ID: Run ID: **O&GMOD_121127A** SeqNo: **2152976** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	5153	50	5733	0	89.9	50-150	0			

MS Sample ID: **1211664-01A MS** Units: **mg/Kg** Analysis Date: **11/27/2012 11:30 AM**

Client ID: **112012-RB2047** Run ID: **O&GMOD_121127A** SeqNo: **2152978** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	16320	50	17930	6956	52.2	50-150	0			

MSD Sample ID: **1211664-01A MSD** Units: **mg/Kg** Analysis Date: **11/27/2012 11:30 AM**

Client ID: **112012-RB2047** Run ID: **O&GMOD_121127A** SeqNo: **2152979** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	14870	50	13470	6956	58.8	50-150	16320	9.28	30	

The following samples were analyzed in this batch: 1211664-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

☐ **ALS Environmental**
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Chain of Custody Form

Page 1 of 1

COC ID: 20095

☒ **ALS Environmental**
3352 128th Ave.
Holland, MI 49424-9263
Tel: +1 616 399 6070
Fax: +1 616 399 6185

ALS Project Manager: | **ALS Work Order #:** 1211664

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Marshall Line 6B	A	Oil and Grease
Work Order		Project Number		B	% Moisture
Company Name	AECOM Environment	Bill To Company	Enbridge Energy	C	
Send Report To		Invoice Attn	Accounts Payable	D	
Address	5555 Glenwood Parkway SE	Address	1100 Louisiana Suite 1100	E	
				F	
City/State/Zip	Grand Rapids, MI 49512	City/State/Zip	Houston, TX 77002	G	
Phone	(616) 942-9600	Phone		H	
Fax		Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
																Note	
1	112012-RB2047	11/20/12	0840	Oily Debris	None	2	X	X						Roll off box #2047			
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Alison Schoeff

Shipment Method: UPS

Required Turnaround Time: (Check Box) ☐ Std 10 WK Days ☐ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by: Alison Schoeff	Date: 11/20/12	Time: 1200	Received by: UPS
Relinquished by: UPS	Date: 11/21/12	Time: 1000	Received by (Laboratory):
Logged by (Laboratory): Ka	Date: 11/27/12	Time: 1040	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp.
	1.4°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other _____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2010 by ALS Environmental.

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **21-Nov-12 10:00**

Work Order: **1211664** Received by: **KRW**

Checklist completed by Joseph Ribar (eSignature) 21-Nov-12 (Date) Reviewed by: Ann Preston (eSignature) 23-Nov-12 (Date)

Matrices: Solid
Carrier name: UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.4 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/21/2012 10:53:02 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

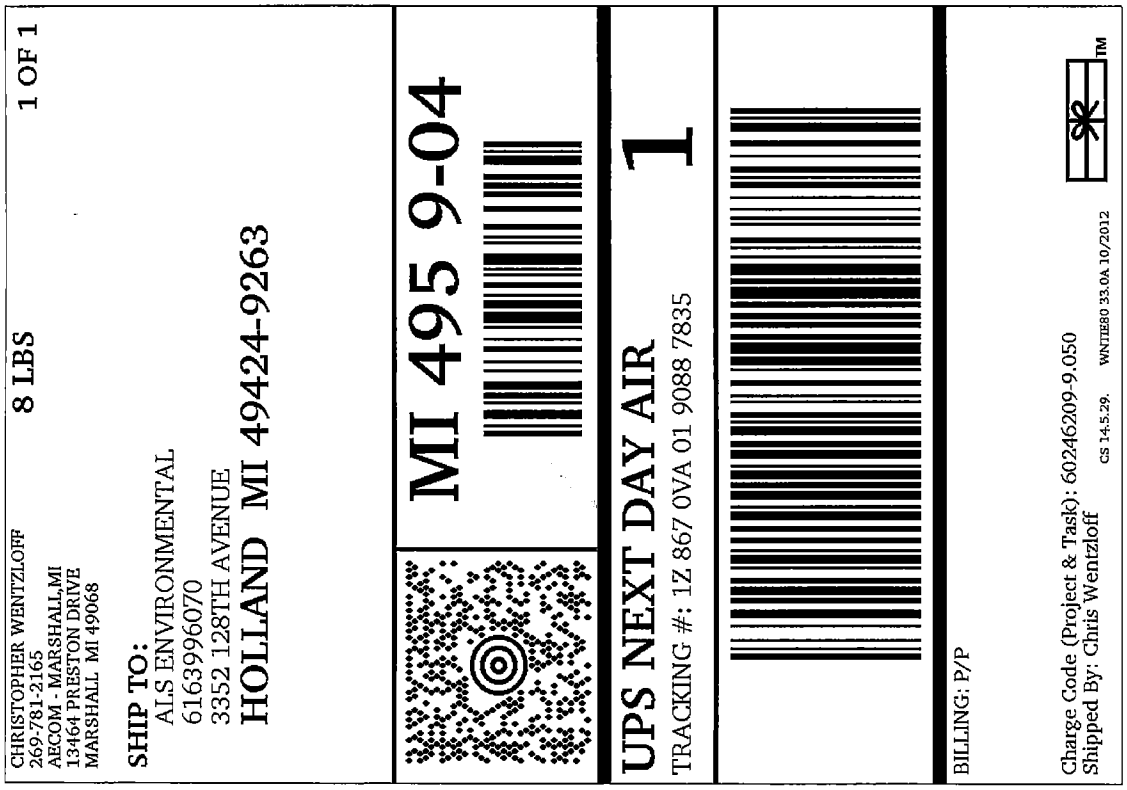
Login Notes:

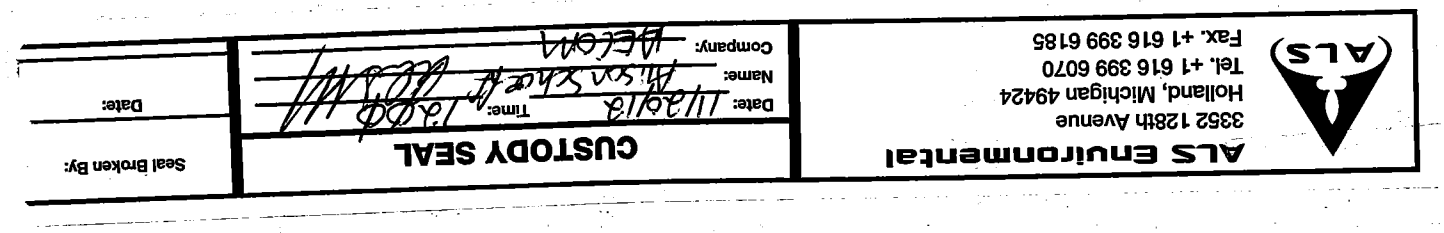
Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


CHRISTOPHER WENTZLOFF
269-781-2165
AECOM - MARSHALL,MI
13464 PRESTON DRIVE
MARSHALL MI 49068
8 LBS
1 OF 1
SHIP TO:
ALS ENVIRONMENTAL
6163996070
3352 128TH AVENUE
HOLLAND MI 49424-9263
MI 495 9-04
UPS NEXT DAY AIR
1
TRACKING #: 1Z 867 0VA 01 9088 7835
BILLING: P/P
Charge Code (Project & Task): 602462O9-9.050
Shipped By: Chris Wentzloff
CS 14.5.29. WNTE80 33.0A 10/2012


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date:
Name:
Company:
Time:
Seal Broken By:
Date:

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix B

Alpha Analytical

Analytical Data Reports

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

ANALYTICAL REPORT

Prepared for:
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Project:	Enbridge Line 6B MP 608
ETR:	1210081
Report Date:	November 19, 2012

Certifications and Accreditations
Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

This report shall not be reproduced except in full, without written approval from the laboratory.

Sample ID Cross Reference

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210081**

Lab Sample ID	Client Sample ID	Matrix
1210081-01	SEKR0000R024S092112D004_MDL1	Sediment
1210081-02	SEKR0000R024S092112D004_MDL2	Sediment
1210081-03	SEKR0000R024S092112D004_MDL3	Sediment
1210081-04	SEKR0000R024S092112D004_MDL4	Sediment
1210081-05	SEKR0000R024S092112D004_MDL5	Sediment
1210081-06	SEKR0000R024S092112D004_MDL6	Sediment
1210081-07	SEKR0000R024S092112D004_MDL7	Sediment

Certificate/Approval Program Summary

Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID : PH-0141 - *Wastewater* (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) *Solid Waste/Soil* (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID : E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID : 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Solid and Hazardous Waste* (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID : MA0030 - *Wastewater* (General Chemistry: EPA 120.1/ SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624).

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID : MA015 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). *Solid & Hazardous Waste* (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID : 11627 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: EPA 1010, 1311; : 245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID : LAO00289 - Chemistry: *Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil* (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy

CASE NARRATIVE
Alpha Analytical

ETR: 1210081
Project: Enbridge Line 6B MP 608

All analyses were performed according to the Alpha Analytical quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Alpha Analytical certifies that the test results within meet all of the requirements of NELAC, for all NELAC accredited parameters.

Sample Receipt

The background sediment sample SEKR0000R024S092112D004 was received in good condition, between 2° and 6°C, and without discrepancies.

The sample received was logged into ETR 1209034 as sample (1209034-01). The jars received were homogenized and aliquots were removed to create samples (1210081-01 through -07).

Samples were released for analysis on 10-30-2012. Samples were frozen until scheduled for analysis. Per the customer's request, all samples (1210081-01 through -07) were analyzed for PAH, BIO and SHC.

Sample Preparation and Extraction

Samples were extracted on 11-06-2012 (prep batch 1210081). The extraction and preparation procedure was performed according to the Alpha Analytical SOP (stated below) with the following deviations:

1. Samples were prepared according to the MDL Range Finding Procedure provided by AECOM.

2. Prior to extraction the Cold Lake Crude was artificially weathered through evaporation using a "Topping" procedure provided by the client. Each selected sediment sample is spiked with 300uL of this topped oil and extracted as stated below.

3. Sample SEKR0000R024S092112D004 was originally logged into ETR 1210002 as sample 1210002-01. A percent solid determination was performed on this sample (1210002-01) and was used for samples (1210081-01 through -07).

The observations noted on the *Forensic Preparation Checklist* should neither have any adverse affect on the analysis nor should they impact data quality for samples in this ETR.

Alkylated Polynuclear Aromatic Hydrocarbons, Steranes, Triterpanes, and Triaromatic Steroids – Sediments

Polynuclear aromatic hydrocarbons and geochemical biomarkers were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP O-008, Issue No. 7, 07/07/2011)*. Sediment samples are spiked with surrogate compounds and extracted by *Shaker Table Extraction (SOP OP-013, Issue No. 5, 07/14/2011)*. Solvent extracts are dried over sodium sulfate and concentrated to a 4mL volume. A 2mL aliquot of the extract is processed through a silica column (*Silica Gel Cleanup Preparation (Manual), SOP 2267, Rev. 2, 03/21/2012*) and concentrated to a 900uL volume. A 450uL aliquot is taken and spiked with internal standard for instrument

analysis. The average weight of all samples included in the extraction batch is used as the weight for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples, comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Alkyl homologues are quantified using the response factor of the parent PAH compound. Target triterpane biomarker concentrations are quantified using the response factor of Hopane and the steranes and steroids are quantified using the response factor of 5β(H)Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific method detection limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensics Preparation Checklist* located in the sample preparation document.

1. The method blanks SS110612B07 contained low-level target compounds. The single component compounds were detected at less than 5x the sample specific method detection limit (MDL), the multi-component compounds were detected at less than 10x the MDL of the associated single component compound with the exception of C3-Phenanthrene/Anthracenes which is "B" qualified on the quantitation report. The method blank met the acceptance criteria (with no more than two compounds outside criteria) therefore no corrective action was required. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10x the concentration in the blank

2. The following continuing calibration verifications (CCV) had the percent deviation above the 25%D acceptance criteria as follows:

   CCV C211131204: Indeno[1,2,3-cd]pyrene at 25.2%D
   CCV C211121205: Indeno[1,2,3-cd]pyrene at 27.6%D

   In each case, the values are below 35%D and represent less than 10% of all compounds; therefore the calibration is deemed acceptable. No corrective action was taken.

3. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

Total Saturated Hydrocarbons and Total Petroleum Hydrocarbons by GC/FID – Sediments

Samples for total saturated hydrocarbons and total petroleum hydrocarbons were analyzed following the procedures in Alpha Analytical SOP *Total Petroleum and Saturated Hydrocarbons by Gas Chromatography/Flame Ionization Detector (SOP O-003, Issue No.7, 08/15/2011)* Method 8100/8015mod. Samples were prepared as stated above for the PAH analysis. A portion of the final extract was analyzed for GC/FID (gas chromatography with flame ionization detection). A multi-level initial calibration over the n-alkane range from C9-C40 was evaluated and quantified using internal standard techniques prior to sample analysis. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific method detection limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensics Preparation Checklist* located in the sample preparation document.

The following compounds co-elute with PAH surrogates and/or internal standards which potentially bias the results high: n-Octadecane (Cl8) - Phenanthrene-d10, n-Pentacosane (C25) - Chrysene-d12 and n-Nonacosane (C29) - Benzo(a)pyrene-d12. If a positive bias is determined to be present the compounds will be reported with a "C" qualifier.

1. The method blank SS110612B07 contained low-level target compounds detected at less than 5x the sample specific method detection limit (MDL) except for n-Octadecane (C18) which is "B" qualified on the Quantitation Report. The method blank met the acceptance criteria (with no more than two compounds outside criteria) therefore no corrective action was required. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10x the concentration in the blank.

2. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Analytical makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Analytical. To the best of my knowledge, the information contained in this report is accurate and complete. For any questions regarding this report, please contact the signatory below at 508-822-9300.

Approved by: Normand Laurianno Jr. Title: **Technical Representative** Date: 11/19/2012

Normand Laurianno Jr.

Alkylated Polynuclear Aromatic Hydrocarbons, Steranes, Triterpanes, and Triaromatic Steroids By GC/MS-SIM

Form II
Surrogate Recovery
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210081**
Matrix: **Sediment**

Case: **N/A** SDG: **N/A**

Client ID	Lab ID	Naphthalene-d8	Phenanthrene-d10	Benzo[a]pyrene-d12	5B(H)Cholan
Blank	SS110612B07	87	88	87	96
LCS	SS110612LCS03	93	93	89	96
LCSD	SS110612LCSD03	86	89	86	92
SEKR0000R024S092112D004_MDL1	1210081-01	67	90	85	94
SEKR0000R024S092112D004_MDL2	1210081-02	72	91	88	96
SEKR0000R024S092112D004_MDL3	1210081-03	70	89	84	93
SEKR0000R024S092112D004_MDL4	1210081-04	70	91	89	96
SEKR0000R024S092112D004_MDL5	1210081-05	73	90	88	95
SEKR0000R024S092112D004_MDL6	1210081-06	71	93	88	93
SEKR0000R024S092112D004_MDL7	1210081-07	70	92	86	92

N/A - Not Applicable

Surrogate	QC Limit
Naphthalene-d8	40-120
Phenanthrene-d10	40-120
Benzo[a]pyrene-d12	40-120
5B(H)Cholane	50-130

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **See Below**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/06/12	100	AC

Lab ID: SS110612B07 SS110612LCS03 SS110612LCSD03

Parameter	Blank Conc.	LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
Naphthalene	0.133	64.3	96	61.7	93	4	30	50-125
Acenaphthylene	0.0455 U	63.9	96	61.3	92	4	30	50-125
Acenaphthene	0.0537 U	63.2	95	60.3	90	5	30	50-125
Fluorene	0.0637 U	64.2	96	62.0	93	3	30	50-125
Anthracene	0.0936 U	70.6	106	69.6	104	1	30	50-125
Phenanthrene	0.128	63.6	95	61.8	93	3	30	50-125
Fluoranthene	0.0980 U	67.4	101	66.3	99	2	30	50-125
Pyrene	0.106	68.2	102	66.5	100	3	30	50-125
Benz[a]anthracene	0.0628	66.1	99	64.7	97	2	30	50-125
Chrysene/Triphenylene	0.0996	64.2	96	62.3	93	3	30	50-125
Benzo[b]fluoranthene	0.123	65.9	99	63.1	95	4	30	50-125
Benzo[j]fluoranthene/ Benzo[k]fluoranthene	0.0768	65.8	99	64.5	97	2	30	50-125
Benzo[a]pyrene	0.183	66.2	99	64.1	96	3	30	50-125
Indeno[1,2,3-cd]pyrene	0.171	68.6	103	61.3	92	11	30	50-125
Dibenz[ah]anthracene/ Dibenz[ac]anthracene	0.275 U	61.8	93	59.8	90	3	30	50-125
Benzo[g,h,i]perylene	0.172	60.2	90	58.2	87	3	30	50-125

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	93	86	40-120
Phenanthrene-d10	93	89	40-120
Benzo[a]pyrene-d12	89	86	40-120
5B(H)Cholane	96	92	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

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Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
cis/trans-Decalin	479.2	468	98	65-135
C1-Decalins	728.9	763	105	65-135
C2-Decalins	635.5	716	113	65-135
C3-Decalins	329.8	410	124	65-135
C4-Decalins	326.5	436	134	65-135
Benzothiophene	5.4	5.40	100	65-135
C1-Benzo(b)thiophenes	28.9	31.6	109	65-135
C2-Benzo(b)thiophenes	49.6	55.4	112	65-135
C3-Benzo(b)thiophenes	99.0	120	121	65-135
C4-Benzo(b)thiophenes	87.1	105	121	65-135
Naphthalene	555.8	584	105	65-135
C1-Naphthalenes	1167.3	1240	106	65-135
C2-Naphthalenes	1409.7	1550	110	65-135
C3-Naphthalenes	1035.9	1180	114	65-135
C4-Naphthalenes	561.1	692	123	65-135
Biphenyl	145.7	143	98	65-135
Dibenzofuran	51.2	54.1	106	65-135
Acenaphthylene	6.5	6.98	107	65-135
Acenaphthene	18.7	14.1	76	65-135
Fluorene	74.6	77.9	104	65-135
C1-Fluorenes	170.2	177	104	65-135
C2-Fluorenes	255.4	299	117	65-135
C3-Fluorenes	238.5	297	124	65-135
Phenanthrene	212.2	224	105	65-135
C1-Phenanthrenes/Anthracenes	432.7	502	116	65-135
C2-Phenanthrenes/Anthracenes	465.9	572	123	65-135
C3-Phenanthrenes/Anthracenes	317.4	419	132	65-135
C4-Phenanthrenes/Anthracenes	129	169	131	65-135
Dibenzothiophene	138.9	146	105	65-135
C1-Dibenzothiophenes	278.6	324	116	65-135
C2-Dibenzothiophenes	377.5	465	123	65-135
C3-Dibenzothiophenes	341.4	428	125	65-135
C4-Dibenzothiophenes	183.4	235	128	65-135

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Fluoranthene	4.00	4.40	110	65-135
Pyrene	13.0	14.9	114	65-135
C1-Fluoranthenes/Pyrenes	63.1	73.8	117	65-135
C2-Fluoranthenes/Pyrenes	102.2	122	119	65-135
C3-Fluoranthenes/Pyrenes	119.6	151	126	65-135
C4-Fluoranthenes/Pyrenes	104	137	131	65-135
Naphthobenzothiophenes	43.8	46.1	105	65-135
C1-Naphthobenzothiophenes	117.2	129	110	65-135
C2-Naphthobenzothiophenes	163.3	184	113	65-135
C3-Naphthobenzothiophenes	128.7	141	110	65-135
C4-Naphthobenzothiophenes	89.0	99.8	112	65-135
Benz[a]anthracene	2.1	2.08	99	65-135
Chrysene/Triphenylene	35.2	39.8	113	65-135
C1-Chrysenes	62.8	71.6	114	65-135
C2-Chrysenes	86.0	102	119	65-135
C3-Chrysenes	97.6	125	129	65-135
C4-Chrysenes	59.4	78.4	132	65-135
Benzo[b]fluoranthene	5.2	5.45	105	65-135
Benzo[e]pyrene	9.8	9.85	100	65-135
Benzo[a]pyrene	1.9	1.84	97	65-135
Perylene	2.8	3.44	123	65-135
Benzo[g,h,i]perylene	3.1	3.62	117	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Carbazole	6.00	7.12	119	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
4-Methyldibenzothiophene	131.8	155	118	65-135
2/3-Methyldibenzothiophene	97.5	115	118	65-135
1-Methyldibenzothiophene	44.2	50.6	114	65-135
3-Methylphenanthrene	89.4	105	117	65-135
2-Methylphenanthrene	97.7	112	114	65-135
2-Methylanthracene	3.2	3.96	124	65-135
9/4-Methylphenanthrene	141.2	163	115	65-135
1-Methylphenanthrene	97.4	112	115	65-135
2-Methylnaphthalene	1081.8	1150	106	65-135
1-Methylnaphthalene	784.8	823	105	65-135
2,6-Dimethylnaphthalene	649.9	661	102	65-135
2,3,5-Trimethylnaphthalene	152	135	89	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

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Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C23 Tricyclic Terpane	67.3	59.2	88	65-135
C24 Tricyclic Terpane	43.0	38.1	89	65-135
C25 Tricyclic Terpane	42.0	35.3	84	65-135
C24 Tetracyclic Terpane	14.8	11.8	80	65-135
C26 Tricyclic Terpane-22S	17.7	13.8	78	65-135
C26 Tricyclic Terpane-22R	15.4	12.7	82	65-135
C28 Tricyclic Terpane-22S	16.8	13.1	78	65-135
C28 Tricyclic Terpane-22R	18.1	14.4	80	65-135
C29 Tricyclic Terpane-22S	20.8	18.2	87	65-135
C29 Tricyclic Terpane-22R	22.6	20.8	92	65-135
18a-22,29,30-Trisnorneohopane-TS	31.3	28.6	91	65-135
C30 Tricyclic Terpane-22S	16.2	17.3	107	65-135
C30 Tricyclic Terpane-22R	16.4	14.3	87	65-135
17a(H)-22,29,30-Trisnorhopane-TM	37.8	31.6	84	65-135
17a/b,21b/a 28,30-Bisnorhopane	7.00	7.27	104	65-135
17a(H),21b(H)-25-Norhopane	8.7	7.55	87	65-135
30-Norhopane	99.7	91.6	92	65-135
18a(H)-30-Norneohopane-C29Ts	25.2	22.9	91	65-135
17a(H)-Diahopane	14.2	12.9	91	65-135
30-Normoretane	11.6	10.1	87	65-135
Hopane	173.6	158	91	65-135
Moretane	17.5	14.4	82	65-135
30-Homohopane-22S	75.1	66.0	88	65-135
30-Homohopane-22R	64.1	57.0	89	65-135
30,31-Bishomohopane-22S	53.6	49.3	92	65-135
30,31-Bishomohopane-22R	39.6	35.0	88	65-135
30,31-Trishomohopane-22S	41.8	37.0	89	65-135
30,31-Trishomohopane-22R	27.2	25.7	94	65-135
Tetrakishomohopane-22S	29.8	29.1	98	65-135
Tetrakishomohopane-22R	21.2	19.4	91	65-135
Pentakishomohopane-22S	30.2	31.3	104	65-135
Pentakishomohopane-22R	23.5	23.8	101	65-135
13b(H),17a(H)-20S-Diacholestane	50.0	52.8	106	65-135

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
13b(H),17a(H)-20R-Diacholestane	26.3	26.4	100	65-135
13b,17a-20S-Methyldiacholestane	25.7	28.9	112	65-135
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	65.0	66.9	103	65-135
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	75.8	74.1	98	65-135
Unknown Sterane (S18)	21.3	19.7	92	65-135
13a,17b-20S-Ethyldiacholestane	3.9	3.23	83	65-135
14a,17a-20S-Methylcholestane	37.3	33.4	90	65-135
14a,17a-20R-Methylcholestane	34.5	34.1	99	65-135
14a(H),17a(H)-20S-Ethylcholestane	51.0	51.1	100	65-135
14a(H),17a(H)-20R-Ethylcholestane	39.5	44.1	112	65-135
14b(H),17b(H)-20R-Cholestane	41.5	44.8	108	65-135
14b(H),17b(H)-20S-Cholestane	42.5	42.4	100	65-135
14b,17b-20R-Methylcholestane	44.8	49.2	110	65-135
14b,17b-20S-Methylcholestane	55.4	55.2	100	65-135
14b(H),17b(H)-20R-Ethylcholestane	60.9	64.6	106	65-135
14b(H),17b(H)-20S-Ethylcholestane	40.3	40.5	100	65-135
C26,20R- +C27,20S- triaromatic steroid	293.9	246	84	65-135
C28,20S-triaromatic steroid	187.6	158	84	65-135
C27,20R-triaromatic steroid	180.2	148	82	65-135
C28,20R-triaromatic steroid	150.5	126	84	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
cis/trans-Decalin	479.2	396	83	65-135
C1-Decalins	728.9	722	99	65-135
C2-Decalins	635.5	695	109	65-135
C3-Decalins	329.8	381	115	65-135
C4-Decalins	326.5	435	133	65-135
Benzothiophene	5.4	5.58	103	65-135
C1-Benzo(b)thiophenes	28.9	30.8	107	65-135
C2-Benzo(b)thiophenes	49.6	51.5	104	65-135
C3-Benzo(b)thiophenes	99.0	108	109	65-135
C4-Benzo(b)thiophenes	87.1	101	116	65-135
Naphthalene	555.8	518	93	65-135
C1-Naphthalenes	1167.3	1140	98	65-135
C2-Naphthalenes	1409.7	1460	103	65-135
C3-Naphthalenes	1035.9	1150	111	65-135
C4-Naphthalenes	561.1	671	120	65-135
Biphenyl	145.7	135	93	65-135
Dibenzofuran	51.2	50.5	99	65-135
Acenaphthylene	6.5	7.13	110	65-135
Acenaphthene	18.7	18.0	96	65-135
Fluorene	74.6	71.6	96	65-135
C1-Fluorenes	170.2	176	103	65-135
C2-Fluorenes	255.4	288	113	65-135
C3-Fluorenes	238.5	281	118	65-135
Phenanthrene	212.2	208	98	65-135
C1-Phenanthrenes/Anthracenes	432.7	470	109	65-135
C2-Phenanthrenes/Anthracenes	465.9	543	116	65-135
C3-Phenanthrenes/Anthracenes	317.4	399	126	65-135
C4-Phenanthrenes/Anthracenes	129	164	127	65-135
Dibenzothiophene	138.9	138	99	65-135
C1-Dibenzothiophenes	278.6	300	108	65-135
C2-Dibenzothiophenes	377.5	437	116	65-135
C3-Dibenzothiophenes	341.4	410	120	65-135
C4-Dibenzothiophenes	183.4	232	126	65-135

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Fluoranthene	4.00	4.04	101	65-135
Pyrene	13.0	14.9	115	65-135
C1-Fluoranthenes/Pyrenes	63.1	72.9	116	65-135
C2-Fluoranthenes/Pyrenes	102.2	118	116	65-135
C3-Fluoranthenes/Pyrenes	119.6	146	122	65-135
C4-Fluoranthenes/Pyrenes	104	133	128	65-135
Naphthobenzothiophenes	43.8	44.2	101	65-135
C1-Naphthobenzothiophenes	117.2	123	105	65-135
C2-Naphthobenzothiophenes	163.3	178	109	65-135
C3-Naphthobenzothiophenes	128.7	146	114	65-135
C4-Naphthobenzothiophenes	89.0	110	124	65-135
Benz[a]anthracene	2.1	2.20	105	65-135
Chrysene/Triphenylene	35.2	37.8	107	65-135
C1-Chrysenes	62.8	70.2	112	65-135
C2-Chrysenes	86.0	95.1	111	65-135
C3-Chrysenes	97.6	115	118	65-135
C4-Chrysenes	59.4	74.1	125	65-135
Benzo[b]fluoranthene	5.2	5.18	100	65-135
Benzo[e]pyrene	9.8	9.71	99	65-135
Benzo[a]pyrene	1.9	1.66	87	65-135
Perylene	2.8	2.96	106	65-135
Benzo[g,h,i]perylene	3.1	3.15	102	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Carbazole	6.00	7.94	132	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
4-Methyldibenzothiophene	131.8	142	108	65-135
2/3-Methyldibenzothiophene	97.5	103	106	65-135
1-Methyldibenzothiophene	44.2	47.2	107	65-135
3-Methylphenanthrene	89.4	99.6	111	65-135
2-Methylphenanthrene	97.7	108	110	65-135
2-Methylanthracene	3.2	2.41	75	65-135
9/4-Methylphenanthrene	141.2	152	108	65-135
1-Methylphenanthrene	97.4	107	109	65-135
2-Methylnaphthalene	1081.8	1050	97	65-135
1-Methylnaphthalene	784.8	758	97	65-135
2,6-Dimethylnaphthalene	649.9	624	96	65-135
2,3,5-Trimethylnaphthalene	152	164	108	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C23 Tricyclic Terpane	67.3	57.6	86	65-135
C24 Tricyclic Terpane	43.0	35.7	83	65-135
C25 Tricyclic Terpane	42.0	35.3	84	65-135
C24 Tetracyclic Terpane	14.8	12.3	83	65-135
C26 Tricyclic Terpane-22S	17.7	14.4	81	65-135
C26 Tricyclic Terpane-22R	15.4	13.0	84	65-135
C28 Tricyclic Terpane-22S	16.8	14.5	86	65-135
C28 Tricyclic Terpane-22R	18.1	15.8	87	65-135
C29 Tricyclic Terpane-22S	20.8	17.9	86	65-135
C29 Tricyclic Terpane-22R	22.6	18.1	80	65-135
18a-22,29,30-Trisnorneohopane-TS	31.3	26.7	85	65-135
C30 Tricyclic Terpane-22S	16.2	14.4	89	65-135
C30 Tricyclic Terpane-22R	16.4	14.9	91	65-135
17a(H)-22,29,30-Trisnorhopane-TM	37.8	31.6	84	65-135
17a/b,21b/a 28,30-Bisnorhopane	7.00	7.02	100	65-135
17a(H),21b(H)-25-Norhopane	8.7	7.91	91	65-135
30-Norhopane	99.7	87.9	88	65-135
18a(H)-30-Norneohopane-C29Ts	25.2	23.1	92	65-135
17a(H)-Diahopane	14.2	13.7	96	65-135
30-Normoretane	11.6	9.85	85	65-135
Hopane	173.6	152	88	65-135
Moretane	17.5	14.9	85	65-135
30-Homohopane-22S	75.1	64.1	85	65-135
30-Homohopane-22R	64.1	54.1	84	65-135
30,31-Bishomohopane-22S	53.6	46.1	86	65-135
30,31-Bishomohopane-22R	39.6	33.5	85	65-135
30,31-Trishomohopane-22S	41.8	37.0	88	65-135
30,31-Trishomohopane-22R	27.2	24.5	90	65-135
Tetrakishomohopane-22S	29.8	26.9	90	65-135
Tetrakishomohopane-22R	21.2	19.7	93	65-135
Pentakishomohopane-22S	30.2	27.6	91	65-135
Pentakishomohopane-22R	23.5	24.7	105	65-135
13b(H),17a(H)-20S-Diacholestane	50.0	50.7	101	65-135

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
13b(H),17a(H)-20R-Diacholestane	26.3	26.4	100	65-135
13b,17a-20S-Methyldiacholestane	25.7	20.8	81	65-135
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	65.0	61.2	94	65-135
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	75.8	70.9	94	65-135
Unknown Sterane (S18)	21.3	19.5	91	65-135
13a,17b-20S-Ethyldiacholestane	3.9	4.77	122	65-135
14a,17a-20S-Methylcholestane	37.3	32.0	86	65-135
14a,17a-20R-Methylcholestane	34.5	34.6	100	65-135
14a(H),17a(H)-20S-Ethylcholestane	51.0	43.0	84	65-135
14a(H),17a(H)-20R-Ethylcholestane	39.5	41.2	104	65-135
14b(H),17b(H)-20R-Cholestane	41.5	39.8	96	65-135
14b(H),17b(H)-20S-Cholestane	42.5	39.7	93	65-135
14b,17b-20R-Methylcholestane	44.8	45.2	101	65-135
14b,17b-20S-Methylcholestane	55.4	55.6	100	65-135
14b(H),17b(H)-20R-Ethylcholestane	60.9	62.5	103	65-135
14b(H),17b(H)-20S-Ethylcholestane	40.3	41.0	102	65-135
C26,20R- +C27,20S- triaromatic steroid	293.9	228	77	65-135
C28,20S-triaromatic steroid	187.6	149	80	65-135
C27,20R-triaromatic steroid	180.2	140	78	65-135
C28,20R-triaromatic steroid	150.5	119	79	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

11/16/12 17:25

Form IV
Method Blank Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Date Analyzed: **11/15/12 00:24**

Client ID	Lab ID	Date/Time Analyzed
LCS	SS110612LCS03	11/15/12 01:52
LCSD	SS110612LCSD03	11/15/12 03:21
SEKR0000R024S092112D004_MDL1	1210081-01	11/15/12 04:49
SEKR0000R024S092112D004_MDL2	1210081-02	11/15/12 06:17
SEKR0000R024S092112D004_MDL3	1210081-03	11/15/12 07:45
SEKR0000R024S092112D004_MDL4	1210081-04	11/15/12 09:14
SEKR0000R024S092112D004_MDL5	1210081-05	11/15/12 10:42
SEKR0000R024S092112D004_MDL6	1210081-06	11/15/12 12:09
SEKR0000R024S092112D004_MDL7	1210081-07	11/15/12 13:47

N/A - Not Applicable

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **C211131203**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	**RT**	**Area**	**RT**
Standard:		52429	42.70	24365	26.20
Upper Limit:		104858	43.20	48730	26.70
Lower Limit:		26214	42.20	12182	25.70
Client ID	**Lab ID**				
Blank	SS110612B07	44721	42.72	20164	26.20
LCS	SS110612LCS03	48231	42.70	21426	26.18
LCSD	SS110612LCSD03	48205	42.70	21345	26.20
SEKR0000R024S092112D004_MDL1	1210081-01	53382	42.72	21605	26.18
SEKR0000R024S092112D004_MDL2	1210081-02	56363	42.72	23350	26.18
SEKR0000R024S092112D004_MDL3	1210081-03	58604	42.72	23569	26.18
SEKR0000R024S092112D004_MDL4	1210081-04	57685	42.72	23956	26.18
SEKR0000R024S092112D004_MDL5	1210081-05	57842	42.72	23829	26.18
SEKR0000R024S092112D004_MDL6	1210081-06	58076	42.72	23314	26.18
SEKR0000R024S092112D004_MDL7	1210081-07	71540	42.73	28266	26.20
CCV	C211131204	52839	42.72	24064	26.20

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-01**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**0.766**	J	C3-Dibenzothiophenes	**197**
C1-Decalins	**3.40**		C4-Dibenzothiophenes	**126**
C2-Decalins	**11.6**		Benzo(b)fluorene	**267**
C3-Decalins	**20.5**		Fluoranthene	**2250**
C4-Decalins	**55.7**		Pyrene	**1970**
Benzothiophene	**1.82**		C1-Fluoranthenes/Pyrenes	**1020**
C1-Benzo(b)thiophenes	**4.29**		C2-Fluoranthenes/Pyrenes	**430**
C2-Benzo(b)thiophenes	**15.5**		C3-Fluoranthenes/Pyrenes	**196**
C3-Benzo(b)thiophenes	**39.4**		C4-Fluoranthenes/Pyrenes	**158**
C4-Benzo(b)thiophenes	**50.7**		Naphthobenzothiophenes	**245**
Naphthalene	**38.4**		C1-Naphthobenzothiophenes	**157**
C1-Naphthalenes	**25.4**		C2-Naphthobenzothiophenes	**140**
C2-Naphthalenes	**89.2**		C3-Naphthobenzothiophenes	**101**
C3-Naphthalenes	**166**		C4-Naphthobenzothiophenes	**74.0**
C4-Naphthalenes	**150**		Benz[a]anthracene	**972**
Biphenyl	**7.16**		Chrysene/Triphenylene	**990**
Dibenzofuran	**22.6**		C1-Chrysenes	**409**
Acenaphthylene	**66.6**		C2-Chrysenes	**211**
Acenaphthene	**39.1**		C3-Chrysenes	**164**
Fluorene	**54.8**		C4-Chrysenes	**75.9**
C1-Fluorenes	**62.9**		Benzo[b]fluoranthene	**912**
C2-Fluorenes	**108**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**719**
C3-Fluorenes	**110**		Benzo[a]fluoranthene	**194**
Anthracene	**204**		Benzo[e]pyrene	**719**
Phenanthrene	**834**		Benzo[a]pyrene	**1090**
C1-Phenanthrenes/Anthracenes	**533**		Perylene	**286**
C2-Phenanthrenes/Anthracenes	**418**		Indeno[1,2,3-cd]pyrene	**727**
C3-Phenanthrenes/Anthracenes	**228**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**202**
C4-Phenanthrenes/Anthracenes	**96.2**		Benzo[g,h,i]perylene	**682**
Retene	0.146	U		
Dibenzothiophene	**61.9**			
C1-Dibenzothiophenes	**116**			
C2-Dibenzothiophenes	**193**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	67	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	85	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-01**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result
Carbazole	**65.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	67	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	85	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-01**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**43.7**
2/3-Methyldibenzothiophene	**38.9**
1-Methyldibenzothiophene	**21.0**
3-Methylphenanthrene	**110**
2-Methylphenanthrene	**134**
2-Methylanthracene	**54.6**
9/4-Methylphenanthrene	**142**
1-Methylphenanthrene	**85.1**
2-Methylnaphthalene	**23.7**
1-Methylnaphthalene	**16.4**
2,6-Dimethylnaphthalene	**34.4**
2,3,5-Trimethylnaphthalene	**23.4**
Naphthobenzothiophene-2,1-D	**160**
Naphthobenzothiophene-1,2-D	**33.3**
Naphthobenzothiophene-2,3-D	**52.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	67	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	85	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-01**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**34.0**	
C24 Tricyclic Terpane	**18.0**	
C25 Tricyclic Terpane	**32.1**	
C24 Tetracyclic Terpane	**8.84**	
C26 Tricyclic Terpane-22S	**9.39**	
C26 Tricyclic Terpane-22R	**7.18**	
C28 Tricyclic Terpane-22S	**8.10**	
C28 Tricyclic Terpane-22R	**9.35**	
C29 Tricyclic Terpane-22S	**9.51**	
C29 Tricyclic Terpane-22R	**9.61**	
18a-22,29,30-Trisnorneohopane-TS	**16.0**	
C30 Tricyclic Terpane-22S	**10.1**	
C30 Tricyclic Terpane-22R	**12.4**	
17a(H)-22,29,30-Trisnorhopane-TM	**33.1**	
17a/b,21b/a 28,30-Bisnorhopane	**17.8**	
17a(H),21b(H)-25-Norhopane	**10.9**	
30-Norhopane	**94.6**	
18a(H)-30-Norneohopane-C29Ts	**19.4**	
17a(H)-Diahopane	**6.68**	
30-Normoretane	**11.7**	
18a(H)&18b(H)-Oleananes	**4.23**	
Hopane	**126**	
Moretane	**15.2**	
30-Homohopane-22S	**58.8**	
30-Homohopane-22R	**46.2**	
T22a-Gammacerane/C32-diahopane	**19.2**	
30,31-Bishomohopane-22S	**81.2**	G
30,31-Bishomohopane-22R	**28.7**	

Parameter	Result
30,31-Trishomohopane-22S	**35.3**
30,31-Trishomohopane-22R	**18.0**
Tetrakishomohopane-22S	**24.6**
Tetrakishomohopane-22R	**11.3**
Pentakishomohopane-22S	**23.9**
Pentakishomohopane-22R	**16.0**
13b(H),17a(H)-20S-Diacholestane	**18.0**
13b(H),17a(H)-20R-Diacholestane	**9.87**
13b,17a-20S-Methyldiacholestane	**8.96**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**32.8**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**36.8**
Unknown Sterane (S18)	**7.34**
13a,17b-20S-Ethyldiacholestane	**2.21**
14a,17a-20S-Methylcholestane	**14.0**
14a,17a-20R-Methylcholestane	**13.9**
14a(H),17a(H)-20S-Ethylcholestane	**24.4**
14a(H),17a(H)-20R-Ethylcholestane	**26.6**
14b(H),17b(H)-20R-Cholestane	**20.4**
14b(H),17b(H)-20S-Cholestane	**20.5**
14b,17b-20R-Methylcholestane	**19.8**
14b,17b-20S-Methylcholestane	**28.8**
14b(H),17b(H)-20R-Ethylcholestane	**37.4**
14b(H),17b(H)-20S-Ethylcholestane	**31.7**
C26,20R- +C27,20S- triaromatic steroid	**84.2**
C28,20S-triaromatic steroid	**72.8**
C27,20R-triaromatic steroid	**55.6**
C28,20R-triaromatic steroid	**59.6**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	94	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28979.D
Acq On : 15 Nov 2012 4:49 am
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	21605M3	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	53382	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	25327	333.278	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	33.33%#		
42) Phenanthrene-d10	32.070	188	35045	450.115	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	45.01%#		
83) Benzo[b]fluoranthene-d12	46.630	264	48243	439.935	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	43.99%#		
88) Benzo[a]pyrene-d12	47.789	264	45048	423.968	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	42.40%#		
129) 5B(H)Cholane - Surr	43.332	217	9898	470.459	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	47.05%#		
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	74M3	4.282	ng/mL	
5) C1-Decalins	17.799	152	328M5	18.979	ng/mL	
6) C2-Decalins	20.298	166	1116M5	64.576	ng/mL	
7) C3-Decalins	22.014	180	1984m	114.801	ng/mL	
8) C4-Decalins	24.995	194	5385M5	311.596	ng/mL	
10) Naphthalene	19.304	128	18253	214.782	ng/mL#	100
11) C1-Naphthalenes	21.999	142	12060M5	141.909	ng/mL	
12) C2-Naphthalenes	24.844	156	42357m	498.412	ng/mL	
13) C3-Naphthalenes	27.524	170	78811m	927.364	ng/mL	
14) C4-Naphthalenes	29.963	184	71511M5	841.466	ng/mL	
16) 2-Methylnaphthalene	21.999	142	7172	132.503	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	4829	91.816	ng/mL#	100
18) Benzothiophene	19.530	134	714M4	10.163	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	1684M5	23.970	ng/mL	
20) C2-Benzo(b)thiophenes	25.025	162	6093m	86.726	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	15480m	220.339	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	19914M5	283.451	ng/mL	
23) Biphenyl	23.881	154	2738	40.025	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	9390	192.465	ng/mL#	100
25) Dibenzofuran	26.967	168	9573M3	126.401	ng/mL	
26) Acenaphthylene	25.582	152	31540	372.247	ng/mL#	100
27) Acenaphthene	26.320	153	11929M3	218.724	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	5971M3	130.811	ng/mL	
29) Fluorene	28.337	166	18628M3	306.240	ng/mL	
30) C1-Fluorenes	30.715	180	21400M5	351.811	ng/mL	
31) C2-Fluorenes	32.928	194	36817M5	605.264	ng/mL	
32) C3-Fluorenes	34.765	208	37258m	612.514	ng/mL	
33) Dibenzothiophene	31.664	184	28861	345.753	ng/mL#	85
34) 4-Methyldibenzothiophene(	33.455	198	20381	244.163	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.802	198	18162M3	217.579	ng/mL	
36) 1-Methyldibenzothiophene(	34.208	198	9818	117.619	ng/mL#	100
37) OTP	33.862	198	3975M3	47.620	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	58050m	695.434	ng/mL	
39) C2-Dibenzothiophenes	35.142	212	90076M5	1079.103	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	91718m	1098.774	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	58853M5	705.054	ng/mL	

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Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43)	Phenanthrene	32.161	178	395983	4662.758	ng/mL	100
44)	3-Methylphenanthrene(3MP)	34.133	192	52055	612.955	ng/mL	98
45)	2-Methylphenanthrene(2MP)	34.253	192	63451	747.145	ng/mL	96
46)	2-Methylanthracene(2MA)	34.404	192	25940	305.447	ng/mL#	37
47)	9/4-Methylphenanthrene(9M	34.584	192	67241M3	791.773	ng/mL	
48)	1-Methylphenanthrene(1MP)	34.675	192	40380M3	475.480	ng/mL	
49)	C1-Phenanthrenes/Anthrace	34.253	192	253015M5	2979.289	ng/mL	
50)	C2-Phenanthrenes/Anthrace	36.421	206	198321M5	2335.259	ng/mL	
52)	C3-Phenanthrenes/Anthrace	38.273	220	108184M5	1273.882	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.456	234	45684M5	537.936	ng/mL	
55)	Anthracene	32.341	178	83545M3	1138.140	ng/mL	
56)	Carbazole	33.034	167	27488	363.854	ng/mL	100
57)	1-Methylphenanthrene	34.675	192	40292M3	621.881	ng/mL	
58)	Fluoranthene	36.963	202	1180841	12590.743	ng/mL	99
59)	Benzo(b)fluorene	39.493	216	93279M3	1492.589	ng/mL	
60)	Pyrene	37.852	202	1048560	10999.732	ng/mL	96
61)	C1-Fluoranthenes/Pyrenes	39.252	216	543203M5	5698.374	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.315	230	229333M5	2405.777	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.212	244	104492M5	1096.155	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.506	258	84330M5	884.649	ng/mL	
66)	Naphthobenzothiophene	41.706	234	83948	892.883	ng/ml#	66
67)	Naphthobenzothiophene-2,1	41.706	234	83948	892.883	ng/mL#	66
68)	Naphthobenzothiophene-1,2	42.052	234	17522	186.366	ng/mL#	18
69)	Naphthobenzothiophene-2,3	42.353	234	27386M3	291.281	ng/mL	
70)	C1-Naphthobenzothiophenes	43.121	248	82391M5	876.322	ng/ml	
71)	C2-Naphthobenzothiophenes	45.184	262	73323M5	779.874	ng/ml	
72)	C3-Naphthobenzothiophenes	46.750	276	53143M5	565.236	ng/ml	
73)	C4-Naphthobenzothiophenes	47.804	290	38865M5	413.374	ng/mL	
75)	Benz[a]anthracene	42.655	228	564873M3	5434.018	ng/mL	
77)	Chrysene/Triphenylene	42.805	228	592121	5532.819	ng/mL	99
78)	C1-Chrysenes	44.296	242	244926M5	2288.605	ng/mL	
79)	C2-Chrysenes	46.027	256	127887M5	1194.985	ng/mL	
80)	BBF-D12 Surr BKGD	46.630	256	1875	17.520	ng/mL	100
81)	C3-Chrysenes	47.594	270	98114M5	916.784	ng/mL	
82)	C4-Chrysenes	48.542	284	45411M5	424.323	ng/mL	
84)	Benzo[b]fluoranthene	46.720	252	616200	5099.888	ng/mL	96
85)	Benzo[j]+[k]fluoranthene	46.795	252	499876	4021.233	ng/mL	95
86)	Benzo[a]fluoranthene	47.097	252	135142M3	1087.144	ng/mL	
87)	Benzo[e]pyrene	47.699	252	474054	4018.159	ng/mL	92
89)	Benzo[a]pyrene	47.880	252	690257	6114.457	ng/mL	92
90)	Perylene	48.166	252	190970	1599.766	ng/mL	92
91)	Indeno[1,2,3-cd]pyrene	52.533	276	539756M3	4062.699	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.564	278	160154M3	1132.122	ng/mL	
93)	Benzo[g,h,i]perylene	53.783	276	545892	3810.710	ng/mL	100
94)	Hopane (T19)	51.630	191	28139M3	702.377	ng/mL	
96)	C23 Tricyclic Terpane (T4	40.351	191	7615M3	190.078	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.074	191	4024M3	100.443	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.639	191	7182	179.270	ng/ml	100
99)	C24 Tetracyclic Terpane (	43.874	191	1979M3	49.398	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	2102M3	52.468	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.739	191	1609M3	40.162	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.042	191	1814M3	45.279	ng/ml	
103)	C28 Tricyclic Terpane-22R	46.208	191	2094M3	52.268	ng/ml	

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Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	2129M3	53.142	ng/ml	
105) C29 Tricyclic Terpane-22R	46.916	191	2153	53.741	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	47.985	191	3591	89.635	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2256M3	56.312	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	2777	69.317	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	7406M3	184.861	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	3982	99.395	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.491	191	2445	61.030	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	21186M3	528.824	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.410	191	4341M3	108.356	ng/ml	
114) 17a(H)-Diahopane (X)	50.546	191	1496M4	37.342	ng/ml	
115) 30-Normoretane (T17)	51.073	191	2622	65.448	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	947M3	23.638	ng/ml	
117) Moretane (T20)	52.292	191	3406M3	85.017	ng/ml	
118) 30-Homohopane-22S (T21)	53.362	191	13175	328.861	ng/ml	100
119) 30-Homohopane-22R (T22)	53.587	191	10338	258.047	ng/ml	100
120) Gammacerane/C32-diahopane	54.099	191	4302M4	107.382	ng/mL	
121) 30,31-Bishomohopane-22S (	54.822	191G	18194M3	454.140	ng/ml	
122) 30,31-Bishomohopane-22R (	55.229	191	6430	160.499	ng/ml	100
123) 30,31-Trishomohopane-22S	56.915	191	7897	197.117	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	4038	100.792	ng/ml	100
125) Tetrakishomohopane-22S (T	59.460	191	5521M3	137.810	ng/ml	
126) Tetrakishomohopane-22R (T	60.288	191	2540M3	63.401	ng/ml	
127) Pentakishomohopane-22S (T	62.487	191	5357	133.716	ng/ml	100
128) Pentakishomohopane-22R (T	63.707	191	3587M3	89.535	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2115M3	100.527	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1161	55.183	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1054M3	50.097	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	3851M3	183.041	ng/ml	
134) 14a,17a-20R-Chol/13b,17a-	47.353	217	4327	205.665	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	863	41.019	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.880	217	260	12.358	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	1642M3	78.045	ng/ml	
138) 14a,17a-20R-Methylcholest	48.723	217	1638M3	77.855	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.070	217	2871M3	136.461	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3131M3	148.819	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2398M3	113.979	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.021	218	2410M3	114.549	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2331	110.794	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	3381M3	160.701	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	4392M3	208.755	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3727M3	177.147	ng/ml	
147) C26,20R- +C27,20S- triaro	49.024	231	9901	470.601	ng/mL	100
148) C28,20S-triaromatic stero	49.853	231	8556M3	406.673	ng/mL	
149) C27,20R-triaromatic stero	50.305	231	6536	310.661	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	7008M3	333.095	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28979.D
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QLast Update : Tue Oct 30 11:49:46 2012
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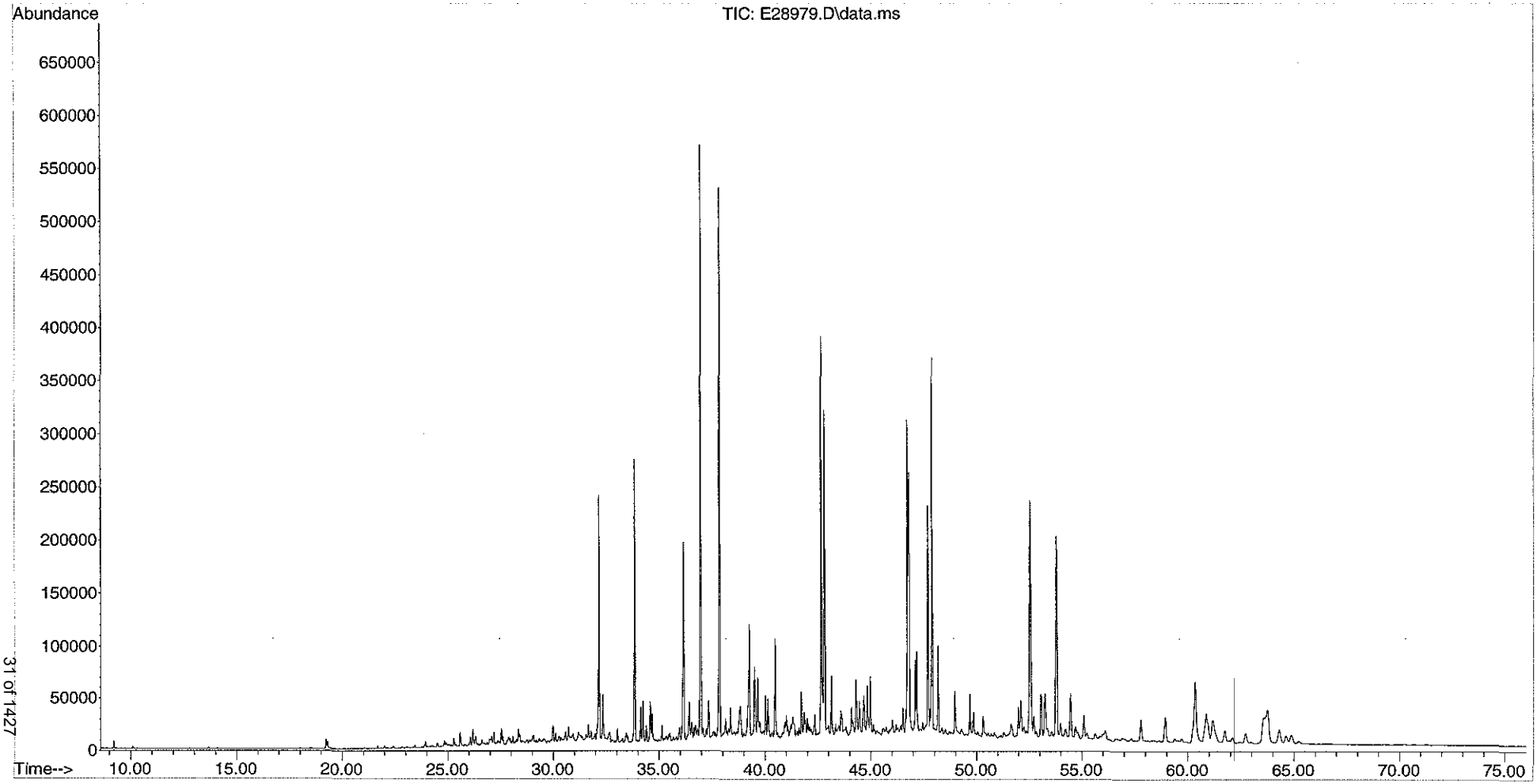
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-02**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**1.14**	J	C3-Dibenzothiophenes	**216**
C1-Decalins	**4.42**		C4-Dibenzothiophenes	**133**
C2-Decalins	**15.4**		Benzo(b)fluorene	**331**
C3-Decalins	**24.4**		Fluoranthene	**2560**
C4-Decalins	**63.1**		Pyrene	**2520**
Benzothiophene	**2.10**		C1-Fluoranthenes/Pyrenes	**1400**
C1-Benzo(b)thiophenes	**4.67**		C2-Fluoranthenes/Pyrenes	**513**
C2-Benzo(b)thiophenes	**17.2**		C3-Fluoranthenes/Pyrenes	**224**
C3-Benzo(b)thiophenes	**43.0**		C4-Fluoranthenes/Pyrenes	**179**
C4-Benzo(b)thiophenes	**51.9**		Naphthobenzothiophenes	**298**
Naphthalene	**46.2**		C1-Naphthobenzothiophenes	**231**
C1-Naphthalenes	**29.0**		C2-Naphthobenzothiophenes	**170**
C2-Naphthalenes	**107**		C3-Naphthobenzothiophenes	**111**
C3-Naphthalenes	**201**		C4-Naphthobenzothiophenes	**80.9**
C4-Naphthalenes	**172**		Benz[a]anthracene	**1210**
Biphenyl	**8.88**		Chrysene/Triphenylene	**1180**
Dibenzofuran	**26.1**		C1-Chrysenes	**541**
Acenaphthylene	**99.2**		C2-Chrysenes	**261**
Acenaphthene	**48.0**		C3-Chrysenes	**188**
Fluorene	**67.6**		C4-Chrysenes	**85.7**
C1-Fluorenes	**89.3**		Benzo[b]fluoranthene	**1150**
C2-Fluorenes	**139**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**924**
C3-Fluorenes	**121**		Benzo[a]fluoranthene	**254**
Anthracene	**270**		Benzo[e]pyrene	**851**
Phenanthrene	**918**		Benzo[a]pyrene	**1330**
C1-Phenanthrenes/Anthracenes	**765**		Perylene	**327**
C2-Phenanthrenes/Anthracenes	**546**		Indeno[1,2,3-cd]pyrene	**868**
C3-Phenanthrenes/Anthracenes	**268**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**227**
C4-Phenanthrenes/Anthracenes	**100**		Benzo[g,h,i]perylene	**811**
Retene	0.146	U		
Dibenzothiophene	**72.6**			
C1-Dibenzothiophenes	**158**			
C2-Dibenzothiophenes	**239**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-02**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result
Carbazole	**45.8**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-02**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**59.9**
2/3-Methyldibenzothiophene	**56.4**
1-Methyldibenzothiophene	**23.9**
3-Methylphenanthrene	**160**
2-Methylphenanthrene	**186**
2-Methylanthracene	**79.1**
9/4-Methylphenanthrene	**209**
1-Methylphenanthrene	**127**
2-Methylnaphthalene	**27.4**
1-Methylnaphthalene	**18.6**
2,6-Dimethylnaphthalene	**40.4**
2,3,5-Trimethylnaphthalene	**30.2**
Naphthobenzothiophene-2,1-D	**202**
Naphthobenzothiophene-1,2-D	**42.0**
Naphthobenzothiophene-2,3-D	**53.6**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-02**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.02	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**34.1**	
C24 Tricyclic Terpane	**21.0**	
C25 Tricyclic Terpane	**22.1**	
C24 Tetracyclic Terpane	**9.25**	
C26 Tricyclic Terpane-22S	**9.32**	
C26 Tricyclic Terpane-22R	**7.47**	
C28 Tricyclic Terpane-22S	**9.41**	
C28 Tricyclic Terpane-22R	**9.60**	
C29 Tricyclic Terpane-22S	**10.6**	
C29 Tricyclic Terpane-22R	**10.8**	
18a-22,29,30-Trisnorneohopane-TS	**16.6**	
C30 Tricyclic Terpane-22S	**10.5**	
C30 Tricyclic Terpane-22R	**12.5**	
17a(H)-22,29,30-Trisnorhopane-TM	**33.6**	
17a/b,21b/a 28,30-Bisnorhopane	**17.8**	
17a(H),21b(H)-25-Norhopane	**12.0**	
30-Norhopane	**98.6**	
18a(H)-30-Norneohopane-C29Ts	**18.0**	
17a(H)-Diahopane	**7.16**	
30-Normoretane	**11.9**	
18a(H)&18b(H)-Oleananes	**4.83**	
Hopane	**130**	
Moretane	**14.9**	
30-Homohopane-22S	**63.3**	
30-Homohopane-22R	**46.5**	
T22a-Gammacerane/C32-diahopane	**21.1**	
30,31-Bishomohopane-22S	**78.1**	G
30,31-Bishomohopane-22R	**28.7**	

Parameter	Result
30,31-Trishomohopane-22S	**36.4**
30,31-Trishomohopane-22R	**17.5**
Tetrakishomohopane-22S	**24.6**
Tetrakishomohopane-22R	**13.6**
Pentakishomohopane-22S	**24.3**
Pentakishomohopane-22R	**16.5**
13b(H),17a(H)-20S-Diacholestane	**18.0**
13b(H),17a(H)-20R-Diacholestane	**9.74**
13b,17a-20S-Methyldiacholestane	**9.62**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**32.7**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**36.8**
Unknown Sterane (S18)	**7.72**
13a,17b-20S-Ethyldiacholestane	**2.96**
14a,17a-20S-Methylcholestane	**15.1**
14a,17a-20R-Methylcholestane	**13.4**
14a(H),17a(H)-20S-Ethylcholestane	**26.6**
14a(H),17a(H)-20R-Ethylcholestane	**27.9**
14b(H),17b(H)-20R-Cholestane	**22.3**
14b(H),17b(H)-20S-Cholestane	**21.2**
14b,17b-20R-Methylcholestane	**21.3**
14b,17b-20S-Methylcholestane	**30.7**
14b(H),17b(H)-20R-Ethylcholestane	**47.6**
14b(H),17b(H)-20S-Ethylcholestane	**25.7**
C26,20R- +C27,20S- triaromatic steroid	**86.4**
C28,20S-triaromatic steroid	**75.7**
C27,20R-triaromatic steroid	**56.9**
C28,20R-triaromatic steroid	**62.4**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23350M3	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	56363	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	29516	359.375	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.94%#			
42) Phenanthrene-d10	32.070	188	38452	456.966	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.70%#			
83) Benzo[b]fluoranthene-d12	46.645	264	52808	456.095	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.61%#			
88) Benzo[a]pyrene-d12	47.789	264	49432	440.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.06%#			
129) 5B(H)Cholane - Surr	43.332	217	10684	480.960	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.10%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	119	6.371	ng/mL	100
5) C1-Decalins	17.362	152	462M5	24.735	ng/mL	
6) C2-Decalins	19.138	166	1611M5	86.252	ng/mL	
7) C3-Decalins	22.014	180	2549m	136.472	ng/mL	
8) C4-Decalins	24.995	194	6589M5	352.771	ng/mL	
10) Naphthalene	19.289	128	23698	258.014	ng/mL#	100
11) C1-Naphthalenes	21.999	142	14907M5	162.301	ng/mL	
12) C2-Naphthalenes	24.844	156	55138M5	600.319	ng/mL	
13) C3-Naphthalenes	27.524	170	103060m	1122.073	ng/mL	
14) C4-Naphthalenes	29.963	184	88299M5	961.361	ng/mL	
16) 2-Methylnaphthalene	21.999	142	8949	152.977	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	5924	104.218	ng/mL#	100
18) Benzothiophene	19.515	134	889M3	11.708	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	1983M5	26.116	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	7313M5	96.313	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18251m	240.367	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	22014M5	289.926	ng/mL	
23) Biphenyl	23.881	154	3669	49.626	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	11913	225.930	ng/mL#	100
25) Dibenzofuran	26.967	168	11950	145.995	ng/mL	93
26) Acenaphthylene	25.582	152	50776	554.492	ng/mL#	100
27) Acenaphthene	26.320	153	15804M3	268.118	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	8313M3	168.509	ng/mL	
29) Fluorene	28.337	166	24829M3	377.679	ng/mL	
30) C1-Fluorenes	30.715	180	32815M5	499.156	ng/mL	
31) C2-Fluorenes	32.928	194	51144M5	777.962	ng/mL	
32) C3-Fluorenes	34.765	208	44510m	677.051	ng/mL	
33) Dibenzothiophene	31.664	184	36590	405.587	ng/mL#	90
34) 4-Methyldibenzothiophene(	33.455	198	30204	334.800	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.801	198	28445M3	315.302	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	12060	133.681	ng/mL#	100
37) OTP	33.862	198	2952M3	32.722	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	82564m	915.192	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	120674M5	1337.627	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	108700m	1204.900	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	66854M5	741.052	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
43) Phenanthrene	32.160	178	470969	5131.283 ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	81886	892.161 ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	95630	1041.904 ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	40603M3	442.376 ng/mL	
47) 9/4-Methylphenanthrene(9M	34.584	192	107020M3	1166.000 ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	65046	708.687 ng/mL	97
49) C1-Phenanthrenes/Anthrace	34.253	192	392699M5	4278.519 ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	279873M5	3049.262 ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	137581M5	1498.967 ng/mL	
53) C4-Phenanthrenes/Anthrace	40.456	234	51466M5	560.730 ng/mL	
55) Anthracene	32.341	178	119948M3	1511.944 ng/mL	
56) Carbazole	33.034	167	20911	256.110 ng/mL	96
57) 1-Methylphenanthrene	34.690	192	64679M3	923.675 ng/mL	
58) Fluoranthene	36.963	202	1450871	14313.839 ng/mL	98
59) Benzo(b)fluorene	39.493	216	125129M3	1852.600 ng/mL	
60) Pyrene	37.852	202	1449054	14065.033 ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.252	216	805230m	7815.849 ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	295580M5	2869.005 ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	128694m	1249.150 ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.506	258	102917M5	998.949 ng/mL	
66) Naphthobenzothiophene	41.721	234	114816	1129.936 ng/ml#	65
67) Naphthobenzothiophene-2,1	41.721	234	114816	1129.936 ng/mL#	65
68) Naphthobenzothiophene-1,2	42.052	234	23827	234.488 ng/mL#	16
69) Naphthobenzothiophene-2,3	42.353	234	30435M3	299.519 ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	131020M5	1289.404 ng/ml	
71) C2-Naphthobenzothiophenes	44.642	262	96334M5	948.049 ng/ml	
72) C3-Naphthobenzothiophenes	46.750	276	62981M5	619.813 ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	45962M5	452.325 ng/mL	
75) Benz[a]anthracene	42.654	228	739959M3	6741.843 ng/mL	
77) Chrysene/Triphenylene	42.820	228	742113	6567.602 ng/mL	98
78) C1-Chrysenes	44.296	242	341795M5	3024.840 ng/mL	
79) C2-Chrysenes	46.027	256	167002M5	1477.946 ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2221	19.656 ng/mL	100
81) C3-Chrysenes	47.594	270	118776M5	1051.152 ng/mL	
82) C4-Chrysenes	48.542	284	54107M5	478.840 ng/mL	
84) Benzo[b]fluoranthene	46.735	252	822395	6446.443 ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.795	252	678125	5166.631 ng/mL	95
86) Benzo[a]fluoranthene	47.097	252	186325M3	1419.609 ng/mL	
87) Benzo[e]pyrene	47.699	252	592626	4757.522 ng/mL	92
89) Benzo[a]pyrene	47.880	252	887517	7446.025 ng/mL	92
90) Perylene	48.181	252	230269	1826.954 ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.548	276	680226M3	4849.211 ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	189752M3	1270.406 ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	685283	4530.747 ng/mL	100
94) Hopane (T19)	51.645	191	30647M3	724.520 ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8069M3	190.758 ng/ml	
97) C24 Tricyclic Terpane (T5	41.089	191	4976	117.637 ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	5230	123.641 ng/ml	100
99) C24 Tetracyclic Terpane (	43.889	191	2187M3	51.702 ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2203M3	52.081 ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	1766M3	41.750 ng/ml	
102) C28 Tricyclic Terpane-22S	46.042	191	2224M3	52.577 ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2270M3	53.665 ng/ml	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	2505	59.220	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.916	191	2557	60.450	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	47.985	191	3913	92.507	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2473M3	58.464	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	2946	69.646	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	7937M3	187.637	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	4216	99.670	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.491	191	2844M3	67.234	ng/ml	
112) 30-Norhopane (T15)	50.320	191	23326	551.446	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.410	191	4248	100.426	ng/ml	100
114) 17a(H)-Diahopane (X)	50.545	191	1694	40.048	ng/ml	100
115) 30-Normoretane (T17)	51.073	191	2820	66.667	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	1143M3	27.021	ng/ml	
117) Moretane (T20)	52.307	191	3514M3	83.074	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	14963	353.738	ng/ml	100
119) 30-Homohopane-22R (T22)	53.602	191	10986	259.718	ng/ml	100
120) Gammacerane/C32-diahopane	54.114	191	4993	118.039	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.837	191G	18466	436.551	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	6782	160.332	ng/ml	100
123) 30,31-Trishomohopane-22S	56.930	191	8614M3	203.642	ng/ml	
124) 30,31-Trishomohopane-22R	57.518	191	4132	97.684	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	5807M3	137.282	ng/ml	
126) Tetrakishomohopane-22R (T	60.288	191	3217M3	76.053	ng/ml	
127) Pentakishomohopane-22S (T	62.472	191	5753	136.006	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	3897	92.128	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2235M3	100.613	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1209	54.425	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1195M3	53.795	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4065	182.993	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4565M3	205.502	ng/ml	
135) Unknown Sterane (S18)	47.639	217	958	43.126	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	367	16.521	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	1871	84.226	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	1664M3	74.908	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.070	217	3307M3	148.871	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3463M3	155.893	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2766M3	124.517	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	2639M3	118.799	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2640	118.844	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	3813M3	171.649	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.310	218	5907M3	265.914	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3186M3	143.424	ng/ml	
147) C26,20R- +C27,20S- triaro	49.024	231	10732	483.121	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	9397M3	423.023	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	7064	317.999	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	7748M3	348.790	ng/mL	

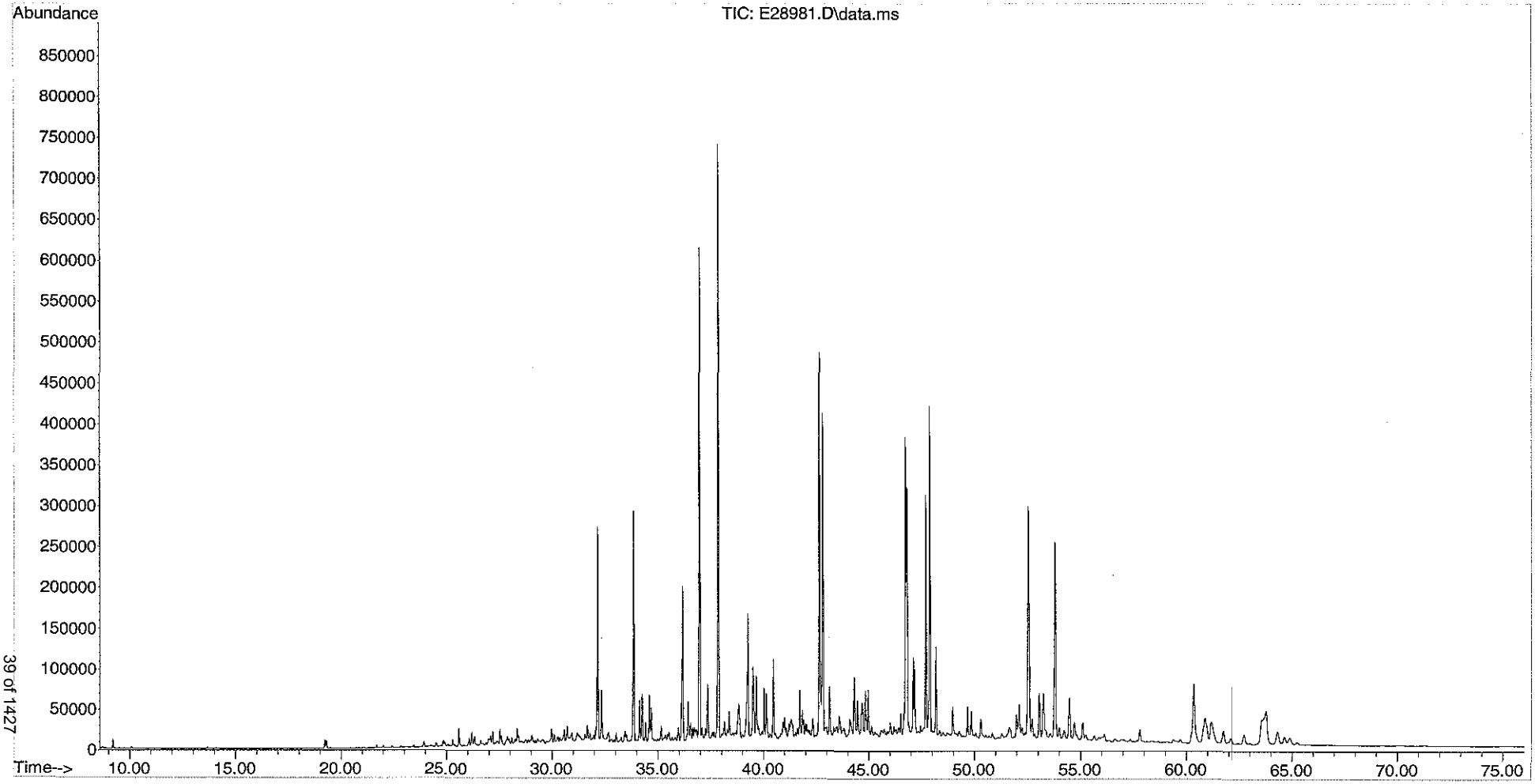
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.04	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**0.929**	J	C3-Dibenzothiophenes	**220**
C1-Decalins	**4.26**		C4-Dibenzothiophenes	**134**
C2-Decalins	**12.6**		Benzo(b)fluorene	**280**
C3-Decalins	**22.9**		Fluoranthene	**2290**
C4-Decalins	**64.6**		Pyrene	**2140**
Benzothiophene	**1.57**	J	C1-Fluoranthenes/Pyrenes	**1200**
C1-Benzo(b)thiophenes	**4.50**		C2-Fluoranthenes/Pyrenes	**522**
C2-Benzo(b)thiophenes	**16.2**		C3-Fluoranthenes/Pyrenes	**227**
C3-Benzo(b)thiophenes	**41.1**		C4-Fluoranthenes/Pyrenes	**177**
C4-Benzo(b)thiophenes	**50.9**		Naphthobenzothiophenes	**286**
Naphthalene	**33.0**		C1-Naphthobenzothiophenes	**238**
C1-Naphthalenes	**26.2**		C2-Naphthobenzothiophenes	**182**
C2-Naphthalenes	**93.5**		C3-Naphthobenzothiophenes	**116**
C3-Naphthalenes	**174**		C4-Naphthobenzothiophenes	**78.6**
C4-Naphthalenes	**160**		Benz[a]anthracene	**1020**
Biphenyl	**7.88**		Chrysene/Triphenylene	**1060**
Dibenzofuran	**25.7**		C1-Chrysenes	**485**
Acenaphthylene	**74.1**		C2-Chrysenes	**243**
Acenaphthene	**47.1**		C3-Chrysenes	**164**
Fluorene	**59.8**		C4-Chrysenes	**83.0**
C1-Fluorenes	**67.8**		Benzo[b]fluoranthene	**1020**
C2-Fluorenes	**124**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**806**
C3-Fluorenes	**126**		Benzo[a]fluoranthene	**204**
Anthracene	**208**		Benzo[e]pyrene	**750**
Phenanthrene	**804**		Benzo[a]pyrene	**1110**
C1-Phenanthrenes/Anthracenes	**601**		Perylene	**275**
C2-Phenanthrenes/Anthracenes	**492**		Indeno[1,2,3-cd]pyrene	**743**
C3-Phenanthrenes/Anthracenes	**259**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**206**
C4-Phenanthrenes/Anthracenes	**99.8**		Benzo[g,h,i]perylene	**688**
Retene	0.146	U		
Dibenzothiophene	**64.2**			
C1-Dibenzothiophenes	**145**			
C2-Dibenzothiophenes	**244**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	84	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.04	2	1	AC

Parameter	Result
Carbazole	**56.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	84	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.04	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**56.4**
2/3-Methyldibenzothiophene	**50.7**
1-Methyldibenzothiophene	**22.8**
3-Methylphenanthrene	**125**
2-Methylphenanthrene	**142**
2-Methylanthracene	**59.9**
9/4-Methylphenanthrene	**163**
1-Methylphenanthrene	**104**
2-Methylnaphthalene	**23.3**
1-Methylnaphthalene	**17.8**
2,6-Dimethylnaphthalene	**36.9**
2,3,5-Trimethylnaphthalene	**25.3**
Naphthobenzothiophene-2,1-D	**198**
Naphthobenzothiophene-1,2-D	**39.2**
Naphthobenzothiophene-2,3-D	**48.8**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	84	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.04	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**34.2**	
C24 Tricyclic Terpane	**18.5**	
C25 Tricyclic Terpane	**21.3**	
C24 Tetracyclic Terpane	**9.19**	
C26 Tricyclic Terpane-22S	**8.68**	
C26 Tricyclic Terpane-22R	**6.76**	
C28 Tricyclic Terpane-22S	**8.40**	
C28 Tricyclic Terpane-22R	**9.31**	
C29 Tricyclic Terpane-22S	**10.3**	
C29 Tricyclic Terpane-22R	**9.63**	
18a-22,29,30-Trisnorneohopane-TS	**17.6**	
C30 Tricyclic Terpane-22S	**8.72**	
C30 Tricyclic Terpane-22R	**11.2**	
17a(H)-22,29,30-Trisnorhopane-TM	**30.6**	
17a/b,21b/a 28,30-Bisnorhopane	**17.4**	
17a(H),21b(H)-25-Norhopane	**12.2**	
30-Norhopane	**98.4**	
18a(H)-30-Norneohopane-C29Ts	**18.6**	
17a(H)-Diahopane	**7.01**	
30-Normoretane	**13.2**	
18a(H)&18b(H)-Oleananes	**3.75**	
Hopane	**129**	
Moretane	**14.7**	
30-Homohopane-22S	**60.1**	
30-Homohopane-22R	**50.4**	
T22a-Gammacerane/C32-diahopane	**20.4**	
30,31-Bishomohopane-22S	**88.9**	G
30,31-Bishomohopane-22R	**30.7**	

Parameter	Result	
30,31-Trishomohopane-22S	**36.3**	
30,31-Trishomohopane-22R	**17.8**	
Tetrakishomohopane-22S	**94.9**	G
Tetrakishomohopane-22R	**157**	G
Pentakishomohopane-22S	**27.3**	
Pentakishomohopane-22R	**15.5**	
13b(H),17a(H)-20S-Diacholestane	**17.2**	
13b(H),17a(H)-20R-Diacholestane	**10.8**	
13b,17a-20S-Methyldiacholestane	**10.1**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**33.3**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**37.7**	
Unknown Sterane (S18)	**7.32**	
13a,17b-20S-Ethyldiacholestane	**2.20**	
14a,17a-20S-Methylcholestane	**16.8**	
14a,17a-20R-Methylcholestane	**14.9**	
14a(H),17a(H)-20S-Ethylcholestane	**27.8**	
14a(H),17a(H)-20R-Ethylcholestane	**28.6**	
14b(H),17b(H)-20R-Cholestane	**21.4**	
14b(H),17b(H)-20S-Cholestane	**21.5**	
14b,17b-20R-Methylcholestane	**19.9**	
14b,17b-20S-Methylcholestane	**31.9**	
14b(H),17b(H)-20R-Ethylcholestane	**47.1**	
14b(H),17b(H)-20S-Ethylcholestane	**24.6**	
C26,20R- +C27,20S- triaromatic steroid	**85.0**	
C28,20S-triaromatic steroid	**73.6**	
C27,20R-triaromatic steroid	**55.6**	
C28,20R-triaromatic steroid	**61.5**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	93	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23569M3	500.000	ng/mL	-0.01
74) Chrysene-d12	42.715	240	58604	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	28882	348.388	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 34.84%#			
42) Phenanthrene-d10	32.070	188	37924	446.504	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.65%#			
83) Benzo[b]fluoranthene-d12	46.645	264	53051M3	440.672	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.07%#			
88) Benzo[a]pyrene-d12	47.790	264	49193	421.724	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.17%#			
129) 5B(H)Cholane - Surr	43.332	217	10790	467.157	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.72%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	98M3	5.198	ng/mL	
5) C1-Decalins	17.362	152	449M5	23.816	ng/mL	
6) C2-Decalins	20.298	166	1334m	70.758	ng/mL	
7) C3-Decalins	21.623	180	2418m	128.255	ng/mL	
8) C4-Decalins	24.995	194	6812M5	361.321	ng/mL	
10) Naphthalene	19.304	128	17118	184.642	ng/mL#	100
11) C1-Naphthalenes	21.999	142	13577M5	146.447	ng/mL	
12) C2-Naphthalenes	24.844	156	48525M5	523.410	ng/mL	
13) C3-Naphthalenes	27.524	170	90207m	973.009	ng/mL	
14) C4-Naphthalenes	29.963	184	83080M5	896.134	ng/mL	
16) 2-Methylnaphthalene	21.999	142	7685	130.149	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	5724	99.764	ng/mL#	100
18) Benzothiophene	19.515	134	673M3	8.781	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	1931M5	25.195	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	6953m	90.721	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	17648m	230.265	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	21854M5	285.144	ng/mL	
23) Biphenyl	23.881	154	3291	44.100	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	10981	206.320	ng/mL#	100
25) Dibenzofuran	26.967	168	11871	143.682	ng/mL	94
26) Acenaphthylene	25.582	152	38332	414.709	ng/mL#	100
27) Acenaphthene	26.320	153	15698	263.845	ng/mL	100
28) 2,3,5-Trimethylnaphthalen	27.885	170	7063M3	141.841	ng/mL	
29) Fluorene	28.337	166	22212M3	334.732	ng/mL	
30) C1-Fluorenes	30.716	180	25199M5	379.745	ng/mL	
31) C2-Fluorenes	32.928	194	46102M5	694.751	ng/mL	
32) C3-Fluorenes	35.458	208	46721M5	704.079	ng/mL	
33) Dibenzothiophene	31.664	184	32747	359.616	ng/mL#	89
34) 4-Methyldibenzothiophene(	33.455	198	28731	315.513	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.802	198	25835M3	283.711	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	11599	127.376	ng/mL#	100
37) OTP	33.862	198	2987M3	32.802	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	76846m	843.895	ng/mL	
39) C2-Dibenzothiophenes	35.142	212	124280M5	1364.798	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	111968m	1229.592	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	68524M5	752.506	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
43) Phenanthrene	32.161	178	417047	4501.574 ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	64770	699.123 ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	73832	796.937 ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	31043	335.076 ng/mL#	37
47) 9/4-Methylphenanthrene(9M	34.585	192	84583M3	912.983 ng/mL	
48) 1-Methylphenanthrene(1MP)	34.675	192	53835	581.091 ng/mL	96
49) C1-Phenanthrenes/Anthrace	34.253	192	311492M5	3362.221 ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	255162M5	2754.200 ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	134133M5	1447.822 ng/mL	
53) C4-Phenanthrenes/Anthrace	40.457	234	51772M5	558.823 ng/mL	
55) Anthracene	32.341	178	93260M3	1164.619 ng/mL	
56) Carbazole	33.034	167	25866	313.854 ng/mL	99
57) 1-Methylphenanthrene	34.675	192	53835	761.669 ng/mL	98
58) Fluoranthene	36.963	202	1313603	12839.177 ng/mL	99
59) Benzo(b)fluorene	39.493	216	106928M3	1568.414 ng/mL	
60) Pyrene	37.852	202	1243842	11960.990 ng/mL	96
61) C1-Fluoranthenes/Pyrenes	39.252	216	696371m	6696.419 ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	303796M5	2921.353 ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	132328m	1272.488 ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.507	258	102970M5	990.177 ng/mL	
66) Naphthobenzothiophene	41.721	234	113668	1108.244 ng/ml#	65
67) Naphthobenzothiophene-2,1	41.721	234	113668	1108.244 ng/mL#	65
68) Naphthobenzothiophene-1,2	42.052	234	22515	219.517 ng/mL#	16
69) Naphthobenzothiophene-2,3	42.354	234	28030M3	273.288 ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	136403M5	1329.906 ng/ml	
71) C2-Naphthobenzothiophenes	44.642	262	104675M5	1020.564 ng/ml	
72) C3-Naphthobenzothiophenes	46.766	276	66615M5	649.485 ng/ml	
73) C4-Naphthobenzothiophenes	47.805	290	45110M5	439.815 ng/mL	
75) Benz[a]anthracene	42.655	228	652099M3	5714.146 ng/mL	
77) Chrysene/Triphenylene	42.820	228	695695	5921.374 ng/mL	99
78) C1-Chrysenes	44.296	242	319005M5	2715.195 ng/mL	
79) C2-Chrysenes	46.028	256	161601M5	1375.459 ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2005	17.065 ng/mL	100
81) C3-Chrysenes	47.594	270	107795M5	917.492 ng/mL	
82) C4-Chrysenes	47.519	284	54609M5	464.802 ng/mL	
84) Benzo[b]fluoranthene	46.735	252	755193	5693.305 ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.796	252	615827	4512.563 ng/mL	95
86) Benzo[a]fluoranthene	47.097	252	155714M3	1141.017 ng/mL	
87) Benzo[e]pyrene	47.699	252	543493	4196.245 ng/mL	92
89) Benzo[a]pyrene	47.880	252	768875	6203.980 ng/mL	92
90) Perylene	48.181	252	201834	1540.116 ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.549	276	606326M3	4157.104 ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	178611M3	1150.089 ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	605315	3849.002 ng/mL	100
94) Hopane (T19)	51.645	191	31842M3	723.985 ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8417	191.376 ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	4552M3	103.498 ng/ml	
98) C25 Tricyclic Terpane (T6	42.579	191	5255	119.482 ng/ml	100
99) C24 Tetracyclic Terpane (	43.889	191	2263M3	51.453 ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2136M3	48.566 ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	1665M3	37.857 ng/ml	
102) C28 Tricyclic Terpane-22S	46.043	191	2069M3	47.042 ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2292M3	52.113 ng/ml	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	2537	57.683	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.916	191	2371M3	53.909	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	4339	98.655	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2147M3	48.816	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	2753	62.594	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.513	191	7545	171.549	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	4289M3	97.518	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	2997	68.142	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	24228M3	550.867	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	4586M3	104.271	ng/ml	
114) 17a(H)-Diahopane (X)	50.546	191	1725	39.221	ng/ml	100
115) 30-Normoretane (T17)	51.073	191	3236	73.576	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	923M3	20.986	ng/ml	
117) Moretane (T20)	52.308	191	3610M3	82.080	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	14786	336.186	ng/ml	100
119) 30-Homohopane-22R (T22)	53.588	191	12402	281.982	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	5011	113.934	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.822	191G	21888M3	497.663	ng/ml	
122) 30,31-Bishomohopane-22R (	55.244	191	7561	171.913	ng/ml	100
123) 30,31-Trishomohopane-22S	56.931	191	8946	203.403	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	4385	99.701	ng/ml	100
125) Tetrakishomohopane-22S (T	59.536	191G	23351	530.927	ng/ml	100
126) Tetrakishomohopane-22R (T	60.258	191G	38609	877.845	ng/ml	100
127) Pentakishomohopane-22S (T	62.487	191	6731	153.041	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	3821	86.877	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2229M3	96.505	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	1396	60.440	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1305M3	56.501	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4308	186.517	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4875	211.065	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	947	41.001	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	284	12.296	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	2168M3	93.864	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	1930M3	83.560	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.070	217	3588M3	155.344	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3696M3	160.020	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2766M3	119.755	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.022	218	2774M3	120.101	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2572	111.356	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.287	218	4127M3	178.680	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	6086M3	263.496	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3175M3	137.463	ng/ml	
147) C26,20R- +C27,20S- triaro	49.025	231	10993	475.946	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	9513M3	411.869	ng/mL	
149) C27,20R-triaromatic stero	50.305	231	7189	311.251	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	7945M3	343.982	ng/mL	

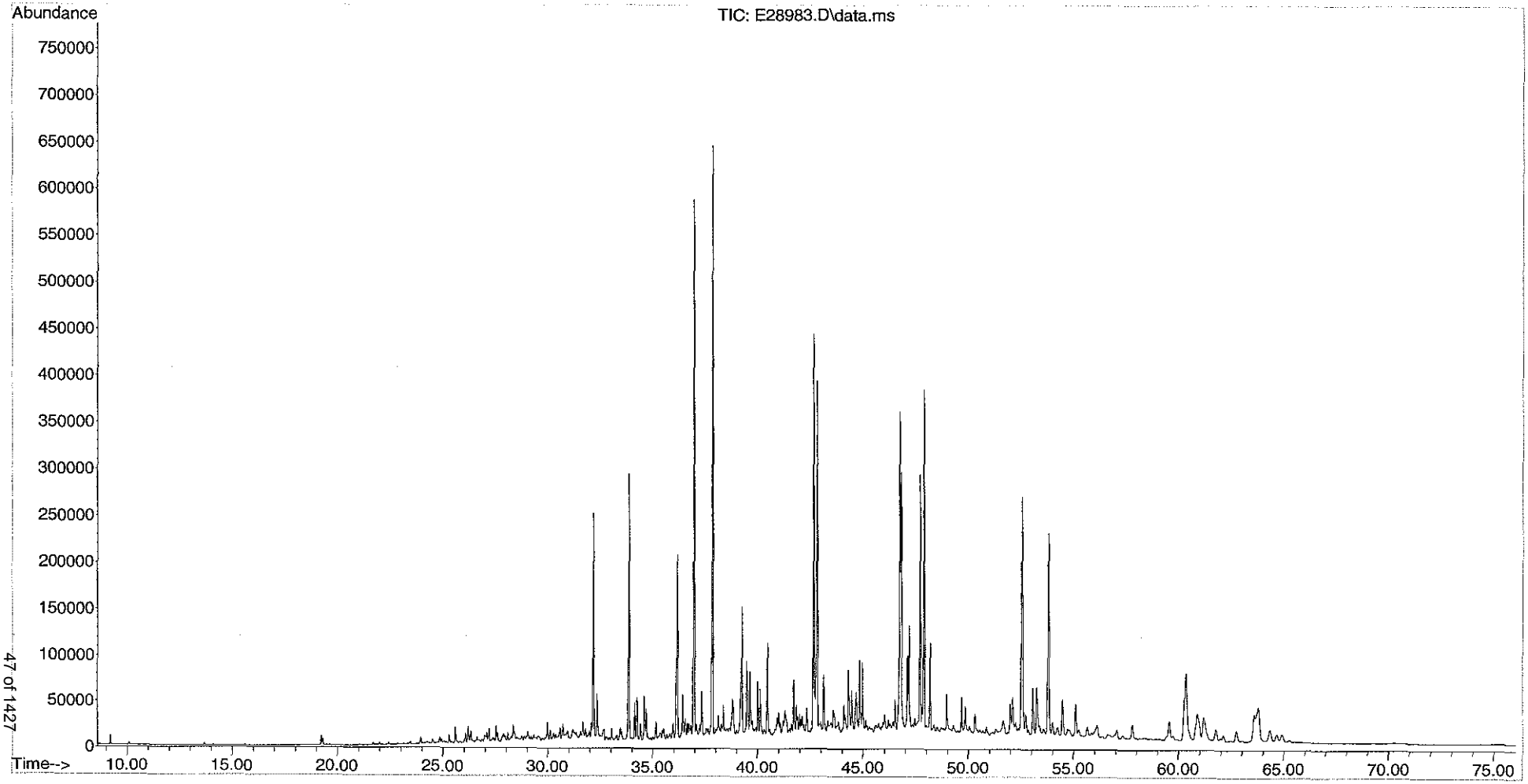
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-04**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.05	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**1.02**	J	C3-Dibenzothiophenes	**210**
C1-Decalins	**3.45**		C4-Dibenzothiophenes	**130**
C2-Decalins	**12.5**		Benzo(b)fluorene	**394**
C3-Decalins	**24.0**		Fluoranthene	**3450**
C4-Decalins	**62.9**		Pyrene	**3100**
Benzothiophene	**2.90**		C1-Fluoranthenes/Pyrenes	**1530**
C1-Benzo(b)thiophenes	**5.10**		C2-Fluoranthenes/Pyrenes	**625**
C2-Benzo(b)thiophenes	**16.8**		C3-Fluoranthenes/Pyrenes	**260**
C3-Benzo(b)thiophenes	**42.9**		C4-Fluoranthenes/Pyrenes	**204**
C4-Benzo(b)thiophenes	**51.9**		Naphthobenzothiophenes	**337**
Naphthalene	**65.2**		C1-Naphthobenzothiophenes	**209**
C1-Naphthalenes	**51.6**		C2-Naphthobenzothiophenes	**159**
C2-Naphthalenes	**118**		C3-Naphthobenzothiophenes	**114**
C3-Naphthalenes	**200**		C4-Naphthobenzothiophenes	**82.6**
C4-Naphthalenes	**172**		Benz[a]anthracene	**1490**
Biphenyl	**13.2**		Chrysene/Triphenylene	**1490**
Dibenzofuran	**44.2**		C1-Chrysenes	**592**
Acenaphthylene	**111**		C2-Chrysenes	**284**
Acenaphthene	**76.8**		C3-Chrysenes	**201**
Fluorene	**119**		C4-Chrysenes	**95.7**
C1-Fluorenes	**97.4**		Benzo[b]fluoranthene	**1380**
C2-Fluorenes	**146**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**1240**
C3-Fluorenes	**138**		Benzo[a]fluoranthene	**282**
Anthracene	**356**		Benzo[e]pyrene	**1040**
Phenanthrene	**1520**		Benzo[a]pyrene	**1610**
C1-Phenanthrenes/Anthracenes	**815**		Perylene	**413**
C2-Phenanthrenes/Anthracenes	**548**		Indeno[1,2,3-cd]pyrene	**1040**
C3-Phenanthrenes/Anthracenes	**279**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**297**
C4-Phenanthrenes/Anthracenes	**98.4**		Benzo[g,h,i]perylene	**966**
Retene	0.146	U		
Dibenzothiophene	**97.3**			
C1-Dibenzothiophenes	**144**			
C2-Dibenzothiophenes	**219**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-04**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.05	2	1	AC

Parameter	Result
Carbazole	103

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-04**
Associated Blank: **SSI10612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.05	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**51.7**
2/3-Methyldibenzothiophene	**50.6**
1-Methyldibenzothiophene	**23.7**
3-Methylphenanthrene	**178**
2-Methylphenanthrene	**218**
2-Methylanthracene	**78.4**
9/4-Methylphenanthrene	**198**
1-Methylphenanthrene	**133**
2-Methylnaphthalene	**44.0**
1-Methylnaphthalene	**38.1**
2,6-Dimethylnaphthalene	**44.7**
2,3,5-Trimethylnaphthalene	**29.7**
Naphthobenzothiophene-2,1-D	**227**
Naphthobenzothiophene-1,2-D	**48.9**
Naphthobenzothiophene-2,3-D	**61.3**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-04**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.05	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**34.9**	
C24 Tricyclic Terpane	**20.2**	
C25 Tricyclic Terpane	**23.5**	
C24 Tetracyclic Terpane	**9.89**	
C26 Tricyclic Terpane-22S	**10.6**	
C26 Tricyclic Terpane-22R	**7.40**	
C28 Tricyclic Terpane-22S	**7.53**	
C28 Tricyclic Terpane-22R	**10.2**	
C29 Tricyclic Terpane-22S	**10.8**	
C29 Tricyclic Terpane-22R	**11.7**	
18a-22,29,30-Trisnorneohopane-TS	**18.4**	
C30 Tricyclic Terpane-22S	**9.44**	
C30 Tricyclic Terpane-22R	**13.4**	
17a(H)-22,29,30-Trisnorhopane-TM	**35.0**	
17a/b,21b/a 28,30-Bisnorhopane	**17.6**	
17a(H),21b(H)-25-Norhopane	**13.6**	
30-Norhopane	**104**	
18a(H)-30-Norneohopane-C29Ts	**20.0**	
17a(H)-Diahopane	**7.02**	
30-Normoretane	**12.9**	
18a(H)&18b(H)-Oleananes	**4.95**	
Hopane	**138**	
Moretane	**16.0**	
30-Homohopane-22S	**62.1**	
30-Homohopane-22R	**50.0**	
T22a-Gammacerane/C32-diahopane	**22.0**	
30,31-Bishomohopane-22S	**84.4**	G
30,31-Bishomohopane-22R	**32.5**	

Parameter	Result
30,31-Trishomohopane-22S	**39.1**
30,31-Trishomohopane-22R	**18.7**
Tetrakishomohopane-22S	**40.8**
Tetrakishomohopane-22R	**13.9**
Pentakishomohopane-22S	**25.6**
Pentakishomohopane-22R	**17.1**
13b(H),17a(H)-20S-Diacholestane	**18.9**
13b(H),17a(H)-20R-Diacholestane	**11.4**
13b,17a-20S-Methyldiacholestane	**11.5**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**40.1**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**44.0**
Unknown Sterane (S18)	**8.26**
13a,17b-20S-Ethyldiacholestane	**2.69**
14a,17a-20S-Methylcholestane	**18.1**
14a,17a-20R-Methylcholestane	**15.4**
14a(H),17a(H)-20S-Ethylcholestane	**32.7**
14a(H),17a(H)-20R-Ethylcholestane	**28.3**
14b(H),17b(H)-20R-Cholestane	**23.8**
14b(H),17b(H)-20S-Cholestane	**23.6**
14b,17b-20R-Methylcholestane	**23.2**
14b,17b-20S-Methylcholestane	**33.6**
14b(H),17b(H)-20R-Ethylcholestane	**51.0**
14b(H),17b(H)-20S-Ethylcholestane	**29.7**
C26,20R- +C27,20S- triaromatic steroid	**94.5**
C28,20S-triaromatic steroid	**93.7**
C27,20R-triaromatic steroid	**62.9**
C28,20R-triaromatic steroid	**76.3**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23956	500.000	ng/mL	-0.01
74) Chrysene-d12	42.715	240	57685	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	29689	352.337	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.23%#			
42) Phenanthrene-d10	32.070	188	39265	454.824	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.48%#			
83) Benzo[b]fluoranthene-d12	46.645	264	54480	459.752	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.98%#			
88) Benzo[a]pyrene-d12	47.805	264	51222	446.114	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.61%#			
129) 5B(H)Cholane - Surr	43.332	217	10888	478.910	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.89%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	109	5.688	ng/mL	100
5) C1-Decalins	17.362	152	370M5	19.308	ng/mL	
6) C2-Decalins	19.139	166	1345M5	70.189	ng/mL	
7) C3-Decalins	21.623	180	2580m	134.637	ng/mL	
8) C4-Decalins	24.995	194	6748M5	352.144	ng/mL	
10) Naphthalene	19.289	128	34409	365.154	ng/mL#	100
11) C1-Naphthalenes	21.999	142	27224M5	288.905	ng/mL	
12) C2-Naphthalenes	24.844	156	62255M5	660.660	ng/mL	
13) C3-Naphthalenes	27.524	170	105735m	1122.076	ng/mL	
14) C4-Naphthalenes	29.963	184	90779M5	963.361	ng/mL	
16) 2-Methylnaphthalene	21.999	142	14778	246.230	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	12458	213.624	ng/mL#	100
18) Benzothiophene	19.515	134	1267	16.264	ng/mL	100
19) C1-Benzo(b)thiophenes	22.390	148	2227M5	28.588	ng/mL	
20) C2-Benzo(b)thiophenes	25.025	162	7329m	94.082	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18718m	240.281	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	22658M5	290.858	ng/mL	
23) Biphenyl	23.881	154	5609	73.947	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	13554	250.549	ng/mL#	100
25) Dibenzofuran	26.967	168	20805	247.748	ng/mL	96
26) Acenaphthylene	25.582	152	58466	622.318	ng/mL#	100
27) Acenaphthene	26.320	153	26020	430.268	ng/mL	96
28) 2,3,5-Trimethylnaphthalen	27.885	170	8420M3	166.361	ng/mL	
29) Fluorene	28.337	166	44959M3	666.581	ng/mL	
30) C1-Fluorenes	30.716	180	36783M5	545.360	ng/mL	
31) C2-Fluorenes	32.928	194	54974M5	815.067	ng/mL	
32) C3-Fluorenes	35.443	208	51957m	770.336	ng/mL	
33) Dibenzothiophene	31.664	184	50418	544.728	ng/mL#	92
34) 4-Methyldibenzothiophene(	33.455	198	26816	289.726	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.772	198	26245M3	283.557	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	12285	132.730	ng/mL#	100
37) OTP	33.862	198	3198M3	34.552	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	77974m	842.449	ng/mL	
39) C2-Dibenzothiophenes	35.142	212	113650M5	1227.901	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	108710m	1174.528	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	67378M5	727.968	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.176	178	804085	8539.024	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	94071	998.992	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	114992	1221.164	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	41331	438.917	ng/mL#	38
47) 9/4-Methylphenanthrene(9M	34.600	192	104701M3	1111.878	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	70121M3	744.654	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	430080M5	4567.258	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	288792M5	3066.842	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	147148M5	1562.646	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.457	234	51870M5	550.836	ng/mL	
55) Anthracene	32.341	178	162538M3	1996.963	ng/mL	
56) Carbazole	33.034	167	48152	574.829	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	70513M3	981.517	ng/mL	
58) Fluoranthene	36.978	202	2007673M3	19306.026	ng/mL	
59) Benzo(b)fluorene	39.493	216	153110M3	2209.529	ng/mL	
60) Pyrene	37.852	202	1833875	17349.961	ng/mL	96
61) C1-Fluoranthenes/Pyrenes	39.252	216	905503m	8566.801	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	370037M5	3500.853	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	153962m	1456.607	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.507	258	120461M5	1139.660	ng/mL	
66) Naphthobenzothiophene	41.721	234	132440	1270.408	ng/ml#	65
67) Naphthobenzothiophene-2,1	41.721	234	132440	1270.408	ng/mL#	65
68) Naphthobenzothiophene-1,2	42.052	234	28584	274.187	ng/mL#	16
69) Naphthobenzothiophene-2,3	42.354	234	35807M3	343.472	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	121819M5	1168.528	ng/ml	
71) C2-Naphthobenzothiophenes	44.642	262	93066M5	892.720	ng/ml	
72) C3-Naphthobenzothiophenes	46.766	276	66275M5	635.731	ng/ml	
73) C4-Naphthobenzothiophenes	47.805	290	48198M5	462.331	ng/mL	
75) Benz[a]anthracene	42.655	228	937941M3	8349.831	ng/mL	
77) Chrysene/Triphenylene	42.820	228	964730	8342.068	ng/mL	99
78) C1-Chrysenes	44.311	242	383393M5	3315.218	ng/mL	
79) C2-Chrysenes	46.028	256	186346M5	1611.343	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2155	18.634	ng/mL	100
81) C3-Chrysenes	47.067	270	130092M5	1124.912	ng/mL	
82) C4-Chrysenes	47.519	284	61977M5	535.918	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	1005982	7704.795	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.811	252	933303M3	6947.868	ng/mL	
86) Benzo[a]fluoranthene	47.097	252	212138M3	1579.237	ng/mL	
87) Benzo[e]pyrene	47.714	252	740936	5811.818	ng/mL	93
89) Benzo[a]pyrene	47.895	252	1101484	9029.365	ng/mL	93
90) Perylene	48.181	252	298125	2311.116	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.564	276	839733M3	5849.117	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	254577M3	1665.354	ng/mL	
93) Benzo[g,h,i]perylene	53.814	276	837425	5409.747	ng/mL	99
94) Hopane (T19)	51.645	191	33343M3	770.191	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8473M3	195.718	ng/ml	
97) C24 Tricyclic Terpane (T5	41.089	191	4902M3	113.231	ng/ml	
98) C25 Tricyclic Terpane (T6	42.579	191	5698	131.618	ng/ml	100
99) C24 Tetracyclic Terpane (	43.889	191	2398M3	55.391	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2572M3	59.411	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	1795	41.463	ng/ml	100
102) C28 Tricyclic Terpane-22S	46.058	191	1825M3	42.156	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2469	57.032	ng/ml	100

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	2610	60.288	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	2842	65.647	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	47.985	191	4462M3	103.068	ng/ml	
107) C30 Tricyclic Terpane-22S	48.106	191	2289M3	52.874	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	3249	75.049	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.513	191	8487	196.041	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	4266	98.540	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.491	191	3309	76.435	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	25114M3	580.109	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	4849M3	112.007	ng/ml	
114) 17a(H)-Diahopane (X)	50.546	191	1701M3	39.291	ng/ml	
115) 30-Normoretane (T17)	51.073	191	3135	72.415	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	1201M3	27.742	ng/ml	
117) Moretane (T20)	52.308	191	3872M3	89.439	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	15048	347.594	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	12124	280.053	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	5333	123.187	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.822	191G	20463M3	472.675	ng/ml	
122) 30,31-Bishomohopane-22R (	55.244	191	7880	182.020	ng/ml	100
123) 30,31-Trishomohopane-22S	56.931	191	9477	218.910	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	4524	104.500	ng/ml	100
125) Tetrakishomohopane-22S (T	59.506	191	9903	228.750	ng/ml	100
126) Tetrakishomohopane-22R (T	60.304	191	3369M3	77.821	ng/ml	
127) Pentakishomohopane-22S (T	62.487	191	6202	143.260	ng/ml	100
128) Pentakishomohopane-22R (T	63.722	191	4147	95.792	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2402M3	105.652	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	1447	63.647	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1465M3	64.438	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	5110	224.764	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	5602M3	246.405	ng/ml	
135) Unknown Sterane (S18)	47.639	217	1052	46.272	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	342	15.043	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	2309M3	101.562	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	1963M3	86.343	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.070	217	4163M3	183.110	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3601M3	158.391	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	3024M3	133.011	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.037	218	3010M3	132.395	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2954	129.932	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.287	218	4274M3	187.993	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	6497M3	285.772	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3782M3	166.352	ng/ml	
147) C26,20R- +C27,20S- triaro	49.040	231	12028	529.053	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	11931M3	524.787	ng/mL	
149) C27,20R-triaromatic stero	50.305	231	8009	352.277	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	9712M3	427.184	ng/mL	

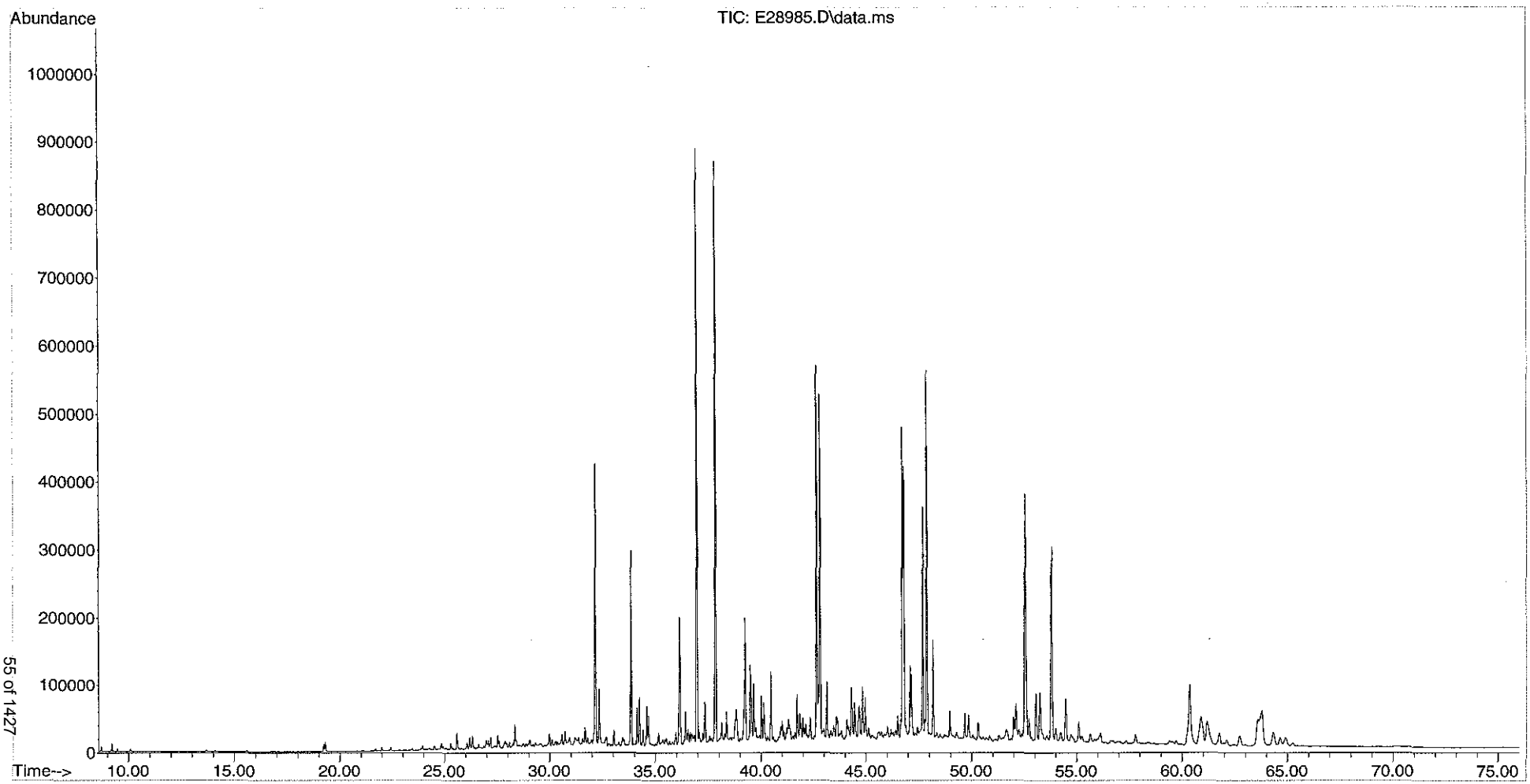
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-05**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.06	2	1	AC

Parameter	Result	
cis/trans-Decalin	**0.702**	J
C1-Decalins	**3.60**	
C2-Decalins	**14.3**	
C3-Decalins	**25.7**	
C4-Decalins	**62.1**	
Benzothiophene	**2.79**	
C1-Benzo(b)thiophenes	**5.07**	
C2-Benzo(b)thiophenes	**16.8**	
C3-Benzo(b)thiophenes	**42.1**	
C4-Benzo(b)thiophenes	**54.2**	
Naphthalene	**50.2**	
C1-Naphthalenes	**28.7**	
C2-Naphthalenes	**105**	
C3-Naphthalenes	**197**	
C4-Naphthalenes	**164**	
Biphenyl	**8.37**	
Dibenzofuran	**28.7**	
Acenaphthylene	**97.6**	
Acenaphthene	**53.4**	
Fluorene	**75.2**	
C1-Fluorenes	**82.8**	
C2-Fluorenes	**131**	
C3-Fluorenes	**133**	
Anthracene	**269**	
Phenanthrene	**1010**	
C1-Phenanthrenes/Anthracenes	**647**	
C2-Phenanthrenes/Anthracenes	**474**	
C3-Phenanthrenes/Anthracenes	**251**	
C4-Phenanthrenes/Anthracenes	**90.9**	
Retene	0.146	U
Dibenzothiophene	**69.2**	
C1-Dibenzothiophenes	**130**	
C2-Dibenzothiophenes	**206**	
C3-Dibenzothiophenes	**202**	
C4-Dibenzothiophenes	**127**	
Benzo(b)fluorene	**315**	
Fluoranthene	**2670**	
Pyrene	**2400**	
C1-Fluoranthenes/Pyrenes	**1240**	
C2-Fluoranthenes/Pyrenes	**528**	
C3-Fluoranthenes/Pyrenes	**229**	
C4-Fluoranthenes/Pyrenes	**181**	
Naphthobenzothiophenes	**252**	
C1-Naphthobenzothiophenes	**182**	
C2-Naphthobenzothiophenes	**148**	
C3-Naphthobenzothiophenes	**106**	
C4-Naphthobenzothiophenes	**77.2**	
Benz[a]anthracene	**1180**	
Chrysene/Triphenylene	**1150**	
C1-Chrysenes	**493**	
C2-Chrysenes	**245**	
C3-Chrysenes	**180**	
C4-Chrysenes	**90.5**	
Benzo[b]fluoranthene	**1130**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**982**	
Benzo[a]fluoranthene	**247**	
Benzo[e]pyrene	**850**	
Benzo[a]pyrene	**1310**	
Perylene	**344**	
Indeno[1,2,3-cd]pyrene	**902**	
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**228**	
Benzo[g,h,i]perylene	**811**	

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	73	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-05**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.06	2	1	AC

Parameter	Result
Carbazole	**56.2**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	73	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-05**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.06	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**46.2**
2/3-Methyldibenzothiophene	**45.4**
1-Methyldibenzothiophene	**22.2**
3-Methylphenanthrene	**138**
2-Methylphenanthrene	**168**
2-Methylanthracene	**68.1**
9/4-Methylphenanthrene	**162**
1-Methylphenanthrene	**103**
2-Methylnaphthalene	**27.1**
1-Methylnaphthalene	**18.0**
2,6-Dimethylnaphthalene	**40.9**
2,3,5-Trimethylnaphthalene	**29.8**
Naphthobenzothiophene-2,1-D	**168**
Naphthobenzothiophene-1,2-D	**37.0**
Naphthobenzothiophene-2,3-D	**46.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	73	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-05**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.06	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**33.3**	
C24 Tricyclic Terpane	**20.0**	
C25 Tricyclic Terpane	**23.0**	
C24 Tetracyclic Terpane	**9.13**	
C26 Tricyclic Terpane-22S	**9.36**	
C26 Tricyclic Terpane-22R	**7.44**	
C28 Tricyclic Terpane-22S	**8.32**	
C28 Tricyclic Terpane-22R	**10.6**	
C29 Tricyclic Terpane-22S	**10.5**	
C29 Tricyclic Terpane-22R	**10.8**	
18a-22,29,30-Trisnorneohopane-TS	**16.5**	
C30 Tricyclic Terpane-22S	**10.4**	
C30 Tricyclic Terpane-22R	**12.2**	
17a(H)-22,29,30-Trisnorhopane-TM	**34.2**	
17a/b,21b/a 28,30-Bisnorhopane	**16.6**	
17a(H),21b(H)-25-Norhopane	**13.6**	
30-Norhopane	**98.2**	
18a(H)-30-Norneohopane-C29Ts	**17.6**	
17a(H)-Diahopane	**6.05**	
30-Normoretane	**12.3**	
18a(H)&18b(H)-Oleananes	**3.72**	
Hopane	**133**	
Moretane	**16.0**	
30-Homohopane-22S	**58.9**	
30-Homohopane-22R	**47.7**	
T22a-Gammacerane/C32-diahopane	**21.8**	
30,31-Bishomohopane-22S	**80.5**	G
30,31-Bishomohopane-22R	**33.6**	

Parameter	Result	
30,31-Trishomohopane-22S	**37.2**	
30,31-Trishomohopane-22R	**17.8**	
Tetrakishomohopane-22S	**38.4**	
Tetrakishomohopane-22R	**71.0**	G
Pentakishomohopane-22S	**23.5**	
Pentakishomohopane-22R	**15.7**	
13b(H),17a(H)-20S-Diacholestane	**16.7**	
13b(H),17a(H)-20R-Diacholestane	**10.8**	
13b,17a-20S-Methyldiacholestane	**10.2**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**32.6**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**37.7**	
Unknown Sterane (S18)	**7.81**	
13a,17b-20S-Ethyldiacholestane	**3.89**	
14a,17a-20S-Methylcholestane	**16.0**	
14a,17a-20R-Methylcholestane	**15.0**	
14a(H),17a(H)-20S-Ethylcholestane	**24.8**	
14a(H),17a(H)-20R-Ethylcholestane	**25.9**	
14b(H),17b(H)-20R-Cholestane	**22.8**	
14b(H),17b(H)-20S-Cholestane	**23.1**	
14b,17b-20R-Methylcholestane	**20.2**	
14b,17b-20S-Methylcholestane	**30.0**	
14b(H),17b(H)-20R-Ethylcholestane	**45.3**	
14b(H),17b(H)-20S-Ethylcholestane	**24.4**	
C26,20R- +C27,20S- triaromatic steroid	**87.7**	
C28,20S-triaromatic steroid	**74.9**	
C27,20R-triaromatic steroid	**56.6**	
C28,20R-triaromatic steroid	**62.5**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	95	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23829	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	57842	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	30513	364.046	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.40%#			
42) Phenanthrene-d10	32.070	188	38567	449.120	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.91%#			
83) Benzo[b]fluoranthene-d12	46.645	264	54189	456.055	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.61%#			
88) Benzo[a]pyrene-d12	47.789	264	50431	438.033	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.80%#			
129) 5B(H)Cholane - Surr	43.332	217	10884	477.435	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.74%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	75M3	3.935	ng/mL	
5) C1-Decalins	17.799	152	384M4	20.146	ng/mL	
6) C2-Decalins	19.138	166	1527m	80.111	ng/mL	
7) C3-Decalins	21.622	180	2743m	143.906	ng/mL	
8) C4-Decalins	24.995	194	6633M5	347.988	ng/mL	
10) Naphthalene	19.289	128	26355	281.174	ng/mL#	100
11) C1-Naphthalenes	21.999	142	15062M5	160.692	ng/mL	
12) C2-Naphthalenes	24.844	156	55375M5	590.780	ng/mL	
13) C3-Naphthalenes	27.524	170	103655m	1105.865	ng/mL	
14) C4-Naphthalenes	29.963	184	86372M5	921.478	ng/mL	
16) 2-Methylnaphthalene	21.999	142	9069	151.912	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	5861	101.037	ng/mL#	100
18) Benzothiophene	19.515	134	1212	15.641	ng/mL	100
19) C1-Benzo(b)thiophenes	22.375	148	2201M5	28.405	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	7278m	93.925	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18295m	236.103	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	23536M5	303.740	ng/mL	
23) Biphenyl	23.881	154	3540	46.919	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	12327	229.082	ng/mL#	100
25) Dibenzofuran	26.967	168	13435	160.838	ng/mL	95
26) Acenaphthylene	25.582	152	51123	547.059	ng/mL#	100
27) Acenaphthene	26.319	153	18007M3	299.352	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	8414M3	167.128	ng/mL	
29) Fluorene	28.337	166	28256M3	421.168	ng/mL	
30) C1-Fluorenes	30.715	180	31151M5	464.319	ng/mL	
31) C2-Fluorenes	32.928	194	49150M5	732.602	ng/mL	
32) C3-Fluorenes	35.443	208	49842m	742.917	ng/mL	
33) Dibenzothiophene	31.664	184	35720	387.984	ng/mL#	86
34) 4-Methyldibenzothiophene(	33.455	198	23830	258.837	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.801	198	23402M3	254.188	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	11438	124.237	ng/mL#	100
37) OTP	33.862	198	2720M3	29.544	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	69892m	759.154	ng/mL	
39) C2-Dibenzothiophenes	35.156	212	106416M5	1155.871	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	104044m	1130.107	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	65810M5	714.816	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
43) Phenanthrene	32.160	178	533026	5690.667 ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	72315	772.046 ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	88131	940.900 ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	35764	381.822 ng/mL#	38
47) 9/4-Methylphenanthrene(9M	34.599	192	84927M3	906.694 ng/mL	
48) 1-Methylphenanthrene(1MP)	34.675	192	54154M3	578.156 ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	339484M5	3624.383 ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	249071M5	2659.120 ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	131602M5	1405.003 ng/mL	
53) C4-Phenanthrenes/Anthrace	40.456	234	47739M5	509.669 ng/mL	
55) Anthracene	32.341	178	121877M3	1505.377 ng/mL	
56) Carbazole	33.034	167	26246	314.990 ng/mL	99
57) 1-Methylphenanthrene	34.675	192	53666M3	750.994 ng/mL	
58) Fluoranthene	36.978	202	1549703	14981.554 ng/mL	99
59) Benzo(b)fluorene	39.493	216	121727M3	1766.004 ng/mL	
60) Pyrene	37.852	202	1411565	13425.737 ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.252	216	730968m	6952.414 ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.314	230	311131M5	2959.242 ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	135111m	1285.073 ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.506	258	106557M5	1013.489 ng/mL	
66) Naphthobenzothiophene	41.721	234	97820	943.322 ng/ml#	65
67) Naphthobenzothiophene-2,1	41.721	234	97820	943.322 ng/mL#	65
68) Naphthobenzothiophene-1,2	42.052	234	21530	207.623 ng/mL#	17
69) Naphthobenzothiophene-2,3	42.353	234	26986M3	260.238 ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	105609M5	1018.435 ng/ml	
71) C2-Naphthobenzothiophenes	45.139	262	86019M5	829.520 ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	61401M5	592.118 ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	44860M5	432.605 ng/mL	
75) Benz[a]anthracene	42.654	228	744584M3	6610.518 ng/mL	
77) Chrysene/Triphenylene	42.820	228	749435	6462.812 ng/mL	99
78) C1-Chrysenes	44.311	242	320742M5	2765.944 ng/mL	
79) C2-Chrysenes	46.027	256	161527M5	1392.941 ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2183	18.825 ng/mL	100
81) C3-Chrysenes	47.609	270	117306M5	1011.598 ng/mL	
82) C4-Chrysenes	47.518	284	58797M5	507.041 ng/mL	
84) Benzo[b]fluoranthene	46.735	252	826534	6313.224 ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.810	252	740994	5501.272 ng/mL	95
86) Benzo[a]fluoranthene	47.097	252	186231M3	1382.612 ng/mL	
87) Benzo[e]pyrene	47.699	252	608936	4763.460 ng/mL	92
89) Benzo[a]pyrene	47.895	252	899831	7356.302 ng/mL	92
90) Perylene	48.181	252	249036	1925.329 ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.563	276	728103M3	5057.798 ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.578	278	196243M3	1280.269 ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	705412	4544.577 ng/mL	100
94) Hopane (T19)	51.645	191	32261M3	743.175 ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8105M3	186.709 ng/ml	
97) C24 Tricyclic Terpane (T5	41.089	191	4854M3	111.818 ng/ml	
98) C25 Tricyclic Terpane (T6	42.624	191	5601	129.027 ng/ml	100
99) C24 Tetracyclic Terpane (	43.889	191	2222M3	51.187 ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2278	52.477 ng/ml	100
101) C26 Tricyclic Terpane-22R	43.738	191	1809	41.673 ng/ml	100
102) C28 Tricyclic Terpane-22S	46.042	191	2025	46.649 ng/ml	100
103) C28 Tricyclic Terpane-22R	46.208	191	2566	59.111 ng/ml	100

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	2562	59.019	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	2639	60.793	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	47.985	191	4009	92.353	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2543M3	58.581	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	2958	68.141	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	8316M3	191.570	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	4039M3	93.044	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.491	191	3305	76.135	ng/ml	100
112) 30-Norhopane (T15)	50.319	191	23892M3	550.384	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	4271M3	98.388	ng/ml	
114) 17a(H)-Diahopane (X)	50.545	191	1472	33.909	ng/ml	100
115) 30-Normoretane (T17)	51.073	191	2980	68.648	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.479	191	904	20.825	ng/ml	100
117) Moretane (T20)	52.307	191	3882M3	89.427	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	14340	330.341	ng/ml	100
119) 30-Homohopane-22R (T22)	53.602	191	11603	267.291	ng/ml	100
120) Gammacerane/C32-diahopane	54.114	191	5313	122.392	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.822	191G	19581	451.074	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	8174	188.299	ng/ml	100
123) 30,31-Trishomohopane-22S	56.930	191	9062	208.755	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	4343	100.047	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	9330M3	214.929	ng/ml	
126) Tetrakishomohopane-22R (T	60.243	191G	17274	397.930	ng/ml	100
127) Pentakishomohopane-22S (T	62.487	191	5721	131.791	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	3811	87.791	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2131M3	93.478	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1373	60.228	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1300M3	57.025	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4165	182.701	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4816M3	211.258	ng/ml	
135) Unknown Sterane (S18)	47.639	217	998	43.778	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	497	21.801	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2040	89.486	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	1923M3	84.354	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.069	217	3162M3	138.704	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3314M3	145.371	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2918M3	128.000	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	2955M3	129.623	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2581	113.218	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	3839M3	168.401	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.310	218	5790M3	253.983	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3123M3	136.993	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	11200	491.297	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	9573M3	419.927	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	7234M3	317.325	ng/mL	
150) C28,20R-triaromatic stero	51.464	231	7986M3	350.312	ng/mL	

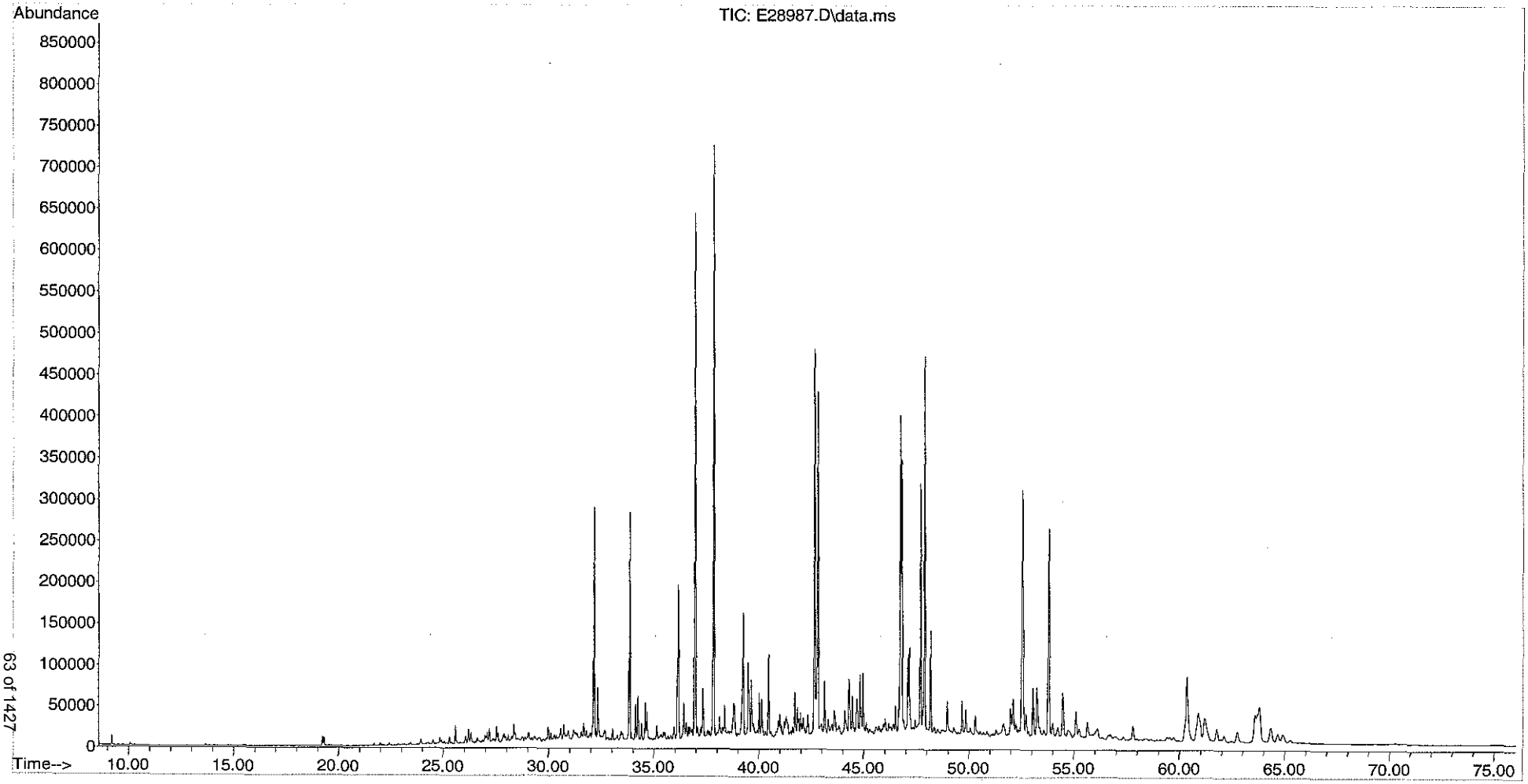
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-06**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.01	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**1.23**	J	C3-Dibenzothiophenes	**212**
C1-Decalins	**4.41**		C4-Dibenzothiophenes	**134**
C2-Decalins	**13.6**		Benzo(b)fluorene	**356**
C3-Decalins	**25.3**		Fluoranthene	**2880**
C4-Decalins	**63.7**		Pyrene	**2640**
Benzothiophene	**3.70**		C1-Fluoranthenes/Pyrenes	**1460**
C1-Benzo(b)thiophenes	**5.12**		C2-Fluoranthenes/Pyrenes	**602**
C2-Benzo(b)thiophenes	**17.1**		C3-Fluoranthenes/Pyrenes	**266**
C3-Benzo(b)thiophenes	**42.9**		C4-Fluoranthenes/Pyrenes	**201**
C4-Benzo(b)thiophenes	**55.7**		Naphthobenzothiophenes	**288**
Naphthalene	**65.3**		C1-Naphthobenzothiophenes	**192**
C1-Naphthalenes	**34.9**		C2-Naphthobenzothiophenes	**154**
C2-Naphthalenes	**111**		C3-Naphthobenzothiophenes	**114**
C3-Naphthalenes	**198**		C4-Naphthobenzothiophenes	**80.6**
C4-Naphthalenes	**176**		Benz[a]anthracene	**1330**
Biphenyl	**8.64**		Chrysene/Triphenylene	**1320**
Dibenzofuran	**33.1**		C1-Chrysenes	**577**
Acenaphthylene	**119**		C2-Chrysenes	**284**
Acenaphthene	**50.1**		C3-Chrysenes	**203**
Fluorene	**73.4**		C4-Chrysenes	**95.9**
C1-Fluorenes	**86.5**		Benzo[b]fluoranthene	**1230**
C2-Fluorenes	**144**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**960**
C3-Fluorenes	**137**		Benzo[a]fluoranthene	**276**
Anthracene	**248**		Benzo[e]pyrene	**978**
Phenanthrene	**954**		Benzo[a]pyrene	**1510**
C1-Phenanthrenes/Anthracenes	**712**		Perylene	**389**
C2-Phenanthrenes/Anthracenes	**555**		Indeno[1,2,3-cd]pyrene	**1020**
C3-Phenanthrenes/Anthracenes	**285**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**263**
C4-Phenanthrenes/Anthracenes	**105**		Benzo[g,h,i]perylene	**941**
Retene	0.146	U		
Dibenzothiophene	**71.6**			
C1-Dibenzothiophenes	**137**			
C2-Dibenzothiophenes	**217**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	71	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-06**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.01	2	1	AC

Parameter	Result
Carbazole	**65.8**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	71	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-06**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.01	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**49.6**
2/3-Methyldibenzothiophene	**48.5**
1-Methyldibenzothiophene	**22.8**
3-Methylphenanthrene	**148**
2-Methylphenanthrene	**180**
2-Methylanthracene	**68.6**
9/4-Methylphenanthrene	**190**
1-Methylphenanthrene	**116**
2-Methylnaphthalene	**33.0**
1-Methylnaphthalene	**22.6**
2,6-Dimethylnaphthalene	**41.8**
2,3,5-Trimethylnaphthalene	**30.2**
Naphthobenzothiophene-2,1-D	**191**
Naphthobenzothiophene-1,2-D	**42.0**
Naphthobenzothiophene-2,3-D	**55.6**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	71	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	88	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-06**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.01	2	1	AC

Parameter	Result		Parameter	Result
C23 Tricyclic Terpane	**35.6**		30,31-Trishomohopane-22S	**35.8**
C24 Tricyclic Terpane	**21.3**		30,31-Trishomohopane-22R	**18.0**
C25 Tricyclic Terpane	**22.3**		Tetrakishomohopane-22S	**31.7**
C24 Tetracyclic Terpane	**9.90**		Tetrakishomohopane-22R	**13.9**
C26 Tricyclic Terpane-22S	**9.73**		Pentakishomohopane-22S	**25.1**
C26 Tricyclic Terpane-22R	**8.03**		Pentakishomohopane-22R	**15.1**
C28 Tricyclic Terpane-22S	**7.62**		13b(H),17a(H)-20S-Diacholestane	**17.8**
C28 Tricyclic Terpane-22R	**10.5**		13b(H),17a(H)-20R-Diacholestane	**10.2**
C29 Tricyclic Terpane-22S	**10.9**		13b,17a-20S-Methyldiacholestane	**11.2**
C29 Tricyclic Terpane-22R	**9.93**		14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**35.2**
18a-22,29,30-Trisnorneohopane-TS	**18.4**		14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**38.8**
C30 Tricyclic Terpane-22S	**10.6**		Unknown Sterane (S18)	**8.14**
C30 Tricyclic Terpane-22R	**12.8**		13a,17b-20S-Ethyldiacholestane	**2.92**
17a(H)-22,29,30-Trisnorhopane-TM	**33.8**		14a,17a-20S-Methylcholestane	**16.9**
17a/b,21b/a 28,30-Bisnorhopane	**16.9**		14a,17a-20R-Methylcholestane	**15.5**
17a(H),21b(H)-25-Norhopane	**14.3**		14a(H),17a(H)-20S-Ethylcholestane	**28.5**
30-Norhopane	**105**		14a(H),17a(H)-20R-Ethylcholestane	**27.9**
18a(H)-30-Norneohopane-C29Ts	**21.0**		14b(H),17b(H)-20R-Cholestane	**22.8**
17a(H)-Diahopane	**8.22**		14b(H),17b(H)-20S-Cholestane	**23.0**
30-Normoretane	**13.3**		14b,17b-20R-Methylcholestane	**23.1**
18a(H)&18b(H)-Oleananes	**4.88**		14b,17b-20S-Methylcholestane	**31.7**
Hopane	**141**		14b(H),17b(H)-20R-Ethylcholestane	**48.5**
Moretane	**16.8**		14b(H),17b(H)-20S-Ethylcholestane	**27.6**
30-Homohopane-22S	**65.9**		C26,20R- +C27,20S- triaromatic steroid	**87.8**
30-Homohopane-22R	**49.9**		C28,20S-triaromatic steroid	**79.8**
T22a-Gammacerane/C32-diahopane	**22.4**		C27,20R-triaromatic steroid	**59.7**
30,31-Bishomohopane-22S	**83.8** G		C28,20R-triaromatic steroid	**66.8**
30,31-Bishomohopane-22R	**31.3**			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	93	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
Acq On : 15 Nov 2012 12:09 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 13:33:46 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23314M3	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	58076	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	29214	356.247	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.62%#			
42) Phenanthrene-d10	32.070	188	38898	462.980	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.30%#			
83) Benzo[b]fluoranthene-d12	46.645	264	54056	453.102	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.31%#			
88) Benzo[a]pyrene-d12	47.805	264	50971	440.939	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.09%#			
129) 5B(H)Cholane - Surr	43.347	217	10621	464.021	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.40%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	128	6.864	ng/mL	100
5) C1-Decalins	17.362	152	459M5	24.613	ng/mL	
6) C2-Decalins	19.139	166	1415M5	75.875	ng/mL	
7) C3-Decalins	21.623	180	2634m	141.240	ng/mL	
8) C4-Decalins	24.995	194	6635M5	355.782	ng/mL	
10) Naphthalene	19.289	128	33433	364.566	ng/mL#	100
11) C1-Naphthalenes	21.999	142	17880M5	194.970	ng/mL	
12) C2-Naphthalenes	24.844	156	56855M5	619.969	ng/mL	
13) C3-Naphthalenes	27.524	170	101209m	1103.621	ng/mL	
14) C4-Naphthalenes	29.963	184	90246M5	984.077	ng/mL	
16) 2-Methylnaphthalene	21.999	142	10767	184.339	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	7159	126.139	ng/mL#	100
18) Benzothiophene	19.515	134	1567	20.669	ng/mL	100
19) C1-Benzo(b)thiophenes	22.375	148	2167M5	28.584	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	7223m	95.274	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18154m	239.458	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	23602M5	311.320	ng/mL	
23) Biphenyl	23.881	154	3561M3	48.240	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	12299	233.611	ng/mL#	100
25) Dibenzofuran	26.967	168	15093M3	184.678	ng/mL	
26) Acenaphthylene	25.582	152	60985	667.006	ng/mL#	100
27) Acenaphthene	26.320	153	16464M2	279.747	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	8324M3	168.993	ng/mL	
29) Fluorene	28.337	166	26902M3	409.844	ng/mL	
30) C1-Fluorenes	30.715	180	31704M5	483.001	ng/mL	
31) C2-Fluorenes	32.928	194	52721M5	803.188	ng/mL	
32) C3-Fluorenes	35.458	208	50254M5	765.604	ng/mL	
33) Dibenzothiophene	31.664	184	36019	399.874	ng/mL#	88
34) 4-Methyldibenzothiophene(	33.455	198	24939	276.867	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.771	198	24418M3	271.083	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	11480	127.448	ng/mL#	100
37) OTP	33.862	198	2899M3	32.184	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	71992m	799.237	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	109235M5	1212.700	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	106902m	1186.799	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	67497M5	749.335	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
Acq On : 15 Nov 2012 12:09 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 16 13:33:46 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.161	178	488365	5329.032	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	75989	829.191	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	92123	1005.245	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	35108M3	383.098	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	97489M3	1063.799	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	59362M3	647.757	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	364634M5	3978.881	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	284200M5	3101.186	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	145914M5	1592.211	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	53691M5	585.875	ng/mL	
55) Anthracene	32.356	178	109586M3	1383.464	ng/mL	
56) Carbazole	33.034	167	29966M3	367.579	ng/mL	
57) 1-Methylphenanthrene	34.690	192	59824M3	855.661	ng/mL	
58) Fluoranthene	36.978	202	1626787M3	16074.154	ng/mL	
59) Benzo(b)fluorene	39.493	216	134013M3	1987.196	ng/mL	
60) Pyrene	37.852	202	1516395	14741.397	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.252	216	838548m	8151.813	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	346181M5	3365.344	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	153009m	1487.453	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.506	258	115379M5	1121.639	ng/mL	
66) Naphthobenzothiophene	41.721	234	108120	1065.682	ng/ml#	66
67) Naphthobenzothiophene-2,1	41.721	234	108120	1065.682	ng/mL#	66
68) Naphthobenzothiophene-1,2	42.052	234	23809	234.673	ng/mL#	17
69) Naphthobenzothiophene-2,3	42.353	234	31527M3	310.745	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	109083M5	1075.174	ng/ml	
71) C2-Naphthobenzothiophenes	45.184	262	87489M5	862.333	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	64688M5	637.595	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	45700M5	450.441	ng/mL	
75) Benz[a]anthracene	42.670	228	841845M3	7443.900	ng/mL	
77) Chrysene/Triphenylene	42.820	228	858878	7376.760	ng/mL	98
78) C1-Chrysenes	44.311	242	375056M5	3221.293	ng/mL	
79) C2-Chrysenes	46.027	256	187042M5	1606.473	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2291	19.677	ng/mL	100
81) C3-Chrysenes	47.609	270	132077M5	1134.387	ng/mL	
82) C4-Chrysenes	48.558	284	62349M5	535.505	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	904333	6879.636	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.811	252	725171	5362.107	ng/mL	95
86) Benzo[a]fluoranthene	47.112	252	208143M3	1539.065	ng/mL	
87) Benzo[e]pyrene	47.714	252	701193	5463.049	ng/mL	92
89) Benzo[a]pyrene	47.895	252	1034670	8424.557	ng/mL	93
90) Perylene	48.181	252	281885	2170.509	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.564	276	821526M3	5683.772	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	226177M3	1469.610	ng/mL	
93) Benzo[g,h,i]perylene	53.828	276	819518	5258.426	ng/mL	100
94) Hopane (T19)	51.645	191	34364M3	788.431	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8674	199.012	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	5175	118.733	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.579	191	5437M3	124.744	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	2410M3	55.294	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2368	54.330	ng/ml	100
101) C26 Tricyclic Terpane-22R	43.739	191	1955M3	44.855	ng/ml	
102) C28 Tricyclic Terpane-22S	46.058	191	1854M3	42.537	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2552M3	58.552	ng/ml	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
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Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 16 13:33:46 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	2661	61.053	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	2417M3	55.454	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	4486	102.925	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2591M3	59.447	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	3111	71.377	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	8224	188.687	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	4122M3	94.573	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	3482	79.889	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	25523	585.587	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.425	191	5103	117.081	ng/ml	100
114) 17a(H)-Diahopane (X)	50.561	191	2002	45.933	ng/ml	100
115) 30-Normoretane (T17)	51.073	191	3249	74.543	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	1187M3	27.234	ng/ml	
117) Moretane (T20)	52.308	191	4079M3	93.587	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	16036	367.922	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	12151	278.787	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	5447	124.973	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.822	191G	20411	468.300	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	7615	174.715	ng/ml	100
123) 30,31-Trishomohopane-22S	56.931	191	8723	200.136	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	4377	100.424	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	7712M3	176.940	ng/ml	
126) Tetrakishomohopane-22R (T	60.304	191	3387M3	77.710	ng/ml	
127) Pentakishomohopane-22S (T	62.487	191	6105	140.070	ng/ml	100
128) Pentakishomohopane-22R (T	63.752	191	3675M3	84.317	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2270M3	99.174	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	1311	57.276	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1435M3	62.694	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4505	196.819	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4966	216.960	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1041	45.480	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	374	16.340	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	2160M3	94.368	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	1981M3	86.548	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	3648M3	159.378	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3572M3	156.057	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2921M3	127.616	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	2943M3	128.577	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2955	129.101	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	4057M3	177.246	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	6206M3	271.134	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3526M3	154.048	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	11232	490.715	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	10199	445.584	ng/mL	100
149) C27,20R-triaromatic stero	50.305	231	7633	333.478	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	8545M3	373.323	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
Acq On : 15 Nov 2012 12:09 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 16 13:33:46 2012
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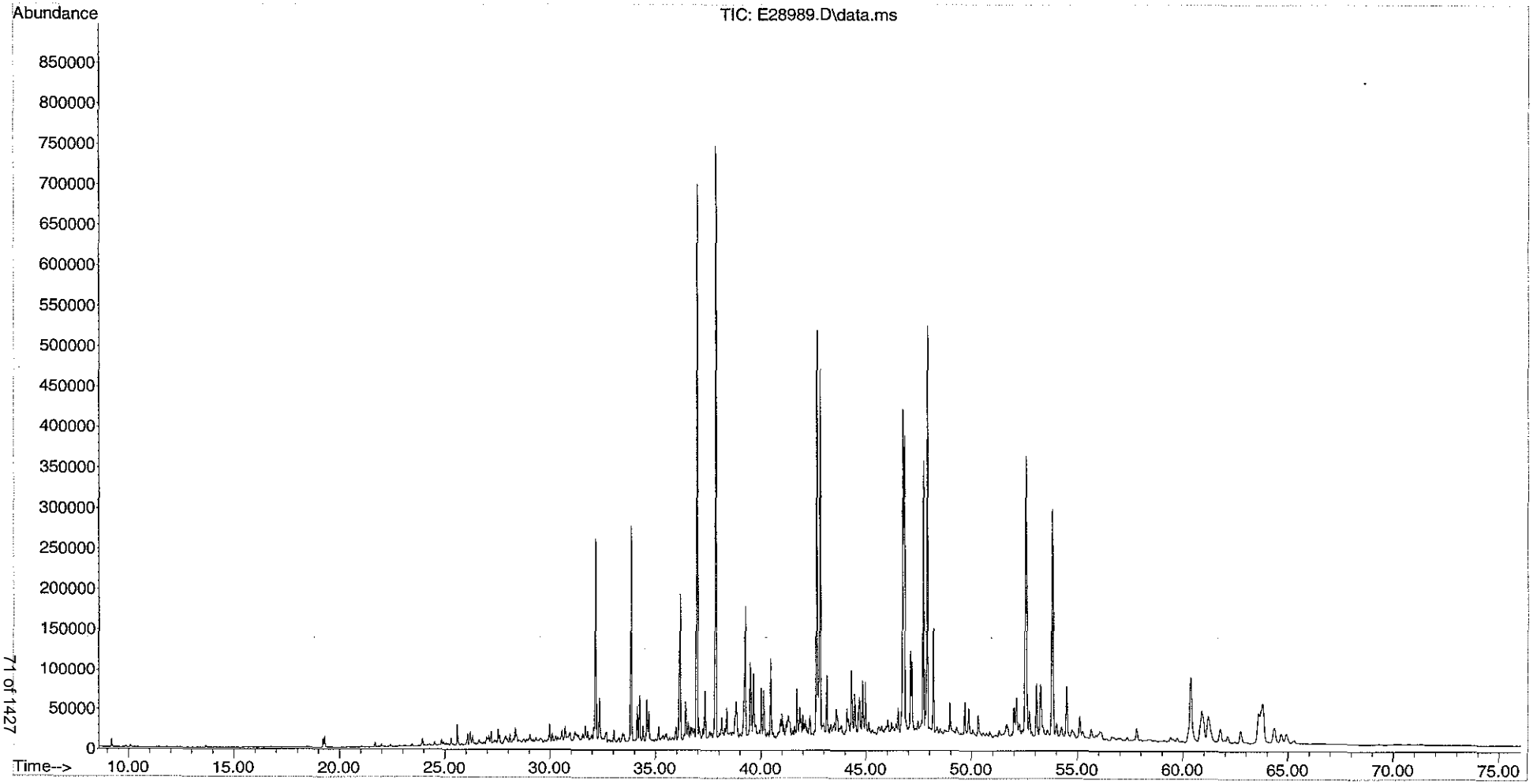
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-07**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.00	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**0.998**	J	C3-Dibenzothiophenes	**219**
C1-Decalins	**4.24**		C4-Dibenzothiophenes	**135**
C2-Decalins	**13.8**		Benzo(b)fluorene	**497**
C3-Decalins	**24.6**		Fluoranthene	**3550**
C4-Decalins	**68.2**		Pyrene	**3150**
Benzothiophene	**4.85**		C1-Fluoranthenes/Pyrenes	**1760**
C1-Benzo(b)thiophenes	**5.21**		C2-Fluoranthenes/Pyrenes	**659**
C2-Benzo(b)thiophenes	**18.7**		C3-Fluoranthenes/Pyrenes	**287**
C3-Benzo(b)thiophenes	**44.7**		C4-Fluoranthenes/Pyrenes	**221**
C4-Benzo(b)thiophenes	**54.9**		Naphthobenzothiophenes	**352**
Naphthalene	**81.0**		C1-Naphthobenzothiophenes	**211**
C1-Naphthalenes	**47.1**		C2-Naphthobenzothiophenes	**163**
C2-Naphthalenes	**158**		C3-Naphthobenzothiophenes	**120**
C3-Naphthalenes	**236**		C4-Naphthobenzothiophenes	**87.8**
C4-Naphthalenes	**186**		Benz[a]anthracene	**1580**
Biphenyl	**16.7**		Chrysene/Triphenylene	**1580**
Dibenzofuran	**74.7**		C1-Chrysenes	**653**
Acenaphthylene	**137**		C2-Chrysenes	**308**
Acenaphthene	**83.1**		C3-Chrysenes	**210**
Fluorene	**127**		C4-Chrysenes	**103**
C1-Fluorenes	**121**		Benzo[b]fluoranthene	**1440**
C2-Fluorenes	**161**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**1310**
C3-Fluorenes	**142**		Benzo[a]fluoranthene	**344**
Anthracene	**437**		Benzo[e]pyrene	**1090**
Phenanthrene	**1540**		Benzo[a]pyrene	**1740**
C1-Phenanthrenes/Anthracenes	**904**		Perylene	**449**
C2-Phenanthrenes/Anthracenes	**631**		Indeno[1,2,3-cd]pyrene	**1180**
C3-Phenanthrenes/Anthracenes	**311**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**308**
C4-Phenanthrenes/Anthracenes	**116**		Benzo[g,h,i]perylene	**1040**
Retene	0.146	U		
Dibenzothiophene	**110**			
C1-Dibenzothiophenes	**159**			
C2-Dibenzothiophenes	**233**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	92	40-120
Benzo[a]pyrene-d12	86	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-07**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.00	2	1	AC

Parameter	Result
Carbazole	**81.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	92	40-120
Benzo[a]pyrene-d12	86	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-07**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**56.2**
2/3-Methyldibenzothiophene	**55.0**
1-Methyldibenzothiophene	**25.8**
3-Methylphenanthrene	**199**
2-Methylphenanthrene	**231**
2-Methylanthracene	**95.3**
9/4-Methylphenanthrene	**218**
1-Methylphenanthrene	**150**
2-Methylnaphthalene	**43.7**
1-Methylnaphthalene	**31.0**
2,6-Dimethylnaphthalene	**66.4**
2,3,5-Trimethylnaphthalene	**28.2**
Naphthobenzothiophene-2,1-D	**221**
Naphthobenzothiophene-1,2-D	**49.1**
Naphthobenzothiophene-2,3-D	**81.9**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	92	40-120
Benzo[a]pyrene-d12	86	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-07**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/15/12	74.4	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**34.6**	
C24 Tricyclic Terpane	**21.7**	
C25 Tricyclic Terpane	**23.0**	
C24 Tetracyclic Terpane	**9.81**	
C26 Tricyclic Terpane-22S	**9.66**	
C26 Tricyclic Terpane-22R	**7.95**	
C28 Tricyclic Terpane-22S	**8.64**	
C28 Tricyclic Terpane-22R	**10.0**	
C29 Tricyclic Terpane-22S	**11.2**	
C29 Tricyclic Terpane-22R	**9.54**	
18a-22,29,30-Trisnorneohopane-TS	**18.8**	
C30 Tricyclic Terpane-22S	**9.82**	
C30 Tricyclic Terpane-22R	**12.8**	
17a(H)-22,29,30-Trisnorhopane-TM	**34.2**	
17a/b,21b/a 28,30-Bisnorhopane	**17.6**	
17a(H),21b(H)-25-Norhopane	**13.8**	
30-Norhopane	**109**	
18a(H)-30-Norneohopane-C29Ts	**19.4**	
17a(H)-Diahopane	**6.85**	
30-Normoretane	**12.4**	
18a(H)&18b(H)-Oleananes	**4.46**	
Hopane	**142**	
Moretane	**16.2**	
30-Homohopane-22S	**68.0**	
30-Homohopane-22R	**52.0**	
T22a-Gammacerane/C32-diahopane	**22.6**	
30,31-Bishomohopane-22S	**83.7**	G
30,31-Bishomohopane-22R	**32.9**	

Parameter	Result
30,31-Trishomohopane-22S	**39.6**
30,31-Trishomohopane-22R	**20.9**
Tetrakishomohopane-22S	**32.9**
Tetrakishomohopane-22R	**11.7**
Pentakishomohopane-22S	**29.7**
Pentakishomohopane-22R	**19.8**
13b(H),17a(H)-20S-Diacholestane	**18.1**
13b(H),17a(H)-20R-Diacholestane	**9.57**
13b,17a-20S-Methyldiacholestane	**9.04**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**36.5**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**41.2**
Unknown Sterane (S18)	**7.20**
13a,17b-20S-Ethyldiacholestane	**2.82**
14a,17a-20S-Methylcholestane	**16.7**
14a,17a-20R-Methylcholestane	**15.7**
14a(H),17a(H)-20S-Ethylcholestane	**28.7**
14a(H),17a(H)-20R-Ethylcholestane	**28.9**
14b(H),17b(H)-20R-Cholestane	**23.6**
14b(H),17b(H)-20S-Cholestane	**23.5**
14b,17b-20R-Methylcholestane	**23.1**
14b,17b-20S-Methylcholestane	**32.3**
14b(H),17b(H)-20R-Ethylcholestane	**44.2**
14b(H),17b(H)-20S-Ethylcholestane	**34.5**
C26,20R- +C27,20S- triaromatic steroid	**90.0**
C28,20S-triaromatic steroid	**81.2**
C27,20R-triaromatic steroid	**60.4**
C28,20R-triaromatic steroid	**67.7**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	92	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	28266	500.000	ng/mL	0.00
74) Chrysene-d12	42.730	240	71540	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	34797	349.989	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.00%#			
42) Phenanthrene-d10	32.085	188	46719	458.650	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.87%#			
83) Benzo[b]fluoranthene-d12	46.660	264	64954	441.984	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.20%#			
88) Benzo[a]pyrene-d12	47.805	264	61414	431.292	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.13%#			
129) 5B(H)Cholane - Surr	43.347	217	13037	462.379	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.24%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	126	5.573	ng/mL	100
5) C1-Decalins	17.814	152	535M5	23.662	ng/mL	
6) C2-Decalins	20.298	166	1735m	76.735	ng/mL	
7) C3-Decalins	21.623	180	3108m	137.460	ng/mL	
8) C4-Decalins	24.995	194	8607M5	380.669	ng/mL	
10) Naphthalene	19.304	128	50255	451.994	ng/mL#	100
11) C1-Naphthalenes	21.999	142	29244M5	263.021	ng/mL	
12) C2-Naphthalenes	24.844	156	98120M5	882.492	ng/mL	
13) C3-Naphthalenes	27.193	170	146317m	1315.977	ng/mL	
14) C4-Naphthalenes	29.963	184	115351M5	1037.468	ng/mL	
16) 2-Methylnaphthalene	21.999	142	17285	244.087	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	11922	173.261	ng/mL#	100
18) Benzothiophene	19.530	134	2489	27.079	ng/mL	100
19) C1-Benzo(b)thiophenes	22.390	148	2672M5	29.070	ng/mL	
20) C2-Benzo(b)thiophenes	24.558	162	9613m	104.585	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	22951m	249.696	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	28186M5	306.650	ng/mL	
23) Biphenyl	23.881	154	8339	93.175	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	23649	370.500	ng/mL#	100
25) Dibenzofuran	26.967	168	41328	417.097	ng/mL	96
26) Acenaphthylene	25.582	152	84721	764.276	ng/mL#	100
27) Acenaphthene	26.320	153	33095M3	463.814	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	9393M3	157.287	ng/mL	
29) Fluorene	28.352	166	56462M3	709.484	ng/mL	
30) C1-Fluorenes	30.580	180	53608M5	673.621	ng/mL	
31) C2-Fluorenes	32.928	194	71581M5	899.464	ng/mL	
32) C3-Fluorenes	35.458	208	63304m	795.458	ng/mL	
33) Dibenzothiophene	31.679	184	66997	613.478	ng/mL#	89
34) 4-Methyldibenzothiophene(	33.455	198	34241	313.538	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.771	198	33528M3	307.009	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	15704	143.798	ng/mL#	100
37) OTP	33.877	198	4300M3	39.374	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	101457m	929.022	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	142290M5	1302.922	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	133634m	1223.660	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	82278M5	753.403	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
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Acq On : 15 Nov 2012 1:47 pm
Operator : AC
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Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.176	178	958032	8622.560	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.148	192	123553	1112.012	ng/mL	97
45) 2-Methylphenanthrene(2MP)	34.253	192	143174	1288.607	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	59119M3	532.088	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.599	192	135203M3	1216.865	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	93056	837.530	ng/mL	97
49) C1-Phenanthrenes/Anthrace	34.253	192	561009M5	5049.240	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.436	206	391536M5	3523.935	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.288	220	192958M5	1736.677	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	72104M5	648.956	ng/mL	
55) Anthracene	32.356	178	234070M3	2437.311	ng/mL	
56) Carbazole	33.034	167	44922M3	454.500	ng/mL	
57) 1-Methylphenanthrene	34.690	192	93056	1097.799	ng/mL	99
58) Fluoranthene	36.993	202	2429395M3	19799.216	ng/mL	
59) Benzo(b)fluorene	39.508	216	226829M3	2774.245	ng/mL	
60) Pyrene	37.867	202	2192672	17581.357	ng/mL	96
61) C1-Fluoranthenes/Pyrenes	39.267	216	1221867m	9797.215	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.330	230	459083M5	3681.035	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.227	244	199824m	1602.236	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.522	258	153704M5	1232.435	ng/mL	
66) Naphthobenzothiophene	41.721	234	151752	1233.697	ng/ml#	66
67) Naphthobenzothiophene-2,1	41.721	234	151752	1233.697	ng/mL#	66
68) Naphthobenzothiophene-1,2	42.067	234	33715	274.092	ng/mL#	16
69) Naphthobenzothiophene-2,3	42.368	234	56251M3	457.303	ng/mL	
70) C1-Naphthobenzothiophenes	43.136	248	144861M5	1177.675	ng/ml	
71) C2-Naphthobenzothiophenes	44.657	262	112122M5	911.517	ng/ml	
72) C3-Naphthobenzothiophenes	46.780	276	82381M5	669.732	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	60266M5	489.944	ng/mL	
75) Benz[a]anthracene	42.670	228	1224970M3	8793.091	ng/mL	
77) Chrysene/Triphenylene	42.835	228	1265525	8823.739	ng/mL	99
78) C1-Chrysenes	44.311	242	523031M5	3646.778	ng/mL	
79) C2-Chrysenes	46.027	256	248629M5	1733.539	ng/mL	
80) BBF-D12 Surr BKGD	46.660	256	2407	16.783	ng/mL	100
81) C3-Chrysenes	47.067	270	168054M5	1171.739	ng/mL	
82) C4-Chrysenes	48.573	284	82652M5	576.282	ng/mL	
84) Benzo[b]fluoranthene	46.750	252	1304377	8055.416	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.826	252	1216183M3	7300.318	ng/mL	
86) Benzo[a]fluoranthene	47.112	252	319758M3	1919.395	ng/mL	
87) Benzo[e]pyrene	47.729	252	964060	6097.465	ng/mL	93
89) Benzo[a]pyrene	47.910	252	1473854	9741.985	ng/mL	93
90) Perylene	48.196	252	400605	2504.111	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.594	276	1168748M3	6564.232	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.609	278	325730M3	1718.143	ng/mL	
93) Benzo[g,h,i]perylene	53.859	276	1110971	5786.924	ng/mL	99
94) Hopane (T19)	51.645	191	42675M3	794.843	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	10357	192.904	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	6519	121.420	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	6877M3	128.088	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	2941	54.778	ng/ml	100
100) C26 Tricyclic Terpane-22S	43.648	191	2896M3	53.939	ng/ml	
101) C26 Tricyclic Terpane-22R	43.754	191	2383	44.385	ng/ml	100
102) C28 Tricyclic Terpane-22S	46.058	191	2589M3	48.221	ng/ml	
103) C28 Tricyclic Terpane-22R	46.223	191	3013M3	56.119	ng/ml	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	46.735	191	3371	62.787	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	2858	53.232	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.000	191	5635	104.955	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.121	191	2944M3	54.833	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	3832	71.373	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.527	191	10256M3	191.023	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	5262M3	98.007	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	4127	76.867	ng/ml	100
112) 30-Norhopane (T15)	50.335	191	32680	608.681	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.425	191	5802M3	108.065	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	2054M3	38.257	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3709	69.082	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.479	191	1338M3	24.921	ng/ml	
117) Moretane (T20)	52.323	191	4848M3	90.296	ng/ml	
118) 30-Homohopane-22S (T21)	53.392	191	20381	379.606	ng/ml	100
119) 30-Homohopane-22R (T22)	53.618	191	15592	290.409	ng/ml	100
120) Gammacerane/C32-diahopane	54.130	191	6775	126.188	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.852	191G	25086M3	467.239	ng/ml	
122) 30,31-Bishomohopane-22R (	55.259	191	9858	183.610	ng/ml	100
123) 30,31-Trishomohopane-22S	56.946	191	11878	221.234	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	6257	116.540	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	9869	183.815	ng/ml	100
126) Tetrakishomohopane-22R (T	60.334	191	3513M3	65.431	ng/ml	
127) Pentakishomohopane-22S (T	62.517	191	8897	165.711	ng/ml	100
128) Pentakishomohopane-22R (T	63.767	191	5922	110.300	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2847M3	100.974	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.305	217	1507	53.448	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1422M3	50.434	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.871	217	5744	203.720	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.383	217	6476	229.682	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1133	40.184	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	443	15.712	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2626M3	93.135	ng/ml	
138) 14a,17a-20R-Methylcholest	48.753	217	2474M3	87.744	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	4521M3	160.345	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	4550M3	161.373	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	3718	131.865	ng/ml	100
142) 14b(H),17b(H)-20S-Cholest	47.036	218	3701M3	131.262	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	3630	128.744	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.301	218	5086M3	180.383	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	6964M3	246.990	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.371	218	5435M3	192.761	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	14171	502.598	ng/mL	100
148) C28,20S-triaromatic stero	49.883	231	12773M3	453.015	ng/mL	
149) C27,20R-triaromatic stero	50.320	231	9502	337.004	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	10659M3	378.039	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
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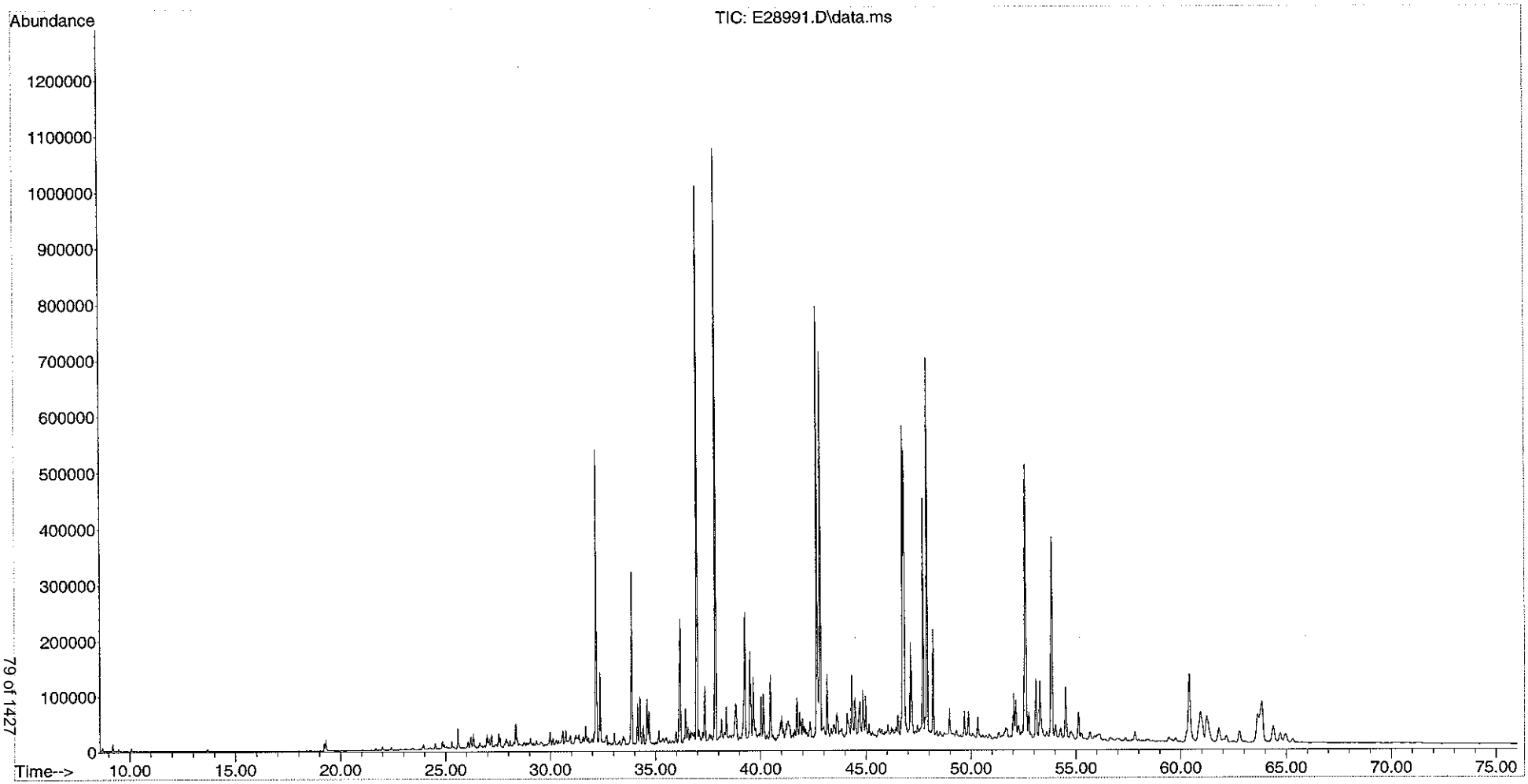
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Method File : PAH2102912.M
Title : Decalins & Alkylated PAH's
Last Update : Tue Oct 30 11:49:46 2012
Response Via : Initial Calibration

JJK (11/05/12)

11/7/12.

Calibration Files
10 =E28517.D 25 =E28519.D 100 =E28521.D 500 =E28523.D 5000=E28525.D 1e4 =E28527.D 2e4 =E28529.D

		Compound	10	25	100	500	5000	1e4	2e4	Avg	%RSD
1)	i	Acenaphthene-d10	ISTD								
2)	t	2-butoxyethanol	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
3)	A1	trans-Decalin	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
4)	t	cis-Decalin	0.331	0.315	0.328	0.294	0.299	0.290	0.269	0.304	7.39
5)	A2	C1-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
6)	A2	C2-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
7)	A2	C3-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
8)	A2	C4-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
9)	s	Naphthalene-d8	1.738	1.812	1.914	1.880	1.630	1.824	1.514	1.759	8.13
10)	A1	Naphthalene	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
11)	A2	C1-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
12)	A2	C2-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
13)	A2	C3-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
14)	A2	C4-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
15)	t	Glycol Ether I...	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
16)	t	2-Methylnaphth...	1.314	1.250	1.284	1.236	1.284	1.246	1.154	1.253	4.10
17)	t	1-Methylnaphth...	1.244	1.216	1.282	1.218	1.236	1.204	1.120	1.217	4.09
18)	A1	Benzothiophene	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
19)	A2	C1-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
20)	A2	C2-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
21)	A2	C3-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
22)	A2	C4-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
23)	t	Biphenyl	1.659	1.533	1.635	1.576	1.627	1.584	1.469	1.583	4.15
24)	t	2,6-Dimethylna...	1.113	1.083	1.144	1.133	1.183	1.158	1.089	1.129	3.21
25)	t	Dibenzofuran	1.682	1.677	1.793	1.765	1.844	1.815	1.693	1.753	3.92
26)	t	Acenaphthylene	1.897	1.870	1.998	1.941	2.086	2.030	1.904	1.961	4.04
27)	t	Acenaphthene	1.291	1.252	1.304	1.251	1.288	1.260	1.188	1.262	3.06
28)	t	2,3,5-Trimethy...	1.015	1.016	1.066	1.043	1.113	1.102	1.039	1.056	3.69
29)	A1	Fluorene	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85
30)	A2	C1-Fluorenes	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85
31)	A2	C2-Fluorenes	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85
32)	A2	C3-Fluorenes	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85

Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Method File : PAH2102912.M

19K (11/05/12)

33)	A1	Dibenzothiophene	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
34)	A2	4-Methyldibenz...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
35)	A2	2/3-Methyldibe...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
36)	A2	1-Methyldibenz...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
37)	A2	OTP	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
38)	A2	C1-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
39)	A2	C2-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
40)	A2	C3-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
41)	A2	C4-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
42)	s	Phenanthrene-d10	1.643	1.709	1.828	1.910	1.748	2.018	1.756	1.802	7.08
43)	A1	Phenanthrene	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
44)	A2	3-Methylphenan...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
45)	A2	2-Methylphenan...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
46)	A2	2-Methylanthra...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
47)	A2	9/4-Methylphen...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
48)	A2	1-Methylphenan...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
49)	A2	C1-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
50)	A2	C2-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
51)	A2	5AA IS BKGD	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
52)	A2	C3-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
53)	A2	C4-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
54)	t	Retene	0.584	0.564	0.588	0.604	0.710	0.709	0.670	0.632	9.82
55)	t	Anthracene	1.580	1.723	1.938	1.825	1.841	1.601	1.384	1.699	11.18
56)	t	Carbazole	1.474	1.546	1.653	1.751	1.986	1.981	1.847	1.748	11.58
57)	t	1-Methylphenan...	1.316	1.410	1.489	1.490	1.646	1.629	1.516	1.499	7.73
58)	A1	Fluoranthene	1.905	2.050	2.151	2.167	2.401	2.354	2.166	2.170	7.81
59)	t	Benzo(b)fluorene	1.206	1.265	1.366	1.426	1.666	1.646	1.550	1.446	12.50
60)	A1	Pyrene	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
61)	A2	C1-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
62)	A2	C2-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
63)	A2	C3-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
64)	A2	C4-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
65)	t	Bis-(2-ethylhe...	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
66)	A1	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
67)	A2	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
68)	A2	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
69)	A2	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
70)	A2	C1-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
71)	A2	C2-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
72)	A2	C3-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
73)	A2	C4-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38

Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Method File : PAH2102912.M

JGK (11/05/12)

74)	i	Chrysene-d12	ISTD								
75)	t	Benz[a]anthracene	0.919	0.949	0.978	1.011	1.050	0.970	0.938	0.974	4.61
76)	A1	Chrysene	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
77)	A2	Chrysene/Triph...	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
78)	A2	C1-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
79)	A2	C2-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
80)	A2	BBF-D12 Surr BKGD	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
81)	A2	C3-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
82)	A2	C4-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
83)	s	Benzo[b]fluora...	1.062	1.046	1.006	1.086	0.970	1.065	0.956	1.027	4.89
84)	t	Benzo[b]fluora...	1.138	1.056	1.108	1.156	1.215	1.146	1.103	1.132	4.41
85)	A1	Benzo[j]+[k]fl...	1.158	1.177	1.192	1.207	1.213	1.104	1.100	1.164	3.99
86)	A2	Benzo[a]fluora...	1.158	1.177	1.192	1.207	1.213	1.104	1.100	1.164	3.99
87)	t	Benzo[e]pyrene	1.215	1.106	1.083	1.098	1.141	1.056	1.036	1.105	5.35
88)	s	Benzo[a]pyrene...	1.030	0.969	0.974	1.015	0.967	1.044	0.967	0.995	3.36
89)	t	Benzo[a]pyrene	1.155	1.023	1.027	1.035	1.120	1.023	1.019	1.057	5.28
90)	t	Perylene	1.169	1.084	1.091	1.101	1.199	1.101	1.084	1.118	4.12
91)	t	Indeno[1,2,3-c...	1.264	1.161	1.112	1.218	1.346	1.303	1.308	1.244	6.82
92)	t	Dibenz[ah]+[ac...	1.350	1.276	1.268	1.324	1.424	1.336	1.296	1.325	4.02
93)	t	Benzo[g,h,i]pe...	1.503	1.393	1.297	1.304	1.371	1.277	1.246	1.342	6.55
94)	A1	Hopane (T19)	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
95)	A2	17a(H),21B(H)-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
96)	A2	C23 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
97)	A2	C24 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
98)	A2	C25 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
99)	A2	C24 Tetracycli...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
100)	A2	C26 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
101)	A2	C26 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
102)	A2	C28 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
103)	A2	C28 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
104)	A2	C29 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
105)	A2	C29 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
106)	A2	18a-22,29,30-T...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
107)	A2	C30 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
108)	A2	C30 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
109)	A2	17a(H)-22,29,3...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
110)	A2	17a/b,21b/a 28...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
111)	A2	17a(H),21b(H)-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
112)	A2	30-Norhopane (...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
113)	A2	18a(H)-30-Norn...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
114)	A2	17a(H)-Diahopa...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
115)	A2	30-Normoretane...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06

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116)	A2	18a(H)&18b(H)-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
117)	A2	Moretane (T20)	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
118)	A2	30-Homohopane-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
119)	A2	30-Homohopane-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
120)	A2	Gammacerane/C3...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
121)	A2	30,31-Bishomoh...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
122)	A2	30,31-Bishomoh...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
123)	A2	30,31-Trishomo...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
124)	A2	30,31-Trishomo...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
125)	A2	Tetrakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
126)	A2	Tetrakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
127)	A2	Pentakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
128)	A2	Pentakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
129)	SA1	5B(H)Cholane -...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
130)	A2	13b(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
131)	A2	13b(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
132)	A2	13b,17a-20S-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
133)	A2	14a,17a-20S-Ch...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
134)	A2	14a,17a-20R-Ch...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
135)	A2	Unknown Steran...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
136)	A2	13a,17b-20S-Et...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
137)	A2	14a,17a-20S-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
138)	A2	14a,17a-20R-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
139)	A2	14a(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
140)	A2	14a(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
141)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
142)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
143)	A2	14b,17b-20R-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
144)	A2	14b,17b-20S-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
145)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
146)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
147)	A2	C26,20R- +C27,...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
148)	A2	C28,20S-triaro...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
149)	A2	C27,20R-triaro...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
150)	A2	C28,20R-triaro...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

JGK (11/5/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	25956	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51989	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	902	9.329	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.93%#			
42) Phenanthrene-d10	32.462	188	853	8.754	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.88%#			
83) Benzo[b]fluoranthene-d12	46.991	264	1104	11.216	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.12%#			
88) Benzo[a]pyrene-d12	48.166	264	1071	11.998	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.20%#			
129) 5B(H)Cholane - Surr	43.724	217	197	10.279	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.03%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	115	5.322	ng/mL	100
4) cis-Decalin	17.483	138	86M2	5.240	ng/mL	
10) Naphthalene	19.696	128	1087	10.481	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	682	10.161	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	646	10.036	ng/mL#	100
18) Benzothiophene	19.906	134	848	10.023	ng/mL	100
23) Biphenyl	24.272	154	861	10.128	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.875	156	578	9.446	ng/mL#	100
25) Dibenzofuran	27.358	168	873	9.503	ng/mL#	90
26) Acenaphthylene	25.973	152	985	9.620	ng/mL#	100
27) Acenaphthene	26.711	153	670	10.499	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.277	170	527	9.528	ng/mL	94
29) Fluorene	28.728	166	672	9.057	ng/mL	98
33) Dibenzothiophene	32.055	184	919	8.846	ng/mL#	81
43) Phenanthrene	32.552	178	923	8.519	ng/mL	99
54) Retene	39.568	234	303	9.135	ng/mL	99
55) Anthracene	32.733	178	820M3	8.076	ng/mL	
56) Carbazole	33.425	167	765	7.978	ng/mL	96
57) 1-Methylphenanthrene	35.066	192	683M3	8.463	ng/mL	
58) Fluoranthene	37.340	202	989	8.376	ng/mL	97
59) Benzo(b)fluorene	39.869	216	626	8.335	ng/mL	99
60) Pyrene	38.213	202	1069	8.993	ng/mL	97
66) Naphthobenzothiophene	42.083	234	993	8.854	ng/ml#	86
67) Naphthobenzothiophene-...	42.083	234	993	8.854	ng/mL#	86

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 13:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

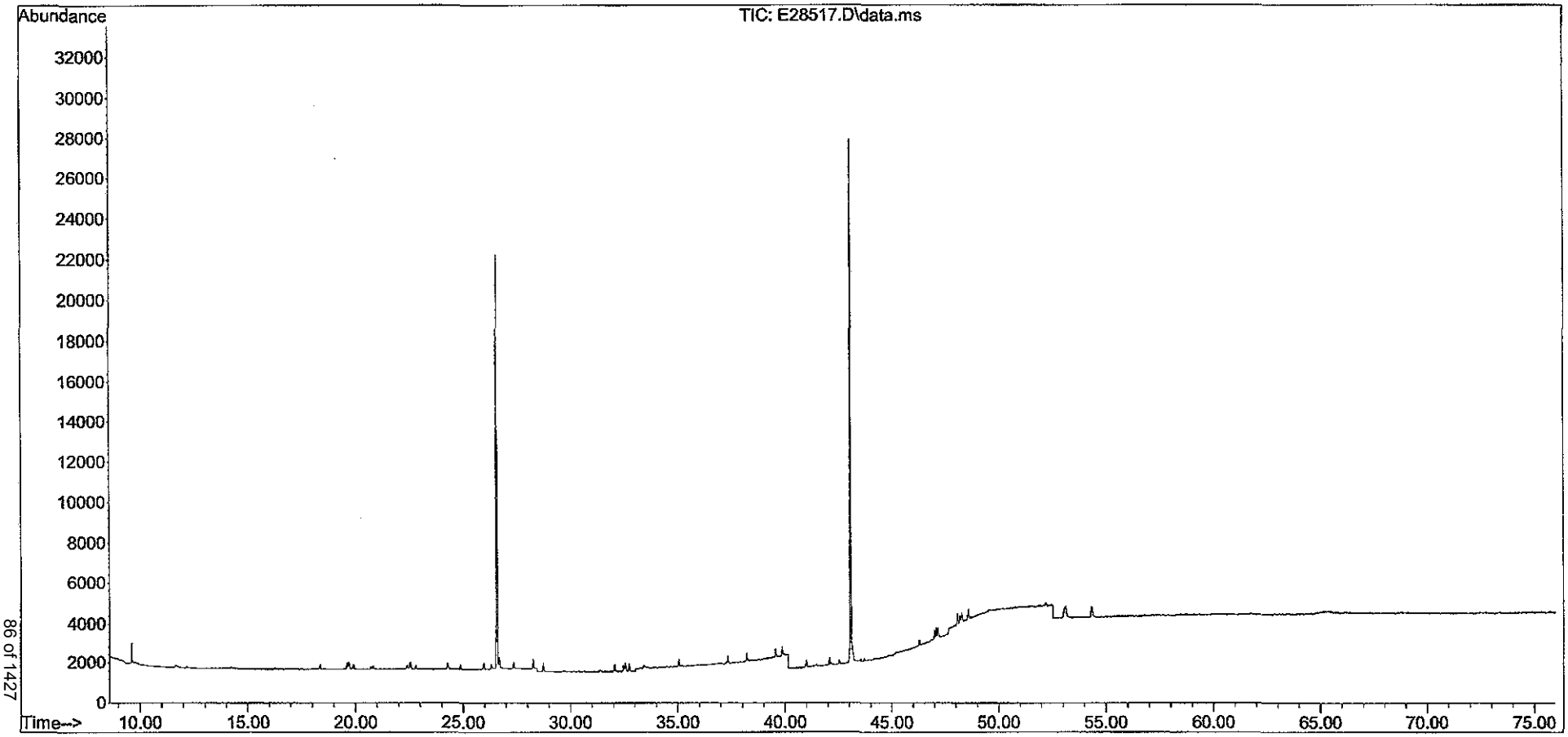
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.016	228	956M3	8.294	ng/mL	
76) Chrysene	43.167	228	1070	9.484	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	1070	9.484	ng/mL	100
84) Benzo[b]fluoranthene	47.082	252	1183	9.748	ng/mL#	84
85) Benzo[j]+[k]fluoranthene	47.157	252	1204	10.543	ng/mL#	88
87) Benzo[e]pyrene	48.076	252	1263	11.728	ng/mL#	84
89) Benzo[a]pyrene	48.256	252	1201	11.796	ng/mL#	77
90) Perylene	48.573	252	1215	11.213	ng/mL#	84
91) Indeno[1,2,3-cd]pyrene	53.045	276	1314M3	10.690	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	1404	11.876	ng/mL	97
93) Benzo[g,h,i]perylene	54.325	276	1563	12.940	ng/mL	100
94) Hopane (T19)	52.187	191	427M3	14.965	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.187	191	416M3	14.579	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 13:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	25519	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51858	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	2312	24.321	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.43%#		
42) Phenanthrene-d10	32.462	188	2181	22.766	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.28%#		
83) Benzo[b]fluoranthene-d12	46.991	264	2711	27.613	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.76%#		
88) Benzo[a]pyrene-d12	48.166	264	2513	28.222	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.82%#		
129) 5B(H)Cholane - Surr	43.723	217	514	26.886	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.69%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	284	13.369	ng/mL	100
4) cis-Decalin	17.482	138	201	12.456	ng/mL	100
10) Naphthalene	19.680	128	2586	25.362	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1595	24.170	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1551	24.508	ng/mL#	100
18) Benzothiophene	19.906	134	2072	24.909	ng/mL	100
23) Biphenyl	24.272	154	1956	23.403	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	1382	22.973	ng/mL#	100
25) Dibenzofuran	27.358	168	2140	23.693	ng/mL	94
26) Acenaphthylene	25.973	152	2386	23.701	ng/mL#	100
27) Acenaphthene	26.696	153	1598	25.471	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.262	170	1297	23.852	ng/mL	98
29) Fluorene	28.728	166	1748	23.964	ng/mL	97
33) Dibenzothiophene	32.055	184	2342	22.930	ng/mL#	94
43) Phenanthrene	32.552	178	2302	21.610	ng/mL	100
54) Retene	39.568	234	719	22.048	ng/mL	93
55) Anthracene	32.733	178	2199M3	22.030	ng/mL	
56) Carbazole	33.425	167	1973	20.927	ng/mL	98
57) 1-Methylphenanthrene	35.066	192	1799	22.673	ng/mL	100
58) Fluoranthene	37.340	202	2616	22.534	ng/mL	98
59) Benzo(b)fluorene	39.869	216	1614	21.858	ng/mL	100
60) Pyrene	38.213	202	2618	22.402	ng/mL	95
66) Naphthobenzothiophene	42.082	234	2577	23.370	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	2577	23.370	ng/mL#	95

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 13:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

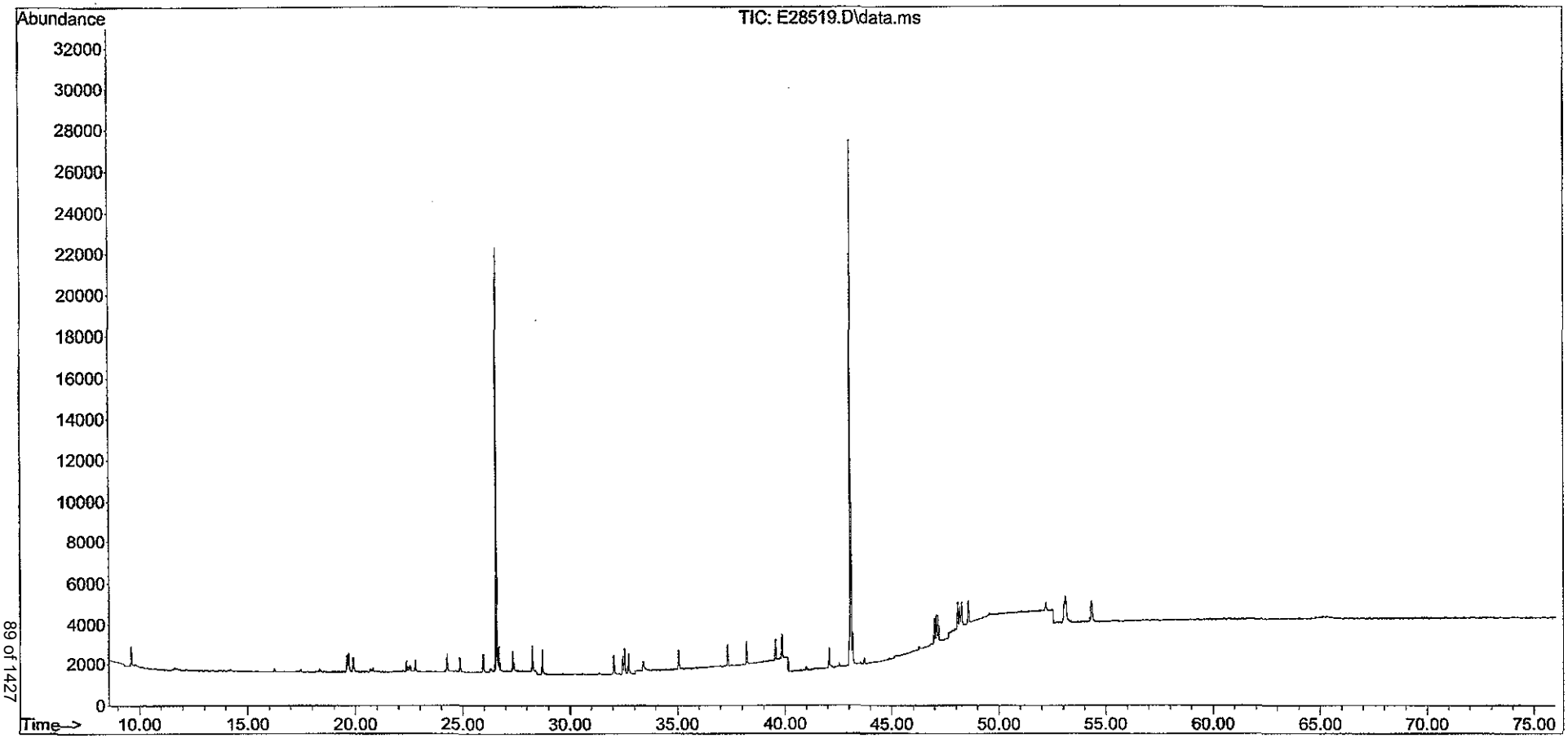
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.016	228	2460M3	21.396	ng/mL	
76) Chrysene	43.166	228	2669	23.716	ng/mL	98
77) Chrysene/Triphenylene	43.166	228	2669	23.716	ng/mL	98
84) Benzo[b]fluoranthene	47.081	252	2739	22.626	ng/mL	92
85) Benzo[j]+[k]fluoranthene	47.157	252	3051	26.783	ng/mL	97
87) Benzo[e]pyrene	48.075	252	2868M3	26.699	ng/mL	
89) Benzo[a]pyrene	48.256	252	2653	26.124	ng/mL	94
90) Perylene	48.572	252	2810	25.999	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.045	276	3010M3	24.550	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	3309	28.060	ng/mL	97
93) Benzo[g,h,i]perylene	54.325	276	3613	29.988	ng/mL	98
94) Hopane (T19)	52.187	191	1010M3	35.486	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.187	191	1032M3	36.259	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : TCAL_CCAL1_NEW_Default_REV2 cc with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 13:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	23755M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	50831	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	9092	102.746	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	10.27%#		
42) Phenanthrene-d10	32.462	188	8686	97.402	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	9.74%#		
83) Benzo[b]fluoranthene-d12	46.991	264	10225	106.250	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	10.63%#		
88) Benzo[a]pyrene-d12	48.166	264	9905	113.485	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	11.35%#		
129) 5B(H)Cholane - Surr	43.708	217	1989	106.142	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	10.61%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	1011	51.127	ng/mL	100
4) cis-Decalin	17.482	138	780	51.928	ng/mL	100
10) Naphthalene	19.680	128	9972	105.060	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	6102	99.335	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	6090	103.378	ng/mL#	100
18) Benzothiophene	19.906	134	8289	107.049	ng/mL	100
23) Biphenyl	24.272	154	7767	99.833	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	5433	97.018	ng/mL#	100
25) Dibenzofuran	27.358	168	8518	101.311	ng/mL	97
26) Acenaphthylene	25.973	152	9493M3	101.299	ng/mL	
27) Acenaphthene	26.696	153	6196	106.092	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.262	170	5064	100.043	ng/mL	95
29) Fluorene	28.728	166	6771	99.718	ng/mL	99
33) Dibenzothiophene	32.055	184	9356	98.404	ng/mL#	96
43) Phenanthrene	32.552	178	9481	95.610	ng/mL	99
54) Retene	39.568	234	2793	92.007	ng/mL	90
55) Anthracene	32.733	178	9206M3	99.074	ng/mL	
56) Carbazole	33.410	167	7855	89.504	ng/mL	100
57) 1-Methylphenanthrene	35.066	192	7075	95.788	ng/mL	98
58) Fluoranthene	37.325	202	10218	94.551	ng/mL	99
59) Benzo(b)fluorene	39.854	216	6491	94.432	ng/mL	100
60) Pyrene	38.213	202	10358	95.214	ng/mL	99
66) Naphthobenzothiophene	42.082	234	10119	98.581	ng/ml	96
67) Naphthobenzothiophene-...	42.082	234	10119	98.581	ng/mL	96

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 13:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

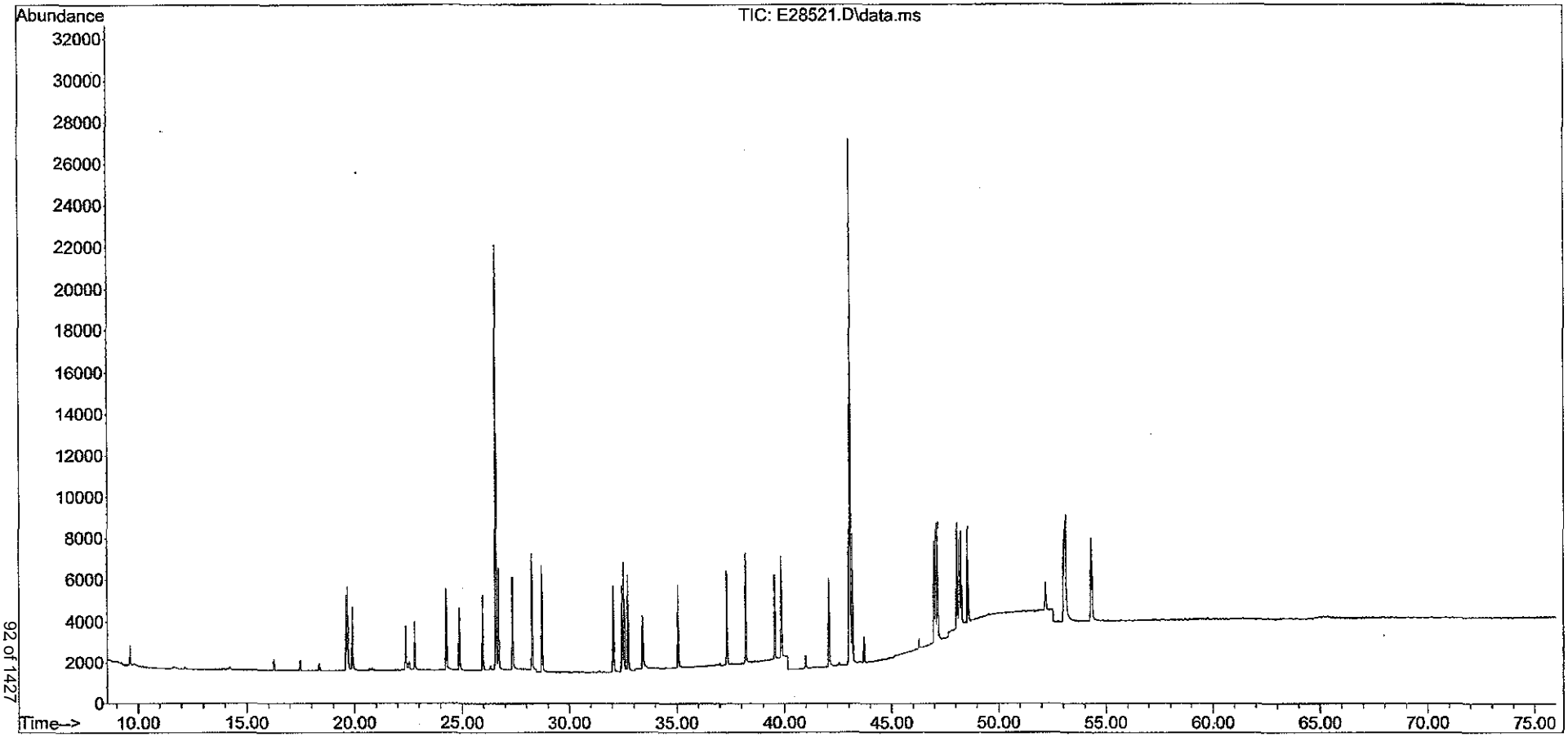
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75)	Benz[a]anthracene	43.016	228	9939	88.192	ng/mL	99
76)	Chrysene	43.166	228	10414	94.407	ng/mL	99
77)	Chrysene/Triphenylene	43.166	228	10414	94.407	ng/mL	99
84)	Benzo[b]fluoranthene	47.066	252	11264	94.928	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	47.157	252	12115	108.499	ng/mL	97
87)	Benzo[e]pyrene	48.060	252	11009	104.557	ng/mL	98
89)	Benzo[a]pyrene	48.256	252	10439	104.868	ng/mL	100
90)	Perylene	48.557	252	11087	104.654	ng/mL	99
91)	Indeno[1,2,3-cd]pyrene	53.045	276	11305M3	94.067	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.106	278	12888	111.498	ng/mL	100
93)	Benzo[g,h,i]perylene	54.325	276	13189	111.682	ng/mL	99
94)	Hopane (T19)	52.187	191	3549M3	127.214	ng/mL	
95)	17a(H),21B(H)-hopane -...	52.187	191	3538M3	126.820	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 CC with 5 Surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 13:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JGK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	36682	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	77083	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	68946	504.564	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.46%			
42) Phenanthrene-d10	32.462	188	70047	508.673	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.87%			
83) Benzo[b]fluoranthene-d12	46.991	264	83676	573.370	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.34%			
88) Benzo[a]pyrene-d12	48.166	264	78237	591.107	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 59.11%			
129) 5B(H)Cholane - Surr	43.724	217	14895	524.160	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.42%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	6961	227.966	ng/mL	100
4) cis-Decalin	17.483	138	5393	232.508	ng/mL	100
10) Naphthalene	19.681	128	72826	496.872	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	45351	478.102	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	44682	491.184	ng/mL#	100
18) Benzothiophene	19.891	134	60586	506.706	ng/mL	100
23) Biphenyl	24.257	154	57808	481.183	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	41569	480.711	ng/mL#	100
25) Dibenzofuran	27.343	168	64736	498.617	ng/mL	98
26) Acenaphthylene	25.958	152	71193M3	491.972	ng/mL	
27) Acenaphthene	26.696	153	45899	508.953	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.262	170	38267	489.576	ng/mL	96
29) Fluorene	28.728	166	51400	490.213	ng/mL	99
33) Dibenzothiophene	32.055	184	71389	486.246	ng/mL#	95
43) Phenanthrene	32.537	178	74232	484.778	ng/mL	99
54) Retene	39.568	234	22141	472.333	ng/mL	92
55) Anthracene	32.718	178	66927M3	466.436	ng/mL	
56) Carbazole	33.395	167	64221	473.886	ng/mL	100
57) 1-Methylphenanthrene	35.051	192	54645	479.112	ng/mL	99
58) Fluoranthene	37.325	202	79475	476.249	ng/mL	99
59) Benzo(b)fluorene	39.854	216	52291	492.646	ng/mL	99
60) Pyrene	38.213	202	80681	480.284	ng/mL	99
66) Naphthobenzothiophene	42.082	234	79024	498.558	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	79024	498.558	ng/mL#	95

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 13:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

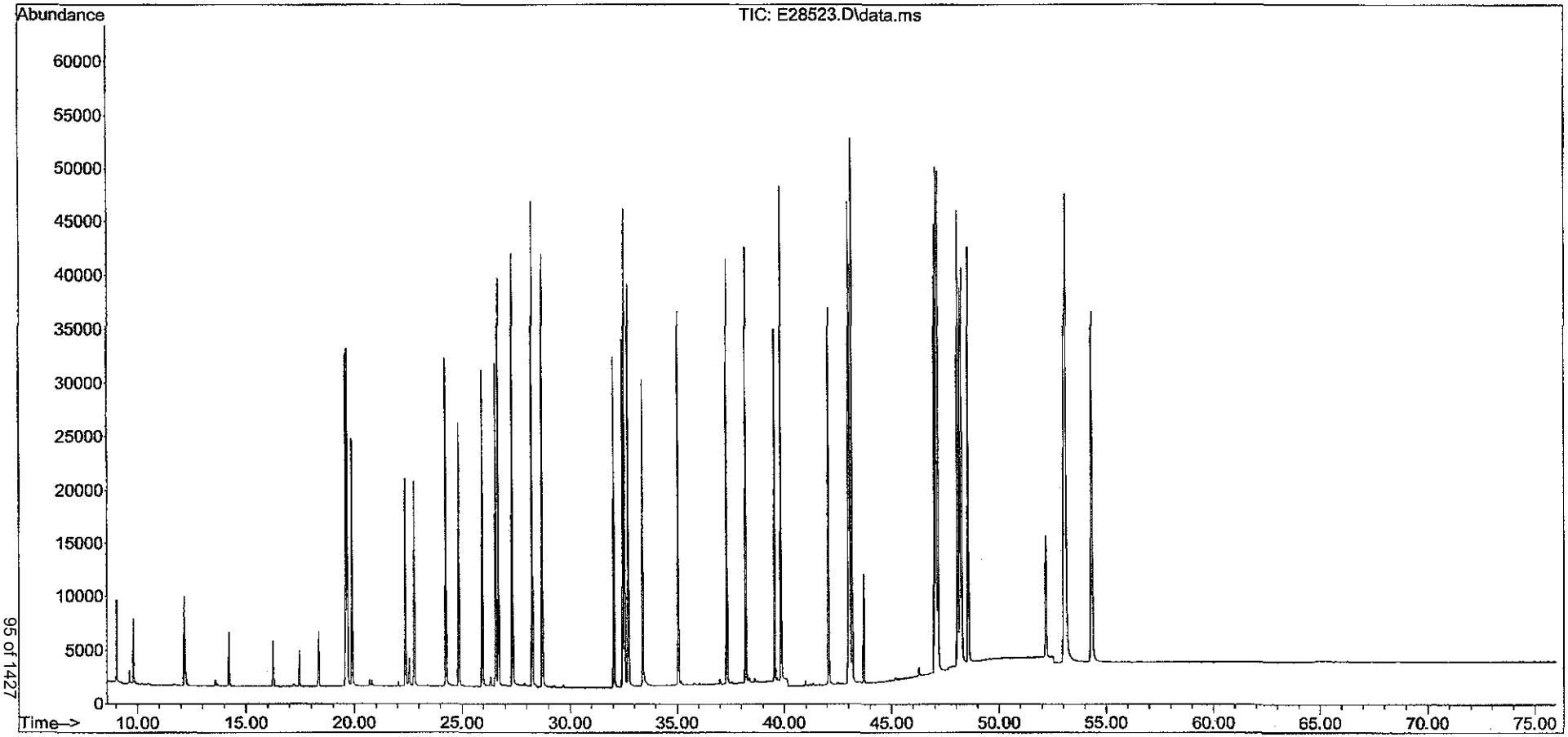
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.016	228	77932	456.006	ng/mL	100
76) Chrysene	43.167	228	79635	476.059	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	79635	476.059	ng/mL	100
84) Benzo[b]fluoranthene	47.067	252	89104	495.187	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	93062	549.600	ng/mL	98
87) Benzo[e]pyrene	48.060	252	84646	530.127	ng/mL	97
89) Benzo[a]pyrene	48.256	252	79782	528.520	ng/mL	97
90) Perylene	48.557	252	84830	528.035	ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.030	276	93871M3	515.074	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.106	278	102096	582.452	ng/mL	99
93) Benzo[g,h,i]perylene	54.325	276	100489	561.124	ng/mL	100
94) Hopane (T19)	52.187	191	28585	675.673	ng/mL#	91
95) 17a(H),21B(H)-hopane -...	52.187	191	28585	675.673	ng/mL#	91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCAL1_NEW_Default_Rev2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 13:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	33843	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	78030	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	551490	4374.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 437.45%#			
42) Phenanthrene-d10	32.462	188	591656	4656.961	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 465.70%#			
83) Benzo[b]fluoranthene-d12	47.006	264	757059	5124.613	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 512.46%#			
88) Benzo[a]pyrene-d12	48.181	264	754524	5631.502	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 563.15%#			
129) 5B(H)Cholane - Surr	43.723	217	164748	5727.173	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 572.72%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	65353	2319.785	ng/mL	100
4) cis-Decalin	17.482	138	50652	2366.946	ng/mL	100
10) Naphthalene	19.680	128	666336	4927.599	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	434650	4966.577	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	418300	4984.067	ng/mL#	100
18) Benzothiophene	19.891	134	560368	5079.742	ng/mL	100
23) Biphenyl	24.272	154	550566	4967.246	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	400289	5017.330	ng/mL#	100
25) Dibenzofuran	27.343	168	624188	5210.994	ng/mL	98
26) Acenaphthylene	25.958	152	705912M3	5287.347	ng/mL	
27) Acenaphthene	26.711	153	436058	5240.867	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	376690	5223.527	ng/mL	97
29) Fluorene	28.728	166	508103	5252.399	ng/mL	100
33) Dibenzothiophene	32.055	184	701873	5181.642	ng/mL#	95
43) Phenanthrene	32.552	178	715454	5064.281	ng/mL	99
54) Retene	39.568	234	240302	5556.394	ng/mL	93
55) Anthracene	32.733	178	623046M3	4706.465	ng/mL	
56) Carbazole	33.395	167	672100	5375.448	ng/mL	99
57) 1-Methylphenanthrene	35.066	192	557136	5294.589	ng/mL	99

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 13:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

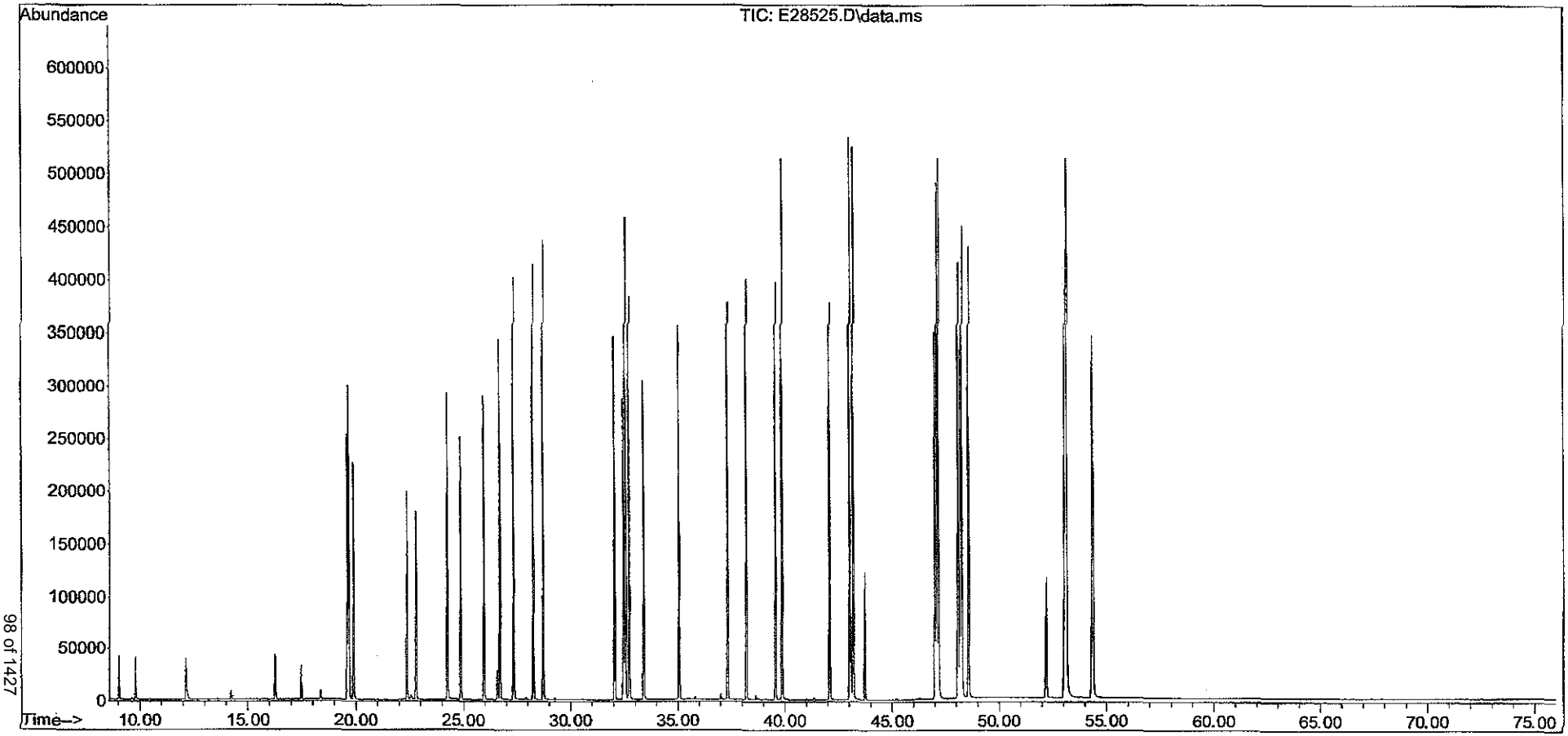
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
58) Fluoranthene	37.340	202	812711M3	5278.661	ng/mL	
59) Benzo(b)fluorene	39.869	216	563733	5756.591	ng/mL	99
60) Pyrene	38.213	202	811273	5234.531	ng/mL	98
66) Naphthobenzothiophene	42.082	234	818126	5594.497	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	818126	5594.497	ng/mL#	95
75) Benz[a]anthracene	43.016	228	819446	4736.655	ng/mL	99
76) Chrysene	43.181	228	799496	4721.396	ng/mL	100
77) Chrysene/Triphenylene	43.181	228	799496	4721.396	ng/mL	100
84) Benzo[b]fluoranthene	47.081	252	948454	5206.972	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.172	252	946512	5522.013	ng/mL	98
87) Benzo[e]pyrene	48.075	252	890237	5507.774	ng/mL	97
89) Benzo[a]pyrene	48.271	252	873584	5716.864	ng/mL	97
90) Perylene	48.572	252	935392	5751.798	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.060	276	1049897M3	5690.915	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	1111133	6262.016	ng/mL	99
93) Benzo[g,h,i]perylene	54.355	276	1070138	5903.057	ng/mL	100
94) Hopane (T19)	52.202	191	293886	6862.372	ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	293886	6862.372	ng/mL#	90

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALI_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 13:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.575	164	34237M3	500.000 ng/mL	0.00
74) Chrysene-d12	43.076	240	83845	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.605	136	1249184	9794.704 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 979.47%#		
42) Phenanthrene-d10	32.462	188	1381837	10751.358 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1075.14%#		
83) Benzo[b]fluoranthene-d12	47.021	264	1786107	11251.833 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1125.18%#		
88) Benzo[a]pyrene-d12	48.196	264	1750732	12160.609 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1216.06%#		
129) 5B(H)Cholane - Surr	43.723	217	325906	10543.794 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1054.38%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	128304	4501.898 ng/mL	100
4) cis-Decalin	17.483	138	99422	4592.482 ng/mL	100
10) Naphthalene	19.680	128	1288199	9416.689 ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	853166	9636.608 ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	824452	9710.342 ng/mL#	100
18) Benzothiophene	19.906	134	1095341	9815.012 ng/mL	100
23) Biphenyl	24.272	154	1084695	9673.576 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	792979	9825.029 ng/mL#	100
25) Dibenzofuran	27.358	168	1242869	10256.606 ng/mL	97
26) Acenaphthylene	25.973	152	1390024M3	10291.595 ng/mL	
27) Acenaphthene	26.711	153	862774	10250.123 ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	754332	10339.879 ng/mL	95
29) Fluorene	28.728	166	1008743	10307.649 ng/mL	100
33) Dibenzothiophene	32.055	184	1394373	10175.622 ng/mL#	95
43) Phenanthrene	32.552	178	1429622	10003.004 ng/mL	100
54) Retene	39.583	234	485174	11089.355 ng/mL	94
55) Anthracene	32.733	178	1096223M3	8185.530 ng/mL	
56) Carbazole	33.410	167	1356581	10725.058 ng/mL	99
57) 1-Methylphenanthrene	35.066	192	1115333	10477.285 ng/mL	99

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 13:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

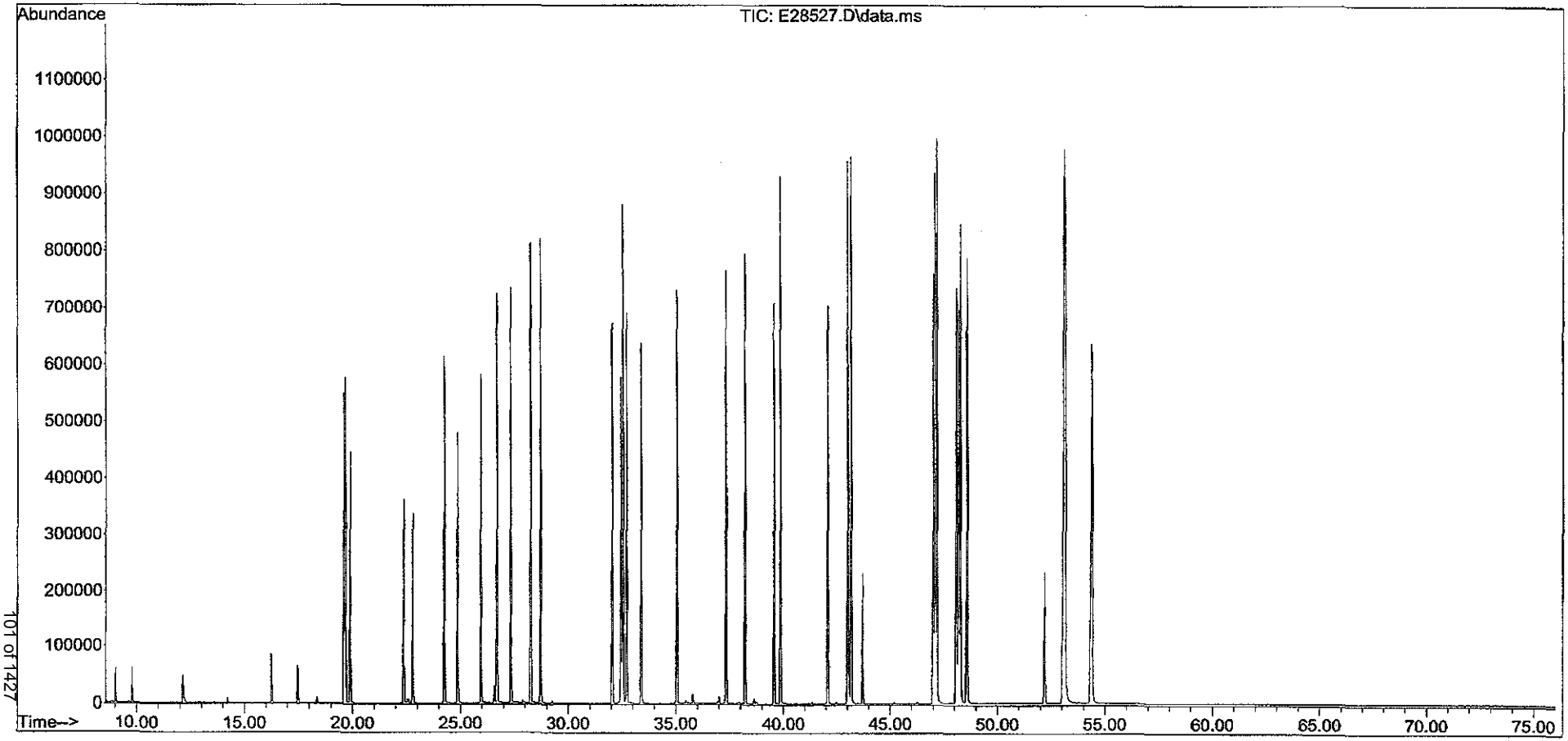
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
58) Fluoranthene	37.340	202	1611679M3	10347.593 ng/mL	
59) Benzo(b)fluorene	39.884	216	1126932	11375.299 ng/mL	99
60) Pyrene	38.228	202	1624916	10363.699 ng/mL	98
66) Naphthobenzothiophene	42.097	234	1632867	11037.350 ng/ml#	95
67) Naphthobenzothiophene-...	42.097	234	1632867	11037.350 ng/mL#	95
75) Benz[a]anthracene	43.031	228	1626986M3	8752.250 ng/mL	
76) Chrysene	43.197	228	1589503	8735.745 ng/mL	99
77) Chrysene/Triphenylene	43.197	228	1589503	8735.745 ng/mL	99
84) Benzo[b]fluoranthene	47.097	252	1921388	9816.767 ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.187	252	1850530	10047.358 ng/mL	99
87) Benzo[e]pyrene	48.090	252	1770929	10196.616 ng/mL	98
89) Benzo[a]pyrene	48.286	252	1716035	10451.142 ng/mL	98
90) Perylene	48.587	252	1845721	10562.348 ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.090	276	2185546M3	11025.031 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.151	278	2240598	11751.587 ng/mL	100
93) Benzo[g,h,i]perylene	54.386	276	2141401	10993.087 ng/mL	99
94) Hopane (T19)	52.202	191	594811	12925.841 ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	594811	12925.841 ng/mL#	90

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCAL1_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 13:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.576	164	37912	500.000 ng/mL	0.00
74) Chrysene-d12	43.091	240	88160	500.000 ng/mL	0.01
System Monitoring Compounds					
9) Naphthalene-d8	19.620	136	2296353	16260.075 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1626.01%#		
42) Phenanthrene-d10	32.477	188	2663465	18714.253 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1871.43%#		
83) Benzo[b]fluoranthene-d12	47.036	264	3370773	20195.327 ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2019.53%#		
88) Benzo[a]pyrene-d12	48.226	264	3410139	22527.516 ng/mL	0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2252.75%#		
129) 5B(H)Cholane - Surr	43.739	217	695988	21414.696 ng/ml	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2141.47%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	261873	8297.842 ng/mL	100
4) cis-Decalin	17.483	138	203630	8494.264 ng/mL	100
10) Naphthalene	19.696	128	2596569	17140.920 ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1749682	17847.146 ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1698936	18070.292 ng/mL#	100
18) Benzothiophene	19.906	134	2232488	18065.485 ng/mL	100
23) Biphenyl	24.272	154	2227434	17939.207 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.889	156	1652186	18486.304 ng/mL#	100
25) Dibenzofuran	27.358	168	2567457	19133.769 ng/mL	98
26) Acenaphthylene	25.973	152	2887125M3	19303.898 ng/mL	
27) Acenaphthene	26.711	153	1802150	19334.902 ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.292	170	1575864	19507.008 ng/mL	94
29) Fluorene	28.743	166	2105968	19433.448 ng/mL	100
33) Dibenzothiophene	32.070	184	2867812	18899.560 ng/mL#	95
43) Phenanthrene	32.567	178	2963936	18728.244 ng/mL	99
54) Retene	39.583	234	1015806	20967.109 ng/mL	96
55) Anthracene	32.748	178	2099409M3	14156.763 ng/mL	
56) Carbazole	33.425	167	2801542M3	20001.846 ng/mL	
57) 1-Methylphenanthrene	35.081	192	2299712	19509.074 ng/mL	99

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 31 13:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

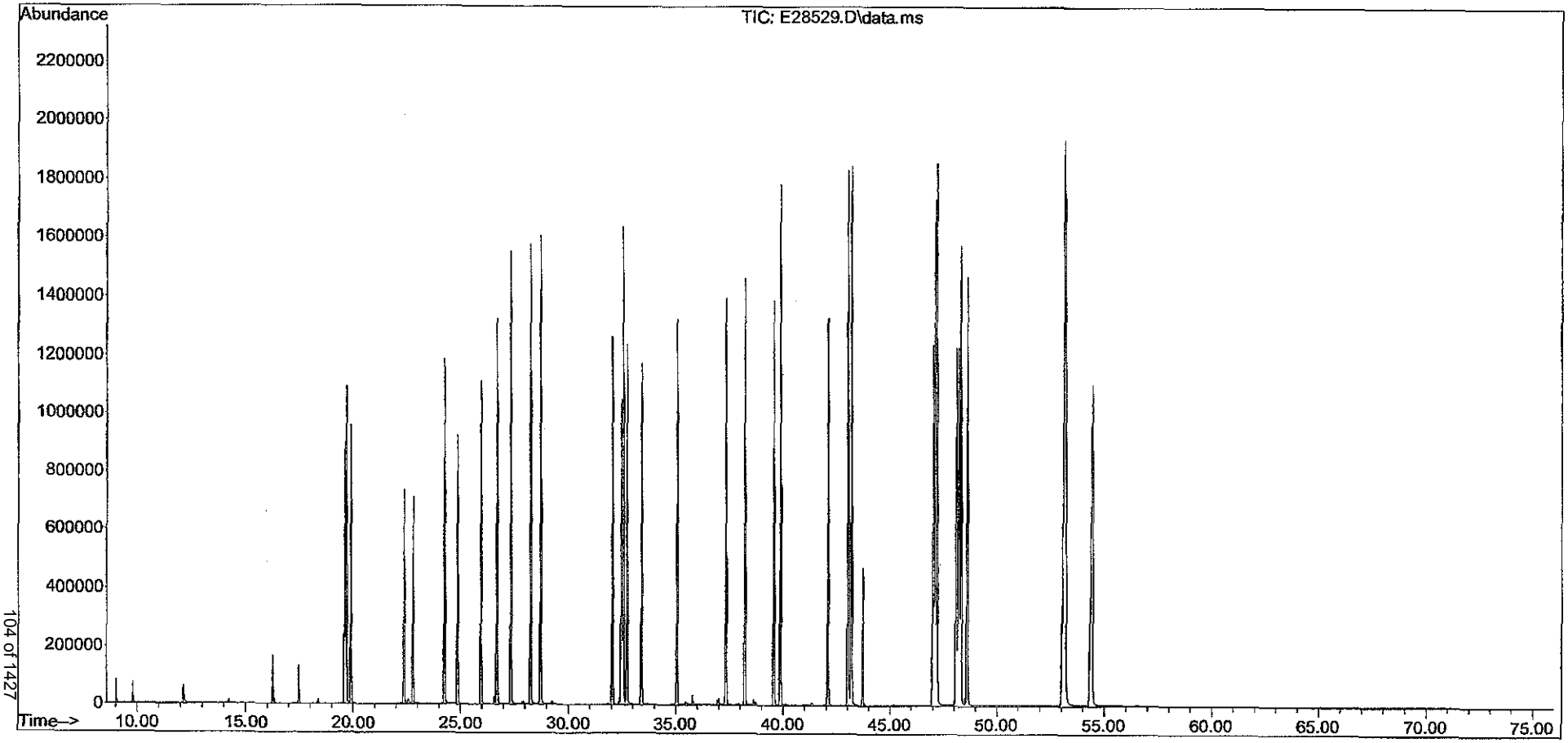
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
58) Fluoranthene	37.355	202	3284016M3	19040.795	ng/mL	
59) Benzo(b)fluorene	39.899	216	2350585	21426.936	ng/mL	99
60) Pyrene	38.243	202	3308735	19057.454	ng/mL	97
66) Naphthobenzothiophene	42.112	234	3354891	20479.127	ng/ml#	94
67) Naphthobenzothiophene-...	42.112	234	3354891	20479.127	ng/mL#	94
75) Benz[a]anthracene	43.046	228	3308979	16929.163	ng/mL	98
76) Chrysene	43.212	228	3273879	17112.238	ng/mL	98
77) Chrysene/Triphenylene	43.212	228	3273879	17112.238	ng/mL	98
84) Benzo[b]fluoranthene	47.127	252	3888463	18894.567	ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.217	252	3879730	20033.777	ng/mL	99
87) Benzo[e]pyrene	48.121	252	3655053	20014.936	ng/mL	99
89) Benzo[a]pyrene	48.331	252	3592144	20806.399	ng/mL	99
90) Perylene	48.633	252	3822620	20804.685	ng/mL	99
91) Indeno[1,2,3-cd]pyrene	53.136	276	4610873M3	22121.197	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.196	278	4571116	22801.341	ng/mL	99
93) Benzo[g,h,i]perylene	54.446	276	4394931	21457.509	ng/mL	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALI_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 31 13:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

11/5/12.

Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

JJK (11/05/12)

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	74	0.00
3	A1	trans-Decalin	0.400	0.387	3.3	75	0.00
4	t	cis-Decalin	0.304	0.295	3.0	74	0.00
9	s	Naphthalene-d8	1.759	1.700	3.4	67	0.00
10	A1	Naphthalene	1.967	1.975	-0.4	74	0.00
16	t	2-Methylnaphthalene	1.253	1.205	3.8	72	0.00
17	t	1-Methylnaphthalene	1.217	1.245	-2.3	76	0.00
18	A1	Benzothiophene	1.626	1.641	-0.9	73	0.02
23	t	Biphenyl	1.583	1.598	-0.9	75	0.00
24	t	2,6-Dimethylnaphthalene	1.129	1.137	-0.7	74	0.00
25	t	Dibenzofuran	1.753	1.769	-0.9	74	0.00
26	t	Acenaphthylene	1.961	1.967	-0.3	75	0.00
27	t	Acenaphthene	1.262	1.250	1.0	74	0.00
28	t	2,3,5-Trimethylnaphthalene	1.056	1.048	0.8	74	0.00
29	A1	Fluorene	1.408	1.420	-0.9	75	0.00
33	A1	Dibenzothiophene	1.932	1.953	-1.1	74	0.00
42	s	Phenanthrene-d10	1.802	1.715	4.8	66	0.00
43	A1	Phenanthrene	1.965	1.978	-0.7	72	0.00
54	t	Retene	0.632	0.694	-9.8	85	0.00
55	t	Anthracene	1.699	1.969	-15.9	80	0.00
56	t	Carbazole	1.748	1.775	-1.5	75	0.00
57	t	1-Methylphenanthrene	1.499	1.491	0.5	74	0.00
58	A1	Fluoranthene	2.170	2.178	-0.4	74	0.00
59	t	Benzo(b)fluorene	1.446	1.430	1.1	74	0.00
60	A1	Pyrene	2.206	2.208	-0.1	74	0.00
66	A1	Naphthobenzothiophene	2.176	2.179	-0.1	75	-0.02
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.179	-0.1	75	-0.02
74	i	Chrysene-d12	1.000	1.000	0.0	74	0.00
75	t	Benz[a]anthracene	0.974	1.043	-7.1	76	-0.02
76	A1	Chrysene	1.002	1.050	-4.8	75	0.00
77	A2	Chrysene/Triphenylene	1.002	1.050	-4.8	75	0.00
83	s	Benzo[b]fluoranthene-d12	1.027	1.009	1.8	69	0.00
84	t	Benzo[b]fluoranthene	1.132	1.189	-5.0	76	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.213	-4.2	74	0.00
87	t	Benzo[e]pyrene	1.105	1.125	-1.8	76	0.00
88	s	Benzo[a]pyrene-d12	0.995	0.994	0.1	72	0.00
89	t	Benzo[a]pyrene	1.057	1.130	-6.9	81	-0.01
90	t	Perylene	1.118	1.180	-5.5	79	0.00

Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.267	-1.8	77	0.00
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.413	-6.6	79	-0.02
93	t	Benzo[g,h,i]perylene	1.342	1.395	-3.9	79	-0.01
94	A1	Hopane (T19)	0.375	0.000#	100.0#	0#	-52.19#
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.000#	100.0#	0#	-52.19#
129	SA1	5B(H)Cholane - Surr	0.197	0.000#	100.0#	0#	-43.72#

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.03	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

YJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	27127M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	56880	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	46123	483.384	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	48.34%#		
42) Phenanthrene-d10	32.462	188	46524	475.913	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	47.59%#		
83) Benzo[b]fluoranthene-d12	46.991	264	57405	491.292	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	49.13%#		
88) Benzo[a]pyrene-d12	48.166	264	56528	499.294	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	49.93%#		
129) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.00%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	5245	241.715	ng/mL	100
4) cis-Decalin	17.483	138	4006	242.994	ng/mL	100
10) Naphthalene	19.681	128	53569	502.030	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	32688	480.979	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	33765	511.305	ng/mL#	100
18) Benzothiophene	19.906	134	44511	504.592	ng/mL	100
23) Biphenyl	24.257	154	43356	504.773	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	30856	503.707	ng/mL#	100
25) Dibenzofuran	27.343	168	47975	504.511	ng/mL	96
26) Acenaphthylene	25.958	152	53359M3	501.567	ng/mL	
27) Acenaphthene	26.696	153	33896	494.986	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.262	170	28417	495.826	ng/mL	96
29) Fluorene	28.728	166	38522	504.380	ng/mL	100
33) Dibenzothiophene	32.055	184	52969	505.392	ng/mL#	95
43) Phenanthrene	32.537	178	53667	503.299	ng/mL	99
54) Retene	39.568	234	18816	548.371	ng/mL	91
55) Anthracene	32.718	178	53410M3	579.496	ng/mL	
56) Carbazole	33.395	167	48151	507.624	ng/mL	99
57) 1-Methylphenanthrene	35.051	192	40451	497.245	ng/mL	99
58) Fluoranthene	37.325	202	59089	501.787	ng/mL	100
59) Benzo(b)fluorene	39.854	216	38785	494.279	ng/mL	100
60) Pyrene	38.213	202	59885	500.333	ng/mL	98
66) Naphthobenzothiophene	42.082	234	59101	500.647	ng/mL#	96
67) Naphthobenzothiophene-...	42.082	234	59101	500.647	ng/mL#	96

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 13:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

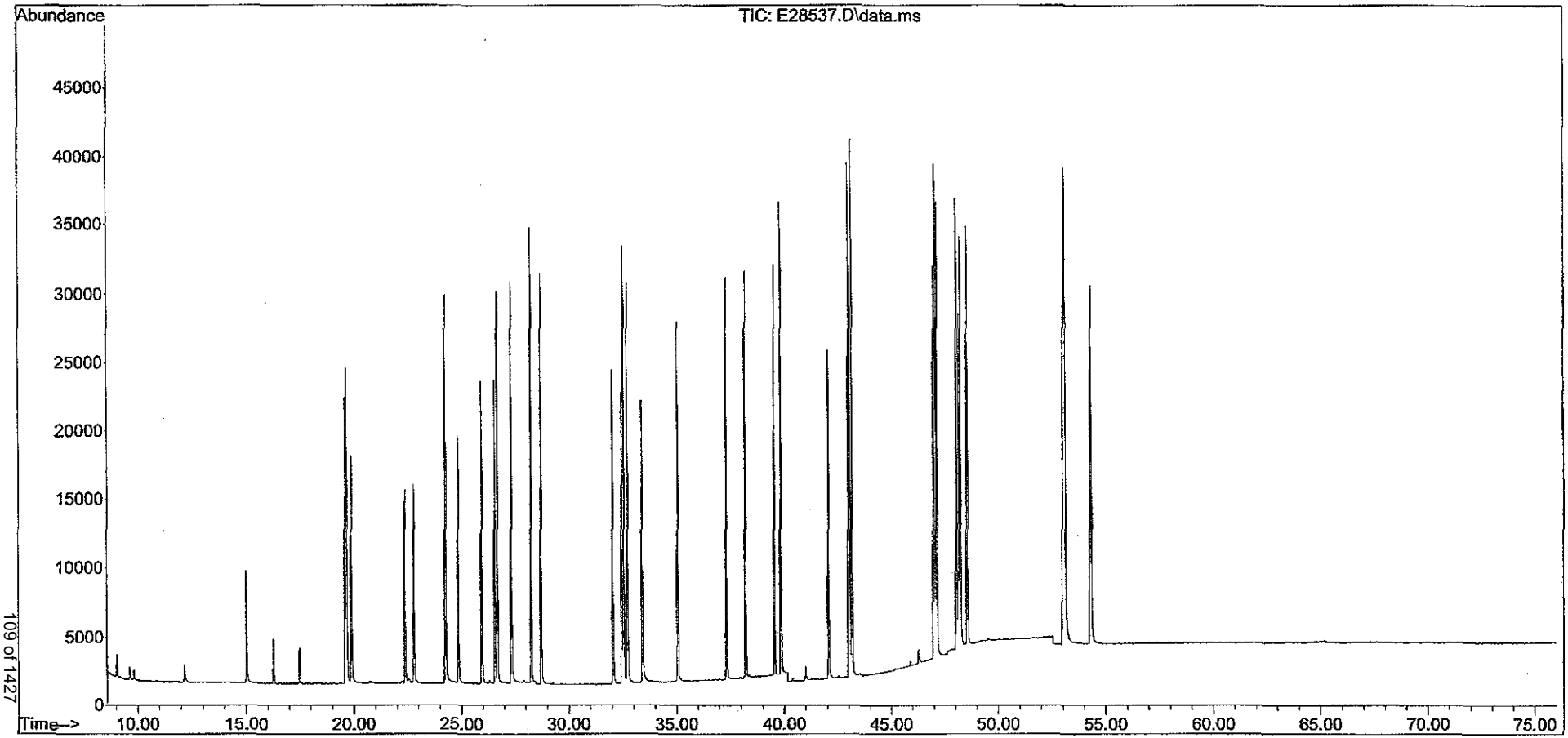
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.001	228	59298	535.360	ng/mL	100
76) Chrysene	43.166	228	59717	523.684	ng/mL	99
77) Chrysene/Triphenylene	43.166	228	59717	523.684	ng/mL	99
84) Benzo[b]fluoranthene	47.066	252	67639	525.377	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	69005	520.970	ng/mL	97
87) Benzo[e]pyrene	48.060	252	63965	508.835	ng/mL	98
89) Benzo[a]pyrene	48.241	252	64274	534.340	ng/mL	96
90) Perylene	48.557	252	67099	527.525	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.030	276	72058M3	509.020	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.091	278	80373	533.213	ng/mL	99
93) Benzo[g,h,i]perylene	54.310	276	79347	519.834	ng/mL	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 13:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	61	-0.23
3	A1	trans-Decalin	0.400	0.411	-2.7	66	-0.21
4	t	cis-Decalin	0.304	0.316	-3.9	66	-0.21
9	s	Naphthalene-d8	1.759	1.809	-2.8	59	-0.21
10	A1	Naphthalene	1.967	2.194	-11.5	67	-0.21
16	t	2-Methylnaphthalene	1.253	1.343	-7.2	66	-0.21
17	t	1-Methylnaphthalene	1.217	1.322	-8.6	66	-0.21
18	A1	Benzothiophene	1.626	1.826	-12.3	68	-0.21
23	t	Biphenyl	1.583	1.711	-8.1	66	-0.23
24	t	2,6-Dimethylnaphthalene	1.129	1.192	-5.6	64	-0.21
25	t	Dibenzofuran	1.753	1.923	-9.7	67	-0.23
26	t	Acenaphthylene	1.961	2.162	-10.2	68	-0.23
27	t	Acenaphthene	1.262	1.351	-7.1	66	-0.23
28	t	2,3,5-Trimethylnaphthalene	1.056	1.083	-2.6	63	-0.23
29	A1	Fluorene	1.408	1.502	-6.7	65	-0.21
33	A1	Dibenzothiophene	1.932	2.092	-8.3	66	-0.23
42	s	Phenanthrene-d10	1.802	1.730	4.0	55	-0.23
43	A1	Phenanthrene	1.965	2.126	-8.2	64	-0.24
54	t	Retene	0.632	0.592	6.3	60	-0.24
55	t	Anthracene	1.699	2.027	-19.3	68	-0.23
56	t	Carbazole	1.748	1.889	-8.1	66	-0.23
57	t	1-Methylphenanthrene	1.499	1.550	-3.4	64	-0.23
58	A1	Fluoranthene	2.170	2.302	-6.1	65	-0.23
59	t	Benzo(b)fluorene	1.446	1.487	-2.8	64	-0.24
60	A1	Pyrene	2.206	2.294	-4.0	64	-0.24
66	A1	Naphthobenzothiophene	2.176	2.264	-4.0	64	-0.26
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.264	-4.0	64	-0.26
74	i	Chrysene-d12	1.000	1.000	0.0	59	-0.24
75	t	Benz[a]anthracene	0.974	1.082	-11.1	63	-0.26
76	A1	Chrysene	1.002	1.090	-8.8	62	-0.24
77	A2	Chrysene/Triphenylene	1.002	1.090	-8.8	62	-0.24
83	s	Benzo[b]fluoranthene-d12	1.027	0.993	3.3	54	-0.26
84	t	Benzo[b]fluoranthene	1.132	1.229	-8.6	62	-0.26
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.282	-10.1	62	-0.26
87	t	Benzo[e]pyrene	1.105	1.185	-7.2	63	-0.27
88	s	Benzo[a]pyrene-d12	0.995	0.969	2.6	56	-0.29
89	t	Benzo[a]pyrene	1.057	1.141	-7.9	65	-0.29
90	t	Perylene	1.118	1.227	-9.7	65	-0.29
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.519	-22.1	73	-0.39
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.491	-12.5	66	-0.39
93	t	Benzo[g,h,i]perylene	1.342	1.484	-10.6	67	-0.42
94	A1	Hopane (T19)	0.375	0.357	4.8	56	-0.39
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.357	4.8	56	-0.39
129	SA1	5B(H)Cholane - Surr	0.197	0.202	-2.5	61	-0.26

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area% Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			1.02	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

11/16/12

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22394	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	45130	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	40509	514.277	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.43%			
42) Phenanthrene-d10	32.085	188	38736	479.993	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.00%#			
83) Benzo[b]fluoranthene-d12	46.630	264	44824	483.498	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.35%#			
88) Benzo[a]pyrene-d12	47.774	264	43715	486.651	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.67%#			
129) 5B(H)Cholane - Surr	43.332	217	9128	513.191	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.32%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4605	257.074	ng/mL	100
4) cis-Decalin	17.091	138	3538	259.964	ng/mL	100
10) Naphthalene	19.304	128	49129	557.730	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	30072	536.007	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	29611	543.171	ng/mL#	100
18) Benzothiophene	19.515	134	40900	561.650	ng/mL	100
23) Biphenyl	23.881	154	38319	540.420	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	26701	528.002	ng/mL#	100
25) Dibenzofuran	26.967	168	43064	548.580	ng/mL	97
26) Acenaphthylene	25.582	152	48407M3	551.188	ng/mL	
27) Acenaphthene	26.320	153	30245	535.018	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	24255	512.652	ng/mL	96
29) Fluorene	28.352	166	33635	533.470	ng/mL	98
33) Dibenzothiophene	31.664	184	46858	541.577	ng/mL	98
43) Phenanthrene	32.161	178	47604	540.795	ng/mL	99
54) Retene	39.192	234	13249	467.736	ng/mL	88
55) Anthracene	32.356	178	45383M3	596.473	ng/mL	
56) Carbazole	33.034	167	42309	540.306	ng/mL	99
57) 1-Methylphenanthrene	34.690	192	34717	516.956	ng/mL	99
58) Fluoranthene	36.963	202	51557	530.359	ng/mL	98
59) Benzo(b)fluorene	39.493	216	33310	514.225	ng/mL	99
60) Pyrene	37.837	202	51369	519.891	ng/mL	98
66) Naphthobenzothiophene	41.706	234	50698	520.232	ng/ml	98
67) Naphthobenzothiophene-2,1	41.706	234	50698	520.232	ng/mL	98
75) Benz[a]anthracene	42.640	228	48820	555.517	ng/mL	99
76) Chrysene	42.805	228	49206	543.856	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	49206	543.856	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	55487	543.200	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.796	252	57848	550.446	ng/mL	95
87) Benzo[e]pyrene	47.684	252	53477	536.162	ng/mL	93
89) Benzo[a]pyrene	47.865	252	51512	539.740	ng/mL	93
90) Perylene	48.166	252	55381	548.759	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.518	276	68575M3	610.538	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	67308	562.797	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	66993	553.169	ng/mL	100
94) Hopane (T19)	51.630	191	16129	476.210	ng/mL#	83

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	51.630	191	16129	476.210	ng/mL#	83

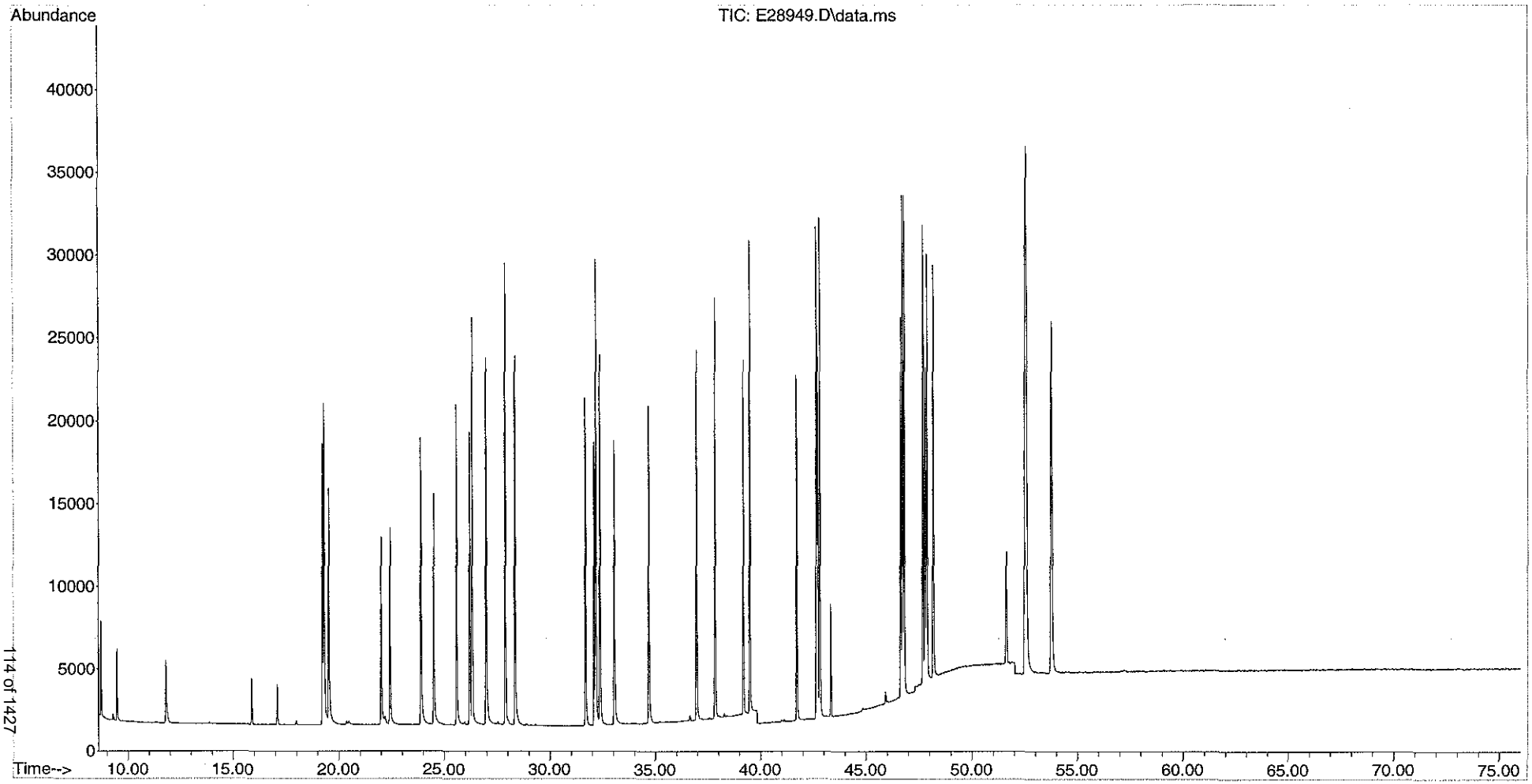
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	66	-0.23
3	A1	trans-Decalin	0.400	0.404	-1.0	71	-0.23
4	t	cis-Decalin	0.304	0.314	-3.3	71	-0.21
9	s	Naphthalene-d8	1.759	1.798	-2.2	64	-0.21
10	A1	Naphthalene	1.967	2.194	-11.5	73	-0.21
16	t	2-Methylnaphthalene	1.253	1.342	-7.1	72	-0.21
17	t	1-Methylnaphthalene	1.217	1.317	-8.2	72	-0.21
18	A1	Benzothiophene	1.626	1.824	-12.2	73	-0.21
23	t	Biphenyl	1.583	1.698	-7.3	72	-0.23
24	t	2,6-Dimethylnaphthalene	1.129	1.195	-5.8	70	-0.21
25	t	Dibenzofuran	1.753	1.905	-8.7	72	-0.23
26	t	Acenaphthylene	1.961	2.202	-12.3	75	-0.23
27	t	Acenaphthene	1.262	1.346	-6.7	71	-0.23
28	t	2,3,5-Trimethylnaphthalene	1.056	1.086	-2.8	69	-0.23
29	A1	Fluorene	1.408	1.510	-7.2	72	-0.23
33	A1	Dibenzothiophene	1.932	2.104	-8.9	72	-0.23
42	s	Phenanthrene-d10	1.802	1.734	3.8	60	-0.24
43	A1	Phenanthrene	1.965	2.108	-7.3	69	-0.24
54	t	Retene	0.632	0.640	-1.3	70	-0.24
55	t	Anthracene	1.699	2.039	-20.0	74	-0.23
56	t	Carbazole	1.748	1.955	-11.8	74	-0.23
57	t	1-Methylphenanthrene	1.499	1.585	-5.7	71	-0.24
58	A1	Fluoranthene	2.170	2.342	-7.9	72	-0.24
59	t	Benzo(b)fluorene	1.446	1.587	-9.8	74	-0.24
60	A1	Pyrene	2.206	2.376	-7.7	72	-0.24
66	A1	Naphthobenzothiophene	2.176	2.423	-11.4	75	-0.26
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.423	-11.4	75	-0.26
74	i	Chrysene-d12	1.000	1.000	0.0	68	-0.26
75	t	Benz[a]anthracene	0.974	1.106	-13.6	74	-0.26
76	A1	Chrysene	1.002	1.084	-8.2	71	-0.24
77	A2	Chrysene/Triphenylene	1.002	1.084	-8.2	71	-0.24
83	s	Benzo[b]fluoranthene-d12	1.027	1.060	-3.2	66	-0.26
84	t	Benzo[b]fluoranthene	1.132	1.293	-14.2	76	-0.26
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.349	-15.9	76	-0.26
87	t	Benzo[e]pyrene	1.105	1.239	-12.1	77	-0.27
88	s	Benzo[a]pyrene-d12	0.995	1.046	-5.1	70	-0.29
89	t	Benzo[a]pyrene	1.057	1.212	-14.7	80	-0.29
90	t	Perylene	1.118	1.300	-16.3	80	-0.29
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.524	-22.5	85	-0.39
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.568	-18.3	81	-0.41
93	t	Benzo[g,h,i]perylene	1.342	1.533	-14.2	80	-0.42
94	A1	Hopane (T19)	0.375	0.380	-1.3	70	-0.39
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.380	-1.3	70	-0.39
129	SA1	5B(H)Cholane - Surr	0.197	0.214	-8.6	75	-0.26

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area% Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			1.07	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24365	500.000	ng/mL	0.00
74) Chrysene-d12	42.700	240	52429	500.000	ng/mL	-0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43806	511.145	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
42) Phenanthrene-d10	32.070	188	42246	481.140	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.11%#			
83) Benzo[b]fluoranthene-d12	46.630	264	55562	515.888	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.59%			
88) Benzo[a]pyrene-d12	47.774	264	54860	525.698	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.57%			
129) 5B(H)Cholane - Surr	43.332	217	11210	542.504	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.25%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4924	252.646	ng/mL	100
4) cis-Decalin	17.091	138	3820	257.979	ng/mL	100
10) Naphthalene	19.304	128	53459	557.792	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32688	535.503	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	32095	541.111	ng/mL#	100
18) Benzothiophene	19.515	134	44435	560.833	ng/mL	100
23) Biphenyl	23.881	154	41378	536.354	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	29119	529.237	ng/mL#	100
25) Dibenzofuran	26.967	168	46406	543.332	ng/mL	98
26) Acenaphthylene	25.582	152	53648M3	561.449	ng/mL	
27) Acenaphthene	26.320	153	32791	533.132	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	26457	513.957	ng/mL	96
29) Fluorene	28.337	166	36791	536.322	ng/mL	99
33) Dibenzothiophene	31.664	184	51254	544.465	ng/mL	99
43) Phenanthrene	32.161	178	51355	536.212	ng/mL	99
54) Retene	39.192	234	15584	505.663	ng/mL	91
55) Anthracene	32.356	178	49682M3	600.153	ng/mL	
56) Carbazole	33.034	167	47641	559.182	ng/mL	100
57) 1-Methylphenanthrene	34.675	192	38623	528.594	ng/mL	99
58) Fluoranthene	36.948	202	57063	539.514	ng/mL	99
59) Benzo(b)fluorene	39.493	216	38675	548.750	ng/mL	99
60) Pyrene	37.837	202	57901	538.596	ng/mL	98
66) Naphthobenzothiophene	41.706	234	59037	556.796	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.706	234	59037	556.796	ng/mL#	64
75) Benz[a]anthracene	42.639	228	57961	567.714	ng/mL	99
76) Chrysene	42.805	228	56830	540.676	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	56830	540.676	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	67802	571.353	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.795	252	70705	579.122	ng/mL	93
87) Benzo[e]pyrene	47.684	252	64947	560.508	ng/mL	94
89) Benzo[a]pyrene	47.865	252	63567	573.327	ng/mL	92
90) Perylene	48.166	252	68142	581.205	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.518	276	79882M3	612.194	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	82188	591.544	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	80391	571.386	ng/mL	100
94) Hopane (T19)	51.630	191	19942	506.820	ng/mL#	82

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	51.630	191	19942	506.820	ng/mL#	82

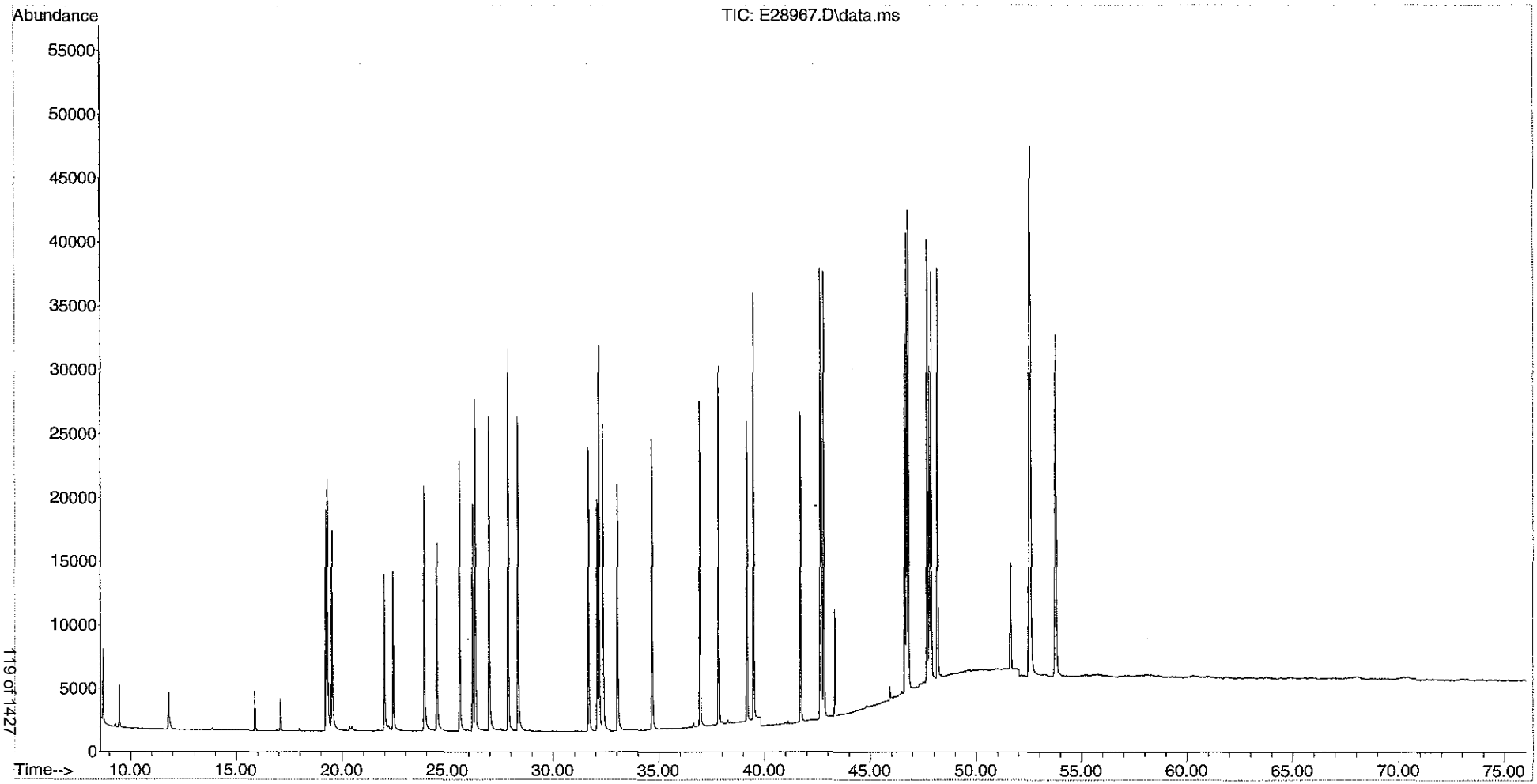
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	
1	i	Acenaphthene-d10	1.000	1.000	0.0	66	-0.23	
3	A1	trans-Decalin	0.400	0.413	-3.2	71	-0.23	
4	t	cis-Decalin	0.304	0.313	-3.0	70	-0.21	
9	s	Naphthalene-d8	1.759	1.793	-1.9	63	-0.21	
10	A1	Naphthalene	1.967	2.166	-10.1	72	-0.21	
16	t	2-Methylnaphthalene	1.253	1.333	-6.4	71	-0.21	
17	t	1-Methylnaphthalene	1.217	1.300	-6.8	70	-0.21	
18	A1	Benzothiophene	1.626	1.801	-10.8	72	-0.21	
23	t	Biphenyl	1.583	1.686	-6.5	70	-0.21	
24	t	2,6-Dimethylnaphthalene	1.129	1.184	-4.9	69	-0.21	
25	t	Dibenzofuran	1.753	1.879	-7.2	70	-0.23	
26	t	Acenaphthylene	1.961	2.180	-11.2	74	-0.23	
27	t	Acenaphthene	1.262	1.332	-5.5	70	-0.23	
28	t	2,3,5-Trimethylnaphthalene	1.056	1.083	-2.6	68	-0.23	
29	A1	Fluorene	1.408	1.507	-7.0	71	-0.21	
33	A1	Dibenzothiophene	1.932	2.116	-9.5	71	-0.21	
42	s	Phenanthrene-d10	1.802	1.764	2.1	61	-0.23	
43	A1	Phenanthrene	1.965	2.107	-7.2	68	-0.23	
54	t	Retene	0.632	0.652	-3.2	71	-0.24	
55	t	Anthracene	1.699	2.019	-18.8	73	-0.23	
56	t	Carbazole	1.748	1.945	-11.3	73	-0.23	
57	t	1-Methylphenanthrene	1.499	1.591	-6.1	70	-0.23	
58	A1	Fluoranthene	2.170	2.368	-9.1	72	-0.23	
59	t	Benzo(b)fluorene	1.446	1.597	-10.4	73	-0.24	
60	A1	Pyrene	2.206	2.379	-7.8	71	-0.24	
66	A1	Naphthobenzothiophene	2.176	2.449	-12.5	75	-0.24	
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.449	-12.5	75	-0.24	
74	i	Chrysene-d12	1.000	1.000	0.0	69	-0.24	
75	t	Benz[a]anthracene	0.974	1.113	-14.3	75	-0.24	
76	A1	Chrysene	1.002	1.096	-9.4	73	-0.24	
77	A2	Chrysene/Triphenylene	1.002	1.096	-9.4	73	-0.24	
83	s	Benzo[b]fluoranthene-d12	1.027	1.072	-4.4	68	-0.24	
84	t	Benzo[b]fluoranthene	1.132	1.341	-18.5	80	-0.26	
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.313	-12.8	75	-0.24	
87	t	Benzo[e]pyrene	1.105	1.253	-13.4	78	-0.26	
88	s	Benzo[a]pyrene-d12	0.995	1.072	-7.7	72	-0.27	
89	t	Benzo[a]pyrene	1.057	1.224	-15.8	81	-0.27	
90	t	Perylene	1.118	1.310	-17.2	82	-0.27	
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.558	-25.2#	88	-0.38	–
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.599	-20.7	83	-0.38	
93	t	Benzo[g,h,i]perylene	1.342	1.555	-15.9	82	-0.41	
94	A1	Hopane (T19)	0.375	0.383	-2.1	71	-0.39	
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.383	-2.1	71	-0.39	
129	SA1	5B(H)Cholane - Surr	0.197	0.213	-8.1	75	-0.26	

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			1.08		0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24064M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	52839	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43136	509.623	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.96%			
42) Phenanthrene-d10	32.085	188	42450	489.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.95%#			
83) Benzo[b]fluoranthene-d12	46.645	264	56634	521.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.18%			
88) Benzo[a]pyrene-d12	47.790	264	56653	538.668	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.87%			
129) 5B(H)Cholane - Surr	43.332	217	11232	539.351	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.94%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4966	257.988	ng/mL	100
4) cis-Decalin	17.091	138	3762	257.240	ng/mL	100
10) Naphthalene	19.304	128	52132	550.750	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32089	532.265	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	31273	533.847	ng/mL#	100
18) Benzothiophene	19.515	134	43328	553.701	ng/mL	100
23) Biphenyl	23.896	154	40583	532.629	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	28488	524.245	ng/mL#	100
25) Dibenzofuran	26.967	168	45217	536.033	ng/mL	97
26) Acenaphthylene	25.582	152	52457M3	555.852	ng/mL	
27) Acenaphthene	26.320	153	32046	527.536	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	27.885	170	26065	512.676	ng/mL	97
29) Fluorene	28.352	166	36253	535.090	ng/mL	100
33) Dibenzothiophene	31.679	184	50924	547.725	ng/mL	99
43) Phenanthrene	32.176	178	50714	536.143	ng/mL	99
54) Retene	39.192	234	15693	515.569	ng/mL	94
55) Anthracene	32.356	178	48591M3	594.316	ng/mL	
56) Carbazole	33.034	167	46813	556.336	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38281	530.467	ng/mL	99
58) Fluoranthene	36.963	202	56975	545.420	ng/mL	98
59) Benzo(b)fluorene	39.493	216	38424	552.008	ng/mL	99
60) Pyrene	37.837	202	57258	539.276	ng/mL	99
66) Naphthobenzothiophene	41.721	234	58939	562.825	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.721	234	58939	562.825	ng/mL#	64
75) Benz[a]anthracene	42.655	228	58810	571.560	ng/mL	99
76) Chrysene	42.805	228	57925	546.817	ng/mL	100
77) Chrysene/Triphenylene	42.805	228	57925	546.817	ng/mL	100
84) Benzo[b]fluoranthene	46.720	252	70856	592.456	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.811	252	69397	563.998	ng/mL	93
87) Benzo[e]pyrene	47.699	252	66232	567.162	ng/mL	94
89) Benzo[a]pyrene	47.880	252	64662	578.677	ng/mL	92
90) Perylene	48.181	252	69214	585.768	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	52.533	276	82316M2	625.953	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	84503	603.487	ng/mL	99
93) Benzo[g,h,i]perylene	53.783	276	82167	579.478	ng/mL	100
94) Hopane (T19)	51.630	191	20233	510.226	ng/mL#	84

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	51.630	191	20233	510.226	ng/mL#	84

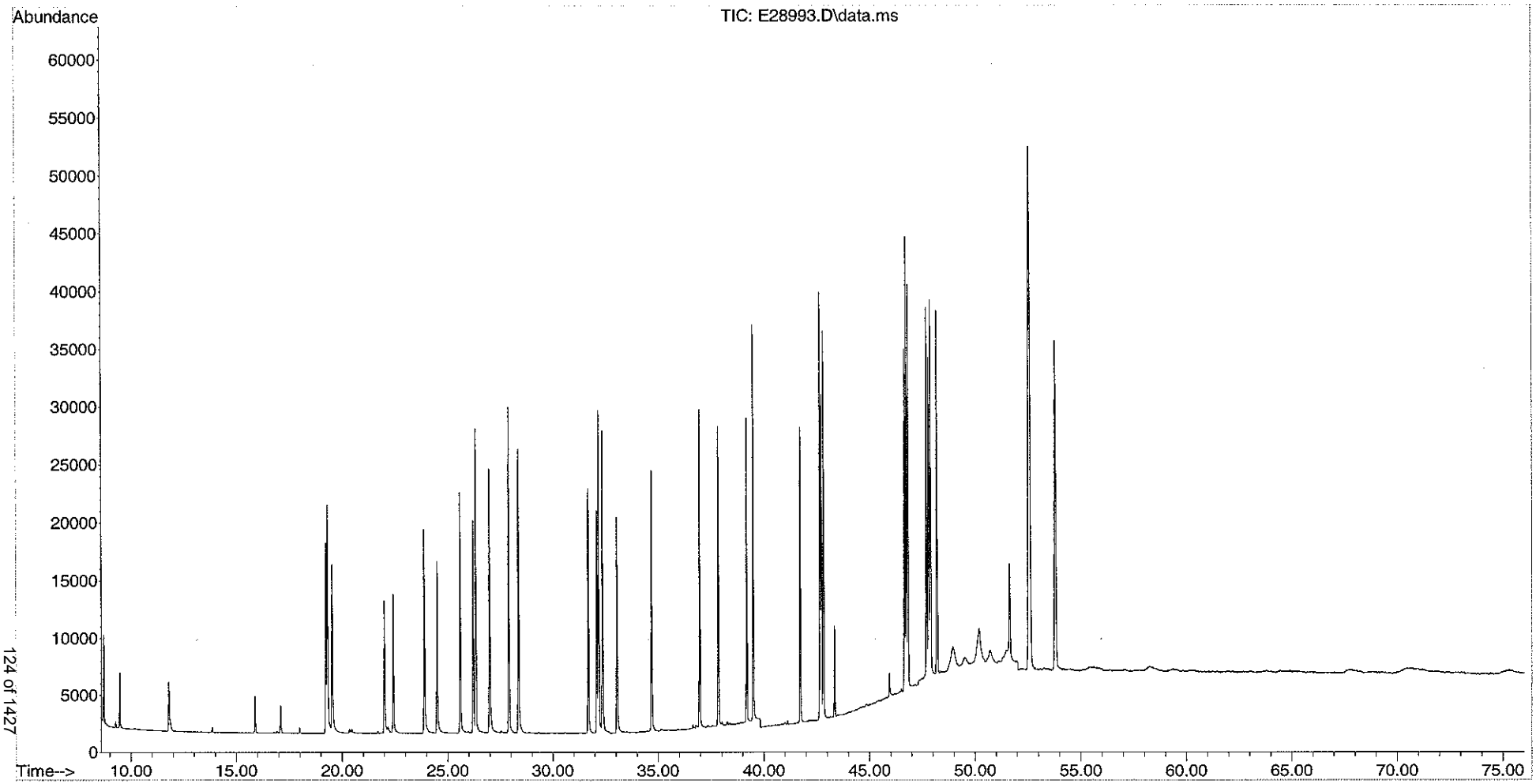
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	65	-0.21
3	A1	trans-Decalin	0.400	0.401	-0.3	69	-0.21
4	t	cis-Decalin	0.304	0.307	-1.0	68	-0.20
9	s	Naphthalene-d8	1.759	1.752	0.4	61	-0.20
10	A1	Naphthalene	1.967	2.109	-7.2	70	-0.20
16	t	2-Methylnaphthalene	1.253	1.305	-4.2	69	-0.20
17	t	1-Methylnaphthalene	1.217	1.261	-3.6	68	-0.20
18	A1	Benzothiophene	1.626	1.783	-9.7	71	-0.20
23	t	Biphenyl	1.583	1.656	-4.6	69	-0.21
24	t	2,6-Dimethylnaphthalene	1.129	1.177	-4.3	68	-0.20
25	t	Dibenzofuran	1.753	1.878	-7.1	70	-0.21
26	t	Acenaphthylene	1.961	2.128	-8.5	72	-0.21
27	t	Acenaphthene	1.262	1.302	-3.2	68	-0.21
28	t	2,3,5-Trimethylnaphthalene	1.056	1.088	-3.0	68	-0.21
29	A1	Fluorene	1.408	1.477	-4.9	69	-0.21
33	A1	Dibenzothiophene	1.932	2.144	-11.0	72	-0.21
42	s	Phenanthrene-d10	1.802	1.761	2.3	60	-0.23
43	A1	Phenanthrene	1.965	2.102	-7.0	68	-0.23
54	t	Retene	0.632	0.649	-2.7	70	-0.23
55	t	Anthracene	1.699	2.018	-18.8	72	-0.21
56	t	Carbazole	1.748	1.948	-11.4	73	-0.21
57	t	1-Methylphenanthrene	1.499	1.592	-6.2	70	-0.23
58	A1	Fluoranthene	2.170	2.342	-7.9	71	-0.23
59	t	Benzo(b)fluorene	1.446	1.588	-9.8	73	-0.23
60	A1	Pyrene	2.206	2.382	-8.0	71	-0.23
66	A1	Naphthobenzothiophene	2.176	2.384	-9.6	72	-0.23
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.384	-9.6	72	-0.23
74	i	Chrysene-d12	1.000	1.000	0.0	67	-0.23
75	t	Benz[a]anthracene	0.974	1.088	-11.7	73	-0.24
76	A1	Chrysene	1.002	1.075	-7.3	70	-0.23
77	A2	Chrysene/Triphenylene	1.002	1.075	-7.3	70	-0.23
83	s	Benzo[b]fluoranthene-d12	1.027	1.030	-0.3	64	-0.24
84	t	Benzo[b]fluoranthene	1.132	1.310	-15.7	76	-0.24
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.258	-8.1	70	-0.24
87	t	Benzo[e]pyrene	1.105	1.218	-10.2	75	-0.26
88	s	Benzo[a]pyrene-d12	0.995	1.017	-2.2	68	-0.26
89	t	Benzo[a]pyrene	1.057	1.184	-12.0	77	-0.26
90	t	Perylene	1.118	1.264	-13.1	77	-0.26
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.587	-27.6#	88	-0.36
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.553	-17.2	79	-0.38
93	t	Benzo[g,h,i]perylene	1.342	1.524	-13.6	79	-0.38
94	A1	Hopane (T19)	0.375	0.387	-3.2	70	-0.38
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.387	-3.2	70	-0.38
129	SA1	5B(H)Cholane - Surr	0.197	0.210	-6.6	73	-0.24

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			1.06		0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	24018	500.000	ng/mL	0.02
74) Chrysene-d12	42.730	240	51970	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	42087	498.182	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.82%#			
42) Phenanthrene-d10	32.085	188	42292	488.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.86%#			
83) Benzo[b]fluoranthene-d12	46.645	264	53512	501.242	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.12%			
88) Benzo[a]pyrene-d12	47.805	264	52874	511.142	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
129) 5B(H)Cholane - Surr	43.347	217	10939	534.065	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.41%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4810	250.362	ng/mL	100
4) cis-Decalin	17.106	138	3688	252.663	ng/mL	100
10) Naphthalene	19.319	128	50662	536.245	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	31345	520.920	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	30282	517.920	ng/mL#	100
18) Benzothiophene	19.530	134	42828	548.360	ng/mL	100
23) Biphenyl	23.896	154	39765	522.893	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	28258	521.008	ng/mL#	100
25) Dibenzofuran	26.982	168	45112	535.812	ng/mL	96
26) Acenaphthylene	25.597	152	51113M3	542.648	ng/mL	
27) Acenaphthene	26.335	153	31260	515.583	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.900	170	26129	514.919	ng/mL	96
29) Fluorene	28.352	166	35474	524.595	ng/mL	99
33) Dibenzothiophene	31.679	184	51505	555.036	ng/mL	98
43) Phenanthrene	32.176	178	50492	534.818	ng/mL	99
54) Retene	39.207	234	15591	513.199	ng/mL	92
55) Anthracene	32.371	178	48471M3	593.984	ng/mL	
56) Carbazole	33.049	167	46782	557.033	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38225	530.705	ng/mL	99
58) Fluoranthene	36.963	202	56249	539.501	ng/mL	98
59) Benzo(b)fluorene	39.508	216	38135	548.905	ng/mL	99
60) Pyrene	37.852	202	57209	539.847	ng/mL	99
66) Naphthobenzothiophene	41.736	234	57263	547.867	ng/ml#	65
67) Naphthobenzothiophene-2,1	41.736	234	57263	547.867	ng/mL#	65
75) Benz[a]anthracene	42.655	228	56552	558.805	ng/mL	100
76) Chrysene	42.820	228	55852	536.064	ng/mL	99
77) Chrysene/Triphenylene	42.820	228	55852	536.064	ng/mL	99
84) Benzo[b]fluoranthene	46.735	252	68060	578.593	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.811	252	65403	540.427	ng/mL	94
87) Benzo[e]pyrene	47.699	252	63310	551.206	ng/mL	92
89) Benzo[a]pyrene	47.895	252	61523	559.792	ng/mL	92
90) Perylene	48.196	252	65712	565.429	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.548	276	82475M3	637.649	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	80707	586.015	ng/mL	98
93) Benzo[g,h,i]perylene	53.813	276	79225	568.072	ng/mL	99
94) Hopane (T19)	51.645	191	20115	515.732	ng/mL#	84

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	51.645	191	20115	515.732	ng/mL#	84

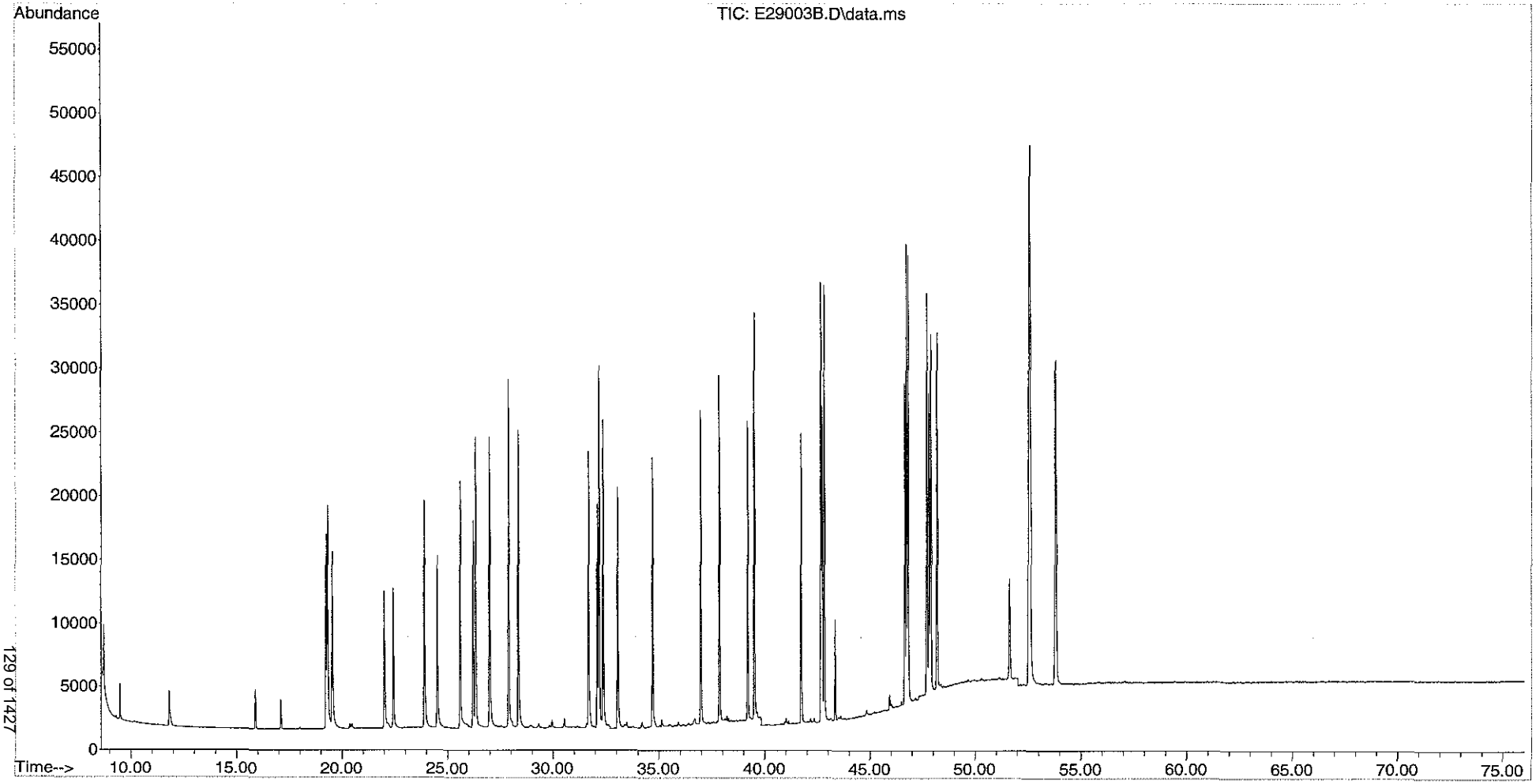
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



cnorm.ini OCT12|OCT28|E28517

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[targets]
base=69
masses=5
mass1=50
mass2=131
mass3=219
mass4=414
mass5=502
target1=1
target2=45
target3=55
target4=2.5
target5=2
[PFTBA.cnorm]
masses=5
69=789376 - BASE
50=7627
131=401280 ✓
219=447872 - 56.73% ✓
414=71392
502=80896 - 10.24% ✓
```

PAH2102912.M

11/2/12.

JGK (11/05/12)

E28949

PAH2/2012/NOV12/NOV13

cnorm.ini

```
[targets]
base=69
masses=5
mass1=50
mass2=131
mass3=219
mass4=414
mass5=502
target1=1
target2=45
target3=55
target4=2.5
target5=2
[PFTBA.cnorm]
masses=5
69=789376
50=7627
131=401280
219=447872
414=71392
502=80896
```

56.7%

10.2%

KML for RZ
11/16/12

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	0.0980	U
C4-Decalins	0.191	U	Pyrene	**0.106**	J
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**0.133**	J	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**0.0628**	J
Biphenyl	0.0604	U	Chrysene/Triphenylene	**0.0996**	J
Dibenzofuran	**0.100**	J	C1-Chrysenes	0.104	U
Acenaphthylene	0.0455	U	C2-Chrysenes	0.104	U
Acenaphthene	0.0537	U	C3-Chrysenes	0.104	U
Fluorene	0.0637	U	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**0.123**	J
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**0.0768**	J
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	0.0936	U	Benzo[e]pyrene	**0.152**	J
Phenanthrene	**0.128**	J	Benzo[a]pyrene	**0.183**	J
C1-Phenanthrenes/Anthracenes	**0.431**	J	Perylene	**0.0933**	J
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**0.171**	J
C3-Phenanthrenes/Anthracenes	**1.15**	J	Dibenz[ah]anthracene/Dibenz[ac]anthracene	0.275	U
C4-Phenanthrenes/Anthracenes	**1.02**	J	Benzo[g,h,i]perylene	**0.172**	J
Retene	**0.193**	J			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	87	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	87	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	87	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	87	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	**0.0841**	J
2-Methylphenanthrene	**0.0791**	J
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	**0.0857**	J
1-Methylphenanthrene	**0.0656**	J
2-Methylnaphthalene	0.0863	U
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	87	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	87	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	**0.439**	J
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	**0.197**	J
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	**0.257**	J
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	**0.991**	J
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	**0.484**	J
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28973.D
Acq On : 15 Nov 2012 12:24 am
Operator : AC
Sample : SS110612B07
Misc : 1X ETR1210081
ALS Vial : 25 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 13:23:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.199	164	20164M3	500.000 ng/mL	0.00
74) Chrysene-d12	42.715	240	44721	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.229	136	30694	432.767 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	43.28%#	
42) Phenanthrene-d10	32.085	188	31833	438.079 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	43.81%#	
83) Benzo[b]fluoranthene-d12	46.630	264	41556	452.347 ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery =	45.23%#	
88) Benzo[a]pyrene-d12	47.790	264	38686	434.605 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	43.46%#	
129) 5B(H)Cholane - Surr	43.332	217	8465	480.269 ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery =	48.03%#	
Target Compounds					Qvalue
10) Naphthalene	19.304	128	79M3	0.996 ng/mL	
25) Dibenzofuran	27.012	168	53M3	0.750 ng/mL	
43) Phenanthrene	32.176	178	76M3	0.959 ng/mL	
44) 3-Methylphenanthrene(3MP)	34.148	192	50M4	0.631 ng/mL	
45) 2-Methylphenanthrene(2MP)	34.253	192	47M3	0.593 ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	51M3	0.643 ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	39M3	0.492 ng/mL	
49) C1-Phenanthrenes/Anthrace	34.148	192	256M5	3.230 ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	683M5	8.617 ng/mL	
53) C4-Phenanthrenes/Anthrace	40.457	234	606M5	7.646 ng/mL	
54) Retene	39.192	234	37M2	1.451 ng/mL	
57) 1-Methylphenanthrene	34.690	192	33M3	0.546 ng/mL	
60) Pyrene	37.852	202	71M3	0.798 ng/mL	
75) Benz[a]anthracene	42.610	228	41M3	0.471 ng/mL	
77) Chrysene/Triphenylene	42.805	228	67M2	0.747 ng/mL	
84) Benzo[b]fluoranthene	46.720	252	93M3	0.919 ng/mL	
85) Benzo[j]+[k]fluoranthene	46.811	252	60M3	0.576 ng/mL	
87) Benzo[e]pyrene	47.684	252	113M3	1.143 ng/mL	
89) Benzo[a]pyrene	47.880	252	130	1.375 ng/mL#	49
90) Perylene	48.196	252	70M3	0.700 ng/mL	
91) Indeno[1,2,3-cd]pyrene	52.564	276	143M3	1.285 ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	155	1.292 ng/mL#	51
130) 13b(H),17a(H)-20S-Diachol	44.868	217	58M3	3.291 ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.931	218	26M2	1.475 ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.022	218	34M2	1.929 ng/ml	
147) C26,20R- +C27,20S- triaro	49.010	231	131	7.432 ng/mL	100
149) C27,20R-triaromatic stero	50.275	231	64M2	3.631 ng/mL	

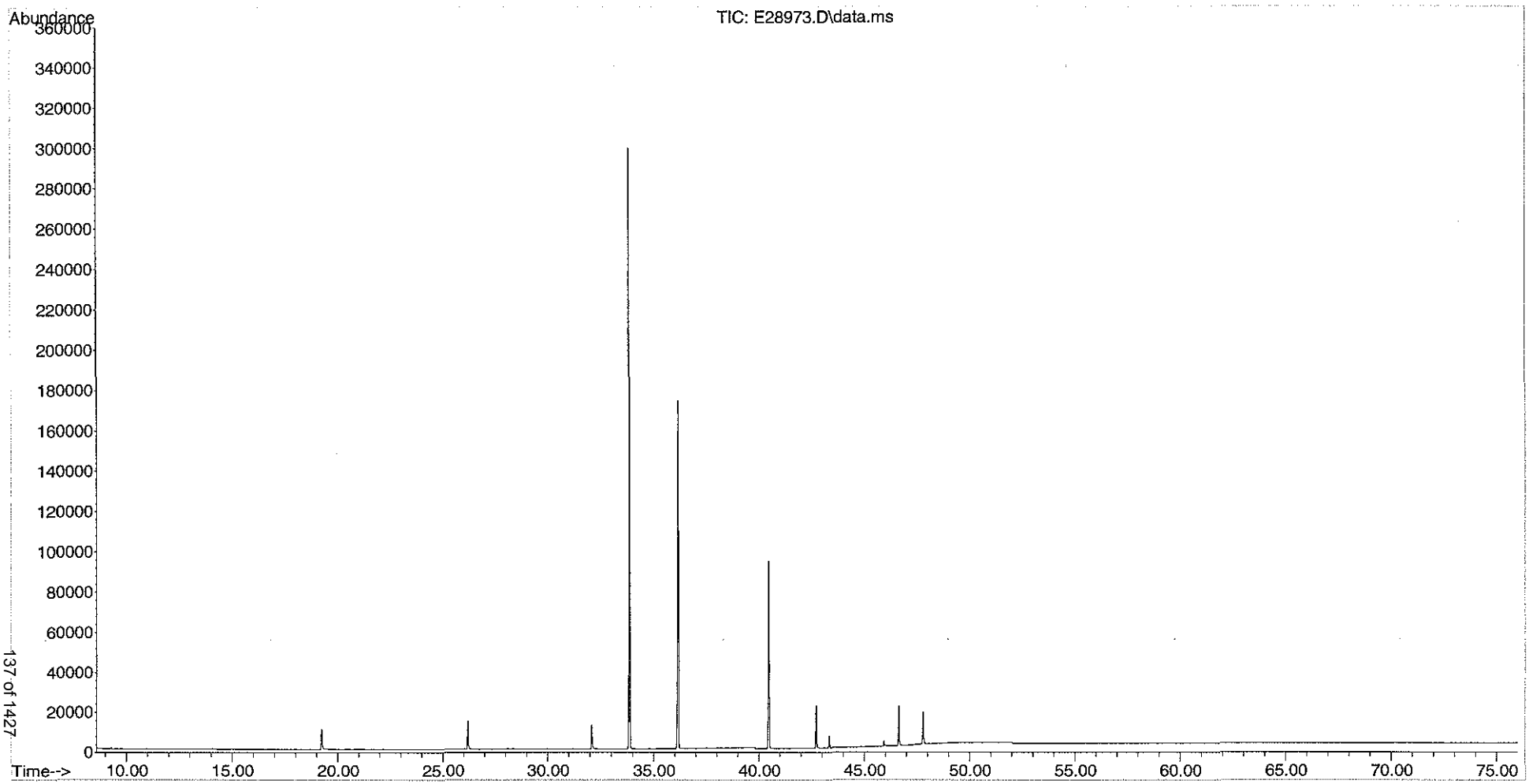
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28973.D
Acq On : 15 Nov 2012 12:24 am
Operator : AC
Sample : SS110612B07
Misc : 1X ETR1210081
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:23:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



137 of 1427
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Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCS03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**67.4**	S
C4-Decalins	0.191	U	Pyrene	**68.2**	S
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**64.3**	S	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**66.1**	S
Biphenyl	0.0604	U	Chrysene/Triphenylene	**64.2**	S
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**63.9**	S	C2-Chrysenes	0.104	U
Acenaphthene	**63.2**	S	C3-Chrysenes	0.104	U
Fluorene	**64.2**	S	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**65.9**	S
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**65.8**	S
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	**70.6**	S	Benzo[e]pyrene	0.107	U
Phenanthrene	**63.6**	S	Benzo[a]pyrene	**66.2**	S
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**68.6**	S
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**61.8**	S
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**60.2**	S
Retene	0.109	U			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	93	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCS03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	93	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCS03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	**63.8**	
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	93	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCS03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	**1.67**	B
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

N/A - Not Applicable
B - Found in associated blank as well as sample.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28975.D
Acq On : 15 Nov 2012 1:52 am
Operator : AC
Sample : SS110612LCS03
Misc : 1X ETR1210081
ALS Vial : 26 Sample Multiplier: 1

11/16/12

Quant Time: Nov 16 12:28:43 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	21426	500.000	ng/mL	-0.01
74) Chrysene-d12	42.700	240	48231	500.000	ng/mL	-0.01
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	34976	464.094	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.41%#			
42) Phenanthrene-d10	32.070	188	35716	462.566	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.26%#			
83) Benzo[b]fluoranthene-d12	46.630	264	45712	461.374	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.14%#			
88) Benzo[a]pyrene-d12	47.775	264	42856	446.414	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.64%#			
129) 5B(H)Cholane - Surr	43.332	217	9157	481.721	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.17%#			
Target Compounds						Qvalue
10) Naphthalene	19.304	128	40633	482.120	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	25706	478.887	ng/mL#	100
26) Acenaphthylene	25.582	152	40255M3	479.073	ng/mL	
27) Acenaphthene	26.320	153	25644	474.123	ng/mL	97
29) Fluorene	28.337	166	29050M3	481.566	ng/mL	
43) Phenanthrene	32.161	178	40146	476.674	ng/mL	99
55) Anthracene	32.356	178	38530M3	529.282	ng/mL	
58) Fluoranthene	36.948	202	47053M3	505.895	ng/mL	
60) Pyrene	37.837	202	48380	511.762	ng/mL	98
75) Benz[a]anthracene	42.640	228	46585	496.004	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	46573	481.658	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	53957	494.260	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.796	252	55471	493.891	ng/mL	94
89) Benzo[a]pyrene	47.865	252	50668	496.763	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.519	276	61779M3	514.667	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	59242	463.504	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	58446	451.567	ng/mL	100
141) 14b(H),17b(H)-20R-Cholest	46.630	218	238	12.520	ng/ml	100

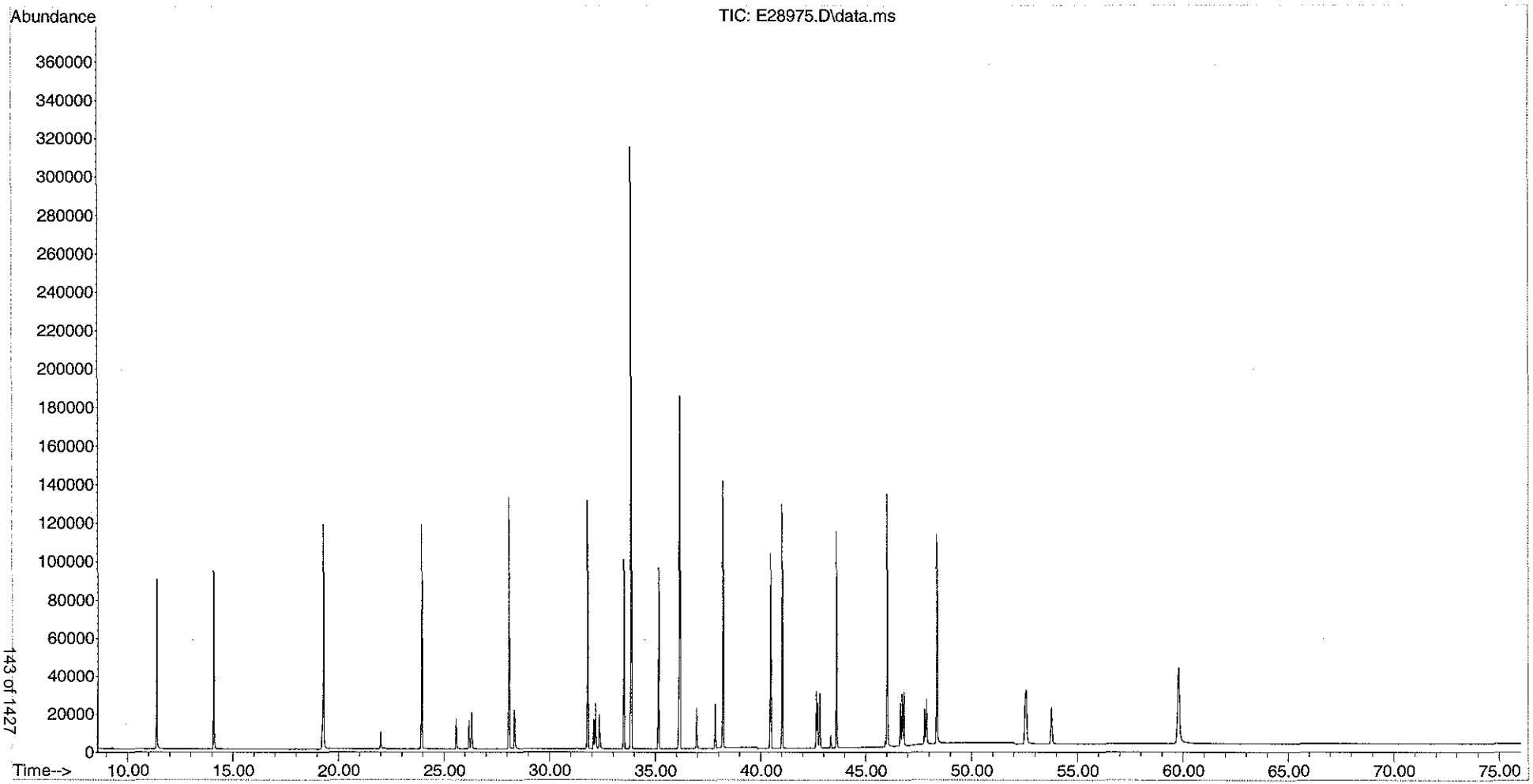
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28975.D
Acq On : 15 Nov 2012 1:52 am
Operator : AC
Sample : SS110612LCS03
Misc : 1X ETR1210081
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Nov 16 12:28:43 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



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Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCSD03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**66.3**	S
C4-Decalins	0.191	U	Pyrene	**66.5**	S
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**61.7**	S	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**64.7**	S
Biphenyl	0.0604	U	Chrysene/Triphenylene	**62.3**	S
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**61.3**	S	C2-Chrysenes	0.104	U
Acenaphthene	**60.3**	S	C3-Chrysenes	0.104	U
Fluorene	**62.0**	S	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**63.1**	S
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**64.5**	S
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	**69.6**	S	Benzo[e]pyrene	0.107	U
Phenanthrene	**61.8**	S	Benzo[a]pyrene	**64.1**	S
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**61.3**	S
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**59.8**	S
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**58.2**	S
Retene	0.109	U			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	86	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	86	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCSD03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	86	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	86	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCSD03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	**60.9**	
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	86	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	86	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCSD03**
Associated Blank: **SS110612B07**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/15/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	92	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28977.D
Acq On : 15 Nov 2012 3:21 am
Operator : AC
Sample : SS110612LCSD03
Misc : 1X ETR1210081
ALS Vial : 27 Sample Multiplier: 1

11/16/12.

Quant Time: Nov 16 12:28:49 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	21345	500.000	ng/mL	0.00
74) Chrysene-d12	42.700	240	48205	500.000	ng/mL	-0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	32348	430.852	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.09%#			
42) Phenanthrene-d10	32.070	188	34268	445.497	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.55%#			
83) Benzo[b]fluoranthene-d12	46.630	264	44137	445.718	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.57%#			
88) Benzo[a]pyrene-d12	47.774	264	41124	428.604	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.86%#			
129) 5B(H)Cholane - Surr	43.332	217	8749	460.506	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.05%#			
Target Compounds						Qvalue
10) Naphthalene	19.304	128	38880	463.071	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	24408	456.432	ng/mL#	100
26) Acenaphthylene	25.582	152	38489M3	459.795	ng/mL	
27) Acenaphthene	26.320	153	24372	452.315	ng/mL	98
29) Fluorene	28.337	166	27948	465.056	ng/mL	99
43) Phenanthrene	32.160	178	38904	463.680	ng/mL	99
55) Anthracene	32.356	178	37836M3	521.721	ng/mL	
58) Fluoranthene	36.948	202	46052M3	497.012	ng/mL	
60) Pyrene	37.837	202	46990	498.945	ng/mL	98
75) Benz[a]anthracene	42.639	228	45520	484.926	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	45127	466.955	ng/mL	99
84) Benzo[b]fluoranthene	46.705	252	51654	473.419	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.795	252	54306	483.780	ng/mL	94
89) Benzo[a]pyrene	47.865	252	48978	480.453	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	52.518	276	55197M3	460.082	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.563	278	57267	448.294	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	56482	436.628	ng/mL	99

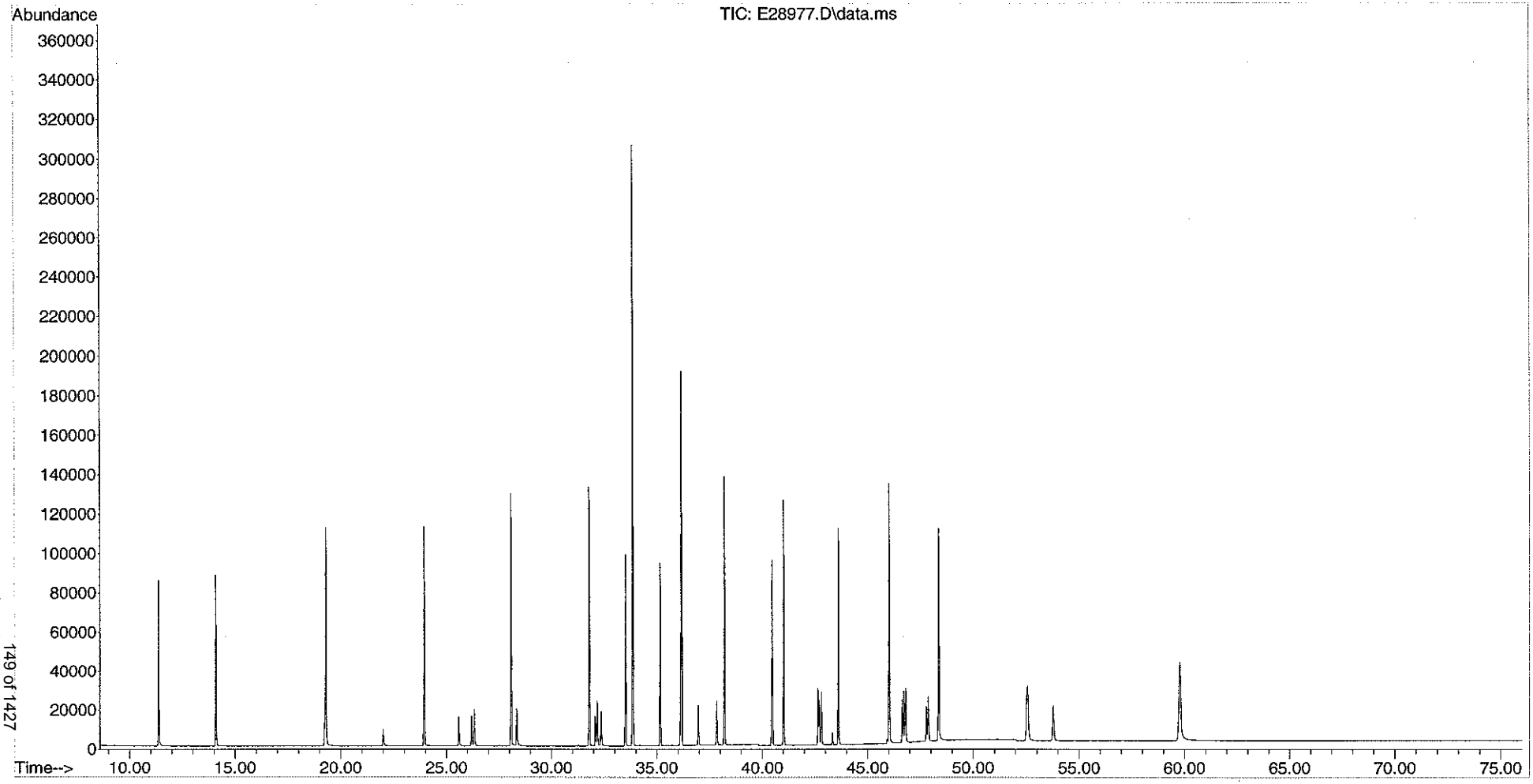
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28977.D
Acq On : 15 Nov 2012 3:21 am
Operator : AC
Sample : SS110612LCSD03
Misc : 1X ETR1210081
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Nov 16 12:28:49 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Cold Lake Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	**140**		C3-Dibenzothiophenes	**506**	
C1-Decalins	**297**		C4-Dibenzothiophenes	**351**	
C2-Decalins	**461**		Benzo(b)fluorene	**7.71**	
C3-Decalins	**354**		Fluoranthene	**6.11**	
C4-Decalins	**378**		Pyrene	**19.6**	
Benzothiophene	**9.60**		C1-Fluoranthenes/Pyrenes	**74.0**	
C1-Benzo(b)thiophenes	**49.8**		C2-Fluoranthenes/Pyrenes	**114**	
C2-Benzo(b)thiophenes	**92.9**		C3-Fluoranthenes/Pyrenes	**139**	
C3-Benzo(b)thiophenes	**165**		C4-Fluoranthenes/Pyrenes	**142**	
C4-Benzo(b)thiophenes	**176**		Naphthobenzothiophenes	**42.3**	
Naphthalene	**66.7**		C1-Naphthobenzothiophenes	**146**	
C1-Naphthalenes	**189**		C2-Naphthobenzothiophenes	**233**	
C2-Naphthalenes	**404**		C3-Naphthobenzothiophenes	**197**	
C3-Naphthalenes	**508**		C4-Naphthobenzothiophenes	**161**	
C4-Naphthalenes	**430**		Benz[a]anthracene	**3.71**	
Biphenyl	**16.0**		Chrysene/Triphenylene	**22.5**	
Dibenzofuran	**8.46**		C1-Chrysenes	**62.2**	
Acenaphthylene	**3.56**		C2-Chrysenes	**101**	
Acenaphthene	**13.1**		C3-Chrysenes	**120**	
Fluorene	**28.8**		C4-Chrysenes	**80.8**	
C1-Fluorenes	**82.2**		Benzo[b]fluoranthene	**5.79**	
C2-Fluorenes	**193**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**1.76**	J
C3-Fluorenes	**232**		Benzo[a]fluoranthene	1.98	U
Anthracene	**5.53**		Benzo[e]pyrene	**9.29**	
Phenanthrene	**83.7**		Benzo[a]pyrene	**5.32**	
C1-Phenanthrenes/Anthracenes	**246**		Perylene	**11.3**	
C2-Phenanthrenes/Anthracenes	**372**		Indeno[1,2,3-cd]pyrene	**3.24**	
C3-Phenanthrenes/Anthracenes	**356**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**1.23**	J
C4-Phenanthrenes/Anthracenes	**165**		Benzo[g,h,i]perylene	**6.82**	
Retene	1.98	U			
Dibenzothiophene	**70.0**				
C1-Dibenzothiophenes	**244**				
C2-Dibenzothiophenes	**461**				

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	40-120
Phenanthrene-d10	103	40-120
Benzo[a]pyrene-d12	104	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Cold Lake Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result
Carbazole	**7.30**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	40-120
Phenanthrene-d10	103	40-120
Benzo[a]pyrene-d12	104	40-120

N/A - Not Applicable

Form I
Cold Lake Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**95.2**
2/3-Methyldibenzothiophene	**80.0**
1-Methyldibenzothiophene	**52.0**
3-Methylphenanthrene	**47.6**
2-Methylphenanthrene	**53.8**
2-Methylanthracene	**5.05**
9/4-Methylphenanthrene	**84.1**
1-Methylphenanthrene	**47.6**
2-Methylnaphthalene	**178**
1-Methylnaphthalene	**122**
2,6-Dimethylnaphthalene	**172**
2,3,5-Trimethylnaphthalene	**49.8**
Naphthobenzothiophene-2,1-D	**29.6**
Naphthobenzothiophene-1,2-D	**7.70**
Naphthobenzothiophene-2,3-D	**4.95**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	40-120
Phenanthrene-d10	103	40-120
Benzo[a]pyrene-d12	104	40-120

N/A - Not Applicable

Form I
Cold Lake Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result	
C23 Tricyclic Terpane	99.8	
C24 Tricyclic Terpane	53.7	
C25 Tricyclic Terpane	50.5	
C24 Tetracyclic Terpane	19.0	
C26 Tricyclic Terpane-22S	19.2	
C26 Tricyclic Terpane-22R	18.3	
C28 Tricyclic Terpane-22S	22.1	
C28 Tricyclic Terpane-22R	22.8	
C29 Tricyclic Terpane-22S	27.2	
C29 Tricyclic Terpane-22R	25.8	
18a-22,29,30-Trisnorneohopane-TS	27.8	
C30 Tricyclic Terpane-22S	22.2	
C30 Tricyclic Terpane-22R	22.5	
17a(H)-22,29,30-Trisnorhopane-TM	68.2	
17a/b,21b/a 28,30-Bisnorhopane	44.2	
17a(H),21b(H)-25-Norhopane	12.7	
30-Norhopane	188	
18a(H)-30-Norneohopane-C29Ts	25.7	
17a(H)-Diahopane	8.87	
30-Normoretane	18.1	
18a(H)&18b(H)-Oleananes	1.26	J
Hopane	254	
Moretane	20.4	
30-Homohopane-22S	115	
30-Homohopane-22R	90.0	
T22a-Gammacerane/C32-diahopane	42.8	
30,31-Bishomohopane-22S	75.1	
30,31-Bishomohopane-22R	54.2	

Parameter	Result
30,31-Trishomohopane-22S	59.3
30,31-Trishomohopane-22R	38.9
Tetrakishomohopane-22S	38.4
Tetrakishomohopane-22R	27.0
Pentakishomohopane-22S	51.7
Pentakishomohopane-22R	34.9
13b(H),17a(H)-20S-Diacholestane	35.7
13b(H),17a(H)-20R-Diacholestane	16.7
13b,17a-20S-Methyldiacholestane	13.4
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	61.9
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	72.6
Unknown Sterane (S18)	12.2
13a,17b-20S-Ethyldiacholestane	7.87
14a,17a-20S-Methylcholestane	24.3
14a,17a-20R-Methylcholestane	27.0
14a(H),17a(H)-20S-Ethylcholestane	57.3
14a(H),17a(H)-20R-Ethylcholestane	56.2
14b(H),17b(H)-20R-Cholestane	54.0
14b(H),17b(H)-20S-Cholestane	52.6
14b,17b-20R-Methylcholestane	45.0
14b,17b-20S-Methylcholestane	59.7
14b(H),17b(H)-20R-Ethylcholestane	75.7
14b(H),17b(H)-20S-Ethylcholestane	58.5
C26,20R- +C27,20S- triaromatic steroid	229
C28,20S-triaromatic steroid	200
C27,20R-triaromatic steroid	151
C28,20R-triaromatic steroid	164

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	108	50-130

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22488M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.730	240	52371	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	75708	957.123	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.71%			
42) Phenanthrene-d10	32.085	188	83705	1032.886	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.29%			
83) Benzo[b]fluoranthene-d12	46.660	264	112882	1049.260	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.93%			
88) Benzo[a]pyrene-d12	47.805	264	108509	1040.944	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.09%			
129) 5B(H)Cholane - Surr	43.347	217	22224	1076.714	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.67%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	11487	638.581	ng/mL	100
4) cis-Decalin	17.091	138	961	70.317	ng/mL	100
5) C1-Decalins	17.362	152	27034M5	1502.863	ng/mL	
6) C2-Decalins	18.792	166	41962m	2332.735	ng/mL	
7) C3-Decalins	21.623	180	32282m	1794.608	ng/mL	
8) C4-Decalins	24.272	194	34396M5	1912.129	ng/mL	
10) Naphthalene	19.304	128	29886	337.858	ng/mL#	100
11) C1-Naphthalenes	21.999	142	84491M5	955.163	ng/mL	
12) C2-Naphthalenes	24.844	156	181124m	2047.590	ng/mL	
13) C3-Naphthalenes	27.539	170	227398m	2570.713	ng/mL	
14) C4-Naphthalenes	29.963	184	192482M5	2175.991	ng/mL	
16) 2-Methylnaphthalene	21.999	142	50808	901.822	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	33707	615.722	ng/mL#	100
18) Benzothiophene	19.515	134	3555M3	48.614	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	18443M5	252.206	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	34386m	470.225	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	61203m	836.944	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	65139M5	890.768	ng/mL	
23) Biphenyl	23.881	154	5778M3	81.148	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	44230	870.976	ng/mL#	100
25) Dibenzofuran	26.982	168	3377M4	42.839	ng/mL	
26) Acenaphthylene	25.597	152	1589M3	18.018	ng/mL	
27) Acenaphthene	26.320	153	3771M3	66.428	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	11977M3	252.087	ng/mL	
29) Fluorene	28.352	166	9231M3	145.797	ng/mL	
30) C1-Fluorenes	30.730	180	26347M5	416.132	ng/mL	
31) C2-Fluorenes	32.928	194	61879M5	977.334	ng/mL	
32) C3-Fluorenes	34.780	208	74460m	1176.041	ng/mL	
33) Dibenzothiophene	31.679	184	30776	354.217	ng/mL#	69
34) 4-Methyldibenzothiophene(	33.455	198	41863	481.823	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	35209M3	405.239	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	22874	263.269	ng/mL#	100
37) OTP	33.877	198	8248M3	94.931	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	115363m	1327.773	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	107115m	1232.843	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	202640M5	2332.290	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	222481m	2560.651	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
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Operator : AC
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Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	38.680	240	154353M5	1776.530	ng/mL	
43) Phenanthrene	32.176	178	37460M3	423.777	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.148	192	21283M3	240.770	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.268	192	24068	272.276	ng/mL	93
46) 2-Methylanthracene(2MA)	34.419	192	2262M3	25.590	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	37627	425.666	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	21311M3	241.087	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	110226M5	1246.964	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	166742M5	1886.317	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	166742m	1886.317	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.553	220	159437M5	1803.677	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	73850M5	835.450	ng/mL	
55) Anthracene	32.386	178	2138M3	27.982	ng/mL	
56) Carbazole	33.034	167	2907M3	36.969	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21431M3	317.786	ng/mL	
58) Fluoranthene	36.963	202	3019M3	30.926	ng/mL	
59) Benzo(b)fluorene	39.508	216	2540M3	39.048	ng/mL	
60) Pyrene	37.852	202	9821	98.980	ng/mL#	58
61) C1-Fluoranthenes/Pyrenes	39.267	216	37164m	374.554	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.074	230	57475M5	579.257	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	70060m	706.094	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.476	258	71175M5	717.331	ng/mL	
66) Naphthobenzothiophene	41.721	234	14696	150.171	ng/ml#	83
67) Naphthobenzothiophene-2,1	41.721	234	14696	150.171	ng/mL#	83
68) Naphthobenzothiophene-1,2	42.067	234	3816M3	38.994	ng/mL	
69) Naphthobenzothiophene-2,3	42.369	234	2452M3	25.056	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	72458M5	740.413	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	115439M5	1179.614	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	97784M5	999.206	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	79999M5	817.470	ng/mL	
75) Benz[a]anthracene	42.670	228	1916M3	18.788	ng/mL	
77) Chrysene/Triphenylene	42.790	228	11966M3	113.970	ng/mL	
78) C1-Chrysenes	44.311	242	33088M5	315.145	ng/mL	
79) C2-Chrysenes	46.404	256	57413M5	546.827	ng/mL	
79) C2-Chrysenes BS	46.404	256	53727m	511.720	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3686	35.107	ng/mL	100
81) C3-Chrysenes	49.039	270	63858M5	608.212	ng/mL	
82) C4-Chrysenes	49.145	284	42938M5	408.961	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	3474M3	29.307	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1089M3	8.930	ng/mL	
87) Benzo[e]pyrene	47.699	252	5445	47.044	ng/mL#	86
89) Benzo[a]pyrene	47.895	252	2983M3	26.934	ng/mL	
90) Perylene	48.196	252	6676	57.005	ng/mL#	65
91) Indeno[1,2,3-cd]pyrene	52.564	276	2135M3	16.380	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	861M3	6.204	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	4854	34.538	ng/mL#	80
94) Hopane (T19)	51.645	191	50509M3	1285.093	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19859	505.270	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10693	272.060	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	10049M3	255.675	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3791M3	96.454	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3812M3	96.988	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3647M3	92.790	ng/ml	
102) C28 Tricyclic Terpane-22S	46.058	191	4407M3	112.127	ng/ml	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.208	191	4541M3	115.536	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5414	137.748	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5133M3	130.598	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5539	140.928	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.121	191	4416M3	112.356	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4472M3	113.780	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.527	191	13579	345.488	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8803	223.973	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.521	191	2536	64.523	ng/ml	100
112) 30-Norhopane (T15)	50.335	191	37394M3	951.410	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5112M3	130.064	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1765M3	44.907	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3598	91.543	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.494	191	251	6.386	ng/ml	100
117) Moretane (T20)	52.308	191	4056M3	103.196	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	22831	580.886	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17916	455.834	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8524	216.875	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.883	191	14956	380.523	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10789	274.503	ng/ml	100
123) 30,31-Trishomohopane-22S	56.946	191	11804	300.327	ng/ml	100
124) 30,31-Trishomohopane-22R	57.548	191	7741	196.953	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	7651M3	194.663	ng/ml	
126) Tetrakishomohopane-22R (T	60.349	191	5366	136.526	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	10288	261.756	ng/ml	100
128) Pentakishomohopane-22R (T	63.767	191	6944	176.675	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	3728M3	180.615	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.305	217	1746M3	84.591	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1405M3	68.070	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6470	313.460	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7592M3	367.819	ng/ml	
135) Unknown Sterane (S18)	47.639	217	1270	61.529	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	823	39.873	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2543	123.204	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2819M2	136.576	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5989M3	290.157	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5879M3	284.827	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5640M3	273.248	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	5501M3	266.514	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4708	228.094	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6238M3	302.220	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7915M3	383.468	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.371	218	6112M3	296.116	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23951	1160.384	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	20900	1012.569	ng/mL	100
149) C27,20R-triaromatic stero	50.320	231	15762	763.641	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17097M3	828.320	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
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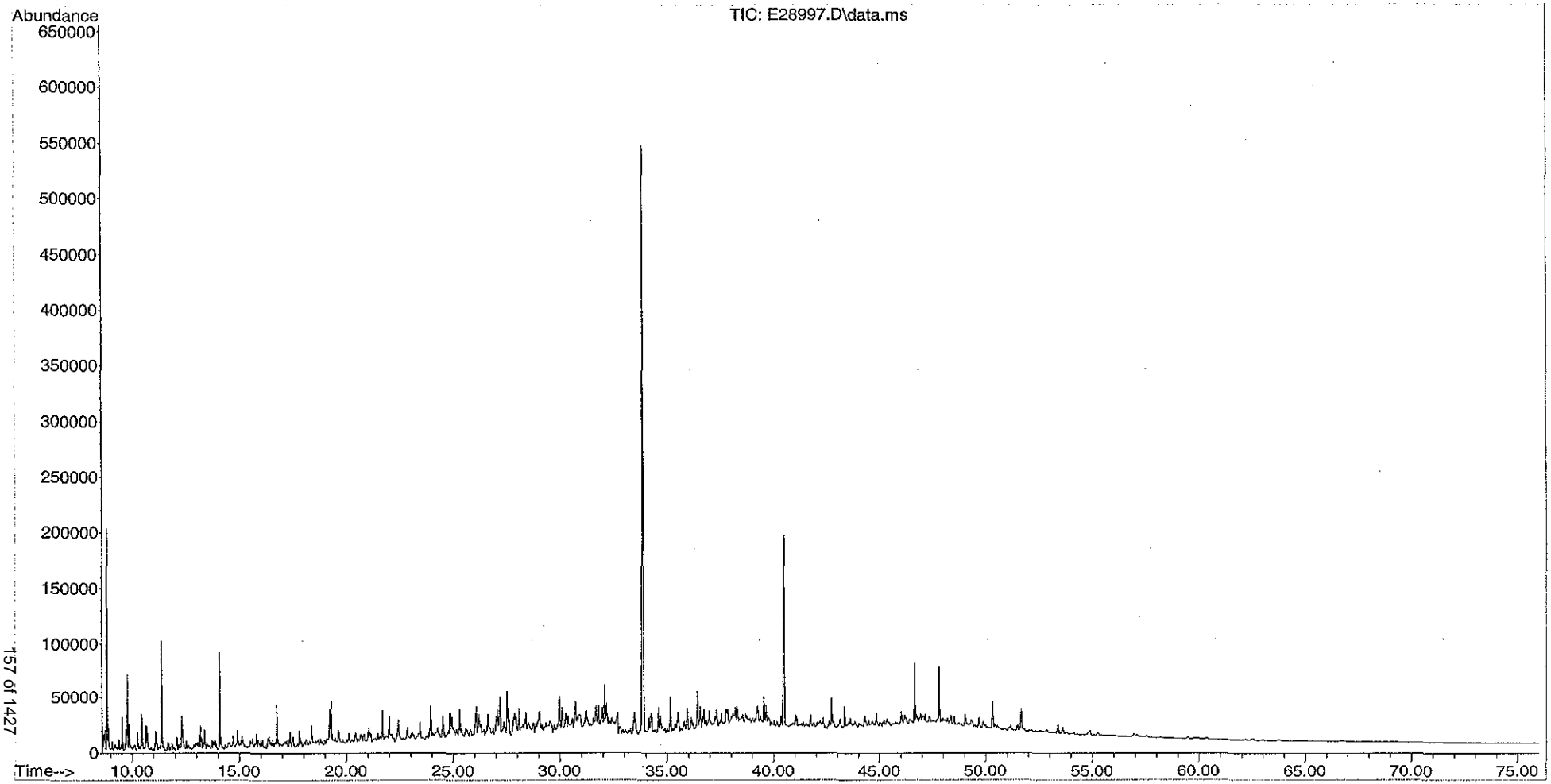
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



157 of 1427
157

Form I
Western Canadian Select
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	165		C3-Dibenzothiophenes	457	
C1-Decalins	337		C4-Dibenzothiophenes	315	
C2-Decalins	483		Benzo(b)fluorene	1.99	U
C3-Decalins	381		Fluoranthene	7.16	
C4-Decalins	425		Pyrene	24.8	
Benzothiophene	7.27		C1-Fluoranthenes/Pyrenes	86.6	
C1-Benzo(b)thiophenes	38.5		C2-Fluoranthenes/Pyrenes	128	
C2-Benzo(b)thiophenes	65.3		C3-Fluoranthenes/Pyrenes	150	
C3-Benzo(b)thiophenes	138		C4-Fluoranthenes/Pyrenes	153	
C4-Benzo(b)thiophenes	148		Naphthobenzothiophenes	38.6	
Naphthalene	73.0		C1-Naphthobenzothiophenes	136	
C1-Naphthalenes	209		C2-Naphthobenzothiophenes	221	
C2-Naphthalenes	514		C3-Naphthobenzothiophenes	184	
C3-Naphthalenes	614		C4-Naphthobenzothiophenes	156	
C4-Naphthalenes	484		Benz[a]anthracene	4.55	
Biphenyl	16.9		Chrysene/Triphenylene	23.1	
Dibenzofuran	8.63		C1-Chrysenes	63.8	
Acenaphthylene	4.61		C2-Chrysenes	103	
Acenaphthene	14.3		C3-Chrysenes	139	
Fluorene	34.8		C4-Chrysenes	90.3	
C1-Fluorenes	91.6		Benzo[b]fluoranthene	6.96	
C2-Fluorenes	221		Benzo[j]fluoranthene/Benzo[k]fluoranthene	2.04	
C3-Fluorenes	248		Benzo[a]fluoranthene	1.99	U
Anthracene	5.67		Benzo[e]pyrene	10.7	
Phenanthrene	90.9		Benzo[a]pyrene	6.11	
C1-Phenanthrenes/Anthracenes	259		Perylene	12.2	
C2-Phenanthrenes/Anthracenes	387		Indeno[1,2,3-cd]pyrene	3.40	
C3-Phenanthrenes/Anthracenes	359		Dibenz[ah]anthracene/Dibenz[ac]anthracene	1.58	J
C4-Phenanthrenes/Anthracenes	190		Benzo[g,h,i]perylene	8.38	
Retene	67.3				
Dibenzothiophene	65.3				
C1-Dibenzothiophenes	219				
C2-Dibenzothiophenes	423				

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	98	40-120
Phenanthrene-d10	106	40-120
Benzo[a]pyrene-d12	107	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Western Canadian Select
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result
Carbazole	**6.28**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	98	40-120
Phenanthrene-d10	106	40-120
Benzo[a]pyrene-d12	107	40-120

N/A - Not Applicable

Form I
Western Canadian Select
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**87.3**
2/3-Methyldibenzothiophene	**75.0**
1-Methyldibenzothiophene	**46.8**
3-Methylphenanthrene	**52.6**
2-Methylphenanthrene	**58.7**
2-Methylanthracene	**3.99**
9/4-Methylphenanthrene	**86.2**
1-Methylphenanthrene	**50.7**
2-Methylnaphthalene	**202**
1-Methylnaphthalene	**130**
2,6-Dimethylnaphthalene	**224**
2,3,5-Trimethylnaphthalene	**85.5**
Naphthobenzothiophene-2,1-D	**26.8**
Naphthobenzothiophene-1,2-D	**7.04**
Naphthobenzothiophene-2,3-D	**4.74**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	98	40-120
Phenanthrene-d10	106	40-120
Benzo[a]pyrene-d12	107	40-120

N/A - Not Applicable

Form I
Western Canadian Select
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	**101**
C24 Tricyclic Terpane	**54.6**
C25 Tricyclic Terpane	**49.9**
C24 Tetracyclic Terpane	**17.6**
C26 Tricyclic Terpane-22S	**18.4**
C26 Tricyclic Terpane-22R	**18.4**
C28 Tricyclic Terpane-22S	**20.2**
C28 Tricyclic Terpane-22R	**23.5**
C29 Tricyclic Terpane-22S	**26.3**
C29 Tricyclic Terpane-22R	**26.7**
18a-22,29,30-Trisnorneohopane-TS	**28.2**
C30 Tricyclic Terpane-22S	**21.1**
C30 Tricyclic Terpane-22R	**21.9**
17a(H)-22,29,30-Trisnorhopane-TM	**64.4**
17a/b,21b/a 28,30-Bisnorhopane	**42.0**
17a(H),21b(H)-25-Norhopane	**12.3**
30-Norhopane	**178**
18a(H)-30-Norneohopane-C29Ts	**28.1**
17a(H)-Diahopane	**9.14**
30-Normoretane	**18.7**
18a(H)&18b(H)-Oleananes	**2.04**
Hopane	**245**
Moretane	**19.9**
30-Homohopane-22S	**109**
30-Homohopane-22R	**89.2**
T22a-Gammacerane/C32-diahopane	**41.1**
30,31-Bishomohopane-22S	**71.9**
30,31-Bishomohopane-22R	**52.1**

Parameter	Result
30,31-Trishomohopane-22S	**57.4**
30,31-Trishomohopane-22R	**39.4**
Tetrakishomohopane-22S	**38.0**
Tetrakishomohopane-22R	**28.4**
Pentakishomohopane-22S	**50.1**
Pentakishomohopane-22R	**34.5**
13b(H),17a(H)-20S-Diacholestane	**40.4**
13b(H),17a(H)-20R-Diacholestane	**16.9**
13b,17a-20S-Methyldiacholestane	**19.2**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**62.0**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**71.4**
Unknown Sterane (S18)	**14.4**
13a,17b-20S-Ethyldiacholestane	**5.95**
14a,17a-20S-Methylcholestane	**26.4**
14a,17a-20R-Methylcholestane	**27.8**
14a(H),17a(H)-20S-Ethylcholestane	**57.4**
14a(H),17a(H)-20R-Ethylcholestane	**48.8**
14b(H),17b(H)-20R-Cholestane	**50.3**
14b(H),17b(H)-20S-Cholestane	**48.2**
14b,17b-20R-Methylcholestane	**42.0**
14b,17b-20S-Methylcholestane	**56.4**
14b(H),17b(H)-20R-Ethylcholestane	**74.0**
14b(H),17b(H)-20S-Ethylcholestane	**51.6**
C26,20R- +C27,20S- triaromatic steroid	**232**
C28,20S-triaromatic steroid	**195**
C27,20R-triaromatic steroid	**150**
C28,20R-triaromatic steroid	**167**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	108	50-130

N/A - Not Applicable

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

11/19/12

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.199	164	21842M3	500.000 ng/mL	0.00
74) Chrysene-d12	42.715	240	51901	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.229	136	75122	977.804 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.78%		
42) Phenanthrene-d10	32.085	188	83311	1058.430 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 105.84%		
83) Benzo[b]fluoranthene-d12	46.660	264	111635	1047.066 ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.71%		
88) Benzo[a]pyrene-d12	47.804	264	110822	1072.760 ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.28%		
129) 5B(H)Cholane - Surr	43.347	217	22186	1084.607 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.46%		
Target Compounds					Qvalue
3) trans-Decalin	15.872	138	13052	747.041 ng/mL	100
4) cis-Decalin	17.091	138	1124	84.676 ng/mL	100
5) C1-Decalins	17.362	152	29663M5	1697.785 ng/mL	
6) C2-Decalins	18.792	166	42504m	2432.750 ng/mL	
7) C3-Decalins	21.622	180	33554m	1920.489 ng/mL	
8) C4-Decalins	24.995	194	37420M5	2141.763 ng/mL	
10) Naphthalene	19.304	128	31606	367.870 ng/mL#	100
11) C1-Naphthalenes	21.999	142	90373M5	1051.875 ng/mL	
12) C2-Naphthalenes	24.844	156	222589m	2590.771 ng/mL	
13) C3-Naphthalenes	27.193	170	265450m	3089.642 ng/mL	
14) C4-Naphthalenes	29.963	184	209560M5	2439.123 ng/mL	
16) 2-Methylnaphthalene	21.999	142	55769	1019.155 ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	34727	653.116 ng/mL#	100
18) Benzothiophene	19.515	134	2602	36.634 ng/mL	100
19) C1-Benzo(b)thiophenes	21.562	148	13786M5	194.098 ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	23346m	328.696 ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49201m	692.717 ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	52800M5	743.389 ng/mL	
23) Biphenyl	23.881	154	5881M3	85.037 ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	55634	1127.945 ng/mL#	100
25) Dibenzofuran	26.967	168	3329	43.479 ng/mL#	50
26) Acenaphthylene	25.597	152	1987	23.197 ng/mL#	100
27) Acenaphthene	26.320	153	3961M3	71.839 ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	19874M3	430.671 ng/mL	
29) Fluorene	28.352	166	10777M3	175.249 ng/mL	
30) C1-Fluorenes	30.730	180	28376M5	461.434 ng/mL	
31) C2-Fluorenes	32.928	194	68351M5	1111.483 ng/mL	
32) C3-Fluorenes	34.780	208	76967m	1251.591 ng/mL	
33) Dibenzothiophene	31.679	184	27741	328.729 ng/mL#	65
34) 4-Methyldibenzothiophene(	33.455	198	37118	439.846 ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	31892M3	377.918 ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	19883	235.612 ng/mL#	100
37) OTP	33.877	198	8252M3	97.786 ng/mL	
38) C1-Dibenzothiophenes	33.455	198	101204m	1199.260 ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	92952m	1101.475 ng/mL	
39) C2-Dibenzothiophenes	35.157	212	179953M5	2132.431 ng/mL	
40) C3-Dibenzothiophenes	36.978	226	194163m	2300.818 ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	38.680	240	133970M5	1587.535	ng/mL	
43) Phenanthrene	32.176	178	39318M3	457.952	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.148	192	22758	265.071	ng/mL	91
45) 2-Methylphenanthrene(2MP)	34.253	192	25392	295.750	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1724M3	20.080	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.599	192	37285	434.272	ng/mL	98
48) 1-Methylphenanthrene(1MP)	34.690	192	21928M3	255.404	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.599	192	111975M5	1304.215	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	167293M5	1948.525	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	167293m	1948.525	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.538	220	155088M5	1806.369	ng/mL	
53) C4-Phenanthrenes/Anthrace	39.192	234	82125M5	956.541	ng/mL	
54) Retene	39.192	234	9360M3	338.791	ng/mL	
55) Anthracene	32.401	178	2120M3	28.568	ng/mL	
56) Carbazole	33.019	167	2417M3	31.646	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21795M3	332.742	ng/mL	
58) Fluoranthene	36.963	202	3417M3	36.039	ng/mL	
60) Pyrene	37.852	202	12034	124.871	ng/mL#	72
61) C1-Fluoranthenes/Pyrenes	39.252	216	42027m	436.093	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.736	230	61979M5	643.125	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	72727m	754.651	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.461	258	74298M5	770.953	ng/mL	
66) Naphthobenzothiophene	41.721	234	13161M3	138.463	ng/ml	
67) Naphthobenzothiophene-2,1	41.721	234	12820M3	134.876	ng/mL	
68) Naphthobenzothiophene-1,2	42.067	234	3370M3	35.455	ng/mL	
69) Naphthobenzothiophene-2,3	42.368	234	2267M3	23.850	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	64936M5	683.174	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	105816M5	1113.262	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	87977M5	925.582	ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	74820M5	787.161	ng/mL	
75) Benz[a]anthracene	42.655	228	2315M3	22.906	ng/mL	
77) Chrysene/Triphenylene	42.805	228	12114M3	116.424	ng/mL	
78) C1-Chrysenes	44.311	242	33434M5	321.324	ng/mL	
79) C2-Chrysenes	46.404	256	57755M5	555.066	ng/mL	
79) C2-Chrysenes BS	46.404	256	54167m	520.583	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3588M6	34.483	ng/mL	
81) C3-Chrysenes	47.729	270	72854M5	700.178	ng/mL	
82) C4-Chrysenes	49.130	284	47325M5	454.826	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	4119M3	35.063	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1239M3	10.251	ng/mL	
87) Benzo[e]pyrene	47.699	252	6166M3	53.755	ng/mL	
89) Benzo[a]pyrene	47.895	252	3378M3	30.777	ng/mL	
90) Perylene	48.196	252	7151	61.614	ng/mL#	74
91) Indeno[1,2,3-cd]pyrene	52.563	276	2214M3	17.140	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	1098M3	7.983	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	5879	42.211	ng/mL#	86
94) Hopane (T19)	51.645	191	48000M3	1232.316	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19756	507.201	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10718	275.166	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.579	191	9782M3	251.136	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3461M3	88.855	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3617M3	92.860	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3620M3	92.937	ng/ml	
102) C28 Tricyclic Terpane-22S	46.057	191	3973M3	102.000	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.208	191	4617M3	118.533	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5151	132.243	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5229M3	134.245	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5523	141.793	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	4143M3	106.364	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4289M3	110.113	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.512	191	12637	324.433	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8237M3	211.471	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	2402	61.667	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	35007M3	898.744	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5508M3	141.408	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1793M3	46.032	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3674	94.324	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.479	191	401M3	10.295	ng/ml	
117) Moretane (T20)	52.308	191	3900M3	100.126	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	21315	547.225	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17506	449.436	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8063	207.003	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.882	191	14103	362.070	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10222	262.432	ng/ml	100
123) 30,31-Trishomohopane-22S	56.945	191	11269	289.312	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	7735	198.583	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	7464	191.625	ng/ml	100
126) Tetrakishomohopane-22R (T	60.349	191	5563	142.820	ng/ml	100
127) Pentakishomohopane-22S (T	62.517	191	9828	252.317	ng/ml	100
128) Pentakishomohopane-22R (T	63.752	191	6771M3	173.834	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	4167	203.712	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1740M3	85.063	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1973M3	96.454	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6392	312.486	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7357	359.662	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1488	72.744	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	613	29.968	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2720	132.973	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2868M3	140.208	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5917M3	289.264	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5030M3	245.902	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5183M3	253.381	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	4969M3	242.919	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4326	211.485	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	5806M3	283.838	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7623M3	372.666	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	5312M3	259.688	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23942	1170.452	ng/mL	100
148) C28,20S-triaromatic stero	49.883	231	20094M3	982.335	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	15473	756.428	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17191M3	840.416	ng/mL	

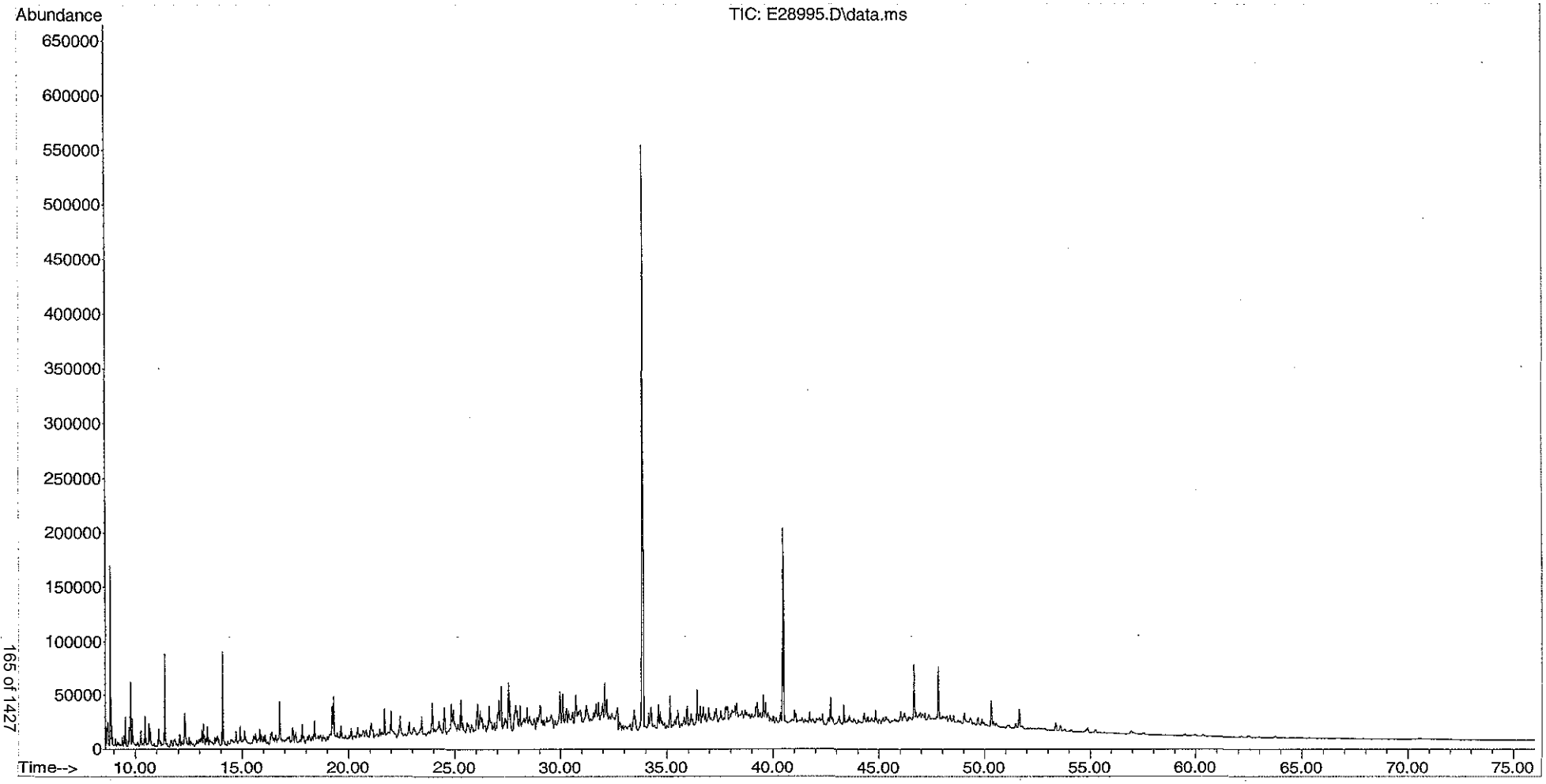
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alaska North Slope Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result	
cis/trans-Decalin	**468**	
C1-Decalins	**763**	
C2-Decalins	**716**	
C3-Decalins	**410**	
C4-Decalins	**436**	
Benzothiophene	**5.40**	
C1-Benzo(b)thiophenes	**31.6**	
C2-Benzo(b)thiophenes	**55.4**	
C3-Benzo(b)thiophenes	**120**	
C4-Benzo(b)thiophenes	**105**	
Naphthalene	**584**	
C1-Naphthalenes	**1240**	
C2-Naphthalenes	**1550**	
C3-Naphthalenes	**1180**	
C4-Naphthalenes	**692**	
Biphenyl	**143**	
Dibenzofuran	**54.1**	
Acenaphthylene	**6.98**	
Acenaphthene	**14.1**	
Fluorene	**77.9**	
C1-Fluorenes	**177**	
C2-Fluorenes	**299**	
C3-Fluorenes	**297**	
Anthracene	1.97	U
Phenanthrene	**224**	
C1-Phenanthrenes/Anthracenes	**502**	
C2-Phenanthrenes/Anthracenes	**572**	
C3-Phenanthrenes/Anthracenes	**419**	
C4-Phenanthrenes/Anthracenes	**169**	
Retene	1.97	U
Dibenzothiophene	**146**	
C1-Dibenzothiophenes	**324**	
C2-Dibenzothiophenes	**465**	

Parameter	Result	
C3-Dibenzothiophenes	**428**	
C4-Dibenzothiophenes	**235**	
Benzo(b)fluorene	**7.59**	
Fluoranthene	**4.40**	
Pyrene	**14.9**	
C1-Fluoranthenes/Pyrenes	**73.8**	
C2-Fluoranthenes/Pyrenes	**122**	
C3-Fluoranthenes/Pyrenes	**151**	
C4-Fluoranthenes/Pyrenes	**137**	
Naphthobenzothiophenes	**46.1**	
C1-Naphthobenzothiophenes	**129**	
C2-Naphthobenzothiophenes	**184**	
C3-Naphthobenzothiophenes	**141**	
C4-Naphthobenzothiophenes	**99.8**	
Benz[a]anthracene	**2.08**	
Chrysene/Triphenylene	**39.8**	
C1-Chrysenes	**71.6**	
C2-Chrysenes	**102**	
C3-Chrysenes	**125**	
C4-Chrysenes	**78.4**	
Benzo[b]fluoranthene	**5.45**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	1.97	U
Benzo[a]fluoranthene	1.97	U
Benzo[e]pyrene	**9.85**	
Benzo[a]pyrene	**1.84**	J
Perylene	**3.44**	
Indeno[1,2,3-cd]pyrene	**0.904**	J
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**0.885**	J
Benzo[g,h,i]perylene	**3.62**	

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Alaska North Slope Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result
Carbazole	**7.12**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**155**
2/3-Methyldibenzothiophene	**115**
1-Methyldibenzothiophene	**50.6**
3-Methylphenanthrene	**105**
2-Methylphenanthrene	**112**
2-Methylanthracene	**3.96**
9/4-Methylphenanthrene	**163**
1-Methylphenanthrene	**112**
2-Methylnaphthalene	**1150**
1-Methylnaphthalene	**823**
2,6-Dimethylnaphthalene	**661**
2,3,5-Trimethylnaphthalene	**135**
Naphthobenzothiophene-2,1-D	**34.1**
Naphthobenzothiophene-1,2-D	**7.95**
Naphthobenzothiophene-2,3-D	**4.00**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**59.2**	
C24 Tricyclic Terpane	**38.1**	
C25 Tricyclic Terpane	**35.3**	
C24 Tetracyclic Terpane	**11.8**	
C26 Tricyclic Terpane-22S	**13.8**	
C26 Tricyclic Terpane-22R	**12.7**	
C28 Tricyclic Terpane-22S	**13.1**	
C28 Tricyclic Terpane-22R	**14.4**	
C29 Tricyclic Terpane-22S	**18.2**	
C29 Tricyclic Terpane-22R	**20.8**	
18a-22,29,30-Trisnorneohopane-TS	**28.6**	
C30 Tricyclic Terpane-22S	**17.3**	
C30 Tricyclic Terpane-22R	**14.3**	
17a(H)-22,29,30-Trisnorhopane-TM	**31.6**	
17a/b,21b/a 28,30-Bisnorhopane	**7.27**	
17a(H),21b(H)-25-Norhopane	**7.55**	
30-Norhopane	**91.6**	
18a(H)-30-Norneohopane-C29Ts	**22.9**	
17a(H)-Diahopane	**12.9**	
30-Normoretane	**10.1**	
18a(H)&18b(H)-Oleananes	1.97	U
Hopane	**158**	
Moretane	**14.4**	
30-Homohopane-22S	**66.0**	
30-Homohopane-22R	**57.0**	
T22a-Gammacerane/C32-diahopane	**11.7**	
30,31-Bishomohopane-22S	**49.3**	
30,31-Bishomohopane-22R	**35.0**	

Parameter	Result
30,31-Trishomohopane-22S	**37.0**
30,31-Trishomohopane-22R	**25.7**
Tetrakishomohopane-22S	**29.1**
Tetrakishomohopane-22R	**19.4**
Pentakishomohopane-22S	**31.3**
Pentakishomohopane-22R	**23.8**
13b(H),17a(H)-20S-Diacholestane	**52.8**
13b(H),17a(H)-20R-Diacholestane	**26.4**
13b,17a-20S-Methyldiacholestane	**28.9**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**66.9**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**74.1**
Unknown Sterane (S18)	**19.7**
13a,17b-20S-Ethyldiacholestane	**3.23**
14a,17a-20S-Methylcholestane	**33.4**
14a,17a-20R-Methylcholestane	**34.1**
14a(H),17a(H)-20S-Ethylcholestane	**51.1**
14a(H),17a(H)-20R-Ethylcholestane	**44.1**
14b(H),17b(H)-20R-Cholestane	**44.8**
14b(H),17b(H)-20S-Cholestane	**42.4**
14b,17b-20R-Methylcholestane	**49.2**
14b,17b-20S-Methylcholestane	**55.2**
14b(H),17b(H)-20R-Ethylcholestane	**64.6**
14b(H),17b(H)-20S-Ethylcholestane	**40.5**
C26,20R- +C27,20S- triaromatic steroid	**246**
C28,20S-triaromatic steroid	**158**
C27,20R-triaromatic steroid	**148**
C28,20R-triaromatic steroid	**126**

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24994M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	55363	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	80738	918.373	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 91.84%			
42) Phenanthrene-d10	32.085	188	87554	972.058	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.21%			
83) Benzo[b]fluoranthene-d12	46.645	264	115728	1017.579	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.76%			
88) Benzo[a]pyrene-d12	47.789	264	115547	1048.556	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.86%			
129) 5B(H)Cholane - Surr	43.347	217	23525	1078.150	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.82%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	44708	2236.194	ng/mL	100
4) cis-Decalin	17.091	138	2137	140.688	ng/mL	100
5) C1-Decalins	17.814	152	77413M5	3872.025	ng/mL	
6) C2-Decalins	19.154	166	72612m	3631.890	ng/mL	
7) C3-Decalins	21.623	180	41578m	2079.639	ng/mL	
8) C4-Decalins	25.010	194	44247M5	2213.136	ng/mL	
10) Naphthalene	19.304	128	291700	2967.006	ng/mL#	100
11) C1-Naphthalenes	21.999	142	619164M5	6297.783	ng/mL	
12) C2-Naphthalenes	24.844	156	774255m	7875.280	ng/mL	
13) C3-Naphthalenes	27.193	170	588218m	5983.018	ng/mL	
14) C4-Naphthalenes	29.963	184	345196M5	3511.137	ng/mL	
16) 2-Methylnaphthalene	21.999	142	364688	5824.053	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	254143	4176.935	ng/mL#	100
18) Benzothiophene	19.530	134	2230M3	27.437	ng/mL	
19) C1-Benzo(b)thiophenes	21.577	148	13032m	160.343	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	22864m	281.314	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49308m	606.675	ng/mL	
22) C4-Benzo(b)thiophenes	28.773	190	43322M5	533.025	ng/mL	
23) Biphenyl	23.881	154	57406M3	725.388	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	189324	3354.362	ng/mL#	100
25) Dibenzofuran	26.967	168	24057	274.576	ng/mL#	84
26) Acenaphthylene	25.597	152	3471M3	35.411	ng/mL	
27) Acenaphthene	26.320	153	4522M3	71.671	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	36242M3	686.324	ng/mL	
29) Fluorene	28.352	166	27831M3	395.497	ng/mL	
30) C1-Fluorenes	30.730	180	63133M5	897.162	ng/mL	
31) C2-Fluorenes	32.928	194	106713M5	1516.464	ng/mL	
32) C3-Fluorenes	34.780	208	106052M5	1507.070	ng/mL	
33) Dibenzothiophene	31.679	184	71705	742.544	ng/mL#	88
34) 4-Methyldibenzothiophene(	33.455	198	76022	787.248	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	56514	585.233	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.223	198	24786	256.672	ng/mL#	100
37) OTP	33.877	198	7808M3	80.856	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	166611m	1725.346	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	227794M5	2358.928	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	209778m	2172.363	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	38.665	240	115055M5	1191.456	ng/mL	
43) Phenanthrene	32.176	178	111573	1135.648	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.148	192	52275	532.082	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.253	192	55603	565.956	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1976	20.113	ng/mL	92
47) 9/4-Methylphenanthrene(9M	34.600	192	81325	827.768	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	55944M3	569.427	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	250470M5	2549.415	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	284998M5	2900.859	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	209062M5	2127.943	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	84348M5	858.538	ng/mL	
56) Carbazole	33.034	167	3161M2	36.168	ng/mL	
57) 1-Methylphenanthrene	34.690	192	54755M3	730.518	ng/mL	
58) Fluoranthene	36.963	202	2424M3	22.341	ng/mL	
59) Benzo(b)fluorene	39.508	216	2784M3	38.507	ng/mL	
60) Pyrene	37.852	202	8320M3	75.445	ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.252	216	41317m	374.659	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.074	230	68144M5	617.924	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	84441M5	765.704	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.461	258	76445M5	693.197	ng/mL	
66) Naphthobenzothiophene	41.721	234	18944M3	174.170	ng/ml	
67) Naphthobenzothiophene-2,1	41.721	234	18844M3	173.251	ng/mL	
68) Naphthobenzothiophene-1,2	42.067	234	4387M6	40.334	ng/mL	
69) Naphthobenzothiophene-2,3	42.369	234	2206M3	20.282	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	71342M5	655.915	ng/ml	
71) C2-Naphthobenzothiophenes	45.139	262	101492M5	933.113	ng/ml	
72) C3-Naphthobenzothiophenes	46.750	276	77926M5	716.448	ng/ml	
73) C4-Naphthobenzothiophenes	47.805	290	55098M5	506.569	ng/mL	
75) Benz[a]anthracene	42.655	228	1139M3	10.565	ng/mL	
77) Chrysene/Triphenylene	42.790	228	22405M3	201.863	ng/mL	
78) C1-Chrysenes	44.296	242	40335M5	363.407	ng/mL	
79) C2-Chrysenes	47.006	256	61351M5	552.755	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3732	33.624	ng/mL	100
81) C3-Chrysenes	49.024	270	70695M5	636.942	ng/mL	
82) C4-Chrysenes	49.130	284	44151M5	397.788	ng/mL	
84) Benzo[b]fluoranthene	46.720	252	3466M3	27.659	ng/mL	
87) Benzo[e]pyrene	47.699	252	6116M3	49.985	ng/mL	
89) Benzo[a]pyrene	47.880	252	1096M3	9.361	ng/mL	
90) Perylene	48.181	252	2160M3	17.447	ng/mL	
91) Indeno[1,2,3-cd]pyrene	52.549	276	632M3	4.587	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	659M3	4.492	ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	2734	18.402	ng/mL#	77
94) Hopane (T19)	51.645	191	33249	800.231	ng/mL#	84
96) C23 Tricyclic Terpane (T4	40.351	191	12477M2	300.294	ng/ml	
97) C24 Tricyclic Terpane (T5	41.089	191	8030M3	193.265	ng/ml	
98) C25 Tricyclic Terpane (T6	42.579	191	7444M3	179.161	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	2483M3	59.760	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2905M3	69.917	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	2670M3	64.261	ng/ml	
102) C28 Tricyclic Terpane-22S	46.043	191	2772M3	66.716	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	3041M3	73.190	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	3836	92.324	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	4396M3	105.802	ng/ml	

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Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
106) 18a-22,29,30-Trisnorneoho	47.985	191	6025	145.009	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	3655M3	87.968	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	3018M3	72.637	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.512	191	6658M3	160.244	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	1533	36.896	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.506	191	1593M4	38.340	ng/ml	
112) 30-Norhopane (T15)	50.320	191	19328	465.183	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.425	191	4835	116.368	ng/ml	100
114) 17a(H)-Diahopane (X)	50.546	191	2730M3	65.705	ng/ml	
115) 30-Normoretane (T17)	51.073	191	2128	51.216	ng/ml	100
117) Moretane (T20)	52.308	191	3031M3	72.950	ng/ml	
118) 30-Homohopane-22S (T21)	53.362	191	13928	335.217	ng/ml	100
119) 30-Homohopane-22R (T22)	53.588	191	12032	289.584	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	2467M3	59.375	ng/mL	
121) 30,31-Bishomohopane-22S (	54.868	191	10409	250.522	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	7380	177.621	ng/ml	100
123) 30,31-Trishomohopane-22S	56.931	191	7813	188.042	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	5411	130.231	ng/ml	100
125) Tetrakishomohopane-22S (T	59.460	191	6144	147.873	ng/ml	100
126) Tetrakishomohopane-22R (T	60.334	191	4086	98.341	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	6600	158.848	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	5017	120.748	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	5848M3	268.014	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	2922M3	133.915	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	3198M3	146.564	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	7405	339.371	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	8209M3	376.218	ng/ml	
135) Unknown Sterane (S18)	47.639	217	2180	99.909	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	358	16.407	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	3700M3	169.571	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	3776M3	173.054	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5663M3	259.535	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	4884M3	223.834	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	4962M3	227.408	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	4692M3	215.034	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	5446	249.590	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6112M3	280.113	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	7154M3	327.867	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	4482M3	205.410	ng/ml	
147) C26,20R- +C27,20S- triaro	49.040	231	27203	1246.712	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	17445	799.504	ng/mL	100
149) C27,20R-triaromatic stero	50.305	231	16412	752.161	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	13961M3	639.832	ng/mL	

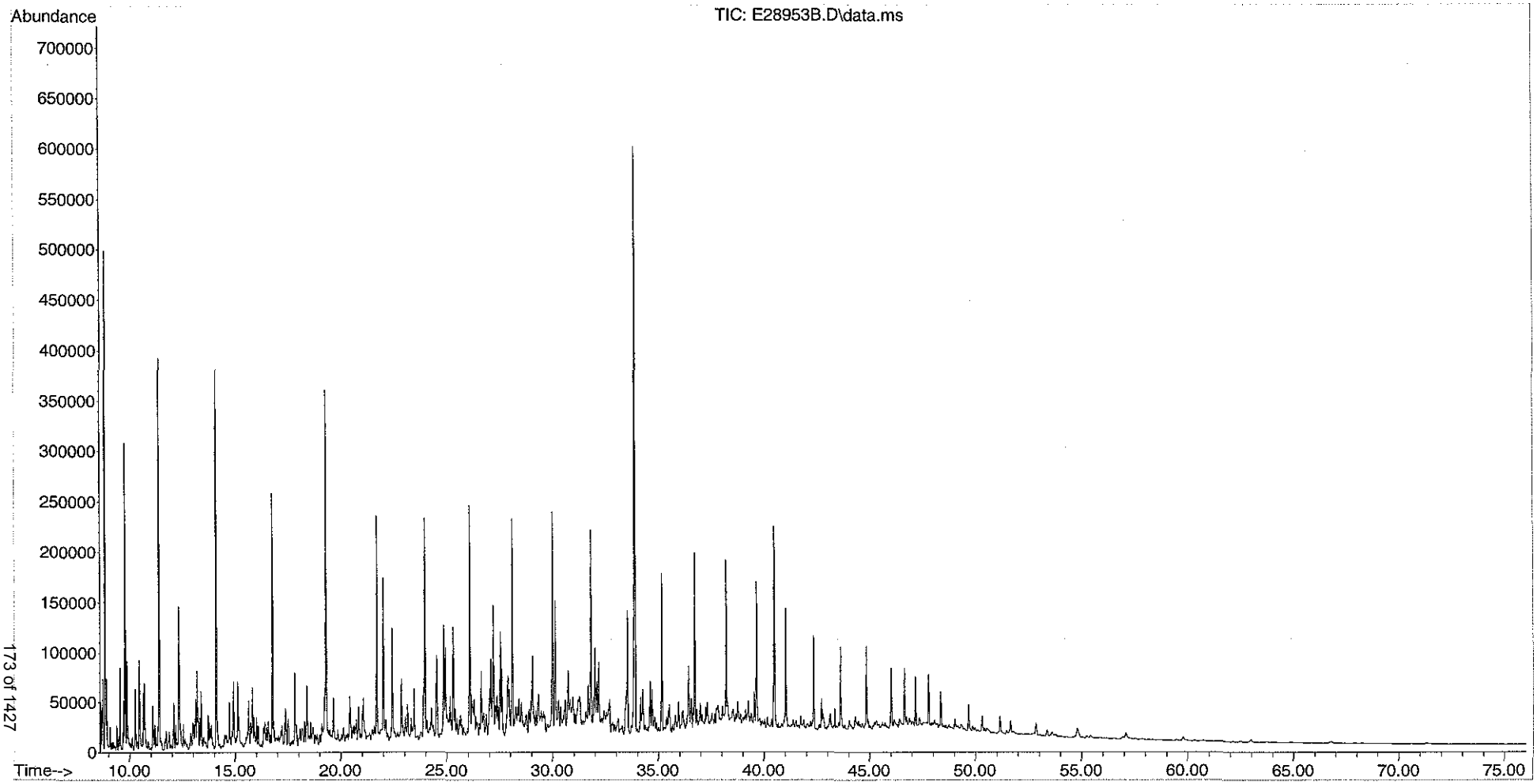
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alaska North Slope Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result	
cis/trans-Decalin	396	
C1-Decalins	722	
C2-Decalins	695	
C3-Decalins	381	
C4-Decalins	435	
Benzothiophene	5.58	
C1-Benzo(b)thiophenes	30.8	
C2-Benzo(b)thiophenes	51.5	
C3-Benzo(b)thiophenes	108	
C4-Benzo(b)thiophenes	101	
Naphthalene	518	
C1-Naphthalenes	1140	
C2-Naphthalenes	1460	
C3-Naphthalenes	1150	
C4-Naphthalenes	671	
Biphenyl	135	
Dibenzofuran	50.5	
Acenaphthylene	7.13	
Acenaphthene	18.0	
Fluorene	71.6	
C1-Fluorenes	176	
C2-Fluorenes	288	
C3-Fluorenes	281	
Anthracene	1.97	U
Phenanthrene	208	
C1-Phenanthrenes/Anthracenes	470	
C2-Phenanthrenes/Anthracenes	543	
C3-Phenanthrenes/Anthracenes	399	
C4-Phenanthrenes/Anthracenes	164	
Retene	1.97	U
Dibenzothiophene	138	
C1-Dibenzothiophenes	300	
C2-Dibenzothiophenes	437	
C3-Dibenzothiophenes	410	
C4-Dibenzothiophenes	232	
Benzo(b)fluorene	7.52	
Fluoranthene	4.04	
Pyrene	14.9	
C1-Fluoranthenes/Pyrenes	72.9	
C2-Fluoranthenes/Pyrenes	118	
C3-Fluoranthenes/Pyrenes	146	
C4-Fluoranthenes/Pyrenes	133	
Naphthobenzothiophenes	44.2	
C1-Naphthobenzothiophenes	123	
C2-Naphthobenzothiophenes	178	
C3-Naphthobenzothiophenes	146	
C4-Naphthobenzothiophenes	110	
Benz[a]anthracene	2.20	
Chrysene/Triphenylene	37.8	
C1-Chrysenes	70.2	
C2-Chrysenes	95.1	
C3-Chrysenes	115	
C4-Chrysenes	74.1	
Benzo[b]fluoranthene	5.18	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	0.440	J
Benzo[a]fluoranthene	1.97	U
Benzo[e]pyrene	9.71	
Benzo[a]pyrene	1.66	J
Perylene	2.96	
Indeno[1,2,3-cd]pyrene	0.816	J
Dibenz[ah]anthracene/Dibenz[ac]anthracene	1.14	J
Benzo[g,h,i]perylene	3.15	

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Alaska North Slope Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result
Carbazole	7.94

N/A - Not Applicable

Form I
Alaska North Slope Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**142**
2/3-Methyldibenzothiophene	**103**
1-Methyldibenzothiophene	**47.2**
3-Methylphenanthrene	**99.6**
2-Methylphenanthrene	**108**
2-Methylanthracene	**2.41**
9/4-Methylphenanthrene	**152**
1-Methylphenanthrene	**107**
2-Methylnaphthalene	**1050**
1-Methylnaphthalene	**758**
2,6-Dimethylnaphthalene	**624**
2,3,5-Trimethylnaphthalene	**164**
Naphthobenzothiophene-2,1-D	**32.8**
Naphthobenzothiophene-1,2-D	**7.89**
Naphthobenzothiophene-2,3-D	**3.51**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**57.6**	
C24 Tricyclic Terpane	**35.7**	
C25 Tricyclic Terpane	**35.3**	
C24 Tetracyclic Terpane	**12.3**	
C26 Tricyclic Terpane-22S	**14.4**	
C26 Tricyclic Terpane-22R	**13.0**	
C28 Tricyclic Terpane-22S	**14.5**	
C28 Tricyclic Terpane-22R	**15.8**	
C29 Tricyclic Terpane-22S	**17.9**	
C29 Tricyclic Terpane-22R	**18.1**	
18a-22,29,30-Trisnorneohopane-TS	**26.7**	
C30 Tricyclic Terpane-22S	**14.4**	
C30 Tricyclic Terpane-22R	**14.9**	
17a(H)-22,29,30-Trisnorhopane-TM	**31.6**	
17a/b,21b/a 28,30-Bisnorhopane	**7.02**	
17a(H),21b(H)-25-Norhopane	**7.91**	
30-Norhopane	**87.9**	
18a(H)-30-Norneohopane-C29Ts	**23.1**	
17a(H)-Diahopane	**13.7**	
30-Normoretane	**9.85**	
18a(H)&18b(H)-Oleananes	1.97	U
Hopane	**152**	
Moretane	**14.9**	
30-Homohopane-22S	**64.1**	
30-Homohopane-22R	**54.1**	
T22a-Gammacerane/C32-diahopane	**11.2**	
30,31-Bishomohopane-22S	**46.1**	
30,31-Bishomohopane-22R	**33.5**	

Parameter	Result
30,31-Trishomohopane-22S	**37.0**
30,31-Trishomohopane-22R	**24.5**
Tetrakishomohopane-22S	**26.9**
Tetrakishomohopane-22R	**19.7**
Pentakishomohopane-22S	**27.6**
Pentakishomohopane-22R	**24.7**
13b(H),17a(H)-20S-Diacholestane	**50.7**
13b(H),17a(H)-20R-Diacholestane	**26.4**
13b,17a-20S-Methyldiacholestane	**20.8**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**61.2**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**70.9**
Unknown Sterane (S18)	**19.5**
13a,17b-20S-Ethyldiacholestane	**4.77**
14a,17a-20S-Methylcholestane	**32.0**
14a,17a-20R-Methylcholestane	**34.6**
14a(H),17a(H)-20S-Ethylcholestane	**43.0**
14a(H),17a(H)-20R-Ethylcholestane	**41.2**
14b(H),17b(H)-20R-Cholestane	**39.8**
14b(H),17b(H)-20S-Cholestane	**39.7**
14b,17b-20R-Methylcholestane	**45.2**
14b,17b-20S-Methylcholestane	**55.6**
14b(H),17b(H)-20R-Ethylcholestane	**62.5**
14b(H),17b(H)-20S-Ethylcholestane	**41.0**
C26,20R- +C27,20S- triaromatic steroid	**228**
C28,20S-triaromatic steroid	**149**
C27,20R-triaromatic steroid	**140**
C28,20R-triaromatic steroid	**119**

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

11/05/12

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

JJK (11/08/12)

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.591	164	47144M3	500.000	ng/mL	0.01
74) Chrysene-d12	43.091	240	105852	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	140871	849.517	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 84.95%			
42) Phenanthrene-d10	32.462	188	163907	964.768	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.48%			
83) Benzo[b]fluoranthene-d12	47.006	264	220790	1015.382	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.54%			
88) Benzo[a]pyrene-d12	48.181	264	210972	1001.332	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 100.13%			
129) 5B(H)Cholane - Surr	43.724	217	46433	1113.004	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.30%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	71200	1888.050	ng/mL	100
4) cis-Decalin	17.483	138	3514	122.649	ng/mL	100
5) C1-Decalins	18.205	152	138309M5	3667.617	ng/mL	
6) C2-Decalins	19.530	166	133037M5	3527.817	ng/mL	
7) C3-Decalins	22.014	180	72889M5	1932.839	ng/mL	
8) C4-Decalins	25.401	194	83324M5	2209.549	ng/mL	
10) Naphthalene	19.681	128	487082	2626.597	ng/mL#	100
11) C1-Naphthalenes	22.390	142	1071394M5	5777.508	ng/mL	
12) C2-Naphthalenes	25.236	156	1371191M5	7394.168	ng/mL	
13) C3-Naphthalenes	27.569	170	1083568M5	5843.156	ng/mL	
14) C4-Naphthalenes	30.339	184	632028M5	3408.220	ng/mL	
16) 2-Methylnaphthalene	22.390	142	627593	5313.630	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	441379	3845.923	ng/mL#	100
18) Benzothiophene	19.906	134	4341M3	28.316	ng/mL	
19) C1-Benzo(b)thiophenes	21.954	148	23978M5	156.409	ng/mL	
20) C2-Benzo(b)thiophenes	25.431	162	40049M5	261.240	ng/mL	
21) C3-Benzo(b)thiophenes	27.404	176	84299M5	549.883	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	78691M5	513.302	ng/mL	
23) Biphenyl	24.272	154	102541	686.942	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.890	156	337170	3167.106	ng/mL#	100
25) Dibenzofuran	27.358	168	42393	256.522	ng/mL	89

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
26)	Acenaphthylene	25.973	152	6691M3	36.190	ng/mL	
27)	Acenaphthene	26.741	153	10860M3	91.253	ng/mL	
28)	2,3,5-Trimethylnaphtha...	28.277	170	83122M3	834.531	ng/mL	
29)	Fluorene	28.728	166	48225M3	363.326	ng/mL	
30)	C1-Fluorenes	31.107	180	118539M5	893.069	ng/mL	
31)	C2-Fluorenes	33.305	194	193676M5	1459.150	ng/mL	
32)	C3-Fluorenes	35.142	208	189287M5	1426.083	ng/mL	
33)	Dibenzothiophene	32.055	184	127296	698.870	ng/mL#	71
34)	4-Methyldibenzothiophe...	33.832	198	131601	722.505	ng/mL#	100
35)	2/3-Methyldibenzothiop...	34.193	198	95587	524.784	ng/mL#	100
36)	1-Methyldibenzothiophe...	34.615	198	43667	239.737	ng/mL#	100
37)	OTP	34.283	198	18036	99.020	ng/mL#	100
38)	C1-Dibenzothiophenes	33.832	198	294951M5	1619.316	ng/mL	
39)	C2-Dibenzothiophenes	35.533	212	404348M5	2219.919	ng/mL	
40)	C3-Dibenzothiophenes	37.340	226	379093M5	2081.266	ng/mL	
41)	C4-Dibenzothiophenes	39.041	240	214446M5	1177.334	ng/mL	
43)	Phenanthrene	32.552	178	195639	1055.722	ng/mL	96
44)	3-Methylphenanthrene(3MP)	34.524	192	93705	505.658	ng/mL	98
45)	2-Methylphenanthrene(2MP)	34.645	192	101546	547.970	ng/mL	97
46)	2-Methylanthracene(2MA)	34.795	192	2266M3	12.228	ng/mL	
47)	9/4-Methylphenanthrene...	34.976	192	143377	773.702	ng/mL	97
48)	1-Methylphenanthrene(1MP)	35.066	192	100277M3	541.122	ng/mL	
49)	C1-Phenanthrenes/Anthr...	34.976	192	441690M5	2383.481	ng/mL	
50)	C2-Phenanthrenes/Anthr...	36.798	206	510520M5	2754.907	ng/mL	
52)	C3-Phenanthrenes/Anthr...	38.650	220	375728M5	2027.532	ng/mL	
53)	C4-Phenanthrenes/Anthr...	40.833	234	154244M5	832.343	ng/mL	
56)	Carbazole	33.410	167	6647M3	40.322	ng/mL	
57)	1-Methylphenanthrene	35.066	192	100650M3	711.918	ng/mL	
58)	Fluoranthene	37.340	202	4201M3	20.528	ng/mL	
59)	Benzo(b)fluorene	39.869	216	5205M3	38.168	ng/mL	
60)	Pyrene	38.228	202	15722M3	75.583	ng/mL	
61)	C1-Fluoranthenes/Pyrenes	39.628	216	77003M5	370.190	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.435	230	124873M5	600.323	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.468	244	153640M5	738.620	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.823	258	140363M5	674.791	ng/mL	
66)	Naphthobenzothiophene	42.098	234	34132	166.369	ng/ml#	72
67)	Naphthobenzothiophene-...	42.098	234	34132	166.369	ng/mL#	72
68)	Naphthobenzothiophene-...	42.429	234	8220	40.067	ng/mL#	5
69)	Naphthobenzothiophene-...	42.730	234	3653M3	17.806	ng/mL	
70)	C1-Naphthobenzothiophenes	43.498	248	127630M5	622.106	ng/ml	
71)	C2-Naphthobenzothiophenes	45.515	262	185905M5	906.156	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
72)	C3-Naphthobenzothiophenes	47.112	276	152145M5	741.600	ng/ml	
73)	C4-Naphthobenzothiophenes	48.196	290	114807M5	559.603	ng/mL	
75)	Benz[a]anthracene	43.016	228	2301M3	11.163	ng/mL	
76)	Chrysene	43.151	228	39715M3	187.149	ng/mL	
77)	Chrysene/Triphenylene	43.151	228	40725M3	191.908	ng/mL	
78)	C1-Chrysenes	44.672	242	75676M5	356.607	ng/mL	
79)	C2-Chrysenes	46.750	256	109371M5	515.388	ng/mL	
80)	BBF-D12 Surr BKGD	47.006	256	6935	32.680	ng/mL	100
81)	C3-Chrysenes	49.446	270	124142M5	584.993	ng/mL	
82)	C4-Chrysenes	49.567	284	79808M5	376.078	ng/mL	
84)	Benzo[b]fluoranthene	47.082	252	6298M3	26.287	ng/mL	
85)	Benzo[j]+[k]fluoranthene	47.142	252	550M3	2.231	ng/mL	
87)	Benzo[e]pyrene	48.076	252	11528	49.278	ng/mL	91
89)	Benzo[a]pyrene	48.271	252	1881M3	8.403	ng/mL	
90)	Perylene	48.588	252	3561M3	15.044	ng/mL	
91)	Indeno[1,2,3-cd]pyrene	53.076	276	1091M3	4.141	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.106	278	1624M3	5.789	ng/mL	
93)	Benzo[g,h,i]perylene	54.340	276	4537	15.972	ng/mL#	68
94)	Hopane (T19)	52.202	191	61269	771.256	ng/mL#	90
95)	17a(H),21B(H)-hopane -...	52.202	191	61269	771.256	ng/mL#	90
96)	C23 Tricyclic Terpane ...	40.743	191	23215	292.231	ng/ml	100
97)	C24 Tricyclic Terpane ...	41.480	191	14405M3	181.331	ng/ml	
98)	C25 Tricyclic Terpane ...	42.971	191	14231M3	179.140	ng/ml	
99)	C24 Tetracyclic Terpan...	44.281	191	4971M3	62.575	ng/ml	
100)	C26 Tricyclic Terpane-...	44.025	191	5793M3	72.922	ng/ml	
101)	C26 Tricyclic Terpane-...	44.130	191	5231	65.848	ng/ml	100
102)	C28 Tricyclic Terpane-...	46.419	191	5851M3	73.653	ng/ml	
103)	C28 Tricyclic Terpane-...	46.585	191	6386M3	80.387	ng/ml	
104)	C29 Tricyclic Terpane-...	47.112	191	7224	90.936	ng/ml	100
105)	C29 Tricyclic Terpane-...	47.307	191	7284M3	91.691	ng/ml	
106)	18a-22,29,30-Trisnorne...	48.422	191	10760	135.447	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.527	191	5804M3	73.061	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.768	191	5992M3	75.427	ng/mL	
109)	17a(H)-22,29,30-Trisno...	48.964	191	12728M3	160.220	ng/ml	
110)	17a/b,21b/a 28,30-Bisn...	50.154	191	2831	35.637	ng/ml	100
111)	17a(H),21b(H)-25-Norho...	49.973	191	3191	40.168	ng/ml	100
112)	30-Norhopane (T15)	50.832	191	35454	446.296	ng/ml	100
113)	18a(H)-30-Norneohopane...	50.937	191	9313M3	117.232	ng/ml	
114)	17a(H)-Diahopane (X)	51.073	191	5508M3	69.335	ng/ml	
115)	30-Normoretane (T17)	51.615	191	3970	49.974	ng/ml	100
117)	Moretane (T20)	52.895	191	6020M3	75.780	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

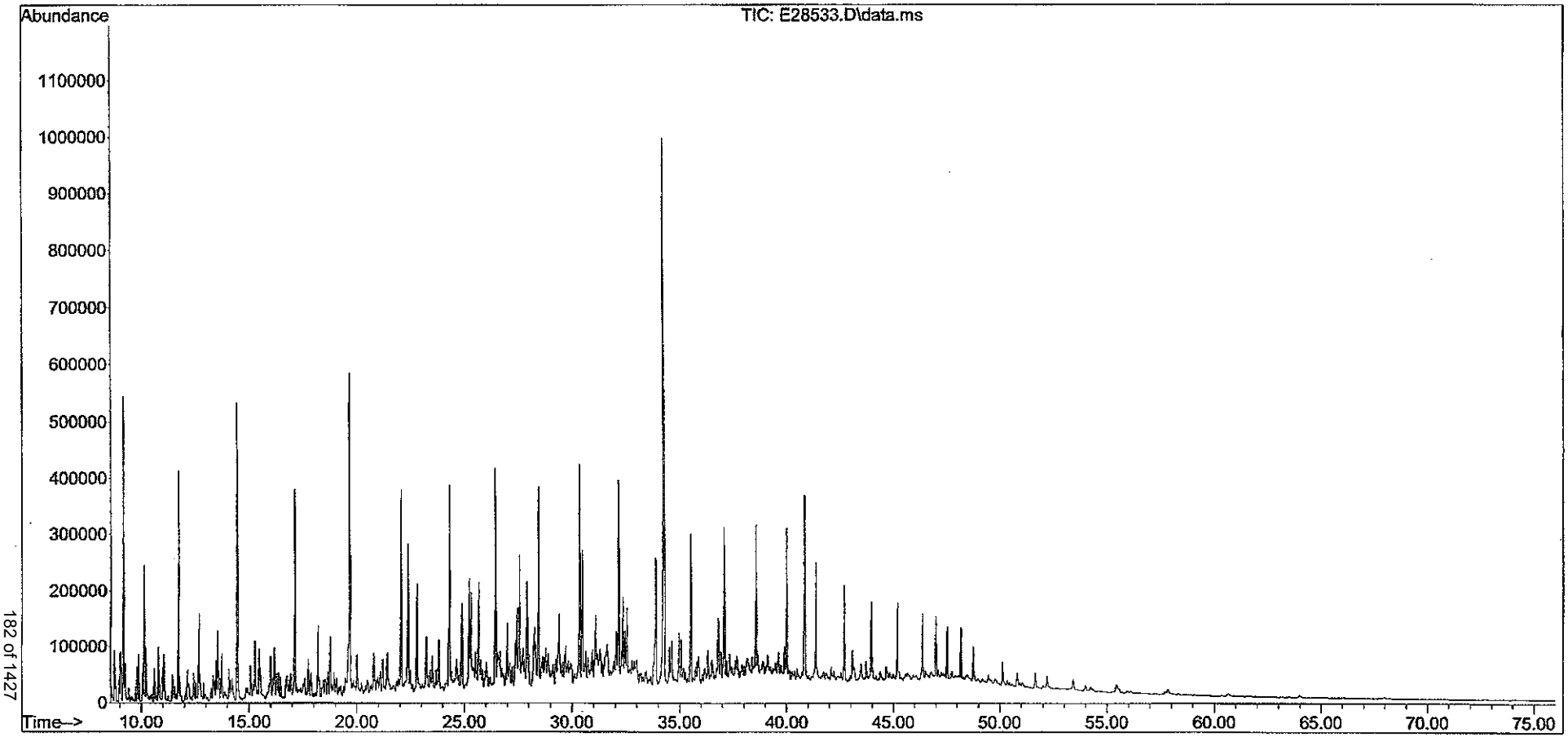
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
118) 30-Homohopane-22S (T21)	53.994	191	25836	325.224	ng/ml	100
119) 30-Homohopane-22R (T22)	54.235	191	21801	274.432	ng/ml	100
120) Gammacerane/C32-diahopane	54.777	191	4499	56.634	ng/mL	100
121) 30,31-Bishomohopane-22...	55.575	191	18579	233.873	ng/ml	100
122) 30,31-Bishomohopane-22...	55.952	191	13513	170.102	ng/ml	100
123) 30,31-Trishomohopane-2...	57.714	191	14906	187.637	ng/ml	100
124) 30,31-Trishomohopane-2...	58.331	191	9896M3	124.571	ng/ml	
125) Tetrakishomohopane-22S...	60.349	191	10857	136.668	ng/ml	100
126) Tetrakishomohopane-22R...	61.252	191	7957	100.163	ng/ml	100
127) Pentakishomohopane-22S...	63.511	191	11110	139.853	ng/ml	100
128) Pentakishomohopane-22R...	64.806	191	9965	125.440	ng/ml	100
130) 13b(H),17a(H)-20S-Diac...	45.244	217	10733M3	257.271	ng/ml	
131) 13b(H),17a(H)-20R-Diac...	45.681	217	5589M3	133.969	ng/ml	
132) 13b,17a-20S-Methyldiac...	46.374	217	4399M3	105.445	ng/ml	
133) 14a,17a-20S-Chol/13b,1...	47.247	217	12966	310.796	ng/ml	100
134) 14a,17a-20R-Chol/13b,1...	47.759	217	15015M3	359.911	ng/ml	
135) Unknown Sterane (S18)	48.045	217	4124	98.853	ng/ml	100
136) 13a,17b-20S-Ethyldiach...	48.317	217	1011	24.234	ng/ml	100
137) 14a,17a-20S-Methylchol...	48.467	217	6766M3	162.182	ng/ml	
138) 14a,17a-20R-Methylchol...	49.190	217	7334M3	175.797	ng/ml	
139) 14a(H),17a(H)-20S-Ethy...	49.536	217	9103M3	218.200	ng/ml	
140) 14a(H),17a(H)-20R-Ethy...	50.455	217	8734M3	209.355	ng/ml	
141) 14b(H),17b(H)-20R-Chol...	47.338	218	8433M3	202.140	ng/ml	
142) 14b(H),17b(H)-20S-Chol...	47.413	218	8412M3	201.637	ng/ml	
143) 14b,17b-20R-Methylchol...	48.633	218	9575	229.514	ng/ml	100
144) 14b,17b-20S-Methylchol...	48.723	218	11768M3	282.080	ng/ml	
145) 14b(H),17b(H)-20R-Ethy...	49.777	218	13230M3	317.125	ng/ml	
146) 14b(H),17b(H)-20S-Ethy...	49.823	218	8678M3	208.013	ng/ml	
147) C26,20R- +C27,20S- tri...	49.476	231	48173	1154.712	ng/mL	100
148) C28,20S-triaromatic st...	50.350	231	31642	758.462	ng/mL	100
149) C27,20R-triaromatic st...	50.801	231	29597	709.443	ng/mL	100
150) C28,20R-triaromatic st...	52.006	231	25116M3	602.033	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : Default - All compounds listed reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration



Alpha Woods Hole Lab
Batch Weight Report
10/05/2012

Lab ID	QC Type	PS1210002 - Pan Weight	PS1210002 - Wet Weight	PS1210002 - Dry Weight	PS1210002 - Dry Weight #2	PS1210002 - Dry Weight #3	Percent Solid
1210002-01	SAM 1210081-01	1.32	7.07	5.61	5.6		74.43
1210002-02	SAM 1210081-02	1.32	7.07	5.61	5.6		74.43
1210002-03	SAM 1210081-03	1.32	7.07	5.61	5.6		74.43
1210002-04	SAM 1210081-04	1.32	7.07	5.61	5.6		74.43
1210002-05	SAM 1210081-05	1.32	7.07	5.61	5.6		74.43
1210002-06	SAM 1210081-06	1.32	7.07	5.61	5.6		74.43
1210002-07	SAM 1210081-07	1.32	7.07	5.61	5.6		74.43
PSS100512B04	B	1.31	1.31	1.31	1.31		100.00

KML 11/16/12

Initial: 10/5/2012 12:28:31 PM wr
Weight #1: 10/9/2012 8:15:35 AM ctk
Weight #2: 10/10/2012 12:19:36 PM bls

Printed On: 10/10/2012 12:21:06 PM (BLS)

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210081 - OP NEWFIE

Lab ID	QC Type	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1210081-01	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-02	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-03	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.04	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-04	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.05	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-05	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.06	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-06	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.01	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-07	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612B07	B	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCS03	LCS	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCSD03	LCSD	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210081 - OP NEWFIE

Lab ID	Notes
1210081-01	1st Prep
1210081-02	1st Prep
1210081-03	1st Prep
1210081-04	1st Prep
1210081-05	1st Prep
1210081-06	1st Prep
1210081-07	1st Prep
SS110612B07	1st Prep
SS110612LCS03	1st Prep
SS110612LCSD03	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210081 - OP NEWFIE Analyst: CTK Witness: AMK

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1210081-01	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-02	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-03	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-04	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-05	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-06	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-07	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612B07	B	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612LCS03	LCS	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl
SS110612LCSD03	LCSD	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ65	Biomarker Surrogate	5b(H) Cholane = 10 ug/mL	DCM	7787
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210081 - OP SHC Analyst: CTK Witness: AMK

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1210081-01	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-02	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-03	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-04	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-05	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-06	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-07	SAM	WHAQ79	100	µl				WHAQ72	50	µl
SS110612B07	B	WHAQ79	100	µl				WHAQ72	50	µl
SS110612LCS03	LCS	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl
SS110612LCSD03	LCSD	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ72	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene-d10, Chrysene-d12 = 5 ug/mL	DCM	L14S03
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Weight Report
11/06/2012

Lab ID	QC Type	1210081 - Sample
1210081-01	SAM	15.02
1210081-02	SAM	15.02
1210081-03	SAM	15.04
1210081-04	SAM	15.05
1210081-05	SAM	15.06
1210081-06	SAM	15.01
1210081-07	SAM	15
SS110612B07	B	15
SS110612LCS03LCS	OP NEWFIE	15
SS110612LCS03LCS	OP SHC	15
SS110612LCS03LCS	OP Steranes/Triterpanes	
SS110612LCSD03LCSD	OP NEWFIE	15
SS110612LCSD03LCSD	OP SHC	15
SS110612LCSD03LCSD	OP Steranes/Triterpanes	
SS111612ANC01	ANC	
SS111612CL01	CL	
SS111612WCS01	WCS	
TS111312ANC01	ANC	
TS111312CL01	CL	
TS111312WCS01	WCS	

ETR 1210081

Analyst AMK

Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	0.280	56.00	N/A	N/A	N/A	104%
1210081	1		4000	50	0.109	8.72	2000	4.36	2.00	
	2		4000	50	0.124	9.92	2000	4.96	2.00	
	3		4000	50	0.118	9.44	2000	4.72	2.00	
	4		4000	50	0.126	10.08	2000	5.04	2.00	
	5		4000	50	0.120	9.60	2000	4.80	2.00	
	6		4000	50	0.118	9.44	2000	4.72	2.00	
	7		4000	50	0.140	11.20	2000	5.60	2.00	

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: BLS

Date: 11/12/12

ETR 1210081

Analyst AMK
Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	.280		N/A	N/A	N/A	0%
1210081	1		4000	50	.109					
	2		4000	50	.124					
	3		4000	50	.118					
	4		4000	50	.126					
	5		4000	50	.120					
	6		4000	50	.118					
	7		4000	50	.140					

Note:
Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)
Gravimetric Standard = 5 mg/mL
LCS Acceptance Criteria: 95% - 105%

Verified by: AMK
Date: 11/7/12

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210081 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210081-01	SAM	3660B	CTK	11/7/2012												True
1210081-02	SAM	3660B	CTK	11/7/2012												True
1210081-03	SAM	3660B	CTK	11/7/2012												True
1210081-04	SAM	3660B	CTK	11/7/2012												True
1210081-05	SAM	3660B	CTK	11/7/2012												True
1210081-06	SAM	3660B	CTK	11/7/2012												True
1210081-07	SAM	3660B	CTK	11/7/2012												True
SS110612B07	B	3660B	CTK	11/7/2012												True
SS110612LCS03	LCS	3660B	CTK	11/7/2012												True
SS110612LCSD03	LCSD	3660B	CTK	11/7/2012												True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210081 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210081-01	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-02	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-03	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-04	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-05	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-06	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-07	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612B07	B	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCS03	LCS	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCSD03	LCSD	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210081 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210081-01	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-02	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-03	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-04	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-05	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-06	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-07	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612B07	B	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCS03	LCS	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCSD03	LCSD	split	KJD	11/8/2012							0.9	0.45	2			True

Forensic Preparation Checklist

Batch ID: 1210081 **Client:** AECOM **Project:** Enbridge MDL

Test(s) Spiked for:
Choose from the following:
F1B, (POIB), POIH, POIHX, POITAS, (TPH+A)

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil
Product • PUF • (Sediment) • Sheen
Soil • Solid • SPMD • Tissue
1L Water • 4L Water • Floc Water

Extraction HT:
9121113

	Date:	Initials:
COC/ETR Check:	11/6/12	CTK
1st Extraction:	11/6/12	CTK
2nd Extraction:	11/6/12	CTK
3rd Extraction:	11/7/12	WR/MH

Cleanup Methods:		Date/Initials:
No Cleanup Required		
Alumina Column (3610)		
Silica Column (3630)	X	11/7/12 AMK
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)	X	11/7/12 CTK
Water pH<2 verified		

	Date/Initials:	ID & Amount:
RIS Spike Analyst:	11/8/12 KTD	WHAQ72 50uL
RIS Spike Witness:	11/9/12 BLS	

Prep Process Notes

Samples 1-7 spiked with 300uL WHAQ62. CTK 11/7/12

REAGENT	LOT #
DCM	15769
SODIUM SULFATE	11407
SILICA GEL	BCBH9150V
ALUMINA	n/a

REAGENT	LOT #
COPPER	OWR110712B
GLASS WOOL	05112999

BATCH COMPLETE Analyst:	KTD	Date:	11/8/12
BATCH REVIEWED Analyst:	BLS	Date:	11/12/12

Injection Log

Directory: O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	E28479.d	0.	PRIME		28 Oct 2012 12:20
2	1	E28481.d	0.	PRIME		28 Oct 2012 13:49
3	2	E28483.d	0.	DCM		28 Oct 2012 15:18
4	3	E28485.d	0.	DCM		28 Oct 2012 16:46
5	4	E28487.d	0.	I210281201		28 Oct 2012 18:15
6	5	E28489.d	0.	I210281202		28 Oct 2012 19:44
7	6	E28491.d	0.	I210281203		28 Oct 2012 21:12
8	7	E28493.d	0.	I210281204		28 Oct 2012 22:41
9	8	E28495.d	0.	I210281205		29 Oct 2012 00:09
10	9	E28497.d	0.	I210281206		29 Oct 2012 01:37
11	10	E28499.d	0.	I210281207		29 Oct 2012 03:06
12	11	E28501.d	0.	DCM		29 Oct 2012 04:34
13	12	E28503.d	0.	ss110412ans01	whaq46 5.076	29 Oct 2012 06:03
14	13	E28505.d	0.	DCM		29 Oct 2012 07:32
15	14	E28507.d	0.	Q210281201	PAH2102912.M JqK (11/05/12)	29 Oct 2012 09:01
16	15	E28509.d	0.	MC252		29 Oct 2012 10:30
17	1	E28511.d	0.	DCM		29 Oct 2012 12:01
18	2	E28513.d	0.	DCM		29 Oct 2012 13:30
19	3	E28515.d	0.	DCM	DCM	29 Oct 2012 15:00
20	4	E28517.d	0.	I210291201	L1 WHAQ33	29 Oct 2012 16:29
21	5	E28519.d	0.	I210291202	L2 WHAQ34	29 Oct 2012 17:58
22	6	E28521.d	0.	I210291203	L3 WHAQ35	29 Oct 2012 19:27
23	7	E28523.d	0.	I210291204	L4 WHAQ66	29 Oct 2012 20:56
24	8	E28525.d	0.	I210291205	L5 WHAQ38	29 Oct 2012 22:25
25	9	E28527.d	0.	I210291206	L6 WHAQ39	29 Oct 2012 23:54
26	10	E28529.d	0.	I210291207	KAL. L7 WHAQ40	30 Oct 2012 01:23
27	11	E28531.d	0.	DCM	DCM	30 Oct 2012 02:52
28	12	E28533.d	0.	ss110512anc02	ANS WHAQ46 5.076M...	30 Oct 2012 04:21
29	13	E28535.d	0.	DCM	DCM	30 Oct 2012 05:50
30	14	E28537.d	0.	Q210291201	ICC WHAQ50	30 Oct 2012 07:19
31	15	E28539.d	0.	MC252210291201	MC252 5.205MG/ML- WHAQ 47	30 Oct 2012 09:16
32	16	E28541.d	0.	SRM210291201	SRM1582	30 Oct 2012 10:47
33	17	E28543.d	0.	COREXIT	RT ONLY	30 Oct 2012 12:21
34	18	E28545.d	0.	C210291201	CC WHAQ66 500NG/ML	30 Oct 2012 13:52
35	19	E28547.d	0.	DCM		30 Oct 2012 15:24
36	20	E28549.d	0.	DCM		30 Oct 2012 16:57
37	21	E28551.d	0.	SS102412B10	1X ETR121001XX	30 Oct 2012 18:30
38	22	E28553.d	0.	SS102412C41BN02	1X ETR121001XX	30 Oct 2012 20:04
39	23	E28555.d	0.	SS102412LCS03	1X ETR121001XX	30 Oct 2012 21:37
40	24	E28557.d	0.	SS102412LCSD03	1X ETR121001XX	30 Oct 2012 23:11
41	25	E28559.d	0.	1200010-01	1X	31 Oct 2012 00:45
42	26	E28561.d	0.	1200010-01D	1X	31 Oct 2012 02:18
43	27	E28563.d	0.	1210001-02	1X	31 Oct 2012 03:51
44	28	E28565.d	0.	1210001-03	1X	31 Oct 2012 05:24
45	29	E28567.d	0.	1210001-04	1X	31 Oct 2012 06:56
46	30	E28569.d	0.	1210001-05	1X	31 Oct 2012 08:29
47	31	E28571.d	0.	C210291202	CC HWAQ66 500NG/ML	31 Oct 2012 11:26
48	100	E28571b.d	0.	SS1024112C41BN02C41	RA	31 Oct 2012 13:00
49	99	E28571d.d	0.	SS1024112C41BN02C41	PRE	31 Oct 2012 14:36
50	32	E28573.d	0.	EN103012WCS01	WHAQ73 WCS 5.036	31 Oct 2012 16:10
51	33	E28575.d	0.	EN103012CL01	WHAQ74 CL 5.064	31 Oct 2012 17:44
52	34	E28577.d	0.	120001-06	1X	31 Oct 2012 19:16
53	35	E28579.d	0.	120001-07	1X	31 Oct 2012 20:50
54	36	E28581.d	0.	120001-08	1X	31 Oct 2012 22:24
55	37	E28583.d	0.	120001-09	1X	31 Oct 2012 23:57

Analysis log File

Total Files Reported in Log : 42
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV13\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E28925.D	PRIME	1X	11/13/2012 10:53 am
2	E28927.D			11/13/2012 12:21 pm
3	E28929.D	C211131201 pass	CC WHAQ80 500NG/ML	11/13/2012 2:01 pm
4	E28931.D	ANS211131201	WHAQ46 5.076	11/13/2012 3:30 pm
5	E28933.D	DCM	DCM	11/13/2012 4:59 pm
6	E28935.D	DCM	DCM	11/13/2012 6:28 pm
7	E28937.D	SS110812B06	1X ETR1209049_50_53_54	11/13/2012 7:58 pm
8	E28939.D	SS110812LCS05	1X ETR1209049_50_53_54	11/13/2012 9:27 pm
9	E28941.D	SS110812LCSD05	1X ETR1209049_50_53_54	11/13/2012 10:55 pm
10	E28943.D	SS110812C41BN01	1X ETR1209049_50_53_54	11/14/2012 12:24 am
11	E28945.D	1209049-15	1X	11/14/2012 1:53 am
12	E28947.D	1209050-03	1X	11/14/2012 3:22 am
13	E28949.D	✓C211131202 pass	CC WHAQ80 500NG/ML	11/14/2012 4:50 am
14	E28951.D	SS111412MC201	WHAQ47 5.205	11/14/2012 6:18 am
15	E28953.D	1209050-04	1X	11/14/2012 7:47 am
16	E28953B.D	✓SS111612ANC01	WHAQ46, 5.076	11/14/2012 9:16 am
17	E28955.D	1209050-04M	1X	11/14/2012 10:45 am
18	E28957.D	1209050-04S	1X	11/14/2012 12:23 pm
19	E28959.D	1209053-09	1X	11/14/2012 2:01 pm
20	E28961.D	1209054-11	1X	11/14/2012 3:31 pm
21	E28963.D	1209054-11D	1X	11/14/2012 5:01 pm
22	E28965.D	ss1114121582c01	WHAQ46 5.437	11/14/2012 6:30 pm
23	E28967.D	✓C211131203 pass	CC WHAQ80 500NG/ML	11/14/2012 7:59 pm
24	E28969.D	DCM		11/14/2012 9:27 pm
25	E28971.D	DCM		11/14/2012 10:55 pm
26	E28973.D	✓SS110612B07	1X ETR1210081	11/15/2012 12:24 am
27	E28975.D	✓SS110612LCS03	1X ETR1210081	11/15/2012 1:52 am
28	E28977.D	✓SS110612LCSD03	1X ETR1210081	11/15/2012 3:21 am
29	E28979.D	✓1210081-01	1X	11/15/2012 4:49 am
30	E28981.D	✓1210081-02	1X	11/15/2012 6:17 am
31	E28983.D	✓1210081-03	1X	11/15/2012 7:45 am
32	E28985.D	✓1210081-04	1X	11/15/2012 9:14 am
33	E28987.D	✓1210081-05	1X	11/15/2012 10:42 am
34	E28989.D	✓1210081-06	1X	11/15/2012 12:09 pm
35	E28991.D	✓1210081-07	1X	11/15/2012 1:47 pm
36	E28993.D	✓C211131204 pass	CC WHAQ80 500NG/ML	11/15/2012 3:14 pm
37	E28995.D	✓SS111612WCS01	WCS WHAQ73 5.036	11/15/2012 4:42 pm
38	E28997.D	✓SS111612CL01	CL WHAQ74 5.064	11/15/2012 6:10 pm
39	E28999.D	DCM	DCM	11/15/2012 7:37 pm
40	E29001.D	DCM	DCM	11/15/2012 9:05 pm
41	E29003.D	SS10612B08	1X ETR1210082	11/15/2012 10:32 pm
42	E29003B.D	✓C211131205 pass	CC WHAQ80 500NG/ML	11/16/2012 7:41 am

DAH2 102912.M
CCV = WHAQ80 = 500ng/mL
DR 11/16/12

Printed: 11/16/12 Page: 1

Total Saturated Hydrocarbons By GC/FID

Form II
Surrogate Recovery
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210081**
Matrix: **Sediment**

Case: **N/A** SDG: **N/A**

Client ID	Lab ID	ortho-Terphenyl	d50-Tetracosane
Blank	SS110612B07	91	91
LCS	SS110612LCS03	93	91
LCSD	SS110612LCSD03	90	89
SEKR0000R024S092112D004_MDL1	1210081-01	85	86
SEKR0000R024S092112D004_MDL2	1210081-02	88	89
SEKR0000R024S092112D004_MDL3	1210081-03	85	84
SEKR0000R024S092112D004_MDL4	1210081-04	88	88
SEKR0000R024S092112D004_MDL5	1210081-05	88	87
SEKR0000R024S092112D004_MDL6	1210081-06	88	89
SEKR0000R024S092112D004_MDL7	1210081-07	87	88

N/A - Not Applicable

Surrogate	QC Limit
ortho-Terphenyl	40-125
d50-Tetracosane	40-125

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **See Below**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/06/12	100	AC

Lab ID: SS110612B07 SS110612LCS03 SS110612LCSD03

Parameter	Blank Conc.	LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
n-Nonane (C9)	0.0181 U	0.987	74	0.984	74	0	30	50-125
n-Decane (C10)	0.00813	1.11	84	1.07	81	4	30	50-125
n-Dodecane (C12)	0.0188 U	1.16	87	1.12	84	3	30	50-125
n-Tetradecane (C14)	0.0139 U	1.20	90	1.17	87	3	30	50-125
n-Hexadecane (C16)	0.0128 U	1.28	96	1.25	93	3	30	50-125
n-Octadecane (C18)	0.0611	1.28	96	1.24	93	3	30	50-125
n-Nonadecane (C19)	0.0108 U	1.19	89	1.16	87	3	30	50-125
n-Eicosane (C20)	0.00741 U	1.22	91	1.18	89	3	30	50-125
n-Docosane (C22)	0.00133	1.23	92	1.20	90	2	30	50-125
n-Tetracosane (C24)	0.0124 U	1.28	96	1.25	94	3	30	50-125
n-Hexacosane (C26)	0.00267	1.26	94	1.23	92	2	30	50-125
n-Octacosane (C28)	0.00320	1.27	95	1.25	94	1	30	50-125
n-Triacontane (C30)	0.00213	1.28	96	1.26	95	1	30	50-125
n-Hexatriacontane (C36)	0.0221 U	1.20	90	1.23	92	2	30	50-125

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	93	90	40-125
d50-Tetracosane	91	89	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Nonane (C9)	6286	7340	117	65-135
n-Decane (C10)	5047	5900	117	65-135
n-Undecane (C11)	4703	5390	115	65-135
n-Dodecane (C12)	4155	5000	120	65-135
n-Tridecane (C13)	4058	4780	118	65-135
2,6,10 Trimethyldodecane (1380)	845	914	108	65-135
n-Tetradecane (C14)	3670	4170	114	65-135
2,6,10 Trimethyltridecane (1470)	1367	1580	115	65-135
n-Pentadecane (C15)	3660	4060	111	65-135
n-Hexadecane (C16)	3330	3940	118	65-135
Norpristane (1650)	1093	1240	113	65-135
n-Heptadecane (C17)	3012	3540	117	65-135
Pristane	2145	2370	110	65-135
n-Octadecane (C18)	2700	3060	114	65-135
Phytane	1215	1410	116	65-135
n-Nonadecane (C19)	2305	2680	116	65-135
n-Eicosane (C20)	2337	2570	110	65-135
n-Heneicosane (C21)	2044	2280	112	65-135
n-Docosane (C22)	1972	2220	112	65-135
n-Tricosane (C23)	1745	1940	111	65-135
n-Tetracosane (C24)	1641	1960	119	65-135
n-Pentacosane (C25)	1562	1730	110	65-135
n-Hexacosane (C26)	1378	1530	111	65-135
n-Heptacosane (C27)	1083	1190	110	65-135
n-Octacosane (C28)	776	881	114	65-135
n-Nonacosane (C29)	734	776	106	65-135
n-Triacontane (C30)	627	724	116	65-135
n-Hentriacontane (C31)	514	674	131	65-135
n-Dotriacontane (C32)	458	446	97	65-135
n-Tritriacontane (C33)	388	371	96	65-135
n-Tetratriacontane (C34)	347	366	105	65-135
n-Pentatriacontane (C35)	278	333	120	65-135
n-Hexatriacontane (C36)	186	219	118	65-135

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Heptatriacontane (C37)	152	169	111	65-135
n-Octatriacontane (C38)	131	154	118	65-135
n-Nonatriacontane (C39)	88.7	99.3	112	65-135
n-Tetracontane (C40)	92.3	99.3	108	65-135
Total Petroleum Hydrocarbons (C9-C44)	554993	627000	113	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Nonane (C9)	6204	6790	109	65-135
n-Decane (C10)	5060	5470	108	65-135
n-Undecane (C11)	4640	5000	108	65-135
n-Dodecane (C12)	4121	4300	104	65-135
n-Tridecane (C13)	3859	4300	111	65-135
2,6,10 Trimethyldodecane (1380)	914	914	100	65-135
n-Tetradecane (C14)	3500	3750	107	65-135
2,6,10 Trimethyltridecane (1470)	1316	1520	115	65-135
n-Pentadecane (C15)	3836	3830	100	65-135
n-Hexadecane (C16)	3174	3530	111	65-135
Norpristane (1650)	1030	1050	102	65-135
n-Heptadecane (C17)	2818	3210	114	65-135
Pristane	2093	2150	103	65-135
n-Octadecane (C18)	2460	2850	116	65-135
Phytane	1213	1260	104	65-135
n-Nonadecane (C19)	2354	2410	103	65-135
n-Eicosane (C20)	2305	2560	111	65-135
n-Heneicosane (C21)	2077	2120	102	65-135
n-Docosane (C22)	2010	2070	103	65-135
n-Tricosane (C23)	1735	1850	107	65-135
n-Tetracosane (C24)	1629	1710	105	65-135
n-Pentacosane (C25)	1607	1630	102	65-135
n-Hexacosane (C26)	1333	1470	110	65-135
n-Heptacosane (C27)	1085	1100	101	65-135
n-Octacosane (C28)	770	782	102	65-135
n-Nonacosane (C29)	774	770	100	65-135
n-Triacontane (C30)	595	655	110	65-135
n-Hentriacontane (C31)	534	493	92	65-135
n-Dotriacontane (C32)	501	441	88	65-135
n-Tritriacontane (C33)	322	403	125	65-135
n-Tetratriacontane (C34)	289	378	131	65-135
n-Pentatriacontane (C35)	271	283	104	65-135
n-Hexatriacontane (C36)	166	207	125	65-135

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Heptatriacontane (C37)	145	172	118	65-135
n-Octatriacontane (C38)	136	136	100	65-135
n-Nonatriacontane (C39)	94.3	104	110	65-135
n-Tetracontane (C40)	86.5	98.2	114	65-135
Total Petroleum Hydrocarbons (C9-C44)	544000	590000	109	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form IV
Method Blank Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Date Analyzed: **11/09/12 17:49**

Client ID	Lab ID	Date/Time Analyzed
LCS	SS110612LCS03	11/09/12 22:17
LCSD	SS110612LCSD03	11/10/12 02:44
SEKR0000R024S092112D004_MDL1	1210081-01	11/10/12 13:08
SEKR0000R024S092112D004_MDL2	1210081-02	11/10/12 14:38
SEKR0000R024S092112D004_MDL3	1210081-03	11/10/12 16:08
SEKR0000R024S092112D004_MDL4	1210081-04	11/10/12 17:38
SEKR0000R024S092112D004_MDL5	1210081-05	11/10/12 19:08
SEKR0000R024S092112D004_MDL6	1210081-06	11/10/12 20:37
SEKR0000R024S092112D004_MDL7	1210081-07	11/10/12 22:06

N/A - Not Applicable

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28814.D
Time Acquired : 09 Nov 2012 11:49 am

C211091201R 59338300

File	Sample	Internal Standard Responses
e28822.D	SS110612B07	60806683
e28828.D	SS110612LCS03	69080064
e28834.D	SS110612LCSD03	64996659
e28840.D	C211091202R	62613621

(fails) - fails 24hr time check * - fails criteria

Created: Sat Nov 17 12:06:50 2012 PAH2

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28840.D
Time Acquired : 10 Nov 2012 7:10 am

C211091202R 62613600

File	Sample	Internal Standard Responses
e28846.D	1210081-01	64670097
e28848.D	1210081-02	65086862
e28850.D	1210081-03	72015177
e28852.D	1210081-04	68571619
e28854.D	1210081-05	64945257
e28856.D	1210081-06	64919954
e28858.D	1210081-07	66745977
e28860.D	C211091203R	61327887

(fails) - fails 24hr time check * - fails criteria

Created: Sat Nov 17 12:08:35 2012 PAH2

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-01**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.02	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0243	U	n-Tricosane (C23)	**0.240**	
n-Decane (C10)	**0.0147**	JB	n-Tetracosane (C24)	**0.0807**	J
n-Undecane (C11)	**0.00912**	JB	n-Pentacosane (C25)	**1.42**	G
n-Dodecane (C12)	**0.0109**	J	n-Hexacosane (C26)	**0.131**	J
n-Tridecane (C13)	**0.0417**	J	n-Heptacosane (C27)	**0.609**	
2,6,10 Trimethyldodecane (1380)	**0.0324**	J	n-Octacosane (C28)	**0.0900**	J
n-Tetradecane (C14)	**0.0902**	J	n-Nonacosane (C29)	**1.14**	
2,6,10 Trimethyltridecane (1470)	**0.146**	GJ	n-Triacontane (C30)	**0.147**	J
n-Pentadecane (C15)	**0.135**	J	n-Hentriacontane (C31)	**0.739**	
n-Hexadecane (C16)	**0.174**	J	n-Dotriacontane (C32)	**0.0785**	J
Norpristane (1650)	**0.0891**	J	n-Tritriacontane (C33)	**0.133**	J
n-Heptadecane (C17)	**0.218**		n-Tetratriacontane (C34)	0.0240	U
Pristane	**0.161**	J	n-Pentatriacontane (C35)	**0.0687**	J
n-Octadecane (C18)	**0.912**	G	n-Hexatriacontane (C36)	0.0297	U
Phytane	**0.250**	G	n-Heptatriacontane (C37)	**0.138**	J
n-Nonadecane (C19)	**0.117**	J	n-Octatriacontane (C38)	**0.0739**	J
n-Eicosane (C20)	**0.139**	J	n-Nonatriacontane (C39)	0.0327	U
n-Heneicosane (C21)	**0.109**	J	n-Tetracontane (C40)	**0.0701**	J
n-Docosane (C22)	**0.0959**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**7.91**
Total Petroleum Hydrocarbons (C9-C44)	**196**
Total Resolved Hydrocarbons	**47.4**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	85	40-125
d50-Tetracosane	86	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28846.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 1:08 pm
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 68 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:56:17 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	64670097G	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.641	29101433	21.306 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	42.61%#
24) s	d50-Tetracosane	35.363	23754268	21.466 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	42.93%#
	Target Compounds			
2) t	n-Octane (C8)	5.217	11549	0.011 ug/mL M4
4) t	n-Decane (C10)	9.816	90307	0.082 ug/mL M4
5) t	n-Undecane (C11)	12.313	56719	0.051 ug/mL M4
6) t	n-Dodecane (C12)	14.732	68886	0.061 ug/mL M4
7) t	n-Tridecane (C13)	17.032	265568	0.233 ug/mL M4
8) t	1380	18.708	208412	0.181 ug/mL M4
9) t	n-Tetradecane (C14)	19.207	580579	0.504 ug/mL M4
10) t	1470	20.491	941764G	0.815 ug/mL M4
11) t	n-Pentadecane (C15)	21.267	869690	0.753 ug/mL M4
12) t	n-Hexadecane (C16)	23.224	1131985	0.972 ug/mL M4
13) t	1650	24.132	576504	0.498 ug/mL M4
14) t	n-Heptadecane (C17)	25.077	1407388	1.216 ug/mL M4
15) t	Pristane	25.174	1065349	0.901 ug/mL M4
16) t	n-Octadecane (C18)	26.813	6034346G	5.098 ug/mL M4
17) t	Phytane	26.991	1639037G	1.400 ug/mL M4
18) t	n-Nonadecane (C19)	28.520	773234	0.654 ug/mL M4
20) t	n-Eicosane (C20)	30.124	925969	0.776 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	731528	0.611 ug/mL M4
22) t	n-Docosane (C22)	33.126	643917	0.536 ug/mL M4
23) t	n-Tricosane (C23)	34.533	1635668	1.341 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	540782	0.451 ug/mL M4
26) t	n-Pentacosane (C25)	37.176	9737367G	7.968 ug/mL M4
27) t	n-Hexacosane (C26)	38.451	891153	0.734 ug/mL M4
28) t	n-Heptacosane (C27)	39.664	4052936	3.404 ug/mL M4
29) t	n-Octacosane (C28)	40.827	604637	0.503 ug/mL M4
30) t	n-Nonacosane (C29)	41.962	7653482	6.365 ug/mL M4
31) t	n-Triacontane (C30)	43.047	974526	0.820 ug/mL M4
32) t	n-Hentriacontane (C31)	44.111	4953560	4.129 ug/mL M4
33) t	n-Dotriacontane (C32)	45.136	524904	0.439 ug/mL M4
34) t	n-Tritriacontane (C33)	46.127	846258	0.741 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.128	460466	0.384 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.580	927734	0.774 ug/mL M4
39) t	n-Octatriacontane (C38)	52.262	492386	0.413 ug/mL M4
41) t	n-Tetracontane (C40)	56.293	442936	0.392 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28846.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 1:08 pm
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 68 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:56:17 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

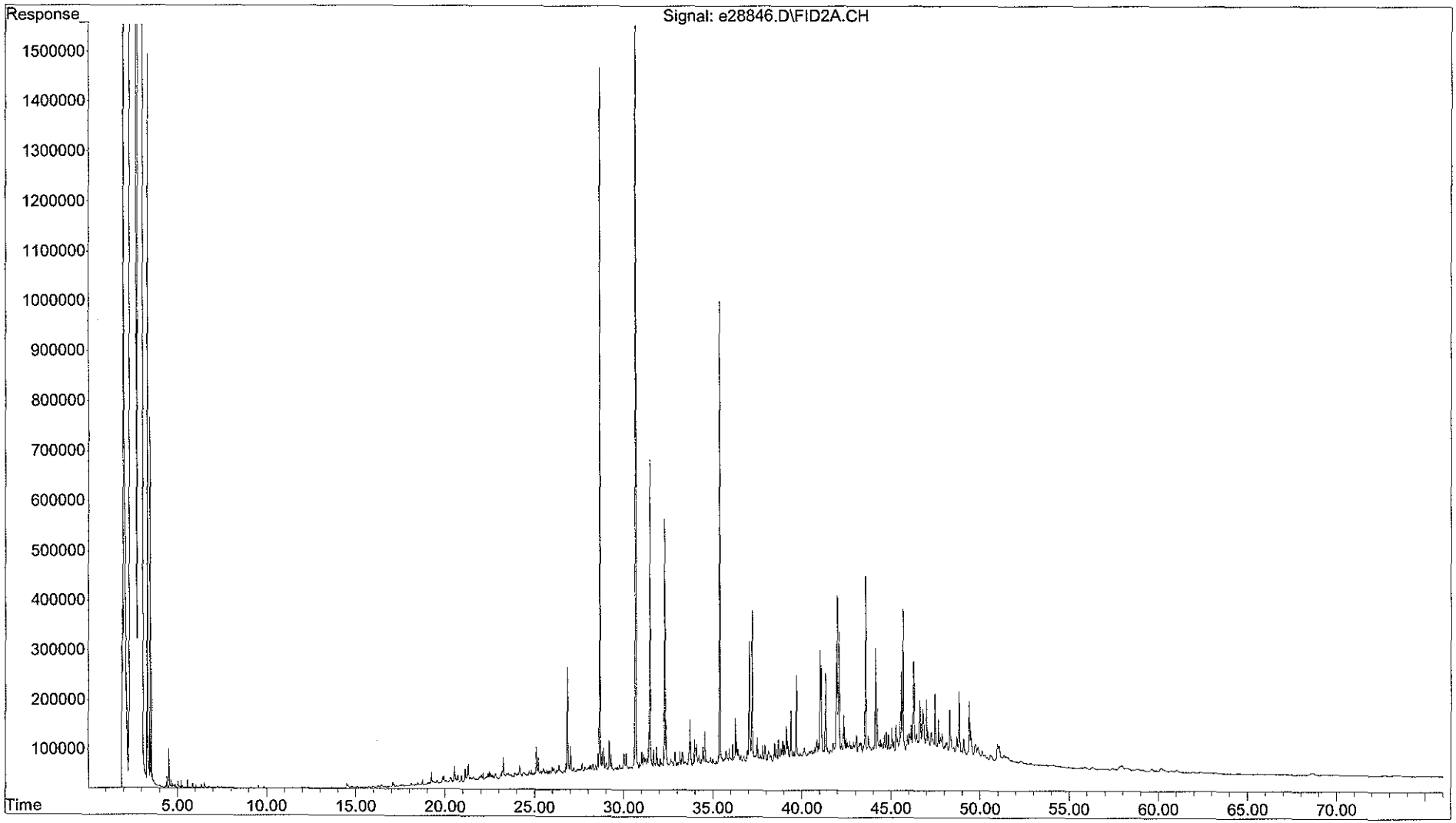
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
42) h	C9-C44 Total Petroleu...	38.728	1893425516	1610.034	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	1288518236	1095.664	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	311799609	265.132	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28846.D
Operator : AC
Acquired : 10 Nov 2012 1:08 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-01
Misc Info : 1X
ALS Vial : 68



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-02**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.02	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00322**	J	n-Tricosane (C23)	**0.296**	
n-Decane (C10)	**0.0168**	JB	n-Tetracosane (C24)	**0.0798**	J
n-Undecane (C11)	**0.0118**	JB	n-Pentacosane (C25)	**1.54**	G
n-Dodecane (C12)	**0.0166**	J	n-Hexacosane (C26)	**0.143**	J
n-Tridecane (C13)	**0.0510**	J	n-Heptacosane (C27)	**0.563**	
2,6,10 Trimethyldodecane (1380)	**0.0377**	J	n-Octacosane (C28)	**0.109**	J
n-Tetradecane (C14)	**0.104**	J	n-Nonacosane (C29)	**1.20**	
2,6,10 Trimethyltridecane (1470)	**0.188**	G	n-Triacontane (C30)	**0.147**	J
n-Pentadecane (C15)	**0.152**	J	n-Hentriacontane (C31)	**0.695**	
n-Hexadecane (C16)	**0.191**		n-Dotriacontane (C32)	**0.0898**	J
Norpristane (1650)	**0.110**	J	n-Tritriacontane (C33)	**0.214**	
n-Heptadecane (C17)	**0.222**		n-Tetratriacontane (C34)	0.0240	U
Pristane	**0.174**	J	n-Pentatriacontane (C35)	**0.0703**	J
n-Octadecane (C18)	**1.02**	G	n-Hexatriacontane (C36)	0.0297	U
Phytane	**0.305**	G	n-Heptatriacontane (C37)	**0.0590**	J
n-Nonadecane (C19)	**0.120**	J	n-Octatriacontane (C38)	**0.102**	J
n-Eicosane (C20)	**0.126**	J	n-Nonatriacontane (C39)	**0.0598**	J
n-Heneicosane (C21)	**0.145**	J	n-Tetracontane (C40)	**0.140**	J
n-Docosane (C22)	**0.0975**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**8.60**
Total Petroleum Hydrocarbons (C9-C44)	**224**
Total Resolved Hydrocarbons	**54.1**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	88	40-125
d50-Tetracosane	89	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28848.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 2:38 pm
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 69 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:58:57 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.668	65086862	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.644	30160836	21.941 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	43.88%#
24) s	d50-Tetracosane	35.364	24865984	22.327 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.65%#
	Target Compounds			
2) t	n-Octane (C8)	5.221	13558	0.013 ug/mL M4
3) t	n-Nonane (C9)	7.364	19315	0.018 ug/mL M4
4) t	n-Decane (C10)	9.818	104013	0.094 ug/mL M4
5) t	n-Undecane (C11)	12.314	74325	0.066 ug/mL M4
6) t	n-Dodecane (C12)	14.733	106402	0.093 ug/mL M4
7) t	n-Tridecane (C13)	17.032	327091	0.285 ug/mL M4
8) t	1380	18.708	244861	0.211 ug/mL M4
9) t	n-Tetradecane (C14)	19.208	672117	0.579 ug/mL M4
10) t	1470	20.488	1220803G	1.050 ug/mL M4
11) t	n-Pentadecane (C15)	21.267	988436	0.850 ug/mL M4
12) t	n-Hexadecane (C16)	23.224	1252279	1.068 ug/mL M4
13) t	1650	24.129	716613	0.615 ug/mL M4
14) t	n-Heptadecane (C17)	25.076	1443507	1.239 ug/mL M4
15) t	Pristane	25.175	1156330	0.972 ug/mL M4
16) t	n-Octadecane (C18)	26.812	6814885G	5.720 ug/mL M4
17) t	Phytane	26.989	2010620G	1.706 ug/mL M4
18) t	n-Nonadecane (C19)	28.522	800165	0.673 ug/mL M4
20) t	n-Eicosane (C20)	30.126	843323	0.702 ug/mL M4
21) t	n-Heneicosane (C21)	31.654	973889	0.808 ug/mL M4
22) t	n-Docosane (C22)	33.128	659230	0.545 ug/mL M4
23) t	n-Tricosane (C23)	34.533	2031051	1.654 ug/mL M4
25) t	n-Tetracosane (C24)	35.894	538661	0.446 ug/mL M4
26) t	n-Pentacosane (C25)	37.179	10596706G	8.616 ug/mL M4
27) t	n-Hexacosane (C26)	38.450	976516	0.799 ug/mL M4
28) t	n-Heptacosane (C27)	39.664	3772591	3.148 ug/mL M4
29) t	n-Octacosane (C28)	40.829	735193	0.607 ug/mL M4
30) t	n-Nonacosane (C29)	41.962	8092222	6.686 ug/mL M4
31) t	n-Triacontane (C30)	43.048	984314	0.822 ug/mL M4
32) t	n-Hentriacontane (C31)	44.114	4690690	3.885 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	604116	0.502 ug/mL M4
34) t	n-Tritriacontane (C33)	46.130	1376899	1.198 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.136	473919	0.393 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.638	398589	0.330 ug/mL M4
39) t	n-Octatriacontane (C38)	52.262	684524	0.570 ug/mL M4

11-16-12

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28848.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 2:38 pm
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 69 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:58:57 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

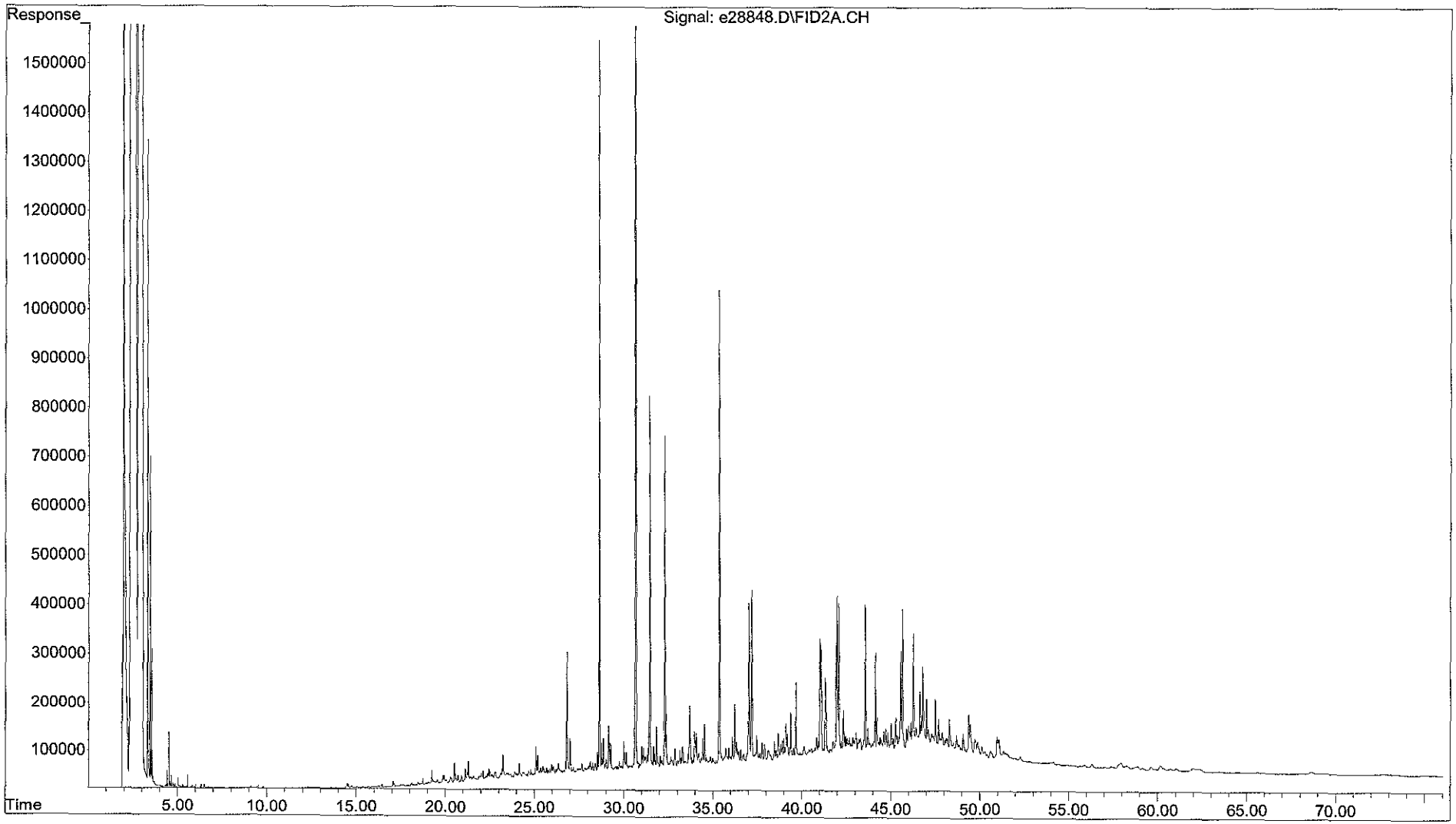
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
40)	t	n-Nonatriacontane (C39)	54.104	380549	0.334	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.290	892063	0.784	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	2085900798	1762.344	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	1480993518	1251.268	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	357698263	302.214	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28848.D
Operator : AC
Acquired : 10 Nov 2012 2:38 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-02
Misc Info : 1X
ALS Vial : 69



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-03**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.04	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0243	U	n-Tricosane (C23)	**0.274**	
n-Decane (C10)	**0.0145**	JB	n-Tetracosane (C24)	**0.0784**	J
n-Undecane (C11)	**0.00947**	JB	n-Pentacosane (C25)	**1.51**	G
n-Dodecane (C12)	**0.0134**	J	n-Hexacosane (C26)	**0.149**	J
n-Tridecane (C13)	**0.0481**	J	n-Heptacosane (C27)	**1.01**	
2,6,10 Trimethyldodecane (1380)	**0.0402**	J	n-Octacosane (C28)	**0.106**	J
n-Tetradecane (C14)	**0.0968**	J	n-Nonacosane (C29)	**1.54**	
2,6,10 Trimethyltridecane (1470)	**0.164**	GJ	n-Triacontane (C30)	**0.140**	J
n-Pentadecane (C15)	**0.152**	J	n-Hentriacontane (C31)	**0.648**	
n-Hexadecane (C16)	**0.189**		n-Dotriacontane (C32)	**0.0879**	J
Norpristane (1650)	**0.0947**	J	n-Tritriacontane (C33)	**0.174**	J
n-Heptadecane (C17)	**0.227**		n-Tetratriacontane (C34)	**0.0784**	J
Pristane	**0.173**	J	n-Pentatriacontane (C35)	**0.104**	J
n-Octadecane (C18)	**0.877**	G	n-Hexatriacontane (C36)	0.0297	U
Phytane	**0.244**	G	n-Heptatriacontane (C37)	**0.0431**	J
n-Nonadecane (C19)	**0.118**	J	n-Octatriacontane (C38)	**0.0779**	J
n-Eicosane (C20)	**0.125**	J	n-Nonatriacontane (C39)	0.0327	U
n-Heneicosane (C21)	**0.109**	J	n-Tetracontane (C40)	**0.0774**	J
n-Docosane (C22)	**0.104**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**8.90**
Total Petroleum Hydrocarbons (C9-C44)	**225**
Total Resolved Hydrocarbons	**52.2**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	85	40-125
d50-Tetracosane	84	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28850.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 4:08 pm
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 70 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:00:05 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.667	72015177	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.644	32279338	21.223 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	42.45%#
24) s	d50-Tetracosane	35.364	25979825	21.083 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	42.17%#
	Target Compounds			
2) t	n-Octane (C8)	5.215	11890	0.010 ug/mL M4
4) t	n-Decane (C10)	9.814	99286	0.081 ug/mL M4
5) t	n-Undecane (C11)	12.307	65835	0.053 ug/mL M4
6) t	n-Dodecane (C12)	14.726	95246	0.075 ug/mL M4
7) t	n-Tridecane (C13)	17.029	341636	0.269 ug/mL M4
8) t	1380	18.706	288748	0.225 ug/mL M4
9) t	n-Tetradecane (C14)	19.205	696243	0.542 ug/mL M4
10) t	1470	20.489	1182206G	0.919 ug/mL M4
11) t	n-Pentadecane (C15)	21.266	1091751	0.849 ug/mL M4
12) t	n-Hexadecane (C16)	23.222	1372559	1.058 ug/mL M4
13) t	1650	24.129	683014	0.530 ug/mL M4
14) t	n-Heptadecane (C17)	25.074	1634650	1.268 ug/mL M4
15) t	Pristane	25.171	1276954	0.970 ug/mL M4
16) t	n-Octadecane (C18)	26.812	6472199G	4.910 ug/mL M4
17) t	Phytane	26.990	1781314G	1.366 ug/mL M4
18) t	n-Nonadecane (C19)	28.520	867625	0.659 ug/mL M4
20) t	n-Eicosane (C20)	30.127	928703	0.699 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	813286	0.610 ug/mL M4
22) t	n-Docosane (C22)	33.128	777697	0.581 ug/mL M4
23) t	n-Tricosane (C23)	34.535	2083747	1.534 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	585739	0.439 ug/mL M4
26) t	n-Pentacosane (C25)	37.178	11516249G	8.463 ug/mL M4
27) t	n-Hexacosane (C26)	38.449	1127937	0.834 ug/mL M4
28) t	n-Heptacosane (C27)	39.664	7496872	5.654 ug/mL M4
29) t	n-Octacosane (C28)	40.831	791879	0.591 ug/mL M4
30) t	n-Nonacosane (C29)	41.967	11567523	8.638 ug/mL M4
31) t	n-Triacontane (C30)	43.050	1037727	0.784 ug/mL M4
32) t	n-Hentriacontane (C31)	44.113	4847840	3.629 ug/mL M4
33) t	n-Dotriacontane (C32)	45.132	655049	0.492 ug/mL M4
34) t	n-Tritriacontane (C33)	46.133	1236931	0.973 ug/mL M4
35) t	n-tetratriacontane (C34)	47.108	575739	0.439 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.143	777124	0.582 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.630	321931	0.241 ug/mL M4
39) t	n-Octatriacontane (C38)	52.251	579787	0.436 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28850.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 4:08 pm
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 70 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:00:05 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

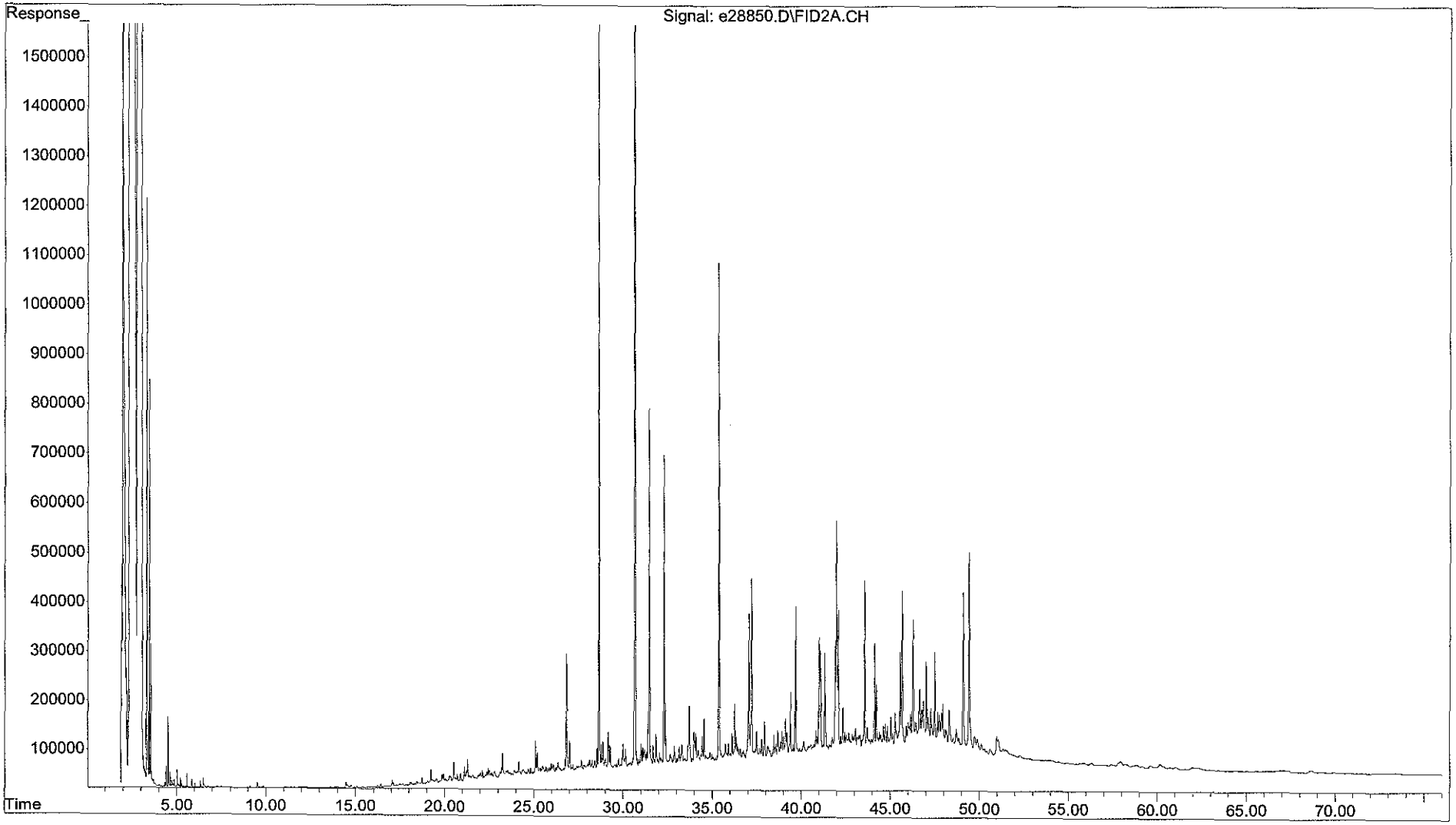
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
41)	t	n-Tetracontane (C40)	56.301	545345	0.433	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	2253617083	1720.864	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	1648709803	1258.956	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	382927687	292.404	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28850.D
Operator : AC
Acquired : 10 Nov 2012 4:08 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-03
Misc Info : 1X
ALS Vial : 70



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-04**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.05	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0243	U	n-Tricosane (C23)	**0.310**	
n-Decane (C10)	**0.0161**	JB	n-Tetracosane (C24)	**0.0787**	J
n-Undecane (C11)	**0.00964**	JB	n-Pentacosane (C25)	**2.06**	G
n-Dodecane (C12)	**0.0136**	J	n-Hexacosane (C26)	**0.159**	J
n-Tridecane (C13)	**0.0487**	J	n-Heptacosane (C27)	**0.853**	
2,6,10 Trimethyldodecane (1380)	**0.0384**	J	n-Octacosane (C28)	**0.114**	J
n-Tetradecane (C14)	**0.101**	J	n-Nonacosane (C29)	**1.28**	
2,6,10 Trimethyltridecane (1470)	**0.187**	G	n-Triacontane (C30)	**0.157**	J
n-Pentadecane (C15)	**0.147**	J	n-Hentriacontane (C31)	**0.646**	
n-Hexadecane (C16)	**0.221**		n-Dotriacontane (C32)	**0.0866**	J
Norpristane (1650)	**0.116**	J	n-Tritriacontane (C33)	**0.215**	
n-Heptadecane (C17)	**0.226**		n-Tetratriacontane (C34)	0.0239	U
Pristane	**0.182**		n-Pentatriacontane (C35)	**0.0714**	J
n-Octadecane (C18)	**1.67**	G	n-Hexatriacontane (C36)	0.0296	U
Phytane	**0.391**	G	n-Heptatriacontane (C37)	**0.0457**	J
n-Nonadecane (C19)	**0.123**	J	n-Octatriacontane (C38)	**0.0761**	J
n-Eicosane (C20)	**0.141**	J	n-Nonatriacontane (C39)	0.0327	U
n-Heneicosane (C21)	**0.113**	J	n-Tetracontane (C40)	**0.115**	J
n-Docosane (C22)	**0.106**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**10.1**
Total Petroleum Hydrocarbons (C9-C44)	**253**
Total Resolved Hydrocarbons	**60.7**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	88	40-125
d50-Tetracosane	88	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28852.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 5:38 pm
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 71 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:44:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.668	68571619	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.643	31963318	22.070 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	44.14%#
24) s	d50-Tetracosane	35.365	25813616	22.000 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	44.00%#
	Target Compounds			
2) t	n-Octane (C8)	5.217	13336	0.012 ug/mL M4
4) t	n-Decane (C10)	9.816	105953	0.090 ug/mL M4
5) t	n-Undecane (C11)	12.309	63574	0.054 ug/mL M4
6) t	n-Dodecane (C12)	14.728	91506	0.076 ug/mL M4
7) t	n-Tridecane (C13)	17.030	330305	0.273 ug/mL M4
8) t	1380	18.706	262746	0.215 ug/mL M4
9) t	n-Tetradecane (C14)	19.206	693347	0.567 ug/mL M4
10) t	1470	20.485	1286283G	1.050 ug/mL M4
11) t	n-Pentadecane (C15)	21.267	1010548	0.825 ug/mL M4
12) t	n-Hexadecane (C16)	23.221	1530294	1.239 ug/mL M4
13) t	1650	24.129	800606	0.652 ug/mL M4
14) t	n-Heptadecane (C17)	25.075	1555690	1.268 ug/mL M4
15) t	Pristane	25.171	1278556	1.020 ug/mL M4
16) t	n-Octadecane (C18)	26.813	11734656G	9.350 ug/mL M4
17) t	Phytane	26.984	2721048G	2.192 ug/mL M4
18) t	n-Nonadecane (C19)	28.521	865443	0.691 ug/mL M4
20) t	n-Eicosane (C20)	30.125	997592	0.789 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	806263	0.635 ug/mL M4
22) t	n-Docosane (C22)	33.127	759037	0.596 ug/mL M4
23) t	n-Tricosane (C23)	34.531	2247982	1.738 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	560856	0.441 ug/mL M4
26) t	n-Pentacosane (C25)	37.179	14985739G	11.565 ug/mL M4
27) t	n-Hexacosane (C26)	38.450	1143642	0.888 ug/mL M4
28) t	n-Heptacosane (C27)	39.662	6032231	4.778 ug/mL M4
29) t	n-Octacosane (C28)	40.831	812136	0.637 ug/mL M4
30) t	n-Nonacosane (C29)	41.962	9132183	7.162 ug/mL M4
31) t	n-Triacontane (C30)	43.043	1112416	0.882 ug/mL M4
32) t	n-Hentriacontane (C31)	44.111	4601496	3.618 ug/mL M4
33) t	n-Dotriacontane (C32)	45.133	614891	0.485 ug/mL M4
34) t	n-Tritriacontane (C33)	46.127	1456790	1.203 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.137	508720	0.400 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.635	324940	0.256 ug/mL M4
39) t	n-Octatriacontane (C38)	52.256	539751	0.426 ug/mL M4
41) t	n-Tetracontane (C40)	56.292	774146	0.646 ug/mL M4

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28852.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 5:38 pm
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 71 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:44:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

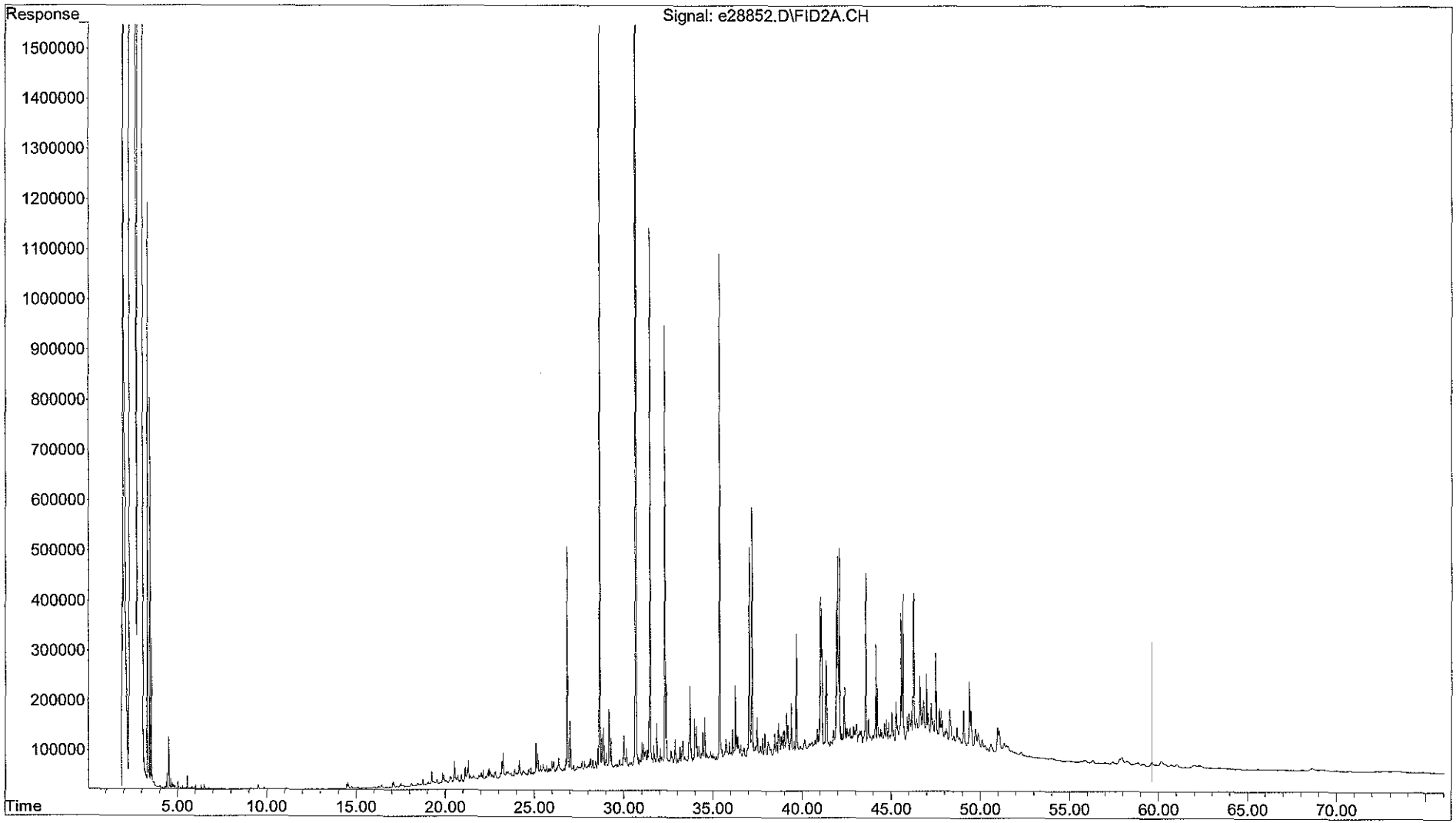
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
42) h	C9-C44 Total Petroleu...	38.728	2369346692	1900.092	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	1764439412	1414.988	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	424139313	340.138	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28852.D
Operator : AC
Acquired : 10 Nov 2012 5:38 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-04
Misc Info : 1X
ALS Vial : 71



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-05**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.06	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0243	U	n-Tricosane (C23)	**0.280**	
n-Decane (C10)	**0.0150**	JB	n-Tetracosane (C24)	**0.0808**	J
n-Undecane (C11)	**0.00946**	JB	n-Pentacosane (C25)	**1.67**	G
n-Dodecane (C12)	**0.0139**	J	n-Hexacosane (C26)	**0.150**	J
n-Tridecane (C13)	**0.0448**	J	n-Heptacosane (C27)	**0.928**	
2,6,10 Trimethyldodecane (1380)	**0.0360**	J	n-Octacosane (C28)	**0.114**	J
n-Tetradecane (C14)	**0.0960**	J	n-Nonacosane (C29)	**1.51**	
2,6,10 Trimethyltridecane (1470)	**0.188**	G	n-Triacontane (C30)	**0.157**	J
n-Pentadecane (C15)	**0.141**	J	n-Hentriacontane (C31)	**0.690**	
n-Hexadecane (C16)	**0.194**		n-Dotriacontane (C32)	**0.0824**	J
Norpristane (1650)	**0.110**	J	n-Tritriacontane (C33)	**0.186**	
n-Heptadecane (C17)	**0.220**		n-Tetratriacontane (C34)	0.0239	U
Pristane	**0.165**	J	n-Pentatriacontane (C35)	**0.0673**	J
n-Octadecane (C18)	**1.11**	G	n-Hexatriacontane (C36)	0.0296	U
Phytane	**0.320**	G	n-Heptatriacontane (C37)	**0.0639**	J
n-Nonadecane (C19)	**0.119**	J	n-Octatriacontane (C38)	**0.0858**	J
n-Eicosane (C20)	**0.137**	J	n-Nonatriacontane (C39)	0.0327	U
n-Heneicosane (C21)	**0.106**	J	n-Tetracontane (C40)	**0.0930**	J
n-Docosane (C22)	**0.101**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**9.28**
Total Petroleum Hydrocarbons (C9-C44)	**246**
Total Resolved Hydrocarbons	**57.3**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	88	40-125
d50-Tetracosane	87	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28854.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:08 pm
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 72 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:02:18 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.665	64945257	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.641	30155788	21.985 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.97%#
24) s	d50-Tetracosane	35.362	24276878	21.846 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.69%#
	Target Compounds			
2) t	n-Octane (C8)	5.219	10646	0.010 ug/mL M4
4) t	n-Decane (C10)	9.817	93286	0.084 ug/mL M4
5) t	n-Undecane (C11)	12.309	60003	0.053 ug/mL M4
6) t	n-Dodecane (C12)	14.727	89366	0.078 ug/mL M4
7) t	n-Tridecane (C13)	17.028	288287	0.251 ug/mL M4
8) t	1380	18.705	234129	0.202 ug/mL M4
9) t	n-Tetradecane (C14)	19.205	622900	0.538 ug/mL M4
10) t	1470	20.485	1221715G	1.053 ug/mL M4
11) t	n-Pentadecane (C15)	21.267	913918	0.788 ug/mL M4
12) t	n-Hexadecane (C16)	23.220	1271304	1.087 ug/mL M4
13) t	1650	24.131	717980	0.618 ug/mL M4
14) t	n-Heptadecane (C17)	25.075	1431954	1.232 ug/mL M4
15) t	Pristane	25.171	1095000	0.922 ug/mL M4
16) t	n-Octadecane (C18)	26.810	7384267G	6.212 ug/mL M4
17) t	Phytane	26.987	2110353G	1.795 ug/mL M4
18) t	n-Nonadecane (C19)	28.521	792553	0.668 ug/mL M4
20) t	n-Eicosane (C20)	30.124	917331	0.766 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	713167	0.593 ug/mL M4
22) t	n-Docosane (C22)	33.127	682262	0.566 ug/mL M4
23) t	n-Tricosane (C23)	34.532	1923828	1.570 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	545431	0.453 ug/mL M4
26) t	n-Pentacosane (C25)	37.177	11491938G	9.364 ug/mL M4
27) t	n-Hexacosane (C26)	38.449	1023239	0.839 ug/mL M4
28) t	n-Heptacosane (C27)	39.659	6218359	5.200 ug/mL M4
29) t	n-Octacosane (C28)	40.829	771664	0.639 ug/mL M4
30) t	n-Nonacosane (C29)	41.963	10216729	8.460 ug/mL M4
31) t	n-Triacontane (C30)	43.047	1050697	0.880 ug/mL M4
32) t	n-Hentriacontane (C31)	44.110	4659551	3.868 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	554542	0.462 ug/mL M4
34) t	n-Tritriacontane (C33)	46.128	1193384	1.041 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.129	454300	0.377 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.628	431607	0.358 ug/mL M4
39) t	n-Octatriacontane (C38)	52.253	577049	0.481 ug/mL M4
41) t	n-Tetracontane (C40)	56.282	591536	0.521 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28854.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:08 pm
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 72 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:02:18 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

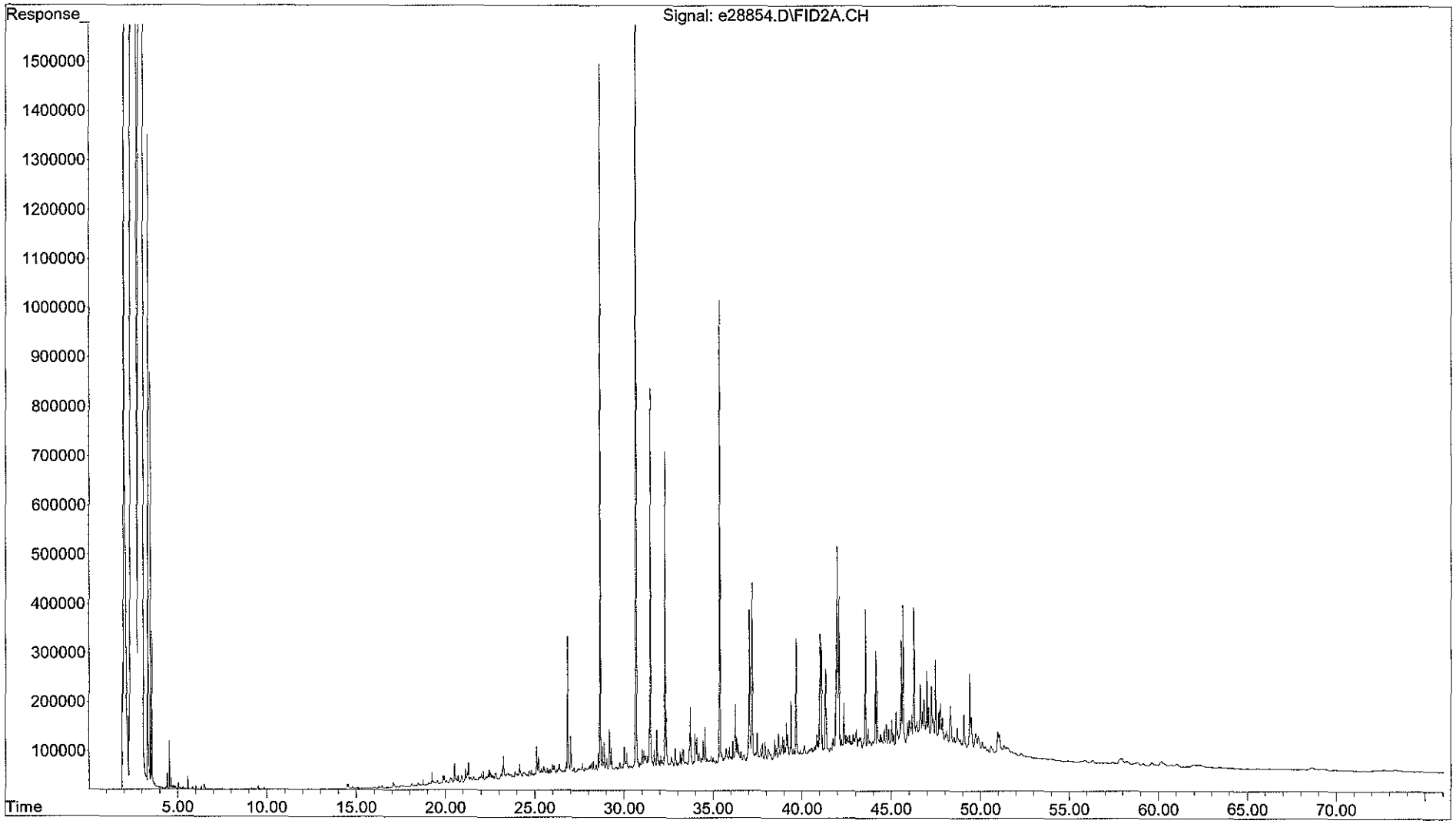
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
42) h	C9-C44 Total Petroleu...	38.728	2234536594	1892.041	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	1629629314	1379.850	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	379219358	321.095	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28854.D
Operator : AC
Acquired : 10 Nov 2012 7:08 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-05
Misc Info : 1X
ALS Vial : 72



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-06**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.01	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00304**	J	n-Tricosane (C23)	**0.288**	
n-Decane (C10)	**0.0168**	JB	n-Tetracosane (C24)	**0.0909**	J
n-Undecane (C11)	**0.0184**	JB	n-Pentacosane (C25)	**1.80**	G
n-Dodecane (C12)	**0.0440**	J	n-Hexacosane (C26)	**0.163**	J
n-Tridecane (C13)	**0.0874**	J	n-Heptacosane (C27)	**0.760**	
2,6,10 Trimethyldodecane (1380)	**0.0430**	J	n-Octacosane (C28)	**0.103**	J
n-Tetradecane (C14)	**0.146**	J	n-Nonacosane (C29)	**1.27**	
2,6,10 Trimethyltridecane (1470)	**0.204**	G	n-Triacontane (C30)	**0.165**	J
n-Pentadecane (C15)	**0.223**		n-Hentriacontane (C31)	**0.698**	
n-Hexadecane (C16)	**0.223**		n-Dotriacontane (C32)	**0.0849**	J
Norpristane (1650)	**0.111**	J	n-Tritriacontane (C33)	**0.204**	
n-Heptadecane (C17)	**0.277**		n-Tetratriacontane (C34)	0.0240	U
Pristane	**0.202**		n-Pentatriacontane (C35)	**0.0750**	J
n-Octadecane (C18)	**1.06**	G	n-Hexatriacontane (C36)	0.0297	U
Phytane	**0.302**	G	n-Heptatriacontane (C37)	0.0304	U
n-Nonadecane (C19)	**0.151**	J	n-Octatriacontane (C38)	**0.0965**	J
n-Eicosane (C20)	**0.161**	J	n-Nonatriacontane (C39)	0.0328	U
n-Heneicosane (C21)	**0.125**	J	n-Tetracontane (C40)	**0.0900**	J
n-Docosane (C22)	**0.124**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**9.41**
Total Petroleum Hydrocarbons (C9-C44)	**257**
Total Resolved Hydrocarbons	**58.8**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	88	40-125
d50-Tetracosane	89	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28856.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 8:37 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 73 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:44:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	64919954	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.640	30028076	21.900 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	43.80%#
24) s	d50-Tetracosane	35.361	24704087	22.239 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	44.48%#
	Target Compounds			
2) t	n-Octane (C8)	5.215	16152	0.015 ug/mL M4
3) t	n-Nonane (C9)	7.359	18623	0.017 ug/mL M4
4) t	n-Decane (C10)	9.815	104360	0.094 ug/mL M4
5) t	n-Undecane (C11)	12.312	115276	0.103 ug/mL M4
6) t	n-Dodecane (C12)	14.728	280518	0.246 ug/mL M4
7) t	n-Tridecane (C13)	17.029	559547	0.488 ug/mL M4
8) t	1380	18.705	277202	0.240 ug/mL M4
9) t	n-Tetradecane (C14)	19.205	944193	0.816 ug/mL M4
10) t	1470	20.484	1319749G	1.138 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	1442571	1.244 ug/mL M4
12) t	n-Hexadecane (C16)	23.219	1459175	1.248 ug/mL M4
13) t	1650	24.129	721743	0.621 ug/mL M4
14) t	n-Heptadecane (C17)	25.074	1799708	1.549 ug/mL M4
15) t	Pristane	25.172	1339271	1.129 ug/mL M4
16) t	n-Octadecane (C18)	26.810	7026535G	5.913 ug/mL M4
17) t	Phytane	26.987	1984472G	1.689 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1003318	0.846 ug/mL M4
20) t	n-Eicosane (C20)	30.121	1080751	0.902 ug/mL M4
21) t	n-Heneicosane (C21)	31.655	837234	0.696 ug/mL M4
22) t	n-Docosane (C22)	33.122	831500	0.690 ug/mL M4
23) t	n-Tricosane (C23)	34.530	1971686	1.610 ug/mL M4
25) t	n-Tetracosane (C24)	35.894	611072	0.508 ug/mL M4
26) t	n-Pentacosane (C25)	37.176	12331292G	10.052 ug/mL M4
27) t	n-Hexacosane (C26)	38.448	1110052	0.911 ug/mL M4
28) t	n-Heptacosane (C27)	39.660	5074933	4.246 ug/mL M4
29) t	n-Octacosane (C28)	40.829	697308	0.578 ug/mL M4
30) t	n-Nonacosane (C29)	41.961	8547143	7.080 ug/mL M4
31) t	n-Triacontane (C30)	43.046	1103406	0.924 ug/mL M4
32) t	n-Hentriacontane (C31)	44.110	4697734	3.901 ug/mL M4
33) t	n-Dotriacontane (C32)	45.128	569027	0.474 ug/mL M4
34) t	n-Tritriacontane (C33)	46.127	1306545	1.140 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.126	504632	0.419 ug/mL M4
39) t	n-Octatriacontane (C38)	52.256	646273	0.539 ug/mL M4
41) t	n-Tetracontane (C40)	56.283	570764	0.503 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28856.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 8:37 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 73 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:44:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

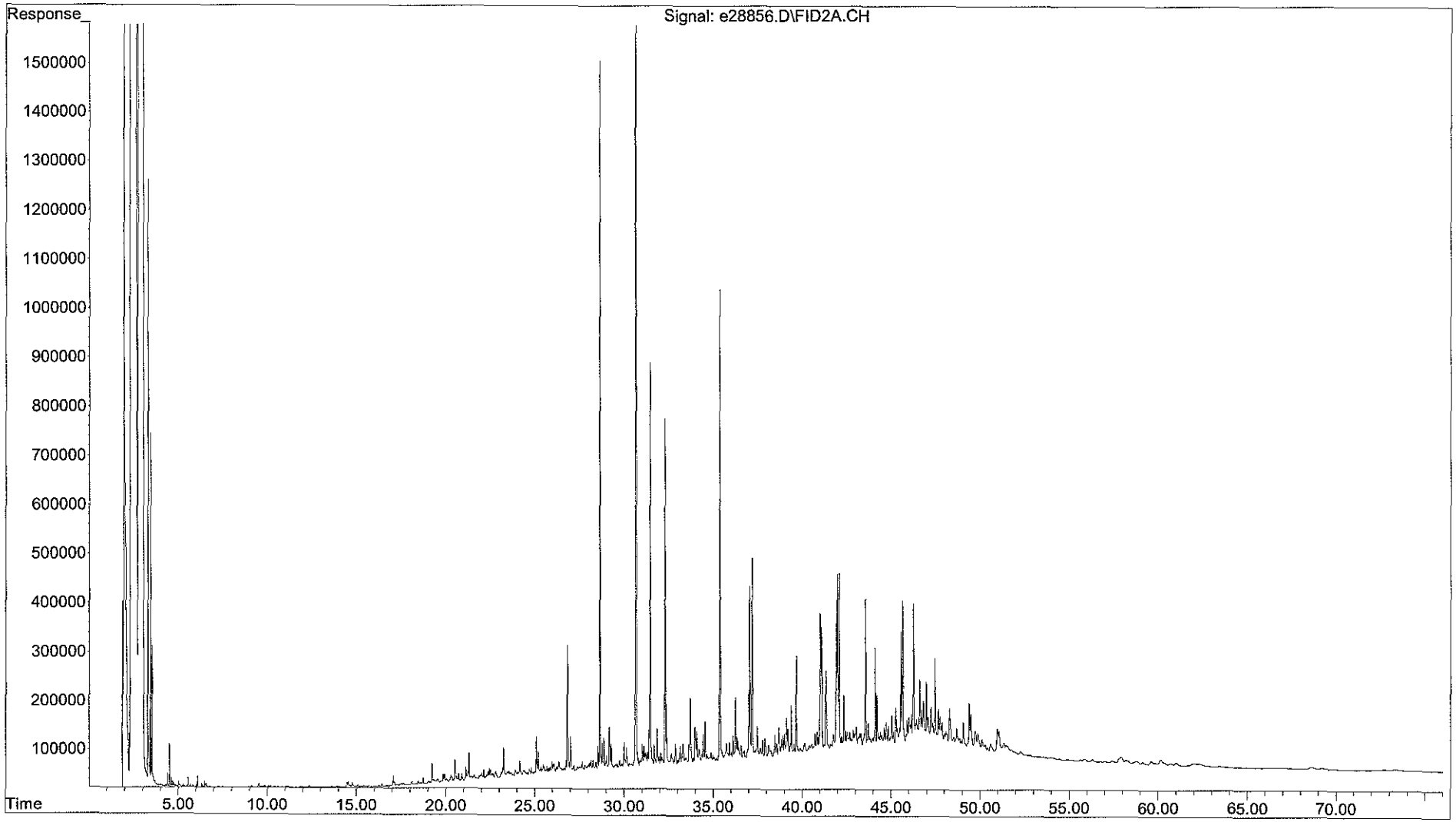
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
42) h	C9-C44 Total Petroleu...	38.728	2302596563	1950.429	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	1697689283	1438.038	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	388114158	328.754	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28856.D
Operator : AC
Acquired : 10 Nov 2012 8:37 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-06
Misc Info : 1X
ALS Vial : 73



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR0000R024S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **1210081-07**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/10/12	74.4	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0244	U	n-Tricosane (C23)	**0.292**	
n-Decane (C10)	**0.0179**	JB	n-Tetracosane (C24)	**0.0756**	J
n-Undecane (C11)	**0.0109**	JB	n-Pentacosane (C25)	**2.13**	G
n-Dodecane (C12)	**0.0204**	J	n-Hexacosane (C26)	**0.155**	J
n-Tridecane (C13)	**0.0545**	J	n-Heptacosane (C27)	**0.634**	
2,6,10 Trimethyldodecane (1380)	**0.0428**	J	n-Octacosane (C28)	**0.101**	J
n-Tetradecane (C14)	**0.107**	J	n-Nonacosane (C29)	**1.36**	
2,6,10 Trimethyltridecane (1470)	**0.218**	G	n-Triacontane (C30)	**0.186**	
n-Pentadecane (C15)	**0.162**	J	n-Hentriacontane (C31)	**0.653**	
n-Hexadecane (C16)	**0.236**		n-Dotriacontane (C32)	**0.0958**	J
Norpristane (1650)	**0.155**	J	n-Tritriacontane (C33)	**0.241**	
n-Heptadecane (C17)	**0.258**		n-Tetratriacontane (C34)	0.0240	U
Pristane	**0.197**		n-Pentatriacontane (C35)	**0.0975**	J
n-Octadecane (C18)	**1.65**	G	n-Hexatriacontane (C36)	0.0297	U
Phytane	**0.458**	G	n-Heptatriacontane (C37)	**0.0724**	J
n-Nonadecane (C19)	**0.127**	J	n-Octatriacontane (C38)	**0.152**	J
n-Eicosane (C20)	**0.134**	J	n-Nonatriacontane (C39)	**0.0688**	J
n-Heneicosane (C21)	**0.114**	J	n-Tetracontane (C40)	**0.152**	J
n-Docosane (C22)	**0.111**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**10.5**
Total Petroleum Hydrocarbons (C9-C44)	**275**
Total Resolved Hydrocarbons	**65.8**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	87	40-125
d50-Tetracosane	88	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28858.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 10:06 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 74 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:44:32 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.662	66745977	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.639	30729420	21.798 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	43.60%#
24) s	d50-Tetracosane	35.361	25247773	22.106 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	44.21%#
	Target Compounds			
2) t	n-Octane (C8)	5.220	14194	0.013 ug/mL M4
4) t	n-Decane (C10)	9.816	113518	0.100 ug/mL M4
5) t	n-Undecane (C11)	12.311	70694	0.061 ug/mL M4
6) t	n-Dodecane (C12)	14.730	133203	0.114 ug/mL M4
7) t	n-Tridecane (C13)	17.030	358597	0.304 ug/mL M4
8) t	1380	18.704	284280	0.239 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	709199	0.596 ug/mL M4
10) t	1470	20.481	1448782G	1.215 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1077636	0.904 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	1580419	1.315 ug/mL M4
13) t	1650	24.126	1035446	0.867 ug/mL M4
14) t	n-Heptadecane (C17)	25.073	1721755	1.441 ug/mL M4
15) t	Pristane	25.173	1339102	1.098 ug/mL M4
16) t	n-Octadecane (C18)	26.809	11263964G	9.220 ug/mL M4
17) t	Phytane	26.983	3085908G	2.554 ug/mL M4
18) t	n-Nonadecane (C19)	28.517	865735	0.710 ug/mL M4
20) t	n-Eicosane (C20)	30.121	918673	0.746 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	785087	0.635 ug/mL M4
22) t	n-Docosane (C22)	33.122	771414	0.622 ug/mL M4
23) t	n-Tricosane (C23)	34.525	2053973	1.631 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	522469	0.422 ug/mL M4
26) t	n-Pentacosane (C25)	37.177	15021679G	11.910 ug/mL M4
27) t	n-Hexacosane (C26)	38.446	1082397	0.864 ug/mL M4
28) t	n-Heptacosane (C27)	39.660	4347635	3.538 ug/mL M4
29) t	n-Octacosane (C28)	40.827	702450	0.566 ug/mL M4
30) t	n-Nonacosane (C29)	41.959	9428229	7.597 ug/mL M4
31) t	n-Triacontane (C30)	43.041	1275608	1.039 ug/mL M4
32) t	n-Hentriacontane (C31)	44.108	4515073	3.647 ug/mL M4
33) t	n-Dotriacontane (C32)	45.130	660565	0.535 ug/mL m
34) t	n-Tritriacontane (C33)	46.122	1584975	1.345 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.131	673330	0.544 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.661	499523	0.404 ug/mL M4
39) t	n-Octatriacontane (C38)	52.253	1042501	0.846 ug/mL M4
40) t	n-Nonatriacontane (C39)	54.079	448610	0.384 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28858.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 10:06 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 74 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:44:32 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091203R
Blank File : e28864.D

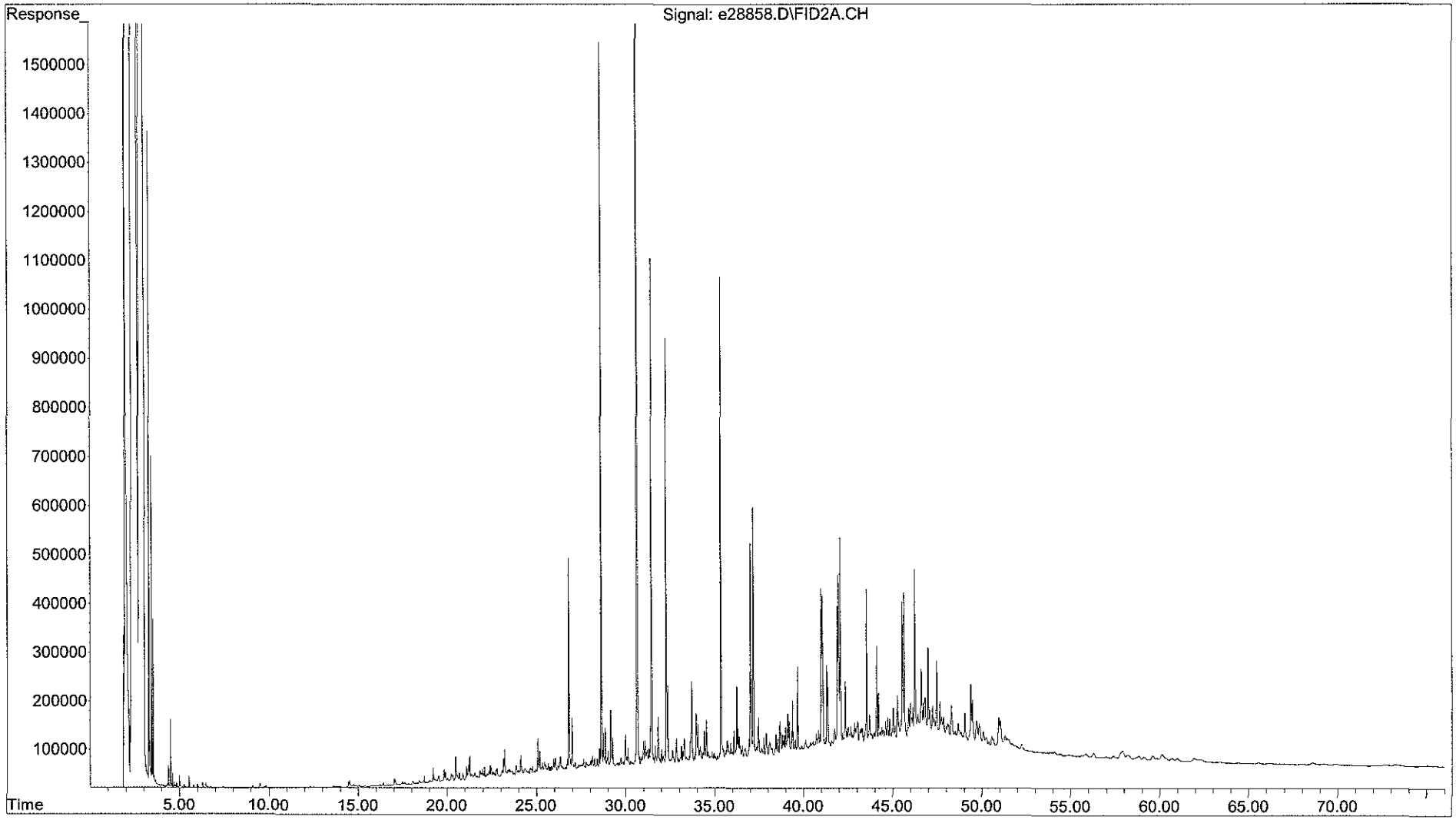
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
41)	t	n-Tetracontane (C40)	56.275	990174	0.849	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	2468480916	2033.738	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	1863573636	1535.366	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	445496230	367.037	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28858.D
Operator : AC
Acquired : 10 Nov 2012 10:06 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210081-07
Misc Info : 1X
ALS Vial : 74



Response Factor Report PAH2

Method Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Method File : HC2090412R.M
Title : FID Forensics
Last Update : Fri Sep 07 14:14:19 2012
Response Via : Initial Calibration

Calibration Files
1 =E27100.D 10 =E27102.D 50 =E27104.D 100 =E27106.D 200 =E27108.D 500 =E27110.D

		Compound	1	10	50	100	200	500	Avg	%RSD
1)	I	5-alpha-androstane	ISTD							
2)	t	n-Octane (C8)	0.811	0.826	0.805	0.799	0.784		0.805	1.89
3)	t	n-Nonane (C9)	0.827	0.841	0.820	0.824	0.802		0.823	1.70
4)	t	n-Decane (C10)	0.845	0.875	0.852	0.863	0.836		0.854	1.77
5)	t	n-Undecane (C11)	0.852	0.884	0.862	0.874	0.846		0.864	1.79
6)	t	n-Dodecane (C12)	0.860	0.900	0.878	0.891	0.861		0.878	2.06
7)	t	n-Tridecane (...	0.874	0.904	0.882	0.894	0.862		0.883	1.86
8)	t	1380	0.885	0.912	0.889	0.901	0.868		0.891	1.89
9)	t	n-Tetradecane...	0.885	0.912	0.889	0.901	0.868		0.891	1.89
10)	t	1470	0.900	0.912	0.889	0.899	0.865		0.893	1.98
11)	t	n-Pentadecane...	0.900	0.912	0.889	0.899	0.865		0.893	1.98
12)	t	n-Hexadecane ...	0.897	0.923	0.899	0.909	0.875		0.900	1.95
13)	t	1650	0.889	0.914	0.891	0.904	0.876		0.895	1.64
14)	t	n-Heptadecane...	0.889	0.914	0.891	0.904	0.876		0.895	1.64
15)	t	Pristane	0.917	0.943	0.915	0.921	0.874		0.914	2.72
16)	t	n-Octadecane ...	0.916	0.939	0.913	0.923	0.885		0.915	2.15
17)	t	Phytane	0.906	0.930	0.903	0.912	0.874		0.905	2.26
18)	t	n-Nonadecane ...	0.915	0.939	0.912	0.920	0.882		0.914	2.23
19)	s	ortho-terphenyl	1.059	1.146	0.999	1.018	0.983	1.131	1.056	6.50
20)	t	n-Eicosane (C20)	0.930	0.948	0.920	0.927	0.887		0.922	2.40
21)	t	n-Heneicosane...	0.952	0.950	0.919	0.925	0.885		0.926	2.96
22)	t	n-Docosane (C22)	0.939	0.957	0.927	0.931	0.890		0.929	2.64
23)	t	n-Tricosane (...	1.012	0.958	0.926	0.930	0.888		0.943	4.88
24)	s	d50-Tetracosane	0.856	0.953	0.833	0.811	0.780	0.901	0.856	7.35
25)	t	n-Tetracosane...	0.950	0.956	0.923	0.925	0.882		0.927	3.13
26)	t	n-Pentacosane...	0.962	0.977	0.943	0.943	0.900		0.945	3.07
27)	t	n-Hexacosane ...	0.959	0.972	0.936	0.935	0.891		0.939	3.27
28)	t	n-Heptacosane...	0.949	0.952	0.916	0.914	0.871		0.921	3.58
29)	t	n-Octacosane ...	0.961	0.963	0.924	0.922	0.879		0.930	3.68
30)	t	n-Nonacosane ...	0.954	0.965	0.925	0.923	0.881		0.930	3.51
31)	t	n-Triacontane...	0.953	0.952	0.911	0.910	0.870		0.919	3.77
32)	t	n-Hentriacont...	0.958	0.962	0.920	0.919	0.879		0.928	3.63
33)	t	n-Dotriaconta...	0.953	0.958	0.916	0.916	0.878		0.924	3.54
34)	t	n-Tritriacont...	0.910	0.915	0.874	0.876	0.839		0.883	3.48
35)	t	n-tetratriaco...	0.939	0.943	0.902	0.905	0.867		0.911	3.40
36)	t	n-Pentatriaco...	0.952	0.960	0.919	0.922	0.884		0.927	3.24
37)	t	n-Hexatriacon...	0.981	0.978	0.938	0.941	0.902		0.948	3.46
38)	t	n-Heptatriaco...	0.951	0.958	0.920	0.923	0.884		0.927	3.16
39)	t	n-Octatriacon...	0.952	0.951	0.915	0.918	0.879		0.923	3.26
40)	t	n-Nonatriacon...	0.899	0.901	0.867	0.870	0.834		0.874	3.15
41)	t	n-Tetracontan...	0.899	0.901	0.867	0.870	0.834		0.874	3.15
42)	h	C9-C44 Total ...	0.924	0.936	0.904	0.909	0.872		0.909	2.67
43)	h	C9-C40 Total ...	0.924	0.936	0.904	0.909	0.872		0.909	2.67
44)	h	C10-C28 DRO	0.924	0.936	0.904	0.909	0.872		0.909	2.67
45)	h	Total Resolve...	0.924	0.936	0.904	0.909	0.872		0.909	2.67

(#) = Out of Range

HC2090412R.M Fri Sep 07 14:43:18 2012

rfupdate

RSF Update Summary Report

Method Path.....: O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Method File.....: HC2090412R.M
Method Title.....: FID Forensics
Last Update.....: Fri Sep 07 13:35:53 2012

Generating Average Response Factor For: C9-C44 Total Petroleum Hydrocarbons

No	Compound	Level	Conc	Response
1	n-Nonane (C9)	1	1.00000	1058594.832
2	n-Decane (C10)	1	1.00000	1081680.094
3	n-Undecane (C11)	1	1.00000	1090605.419
4	n-Dodecane (C12)	1	1.00000	1100096.066
5	n-Tridecane (C13)	1	1.00000	1118594.131
6	n-Tetradecane (C14)	1	1.00000	1131811.217
7	n-Pentadecane (C15)	1	1.00000	1152025.742
8	n-Hexadecane (C16)	1	1.00000	1147414.030
9	n-Heptadecane (C17)	1	1.00000	1137165.347
10	Pristane	1	1.00000	1173645.774
11	n-Octadecane (C18)	1	1.00000	1172041.065
12	Phytane	1	1.00000	1159670.706
13	n-Nonadecane (C19)	1	1.00000	1170948.694
14	n-Eicosane (C20)	1	1.00000	1189205.460
15	n-Heneicosane (C21)	1	1.00000	1218462.382
16	n-Docosane (C22)	1	1.00000	1200777.971
17	n-Tricosane (C23)	1	1.00000	1295230.182
18	n-Tetracosane (C24)	1	1.00000	1215267.007
19	n-Pentacosane (C25)	1	1.00000	1230493.463
20	n-Hexacosane (C26)	1	1.00000	1227506.722
21	n-Heptacosane (C27)	1	1.00000	1214572.774
22	n-Octacosane (C28)	1	1.00000	1229079.729
23	n-Nonacosane (C29)	1	1.00000	1220303.287
24	n-Triacontane (C30)	1	1.00000	1219155.295
25	n-Hentriacontane (C31)	1	1.00000	1225588.003
26	n-Dotriacontane (C32)	1	1.00000	1219518.985
27	n-Tritriacontane (C33)	1	1.00000	1163577.647
28	n-tetratriacontane (C34)	1	1.00000	1201629.642
29	n-Pentatriacontane (C35)	1	1.00000	1217652.701
30	n-Hexatriacontane (C36)	1	1.00000	1255297.278
31	n-Heptatriacontane (C37)	1	1.00000	1216439.627
32	n-Octatriacontane (C38)	1	1.00000	1217319.017
33	n-Tetracontane (C40)	1	1.00000	1150188.078
Avg RSF For: C9-C44 Total Petroleum			1.00000	1182471.466
1	n-Nonane (C9)	2	10.00000	10984036.148
2	n-Decane (C10)	2	10.00000	11426913.435
3	n-Undecane (C11)	2	10.00000	11541092.695
4	n-Dodecane (C12)	2	10.00000	11759368.321
5	n-Tridecane (C13)	2	10.00000	11803720.967
6	n-Tetradecane (C14)	2	10.00000	11918135.542
7	n-Pentadecane (C15)	2	10.00000	11911917.164
8	n-Hexadecane (C16)	2	10.00000	12051235.427
9	n-Heptadecane (C17)	2	10.00000	11942187.715

		rfupdate		
10	Pristane	2	10.00000	12312714.192
11	n-Octadecane (C18)	2	10.00000	12267744.016
12	Phytane	2	10.00000	12154748.453
13	n-Nonadecane (C19)	2	10.00000	12262858.725
14	n-Eicosane (C20)	2	10.00000	12385892.855
15	n-Heneicosane (C21)	2	10.00000	12409357.102
16	n-Docosane (C22)	2	10.00000	12501279.532
17	n-Tricosane (C23)	2	10.00000	12518262.662
18	n-Tetracosane (C24)	2	10.00000	12486435.610
19	n-Pentacosane (C25)	2	10.00000	12760359.164
20	n-Hexacosane (C26)	2	10.00000	12692005.077
21	n-Heptacosane (C27)	2	10.00000	12441614.096
22	n-Octacosane (C28)	2	10.00000	12578571.784
23	n-Nonacosane (C29)	2	10.00000	12608505.444
24	n-Triacontane (C30)	2	10.00000	12441268.160
25	n-Hentriacontane (C31)	2	10.00000	12562193.326
26	n-Dotriacontane (C32)	2	10.00000	12516087.109
27	n-Tritriacontane (C33)	2	10.00000	11955175.333
28	n-tetratriacontane (C34)	2	10.00000	12319701.907
29	n-Pentatriacontane (C35)	2	10.00000	12536902.969
30	n-Hexatriacontane (C36)	2	10.00000	12781199.118
31	n-Heptatriacontane (C37)	2	10.00000	12507537.054
32	n-Octatriacontane (C38)	2	10.00000	12423624.790
33	n-Tetracontane (C40)	2	10.00000	11764410.929
Avg RSF For: C9-C44 Total Petroleum			10.00000	12228092.631

1	n-Nonane (C9)	3	50.00000	51431899.250
2	n-Decane (C10)	3	50.00000	53477708.452
3	n-Undecane (C11)	3	50.00000	54086162.221
4	n-Dodecane (C12)	3	50.00000	55112695.928
5	n-Tridecane (C13)	3	50.00000	55323499.897
6	n-Tetradecane (C14)	3	50.00000	55819898.370
7	n-Pentadecane (C15)	3	50.00000	55798198.582
8	n-Hexadecane (C16)	3	50.00000	56395639.587
9	n-Heptadecane (C17)	3	50.00000	55912409.212
10	Pristane	3	50.00000	57437430.240
11	n-Octadecane (C18)	3	50.00000	57286525.276
12	Phytane	3	50.00000	56698111.863
13	n-Nonadecane (C19)	3	50.00000	57214049.606
14	n-Eicosane (C20)	3	50.00000	57746295.867
15	n-Heneicosane (C21)	3	50.00000	57661836.730
16	n-Docosane (C22)	3	50.00000	58144372.499
17	n-Tricosane (C23)	3	50.00000	58140566.950
18	n-Tetracosane (C24)	3	50.00000	57910263.550
19	n-Pentacosane (C25)	3	50.00000	59153058.151
20	n-Hexacosane (C26)	3	50.00000	58717976.872
21	n-Heptacosane (C27)	3	50.00000	57481187.004
22	n-Octacosane (C28)	3	50.00000	58008772.195
23	n-Nonacosane (C29)	3	50.00000	58069091.972
24	n-Triacontane (C30)	3	50.00000	57200513.657
25	n-Hentriacontane (C31)	3	50.00000	57723927.186
26	n-Dotriacontane (C32)	3	50.00000	57470436.162
27	n-Tritriacontane (C33)	3	50.00000	54868096.236
28	n-tetratriacontane (C34)	3	50.00000	56607059.512
29	n-Pentatriacontane (C35)	3	50.00000	57676295.954
30	n-Hexatriacontane (C36)	3	50.00000	58855677.139
31	n-Heptatriacontane (C37)	3	50.00000	57717954.923
32	n-Octatriacontane (C38)	3	50.00000	57409255.550
33	n-Tetracontane (C40)	3	50.00000	54429678.824
Avg RSF For: C9-C44 Total Petroleum			50.00000	56757168.043

1	n-Nonane (C9)	4	100.00000	111752271.345
2	n-Decane (C10)	4	100.00000	116984897.373
3	n-Undecane (C11)	4	100.00000	118514867.736
4	n-Dodecane (C12)	4	100.00000	120843203.816
5	n-Tridecane (C13)	4	100.00000	121149783.816
6	n-Tetradecane (C14)	4	100.00000	122139240.252
7	n-Pentadecane (C15)	4	100.00000	121857533.730
8	n-Hexadecane (C16)	4	100.00000	123242271.456
9	n-Heptadecane (C17)	4	100.00000	122526770.850
10	Pristane	4	100.00000	124809058.330
11	n-Octadecane (C18)	4	100.00000	125112512.642
12	Phytane	4	100.00000	123586542.283
13	n-Nonadecane (C19)	4	100.00000	124732127.711
14	n-Eicosane (C20)	4	100.00000	125691042.797
15	n-Heneicosane (C21)	4	100.00000	125366878.886
16	n-Docosane (C22)	4	100.00000	126233873.550
17	n-Tricosane (C23)	4	100.00000	126131442.518
18	n-Tetracosane (C24)	4	100.00000	125399621.174
19	n-Pentacosane (C25)	4	100.00000	127879101.521
20	n-Hexacosane (C26)	4	100.00000	126799057.051
21	n-Heptacosane (C27)	4	100.00000	123932414.032
22	n-Octacosane (C28)	4	100.00000	125029911.858
23	n-Nonacosane (C29)	4	100.00000	125125083.556
24	n-Triacontane (C30)	4	100.00000	123385317.523
25	n-Hentriacontane (C31)	4	100.00000	124529688.560
26	n-Dotriacontane (C32)	4	100.00000	124184813.333
27	n-Tritriacontane (C33)	4	100.00000	118737875.555
28	n-tetratriacontane (C34)	4	100.00000	122711891.431
29	n-Pentatriacontane (C35)	4	100.00000	125058476.886
30	n-Hexatriacontane (C36)	4	100.00000	127622682.143
31	n-Heptatriacontane (C37)	4	100.00000	125075125.481
32	n-Octatriacontane (C38)	4	100.00000	124388237.286
33	n-Tetracontane (C40)	4	100.00000	117936987.855
Avg RSF For: C9-C44 Total Petroleum			100.00000	123286988.010

1	n-Nonane (C9)	5	200.00000	218945844.183
2	n-Decane (C10)	5	200.00000	228110991.458
3	n-Undecane (C11)	5	200.00000	230818796.408
4	n-Dodecane (C12)	5	200.00000	234831426.459
5	n-Tridecane (C13)	5	200.00000	235100149.350
6	n-Tetradecane (C14)	5	200.00000	236826645.070
7	n-Pentadecane (C15)	5	200.00000	236005456.586
8	n-Hexadecane (C16)	5	200.00000	238720267.241
9	n-Heptadecane (C17)	5	200.00000	239070404.726
10	Pristane	5	200.00000	238512894.131
11	n-Octadecane (C18)	5	200.00000	241489233.828
12	Phytane	5	200.00000	238431706.212
13	n-Nonadecane (C19)	5	200.00000	240747450.530
14	n-Eicosane (C20)	5	200.00000	242168551.102
15	n-Heneicosane (C21)	5	200.00000	241506941.187
16	n-Docosane (C22)	5	200.00000	242910758.874
17	n-Tricosane (C23)	5	200.00000	242370056.561
18	n-Tetracosane (C24)	5	200.00000	240808405.475
19	n-Pentacosane (C25)	5	200.00000	245473132.745
20	n-Hexacosane (C26)	5	200.00000	243267757.250
21	n-Heptacosane (C27)	5	200.00000	237743444.733
22	n-Octacosane (C28)	5	200.00000	239982573.735
23	n-Nonacosane (C29)	5	200.00000	240486580.739
24	n-Triacontane (C30)	5	200.00000	237389922.184

			rfupdate	
25	n-Hentriacontane (C31)	5	200.00000	239996685.433
26	n-Dotriacontane (C32)	5	200.00000	239559495.241
27	n-Tritriacontane (C33)	5	200.00000	229022990.546
28	n-tetratriacontane (C34)	5	200.00000	236682062.459
29	n-Pentatriacontane (C35)	5	200.00000	241226825.797
30	n-Hexatriacontane (C36)	5	200.00000	246080144.446
31	n-Heptatriacontane (C37)	5	200.00000	241177910.897
32	n-Octatriacontane (C38)	5	200.00000	239930610.526
33	n-Tetracontane (C40)	5	200.00000	227487481.370
Avg RSF For: C9-C44 Total Petroleum			200.00000	237966169.621

Generating Reference Response Factors

No	Compound	No	Refrence Compound
8	1380	9	n-Tetradecane (C14)
10	1470	11	n-Pentadecane (C15)
13	1650	14	n-Heptadecane (C17)
40	n-Nonatriacontane (C39)	41	n-Tetracontane (C40)
43	C9-C40 Total Petroleum Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons
44	C10-C28 DRO	42	C9-C44 Total Petroleum Hydrocarbons
45	Total Resolved Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons

Abacus Response Factor Update Macro Ver. 1.0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27100.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 4:46 pm
Operator : AC
Sample : I209041201R
Misc : WHAO93
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 11:46:48 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

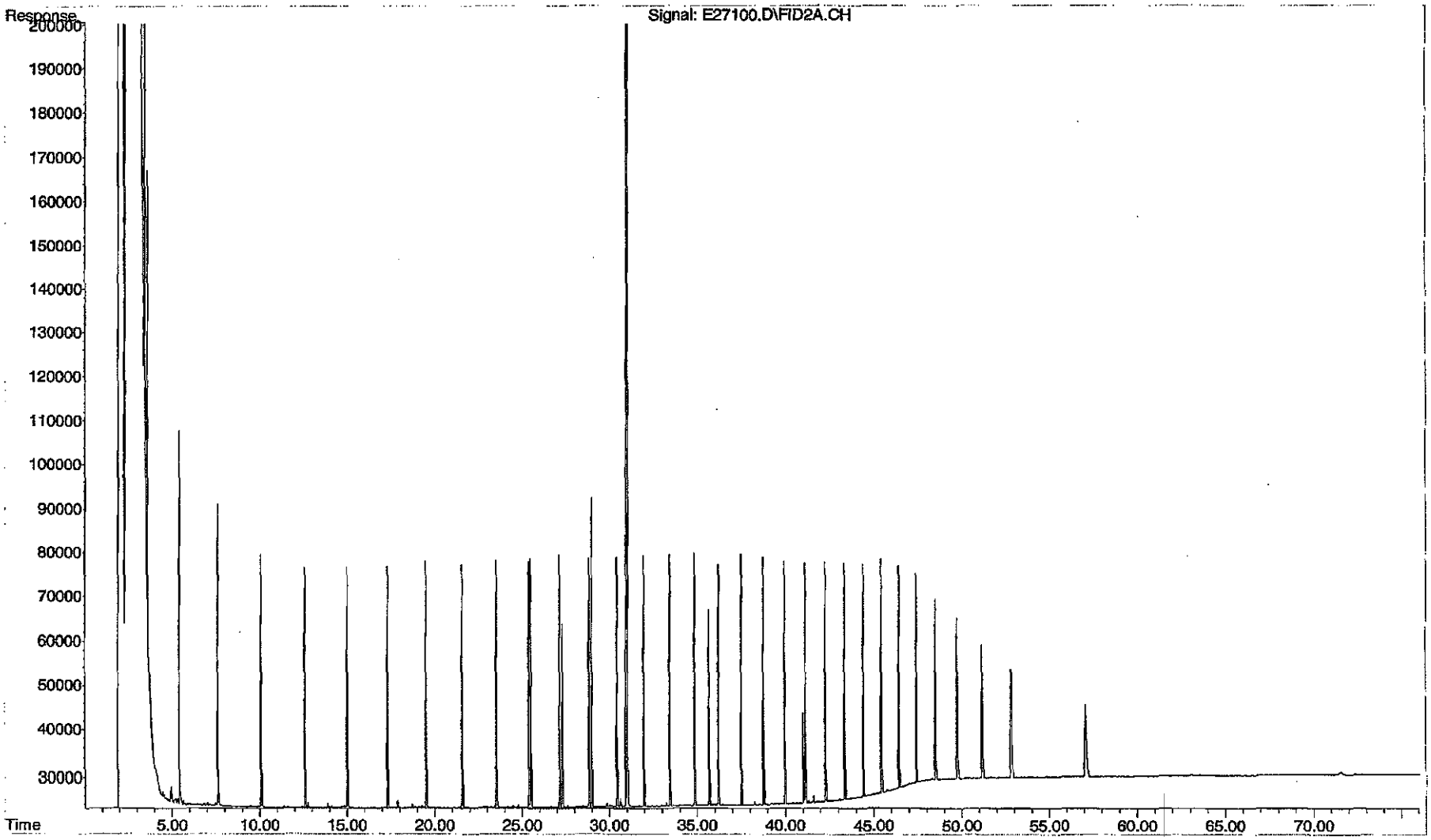
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.020	63967821	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.981	1355313	1.013 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	2.03%#
24) s	d50-Tetracosane	35.663	1095582	0.986 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	1.97%#
	Target Compounds			
2) t	n-Octane (C8)	5.423	1037454	0.997 ug/mL M4
3) t	n-Nonane (C9)	7.608	1058595	1.003 ug/mL M4
4) t	n-Decane (C10)	10.084	1081680	0.991 ug/mL M4
5) t	n-Undecane (C11)	12.592	1090605	0.994 ug/mL M4
6) t	n-Dodecane (C12)	15.017	1100096	0.983 ug/mL M4
7) t	n-Tridecane (C13)	17.323	1118594	0.991 ug/mL M4
9) t	n-Tetradecane (C14)	19.505	1131811	0.995 ug/mL M4
11) t	n-Pentadecane (C15)	21.569	1152026	1.010 ug/mL M4
12) t	n-Hexadecane (C16)	23.525	1147414	0.992 ug/mL M4
14) t	n-Heptadecane (C17)	25.381	1137165	0.999 ug/mL M4
15) t	Pristane	25.492	1173646	0.986 ug/mL M4
16) t	n-Octadecane (C18)	27.146	1172041	0.997 ug/mL M4
17) t	Phytane	27.310	1159671	0.990 ug/mL M4
18) t	n-Nonadecane (C19)	28.830	1170949	0.987 ug/mL M4
20) t	n-Eicosane (C20)	30.435	1189205	1.000 ug/mL M4
21) t	n-Heneicosane (C21)	31.968	1218462	1.024 ug/mL M4
22) t	n-Docosane (C22)	33.440	1200778	0.998 ug/mL M4
23) t	n-Tricosane (C23)	34.850	1295230	1.056 ug/mL M4
25) t	n-Tetracosane (C24)	36.206	1215267	1.004 ug/mL M4
26) t	n-Pentacosane (C25)	37.506	1230493	0.997 ug/mL M4
27) t	n-Hexacosane (C26)	38.761	1227507	1.000 ug/mL M4
28) t	n-Heptacosane (C27)	39.972	1214573	1.003 ug/mL M4
29) t	n-Octacosane (C28)	41.138	1229080	1.005 ug/mL M4
30) t	n-Nonacosane (C29)	42.269	1220303	0.992 ug/mL M4
31) t	n-Triacontane (C30)	43.358	1219155	1.000 ug/mL M4
32) t	n-Hentriacontane (C31)	44.415	1225588	0.990 ug/mL M4
33) t	n-Dotriacontane (C32)	45.439	1219519	0.986 ug/mL M4
34) t	n-Tritriacontane (C33)	46.431	1163578	0.980 ug/mL M4
35) t	n-tetratriacontane (C34)	47.414	1201630	0.977 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.499	1217653	0.970 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.738	1255297	0.980 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.167	1216440	0.966 ug/mL M4
39) t	n-Octatriacontane (C38)	52.830	1217319	0.969 ug/mL M4
41) t	n-Tetracontane (C40)	57.089	1150188	0.964 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27100.D
Operator : AC
Acquired : 04 Sep 2012 4:46 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041201R
Misc Info : WHAO93
ALS Vial : 56



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27102.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 6:18 pm
Operator : AC
Sample : I209041202R
Misc : WHAP92
ALS Vial : 57 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 12:31:19 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

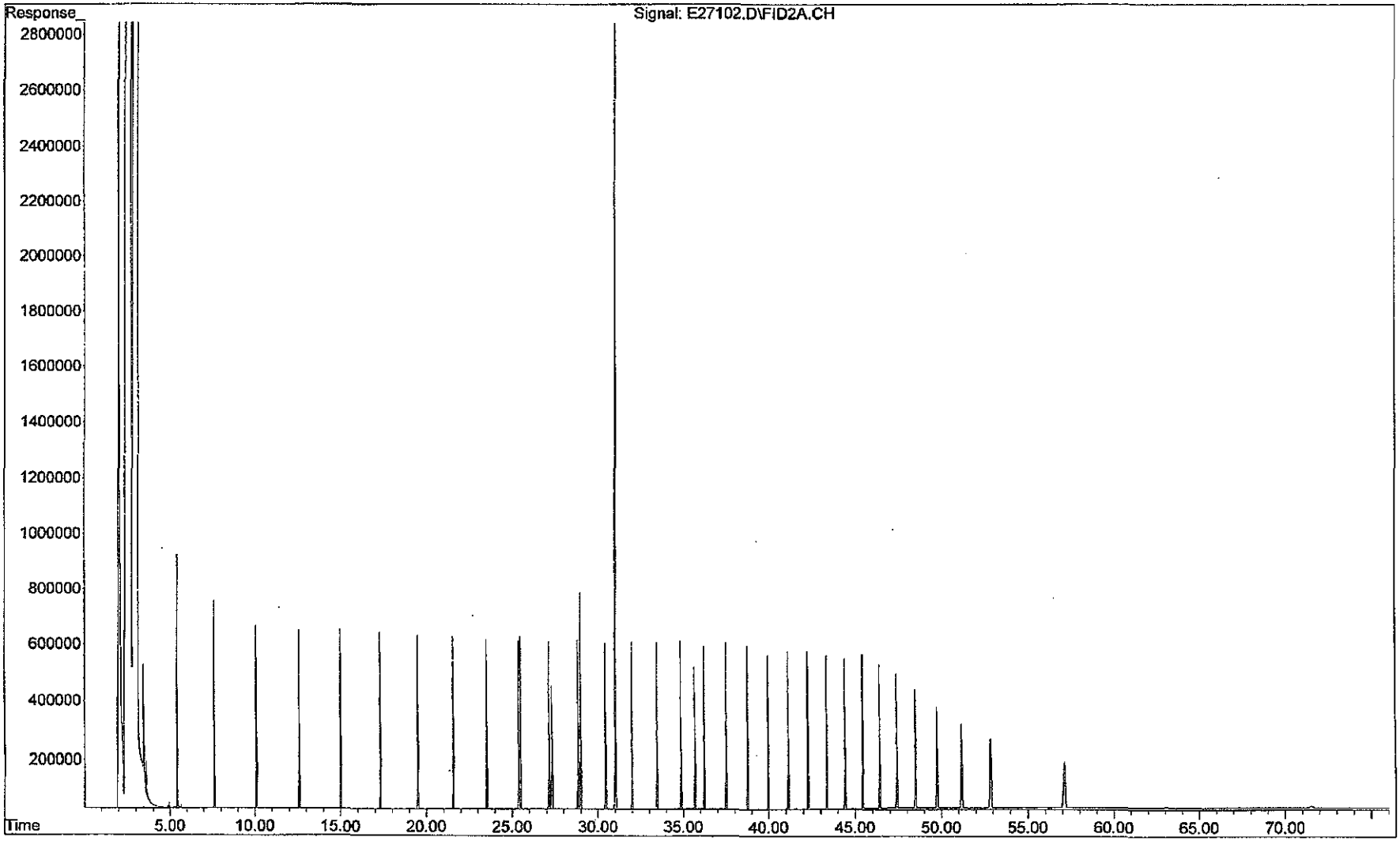
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.021	65313442	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.987	14965081	10.953 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	21.91%#
24) s	d50-Tetracosane	35.669	12446669	10.975 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	21.95%#
	Target Compounds			
2) t	n-Octane (C8)	5.429	10787663	10.152 ug/mL M4
3) t	n-Nonane (C9)	7.611	10984036	10.192 ug/mL M4
4) t	n-Decane (C10)	10.088	11426913	10.253 ug/mL M4
5) t	n-Undecane (C11)	12.595	11541093	10.300 ug/mL M4
6) t	n-Dodecane (C12)	15.021	11759368	10.295 ug/mL M4
7) t	n-Tridecane (C13)	17.327	11803721	10.240 ug/mL M4
9) t	n-Tetradecane (C14)	19.509	11918136	10.260 ug/mL M4
11) t	n-Pentadecane (C15)	21.573	11911917	10.224 ug/mL M4
12) t	n-Hexadecane (C16)	23.529	12051235	10.202 ug/mL M4
14) t	n-Heptadecane (C17)	25.385	11942188	10.280 ug/mL M4
15) t	Pristane	25.496	12312714	10.129 ug/mL M4
16) t	n-Octadecane (C18)	27.151	12267744	10.217 ug/mL M4
17) t	Phytane	27.314	12154748	10.167 ug/mL M4
18) t	n-Nonadecane (C19)	28.836	12262859	10.121 ug/mL M4
20) t	n-Eicosane (C20)	30.440	12385893	10.206 ug/mL M4
21) t	n-Heneicosane (C21)	31.974	12409357	10.210 ug/mL M4
22) t	n-Docosane (C22)	33.445	12501280	10.177 ug/mL M4
23) t	n-Tricosane (C23)	34.856	12518263	9.998 ug/mL M4
25) t	n-Tetracosane (C24)	36.209	12486436	10.102 ug/mL M4
26) t	n-Pentacosane (C25)	37.514	12760359	10.128 ug/mL M4
27) t	n-Hexacosane (C26)	38.769	12692005	10.124 ug/mL M4
28) t	n-Heptacosane (C27)	39.978	12441614	10.067 ug/mL M4
29) t	n-Octacosane (C28)	41.145	12578572	10.074 ug/mL M4
30) t	n-Nonacosane (C29)	42.273	12608505	10.041 ug/mL M4
31) t	n-Triacontane (C30)	43.365	12441268	9.998 ug/mL M4
32) t	n-Hentriacontane (C31)	44.423	12562193	9.941 ug/mL M4
33) t	n-Dotriacontane (C32)	45.443	12516087	9.914 ug/mL M4
34) t	n-Tritriacontane (C33)	46.436	11955175	9.860 ug/mL M4
35) t	n-tetratriacontane (C34)	47.421	12319702	9.810 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.509	12536903	9.781 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.746	12781199	9.768 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.176	12507537	9.727 ug/mL M4
39) t	n-Octatriacontane (C38)	52.842	12423625	9.686 ug/mL M4
41) t	n-Tetracontane (C40)	57.111	11764411	9.660 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27102.D
Operator : AC
Acquired : 04 Sep 2012 6:18 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041202R
Misc Info : WHAP92
ALS Vial : 57



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27104.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 7:50 pm
Operator : AC
Sample : I209041203R
Misc : WHAQ26
ALS Vial : 58 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 12:44:59 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

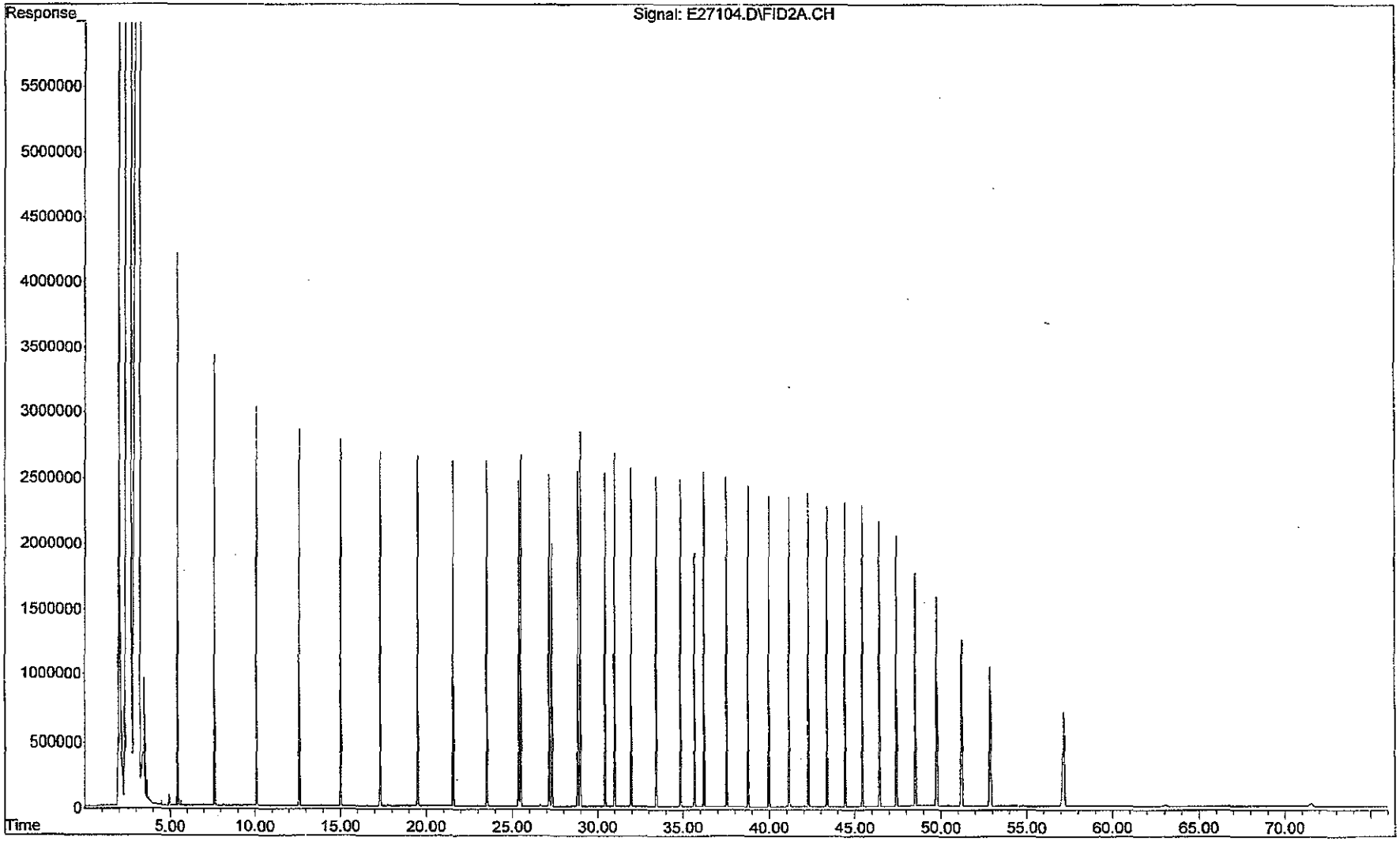
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.022	62756803	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.010	62693889	47.757 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	95.51%
24) s	d50-Tetracosane	35.687	52247168	47.945 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	95.89%
	Target Compounds			
2) t	n-Octane (C8)	5.453	50532455	49.490 ug/mL M4
3) t	n-Nonane (C9)	7.629	51431899	49.669 ug/mL M4
4) t	n-Decane (C10)	10.104	53477708	49.937 ug/mL M4
5) t	n-Undecane (C11)	12.610	54086162	50.236 ug/mL M4
6) t	n-Dodecane (C12)	15.035	55112696	50.215 ug/mL M4
7) t	n-Tridecane (C13)	17.343	55323500	49.950 ug/mL M4
9) t	n-Tetradecane (C14)	19.525	55819898	50.011 ug/mL M4
11) t	n-Pentadecane (C15)	21.590	55798199	49.844 ug/mL M4
12) t	n-Hexadecane (C16)	23.547	56395640	49.688 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	55912409	50.090 ug/mL M4
15) t	Pristane	25.517	57437430	49.177 ug/mL M4
16) t	n-Octadecane (C18)	27.170	57286525	49.653 ug/mL M4
17) t	Phytane	27.336	56698112	49.359 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	57214050	49.147 ug/mL M4
20) t	n-Eicosane (C20)	30.460	57746296	49.519 ug/mL M4
21) t	n-Heneicosane (C21)	31.995	57661837	49.376 ug/mL M4
22) t	n-Docosane (C22)	33.466	58144372	49.262 ug/mL M4
23) t	n-Tricosane (C23)	34.876	58140567	48.328 ug/mL M4
25) t	n-Tetracosane (C24)	36.233	57910264	48.762 ug/mL M4
26) t	n-Pentacosane (C25)	37.536	59153058	48.864 ug/mL M4
27) t	n-Hexacosane (C26)	38.791	58717977	48.747 ug/mL M4
28) t	n-Heptacosane (C27)	40.000	57481187	48.405 ug/mL M4
29) t	n-Octacosane (C28)	41.169	58008772	48.351 ug/mL M4
30) t	n-Nonacosane (C29)	42.297	58069092	48.126 ug/mL M4
31) t	n-Triacontane (C30)	43.386	57200514	47.840 ug/mL M4
32) t	n-Hentriacontane (C31)	44.446	57723927	47.541 ug/mL M4
33) t	n-Dotriacontane (C32)	45.469	57470436	47.378 ug/mL M4
34) t	n-Tritriacontane (C33)	46.459	54868096	47.094 ug/mL M4
35) t	n-tetratriacontane (C34)	47.446	56607060	46.909 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.539	57676296	46.830 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.783	58855677	46.815 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.219	57717955	46.716 ug/mL M4
39) t	n-Octatriacontane (C38)	52.895	57409256	46.580 ug/mL M4
41) t	n-Tetracontane (C40)	57.178	54429679	46.515 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27104.D
Operator : AC
Acquired : 04 Sep 2012 7:50 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041203R
Misc Info : WHAQ26
ALS Vial : 58



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27106.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 9:22 pm
Operator : AC
Sample : I209041204R
Misc : WHAO95
ALS Vial : 59 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:07:59 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

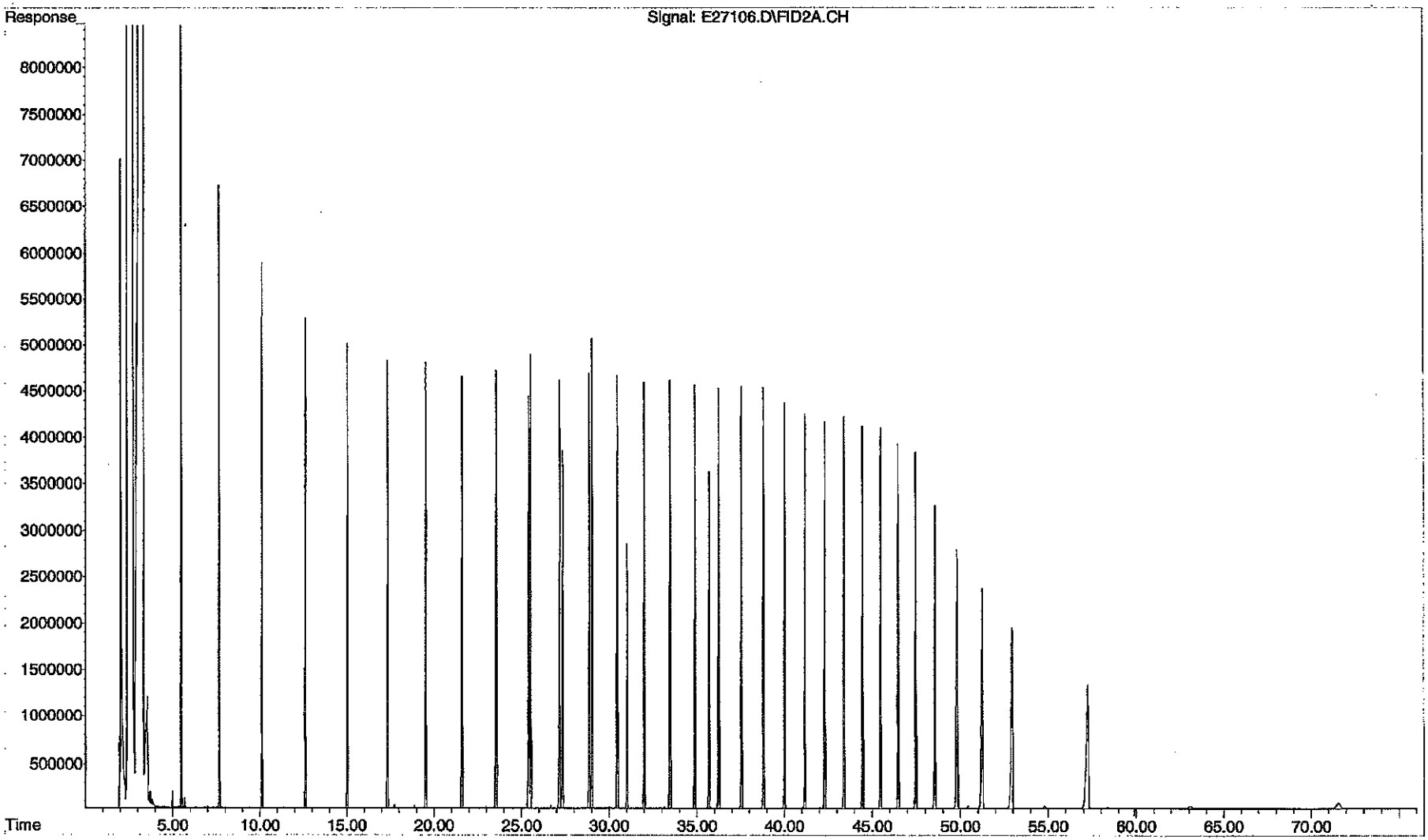
Sub List : CCAL - CCAL

9-7-12

	Compound	R.T.	Response	Conc	Units	
Internal Standards						
1) I	5-alpha-androstane	31.027	67785779	50.000	ug/mL	M4
System Monitoring Compounds						
19) s	ortho-terphenyl	29.035	138056751	97.363	ug/mL	M4
Spiked Amount	50.000	Range 50 - 130	Recovery = 194.73%#			
24) s	d50-Tetracosane	35.709	109892560	93.362	ug/mL	M4
Spiked Amount	50.000	Range 50 - 130	Recovery = 186.72%#			
Target Compounds						
2) t	n-Octane (C8)	5.486	108325396	98.220	ug/mL	M4
3) t	n-Nonane (C9)	7.654	111752271	99.915	ug/mL	M4
4) t	n-Decane (C10)	10.122	116984897	101.135	ug/mL	M4
5) t	n-Undecane (C11)	12.626	118514868	101.911	ug/mL	M4
6) t	n-Dodecane (C12)	15.051	120843204	101.935	ug/mL	M4
7) t	n-Tridecane (C13)	17.357	121149784	101.267	ug/mL	M4
9) t	n-Tetradecane (C14)	19.541	122139240	101.311	ug/mL	M4
11) t	n-Pentadecane (C15)	21.608	121857534	100.779	ug/mL	M4
12) t	n-Hexadecane (C16)	23.565	123242271	100.529	ug/mL	M4
14) t	n-Heptadecane (C17)	25.424	122526771	101.625	ug/mL	M4
15) t	Pristane	25.539	124809058	98.931	ug/mL	M4
16) t	n-Octadecane (C18)	27.193	125112513	100.395	ug/mL	M4
17) t	Phytane	27.360	123586542	99.608	ug/mL	M4
18) t	n-Nonadecane (C19)	28.879	124732128	99.195	ug/mL	M4
20) t	n-Eicosane (C20)	30.483	125691043	99.787	ug/mL	M4
21) t	n-Heneicosane (C21)	32.018	125366879	99.387	ug/mL	M4
22) t	n-Docosane (C22)	33.488	126233874	99.015	ug/mL	M4
23) t	n-Tricosane (C23)	34.900	126131443	97.066	ug/mL	M4
25) t	n-Tetracosane (C24)	36.258	125399621	97.756	ug/mL	M4
26) t	n-Pentacosane (C25)	37.561	127879102	97.799	ug/mL	M4
27) t	n-Hexacosane (C26)	38.816	126799057	97.457	ug/mL	M4
28) t	n-Heptacosane (C27)	40.026	123932414	96.620	ug/mL	M4
29) t	n-Octacosane (C28)	41.194	125029912	96.483	ug/mL	M4
30) t	n-Nonacosane (C29)	42.322	125125084	96.008	ug/mL	M4
31) t	n-Triacontane (C30)	43.414	123385318	95.538	ug/mL	M4
32) t	n-Hentriacontane (C31)	44.471	124529689	94.952	ug/mL	M4
33) t	n-Dotriacontane (C32)	45.494	124184813	94.781	ug/mL	M4
34) t	n-Tritriacontane (C33)	46.486	118737876	94.353	ug/mL	M4
35) t	n-tetratriacontane (C34)	47.475	122711891	94.145	ug/mL	M4
36) t	n-Pentatriacontane (C35)	48.572	125058477	94.007	ug/mL	M4
37) t	n-Hexatriacontane (C36)	49.826	127622682	93.982	ug/mL	M4
38) t	n-Heptatriacontane (C37)	51.271	125075125	93.722	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.951	124388237	93.437	ug/mL	M4
41) t	n-Tetracontane (C40)	57.256	117936988	93.310	ug/mL	M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27106.D
Operator : AC
Acquired : 04 Sep 2012 9:22 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041204R
Misc Info : WHAO95
ALS Vial : 59



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27108.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 10:53 pm
Operator : AC
Sample : I209041205R
Misc : WHAO96
ALS Vial : 60 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:35:38 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

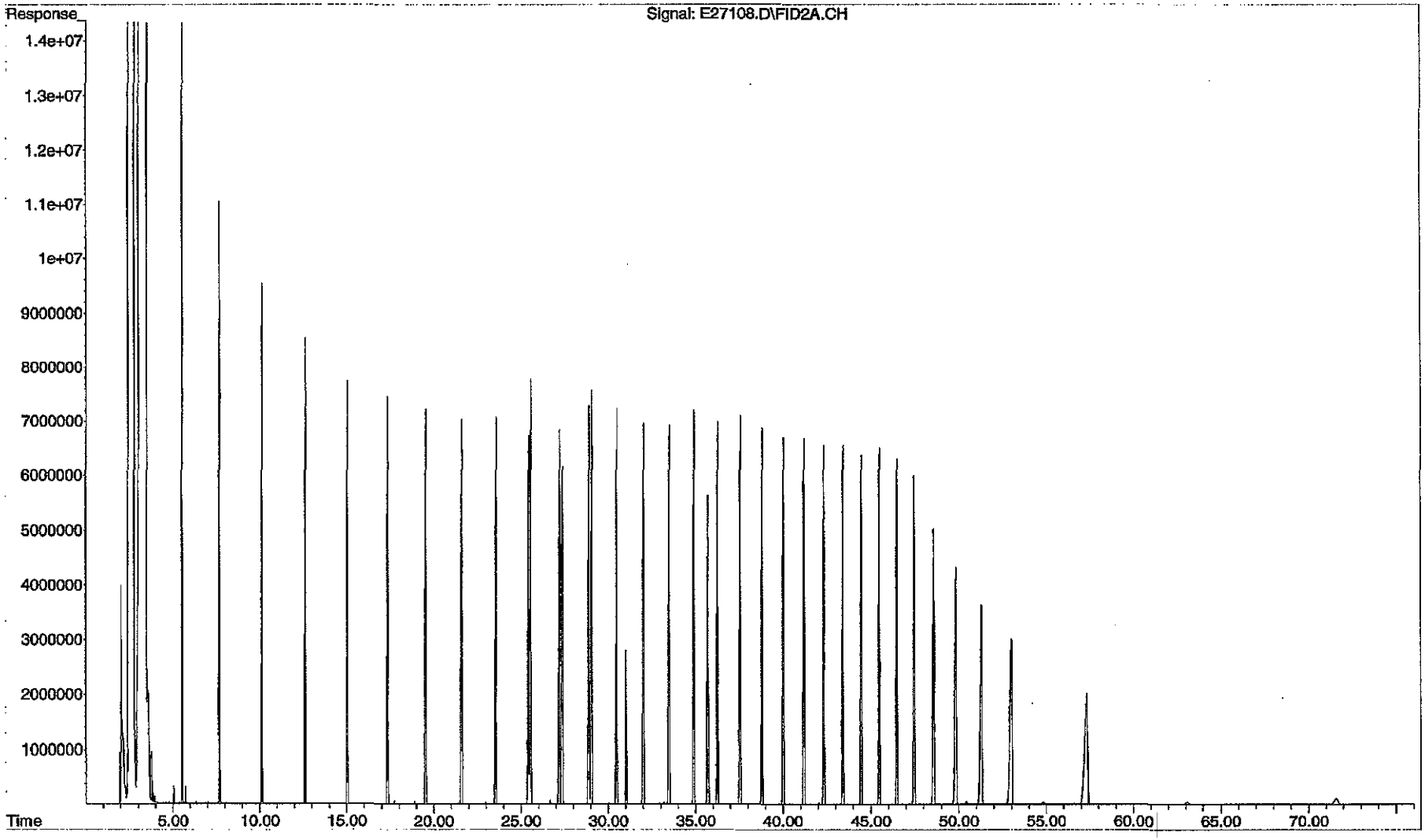
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	31.033	68220607	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	29.064	268314389	188.019	ug/mL	M4
Spiked Amount	50.000 Range 50 - 130		Recovery = 376.04%#			
24) s	d50-Tetracosane	35.737	212880617	179.706	ug/mL	M4
Spiked Amount	50.000 Range 50 - 130		Recovery = 359.41%#			
	Target Compounds					
2) t	n-Octane (C8)	5.549	214066752	192.861	ug/mL	M4
3) t	n-Nonane (C9)	7.699	218945844	194.507	ug/mL	M4
4) t	n-Decane (C10)	10.149	228110991	195.947	ug/mL	M4
5) t	n-Undecane (C11)	12.647	230818796	197.216	ug/mL	M4
6) t	n-Dodecane (C12)	15.070	234831426	196.825	ug/mL	M4
7) t	n-Tridecane (C13)	17.376	235100149	195.264	ug/mL	M4
9) t	n-Tetradecane (C14)	19.561	236826645	195.189	ug/mL	M4
11) t	n-Pentadecane (C15)	21.627	236005457	193.938	ug/mL	M4
12) t	n-Hexadecane (C16)	23.586	238720267	193.483	ug/mL	M4
14) t	n-Heptadecane (C17)	25.450	239070405	197.023	ug/mL	M4
15) t	Pristane	25.566	238512894	187.854	ug/mL	M4
16) t	n-Octadecane (C18)	27.219	241489234	192.546	ug/mL	M4
17) t	Phytane	27.389	238431706	190.945	ug/mL	M4
18) t	n-Nonadecane (C19)	28.905	240747451	190.238	ug/mL	M4
20) t	n-Eicosane (C20)	30.509	242168551	191.035	ug/mL	M4
21) t	n-Heneicosane (C21)	32.045	241506941	190.239	ug/mL	M4
22) t	n-Docosane (C22)	33.517	242910759	189.320	ug/mL	M4
23) t	n-Tricosane (C23)	34.928	242370057	185.330	ug/mL	M4
25) t	n-Tetracosane (C24)	36.287	240808405	186.527	ug/mL	M4
26) t	n-Pentacosane (C25)	37.590	245473133	186.536	ug/mL	M4
27) t	n-Hexacosane (C26)	38.846	243267757	185.782	ug/mL	M4
28) t	n-Heptacosane (C27)	40.056	237743445	184.168	ug/mL	M4
29) t	n-Octacosane (C28)	41.225	239982574	184.009	ug/mL	M4
30) t	n-Nonacosane (C29)	42.354	240486581	183.347	ug/mL	M4
31) t	n-Triacontane (C30)	43.446	237389922	182.641	ug/mL	M4
32) t	n-Hentriacontane (C31)	44.502	239996685	181.828	ug/mL	M4
33) t	n-Dotriacontane (C32)	45.529	239559495	181.672	ug/mL	M4
34) t	n-Tritriacontane (C33)	46.516	229022991	180.828	ug/mL	M4
35) t	n-tetratriacontane (C34)	47.510	236682062	180.426	ug/mL	M4
36) t	n-Pentatriacontane (C35)	48.614	241226826	180.175	ug/mL	M4
37) t	n-Hexatriacontane (C36)	49.877	246080144	180.060	ug/mL	M4
38) t	n-Heptatriacontane (C37)	51.328	241177911	179.570	ug/mL	M4
39) t	n-Octatriacontane (C38)	53.022	239930611	179.081	ug/mL	M4
41) t	n-Tetracontane (C40)	57.347	227487481	178.837	ug/mL	M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27108.D
Operator : AC
Acquired : 04 Sep 2012 10:53 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041205R
Misc Info : WHA096
ALS Vial : 60



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27110.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 12:26 am
Operator : AC
Sample : I209041206R
Misc : WHAP58
ALS Vial : 61 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:32:09 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

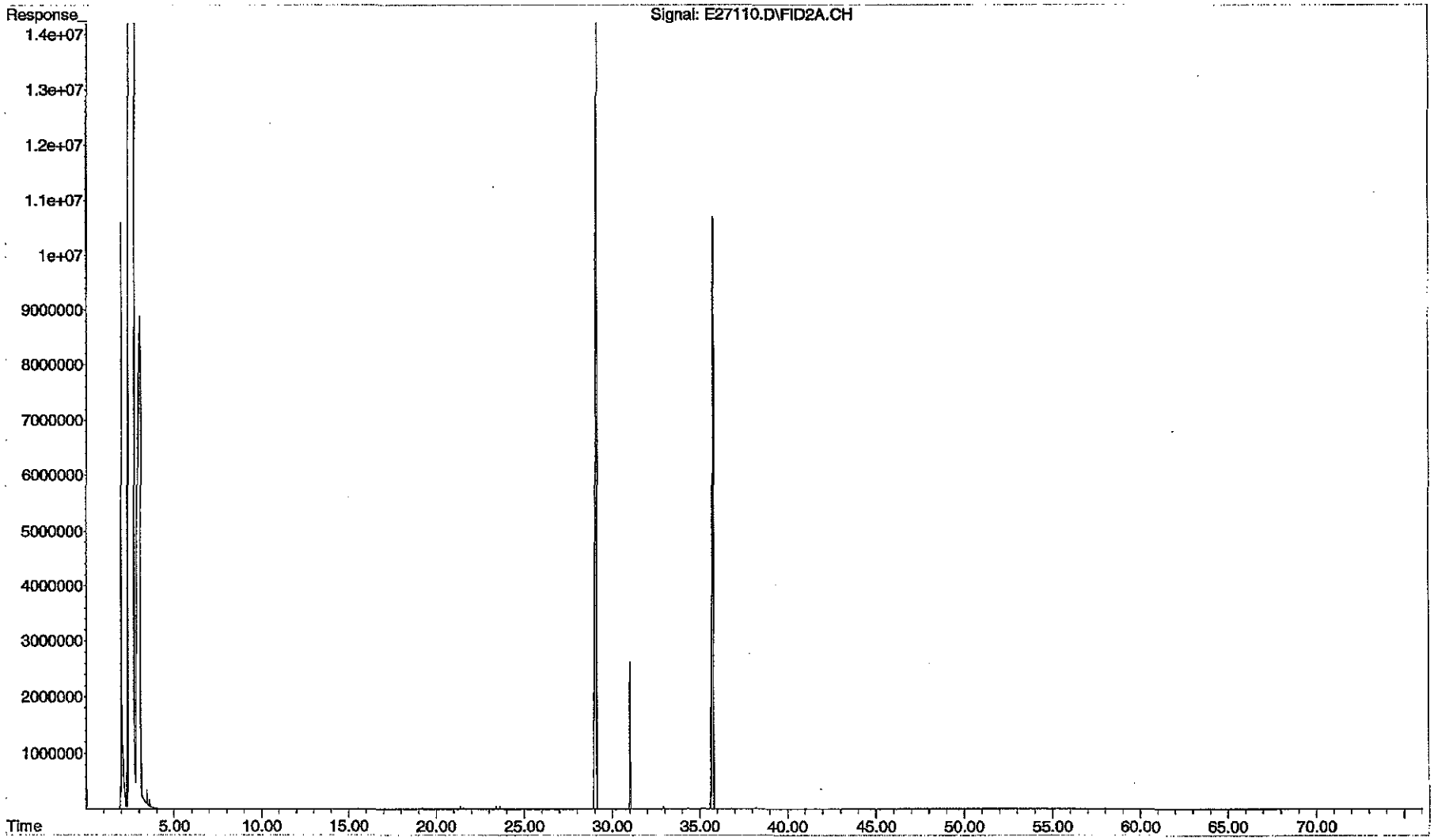
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

Compound		R.T.	Response	Conc Units
Internal Standards				
1) I	5-alpha-androstane	31.025	61806277	50.000 ug/mL M4
System Monitoring Compounds				
19) s	ortho-terphenyl	29.116f	698740911	540.453 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 1080.91%#
24) s	d50-Tetracosane	35.785	556842709	518.851 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 1037.70%#
Target Compounds				
SemiQuant Compounds - Not Calibrated on this Instrument				

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27110.D
Operator : AC
Acquired : 05 Sep 2012 12:26 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041206R
Misc Info : WHAP58
ALS Vial : 61



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27114.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 3:31 am
Operator : AC
Sample : CQ209041201R
Misc : WHAQ27
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:25:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	104	0.00
2	t	n-Octane (C8)	50.000	47.063	5.9	98	0.00
3	t	n-Nonane (C9)	50.000	49.007	2.0	103	0.00
4	t	n-Decane (C10)	50.000	50.320	-0.6	105	0.00
5	t	n-Undecane (C11)	50.000	49.146	1.7	103	0.00
6	t	n-Dodecane (C12)	50.000	48.915	2.2	102	0.00
7	t	n-Tridecane (C13)	50.000	48.760	2.5	102	0.00
9	t	n-Tetradecane (C14)	50.000	50.157	-0.3	105	0.00
11	t	n-Pentadecane (C15)	50.000	49.481	1.0	104	0.00
12	t	n-Hexadecane (C16)	50.000	49.370	1.3	103	0.00
14	t	n-Heptadecane (C17)	50.000	50.050	-0.1	105	0.00
15	t	Pristane	50.000	48.998	2.0	102	0.00
16	t	n-Octadecane (C18)	50.000	48.584	2.8	102	0.00
17	t	Phytane	50.000	49.812	0.4	104	0.00
18	t	n-Nonadecane (C19)	50.000	48.354	3.3	101	0.00
19	s	ortho-terphenyl	50.000	46.094	7.8	102	0.00
20	t	n-Eicosane (C20)	50.000	48.032	3.9	101	0.00
21	t	n-Heneicosane (C21)	50.000	48.244	3.5	102	0.00
22	t	n-Docosane (C22)	50.000	48.375	3.3	101	0.00
23	t	n-Tricosane (C23)	50.000	47.726	4.5	102	0.00
24	s	d50-Tetracosane	50.000	47.325	5.3	102	0.00
25	t	n-Tetracosane (C24)	50.000	48.418	3.2	102	0.00
26	t	n-Pentacosane (C25)	50.000	47.522	5.0	100	0.00
27	t	n-Hexacosane (C26)	50.000	48.612	2.8	102	0.00
28	t	n-Heptacosane (C27)	50.000	48.885	2.2	103	0.00
29	t	n-Octacosane (C28)	50.000	48.281	3.4	102	0.00
30	t	n-Nonacosane (C29)	50.000	48.446	3.1	102	0.00
31	t	n-Triacontane (C30)	50.000	48.776	2.4	103	0.00
32	t	n-Hentriacontane (C31)	50.000	48.323	3.4	102	0.00
33	t	n-Dotriacontane (C32)	50.000	47.821	4.4	101	0.00
34	t	n-Tritriacontane (C33)	50.000	48.228	3.5	102	0.00
35	t	n-tetratriacontane (C34)	50.000	49.219	1.6	104	0.00
36	t	n-Pentatriacontane (C35)	50.000	48.298	3.4	102	0.00
37	t	n-Hexatriacontane (C36)	50.000	50.607	-1.2	107	0.00
38	t	n-Heptatriacontane (C37)	50.000	48.327	3.3	102	0.00
39	t	n-Octatriacontane (C38)	50.000	48.341	3.3	102	0.00
41	t	n-Tetracontane (C40)	50.000	48.568	2.9	102	-0.02

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.08	0.85 - 1.15

HC2090412R.M Fri Sep 07 14:40:59 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27114.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 3:31 am
Operator : AC
Sample : CQ209041201R
Misc : WHAQ27
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:25:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

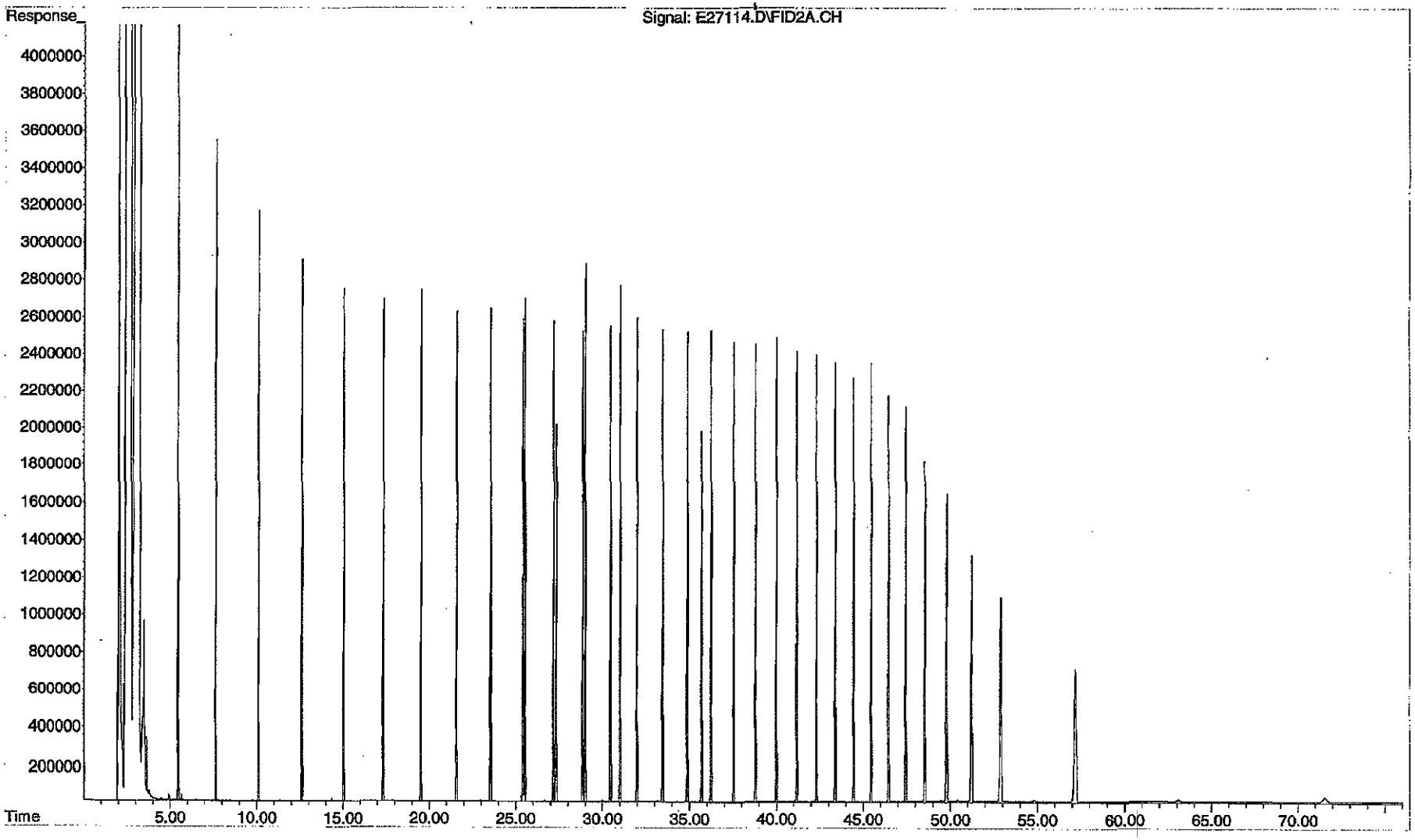
Sub List : CCAL - CCAL

9-7-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.024	65571366	50.000 ug/mL
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.012	63835564	46.094 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	92.19%
24) s	d50-Tetracosane	35.689	53098557	47.325 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	94.65%
	Target Compounds			
2) t	n-Octane (C8)	5.453	49690127	47.063 ug/mL M4
3) t	n-Nonane (C9)	7.630	52887630	49.007 ug/mL M4
4) t	n-Decane (C10)	10.102	56372966	50.320 ug/mL M4
5) t	n-Undecane (C11)	12.609	55658323	49.146 ug/mL M4
6) t	n-Dodecane (C12)	15.035	56324963	48.915 ug/mL M4
7) t	n-Tridecane (C13)	17.342	56459788	48.760 ug/mL M4
9) t	n-Tetradecane (C14)	19.526	58612103	50.157 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	57949659	49.481 ug/mL M4
12) t	n-Hexadecane (C16)	23.547	58296284	49.370 ug/mL M4
14) t	n-Heptadecane (C17)	25.406	58730121	50.050 ug/mL M4
15) t	Pristane	25.519	58729630	48.998 ug/mL M4
16) t	n-Octadecane (C18)	27.172	58310676	48.584 ug/mL M4
17) t	Phytane	27.337	59128171	49.812 ug/mL M4
18) t	n-Nonadecane (C19)	28.857	57933404	48.354 ug/mL M4
20) t	n-Eicosane (C20)	30.460	58108037	48.032 ug/mL M4
21) t	n-Heneicosane (C21)	31.997	58598806	48.244 ug/mL M4
22) t	n-Docosane (C22)	33.468	58916110	48.375 ug/mL M4
23) t	n-Tricosane (C23)	34.880	59031115	47.726 ug/mL M4
25) t	n-Tetracosane (C24)	36.236	58874577	48.418 ug/mL M4
26) t	n-Pentacosane (C25)	37.538	58882462	47.522 ug/mL M4
27) t	n-Hexacosane (C26)	38.793	59842693	48.612 ug/mL M4
28) t	n-Heptacosane (C27)	40.004	59020259	48.885 ug/mL M4
29) t	n-Octacosane (C28)	41.170	58880667	48.281 ug/mL M4
30) t	n-Nonacosane (C29)	42.300	59068845	48.446 ug/mL M4
31) t	n-Triacontane (C30)	43.391	58809464	48.776 ug/mL M4
32) t	n-Hentriacontane (C31)	44.447	58777847	48.323 ug/mL M4
33) t	n-Dotriacontane (C32)	45.469	57961177	47.821 ug/mL M4
34) t	n-Tritriacontane (C33)	46.464	55836240	48.228 ug/mL M4
35) t	n-tetratriacontane (C34)	47.449	58826487	49.219 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.542	58740743	48.298 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.790	62924218	50.607 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.227	58743156	48.327 ug/mL M4
39) t	n-Octatriacontane (C38)	52.903	58503229	48.341 ug/mL M4
41) t	n-Tetracontane (C40)	57.180	55675313	48.568 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27114.D
Operator : AC
Acquired : 05 Sep 2012 3:31 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : CQ209041201R
Misc Info : WHAQ27
ALS Vial : 63



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.032	67666055	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.018	69566380	48.677 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	97.35%
24) s	d50-Tetracosane	35.697	57141267	49.351 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	98.70%
	Target Compounds			
2) t	n-Octane (C8)	5.422	102285134	93.879 ug/mL M4
3) t	n-Nonane (C9)	7.619	76013115	68.256 ug/mL M4
4) t	n-Decane (C10)	10.101	63613609	55.026 ug/mL M4
5) t	n-Undecane (C11)	12.611	58788004	50.302 ug/mL M4
6) t	n-Dodecane (C12)	15.036	51442150	43.291 ug/mL M4
7) t	n-Tridecane (C13)	17.344	51674013	43.246 ug/mL M4
8) t	1380	19.019	11081649	9.190 ug/mL M4
9) t	n-Tetradecane (C14)	19.527	45446037	37.687 ug/mL M4
10) t	1470	20.811	18437347	15.256 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	46510985	38.484 ug/mL M4
12) t	n-Hexadecane (C16)	23.546	43300293	35.535 ug/mL M4
13) t	1650	24.454	12821499	10.588 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	39092129	32.283 ug/mL M4
15) t	Pristane	25.504	26773773	21.646 ug/mL M4
16) t	n-Octadecane (C18)	27.170	35486858	28.652 ug/mL M4
17) t	Phytane	27.326	15485089	12.641 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	30026103	24.285 ug/mL M4
20) t	n-Eicosane (C20)	30.459	32191313	25.786 ug/mL M4
21) t	n-Heneicosane (C21)	31.993	26761484	21.351 ug/mL M4
22) t	n-Docosane (C22)	33.463	26156955	20.812 ug/mL M4
23) t	n-Tricosane (C23)	34.874	23790002	18.639 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

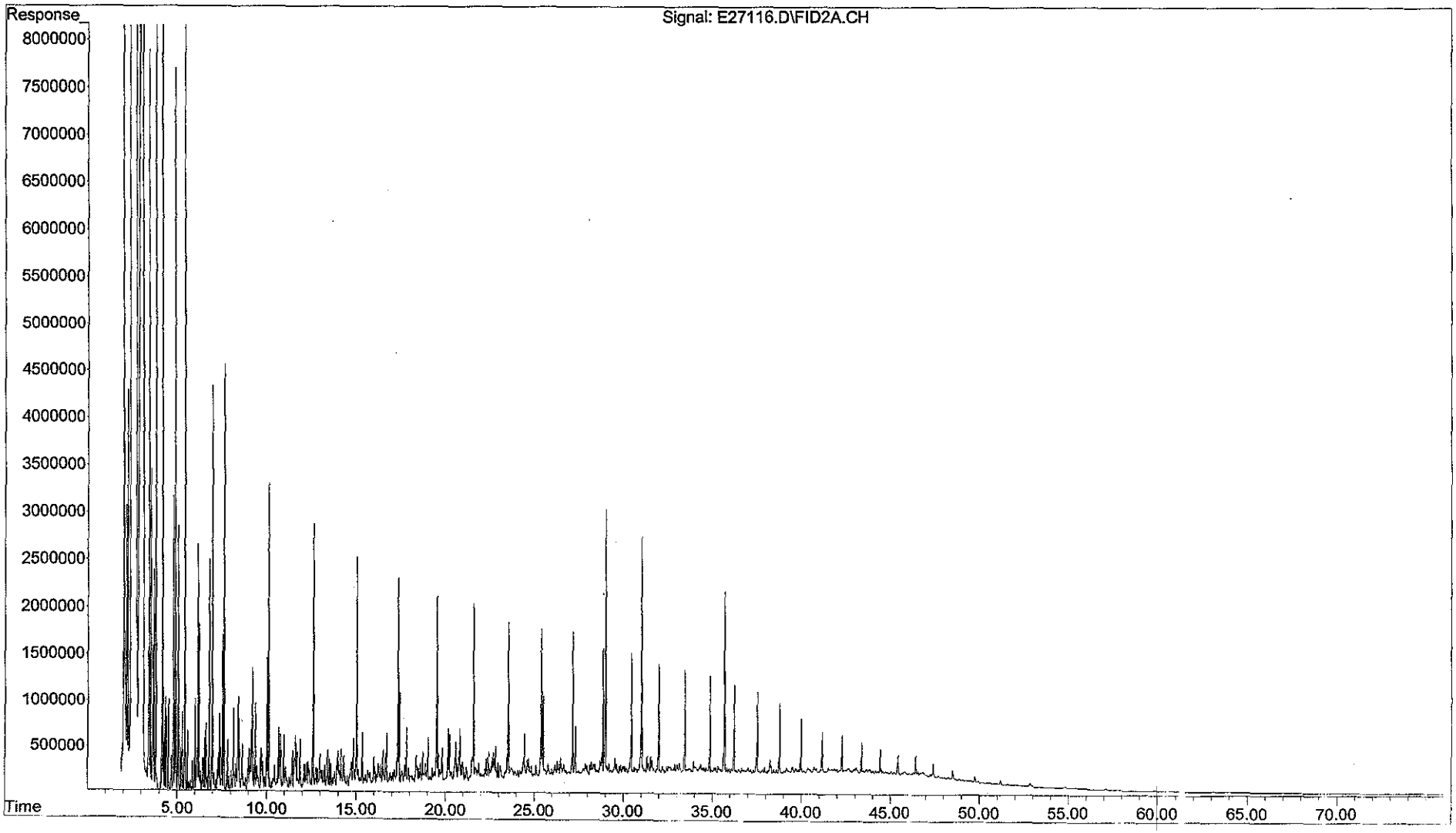
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units
25)	t	n-Tetracosane (C24)	36.229	21569823	17.190	ug/mL M4
26)	t	n-Pentacosane (C25)	37.530	21011766	16.433	ug/mL M4
27)	t	n-Hexacosane (C26)	38.784	18776288	14.780	ug/mL M4
28)	t	n-Heptacosane (C27)	39.993	13757353	11.042	ug/mL M4
29)	t	n-Octacosane (C28)	41.160	9894280	7.862	ug/mL M4
30)	t	n-Nonacosane (C29)	42.290	9748811	7.748	ug/mL M4
31)	t	n-Triacontane (C30)	43.376	8202260	6.592	ug/mL M4
32)	t	n-Hentriacontane (C31)	44.435	6227691	4.961	ug/mL M4
33)	t	n-Dotriacontane (C32)	45.452	5544934	4.433	ug/mL M4
34)	t	n-Tritriacontane (C33)	46.450	4844041	4.054	ug/mL M4
35)	t	n-tetratriacontane (C34)	47.431	4685802	3.799	ug/mL M4
36)	t	n-Pentatriacontane (C35)	48.521	3574400	2.848	ug/mL M4
37)	t	n-Hexatriacontane (C36)	49.764	2674892	2.085	ug/mL M4
38)	t	n-Heptatriacontane (C37)	51.193	2164492	1.726	ug/mL M4
39)	t	n-Octatriacontane (C38)	52.859	1707302	1.367	ug/mL M4
40)	t	n-Nonatriacontane (C39)	54.811	1232956	1.042	ug/mL M4
41)	t	n-Tetracontane (C40)	57.125	1168429	0.988	ug/mL M4
42)	h	C9-C44 Total Petroleu...	39.610	7428814548	6037.249	ug/mL M4
42)	h	C9-C44 Total Petroleu BS	39.610	7306360378	5937.733	ug/mLM4
45)	h	Total Resolved Hydroc...	39.151	2429958845	1974.779	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27116.D
Operator : AC
Acquired : 05 Sep 2012 5:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TW090712ANS01
Misc Info : WHAP13
ALS Vial : 64



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28814.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:49 am
Operator : AC
Sample : C211091201R
Misc : WHAQ67
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:34:46 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

GA 11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	95	0.02
2	t	n-Octane (C8)	50.000	52.684	-5.4	100	0.01
3	t	n-Nonane (C9)	50.000	52.703	-5.4	100	0.01
4	t	n-Decane (C10)	50.000	52.442	-4.9	99	0.01
5	t	n-Undecane (C11)	50.000	52.383	-4.8	99	0.01
6	t	n-Dodecane (C12)	50.000	52.518	-5.0	99	0.01
7	t	n-Tridecane (C13)	50.000	52.340	-4.7	99	0.01
9	t	n-Tetradecane (C14)	50.000	52.078	-4.2	99	0.01
11	t	n-Pentadecane (C15)	50.000	51.863	-3.7	99	0.02
12	t	n-Hexadecane (C16)	50.000	52.102	-4.2	99	0.01
14	t	n-Heptadecane (C17)	50.000	51.282	-2.6	97	0.02
15	t	Pristane	50.000	52.310	-4.6	99	0.02
16	t	n-Octadecane (C18)	50.000	51.646	-3.3	98	0.02
17	t	Phytane	50.000	51.732	-3.5	98	0.02
18	t	n-Nonadecane (C19)	50.000	51.545	-3.1	98	0.02
19	s	ortho-terphenyl	50.000	50.005	-0.0	100	0.02
20	t	n-Eicosane (C20)	50.000	51.665	-3.3	98	0.02
21	t	n-Heneicosane (C21)	50.000	51.345	-2.7	98	0.02
22	t	n-Docosane (C22)	50.000	51.572	-3.1	98	0.02
23	t	n-Tricosane (C23)	50.000	50.839	-1.7	98	0.02
24	s	d50-Tetracosane	50.000	51.404	-2.8	100	0.02
25	t	n-Tetracosane (C24)	50.000	54.645	-9.3	104	0.02
26	t	n-Pentacosane (C25)	50.000	51.600	-3.2	98	0.02
27	t	n-Hexacosane (C26)	50.000	51.587	-3.2	98	0.04
28	t	n-Heptacosane (C27)	50.000	51.557	-3.1	98	0.04
29	t	n-Octacosane (C28)	50.000	51.560	-3.1	98	0.04
30	t	n-Nonacosane (C29)	50.000	51.766	-3.5	98	0.04
31	t	n-Triacontane (C30)	50.000	51.676	-3.4	99	0.04
32	t	n-Hentriacontane (C31)	50.000	51.809	-3.6	99	0.05
33	t	n-Dotriacontane (C32)	50.000	51.869	-3.7	99	0.05
34	t	n-Tritriacontane (C33)	50.000	51.965	-3.9	99	0.05
35	t	n-tetratriacontane (C34)	50.000	52.016	-4.0	99	0.05
36	t	n-Pentatriacontane (C35)	50.000	52.017	-4.0	99	0.06
37	t	n-Hexatriacontane (C36)	50.000	51.862	-3.7	99	0.06
38	t	n-Heptatriacontane (C37)	50.000	51.978	-4.0	99	0.08
39	t	n-Octatriacontane (C38)	50.000	51.908	-3.8	99	0.08
41	t	n-Tetracontane (C40)	50.000	51.924	-3.8	99	0.11

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.03	0.85 - 1.15

HC2090412R.M Fri Nov 16 15:36:22 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28814.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:49 am
Operator : AC
Sample : C211091201R
Misc : WHAQ67
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:34:46 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

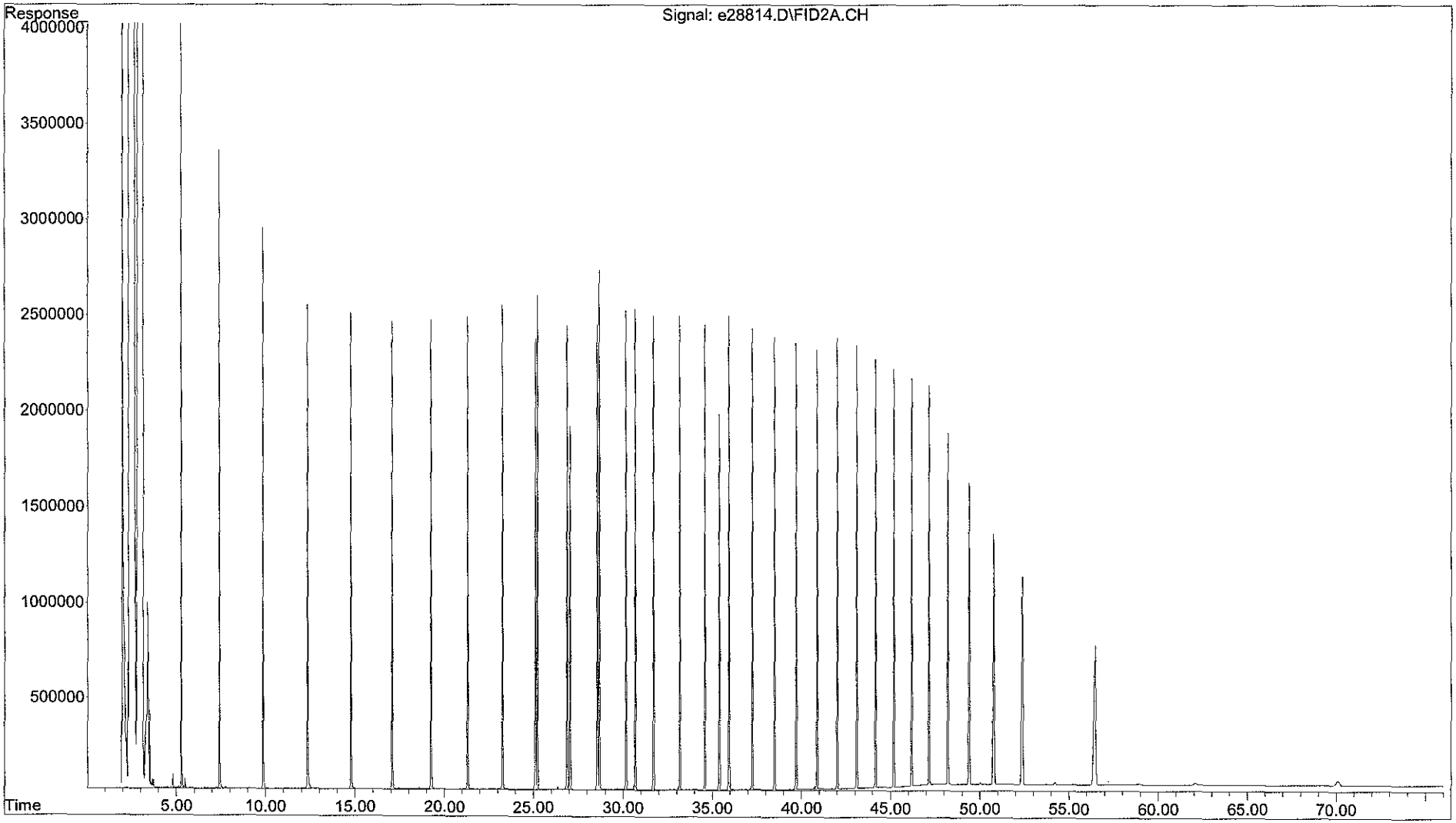
Sub List : CCAL - CCAL

GA 11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.682	59338325	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.673	62668313	50.005 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	100.01%
24) s	d50-Tetracosane	35.392	52193464	51.404 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	102.81%
	Target Compounds			
2) t	n-Octane (C8)	5.255	50337544	52.684 ug/mL M4
3) t	n-Nonane (C9)	7.396	51469196	52.703 ug/mL M4
4) t	n-Decane (C10)	9.840	53164966	52.442 ug/mL M4
5) t	n-Undecane (C11)	12.334	53685449	52.383 ug/mL M4
6) t	n-Dodecane (C12)	14.754	54725925	52.518 ug/mL M4
7) t	n-Tridecane (C13)	17.057	54844079	52.340 ug/mL M4
9) t	n-Tetradecane (C14)	19.237	55071777	52.078 ug/mL M4
11) t	n-Pentadecane (C15)	21.300	54966349	51.863 ug/mL M4
12) t	n-Hexadecane (C16)	23.254	55673725	52.102 ug/mL M4
14) t	n-Heptadecane (C17)	25.111	54455883	51.282 ug/mL M4
15) t	Pristane	25.224	56739504	52.310 ug/mL M4
16) t	n-Octadecane (C18)	26.877	56092925	51.646 ug/mL M4
17) t	Phytane	27.040	55570435	51.732 ug/mL M4
18) t	n-Nonadecane (C19)	28.560	55886648	51.545 ug/mL M4
20) t	n-Eicosane (C20)	30.163	56562006	51.665 ug/mL M4
21) t	n-Heneicosane (C21)	31.698	56437101	51.345 ug/mL M4
22) t	n-Docosane (C22)	33.169	56838486	51.572 ug/mL M4
23) t	n-Tricosane (C23)	34.582	56904124	50.839 ug/mL M4
25) t	n-Tetracosane (C24)	35.939	60129103	54.645 ug/mL M4
26) t	n-Pentacosane (C25)	37.242	57857579	51.600 ug/mL M4
27) t	n-Hexacosane (C26)	38.496	57468791	51.587 ug/mL M4
28) t	n-Heptacosane (C27)	39.708	56329431	51.557 ug/mL M4
29) t	n-Octacosane (C28)	40.876	56901866	51.560 ug/mL M4
30) t	n-Nonacosane (C29)	42.007	57116400	51.766 ug/mL M4
31) t	n-Triacontane (C30)	43.099	56382835	51.676 ug/mL M4
32) t	n-Hentriacontane (C31)	44.157	57027946	51.809 ug/mL M4
33) t	n-Dotriacontane (C32)	45.184	56891160	51.869 ug/mL M4
34) t	n-Tritriacontane (C33)	46.178	54444135	51.965 ug/mL M4
35) t	n-tetratriacontane (C34)	47.150	56259465	52.016 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.201	57249960	52.017 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.392	58355104	51.862 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.765	57175973	51.978 ug/mL M4
39) t	n-Octatriacontane (C38)	52.357	56848642	51.908 ug/mL M4
41) t	n-Tetracontane (C40)	56.435	53864301	51.924 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28814.D
Operator : AC
Acquired : 09 Nov 2012 11:49 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091201R
Misc Info : WHAQ67
ALS Vial : 52



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28840.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:10 am
Operator : AC
Sample : C211091202R
Misc : WHAQ67
ALS Vial : 65 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:59:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	100	0.00
2	t	n-Octane (C8)	50.000	50.921	-1.8	102	0.00
3	t	n-Nonane (C9)	50.000	51.309	-2.6	103	0.00
4	t	n-Decane (C10)	50.000	51.582	-3.2	103	0.00
5	t	n-Undecane (C11)	50.000	50.532	-1.1	101	0.00
6	t	n-Dodecane (C12)	50.000	51.614	-3.2	103	0.00
7	t	n-Tridecane (C13)	50.000	51.734	-3.5	103	0.00
9	t	n-Tetradecane (C14)	50.000	51.534	-3.1	103	0.00
11	t	n-Pentadecane (C15)	50.000	51.344	-2.7	103	0.00
12	t	n-Hexadecane (C16)	50.000	51.669	-3.3	103	0.00
14	t	n-Heptadecane (C17)	50.000	50.856	-1.7	102	0.00
15	t	Pristane	50.000	52.019	-4.0	104	0.00
16	t	n-Octadecane (C18)	50.000	51.290	-2.6	103	0.00
17	t	Phytane	50.000	51.754	-3.5	103	0.00
18	t	n-Nonadecane (C19)	50.000	51.217	-2.4	102	0.00
19	s	ortho-terphenyl	50.000	49.941	0.1	105	0.00
20	t	n-Eicosane (C20)	50.000	51.292	-2.6	103	0.00
21	t	n-Heneicosane (C21)	50.000	51.010	-2.0	103	0.00
22	t	n-Docosane (C22)	50.000	51.223	-2.4	102	0.00
23	t	n-Tricosane (C23)	50.000	50.509	-1.0	103	0.00
24	s	d50-Tetracosane	50.000	51.064	-2.1	105	0.00
25	t	n-Tetracosane (C24)	50.000	51.186	-2.4	103	0.00
26	t	n-Pentacosane (C25)	50.000	51.228	-2.5	102	0.00
27	t	n-Hexacosane (C26)	50.000	51.194	-2.4	102	0.02
28	t	n-Heptacosane (C27)	50.000	51.118	-2.2	103	0.03
29	t	n-Octacosane (C28)	50.000	51.147	-2.3	103	0.03
30	t	n-Nonacosane (C29)	50.000	51.147	-2.3	103	0.03
31	t	n-Triacontane (C30)	50.000	50.916	-1.8	102	0.03
32	t	n-Hentriacontane (C31)	50.000	50.904	-1.8	102	0.03
33	t	n-Dotriacontane (C32)	50.000	50.870	-1.7	102	0.03
34	t	n-Tritriacontane (C33)	50.000	50.798	-1.6	102	0.03
35	t	n-tetratriacontane (C34)	50.000	50.713	-1.4	102	0.03
36	t	n-Pentatriacontane (C35)	50.000	50.602	-1.2	102	0.03
37	t	n-Hexatriacontane (C36)	50.000	50.342	-0.7	102	0.03
38	t	n-Heptatriacontane (C37)	50.000	50.296	-0.6	101	0.03
39	t	n-Octatriacontane (C38)	50.000	50.047	-0.1	101	0.03
41	t	n-Tetracontane (C40)	50.000	49.647	0.7	100	0.04

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.01	0.85 - 1.15

HC2090412R.M Fri Nov 16 15:36:40 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28840.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:10 am
Operator : AC
Sample : C211091202R
Misc : WHAQ67
ALS Vial : 65 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:59:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

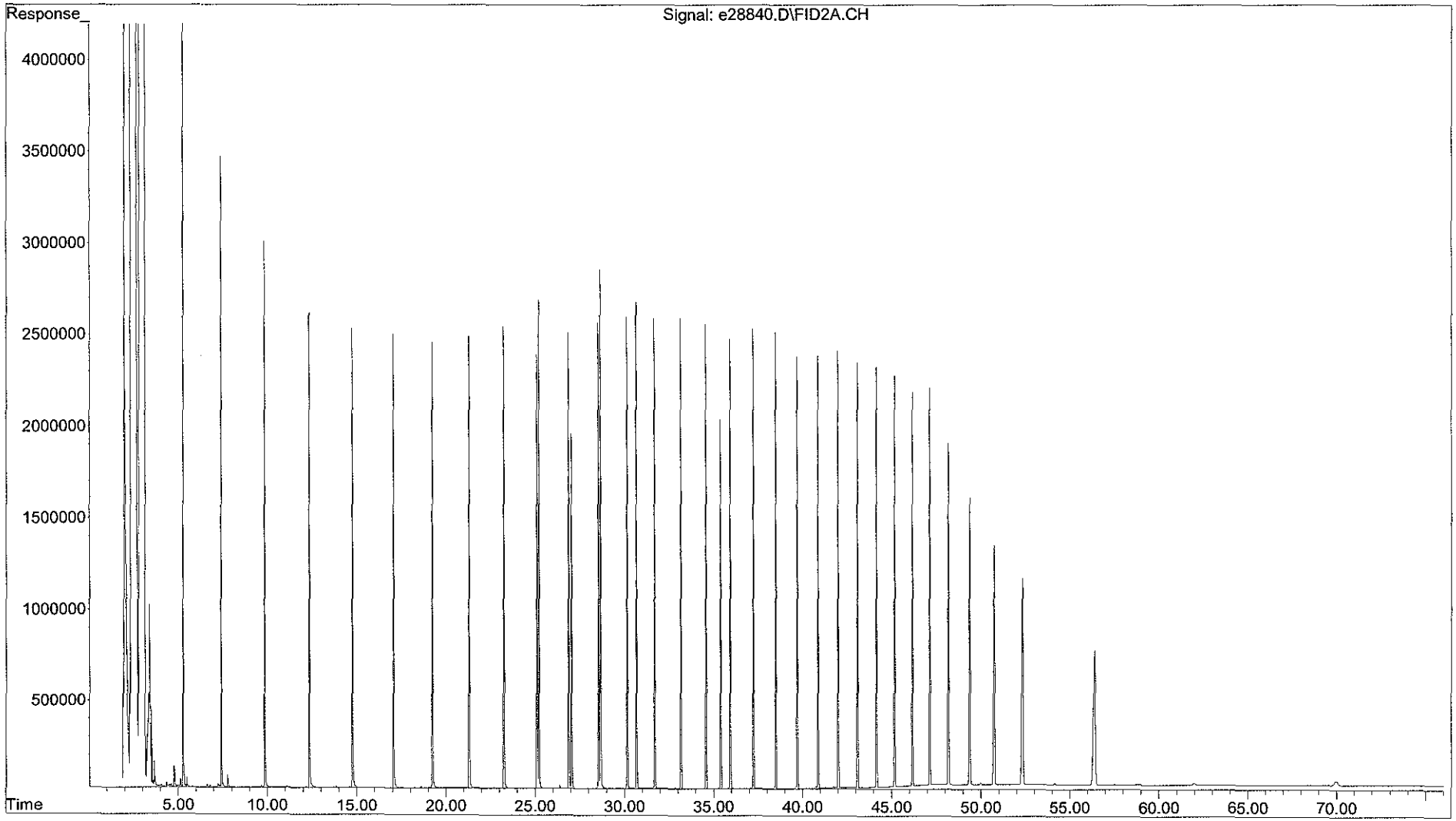
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.667	62613621	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.660	66042741	49.941 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	99.88%
24) s	d50-Tetracosane	35.378	54709612	51.064 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	102.13%
	Target Compounds			
2) t	n-Octane (C8)	5.250	51337889	50.921 ug/mL M4
3) t	n-Nonane (C9)	7.388	52873524	51.309 ug/mL M4
4) t	n-Decane (C10)	9.831	55179452	51.582 ug/mL M4
5) t	n-Undecane (C11)	12.324	54646866	50.532 ug/mL M4
6) t	n-Dodecane (C12)	14.744	56752330	51.614 ug/mL M4
7) t	n-Tridecane (C13)	17.047	57201404	51.734 ug/mL M4
9) t	n-Tetradecane (C14)	19.226	57504724	51.534 ug/mL M4
11) t	n-Pentadecane (C15)	21.289	57419940	51.344 ug/mL M4
12) t	n-Hexadecane (C16)	23.243	58258144	51.669 ug/mL M4
14) t	n-Heptadecane (C17)	25.099	56984355	50.856 ug/mL M4
15) t	Pristane	25.211	59537775	52.019 ug/mL M4
16) t	n-Octadecane (C18)	26.864	58781589	51.290 ug/mL M4
17) t	Phytane	27.029	58662983	51.754 ug/mL M4
18) t	n-Nonadecane (C19)	28.547	58595574	51.217 ug/mL M4
20) t	n-Eicosane (C20)	30.150	59252937	51.292 ug/mL M4
21) t	n-Heneicosane (C21)	31.685	59163614	51.010 ug/mL M4
22) t	n-Docosane (C22)	33.154	59570222	51.223 ug/mL M4
23) t	n-Tricosane (C23)	34.566	59654582	50.509 ug/mL M4
25) t	n-Tetracosane (C24)	35.921	59432710	51.186 ug/mL M4
26) t	n-Pentacosane (C25)	37.226	60611235	51.228 ug/mL M4
27) t	n-Hexacosane (C26)	38.480	60179189	51.194 ug/mL M4
28) t	n-Heptacosane (C27)	39.691	58932628	51.118 ug/mL M4
29) t	n-Octacosane (C28)	40.861	59562569	51.147 ug/mL M4
30) t	n-Nonacosane (C29)	41.988	59548759	51.147 ug/mL M4
31) t	n-Triacontane (C30)	43.081	58620633	50.916 ug/mL M4
32) t	n-Hentriacontane (C31)	44.140	59124345	50.904 ug/mL M4
33) t	n-Dotriacontane (C32)	45.165	58874892	50.870 ug/mL M4
34) t	n-Tritriacontane (C33)	46.157	56159221	50.798 ug/mL M4
35) t	n-tetratriacontane (C34)	47.127	57877859	50.713 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.172	58766768	50.602 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.362	59772034	50.342 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.724	58379594	50.296 ug/mL M4
39) t	n-Octatriacontane (C38)	52.313	57835381	50.047 ug/mL M4
41) t	n-Tetracontane (C40)	56.370	54344567	49.647 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28840.D
Operator : AC
Acquired : 10 Nov 2012 7:10 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091202R
Misc Info : WHAQ67
ALS Vial : 65



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28860.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 11:35 pm
Operator : AC
Sample : C211091203R
Misc : WHAQ67
ALS Vial : 75 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:07:05 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

CH 11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	98	0.00
2	t	n-Octane (C8)	50.000	50.579	-1.2	99	0.00
3	t	n-Nonane (C9)	50.000	50.349	-0.7	99	0.00
4	t	n-Decane (C10)	50.000	50.845	-1.7	100	0.00
5	t	n-Undecane (C11)	50.000	50.502	-1.0	99	0.00
6	t	n-Dodecane (C12)	50.000	51.315	-2.6	100	0.00
7	t	n-Tridecane (C13)	50.000	51.255	-2.5	100	0.00
9	t	n-Tetradecane (C14)	50.000	51.149	-2.3	100	0.00
11	t	n-Pentadecane (C15)	50.000	51.110	-2.2	100	0.00
12	t	n-Hexadecane (C16)	50.000	51.473	-2.9	101	0.00
14	t	n-Heptadecane (C17)	50.000	50.661	-1.3	99	0.00
15	t	Pristane	50.000	51.973	-3.9	101	0.00
16	t	n-Octadecane (C18)	50.000	51.300	-2.6	101	0.00
17	t	Phytane	50.000	51.647	-3.3	101	0.00
18	t	n-Nonadecane (C19)	50.000	51.145	-2.3	100	0.00
19	s	ortho-terphenyl	50.000	49.718	0.6	103	0.00
20	t	n-Eicosane (C20)	50.000	51.206	-2.4	100	0.00
21	t	n-Heneicosane (C21)	50.000	50.946	-1.9	100	0.00
22	t	n-Docosane (C22)	50.000	51.110	-2.2	100	0.00
23	t	n-Tricosane (C23)	50.000	50.412	-0.8	100	0.00
24	s	d50-Tetracosane	50.000	50.984	-2.0	102	0.00
25	t	n-Tetracosane (C24)	50.000	51.065	-2.1	100	0.00
26	t	n-Pentacosane (C25)	50.000	51.201	-2.4	100	0.00
27	t	n-Hexacosane (C26)	50.000	51.199	-2.4	100	0.02
28	t	n-Heptacosane (C27)	50.000	51.065	-2.1	100	0.02
29	t	n-Octacosane (C28)	50.000	51.068	-2.1	100	0.02
30	t	n-Nonacosane (C29)	50.000	51.102	-2.2	100	0.02
31	t	n-Triacontane (C30)	50.000	51.146	-2.3	101	0.02
32	t	n-Hentriacontane (C31)	50.000	51.099	-2.2	101	0.02
33	t	n-Dotriacontane (C32)	50.000	51.121	-2.2	101	0.02
34	t	n-Tritriacontane (C33)	50.000	51.212	-2.4	101	0.02
35	t	n-tetratriacontane (C34)	50.000	51.175	-2.3	101	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.183	-2.4	101	0.02
37	t	n-Hexatriacontane (C36)	50.000	50.936	-1.9	101	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.908	-1.8	100	0.02
39	t	n-Octatriacontane (C38)	50.000	50.624	-1.2	100	0.03
41	t	n-Tetracontane (C40)	50.000	50.147	-0.3	99	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Fri Nov 16 15:37:05 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28860.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 11:35 pm
Operator : AC
Sample : C211091203R
Misc : WHAQ67
ALS Vial : 75 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:07:05 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

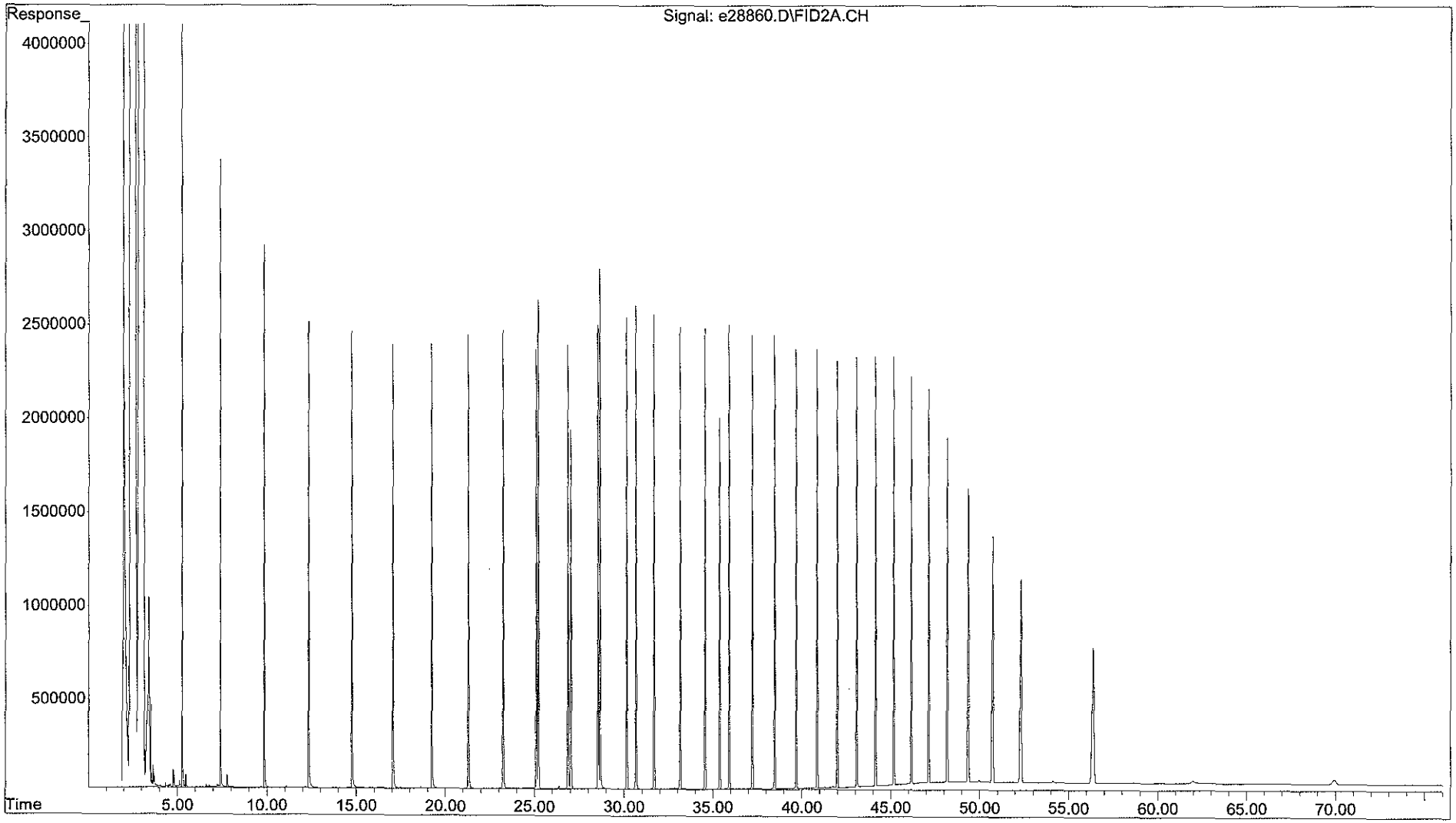
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.661	61327887	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	64397780	49.718 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	99.44%
24) s	d50-Tetracosane	35.372	53502611	50.984 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	101.97%
	Target Compounds			
2) t	n-Octane (C8)	5.247	49946704	50.579 ug/mL M4
3) t	n-Nonane (C9)	7.385	50819161	50.349 ug/mL M4
4) t	n-Decane (C10)	9.829	53275010	50.845 ug/mL M4
5) t	n-Undecane (C11)	12.322	53492953	50.502 ug/mL M4
6) t	n-Dodecane (C12)	14.742	55264831	51.315 ug/mL M4
7) t	n-Tridecane (C13)	17.044	55507971	51.255 ug/mL M4
9) t	n-Tetradecane (C14)	19.222	55902978	51.149 ug/mL M4
11) t	n-Pentadecane (C15)	21.284	55983962	51.110 ug/mL M4
12) t	n-Hexadecane (C16)	23.237	56845586	51.473 ug/mL M4
14) t	n-Heptadecane (C17)	25.094	55599818	50.661 ug/mL M4
15) t	Pristane	25.206	58263702	51.973 ug/mL M4
16) t	n-Octadecane (C18)	26.858	57585881	51.300 ug/mL M4
17) t	Phytane	27.021	57339653	51.647 ug/mL M4
18) t	n-Nonadecane (C19)	28.541	57312231	51.145 ug/mL M4
20) t	n-Eicosane (C20)	30.145	57938519	51.206 ug/mL M4
21) t	n-Heneicosane (C21)	31.680	57875539	50.946 ug/mL M4
22) t	n-Docosane (C22)	33.150	58218259	51.110 ug/mL M4
23) t	n-Tricosane (C23)	34.562	58317540	50.412 ug/mL M4
25) t	n-Tetracosane (C24)	35.916	58074872	51.065 ug/mL M4
26) t	n-Pentacosane (C25)	37.219	59334818	51.201 ug/mL M4
27) t	n-Hexacosane (C26)	38.473	58949602	51.199 ug/mL M4
28) t	n-Heptacosane (C27)	39.683	57662111	51.065 ug/mL M4
29) t	n-Octacosane (C28)	40.852	58249175	51.068 ug/mL M4
30) t	n-Nonacosane (C29)	41.979	58274243	51.102 ug/mL M4
31) t	n-Triacontane (C30)	43.073	57675507	51.146 ug/mL M4
32) t	n-Hentriacontane (C31)	44.131	58131849	51.099 ug/mL M4
33) t	n-Dotriacontane (C32)	45.157	57950565	51.121 ug/mL M4
34) t	n-Tritriacontane (C33)	46.148	55454596	51.212 ug/mL M4
35) t	n-tetratriacontane (C34)	47.120	57205500	51.175 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.162	58220895	51.183 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.350	59235077	50.936 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.714	57875883	50.908 ug/mL M4
39) t	n-Octatriacontane (C38)	52.306	57301775	50.624 ug/mL M4
41) t	n-Tetracontane (C40)	56.353	53764908	50.147 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28860.D
Operator : AC
Acquired : 10 Nov 2012 11:35 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091203R
Misc Info : WHAQ67
ALS Vial : 75



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28906.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:47 pm
Operator : AC
Sample : C211091206R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:44:13 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

BH 11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	93	0.00
2	t	n-Octane (C8)	50.000	53.214	-6.4	99	0.00
3	t	n-Nonane (C9)	50.000	52.183	-4.4	97	0.00
4	t	n-Decane (C10)	50.000	51.076	-2.2	95	0.00
5	t	n-Undecane (C11)	50.000	50.552	-1.1	94	0.00
6	t	n-Dodecane (C12)	50.000	52.293	-4.6	97	0.00
7	t	n-Tridecane (C13)	50.000	52.312	-4.6	97	0.00
9	t	n-Tetradecane (C14)	50.000	52.096	-4.2	97	0.00
11	t	n-Pentadecane (C15)	50.000	51.870	-3.7	97	0.00
12	t	n-Hexadecane (C16)	50.000	52.263	-4.5	97	0.00
14	t	n-Heptadecane (C17)	50.000	51.228	-2.5	95	0.00
15	t	Pristane	50.000	53.135	-6.3	98	0.00
16	t	n-Octadecane (C18)	50.000	51.908	-3.8	96	0.00
17	t	Phytane	50.000	52.389	-4.8	97	0.00
18	t	n-Nonadecane (C19)	50.000	51.825	-3.7	96	0.00
19	s	ortho-terphenyl	50.000	50.302	-0.6	99	0.00
20	t	n-Eicosane (C20)	50.000	52.013	-4.0	97	0.00
21	t	n-Heneicosane (C21)	50.000	51.851	-3.7	97	0.00
22	t	n-Docosane (C22)	50.000	51.905	-3.8	96	0.00
23	t	n-Tricosane (C23)	50.000	51.240	-2.5	97	0.00
24	s	d50-Tetracosane	50.000	51.902	-3.8	99	0.00
25	t	n-Tetracosane (C24)	50.000	52.000	-4.0	97	0.00
26	t	n-Pentacosane (C25)	50.000	52.206	-4.4	97	0.00
27	t	n-Hexacosane (C26)	50.000	52.323	-4.6	97	0.02
28	t	n-Heptacosane (C27)	50.000	52.445	-4.9	98	0.02
29	t	n-Octacosane (C28)	50.000	52.742	-5.5	98	0.02
30	t	n-Nonacosane (C29)	50.000	52.990	-6.0	99	0.02
31	t	n-Triacontane (C30)	50.000	53.030	-6.1	99	0.02
32	t	n-Hentriacontane (C31)	50.000	53.196	-6.4	99	0.02
33	t	n-Dotriacontane (C32)	50.000	53.319	-6.6	100	0.02
34	t	n-Tritriacontane (C33)	50.000	53.357	-6.7	100	0.02
35	t	n-tetratriacontane (C34)	50.000	53.057	-6.1	99	0.02
36	t	n-Pentatriacontane (C35)	50.000	52.981	-6.0	99	0.02
37	t	n-Hexatriacontane (C36)	50.000	52.653	-5.3	99	0.02
38	t	n-Heptatriacontane (C37)	50.000	52.605	-5.2	98	0.02
39	t	n-Octatriacontane (C38)	50.000	52.261	-4.5	98	0.01
41	t	n-Tetracontane (C40)	50.000	51.515	-3.0	96	0.02

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.04	0.85 - 1.15

HC2090412R.M Fri Nov 16 15:37:22 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28906.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:47 pm
Operator : AC
Sample : C211091206R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:44:13 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

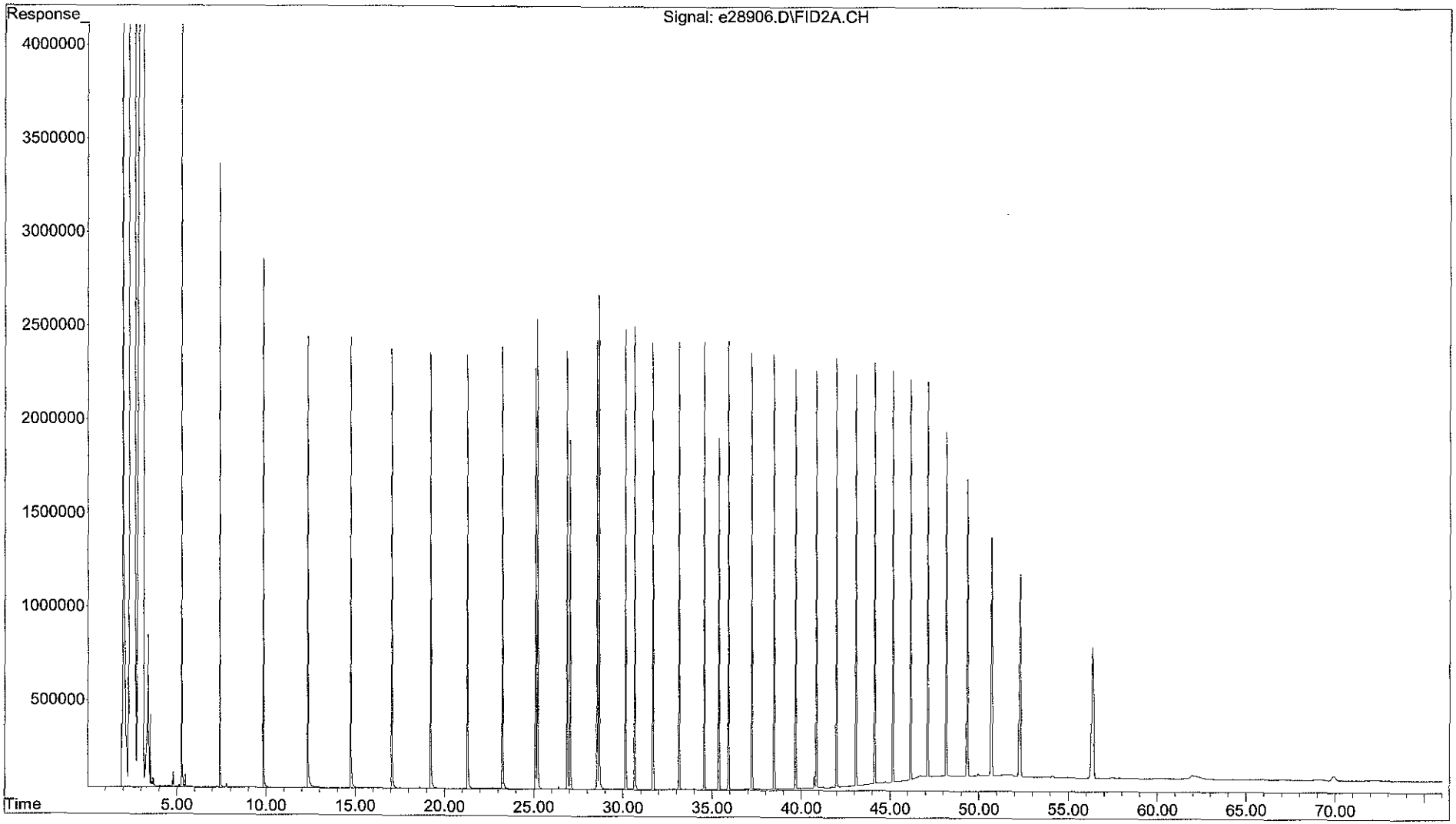
Sub List : CCAL - CCAL

11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.658	58151868	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.650	61780706	50.302 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	100.60%
24) s	d50-Tetracosane	35.369	51644987	51.902 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	103.80%
	Target Compounds			
2) t	n-Octane (C8)	5.253	49826989	53.214 ug/mL M4
3) t	n-Nonane (C9)	7.389	49942317	52.183 ug/mL M4
4) t	n-Decane (C10)	9.829	50744703	51.076 ug/mL M4
5) t	n-Undecane (C11)	12.320	50772546	50.552 ug/mL M4
6) t	n-Dodecane (C12)	14.739	53401489	52.293 ug/mL M4
7) t	n-Tridecane (C13)	17.041	53718453	52.312 ug/mL M4
9) t	n-Tetradecane (C14)	19.220	53988970	52.096 ug/mL M4
11) t	n-Pentadecane (C15)	21.282	53873916	51.870 ug/mL M4
12) t	n-Hexadecane (C16)	23.235	54728697	52.263 ug/mL M4
14) t	n-Heptadecane (C17)	25.092	53310847	51.228 ug/mL M4
15) t	Pristane	25.203	56481520	53.135 ug/mL M4
16) t	n-Octadecane (C18)	26.856	55250547	51.908 ug/mL M4
17) t	Phytane	27.021	55151283	52.389 ug/mL M4
18) t	n-Nonadecane (C19)	28.538	55066508	51.825 ug/mL M4
20) t	n-Eicosane (C20)	30.143	55803773	52.013 ug/mL M4
21) t	n-Heneicosane (C21)	31.676	55853174	51.851 ug/mL M4
22) t	n-Docosane (C22)	33.146	56062300	51.905 ug/mL M4
23) t	n-Tricosane (C23)	34.558	56205678	51.240 ug/mL M4
25) t	n-Tetracosane (C24)	35.913	56074926	52.000 ug/mL M4
26) t	n-Pentacosane (C25)	37.217	57367000	52.206 ug/mL M4
27) t	n-Hexacosane (C26)	38.472	57123451	52.323 ug/mL M4
28) t	n-Heptacosane (C27)	39.680	56154306	52.445 ug/mL M4
29) t	n-Octacosane (C28)	40.849	57042504	52.742 ug/mL M4
30) t	n-Nonacosane (C29)	41.979	57298458	52.990 ug/mL M4
31) t	n-Triacontane (C30)	43.072	56703611	53.030 ug/mL M4
32) t	n-Hentriacontane (C31)	44.129	57383852	53.196 ug/mL M4
33) t	n-Dotriacontane (C32)	45.154	57311932	53.319 ug/mL M4
34) t	n-Tritriacontane (C33)	46.146	54784413	53.357 ug/mL M4
35) t	n-tetratriacontane (C34)	47.119	56238234	53.057 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.160	57145086	52.981 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.343	58060296	52.653 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.708	56708434	52.605 ug/mL M4
39) t	n-Octatriacontane (C38)	52.293	56090620	52.261 ug/mL M4
41) t	n-Tetracontane (C40)	56.344	52371393	51.515 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28906.D
Operator : AC
Acquired : 12 Nov 2012 5:47 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091206R
Misc Info : WHAQ67
ALS Vial : 95



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28918.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 2:43 am
Operator : AC
Sample : C211091207R
Misc : WHAQ67
ALS Vial : 51 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:33:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	108	0.00
2	t	n-Octane (C8)	50.000	47.561	4.9	103	0.00
3	t	n-Nonane (C9)	50.000	49.337	1.3	107	0.00
4	t	n-Decane (C10)	50.000	50.284	-0.6	109	0.00
5	t	n-Undecane (C11)	50.000	49.835	0.3	108	0.00
6	t	n-Dodecane (C12)	50.000	51.373	-2.7	111	0.00
7	t	n-Tridecane (C13)	50.000	51.578	-3.2	112	0.00
9	t	n-Tetradecane (C14)	50.000	51.411	-2.8	112	0.00
11	t	n-Pentadecane (C15)	50.000	51.536	-3.1	112	0.00
12	t	n-Hexadecane (C16)	50.000	51.849	-3.7	113	0.00
14	t	n-Heptadecane (C17)	50.000	50.794	-1.6	111	0.00
15	t	Pristane	50.000	52.771	-5.5	114	0.00
16	t	n-Octadecane (C18)	50.000	51.576	-3.2	112	0.00
17	t	Phytane	50.000	51.570	-3.1	112	0.00
18	t	n-Nonadecane (C19)	50.000	51.450	-2.9	112	0.00
19	s	ortho-terphenyl	50.000	50.301	-0.6	115	0.00
20	t	n-Eicosane (C20)	50.000	51.643	-3.3	112	0.00
21	t	n-Heneicosane (C21)	50.000	51.435	-2.9	112	0.00
22	t	n-Docosane (C22)	50.000	51.508	-3.0	112	0.00
23	t	n-Tricosane (C23)	50.000	50.776	-1.6	112	0.00
24	s	d50-Tetracosane	50.000	51.356	-2.7	114	0.00
25	t	n-Tetracosane (C24)	50.000	51.360	-2.7	112	0.00
26	t	n-Pentacosane (C25)	50.000	51.483	-3.0	112	0.00
27	t	n-Hexacosane (C26)	50.000	51.494	-3.0	112	0.02
28	t	n-Heptacosane (C27)	50.000	51.491	-3.0	112	0.02
29	t	n-Octacosane (C28)	50.000	51.648	-3.3	113	0.02
30	t	n-Nonacosane (C29)	50.000	51.822	-3.6	113	0.02
31	t	n-Triacontane (C30)	50.000	51.778	-3.6	113	0.02
32	t	n-Hentriacontane (C31)	50.000	51.906	-3.8	113	0.02
33	t	n-Dotriacontane (C32)	50.000	51.937	-3.9	114	0.02
34	t	n-Tritriacontane (C33)	50.000	51.942	-3.9	114	0.02
35	t	n-tetratriacontane (C34)	50.000	51.812	-3.6	113	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.485	-3.0	113	0.02
37	t	n-Hexatriacontane (C36)	50.000	51.129	-2.3	112	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.834	-1.7	111	0.02
39	t	n-Octatriacontane (C38)	50.000	50.409	-0.8	110	0.02
41	t	n-Tetracontane (C40)	50.000	49.602	0.8	108	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Fri Nov 16 15:37:49 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28918.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 2:43 am
Operator : AC
Sample : C211091207R
Misc : WHAQ67
ALS Vial : 51 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:33:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

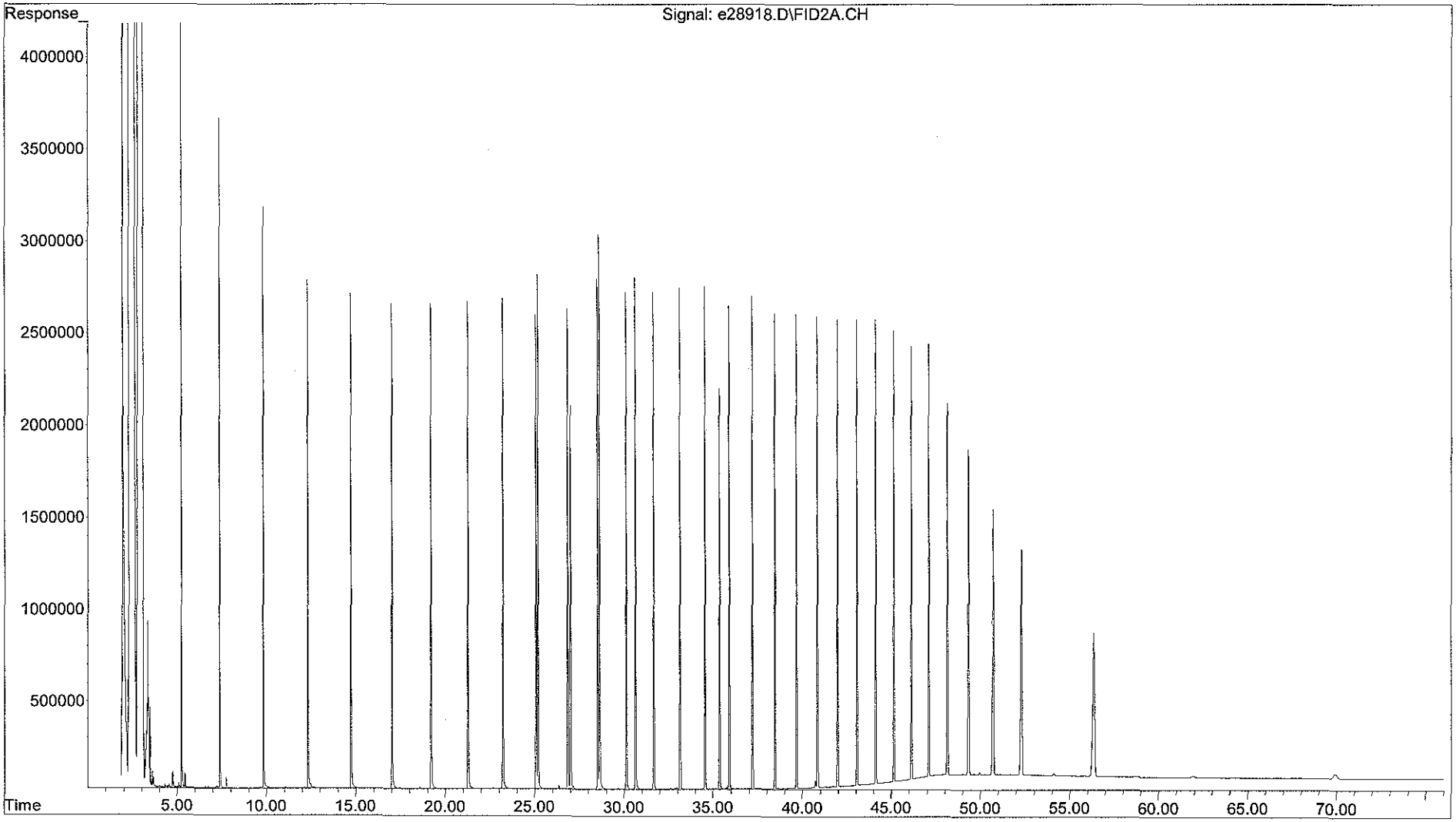
Sub List : CCAL - CCAL

BF 11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.659	67988757	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.652	72230407	50.301 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	100.60%
24) s	d50-Tetracosane	35.369	59745833	51.356 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	102.71%
	Target Compounds			
2) t	n-Octane (C8)	5.241	52067502	47.561 ug/mL M4
3) t	n-Nonane (C9)	7.382	55206171	49.337 ug/mL M4
4) t	n-Decane (C10)	9.824	58408886	50.284 ug/mL M4
5) t	n-Undecane (C11)	12.317	58519851	49.835 ug/mL M4
6) t	n-Dodecane (C12)	14.737	61336288	51.373 ug/mL M4
7) t	n-Tridecane (C13)	17.040	61924069	51.578 ug/mL M4
9) t	n-Tetradecane (C14)	19.220	62292362	51.411 ug/mL M4
11) t	n-Pentadecane (C15)	21.281	62581928	51.536 ug/mL M4
12) t	n-Hexadecane (C16)	23.235	63480076	51.849 ug/mL M4
14) t	n-Heptadecane (C17)	25.093	61800397	50.794 ug/mL M4
15) t	Pristane	25.205	65583341	52.771 ug/mL M4
16) t	n-Octadecane (C18)	26.856	64183124	51.576 ug/mL M4
17) t	Phytane	27.022	63472368	51.570 ug/mL M4
18) t	n-Nonadecane (C19)	28.540	63915448	51.450 ug/mL M4
20) t	n-Eicosane (C20)	30.145	64779741	51.643 ug/mL M4
21) t	n-Heneicosane (C21)	31.679	64778126	51.435 ug/mL M4
22) t	n-Docosane (C22)	33.150	65043518	51.508 ug/mL M4
23) t	n-Tricosane (C23)	34.560	65118989	50.776 ug/mL M4
25) t	n-Tetracosane (C24)	35.916	64753702	51.360 ug/mL M4
26) t	n-Pentacosane (C25)	37.219	66141640	51.483 ug/mL M4
27) t	n-Hexacosane (C26)	38.476	65728239	51.494 ug/mL M4
28) t	n-Heptacosane (C27)	39.683	64459250	51.491 ug/mL M4
29) t	n-Octacosane (C28)	40.853	65308380	51.648 ug/mL M4
30) t	n-Nonacosane (C29)	41.982	65514519	51.822 ug/mL M4
31) t	n-Triacontane (C30)	43.075	64730471	51.778 ug/mL M4
32) t	n-Hentriacontane (C31)	44.132	65463535	51.906 ug/mL M4
33) t	n-Dotriacontane (C32)	45.157	65270107	51.937 ug/mL M4
34) t	n-Tritriacontane (C33)	46.149	62353361	51.942 ug/mL M4
35) t	n-tetratriacontane (C34)	47.121	64208419	51.812 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.163	64925963	51.485 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.350	65917470	51.129 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.714	64068968	50.834 ug/mL M4
39) t	n-Octatriacontane (C38)	52.302	63254438	50.409 ug/mL M4
41) t	n-Tetracontane (C40)	56.354	58956520	49.602 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28918.D
Operator : AC
Acquired : 13 Nov 2012 2:43 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091207R
Misc Info : WHAQ67
ALS Vial : 51



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Raw Data

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27112.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 1:58 am
Operator : AC
Sample : IB209041203R
Misc : DCM
ALS Vial : 62 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:35:50 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

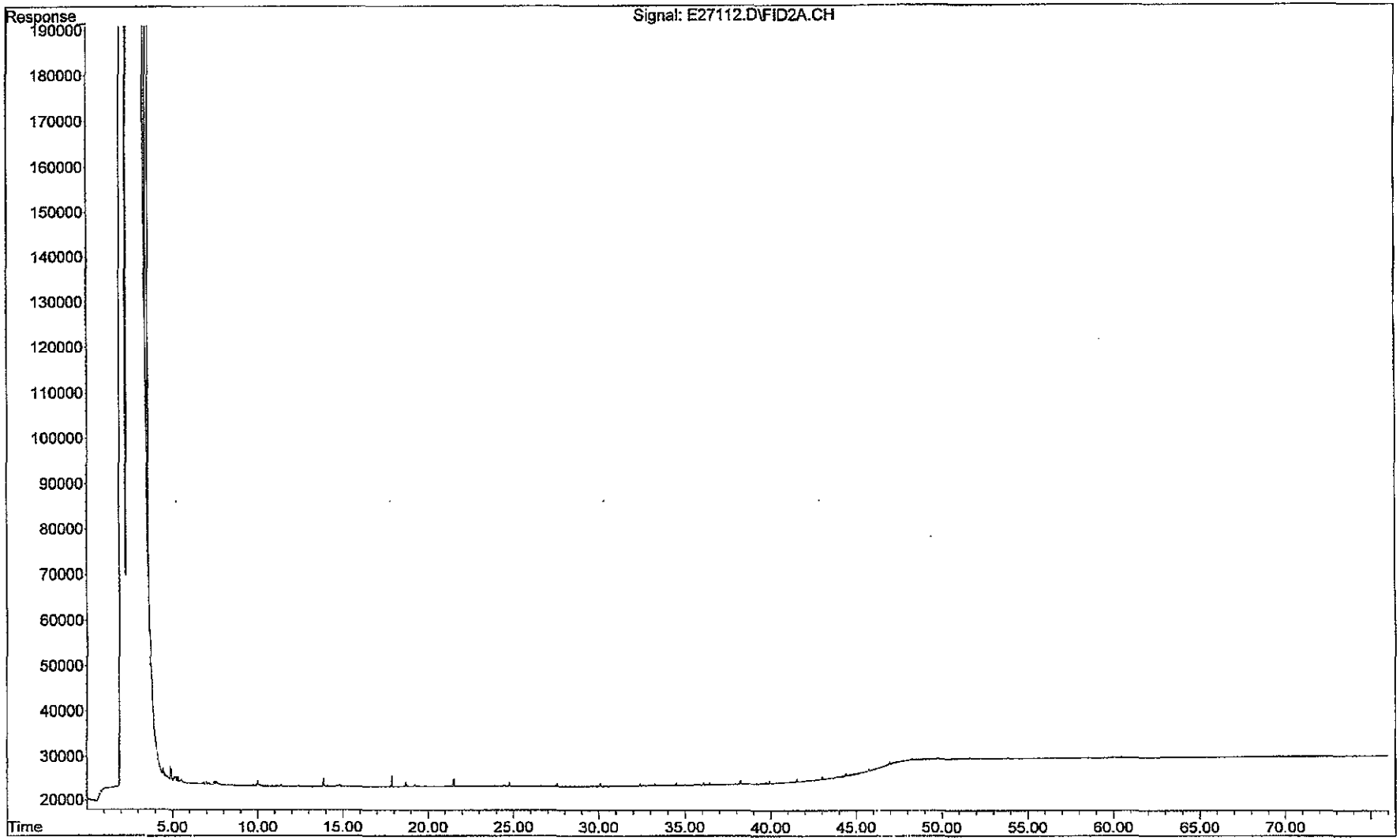
Sub List : TPH - TPH

9-7-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.016	1184	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	39.610	122454170	5687693.907 ug/mL M5
45) h	Total Resolved Hydroc...	39.151	1666475	77403.663 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27112.D
Operator : AC
Acquired : 05 Sep 2012 1:58 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB209041203R
Misc Info : DCM
ALS Vial : 62



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28820.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 4:19 pm
Operator : AC
Sample : IB211091201R
Misc : DCM
ALS Vial : 55 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:42:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

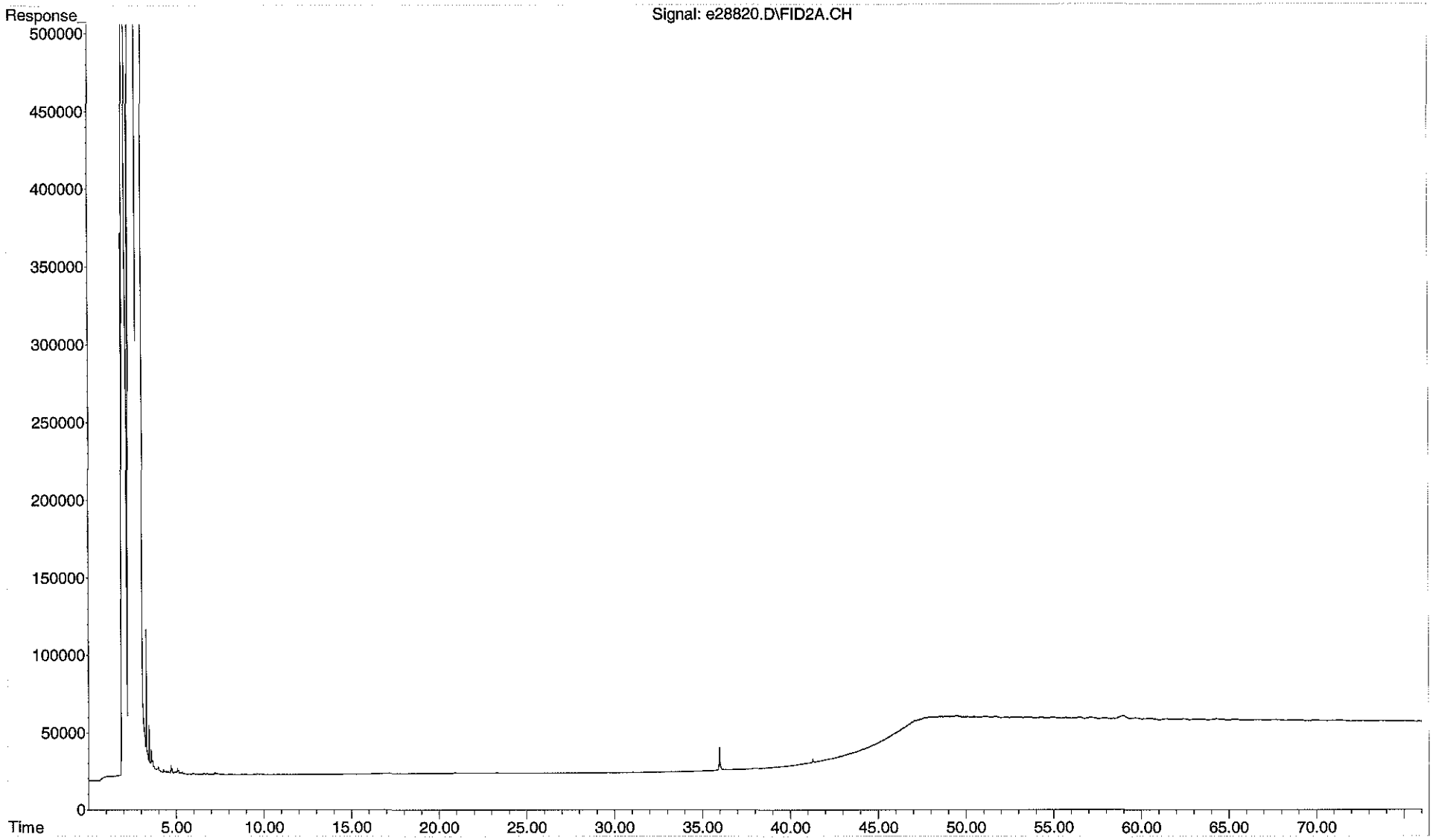
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.710	3120	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	660485366	11640050.890 ug/mL M5
45) h	Total Resolved Hydroc...	38.728	5850614	103108.185 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28820.D
Operator : AC
Acquired : 09 Nov 2012 4:19 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091201R
Misc Info : DCM
ALS Vial : 55



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28864.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 2:34 am
Operator : AC
Sample : IB211091203R
Misc : DCM
ALS Vial : 77 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:43:55 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

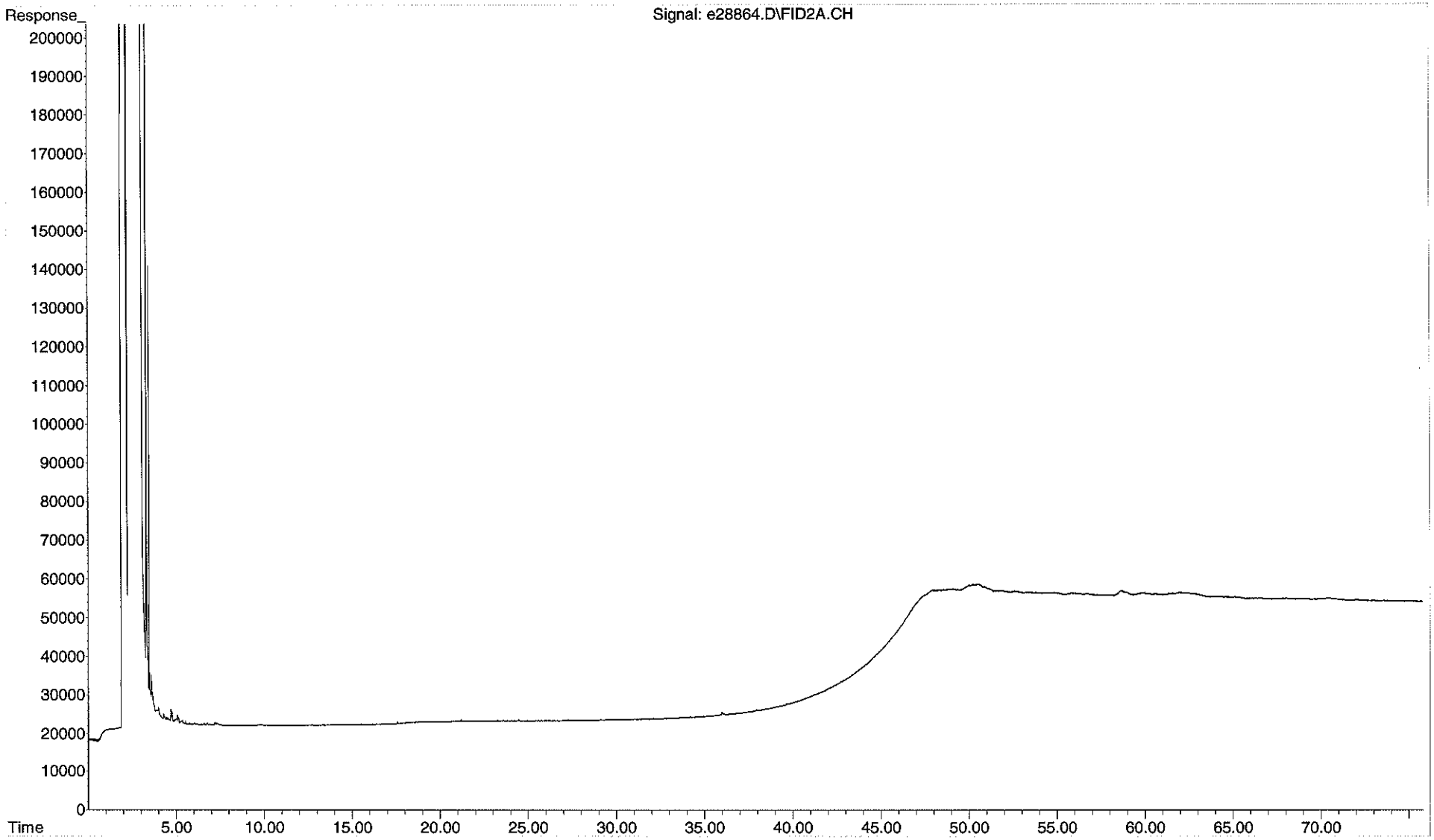
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.710	3042	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	604907280	10935409.365 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	2796005	50545.691 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28864.D
Operator : AC
Acquired : 11 Nov 2012 2:34 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091203R
Misc Info : DCM
ALS Vial : 77



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28922.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 5:41 am
Operator : AC
Sample : IB211091206R
Misc : DCM
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:28 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

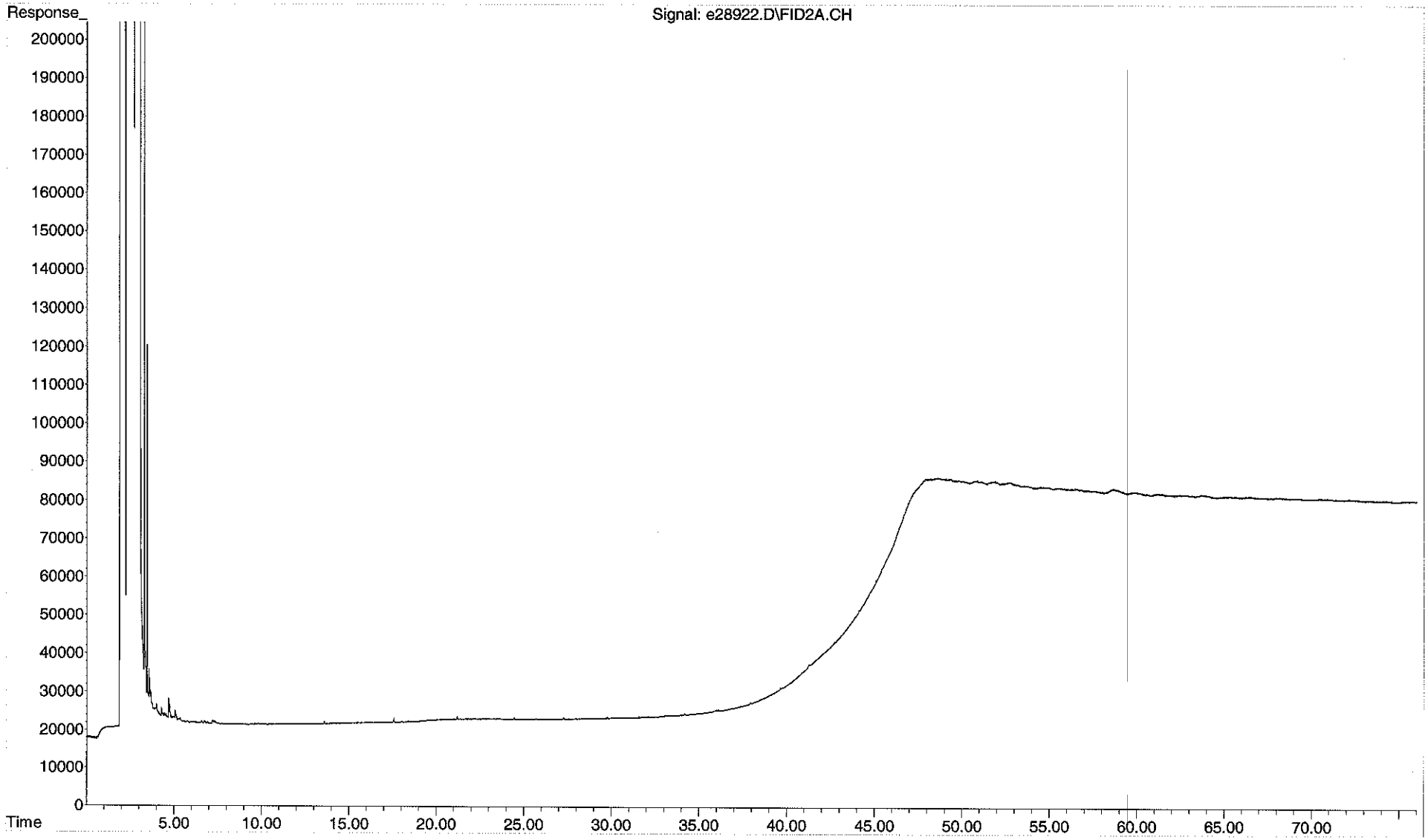
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.696	5463	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	1041692890	10485840.730 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	4731261	47625.603 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28922.D
Operator : AC
Acquired : 13 Nov 2012 5:41 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091206R
Misc Info : DCM
ALS Vial : 53



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612B07**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/09/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0181	U	n-Tricosane (C23)	**0.00427**	J
n-Decane (C10)	**0.00813**	J	n-Tetracosane (C24)	0.0124	U
n-Undecane (C11)	**0.00187**	J	n-Pentacosane (C25)	**0.0732**	CJ
n-Dodecane (C12)	0.0188	U	n-Hexacosane (C26)	**0.00267**	J
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	**0.00440**	J
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**0.00320**	J
n-Tetradecane (C14)	0.0139	U	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**0.00213**	J
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	**0.00320**	J
n-Hexadecane (C16)	0.0128	U	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	**0.00173**	J	n-Tetratriacontane (C34)	0.0179	U
Pristane	**0.00120**	J	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**0.0611**	CJ	n-Hexatriacontane (C36)	0.0221	U
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	0.0108	U	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	0.00741	U	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	**0.00147**	J	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**0.00133**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**0.170**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	91	40-125
d50-Tetracosane	91	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
C - Co-elution

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28822.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 5:49 pm
Operator : AC
Sample : SS110612B07
Misc : 1X
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:49:15 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

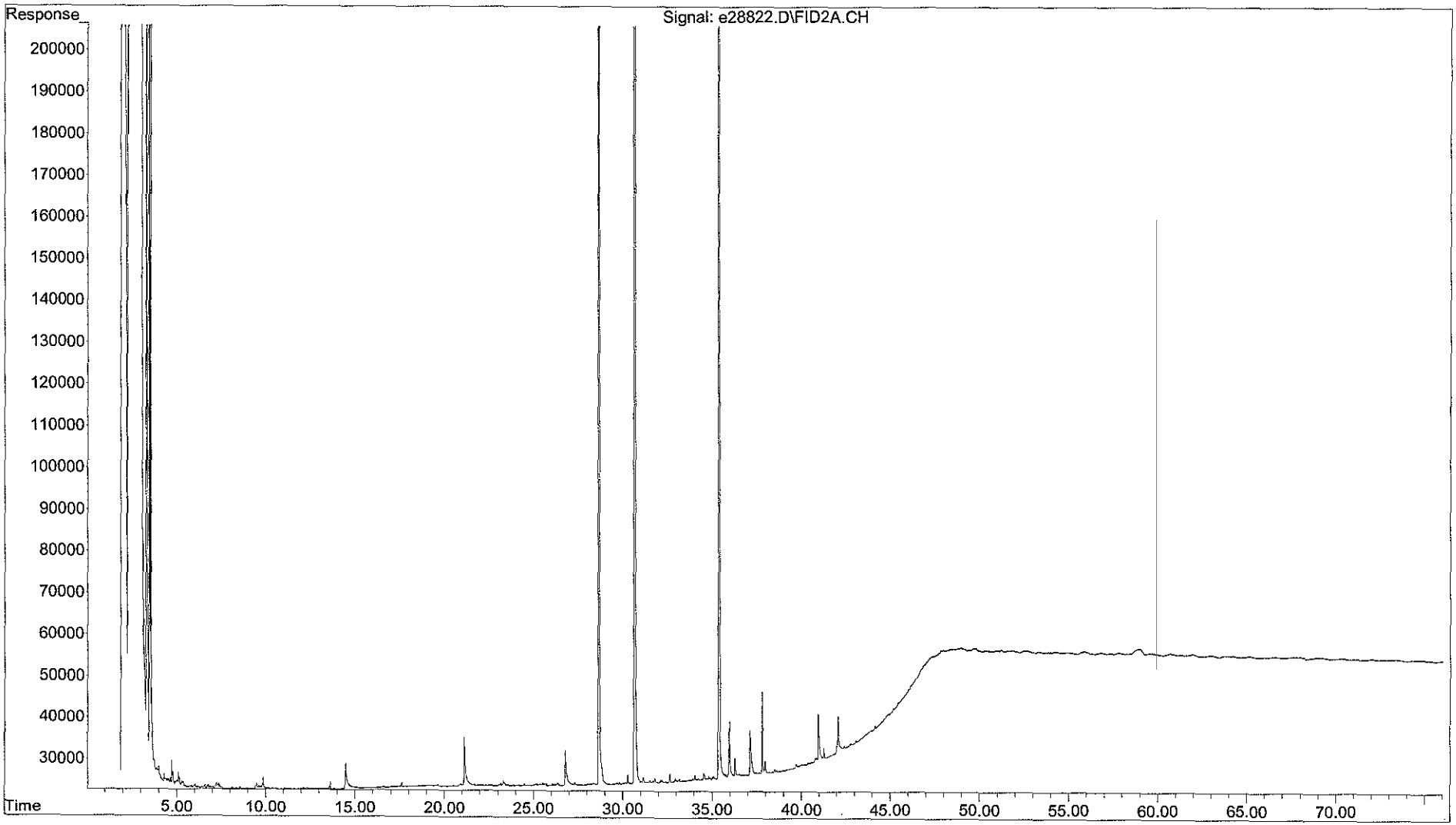
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	30.673	60806683	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	28.651	29233713	22.763	ug/mL	M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	45.53%#		
24) s	d50-Tetracosane	35.374	23623330	22.704	ug/mL	M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	45.41%#		
	Target Compounds					
2) t	n-Octane (C8)	5.214	7514	0.008	ug/mL	M4
4) t	n-Decane (C10)	9.821	62877	0.061	ug/mL	M4
5) t	n-Undecane (C11)	12.318	15179	0.014	ug/mL	M4
14) t	n-Heptadecane (C17)	25.095	14637	0.013	ug/mL	M4
15) t	Pristane	25.189	10391	0.009	ug/mL	M4
16) t	n-Octadecane (C18)	26.770	509515C	0.458	ug/mL	M4
21) t	n-Heneicosane (C21)	31.680	11855	0.011	ug/mL	M4
22) t	n-Docosane (C22)	33.147	11687	0.010	ug/mL	M4
23) t	n-Tricosane (C23)	34.507	36371	0.032	ug/mL	M4
26) t	n-Pentacosane (C25)	37.116f	630662C	0.549	ug/mL	M4
27) t	n-Hexacosane (C26)	38.476	22887	0.020	ug/mL	M4
28) t	n-Heptacosane (C27)	39.690	36538	0.033	ug/mL	M4
29) t	n-Octacosane (C28)	40.850	27008	0.024	ug/mL	M4
31) t	n-Triacontane (C30)	43.079	17542	0.016	ug/mL	M4
32) t	n-Hentriacontane (C31)	44.130	27374	0.024	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	631093217	570.733	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	-29392149	N.D.	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	9605475	8.687	ug/mL	m
	SemiQuant Compounds - Not Calibrated on this Instrument					

(f)=RT Delta > 1/2 Window (m)=manual int.

11-16-12

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28822.D
Operator : AC
Acquired : 09 Nov 2012 5:49 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612B07
Misc Info : 1X
ALS Vial : 56



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCS03**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/09/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.987**	S	n-Tricosane (C23)	0.00793	U
n-Decane (C10)	**1.11**	S	n-Tetracosane (C24)	**1.28**	S
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	0.0781	U
n-Dodecane (C12)	**1.16**	S	n-Hexacosane (C26)	**1.26**	S
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	0.0104	U
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**1.27**	S
n-Tetradecane (C14)	**1.20**	S	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**1.28**	S
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	0.0143	U
n-Hexadecane (C16)	**1.28**	S	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	0.0161	U	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**1.28**	S	n-Hexatriacontane (C36)	**1.20**	S
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	**1.19**	S	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	**1.22**	S	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**1.23**	S			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**17.0**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	93	40-125
d50-Tetracosane	91	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28828.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 10:17 pm
Operator : AC
Sample : SS110612LCS03
Misc : 1X
ALS Vial : 59 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:51:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

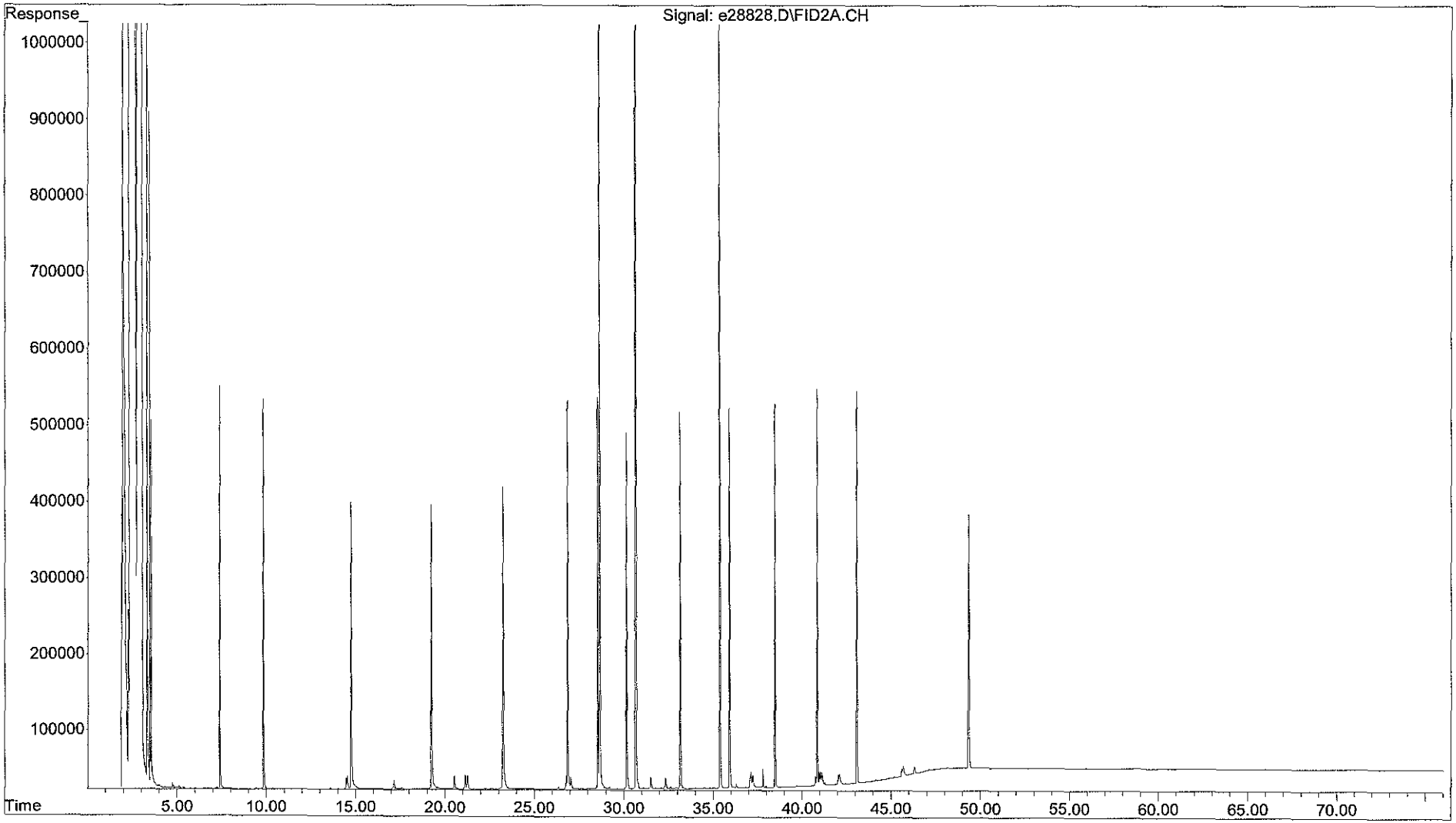
Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.673	69080064	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.651	34031751	23.325 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	46.65%#
24) s	d50-Tetracosane	35.370	26975198	22.821 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	45.64%#
	Target Compounds			
3) t	n-Nonane (C9)	7.366	8420521	7.406 ug/mL M4
4) t	n-Decane (C10)	9.816	9856457	8.351 ug/mL M4
6) t	n-Dodecane (C12)	14.734	10538555	8.687 ug/mL M4
9) t	n-Tetradecane (C14)	19.216	11101246	9.017 ug/mL M4
12) t	n-Hexadecane (C16)	23.232	11984423	9.634 ug/mL M4
16) t	n-Octadecane (C18)	26.847	12189684	9.641 ug/mL M4
18) t	n-Nonadecane (C19)	28.532	11267764	8.927 ug/mL M4
20) t	n-Eicosane (C20)	30.137	11633839	9.128 ug/mL M4
22) t	n-Docosane (C22)	33.141	11804387	9.200 ug/mL M4
25) t	n-Tetracosane (C24)	35.908	12284528	9.590 ug/mL M4
27) t	n-Hexacosane (C26)	38.465	12221077	9.423 ug/mL M4
29) t	n-Octacosane (C28)	40.843	12244868	9.531 ug/mL M4
31) t	n-Triacontane (C30)	43.064	12163958	9.576 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.334	11809064	9.015 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.728	745607369	593.537 ug/mL M4
42) h	C9-C44 Total Petroleu BS	38.728	85122003	67.761 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	176263318	140.314 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28828.D
Operator : AC
Acquired : 09 Nov 2012 10:17 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612LCS03
Misc Info : 1X
ALS Vial : 59



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **SS110612LCSD03**
Associated Blank: **SS110612B07**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/10/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.984**	S	n-Tricosane (C23)	0.00793	U
n-Decane (C10)	**1.07**	S	n-Tetracosane (C24)	**1.25**	S
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	0.0781	U
n-Dodecane (C12)	**1.12**	S	n-Hexacosane (C26)	**1.23**	S
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	0.0104	U
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**1.25**	S
n-Tetradecane (C14)	**1.17**	S	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**1.26**	S
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	0.0143	U
n-Hexadecane (C16)	**1.25**	S	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	0.0161	U	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**1.24**	S	n-Hexatriacontane (C36)	**1.23**	S
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	**1.16**	S	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	**1.18**	S	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**1.20**	S			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**16.6**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	90	40-125
d50-Tetracosane	89	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28834.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 2:44 am
Operator : AC
Sample : SS110612LCSD03
Misc : 1X
ALS Vial : 62 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:42:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

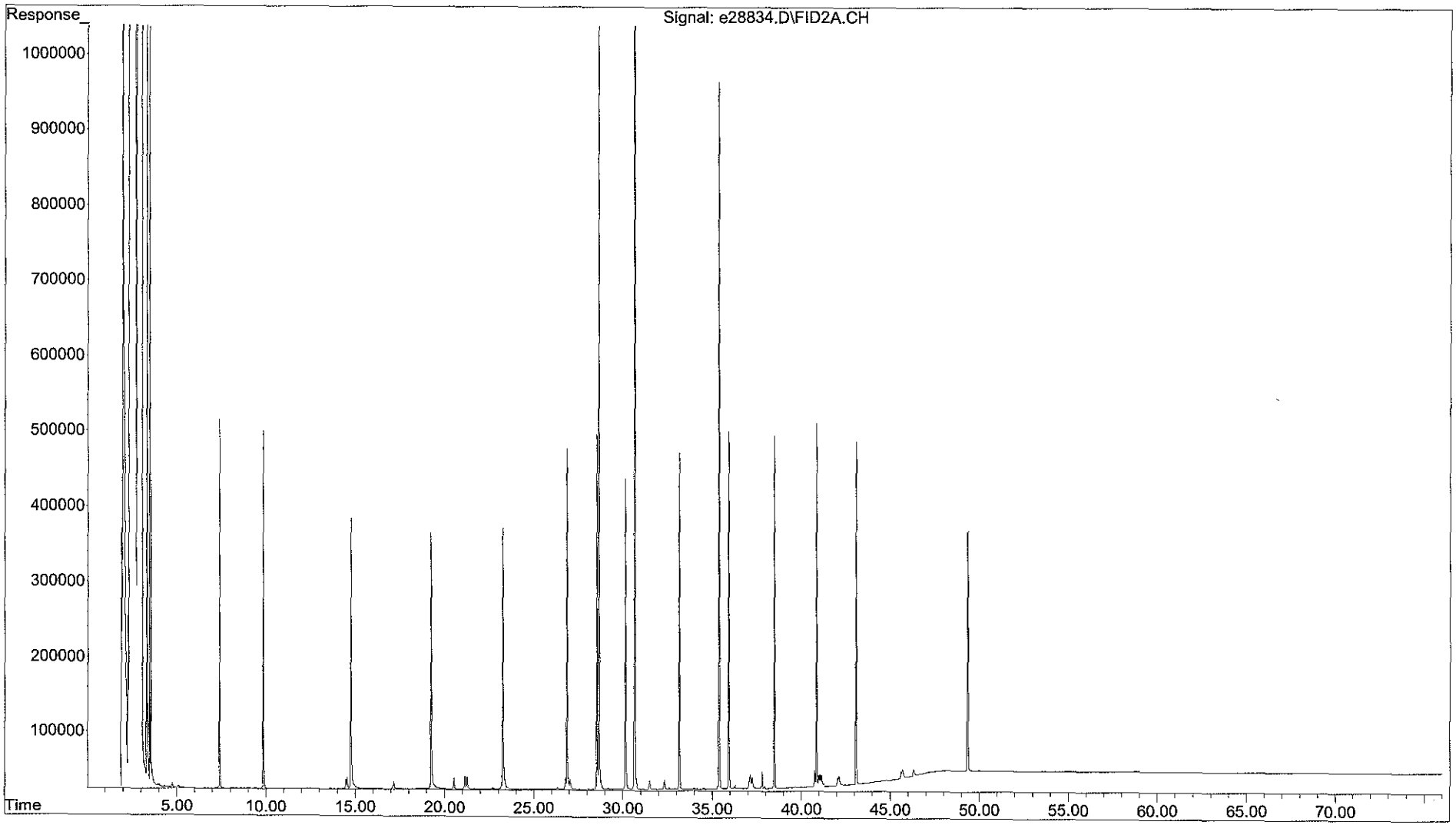
Sub List : SHC - SHC

11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.668	64996659	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.646	30741546	22.394 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.79%#
24) s	d50-Tetracosane	35.369	24646404	22.161 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.32%#
	Target Compounds			
3) t	n-Nonane (C9)	7.364	7893184	7.379 ug/mL M4
4) t	n-Decane (C10)	9.818	8942673	8.053 ug/mL M4
6) t	n-Dodecane (C12)	14.734	9604349	8.415 ug/mL M4
9) t	n-Tetradecane (C14)	19.214	10127164	8.743 ug/mL M4
12) t	n-Hexadecane (C16)	23.231	10934124	9.342 ug/mL M4
16) t	n-Octadecane (C18)	26.847	11094045	9.325 ug/mL M4
18) t	n-Nonadecane (C19)	28.530	10305604	8.678 ug/mL M4
20) t	n-Eicosane (C20)	30.135	10655464	8.886 ug/mL M4
22) t	n-Docosane (C22)	33.140	10861771	8.997 ug/mL M4
25) t	n-Tetracosane (C24)	35.905	11268986	9.350 ug/mL M4
27) t	n-Hexacosane (C26)	38.464	11277408	9.242 ug/mL M4
29) t	n-Octacosane (C28)	40.840	11377567	9.412 ug/mL M4
31) t	n-Triacontane (C30)	43.064	11313656	9.466 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.330	11319481	9.184 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.728	704422297	595.981 ug/mL M4
42) h	C9-C44 Total Petroleu BS	38.728	43936931	37.173 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	162445051	137.438 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28834.D
Operator : AC
Acquired : 10 Nov 2012 2:44 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612LCSD03
Misc Info : 1X
ALS Vial : 62



Form I
Cold Lake Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TS111312CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/12/12	100	0.10018	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**1900**		n-Tricosane (C23)	**213**	
n-Decane (C10)	**1000**		n-Tetracosane (C24)	**191**	
n-Undecane (C11)	**841**		n-Pentacosane (C25)	**250**	
n-Dodecane (C12)	**590**		n-Hexacosane (C26)	**154**	
n-Tridecane (C13)	**633**		n-Heptacosane (C27)	**143**	
2,6,10 Trimethyldodecane (1380)	**305**		n-Octacosane (C28)	**114**	
n-Tetradecane (C14)	**704**		n-Nonacosane (C29)	**120**	
2,6,10 Trimethyltridecane (1470)	**461**		n-Triacontane (C30)	**133**	
n-Pentadecane (C15)	**571**		n-Hentriacontane (C31)	**341**	
n-Hexadecane (C16)	**612**		n-Dotriacontane (C32)	**117**	
Norpristane (1650)	**226**		n-Tritriacontane (C33)	**76.3**	J
n-Heptadecane (C17)	**463**		n-Tetratriacontane (C34)	**196**	
Pristane	**443**		n-Pentatriacontane (C35)	**122**	
n-Octadecane (C18)	**401**		n-Hexatriacontane (C36)	**112**	
Phytane	**330**		n-Heptatriacontane (C37)	**71.9**	J
n-Nonadecane (C19)	**303**		n-Octatriacontane (C38)	**68.5**	J
n-Eicosane (C20)	**322**		n-Nonatriacontane (C39)	**35.5**	J
n-Heneicosane (C21)	**229**		n-Tetracontane (C40)	**42.2**	J
n-Docosane (C22)	**218**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**13000**
Total Petroleum Hydrocarbons (C9-C44)	**467000**
Total Resolved Hydrocarbons	**64600**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	40-125
d50-Tetracosane	94	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28914.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:44 pm
Operator : AC
Sample : TS111312CL01
Misc : WHAP16
ALS Vial : 99 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	65826060	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	71118073	51.154 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	102.31%
24) s	d50-Tetracosane	35.375	53029960	47.080 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	94.16%
	Target Compounds			
2) t	n-Octane (C8)	5.211	32587805	30.746 ug/mL M4
3) t	n-Nonane (C9)	7.359	20587631	19.003 ug/mL M4
4) t	n-Decane (C10)	9.808	11262429	10.014 ug/mL M4
5) t	n-Undecane (C11)	12.304	9576562	8.423 ug/mL M4
6) t	n-Dodecane (C12)	14.724	6828149	5.907 ug/mL M4
7) t	n-Tridecane (C13)	17.026	7366389	6.337 ug/mL M4
8) t	1380	18.704	3580328	3.052 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	8275895	7.055 ug/mL M4
10) t	1470	20.494	5428434	4.617 ug/mL M4
11) t	n-Pentadecane (C15)	21.264	6725409	5.720 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	7271259	6.134 ug/mL M4
13) t	1650	24.127	2669829	2.266 ug/mL M4
14) t	n-Heptadecane (C17)	25.075	5466206	4.640 ug/mL M4
15) t	Pristane	25.173	5337565	4.436 ug/mL M4
16) t	n-Octadecane (C18)	26.837	4834604	4.013 ug/mL M4
17) t	Phytane	27.000	3938903	3.305 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	3646196	3.031 ug/mL M4
20) t	n-Eicosane (C20)	30.126	3924339	3.231 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	2797500	2.294 ug/mL M4
22) t	n-Docosane (C22)	33.128	2665808	2.180 ug/mL M4
23) t	n-Tricosane (C23)	34.539	2647949	2.133 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	2334559	1.913 ug/mL M4
26) t	n-Pentacosane (C25)	37.195	3110581	2.501 ug/mL M4
27) t	n-Hexacosane (C26)	38.451	1903410	1.540 ug/mL M4
28) t	n-Heptacosane (C27)	39.659	1733325	1.430 ug/mL M4
29) t	n-Octacosane (C28)	40.828	1397060	1.141 ug/mL M4
30) t	n-Nonacosane (C29)	41.958	1466178	1.198 ug/mL M4
31) t	n-Triacontane (C30)	43.051	1610237	1.330 ug/mL M4
32) t	n-Hentriacontane (C31)	44.121	4170703	3.416 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	1429256	1.175 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	888465	0.764 ug/mL M4
35) t	n-tetratriacontane (C34)	47.050	2358831	1.966 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.137	1496801	1.226 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.288	1406017	1.126 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28914.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:44 pm
Operator : AC
Sample : TS111312CL01
Misc : WHAP16
ALS Vial : 99 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

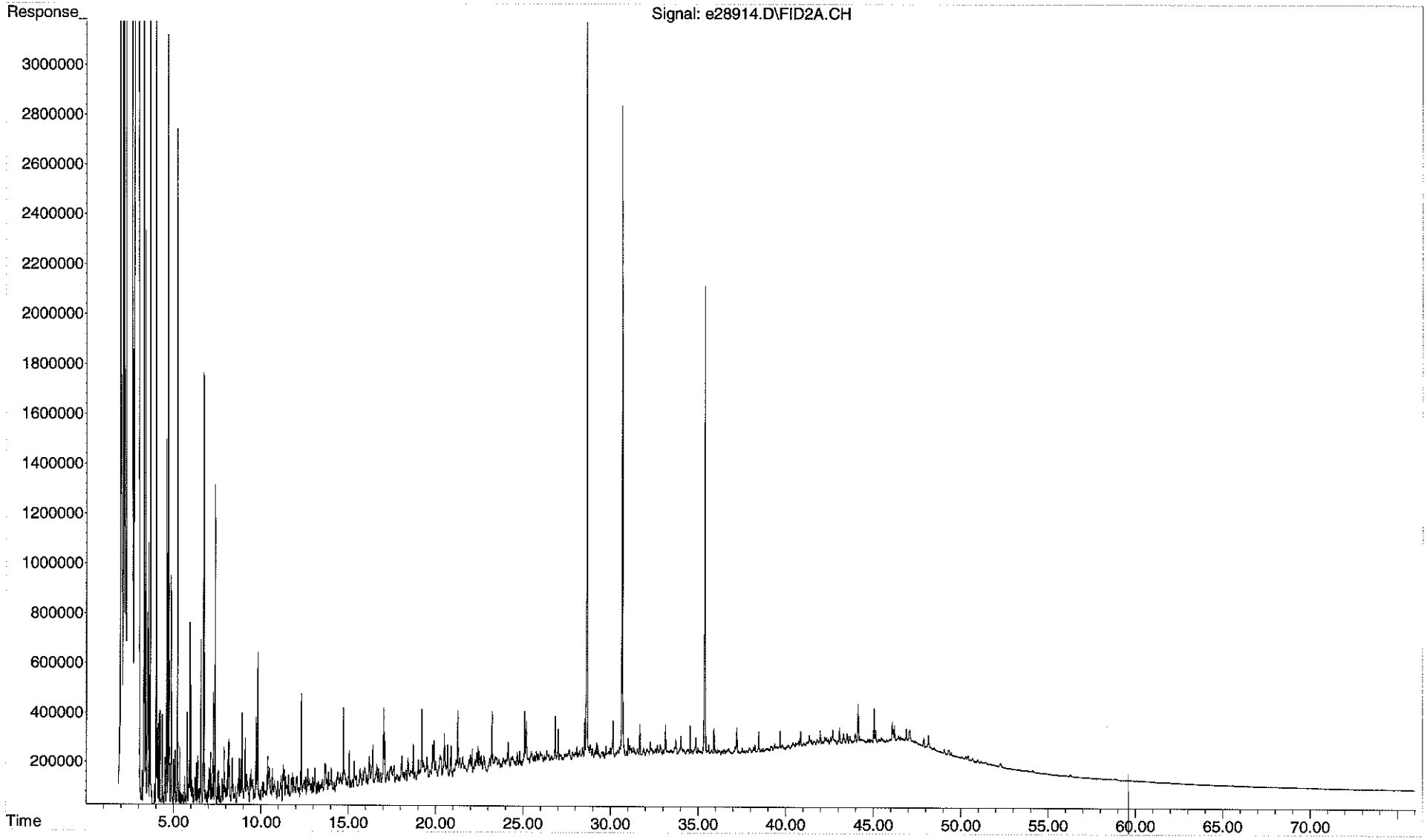
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.671	878384	0.720	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.270	832971	0.686	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.095	409877	0.356	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.286	486821	0.423	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	6637208111	5544.699	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	5595515221	4674.473	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	774204769	646.768	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28914.D
Operator : AC
Acquired : 12 Nov 2012 11:44 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312CL01
Misc Info : WHAP16
ALS Vial : 99



Form I
Western Canadian Select
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TS111312WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/12/12	100	0.10119	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**1600**		n-Tricosane (C23)	**207**	
n-Decane (C10)	**1000**		n-Tetracosane (C24)	**196**	
n-Undecane (C11)	**874**		n-Pentacosane (C25)	**224**	
n-Dodecane (C12)	**574**		n-Hexacosane (C26)	**155**	
n-Tridecane (C13)	**689**		n-Heptacosane (C27)	**127**	
2,6,10 Trimethyldodecane (1380)	**299**		n-Octacosane (C28)	**89.7**	J
n-Tetradecane (C14)	**688**		n-Nonacosane (C29)	**89.9**	J
2,6,10 Trimethyltridecane (1470)	**534**		n-Triacontane (C30)	**113**	
n-Pentadecane (C15)	**610**		n-Hentriacontane (C31)	**298**	
n-Hexadecane (C16)	**658**		n-Dotriacontane (C32)	**67.9**	J
Norpristane (1650)	**244**		n-Tritriacontane (C33)	**44.3**	J
n-Heptadecane (C17)	**455**		n-Tetratriacontane (C34)	**192**	
Pristane	**613**		n-Pentatriacontane (C35)	**93.8**	J
n-Octadecane (C18)	**397**		n-Hexatriacontane (C36)	**85.7**	J
Phytane	**355**		n-Heptatriacontane (C37)	**38.4**	J
n-Nonadecane (C19)	**306**		n-Octatriacontane (C38)	**82.8**	J
n-Eicosane (C20)	**310**		n-Nonatriacontane (C39)	98.8	U
n-Heneicosane (C21)	**225**		n-Tetracontane (C40)	98.8	U
n-Docosane (C22)	**208**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**12700**
Total Petroleum Hydrocarbons (C9-C44)	**464000**
Total Resolved Hydrocarbons	**67400**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	97	40-125
d50-Tetracosane	95	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28912.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:15 pm
Operator : AC
Sample : TS111312WCS01
Misc : WHAP15
ALS Vial : 98 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:53 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.666	69883728	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	71871575	48.694 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	97.39%
24) s	d50-Tetracosane	35.375	56901718	47.585 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	95.17%
	Target Compounds			
2) t	n-Octane (C8)	5.206	27301688	24.263 ug/mL M4
3) t	n-Nonane (C9)	7.356	18673033	16.235 ug/mL M4
4) t	n-Decane (C10)	9.807	12082767	10.120 ug/mL M4
5) t	n-Undecane (C11)	12.304	10672327	8.842 ug/mL M4
6) t	n-Dodecane (C12)	14.722	7122246	5.804 ug/mL M4
7) t	n-Tridecane (C13)	17.025	8600410	6.969 ug/mL M4
8) t	1380	18.704	3767421	3.025 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	8669720	6.961 ug/mL M4
10) t	1470	20.492	6744645	5.404 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	7707900	6.175 ug/mL M4
12) t	n-Hexadecane (C16)	23.221	8378975	6.658 ug/mL M4
13) t	1650	24.130	3087847	2.469 ug/mL M4
14) t	n-Heptadecane (C17)	25.076	5760489	4.606 ug/mL M4
15) t	Pristane	25.174	7920762	6.201 ug/mL M4
16) t	n-Octadecane (C18)	26.839	5138781	4.017 ug/mL M4
17) t	Phytane	27.001	4539345	3.588 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	3948450	3.092 ug/mL M4
20) t	n-Eicosane (C20)	30.126	4047588	3.139 ug/mL M4
21) t	n-Heneicosane (C21)	31.658	2947227	2.277 ug/mL M4
22) t	n-Docosane (C22)	33.129	2736106	2.108 ug/mL M4
23) t	n-Tricosane (C23)	34.538	2756718	2.091 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	2570359	1.983 ug/mL M4
26) t	n-Pentacosane (C25)	37.195	2989618	2.264 ug/mL M4
27) t	n-Hexacosane (C26)	38.452	2057263	1.568 ug/mL M4
28) t	n-Heptacosane (C27)	39.661	1656881	1.288 ug/mL M4
29) t	n-Octacosane (C28)	40.832	1179728	0.908 ug/mL M4
30) t	n-Nonacosane (C29)	41.961	1183107	0.910 ug/mL M4
31) t	n-Triacontane (C30)	43.058	1475563	1.148 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	3910023	3.016 ug/mL M4
33) t	n-Dotriacontane (C32)	45.132	887245	0.687 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	552842	0.448 ug/mL M4
35) t	n-tetratriacontane (C34)	47.049	2469637	1.939 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.136	1229457	0.949 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.268	1148441	0.867 ug/mL M4

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28912.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:15 pm
Operator : AC
Sample : TS111312WCS01
Misc : WHAP15
ALS Vial : 98 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:53 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

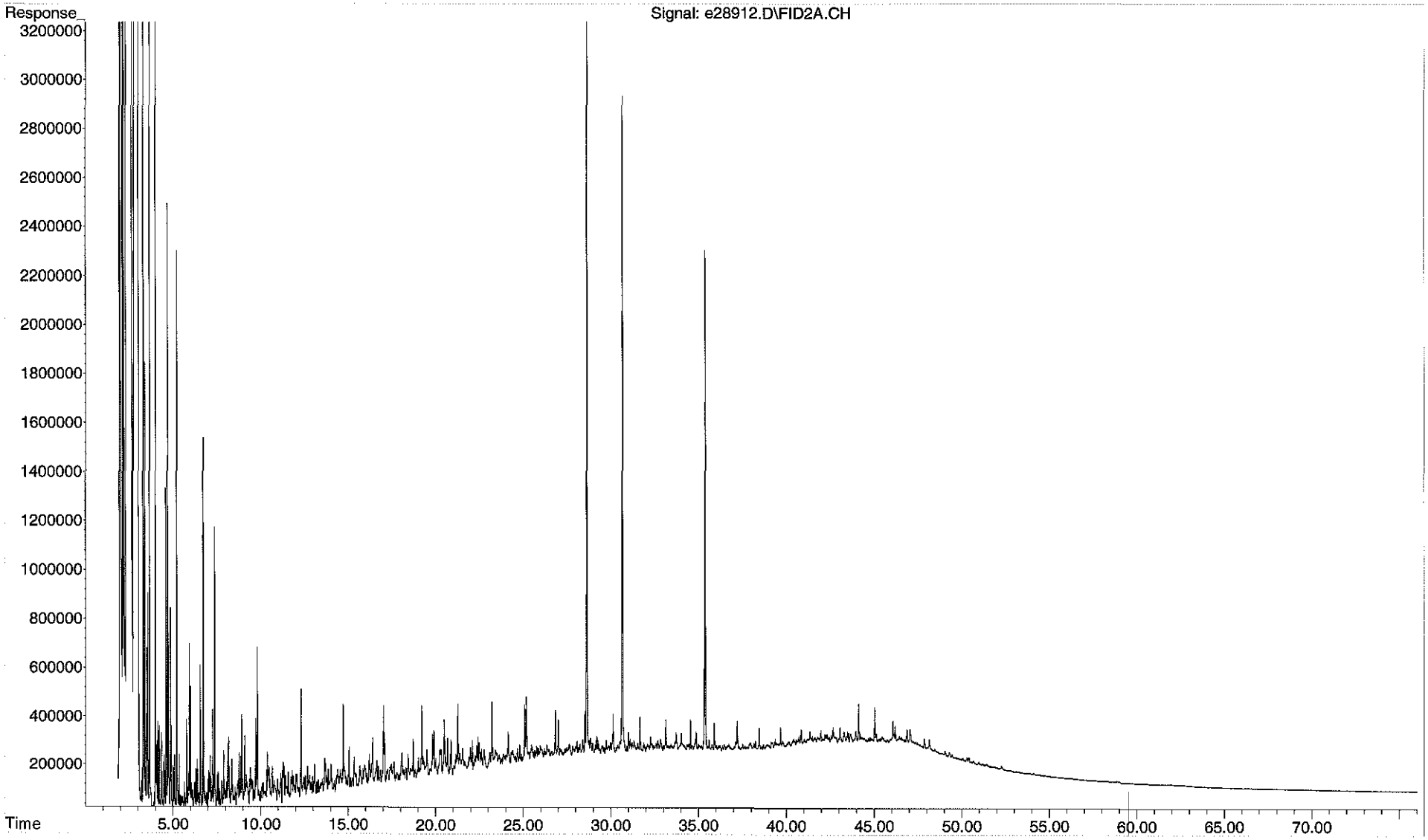
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.657	504384	0.389	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.279	1080989	0.838	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	7008489108	5514.914	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	5966796218	4695.216	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	866480449	681.825	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28912.D
Operator : AC
Acquired : 12 Nov 2012 10:15 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312WCS01
Misc Info : WHAP15
ALS Vial : 98



Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/09/12	100	0.10058	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**7340**		n-Tricosane (C23)	**1940**	
n-Decane (C10)	**5900**		n-Tetracosane (C24)	**1960**	
n-Undecane (C11)	**5390**		n-Pentacosane (C25)	**1730**	
n-Dodecane (C12)	**5000**		n-Hexacosane (C26)	**1530**	
n-Tridecane (C13)	**4780**		n-Heptacosane (C27)	**1190**	
2,6,10 Trimethyldodecane (1380)	**914**		n-Octacosane (C28)	**881**	
n-Tetradecane (C14)	**4170**		n-Nonacosane (C29)	**776**	
2,6,10 Trimethyltridecane (1470)	**1580**		n-Triacontane (C30)	**724**	
n-Pentadecane (C15)	**4060**		n-Hentriacontane (C31)	**674**	
n-Hexadecane (C16)	**3940**		n-Dotriacontane (C32)	**446**	
Norpristane (1650)	**1240**		n-Tritriacontane (C33)	**371**	
n-Heptadecane (C17)	**3540**		n-Tetratriacontane (C34)	**366**	
Pristane	**2370**		n-Pentatriacontane (C35)	**333**	
n-Octadecane (C18)	**3060**		n-Hexatriacontane (C36)	**219**	
Phytane	**1410**		n-Heptatriacontane (C37)	**169**	
n-Nonadecane (C19)	**2680**		n-Octatriacontane (C38)	**154**	
n-Eicosane (C20)	**2570**		n-Nonatriacontane (C39)	**99.3**	J
n-Heneicosane (C21)	**2280**		n-Tetracontane (C40)	**99.3**	J
n-Docosane (C22)	**2220**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**78100**
Total Petroleum Hydrocarbons (C9-C44)	**627000**
Total Resolved Hydrocarbons	**197000**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28816.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 1:19 pm
Operator : AC
Sample : TS111312ANC01
Misc : 1X WHAP13
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:11:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.690	64252423	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.680	70802069	52.174 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	104.35%
24) s	d50-Tetracosane	35.400	58230087	52.963 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	105.93%
	Target Compounds			
2) t	n-Octane (C8)	5.231	105612147	102.082 ug/mL M4
3) t	n-Nonane (C9)	7.386	78036226	73.795 ug/mL M4
4) t	n-Decane (C10)	9.837	65194237	59.389 ug/mL M4
5) t	n-Undecane (C11)	12.336	60154601	54.206 ug/mL M4
6) t	n-Dodecane (C12)	14.756	56684456	50.237 ug/mL M4
7) t	n-Tridecane (C13)	17.059	54610876	48.132 ug/mL M4
8) t	1380	18.728	10528329	9.195 ug/mL M4
9) t	n-Tetradecane (C14)	19.239	48049969	41.963 ug/mL M4
10) t	1470	20.519	18178259	15.840 ug/mL M4
11) t	n-Pentadecane (C15)	21.301	46854027	40.828 ug/mL M4
12) t	n-Hexadecane (C16)	23.252	45801337	39.585 ug/mL M4
13) t	1650	24.154	14329063	12.462 ug/mL M4
14) t	n-Heptadecane (C17)	25.109	40902782	35.573 ug/mL M4
15) t	Pristane	25.206	27939411	23.788 ug/mL M4
16) t	n-Octadecane (C18)	26.873	36257328	30.830 ug/mL M4
17) t	Phytane	27.030	16542980	14.222 ug/mL M4
18) t	n-Nonadecane (C19)	28.556	31604938	26.920 ug/mL M4
20) t	n-Eicosane (C20)	30.159	30589125	25.804 ug/mL M4
21) t	n-Heneicosane (C21)	31.692	27320748	22.955 ug/mL M4
22) t	n-Docosane (C22)	33.163	26612353	22.300 ug/mL M4
23) t	n-Tricosane (C23)	34.574	23643581	19.508 ug/mL M4
25) t	n-Tetracosane (C24)	35.931	23473852	19.701 ug/mL M4
26) t	n-Pentacosane (C25)	37.231	21072792	17.356 ug/mL M4
27) t	n-Hexacosane (C26)	38.487	18557529	15.384 ug/mL M4
28) t	n-Heptacosane (C27)	39.697	14192088	11.996 ug/mL M4
29) t	n-Octacosane (C28)	40.862	10589890	8.862 ug/mL M4
30) t	n-Nonacosane (C29)	41.994	9318520	7.800 ug/mL M4
31) t	n-Triacontane (C30)	43.085	8607714	7.286 ug/mL M4
32) t	n-Hentriacontane (C31)	44.144	8081325	6.780 ug/mL M4
33) t	n-Dotriacontane (C32)	45.168	5333538	4.491 ug/mL M4
34) t	n-Tritriacontane (C33)	46.162	4228293	3.727 ug/mL M4
35) t	n-tetratriacontane (C34)	47.128	4306436	3.677 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.178	3990307	3.348 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.360	2678828	2.199 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28816.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 1:19 pm
Operator : AC
Sample : TS111312ANC01
Misc : 1X WHAP13
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:11:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

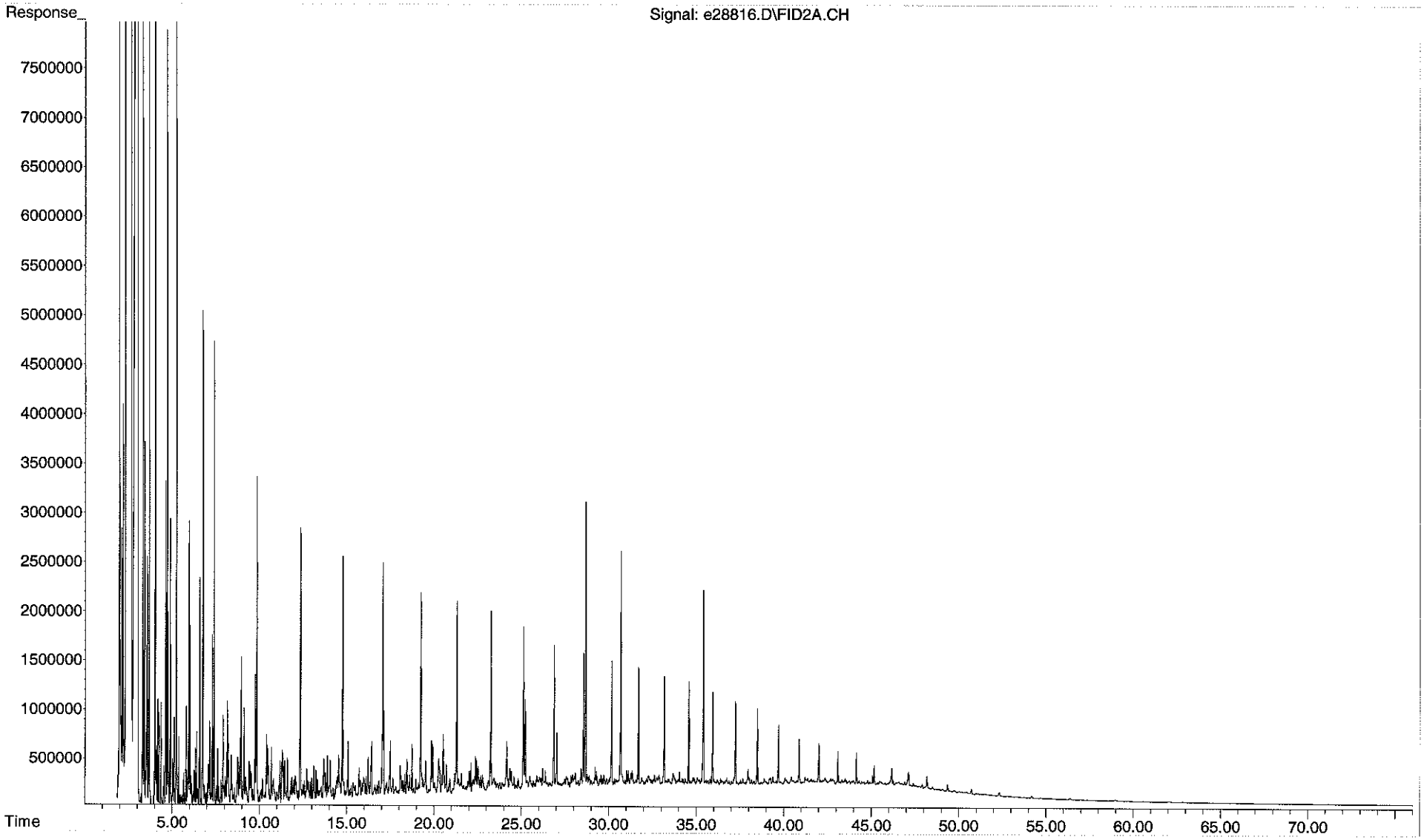
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.732	2028207	1.703	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.323	1836612	1.549	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.178	1121630	0.999	ug/mL	m
41)	t	n-Tetracontane (C40)	56.381	1122632	0.999	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	8023993224	6867.386	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	7363507858	6302.106	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	2316966904	1982.991	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28816.D
Operator : AC
Acquired : 09 Nov 2012 1:19 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312ANC01
Misc Info : 1X WHAP13
ALS Vial : 53



Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210081**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	09/05/12	100	0.10058	10	1	AC

Parameter	Result	Parameter	Result
n-Nonane (C9)	**6790**	n-Tricosane (C23)	**1850**
n-Decane (C10)	**5470**	n-Tetracosane (C24)	**1710**
n-Undecane (C11)	**5000**	n-Pentacosane (C25)	**1630**
n-Dodecane (C12)	**4300**	n-Hexacosane (C26)	**1470**
n-Tridecane (C13)	**4300**	n-Heptacosane (C27)	**1100**
2,6,10 Trimethyldodecane (1380)	**914**	n-Octacosane (C28)	**782**
n-Tetradecane (C14)	**3750**	n-Nonacosane (C29)	**770**
2,6,10 Trimethyltridecane (1470)	**1520**	n-Triacontane (C30)	**655**
n-Pentadecane (C15)	**3830**	n-Hentriacontane (C31)	**493**
n-Hexadecane (C16)	**3530**	n-Dotriacontane (C32)	**441**
Norpristane (1650)	**1050**	n-Tritriacontane (C33)	**403**
n-Heptadecane (C17)	**3210**	n-Tetratriacontane (C34)	**378**
Pristane	**2150**	n-Pentatriacontane (C35)	**283**
n-Octadecane (C18)	**2850**	n-Hexatriacontane (C36)	**207**
Phytane	**1260**	n-Heptatriacontane (C37)	**172**
n-Nonadecane (C19)	**2410**	n-Octatriacontane (C38)	**136**
n-Eicosane (C20)	**2560**	n-Nonatriacontane (C39)	**104**
n-Heneicosane (C21)	**2120**	n-Tetracontane (C40)	**98.2** J
n-Docosane (C22)	**2070**		

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**71800**
Total Petroleum Hydrocarbons (C9-C44)	**590000**
Total Resolved Hydrocarbons	**196000**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.032	67666055	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.018	69566380	48.677 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	97.35%
24) s	d50-Tetracosane	35.697	57141267	49.351 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	98.70%
	Target Compounds			
2) t	n-Octane (C8)	5.422	102285134	93.879 ug/mL M4
3) t	n-Nonane (C9)	7.619	76013115	68.256 ug/mL M4
4) t	n-Decane (C10)	10.101	63613609	55.026 ug/mL M4
5) t	n-Undecane (C11)	12.611	58788004	50.302 ug/mL M4
6) t	n-Dodecane (C12)	15.036	51442150	43.291 ug/mL M4
7) t	n-Tridecane (C13)	17.344	51674013	43.246 ug/mL M4
8) t	1380	19.019	11081649	9.190 ug/mL M4
9) t	n-Tetradecane (C14)	19.527	45446037	37.687 ug/mL M4
10) t	1470	20.811	18437347	15.256 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	46510985	38.484 ug/mL M4
12) t	n-Hexadecane (C16)	23.546	43300293	35.535 ug/mL M4
13) t	1650	24.454	12821499	10.588 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	39092129	32.283 ug/mL M4
15) t	Pristane	25.504	26773773	21.646 ug/mL M4
16) t	n-Octadecane (C18)	27.170	35486858	28.652 ug/mL M4
17) t	Phytane	27.326	15485089	12.641 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	30026103	24.285 ug/mL M4
20) t	n-Eicosane (C20)	30.459	32191313	25.786 ug/mL M4
21) t	n-Heneicosane (C21)	31.993	26761484	21.351 ug/mL M4
22) t	n-Docosane (C22)	33.463	26156955	20.812 ug/mL M4
23) t	n-Tricosane (C23)	34.874	23790002	18.639 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

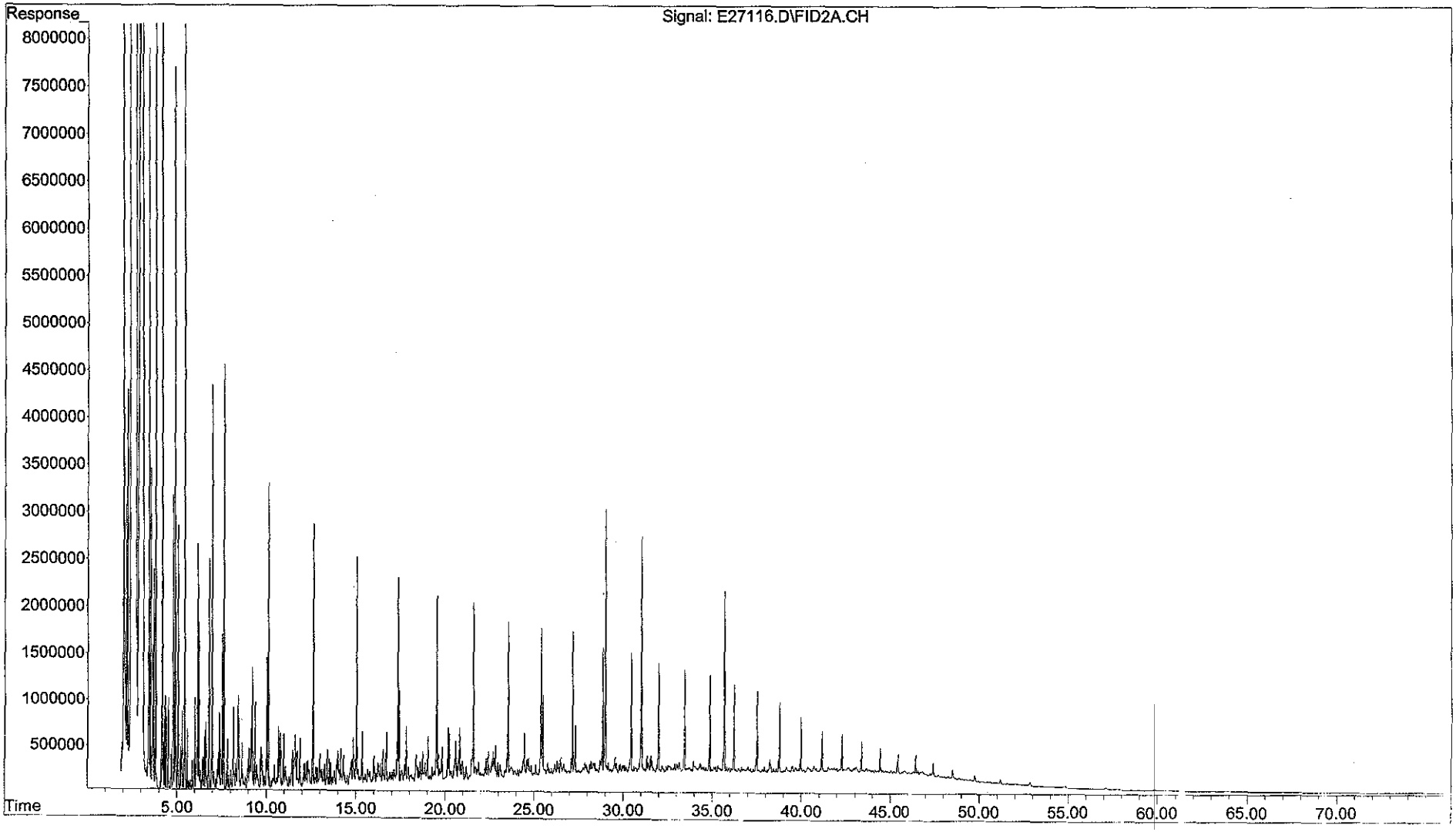
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units
25)	t	n-Tetracosane (C24)	36.229	21569823	17.190	ug/mL M4
26)	t	n-Pentacosane (C25)	37.530	21011766	16.433	ug/mL M4
27)	t	n-Hexacosane (C26)	38.784	18776288	14.780	ug/mL M4
28)	t	n-Heptacosane (C27)	39.993	13757353	11.042	ug/mL M4
29)	t	n-Octacosane (C28)	41.160	9894280	7.862	ug/mL M4
30)	t	n-Nonacosane (C29)	42.290	9748811	7.748	ug/mL M4
31)	t	n-Triacontane (C30)	43.376	8202260	6.592	ug/mL M4
32)	t	n-Hentriacontane (C31)	44.435	6227691	4.961	ug/mL M4
33)	t	n-Dotriacontane (C32)	45.452	5544934	4.433	ug/mL M4
34)	t	n-Tritriacontane (C33)	46.450	4844041	4.054	ug/mL M4
35)	t	n-tetratriacontane (C34)	47.431	4685802	3.799	ug/mL M4
36)	t	n-Pentatriacontane (C35)	48.521	3574400	2.848	ug/mL M4
37)	t	n-Hexatriacontane (C36)	49.764	2674892	2.085	ug/mL M4
38)	t	n-Heptatriacontane (C37)	51.193	2164492	1.726	ug/mL M4
39)	t	n-Octatriacontane (C38)	52.859	1707302	1.367	ug/mL M4
40)	t	n-Nonatriacontane (C39)	54.811	1232956	1.042	ug/mL M4
41)	t	n-Tetracontane (C40)	57.125	1168429	0.988	ug/mL M4
42)	h	C9-C44 Total Petroleu...	39.610	7428814548	6037.249	ug/mL M4
42)	h	C9-C44 Total Petroleu BS	39.610	7306360378	5937.733	ug/mLM4
45)	h	Total Resolved Hydroc...	39.151	2429958845	1974.779	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27116.D
Operator : AC
Acquired : 05 Sep 2012 5:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TW090712ANS01
Misc Info : WHAP13
ALS Vial : 64



Alpha Woods Hole Lab
Batch Weight Report
10/05/2012

Lab ID	QC Type	PS1210002 - Pan Weight	PS1210002 - Wet Weight	PS1210002 - Dry Weight	PS1210002 - Dry Weight #2	PS1210002 - Dry Weight #3	Percent Solid
1210002-01	SAM 1210081-01	1.32	7.07	5.61	5.6		74.43
1210002-02	SAM 1210081-02	1.32	7.07	5.61	5.6		74.43
1210002-03	SAM 1210081-03	1.32	7.07	5.61	5.6		74.43
1210002-04	SAM 1210081-04	1.32	7.07	5.61	5.6		74.43
1210002-05	SAM 1210081-05	1.32	7.07	5.61	5.6		74.43
1210002-06	SAM 1210081-06	1.32	7.07	5.61	5.6		74.43
1210002-07	SAM 1210081-07	1.32	7.07	5.61	5.6		74.43
PSS100512B04	B	1.31	1.31	1.31	1.31		100.00

KMC 11/16/12

Initial: 10/5/2012 12:28:31 PM wr
Weight #1: 10/9/2012 8:15:35 AM ctk
Weight #2: 10/10/2012 12:19:36 PM bls

Printed On: 10/10/2012 12:21:06 PM (BLS)

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210081 - OP SHC

Lab ID	QC Type	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1210081-01	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-02	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-03	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.04	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-04	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.05	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-05	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.06	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-06	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.01	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210081-07	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612B07	B	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCS03	LCS	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCSD03	LCSD	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210081 - OP SHC

Lab ID	Notes
1210081-01	1st Prep
1210081-02	1st Prep
1210081-03	1st Prep
1210081-04	1st Prep
1210081-05	1st Prep
1210081-06	1st Prep
1210081-07	1st Prep
SS110612B07	1st Prep
SS110612LCS03	1st Prep
SS110612LCSD03	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210081 - OP NEWFIE Analyst: CTK Witness: AMK

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1210081-01	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-02	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-03	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-04	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-05	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-06	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210081-07	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612B07	B	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612LCS03	LCS	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl
SS110612LCSD03	LCSD	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ65	Biomarker Surrogate	5b(H) Cholane = 10 ug/mL	DCM	7787
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210081 - OP SHC Analyst: CTK Witness: AMK

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1210081-01	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-02	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-03	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-04	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-05	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-06	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210081-07	SAM	WHAQ79	100	µl				WHAQ72	50	µl
SS110612B07	B	WHAQ79	100	µl				WHAQ72	50	µl
SS110612LCS03	LCS	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl
SS110612LCSD03	LCSD	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ72	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene-d10, Chrysene-d12 = 5 ug/mL	DCM	L14S03
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Weight Report
11/06/2012

Lab ID	QC Type	1210081 - Sample
1210081-01	SAM	15.02
1210081-02	SAM	15.02
1210081-03	SAM	15.04
1210081-04	SAM	15.05
1210081-05	SAM	15.06
1210081-06	SAM	15.01
1210081-07	SAM	15
SS110612B07	B	15
SS110612LCS03LCS	OP NEWFIE	15
SS110612LCS03LCS	OP SHC	15
SS110612LCS03LCS	OP Steranes/Triterpanes	
SS110612LCSD03LCSD	OP NEWFIE	15
SS110612LCSD03LCSD	OP SHC	15
SS110612LCSD03LCSD	OP Steranes/Triterpanes	

ETR 1210081

Analyst AMK

Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	0.280	56.00	N/A	N/A	N/A	104%
1210081	1		4000	50	0.109	8.72	2000	4.36	2.00	
	2		4000	50	0.124	9.92	2000	4.96	2.00	
	3		4000	50	0.118	9.44	2000	4.72	2.00	
	4		4000	50	0.126	10.08	2000	5.04	2.00	
	5		4000	50	0.120	9.60	2000	4.80	2.00	
	6		4000	50	0.118	9.44	2000	4.72	2.00	
	7		4000	50	0.140	11.20	2000	5.60	2.00	

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: BLS

Date: 11/12/12

ETR 1210081

Analyst AMK

Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	.280		N/A	N/A	N/A	0%
1210081	1		4000	50	.109					
	2		4000	50	.124					
	3		4000	50	.118					
	4		4000	50	.126					
	5		4000	50	.120					
	6		4000	50	.118					
	7		4000	50	.140					

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: AMK

Date: 11/7/12

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210081 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210081-01	SAM	3660B	CTK	11/7/2012												True
1210081-02	SAM	3660B	CTK	11/7/2012												True
1210081-03	SAM	3660B	CTK	11/7/2012												True
1210081-04	SAM	3660B	CTK	11/7/2012												True
1210081-05	SAM	3660B	CTK	11/7/2012												True
1210081-06	SAM	3660B	CTK	11/7/2012												True
1210081-07	SAM	3660B	CTK	11/7/2012												True
SS110612B07	B	3660B	CTK	11/7/2012												True
SS110612LCS03	LCS	3660B	CTK	11/7/2012												True
SS110612LCSD03	LCSD	3660B	CTK	11/7/2012												True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210081 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210081-01	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-02	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-03	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-04	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-05	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-06	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210081-07	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612B07	B	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCS03	LCS	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCSD03	LCSD	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210081 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210081-01	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-02	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-03	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-04	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-05	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-06	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210081-07	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612B07	B	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCS03	LCS	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCSD03	LCSD	split	KJD	11/8/2012							0.9	0.45	2			True

Forensic Preparation Checklist

Batch ID: 1210081 **Client:** AECOM **Project:** Enbridge MDL

Test(s) Spiked for:
Choose from the following:
F1B, (POIB), POIH, POIHX, POITAS, (TPH+A)

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil Product • PUF • (Sediment) • Sheen Soil • Solid • SPMD • Tissue 1L Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:	11/6/12	CTK
1st Extraction:	11/6/12	CTK
2nd Extraction:	11/6/12	CTK
3rd Extraction:	11/7/12	WR/MH

Extraction HT:
9121113

Cleanup Methods:		Date/Initials:
No Cleanup Required		
Alumina Column (3610)		
Silica Column (3630)	X	11/7/12 AMK
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)	X	11/7/12 CTK
Water pH<2 verified		

Date/Initials:		ID & Amount:
RIS Spike Analyst:	11/8/12 KTD	WHAQ 72 50 mL
RIS Spike Witness:	11/9/12 BLS	

Prep Process Notes

Samples 1-7 spiked with 300uL WHAQ 62. CTK 11/7/12

REAGENT	LOT #
DCM	000015769
SODIUM SULFATE	000011407
SILICA GEL	BCBH9150V
ALUMINA	n/a

REAGENT	LOT #
COPPER	QWR110712B
GLASS WOOL	05112999

BATCH COMPLETE Analyst:	KTD	Date:	11/8/12
BATCH REVIEWED Analyst:	BLS	Date:	11/12/12

Analysis log File

Total Files Reported in Log : 30
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\

9.7.12

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E27092.D	DCM	DCM	9/4/2012 9:08 am
2	E27094.D	IB209041201R	DCM	9/4/2012 10:36 am
3	E27095A.D	DCM	DCM	9/4/2012 12:13 pm
4	E27096.D	C209041201R	WHAQ26	9/4/2012 1:43 pm
5	E27098.D	IB209041202R	DCM	9/4/2012 3:14 pm
6	E27100.D	I209041201R	WHAO93	9/4/2012 4:46 pm
7	E27102.D	I209041202R	WHAP92	9/4/2012 6:18 pm
8	E27104.D	I209041203R	WHAQ26	9/4/2012 7:50 pm
9	E27106.D	I209041204R	WHAO95	9/4/2012 9:22 pm
10	E27108.D	I209041205R	WHAO96	9/4/2012 10:53 pm
11	E27110.D	I209041206R	WHAP58	9/5/2012 12:26 am
12	E27112.D	IB209041203R	DCM	9/5/2012 1:58 am
13	E27114.D	CQ209041201R	WHAQ27	9/5/2012 3:31 am
14	E27116.D	TW090712ANS01	WHAP13	9/5/2012 5:03 am
15	E27118.D	TW090712MC206	WHAP35	9/5/2012 6:36 am
16	E27120.D	DCM	DCM	9/5/2012 8:19 am
17	E27122.D		DCM	9/5/2012 9:48 am
18	E27124.D		DCM	9/5/2012 11:17 am
19	E27126.D		DCM	9/5/2012 12:46 pm
20	E27128.D		DCM	9/5/2012 2:16 pm
21	E27130.D		DCM	9/5/2012 3:45 pm
22	E27132.D		DCM	9/5/2012 5:15 pm
23	E27134.D		DCM	9/5/2012 6:44 pm
24	E27136.D			9/5/2012 8:13 pm
25	E27138.D			9/5/2012 9:41 pm
26	E27140.D			9/5/2012 11:09 pm
27	E27142.D			9/6/2012 12:36 am
28	E27144.D			9/6/2012 2:04 am
29	E27146.D			9/6/2012 3:31 am
30	E27148.D			9/6/2012 4:58 am

Data files for method HC290412R.m

IB for ANS+MC252

ICV ✓ pass

ANS ✓ pass

MC252 ✓ pass

Printed: 09/07/12 Page: 1

SeqLog 1.0.0.1 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 58
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\

A 11-16-12

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E28812.D	SPIKE CGECK	1X	11/9/2012 10:12 am
2	e28814.D	C211091201R	WHAQ67	11/9/2012 11:49 am
3	e28816.D	TS111312ANC01	1X WHAP13	11/9/2012 1:19 pm
4	e28818.D	DCM	DCM	11/9/2012 2:49 pm
5	e28820.D	IB211091201R	DCM	11/9/2012 4:19 pm
6	e28822.D	SS110612B07	1X	11/9/2012 5:49 pm
7	e28824.D	SS110612B08	1X	11/9/2012 7:18 pm
8	e28826.D	SS110612B09	1X	11/9/2012 8:48 pm
9	e28828.D	SS110612LCS03	1X	11/9/2012 10:17 pm
10	e28830.D	SS110612LCS04	1X	11/9/2012 11:46 pm
11	e28832.D	SS110612LCS05	1X	11/10/2012 1:15 am
12	e28834.D	SS110612LCSD03	1X	11/10/2012 2:44 am
13	e28836.D	SS110612LCSD04	1X	11/10/2012 4:13 am
14	e28838.D	SS110612LCSD05	1X	11/10/2012 5:41 am
15	e28840.D	C211091202R	WHAQ67	11/10/2012 7:10 am
16	e28842.D	DCM	DCM	11/10/2012 8:38 am
17	e28844.D	IB211091202R	DCM	11/10/2012 10:08 am
18	e28845a.D	dcm		11/10/2012 11:39 am
19	e28846.D	1210081-01	1X	11/10/2012 1:08 pm
20	e28848.D	1210081-02	1X	11/10/2012 2:38 pm
21	e28850.D	1210081-03	1X	11/10/2012 4:08 pm
22	e28852.D	1210081-04	1X	11/10/2012 5:38 pm
23	e28854.D	1210081-05	1X	11/10/2012 7:08 pm
24	e28856.D	1210081-06	1X	11/10/2012 8:37 pm
25	e28858.D	1210081-07	1X	11/10/2012 10:06 pm
26	e28860.D	C211091203R	WHAQ67	11/10/2012 11:35 pm
27	e28862.D	DCM	DCM	11/11/2012 1:04 am
28	e28864.D	IB211091203R	DCM	11/11/2012 2:34 am
29	e28866.D	1210082-01	1X	11/11/2012 4:03 am
30	e28868.D	1210082-02	1X	11/11/2012 5:33 am
31	e28870.D	1210082-03	1X	11/11/2012 7:02 am
32	e28872.D	1210082-04	1X	11/11/2012 8:32 am
33	e28874.D	1210082-05	1X	11/11/2012 10:02 am
34	e28876.D	1210082-06	1X	11/11/2012 11:31 am
35	e28878.D	1210082-07	1X	11/11/2012 1:02 pm
36	e28880.D	C211091204R	WHAQ67	11/11/2012 2:32 pm
37	e28882.D	DCM	DCM	11/11/2012 4:02 pm
38	e28884.D	IB211091204R	DCM	11/11/2012 5:32 pm
39	e28886.D	1210083-01	RA, INST STOPPED	11/11/2012 7:02 pm
40	e28888.D	1210083-02	RA, INST STOPPED	11/11/2012 8:39 pm
41	e28890.D	1210083-03	RA, FAILED IS	11/12/2012 4:22 am
42	e28892.D	1210083-04	1X	11/12/2012 5:50 am
43	e28893a.D	C211091205R	WHAQ67	11/12/2012 7:20 am
44	e28894.D	1210083-05	1X	11/12/2012 8:49 am
45	e28896.D	1210083-06	1X	11/12/2012 10:18 am
46	e28898.D	1210083-07	1X	11/12/2012 11:48 am
47	e28900.D	1210083-01	1X	11/12/2012 1:18 pm
48	e28902.D	1210083-02	1X	11/12/2012 2:48 pm
49	e28904.D	1210083-03	1X	11/12/2012 4:17 pm
50	e28906.D	C211091206R	WHAQ67	11/12/2012 5:47 pm
51	e28908.D	DCM	DCM	11/12/2012 7:16 pm
52	e28910.D	IB211091205R	DCM	11/12/2012 8:46 pm
53	e28912.D	TS111312WCS01	WHAP15	11/12/2012 10:15 pm
54	e28914.D	TS111312CL01	WHAP16	11/12/2012 11:44 pm

Printed: 11/16/12

METHOD: HC2090412R.m
CCV= WHAQ67 50ug/ml

Analysis log File

Total Files Reported in Log : 58
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
55	e28916.D	DCM	DCM	11/13/2012 1:14 am
56	e28918.D	C211091207R	WHAQ67	11/13/2012 2:43 am
57	e28920.D	DCM	DCM	11/13/2012 4:12 am
58	e28922.D	IB211091206R	DCM	11/13/2012 5:41 am

Chain of Custody Records

MANSFIELD CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
World Class Chemistry

Westborough, MA
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA
TEL: 508-822-9300
FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #: 1209034

Project Information

Project Name: MDLSed

Project Location: MARSHALL, MI

Project #: 60246209

Project Manager: DAVE BAREHAM

ALPHA Quote #:

Client Information

Client: ENBRIDGE

Address: 333 KALAMAZOO AVE

MARSHALL , MI 49068

Phone: 616.970.9700

Fax:

Email: JOHN.BOHRMAN@ENBRIDGE.COM

☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information

☐ FAX ☐ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info

PO #: TASK# 9.04

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

Other Project Specific Requirements/Comments/Detection Limits:

Oil Topping-Range Finding-MDL Study'

☐ MS/MSD (at unit cost) will be omitted unless you check here

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

MDL Study:

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Sample Specific Comments	TOTAL # BOTTLES
1209034-01	SEKR0000R024S092112D004	09/21/12	1630	SE	ADM	1210081	8
-02	SEBC0000L012S092112D004	09/21/12	1455	SE	ADM	1210082	8
-03	SEKR3510R018S092112D004	09/21/12	1031	SE	ADM	1210083	8
-04	SEKR0000R024AS092112D004	09/21/12	1630	CORE	ADM		1

Container Type	G	G	G	G	G	G	G	-	-	-	-	-
Preservative	A	A	A	A	A	A	A	-	-	-	-	-

Relinquished By:	Date/Time	Received By:	Date/Time
Amber McDonald	9.24.12/0950	[signature]	9.24.12/0950
[signature]	9.24.12 0900	FED EX	
FED EX	9/25/12 1025	[signature]	9/25/12 1025

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 101-09(I-NJ)
(rev. 5-JAN-12)

Sample Delivery Group Form

Laboratory Job No: 1209034 Client: AECOM

Receipt Date/Time: 9/25/12 1025 SDG Reviewer: MS

1210081, 1210082, 1210083

Samples Delivered By:

[ ] Alpha Courier [ ] Client [ ] UPS [X] FedEx [ ] Other _____

Bill of Laden: [X] Yes [ ] Unavailable Tracking #: Attached

Chain of Custody: [ ] Present [ ] Absent: _____

Custody Seals: [ ] Absent [X] Present/Intact [ ] Present/Broken

Cooler/Sample Temperature:

Is Ice/Blue Ice present? [X] Yes [ ] No [ ] N/A _____

A = Cores
B = Jars

Temp taken from: Temp Blank:(a) 20° (b) WF (c)_____ (d)_____ (e)_____

IR Gun: (a) 2.3° (b) 2.7° (c)_____ (d)_____ (e)_____

IR Gun SN (circle one): (90512810) 100311463

Was Temp: [X] 2-6 Celsius

[ ] <2 Celsius ... were samples frozen upon receipt? [ ] Yes [ ] No

[ ] >6 Celsius ... were samples delivered direct from site? [ ] Yes [ ] No

Containers Received: [X] Intact

[ ] Broken/Leaking Sample IDs: _____

Sample IDs: _____

All Containers Accounted For? [X] Yes

[ ] No: rec'd 2 cores - A1, A2 Not 1 as on COC

Extra Samples Received? [X] No

[ ] Yes: _____

Do Sample Labels and COC agree? [X] Yes

[ ] No: _____

Are Samples in Appropriate Containers? [X] Yes

[ ] No: _____

Are samples rec'd within holding time? [X] Yes

[ ] No: _____

* Please note: the analysis of pH will always be performed beyond the regulatory-required holding time of 15 min. from the time of collection.

pH of samples upon receipt: [X] N/A [ ] <2 [ ] >12 and/or [ ] _____

Are samples properly preserved? [ ] Yes [ ] No If No then.....

Initial pH= _____ preserved In-House with [ ] HCL [ ] H_2SO_4 [ ] HNO_3 [ ] NAOH <<Final pH = _____>>

Other Issues: _____

Chlorine Check: [ ] N/A [ ] Present [ ] Absent

VOA/VPH vials: [ ] Yes [X] No Preserved? [ ] Yes [ ] No If yes: [ ] HCL, [ ] _____

Aqueous: vials contain head space? [ ] No [ ] Yes: _____

Soils: MeOH covering soil? [ ] Yes [ ] No: _____

Reagent H_2O Preserved vials Frozen @ date/time: _____

Frozen by Client? [ ] No [ ] Yes @ date/time: _____

Was Client notified of any discrepancies listed above? [X] Yes [ ] No [ ] N/A

If Yes: Call Tracker # _____

FedEx Express **NEW Package US Airbill**

FedEx Tracking Number: 8762 5989 8873 | Form ID No.: 0200 | **FedEx Retrieval Copy**

From

Date: 9.24.12 | Sender's FedEx Account Number: 2138-5929-3

Sender's Name: APRIL MODERT | Phone: 517 2274710

Company: SUPERIOR ENVIRONMENTAL CORP

Address: 1680 Marquette Street | Dept./Floor/Suite/Room:

City: Bay City | State: MI | ZIP: 48706-4178

Your Internal Billing Reference: BC3279. TASK 9.045

To

Recipient's Name: SUE O'NEIL | Phone: 508 844 4117

Company: ALPHA WOODS HOLE LABS

Address: 320 FORBES BLVD | Dept./Floor/Suite/Room:
We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address: | Dept./Floor/Suite/Room:
Use this line for the HOLD location address or for continuation of your shipping address.

City: MANSFIELD | State: MA | ZIP: 02048

4 Express Package Service • To most locations.
NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day		2 or 3 Business Days	
06 ☐	FedEx First Overnight. Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	49 ☐	NEW FedEx 2Day A.M. Second business morning.* Saturday Delivery NOT available.
01 ☒	FedEx Priority Overnight. Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	03 ☐	FedEx 2Day. Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
05 ☐	FedEx Standard Overnight. Next business afternoon.* Saturday Delivery NOT available.	20 ☐	FedEx Express Saver. Third business day.* Saturday Delivery NOT available.

5 Packaging • Declared value limit $500.

06 ☐ FedEx Envelope* 02 ☐ FedEx Pak* 03 ☐ FedEx Box 04 ☐ FedEx Tube 01 ☒ Other

6 Special Handling and Delivery Signature Options

03 ☐ **SATURDAY DELIVERY**

☒ No Signature Required. Package may be left without obtaining a signature for delivery.
10 ☐ Direct Signature. Someone at recipient's address may sign for delivery. Fee applies.
34 ☐ Indirect Signature. If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

01 ☐ HOLD Weekday. FedEx location address REQUIRED. NOT available for FedEx First Overnight.

31 ☐ HOLD Saturday. FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods? One box must be checked.

☒ No 04 ☐ Yes. As per attached Shipper's Declaration. ☐ Yes. Shipper's Declaration not required. 06 ☐ Dry Ice. Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

1 ☒ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

[redacted] [redacted]

Total Packages: 1 | Total Weight: ____ lbs. | Credit Card Auth.: [redacted]

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

612

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8762 5989 8873

287

FedEx Express **NEW Package US Airbill**

FedEx Tracking Number: 8762 5989 8884 | Form ID No.: 0200 | **FedEx Retrieval Copy**

From

Date: 9.24.12 | Sender's FedEx Account Number: 2138-5929-3

Sender's Name: APRIL MODERT | Phone: 517 2274710

Company: SUPERIOR ENVIRONMENTAL CORP

Address: 1680 MARQUETTE STREET | Dept./Floor/Suite/Room:

City: BAY CITY | State: MI | ZIP: 48706-4178

Your Internal Billing Reference: BC3279 TASK 9.045

To

Recipient's Name: SUE O'NEIL | Phone: 5088444117

Company: ALPHA WOODS HOLE LABS

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We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address: | Dept./Floor/Suite/Room:
Use this line for the HOLD location address or for continuation of your shipping address.

City: MANSFIELD | State: MA | ZIP: 02048

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1 ☒ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

[redacted] [redacted]

Total Packages: 1 | Total Weight: ____ lbs. | Credit Card Auth.: [redacted]

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

612

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8762 5989 8884

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 9.24.12 Time: 0900
Name:
Company: BEC

Seal Broken By:

Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

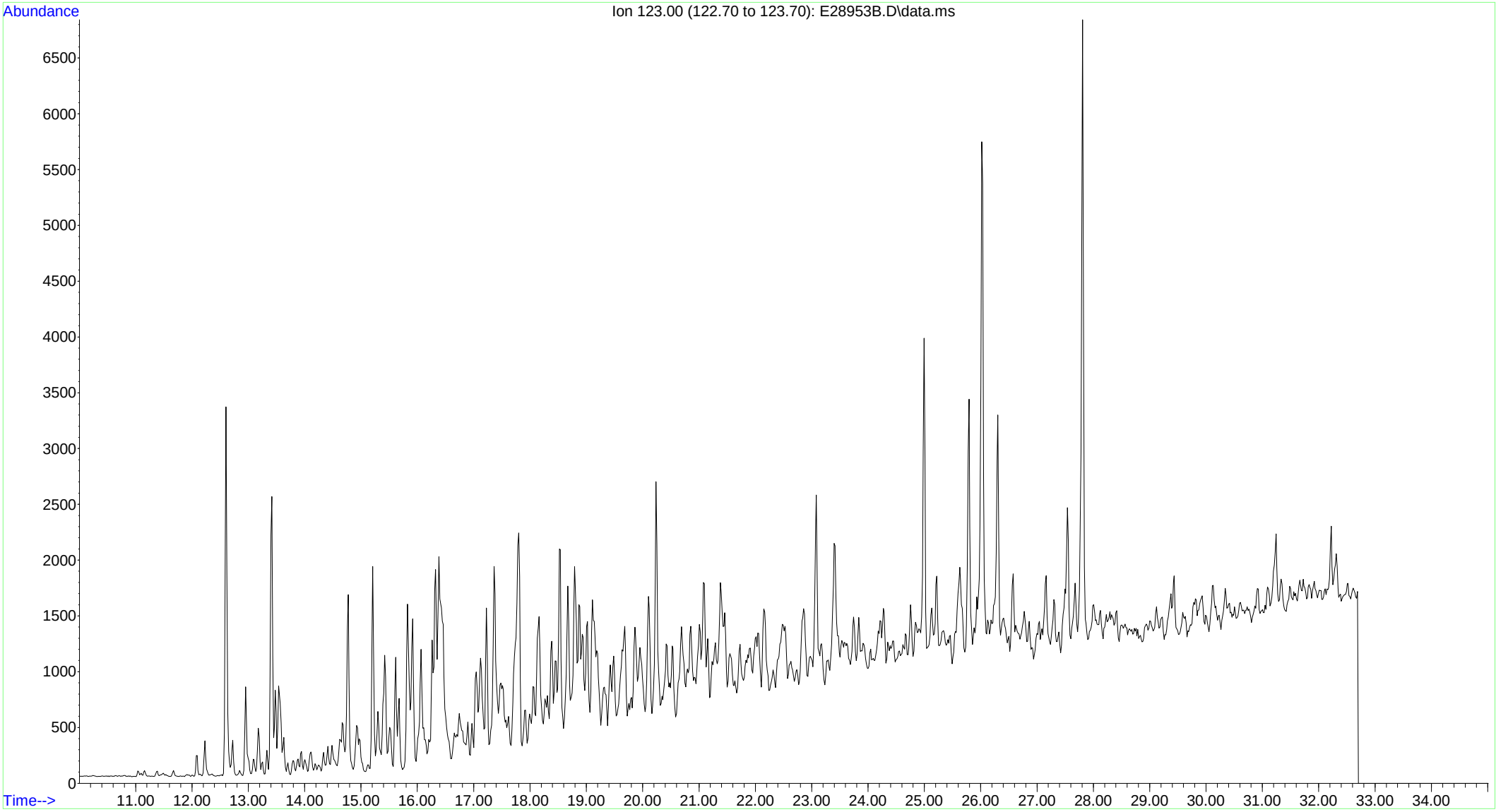
CUSTODY SEAL

Date: 9.24.12 Time: 0900
Name:
Company: BEC

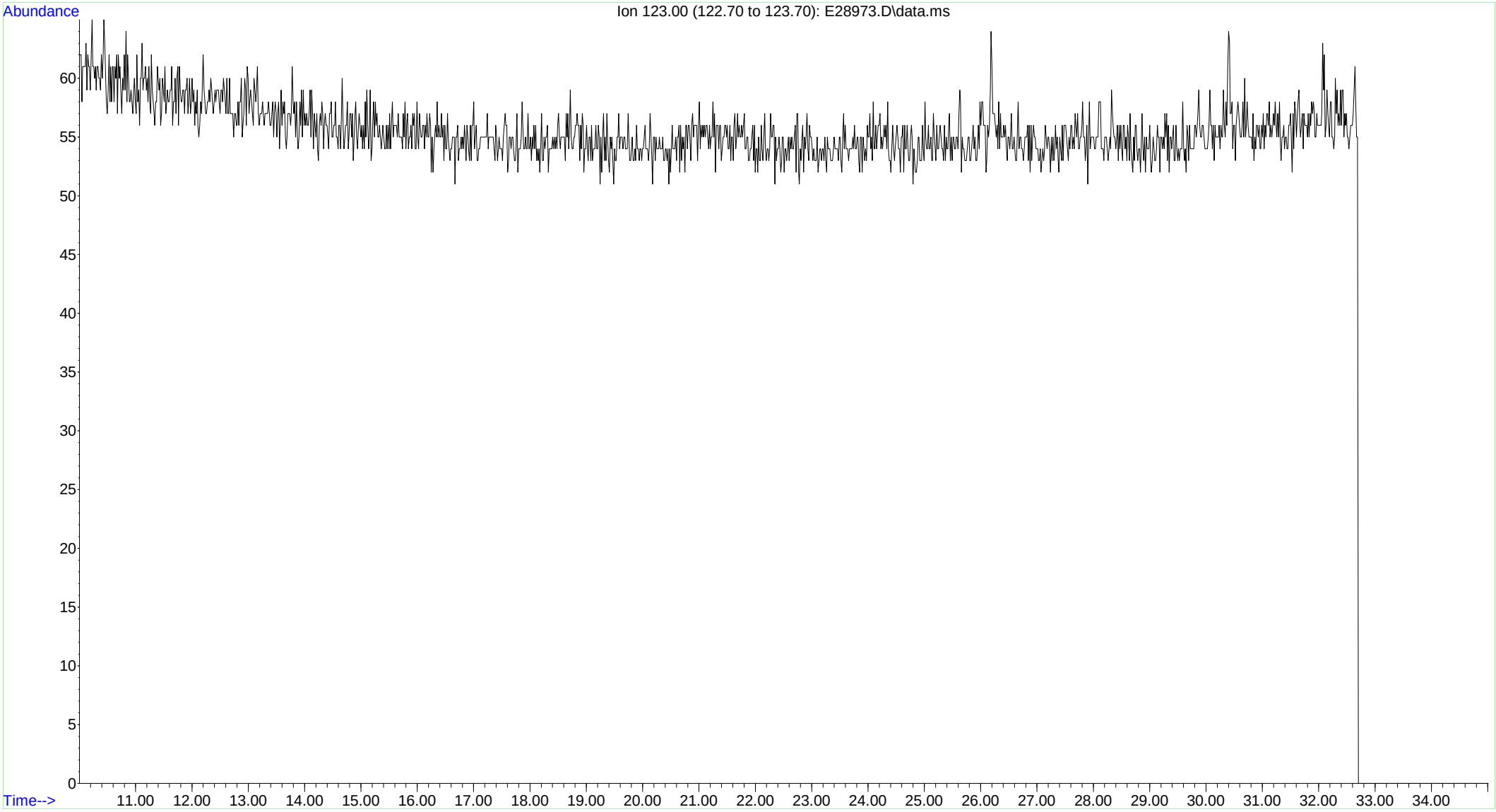
Seal Broken By:

Date:

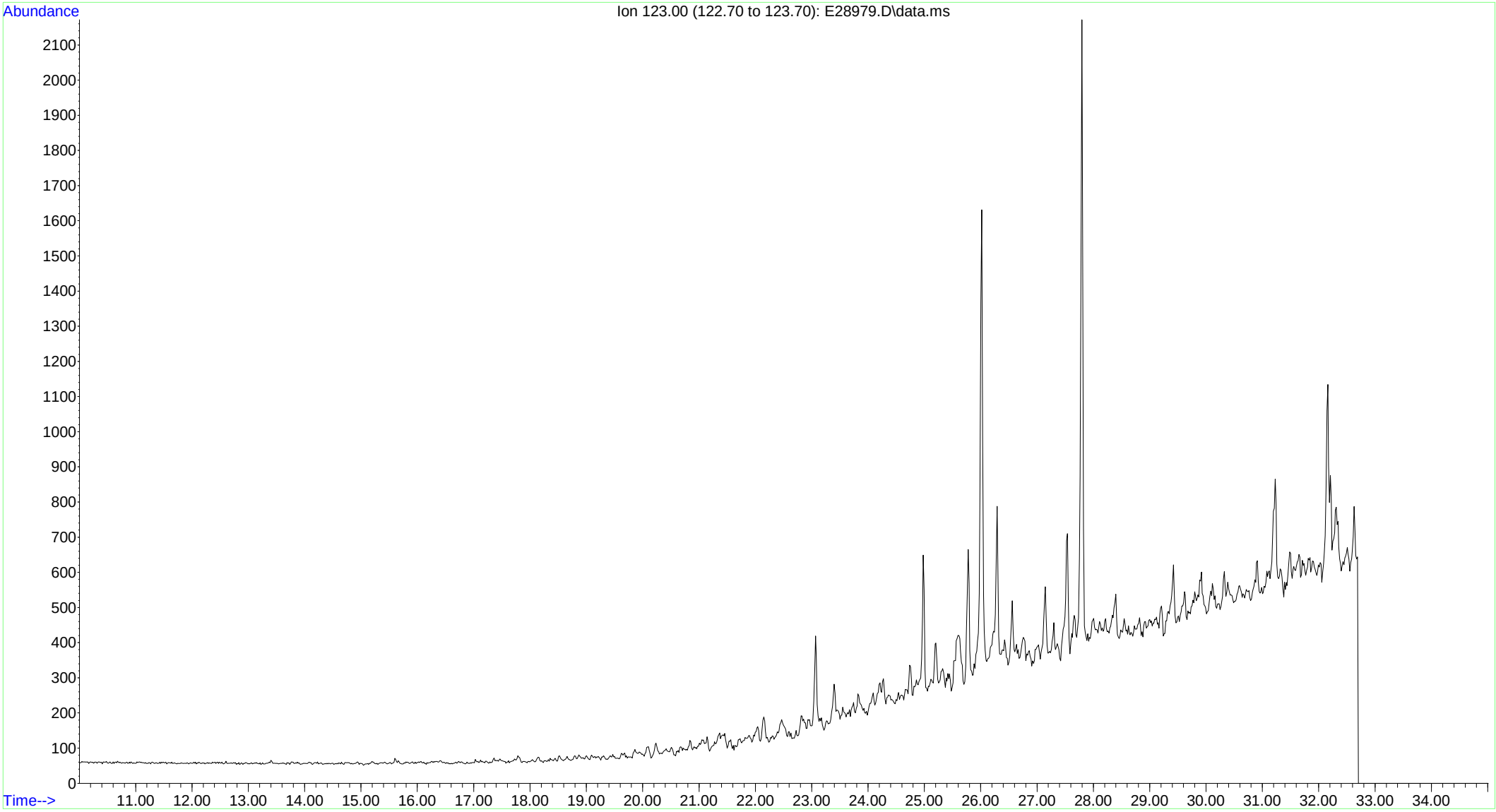
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28953B.D
Operator : AC
Acquired : 14 Nov 2012 9:16 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS111612ANC01
Misc Info : WHAQ46, 5.076
Vial Number: 25



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28973.D
Operator : AC
Acquired : 15 Nov 2012 12:24 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS110612B07
Misc Info : 1X ETR1210081
Vial Number: 25



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28979.D
Operator : AC
Acquired : 15 Nov 2012 4:49 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210081-01
Misc Info : 1X
Vial Number: 28



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Acquired : 15 Nov 2012 6:17 am using AcqMethod FRNC2A.M
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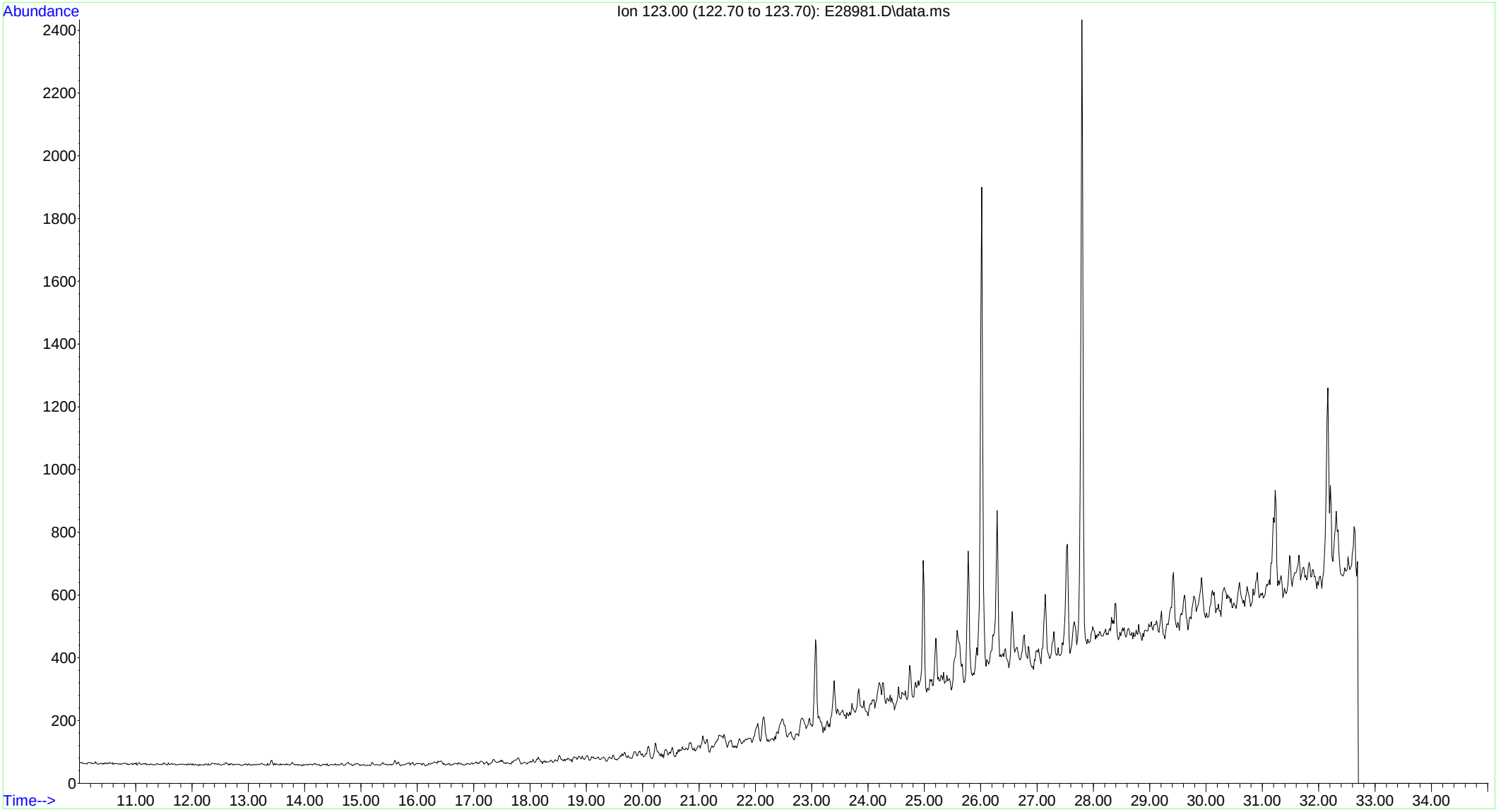
Sample Name: 1210081-02
Misc Info : 1X
Vial Number: 29



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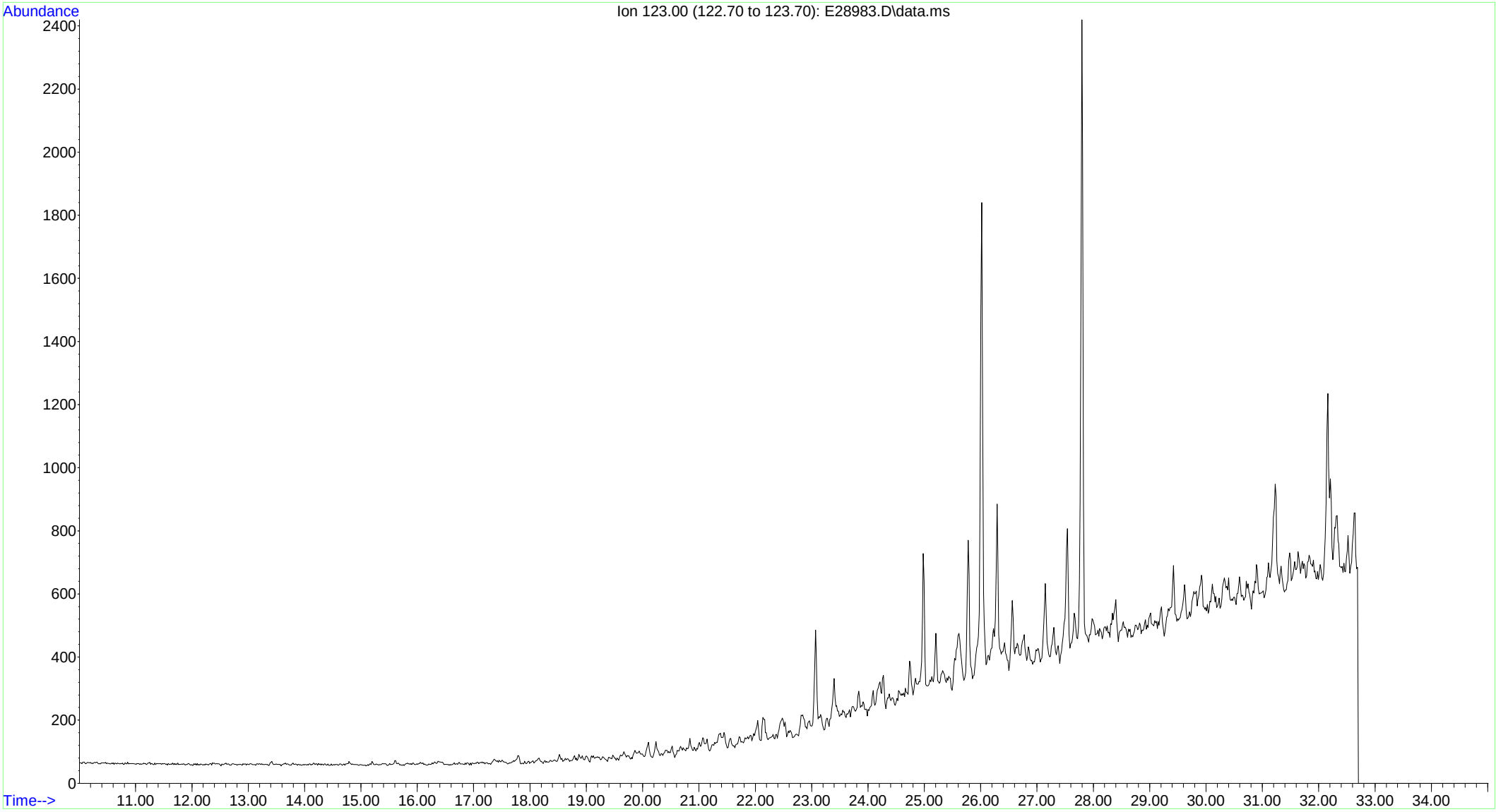
Operator : AC
Acquired : 15 Nov 2012 7:45 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210081-03
Misc Info : 1X
Vial Number: 30



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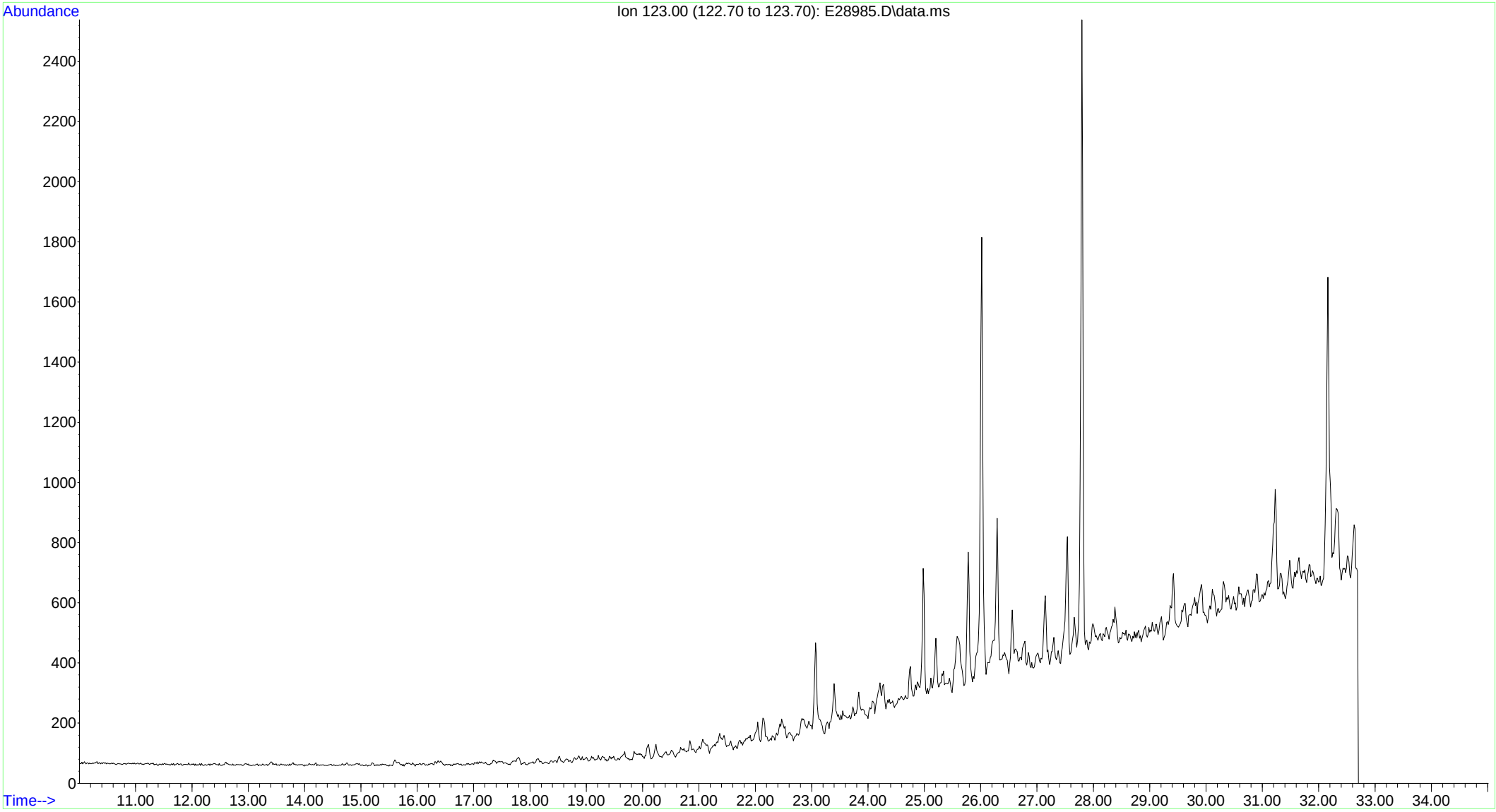
Operator : AC
Acquired : 15 Nov 2012 9:14 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210081-04
Misc Info : 1X
Vial Number: 31



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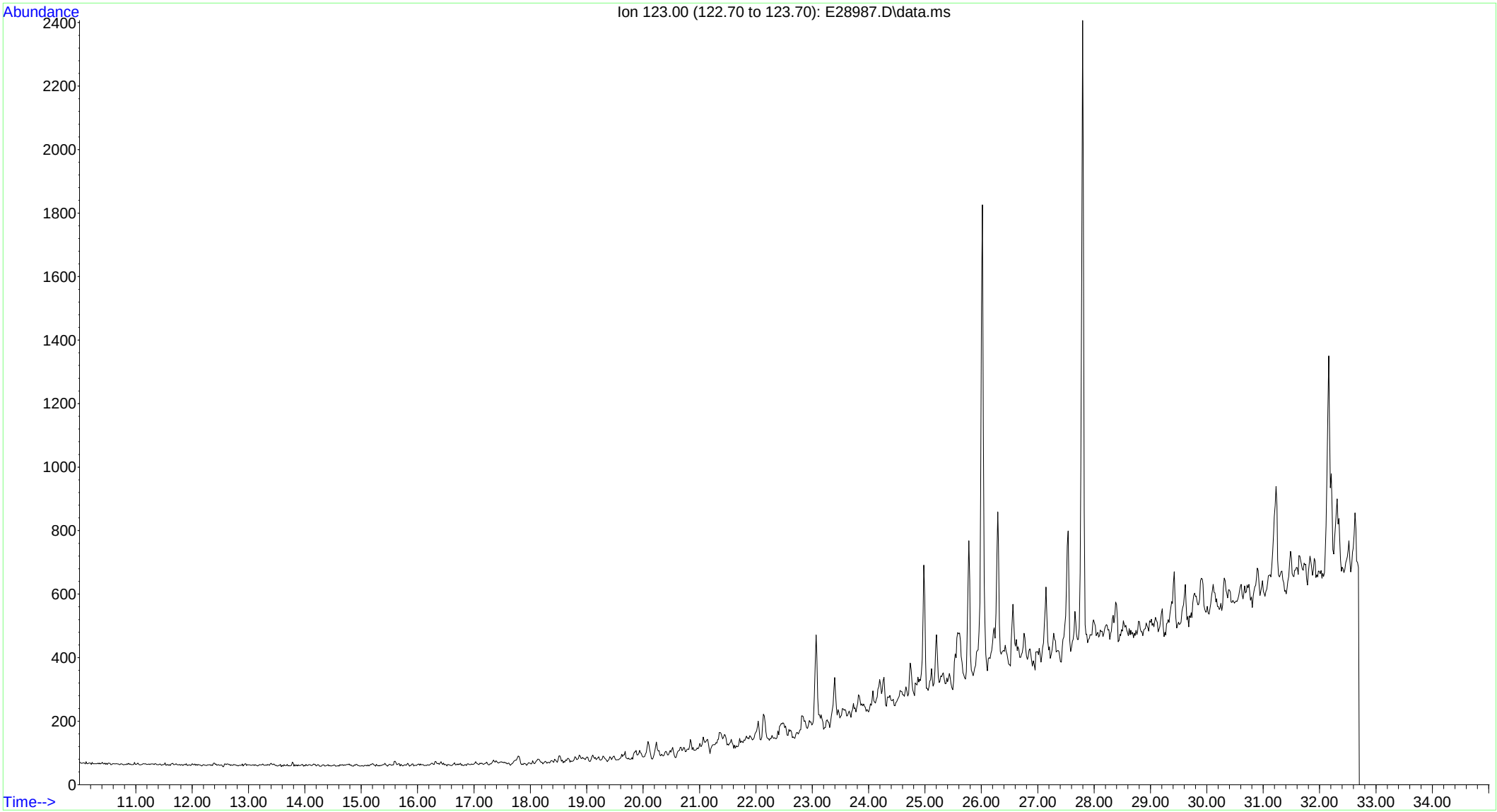
Acquired : 15 Nov 2012 10:42 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210081-05
Misc Info : 1X
Vial Number: 32



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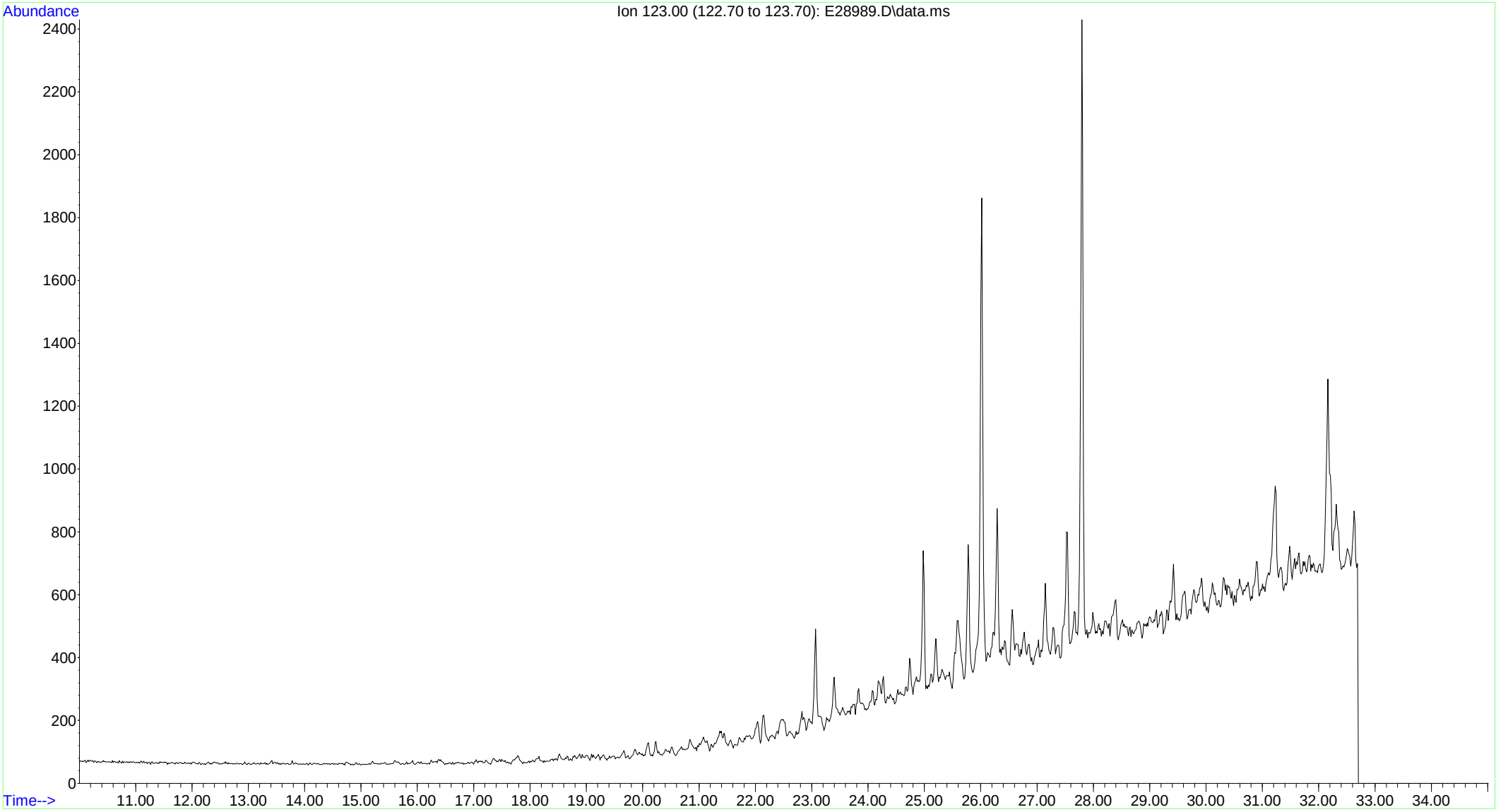
Operator   : AC
Acquired   : 15 Nov 2012 12:09 pm using AcqMethod FRNC2A.M
Instrument :   PAH2
Sample Name: 1210081-06
Misc Info : 1X
Vial Number: 33



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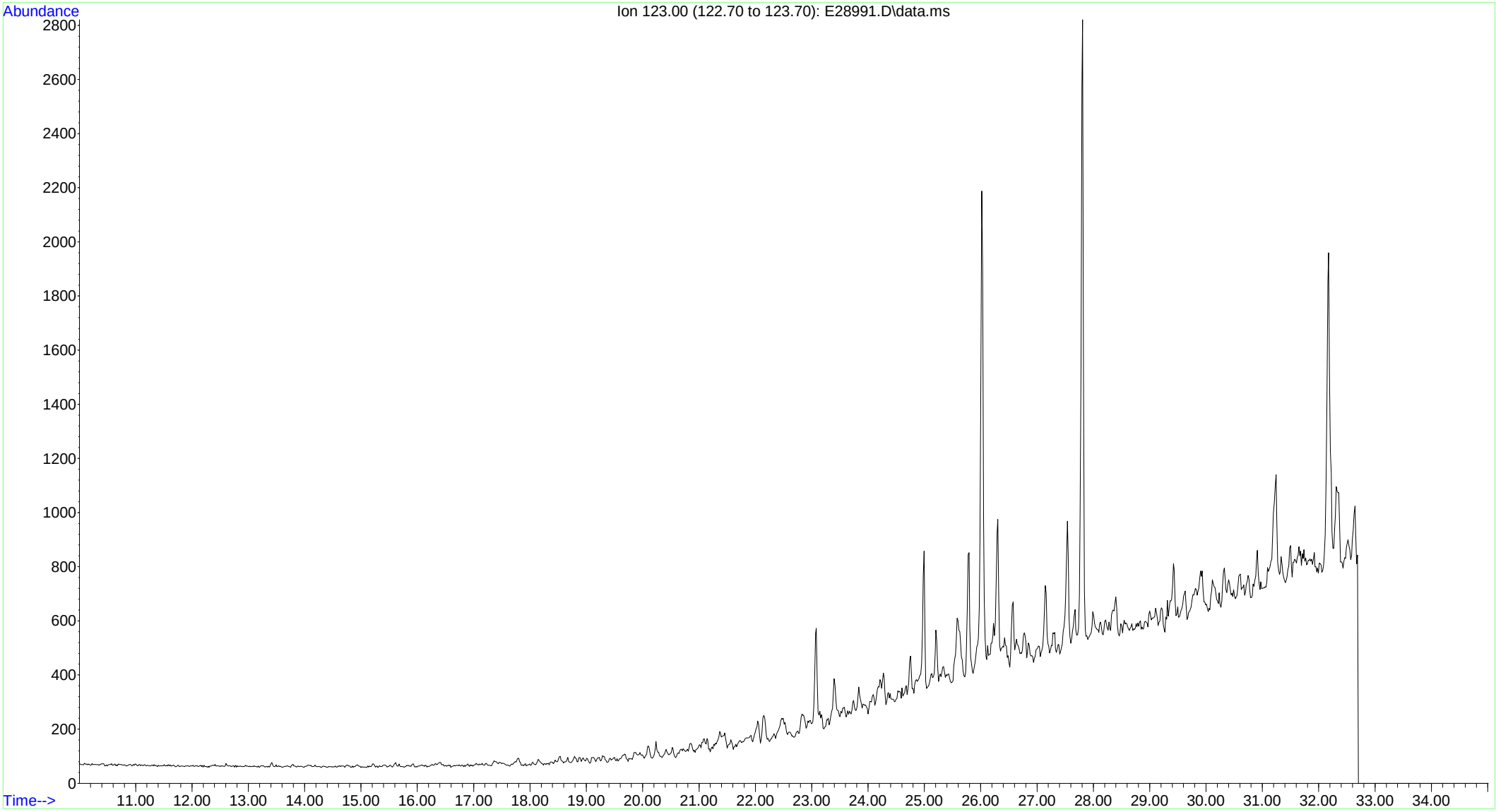
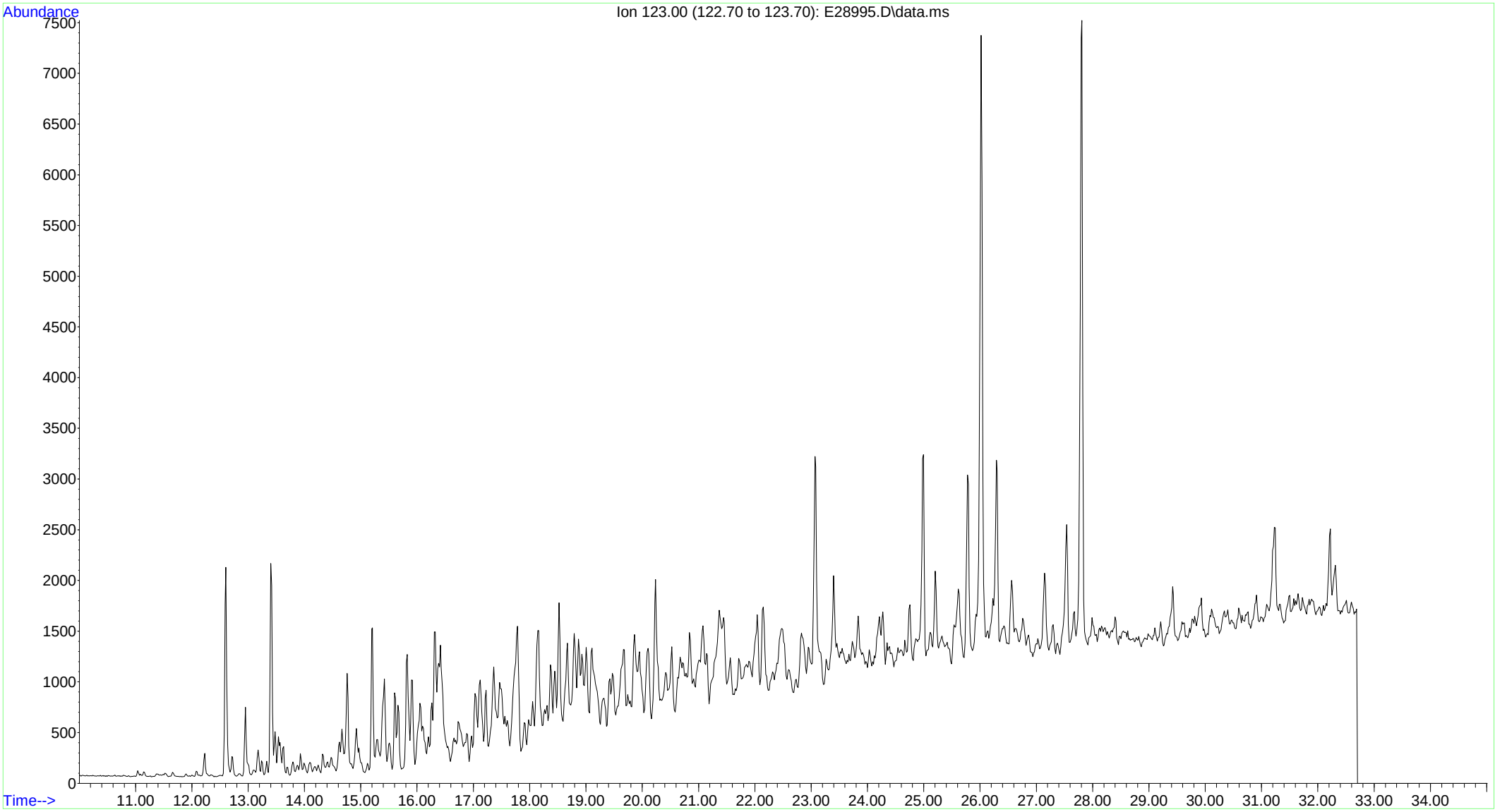
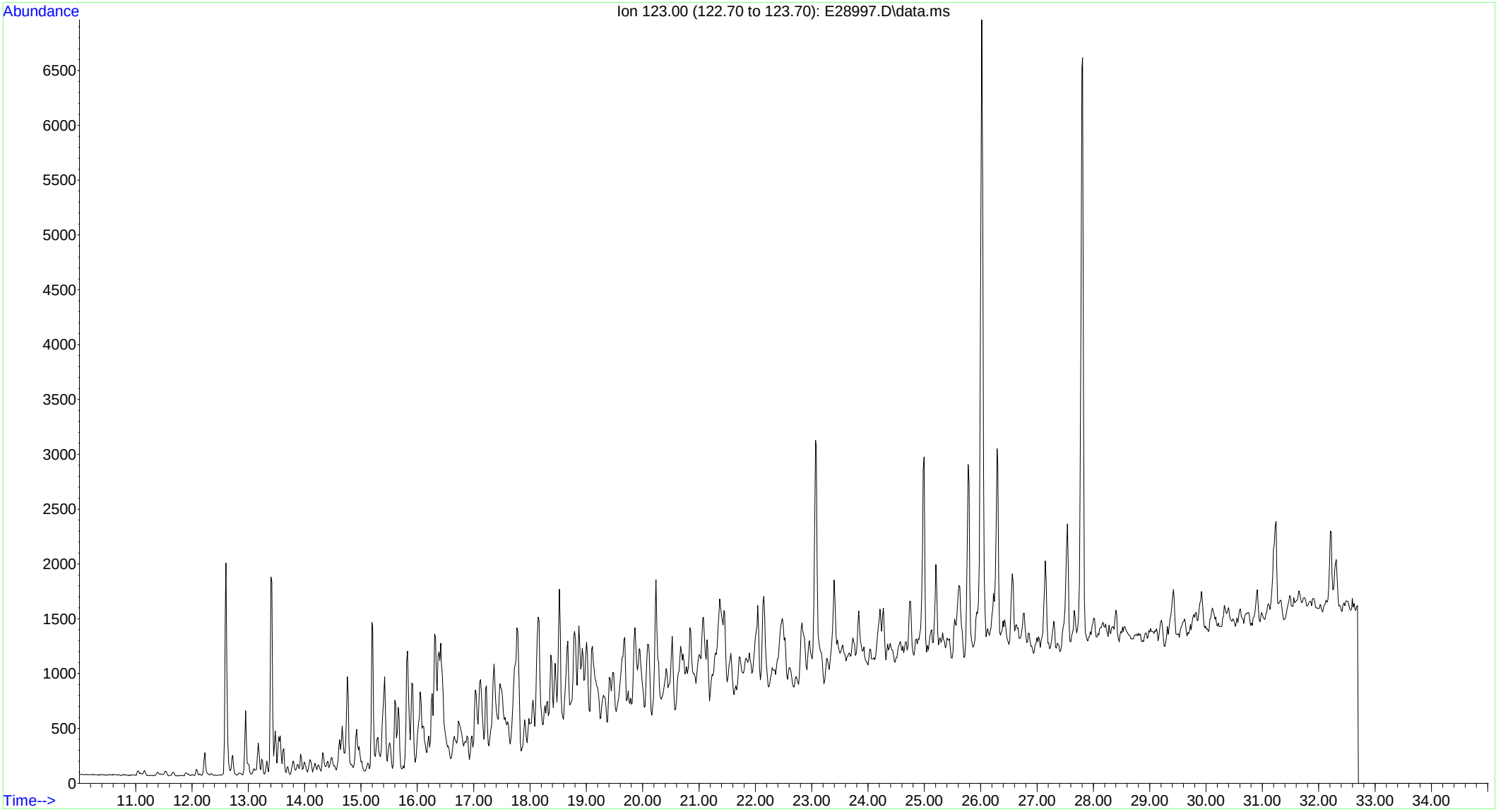
Acquired : 15 Nov 2012 1:47 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210081-07
Misc Info : 1X
Vial Number: 34



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28995.D
Operator : AC
Acquired : 15 Nov 2012 4:42 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS111612WCS01
Misc Info : WCS WHAQ73 5.036
Vial Number: 36



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28997.D
Operator : AC
Acquired : 15 Nov 2012 6:10 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS111612CL01
Misc Info : CL WHAQ74 5.064
Vial Number: 37



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24994M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	55363	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	80738	918.373	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 91.84%			
42) Phenanthrene-d10	32.085	188	87554	972.058	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.21%			
83) Benzo[b]fluoranthene-d12	46.645	264	115728	1017.579	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.76%			
88) Benzo[a]pyrene-d12	47.789	264	115547	1048.556	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.86%			
129) 5B(H)Cholane - Surr	43.347	217	23525	1078.150	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.82%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	44708	2236.194	ng/mL	100
4) cis-Decalin	17.091	138	2137	140.688	ng/mL	100
5) C1-Decalins	17.814	152	77413M5	3872.025	ng/mL	
6) C2-Decalins	19.154	166	72612m	3631.890	ng/mL	
7) C3-Decalins	21.623	180	41578m	2079.639	ng/mL	
8) C4-Decalins	25.010	194	44247M5	2213.136	ng/mL	
10) Naphthalene	19.304	128	291700	2967.006	ng/mL#	100
11) C1-Naphthalenes	21.999	142	619164M5	6297.783	ng/mL	
12) C2-Naphthalenes	24.844	156	774255m	7875.280	ng/mL	
13) C3-Naphthalenes	27.193	170	588218m	5983.018	ng/mL	
14) C4-Naphthalenes	29.963	184	345196M5	3511.137	ng/mL	
16) 2-Methylnaphthalene	21.999	142	364688	5824.053	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	254143	4176.935	ng/mL#	100
18) Benzothiophene	19.530	134	2230M3	27.437	ng/mL	
19) C1-Benzo(b)thiophenes	21.577	148	13032m	160.343	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	22864m	281.314	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49308m	606.675	ng/mL	
22) C4-Benzo(b)thiophenes	28.773	190	43322M5	533.025	ng/mL	
23) Biphenyl	23.881	154	57406M3	725.388	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	189324	3354.362	ng/mL#	100
25) Dibenzofuran	26.967	168	24057	274.576	ng/mL#	84
26) Acenaphthylene	25.597	152	3471M3	35.411	ng/mL	
27) Acenaphthene	26.320	153	4522M3	71.671	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	36242M3	686.324	ng/mL	
29) Fluorene	28.352	166	27831M3	395.497	ng/mL	
30) C1-Fluorenes	30.730	180	63133M5	897.162	ng/mL	
31) C2-Fluorenes	32.928	194	106713M5	1516.464	ng/mL	
32) C3-Fluorenes	34.780	208	106052M5	1507.070	ng/mL	
33) Dibenzothiophene	31.679	184	71705	742.544	ng/mL#	88
34) 4-Methyldibenzothiophene(	33.455	198	76022	787.248	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	56514	585.233	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.223	198	24786	256.672	ng/mL#	100
37) OTP	33.877	198	7808M3	80.856	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	166611m	1725.346	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	227794M5	2358.928	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	209778m	2172.363	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	115055M5	1191.456	ng/mL	
43) Phenanthrene	32.176	178	111573	1135.648	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.148	192	52275	532.082	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.253	192	55603	565.956	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1976	20.113	ng/mL	92
47) 9/4-Methylphenanthrene(9M	34.600	192	81325	827.768	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	55944M3	569.427	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	250470M5	2549.415	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50)	C2-Phenanthrenes/Anthrace	36.421	206	284998M5	2900.859	ng/mL	
52)	C3-Phenanthrenes/Anthrace	38.273	220	209062M5	2127.943	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.471	234	84348M5	858.538	ng/mL	
56)	Carbazole	33.034	167	3161M2	36.168	ng/mL	
57)	1-Methylphenanthrene	34.690	192	54755M3	730.518	ng/mL	
58)	Fluoranthene	36.963	202	2424M3	22.341	ng/mL	
59)	Benzo(b)fluorene	39.508	216	2784M3	38.507	ng/mL	
60)	Pyrene	37.852	202	8320M3	75.445	ng/mL	
61)	C1-Fluoranthenes/Pyrenes	39.252	216	41317m	374.659	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.074	230	68144M5	617.924	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.106	244	84441M5	765.704	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.461	258	76445M5	693.197	ng/mL	
66)	Naphthobenzothiophene	41.721	234	18944M3	174.170	ng/ml	
67)	Naphthobenzothiophene-2,1	41.721	234	18844M3	173.251	ng/mL	
68)	Naphthobenzothiophene-1,2	42.067	234	4387M6	40.334	ng/mL	
69)	Naphthobenzothiophene-2,3	42.369	234	2206M3	20.282	ng/mL	
70)	C1-Naphthobenzothiophenes	43.121	248	71342M5	655.915	ng/ml	
71)	C2-Naphthobenzothiophenes	45.139	262	101492M5	933.113	ng/ml	
72)	C3-Naphthobenzothiophenes	46.750	276	77926M5	716.448	ng/ml	
73)	C4-Naphthobenzothiophenes	47.805	290	55098M5	506.569	ng/mL	
75)	Benz[a]anthracene	42.655	228	1139M3	10.565	ng/mL	
77)	Chrysene/Triphenylene	42.790	228	22405M3	201.863	ng/mL	
78)	C1-Chrysenes	44.296	242	40335M5	363.407	ng/mL	
79)	C2-Chrysenes	47.006	256	61351M5	552.755	ng/mL	
80)	BBF-D12 Surr BKGD	46.645	256	3732	33.624	ng/mL	100
81)	C3-Chrysenes	49.024	270	70695M5	636.942	ng/mL	
82)	C4-Chrysenes	49.130	284	44151M5	397.788	ng/mL	
84)	Benzo[b]fluoranthene	46.720	252	3466M3	27.659	ng/mL	
87)	Benzo[e]pyrene	47.699	252	6116M3	49.985	ng/mL	
89)	Benzo[a]pyrene	47.880	252	1096M3	9.361	ng/mL	
90)	Perylene	48.181	252	2160M3	17.447	ng/mL	
91)	Indeno[1,2,3-cd]pyrene	52.549	276	632M3	4.587	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.579	278	659M3	4.492	ng/mL	
93)	Benzo[g,h,i]perylene	53.798	276	2734	18.402	ng/mL#	77
94)	Hopane (T19)	51.645	191	33249	800.231	ng/mL#	84
96)	C23 Tricyclic Terpane (T4	40.351	191	12477M2	300.294	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.089	191	8030M3	193.265	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.579	191	7444M3	179.161	ng/ml	
99)	C24 Tetracyclic Terpane (	43.889	191	2483M3	59.760	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	2905M3	69.917	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.739	191	2670M3	64.261	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.043	191	2772M3	66.716	ng/ml	
103)	C28 Tricyclic Terpane-22R	46.208	191	3041M3	73.190	ng/ml	
104)	C29 Tricyclic Terpane-22S	46.735	191	3836	92.324	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.931	191	4396M3	105.802	ng/ml	
106)	18a-22,29,30-Trisnorneoho	47.985	191	6025	145.009	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.106	191	3655M3	87.968	ng/ml	
108)	C30 Tricyclic Terpane-22R	48.347	191	3018M3	72.637	ng/ml	
109)	17a(H)-22,29,30-Trisnorho	48.512	191	6658M3	160.244	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	49.672	191	1533	36.896	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	49.506	191	1593M4	38.340	ng/ml	
112)	30-Norhopane (T15)	50.320	191	19328	465.183	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	50.425	191	4835	116.368	ng/ml	100
114)	17a(H)-Diahopane (X)	50.546	191	2730M3	65.705	ng/ml	
115)	30-Normoretane (T17)	51.073	191	2128	51.216	ng/ml	100
117)	Moretane (T20)	52.308	191	3031M3	72.950	ng/ml	
118)	30-Homohopane-22S (T21)	53.362	191	13928	335.217	ng/ml	100
119)	30-Homohopane-22R (T22)	53.588	191	12032	289.584	ng/ml	100
120)	Gammacerane/C32-diahopane	54.115	191	2467M3	59.375	ng/mL	
121)	30,31-Bishomohopane-22S (	54.868	191	10409	250.522	ng/ml	100
122)	30,31-Bishomohopane-22R (	55.244	191	7380	177.621	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
123) 30,31-Trishomohopane-22S	56.931	191	7813	188.042	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	5411	130.231	ng/ml	100
125) Tetrakishomohopane-22S (T	59.460	191	6144	147.873	ng/ml	100
126) Tetrakishomohopane-22R (T	60.334	191	4086	98.341	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	6600	158.848	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	5017	120.748	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	5848M3	268.014	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	2922M3	133.915	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	3198M3	146.564	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	7405	339.371	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	8209M3	376.218	ng/ml	
135) Unknown Sterane (S18)	47.639	217	2180	99.909	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	358	16.407	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	3700M3	169.571	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	3776M3	173.054	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5663M3	259.535	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	4884M3	223.834	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	4962M3	227.408	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	4692M3	215.034	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	5446	249.590	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6112M3	280.113	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	7154M3	327.867	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	4482M3	205.410	ng/ml	
147) C26,20R- +C27,20S- triaro	49.040	231	27203	1246.712	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	17445	799.504	ng/mL	100
149) C27,20R-triaromatic stero	50.305	231	16412	752.161	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	13961M3	639.832	ng/mL	

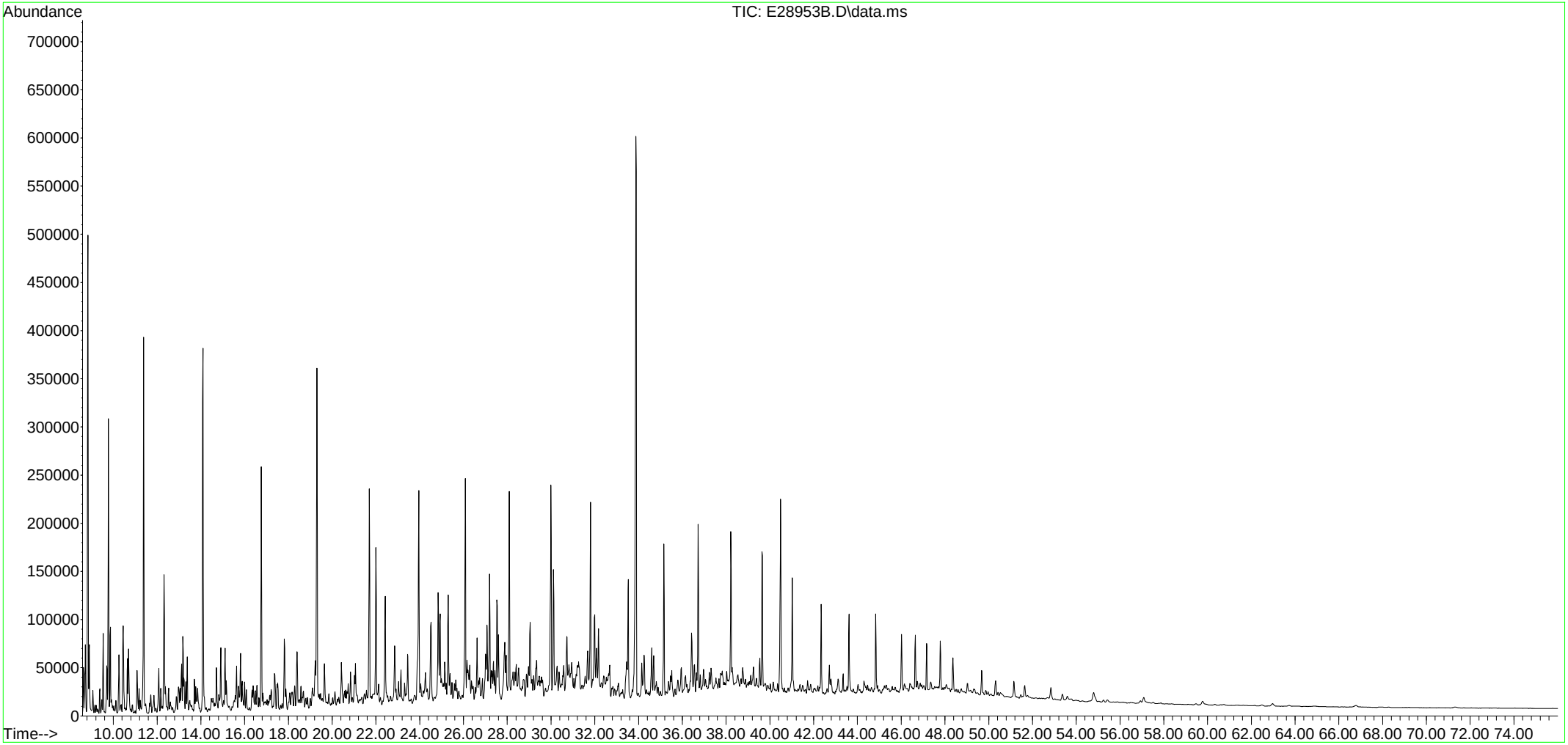
(#) = qualifier out of range (m) = manual integration (+) = signals summed

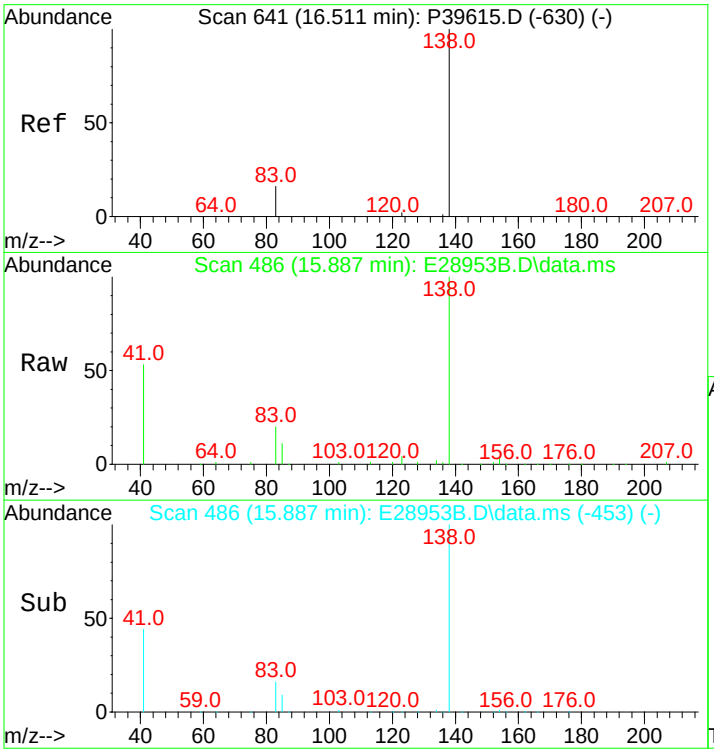
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

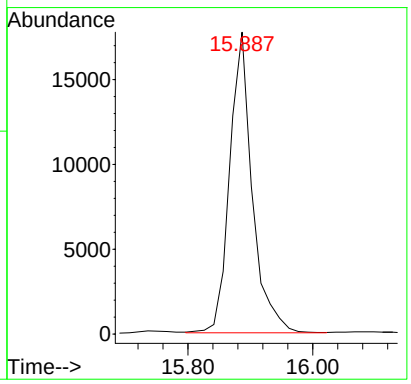
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

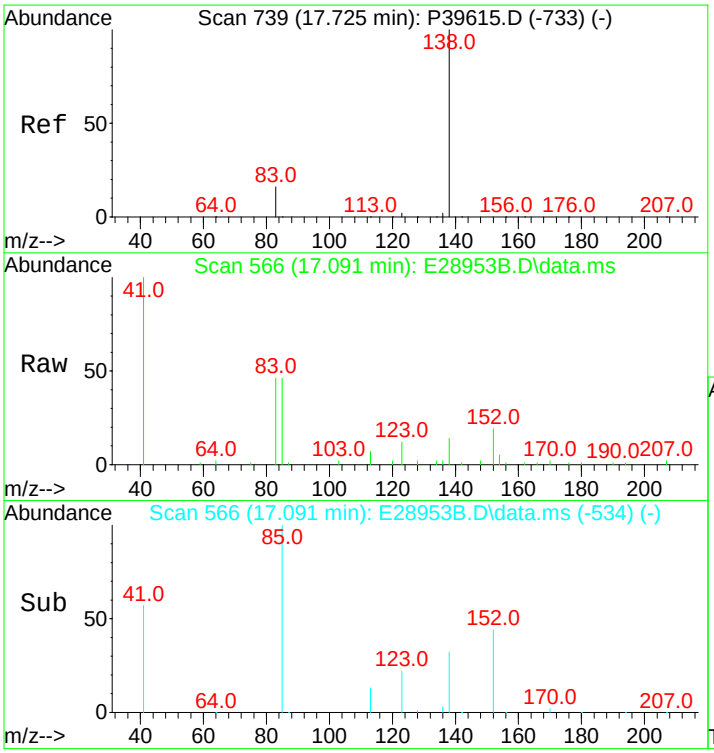




#3
trans-Decalin
Concen: 2236.19 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

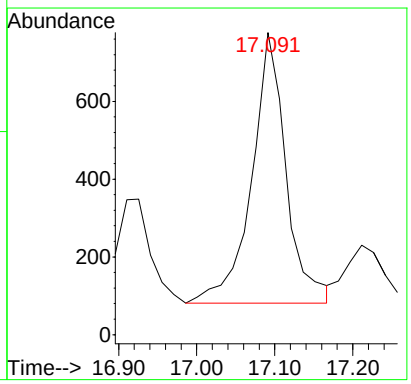
Tgt Ion:138 Resp: 44708

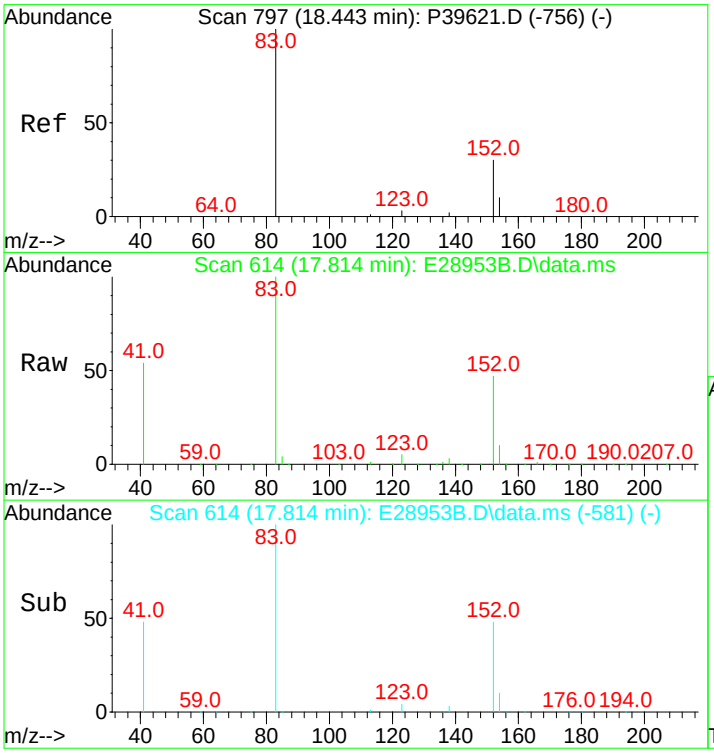




#4
cis-Decalin
Concen: 140.69 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

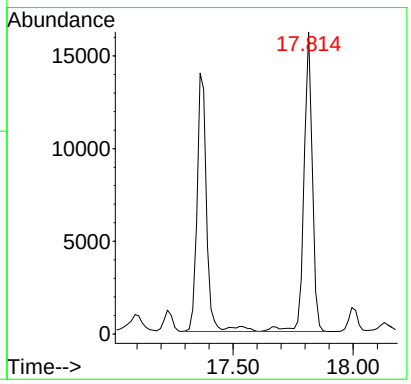
Tgt Ion:138 Resp: 2137

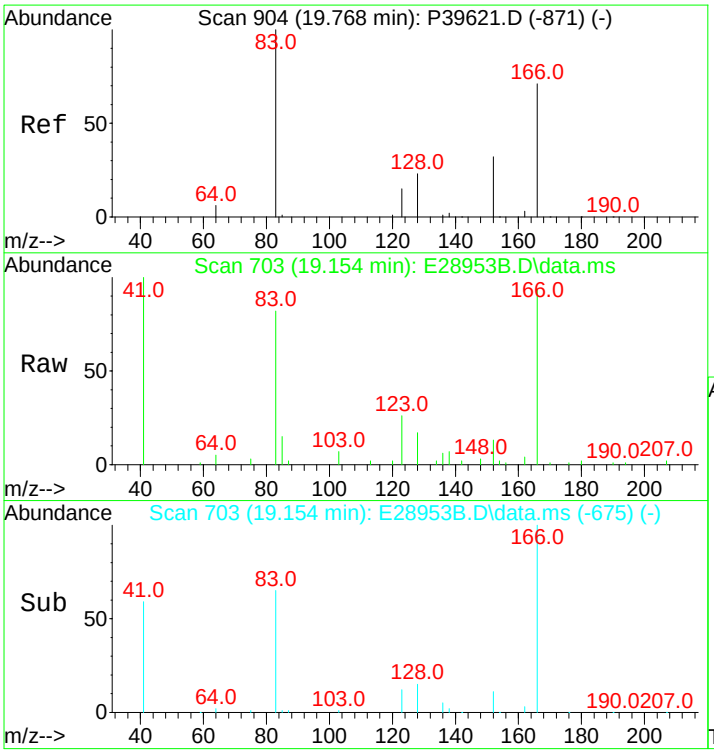




#5
C1-Decalins
Concen: 3872.03 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

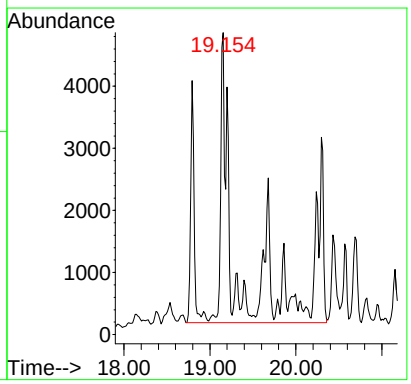
Tgt Ion:152 Resp: 77413

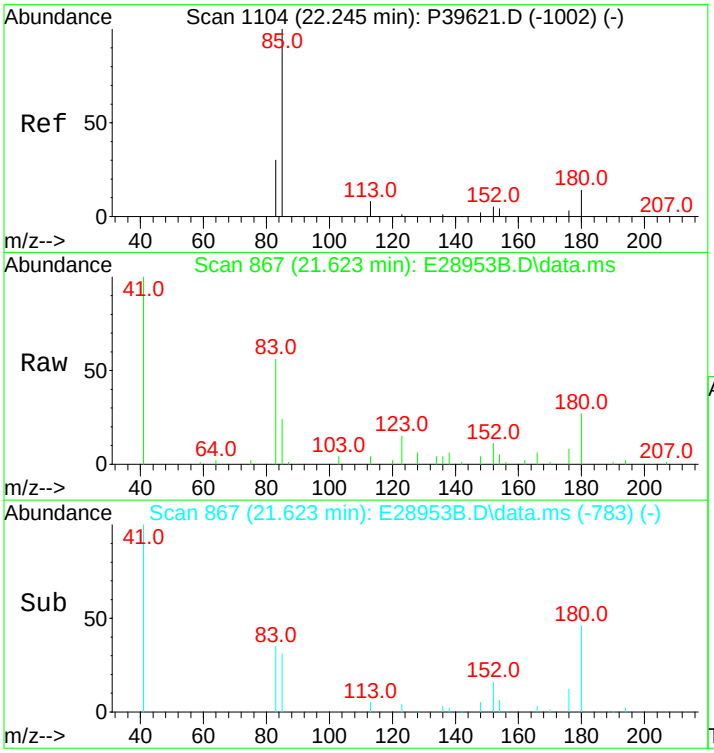




#6
C2-Decalins
Concen: 3631.89 ng/mL m
RT: 19.154 min Scan# 703
Delta R.T. -0.189 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

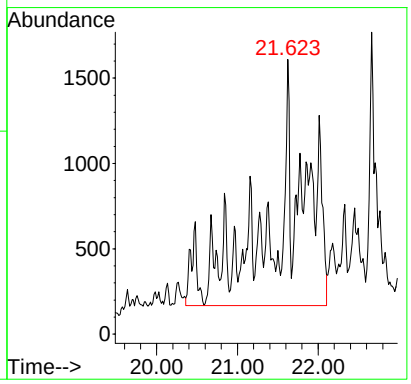
Tgt Ion:166 Resp: 72612

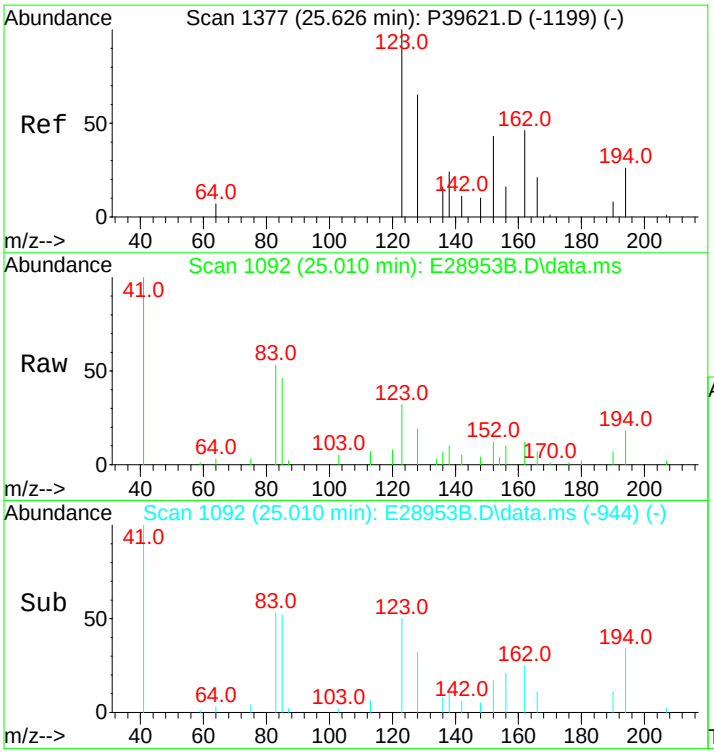




#7
C3-Decalins
Concen: 2079.64 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

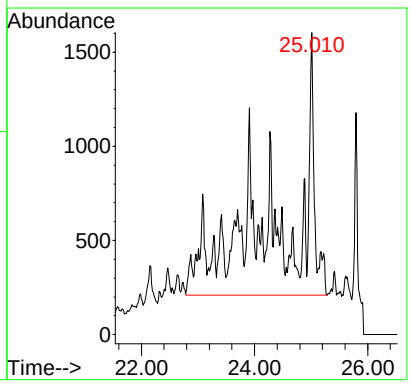
Tgt Ion:180 Resp: 41578

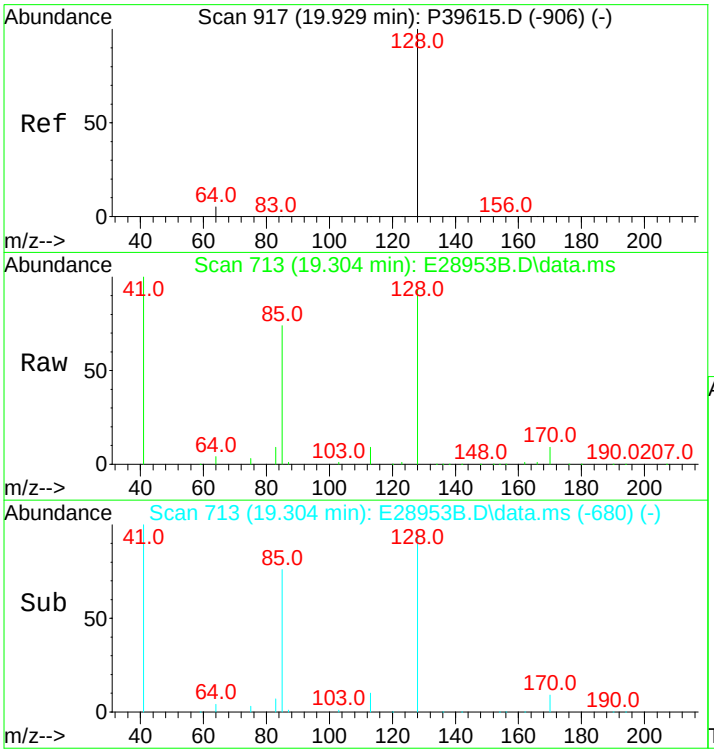




#8
C4-Decalins
Concen: 2213.14 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.046 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:194 Resp: 44247

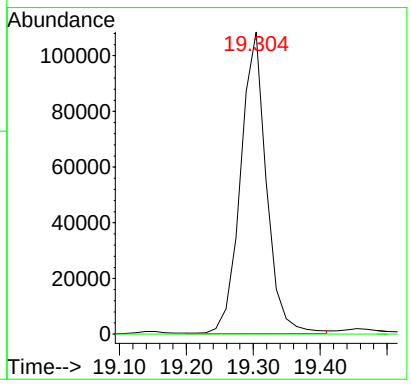


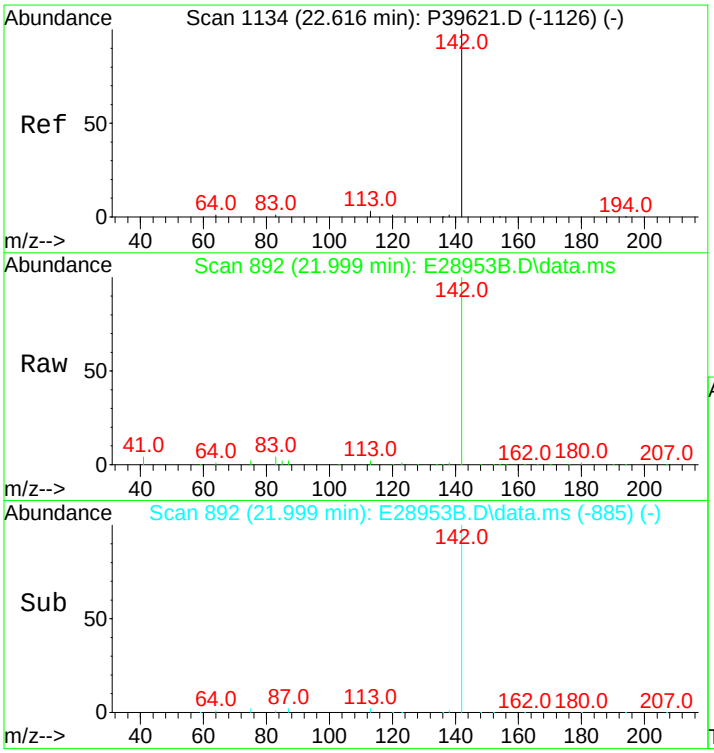


#10
Naphthalene
Concen: 2967.01 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:128 Resp: 291700

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

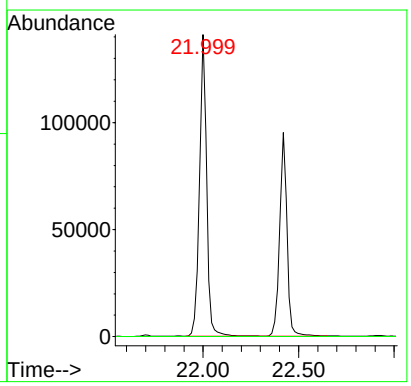


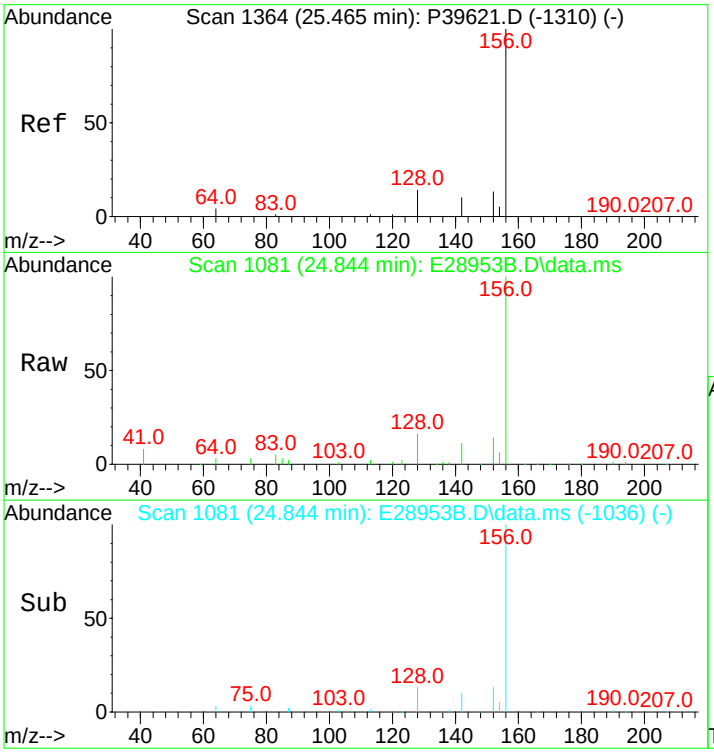


#11
C1-Naphthalenes
Concen: 6297.78 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:142 Resp: 619164

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

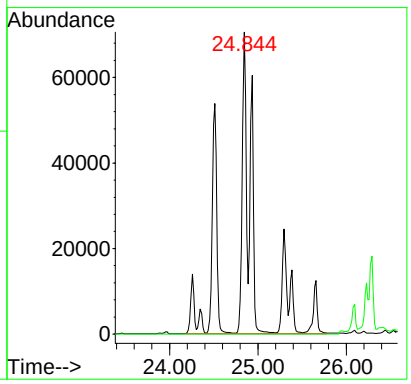


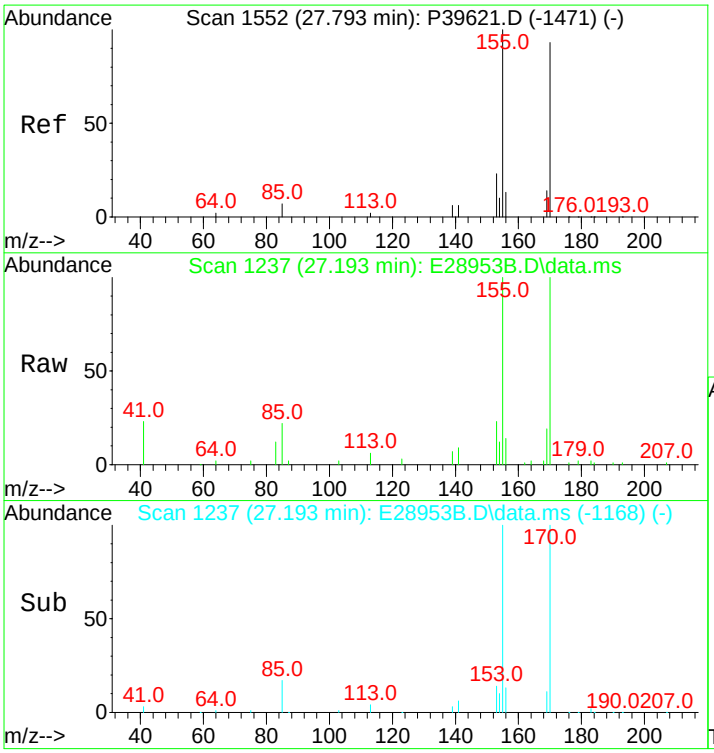


#12
C2-Naphthalenes
Concen: 7875.28 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:156 Resp: 774255

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

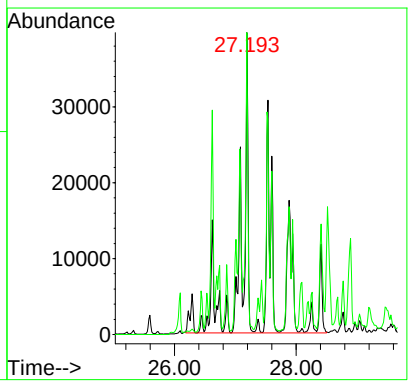


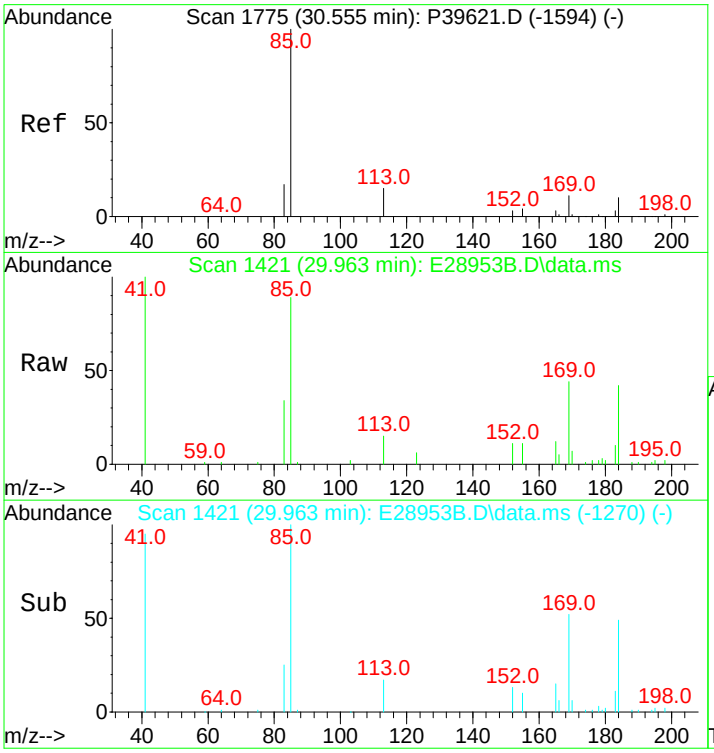


#13
C3-Naphthalenes
Concen: 5983.02 ng/mL m
RT: 27.193 min Scan# 1237
Delta R.T. 0.013 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:170 Resp: 588218

Ion	Ratio	Lower	Upper
170	100		
155	11.0	66.8	100.2#

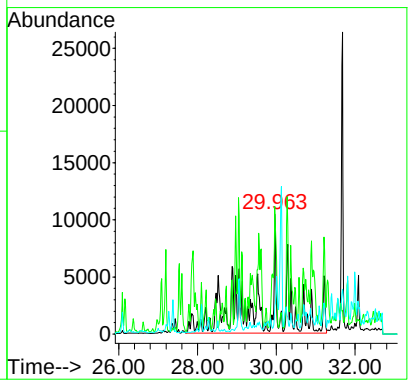


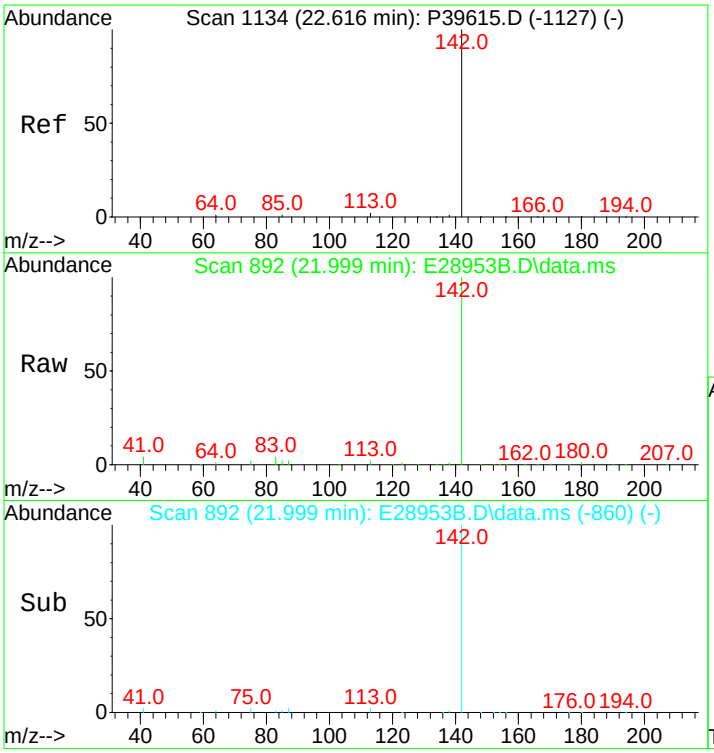


#14
C4-Naphthalenes
Concen: 3511.14 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.087 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:184 Resp: 345196

Ion	Ratio	Lower	Upper
184	100		
169	17.2	78.7	118.1#
183	0.0	26.7	40.1#

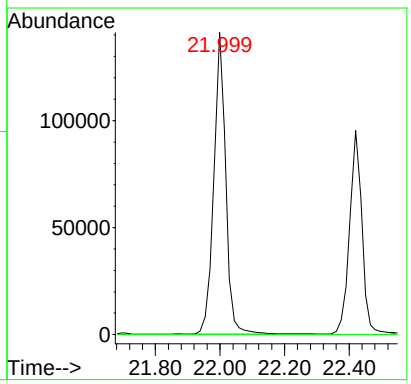


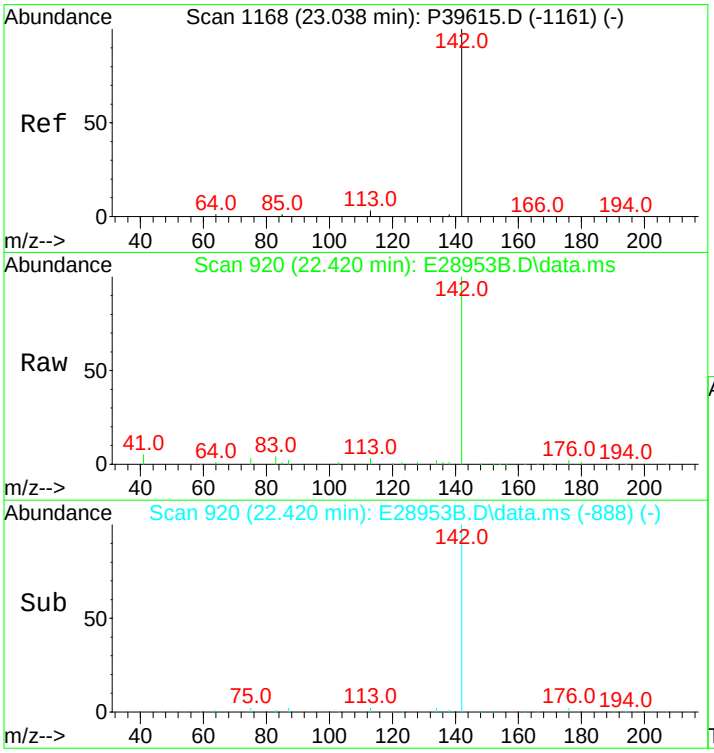


#16
2-Methylnaphthalene
Concen: 5824.05 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:142 Resp: 364688

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

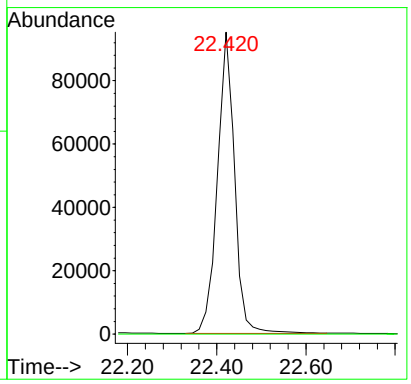


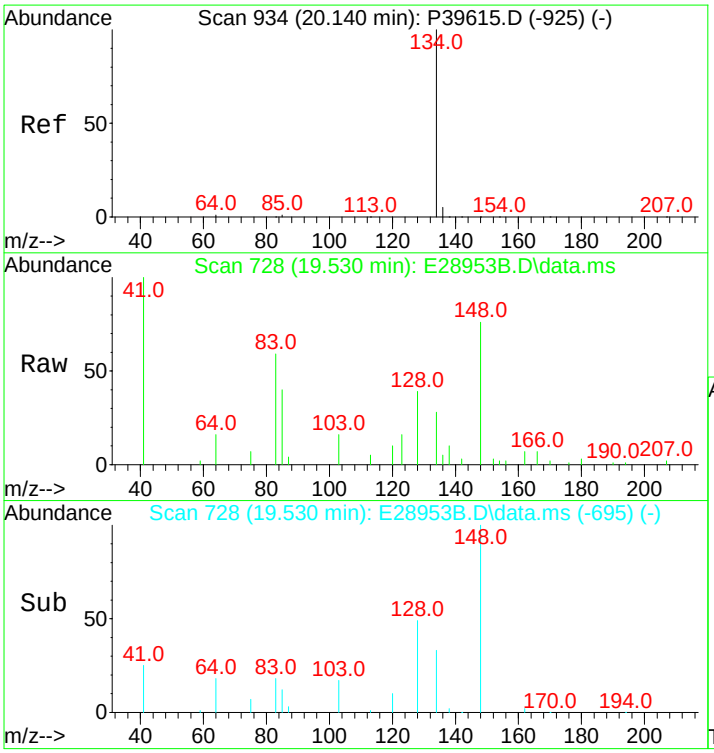


#17
1-Methylnaphthalene
Concen: 4176.93 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:142 Resp: 254143

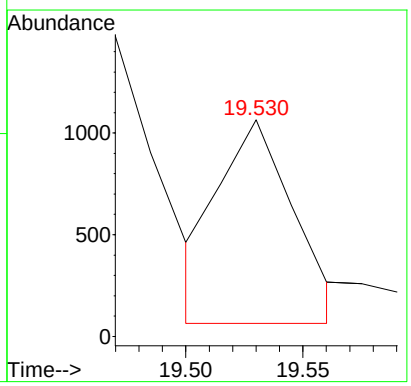
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

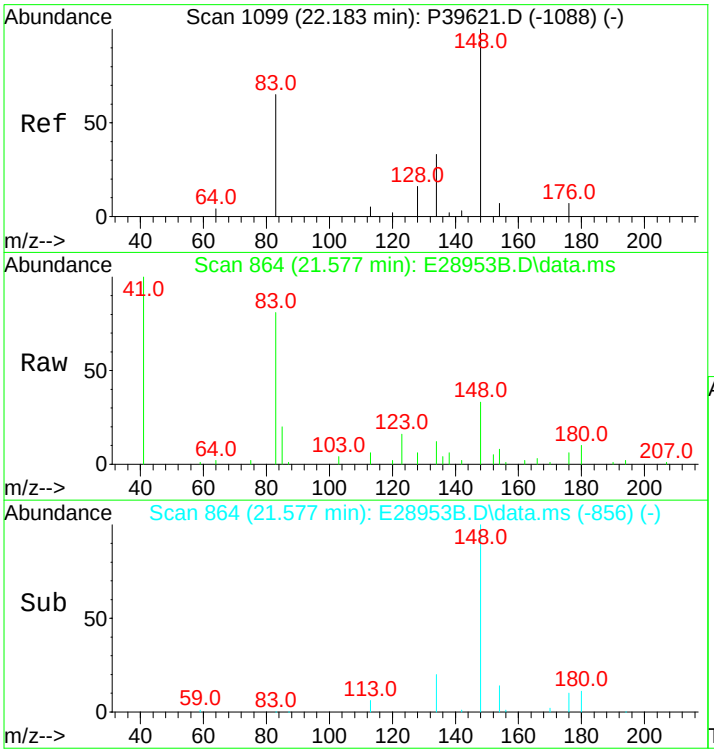




#18
Benzothiophene
Concen: 27.44 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

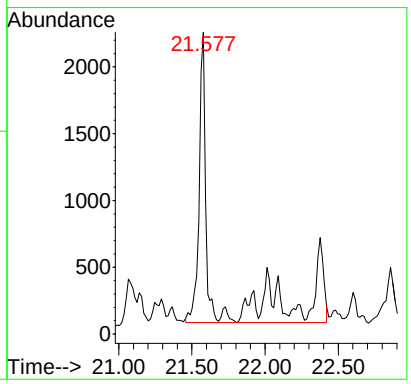
Tgt Ion:134 Resp: 2230

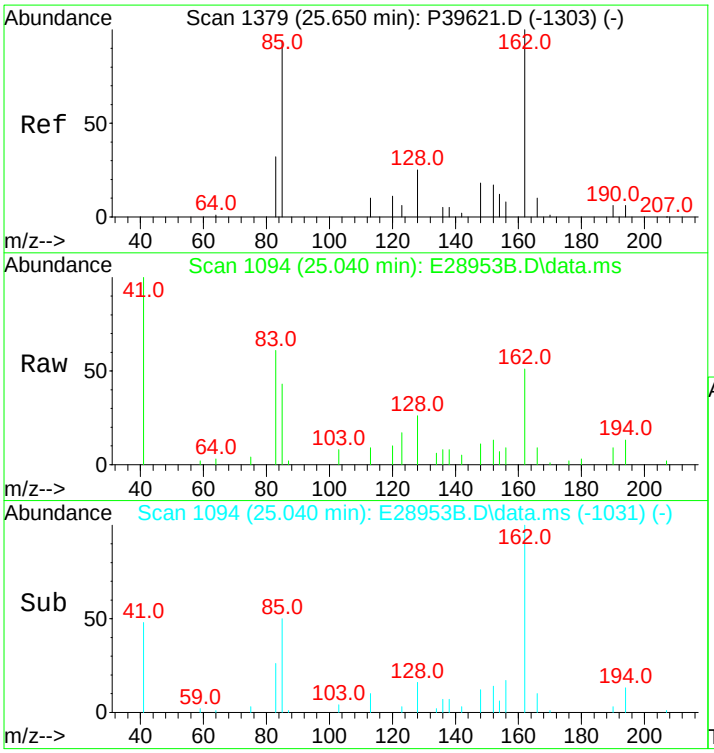




#19
C1-Benzo(b)thiophenes
Concen: 160.34 ng/mL m
RT: 21.577 min Scan# 864
Delta R.T. -0.123 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

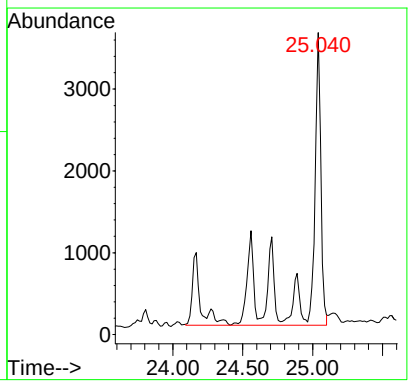
Tgt Ion:148 Resp: 13032

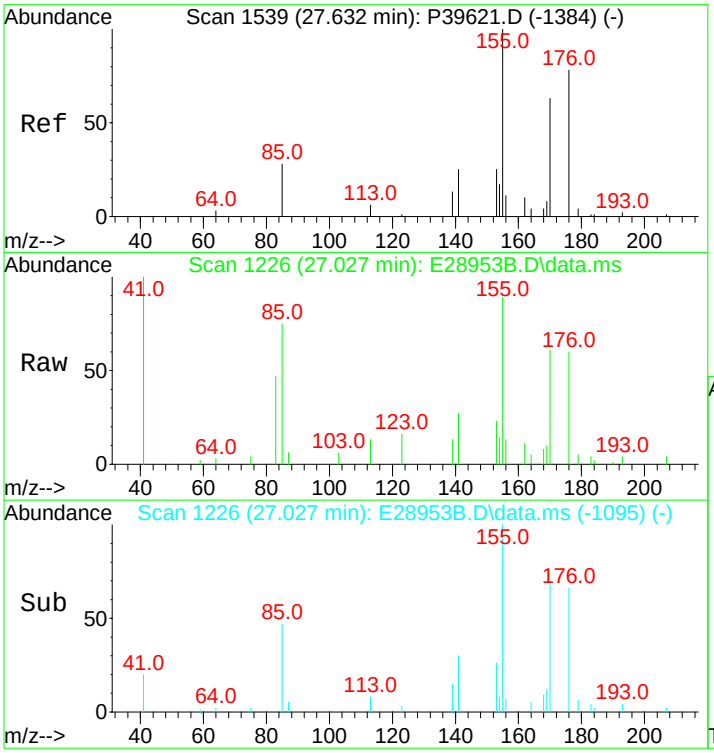




#20
C2-Benzo(b)thiophenes
Concen: 281.31 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

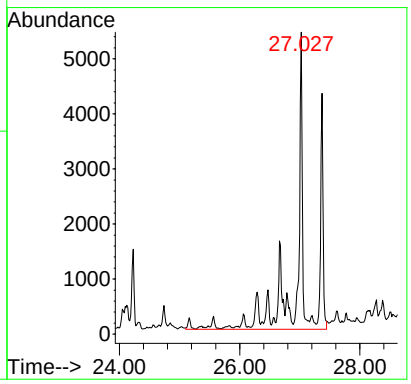
Tgt Ion:162 Resp: 22864

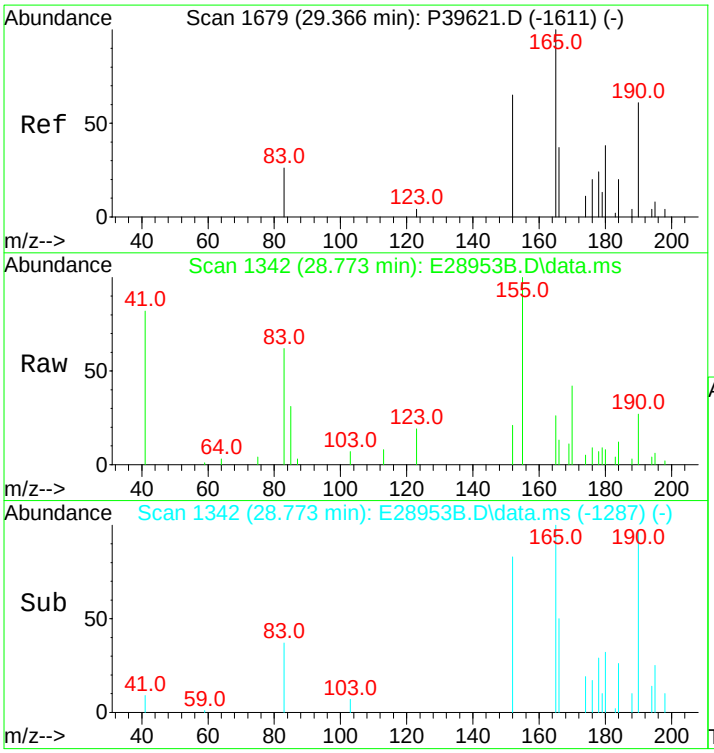




#21
C3-Benzo(b)thiophenes
Concen: 606.67 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

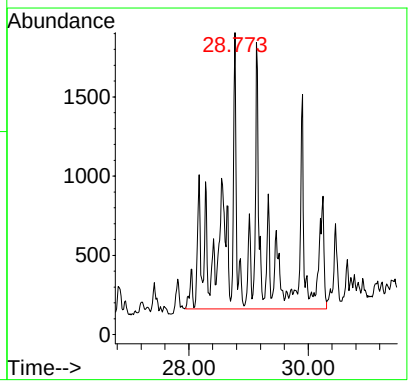
Tgt Ion:176 Resp: 49308

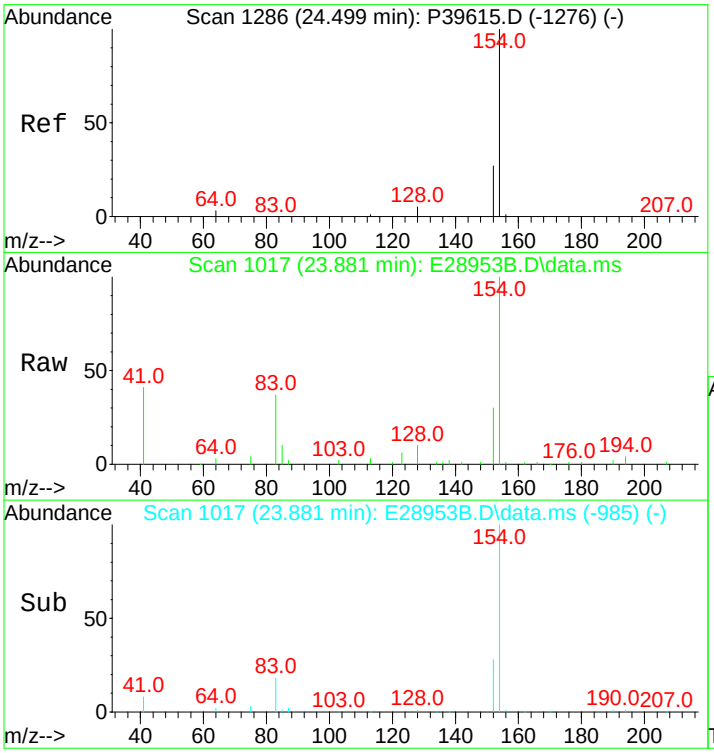




#22
C4-Benzo(b)thiophenes
Concen: 533.02 ng/mL m
RT: 28.773 min Scan# 1342
Delta R.T. -0.296 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:190 Resp: 43322

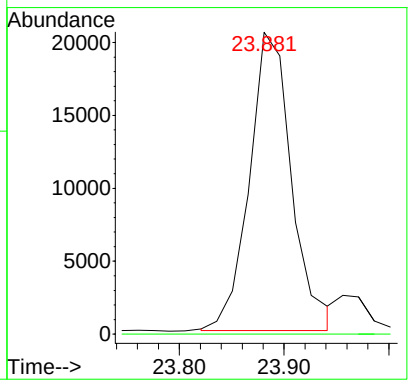


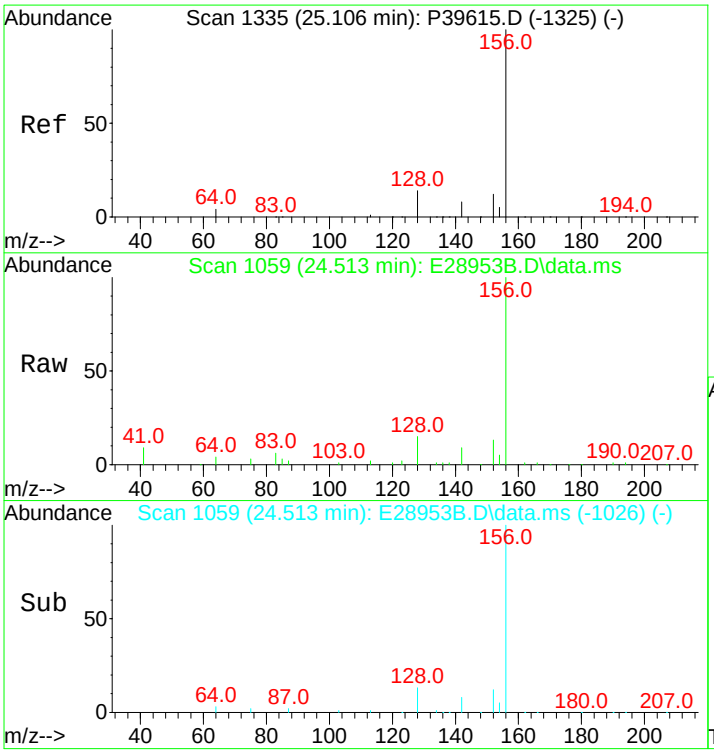


#23
Biphenyl
Concen: 725.39 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:154 Resp: 57406

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

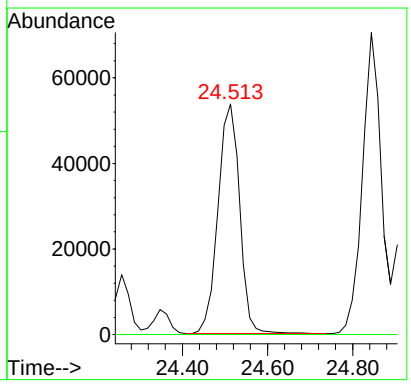


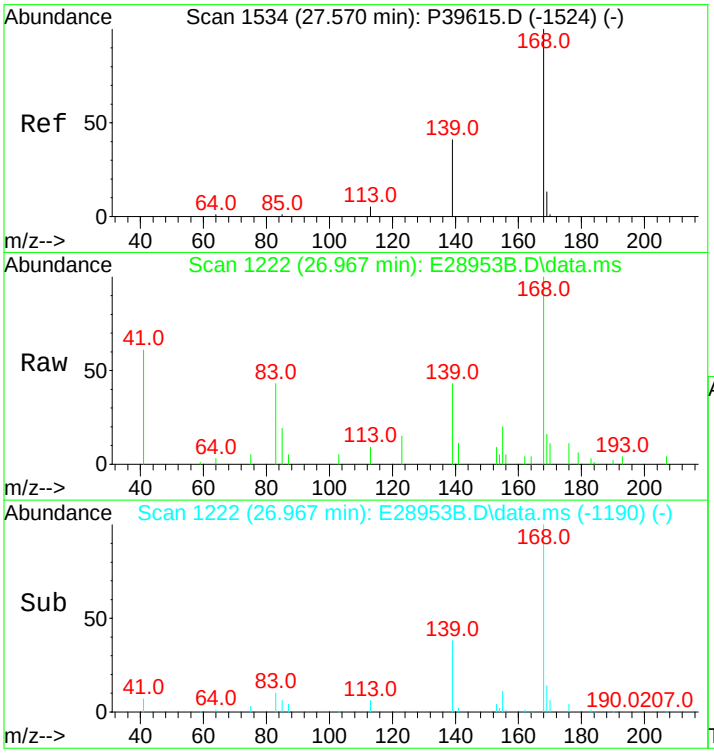


#24
2,6-Dimethylnaphthalene
Concen: 3354.36 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:156 Resp: 189324

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

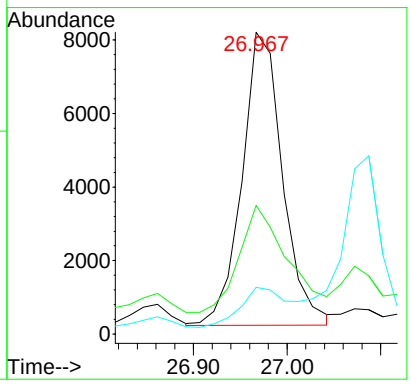


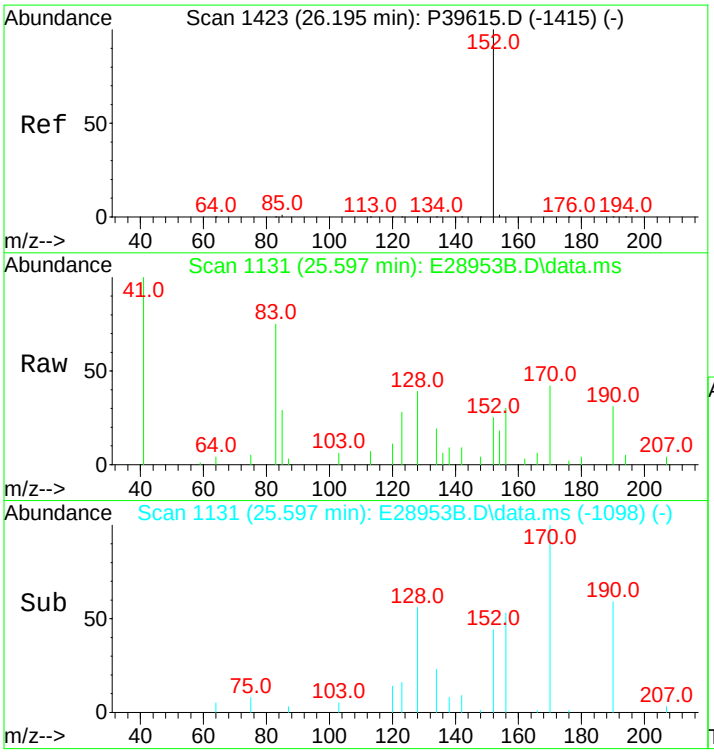


#25
Dibenzofuran
Concen: 274.58 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:168 Resp: 24057

Ion	Ratio	Lower	Upper
168	100		
139	43.2	26.0	39.0#
169	16.7	10.6	16.0#

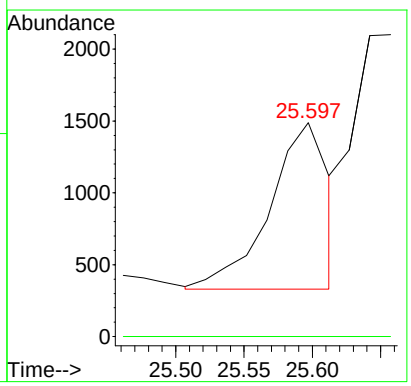


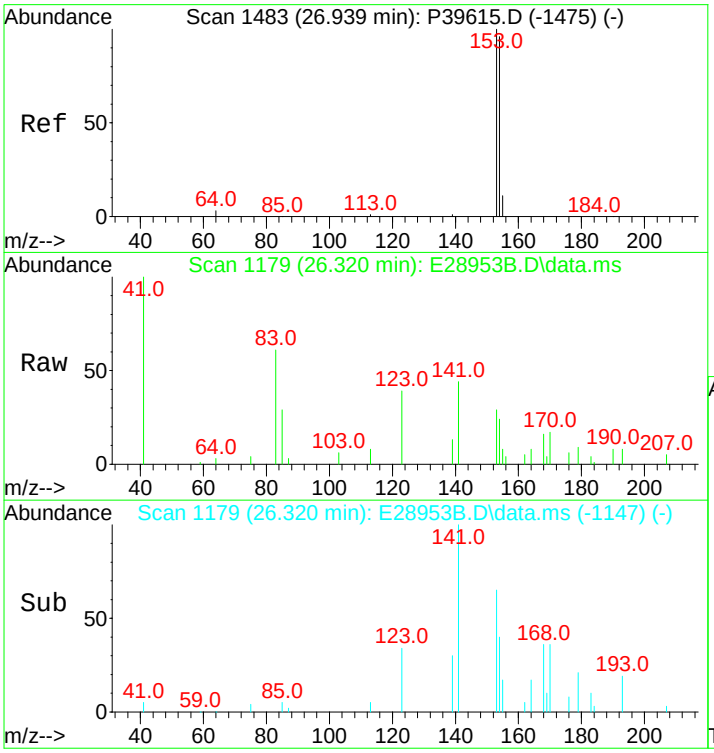


#26
Acenaphthylene
Concen: 35.41 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:152 Resp: 3471

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

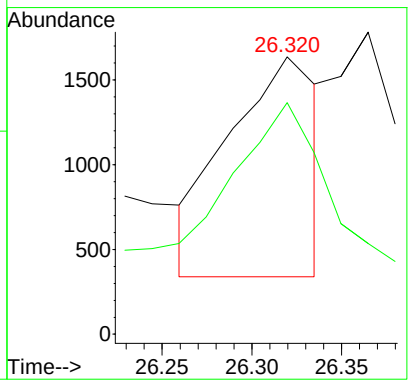


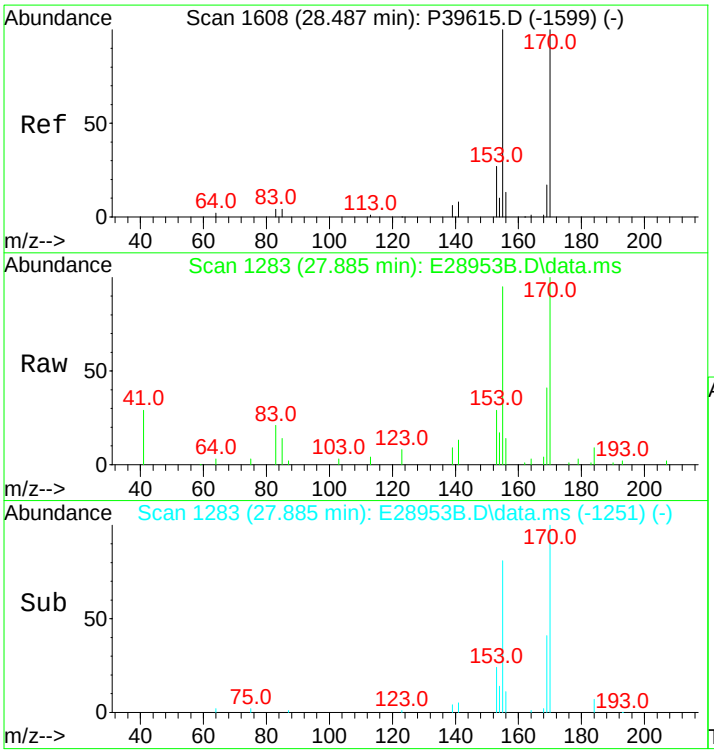


#27
Acenaphthene
Concen: 71.67 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:153 Resp: 4522

Ion	Ratio	Lower	Upper
153	100		
154	0.0	74.1	111.1#

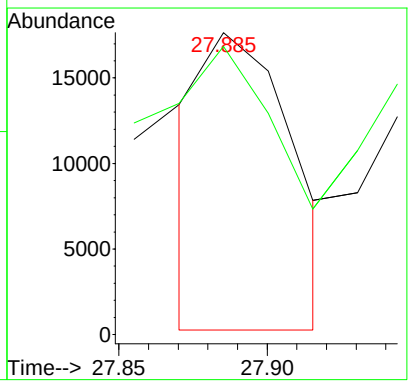


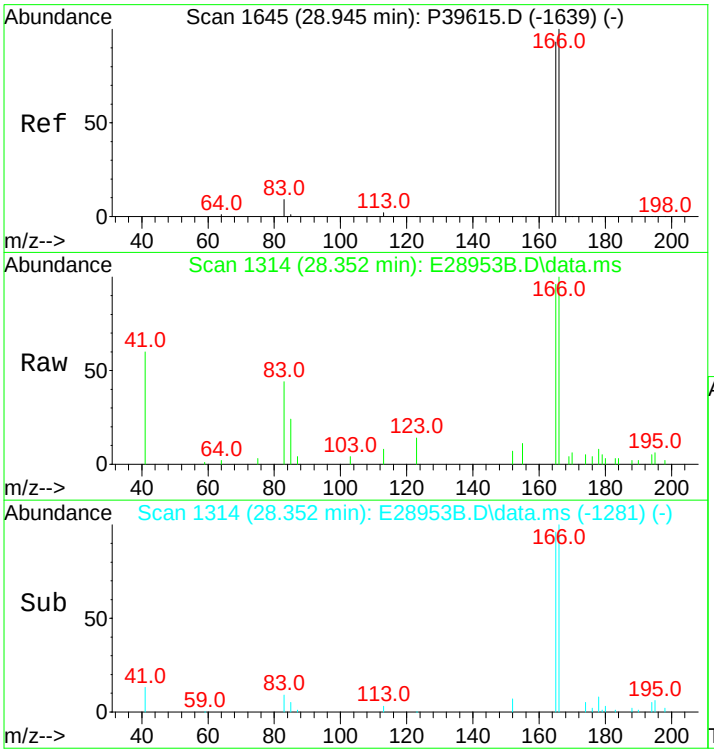


#28
2,3,5-Trimethylnaphthalene
Concen: 686.32 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:170 Resp: 36242

Ion	Ratio	Lower	Upper
170	100		
155	180.5	70.7	106.1#

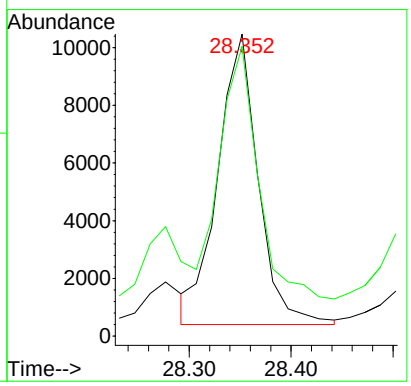


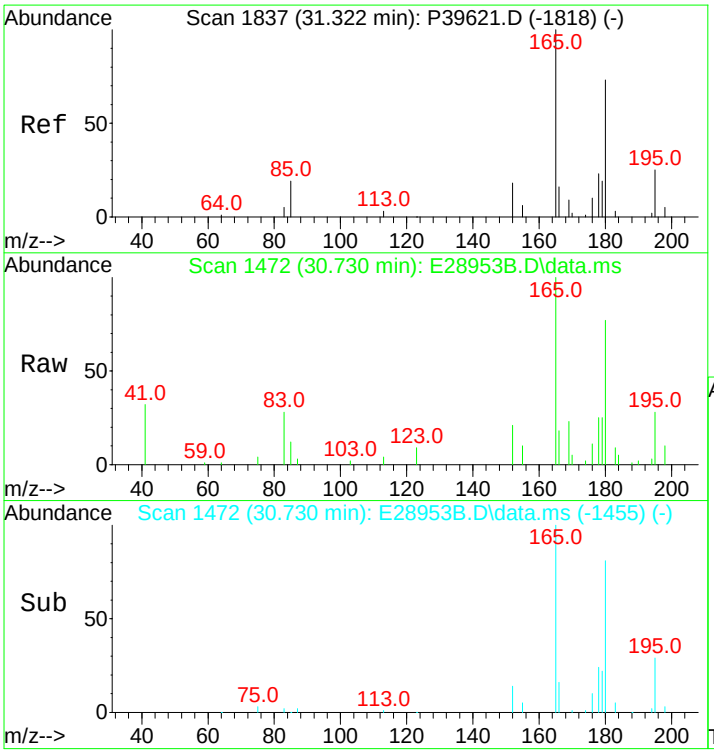


#29
Fluorene
Concen: 395.50 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:166 Resp: 27831

Ion	Ratio	Lower	Upper
166	100		
165	101.4	74.7	112.1

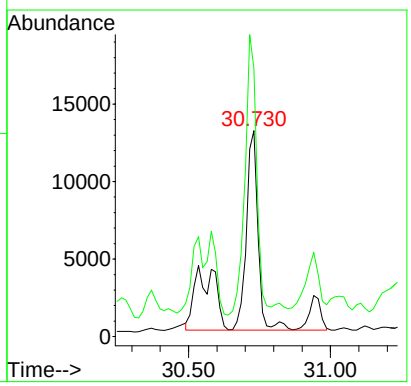


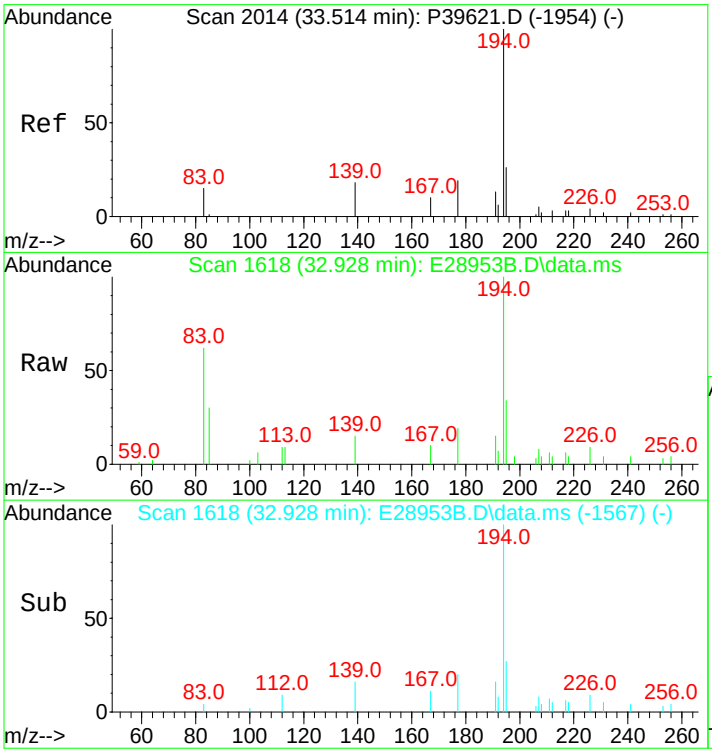


#30
C1-Fluorenes
Concen: 897.16 ng/mL m
RT: 30.730 min Scan# 1472
Delta R.T. 0.108 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:180 Resp: 63133

Ion	Ratio	Lower	Upper
180	100		
165	0.0	94.3	141.5#

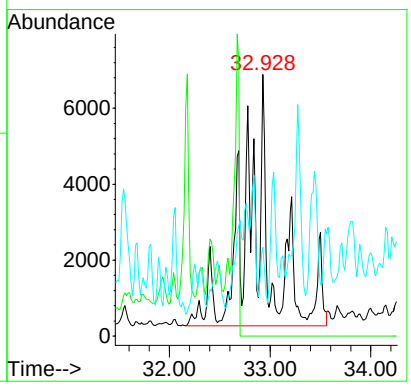


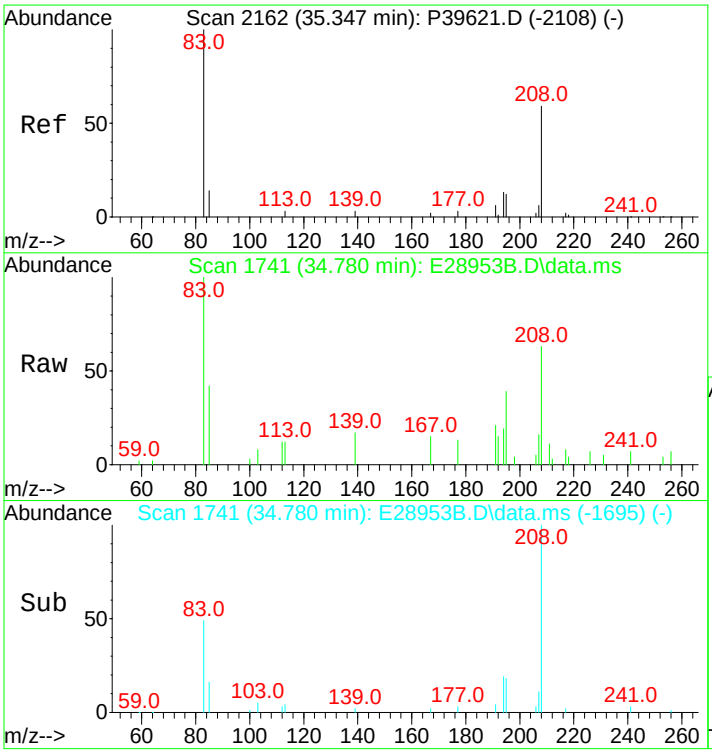


#31
C2-Fluorenes
Concen: 1516.46 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:194 Resp: 106713

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	6.7	27.0	40.4#

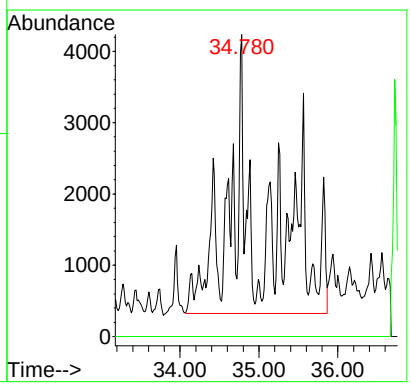


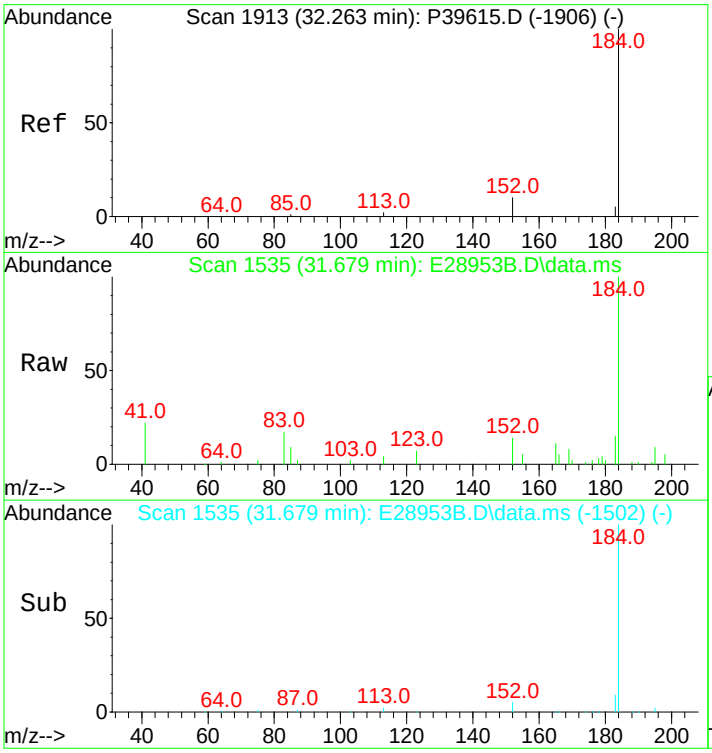


#32
C3-Fluorenes
Concen: 1507.07 ng/mL m
RT: 34.780 min Scan# 1741
Delta R.T. 0.231 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:208 Resp: 106052

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

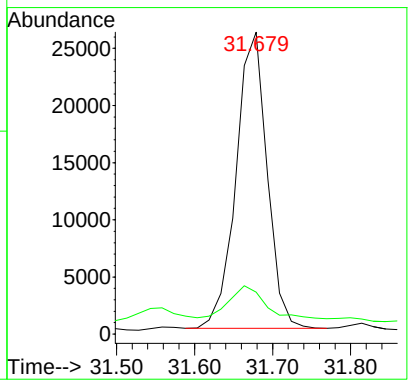


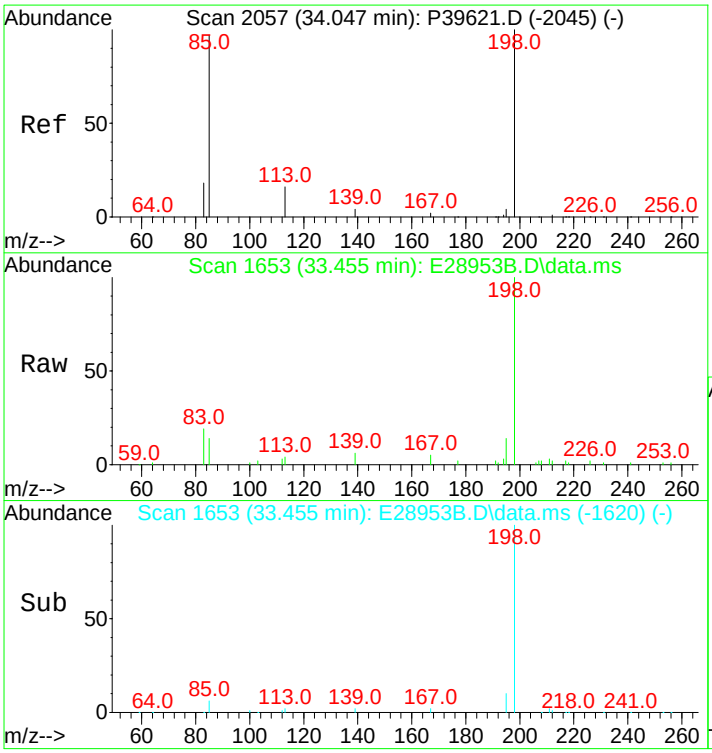


#33
Dibenzothiophene
Concen: 742.54 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:184 Resp: 71705

Ion	Ratio	Lower	Upper
184	100		
152	13.2	7.0	10.6#

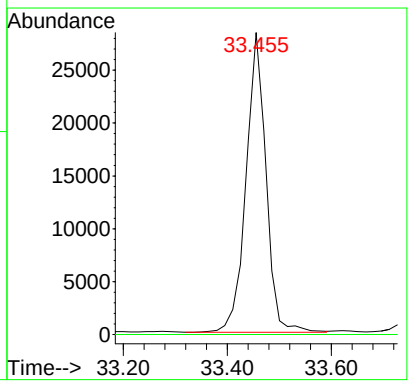


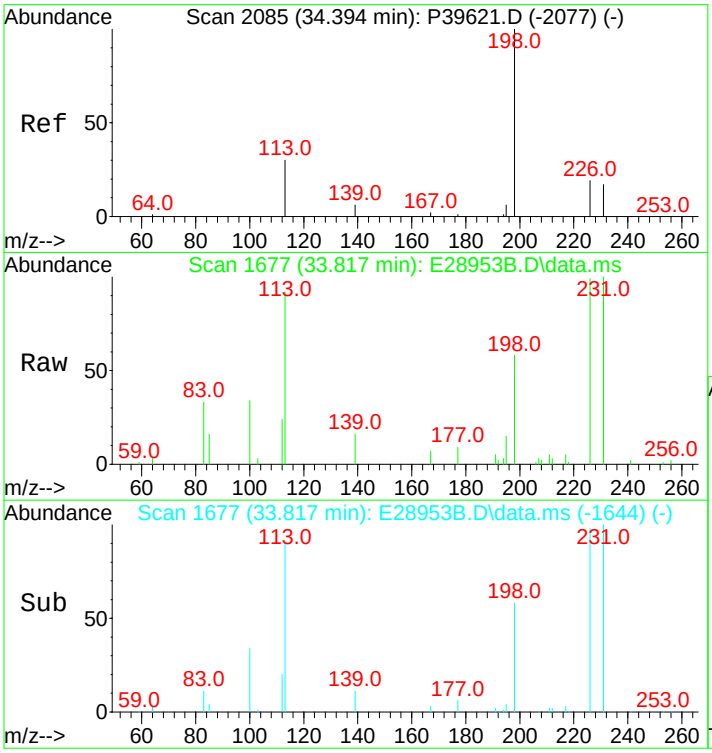


#34
4-Methyldibenzothiophene(4MDT)
Concen: 787.25 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 76022

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

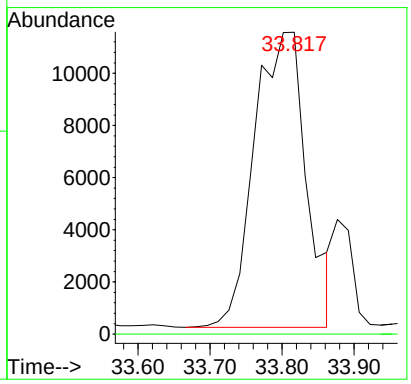


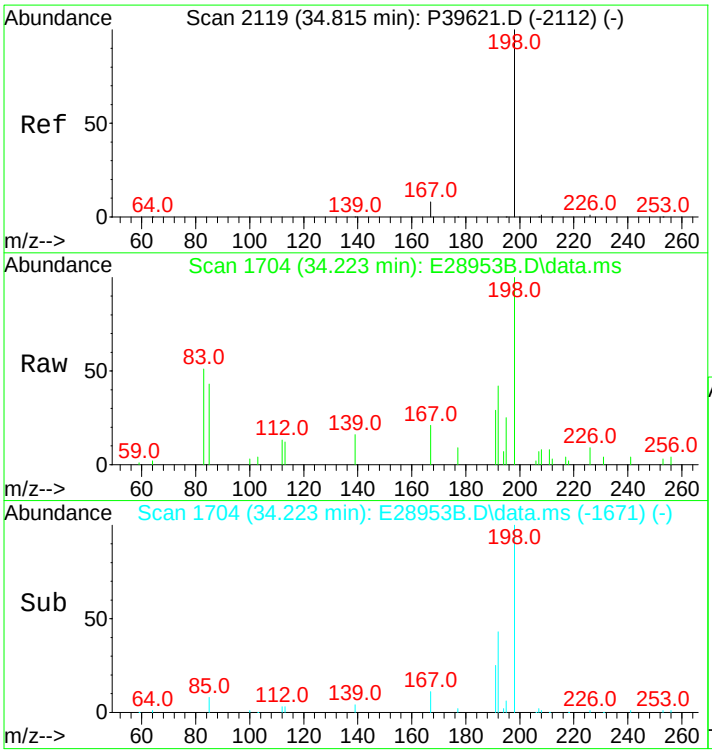


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 585.23 ng/mL
RT: 33.817 min Scan# 1677
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 56514

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

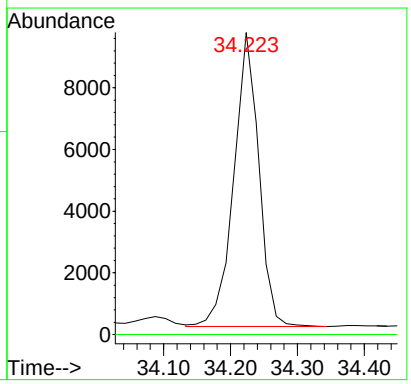


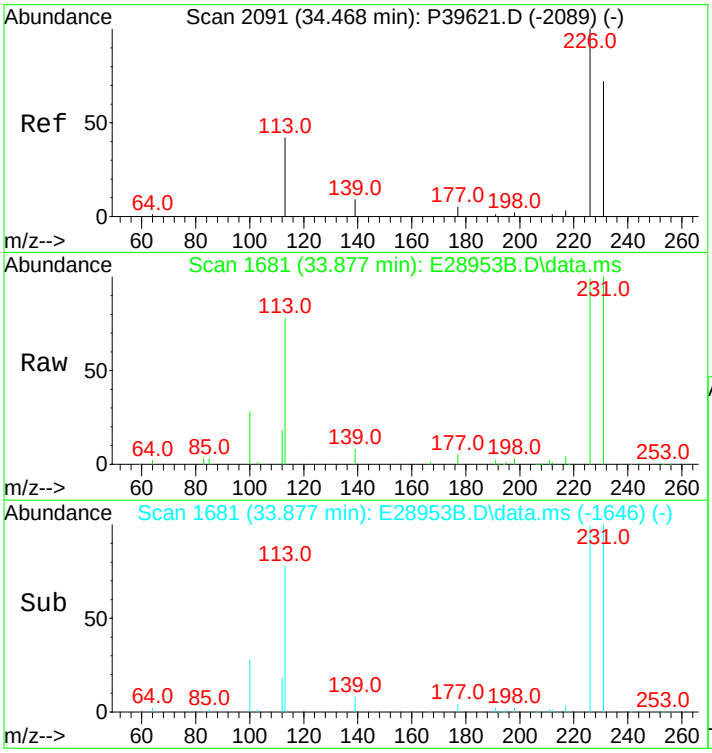


#36
1-Methyldibenzothiophene(1MDT)
Concen: 256.67 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 24786

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

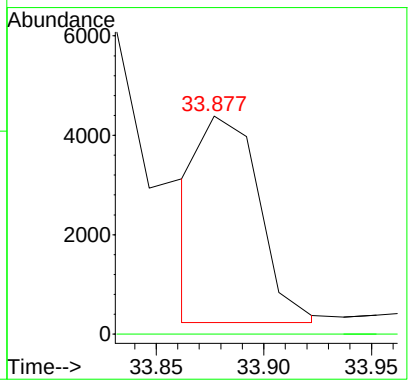


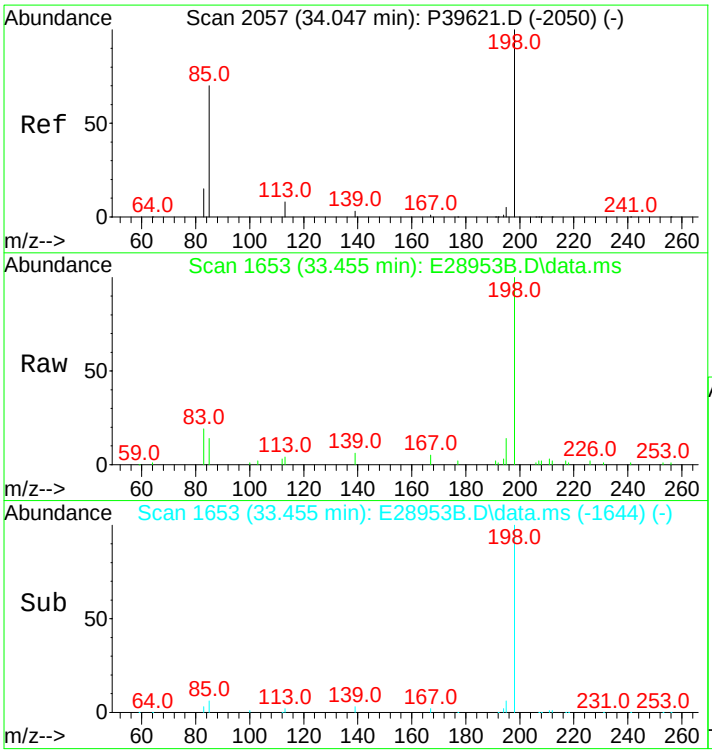


#37
OTP
Concen: 80.86 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 7808

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

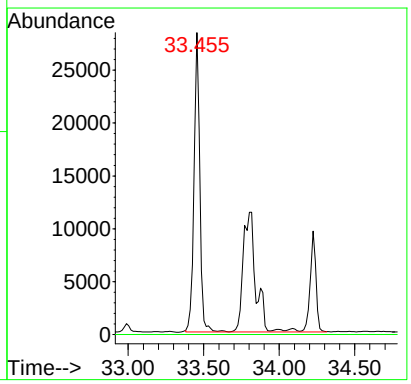


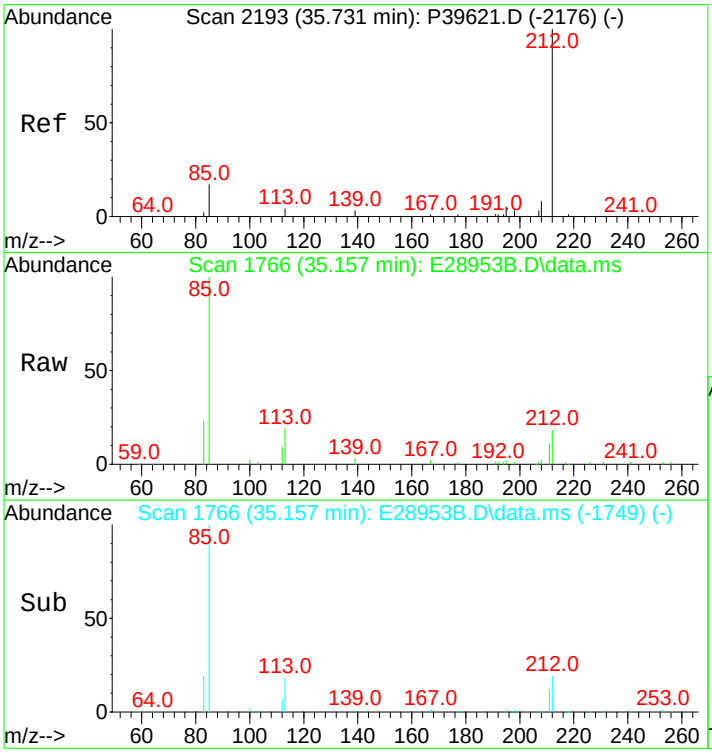


#38
C1-Dibenzothiophenes
Concen: 1725.35 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 166611

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

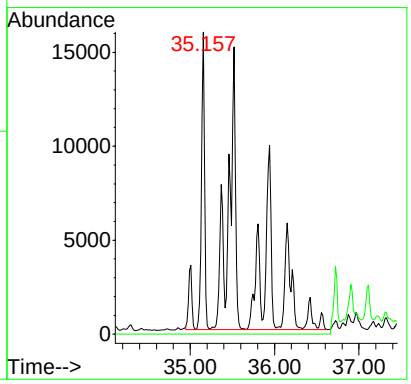


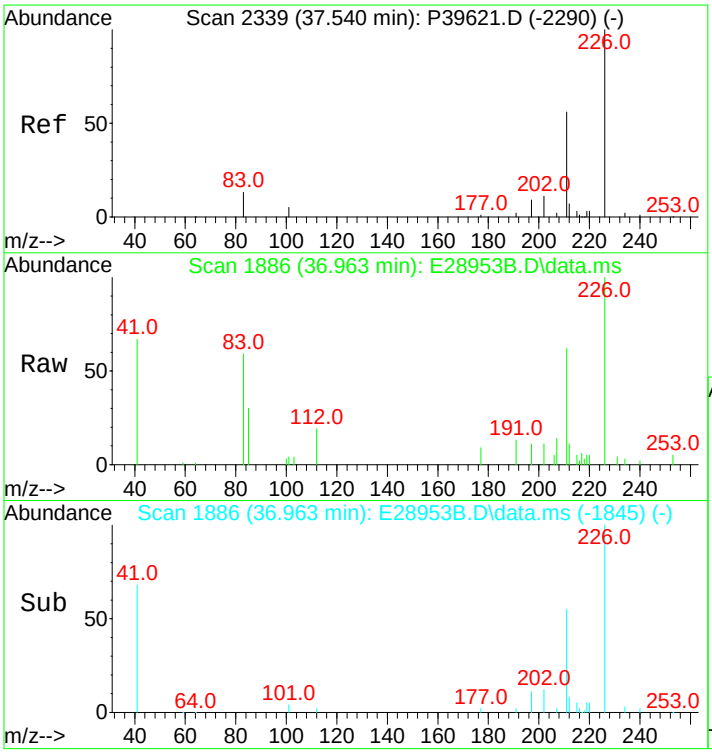


#39
C2-Dibenzothiophenes
Concen: 2358.93 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:212 Resp: 227794

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

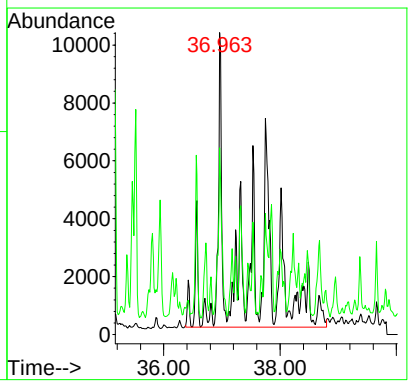


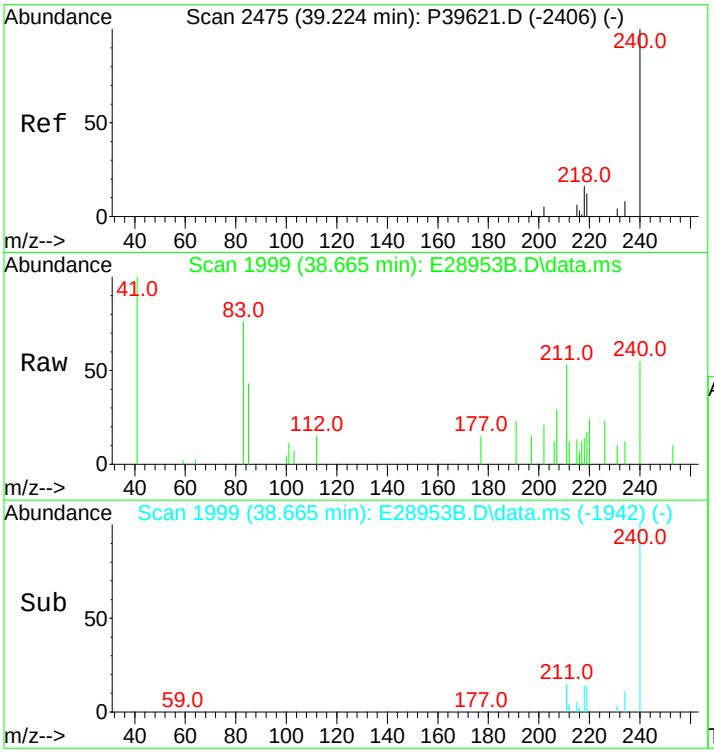


#40
C3-Dibenzothiophenes
Concen: 2172.36 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:226 Resp: 209778

Ion	Ratio	Lower	Upper
226	100		
211	4.1	44.1	66.1#

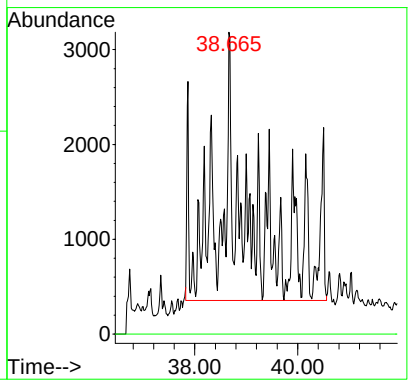


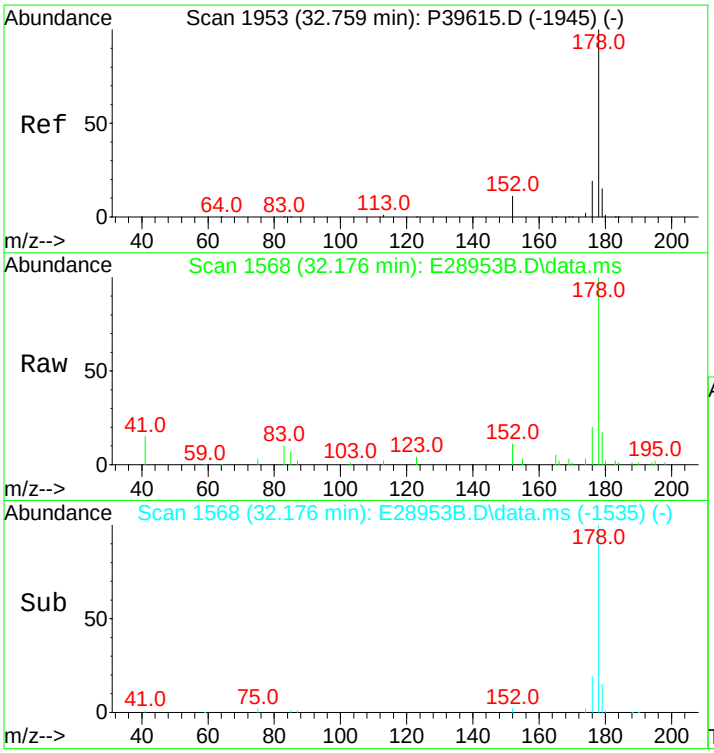


#41
C4-Dibenzothiophenes
Concen: 1191.46 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:240 Resp: 115055

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

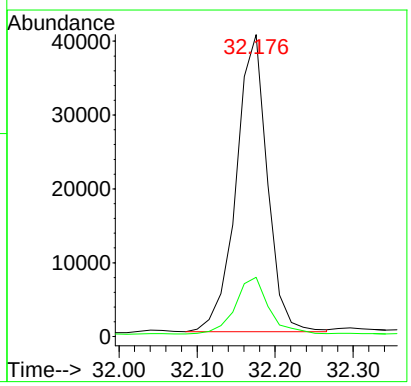


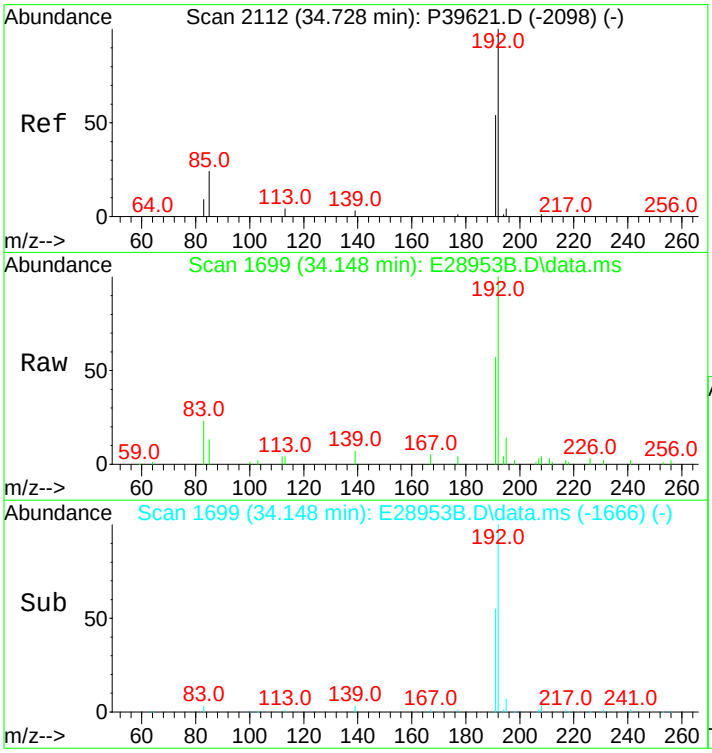


#43
Phenanthrene
Concen: 1135.65 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:178 Resp: 111573

Ion	Ratio	Lower	Upper
178	100		
176	20.6	15.0	22.4

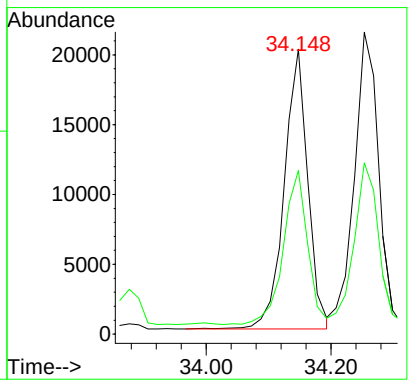


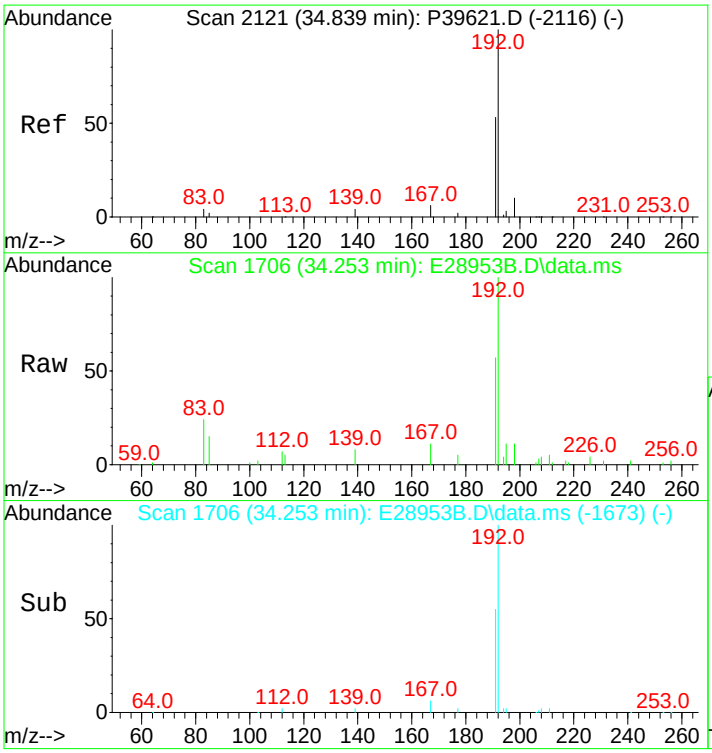


#44
3-Methylphenanthrene(3MP)
Concen: 532.08 ng/mL
RT: 34.148 min Scan# 1699
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 52275

Ion	Ratio	Lower	Upper
192	100		
191	57.2	45.9	68.9

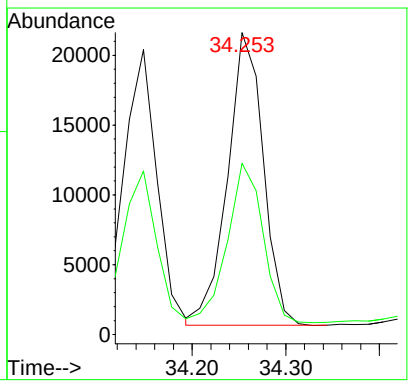


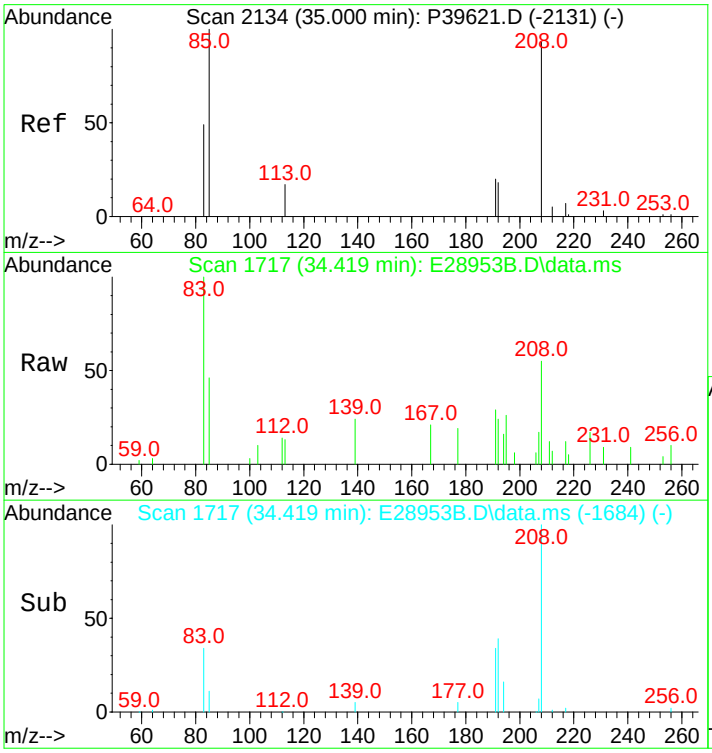


#45
2-Methylphenanthrene(2MP)
Concen: 565.96 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 55603

Ion	Ratio	Lower	Upper
192	100		
191	54.1	45.4	68.0

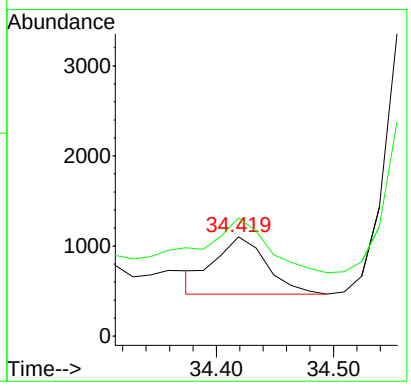


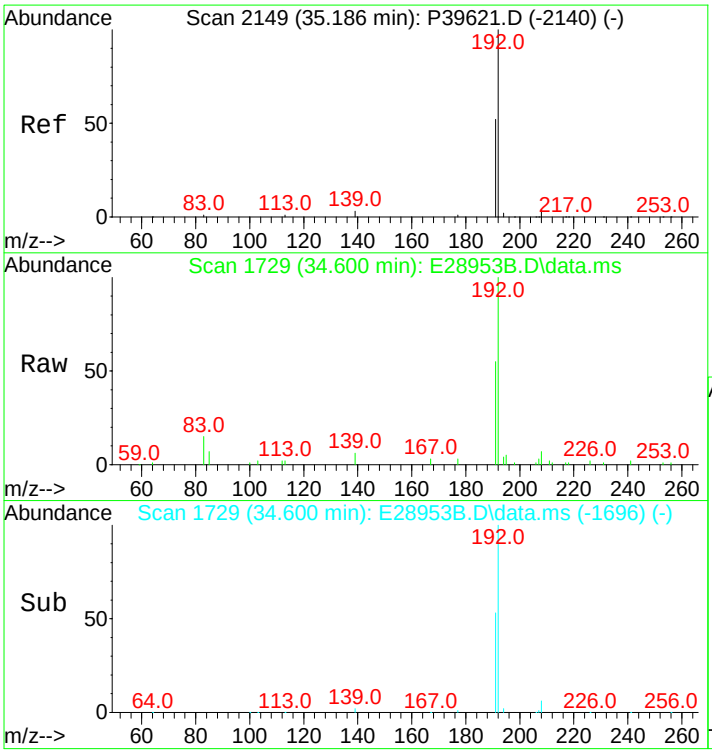


#46
2-Methylanthracene(2MA)
Concen: 20.11 ng/mL
RT: 34.419 min Scan# 1717
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 1976

Ion	Ratio	Lower	Upper
192	100		
191	128.1	95.4	143.0

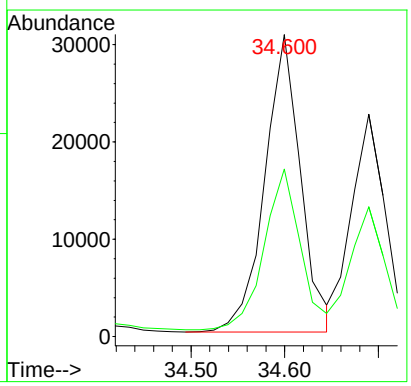


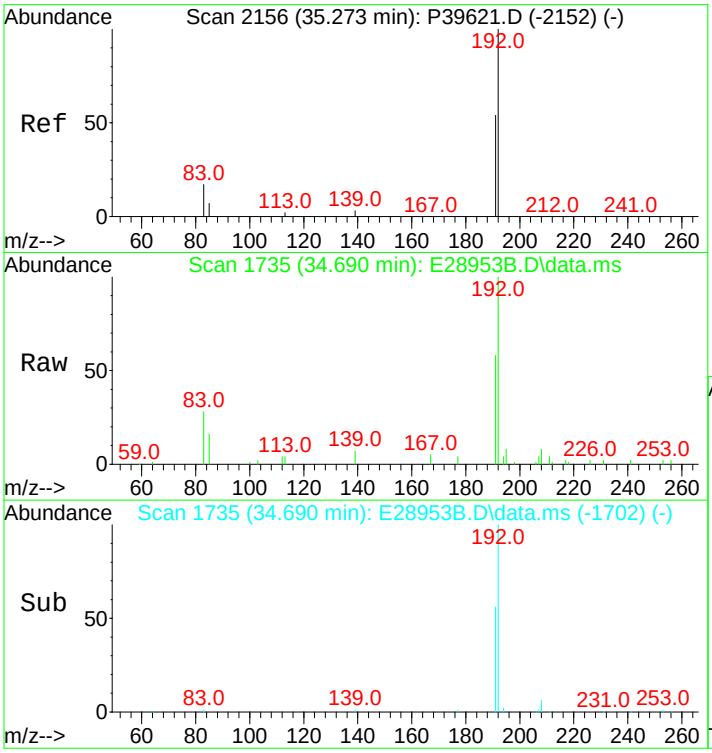


#47
9/4-Methylphenanthrene(9MP)
Concen: 827.77 ng/mL
RT: 34.600 min Scan# 1729
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 81325

Ion	Ratio	Lower	Upper
192	100		
191	54.8	44.3	66.5

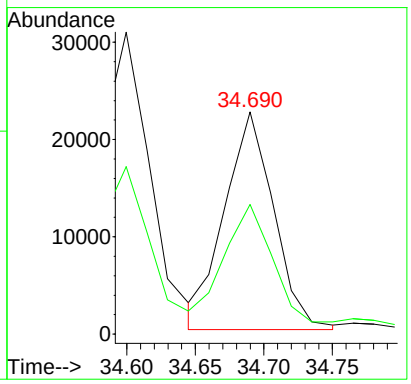


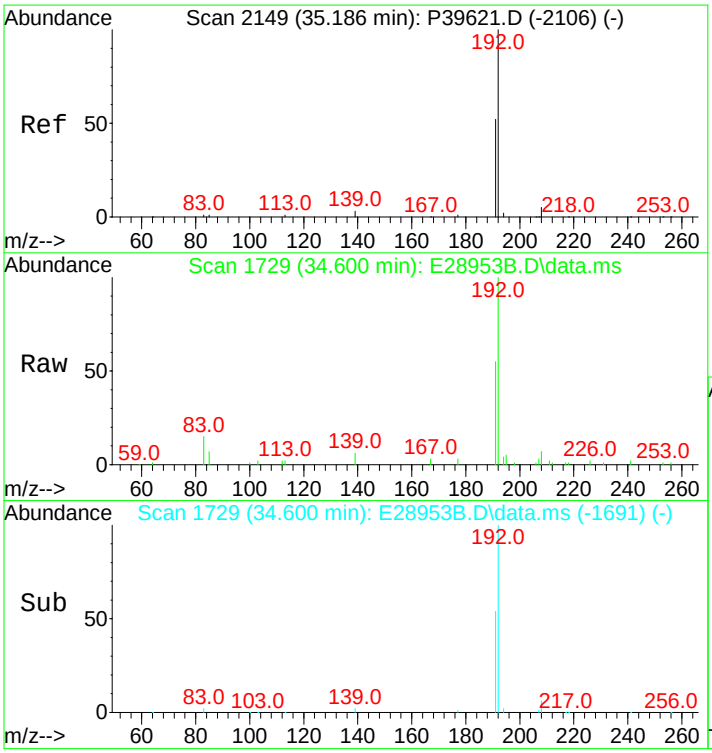


#48
1-Methylphenanthrene(1MP)
Concen: 569.43 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 55944

Ion	Ratio	Lower	Upper
192	100		
191	52.1	46.7	70.1

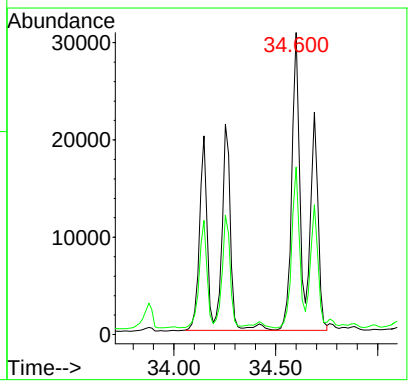


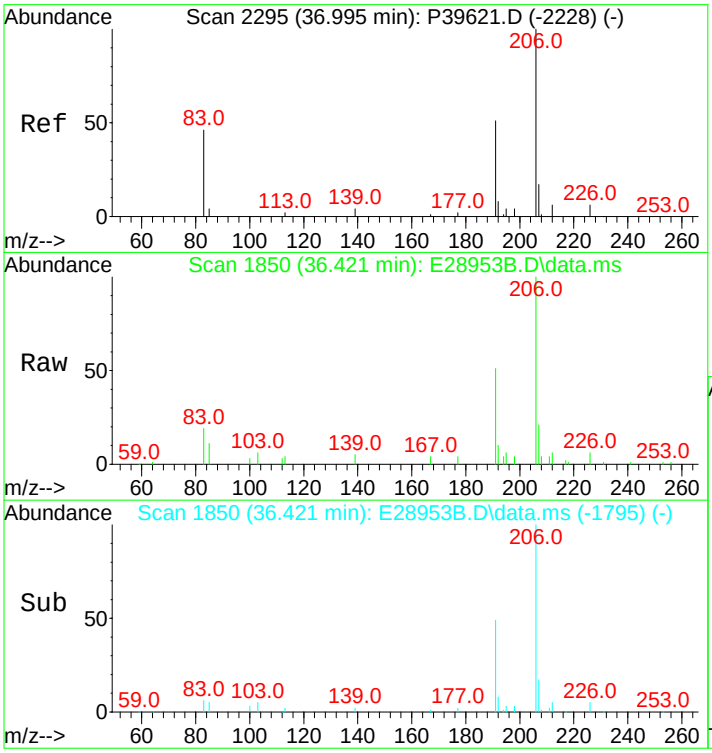


#49
C1-Phenanthrenes/Anthracenes
Concen: 2549.41 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.196 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 250470

Ion	Ratio	Lower	Upper
192	100		
191	12.0	44.0	66.0#

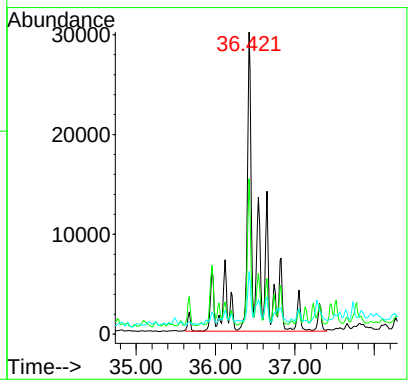


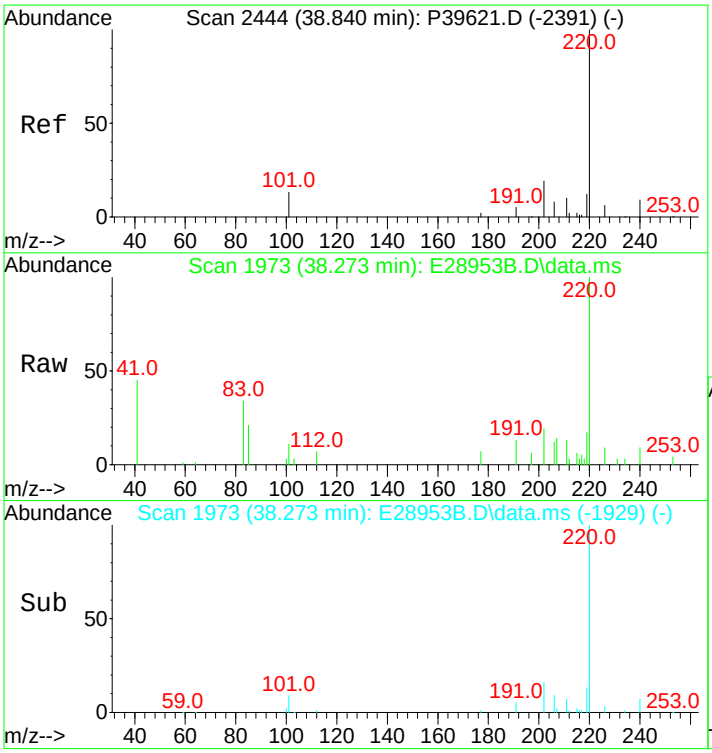


#50
C2-Phenanthrenes/Anthracenes
Concen: 2900.86 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:206 Resp: 284998

Ion	Ratio	Lower	Upper
206	100		
191	1.3	35.7	53.5#
207	0.6	16.5	24.7#

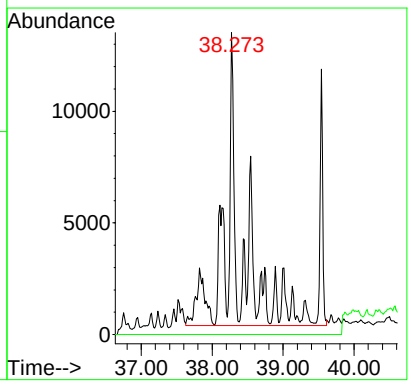


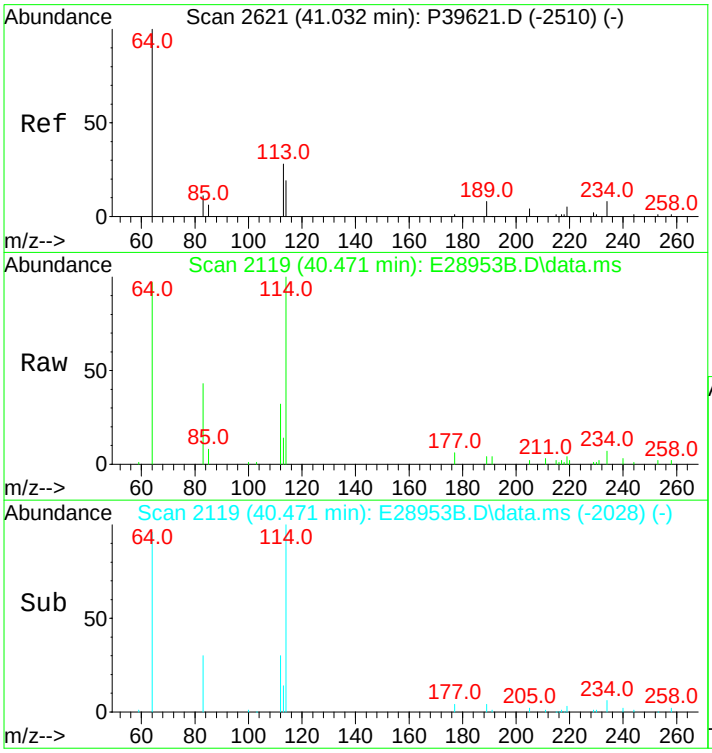


#52
C3-Phenanthrenes/Anthracenes
Concen: 2127.94 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:220 Resp: 209062

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

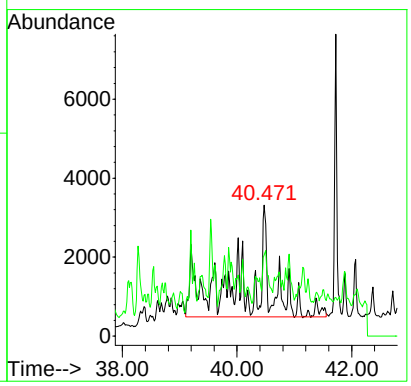


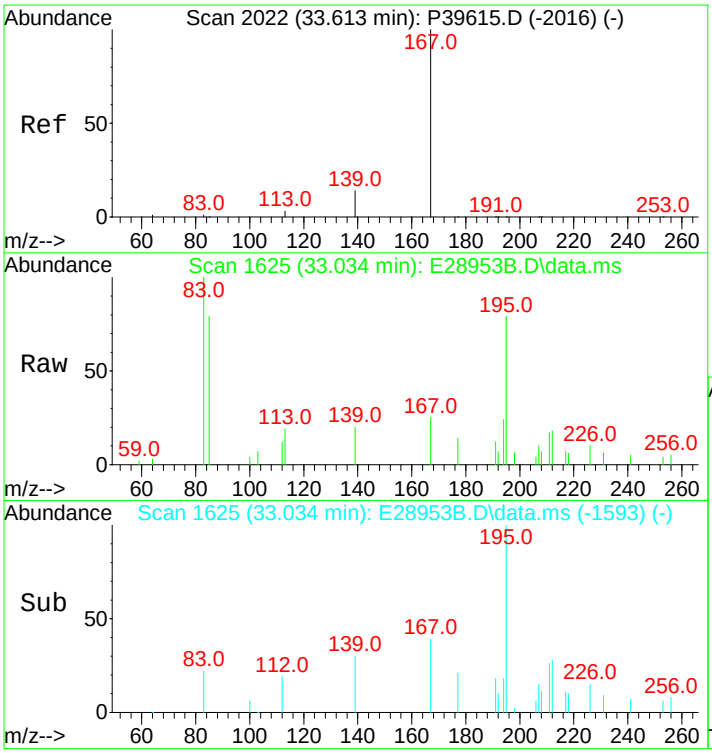


#53
C4-Phenanthrenes/Anthracenes
Concen: 858.54 ng/mL m
RT: 40.471 min Scan# 2119
Delta R.T. 0.384 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 84348

Ion	Ratio	Lower	Upper
234	100		
219	3.1	46.6	70.0#

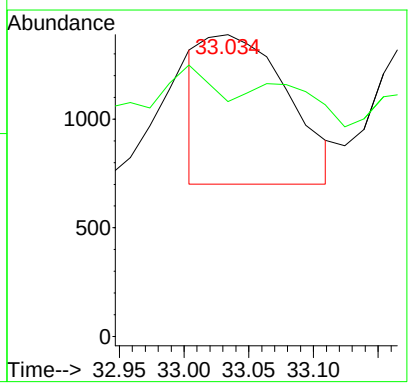


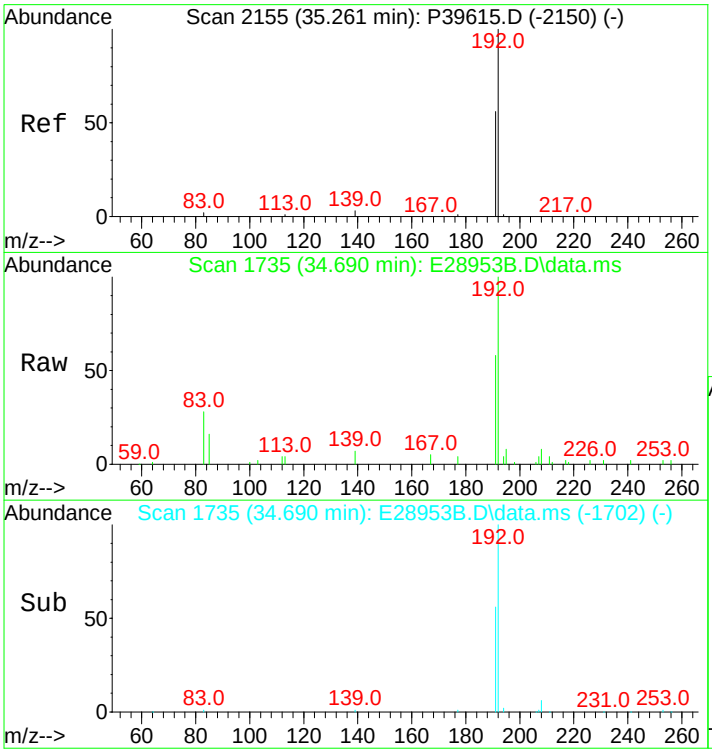


#56
Carbazole
Concen: 36.17 ng/mL m
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:167 Resp: 3161

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.1	15.1#

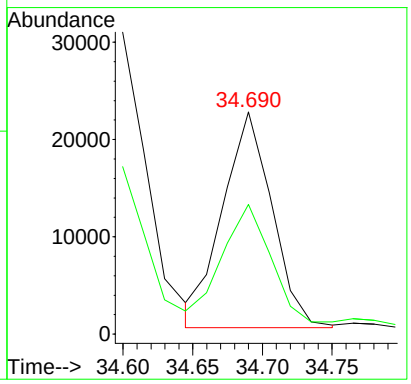


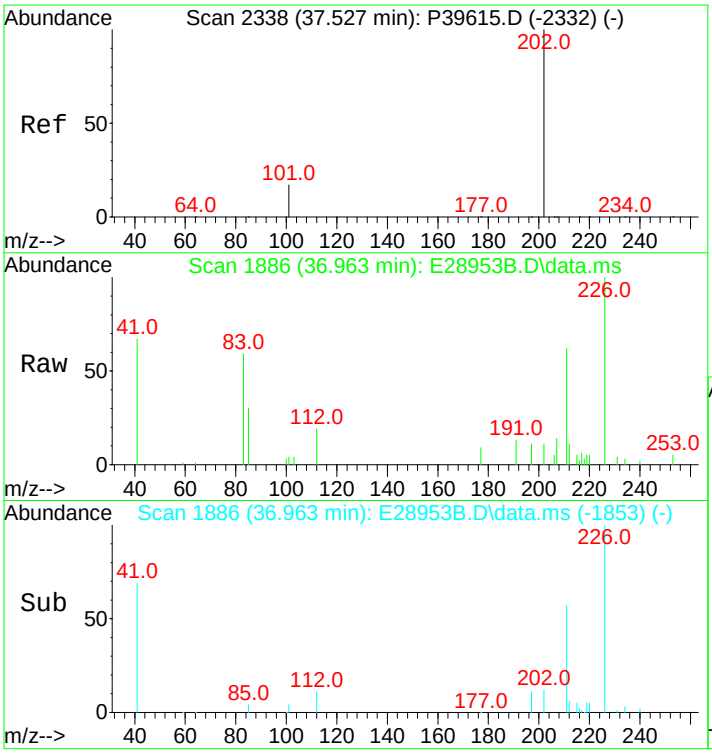


#57
1-Methylphenanthrene
Concen: 730.52 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 54755

Ion	Ratio	Lower	Upper
192	100		
191	53.2	45.4	68.2

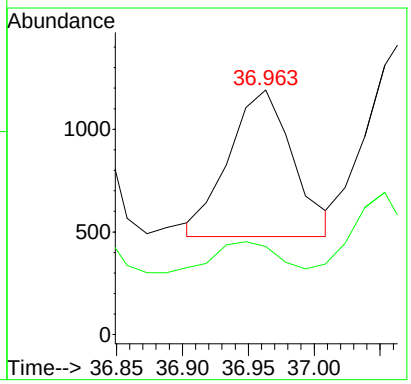


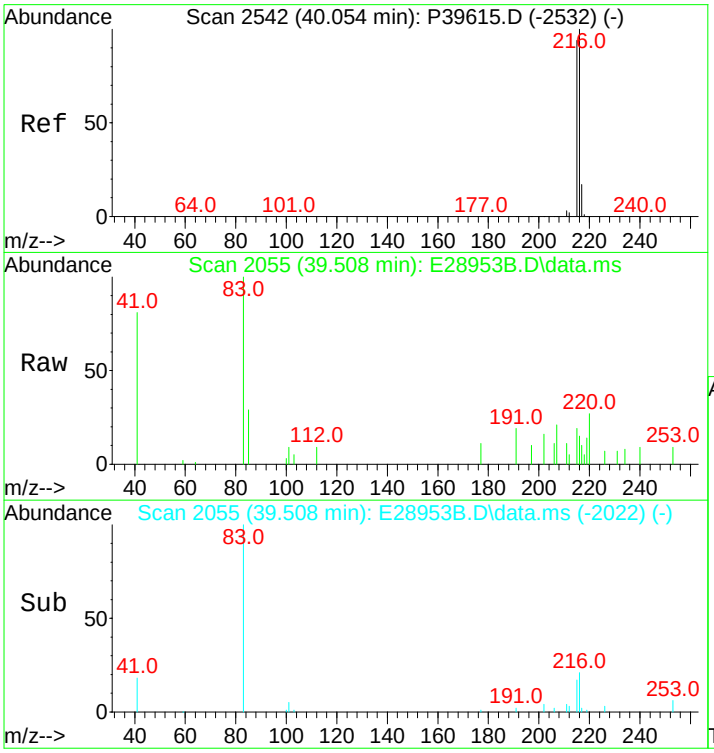


#58
Fluoranthene
Concen: 22.34 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:202 Resp: 2424

Ion	Ratio	Lower	Upper
202	100		
101	42.8	10.4	15.6#

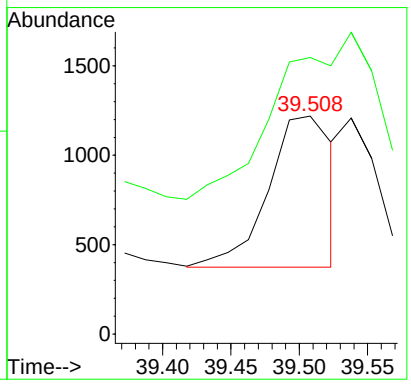


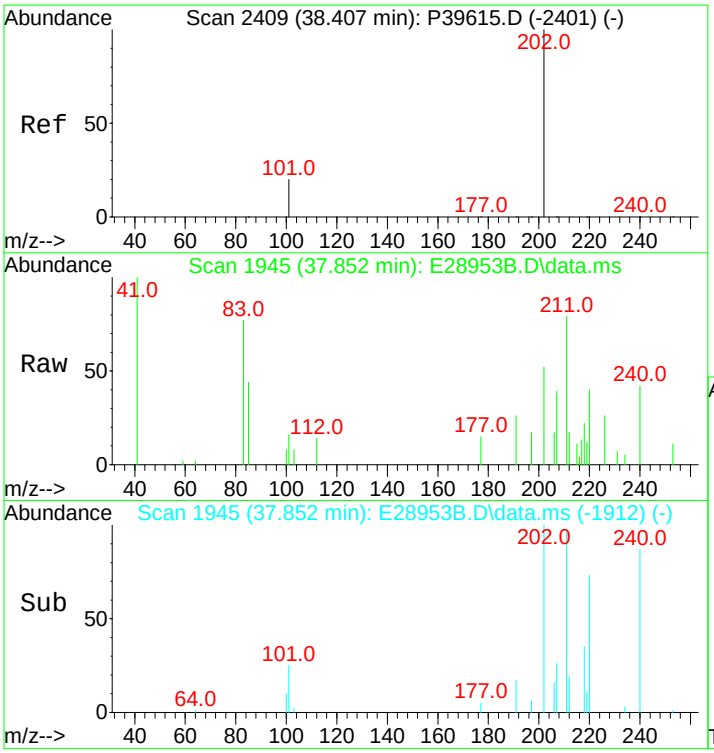


#59
Benzo(b)fluorene
Concen: 38.51 ng/mL m
RT: 39.508 min Scan# 2055
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:216 Resp: 2784

Ion	Ratio	Lower	Upper
216	100		
215	73.9	72.6	109.0

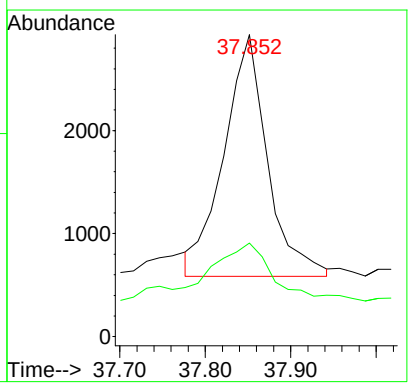


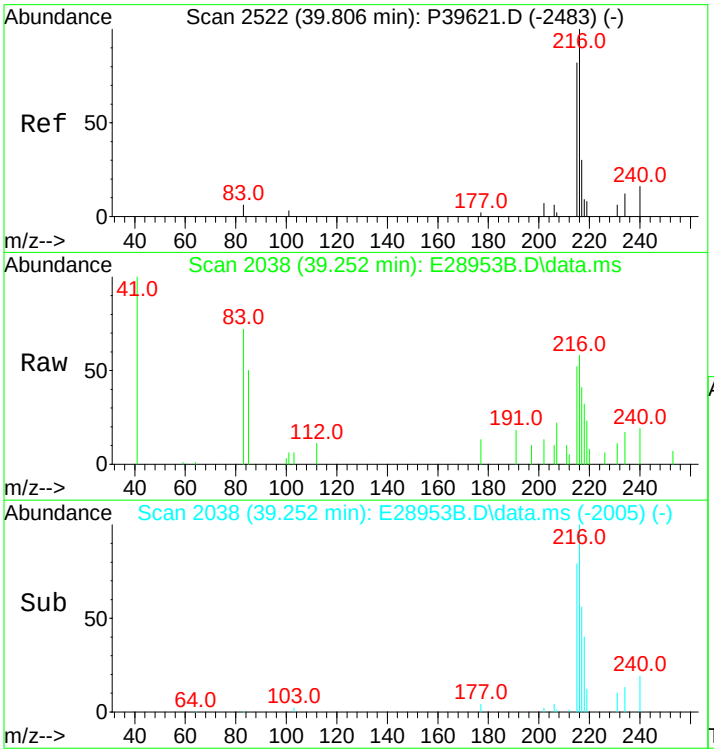


#60
Pyrene
Concen: 75.45 ng/mL m
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:202 Resp: 8320

Ion	Ratio	Lower	Upper
202	100		
101	33.8	11.0	16.4#

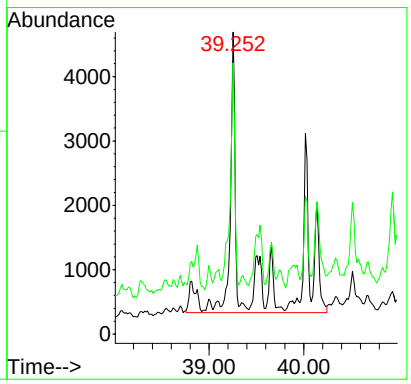


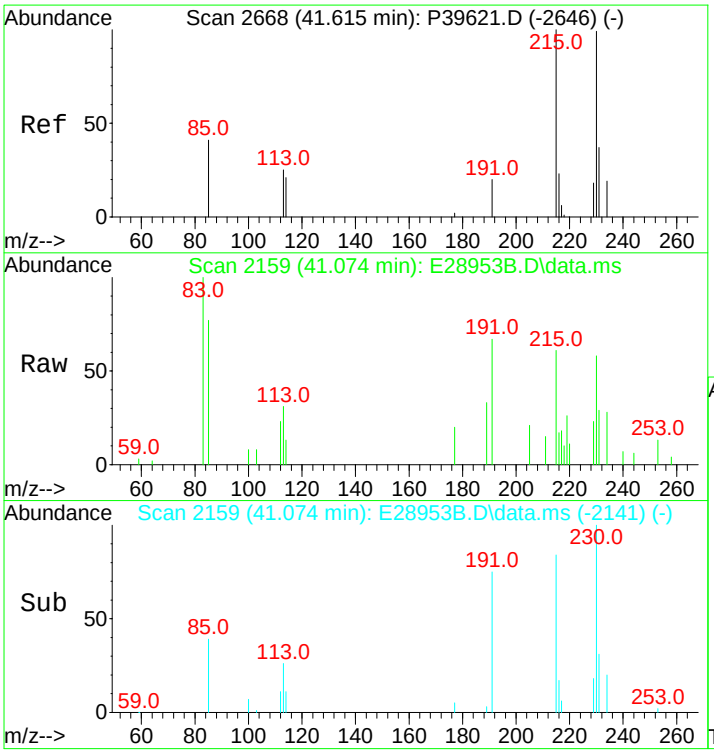


#61
C1-Fluoranthenes/Pyrenes
Concen: 374.66 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:216 Resp: 41317

Ion	Ratio	Lower	Upper
216	100		
215	28.7	73.4	110.2#

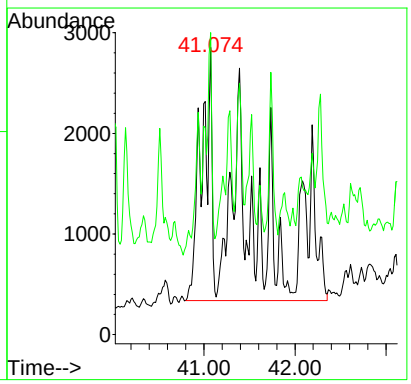


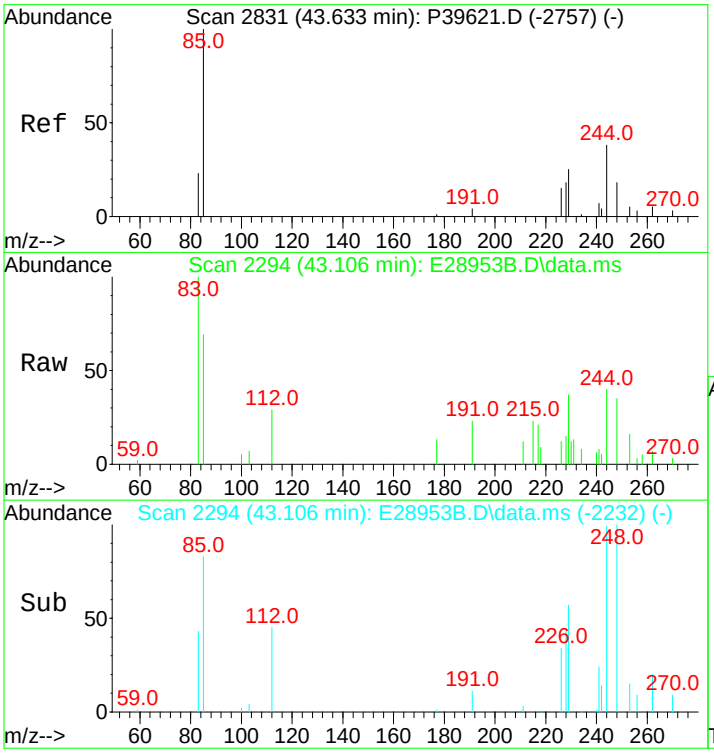


#62
C2-Fluoranthenes/Pyrenes
Concen: 617.92 ng/mL m
RT: 41.074 min Scan# 2159
Delta R.T. 0.194 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:230 Resp: 68144

Ion	Ratio	Lower	Upper
230	100		
215	7.0	93.8	140.8#

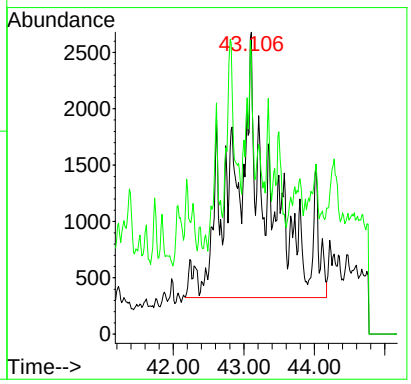


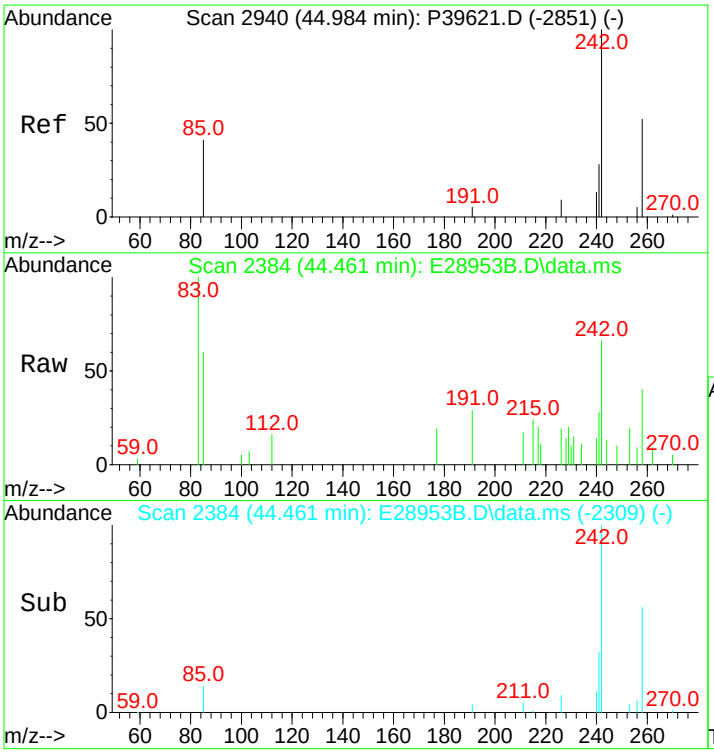


#63
C3-Fluoranthenes/Pyrenes
Concen: 765.70 ng/mL m
RT: 43.106 min Scan# 2294
Delta R.T. 0.455 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:244 Resp: 84441

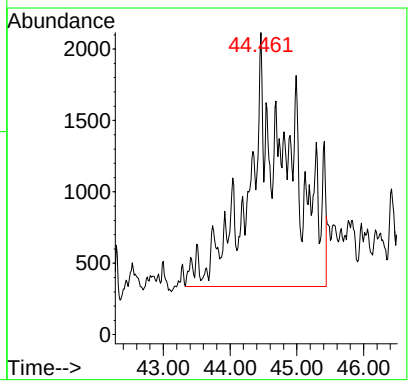
Ion	Ratio	Lower	Upper
244	100		
229	7.8	72.2	108.2#

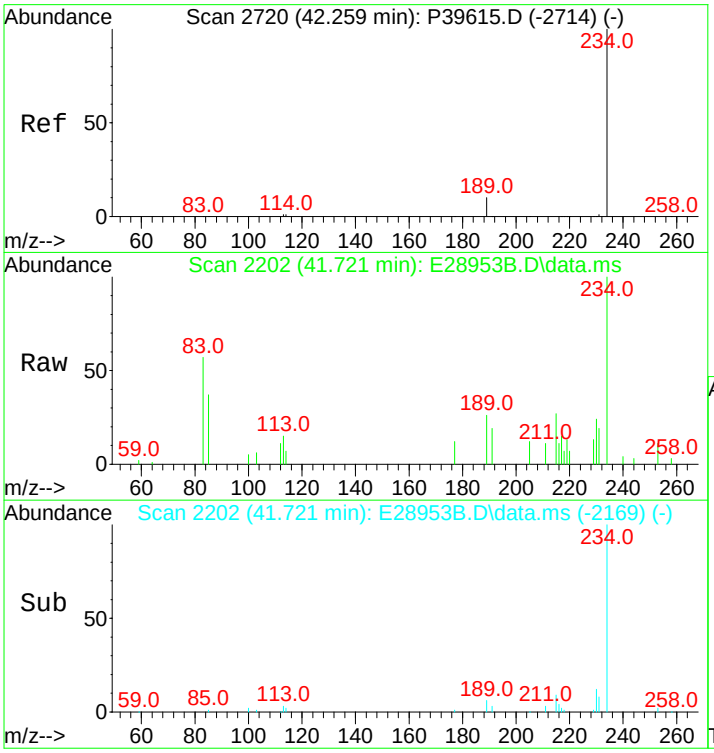




#64
C4-Fluoranthenes/Pyrenes
Concen: 693.20 ng/mL m
RT: 44.461 min Scan# 2384
Delta R.T. 0.491 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:258 Resp: 76445

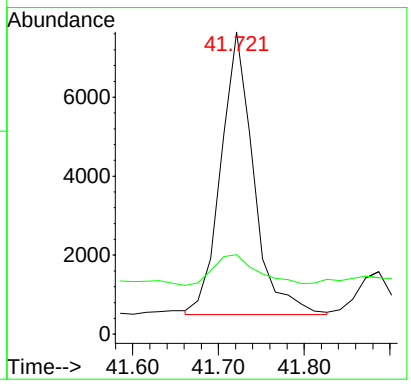


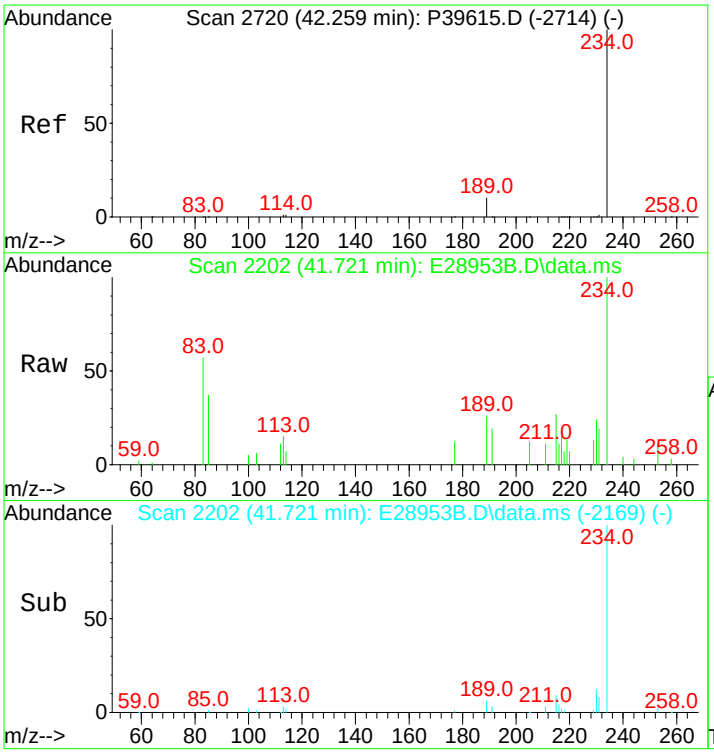


#66
Naphthobenzothiophene
Concen: 174.17 ng/ml m
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 18944

Ion	Ratio	Lower	Upper
234	100		
189	4.2	21.1	31.7#

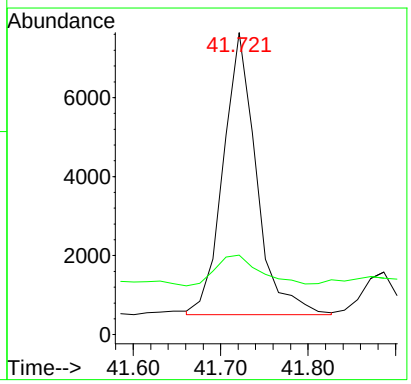


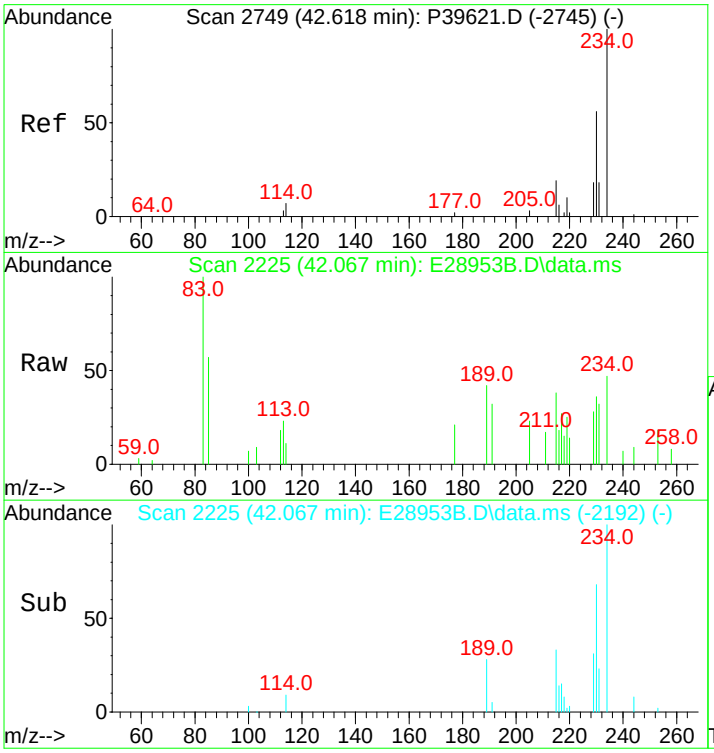


#67
Naphthobenzothiophene-2,1-D
Concen: 173.25 ng/mL m
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 18844

Ion	Ratio	Lower	Upper
234	100		
189	4.2	21.1	31.7#

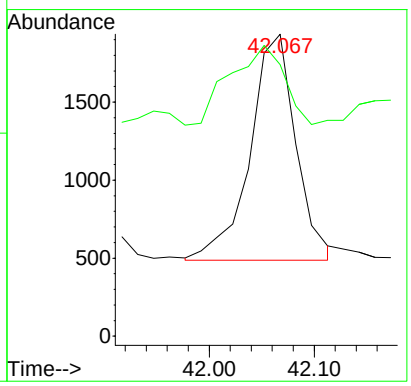


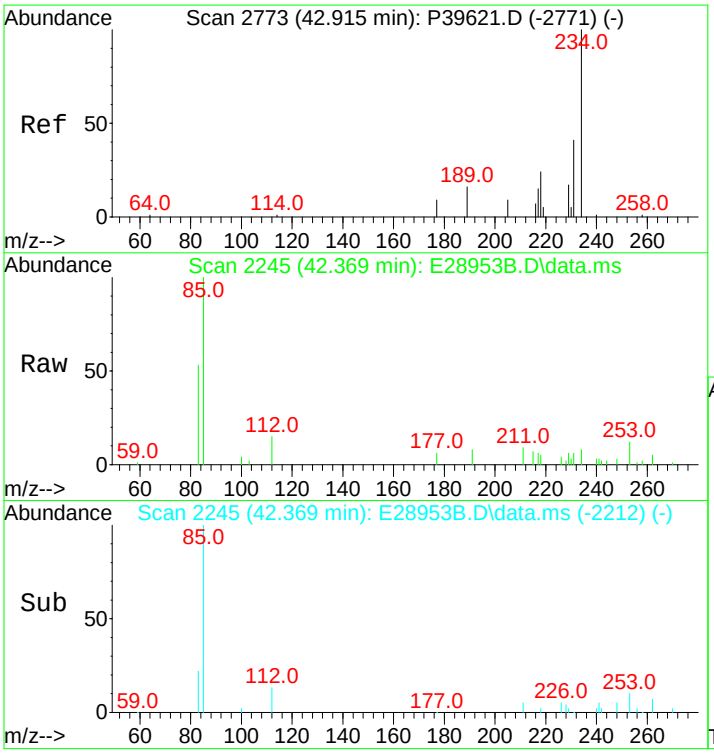


#68
Naphthobenzothiophene-1,2-D
Concen: 40.33 ng/mL m
RT: 42.067 min Scan# 2225
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 4387

Ion	Ratio	Lower	Upper
234	100		
189	40.9	71.9	107.9#

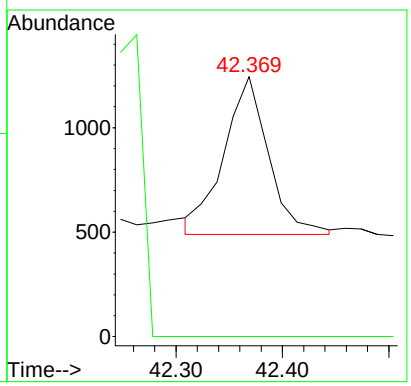


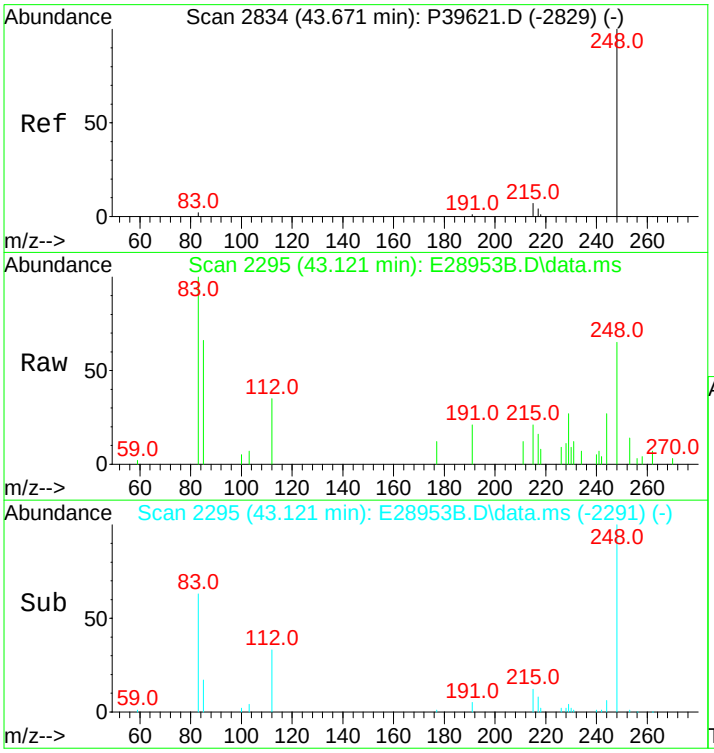


#69
Naphthobenzothiophene-2,3-D
Concen: 20.28 ng/mL m
RT: 42.369 min Scan# 2245
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 2206

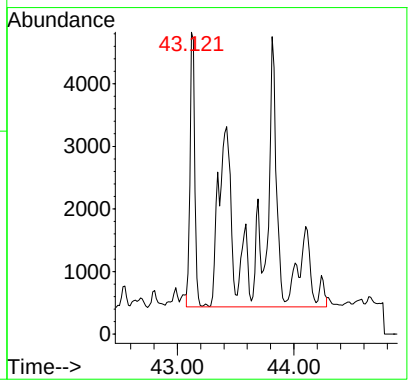
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

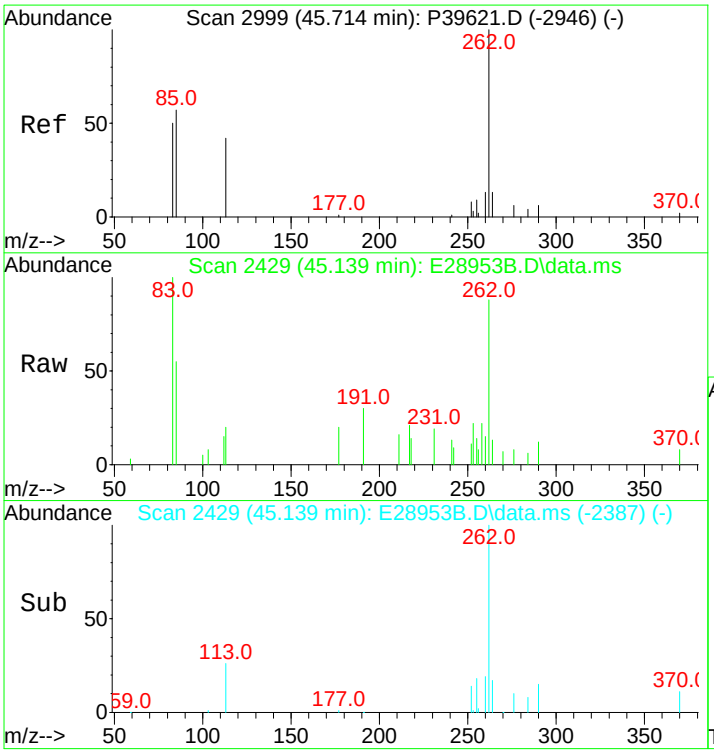




#70
C1-Naphthobenzothiophenes
Concen: 655.92 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

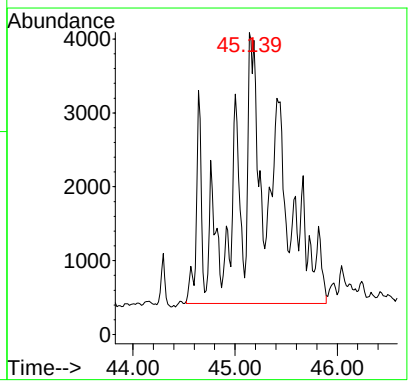
Tgt Ion:248 Resp: 71342

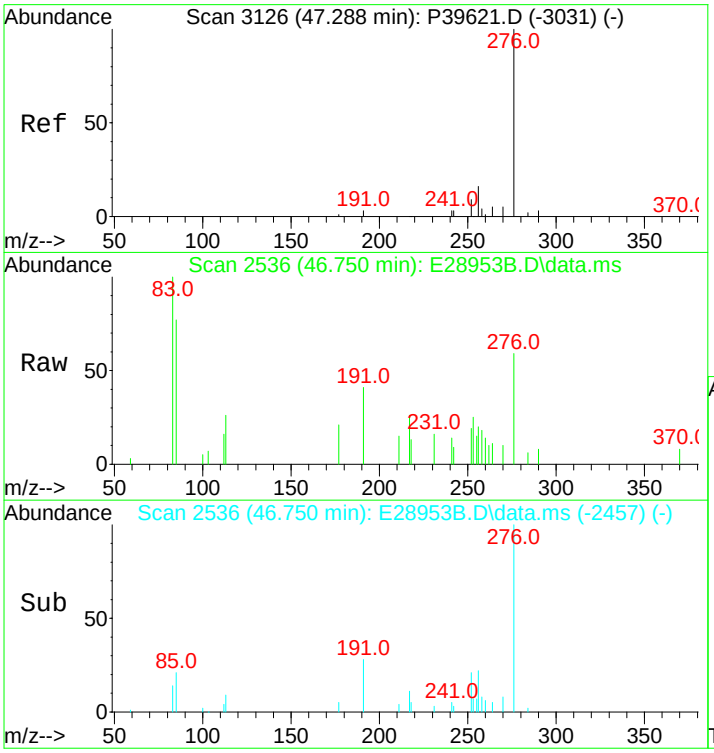




#71
C2-Naphthobenzothiophenes
Concen: 933.11 ng/ml m
RT: 45.139 min Scan# 2429
Delta R.T. 0.494 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

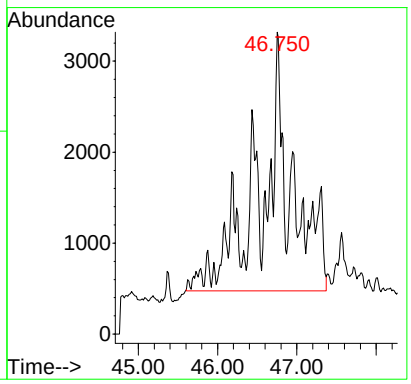
Tgt Ion:262 Resp: 101492

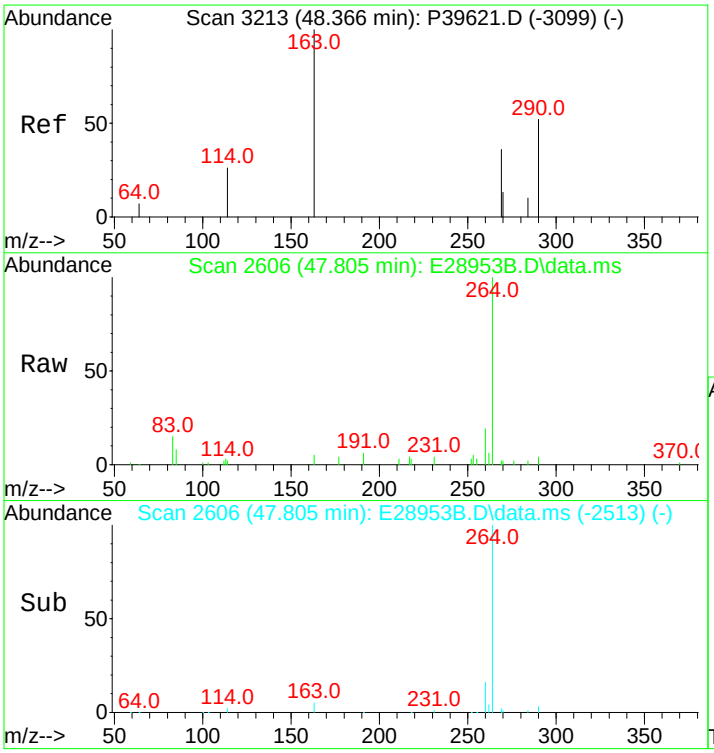




#72
C3-Naphthobenzothiophenes
Concen: 716.45 ng/ml m
RT: 46.750 min Scan# 2536
Delta R.T. 0.523 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

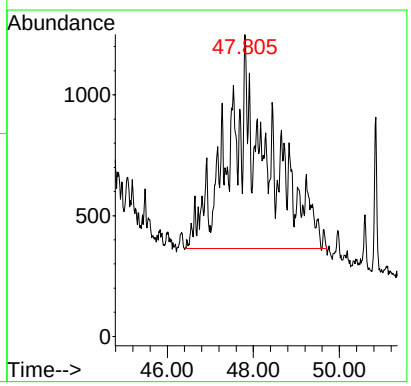
Tgt Ion:276 Resp: 77926

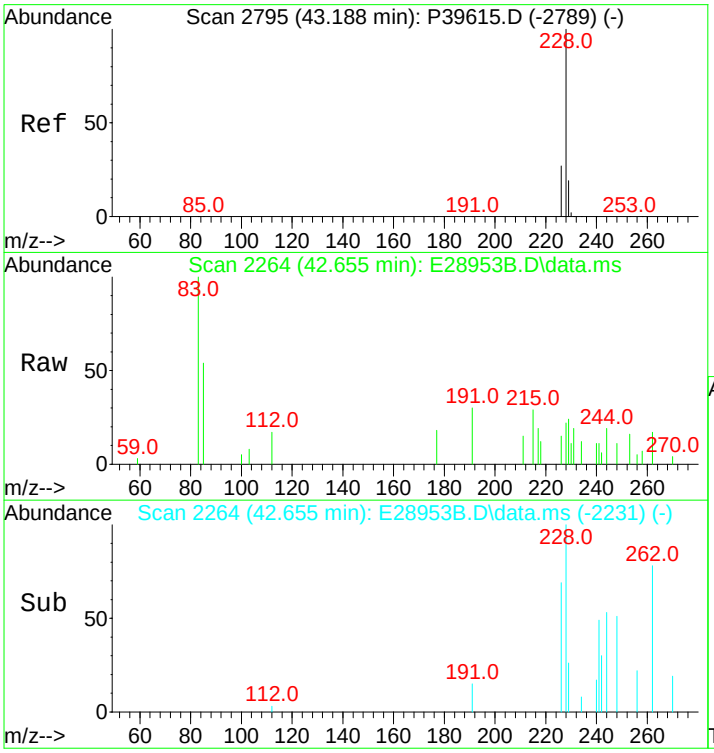




#73
C4-Naphthobenzothiophenes
Concen: 506.57 ng/mL m
RT: 47.805 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:290 Resp: 55098

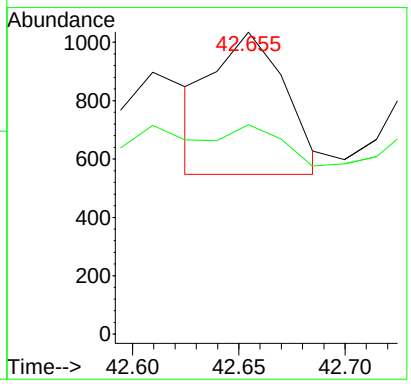


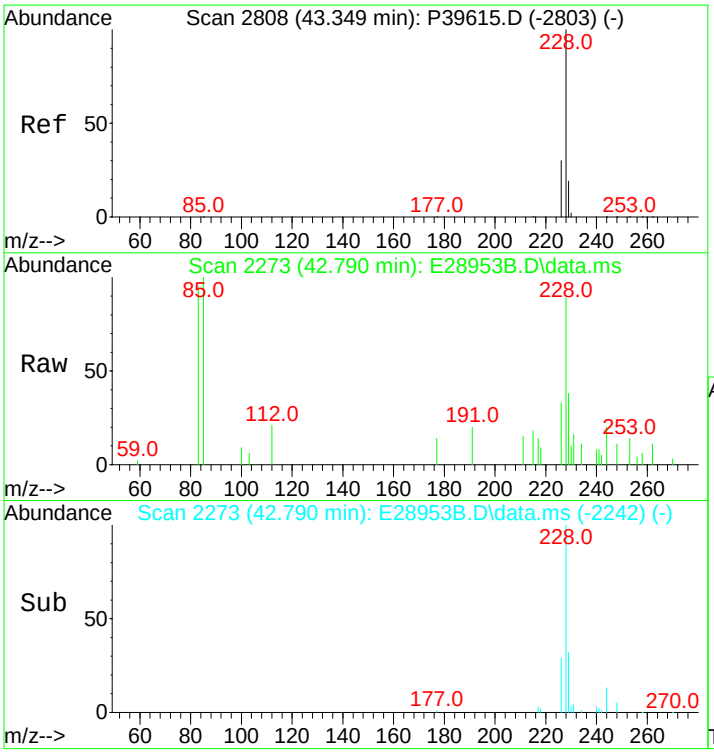


#75
Benz[a]anthracene
Concen: 10.56 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:228 Resp: 1139

Ion	Ratio	Lower	Upper
228	100		
226	588.3	20.7	31.1#

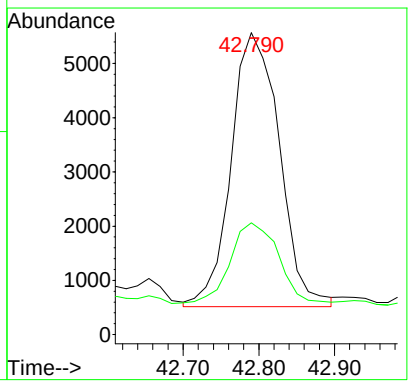


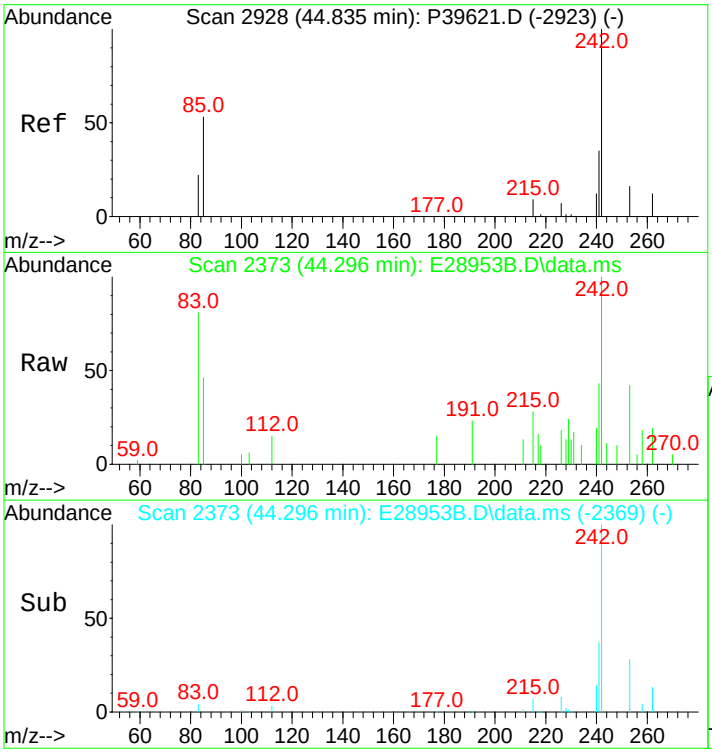


#77
Chrysene/Triphenylene
Concen: 201.86 ng/mL m
RT: 42.790 min Scan# 2273
Delta R.T. -0.030 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:228 Resp: 22405

Ion	Ratio	Lower	Upper
228	100		
226	30.0	22.6	34.0

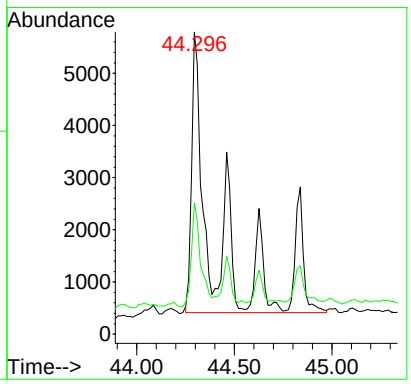


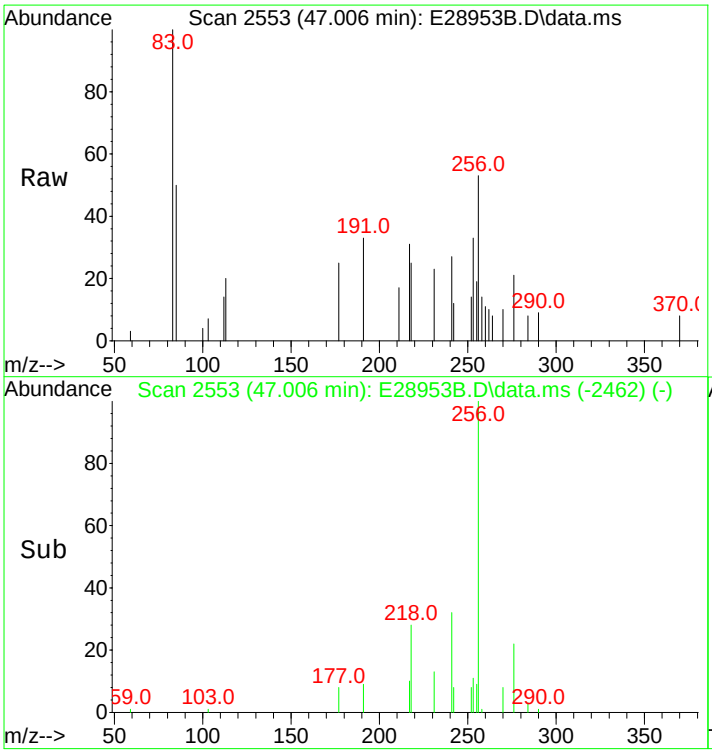


#78
C1-Chrysenes
Concen: 363.41 ng/mL m
RT: 44.296 min Scan# 2373
Delta R.T. 0.011 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:242 Resp: 40335

Ion	Ratio	Lower	Upper
242	100		
241	12.5	32.2	48.4#

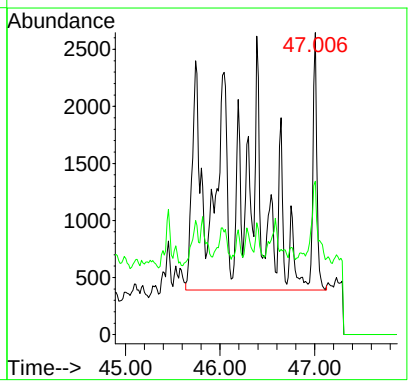


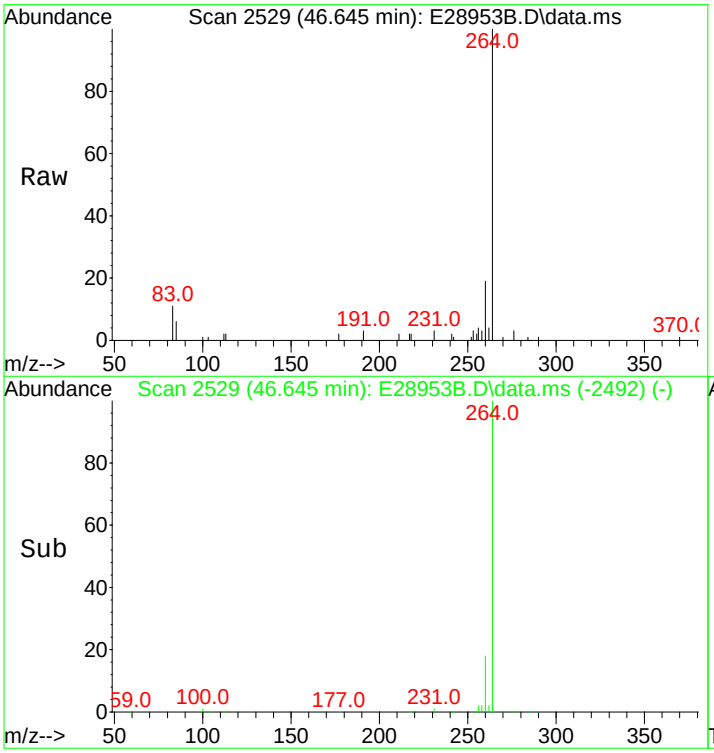


#79
C2-Chrysenes
Concen: 552.76 ng/mL m
RT: 47.006 min Scan# 2553
Delta R.T. 0.663 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:256 Resp: 61351

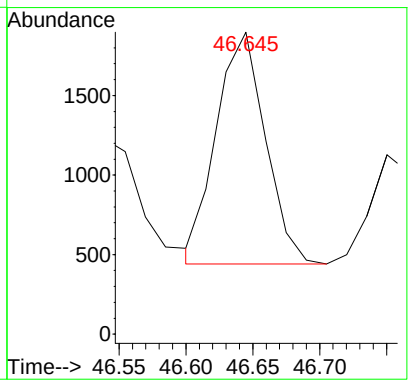
Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

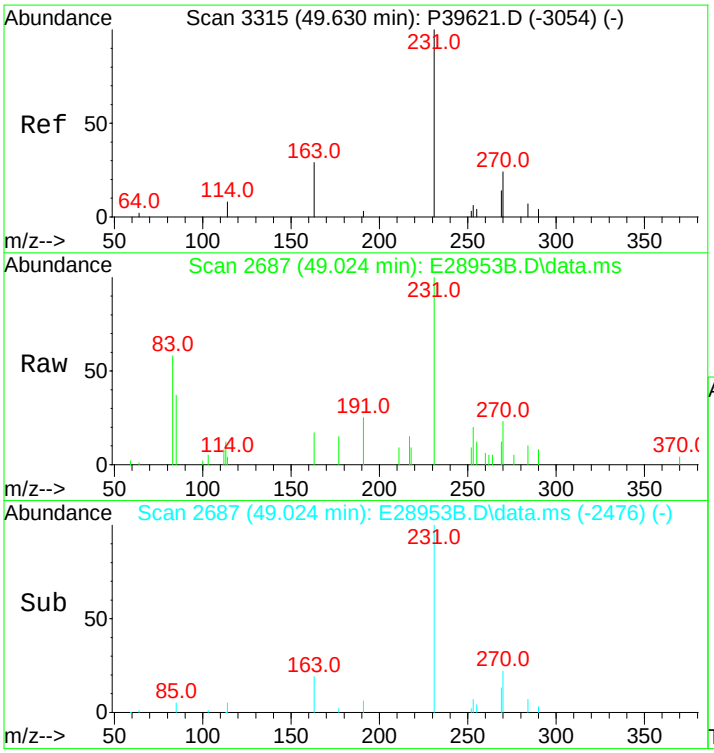




#80
BBF-D12 Surr BKGD
Concen: 33.62 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:256 Resp: 3732

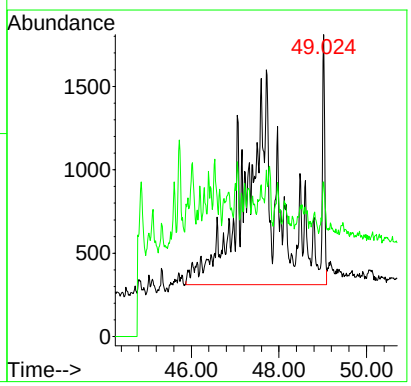


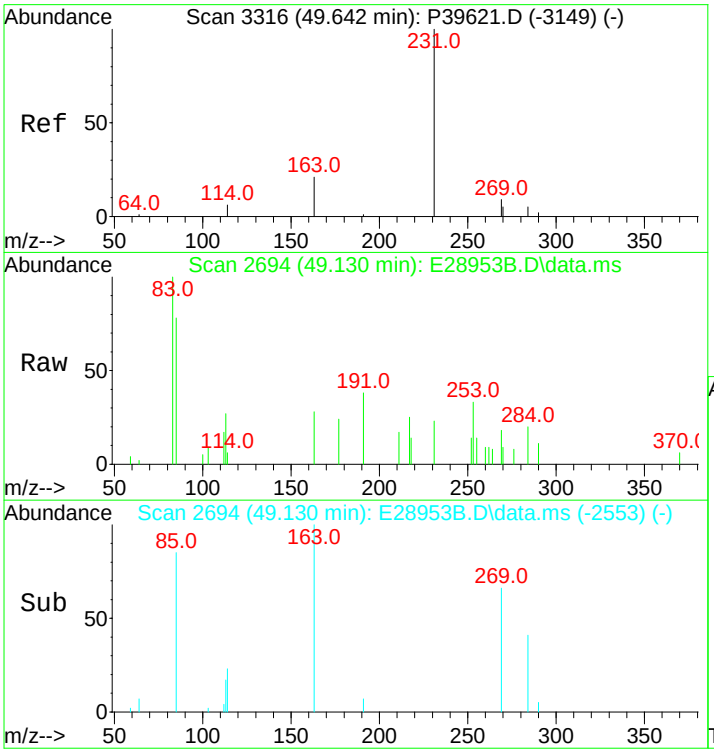


#81
C3-Chrysenes
Concen: 636.94 ng/mL m
RT: 49.024 min Scan# 2687
Delta R.T. -0.044 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:270 Resp: 70695

Ion	Ratio	Lower	Upper
270	100		
255	1.1	38.0	57.0#

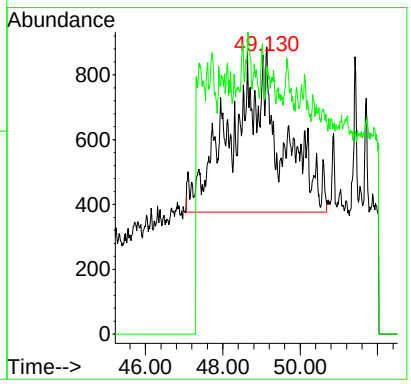


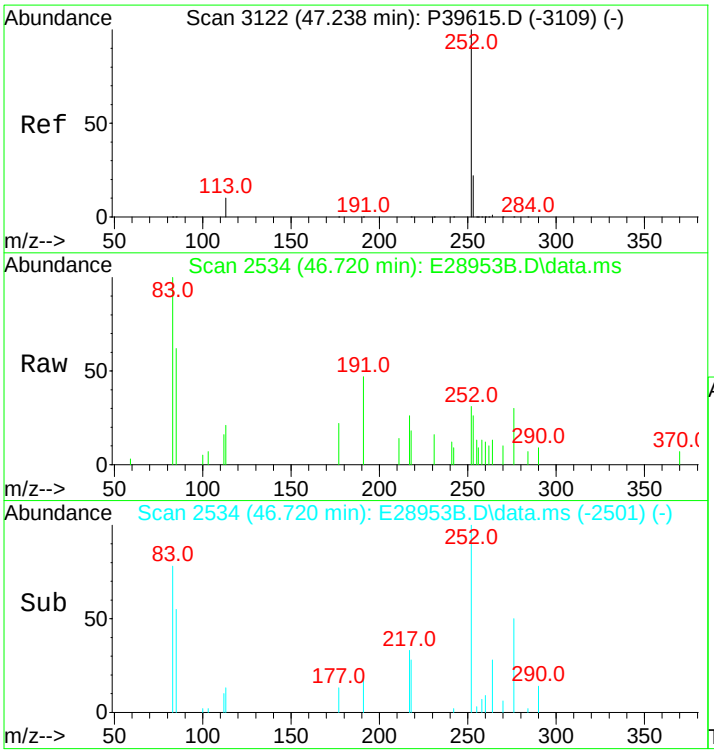


#82
C4-Chrysenes
Concen: 397.79 ng/mL m
RT: 49.130 min Scan# 2694
Delta R.T. -0.056 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:284 Resp: 44151

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

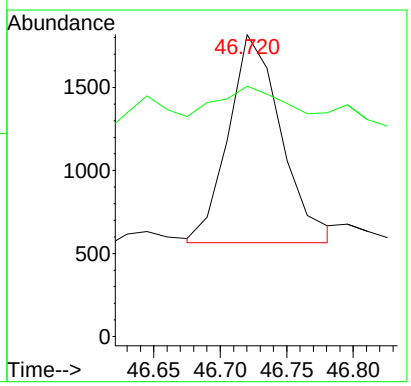


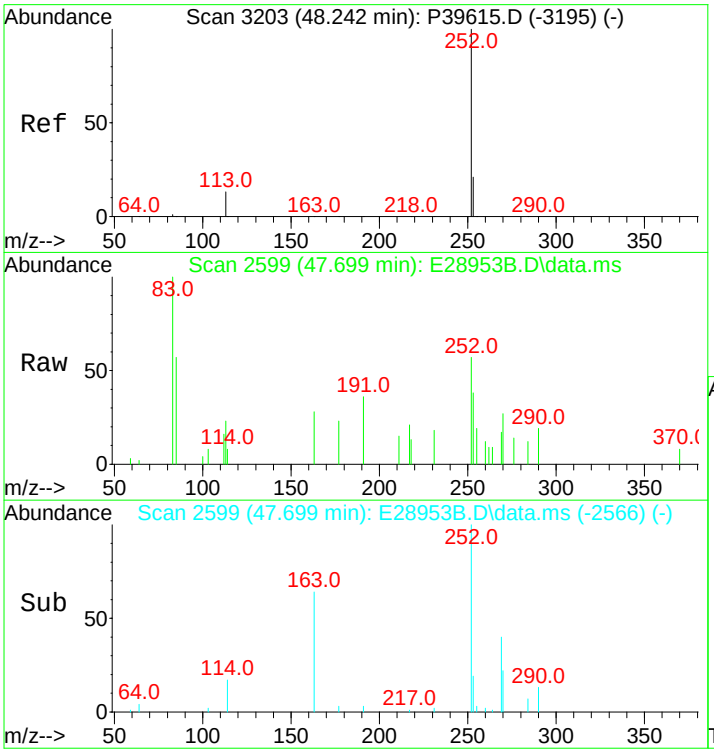


#84
Benzo[b]fluoranthene
Concen: 27.66 ng/mL m
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 3466

Ion	Ratio	Lower	Upper
252	100		
253	31.3	19.5	29.3#

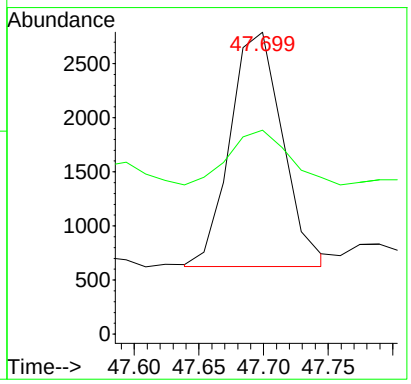


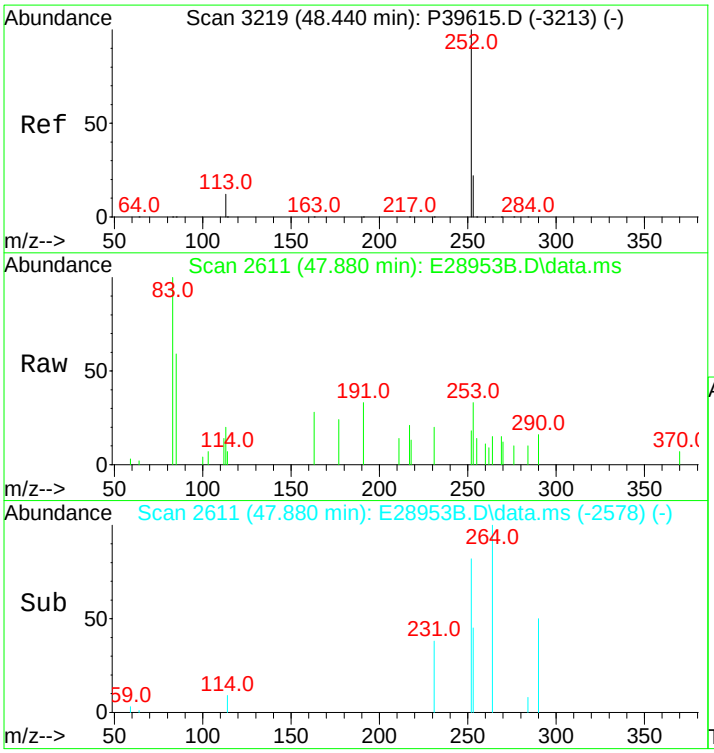


#87
Benzo[e]pyrene
Concen: 49.99 ng/mL m
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 6116

Ion	Ratio	Lower	Upper
252	100		
253	26.4	20.6	31.0

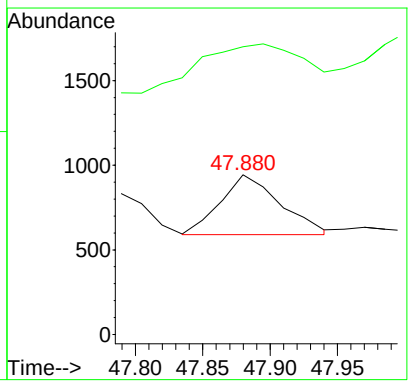


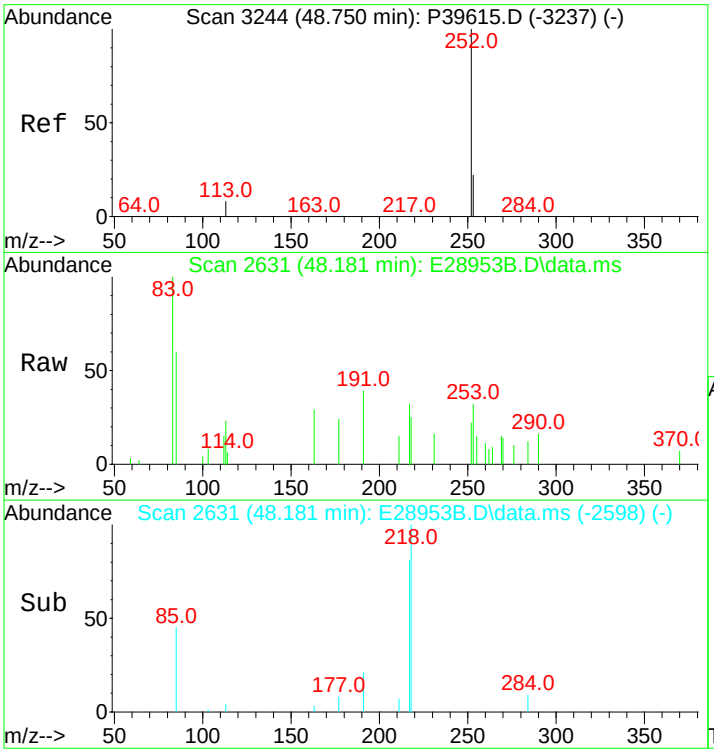


#89
Benzo[a]pyrene
Concen: 9.36 ng/mL m
RT: 47.880 min Scan# 2611
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 1096

Ion	Ratio	Lower	Upper
252	100		
253	153.0	20.8	31.2#

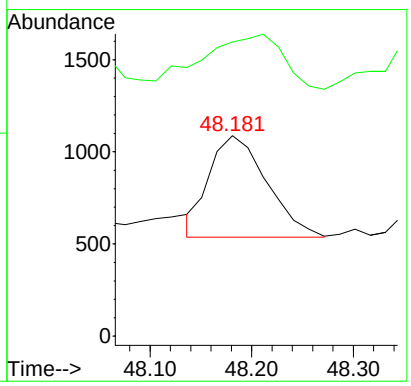


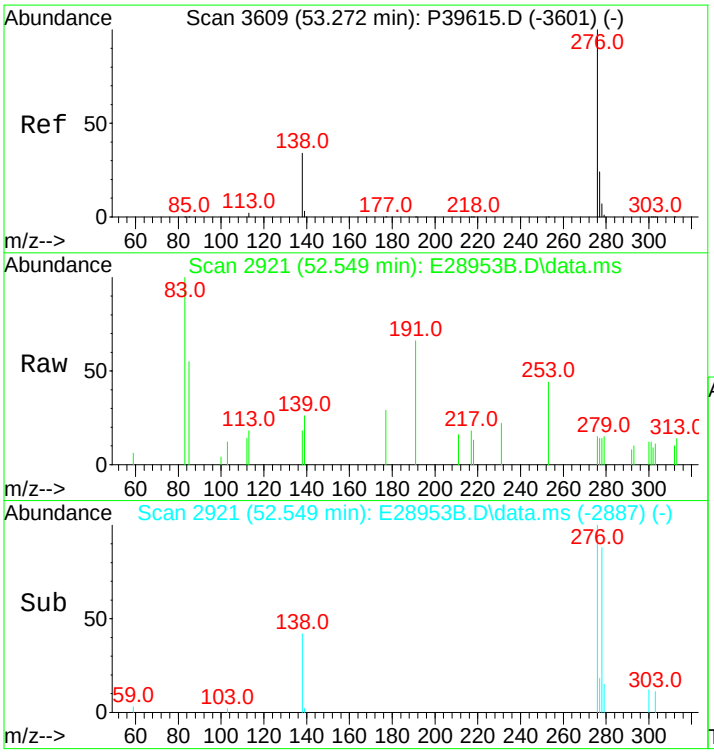


#90
Perylene
Concen: 17.45 ng/mL m
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 2160

Ion	Ratio	Lower	Upper
252	100		
253	0.0	20.7	31.1#

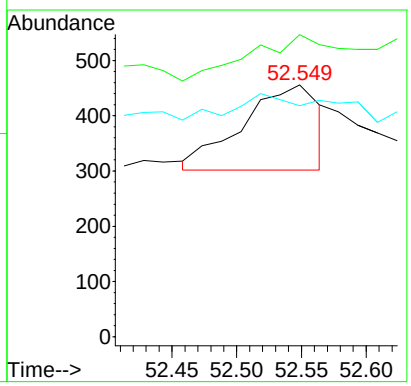


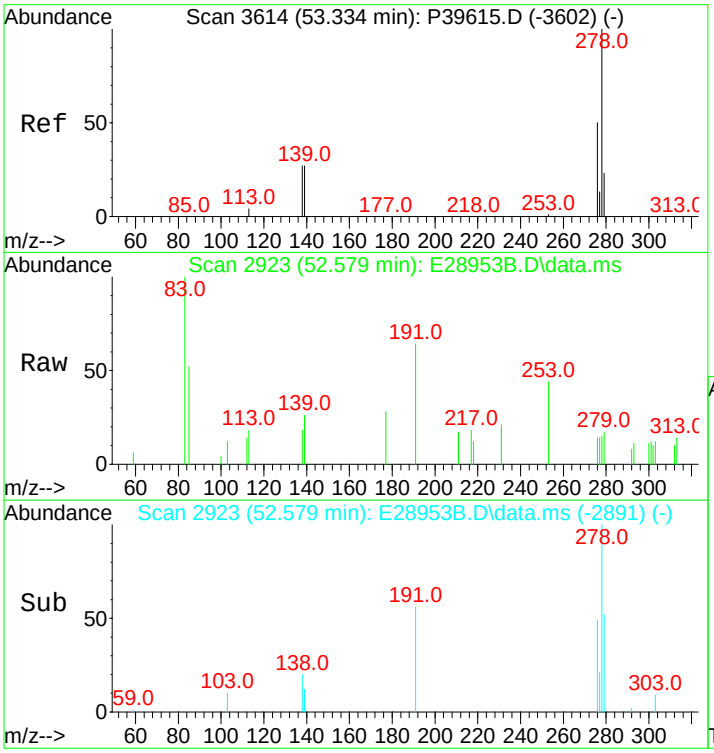


#91
Indeno[1,2,3-cd]pyrene
Concen: 4.59 ng/mL m
RT: 52.549 min Scan# 2921
Delta R.T. 0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:276 Resp: 632

Ion	Ratio	Lower	Upper
276	100		
138	67.6	16.3	24.5#
277	0.0	19.4	29.2#

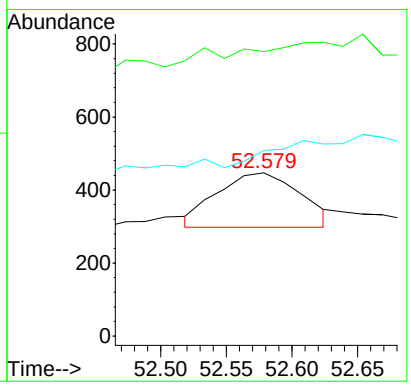


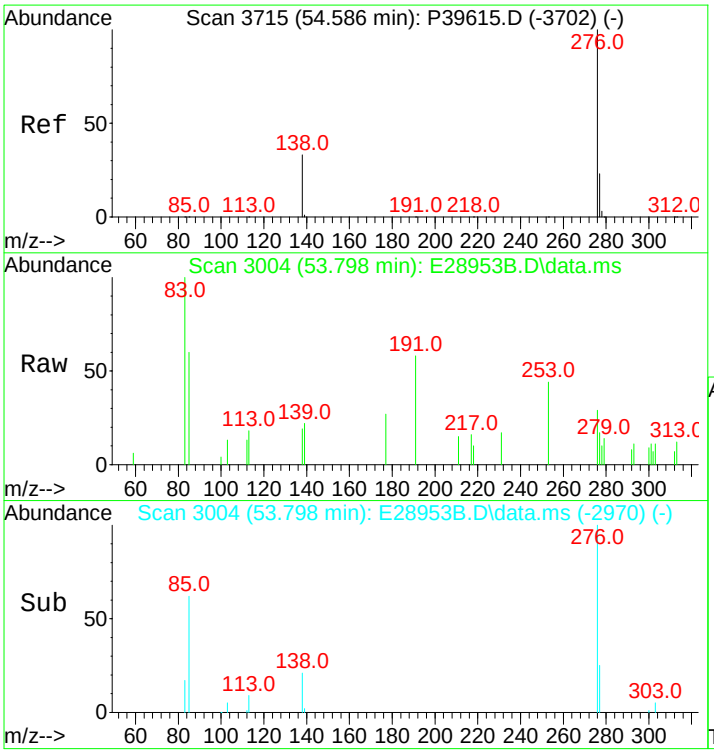


#92
Dibenz[ah]+[ac]anthracene
Concen: 4.49 ng/mL m
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:278 Resp: 659

Ion	Ratio	Lower	Upper
278	100		
139	0.0	11.6	17.4#
279	0.0	19.3	28.9#

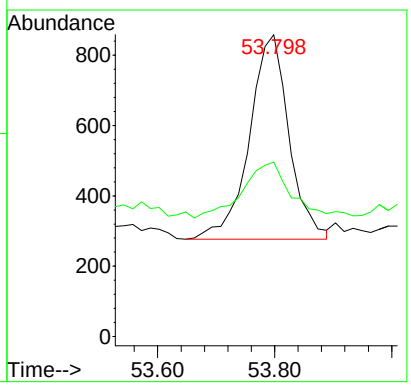


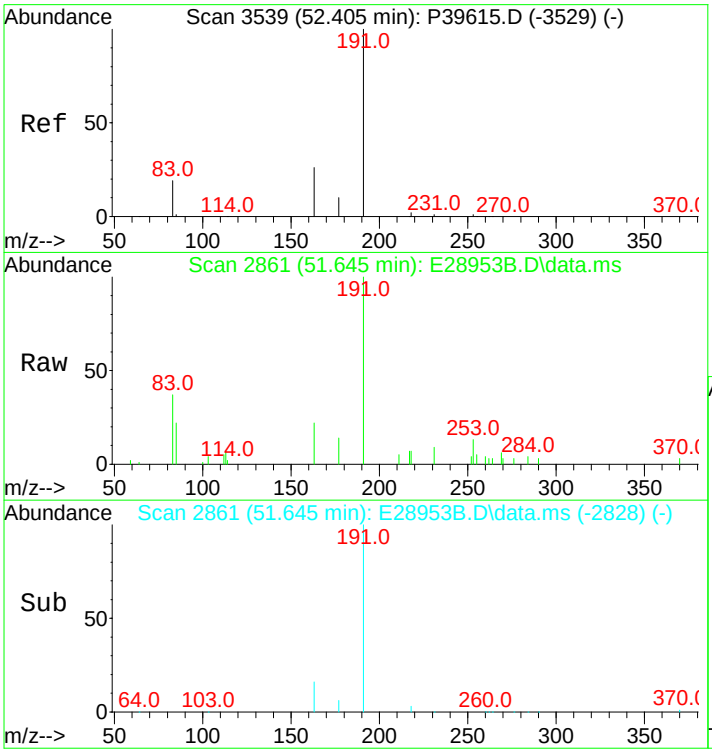


#93
Benzo[g,h,i]perylene
Concen: 18.40 ng/mL
RT: 53.798 min Scan# 3004
Delta R.T. 0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:276 Resp: 2734

Ion	Ratio	Lower	Upper
276	100		
277	35.0	19.1	28.7#

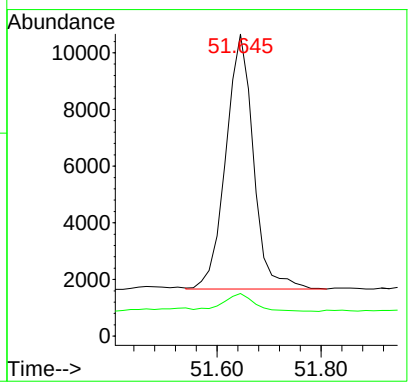


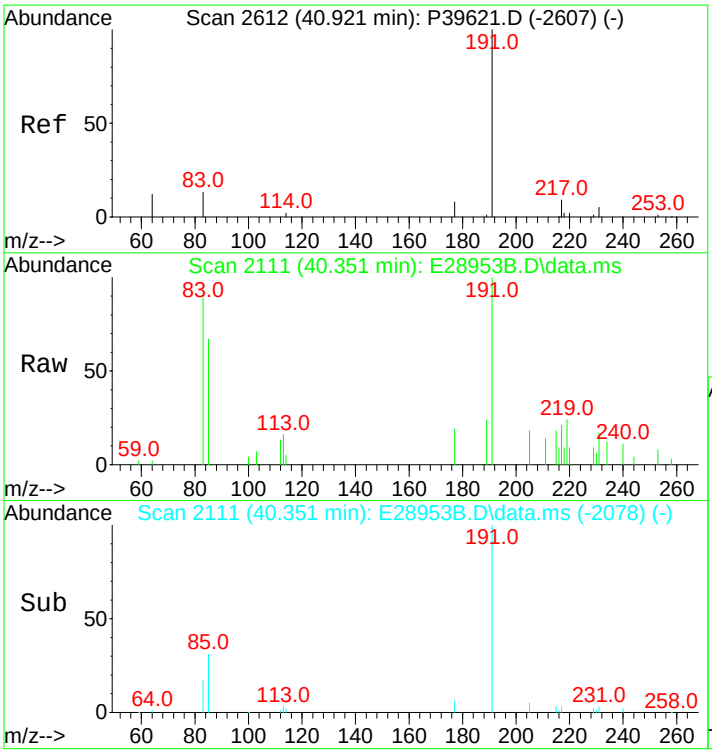


#94
Hopane (T19)
Concen: 800.23 ng/mL
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:191 Resp: 33249

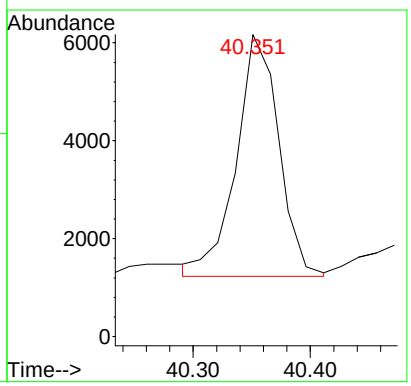
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.6	17.4#

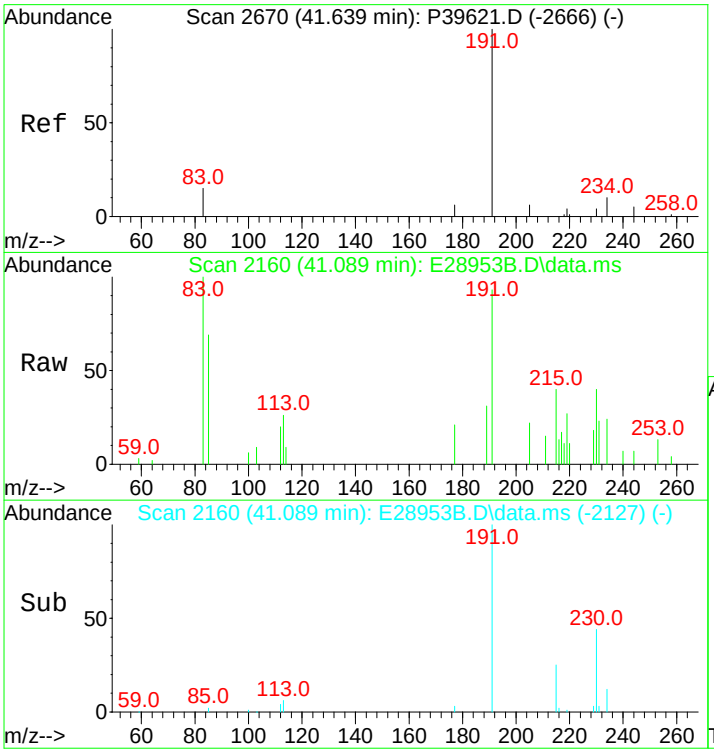




#96
C23 Tricyclic Terpane (T4)
Concen: 300.29 ng/ml m
RT: 40.351 min Scan# 2111
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

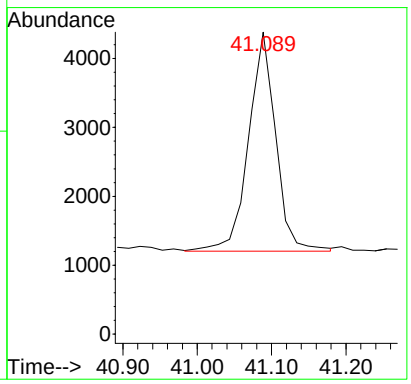
Tgt Ion:191 Resp: 12477

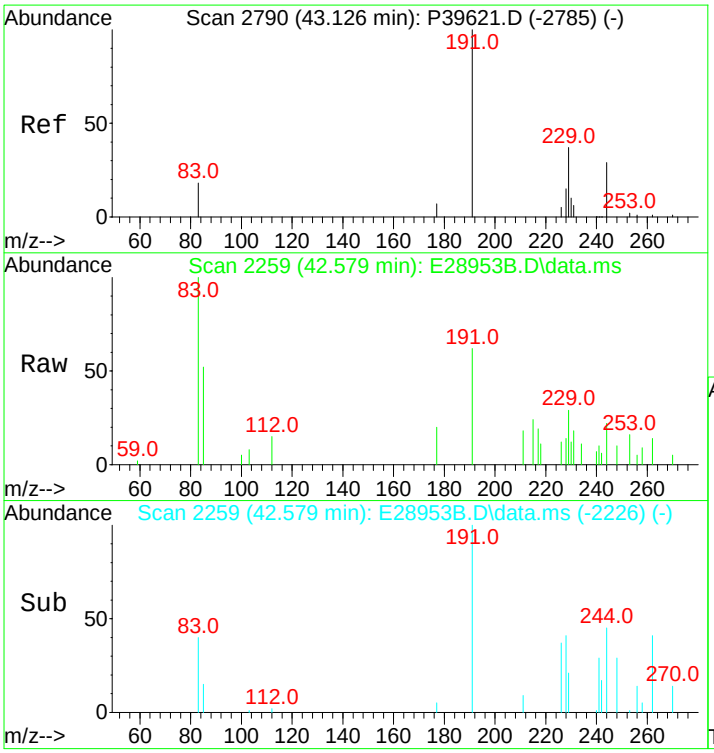




#97
C24 Tricyclic Terpane (T5)
Concen: 193.26 ng/ml m
RT: 41.089 min Scan# 2160
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

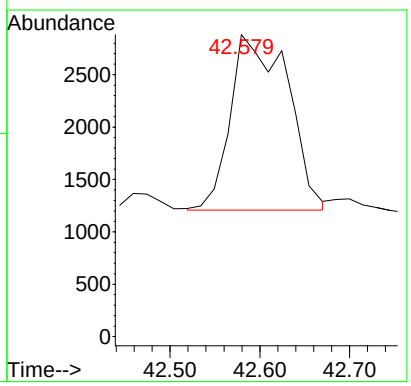
Tgt Ion:191 Resp: 8030

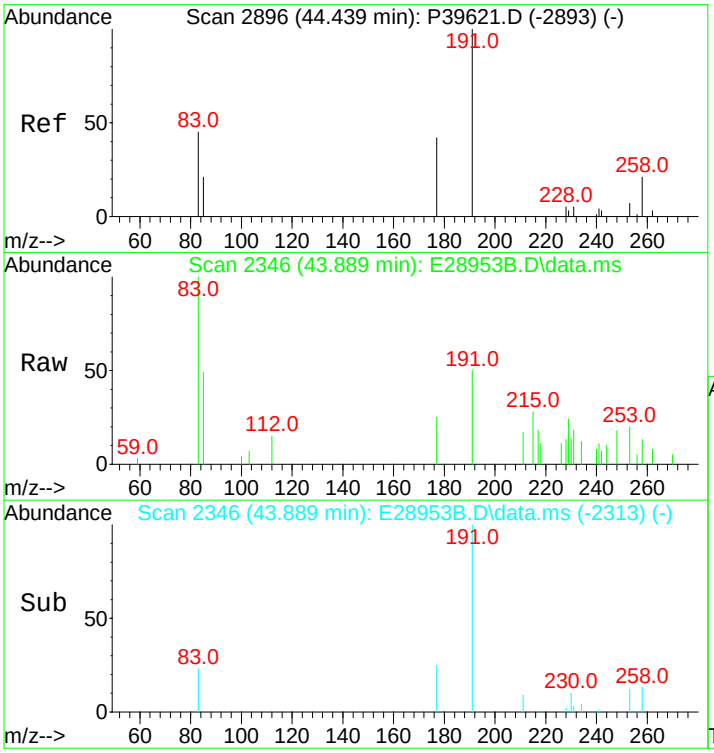




#98
C25 Tricyclic Terpane (T6)
Concen: 179.16 ng/ml m
RT: 42.579 min Scan# 2259
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

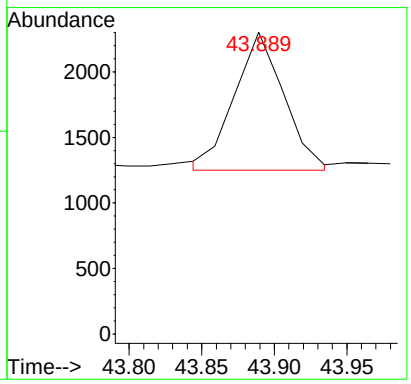
Tgt Ion:191 Resp: 7444

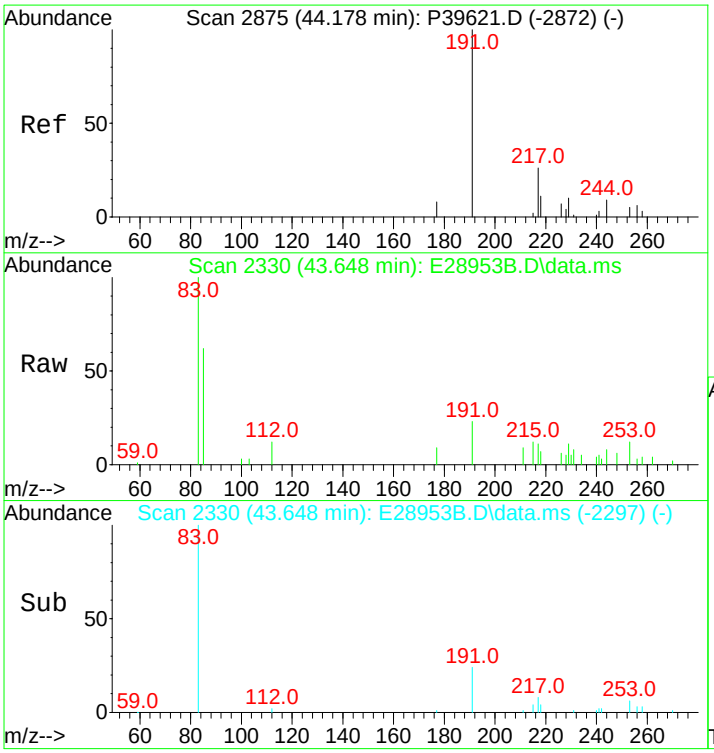




#99
C24 Tetracyclic Terpane (T6a)
Concen: 59.76 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

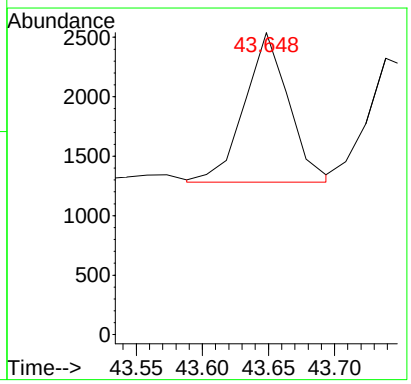
Tgt Ion:191 Resp: 2483

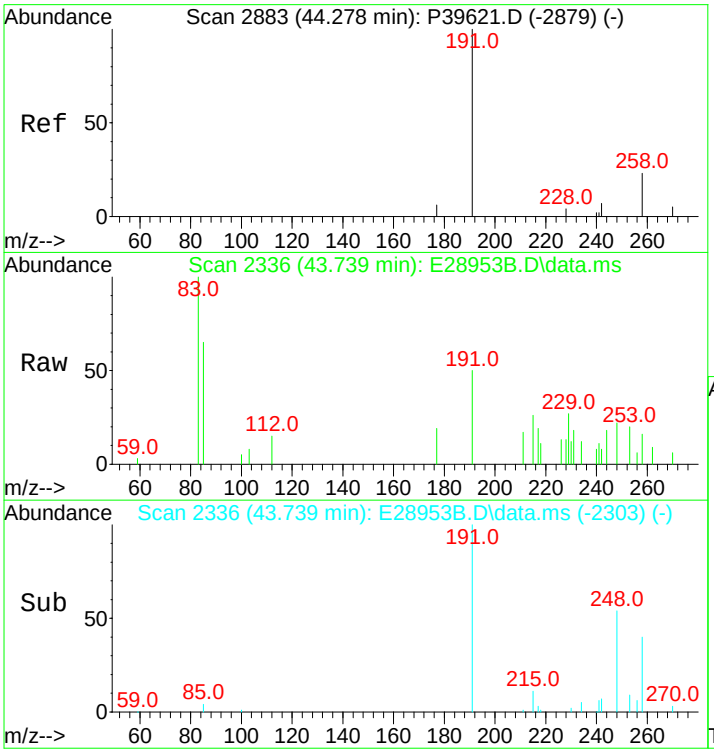




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 69.92 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

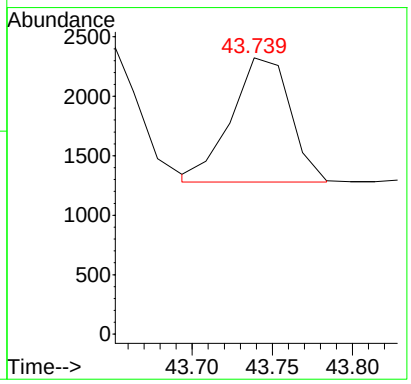
Tgt Ion:191 Resp: 2905

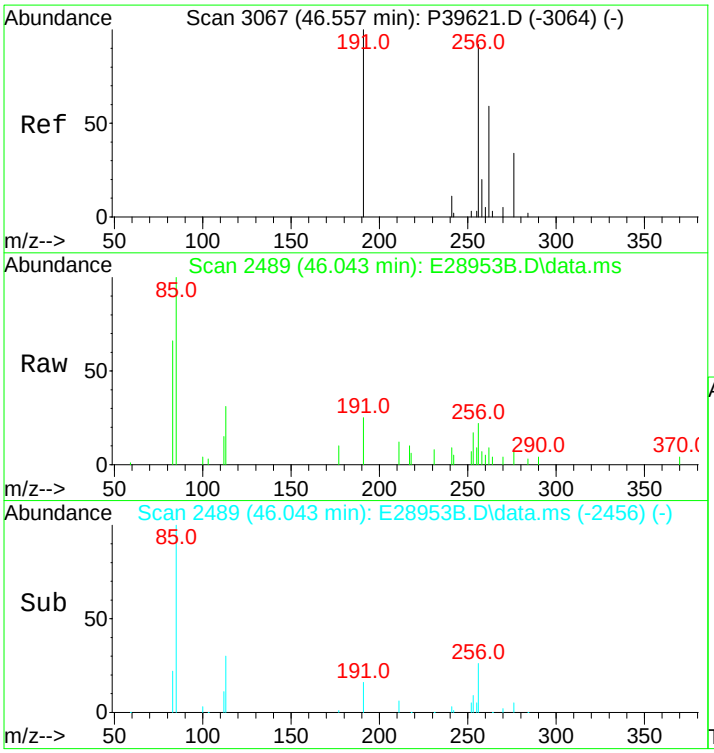




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 64.26 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

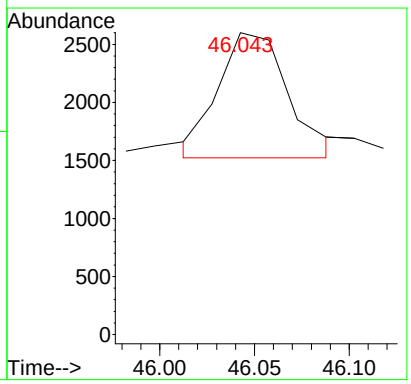
Tgt Ion:191 Resp: 2670

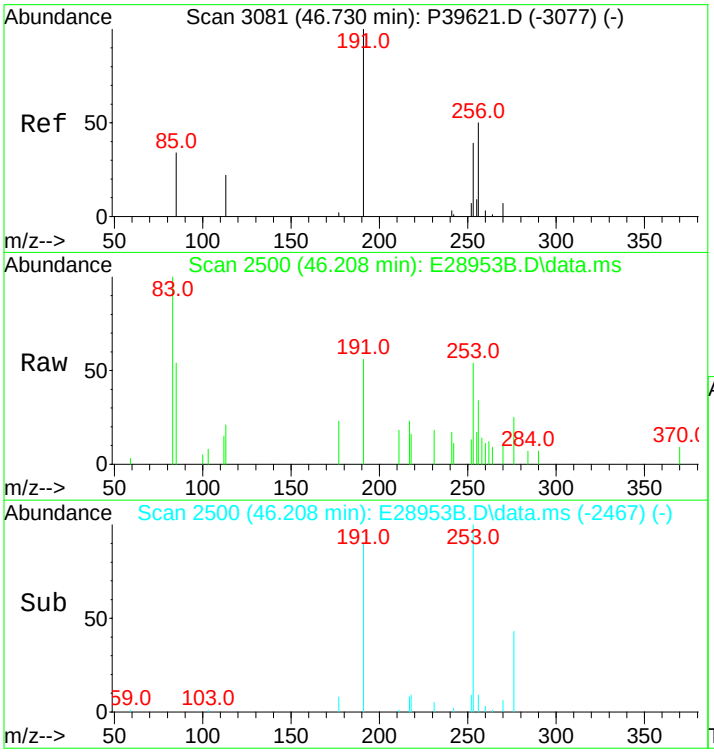




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 66.72 ng/ml m
RT: 46.043 min Scan# 2489
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

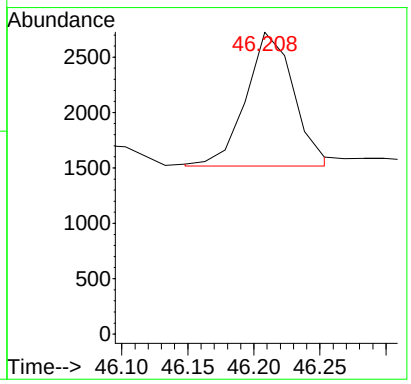
Tgt Ion:191 Resp: 2772

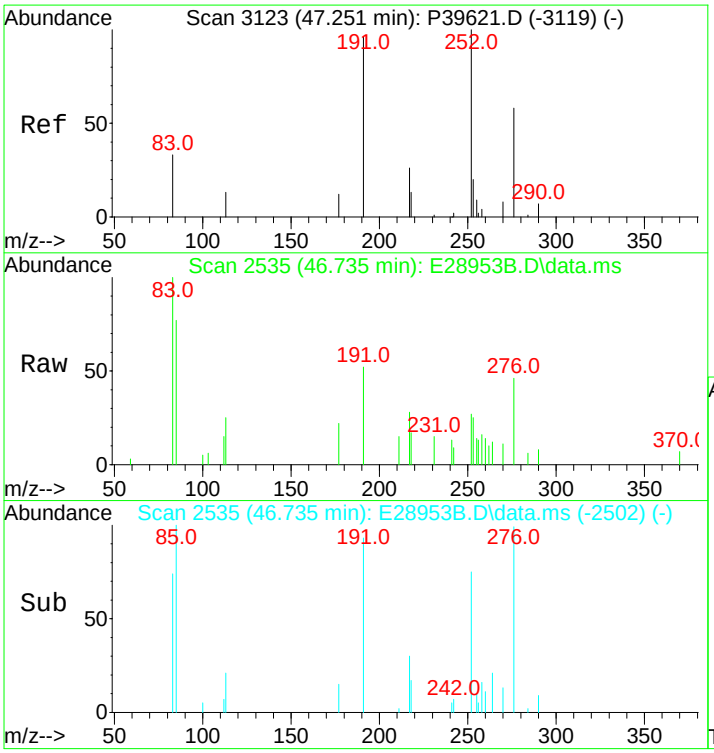




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 73.19 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

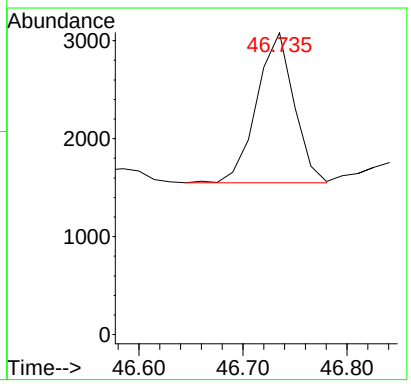
Tgt Ion:191 Resp: 3041

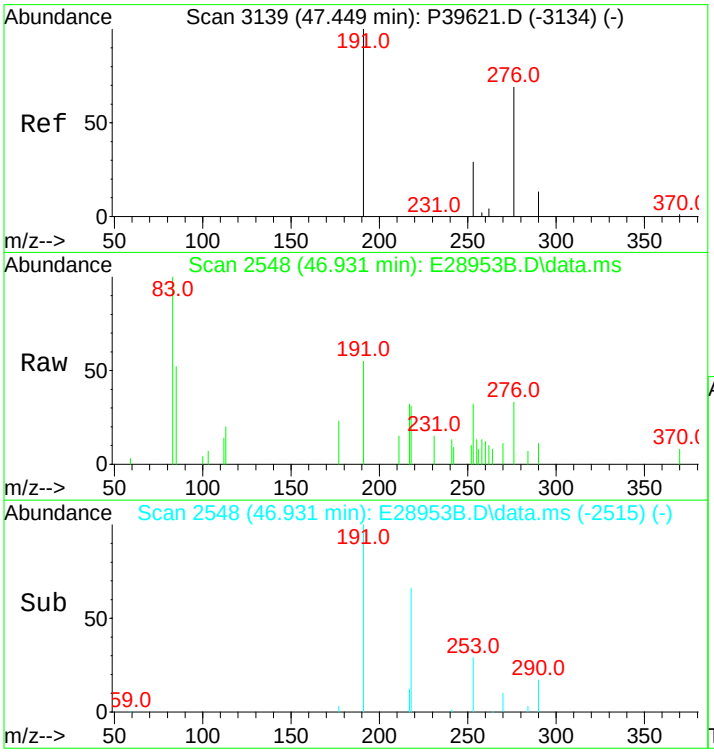




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 92.32 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

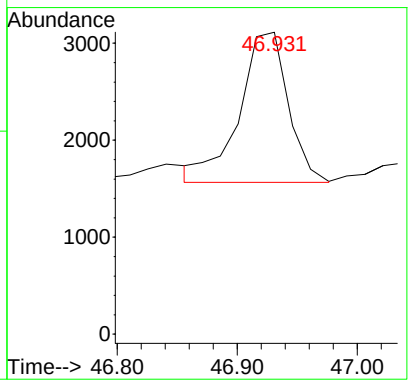
Tgt Ion:191 Resp: 3836

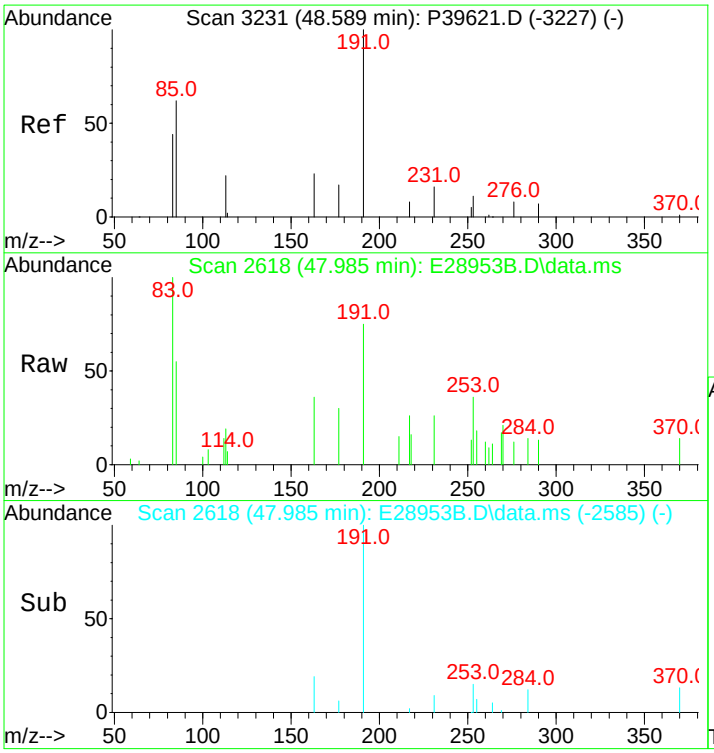




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 105.80 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

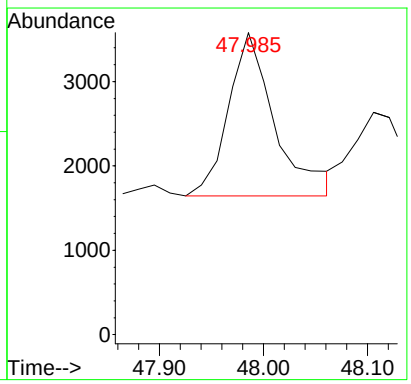
Tgt Ion:191 Resp: 4396

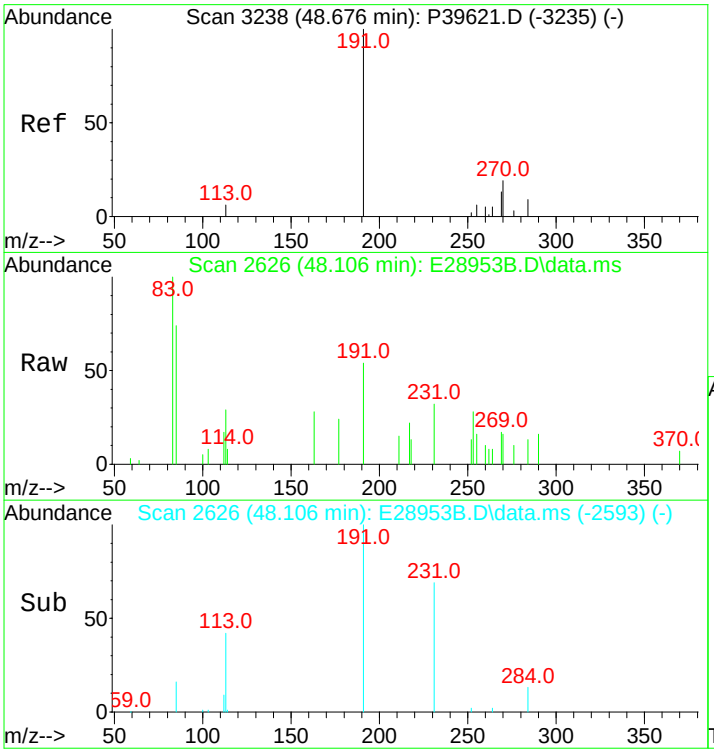




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 145.01 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

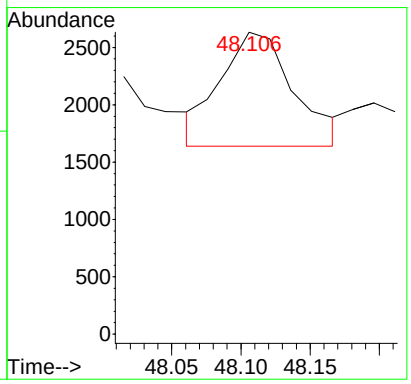
Tgt Ion:191 Resp: 6025

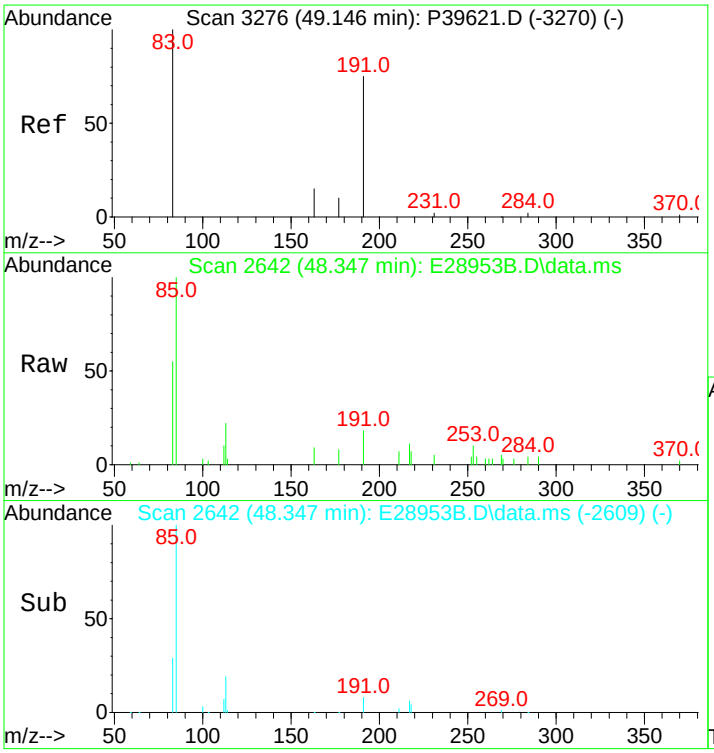




#107
C30 Tricyclic Terpane-22S
Concen: 87.97 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

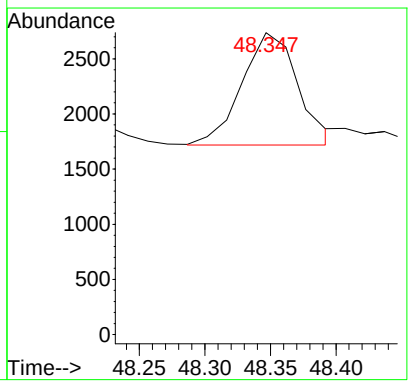
Tgt Ion:191 Resp: 3655

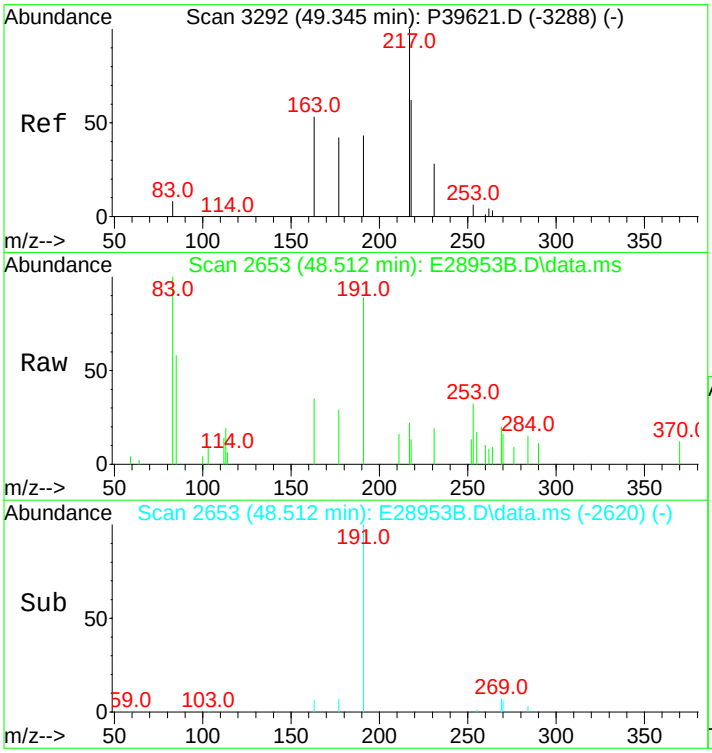




#108
C30 Tricyclic Terpane-22R
Concen: 72.64 ng/mL m
RT: 48.347 min Scan# 2642
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

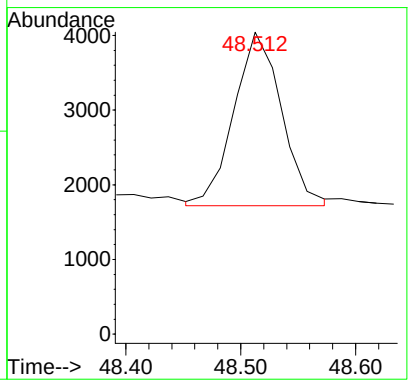
Tgt Ion:191 Resp: 3018

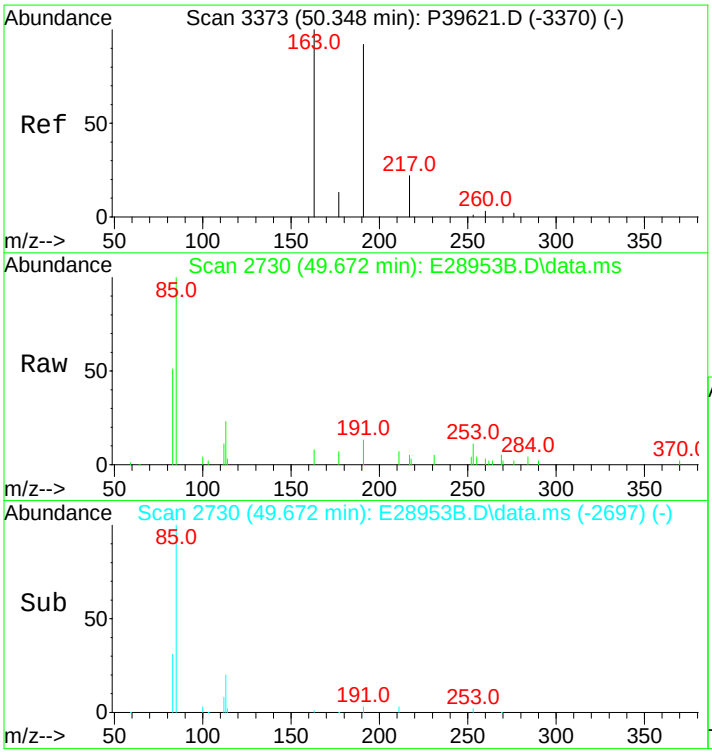




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 160.24 ng/ml m
RT: 48.512 min Scan# 2653
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

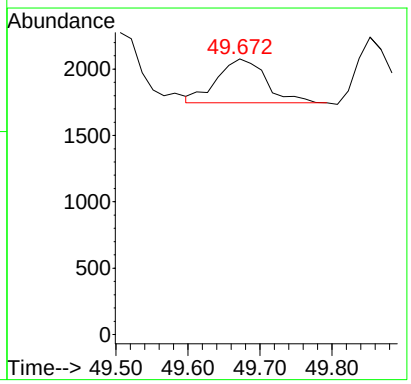
Tgt Ion:191 Resp: 6658

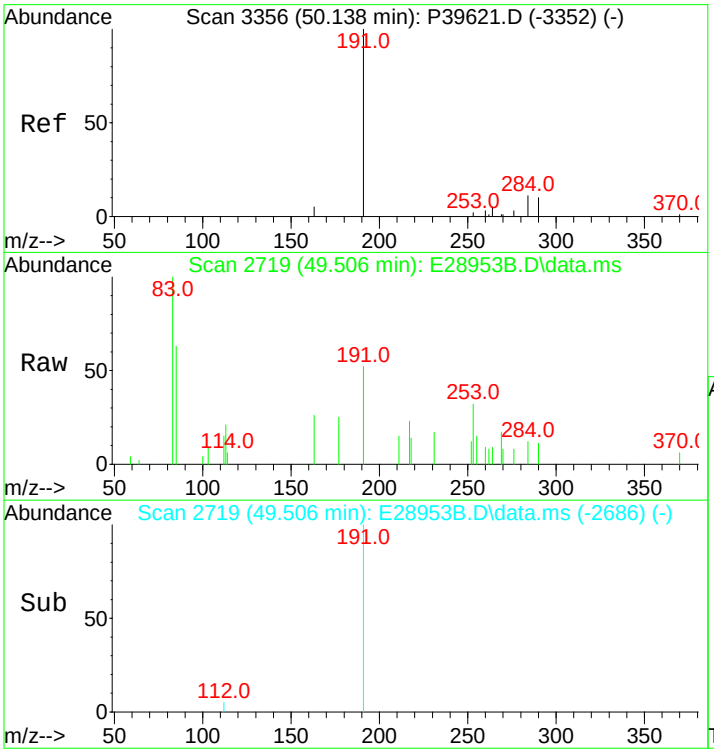




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 36.90 ng/ml
RT: 49.672 min Scan# 2730
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

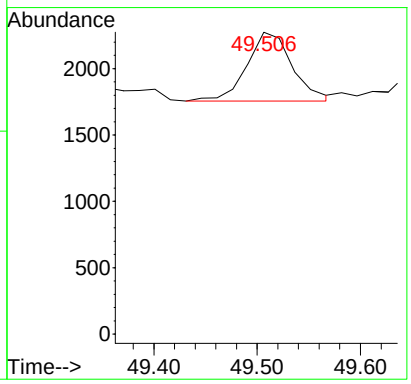
Tgt Ion:191 Resp: 1533

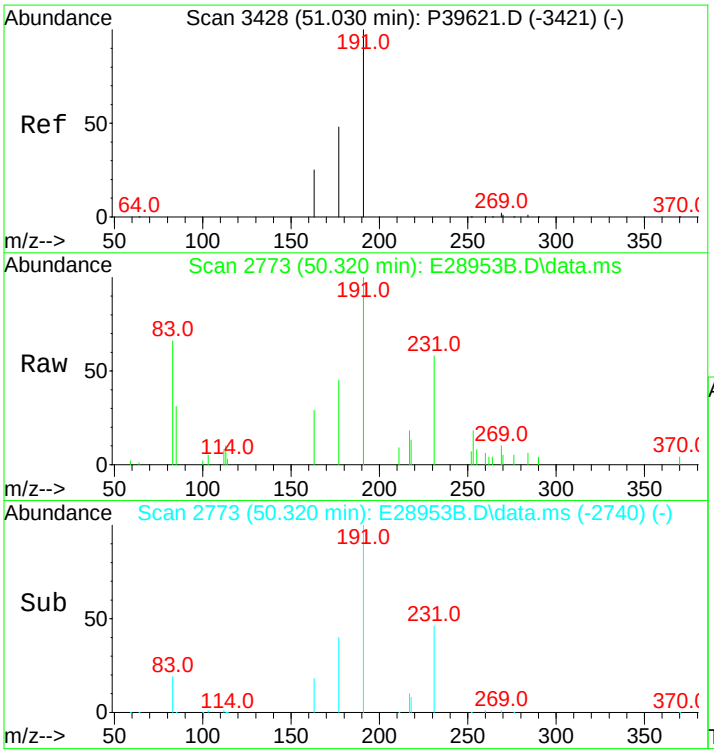




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 38.34 ng/ml m
RT: 49.506 min Scan# 2719
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

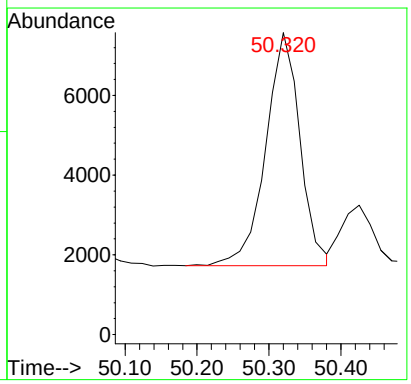
Tgt Ion:191 Resp: 1593

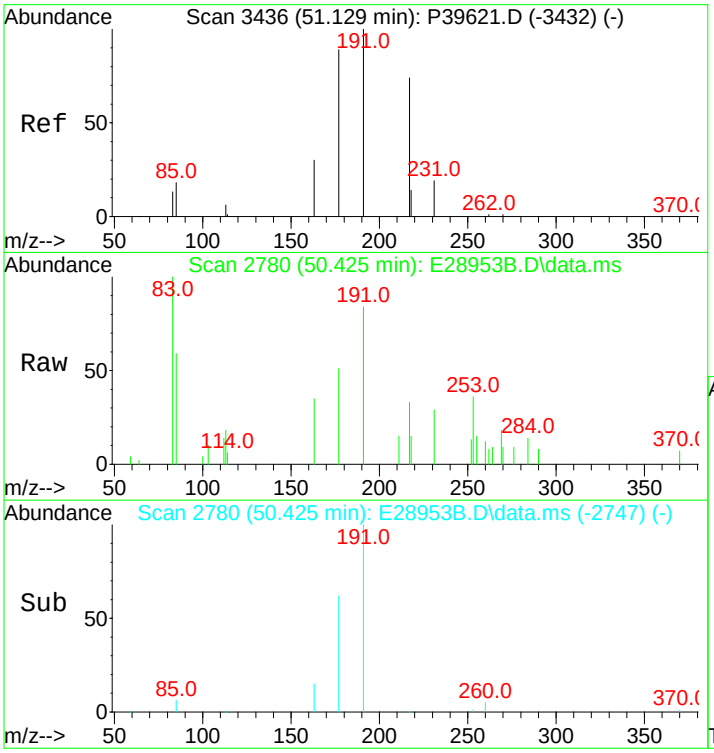




#112
30-Norhopane (T15)
Concen: 465.18 ng/ml
RT: 50.320 min Scan# 2773
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

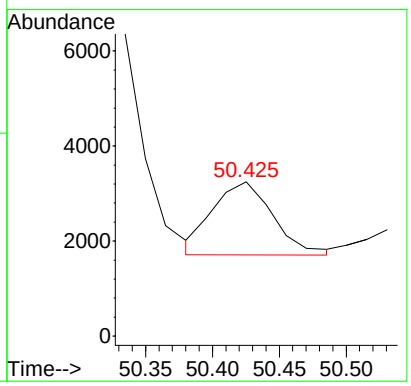
Tgt Ion:191 Resp: 19328

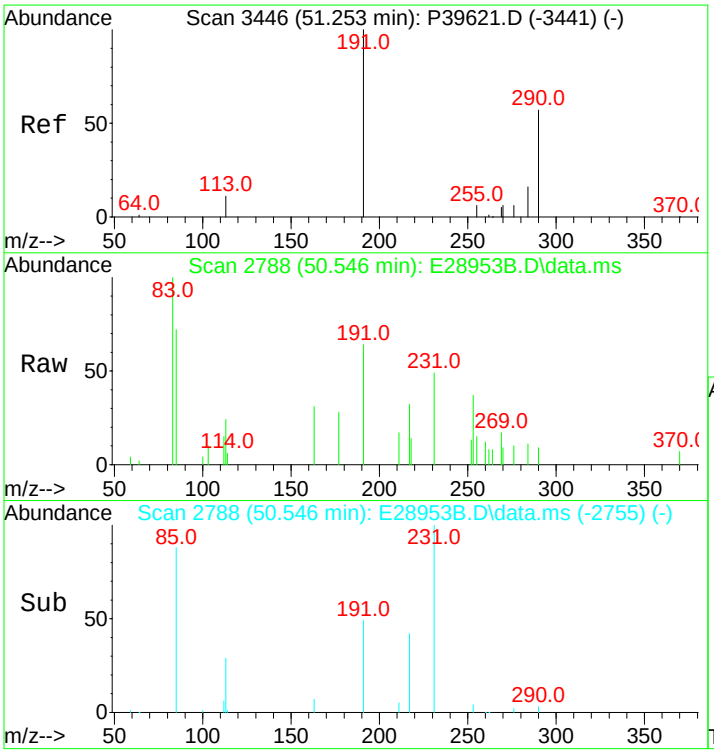




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 116.37 ng/ml
RT: 50.425 min Scan# 2780
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

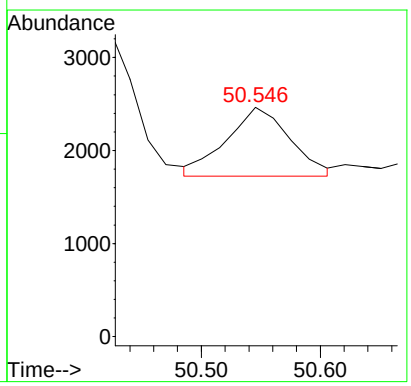
Tgt Ion:191 Resp: 4835

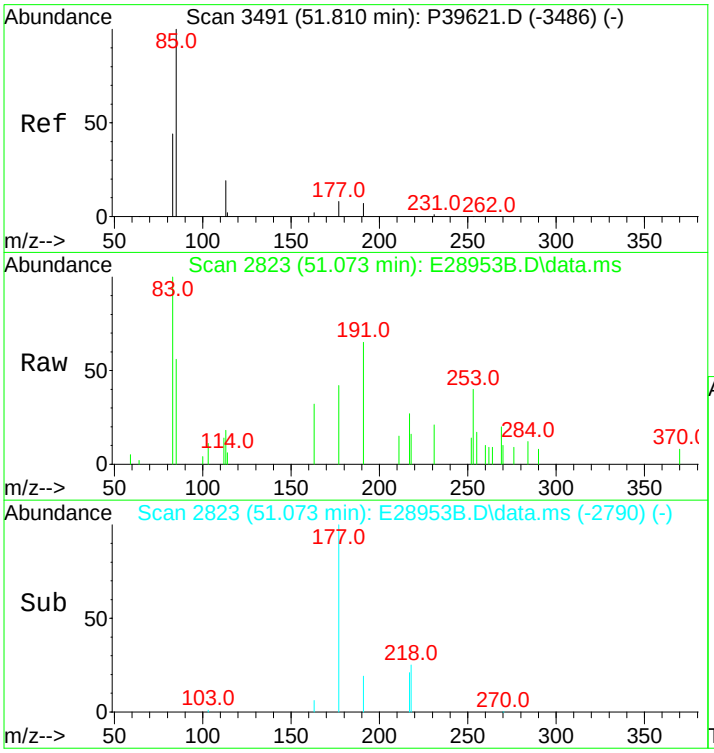




#114
17a(H)-Diahopane (X)
Concen: 65.71 ng/ml m
RT: 50.546 min Scan# 2788
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

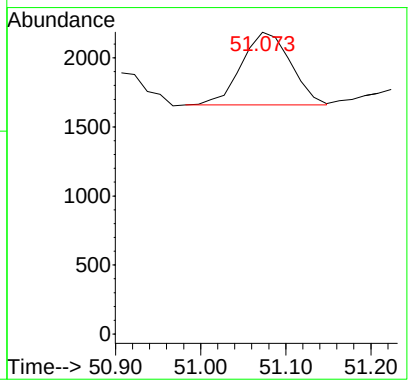
Tgt Ion:191 Resp: 2730

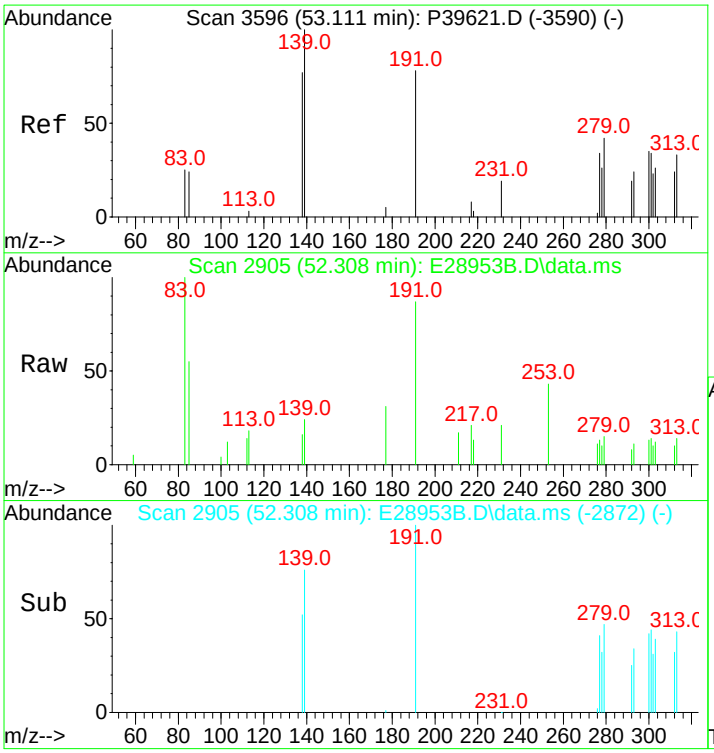




#115
30-Normoretane (T17)
Concen: 51.22 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

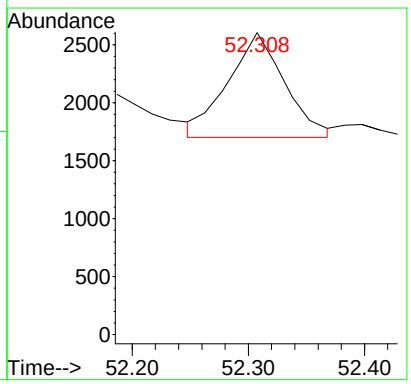
Tgt Ion:191 Resp: 2128

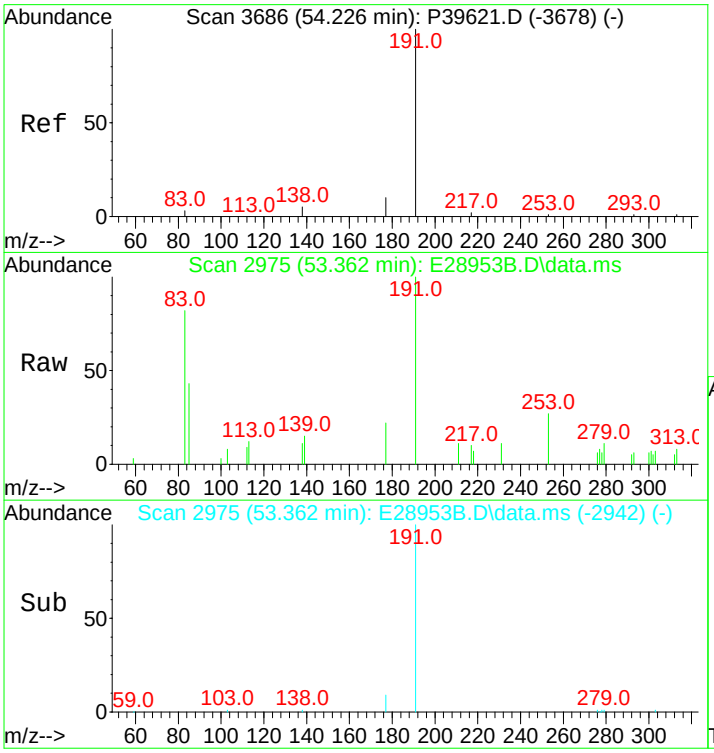




#117
Moretane (T20)
Concen: 72.95 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

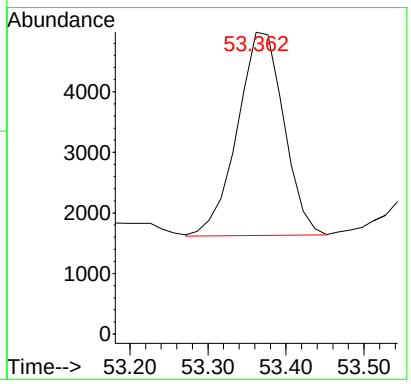
Tgt Ion:191 Resp: 3031

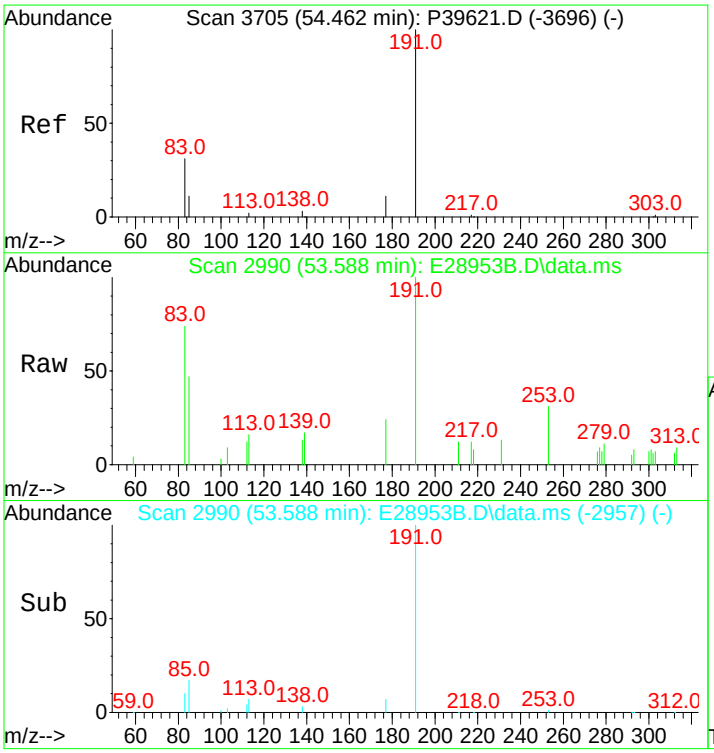




#118
30-Homohopane-22S (T21)
Concen: 335.22 ng/ml
RT: 53.362 min Scan# 2975
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

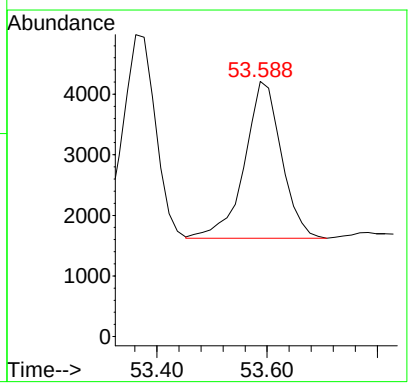
Tgt Ion:191 Resp: 13928

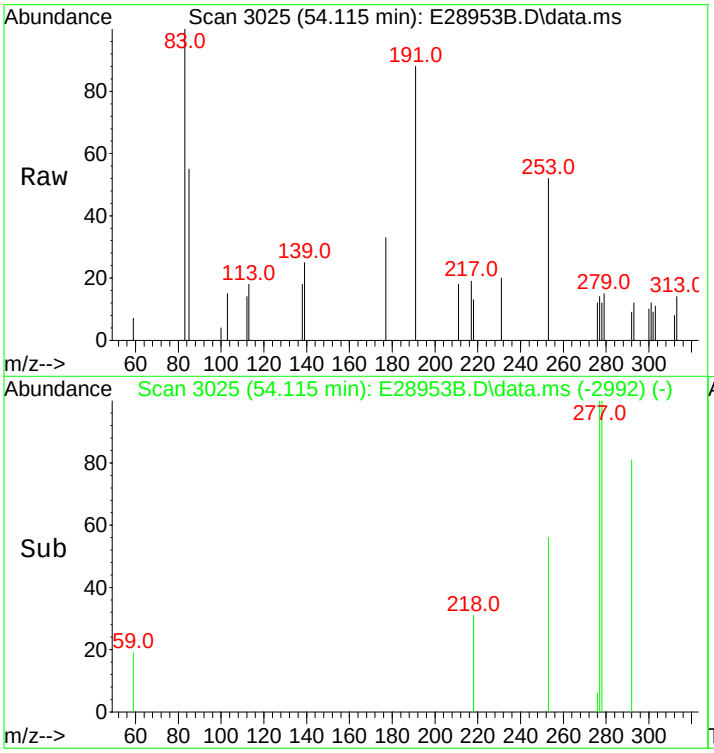




#119
30-Homohopane-22R (T22)
Concen: 289.58 ng/ml
RT: 53.588 min Scan# 2990
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

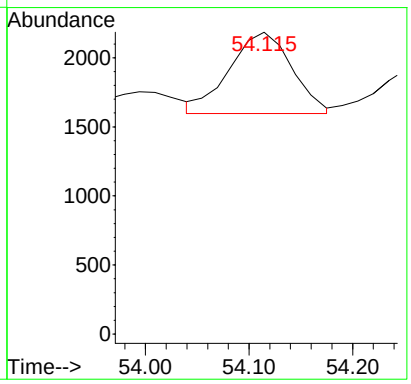
Tgt Ion:191 Resp: 12032

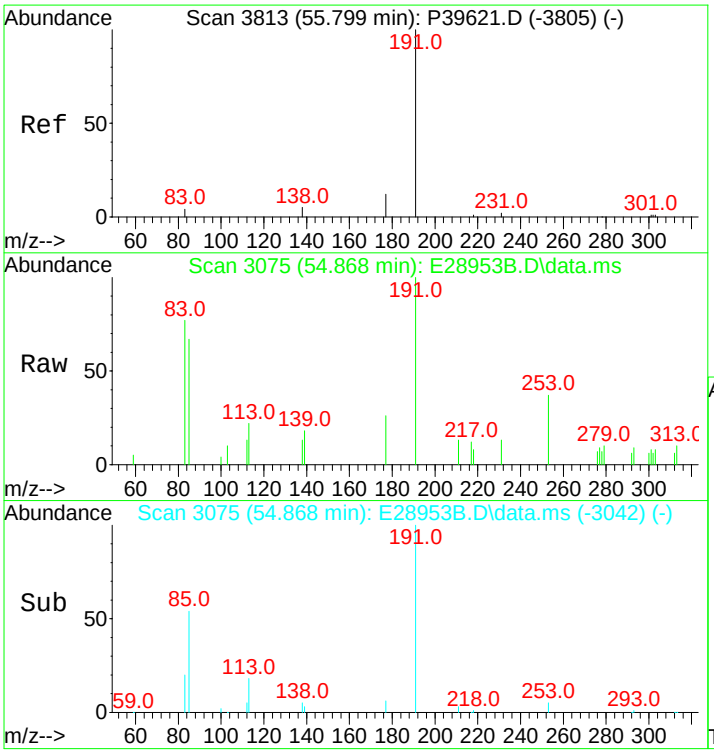




#120
Gammacerane/C32-diahopane
Concen: 59.38 ng/mL m
RT: 54.115 min Scan# 3025
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

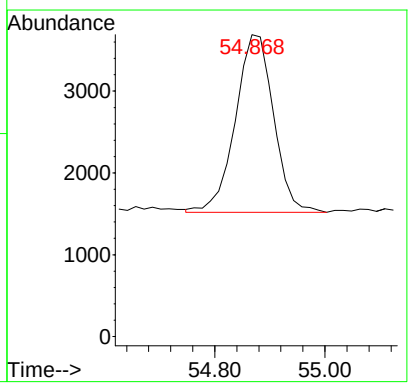
Tgt Ion:191 Resp: 2467

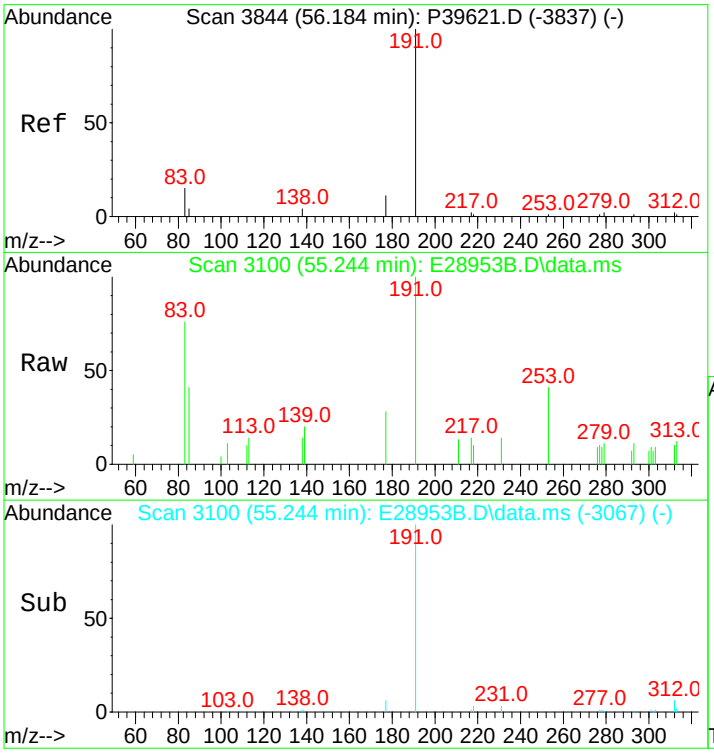




#121
30,31-Bishomohopane-22S (T26)
Concen: 250.52 ng/ml
RT: 54.868 min Scan# 3075
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

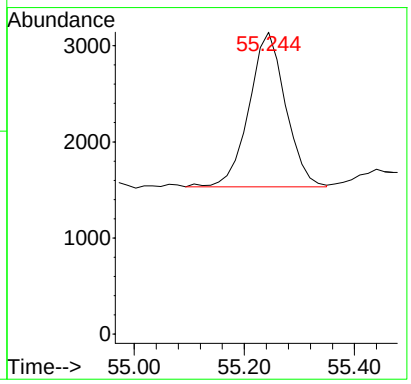
Tgt Ion:191 Resp: 10409

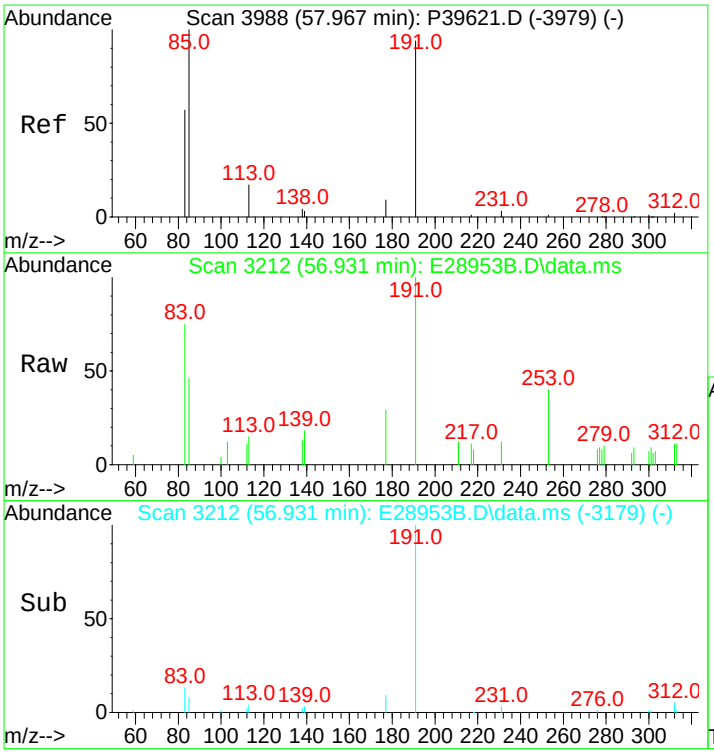




#122
30,31-Bishomohopane-22R (T27)
Concen: 177.62 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

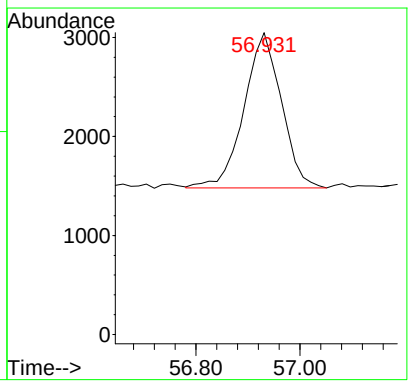
Tgt Ion:191 Resp: 7380

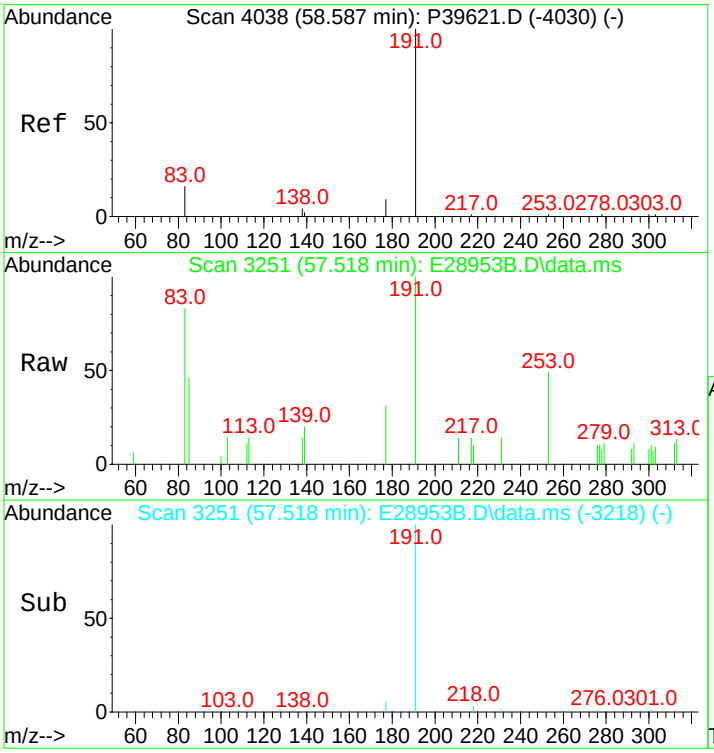




#123
30,31-Trishomohopane-22S (T30)
Concen: 188.04 ng/ml
RT: 56.931 min Scan# 3212
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

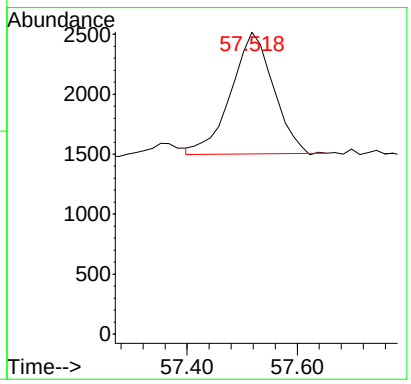
Tgt Ion:191 Resp: 7813

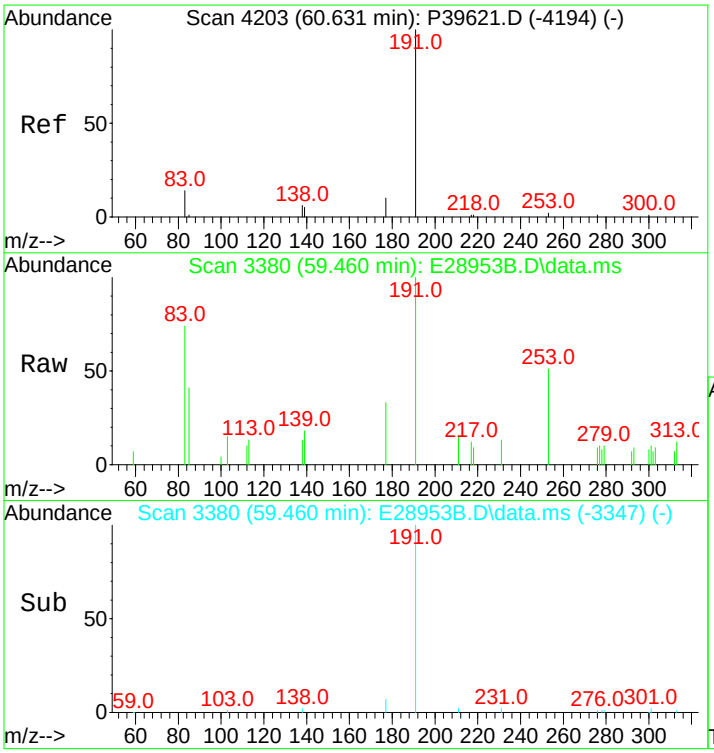




#124
30,31-Trishomohopane-22R (T31)
Concen: 130.23 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

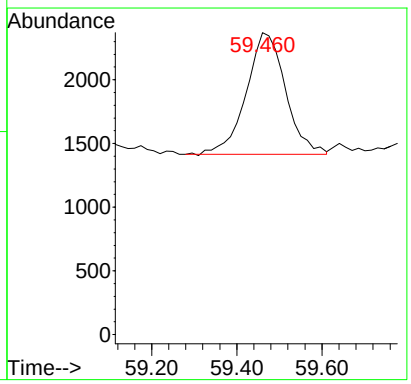
Tgt Ion:191 Resp: 5411

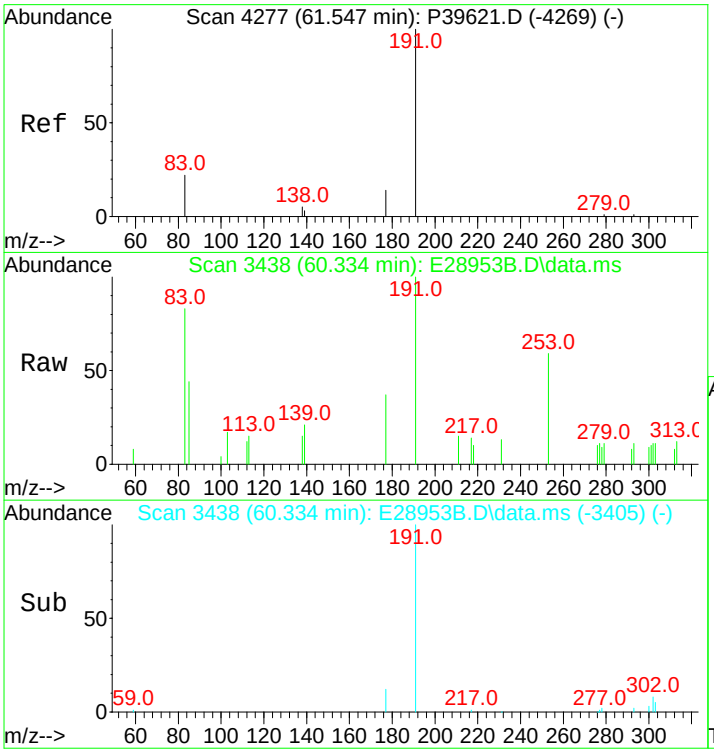




#125
Tetrakishomohopane-22S (T32)
Concen: 147.87 ng/ml
RT: 59.460 min Scan# 3380
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

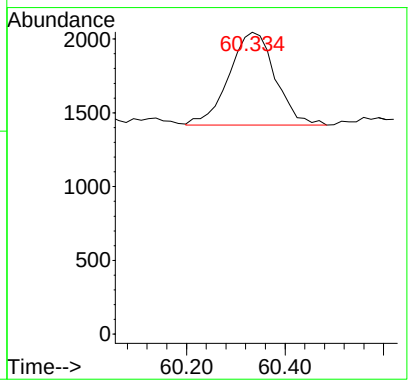
Tgt Ion:191 Resp: 6144

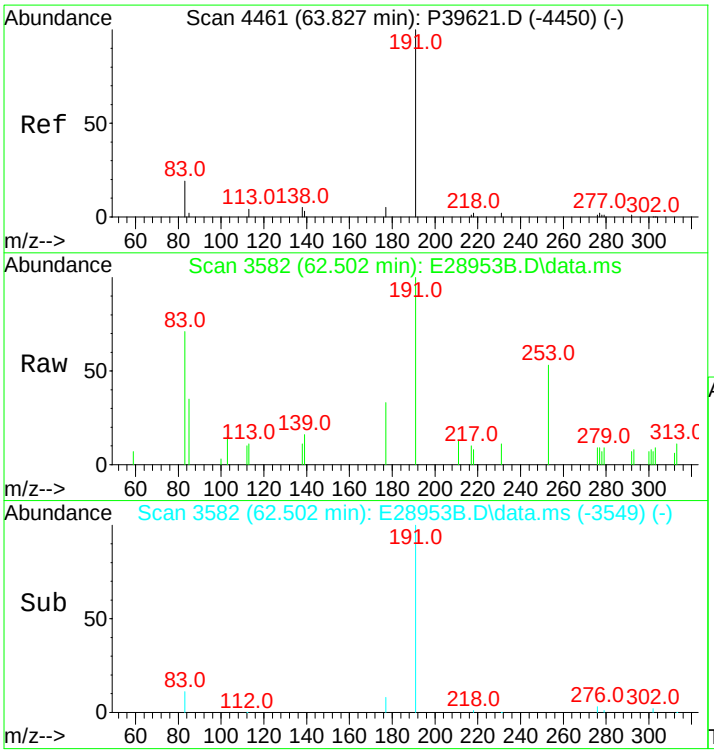




#126
Tetrakishomohopane-22R (T33)
Concen: 98.34 ng/ml
RT: 60.334 min Scan# 3438
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

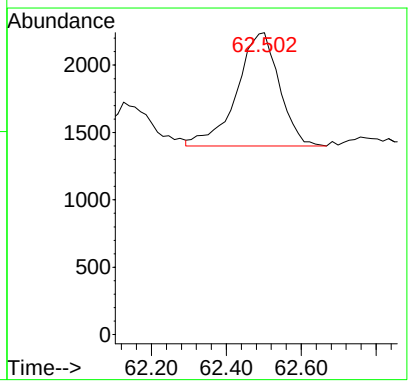
Tgt Ion:191 Resp: 4086

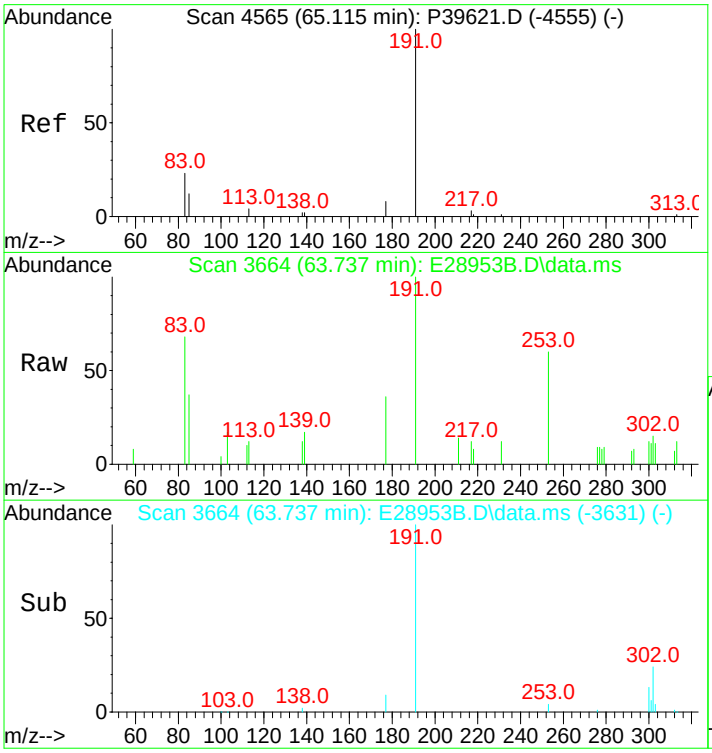




#127
Pentakishomohopane-22S (T34)
Concen: 158.85 ng/ml
RT: 62.502 min Scan# 3582
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

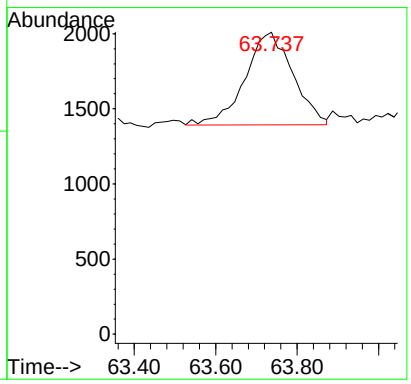
Tgt Ion:191 Resp: 6600

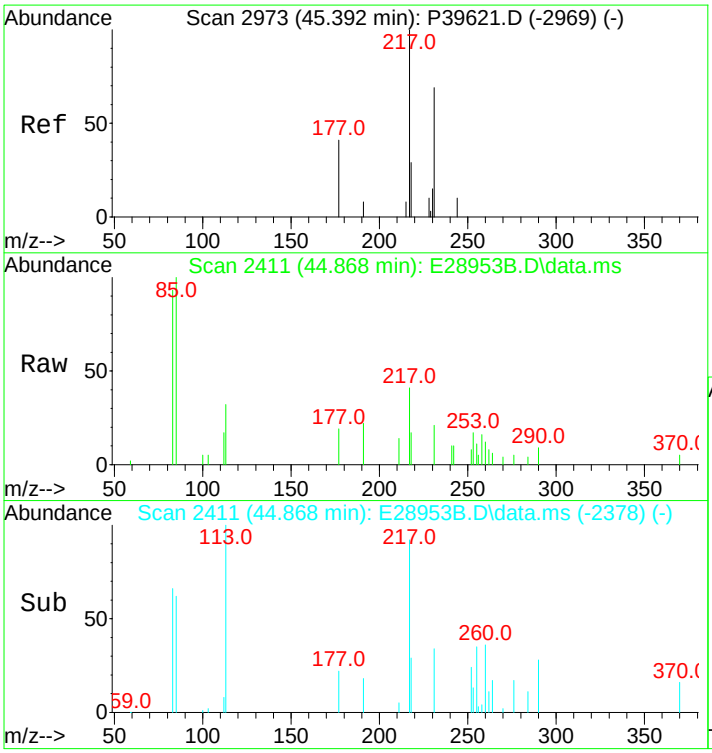




#128
Pentakishomohopane-22R (T35)
Concen: 120.75 ng/ml
RT: 63.737 min Scan# 3664
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

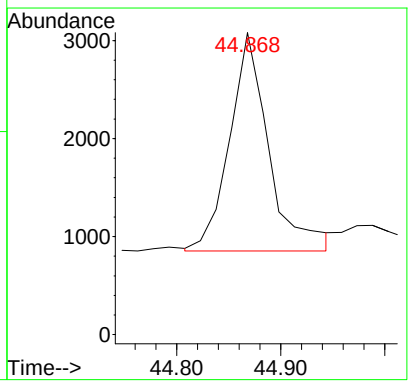
Tgt Ion:191 Resp: 5017

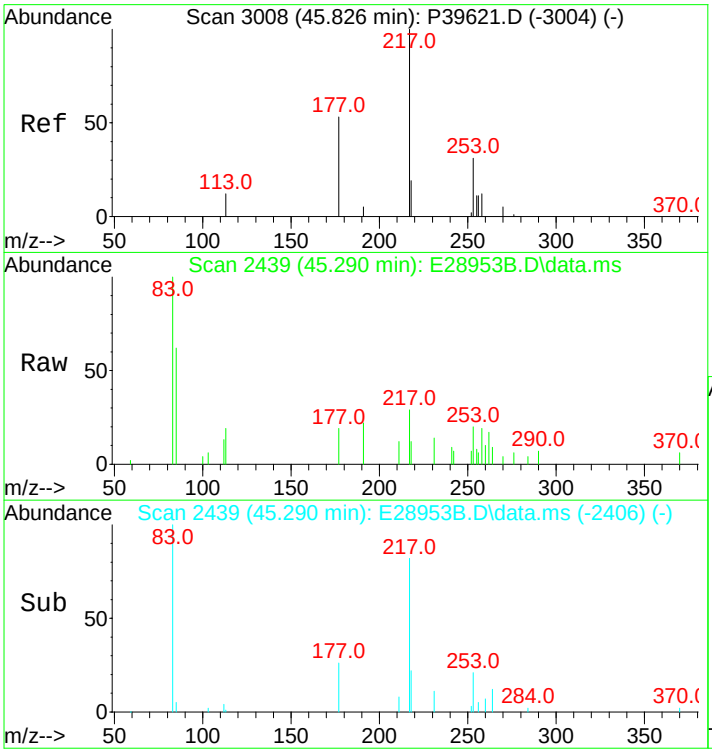




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 268.01 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

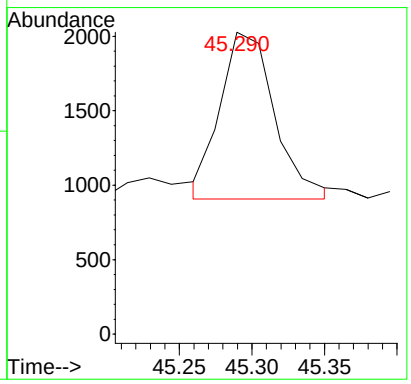
Tgt Ion:217 Resp: 5848

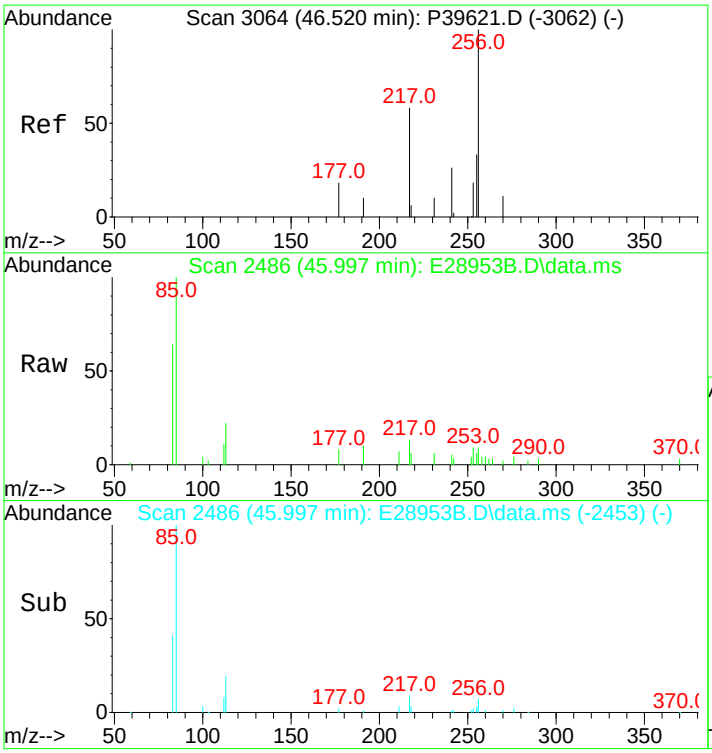




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 133.92 ng/ml m
RT: 45.290 min Scan# 2439
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

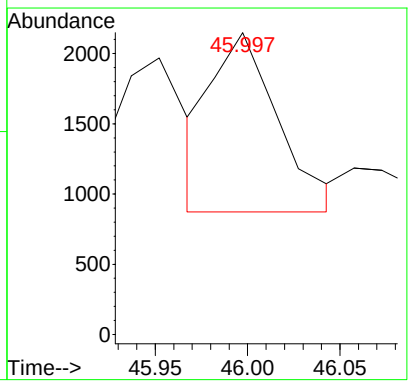
Tgt Ion:217 Resp: 2922

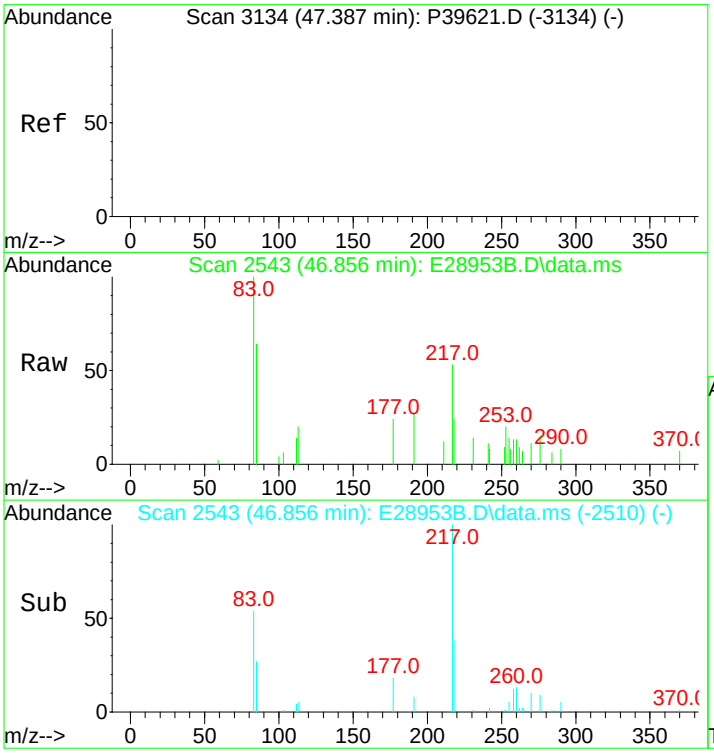




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 146.56 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

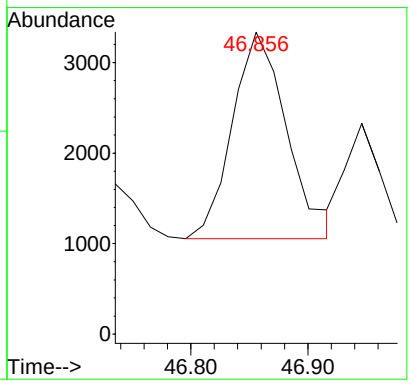
Tgt Ion:217 Resp: 3198

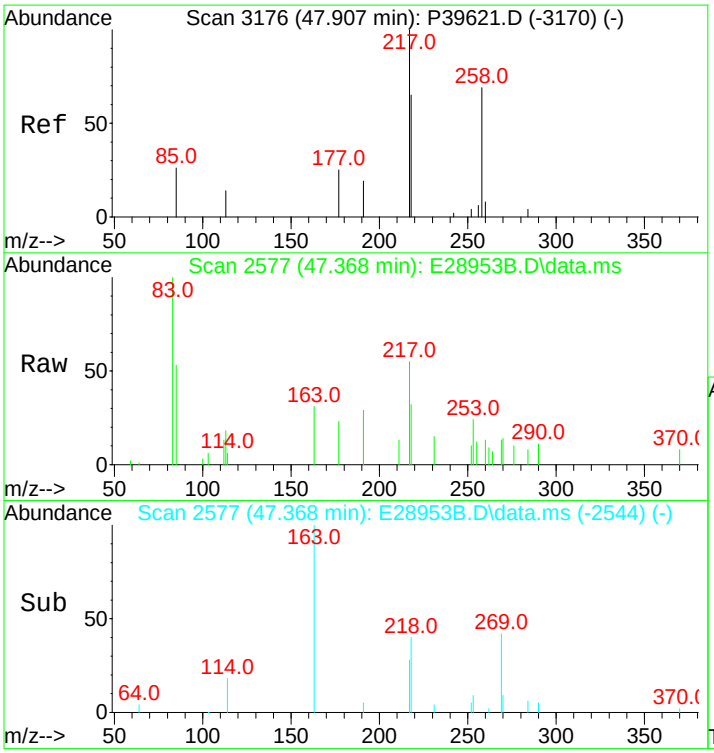




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 339.37 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

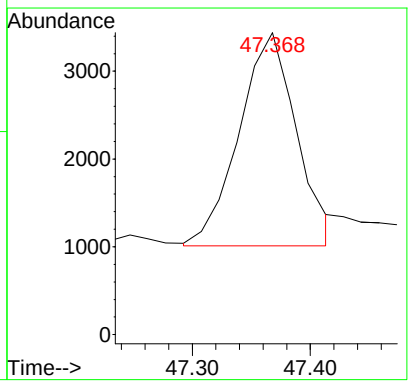
Tgt Ion:217 Resp: 7405

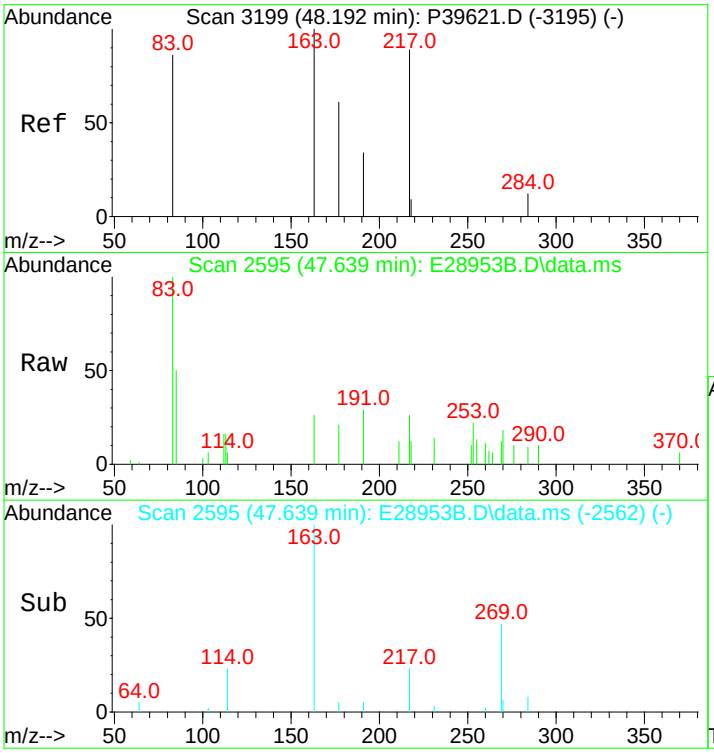




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 376.22 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

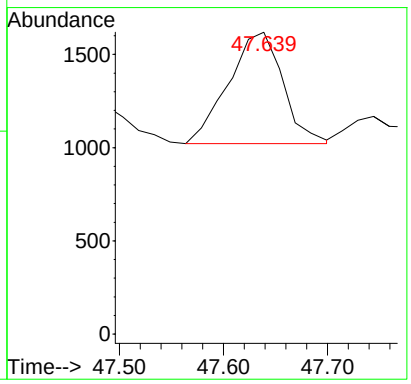
Tgt Ion:217 Resp: 8209

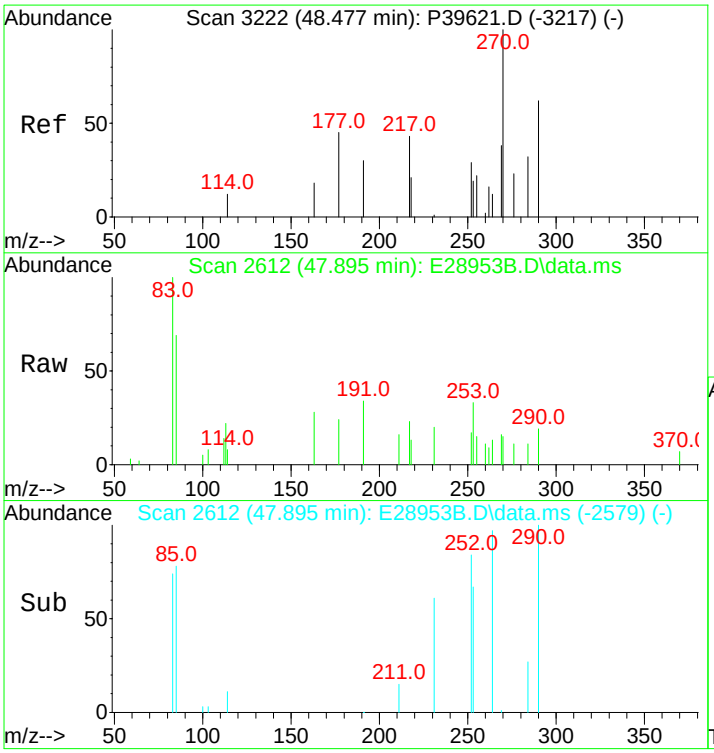




#135
Unknown Sterane (S18)
Concen: 99.91 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

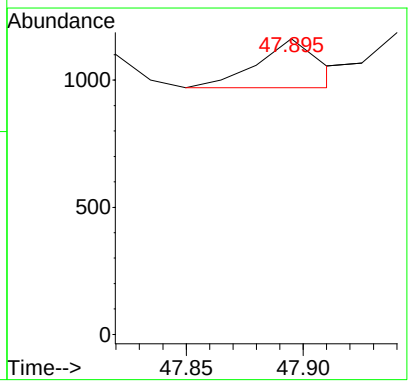
Tgt Ion:217 Resp: 2180

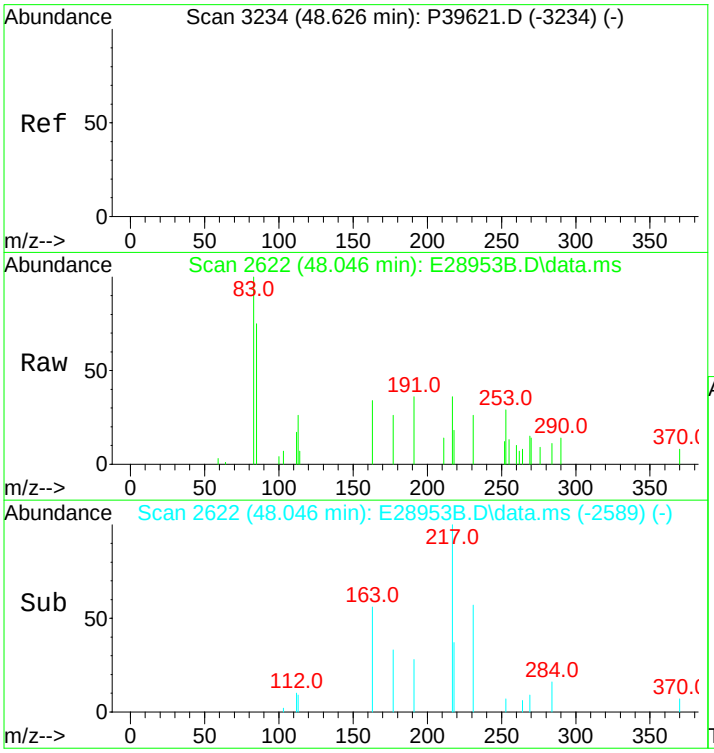




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 16.41 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

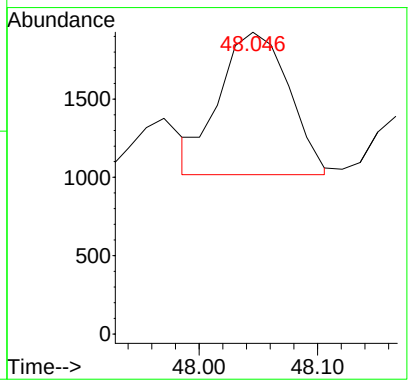
Tgt Ion:217 Resp: 358

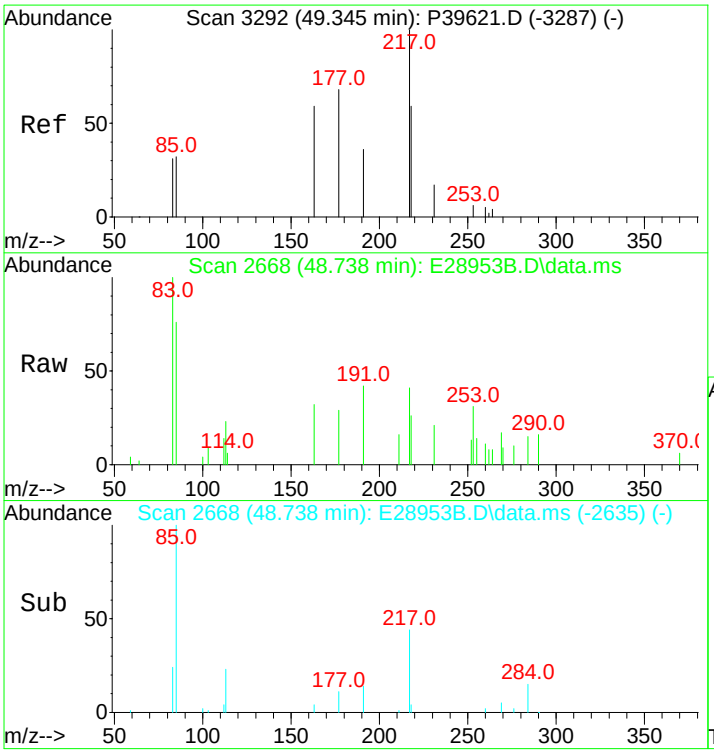




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 169.57 ng/ml m
RT: 48.046 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

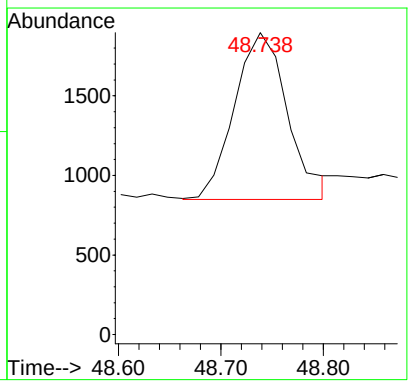
Tgt Ion:217 Resp: 3700

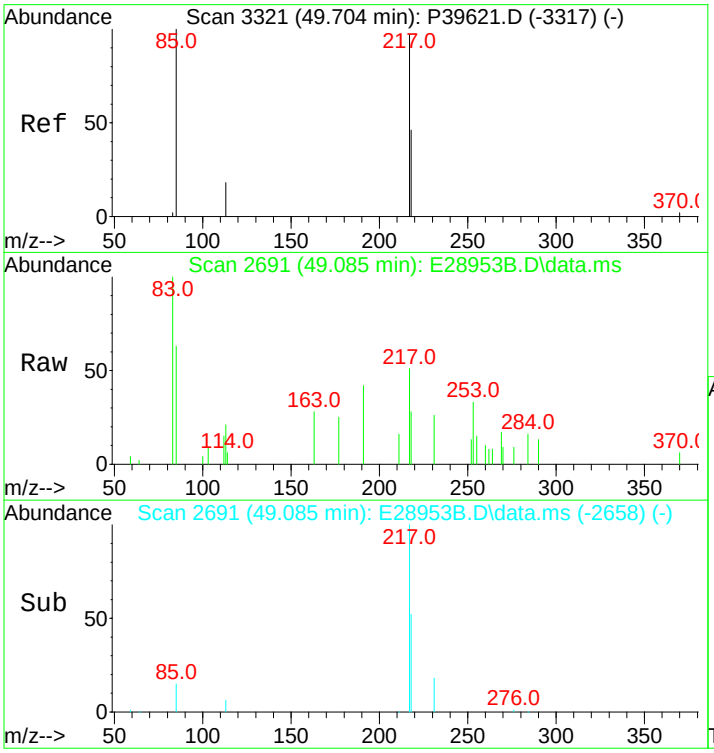




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 173.05 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

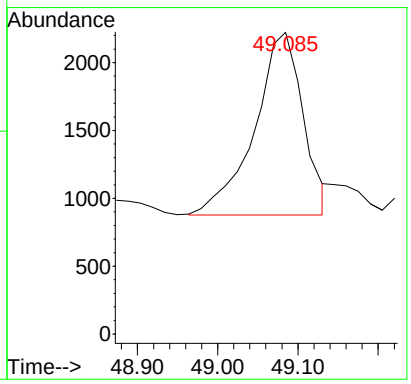
Tgt Ion:217 Resp: 3776

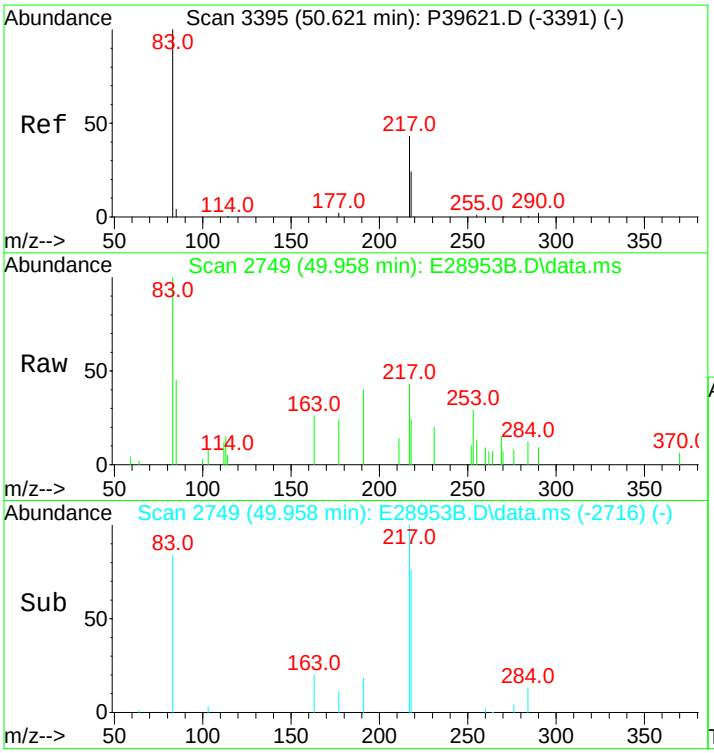




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 259.54 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

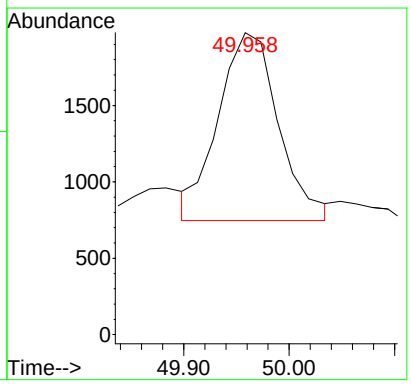
Tgt Ion:217 Resp: 5663

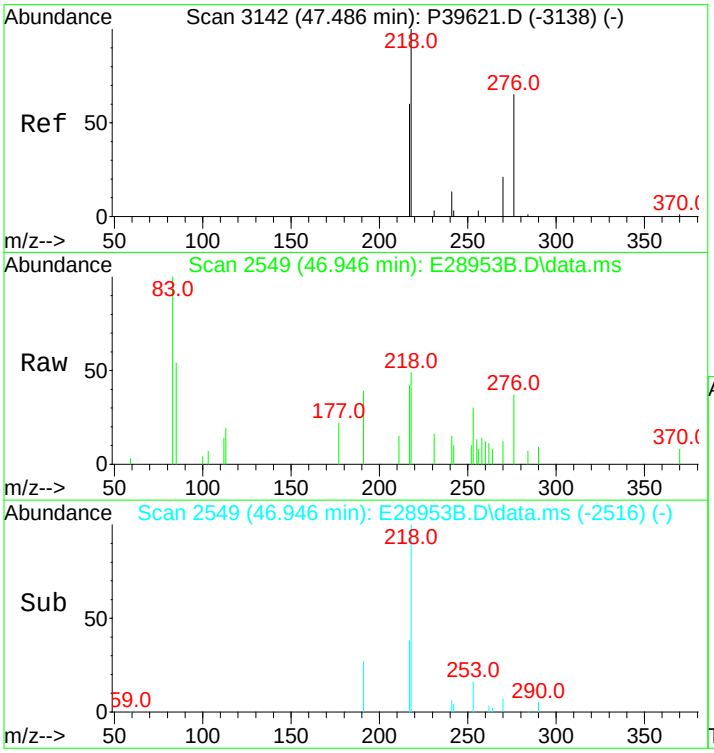




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 223.83 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

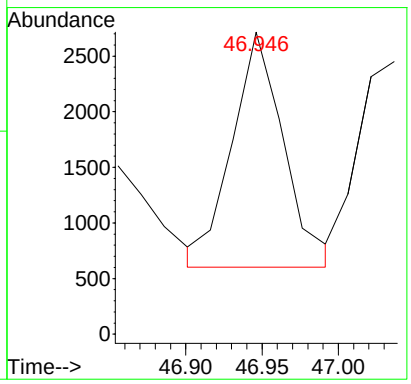
Tgt Ion:217 Resp: 4884

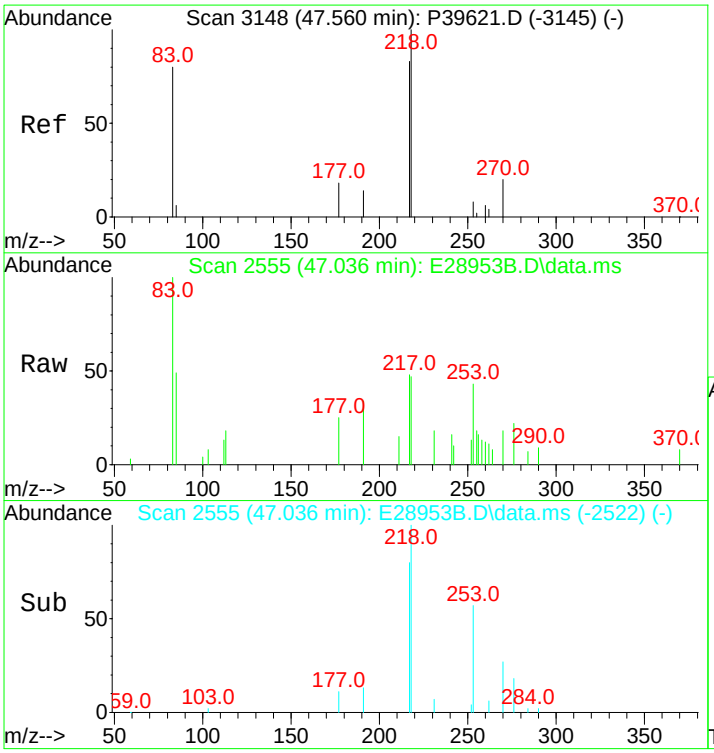




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 227.41 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

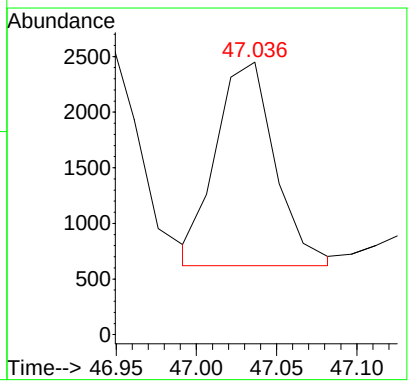
Tgt Ion:218 Resp: 4962

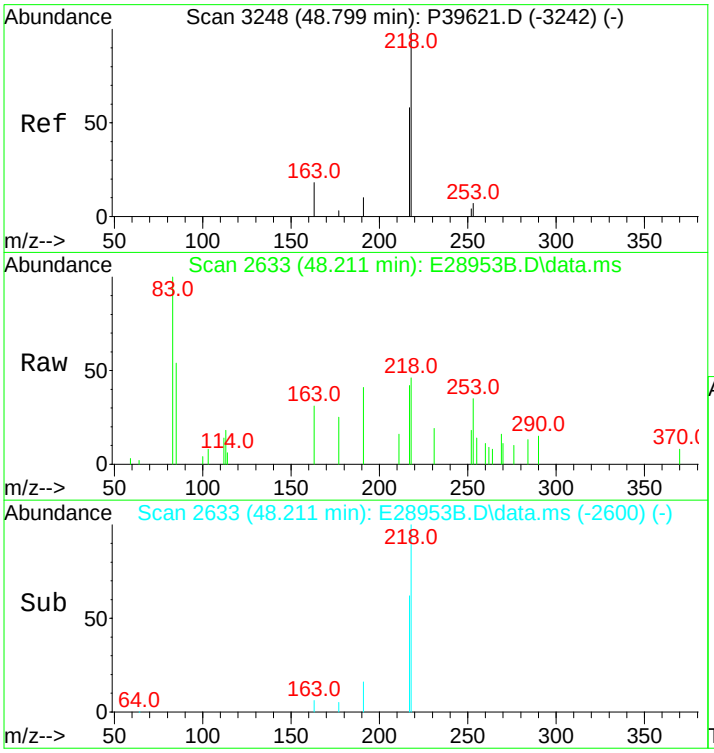




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 215.03 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

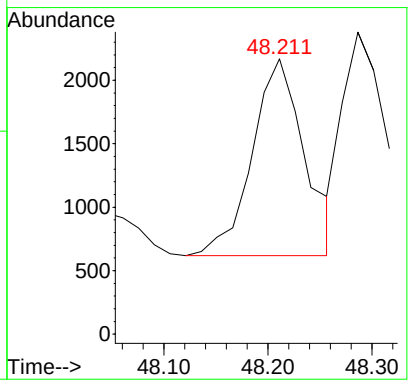
Tgt Ion:218 Resp: 4692

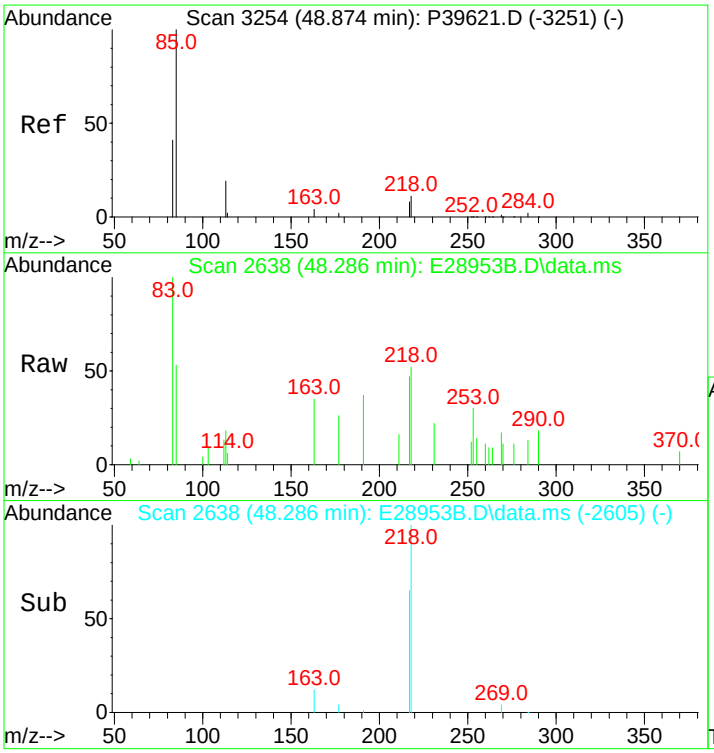




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 249.59 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

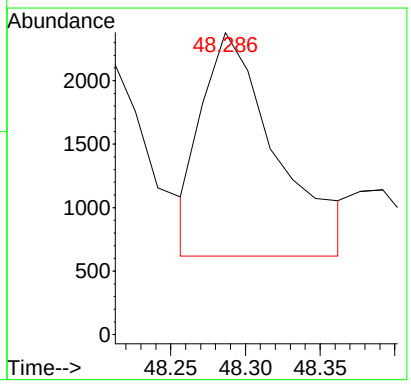
Tgt Ion:218 Resp: 5446

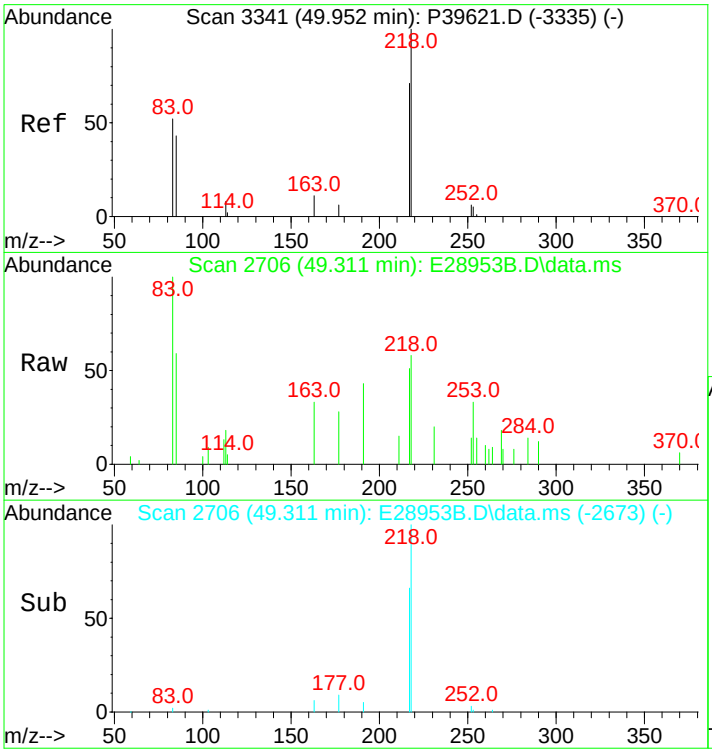




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 280.11 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

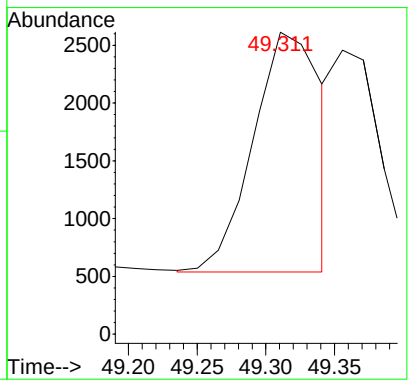
Tgt Ion:218 Resp: 6112

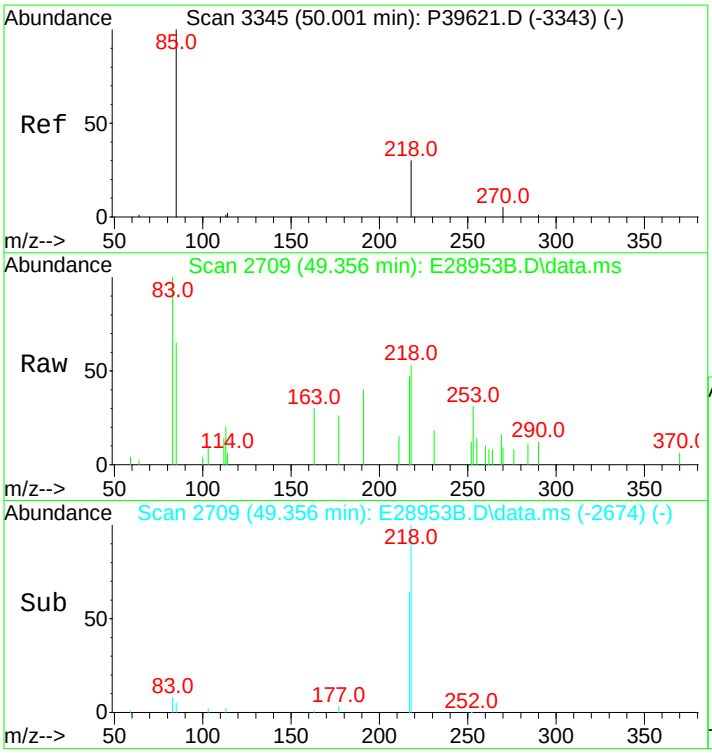




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 327.87 ng/ml m
RT: 49.311 min Scan# 2706
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

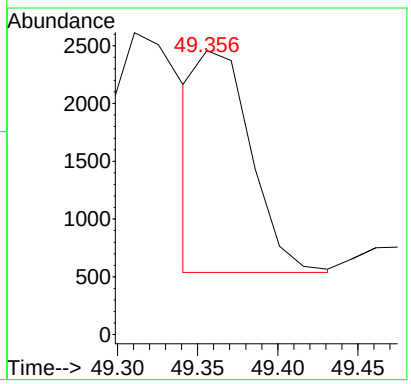
Tgt Ion:218 Resp: 7154

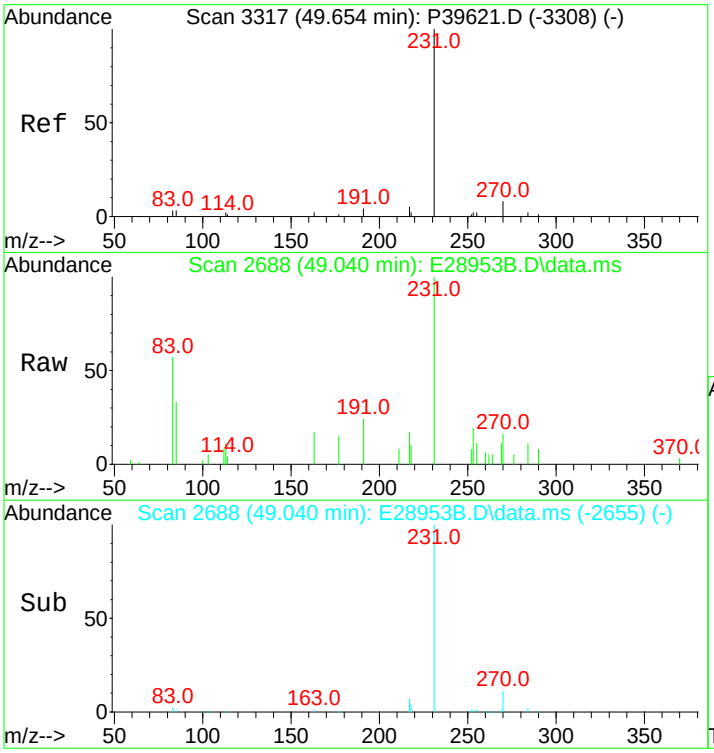




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 205.41 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

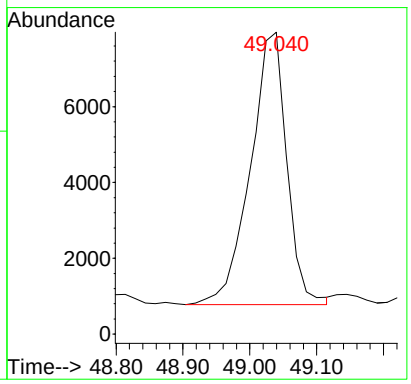
Tgt Ion:218 Resp: 4482

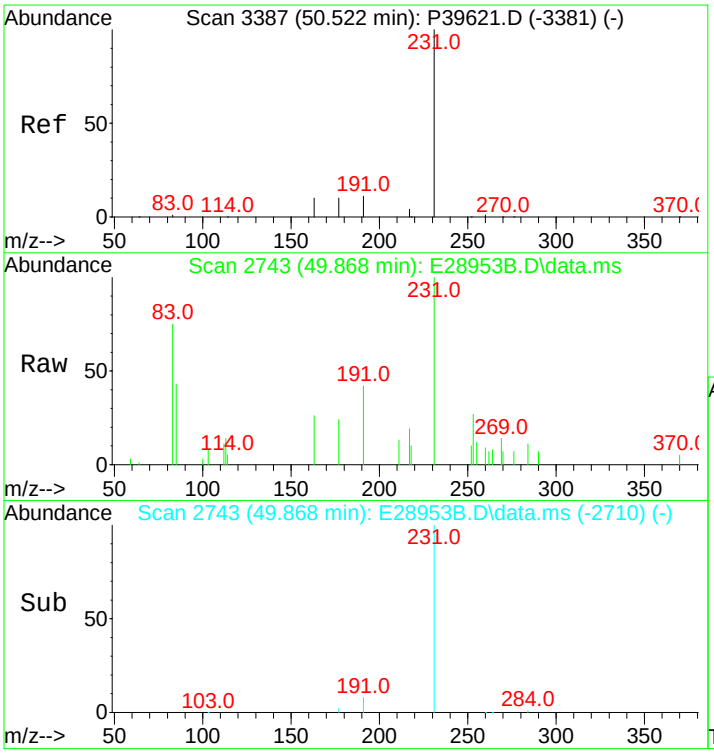




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1246.71 ng/mL
RT: 49.040 min Scan# 2688
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

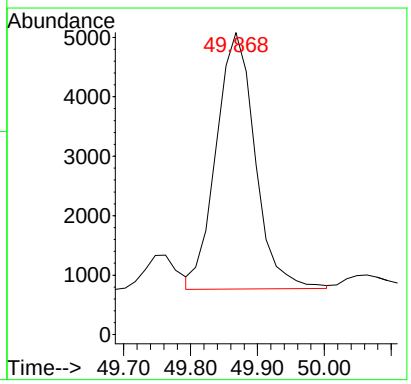
Tgt Ion:231 Resp: 27203

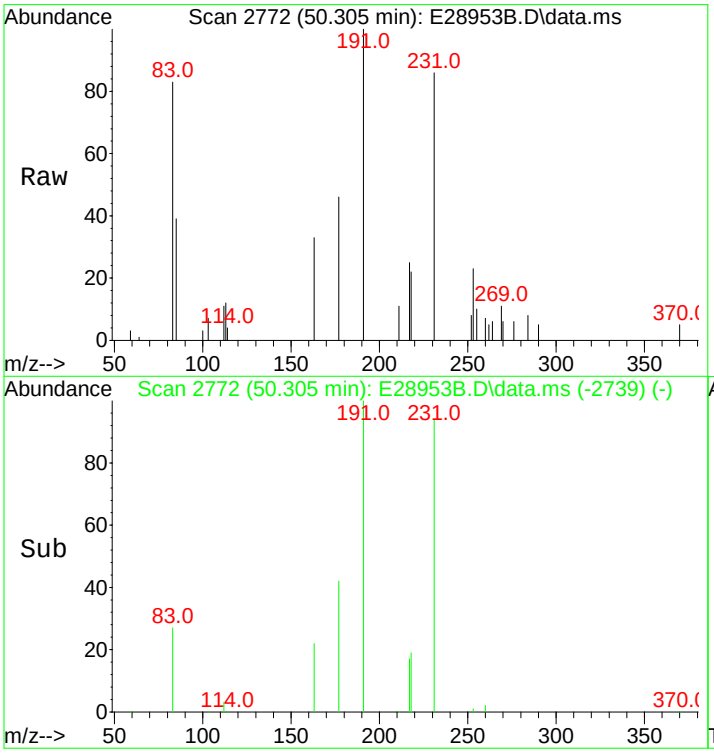


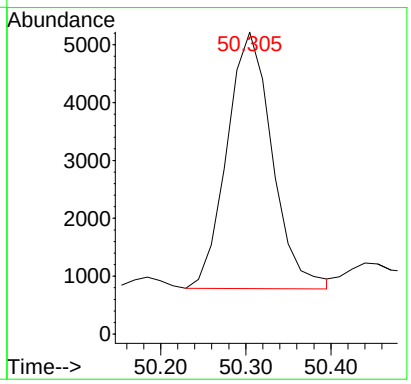


#148
C28,20S-triaromatic steroid
Concen: 799.50 ng/mL
RT: 49.868 min Scan# 2743
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:231 Resp: 17445

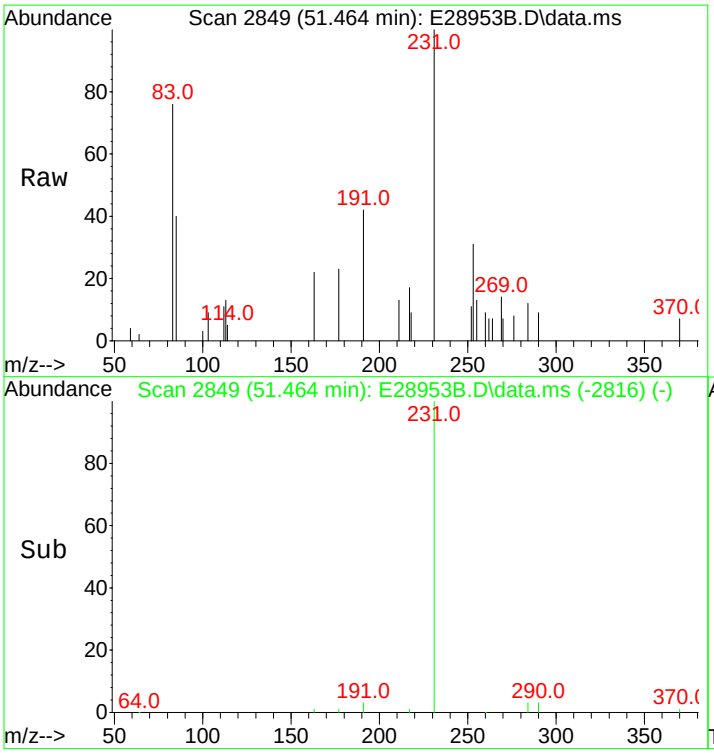


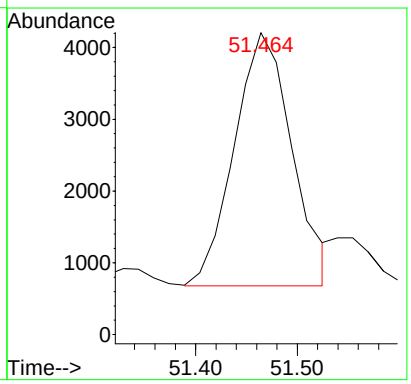




#149
C27,20R-triaromatic steroid
Concen: 752.16 ng/mL
RT: 50.305 min Scan# 2772
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:231 Resp: 16412





#150
C28,20R-triaromatic steroid
Concen: 639.83 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:231 Resp: 13961

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28973.D
Acq On : 15 Nov 2012 12:24 am
Operator : AC
Sample : SS110612B07
Misc : 1X ETR1210081
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:23:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	20164M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	44721	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	30694	432.767	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.28%#			
42) Phenanthrene-d10	32.085	188	31833	438.079	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.81%#			
83) Benzo[b]fluoranthene-d12	46.630	264	41556	452.347	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.23%#			
88) Benzo[a]pyrene-d12	47.790	264	38686	434.605	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.46%#			
129) 5B(H)Cholane - Surr	43.332	217	8465	480.269	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.03%#			
Target Compounds						Qvalue
10) Naphthalene	19.304	128	79M3	0.996	ng/mL	
25) Dibenzofuran	27.012	168	53M3	0.750	ng/mL	
43) Phenanthrene	32.176	178	76M3	0.959	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.148	192	50M4	0.631	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.253	192	47M3	0.593	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	51M3	0.643	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	39M3	0.492	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.148	192	256M5	3.230	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	683M5	8.617	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.457	234	606M5	7.646	ng/mL	
54) Retene	39.192	234	37M2	1.451	ng/mL	
57) 1-Methylphenanthrene	34.690	192	33M3	0.546	ng/mL	
60) Pyrene	37.852	202	71M3	0.798	ng/mL	
75) Benz[a]anthracene	42.610	228	41M3	0.471	ng/mL	
77) Chrysene/Triphenylene	42.805	228	67M2	0.747	ng/mL	
84) Benzo[b]fluoranthene	46.720	252	93M3	0.919	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.811	252	60M3	0.576	ng/mL	
87) Benzo[e]pyrene	47.684	252	113M3	1.143	ng/mL	
89) Benzo[a]pyrene	47.880	252	130	1.375	ng/mL#	49
90) Perylene	48.196	252	70M3	0.700	ng/mL	
91) Indeno[1,2,3-cd]pyrene	52.564	276	143M3	1.285	ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	155	1.292	ng/mL#	51
130) 13b(H),17a(H)-20S-Diachol	44.868	217	58M3	3.291	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.931	218	26M2	1.475	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.022	218	34M2	1.929	ng/ml	
147) C26,20R- +C27,20S- triaro	49.010	231	131	7.432	ng/mL	100
149) C27,20R-triaromatic stero	50.275	231	64M2	3.631	ng/mL	

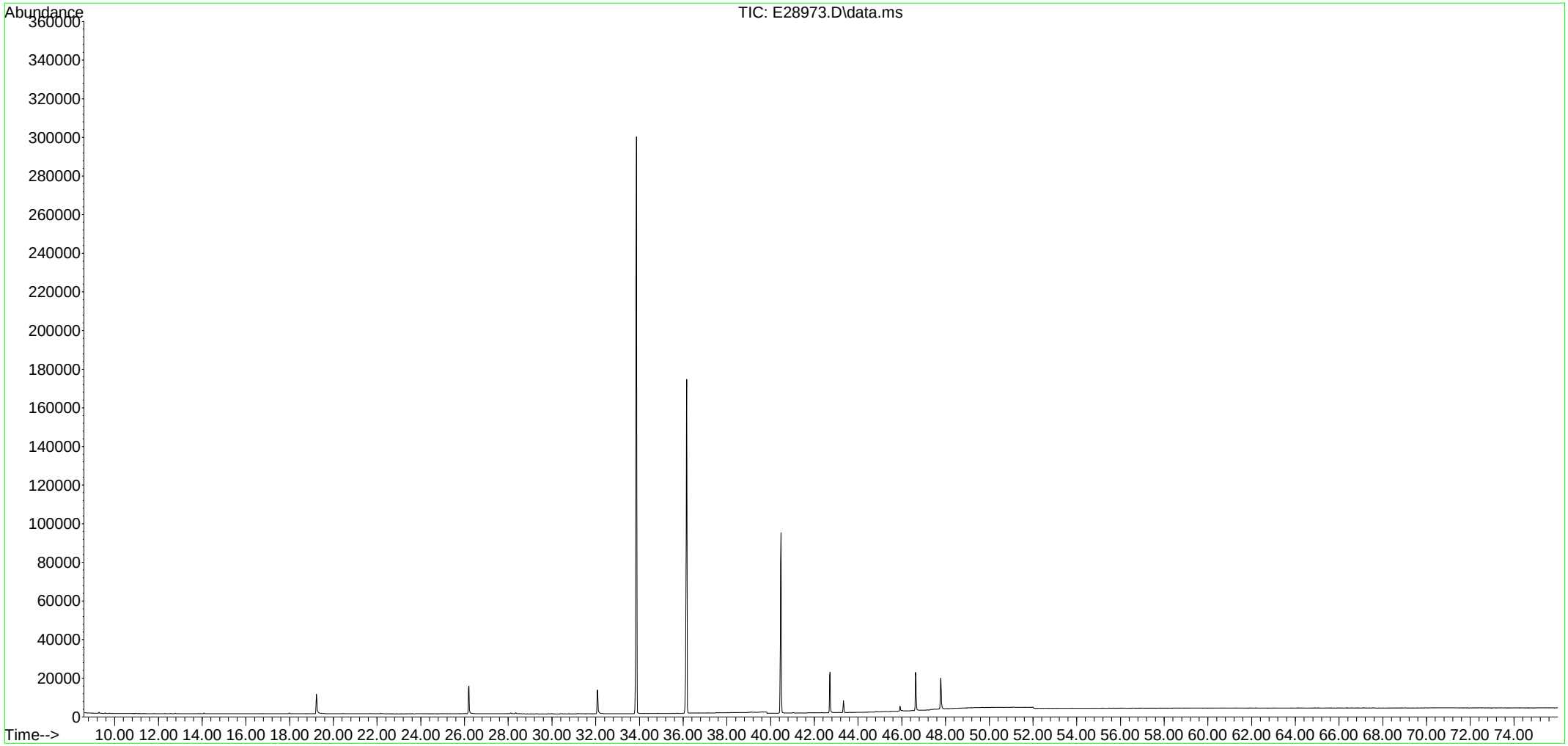
(#) = qualifier out of range (m) = manual integration (+) = signals summed

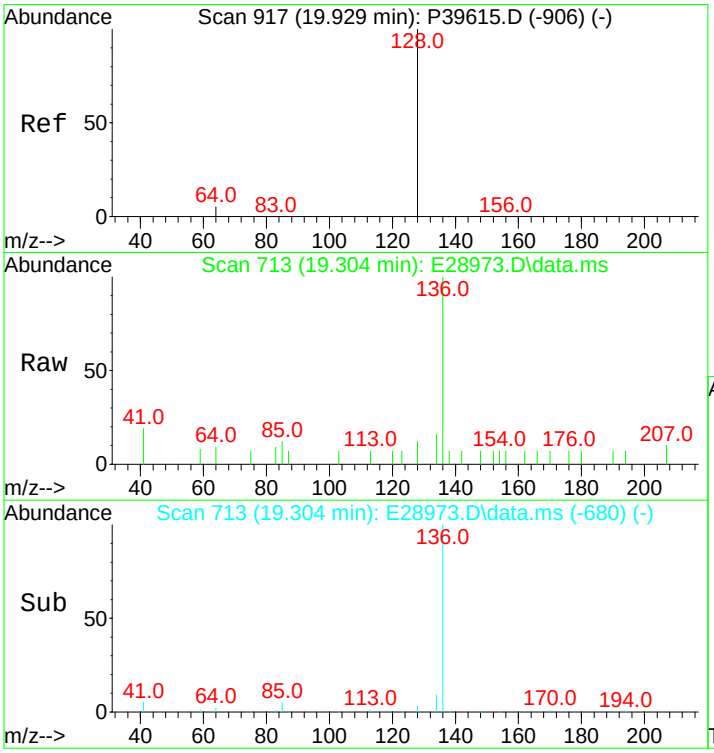
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28973.D
Acq On : 15 Nov 2012 12:24 am
Operator : AC
Sample : SS110612B07
Misc : 1X ETR1210081
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:23:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

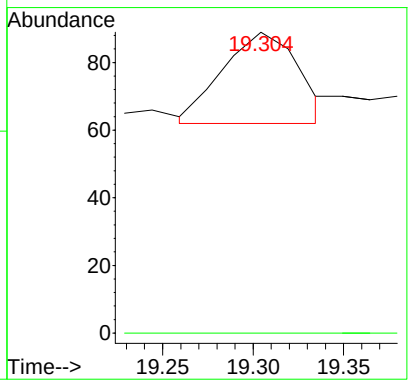


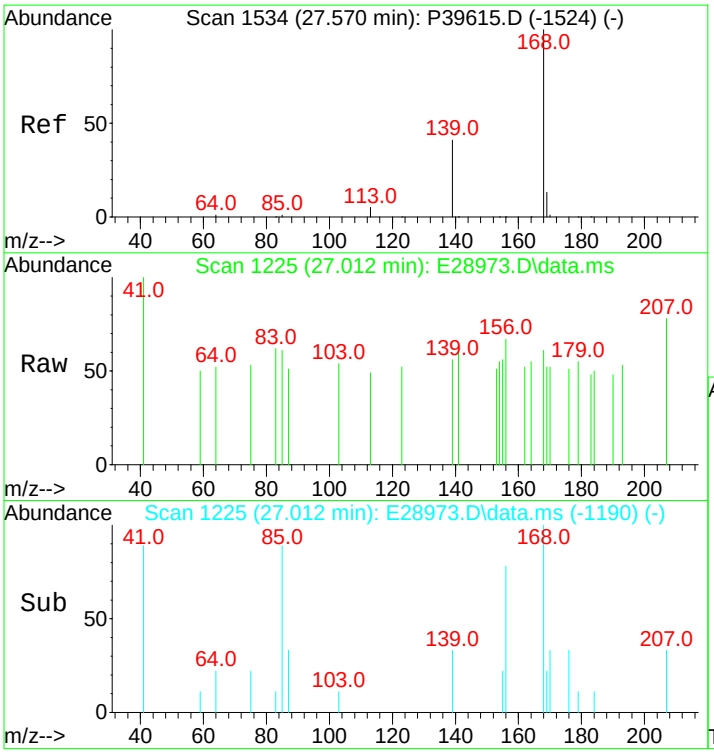


#10
Naphthalene
Concen: 1.00 ng/mL m
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:128 Resp: 79

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

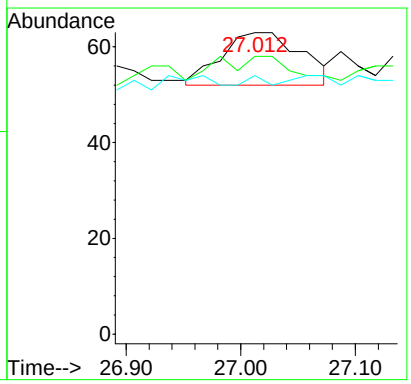


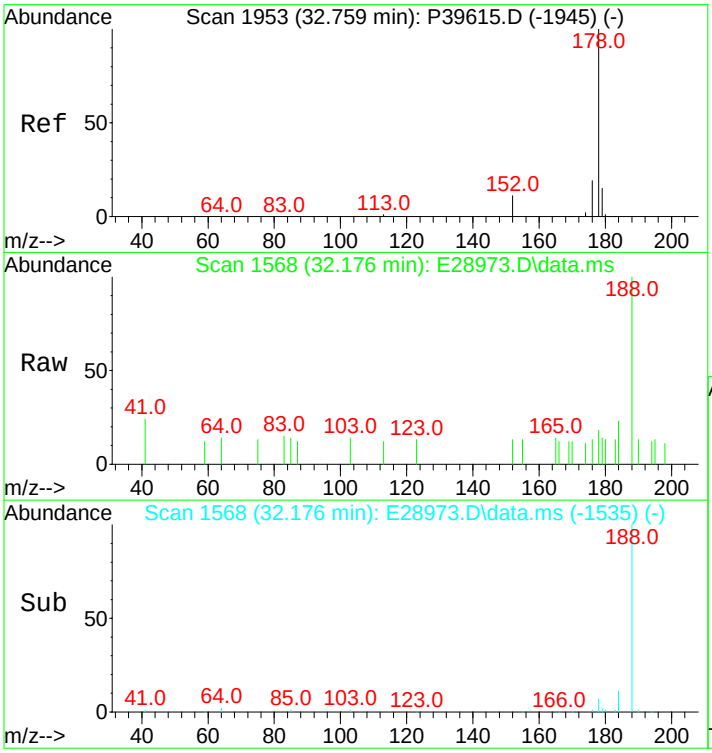


#25
Dibenzofuran
Concen: 0.75 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. 0.030 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:168 Resp: 53

Ion	Ratio	Lower	Upper
168	100		
139	0.0	26.0	39.0#
169	0.0	10.6	16.0#

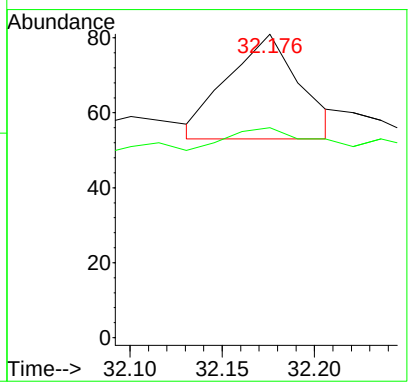


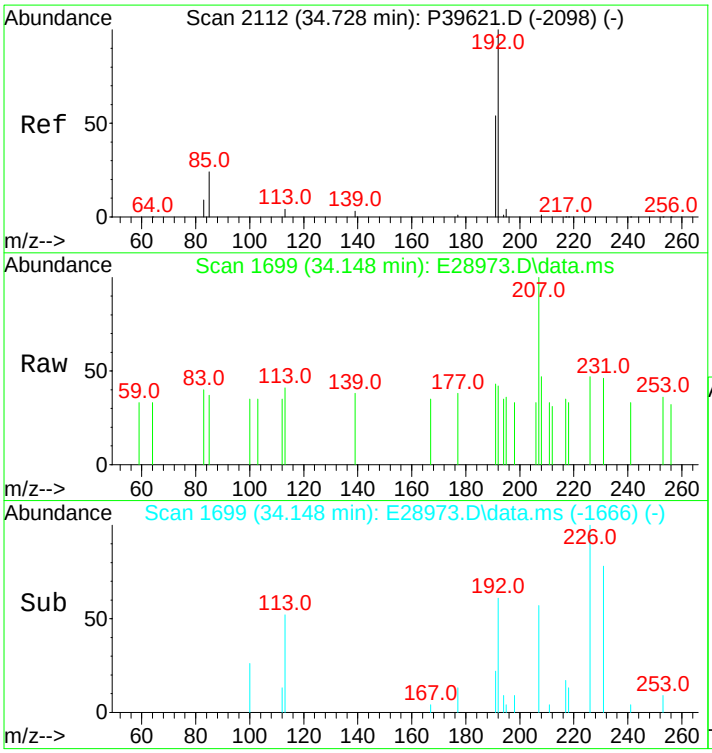


#43
Phenanthrene
Concen: 0.96 ng/mL m
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:178 Resp: 76

Ion	Ratio	Lower	Upper
178	100		
176	0.0	15.0	22.4#

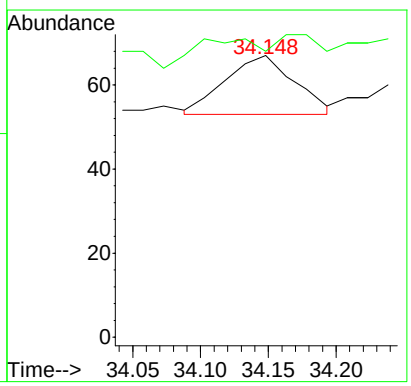


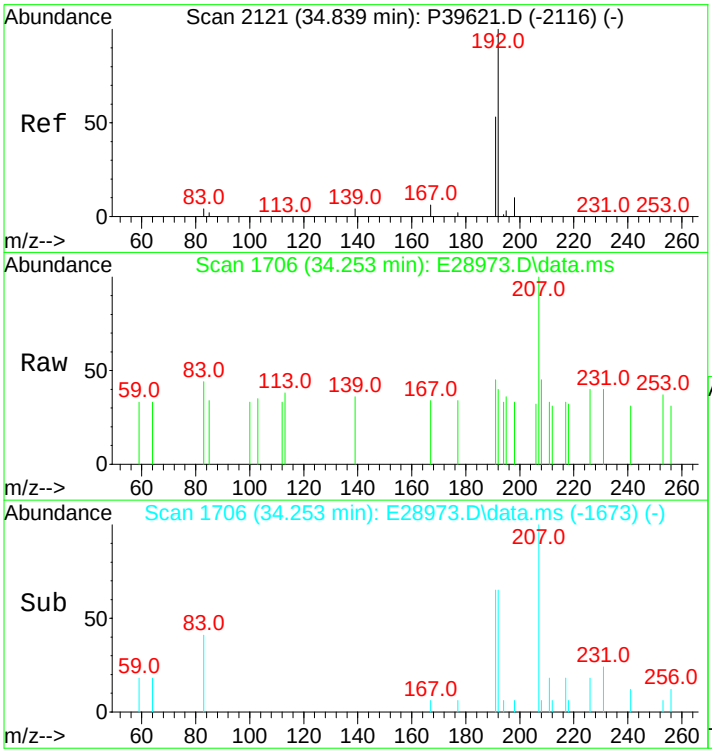


#44
3-Methylphenanthrene(3MP)
Concen: 0.63 ng/mL m
RT: 34.148 min Scan# 1699
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:192 Resp: 50

Ion	Ratio	Lower	Upper
192	100		
191	0.0	45.9	68.9#

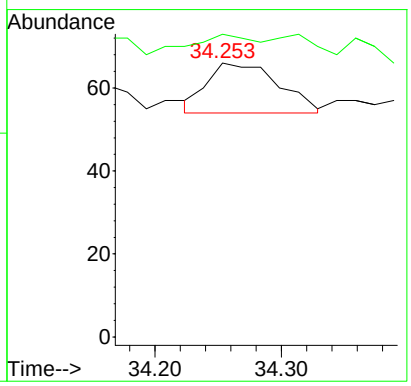


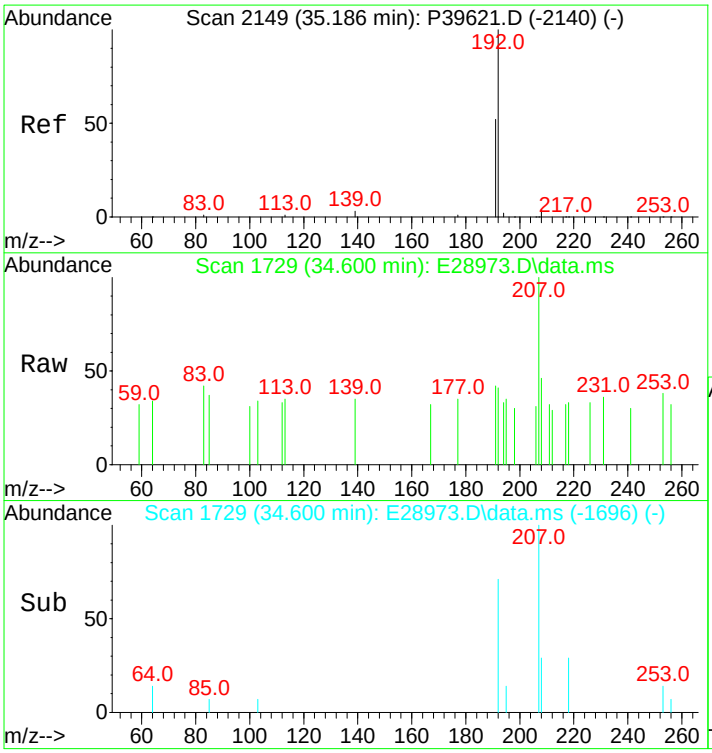


#45
2-Methylphenanthrene(2MP)
Concen: 0.59 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:192 Resp: 47

Ion	Ratio	Lower	Upper
192	100		
191	6597.9	45.4	68.0#

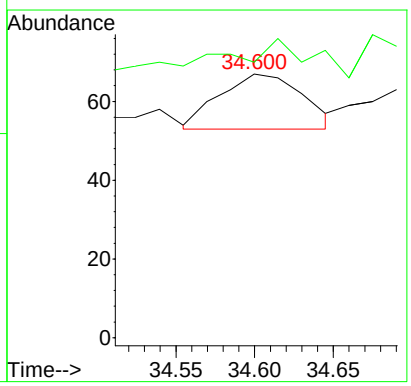


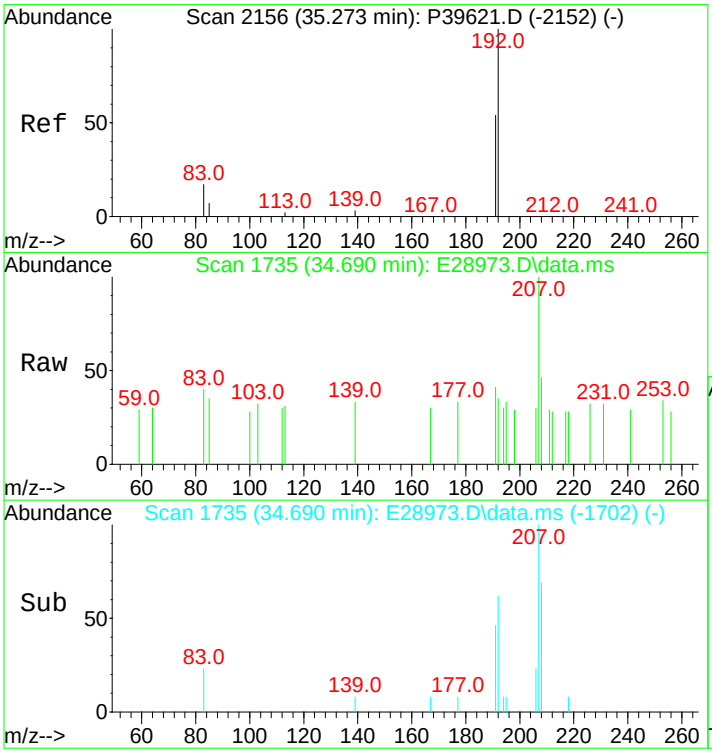


#47
9/4-Methylphenanthrene(9MP)
Concen: 0.64 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:192 Resp: 51

Ion	Ratio	Lower	Upper
192	100		
191	0.0	44.3	66.5#

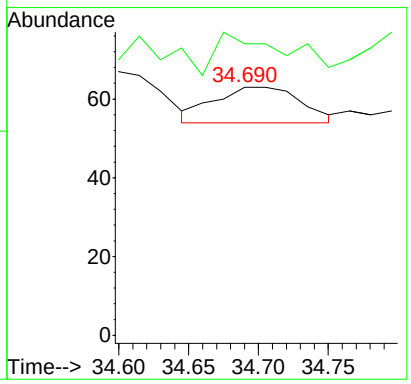


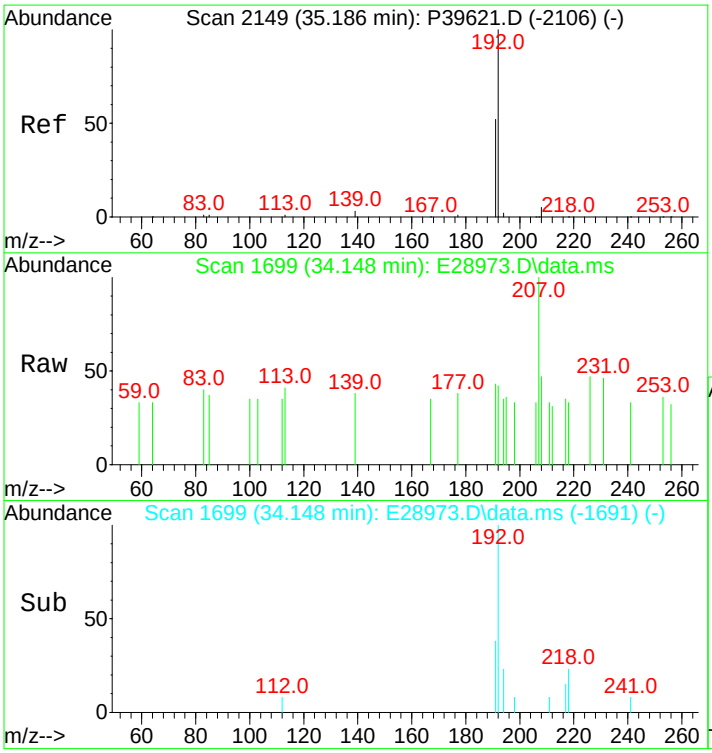


#48
1-Methylphenanthrene(1MP)
Concen: 0.49 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:192 Resp: 39

Ion	Ratio	Lower	Upper
192	100		
191	0.0	46.7	70.1#

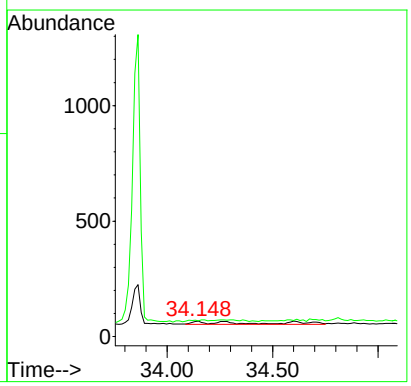


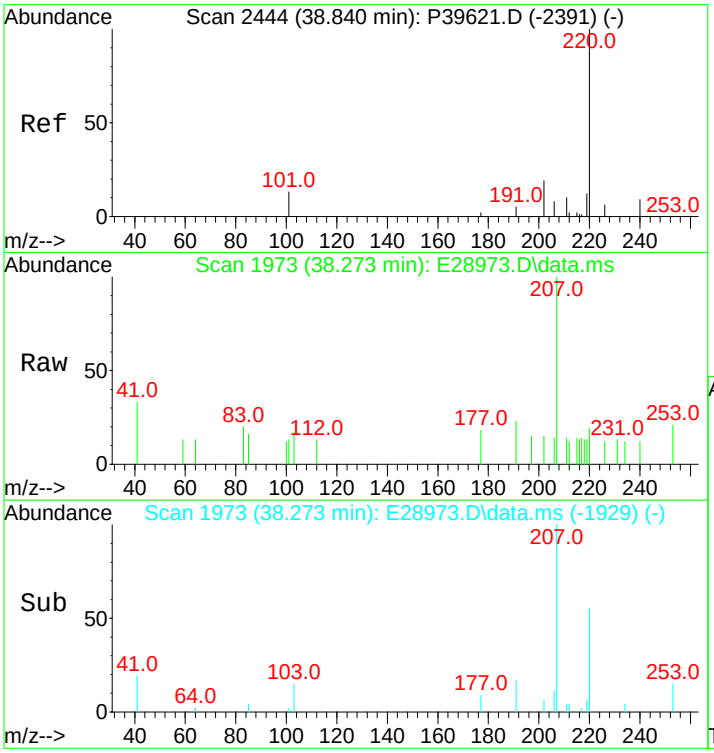


#49
C1-Phenanthrenes/Anthracenes
Concen: 3.23 ng/mL m
RT: 34.148 min Scan# 1699
Delta R.T. -0.255 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:192 Resp: 256

Ion	Ratio	Lower	Upper
192	100		
191	0.0	44.0	66.0#

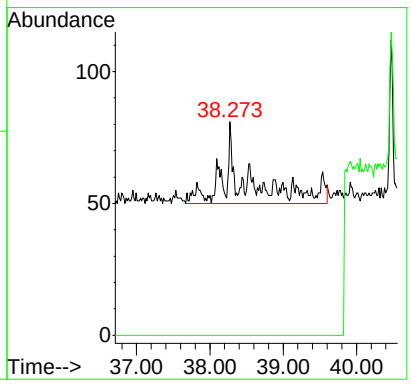


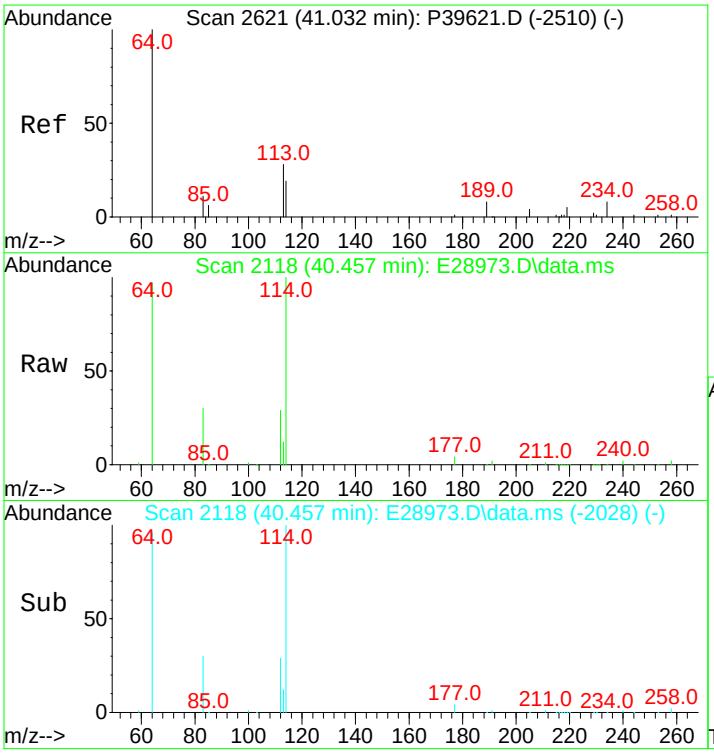


#52
C3-Phenanthrenes/Anthracenes
Concen: 8.62 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:220 Resp: 683

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

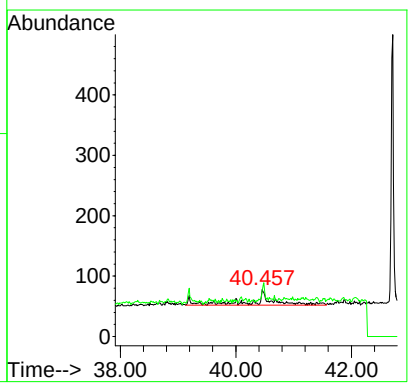


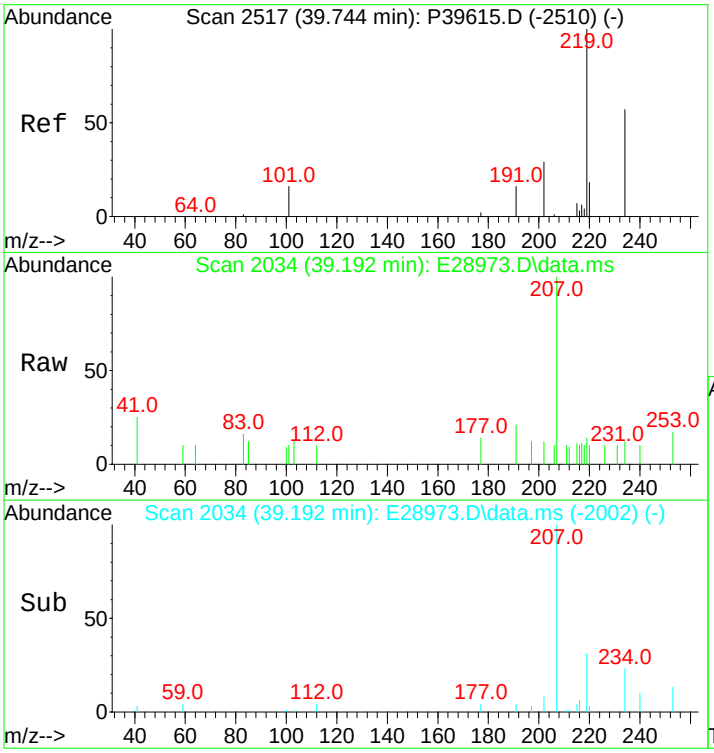


#53
C4-Phenanthrenes/Anthracenes
Concen: 7.65 ng/mL m
RT: 40.457 min Scan# 2118
Delta R.T. 0.369 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:234 Resp: 606

Ion	Ratio	Lower	Upper
234	100		
219	0.0	46.6	70.0#

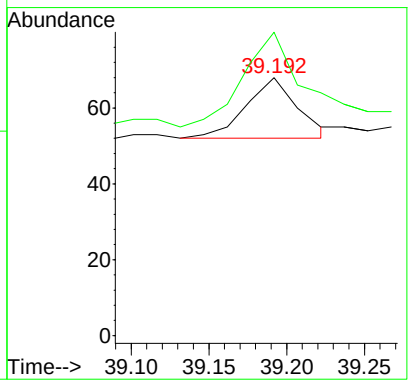


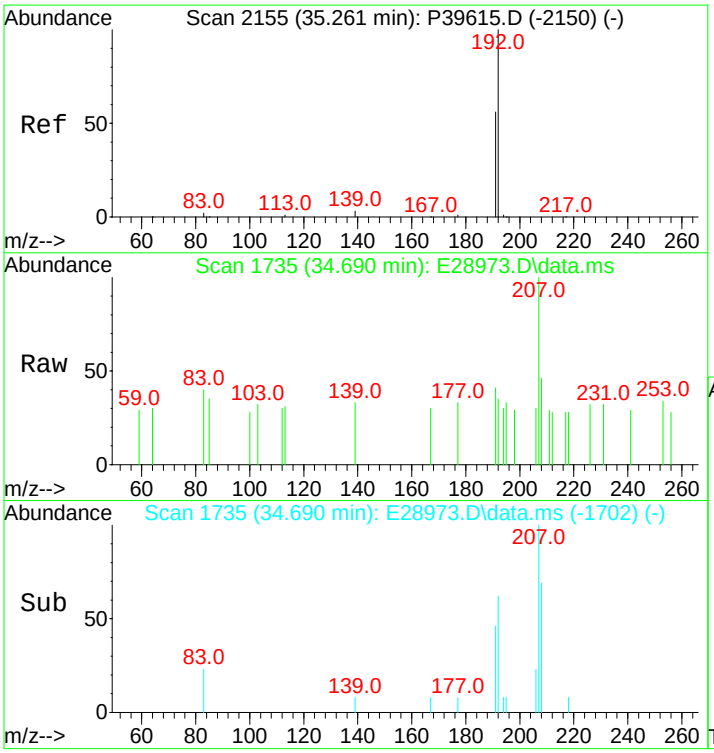


#54
Retene
Concen: 1.45 ng/mL m
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:234 Resp: 37

Ion	Ratio	Lower	Upper
234	100		
219	0.0	115.3	172.9#

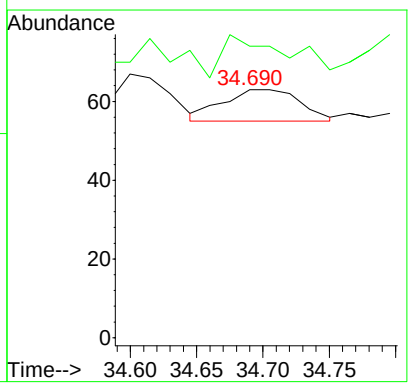


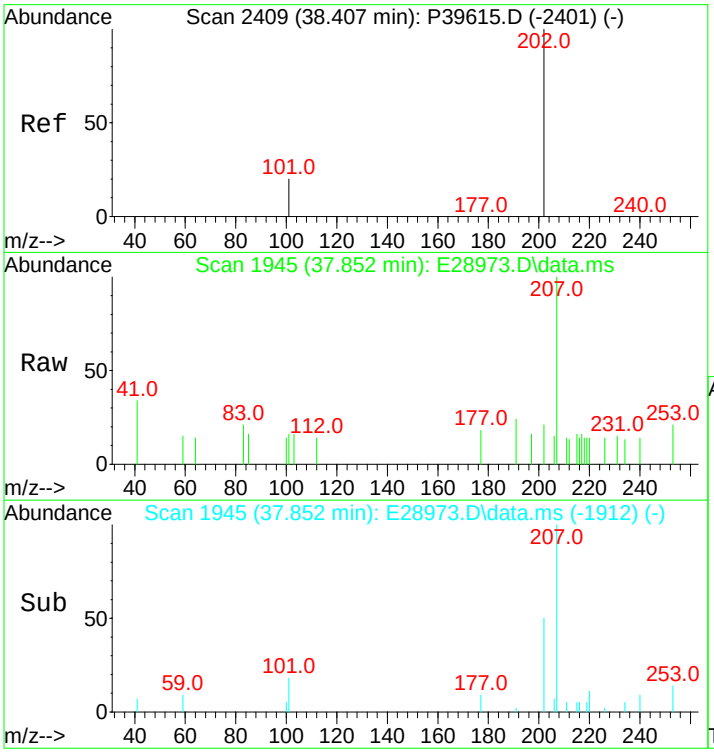


#57
1-Methylphenanthrene
Concen: 0.55 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:192 Resp: 33

Ion	Ratio	Lower	Upper
192	100		
191	0.0	45.4	68.2#

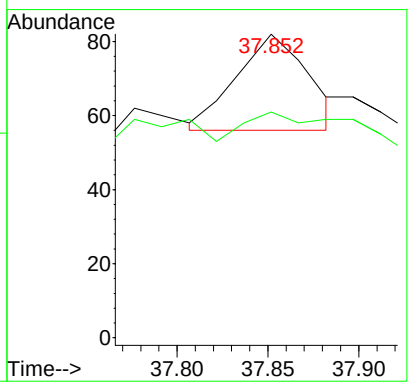


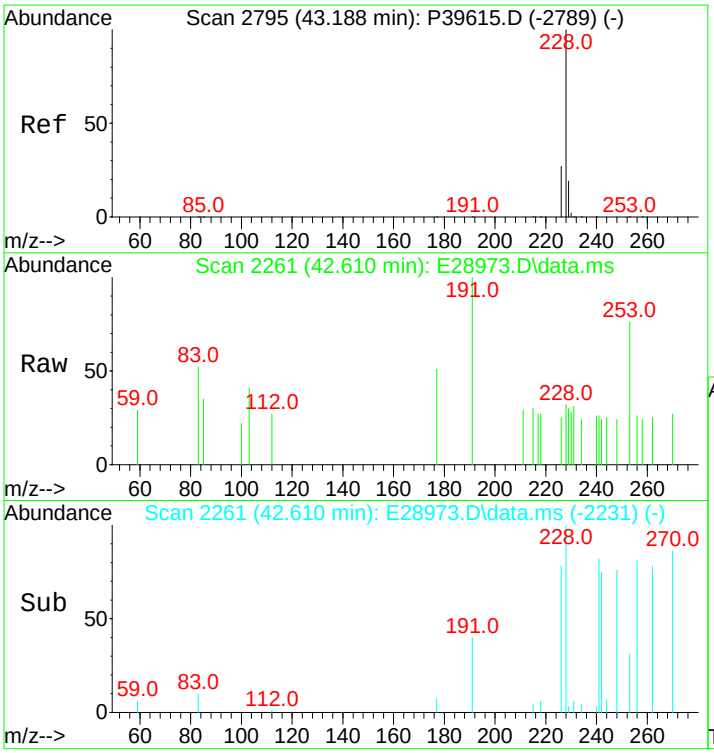


#60
Pyrene
Concen: 0.80 ng/mL m
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:202 Resp: 71

Ion	Ratio	Lower	Upper
202	100		
101	0.0	11.0	16.4#

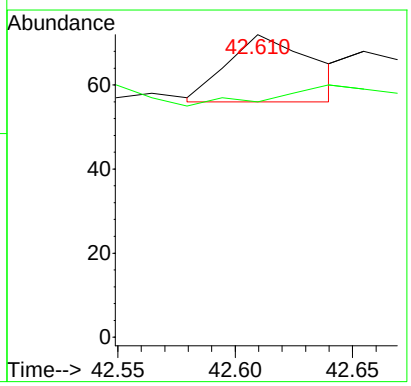


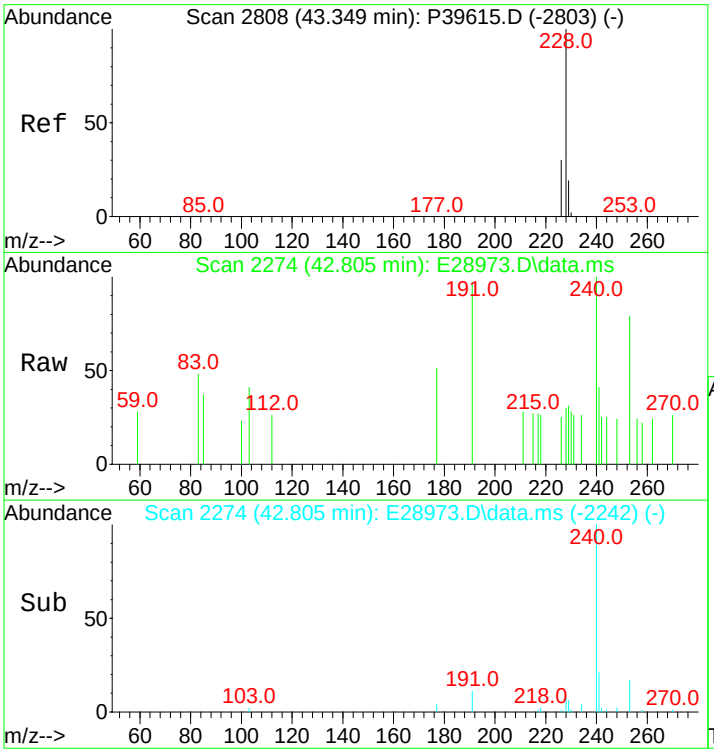


#75
Benz[a]anthracene
Concen: 0.47 ng/mL m
RT: 42.610 min Scan# 2261
Delta R.T. -0.045 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:228 Resp: 41

Ion	Ratio	Lower	Upper
228	100		
226	0.0	20.7	31.1#

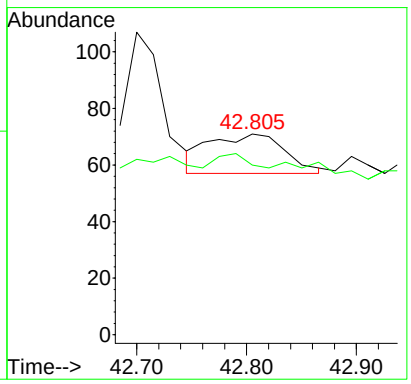


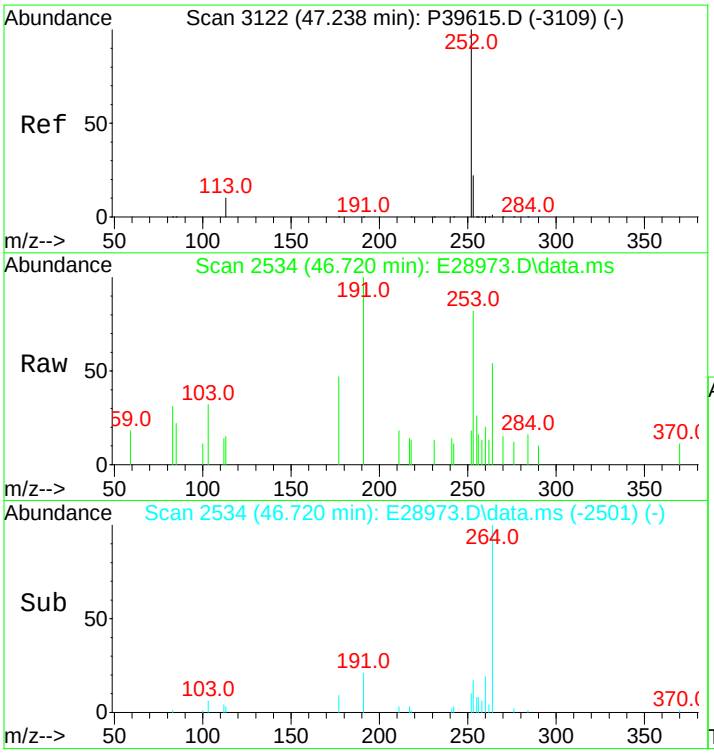


#77
Chrysene/Triphenylene
Concen: 0.75 ng/mL m
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:228 Resp: 67

Ion	Ratio	Lower	Upper
228	100		
226	0.0	22.6	34.0#

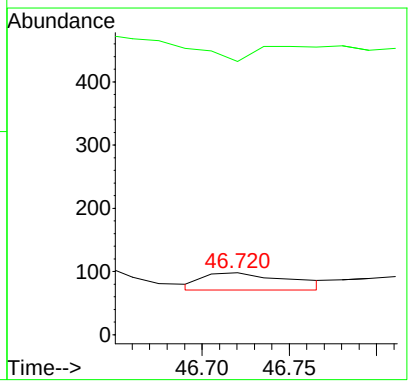


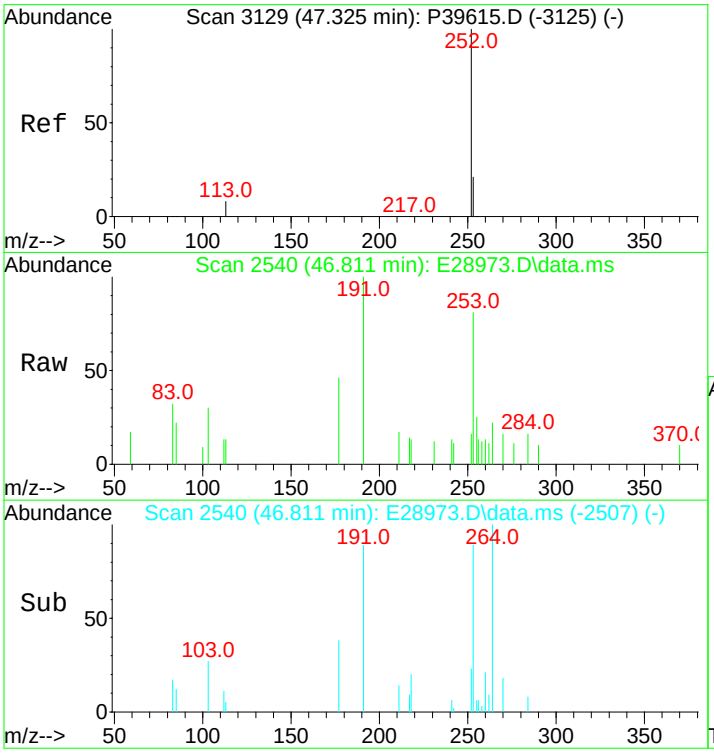


#84
Benzo[b]fluoranthene
Concen: 0.92 ng/mL m
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:252 Resp: 93

Ion	Ratio	Lower	Upper
252	100		
253	292.5	19.5	29.3#

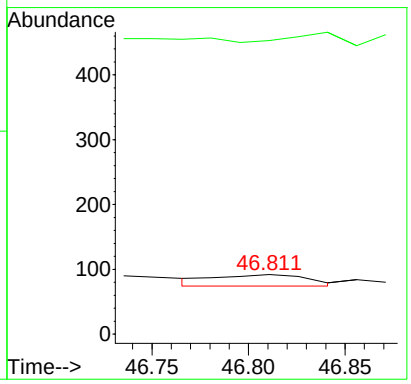


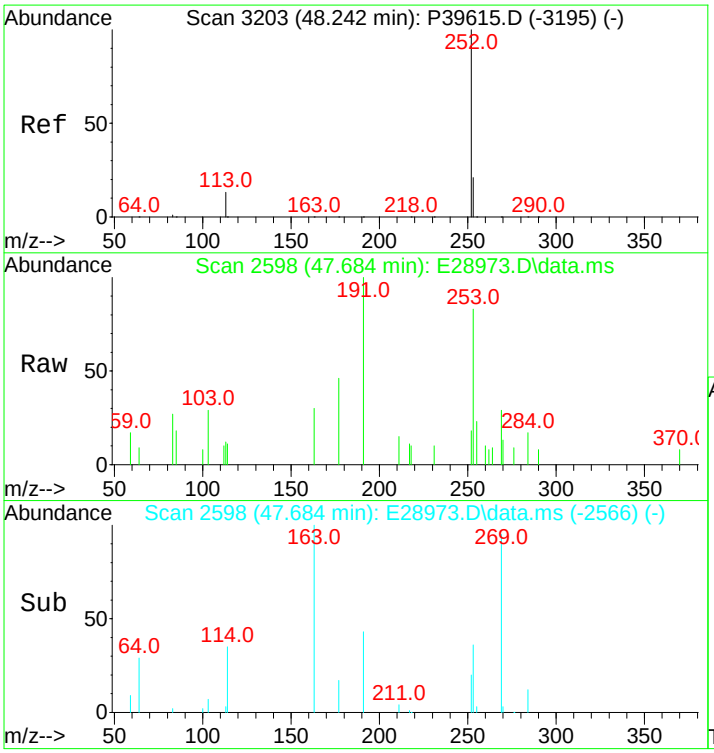


#85
Benzo[j]+[k]fluoranthene
Concen: 0.58 ng/mL m
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:252 Resp: 60

Ion	Ratio	Lower	Upper
252	100		
253	453.3	19.7	29.5#

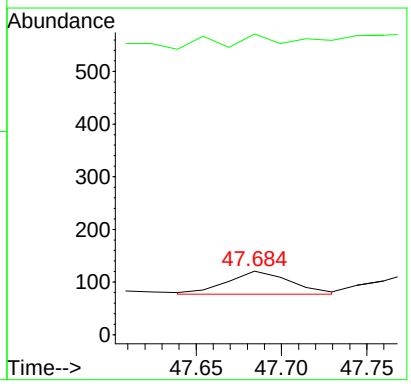


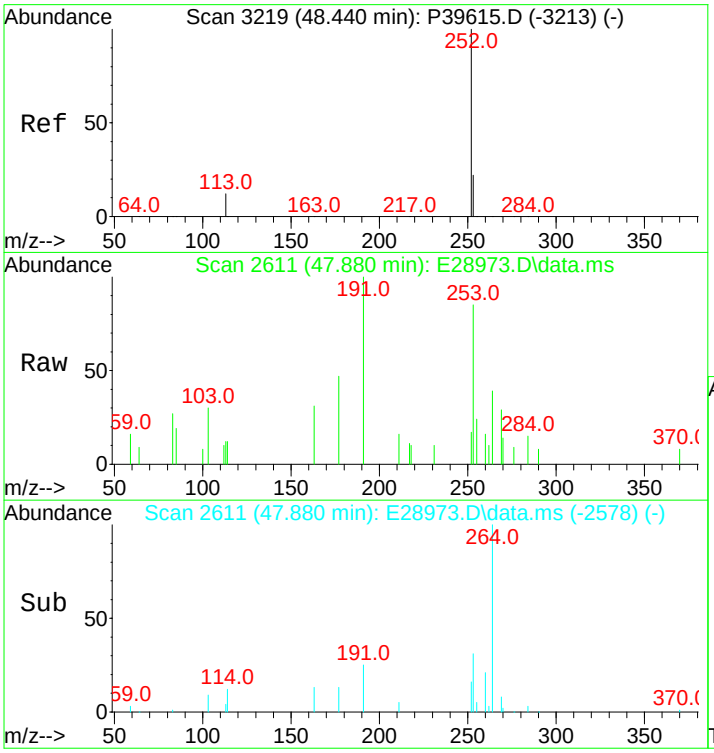


#87
Benzo[e]pyrene
Concen: 1.14 ng/mL m
RT: 47.684 min Scan# 2598
Delta R.T. -0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:252 Resp: 113

Ion	Ratio	Lower	Upper
252	100		
253	0.0	20.6	31.0#

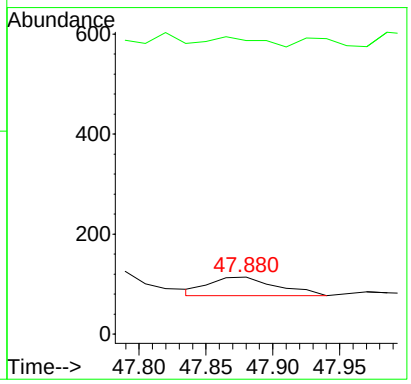


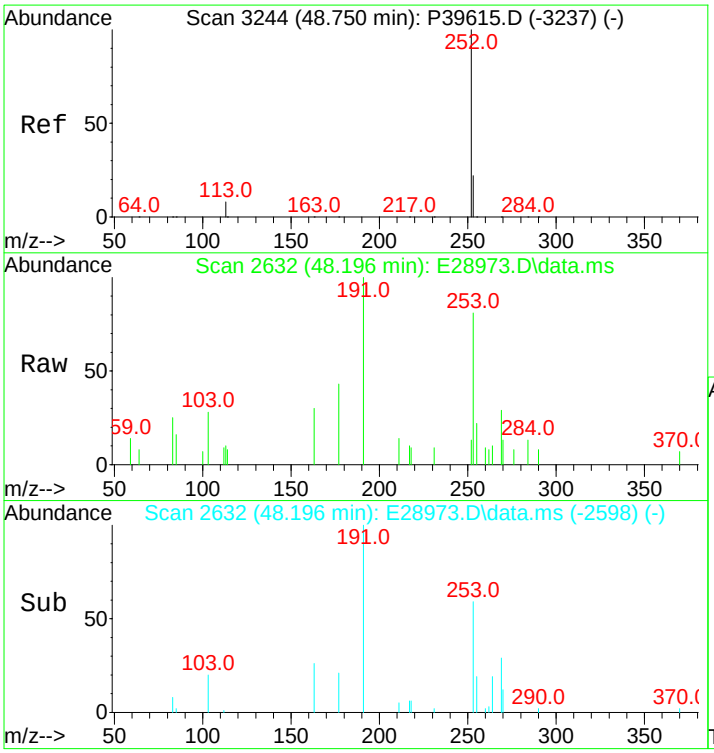


#89
Benzo[a]pyrene
Concen: 1.37 ng/mL
RT: 47.880 min Scan# 2611
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:252 Resp: 130

Ion	Ratio	Lower	Upper
252	100		
253	0.0	20.8	31.2#

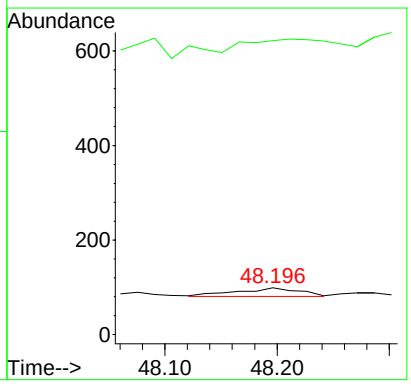


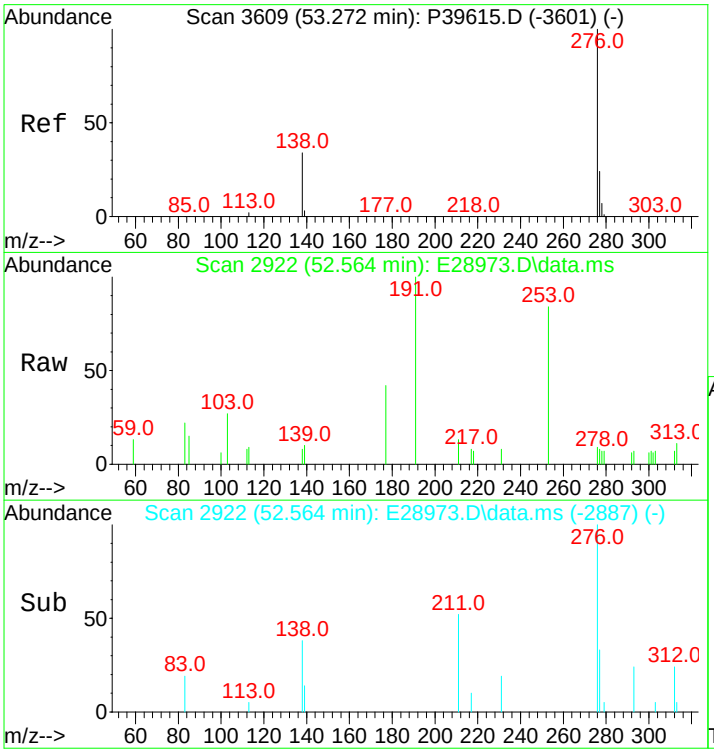


#90
Perylene
Concen: 0.70 ng/mL m
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:252 Resp: 70

Ion	Ratio	Lower	Upper
252	100		
253	0.0	20.7	31.1#

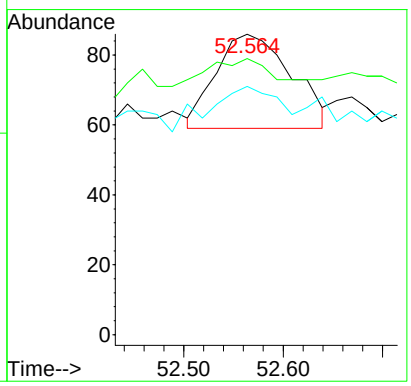


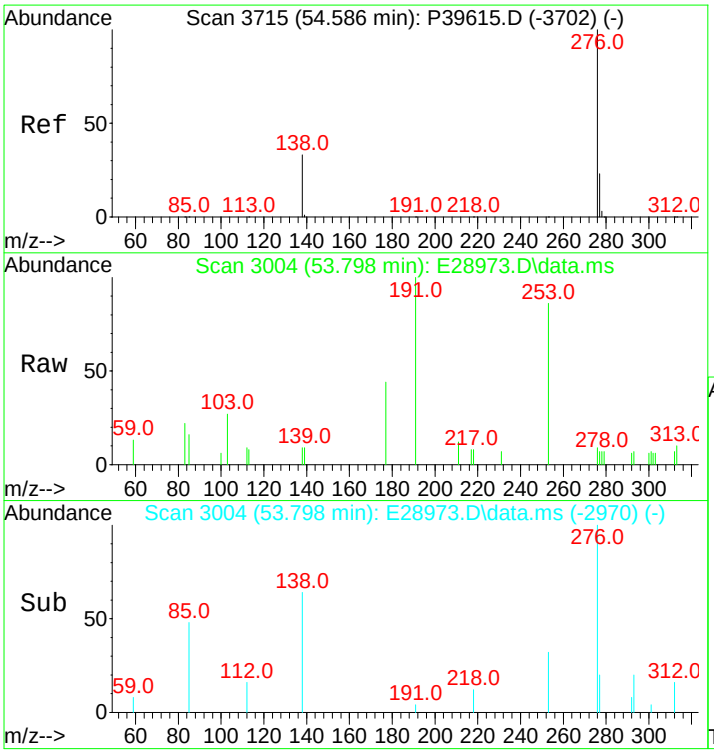


#91
Indeno[1,2,3-cd]pyrene
Concen: 1.28 ng/mL m
RT: 52.564 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:276 Resp: 143

Ion	Ratio	Lower	Upper
276	100		
138	0.0	16.3	24.5#
277	0.0	19.4	29.2#

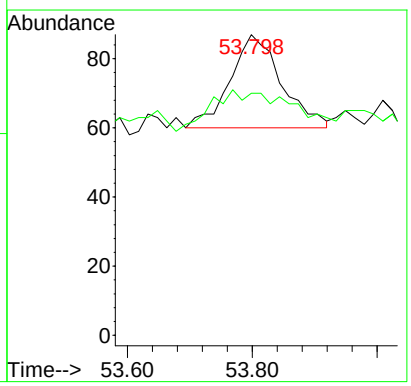


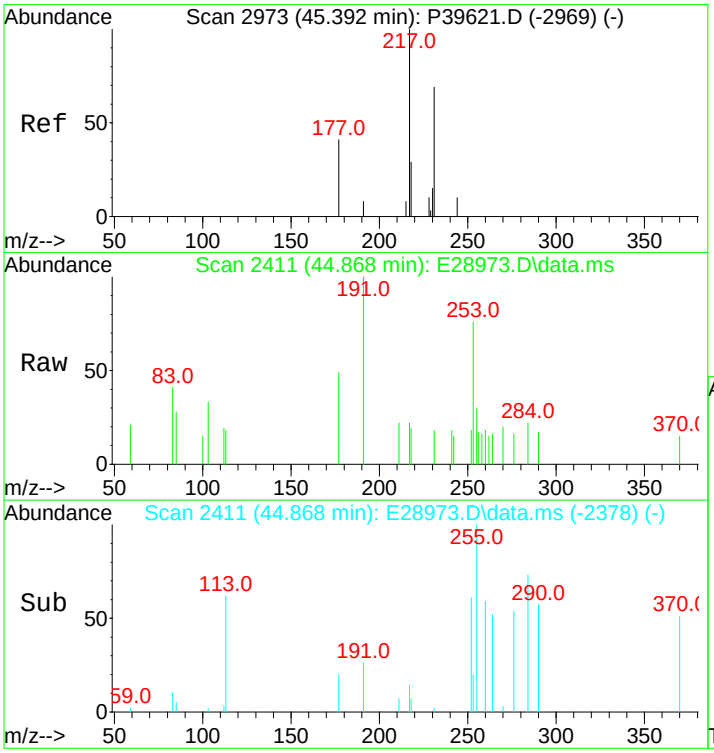


#93
Benzo[g,h,i]perylene
Concen: 1.29 ng/mL
RT: 53.798 min Scan# 3004
Delta R.T. 0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:276 Resp: 155

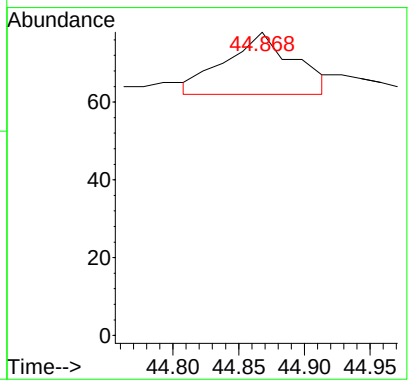
Ion	Ratio	Lower	Upper
276	100		
277	0.0	19.1	28.7#

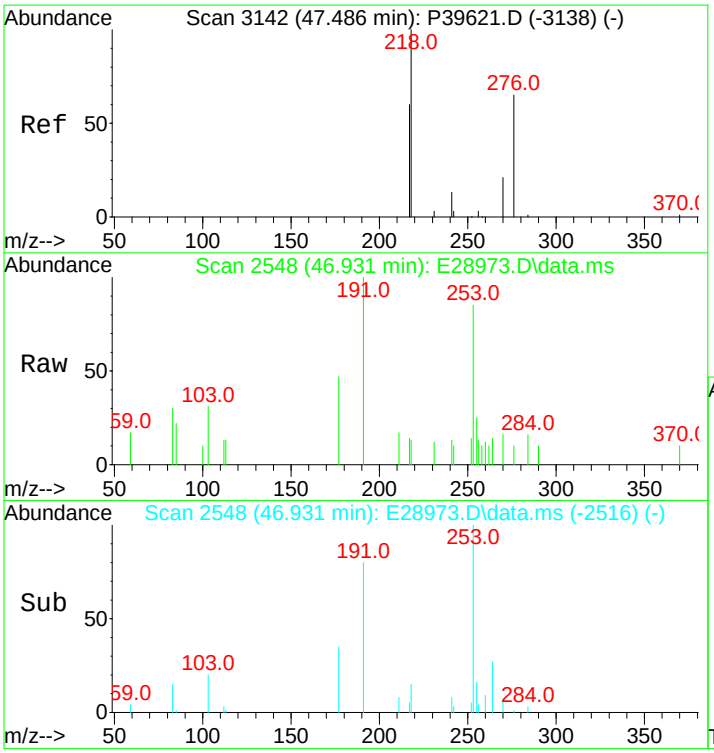




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 3.29 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. 0.000 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

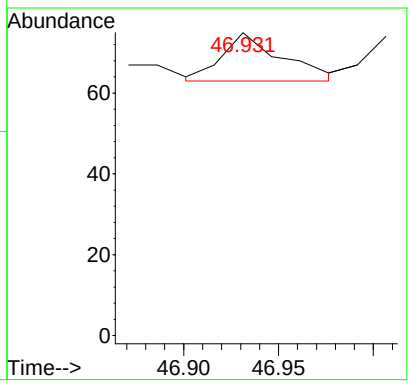
Tgt Ion:217 Resp: 58

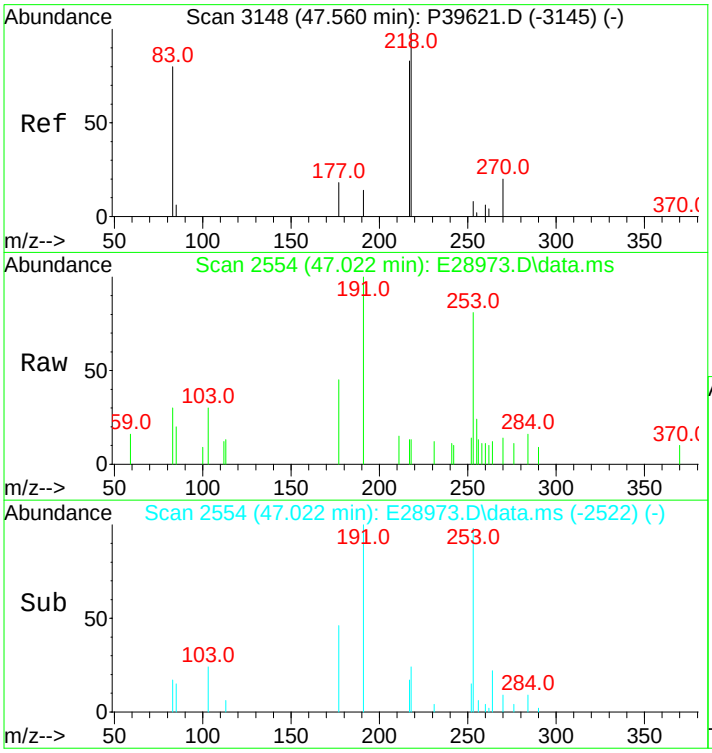




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 1.48 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. -0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

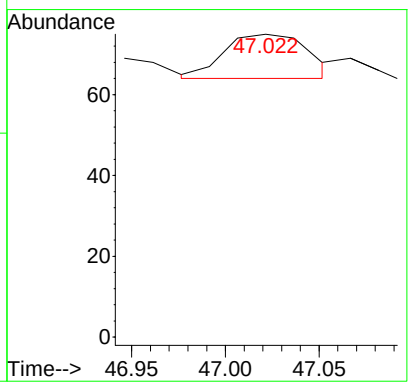
Tgt Ion:218 Resp: 26

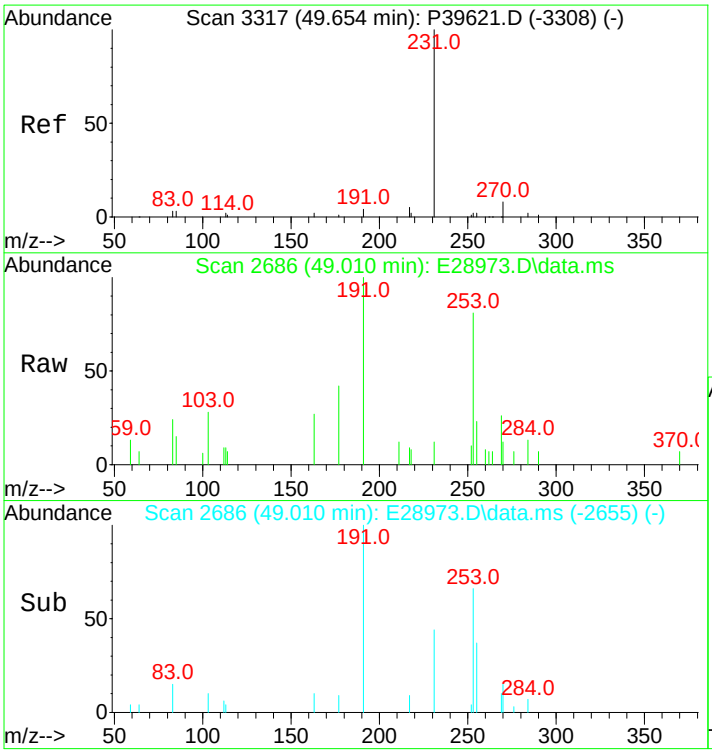




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 1.93 ng/ml m
RT: 47.022 min Scan# 2554
Delta R.T. -0.015 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

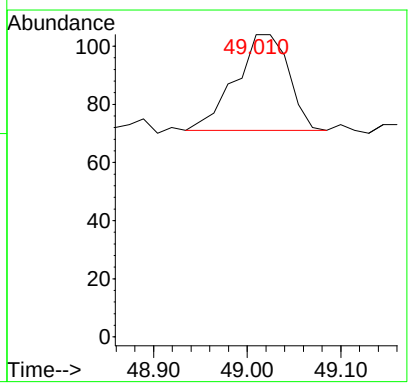
Tgt Ion:218 Resp: 34

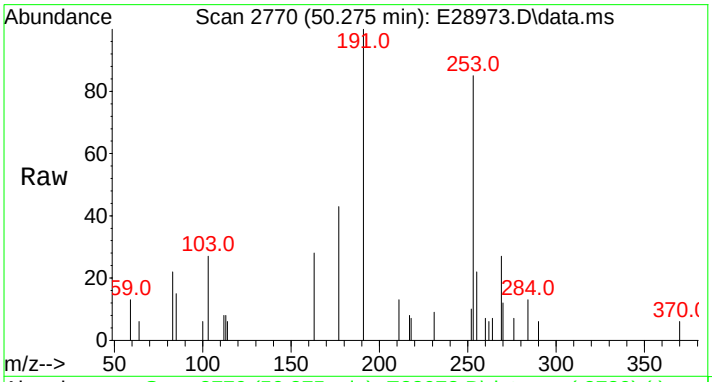




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 7.43 ng/mL
RT: 49.010 min Scan# 2686
Delta R.T. -0.030 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

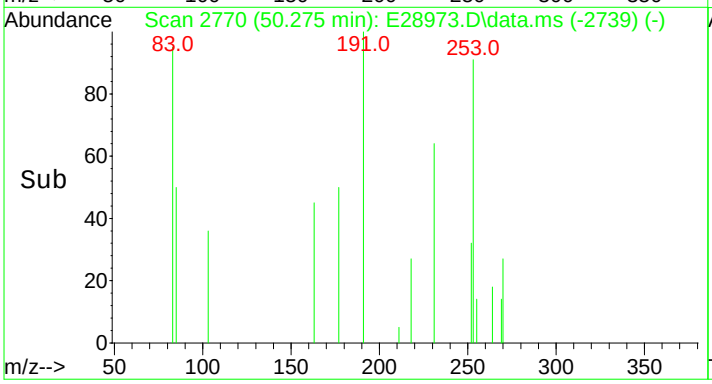
Tgt Ion:231 Resp: 131

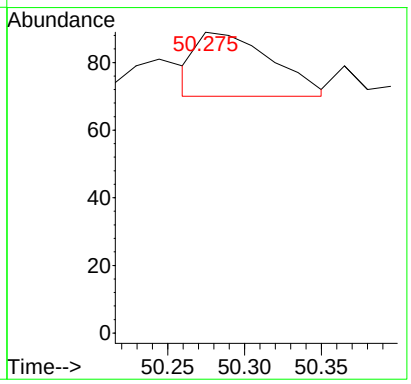




#149
C27,20R-triaromatic steroid
Concen: 3.63 ng/mL m
RT: 50.275 min Scan# 2770
Delta R.T. -0.030 min
Lab File: E28973.D
Acq: 15 Nov 2012 12:24 am

Tgt Ion:231 Resp: 64





Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28975.D
Acq On : 15 Nov 2012 1:52 am
Operator : AC
Sample : SS110612LCS03
Misc : 1X ETR1210081
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Nov 16 12:28:43 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	21426	500.000	ng/mL	-0.01
74) Chrysene-d12	42.700	240	48231	500.000	ng/mL	-0.01
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	34976	464.094	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.41%#			
42) Phenanthrene-d10	32.070	188	35716	462.566	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.26%#			
83) Benzo[b]fluoranthene-d12	46.630	264	45712	461.374	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.14%#			
88) Benzo[a]pyrene-d12	47.775	264	42856	446.414	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.64%#			
129) 5B(H)Cholane - Surr	43.332	217	9157	481.721	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.17%#			
Target Compounds						Qvalue
10) Naphthalene	19.304	128	40633	482.120	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	25706	478.887	ng/mL#	100
26) Acenaphthylene	25.582	152	40255M3	479.073	ng/mL	
27) Acenaphthene	26.320	153	25644	474.123	ng/mL	97
29) Fluorene	28.337	166	29050M3	481.566	ng/mL	
43) Phenanthrene	32.161	178	40146	476.674	ng/mL	99
55) Anthracene	32.356	178	38530M3	529.282	ng/mL	
58) Fluoranthene	36.948	202	47053M3	505.895	ng/mL	
60) Pyrene	37.837	202	48380	511.762	ng/mL	98
75) Benz[a]anthracene	42.640	228	46585	496.004	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	46573	481.658	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	53957	494.260	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.796	252	55471	493.891	ng/mL	94
89) Benzo[a]pyrene	47.865	252	50668	496.763	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.519	276	61779M3	514.667	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	59242	463.504	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	58446	451.567	ng/mL	100
141) 14b(H),17b(H)-20R-Cholest	46.630	218	238	12.520	ng/ml	100

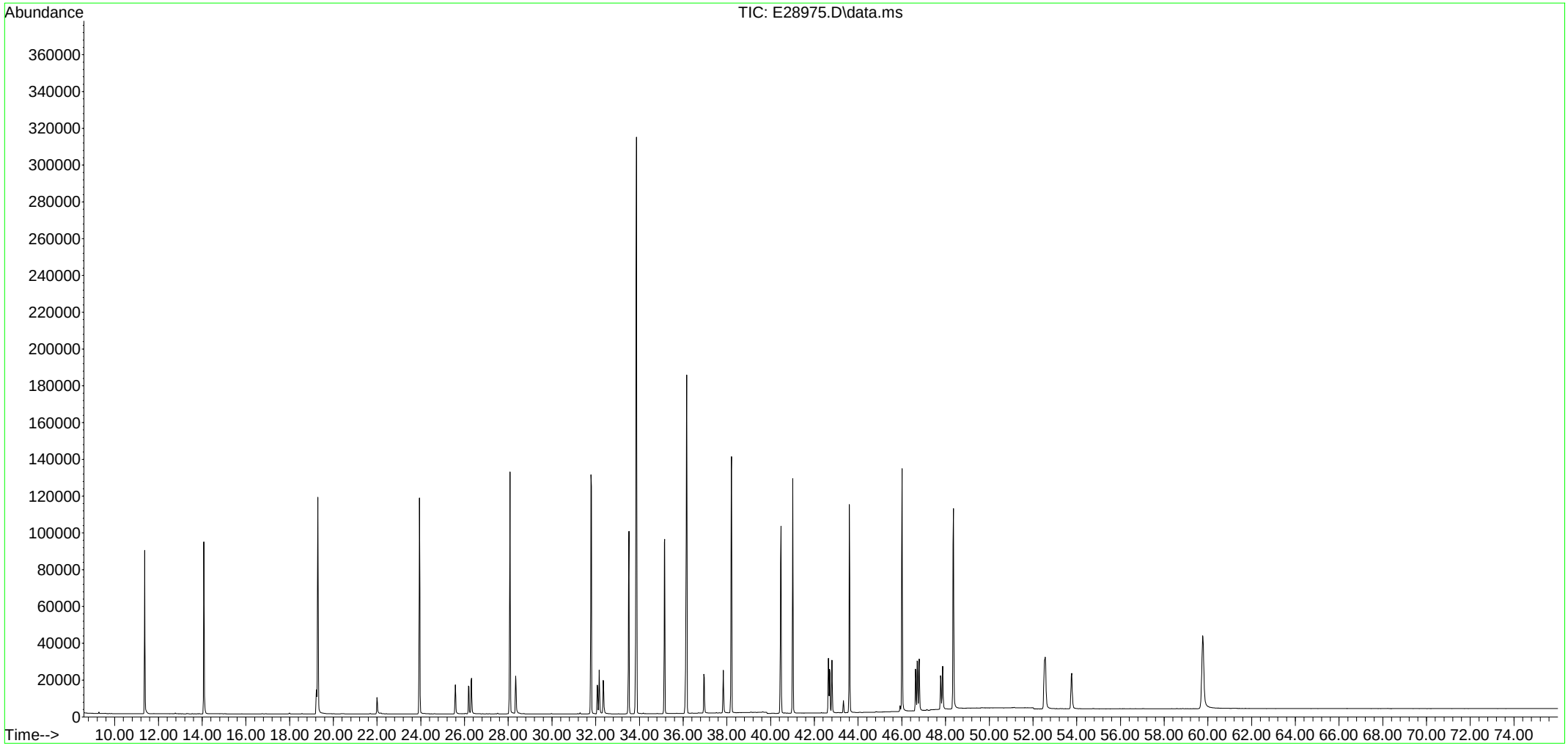
(#) = qualifier out of range (m) = manual integration (+) = signals summed

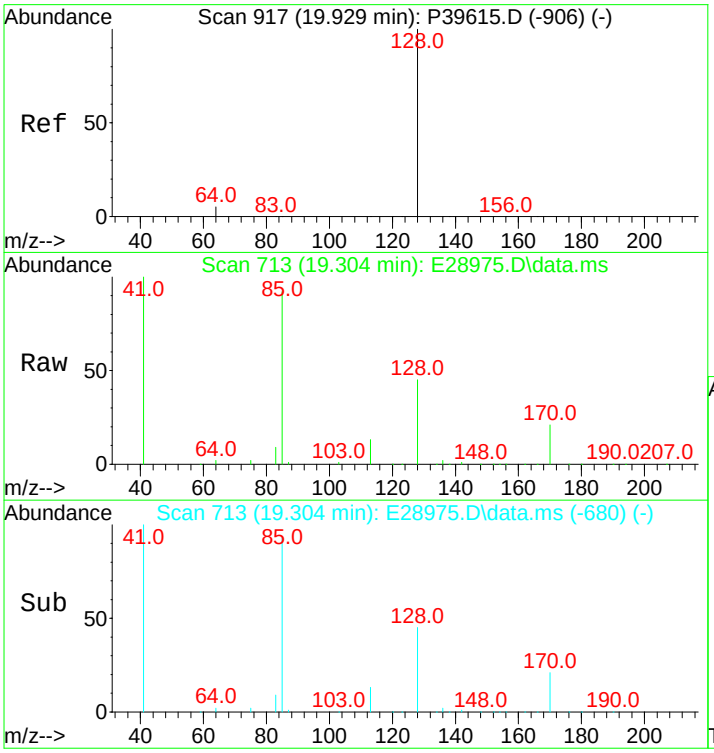
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28975.D
Acq On : 15 Nov 2012 1:52 am
Operator : AC
Sample : SS110612LCS03
Misc : 1X ETR1210081
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Nov 16 12:28:43 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

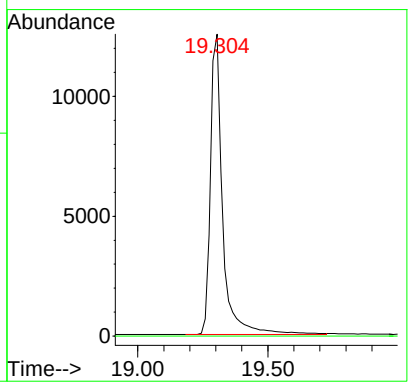


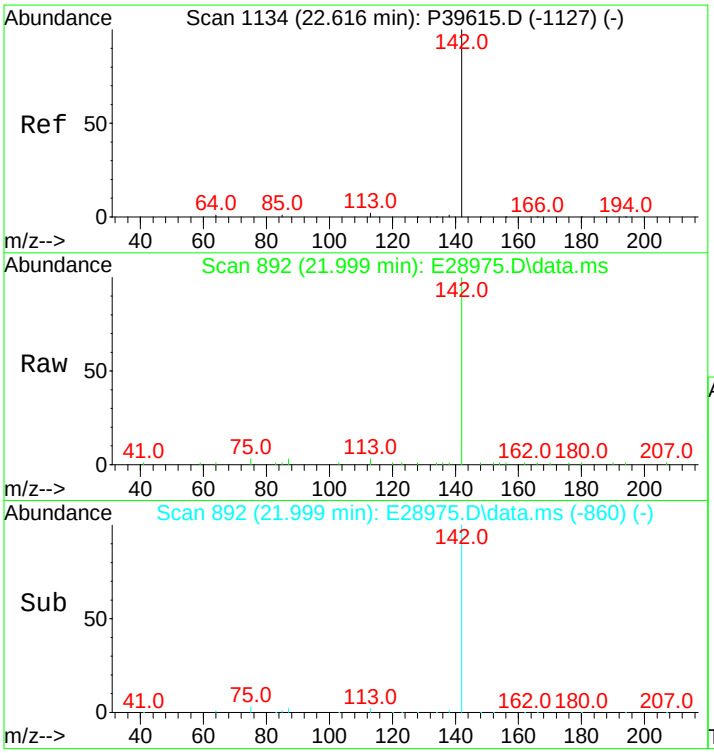


#10
Naphthalene
Concen: 482.12 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:128 Resp: 40633

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

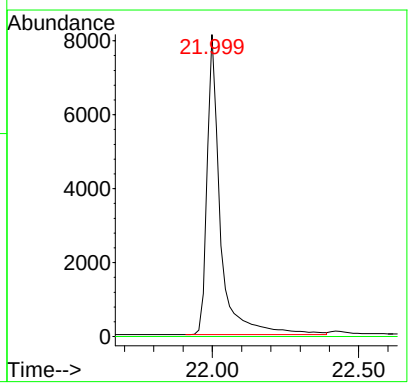


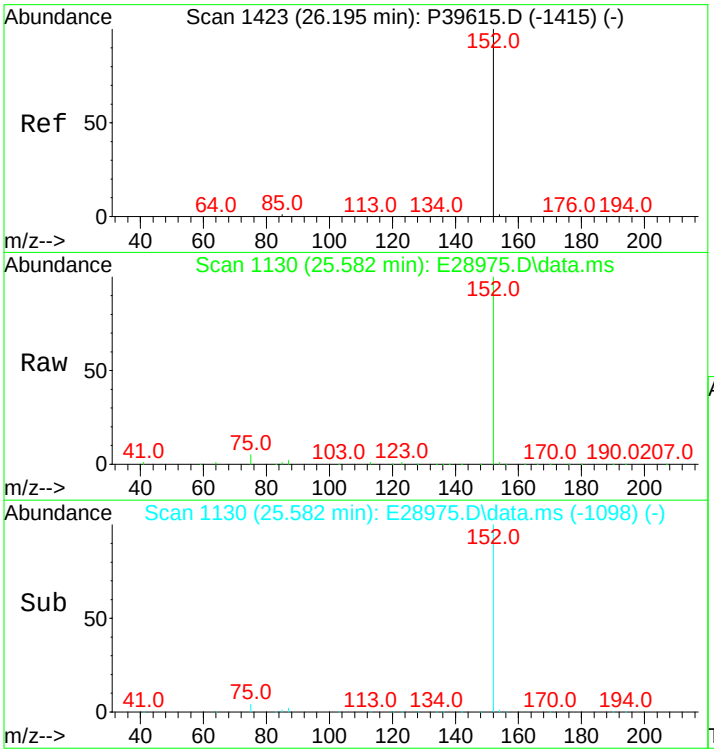


#16
2-Methylnaphthalene
Concen: 478.89 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:142 Resp: 25706

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

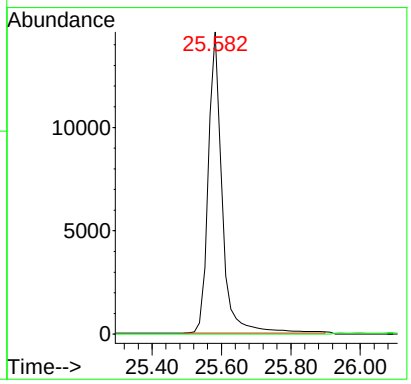


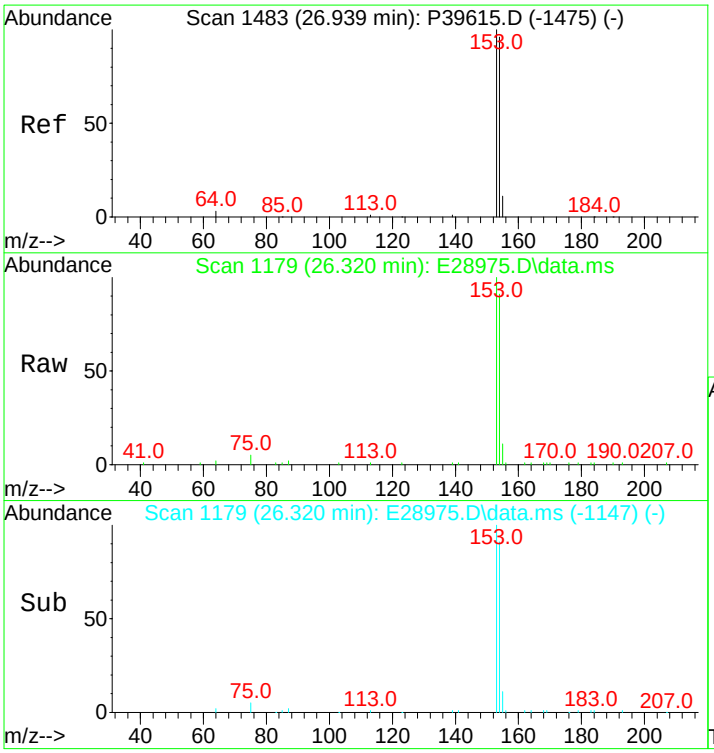


#26
Acenaphthylene
Concen: 479.07 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:152 Resp: 40255

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

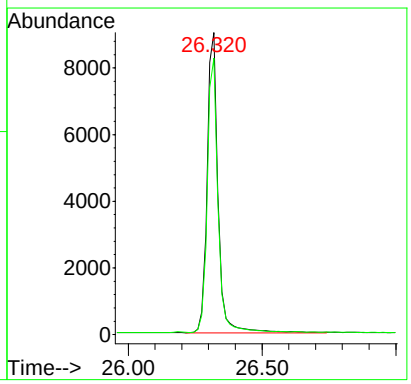


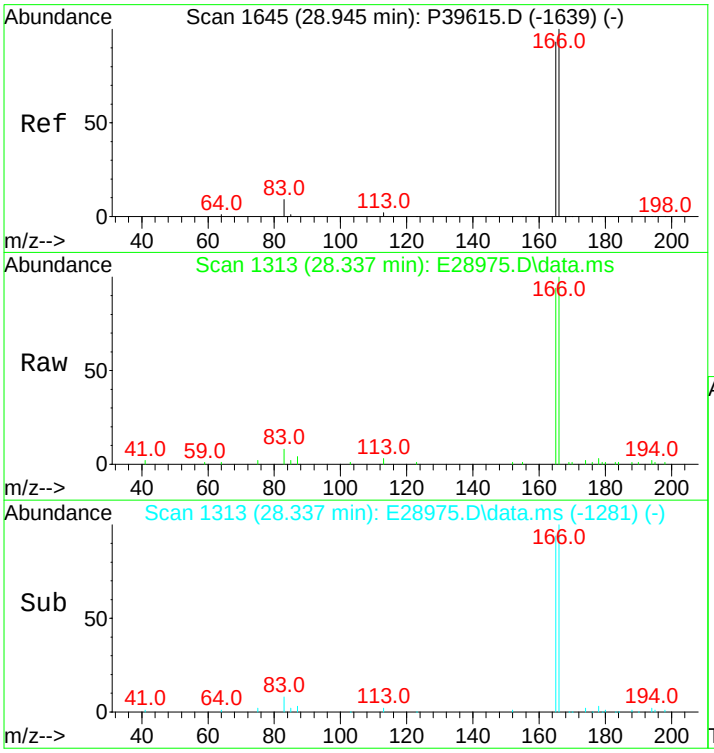


#27
Acenaphthene
Concen: 474.12 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:153 Resp: 25644

Ion	Ratio	Lower	Upper
153	100		
154	89.7	74.1	111.1

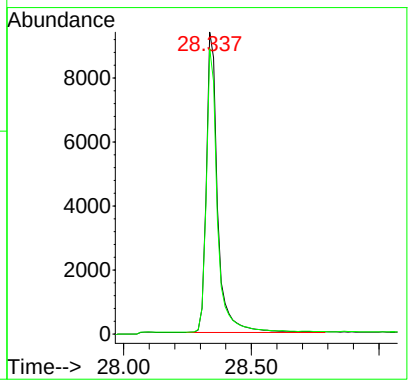


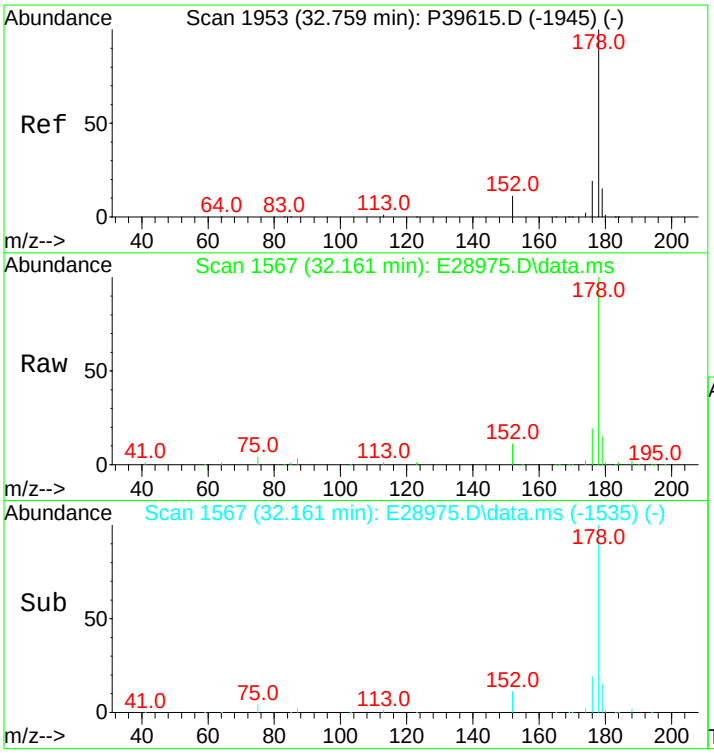


#29
Fluorene
Concen: 481.57 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:166 Resp: 29050

Ion	Ratio	Lower	Upper
166	100		
165	93.3	74.7	112.1

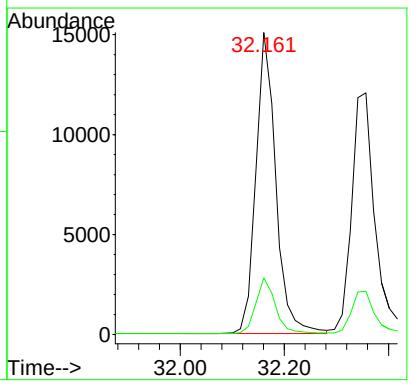


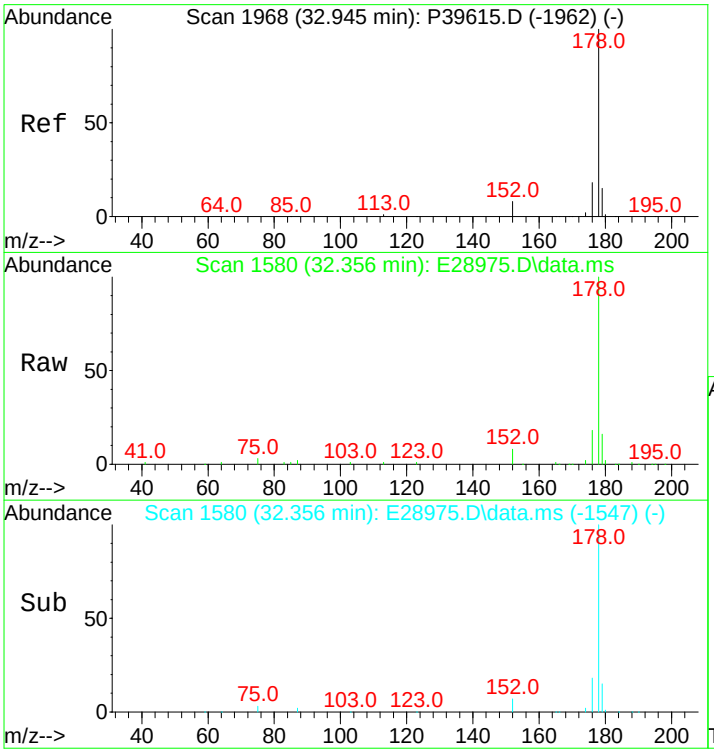


#43
Phenanthrene
Concen: 476.67 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:178 Resp: 40146

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.4

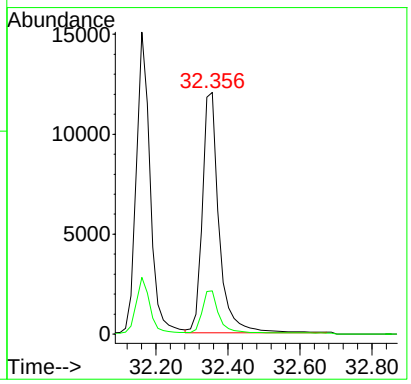


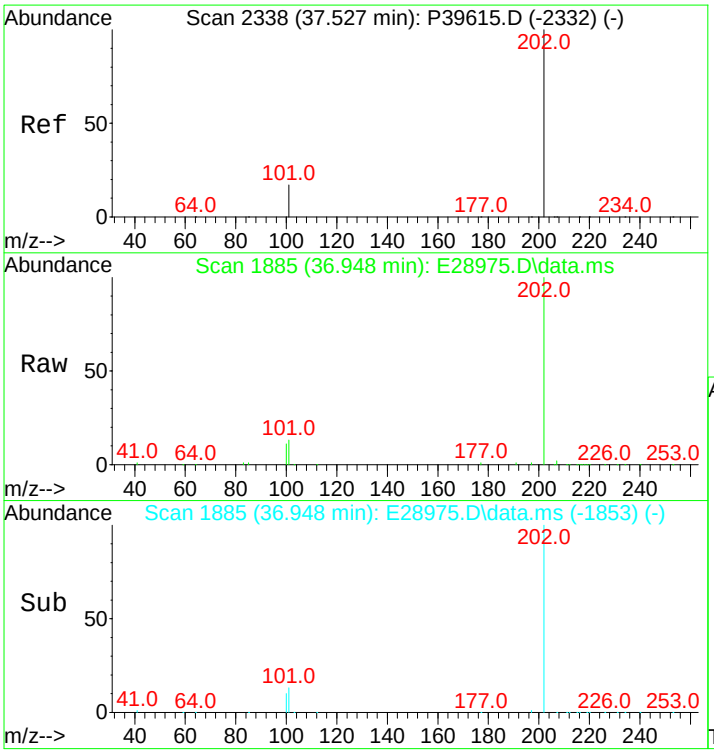


#55
Anthracene
Concen: 529.28 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. 0.000 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:178 Resp: 38530

Ion	Ratio	Lower	Upper
178	100		
176	17.4	14.3	21.5

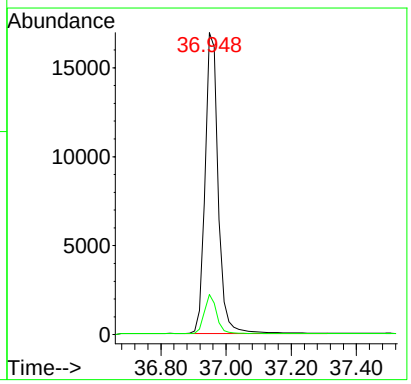


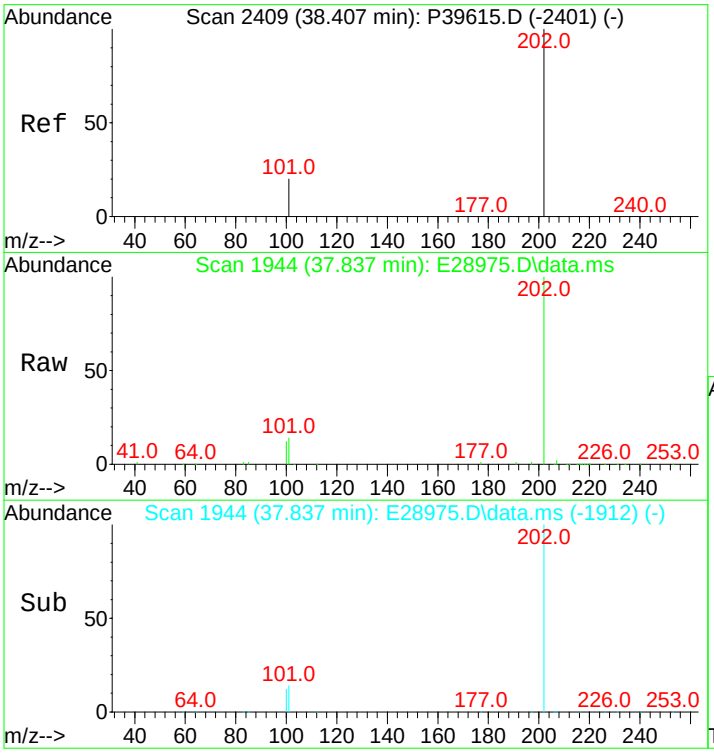


#58
Fluoranthene
Concen: 505.90 ng/mL m
RT: 36.948 min Scan# 1885
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:202 Resp: 47053

Ion	Ratio	Lower	Upper
202	100		
101	12.2	10.4	15.6

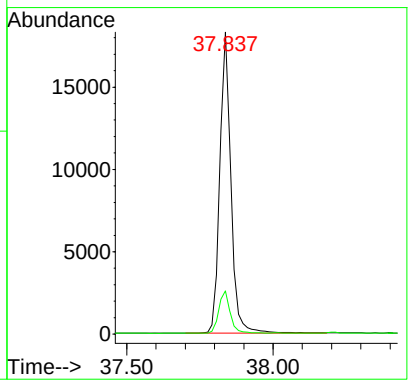


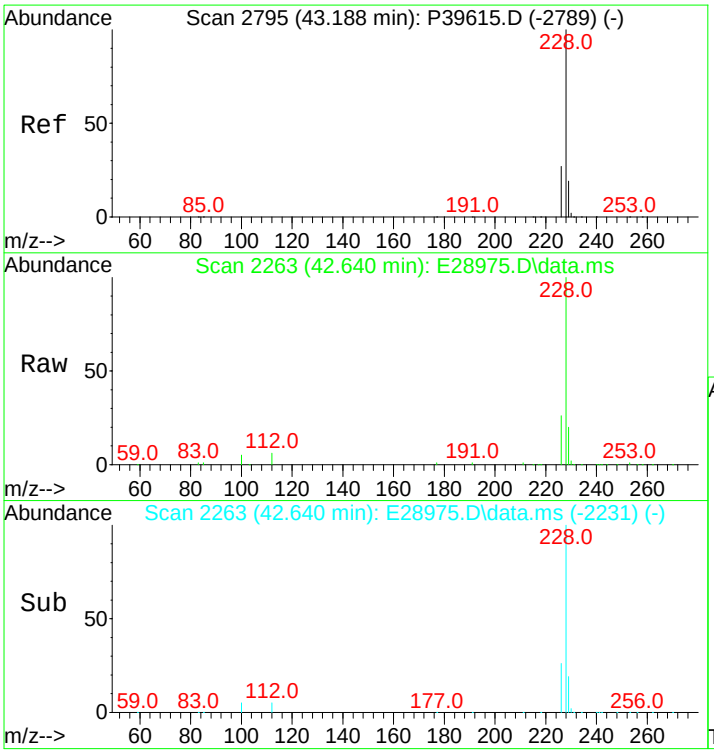


#60
Pyrene
Concen: 511.76 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:202 Resp: 48380

Ion	Ratio	Lower	Upper
202	100		
101	14.5	11.0	16.4

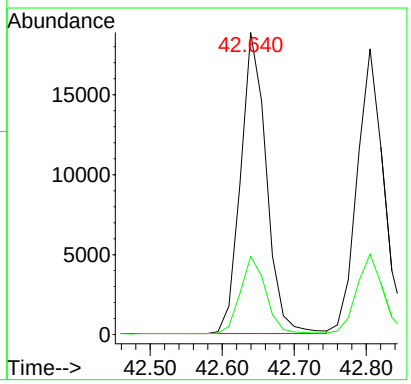


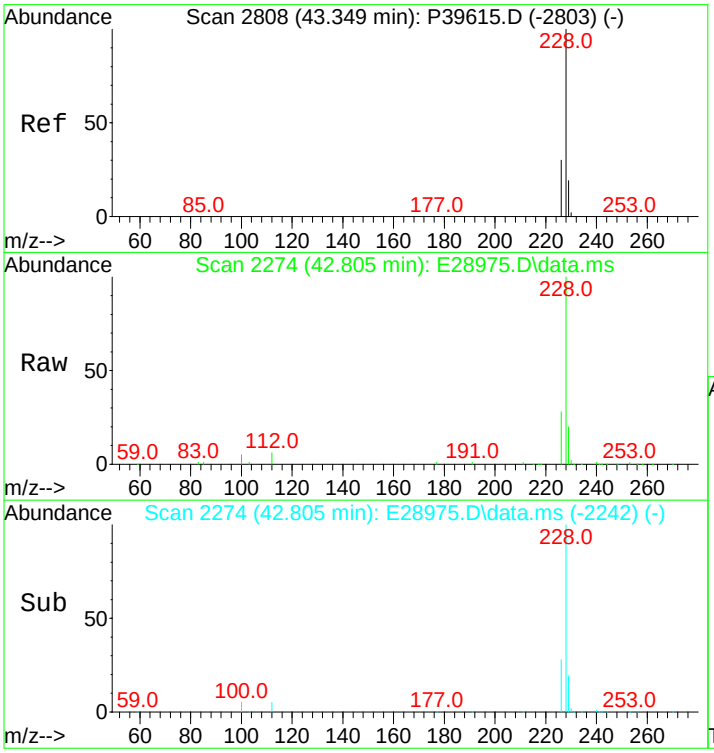


#75
Benz[a]anthracene
Concen: 496.00 ng/mL
RT: 42.640 min Scan# 2263
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:228 Resp: 46585

Ion	Ratio	Lower	Upper
228	100		
226	25.4	20.7	31.1

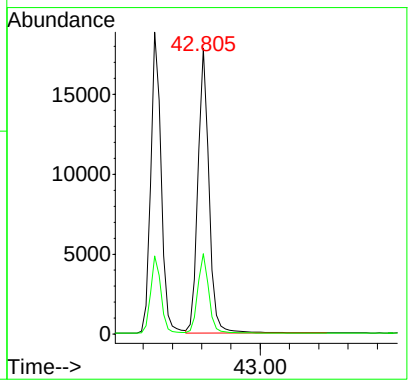


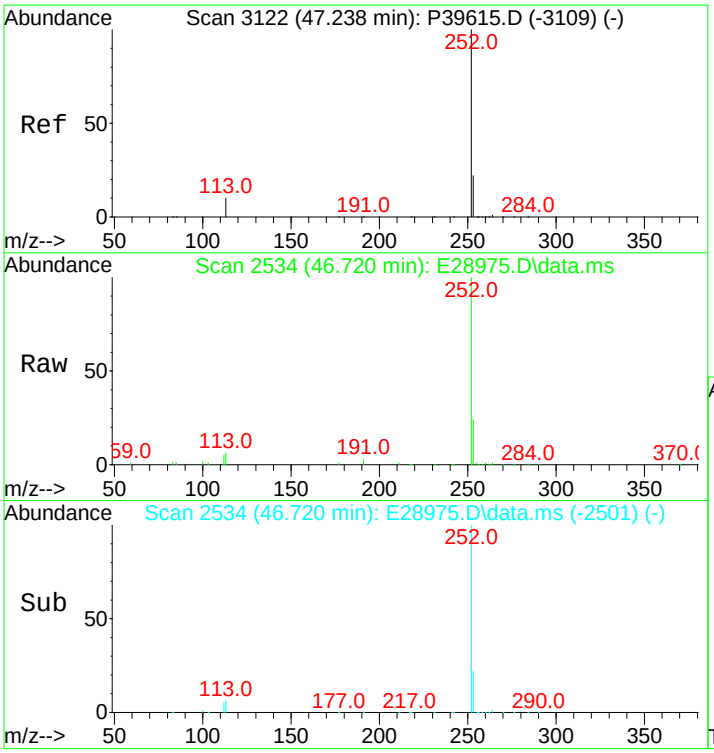


#77
Chrysene/Triphenylene
Concen: 481.66 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:228 Resp: 46573

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.6	34.0

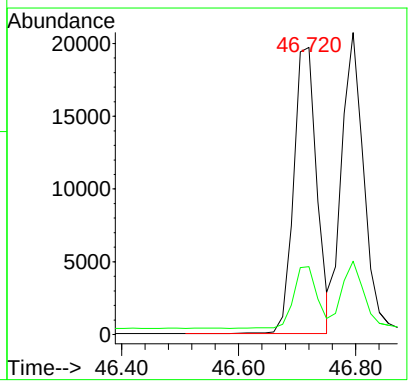


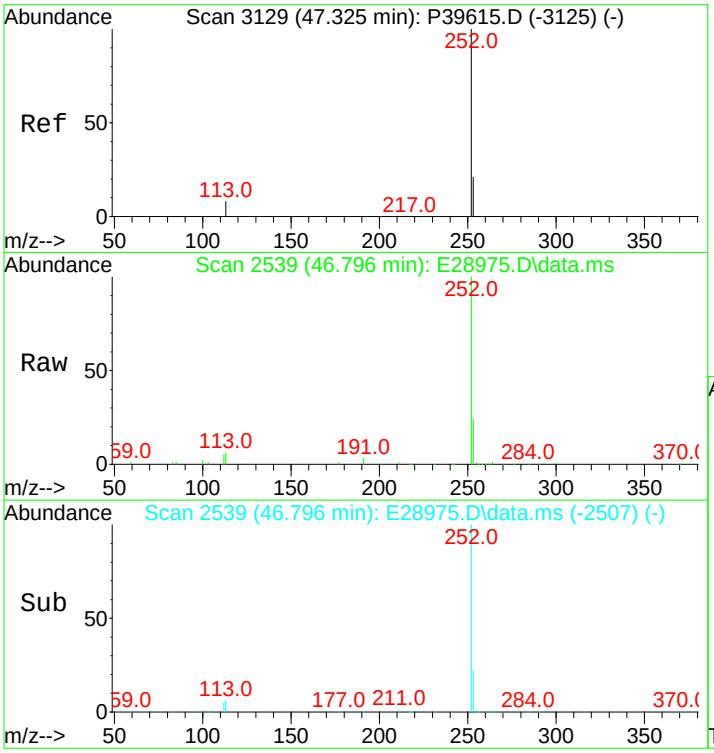


#84
Benzo[b]fluoranthene
Concen: 494.26 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:252 Resp: 53957

Ion	Ratio	Lower	Upper
252	100		
253	22.1	19.5	29.3

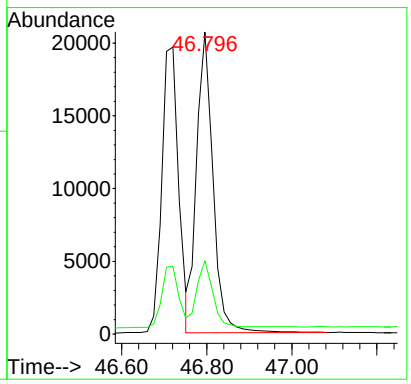


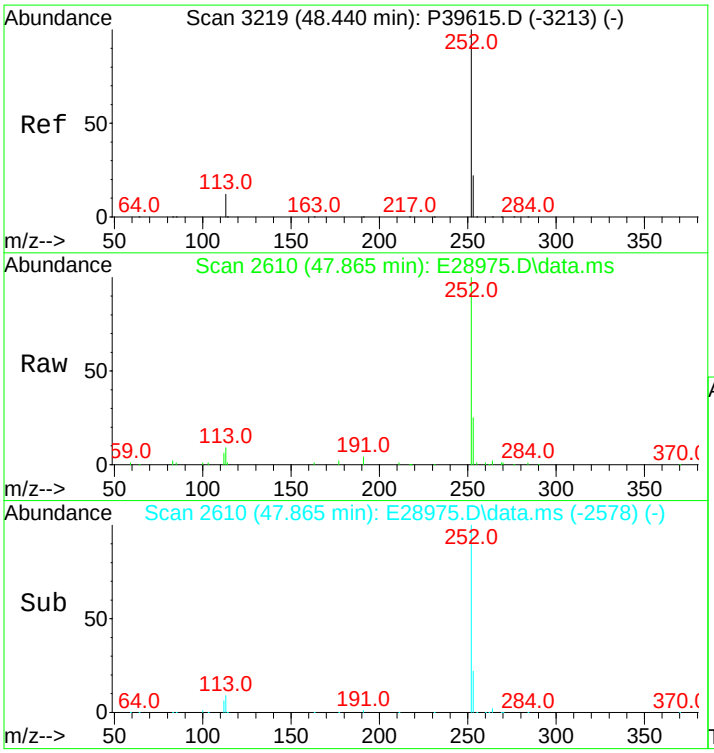


#85
Benzo[j]+[k]fluoranthene
Concen: 493.89 ng/mL
RT: 46.796 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:252 Resp: 55471

Ion	Ratio	Lower	Upper
252	100		
253	21.6	19.7	29.5

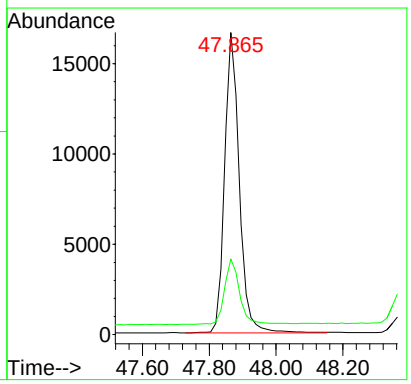


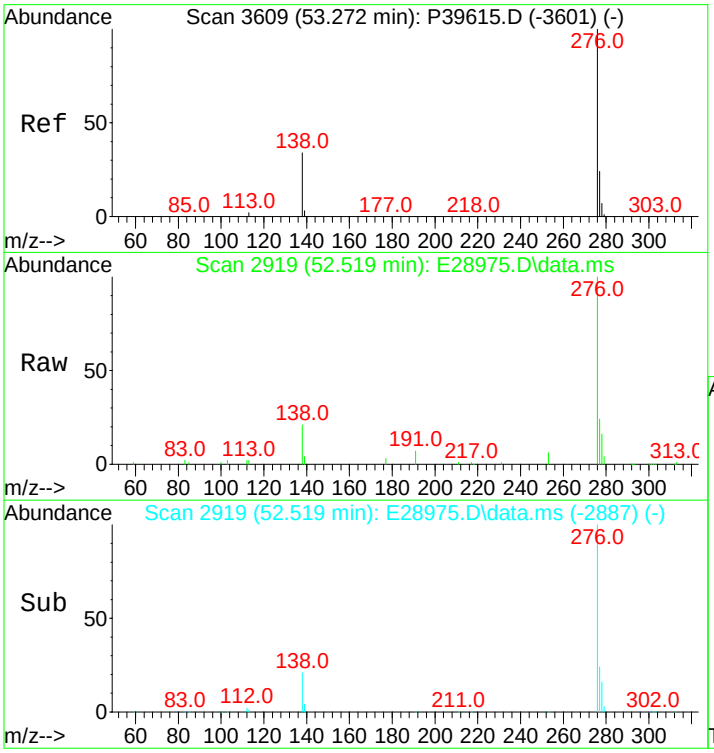


#89
Benzo[a]pyrene
Concen: 496.76 ng/mL
RT: 47.865 min Scan# 2610
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:252 Resp: 50668

Ion	Ratio	Lower	Upper
252	100		
253	22.9	20.8	31.2

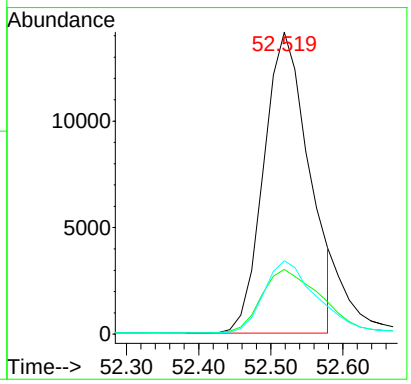


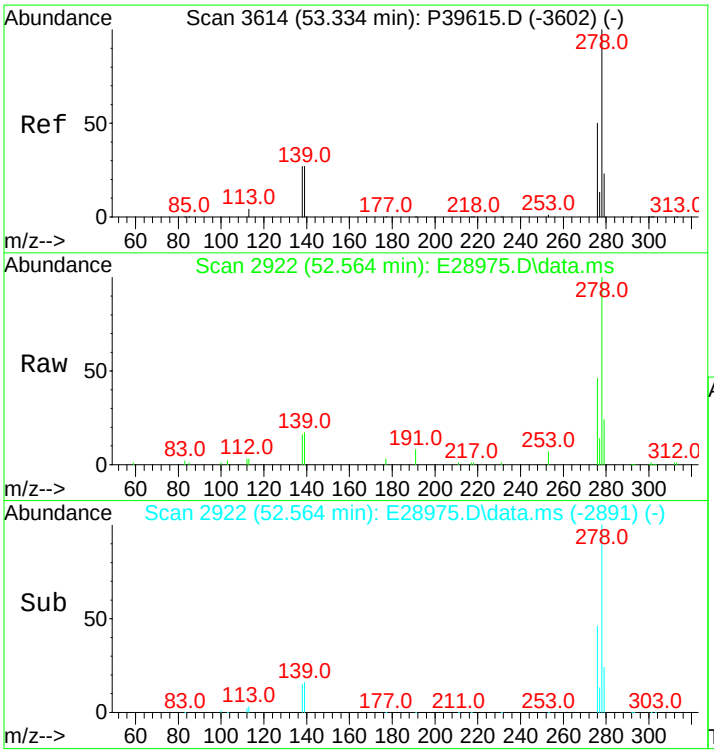


#91
Indeno[1,2,3-cd]pyrene
Concen: 514.67 ng/mL m
RT: 52.519 min Scan# 2919
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:276 Resp: 61779

Ion	Ratio	Lower	Upper
276	100		
138	28.3	16.3	24.5#
277	28.7	19.4	29.2

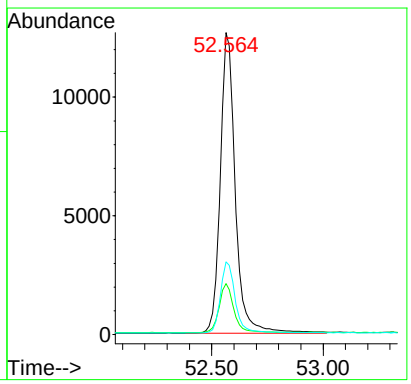


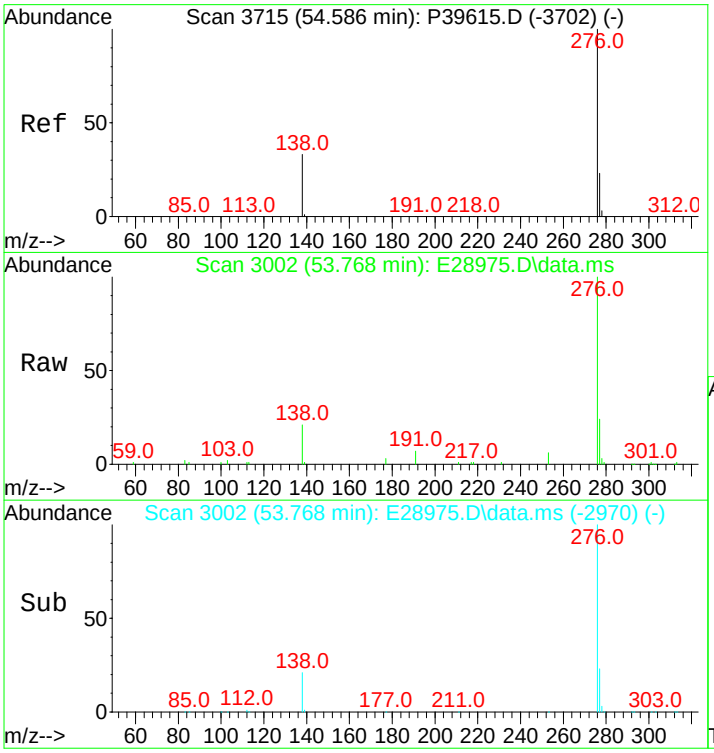


#92
Dibenz[ah]+[ac]anthracene
Concen: 463.50 ng/mL
RT: 52.564 min Scan# 2922
Delta R.T. -0.030 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:278 Resp: 59242

Ion	Ratio	Lower	Upper
278	100		
139	15.9	11.6	17.4
279	23.4	19.3	28.9

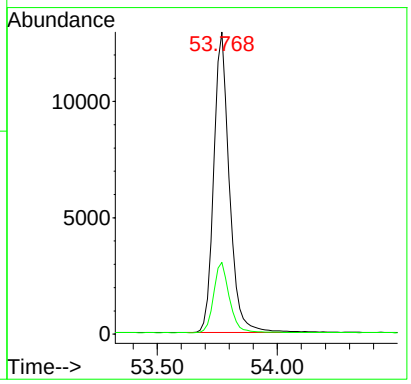


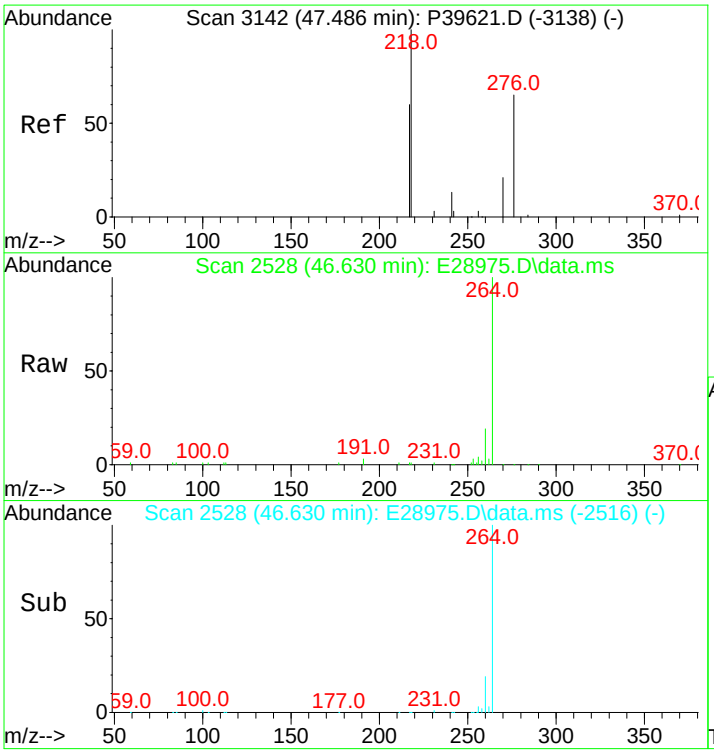


#93
Benzo[g,h,i]perylene
Concen: 451.57 ng/mL
RT: 53.768 min Scan# 3002
Delta R.T. -0.015 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:276 Resp: 58446

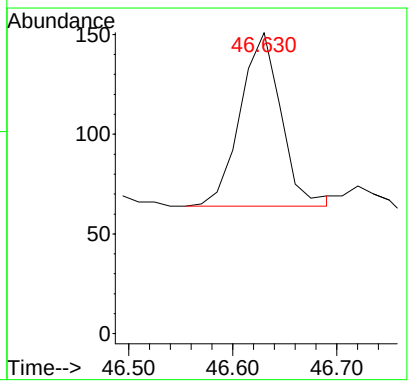
Ion	Ratio	Lower	Upper
276	100		
277	23.7	19.1	28.7





#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 12.52 ng/ml
RT: 46.630 min Scan# 2528
Delta R.T. -0.316 min
Lab File: E28975.D
Acq: 15 Nov 2012 1:52 am

Tgt Ion:218 Resp: 238



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28977.D
Acq On : 15 Nov 2012 3:21 am
Operator : AC
Sample : SS110612LCSD03
Misc : 1X ETR1210081
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Nov 16 12:28:49 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	21345	500.000	ng/mL	0.00
74) Chrysene-d12	42.700	240	48205	500.000	ng/mL	-0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	32348	430.852	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.09%#			
42) Phenanthrene-d10	32.070	188	34268	445.497	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.55%#			
83) Benzo[b]fluoranthene-d12	46.630	264	44137	445.718	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.57%#			
88) Benzo[a]pyrene-d12	47.774	264	41124	428.604	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.86%#			
129) 5B(H)Cholane - Surr	43.332	217	8749	460.506	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.05%#			
Target Compounds						Qvalue
10) Naphthalene	19.304	128	38880	463.071	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	24408	456.432	ng/mL#	100
26) Acenaphthylene	25.582	152	38489M3	459.795	ng/mL	
27) Acenaphthene	26.320	153	24372	452.315	ng/mL	98
29) Fluorene	28.337	166	27948	465.056	ng/mL	99
43) Phenanthrene	32.160	178	38904	463.680	ng/mL	99
55) Anthracene	32.356	178	37836M3	521.721	ng/mL	
58) Fluoranthene	36.948	202	46052M3	497.012	ng/mL	
60) Pyrene	37.837	202	46990	498.945	ng/mL	98
75) Benz[a]anthracene	42.639	228	45520	484.926	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	45127	466.955	ng/mL	99
84) Benzo[b]fluoranthene	46.705	252	51654	473.419	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.795	252	54306	483.780	ng/mL	94
89) Benzo[a]pyrene	47.865	252	48978	480.453	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	52.518	276	55197M3	460.082	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.563	278	57267	448.294	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	56482	436.628	ng/mL	99

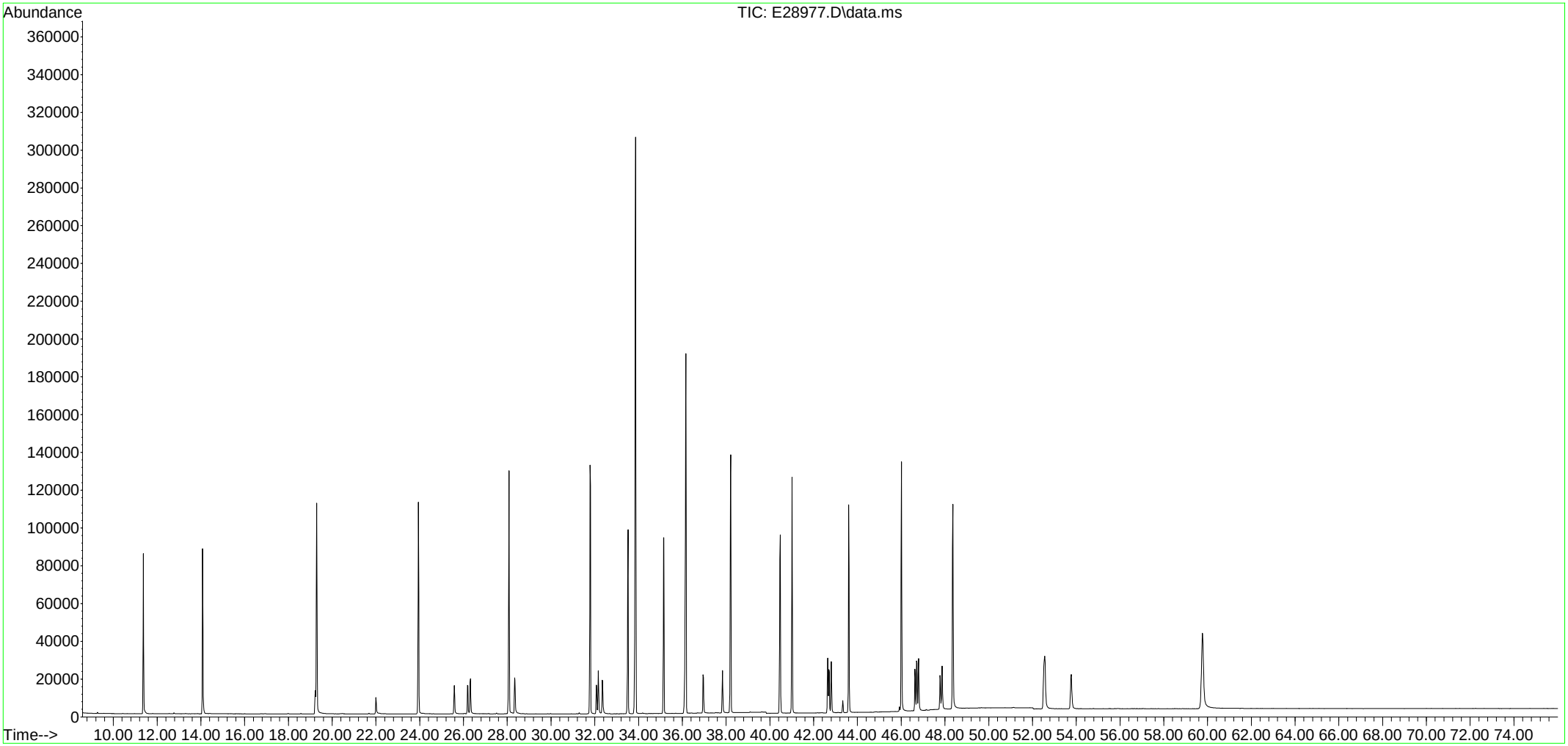
(#) = qualifier out of range (m) = manual integration (+) = signals summed

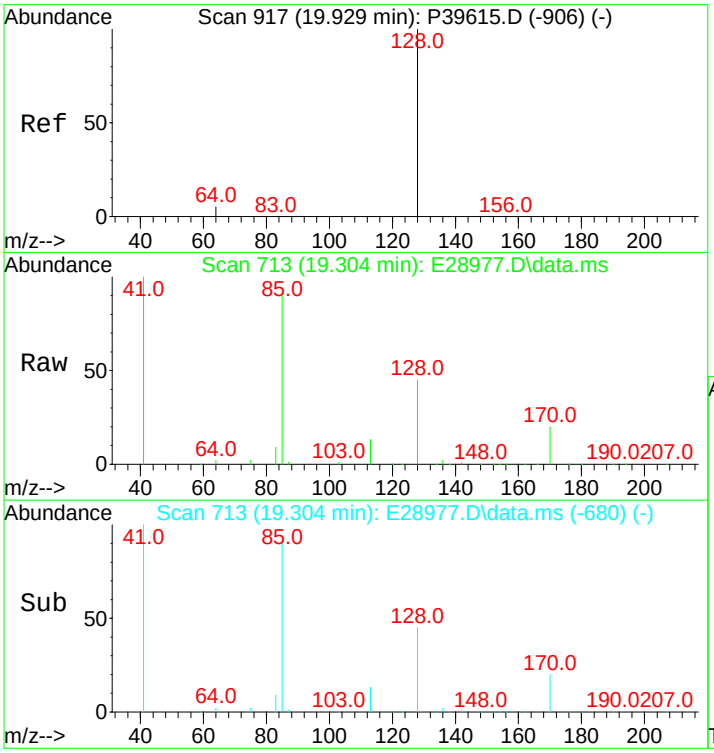
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28977.D
Acq On : 15 Nov 2012 3:21 am
Operator : AC
Sample : SS110612LCSD03
Misc : 1X ETR1210081
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Nov 16 12:28:49 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

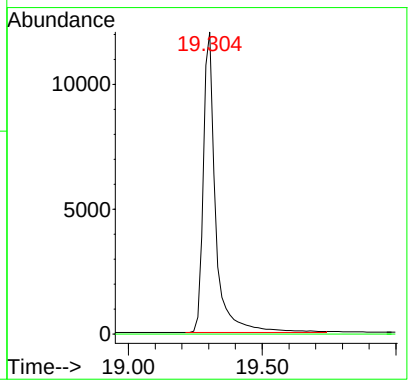


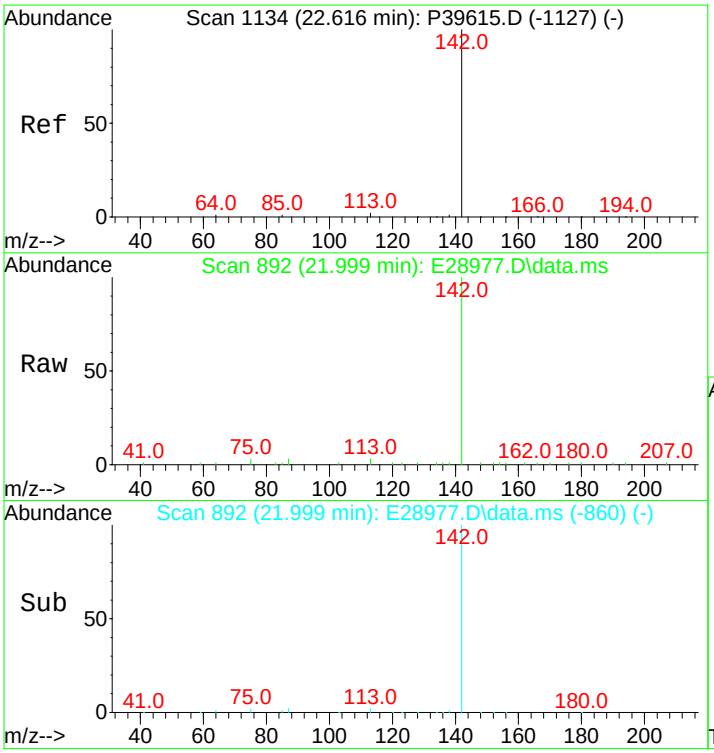


#10
Naphthalene
Concen: 463.07 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:128 Resp: 38880

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

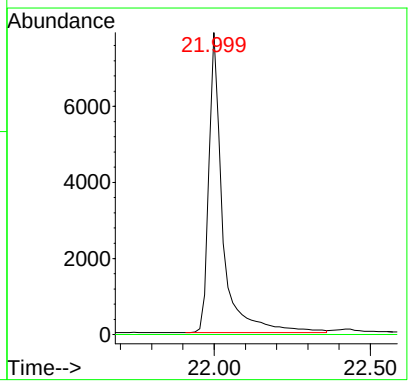


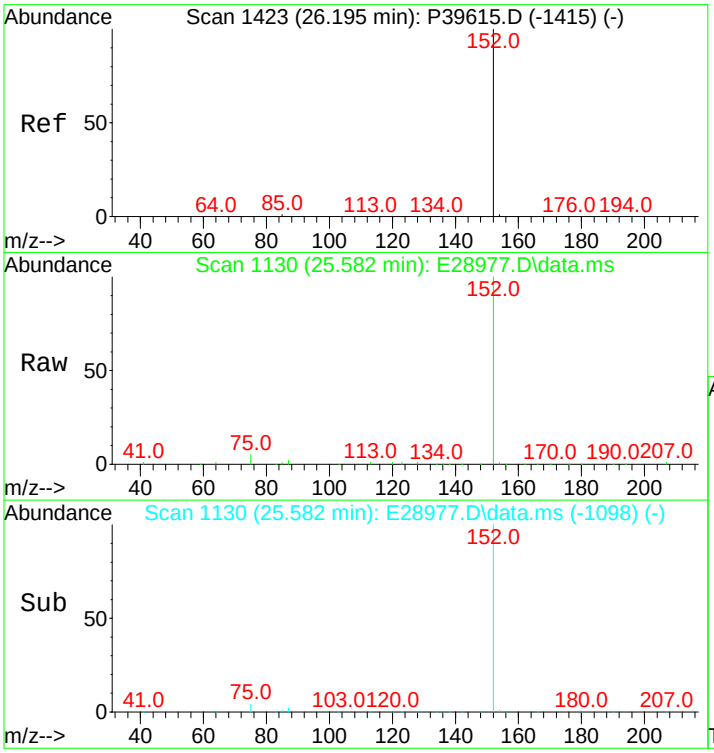


#16
2-Methylnaphthalene
Concen: 456.43 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:142 Resp: 24408

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

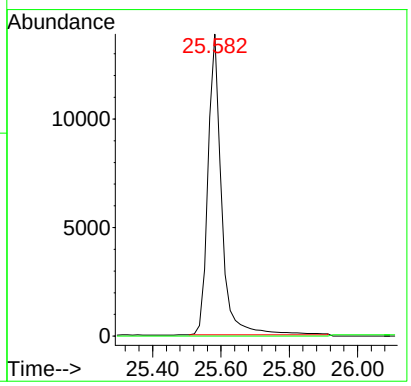


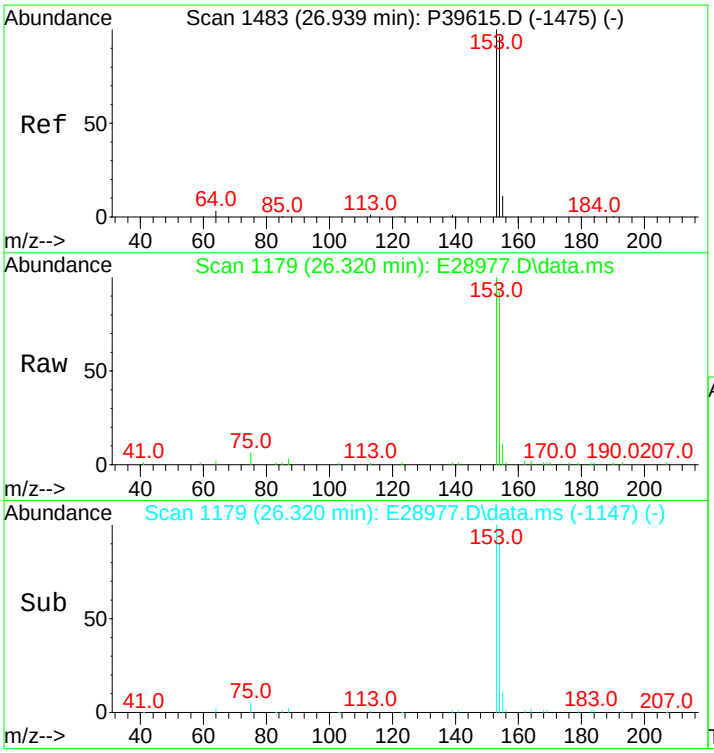


#26
Acenaphthylene
Concen: 459.79 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:152 Resp: 38489

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

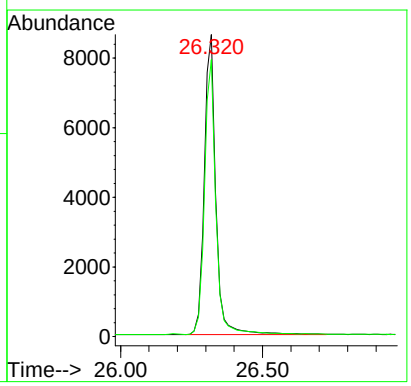


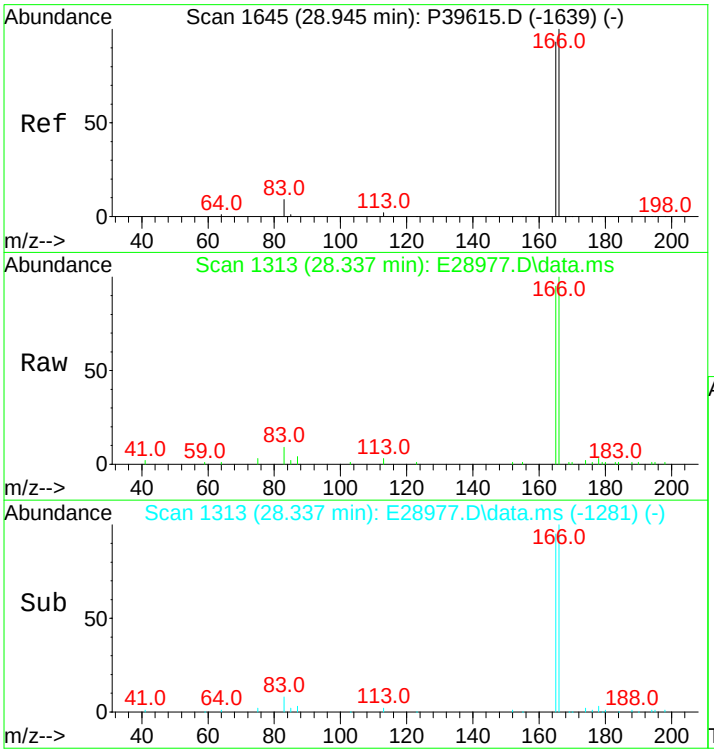


#27
Acenaphthene
Concen: 452.32 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:153 Resp: 24372

Ion	Ratio	Lower	Upper
153	100		
154	90.3	74.1	111.1

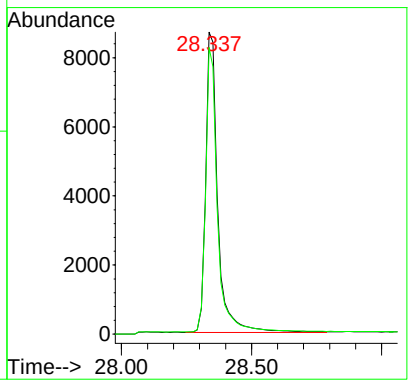


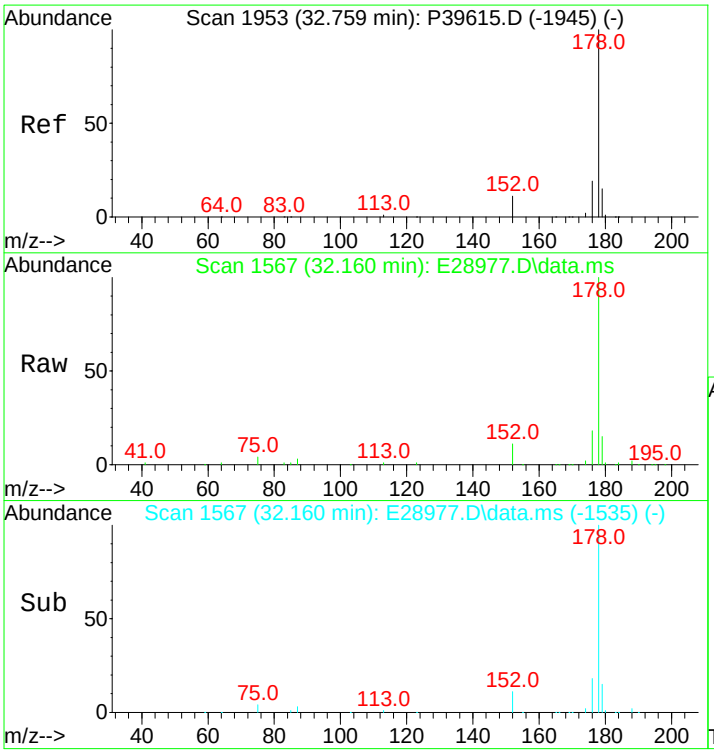


#29
Fluorene
Concen: 465.06 ng/mL
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:166 Resp: 27948

Ion	Ratio	Lower	Upper
166	100		
165	92.7	74.7	112.1

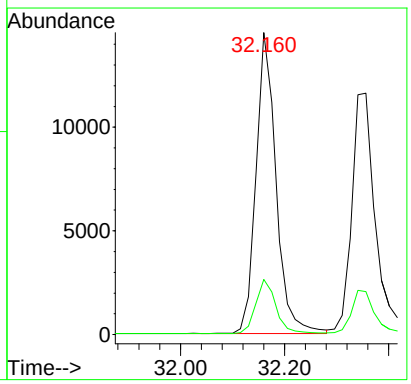


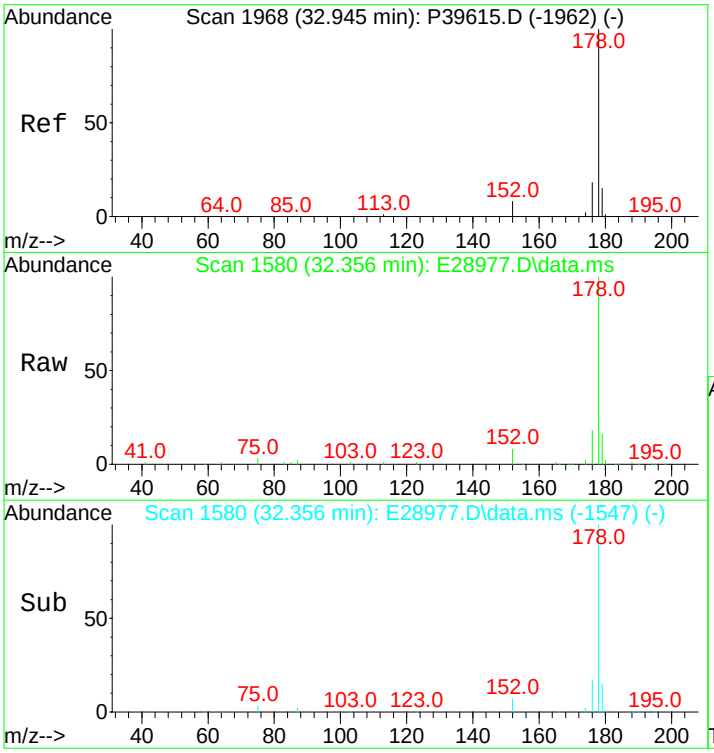


#43
Phenanthrene
Concen: 463.68 ng/mL
RT: 32.160 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:178 Resp: 38904

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.4

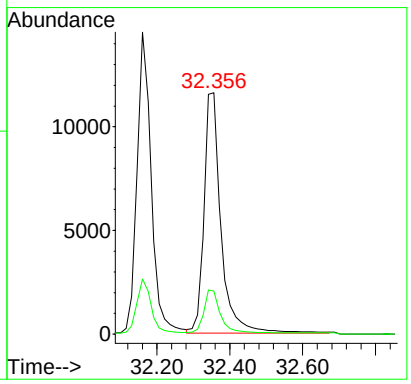


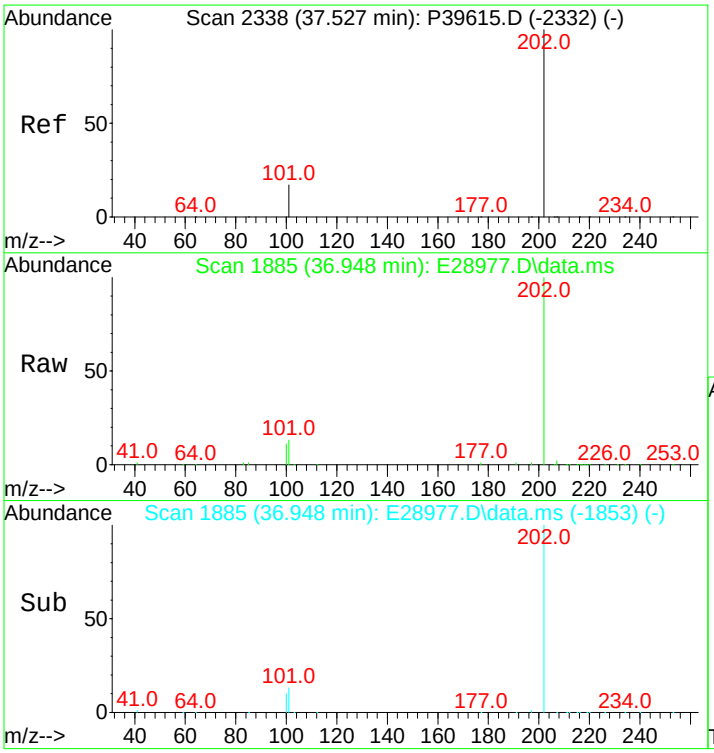


#55
Anthracene
Concen: 521.72 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. -0.000 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:178 Resp: 37836

Ion	Ratio	Lower	Upper
178	100		
176	17.3	14.3	21.5

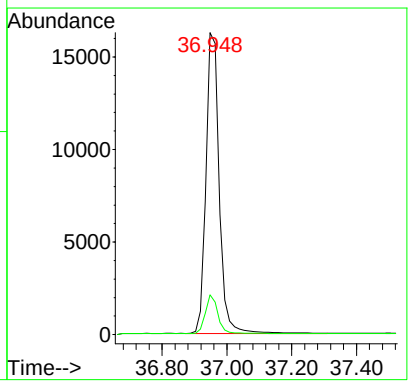


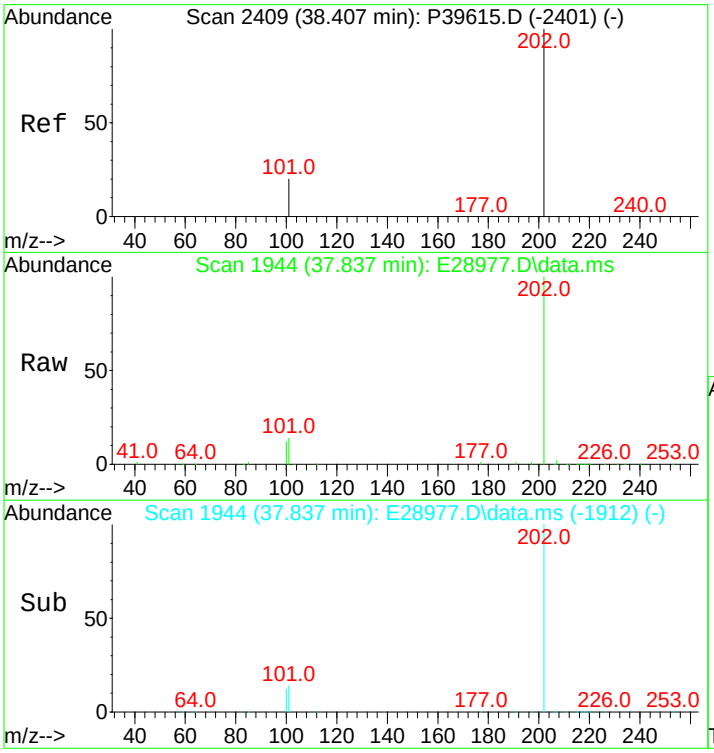


#58
Fluoranthene
Concen: 497.01 ng/mL m
RT: 36.948 min Scan# 1885
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:202 Resp: 46052

Ion	Ratio	Lower	Upper
202	100		
101	12.1	10.4	15.6

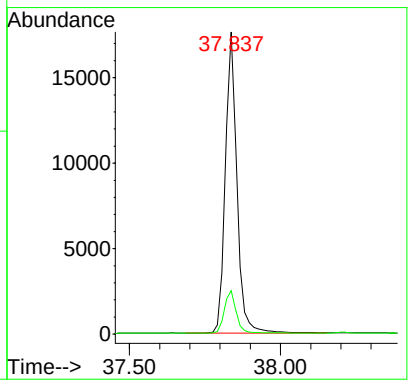


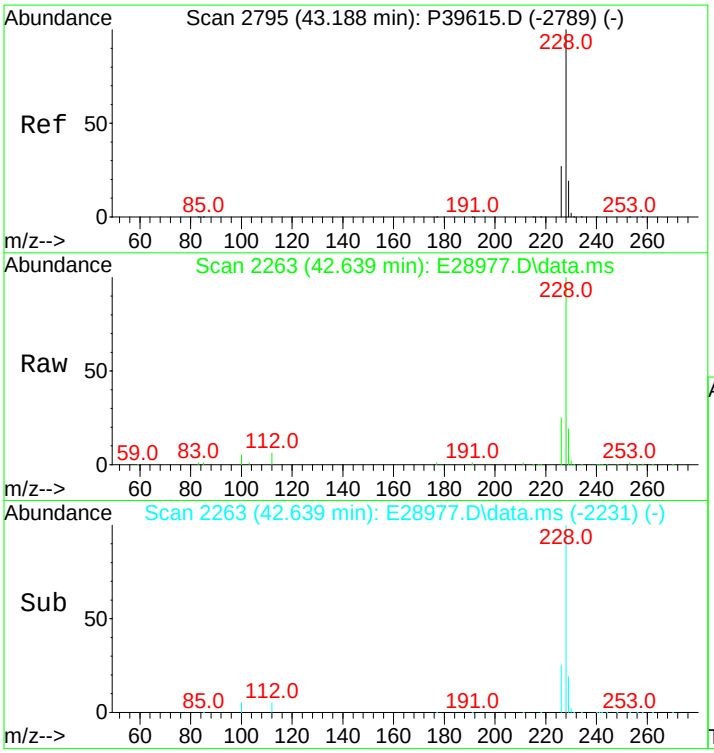


#60
Pyrene
Concen: 498.94 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:202 Resp: 46990

Ion	Ratio	Lower	Upper
202	100		
101	14.5	11.0	16.4

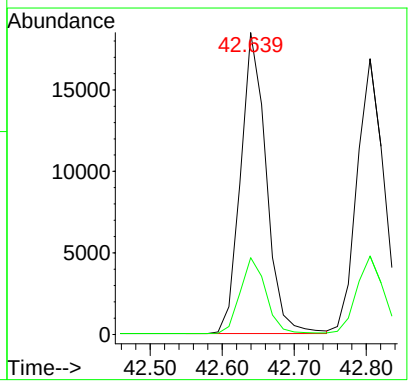


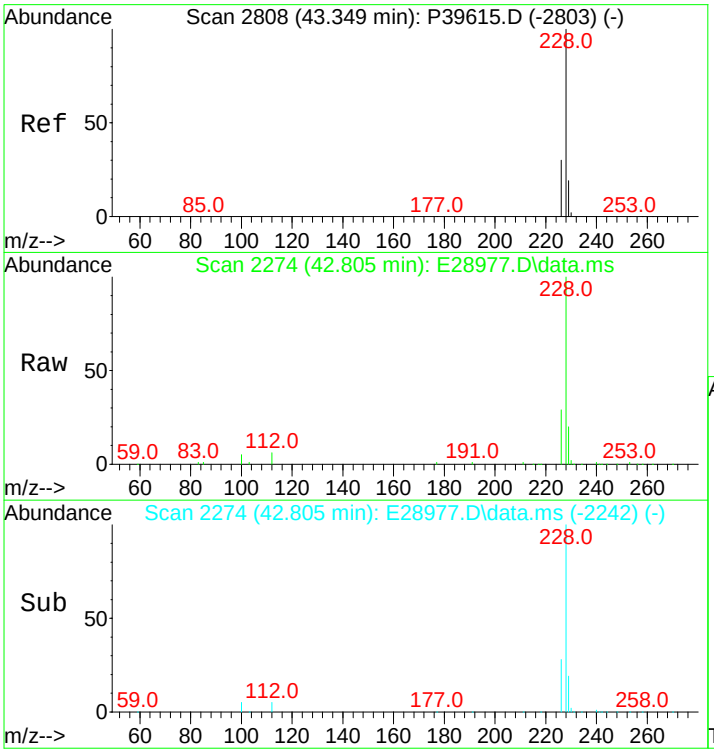


#75
Benz[a]anthracene
Concen: 484.93 ng/mL
RT: 42.639 min Scan# 2263
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:228 Resp: 45520

Ion	Ratio	Lower	Upper
228	100		
226	25.5	20.7	31.1

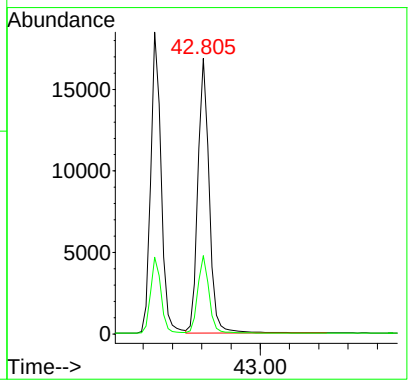


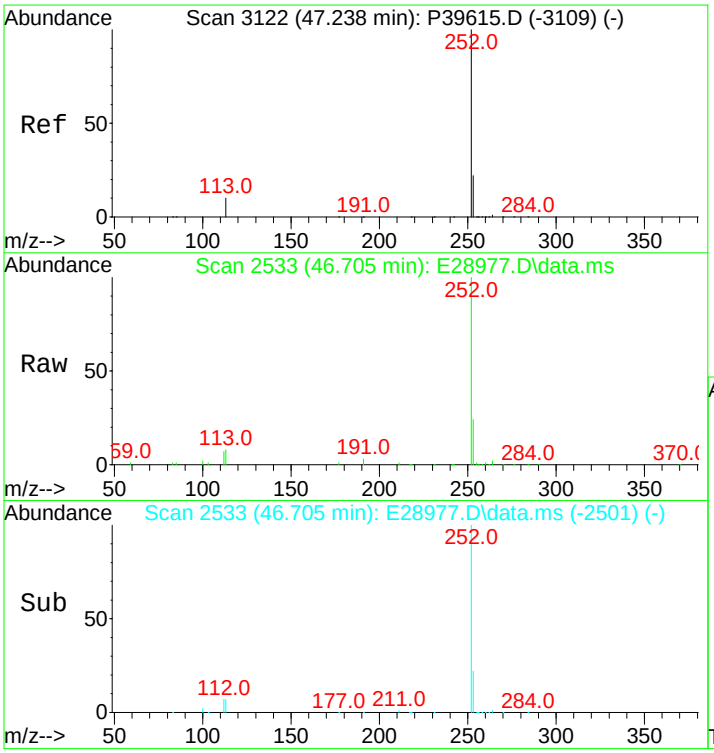


#77
Chrysene/Triphenylene
Concen: 466.96 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:228 Resp: 45127

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

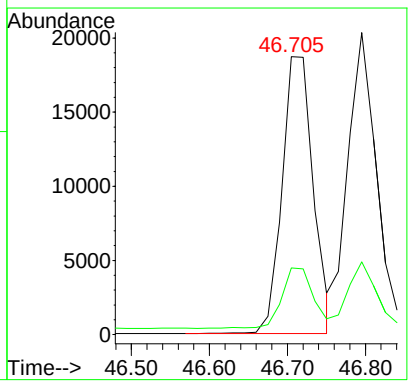


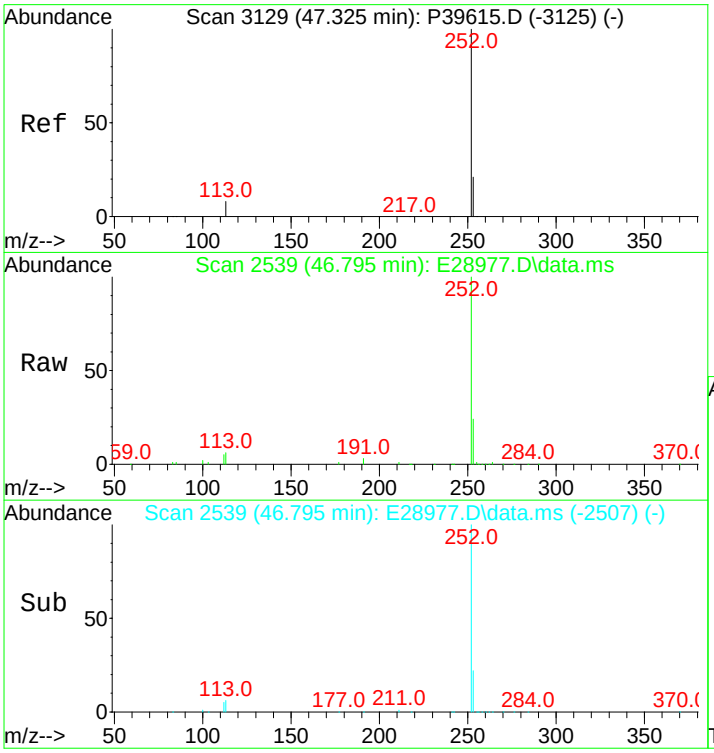


#84
Benzo[b]fluoranthene
Concen: 473.42 ng/mL
RT: 46.705 min Scan# 2533
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:252 Resp: 51654

Ion	Ratio	Lower	Upper
252	100		
253	22.2	19.5	29.3

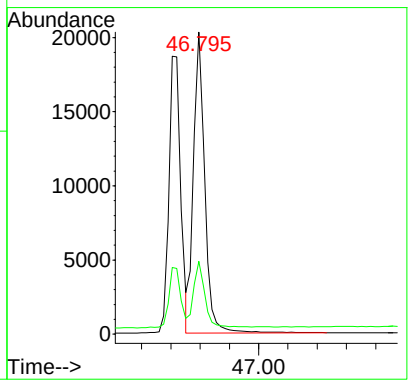


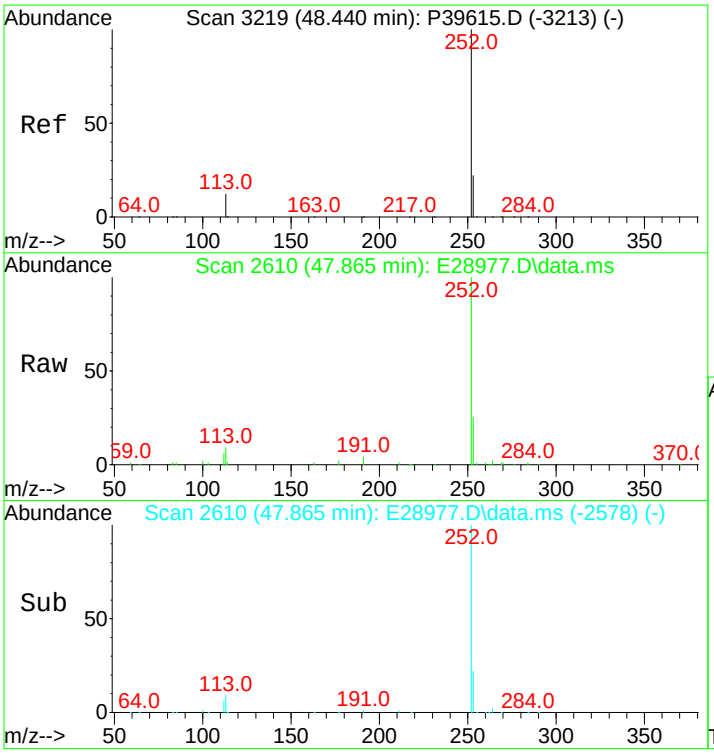


#85
Benzo[j]+[k]fluoranthene
Concen: 483.78 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:252 Resp: 54306

Ion	Ratio	Lower	Upper
252	100		
253	21.6	19.7	29.5

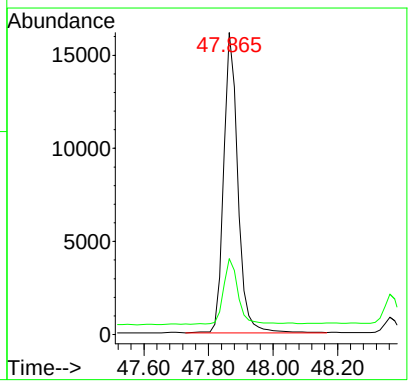


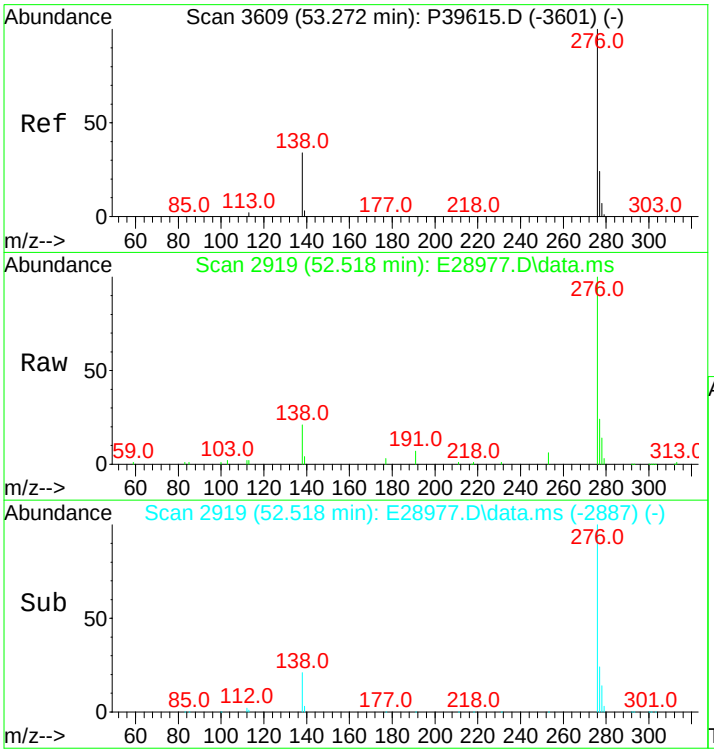


#89
Benzo[a]pyrene
Concen: 480.45 ng/mL
RT: 47.865 min Scan# 2610
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:252 Resp: 48978

Ion	Ratio	Lower	Upper
252	100		
253	22.3	20.8	31.2

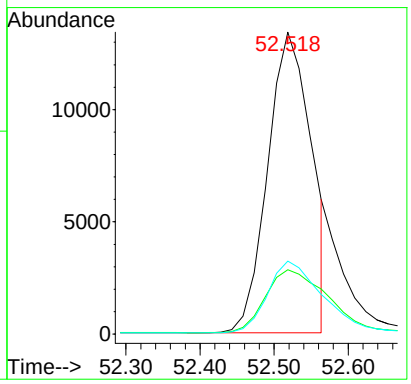


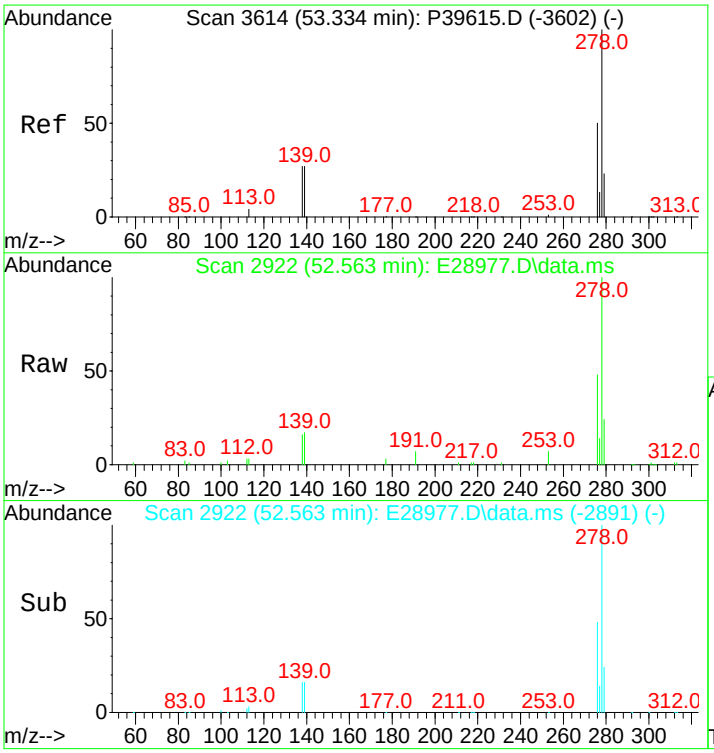


#91
Indeno[1,2,3-cd]pyrene
Concen: 460.08 ng/mL m
RT: 52.518 min Scan# 2919
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:276 Resp: 55197

Ion	Ratio	Lower	Upper
276	100		
138	30.5	16.3	24.5#
277	30.7	19.4	29.2#

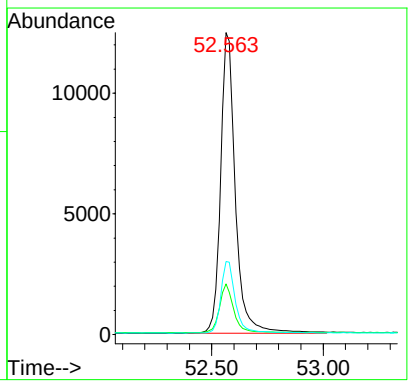


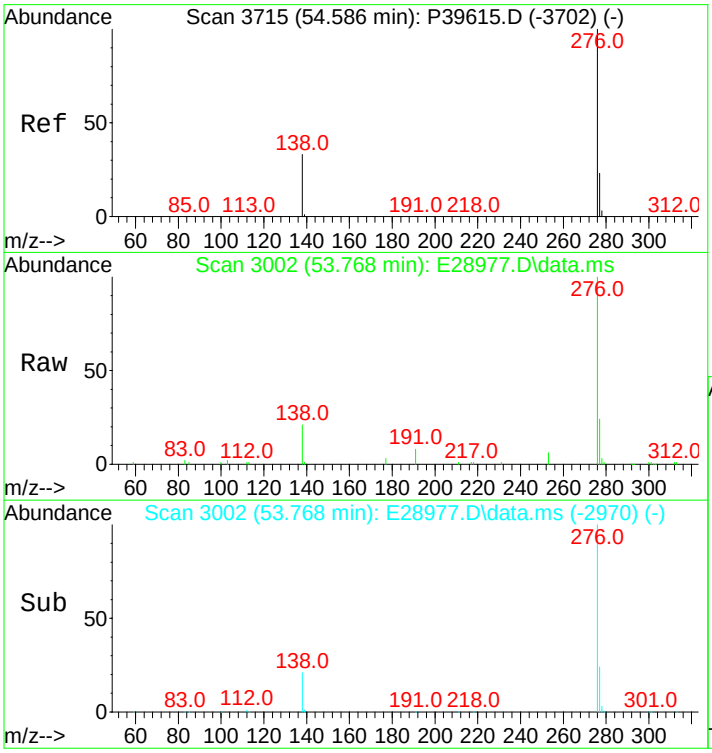


#92
Dibenz[ah]+[ac]anthracene
Concen: 448.29 ng/mL
RT: 52.563 min Scan# 2922
Delta R.T. -0.030 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:278 Resp: 57267

Ion	Ratio	Lower	Upper
278	100		
139	15.8	11.6	17.4
279	23.4	19.3	28.9

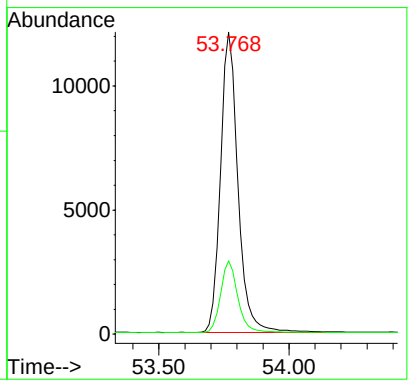




#93
Benzo[g,h,i]perylene
Concen: 436.63 ng/mL
RT: 53.768 min Scan# 3002
Delta R.T. -0.015 min
Lab File: E28977.D
Acq: 15 Nov 2012 3:21 am

Tgt Ion:276 Resp: 56482

Ion	Ratio	Lower	Upper
276	100		
277	23.5	19.1	28.7



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28979.D
Acq On : 15 Nov 2012 4:49 am
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	21605M3	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	53382	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	25327	333.278	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 33.33%#			
42) Phenanthrene-d10	32.070	188	35045	450.115	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.01%#			
83) Benzo[b]fluoranthene-d12	46.630	264	48243	439.935	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.99%#			
88) Benzo[a]pyrene-d12	47.789	264	45048	423.968	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.40%#			
129) 5B(H)Cholane - Surr	43.332	217	9898	470.459	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.05%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	74M3	4.282	ng/mL	
5) C1-Decalins	17.799	152	328M5	18.979	ng/mL	
6) C2-Decalins	20.298	166	1116M5	64.576	ng/mL	
7) C3-Decalins	22.014	180	1984m	114.801	ng/mL	
8) C4-Decalins	24.995	194	5385M5	311.596	ng/mL	
10) Naphthalene	19.304	128	18253	214.782	ng/mL#	100
11) C1-Naphthalenes	21.999	142	12060M5	141.909	ng/mL	
12) C2-Naphthalenes	24.844	156	42357m	498.412	ng/mL	
13) C3-Naphthalenes	27.524	170	78811m	927.364	ng/mL	
14) C4-Naphthalenes	29.963	184	71511M5	841.466	ng/mL	
16) 2-Methylnaphthalene	21.999	142	7172	132.503	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	4829	91.816	ng/mL#	100
18) Benzothiophene	19.530	134	714M4	10.163	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	1684M5	23.970	ng/mL	
20) C2-Benzo(b)thiophenes	25.025	162	6093m	86.726	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	15480m	220.339	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	19914M5	283.451	ng/mL	
23) Biphenyl	23.881	154	2738	40.025	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	9390	192.465	ng/mL#	100
25) Dibenzofuran	26.967	168	9573M3	126.401	ng/mL	
26) Acenaphthylene	25.582	152	31540	372.247	ng/mL#	100
27) Acenaphthene	26.320	153	11929M3	218.724	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	5971M3	130.811	ng/mL	
29) Fluorene	28.337	166	18628M3	306.240	ng/mL	
30) C1-Fluorenes	30.715	180	21400M5	351.811	ng/mL	
31) C2-Fluorenes	32.928	194	36817M5	605.264	ng/mL	
32) C3-Fluorenes	34.765	208	37258m	612.514	ng/mL	
33) Dibenzothiophene	31.664	184	28861	345.753	ng/mL#	85
34) 4-Methyldibenzothiophene(	33.455	198	20381	244.163	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.802	198	18162M3	217.579	ng/mL	
36) 1-Methyldibenzothiophene(	34.208	198	9818	117.619	ng/mL#	100
37) OTP	33.862	198	3975M3	47.620	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	58050m	695.434	ng/mL	
39) C2-Dibenzothiophenes	35.142	212	90076M5	1079.103	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	91718m	1098.774	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	58853M5	705.054	ng/mL	
43) Phenanthrene	32.161	178	395983	4662.758	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	52055	612.955	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	63451	747.145	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	25940	305.447	ng/mL#	37
47) 9/4-Methylphenanthrene(9M	34.584	192	67241M3	791.773	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.675	192	40380M3	475.480	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	253015M5	2979.289	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	198321M5	2335.259	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28979.D
Acq On : 15 Nov 2012 4:49 am
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52) C3-Phenanthrenes/Anthrace	38.273	220	108184M5	1273.882	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.456	234	45684M5	537.936	ng/mL	
55) Anthracene	32.341	178	83545M3	1138.140	ng/mL	
56) Carbazole	33.034	167	27488	363.854	ng/mL	100
57) 1-Methylphenanthrene	34.675	192	40292M3	621.881	ng/mL	
58) Fluoranthene	36.963	202	1180841	12590.743	ng/mL	99
59) Benzo(b)fluorene	39.493	216	93279M3	1492.589	ng/mL	
60) Pyrene	37.852	202	1048560	10999.732	ng/mL	96
61) C1-Fluoranthenes/Pyrenes	39.252	216	543203M5	5698.374	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	229333M5	2405.777	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	104492M5	1096.155	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.506	258	84330M5	884.649	ng/mL	
66) Naphthobenzothiophene	41.706	234	83948	892.883	ng/ml#	66
67) Naphthobenzothiophene-2,1	41.706	234	83948	892.883	ng/mL#	66
68) Naphthobenzothiophene-1,2	42.052	234	17522	186.366	ng/mL#	18
69) Naphthobenzothiophene-2,3	42.353	234	27386M3	291.281	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	82391M5	876.322	ng/ml	
71) C2-Naphthobenzothiophenes	45.184	262	73323M5	779.874	ng/ml	
72) C3-Naphthobenzothiophenes	46.750	276	53143M5	565.236	ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	38865M5	413.374	ng/mL	
75) Benz[a]anthracene	42.655	228	564873M3	5434.018	ng/mL	
77) Chrysene/Triphenylene	42.805	228	592121	5532.819	ng/mL	99
78) C1-Chrysenes	44.296	242	244926M5	2288.605	ng/mL	
79) C2-Chrysenes	46.027	256	127887M5	1194.985	ng/mL	
80) BBF-D12 Surr BKGD	46.630	256	1875	17.520	ng/mL	100
81) C3-Chrysenes	47.594	270	98114M5	916.784	ng/mL	
82) C4-Chrysenes	48.542	284	45411M5	424.323	ng/mL	
84) Benzo[b]fluoranthene	46.720	252	616200	5099.888	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.795	252	499876	4021.233	ng/mL	95
86) Benzo[a]fluoranthene	47.097	252	135142M3	1087.144	ng/mL	
87) Benzo[e]pyrene	47.699	252	474054	4018.159	ng/mL	92
89) Benzo[a]pyrene	47.880	252	690257	6114.457	ng/mL	92
90) Perylene	48.166	252	190970	1599.766	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.533	276	539756M3	4062.699	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	160154M3	1132.122	ng/mL	
93) Benzo[g,h,i]perylene	53.783	276	545892	3810.710	ng/mL	100
94) Hopane (T19)	51.630	191	28139M3	702.377	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	7615M3	190.078	ng/ml	
97) C24 Tricyclic Terpane (T5	41.074	191	4024M3	100.443	ng/ml	
98) C25 Tricyclic Terpane (T6	42.639	191	7182	179.270	ng/ml	100
99) C24 Tetracyclic Terpane (	43.874	191	1979M3	49.398	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2102M3	52.468	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	1609M3	40.162	ng/ml	
102) C28 Tricyclic Terpane-22S	46.042	191	1814M3	45.279	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2094M3	52.268	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	2129M3	53.142	ng/ml	
105) C29 Tricyclic Terpane-22R	46.916	191	2153	53.741	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	47.985	191	3591	89.635	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2256M3	56.312	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	2777	69.317	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	7406M3	184.861	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	3982	99.395	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.491	191	2445	61.030	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	21186M3	528.824	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.410	191	4341M3	108.356	ng/ml	
114) 17a(H)-Diahopane (X)	50.546	191	1496M4	37.342	ng/ml	
115) 30-Normoretane (T17)	51.073	191	2622	65.448	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	947M3	23.638	ng/ml	
117) Moretane (T20)	52.292	191	3406M3	85.017	ng/ml	
118) 30-Homohopane-22S (T21)	53.362	191	13175	328.861	ng/ml	100
119) 30-Homohopane-22R (T22)	53.587	191	10338	258.047	ng/ml	100

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28979.D
Acq On : 15 Nov 2012 4:49 am
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120) Gammacerane/C32-diahopane	54.099	191	4302M4	107.382	ng/mL	
121) 30,31-Bishomohopane-22S (	54.822	191G	18194M3	454.140	ng/ml	
122) 30,31-Bishomohopane-22R (	55.229	191	6430	160.499	ng/ml	100
123) 30,31-Trishomohopane-22S	56.915	191	7897	197.117	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	4038	100.792	ng/ml	100
125) Tetrakishomohopane-22S (T	59.460	191	5521M3	137.810	ng/ml	
126) Tetrakishomohopane-22R (T	60.288	191	2540M3	63.401	ng/ml	
127) Pentakishomohopane-22S (T	62.487	191	5357	133.716	ng/ml	100
128) Pentakishomohopane-22R (T	63.707	191	3587M3	89.535	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2115M3	100.527	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1161	55.183	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1054M3	50.097	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	3851M3	183.041	ng/ml	
134) 14a,17a-20R-Chol/13b,17a-	47.353	217	4327	205.665	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	863	41.019	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.880	217	260	12.358	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	1642M3	78.045	ng/ml	
138) 14a,17a-20R-Methylcholest	48.723	217	1638M3	77.855	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.070	217	2871M3	136.461	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3131M3	148.819	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2398M3	113.979	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.021	218	2410M3	114.549	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2331	110.794	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	3381M3	160.701	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	4392M3	208.755	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3727M3	177.147	ng/ml	
147) C26,20R- +C27,20S- triaro	49.024	231	9901	470.601	ng/mL	100
148) C28,20S-triaromatic stero	49.853	231	8556M3	406.673	ng/mL	
149) C27,20R-triaromatic stero	50.305	231	6536	310.661	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	7008M3	333.095	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28979.D
Acq On : 15 Nov 2012 4:49 am
Operator : AC
Sample : 1210081-01
Misc : 1X
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 16 13:31:08 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
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QLast Update : Tue Oct 30 11:49:46 2012
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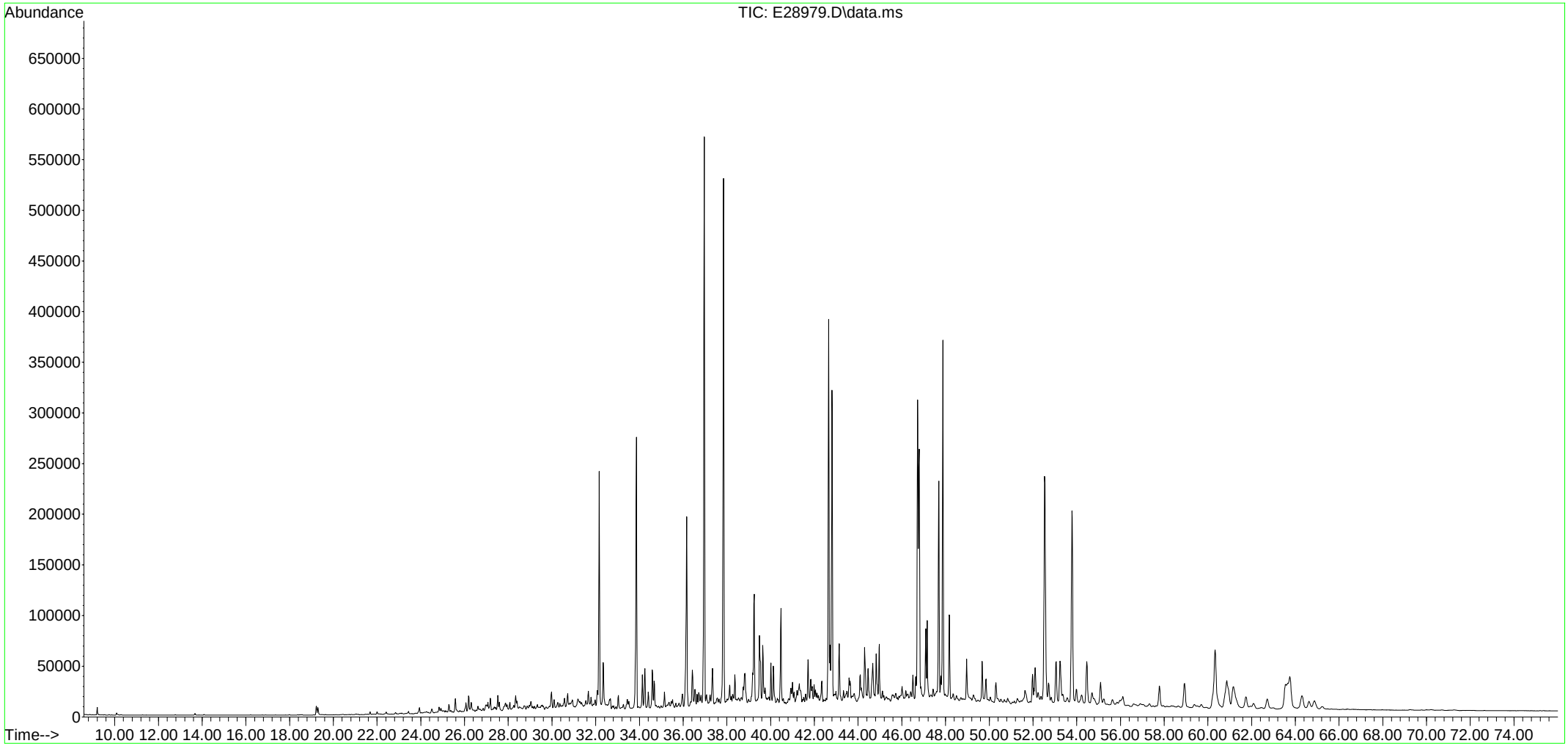
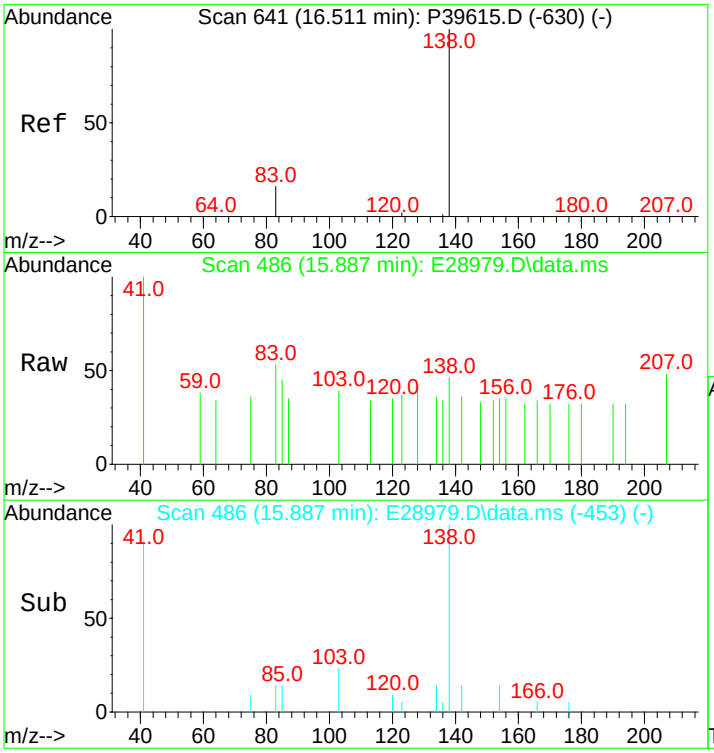
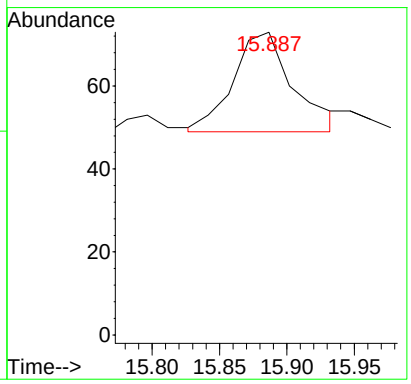
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

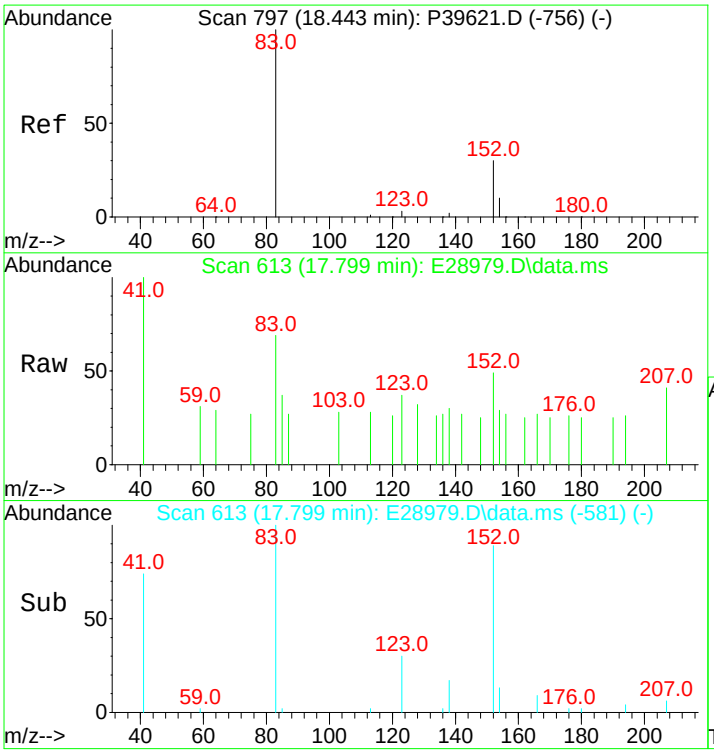




#3
trans-Decalin
Concen: 4.28 ng/mL m
RT: 15.887 min Scan# 486
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

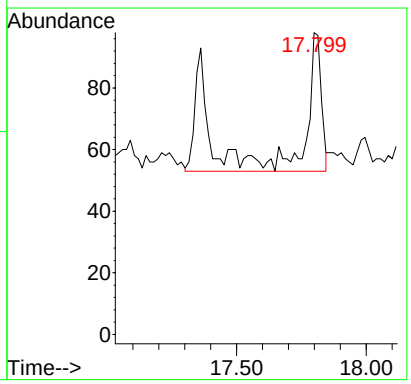
Tgt Ion:138 Resp: 74

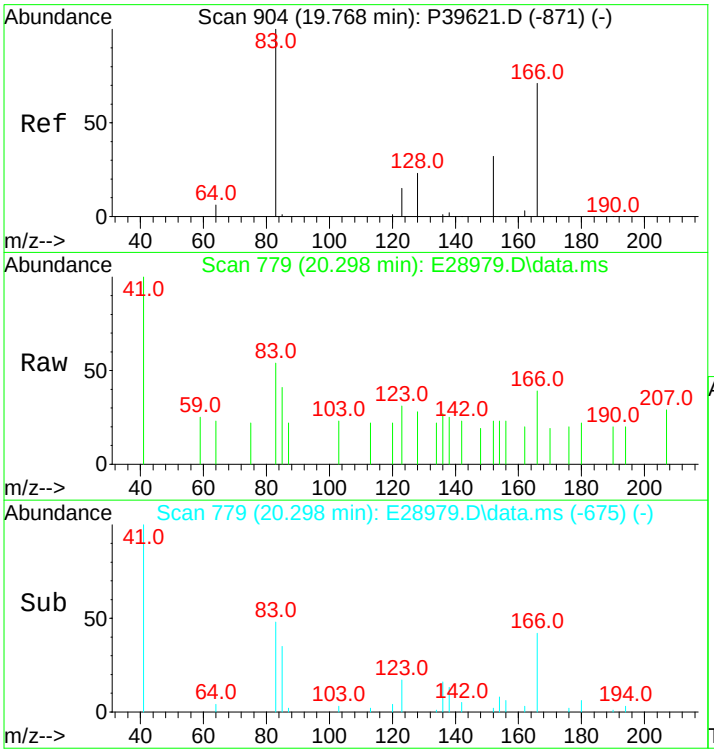




#5
C1-Decalins
Concen: 18.98 ng/mL m
RT: 17.799 min Scan# 613
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

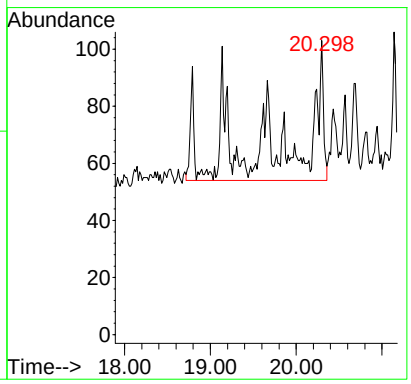
Tgt Ion:152 Resp: 328

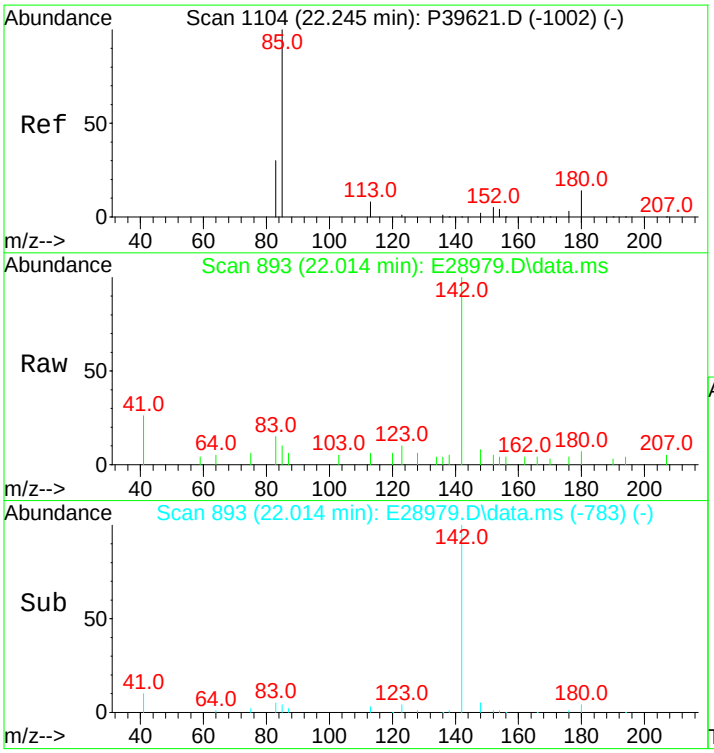




#6
C2-Decalins
Concen: 64.58 ng/mL m
RT: 20.298 min Scan# 779
Delta R.T. 0.955 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

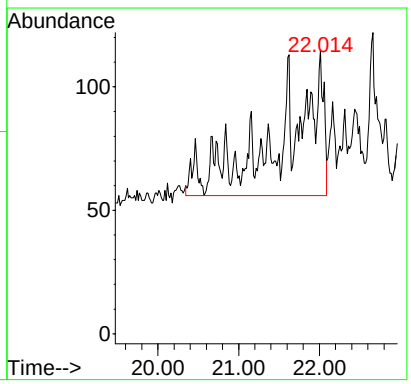
Tgt Ion:166 Resp: 1116

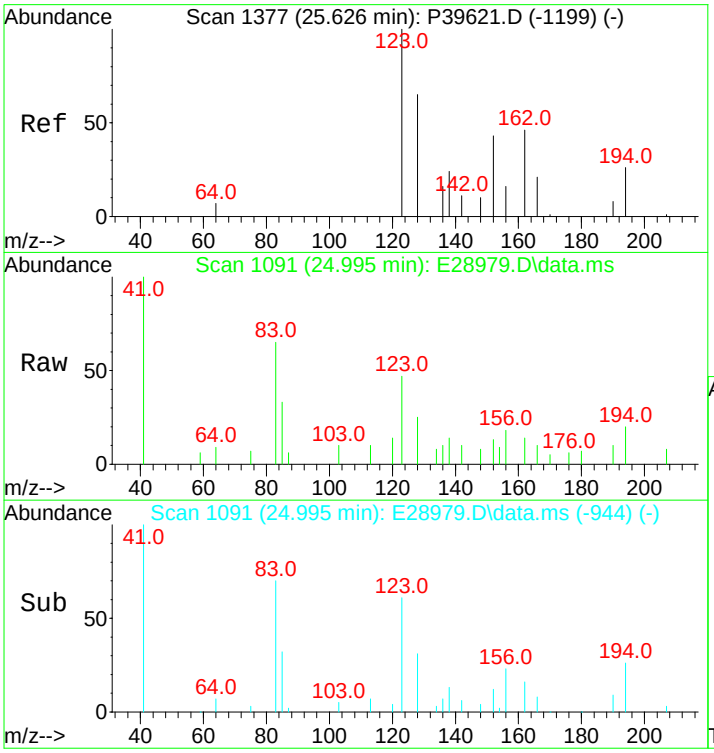




#7
C3-Decalins
Concen: 114.80 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. 0.269 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

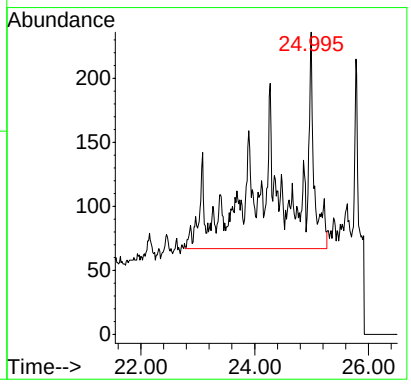
Tgt Ion:180 Resp: 1984

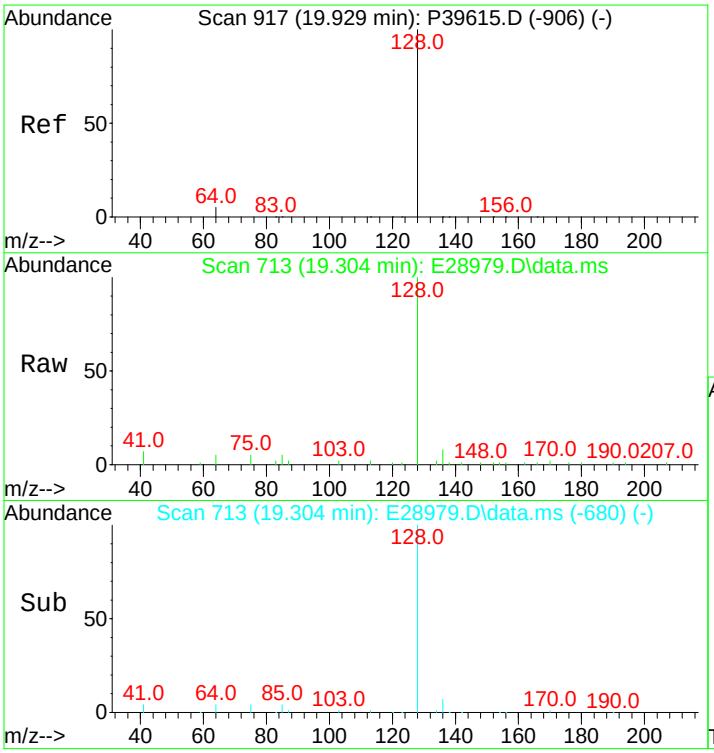




#8
C4-Decalins
Concen: 311.60 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:194 Resp: 5385

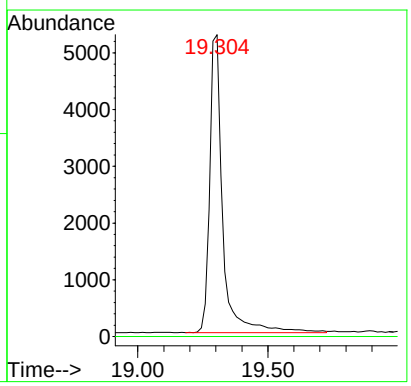


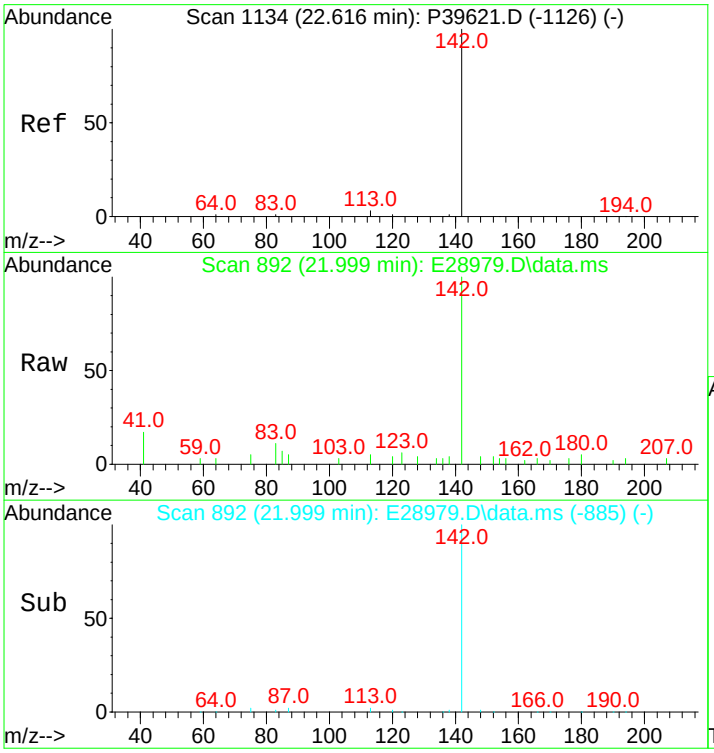


#10
Naphthalene
Concen: 214.78 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:128 Resp: 18253

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

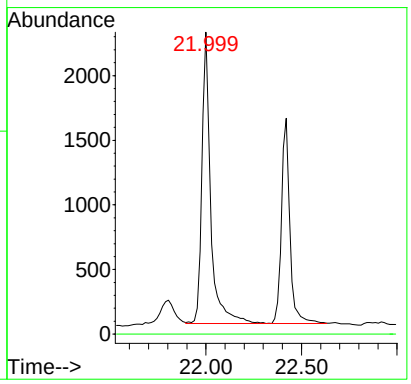


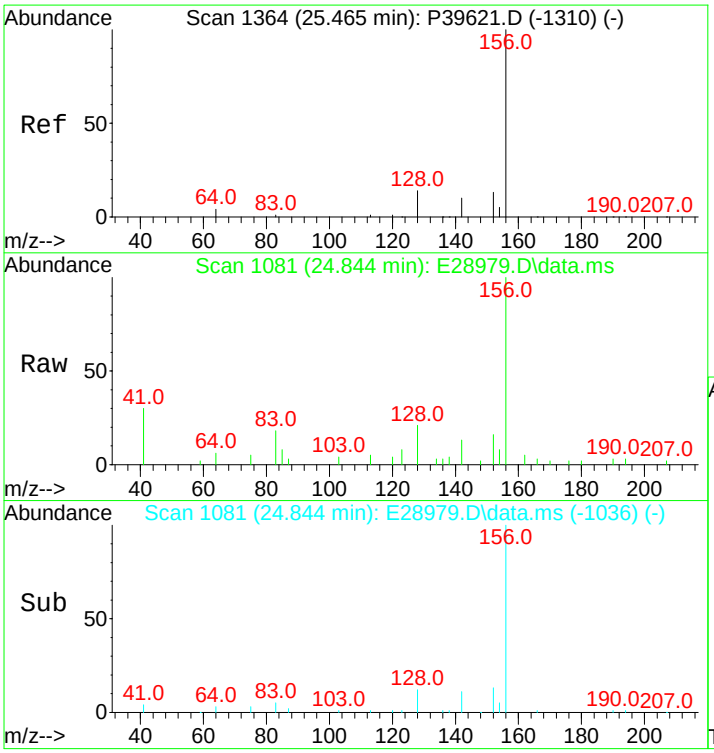


#11
C1-Naphthalenes
Concen: 141.91 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:142 Resp: 12060

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

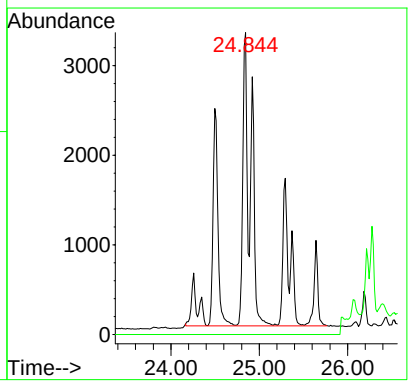


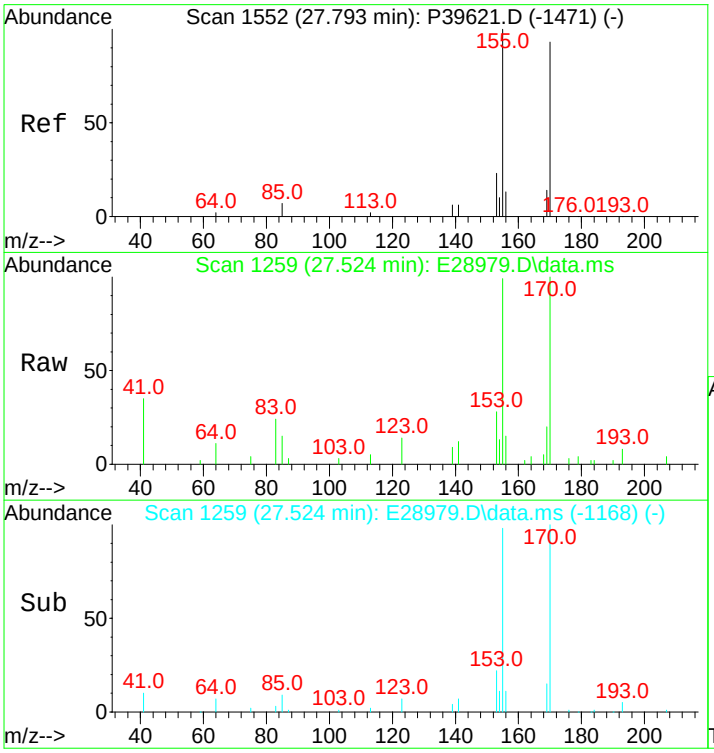


#12
C2-Naphthalenes
Concen: 498.41 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:156 Resp: 42357

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

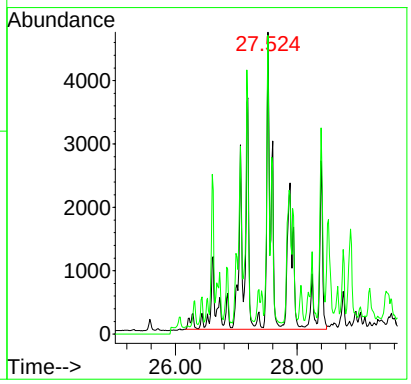


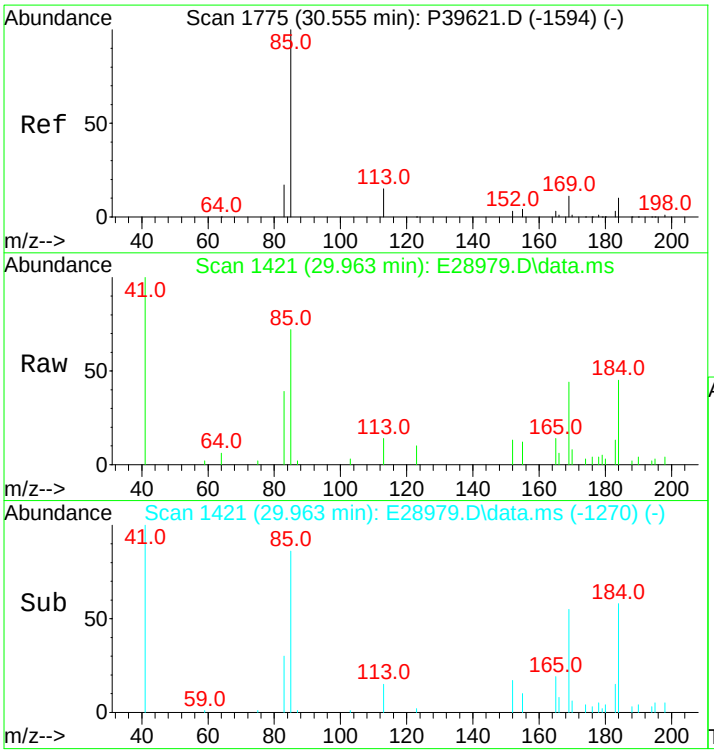


#13
C3-Naphthalenes
Concen: 927.36 ng/mL m
RT: 27.524 min Scan# 1259
Delta R.T. 0.344 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:170 Resp: 78811

Ion	Ratio	Lower	Upper
170	100		
155	15.4	66.8	100.2#

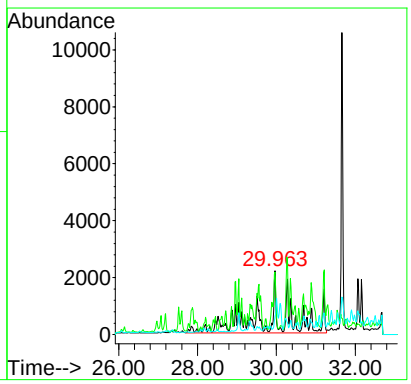


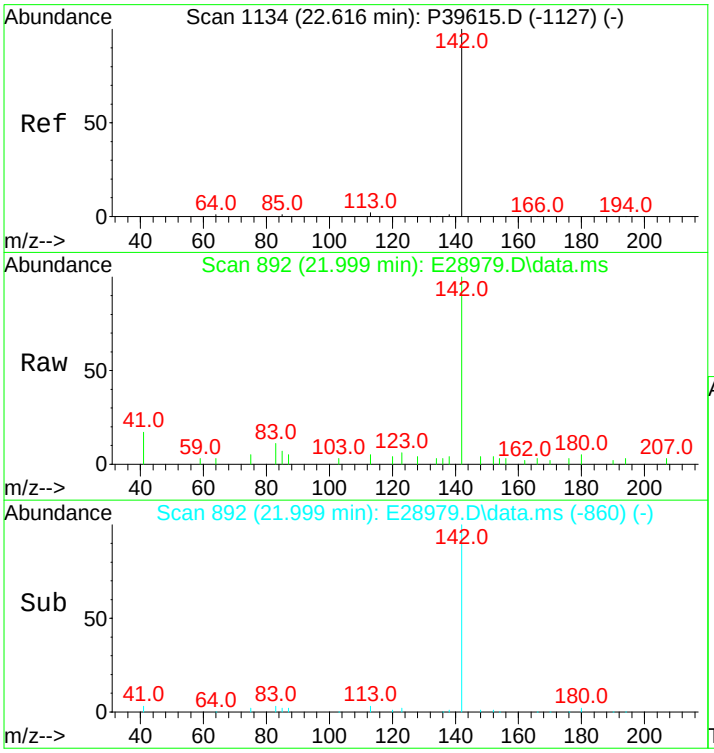


#14
C4-Naphthalenes
Concen: 841.47 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:184 Resp: 71511

Ion	Ratio	Lower	Upper
184	100		
169	4.8	78.7	118.1#
183	1.3	26.7	40.1#

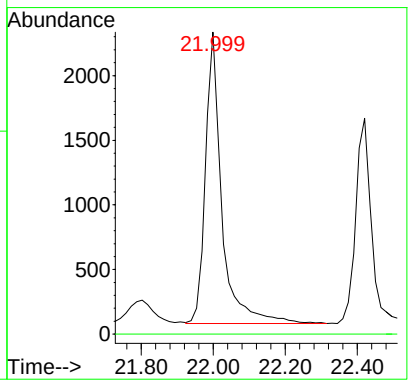


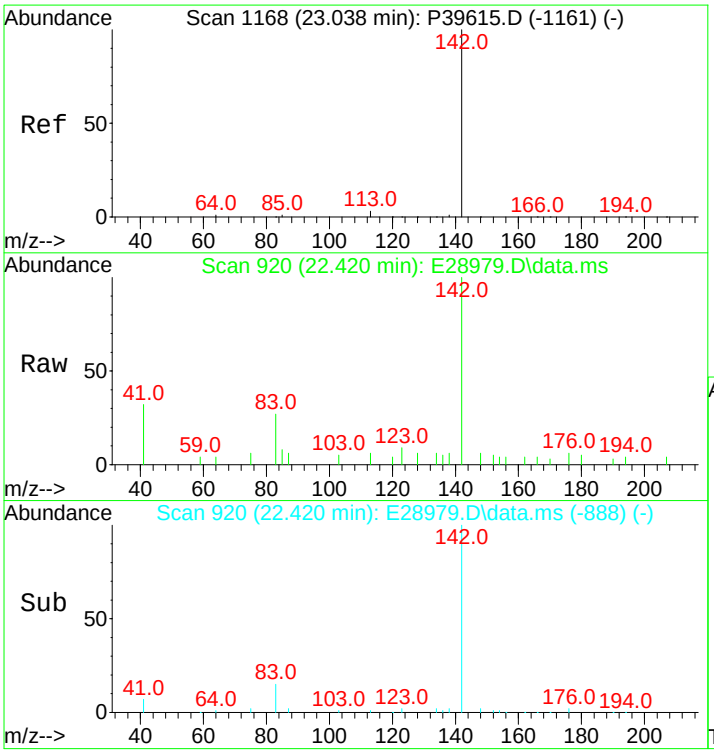


#16
2-Methylnaphthalene
Concen: 132.50 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:142 Resp: 7172

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

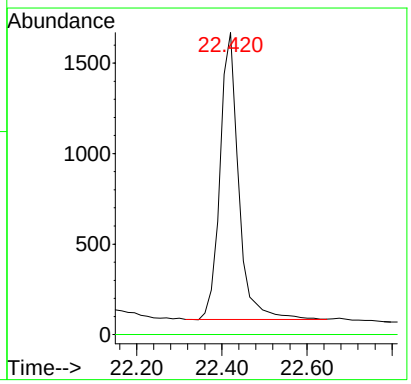


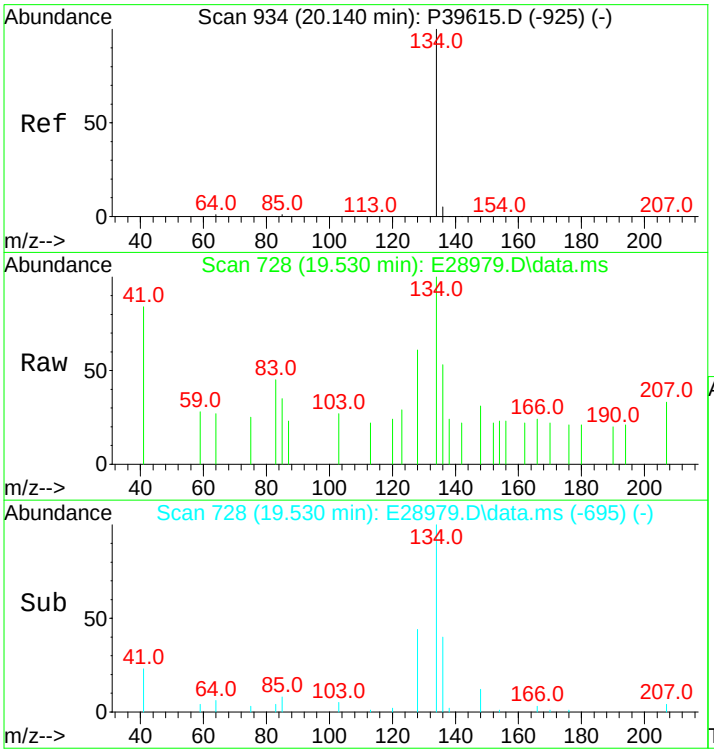


#17
1-Methylnaphthalene
Concen: 91.82 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:142 Resp: 4829

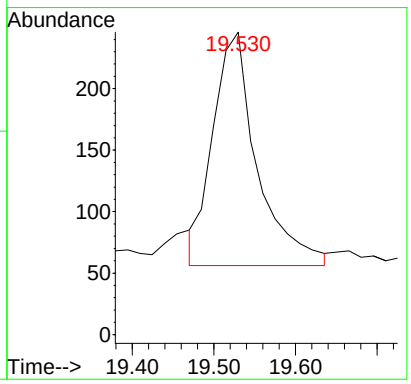
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

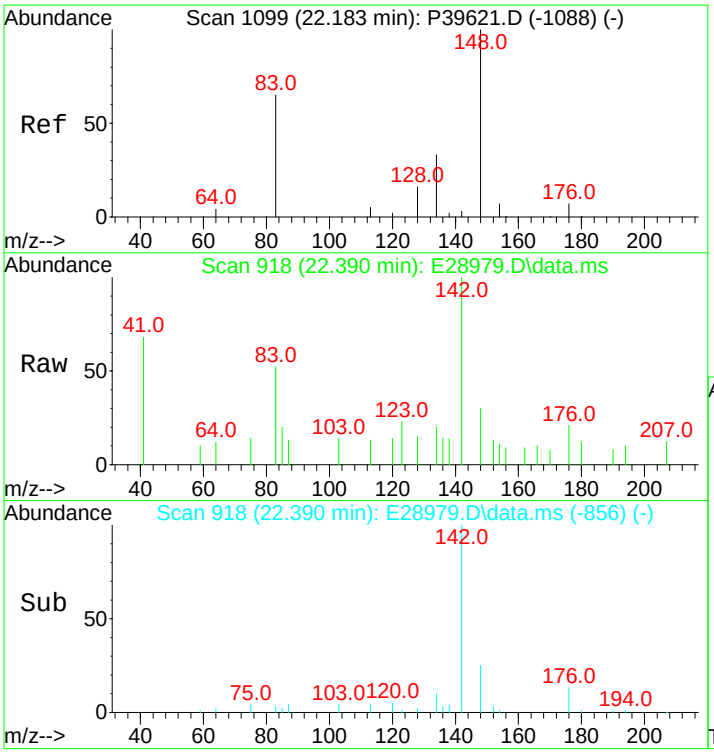




#18
Benzothiophene
Concen: 10.16 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

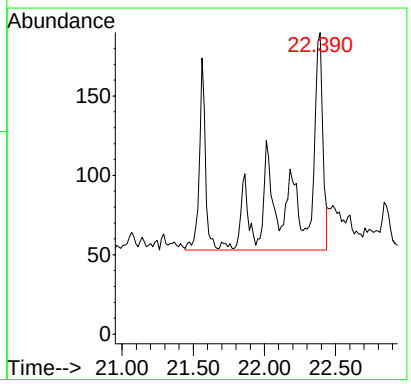
Tgt Ion:134 Resp: 714

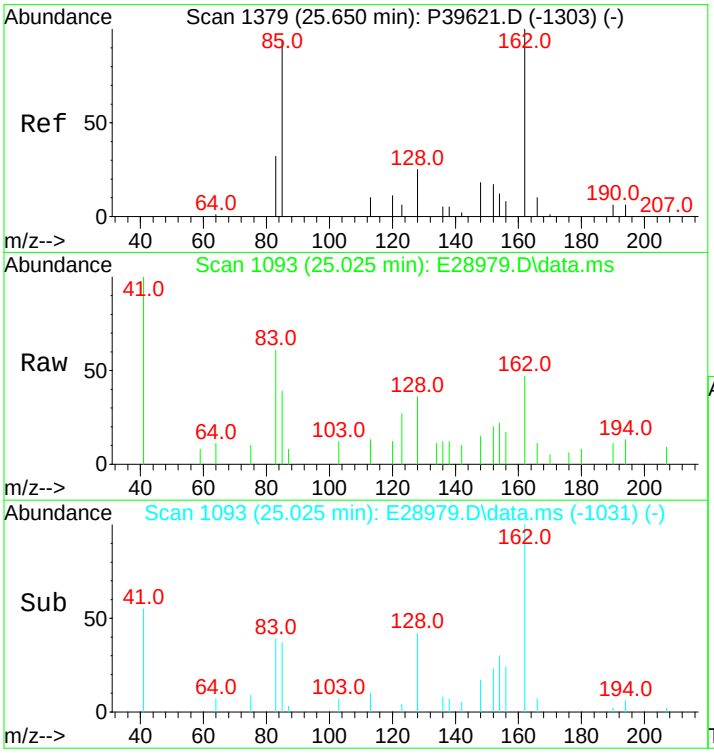




#19
C1-Benzo(b)thiophenes
Concen: 23.97 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.689 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

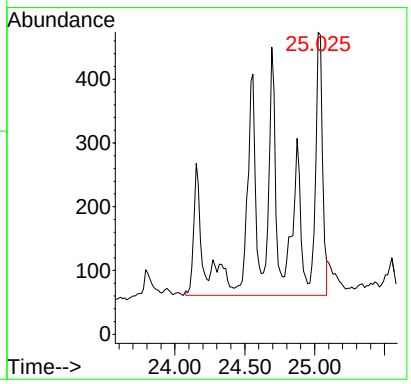
Tgt Ion:148 Resp: 1684

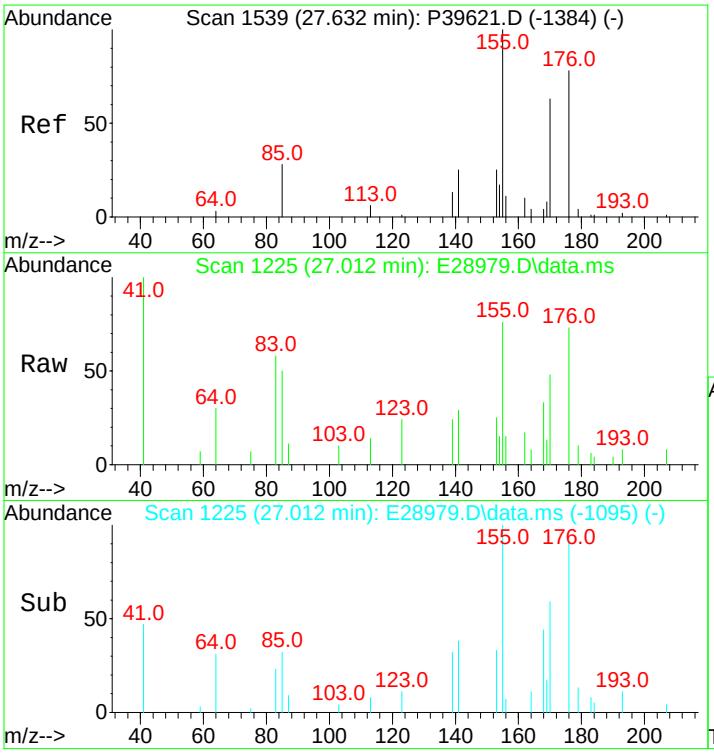




#20
C2-Benzo(b)thiophenes
Concen: 86.73 ng/mL m
RT: 25.025 min Scan# 1093
Delta R.T. -0.060 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

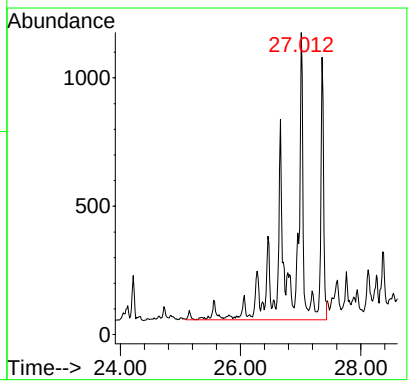
Tgt Ion:162 Resp: 6093

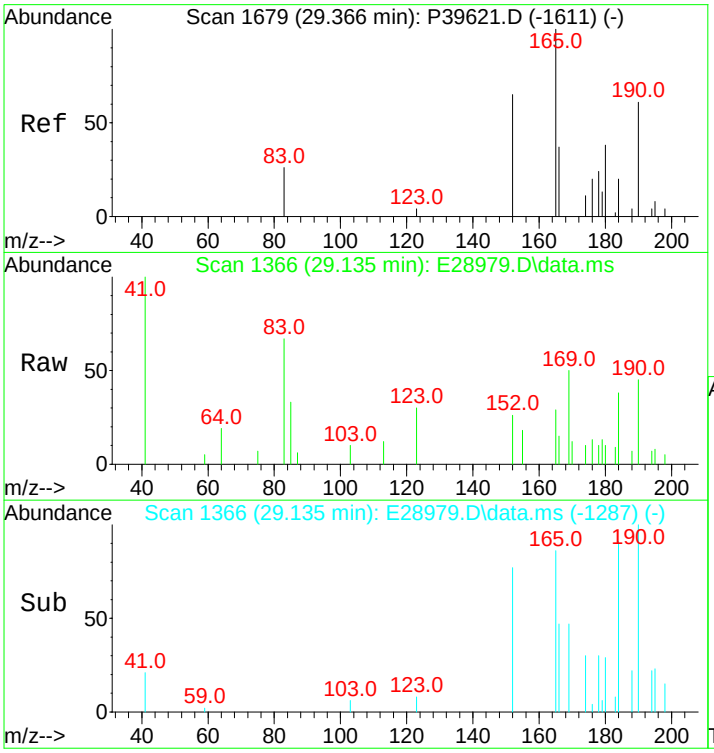




#21
C3-Benzo(b)thiophenes
Concen: 220.34 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. -0.007 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

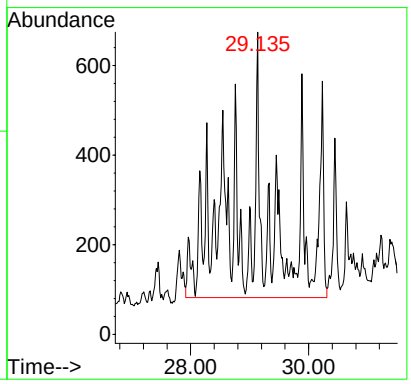
Tgt Ion:176 Resp: 15480

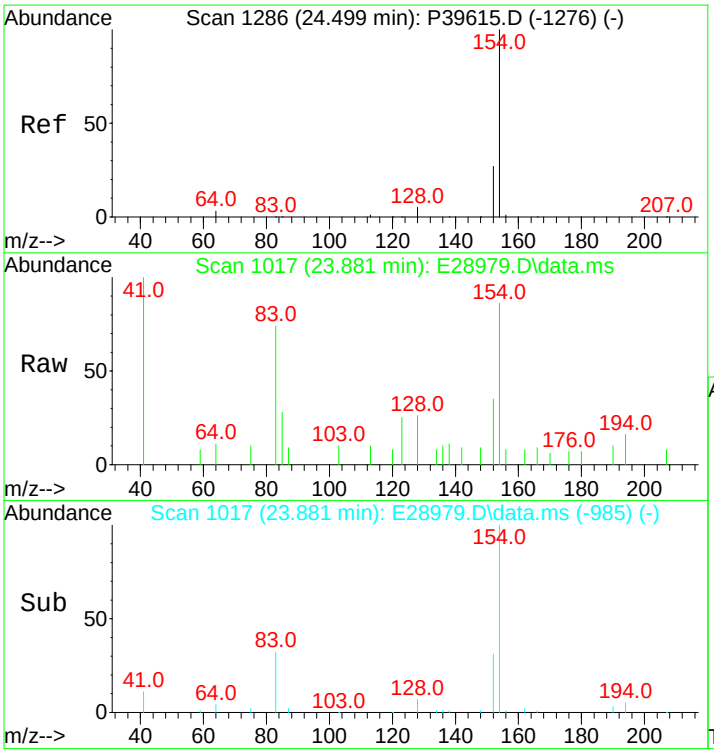




#22
C4-Benzo(b)thiophenes
Concen: 283.45 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:190 Resp: 19914

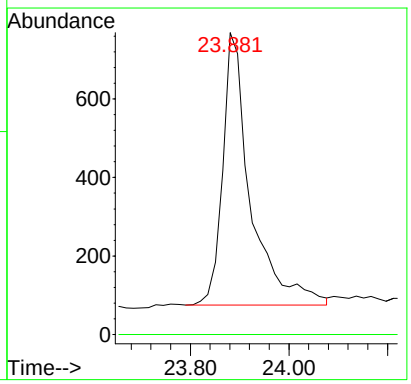


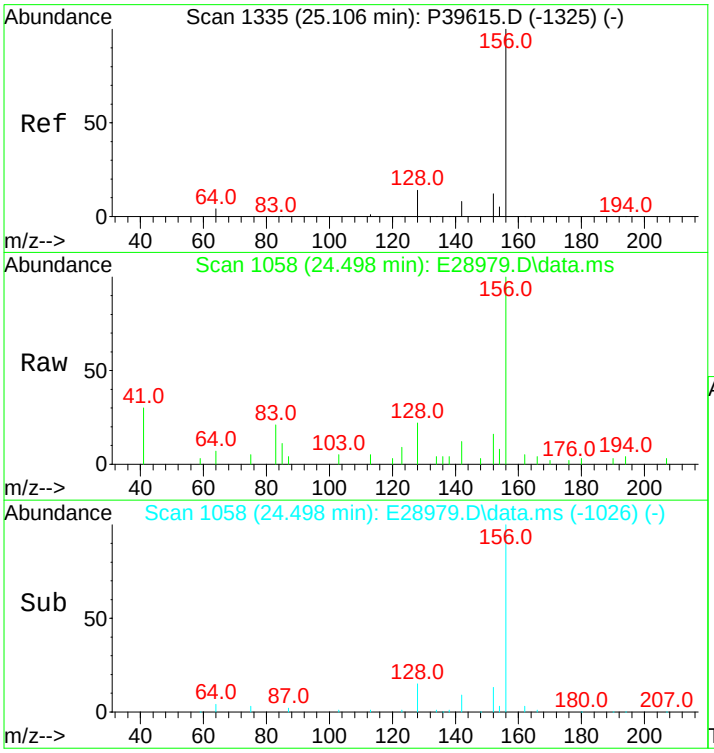


#23
Biphenyl
Concen: 40.02 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:154 Resp: 2738

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

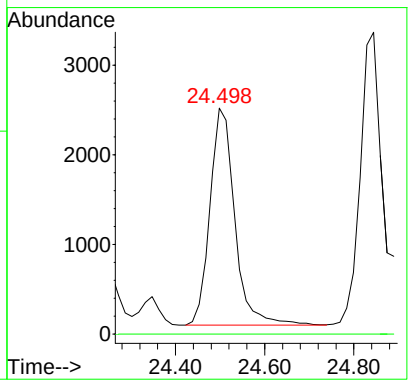


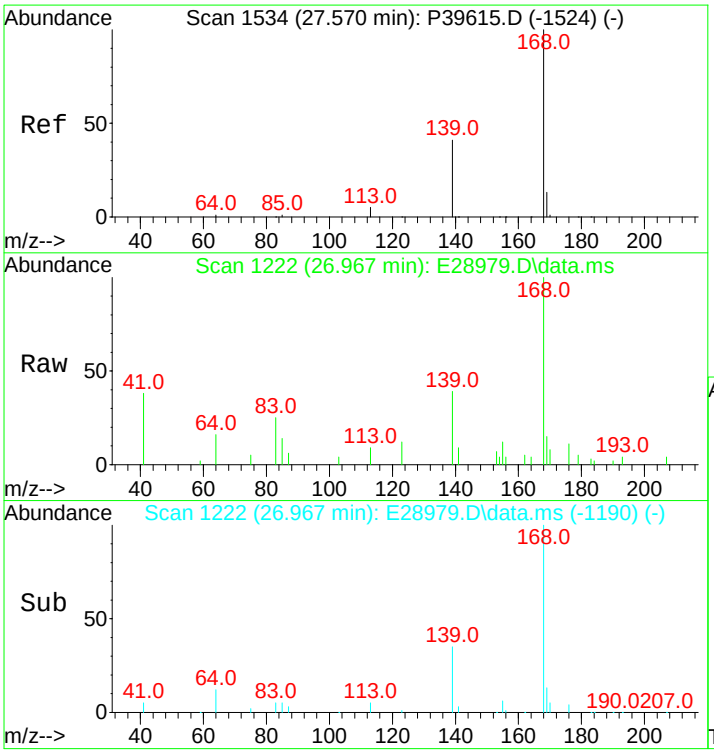


#24
2,6-Dimethylnaphthalene
Concen: 192.46 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:156 Resp: 9390

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

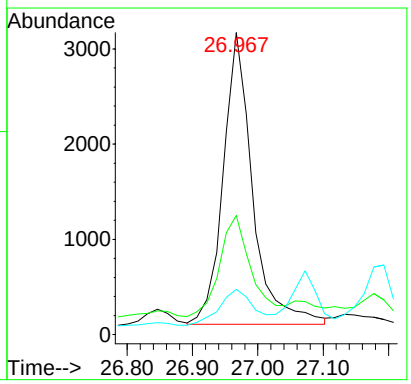


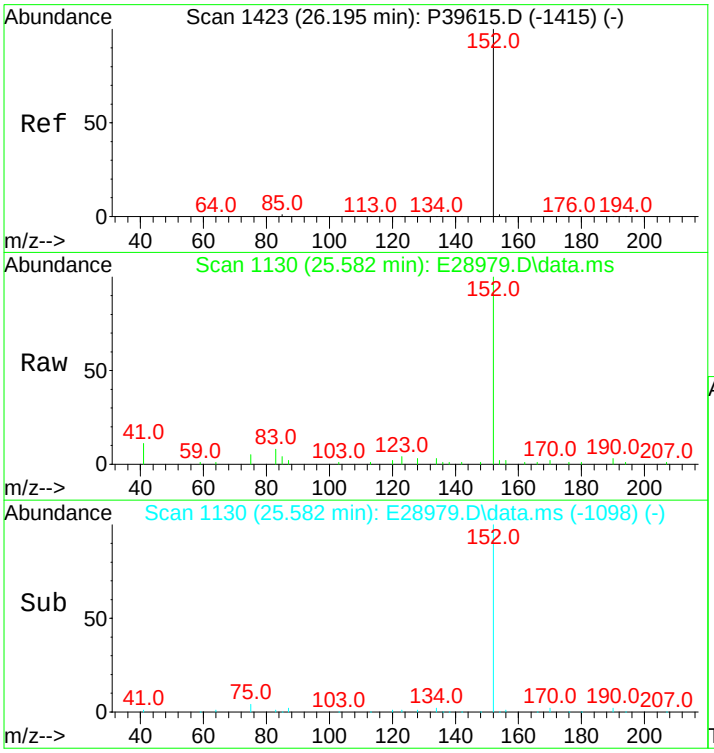


#25
Dibenzofuran
Concen: 126.40 ng/mL m
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:168 Resp: 9573

Ion	Ratio	Lower	Upper
168	100		
139	37.5	26.0	39.0
169	14.6	10.6	16.0

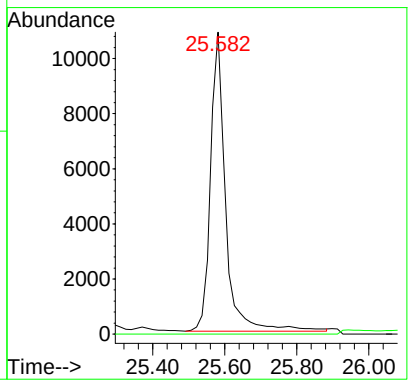


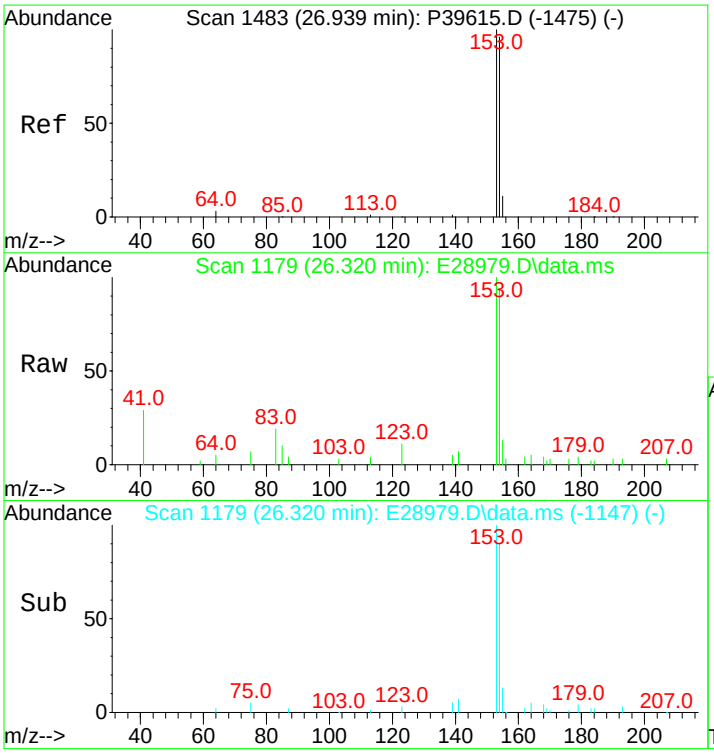


#26
Acenaphthylene
Concen: 372.25 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:152 Resp: 31540

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

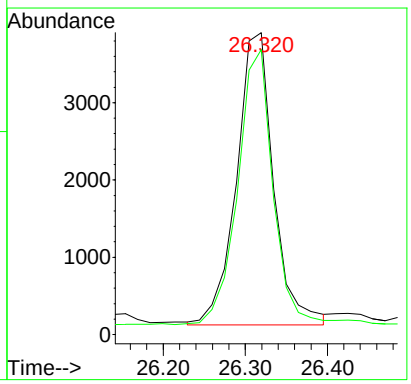


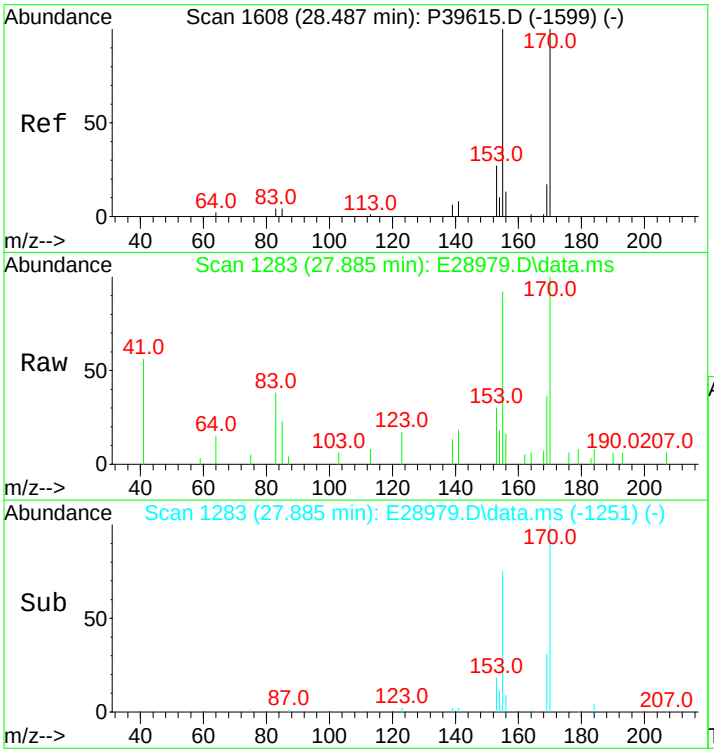


#27
Acenaphthene
Concen: 218.72 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:153 Resp: 11929

Ion	Ratio	Lower	Upper
153	100		
154	94.2	74.1	111.1

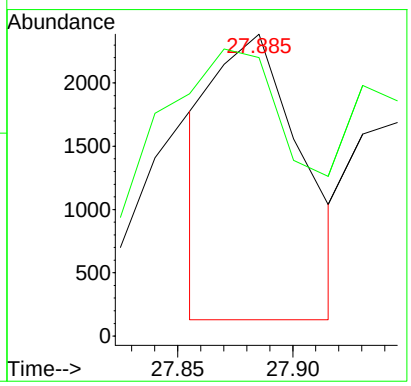


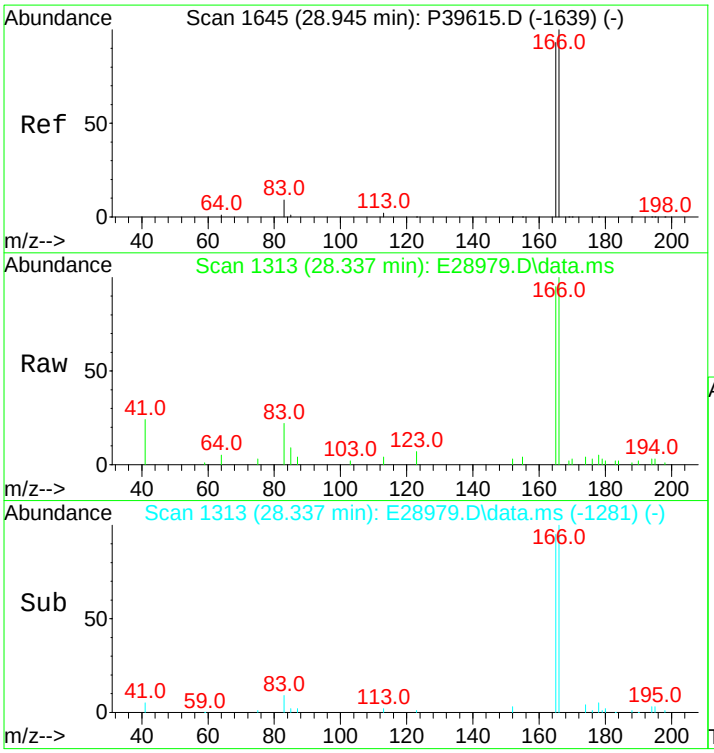


#28
2,3,5-Trimethylnaphthalene
Concen: 130.81 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:170 Resp: 5971

Ion	Ratio	Lower	Upper
170	100		
155	164.3	70.7	106.1#

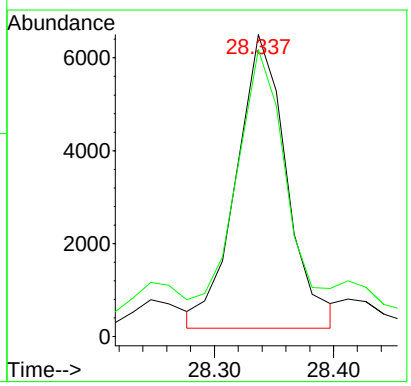


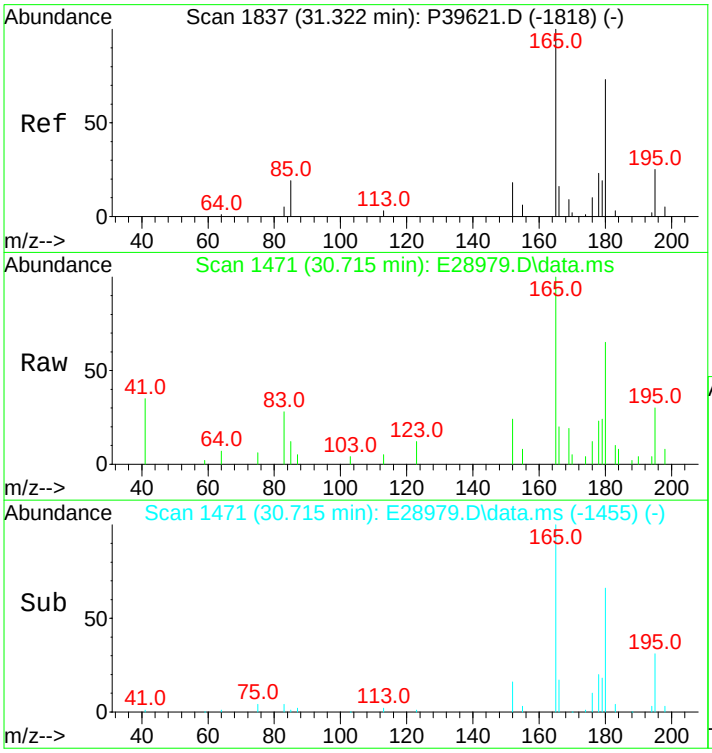


#29
Fluorene
Concen: 306.24 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:166 Resp: 18628

Ion	Ratio	Lower	Upper
166	100		
165	110.5	74.7	112.1

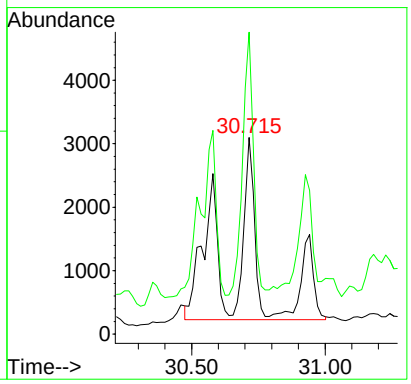


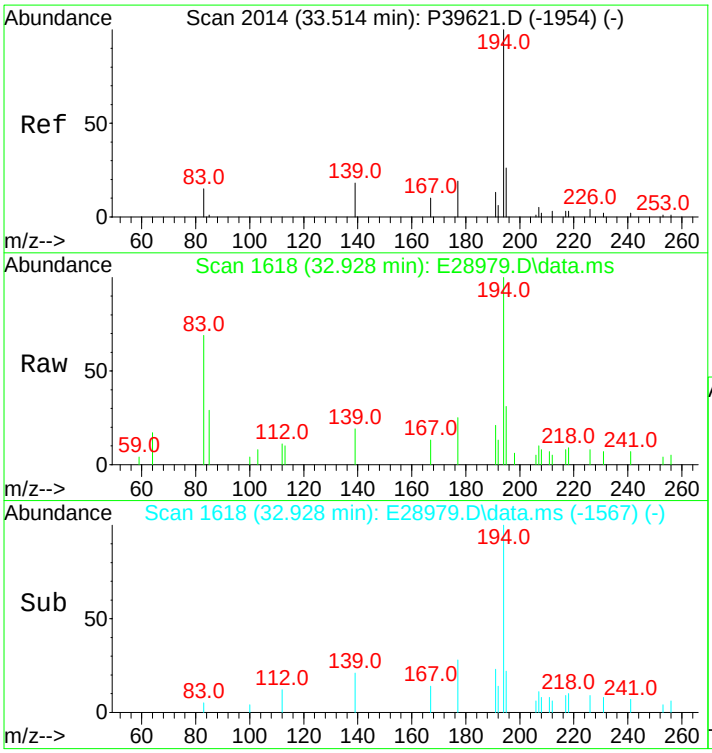


#30
C1-Fluorenes
Concen: 351.81 ng/mL m
RT: 30.715 min Scan# 1471
Delta R.T. 0.093 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:180 Resp: 21400

Ion	Ratio	Lower	Upper
180	100		
165	46.7	94.3	141.5#

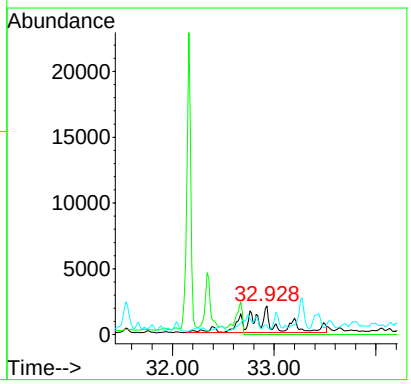


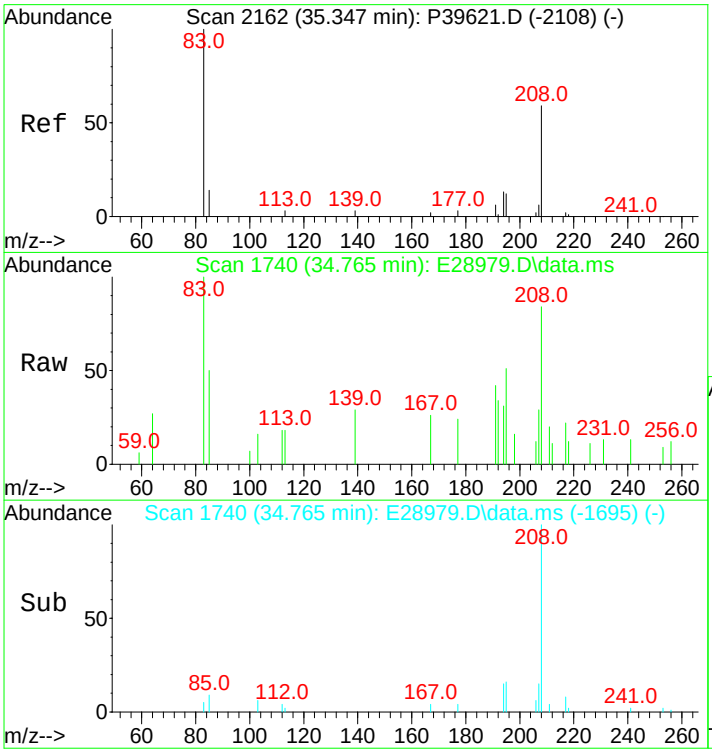


#31
C2-Fluorenes
Concen: 605.26 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:194 Resp: 36817

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	21.7	27.0	40.4#

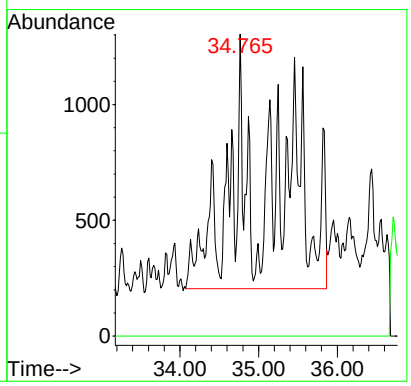


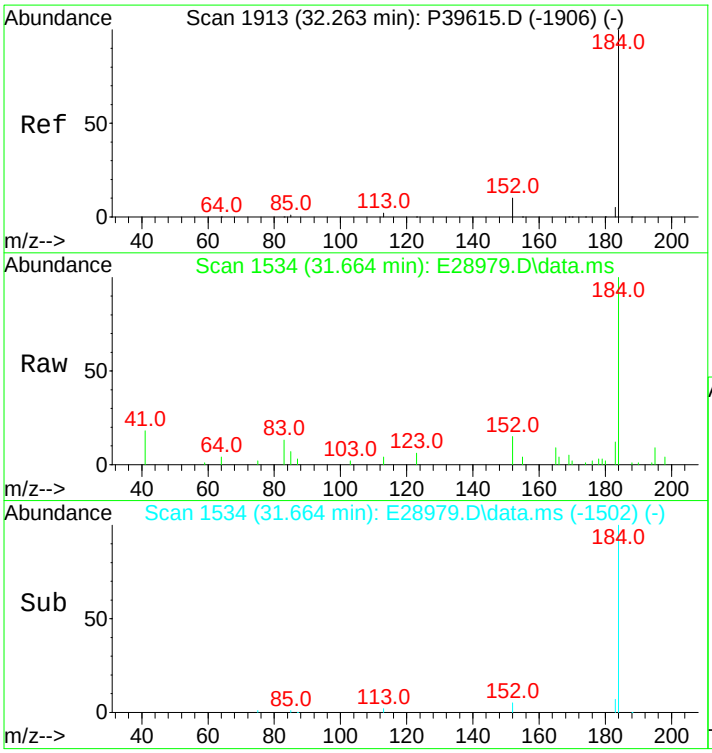


#32
C3-Fluorenes
Concen: 612.51 ng/mL m
RT: 34.765 min Scan# 1740
Delta R.T. 0.216 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:208 Resp: 37258

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

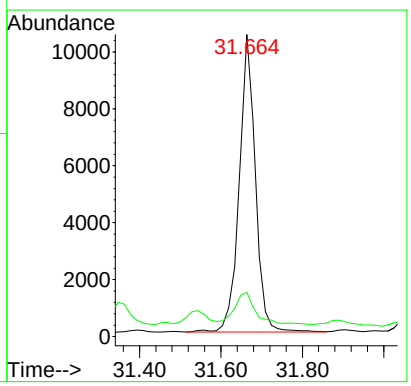


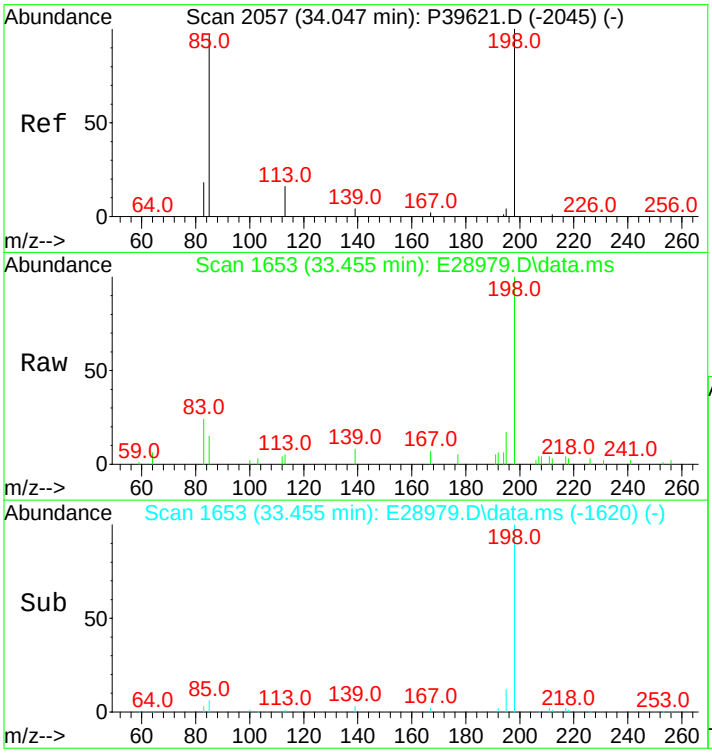


#33
Dibenzothiophene
Concen: 345.75 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:184 Resp: 28861

Ion	Ratio	Lower	Upper
184	100		
152	14.2	7.0	10.6#

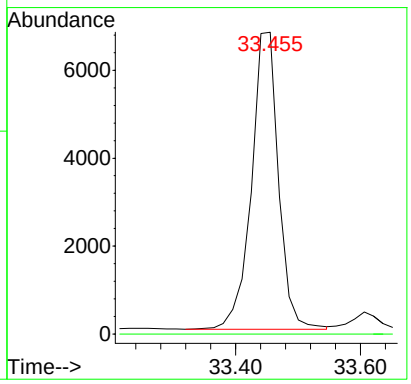


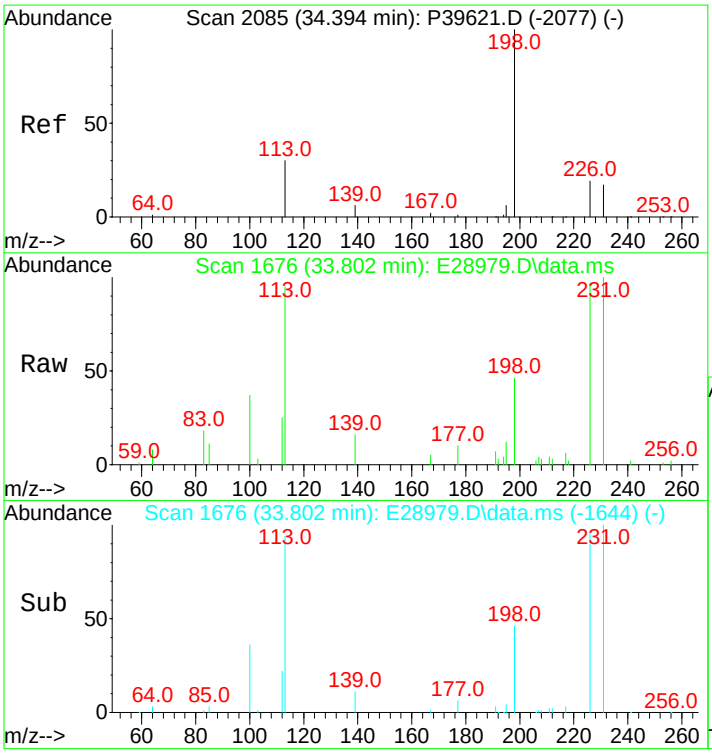


#34
4-Methyldibenzothiophene(4MDT)
Concen: 244.16 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:198 Resp: 20381

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

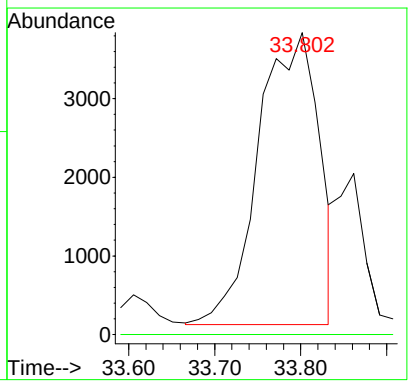


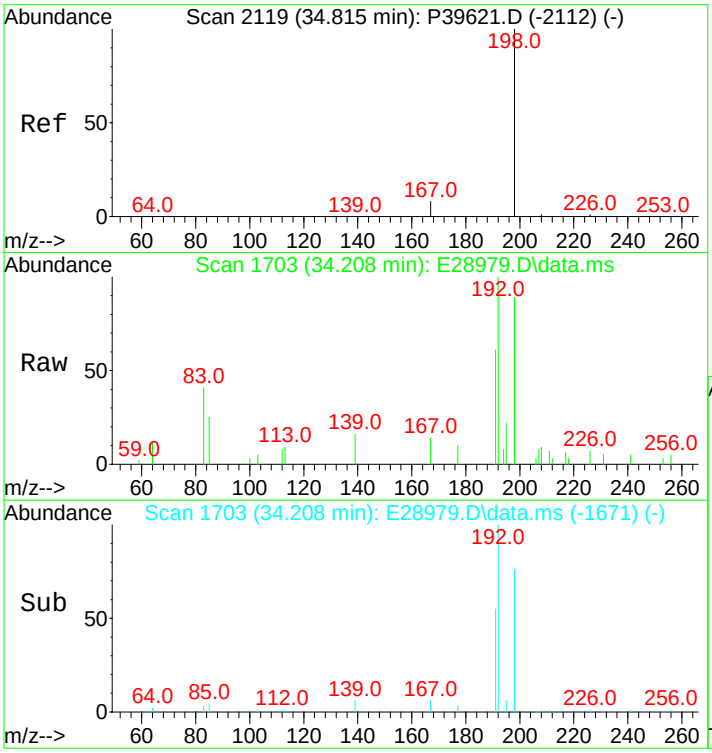


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 217.58 ng/mL m
RT: 33.802 min Scan# 1676
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:198 Resp: 18162

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

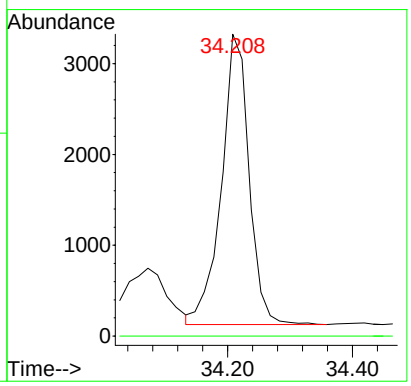


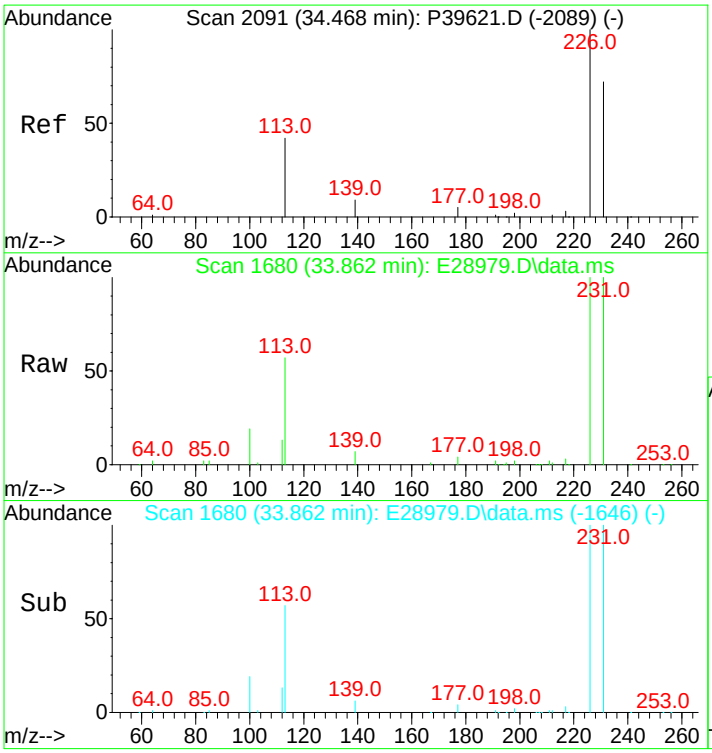


#36
1-Methyldibenzothiophene(1MDT)
Concen: 117.62 ng/mL
RT: 34.208 min Scan# 1703
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:198 Resp: 9818

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

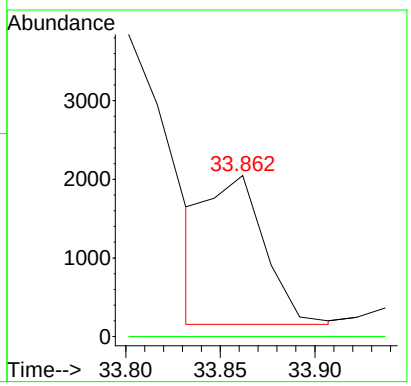


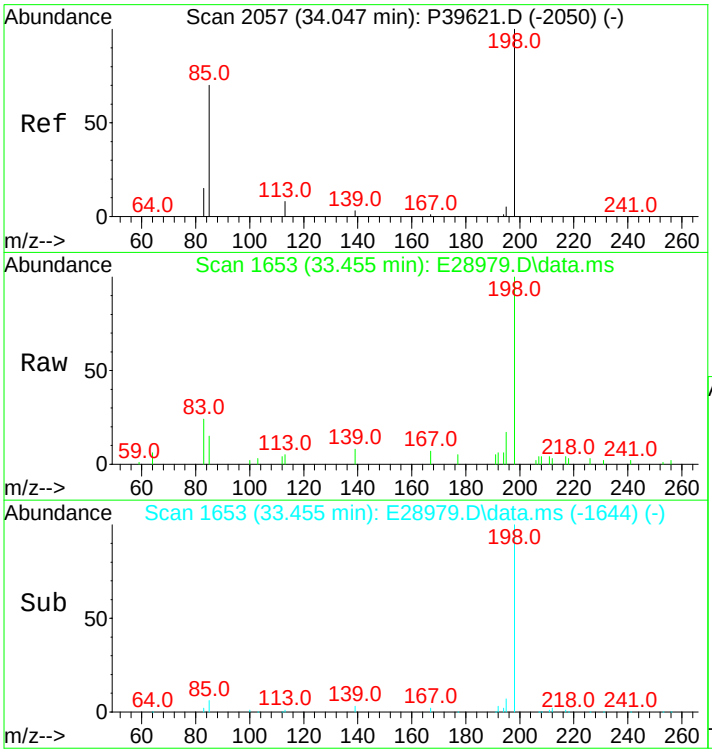


#37
OTP
Concen: 47.62 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:198 Resp: 3975

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

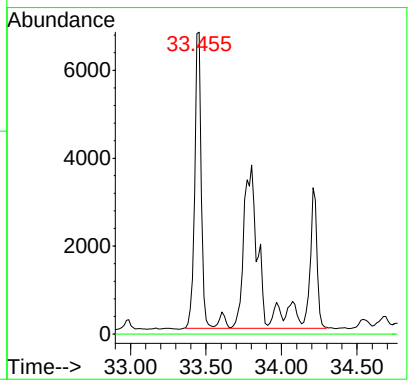


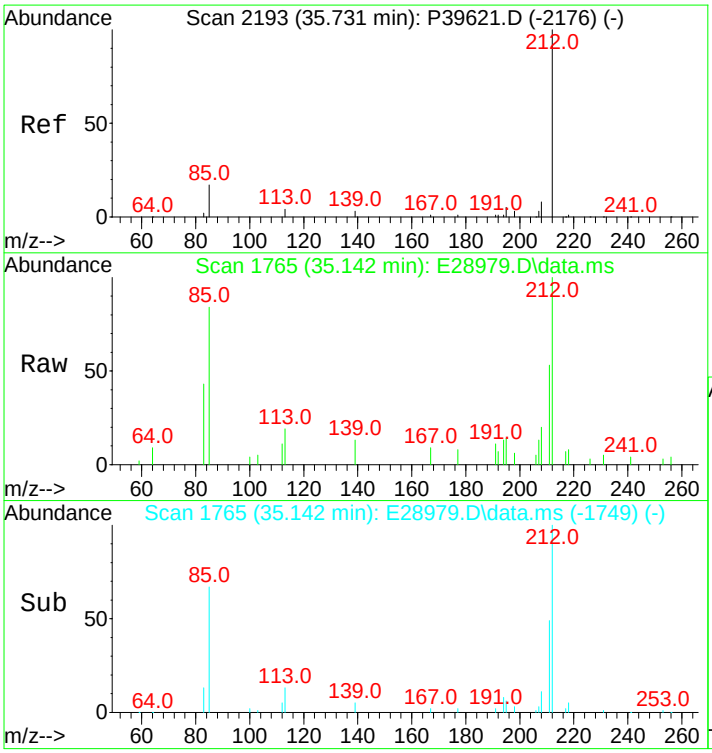


#38
C1-Dibenzothiophenes
Concen: 695.43 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:198 Resp: 58050

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

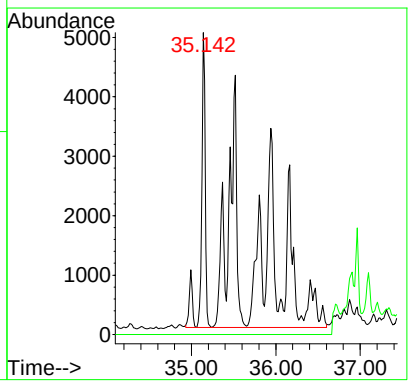


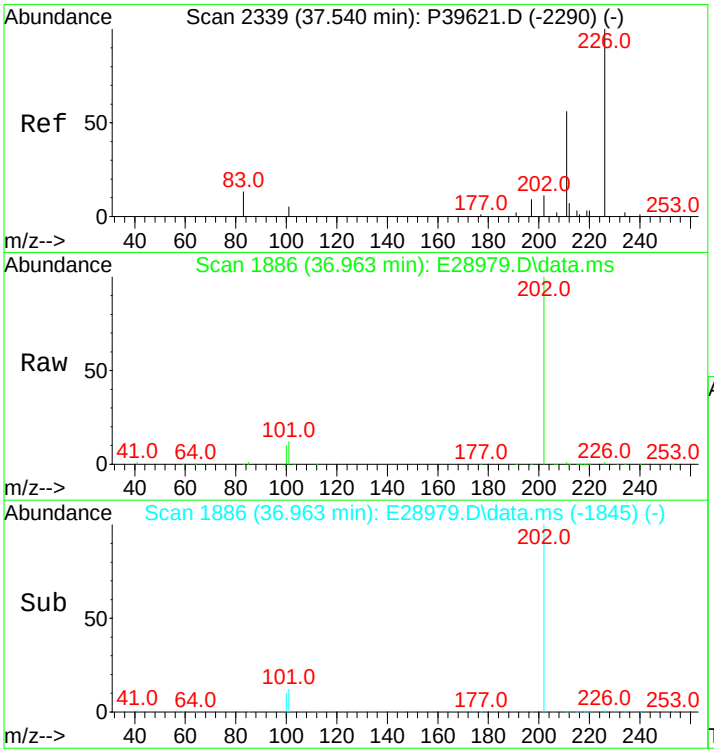


#39
C2-Dibenzothiophenes
Concen: 1079.10 ng/mL m
RT: 35.142 min Scan# 1765
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:212 Resp: 90076

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

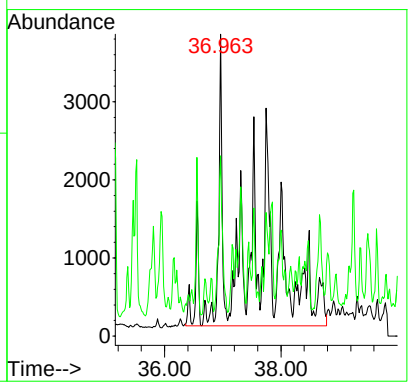


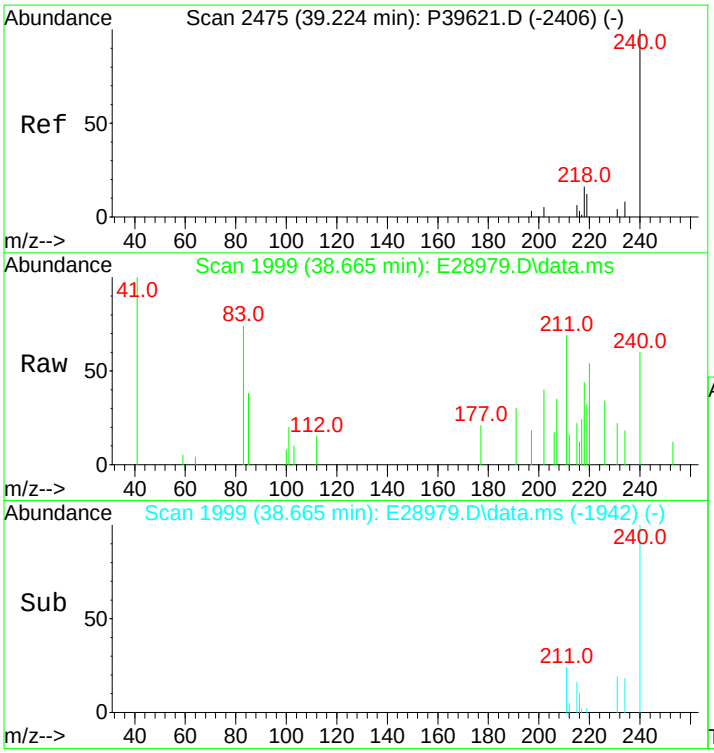


#40
C3-Dibenzothiophenes
Concen: 1098.77 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:226 Resp: 91718

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

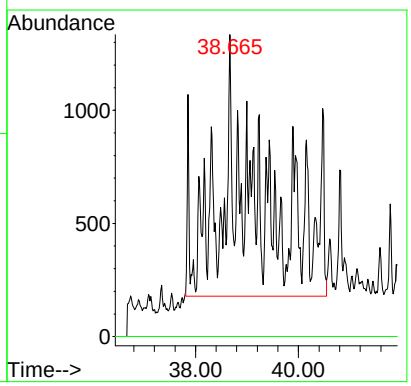


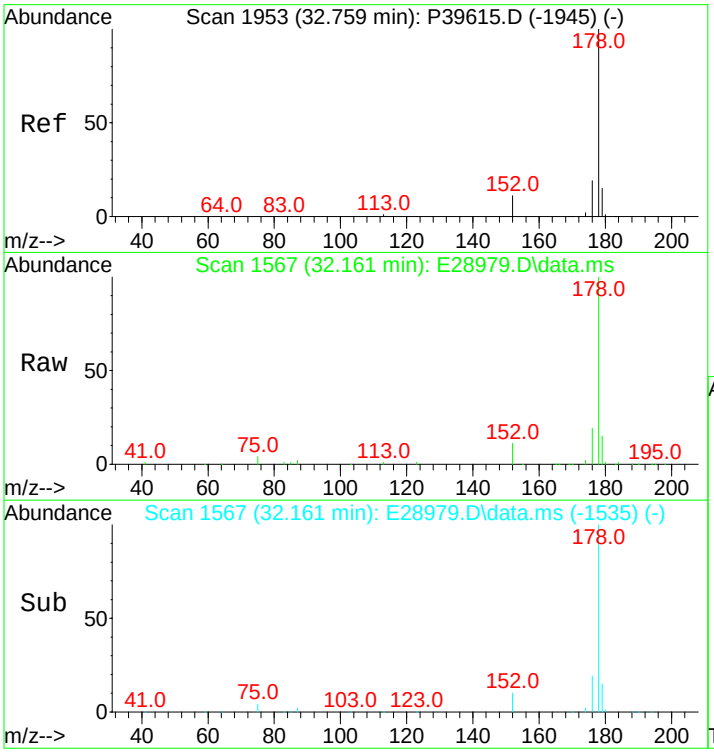


#41
C4-Dibenzothiophenes
Concen: 705.05 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:240 Resp: 58853

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

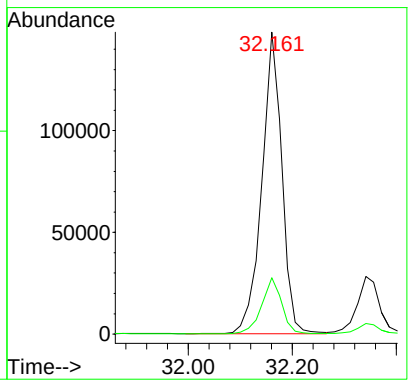


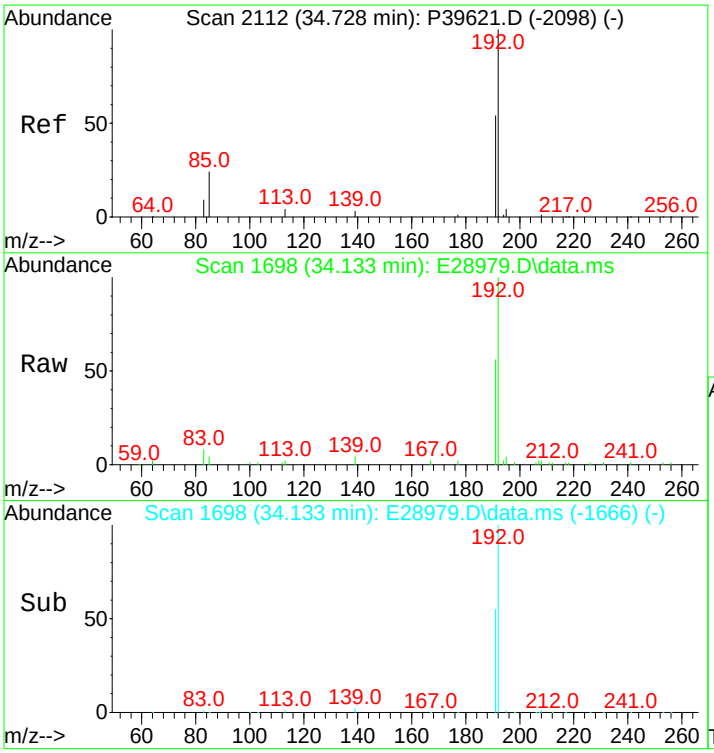


#43
Phenanthrene
Concen: 4662.76 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:178 Resp: 395983

Ion	Ratio	Lower	Upper
178	100		
176	18.6	15.0	22.4

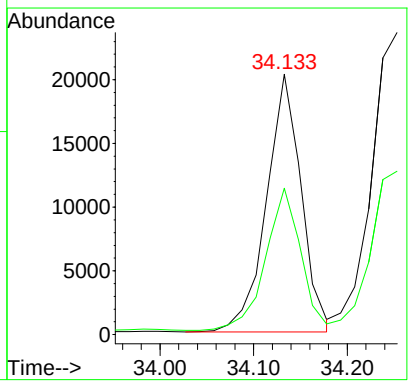


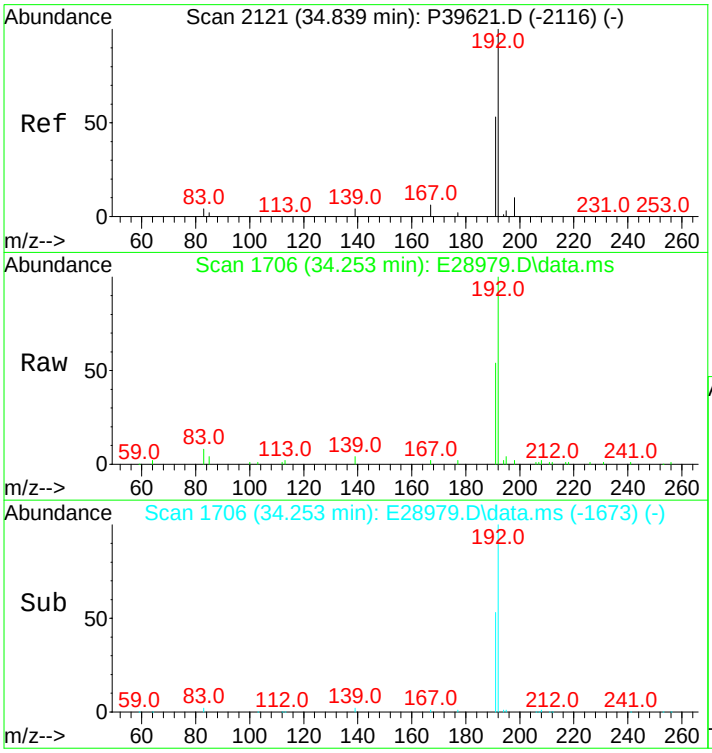


#44
3-Methylphenanthrene(3MP)
Concen: 612.96 ng/mL
RT: 34.133 min Scan# 1698
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 52055

Ion	Ratio	Lower	Upper
192	100		
191	55.9	45.9	68.9

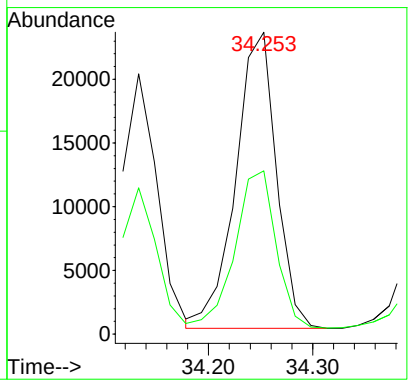


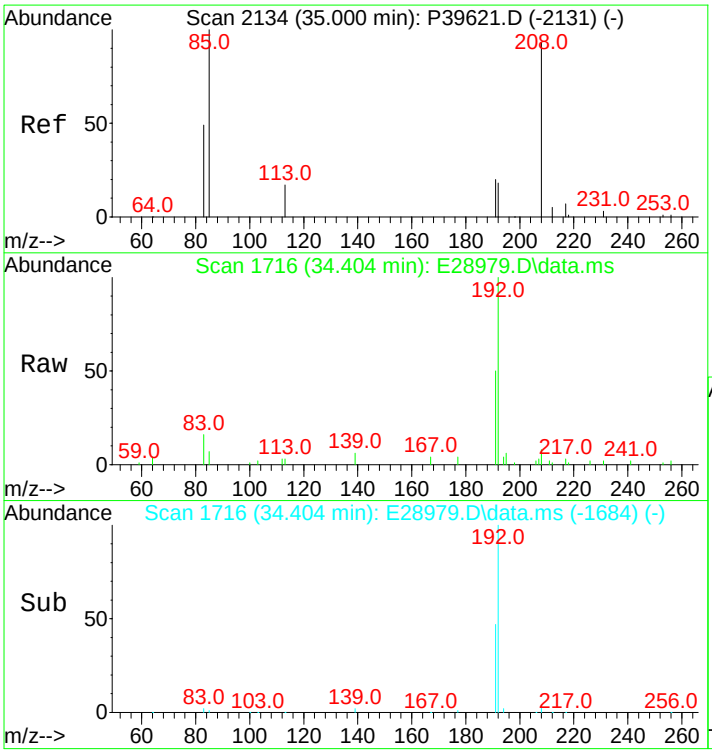


#45
2-Methylphenanthrene(2MP)
Concen: 747.14 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 63451

Ion	Ratio	Lower	Upper
192	100		
191	53.5	45.4	68.0

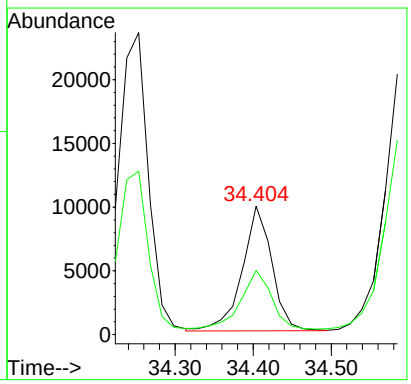


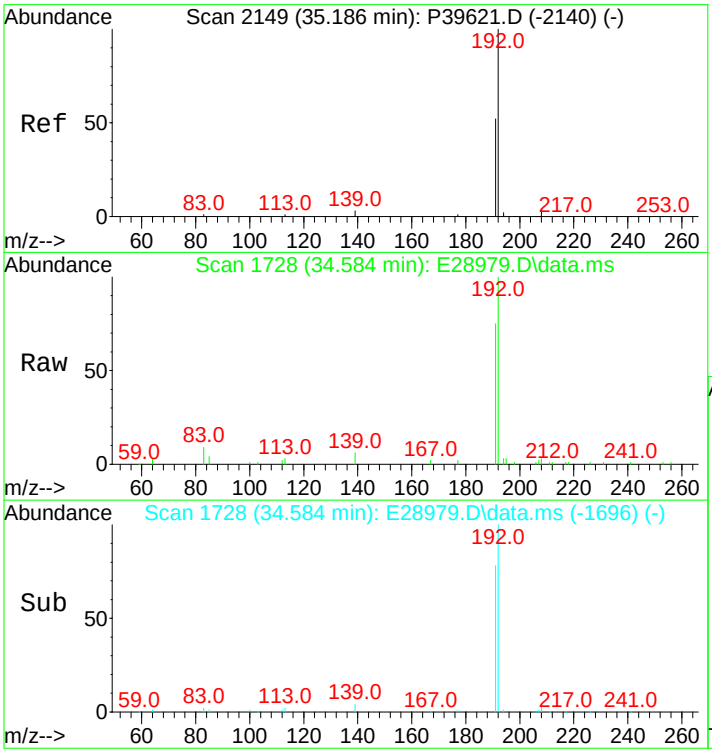


#46
2-Methylanthracene(2MA)
Concen: 305.45 ng/mL
RT: 34.404 min Scan# 1716
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 25940

Ion	Ratio	Lower	Upper
192	100		
191	49.8	95.4	143.0#

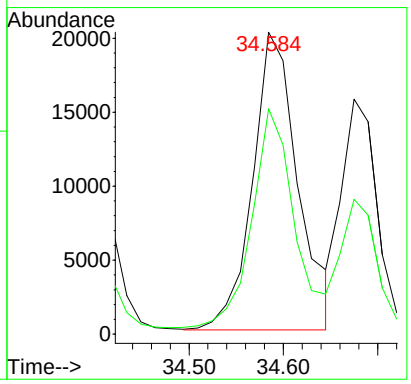


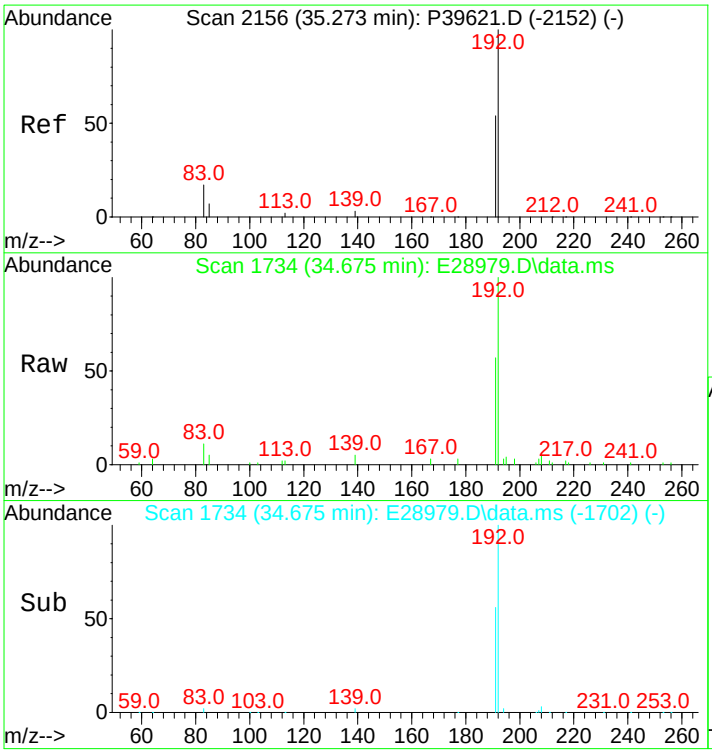


#47
9/4-Methylphenanthrene(9MP)
Concen: 791.77 ng/mL m
RT: 34.584 min Scan# 1728
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 67241

Ion	Ratio	Lower	Upper
192	100		
191	33.7	44.3	66.5#

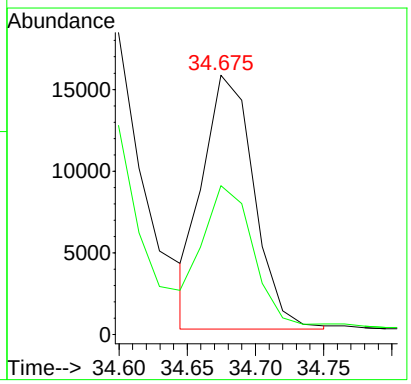


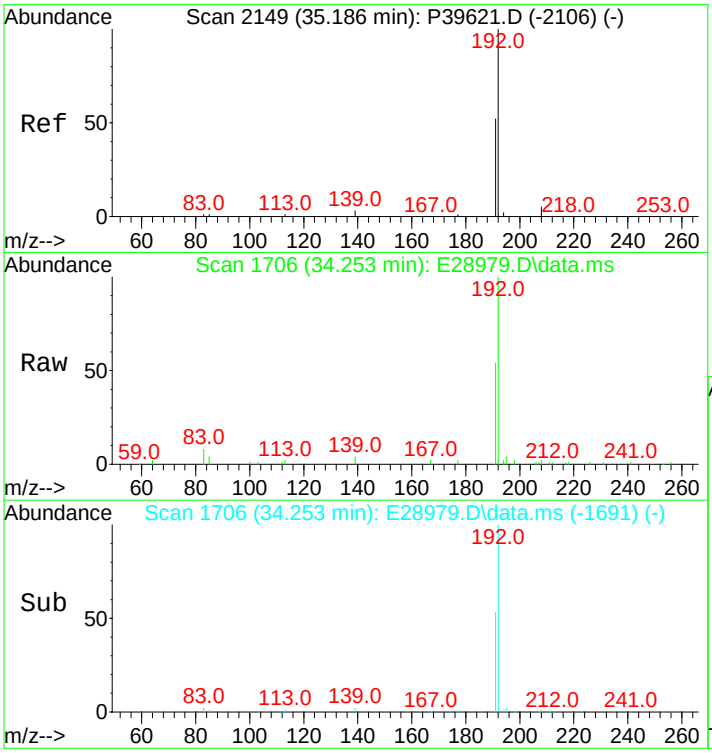


#48
1-Methylphenanthrene(1MP)
Concen: 475.48 ng/mL m
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 40380

Ion	Ratio	Lower	Upper
192	100		
191	56.1	46.7	70.1

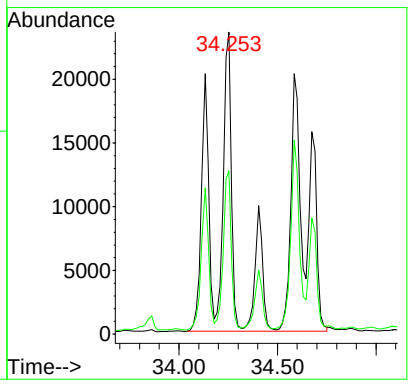


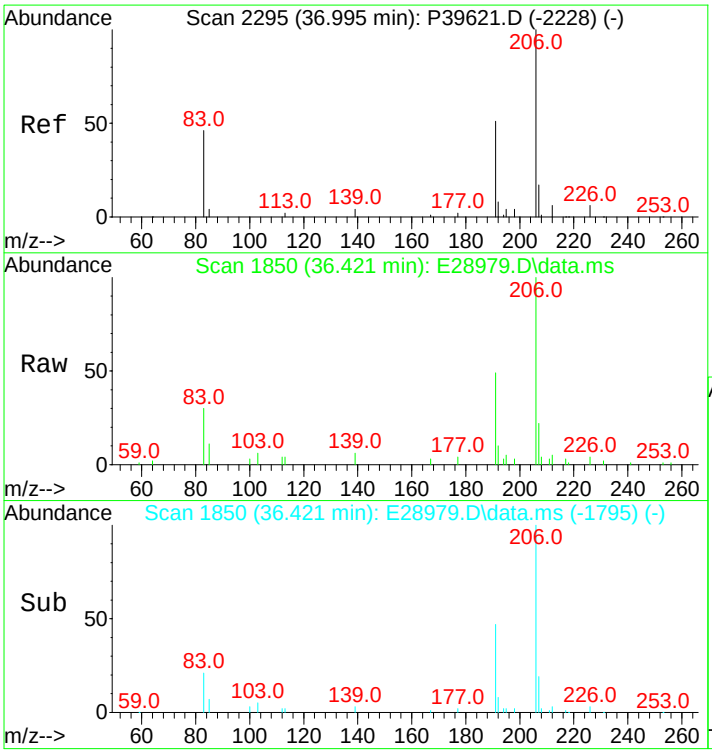


#49
C1-Phenanthrenes/Anthracenes
Concen: 2979.29 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 253015

Ion	Ratio	Lower	Upper
192	100		
191	4.9	44.0	66.0#

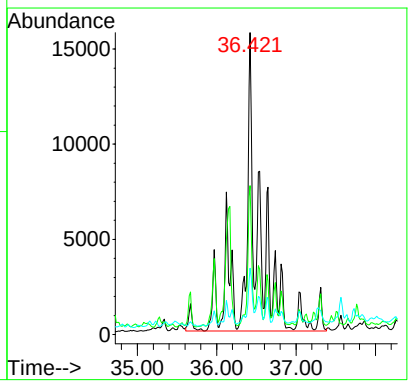


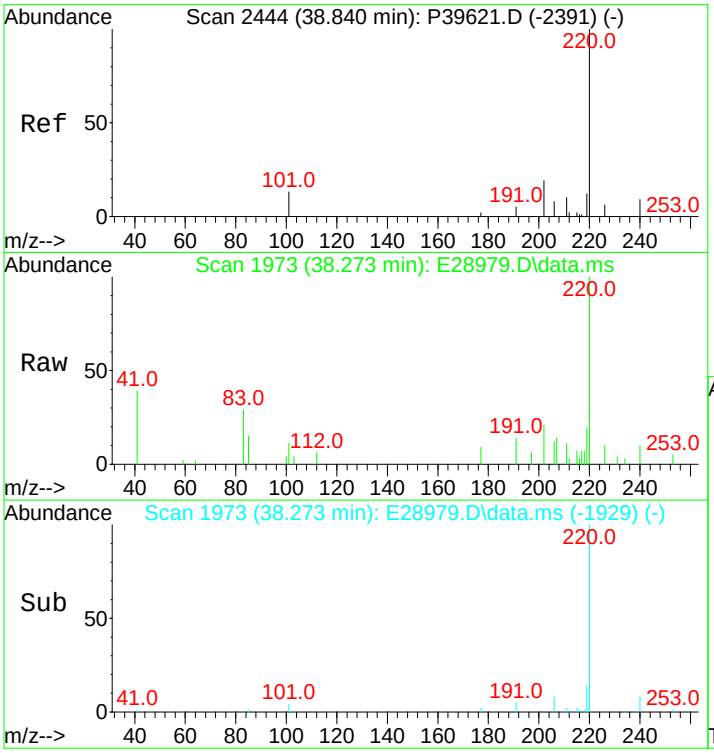


#50
C2-Phenanthrenes/Anthracenes
Concen: 2335.26 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:206 Resp: 198321

Ion	Ratio	Lower	Upper
206	100		
191	13.4	35.7	53.5#
207	6.0	16.5	24.7#

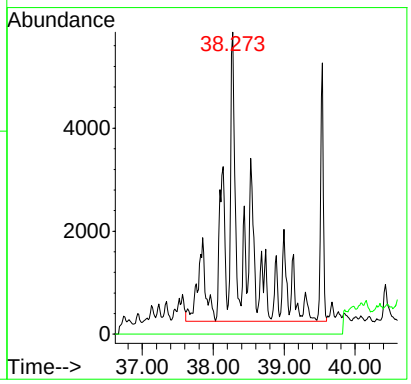


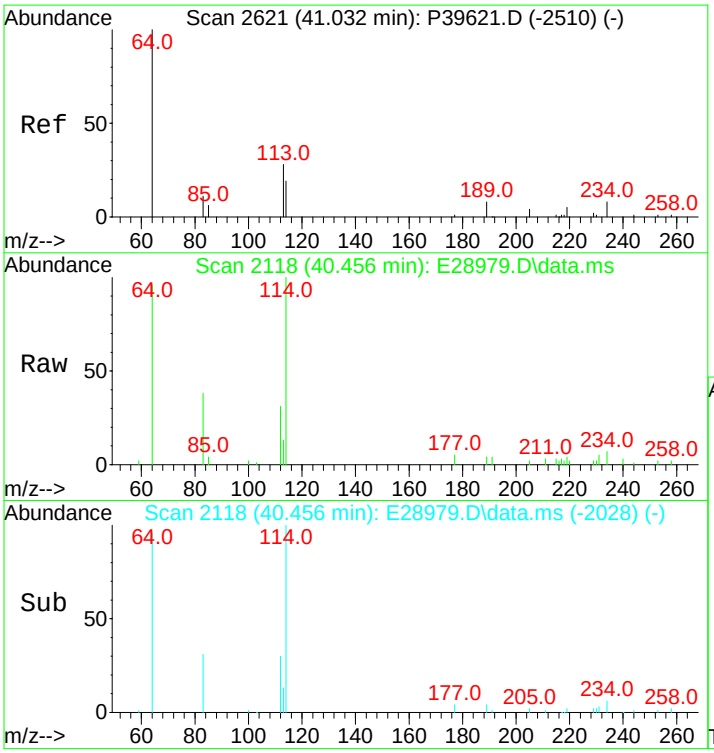


#52
C3-Phenanthrenes/Anthracenes
Concen: 1273.88 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:220 Resp: 108184

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

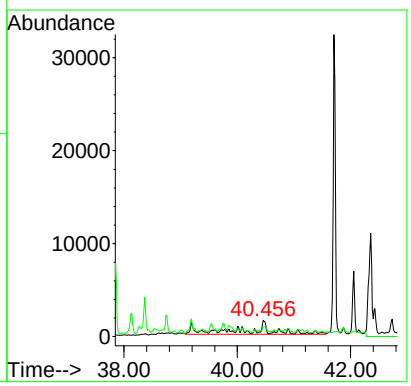


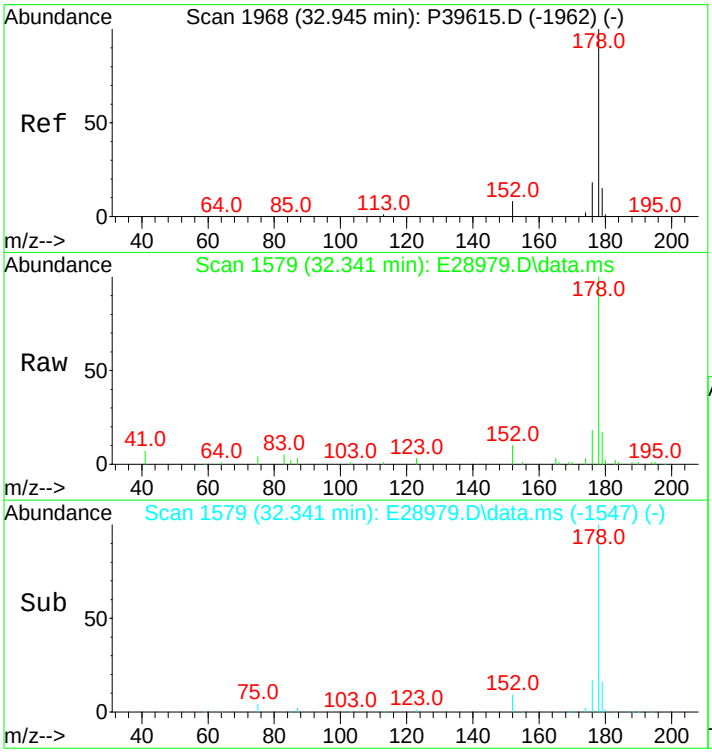


#53
C4-Phenanthrenes/Anthracenes
Concen: 537.94 ng/mL m
RT: 40.456 min Scan# 2118
Delta R.T. 0.369 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:234 Resp: 45684

Ion	Ratio	Lower	Upper
234	100		
219	2.1	46.6	70.0#

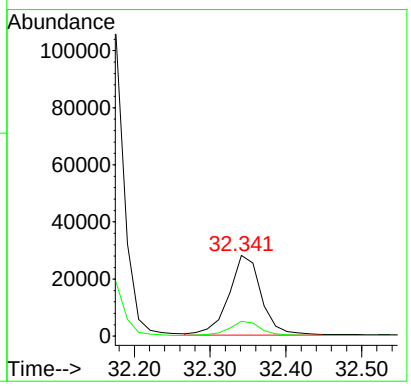


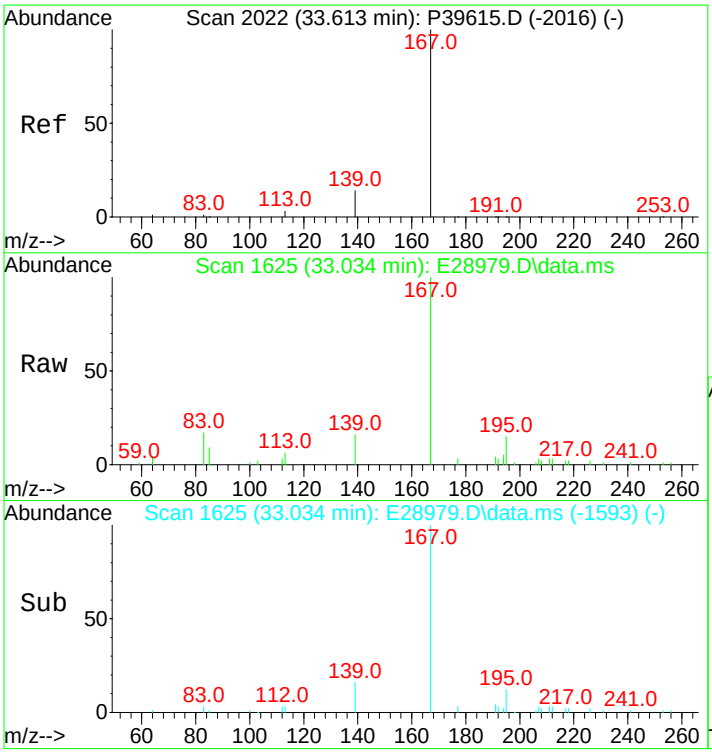


#55
Anthracene
Concen: 1138.14 ng/mL m
RT: 32.341 min Scan# 1579
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:178 Resp: 83545

Ion	Ratio	Lower	Upper
178	100		
176	17.3	14.3	21.5

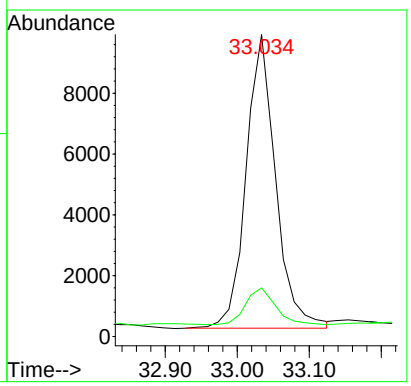


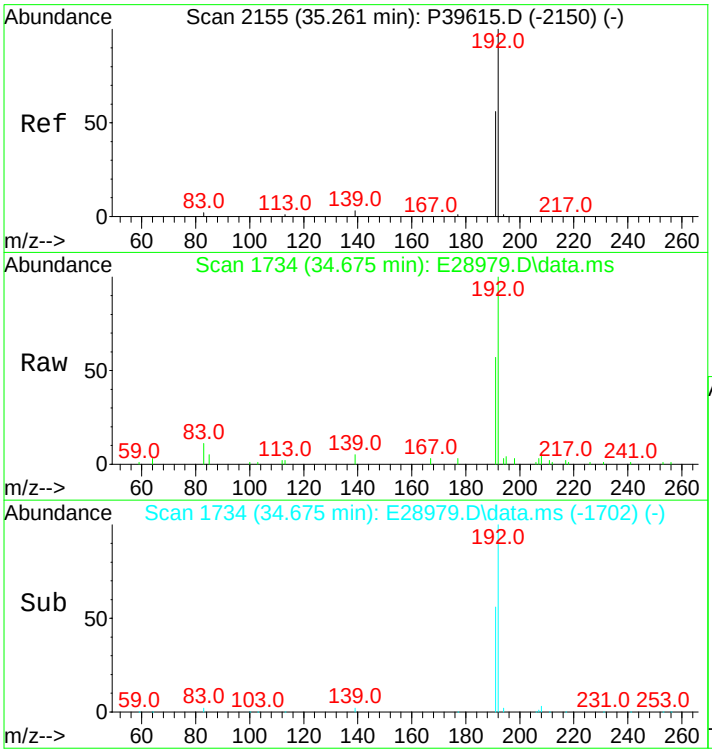


#56
Carbazole
Concen: 363.85 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:167 Resp: 27488

Ion	Ratio	Lower	Upper
167	100		
139	12.7	10.1	15.1

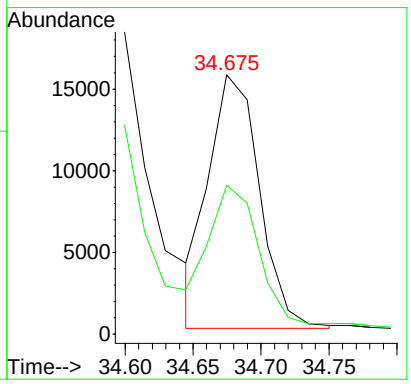


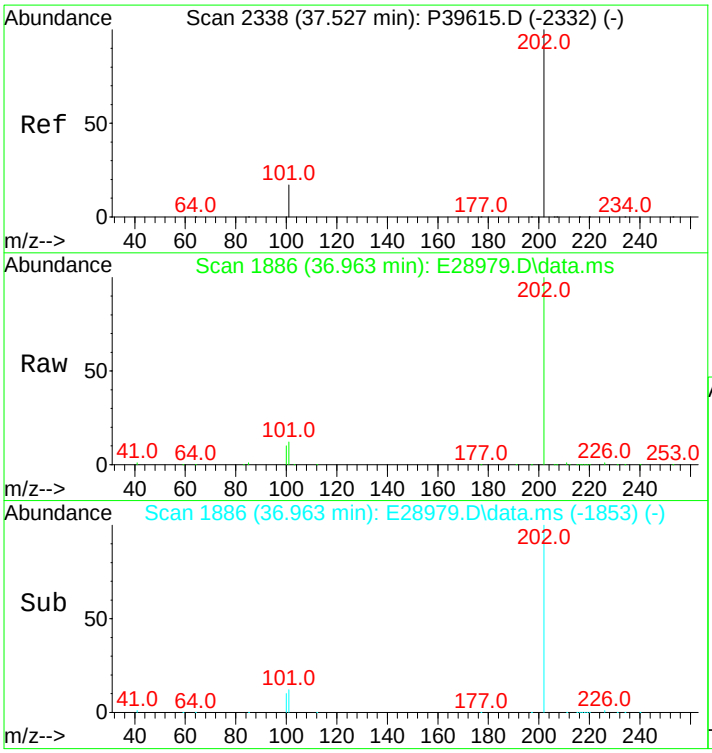


#57
1-Methylphenanthrene
Concen: 621.88 ng/mL m
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:192 Resp: 40292

Ion	Ratio	Lower	Upper
192	100		
191	56.2	45.4	68.2

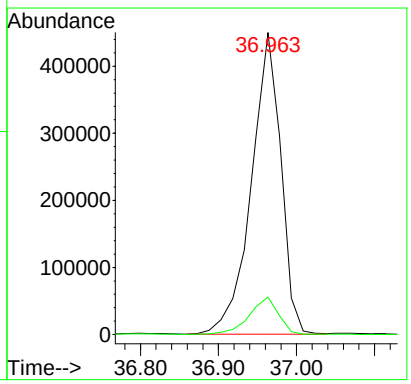


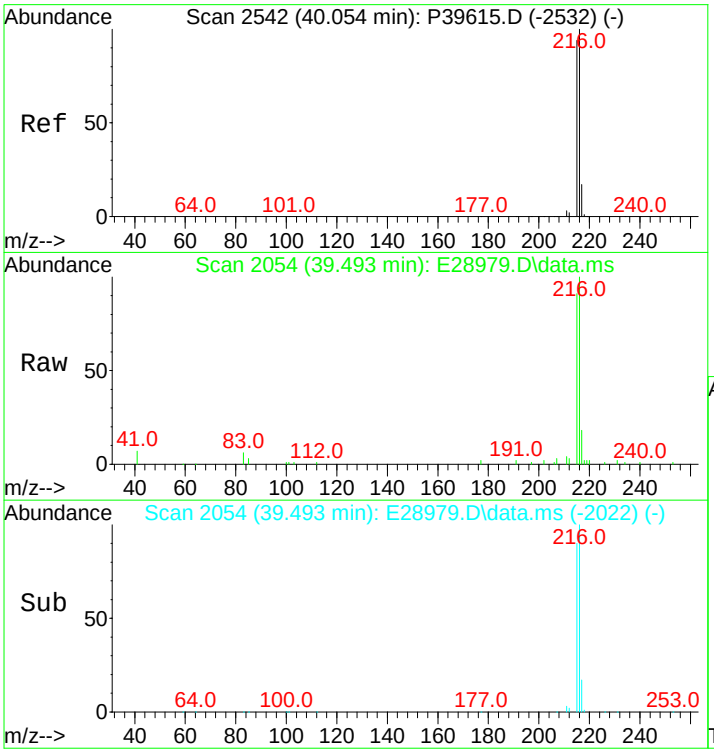


#58
Fluoranthene
Concen: 12590.74 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:202 Resp: 1180841

Ion	Ratio	Lower	Upper
202	100		
101	12.5	10.4	15.6

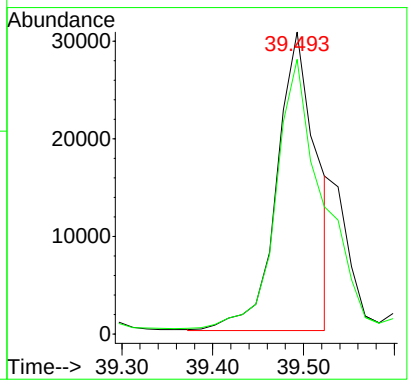


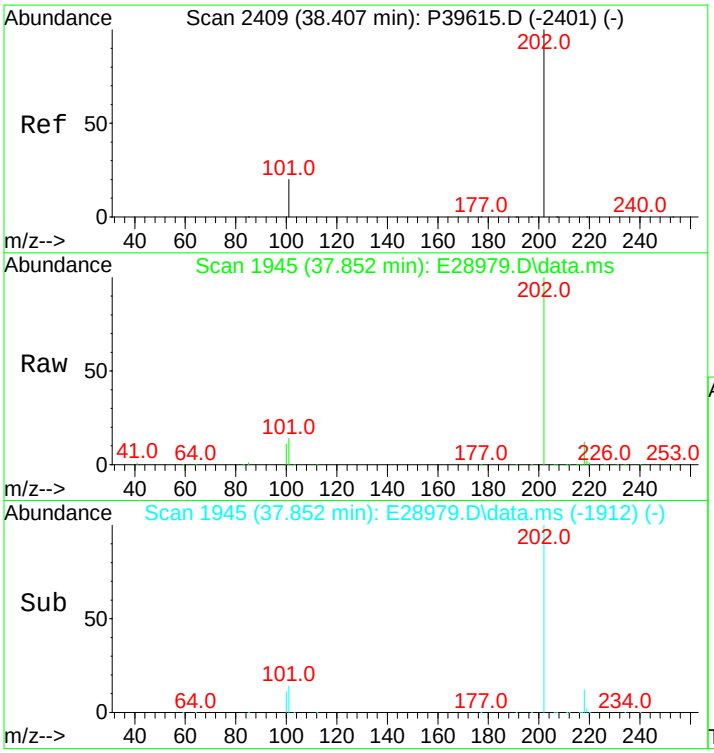


#59
Benzo(b)fluorene
Concen: 1492.59 ng/mL m
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:216 Resp: 93279

Ion	Ratio	Lower	Upper
216	100		
215	105.8	72.6	109.0

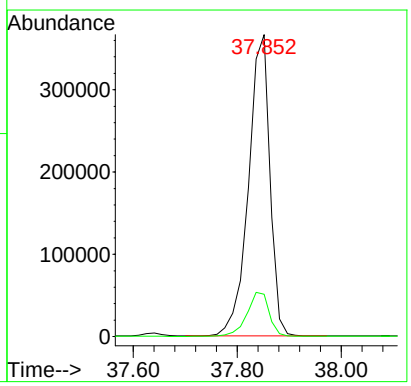


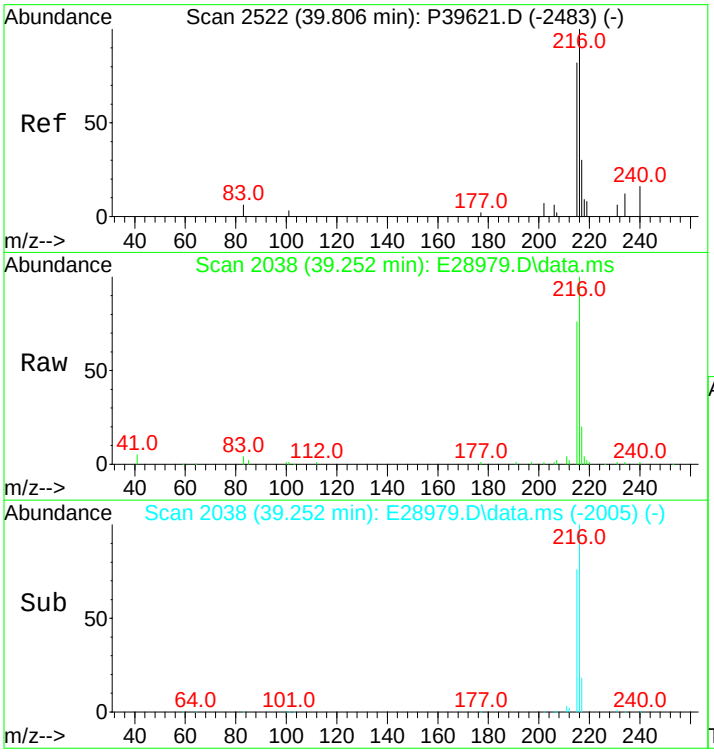


#60
Pyrene
Concen: 10999.73 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:202 Resp: 1048560

Ion	Ratio	Lower	Upper
202	100		
101	15.2	11.0	16.4

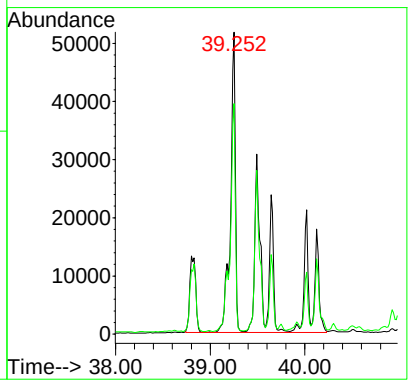


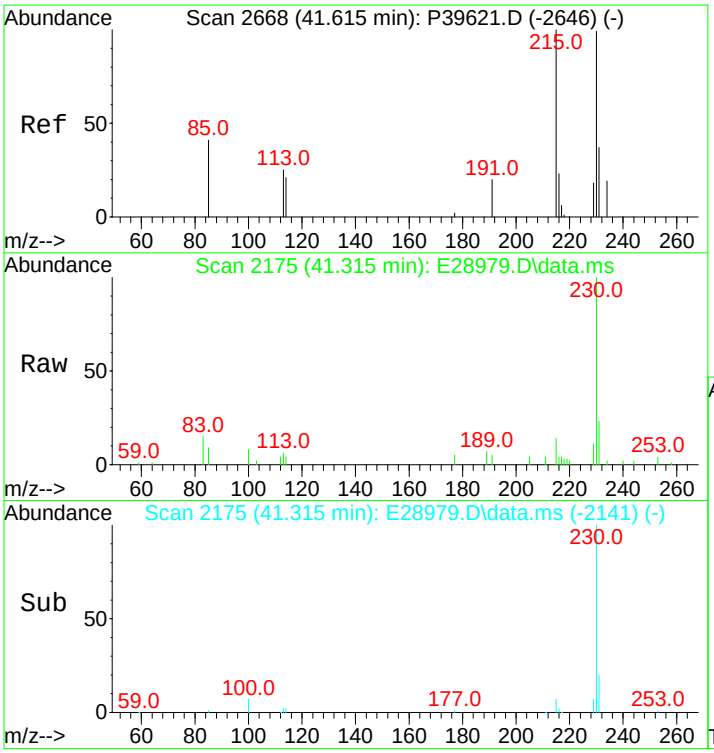


#61
C1-Fluoranthenes/Pyrenes
Concen: 5698.37 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:216 Resp: 543203

Ion	Ratio	Lower	Upper
216	100		
215	27.3	73.4	110.2#

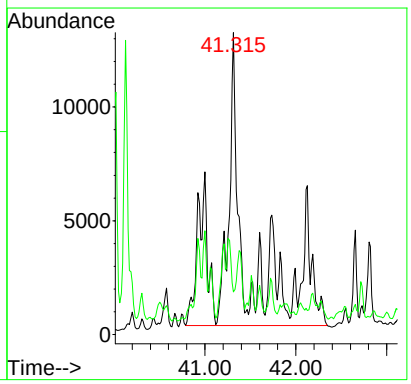


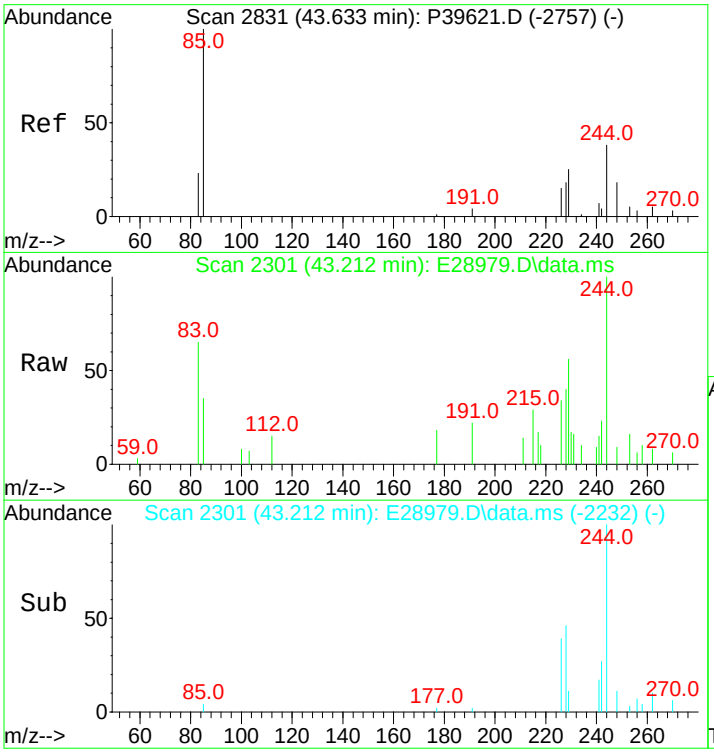


#62
C2-Fluoranthenes/Pyrenes
Concen: 2405.78 ng/mL m
RT: 41.315 min Scan# 2175
Delta R.T. 0.435 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:230 Resp: 229333

Ion	Ratio	Lower	Upper
230	100		
215	1.7	93.8	140.8#

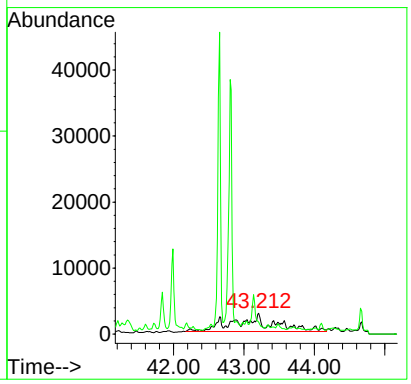


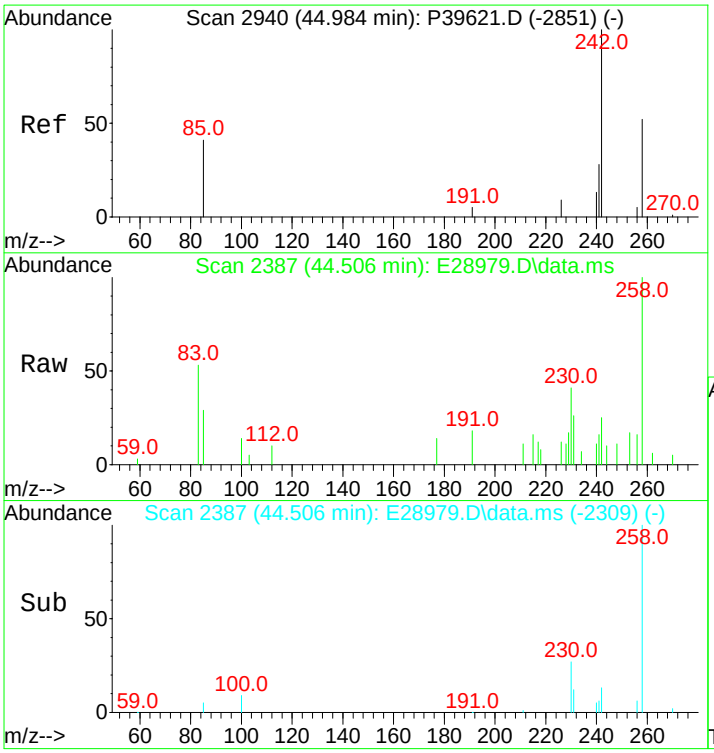


#63
C3-Fluoranthenes/Pyrenes
Concen: 1096.15 ng/mL m
RT: 43.212 min Scan# 2301
Delta R.T. 0.560 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:244 Resp: 104492

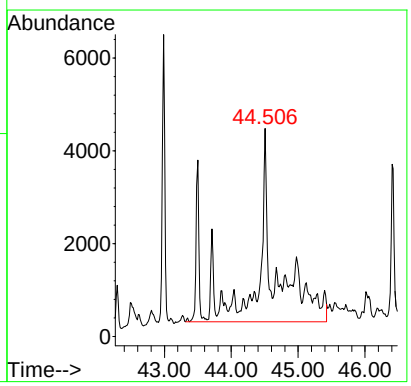
Ion	Ratio	Lower	Upper
244	100		
229	110.6	72.2	108.2#

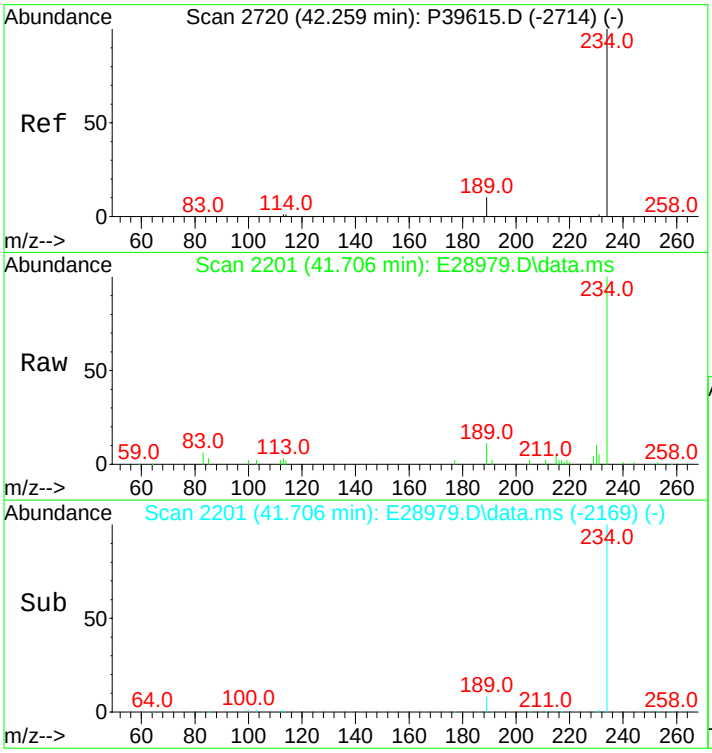




#64
C4-Fluoranthenes/Pyrenes
Concen: 884.65 ng/mL m
RT: 44.506 min Scan# 2387
Delta R.T. 0.536 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:258 Resp: 84330

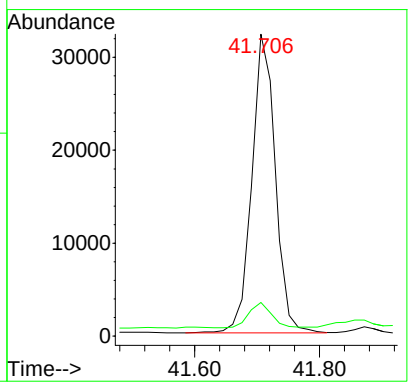


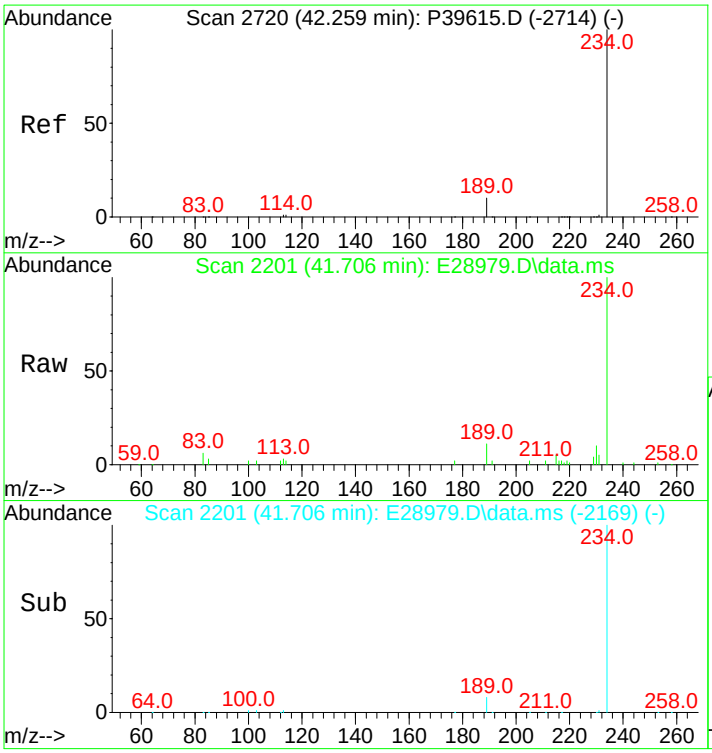


#66
Naphthobenzothiophene
Concen: 892.88 ng/ml
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:234 Resp: 83948

Ion	Ratio	Lower	Upper
234	100		
189	8.7	21.1	31.7#

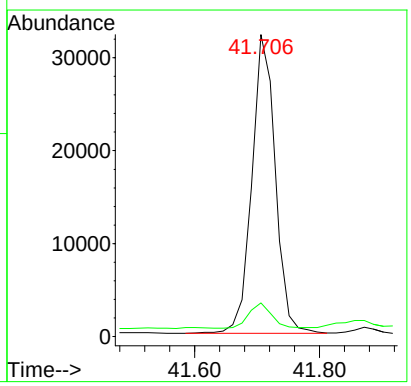


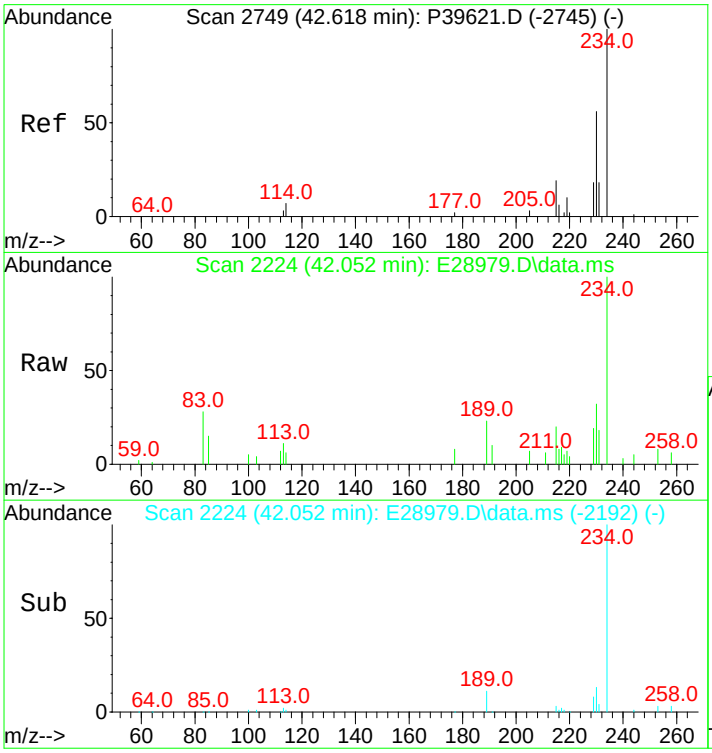


#67
Naphthobenzothiophene-2,1-D
Concen: 892.88 ng/mL
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:234 Resp: 83948

Ion	Ratio	Lower	Upper
234	100		
189	8.7	21.1	31.7#

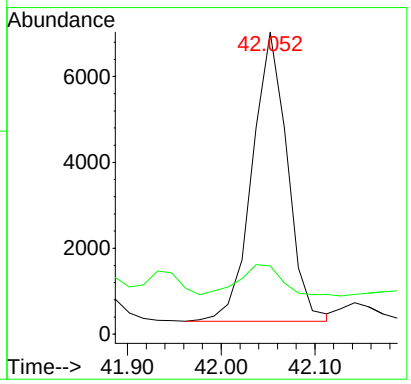


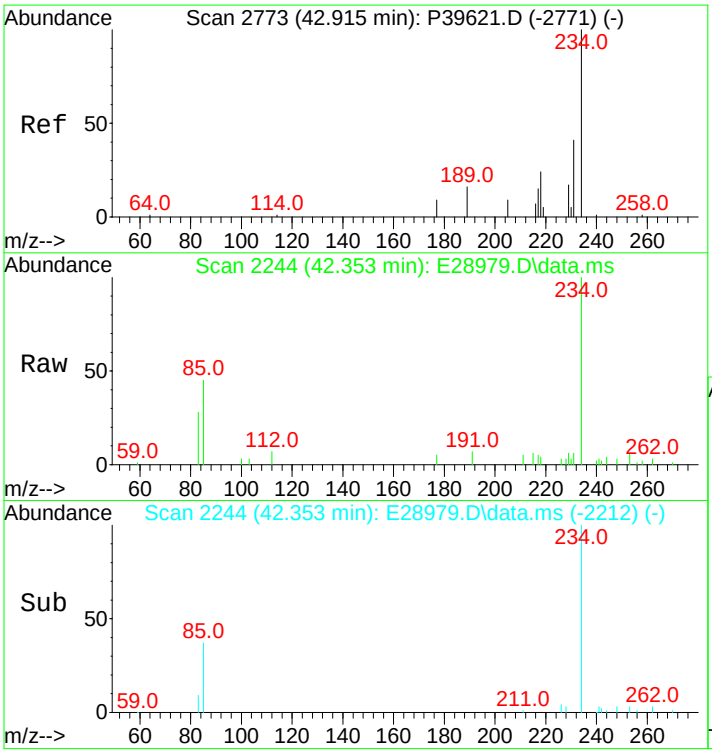


#68
Naphthobenzothiophene-1,2-D
Concen: 186.37 ng/mL
RT: 42.052 min Scan# 2224
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:234 Resp: 17522

Ion	Ratio	Lower	Upper
234	100		
189	12.8	71.9	107.9#

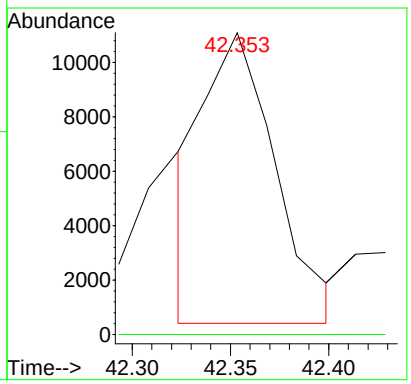


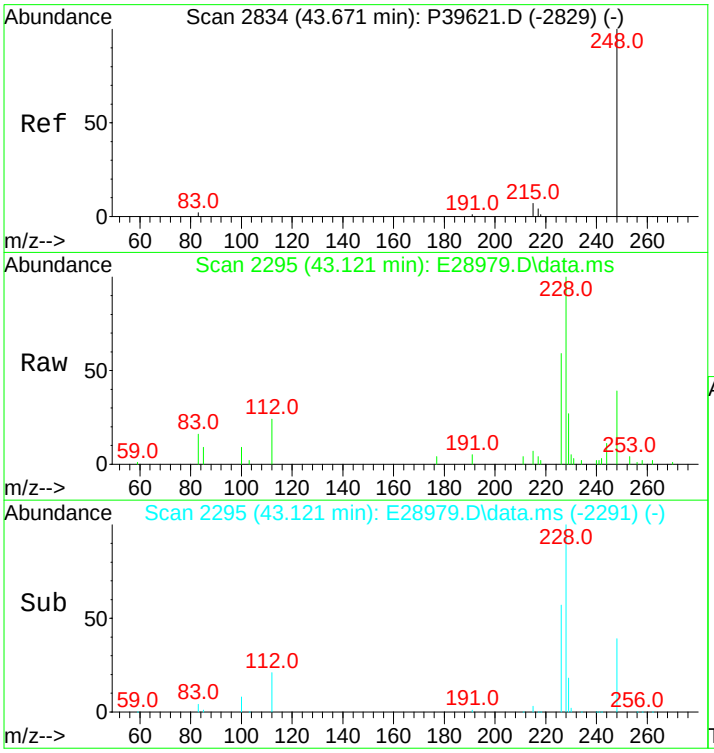


#69
Naphthobenzothiophene-2,3-D
Concen: 291.28 ng/mL m
RT: 42.353 min Scan# 2244
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:234 Resp: 27386

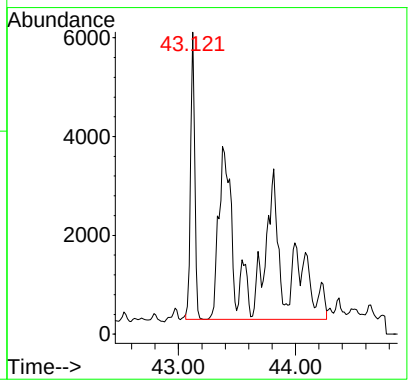
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

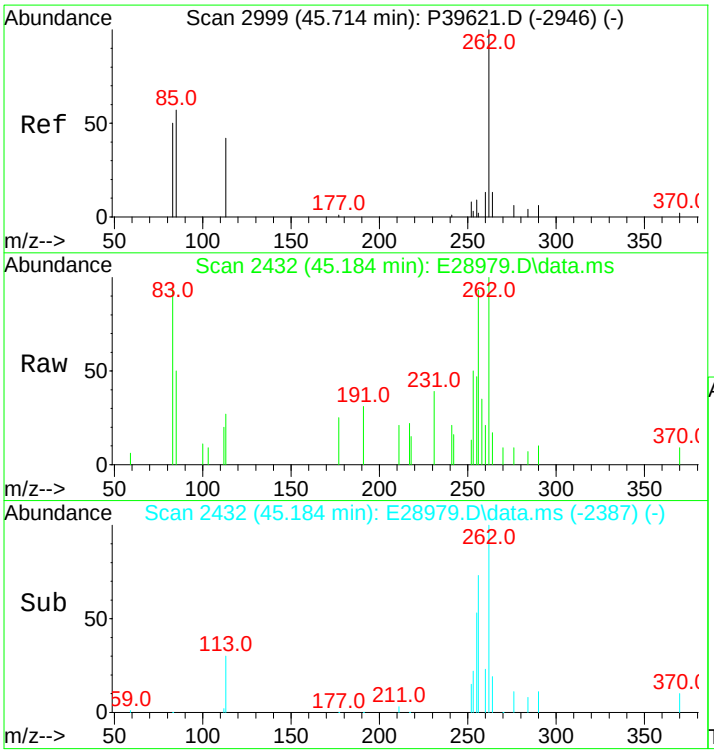




#70
C1-Naphthobenzothiophenes
Concen: 876.32 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

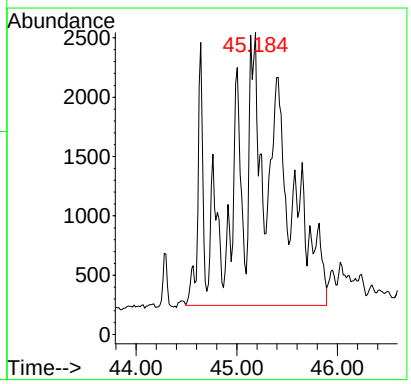
Tgt Ion:248 Resp: 82391

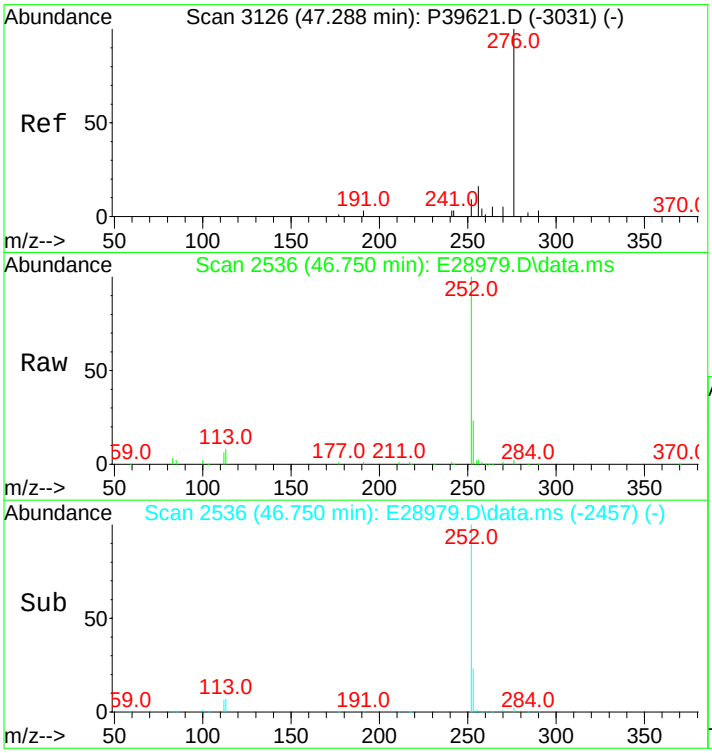




#71
C2-Naphthobenzothiophenes
Concen: 779.87 ng/ml m
RT: 45.184 min Scan# 2432
Delta R.T. 0.539 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

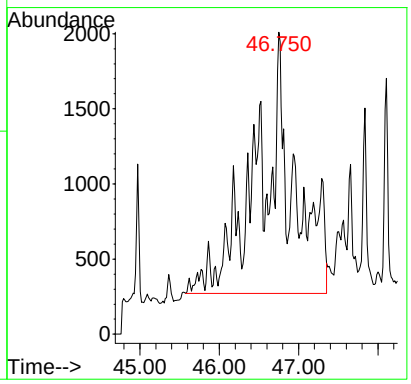
Tgt Ion:262 Resp: 73323

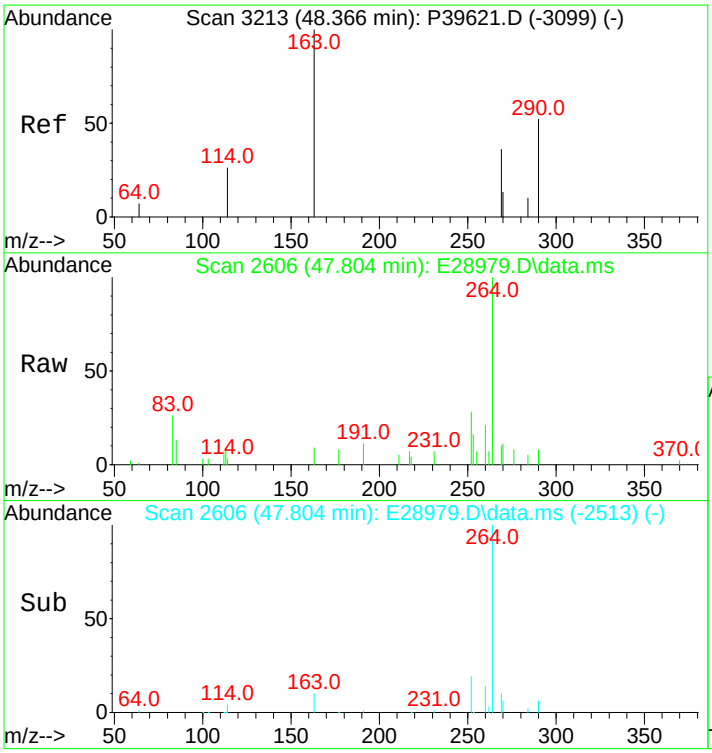




#72
C3-Naphthobenzothiophenes
Concen: 565.24 ng/ml m
RT: 46.750 min Scan# 2536
Delta R.T. 0.523 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

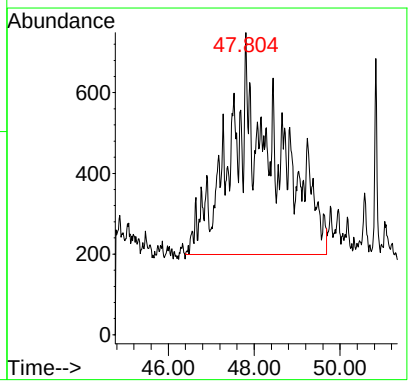
Tgt Ion:276 Resp: 53143

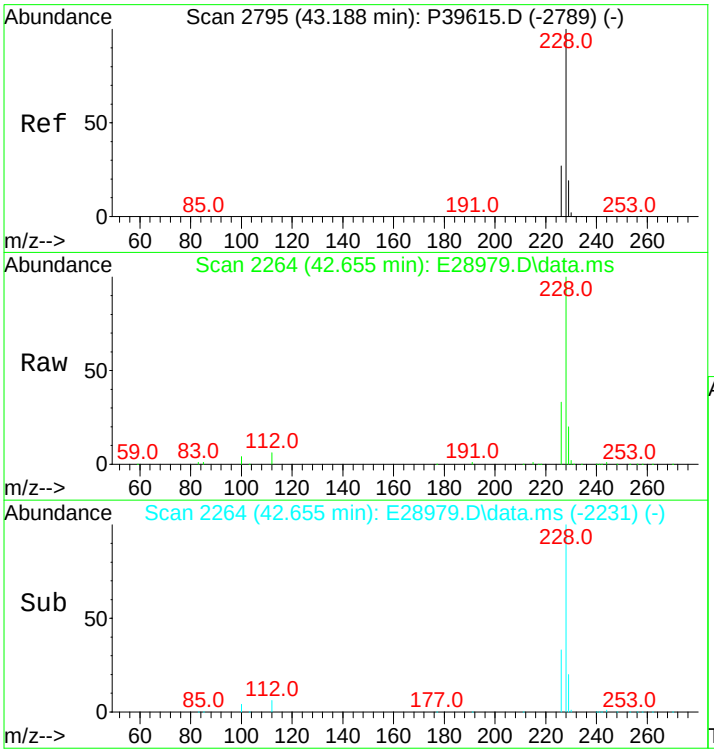




#73
C4-Naphthobenzothiophenes
Concen: 413.37 ng/mL m
RT: 47.804 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:290 Resp: 38865

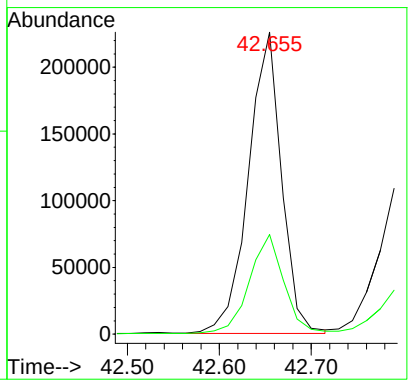


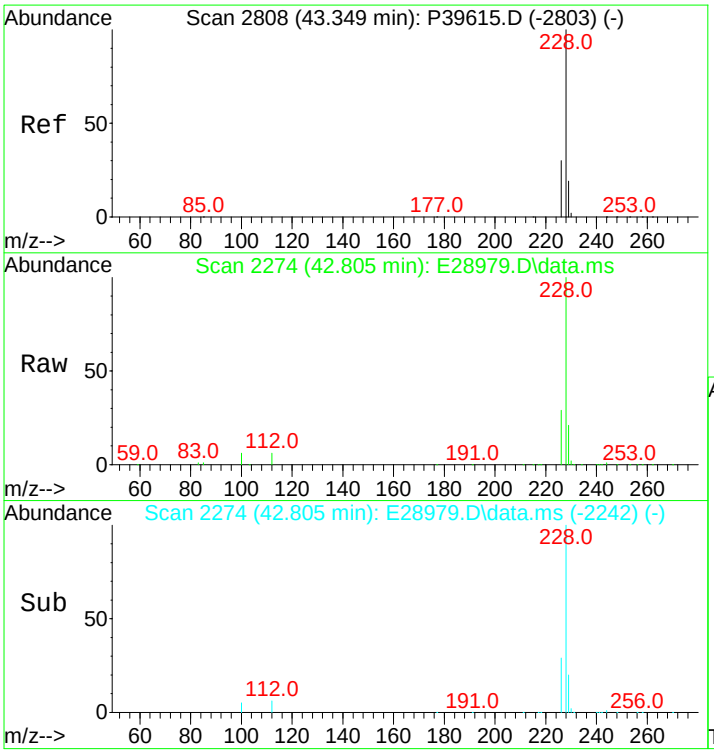


#75
Benz[a]anthracene
Concen: 5434.02 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:228 Resp: 564873

Ion	Ratio	Lower	Upper
228	100		
226	29.5	20.7	31.1

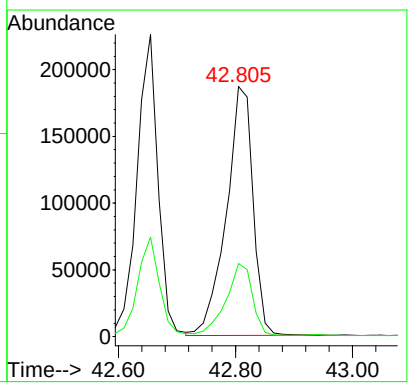


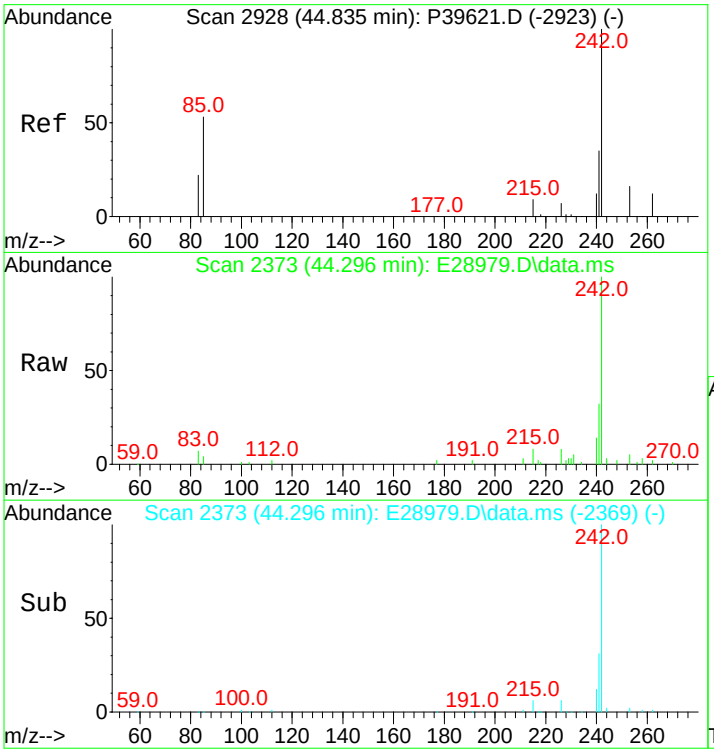


#77
Chrysene/Triphenylene
Concen: 5532.82 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:228 Resp: 592121

Ion	Ratio	Lower	Upper
228	100		
226	28.9	22.6	34.0

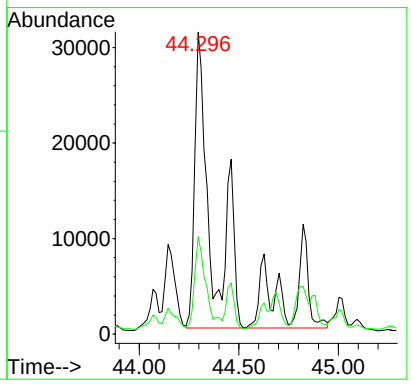


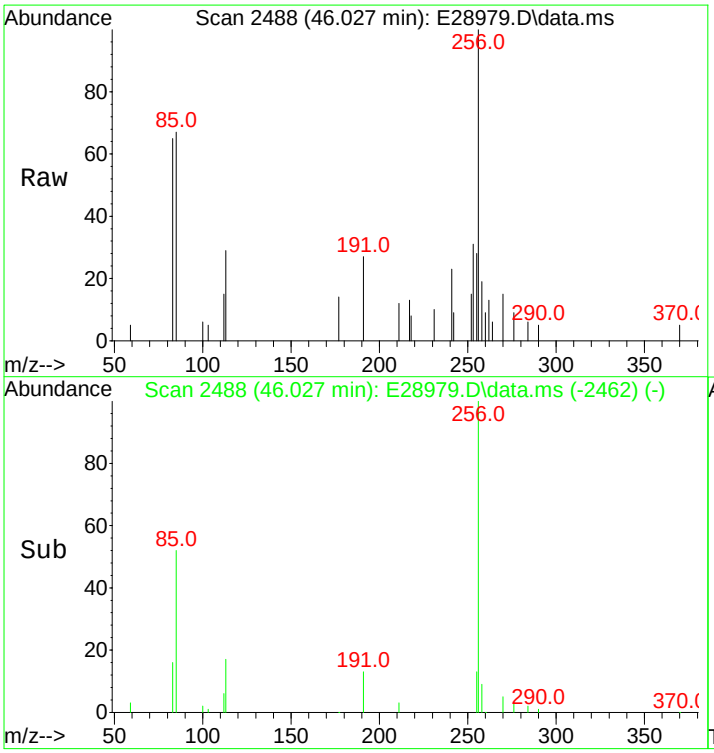


#78
C1-Chrysenes
Concen: 2288.61 ng/mL m
RT: 44.296 min Scan# 2373
Delta R.T. 0.011 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:242 Resp: 244926

Ion	Ratio	Lower	Upper
242	100		
241	3.2	32.2	48.4#

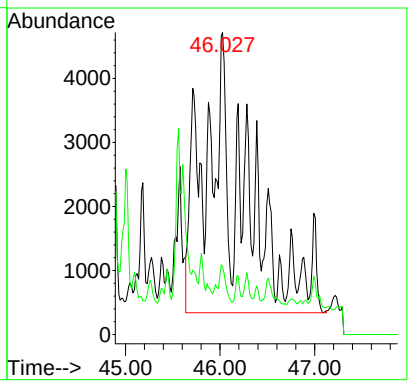


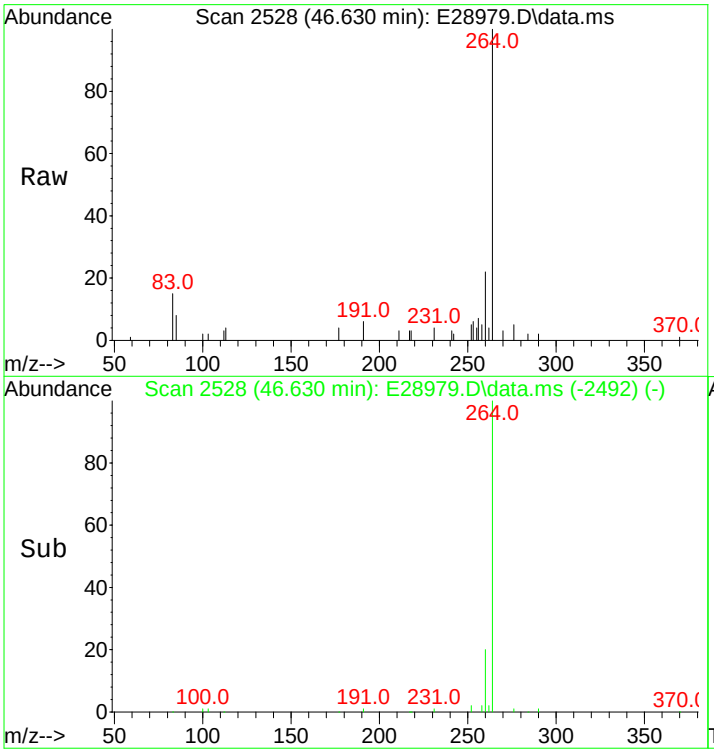


#79
C2-Chrysenes
Concen: 1194.98 ng/mL m
RT: 46.027 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:256 Resp: 127887

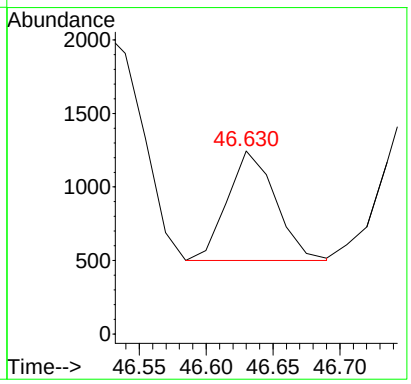
Ion	Ratio	Lower	Upper
256	100		
241	0.8	25.3	37.9#

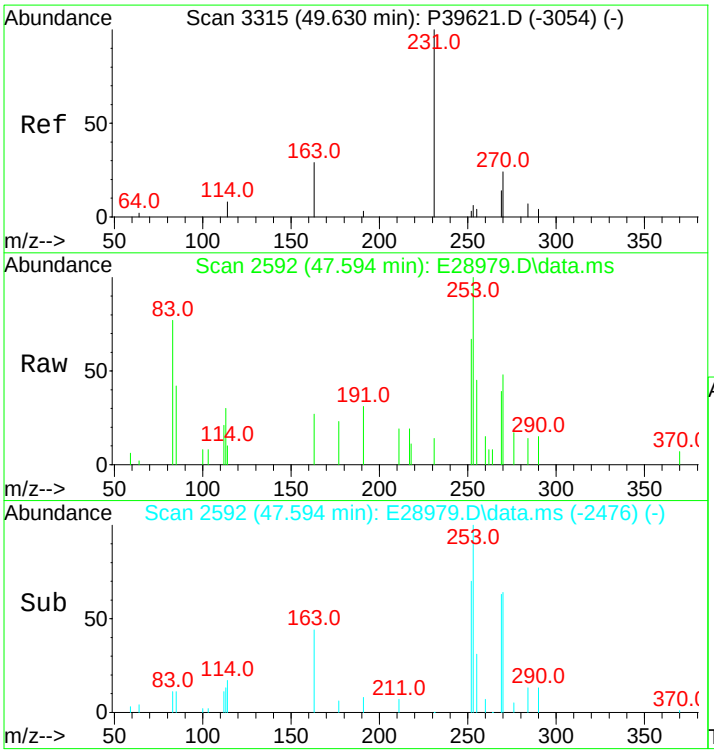




#80
BBF-D12 Surr BKGD
Concen: 17.52 ng/mL
RT: 46.630 min Scan# 2528
Delta R.T. 0.035 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:256 Resp: 1875

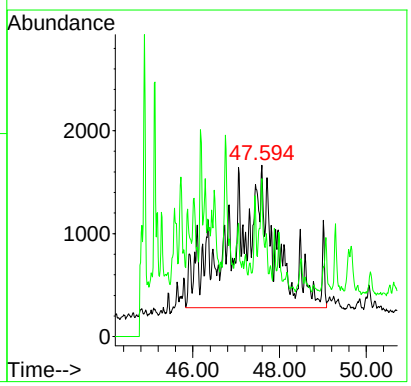


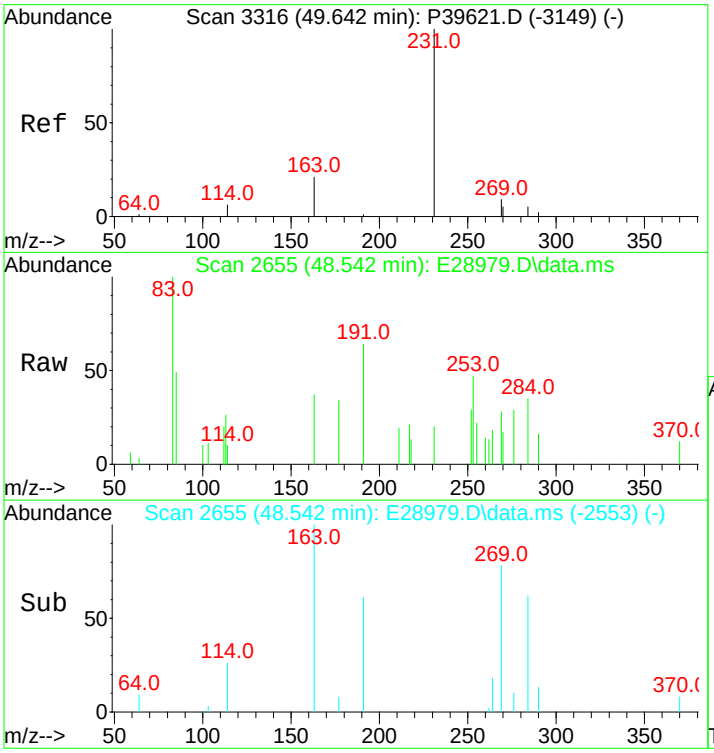


#81
C3-Chrysenes
Concen: 916.78 ng/mL m
RT: 47.594 min Scan# 2592
Delta R.T. -1.474 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:270 Resp: 98114

Ion	Ratio	Lower	Upper
270	100		
255	0.2	38.0	57.0#

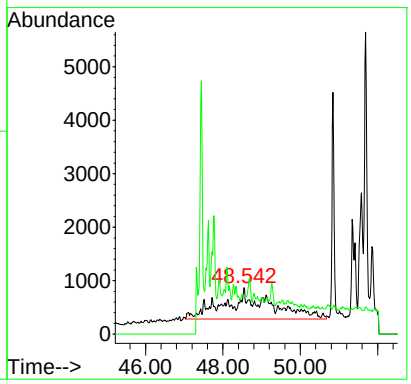


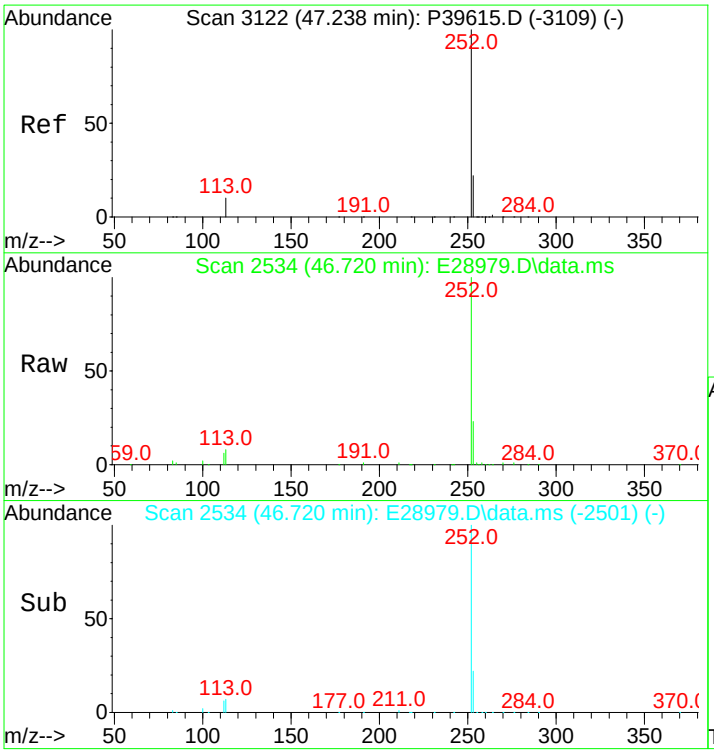


#82
C4-Chrysenes
Concen: 424.32 ng/mL m
RT: 48.542 min Scan# 2655
Delta R.T. -0.644 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:284 Resp: 45411

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

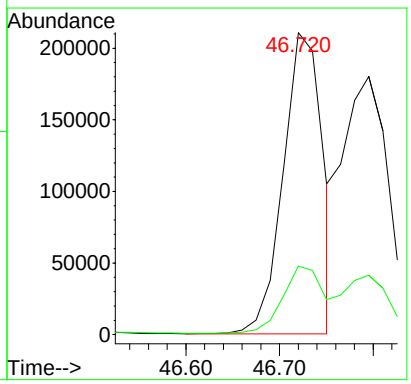


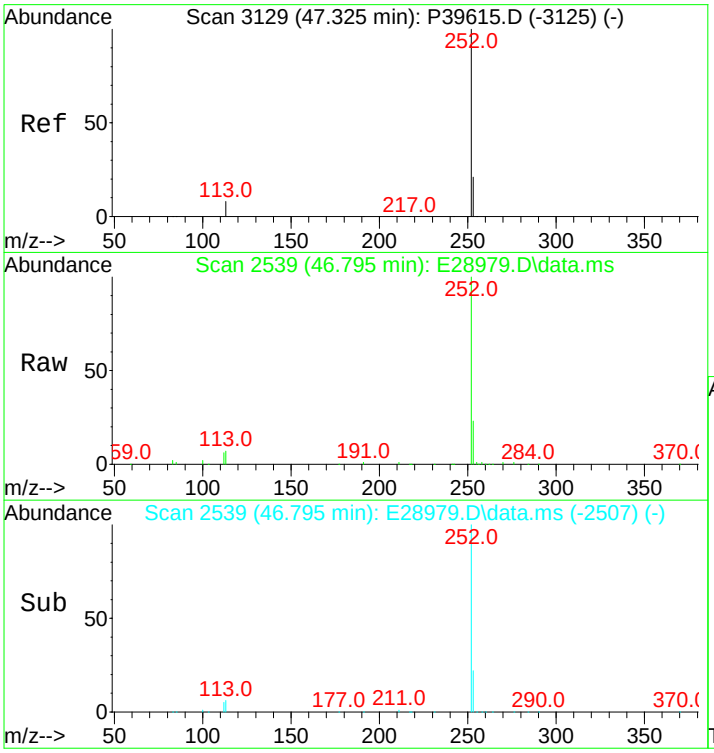


#84
Benzo[b]fluoranthene
Concen: 5099.89 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:252 Resp: 616200

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.5	29.3

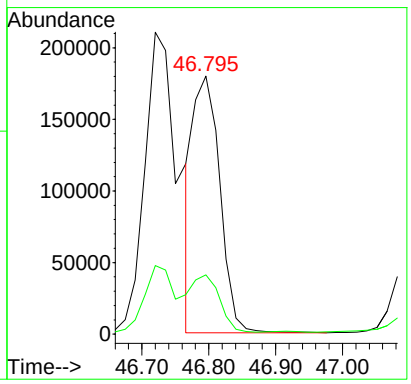


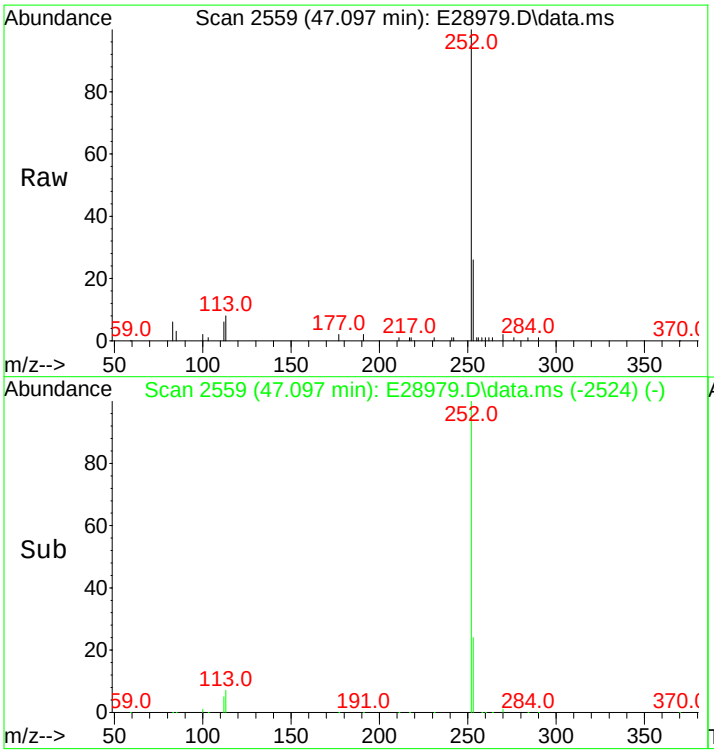


#85
Benzo[j]+[k]fluoranthene
Concen: 4021.23 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:252 Resp: 499876

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.7	29.5

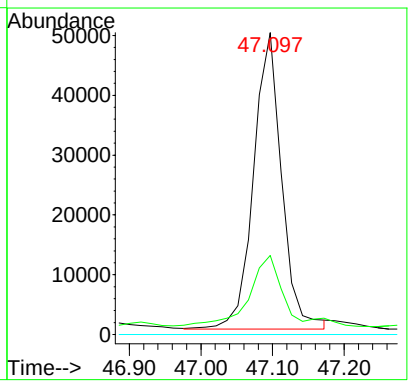


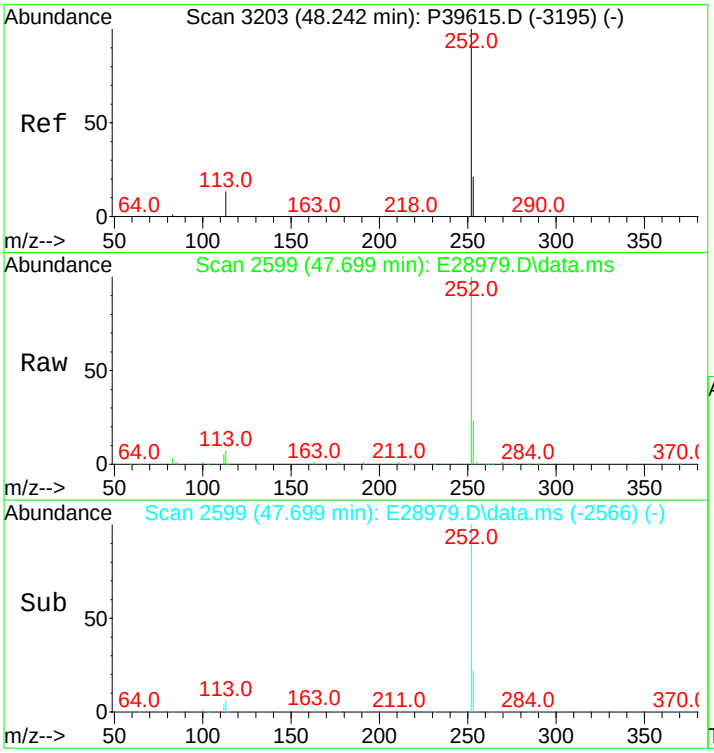


#86
Benzo[a]fluoranthene
Concen: 1087.14 ng/mL m
RT: 47.097 min Scan# 2559
Delta R.T. 0.025 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:252 Resp: 135142

Ion	Ratio	Lower	Upper
252	100		
253	32.6	456.0	684.0#
125	0.0	0.0	0.0

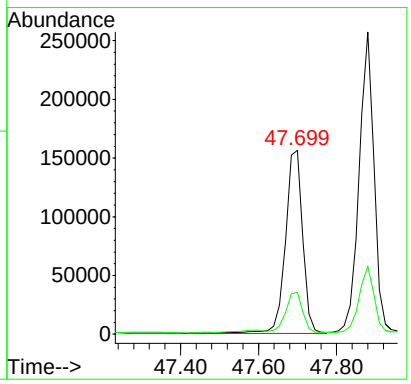


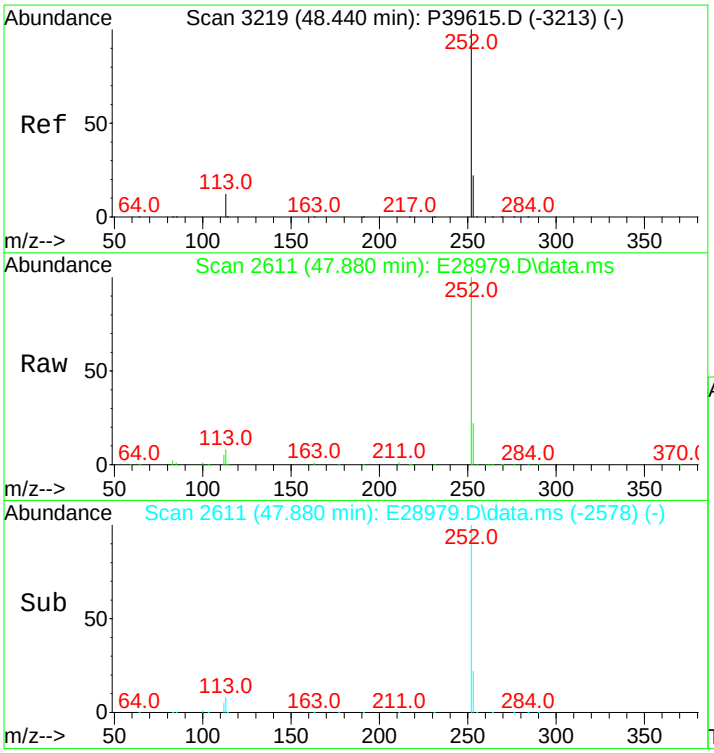


#87
Benzo[e]pyrene
Concen: 4018.16 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:252 Resp: 474054

Ion	Ratio	Lower	Upper
252	100		
253	21.6	20.6	31.0

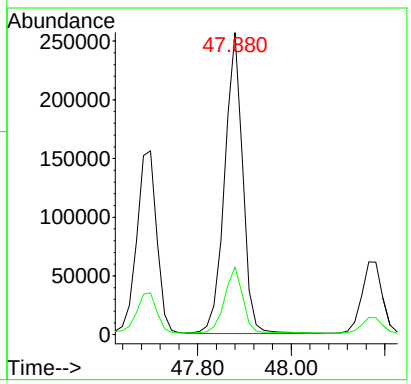


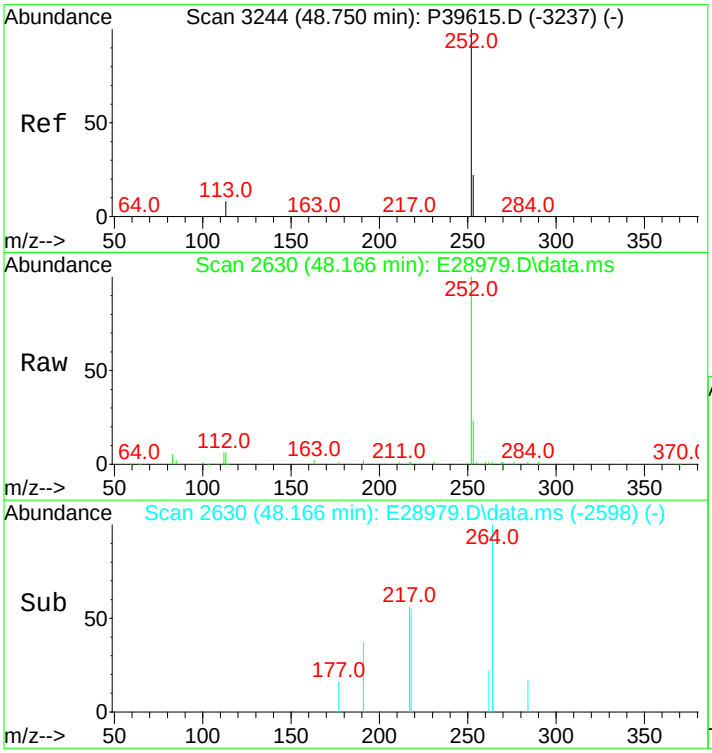


#89
Benzo[a]pyrene
Concen: 6114.46 ng/mL
RT: 47.880 min Scan# 2611
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:252 Resp: 690257

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.8	31.2

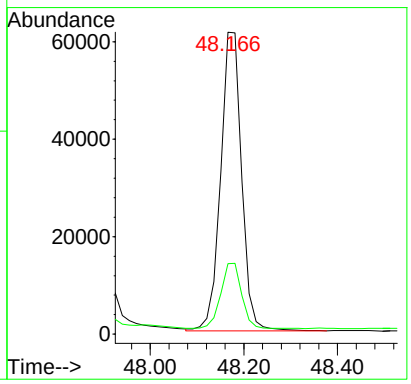


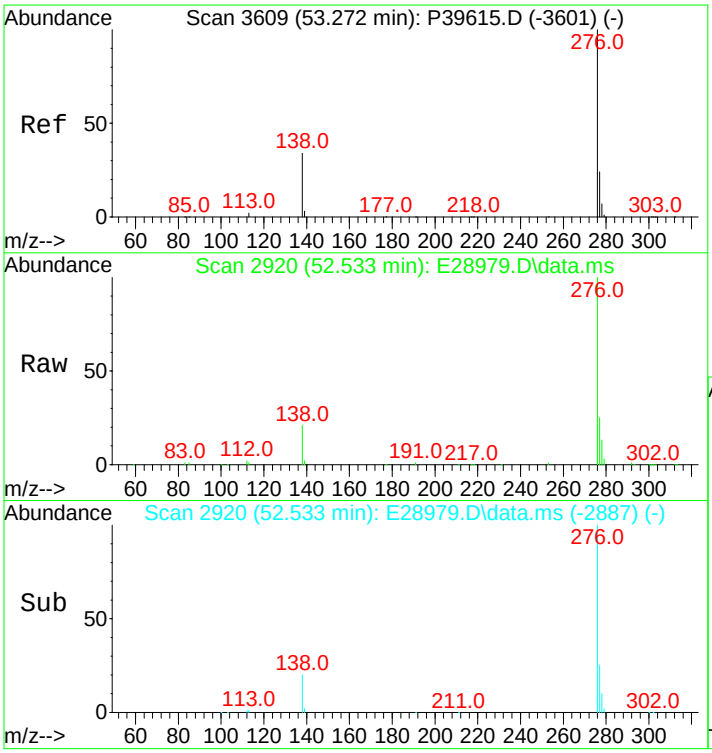


#90
Perylene
Concen: 1599.77 ng/mL
RT: 48.166 min Scan# 2630
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:252 Resp: 190970

Ion	Ratio	Lower	Upper
252	100		
253	21.8	20.7	31.1

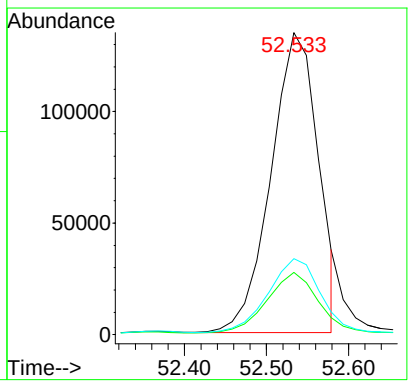


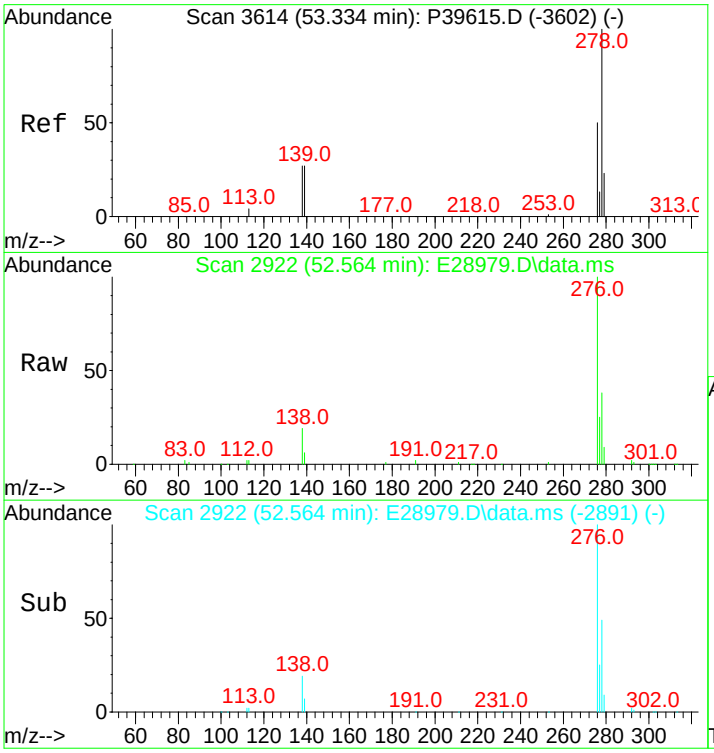


#91
Indeno[1,2,3-cd]pyrene
Concen: 4062.70 ng/mL m
RT: 52.533 min Scan# 2920
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:276 Resp: 539756

Ion	Ratio	Lower	Upper
276	100		
138	22.0	16.3	24.5
277	27.9	19.4	29.2

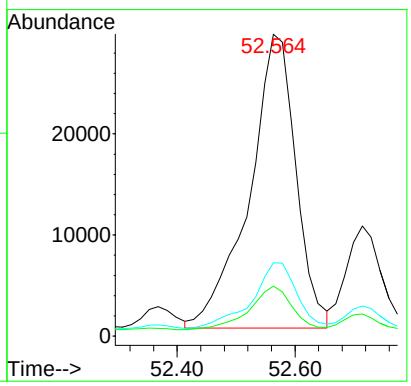


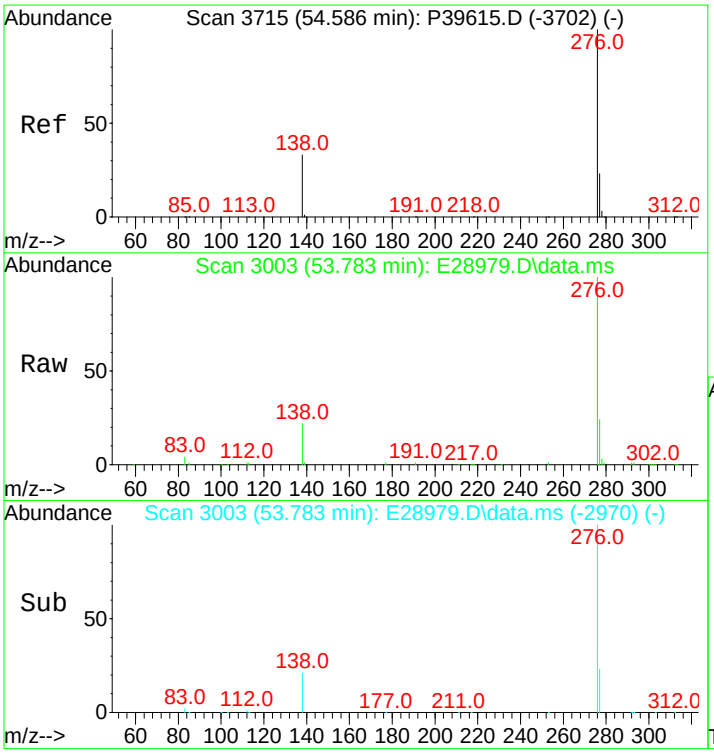


#92
Dibenz[ah]+[ac]anthracene
Concen: 1132.12 ng/mL m
RT: 52.564 min Scan# 2922
Delta R.T. -0.030 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:278 Resp: 160154

Ion	Ratio	Lower	Upper
278	100		
139	13.4	11.6	17.4
279	21.3	19.3	28.9

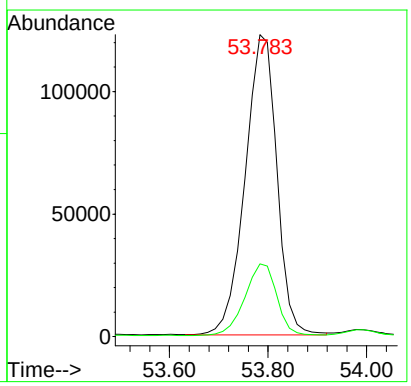


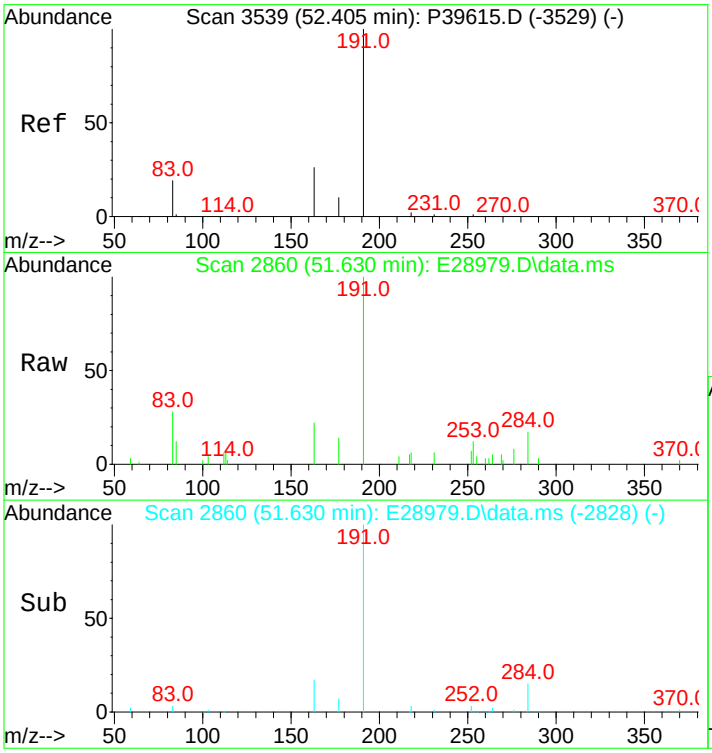


#93
Benzo[g,h,i]perylene
Concen: 3810.71 ng/mL
RT: 53.783 min Scan# 3003
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:276 Resp: 545892

Ion	Ratio	Lower	Upper
276	100		
277	24.0	19.1	28.7

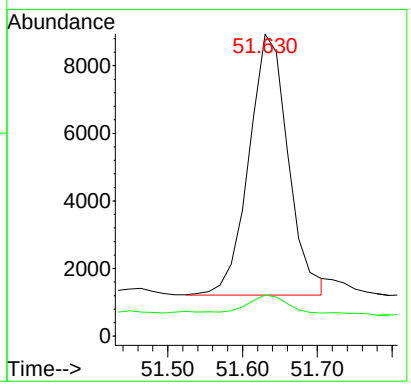


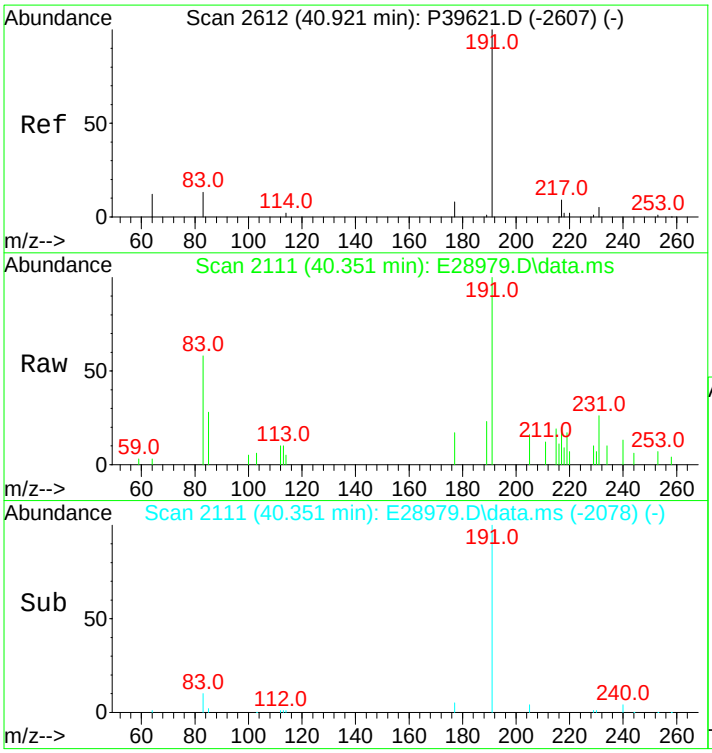


#94
Hopane (T19)
Concen: 702.38 ng/mL m
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:191 Resp: 28139

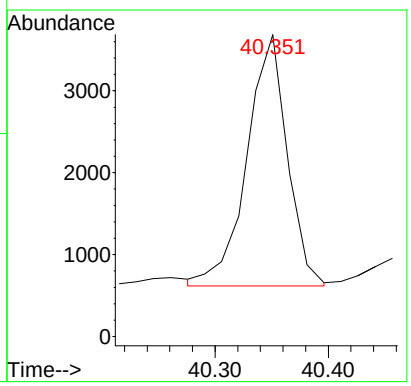
Ion	Ratio	Lower	Upper
191	100		
177	8.9	11.6	17.4#

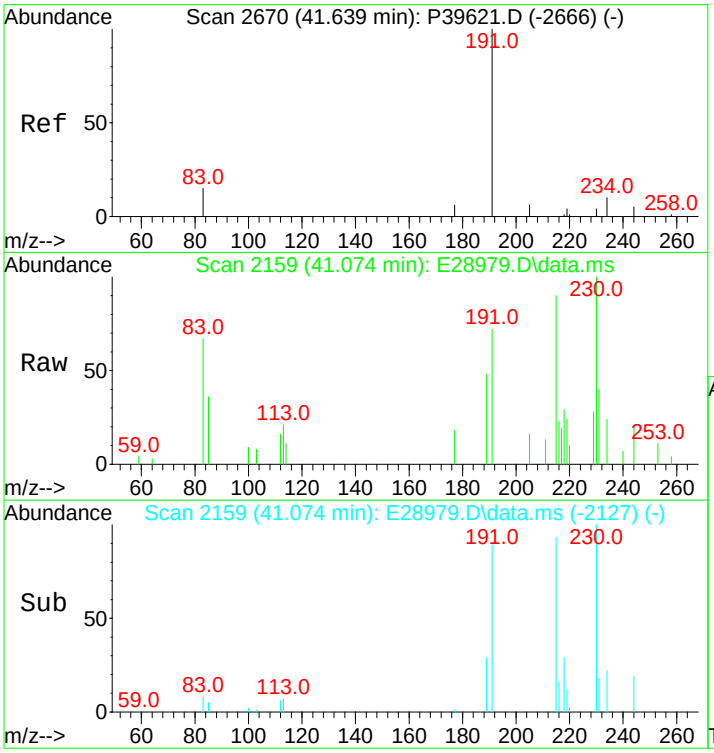




#96
C23 Tricyclic Terpane (T4)
Concen: 190.08 ng/ml m
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

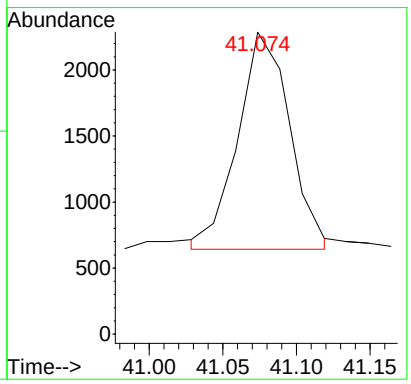
Tgt Ion:191 Resp: 7615

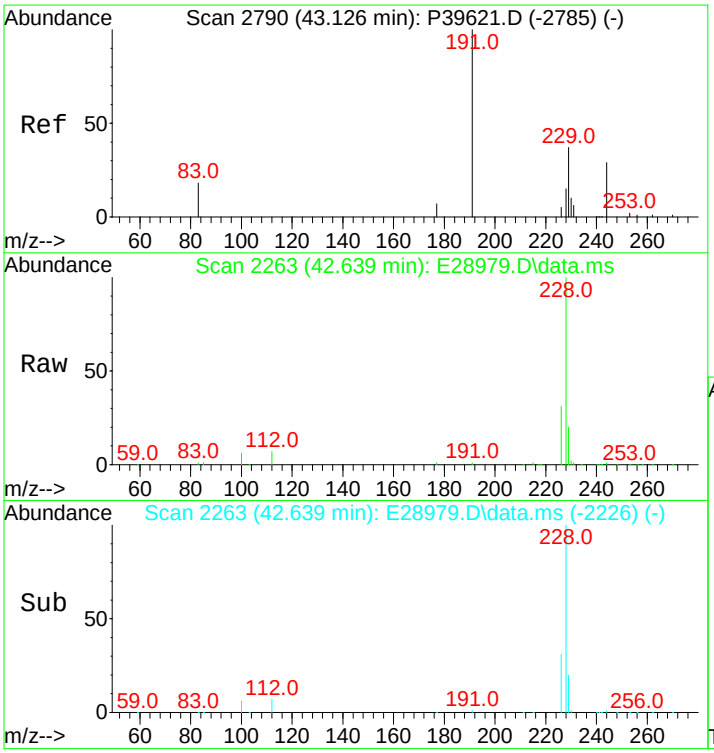




#97
C24 Tricyclic Terpane (T5)
Concen: 100.44 ng/ml m
RT: 41.074 min Scan# 2159
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

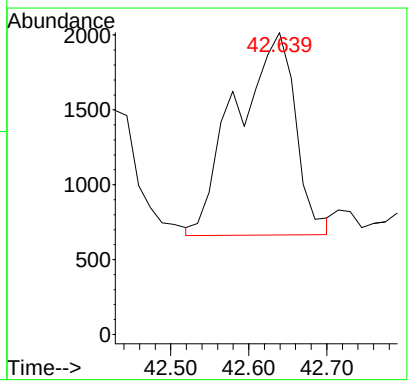
Tgt Ion:191 Resp: 4024

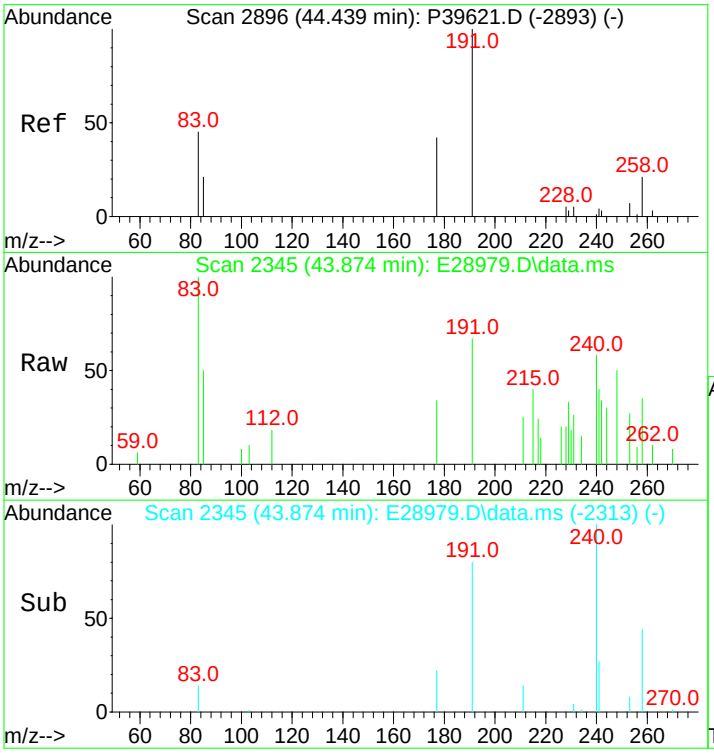




#98
C25 Tricyclic Terpane (T6)
Concen: 179.27 ng/ml
RT: 42.639 min Scan# 2263
Delta R.T. 0.060 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

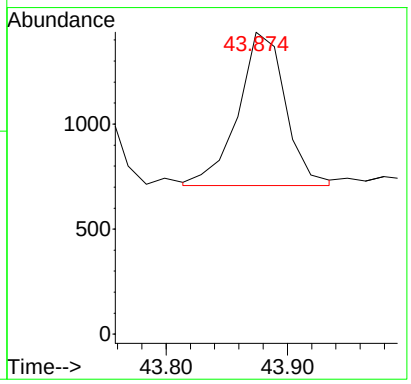
Tgt Ion:191 Resp: 7182

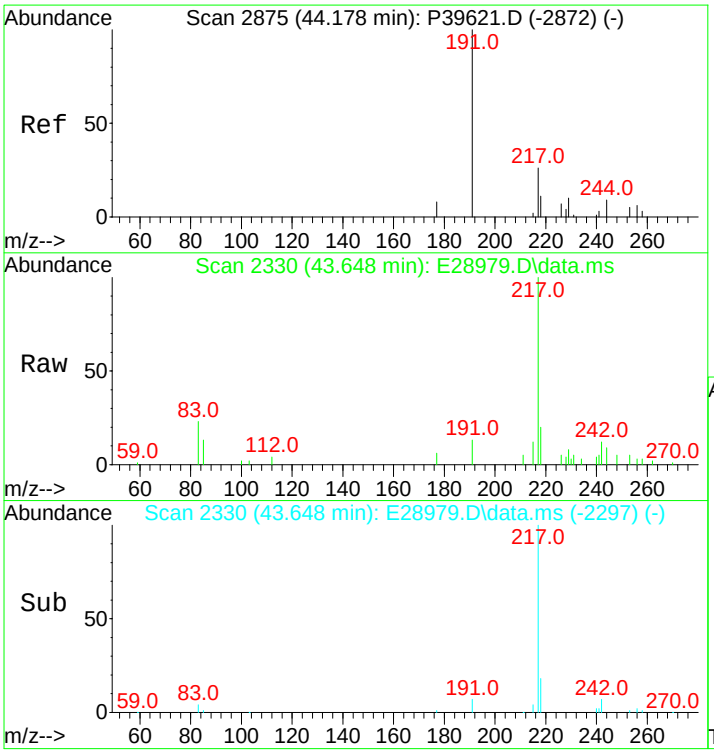




#99
C24 Tetracyclic Terpane (T6a)
Concen: 49.40 ng/ml m
RT: 43.874 min Scan# 2345
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

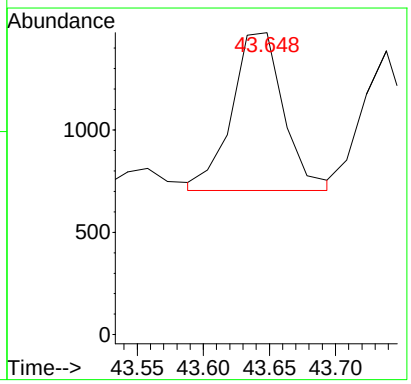
Tgt Ion:191 Resp: 1979

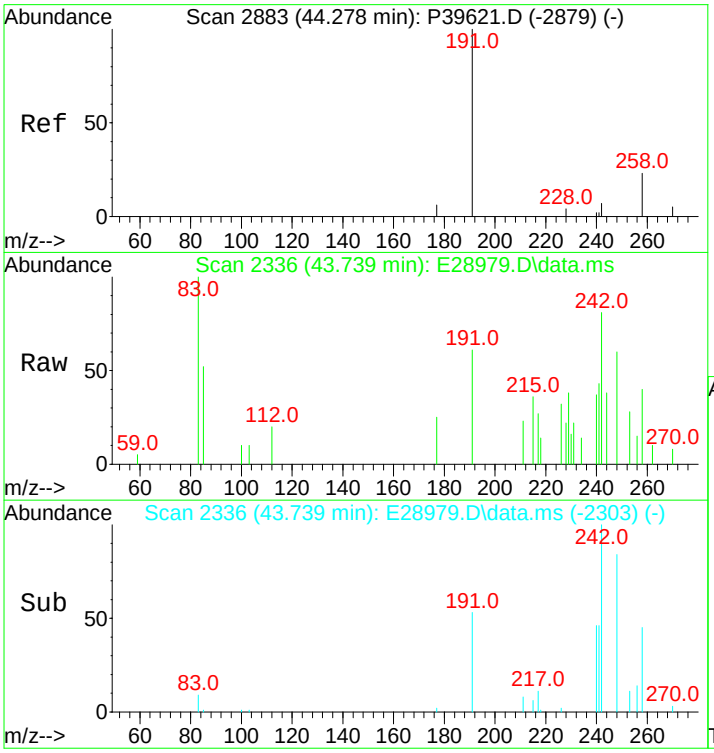




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 52.47 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

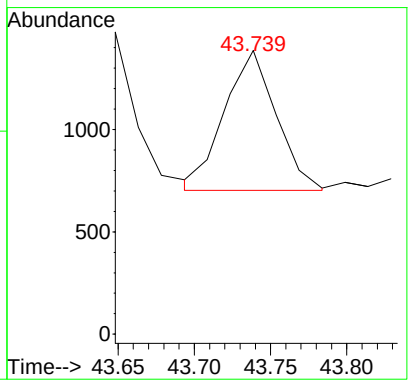
Tgt Ion:191 Resp: 2102

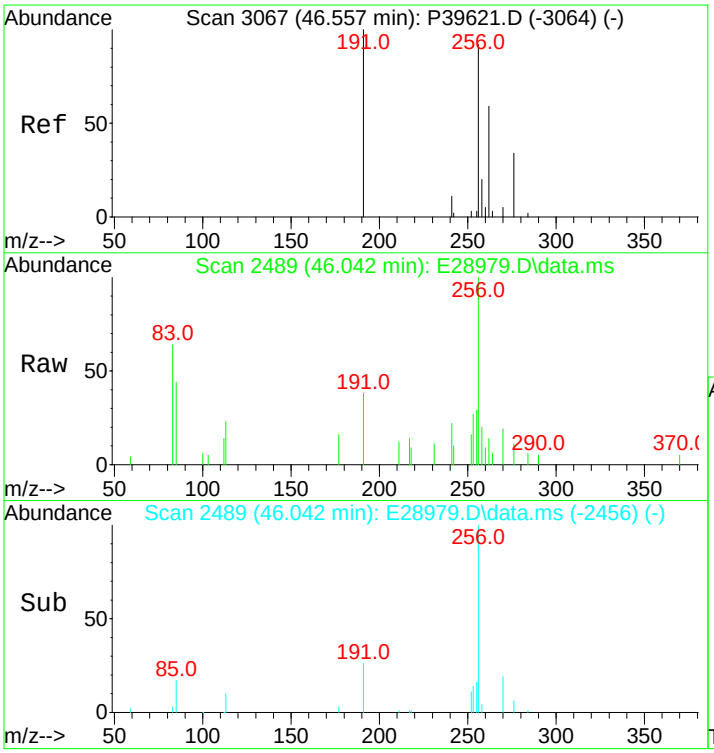




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 40.16 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

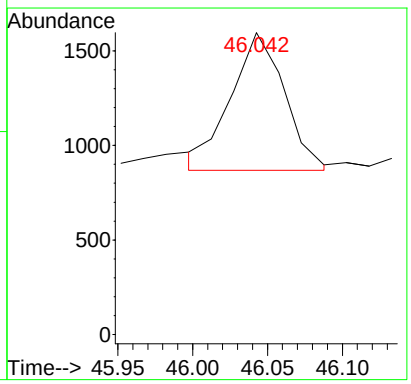
Tgt Ion:191 Resp: 1609

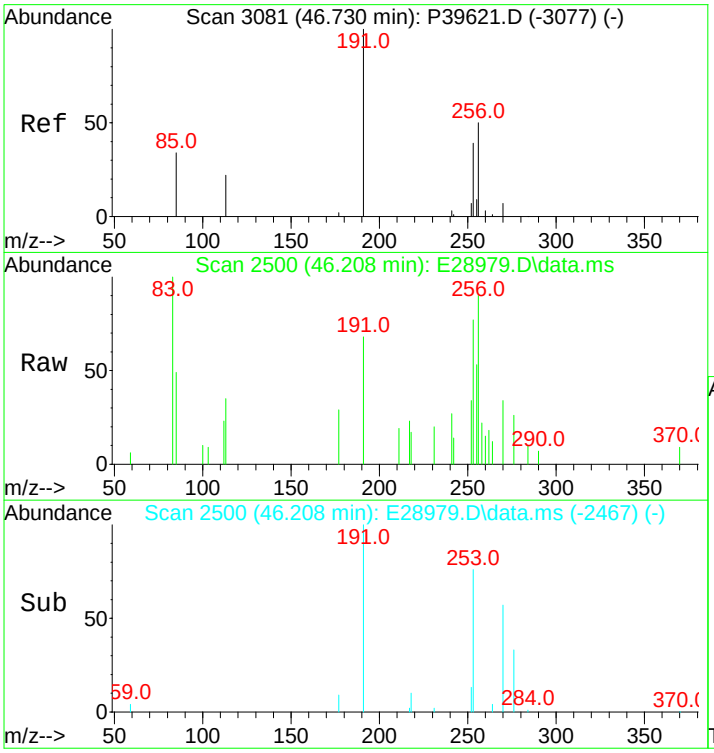




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 45.28 ng/ml m
RT: 46.042 min Scan# 2489
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

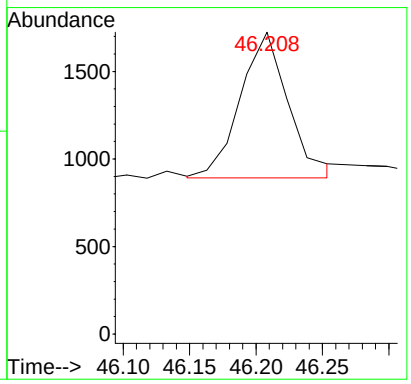
Tgt Ion:191 Resp: 1814

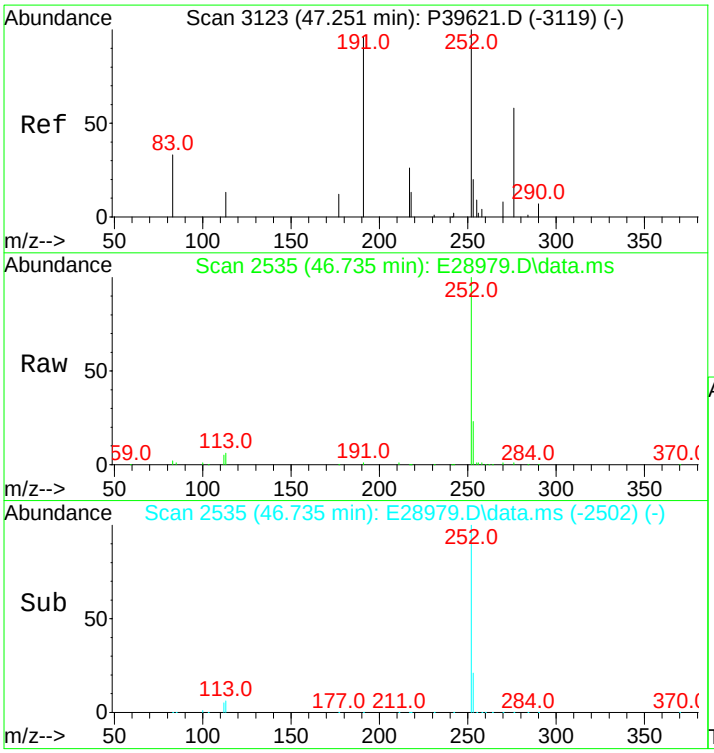




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 52.27 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

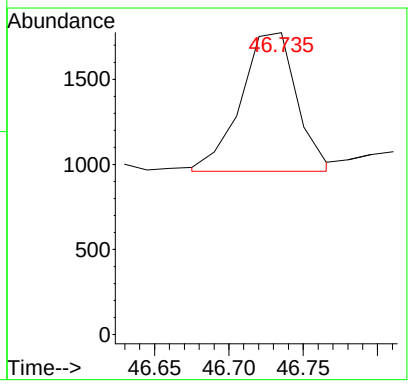
Tgt Ion:191 Resp: 2094

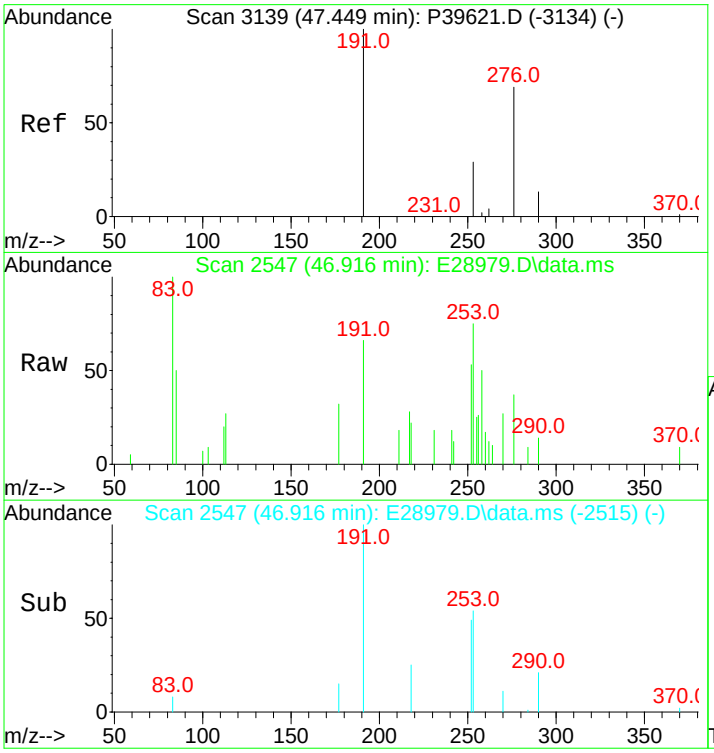




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 53.14 ng/ml m
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

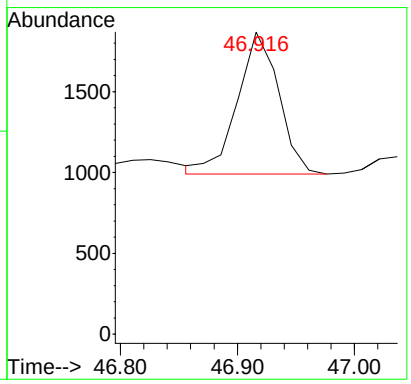
Tgt Ion:191 Resp: 2129

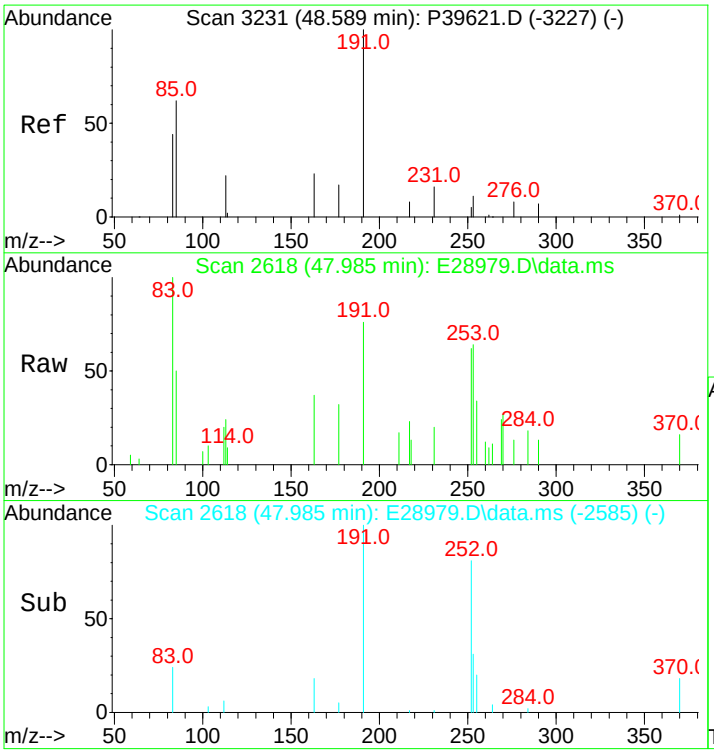




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 53.74 ng/ml
RT: 46.916 min Scan# 2547
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

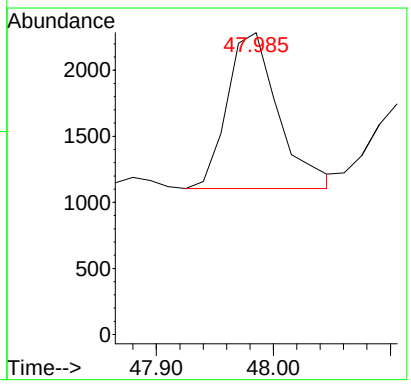
Tgt Ion:191 Resp: 2153

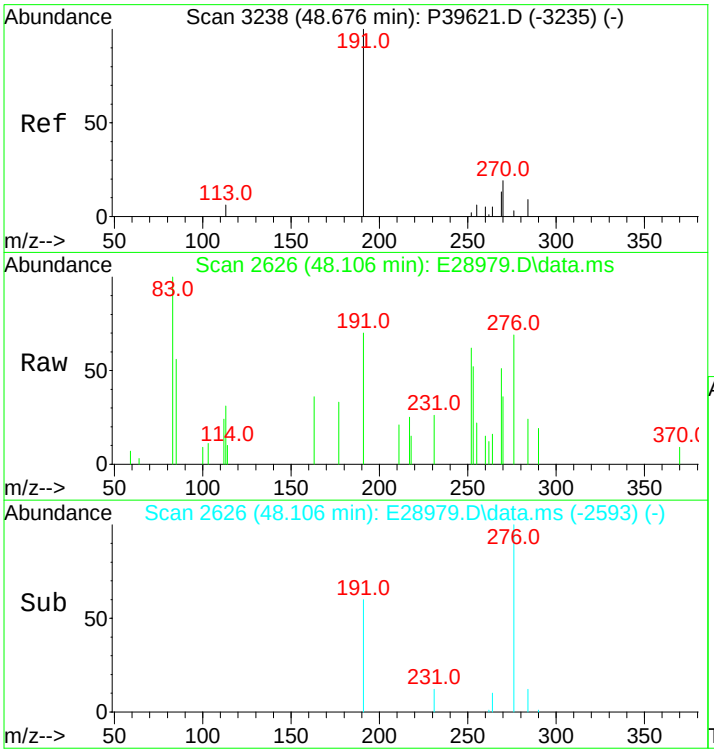




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 89.63 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

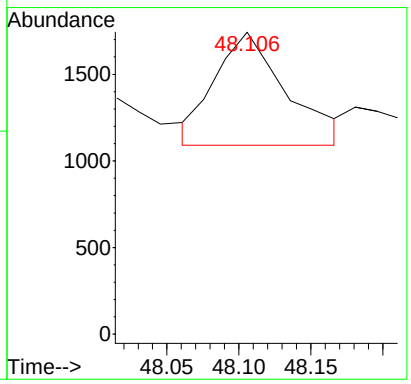
Tgt Ion:191 Resp: 3591

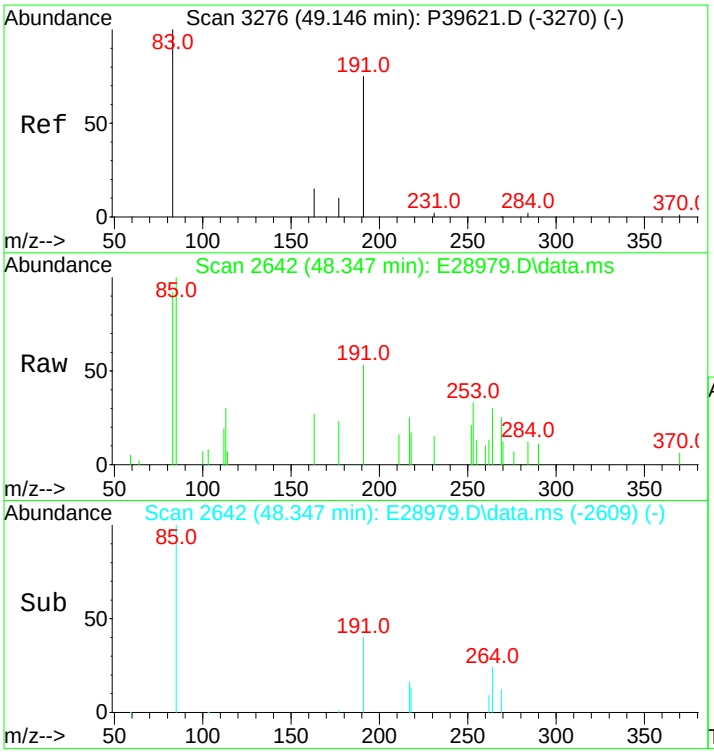




#107
C30 Tricyclic Terpane-22S
Concen: 56.31 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

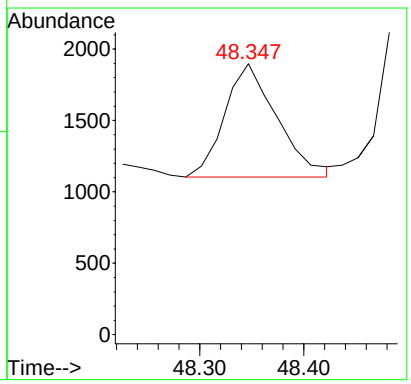
Tgt Ion:191 Resp: 2256

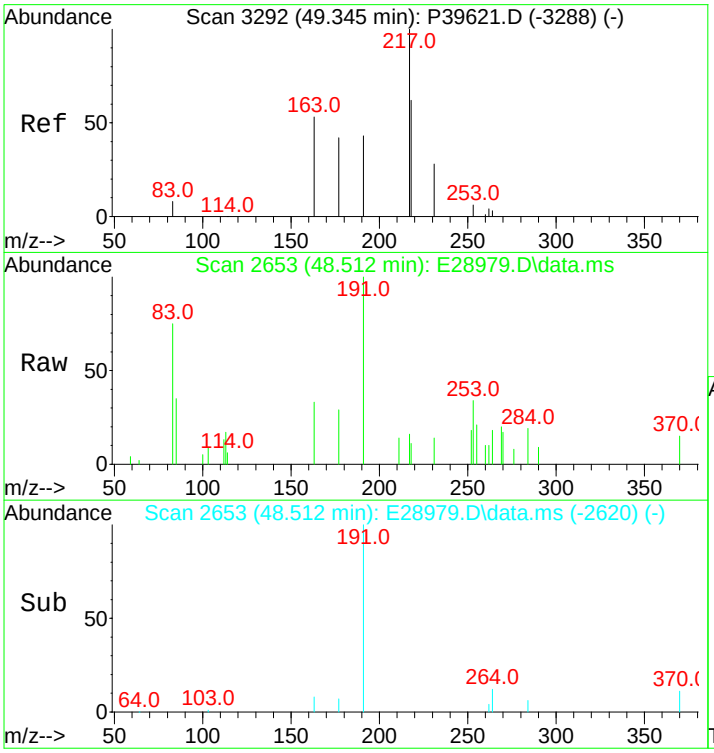




#108
C30 Tricyclic Terpane-22R
Concen: 69.32 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

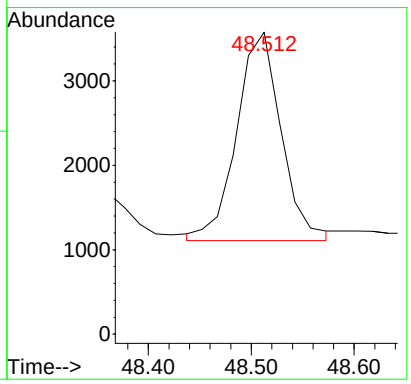
Tgt Ion:191 Resp: 2777

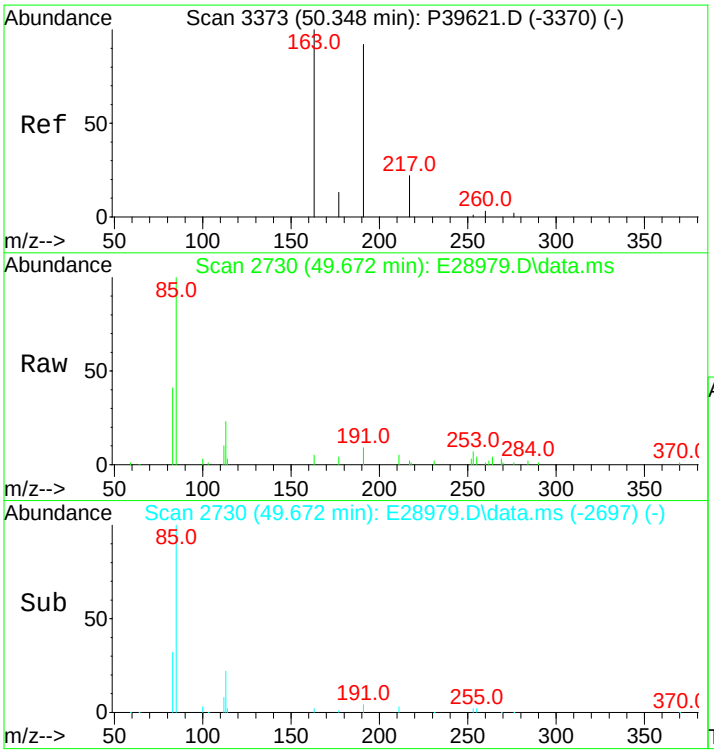




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 184.86 ng/ml m
RT: 48.512 min Scan# 2653
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

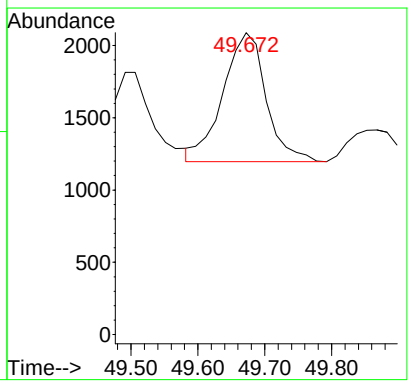
Tgt Ion:191 Resp: 7406

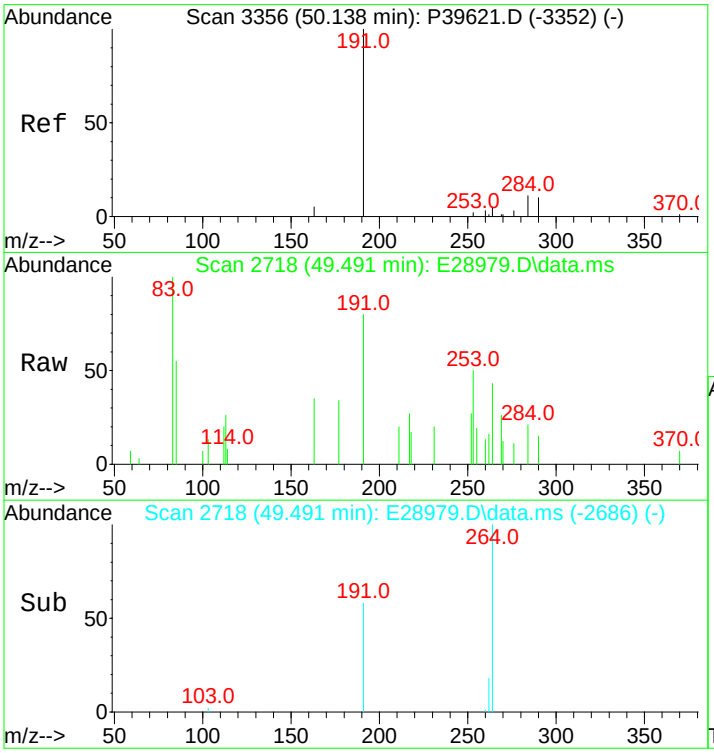




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 99.39 ng/ml
RT: 49.672 min Scan# 2730
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

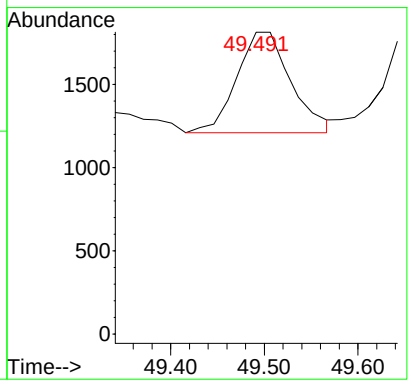
Tgt Ion:191 Resp: 3982

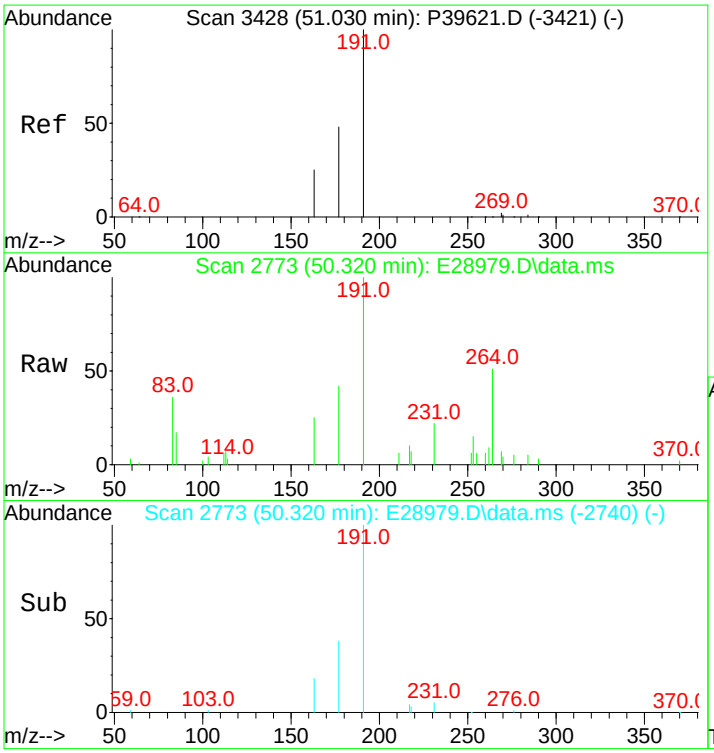




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 61.03 ng/ml
RT: 49.491 min Scan# 2718
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

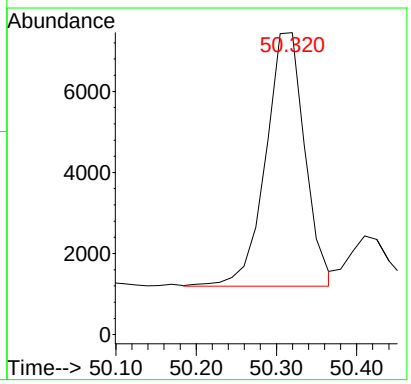
Tgt Ion:191 Resp: 2445

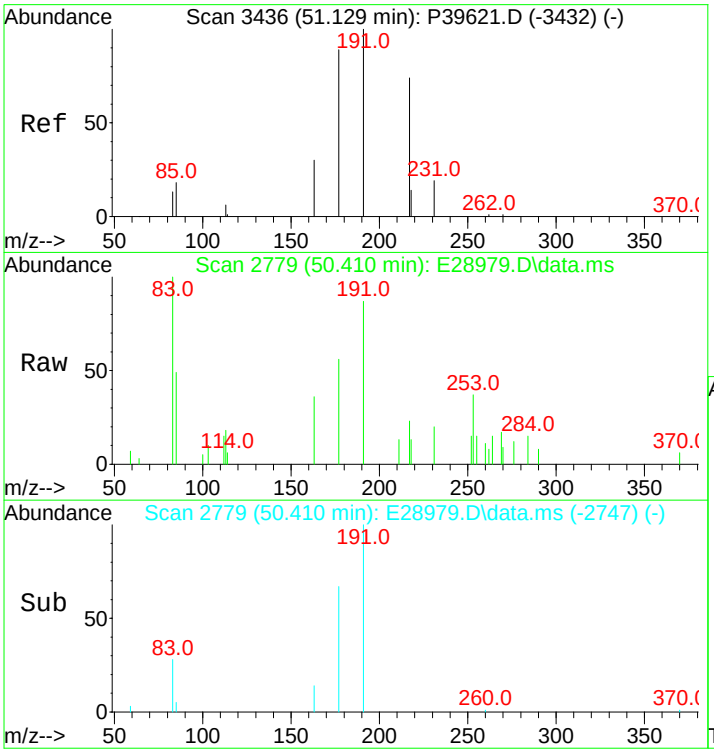




#112
30-Norhopane (T15)
Concen: 528.82 ng/ml m
RT: 50.320 min Scan# 2773
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

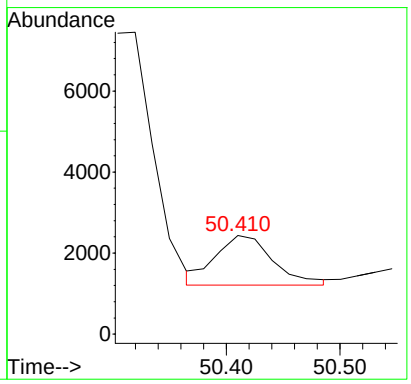
Tgt Ion:191 Resp: 21186

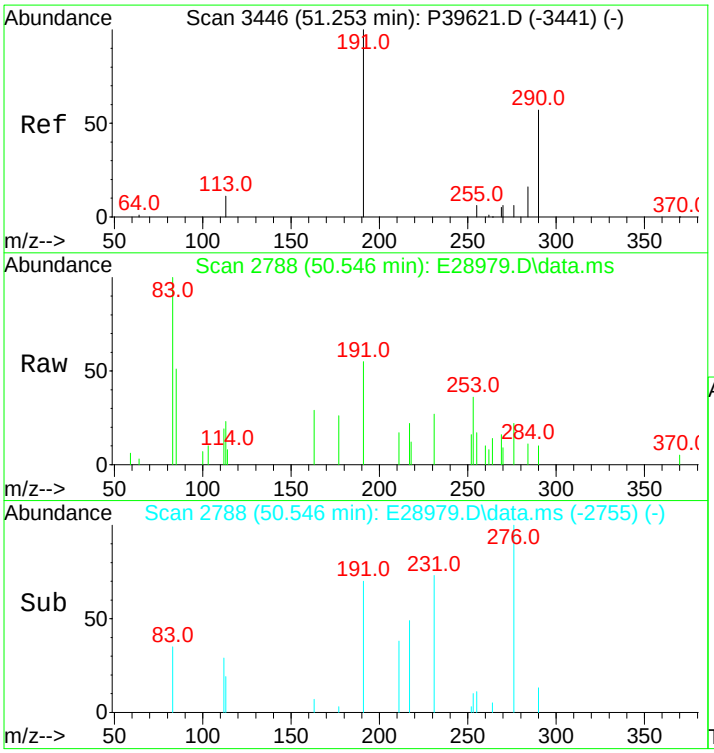




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 108.36 ng/ml m
RT: 50.410 min Scan# 2779
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

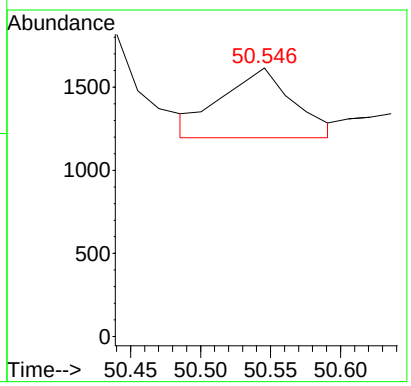
Tgt Ion:191 Resp: 4341

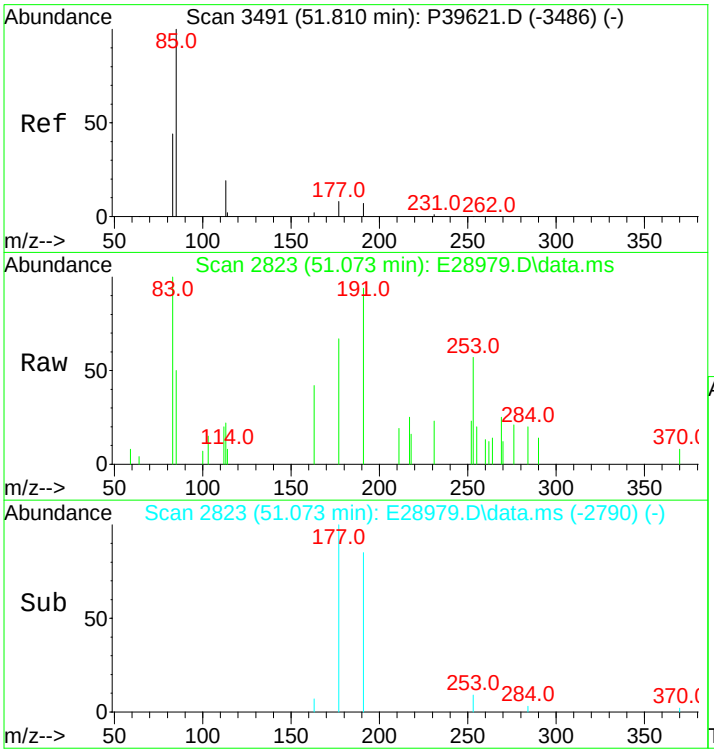




#114
17a(H)-Diahopane (X)
Concen: 37.34 ng/ml m
RT: 50.546 min Scan# 2788
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

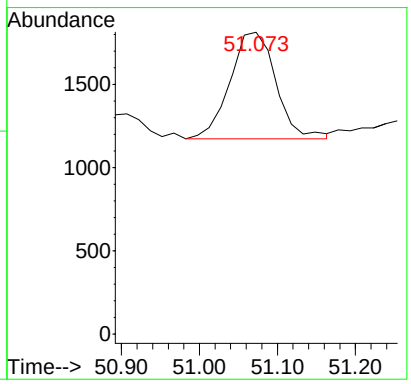
Tgt Ion:191 Resp: 1496

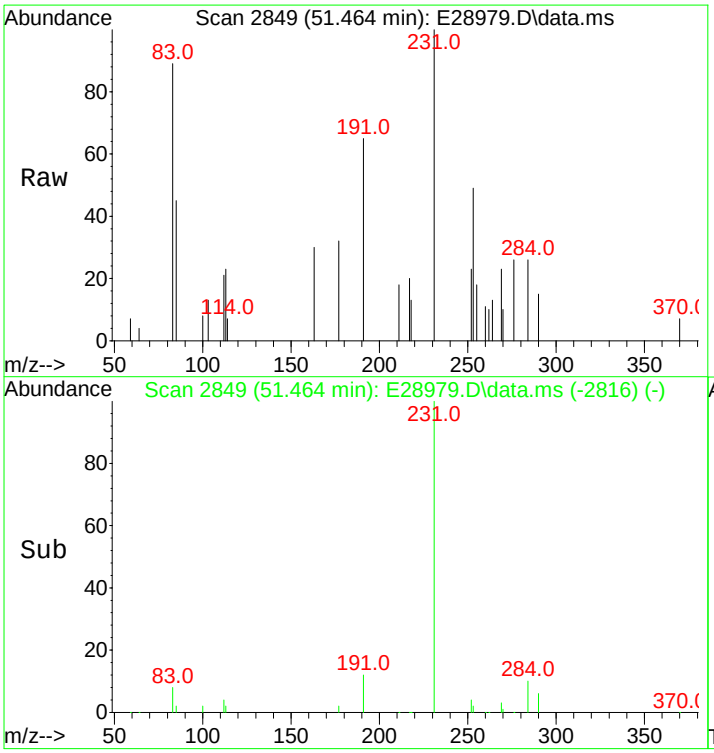




#115
30-Normoretane (T17)
Concen: 65.45 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

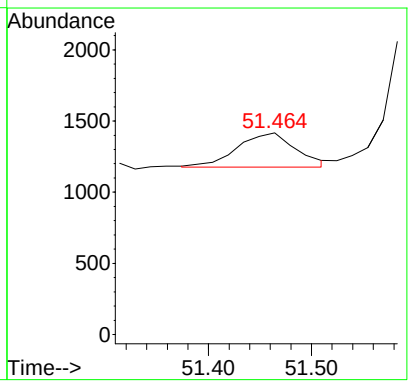
Tgt Ion:191 Resp: 2622

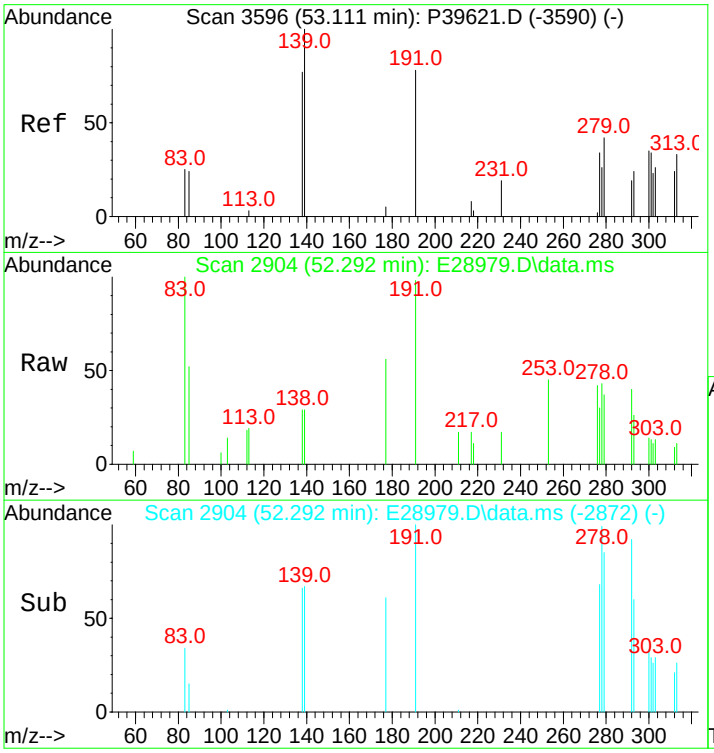




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 23.64 ng/ml m
RT: 51.464 min Scan# 2849
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

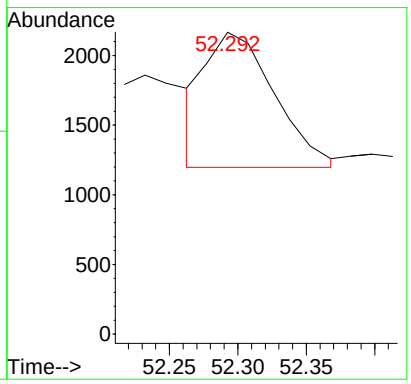
Tgt Ion:191 Resp: 947

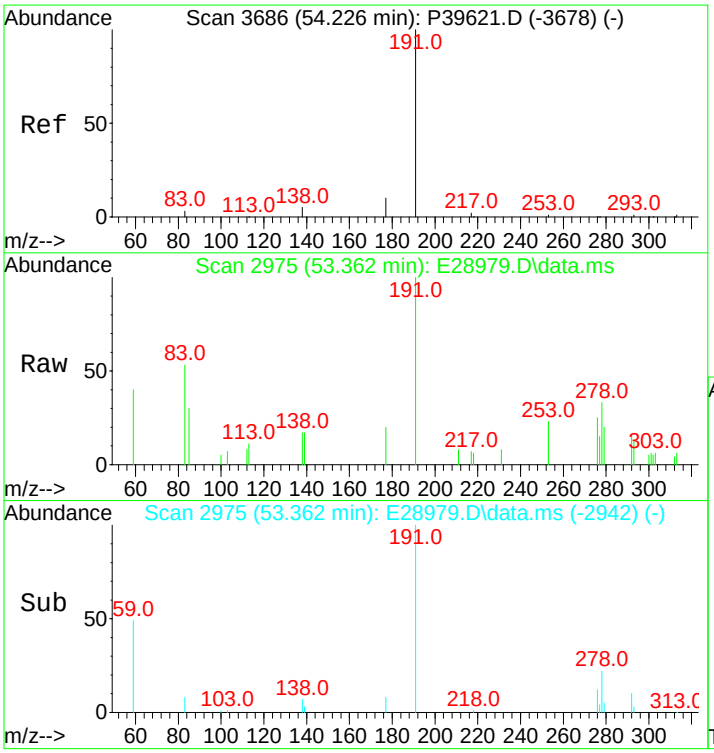




#117
Moretane (T20)
Concen: 85.02 ng/ml m
RT: 52.292 min Scan# 2904
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

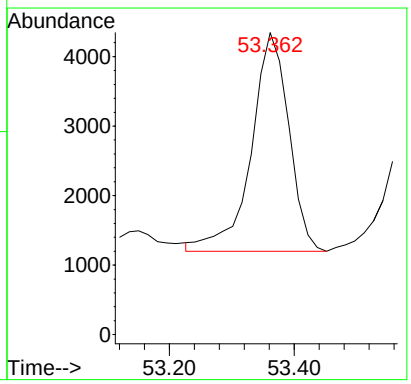
Tgt Ion:191 Resp: 3406

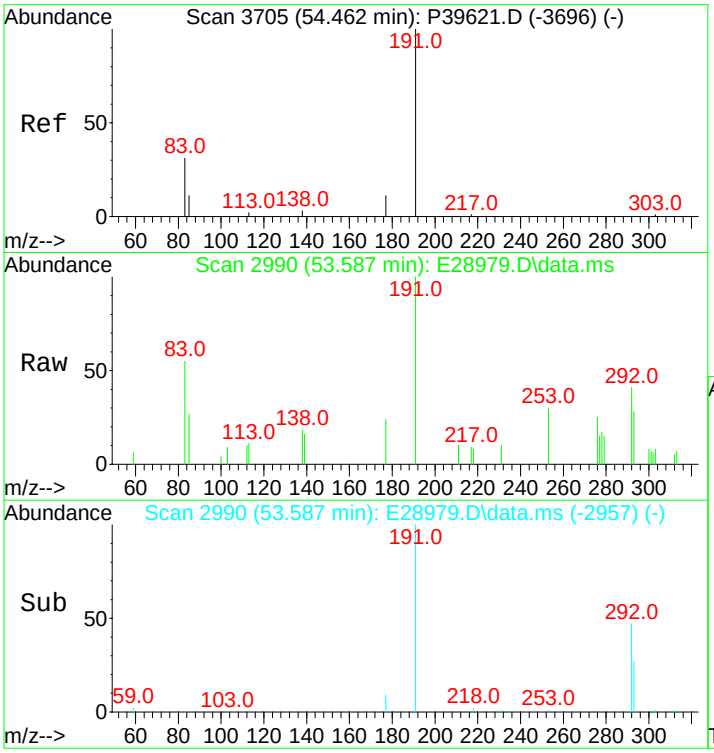




#118
30-Homohopane-22S (T21)
Concen: 328.86 ng/ml
RT: 53.362 min Scan# 2975
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

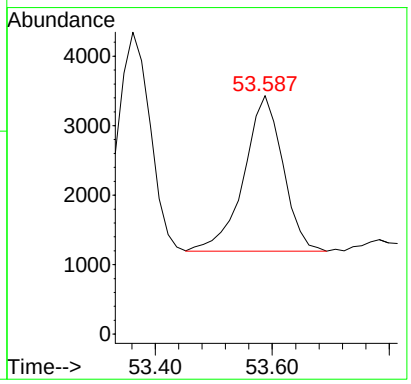
Tgt Ion:191 Resp: 13175

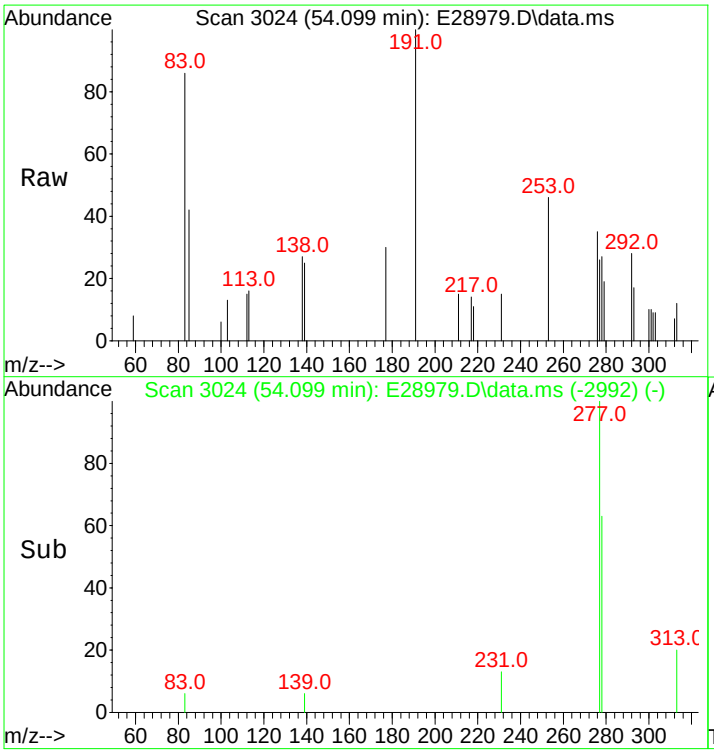




#119
30-Homohopane-22R (T22)
Concen: 258.05 ng/ml
RT: 53.587 min Scan# 2990
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

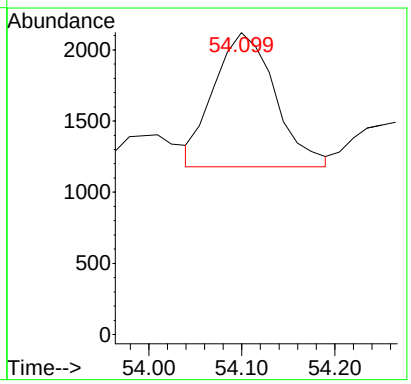
Tgt Ion:191 Resp: 10338

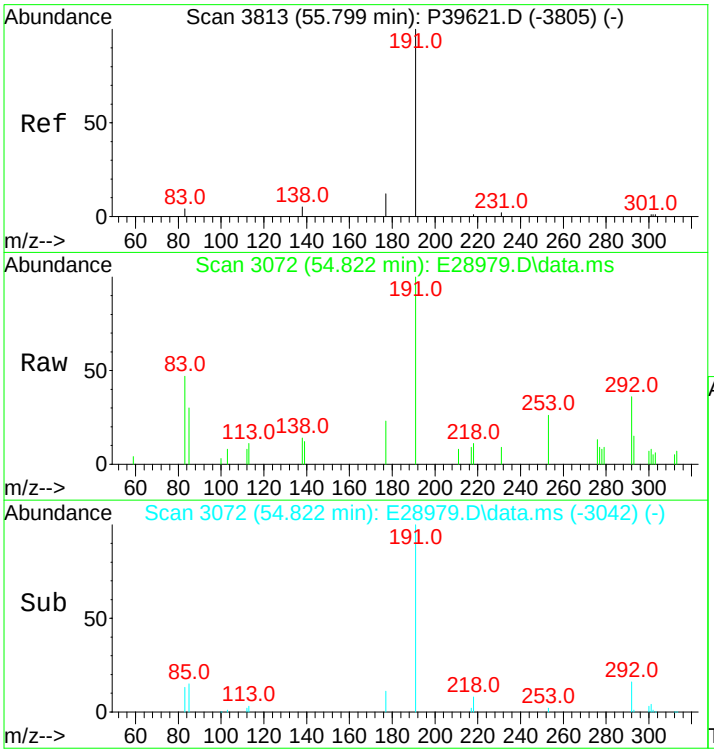




#120
Gammacerane/C32-diahopane
Concen: 107.38 ng/mL m
RT: 54.099 min Scan# 3024
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

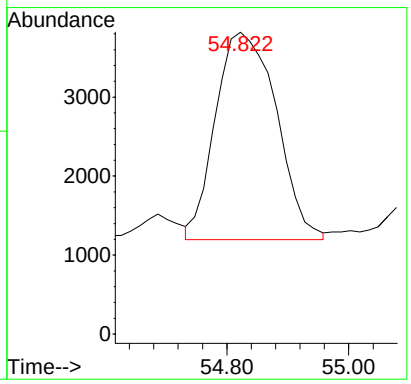
Tgt Ion:191 Resp: 4302

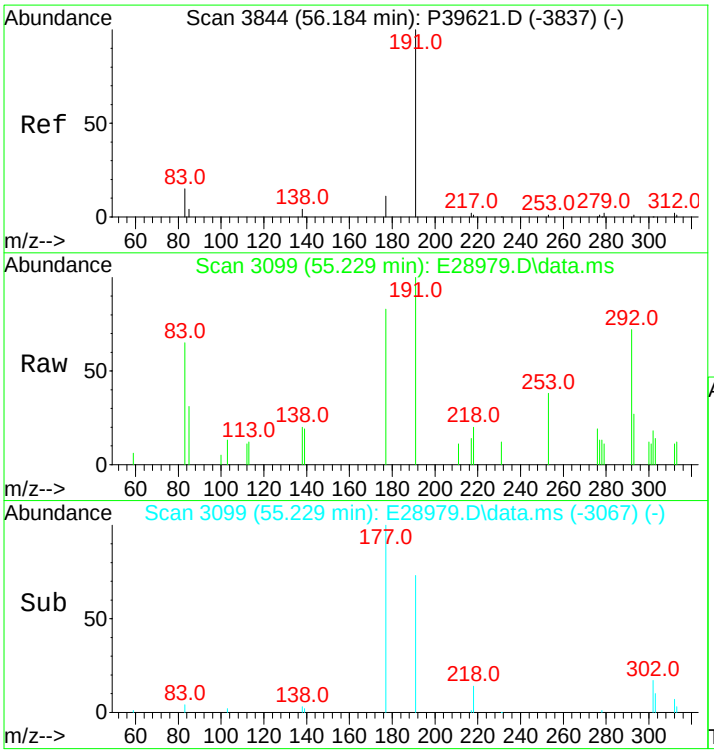




#121
30,31-Bishomohopane-22S (T26)
Concen: 454.14 ng/ml m
RT: 54.822 min Scan# 3072
Delta R.T. -0.045 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

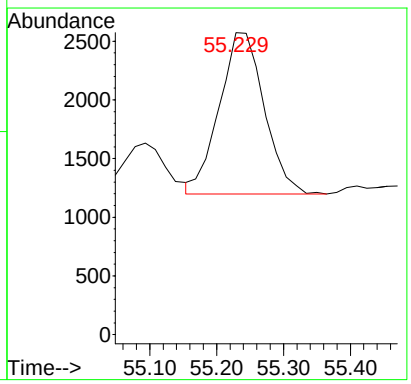
Tgt Ion:191 Resp: 18194

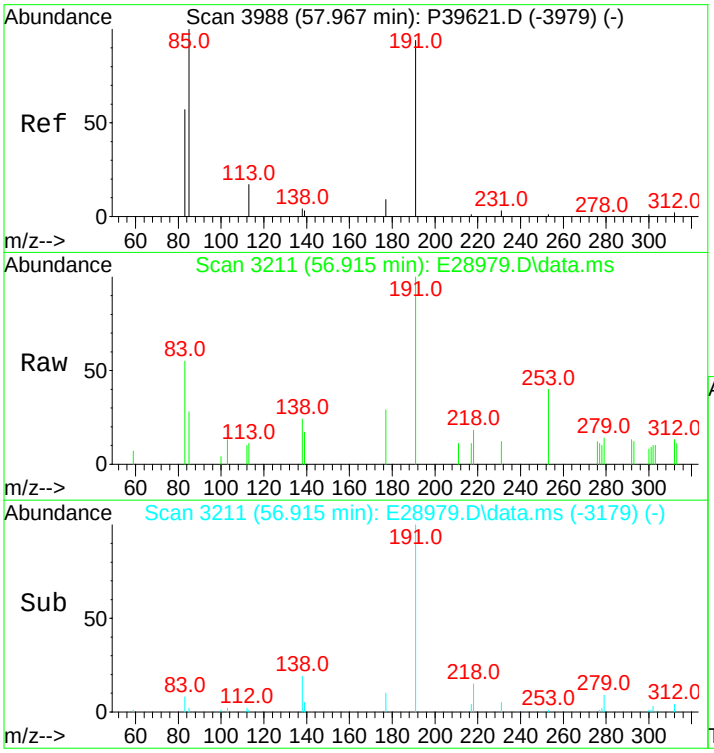




#122
30,31-Bishomohopane-22R (T27)
Concen: 160.50 ng/ml
RT: 55.229 min Scan# 3099
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

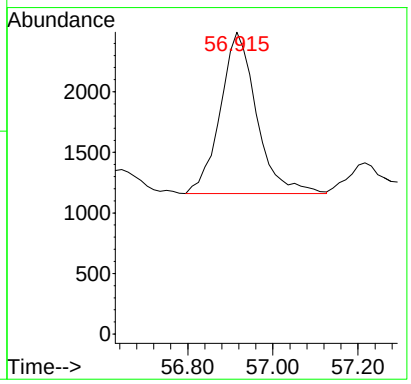
Tgt Ion:191 Resp: 6430

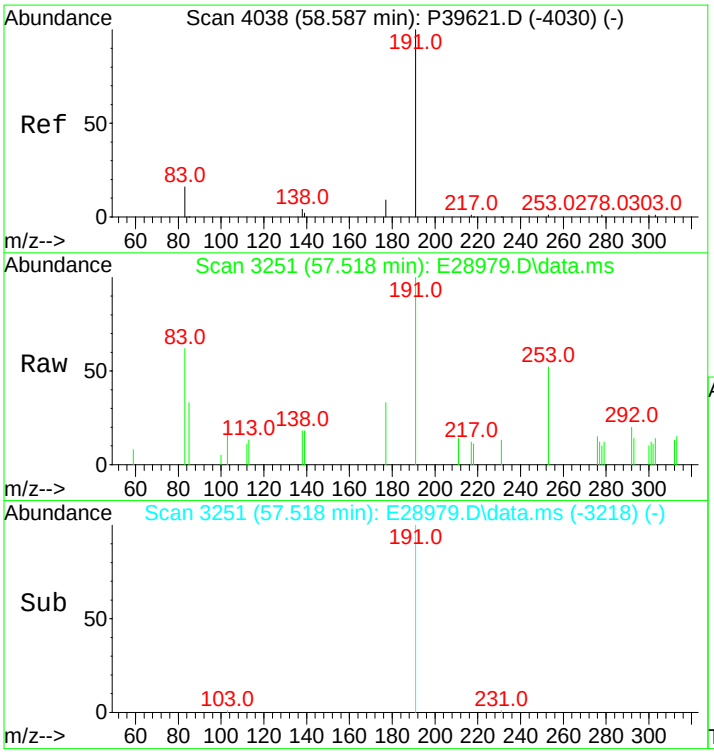




#123
30,31-Trishomohopane-22S (T30)
Concen: 197.12 ng/ml
RT: 56.915 min Scan# 3211
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

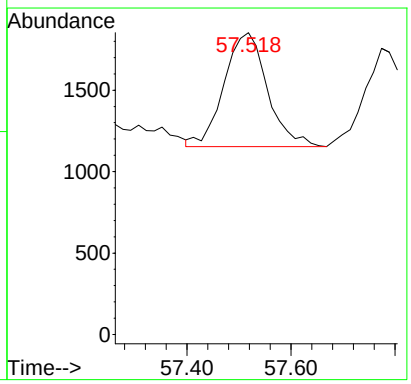
Tgt Ion:191 Resp: 7897

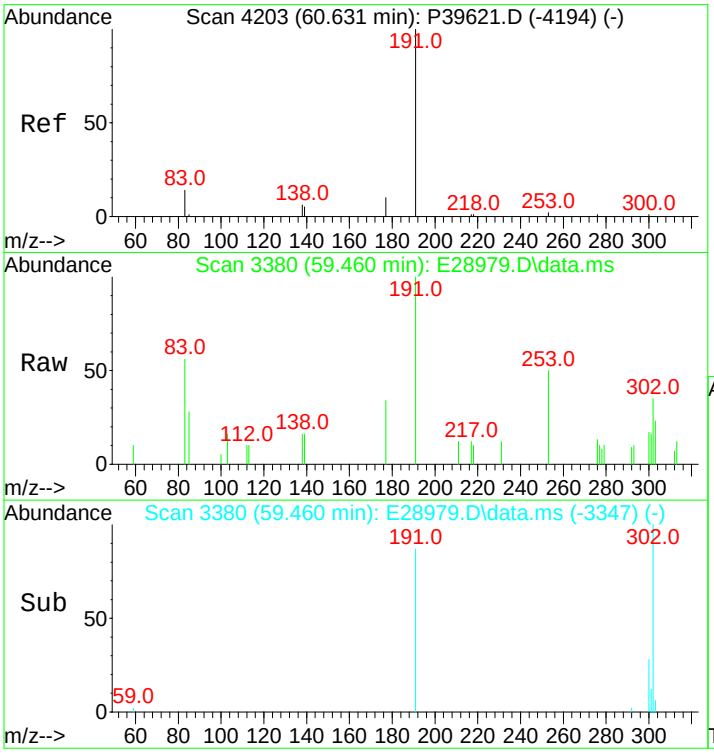




#124
30,31-Trishomohopane-22R (T31)
Concen: 100.79 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

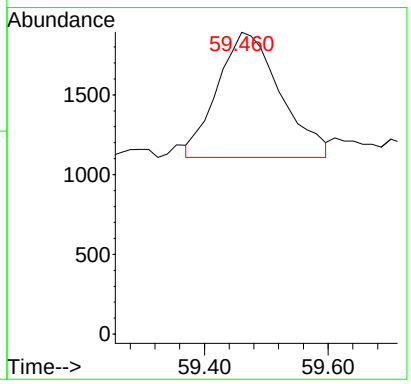
Tgt Ion:191 Resp: 4038

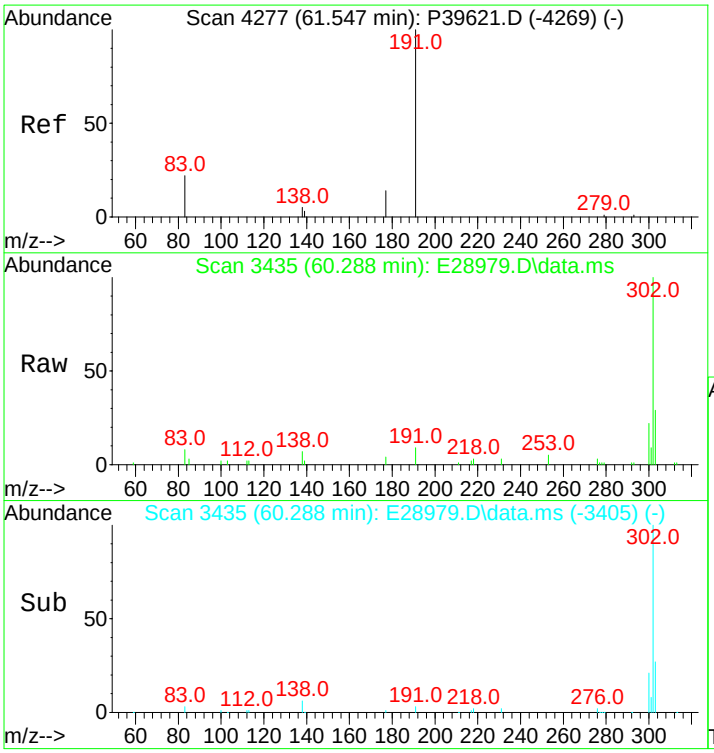




#125
Tetrakishomohopane-22S (T32)
Concen: 137.81 ng/ml m
RT: 59.460 min Scan# 3380
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

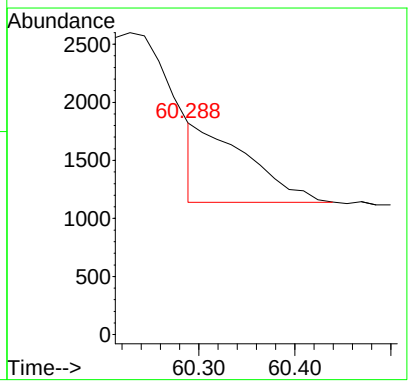
Tgt Ion:191 Resp: 5521

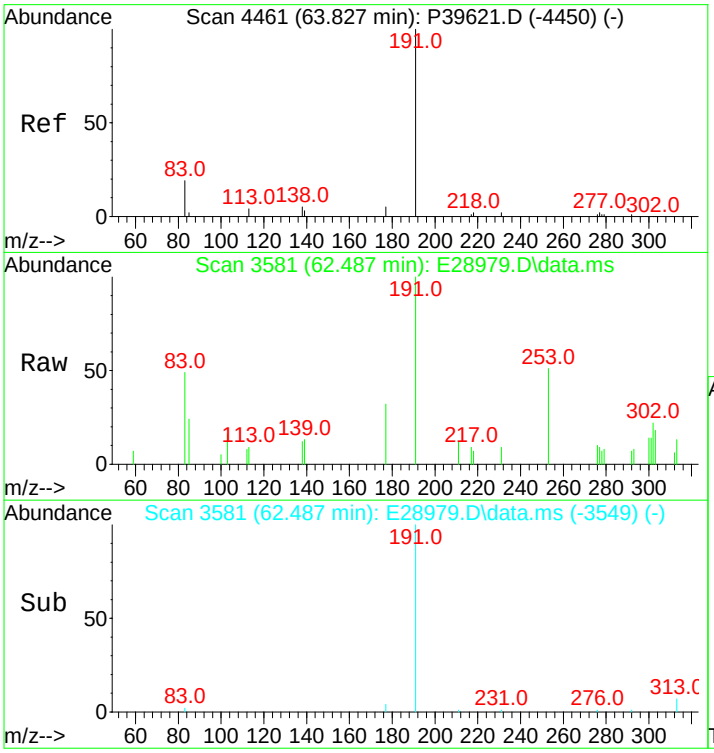




#126
Tetrakishomohopane-22R (T33)
Concen: 63.40 ng/ml m
RT: 60.288 min Scan# 3435
Delta R.T. -0.045 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

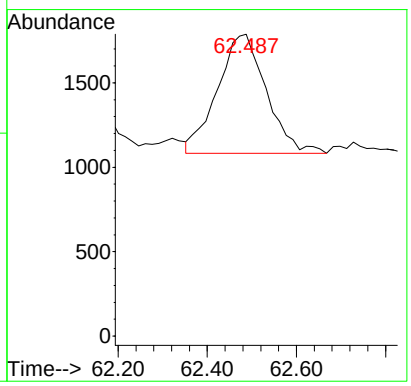
Tgt Ion:191 Resp: 2540

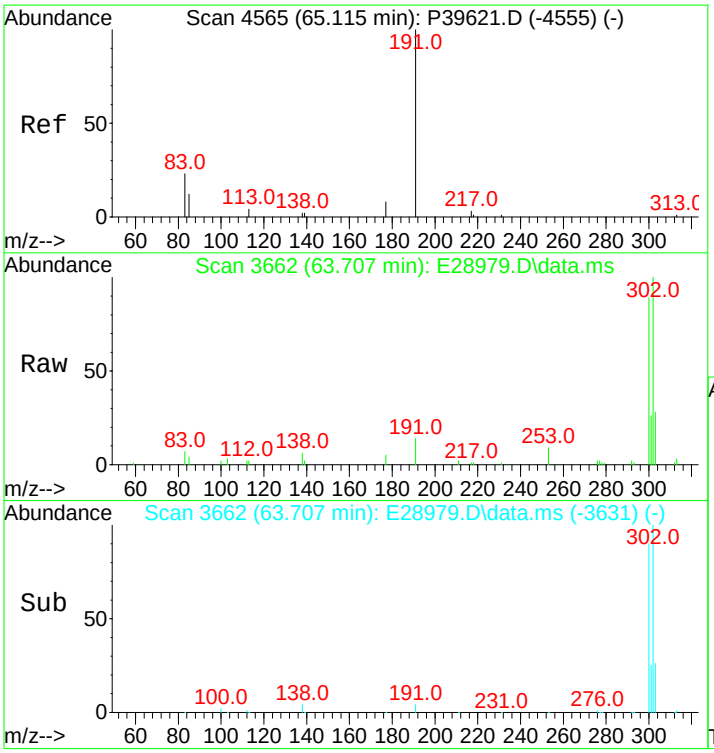




#127
Pentakishomohopane-22S (T34)
Concen: 133.72 ng/ml
RT: 62.487 min Scan# 3581
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

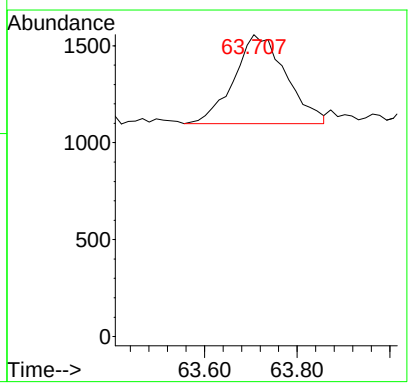
Tgt Ion:191 Resp: 5357

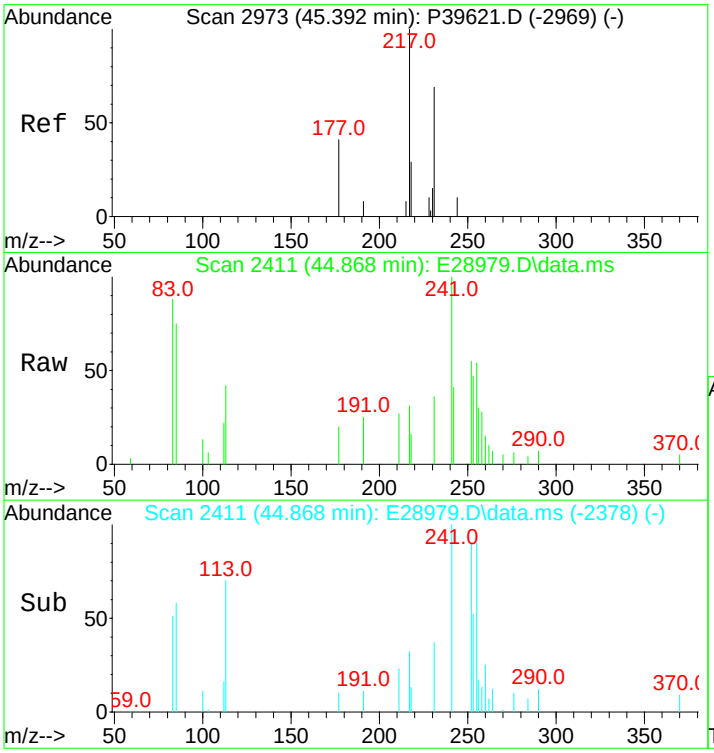




#128
Pentakishomohopane-22R (T35)
Concen: 89.54 ng/ml m
RT: 63.707 min Scan# 3662
Delta R.T. -0.030 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

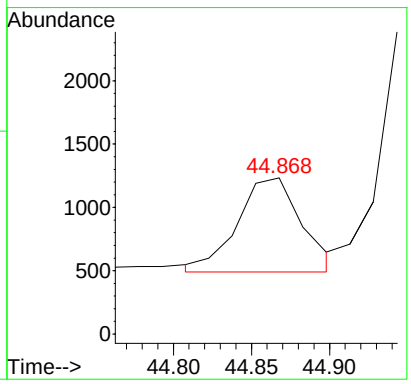
Tgt Ion:191 Resp: 3587

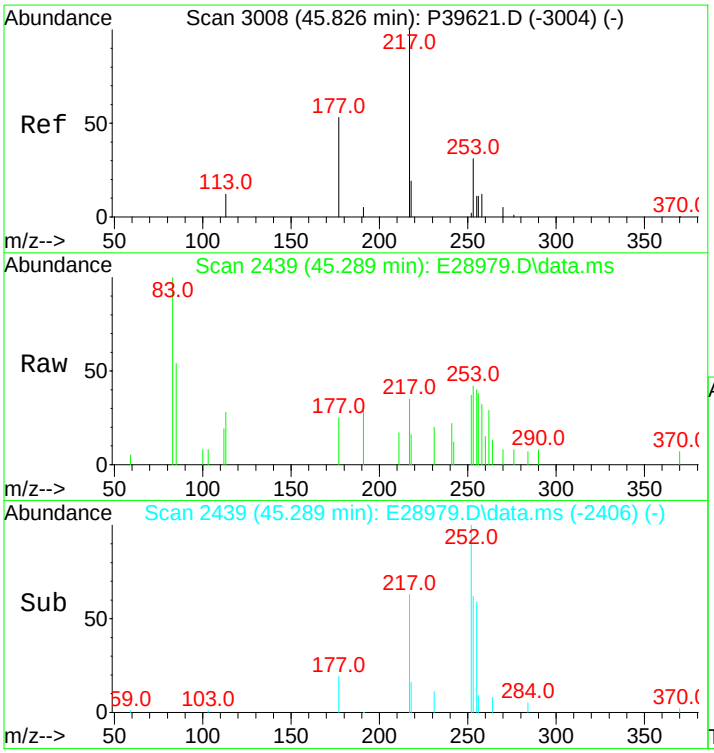




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 100.53 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

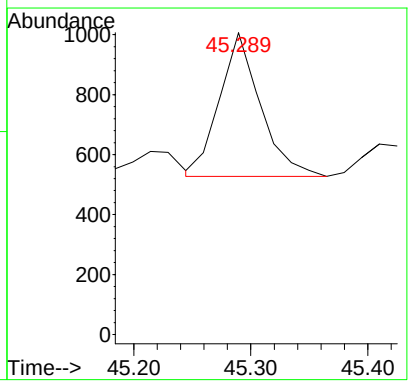
Tgt Ion:217 Resp: 2115

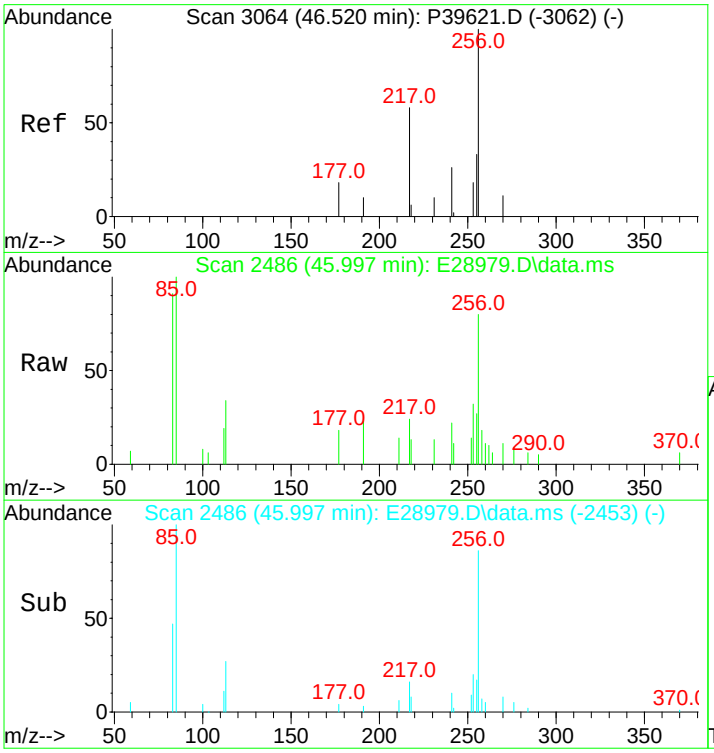




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 55.18 ng/ml
RT: 45.289 min Scan# 2439
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

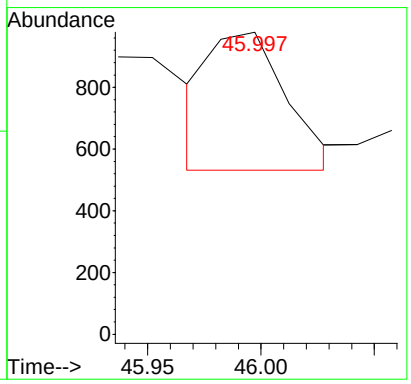
Tgt Ion:217 Resp: 1161

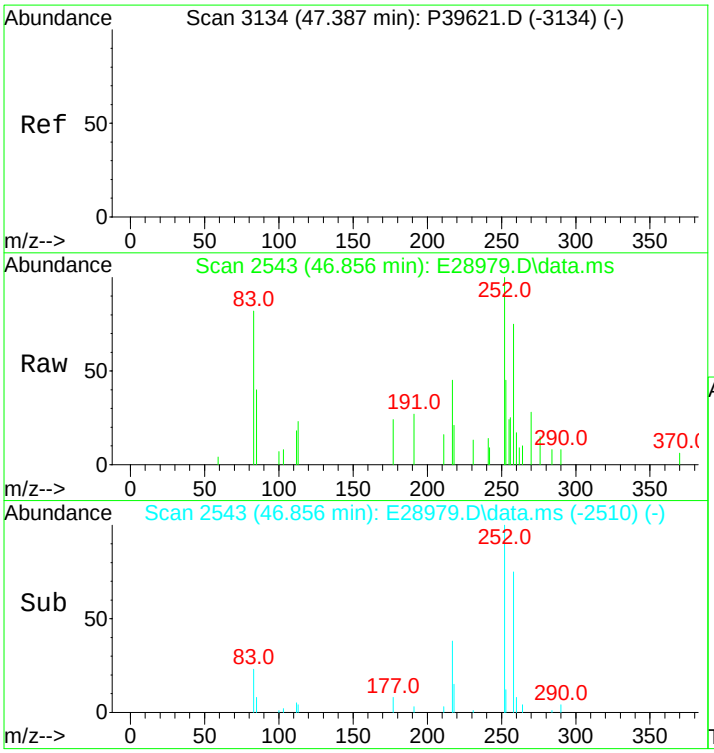




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 50.10 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

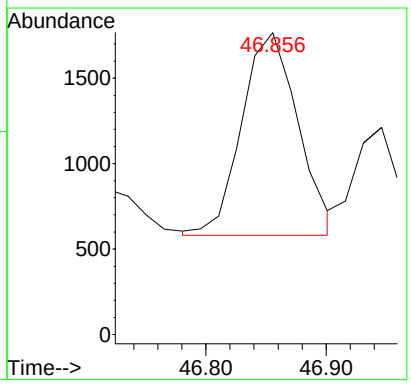
Tgt Ion:217 Resp: 1054

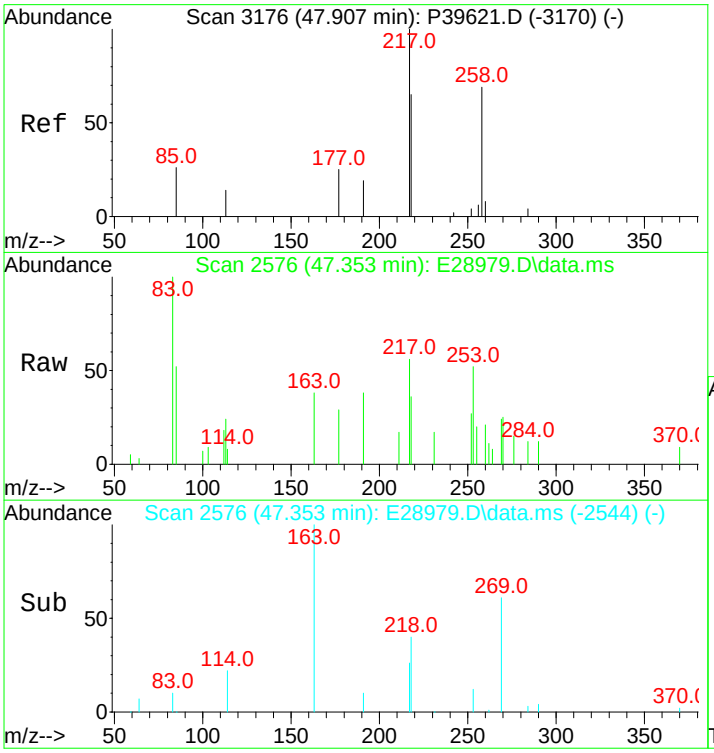




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 183.04 ng/ml m
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

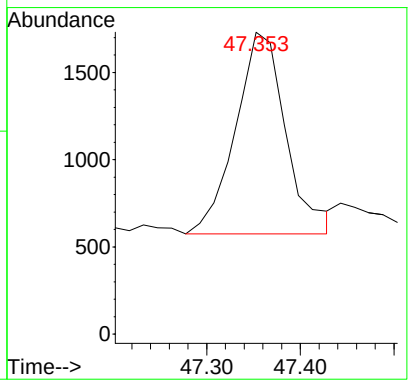
Tgt Ion:217 Resp: 3851

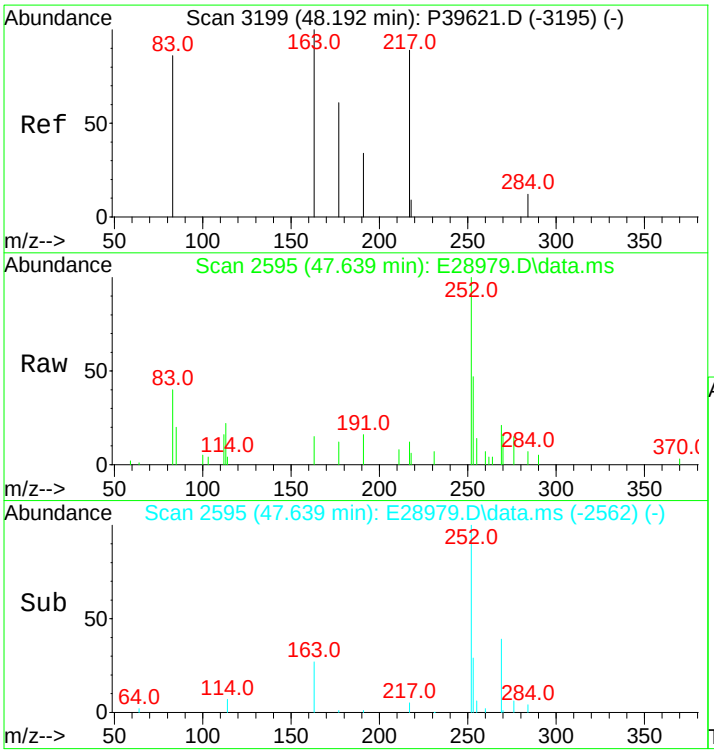




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 205.67 ng/ml
RT: 47.353 min Scan# 2576
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

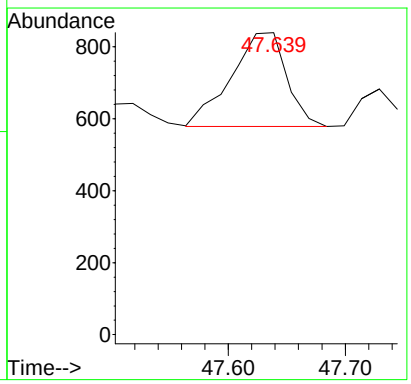
Tgt Ion:217 Resp: 4327

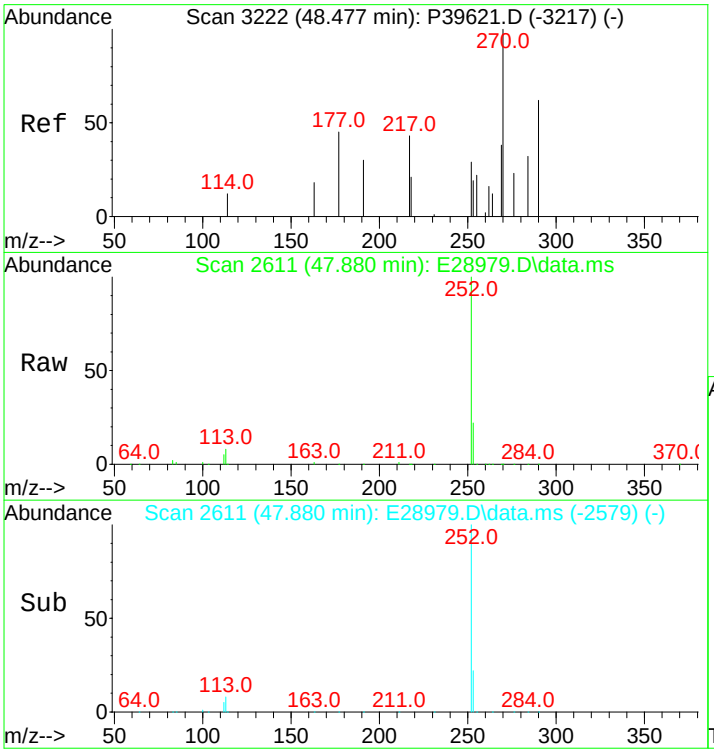




#135
Unknown Sterane (S18)
Concen: 41.02 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

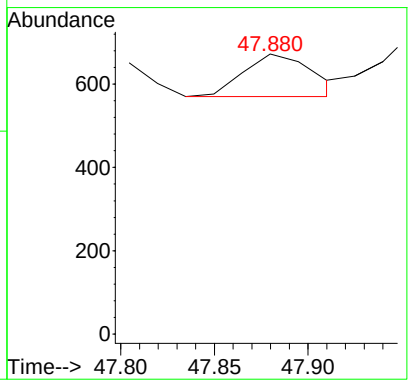
Tgt Ion:217 Resp: 863

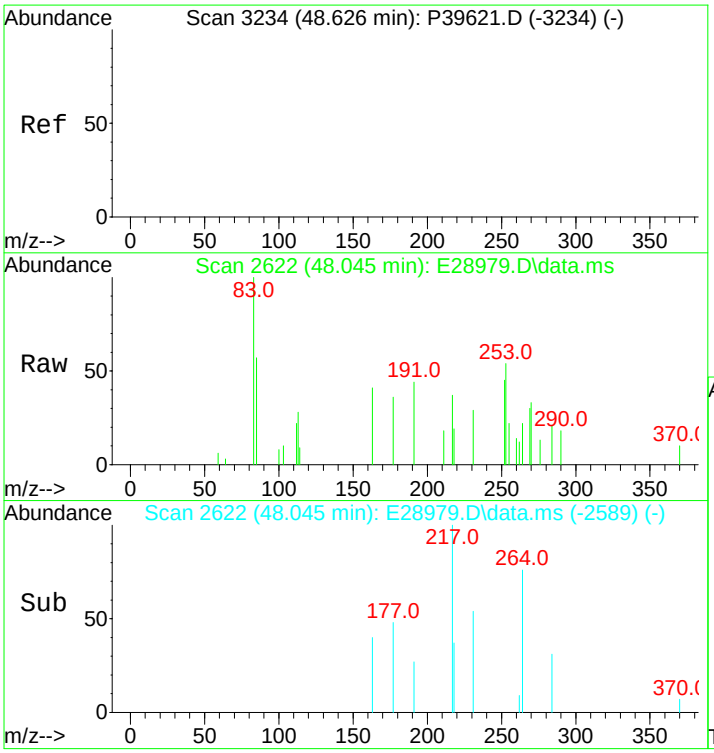




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 12.36 ng/ml
RT: 47.880 min Scan# 2611
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

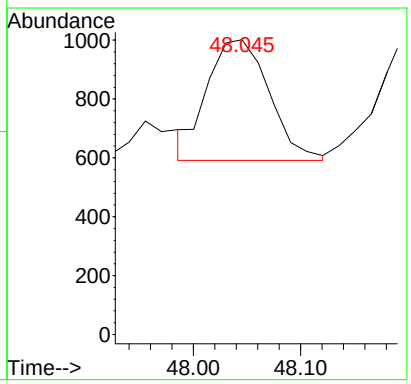
Tgt Ion:217 Resp: 260

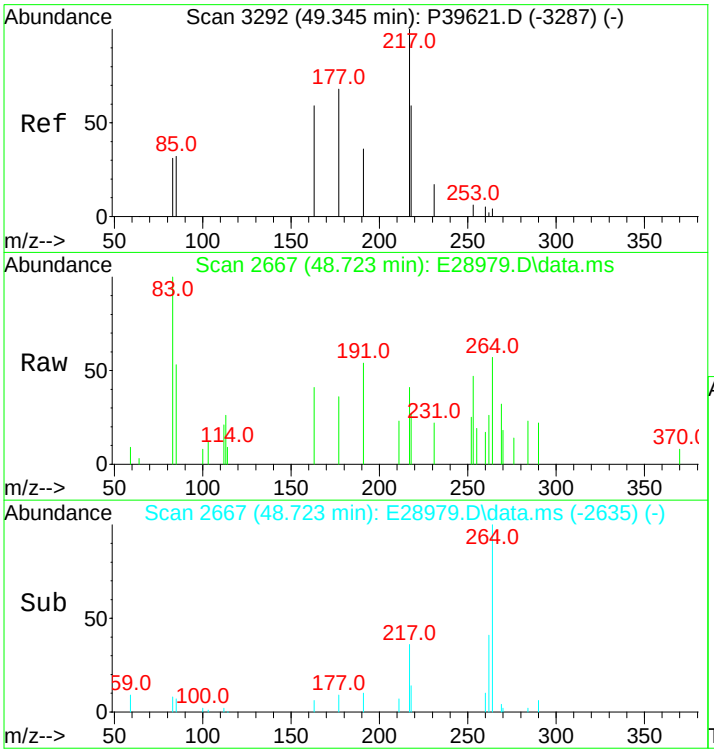




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 78.05 ng/ml m
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

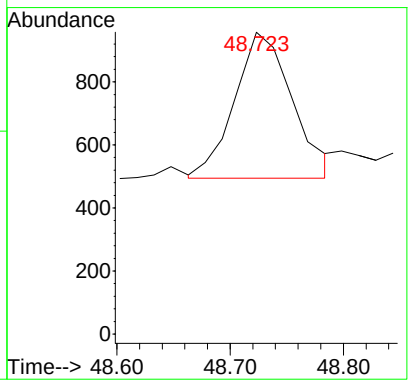
Tgt Ion:217 Resp: 1642

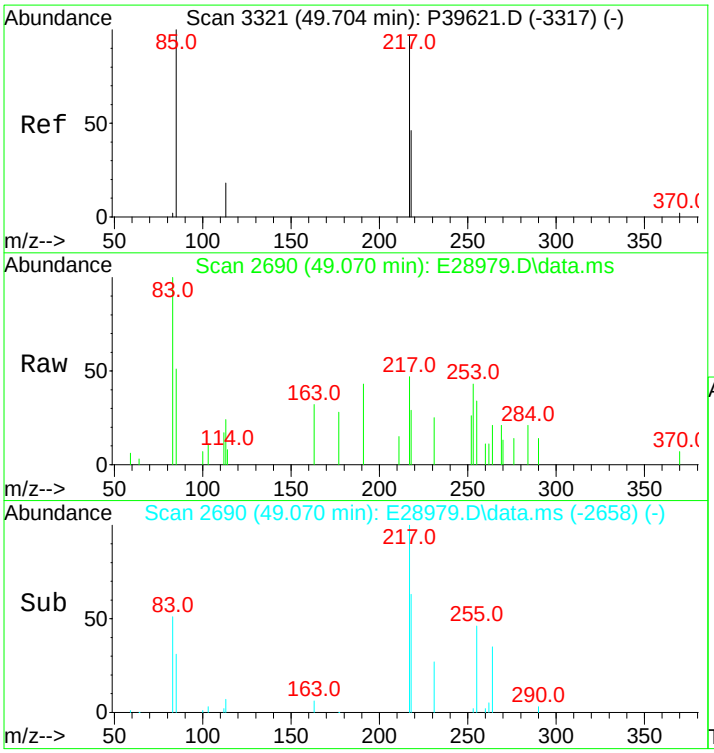




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 77.86 ng/ml m
RT: 48.723 min Scan# 2667
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

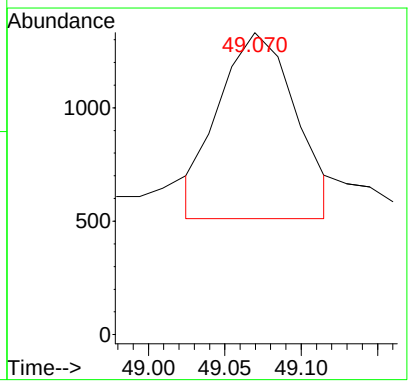
Tgt Ion:217 Resp: 1638

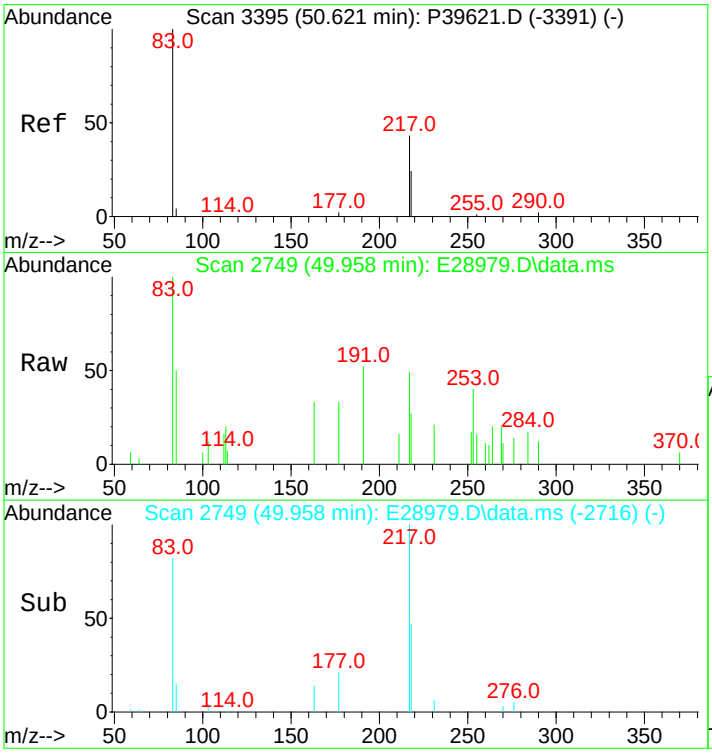




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 136.46 ng/ml m
RT: 49.070 min Scan# 2690
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

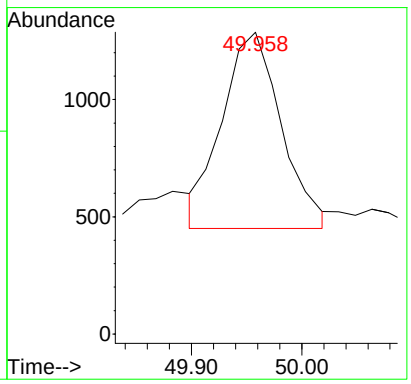
Tgt Ion:217 Resp: 2871

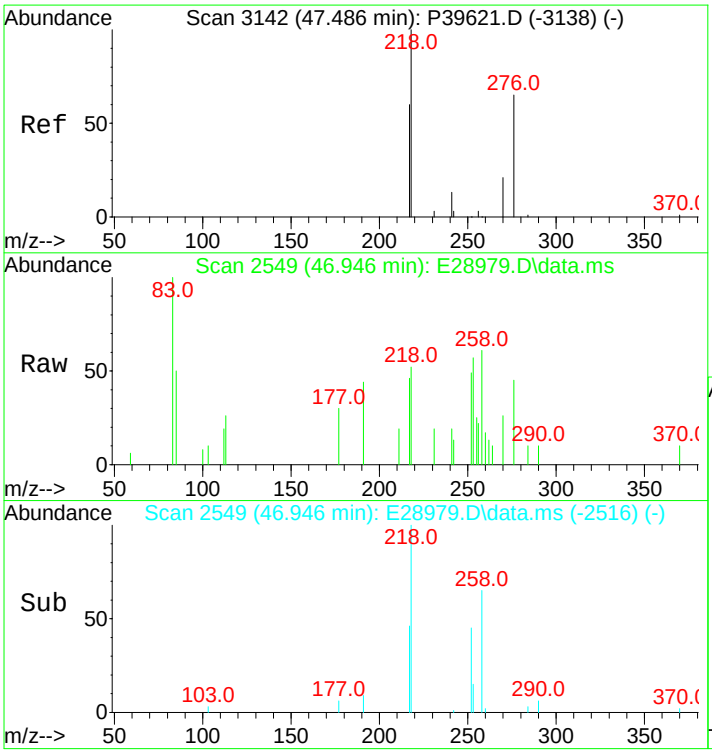




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 148.82 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

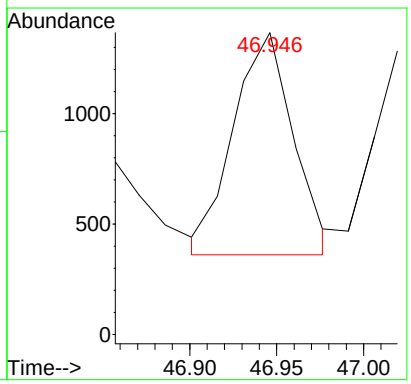
Tgt Ion:217 Resp: 3131

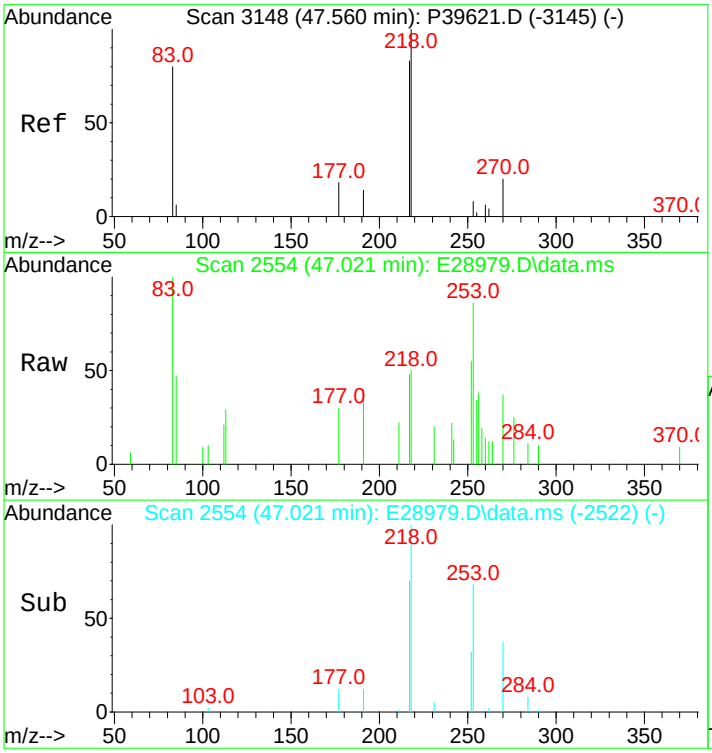




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 113.98 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

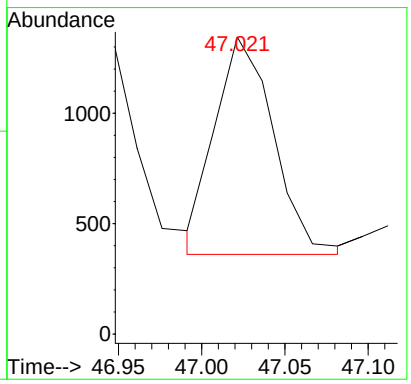
Tgt Ion:218 Resp: 2398

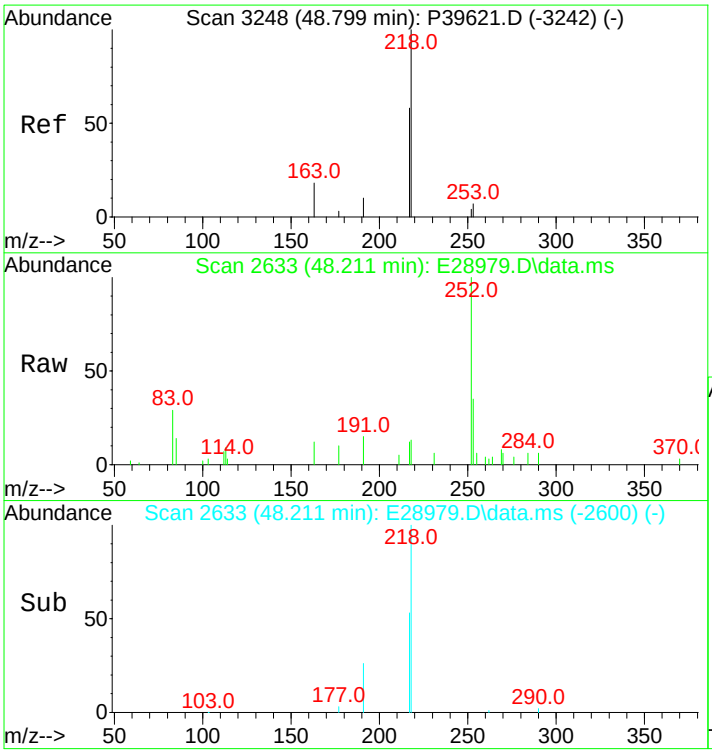




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 114.55 ng/ml m
RT: 47.021 min Scan# 2554
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

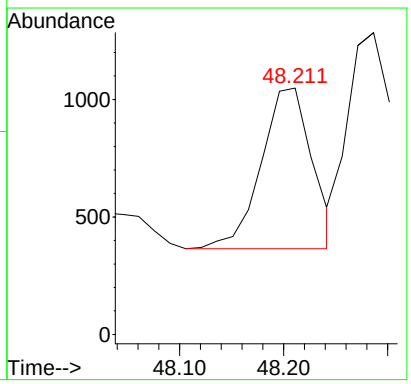
Tgt Ion:218 Resp: 2410

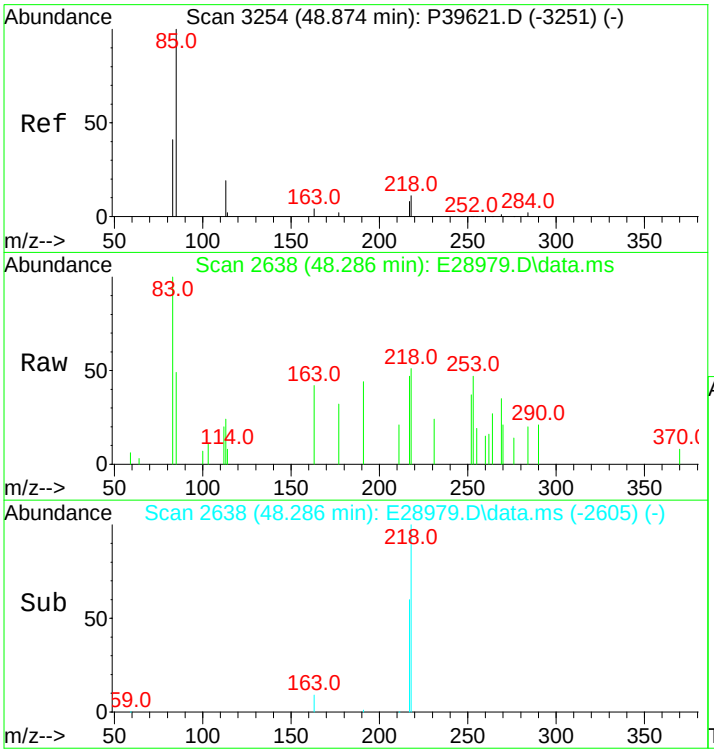




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 110.79 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

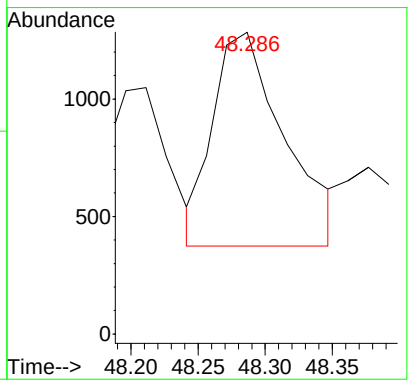
Tgt Ion:218 Resp: 2331

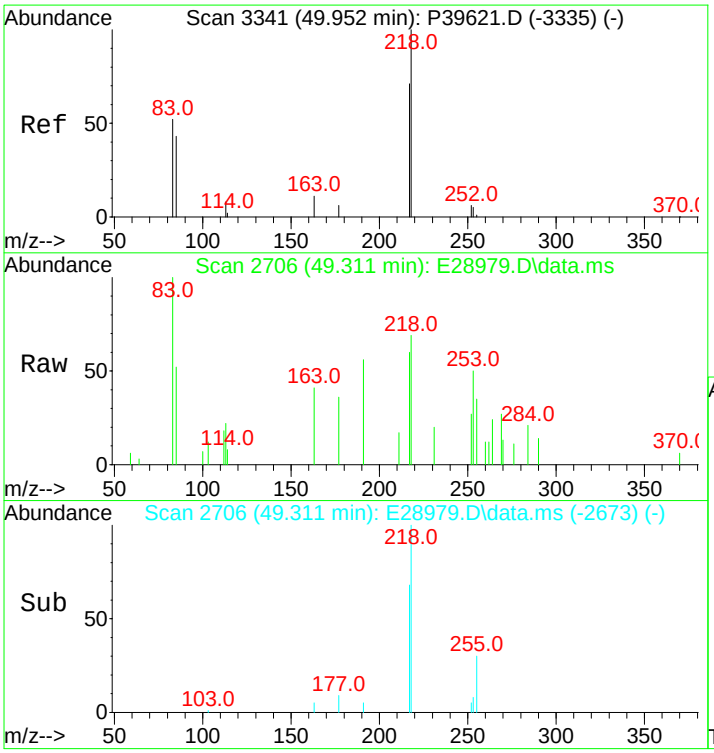




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 160.70 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

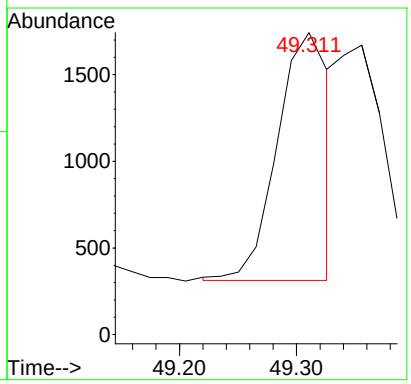
Tgt Ion:218 Resp: 3381

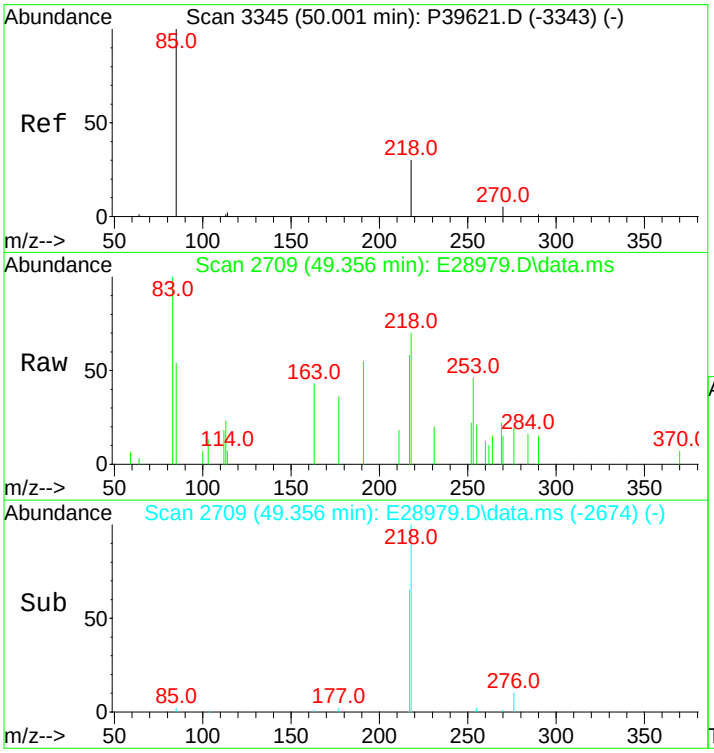




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 208.75 ng/ml m
RT: 49.311 min Scan# 2706
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

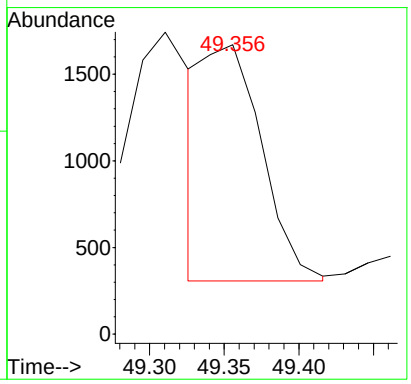
Tgt Ion:218 Resp: 4392

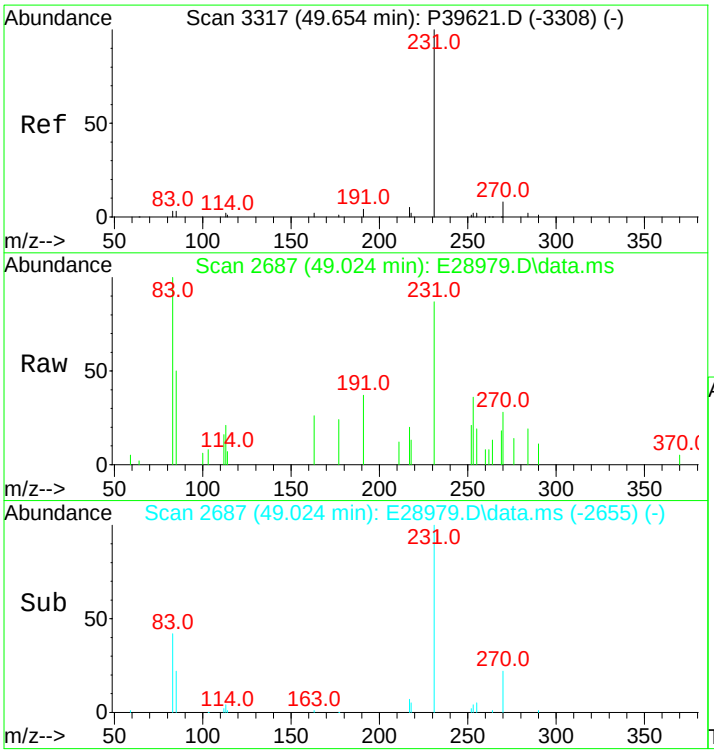




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 177.15 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

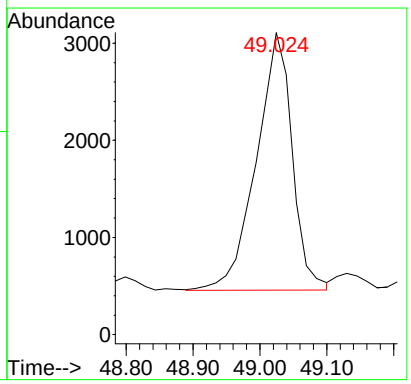
Tgt Ion:218 Resp: 3727

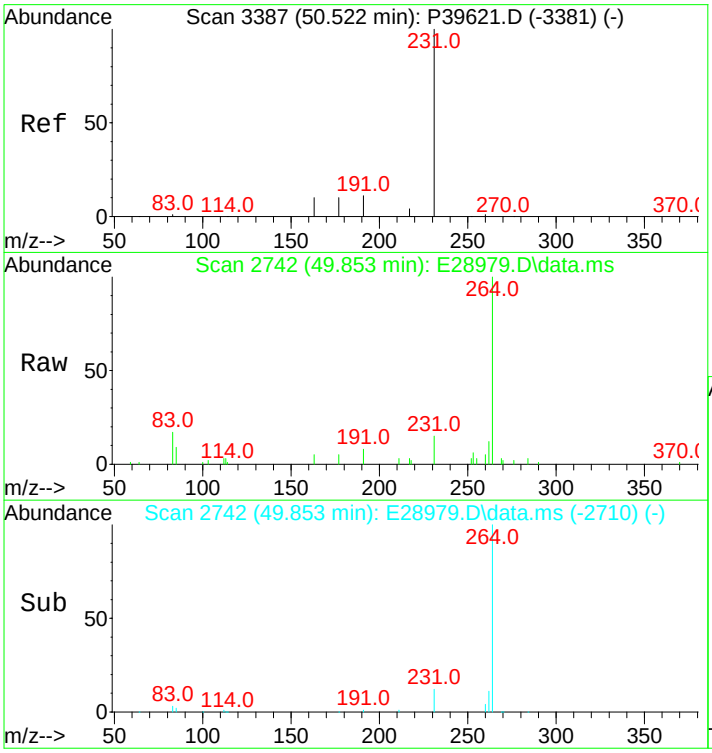




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 470.60 ng/mL
RT: 49.024 min Scan# 2687
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

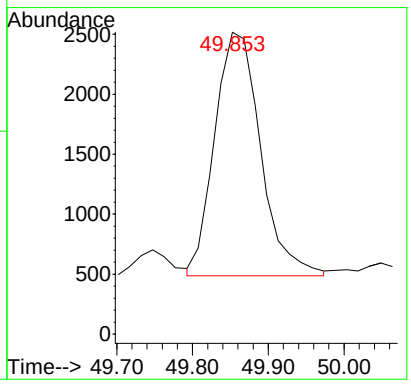
Tgt Ion:231 Resp: 9901

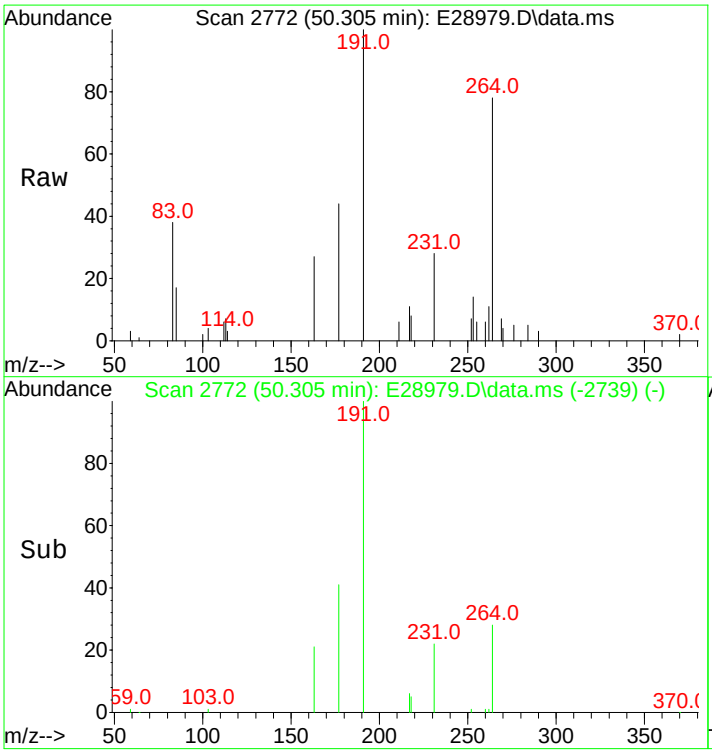




#148
C28,20S-triaromatic steroid
Concen: 406.67 ng/mL m
RT: 49.853 min Scan# 2742
Delta R.T. -0.015 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

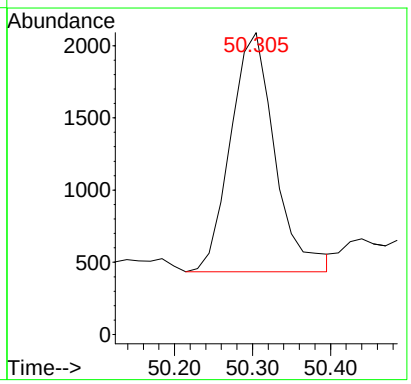
Tgt Ion:231 Resp: 8556

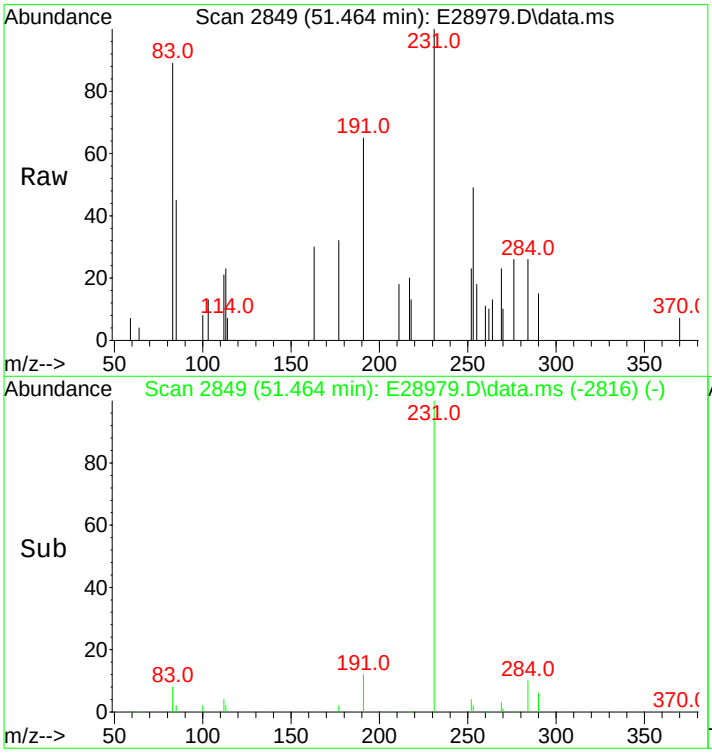




#149
C27,20R-triaromatic steroid
Concen: 310.66 ng/mL
RT: 50.305 min Scan# 2772
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

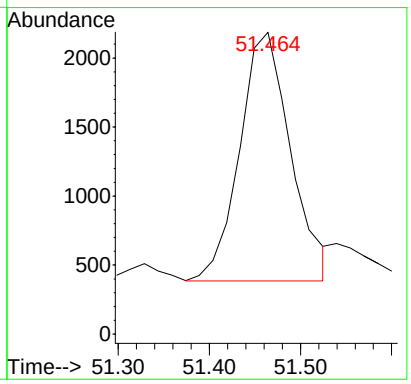
Tgt Ion:231 Resp: 6536





#150
C28,20R-triaromatic steroid
Concen: 333.10 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. -0.000 min
Lab File: E28979.D
Acq: 15 Nov 2012 4:49 am

Tgt Ion:231 Resp: 7008



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23350M3	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	56363	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	29516	359.375	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.94%#			
42) Phenanthrene-d10	32.070	188	38452	456.966	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.70%#			
83) Benzo[b]fluoranthene-d12	46.645	264	52808	456.095	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.61%#			
88) Benzo[a]pyrene-d12	47.789	264	49432	440.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.06%#			
129) 5B(H)Cholane - Surr	43.332	217	10684	480.960	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.10%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	119	6.371	ng/mL	100
5) C1-Decalins	17.362	152	462M5	24.735	ng/mL	
6) C2-Decalins	19.138	166	1611M5	86.252	ng/mL	
7) C3-Decalins	22.014	180	2549m	136.472	ng/mL	
8) C4-Decalins	24.995	194	6589M5	352.771	ng/mL	
10) Naphthalene	19.289	128	23698	258.014	ng/mL#	100
11) C1-Naphthalenes	21.999	142	14907M5	162.301	ng/mL	
12) C2-Naphthalenes	24.844	156	55138M5	600.319	ng/mL	
13) C3-Naphthalenes	27.524	170	103060m	1122.073	ng/mL	
14) C4-Naphthalenes	29.963	184	88299M5	961.361	ng/mL	
16) 2-Methylnaphthalene	21.999	142	8949	152.977	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	5924	104.218	ng/mL#	100
18) Benzothiophene	19.515	134	889M3	11.708	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	1983M5	26.116	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	7313M5	96.313	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18251m	240.367	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	22014M5	289.926	ng/mL	
23) Biphenyl	23.881	154	3669	49.626	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	11913	225.930	ng/mL#	100
25) Dibenzofuran	26.967	168	11950	145.995	ng/mL	93
26) Acenaphthylene	25.582	152	50776	554.492	ng/mL#	100
27) Acenaphthene	26.320	153	15804M3	268.118	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	8313M3	168.509	ng/mL	
29) Fluorene	28.337	166	24829M3	377.679	ng/mL	
30) C1-Fluorenes	30.715	180	32815M5	499.156	ng/mL	
31) C2-Fluorenes	32.928	194	51144M5	777.962	ng/mL	
32) C3-Fluorenes	34.765	208	44510m	677.051	ng/mL	
33) Dibenzothiophene	31.664	184	36590	405.587	ng/mL#	90
34) 4-Methyldibenzothiophene(	33.455	198	30204	334.800	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.801	198	28445M3	315.302	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	12060	133.681	ng/mL#	100
37) OTP	33.862	198	2952M3	32.722	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	82564m	915.192	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	120674M5	1337.627	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	108700m	1204.900	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	66854M5	741.052	ng/mL	
43) Phenanthrene	32.160	178	470969	5131.283	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	81886	892.161	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	95630	1041.904	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	40603M3	442.376	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.584	192	107020M3	1166.000	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	65046	708.687	ng/mL	97
49) C1-Phenanthrenes/Anthrace	34.253	192	392699M5	4278.519	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	279873M5	3049.262	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52) C3-Phenanthrenes/Anthrace	38.273	220	137581M5	1498.967	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.456	234	51466M5	560.730	ng/mL	
55) Anthracene	32.341	178	119948M3	1511.944	ng/mL	
56) Carbazole	33.034	167	20911	256.110	ng/mL	96
57) 1-Methylphenanthrene	34.690	192	64679M3	923.675	ng/mL	
58) Fluoranthene	36.963	202	1450871	14313.839	ng/mL	98
59) Benzo(b)fluorene	39.493	216	125129M3	1852.600	ng/mL	
60) Pyrene	37.852	202	1449054	14065.033	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.252	216	805230m	7815.849	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	295580M5	2869.005	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	128694m	1249.150	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.506	258	102917M5	998.949	ng/mL	
66) Naphthobenzothiophene	41.721	234	114816	1129.936	ng/ml#	65
67) Naphthobenzothiophene-2,1	41.721	234	114816	1129.936	ng/mL#	65
68) Naphthobenzothiophene-1,2	42.052	234	23827	234.488	ng/mL#	16
69) Naphthobenzothiophene-2,3	42.353	234	30435M3	299.519	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	131020M5	1289.404	ng/ml	
71) C2-Naphthobenzothiophenes	44.642	262	96334M5	948.049	ng/ml	
72) C3-Naphthobenzothiophenes	46.750	276	62981M5	619.813	ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	45962M5	452.325	ng/mL	
75) Benz[a]anthracene	42.654	228	739959M3	6741.843	ng/mL	
77) Chrysene/Triphenylene	42.820	228	742113	6567.602	ng/mL	98
78) C1-Chrysenes	44.296	242	341795M5	3024.840	ng/mL	
79) C2-Chrysenes	46.027	256	167002M5	1477.946	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2221	19.656	ng/mL	100
81) C3-Chrysenes	47.594	270	118776M5	1051.152	ng/mL	
82) C4-Chrysenes	48.542	284	54107M5	478.840	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	822395	6446.443	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.795	252	678125	5166.631	ng/mL	95
86) Benzo[a]fluoranthene	47.097	252	186325M3	1419.609	ng/mL	
87) Benzo[e]pyrene	47.699	252	592626	4757.522	ng/mL	92
89) Benzo[a]pyrene	47.880	252	887517	7446.025	ng/mL	92
90) Perylene	48.181	252	230269	1826.954	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.548	276	680226M3	4849.211	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	189752M3	1270.406	ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	685283	4530.747	ng/mL	100
94) Hopane (T19)	51.645	191	30647M3	724.520	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8069M3	190.758	ng/ml	
97) C24 Tricyclic Terpane (T5	41.089	191	4976	117.637	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	5230	123.641	ng/ml	100
99) C24 Tetracyclic Terpane (	43.889	191	2187M3	51.702	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2203M3	52.081	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	1766M3	41.750	ng/ml	
102) C28 Tricyclic Terpane-22S	46.042	191	2224M3	52.577	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2270M3	53.665	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	2505	59.220	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.916	191	2557	60.450	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	47.985	191	3913	92.507	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2473M3	58.464	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	2946	69.646	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	7937M3	187.637	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.672	191	4216	99.670	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.491	191	2844M3	67.234	ng/ml	
112) 30-Norhopane (T15)	50.320	191	23326	551.446	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.410	191	4248	100.426	ng/ml	100
114) 17a(H)-Diahopane (X)	50.545	191	1694	40.048	ng/ml	100
115) 30-Normoretane (T17)	51.073	191	2820	66.667	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	1143M3	27.021	ng/ml	
117) Moretane (T20)	52.307	191	3514M3	83.074	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	14963	353.738	ng/ml	100
119) 30-Homohopane-22R (T22)	53.602	191	10986	259.718	ng/ml	100

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120) Gammacerane/C32-diahopane	54.114	191	4993	118.039	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.837	191G	18466	436.551	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	6782	160.332	ng/ml	100
123) 30,31-Trishomohopane-22S	56.930	191	8614M3	203.642	ng/ml	
124) 30,31-Trishomohopane-22R	57.518	191	4132	97.684	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	5807M3	137.282	ng/ml	
126) Tetrakishomohopane-22R (T	60.288	191	3217M3	76.053	ng/ml	
127) Pentakishomohopane-22S (T	62.472	191	5753	136.006	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	3897	92.128	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2235M3	100.613	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1209	54.425	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1195M3	53.795	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4065	182.993	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4565M3	205.502	ng/ml	
135) Unknown Sterane (S18)	47.639	217	958	43.126	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	367	16.521	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	1871	84.226	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	1664M3	74.908	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.070	217	3307M3	148.871	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3463M3	155.893	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2766M3	124.517	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	2639M3	118.799	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2640	118.844	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	3813M3	171.649	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.310	218	5907M3	265.914	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3186M3	143.424	ng/ml	
147) C26,20R- +C27,20S- triaro	49.024	231	10732	483.121	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	9397M3	423.023	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	7064	317.999	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	7748M3	348.790	ng/mL	

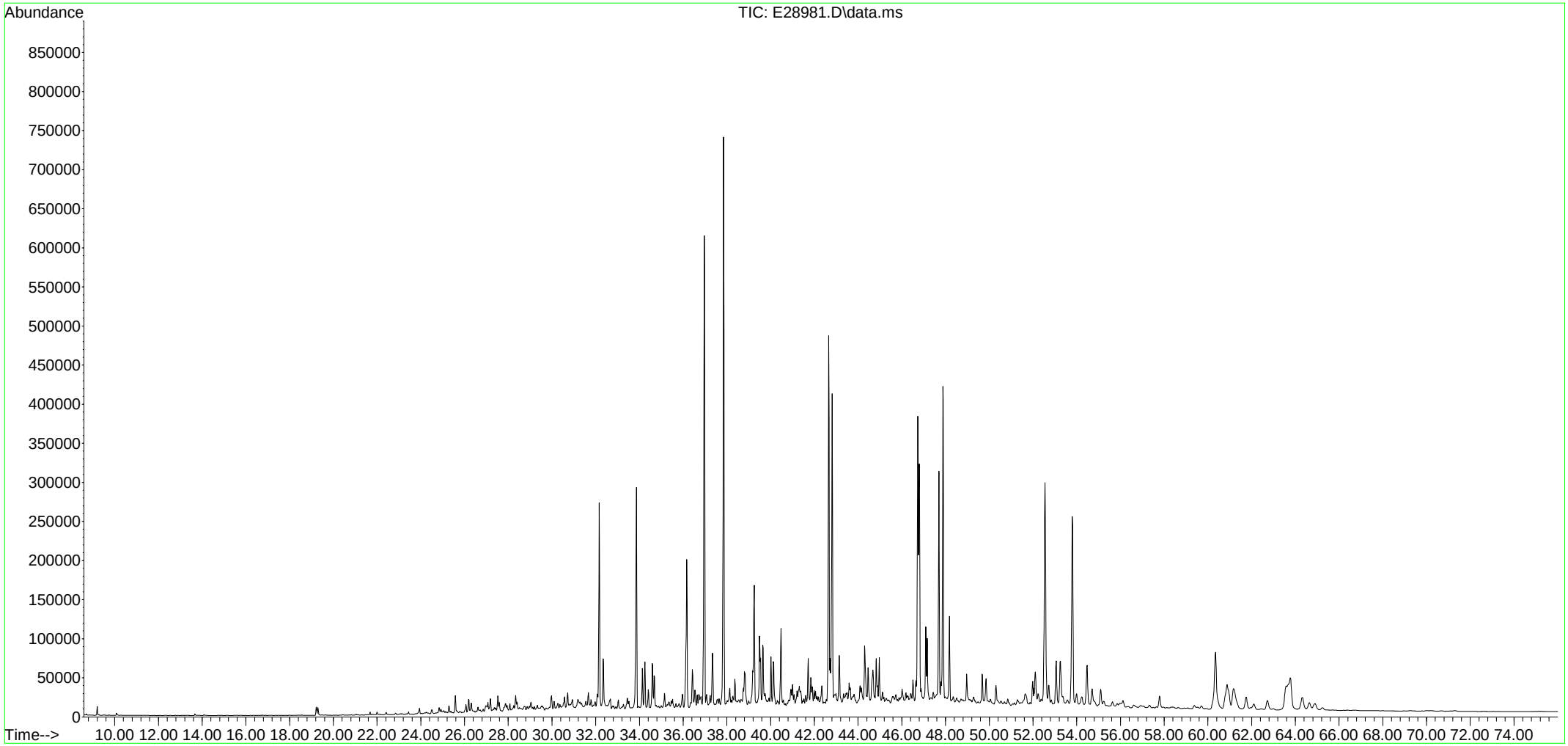
(#) = qualifier out of range (m) = manual integration (+) = signals summed

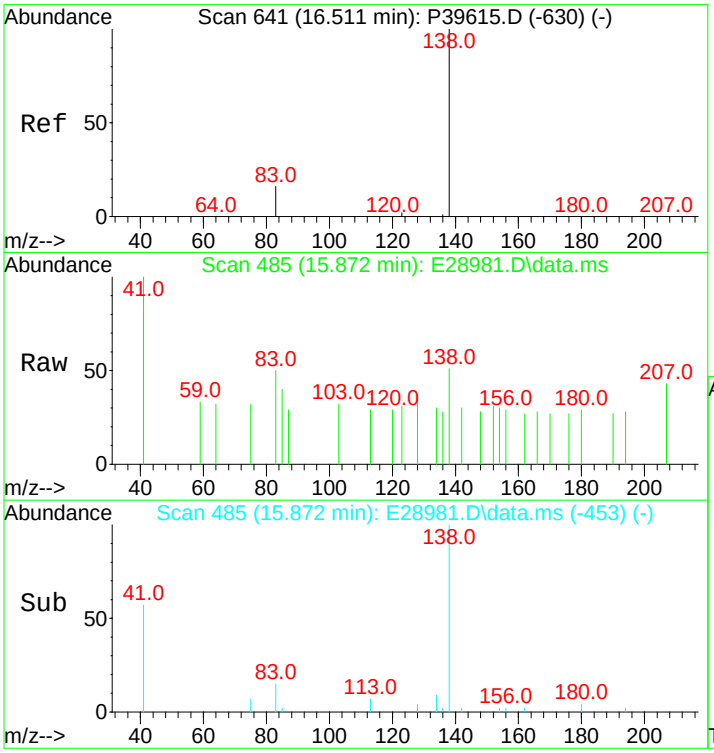
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28981.D
Acq On : 15 Nov 2012 6:17 am
Operator : AC
Sample : 1210081-02
Misc : 1X
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 16 13:32:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

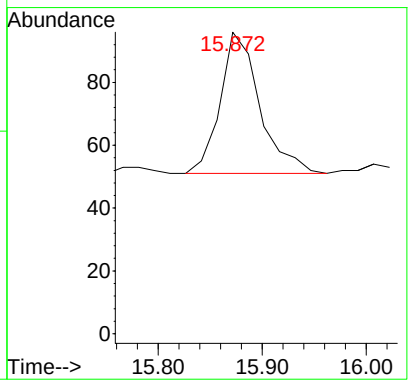
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

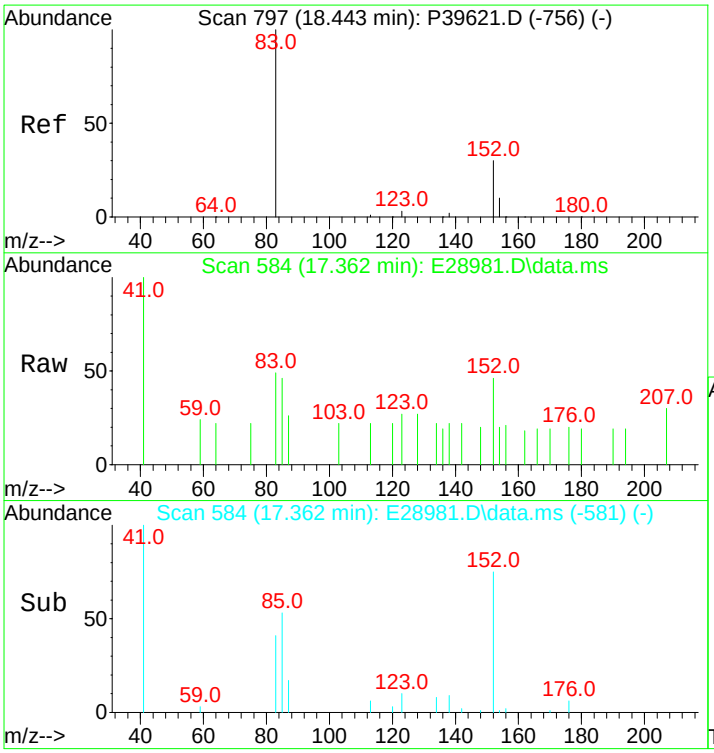




#3
trans-Decalin
Concen: 6.37 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

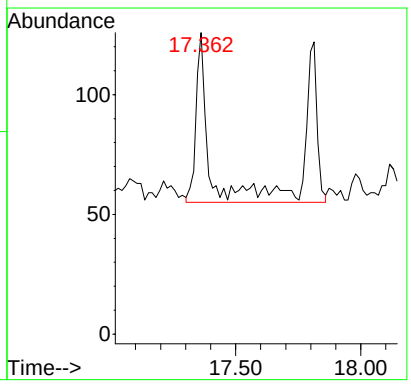
Tgt Ion:138 Resp: 119

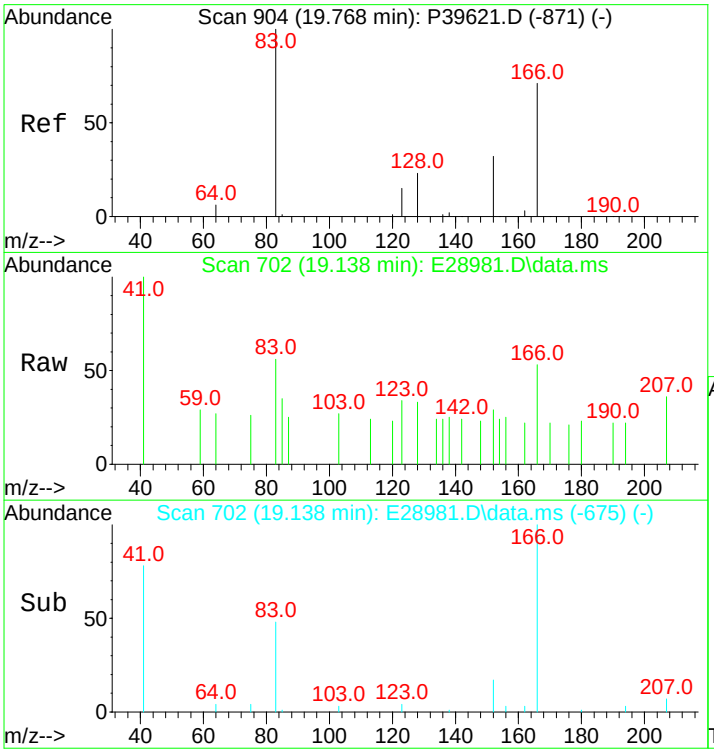




#5
C1-Decalins
Concen: 24.74 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

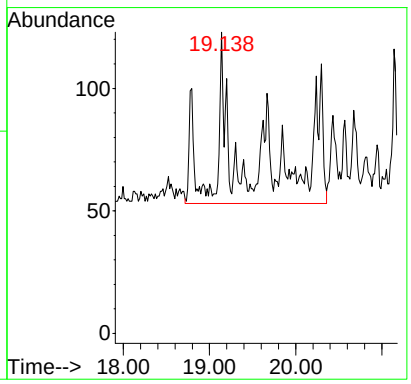
Tgt Ion:152 Resp: 462

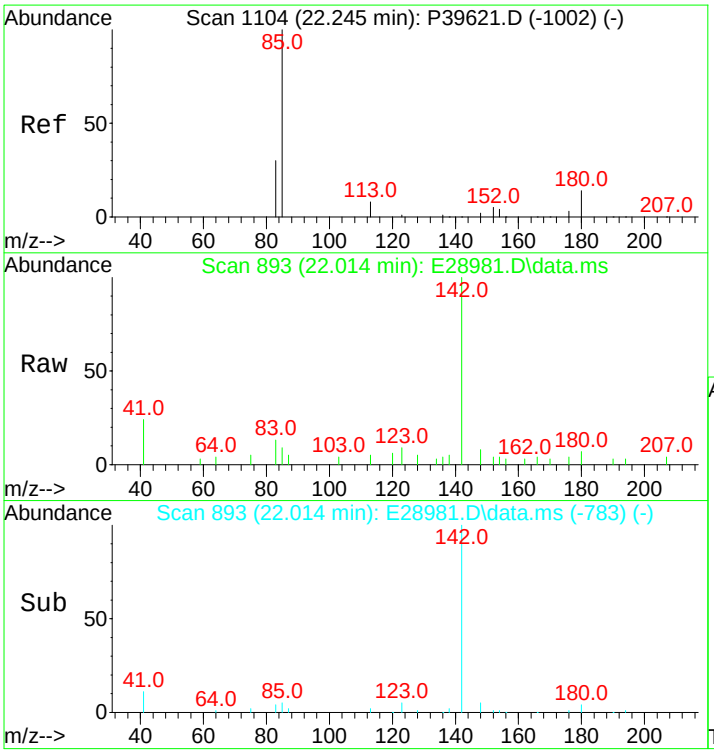




#6
C2-Decalins
Concen: 86.25 ng/mL m
RT: 19.138 min Scan# 702
Delta R.T. -0.204 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

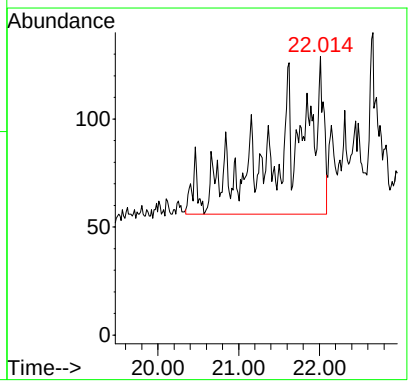
Tgt Ion:166 Resp: 1611

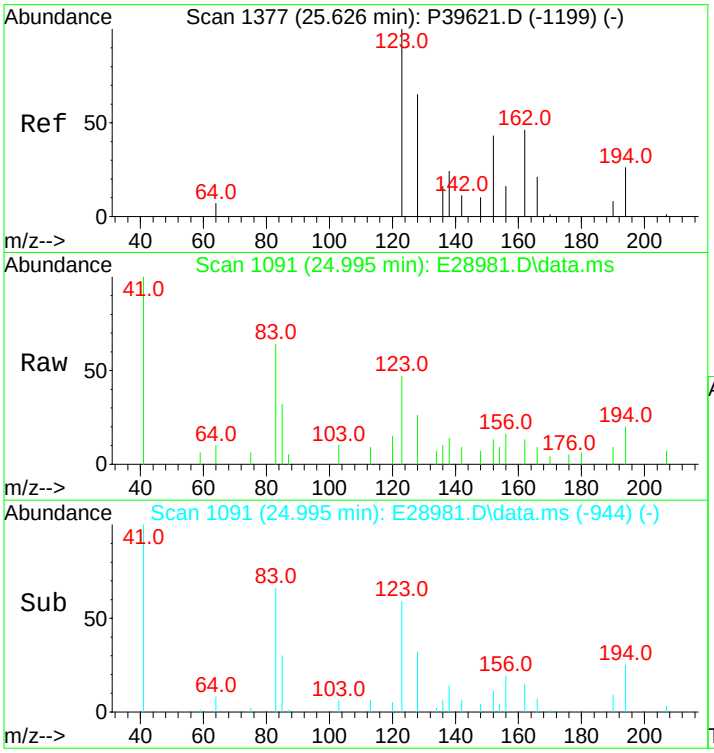




#7
C3-Decalins
Concen: 136.47 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. 0.269 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

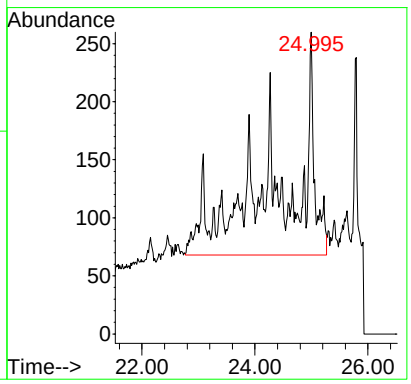
Tgt Ion:180 Resp: 2549

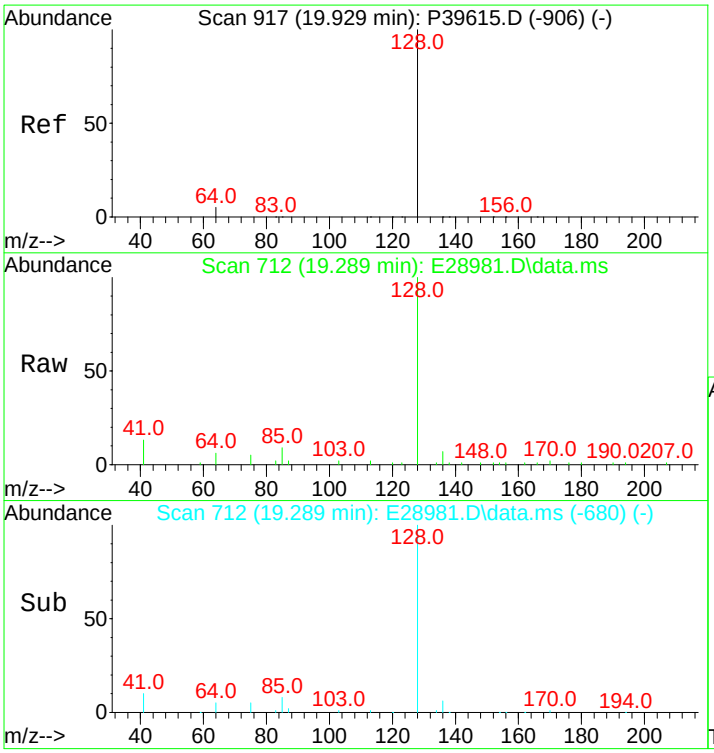




#8
C4-Decalins
Concen: 352.77 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:194 Resp: 6589

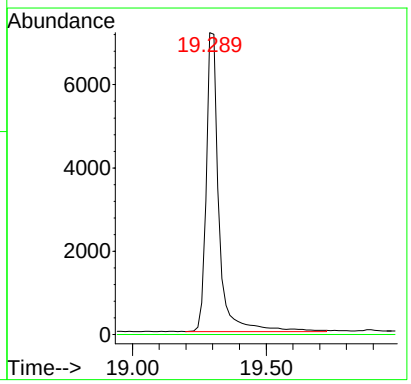


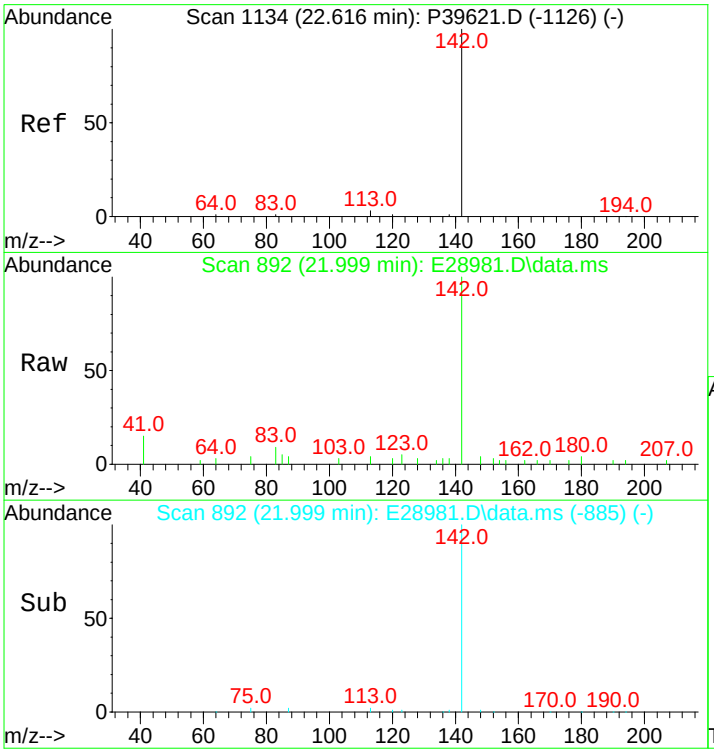


#10
Naphthalene
Concen: 258.01 ng/mL
RT: 19.289 min Scan# 712
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:128 Resp: 23698

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

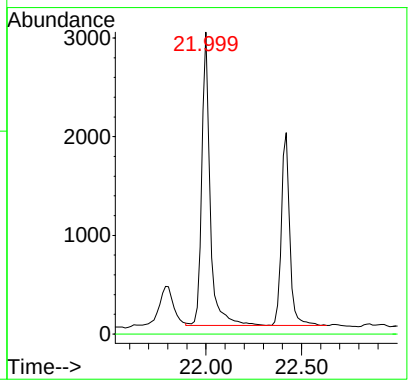


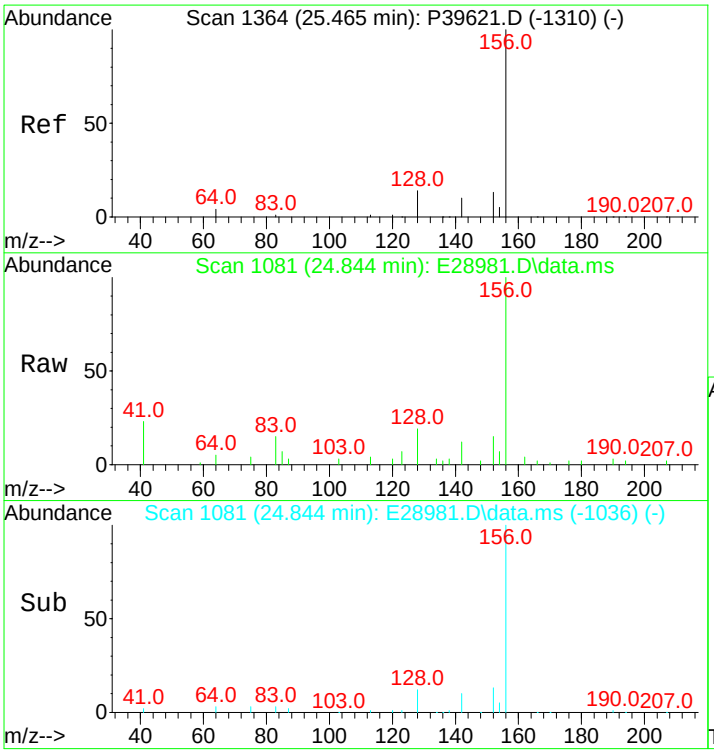


#11
C1-Naphthalenes
Concen: 162.30 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:142 Resp: 14907

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

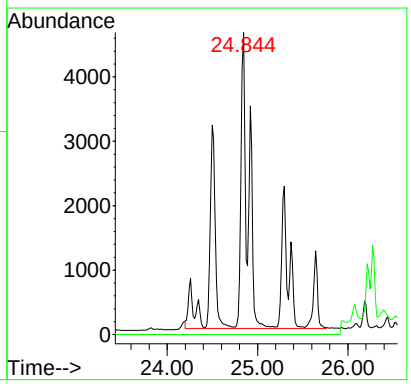


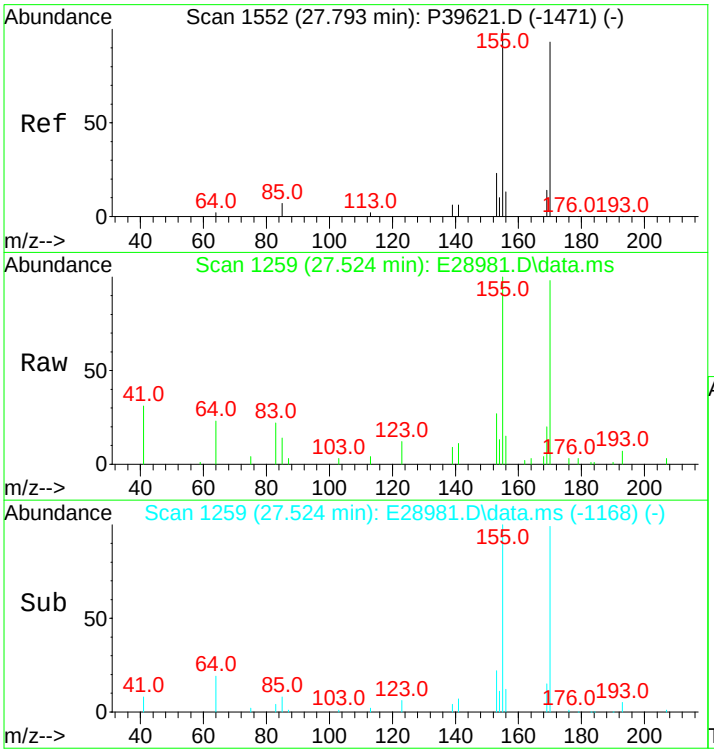


#12
C2-Naphthalenes
Concen: 600.32 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:156 Resp: 55138

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

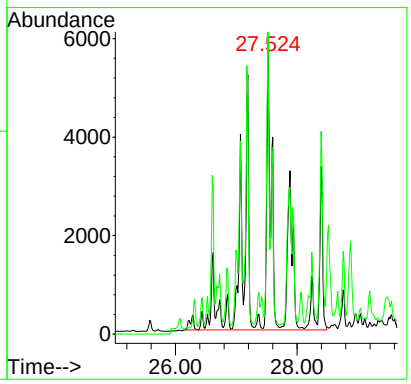


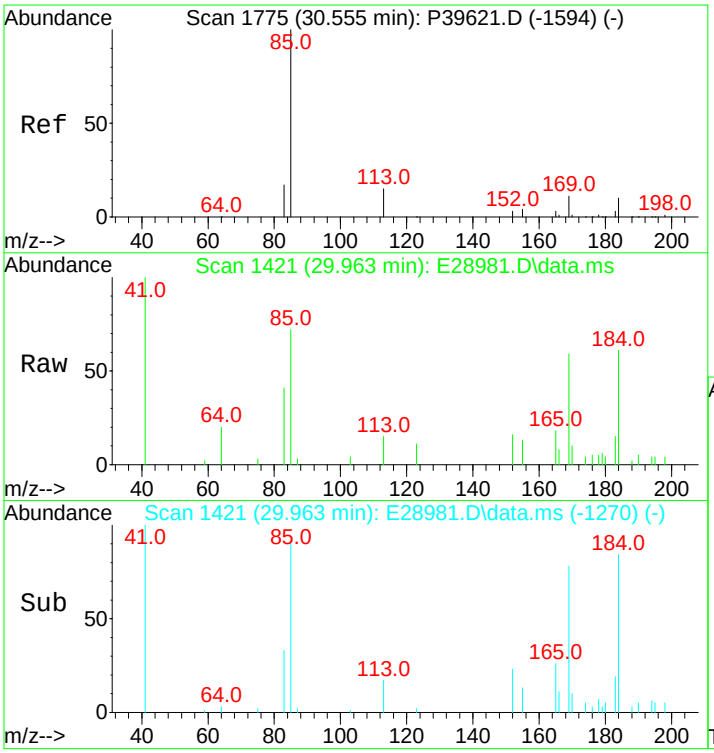


#13
C3-Naphthalenes
Concen: 1122.07 ng/mL m
RT: 27.524 min Scan# 1259
Delta R.T. 0.344 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:170 Resp: 103060

Ion	Ratio	Lower	Upper
170	100		
155	14.8	66.8	100.2#

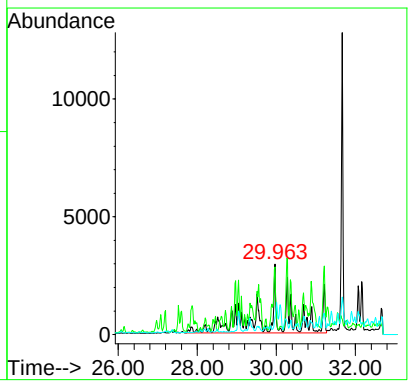


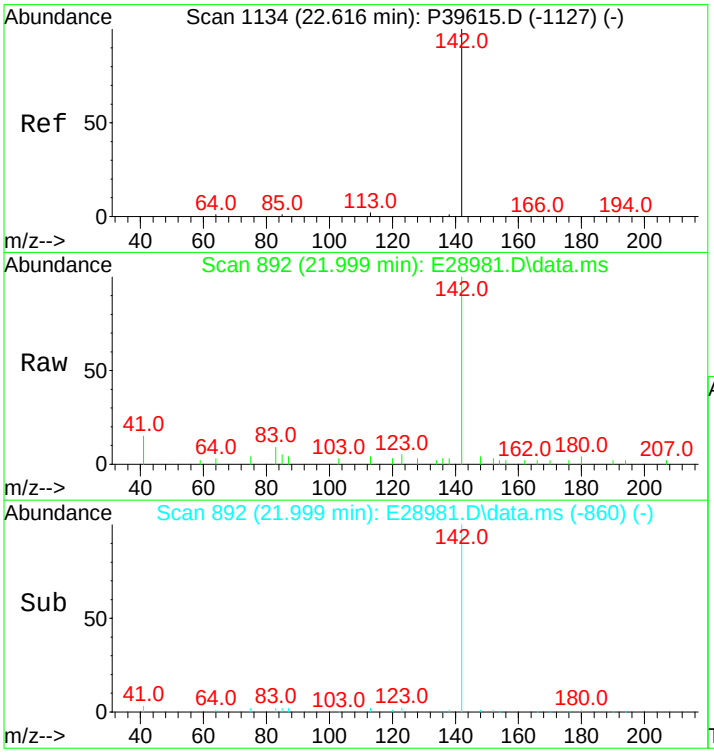


#14
C4-Naphthalenes
Concen: 961.36 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:184 Resp: 88299

Ion	Ratio	Lower	Upper
184	100		
169	4.9	78.7	118.1#
183	1.3	26.7	40.1#

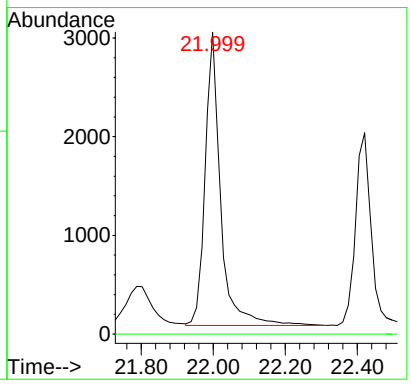


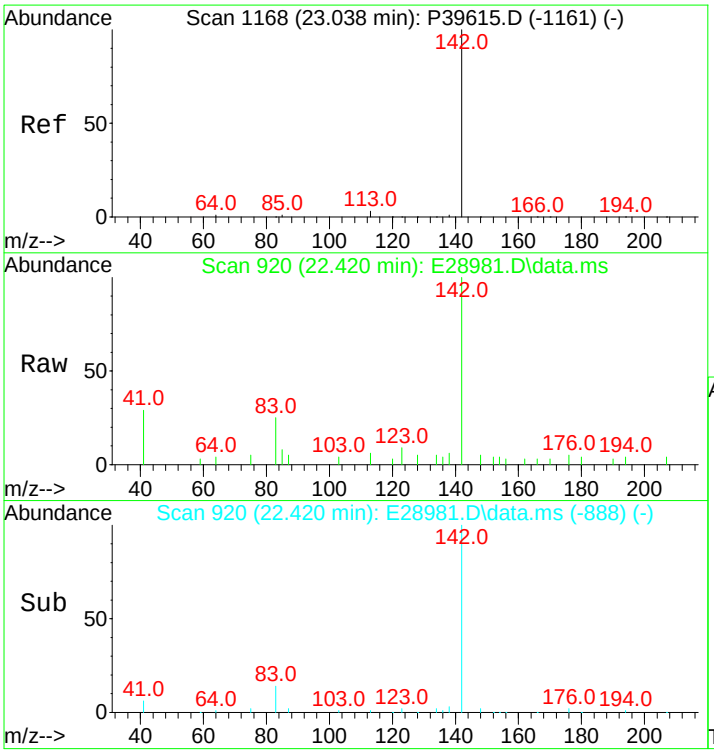


#16
2-Methylnaphthalene
Concen: 152.98 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:142 Resp: 8949

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

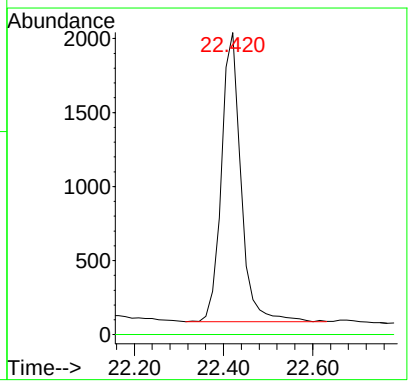


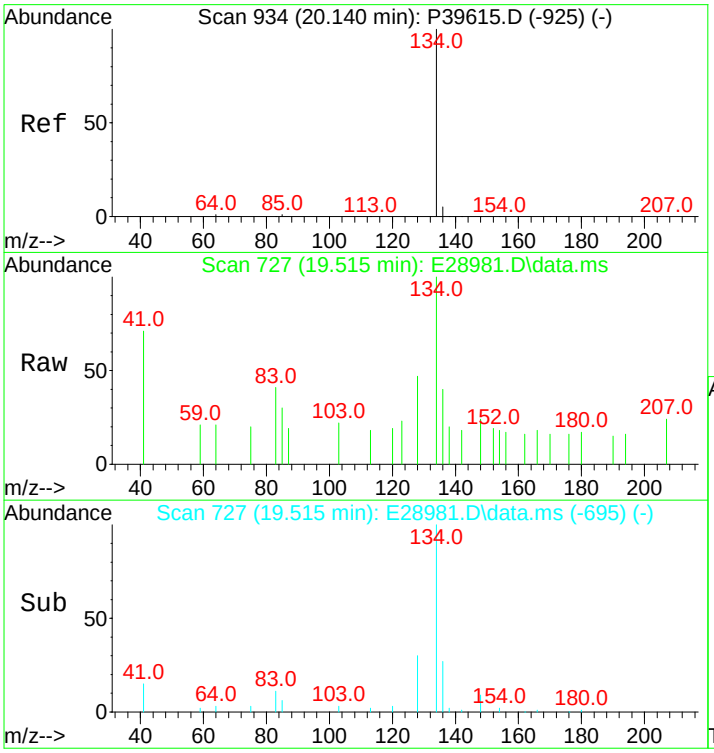


#17
1-Methylnaphthalene
Concen: 104.22 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:142 Resp: 5924

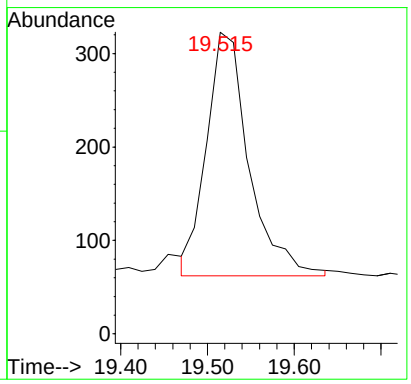
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

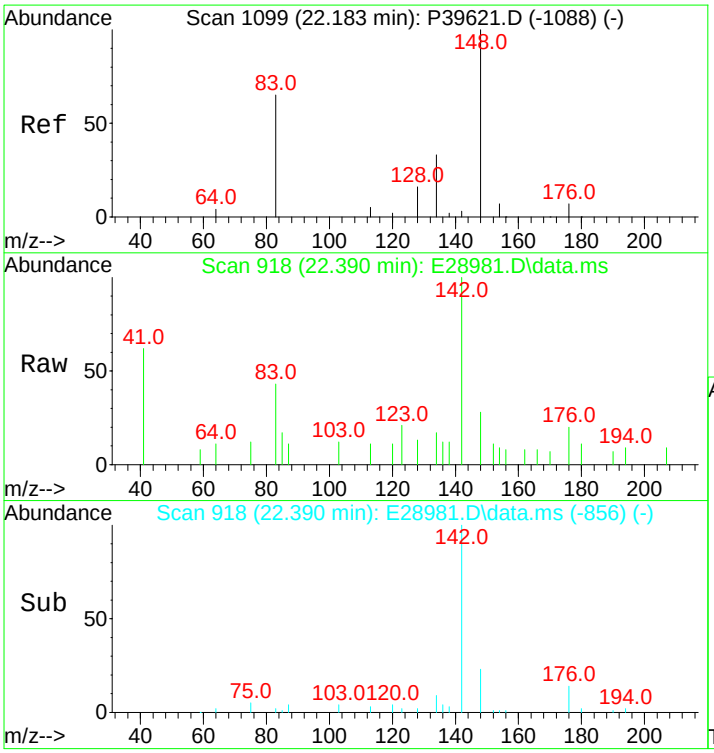




#18
Benzothiophene
Concen: 11.71 ng/mL m
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

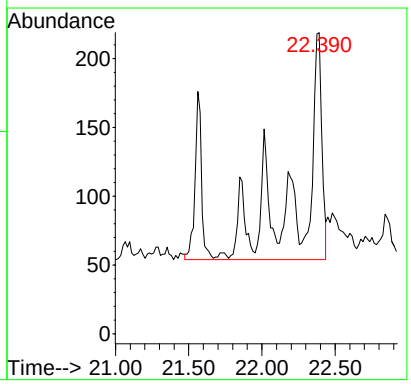
Tgt Ion:134 Resp: 889

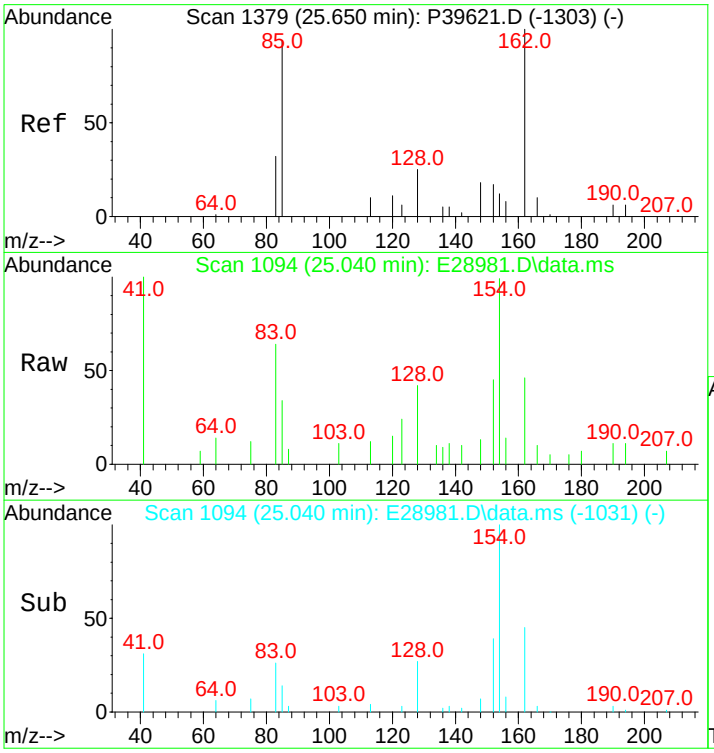




#19
C1-Benzo(b)thiophenes
Concen: 26.12 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.689 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

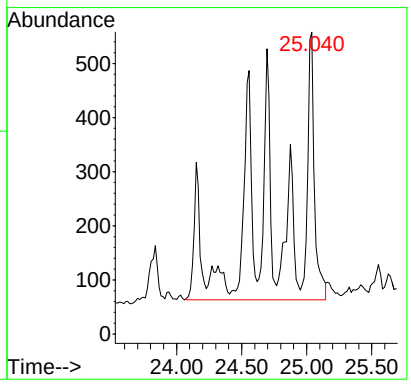
Tgt Ion:148 Resp: 1983

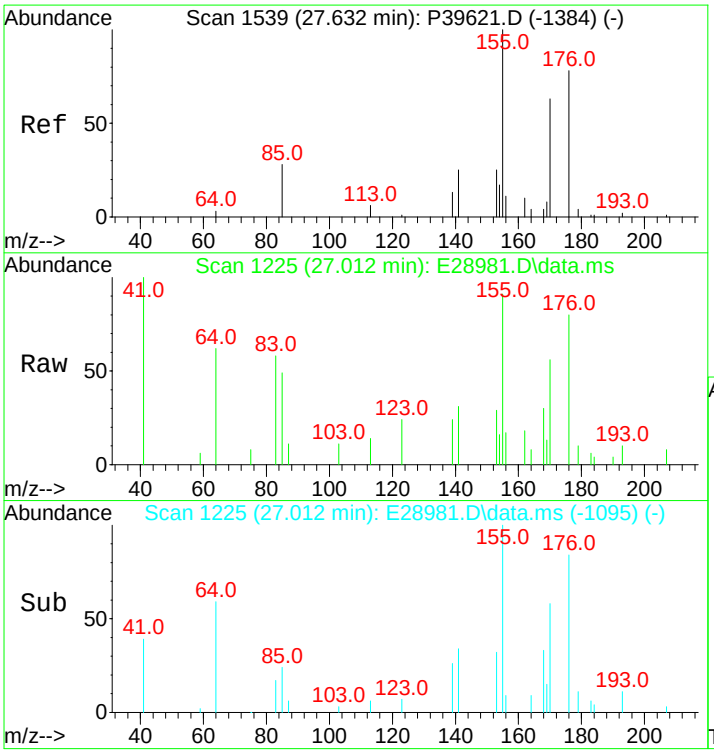




#20
C2-Benzo(b)thiophenes
Concen: 96.31 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

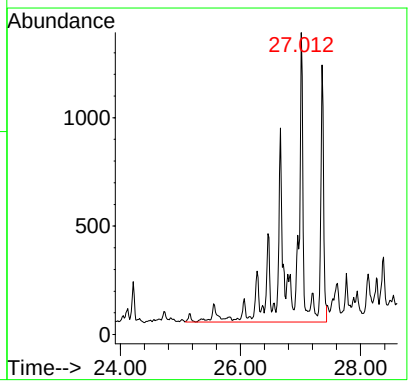
Tgt Ion:162 Resp: 7313

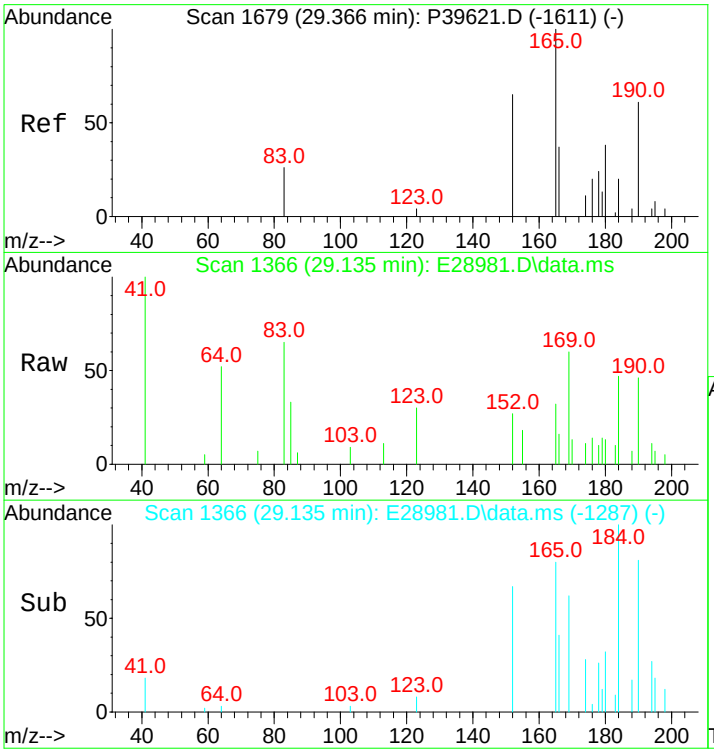




#21
C3-Benzo(b)thiophenes
Concen: 240.37 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. -0.007 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

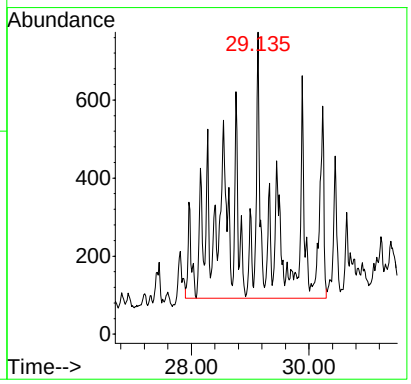
Tgt Ion:176 Resp: 18251

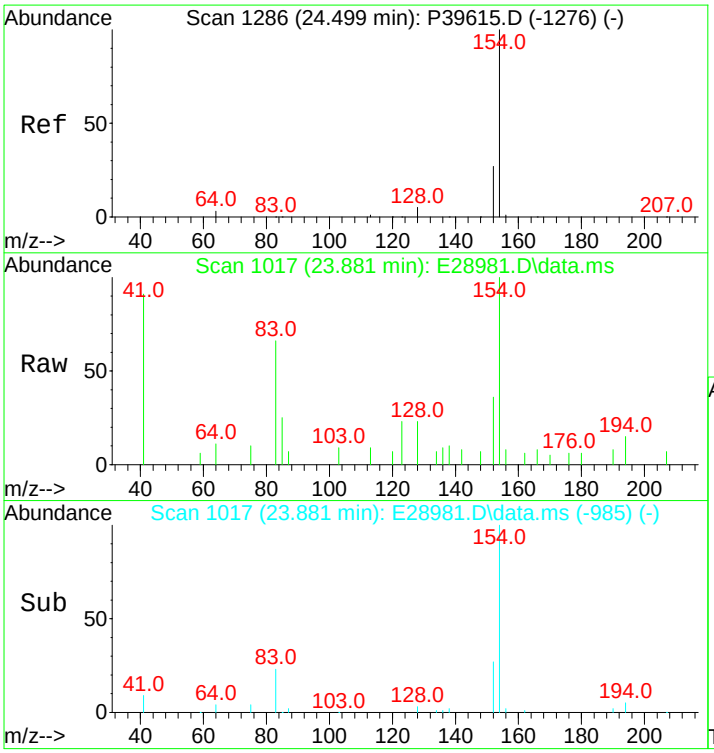




#22
C4-Benzo(b)thiophenes
Concen: 289.93 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:190 Resp: 22014

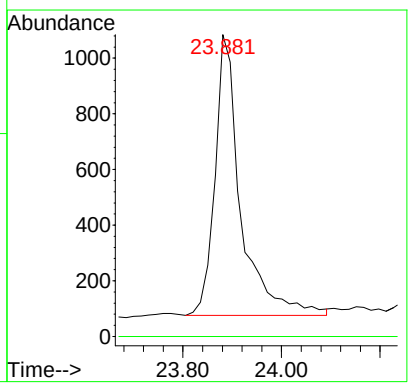


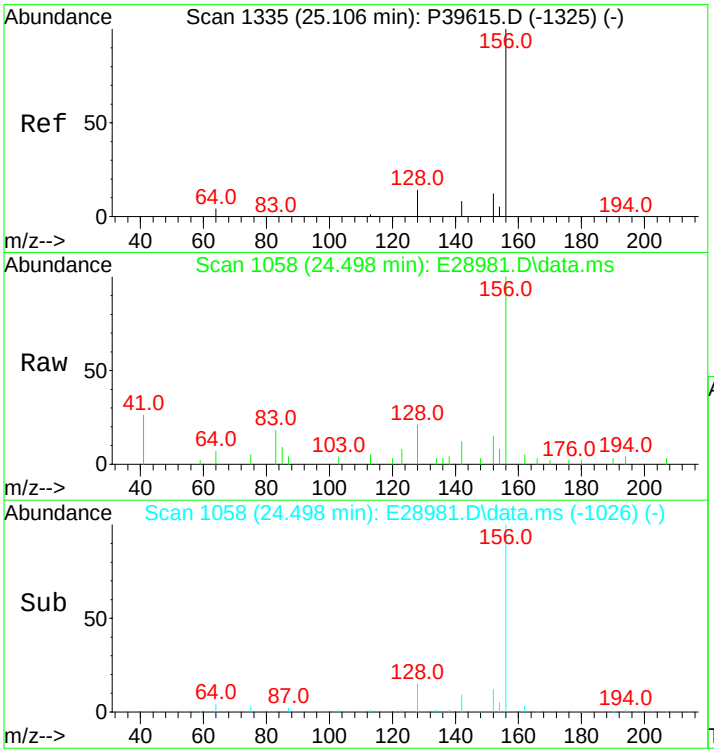


#23
Biphenyl
Concen: 49.63 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:154 Resp: 3669

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

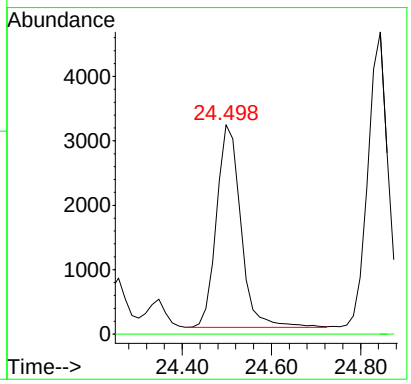


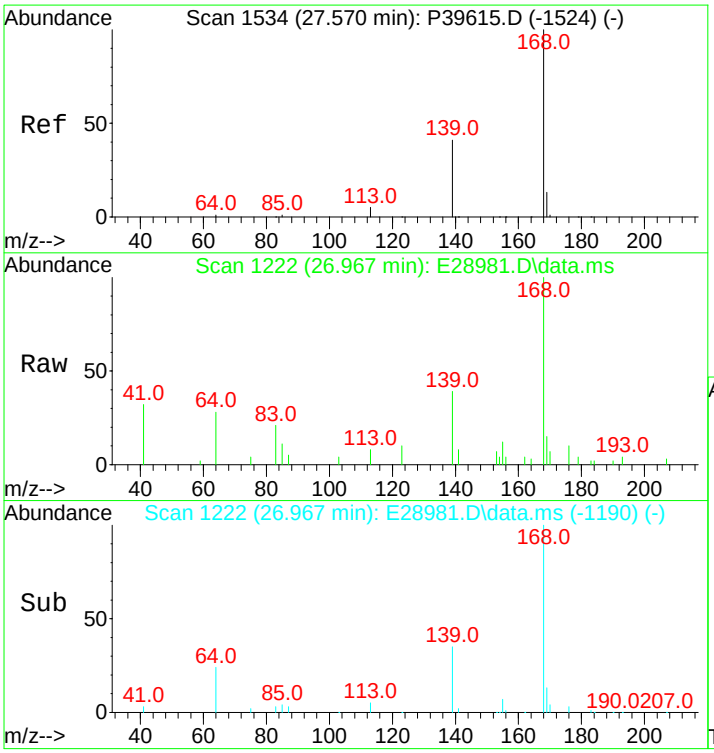


#24
2,6-Dimethylnaphthalene
Concen: 225.93 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:156 Resp: 11913

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

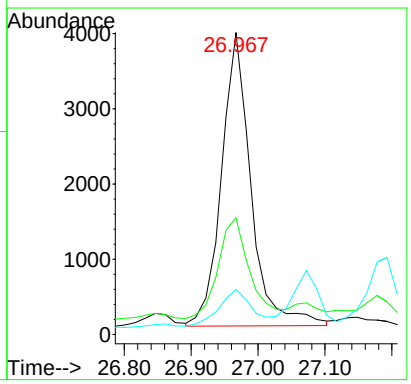


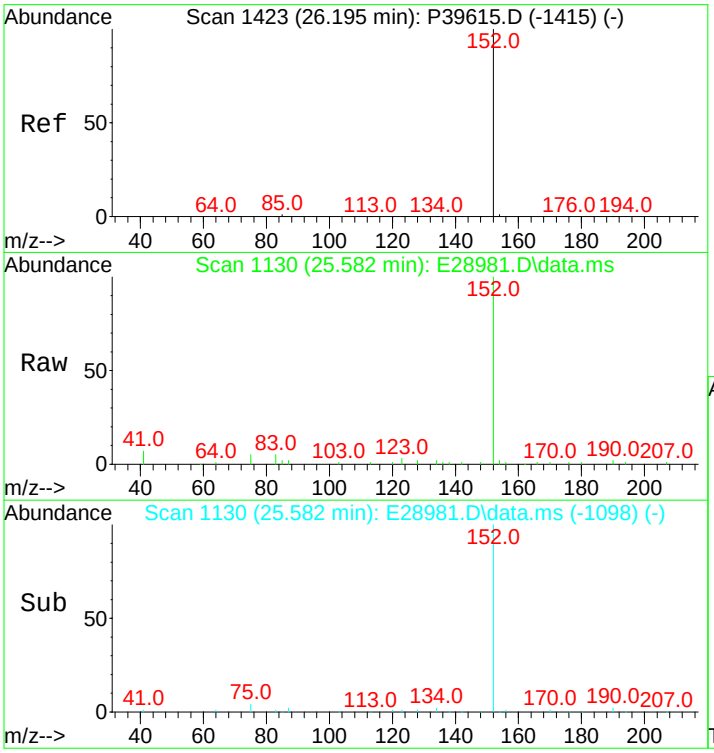


#25
Dibenzofuran
Concen: 146.00 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:168 Resp: 11950

Ion	Ratio	Lower	Upper
168	100		
139	37.1	26.0	39.0
169	14.6	10.6	16.0

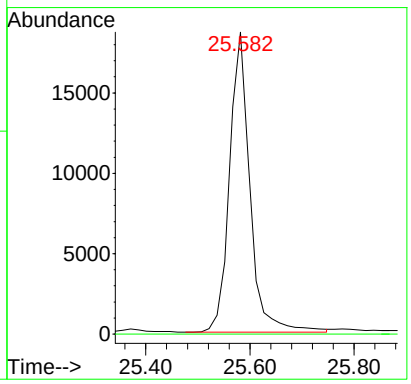


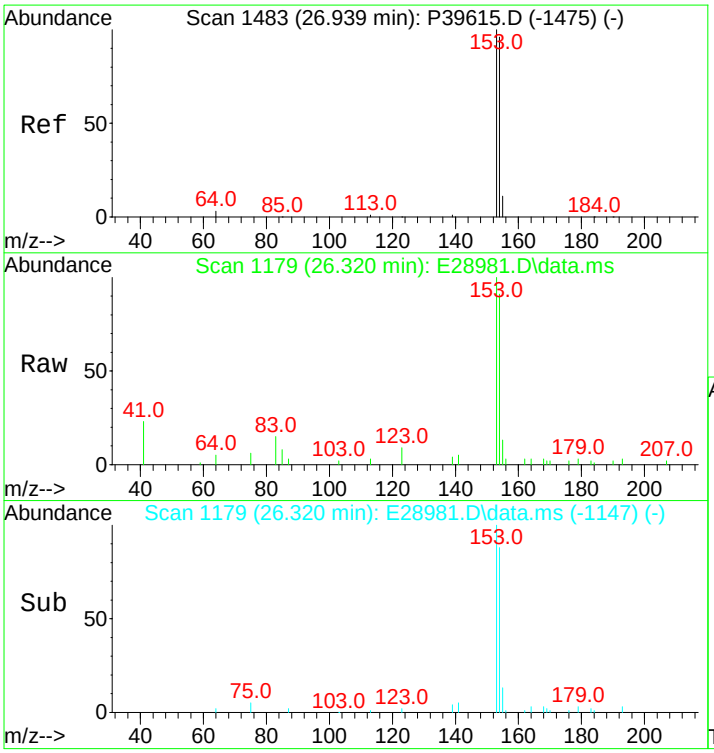


#26
Acenaphthylene
Concen: 554.49 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:152 Resp: 50776

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

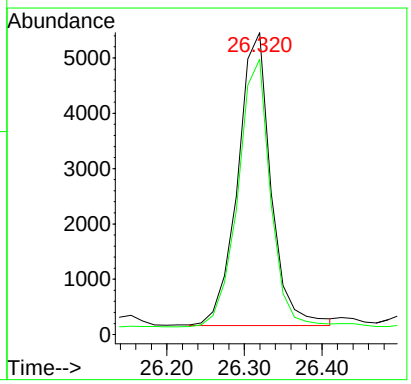


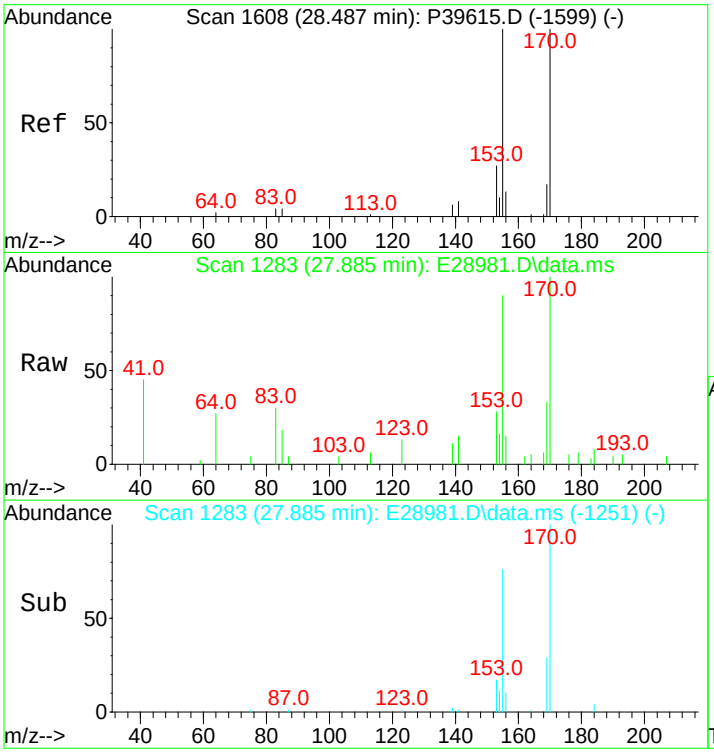


#27
Acenaphthene
Concen: 268.12 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:153 Resp: 15804

Ion	Ratio	Lower	Upper
153	100		
154	90.2	74.1	111.1

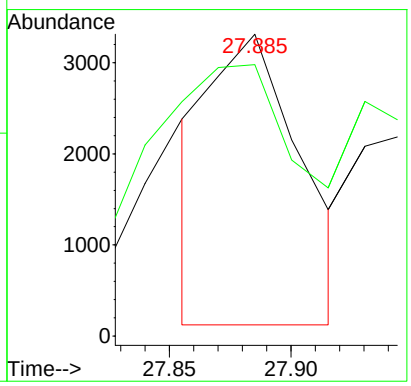


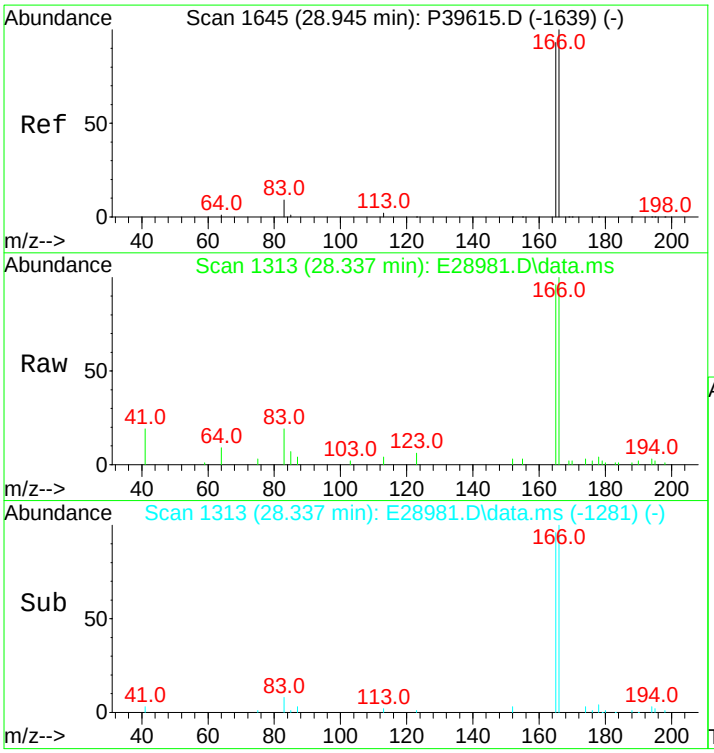


#28
2,3,5-Trimethylnaphthalene
Concen: 168.51 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:170 Resp: 8313

Ion	Ratio	Lower	Upper
170	100		
155	157.7	70.7	106.1#

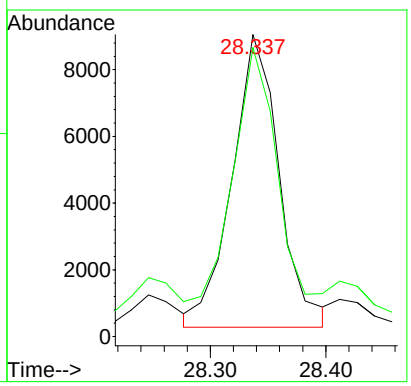


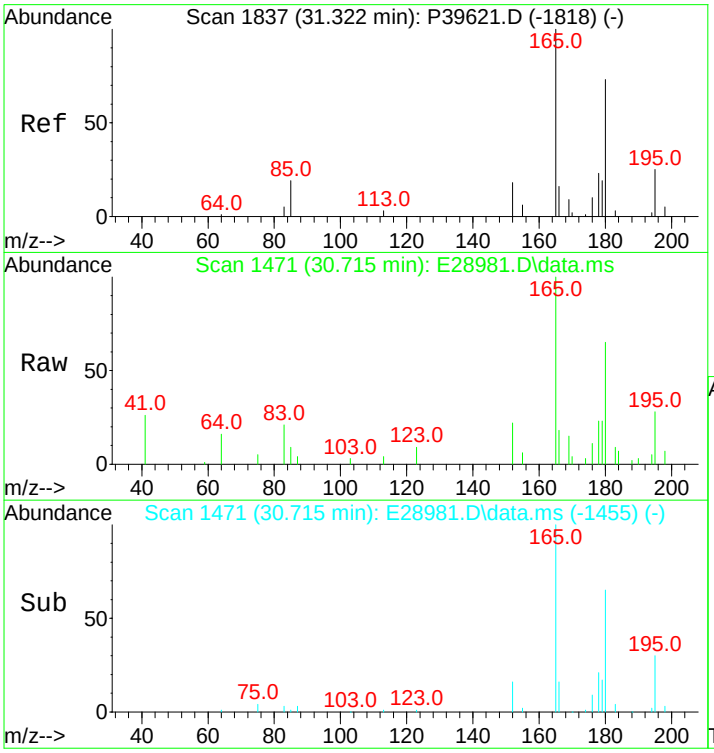


#29
Fluorene
Concen: 377.68 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:166 Resp: 24829

Ion	Ratio	Lower	Upper
166	100		
165	3.5	74.7	112.1#

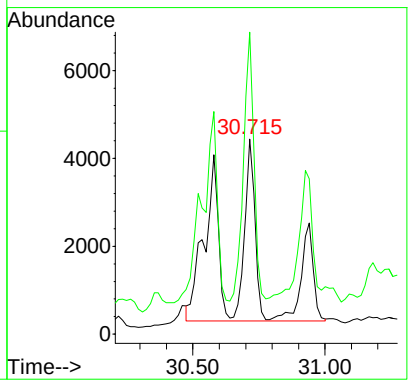


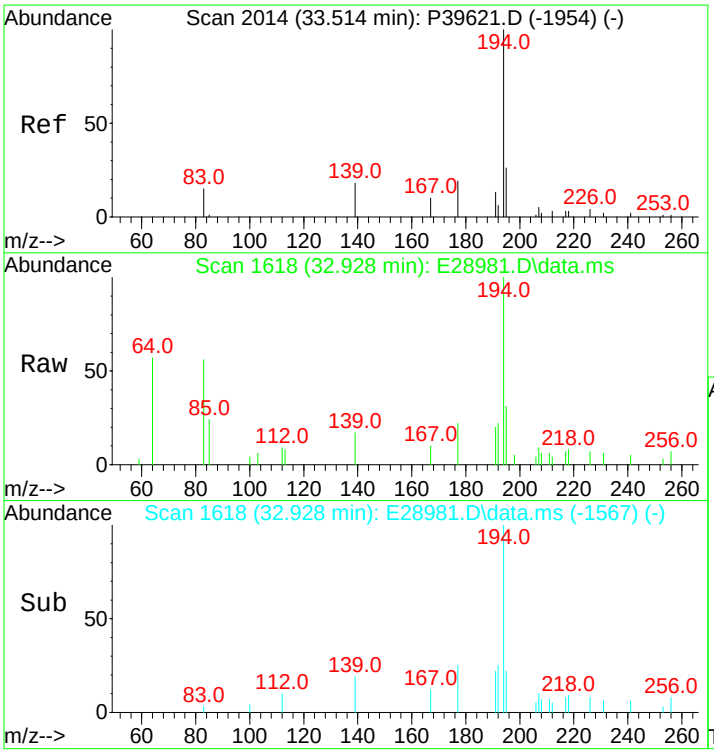


#30
C1-Fluorenes
Concen: 499.16 ng/mL m
RT: 30.715 min Scan# 1471
Delta R.T. 0.093 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:180 Resp: 32815

Ion	Ratio	Lower	Upper
180	100		
165	49.9	94.3	141.5#

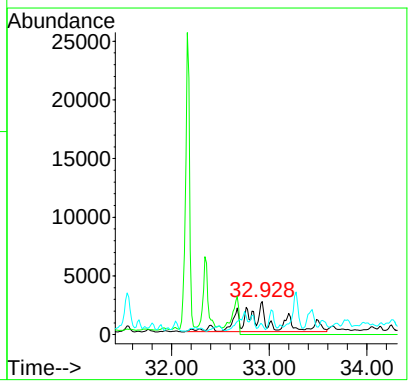


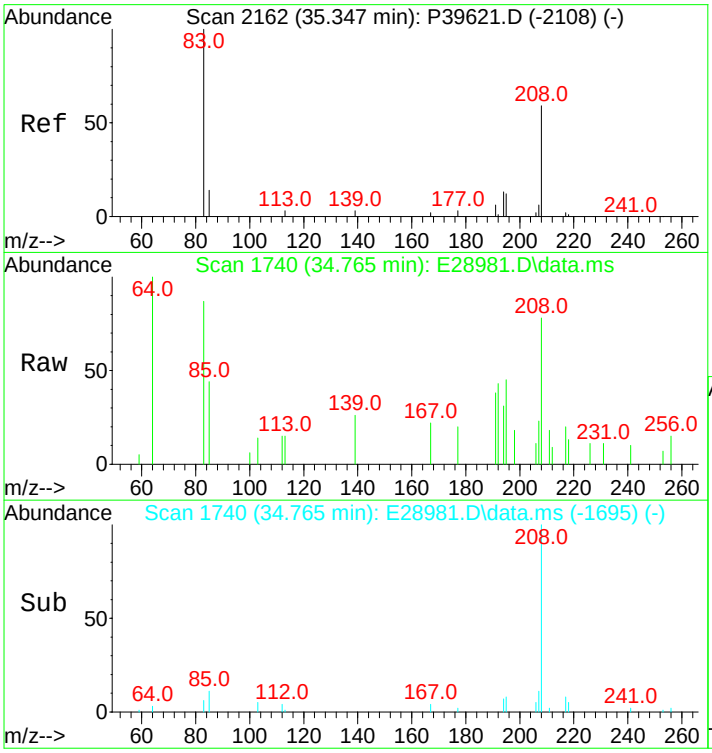


#31
C2-Fluorenes
Concen: 777.96 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.166 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:194 Resp: 51144

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	19.6	27.0	40.4#

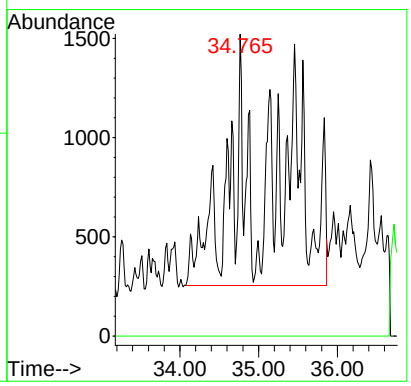


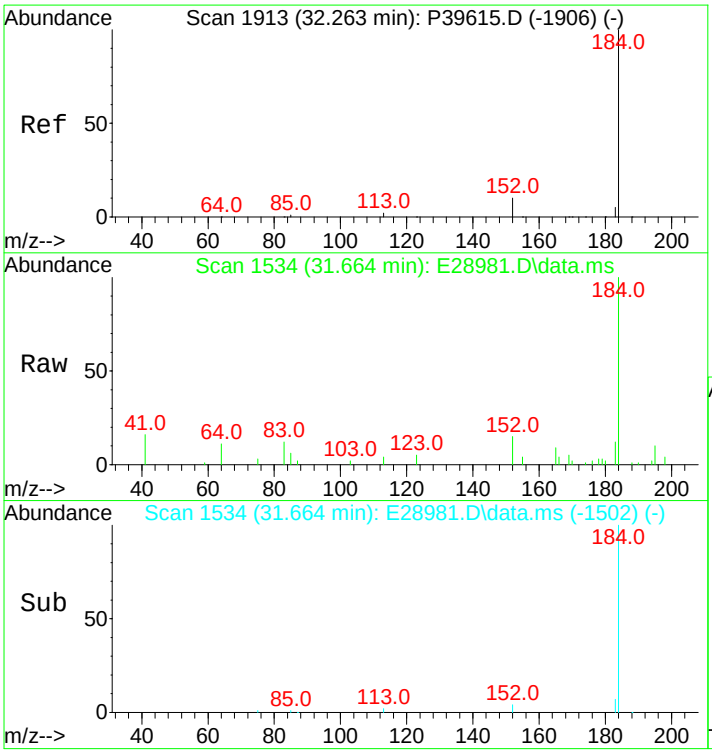


#32
C3-Fluorenes
Concen: 677.05 ng/mL m
RT: 34.765 min Scan# 1740
Delta R.T. 0.216 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:208 Resp: 44510

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

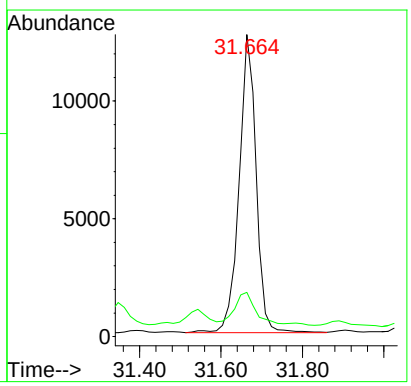


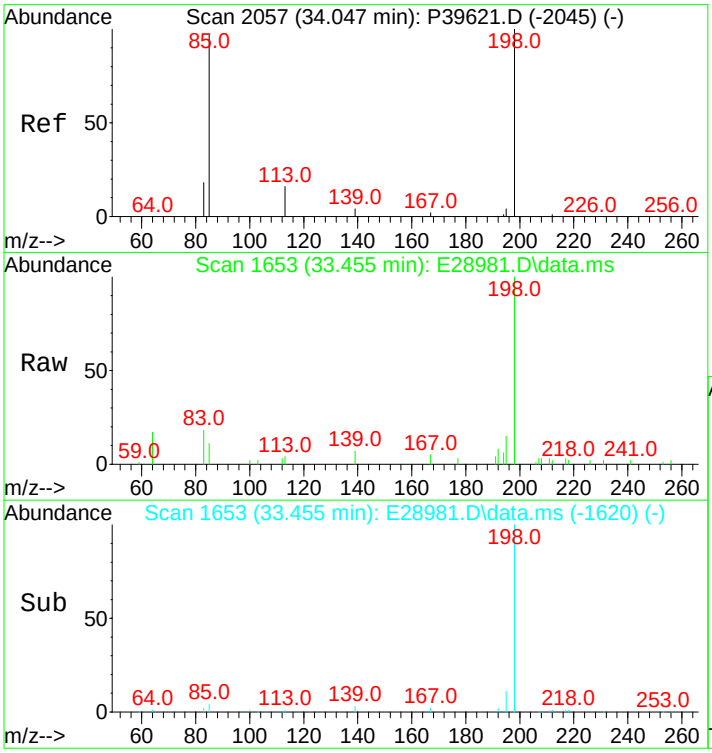


#33
Dibenzothiophene
Concen: 405.59 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:184 Resp: 36590

Ion	Ratio	Lower	Upper
184	100		
152	12.5	7.0	10.6#

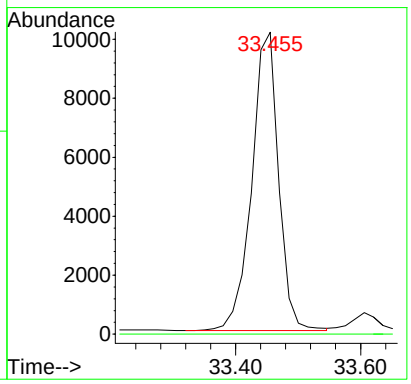


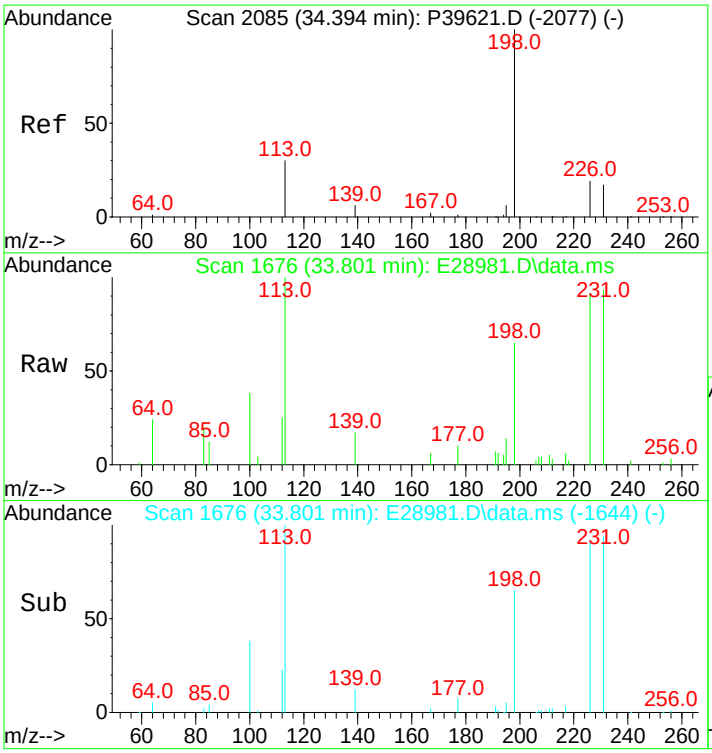


#34
4-Methyldibenzothiophene(4MDT)
Concen: 334.80 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:198 Resp: 30204

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

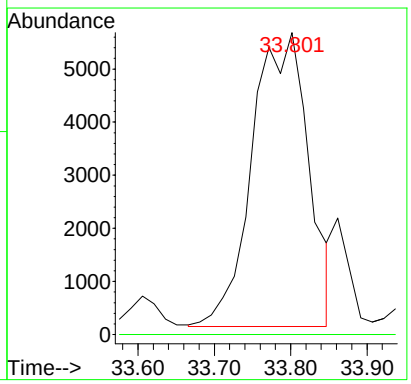


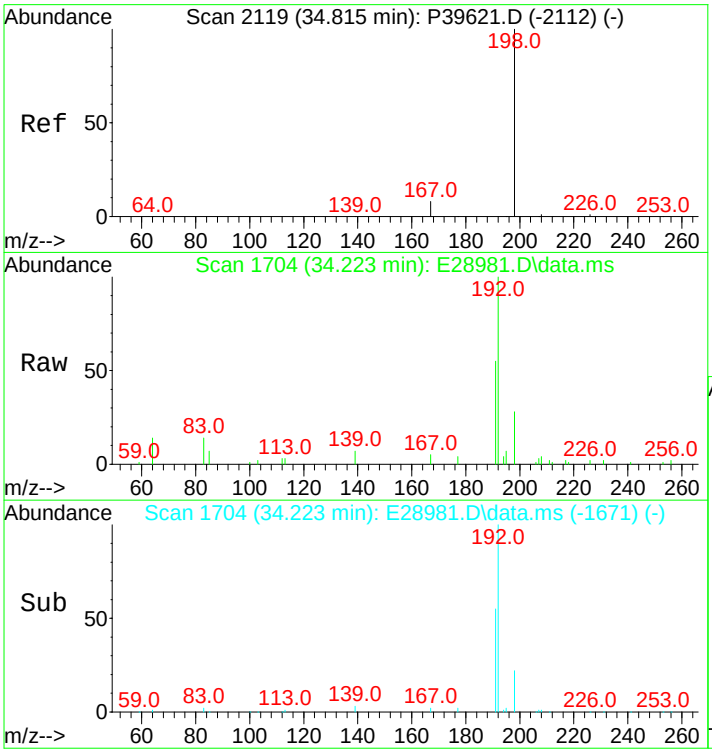


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 315.30 ng/mL m
RT: 33.801 min Scan# 1676
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:198 Resp: 28445

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

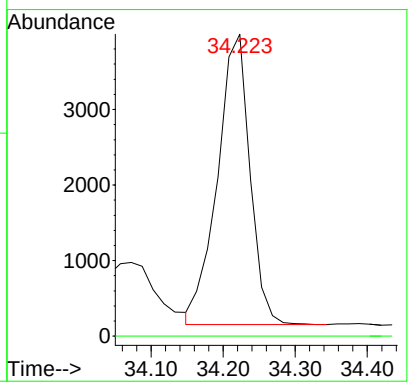


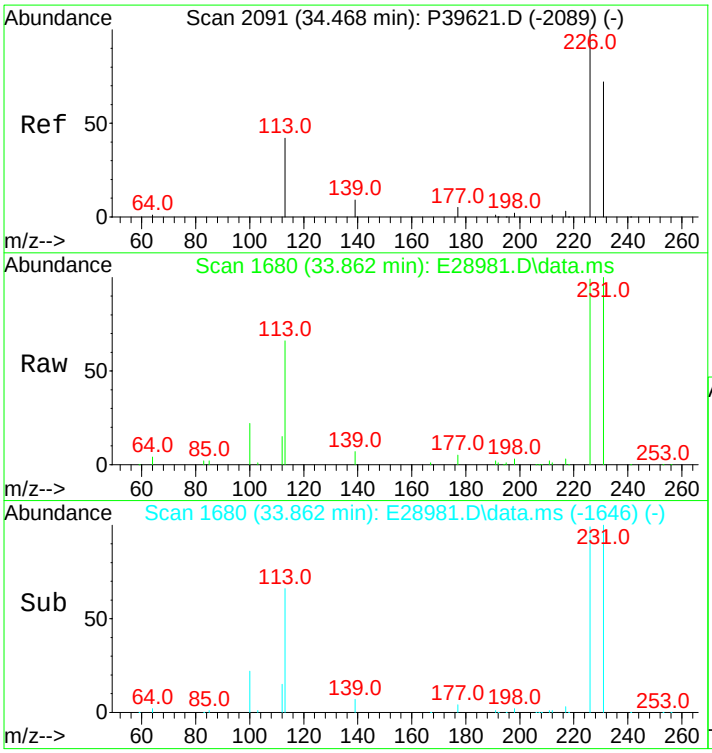


#36
1-Methyldibenzothiophene(1MDT)
Concen: 133.68 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:198 Resp: 12060

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

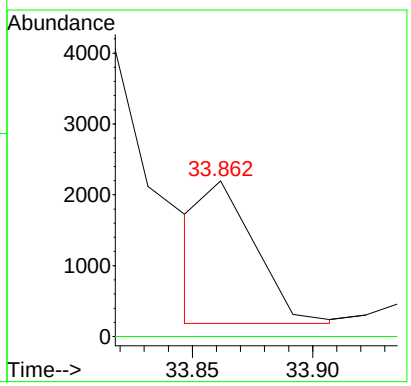


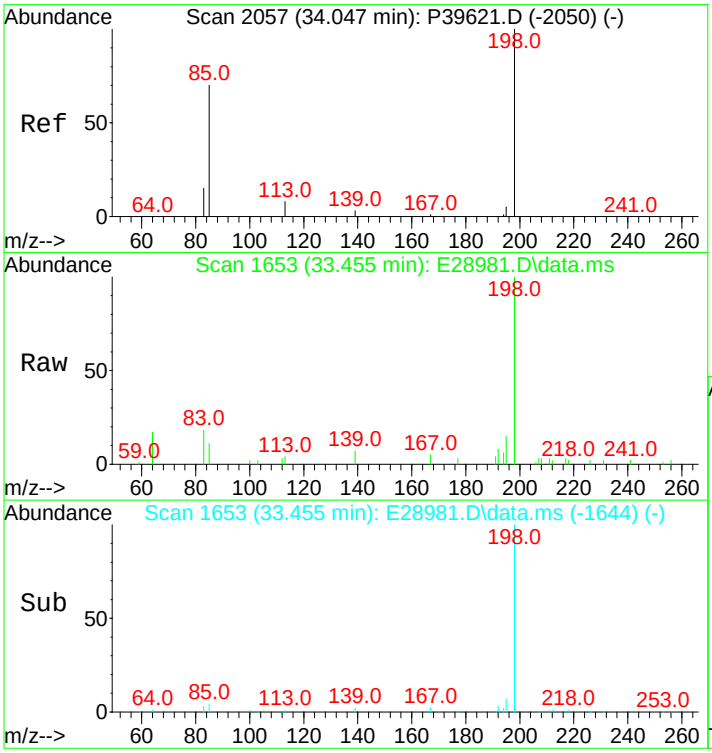


#37
OTP
Concen: 32.72 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:198 Resp: 2952

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

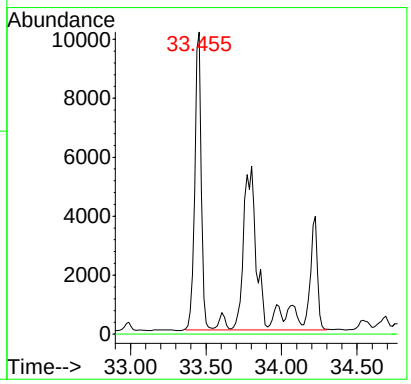


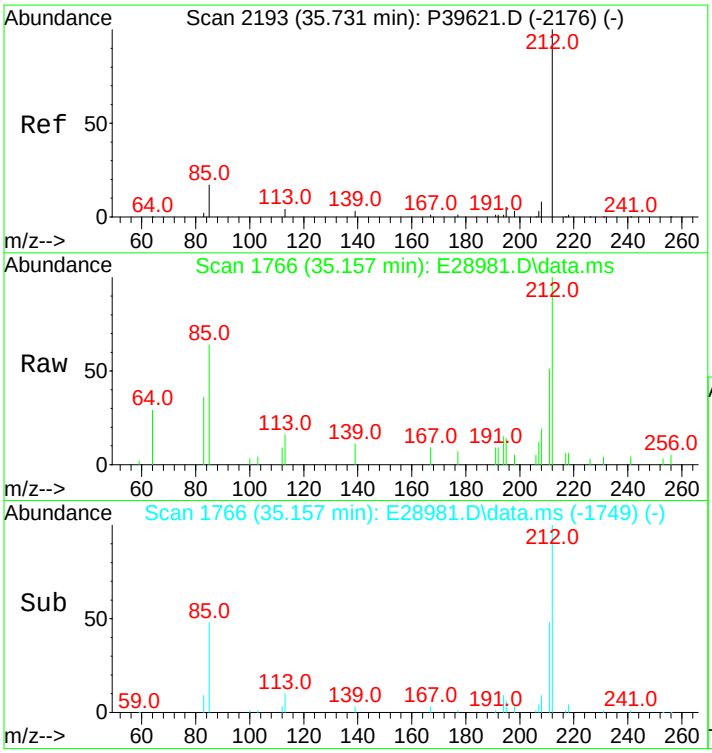


#38
C1-Dibenzothiophenes
Concen: 915.19 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:198 Resp: 82564

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

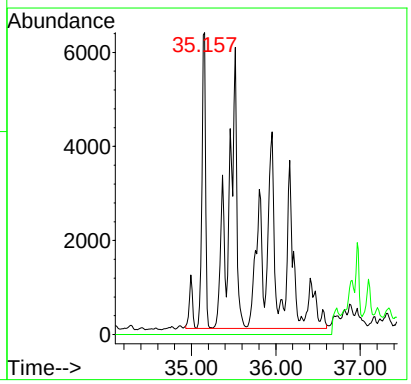


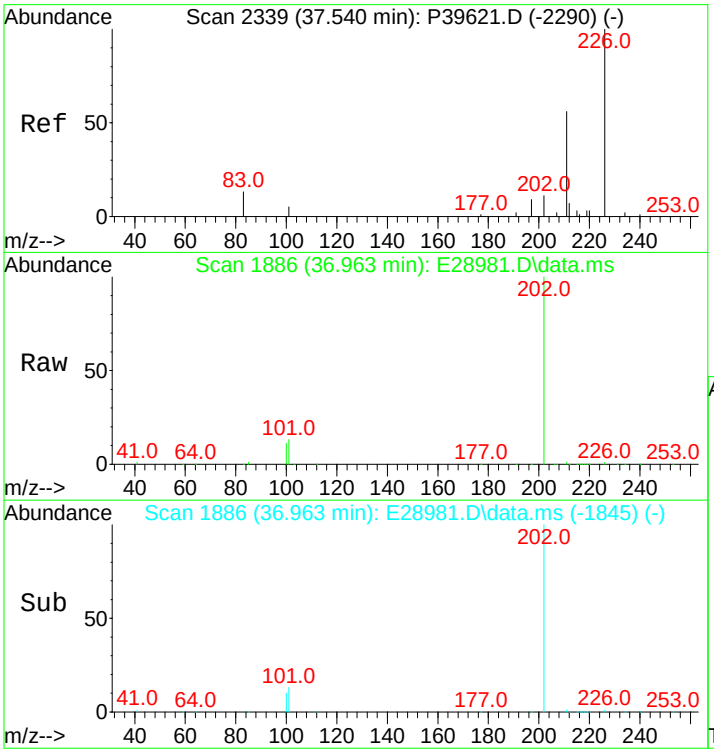


#39
C2-Dibenzothiophenes
Concen: 1337.63 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:212 Resp: 120674

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

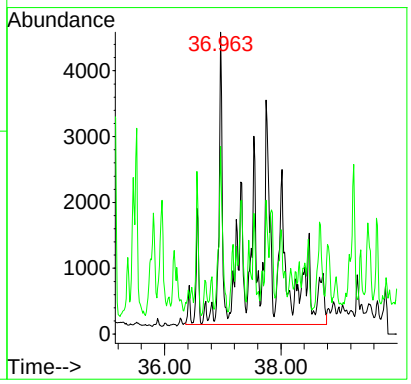


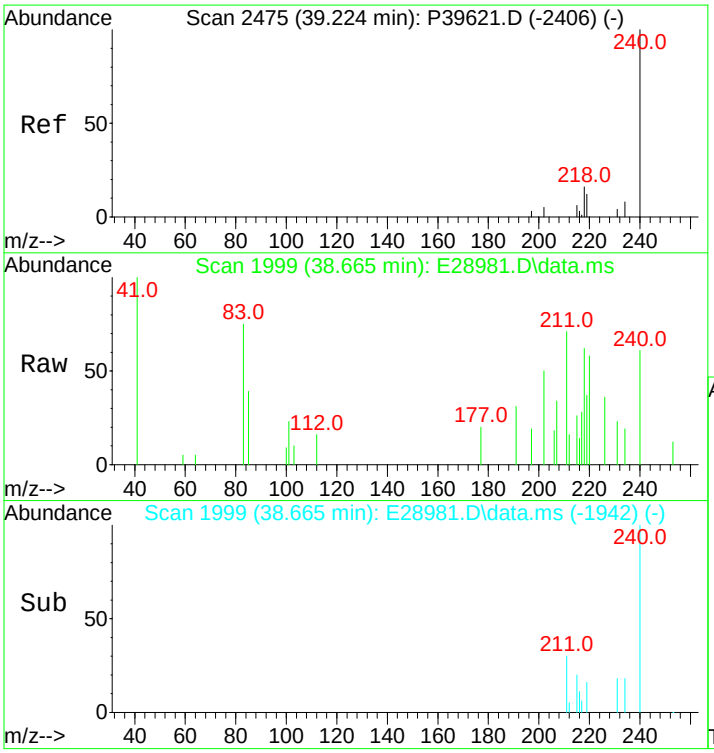


#40
C3-Dibenzothiophenes
Concen: 1204.90 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:226 Resp: 108700

Ion	Ratio	Lower	Upper
226	100		
211	1.9	44.1	66.1#

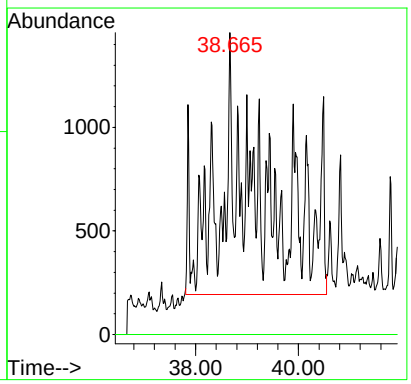


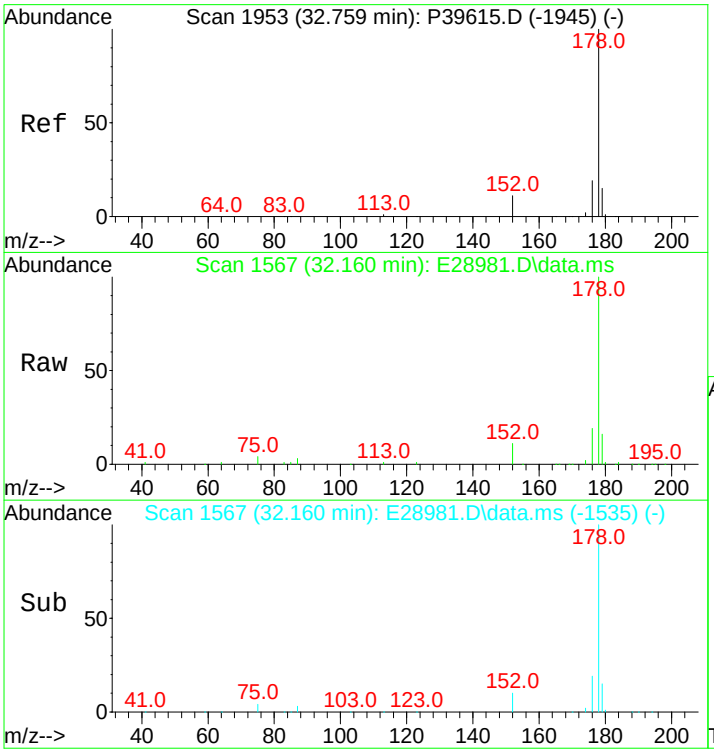


#41
C4-Dibenzothiophenes
Concen: 741.05 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:240 Resp: 66854

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

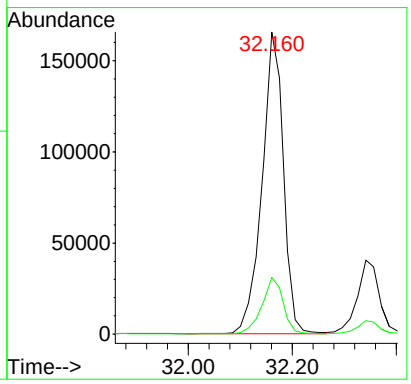


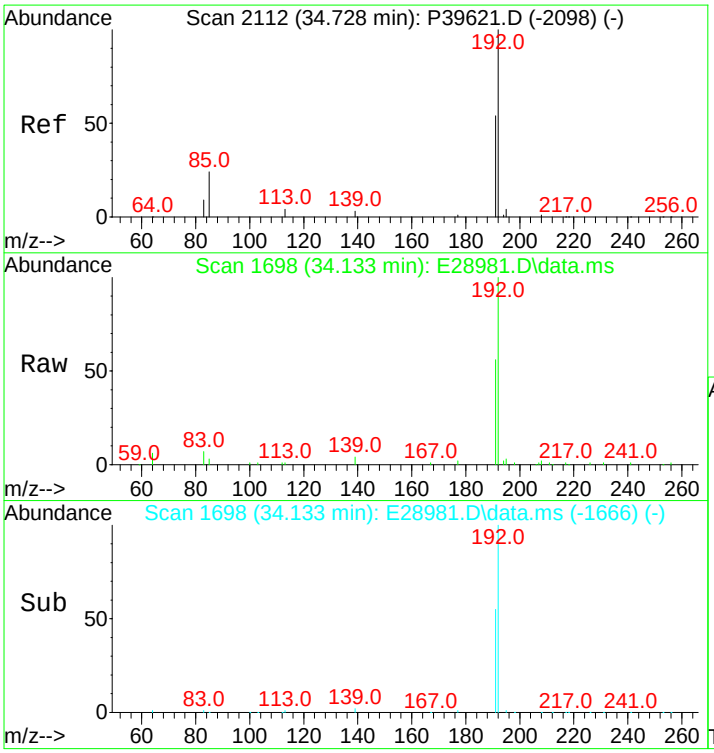


#43
Phenanthrene
Concen: 5131.28 ng/mL
RT: 32.160 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:178 Resp: 470969

Ion	Ratio	Lower	Upper
178	100		
176	18.7	15.0	22.4

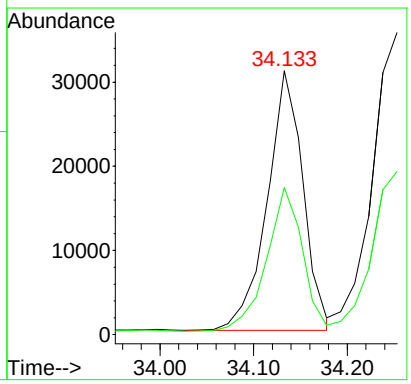


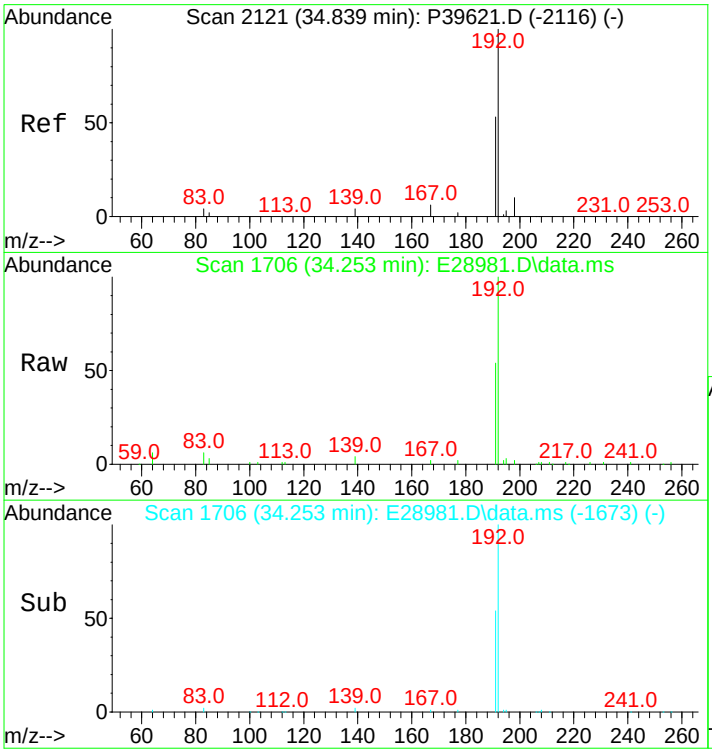


#44
3-Methylphenanthrene(3MP)
Concen: 892.16 ng/mL
RT: 34.133 min Scan# 1698
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 81886

Ion	Ratio	Lower	Upper
192	100		
191	55.6	45.9	68.9

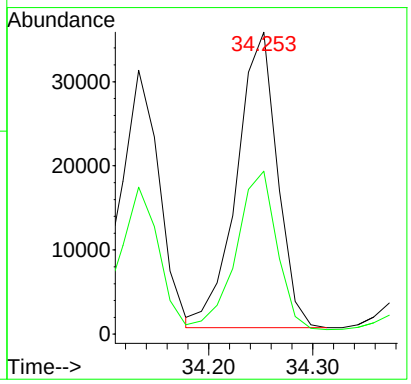


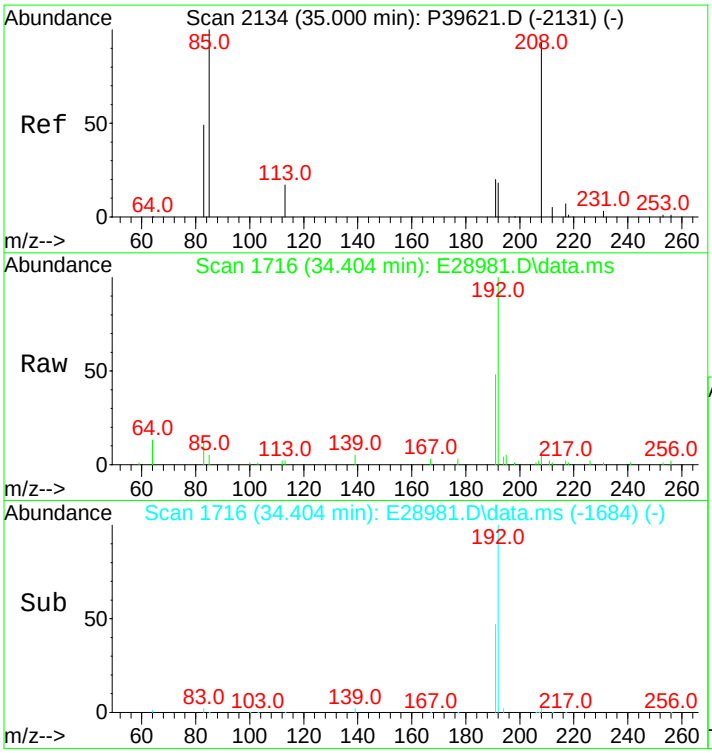


#45
2-Methylphenanthrene(2MP)
Concen: 1041.90 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 95630

Ion	Ratio	Lower	Upper
192	100		
191	53.7	45.4	68.0

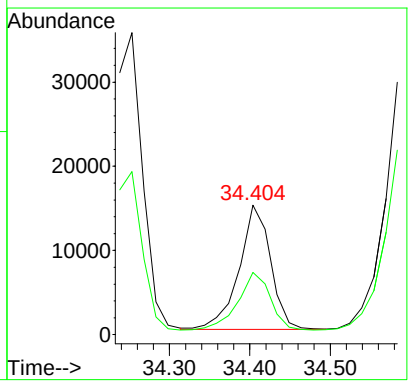


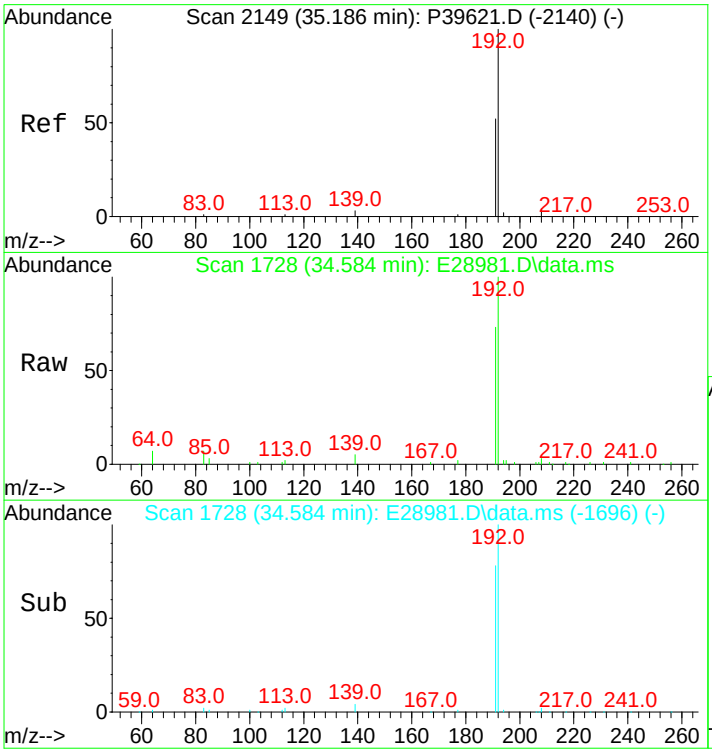


#46
2-Methylanthracene(2MA)
Concen: 442.38 ng/mL m
RT: 34.404 min Scan# 1716
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 40603

Ion	Ratio	Lower	Upper
192	100		
191	0.9	95.4	143.0#

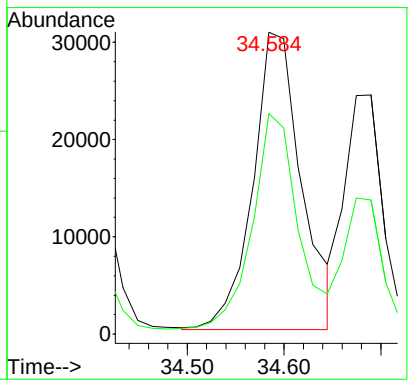


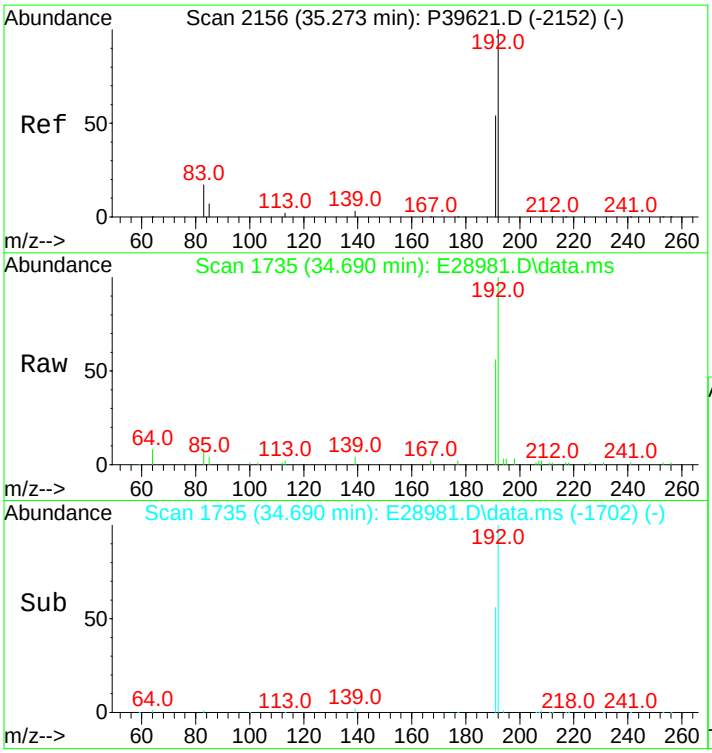


#47
9/4-Methylphenanthrene(9MP)
Concen: 1166.00 ng/mL m
RT: 34.584 min Scan# 1728
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 107020

Ion	Ratio	Lower	Upper
192	100		
191	34.0	44.3	66.5#

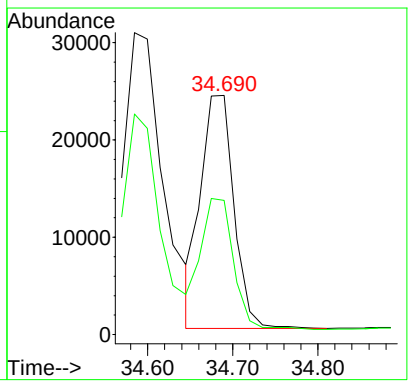


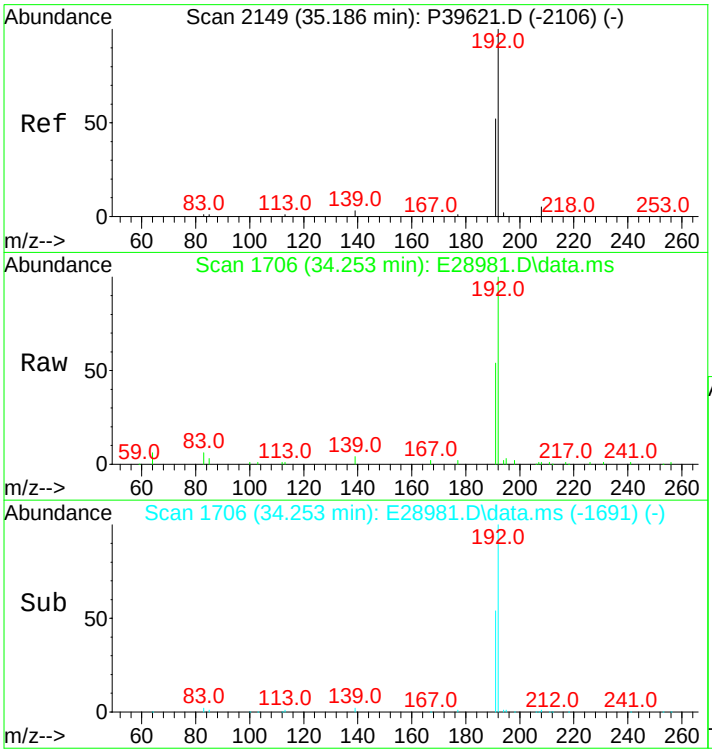


#48
1-Methylphenanthrene(1MP)
Concen: 708.69 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 65046

Ion	Ratio	Lower	Upper
192	100		
191	56.0	46.7	70.1

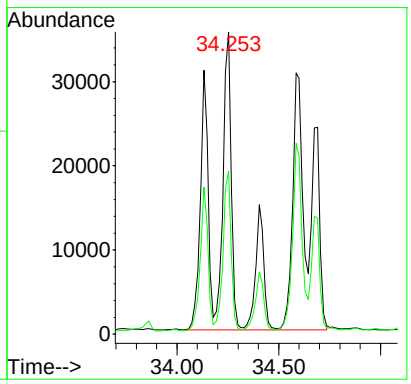


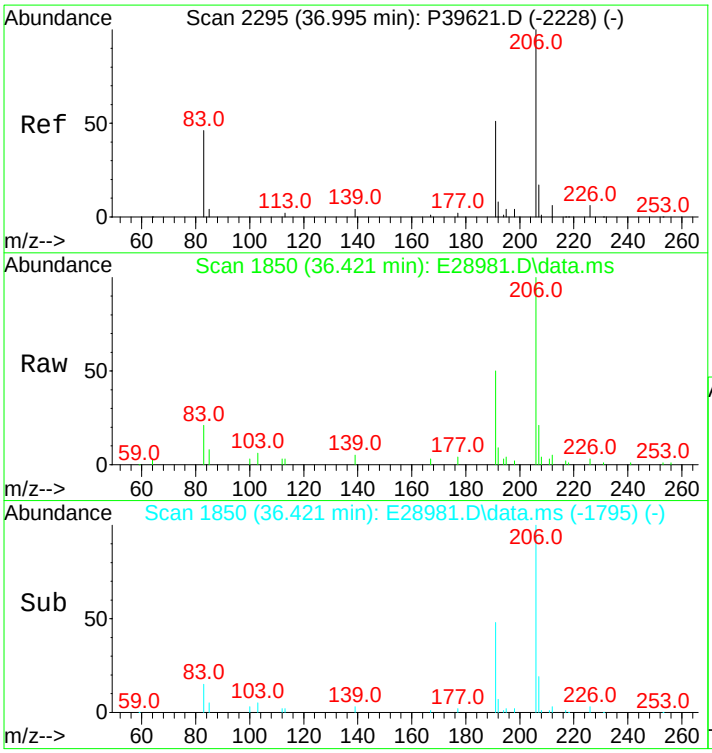


#49
C1-Phenanthrenes/Anthracenes
Concen: 4278.52 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 392699

Ion	Ratio	Lower	Upper
192	100		
191	4.9	44.0	66.0#

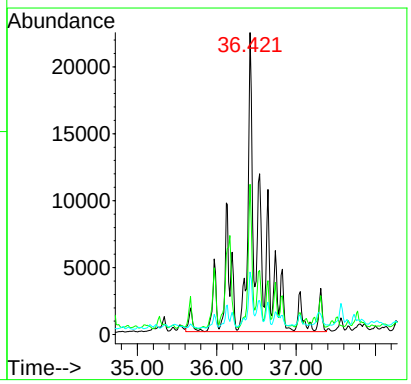


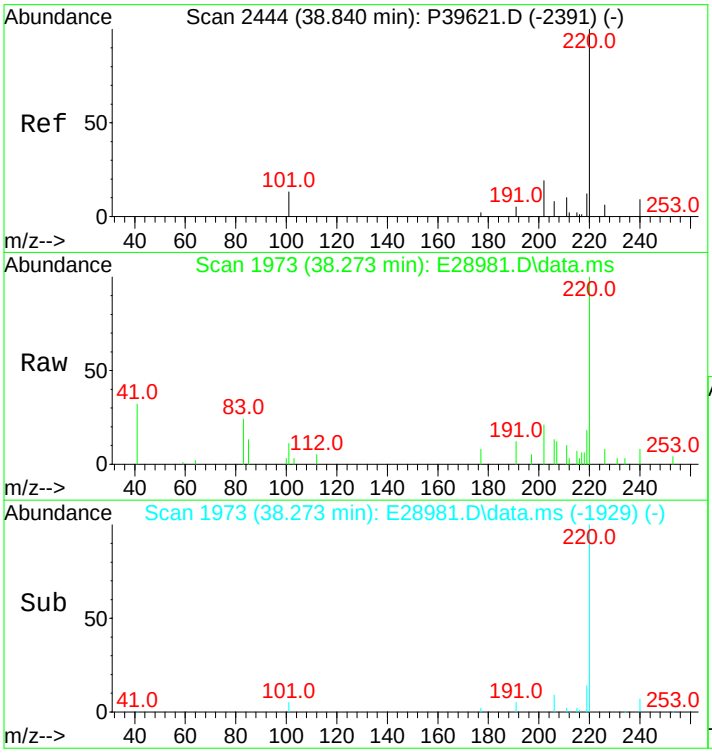


#50
C2-Phenanthrenes/Anthracenes
Concen: 3049.26 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:206 Resp: 279873

Ion	Ratio	Lower	Upper
206	100		
191	13.3	35.7	53.5#
207	5.8	16.5	24.7#

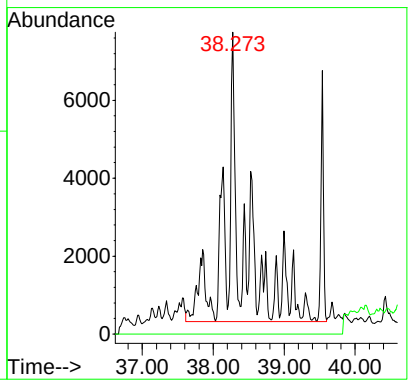


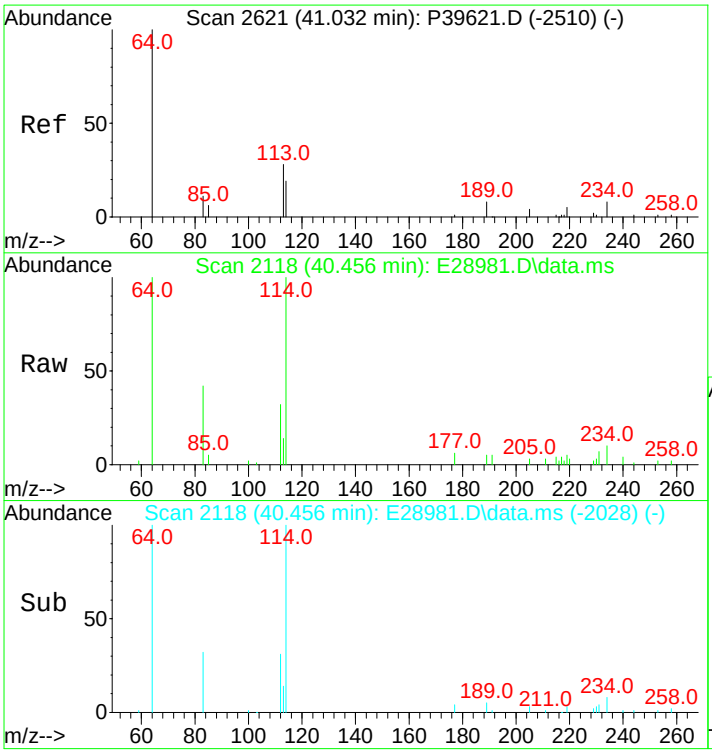


#52
C3-Phenanthrenes/Anthracenes
Concen: 1498.97 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:220 Resp: 137581

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

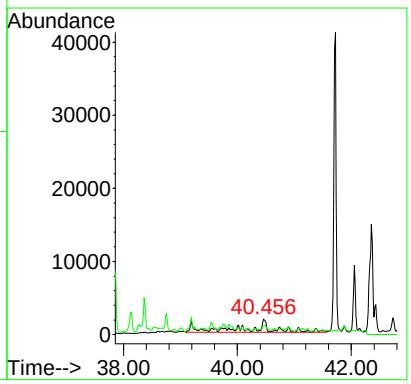


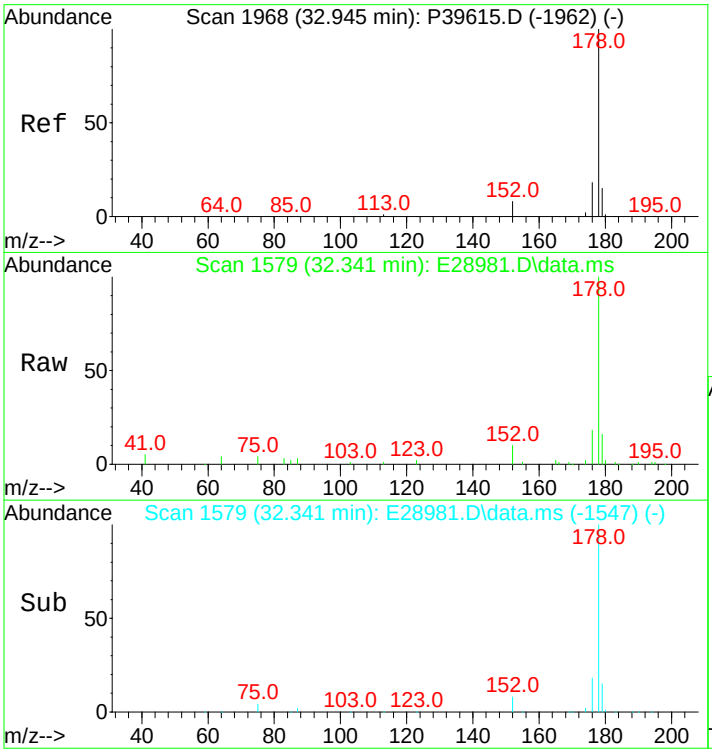


#53
C4-Phenanthrenes/Anthracenes
Concen: 560.73 ng/mL m
RT: 40.456 min Scan# 2118
Delta R.T. 0.369 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:234 Resp: 51466

Ion	Ratio	Lower	Upper
234	100		
219	2.6	46.6	70.0#

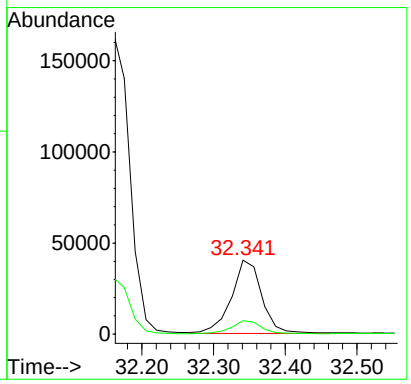


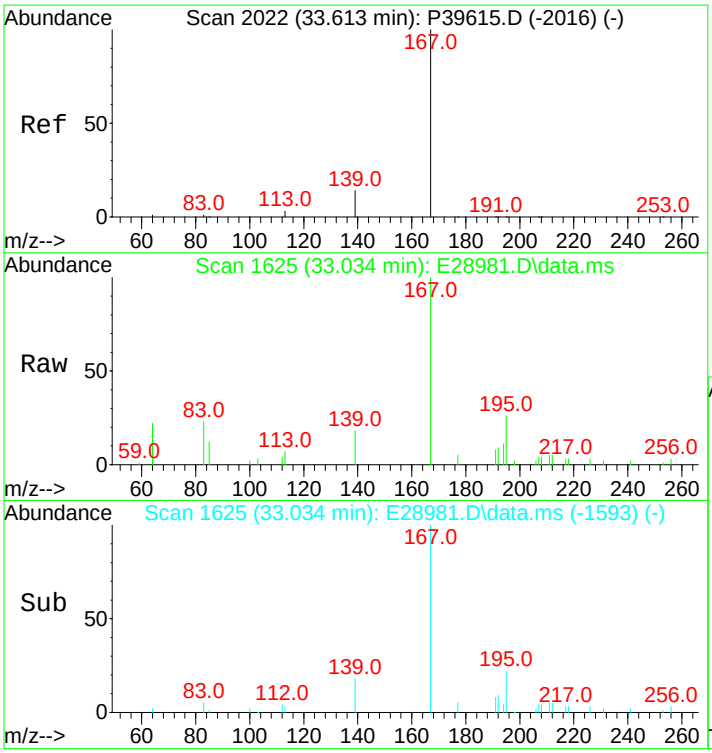


#55
Anthracene
Concen: 1511.94 ng/mL m
RT: 32.341 min Scan# 1579
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:178 Resp: 119948

Ion	Ratio	Lower	Upper
178	100		
176	17.2	14.3	21.5

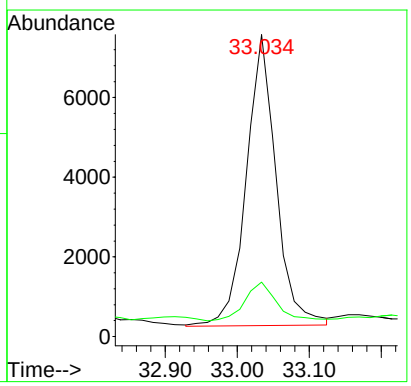


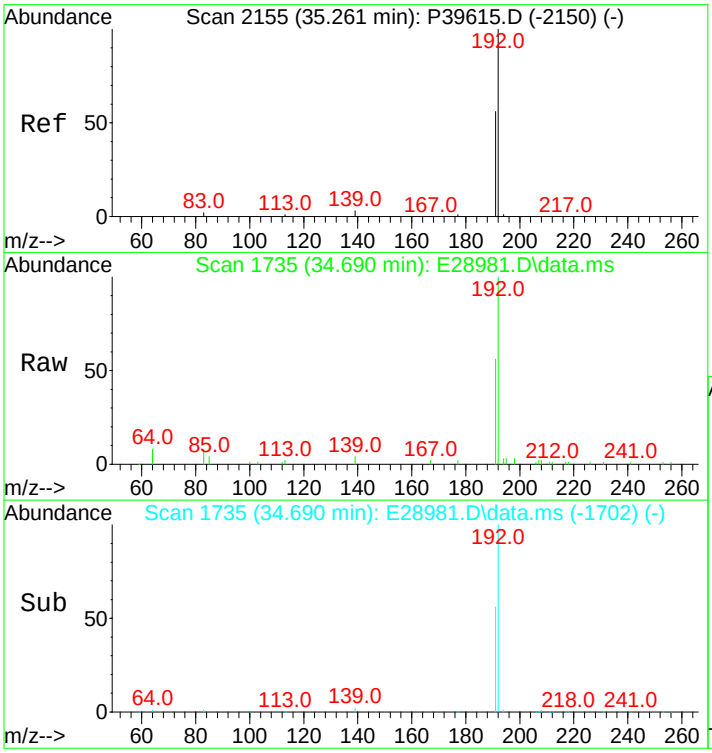


#56
Carbazole
Concen: 256.11 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:167 Resp: 20911

Ion	Ratio	Lower	Upper
167	100		
139	14.0	10.1	15.1

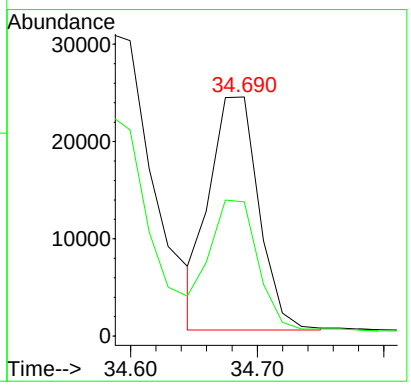


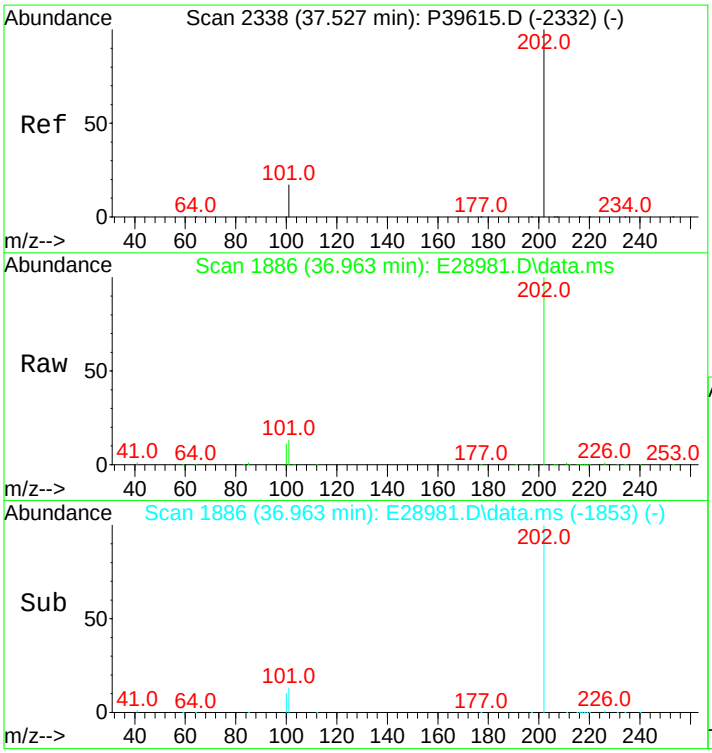


#57
1-Methylphenanthrene
Concen: 923.68 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:192 Resp: 64679

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

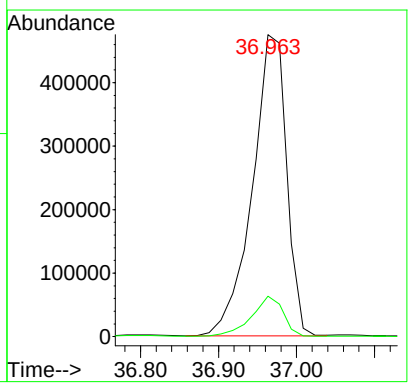


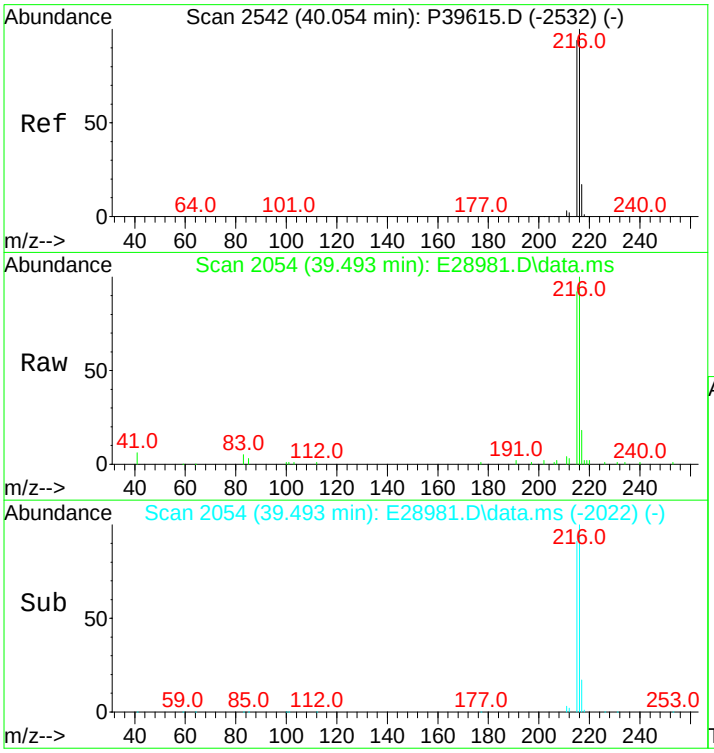


#58
Fluoranthene
Concen: 14313.84 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:202 Resp: 1450871

Ion	Ratio	Lower	Upper
202	100		
101	12.4	10.4	15.6

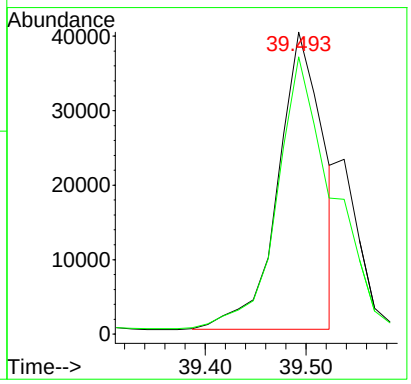


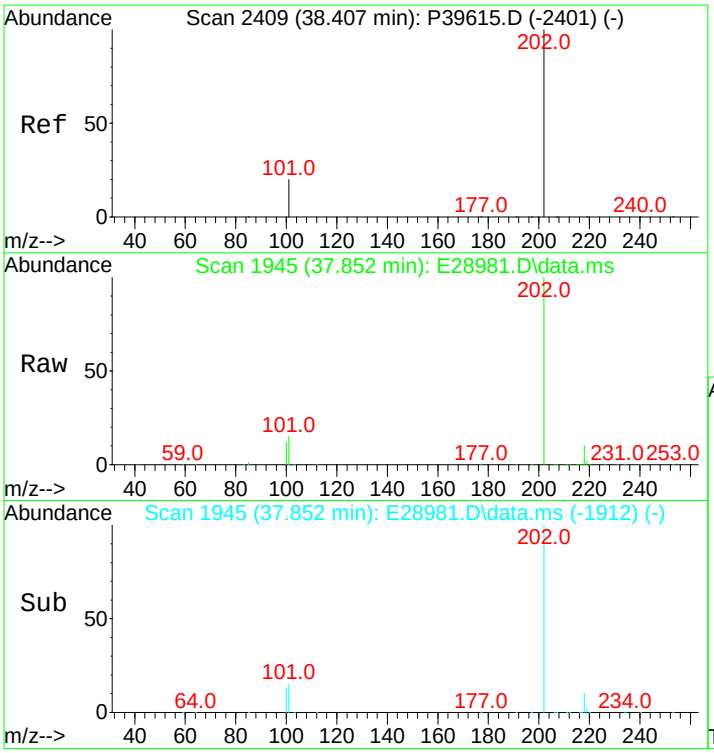


#59
Benzo(b)fluorene
Concen: 1852.60 ng/mL m
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:216 Resp: 125129

Ion	Ratio	Lower	Upper
216	100		
215	111.1	72.6	109.0#

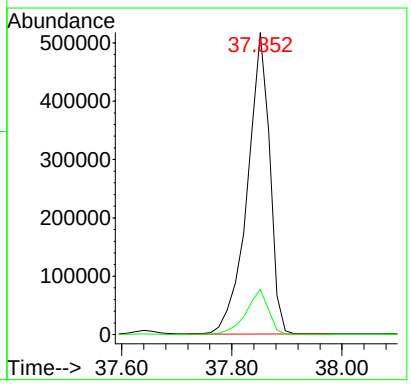


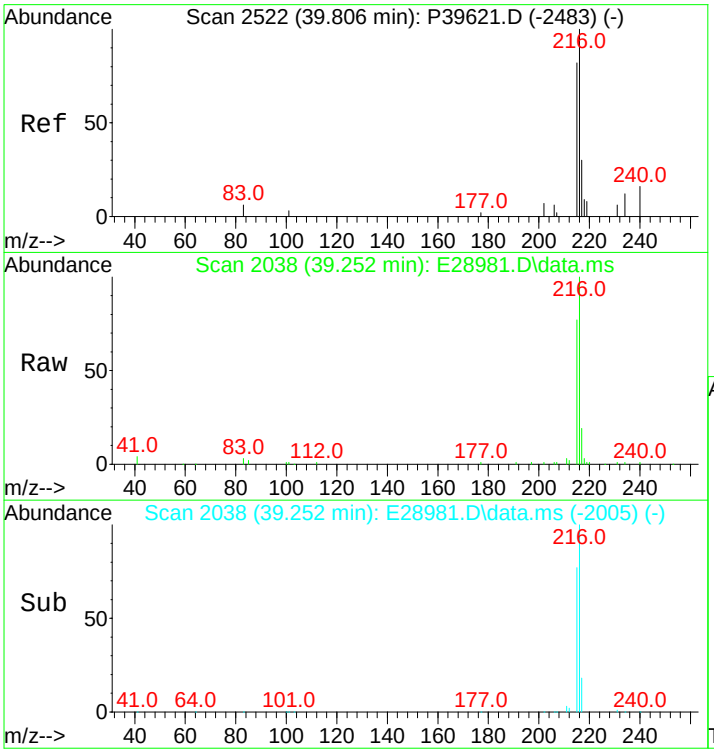


#60
Pyrene
Concen: 14065.03 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:202 Resp: 1449054

Ion	Ratio	Lower	Upper
202	100		
101	14.8	11.0	16.4

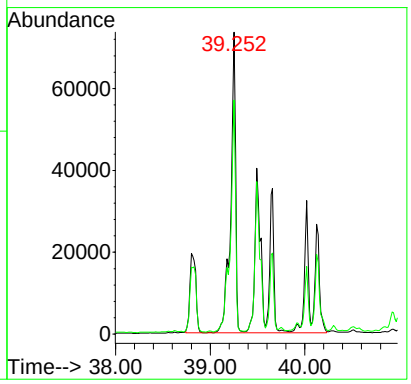


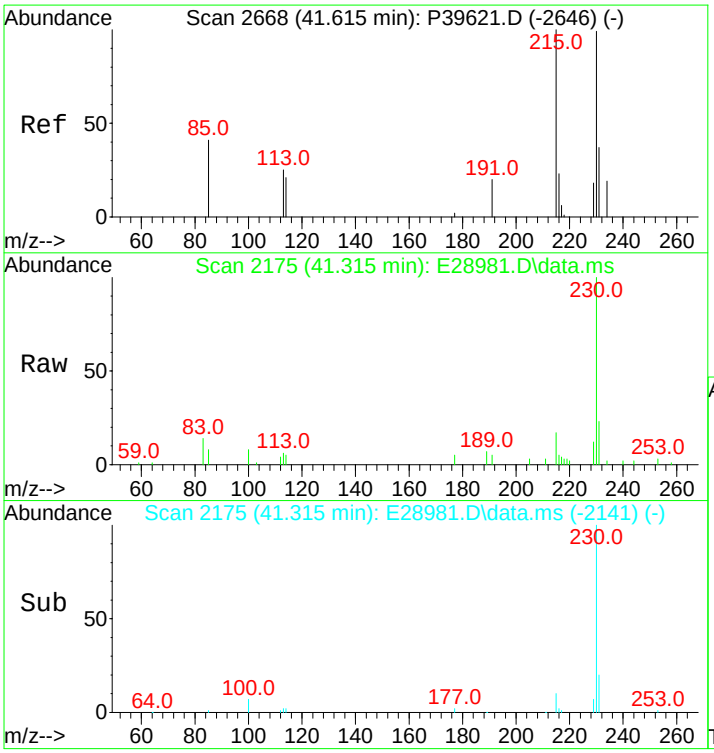


#61
C1-Fluoranthenes/Pyrenes
Concen: 7815.85 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:216 Resp: 805230

Ion	Ratio	Lower	Upper
216	100		
215	26.7	73.4	110.2#

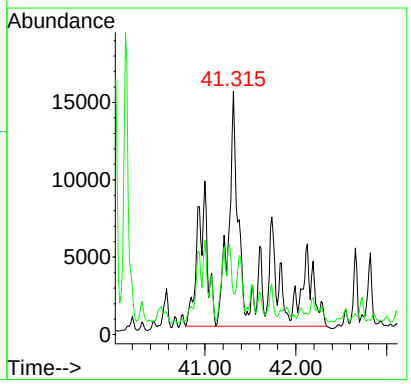


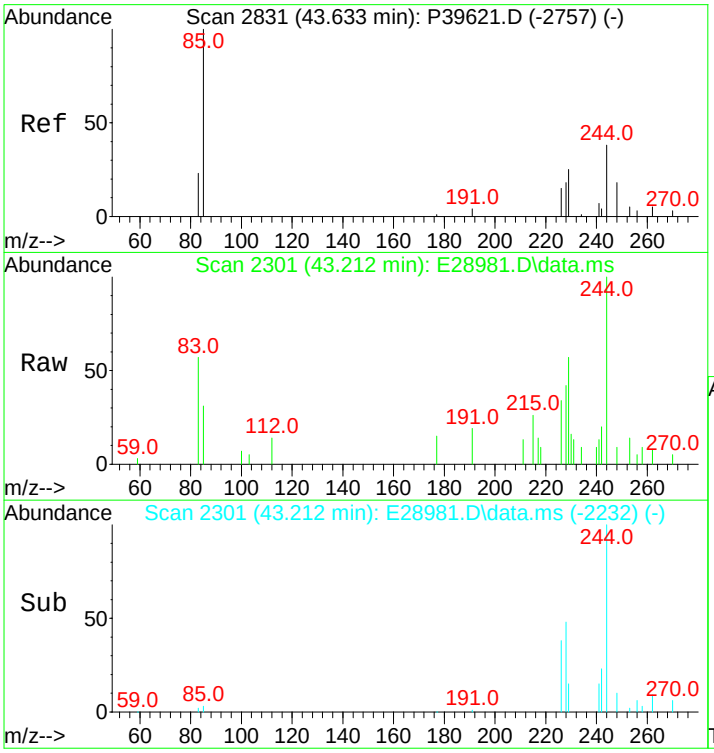


#62
C2-Fluoranthenes/Pyrenes
Concen: 2869.00 ng/mL m
RT: 41.315 min Scan# 2175
Delta R.T. 0.435 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:230 Resp: 295580

Ion	Ratio	Lower	Upper
230	100		
215	1.7	93.8	140.8#

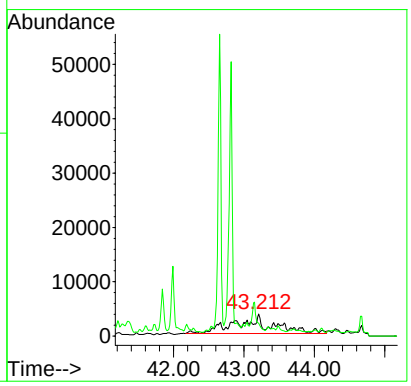


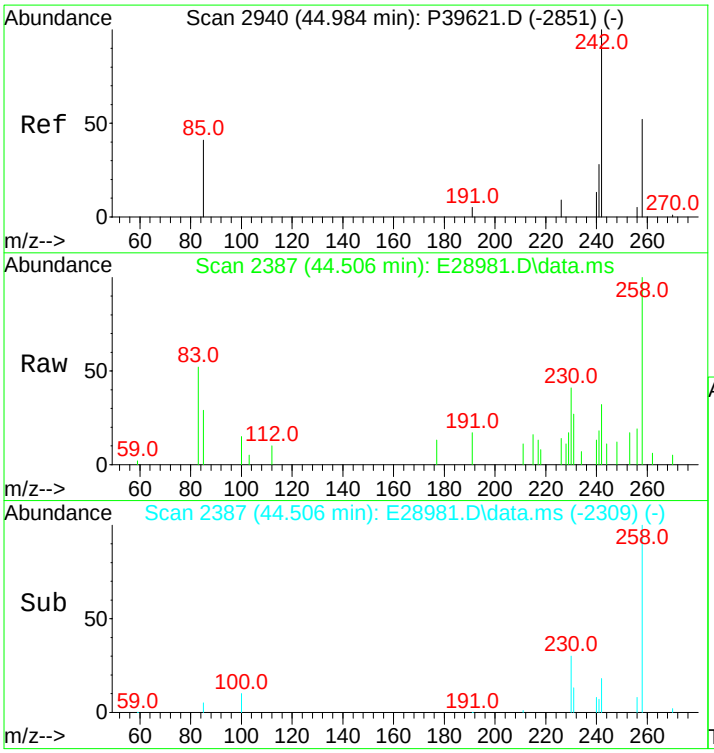


#63
C3-Fluoranthenes/Pyrenes
Concen: 1249.15 ng/mL m
RT: 43.212 min Scan# 2301
Delta R.T. 0.560 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:244 Resp: 128694

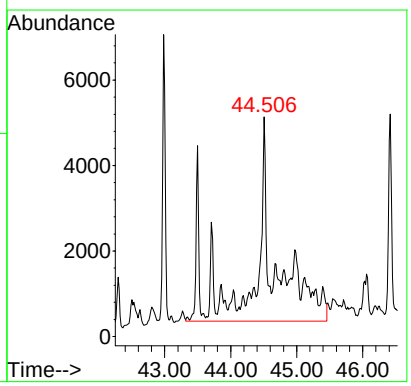
Ion	Ratio	Lower	Upper
244	100		
229	116.5	72.2	108.2#

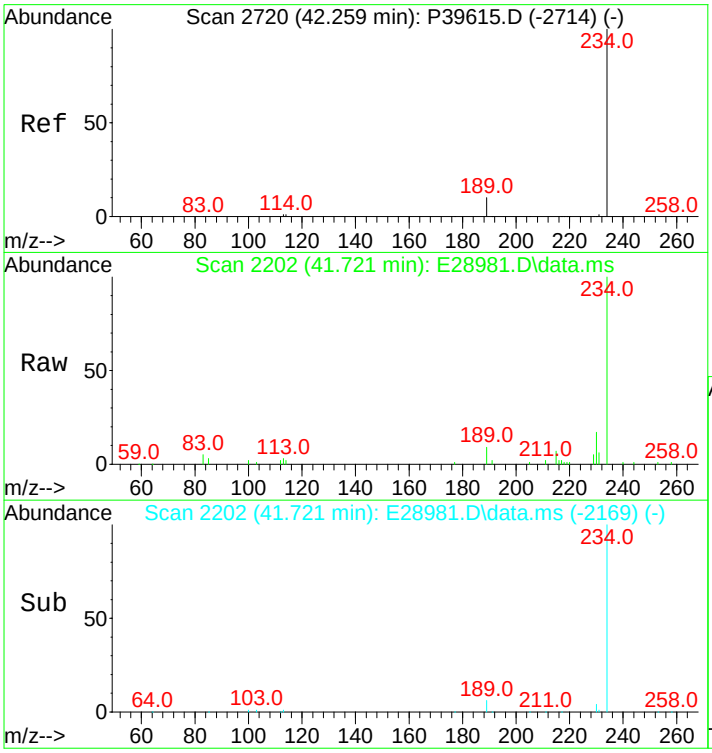




#64
C4-Fluoranthenes/Pyrenes
Concen: 998.95 ng/mL m
RT: 44.506 min Scan# 2387
Delta R.T. 0.536 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:258 Resp: 102917

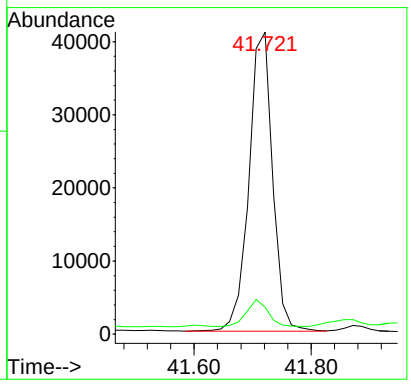


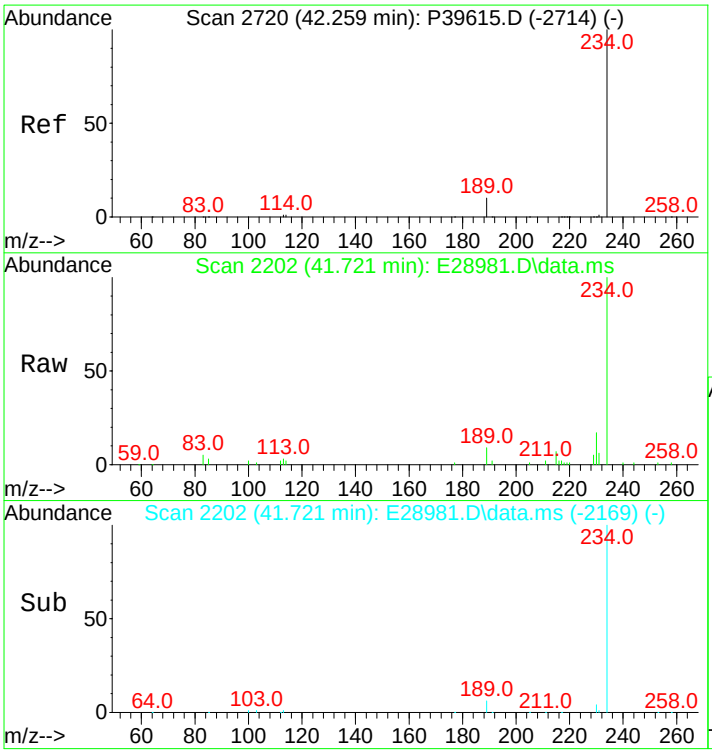


#66
Naphthobenzothiophene
Concen: 1129.94 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:234 Resp: 114816

Ion	Ratio	Lower	Upper
234	100		
189	8.5	21.1	31.7#

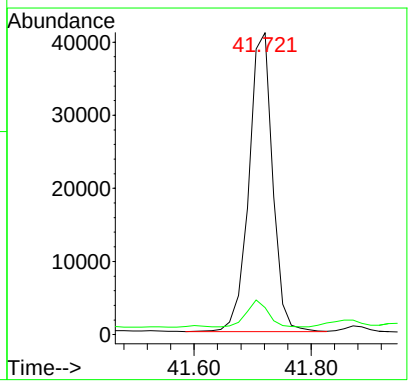


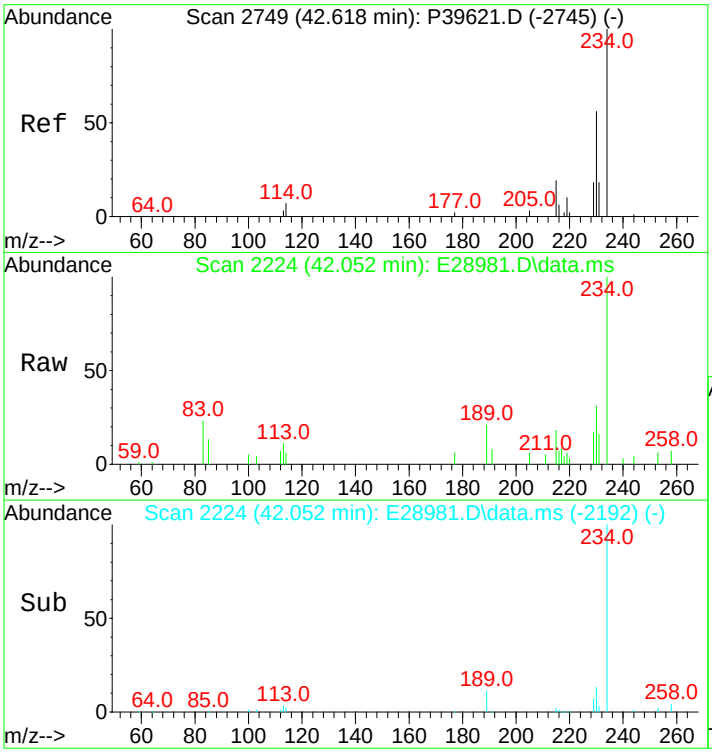


#67
Naphthobenzothiophene-2,1-D
Concen: 1129.94 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:234 Resp: 114816

Ion	Ratio	Lower	Upper
234	100		
189	8.5	21.1	31.7#

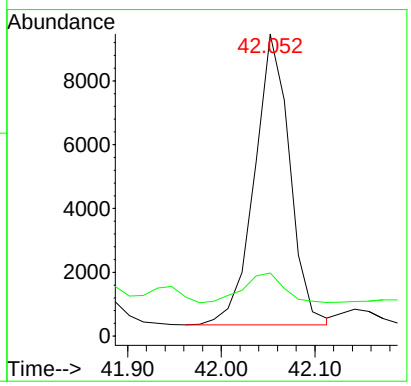


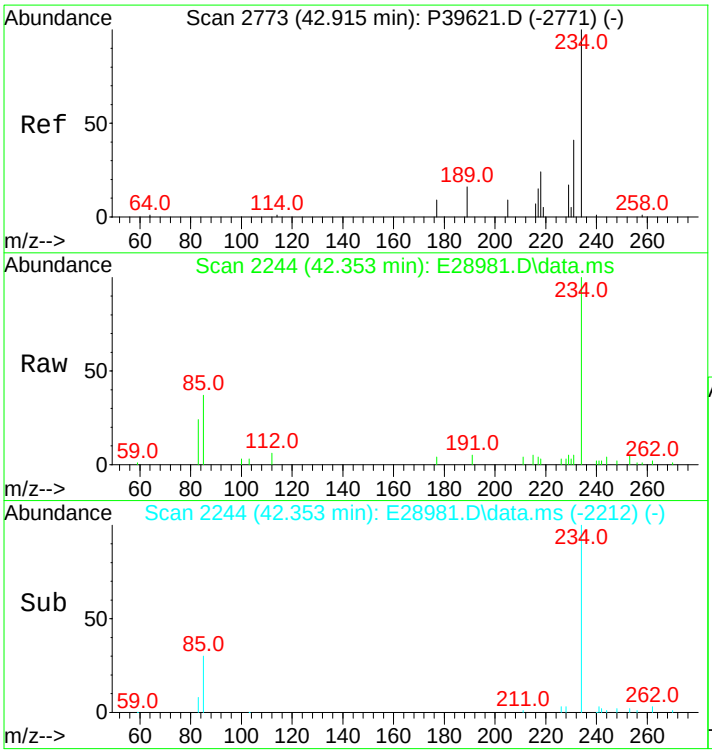


#68
Naphthobenzothiophene-1,2-D
Concen: 234.49 ng/mL
RT: 42.052 min Scan# 2224
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:234 Resp: 23827

Ion	Ratio	Lower	Upper
234	100		
189	11.1	71.9	107.9#

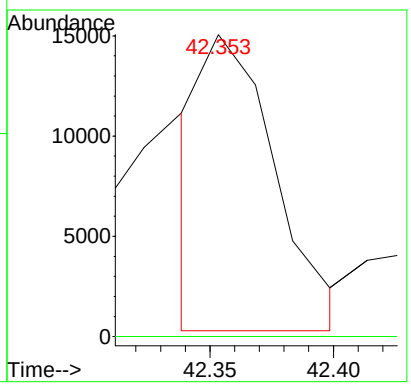


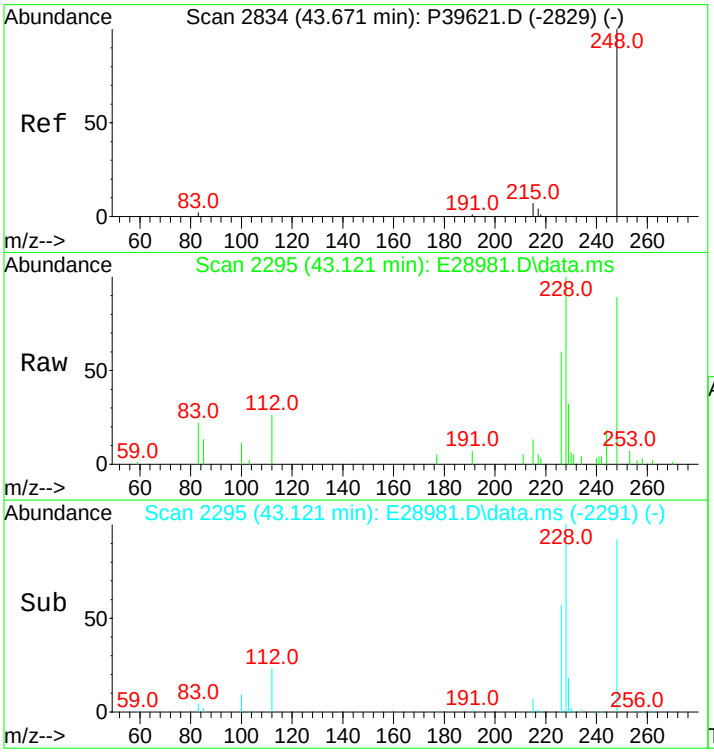


#69
Naphthobenzothiophene-2,3-D
Concen: 299.52 ng/mL m
RT: 42.353 min Scan# 2244
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:234 Resp: 30435

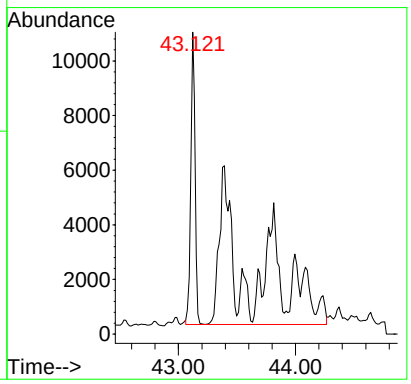
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

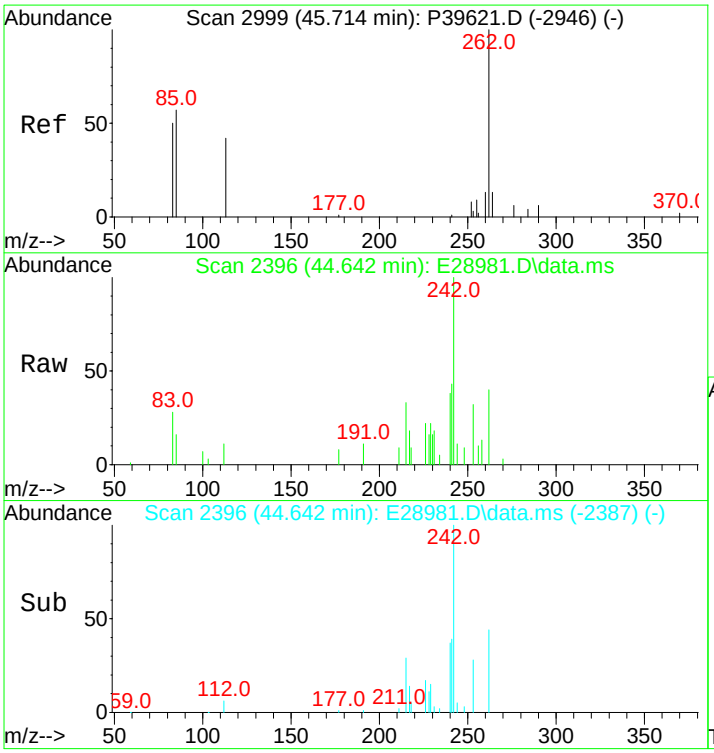




#70
C1-Naphthobenzothiophenes
Concen: 1289.40 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

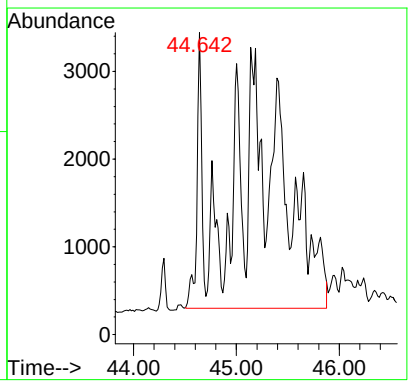
Tgt Ion:248 Resp: 131020

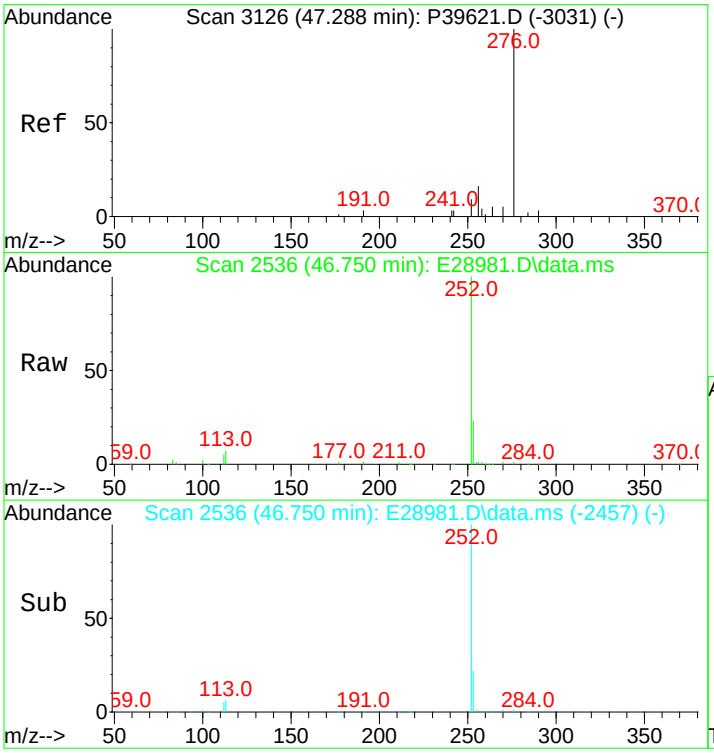




#71
C2-Naphthobenzothiophenes
Concen: 948.05 ng/ml m
RT: 44.642 min Scan# 2396
Delta R.T. -0.003 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

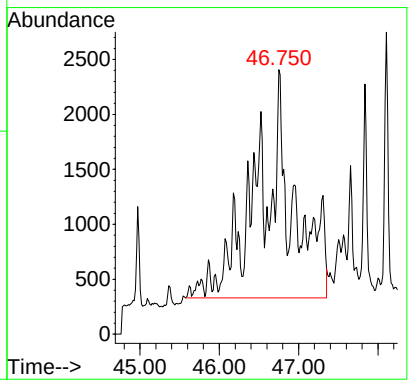
Tgt Ion:262 Resp: 96334

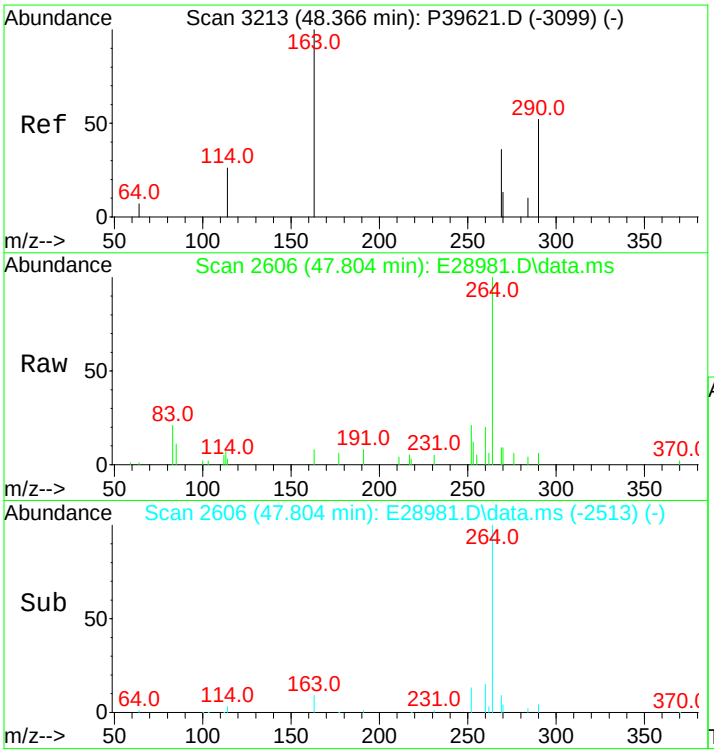




#72
C3-Naphthobenzothiophenes
Concen: 619.81 ng/ml m
RT: 46.750 min Scan# 2536
Delta R.T. 0.523 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

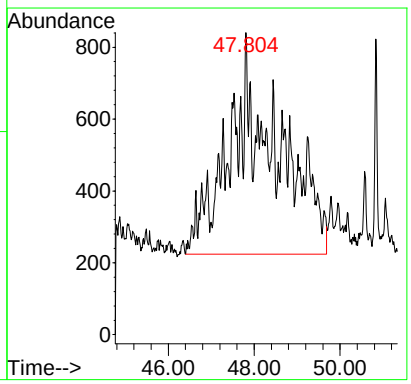
Tgt Ion:276 Resp: 62981

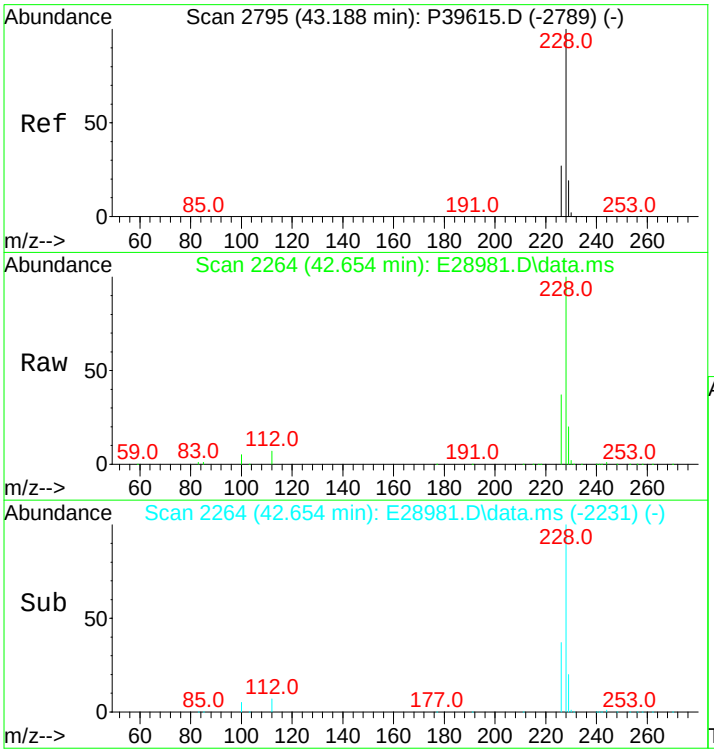




#73
C4-Naphthobenzothiophenes
Concen: 452.32 ng/mL m
RT: 47.804 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:290 Resp: 45962

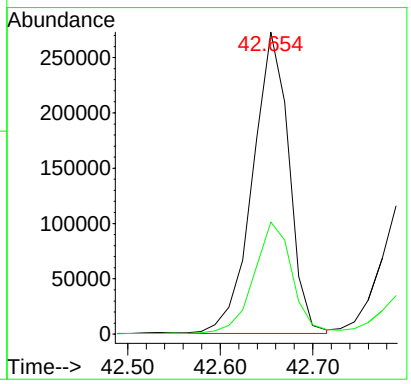


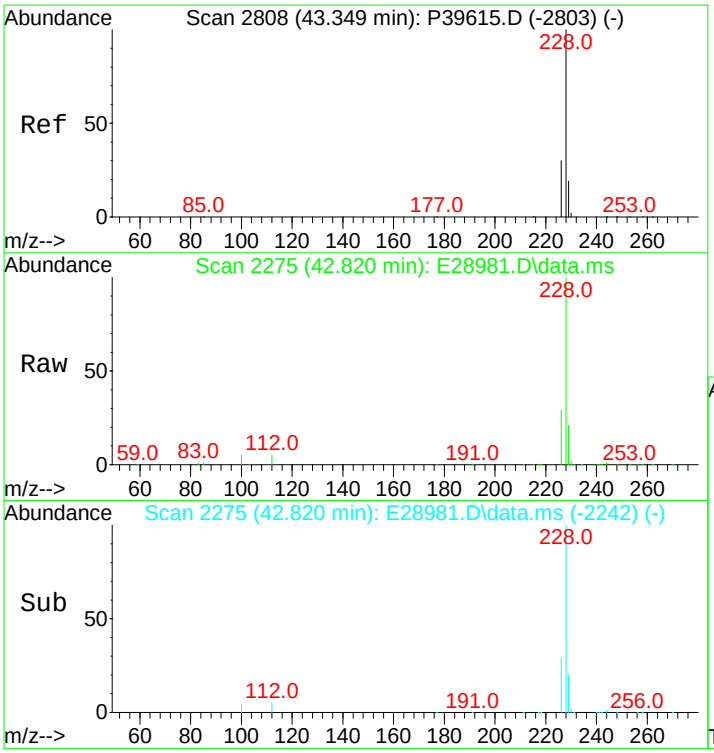


#75
Benz[a]anthracene
Concen: 6741.84 ng/mL m
RT: 42.654 min Scan# 2264
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:228 Resp: 739959

Ion	Ratio	Lower	Upper
228	100		
226	29.3	20.7	31.1

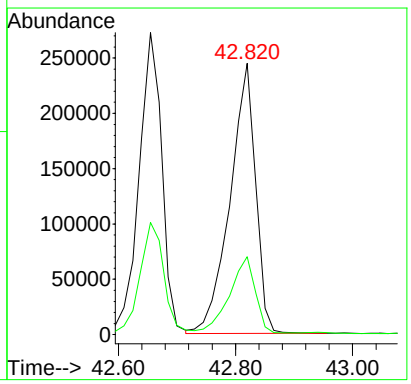


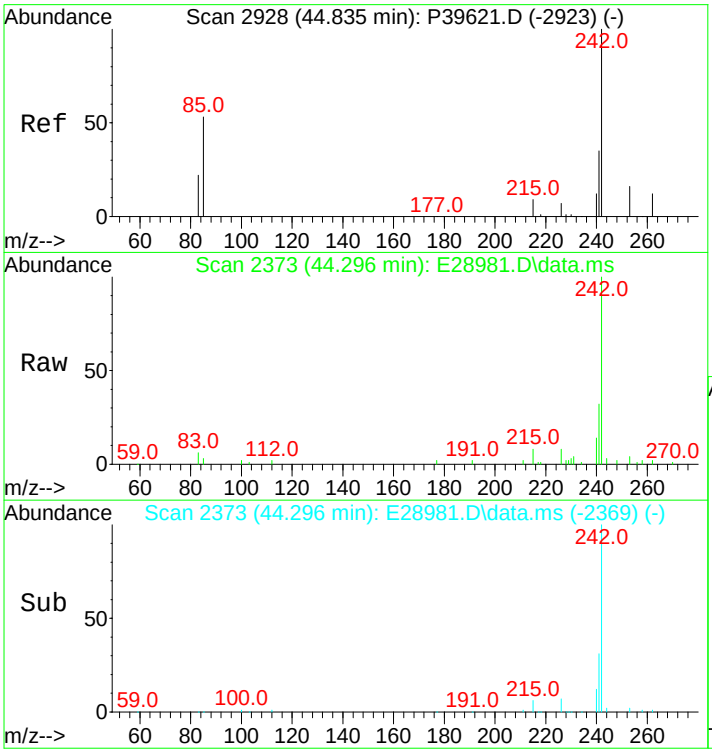


#77
Chrysene/Triphenylene
Concen: 6567.60 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:228 Resp: 742113

Ion	Ratio	Lower	Upper
228	100		
226	29.3	22.6	34.0

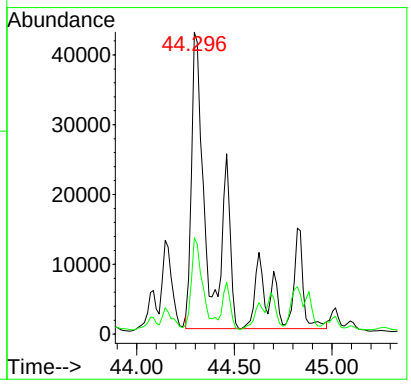


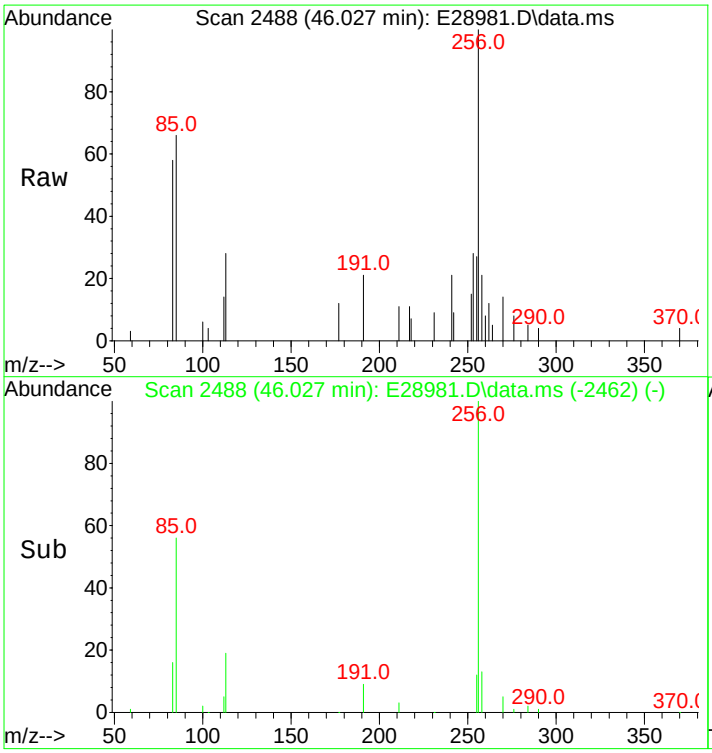


#78
C1-Chrysenes
Concen: 3024.84 ng/mL m
RT: 44.296 min Scan# 2373
Delta R.T. 0.011 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:242 Resp: 341795

Ion	Ratio	Lower	Upper
242	100		
241	3.9	32.2	48.4#

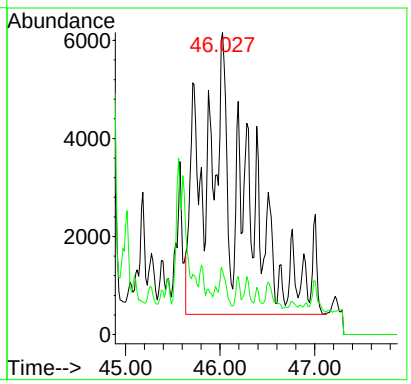


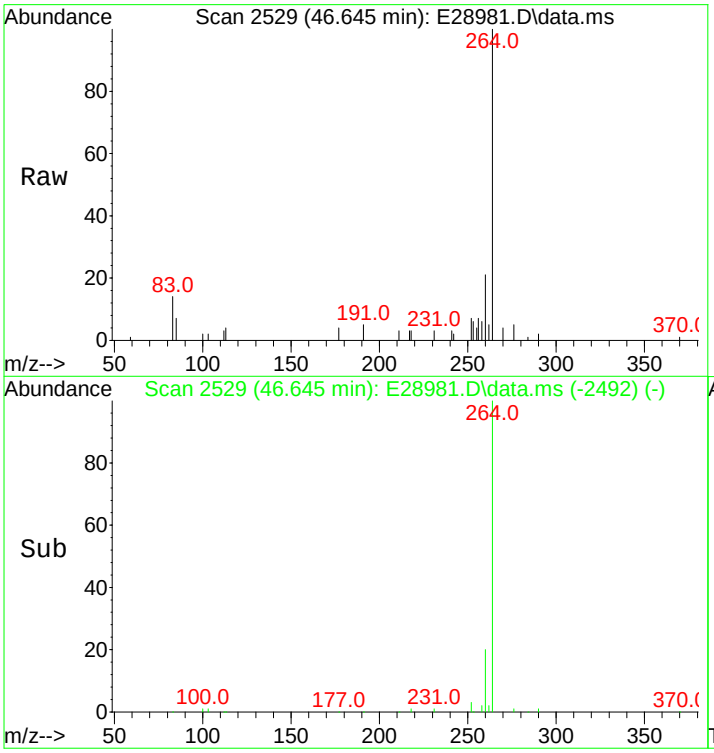


#79
C2-Chrysenes
Concen: 1477.95 ng/mL m
RT: 46.027 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:256 Resp: 167002

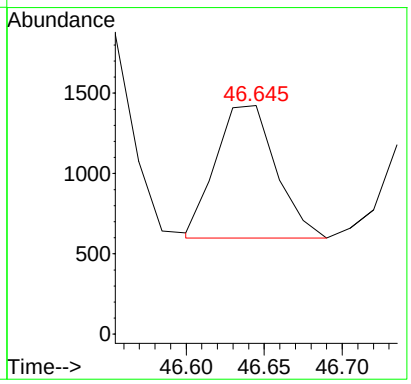
Ion	Ratio	Lower	Upper
256	100		
241	1.6	25.3	37.9#

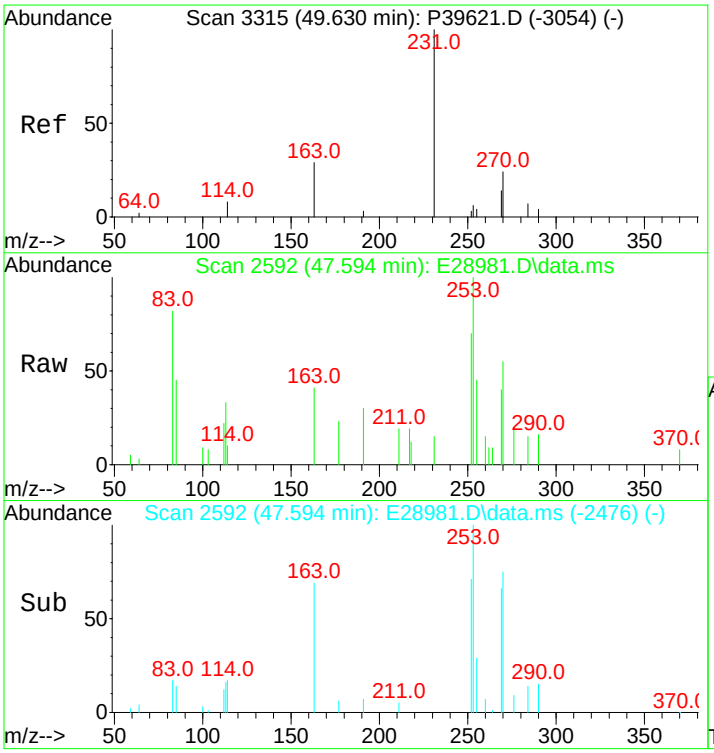




#80
BBF-D12 Surr BKGD
Concen: 19.66 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:256 Resp: 2221

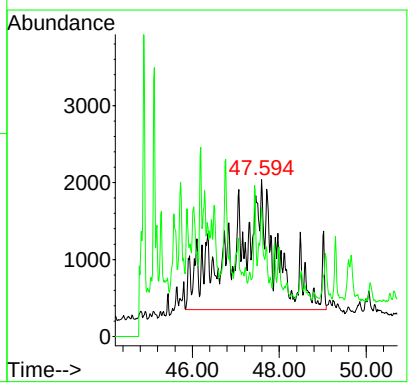


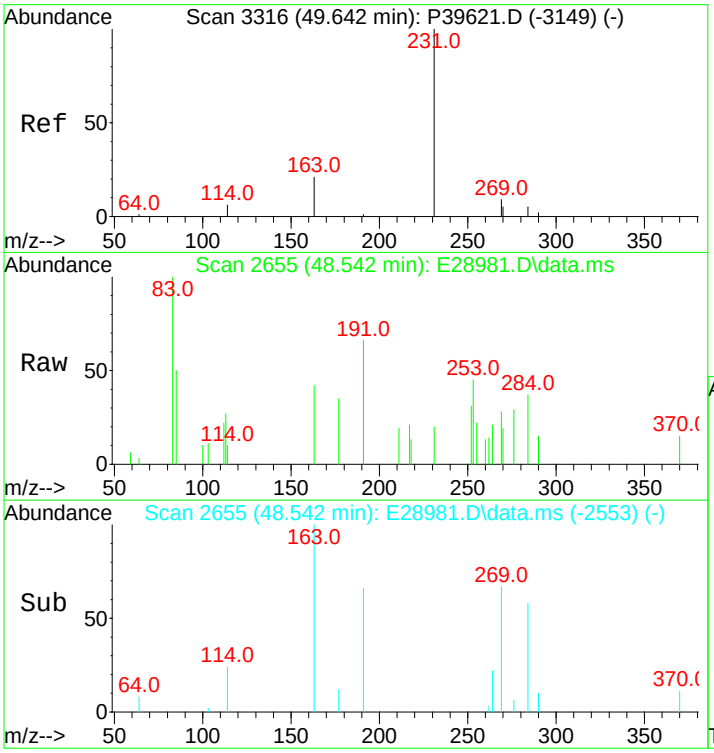


#81
C3-Chrysenes
Concen: 1051.15 ng/mL m
RT: 47.594 min Scan# 2592
Delta R.T. -1.474 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:270 Resp: 118776

Ion	Ratio	Lower	Upper
270	100		
255	0.9	38.0	57.0#

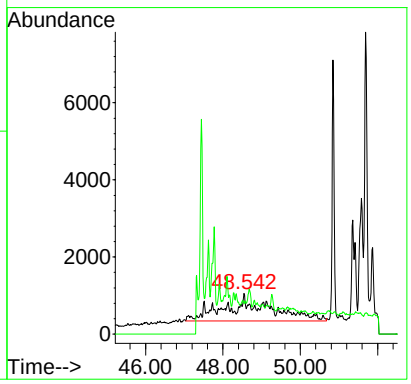


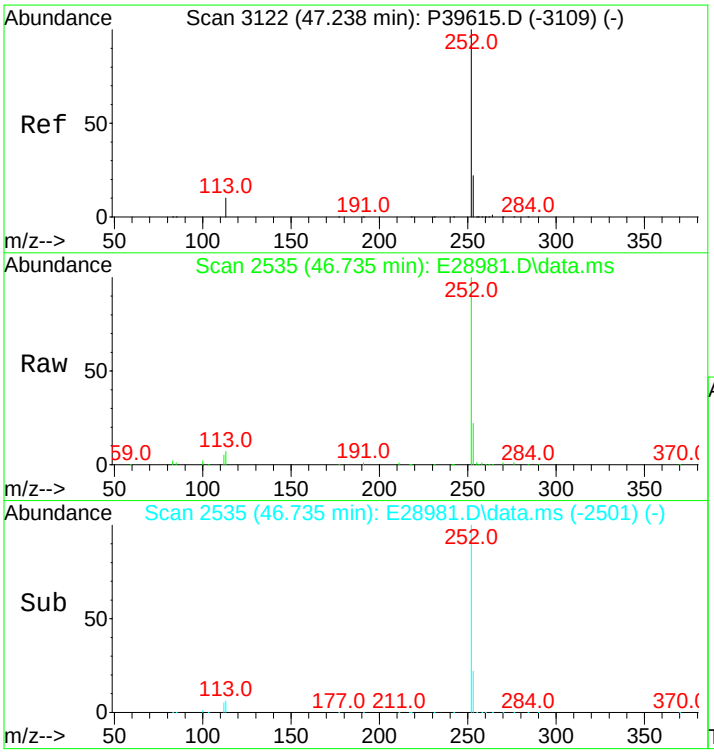


#82
C4-Chrysenes
Concen: 478.84 ng/mL m
RT: 48.542 min Scan# 2655
Delta R.T. -0.644 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:284 Resp: 54107

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

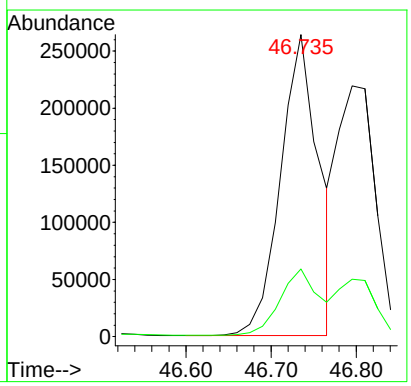


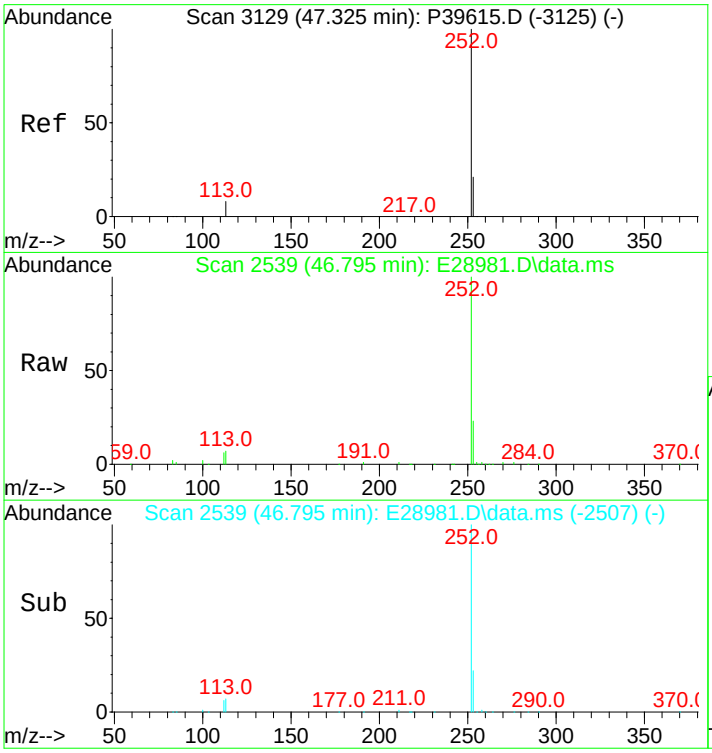


#84
Benzo[b]fluoranthene
Concen: 6446.44 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:252 Resp: 822395

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.5	29.3

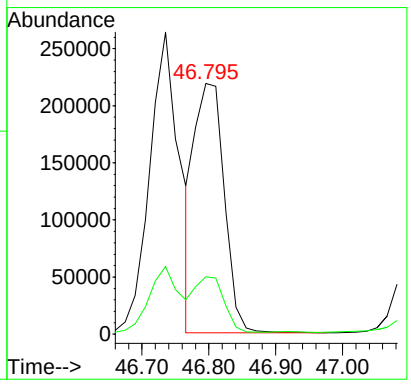


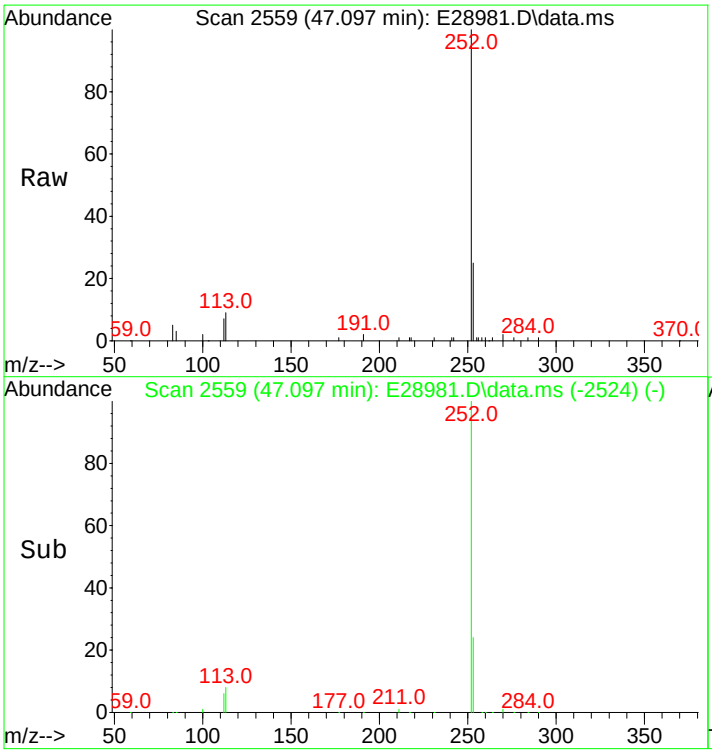


#85
Benzo[j]+[k]fluoranthene
Concen: 5166.63 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:252 Resp: 678125

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.7	29.5

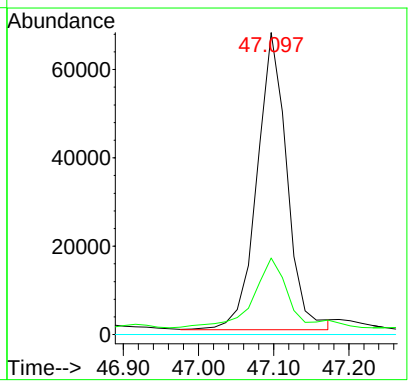


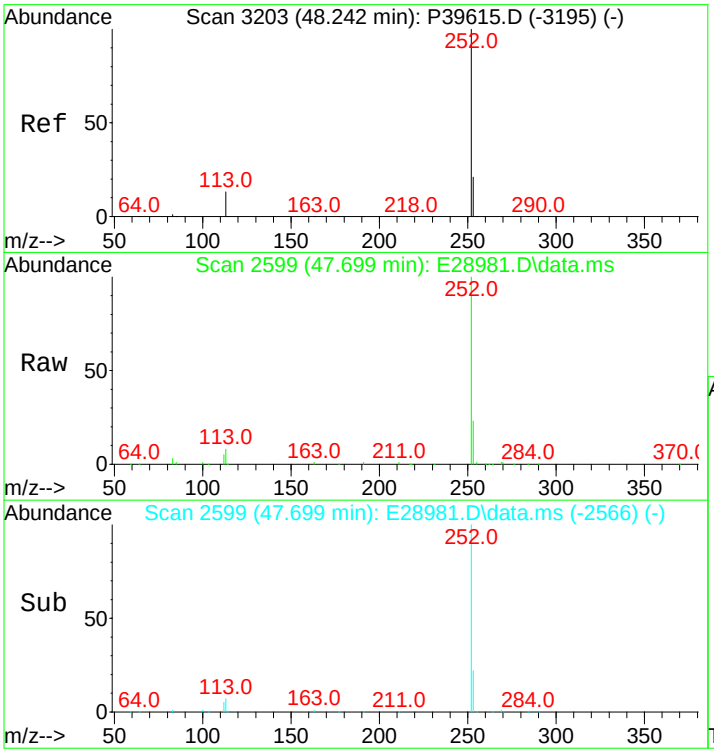


#86
Benzo[a]fluoranthene
Concen: 1419.61 ng/mL m
RT: 47.097 min Scan# 2559
Delta R.T. 0.025 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:252 Resp: 186325

Ion	Ratio	Lower	Upper
252	100		
253	30.2	456.0	684.0#
125	0.0	0.0	0.0

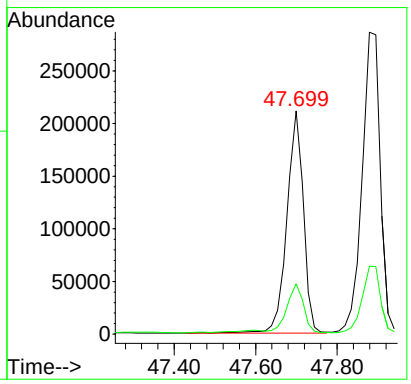


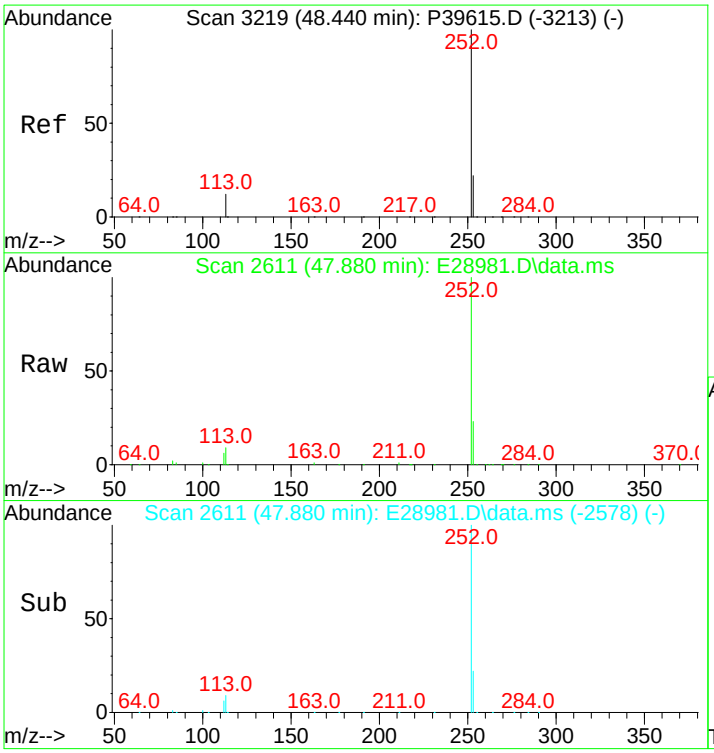


#87
Benzo[e]pyrene
Concen: 4757.52 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:252 Resp: 592626

Ion	Ratio	Lower	Upper
252	100		
253	21.8	20.6	31.0

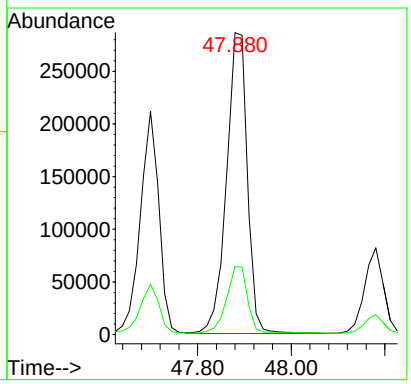


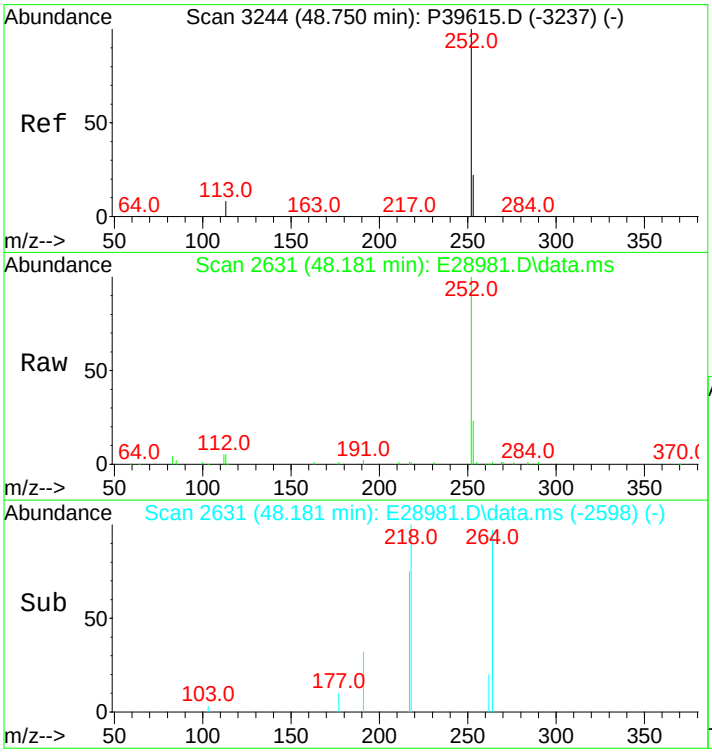


#89
Benzo[a]pyrene
Concen: 7446.03 ng/mL
RT: 47.880 min Scan# 2611
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:252 Resp: 887517

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.8	31.2

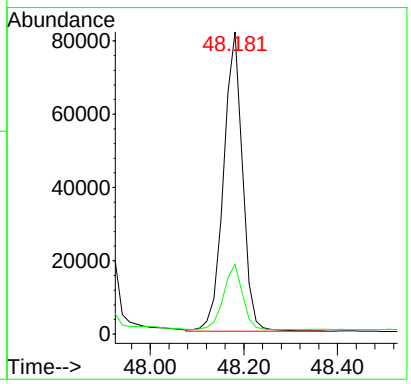


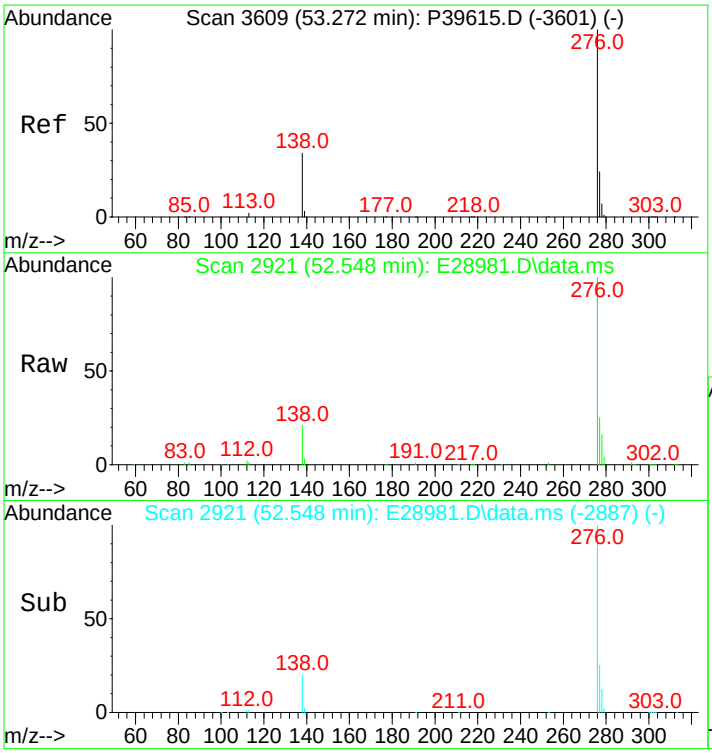


#90
Perylene
Concen: 1826.95 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:252 Resp: 230269

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.7	31.1

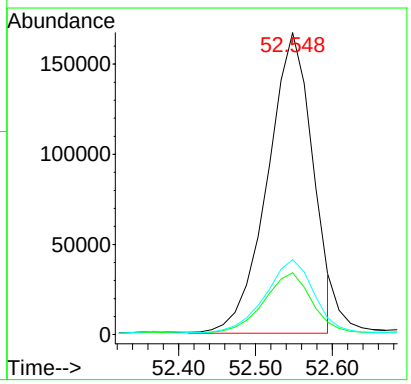


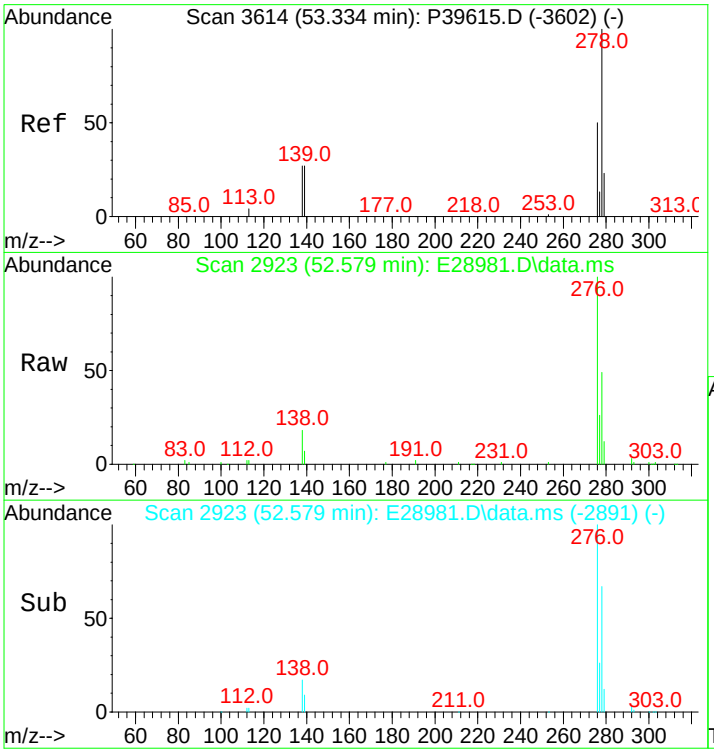


#91
Indeno[1,2,3-cd]pyrene
Concen: 4849.21 ng/mL m
RT: 52.548 min Scan# 2921
Delta R.T. 0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:276 Resp: 680226

Ion	Ratio	Lower	Upper
276	100		
138	21.5	16.3	24.5
277	26.7	19.4	29.2

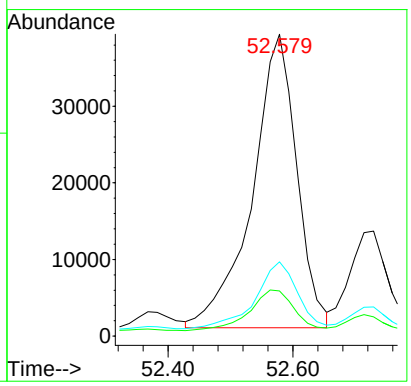


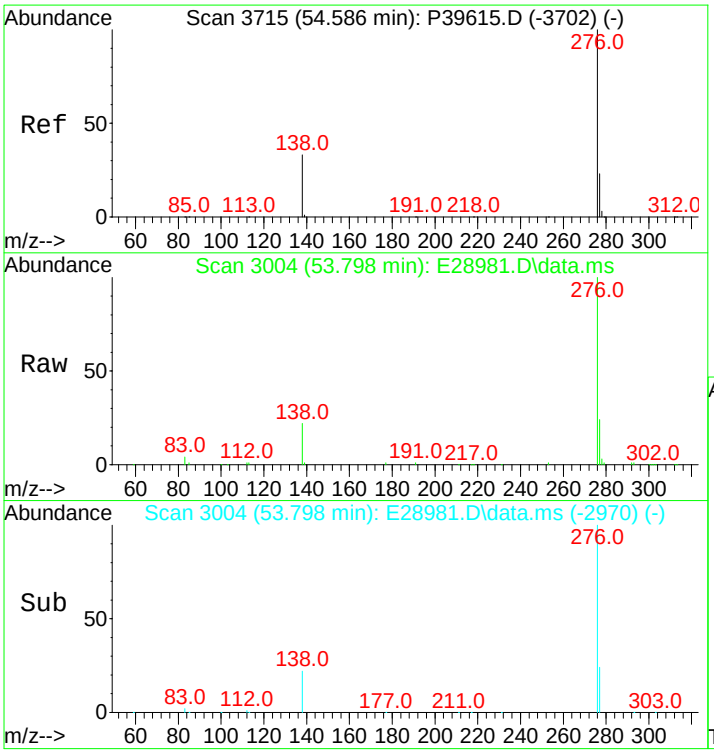


#92
Dibenz[ah]+[ac]anthracene
Concen: 1270.41 ng/mL m
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:278 Resp: 189752

Ion	Ratio	Lower	Upper
278	100		
139	13.9	11.6	17.4
279	21.4	19.3	28.9

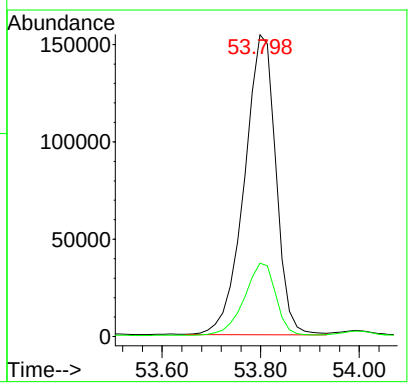


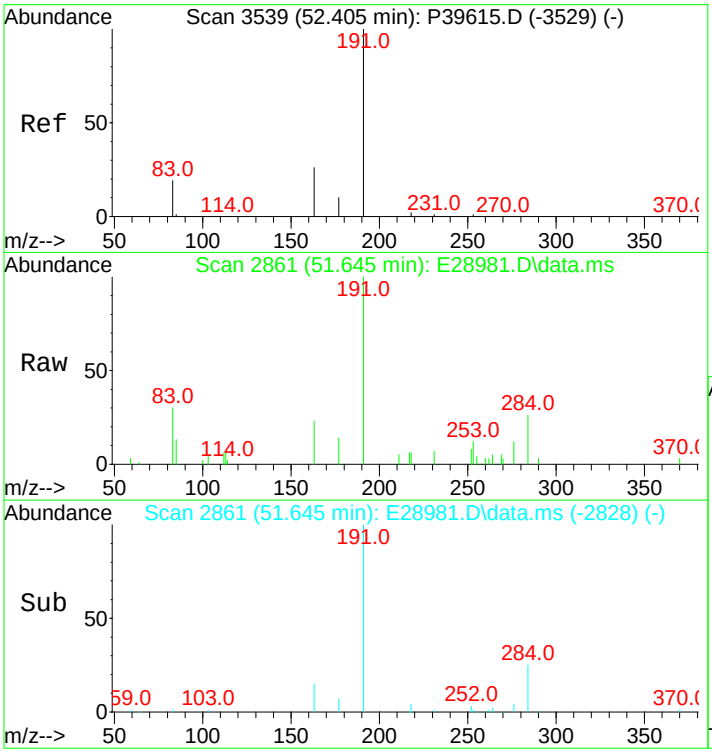


#93
Benzo[g,h,i]perylene
Concen: 4530.75 ng/mL
RT: 53.798 min Scan# 3004
Delta R.T. 0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:276 Resp: 685283

Ion	Ratio	Lower	Upper
276	100		
277	24.0	19.1	28.7

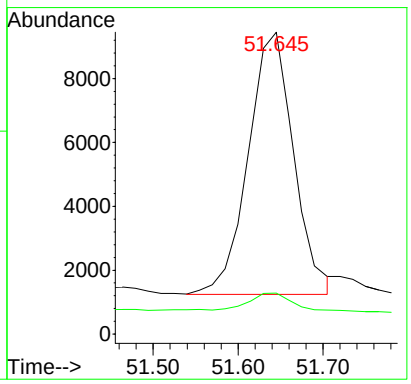


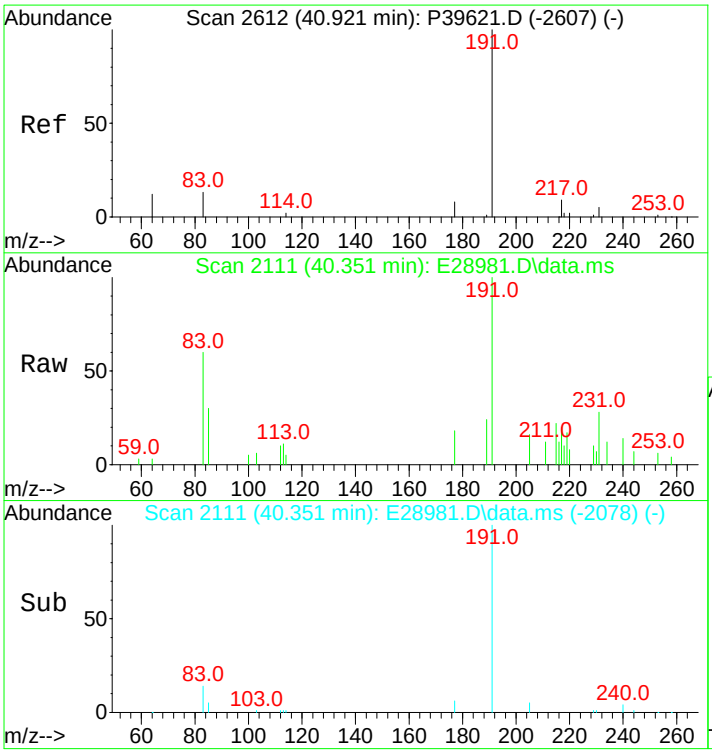


#94
Hopane (T19)
Concen: 724.52 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:191 Resp: 30647

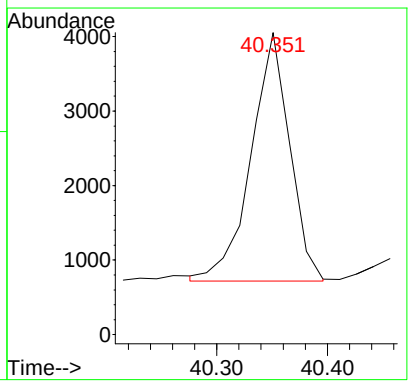
Ion	Ratio	Lower	Upper
191	100		
177	8.8	11.6	17.4#

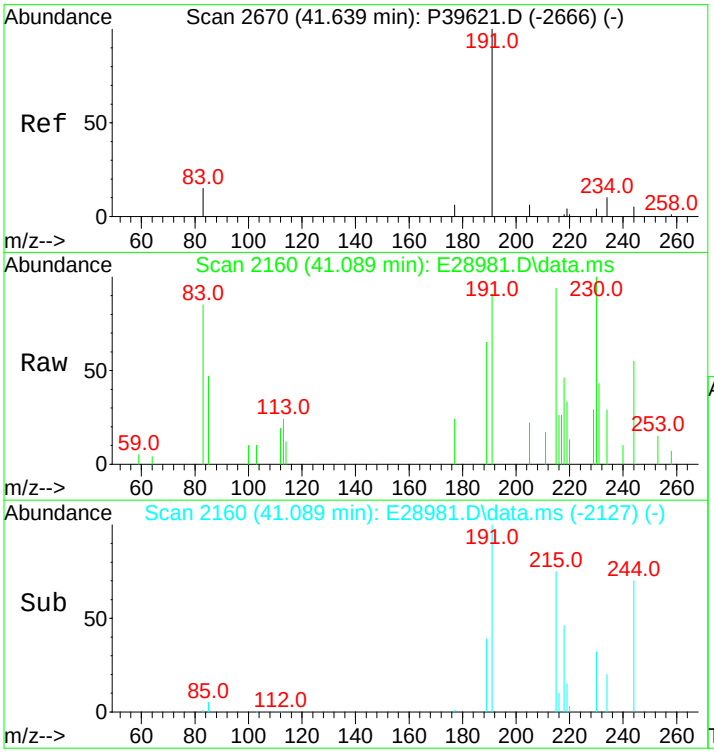




#96
C23 Tricyclic Terpane (T4)
Concen: 190.76 ng/ml m
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

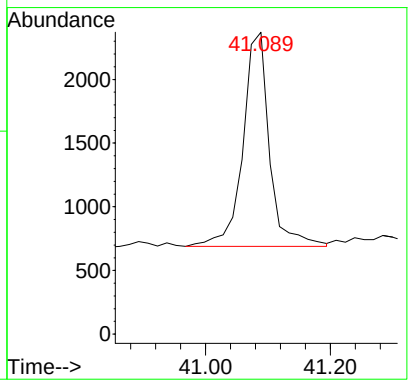
Tgt Ion:191 Resp: 8069

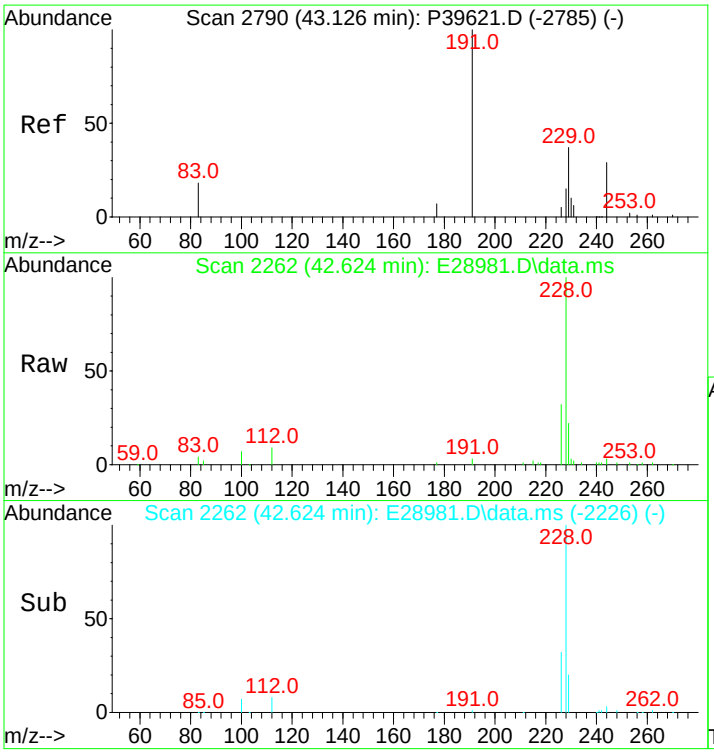




#97
C24 Tricyclic Terpane (T5)
Concen: 117.64 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

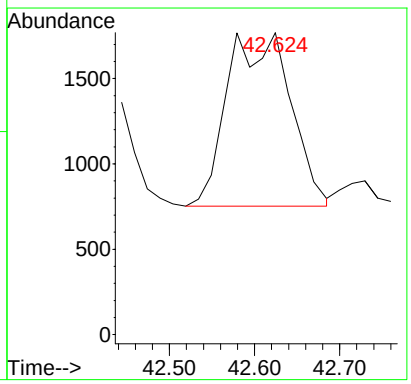
Tgt Ion:191 Resp: 4976

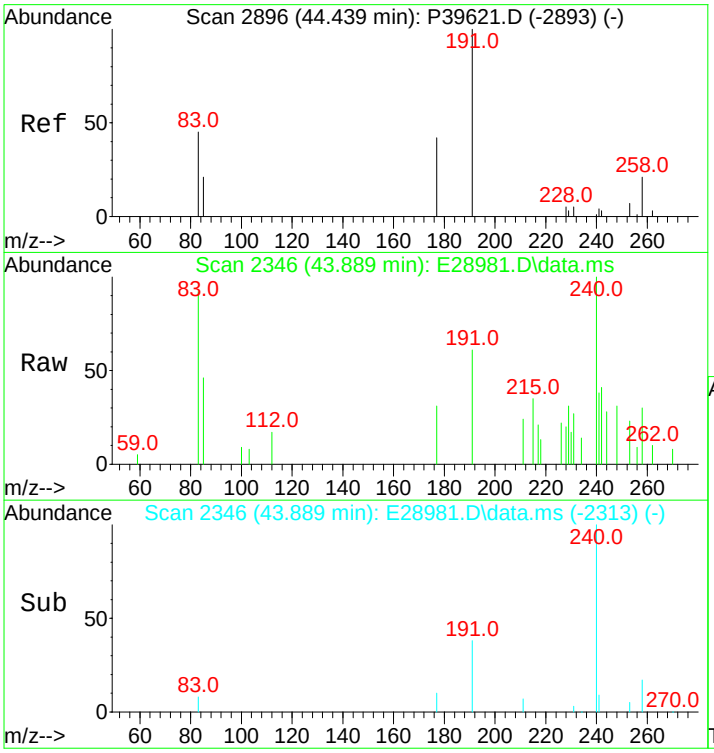




#98
C25 Tricyclic Terpane (T6)
Concen: 123.64 ng/ml
RT: 42.624 min Scan# 2262
Delta R.T. 0.045 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

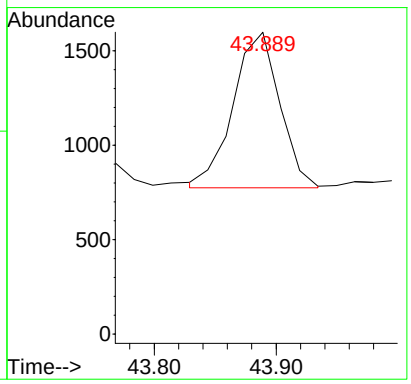
Tgt Ion:191 Resp: 5230

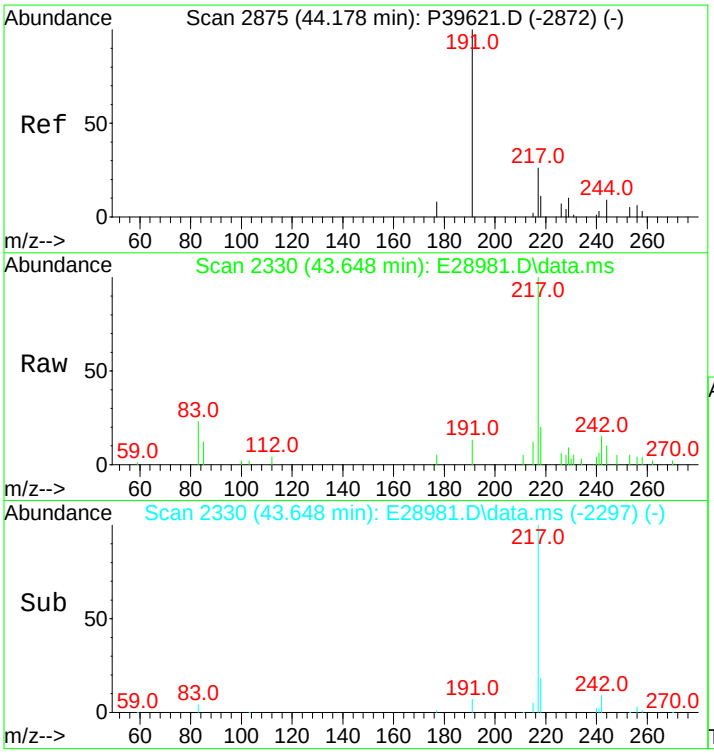




#99
C24 Tetracyclic Terpane (T6a)
Concen: 51.70 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

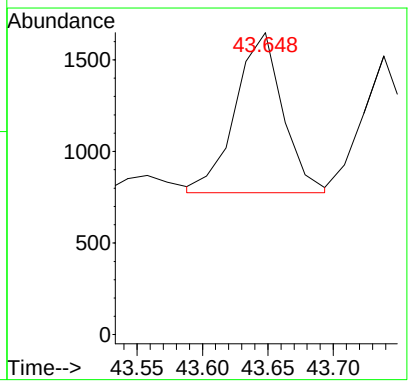
Tgt Ion:191 Resp: 2187

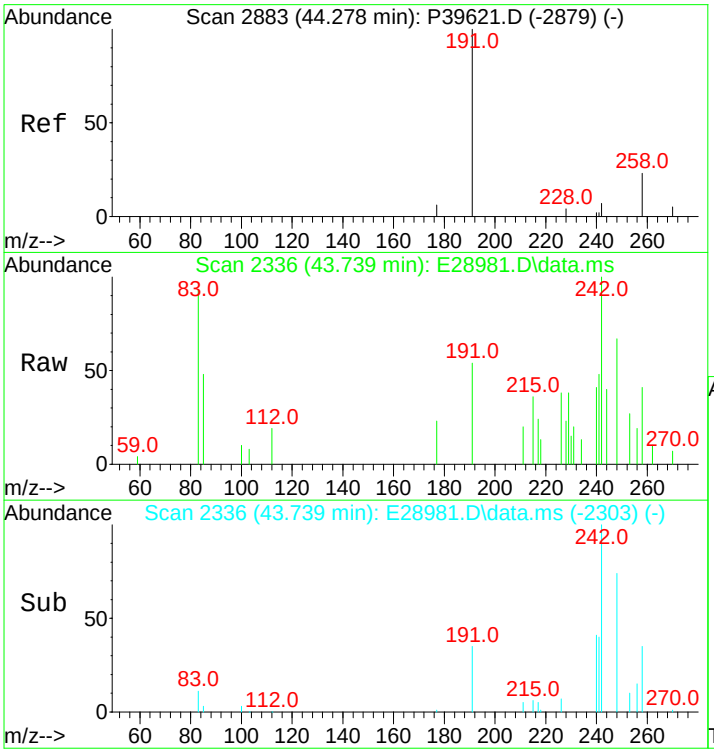




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 52.08 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

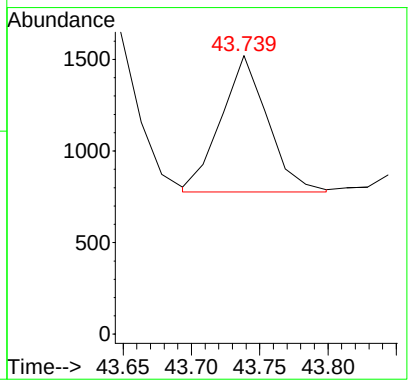
Tgt Ion:191 Resp: 2203

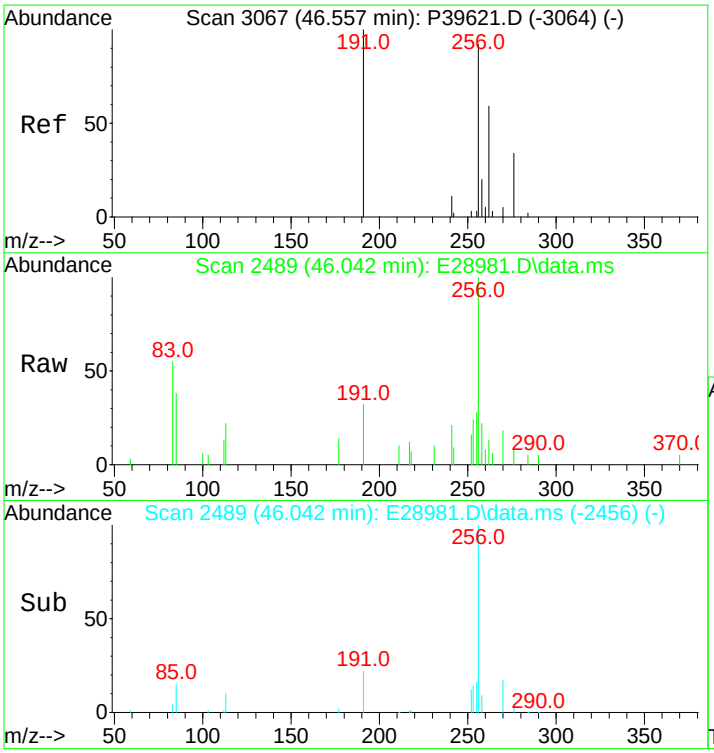




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 41.75 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

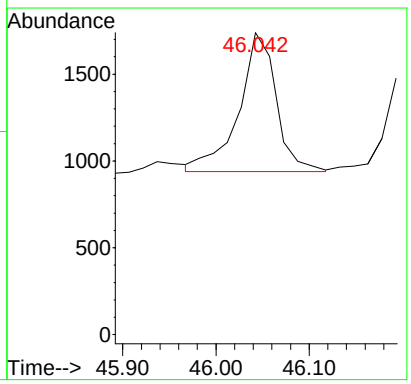
Tgt Ion:191 Resp: 1766

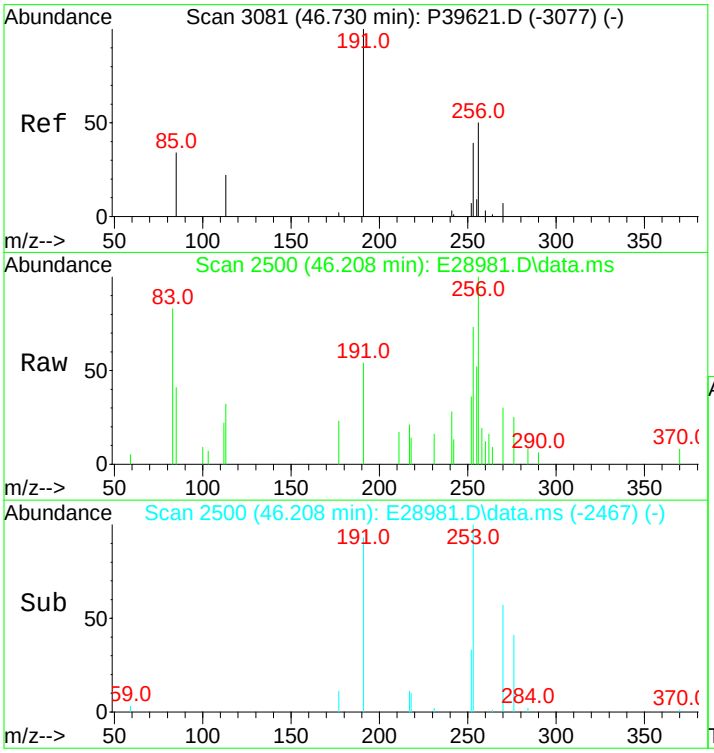




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 52.58 ng/ml m
RT: 46.042 min Scan# 2489
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

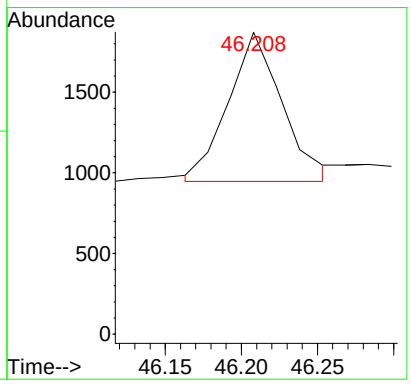
Tgt Ion:191 Resp: 2224

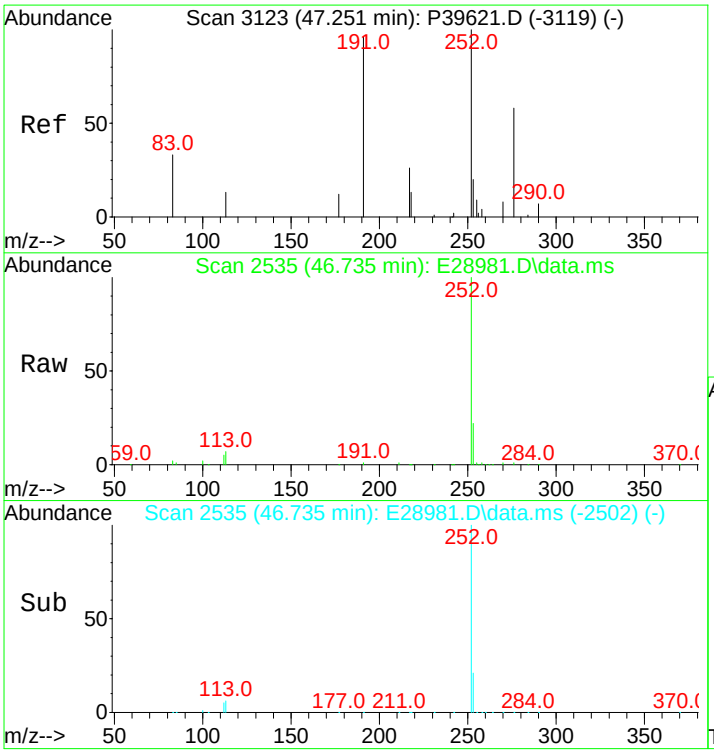




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 53.66 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

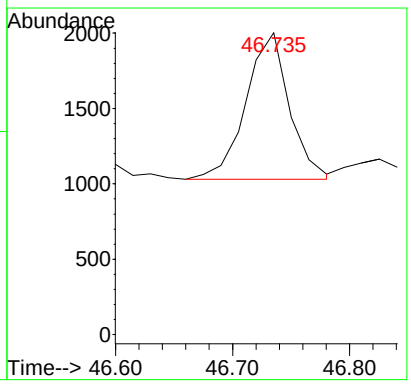
Tgt Ion:191 Resp: 2270

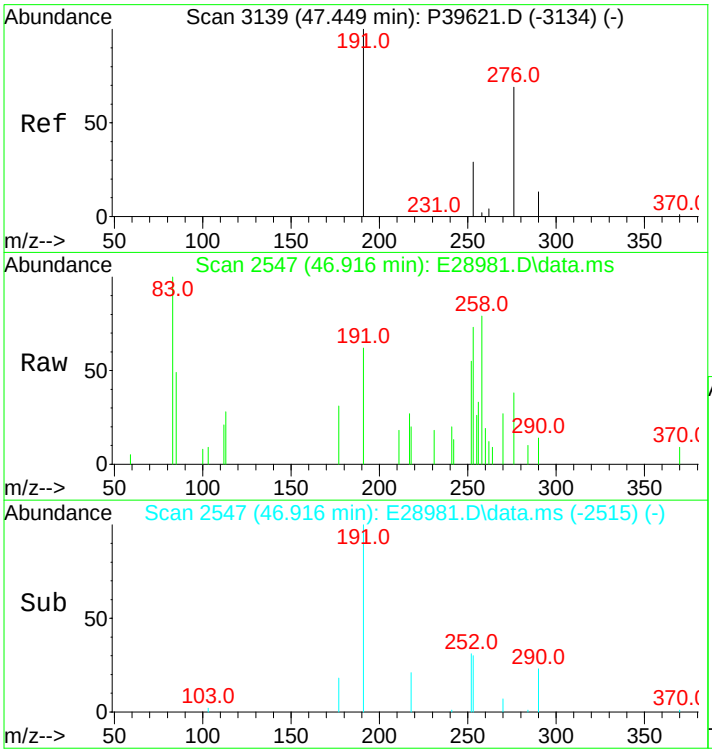




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 59.22 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

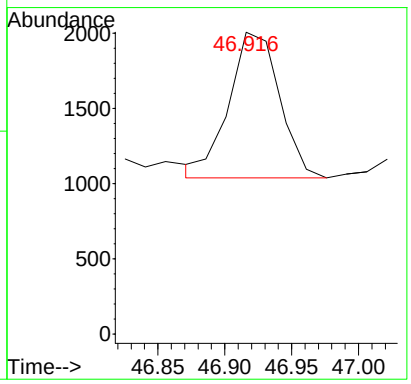
Tgt Ion:191 Resp: 2505

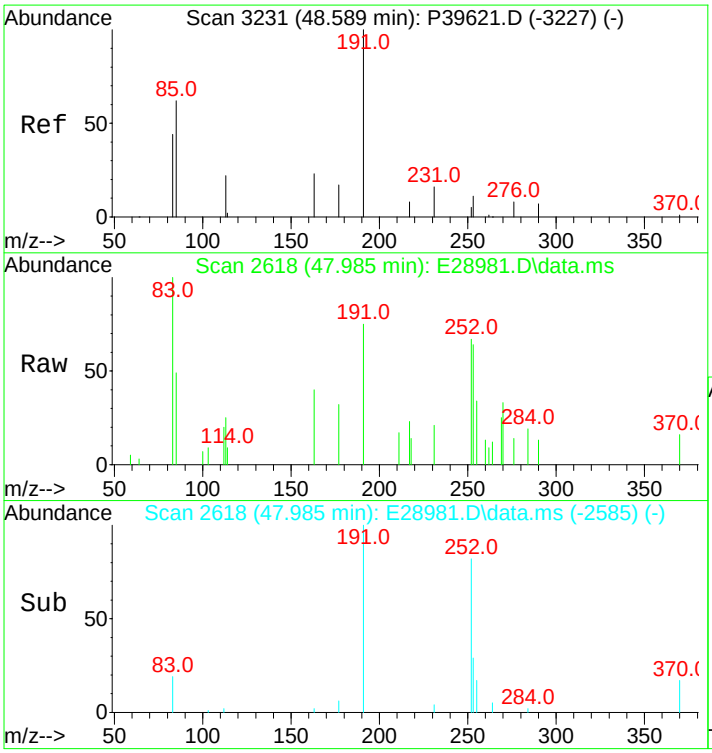




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 60.45 ng/ml
RT: 46.916 min Scan# 2547
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

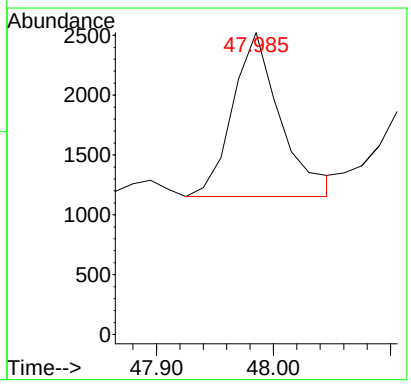
Tgt Ion:191 Resp: 2557

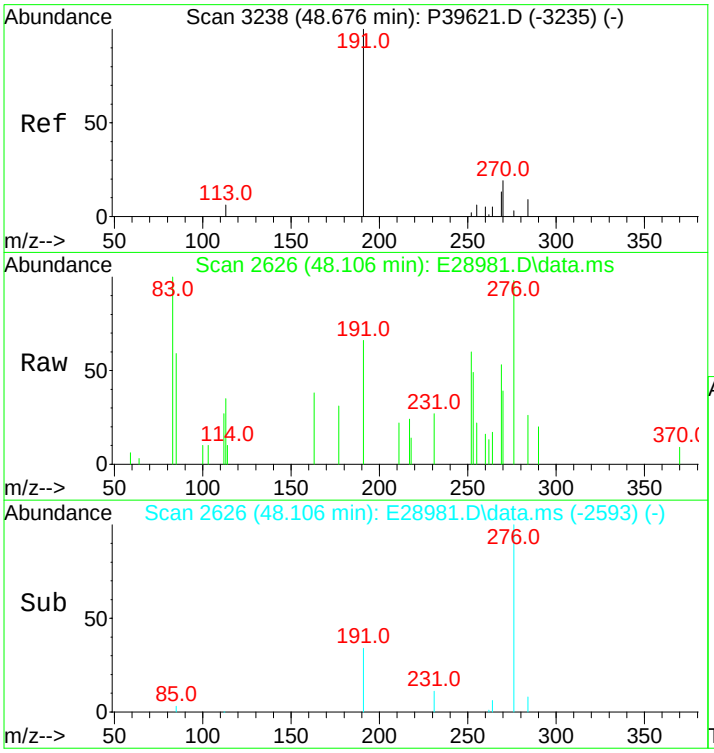




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 92.51 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

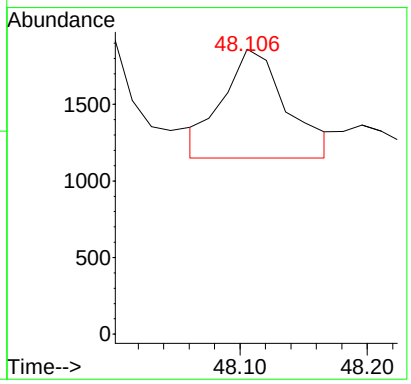
Tgt Ion:191 Resp: 3913

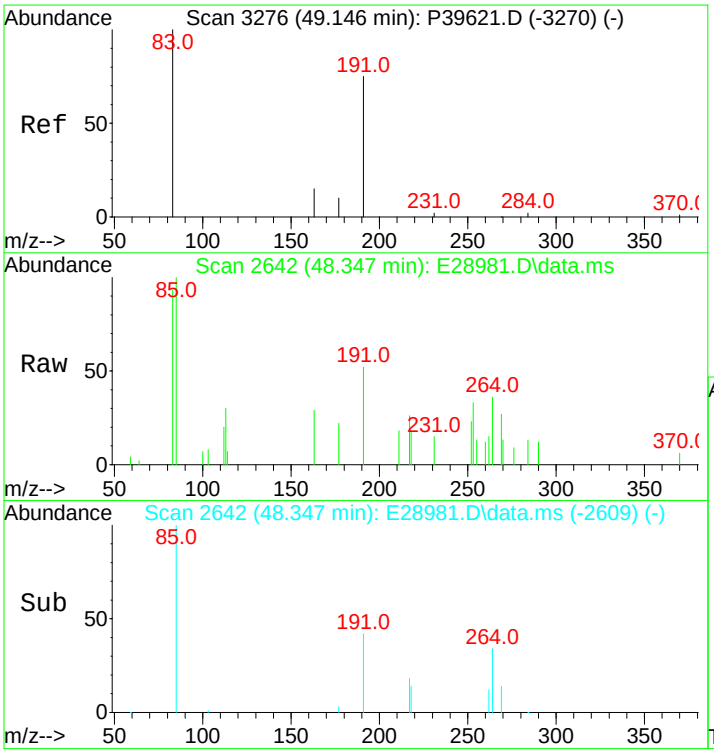




#107
C30 Tricyclic Terpane-22S
Concen: 58.46 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

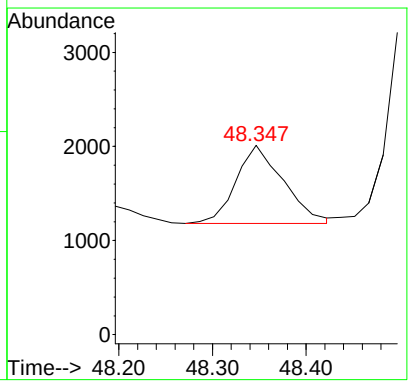
Tgt Ion:191 Resp: 2473

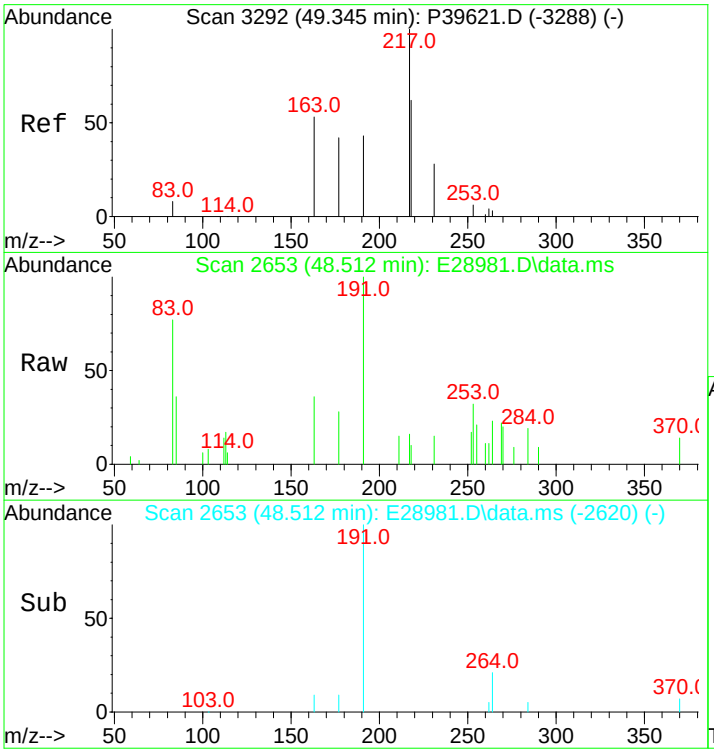




#108
C30 Tricyclic Terpane-22R
Concen: 69.65 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

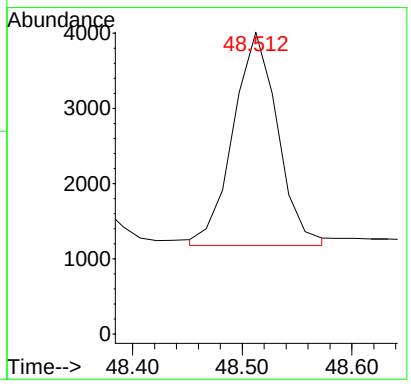
Tgt Ion:191 Resp: 2946

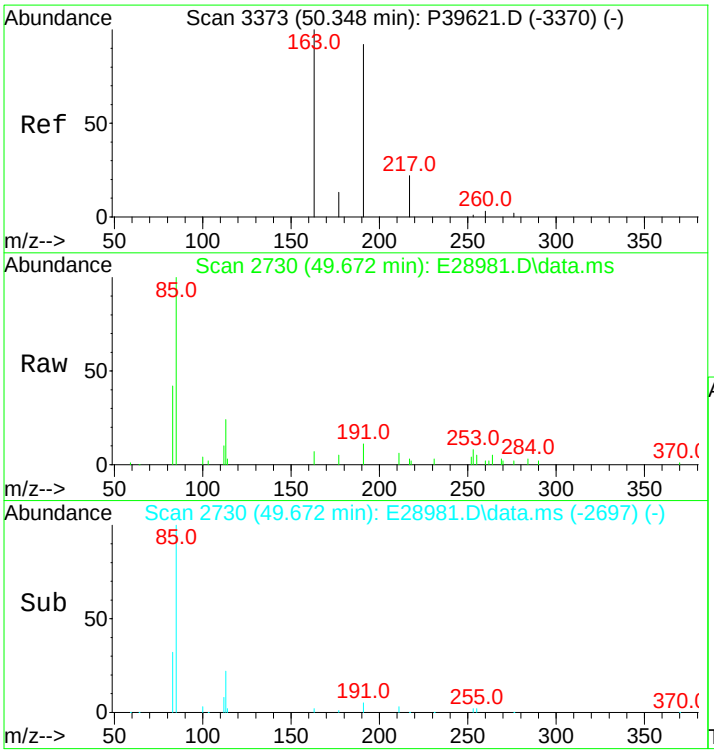




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 187.64 ng/ml m
RT: 48.512 min Scan# 2653
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

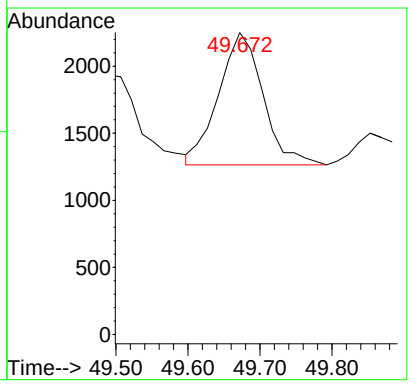
Tgt Ion:191 Resp: 7937

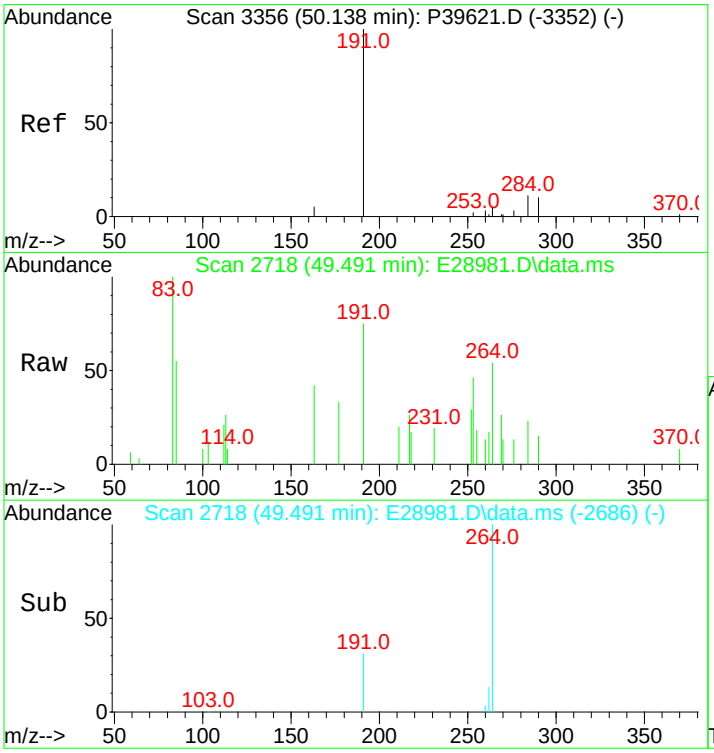




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 99.67 ng/ml
RT: 49.672 min Scan# 2730
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

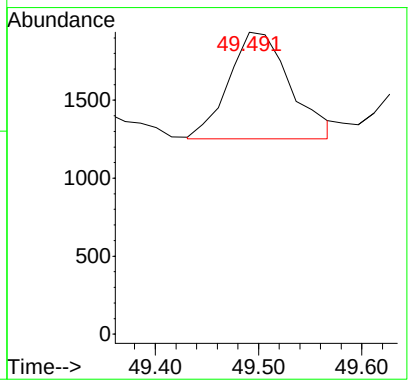
Tgt Ion:191 Resp: 4216

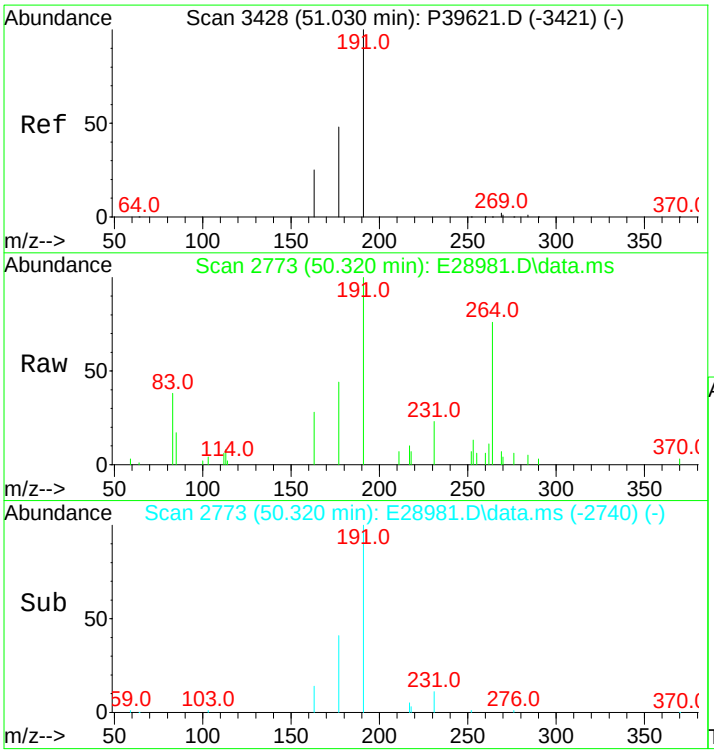




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 67.23 ng/ml m
RT: 49.491 min Scan# 2718
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

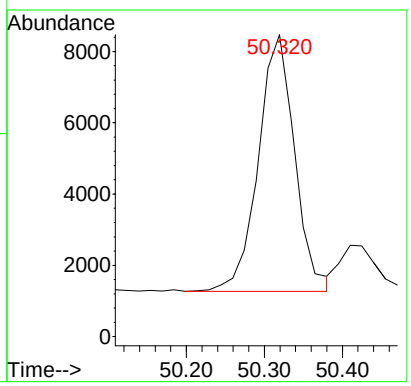
Tgt Ion:191 Resp: 2844

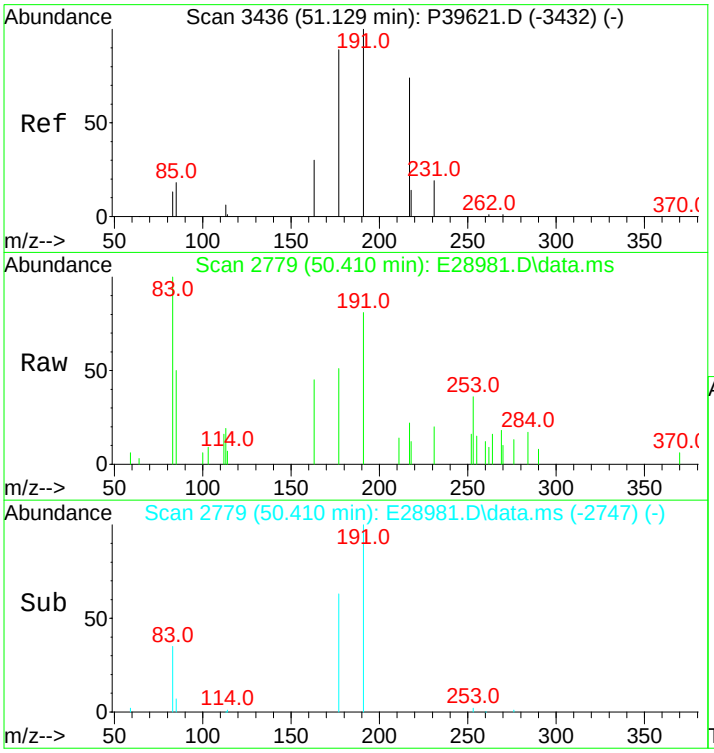




#112
30-Norhopane (T15)
Concen: 551.45 ng/ml
RT: 50.320 min Scan# 2773
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

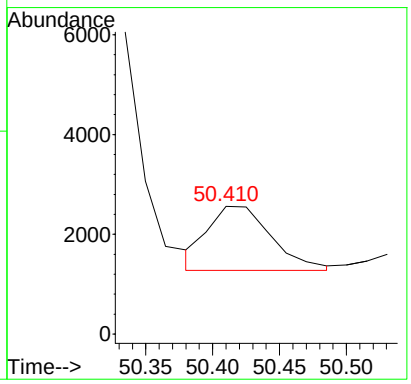
Tgt Ion:191 Resp: 23326

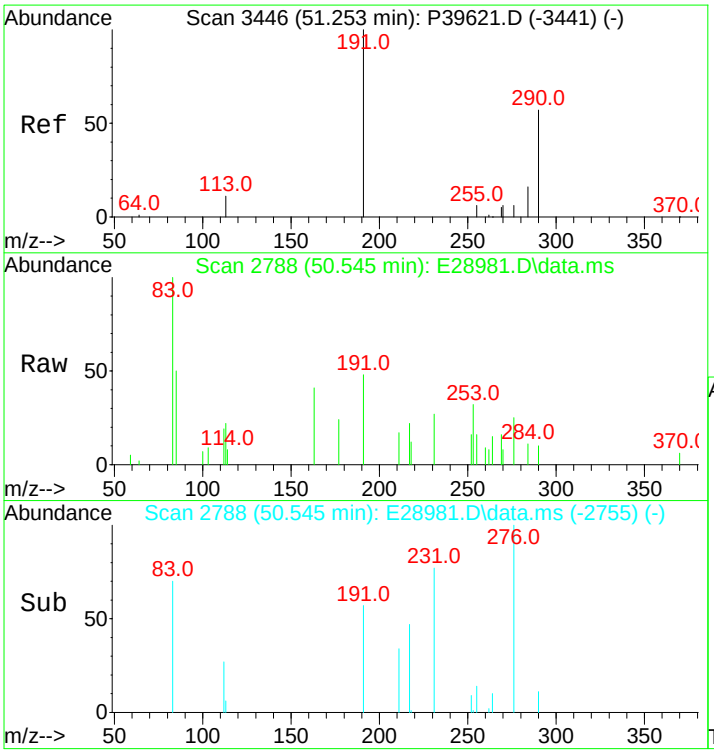




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 100.43 ng/ml
RT: 50.410 min Scan# 2779
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

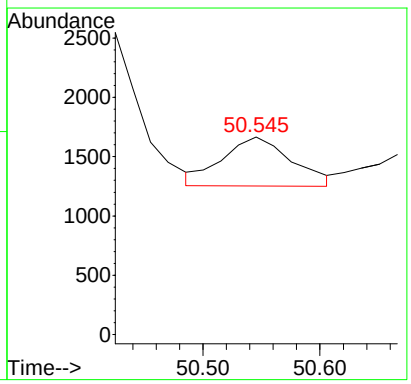
Tgt Ion:191 Resp: 4248

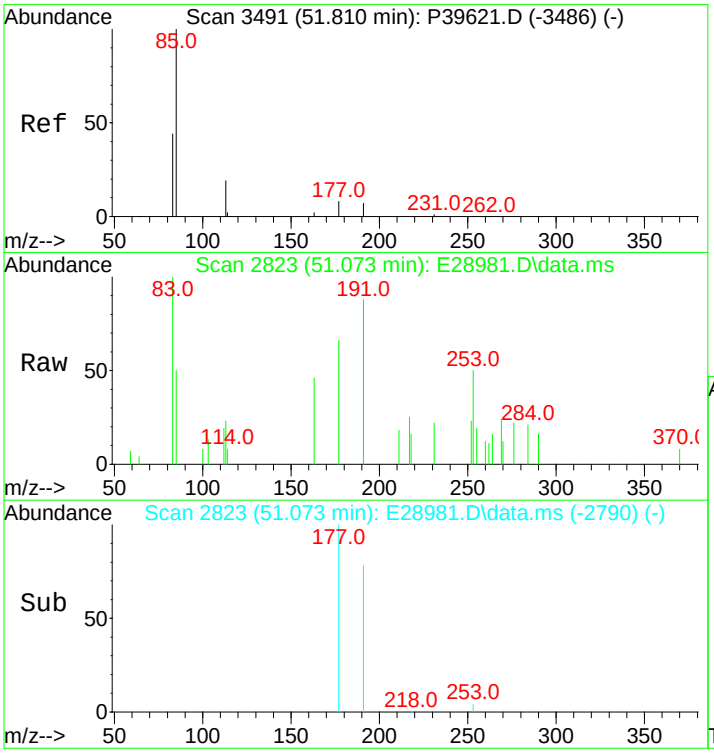




#114
17a(H)-Diahopane (X)
Concen: 40.05 ng/ml
RT: 50.545 min Scan# 2788
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

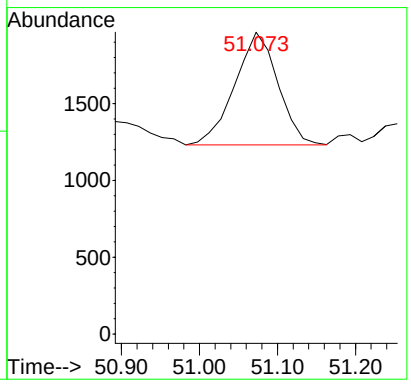
Tgt Ion:191 Resp: 1694

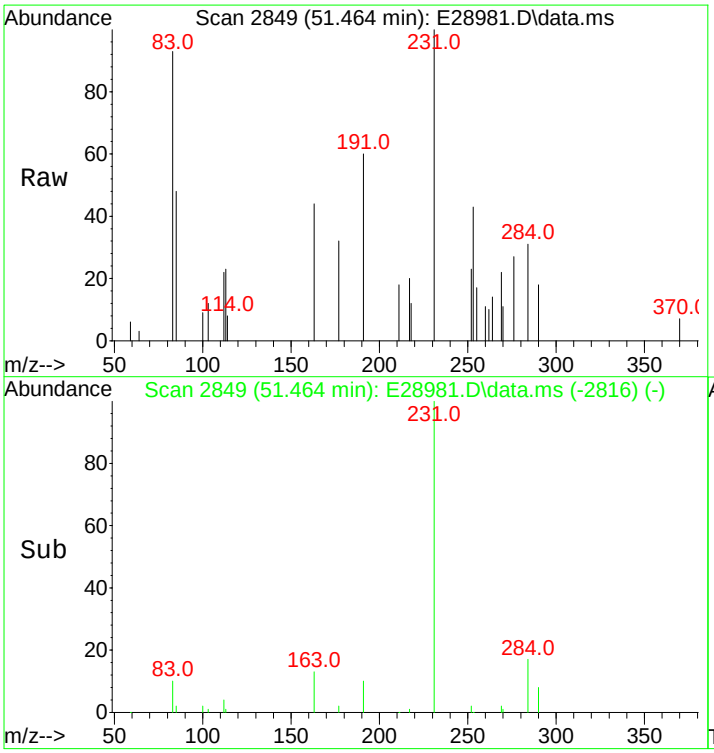




#115
30-Normoretane (T17)
Concen: 66.67 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

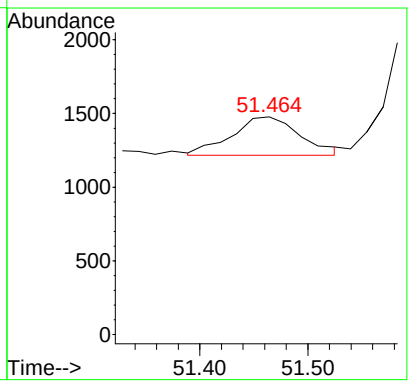
Tgt Ion:191 Resp: 2820

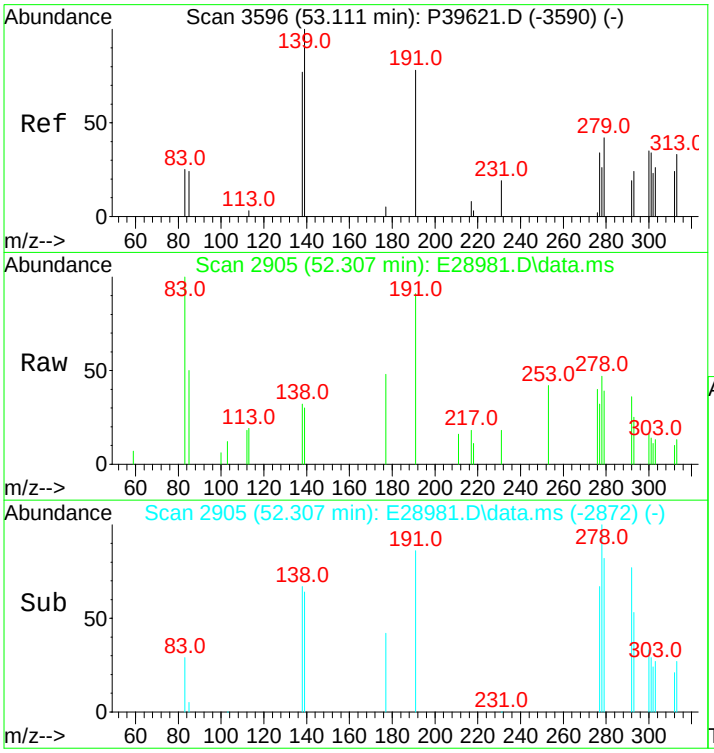




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 27.02 ng/ml m
RT: 51.464 min Scan# 2849
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

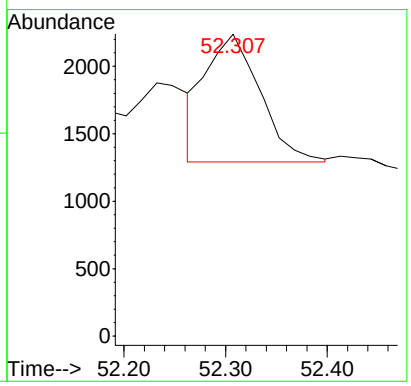
Tgt Ion:191 Resp: 1143

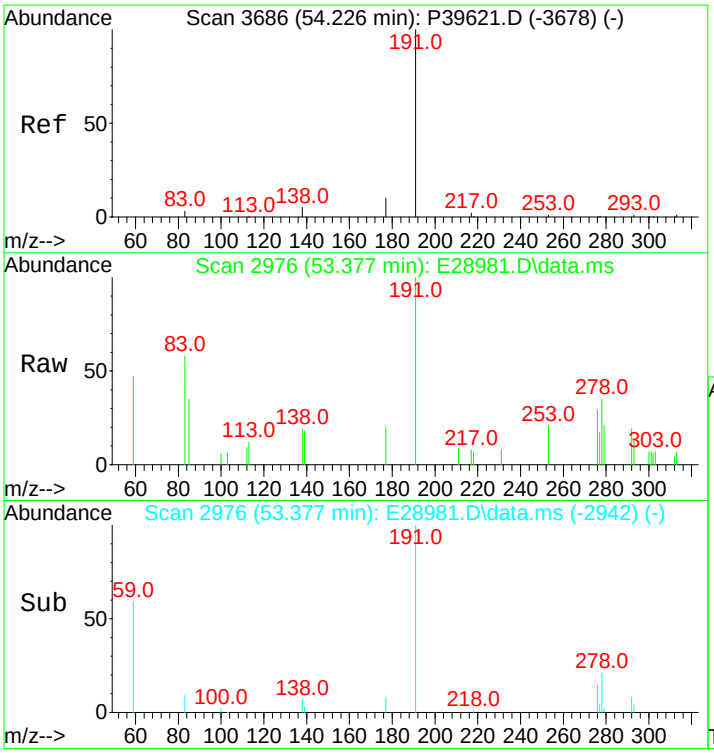




#117
Moretane (T20)
Concen: 83.07 ng/ml m
RT: 52.307 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

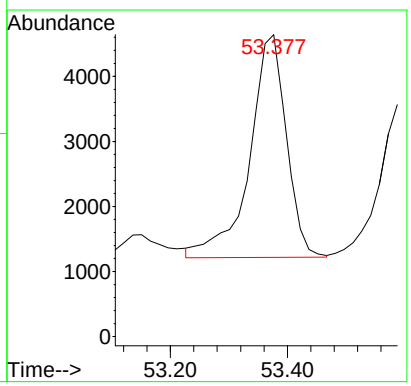
Tgt Ion:191 Resp: 3514

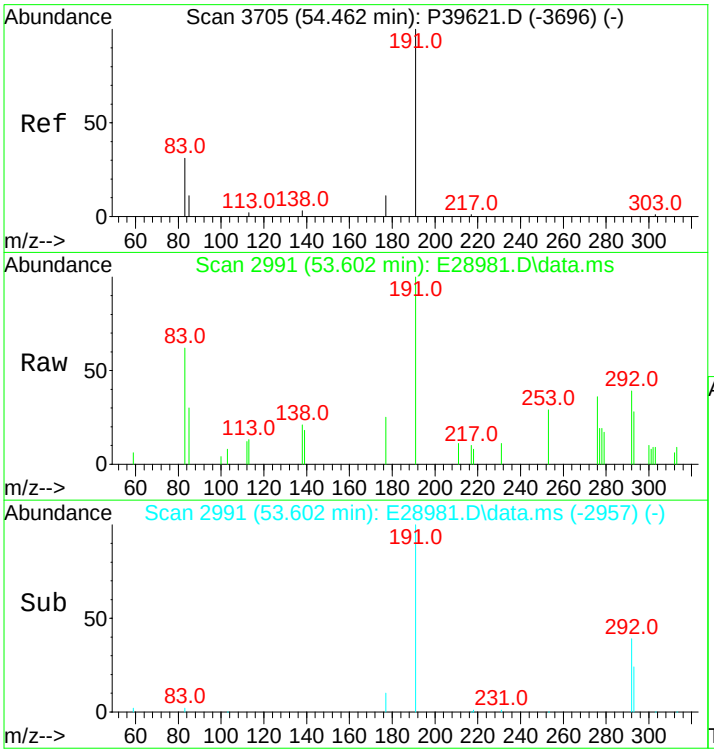




#118
30-Homohopane-22S (T21)
Concen: 353.74 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

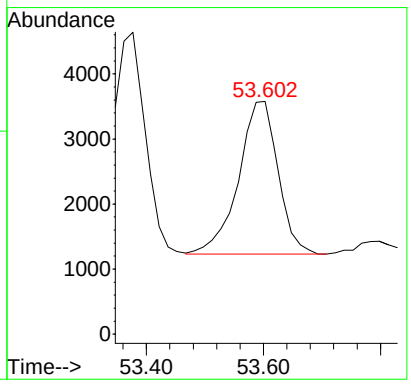
Tgt Ion:191 Resp: 14963

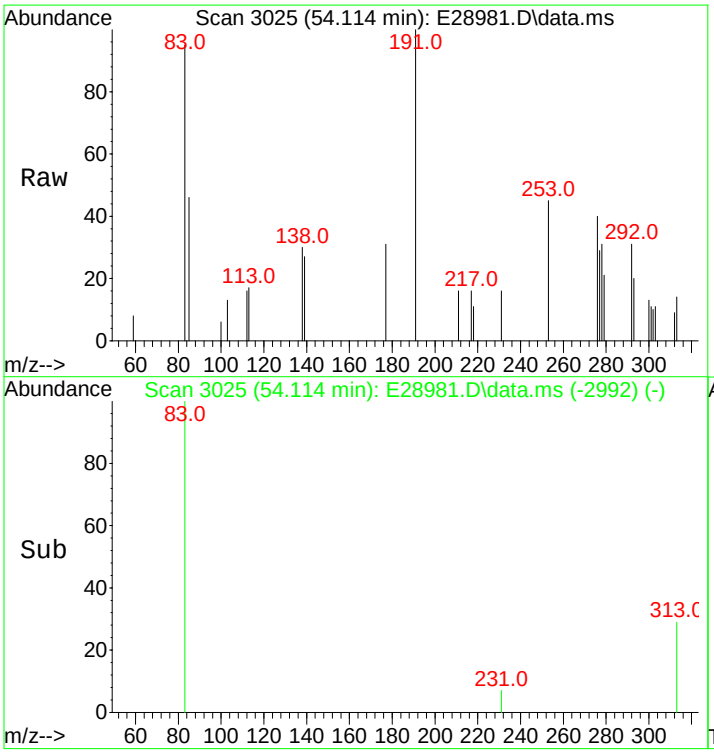




#119
30-Homohopane-22R (T22)
Concen: 259.72 ng/ml
RT: 53.602 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

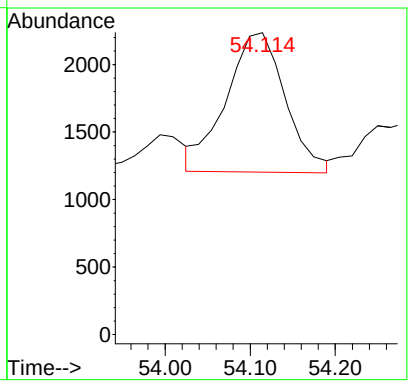
Tgt Ion:191 Resp: 10986

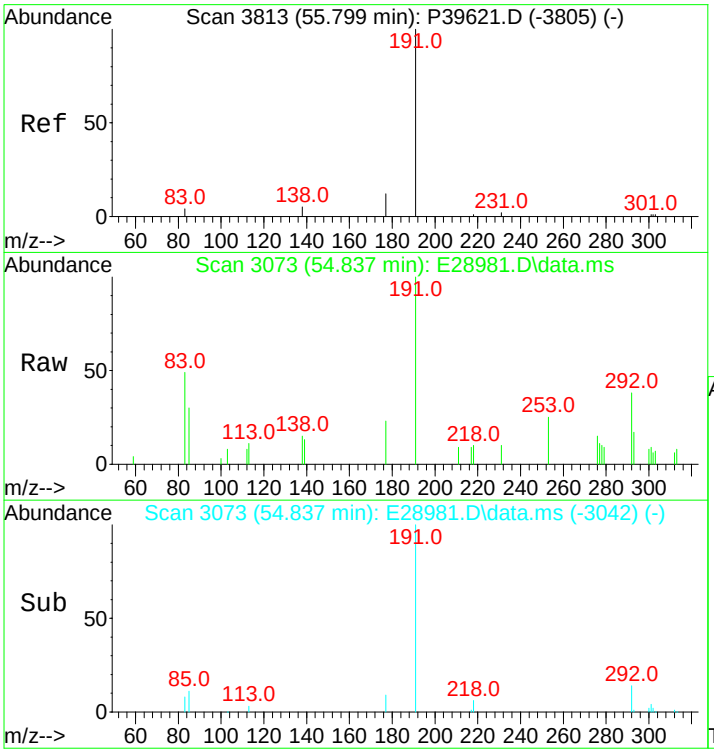




#120
Gammacerane/C32-diahopane
Concen: 118.04 ng/mL
RT: 54.114 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

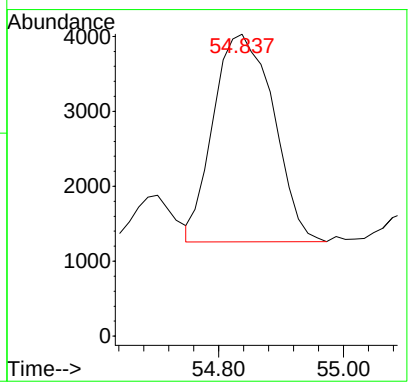
Tgt Ion:191 Resp: 4993

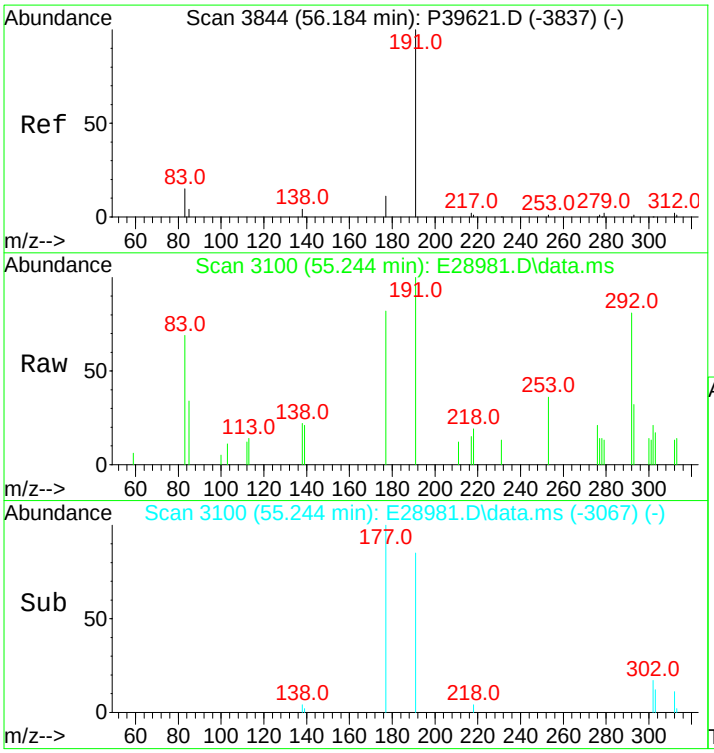




#121
30,31-Bishomohopane-22S (T26)
Concen: 436.55 ng/ml
RT: 54.837 min Scan# 3073
Delta R.T. -0.030 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

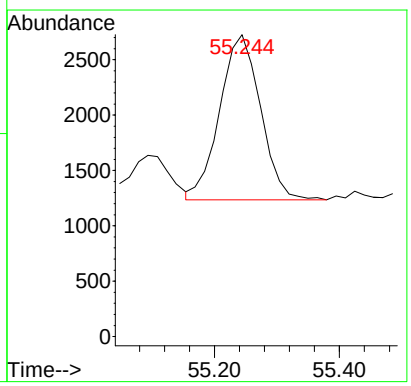
Tgt Ion:191 Resp: 18466

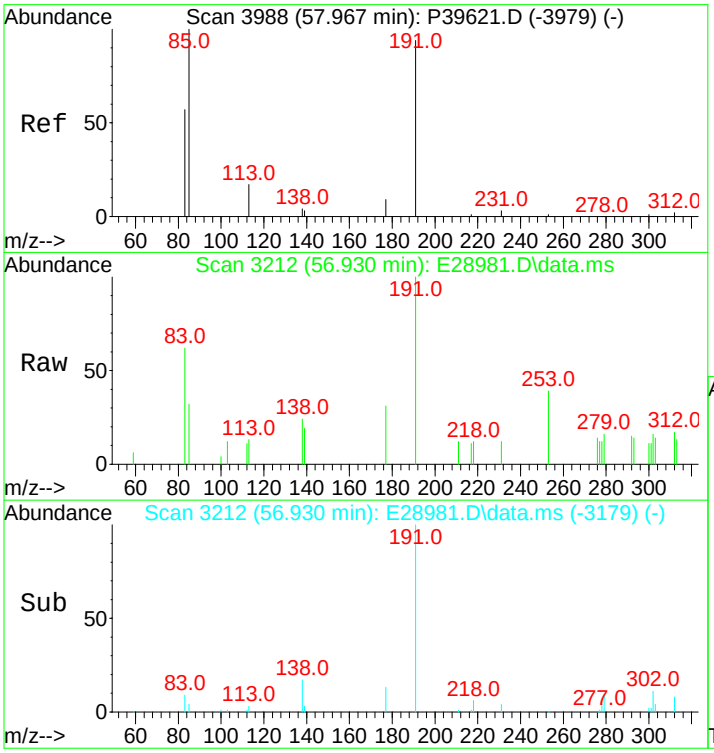




#122
30,31-Bishomohopane-22R (T27)
Concen: 160.33 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

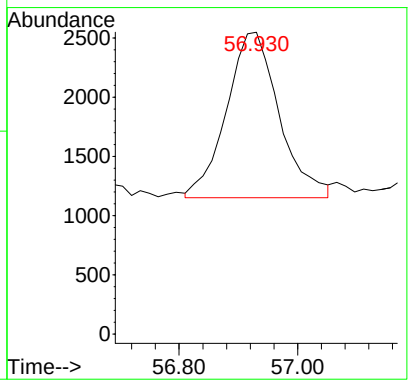
Tgt Ion:191 Resp: 6782

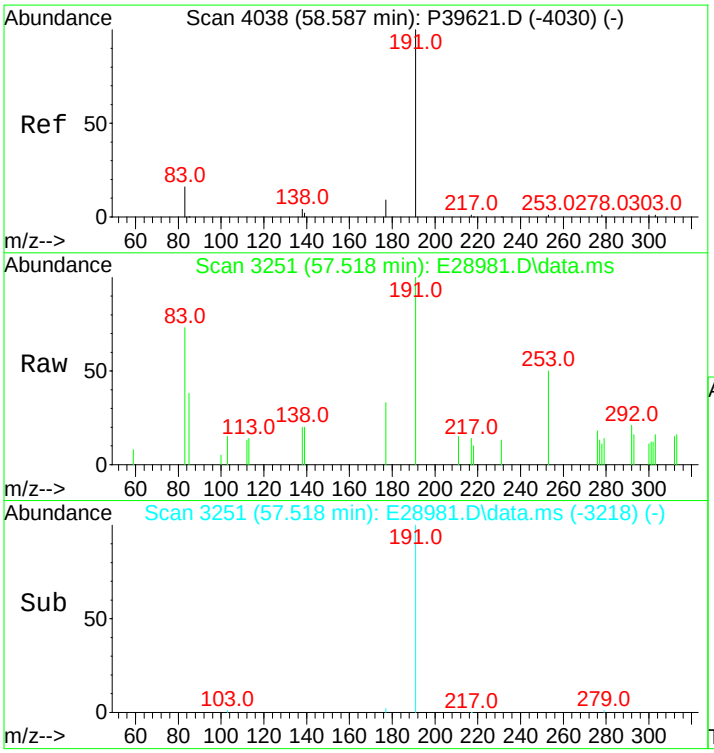




#123
30,31-Trishomohopane-22S (T30)
Concen: 203.64 ng/ml m
RT: 56.930 min Scan# 3212
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

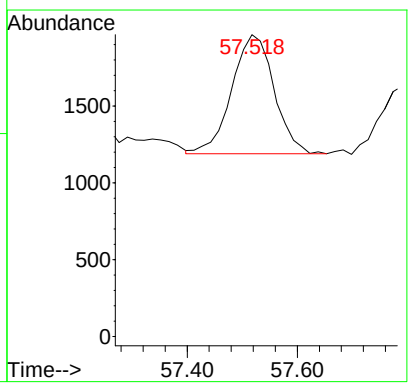
Tgt Ion:191 Resp: 8614

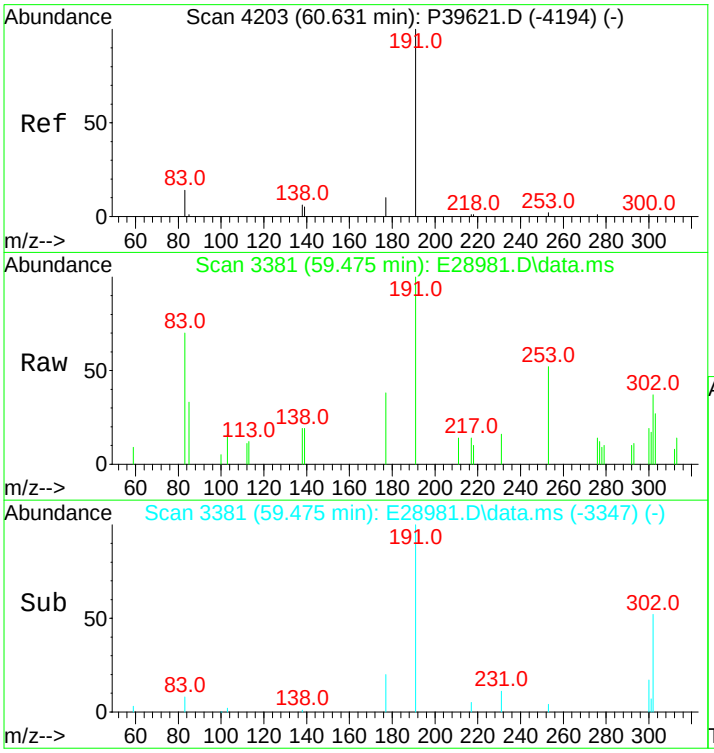




#124
30,31-Trishomohopane-22R (T31)
Concen: 97.68 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

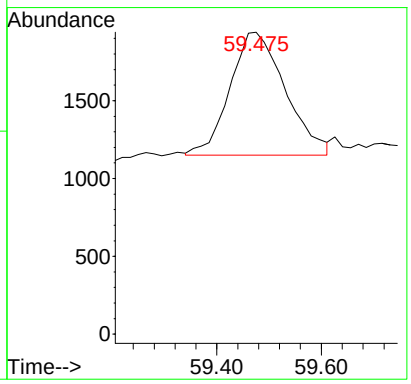
Tgt Ion:191 Resp: 4132

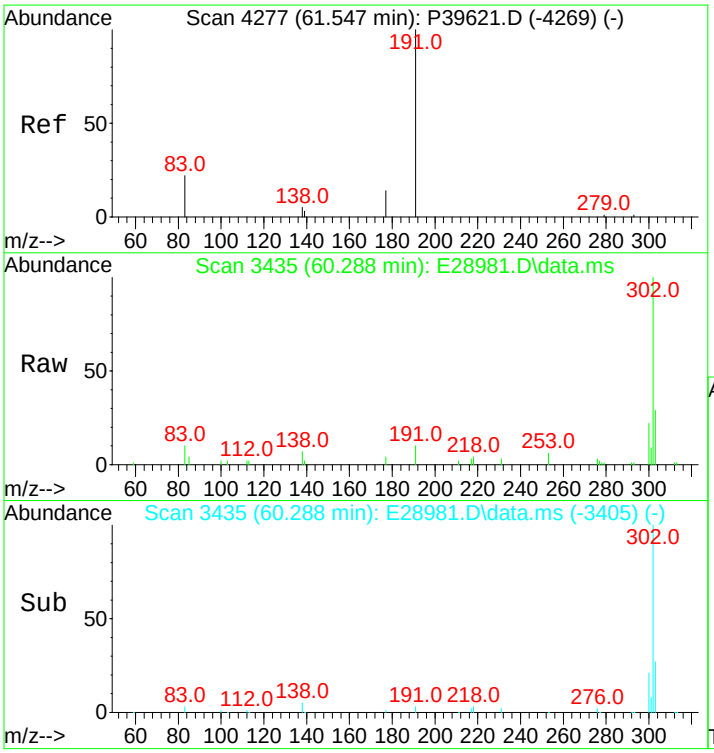




#125
Tetrakishomohopane-22S (T32)
Concen: 137.28 ng/ml m
RT: 59.475 min Scan# 3381
Delta R.T. 0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

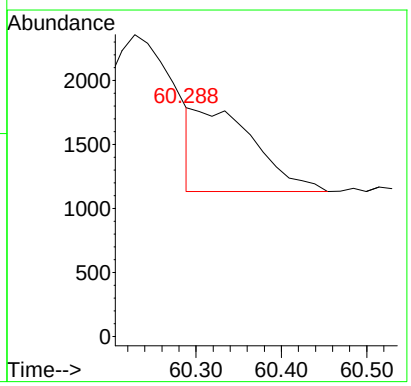
Tgt Ion:191 Resp: 5807

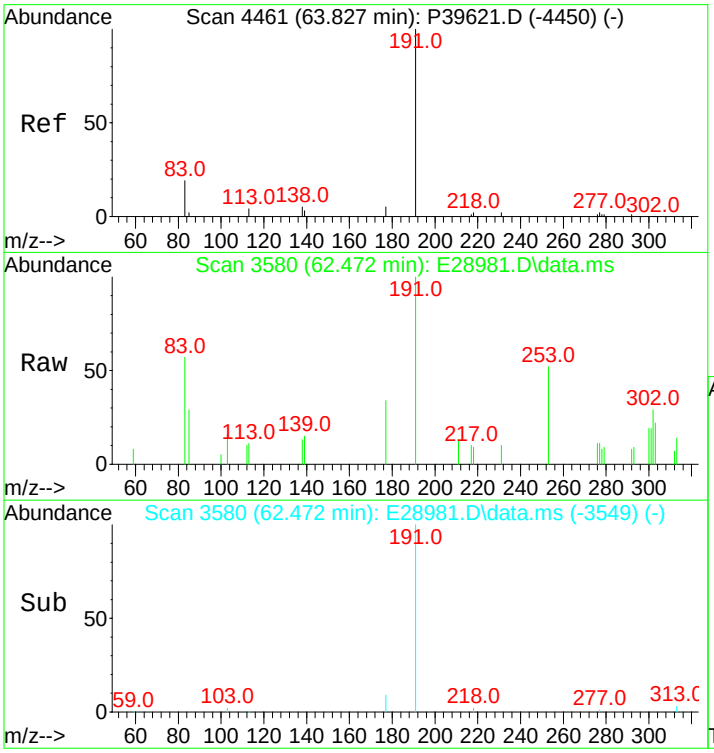




#126
Tetrakishomohopane-22R (T33)
Concen: 76.05 ng/ml m
RT: 60.288 min Scan# 3435
Delta R.T. -0.045 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

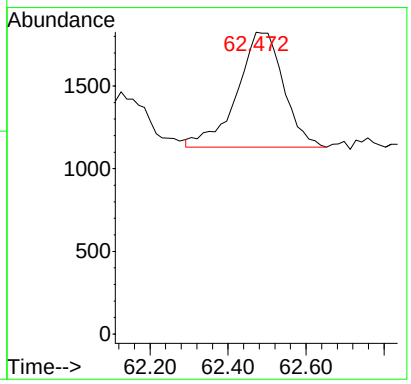
Tgt Ion:191 Resp: 3217

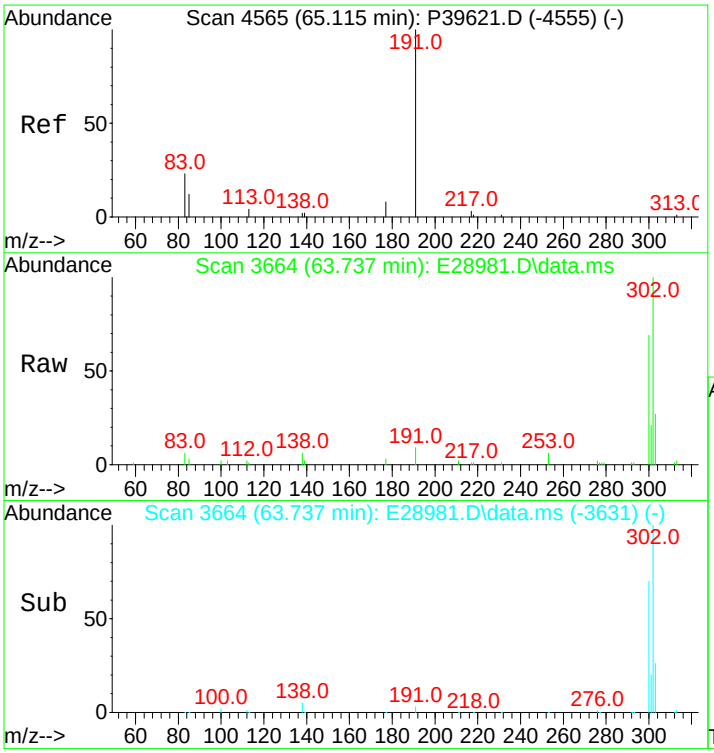




#127
Pentakishomohopane-22S (T34)
Concen: 136.01 ng/ml
RT: 62.472 min Scan# 3580
Delta R.T. -0.030 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

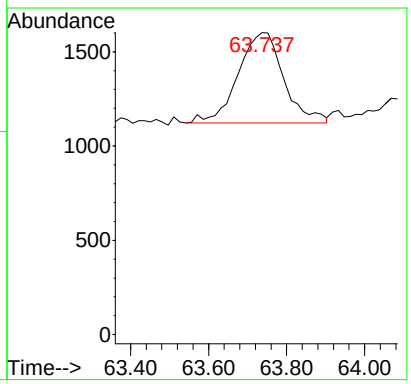
Tgt Ion:191 Resp: 5753

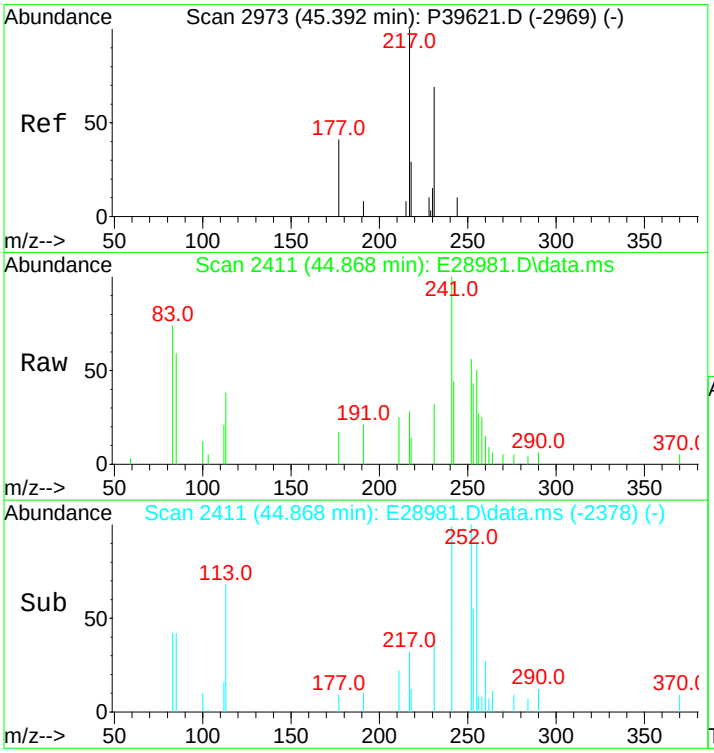




#128
Pentakishomohopane-22R (T35)
Concen: 92.13 ng/ml
RT: 63.737 min Scan# 3664
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

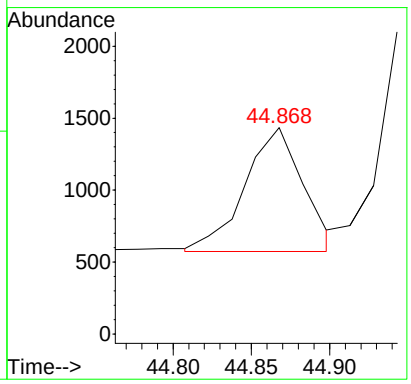
Tgt Ion:191 Resp: 3897

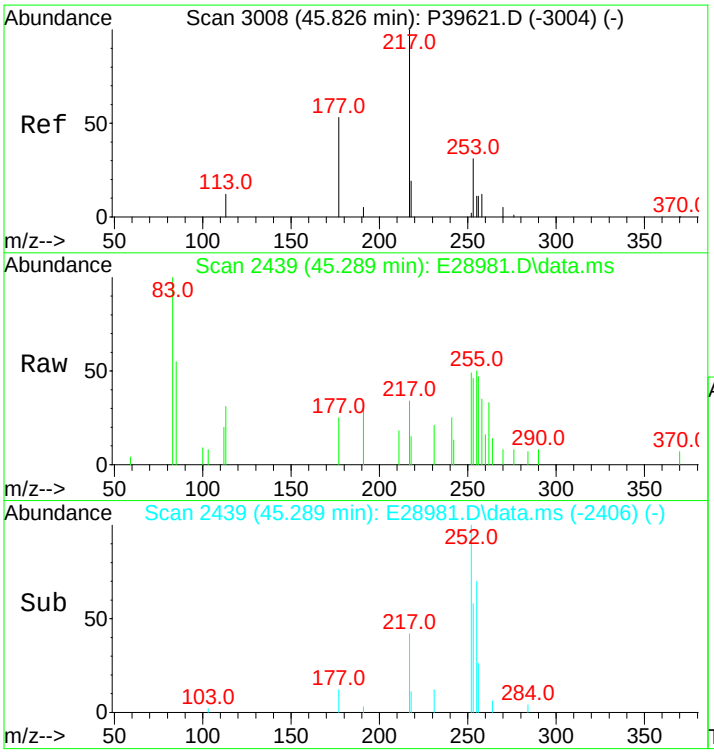




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 100.61 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

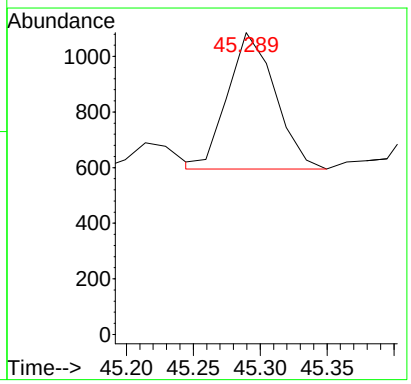
Tgt Ion:217 Resp: 2235

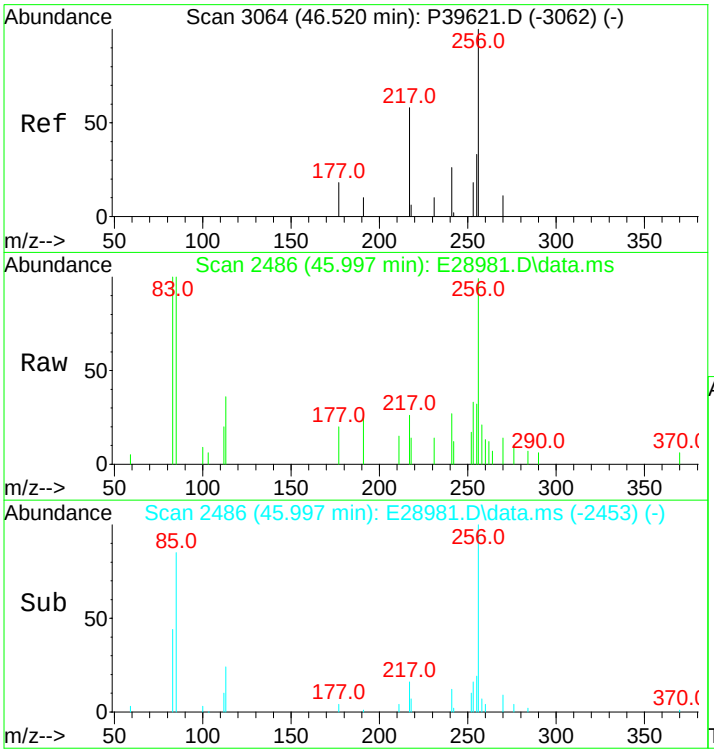




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 54.43 ng/ml
RT: 45.289 min Scan# 2439
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

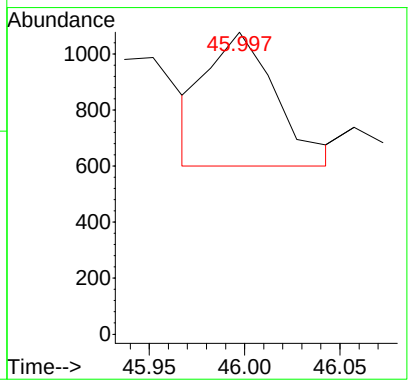
Tgt Ion:217 Resp: 1209

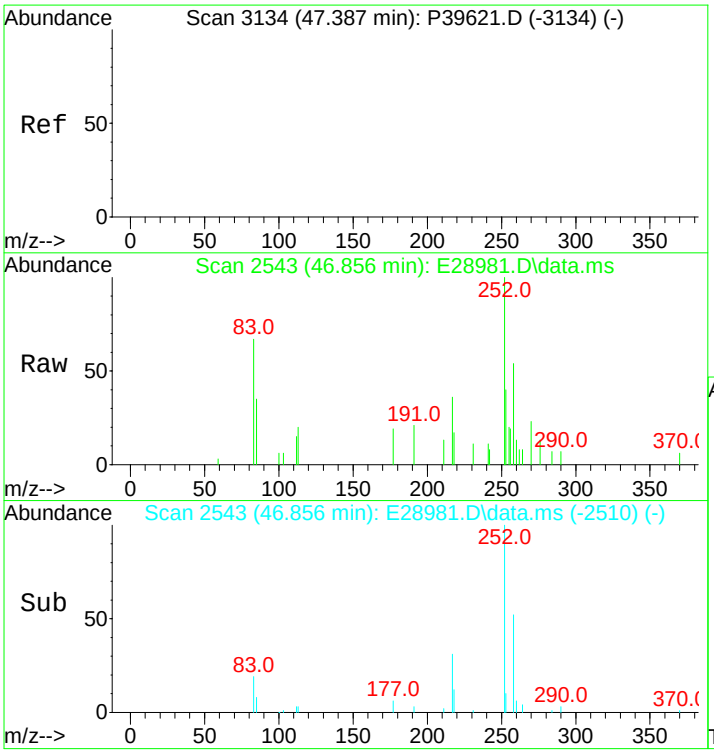




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 53.80 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

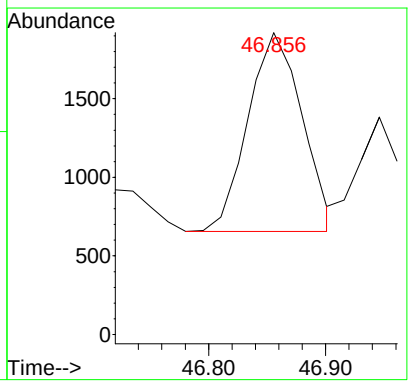
Tgt Ion:217 Resp: 1195

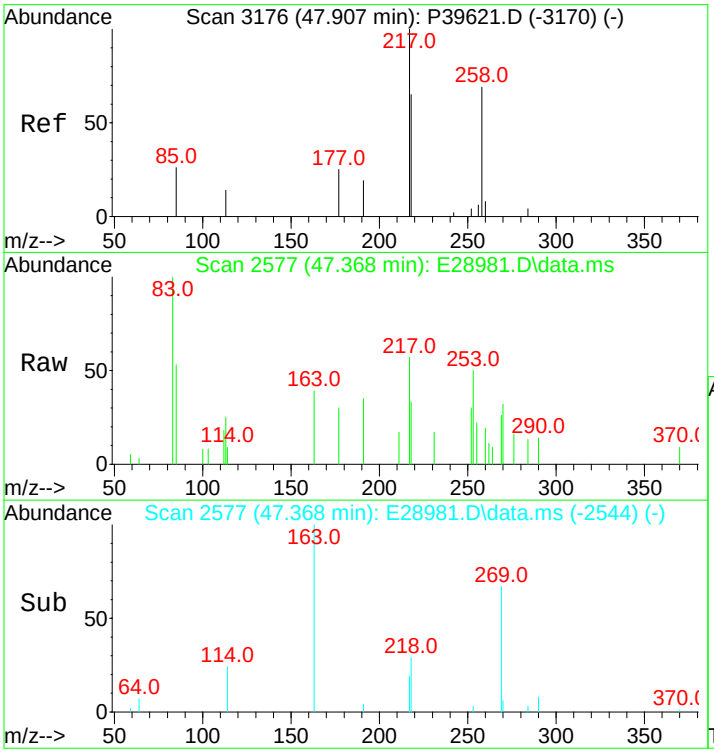




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 182.99 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

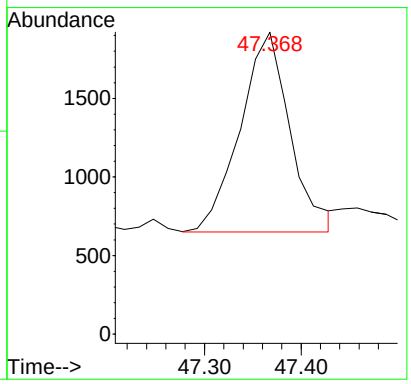
Tgt Ion:217 Resp: 4065

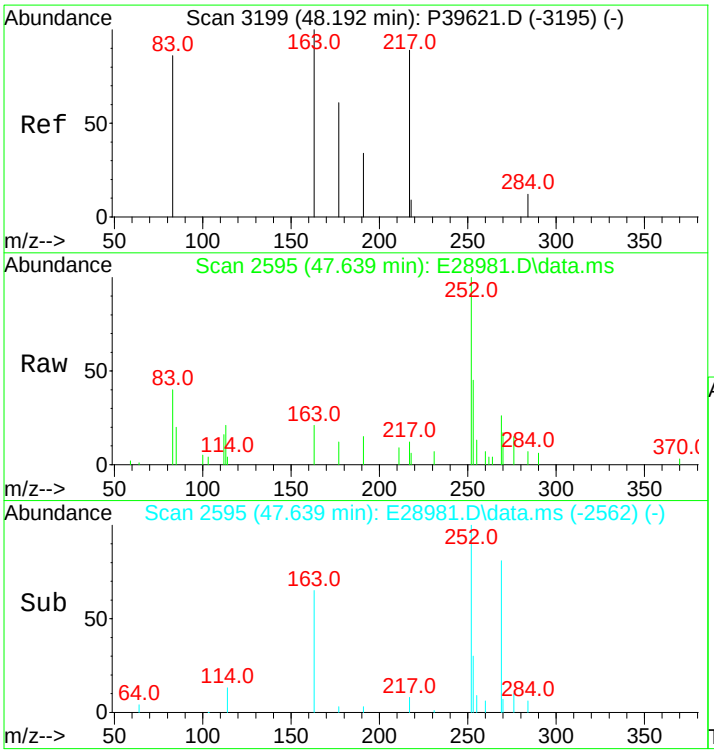




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 205.50 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

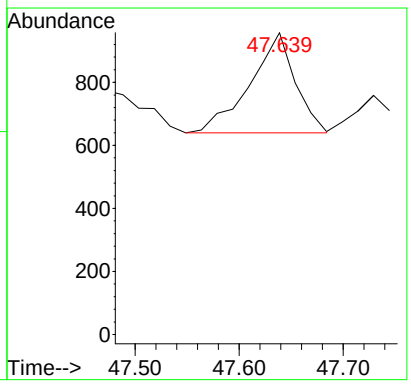
Tgt Ion:217 Resp: 4565

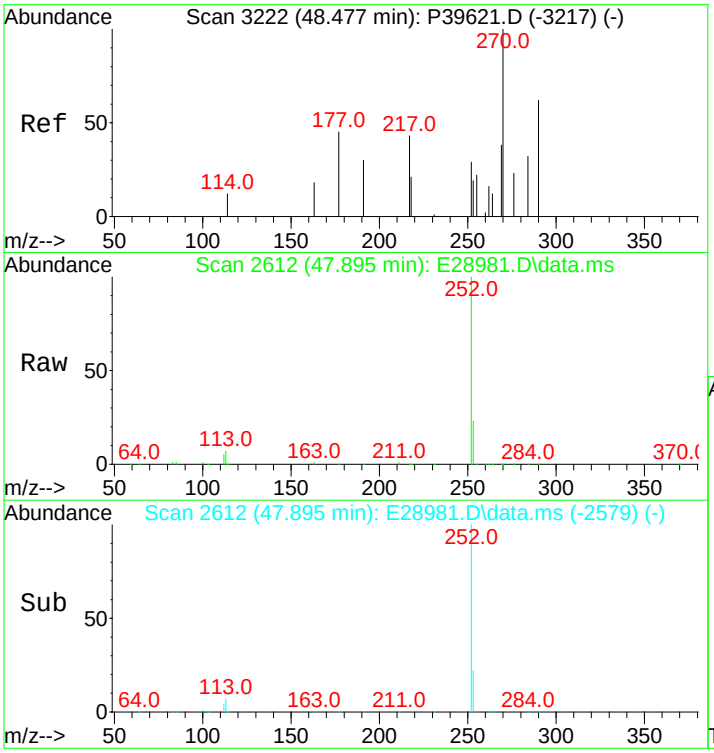




#135
Unknown Sterane (S18)
Concen: 43.13 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

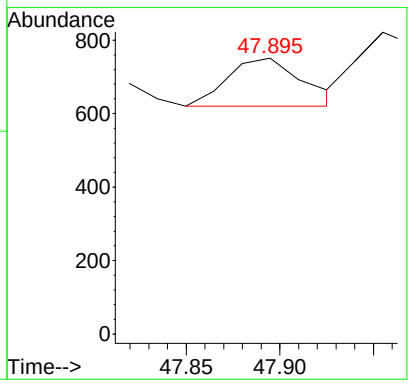
Tgt Ion:217 Resp: 958

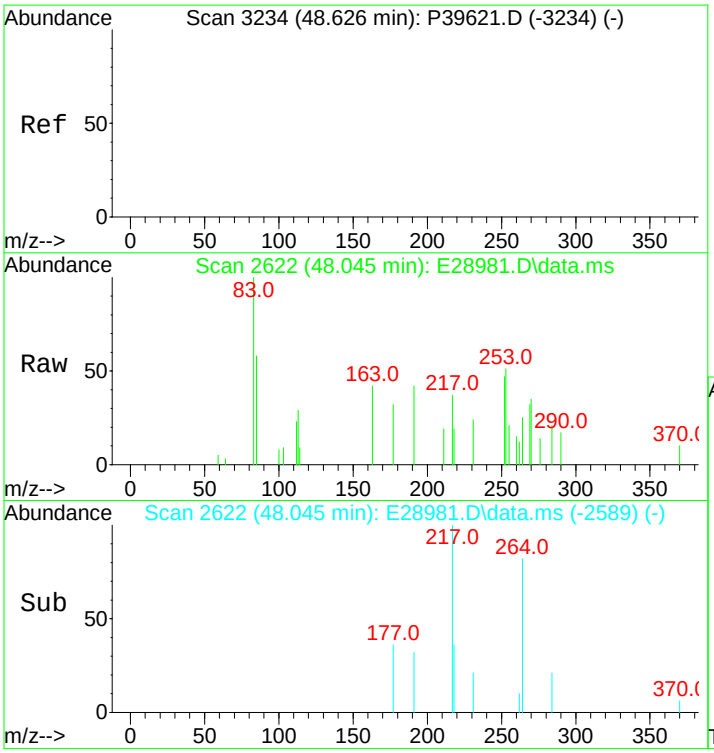




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 16.52 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

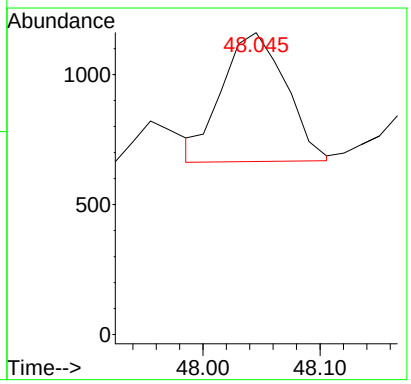
Tgt Ion:217 Resp: 367

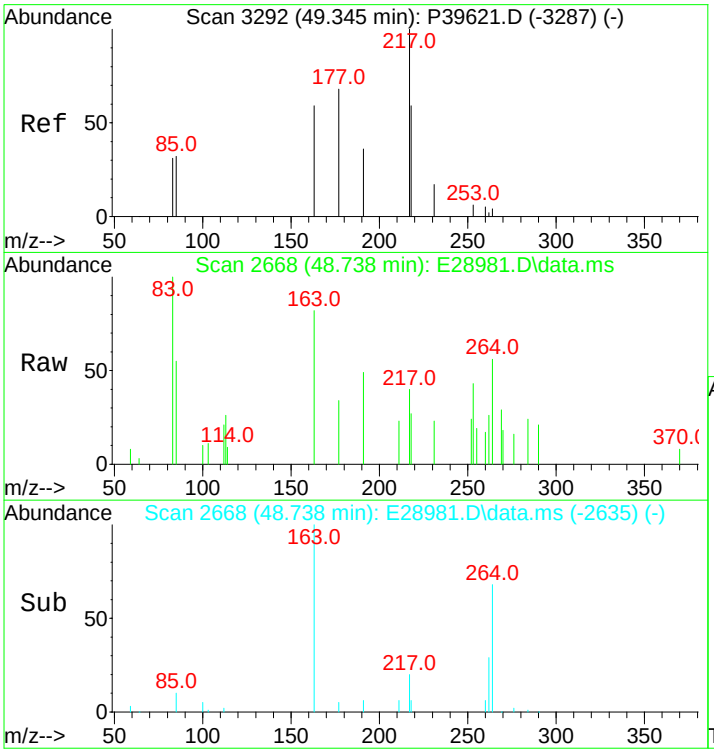




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 84.23 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

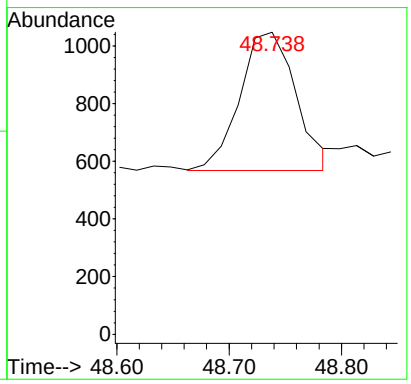
Tgt Ion:217 Resp: 1871

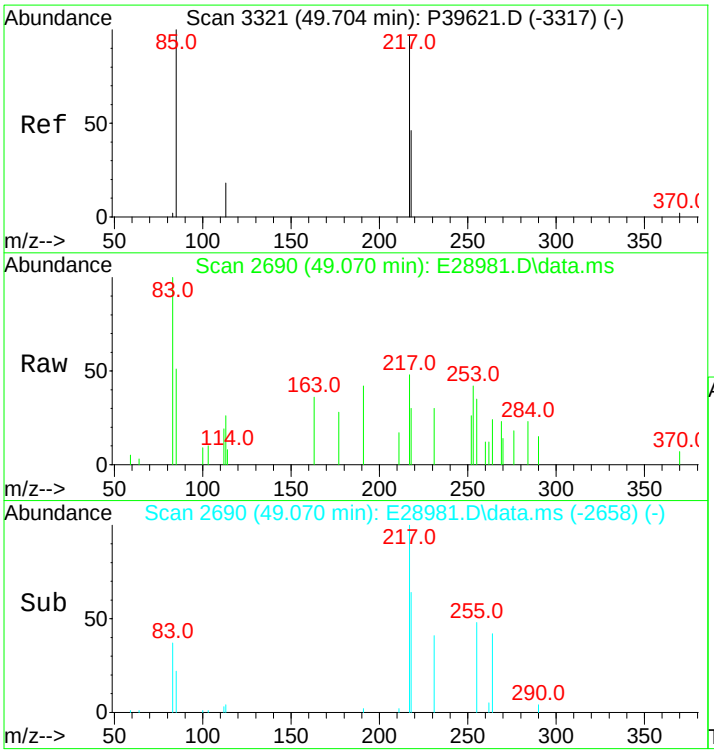




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 74.91 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

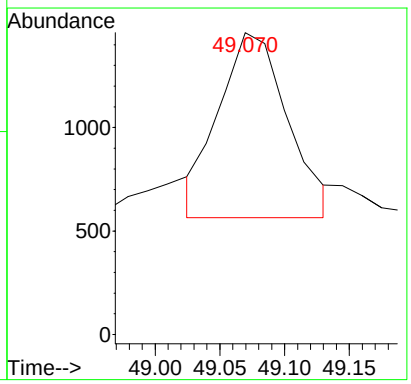
Tgt Ion:217 Resp: 1664

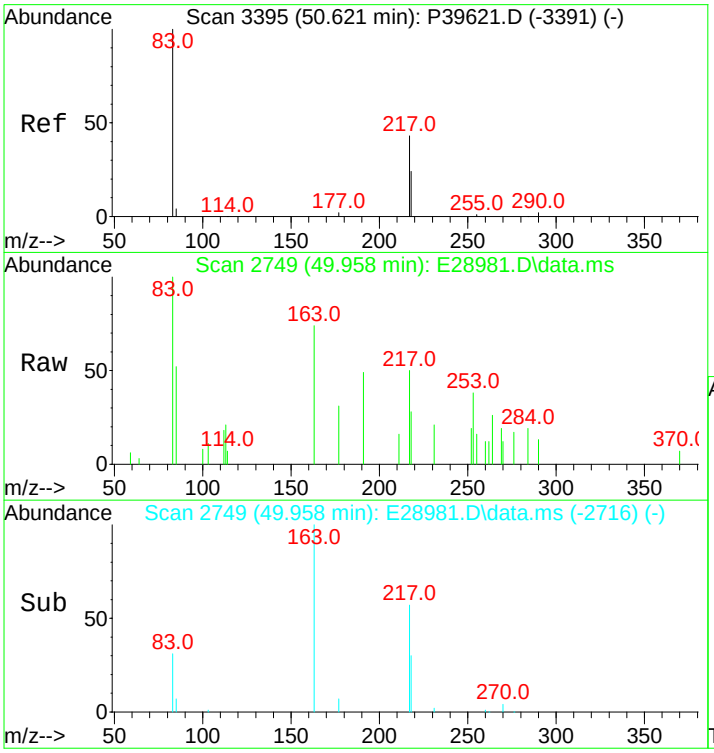




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 148.87 ng/ml m
RT: 49.070 min Scan# 2690
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

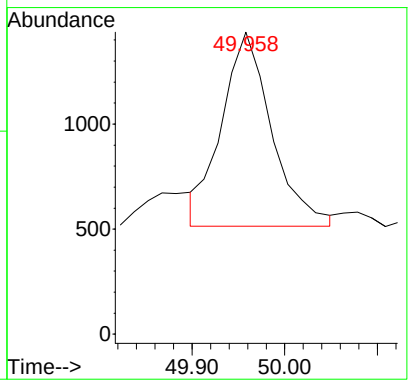
Tgt Ion:217 Resp: 3307

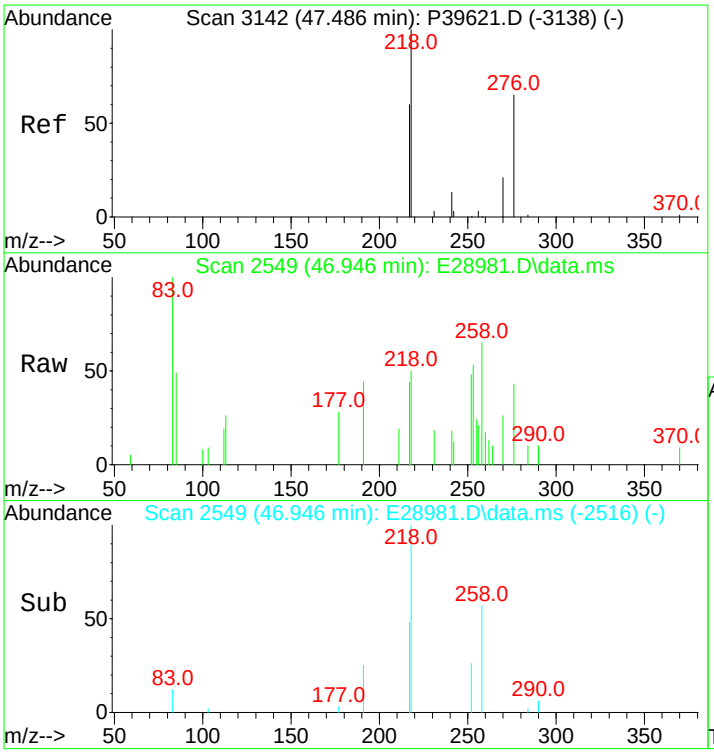




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 155.89 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

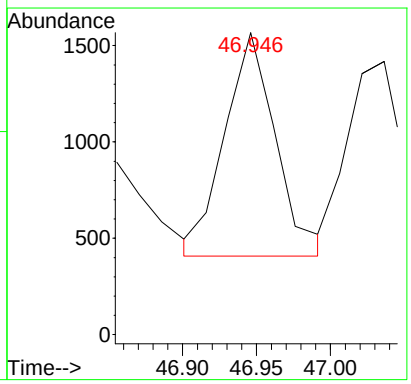
Tgt Ion:217 Resp: 3463

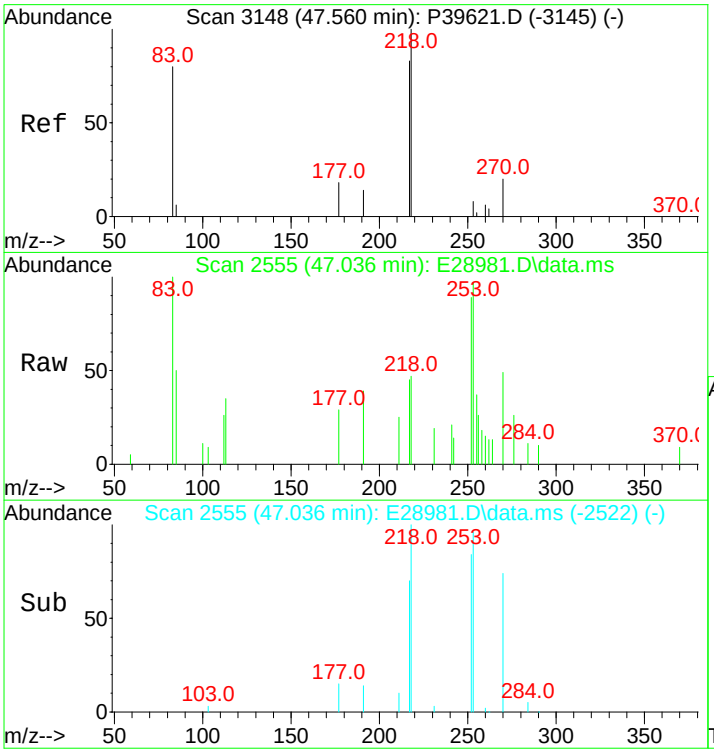




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 124.52 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

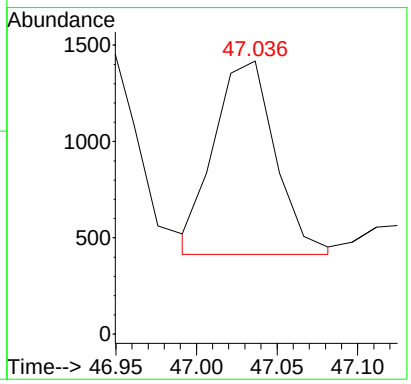
Tgt Ion:218 Resp: 2766

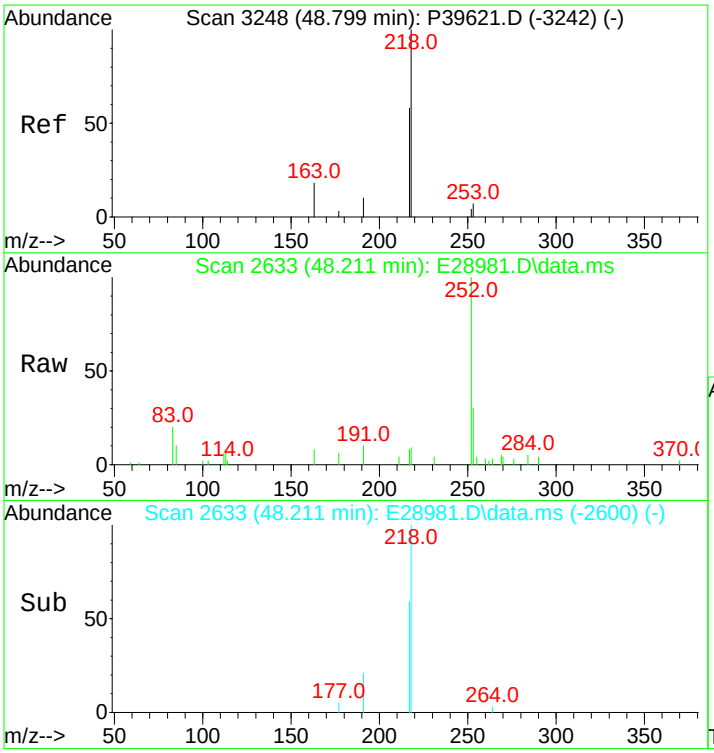




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 118.80 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

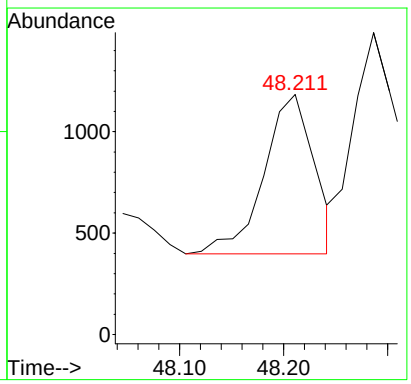
Tgt Ion:218 Resp: 2639

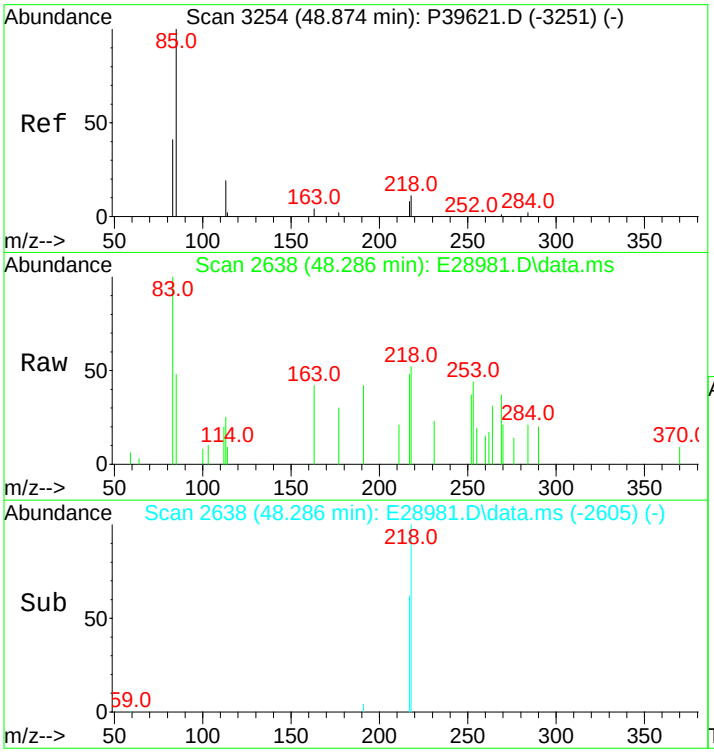




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 118.84 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

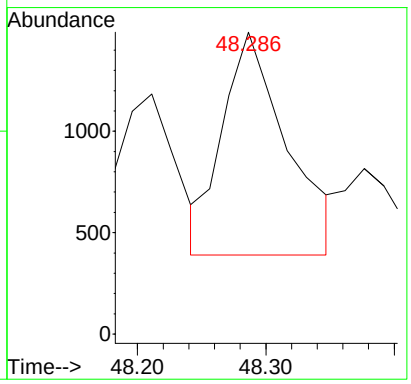
Tgt Ion:218 Resp: 2640

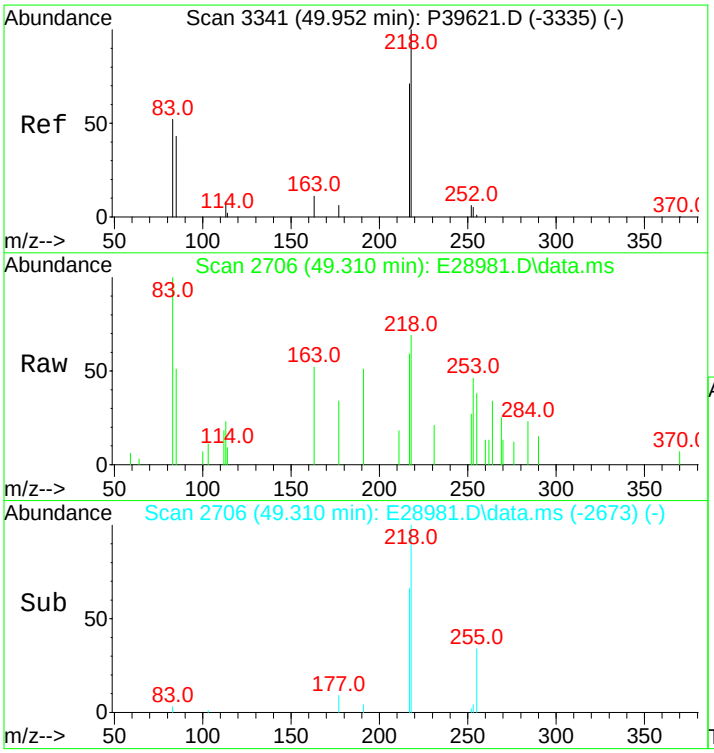




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 171.65 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

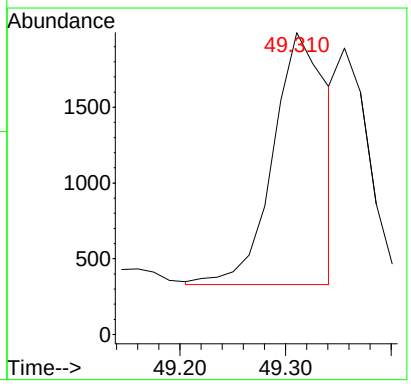
Tgt Ion:218 Resp: 3813

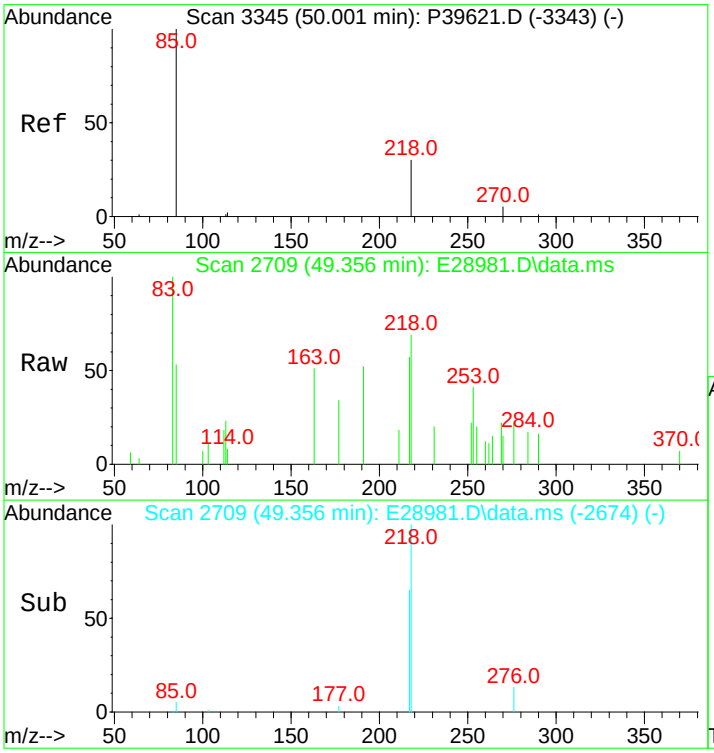




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 265.91 ng/ml m
RT: 49.310 min Scan# 2706
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

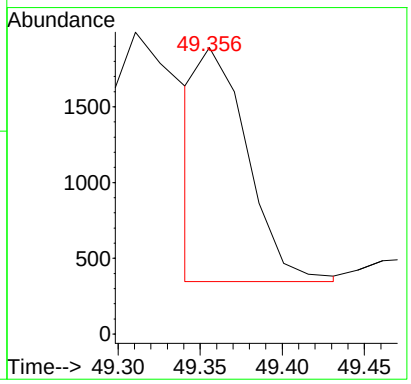
Tgt Ion:218 Resp: 5907

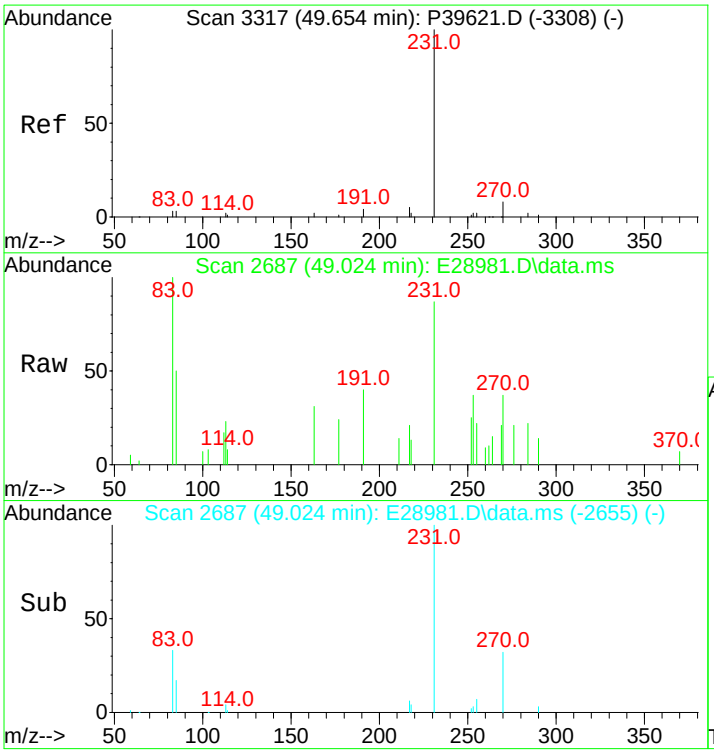




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 143.42 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

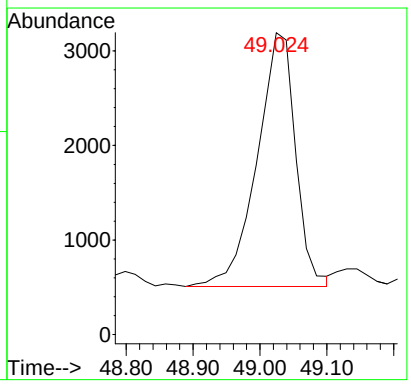
Tgt Ion:218 Resp: 3186

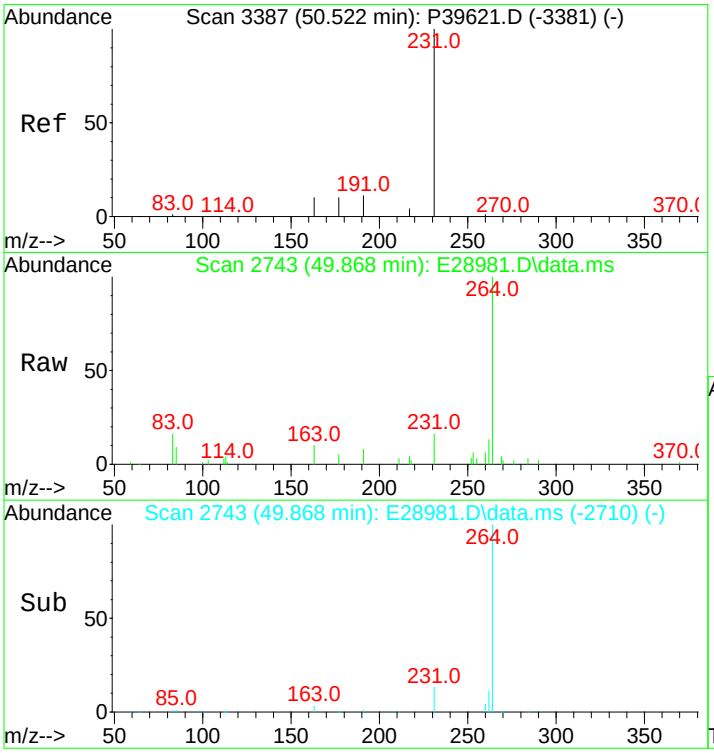




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 483.12 ng/mL
RT: 49.024 min Scan# 2687
Delta R.T. -0.015 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

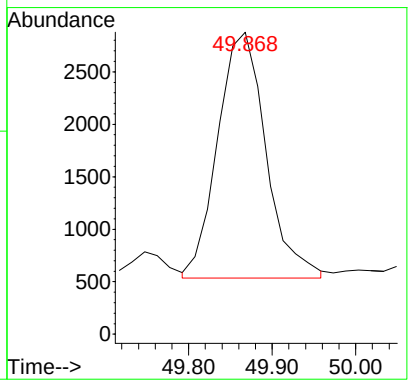
Tgt Ion:231 Resp: 10732

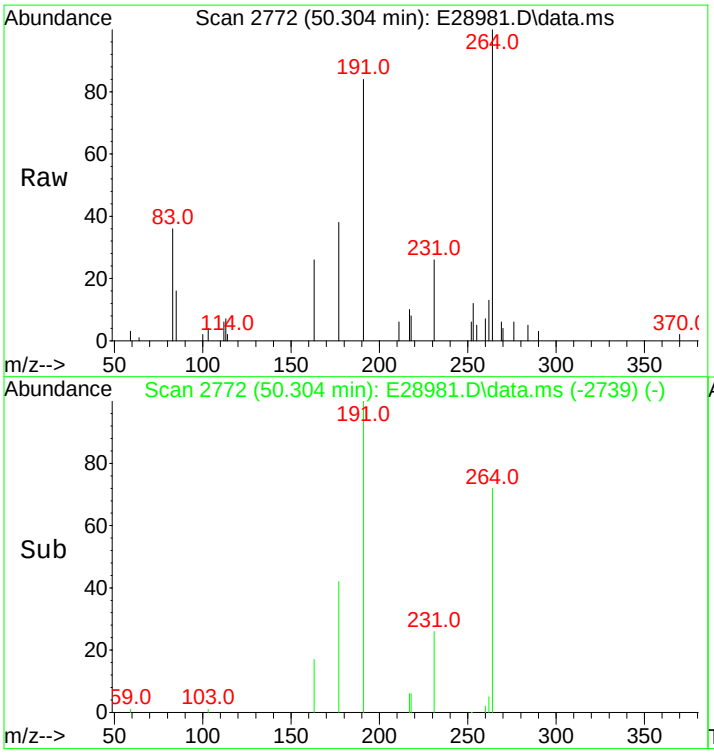




#148
C28,20S-triaromatic steroid
Concen: 423.02 ng/mL m
RT: 49.868 min Scan# 2743
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

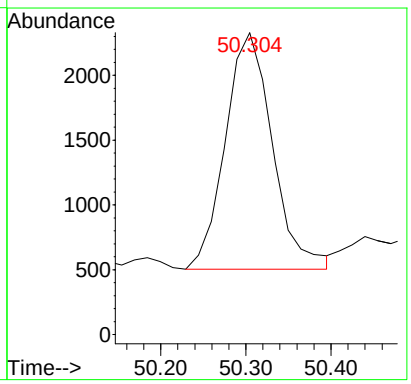
Tgt Ion:231 Resp: 9397

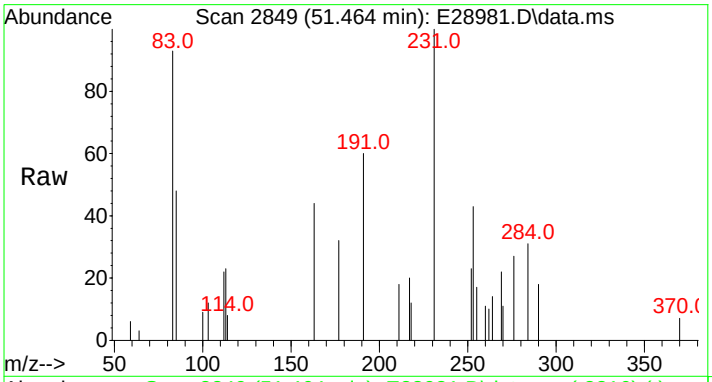




#149
C27,20R-triaromatic steroid
Concen: 318.00 ng/mL
RT: 50.304 min Scan# 2772
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

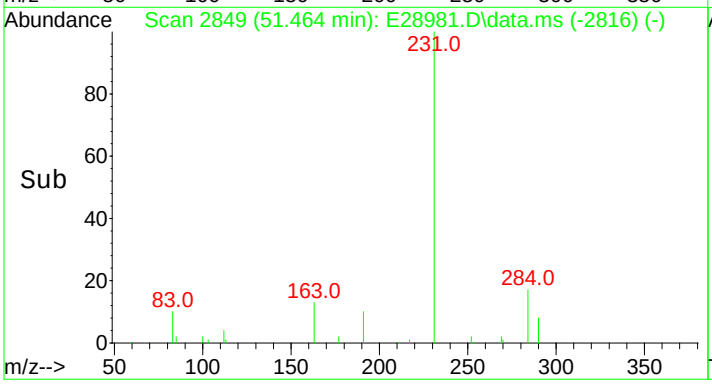
Tgt Ion:231 Resp: 7064

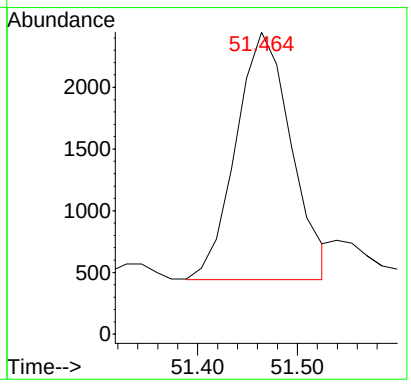




#150
C28,20R-triaromatic steroid
Concen: 348.79 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. -0.000 min
Lab File: E28981.D
Acq: 15 Nov 2012 6:17 am

Tgt Ion:231 Resp: 7748





Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23569M3	500.000	ng/mL	-0.01
74) Chrysene-d12	42.715	240	58604	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	28882	348.388	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 34.84%#			
42) Phenanthrene-d10	32.070	188	37924	446.504	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.65%#			
83) Benzo[b]fluoranthene-d12	46.645	264	53051M3	440.672	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.07%#			
88) Benzo[a]pyrene-d12	47.790	264	49193	421.724	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.17%#			
129) 5B(H)Cholane - Surr	43.332	217	10790	467.157	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.72%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	98M3	5.198	ng/mL	
5) C1-Decalins	17.362	152	449M5	23.816	ng/mL	
6) C2-Decalins	20.298	166	1334m	70.758	ng/mL	
7) C3-Decalins	21.623	180	2418m	128.255	ng/mL	
8) C4-Decalins	24.995	194	6812M5	361.321	ng/mL	
10) Naphthalene	19.304	128	17118	184.642	ng/mL#	100
11) C1-Naphthalenes	21.999	142	13577M5	146.447	ng/mL	
12) C2-Naphthalenes	24.844	156	48525M5	523.410	ng/mL	
13) C3-Naphthalenes	27.524	170	90207m	973.009	ng/mL	
14) C4-Naphthalenes	29.963	184	83080M5	896.134	ng/mL	
16) 2-Methylnaphthalene	21.999	142	7685	130.149	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	5724	99.764	ng/mL#	100
18) Benzothiophene	19.515	134	673M3	8.781	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	1931M5	25.195	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	6953m	90.721	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	17648m	230.265	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	21854M5	285.144	ng/mL	
23) Biphenyl	23.881	154	3291	44.100	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	10981	206.320	ng/mL#	100
25) Dibenzofuran	26.967	168	11871	143.682	ng/mL	94
26) Acenaphthylene	25.582	152	38332	414.709	ng/mL#	100
27) Acenaphthene	26.320	153	15698	263.845	ng/mL	100
28) 2,3,5-Trimethylnaphthalen	27.885	170	7063M3	141.841	ng/mL	
29) Fluorene	28.337	166	22212M3	334.732	ng/mL	
30) C1-Fluorenes	30.716	180	25199M5	379.745	ng/mL	
31) C2-Fluorenes	32.928	194	46102M5	694.751	ng/mL	
32) C3-Fluorenes	35.458	208	46721M5	704.079	ng/mL	
33) Dibenzothiophene	31.664	184	32747	359.616	ng/mL#	89
34) 4-Methyldibenzothiophene(	33.455	198	28731	315.513	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.802	198	25835M3	283.711	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	11599	127.376	ng/mL#	100
37) OTP	33.862	198	2987M3	32.802	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	76846m	843.895	ng/mL	
39) C2-Dibenzothiophenes	35.142	212	124280M5	1364.798	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	111968m	1229.592	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	68524M5	752.506	ng/mL	
43) Phenanthrene	32.161	178	417047	4501.574	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	64770	699.123	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	73832	796.937	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	31043	335.076	ng/mL#	37
47) 9/4-Methylphenanthrene(9M	34.585	192	84583M3	912.983	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.675	192	53835	581.091	ng/mL	96
49) C1-Phenanthrenes/Anthrace	34.253	192	311492M5	3362.221	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	255162M5	2754.200	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52)	C3-Phenanthrenes/Anthrace	38.273	220	134133M5	1447.822	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.457	234	51772M5	558.823	ng/mL	
55)	Anthracene	32.341	178	93260M3	1164.619	ng/mL	
56)	Carbazole	33.034	167	25866	313.854	ng/mL	99
57)	1-Methylphenanthrene	34.675	192	53835	761.669	ng/mL	98
58)	Fluoranthene	36.963	202	1313603	12839.177	ng/mL	99
59)	Benzo(b)fluorene	39.493	216	106928M3	1568.414	ng/mL	
60)	Pyrene	37.852	202	1243842	11960.990	ng/mL	96
61)	C1-Fluoranthenes/Pyrenes	39.252	216	696371m	6696.419	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.315	230	303796M5	2921.353	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.212	244	132328m	1272.488	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.507	258	102970M5	990.177	ng/mL	
66)	Naphthobenzothiophene	41.721	234	113668	1108.244	ng/ml#	65
67)	Naphthobenzothiophene-2,1	41.721	234	113668	1108.244	ng/mL#	65
68)	Naphthobenzothiophene-1,2	42.052	234	22515	219.517	ng/mL#	16
69)	Naphthobenzothiophene-2,3	42.354	234	28030M3	273.288	ng/mL	
70)	C1-Naphthobenzothiophenes	43.121	248	136403M5	1329.906	ng/ml	
71)	C2-Naphthobenzothiophenes	44.642	262	104675M5	1020.564	ng/ml	
72)	C3-Naphthobenzothiophenes	46.766	276	66615M5	649.485	ng/ml	
73)	C4-Naphthobenzothiophenes	47.805	290	45110M5	439.815	ng/mL	
75)	Benz[a]anthracene	42.655	228	652099M3	5714.146	ng/mL	
77)	Chrysene/Triphenylene	42.820	228	695695	5921.374	ng/mL	99
78)	C1-Chrysenes	44.296	242	319005M5	2715.195	ng/mL	
79)	C2-Chrysenes	46.028	256	161601M5	1375.459	ng/mL	
80)	BBF-D12 Surr BKGD	46.645	256	2005	17.065	ng/mL	100
81)	C3-Chrysenes	47.594	270	107795M5	917.492	ng/mL	
82)	C4-Chrysenes	47.519	284	54609M5	464.802	ng/mL	
84)	Benzo[b]fluoranthene	46.735	252	755193	5693.305	ng/mL	96
85)	Benzo[j]+[k]fluoranthene	46.796	252	615827	4512.563	ng/mL	95
86)	Benzo[a]fluoranthene	47.097	252	155714M3	1141.017	ng/mL	
87)	Benzo[e]pyrene	47.699	252	543493	4196.245	ng/mL	92
89)	Benzo[a]pyrene	47.880	252	768875	6203.980	ng/mL	92
90)	Perylene	48.181	252	201834	1540.116	ng/mL	92
91)	Indeno[1,2,3-cd]pyrene	52.549	276	606326M3	4157.104	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.579	278	178611M3	1150.089	ng/mL	
93)	Benzo[g,h,i]perylene	53.798	276	605315	3849.002	ng/mL	100
94)	Hopane (T19)	51.645	191	31842M3	723.985	ng/mL	
96)	C23 Tricyclic Terpane (T4	40.351	191	8417	191.376	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.089	191	4552M3	103.498	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.579	191	5255	119.482	ng/ml	100
99)	C24 Tetracyclic Terpane (	43.889	191	2263M3	51.453	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	2136M3	48.566	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.739	191	1665M3	37.857	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.043	191	2069M3	47.042	ng/ml	
103)	C28 Tricyclic Terpane-22R	46.208	191	2292M3	52.113	ng/ml	
104)	C29 Tricyclic Terpane-22S	46.735	191	2537	57.683	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.916	191	2371M3	53.909	ng/ml	
106)	18a-22,29,30-Trisnorneoho	47.985	191	4339	98.655	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.106	191	2147M3	48.816	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.347	191	2753	62.594	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	48.513	191	7545	171.549	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	49.672	191	4289M3	97.518	ng/ml	
111)	17a(H),21b(H)-25-Norhopan	49.506	191	2997	68.142	ng/ml	100
112)	30-Norhopane (T15)	50.320	191	24228M3	550.867	ng/ml	
113)	18a(H)-30-Norneohopane-C2	50.425	191	4586M3	104.271	ng/ml	
114)	17a(H)-Diahopane (X)	50.546	191	1725	39.221	ng/ml	100
115)	30-Normoretane (T17)	51.073	191	3236	73.576	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	51.464	191	923M3	20.986	ng/ml	
117)	Moretane (T20)	52.308	191	3610M3	82.080	ng/ml	
118)	30-Homohopane-22S (T21)	53.377	191	14786	336.186	ng/ml	100
119)	30-Homohopane-22R (T22)	53.588	191	12402	281.982	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
Sample : 1210081-03
Misc : 1X
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 16 13:32:35 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120)	Gammacerane/C32-diahopane	54.115	191	5011	113.934	ng/mL	100
121)	30,31-Bishomohopane-22S (	54.822	191G	21888M3	497.663	ng/ml	
122)	30,31-Bishomohopane-22R (	55.244	191	7561	171.913	ng/ml	100
123)	30,31-Trishomohopane-22S	56.931	191	8946	203.403	ng/ml	100
124)	30,31-Trishomohopane-22R	57.518	191	4385	99.701	ng/ml	100
125)	Tetrakishomohopane-22S (T	59.536	191G	23351	530.927	ng/ml	100
126)	Tetrakishomohopane-22R (T	60.258	191G	38609	877.845	ng/ml	100
127)	Pentakishomohopane-22S (T	62.487	191	6731	153.041	ng/ml	100
128)	Pentakishomohopane-22R (T	63.737	191	3821	86.877	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	44.868	217	2229M3	96.505	ng/ml	
131)	13b(H),17a(H)-20R-Diachol	45.290	217	1396	60.440	ng/ml	100
132)	13b,17a-20S-Methyldiachol	45.997	217	1305M3	56.501	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	46.856	217	4308	186.517	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	47.368	217	4875	211.065	ng/ml	100
135)	Unknown Sterane (S18)	47.639	217	947	41.001	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	47.895	217	284	12.296	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.046	217	2168M3	93.864	ng/ml	
138)	14a,17a-20R-Methylcholest	48.738	217	1930M3	83.560	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.070	217	3588M3	155.344	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	49.958	217	3696M3	160.020	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	46.946	218	2766M3	119.755	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.022	218	2774M3	120.101	ng/ml	
143)	14b,17b-20R-Methylcholest	48.211	218	2572	111.356	ng/ml	100
144)	14b,17b-20S-Methylcholest	48.287	218	4127M3	178.680	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	49.311	218	6086M3	263.496	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	49.356	218	3175M3	137.463	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.025	231	10993	475.946	ng/mL	100
148)	C28,20S-triaromatic stero	49.868	231	9513M3	411.869	ng/mL	
149)	C27,20R-triaromatic stero	50.305	231	7189	311.251	ng/mL	100
150)	C28,20R-triaromatic stero	51.464	231	7945M3	343.982	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28983.D
Acq On : 15 Nov 2012 7:45 am
Operator : AC
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Quant Time: Nov 16 13:32:35 2012
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Quant Title : Decalins & Alkylated PAH's
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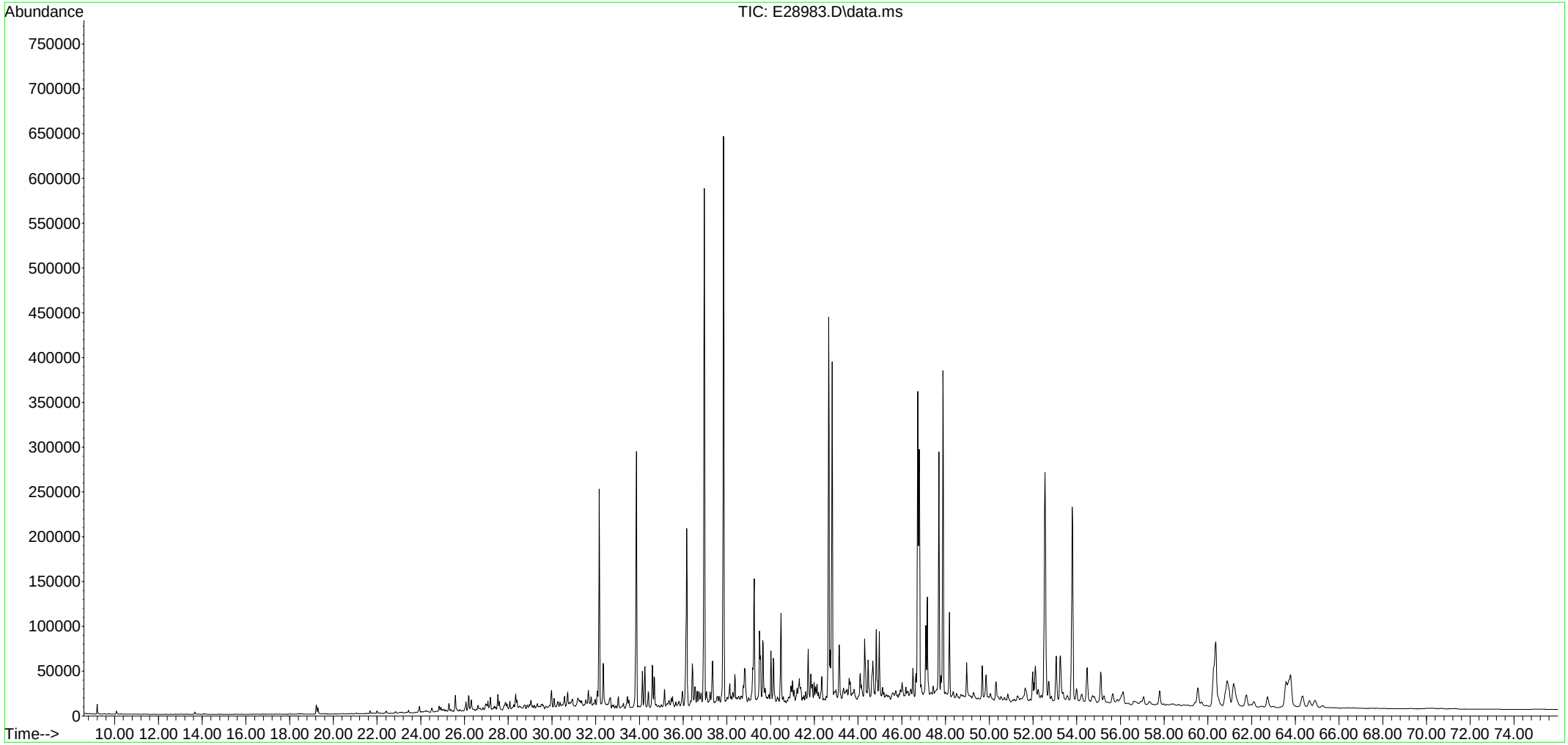
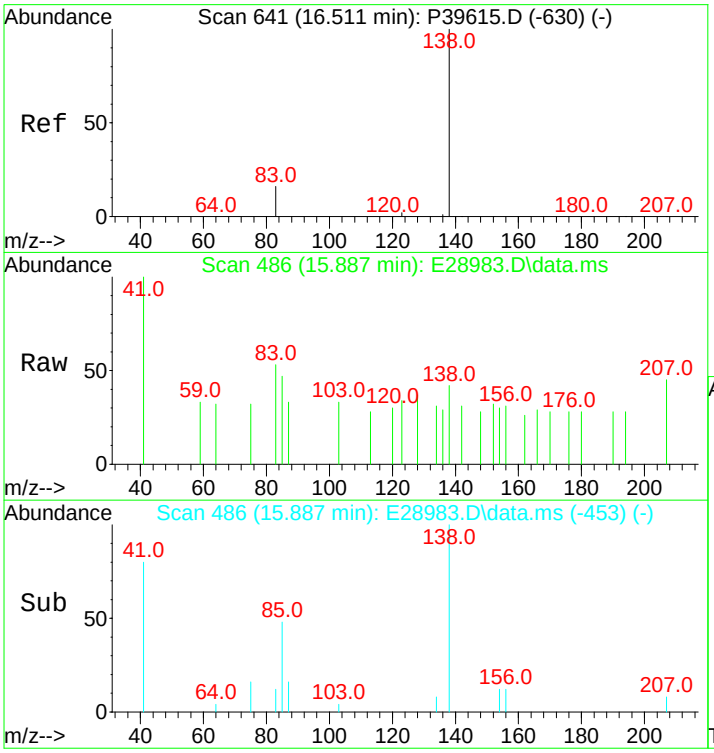
Response via : Initial Calibration

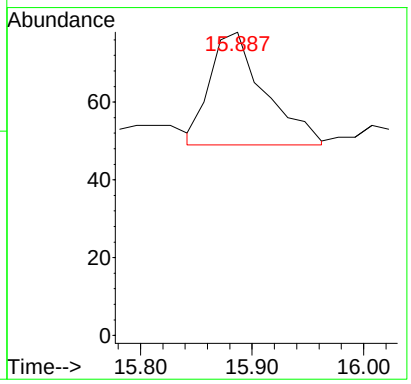
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

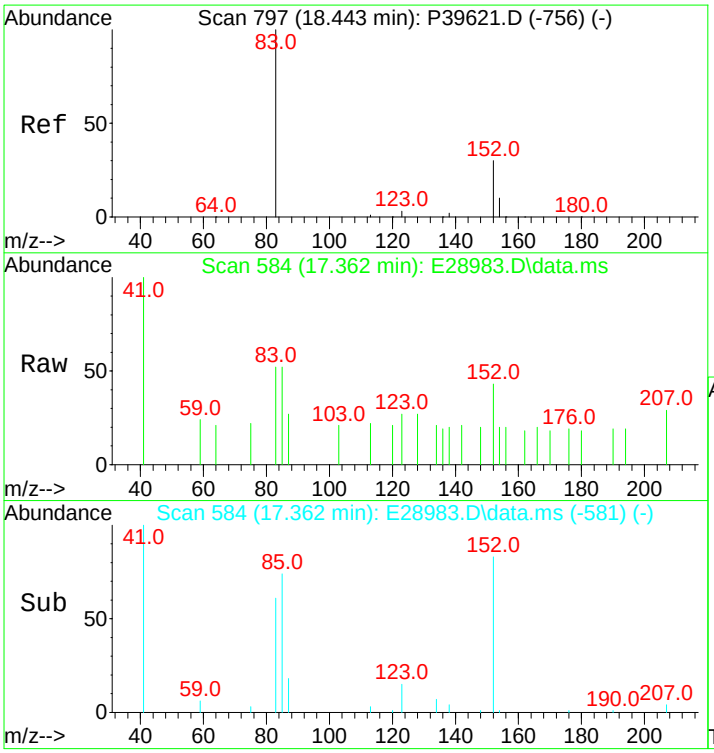




#3
trans-Decalin
Concen: 5.20 ng/mL m
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

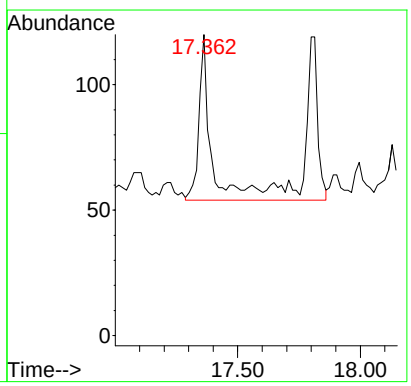
Tgt Ion:138 Resp: 98

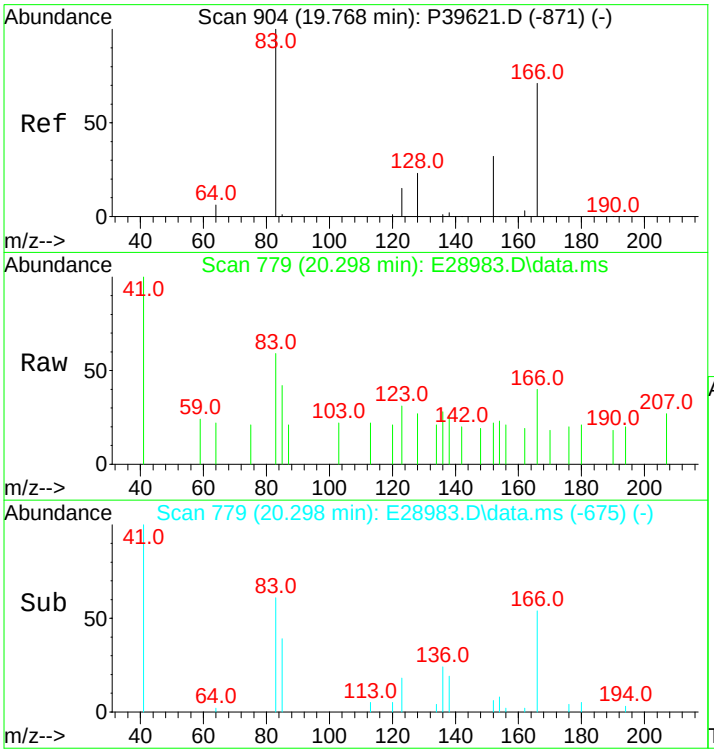




#5
C1-Decalins
Concen: 23.82 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

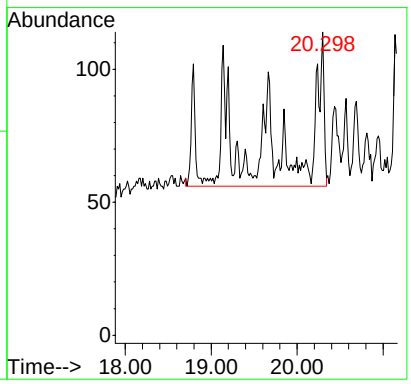
Tgt Ion:152 Resp: 449

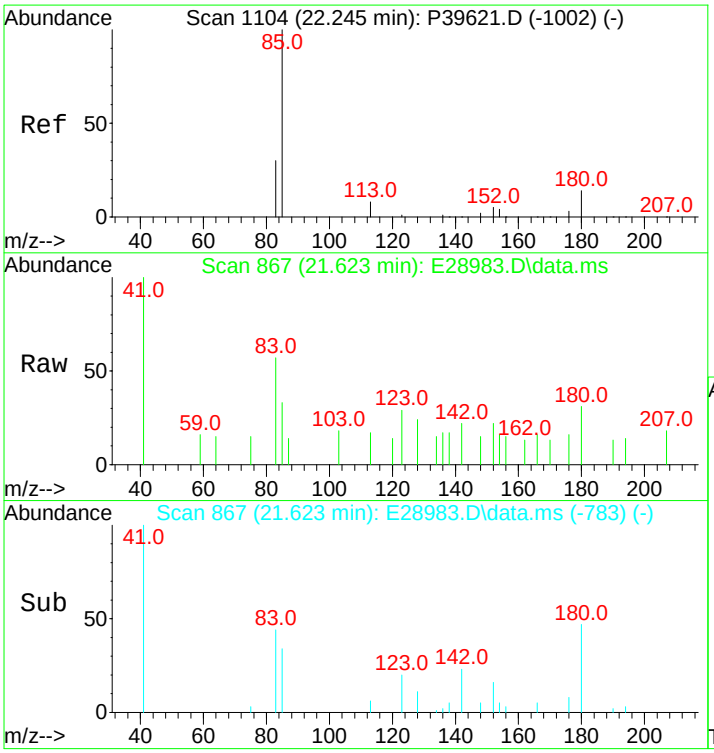




#6
C2-Decalins
Concen: 70.76 ng/mL m
RT: 20.298 min Scan# 779
Delta R.T. 0.955 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

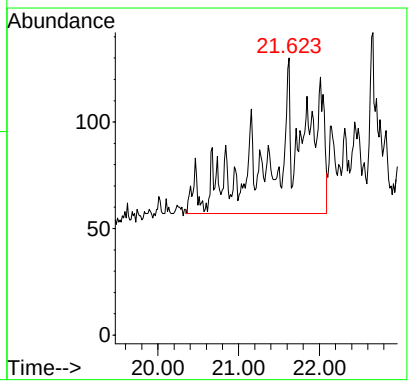
Tgt Ion:166 Resp: 1334

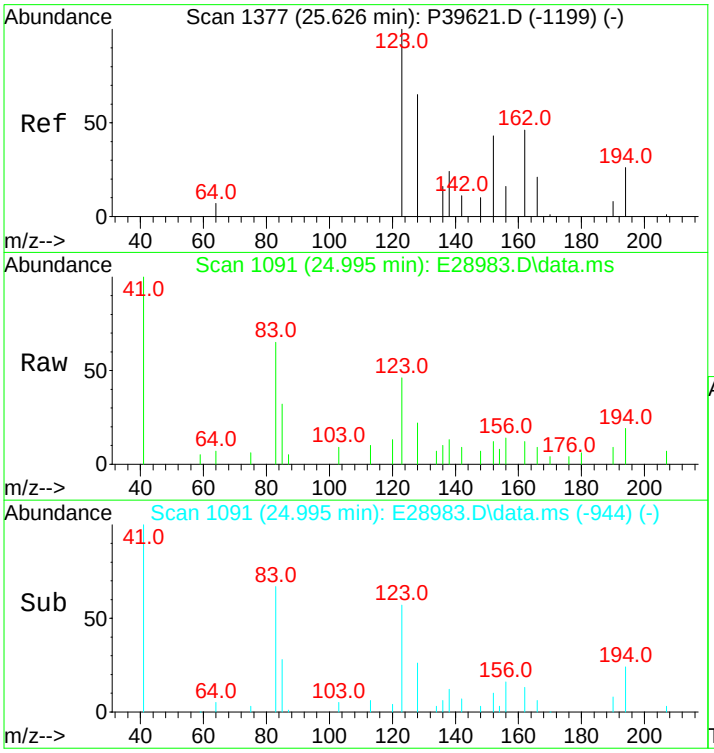




#7
C3-Decalins
Concen: 128.26 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

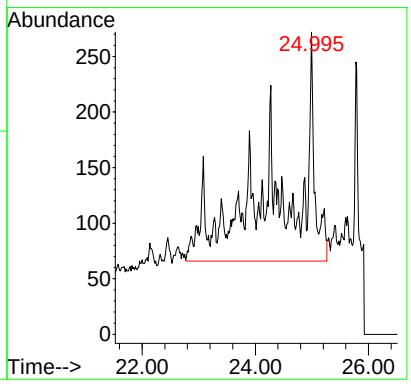
Tgt Ion:180 Resp: 2418

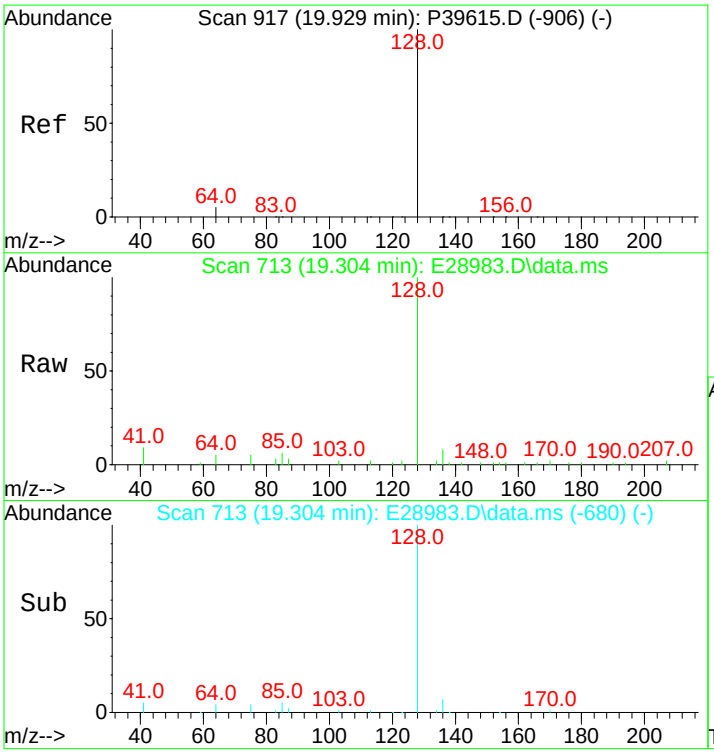




#8
C4-Decalins
Concen: 361.32 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:194 Resp: 6812

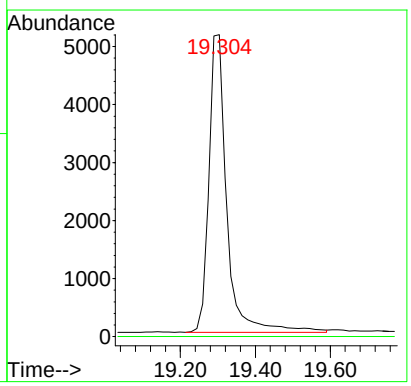


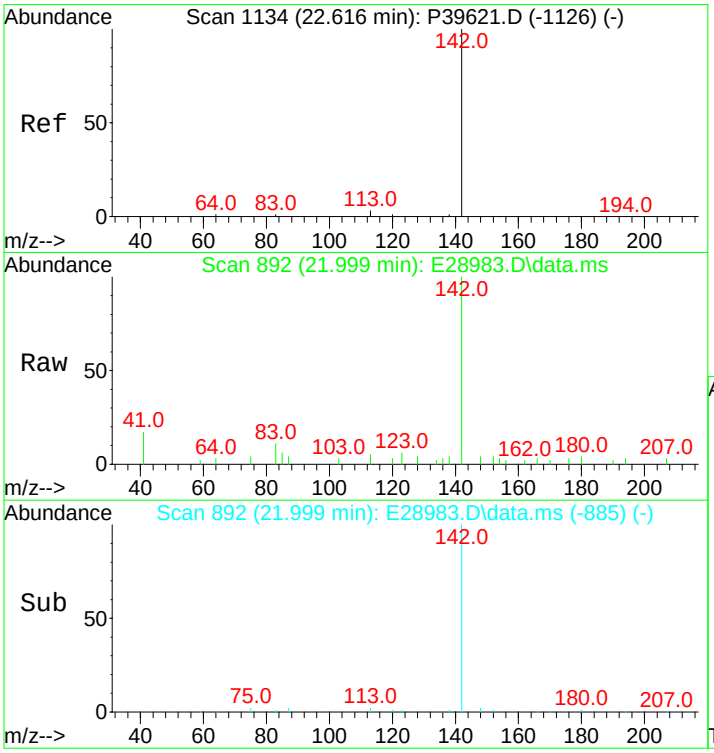


#10
Naphthalene
Concen: 184.64 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:128 Resp: 17118

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

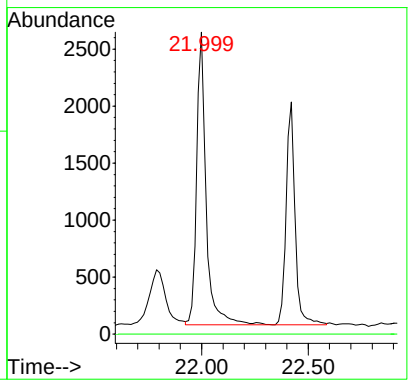


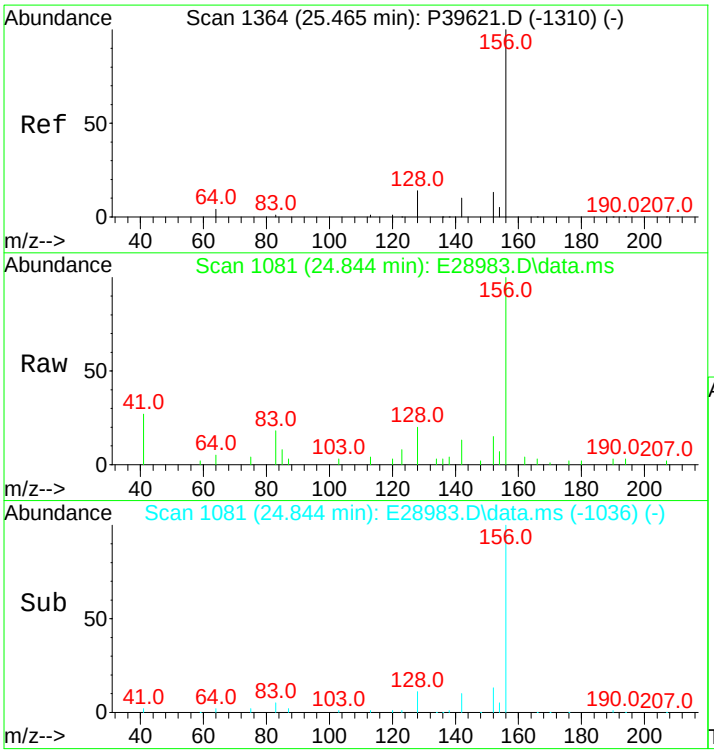


#11
C1-Naphthalenes
Concen: 146.45 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:142 Resp: 13577

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

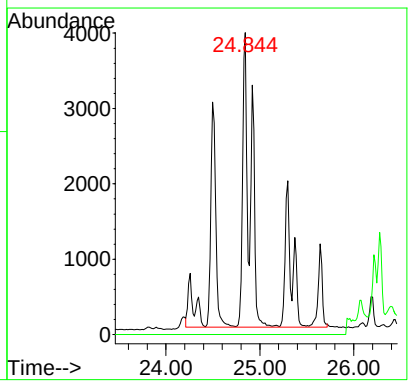


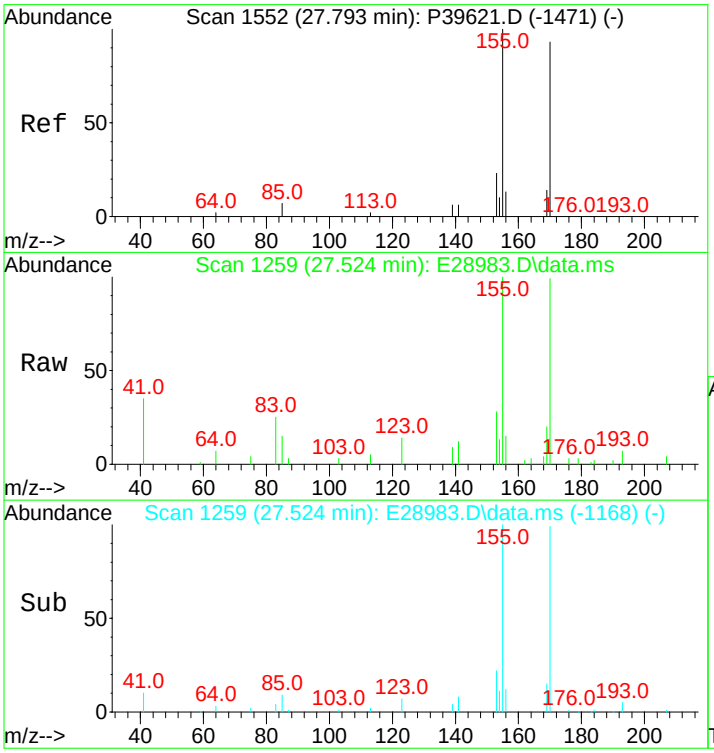


#12
C2-Naphthalenes
Concen: 523.41 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:156 Resp: 48525

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

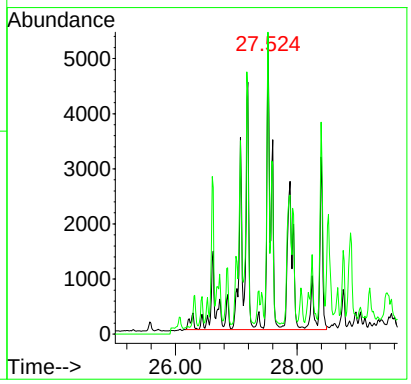


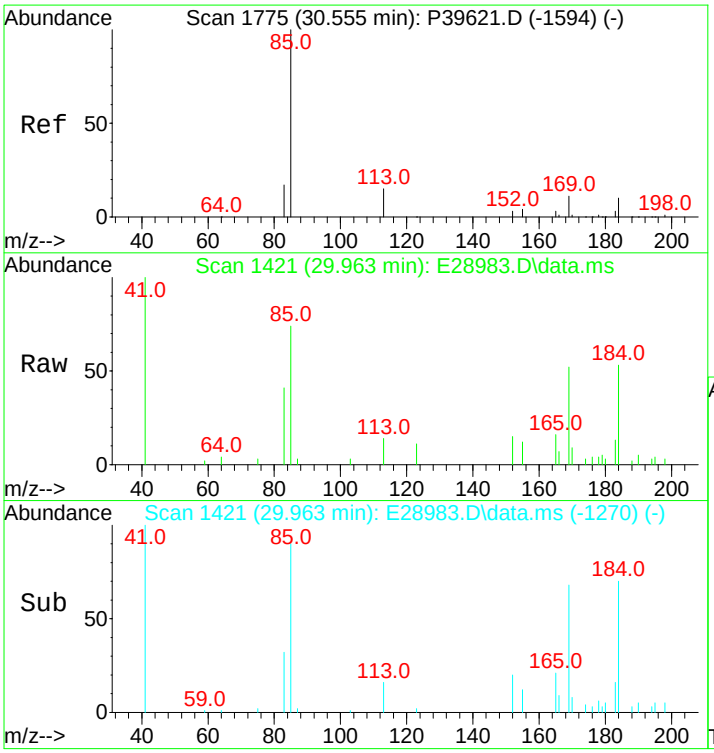


#13
C3-Naphthalenes
Concen: 973.01 ng/mL m
RT: 27.524 min Scan# 1259
Delta R.T. 0.344 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:170 Resp: 90207

Ion	Ratio	Lower	Upper
170	100		
155	15.2	66.8	100.2#

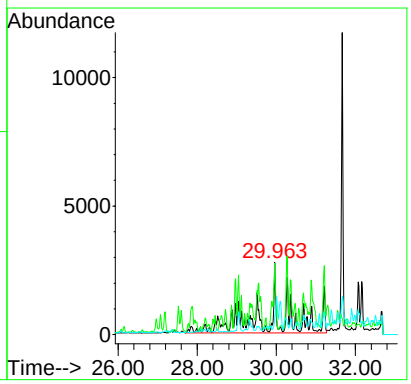


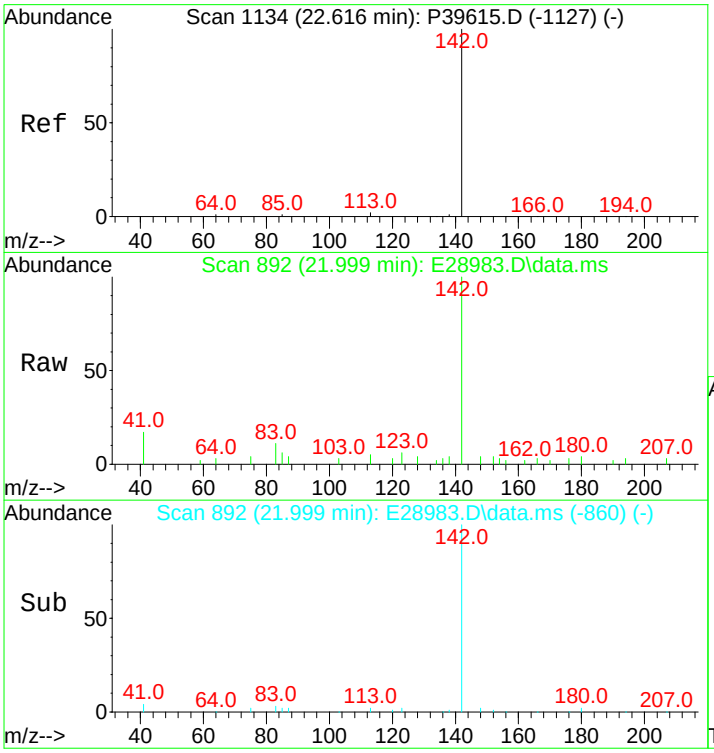


#14
C4-Naphthalenes
Concen: 896.13 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.087 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:184 Resp: 83080

Ion	Ratio	Lower	Upper
184	100		
169	4.8	78.7	118.1#
183	1.3	26.7	40.1#

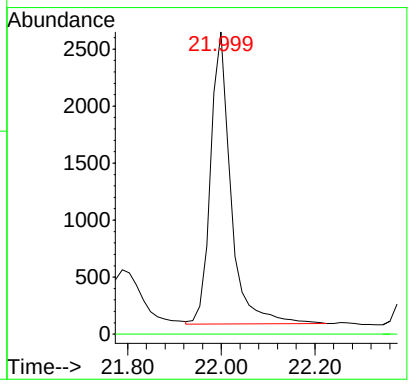


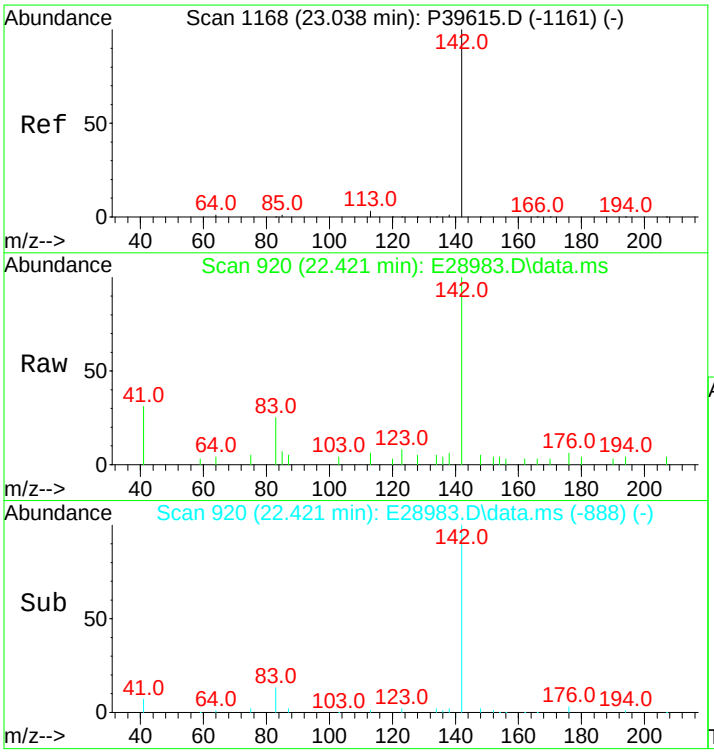


#16
2-Methylnaphthalene
Concen: 130.15 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:142 Resp: 7685

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

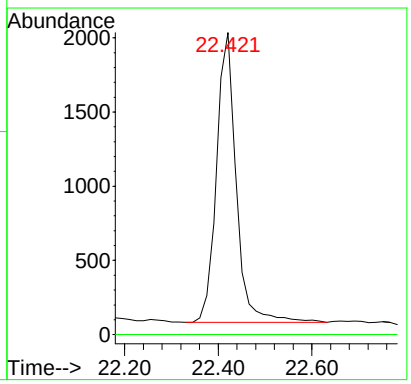


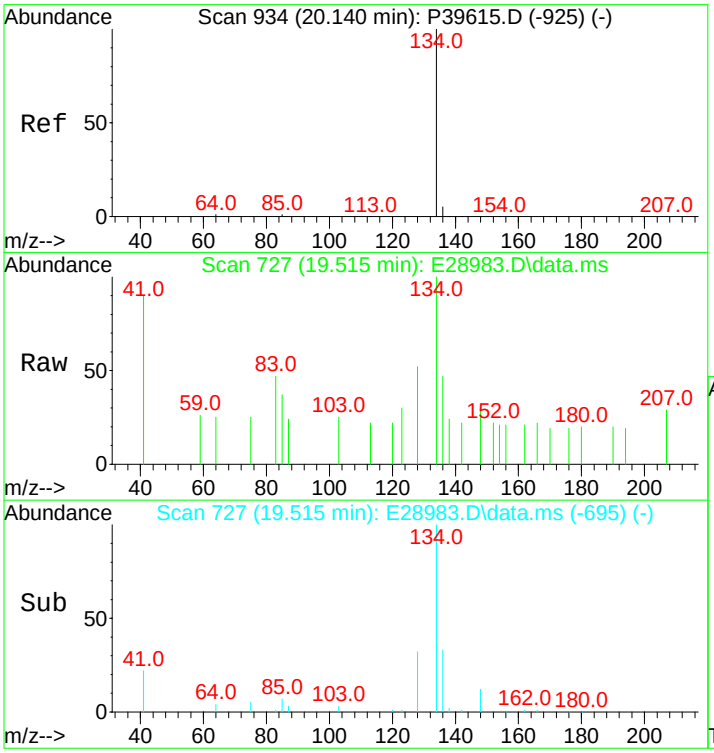


#17
1-Methylnaphthalene
Concen: 99.76 ng/mL
RT: 22.421 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:142 Resp: 5724

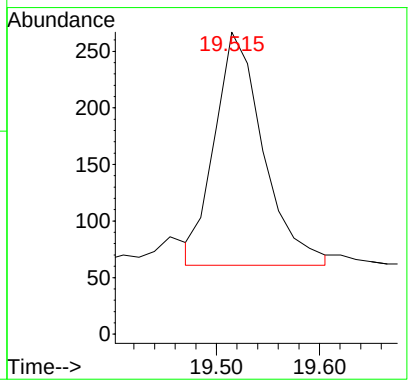
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

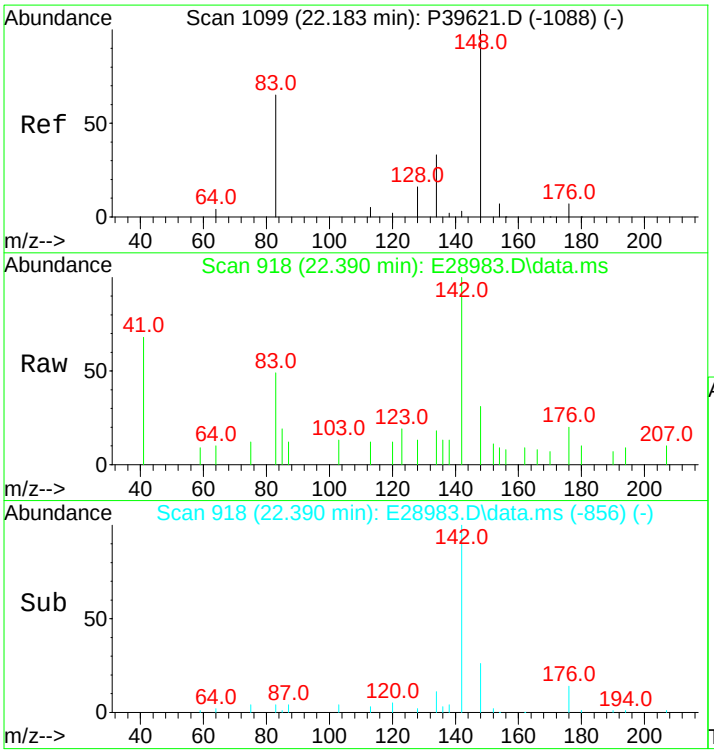




#18
Benzothiophene
Concen: 8.78 ng/mL m
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

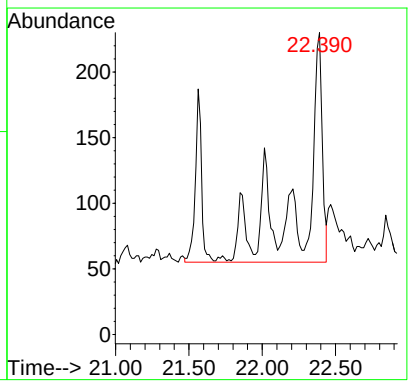
Tgt Ion:134 Resp: 673

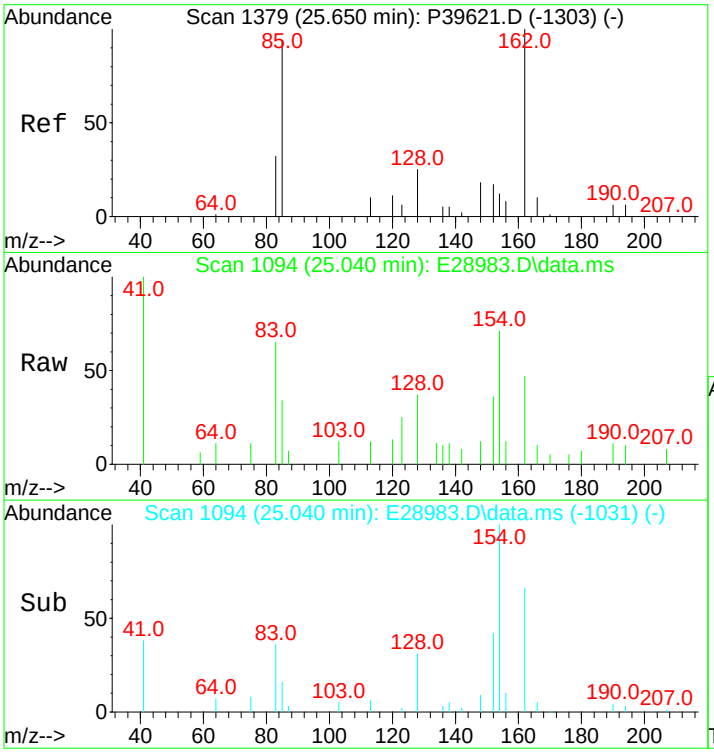




#19
C1-Benzo(b)thiophenes
Concen: 25.20 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.690 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

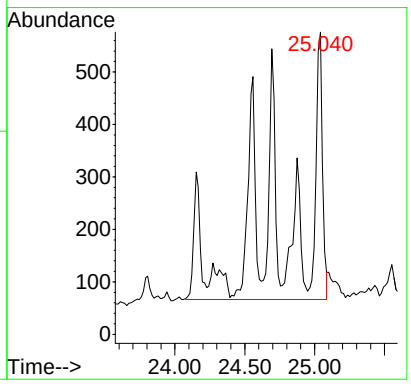
Tgt Ion:148 Resp: 1931

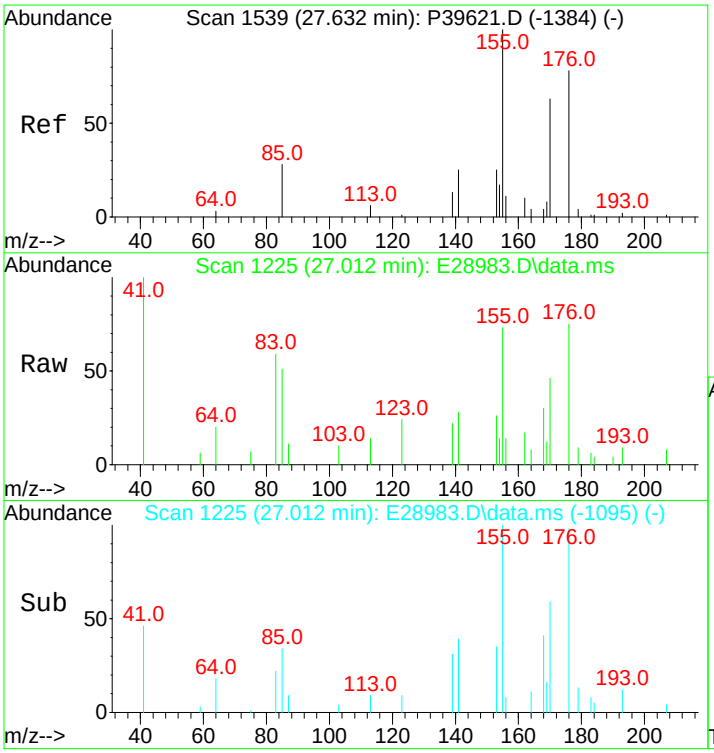




#20
C2-Benzo(b)thiophenes
Concen: 90.72 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

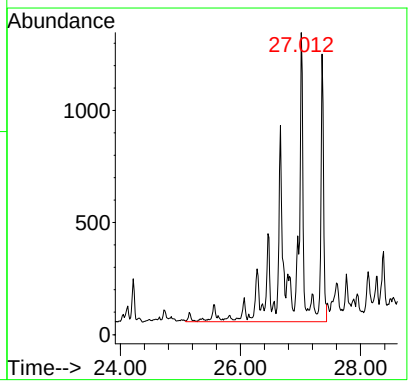
Tgt Ion:162 Resp: 6953

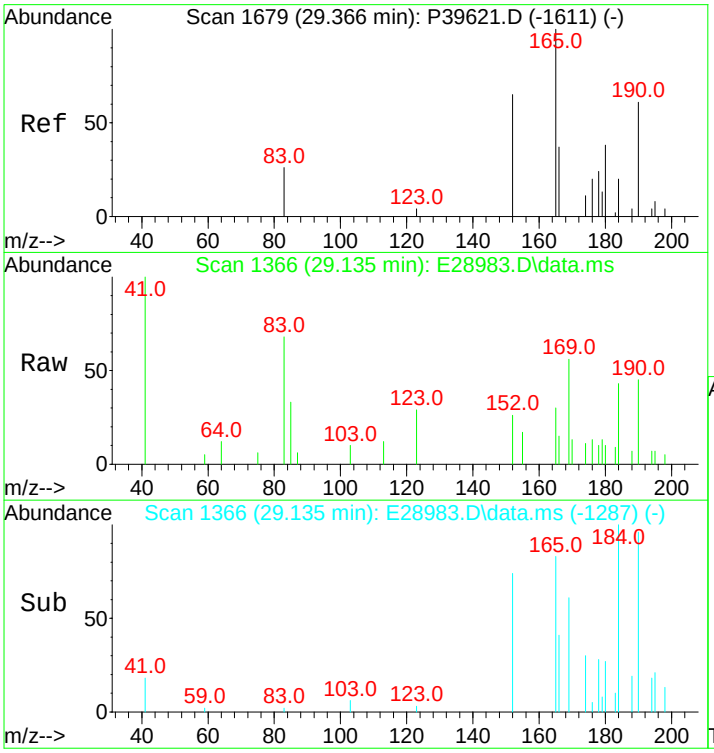




#21
C3-Benzo(b)thiophenes
Concen: 230.27 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. -0.007 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

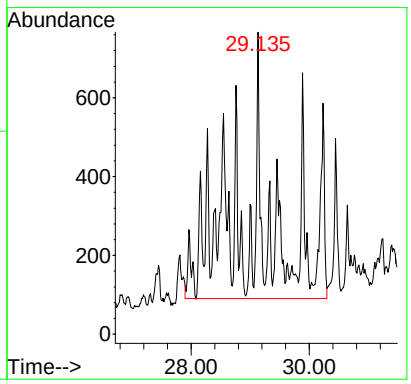
Tgt Ion:176 Resp: 17648

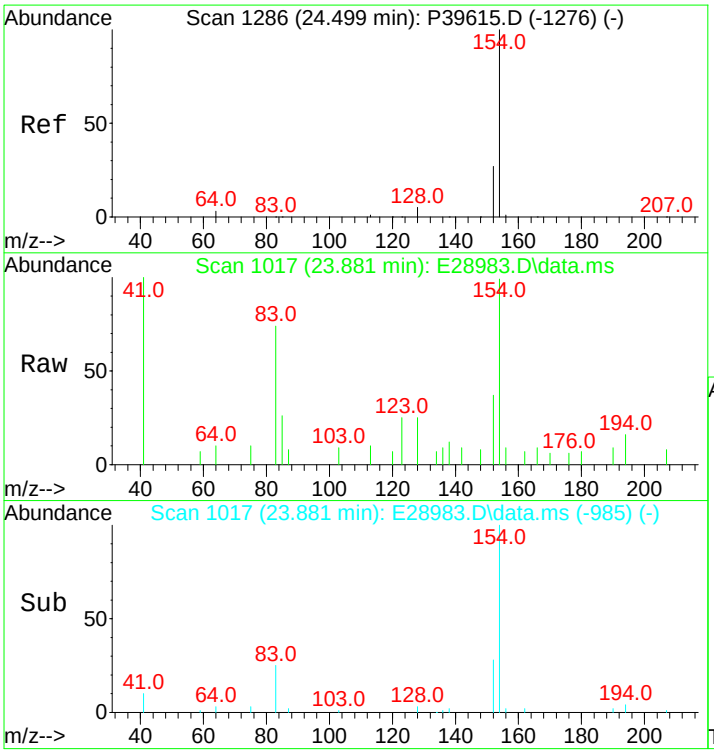




#22
C4-Benzo(b)thiophenes
Concen: 285.14 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:190 Resp: 21854

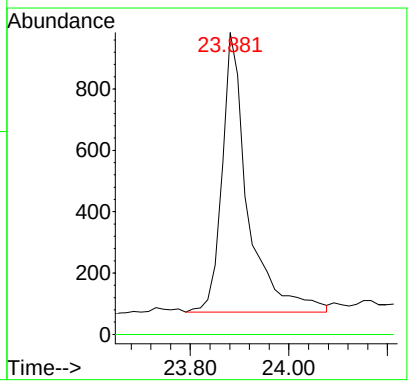


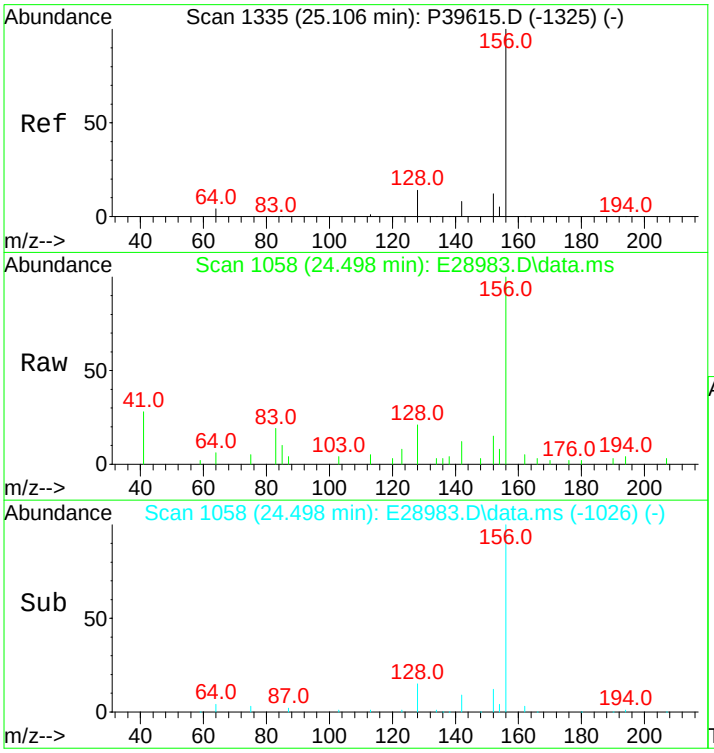


#23
Biphenyl
Concen: 44.10 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:154 Resp: 3291

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

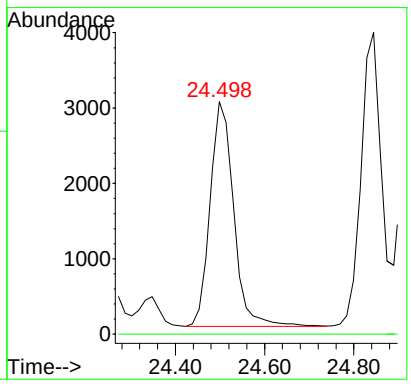


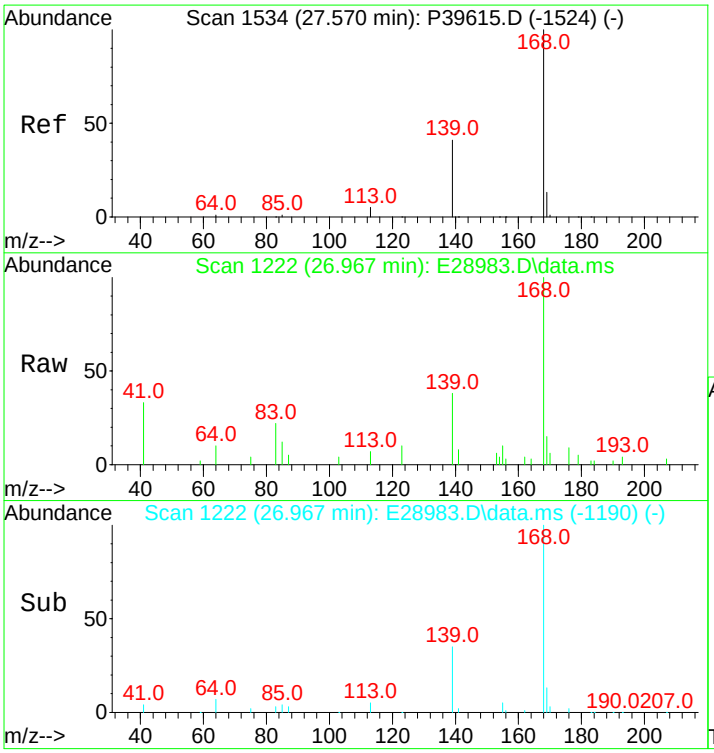


#24
2,6-Dimethylnaphthalene
Concen: 206.32 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:156 Resp: 10981

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

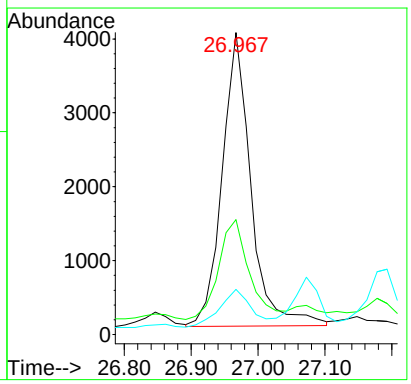


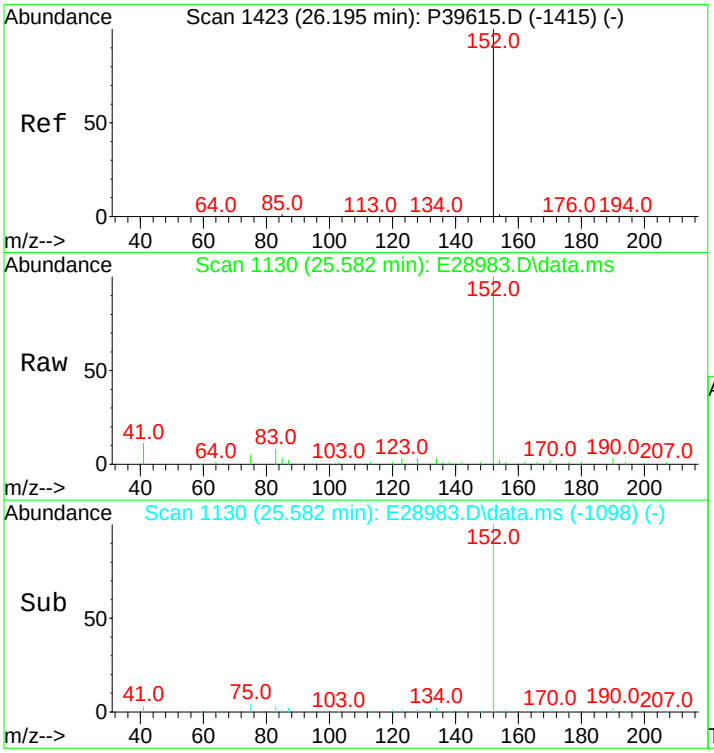


#25
Dibenzofuran
Concen: 143.68 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:168 Resp: 11871

Ion	Ratio	Lower	Upper
168	100		
139	36.8	26.0	39.0
169	14.1	10.6	16.0

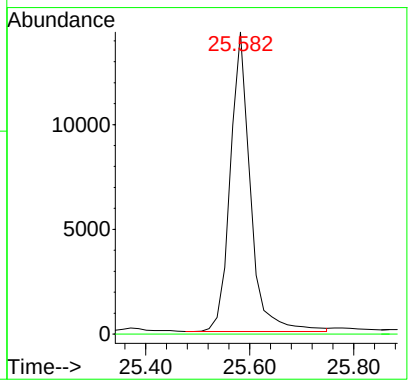


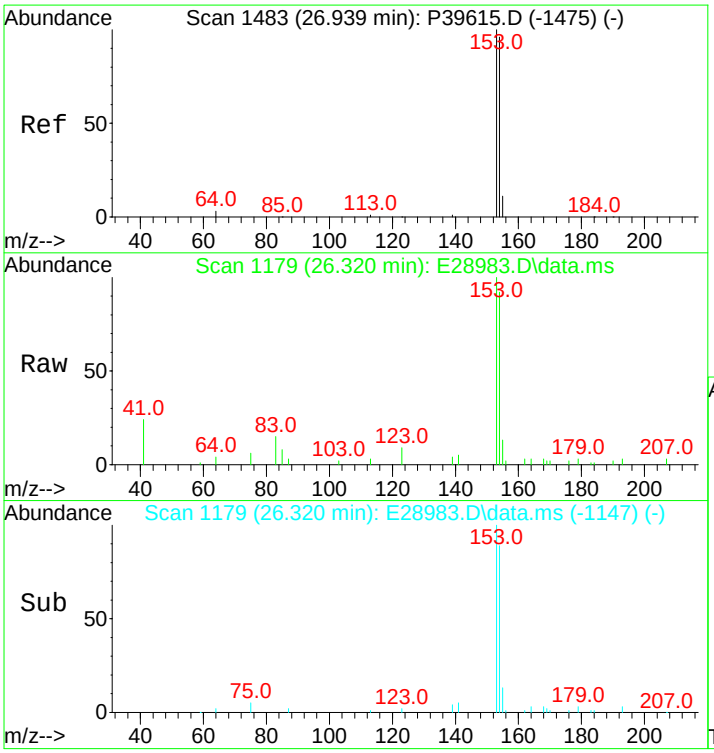


#26
Acenaphthylene
Concen: 414.71 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:152 Resp: 38332

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

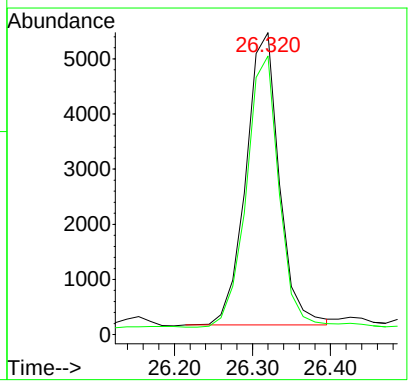


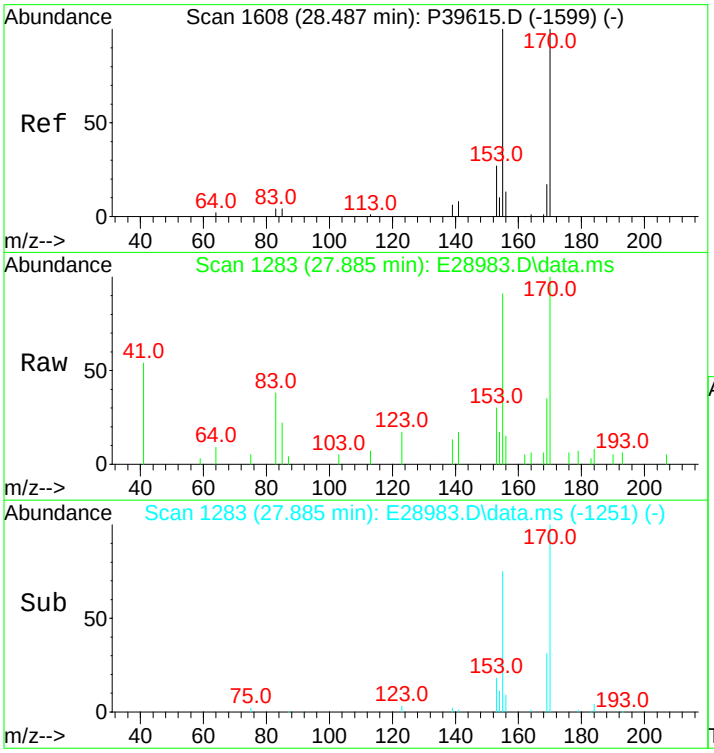


#27
Acenaphthene
Concen: 263.85 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:153 Resp: 15698

Ion	Ratio	Lower	Upper
153	100		
154	92.6	74.1	111.1

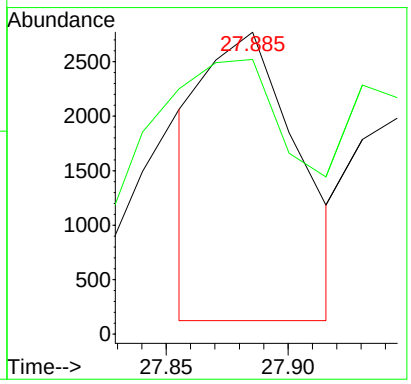


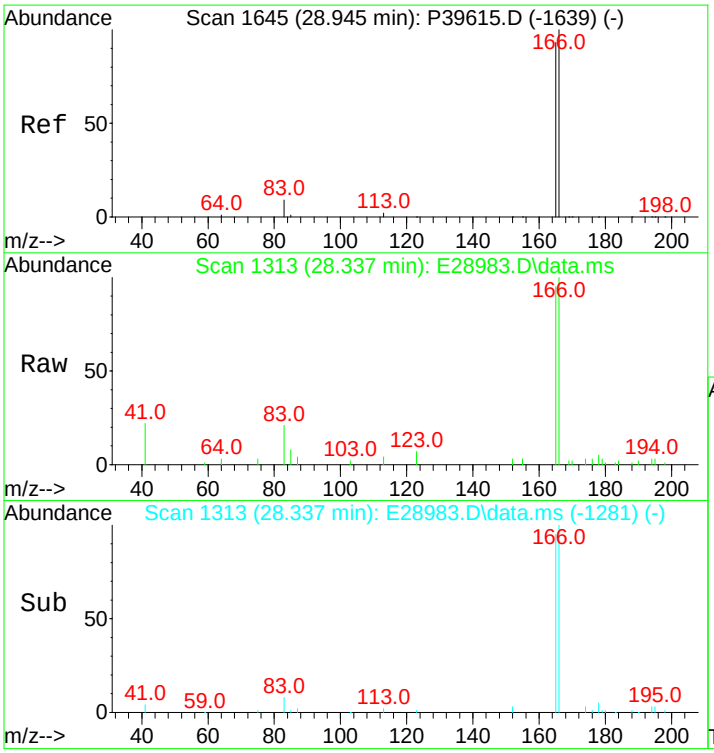


#28
2,3,5-Trimethylnaphthalene
Concen: 141.84 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:170 Resp: 7063

Ion	Ratio	Lower	Upper
170	100		
155	157.3	70.7	106.1#

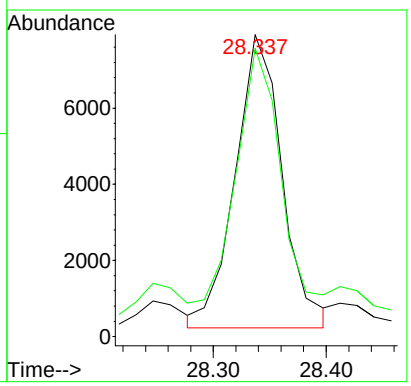


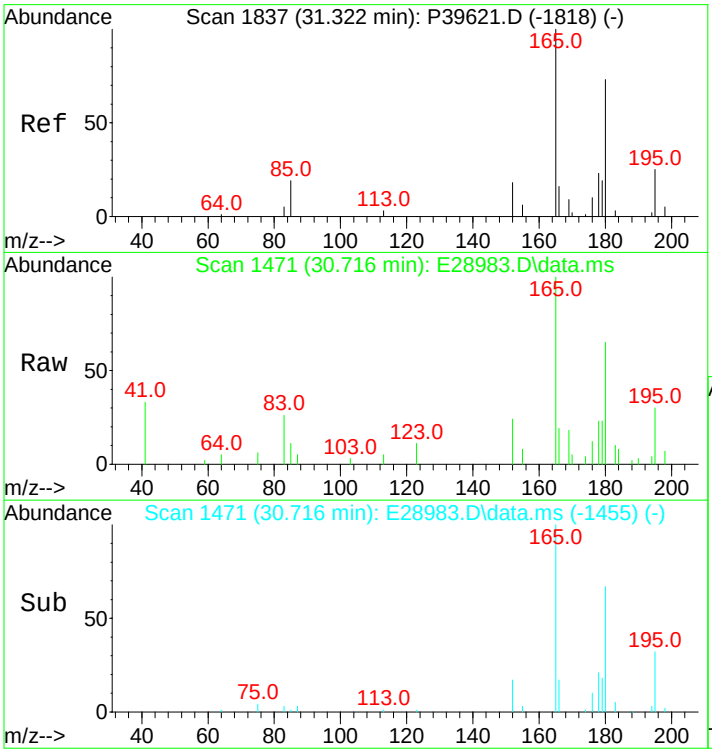


#29
Fluorene
Concen: 334.73 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:166 Resp: 22212

Ion	Ratio	Lower	Upper
166	100		
165	80.3	74.7	112.1

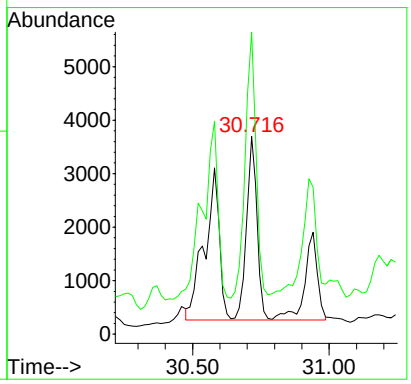


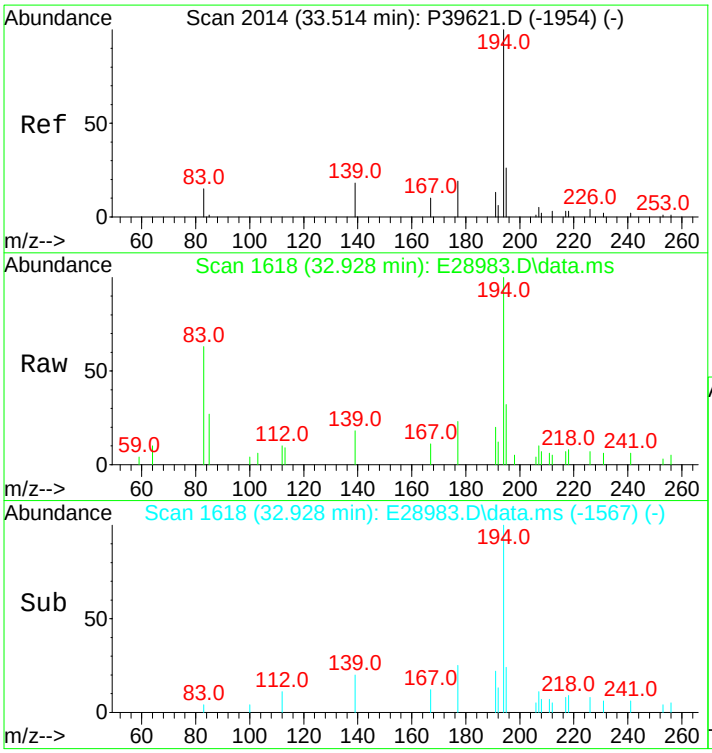


#30
C1-Fluorenes
Concen: 379.75 ng/mL m
RT: 30.716 min Scan# 1471
Delta R.T. 0.093 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:180 Resp: 25199

Ion	Ratio	Lower	Upper
180	100		
165	48.8	94.3	141.5#

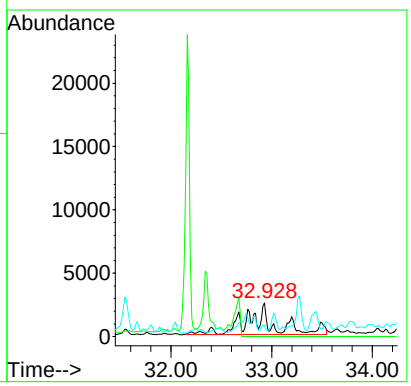


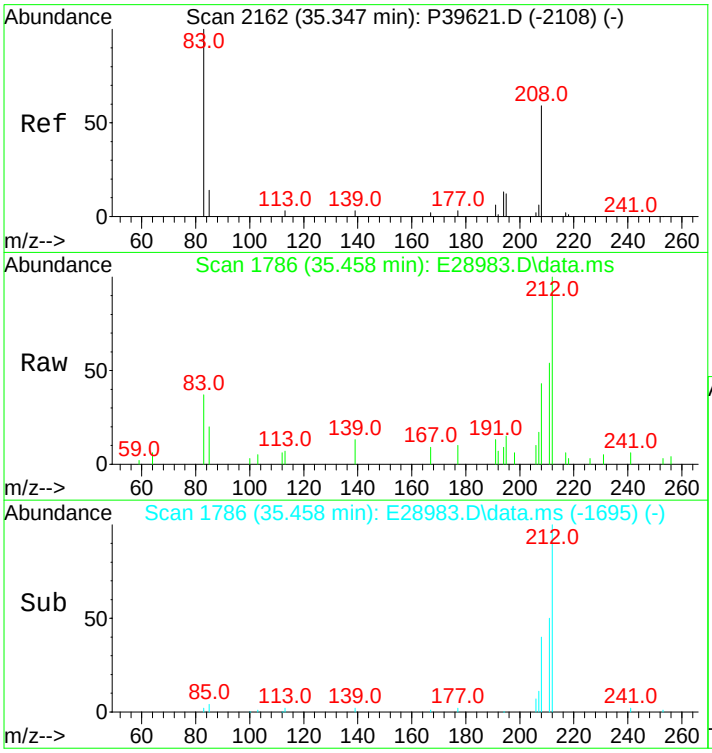


#31
C2-Fluorenes
Concen: 694.75 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:194 Resp: 46102

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	20.3	27.0	40.4#

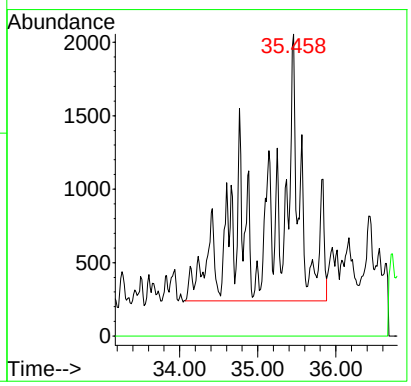


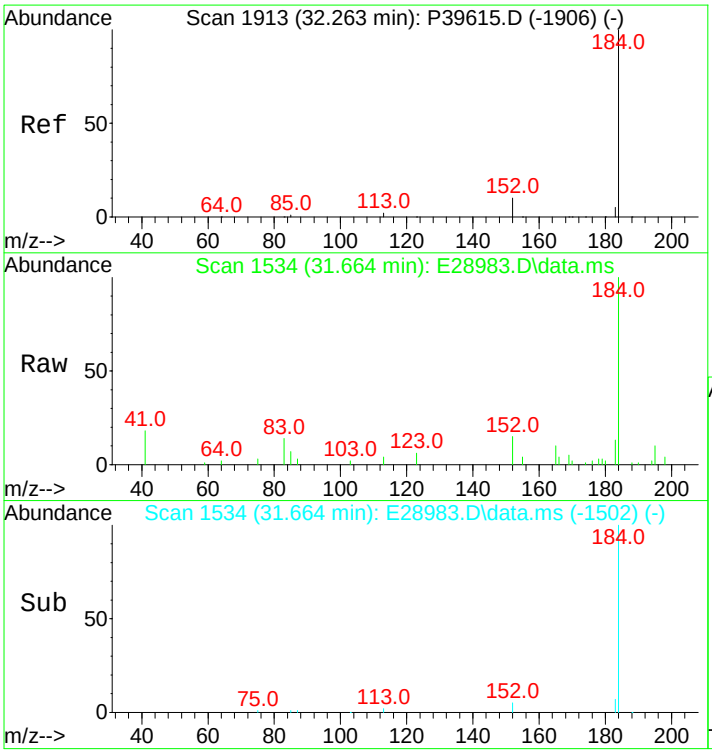


#32
C3-Fluorenes
Concen: 704.08 ng/mL m
RT: 35.458 min Scan# 1786
Delta R.T. 0.909 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:208 Resp: 46721

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

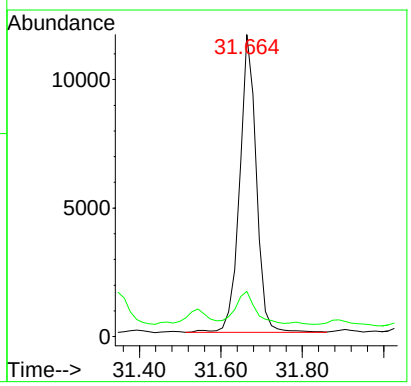


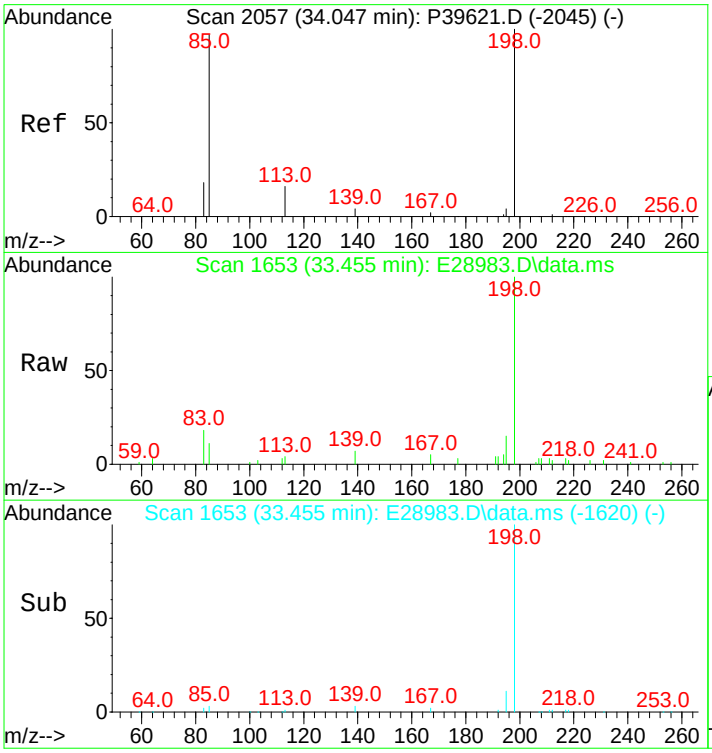


#33
Dibenzothiophene
Concen: 359.62 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:184 Resp: 32747

Ion	Ratio	Lower	Upper
184	100		
152	12.9	7.0	10.6#

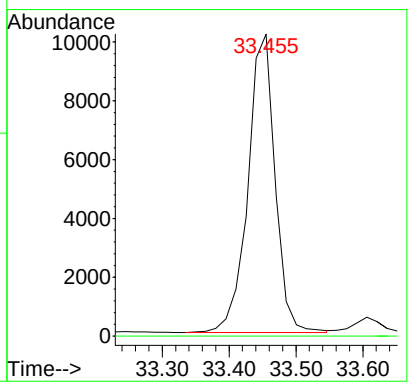


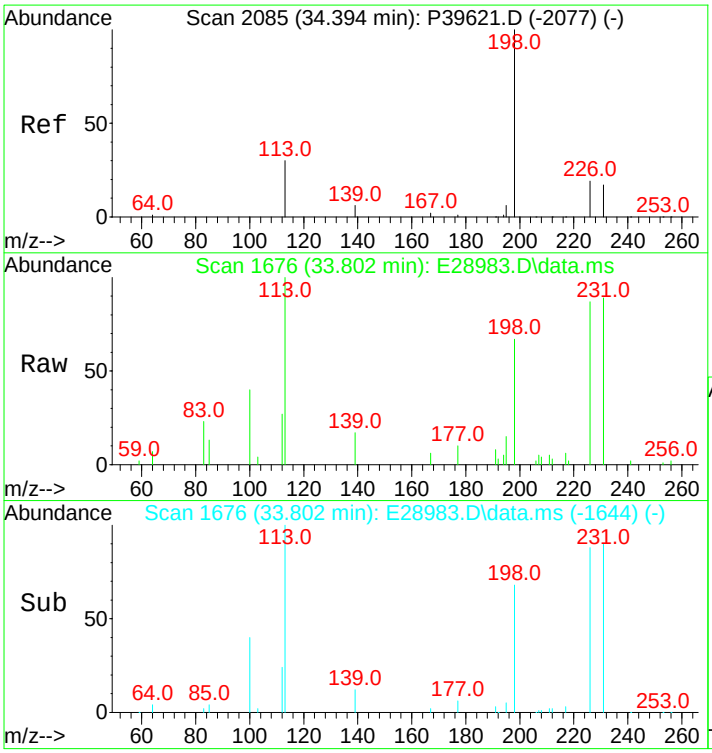


#34
4-Methyldibenzothiophene(4MDT)
Concen: 315.51 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:198 Resp: 28731

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

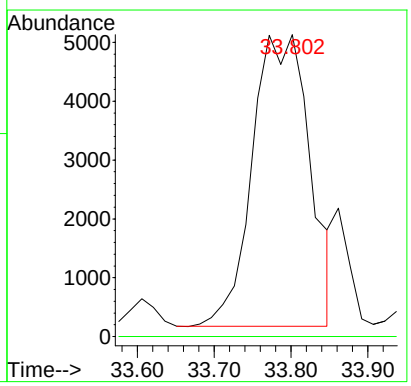


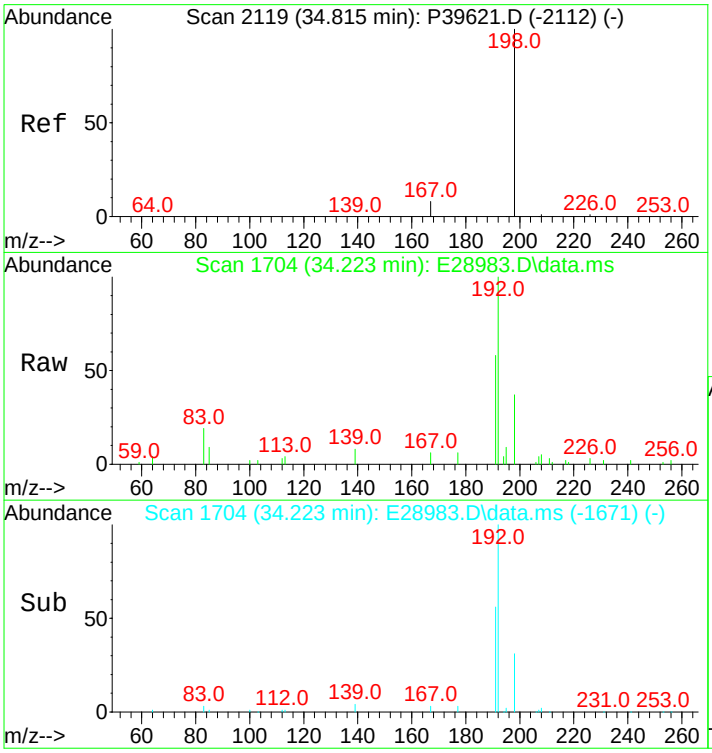


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 283.71 ng/mL m
RT: 33.802 min Scan# 1676
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:198 Resp: 25835

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

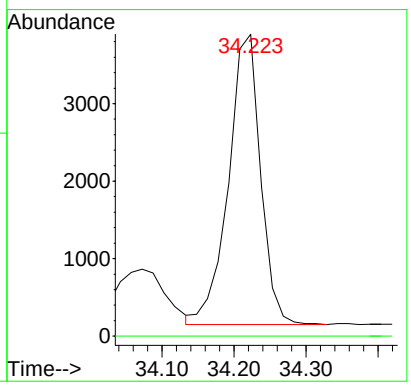


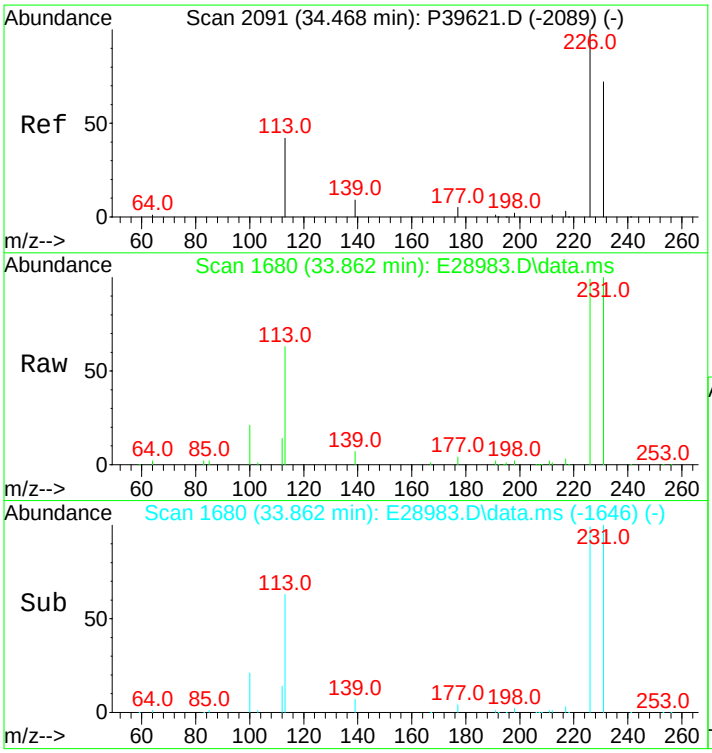


#36
1-Methyldibenzothiophene(1MDT)
Concen: 127.38 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:198 Resp: 11599

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

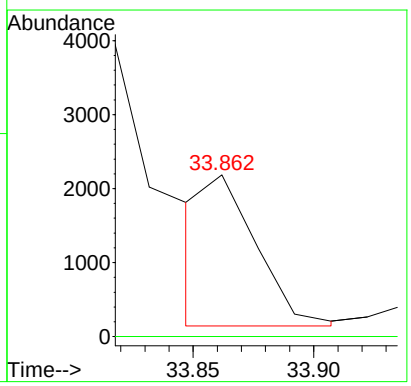


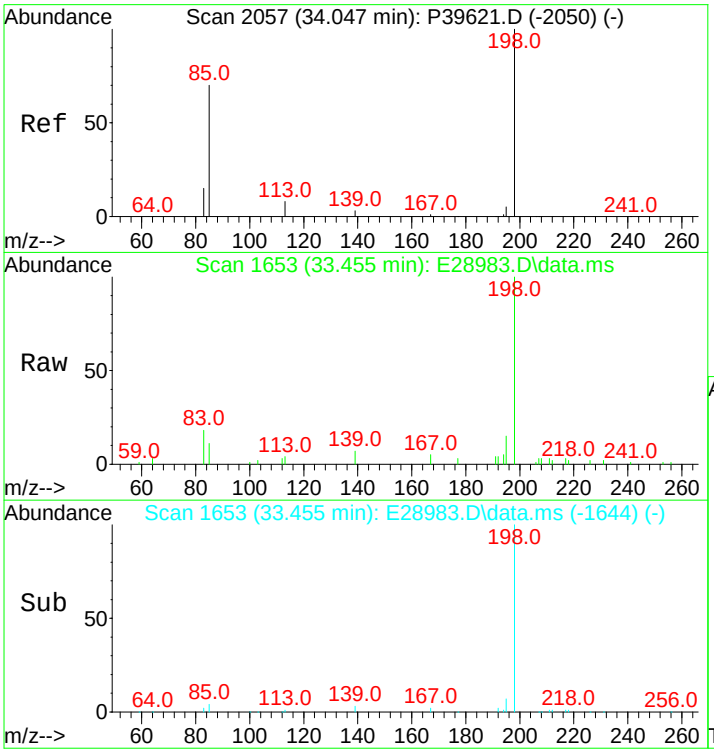


#37
OTP
Concen: 32.80 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:198 Resp: 2987

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

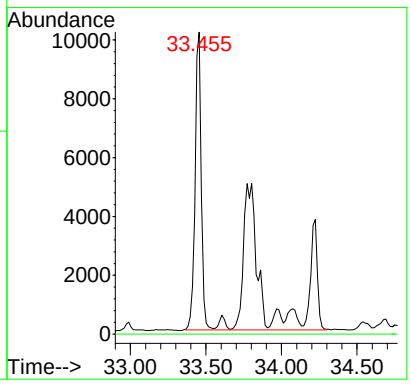


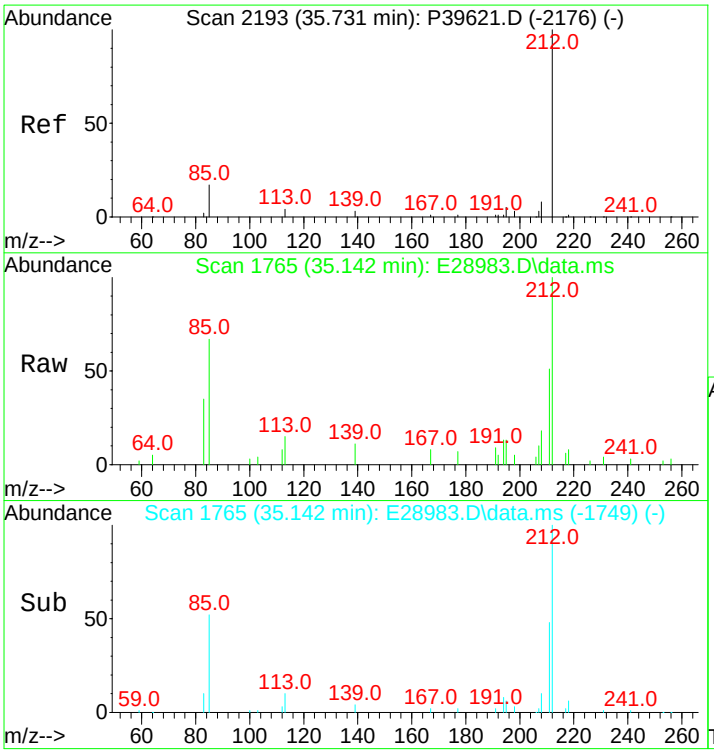


#38
C1-Dibenzothiophenes
Concen: 843.89 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:198 Resp: 76846

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

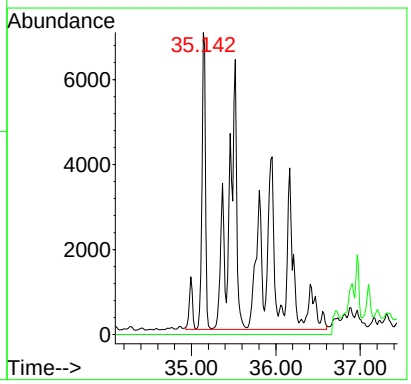


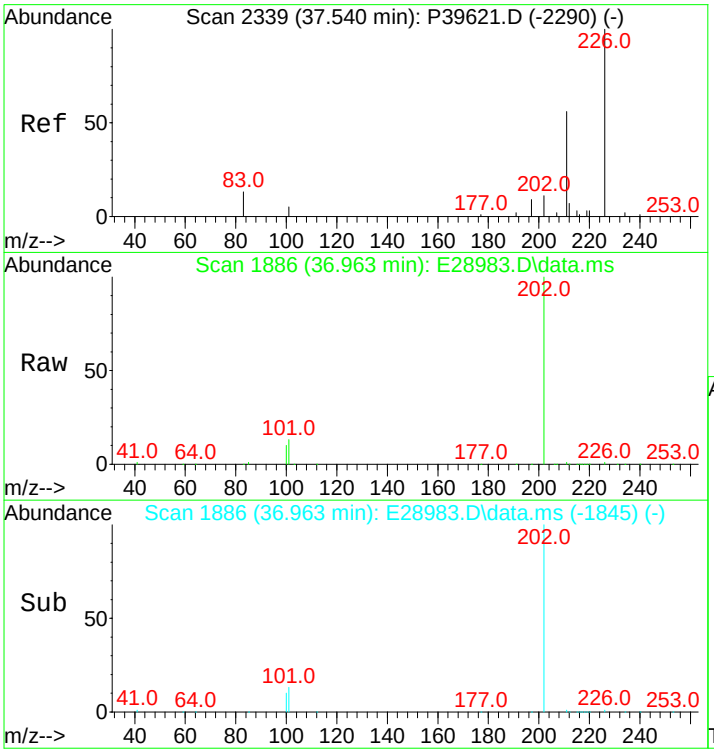


#39
C2-Dibenzothiophenes
Concen: 1364.80 ng/mL m
RT: 35.142 min Scan# 1765
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:212 Resp: 124280

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

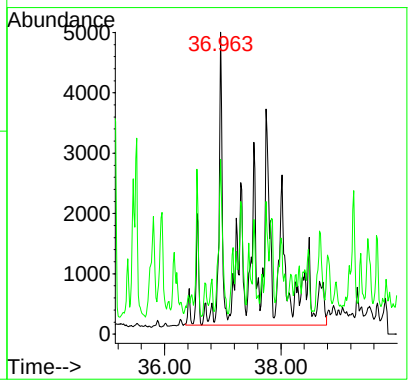


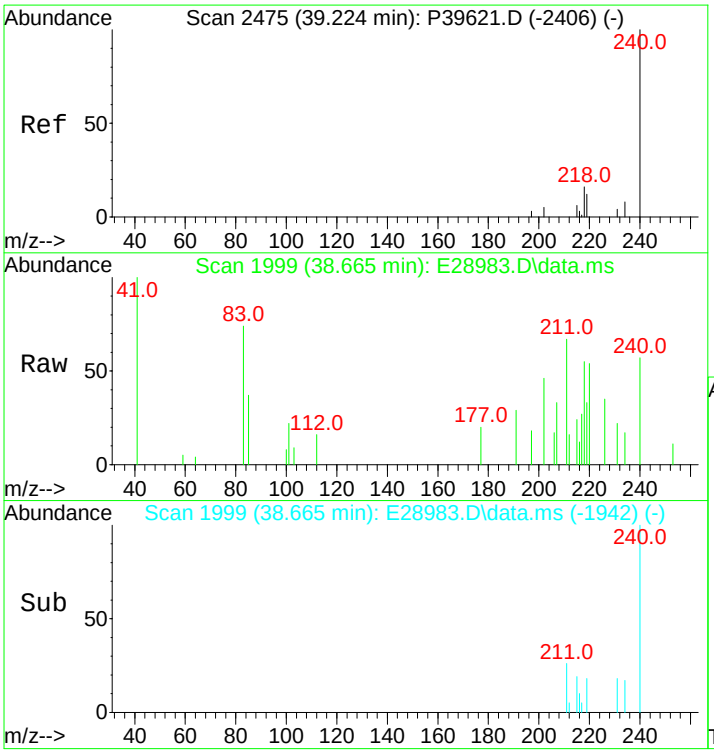


#40
C3-Dibenzothiophenes
Concen: 1229.59 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:226 Resp: 111968

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

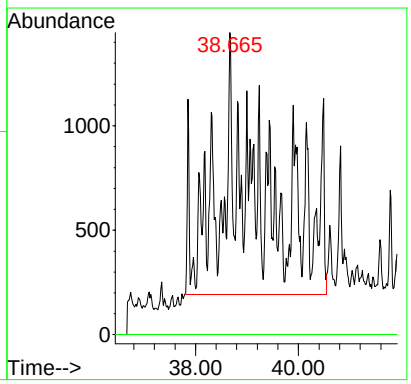


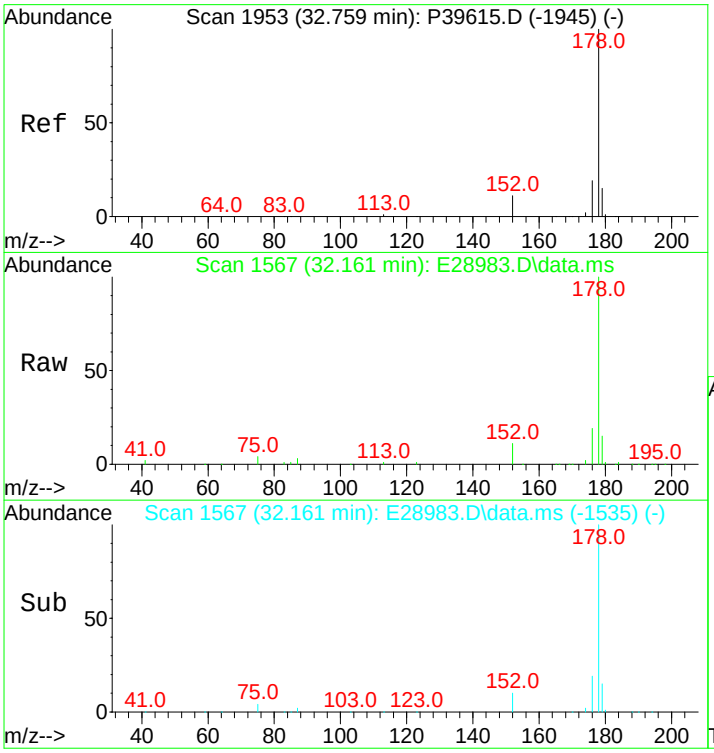


#41
C4-Dibenzothiophenes
Concen: 752.51 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:240 Resp: 68524

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

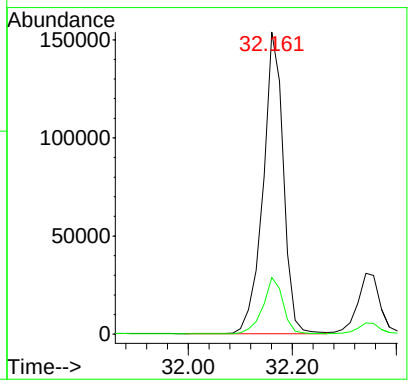


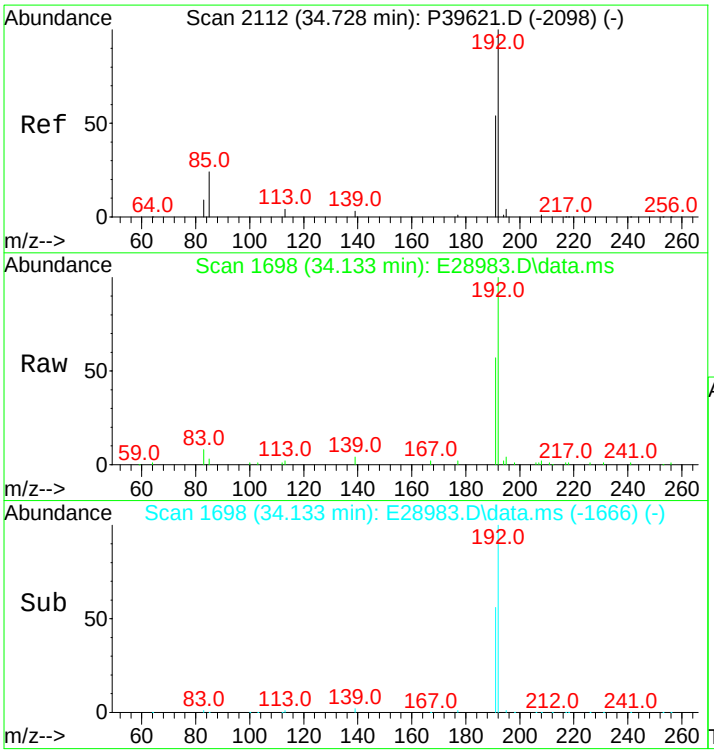


#43
Phenanthrene
Concen: 4501.57 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:178 Resp: 417047

Ion	Ratio	Lower	Upper
178	100		
176	18.6	15.0	22.4

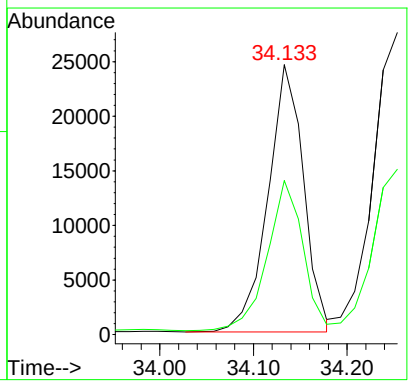


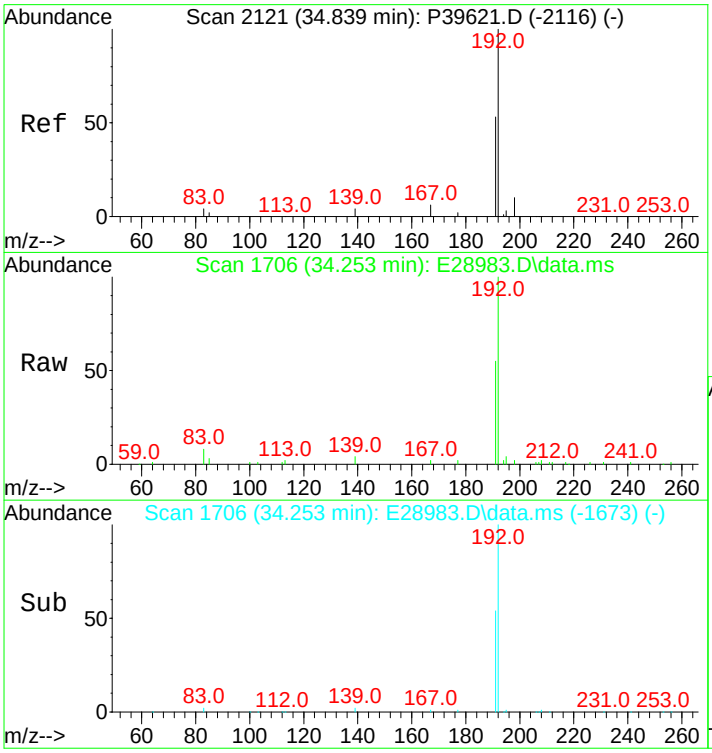


#44
3-Methylphenanthrene(3MP)
Concen: 699.12 ng/mL
RT: 34.133 min Scan# 1698
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 64770

Ion	Ratio	Lower	Upper
192	100		
191	55.9	45.9	68.9

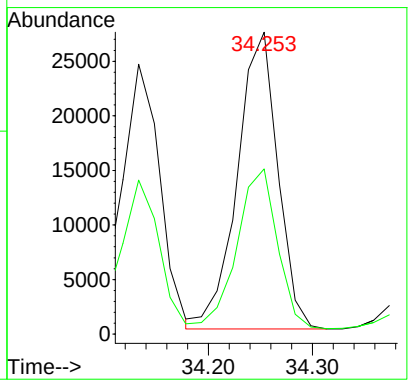


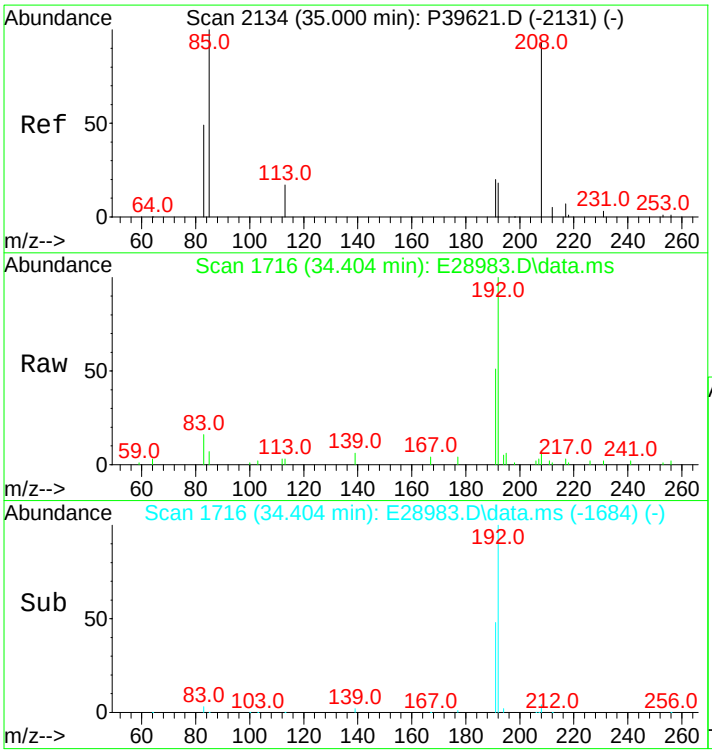


#45
2-Methylphenanthrene(2MP)
Concen: 796.94 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 73832

Ion	Ratio	Lower	Upper
192	100		
191	53.7	45.4	68.0

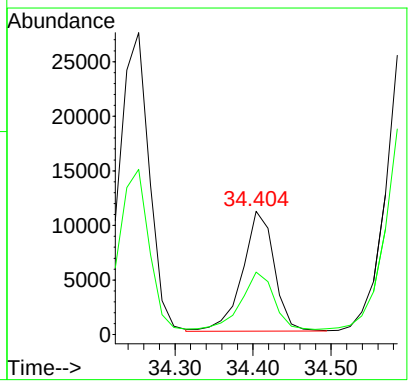


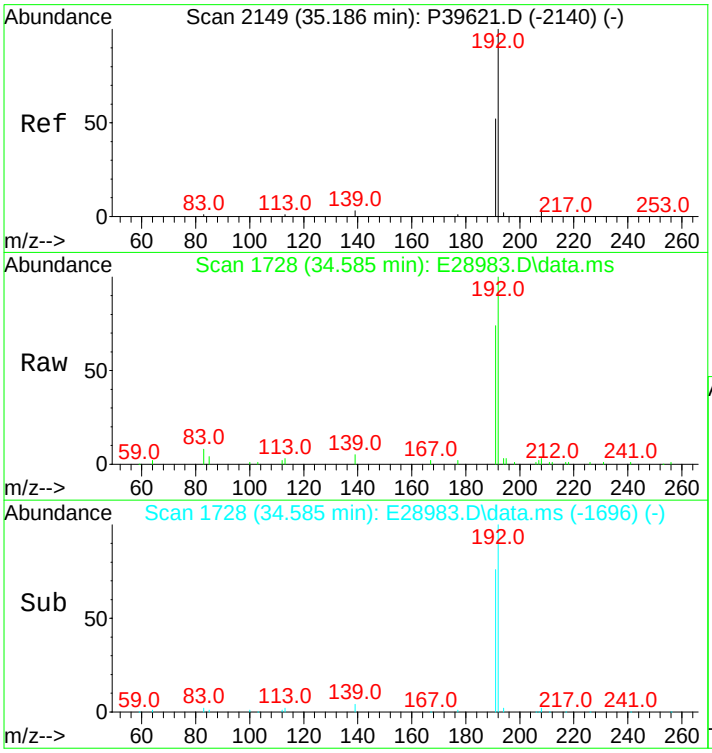


#46
2-Methylanthracene(2MA)
Concen: 335.08 ng/mL
RT: 34.404 min Scan# 1716
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 31043

Ion	Ratio	Lower	Upper
192	100		
191	49.8	95.4	143.0#

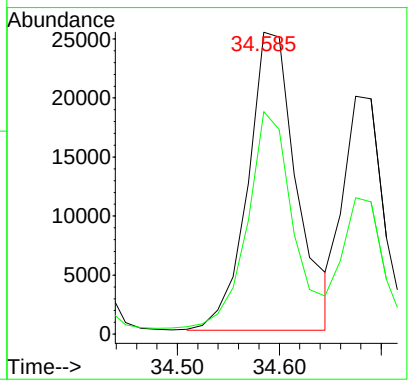


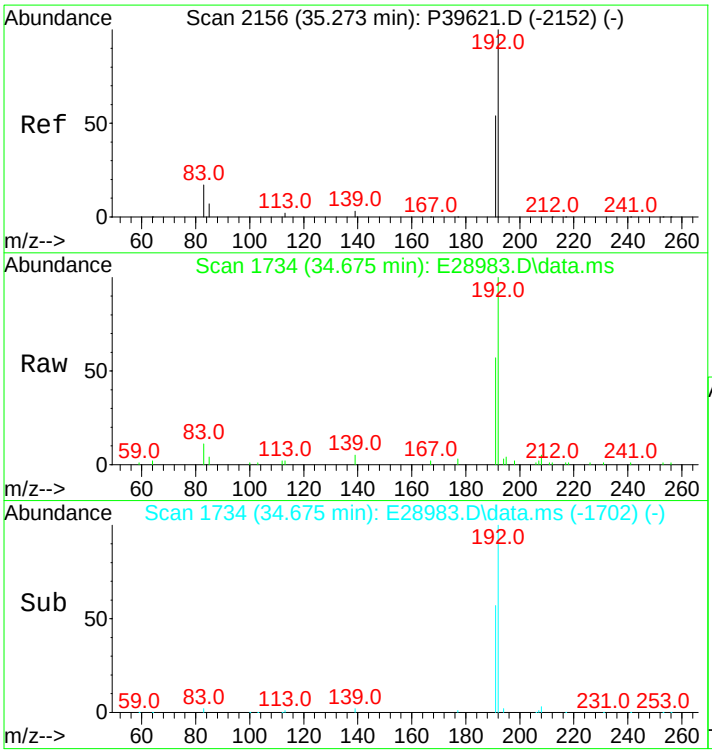


#47
9/4-Methylphenanthrene(9MP)
Concen: 912.98 ng/mL m
RT: 34.585 min Scan# 1728
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 84583

Ion	Ratio	Lower	Upper
192	100		
191	35.3	44.3	66.5#

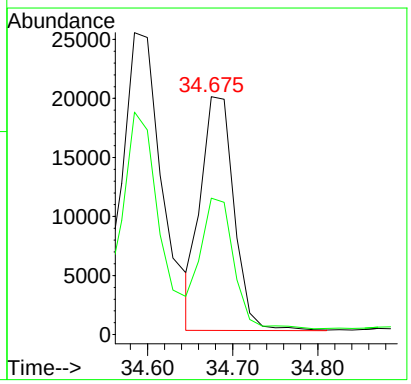


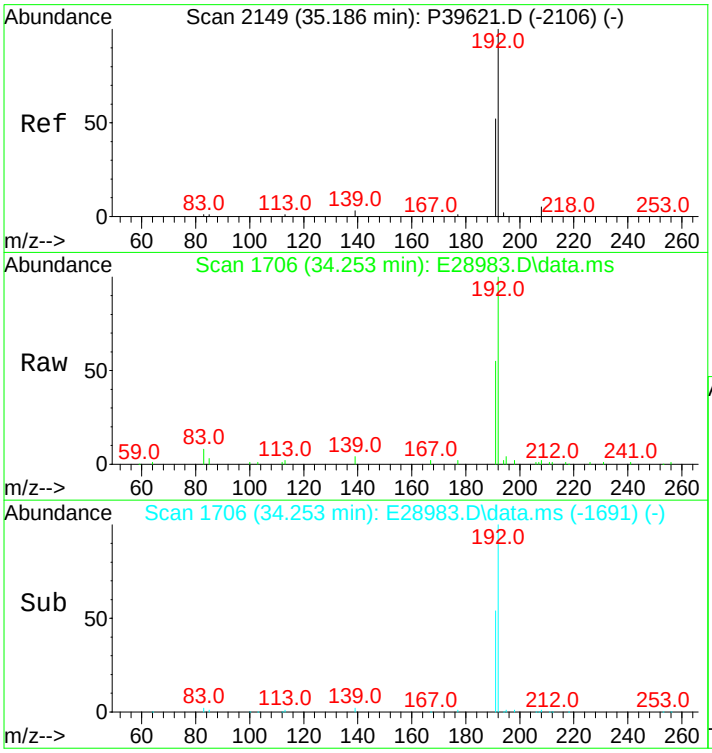


#48
1-Methylphenanthrene(1MP)
Concen: 581.09 ng/mL
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 53835

Ion	Ratio	Lower	Upper
192	100		
191	55.4	46.7	70.1

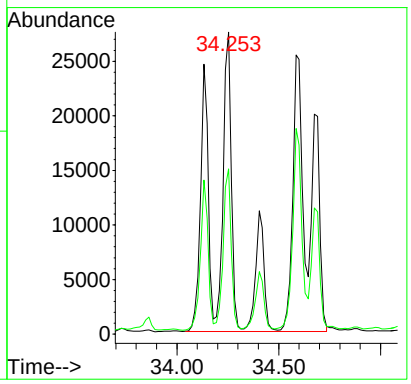


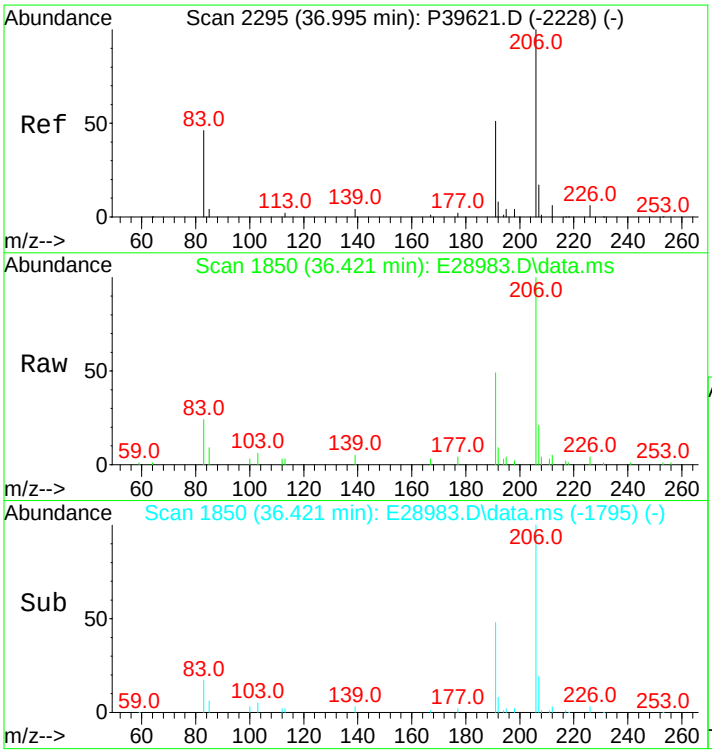


#49
C1-Phenanthrenes/Anthracenes
Concen: 3362.22 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 311492

Ion	Ratio	Lower	Upper
192	100		
191	4.9	44.0	66.0#

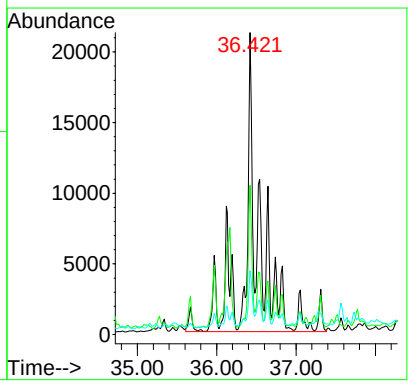


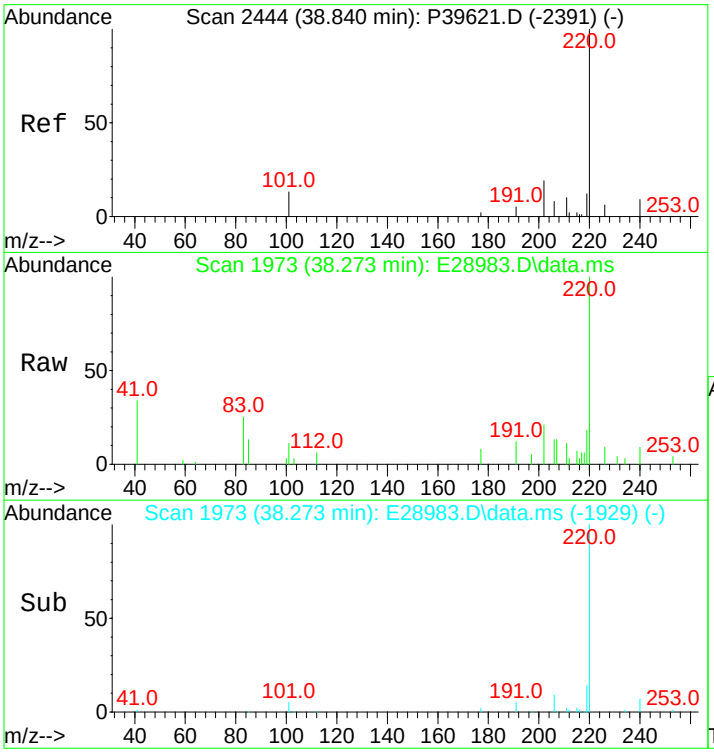


#50
C2-Phenanthrenes/Anthracenes
Concen: 2754.20 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.261 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:206 Resp: 255162

Ion	Ratio	Lower	Upper
206	100		
191	13.3	35.7	53.5#
207	5.7	16.5	24.7#

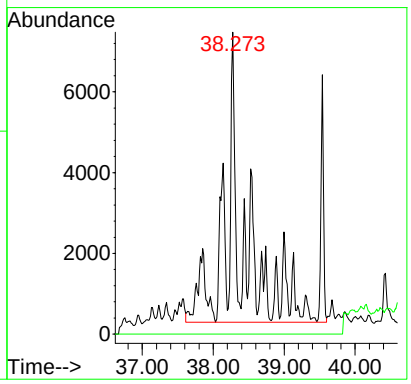


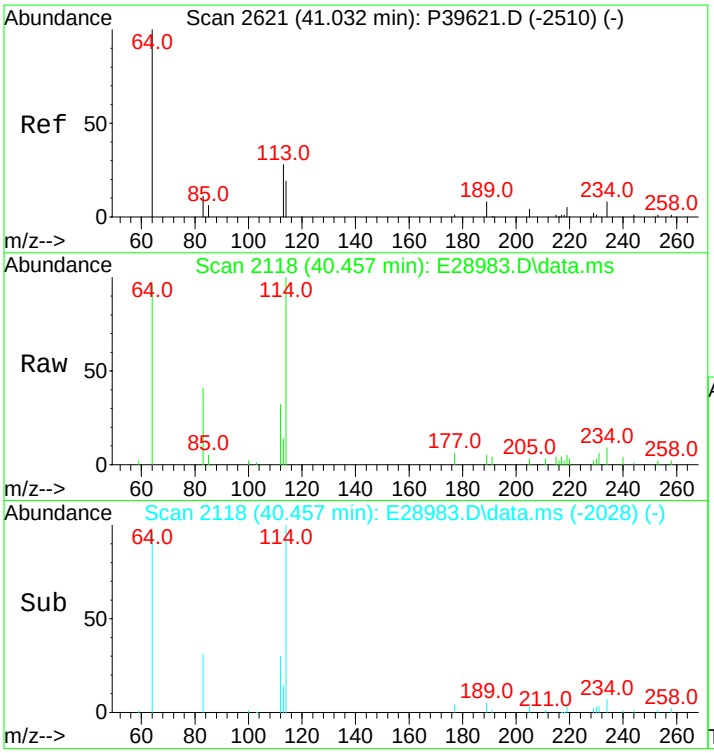


#52
C3-Phenanthrenes/Anthracenes
Concen: 1447.82 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:220 Resp: 134133

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

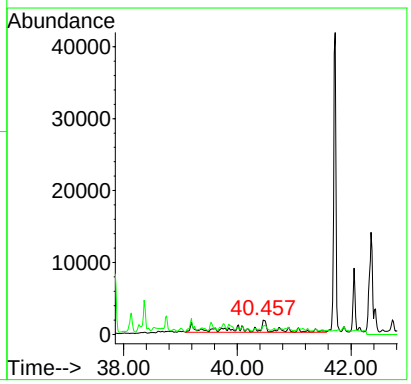


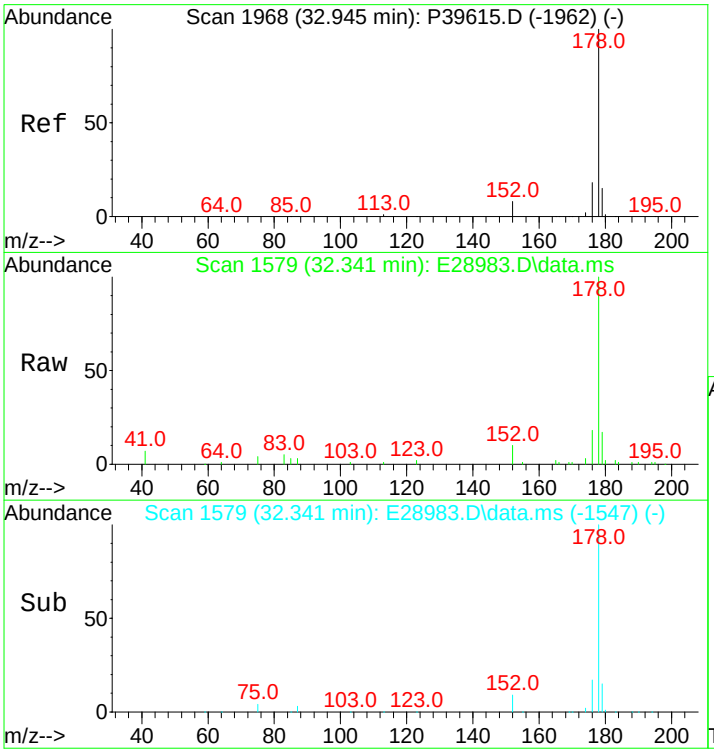


#53
C4-Phenanthrenes/Anthracenes
Concen: 558.82 ng/mL m
RT: 40.457 min Scan# 2118
Delta R.T. 0.369 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:234 Resp: 51772

Ion	Ratio	Lower	Upper
234	100		
219	2.2	46.6	70.0#

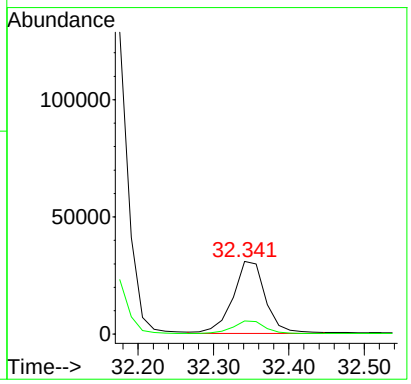


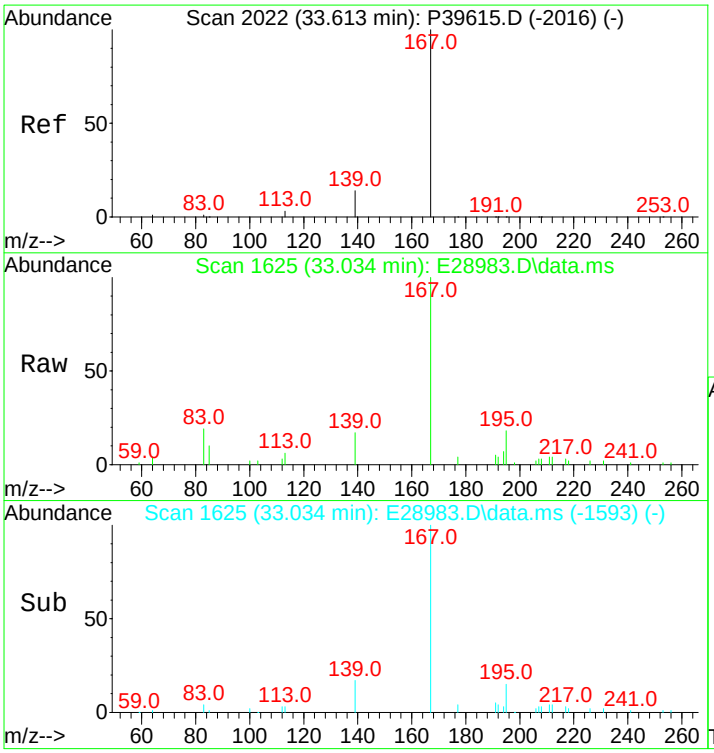


#55
Anthracene
Concen: 1164.62 ng/mL m
RT: 32.341 min Scan# 1579
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:178 Resp: 93260

Ion	Ratio	Lower	Upper
178	100		
176	17.2	14.3	21.5

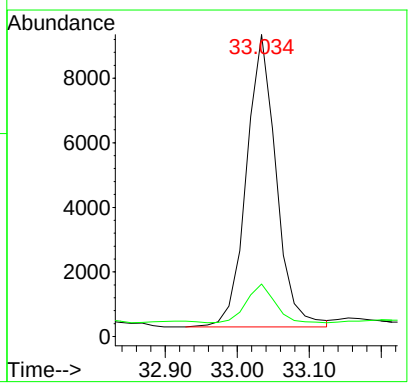


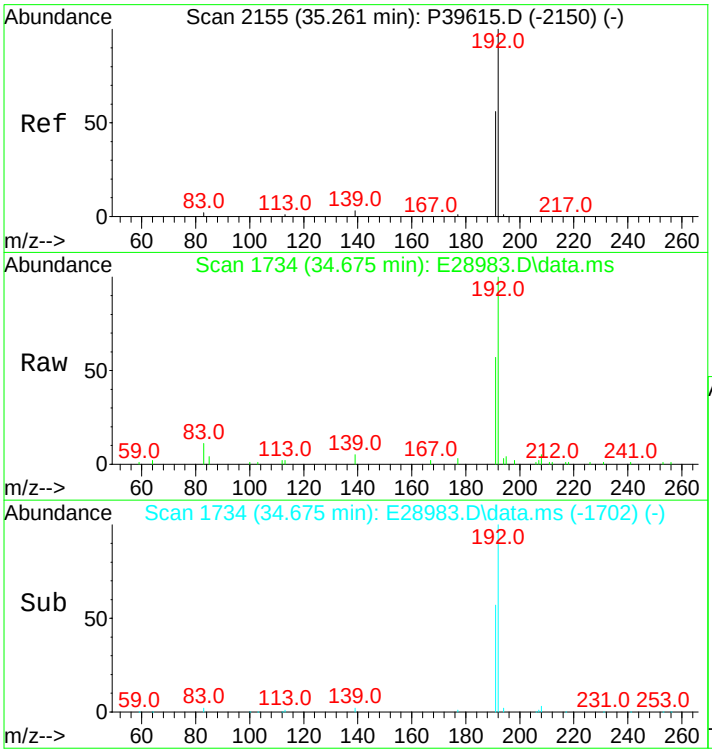


#56
Carbazole
Concen: 313.85 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:167 Resp: 25866

Ion	Ratio	Lower	Upper
167	100		
139	12.8	10.1	15.1

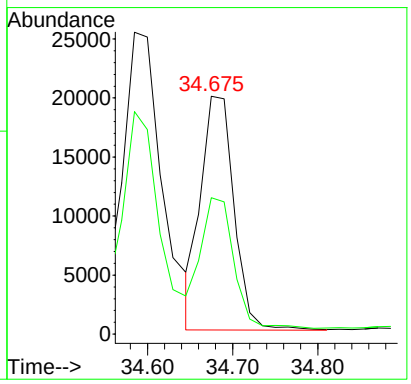


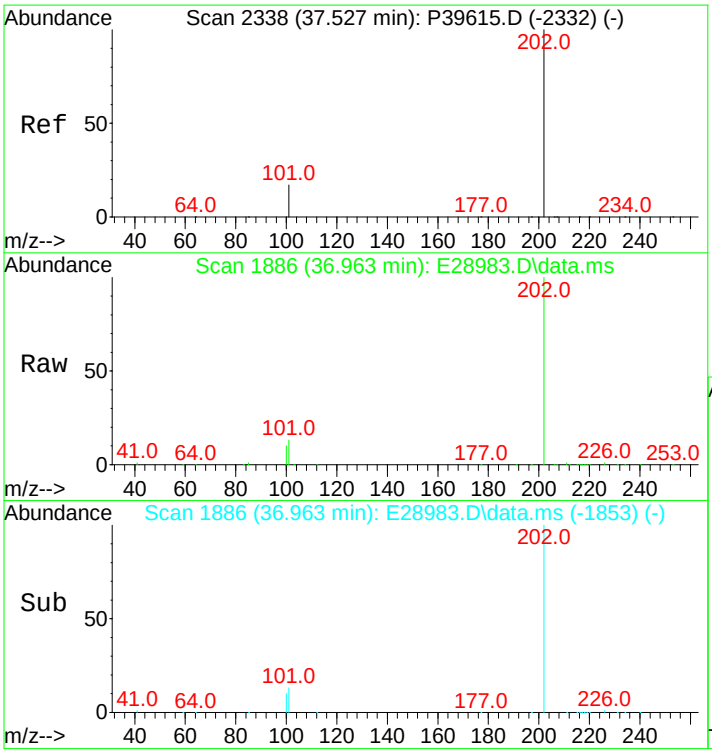


#57
1-Methylphenanthrene
Concen: 761.67 ng/mL
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:192 Resp: 53835

Ion	Ratio	Lower	Upper
192	100		
191	55.4	45.4	68.2

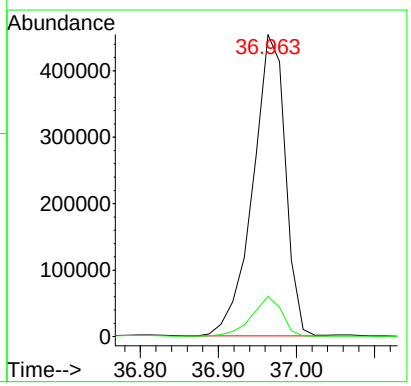


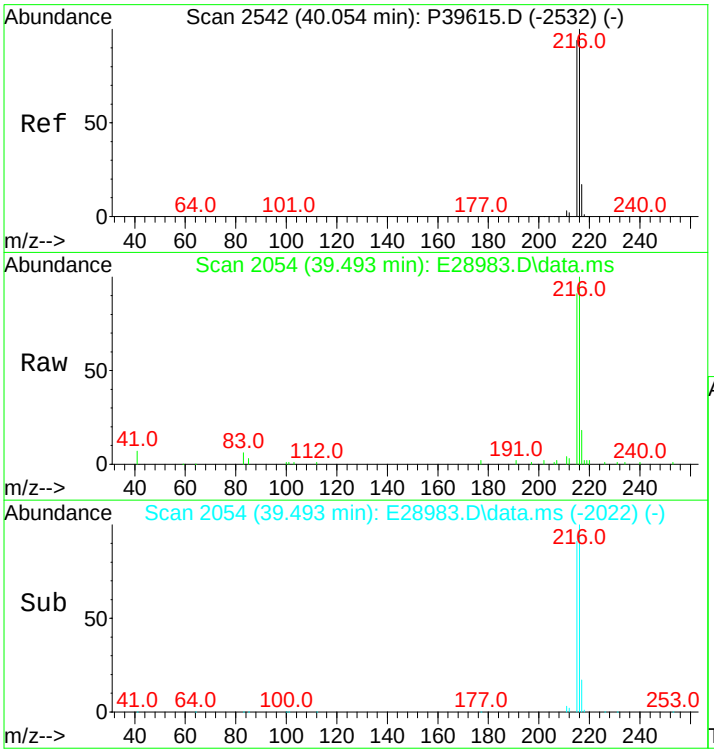


#58
Fluoranthene
Concen: 12839.18 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:202 Resp: 1313603

Ion	Ratio	Lower	Upper
202	100		
101	12.5	10.4	15.6

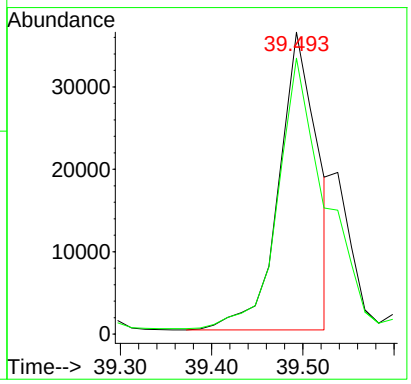


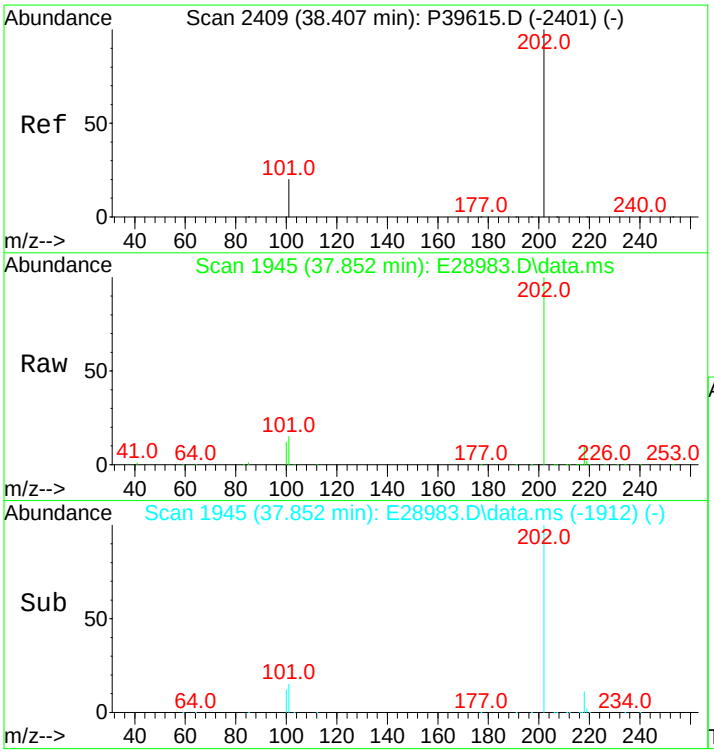


#59
Benzo(b)fluorene
Concen: 1568.41 ng/mL m
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:216 Resp: 106928

Ion	Ratio	Lower	Upper
216	100		
215	110.4	72.6	109.0#

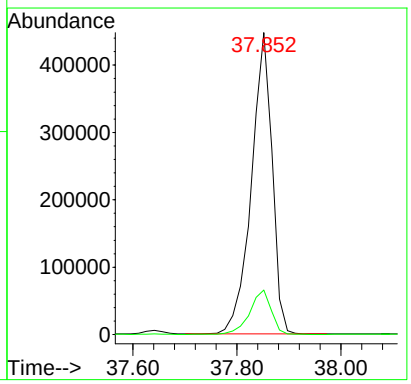


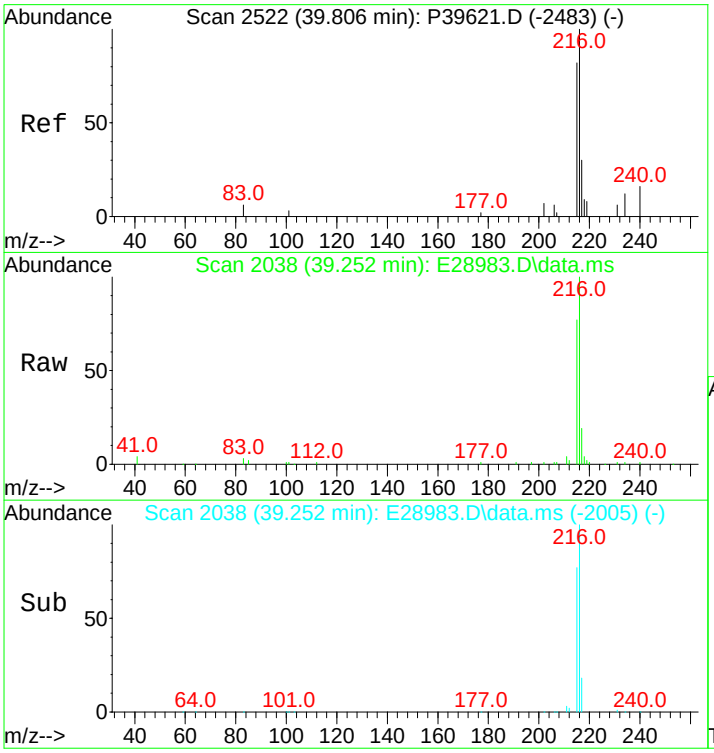


#60
Pyrene
Concen: 11960.99 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:202 Resp: 1243842

Ion	Ratio	Lower	Upper
202	100		
101	15.2	11.0	16.4

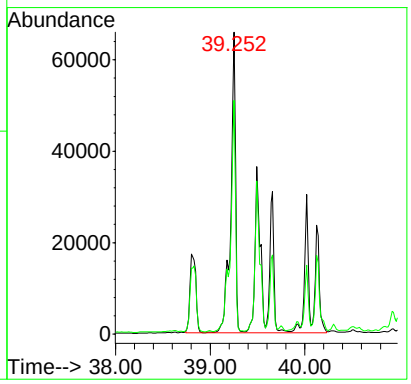


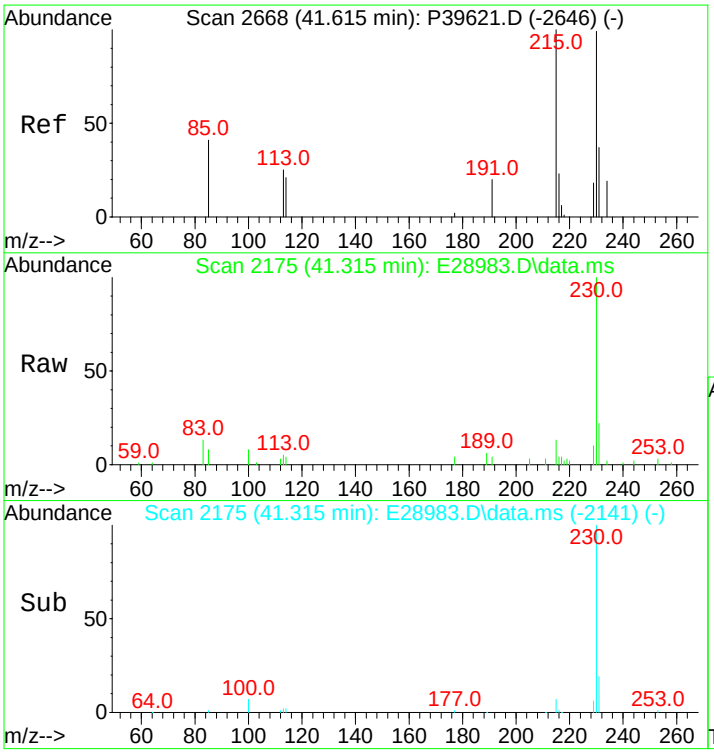


#61
C1-Fluoranthenes/Pyrenes
Concen: 6696.42 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:216 Resp: 696371

Ion	Ratio	Lower	Upper
216	100		
215	26.8	73.4	110.2#

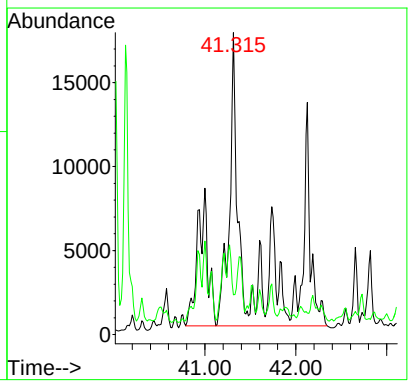


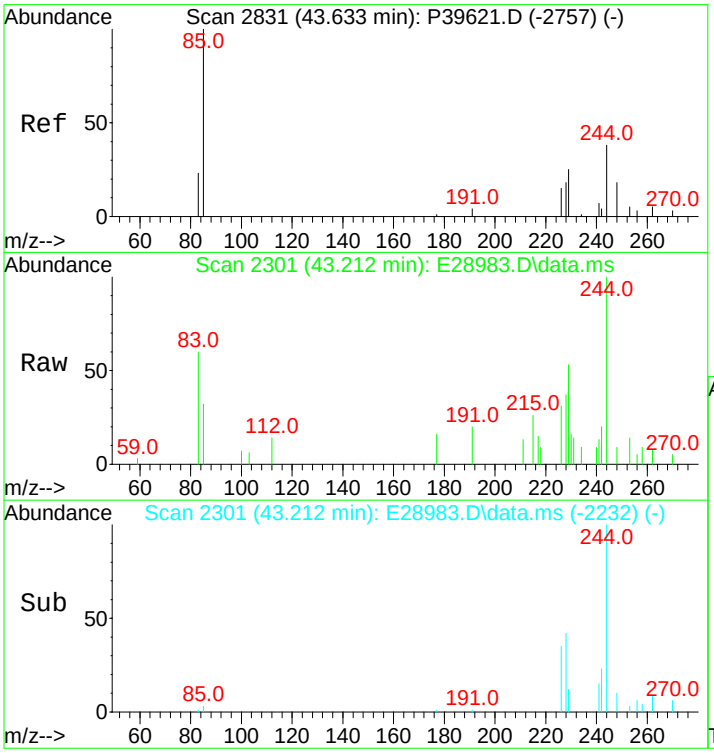


#62
C2-Fluoranthenes/Pyrenes
Concen: 2921.35 ng/mL m
RT: 41.315 min Scan# 2175
Delta R.T. 0.435 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:230 Resp: 303796

Ion	Ratio	Lower	Upper
230	100		
215	1.5	93.8	140.8#

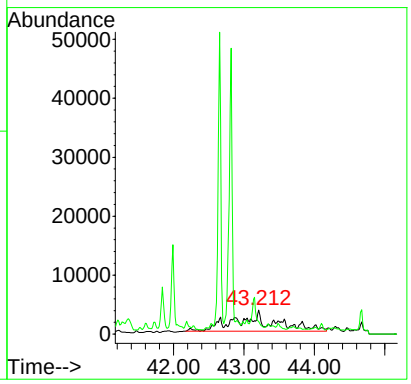


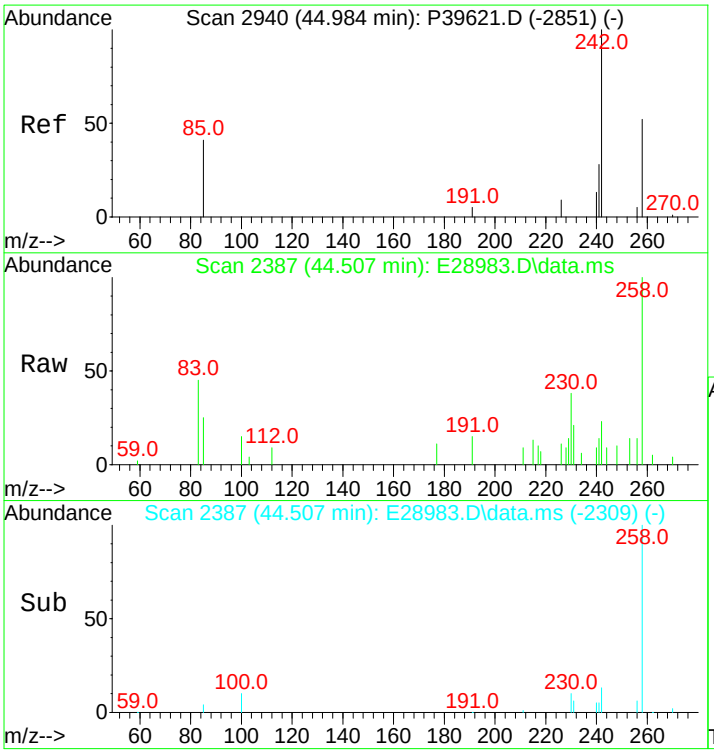


#63
C3-Fluoranthenes/Pyrenes
Concen: 1272.49 ng/mL m
RT: 43.212 min Scan# 2301
Delta R.T. 0.560 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:244 Resp: 132328

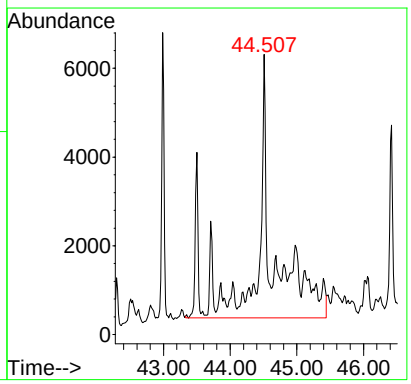
Ion	Ratio	Lower	Upper
244	100		
229	97.7	72.2	108.2

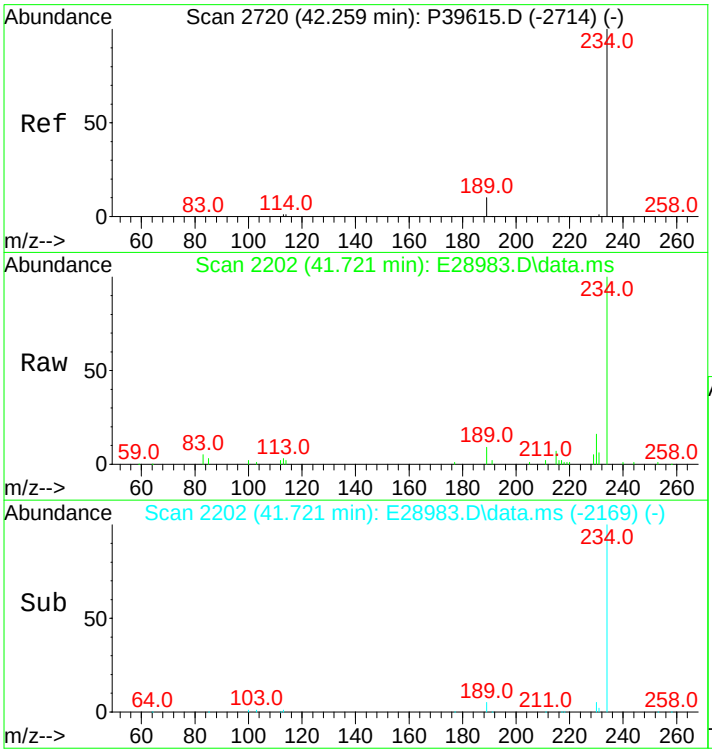




#64
C4-Fluoranthenes/Pyrenes
Concen: 990.18 ng/mL m
RT: 44.507 min Scan# 2387
Delta R.T. 0.536 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:258 Resp: 102970

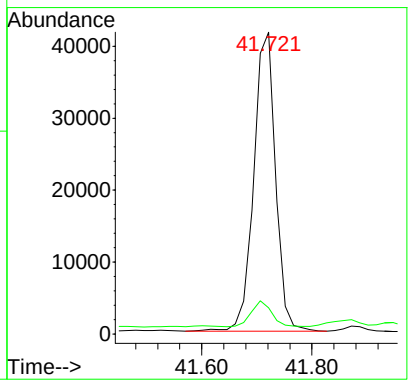


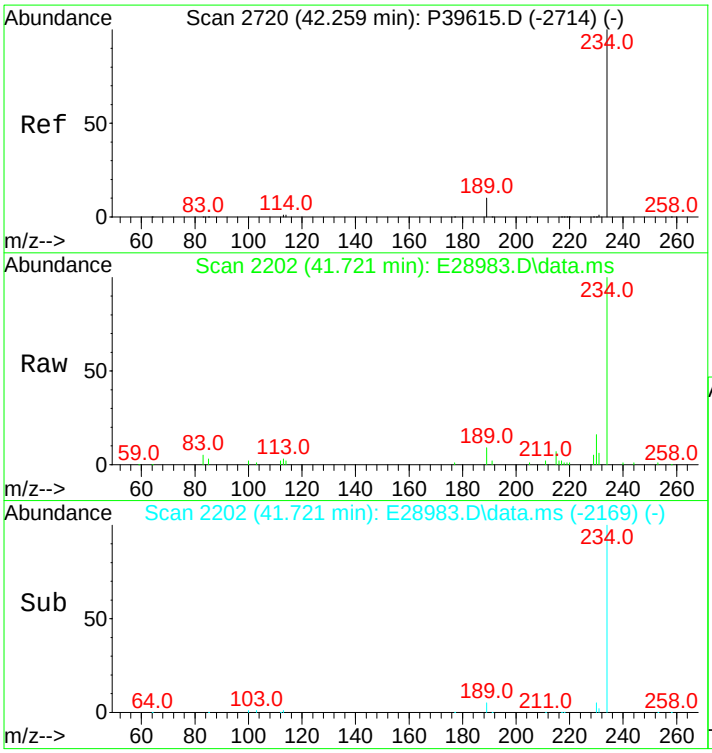


#66
Naphthobenzothiophene
Concen: 1108.24 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:234 Resp: 113668

Ion	Ratio	Lower	Upper
234	100		
189	8.5	21.1	31.7#

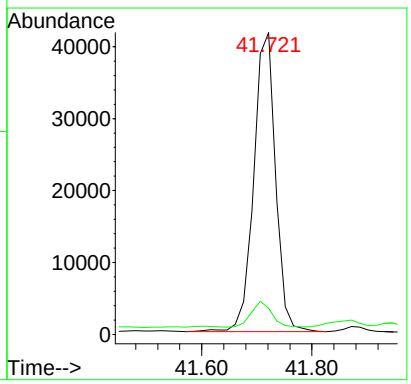


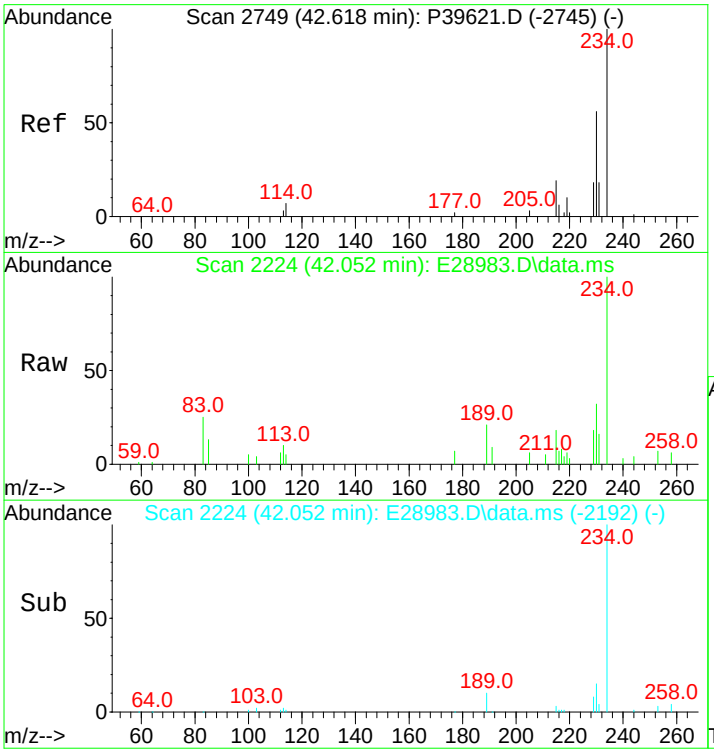


#67
Naphthobenzothiophene-2,1-D
Concen: 1108.24 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:234 Resp: 113668

Ion	Ratio	Lower	Upper
234	100		
189	8.5	21.1	31.7#

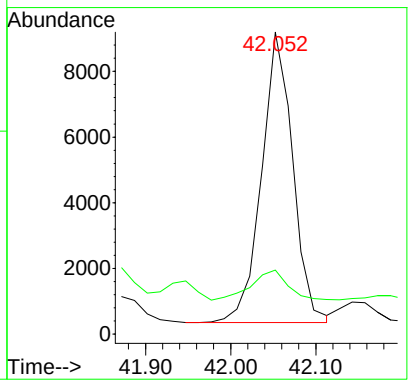


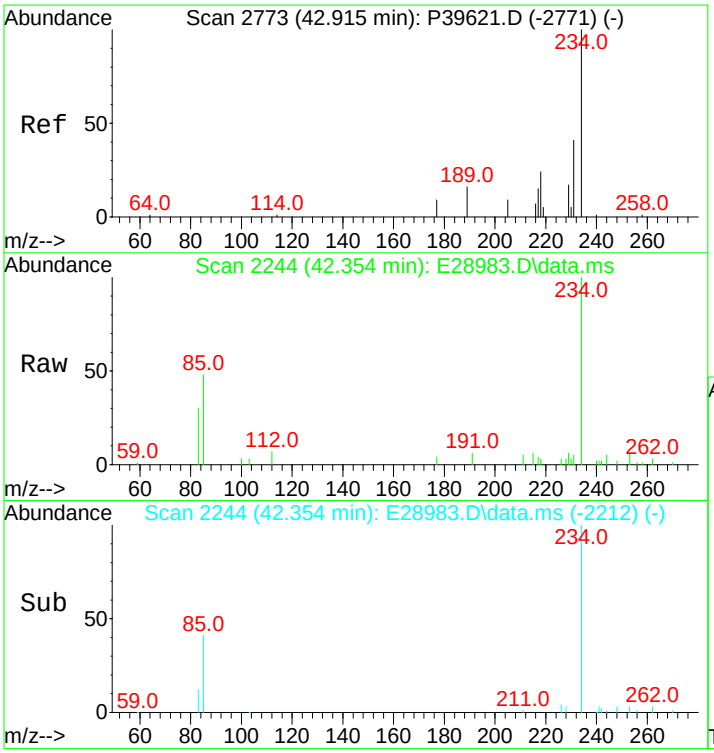


#68
Naphthobenzothiophene-1,2-D
Concen: 219.52 ng/mL
RT: 42.052 min Scan# 2224
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:234 Resp: 22515

Ion	Ratio	Lower	Upper
234	100		
189	11.3	71.9	107.9#

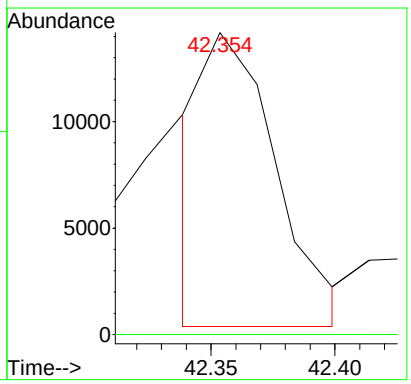


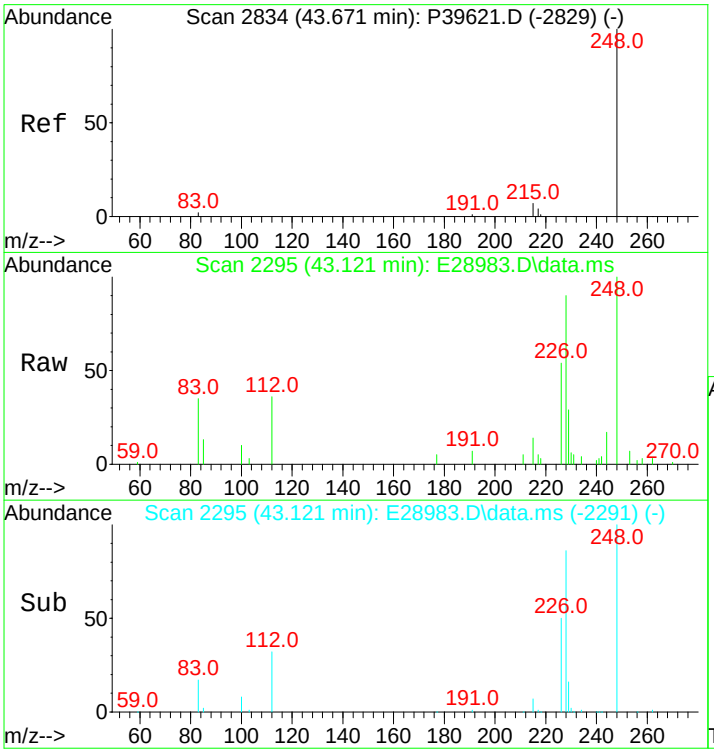


#69
Naphthobenzothiophene-2,3-D
Concen: 273.29 ng/mL m
RT: 42.354 min Scan# 2244
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:234 Resp: 28030

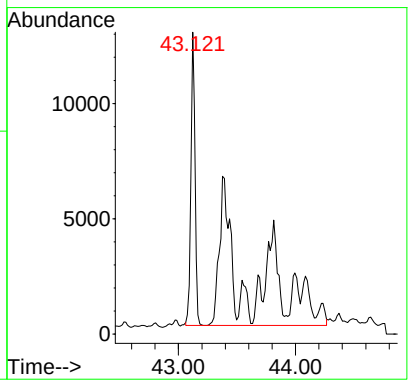
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

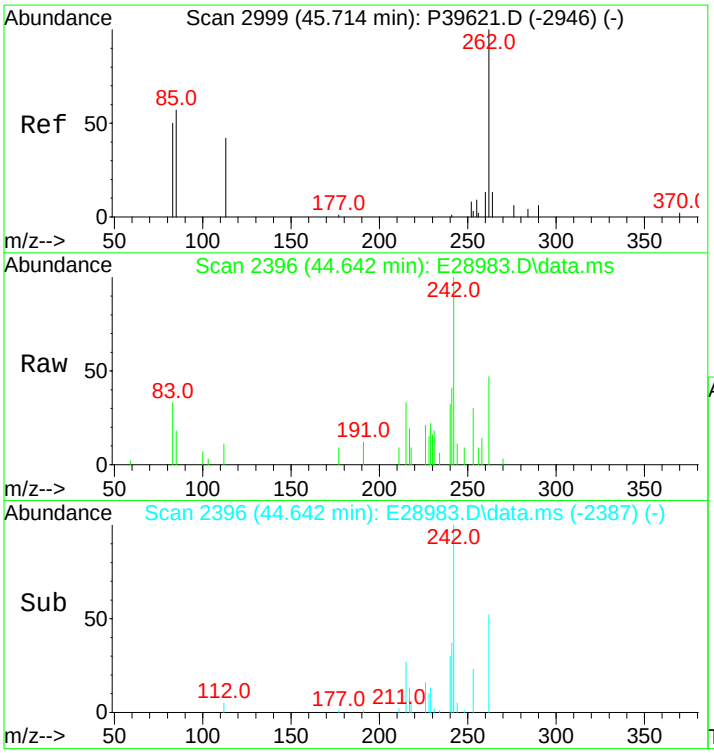




#70
C1-Naphthobenzothiophenes
Concen: 1329.91 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

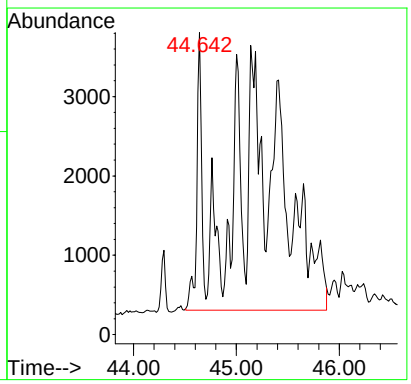
Tgt Ion:248 Resp: 136403

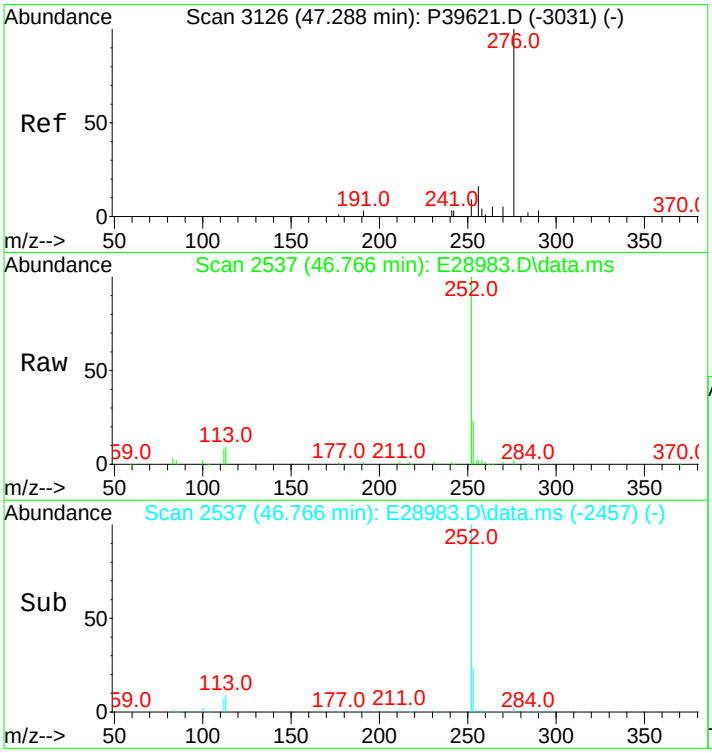




#71
C2-Naphthobenzothiophenes
Concen: 1020.56 ng/ml m
RT: 44.642 min Scan# 2396
Delta R.T. -0.003 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

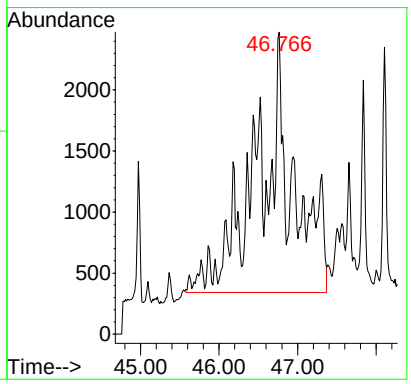
Tgt Ion:262 Resp: 104675

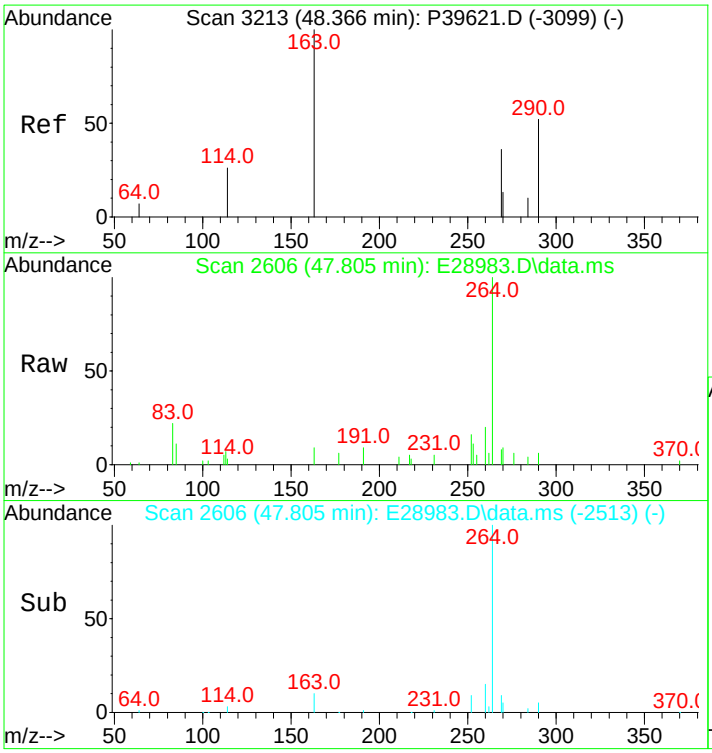




#72
C3-Naphthobenzothiophenes
Concen: 649.49 ng/ml m
RT: 46.766 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

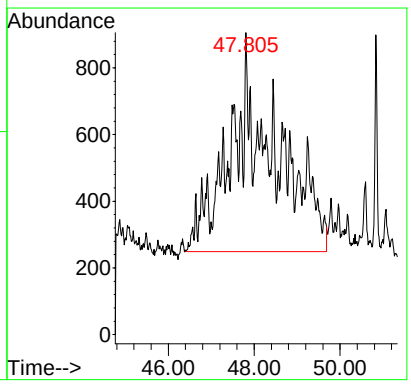
Tgt Ion:276 Resp: 66615

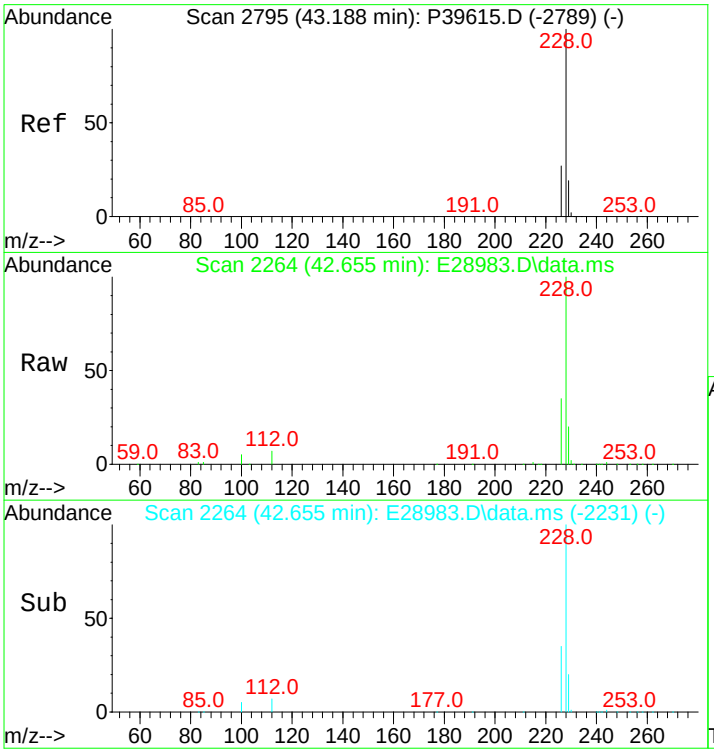




#73
C4-Naphthobenzothiophenes
Concen: 439.81 ng/mL m
RT: 47.805 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:290 Resp: 45110

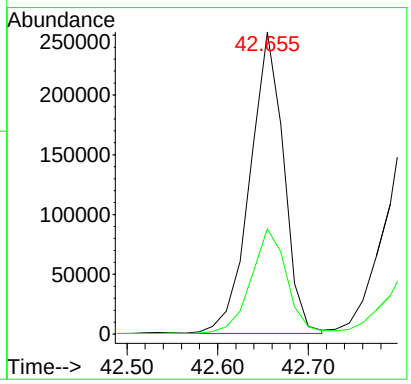


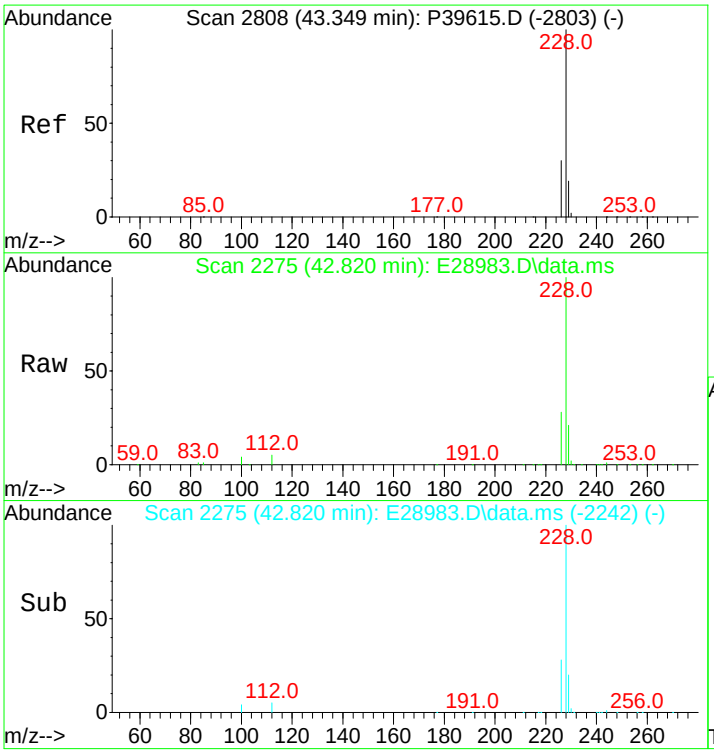


#75
Benz[a]anthracene
Concen: 5714.15 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:228 Resp: 652099

Ion	Ratio	Lower	Upper
228	100		
226	30.9	20.7	31.1

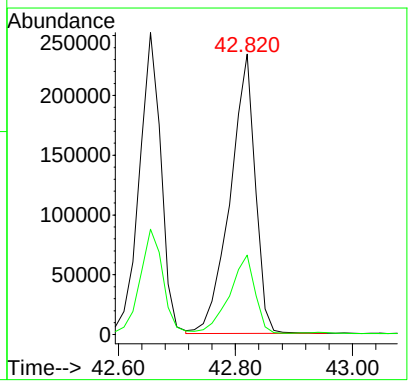


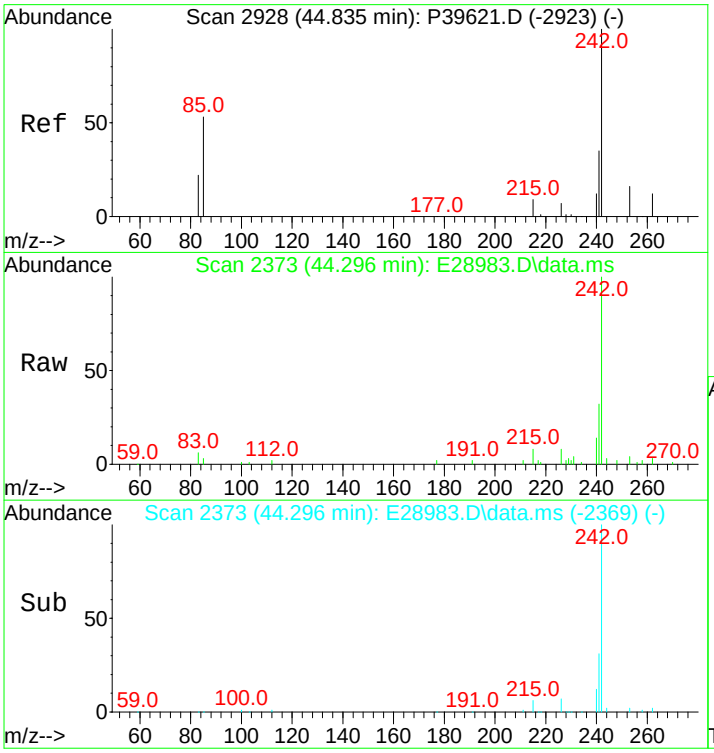


#77
Chrysene/Triphenylene
Concen: 5921.37 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:228 Resp: 695695

Ion	Ratio	Lower	Upper
228	100		
226	29.0	22.6	34.0

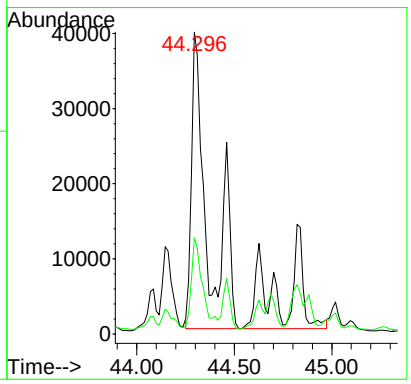


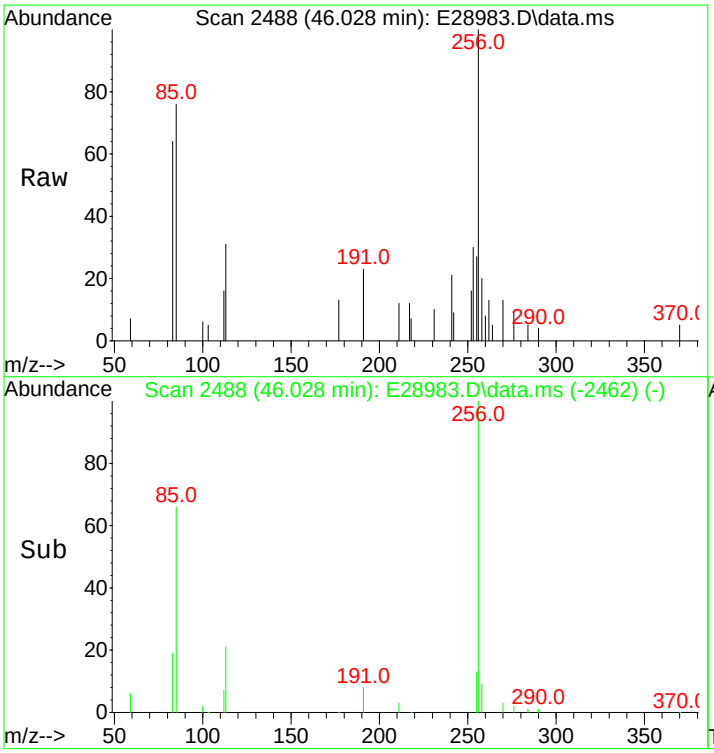


#78
C1-Chrysenes
Concen: 2715.20 ng/mL m
RT: 44.296 min Scan# 2373
Delta R.T. 0.011 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:242 Resp: 319005

Ion	Ratio	Lower	Upper
242	100		
241	3.9	32.2	48.4#

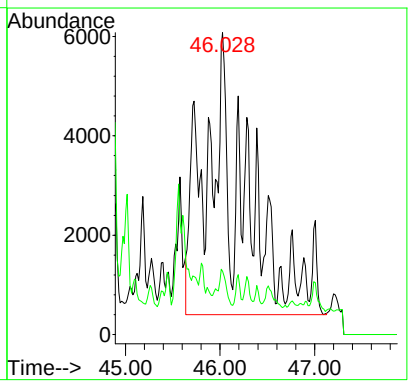


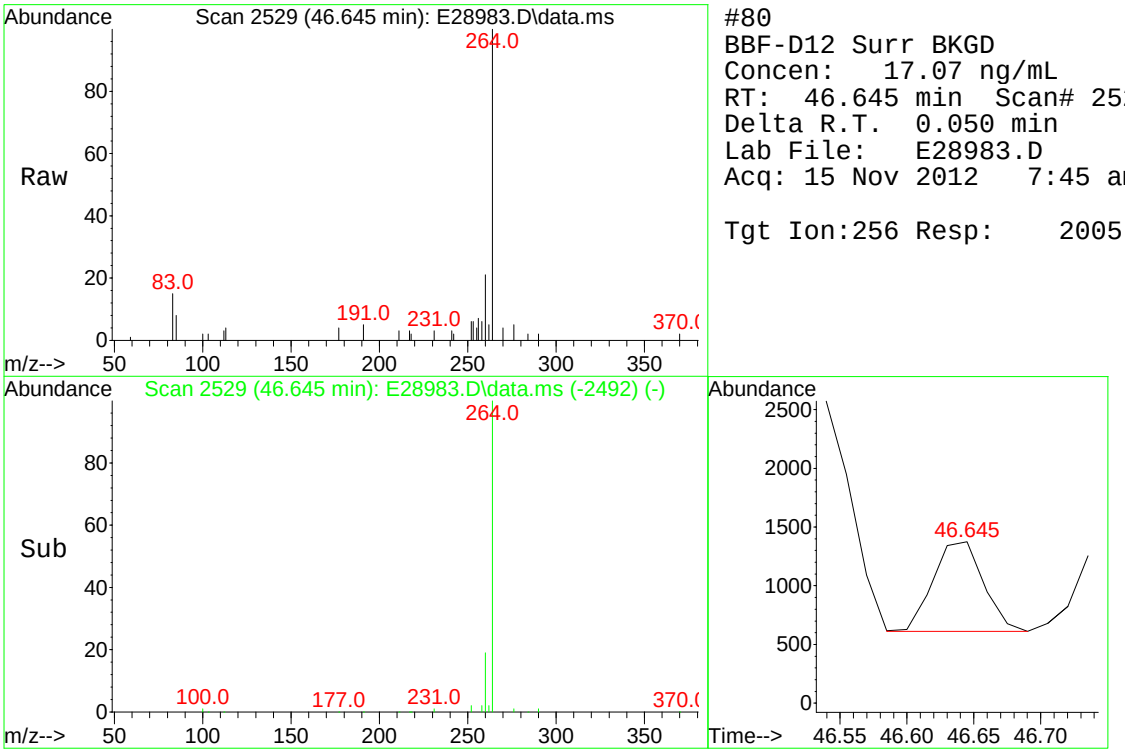


#79
C2-Chrysenes
Concen: 1375.46 ng/mL m
RT: 46.028 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:256 Resp: 161601

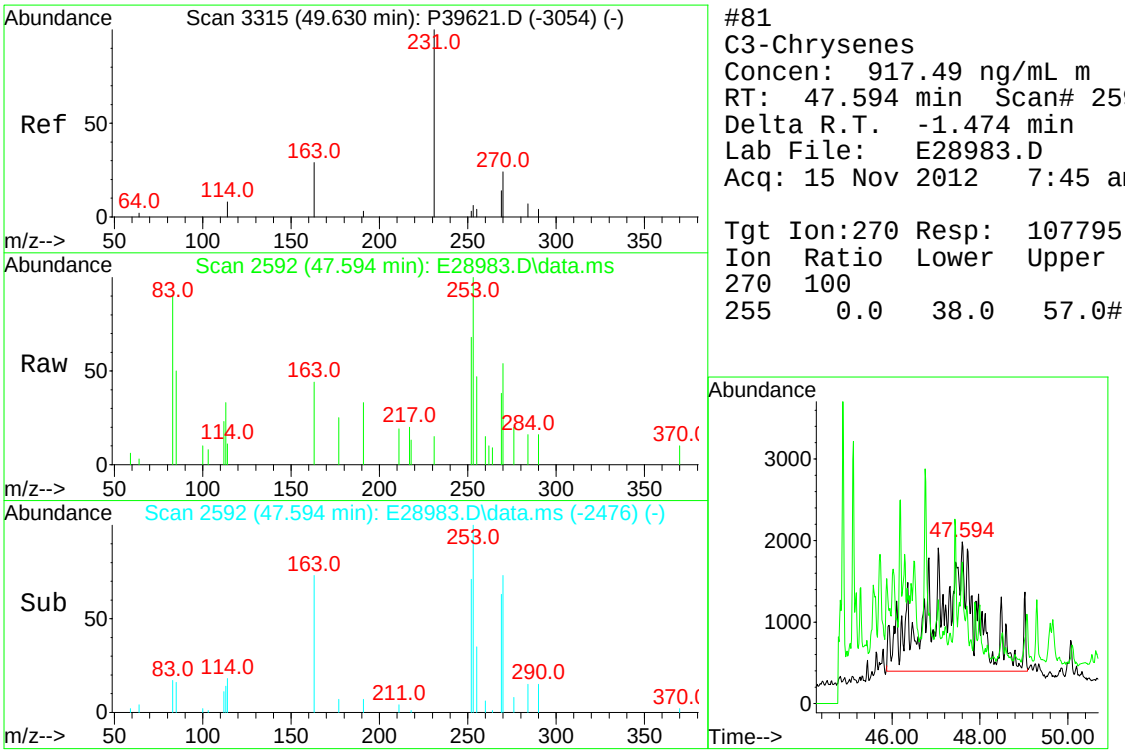
Ion	Ratio	Lower	Upper
256	100		
241	0.8	25.3	37.9#





#80
BBF-D12 Surr BKGD
Concen: 17.07 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

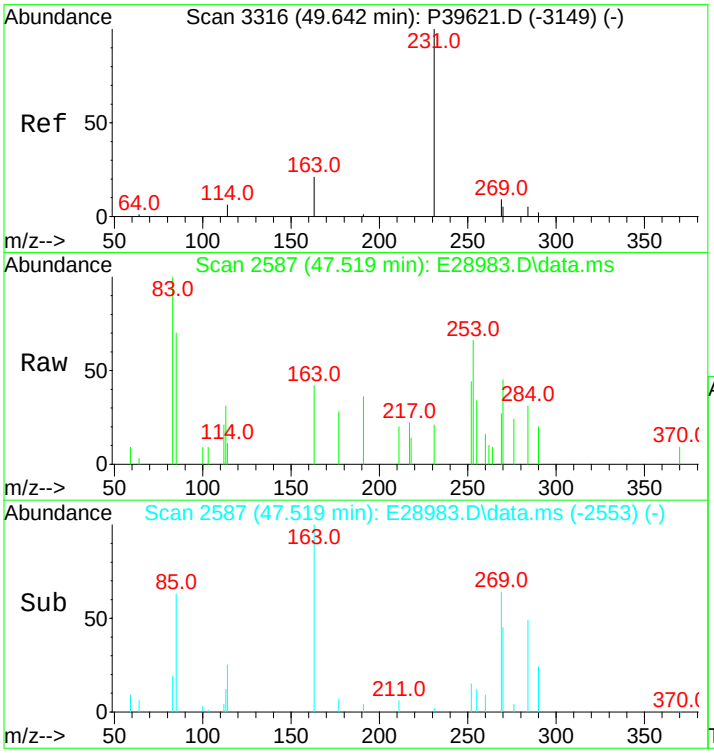
Tgt Ion:256 Resp: 2005



#81
C3-Chrysenes
Concen: 917.49 ng/mL m
RT: 47.594 min Scan# 2592
Delta R.T. -1.474 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:270 Resp: 107795

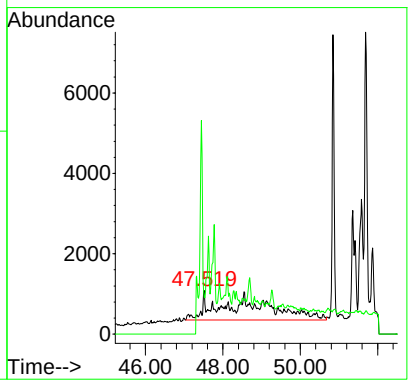
Ion	Ratio	Lower	Upper
270	100		
255	0.0	38.0	57.0#

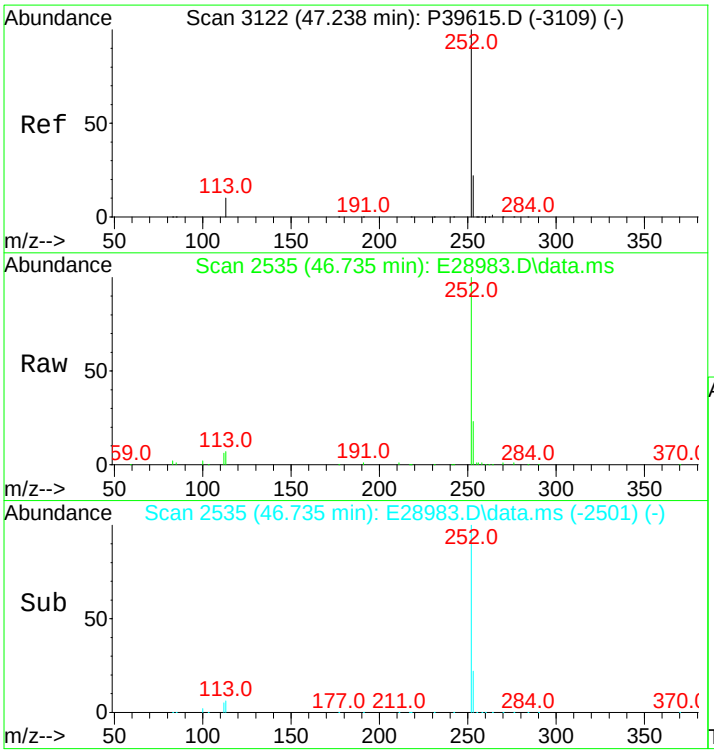


#82
C4-Chrysenes
Concen: 464.80 ng/mL m
RT: 47.519 min Scan# 2587
Delta R.T. -1.668 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:284 Resp: 54609

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

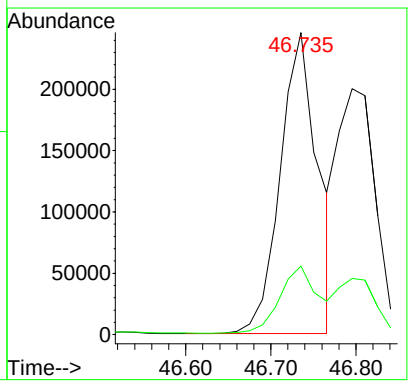


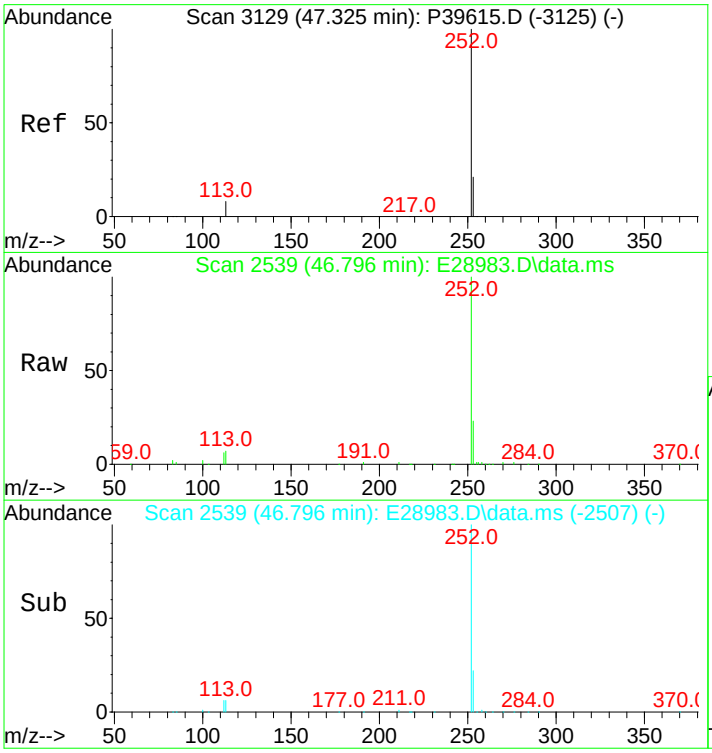


#84
Benzo[b]fluoranthene
Concen: 5693.31 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:252 Resp: 755193

Ion	Ratio	Lower	Upper
252	100		
253	22.6	19.5	29.3

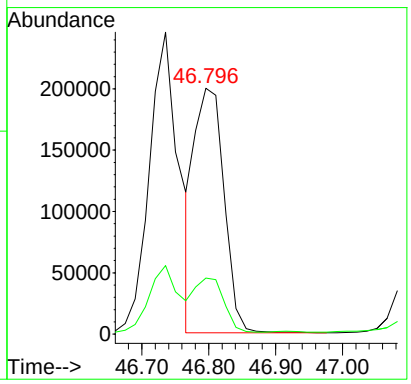


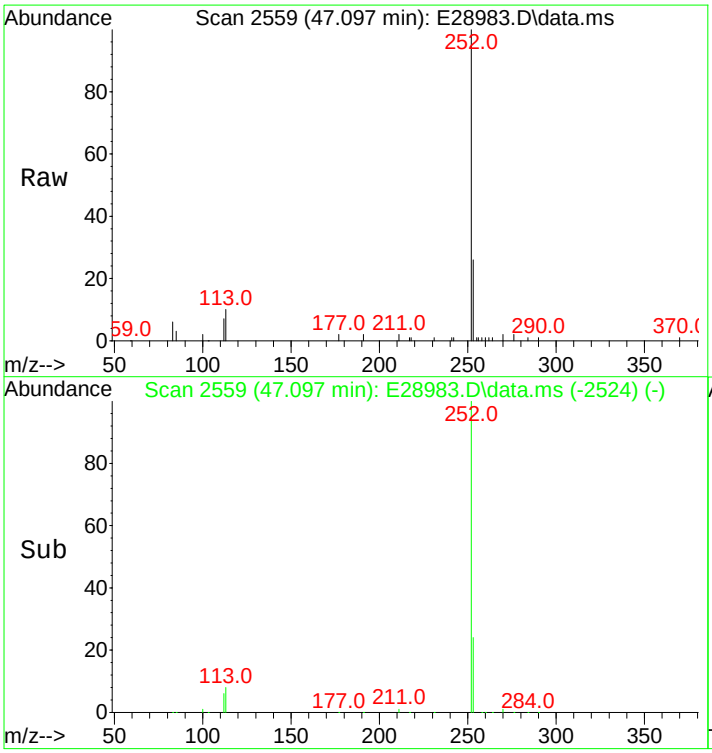


#85
Benzo[j]+[k]fluoranthene
Concen: 4512.56 ng/mL
RT: 46.796 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:252 Resp: 615827

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.7	29.5

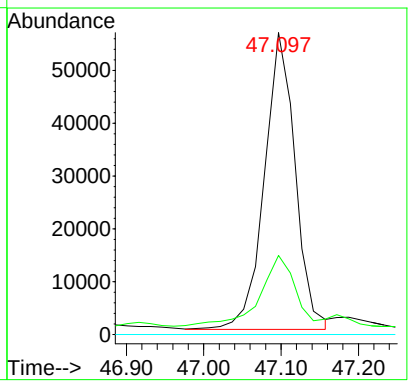


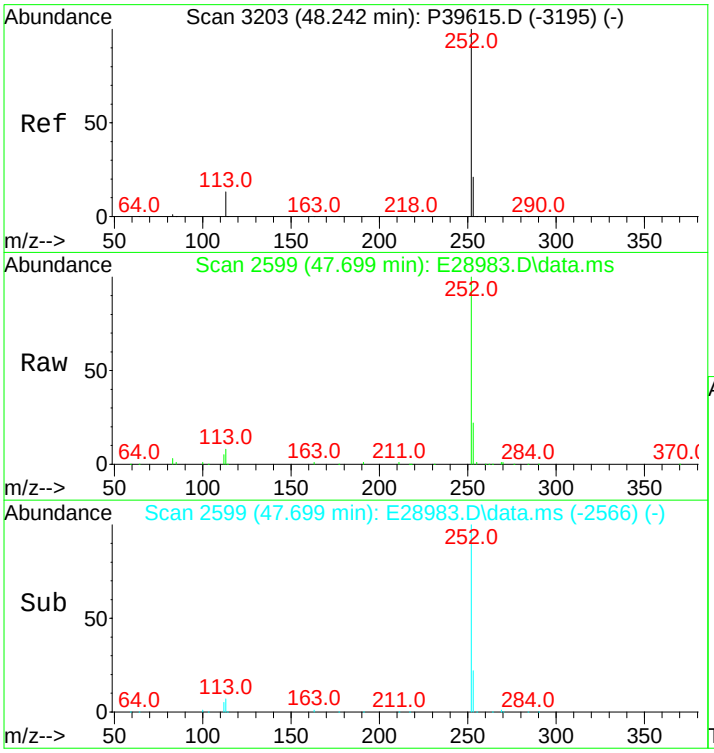


#86
Benzo[a]fluoranthene
Concen: 1141.02 ng/mL m
RT: 47.097 min Scan# 2559
Delta R.T. 0.025 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:252 Resp: 155714

Ion	Ratio	Lower	Upper
252	100		
253	27.9	456.0	684.0#
125	0.0	0.0	0.0

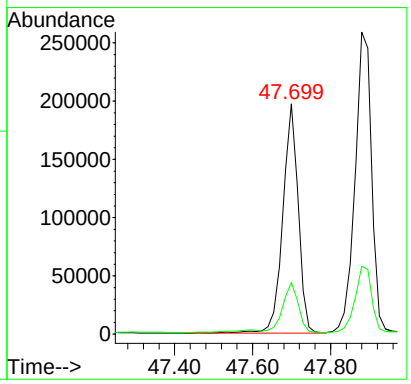


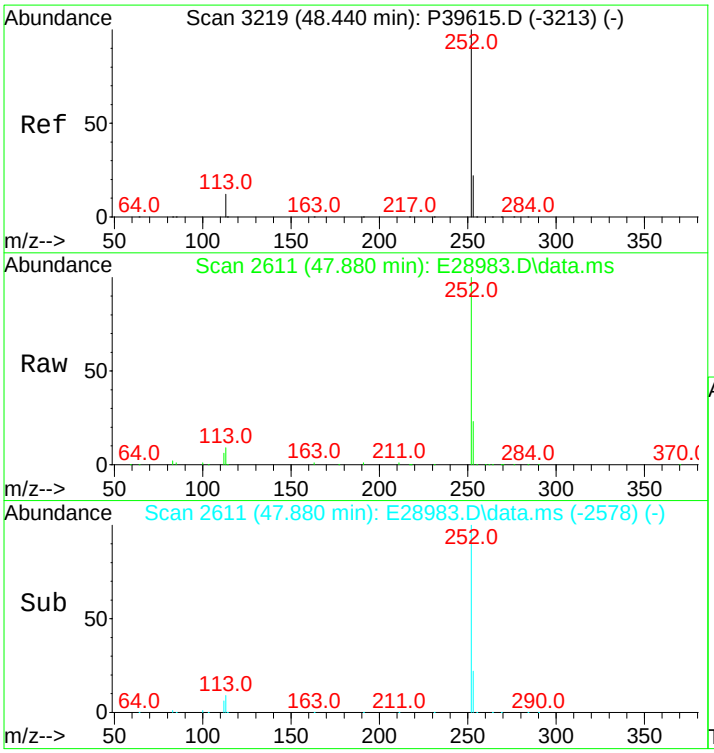


#87
Benzo[e]pyrene
Concen: 4196.25 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:252 Resp: 543493

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.6	31.0

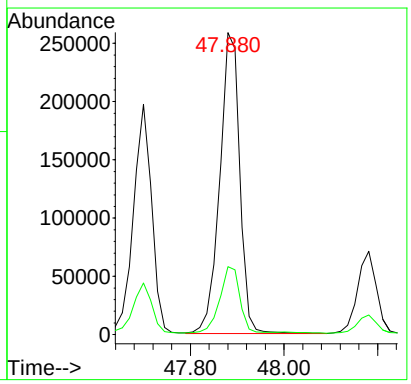


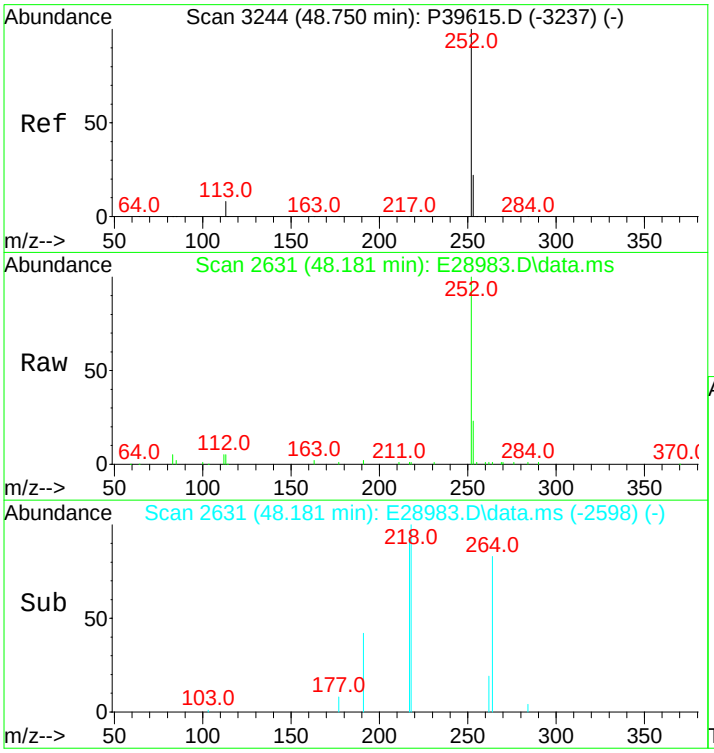


#89
Benzo[a]pyrene
Concen: 6203.98 ng/mL
RT: 47.880 min Scan# 2611
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:252 Resp: 768875

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.8	31.2

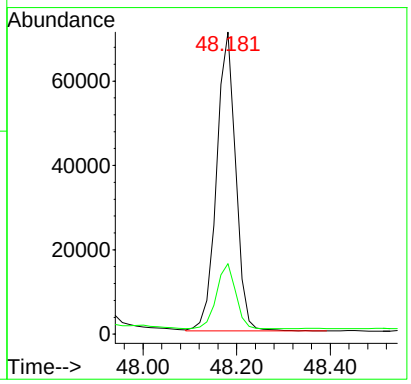


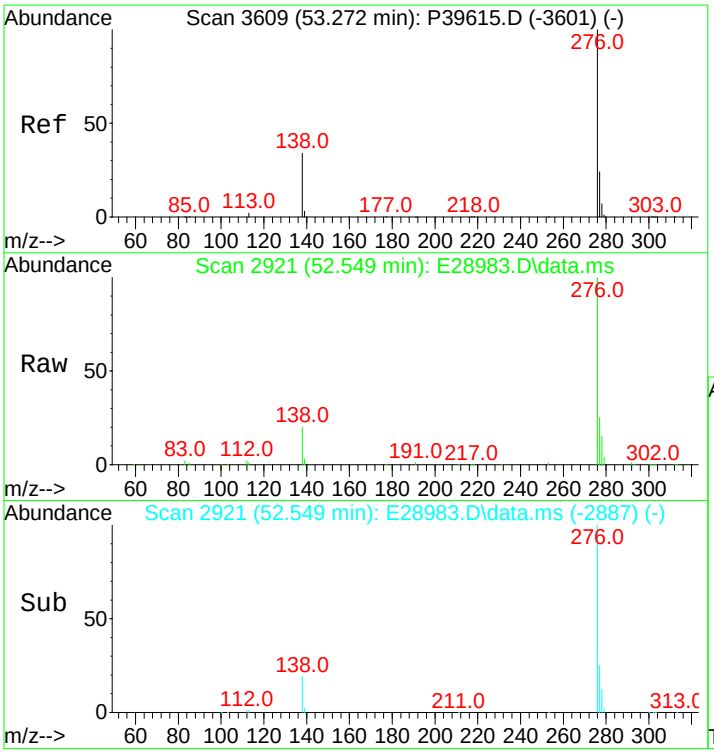


#90
Perylene
Concen: 1540.12 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:252 Resp: 201834

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.7	31.1

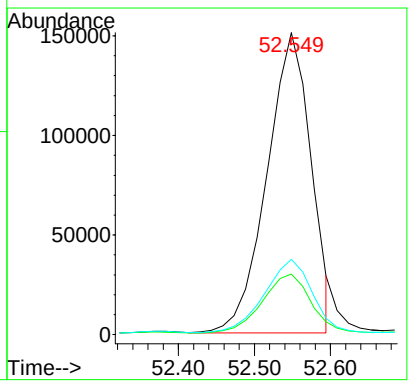


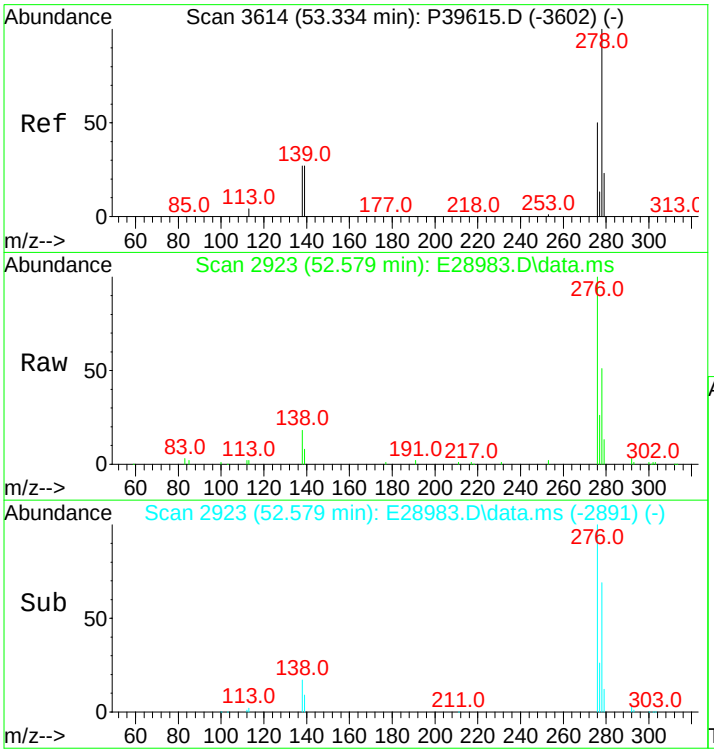


#91
Indeno[1,2,3-cd]pyrene
Concen: 4157.10 ng/mL m
RT: 52.549 min Scan# 2921
Delta R.T. 0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:276 Resp: 606326

Ion	Ratio	Lower	Upper
276	100		
138	21.8	16.3	24.5
277	27.1	19.4	29.2

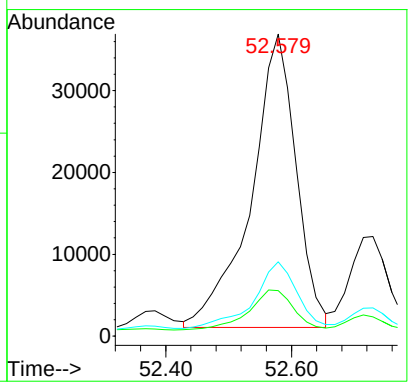


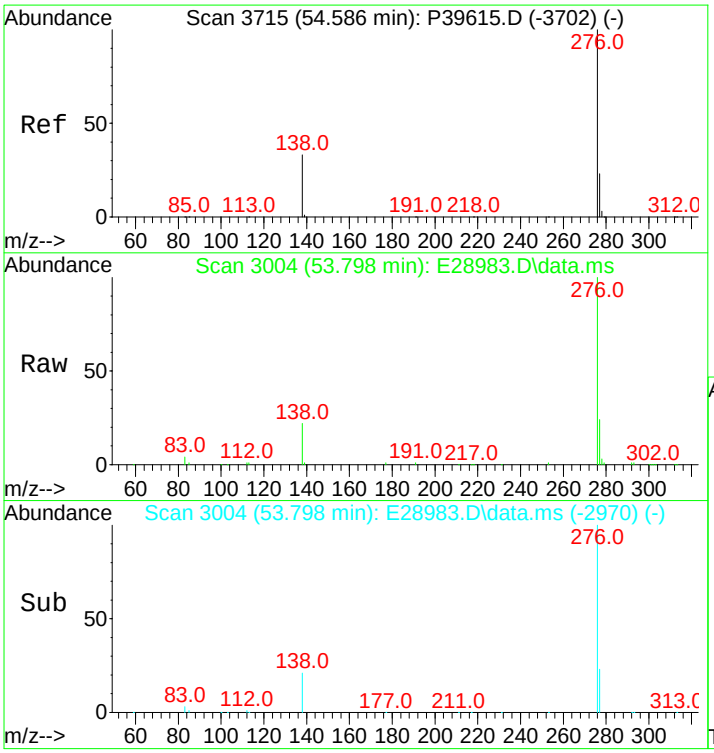


#92
Dibenz[ah]+[ac]anthracene
Concen: 1150.09 ng/mL m
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:278 Resp: 178611

Ion	Ratio	Lower	Upper
278	100		
139	13.7	11.6	17.4
279	21.9	19.3	28.9

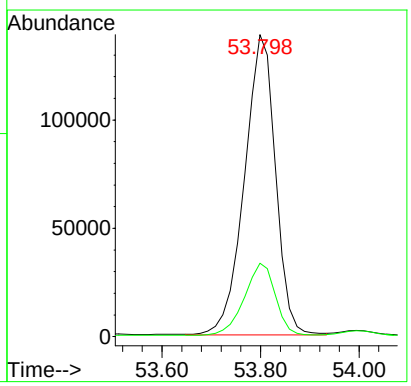


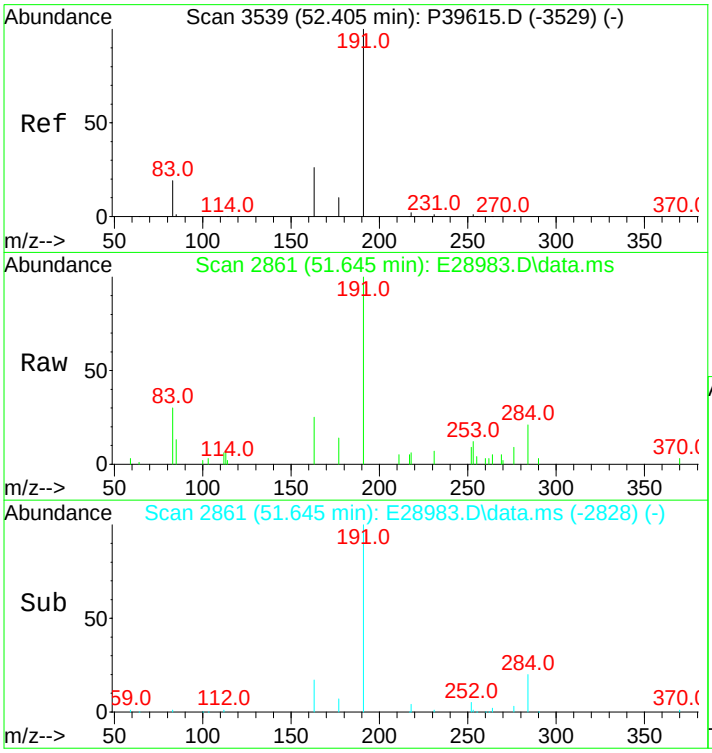


#93
Benzo[g,h,i]perylene
Concen: 3849.00 ng/mL
RT: 53.798 min Scan# 3004
Delta R.T. 0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:276 Resp: 605315

Ion	Ratio	Lower	Upper
276	100		
277	24.0	19.1	28.7

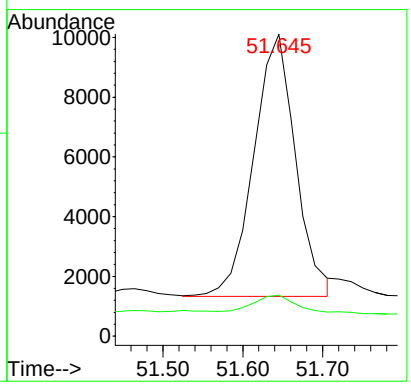


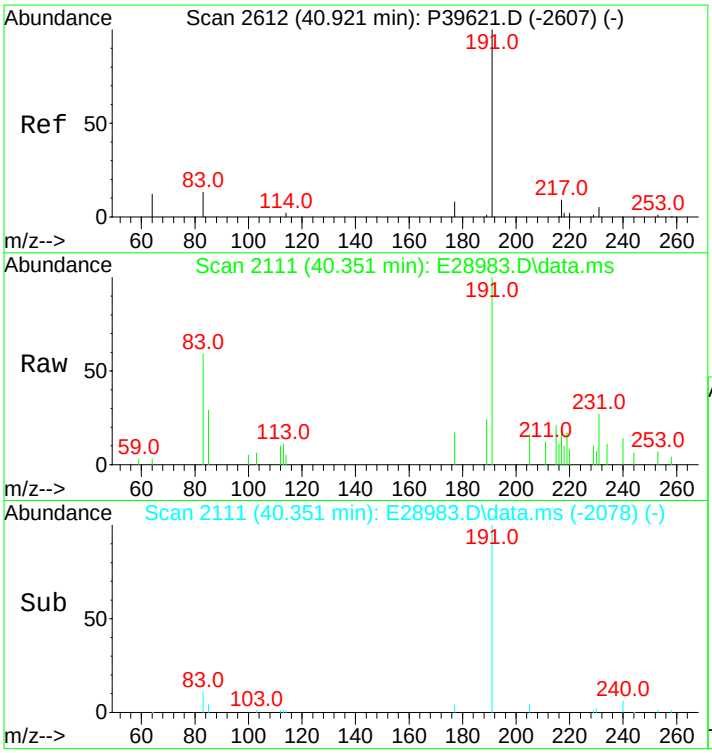


#94
Hopane (T19)
Concen: 723.99 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:191 Resp: 31842

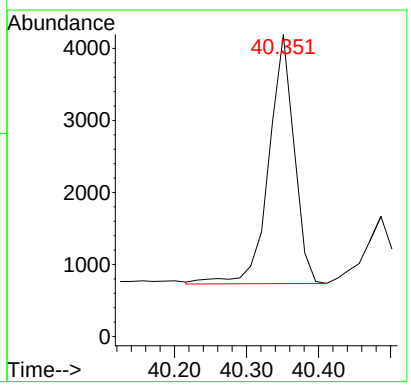
Ion	Ratio	Lower	Upper
191	100		
177	8.3	11.6	17.4#

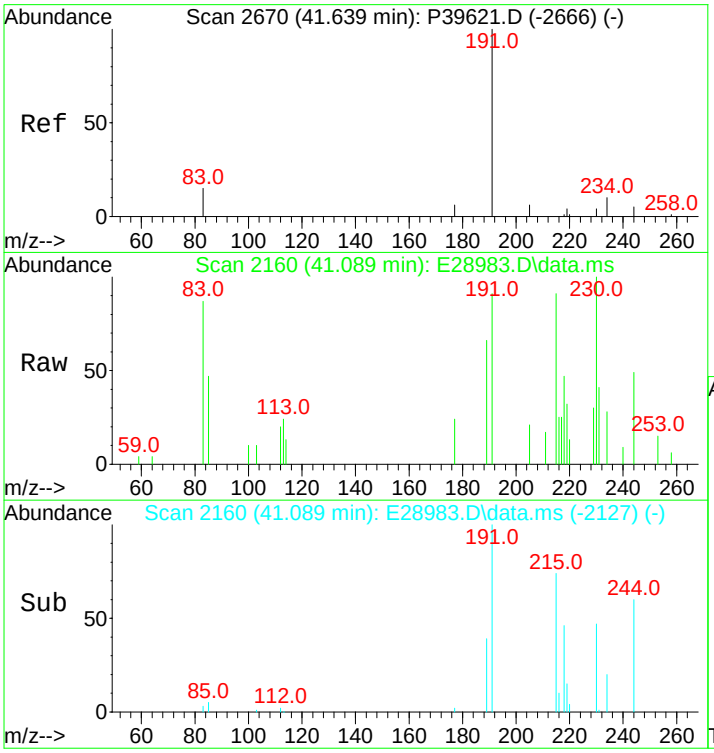




#96
C23 Tricyclic Terpane (T4)
Concen: 191.38 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

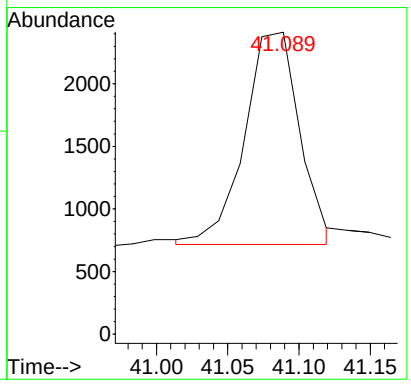
Tgt Ion:191 Resp: 8417

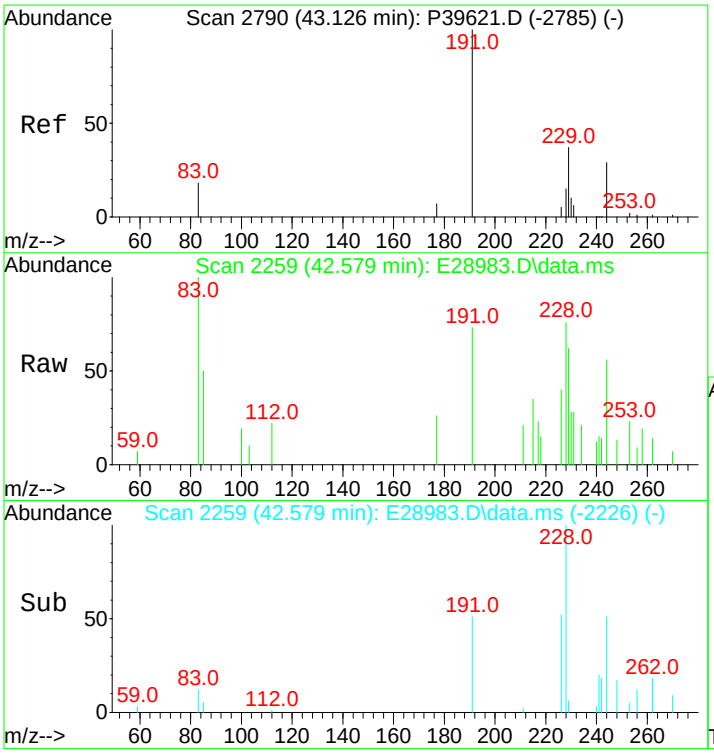




#97
C24 Tricyclic Terpane (T5)
Concen: 103.50 ng/ml m
RT: 41.089 min Scan# 2160
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

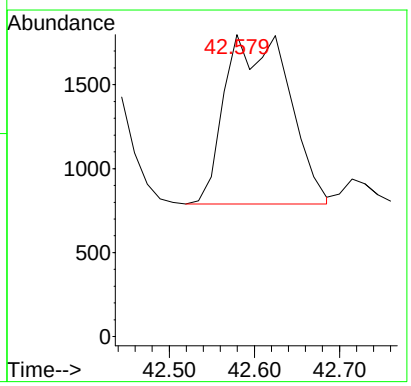
Tgt Ion:191 Resp: 4552

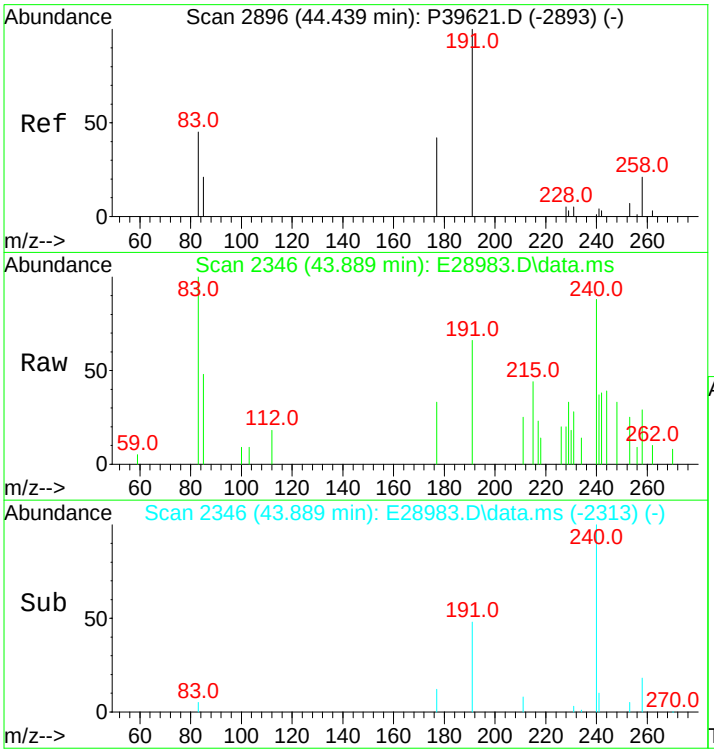




#98
C25 Tricyclic Terpane (T6)
Concen: 119.48 ng/ml
RT: 42.579 min Scan# 2259
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

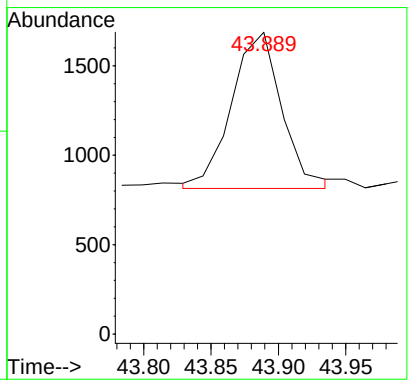
Tgt Ion:191 Resp: 5255

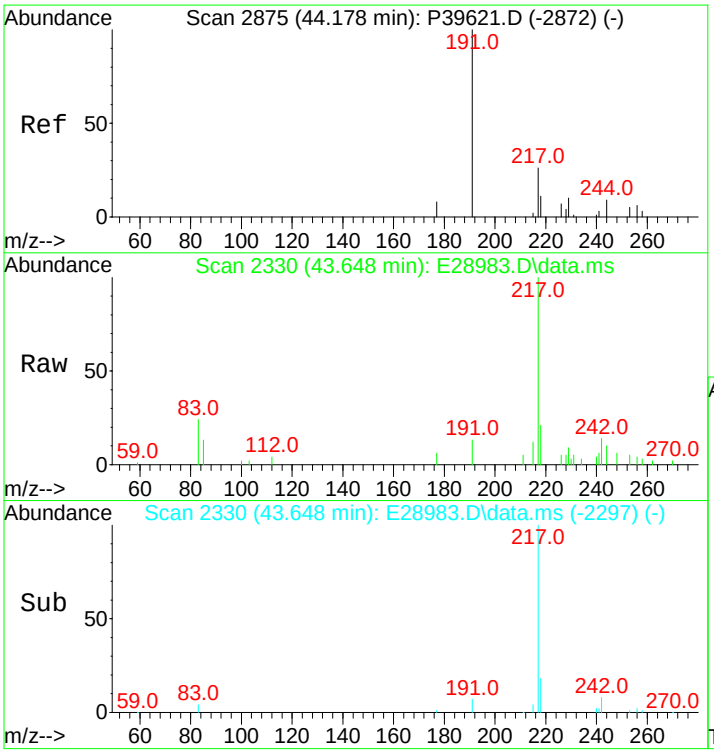




#99
C24 Tetracyclic Terpane (T6a)
Concen: 51.45 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

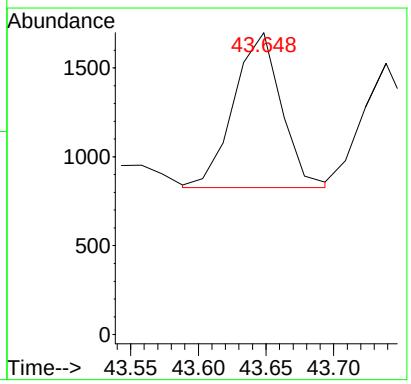
Tgt Ion:191 Resp: 2263

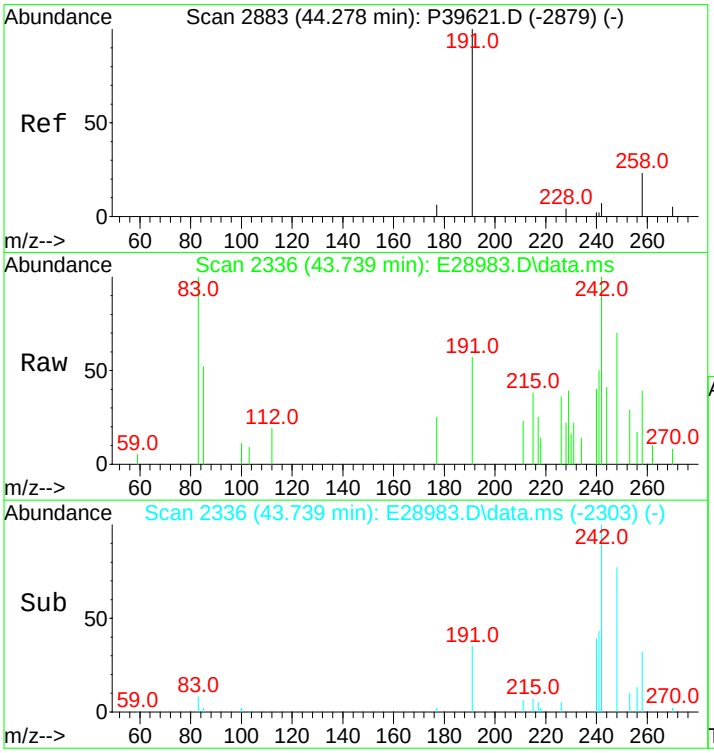




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 48.57 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

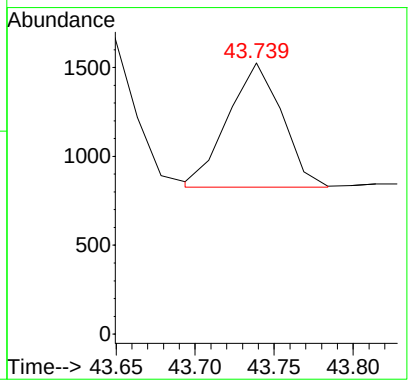
Tgt Ion:191 Resp: 2136

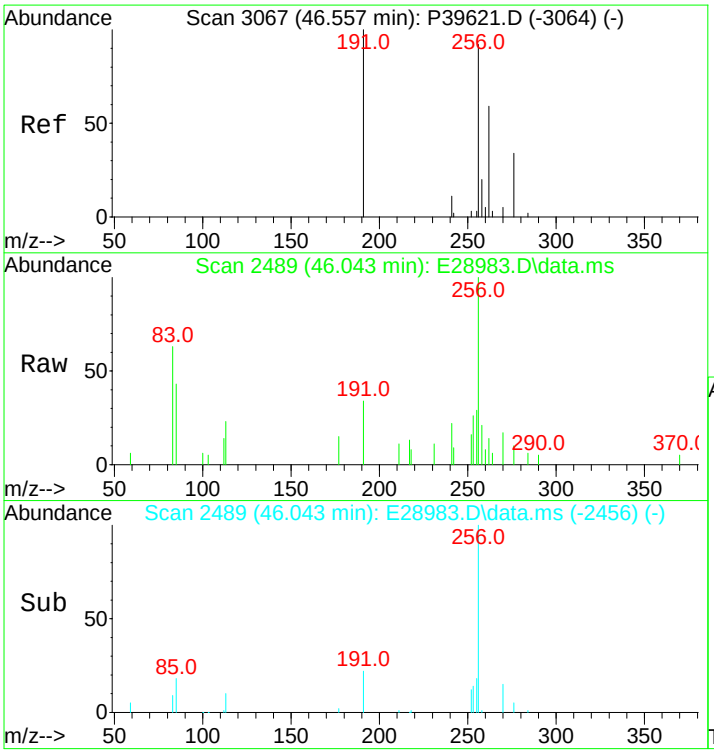




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 37.86 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

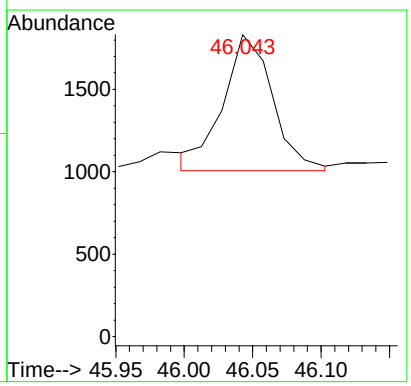
Tgt Ion:191 Resp: 1665

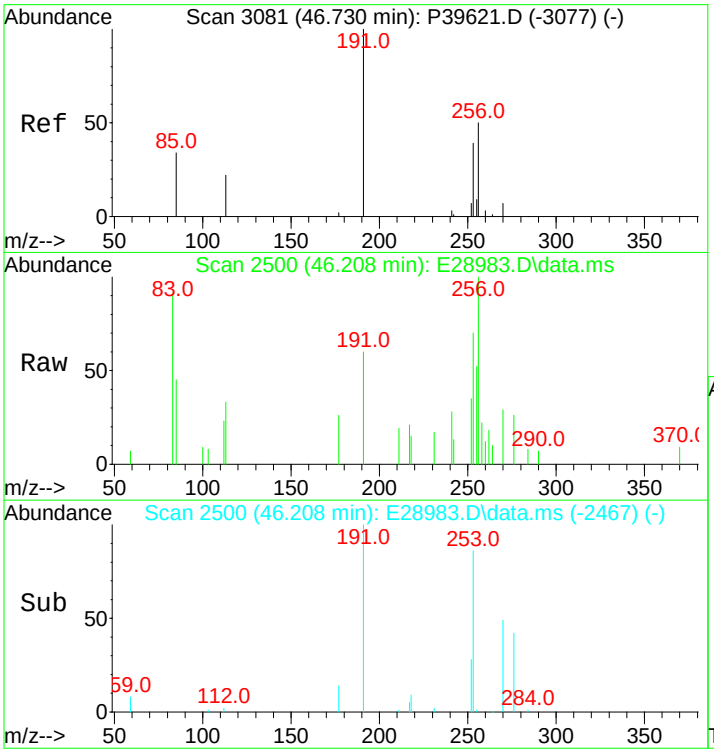




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 47.04 ng/ml m
RT: 46.043 min Scan# 2489
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

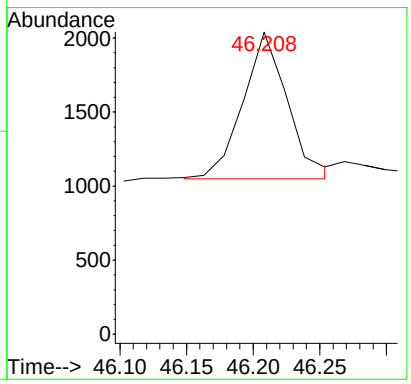
Tgt Ion:191 Resp: 2069

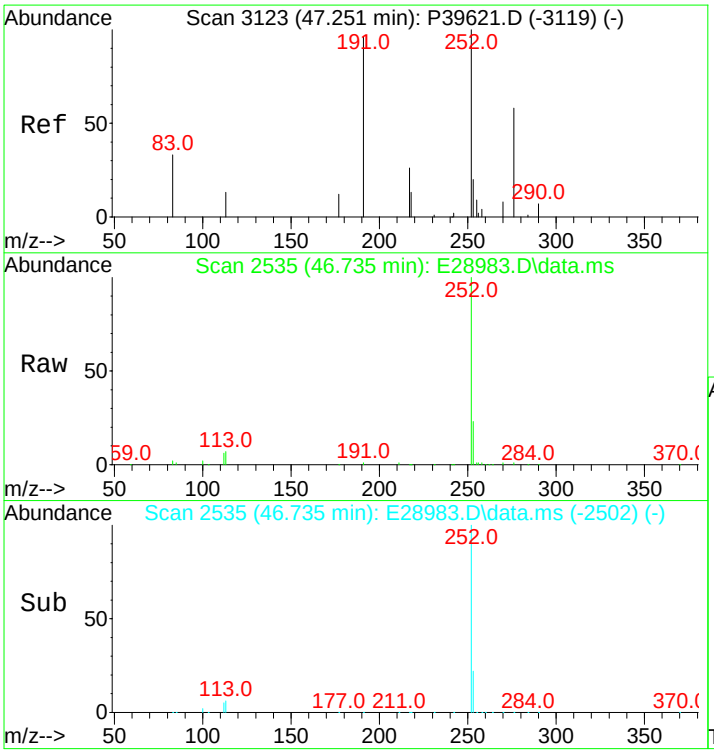




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 52.11 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

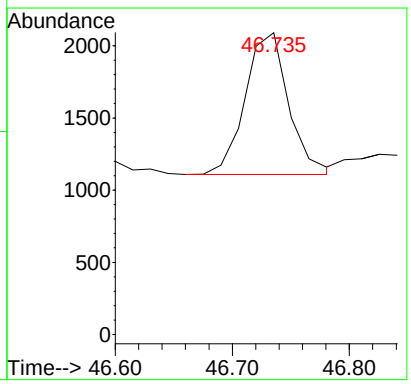
Tgt Ion:191 Resp: 2292

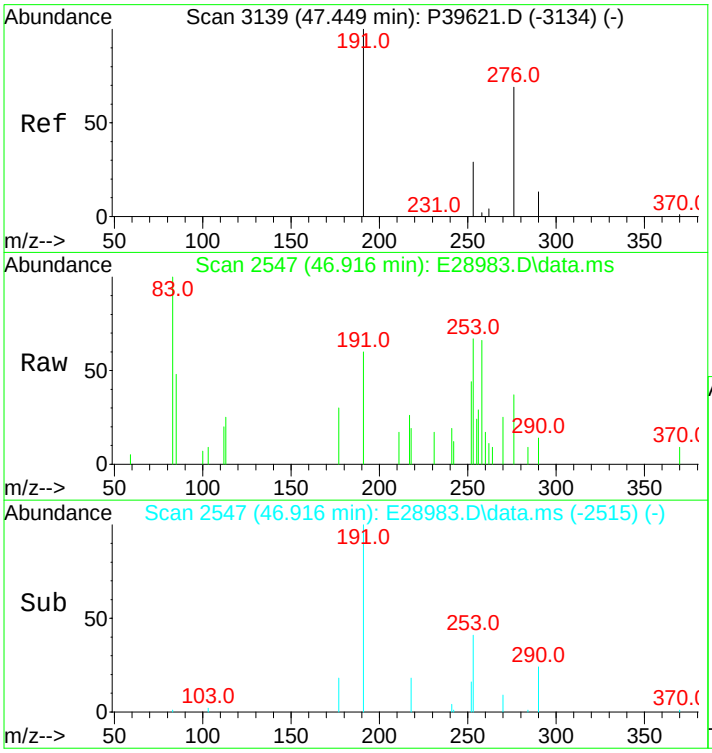




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 57.68 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

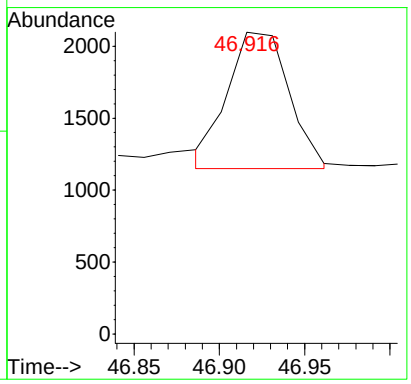
Tgt Ion:191 Resp: 2537

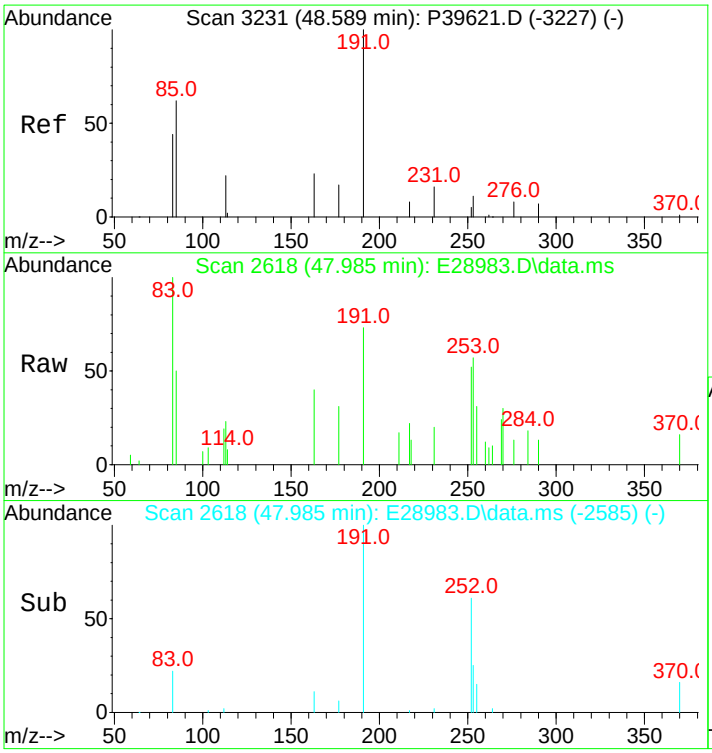




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 53.91 ng/ml m
RT: 46.916 min Scan# 2547
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

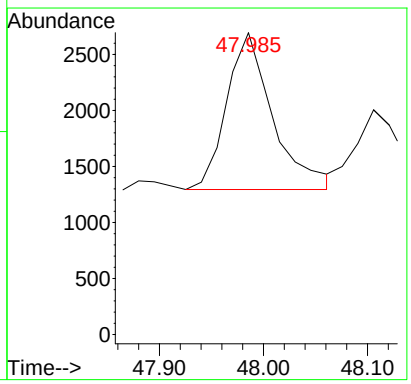
Tgt Ion:191 Resp: 2371

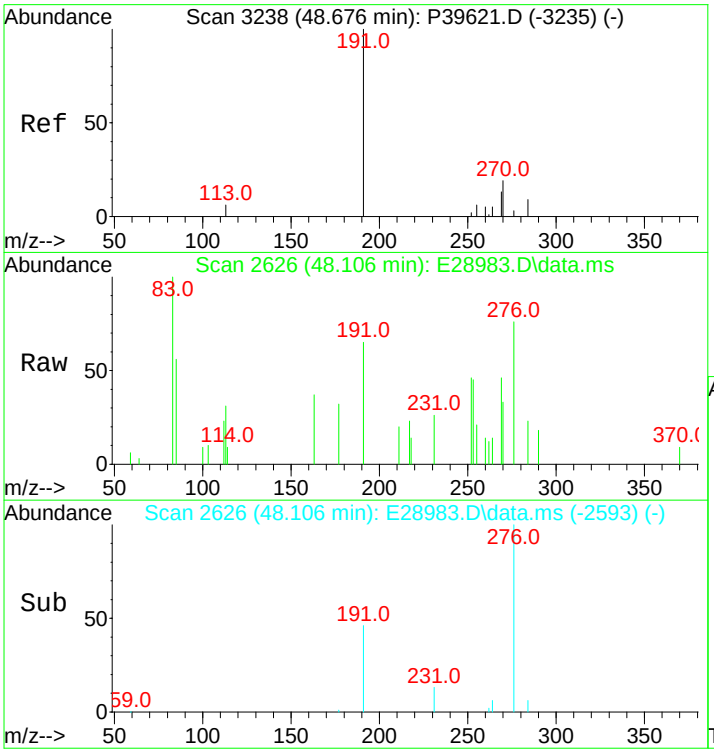




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 98.65 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

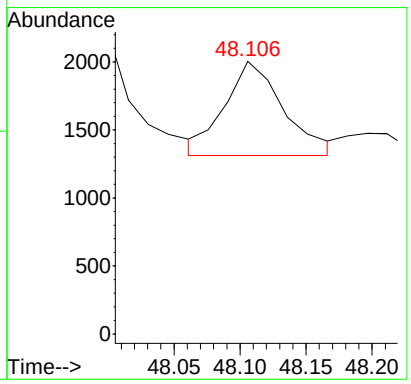
Tgt Ion:191 Resp: 4339

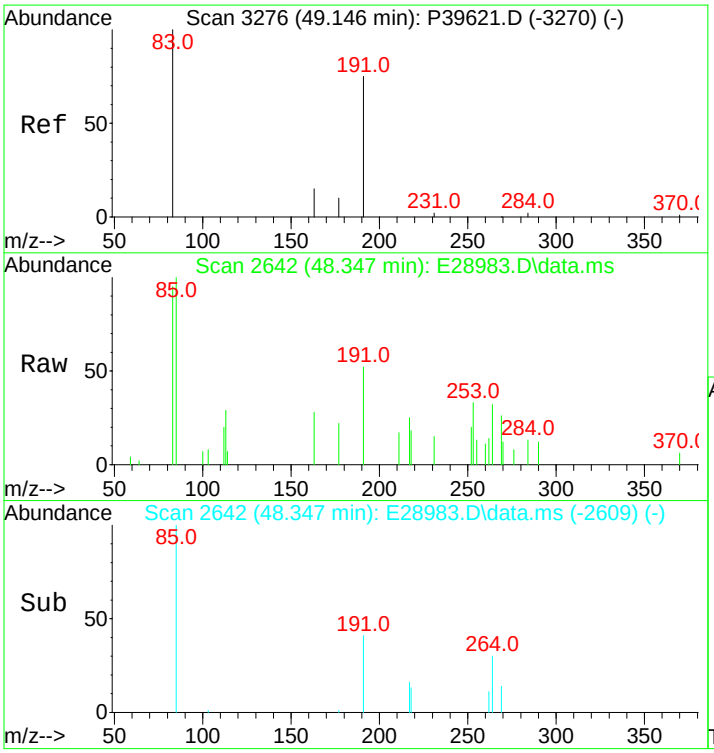




#107
C30 Tricyclic Terpane-22S
Concen: 48.82 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

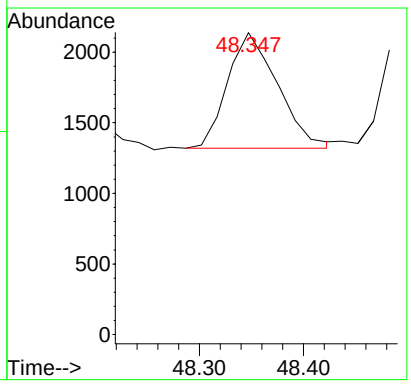
Tgt Ion:191 Resp: 2147

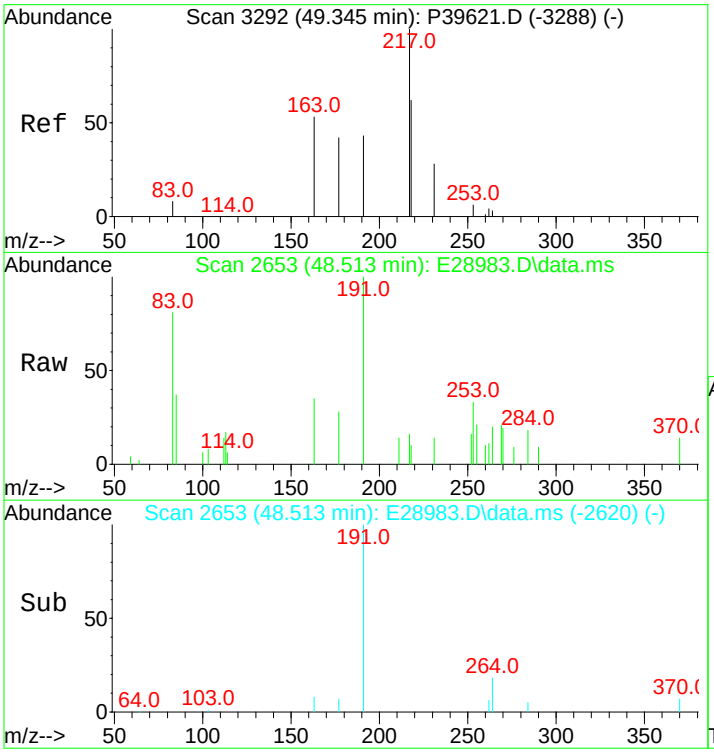




#108
C30 Tricyclic Terpane-22R
Concen: 62.59 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

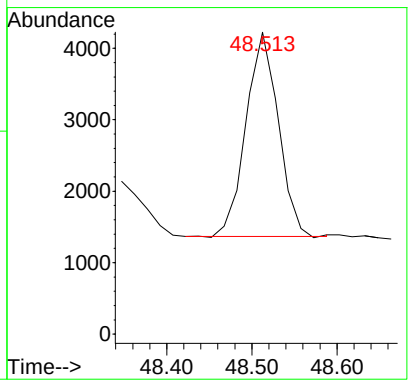
Tgt Ion:191 Resp: 2753

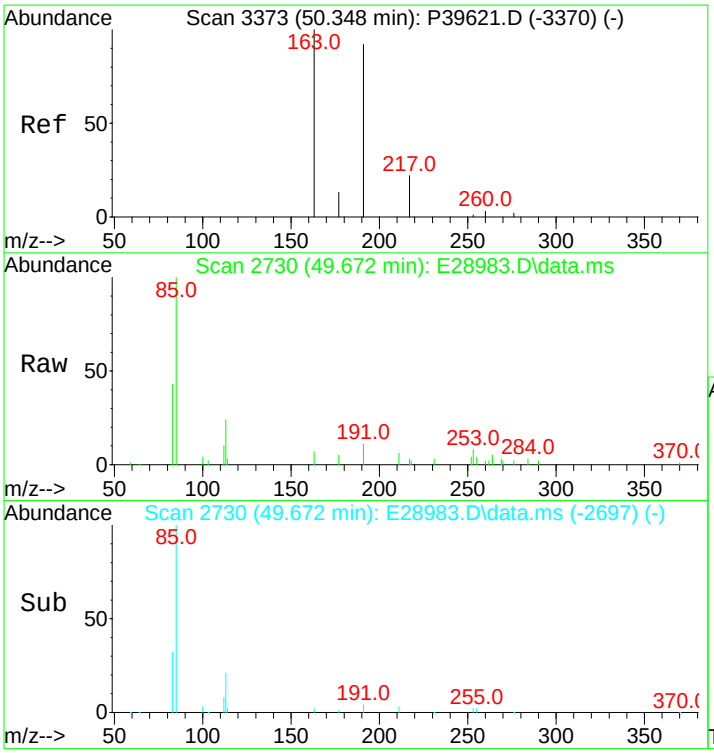




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 171.55 ng/ml
RT: 48.513 min Scan# 2653
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

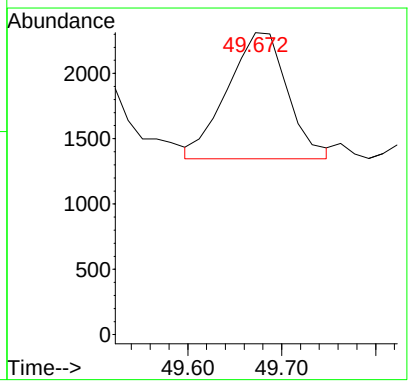
Tgt Ion:191 Resp: 7545

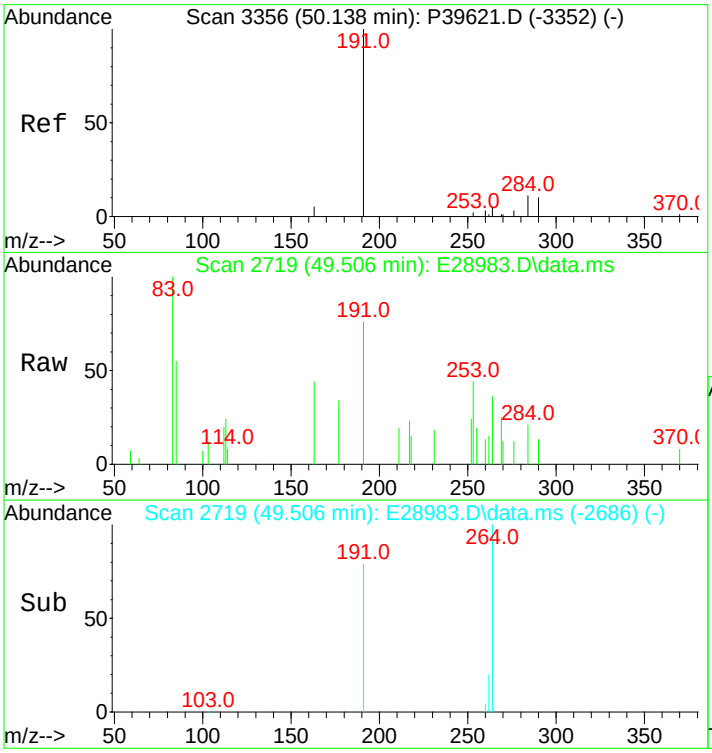




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 97.52 ng/ml m
RT: 49.672 min Scan# 2730
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

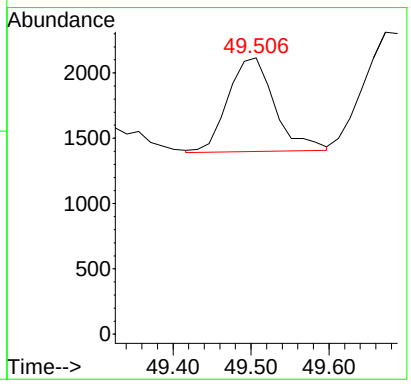
Tgt Ion:191 Resp: 4289

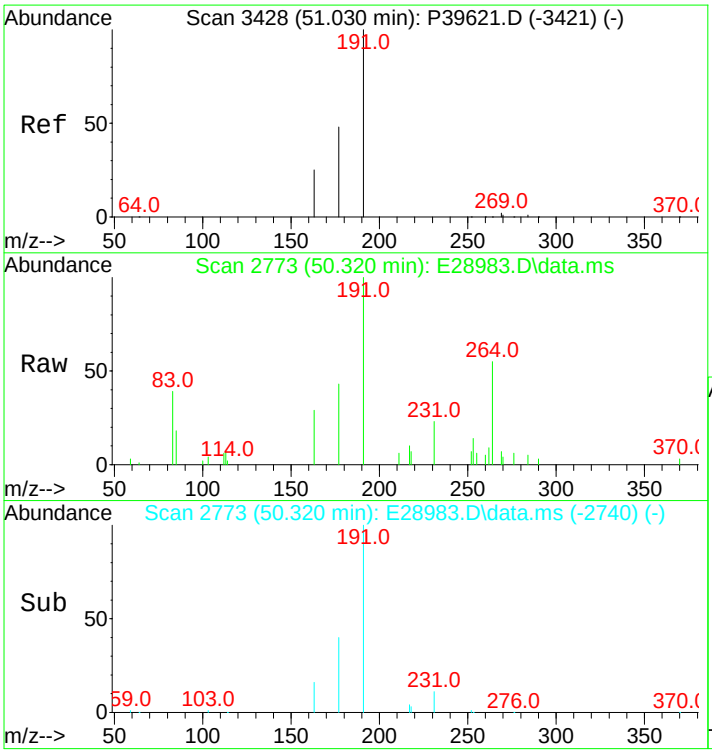




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 68.14 ng/ml
RT: 49.506 min Scan# 2719
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

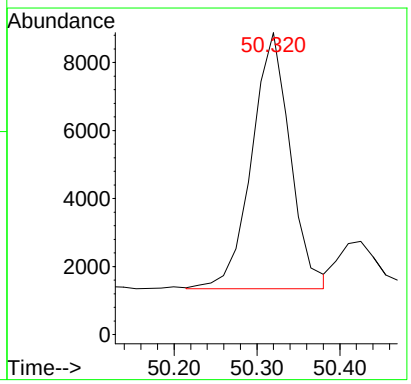
Tgt Ion:191 Resp: 2997

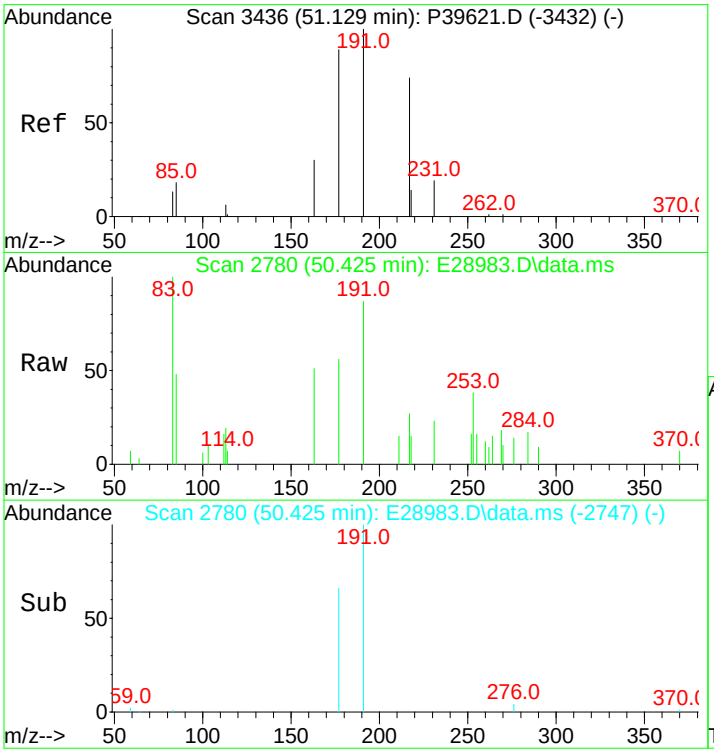




#112
30-Norhopane (T15)
Concen: 550.87 ng/ml m
RT: 50.320 min Scan# 2773
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

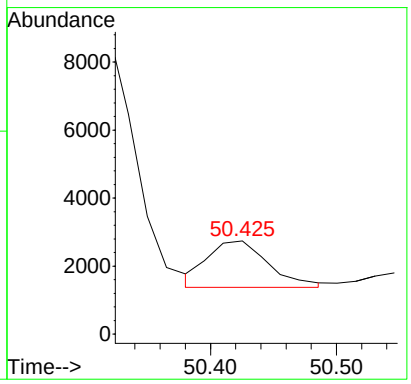
Tgt Ion:191 Resp: 24228

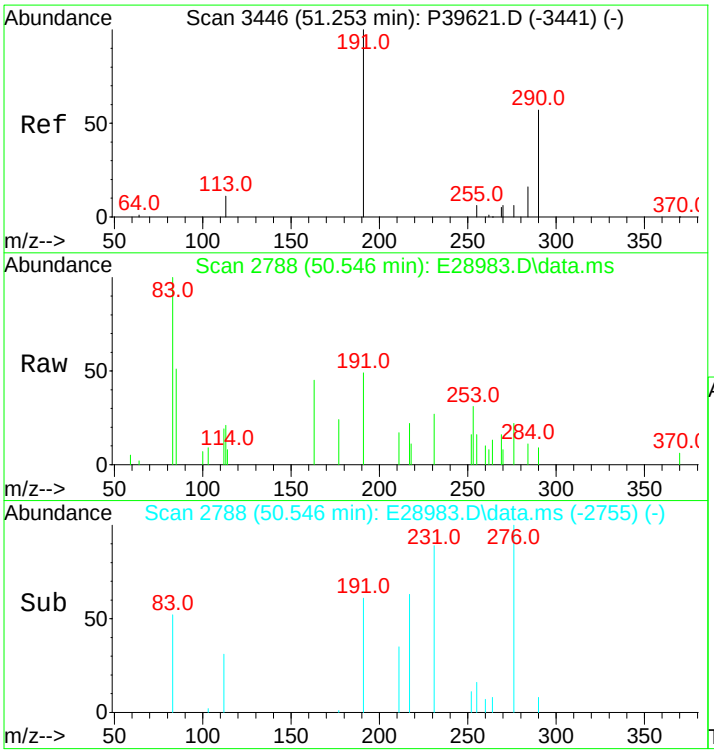




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 104.27 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

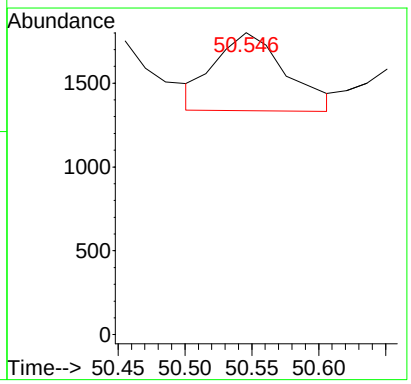
Tgt Ion:191 Resp: 4586

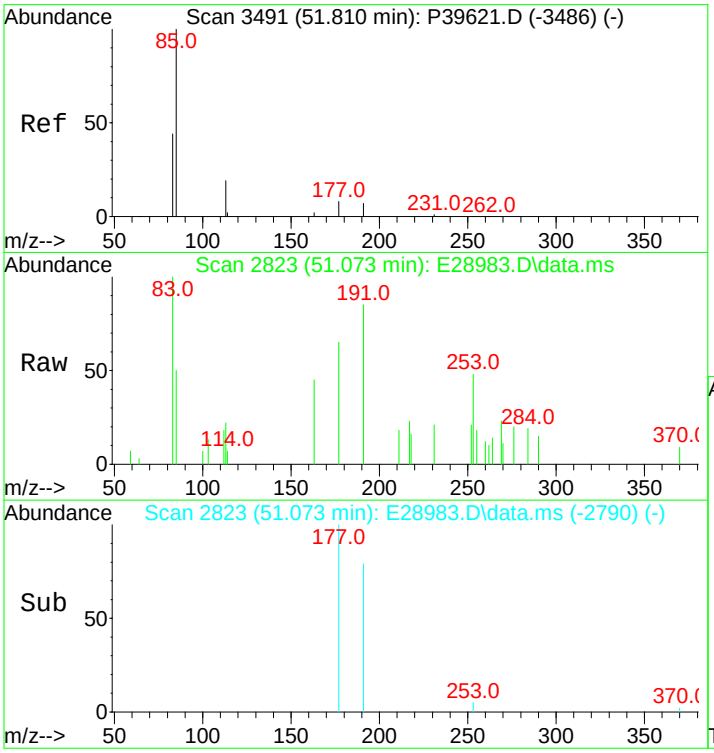




#114
17a(H)-Diahopane (X)
Concen: 39.22 ng/ml
RT: 50.546 min Scan# 2788
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

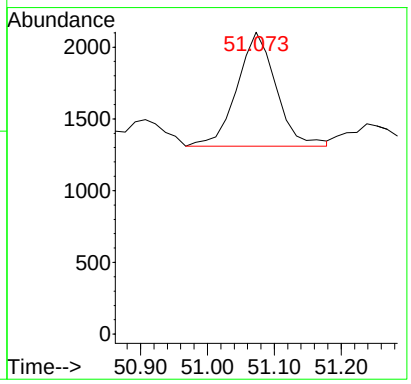
Tgt Ion:191 Resp: 1725

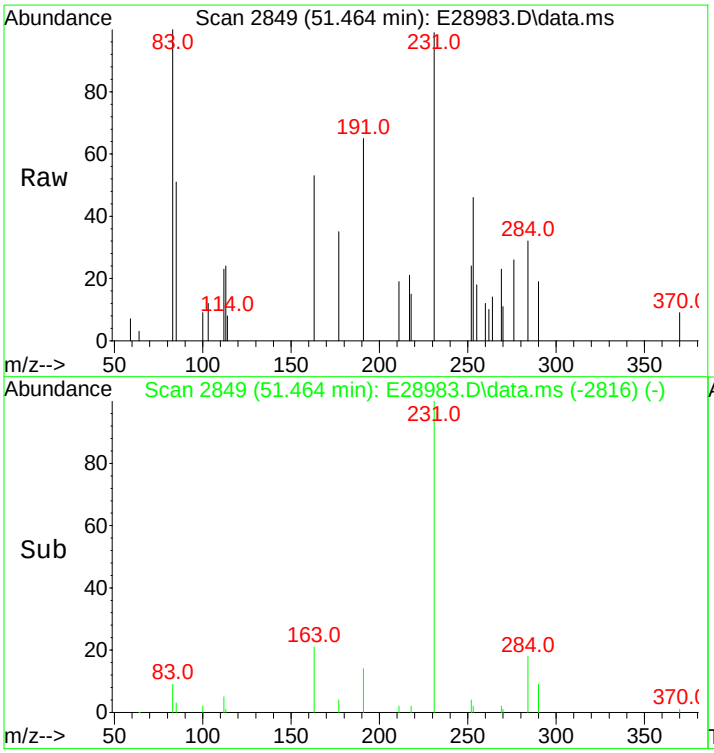




#115
30-Normoretane (T17)
Concen: 73.58 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

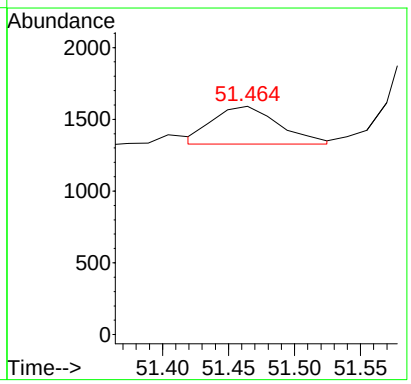
Tgt Ion:191 Resp: 3236

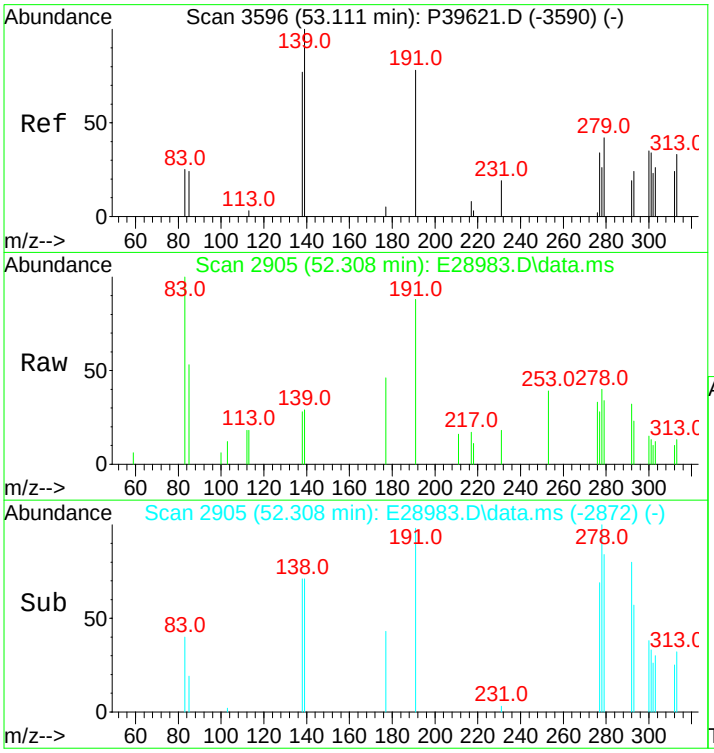




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 20.99 ng/ml m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

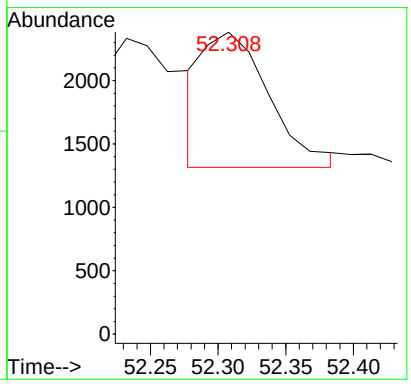
Tgt Ion:191 Resp: 923

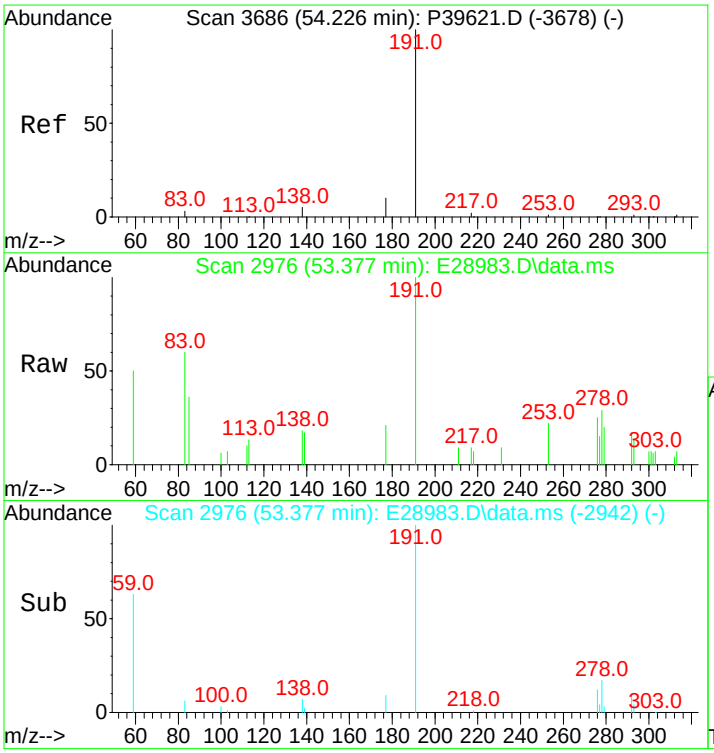




#117
Moretane (T20)
Concen: 82.08 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

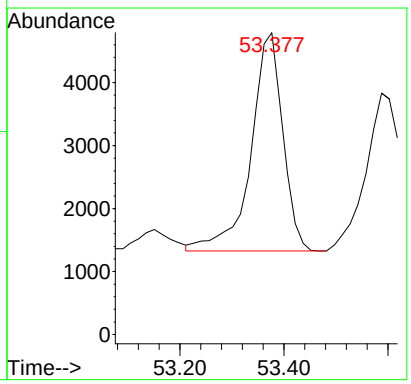
Tgt Ion:191 Resp: 3610

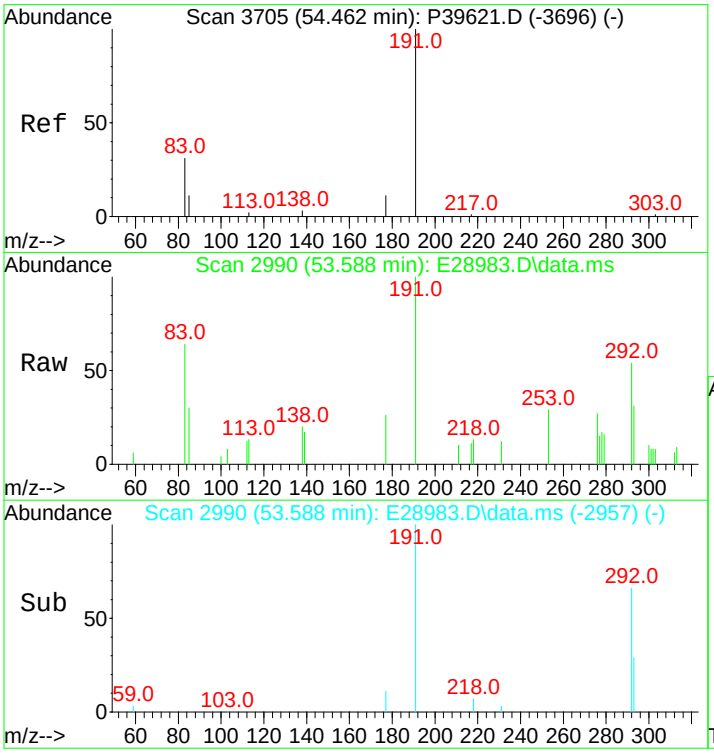




#118
30-Homohopane-22S (T21)
Concen: 336.19 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

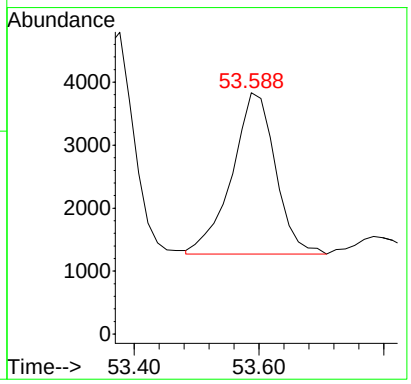
Tgt Ion:191 Resp: 14786

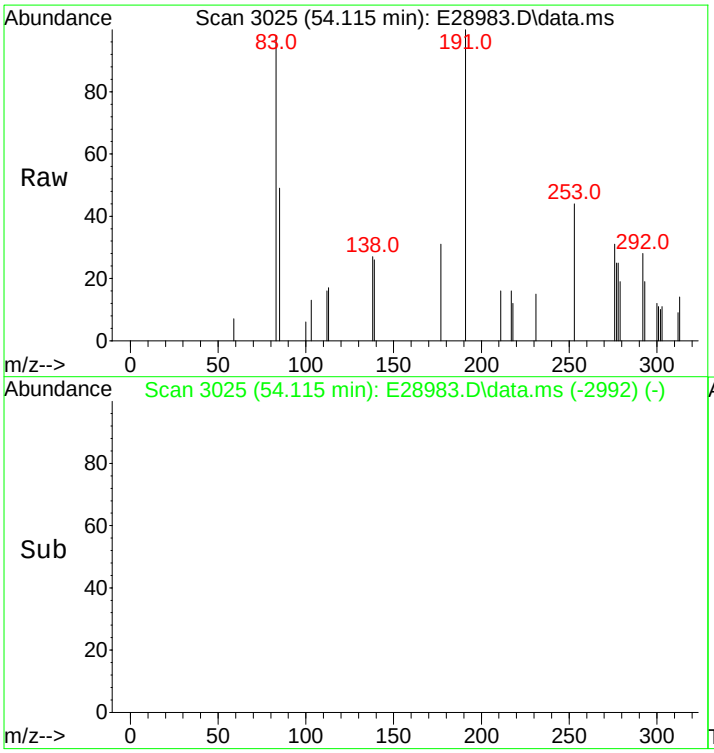




#119
30-Homohopane-22R (T22)
Concen: 281.98 ng/ml
RT: 53.588 min Scan# 2990
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

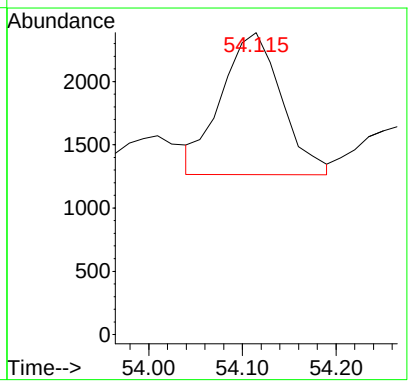
Tgt Ion:191 Resp: 12402

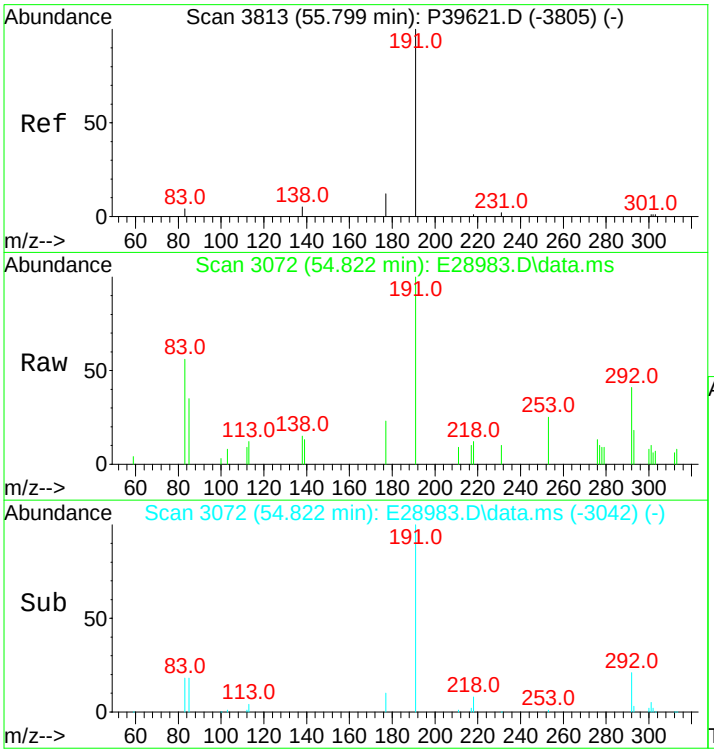




#120
Gammacerane/C32-diahopane
Concen: 113.93 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

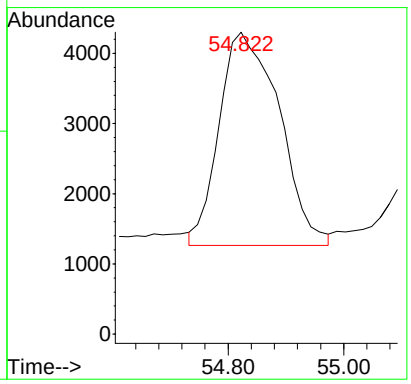
Tgt Ion:191 Resp: 5011

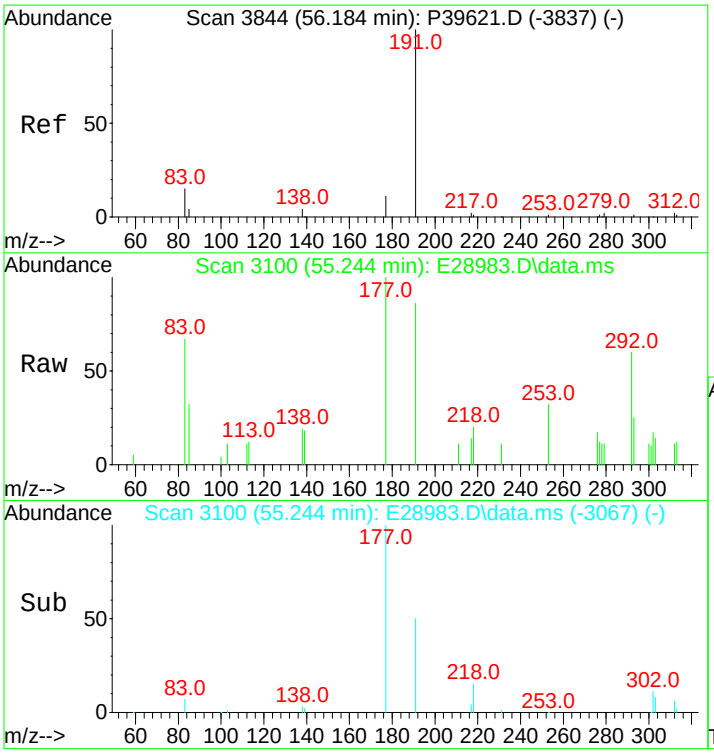




#121
30,31-Bishomohopane-22S (T26)
Concen: 497.66 ng/ml m
RT: 54.822 min Scan# 3072
Delta R.T. -0.045 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

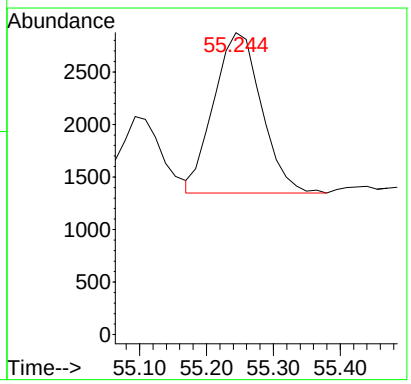
Tgt Ion:191 Resp: 21888

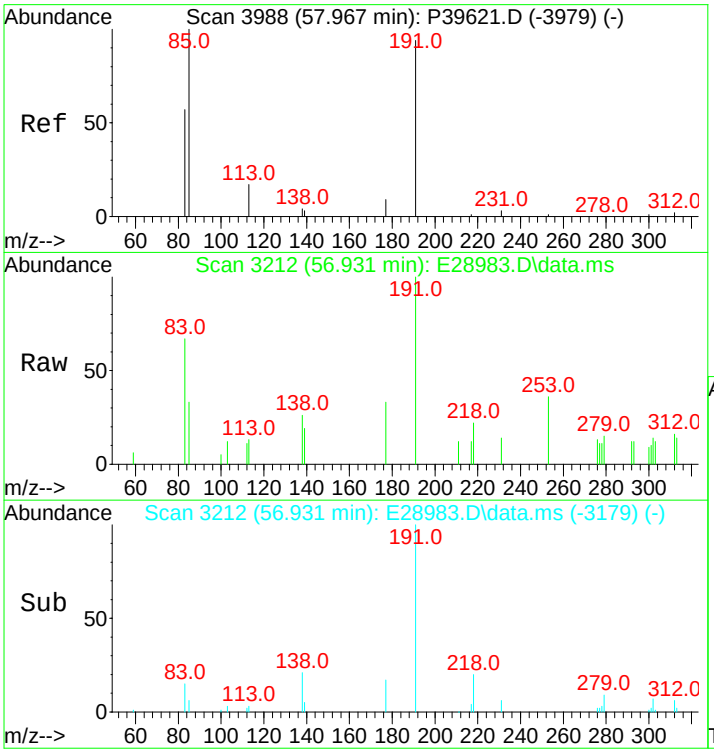




#122
30,31-Bishomohopane-22R (T27)
Concen: 171.91 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

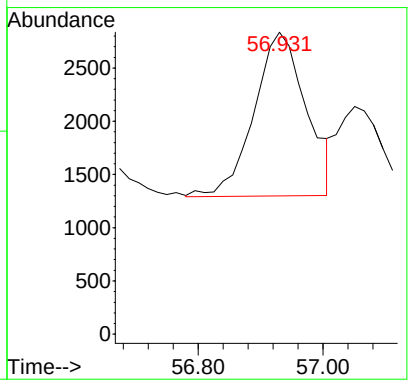
Tgt Ion:191 Resp: 7561

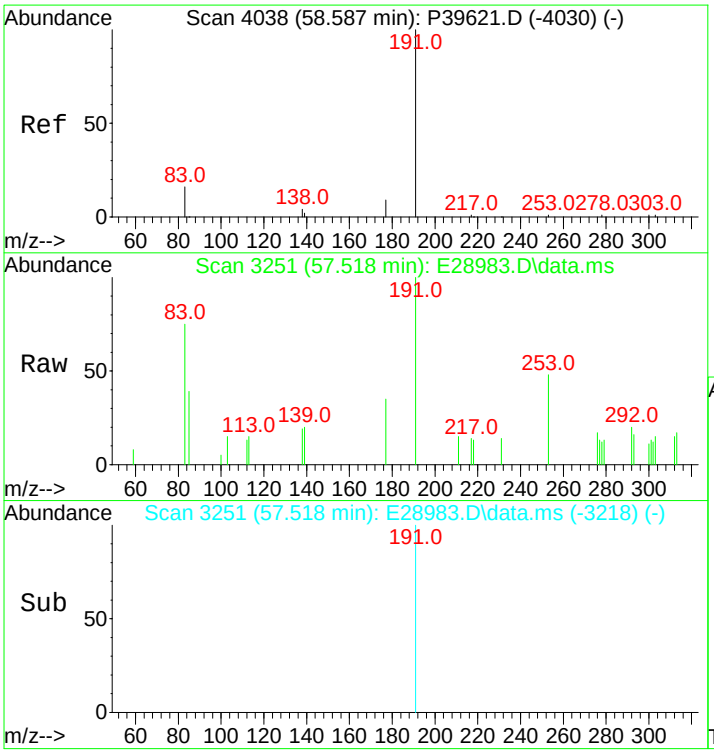




#123
30,31-Trishomohopane-22S (T30)
Concen: 203.40 ng/ml
RT: 56.931 min Scan# 3212
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

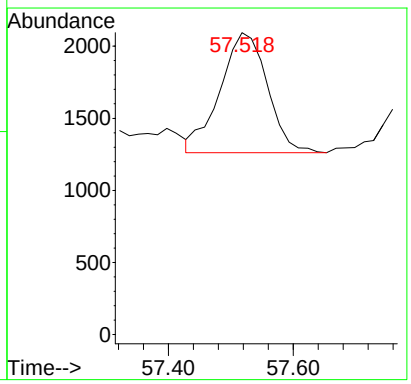
Tgt Ion:191 Resp: 8946

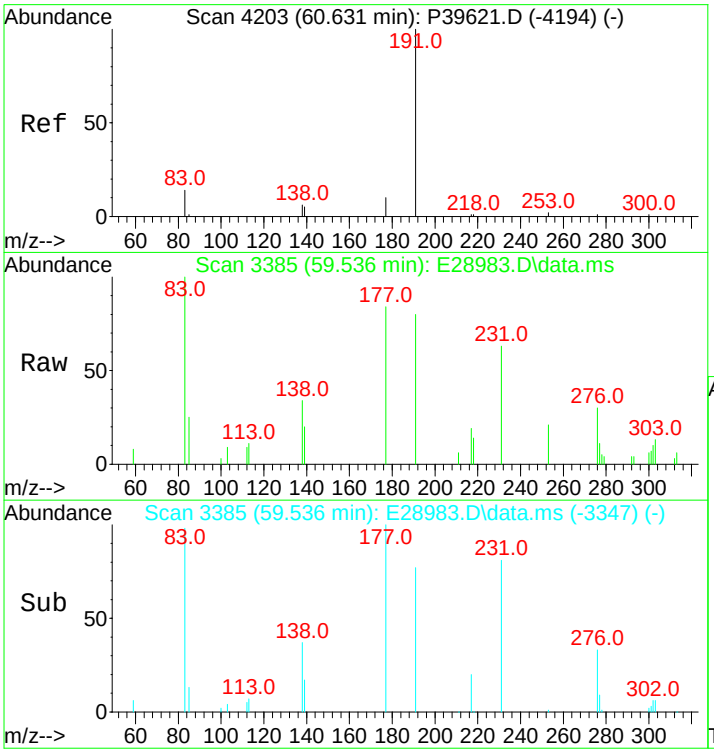




#124
30,31-Trishomohopane-22R (T31)
Concen: 99.70 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

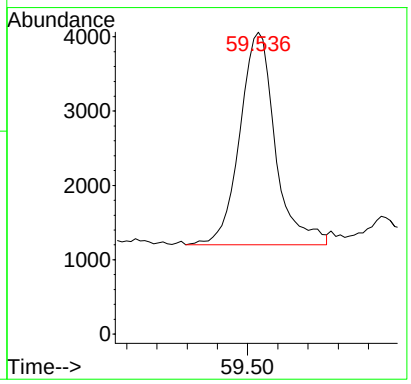
Tgt Ion:191 Resp: 4385

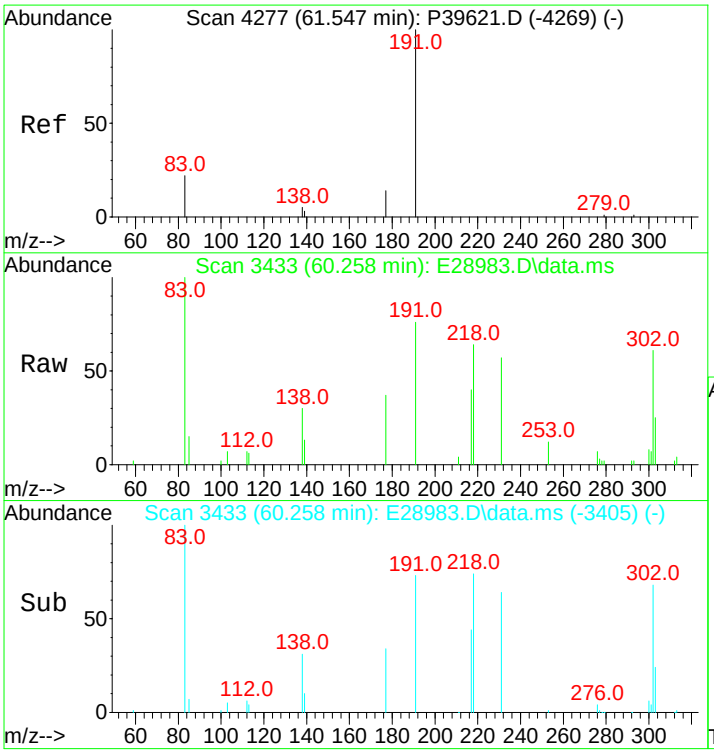




#125
Tetrakishomohopane-22S (T32)
Concen: 530.93 ng/ml
RT: 59.536 min Scan# 3385
Delta R.T. 0.075 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

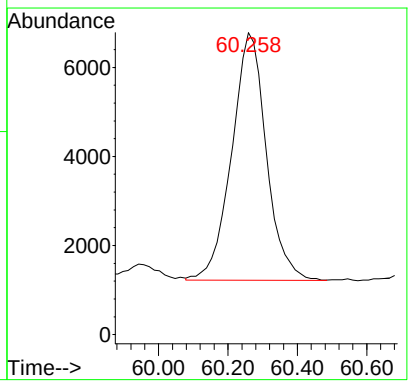
Tgt Ion:191 Resp: 23351

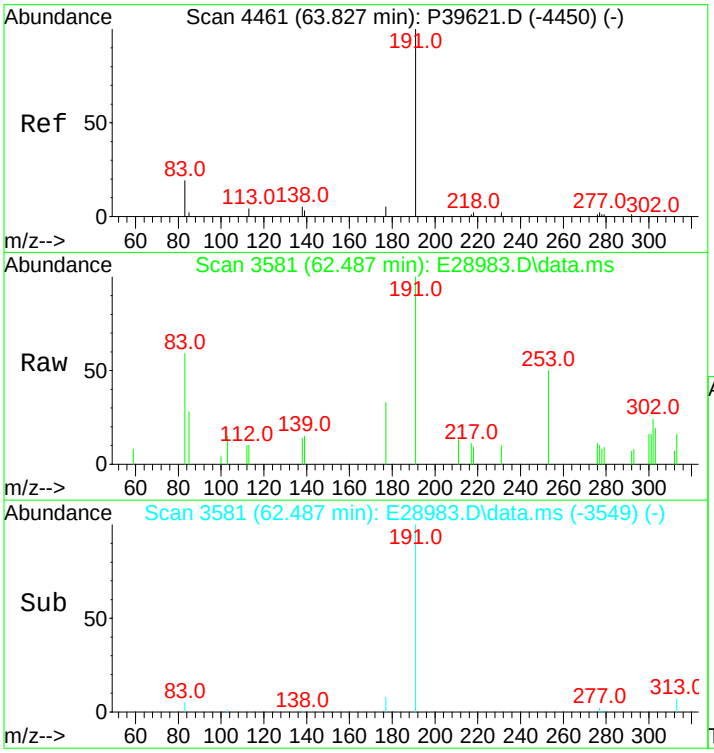




#126
Tetrakishomohopane-22R (T33)
Concen: 877.85 ng/ml
RT: 60.258 min Scan# 3433
Delta R.T. -0.075 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

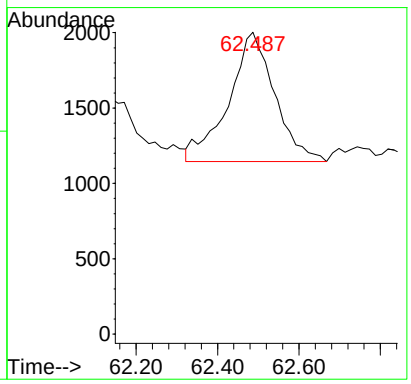
Tgt Ion:191 Resp: 38609

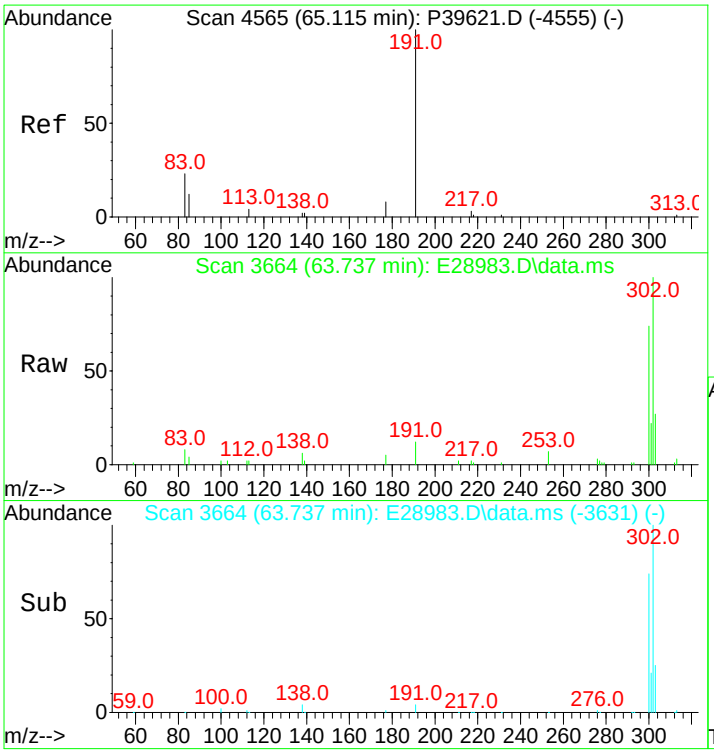




#127
Pentakishomohopane-22S (T34)
Concen: 153.04 ng/ml
RT: 62.487 min Scan# 3581
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

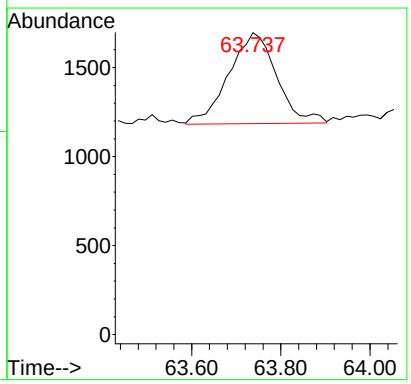
Tgt Ion:191 Resp: 6731

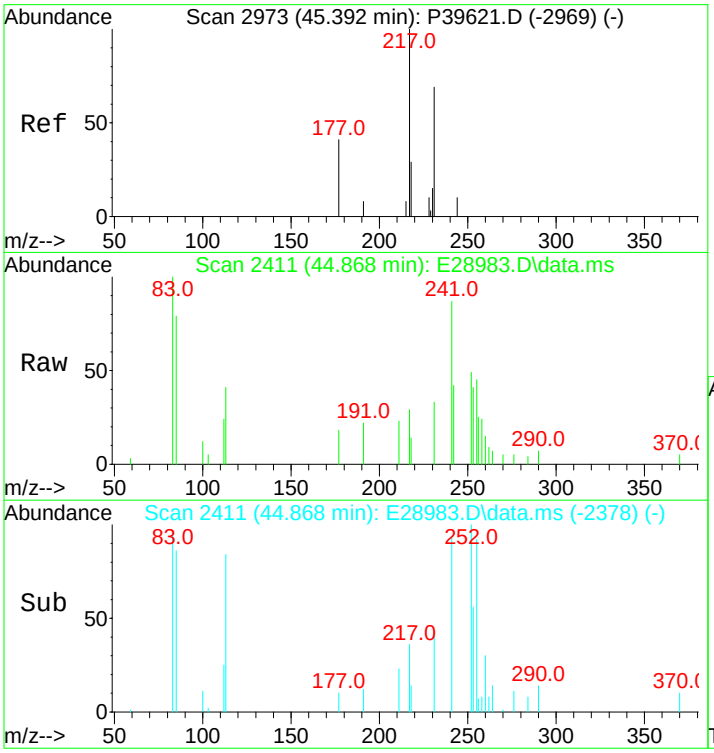




#128
Pentakishomohopane-22R (T35)
Concen: 86.88 ng/ml
RT: 63.737 min Scan# 3664
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

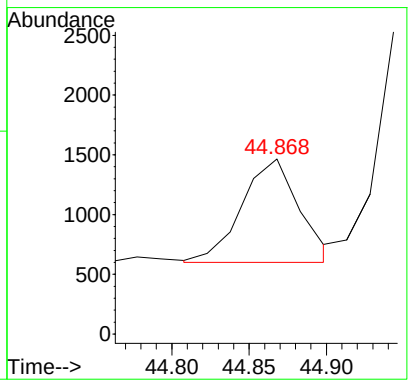
Tgt Ion:191 Resp: 3821

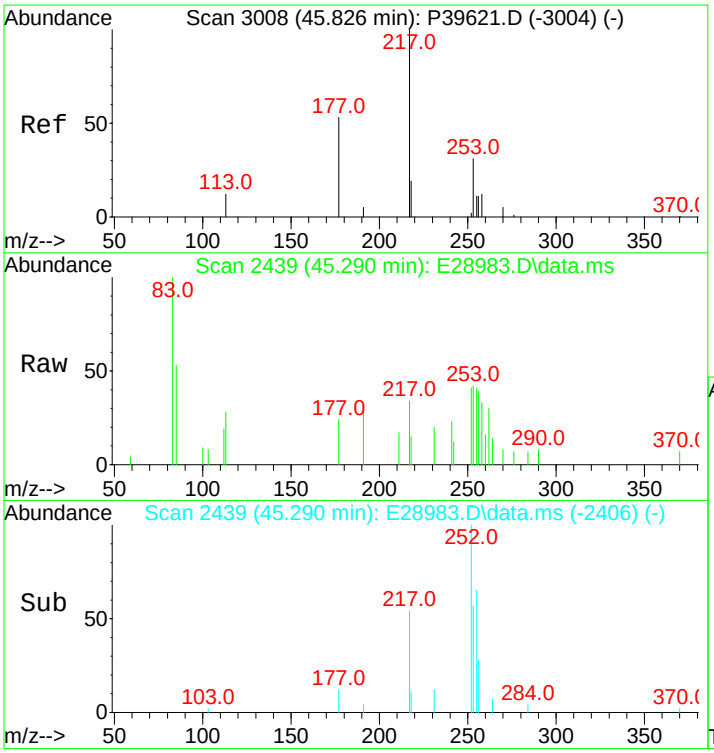




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 96.51 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

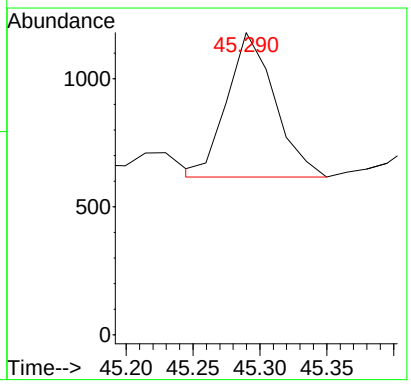
Tgt Ion:217 Resp: 2229

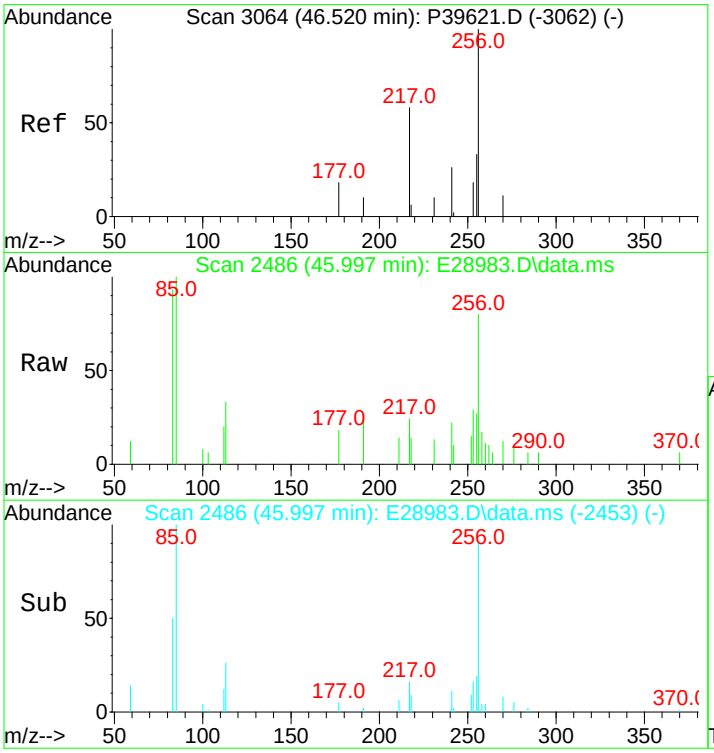




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 60.44 ng/ml
RT: 45.290 min Scan# 2439
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

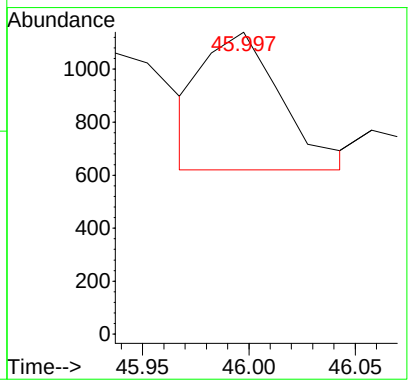
Tgt Ion:217 Resp: 1396

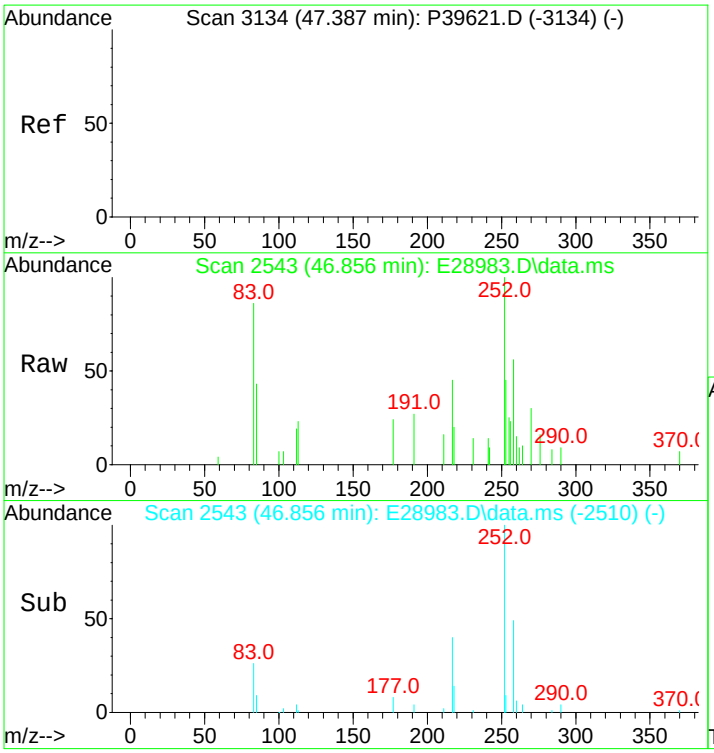




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 56.50 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

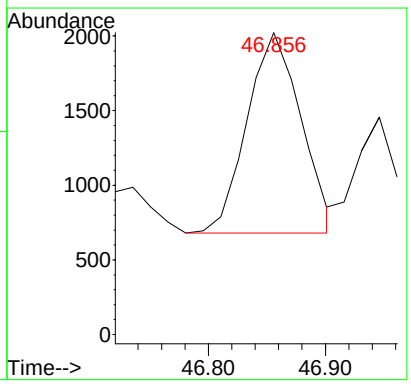
Tgt Ion:217 Resp: 1305

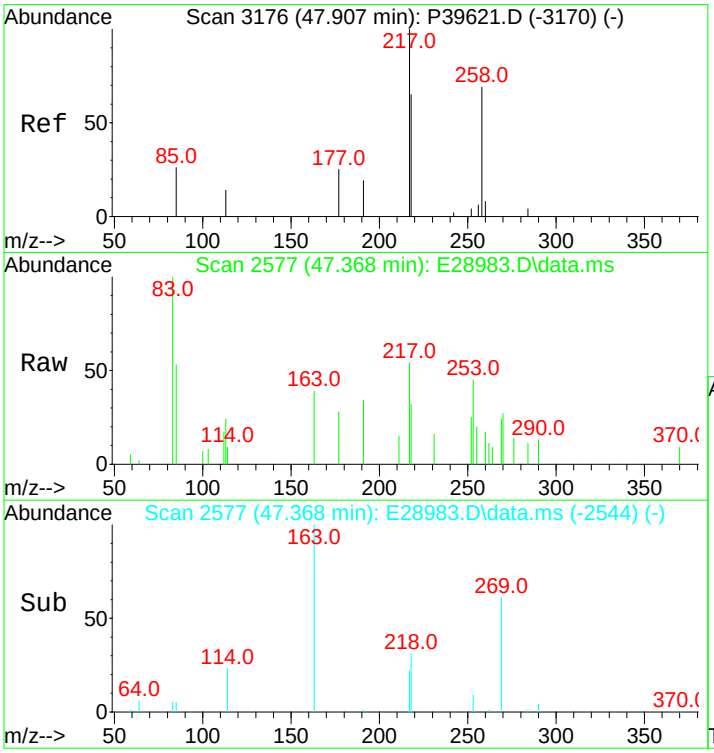




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 186.52 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

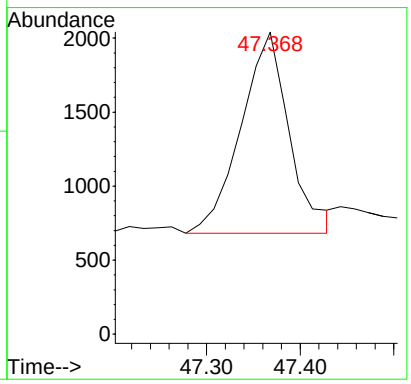
Tgt Ion:217 Resp: 4308

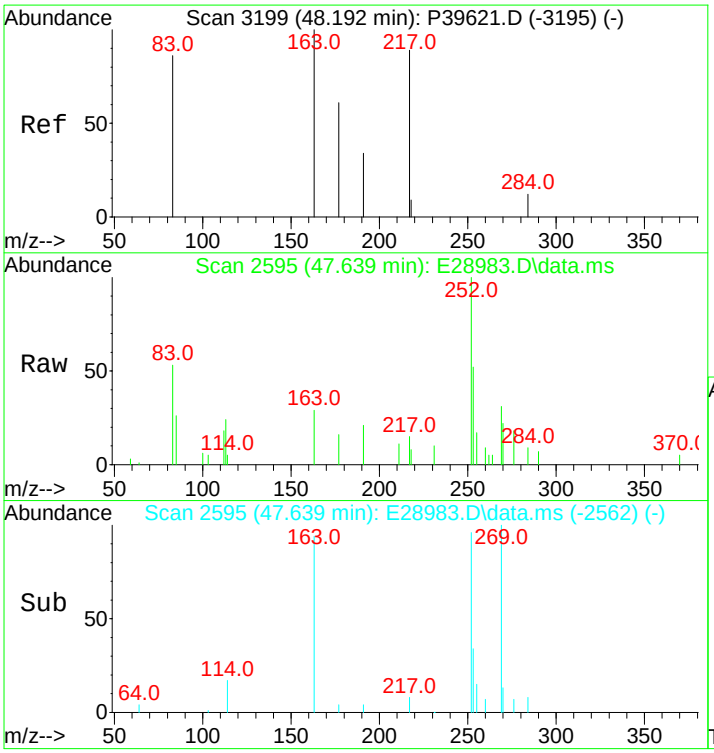




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 211.07 ng/ml
RT: 47.368 min Scan# 2577
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

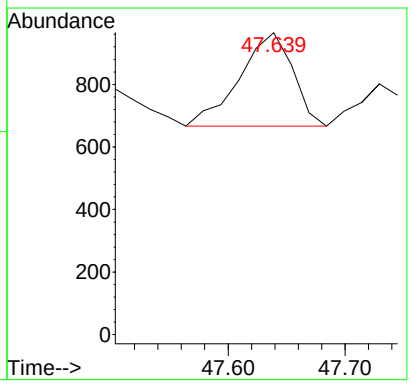
Tgt Ion:217 Resp: 4875

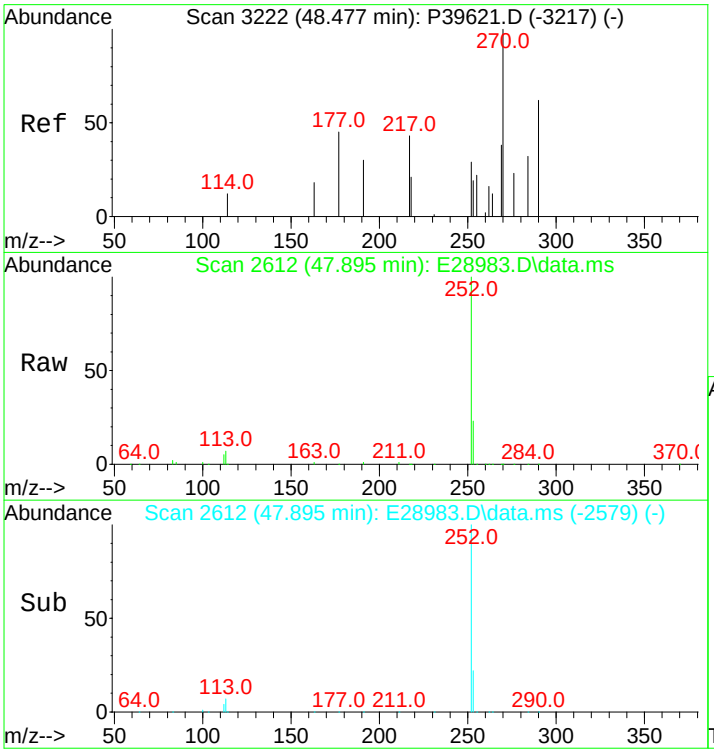




#135
Unknown Sterane (S18)
Concen: 41.00 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

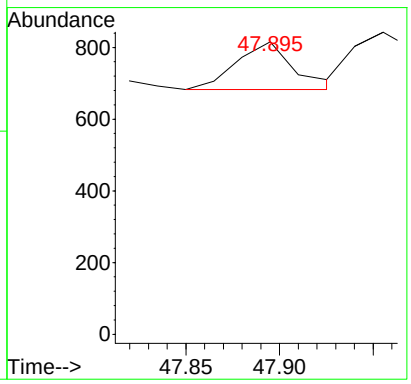
Tgt Ion:217 Resp: 947

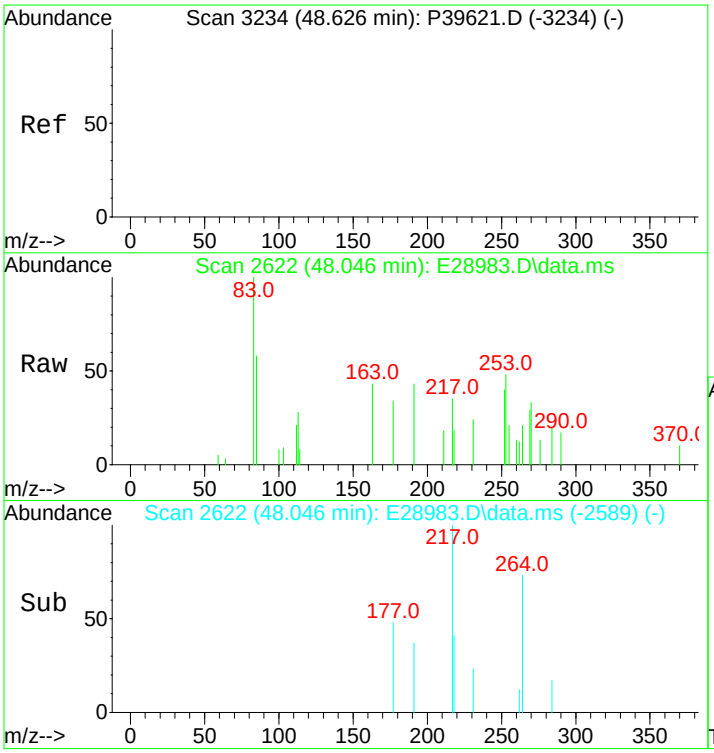




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 12.30 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

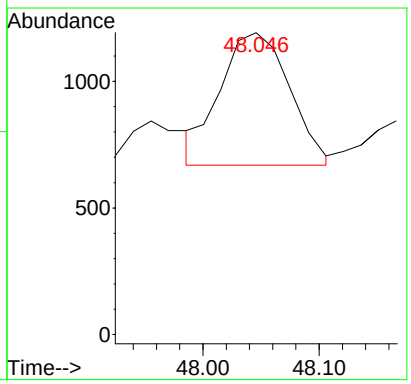
Tgt Ion:217 Resp: 284

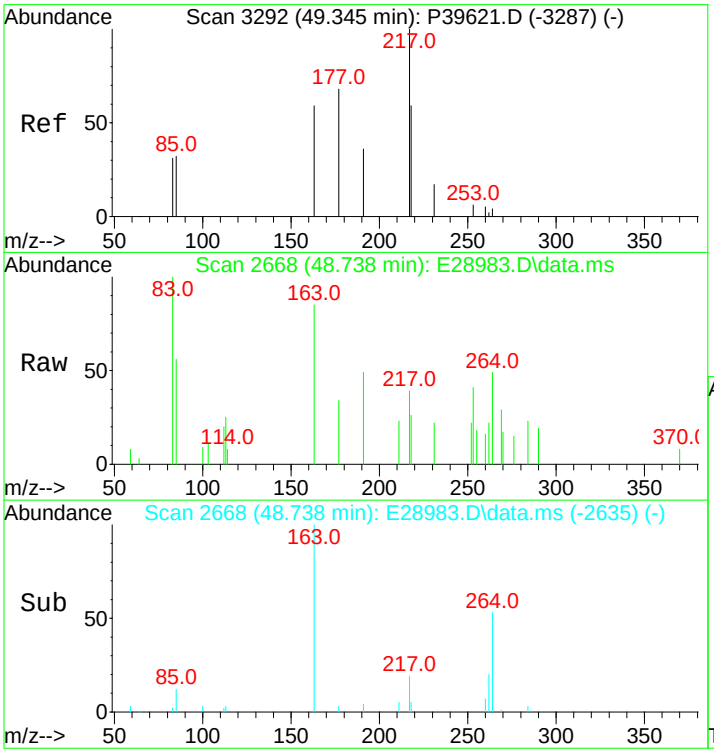




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 93.86 ng/ml m
RT: 48.046 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

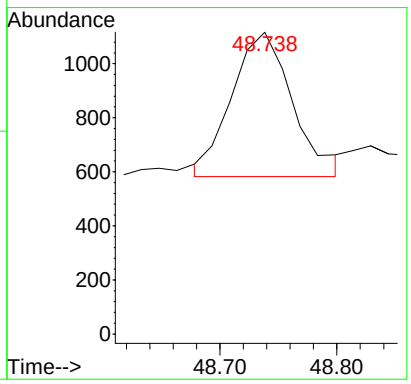
Tgt Ion:217 Resp: 2168

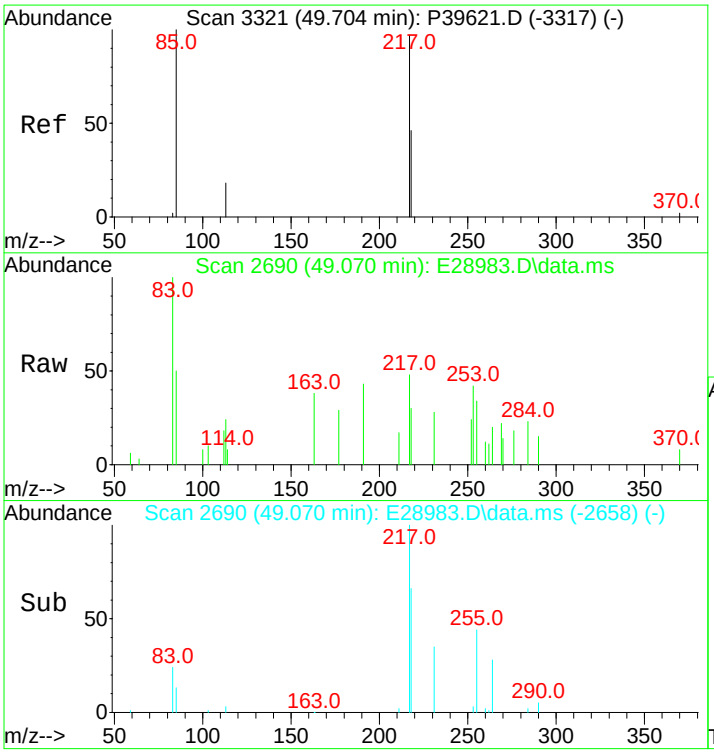




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 83.56 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

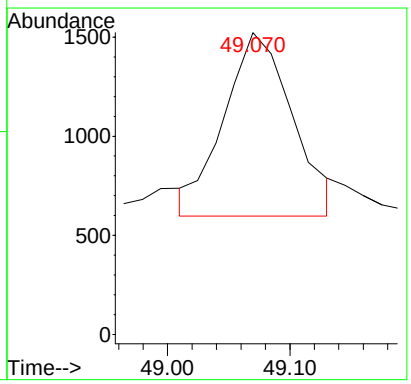
Tgt Ion:217 Resp: 1930

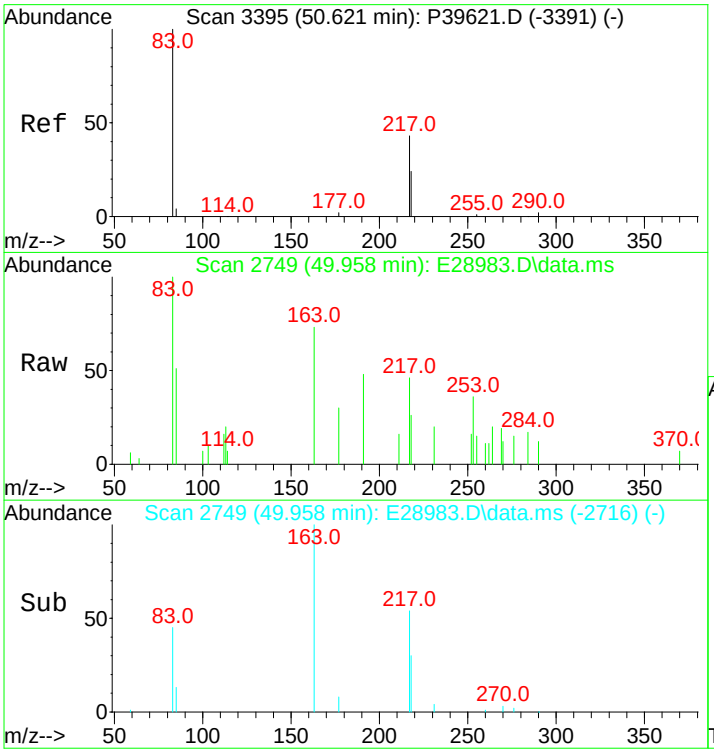




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 155.34 ng/ml m
RT: 49.070 min Scan# 2690
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

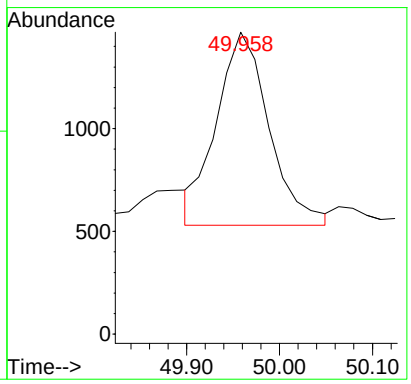
Tgt Ion:217 Resp: 3588

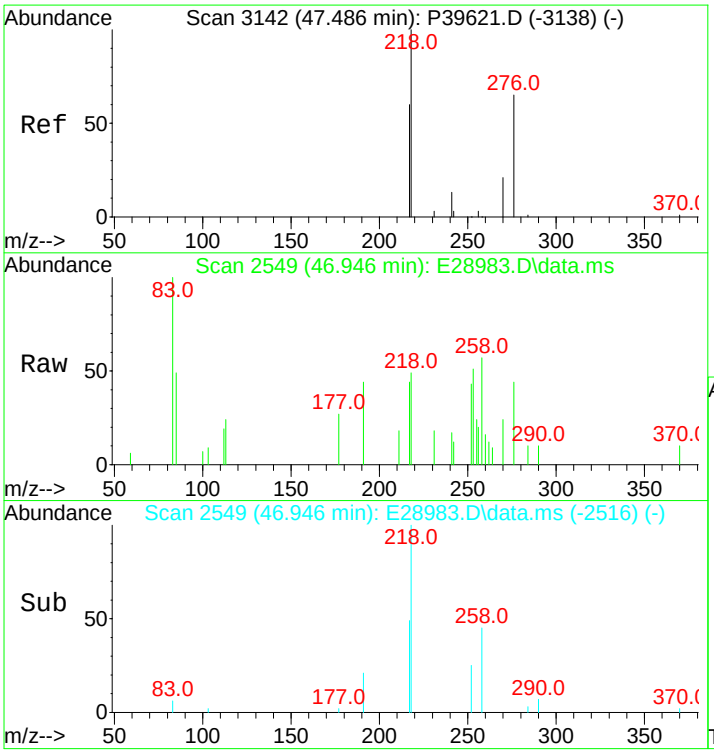




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 160.02 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

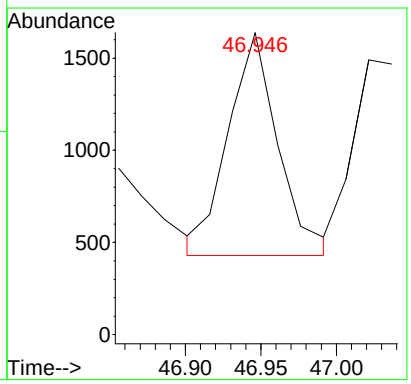
Tgt Ion:217 Resp: 3696

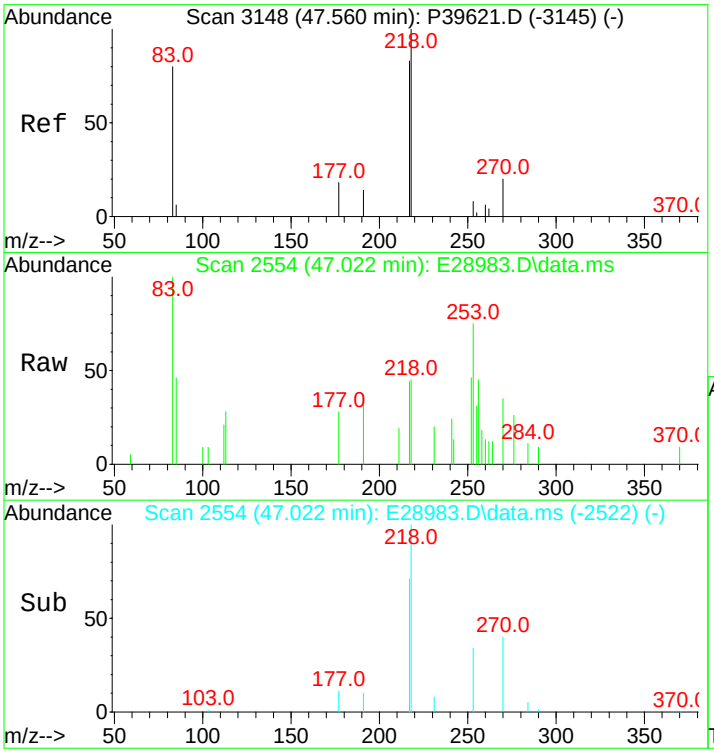




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 119.76 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

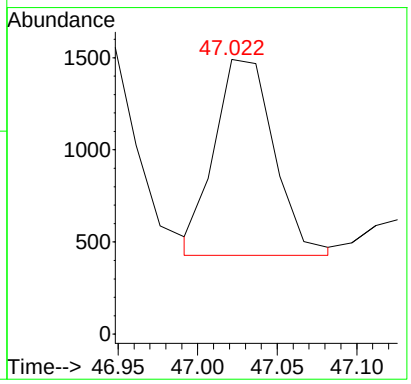
Tgt Ion:218 Resp: 2766

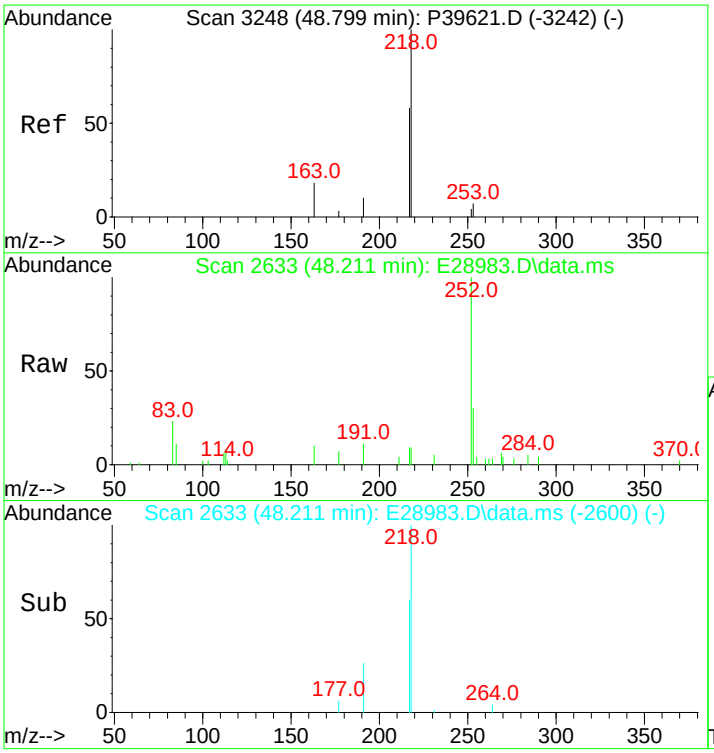




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 120.10 ng/ml m
RT: 47.022 min Scan# 2554
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

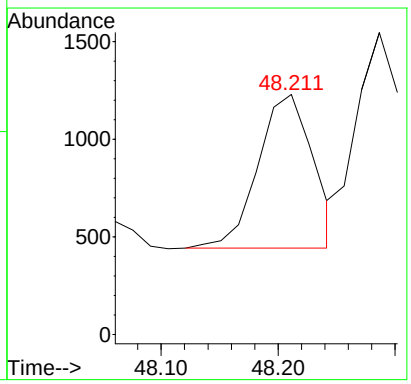
Tgt Ion:218 Resp: 2774

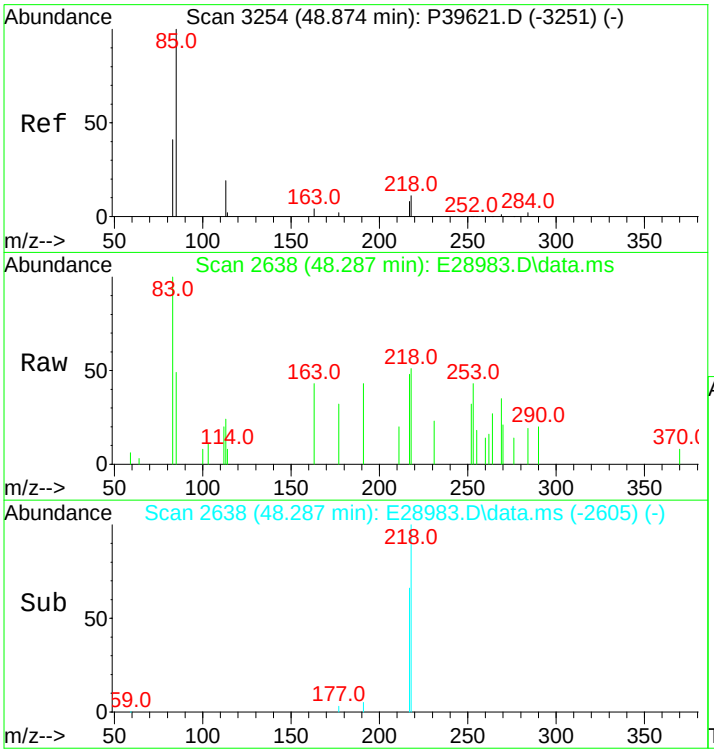




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 111.36 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

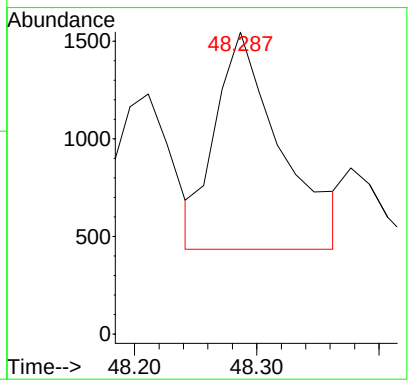
Tgt Ion:218 Resp: 2572

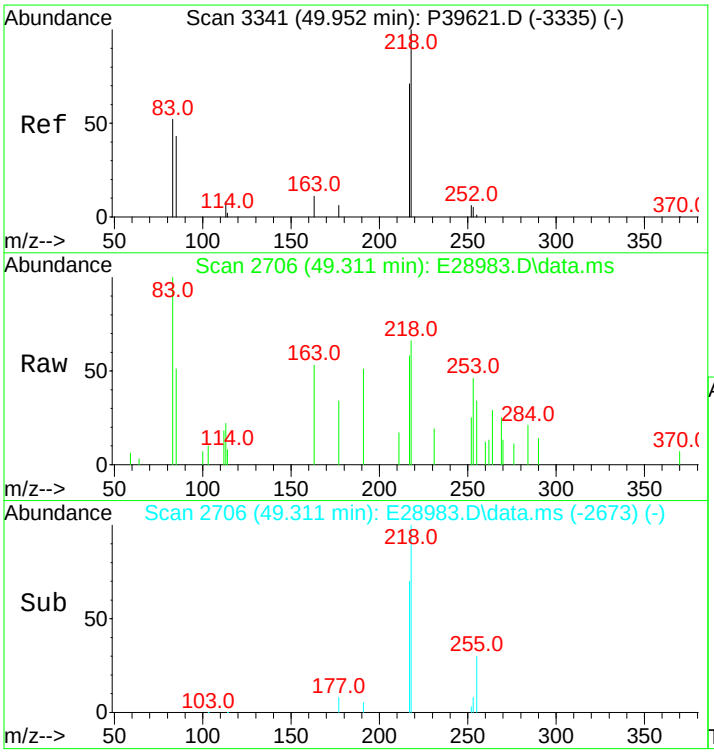




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 178.68 ng/ml m
RT: 48.287 min Scan# 2638
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

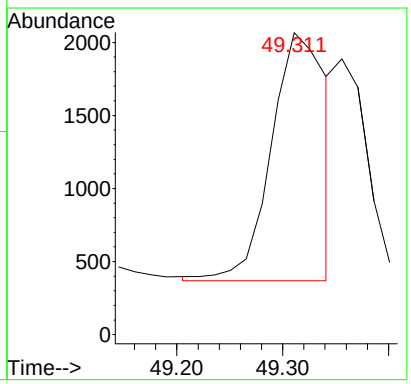
Tgt Ion:218 Resp: 4127

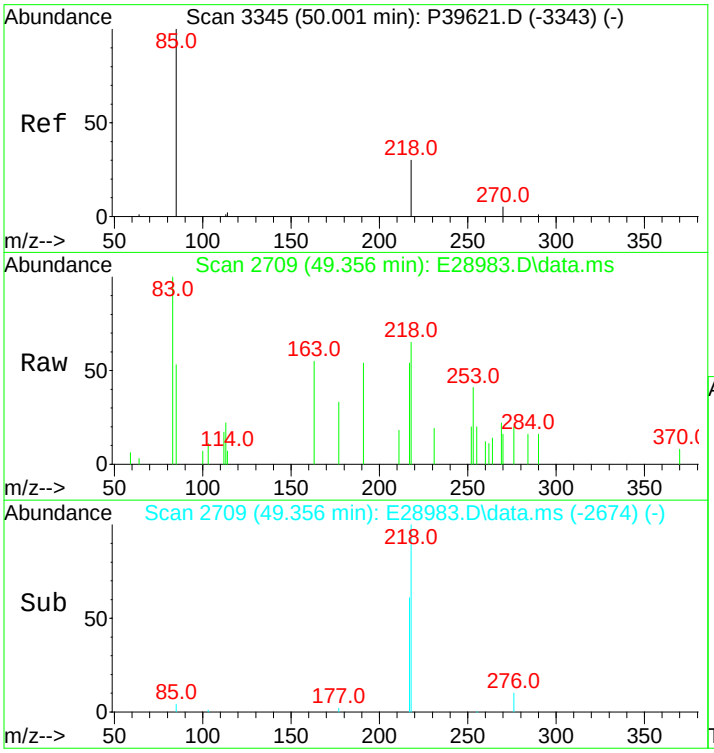




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 263.50 ng/ml m
RT: 49.311 min Scan# 2706
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

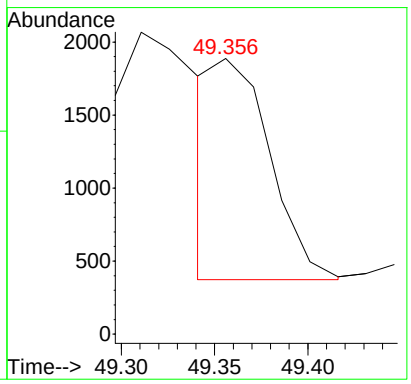
Tgt Ion:218 Resp: 6086

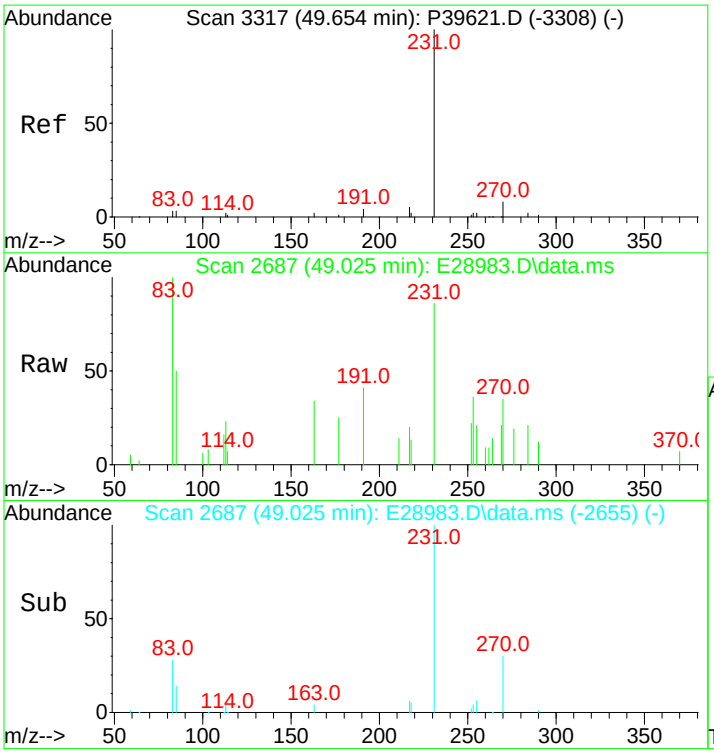




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 137.46 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

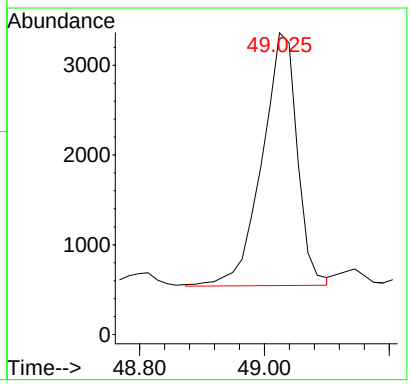
Tgt Ion:218 Resp: 3175

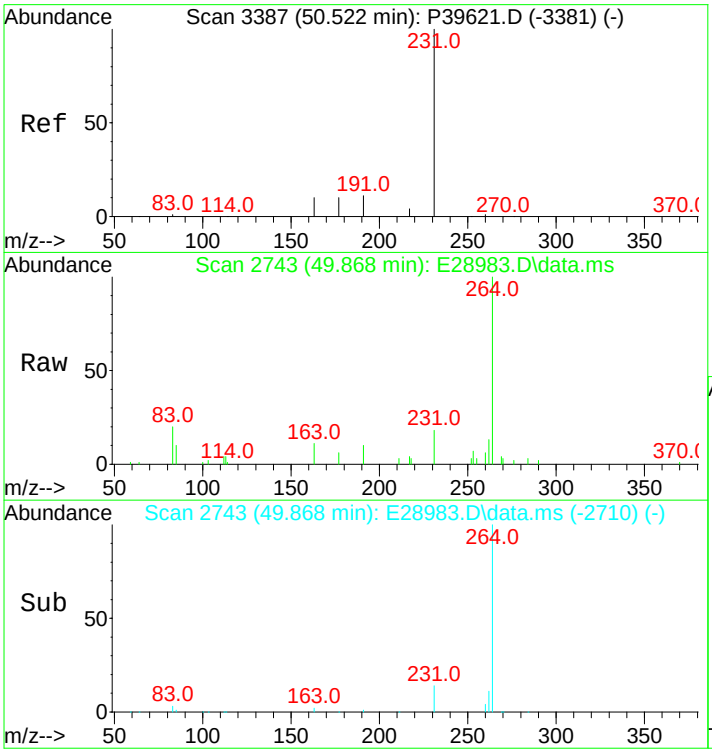




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 475.95 ng/mL
RT: 49.025 min Scan# 2687
Delta R.T. -0.015 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

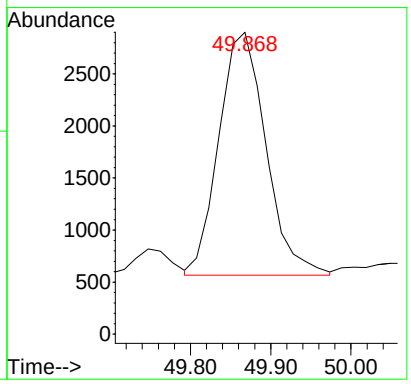
Tgt Ion:231 Resp: 10993

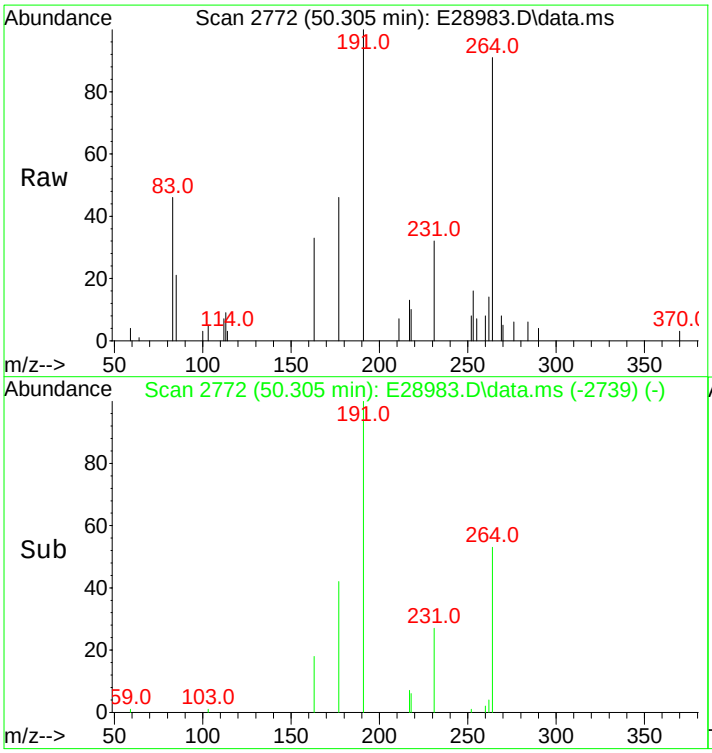




#148
C28,20S-triaromatic steroid
Concen: 411.87 ng/mL m
RT: 49.868 min Scan# 2743
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

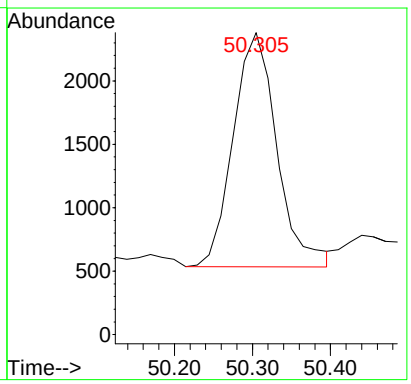
Tgt Ion:231 Resp: 9513

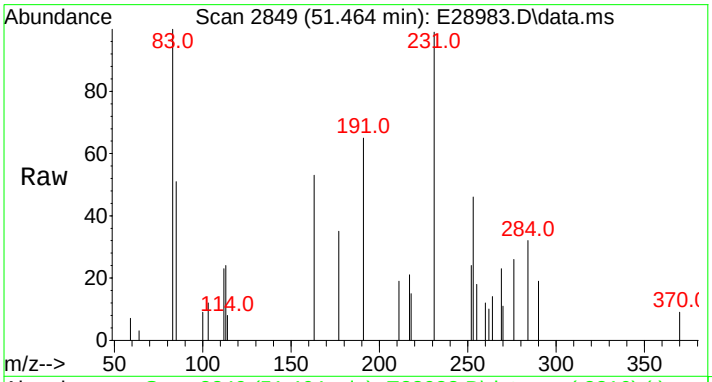




#149
C27,20R-triaromatic steroid
Concen: 311.25 ng/mL
RT: 50.305 min Scan# 2772
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

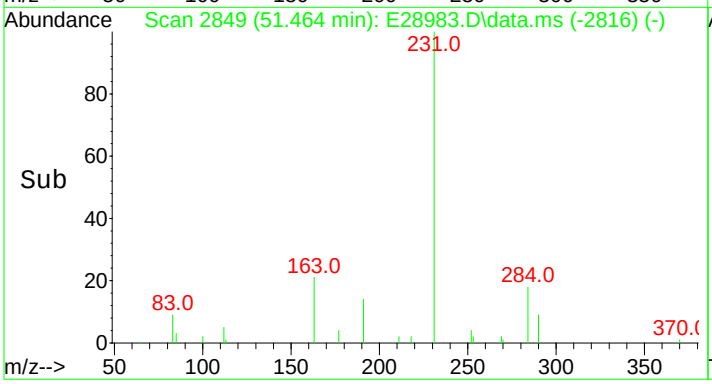
Tgt Ion:231 Resp: 7189

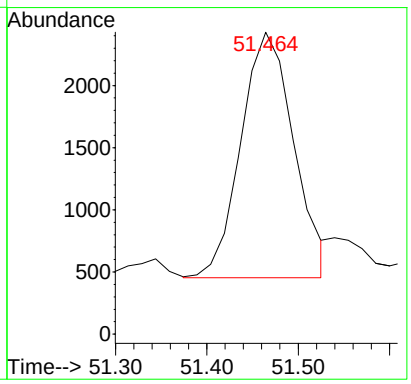




#150
C28,20R-triaromatic steroid
Concen: 343.98 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28983.D
Acq: 15 Nov 2012 7:45 am

Tgt Ion:231 Resp: 7945





Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23956	500.000	ng/mL	-0.01
74) Chrysene-d12	42.715	240	57685	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	29689	352.337	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.23%#			
42) Phenanthrene-d10	32.070	188	39265	454.824	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.48%#			
83) Benzo[b]fluoranthene-d12	46.645	264	54480	459.752	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.98%#			
88) Benzo[a]pyrene-d12	47.805	264	51222	446.114	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.61%#			
129) 5B(H)Cholane - Surr	43.332	217	10888	478.910	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.89%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	109	5.688	ng/mL	100
5) C1-Decalins	17.362	152	370M5	19.308	ng/mL	
6) C2-Decalins	19.139	166	1345M5	70.189	ng/mL	
7) C3-Decalins	21.623	180	2580m	134.637	ng/mL	
8) C4-Decalins	24.995	194	6748M5	352.144	ng/mL	
10) Naphthalene	19.289	128	34409	365.154	ng/mL#	100
11) C1-Naphthalenes	21.999	142	27224M5	288.905	ng/mL	
12) C2-Naphthalenes	24.844	156	62255M5	660.660	ng/mL	
13) C3-Naphthalenes	27.524	170	105735m	1122.076	ng/mL	
14) C4-Naphthalenes	29.963	184	90779M5	963.361	ng/mL	
16) 2-Methylnaphthalene	21.999	142	14778	246.230	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	12458	213.624	ng/mL#	100
18) Benzothiophene	19.515	134	1267	16.264	ng/mL	100
19) C1-Benzo(b)thiophenes	22.390	148	2227M5	28.588	ng/mL	
20) C2-Benzo(b)thiophenes	25.025	162	7329m	94.082	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18718m	240.281	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	22658M5	290.858	ng/mL	
23) Biphenyl	23.881	154	5609	73.947	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	13554	250.549	ng/mL#	100
25) Dibenzofuran	26.967	168	20805	247.748	ng/mL	96
26) Acenaphthylene	25.582	152	58466	622.318	ng/mL#	100
27) Acenaphthene	26.320	153	26020	430.268	ng/mL	96
28) 2,3,5-Trimethylnaphthalen	27.885	170	8420M3	166.361	ng/mL	
29) Fluorene	28.337	166	44959M3	666.581	ng/mL	
30) C1-Fluorenes	30.716	180	36783M5	545.360	ng/mL	
31) C2-Fluorenes	32.928	194	54974M5	815.067	ng/mL	
32) C3-Fluorenes	35.443	208	51957m	770.336	ng/mL	
33) Dibenzothiophene	31.664	184	50418	544.728	ng/mL#	92
34) 4-Methyldibenzothiophene(	33.455	198	26816	289.726	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.772	198	26245M3	283.557	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	12285	132.730	ng/mL#	100
37) OTP	33.862	198	3198M3	34.552	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	77974m	842.449	ng/mL	
39) C2-Dibenzothiophenes	35.142	212	113650M5	1227.901	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	108710m	1174.528	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	67378M5	727.968	ng/mL	
43) Phenanthrene	32.176	178	804085	8539.024	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	94071	998.992	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	114992	1221.164	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	41331	438.917	ng/mL#	38
47) 9/4-Methylphenanthrene(9M	34.600	192	104701M3	1111.878	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	70121M3	744.654	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	430080M5	4567.258	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	288792M5	3066.842	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52)	C3-Phenanthrenes/Anthrace	38.273	220	147148M5	1562.646	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.457	234	51870M5	550.836	ng/mL	
55)	Anthracene	32.341	178	162538M3	1996.963	ng/mL	
56)	Carbazole	33.034	167	48152	574.829	ng/mL	100
57)	1-Methylphenanthrene	34.690	192	70513M3	981.517	ng/mL	
58)	Fluoranthene	36.978	202	2007673M3	19306.026	ng/mL	
59)	Benzo(b)fluorene	39.493	216	153110M3	2209.529	ng/mL	
60)	Pyrene	37.852	202	1833875	17349.961	ng/mL	96
61)	C1-Fluoranthenes/Pyrenes	39.252	216	905503m	8566.801	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.315	230	370037M5	3500.853	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.212	244	153962m	1456.607	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.507	258	120461M5	1139.660	ng/mL	
66)	Naphthobenzothiophene	41.721	234	132440	1270.408	ng/ml#	65
67)	Naphthobenzothiophene-2,1	41.721	234	132440	1270.408	ng/mL#	65
68)	Naphthobenzothiophene-1,2	42.052	234	28584	274.187	ng/mL#	16
69)	Naphthobenzothiophene-2,3	42.354	234	35807M3	343.472	ng/mL	
70)	C1-Naphthobenzothiophenes	43.121	248	121819M5	1168.528	ng/ml	
71)	C2-Naphthobenzothiophenes	44.642	262	93066M5	892.720	ng/ml	
72)	C3-Naphthobenzothiophenes	46.766	276	66275M5	635.731	ng/ml	
73)	C4-Naphthobenzothiophenes	47.805	290	48198M5	462.331	ng/mL	
75)	Benz[a]anthracene	42.655	228	937941M3	8349.831	ng/mL	
77)	Chrysene/Triphenylene	42.820	228	964730	8342.068	ng/mL	99
78)	C1-Chrysenes	44.311	242	383393M5	3315.218	ng/mL	
79)	C2-Chrysenes	46.028	256	186346M5	1611.343	ng/mL	
80)	BBF-D12 Surr BKGD	46.645	256	2155	18.634	ng/mL	100
81)	C3-Chrysenes	47.067	270	130092M5	1124.912	ng/mL	
82)	C4-Chrysenes	47.519	284	61977M5	535.918	ng/mL	
84)	Benzo[b]fluoranthene	46.735	252	1005982	7704.795	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	46.811	252	933303M3	6947.868	ng/mL	
86)	Benzo[a]fluoranthene	47.097	252	212138M3	1579.237	ng/mL	
87)	Benzo[e]pyrene	47.714	252	740936	5811.818	ng/mL	93
89)	Benzo[a]pyrene	47.895	252	1101484	9029.365	ng/mL	93
90)	Perylene	48.181	252	298125	2311.116	ng/mL	92
91)	Indeno[1,2,3-cd]pyrene	52.564	276	839733M3	5849.117	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.579	278	254577M3	1665.354	ng/mL	
93)	Benzo[g,h,i]perylene	53.814	276	837425	5409.747	ng/mL	99
94)	Hopane (T19)	51.645	191	33343M3	770.191	ng/mL	
96)	C23 Tricyclic Terpane (T4	40.351	191	8473M3	195.718	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.089	191	4902M3	113.231	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.579	191	5698	131.618	ng/ml	100
99)	C24 Tetracyclic Terpane (	43.889	191	2398M3	55.391	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	2572M3	59.411	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.739	191	1795	41.463	ng/ml	100
102)	C28 Tricyclic Terpane-22S	46.058	191	1825M3	42.156	ng/ml	
103)	C28 Tricyclic Terpane-22R	46.208	191	2469	57.032	ng/ml	100
104)	C29 Tricyclic Terpane-22S	46.735	191	2610	60.288	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.931	191	2842	65.647	ng/ml	100
106)	18a-22,29,30-Trisnorneoho	47.985	191	4462M3	103.068	ng/ml	
107)	C30 Tricyclic Terpane-22S	48.106	191	2289M3	52.874	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.347	191	3249	75.049	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	48.513	191	8487	196.041	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	49.687	191	4266	98.540	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	49.491	191	3309	76.435	ng/ml	100
112)	30-Norhopane (T15)	50.320	191	25114M3	580.109	ng/ml	
113)	18a(H)-30-Norneohopane-C2	50.425	191	4849M3	112.007	ng/ml	
114)	17a(H)-Diahopane (X)	50.546	191	1701M3	39.291	ng/ml	
115)	30-Normoretane (T17)	51.073	191	3135	72.415	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	51.464	191	1201M3	27.742	ng/ml	
117)	Moretane (T20)	52.308	191	3872M3	89.439	ng/ml	
118)	30-Homohopane-22S (T21)	53.377	191	15048	347.594	ng/ml	100
119)	30-Homohopane-22R (T22)	53.603	191	12124	280.053	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120)	Gammacerane/C32-diahopane	54.115	191	5333	123.187	ng/mL	100
121)	30,31-Bishomohopane-22S (	54.822	191G	20463M3	472.675	ng/ml	
122)	30,31-Bishomohopane-22R (	55.244	191	7880	182.020	ng/ml	100
123)	30,31-Trishomohopane-22S	56.931	191	9477	218.910	ng/ml	100
124)	30,31-Trishomohopane-22R	57.518	191	4524	104.500	ng/ml	100
125)	Tetrakishomohopane-22S (T	59.506	191	9903	228.750	ng/ml	100
126)	Tetrakishomohopane-22R (T	60.304	191	3369M3	77.821	ng/ml	
127)	Pentakishomohopane-22S (T	62.487	191	6202	143.260	ng/ml	100
128)	Pentakishomohopane-22R (T	63.722	191	4147	95.792	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	44.868	217	2402M3	105.652	ng/ml	
131)	13b(H),17a(H)-20R-Diachol	45.290	217	1447	63.647	ng/ml	100
132)	13b,17a-20S-Methyldiachol	45.997	217	1465M3	64.438	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	46.856	217	5110	224.764	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	47.368	217	5602M3	246.405	ng/ml	
135)	Unknown Sterane (S18)	47.639	217	1052	46.272	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	47.895	217	342	15.043	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.046	217	2309M3	101.562	ng/ml	
138)	14a,17a-20R-Methylcholest	48.738	217	1963M3	86.343	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.070	217	4163M3	183.110	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	49.958	217	3601M3	158.391	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	46.946	218	3024M3	133.011	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.037	218	3010M3	132.395	ng/ml	
143)	14b,17b-20R-Methylcholest	48.211	218	2954	129.932	ng/ml	100
144)	14b,17b-20S-Methylcholest	48.287	218	4274M3	187.993	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	49.311	218	6497M3	285.772	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	49.356	218	3782M3	166.352	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.040	231	12028	529.053	ng/mL	100
148)	C28,20S-triaromatic stero	49.868	231	11931M3	524.787	ng/mL	
149)	C27,20R-triaromatic stero	50.305	231	8009	352.277	ng/mL	100
150)	C28,20R-triaromatic stero	51.464	231	9712M3	427.184	ng/mL	

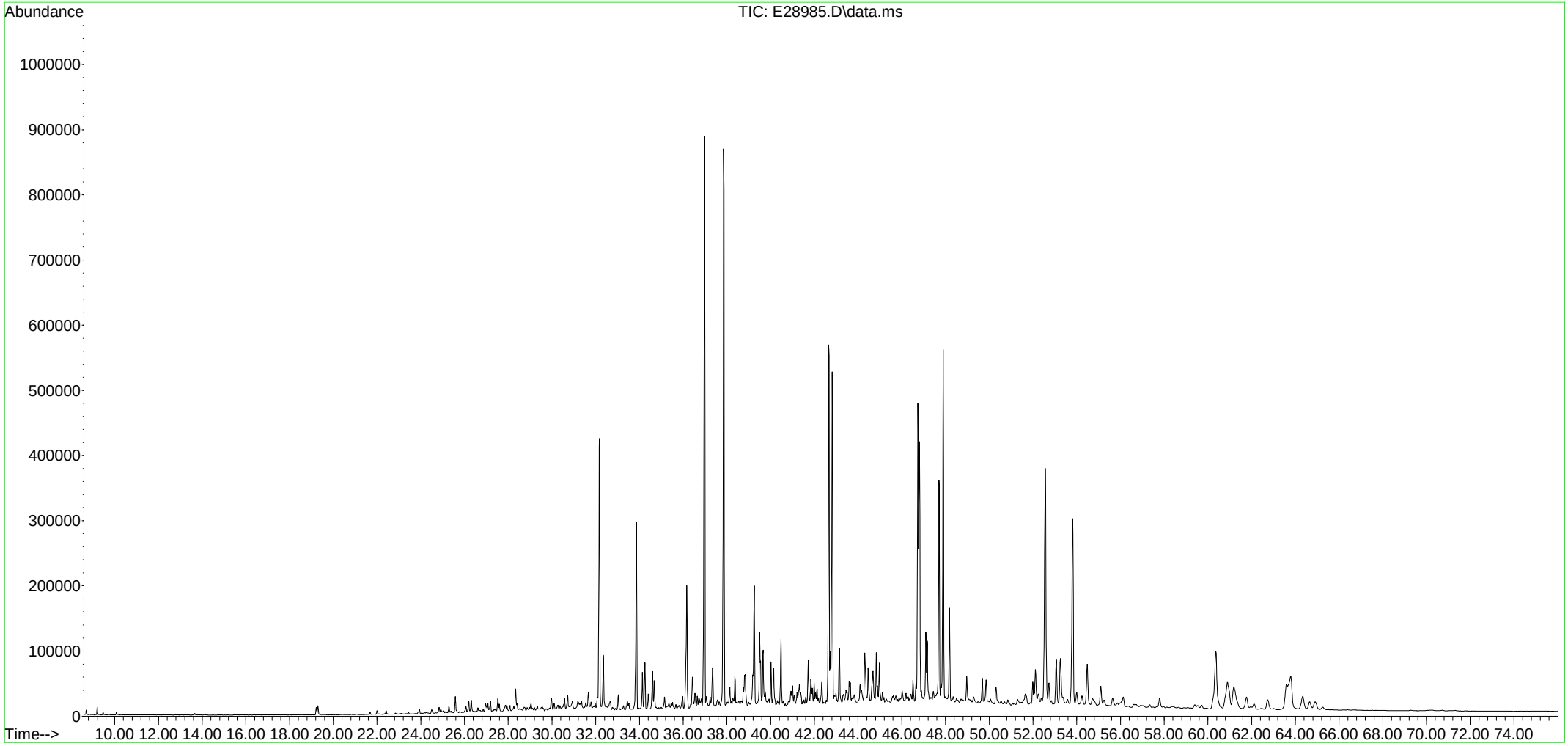
(#) = qualifier out of range (m) = manual integration (+) = signals summed

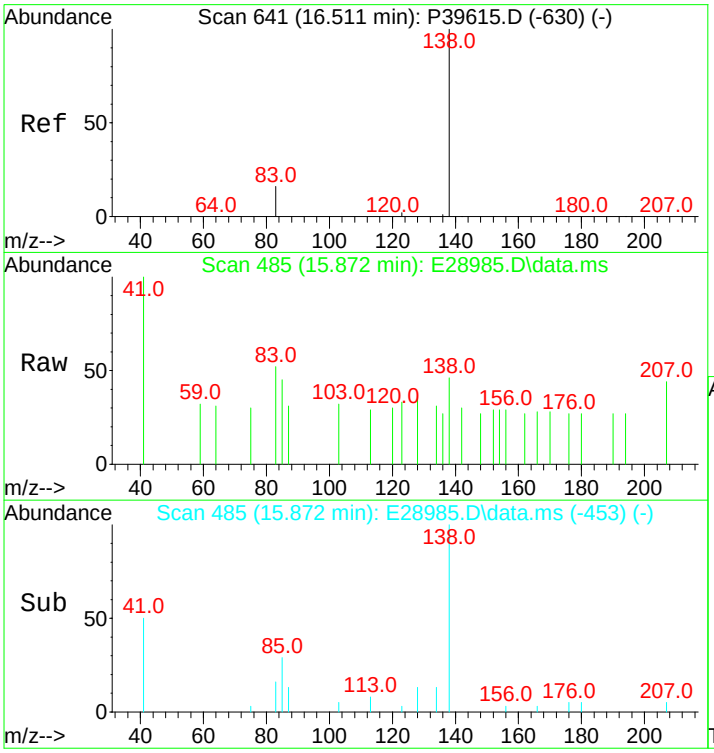
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28985.D
Acq On : 15 Nov 2012 9:14 am
Operator : AC
Sample : 1210081-04
Misc : 1X
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 16 13:33:04 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

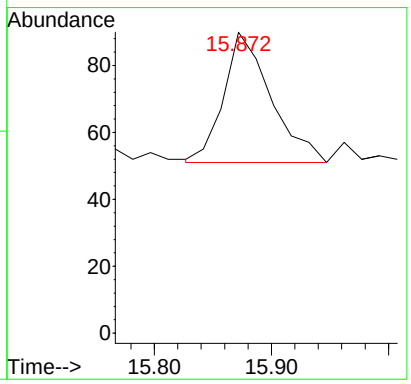
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

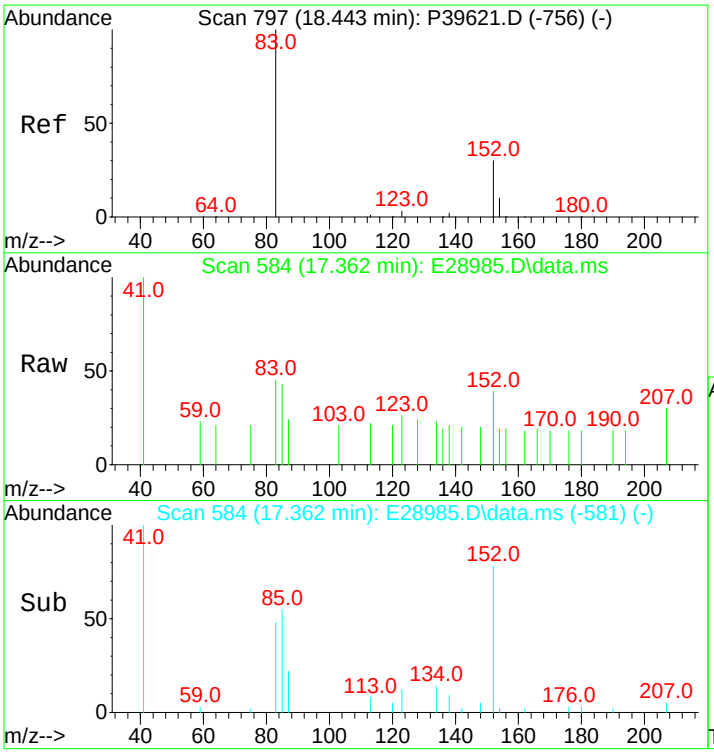




#3
trans-Decalin
Concen: 5.69 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

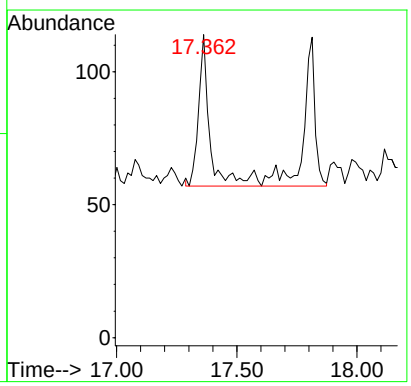
Tgt Ion:138 Resp: 109

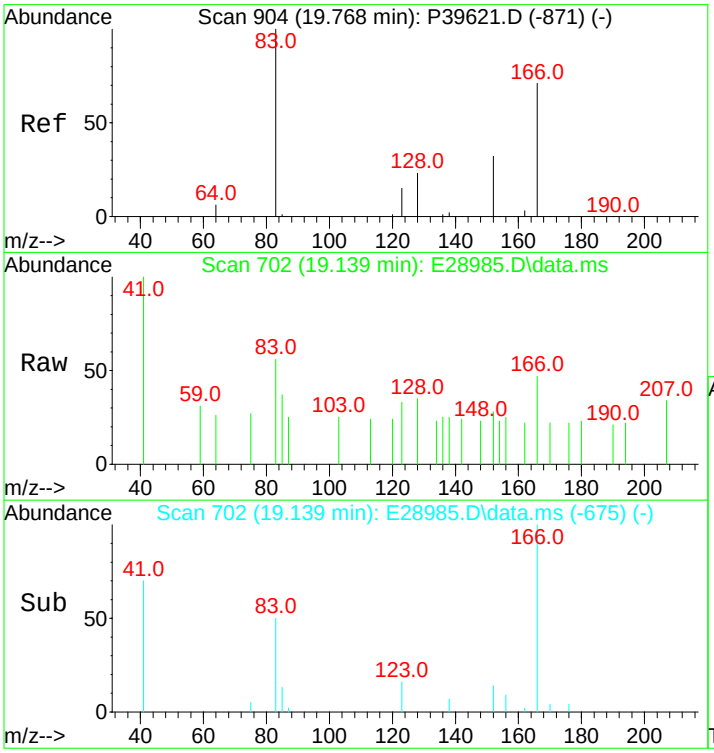




#5
C1-Decalins
Concen: 19.31 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

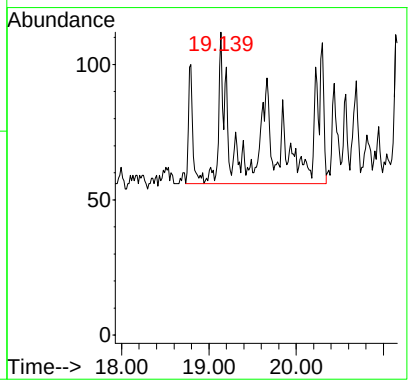
Tgt Ion:152 Resp: 370

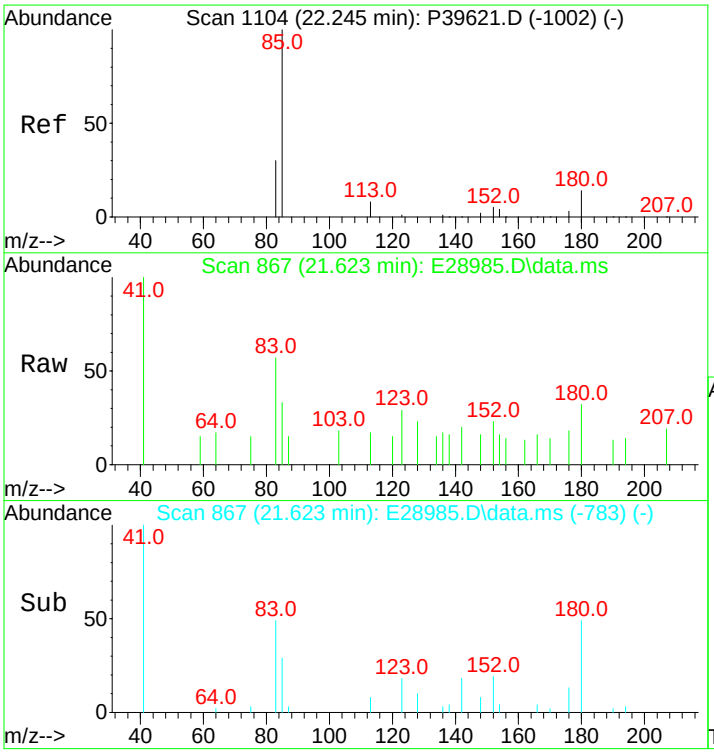




#6
C2-Decalins
Concen: 70.19 ng/mL m
RT: 19.139 min Scan# 702
Delta R.T. -0.204 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

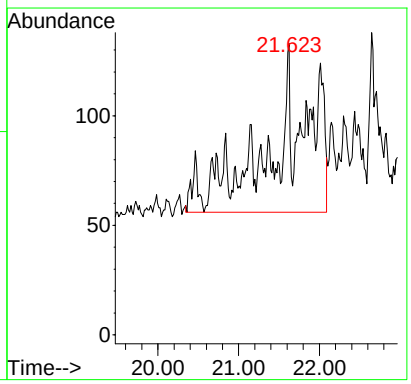
Tgt Ion:166 Resp: 1345

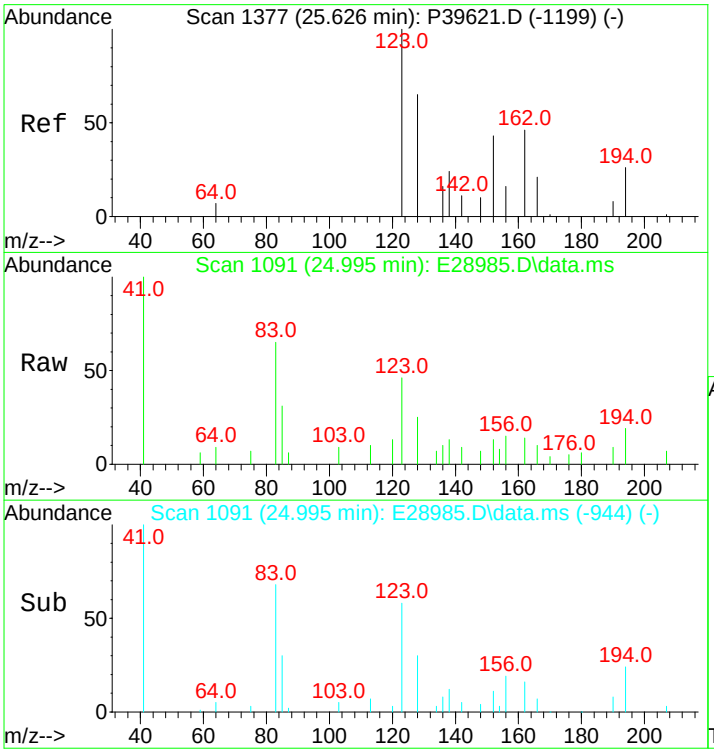




#7
C3-Decalins
Concen: 134.64 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

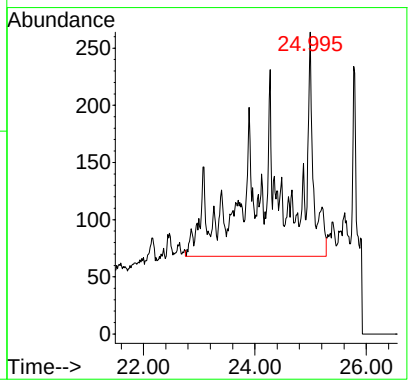
Tgt Ion:180 Resp: 2580

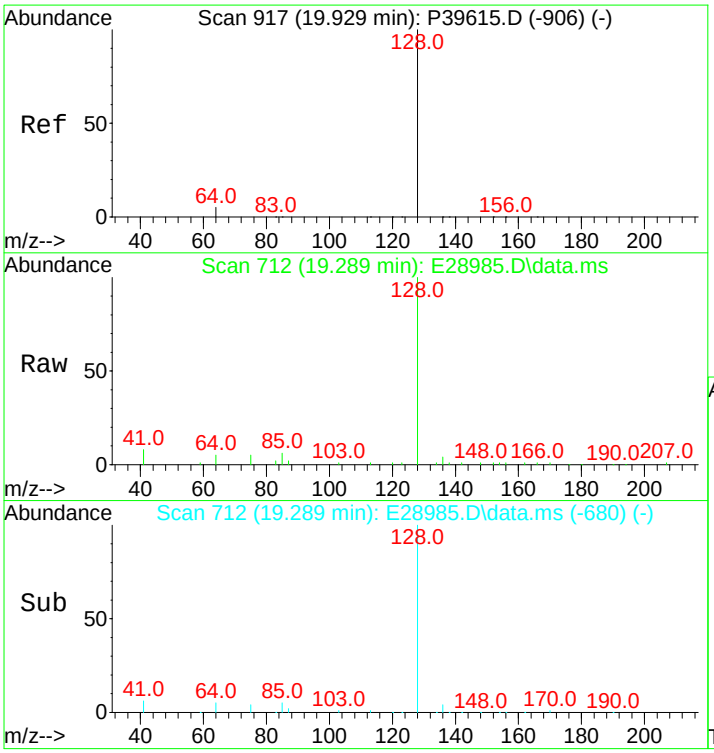




#8
C4-Decalins
Concen: 352.14 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:194 Resp: 6748

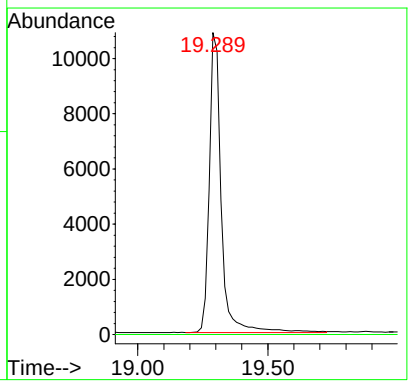


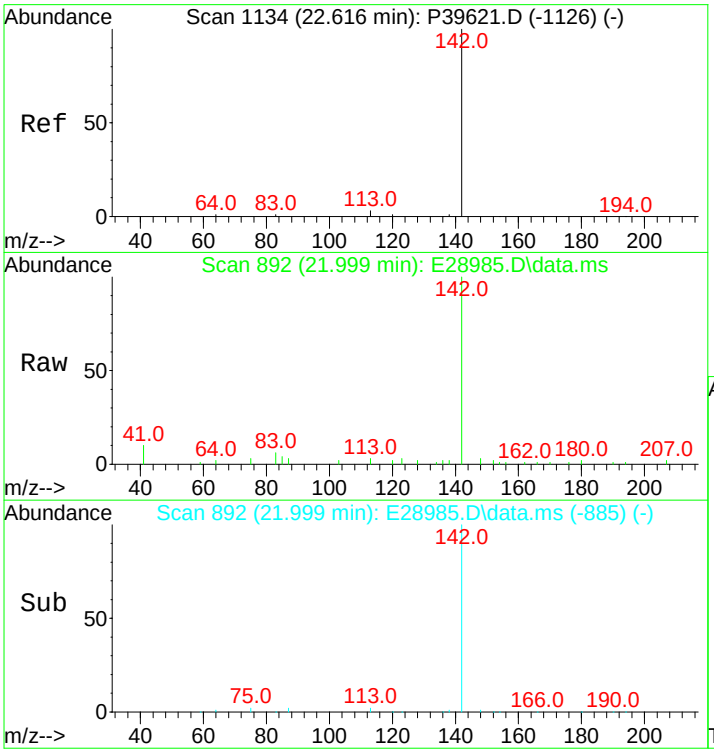


#10
Naphthalene
Concen: 365.15 ng/mL
RT: 19.289 min Scan# 712
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:128 Resp: 34409

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

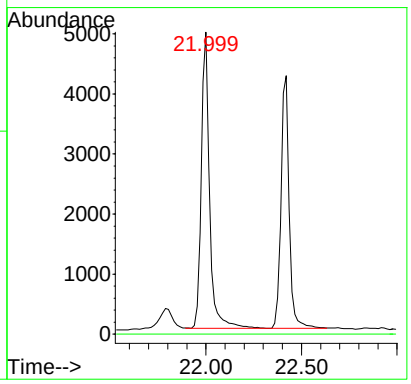


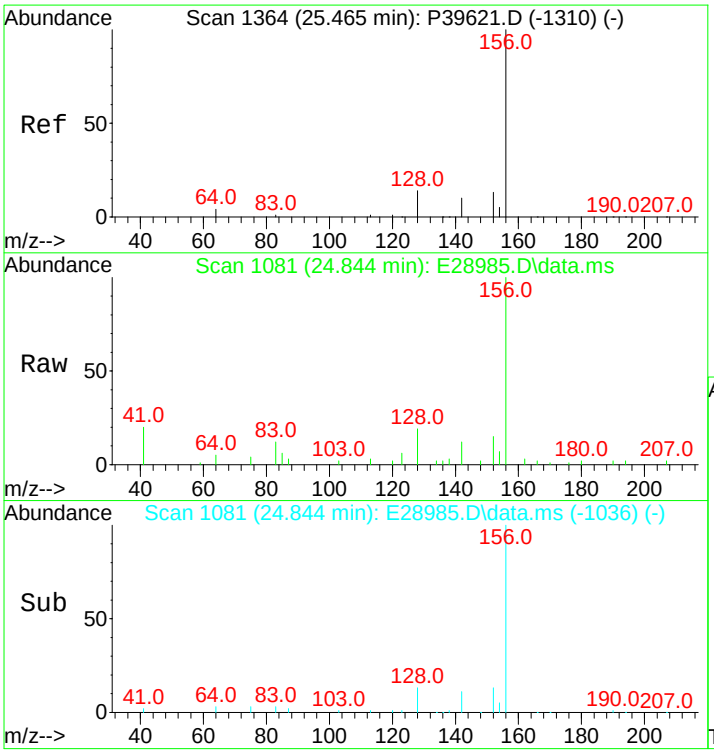


#11
C1-Naphthalenes
Concen: 288.91 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:142 Resp: 27224

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

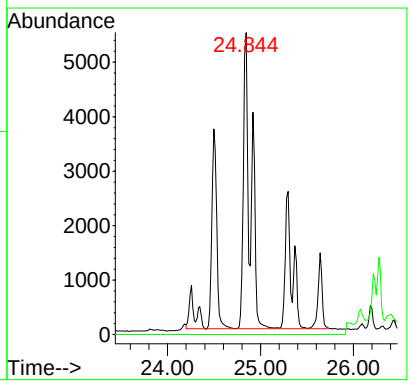


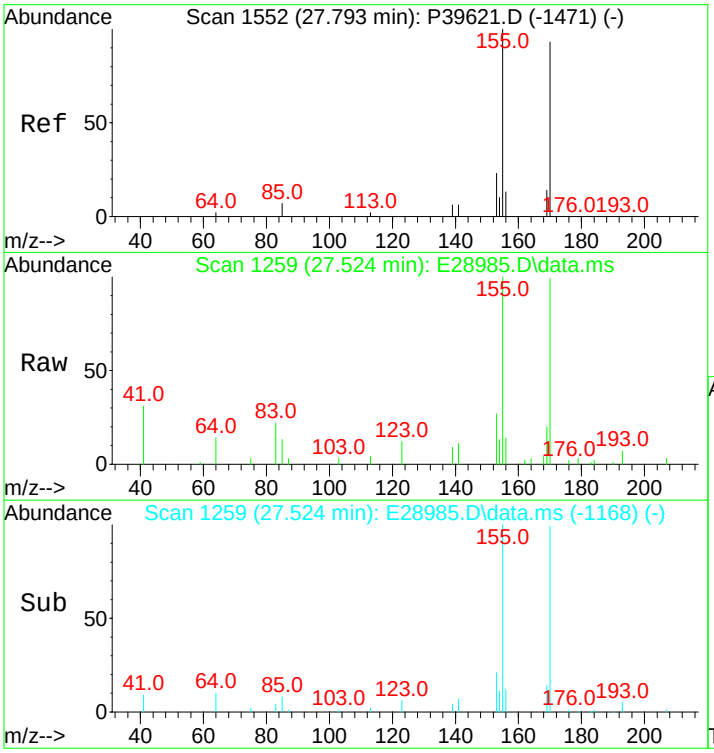


#12
C2-Naphthalenes
Concen: 660.66 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:156 Resp: 62255

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

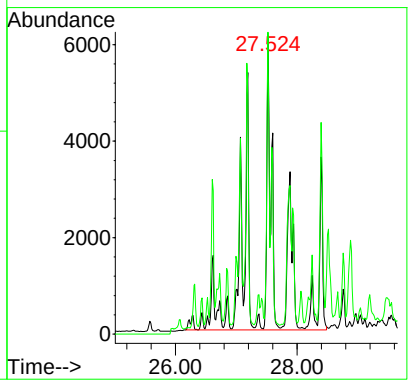


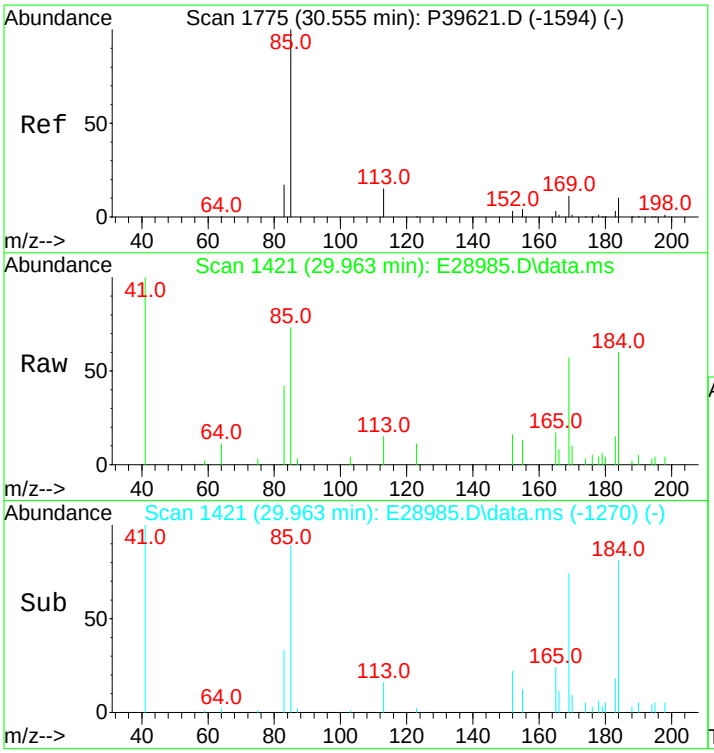


#13
C3-Naphthalenes
Concen: 1122.08 ng/mL m
RT: 27.524 min Scan# 1259
Delta R.T. 0.344 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:170 Resp: 105735

Ion	Ratio	Lower	Upper
170	100		
155	15.0	66.8	100.2#

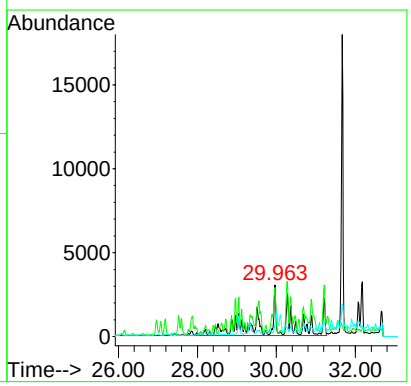


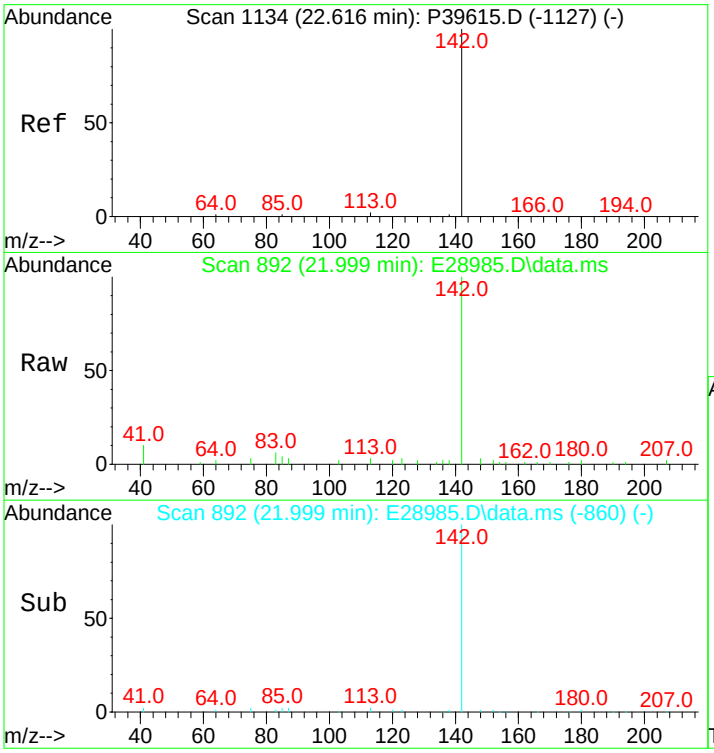


#14
C4-Naphthalenes
Concen: 963.36 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.087 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:184 Resp: 90779

Ion	Ratio	Lower	Upper
184	100		
169	15.8	78.7	118.1#
183	0.0	26.7	40.1#

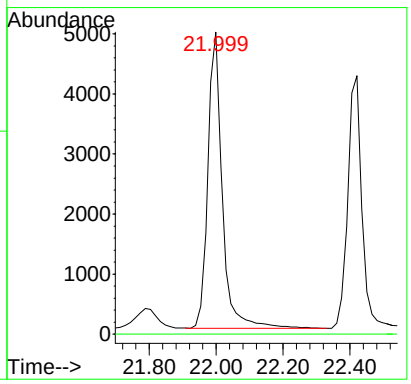


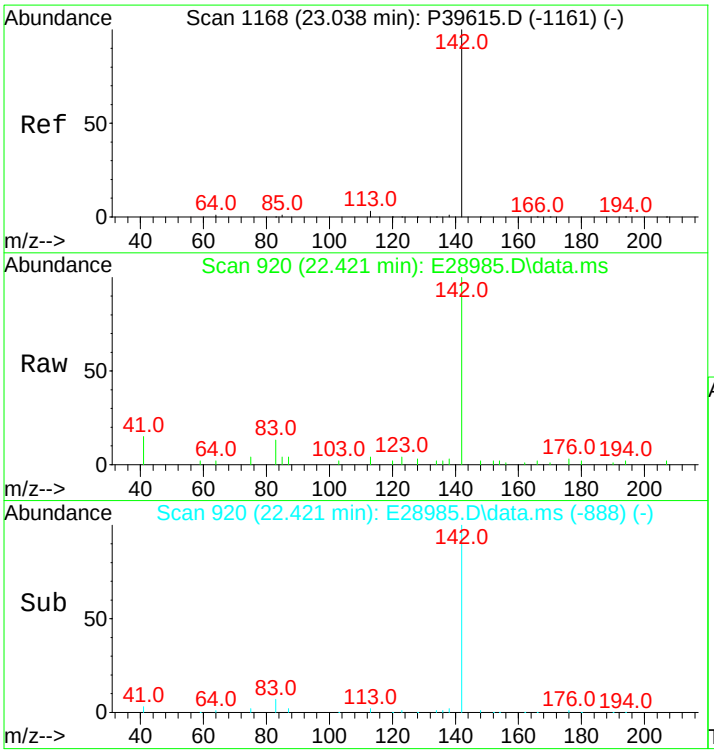


#16
2-Methylnaphthalene
Concen: 246.23 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:142 Resp: 14778

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

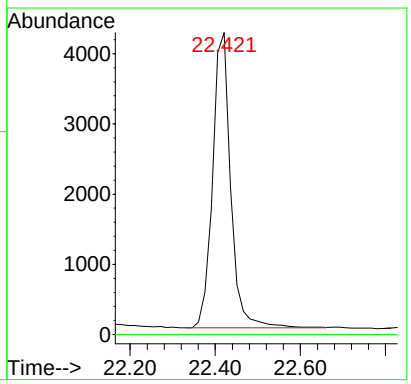


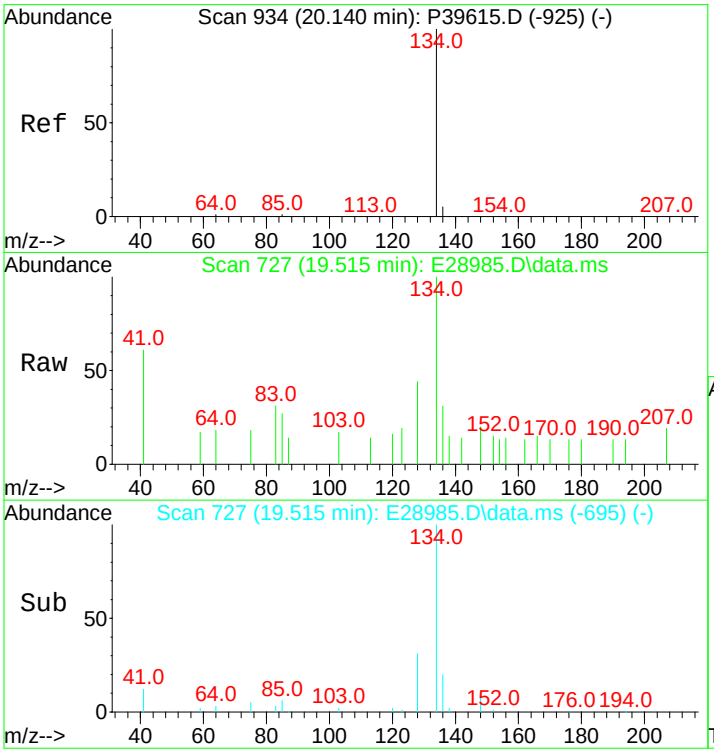


#17
1-Methylnaphthalene
Concen: 213.62 ng/mL
RT: 22.421 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:142 Resp: 12458

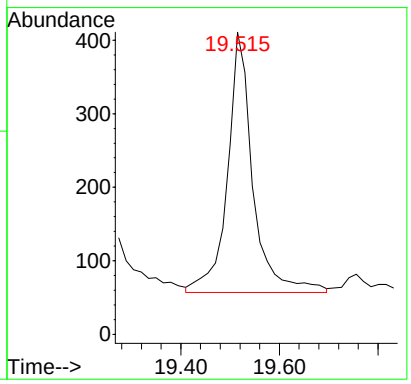
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

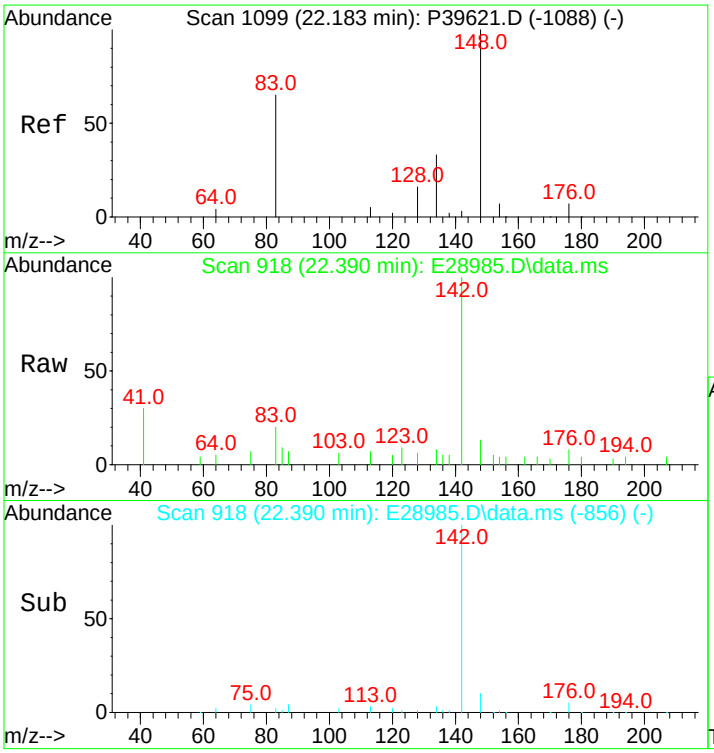




#18
Benzothiophene
Concen: 16.26 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

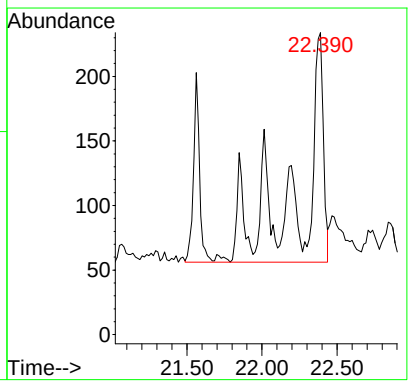
Tgt Ion:134 Resp: 1267

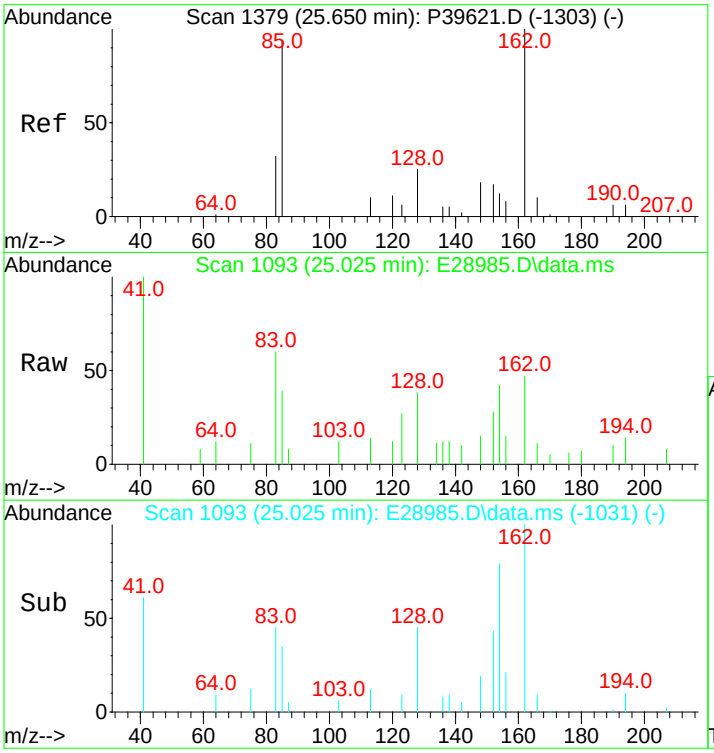




#19
C1-Benzo(b)thiophenes
Concen: 28.59 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.690 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

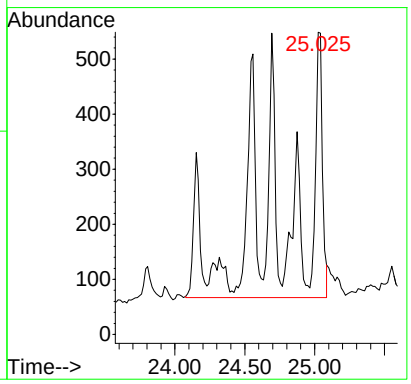
Tgt Ion:148 Resp: 2227

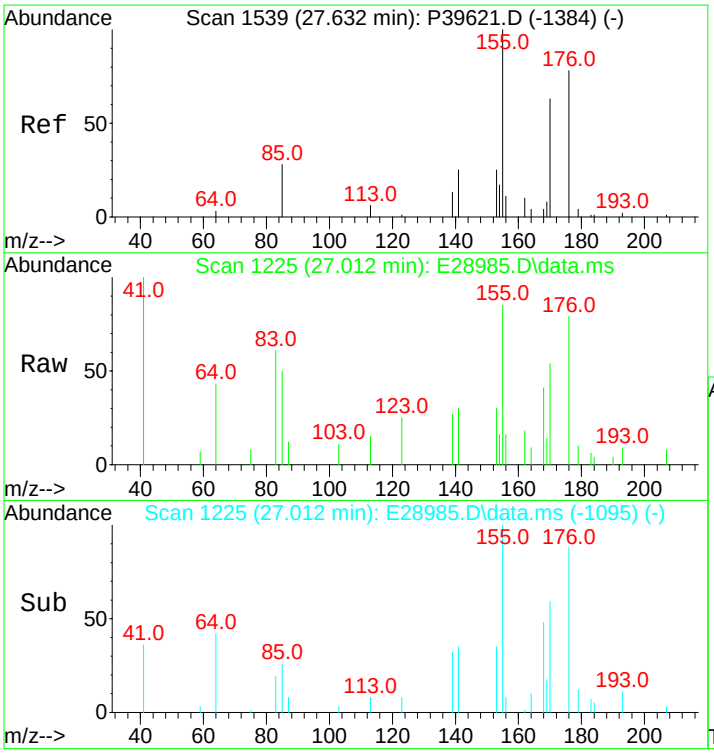




#20
C2-Benzo(b)thiophenes
Concen: 94.08 ng/mL m
RT: 25.025 min Scan# 1093
Delta R.T. -0.060 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

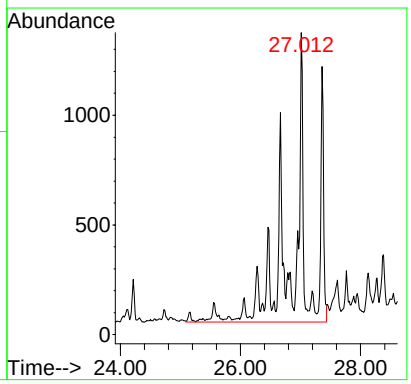
Tgt Ion:162 Resp: 7329

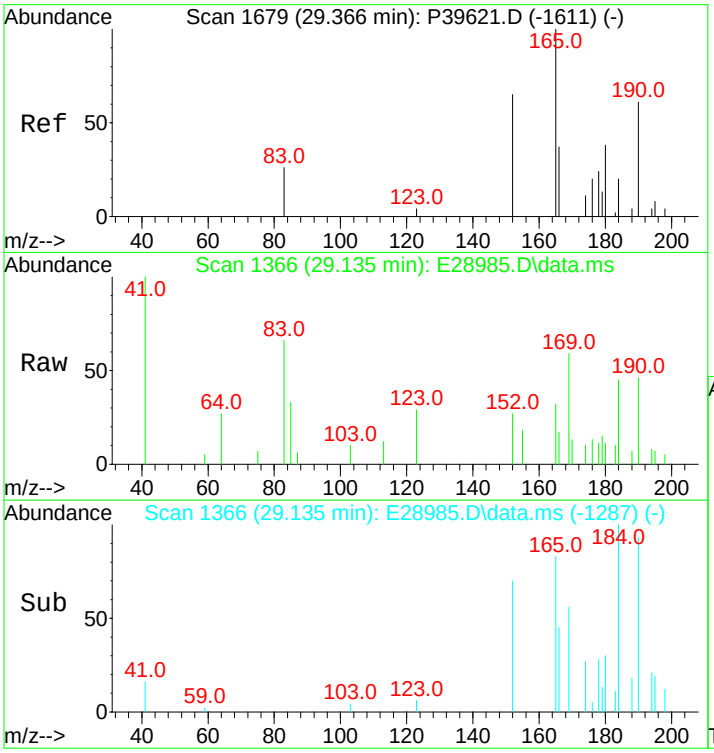




#21
C3-Benzo(b)thiophenes
Concen: 240.28 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. -0.007 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

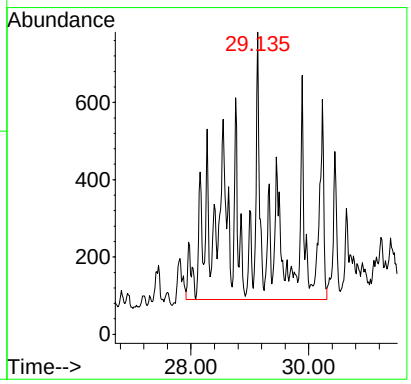
Tgt Ion:176 Resp: 18718

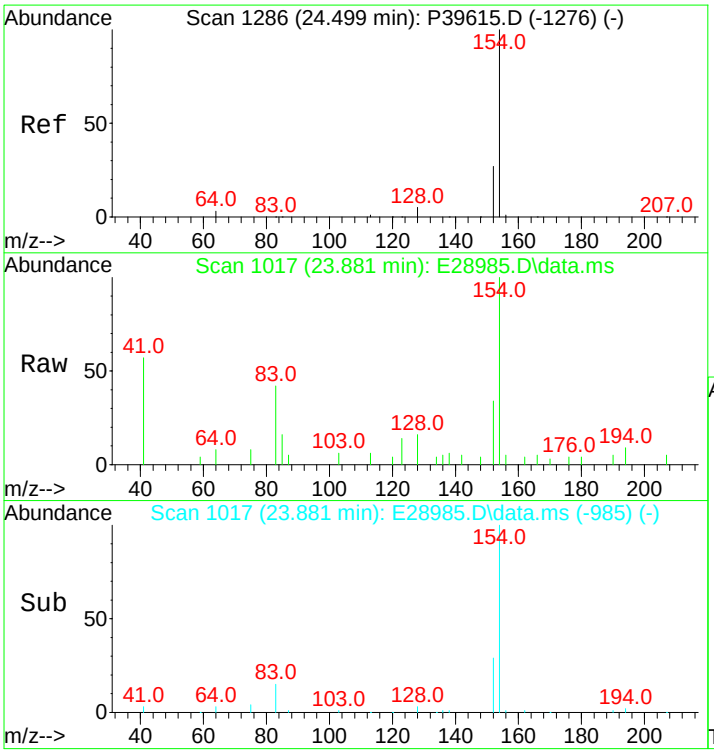




#22
C4-Benzo(b)thiophenes
Concen: 290.86 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:190 Resp: 22658

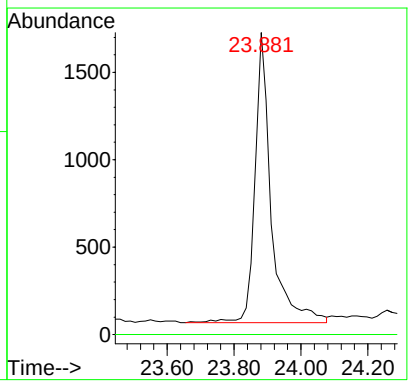


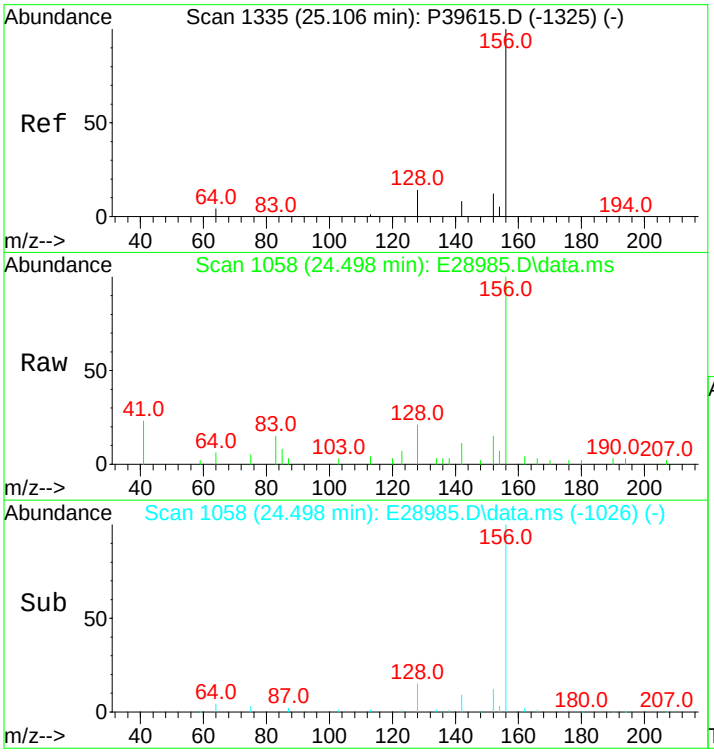


#23
Biphenyl
Concen: 73.95 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:154 Resp: 5609

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

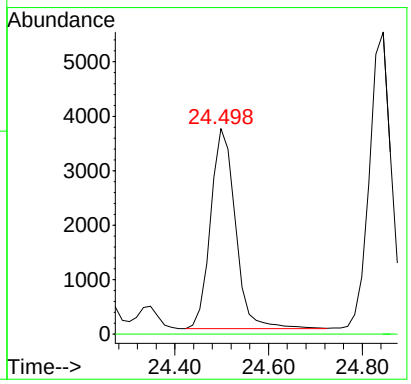


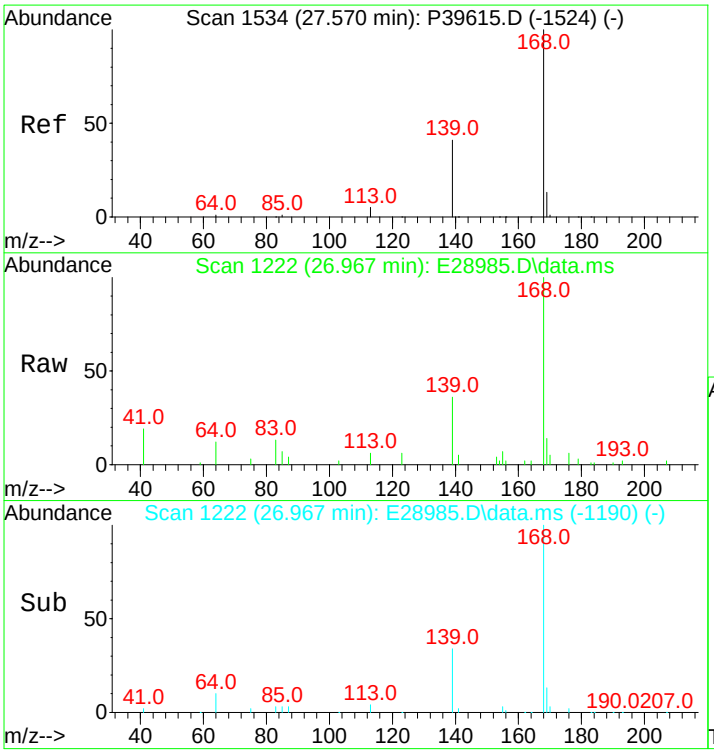


#24
2,6-Dimethylnaphthalene
Concen: 250.55 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:156 Resp: 13554

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

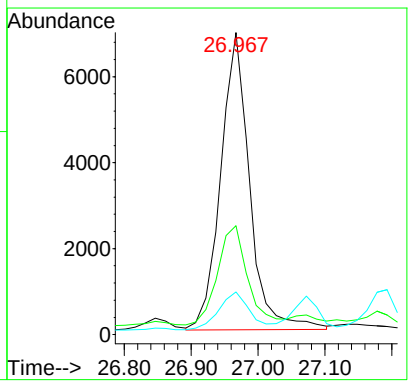


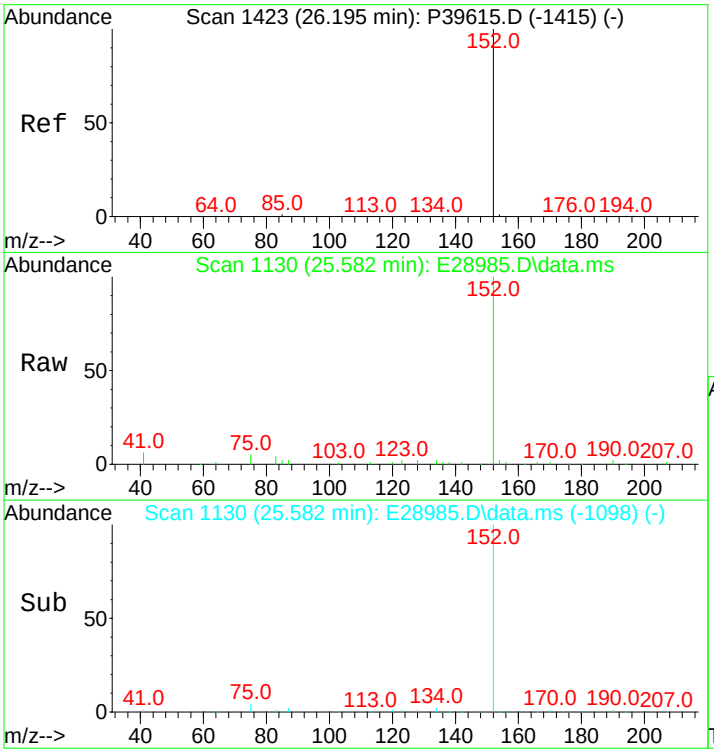


#25
Dibenzofuran
Concen: 247.75 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:168 Resp: 20805

Ion	Ratio	Lower	Upper
168	100		
139	35.5	26.0	39.0
169	13.7	10.6	16.0

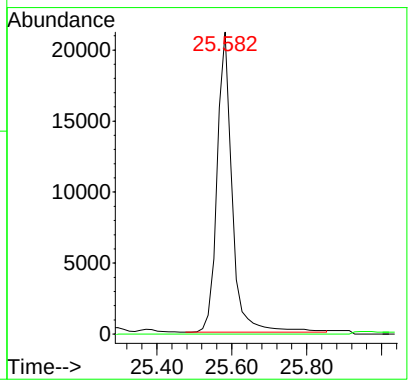


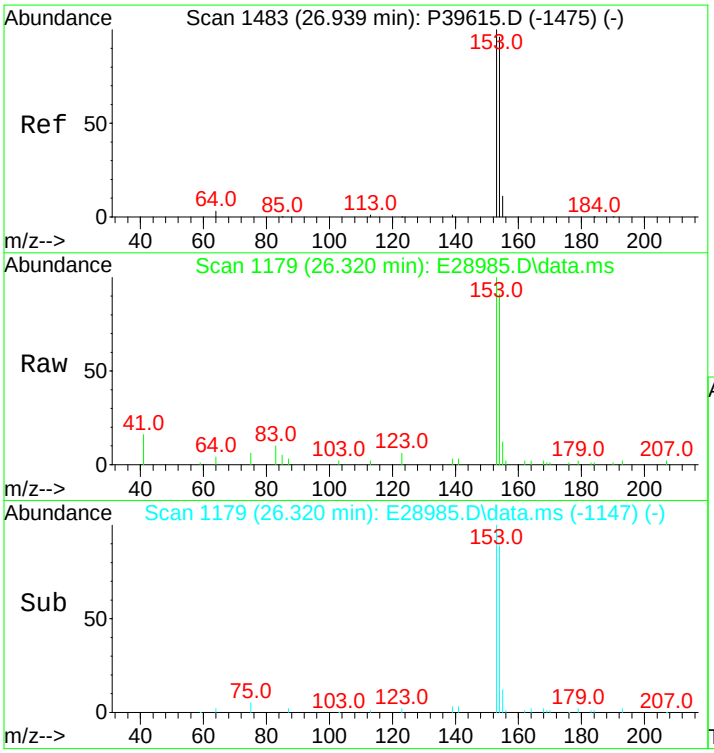


#26
Acenaphthylene
Concen: 622.32 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:152 Resp: 58466

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

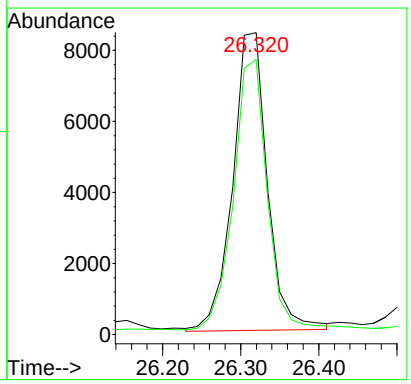


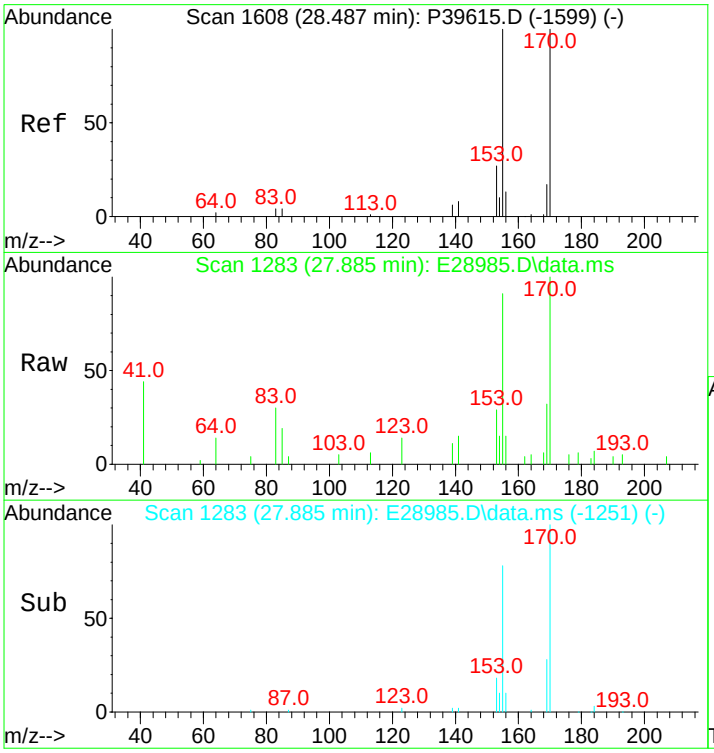


#27
Acenaphthene
Concen: 430.27 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:153 Resp: 26020

Ion	Ratio	Lower	Upper
153	100		
154	88.5	74.1	111.1

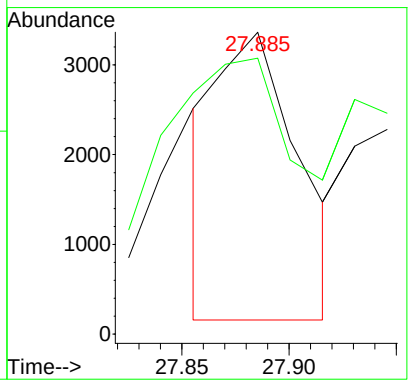


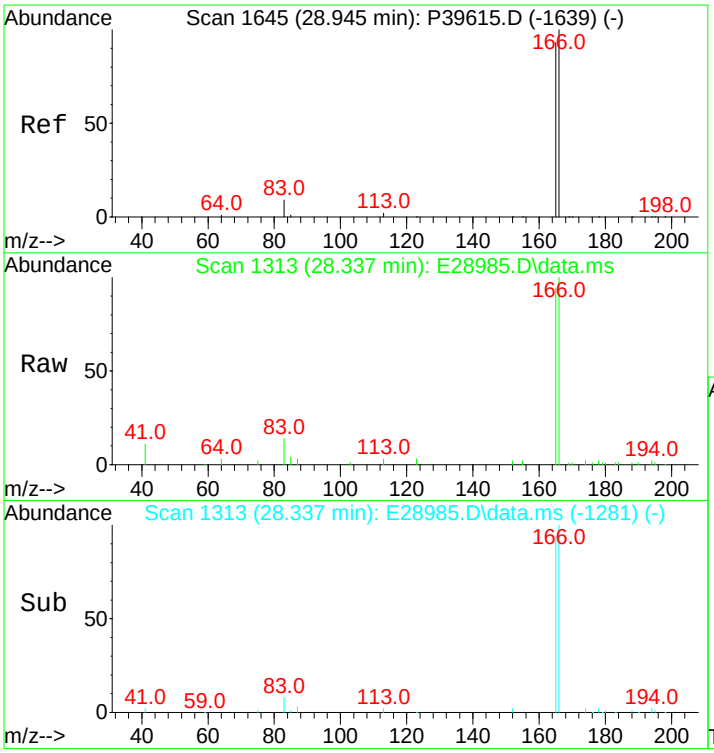


#28
2,3,5-Trimethylnaphthalene
Concen: 166.36 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:170 Resp: 8420

Ion	Ratio	Lower	Upper
170	100		
155	161.3	70.7	106.1#

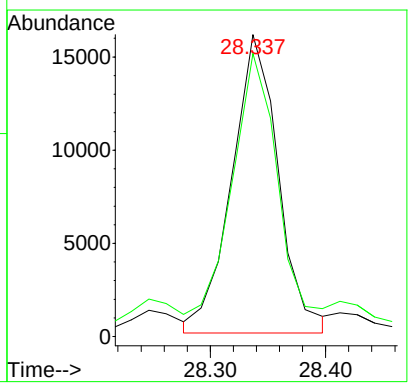


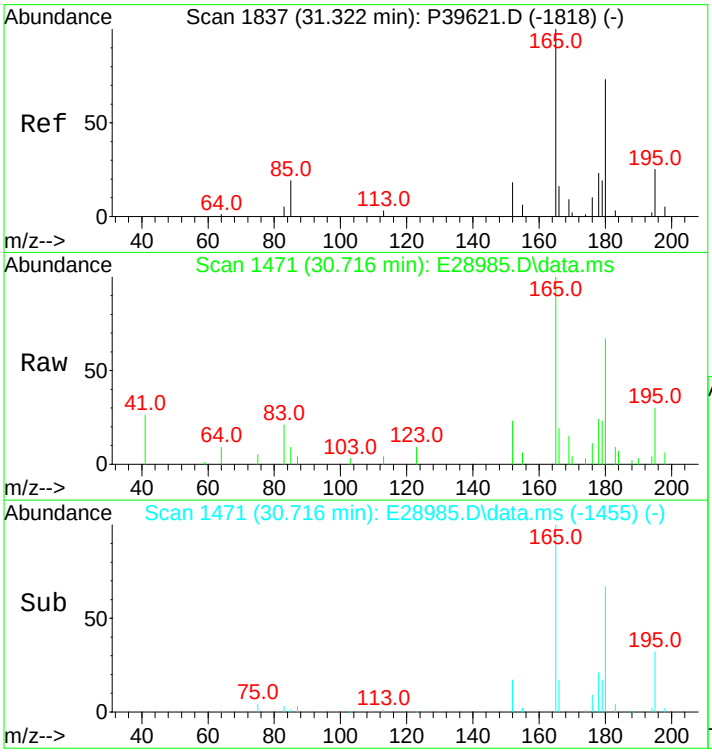


#29
Fluorene
Concen: 666.58 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:166 Resp: 44959

Ion	Ratio	Lower	Upper
166	100		
165	81.6	74.7	112.1

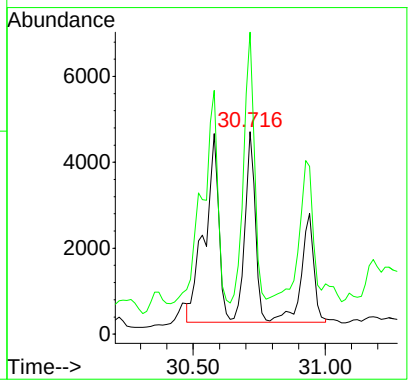


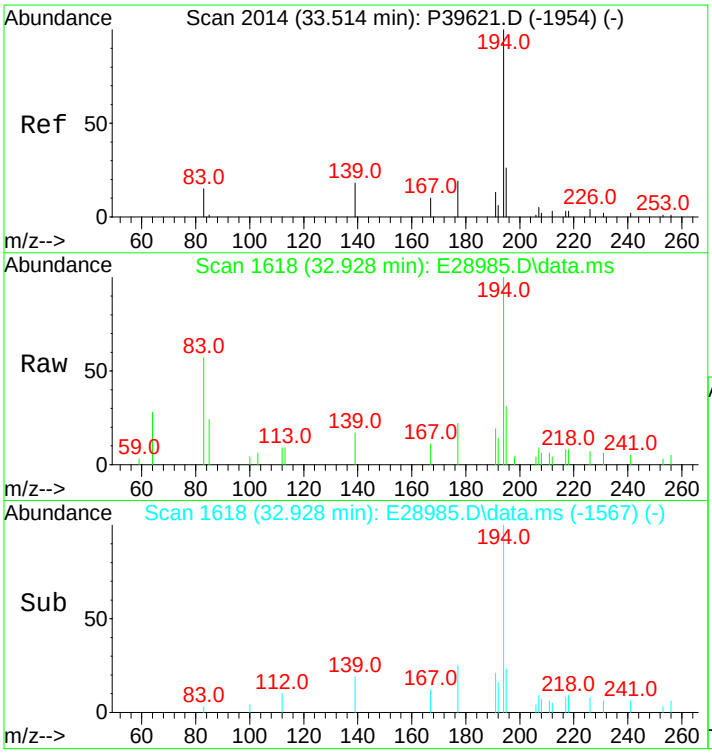


#30
C1-Fluorenes
Concen: 545.36 ng/mL m
RT: 30.716 min Scan# 1471
Delta R.T. 0.093 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:180 Resp: 36783

Ion	Ratio	Lower	Upper
180	100		
165	51.0	94.3	141.5#

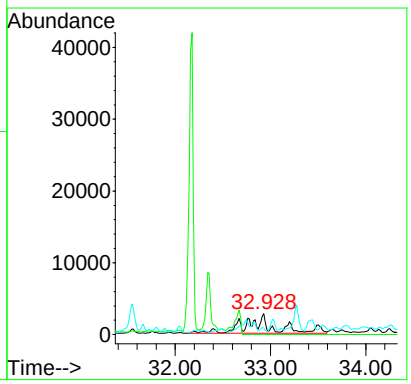


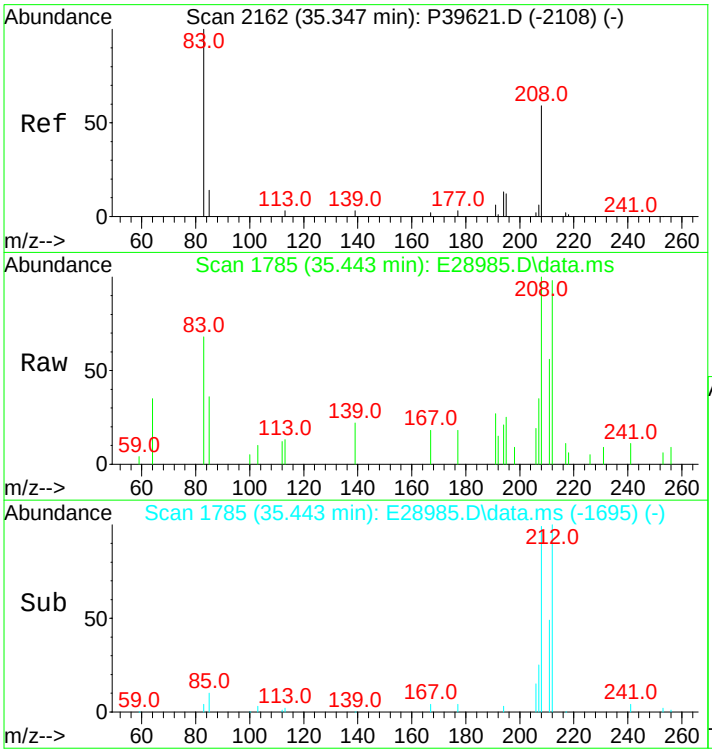


#31
C2-Fluorenes
Concen: 815.07 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:194 Resp: 54974

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	19.4	27.0	40.4#

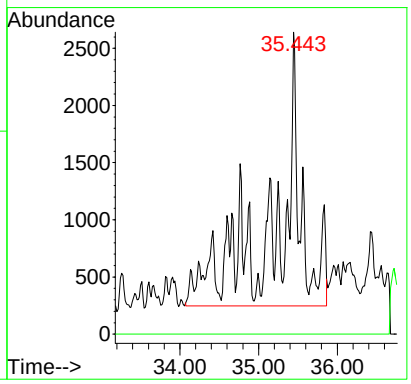


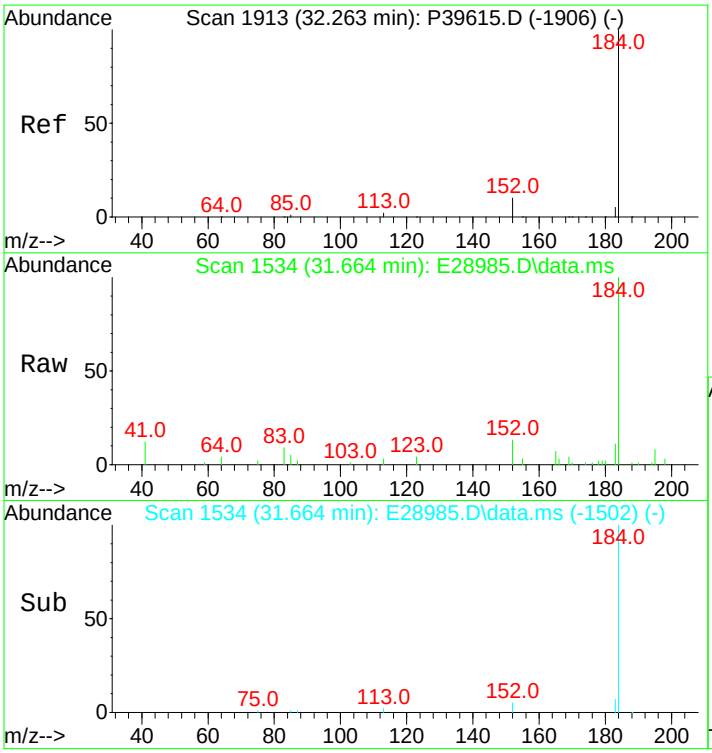


#32
C3-Fluorenes
Concen: 770.34 ng/mL m
RT: 35.443 min Scan# 1785
Delta R.T. 0.894 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:208 Resp: 51957

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

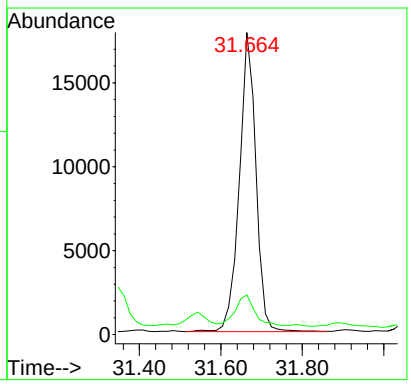


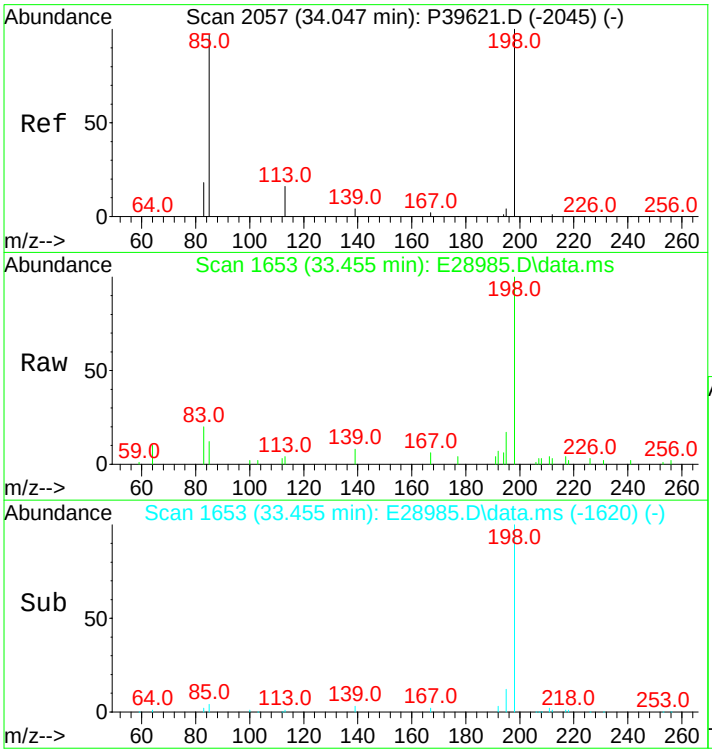


#33
Dibenzothiophene
Concen: 544.73 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:184 Resp: 50418

Ion	Ratio	Lower	Upper
184	100		
152	11.6	7.0	10.6#

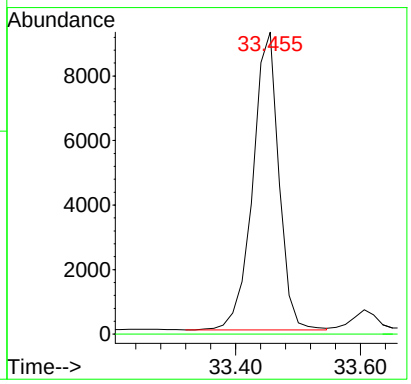


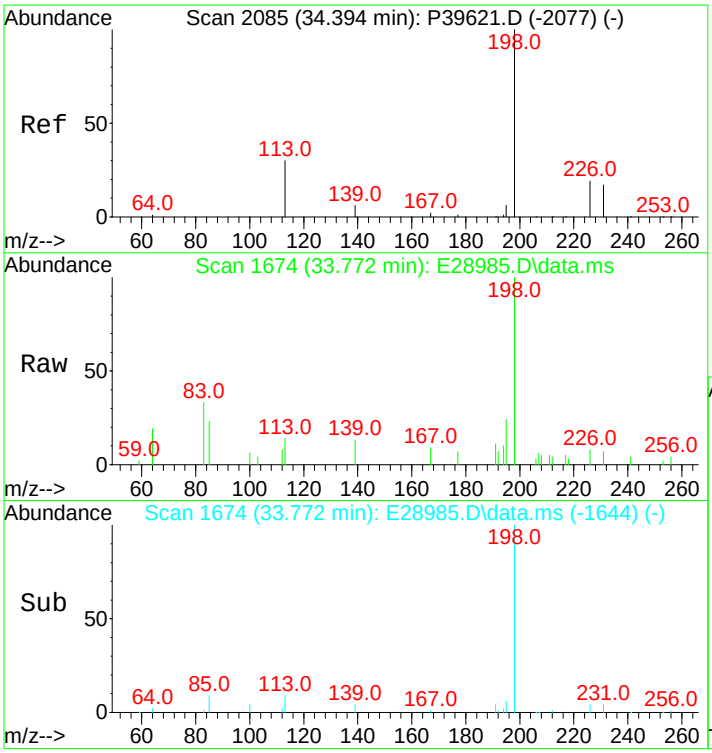


#34
4-Methyldibenzothiophene(4MDT)
Concen: 289.73 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:198 Resp: 26816

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

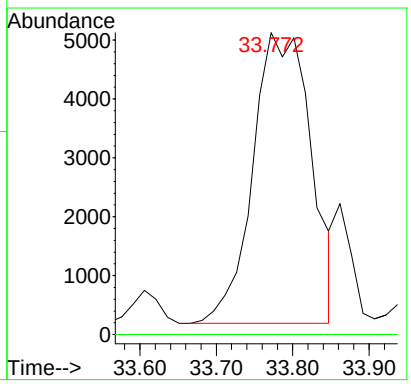


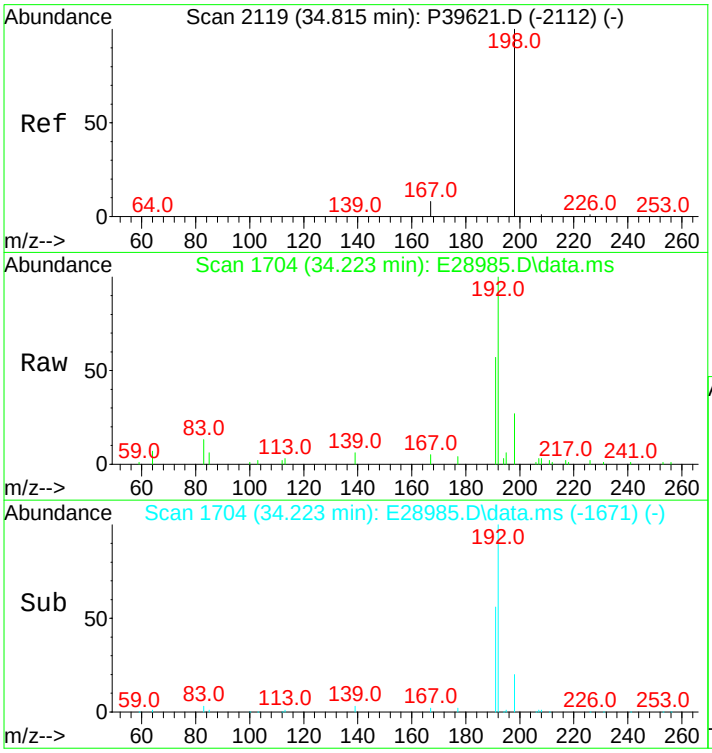


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 283.56 ng/mL m
RT: 33.772 min Scan# 1674
Delta R.T. -0.045 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:198 Resp: 26245

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

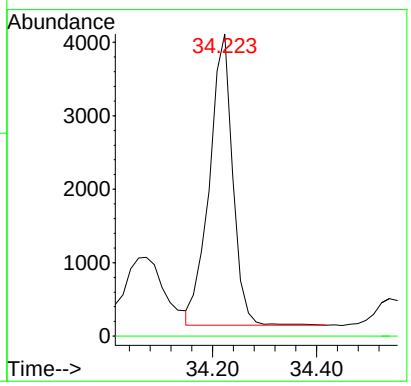


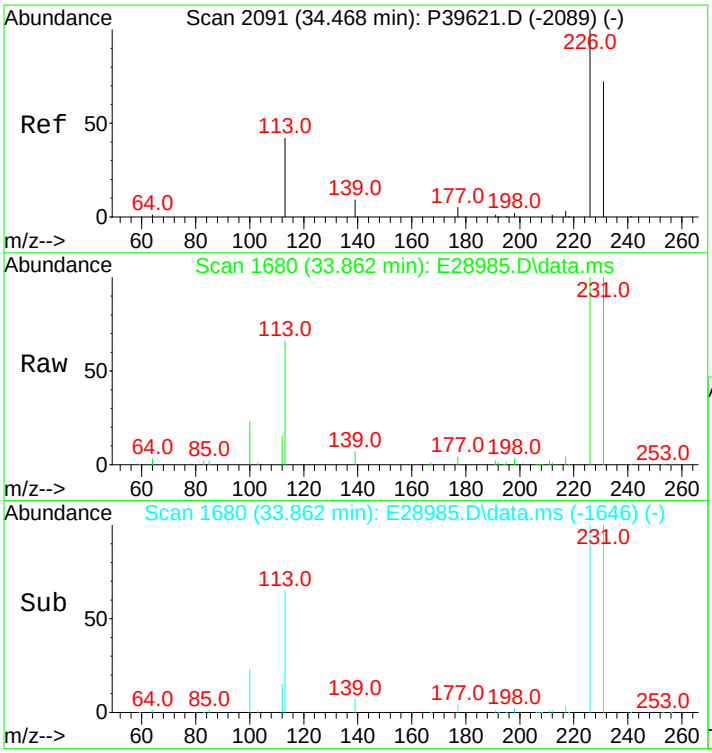


#36
1-Methyldibenzothiophene(1MDT)
Concen: 132.73 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:198 Resp: 12285

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

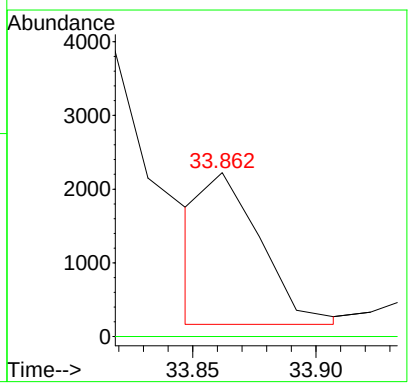


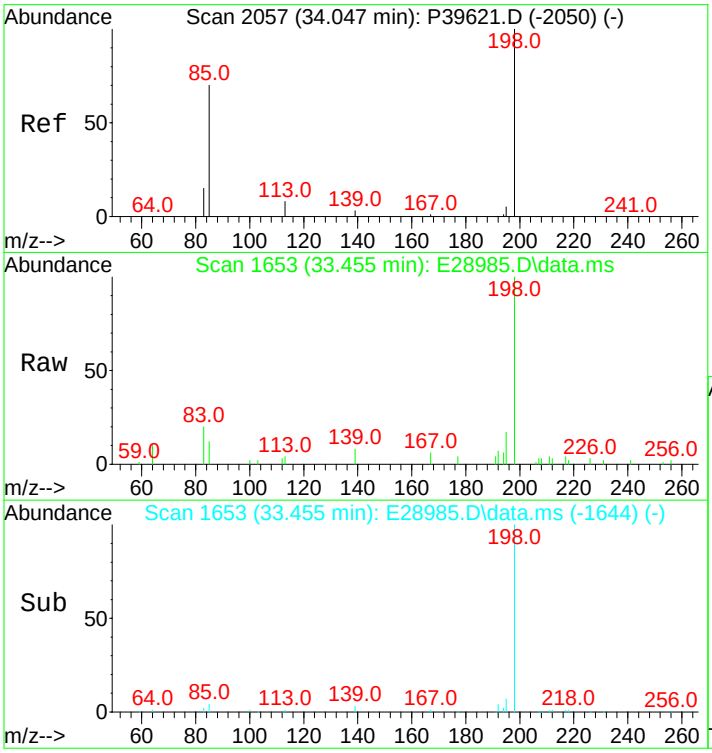


#37
OTP
Concen: 34.55 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:198 Resp: 3198

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

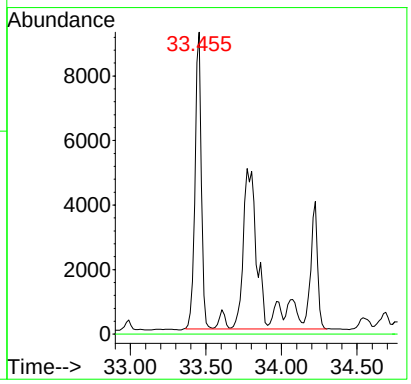


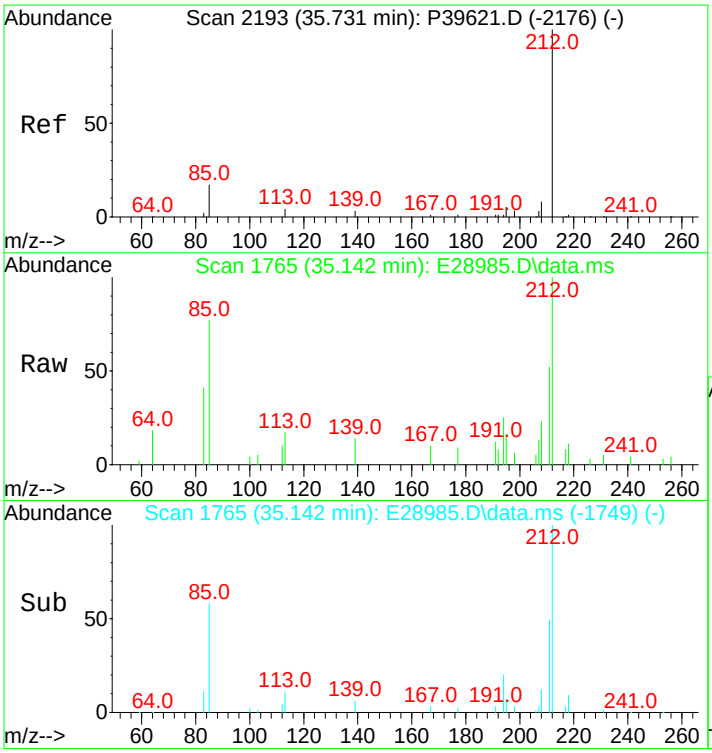


#38
C1-Dibenzothiophenes
Concen: 842.45 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:198 Resp: 77974

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

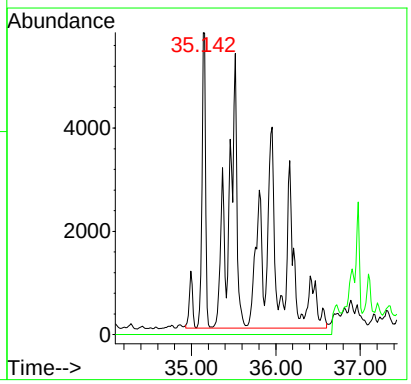


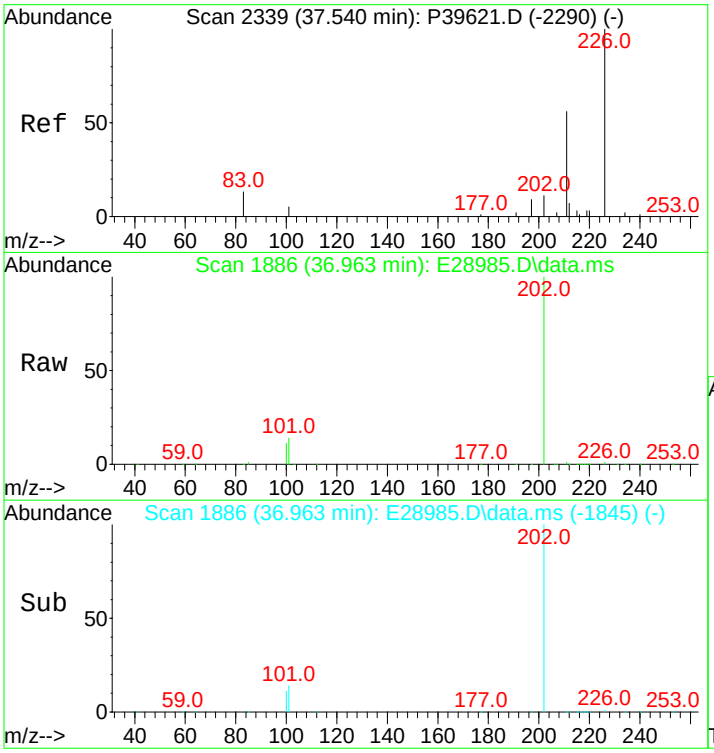


#39
C2-Dibenzothiophenes
Concen: 1227.90 ng/mL m
RT: 35.142 min Scan# 1765
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:212 Resp: 113650

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

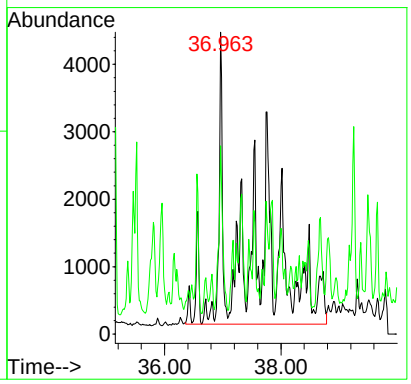


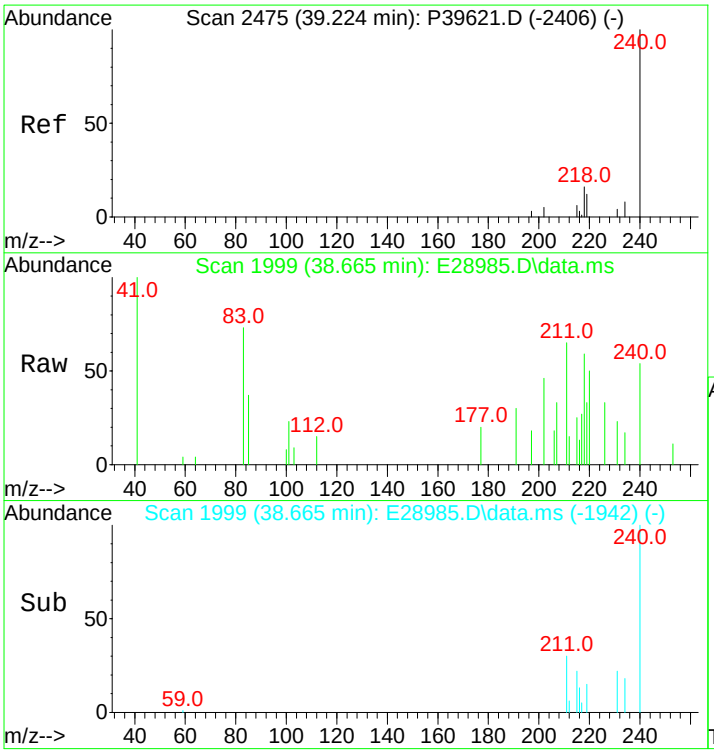


#40
C3-Dibenzothiophenes
Concen: 1174.53 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:226 Resp: 108710

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

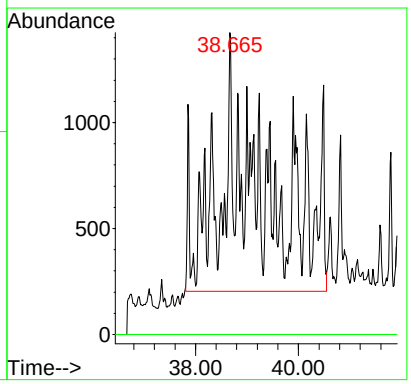


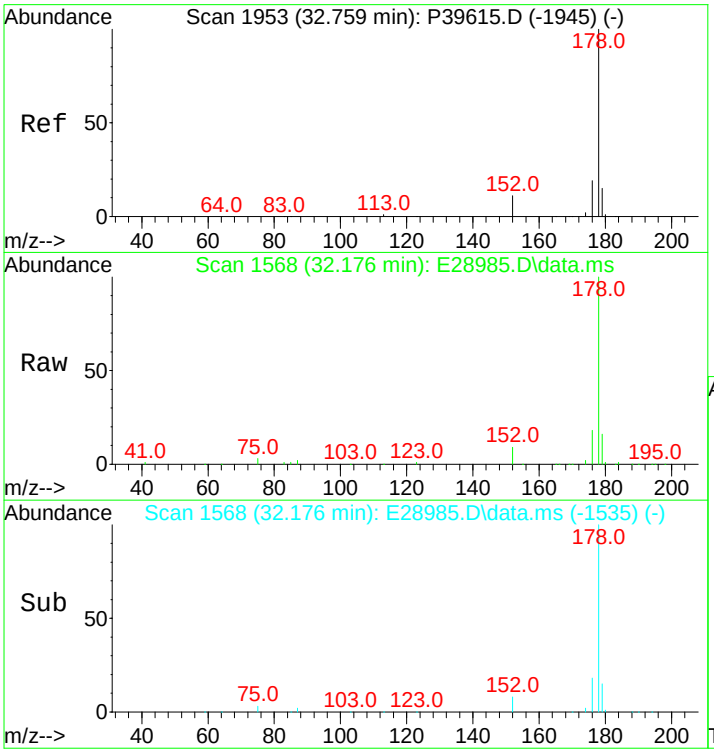


#41
C4-Dibenzothiophenes
Concen: 727.97 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:240 Resp: 67378

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

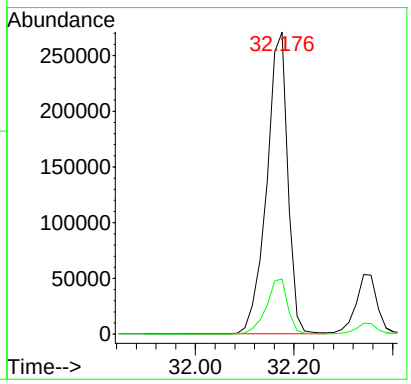


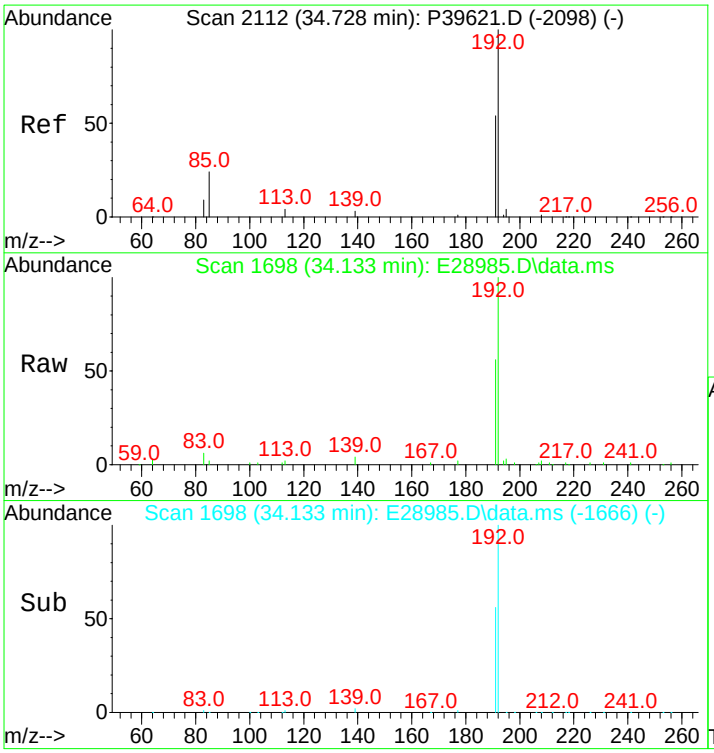


#43
Phenanthrene
Concen: 8539.02 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:178 Resp: 804085

Ion	Ratio	Lower	Upper
178	100		
176	18.5	15.0	22.4

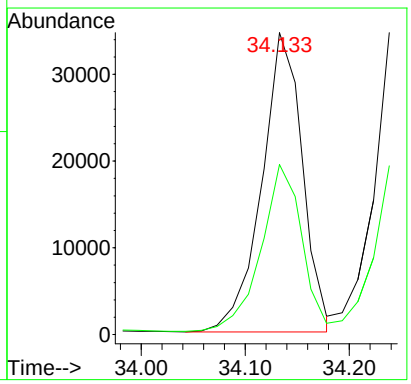


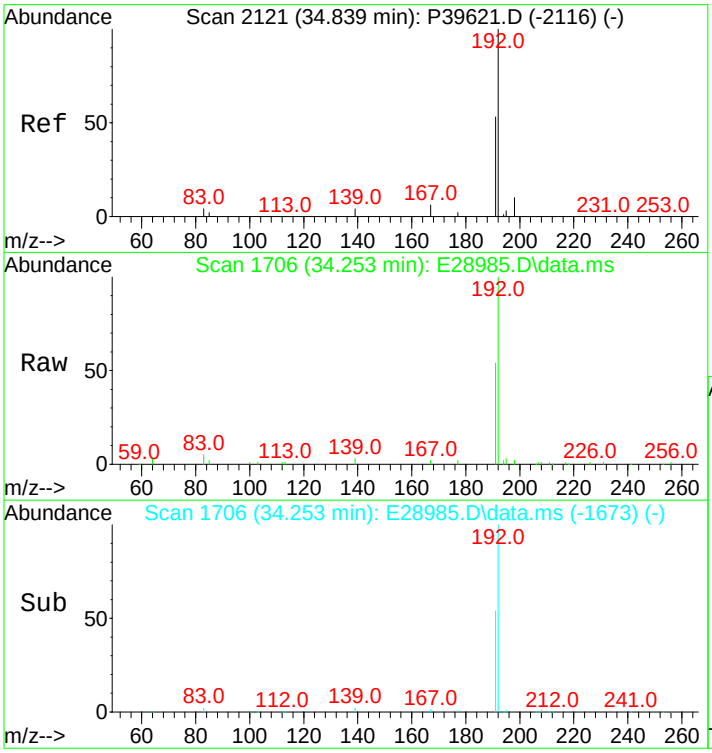


#44
3-Methylphenanthrene(3MP)
Concen: 998.99 ng/mL
RT: 34.133 min Scan# 1698
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 94071

Ion	Ratio	Lower	Upper
192	100		
191	55.6	45.9	68.9

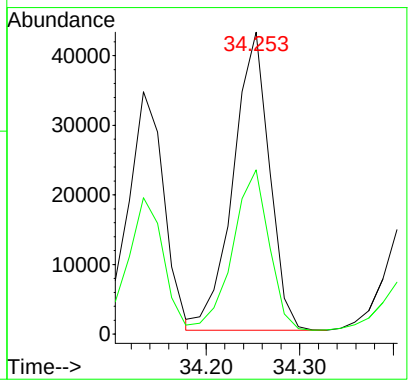


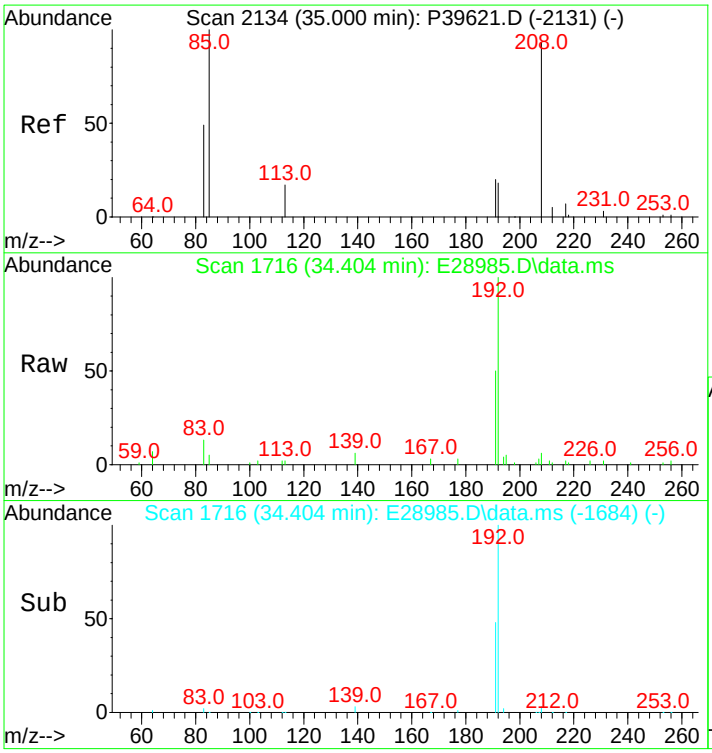


#45
2-Methylphenanthrene(2MP)
Concen: 1221.16 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 114992

Ion	Ratio	Lower	Upper
192	100		
191	53.9	45.4	68.0

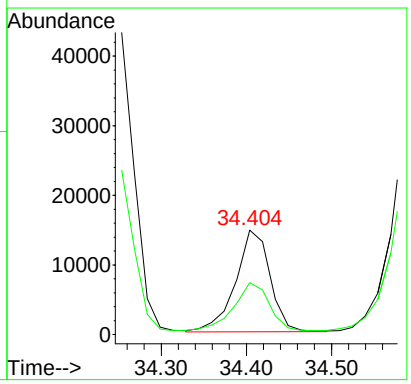


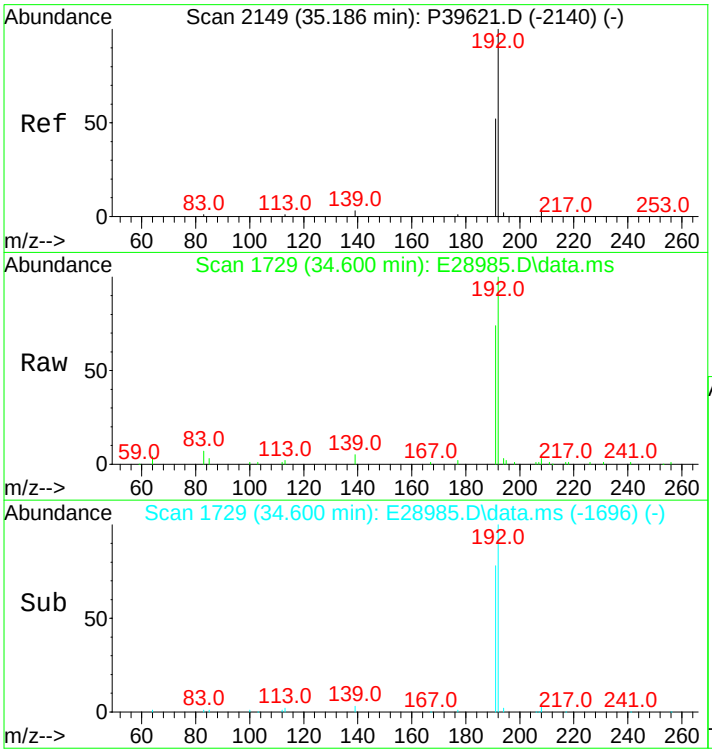


#46
2-Methylanthracene(2MA)
Concen: 438.92 ng/mL
RT: 34.404 min Scan# 1716
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 41331

Ion	Ratio	Lower	Upper
192	100		
191	50.4	95.4	143.0#

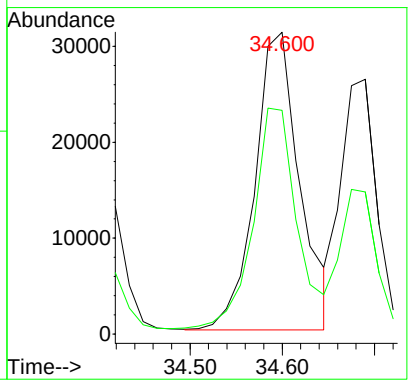


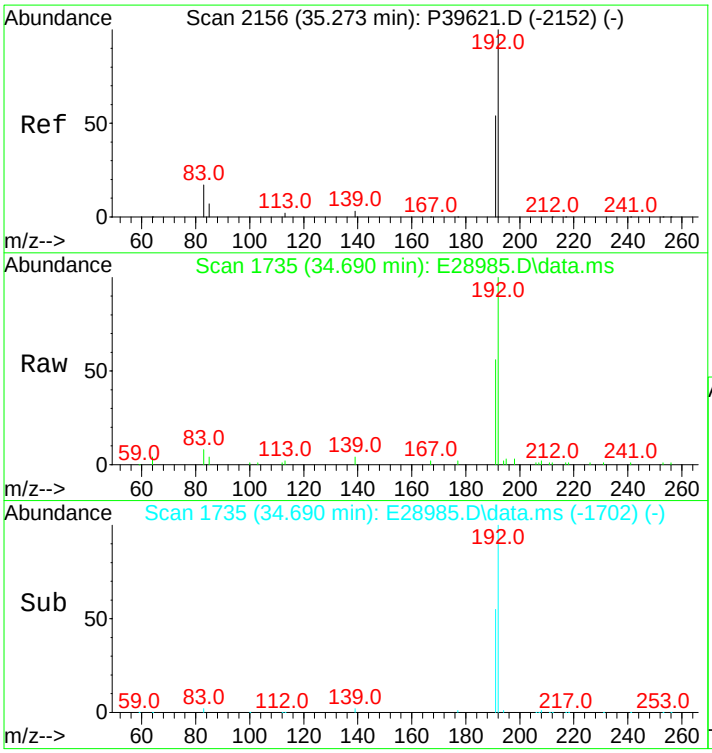


#47
9/4-Methylphenanthrene(9MP)
Concen: 1111.88 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 104701

Ion	Ratio	Lower	Upper
192	100		
191	37.6	44.3	66.5#

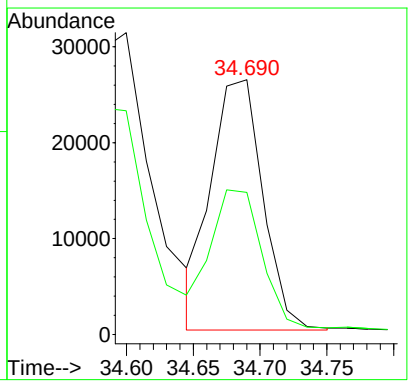


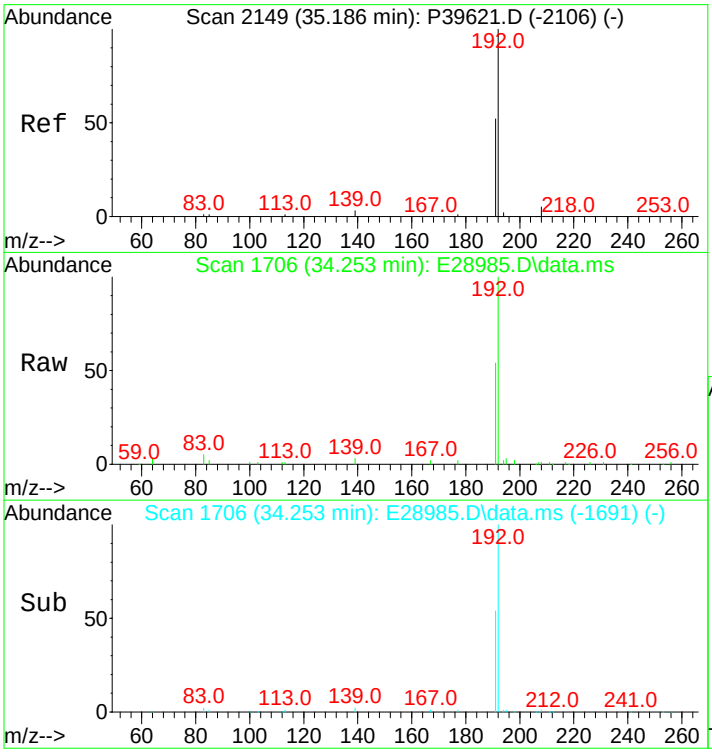


#48
1-Methylphenanthrene(1MP)
Concen: 744.65 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 70121

Ion	Ratio	Lower	Upper
192	100		
191	56.1	46.7	70.1

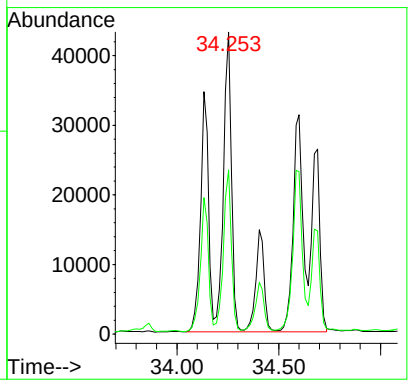


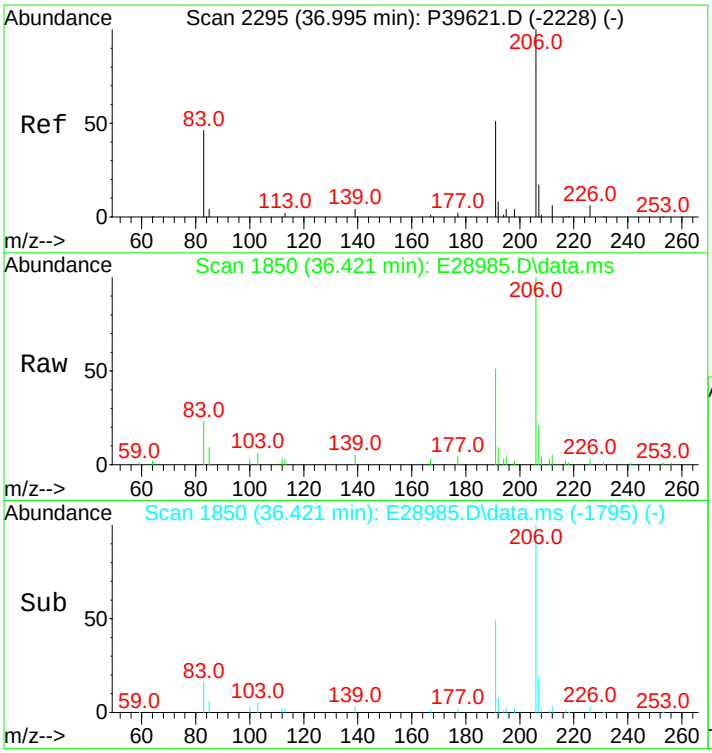


#49
C1-Phenanthrenes/Anthracenes
Concen: 4567.26 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 430080

Ion	Ratio	Lower	Upper
192	100		
191	4.6	44.0	66.0#

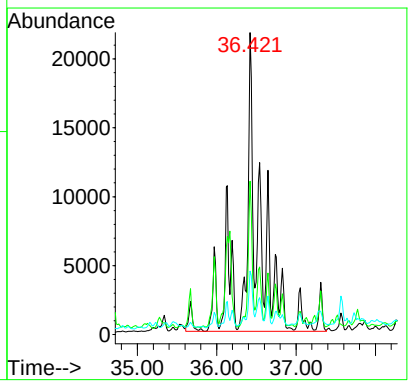


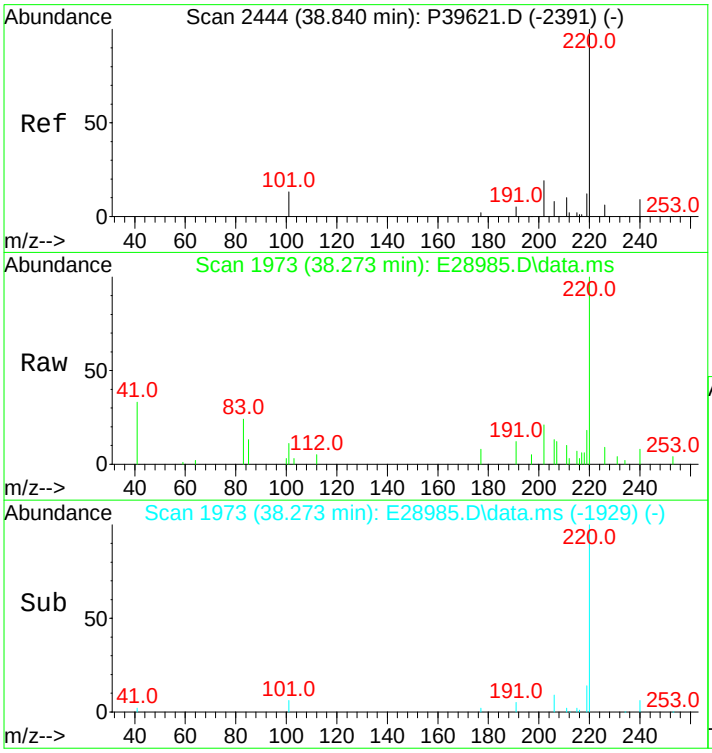


#50
C2-Phenanthrenes/Anthracenes
Concen: 3066.84 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.261 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:206 Resp: 288792

Ion	Ratio	Lower	Upper
206	100		
191	2.9	35.7	53.5#
207	1.3	16.5	24.7#

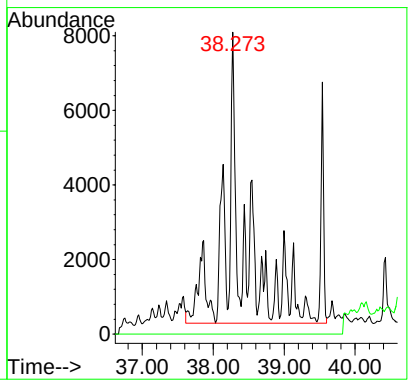


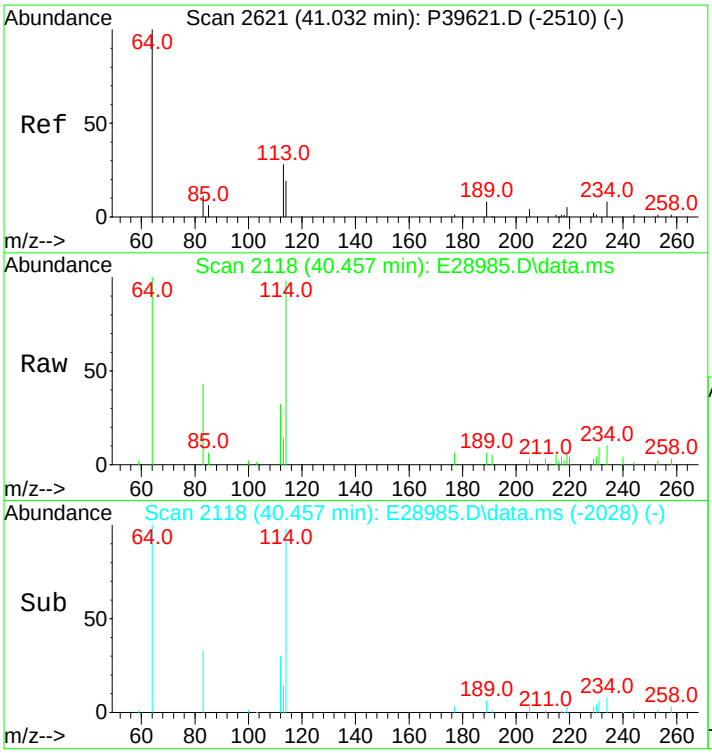


#52
C3-Phenanthrenes/Anthracenes
Concen: 1562.65 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:220 Resp: 147148

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

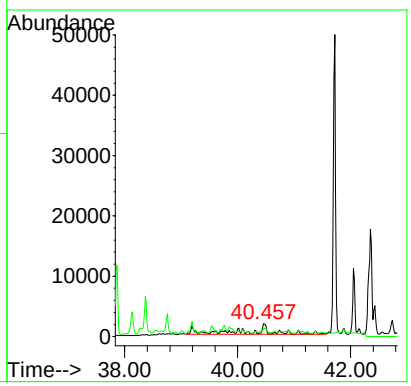


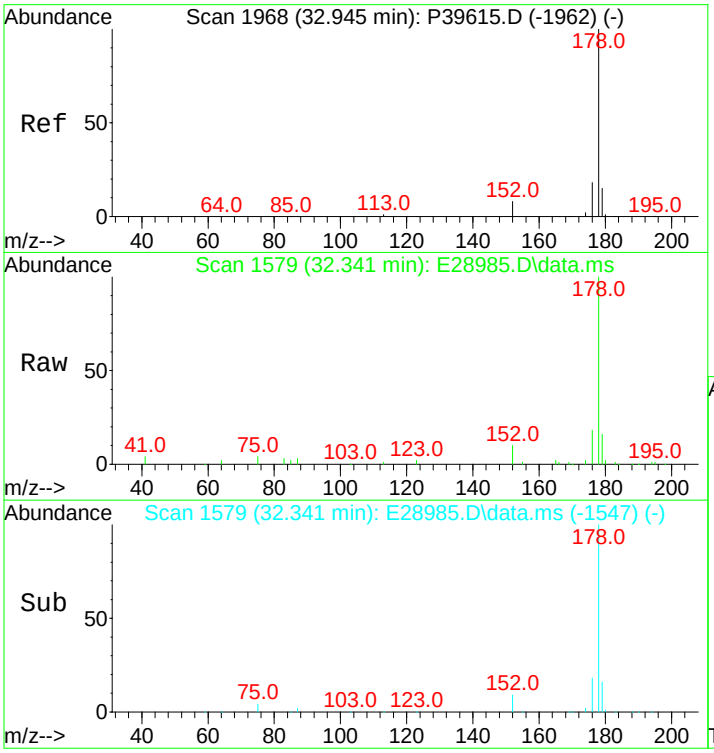


#53
C4-Phenanthrenes/Anthracenes
Concen: 550.84 ng/mL m
RT: 40.457 min Scan# 2118
Delta R.T. 0.369 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:234 Resp: 51870

Ion	Ratio	Lower	Upper
234	100		
219	2.8	46.6	70.0#

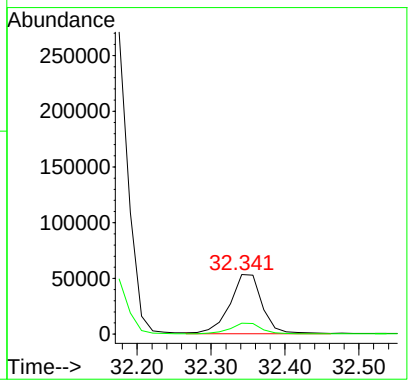


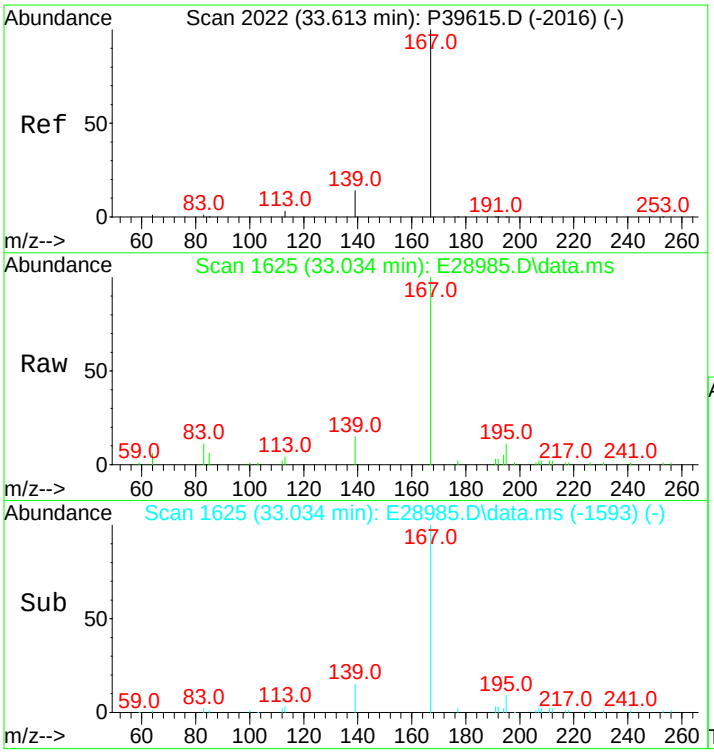


#55
Anthracene
Concen: 1996.96 ng/mL m
RT: 32.341 min Scan# 1579
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:178 Resp: 162538

Ion	Ratio	Lower	Upper
178	100		
176	17.2	14.3	21.5

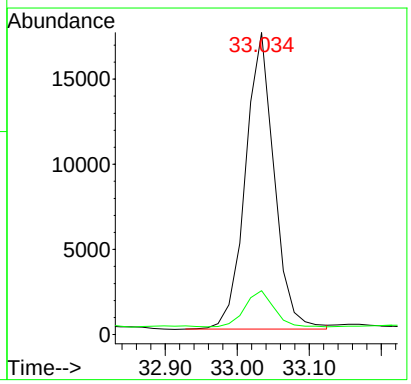


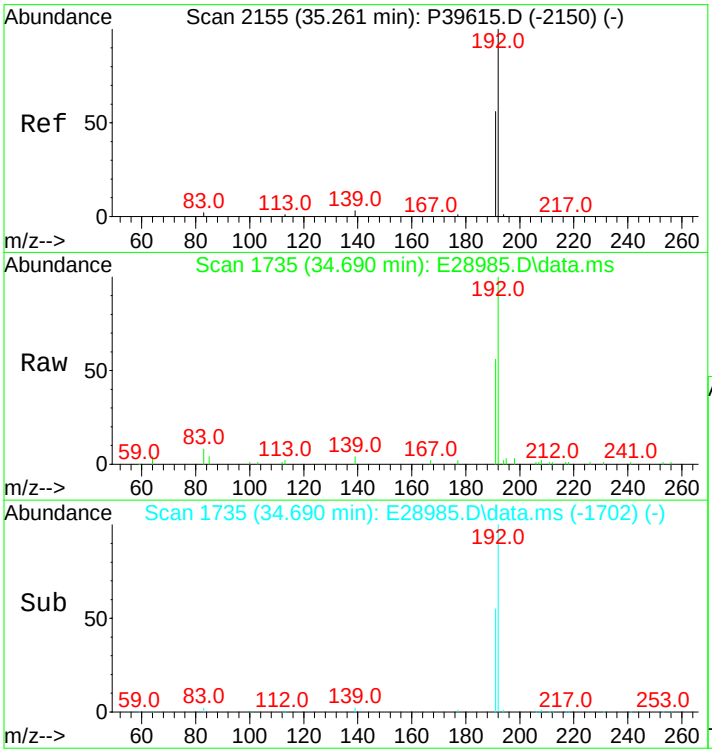


#56
Carbazole
Concen: 574.83 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:167 Resp: 48152

Ion	Ratio	Lower	Upper
167	100		
139	12.4	10.1	15.1

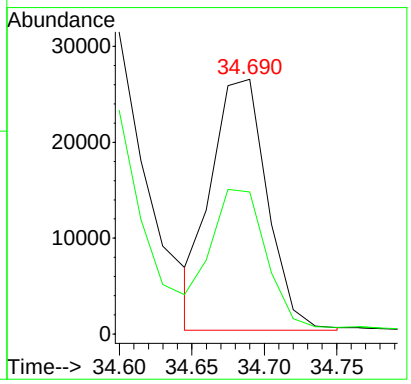


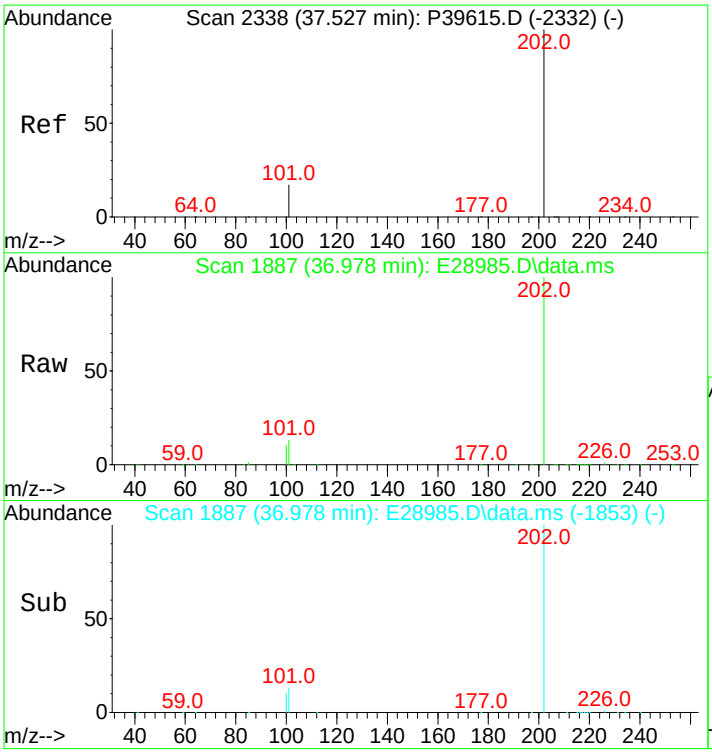


#57
1-Methylphenanthrene
Concen: 981.52 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:192 Resp: 70513

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.4	68.2

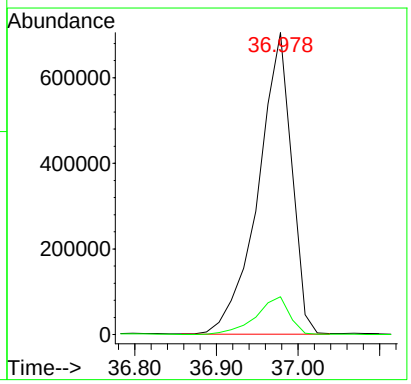


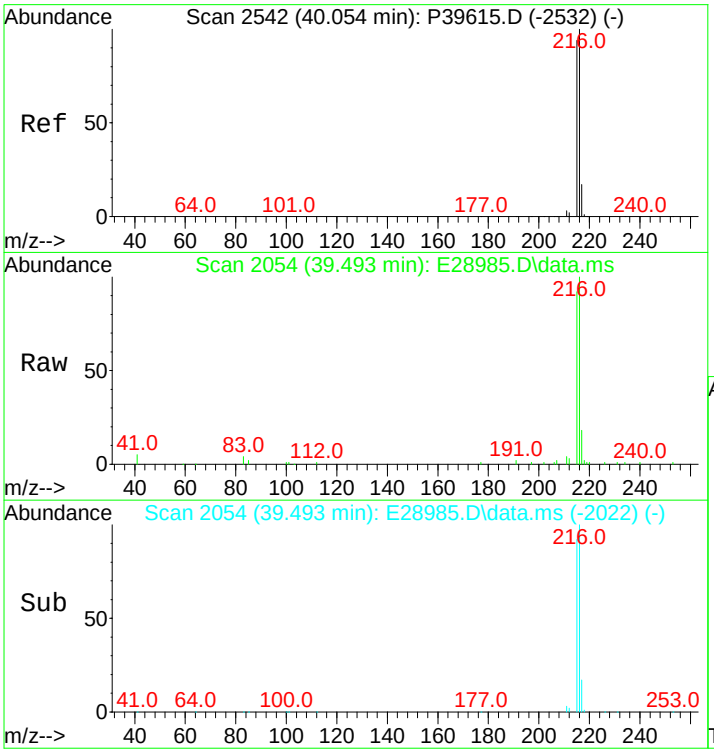


#58
Fluoranthene
Concen: 19306.03 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:202 Resp: 2007673

Ion	Ratio	Lower	Upper
202	100		
101	12.5	10.4	15.6

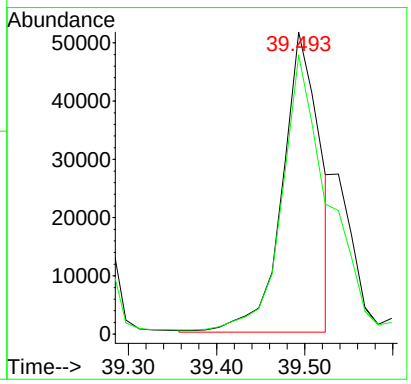


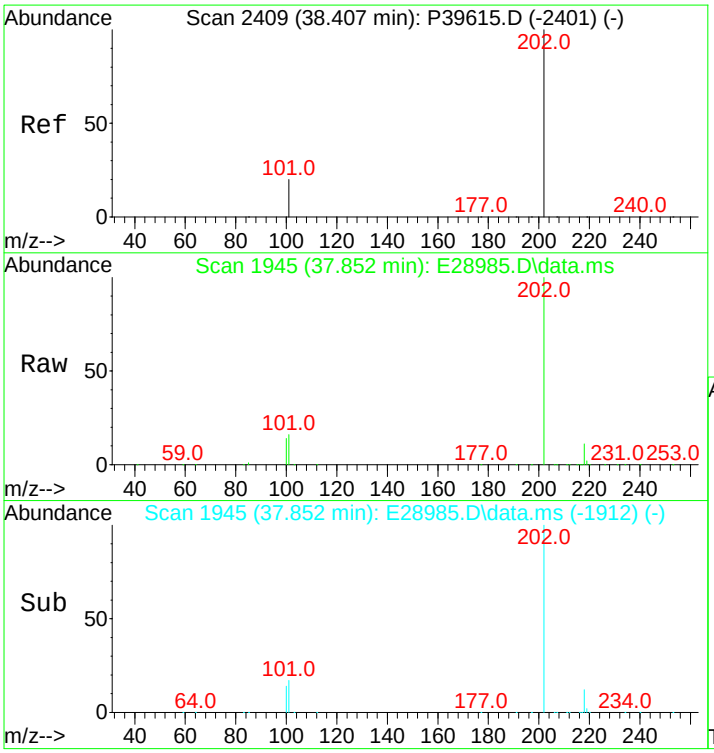


#59
Benzo(b)fluorene
Concen: 2209.53 ng/mL m
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:216 Resp: 153110

Ion	Ratio	Lower	Upper
216	100		
215	110.0	72.6	109.0#

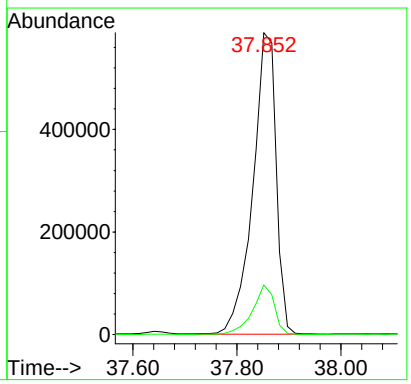


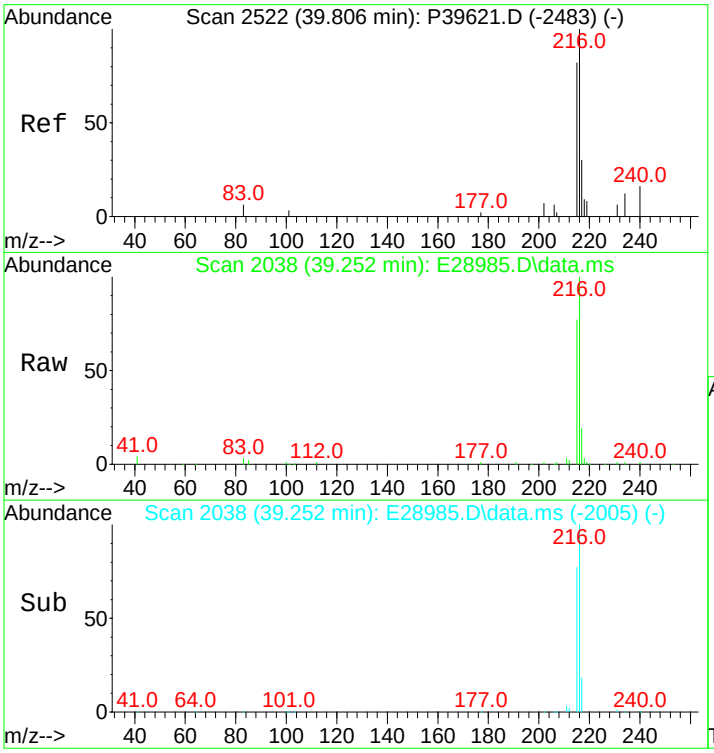


#60
Pyrene
Concen: 17349.96 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:202 Resp: 1833875

Ion	Ratio	Lower	Upper
202	100		
101	15.3	11.0	16.4

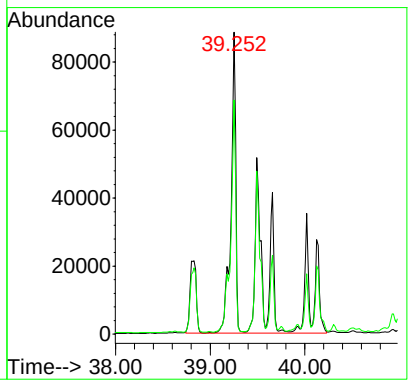


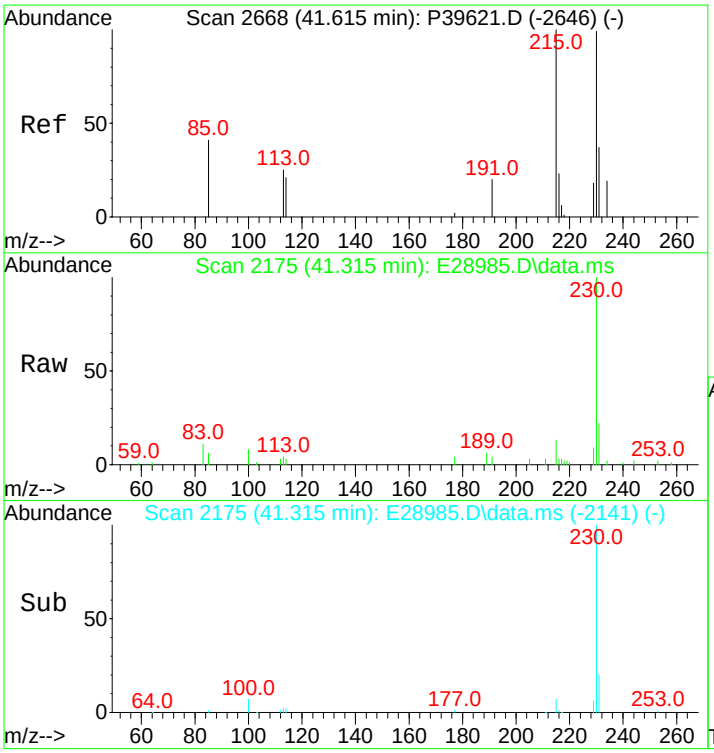


#61
C1-Fluoranthenes/Pyrenes
Concen: 8566.80 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:216 Resp: 905503

Ion	Ratio	Lower	Upper
216	100		
215	9.3	73.4	110.2#

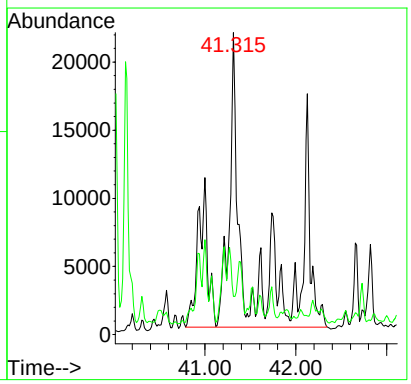


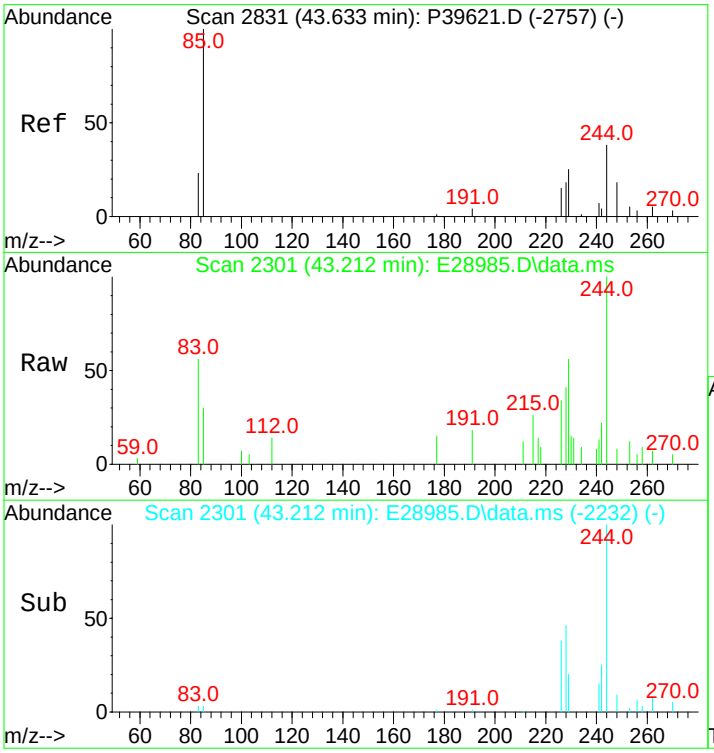


#62
C2-Fluoranthenes/Pyrenes
Concen: 3500.85 ng/mL m
RT: 41.315 min Scan# 2175
Delta R.T. 0.435 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:230 Resp: 370037

Ion	Ratio	Lower	Upper
230	100		
215	1.4	93.8	140.8#

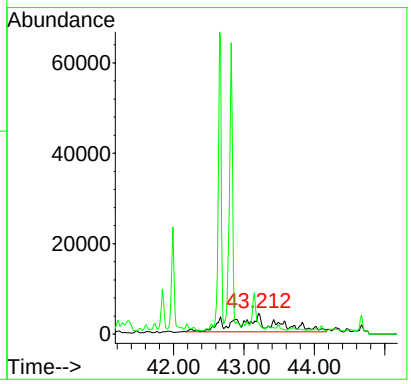


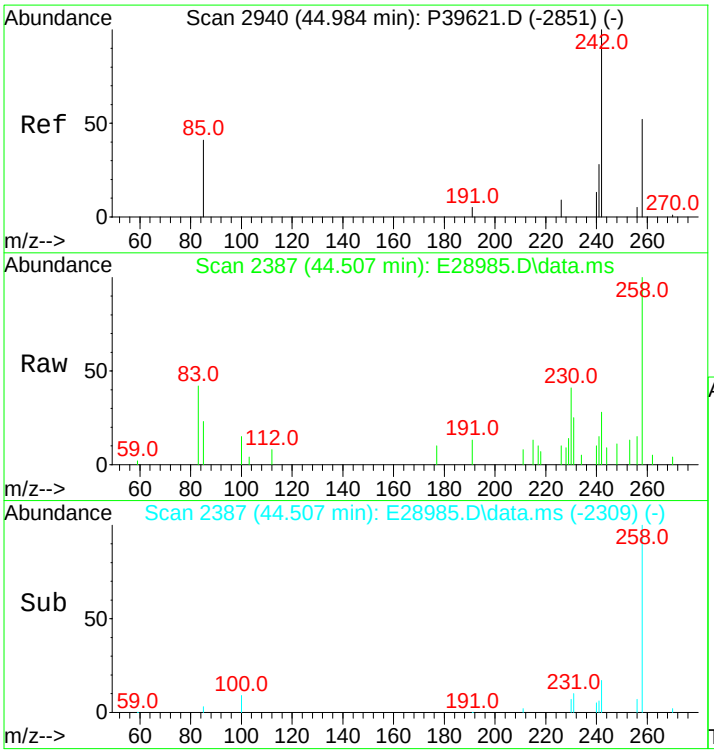


#63
C3-Fluoranthenes/Pyrenes
Concen: 1456.61 ng/mL m
RT: 43.212 min Scan# 2301
Delta R.T. 0.560 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:244 Resp: 153962

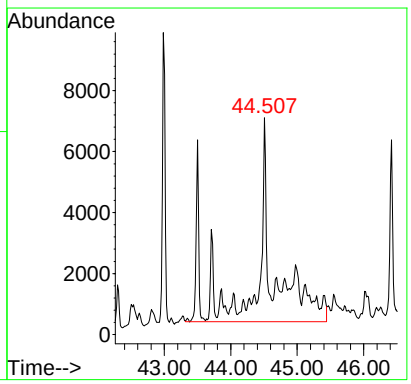
Ion	Ratio	Lower	Upper
244	100		
229	123.1	72.2	108.2#

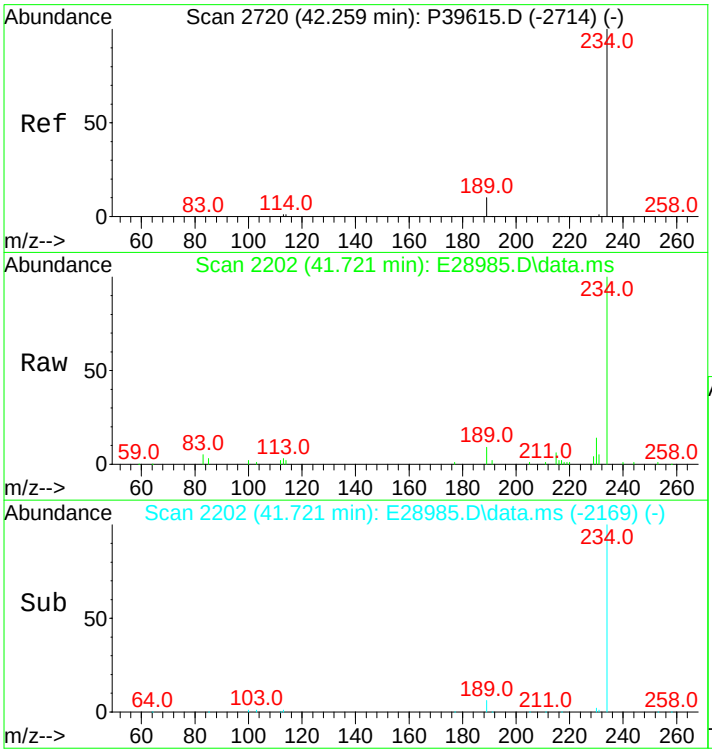




#64
C4-Fluoranthenes/Pyrenes
Concen: 1139.66 ng/mL m
RT: 44.507 min Scan# 2387
Delta R.T. 0.536 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:258 Resp: 120461

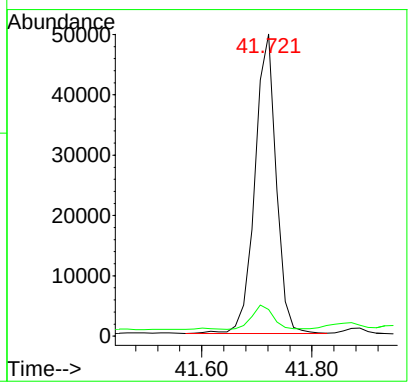


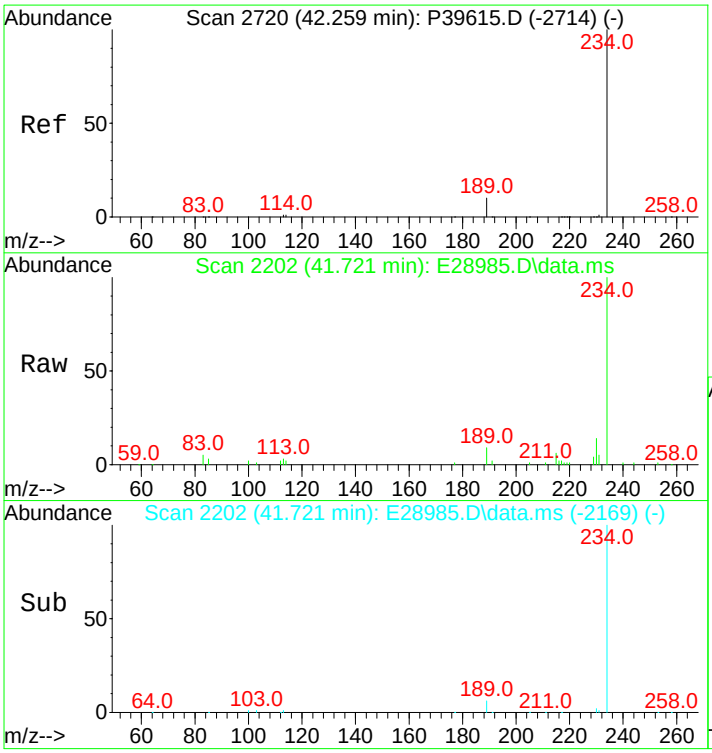


#66
Naphthobenzothiophene
Concen: 1270.41 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:234 Resp: 132440

Ion	Ratio	Lower	Upper
234	100		
189	8.5	21.1	31.7#

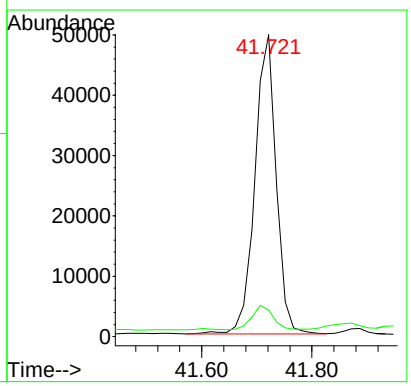


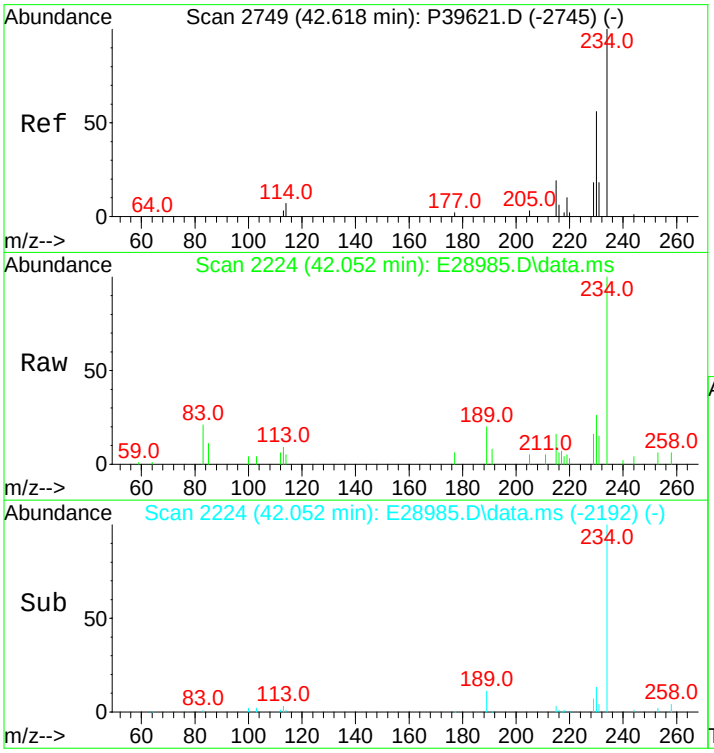


#67
Naphthobenzothiophene-2,1-D
Concen: 1270.41 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:234 Resp: 132440

Ion	Ratio	Lower	Upper
234	100		
189	8.5	21.1	31.7#

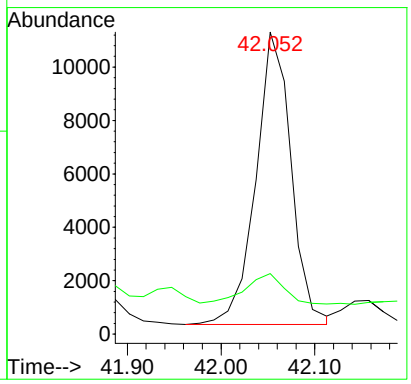


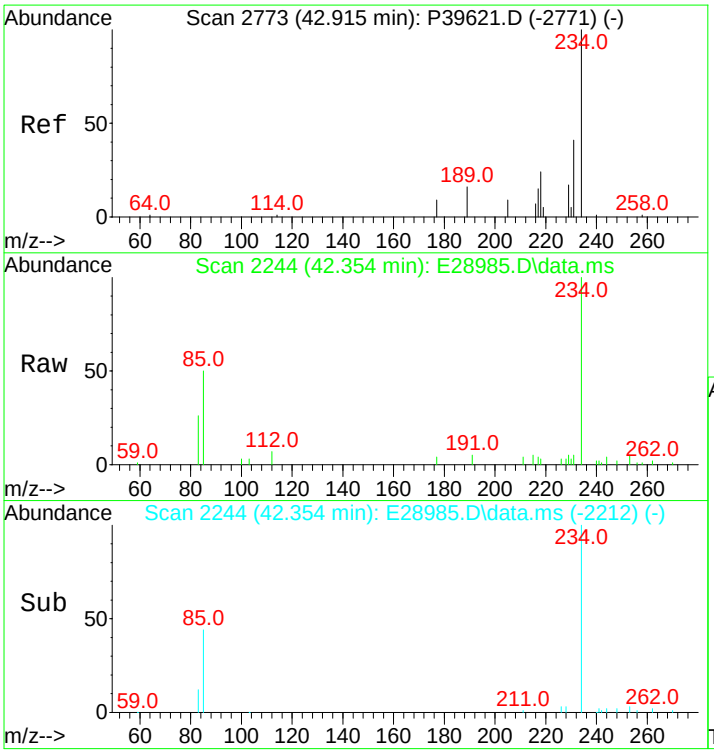


#68
Naphthobenzothiophene-1,2-D
Concen: 274.19 ng/mL
RT: 42.052 min Scan# 2224
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:234 Resp: 28584

Ion	Ratio	Lower	Upper
234	100		
189	10.9	71.9	107.9#

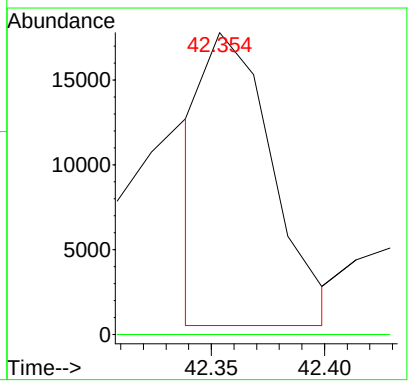


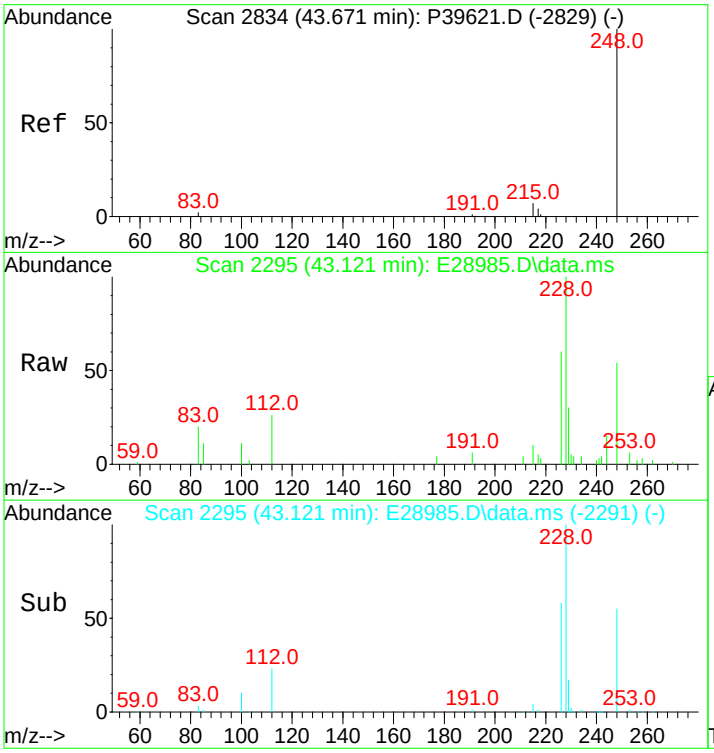


#69
Naphthobenzothiophene-2,3-D
Concen: 343.47 ng/mL m
RT: 42.354 min Scan# 2244
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:234 Resp: 35807

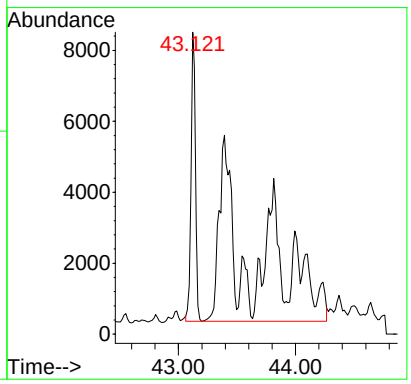
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

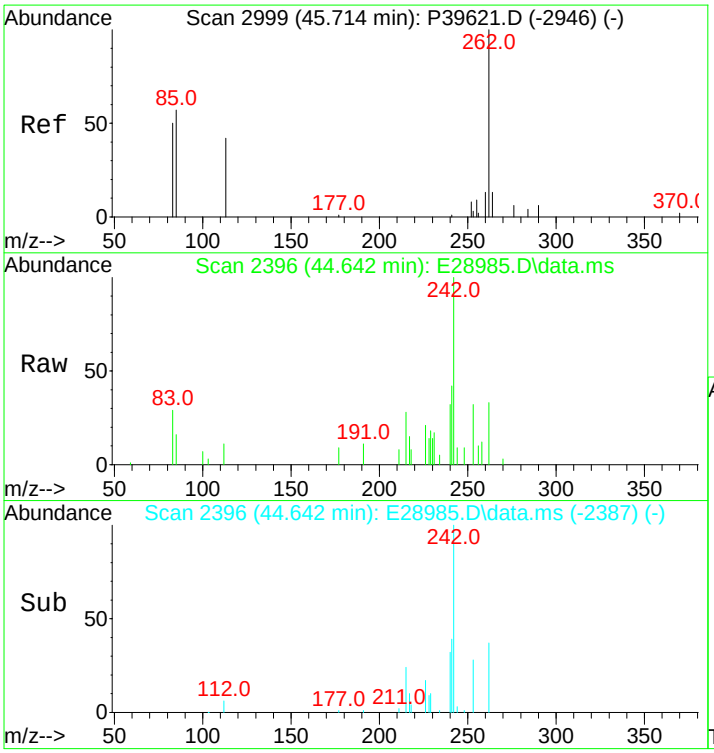




#70
C1-Naphthobenzothiophenes
Concen: 1168.53 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

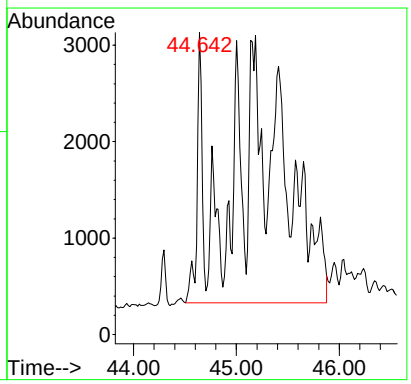
Tgt Ion:248 Resp: 121819

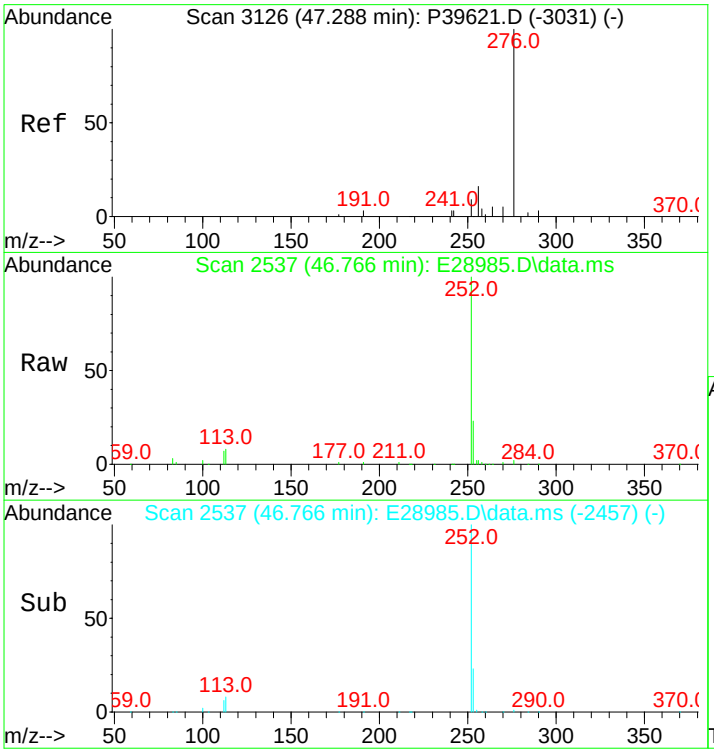




#71
C2-Naphthobenzothiophenes
Concen: 892.72 ng/ml m
RT: 44.642 min Scan# 2396
Delta R.T. -0.003 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

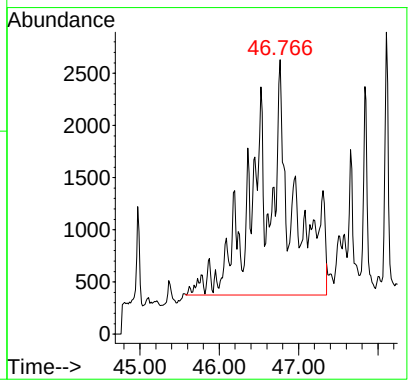
Tgt Ion:262 Resp: 93066

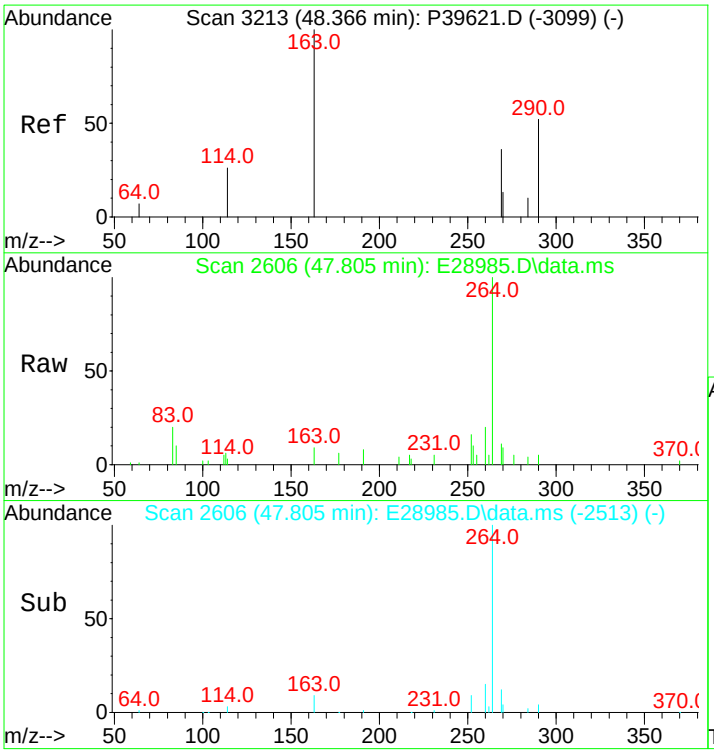




#72
C3-Naphthobenzothiophenes
Concen: 635.73 ng/ml m
RT: 46.766 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

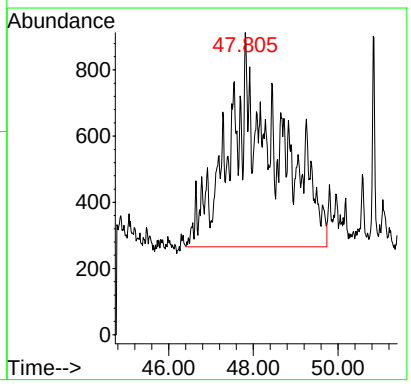
Tgt Ion:276 Resp: 66275

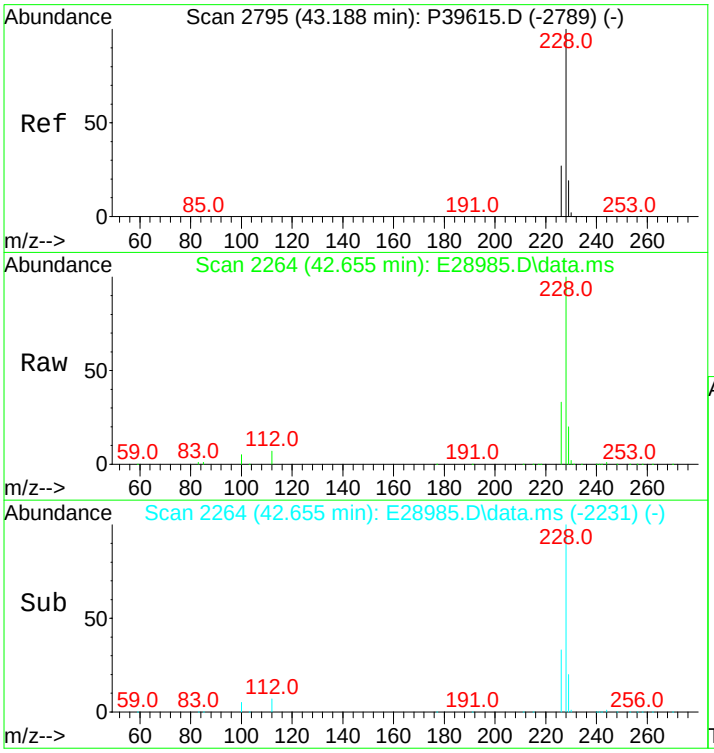




#73
C4-Naphthobenzothiophenes
Concen: 462.33 ng/mL m
RT: 47.805 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:290 Resp: 48198

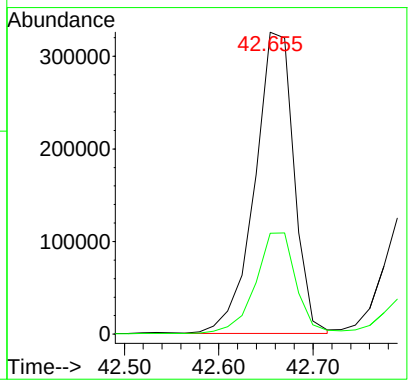


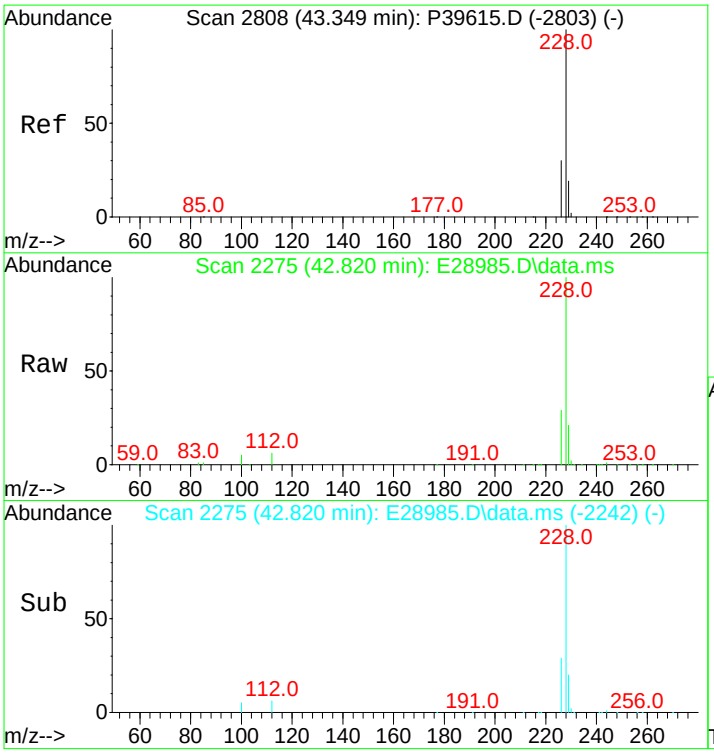


#75
Benz[a]anthracene
Concen: 8349.83 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:228 Resp: 937941

Ion	Ratio	Lower	Upper
228	100		
226	29.8	20.7	31.1

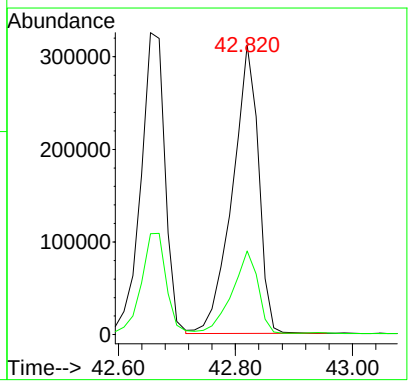


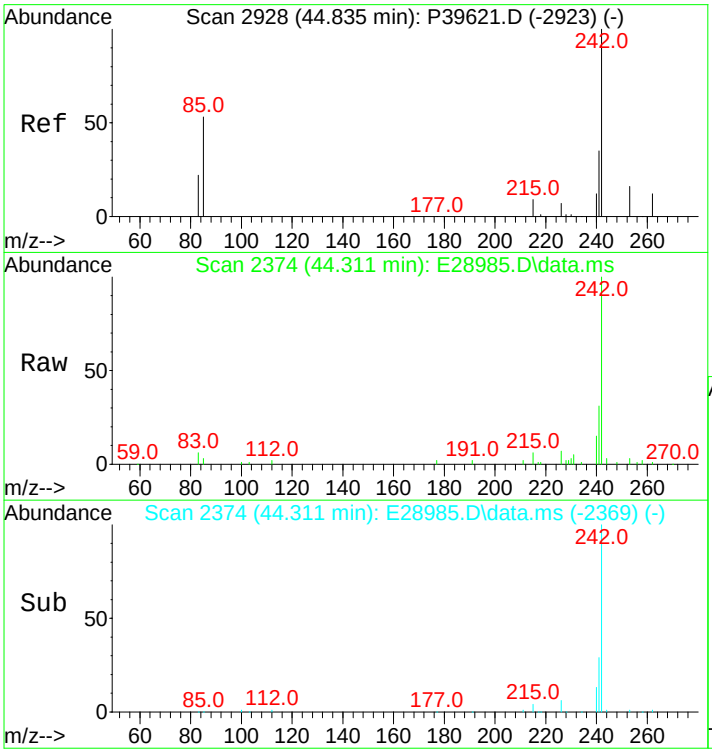


#77
Chrysene/Triphenylene
Concen: 8342.07 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:228 Resp: 964730

Ion	Ratio	Lower	Upper
228	100		
226	29.0	22.6	34.0

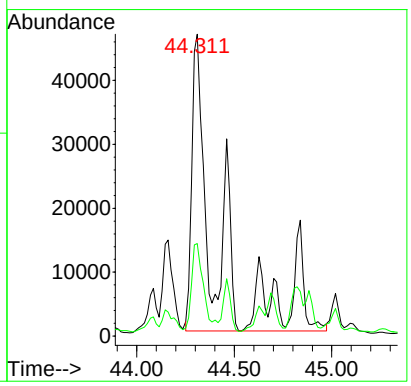


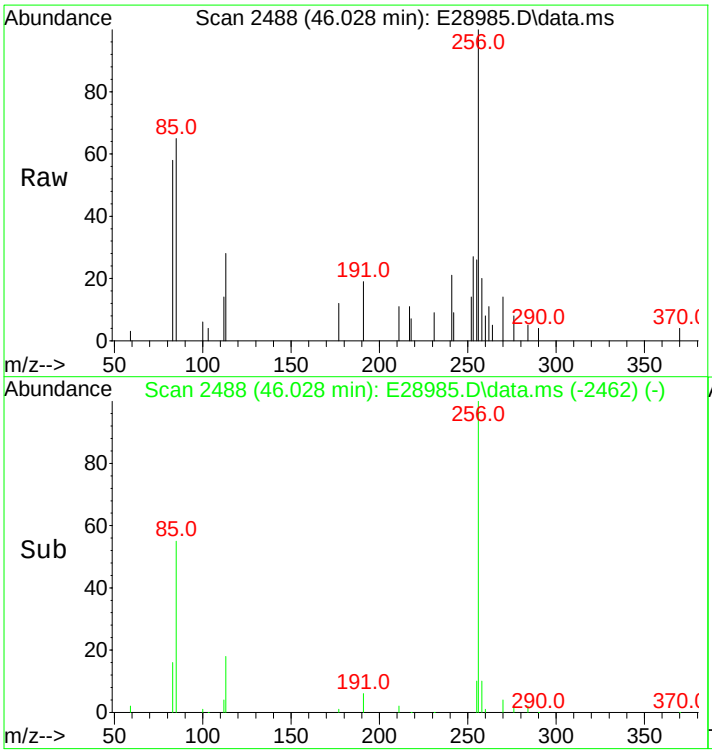


#78
C1-Chrysenes
Concen: 3315.22 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:242 Resp: 383393

Ion	Ratio	Lower	Upper
242	100		
241	3.5	32.2	48.4#

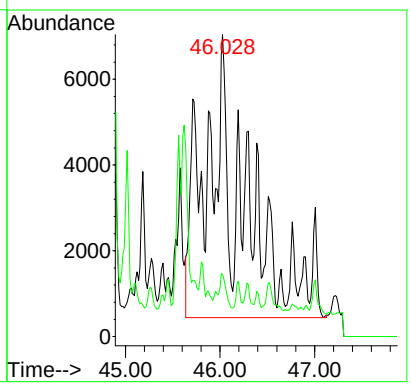


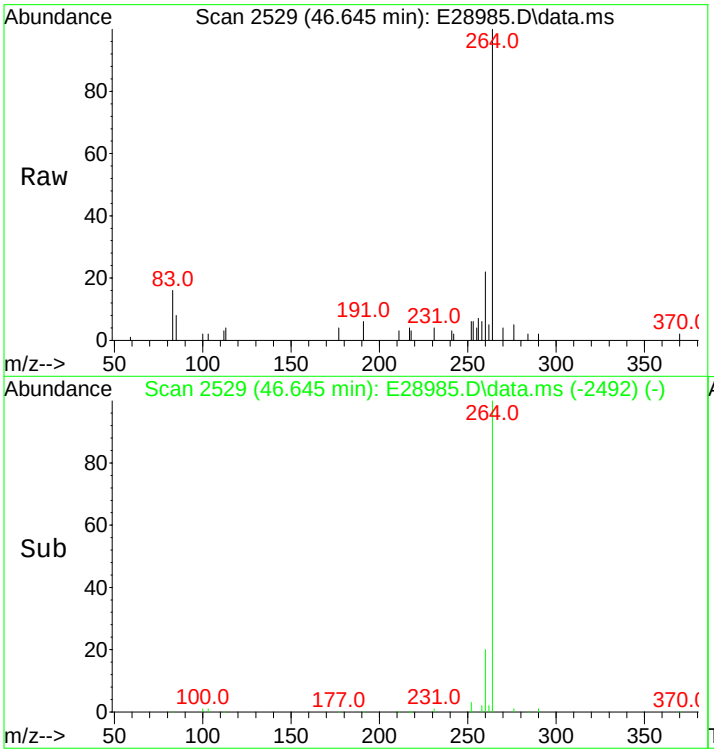


#79
C2-Chrysenes
Concen: 1611.34 ng/mL m
RT: 46.028 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:256 Resp: 186346

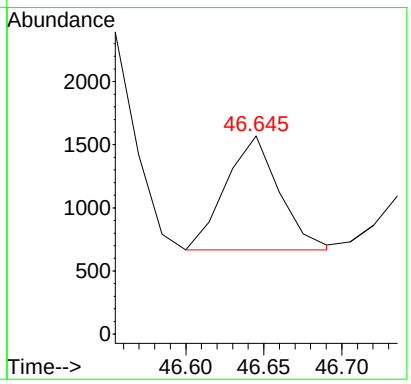
Ion	Ratio	Lower	Upper
256	100		
241	1.0	25.3	37.9#

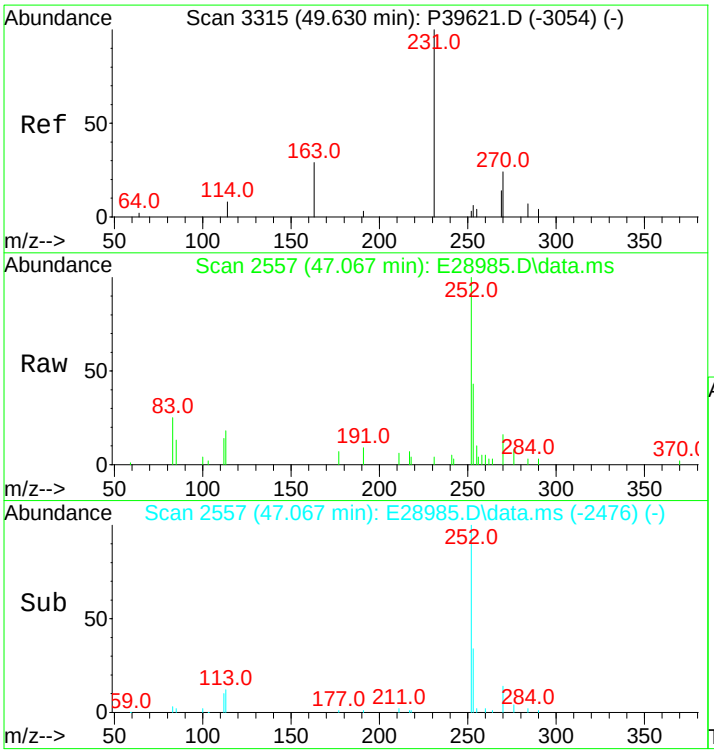




#80
BBF-D12 Surr BKGD
Concen: 18.63 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:256 Resp: 2155

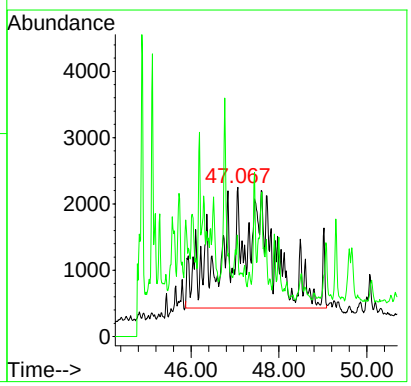


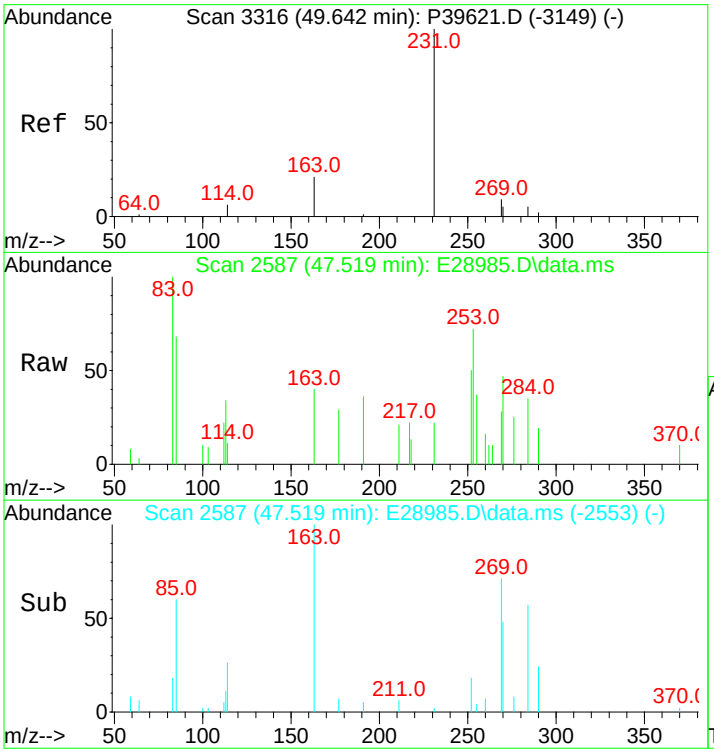


#81
C3-Chrysenes
Concen: 1124.91 ng/mL m
RT: 47.067 min Scan# 2557
Delta R.T. -2.001 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:270 Resp: 130092

Ion	Ratio	Lower	Upper
270	100		
255	0.3	38.0	57.0#

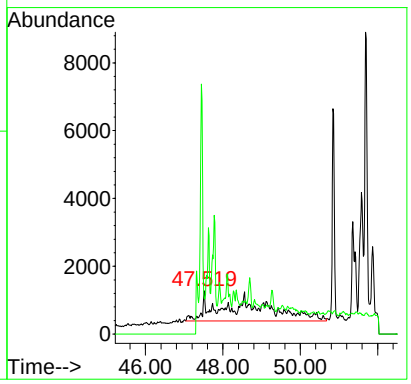


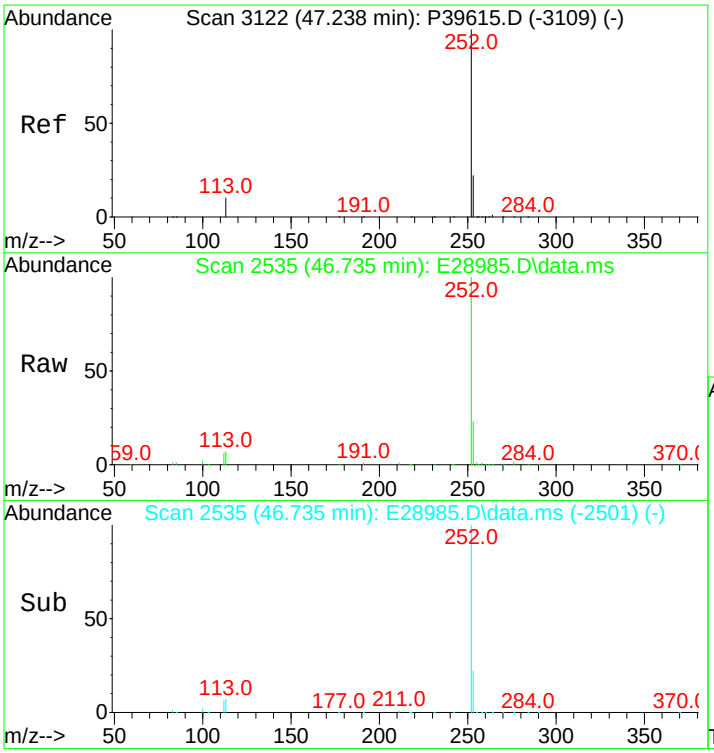


#82
C4-Chrysenes
Concen: 535.92 ng/mL m
RT: 47.519 min Scan# 2587
Delta R.T. -1.668 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:284 Resp: 61977

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

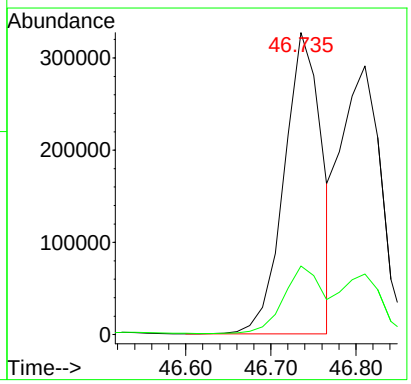


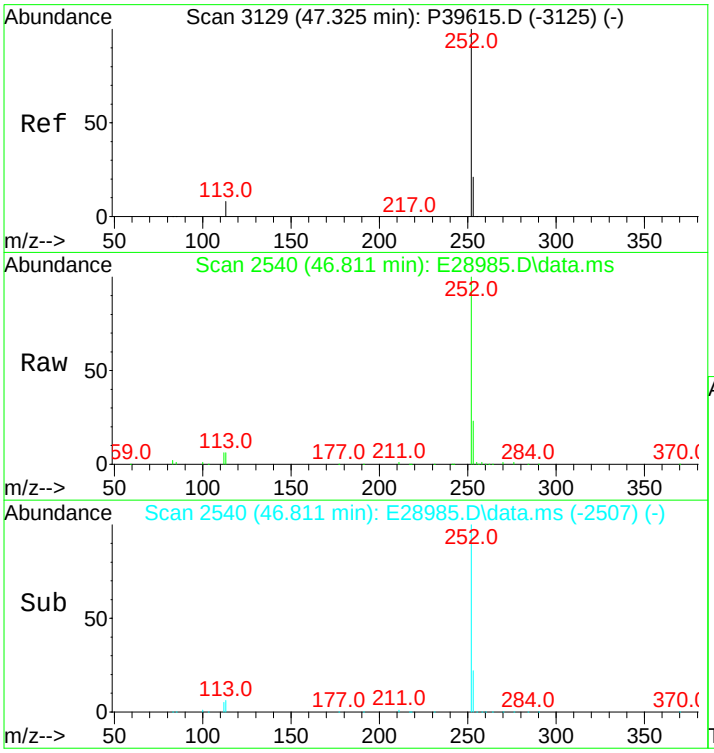


#84
Benzo[b]fluoranthene
Concen: 7704.79 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:252 Resp: 1005982

Ion	Ratio	Lower	Upper
252	100		
253	22.7	19.5	29.3

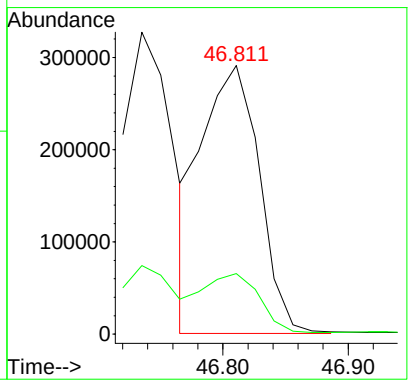


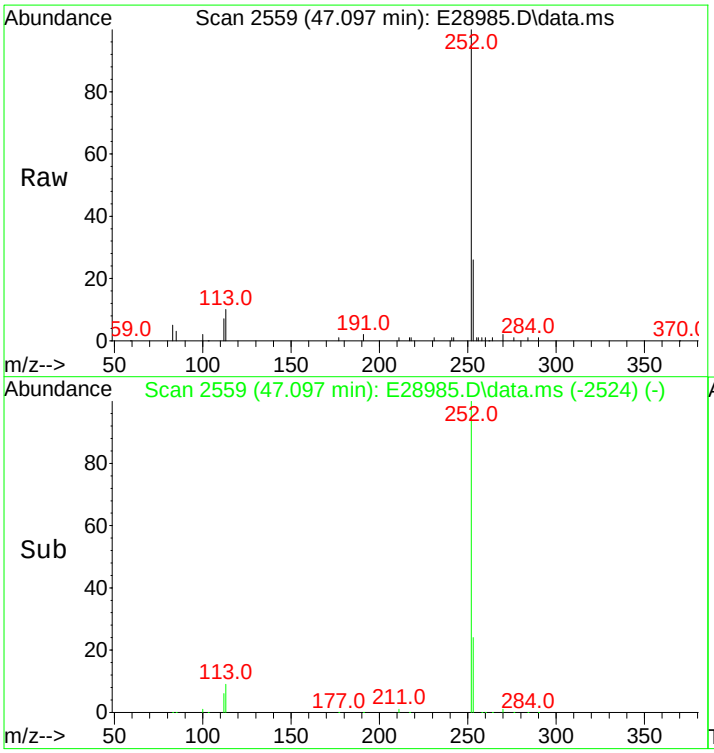


#85
Benzo[j]+[k]fluoranthene
Concen: 6947.87 ng/mL m
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:252 Resp: 933303

Ion	Ratio	Lower	Upper
252	100		
253	17.8	19.7	29.5#

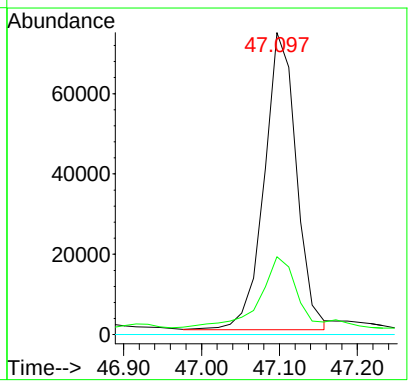


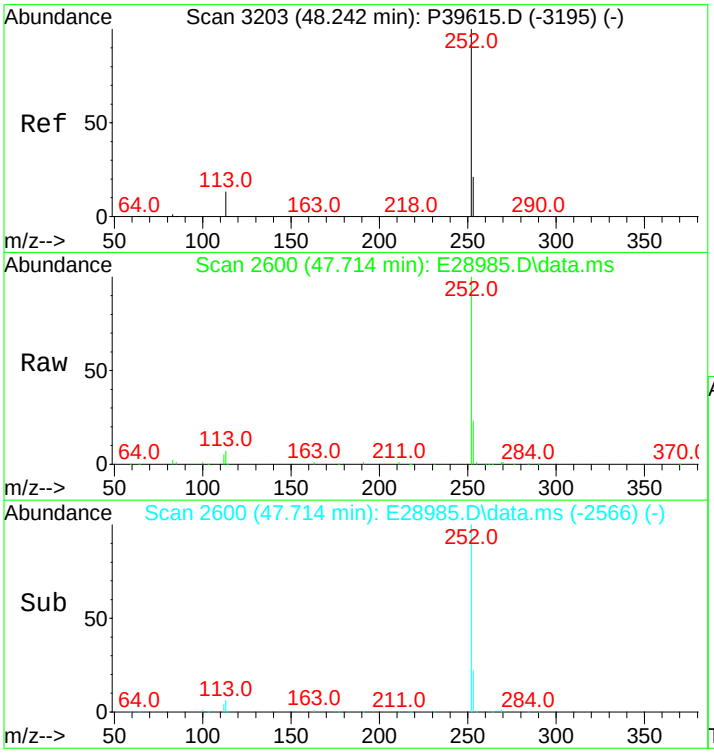


#86
Benzo[a]fluoranthene
Concen: 1579.24 ng/mL m
RT: 47.097 min Scan# 2559
Delta R.T. 0.025 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:252 Resp: 212138

Ion	Ratio	Lower	Upper
252	100		
253	31.1	456.0	684.0#
125	0.0	0.0	0.0

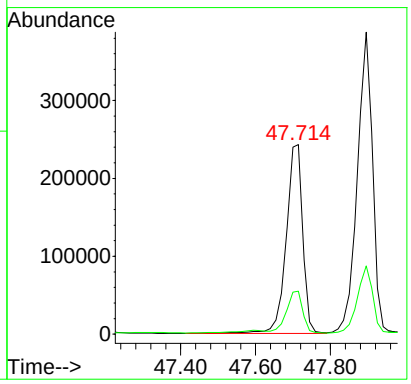


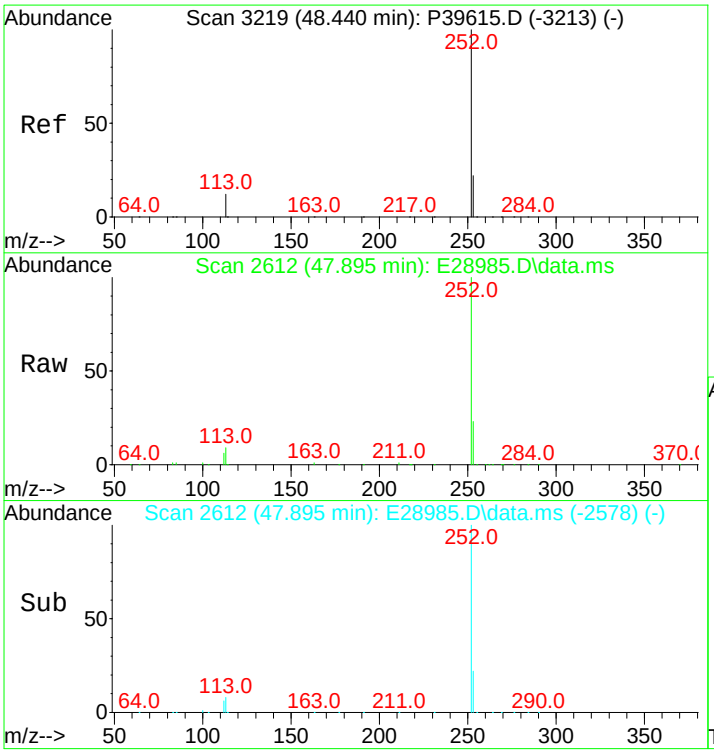


#87
Benzo[e]pyrene
Concen: 5811.82 ng/mL
RT: 47.714 min Scan# 2600
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:252 Resp: 740936

Ion	Ratio	Lower	Upper
252	100		
253	22.1	20.6	31.0

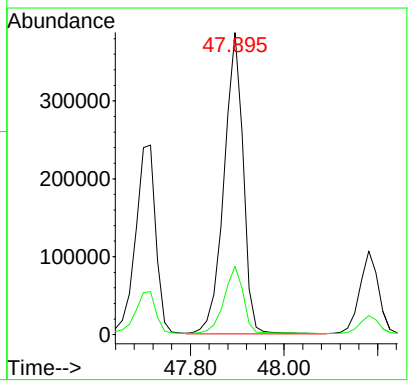


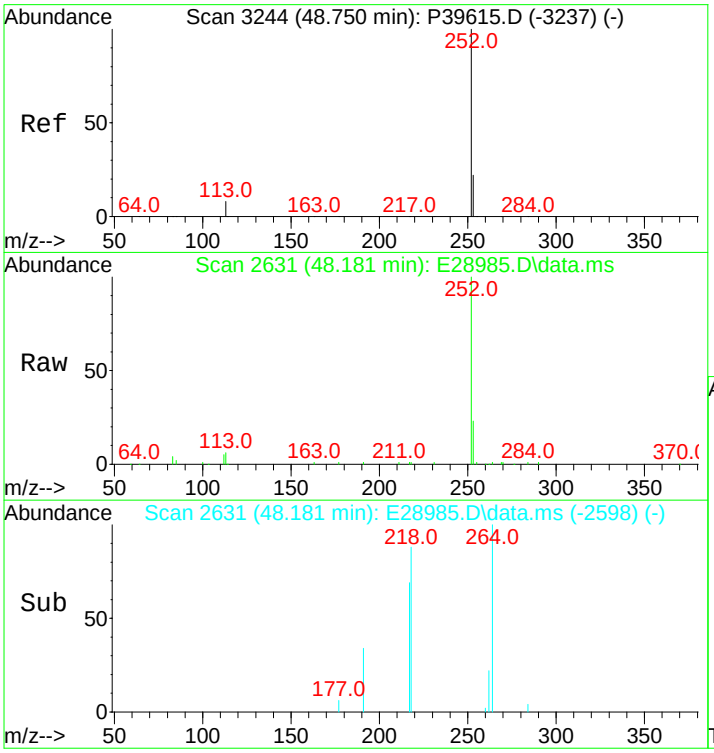


#89
Benzo[a]pyrene
Concen: 9029.36 ng/mL
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:252 Resp: 1101484

Ion	Ratio	Lower	Upper
252	100		
253	22.5	20.8	31.2

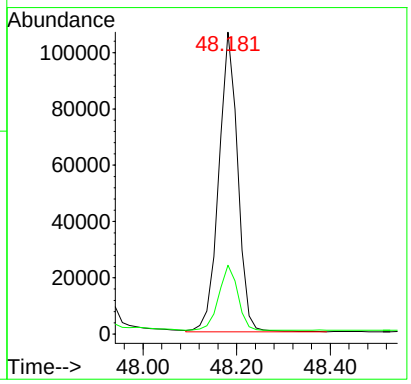


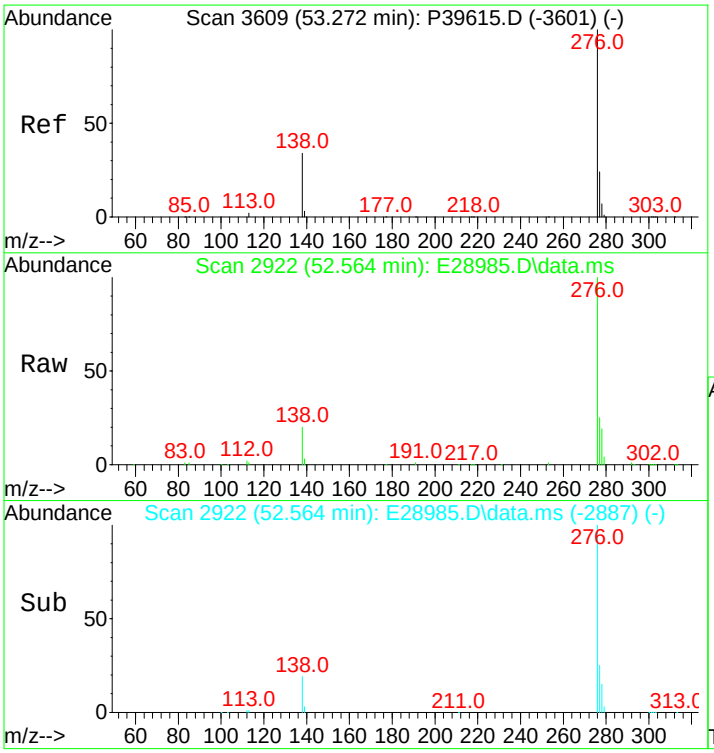


#90
Perylene
Concen: 2311.12 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:252 Resp: 298125

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.7	31.1

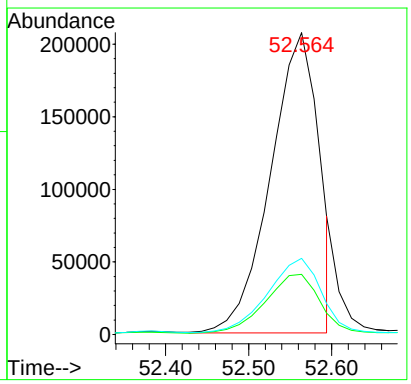


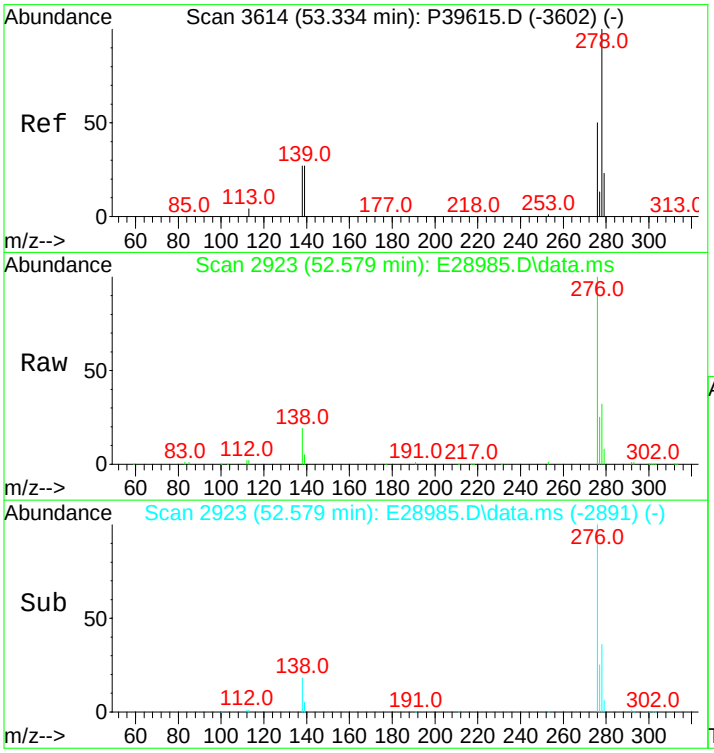


#91
Indeno[1,2,3-cd]pyrene
Concen: 5849.12 ng/mL m
RT: 52.564 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:276 Resp: 839733

Ion	Ratio	Lower	Upper
276	100		
138	22.4	16.3	24.5
277	28.0	19.4	29.2

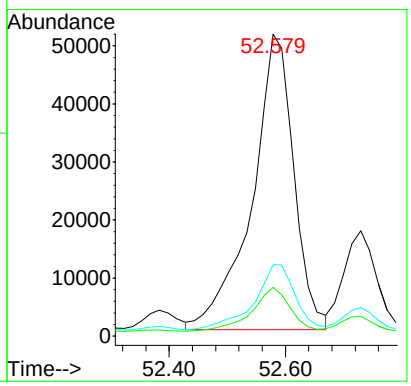


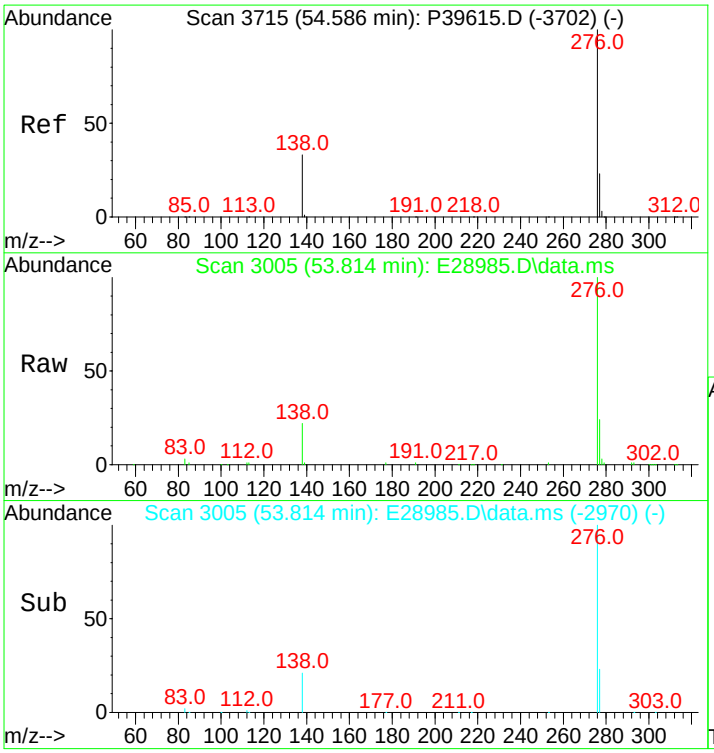


#92
Dibenz[ah]+[ac]anthracene
Concen: 1665.35 ng/mL m
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:278 Resp: 254577

Ion	Ratio	Lower	Upper
278	100		
139	13.7	11.6	17.4
279	21.4	19.3	28.9

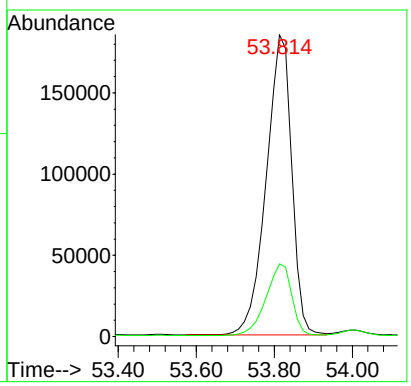


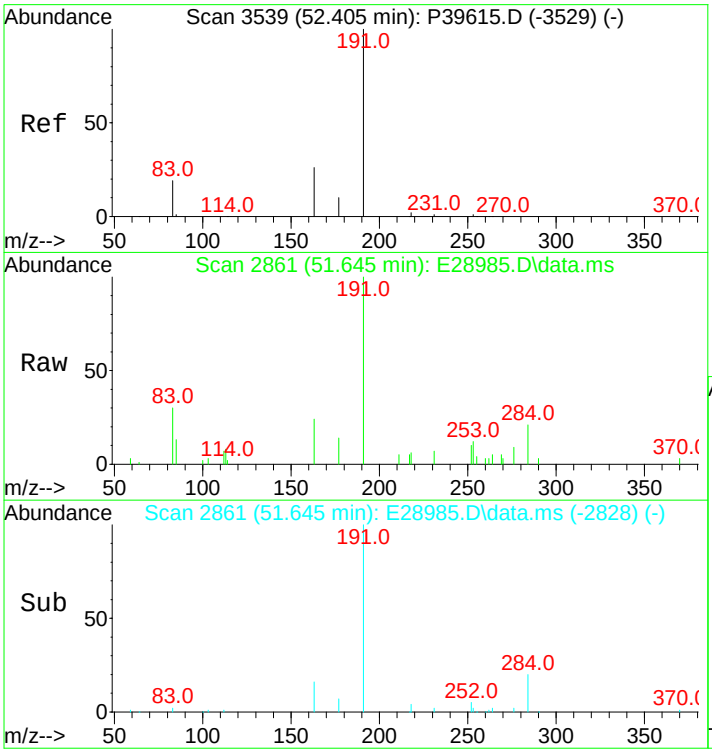


#93
Benzo[g,h,i]perylene
Concen: 5409.75 ng/mL
RT: 53.814 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:276 Resp: 837425

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.1	28.7

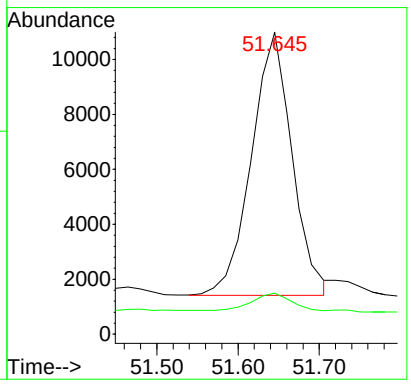


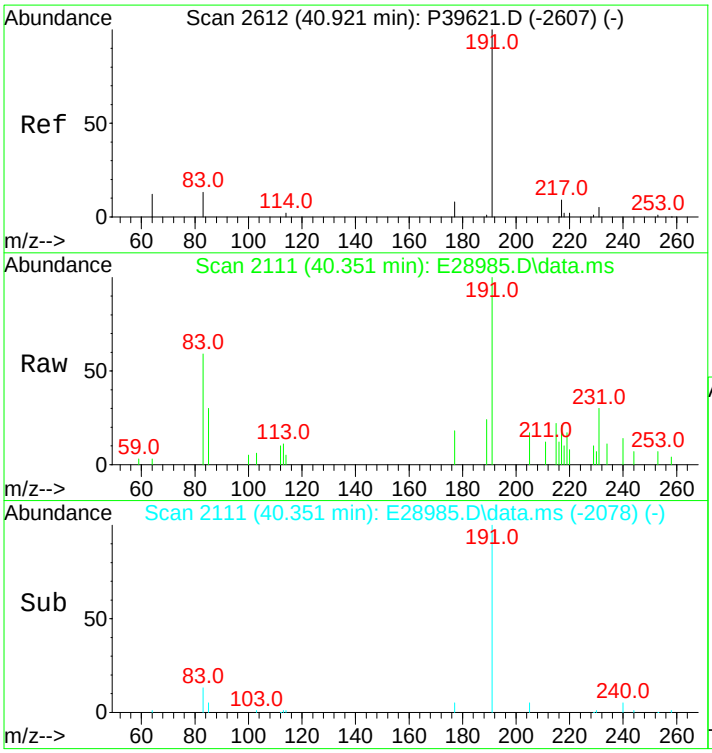


#94
Hopane (T19)
Concen: 770.19 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:191 Resp: 33343

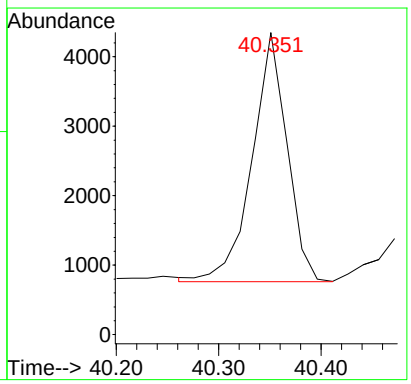
Ion	Ratio	Lower	Upper
191	100		
177	8.2	11.6	17.4#

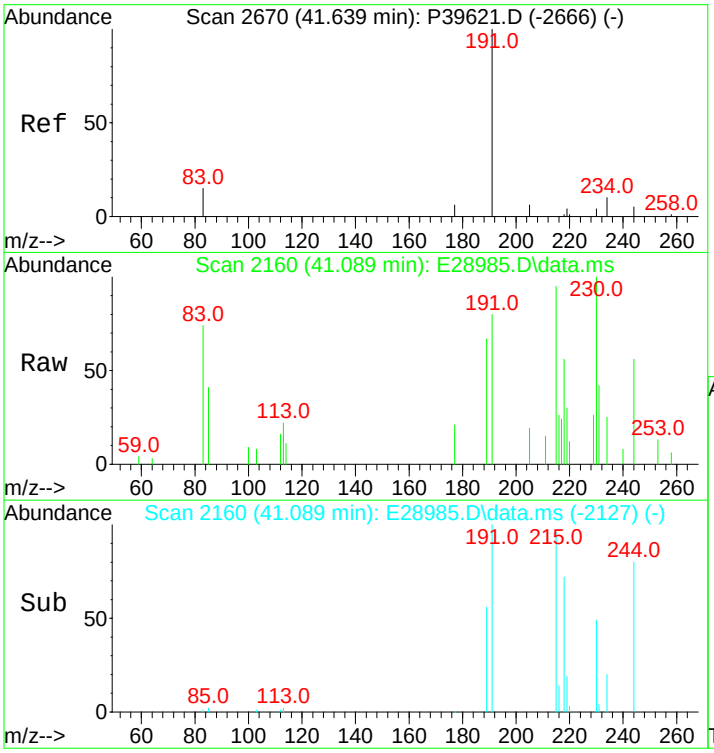




#96
C23 Tricyclic Terpane (T4)
Concen: 195.72 ng/ml m
RT: 40.351 min Scan# 2111
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

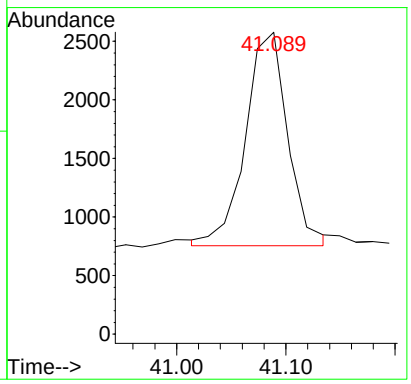
Tgt Ion:191 Resp: 8473

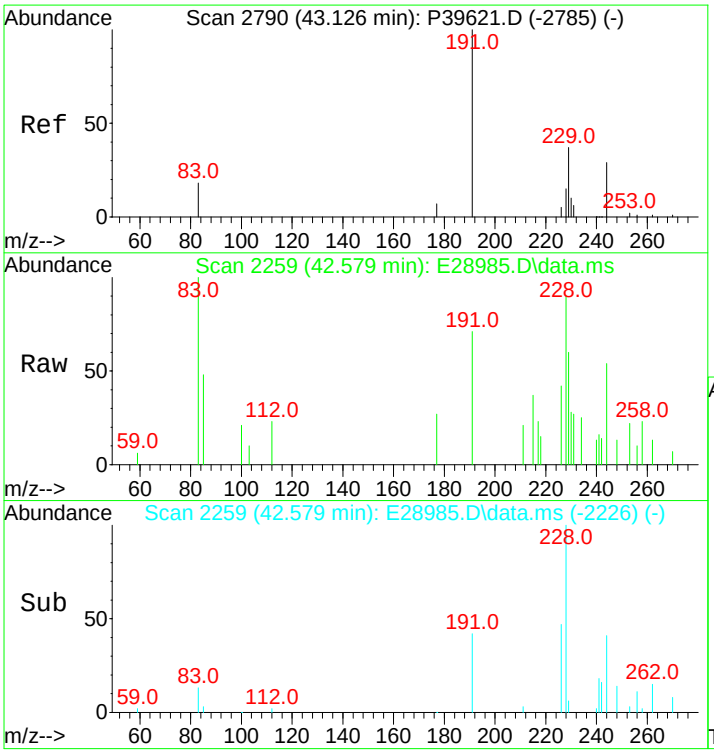




#97
C24 Tricyclic Terpane (T5)
Concen: 113.23 ng/ml m
RT: 41.089 min Scan# 2160
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

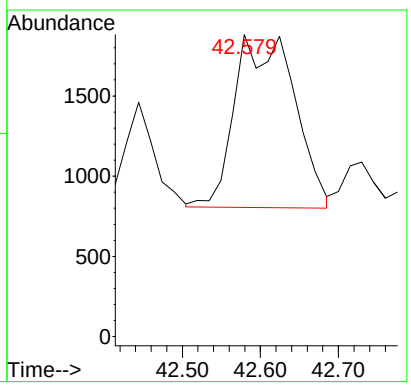
Tgt Ion:191 Resp: 4902

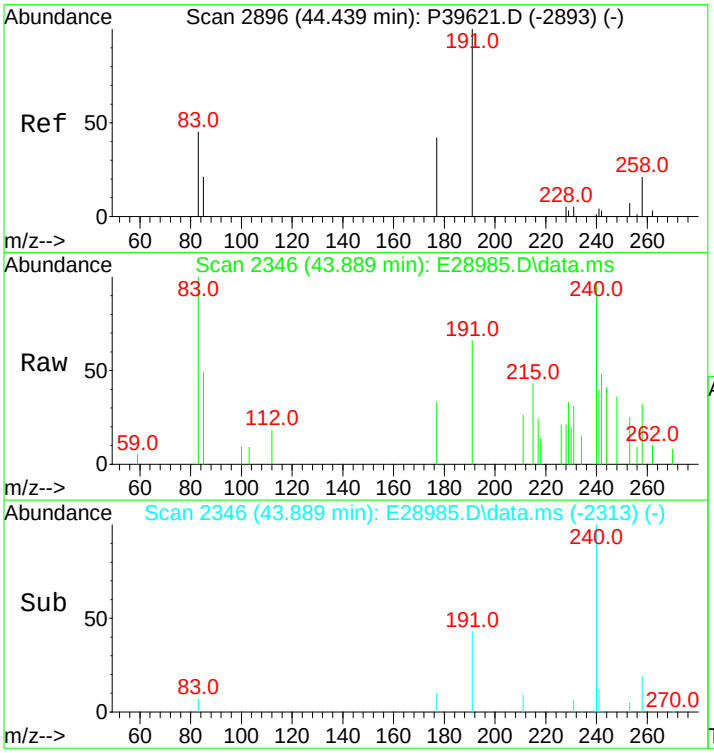




#98
C25 Tricyclic Terpane (T6)
Concen: 131.62 ng/ml
RT: 42.579 min Scan# 2259
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

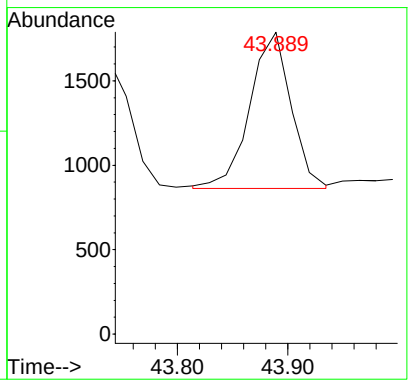
Tgt Ion:191 Resp: 5698

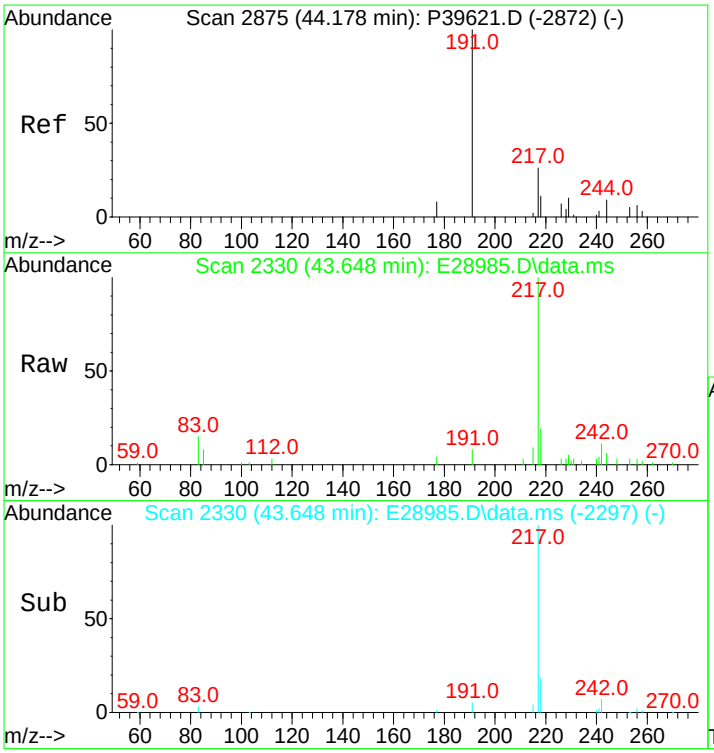




#99
C24 Tetracyclic Terpane (T6a)
Concen: 55.39 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

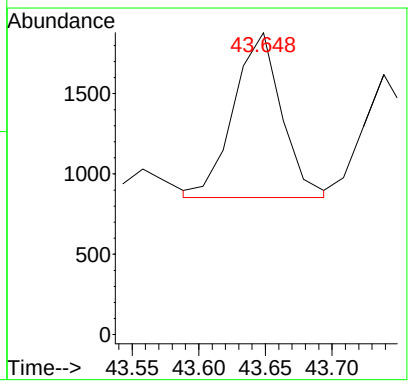
Tgt Ion:191 Resp: 2398

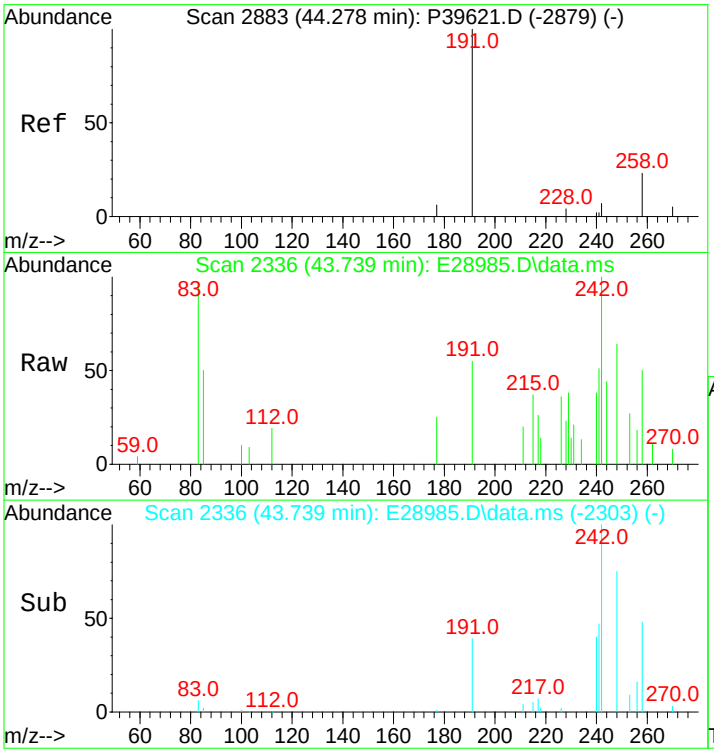




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 59.41 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

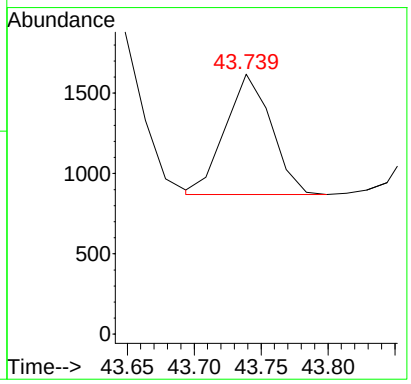
Tgt Ion:191 Resp: 2572

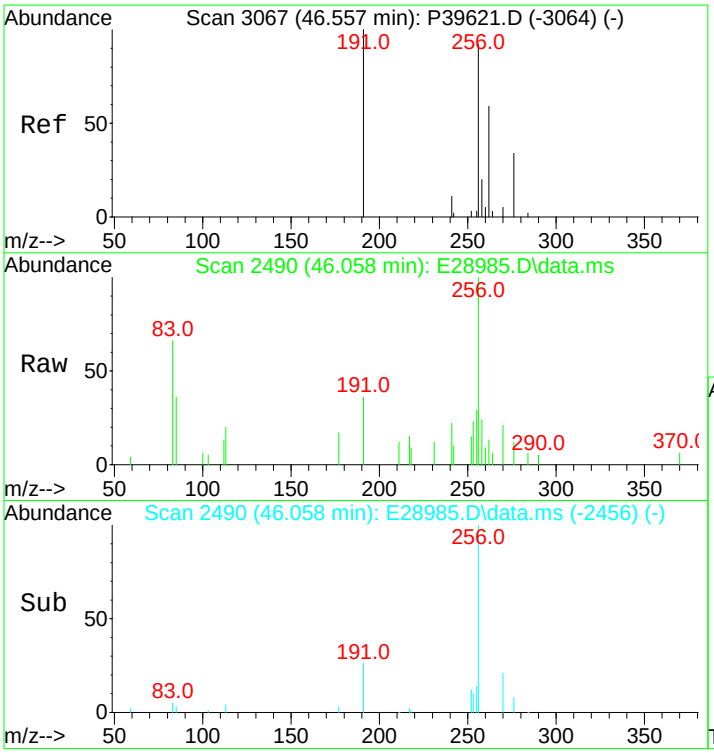




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 41.46 ng/ml
RT: 43.739 min Scan# 2336
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

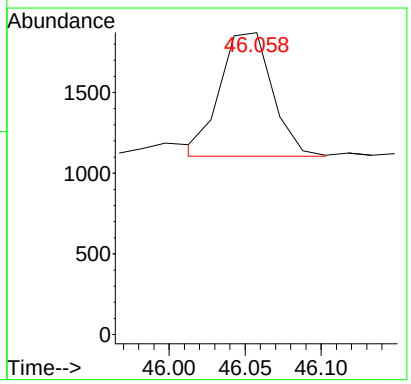
Tgt Ion:191 Resp: 1795

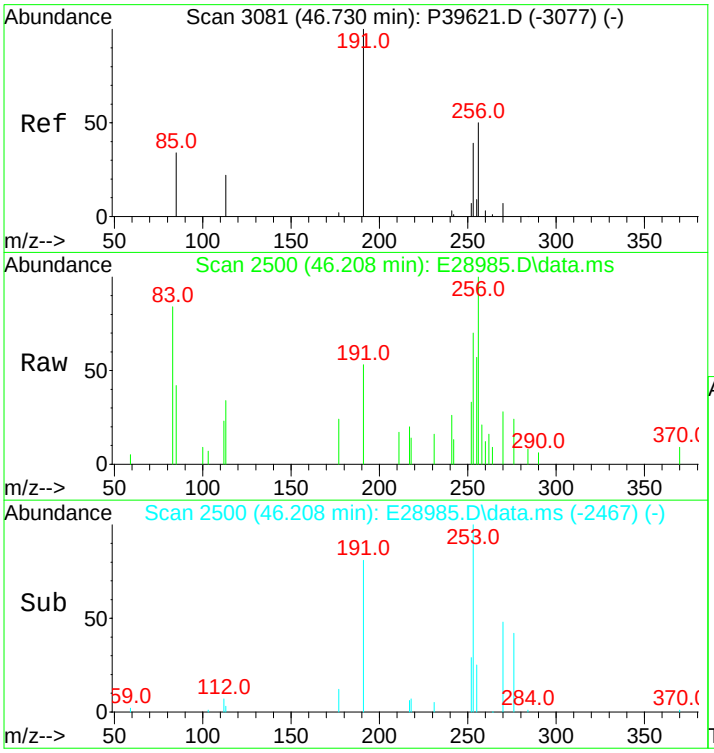




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 42.16 ng/ml m
RT: 46.058 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

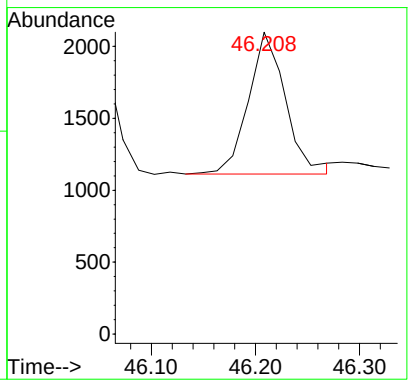
Tgt Ion:191 Resp: 1825

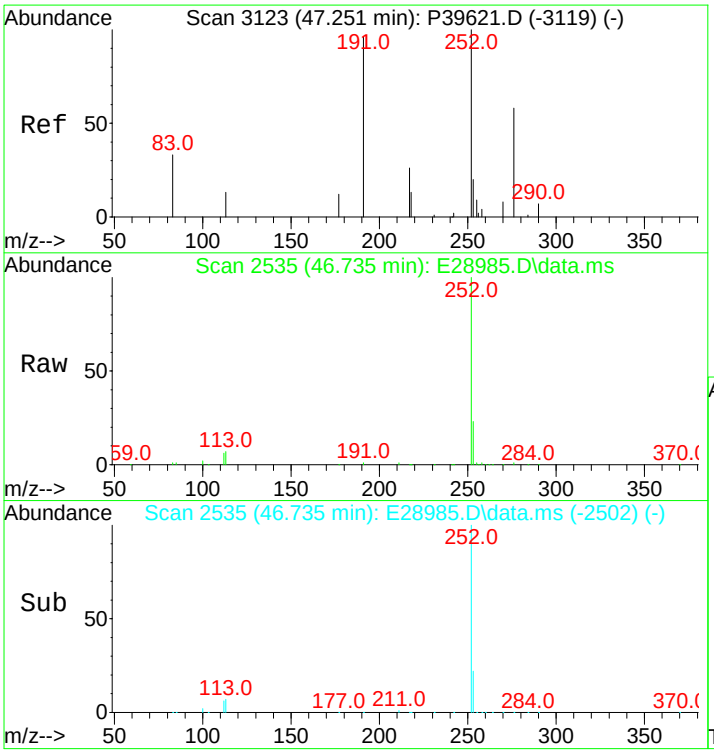




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 57.03 ng/ml
RT: 46.208 min Scan# 2500
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

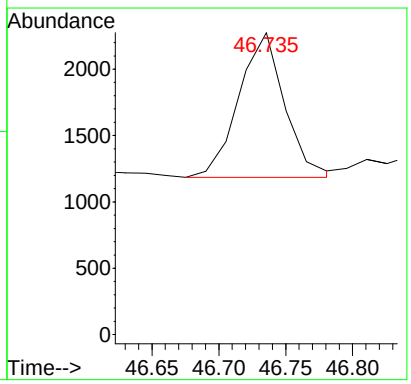
Tgt Ion:191 Resp: 2469

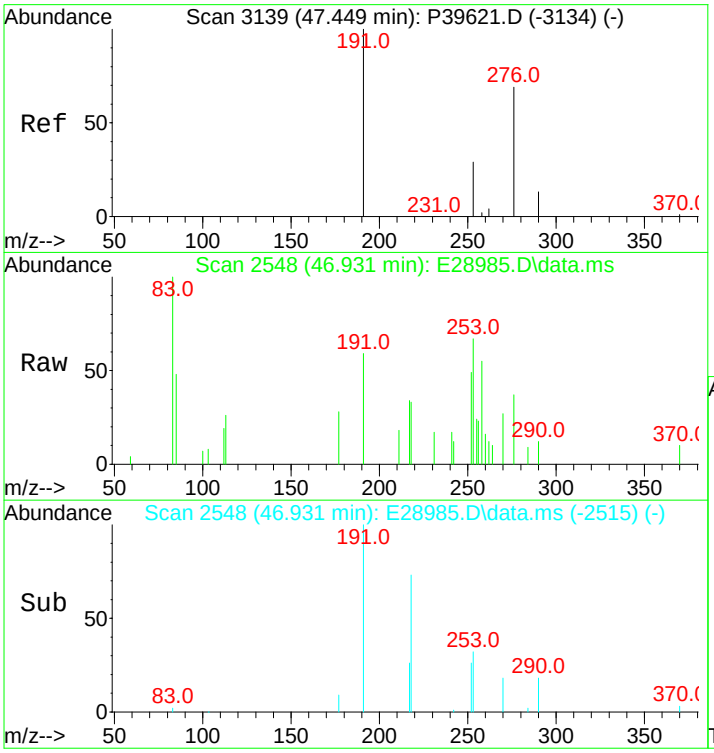




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 60.29 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

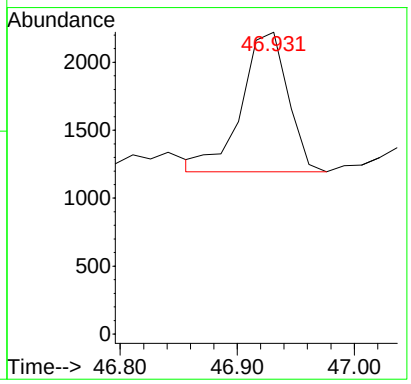
Tgt Ion:191 Resp: 2610

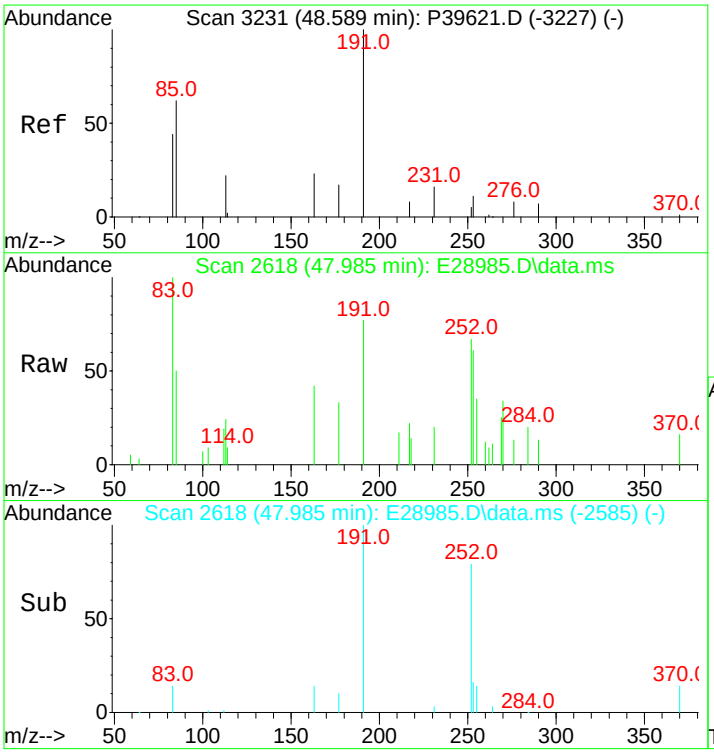




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 65.65 ng/ml
RT: 46.931 min Scan# 2548
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

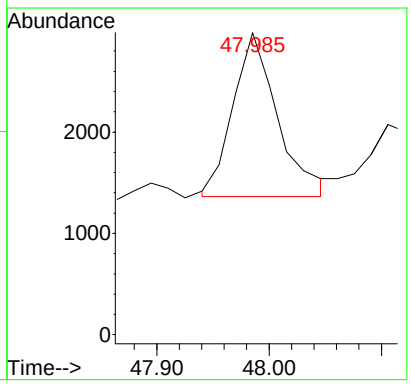
Tgt Ion:191 Resp: 2842

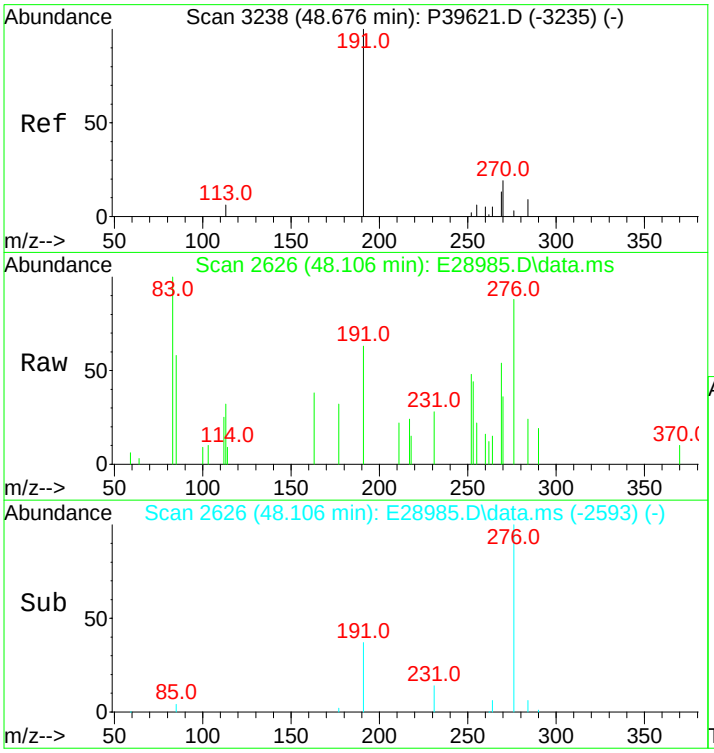




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 103.07 ng/ml m
RT: 47.985 min Scan# 2618
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

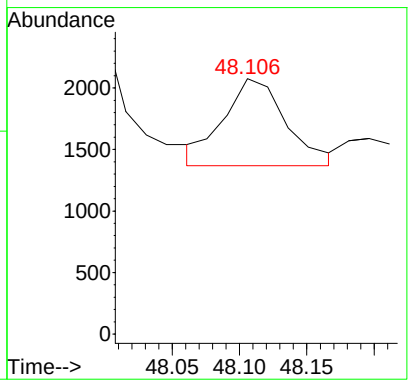
Tgt Ion:191 Resp: 4462

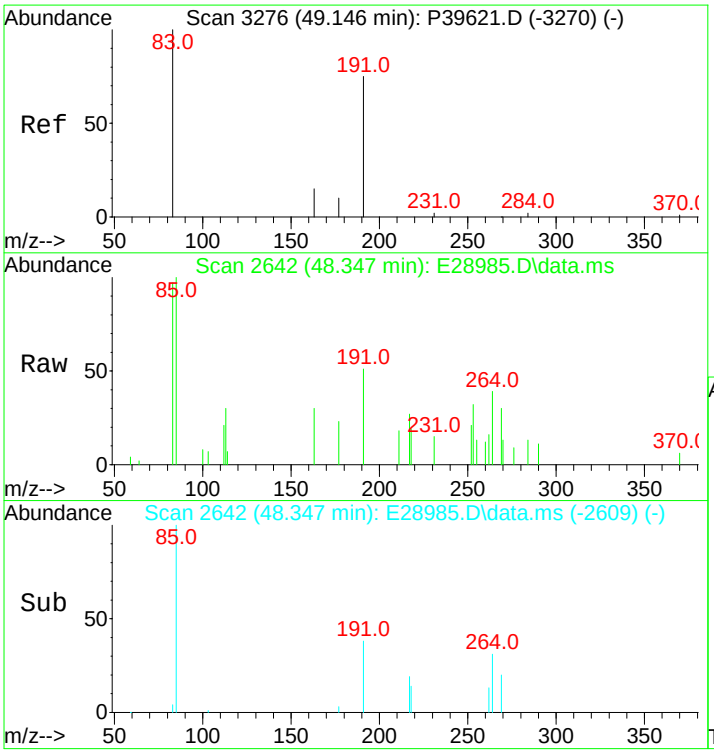




#107
C30 Tricyclic Terpane-22S
Concen: 52.87 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

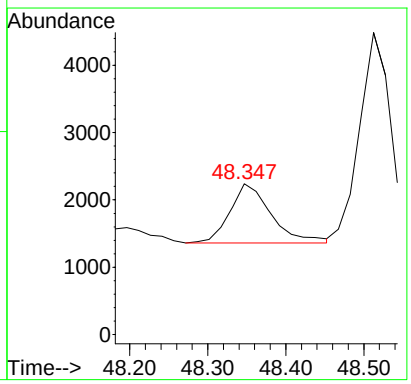
Tgt Ion:191 Resp: 2289

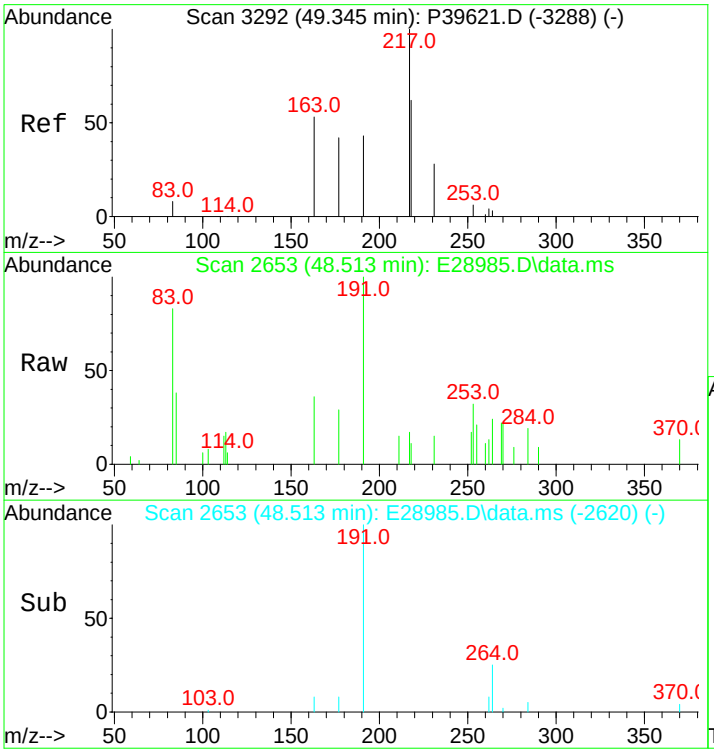




#108
C30 Tricyclic Terpane-22R
Concen: 75.05 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

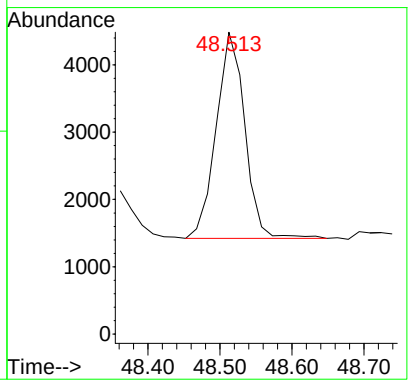
Tgt Ion:191 Resp: 3249

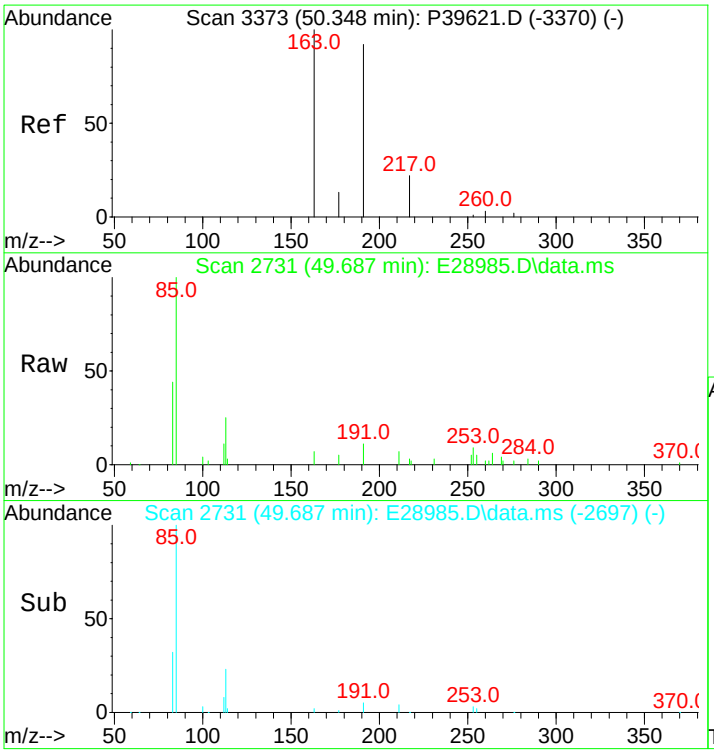




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 196.04 ng/ml
RT: 48.513 min Scan# 2653
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

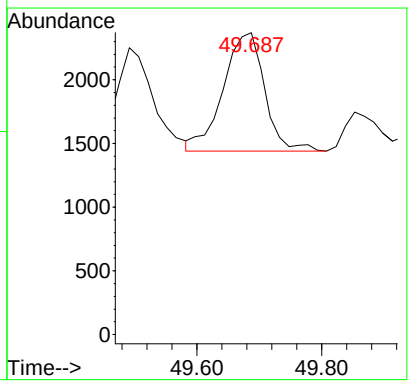
Tgt Ion:191 Resp: 8487

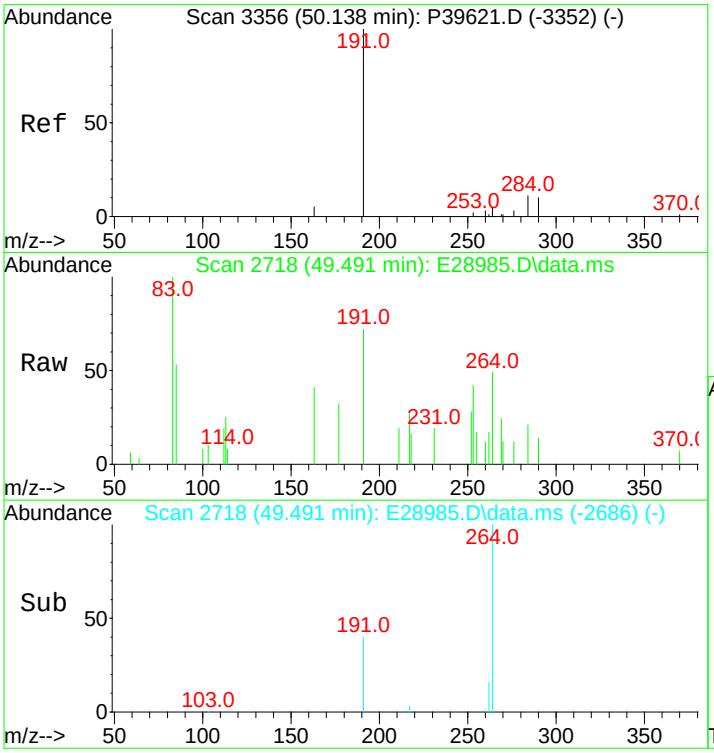




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 98.54 ng/ml
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

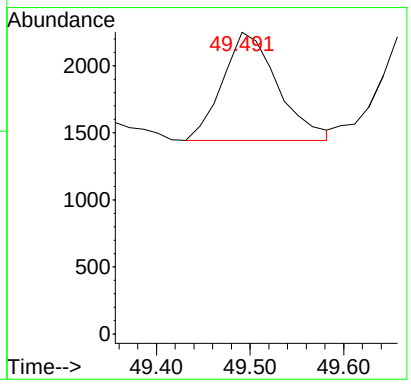
Tgt Ion:191 Resp: 4266

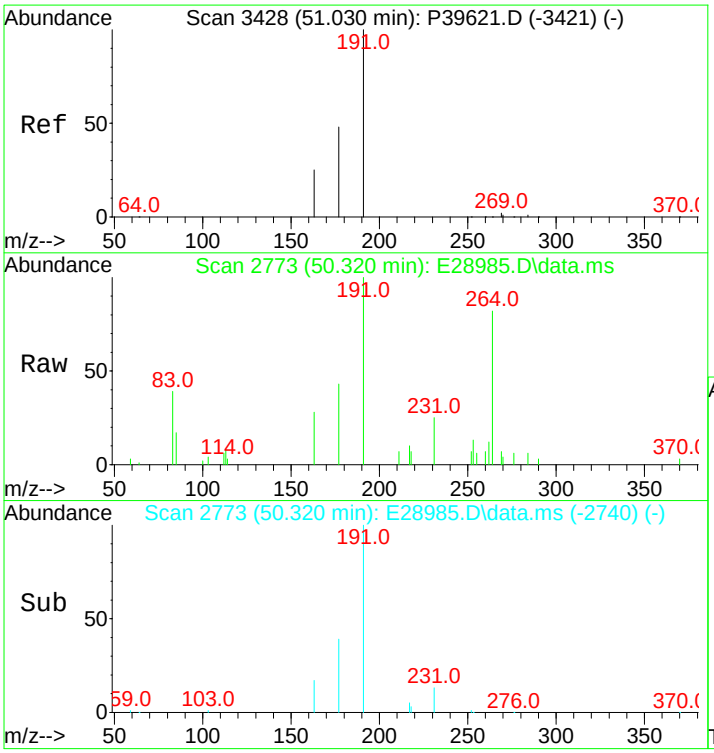




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 76.43 ng/ml
RT: 49.491 min Scan# 2718
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

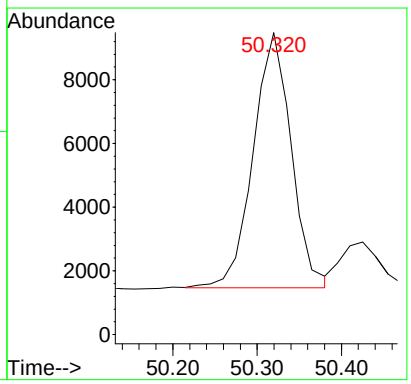
Tgt Ion:191 Resp: 3309

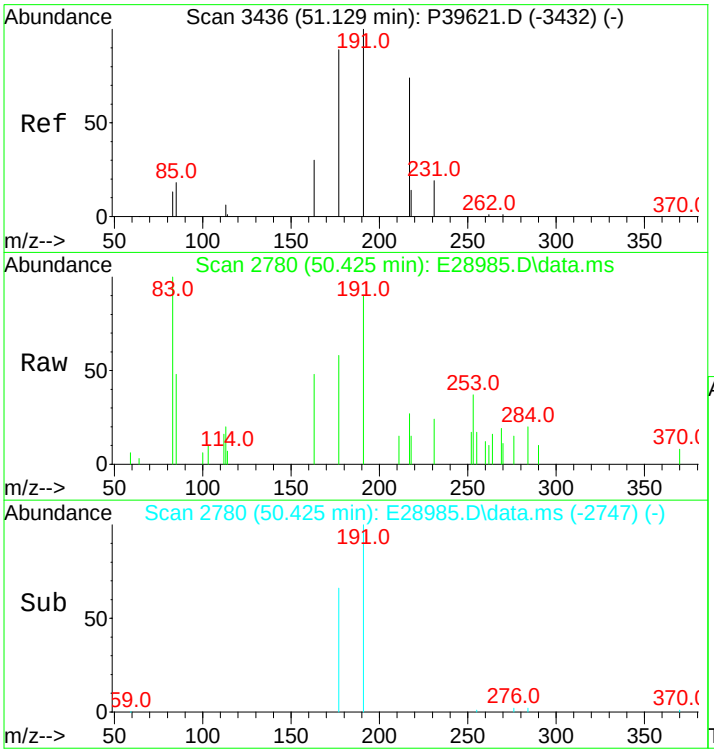




#112
30-Norhopane (T15)
Concen: 580.11 ng/ml m
RT: 50.320 min Scan# 2773
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

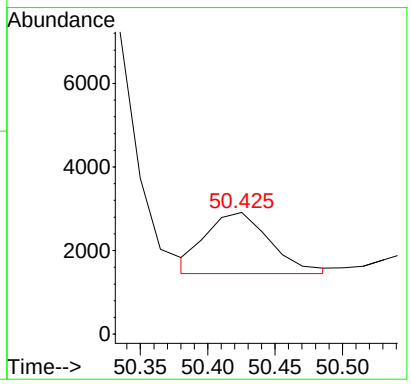
Tgt Ion:191 Resp: 25114

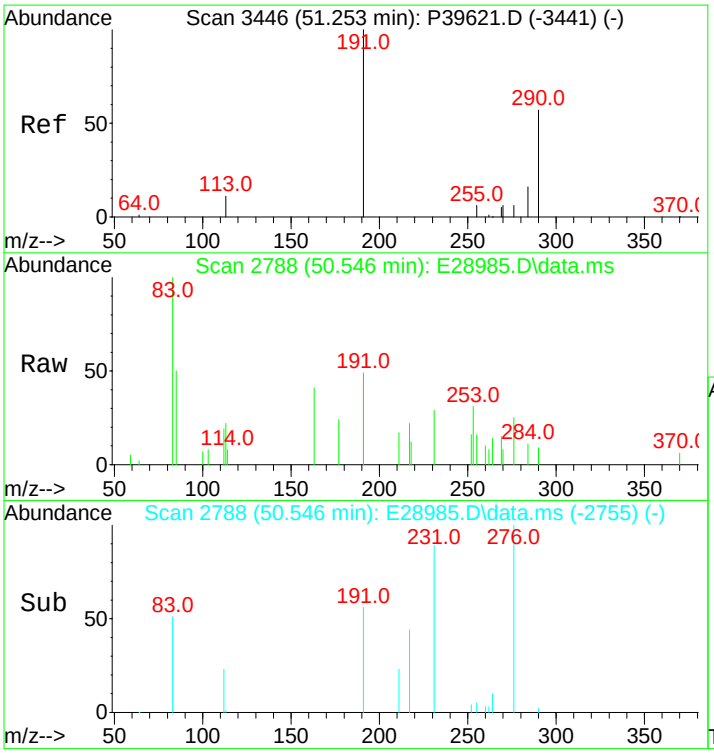




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 112.01 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

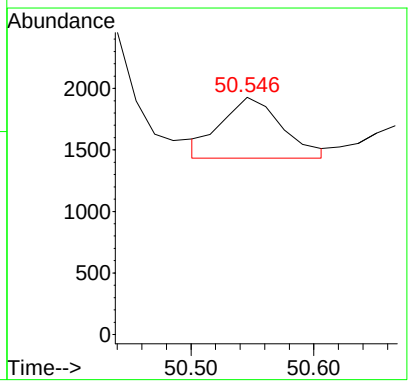
Tgt Ion:191 Resp: 4849

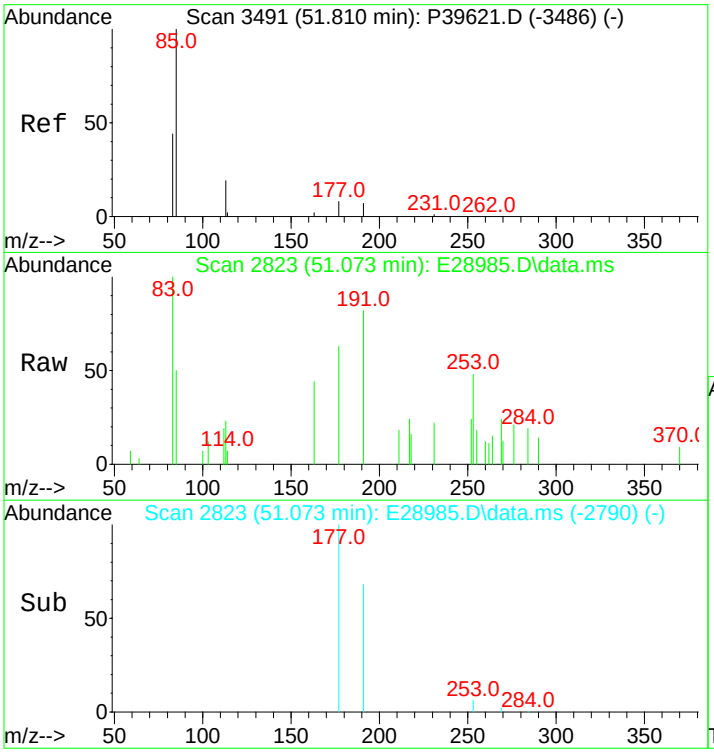




#114
17a(H)-Diahopane (X)
Concen: 39.29 ng/ml m
RT: 50.546 min Scan# 2788
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

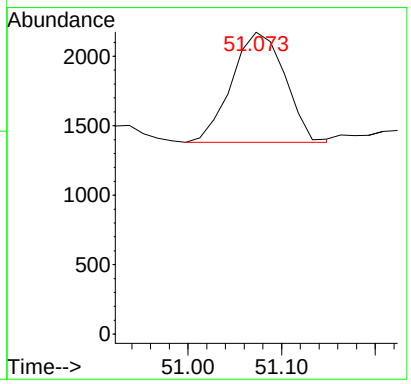
Tgt Ion:191 Resp: 1701

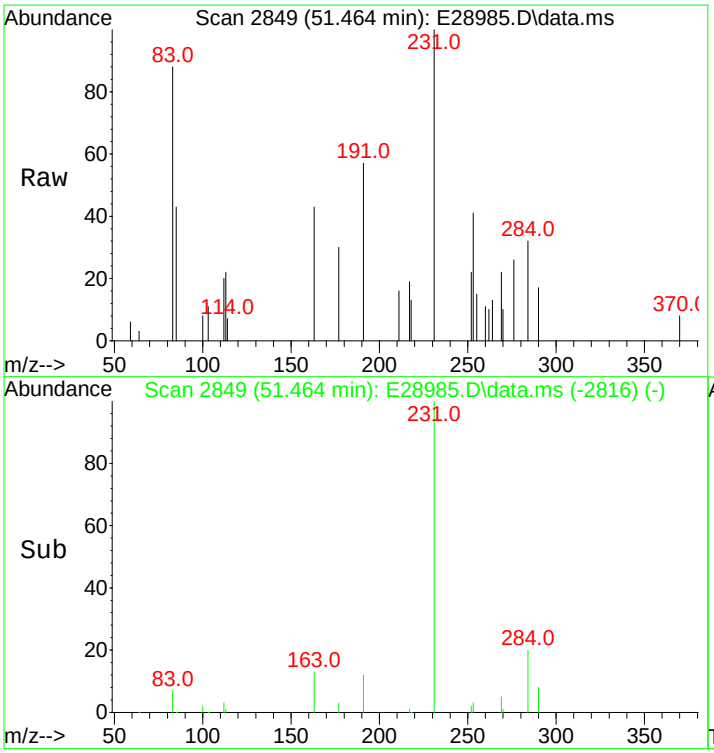




#115
30-Normoretane (T17)
Concen: 72.42 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

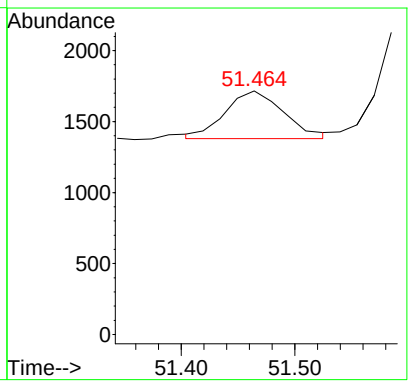
Tgt Ion:191 Resp: 3135

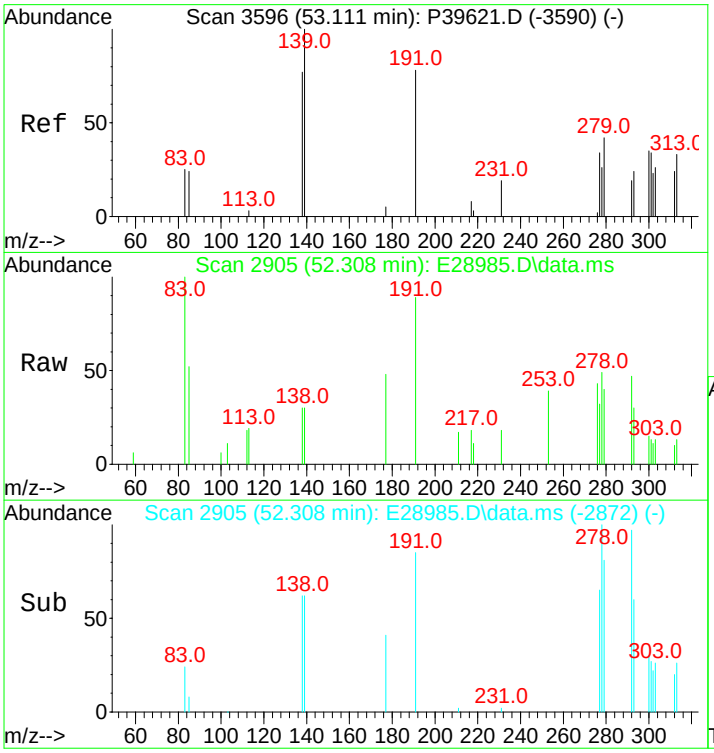




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 27.74 ng/ml m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

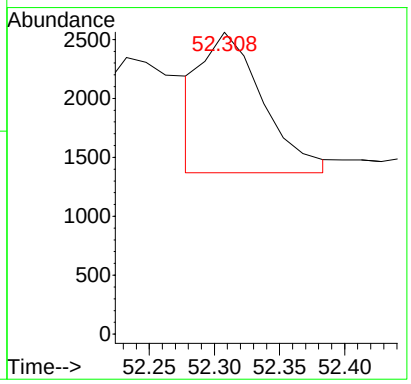
Tgt Ion:191 Resp: 1201

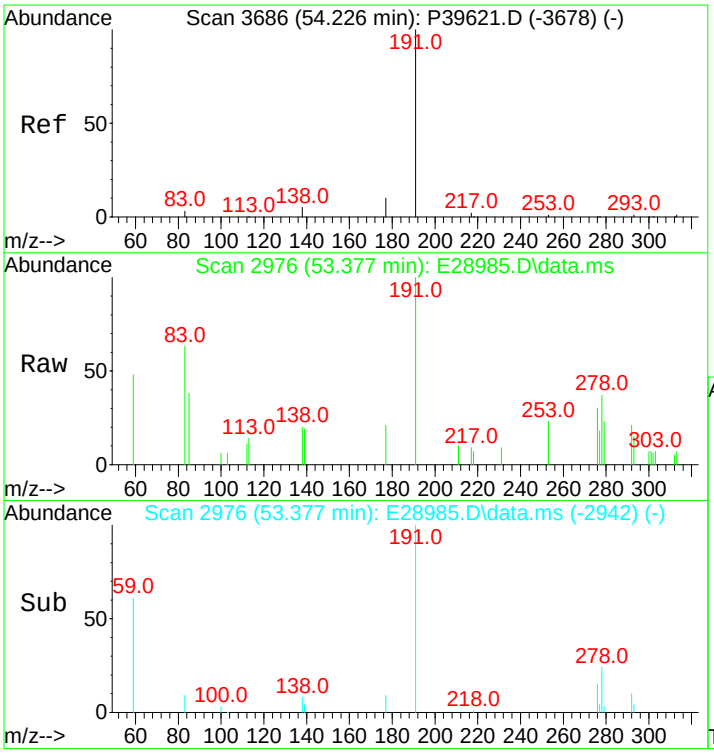




#117
Moretane (T20)
Concen: 89.44 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

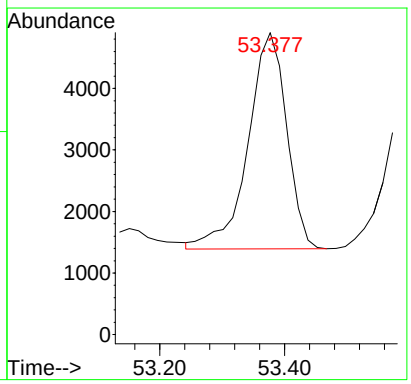
Tgt Ion:191 Resp: 3872

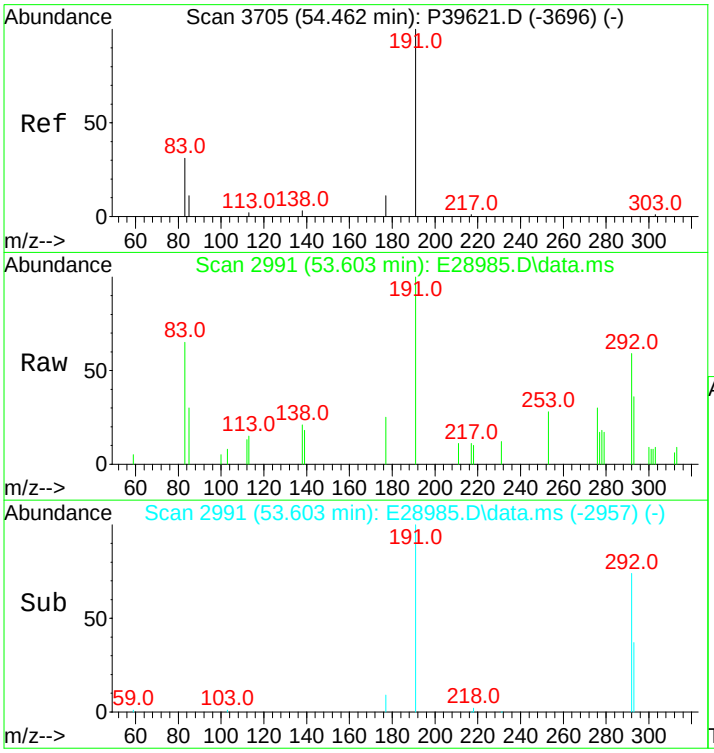




#118
30-Homohopane-22S (T21)
Concen: 347.59 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

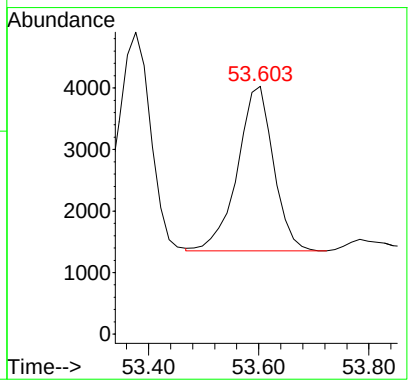
Tgt Ion:191 Resp: 15048

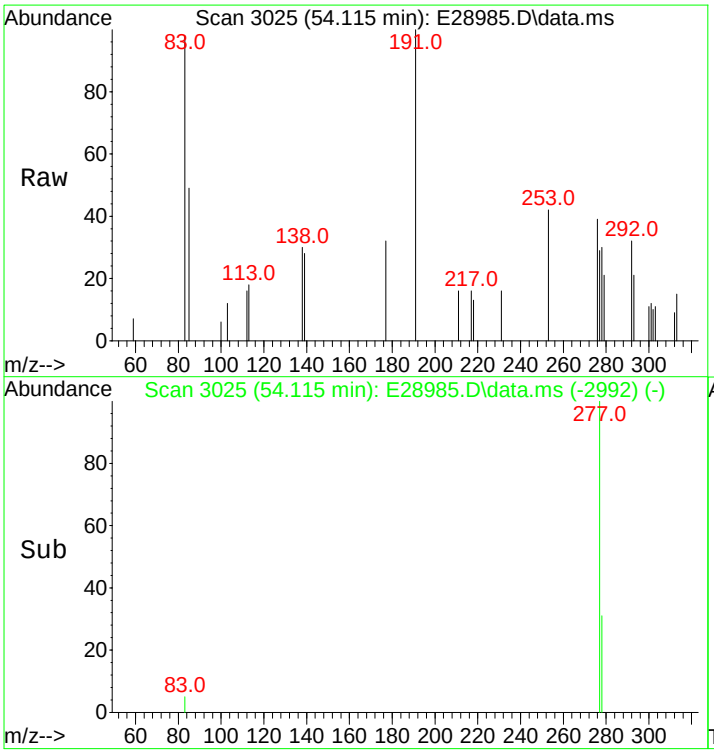




#119
30-Homohopane-22R (T22)
Concen: 280.05 ng/ml
RT: 53.603 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

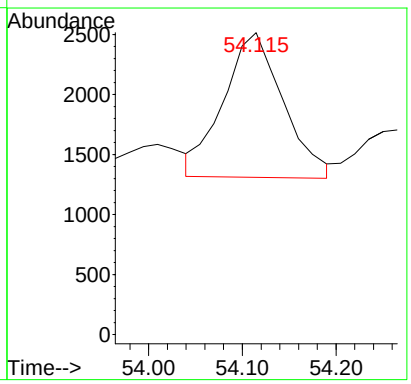
Tgt Ion:191 Resp: 12124

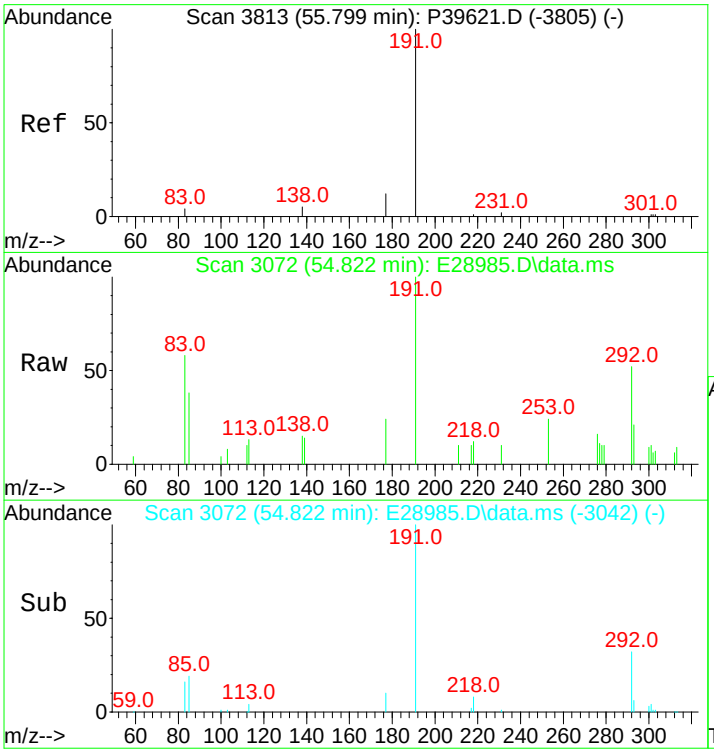




#120
Gammacerane/C32-diahopane
Concen: 123.19 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

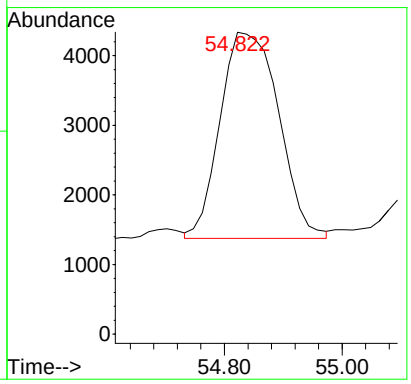
Tgt Ion:191 Resp: 5333

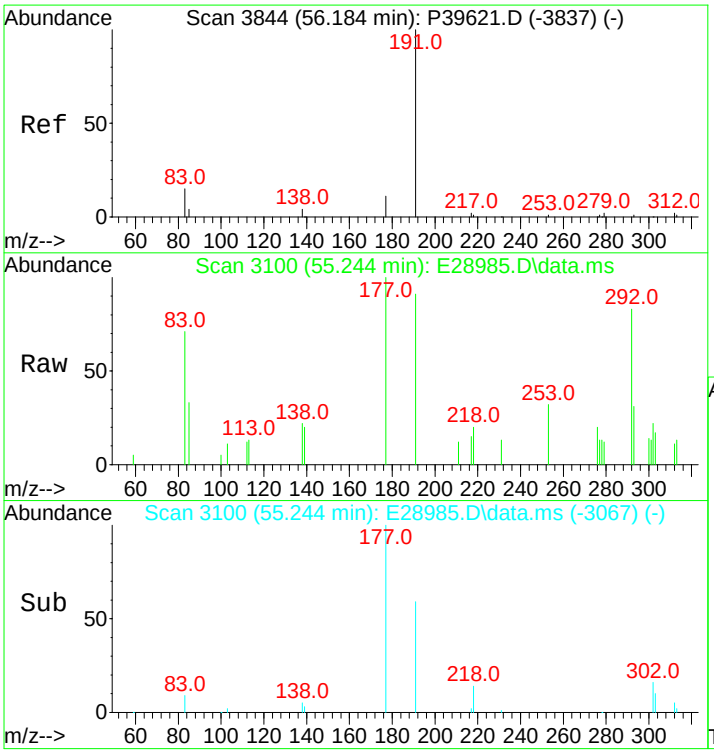




#121
30,31-Bishomohopane-22S (T26)
Concen: 472.68 ng/ml m
RT: 54.822 min Scan# 3072
Delta R.T. -0.045 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

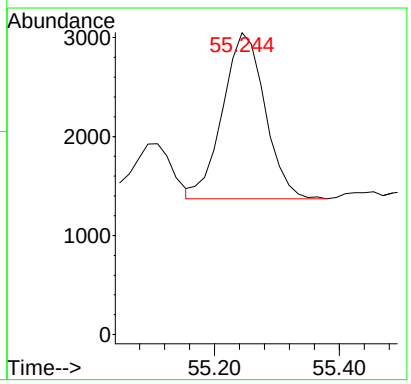
Tgt Ion:191 Resp: 20463

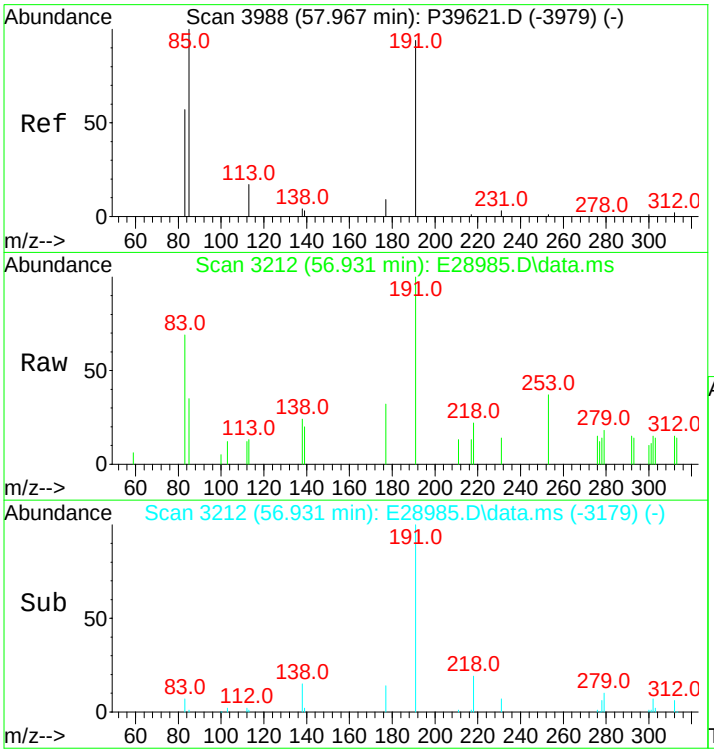




#122
30,31-Bishomohopane-22R (T27)
Concen: 182.02 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

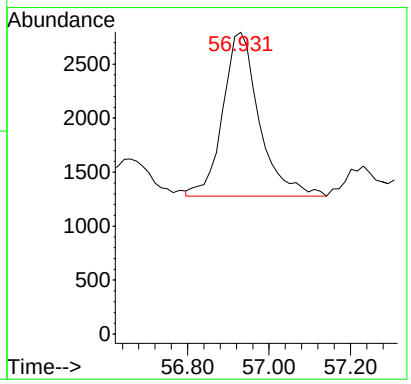
Tgt Ion:191 Resp: 7880

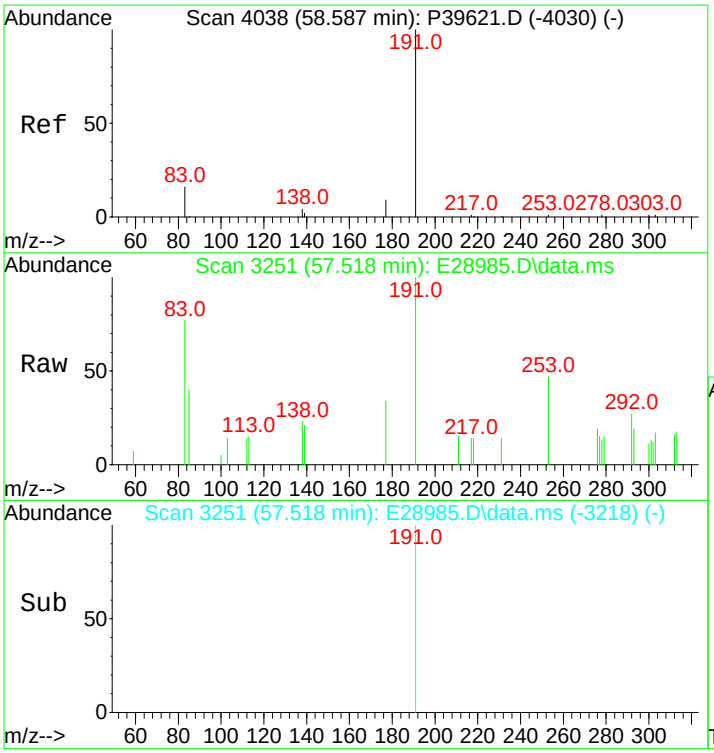




#123
30,31-Trishomohopane-22S (T30)
Concen: 218.91 ng/ml
RT: 56.931 min Scan# 3212
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

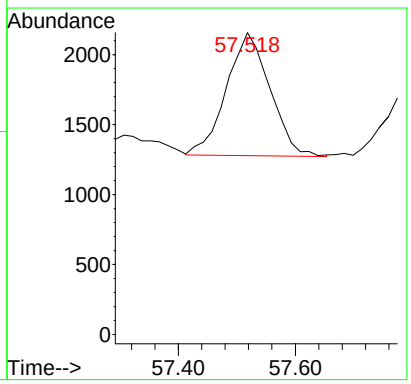
Tgt Ion:191 Resp: 9477

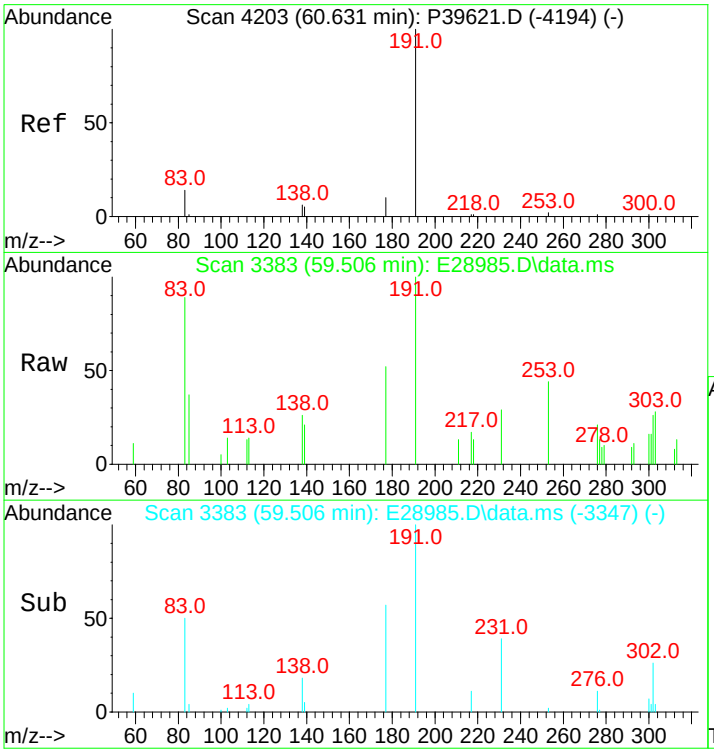




#124
30,31-Trishomohopane-22R (T31)
Concen: 104.50 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

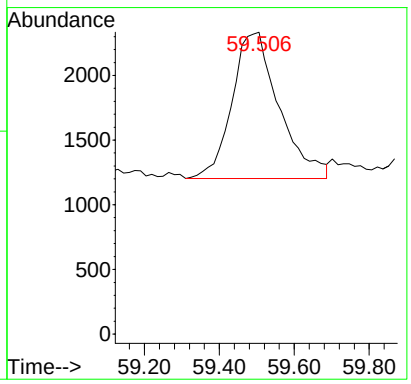
Tgt Ion:191 Resp: 4524

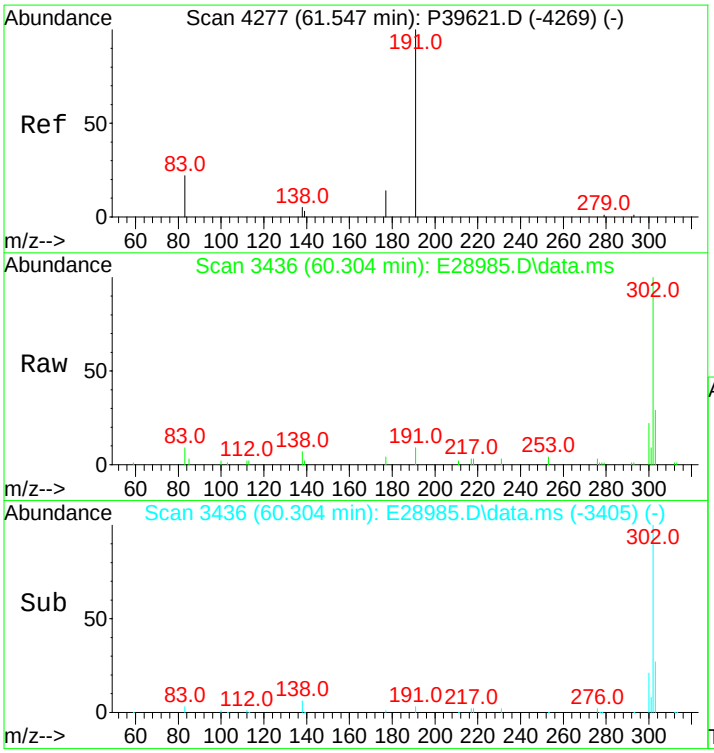




#125
Tetrakishomohopane-22S (T32)
Concen: 228.75 ng/ml
RT: 59.506 min Scan# 3383
Delta R.T. 0.045 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

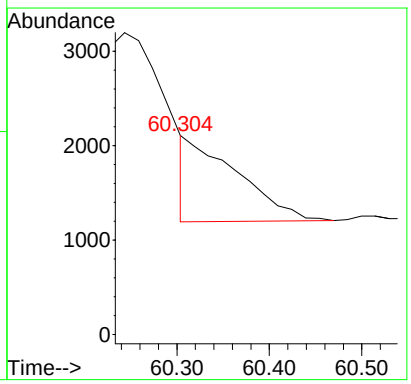
Tgt Ion:191 Resp: 9903

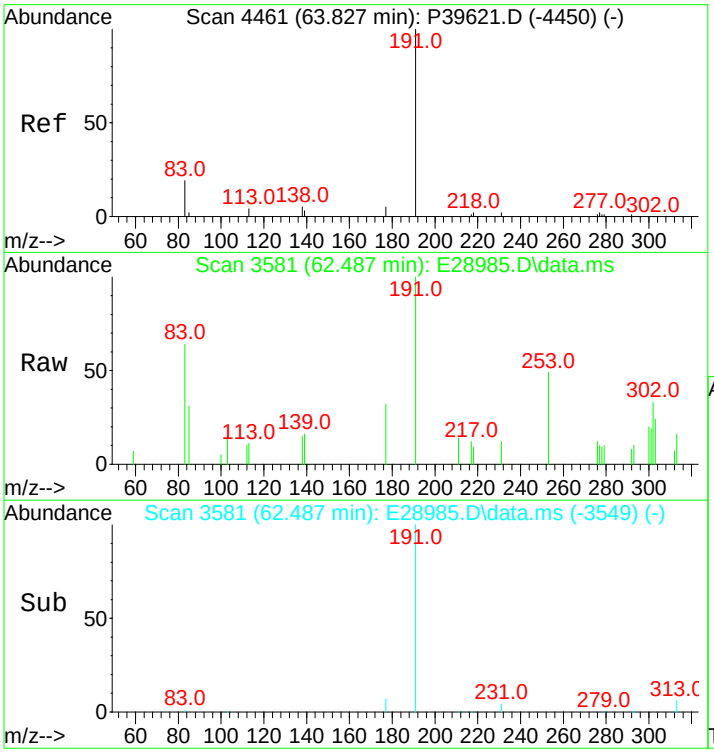




#126
Tetrakishomohopane-22R (T33)
Concen: 77.82 ng/ml m
RT: 60.304 min Scan# 3436
Delta R.T. -0.030 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

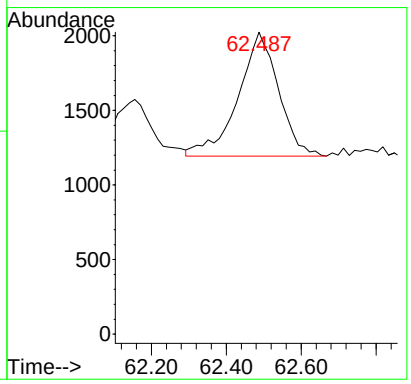
Tgt Ion:191 Resp: 3369

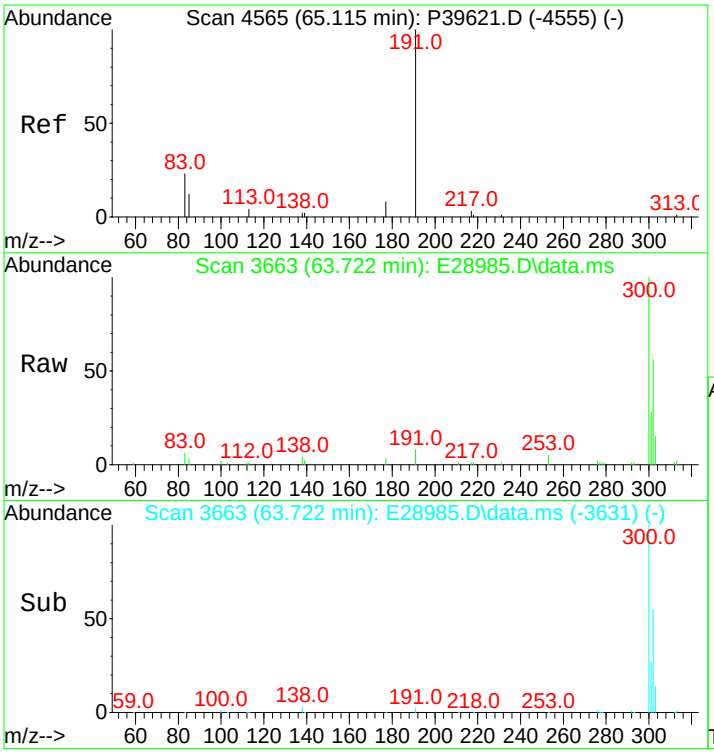




#127
Pentakishomohopane-22S (T34)
Concen: 143.26 ng/ml
RT: 62.487 min Scan# 3581
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

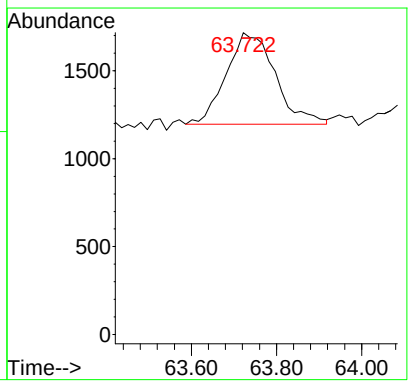
Tgt Ion:191 Resp: 6202

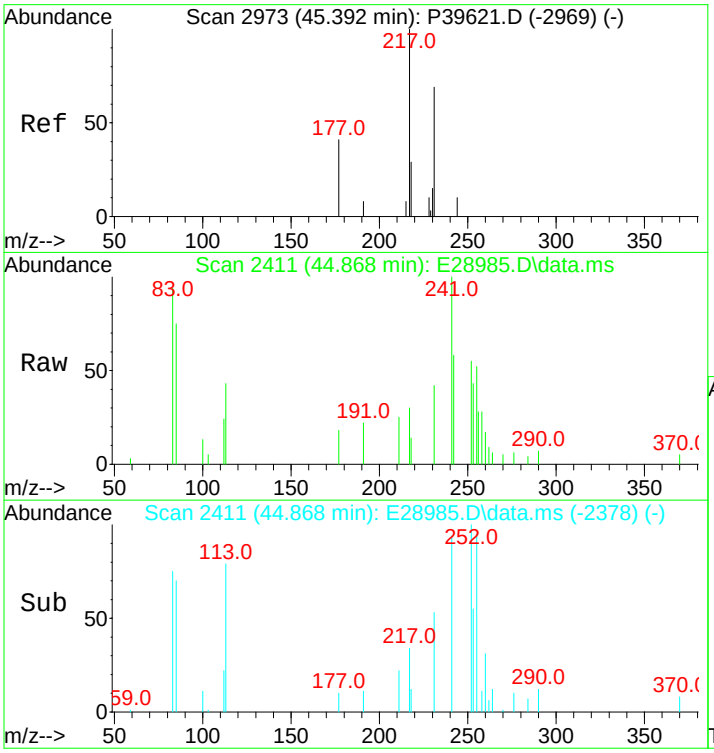




#128
Pentakishomohopane-22R (T35)
Concen: 95.79 ng/ml
RT: 63.722 min Scan# 3663
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

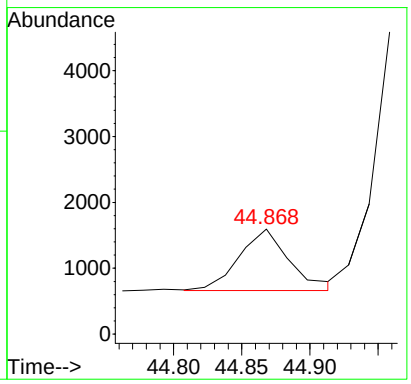
Tgt Ion:191 Resp: 4147

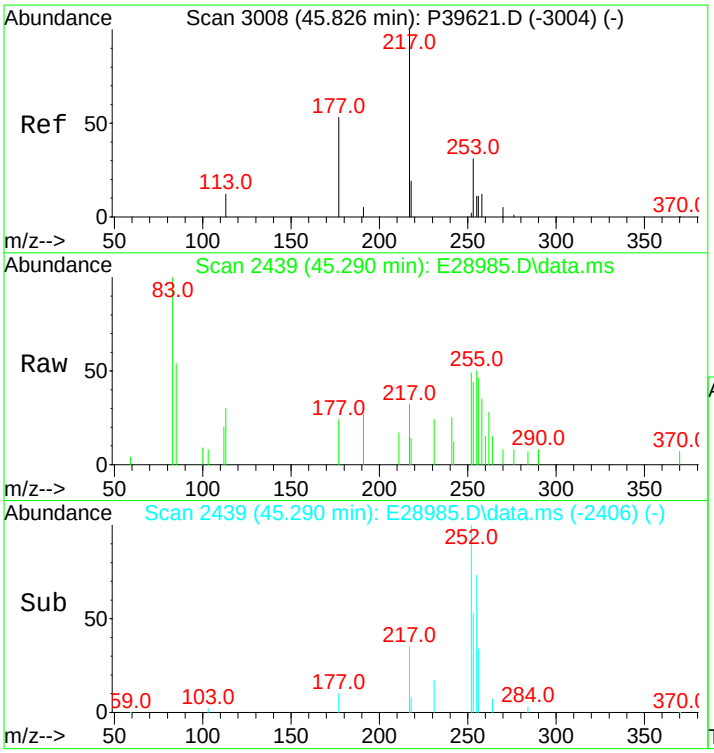




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 105.65 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

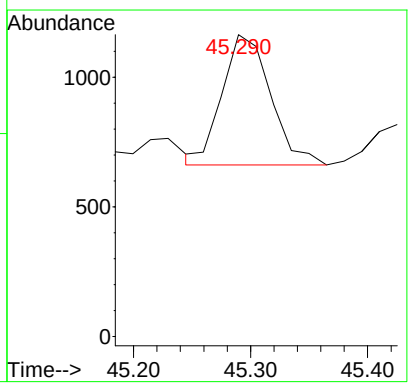
Tgt Ion:217 Resp: 2402

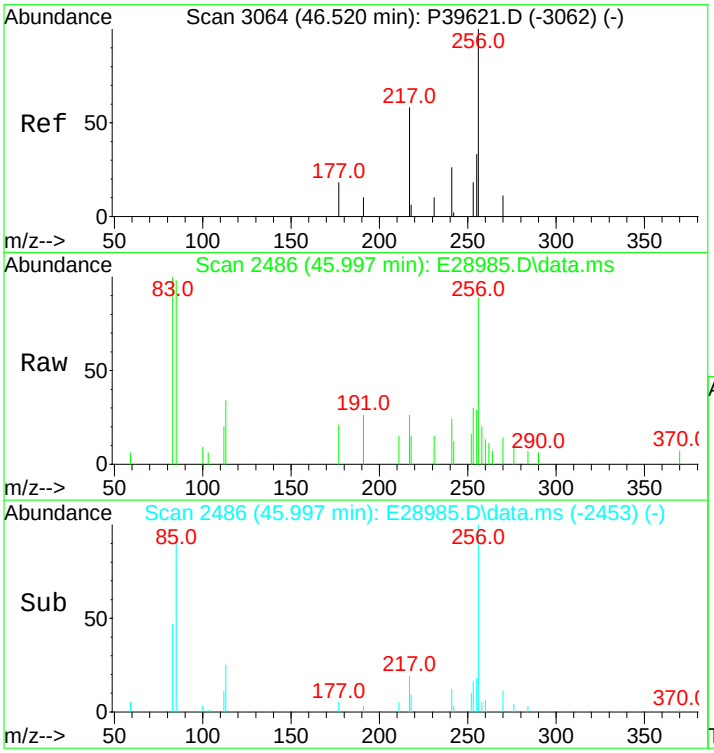




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 63.65 ng/ml
RT: 45.290 min Scan# 2439
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

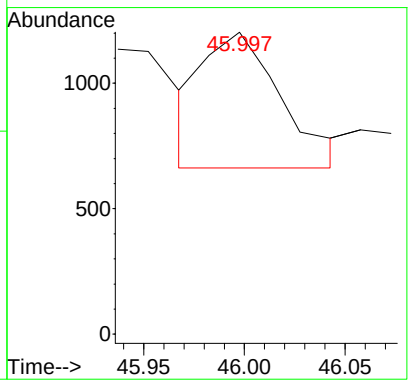
Tgt Ion:217 Resp: 1447

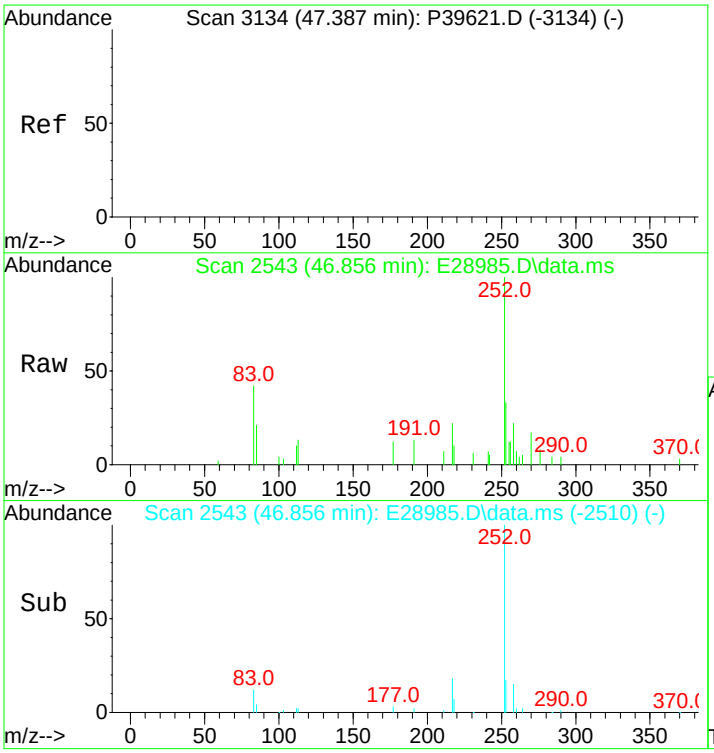




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 64.44 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

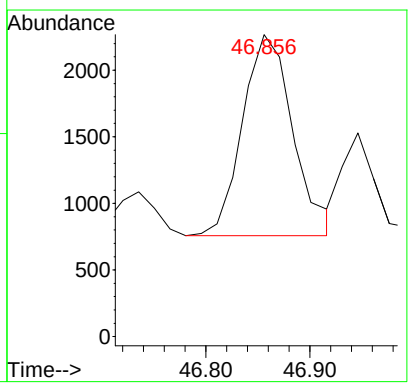
Tgt Ion:217 Resp: 1465

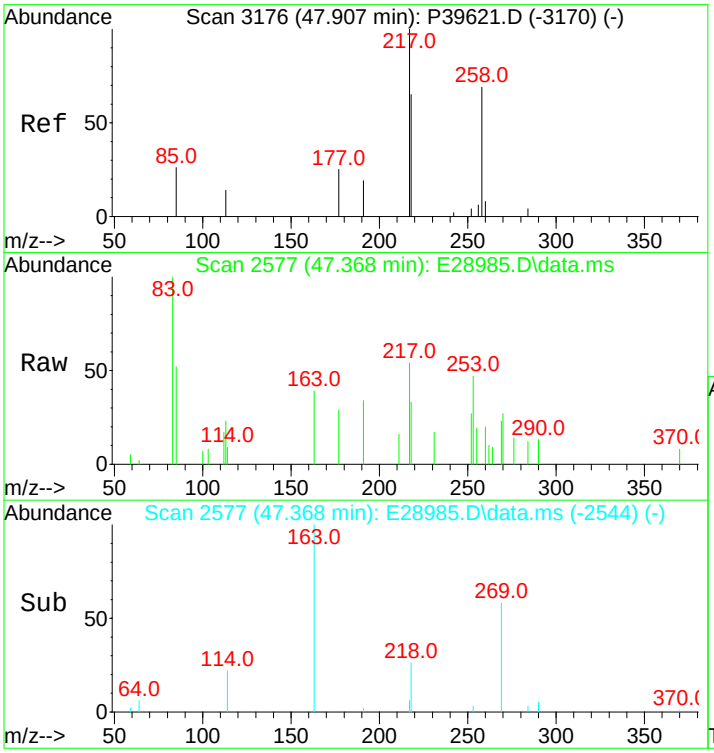




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 224.76 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

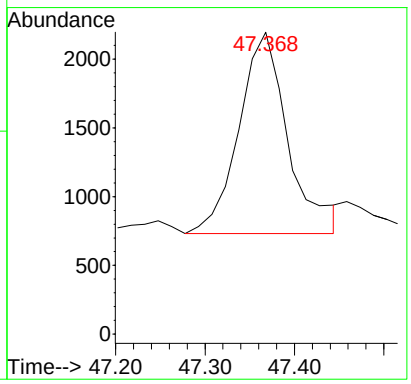
Tgt Ion:217 Resp: 5110

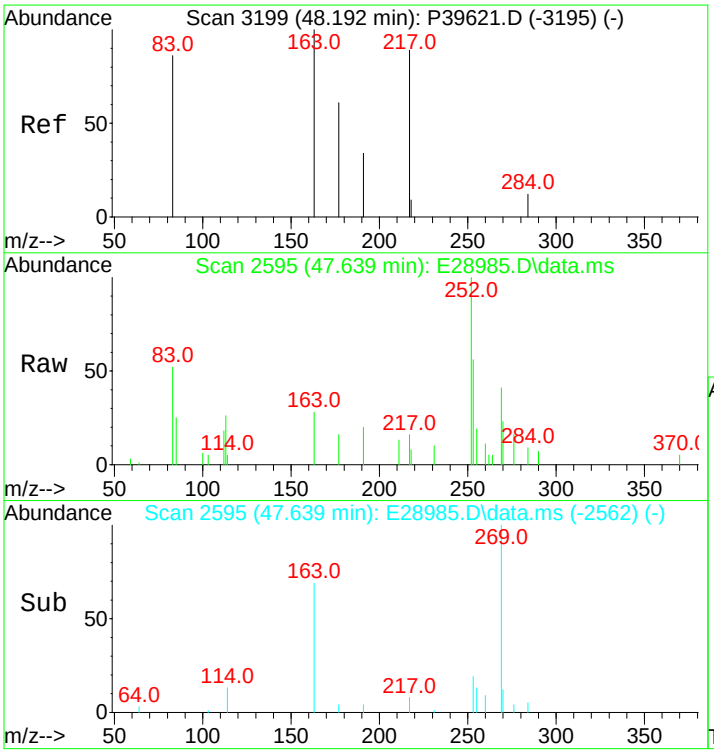




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 246.40 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

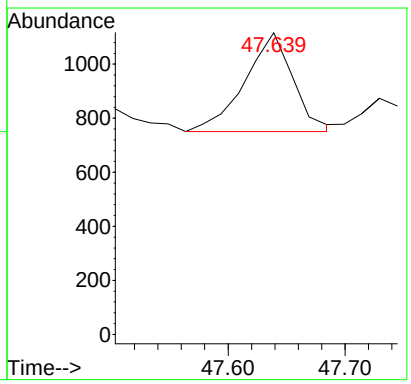
Tgt Ion:217 Resp: 5602

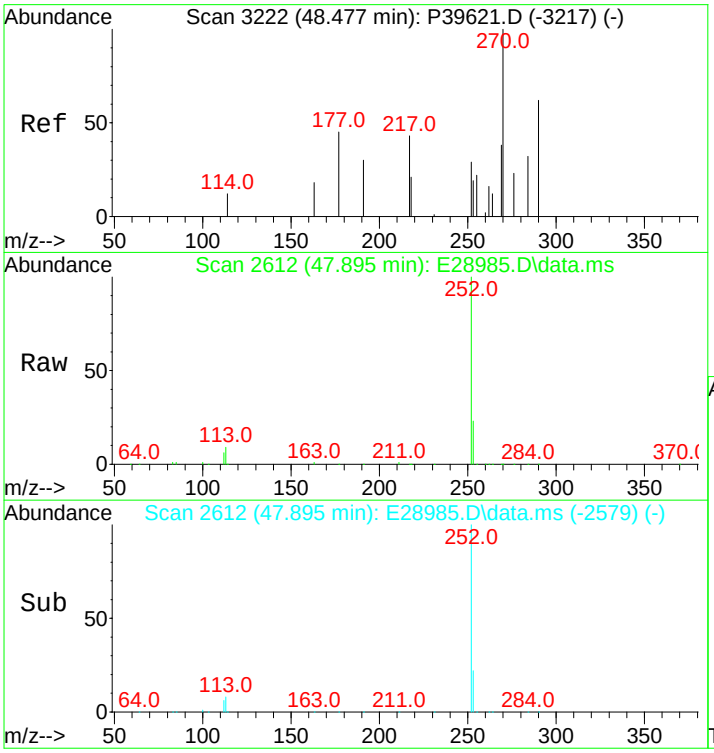




#135
Unknown Sterane (S18)
Concen: 46.27 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

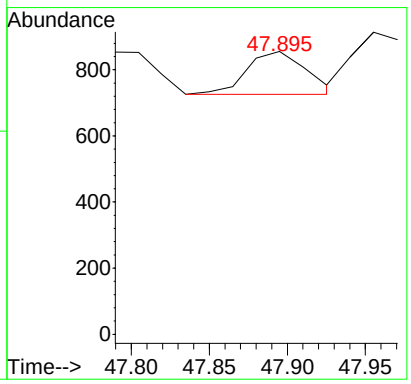
Tgt Ion:217 Resp: 1052

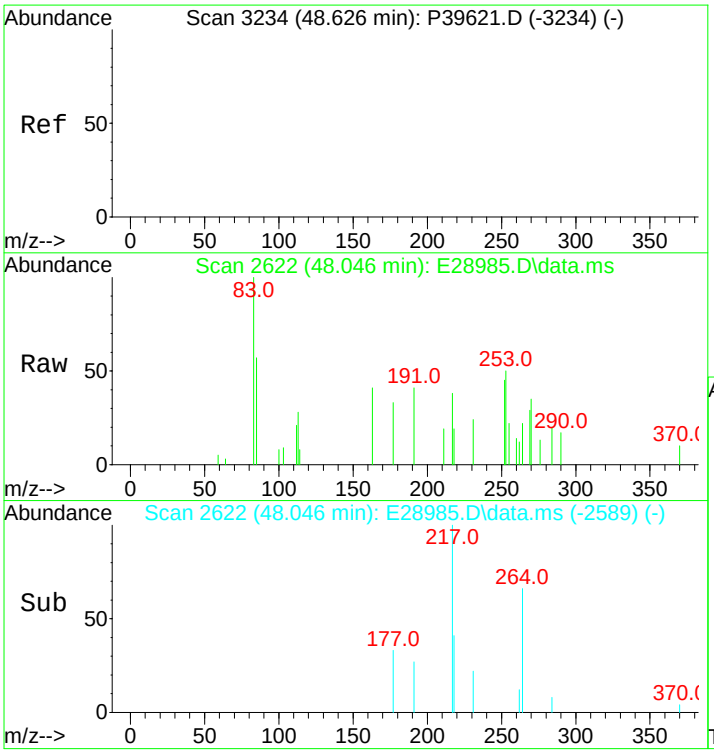




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 15.04 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

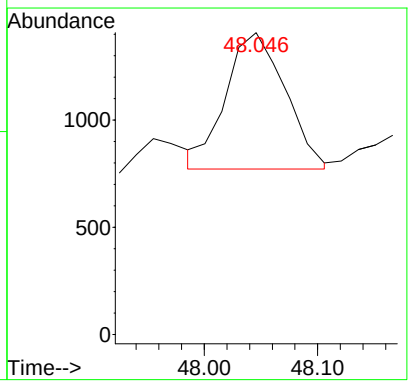
Tgt Ion:217 Resp: 342

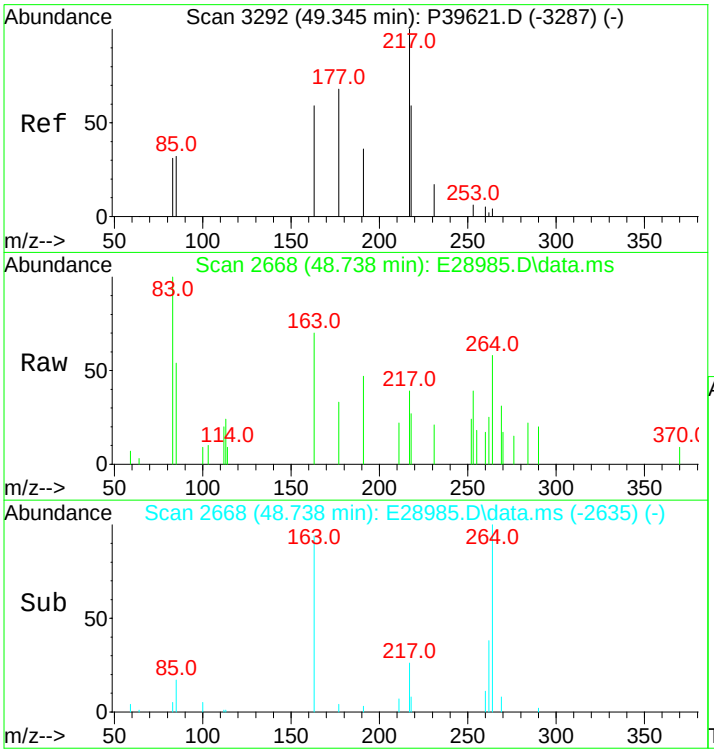




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 101.56 ng/ml m
RT: 48.046 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

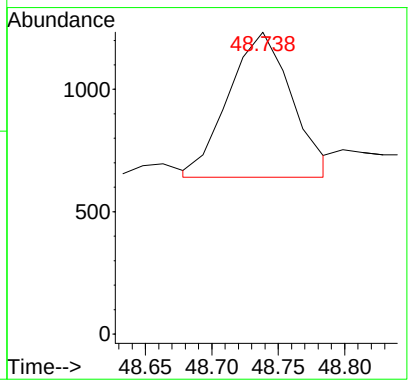
Tgt Ion:217 Resp: 2309

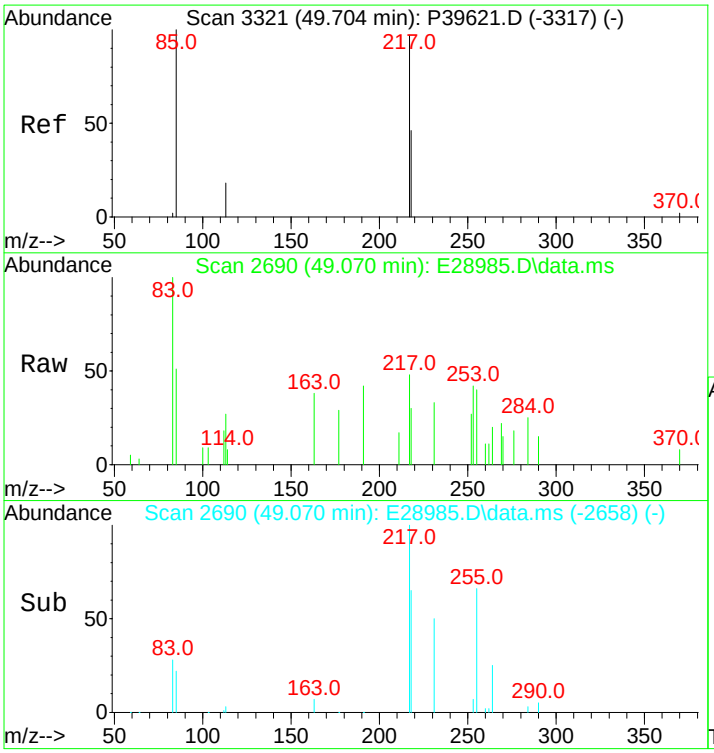




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 86.34 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

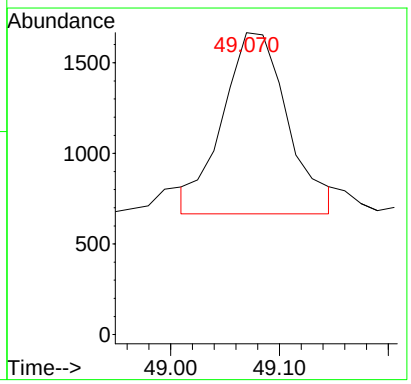
Tgt Ion:217 Resp: 1963

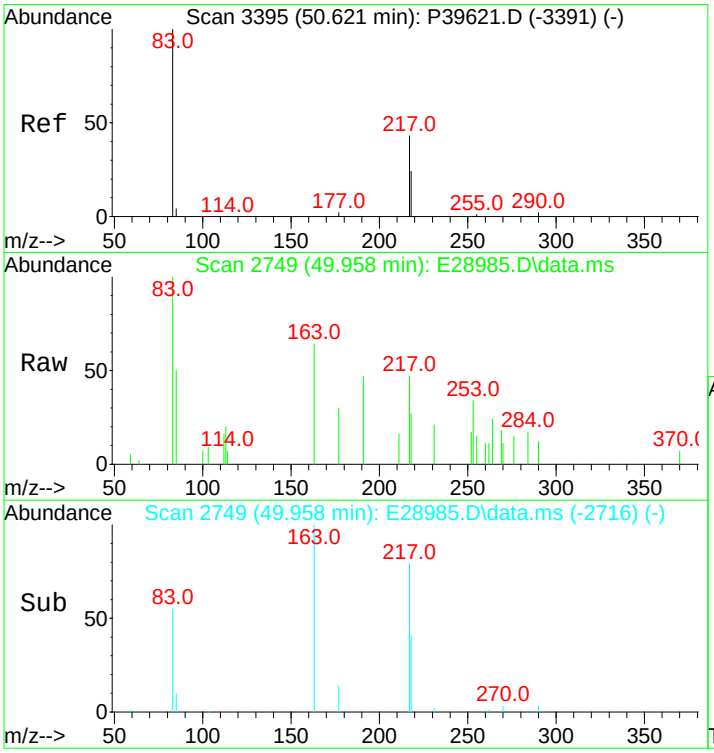




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 183.11 ng/ml m
RT: 49.070 min Scan# 2690
Delta R.T. -0.015 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

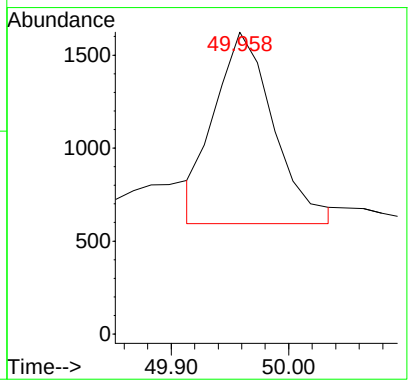
Tgt Ion:217 Resp: 4163

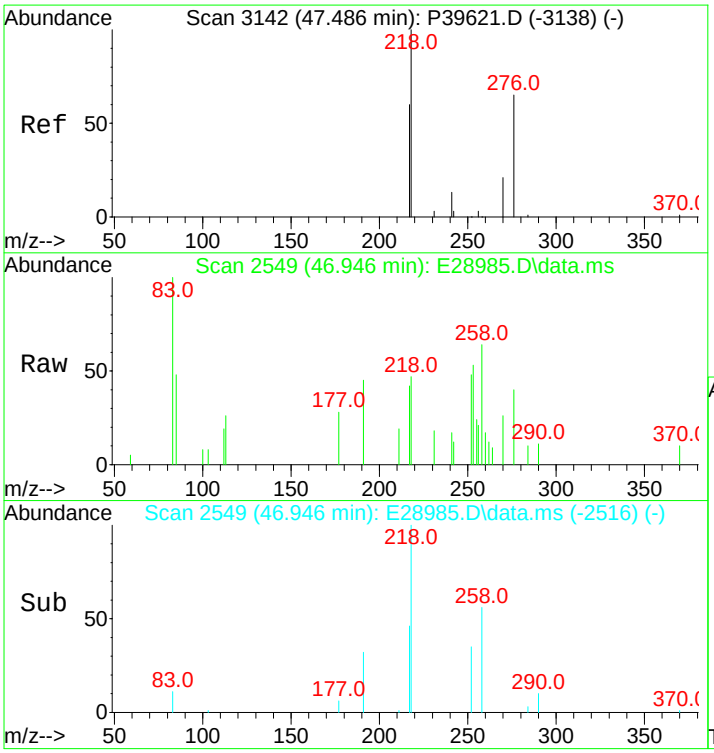




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 158.39 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

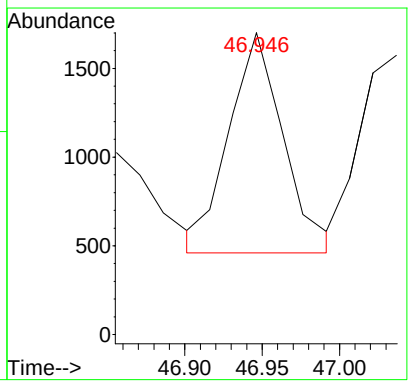
Tgt Ion:217 Resp: 3601

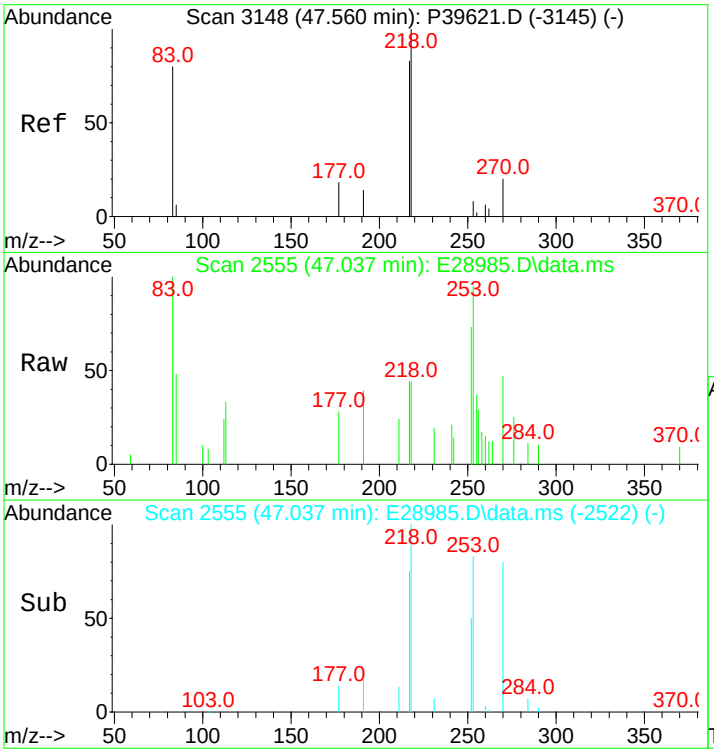




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 133.01 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

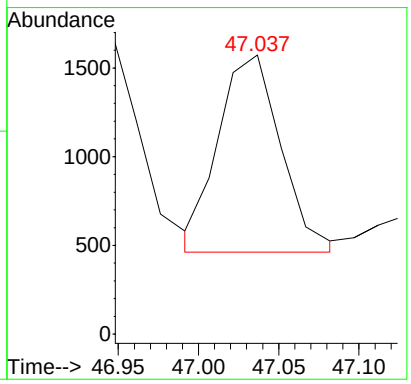
Tgt Ion:218 Resp: 3024

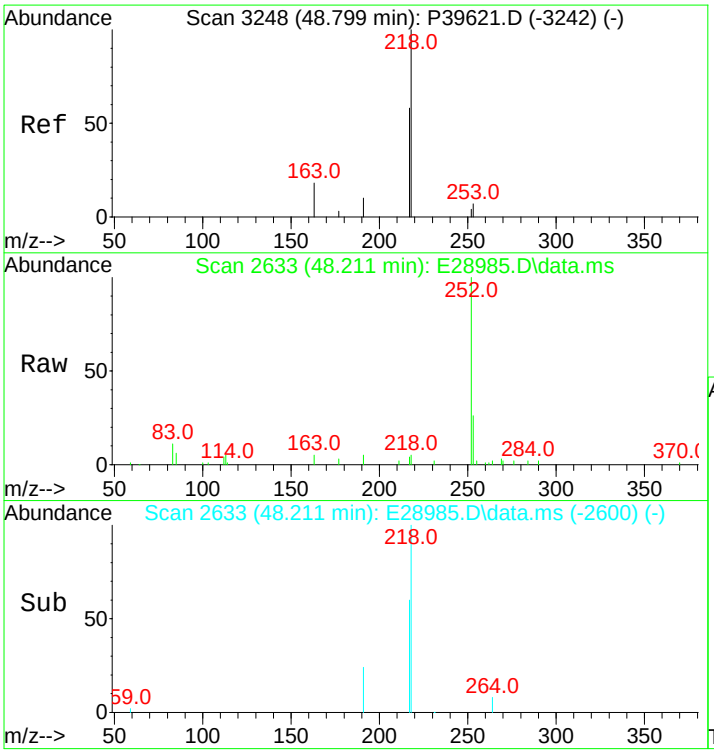




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 132.40 ng/ml m
RT: 47.037 min Scan# 2555
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

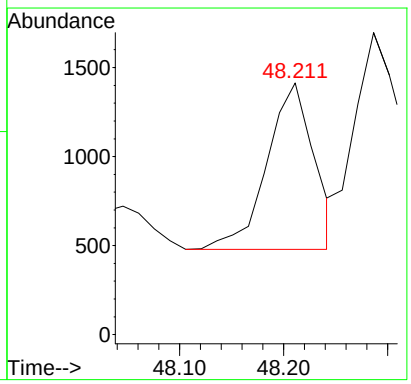
Tgt Ion:218 Resp: 3010

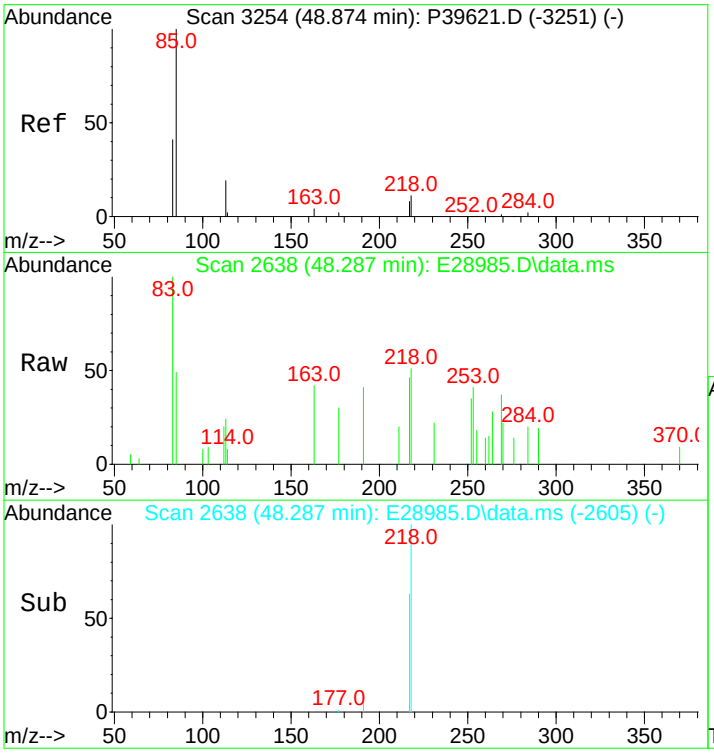




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 129.93 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

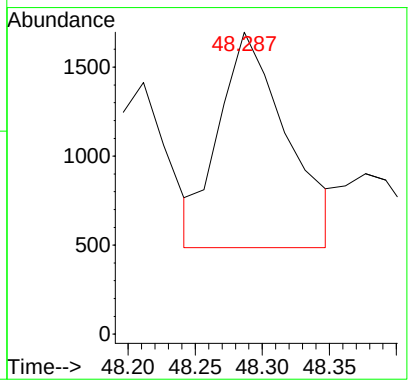
Tgt Ion:218 Resp: 2954

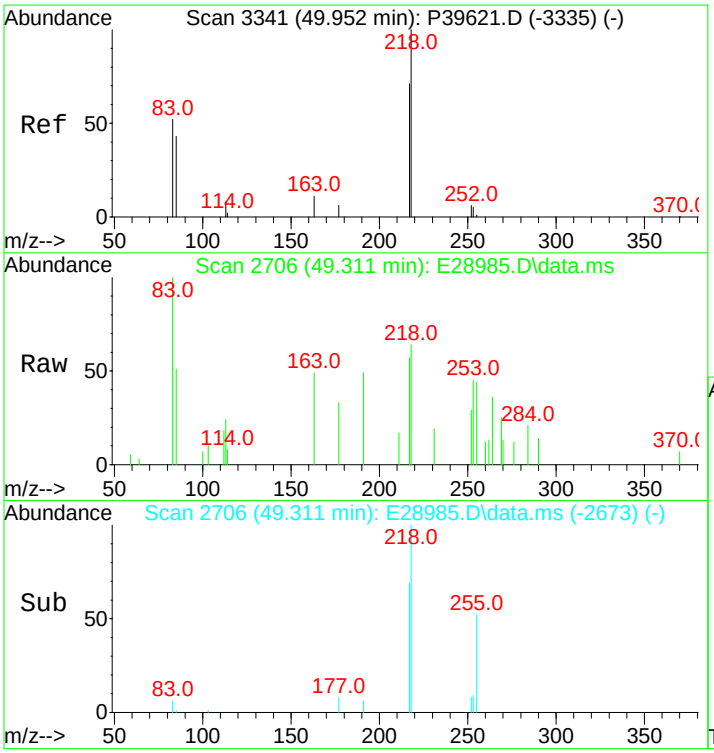




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 187.99 ng/ml m
RT: 48.287 min Scan# 2638
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

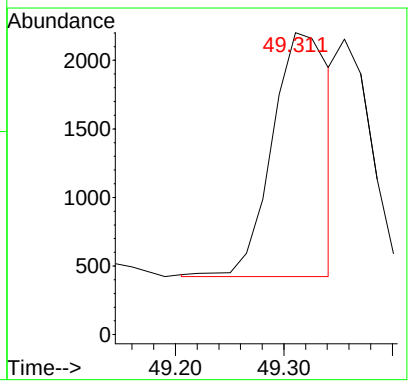
Tgt Ion:218 Resp: 4274

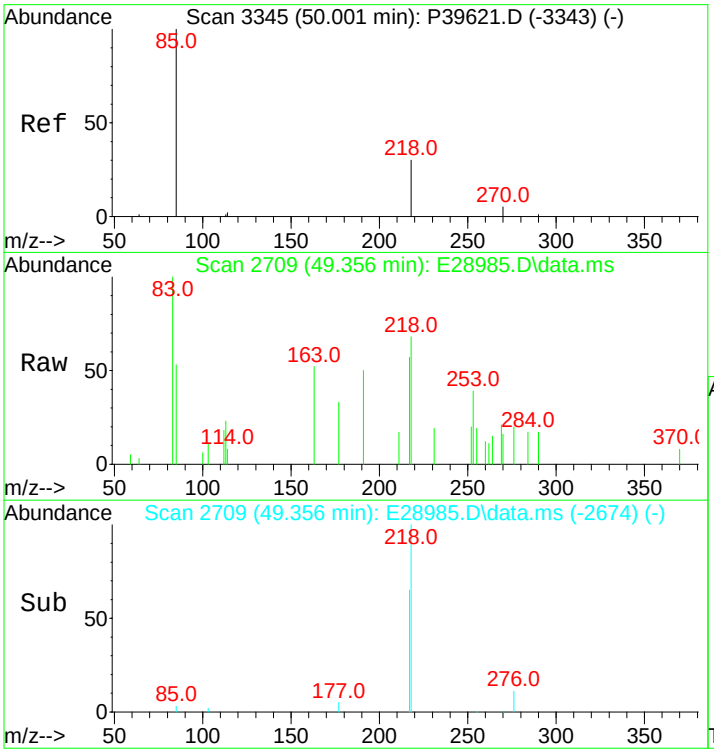




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 285.77 ng/ml m
RT: 49.311 min Scan# 2706
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

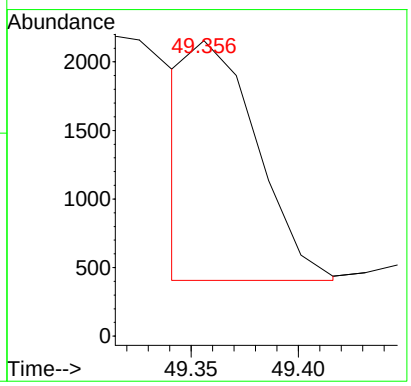
Tgt Ion:218 Resp: 6497

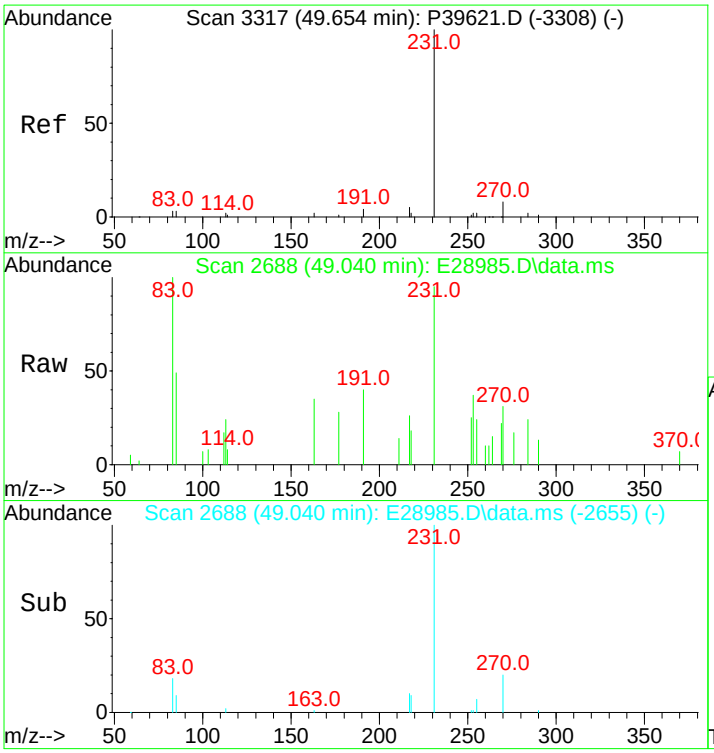




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 166.35 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

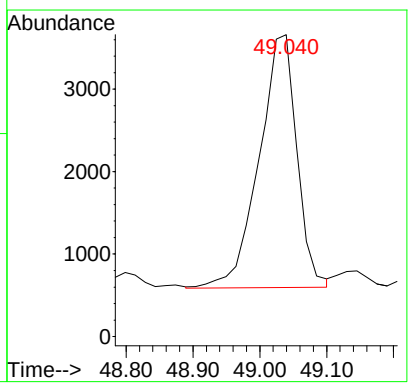
Tgt Ion:218 Resp: 3782

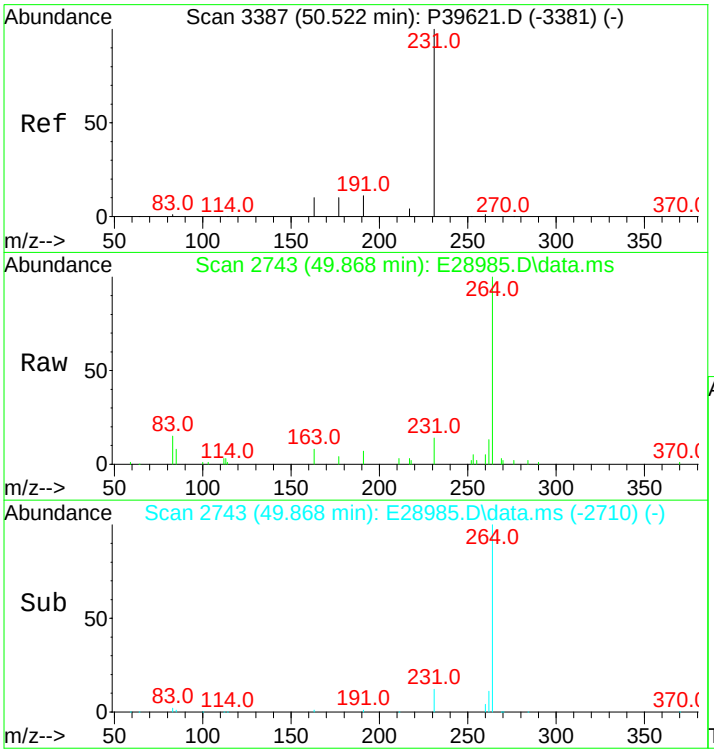




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 529.05 ng/mL
RT: 49.040 min Scan# 2688
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

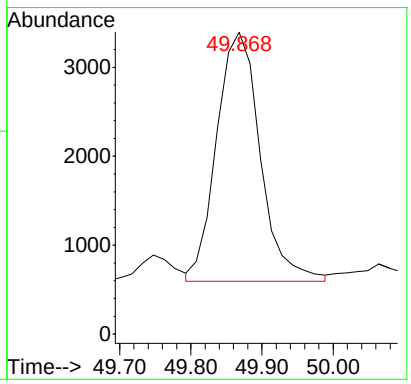
Tgt Ion:231 Resp: 12028

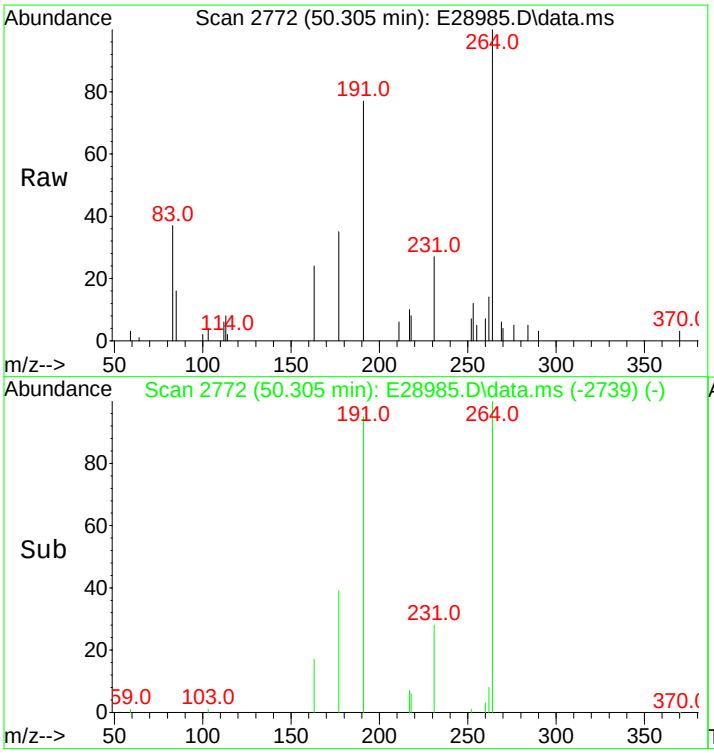




#148
C28,20S-triaromatic steroid
Concen: 524.79 ng/mL m
RT: 49.868 min Scan# 2743
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

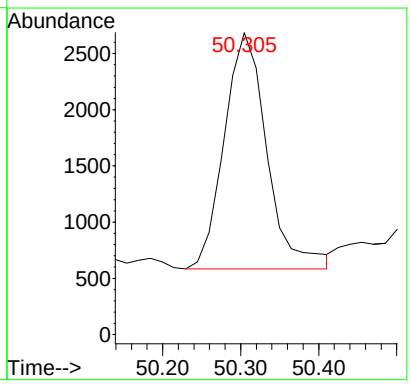
Tgt Ion:231 Resp: 11931

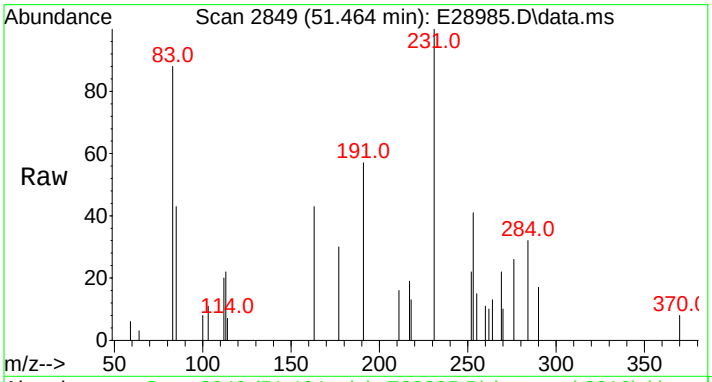




#149
C27,20R-triaromatic steroid
Concen: 352.28 ng/mL
RT: 50.305 min Scan# 2772
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

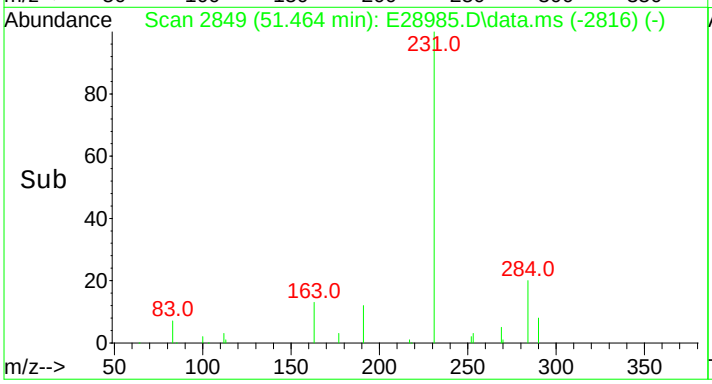
Tgt Ion:231 Resp: 8009

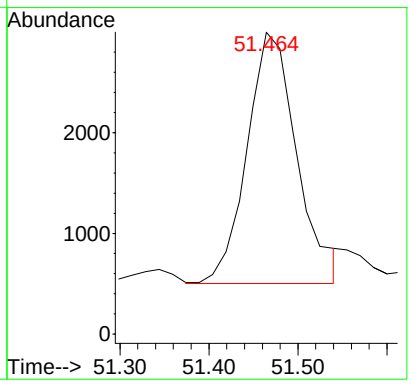




#150
C28,20R-triaromatic steroid
Concen: 427.18 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28985.D
Acq: 15 Nov 2012 9:14 am

Tgt Ion:231 Resp: 9712





Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23829	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	57842	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	30513	364.046	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.40%#			
42) Phenanthrene-d10	32.070	188	38567	449.120	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.91%#			
83) Benzo[b]fluoranthene-d12	46.645	264	54189	456.055	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.61%#			
88) Benzo[a]pyrene-d12	47.789	264	50431	438.033	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.80%#			
129) 5B(H)Cholane - Surr	43.332	217	10884	477.435	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.74%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	75M3	3.935	ng/mL	
5) C1-Decalins	17.799	152	384M4	20.146	ng/mL	
6) C2-Decalins	19.138	166	1527m	80.111	ng/mL	
7) C3-Decalins	21.622	180	2743m	143.906	ng/mL	
8) C4-Decalins	24.995	194	6633M5	347.988	ng/mL	
10) Naphthalene	19.289	128	26355	281.174	ng/mL#	100
11) C1-Naphthalenes	21.999	142	15062M5	160.692	ng/mL	
12) C2-Naphthalenes	24.844	156	55375M5	590.780	ng/mL	
13) C3-Naphthalenes	27.524	170	103655m	1105.865	ng/mL	
14) C4-Naphthalenes	29.963	184	86372M5	921.478	ng/mL	
16) 2-Methylnaphthalene	21.999	142	9069	151.912	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	5861	101.037	ng/mL#	100
18) Benzothiophene	19.515	134	1212	15.641	ng/mL	100
19) C1-Benzo(b)thiophenes	22.375	148	2201M5	28.405	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	7278m	93.925	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18295m	236.103	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	23536M5	303.740	ng/mL	
23) Biphenyl	23.881	154	3540	46.919	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	12327	229.082	ng/mL#	100
25) Dibenzofuran	26.967	168	13435	160.838	ng/mL	95
26) Acenaphthylene	25.582	152	51123	547.059	ng/mL#	100
27) Acenaphthene	26.319	153	18007M3	299.352	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	8414M3	167.128	ng/mL	
29) Fluorene	28.337	166	28256M3	421.168	ng/mL	
30) C1-Fluorenes	30.715	180	31151M5	464.319	ng/mL	
31) C2-Fluorenes	32.928	194	49150M5	732.602	ng/mL	
32) C3-Fluorenes	35.443	208	49842m	742.917	ng/mL	
33) Dibenzothiophene	31.664	184	35720	387.984	ng/mL#	86
34) 4-Methyldibenzothiophene(	33.455	198	23830	258.837	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.801	198	23402M3	254.188	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	11438	124.237	ng/mL#	100
37) OTP	33.862	198	2720M3	29.544	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	69892m	759.154	ng/mL	
39) C2-Dibenzothiophenes	35.156	212	106416M5	1155.871	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	104044m	1130.107	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	65810M5	714.816	ng/mL	
43) Phenanthrene	32.160	178	533026	5690.667	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	72315	772.046	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	88131	940.900	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	35764	381.822	ng/mL#	38
47) 9/4-Methylphenanthrene(9M	34.599	192	84927M3	906.694	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.675	192	54154M3	578.156	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	339484M5	3624.383	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	249071M5	2659.120	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52)	C3-Phenanthrenes/Anthrace	38.273	220	131602M5	1405.003	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.456	234	47739M5	509.669	ng/mL	
55)	Anthracene	32.341	178	121877M3	1505.377	ng/mL	
56)	Carbazole	33.034	167	26246	314.990	ng/mL	99
57)	1-Methylphenanthrene	34.675	192	53666M3	750.994	ng/mL	
58)	Fluoranthene	36.978	202	1549703	14981.554	ng/mL	99
59)	Benzo(b)fluorene	39.493	216	121727M3	1766.004	ng/mL	
60)	Pyrene	37.852	202	1411565	13425.737	ng/mL	97
61)	C1-Fluoranthenes/Pyrenes	39.252	216	730968m	6952.414	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.314	230	311131M5	2959.242	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.212	244	135111m	1285.073	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.506	258	106557M5	1013.489	ng/mL	
66)	Naphthobenzothiophene	41.721	234	97820	943.322	ng/ml#	65
67)	Naphthobenzothiophene-2,1	41.721	234	97820	943.322	ng/mL#	65
68)	Naphthobenzothiophene-1,2	42.052	234	21530	207.623	ng/mL#	17
69)	Naphthobenzothiophene-2,3	42.353	234	26986M3	260.238	ng/mL	
70)	C1-Naphthobenzothiophenes	43.121	248	105609M5	1018.435	ng/ml	
71)	C2-Naphthobenzothiophenes	45.139	262	86019M5	829.520	ng/ml	
72)	C3-Naphthobenzothiophenes	46.765	276	61401M5	592.118	ng/ml	
73)	C4-Naphthobenzothiophenes	47.804	290	44860M5	432.605	ng/mL	
75)	Benz[a]anthracene	42.654	228	744584M3	6610.518	ng/mL	
77)	Chrysene/Triphenylene	42.820	228	749435	6462.812	ng/mL	99
78)	C1-Chrysenes	44.311	242	320742M5	2765.944	ng/mL	
79)	C2-Chrysenes	46.027	256	161527M5	1392.941	ng/mL	
80)	BBF-D12 Surr BKGD	46.645	256	2183	18.825	ng/mL	100
81)	C3-Chrysenes	47.609	270	117306M5	1011.598	ng/mL	
82)	C4-Chrysenes	47.518	284	58797M5	507.041	ng/mL	
84)	Benzo[b]fluoranthene	46.735	252	826534	6313.224	ng/mL	96
85)	Benzo[j]+[k]fluoranthene	46.810	252	740994	5501.272	ng/mL	95
86)	Benzo[a]fluoranthene	47.097	252	186231M3	1382.612	ng/mL	
87)	Benzo[e]pyrene	47.699	252	608936	4763.460	ng/mL	92
89)	Benzo[a]pyrene	47.895	252	899831	7356.302	ng/mL	92
90)	Perylene	48.181	252	249036	1925.329	ng/mL	92
91)	Indeno[1,2,3-cd]pyrene	52.563	276	728103M3	5057.798	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.578	278	196243M3	1280.269	ng/mL	
93)	Benzo[g,h,i]perylene	53.813	276	705412	4544.577	ng/mL	100
94)	Hopane (T19)	51.645	191	32261M3	743.175	ng/mL	
96)	C23 Tricyclic Terpane (T4	40.351	191	8105M3	186.709	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.089	191	4854M3	111.818	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.624	191	5601	129.027	ng/ml	100
99)	C24 Tetracyclic Terpane (	43.889	191	2222M3	51.187	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	2278	52.477	ng/ml	100
101)	C26 Tricyclic Terpane-22R	43.738	191	1809	41.673	ng/ml	100
102)	C28 Tricyclic Terpane-22S	46.042	191	2025	46.649	ng/ml	100
103)	C28 Tricyclic Terpane-22R	46.208	191	2566	59.111	ng/ml	100
104)	C29 Tricyclic Terpane-22S	46.735	191	2562	59.019	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.931	191	2639	60.793	ng/ml	100
106)	18a-22,29,30-Trisnorneoho	47.985	191	4009	92.353	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.106	191	2543M3	58.581	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.347	191	2958	68.141	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	48.512	191	8316M3	191.570	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	49.672	191	4039M3	93.044	ng/ml	
111)	17a(H),21b(H)-25-Norhopan	49.491	191	3305	76.135	ng/ml	100
112)	30-Norhopane (T15)	50.319	191	23892M3	550.384	ng/ml	
113)	18a(H)-30-Norneohopane-C2	50.425	191	4271M3	98.388	ng/ml	
114)	17a(H)-Diahopane (X)	50.545	191	1472	33.909	ng/ml	100
115)	30-Normoretane (T17)	51.073	191	2980	68.648	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	51.479	191	904	20.825	ng/ml	100
117)	Moretane (T20)	52.307	191	3882M3	89.427	ng/ml	
118)	30-Homohopane-22S (T21)	53.377	191	14340	330.341	ng/ml	100
119)	30-Homohopane-22R (T22)	53.602	191	11603	267.291	ng/ml	100

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120) Gammacerane/C32-diahopane	54.114	191	5313	122.392	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.822	191G	19581	451.074	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	8174	188.299	ng/ml	100
123) 30,31-Trishomohopane-22S	56.930	191	9062	208.755	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	4343	100.047	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	9330M3	214.929	ng/ml	
126) Tetrakishomohopane-22R (T	60.243	191G	17274	397.930	ng/ml	100
127) Pentakishomohopane-22S (T	62.487	191	5721	131.791	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	3811	87.791	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2131M3	93.478	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1373	60.228	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1300M3	57.025	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4165	182.701	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4816M3	211.258	ng/ml	
135) Unknown Sterane (S18)	47.639	217	998	43.778	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	497	21.801	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2040	89.486	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	1923M3	84.354	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.069	217	3162M3	138.704	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3314M3	145.371	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2918M3	128.000	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	2955M3	129.623	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2581	113.218	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	3839M3	168.401	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.310	218	5790M3	253.983	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3123M3	136.993	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	11200	491.297	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	9573M3	419.927	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	7234M3	317.325	ng/mL	
150) C28,20R-triaromatic stero	51.464	231	7986M3	350.312	ng/mL	

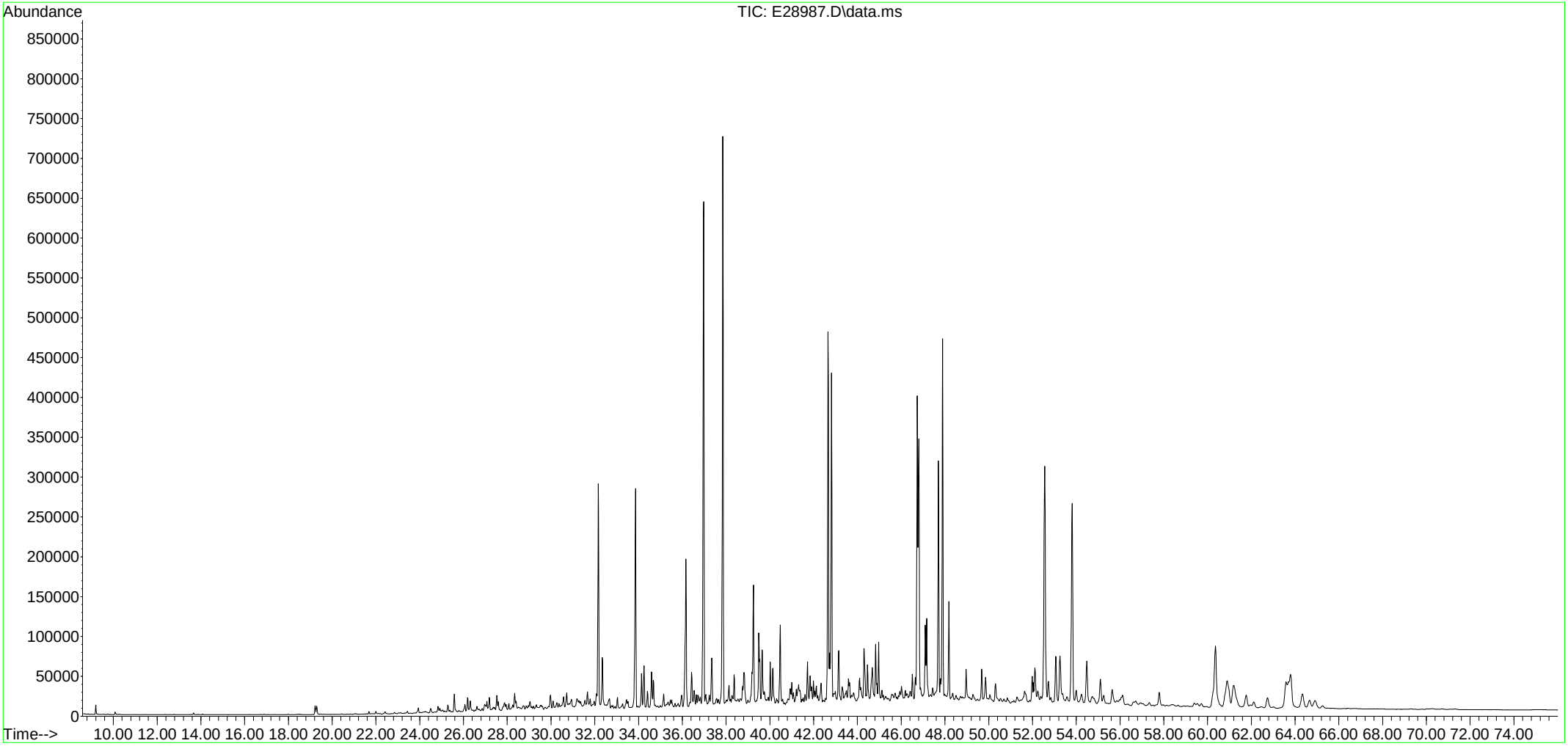
(#) = qualifier out of range (m) = manual integration (+) = signals summed

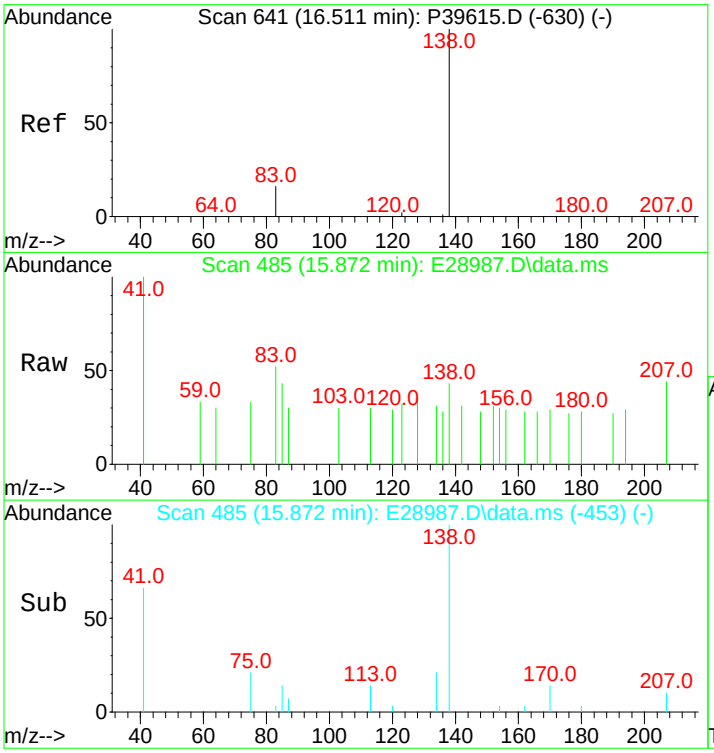
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28987.D
Acq On : 15 Nov 2012 10:42 am
Operator : AC
Sample : 1210081-05
Misc : 1X
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 16 13:33:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

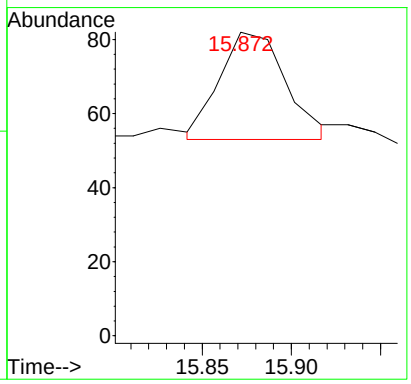
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

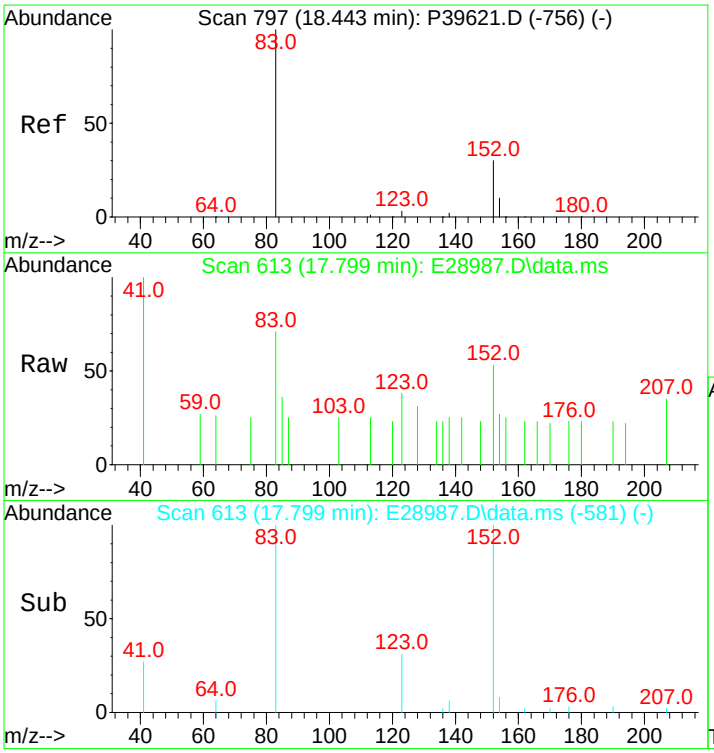




#3
trans-Decalin
Concen: 3.93 ng/mL m
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

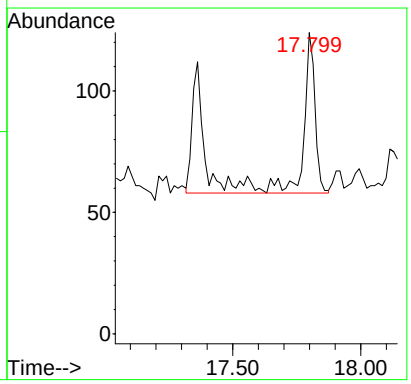
Tgt Ion:138 Resp: 75

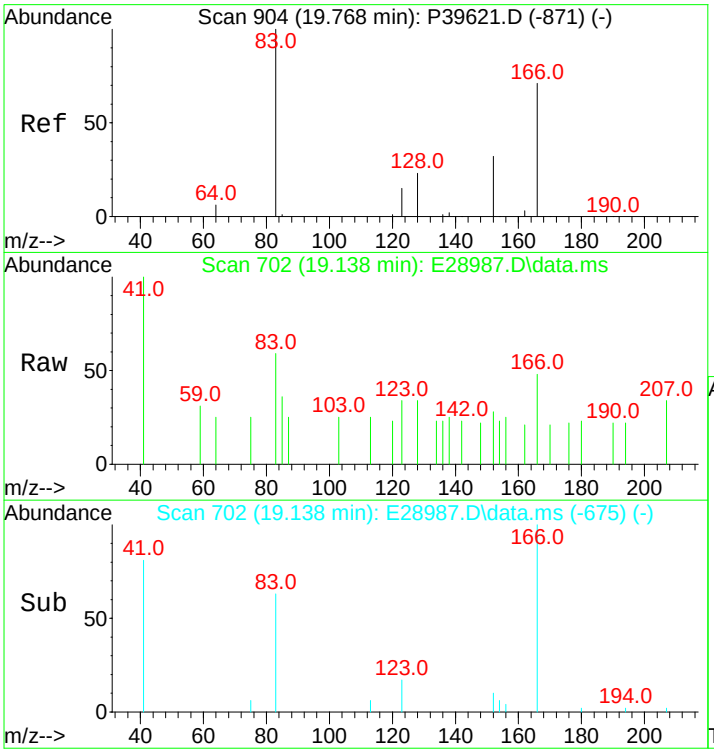




#5
C1-Decalins
Concen: 20.15 ng/mL m
RT: 17.799 min Scan# 613
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

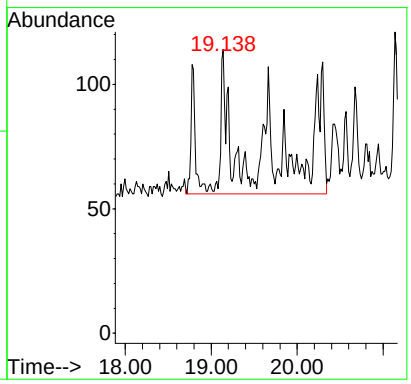
Tgt Ion:152 Resp: 384

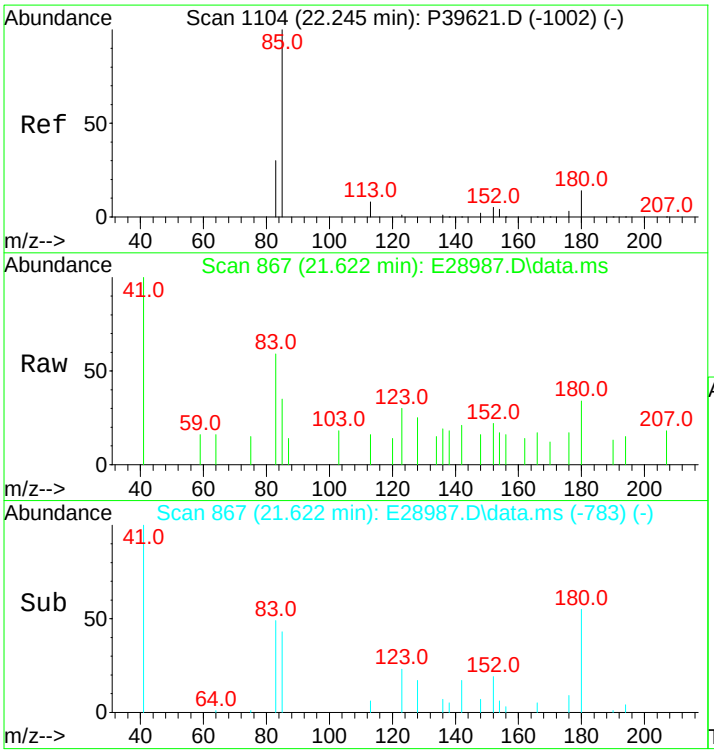




#6
C2-Decalins
Concen: 80.11 ng/mL m
RT: 19.138 min Scan# 702
Delta R.T. -0.204 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

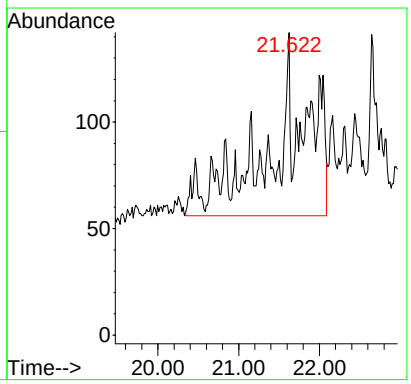
Tgt Ion:166 Resp: 1527

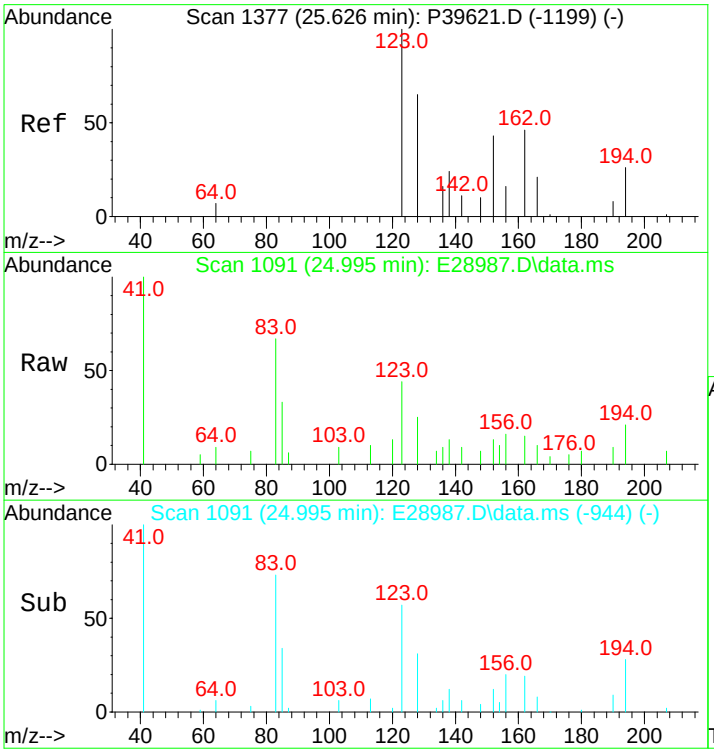




#7
C3-Decalins
Concen: 143.91 ng/mL m
RT: 21.622 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

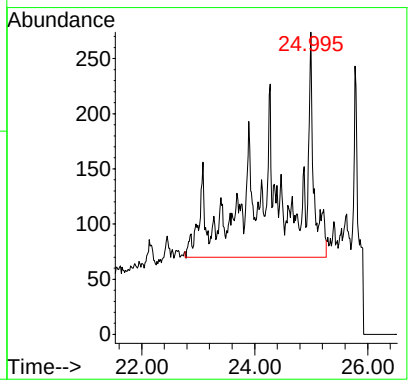
Tgt Ion:180 Resp: 2743

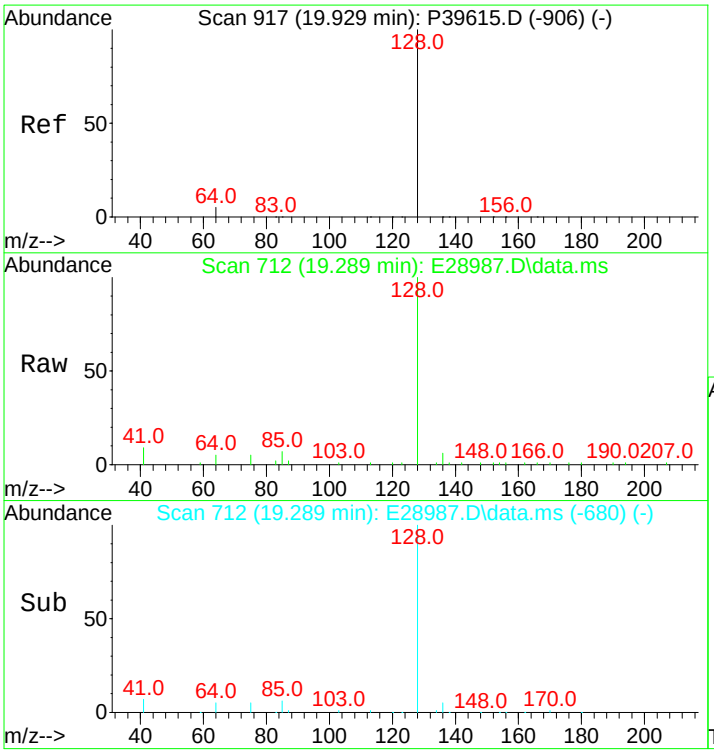




#8
C4-Decalins
Concen: 347.99 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:194 Resp: 6633

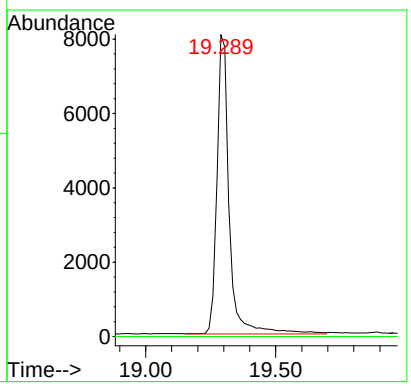


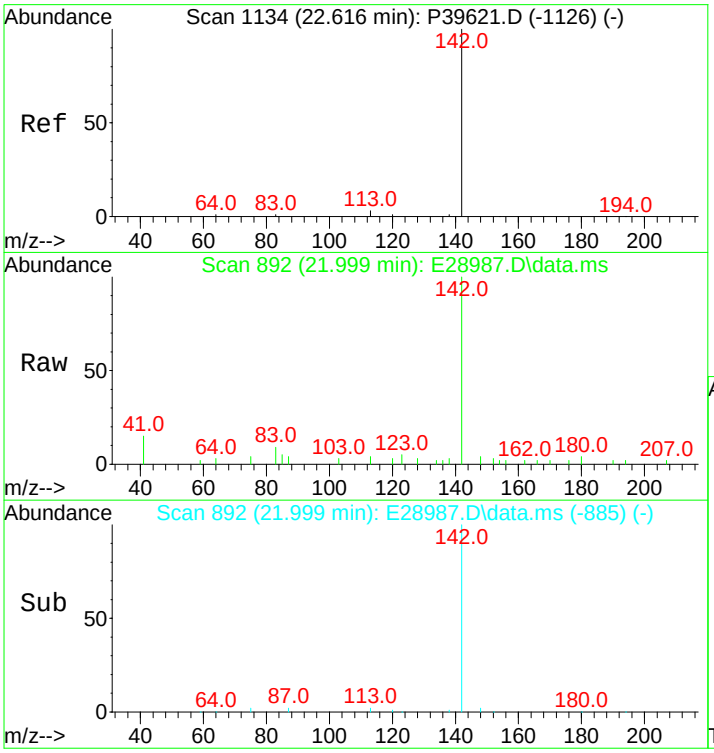


#10
Naphthalene
Concen: 281.17 ng/mL
RT: 19.289 min Scan# 712
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:128 Resp: 26355

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

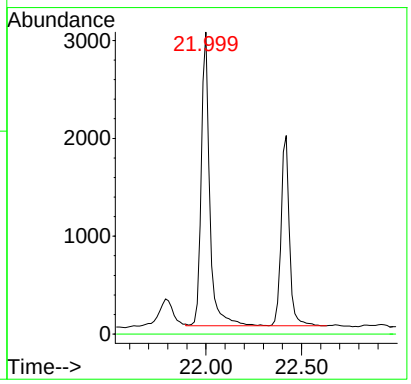


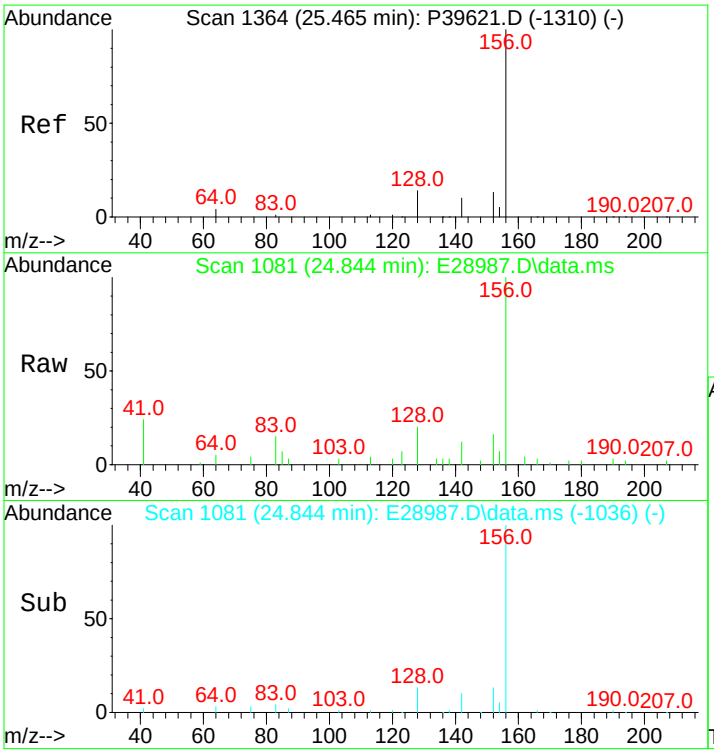


#11
C1-Naphthalenes
Concen: 160.69 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:142 Resp: 15062

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

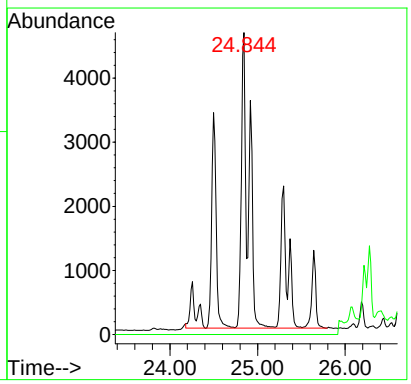


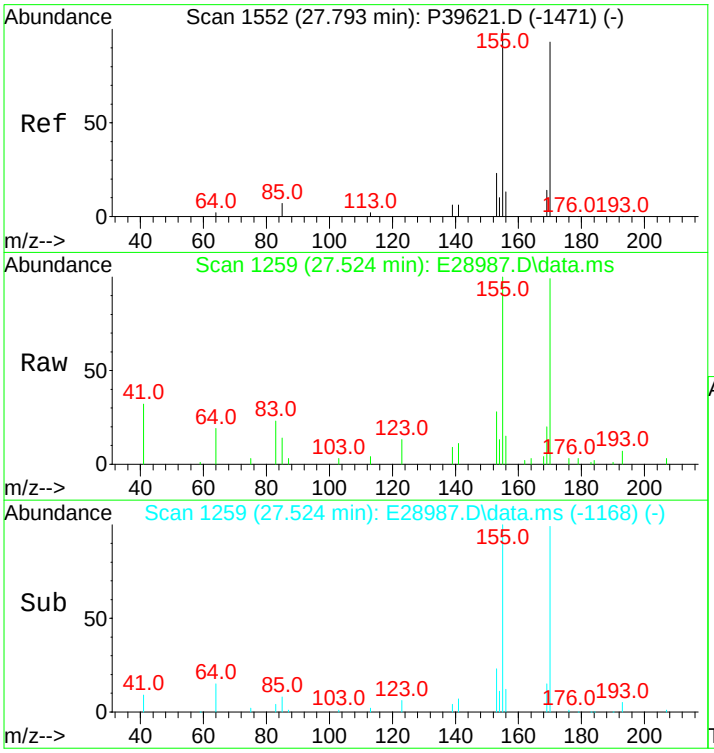


#12
C2-Naphthalenes
Concen: 590.78 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:156 Resp: 55375

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

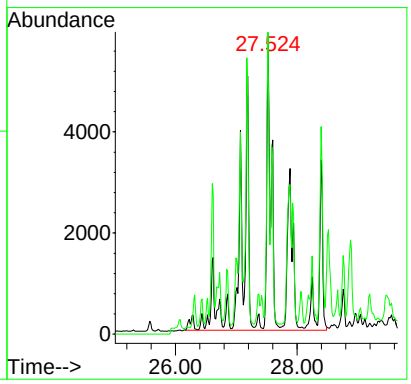


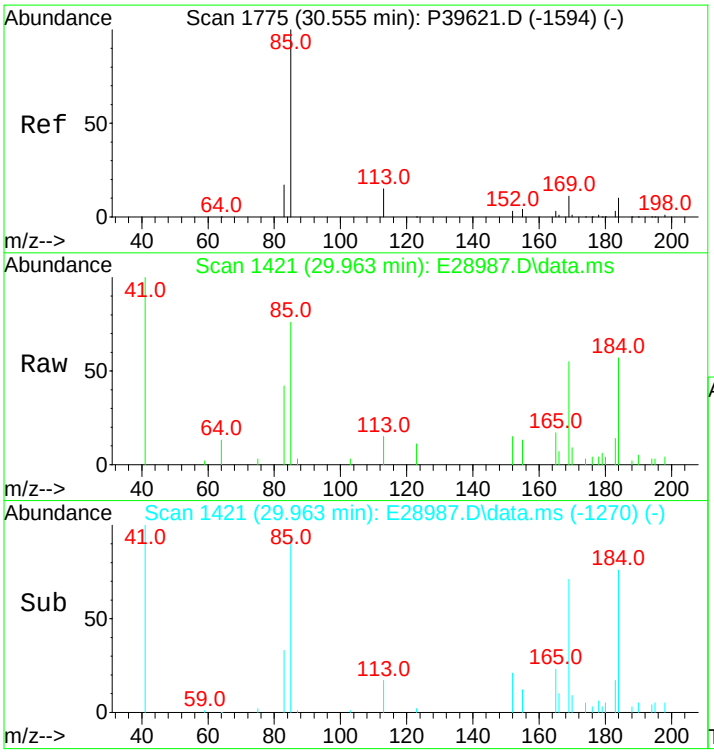


#13
C3-Naphthalenes
Concen: 1105.87 ng/mL m
RT: 27.524 min Scan# 1259
Delta R.T. 0.344 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:170 Resp: 103655

Ion	Ratio	Lower	Upper
170	100		
155	14.8	66.8	100.2#

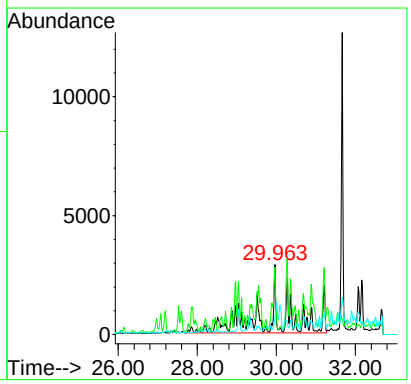


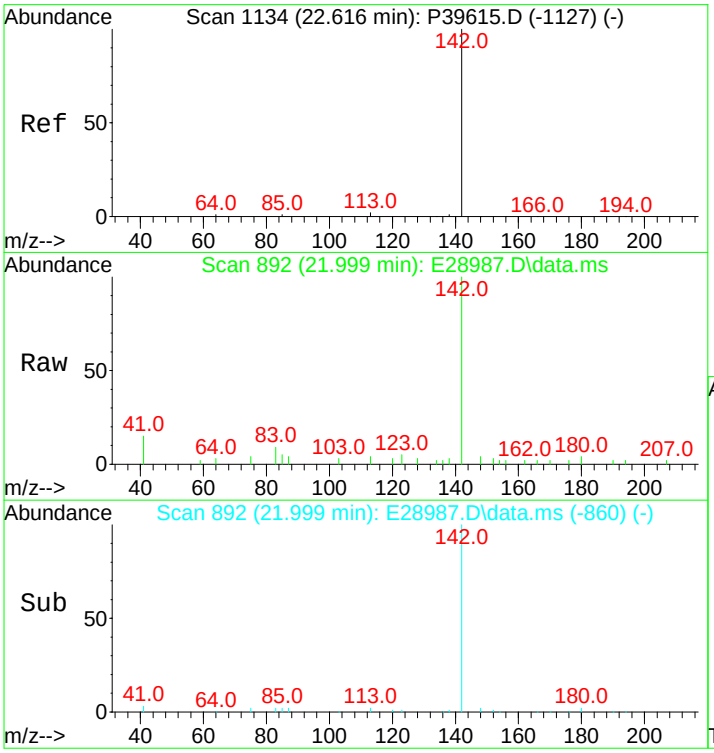


#14
C4-Naphthalenes
Concen: 921.48 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:184 Resp: 86372

Ion	Ratio	Lower	Upper
184	100		
169	4.8	78.7	118.1#
183	1.4	26.7	40.1#

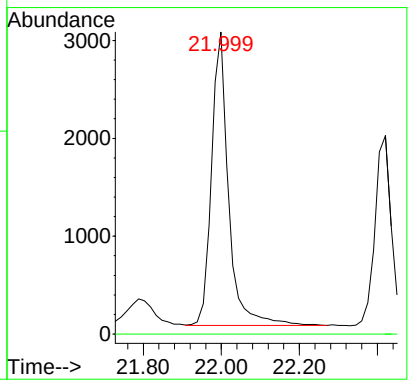


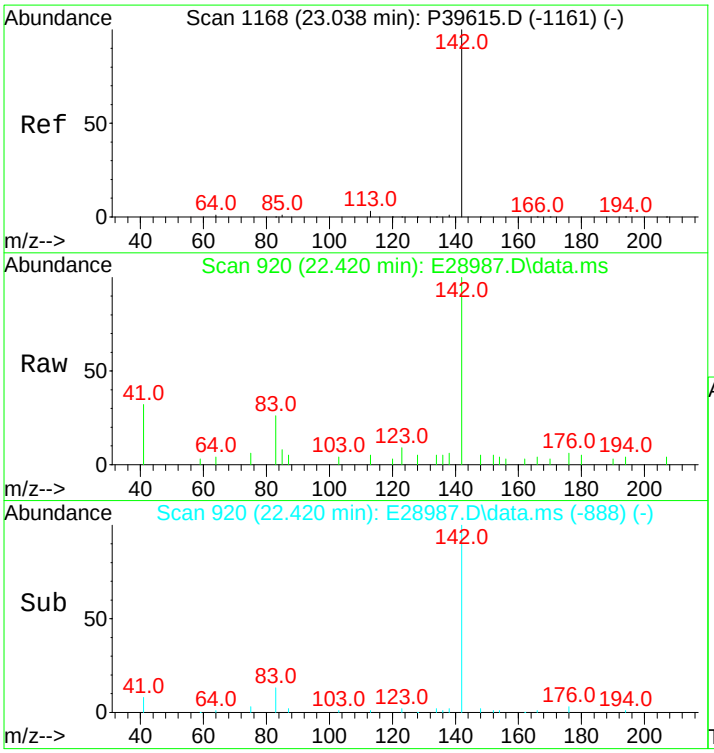


#16
2-Methylnaphthalene
Concen: 151.91 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:142 Resp: 9069

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

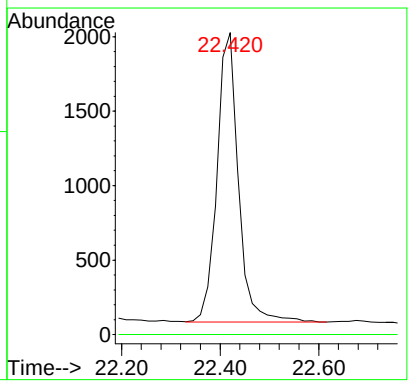


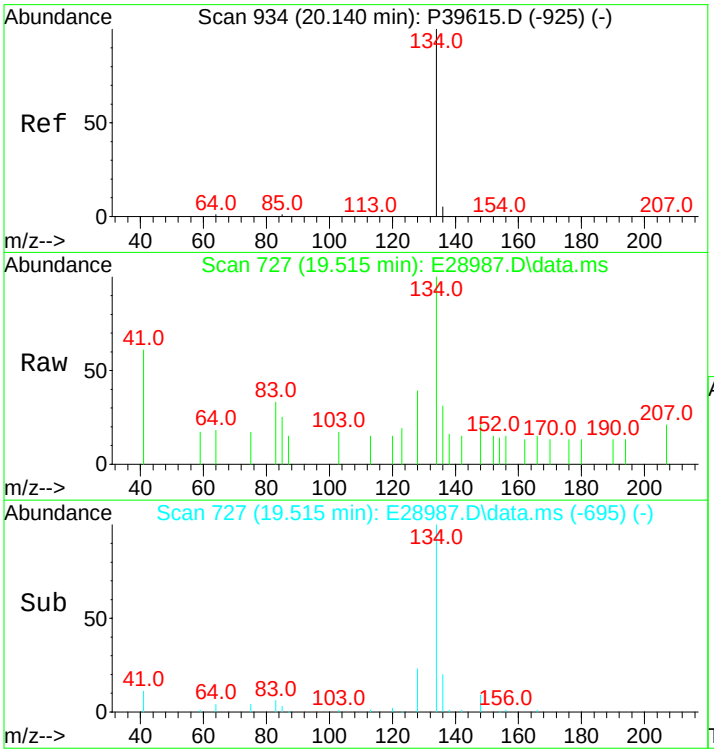


#17
1-Methylnaphthalene
Concen: 101.04 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:142 Resp: 5861

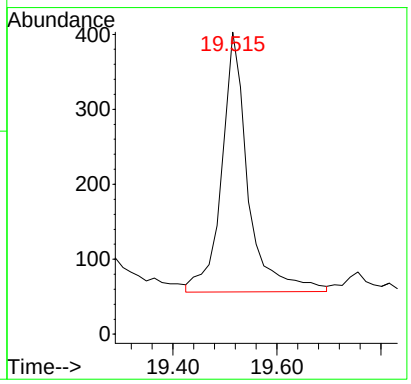
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

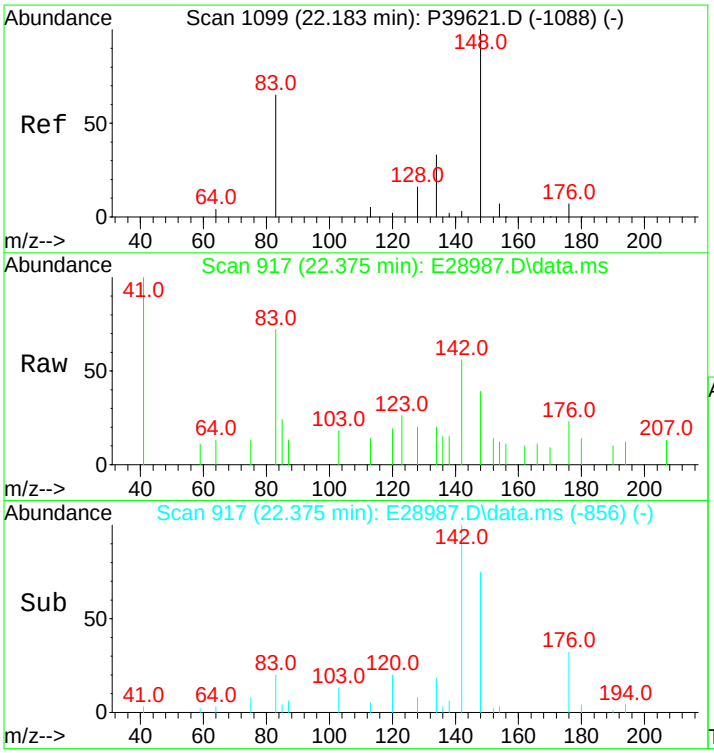




#18
Benzothiophene
Concen: 15.64 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

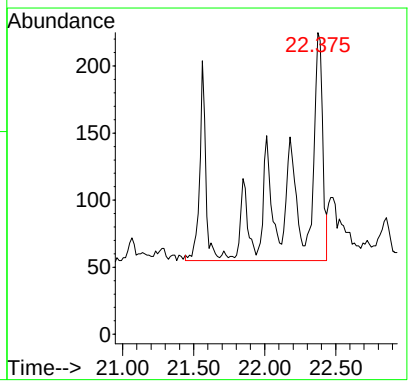
Tgt Ion:134 Resp: 1212

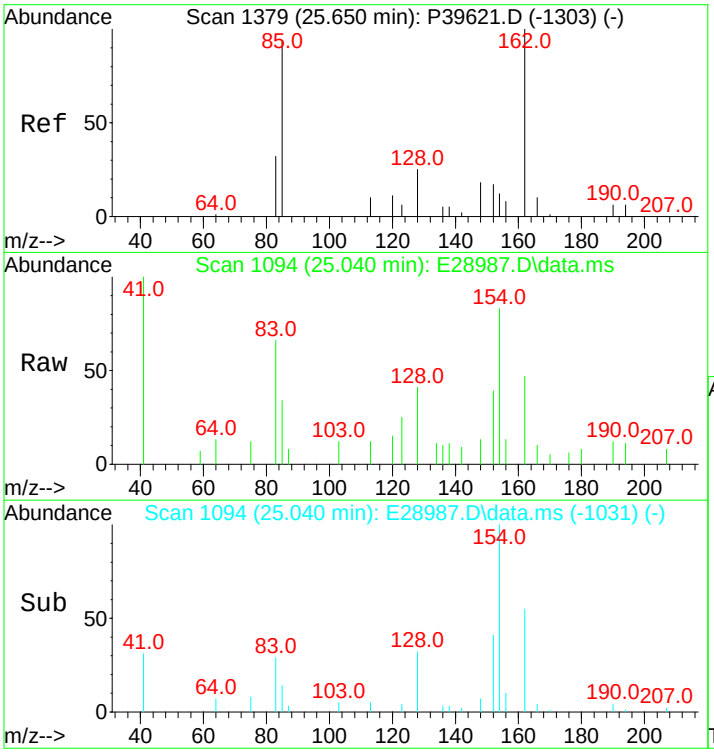




#19
C1-Benzo(b)thiophenes
Concen: 28.40 ng/mL m
RT: 22.375 min Scan# 917
Delta R.T. 0.674 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

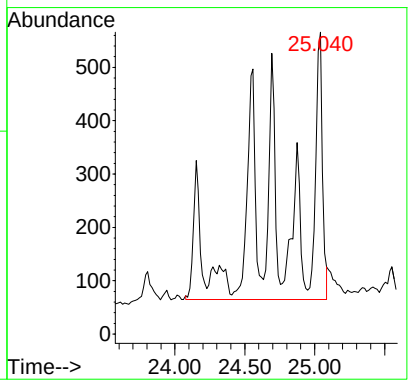
Tgt Ion:148 Resp: 2201

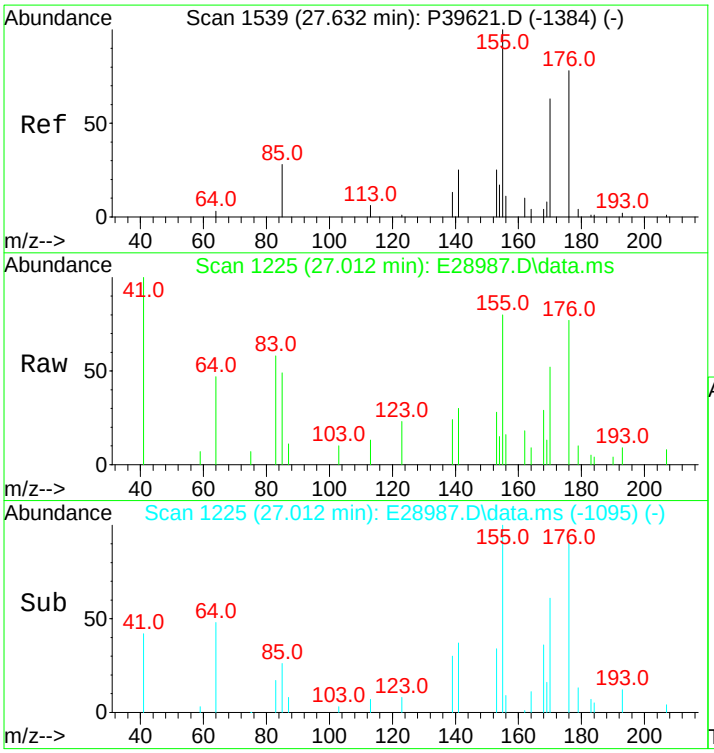




#20
C2-Benzo(b)thiophenes
Concen: 93.92 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

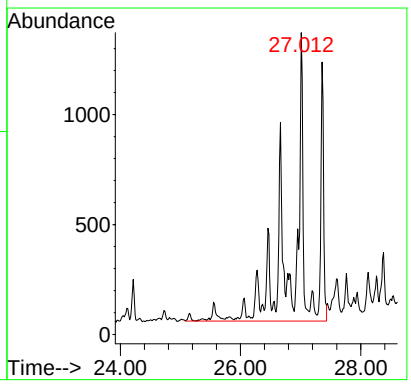
Tgt Ion:162 Resp: 7278

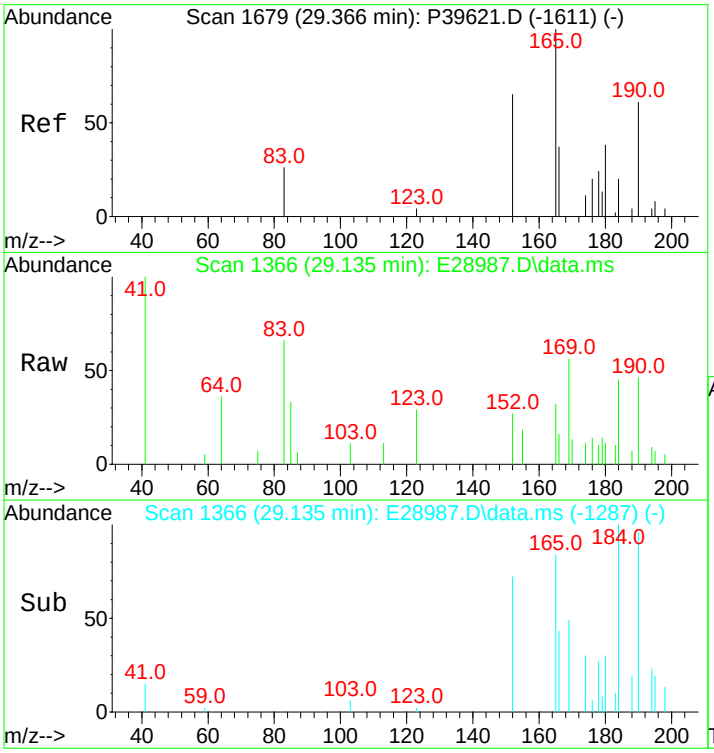




#21
C3-Benzo(b)thiophenes
Concen: 236.10 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. -0.007 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

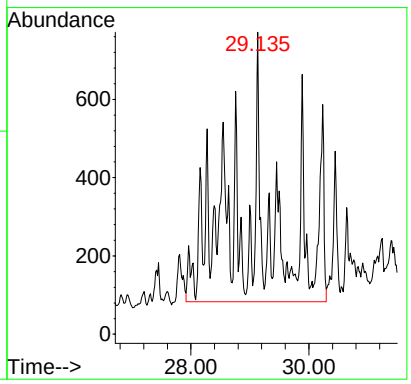
Tgt Ion:176 Resp: 18295

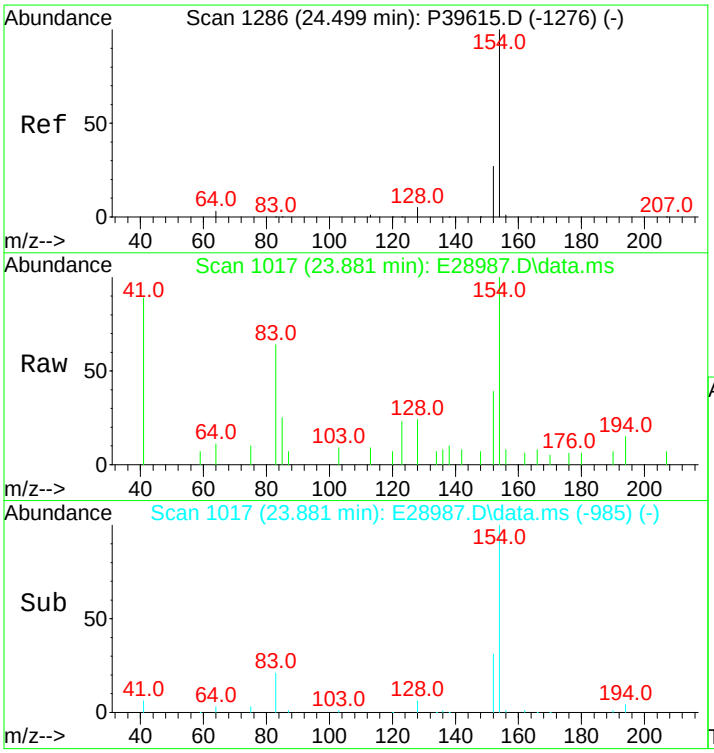




#22
C4-Benzo(b)thiophenes
Concen: 303.74 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:190 Resp: 23536

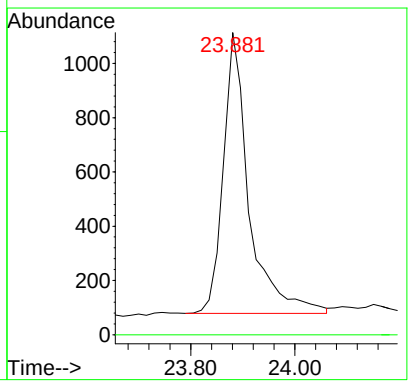


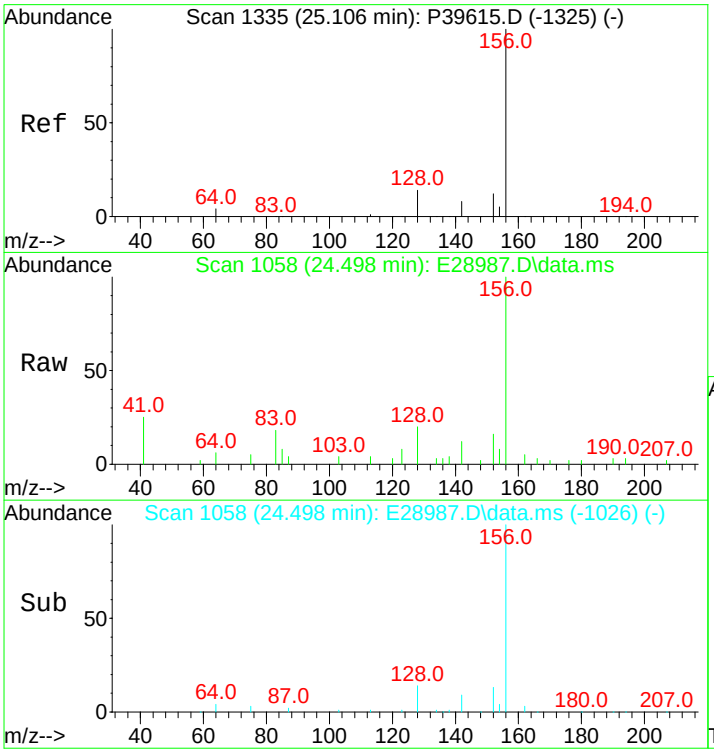


#23
Biphenyl
Concen: 46.92 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:154 Resp: 3540

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

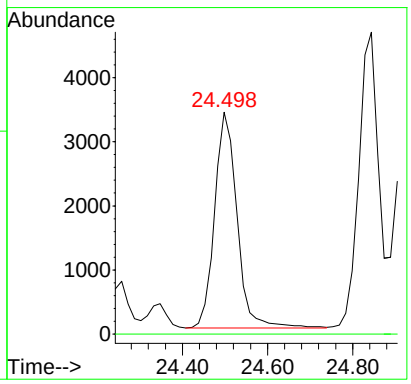


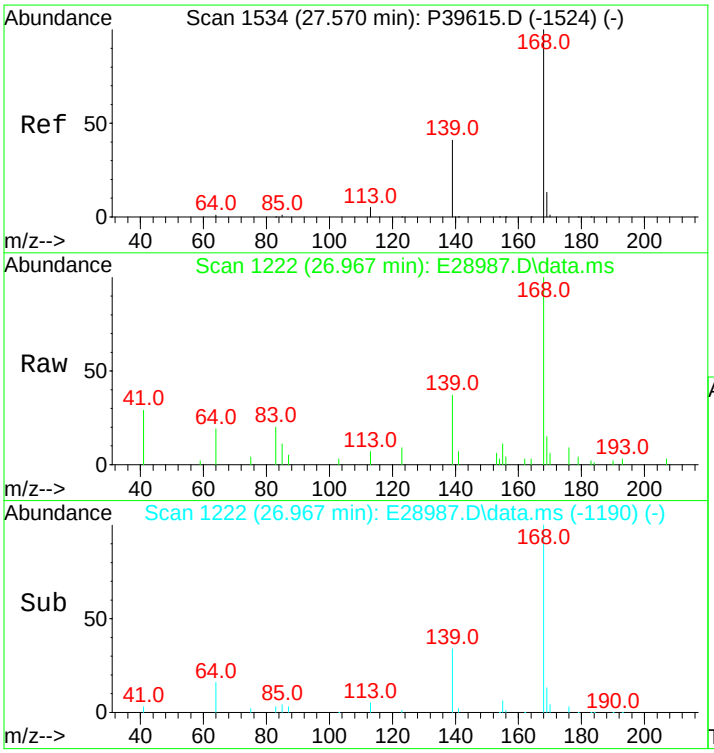


#24
2,6-Dimethylnaphthalene
Concen: 229.08 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:156 Resp: 12327

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

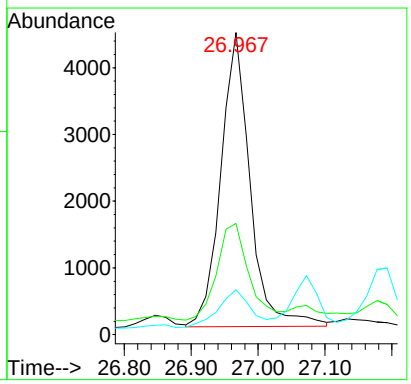


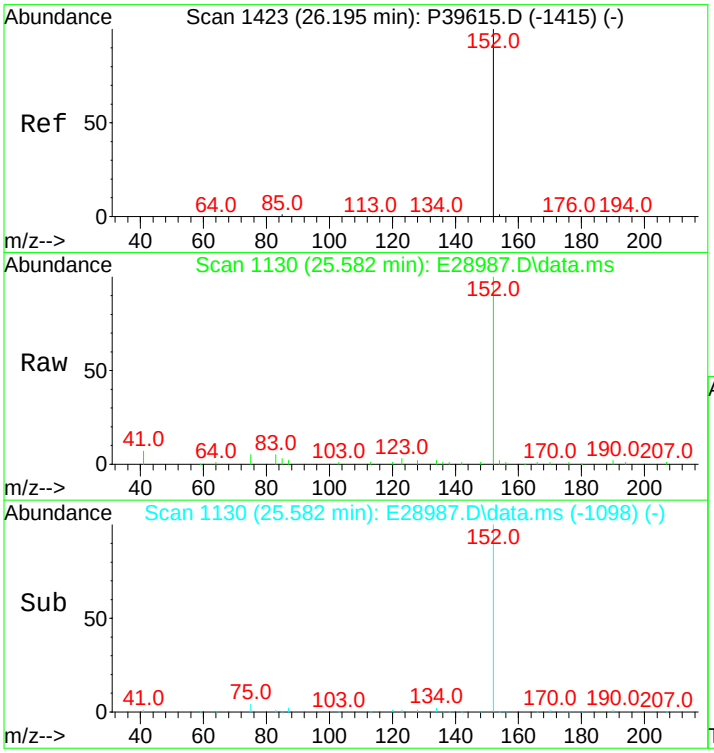


#25
Dibenzofuran
Concen: 160.84 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:168 Resp: 13435

Ion	Ratio	Lower	Upper
168	100		
139	36.1	26.0	39.0
169	14.4	10.6	16.0

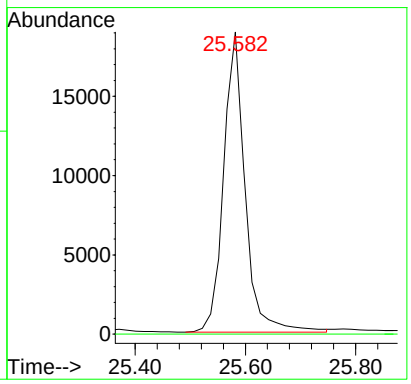


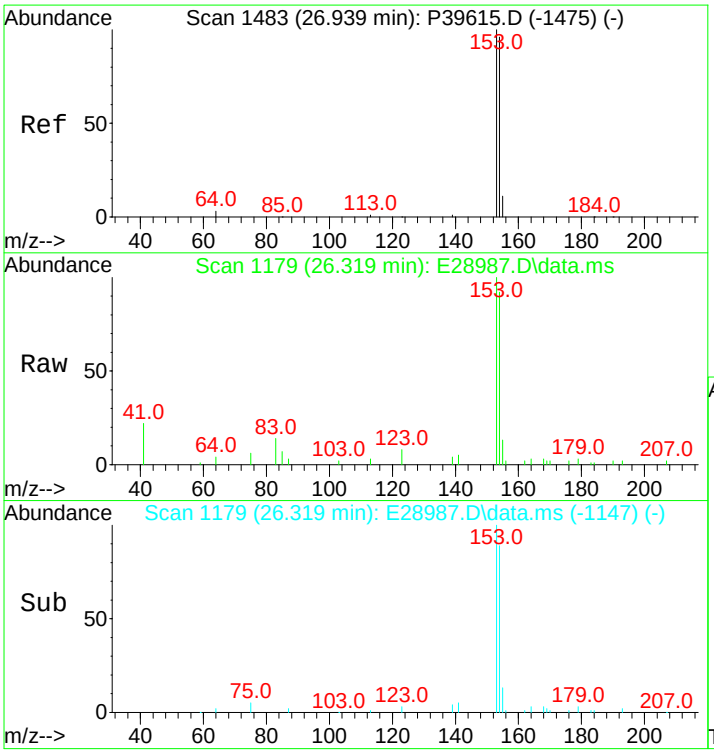


#26
Acenaphthylene
Concen: 547.06 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:152 Resp: 51123

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

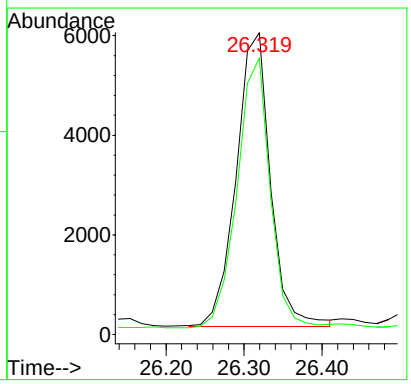


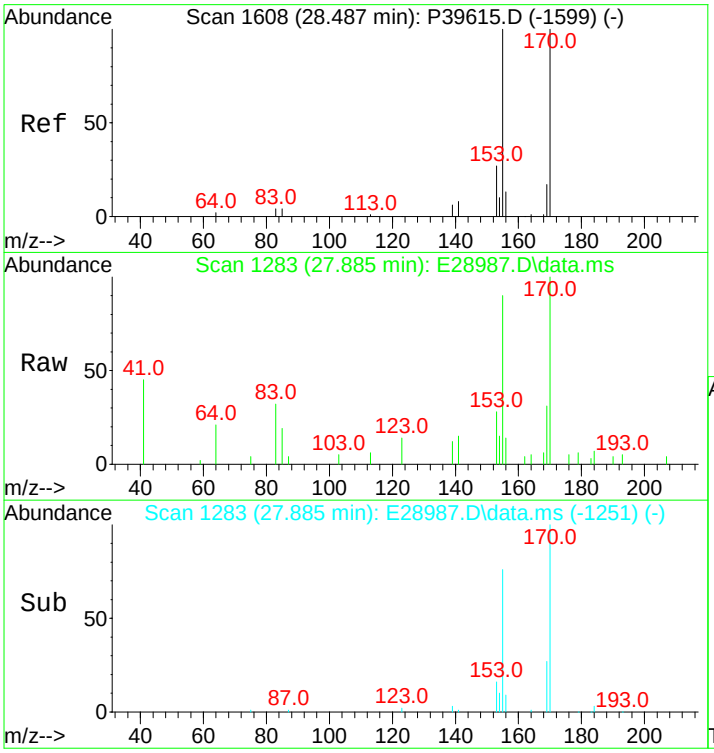


#27
Acenaphthene
Concen: 299.35 ng/mL m
RT: 26.319 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:153 Resp: 18007

Ion	Ratio	Lower	Upper
153	100		
154	89.8	74.1	111.1

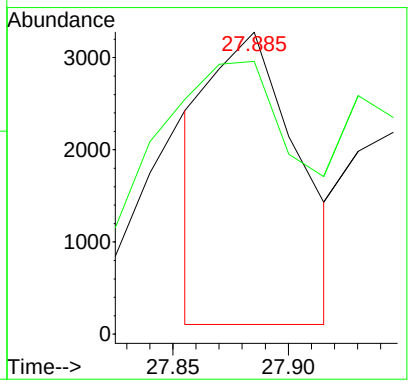


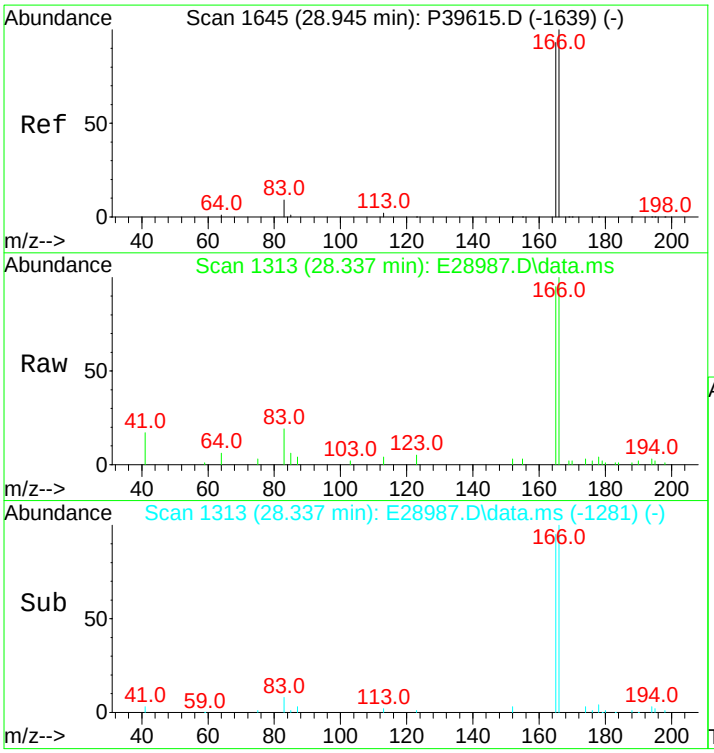


#28
2,3,5-Trimethylnaphthalene
Concen: 167.13 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:170 Resp: 8414

Ion	Ratio	Lower	Upper
170	100		
155	155.2	70.7	106.1#

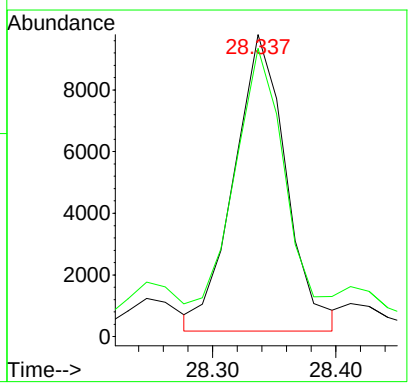


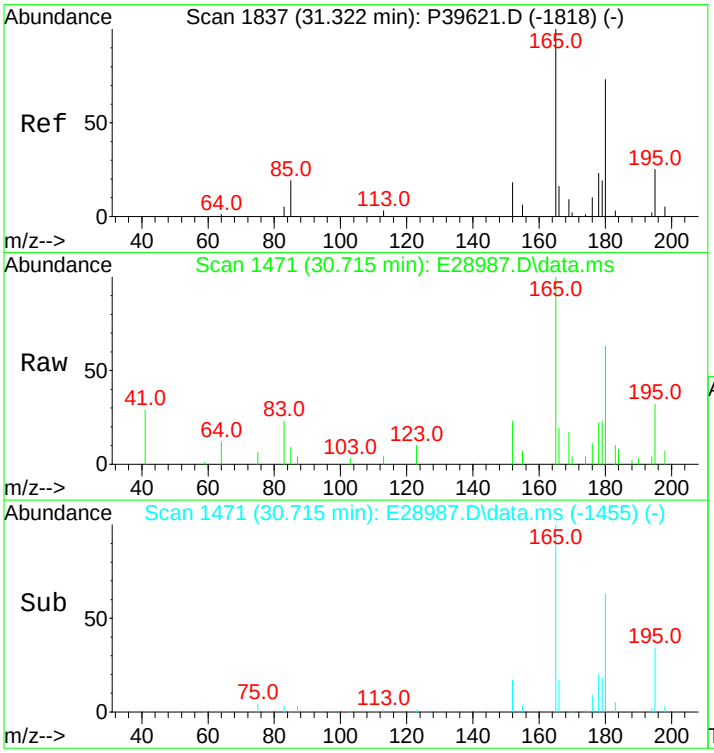


#29
Fluorene
Concen: 421.17 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:166 Resp: 28256

Ion	Ratio	Lower	Upper
166	100		
165	79.1	74.7	112.1

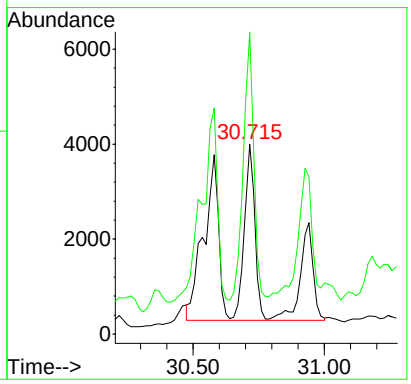


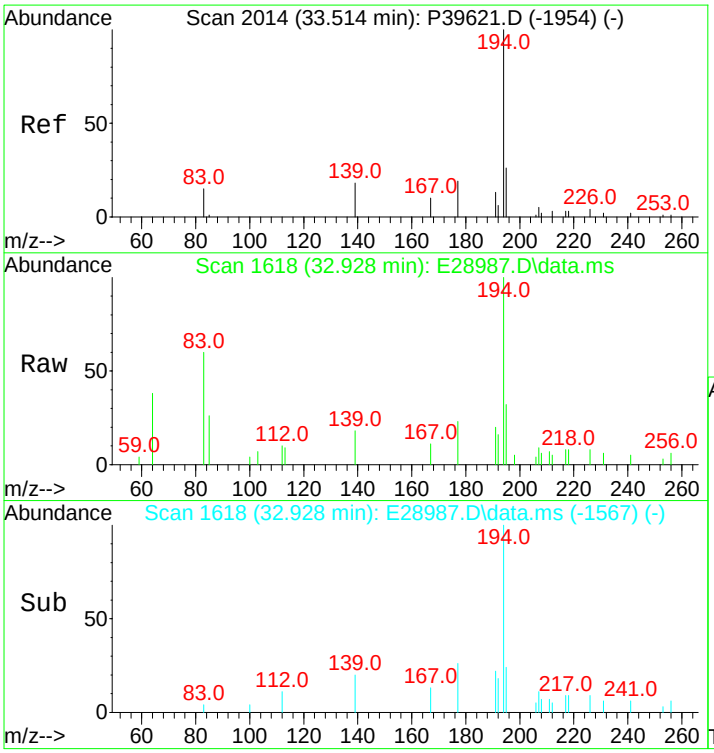


#30
C1-Fluorenes
Concen: 464.32 ng/mL m
RT: 30.715 min Scan# 1471
Delta R.T. 0.093 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:180 Resp: 31151

Ion	Ratio	Lower	Upper
180	100		
165	50.4	94.3	141.5#

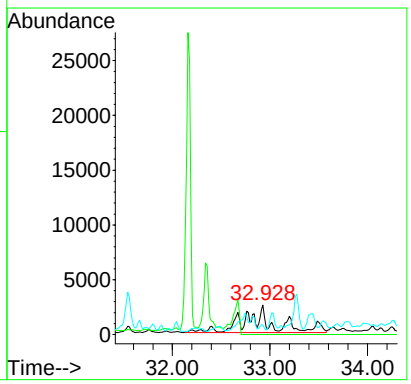


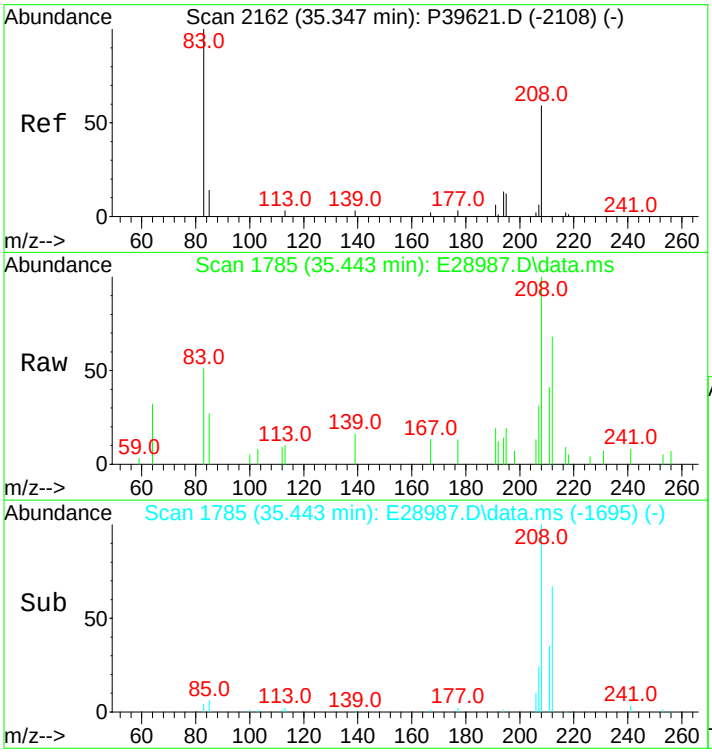


#31
C2-Fluorenes
Concen: 732.60 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.166 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:194 Resp: 49150

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	20.4	27.0	40.4#

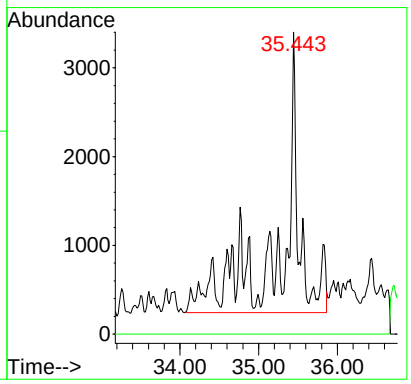


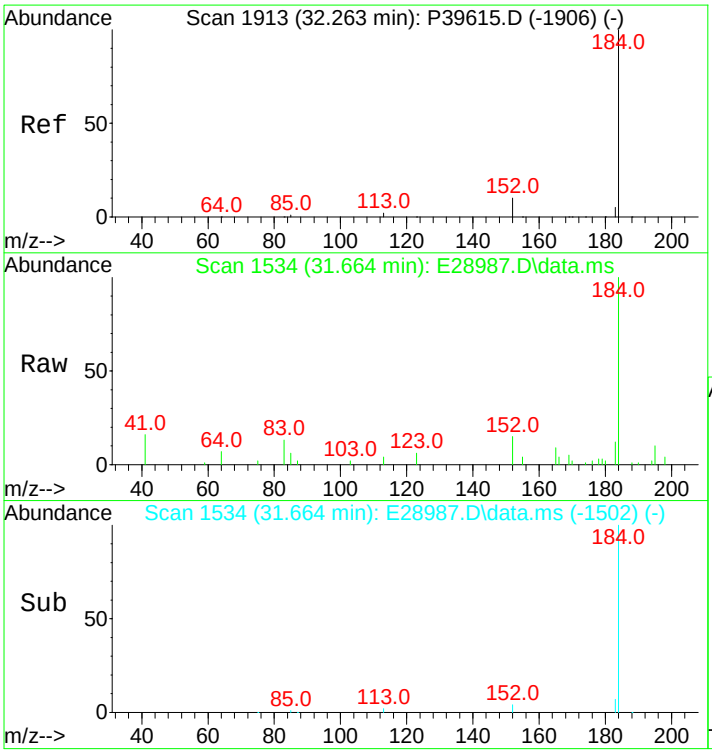


#32
C3-Fluorenes
Concen: 742.92 ng/mL m
RT: 35.443 min Scan# 1785
Delta R.T. 0.893 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:208 Resp: 49842

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

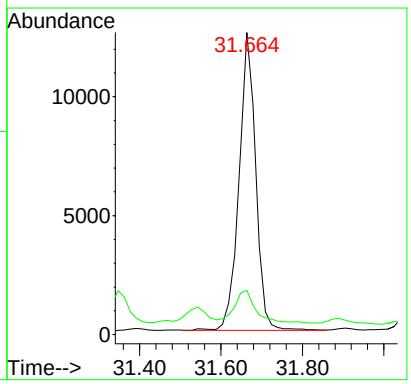


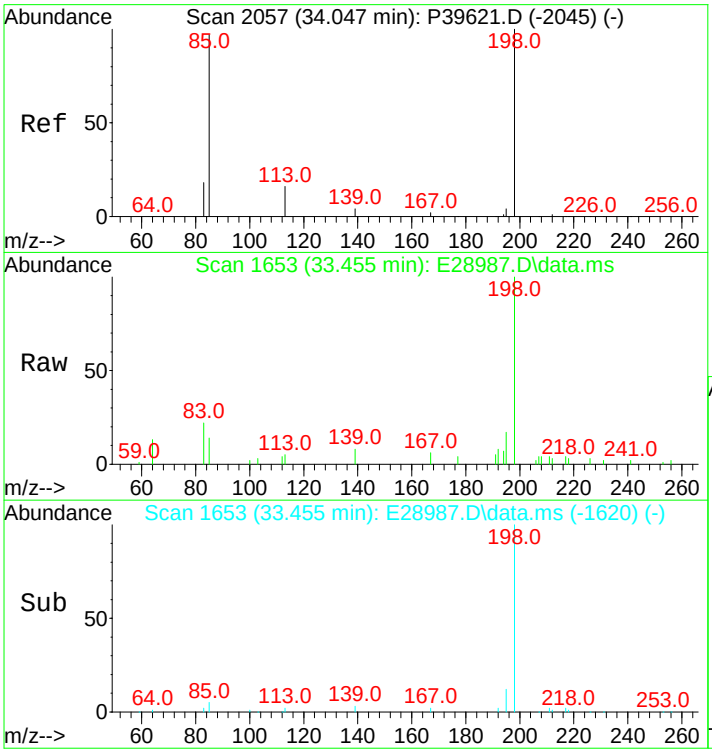


#33
Dibenzothiophene
Concen: 387.98 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:184 Resp: 35720

Ion	Ratio	Lower	Upper
184	100		
152	14.0	7.0	10.6#

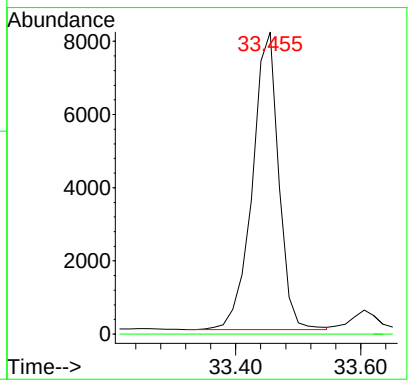


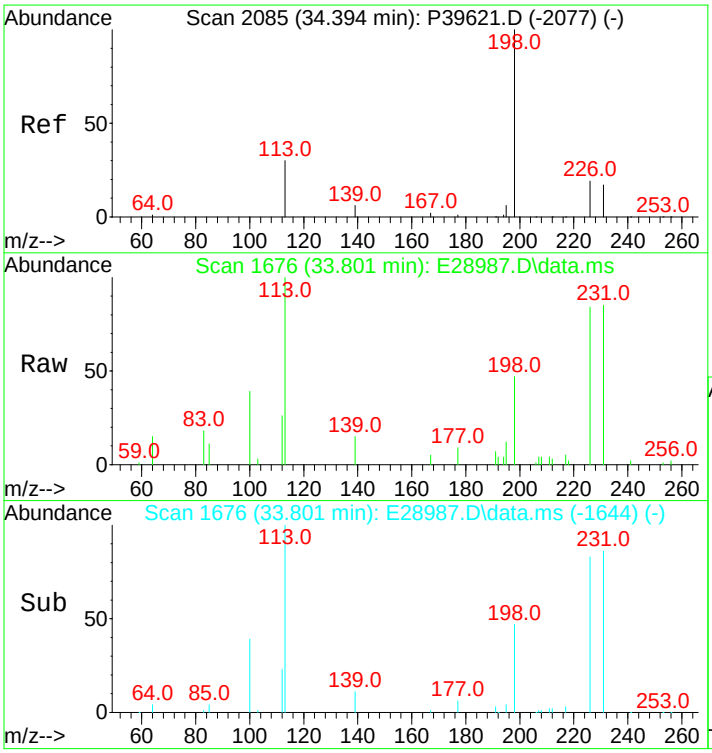


#34
4-Methyldibenzothiophene(4MDT)
Concen: 258.84 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:198 Resp: 23830

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

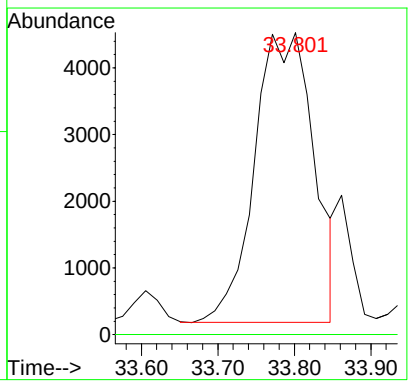


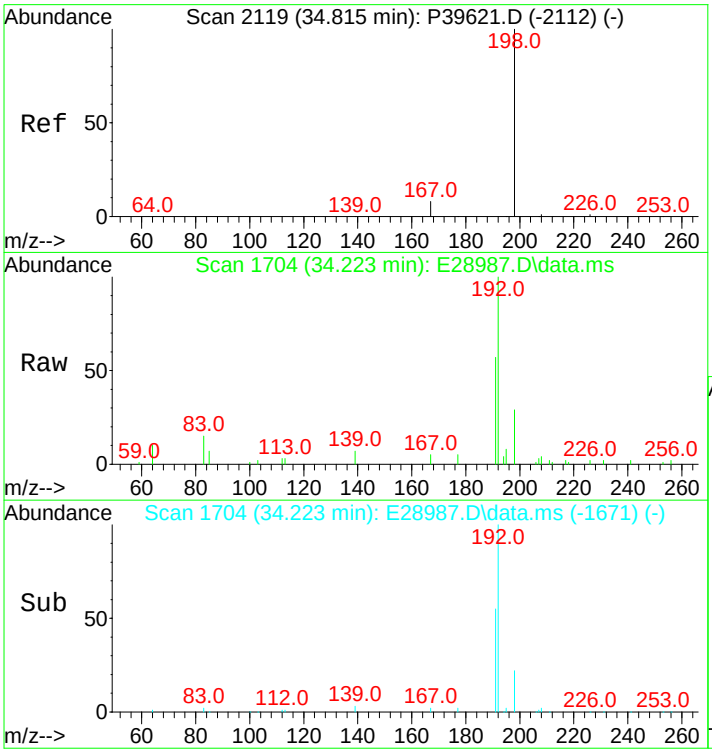


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 254.19 ng/mL m
RT: 33.801 min Scan# 1676
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:198 Resp: 23402

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

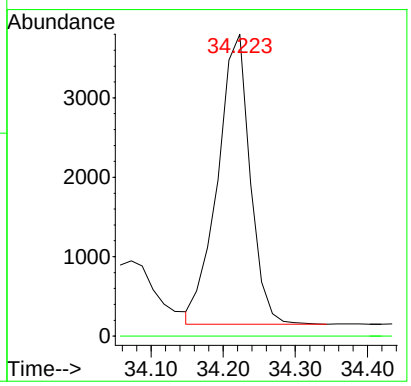


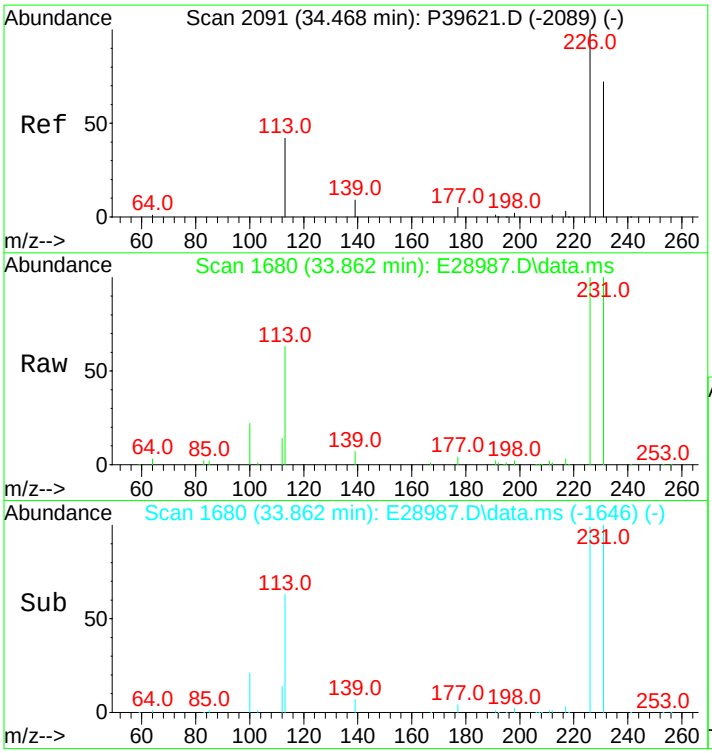


#36
1-Methyldibenzothiophene(1MDT)
Concen: 124.24 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:198 Resp: 11438

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

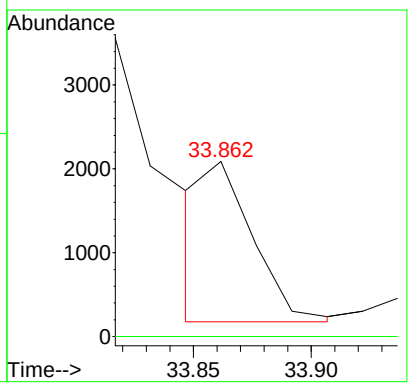


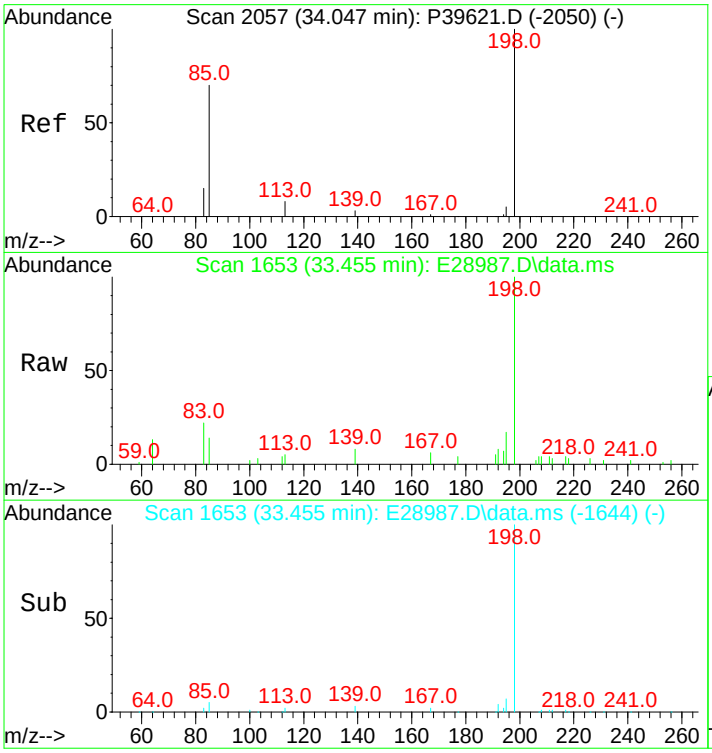


#37
OTP
Concen: 29.54 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:198 Resp: 2720

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

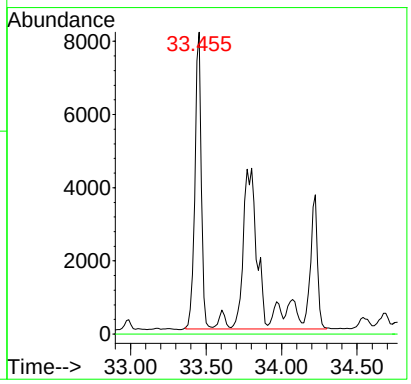


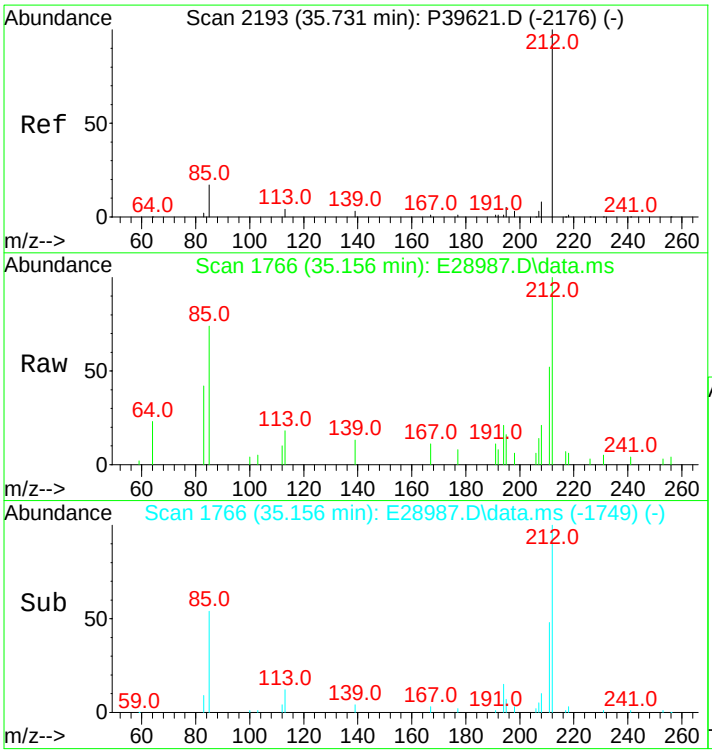


#38
C1-Dibenzothiophenes
Concen: 759.15 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:198 Resp: 69892

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

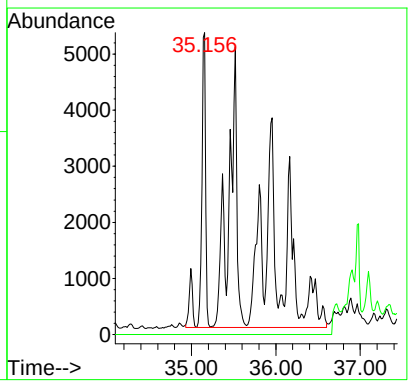


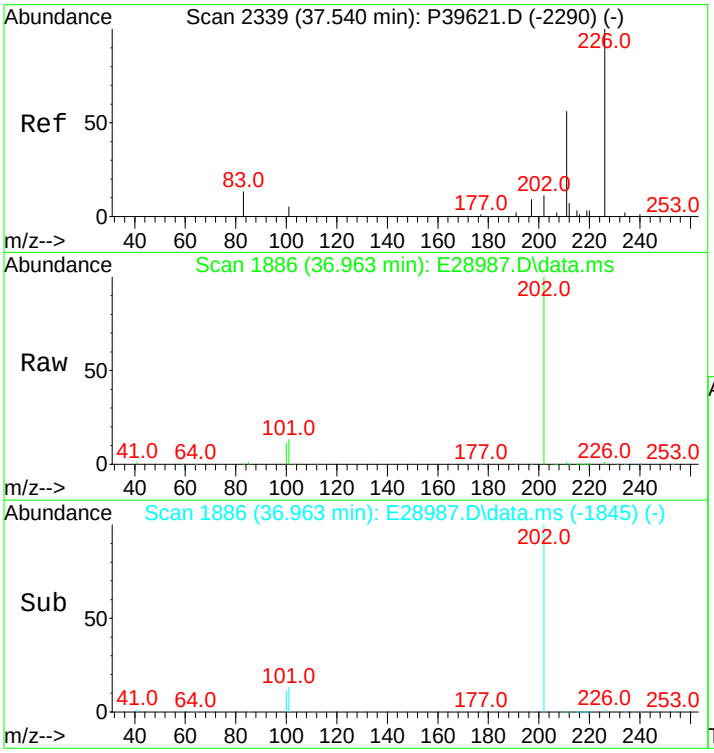


#39
C2-Dibenzothiophenes
Concen: 1155.87 ng/mL m
RT: 35.156 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:212 Resp: 106416

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

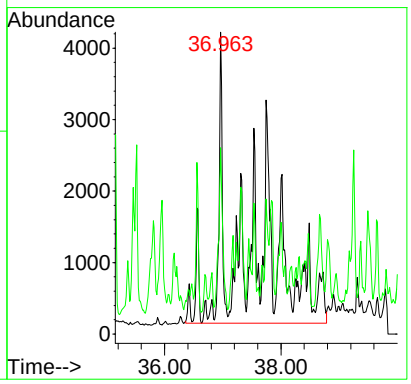


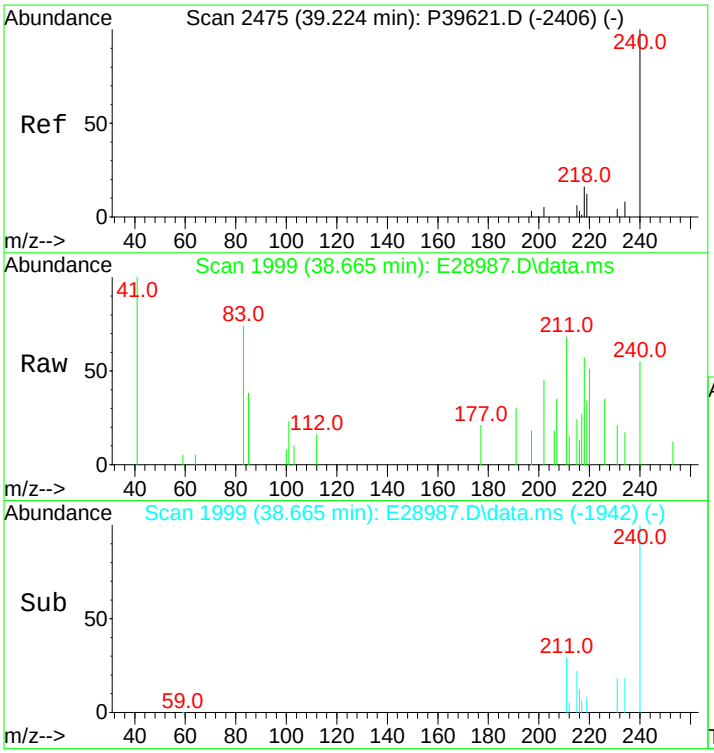


#40
C3-Dibenzothiophenes
Concen: 1130.11 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:226 Resp: 104044

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

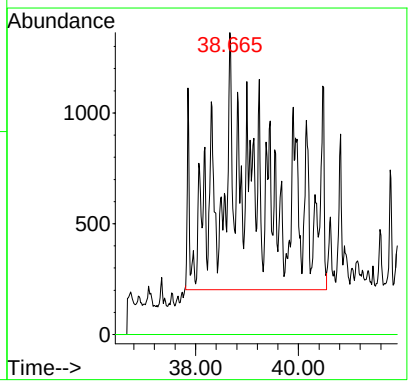


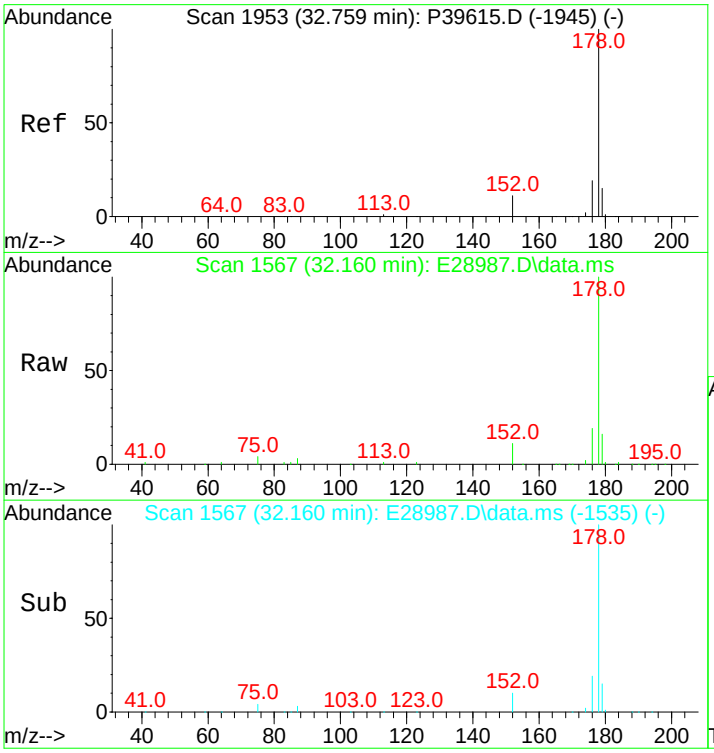


#41
C4-Dibenzothiophenes
Concen: 714.82 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:240 Resp: 65810

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

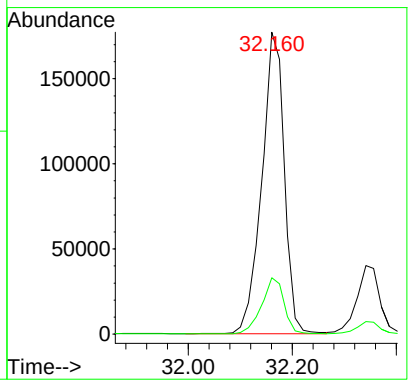


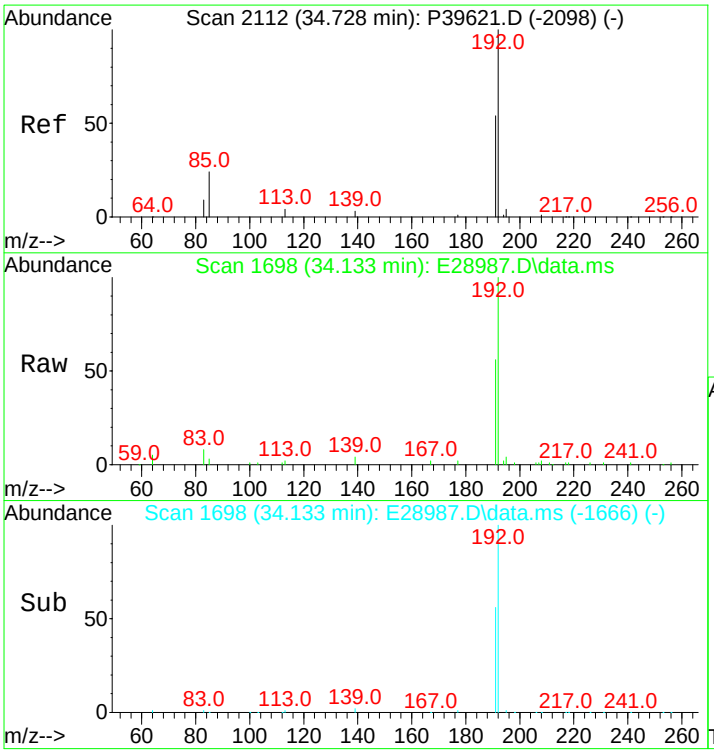


#43
Phenanthrene
Concen: 5690.67 ng/mL
RT: 32.160 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:178 Resp: 533026

Ion	Ratio	Lower	Upper
178	100		
176	18.6	15.0	22.4

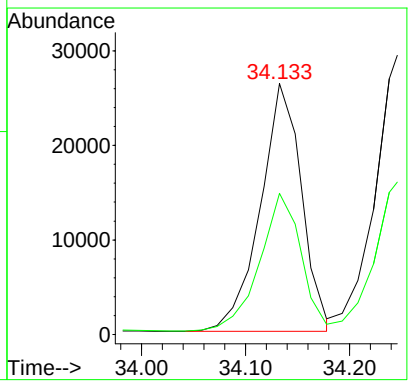


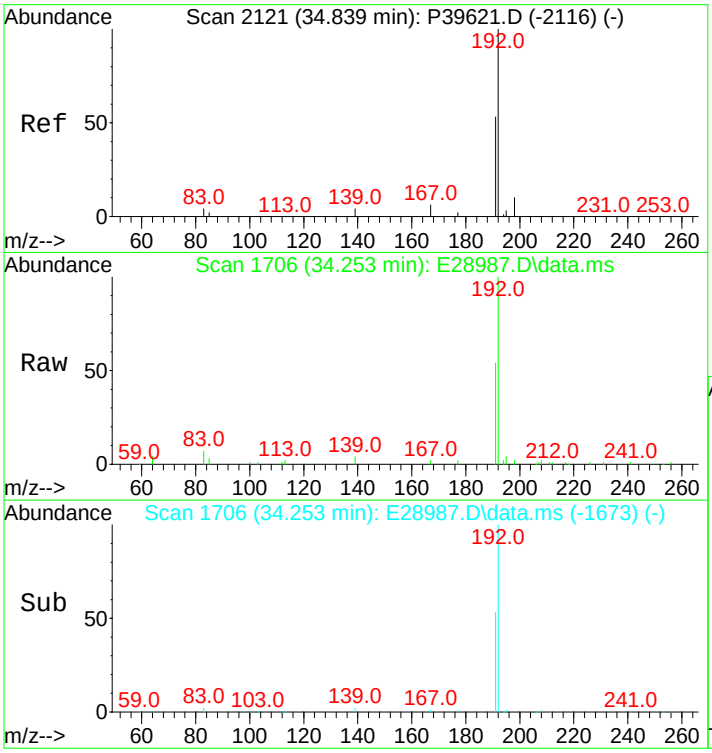


#44
3-Methylphenanthrene(3MP)
Concen: 772.05 ng/mL
RT: 34.133 min Scan# 1698
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 72315

Ion	Ratio	Lower	Upper
192	100		
191	56.0	45.9	68.9

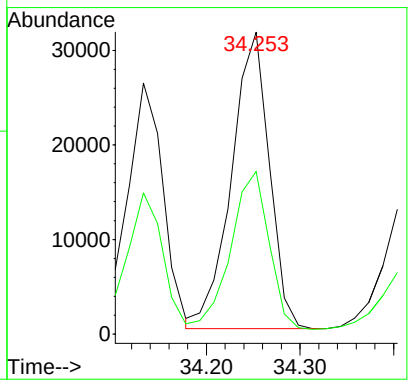


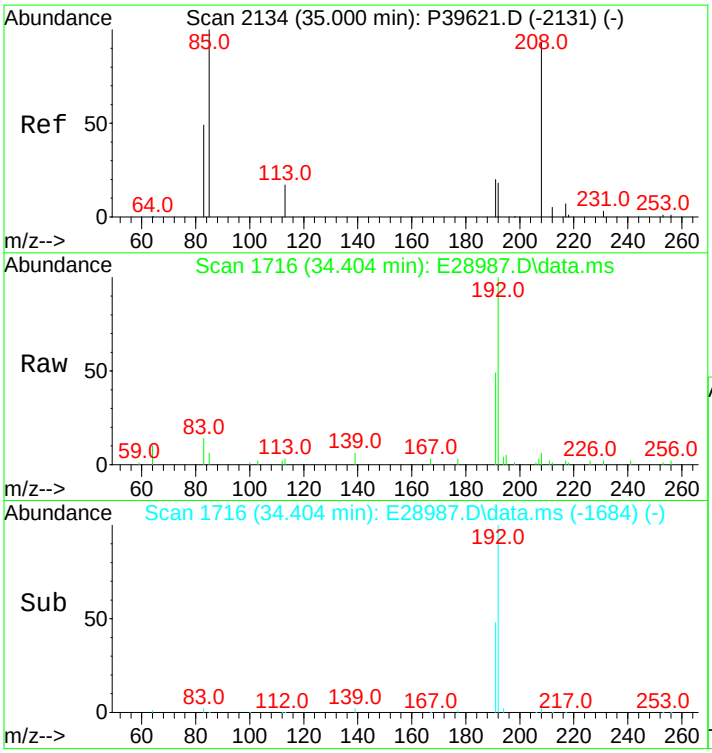


#45
2-Methylphenanthrene(2MP)
Concen: 940.90 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 88131

Ion	Ratio	Lower	Upper
192	100		
191	53.6	45.4	68.0

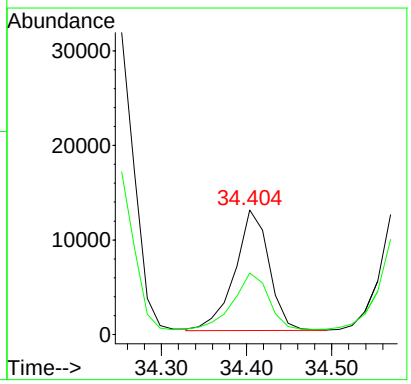


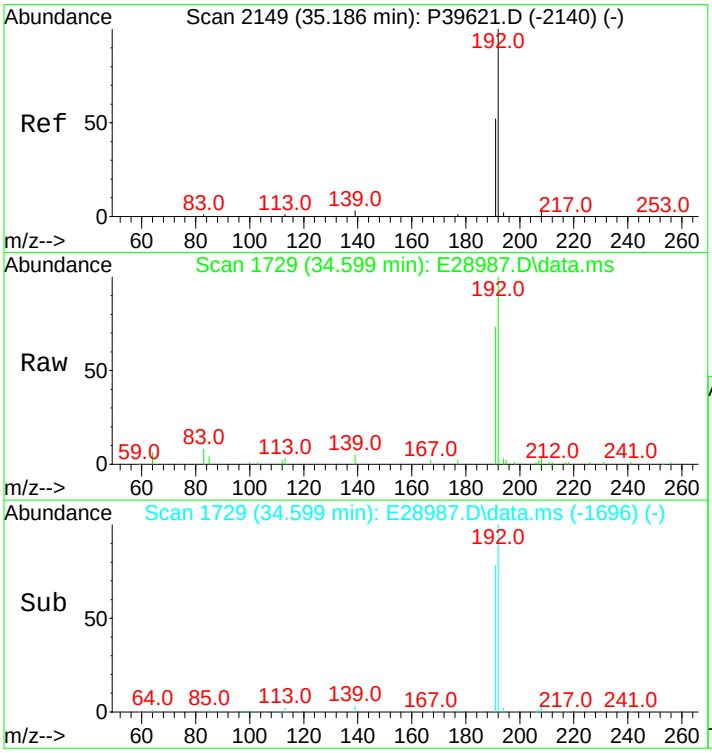


#46
2-Methylanthracene(2MA)
Concen: 381.82 ng/mL
RT: 34.404 min Scan# 1716
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 35764

Ion	Ratio	Lower	Upper
192	100		
191	50.6	95.4	143.0#

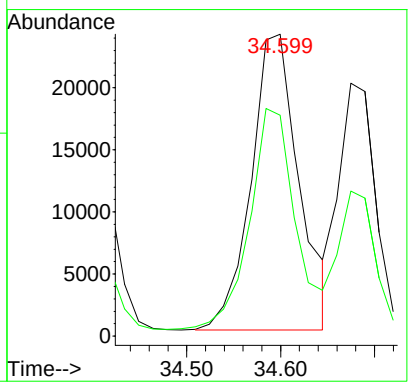


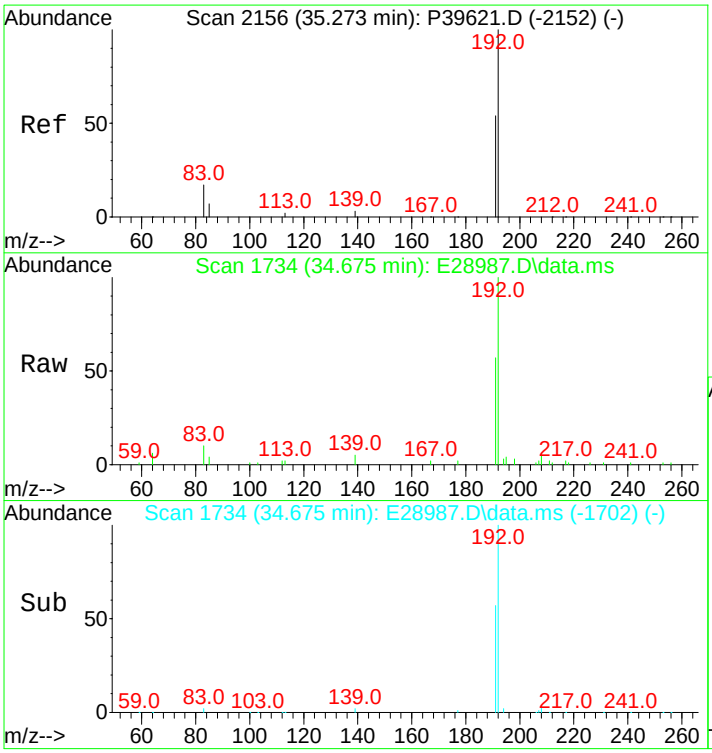


#47
9/4-Methylphenanthrene(9MP)
Concen: 906.69 ng/mL m
RT: 34.599 min Scan# 1729
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 84927

Ion	Ratio	Lower	Upper
192	100		
191	35.5	44.3	66.5#

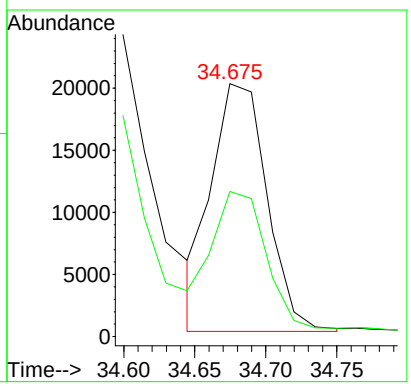


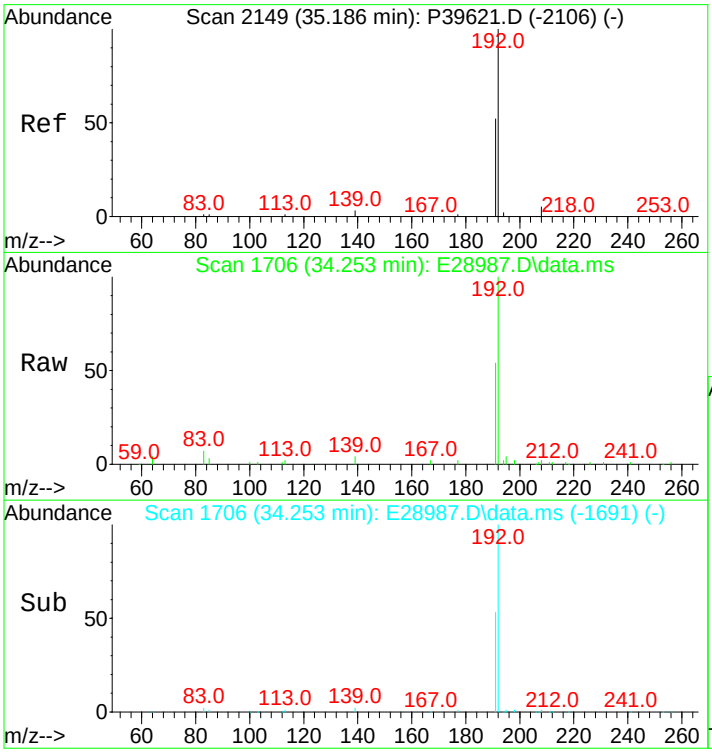


#48
1-Methylphenanthrene(1MP)
Concen: 578.16 ng/mL m
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 54154

Ion	Ratio	Lower	Upper
192	100		
191	55.6	46.7	70.1

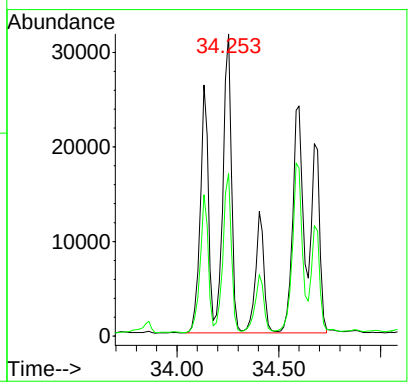


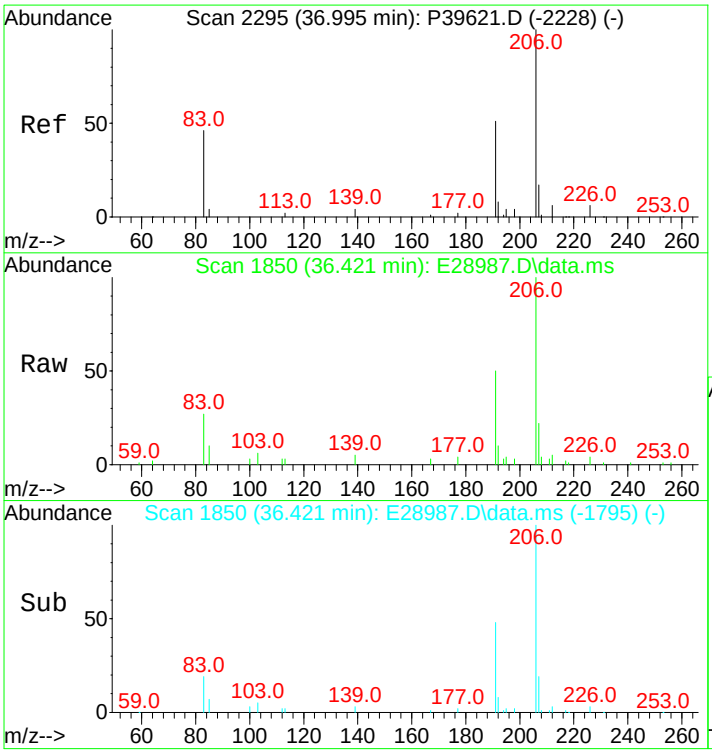


#49
C1-Phenanthrenes/Anthracenes
Concen: 3624.38 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 339484

Ion	Ratio	Lower	Upper
192	100		
191	5.1	44.0	66.0#

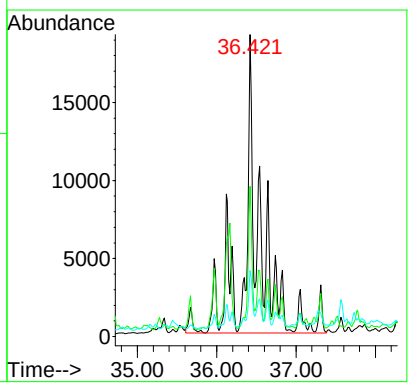


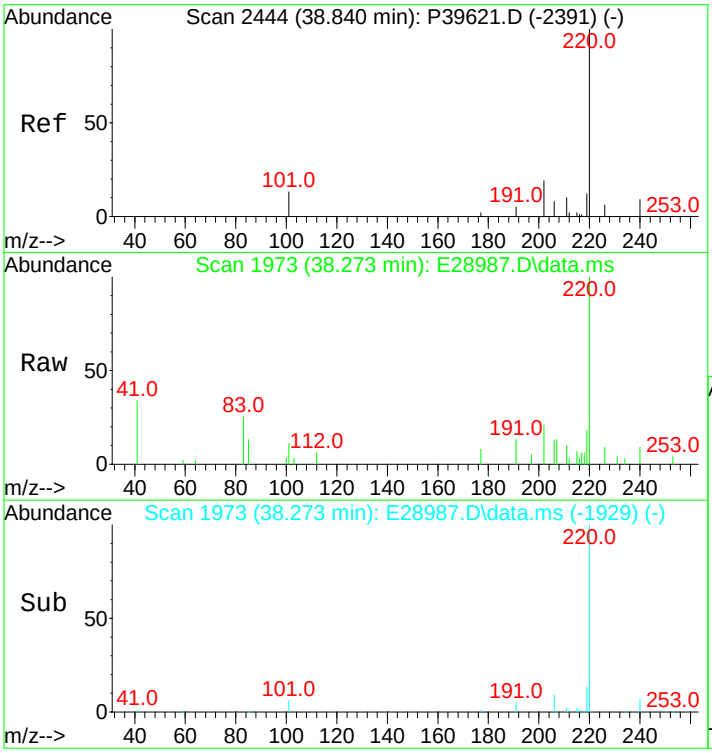


#50
C2-Phenanthrenes/Anthracenes
Concen: 2659.12 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:206 Resp: 249071

Ion	Ratio	Lower	Upper
206	100		
191	12.8	35.7	53.5#
207	5.7	16.5	24.7#

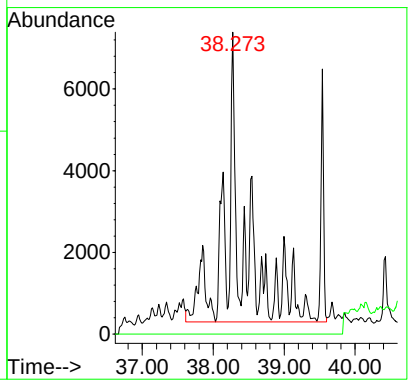


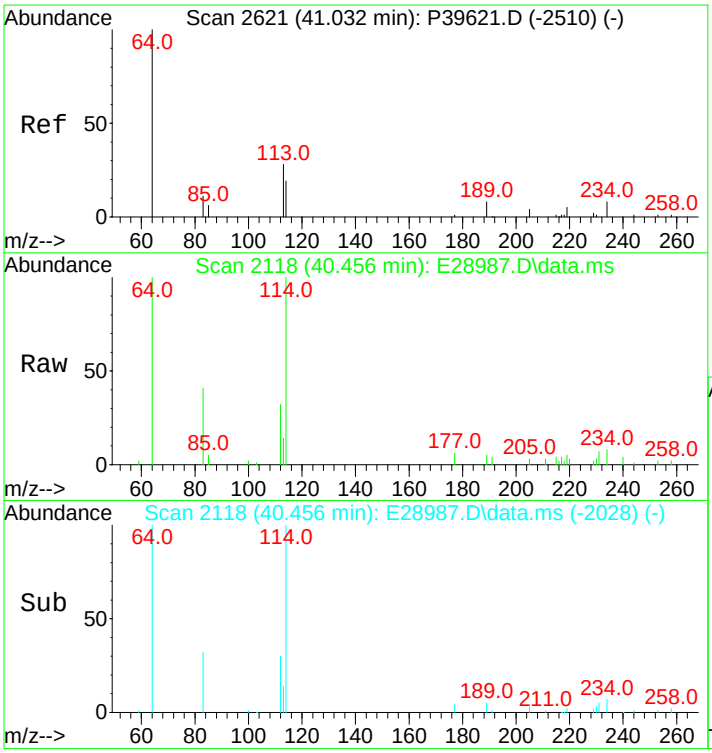


#52
C3-Phenanthrenes/Anthracenes
Concen: 1405.00 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:220 Resp: 131602

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

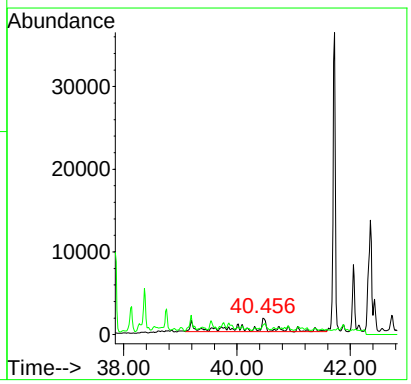


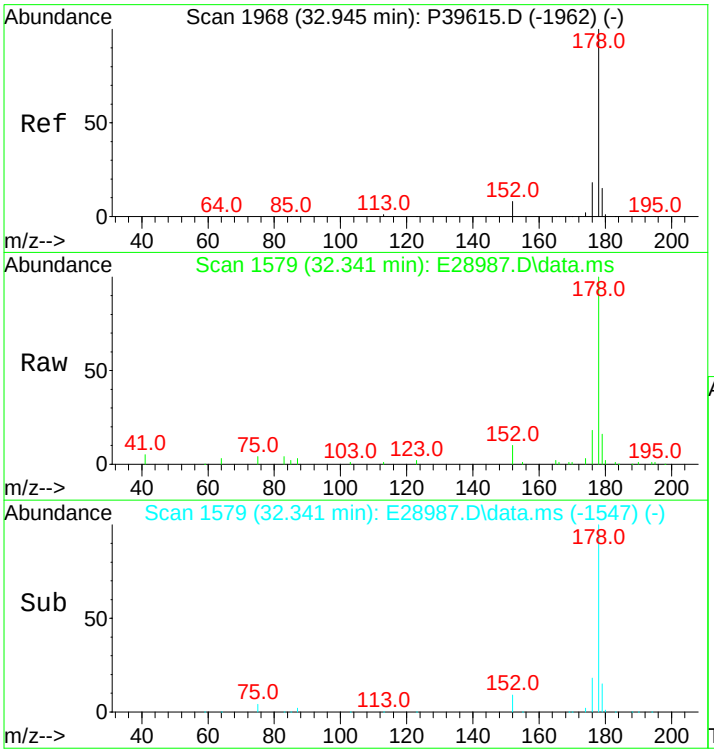


#53
C4-Phenanthrenes/Anthracenes
Concen: 509.67 ng/mL m
RT: 40.456 min Scan# 2118
Delta R.T. 0.369 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:234 Resp: 47739

Ion	Ratio	Lower	Upper
234	100		
219	2.5	46.6	70.0#

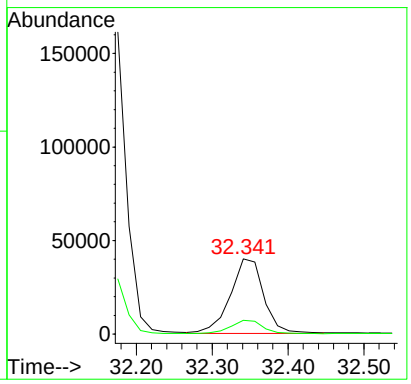


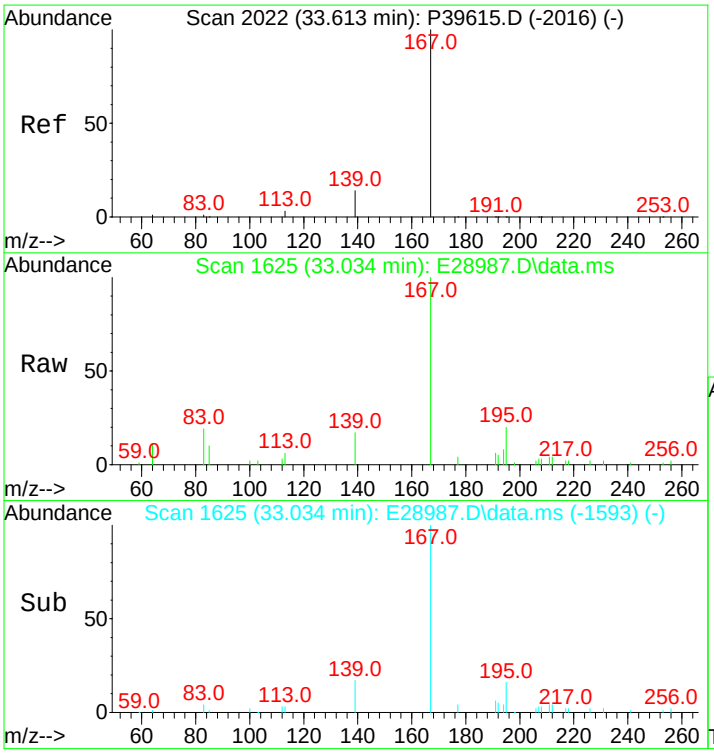


#55
Anthracene
Concen: 1505.38 ng/mL m
RT: 32.341 min Scan# 1579
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:178 Resp: 121877

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

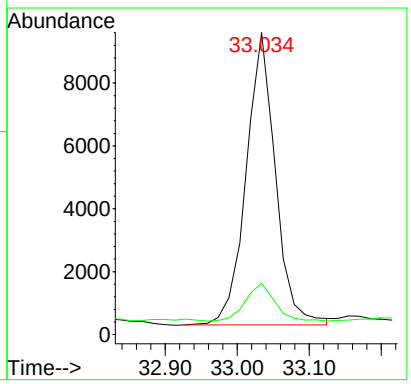


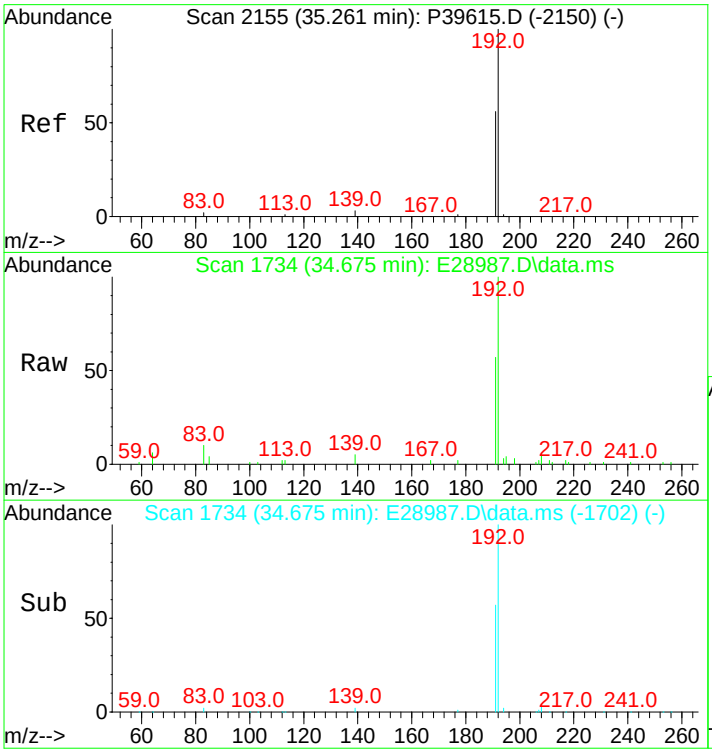


#56
Carbazole
Concen: 314.99 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:167 Resp: 26246

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.1	15.1

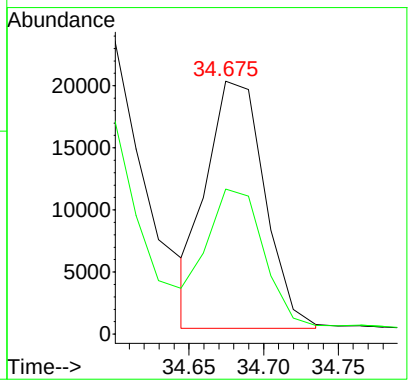


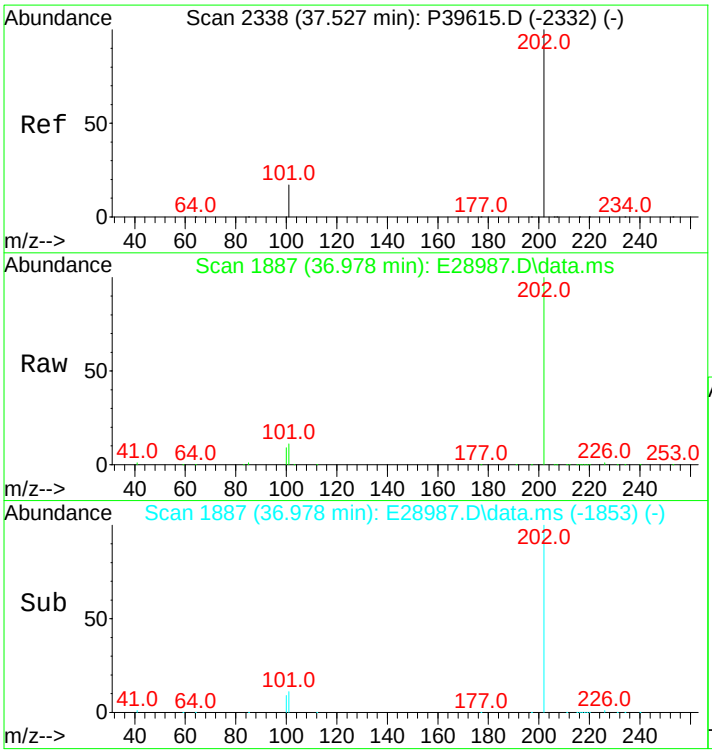


#57
1-Methylphenanthrene
Concen: 750.99 ng/mL m
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:192 Resp: 53666

Ion	Ratio	Lower	Upper
192	100		
191	56.1	45.4	68.2

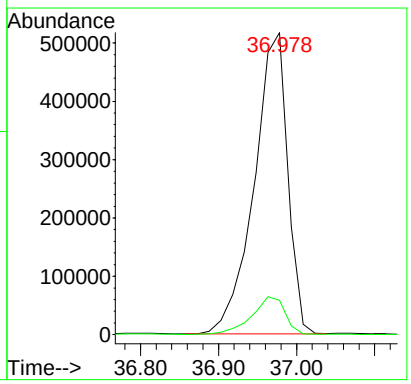


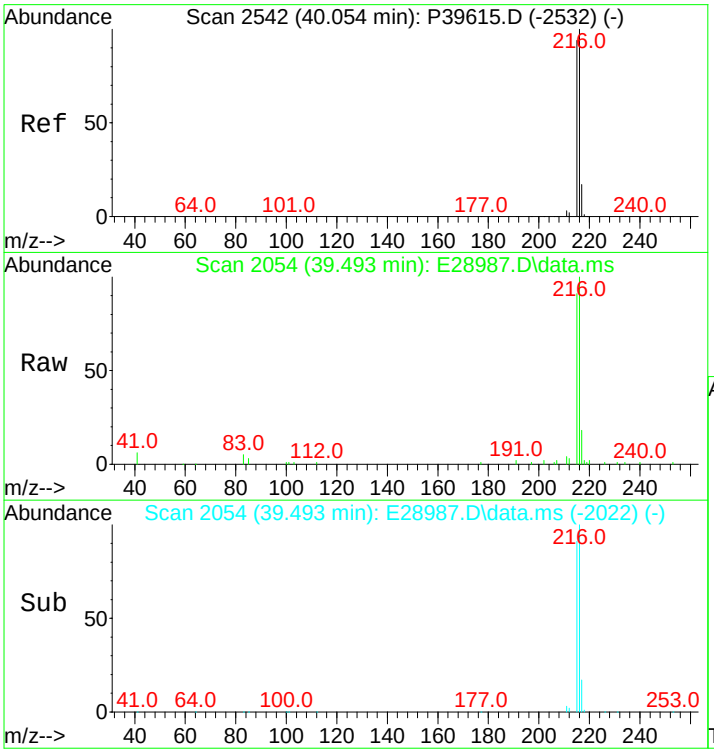


#58
Fluoranthene
Concen: 14981.55 ng/mL
RT: 36.978 min Scan# 1887
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:202 Resp: 1549703

Ion	Ratio	Lower	Upper
202	100		
101	12.5	10.4	15.6

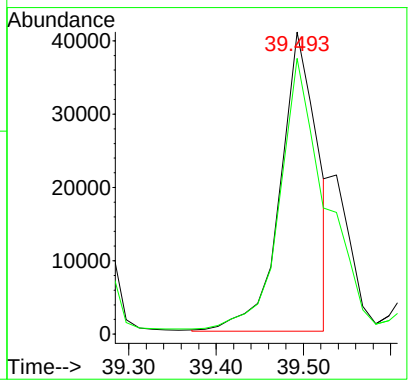


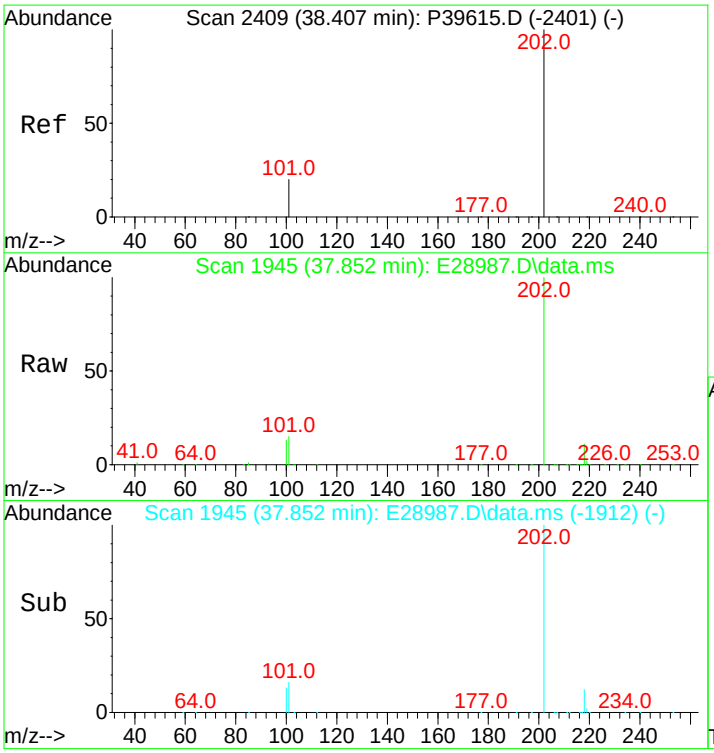


#59
Benzo(b)fluorene
Concen: 1766.00 ng/mL m
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:216 Resp: 121727

Ion	Ratio	Lower	Upper
216	100		
215	109.8	72.6	109.0#

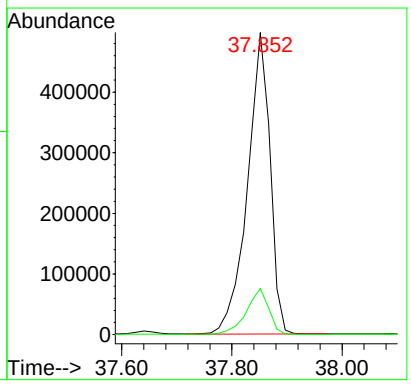


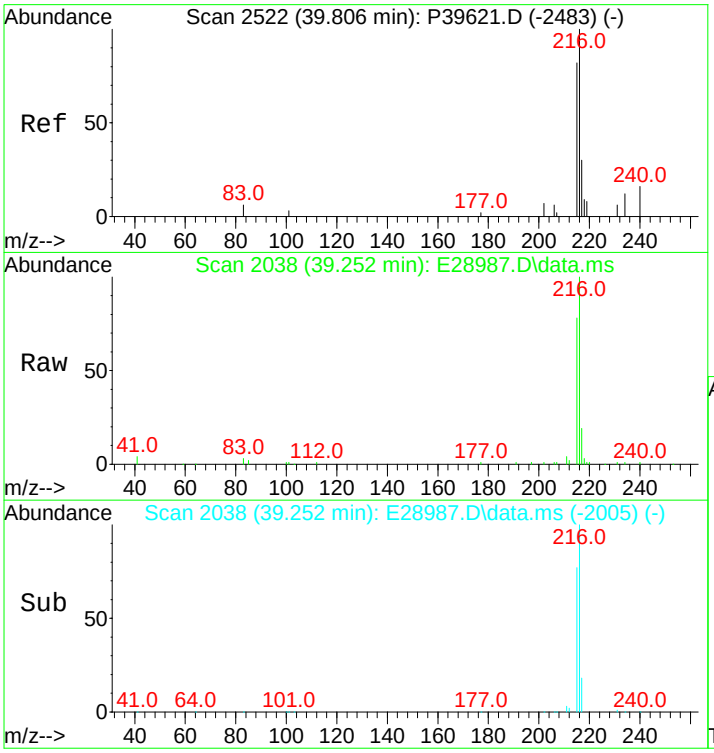


#60
Pyrene
Concen: 13425.74 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:202 Resp: 1411565

Ion	Ratio	Lower	Upper
202	100		
101	15.1	11.0	16.4

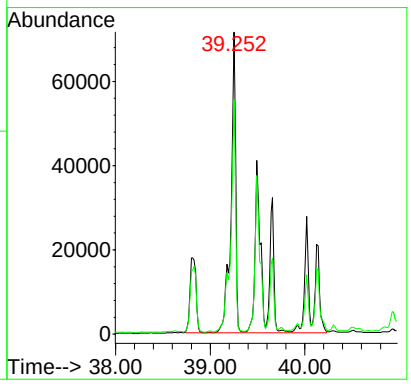


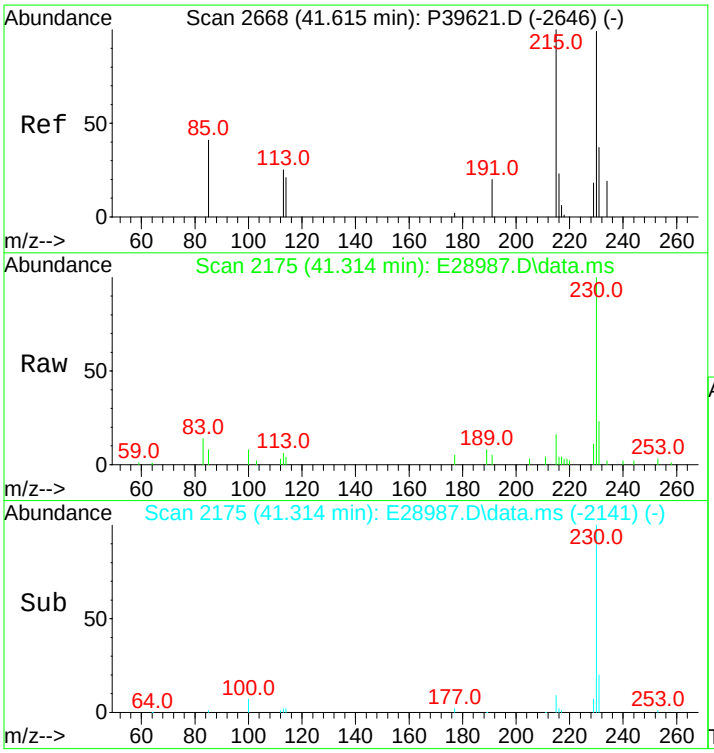


#61
C1-Fluoranthenes/Pyrenes
Concen: 6952.41 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:216 Resp: 730968

Ion	Ratio	Lower	Upper
216	100		
215	9.4	73.4	110.2#

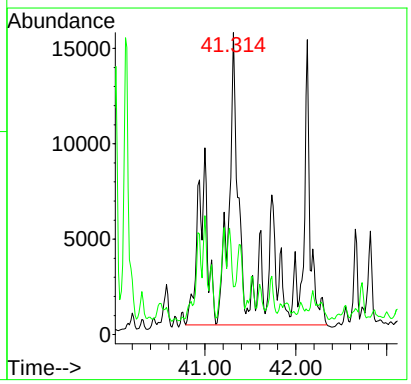


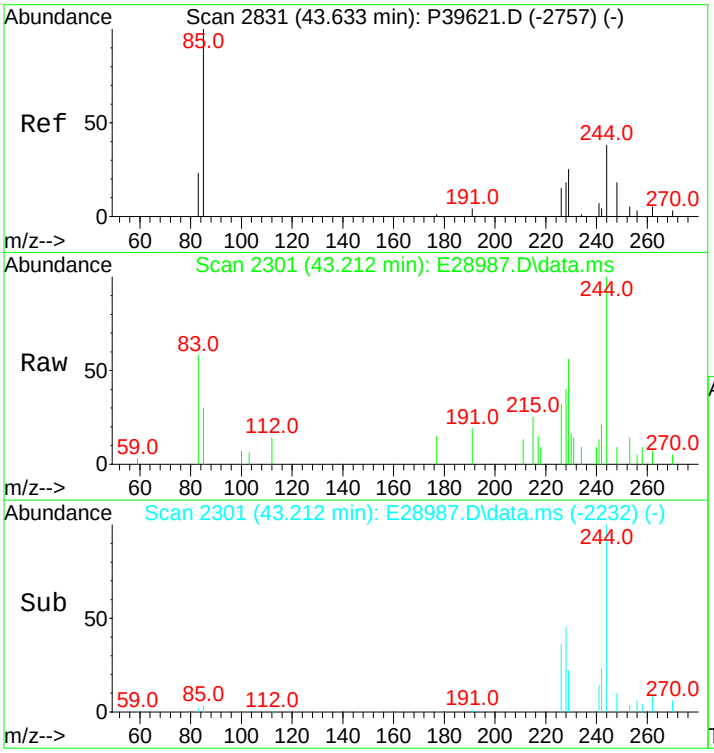


#62
C2-Fluoranthenes/Pyrenes
Concen: 2959.24 ng/mL m
RT: 41.314 min Scan# 2175
Delta R.T. 0.435 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:230 Resp: 311131

Ion	Ratio	Lower	Upper
230	100		
215	1.5	93.8	140.8#

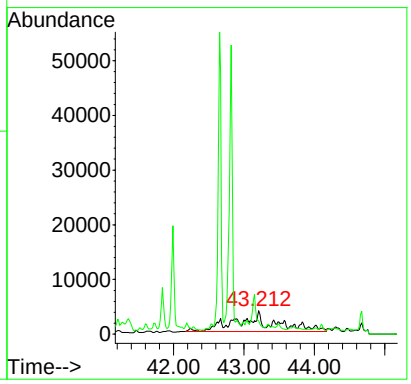


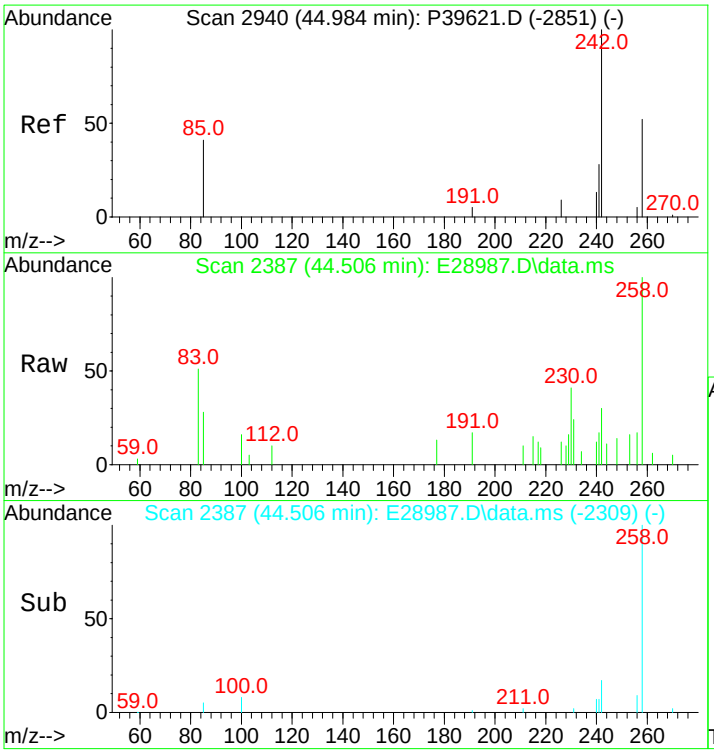


#63
C3-Fluoranthenes/Pyrenes
Concen: 1285.07 ng/mL m
RT: 43.212 min Scan# 2301
Delta R.T. 0.560 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:244 Resp: 135111

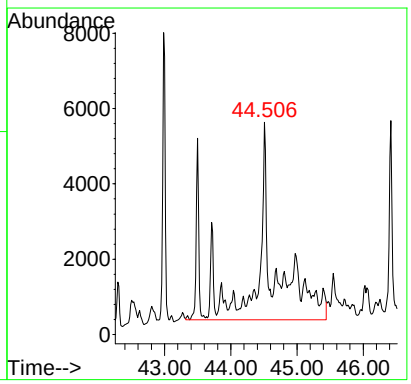
Ion	Ratio	Lower	Upper
244	100		
229	109.0	72.2	108.2#

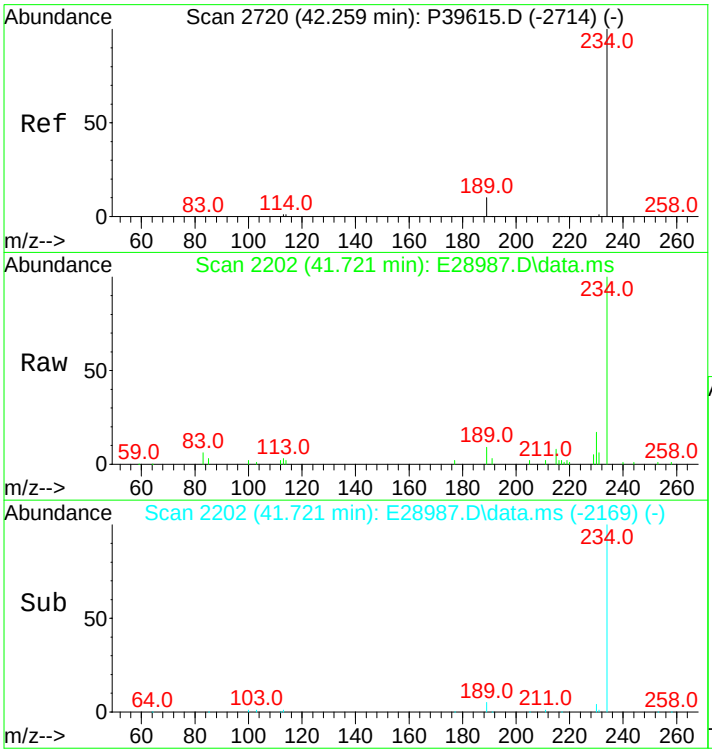




#64
C4-Fluoranthenes/Pyrenes
Concen: 1013.49 ng/mL m
RT: 44.506 min Scan# 2387
Delta R.T. 0.536 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:258 Resp: 106557

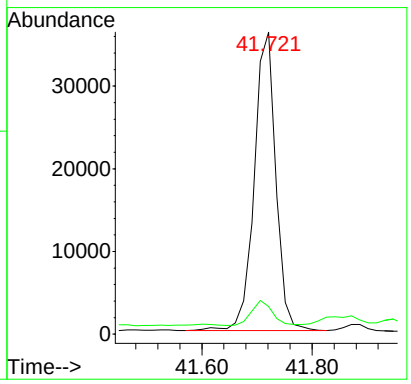


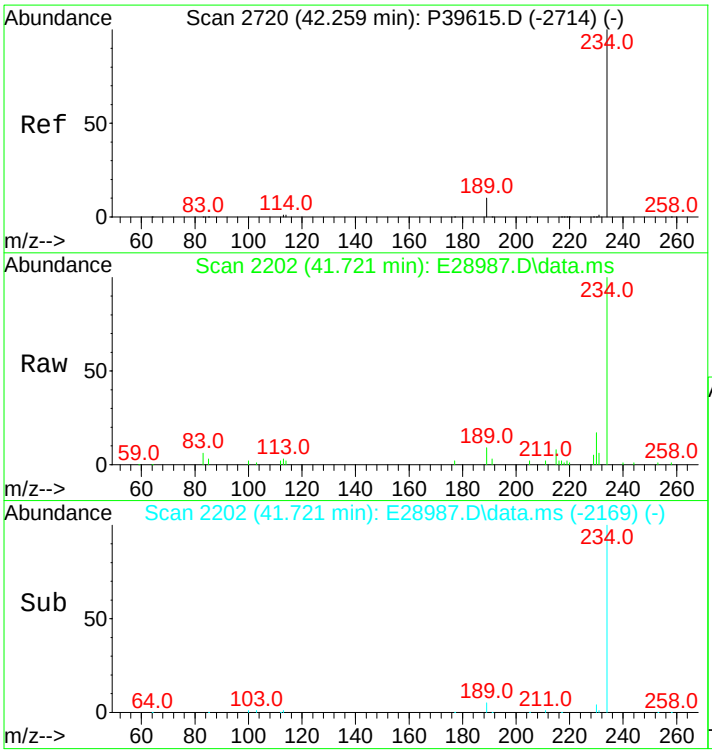


#66
Naphthobenzothiophene
Concen: 943.32 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:234 Resp: 97820

Ion	Ratio	Lower	Upper
234	100		
189	8.4	21.1	31.7#

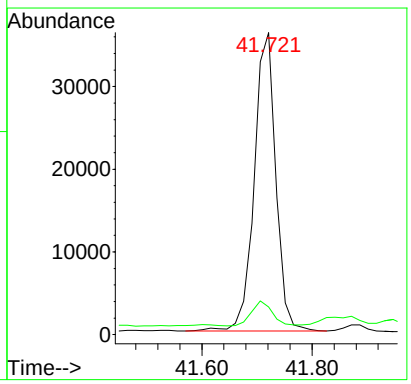


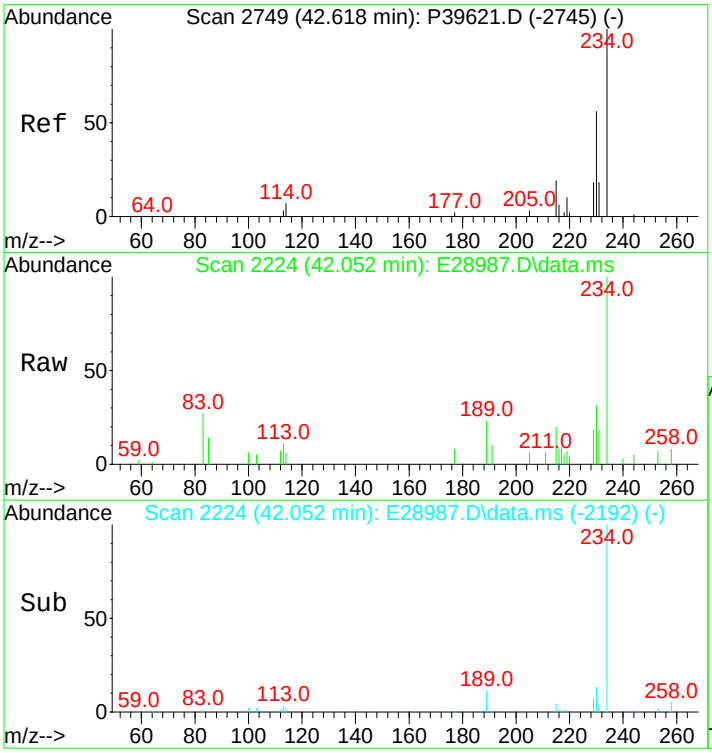


#67
Naphthobenzothiophene-2,1-D
Concen: 943.32 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:234 Resp: 97820

Ion	Ratio	Lower	Upper
234	100		
189	8.4	21.1	31.7#

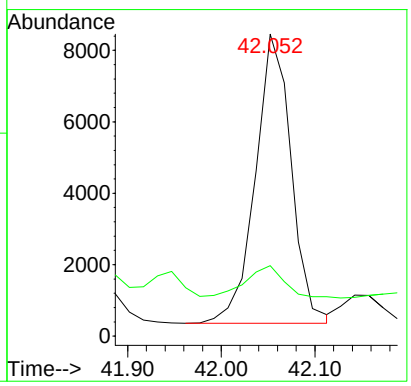


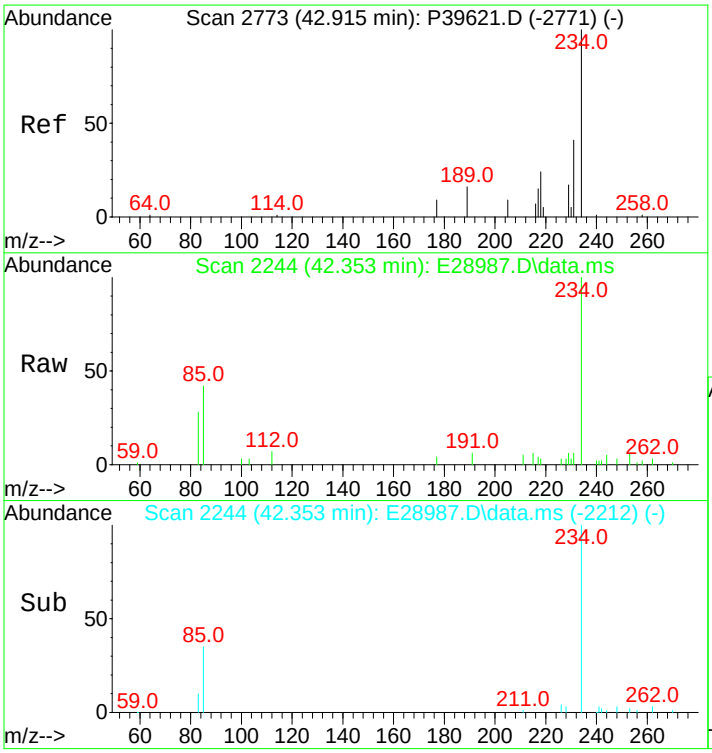


#68
Naphthobenzothiophene-1,2-D
Concen: 207.62 ng/mL
RT: 42.052 min Scan# 2224
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:234 Resp: 21530

Ion	Ratio	Lower	Upper
234	100		
189	11.7	71.9	107.9#

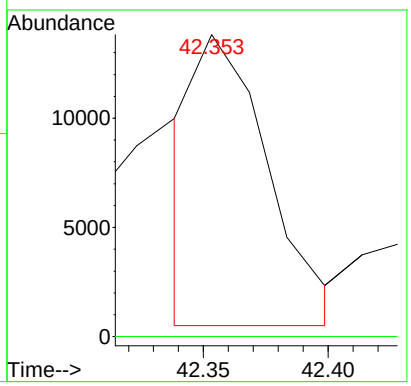


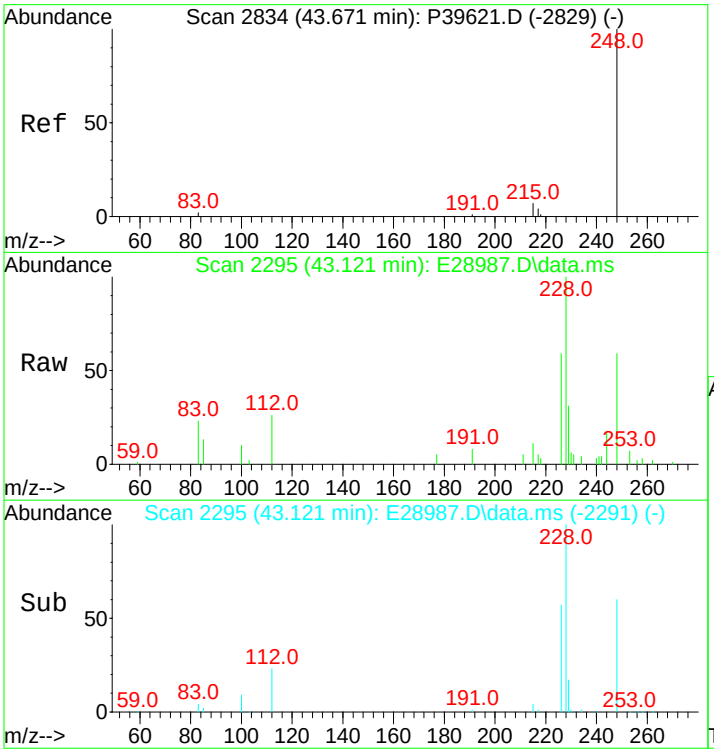


#69
Naphthobenzothiophene-2,3-D
Concen: 260.24 ng/mL m
RT: 42.353 min Scan# 2244
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:234 Resp: 26986

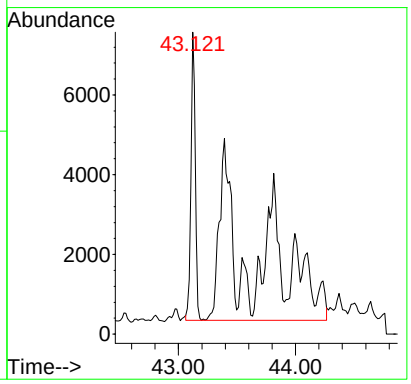
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

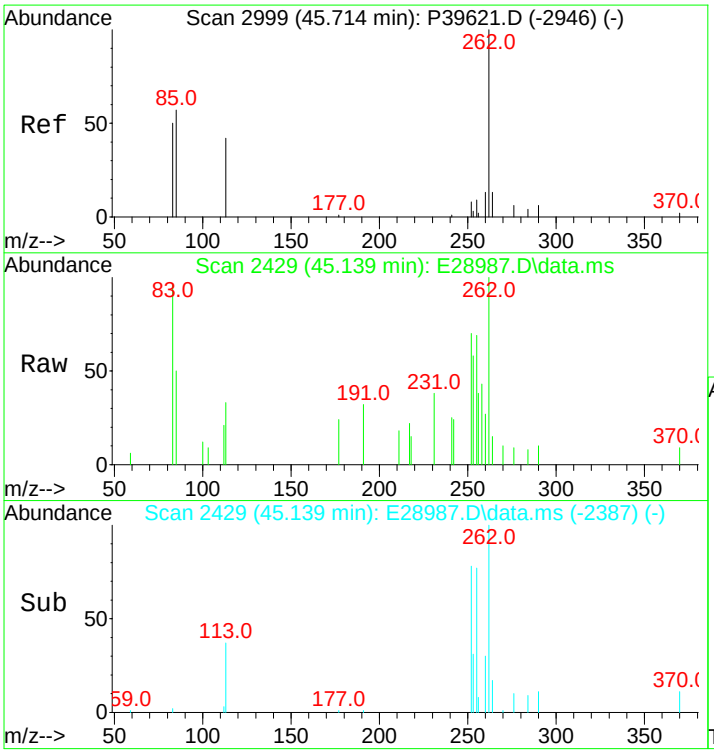




#70
C1-Naphthobenzothiophenes
Concen: 1018.44 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

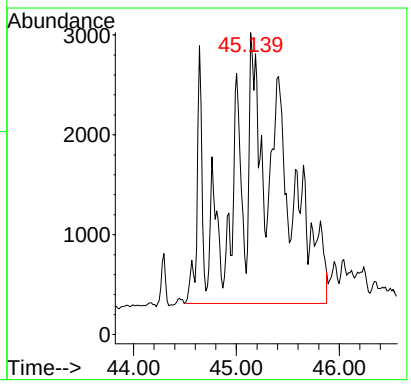
Tgt Ion:248 Resp: 105609

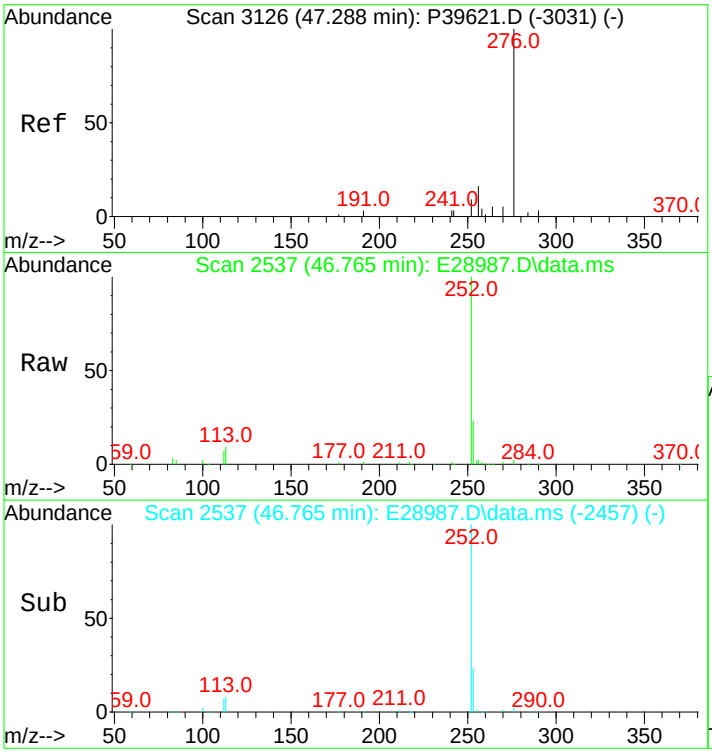




#71
C2-Naphthobenzothiophenes
Concen: 829.52 ng/ml m
RT: 45.139 min Scan# 2429
Delta R.T. 0.494 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

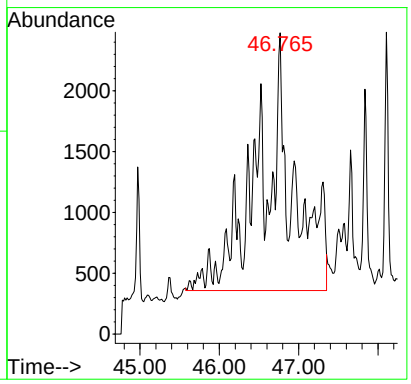
Tgt Ion:262 Resp: 86019

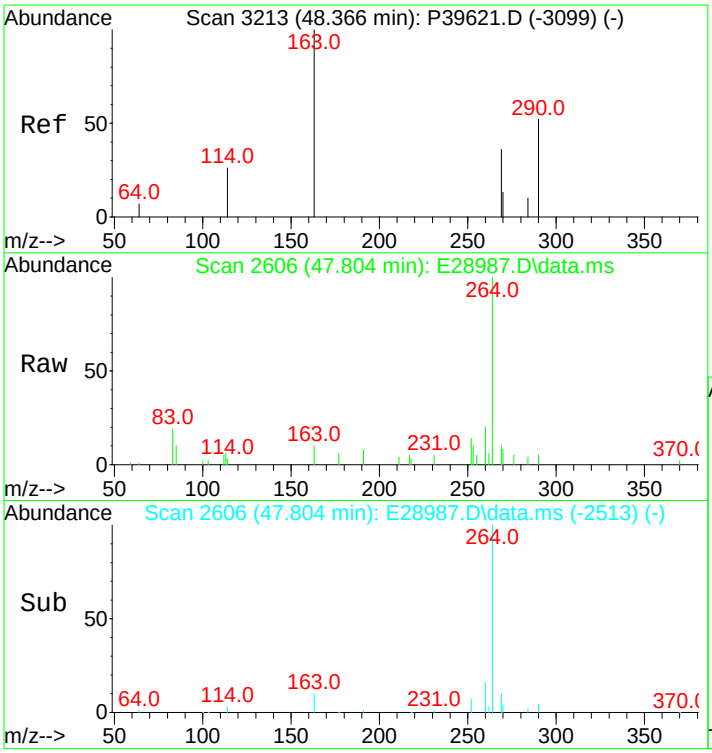




#72
C3-Naphthobenzothiophenes
Concen: 592.12 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

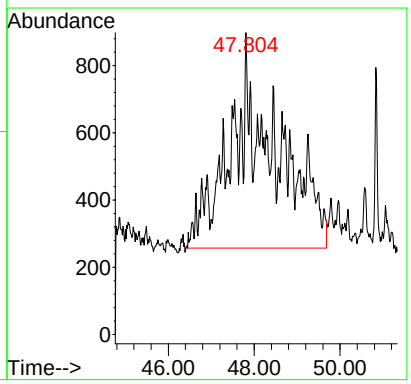
Tgt Ion:276 Resp: 61401

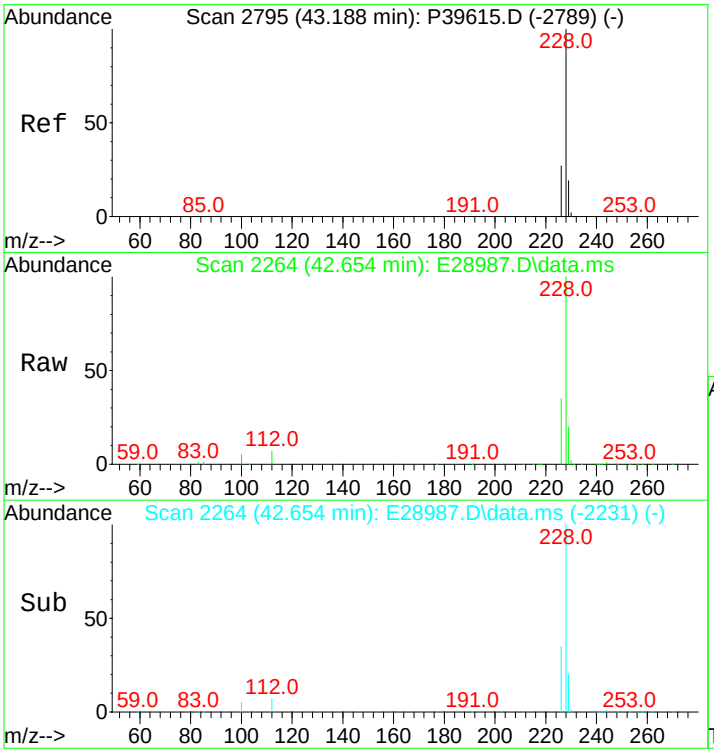




#73
C4-Naphthobenzothiophenes
Concen: 432.61 ng/mL m
RT: 47.804 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:290 Resp: 44860

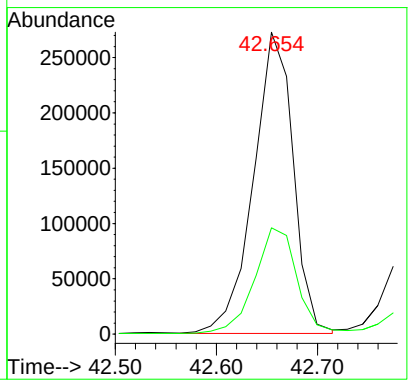


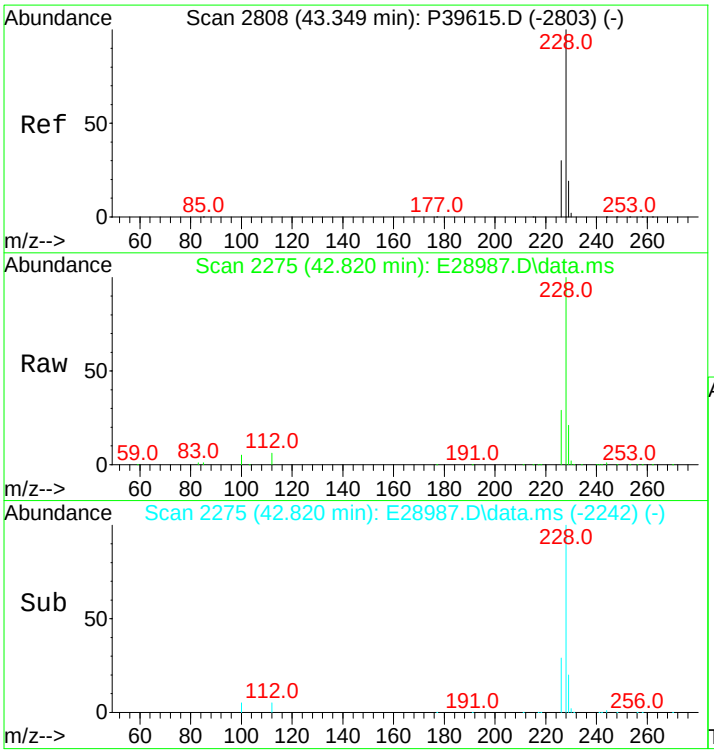


#75
Benz[a]anthracene
Concen: 6610.52 ng/mL m
RT: 42.654 min Scan# 2264
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:228 Resp: 744584

Ion	Ratio	Lower	Upper
228	100		
226	29.2	20.7	31.1

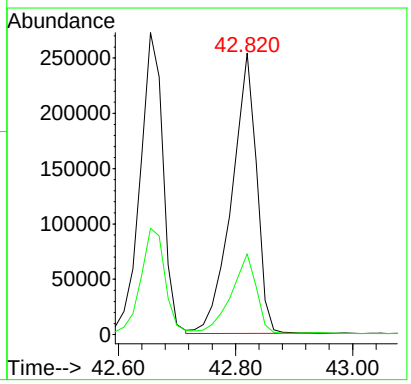


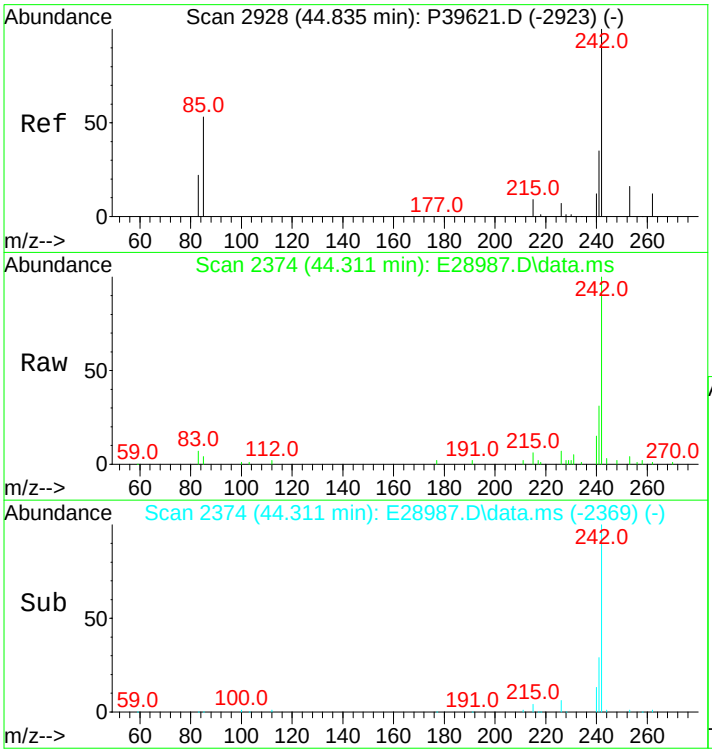


#77
Chrysene/Triphenylene
Concen: 6462.81 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:228 Resp: 749435

Ion	Ratio	Lower	Upper
228	100		
226	29.1	22.6	34.0

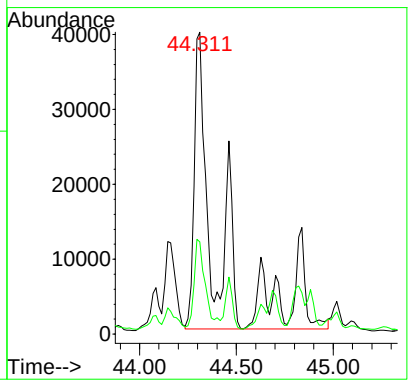


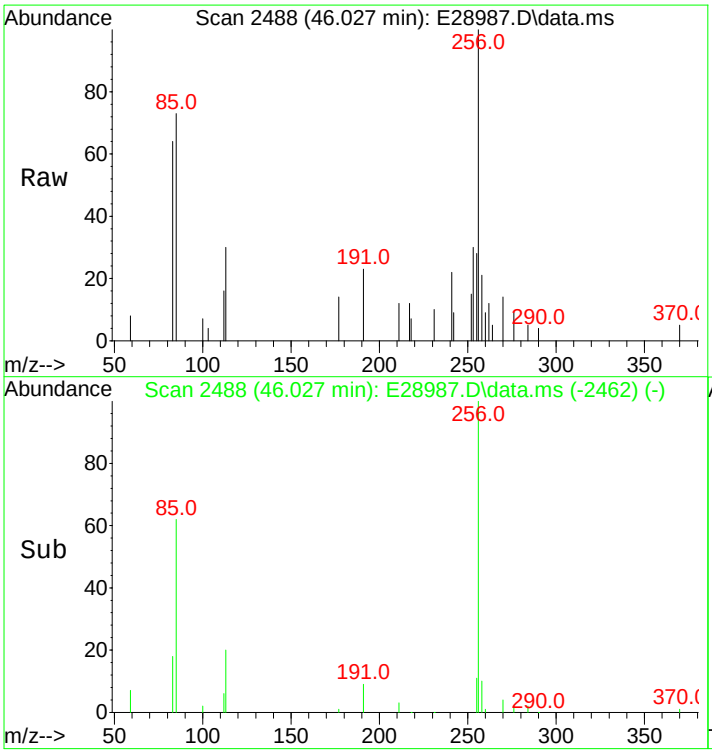


#78
C1-Chrysenes
Concen: 2765.94 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:242 Resp: 320742

Ion	Ratio	Lower	Upper
242	100		
241	3.5	32.2	48.4#

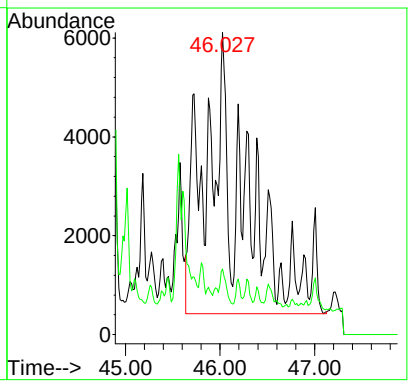


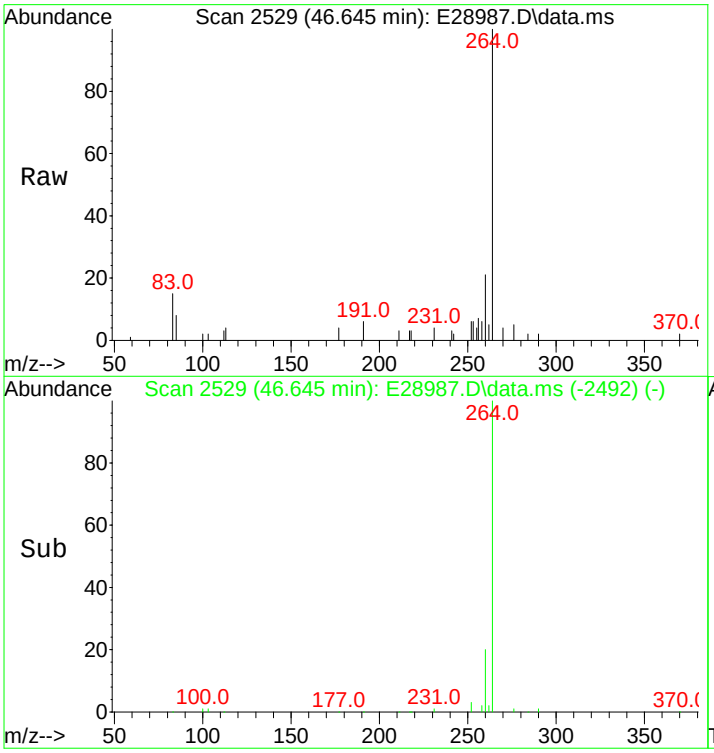


#79
C2-Chrysenes
Concen: 1392.94 ng/mL m
RT: 46.027 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:256 Resp: 161527

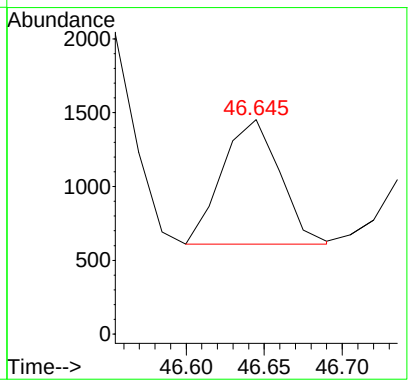
Ion	Ratio	Lower	Upper
256	100		
241	0.9	25.3	37.9#

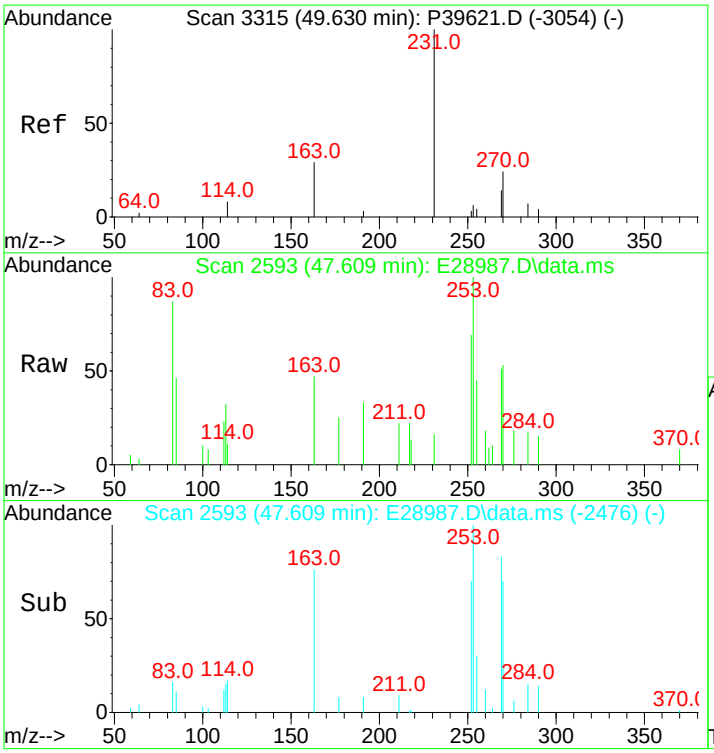




#80
BBF-D12 Surr BKGD
Concen: 18.83 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:256 Resp: 2183

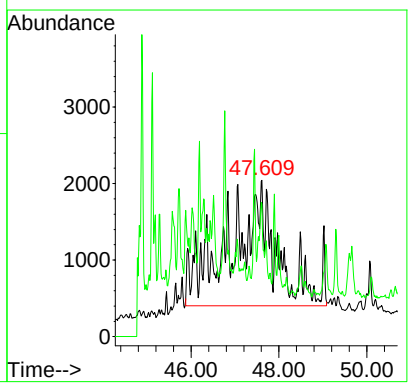


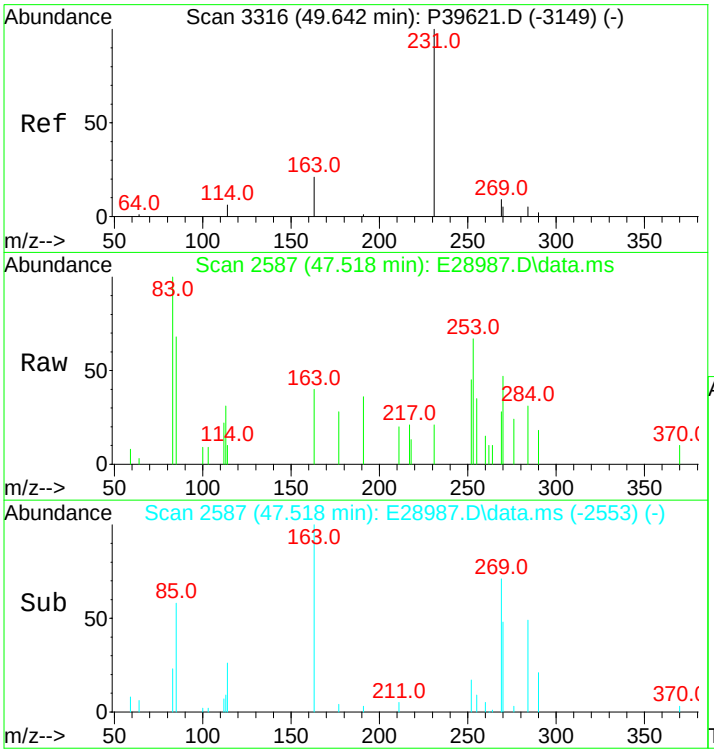


#81
C3-Chrysenes
Concen: 1011.60 ng/mL m
RT: 47.609 min Scan# 2593
Delta R.T. -1.459 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:270 Resp: 117306

Ion	Ratio	Lower	Upper
270	100		
255	0.2	38.0	57.0#

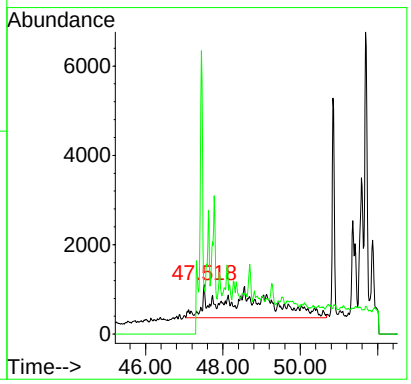


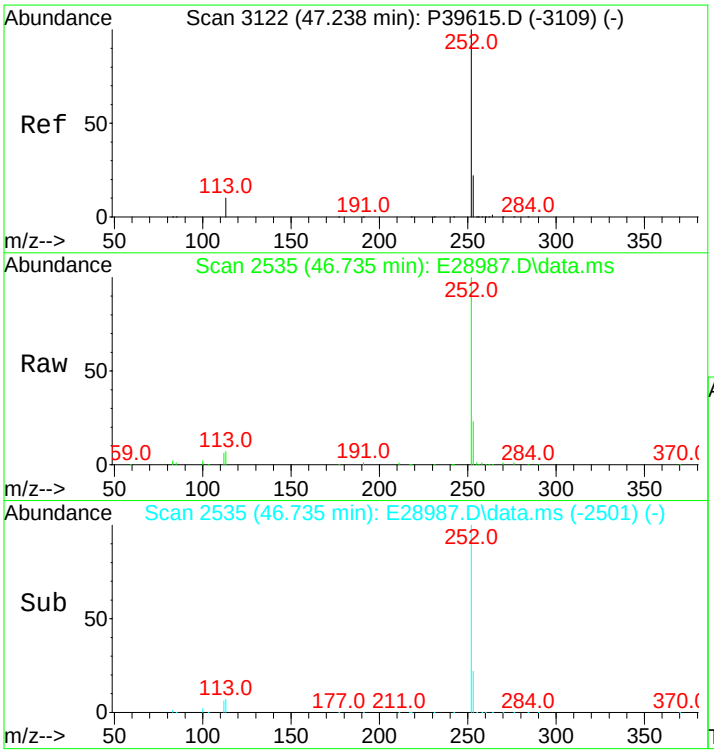


#82
C4-Chrysenes
Concen: 507.04 ng/mL m
RT: 47.518 min Scan# 2587
Delta R.T. -1.668 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:284 Resp: 58797

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

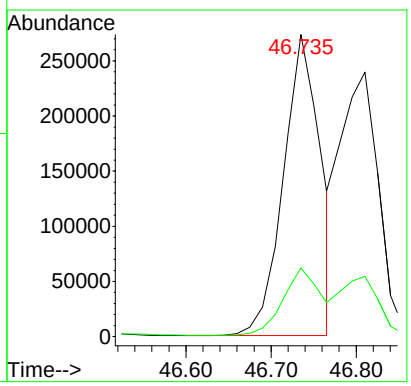


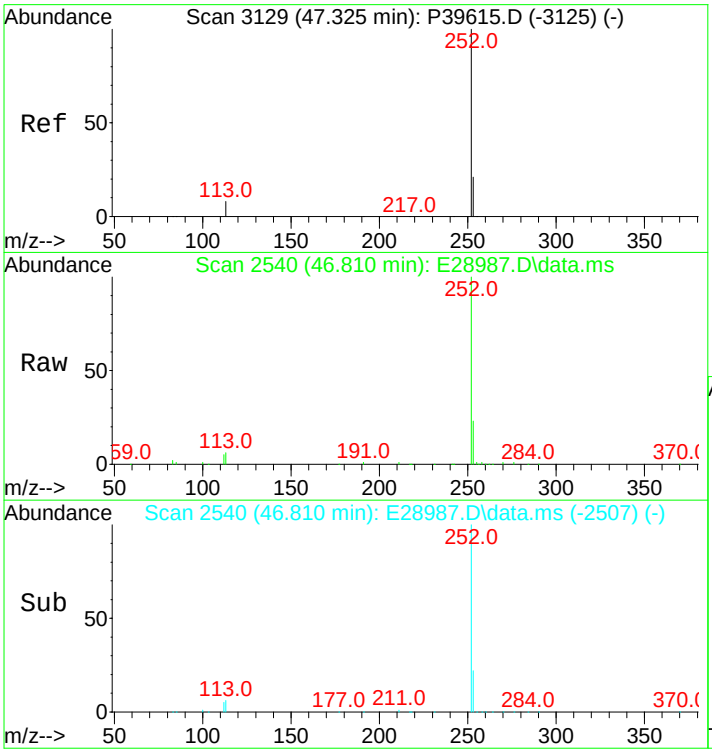


#84
Benzo[b]fluoranthene
Concen: 6313.22 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:252 Resp: 826534

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.5	29.3

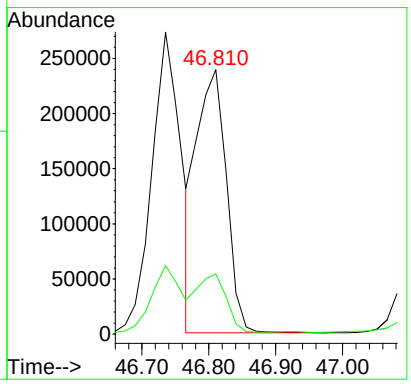


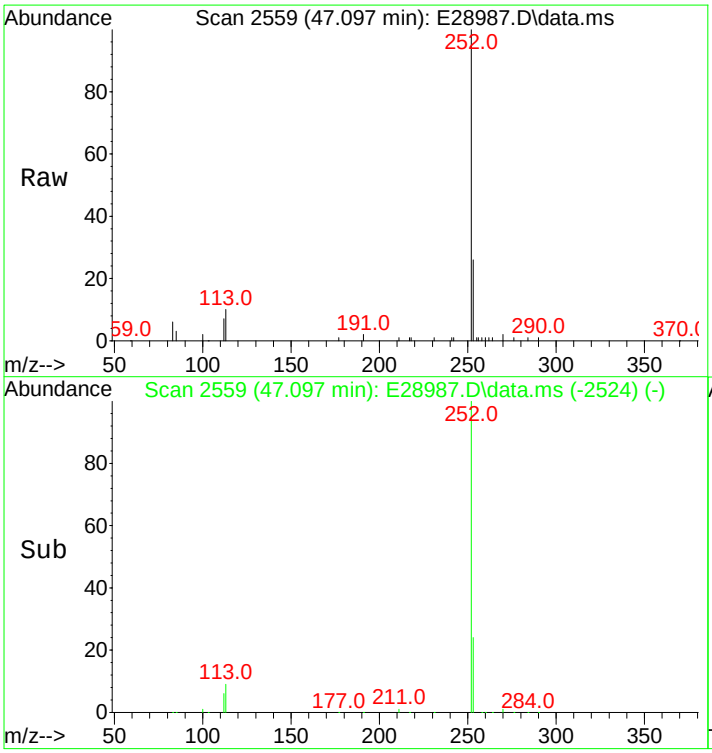


#85
Benzo[j]+[k]fluoranthene
Concen: 5501.27 ng/mL
RT: 46.810 min Scan# 2540
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:252 Resp: 740994

Ion	Ratio	Lower	Upper
252	100		
253	22.2	19.7	29.5

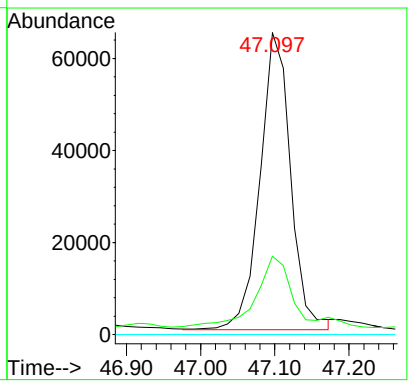


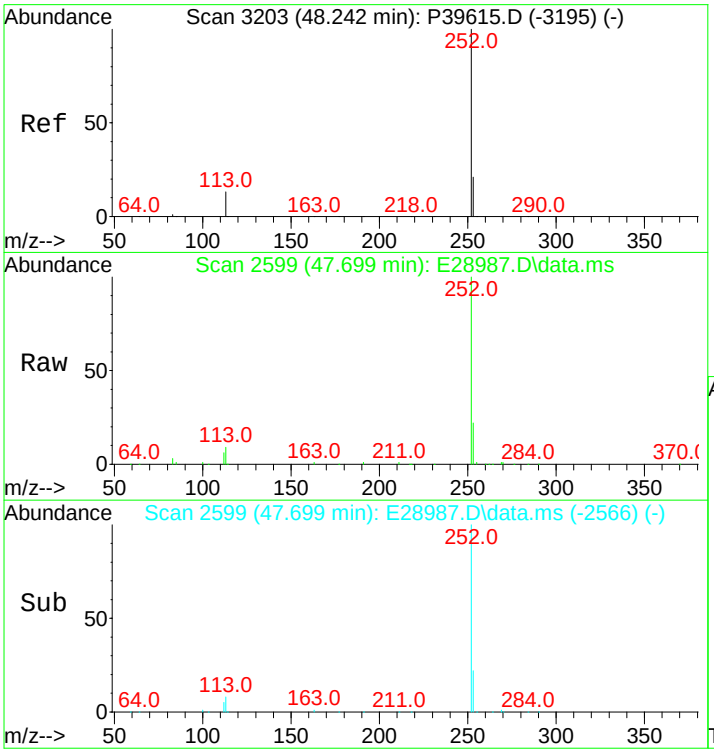


#86
Benzo[a]fluoranthene
Concen: 1382.61 ng/mL m
RT: 47.097 min Scan# 2559
Delta R.T. 0.024 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:252 Resp: 186231

Ion	Ratio	Lower	Upper
252	100		
253	31.4	456.0	684.0#
125	0.0	0.0	0.0

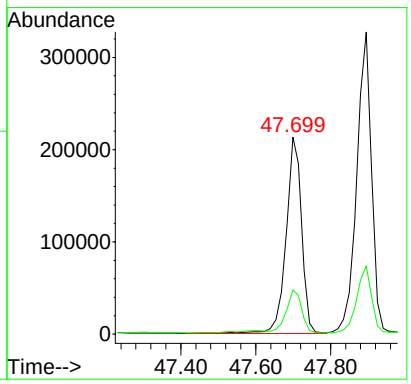


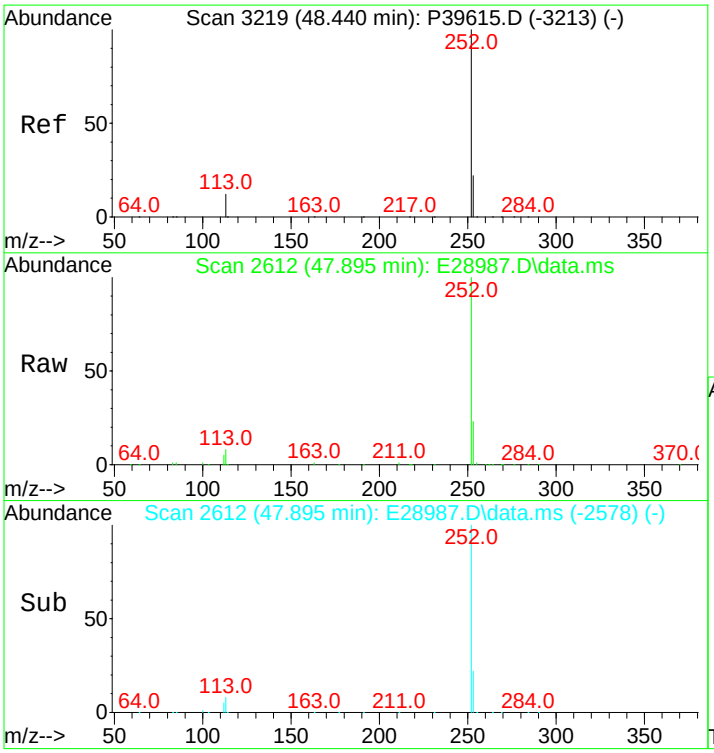


#87
Benzo[e]pyrene
Concen: 4763.46 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:252 Resp: 608936

Ion	Ratio	Lower	Upper
252	100		
253	21.8	20.6	31.0

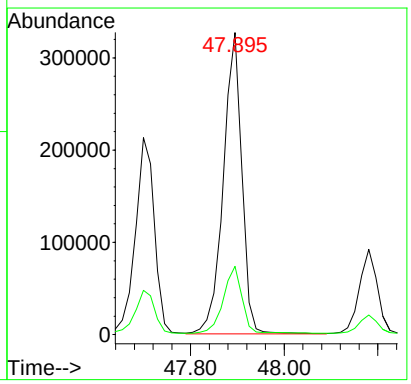


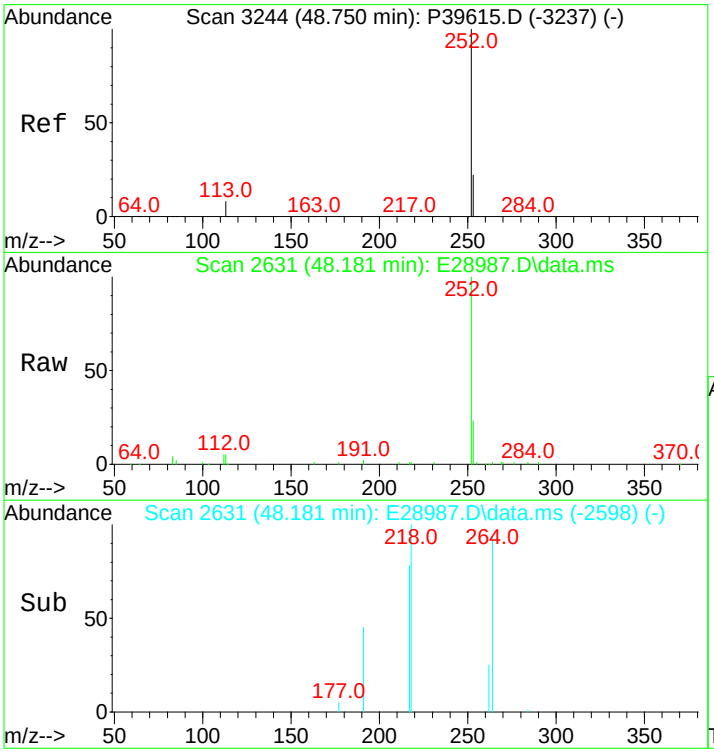


#89
Benzo[a]pyrene
Concen: 7356.30 ng/mL
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:252 Resp: 899831

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.8	31.2

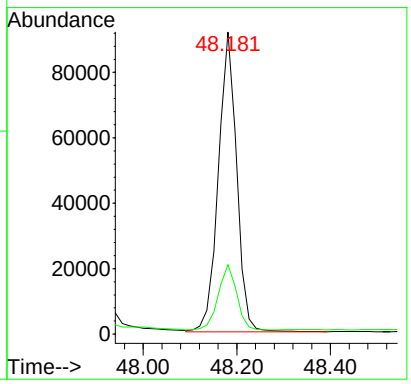


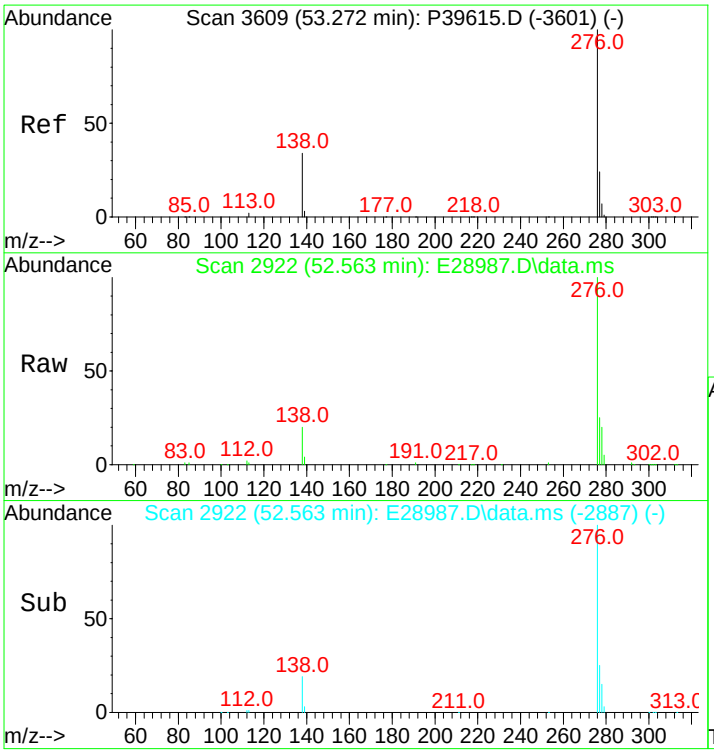


#90
Perylene
Concen: 1925.33 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:252 Resp: 249036

Ion	Ratio	Lower	Upper
252	100		
253	21.8	20.7	31.1

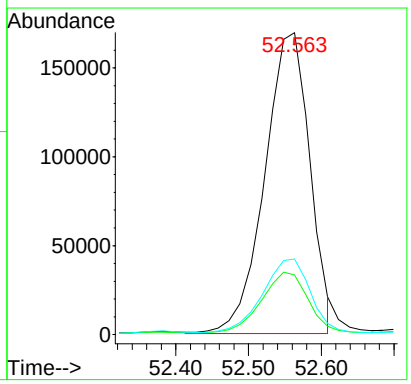


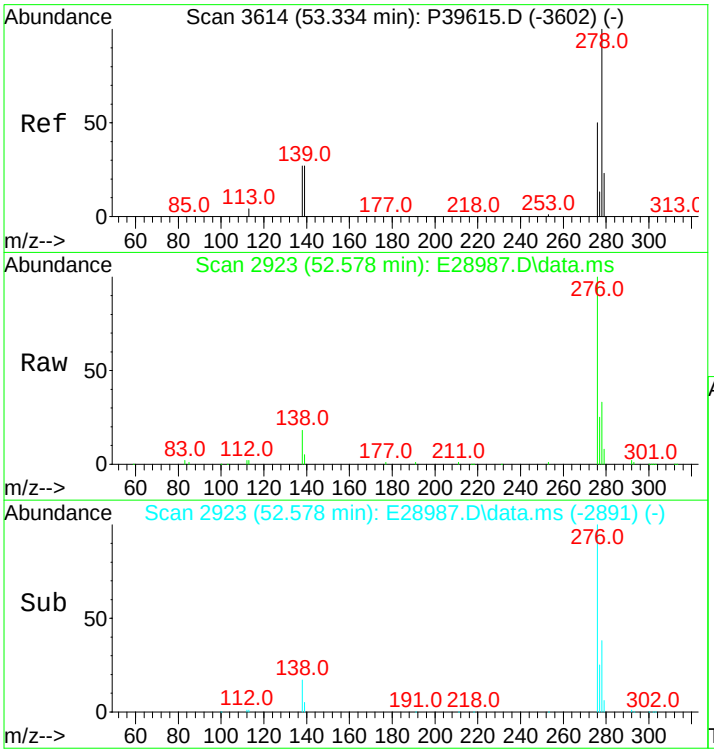


#91
Indeno[1,2,3-cd]pyrene
Concen: 5057.80 ng/mL m
RT: 52.563 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:276 Resp: 728103

Ion	Ratio	Lower	Upper
276	100		
138	21.2	16.3	24.5
277	26.5	19.4	29.2

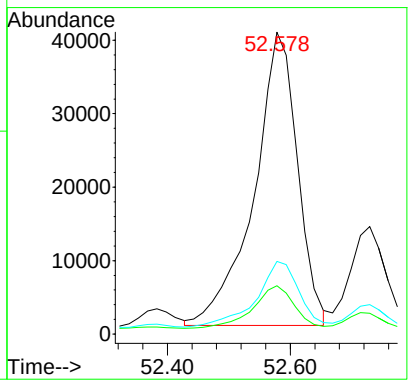


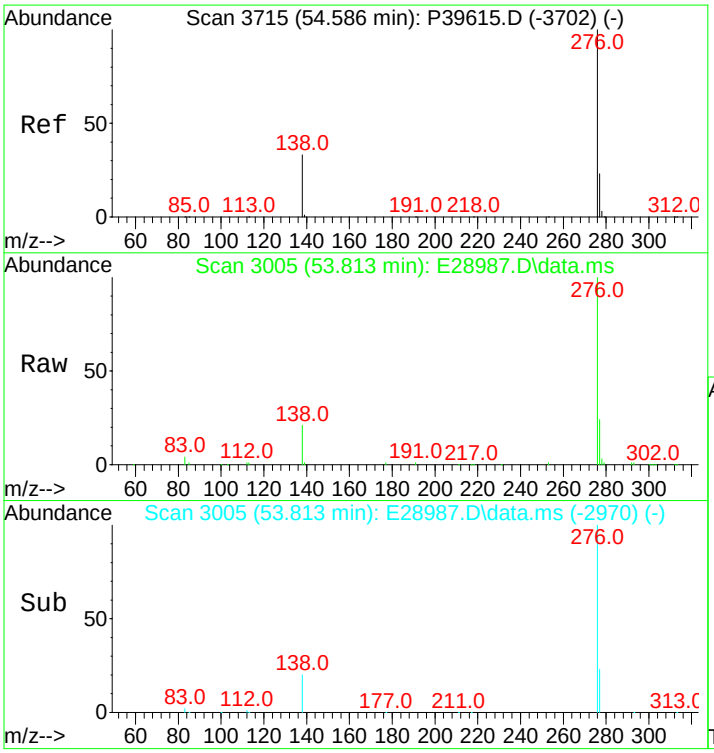


#92
Dibenz[ah]+[ac]anthracene
Concen: 1280.27 ng/mL m
RT: 52.578 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:278 Resp: 196243

Ion	Ratio	Lower	Upper
278	100		
139	13.9	11.6	17.4
279	22.3	19.3	28.9

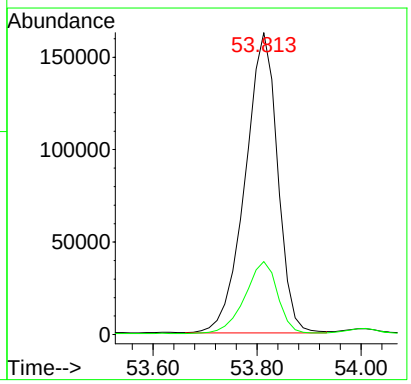


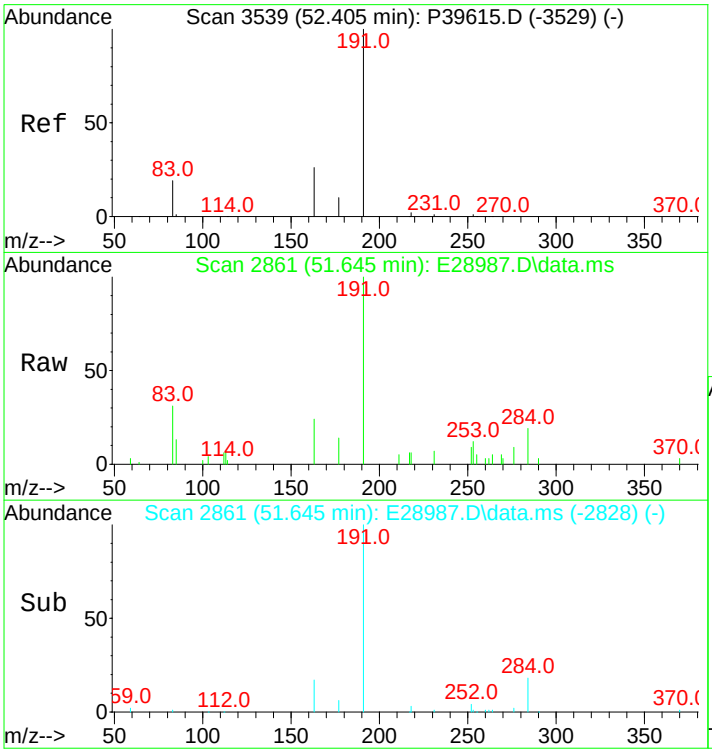


#93
Benzo[g,h,i]perylene
Concen: 4544.58 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:276 Resp: 705412

Ion	Ratio	Lower	Upper
276	100		
277	24.1	19.1	28.7

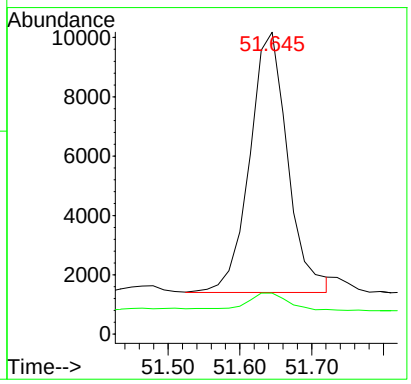


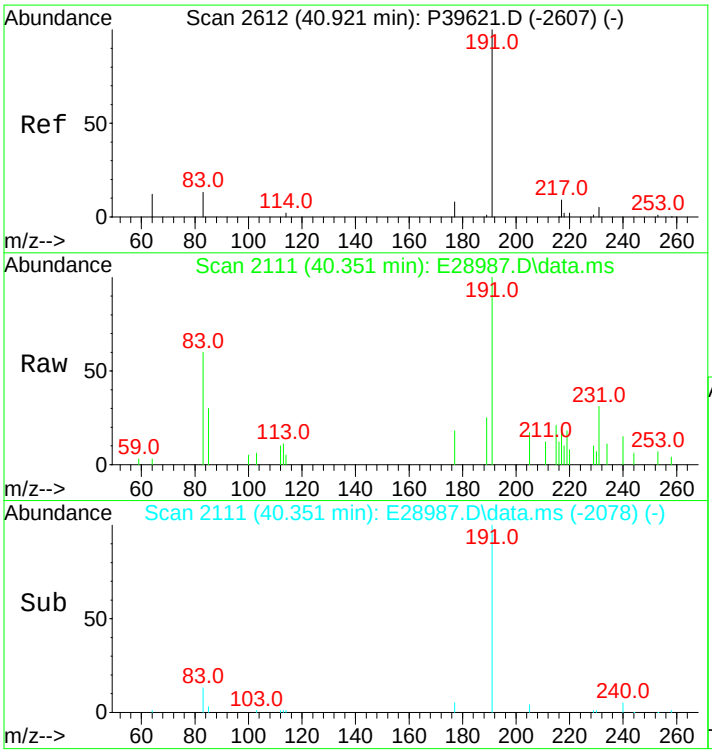


#94
Hopane (T19)
Concen: 743.18 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:191 Resp: 32261

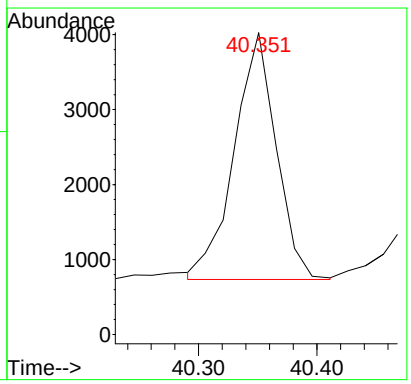
Ion	Ratio	Lower	Upper
191	100		
177	7.2	11.6	17.4#

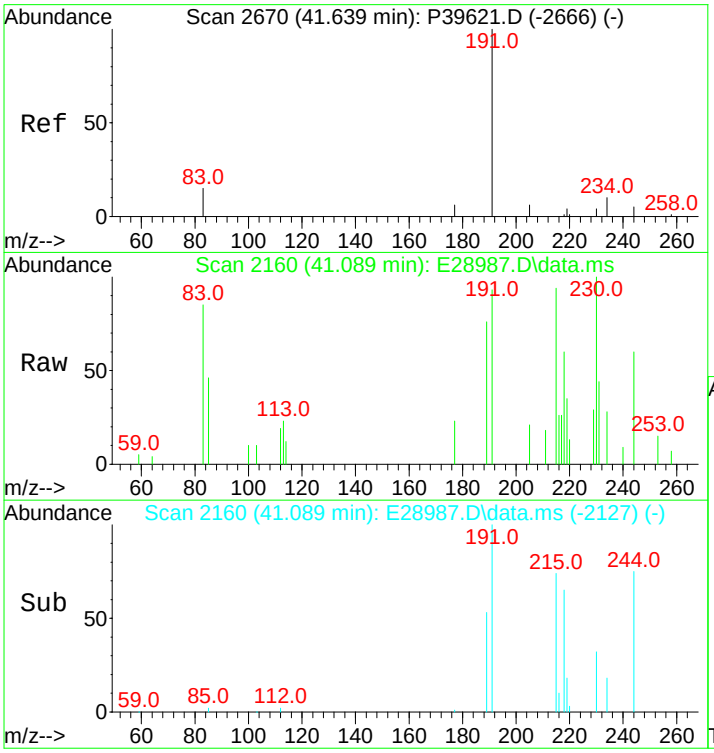




#96
C23 Tricyclic Terpane (T4)
Concen: 186.71 ng/ml m
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

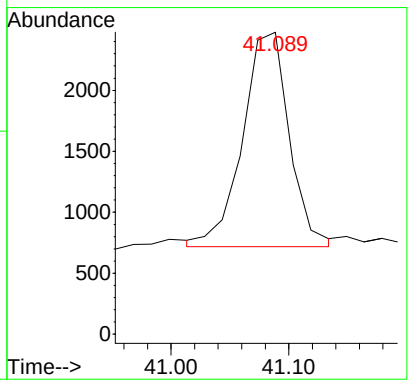
Tgt Ion:191 Resp: 8105

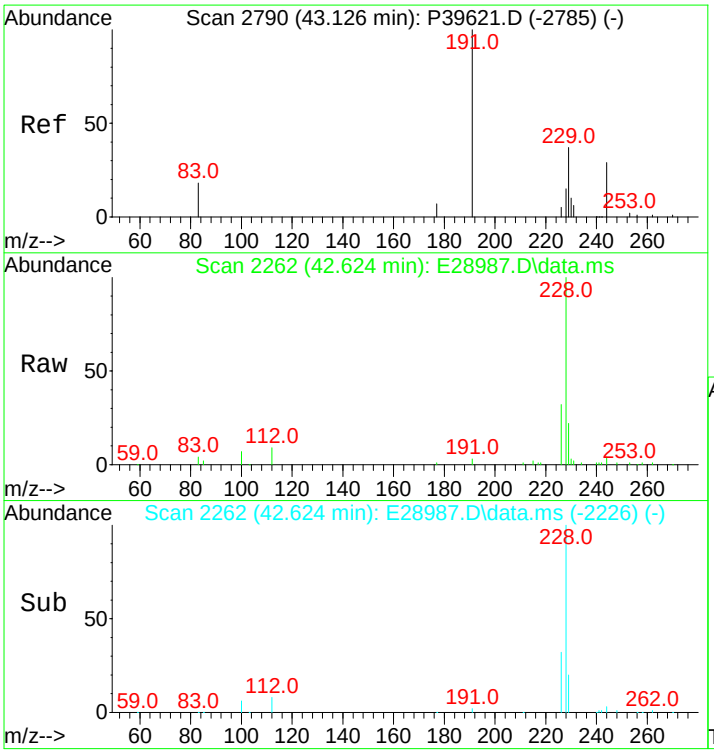




#97
C24 Tricyclic Terpane (T5)
Concen: 111.82 ng/ml m
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

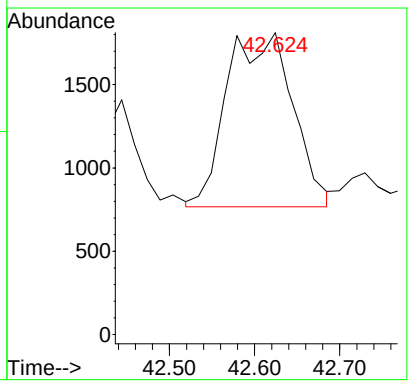
Tgt Ion:191 Resp: 4854

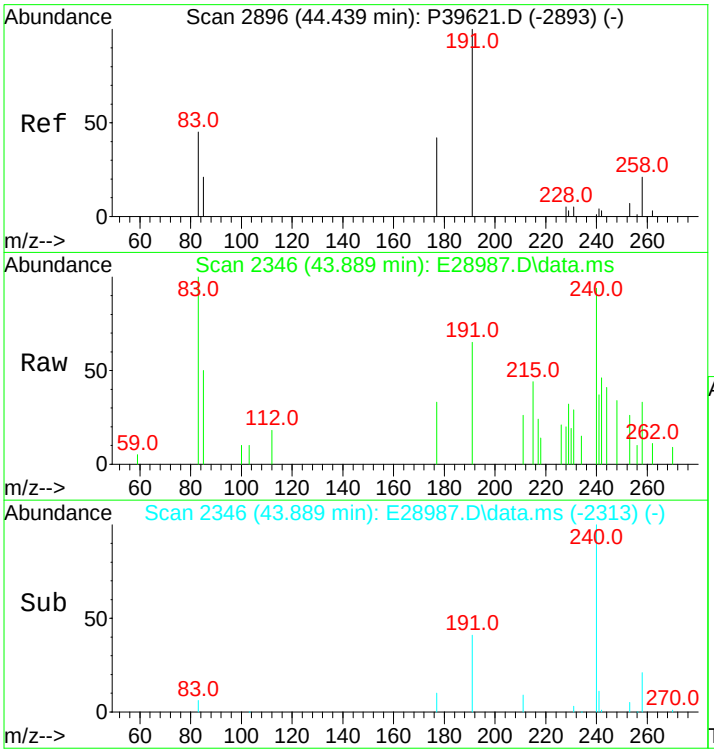




#98
C25 Tricyclic Terpane (T6)
Concen: 129.03 ng/ml
RT: 42.624 min Scan# 2262
Delta R.T. 0.045 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

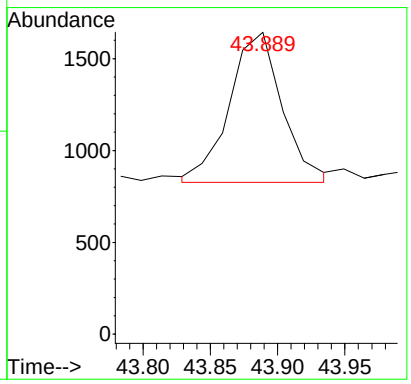
Tgt Ion:191 Resp: 5601

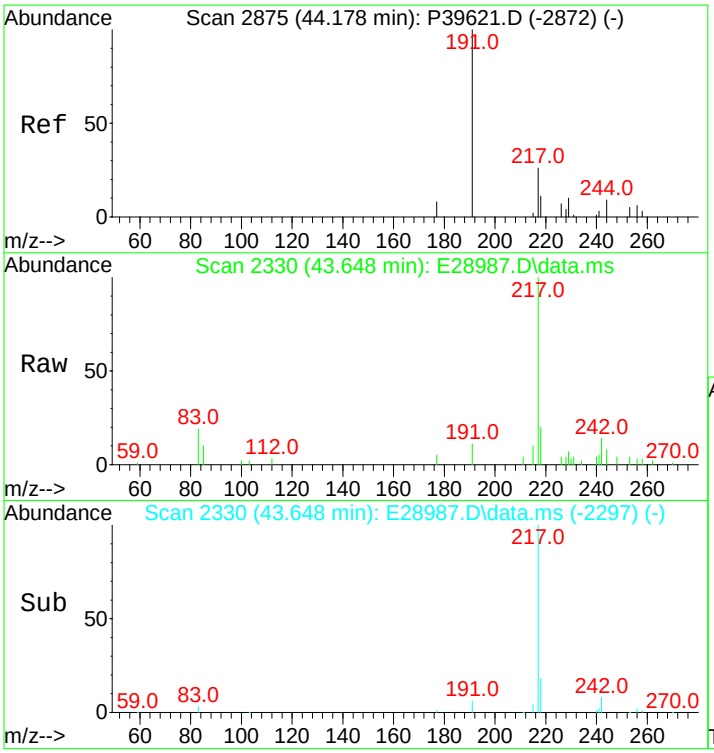




#99
C24 Tetracyclic Terpane (T6a)
Concen: 51.19 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

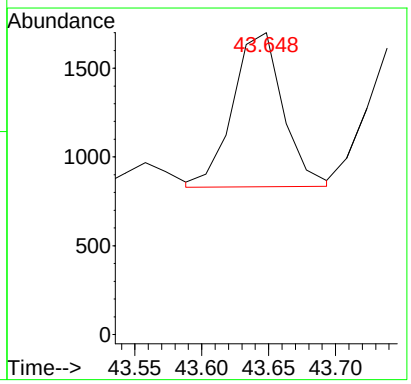
Tgt Ion:191 Resp: 2222

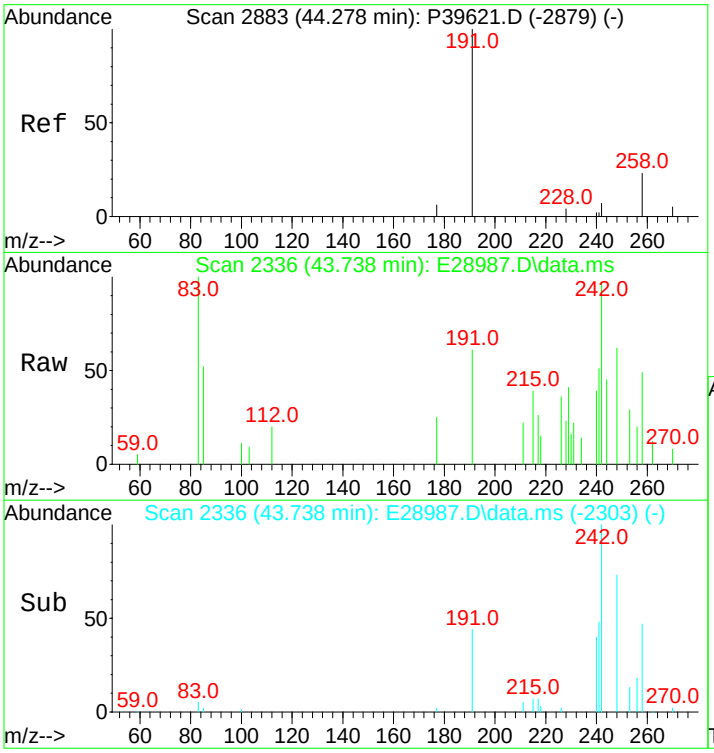




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 52.48 ng/ml
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

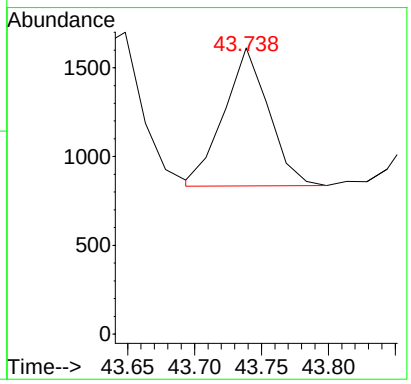
Tgt Ion:191 Resp: 2278

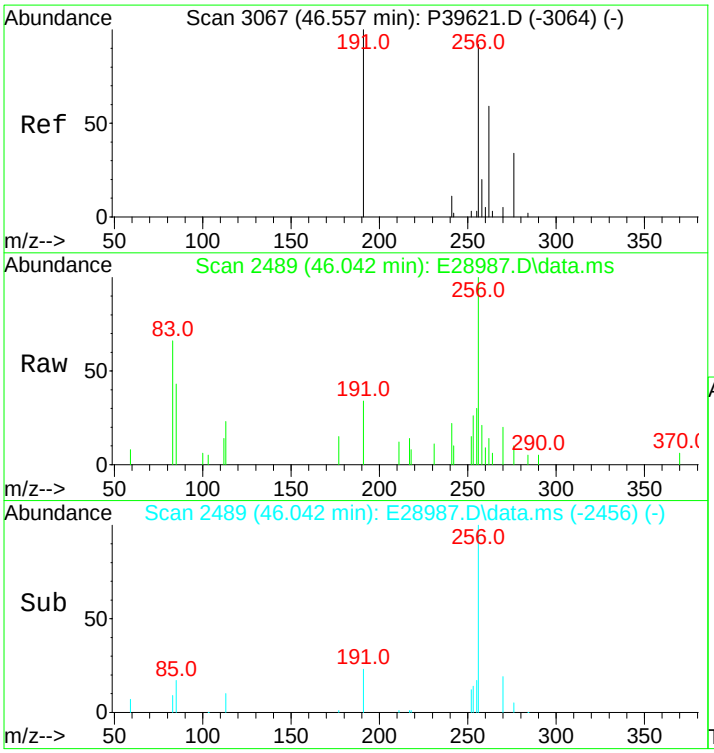




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 41.67 ng/ml
RT: 43.738 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

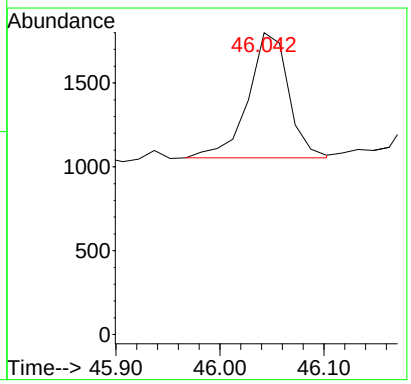
Tgt Ion:191 Resp: 1809

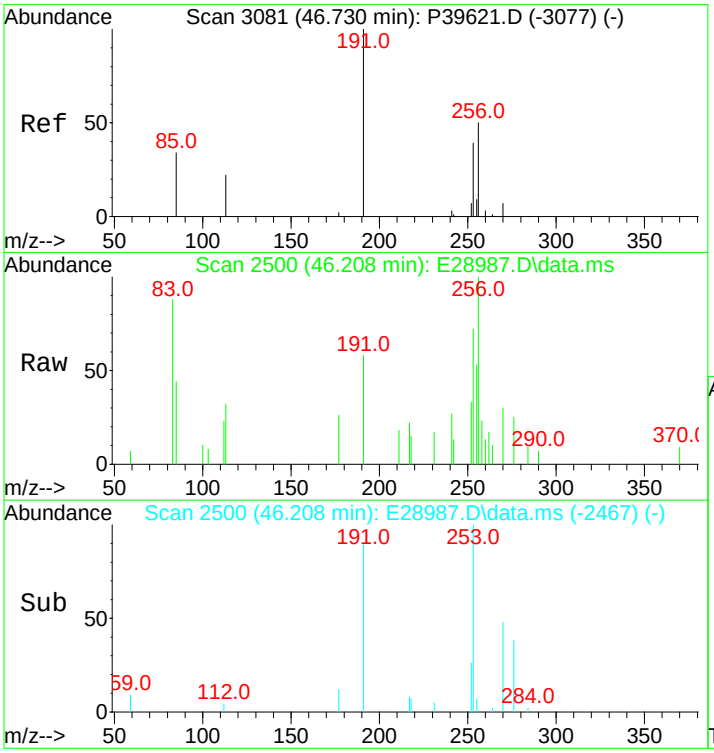




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 46.65 ng/ml
RT: 46.042 min Scan# 2489
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

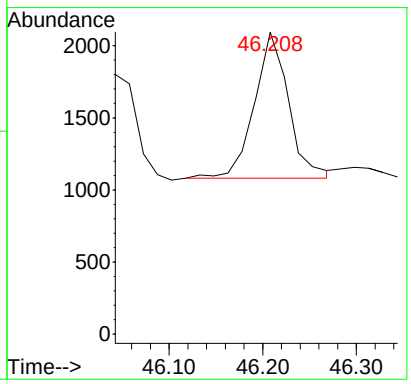
Tgt Ion:191 Resp: 2025

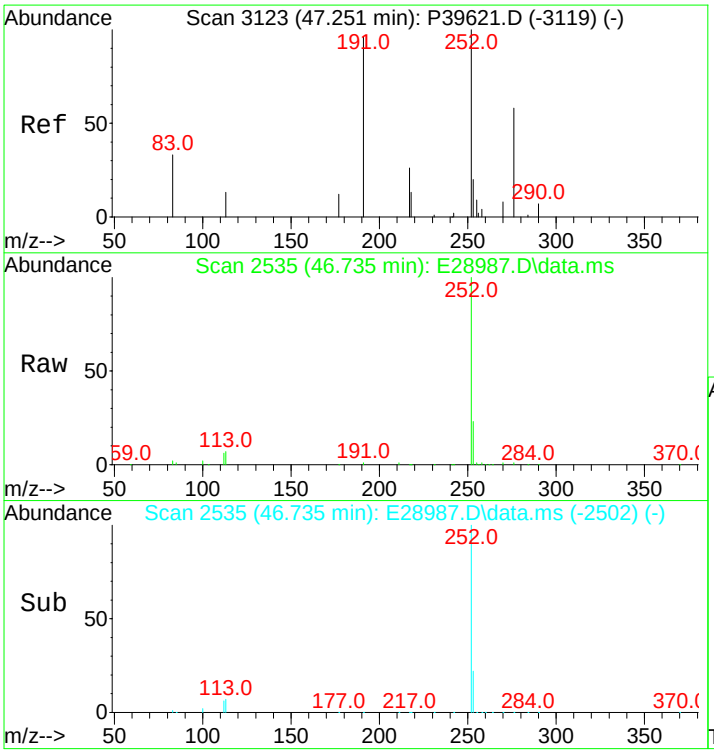




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 59.11 ng/ml
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

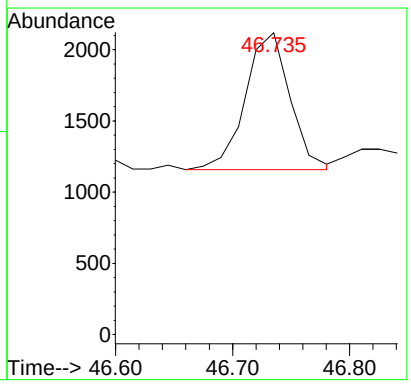
Tgt Ion:191 Resp: 2566

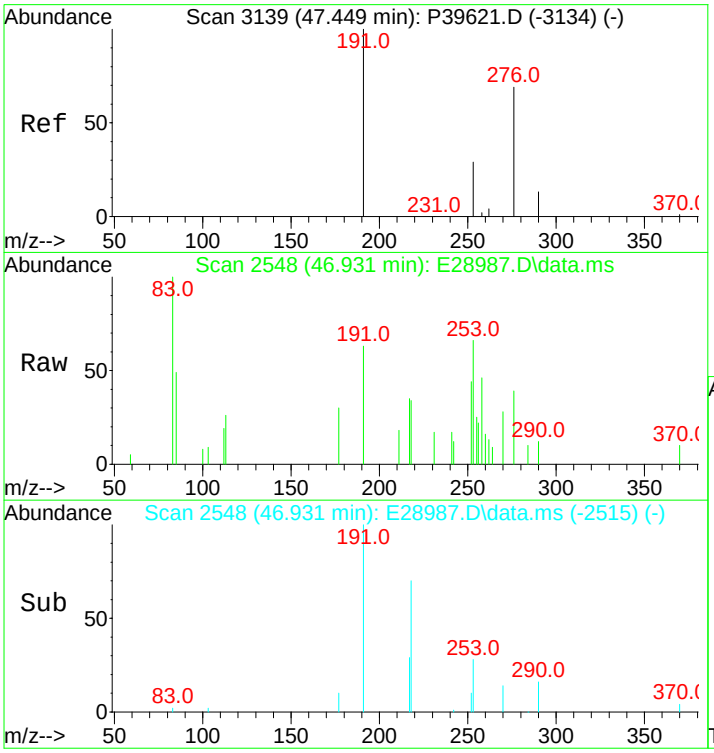




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 59.02 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

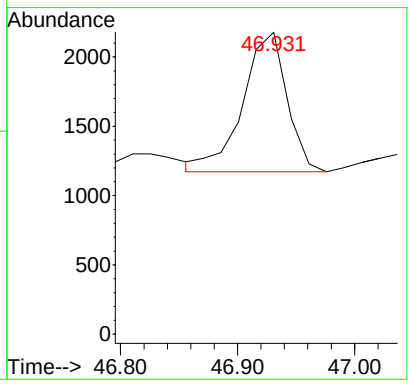
Tgt Ion:191 Resp: 2562

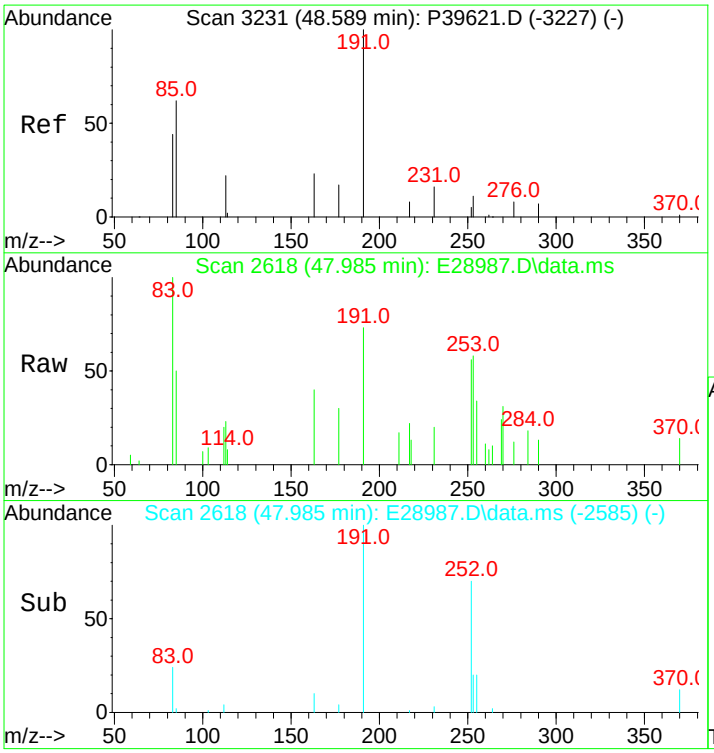




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 60.79 ng/ml
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

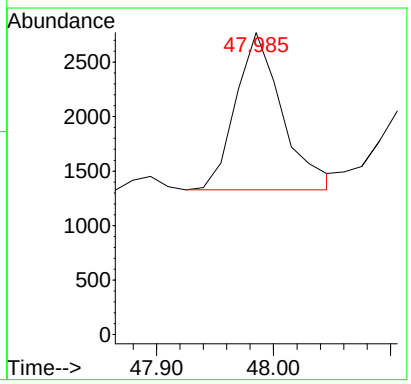
Tgt Ion:191 Resp: 2639

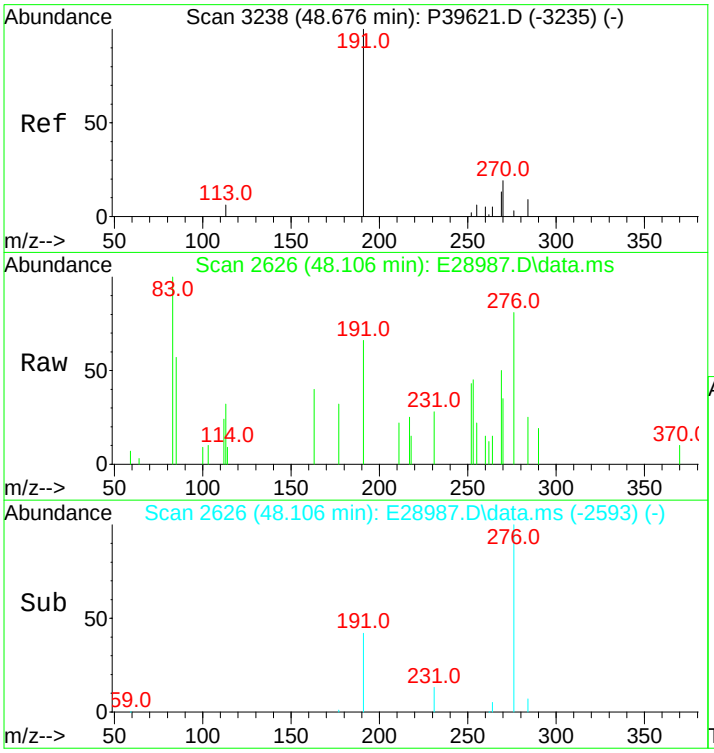




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 92.35 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

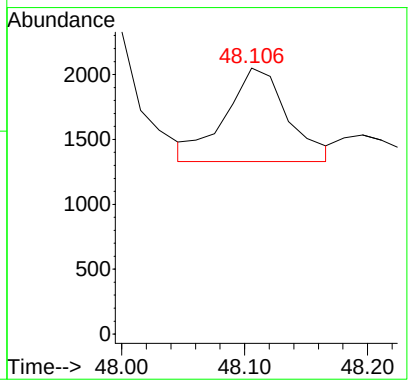
Tgt Ion:191 Resp: 4009

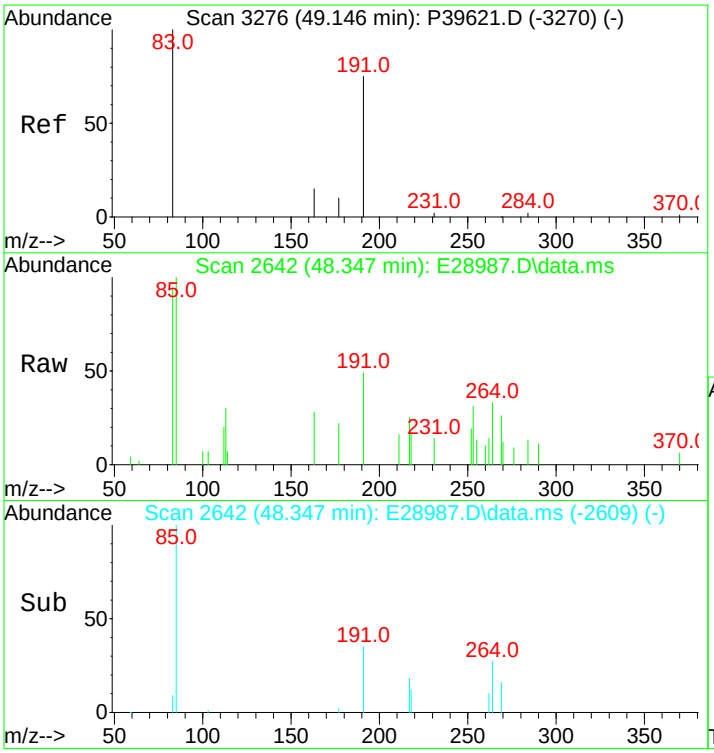




#107
C30 Tricyclic Terpane-22S
Concen: 58.58 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

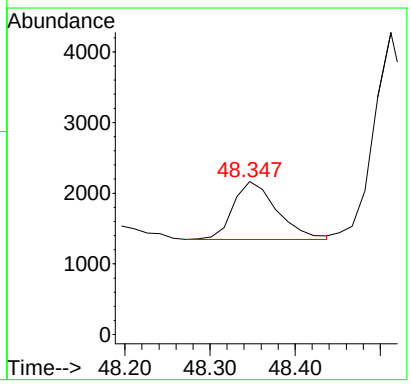
Tgt Ion:191 Resp: 2543

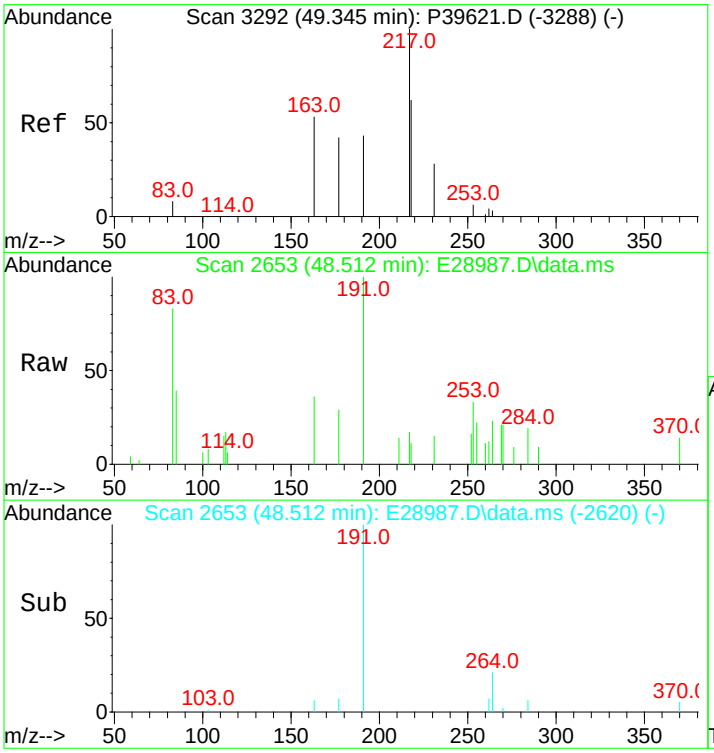




#108
C30 Tricyclic Terpane-22R
Concen: 68.14 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

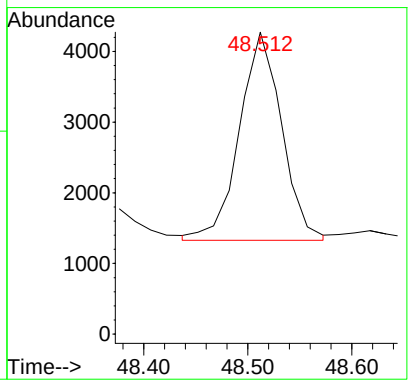
Tgt Ion:191 Resp: 2958

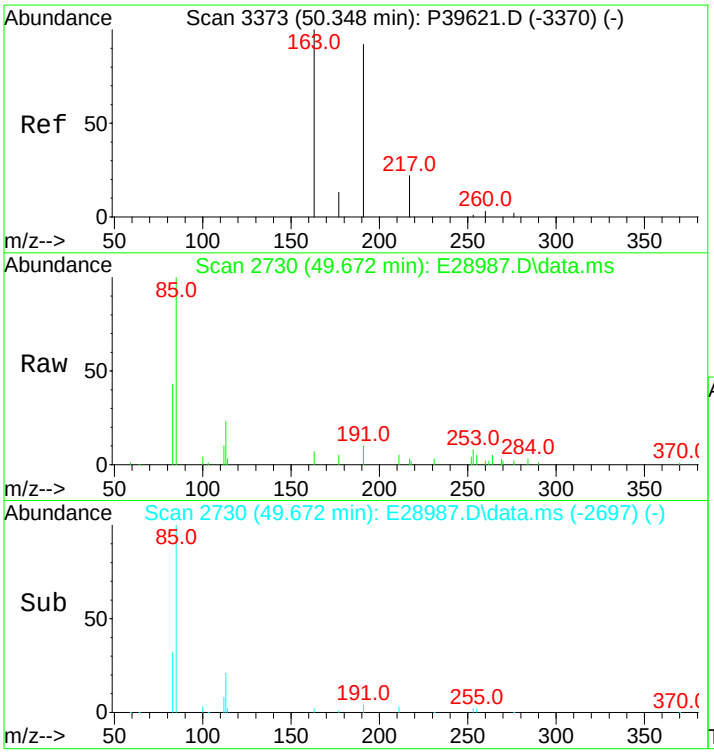




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 191.57 ng/ml m
RT: 48.512 min Scan# 2653
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

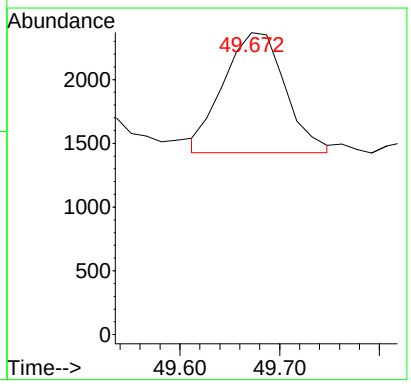
Tgt Ion:191 Resp: 8316

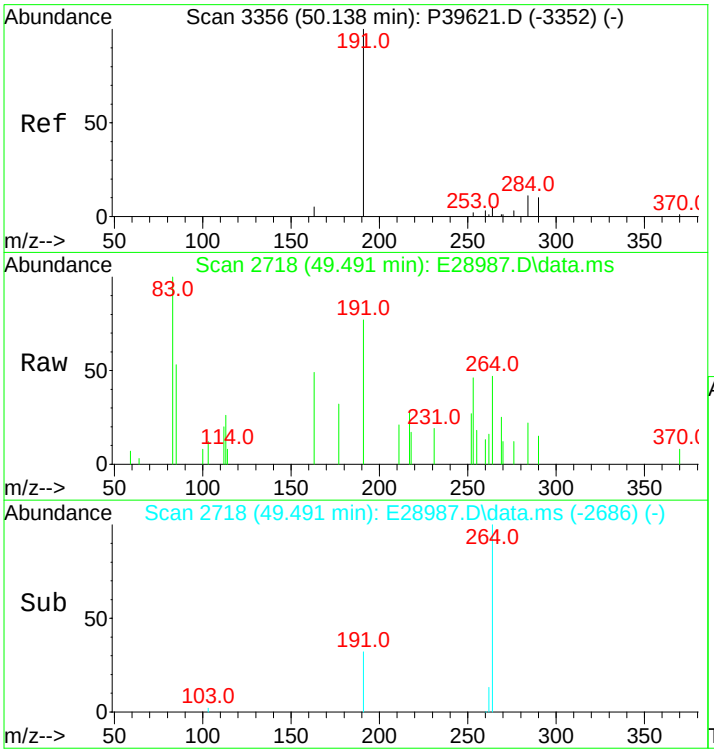




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 93.04 ng/ml m
RT: 49.672 min Scan# 2730
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

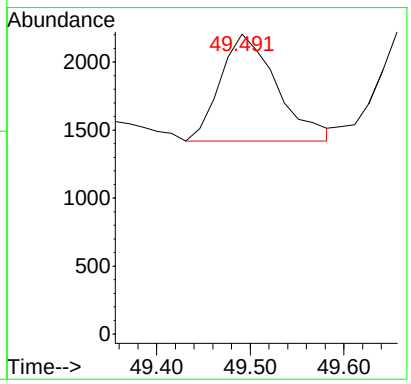
Tgt Ion:191 Resp: 4039

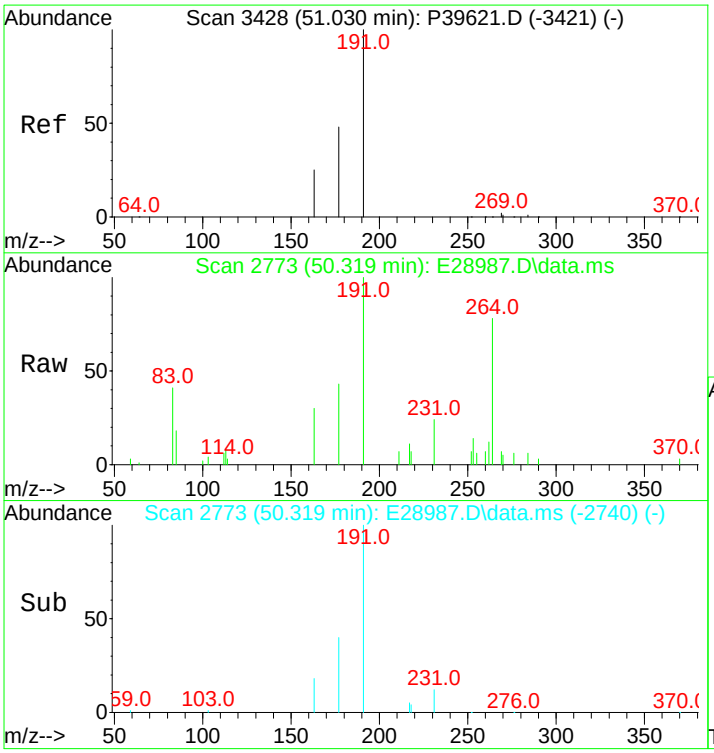




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 76.14 ng/ml
RT: 49.491 min Scan# 2718
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

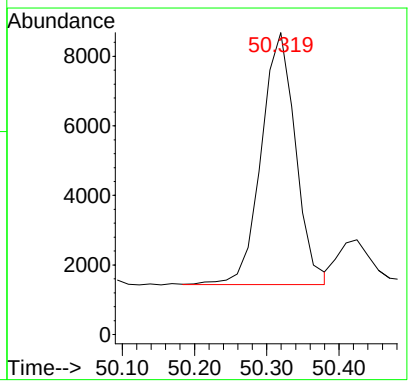
Tgt Ion:191 Resp: 3305

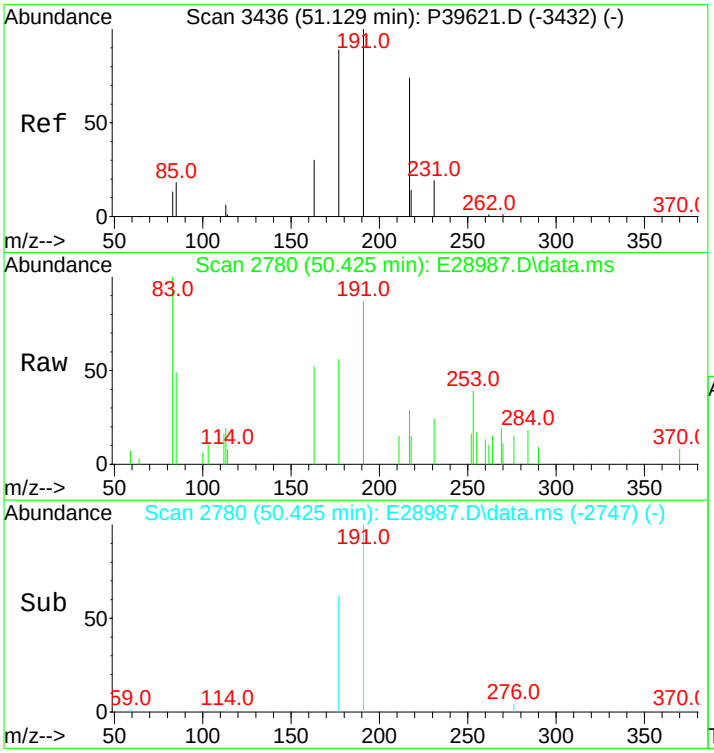




#112
30-Norhopane (T15)
Concen: 550.38 ng/ml m
RT: 50.319 min Scan# 2773
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

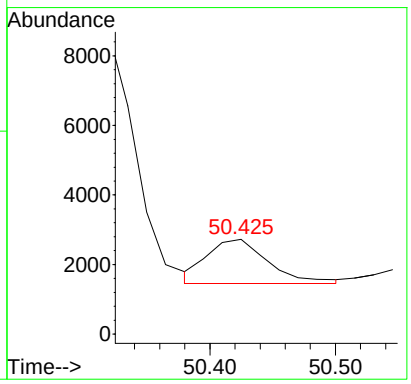
Tgt Ion:191 Resp: 23892

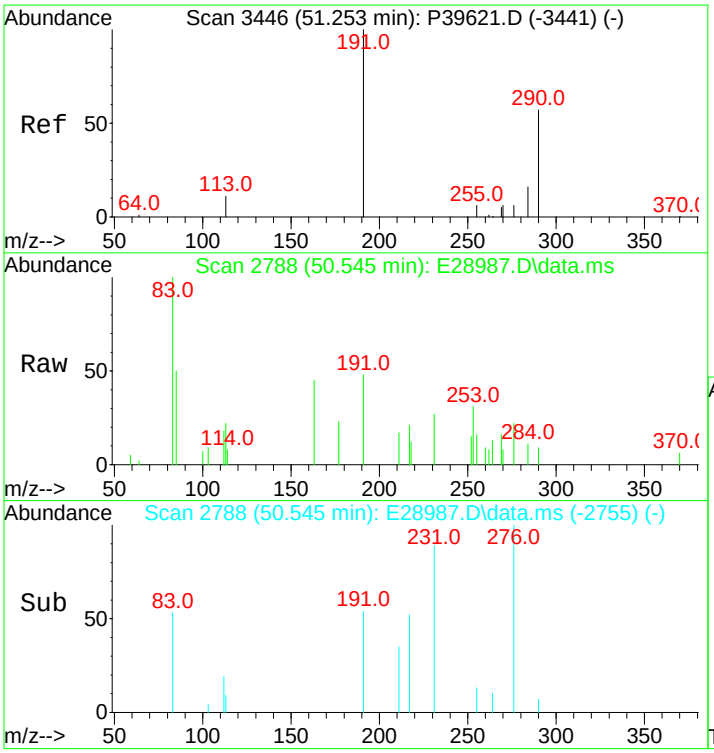




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 98.39 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

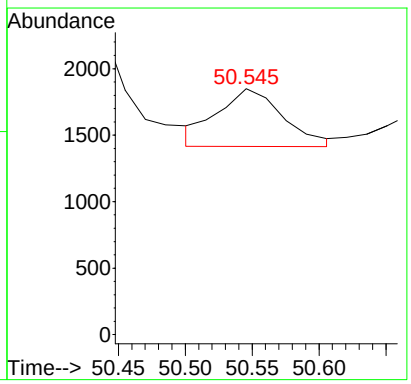
Tgt Ion:191 Resp: 4271

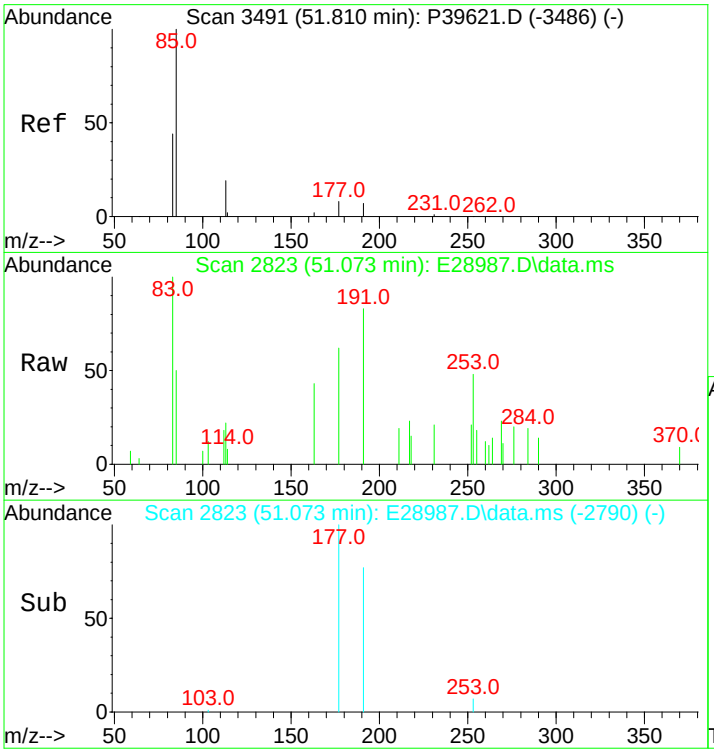




#114
17a(H)-Diahopane (X)
Concen: 33.91 ng/ml
RT: 50.545 min Scan# 2788
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

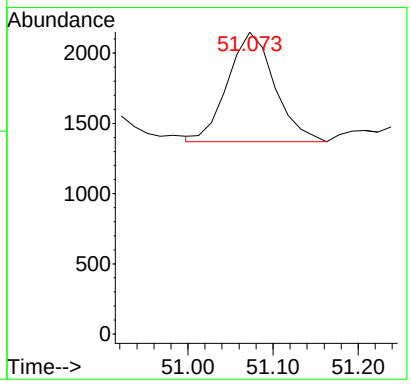
Tgt Ion:191 Resp: 1472

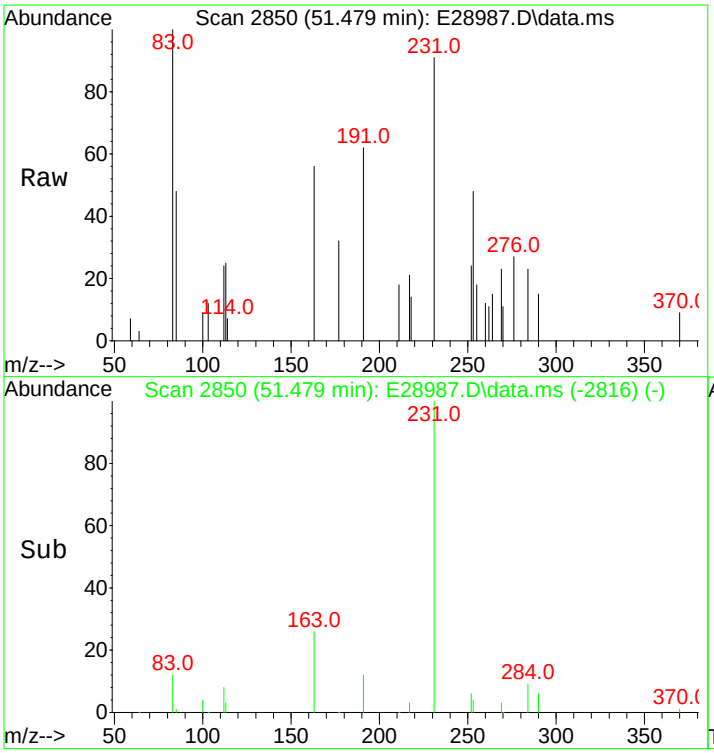




#115
30-Normoretane (T17)
Concen: 68.65 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

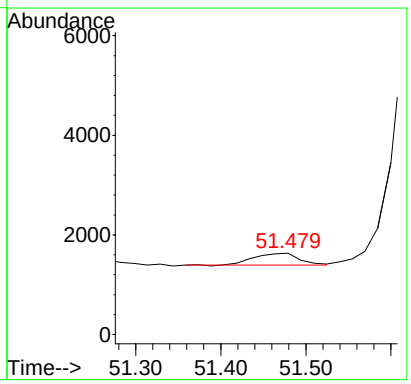
Tgt Ion:191 Resp: 2980

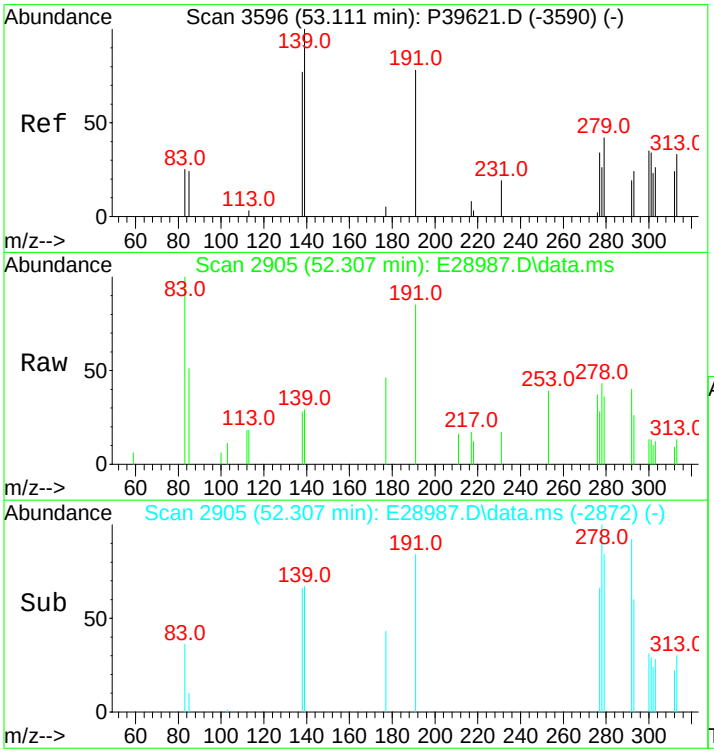




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 20.82 ng/ml
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

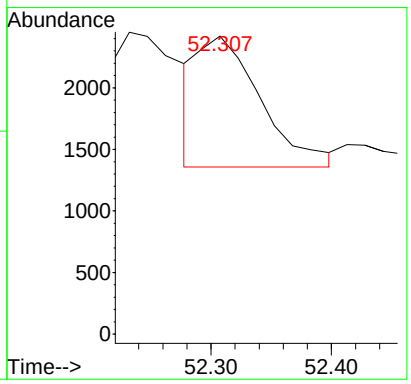
Tgt Ion:191 Resp: 904

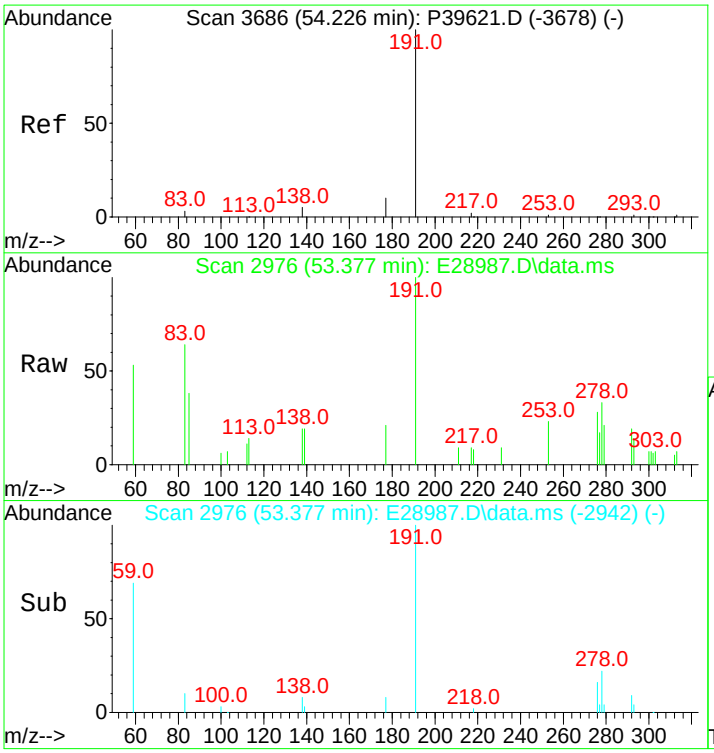




#117
Moretane (T20)
Concen: 89.43 ng/ml m
RT: 52.307 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

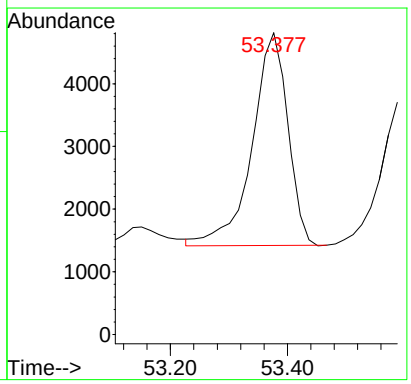
Tgt Ion:191 Resp: 3882

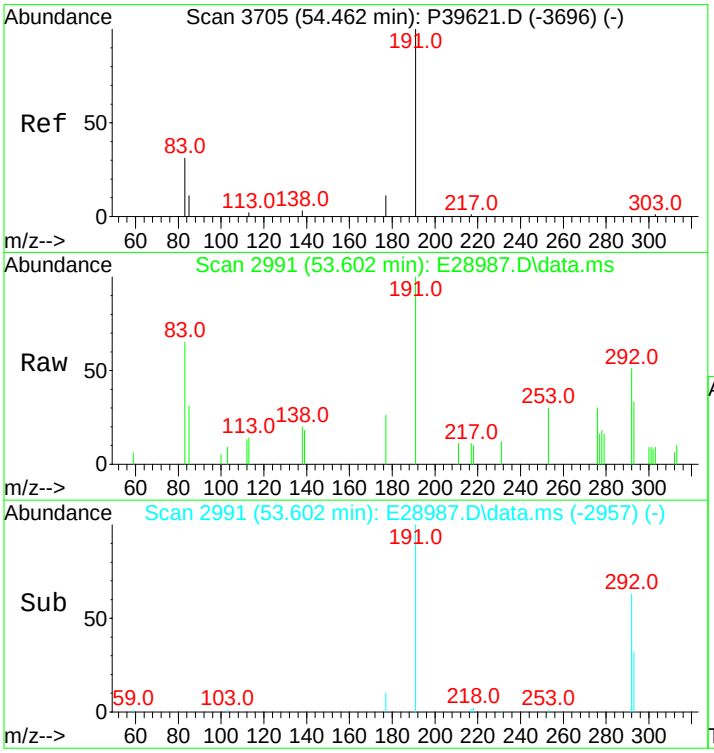




#118
30-Homohopane-22S (T21)
Concen: 330.34 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

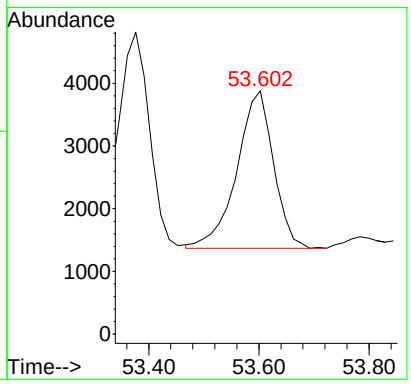
Tgt Ion:191 Resp: 14340

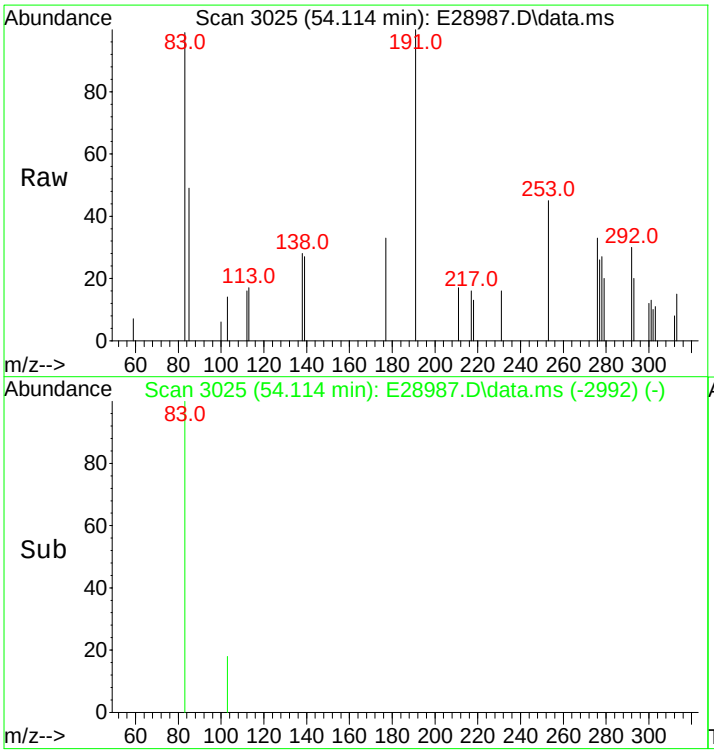




#119
30-Homohopane-22R (T22)
Concen: 267.29 ng/ml
RT: 53.602 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

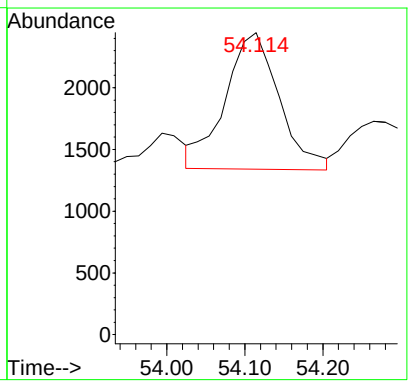
Tgt Ion:191 Resp: 11603

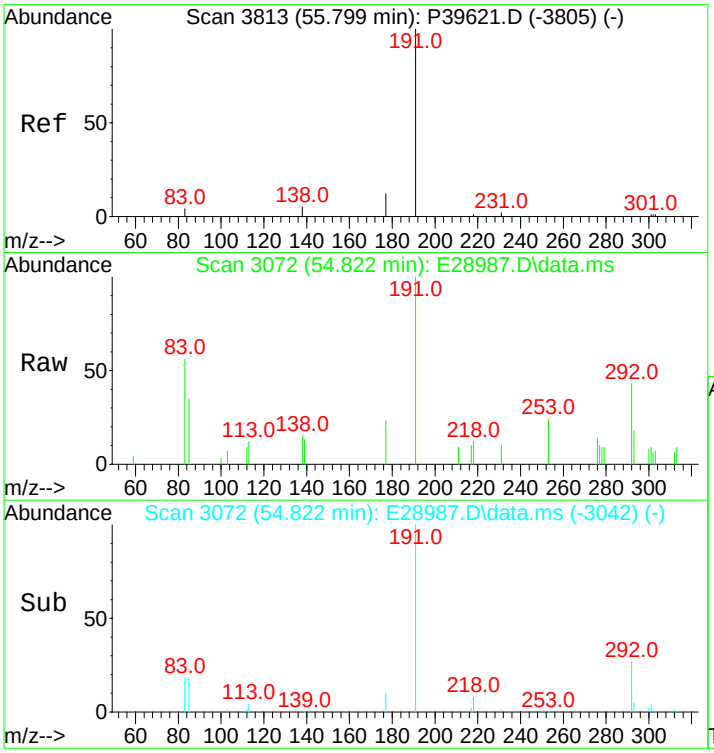




#120
Gammacerane/C32-diahopane
Concen: 122.39 ng/mL
RT: 54.114 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

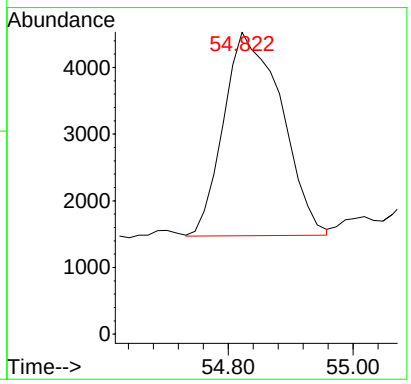
Tgt Ion:191 Resp: 5313

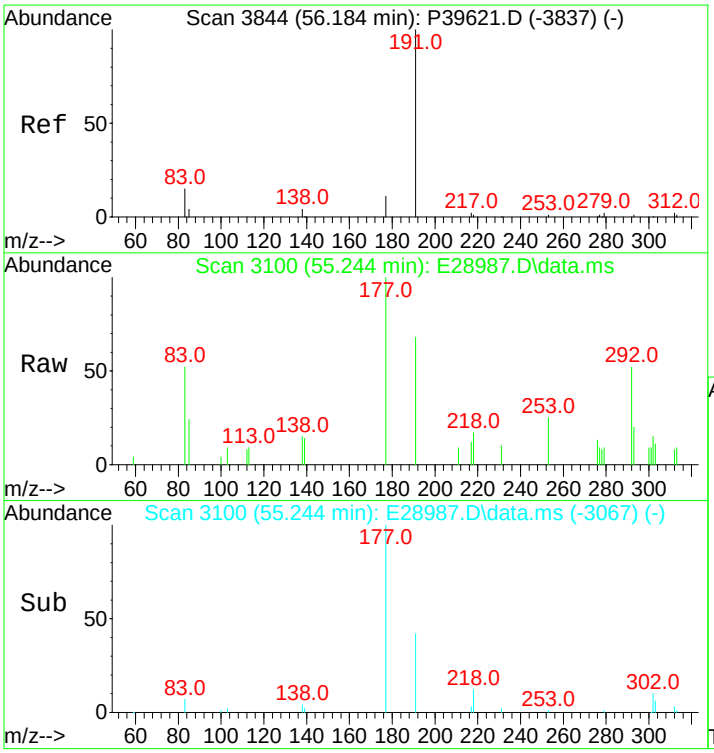




#121
30,31-Bishomohopane-22S (T26)
Concen: 451.07 ng/ml
RT: 54.822 min Scan# 3072
Delta R.T. -0.045 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

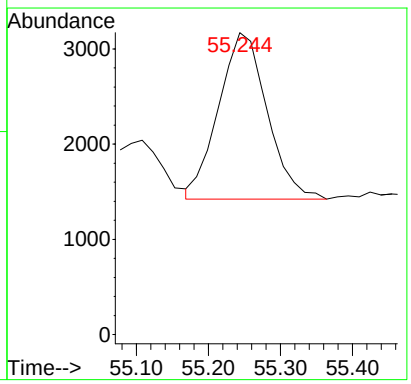
Tgt Ion:191 Resp: 19581

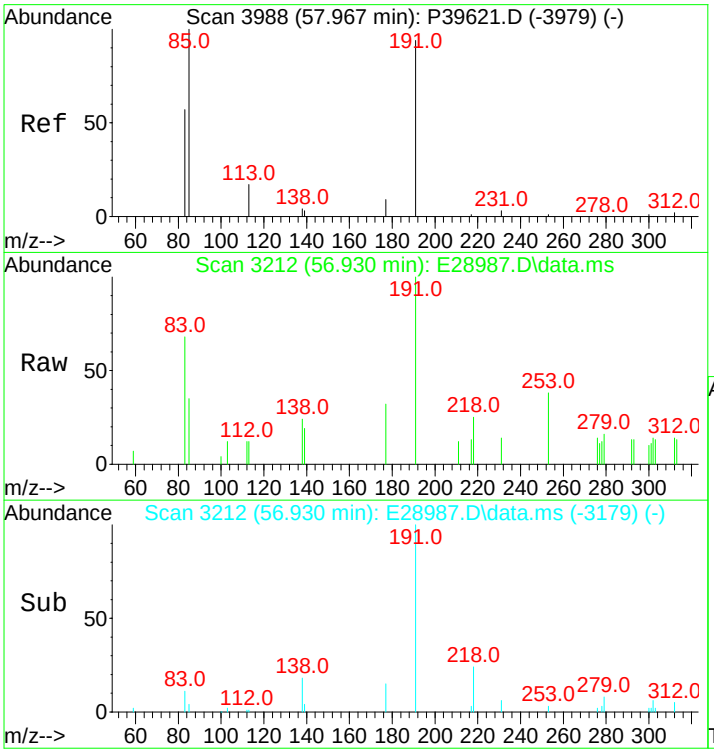




#122
30,31-Bishomohopane-22R (T27)
Concen: 188.30 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

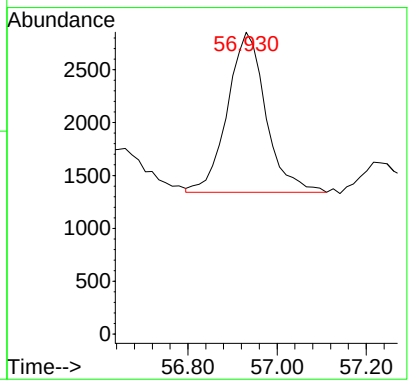
Tgt Ion:191 Resp: 8174

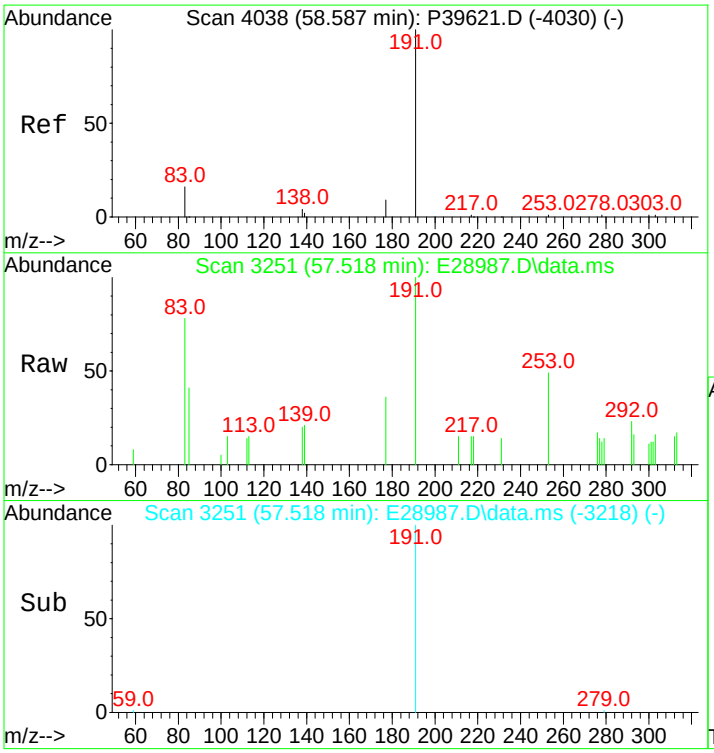




#123
30,31-Trishomohopane-22S (T30)
Concen: 208.76 ng/ml
RT: 56.930 min Scan# 3212
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

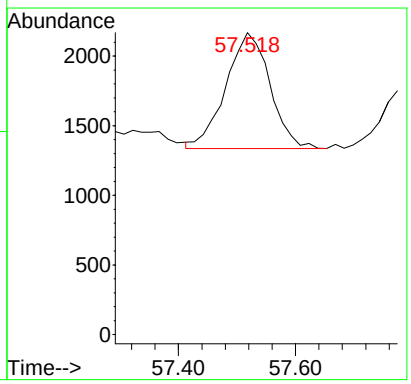
Tgt Ion:191 Resp: 9062

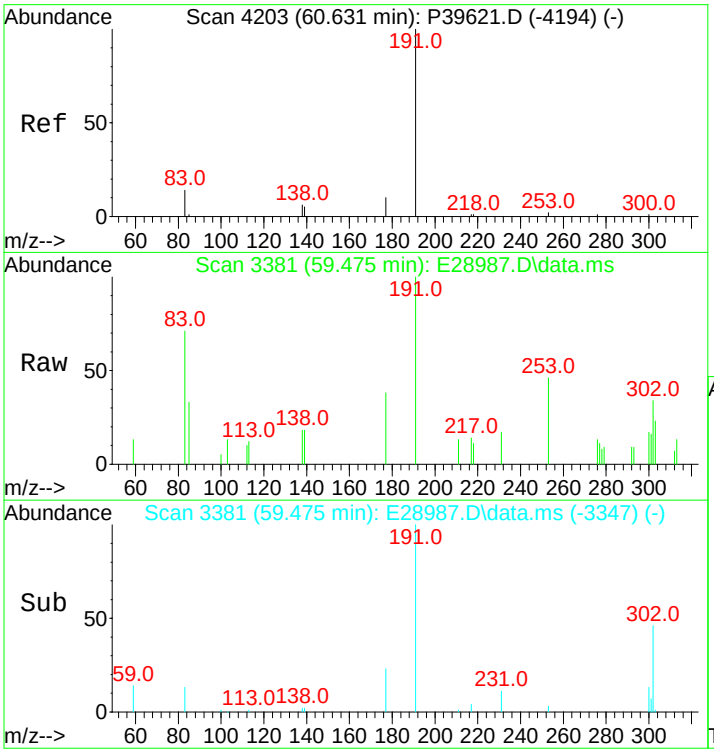




#124
30,31-Trishomohopane-22R (T31)
Concen: 100.05 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

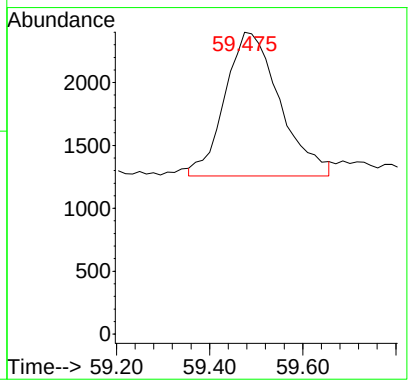
Tgt Ion:191 Resp: 4343

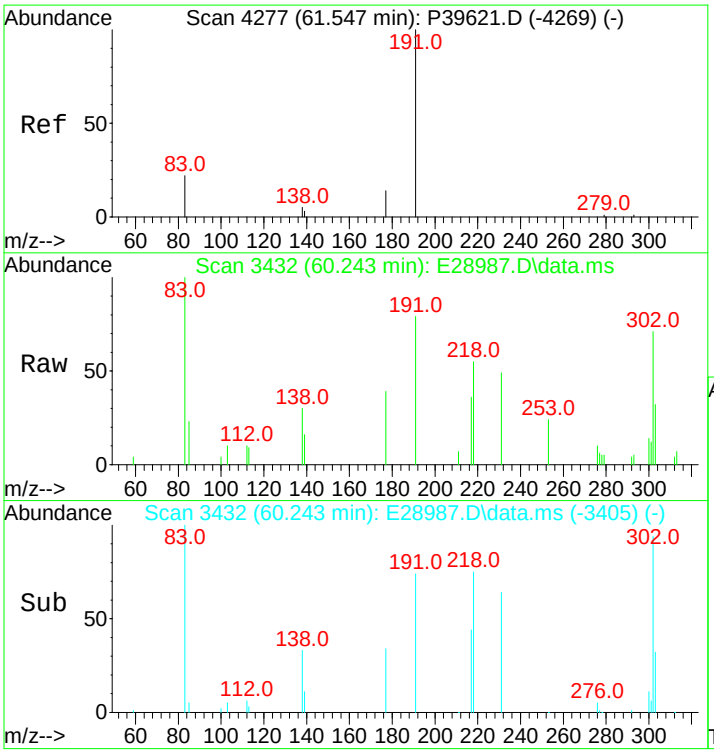




#125
Tetrakishomohopane-22S (T32)
Concen: 214.93 ng/ml m
RT: 59.475 min Scan# 3381
Delta R.T. 0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

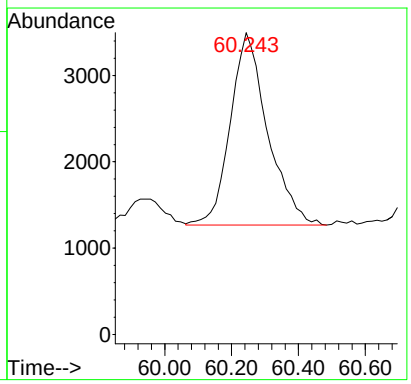
Tgt Ion:191 Resp: 9330

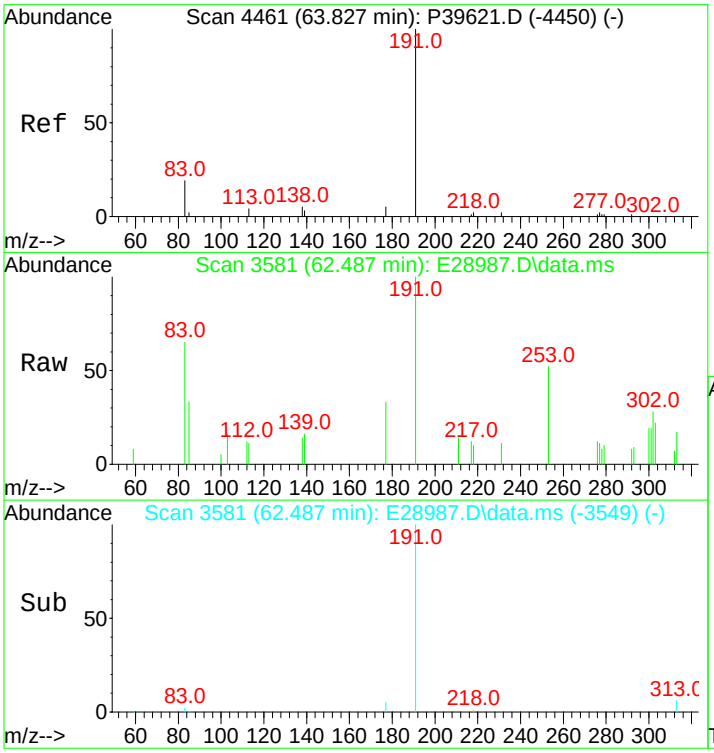




#126
Tetrakishomohopane-22R (T33)
Concen: 397.93 ng/ml
RT: 60.243 min Scan# 3432
Delta R.T. -0.090 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

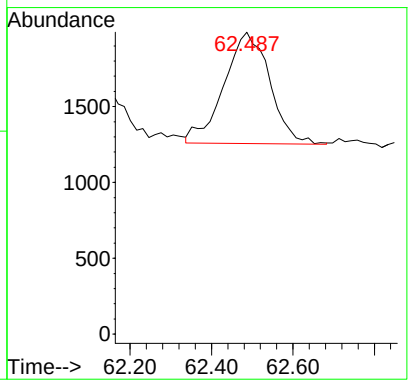
Tgt Ion:191 Resp: 17274

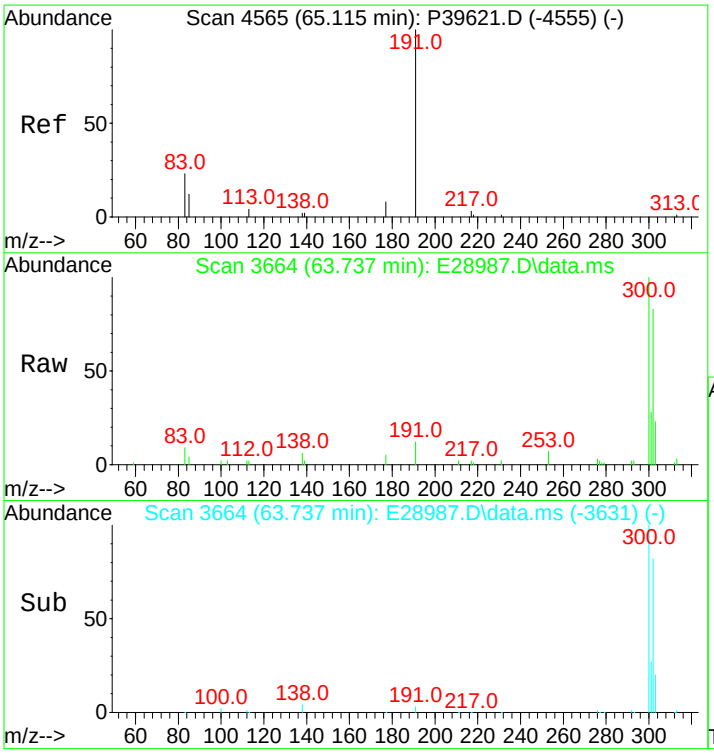




#127
Pentakishomohopane-22S (T34)
Concen: 131.79 ng/ml
RT: 62.487 min Scan# 3581
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

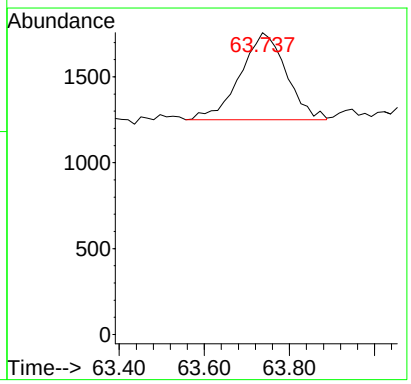
Tgt Ion:191 Resp: 5721

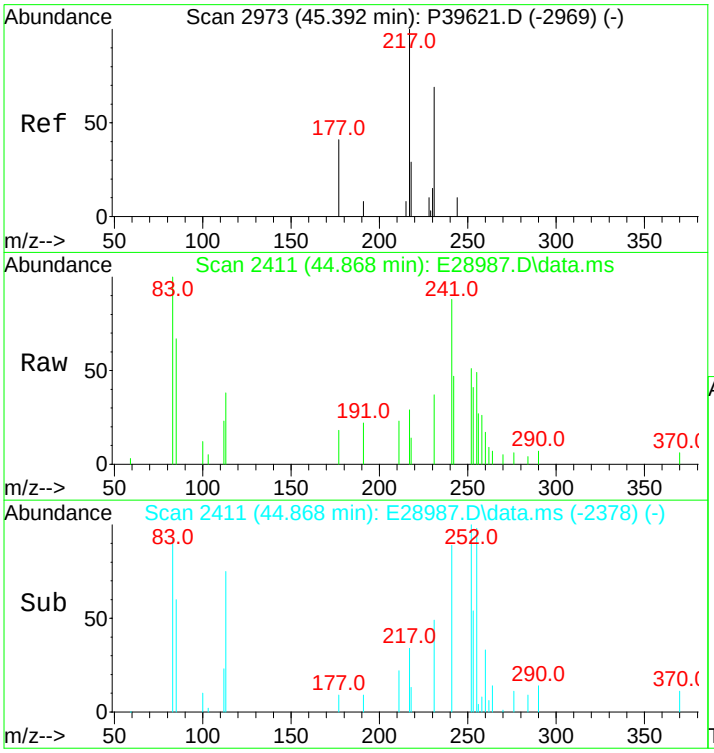




#128
Pentakishomohopane-22R (T35)
Concen: 87.79 ng/ml
RT: 63.737 min Scan# 3664
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

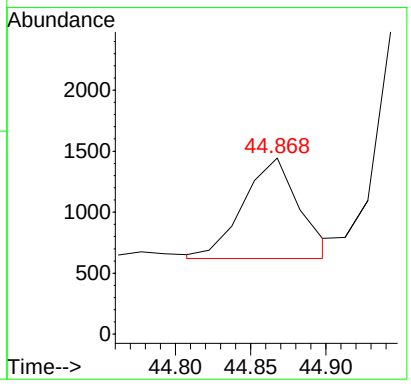
Tgt Ion:191 Resp: 3811

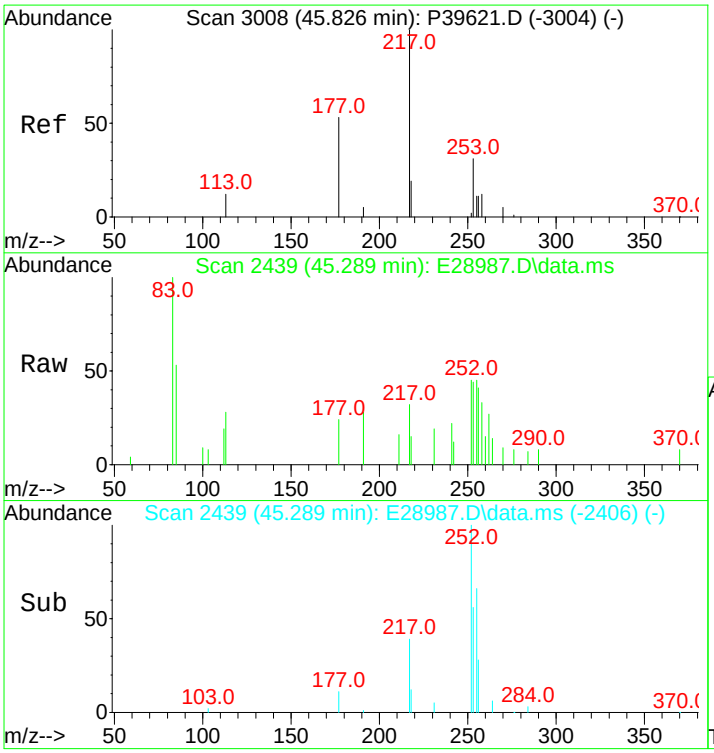




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 93.48 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

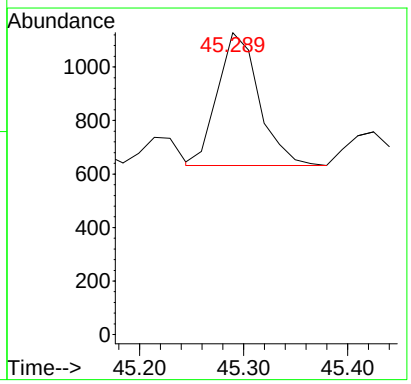
Tgt Ion:217 Resp: 2131

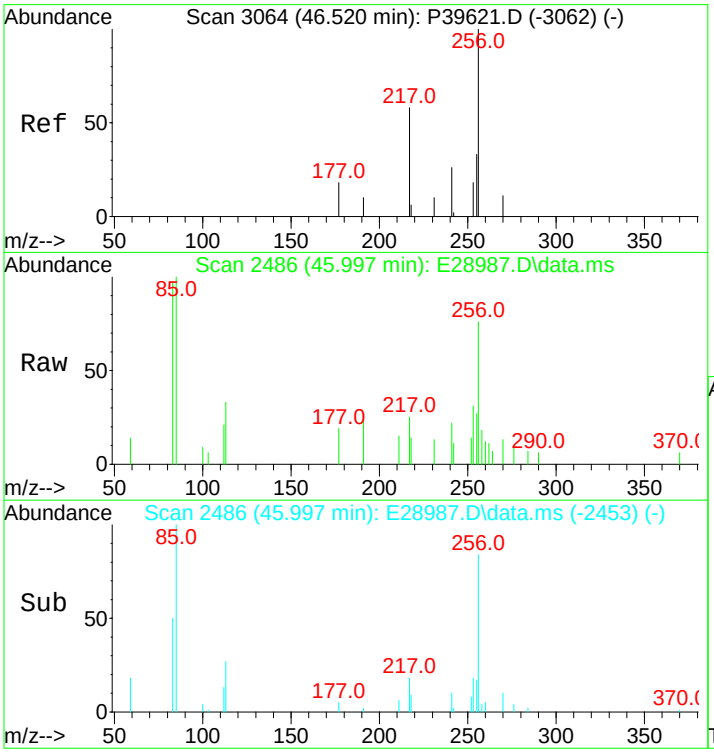




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 60.23 ng/ml
RT: 45.289 min Scan# 2439
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

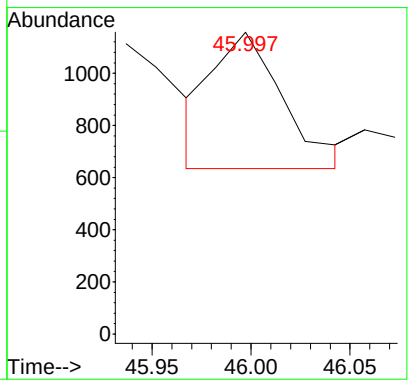
Tgt Ion:217 Resp: 1373

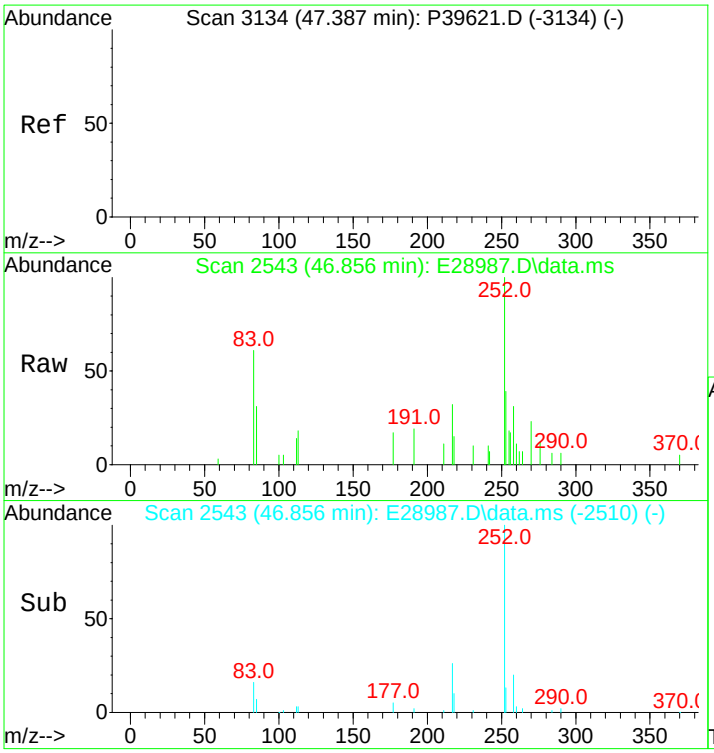




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 57.03 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

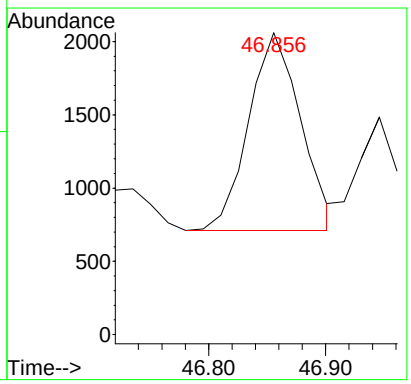
Tgt Ion:217 Resp: 1300

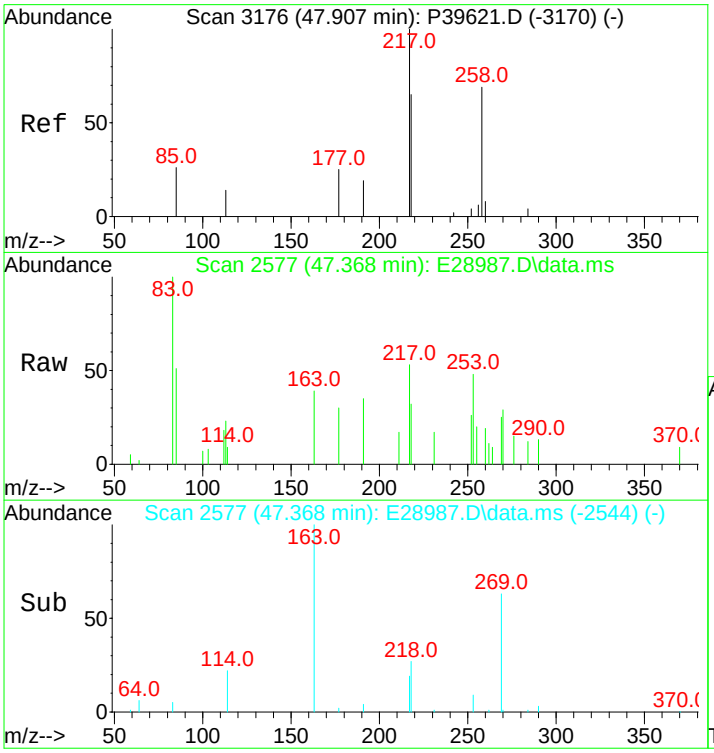




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 182.70 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

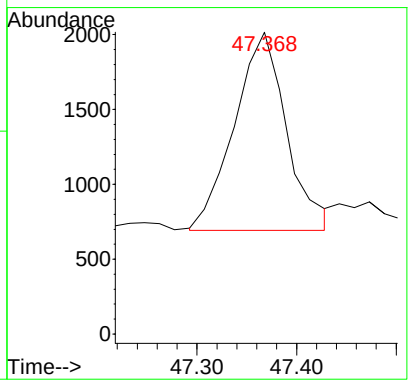
Tgt Ion:217 Resp: 4165

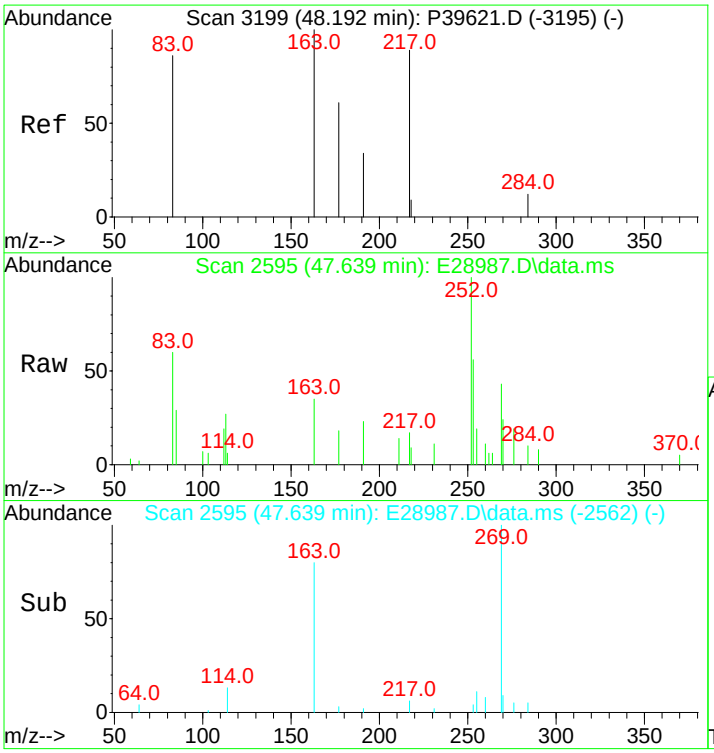




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 211.26 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

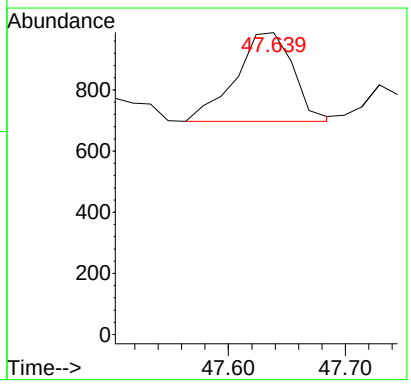
Tgt Ion:217 Resp: 4816

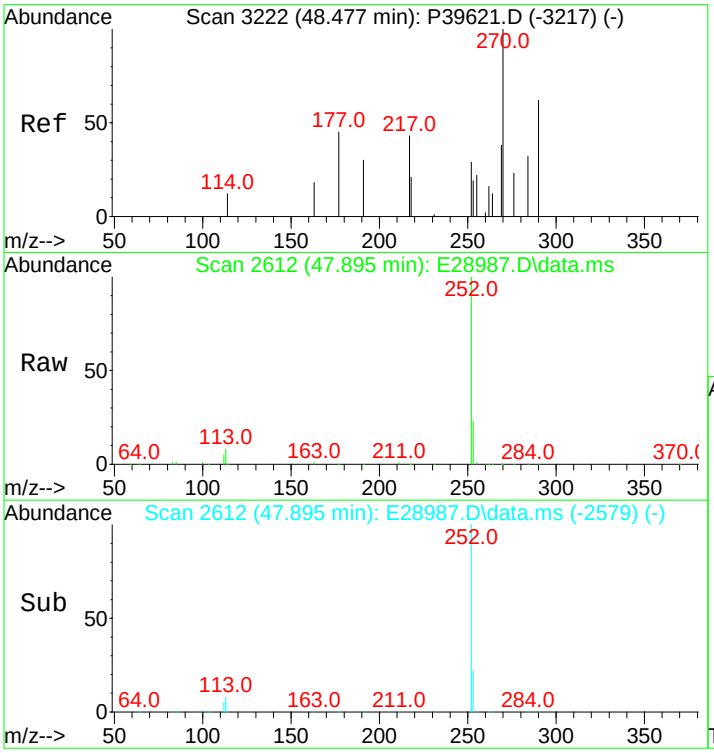




#135
Unknown Sterane (S18)
Concen: 43.78 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

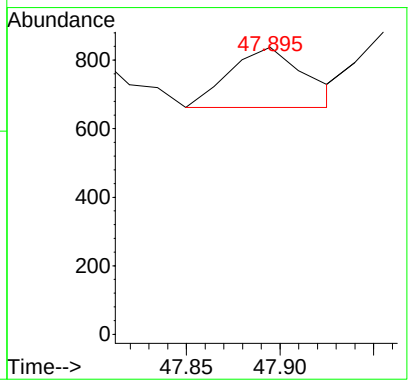
Tgt Ion:217 Resp: 998

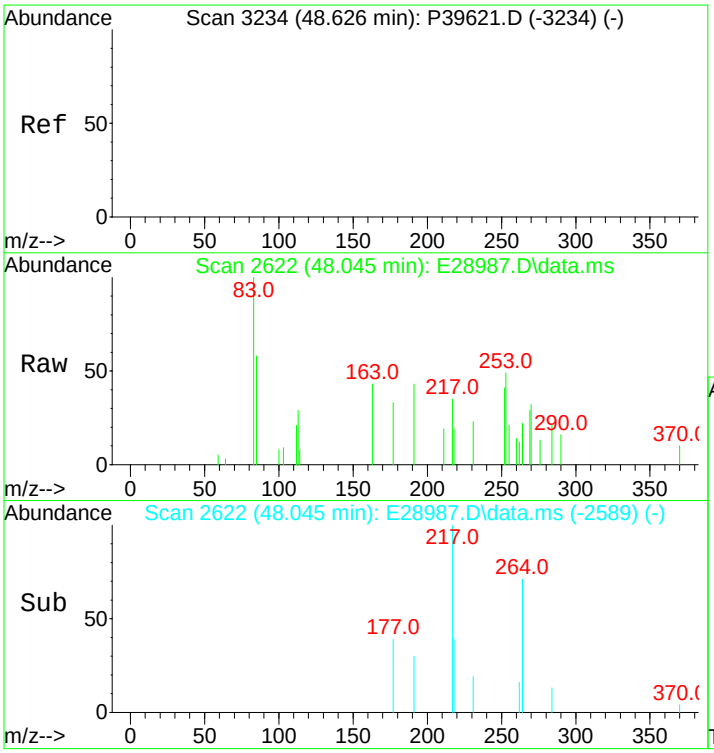




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 21.80 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

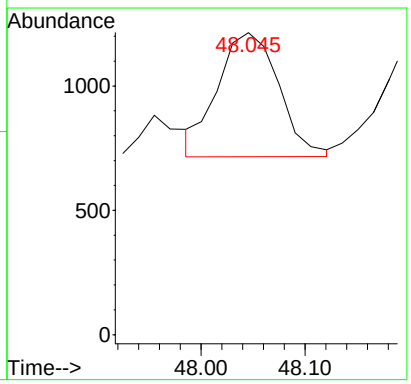
Tgt Ion:217 Resp: 497

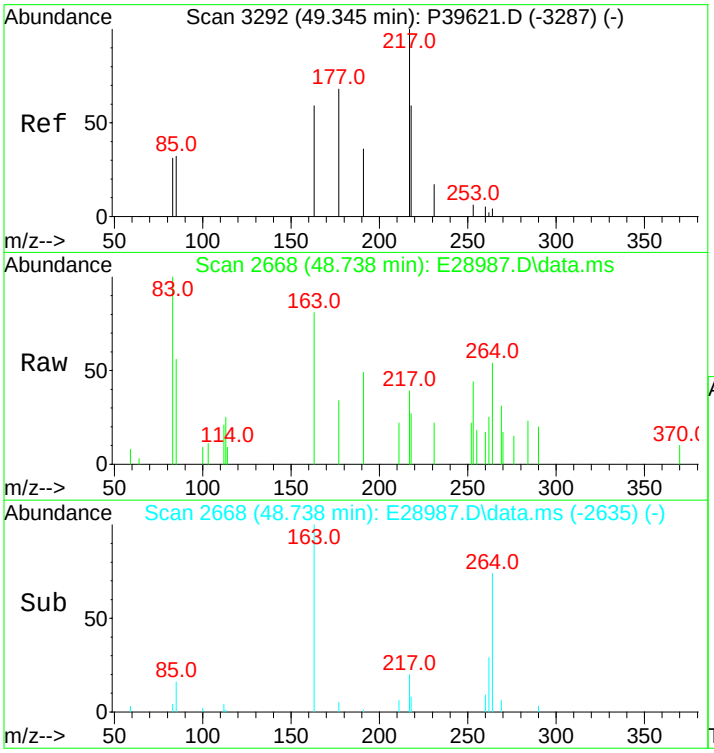




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 89.49 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

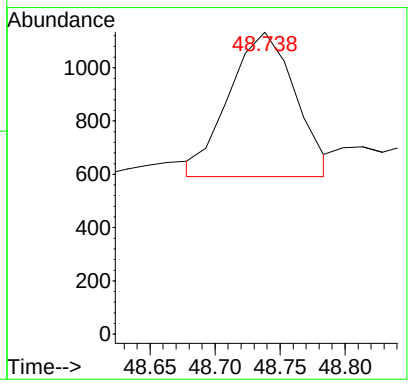
Tgt Ion:217 Resp: 2040

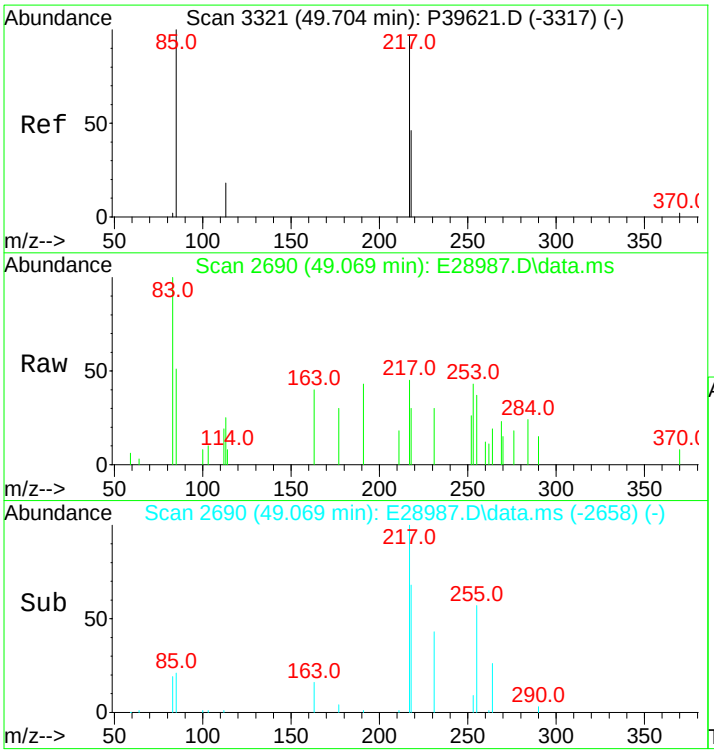




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 84.35 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

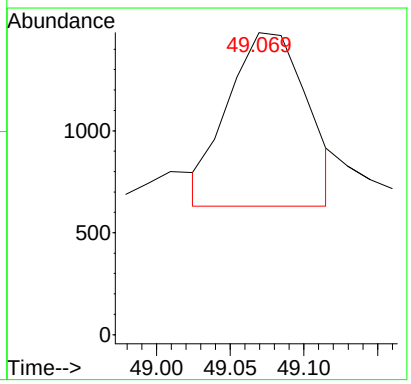
Tgt Ion:217 Resp: 1923

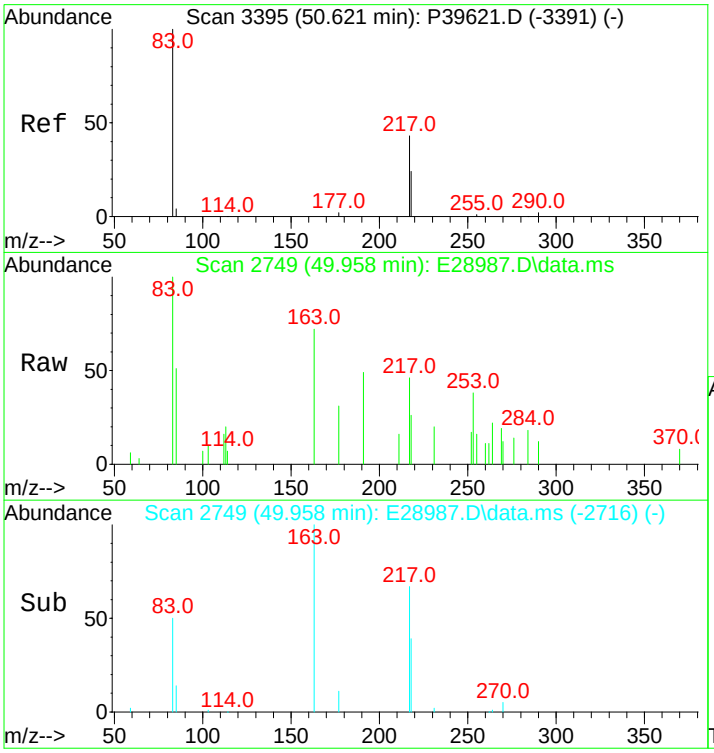




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 138.70 ng/ml m
RT: 49.069 min Scan# 2690
Delta R.T. -0.015 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

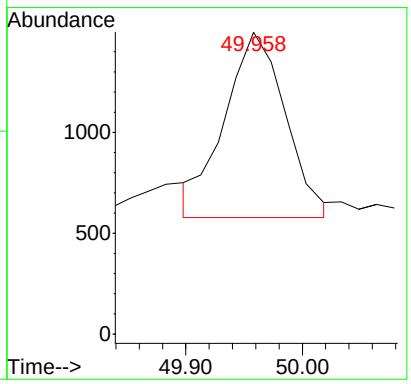
Tgt Ion:217 Resp: 3162

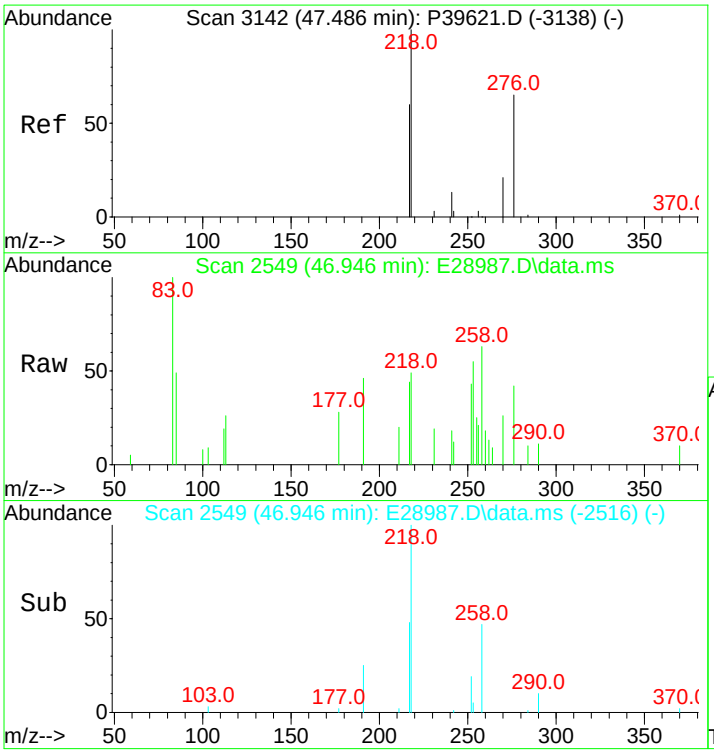




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 145.37 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

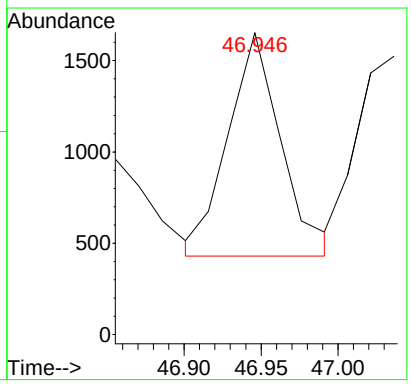
Tgt Ion:217 Resp: 3314

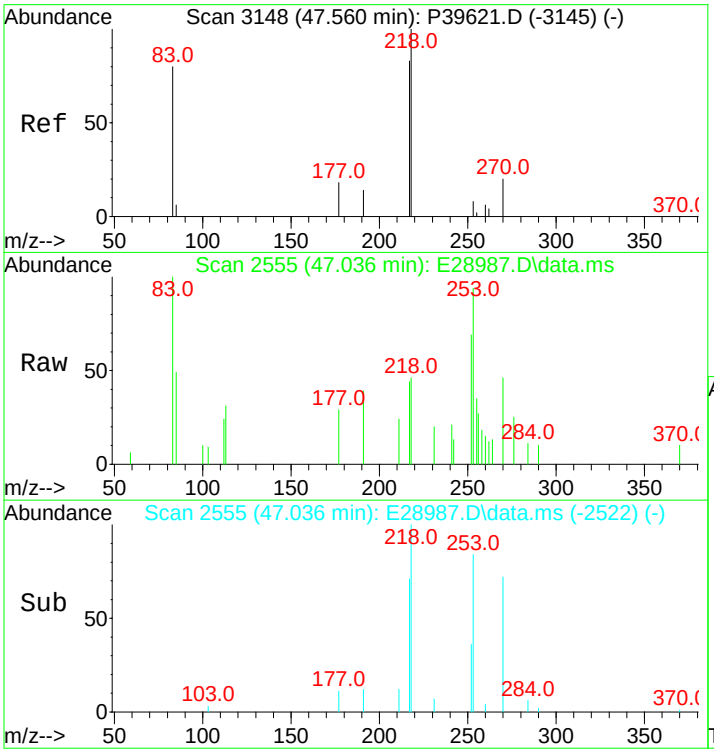




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 128.00 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

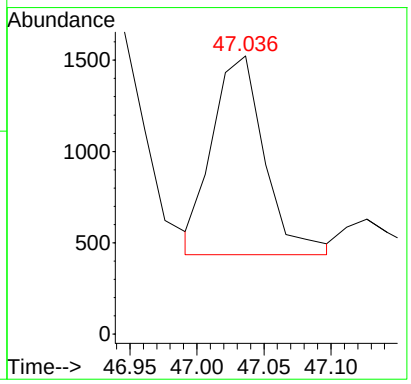
Tgt Ion:218 Resp: 2918

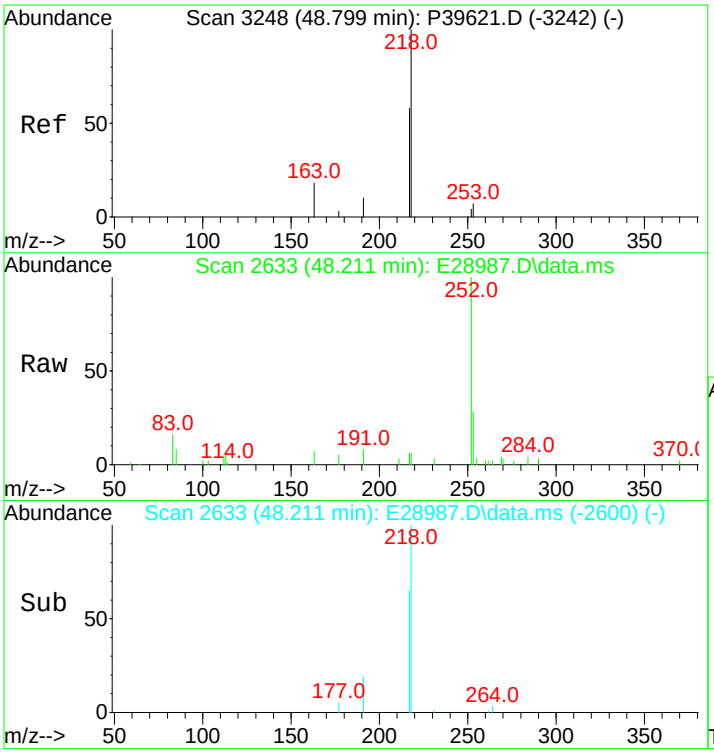




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 129.62 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

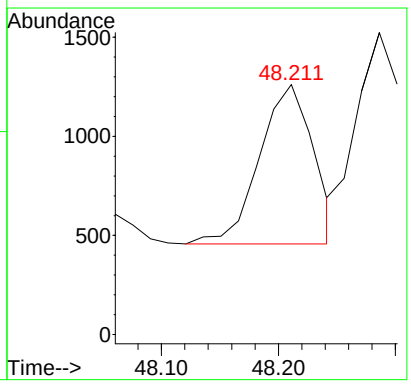
Tgt Ion:218 Resp: 2955

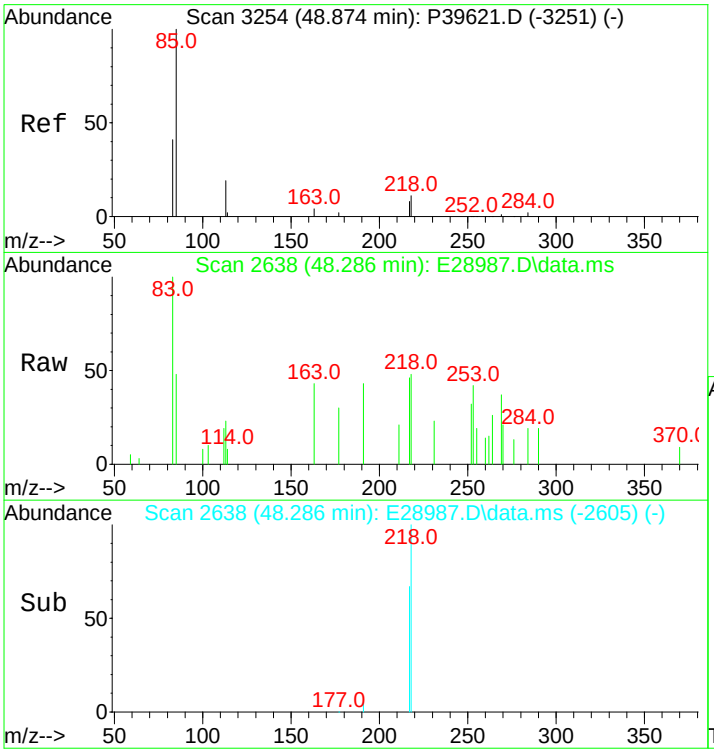




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 113.22 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

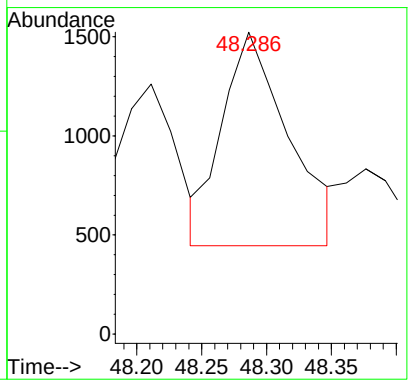
Tgt Ion:218 Resp: 2581

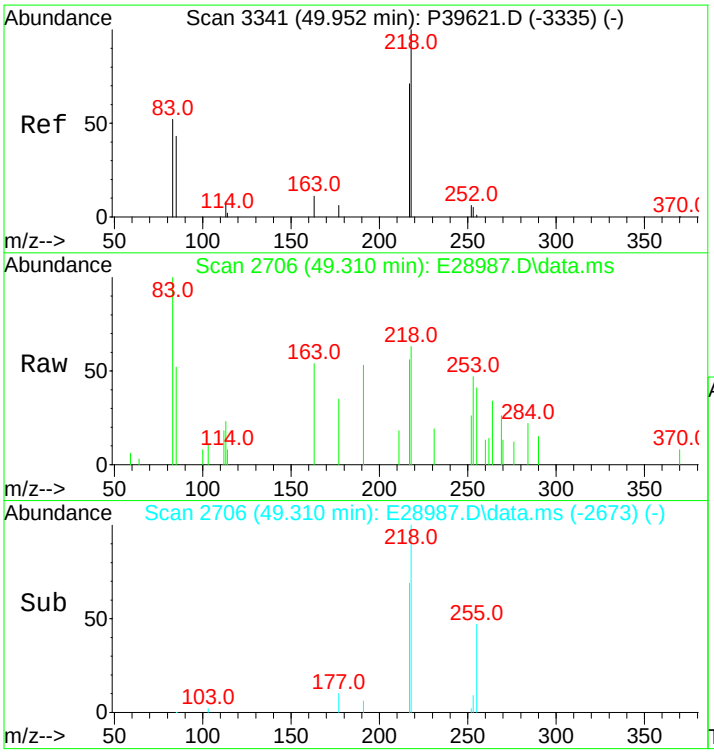




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 168.40 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

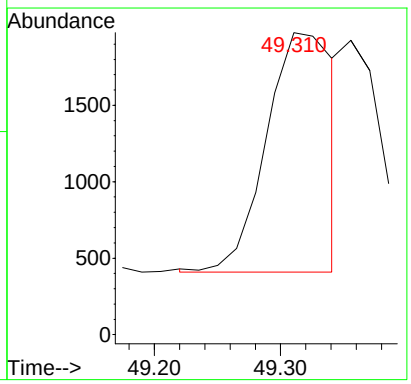
Tgt Ion:218 Resp: 3839

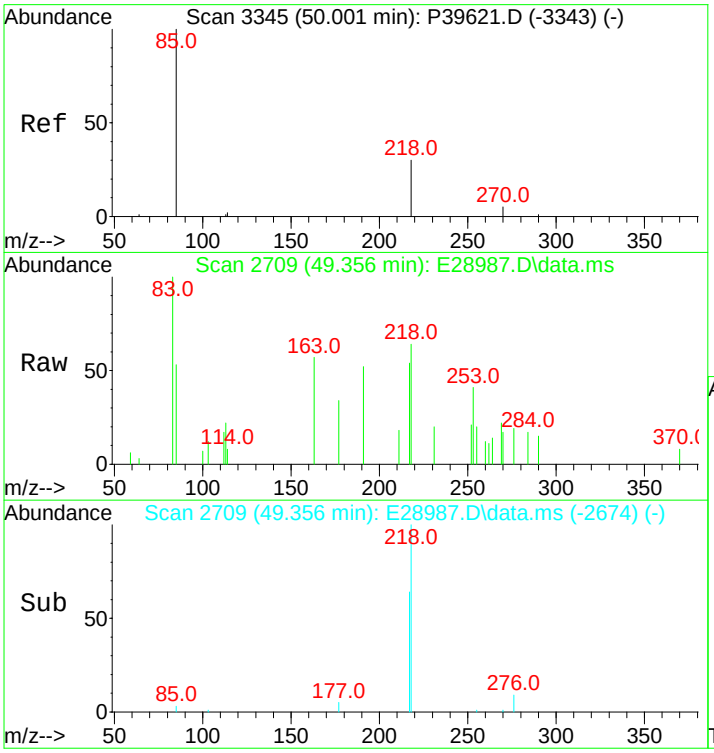




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 253.98 ng/ml m
RT: 49.310 min Scan# 2706
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

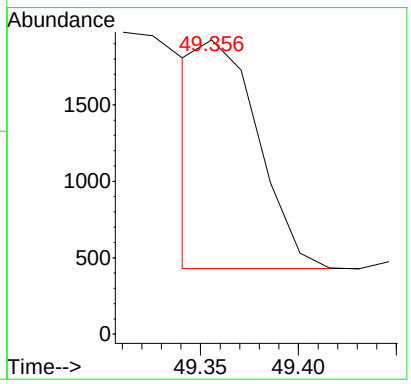
Tgt Ion:218 Resp: 5790

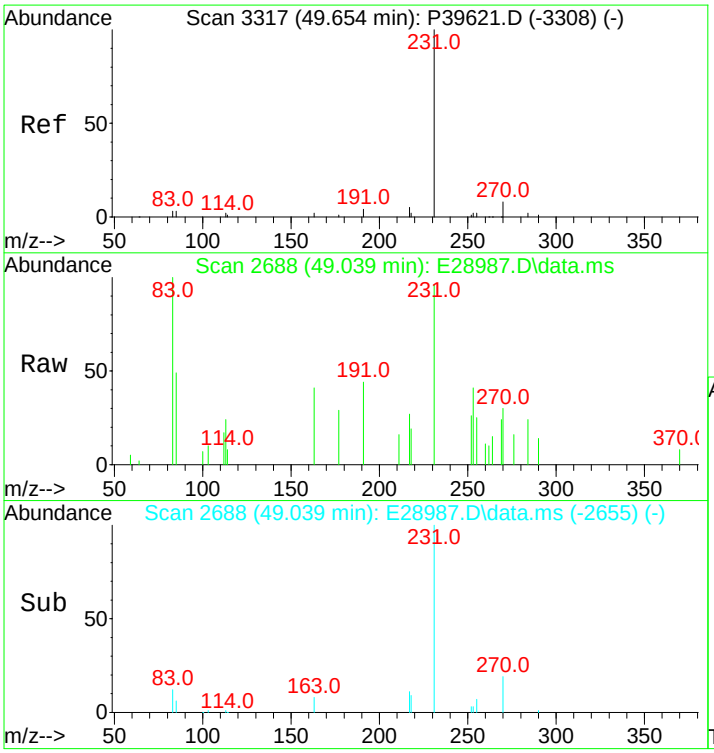




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 136.99 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

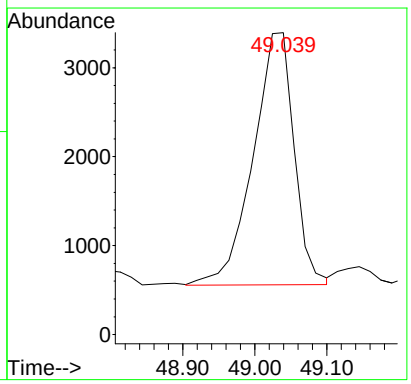
Tgt Ion:218 Resp: 3123

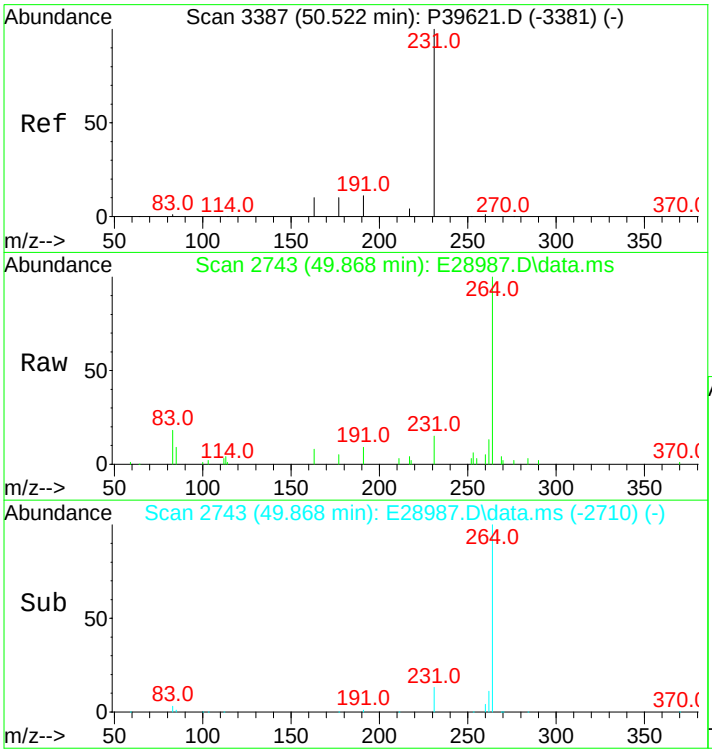




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 491.30 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

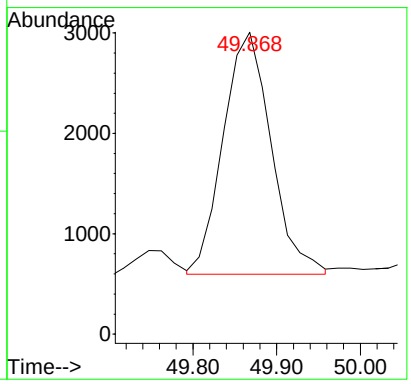
Tgt Ion:231 Resp: 11200

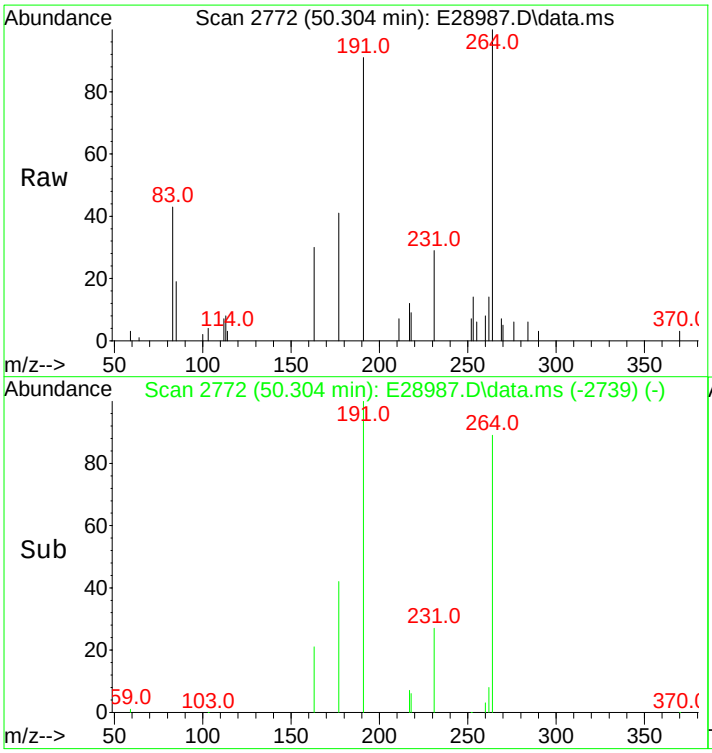




#148
C28,20S-triaromatic steroid
Concen: 419.93 ng/mL m
RT: 49.868 min Scan# 2743
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

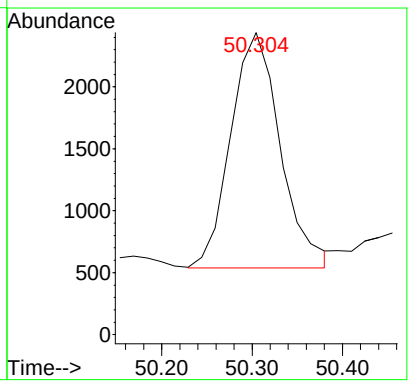
Tgt Ion:231 Resp: 9573

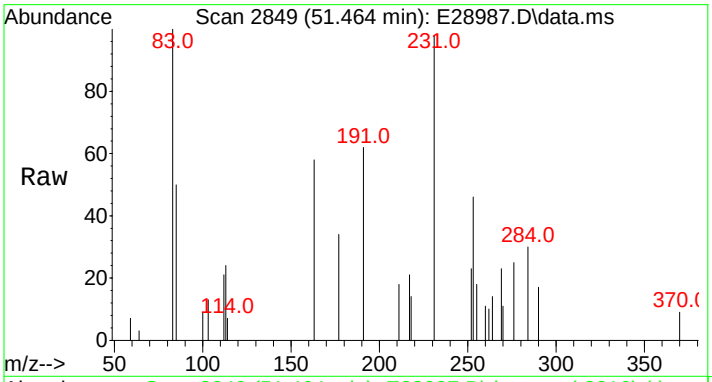




#149
C27,20R-triaromatic steroid
Concen: 317.32 ng/mL m
RT: 50.304 min Scan# 2772
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

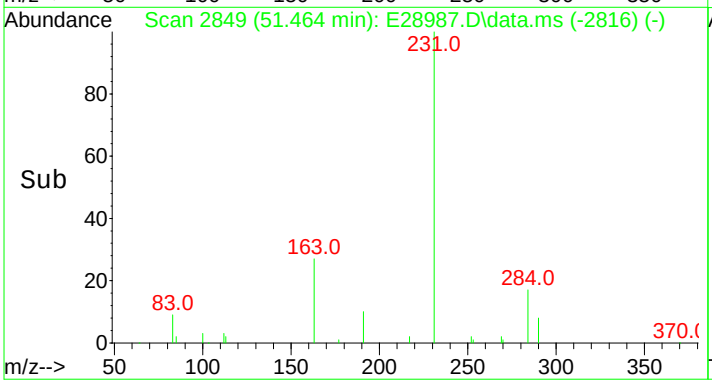
Tgt Ion:231 Resp: 7234

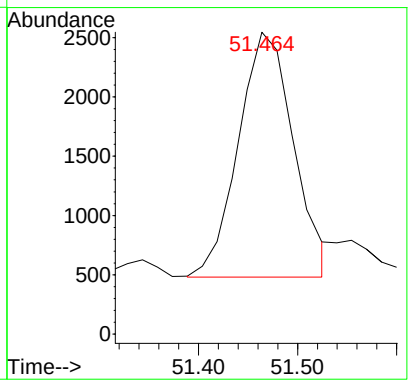




#150
C28,20R-triaromatic steroid
Concen: 350.31 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. -0.000 min
Lab File: E28987.D
Acq: 15 Nov 2012 10:42 am

Tgt Ion:231 Resp: 7986





Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
Acq On : 15 Nov 2012 12:09 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 16 13:33:46 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.184	164	23314M3	500.000	ng/mL	-0.02
74) Chrysene-d12	42.715	240	58076	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.214	136	29214	356.247	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.62%#			
42) Phenanthrene-d10	32.070	188	38898	462.980	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.30%#			
83) Benzo[b]fluoranthene-d12	46.645	264	54056	453.102	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.31%#			
88) Benzo[a]pyrene-d12	47.805	264	50971	440.939	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.09%#			
129) 5B(H)Cholane - Surr	43.347	217	10621	464.021	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.40%#			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	128	6.864	ng/mL	100
5) C1-Decalins	17.362	152	459M5	24.613	ng/mL	
6) C2-Decalins	19.139	166	1415M5	75.875	ng/mL	
7) C3-Decalins	21.623	180	2634m	141.240	ng/mL	
8) C4-Decalins	24.995	194	6635M5	355.782	ng/mL	
10) Naphthalene	19.289	128	33433	364.566	ng/mL#	100
11) C1-Naphthalenes	21.999	142	17880M5	194.970	ng/mL	
12) C2-Naphthalenes	24.844	156	56855M5	619.969	ng/mL	
13) C3-Naphthalenes	27.524	170	101209m	1103.621	ng/mL	
14) C4-Naphthalenes	29.963	184	90246M5	984.077	ng/mL	
16) 2-Methylnaphthalene	21.999	142	10767	184.339	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	7159	126.139	ng/mL#	100
18) Benzothiophene	19.515	134	1567	20.669	ng/mL	100
19) C1-Benzo(b)thiophenes	22.375	148	2167M5	28.584	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	7223m	95.274	ng/mL	
21) C3-Benzo(b)thiophenes	27.012	176	18154m	239.458	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	23602M5	311.320	ng/mL	
23) Biphenyl	23.881	154	3561M3	48.240	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	12299	233.611	ng/mL#	100
25) Dibenzofuran	26.967	168	15093M3	184.678	ng/mL	
26) Acenaphthylene	25.582	152	60985	667.006	ng/mL#	100
27) Acenaphthene	26.320	153	16464M2	279.747	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	8324M3	168.993	ng/mL	
29) Fluorene	28.337	166	26902M3	409.844	ng/mL	
30) C1-Fluorenes	30.715	180	31704M5	483.001	ng/mL	
31) C2-Fluorenes	32.928	194	52721M5	803.188	ng/mL	
32) C3-Fluorenes	35.458	208	50254M5	765.604	ng/mL	
33) Dibenzothiophene	31.664	184	36019	399.874	ng/mL#	88
34) 4-Methyldibenzothiophene(	33.455	198	24939	276.867	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.771	198	24418M3	271.083	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	11480	127.448	ng/mL#	100
37) OTP	33.862	198	2899M3	32.184	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	71992m	799.237	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	109235M5	1212.700	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	106902m	1186.799	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	67497M5	749.335	ng/mL	
43) Phenanthrene	32.161	178	488365	5329.032	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.133	192	75989	829.191	ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.253	192	92123	1005.245	ng/mL	96
46) 2-Methylanthracene(2MA)	34.404	192	35108M3	383.098	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	97489M3	1063.799	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	59362M3	647.757	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.253	192	364634M5	3978.881	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	284200M5	3101.186	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52) C3-Phenanthrenes/Anthrace	38.273	220	145914M5	1592.211	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	53691M5	585.875	ng/mL	
55) Anthracene	32.356	178	109586M3	1383.464	ng/mL	
56) Carbazole	33.034	167	29966M3	367.579	ng/mL	
57) 1-Methylphenanthrene	34.690	192	59824M3	855.661	ng/mL	
58) Fluoranthene	36.978	202	1626787M3	16074.154	ng/mL	
59) Benzo(b)fluorene	39.493	216	134013M3	1987.196	ng/mL	
60) Pyrene	37.852	202	1516395	14741.397	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.252	216	838548m	8151.813	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.315	230	346181M5	3365.344	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.212	244	153009m	1487.453	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.506	258	115379M5	1121.639	ng/mL	
66) Naphthobenzothiophene	41.721	234	108120	1065.682	ng/ml#	66
67) Naphthobenzothiophene-2,1	41.721	234	108120	1065.682	ng/mL#	66
68) Naphthobenzothiophene-1,2	42.052	234	23809	234.673	ng/mL#	17
69) Naphthobenzothiophene-2,3	42.353	234	31527M3	310.745	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	109083M5	1075.174	ng/ml	
71) C2-Naphthobenzothiophenes	45.184	262	87489M5	862.333	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	64688M5	637.595	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	45700M5	450.441	ng/mL	
75) Benz[a]anthracene	42.670	228	841845M3	7443.900	ng/mL	
77) Chrysene/Triphenylene	42.820	228	858878	7376.760	ng/mL	98
78) C1-Chrysenes	44.311	242	375056M5	3221.293	ng/mL	
79) C2-Chrysenes	46.027	256	187042M5	1606.473	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	2291	19.677	ng/mL	100
81) C3-Chrysenes	47.609	270	132077M5	1134.387	ng/mL	
82) C4-Chrysenes	48.558	284	62349M5	535.505	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	904333	6879.636	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.811	252	725171	5362.107	ng/mL	95
86) Benzo[a]fluoranthene	47.112	252	208143M3	1539.065	ng/mL	
87) Benzo[e]pyrene	47.714	252	701193	5463.049	ng/mL	92
89) Benzo[a]pyrene	47.895	252	1034670	8424.557	ng/mL	93
90) Perylene	48.181	252	281885	2170.509	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.564	276	821526M3	5683.772	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	226177M3	1469.610	ng/mL	
93) Benzo[g,h,i]perylene	53.828	276	819518	5258.426	ng/mL	100
94) Hopane (T19)	51.645	191	34364M3	788.431	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	8674	199.012	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	5175	118.733	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.579	191	5437M3	124.744	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	2410M3	55.294	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2368	54.330	ng/ml	100
101) C26 Tricyclic Terpane-22R	43.739	191	1955M3	44.855	ng/ml	
102) C28 Tricyclic Terpane-22S	46.058	191	1854M3	42.537	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	2552M3	58.552	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	2661	61.053	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	2417M3	55.454	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	4486	102.925	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.106	191	2591M3	59.447	ng/ml	
108) C30 Tricyclic Terpane-22R	48.347	191	3111	71.377	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.512	191	8224	188.687	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	4122M3	94.573	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	3482	79.889	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	25523	585.587	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.425	191	5103	117.081	ng/ml	100
114) 17a(H)-Diahopane (X)	50.561	191	2002	45.933	ng/ml	100
115) 30-Normoretane (T17)	51.073	191	3249	74.543	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.464	191	1187M3	27.234	ng/ml	
117) Moretane (T20)	52.308	191	4079M3	93.587	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	16036	367.922	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	12151	278.787	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
Acq On : 15 Nov 2012 12:09 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 16 13:33:46 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120) Gammacerane/C32-diahopane	54.115	191	5447	124.973	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.822	191G	20411	468.300	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.244	191	7615	174.715	ng/ml	100
123) 30,31-Trishomohopane-22S	56.931	191	8723	200.136	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	4377	100.424	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	7712M3	176.940	ng/ml	
126) Tetrakishomohopane-22R (T	60.304	191	3387M3	77.710	ng/ml	
127) Pentakishomohopane-22S (T	62.487	191	6105	140.070	ng/ml	100
128) Pentakishomohopane-22R (T	63.752	191	3675M3	84.317	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2270M3	99.174	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	1311	57.276	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1435M3	62.694	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	4505	196.819	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	4966	216.960	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1041	45.480	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	374	16.340	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	2160M3	94.368	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	1981M3	86.548	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	3648M3	159.378	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	3572M3	156.057	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	2921M3	127.616	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	2943M3	128.577	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	2955	129.101	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	4057M3	177.246	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	6206M3	271.134	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	3526M3	154.048	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	11232	490.715	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	10199	445.584	ng/mL	100
149) C27,20R-triaromatic stero	50.305	231	7633	333.478	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	8545M3	373.323	ng/mL	

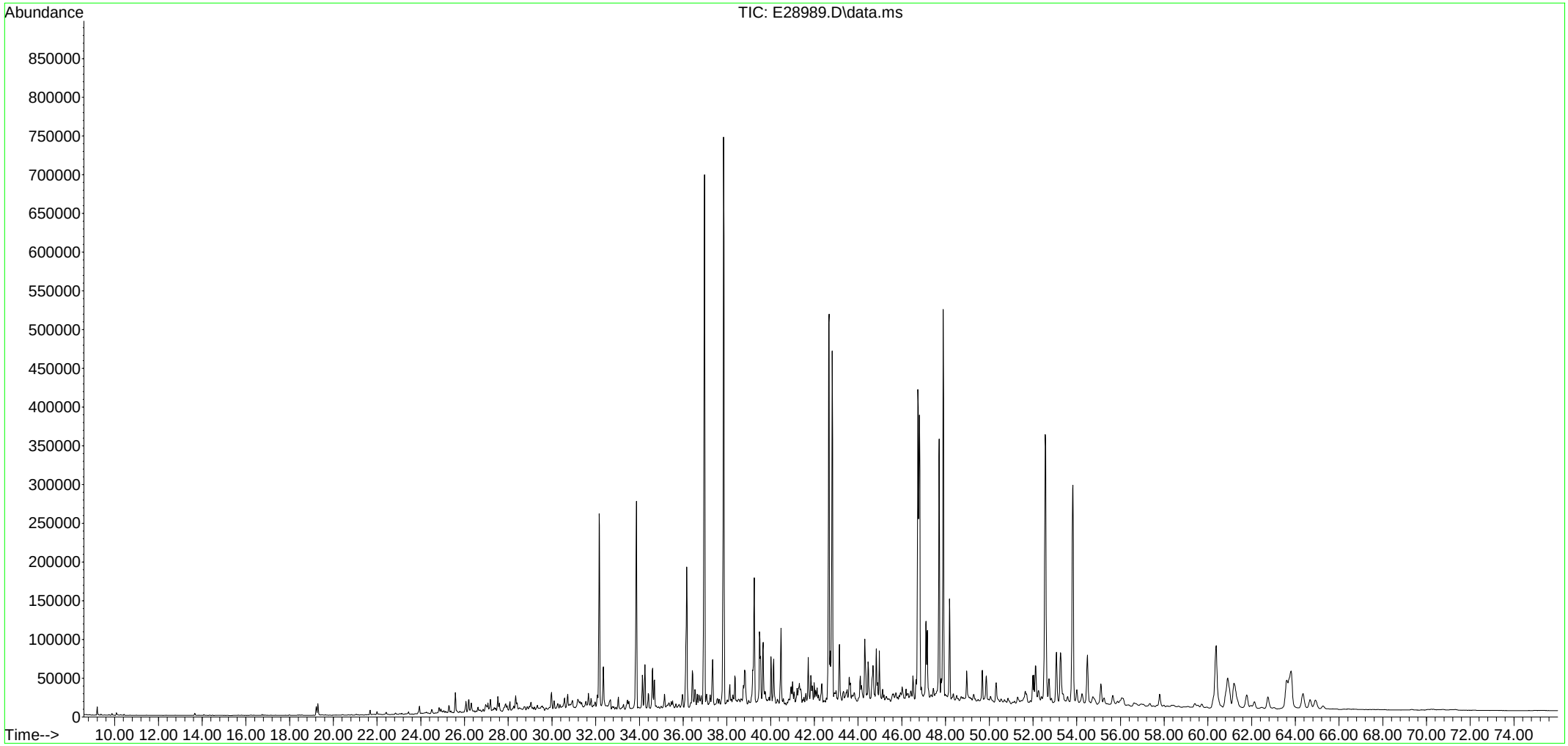
(#) = qualifier out of range (m) = manual integration (+) = signals summed

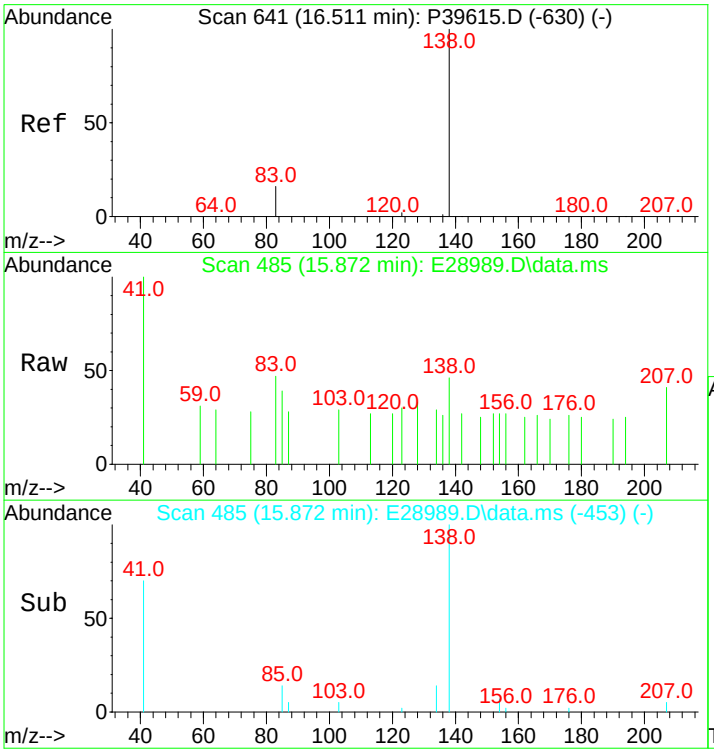
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28989.D
Acq On : 15 Nov 2012 12:09 pm
Operator : AC
Sample : 1210081-06
Misc : 1X
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 16 13:33:46 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

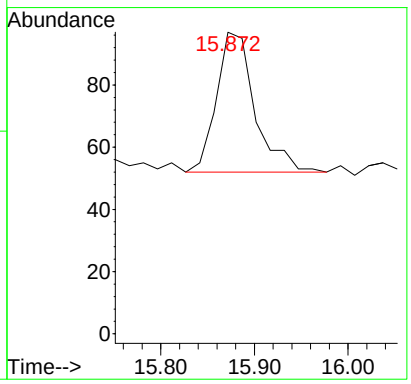
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

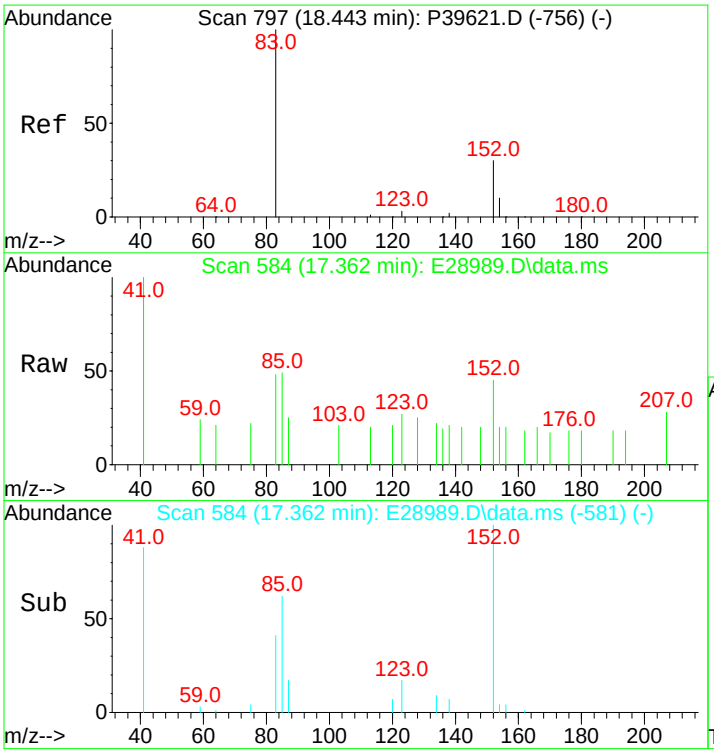




#3
trans-Decalin
Concen: 6.86 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

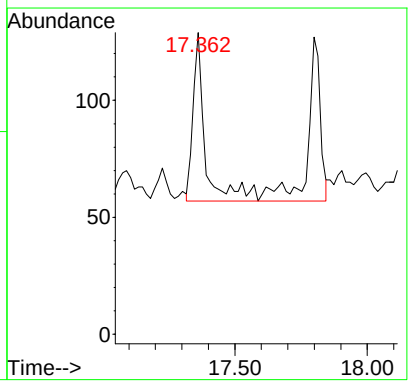
Tgt Ion:138 Resp: 128

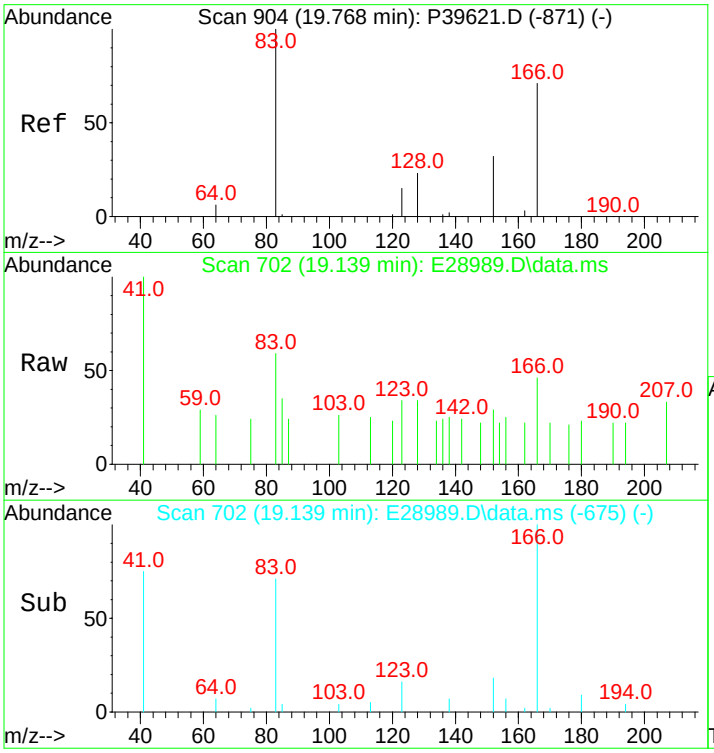




#5
C1-Decalins
Concen: 24.61 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

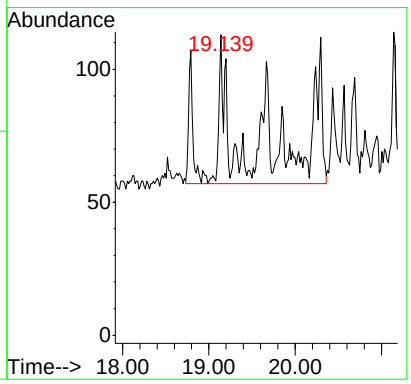
Tgt Ion:152 Resp: 459

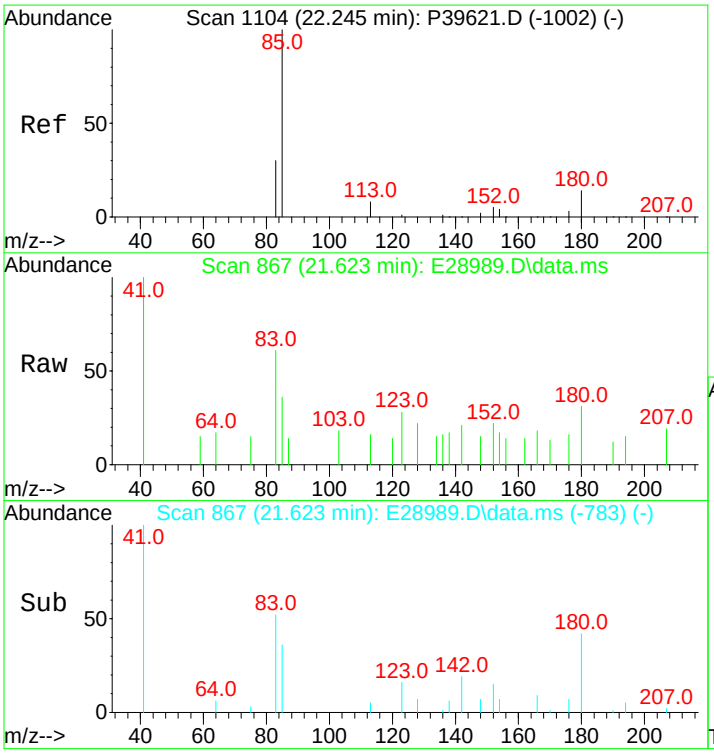




#6
C2-Decalins
Concen: 75.88 ng/mL m
RT: 19.139 min Scan# 702
Delta R.T. -0.204 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

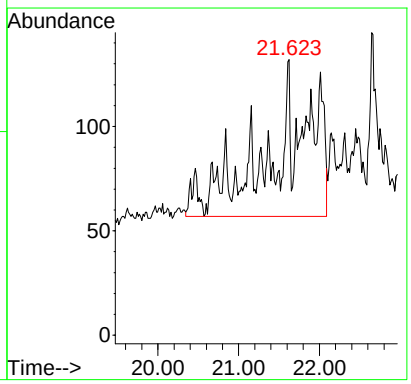
Tgt Ion:166 Resp: 1415

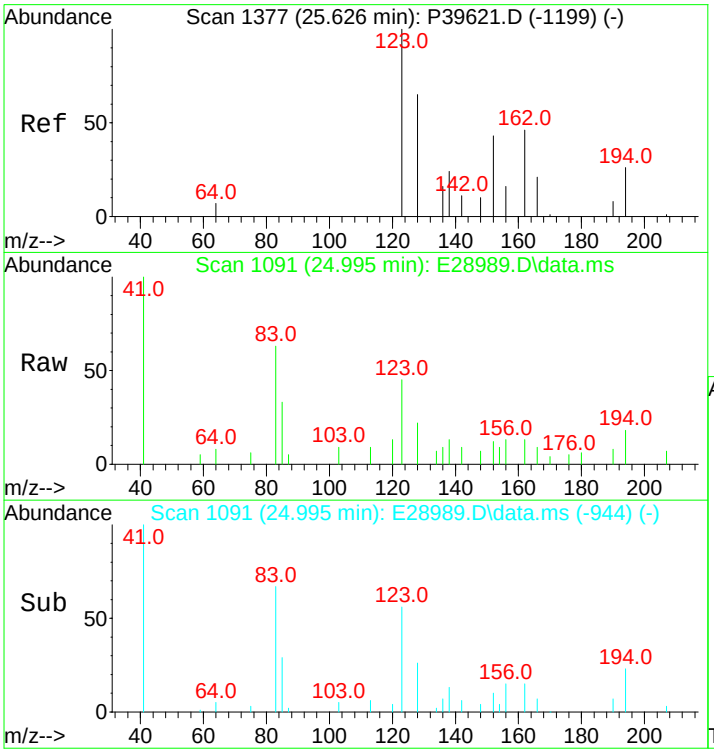




#7
C3-Decalins
Concen: 141.24 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

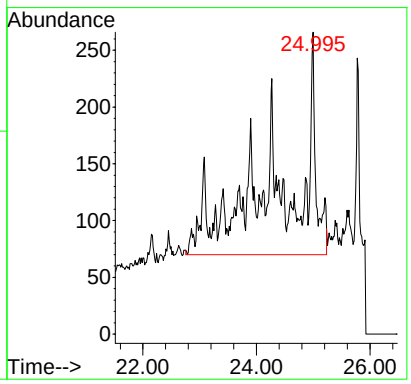
Tgt Ion:180 Resp: 2634

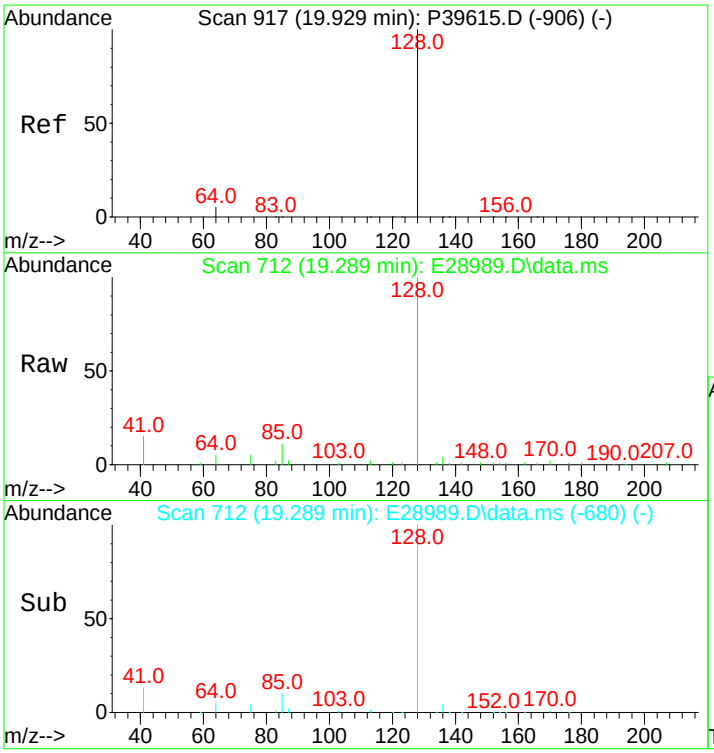




#8
C4-Decalins
Concen: 355.78 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:194 Resp: 6635

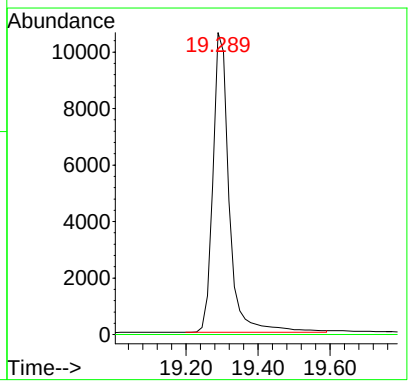


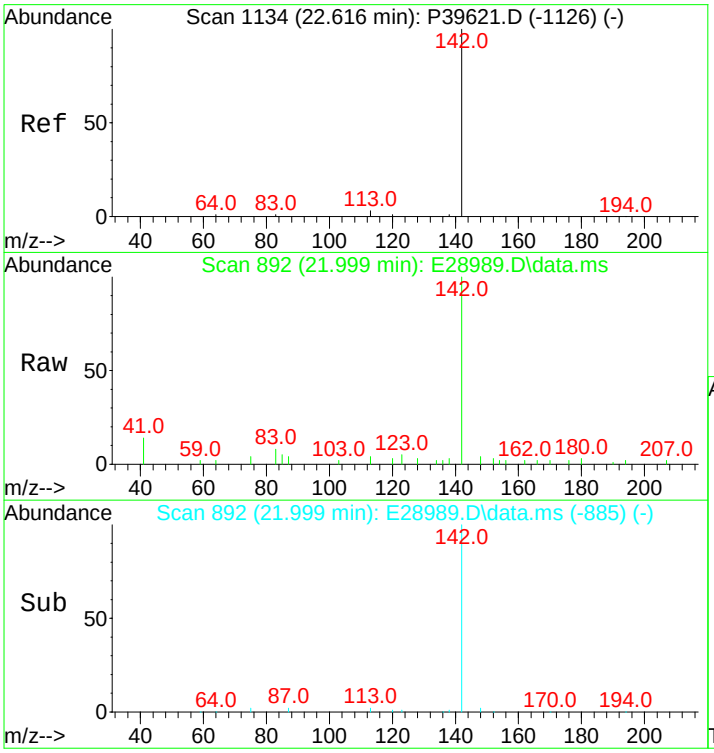


#10
Naphthalene
Concen: 364.57 ng/mL
RT: 19.289 min Scan# 712
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:128 Resp: 33433

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

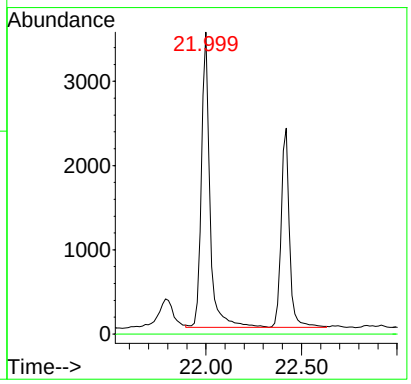


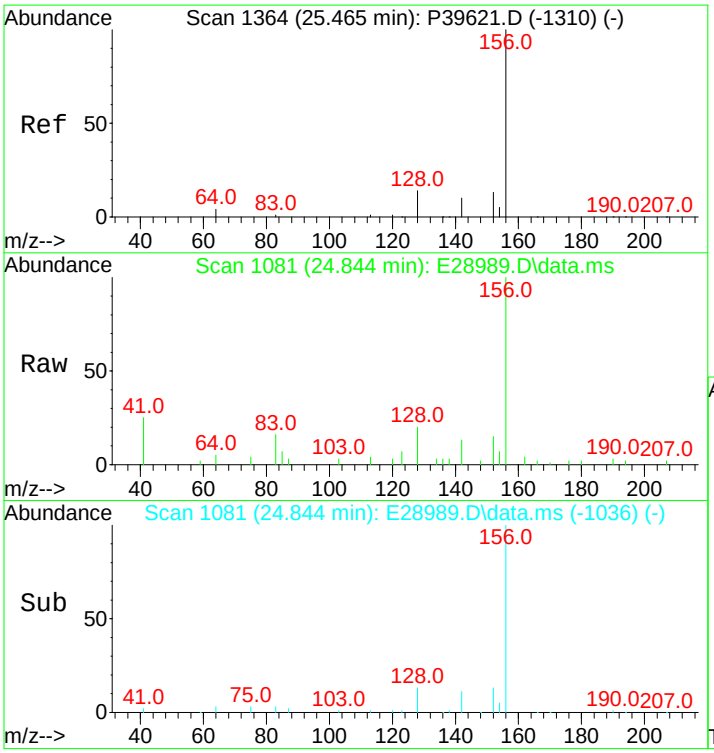


#11
C1-Naphthalenes
Concen: 194.97 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:142 Resp: 17880

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

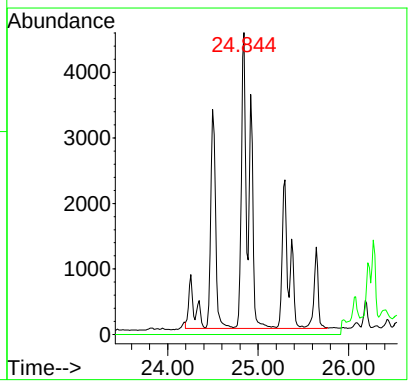


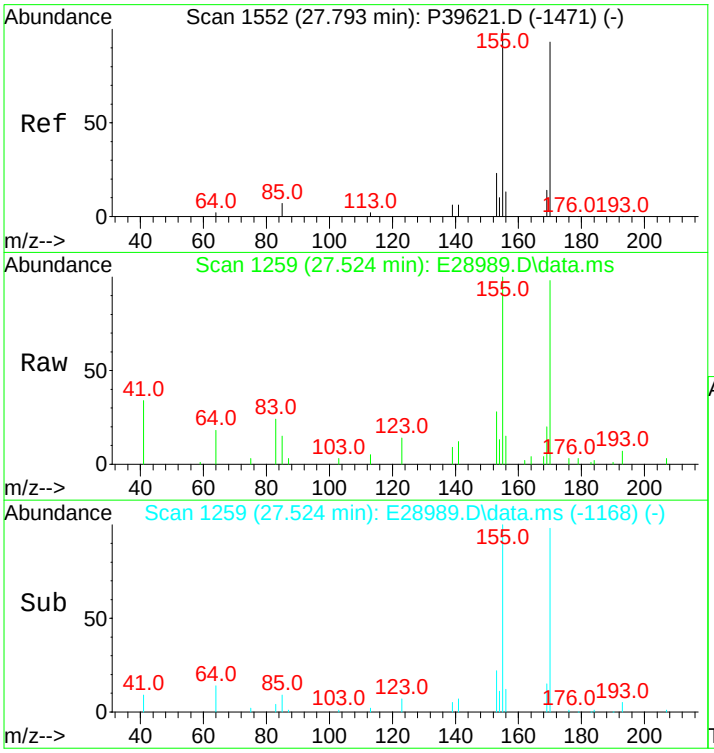


#12
C2-Naphthalenes
Concen: 619.97 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:156 Resp: 56855

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

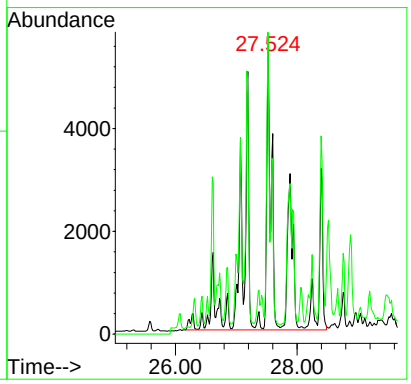


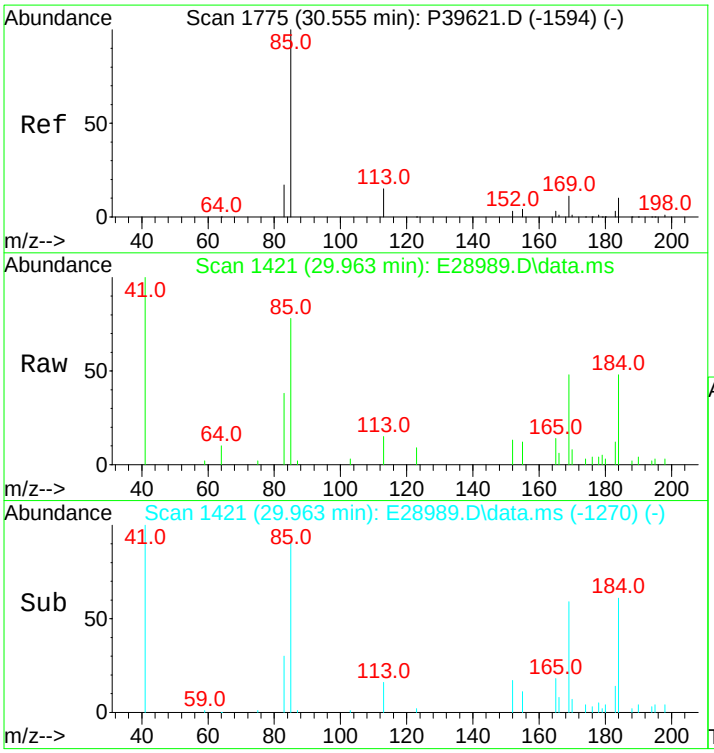


#13
C3-Naphthalenes
Concen: 1103.62 ng/mL m
RT: 27.524 min Scan# 1259
Delta R.T. 0.344 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:170 Resp: 101209

Ion	Ratio	Lower	Upper
170	100		
155	14.9	66.8	100.2#

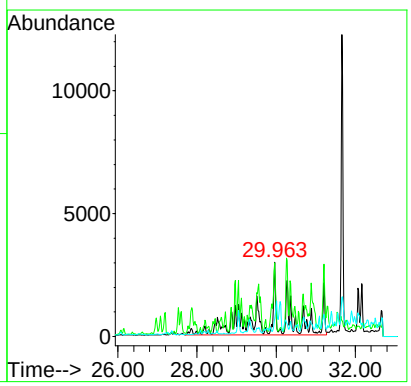


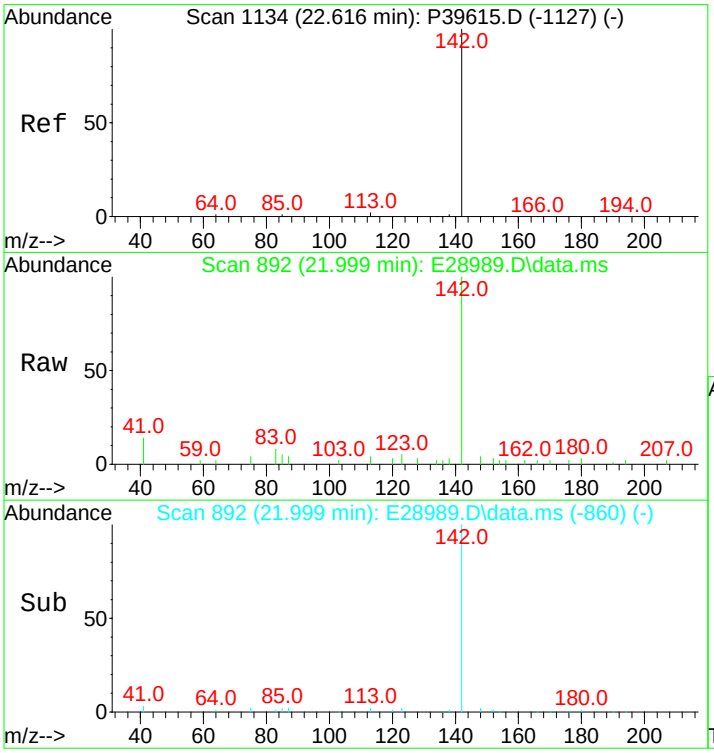


#14
C4-Naphthalenes
Concen: 984.08 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:184 Resp: 90246

Ion	Ratio	Lower	Upper
184	100		
169	16.0	78.7	118.1#
183	0.0	26.7	40.1#

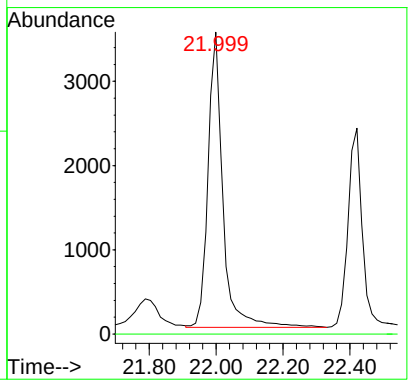


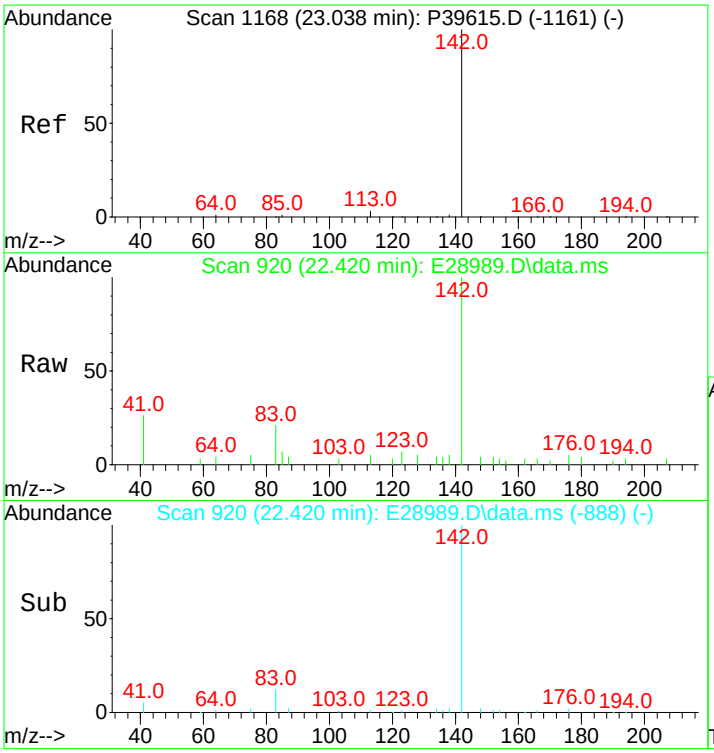


#16
2-Methylnaphthalene
Concen: 184.34 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:142 Resp: 10767

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

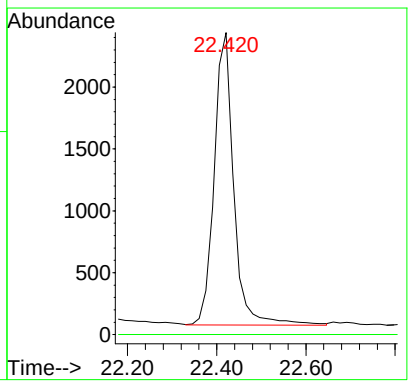


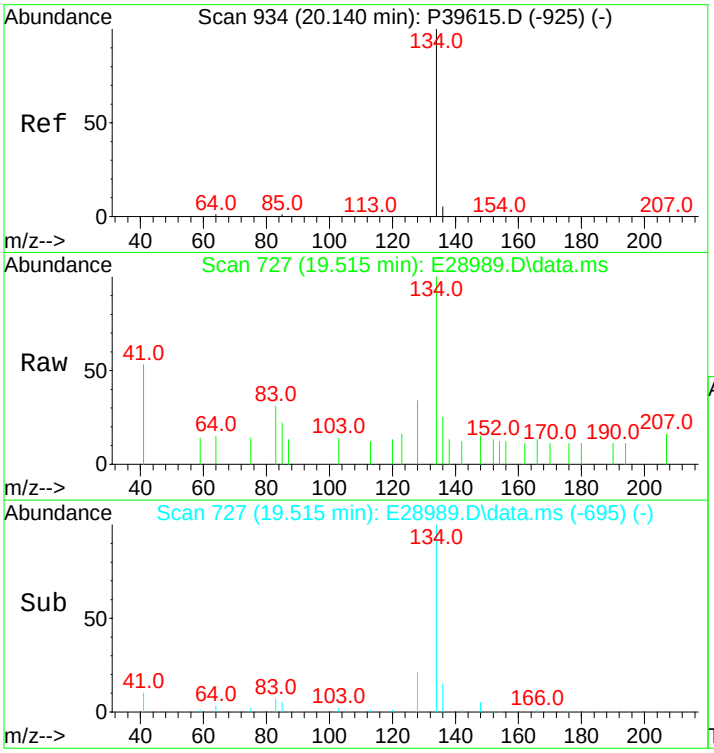


#17
1-Methylnaphthalene
Concen: 126.14 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:142 Resp: 7159

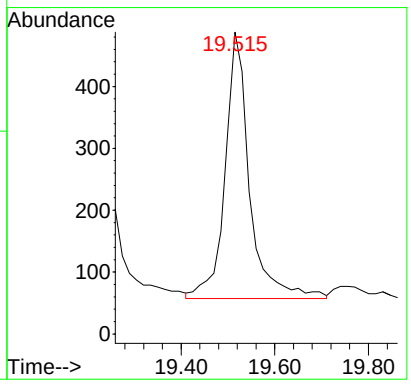
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

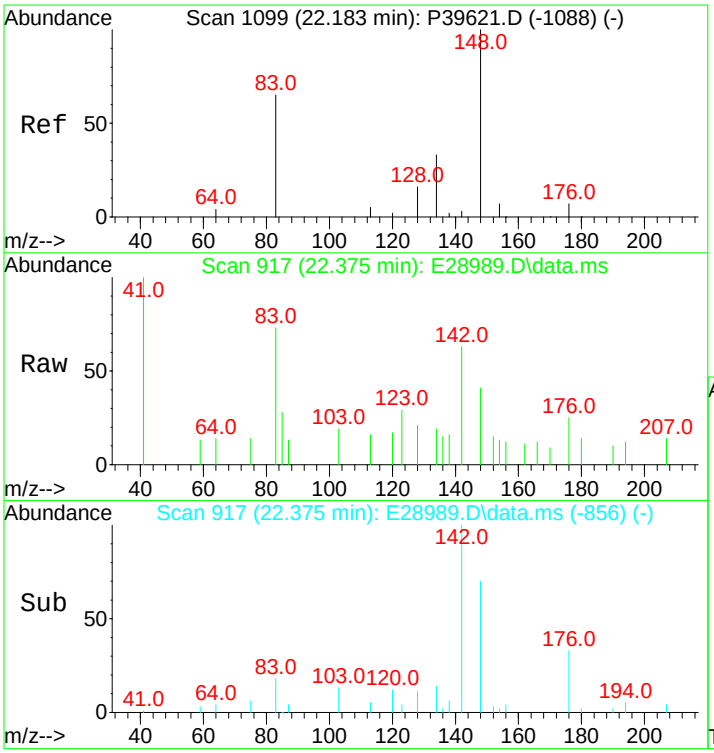




#18
Benzothiophene
Concen: 20.67 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

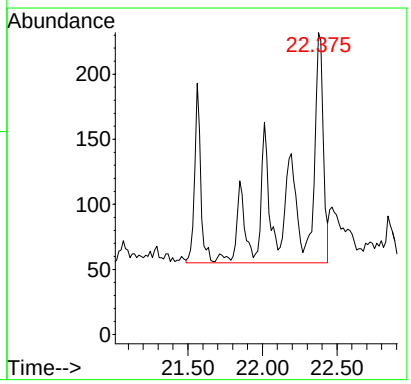
Tgt Ion:134 Resp: 1567

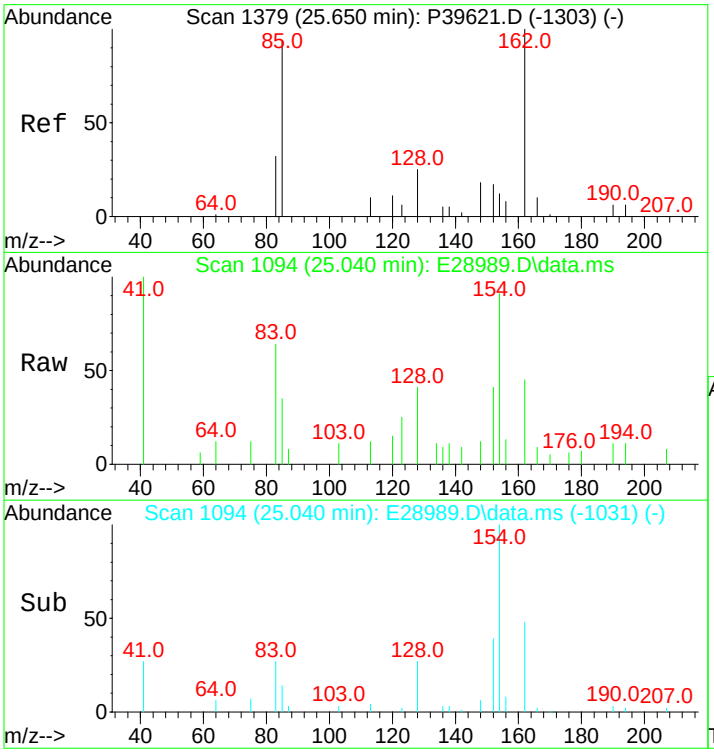




#19
C1-Benzo(b)thiophenes
Concen: 28.58 ng/mL m
RT: 22.375 min Scan# 917
Delta R.T. 0.674 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

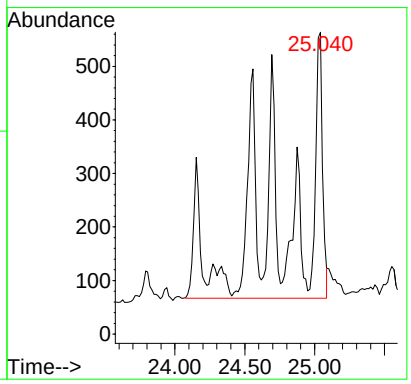
Tgt Ion:148 Resp: 2167

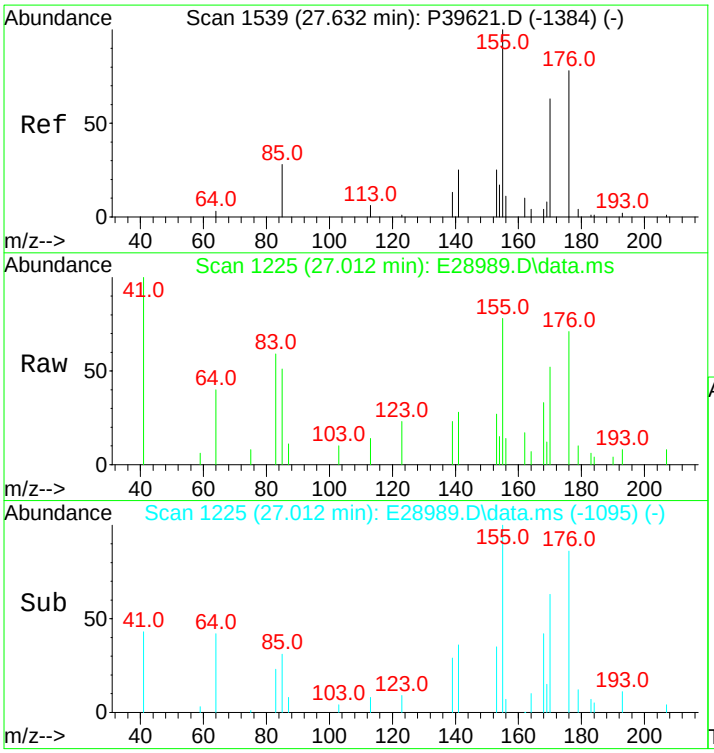




#20
C2-Benzo(b)thiophenes
Concen: 95.27 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

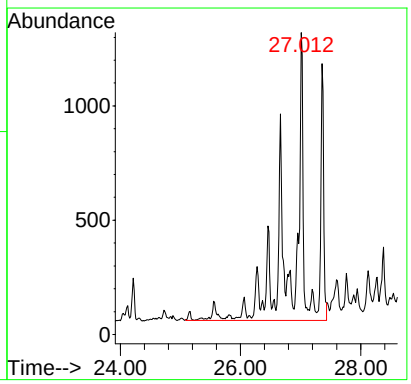
Tgt Ion:162 Resp: 7223

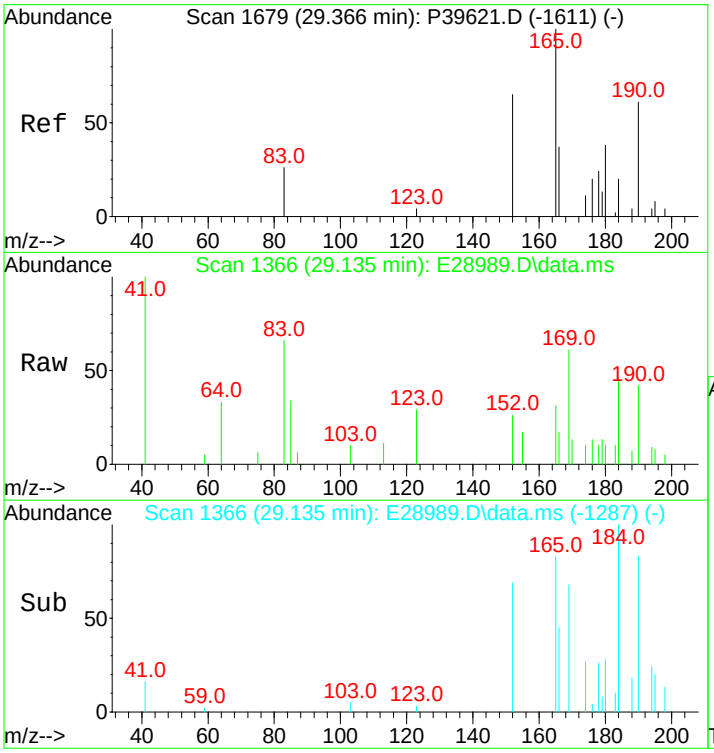




#21
C3-Benzo(b)thiophenes
Concen: 239.46 ng/mL m
RT: 27.012 min Scan# 1225
Delta R.T. -0.007 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

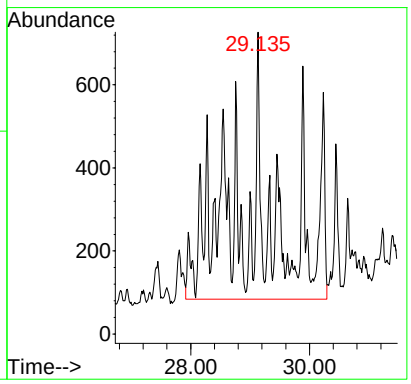
Tgt Ion:176 Resp: 18154

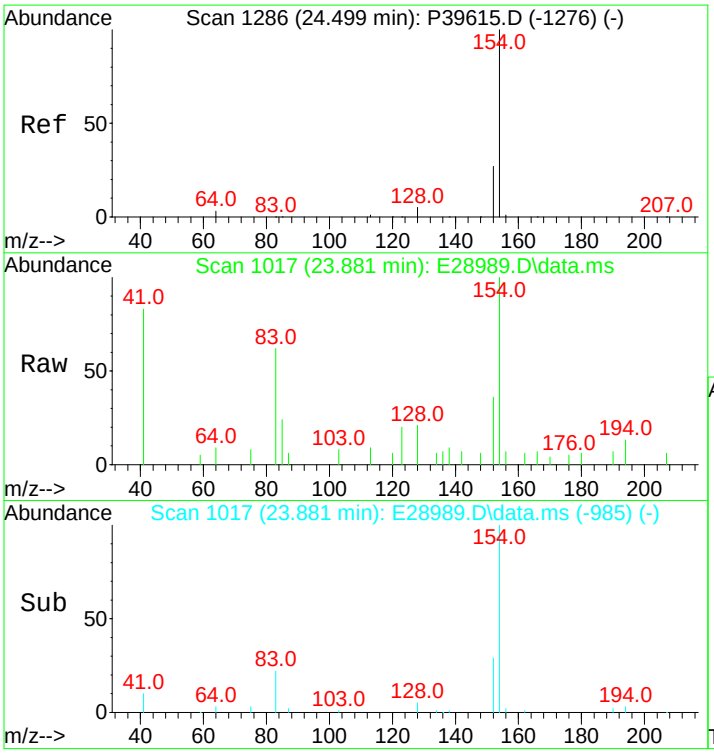




#22
C4-Benzo(b)thiophenes
Concen: 311.32 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:190 Resp: 23602

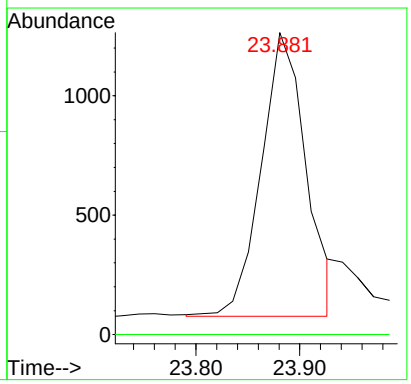


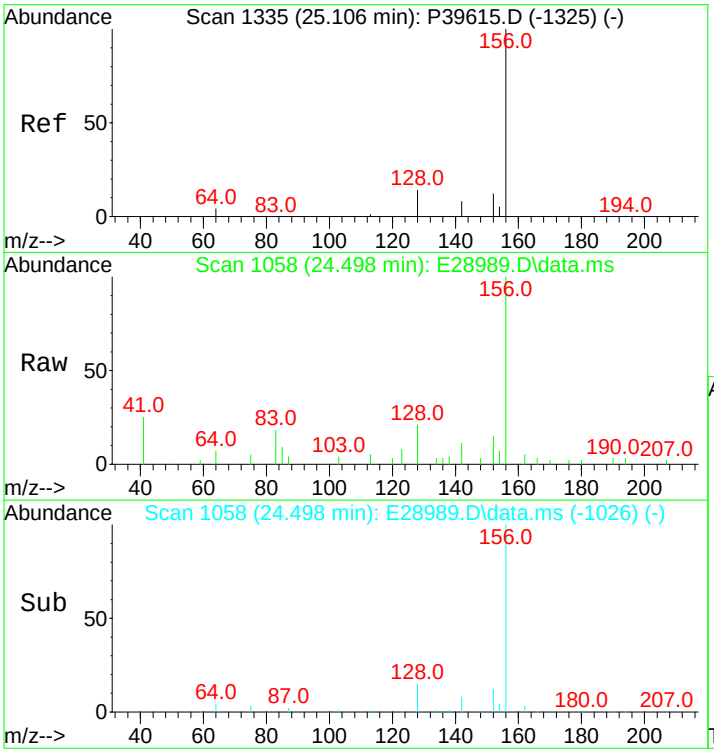


#23
Biphenyl
Concen: 48.24 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:154 Resp: 3561

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

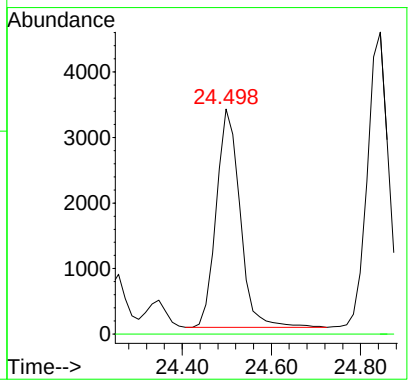


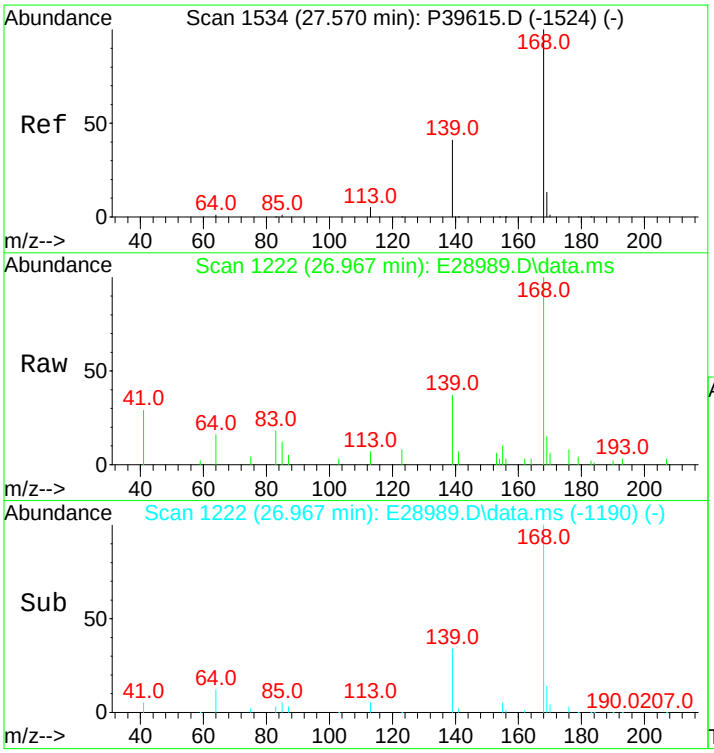


#24
2,6-Dimethylnaphthalene
Concen: 233.61 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:156 Resp: 12299

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

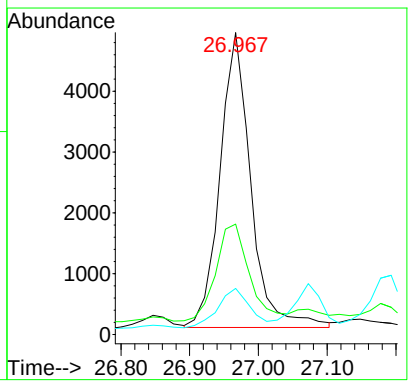


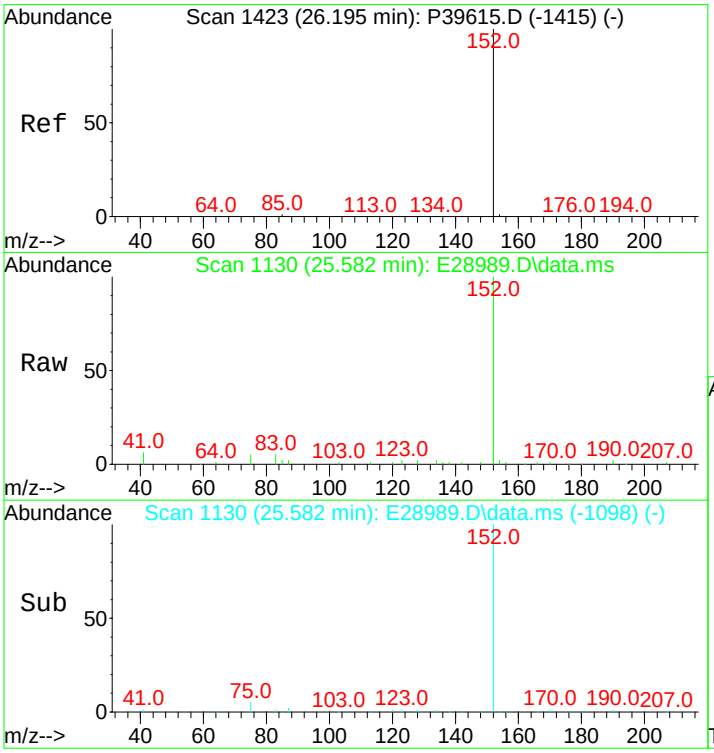


#25
Dibenzofuran
Concen: 184.68 ng/mL m
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:168 Resp: 15093

Ion	Ratio	Lower	Upper
168	100		
139	36.6	26.0	39.0
169	14.4	10.6	16.0

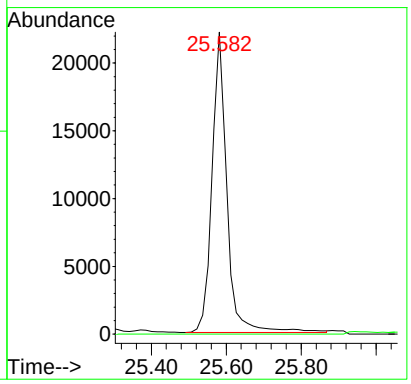


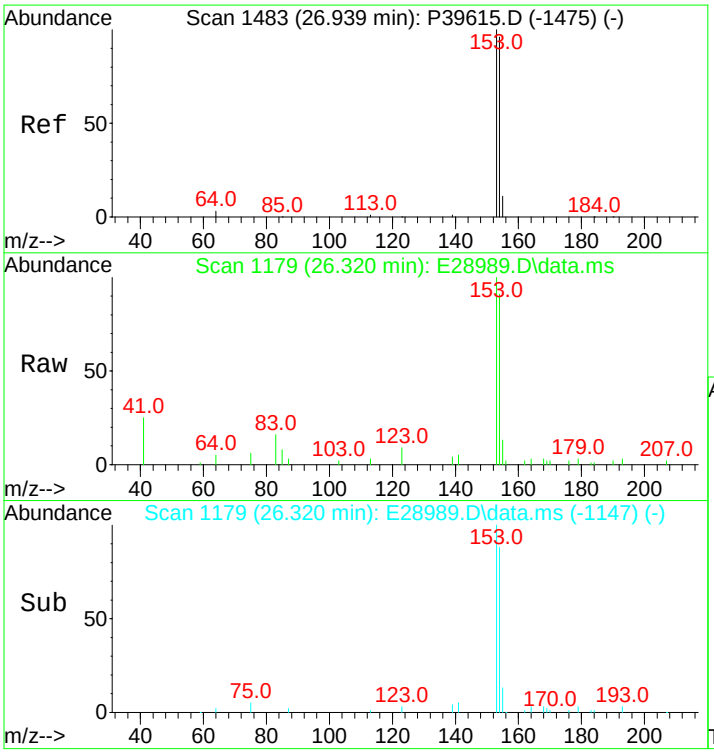


#26
Acenaphthylene
Concen: 667.01 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:152 Resp: 60985

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

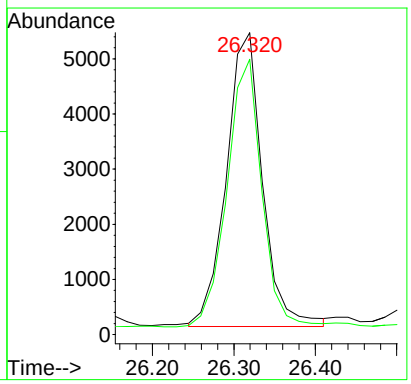


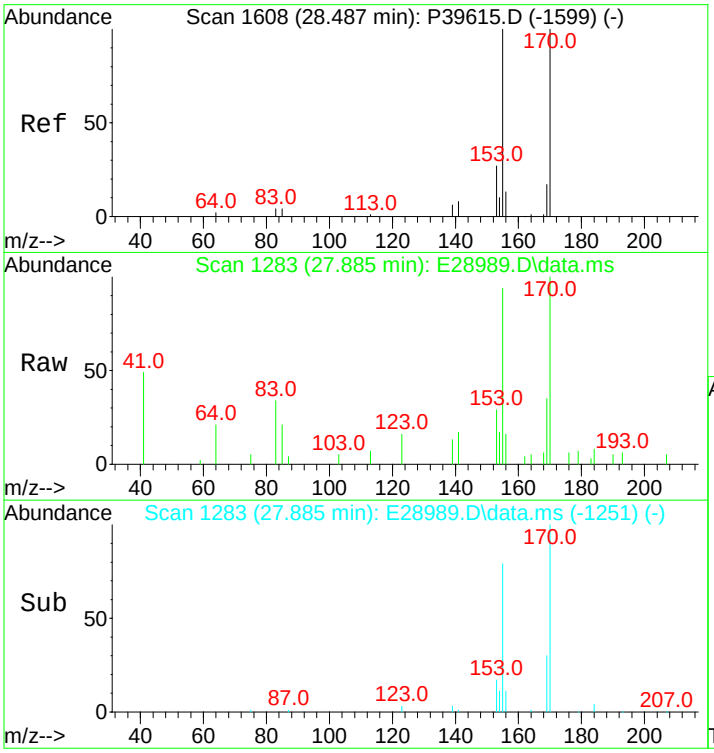


#27
Acenaphthene
Concen: 279.75 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:153 Resp: 16464

Ion	Ratio	Lower	Upper
153	100		
154	88.5	74.1	111.1

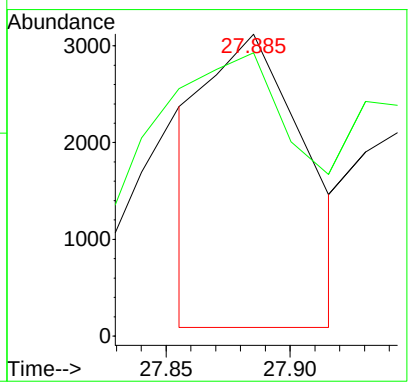


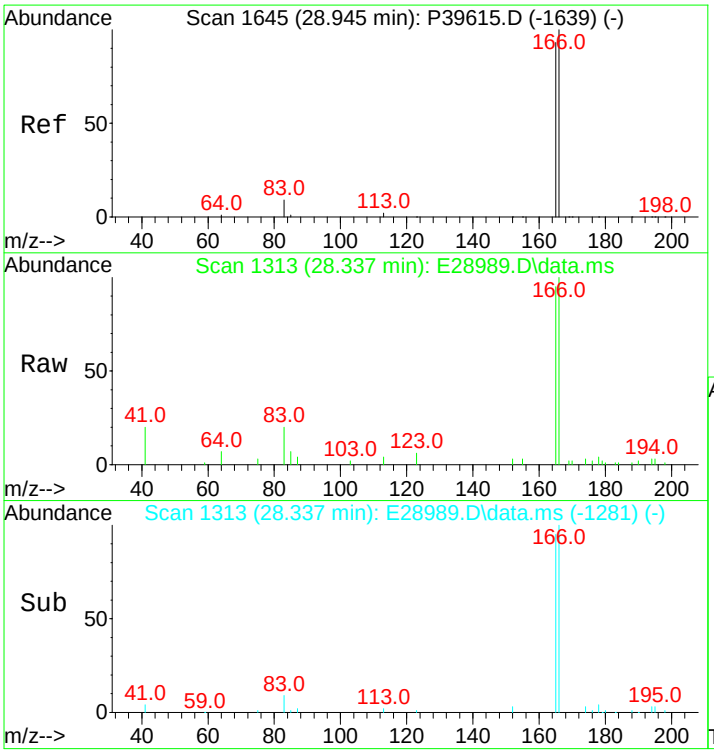


#28
2,3,5-Trimethylnaphthalene
Concen: 168.99 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:170 Resp: 8324

Ion	Ratio	Lower	Upper
170	100		
155	153.9	70.7	106.1#

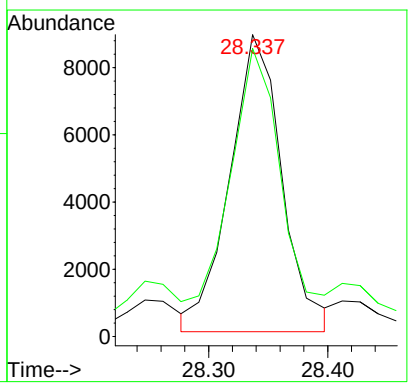


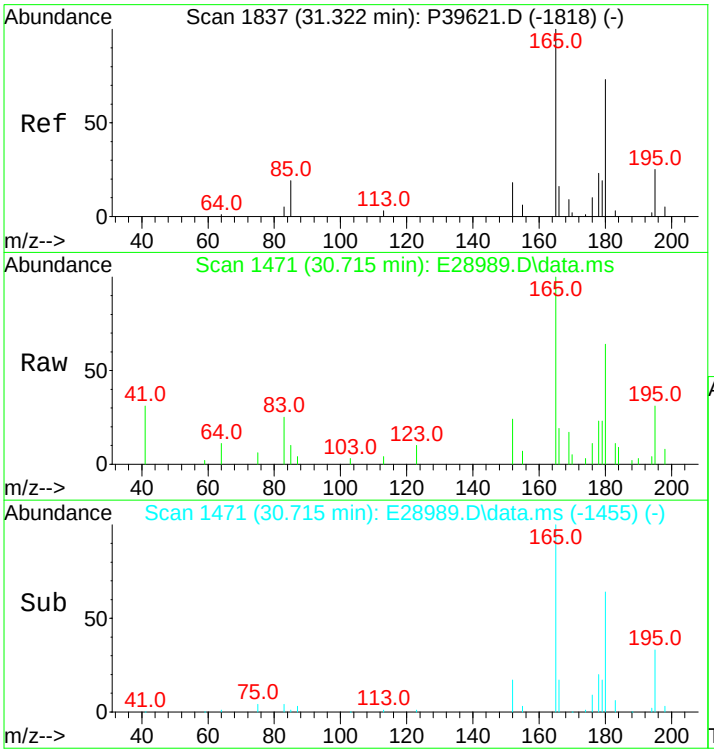


#29
Fluorene
Concen: 409.84 ng/mL m
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:166 Resp: 26902

Ion	Ratio	Lower	Upper
166	100		
165	77.8	74.7	112.1

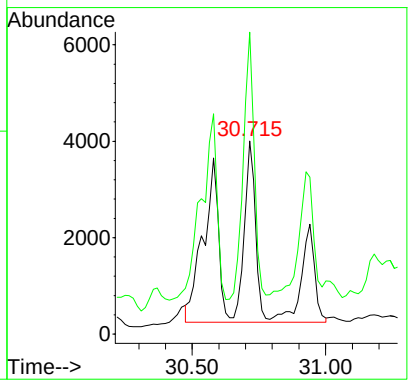


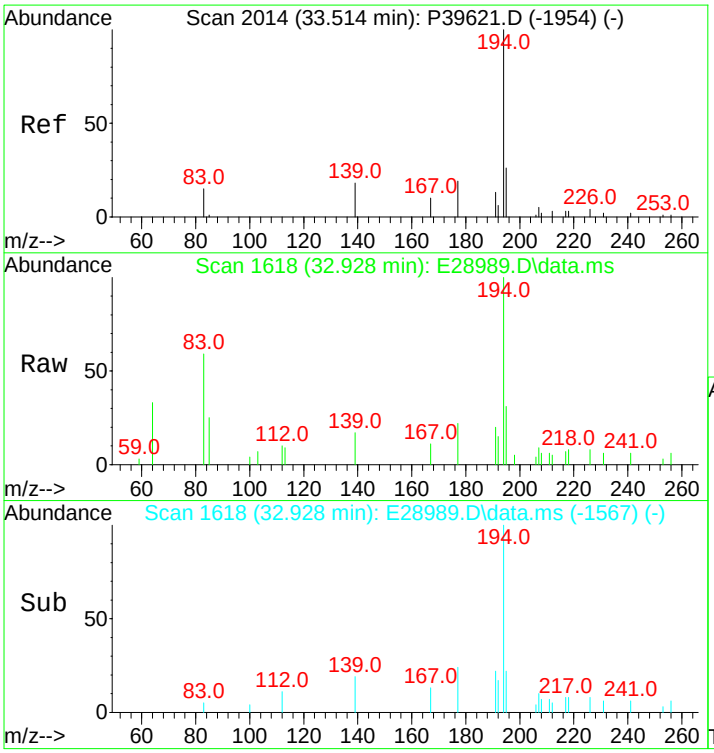


#30
C1-Fluorenes
Concen: 483.00 ng/mL m
RT: 30.715 min Scan# 1471
Delta R.T. 0.093 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:180 Resp: 31704

Ion	Ratio	Lower	Upper
180	100		
165	47.1	94.3	141.5#

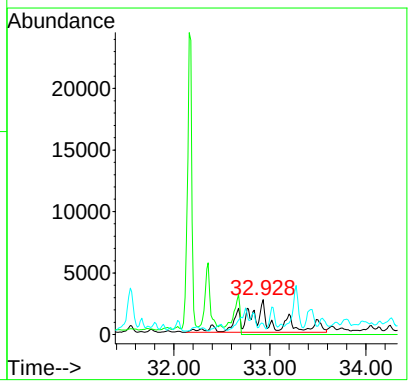


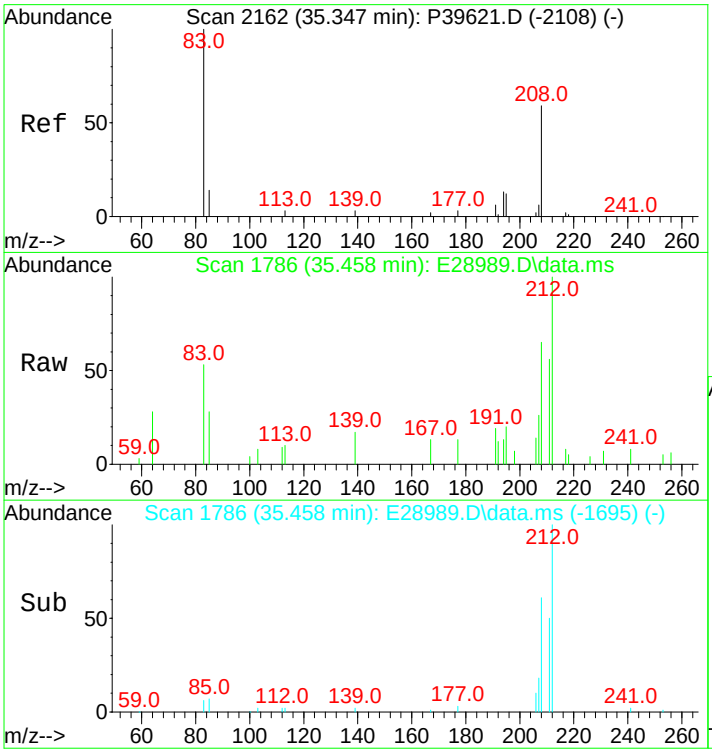


#31
C2-Fluorenes
Concen: 803.19 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:194 Resp: 52721

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	20.6	27.0	40.4#

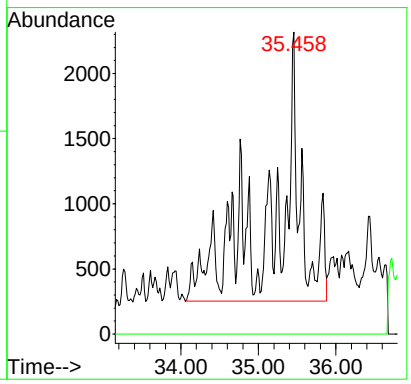


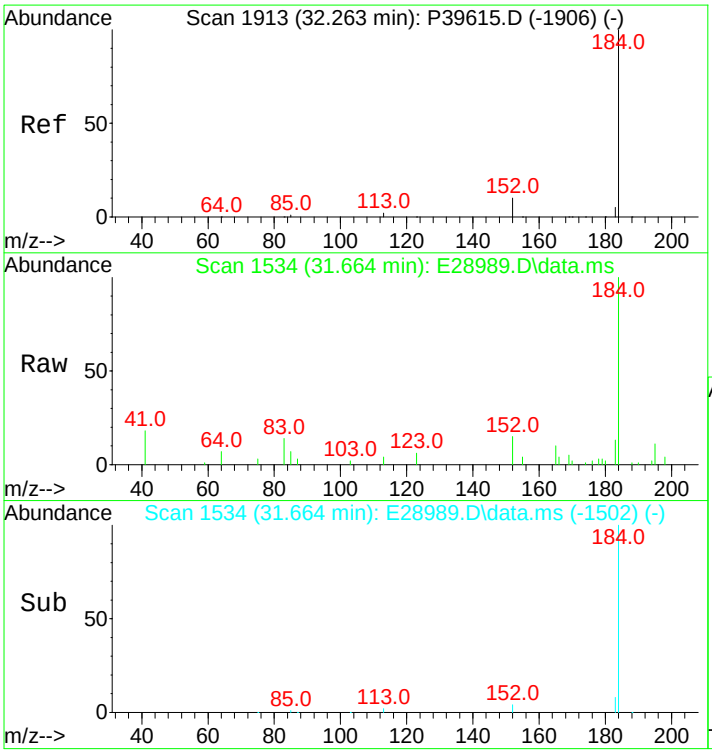


#32
C3-Fluorenes
Concen: 765.60 ng/mL m
RT: 35.458 min Scan# 1786
Delta R.T. 0.909 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:208 Resp: 50254

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

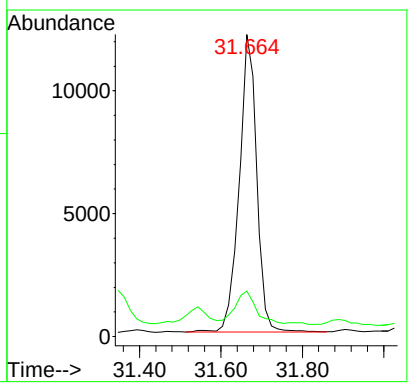


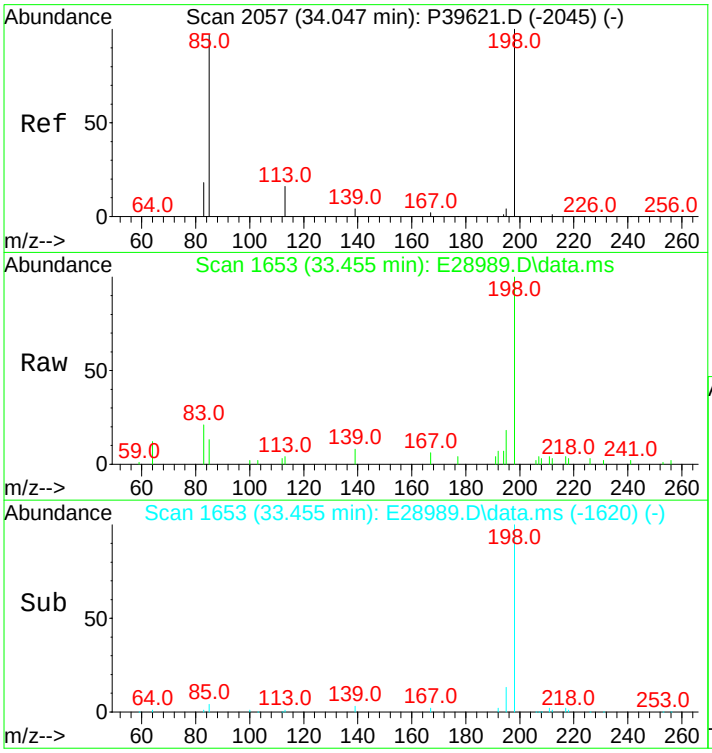


#33
Dibenzothiophene
Concen: 399.87 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:184 Resp: 36019

Ion	Ratio	Lower	Upper
184	100		
152	13.0	7.0	10.6#

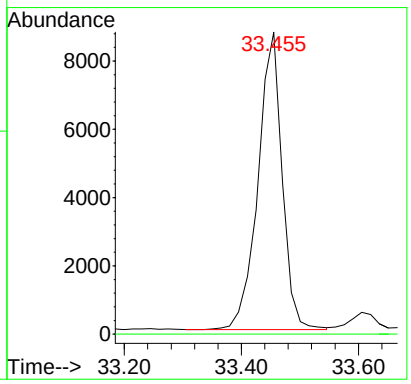


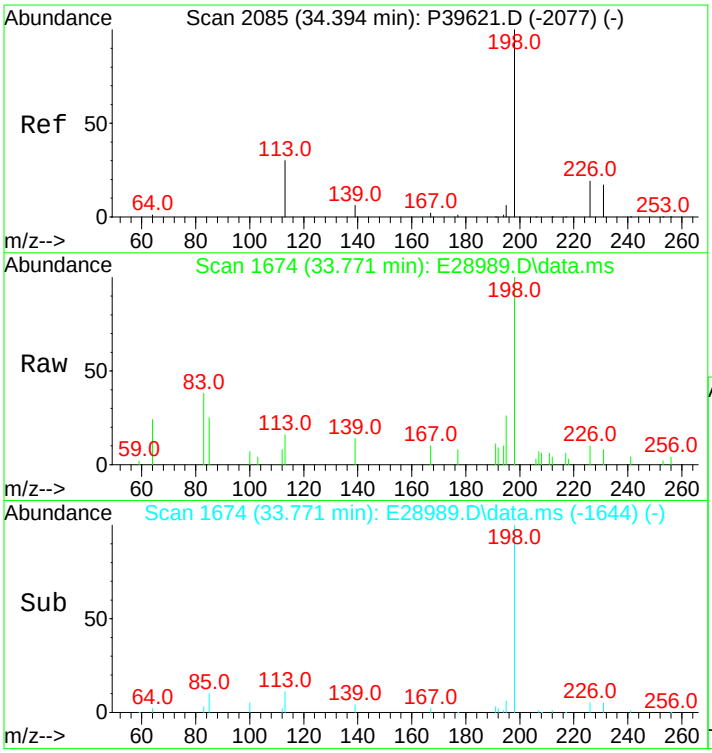


#34
4-Methyldibenzothiophene(4MDT)
Concen: 276.87 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:198 Resp: 24939

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

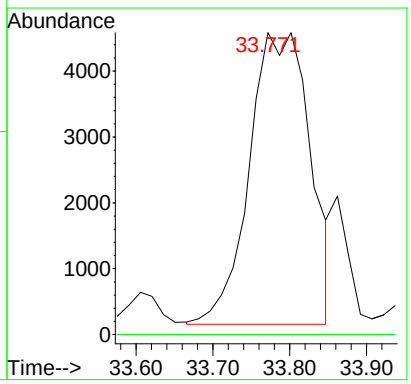


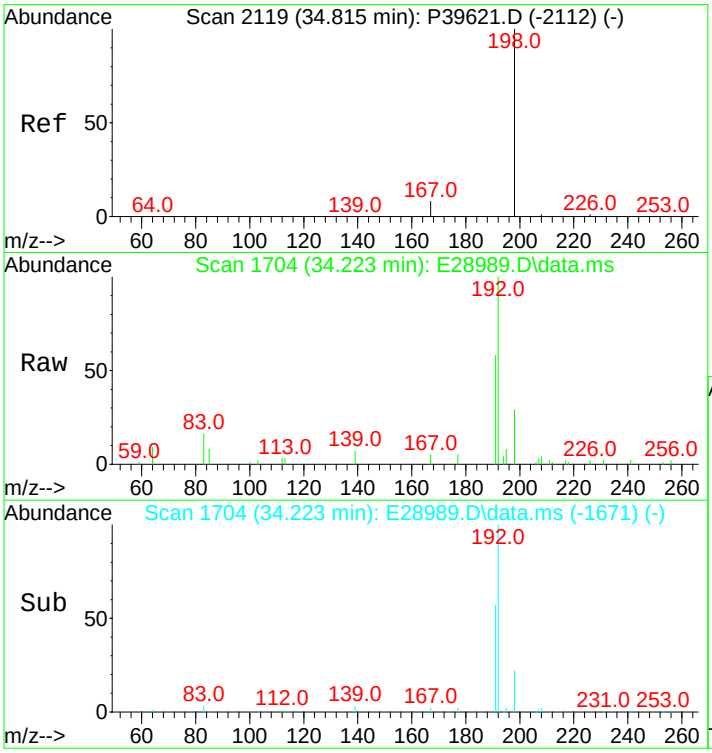


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 271.08 ng/mL m
RT: 33.771 min Scan# 1674
Delta R.T. -0.045 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:198 Resp: 24418

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

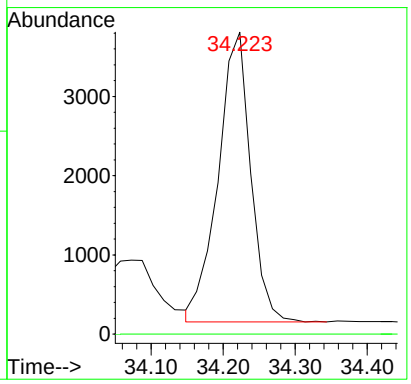


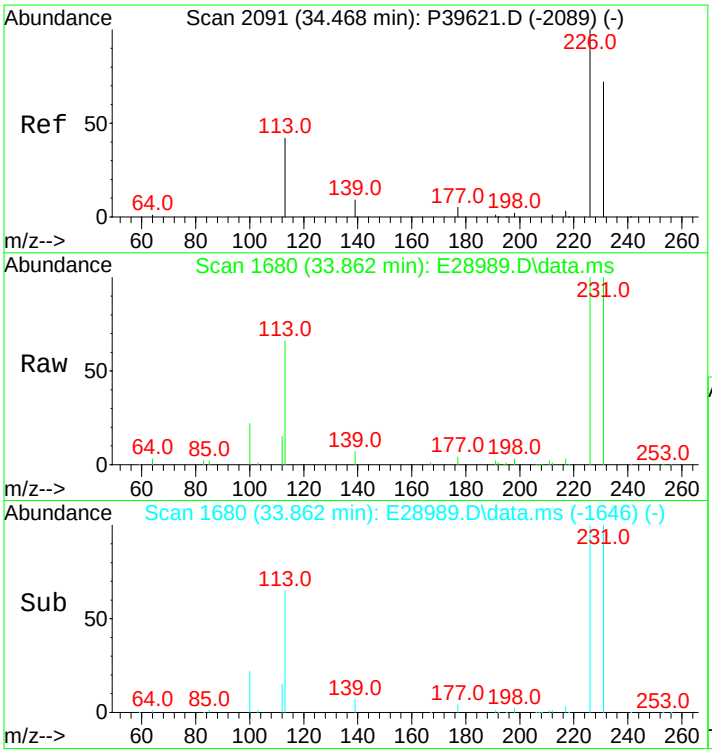


#36
1-Methyldibenzothiophene(1MDT)
Concen: 127.45 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:198 Resp: 11480

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

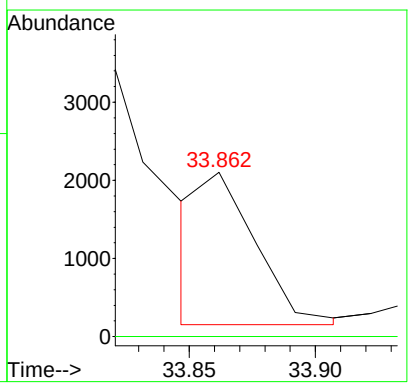


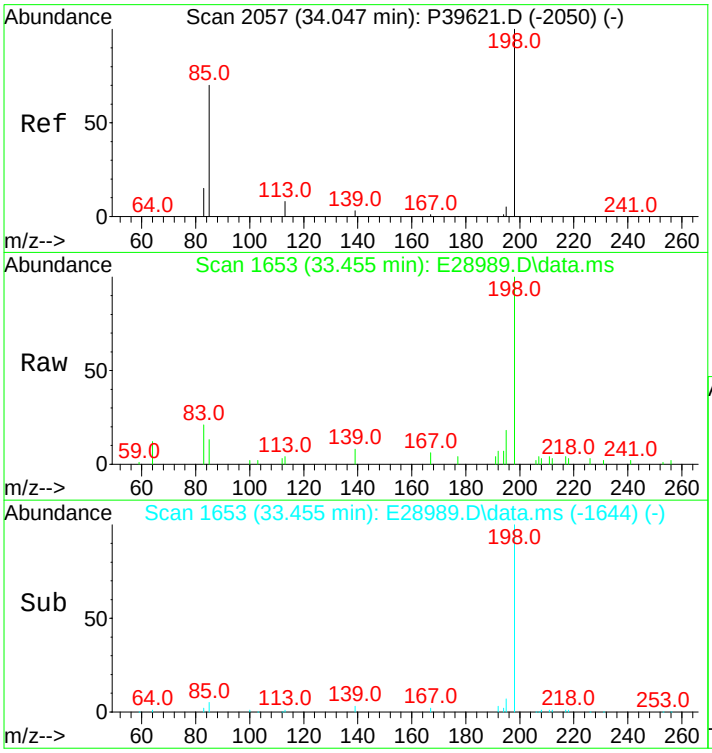


#37
OTP
Concen: 32.18 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:198 Resp: 2899

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

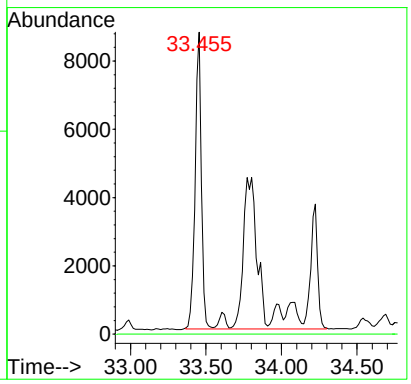


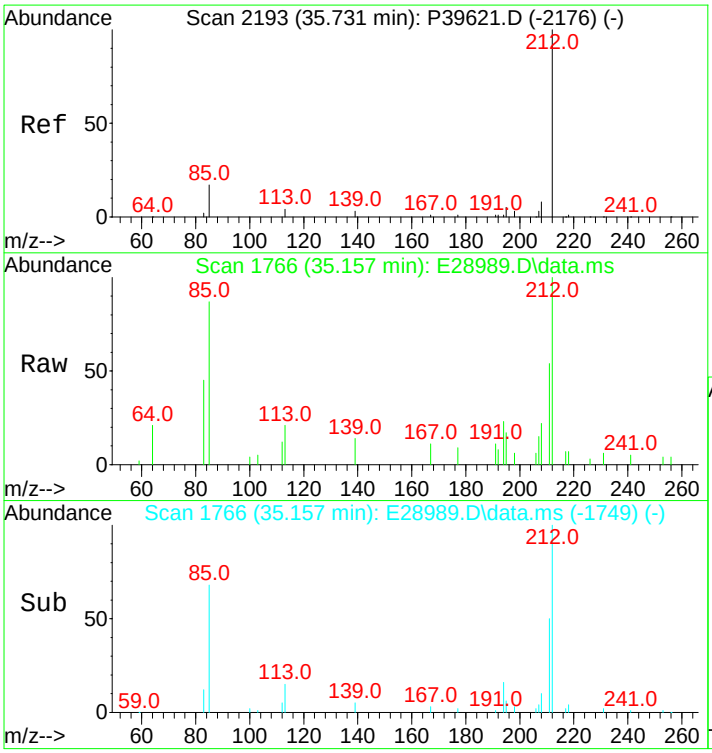


#38
C1-Dibenzothiophenes
Concen: 799.24 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:198 Resp: 71992

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

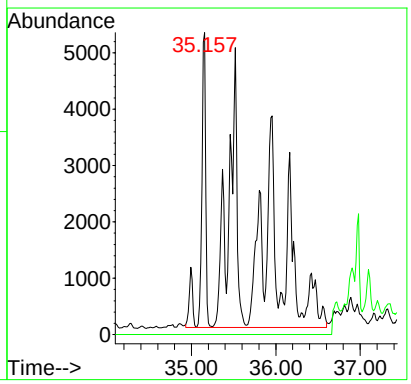


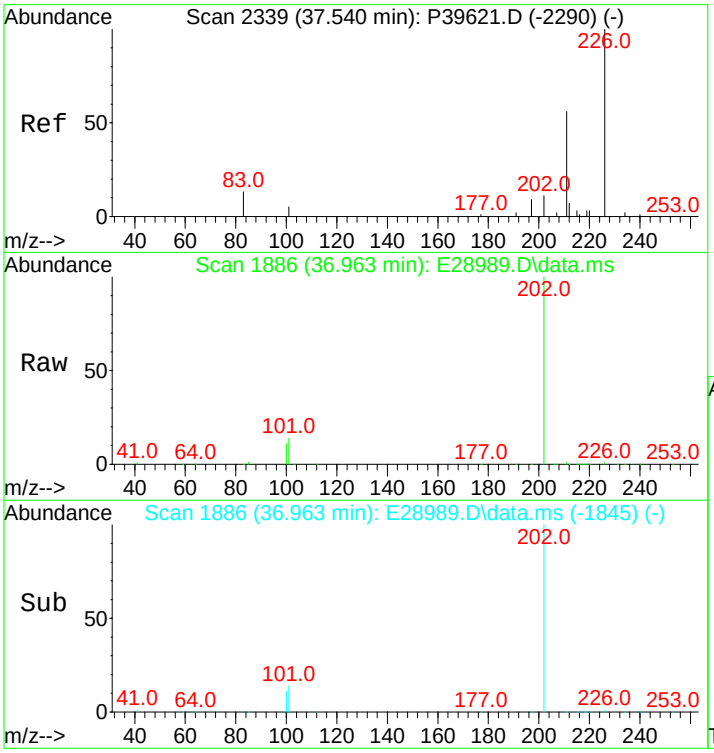


#39
C2-Dibenzothiophenes
Concen: 1212.70 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:212 Resp: 109235

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

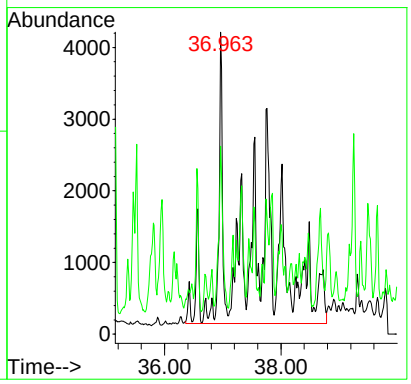


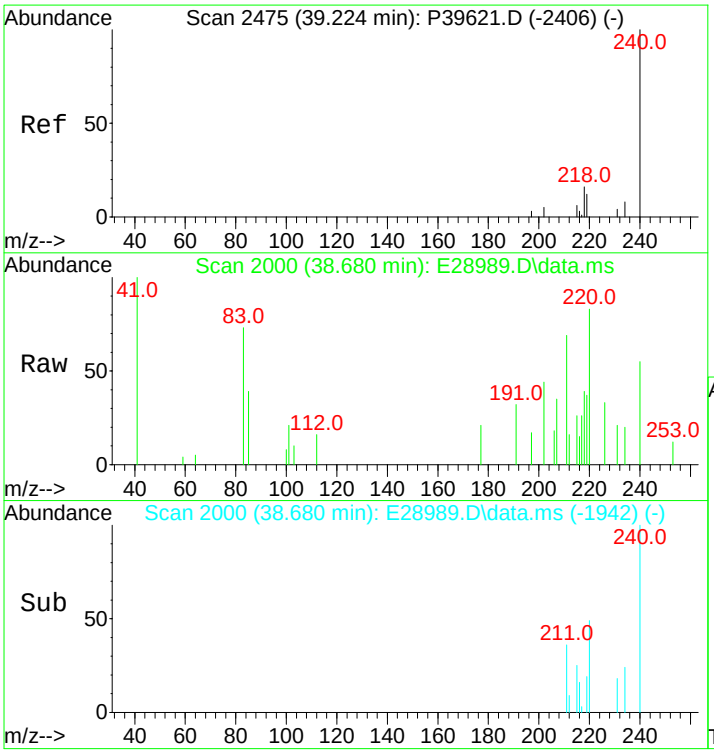


#40
C3-Dibenzothiophenes
Concen: 1186.80 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:226 Resp: 106902

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

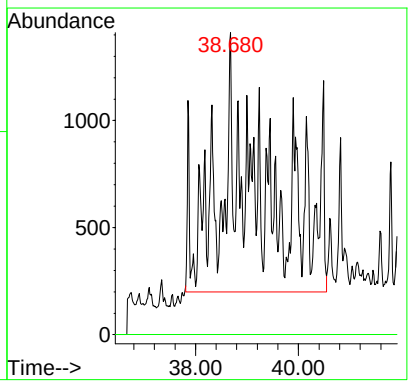


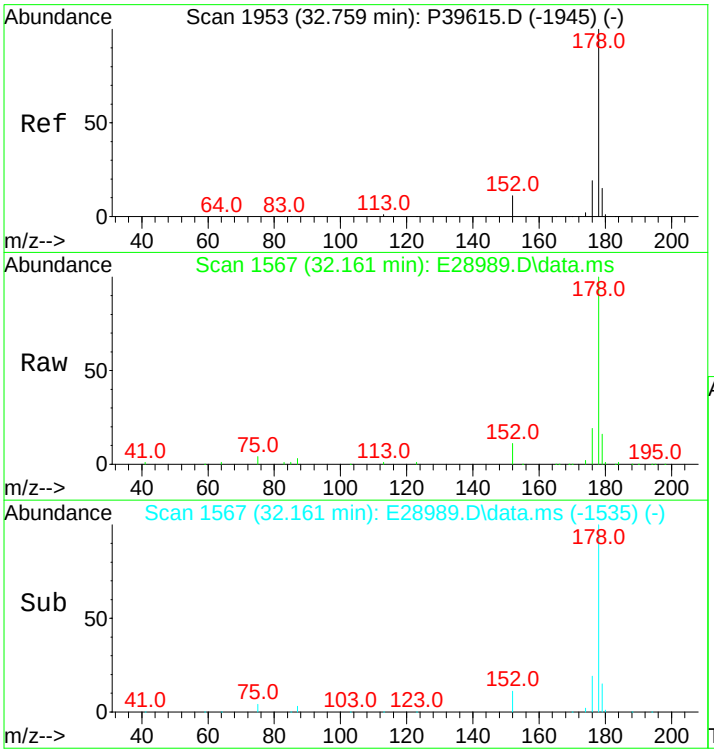


#41
C4-Dibenzothiophenes
Concen: 749.33 ng/mL m
RT: 38.680 min Scan# 2000
Delta R.T. 0.335 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:240 Resp: 67497

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

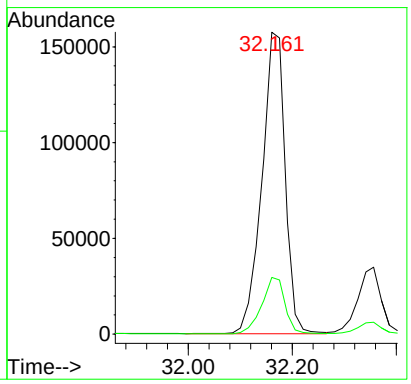


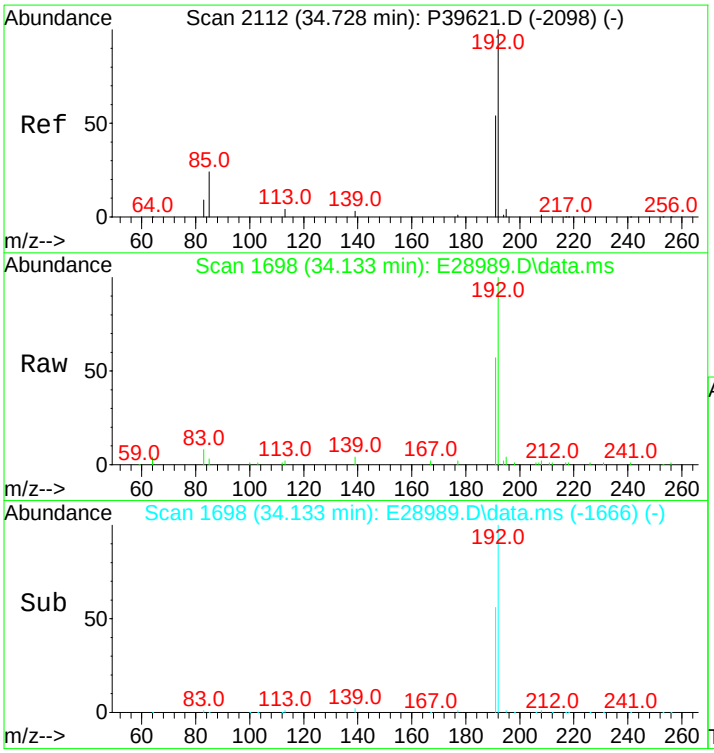


#43
Phenanthrene
Concen: 5329.03 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:178 Resp: 488365

Ion	Ratio	Lower	Upper
178	100		
176	18.6	15.0	22.4

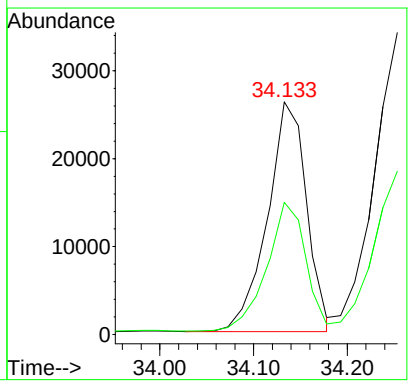


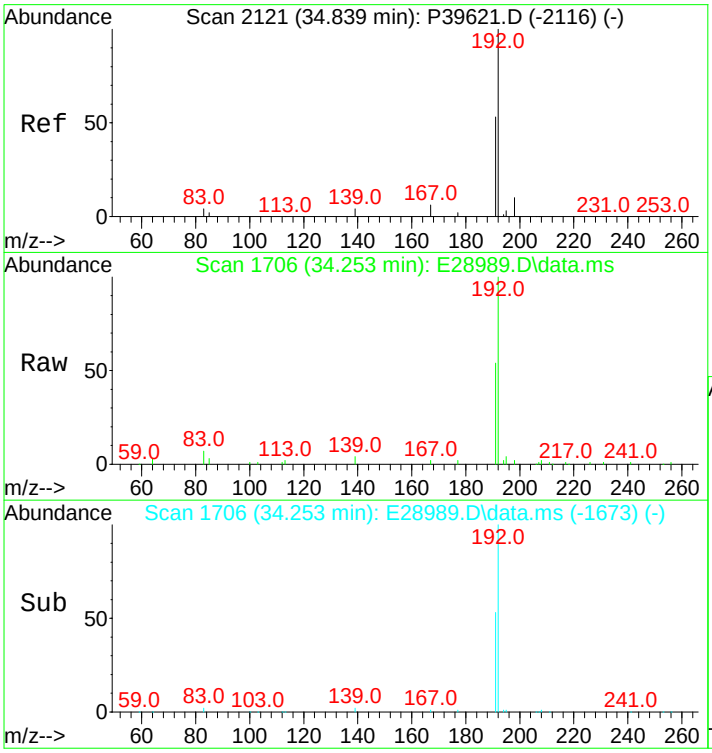


#44
3-Methylphenanthrene(3MP)
Concen: 829.19 ng/mL
RT: 34.133 min Scan# 1698
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 75989

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.9	68.9

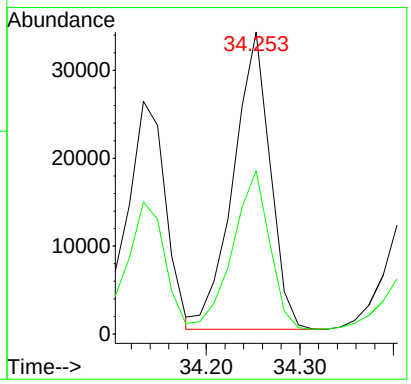


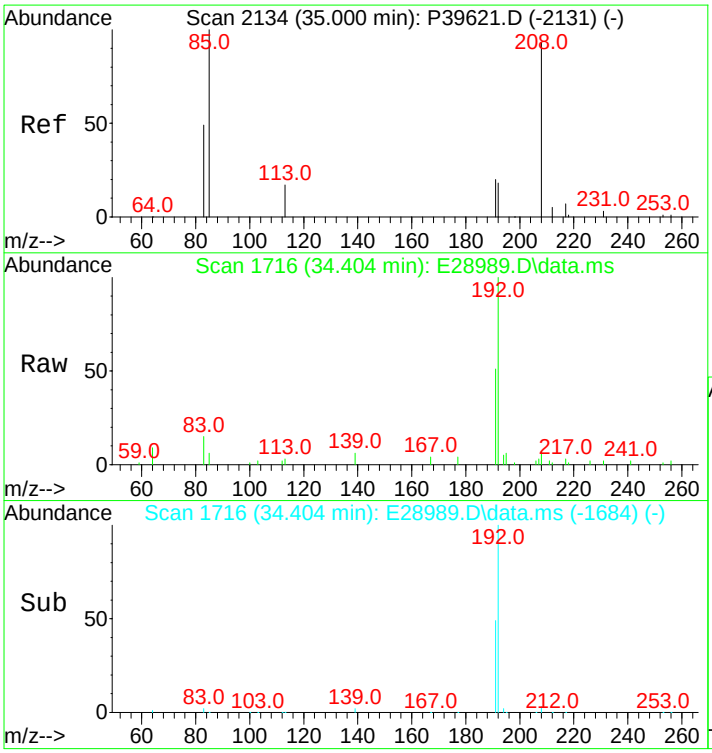


#45
2-Methylphenanthrene(2MP)
Concen: 1005.24 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 92123

Ion	Ratio	Lower	Upper
192	100		
191	53.5	45.4	68.0

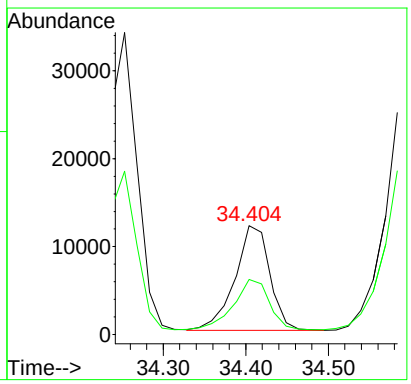


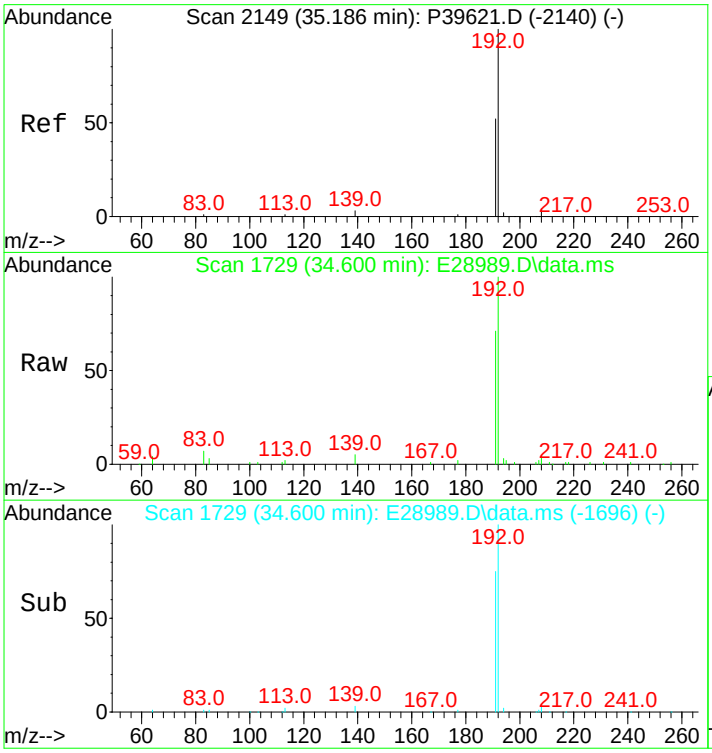


#46
2-Methylanthracene(2MA)
Concen: 383.10 ng/mL m
RT: 34.404 min Scan# 1716
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 35108

Ion	Ratio	Lower	Upper
192	100		
191	0.7	95.4	143.0#

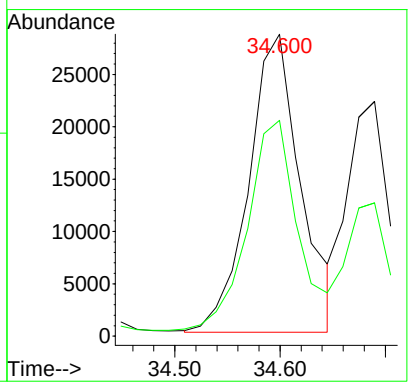


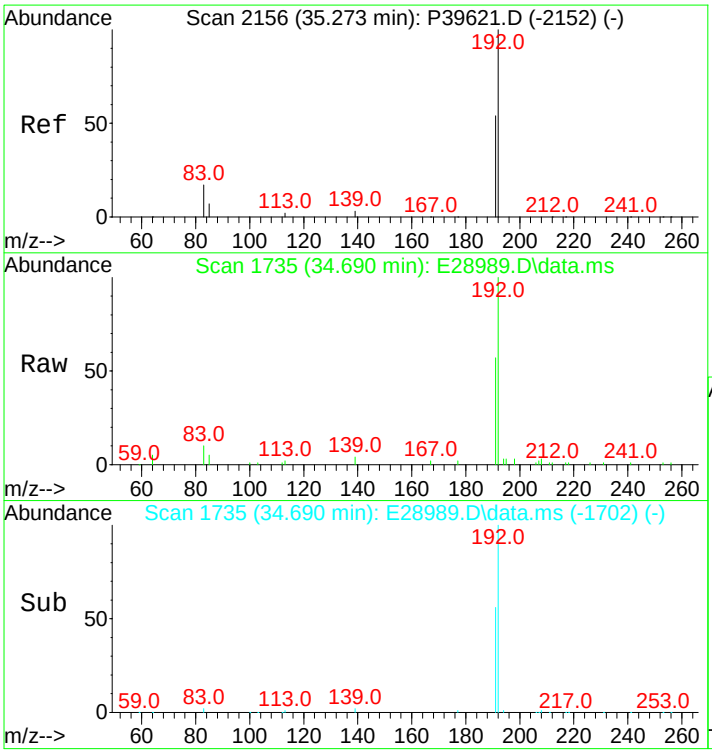


#47
9/4-Methylphenanthrene(9MP)
Concen: 1063.80 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 97489

Ion	Ratio	Lower	Upper
192	100		
191	34.5	44.3	66.5#

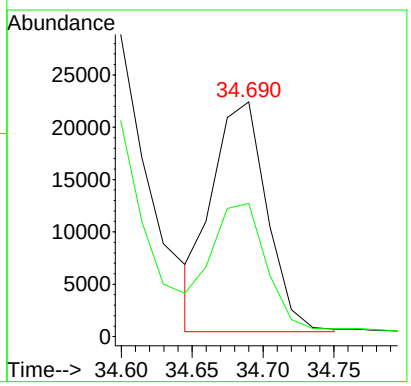


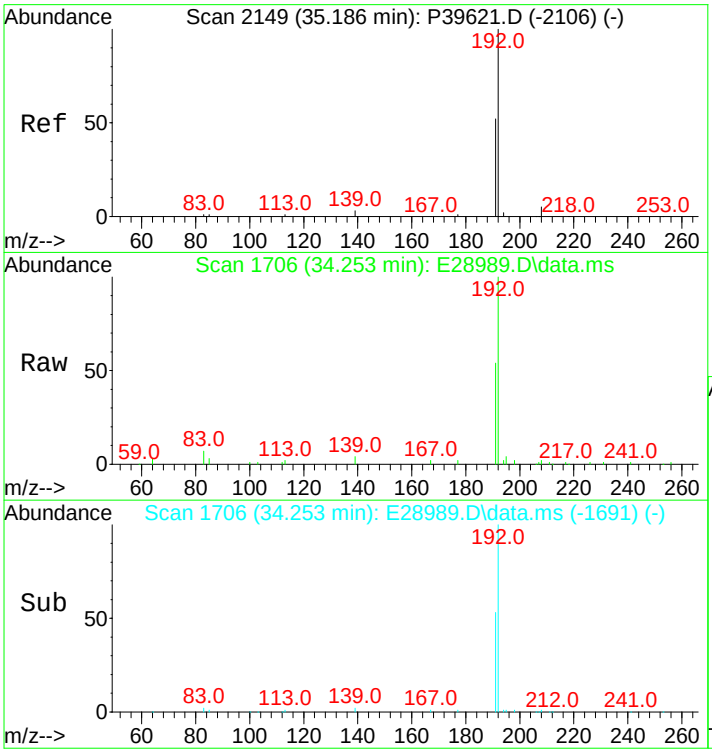


#48
1-Methylphenanthrene(1MP)
Concen: 647.76 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 59362

Ion	Ratio	Lower	Upper
192	100		
191	56.6	46.7	70.1

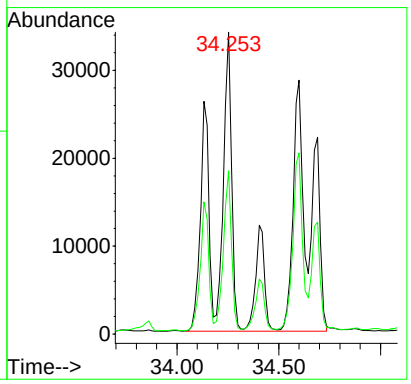


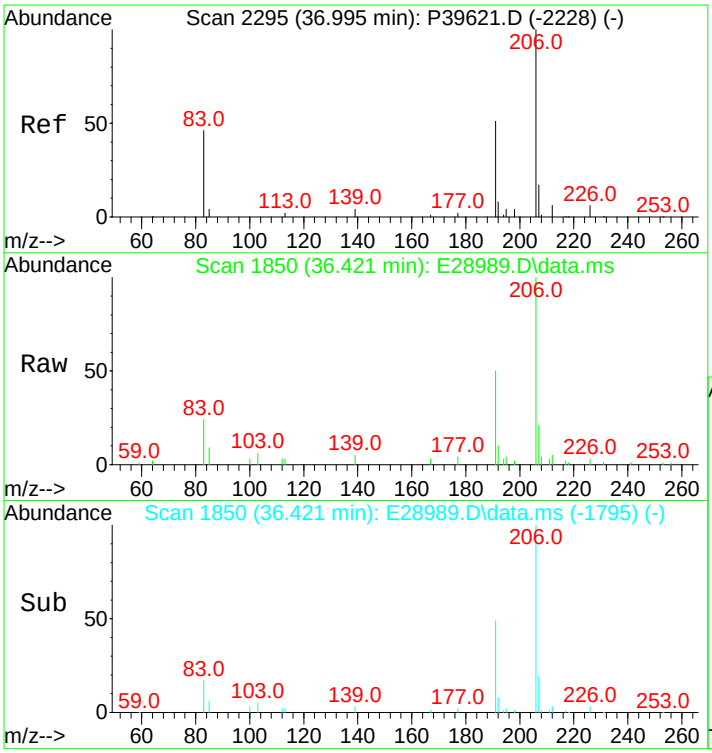


#49
C1-Phenanthrenes/Anthracenes
Concen: 3978.88 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 364634

Ion	Ratio	Lower	Upper
192	100		
191	4.7	44.0	66.0#

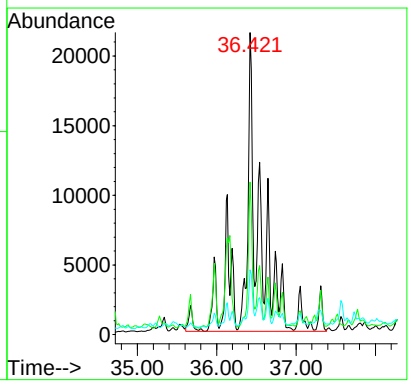


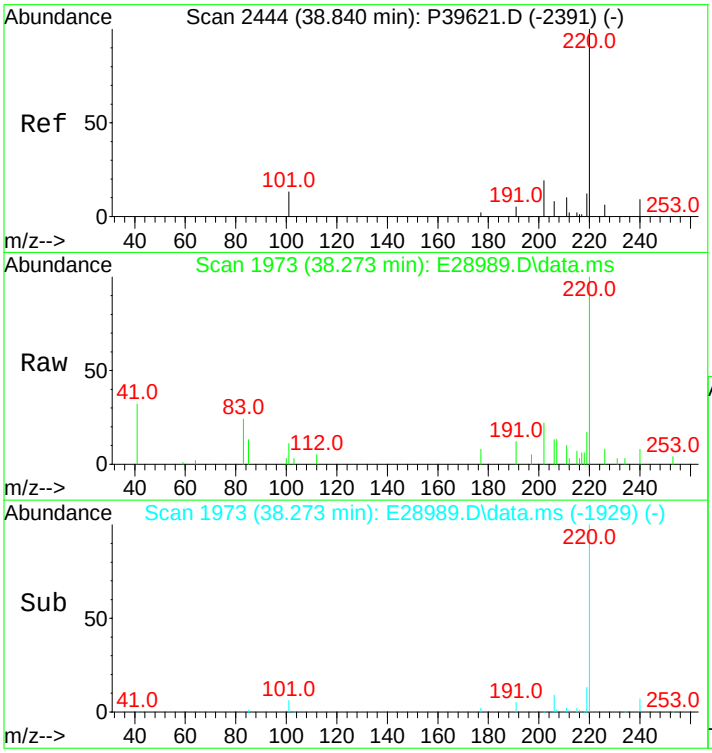


#50
C2-Phenanthrenes/Anthracenes
Concen: 3101.19 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:206 Resp: 284200

Ion	Ratio	Lower	Upper
206	100		
191	12.9	35.7	53.5#
207	5.6	16.5	24.7#

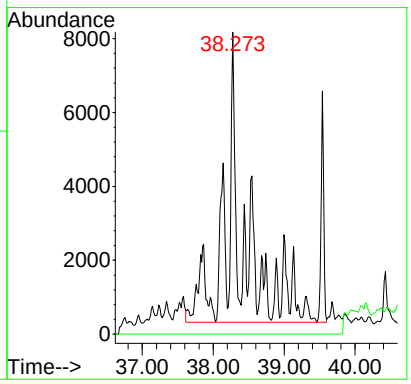


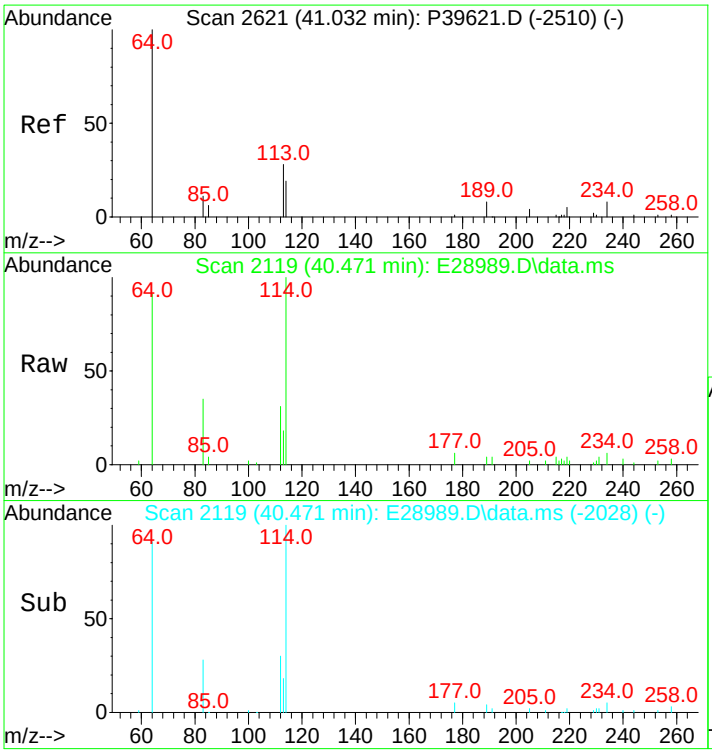


#52
C3-Phenanthrenes/Anthracenes
Concen: 1592.21 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:220 Resp: 145914

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

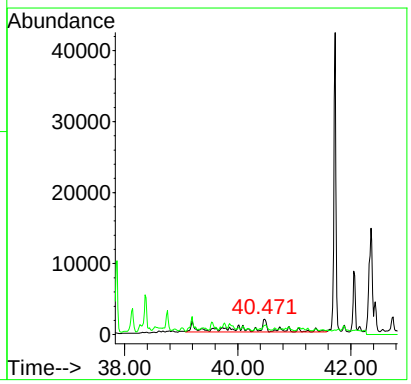


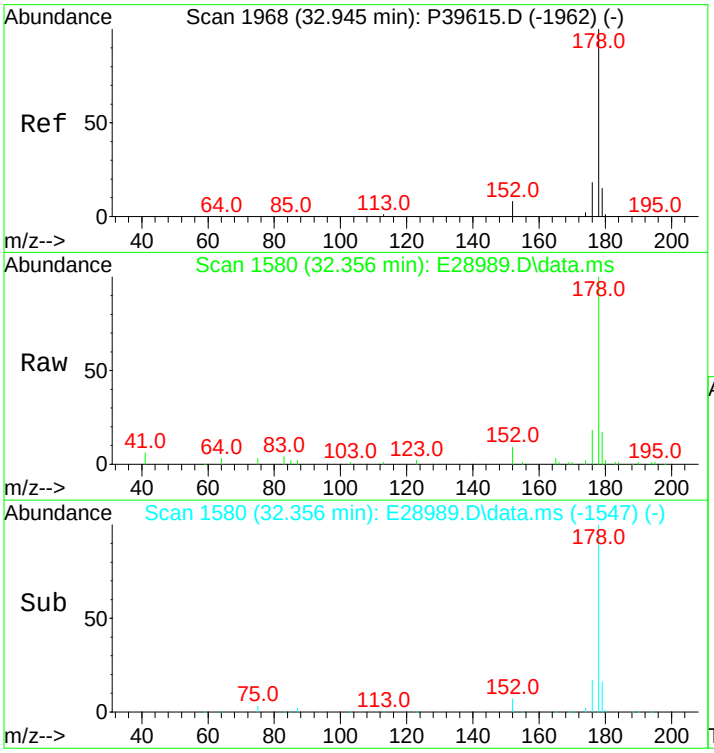


#53
C4-Phenanthrenes/Anthracenes
Concen: 585.88 ng/mL m
RT: 40.471 min Scan# 2119
Delta R.T. 0.384 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:234 Resp: 53691

Ion	Ratio	Lower	Upper
234	100		
219	2.3	46.6	70.0#

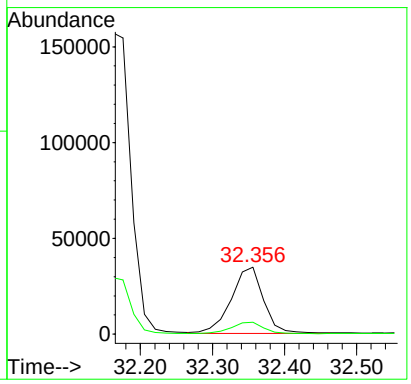


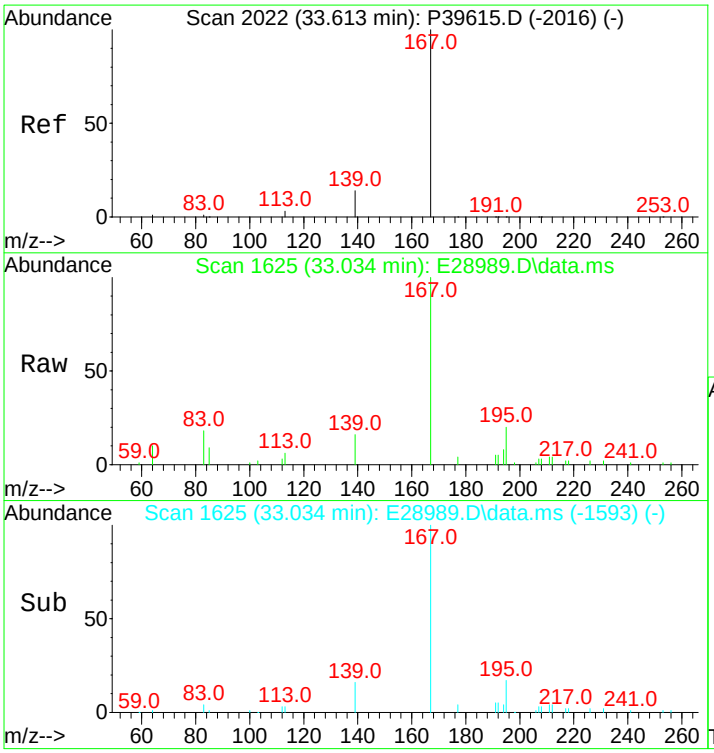


#55
Anthracene
Concen: 1383.46 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:178 Resp: 109586

Ion	Ratio	Lower	Upper
178	100		
176	17.1	14.3	21.5

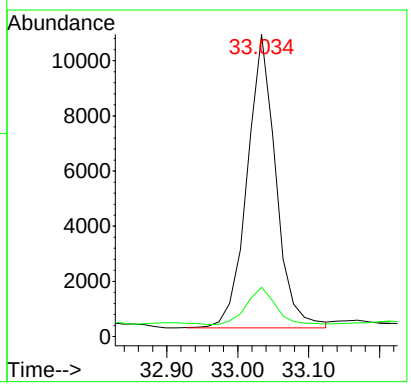


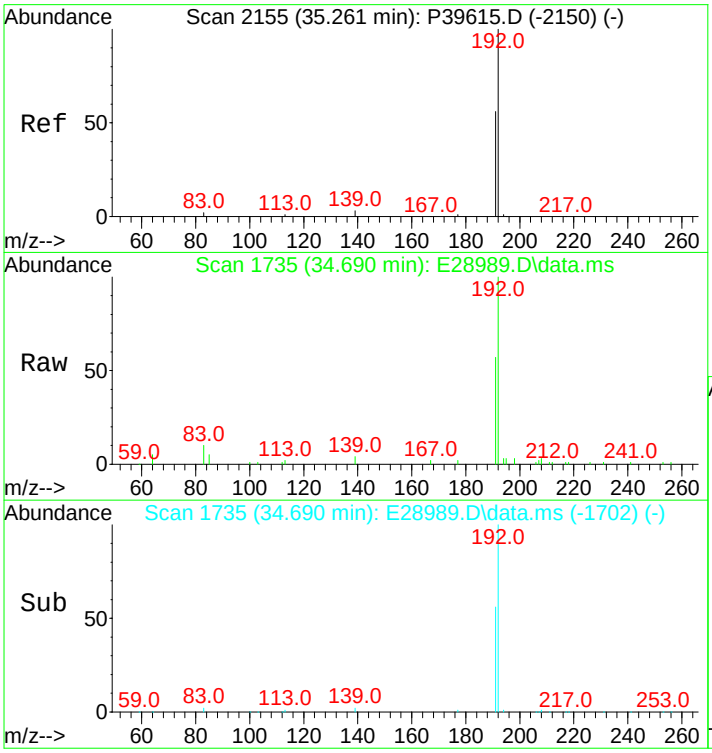


#56
Carbazole
Concen: 367.58 ng/mL m
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:167 Resp: 29966

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.1	15.1

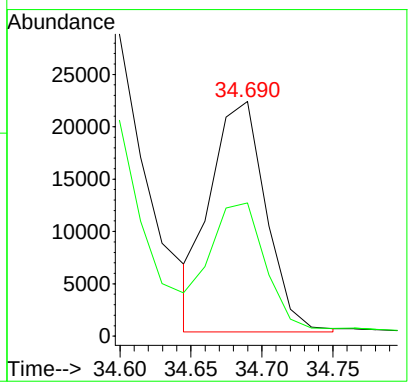


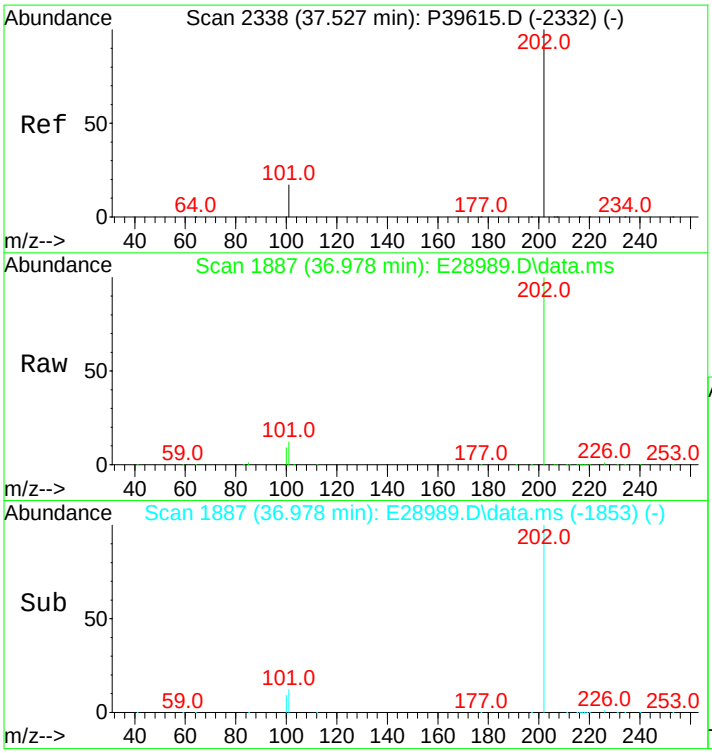


#57
1-Methylphenanthrene
Concen: 855.66 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:192 Resp: 59824

Ion	Ratio	Lower	Upper
192	100		
191	56.2	45.4	68.2

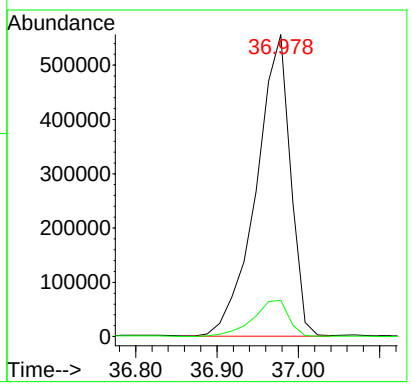


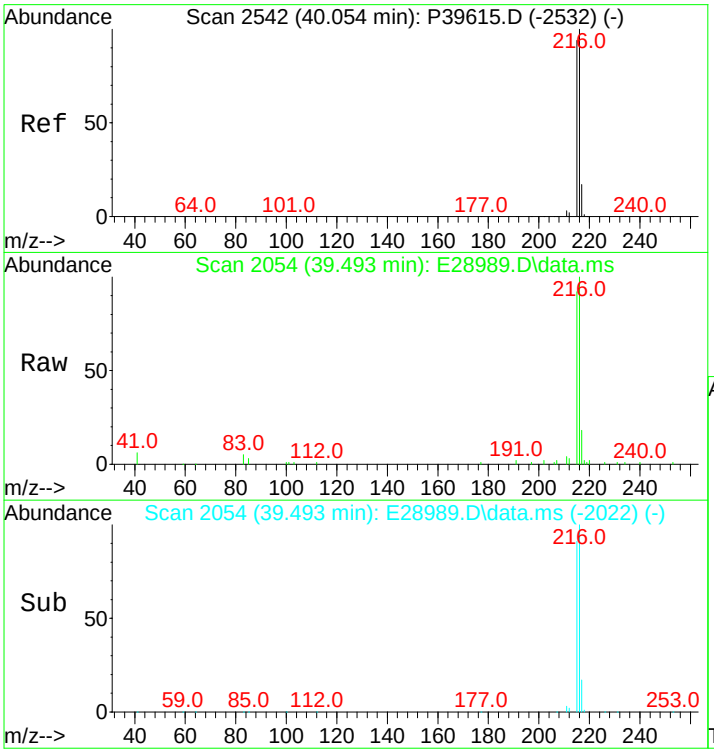


#58
Fluoranthene
Concen: 16074.15 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:202 Resp: 1626787

Ion	Ratio	Lower	Upper
202	100		
101	12.4	10.4	15.6

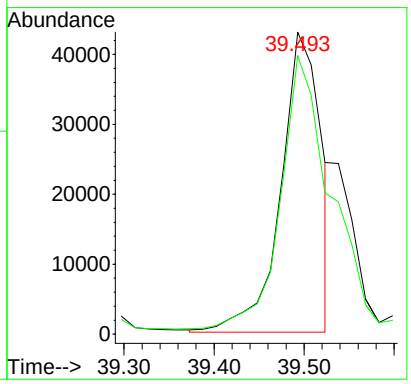


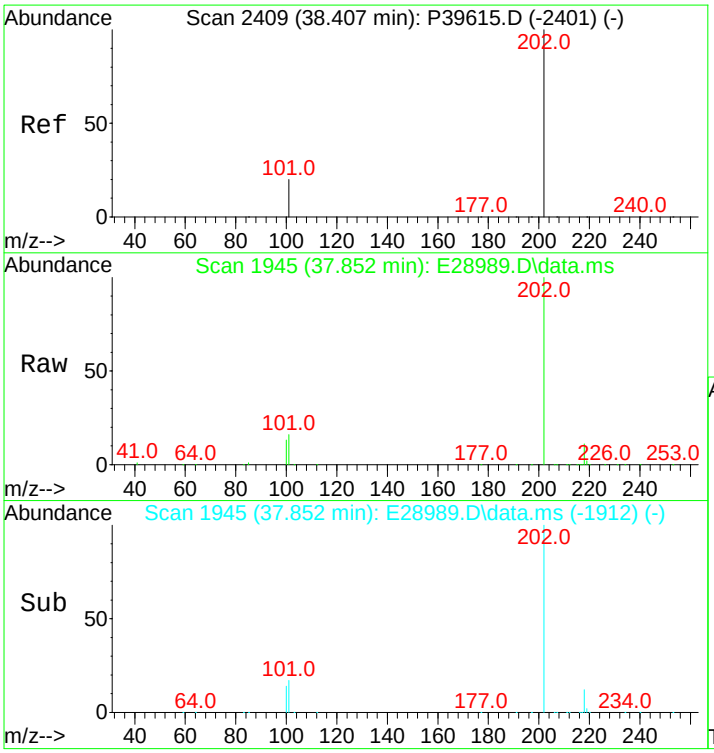


#59
Benzo(b)fluorene
Concen: 1987.20 ng/mL m
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:216 Resp: 134013

Ion	Ratio	Lower	Upper
216	100		
215	111.4	72.6	109.0#

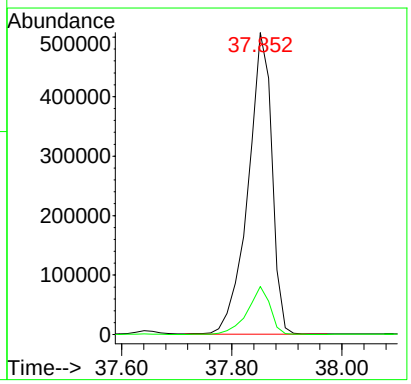


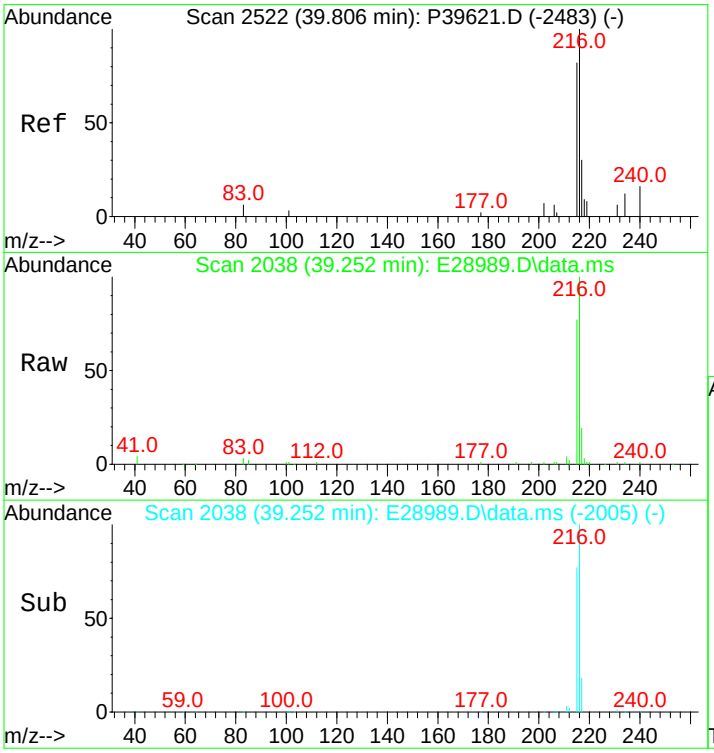


#60
Pyrene
Concen: 14741.40 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:202 Resp: 1516395

Ion	Ratio	Lower	Upper
202	100		
101	15.1	11.0	16.4

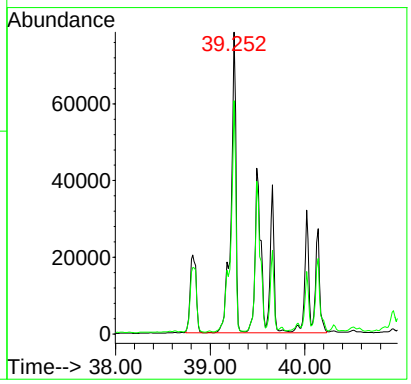


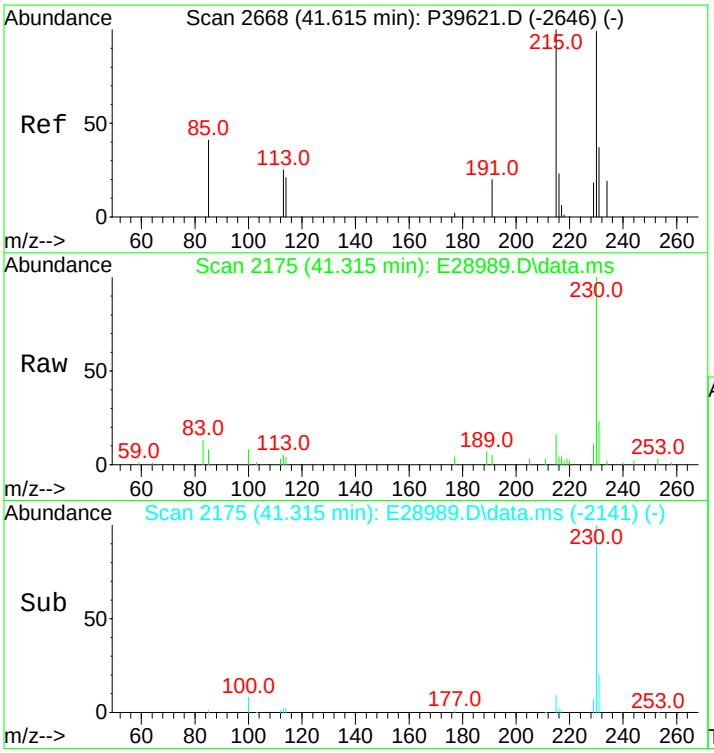


#61
C1-Fluoranthenes/Pyrenes
Concen: 8151.81 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:216 Resp: 838548

Ion	Ratio	Lower	Upper
216	100		
215	9.3	73.4	110.2#

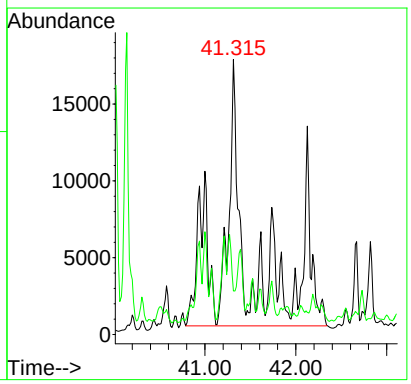


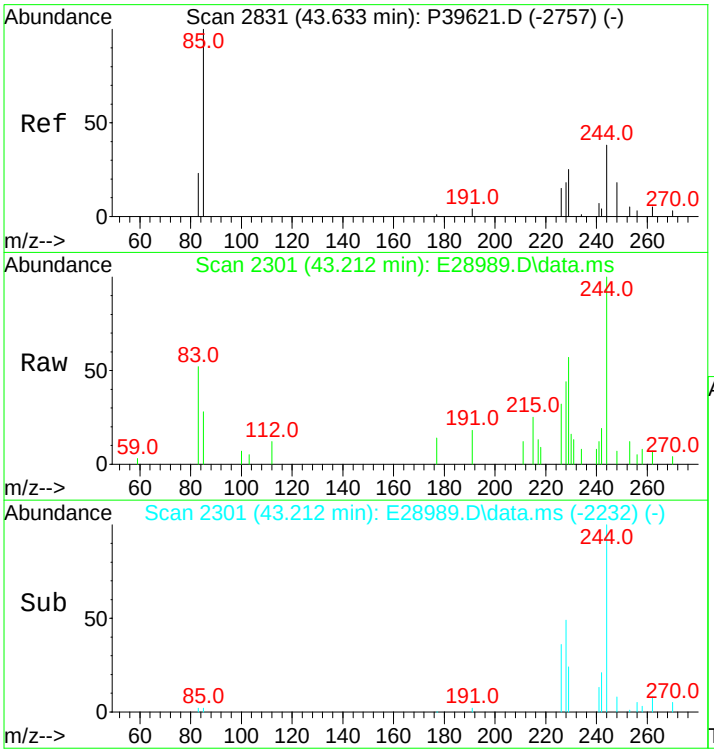


#62
C2-Fluoranthenes/Pyrenes
Concen: 3365.34 ng/mL m
RT: 41.315 min Scan# 2175
Delta R.T. 0.435 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:230 Resp: 346181

Ion	Ratio	Lower	Upper
230	100		
215	1.6	93.8	140.8#

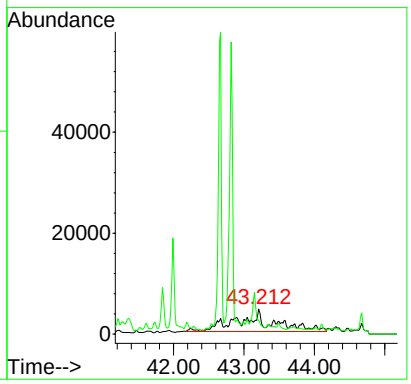


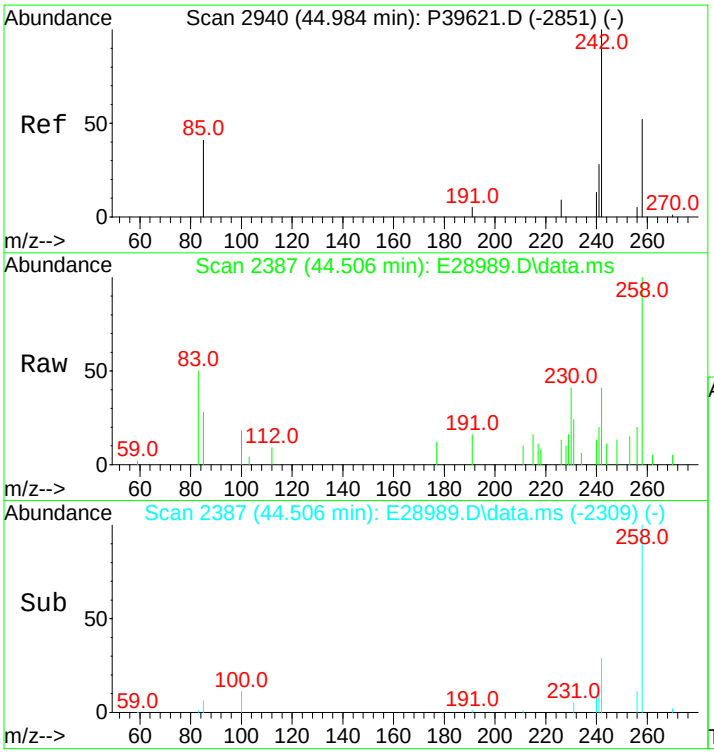


#63
C3-Fluoranthenes/Pyrenes
Concen: 1487.45 ng/mL m
RT: 43.212 min Scan# 2301
Delta R.T. 0.560 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:244 Resp: 153009

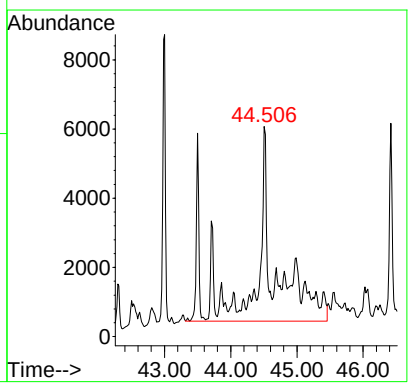
Ion	Ratio	Lower	Upper
244	100		
229	3.5	72.2	108.2#

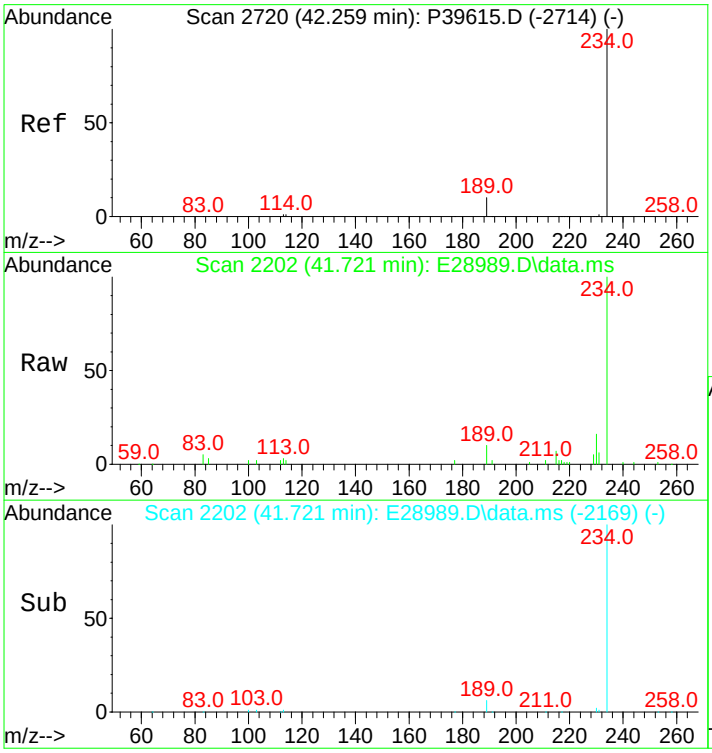




#64
C4-Fluoranthenes/Pyrenes
Concen: 1121.64 ng/mL m
RT: 44.506 min Scan# 2387
Delta R.T. 0.536 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:258 Resp: 115379

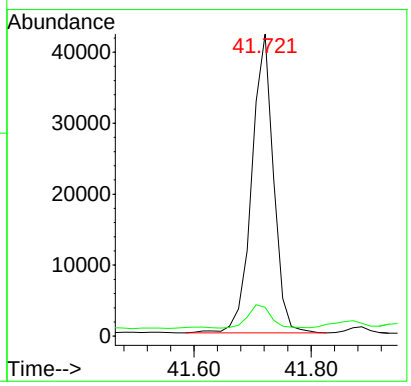


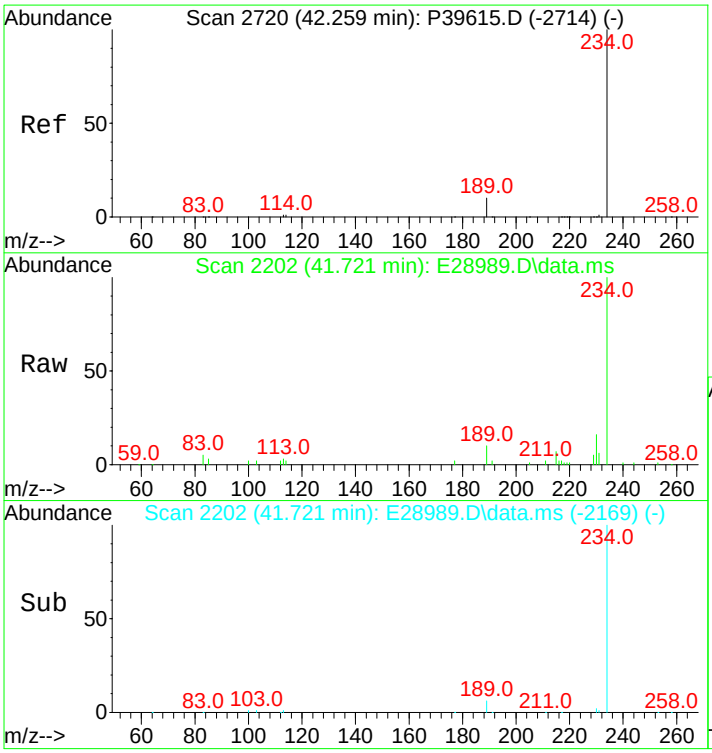


#66
Naphthobenzothiophene
Concen: 1065.68 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:234 Resp: 108120

Ion	Ratio	Lower	Upper
234	100		
189	8.7	21.1	31.7#

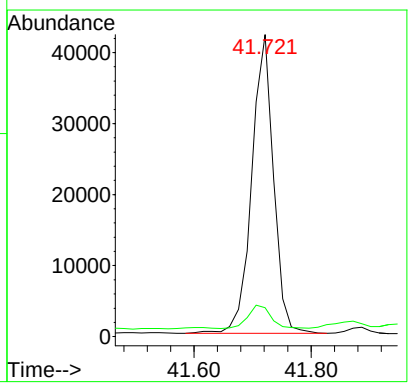


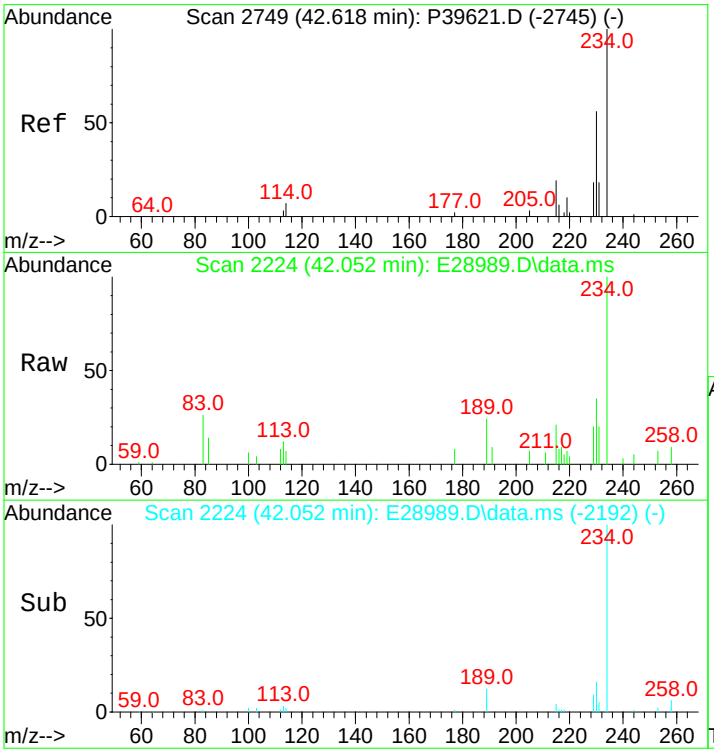


#67
Naphthobenzothiophene-2,1-D
Concen: 1065.68 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:234 Resp: 108120

Ion	Ratio	Lower	Upper
234	100		
189	8.7	21.1	31.7#

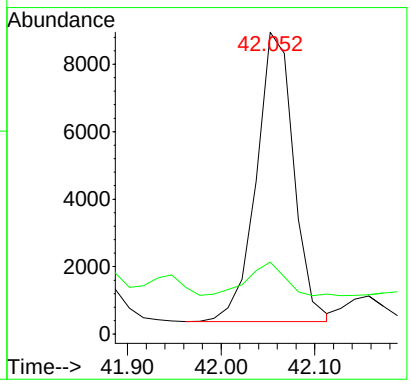


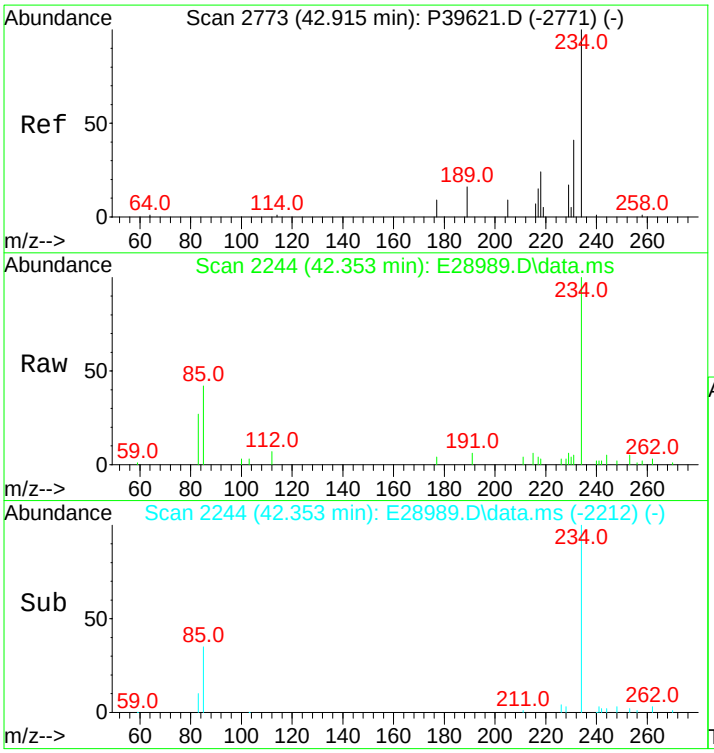


#68
Naphthobenzothiophene-1,2-D
Concen: 234.67 ng/mL
RT: 42.052 min Scan# 2224
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:234 Resp: 23809

Ion	Ratio	Lower	Upper
234	100		
189	11.4	71.9	107.9#

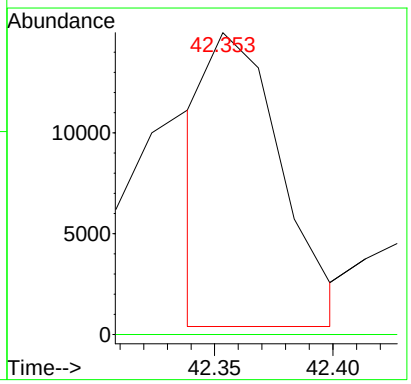


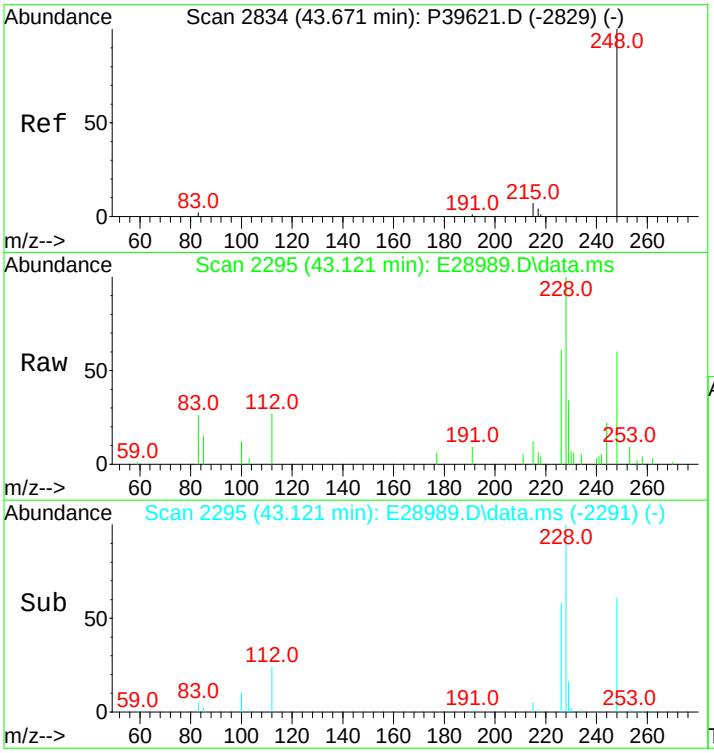


#69
Naphthobenzothiophene-2,3-D
Concen: 310.74 ng/mL m
RT: 42.353 min Scan# 2244
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:234 Resp: 31527

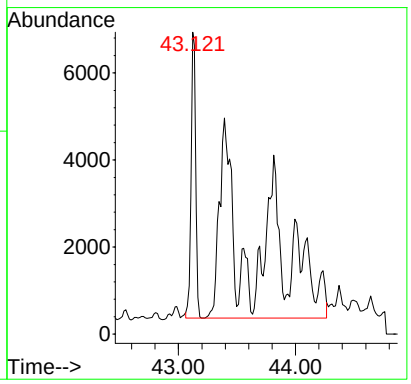
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

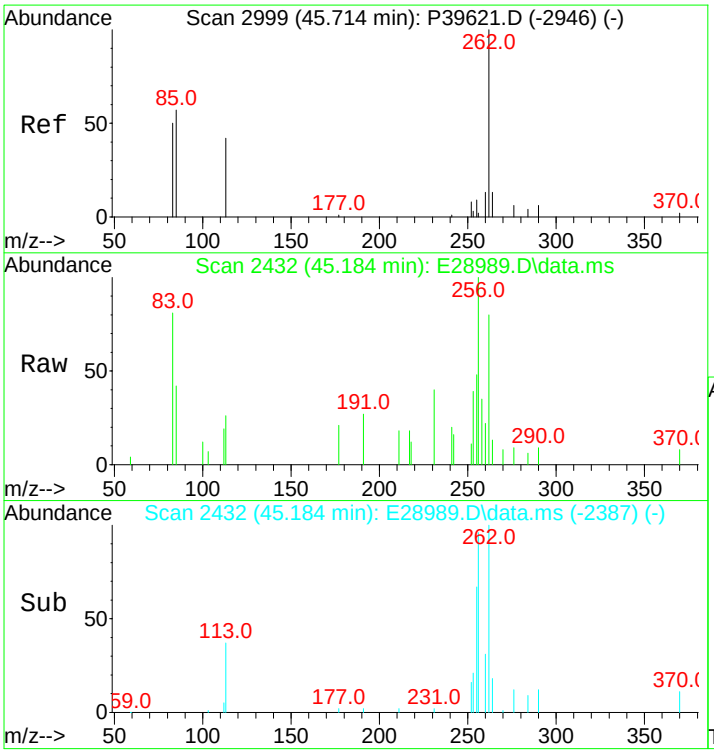




#70
C1-Naphthobenzothiophenes
Concen: 1075.17 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

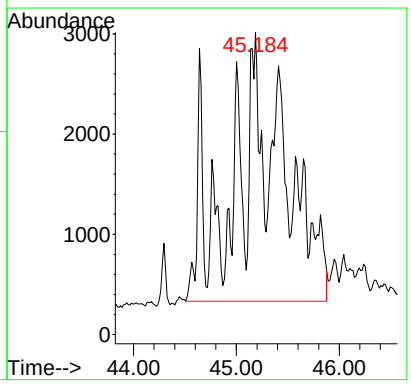
Tgt Ion:248 Resp: 109083

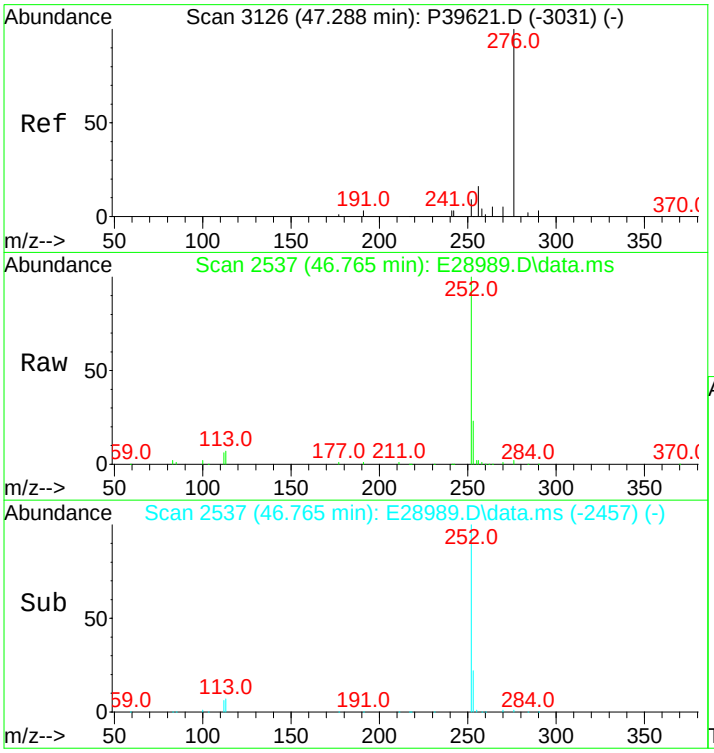




#71
C2-Naphthobenzothiophenes
Concen: 862.33 ng/ml m
RT: 45.184 min Scan# 2432
Delta R.T. 0.539 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

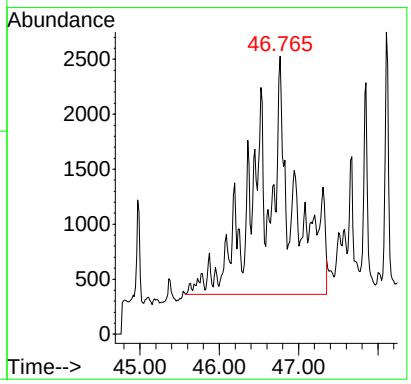
Tgt Ion:262 Resp: 87489

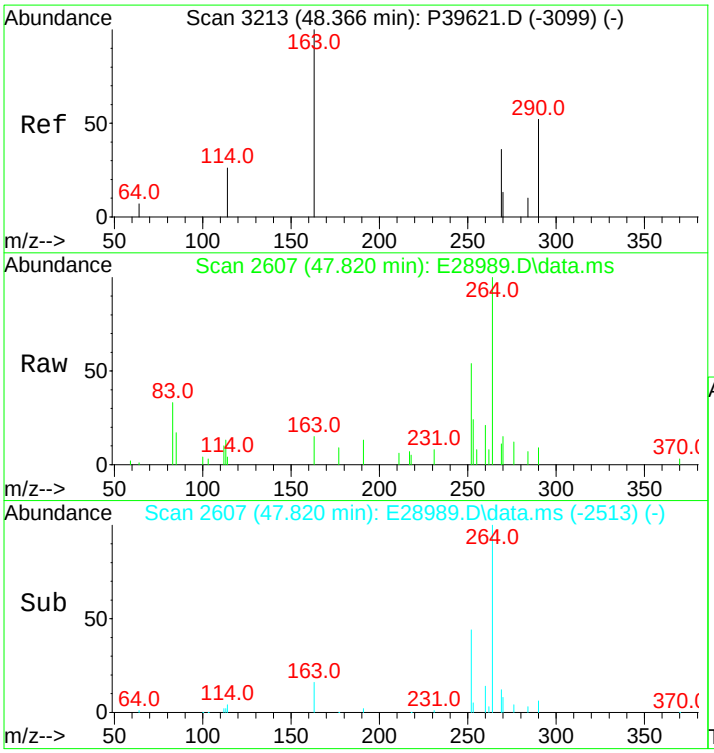




#72
C3-Naphthobenzothiophenes
Concen: 637.60 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

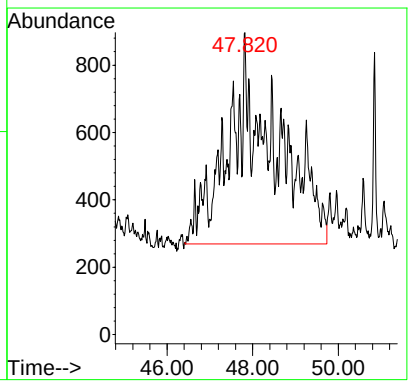
Tgt Ion:276 Resp: 64688

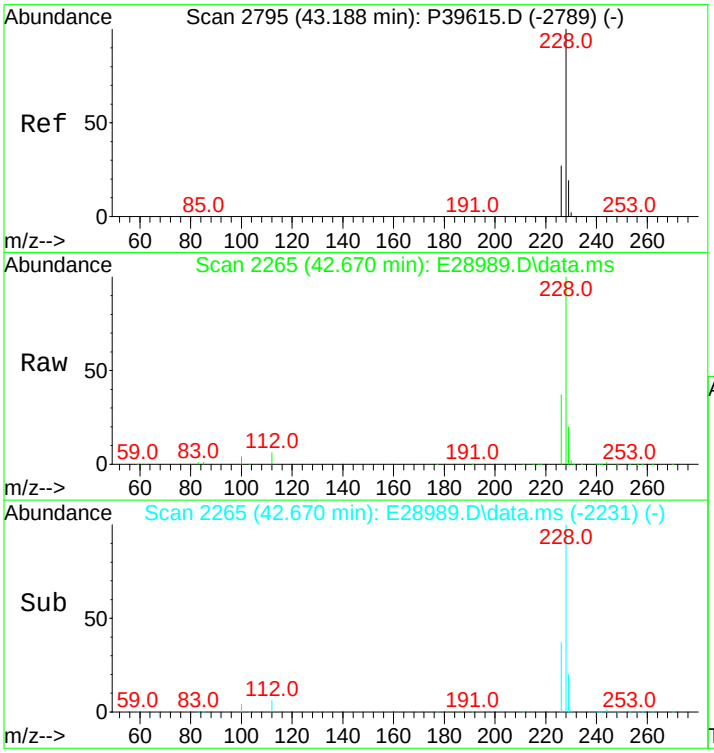




#73
C4-Naphthobenzothiophenes
Concen: 450.44 ng/mL m
RT: 47.820 min Scan# 2607
Delta R.T. 0.523 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:290 Resp: 45700

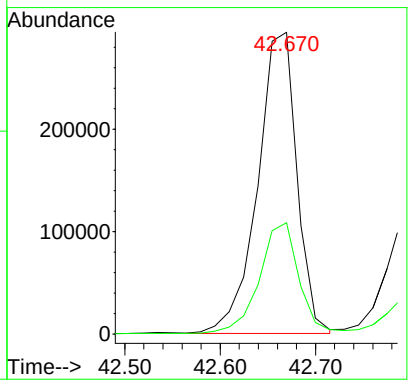


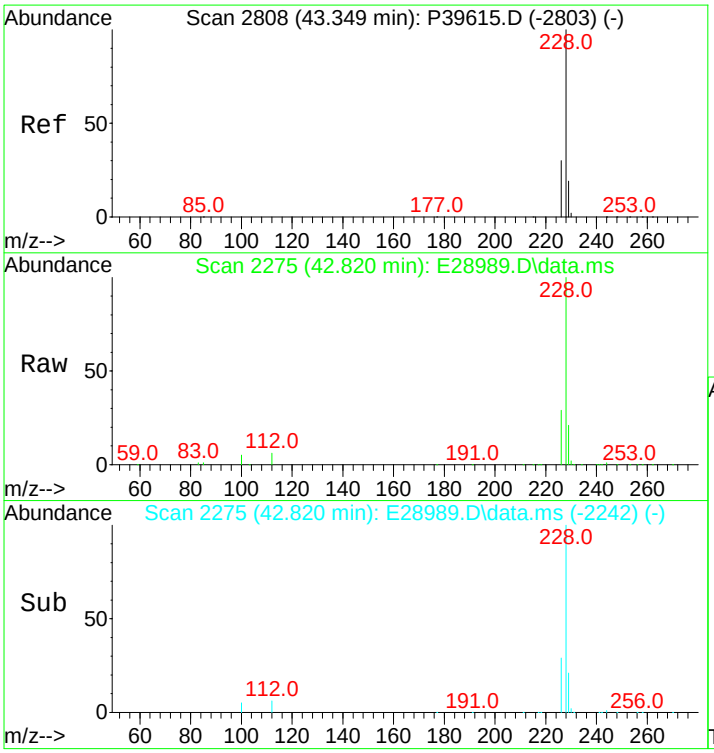


#75
Benz[a]anthracene
Concen: 7443.90 ng/mL m
RT: 42.670 min Scan# 2265
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:228 Resp: 841845

Ion	Ratio	Lower	Upper
228	100		
226	29.5	20.7	31.1

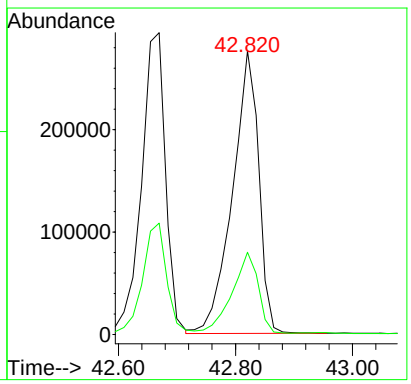


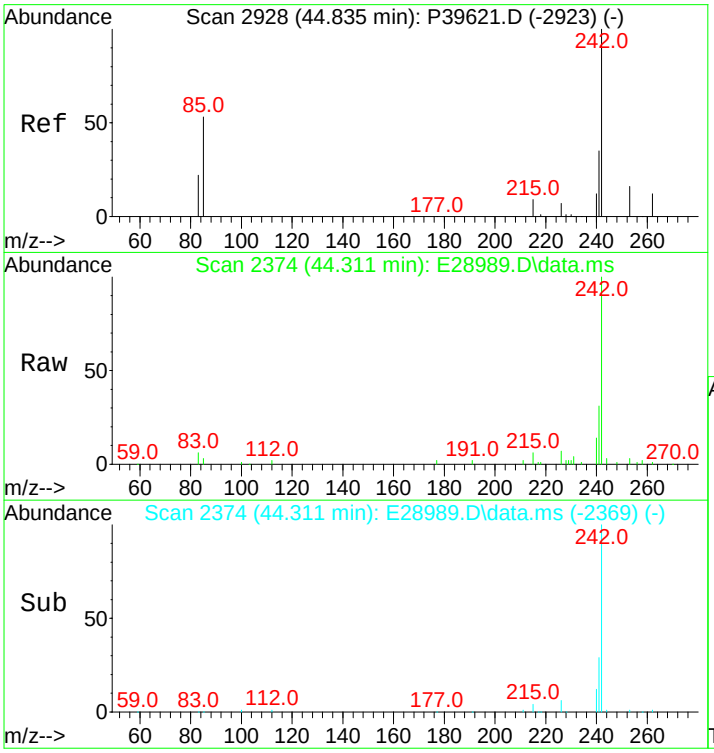


#77
Chrysene/Triphenylene
Concen: 7376.76 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:228 Resp: 858878

Ion	Ratio	Lower	Upper
228	100		
226	29.1	22.6	34.0

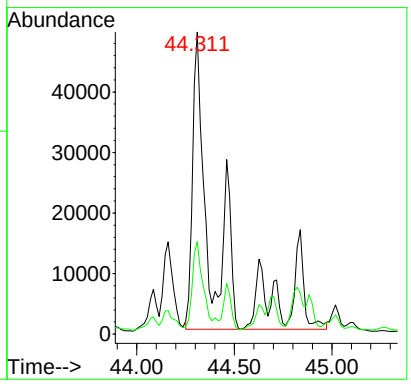


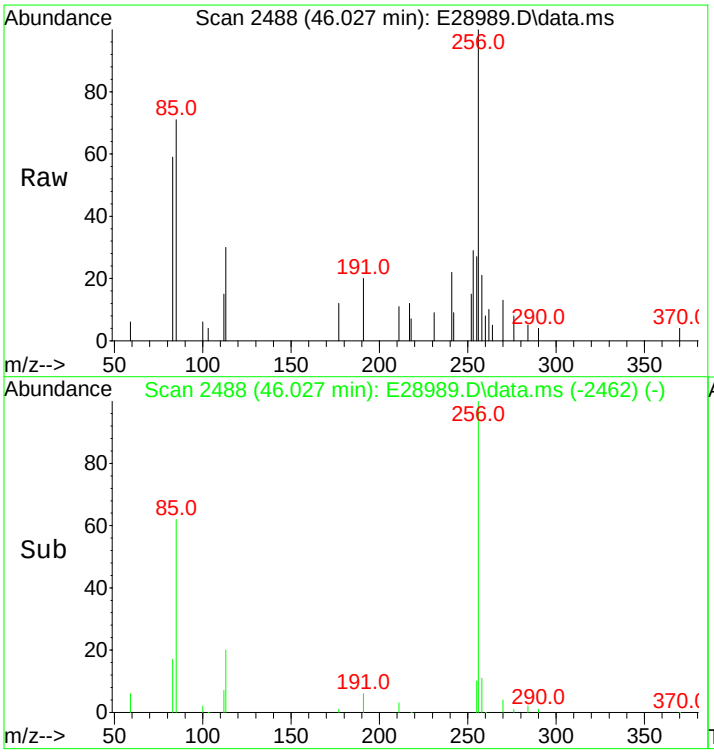


#78
C1-Chrysenes
Concen: 3221.29 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:242 Resp: 375056

Ion	Ratio	Lower	Upper
242	100		
241	3.6	32.2	48.4#

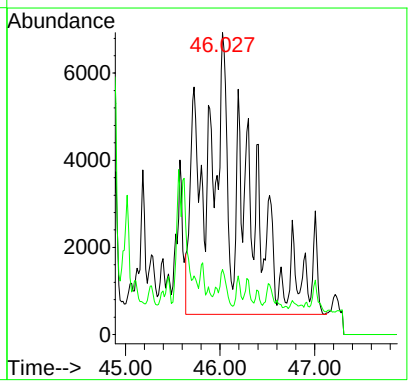


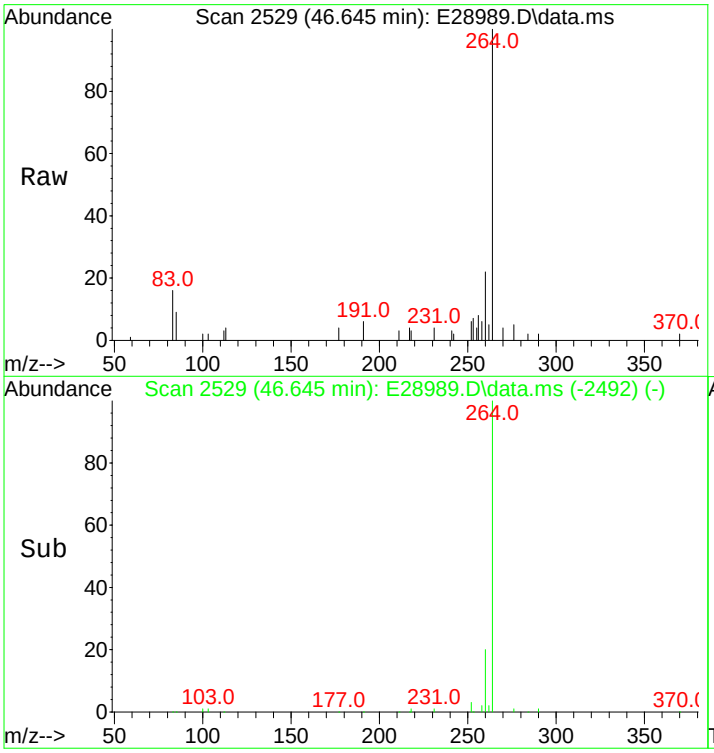


#79
C2-Chrysenes
Concen: 1606.47 ng/mL m
RT: 46.027 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:256 Resp: 187042

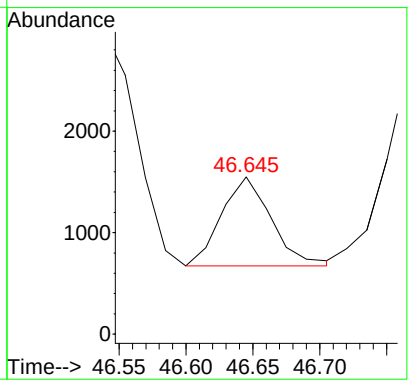
Ion	Ratio	Lower	Upper
256	100		
241	0.8	25.3	37.9#

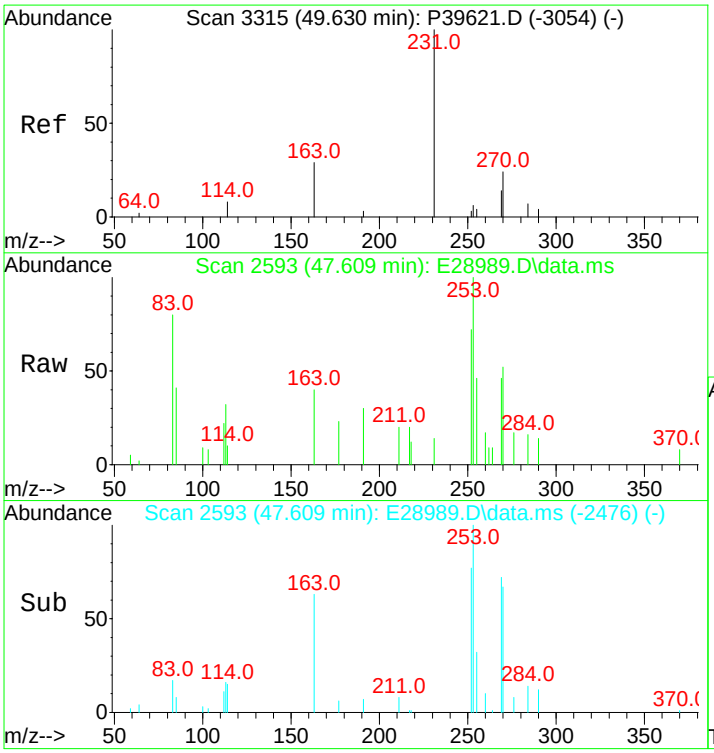




#80
BBF-D12 Surr BKGD
Concen: 19.68 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:256 Resp: 2291

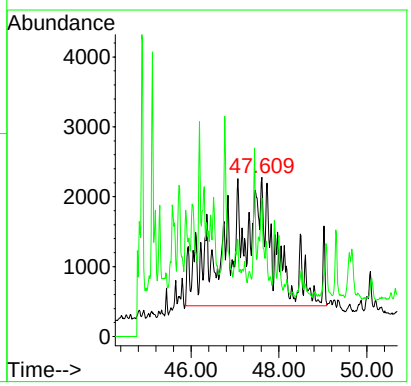


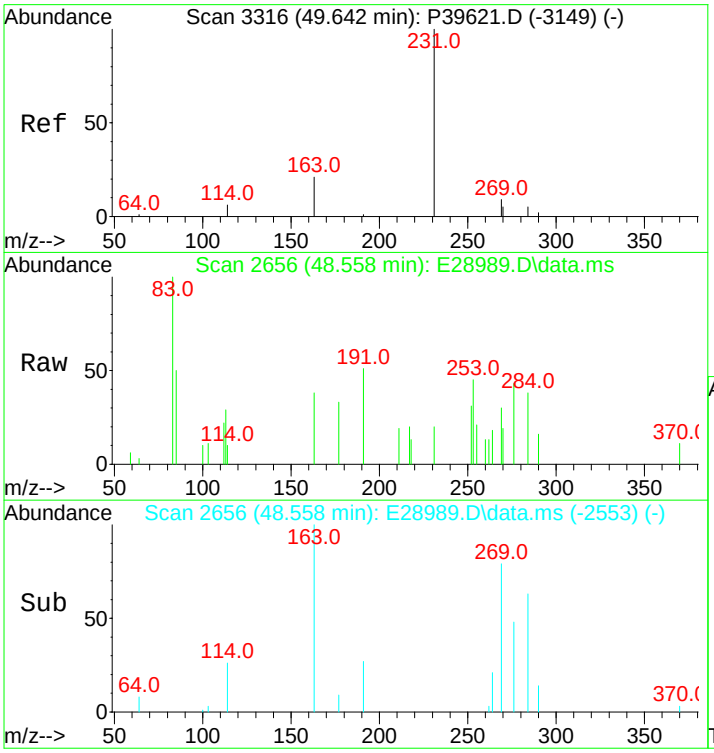


#81
C3-Chrysenes
Concen: 1134.39 ng/mL m
RT: 47.609 min Scan# 2593
Delta R.T. -1.459 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:270 Resp: 132077

Ion	Ratio	Lower	Upper
270	100		
255	0.0	38.0	57.0#

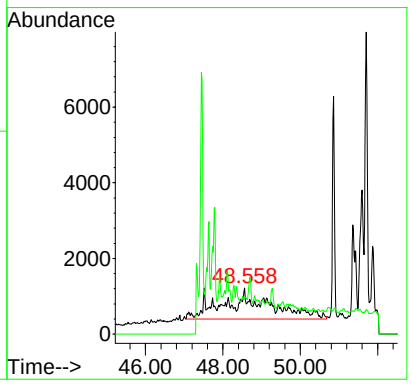


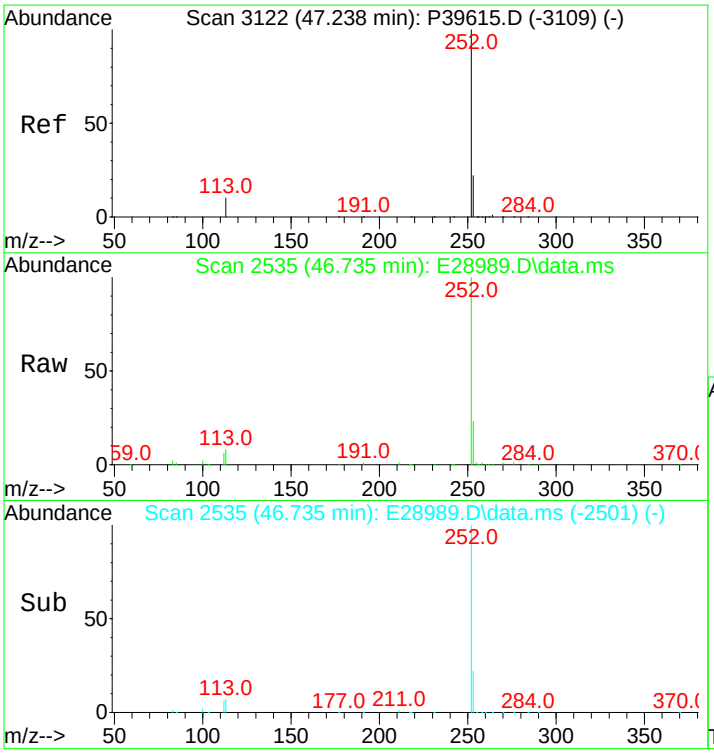


#82
C4-Chrysenes
Concen: 535.51 ng/mL m
RT: 48.558 min Scan# 2656
Delta R.T. -0.629 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:284 Resp: 62349

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

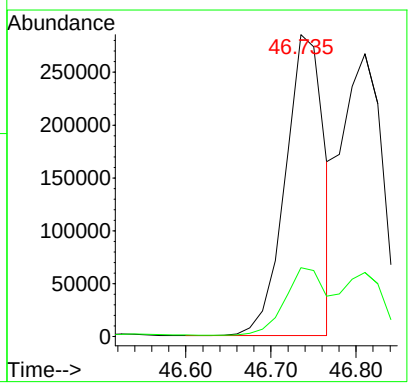


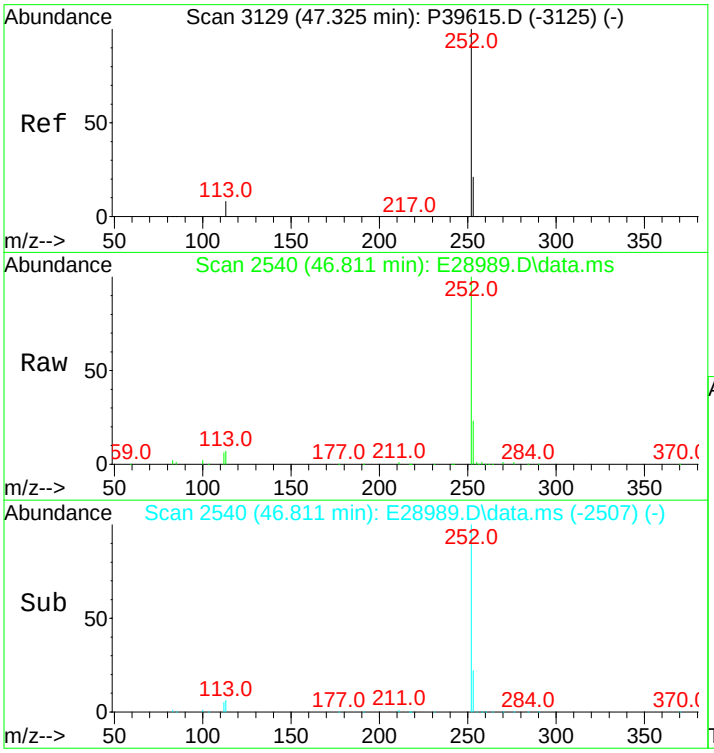


#84
Benzo[b]fluoranthene
Concen: 6879.64 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:252 Resp: 904333

Ion	Ratio	Lower	Upper
252	100		
253	22.6	19.5	29.3

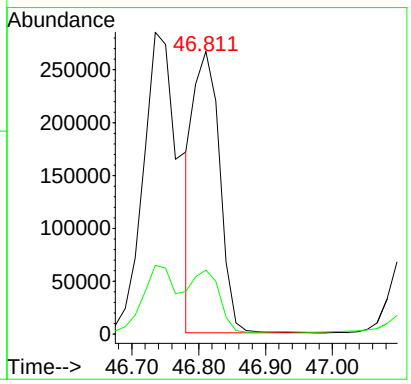


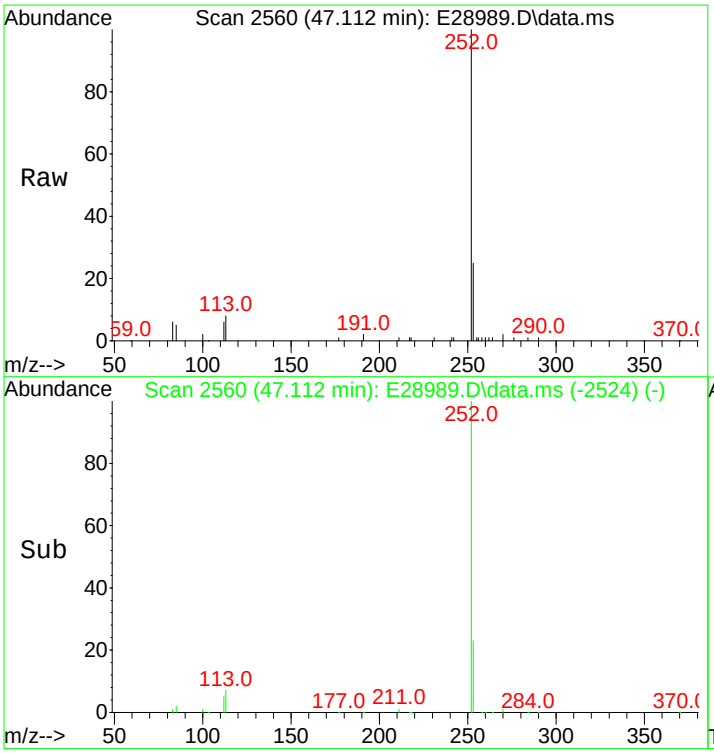


#85
Benzo[j]+[k]fluoranthene
Concen: 5362.11 ng/mL
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:252 Resp: 725171

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.7	29.5

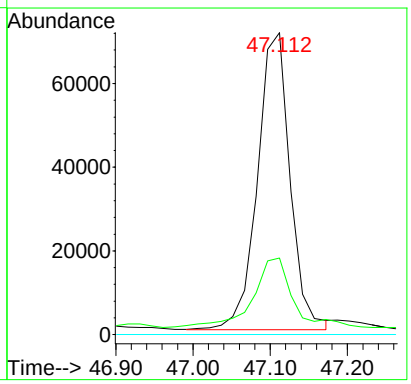


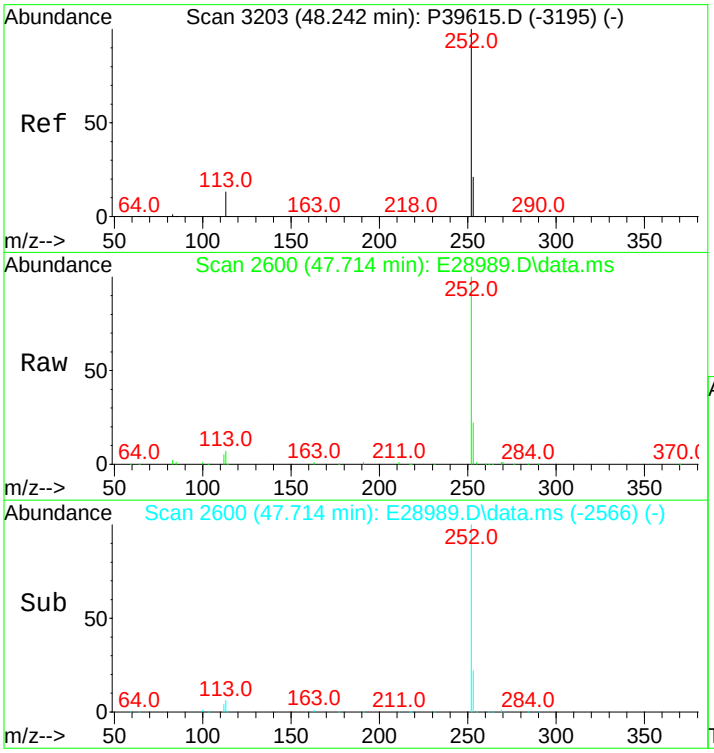


#86
Benzo[a]fluoranthene
Concen: 1539.06 ng/mL m
RT: 47.112 min Scan# 2560
Delta R.T. 0.040 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:252 Resp: 208143

Ion	Ratio	Lower	Upper
252	100		
253	30.7	456.0	684.0#
125	0.0	0.0	0.0

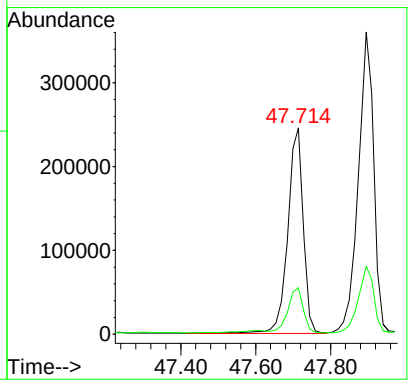


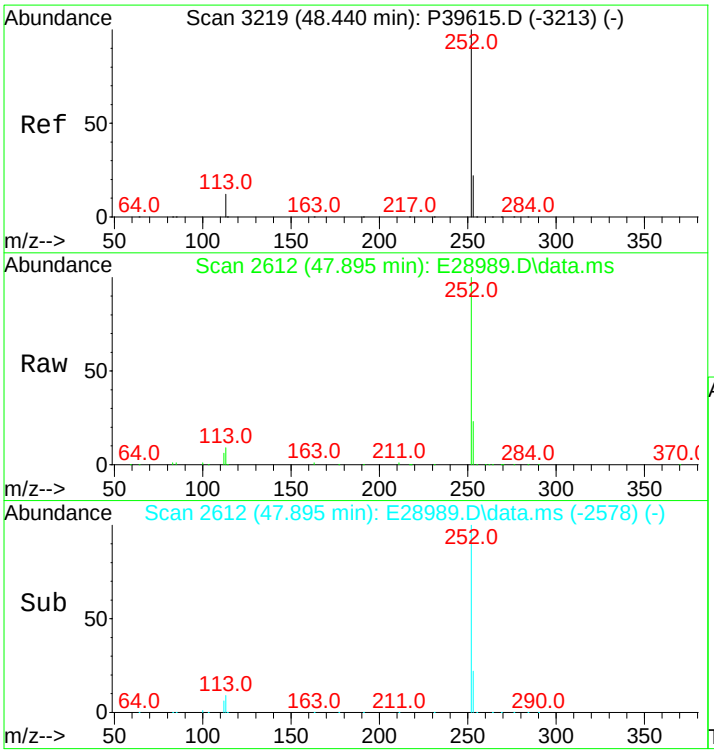


#87
Benzo[e]pyrene
Concen: 5463.05 ng/mL
RT: 47.714 min Scan# 2600
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:252 Resp: 701193

Ion	Ratio	Lower	Upper
252	100		
253	21.8	20.6	31.0

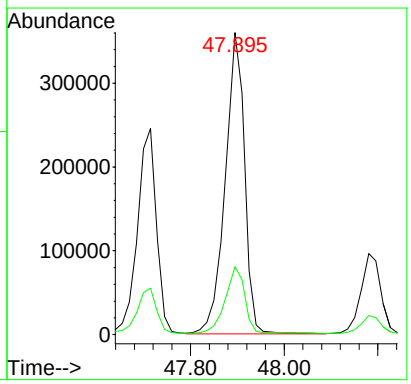


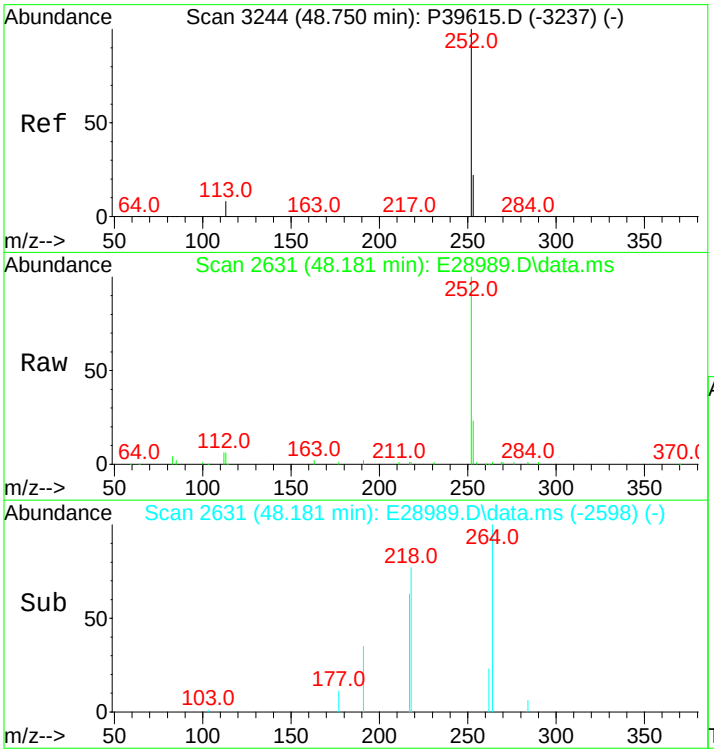


#89
Benzo[a]pyrene
Concen: 8424.56 ng/mL
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:252 Resp: 1034670

Ion	Ratio	Lower	Upper
252	100		
253	22.6	20.8	31.2

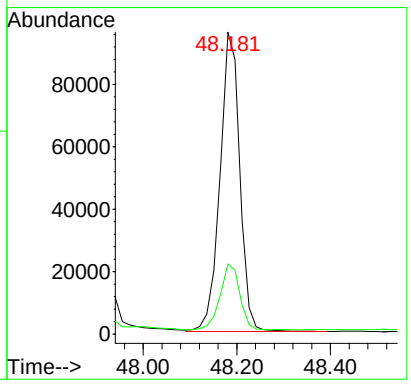


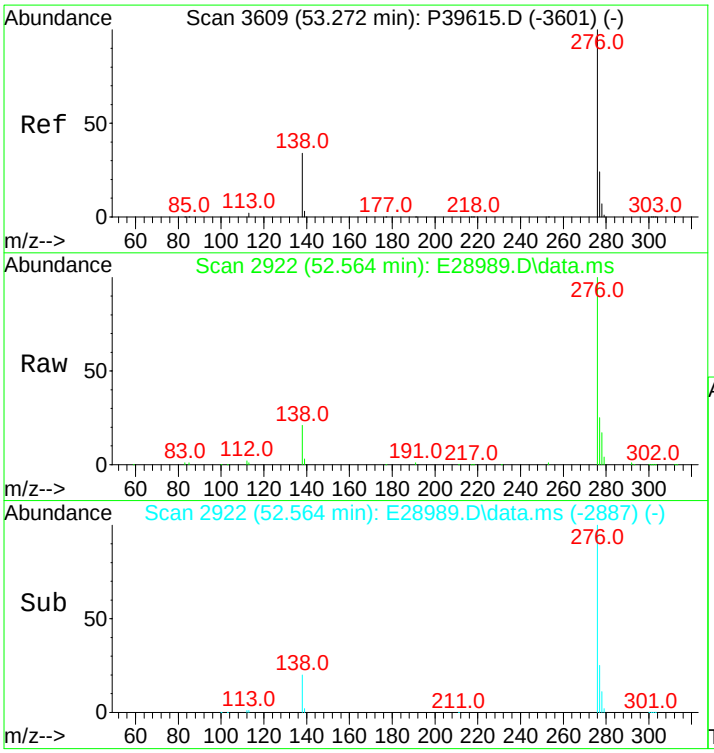


#90
Perylene
Concen: 2170.51 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:252 Resp: 281885

Ion	Ratio	Lower	Upper
252	100		
253	21.8	20.7	31.1

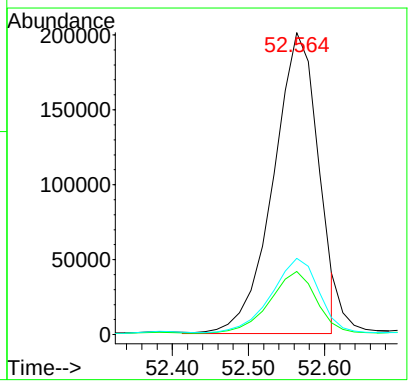


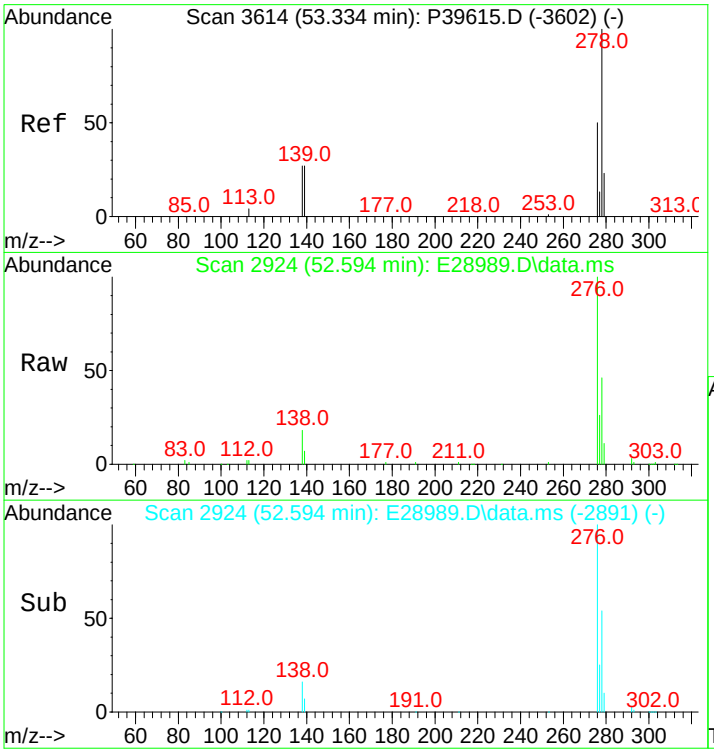


#91
Indeno[1,2,3-cd]pyrene
Concen: 5683.77 ng/mL m
RT: 52.564 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:276 Resp: 821526

Ion	Ratio	Lower	Upper
276	100		
138	21.5	16.3	24.5
277	27.0	19.4	29.2

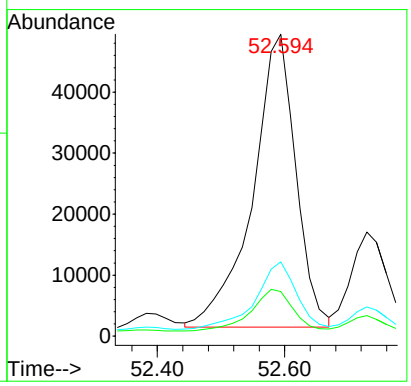


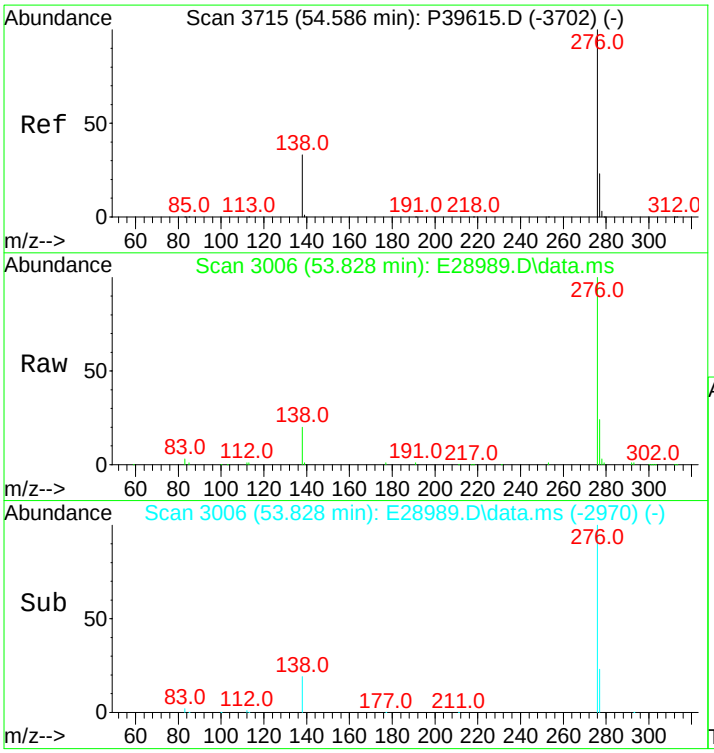


#92
Dibenz[ah]+[ac]anthracene
Concen: 1469.61 ng/mL m
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:278 Resp: 226177

Ion	Ratio	Lower	Upper
278	100		
139	14.0	11.6	17.4
279	21.9	19.3	28.9

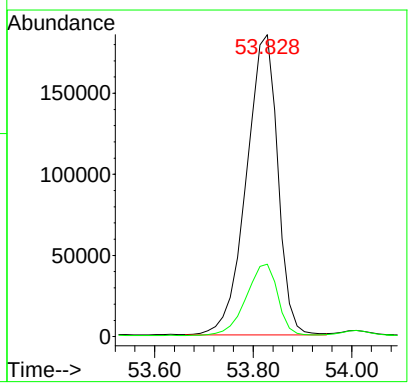


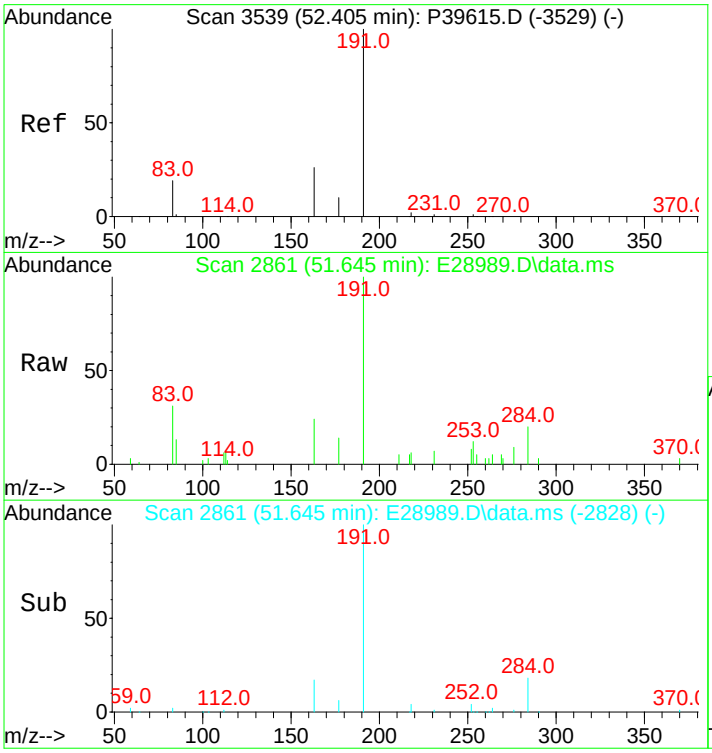


#93
Benzo[g,h,i]perylene
Concen: 5258.43 ng/mL
RT: 53.828 min Scan# 3006
Delta R.T. 0.045 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:276 Resp: 819518

Ion	Ratio	Lower	Upper
276	100		
277	24.1	19.1	28.7

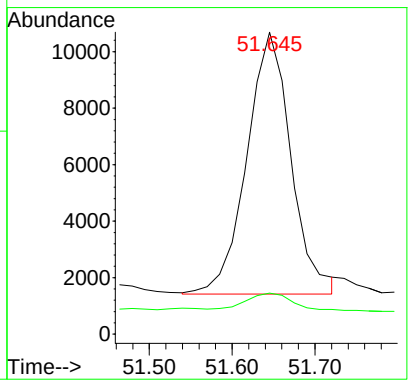


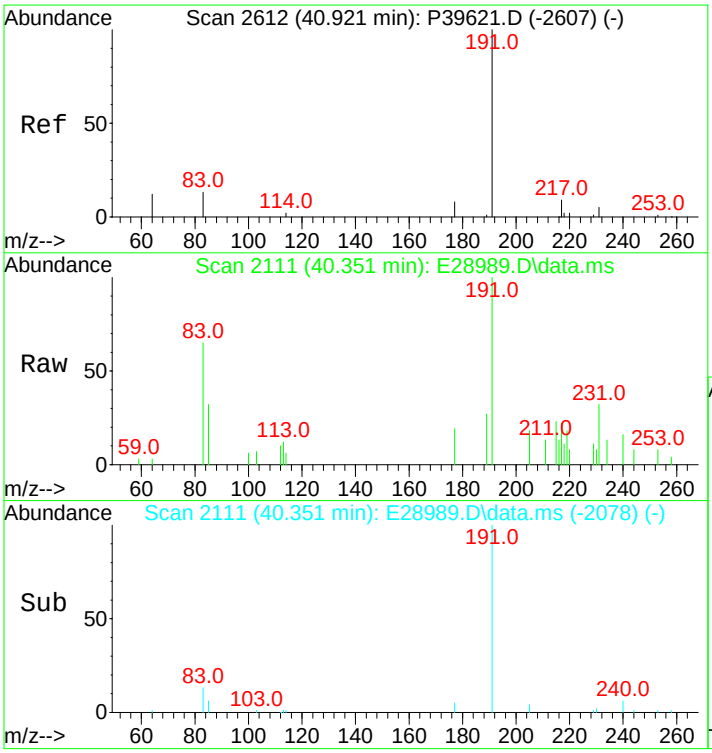


#94
Hopane (T19)
Concen: 788.43 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:191 Resp: 34364

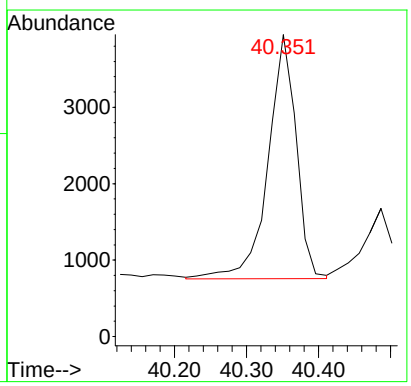
Ion	Ratio	Lower	Upper
191	100		
177	0.6	11.6	17.4#

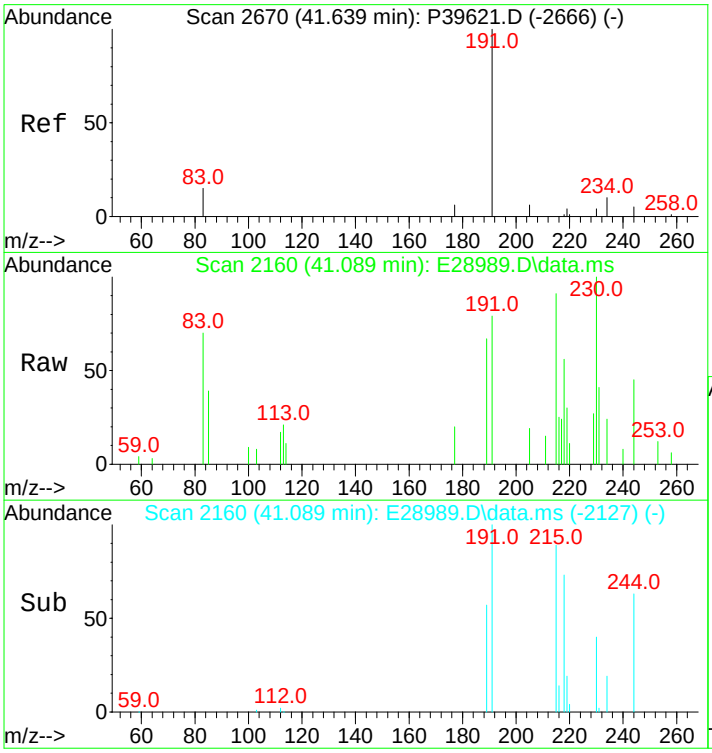




#96
C23 Tricyclic Terpane (T4)
Concen: 199.01 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

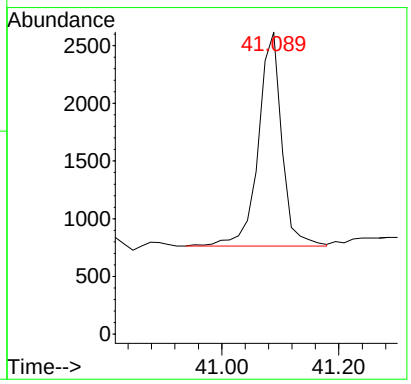
Tgt Ion:191 Resp: 8674

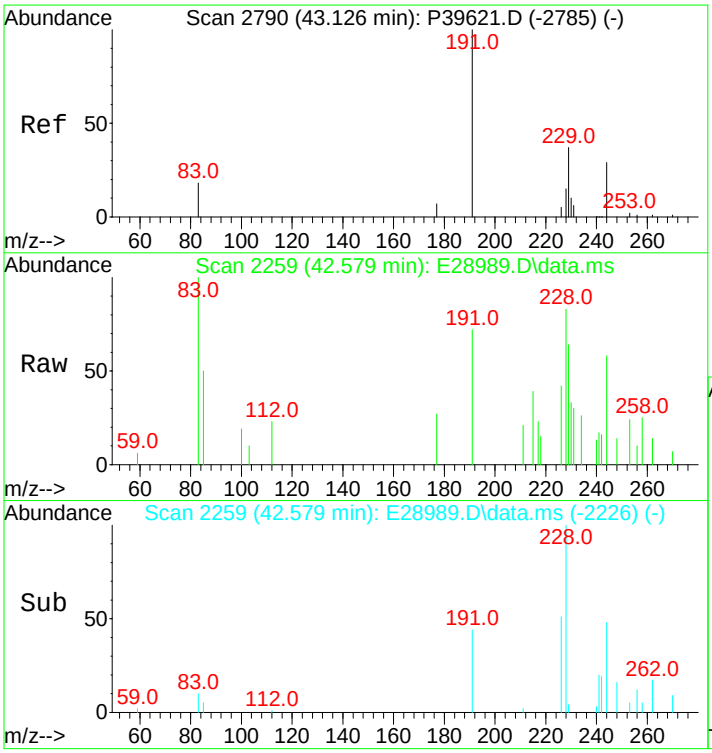




#97
C24 Tricyclic Terpane (T5)
Concen: 118.73 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

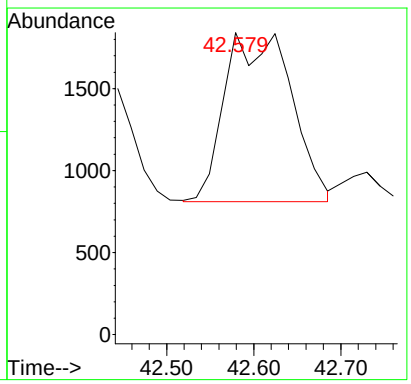
Tgt Ion:191 Resp: 5175

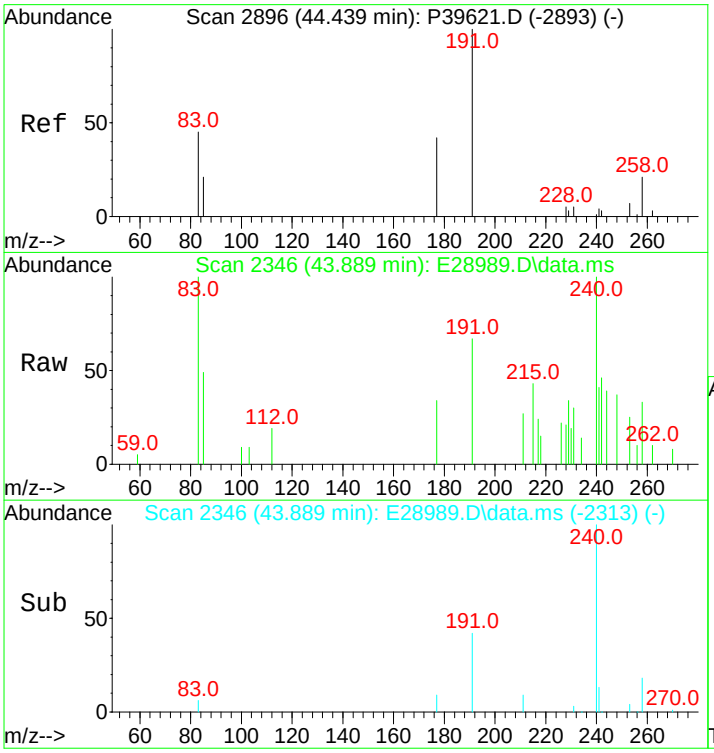




#98
C25 Tricyclic Terpane (T6)
Concen: 124.74 ng/ml m
RT: 42.579 min Scan# 2259
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

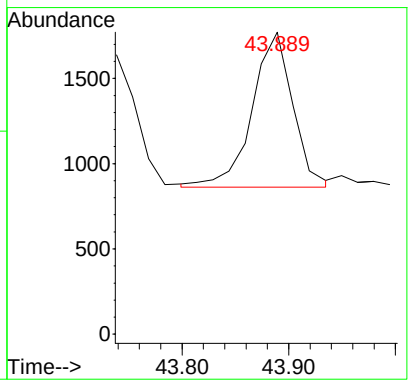
Tgt Ion:191 Resp: 5437

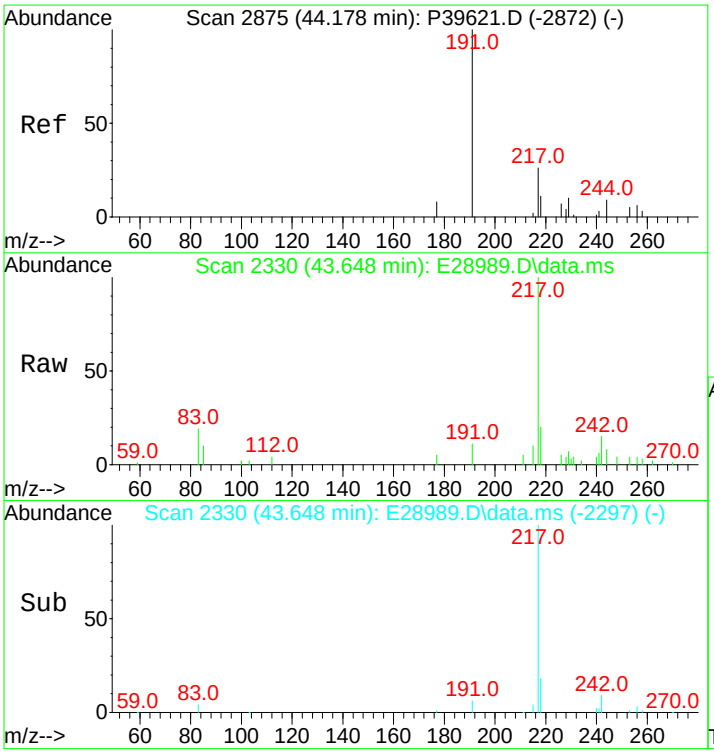




#99
C24 Tetracyclic Terpane (T6a)
Concen: 55.29 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

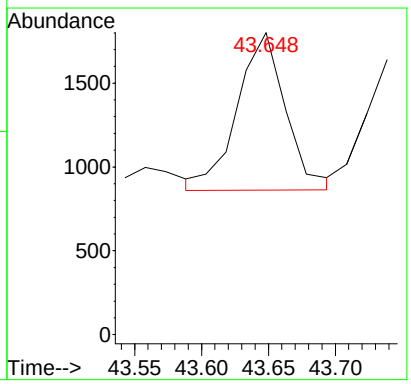
Tgt Ion:191 Resp: 2410

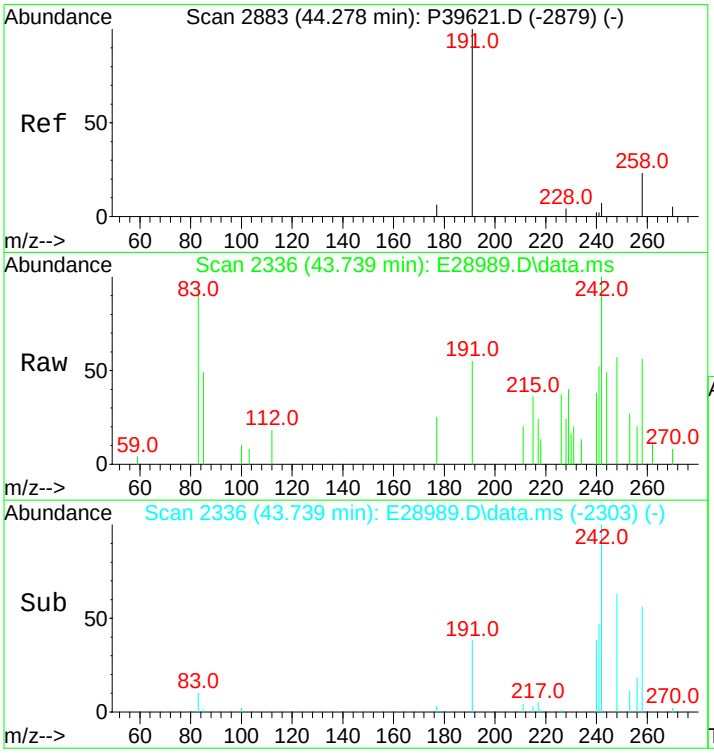




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 54.33 ng/ml
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

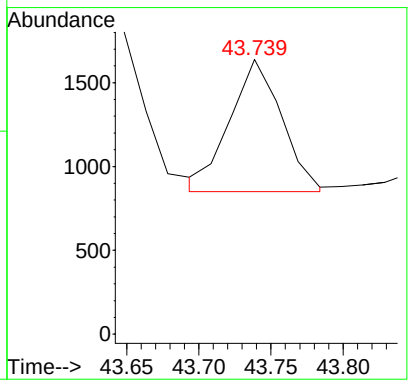
Tgt Ion:191 Resp: 2368

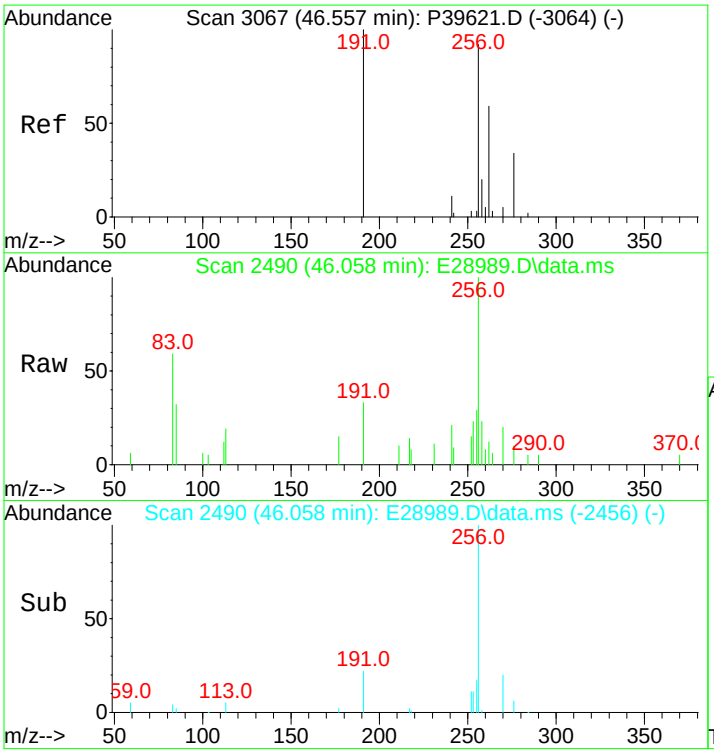




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 44.85 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

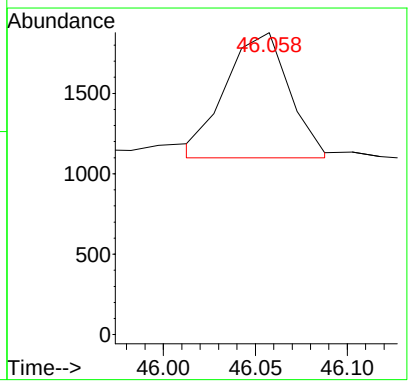
Tgt Ion:191 Resp: 1955

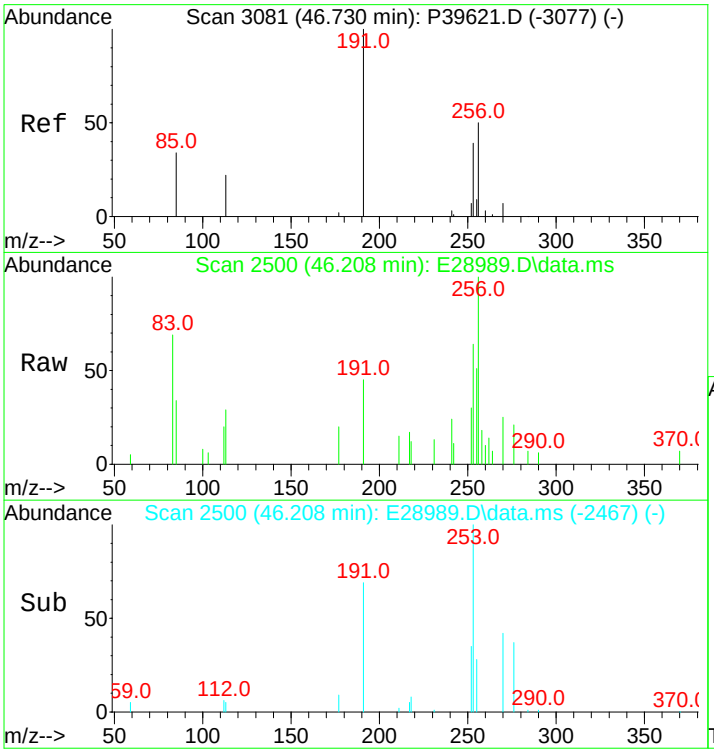




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 42.54 ng/ml m
RT: 46.058 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

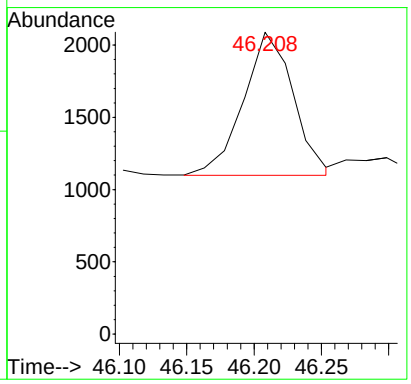
Tgt Ion:191 Resp: 1854

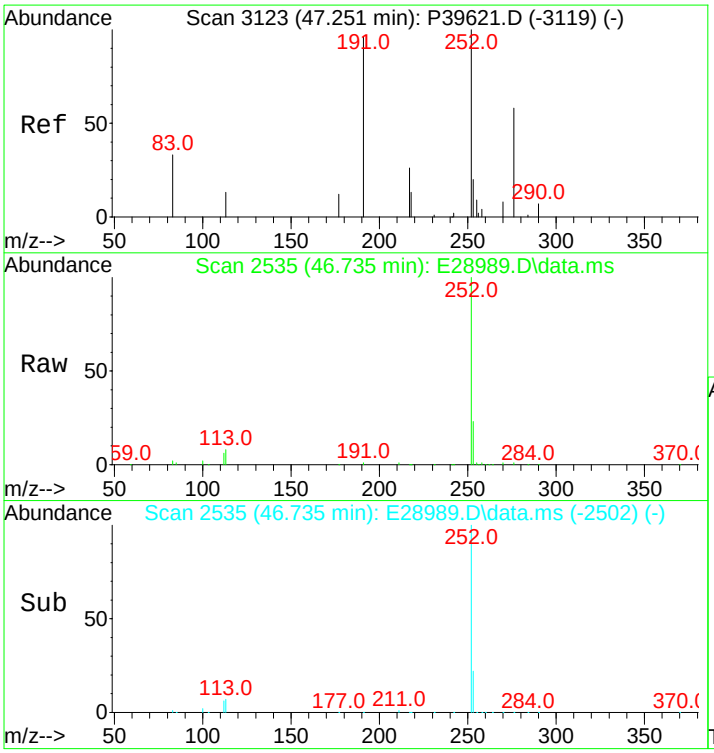




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 58.55 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

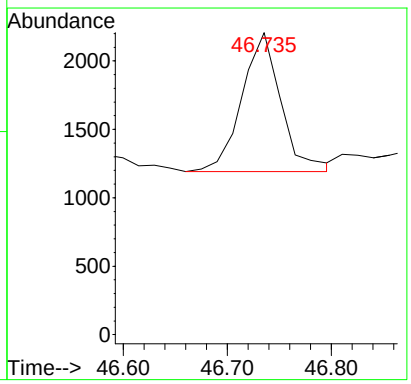
Tgt Ion:191 Resp: 2552

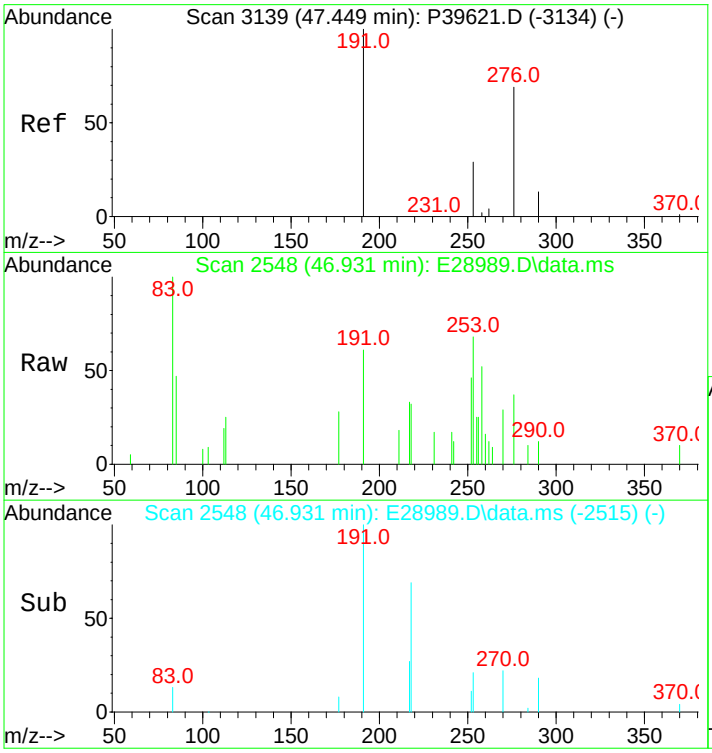




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 61.05 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

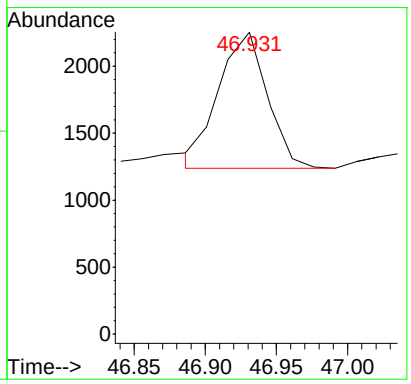
Tgt Ion:191 Resp: 2661

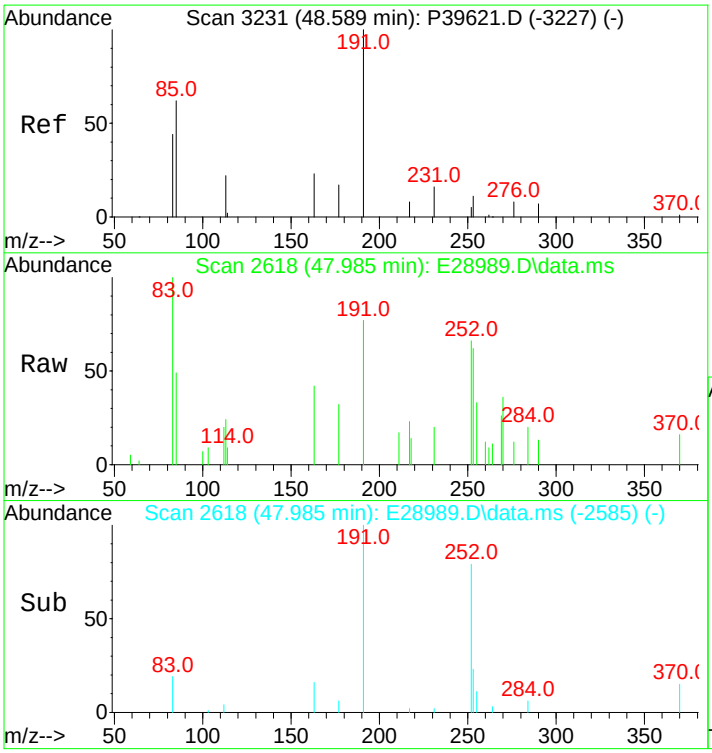




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 55.45 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

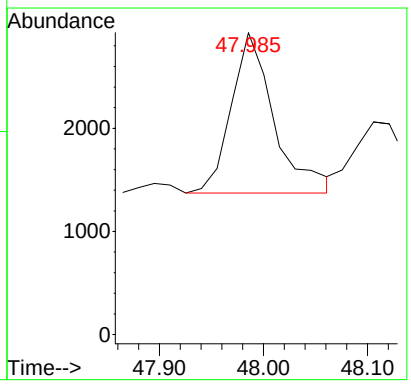
Tgt Ion:191 Resp: 2417

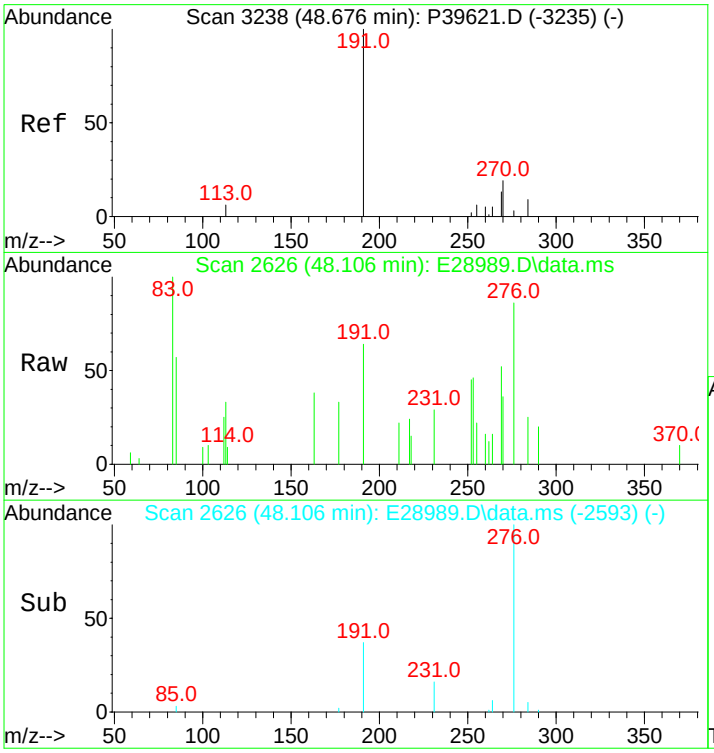




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 102.92 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

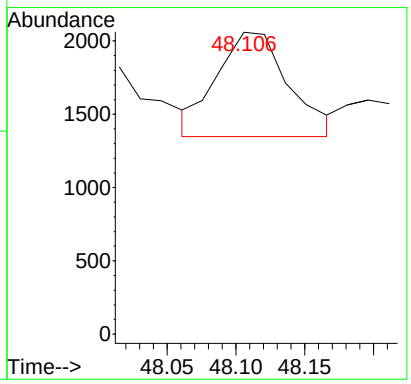
Tgt Ion:191 Resp: 4486

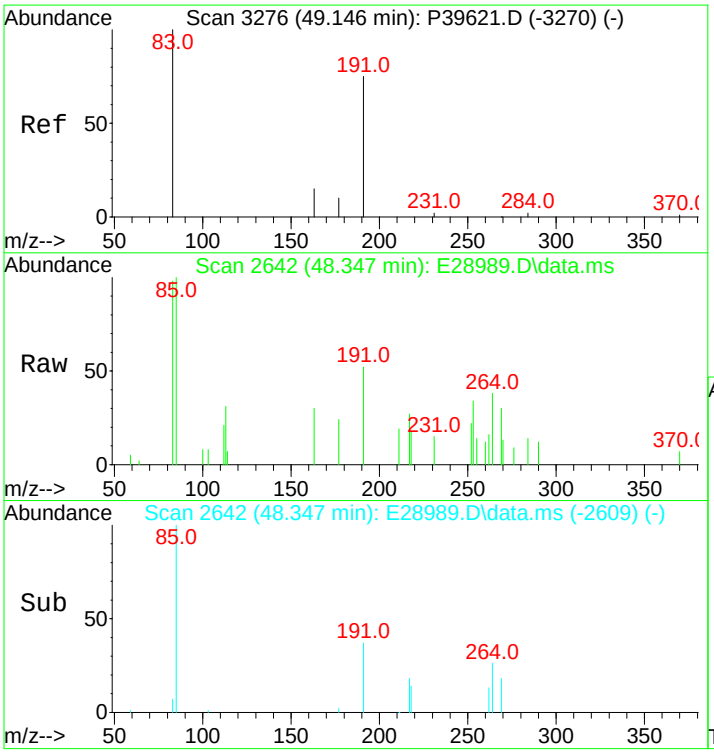




#107
C30 Tricyclic Terpane-22S
Concen: 59.45 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

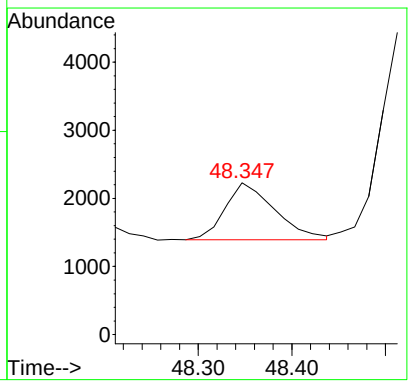
Tgt Ion:191 Resp: 2591

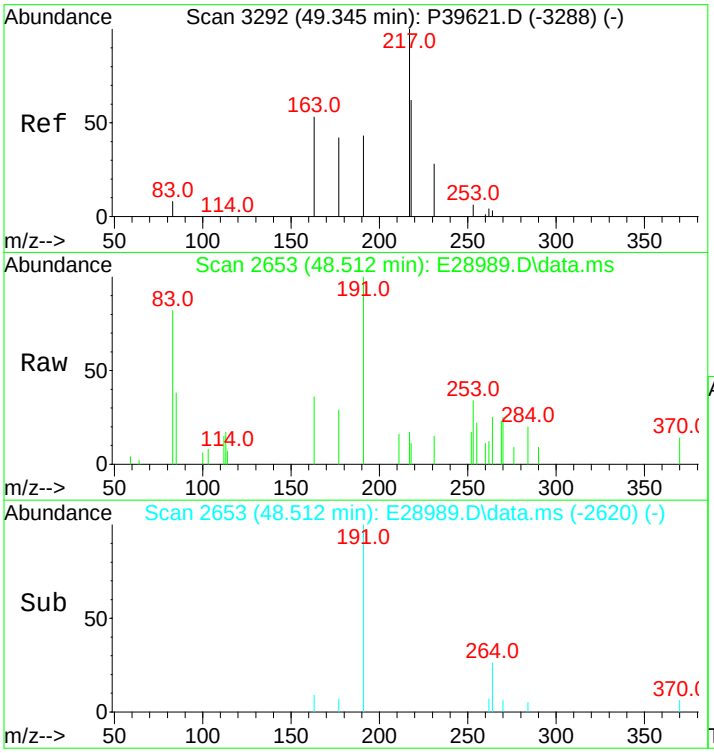




#108
C30 Tricyclic Terpane-22R
Concen: 71.38 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

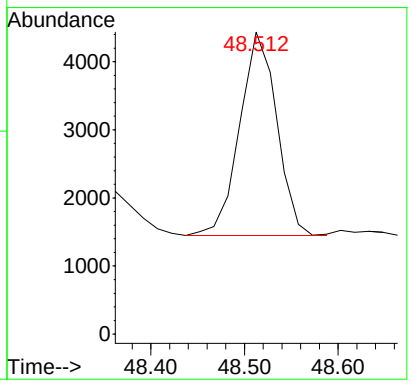
Tgt Ion:191 Resp: 3111

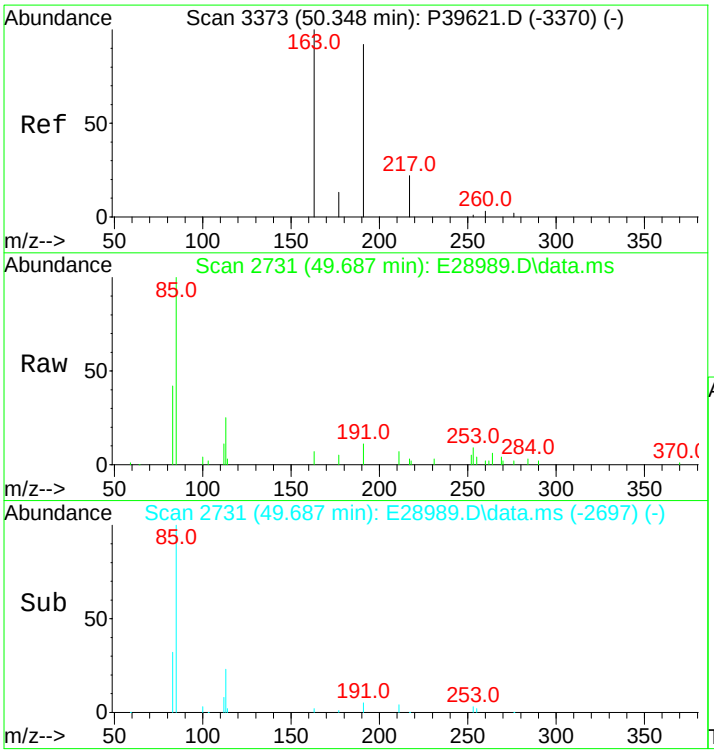




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 188.69 ng/ml
RT: 48.512 min Scan# 2653
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

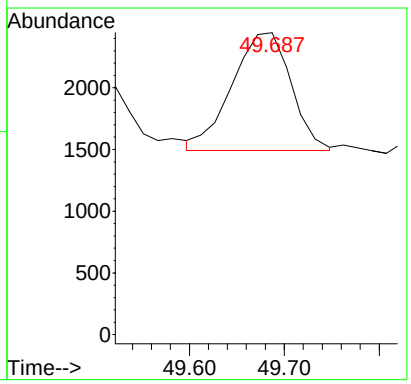
Tgt Ion:191 Resp: 8224

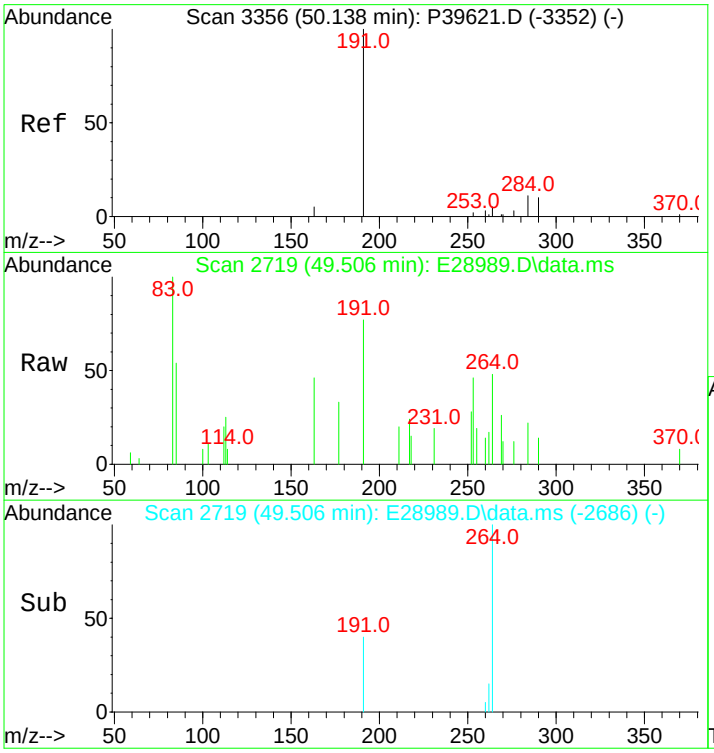




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 94.57 ng/ml m
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

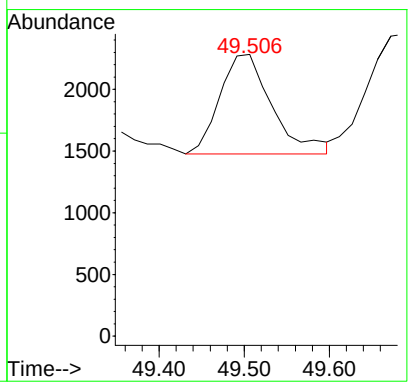
Tgt Ion:191 Resp: 4122

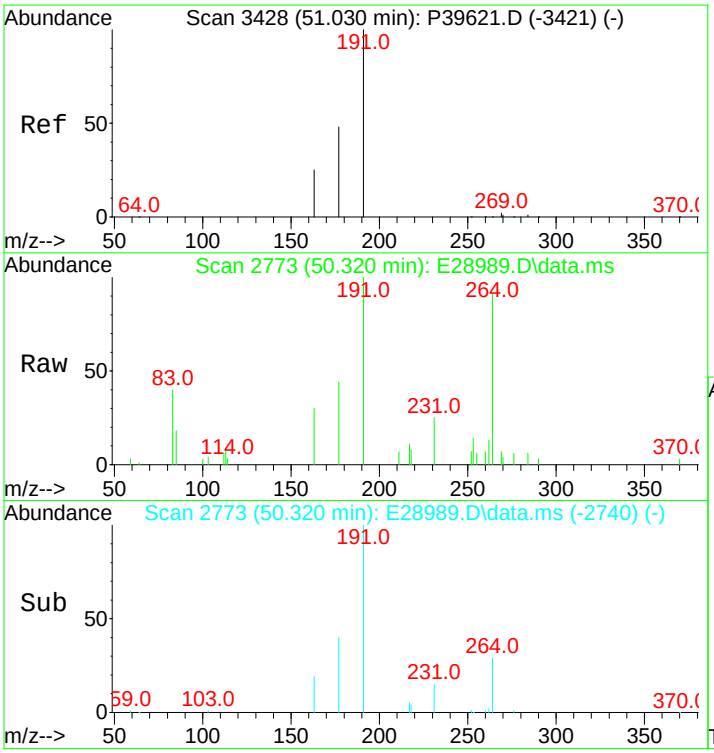




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 79.89 ng/ml
RT: 49.506 min Scan# 2719
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

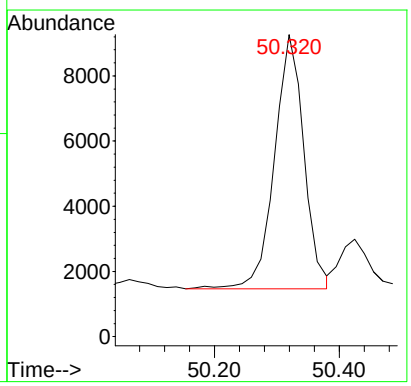
Tgt Ion:191 Resp: 3482

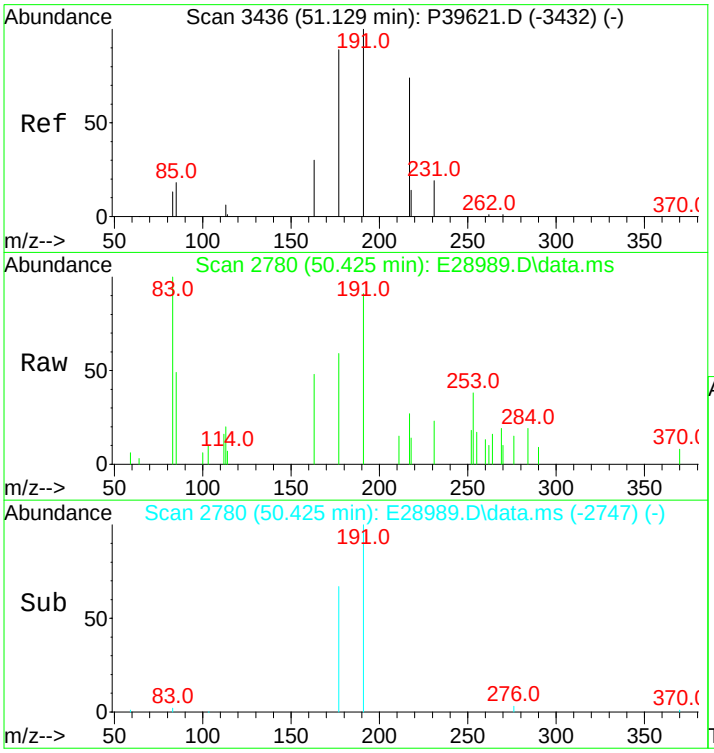




#112
30-Norhopane (T15)
Concen: 585.59 ng/ml
RT: 50.320 min Scan# 2773
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

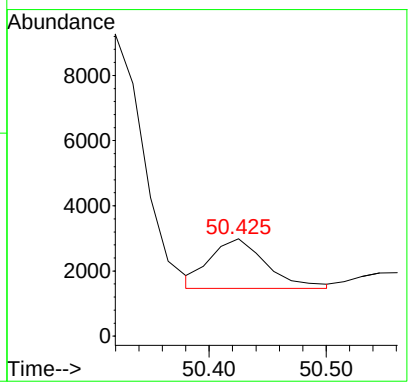
Tgt Ion:191 Resp: 25523

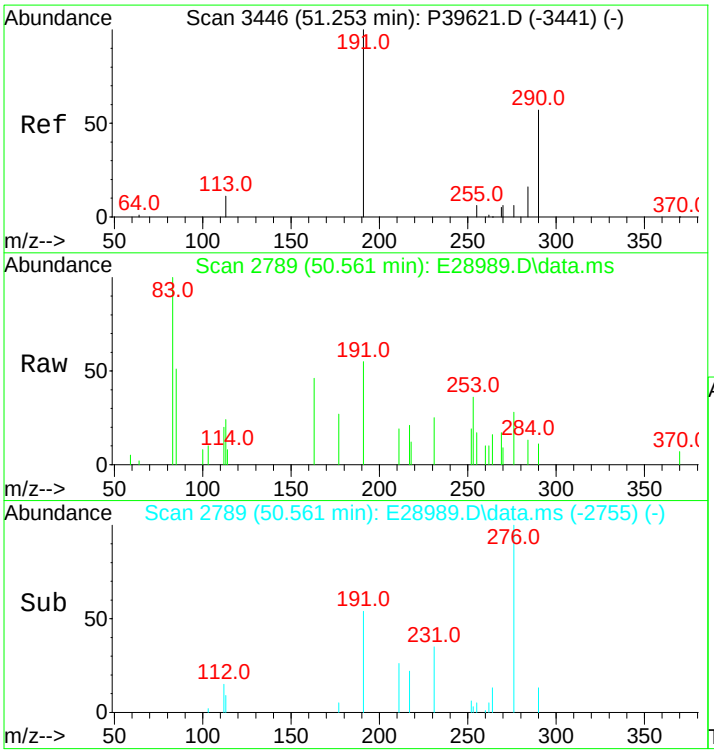




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 117.08 ng/ml
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

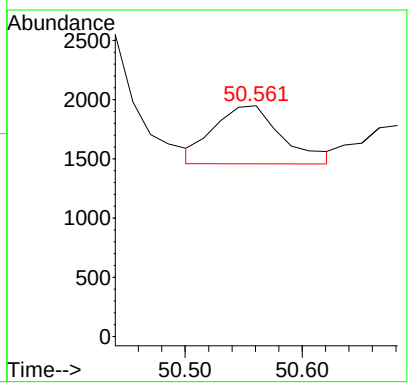
Tgt Ion:191 Resp: 5103

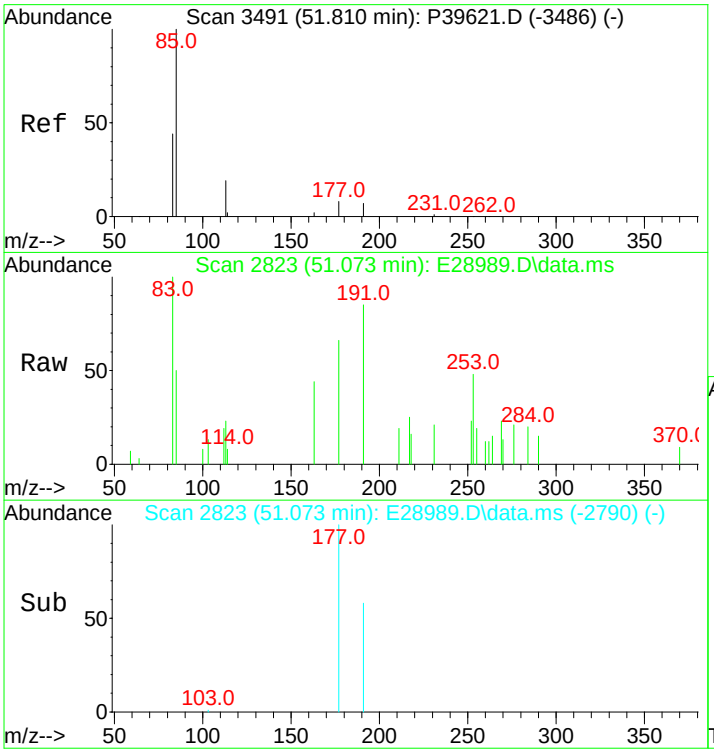




#114
17a(H)-Diahopane (X)
Concen: 45.93 ng/ml
RT: 50.561 min Scan# 2789
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

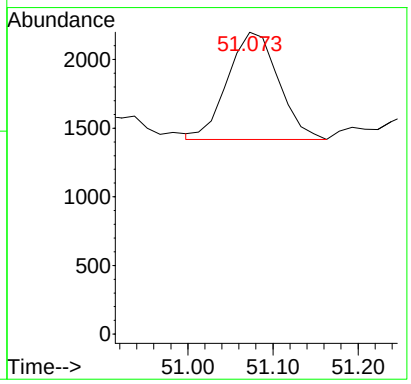
Tgt Ion:191 Resp: 2002

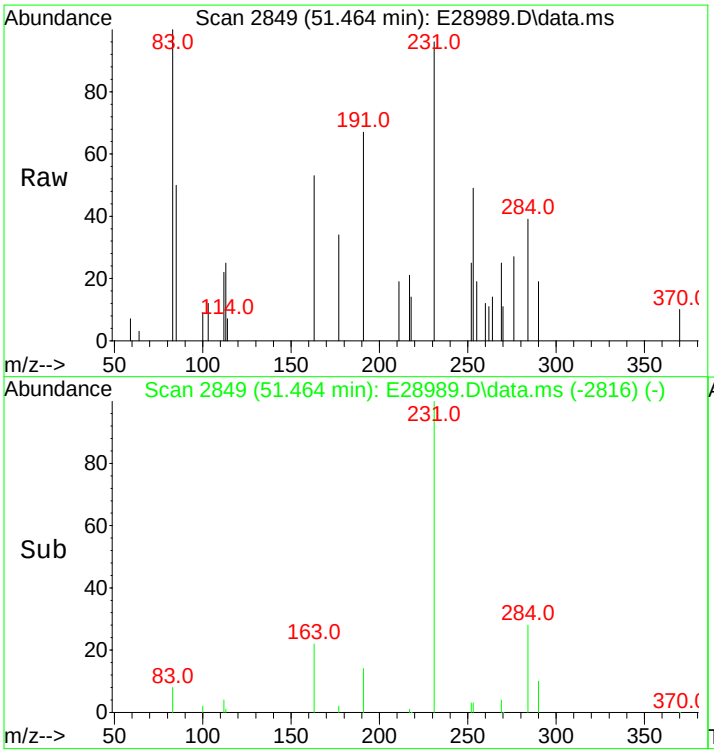




#115
30-Normoretane (T17)
Concen: 74.54 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

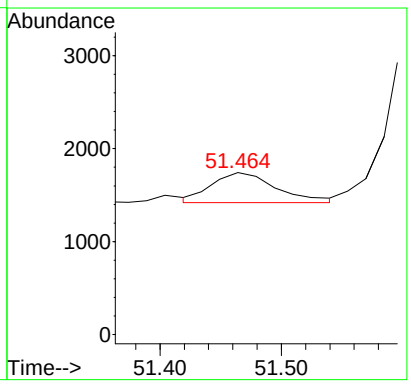
Tgt Ion:191 Resp: 3249

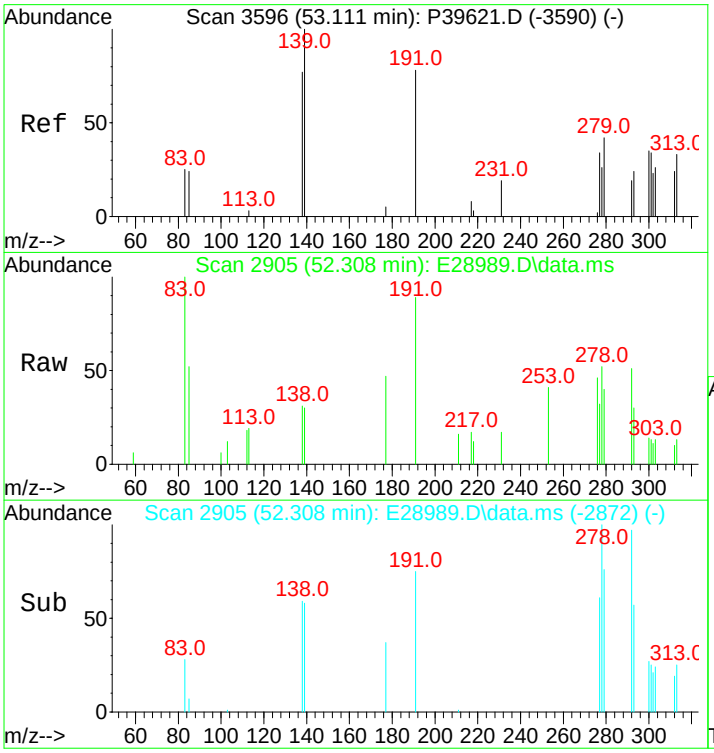




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 27.23 ng/ml m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

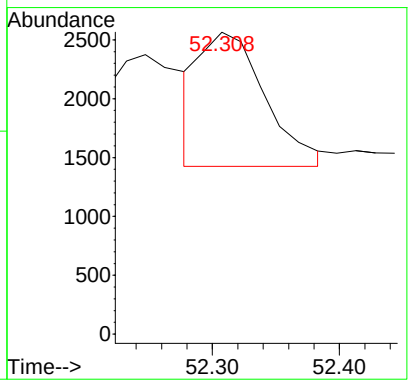
Tgt Ion:191 Resp: 1187

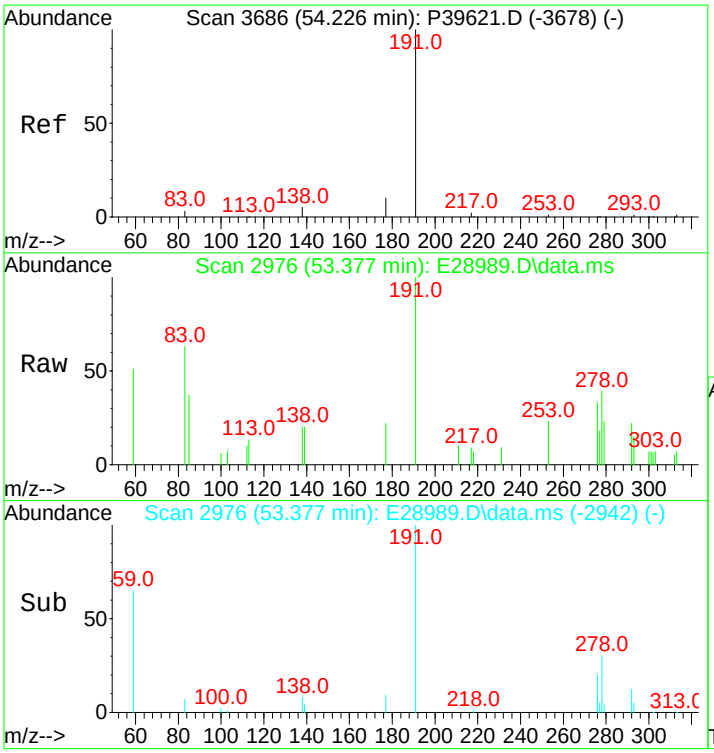




#117
Moretane (T20)
Concen: 93.59 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

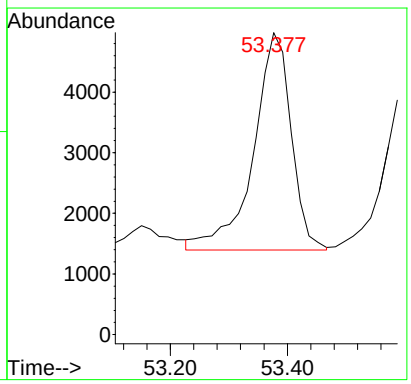
Tgt Ion:191 Resp: 4079

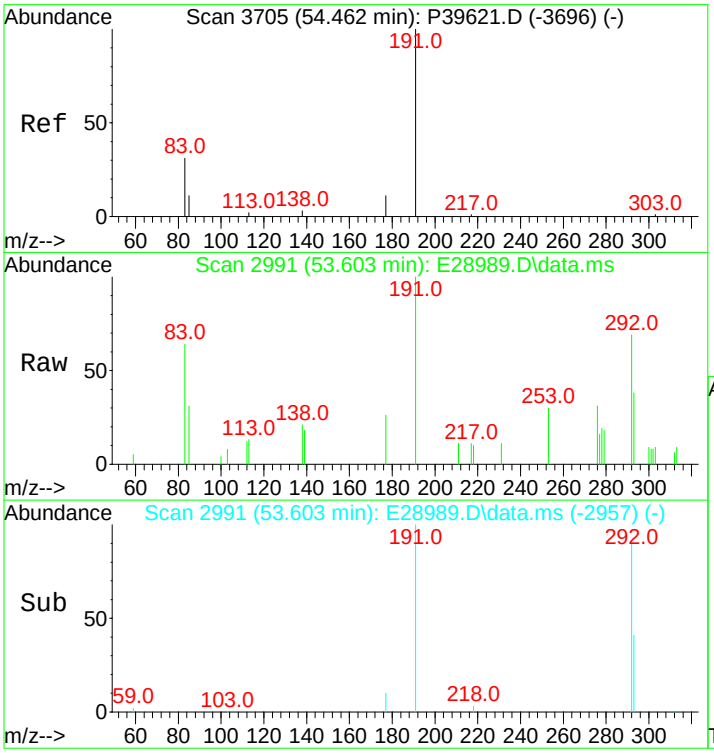




#118
30-Homohopane-22S (T21)
Concen: 367.92 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

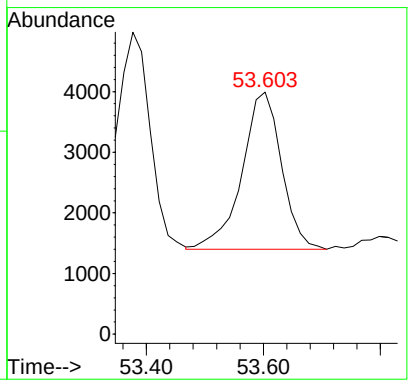
Tgt Ion:191 Resp: 16036

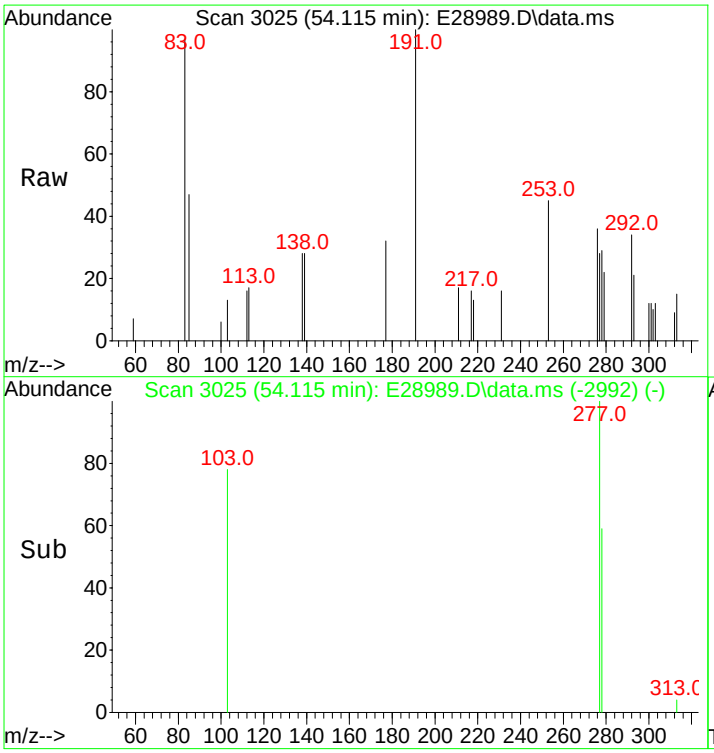




#119
30-Homohopane-22R (T22)
Concen: 278.79 ng/ml
RT: 53.603 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

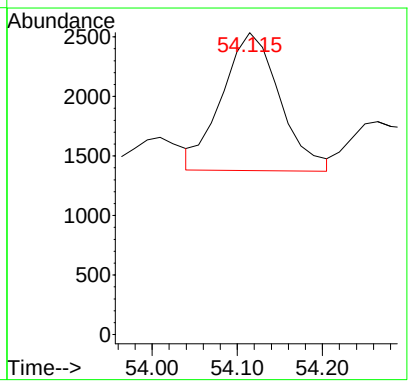
Tgt Ion:191 Resp: 12151

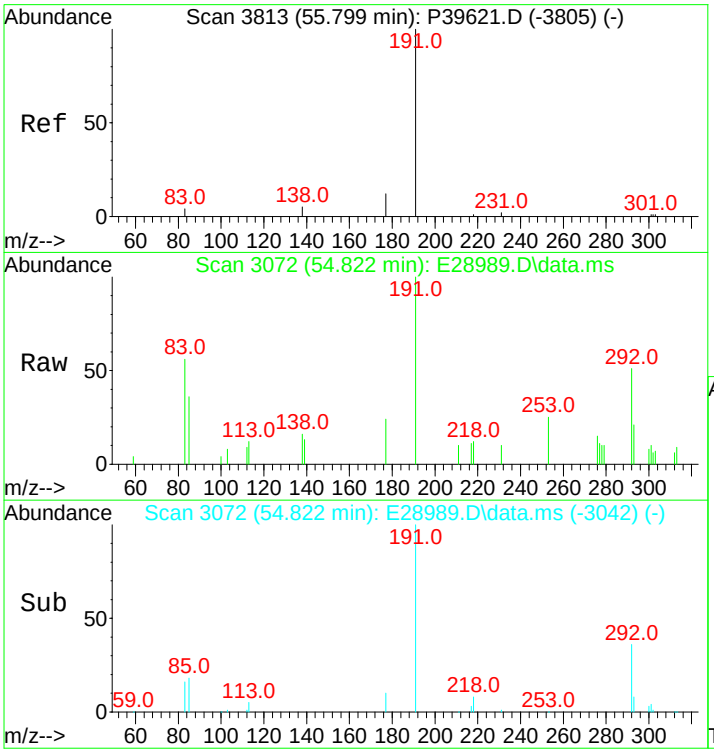




#120
Gammacerane/C32-diahopane
Concen: 124.97 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

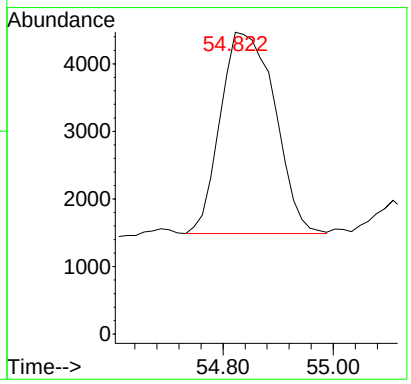
Tgt Ion:191 Resp: 5447

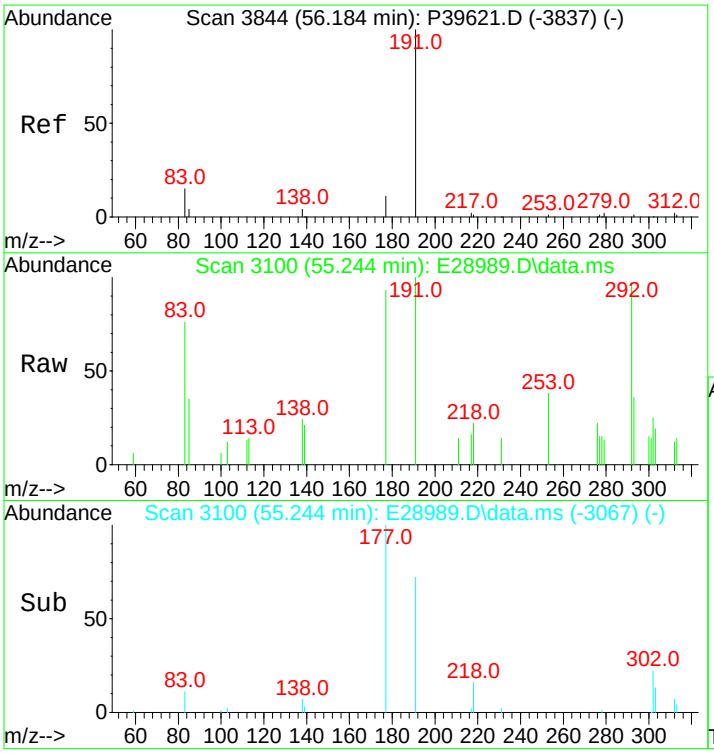




#121
30,31-Bishomohopane-22S (T26)
Concen: 468.30 ng/ml
RT: 54.822 min Scan# 3072
Delta R.T. -0.045 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

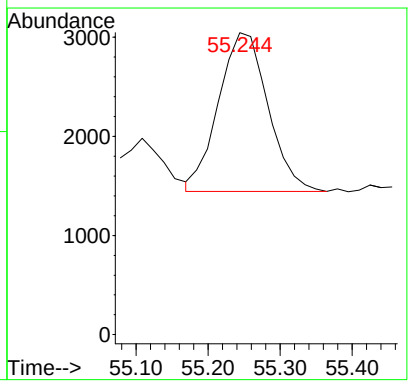
Tgt Ion:191 Resp: 20411

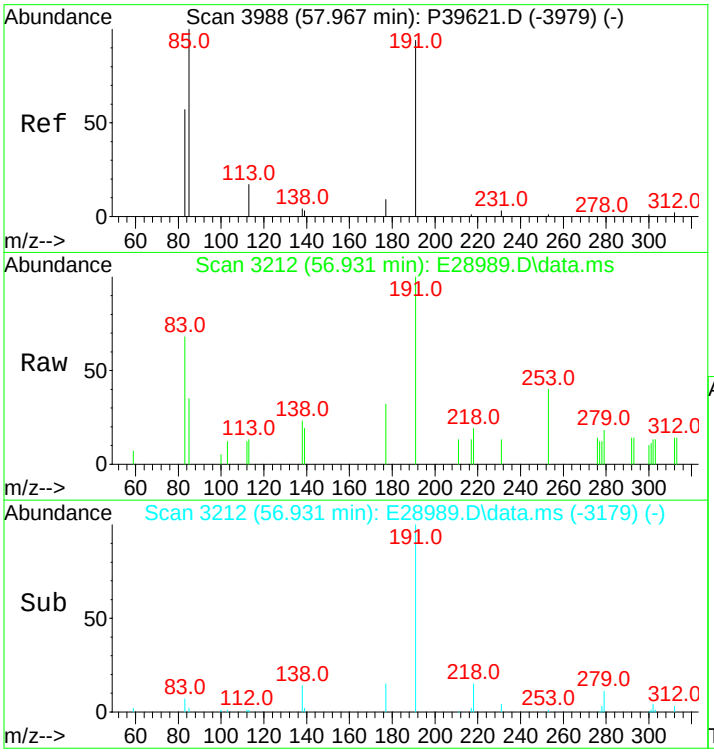




#122
30,31-Bishomohopane-22R (T27)
Concen: 174.71 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

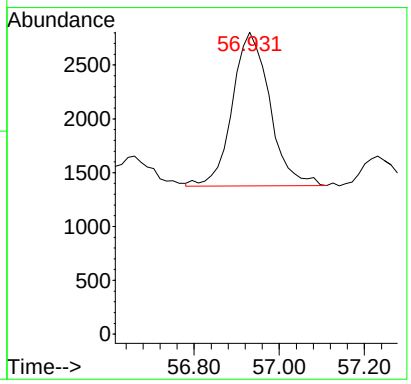
Tgt Ion:191 Resp: 7615

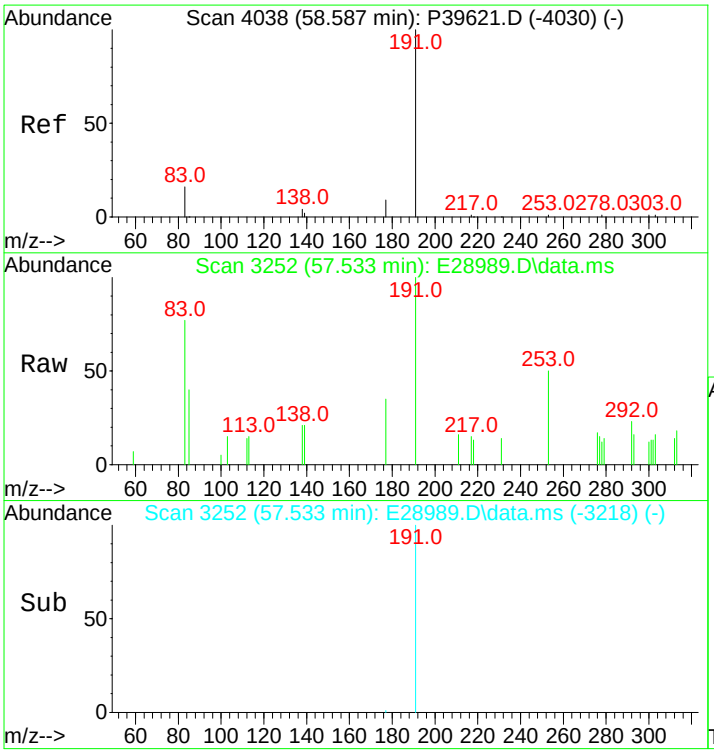




#123
30,31-Trishomohopane-22S (T30)
Concen: 200.14 ng/ml
RT: 56.931 min Scan# 3212
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

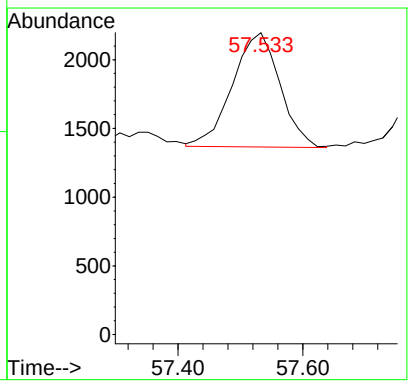
Tgt Ion:191 Resp: 8723

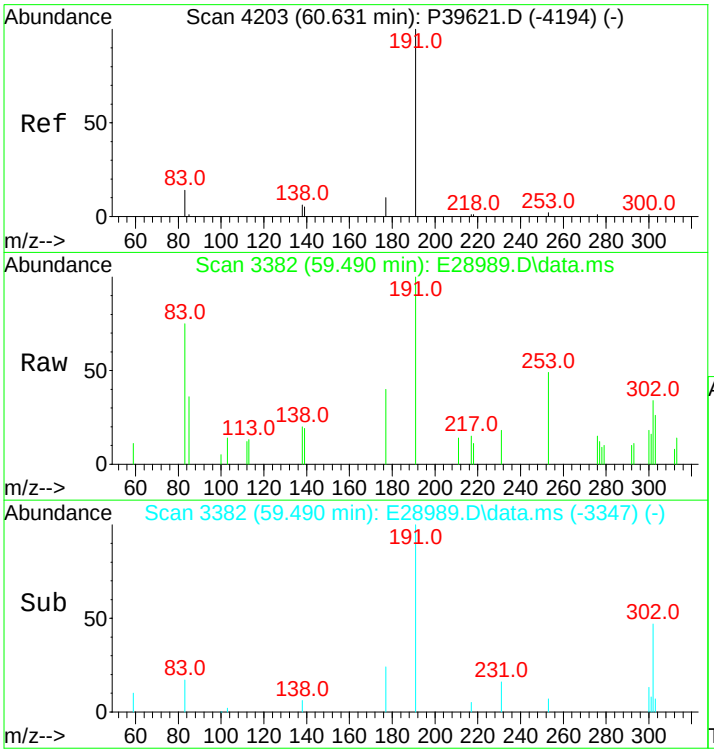




#124
30,31-Trishomohopane-22R (T31)
Concen: 100.42 ng/ml
RT: 57.533 min Scan# 3252
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

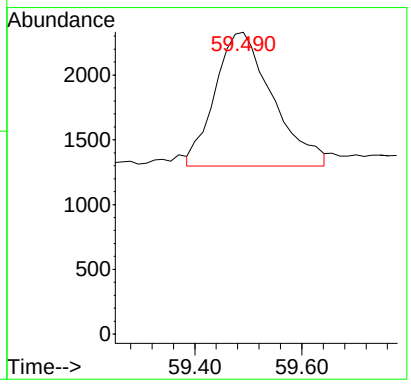
Tgt Ion:191 Resp: 4377

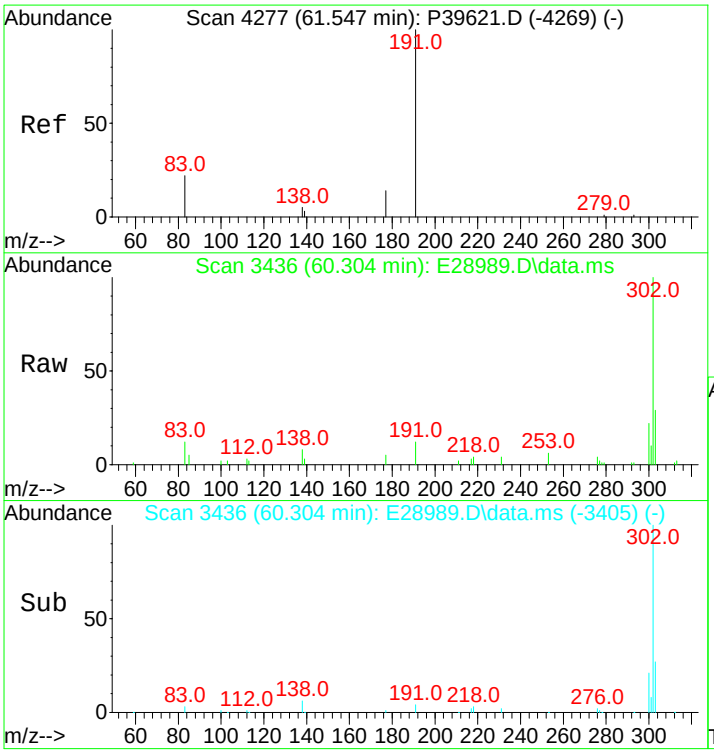




#125
Tetrakishomohopane-22S (T32)
Concen: 176.94 ng/ml m
RT: 59.490 min Scan# 3382
Delta R.T. 0.030 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

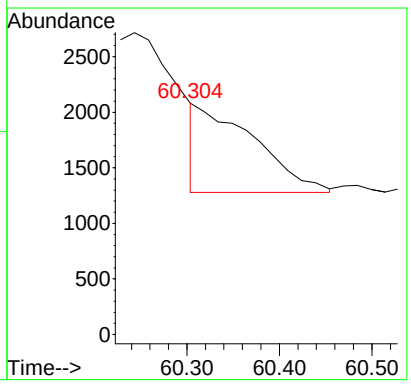
Tgt Ion:191 Resp: 7712

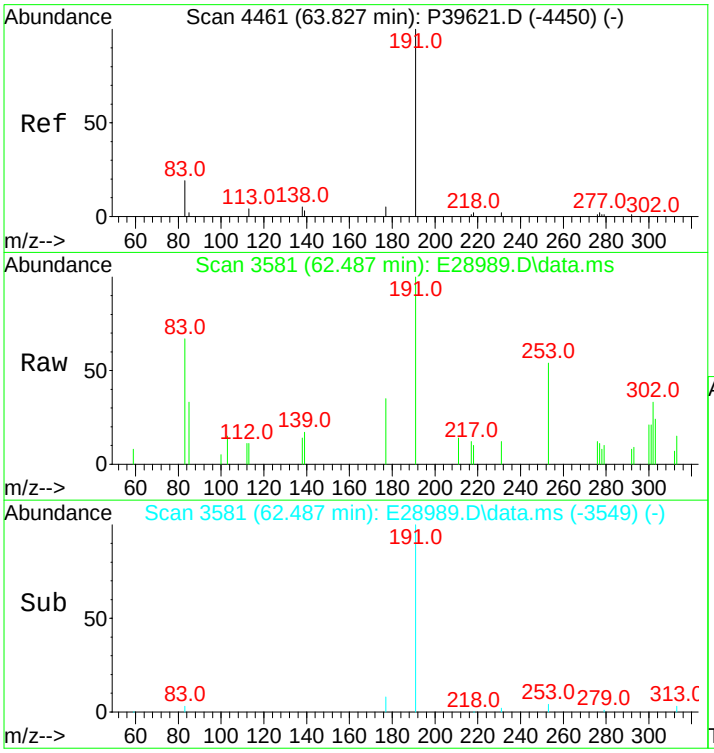




#126
Tetrakishomohopane-22R (T33)
Concen: 77.71 ng/ml m
RT: 60.304 min Scan# 3436
Delta R.T. -0.030 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

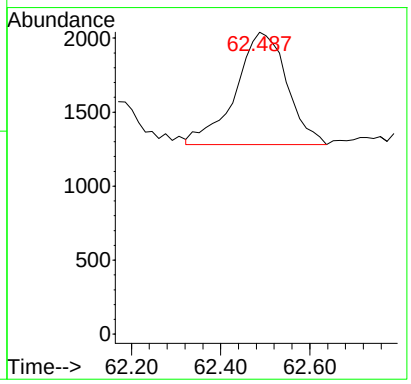
Tgt Ion:191 Resp: 3387

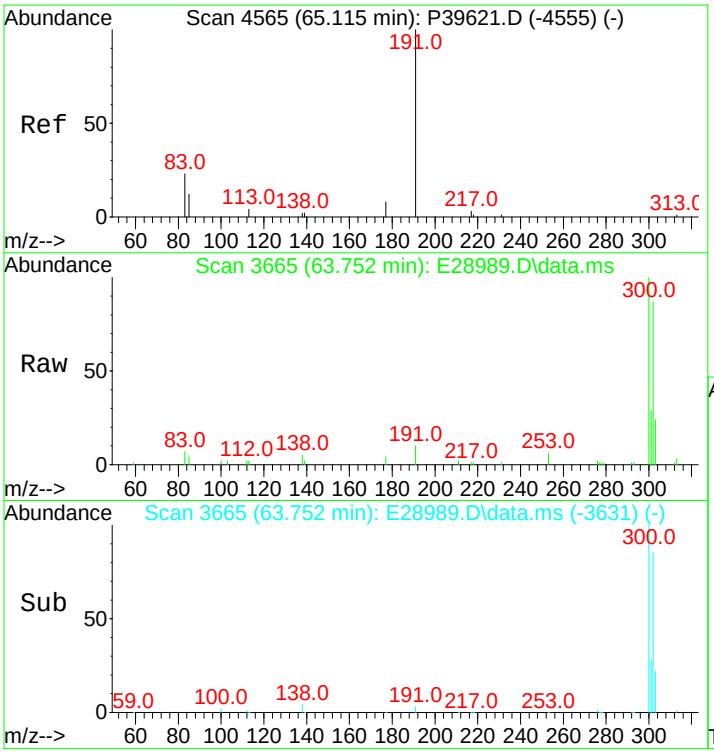




#127
Pentakishomohopane-22S (T34)
Concen: 140.07 ng/ml
RT: 62.487 min Scan# 3581
Delta R.T. -0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

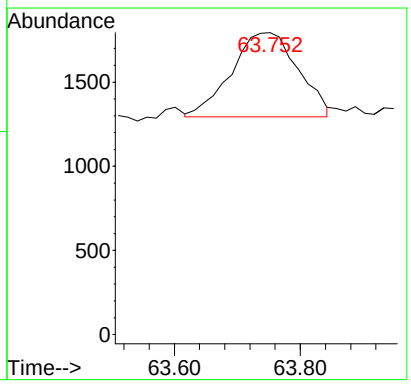
Tgt Ion:191 Resp: 6105

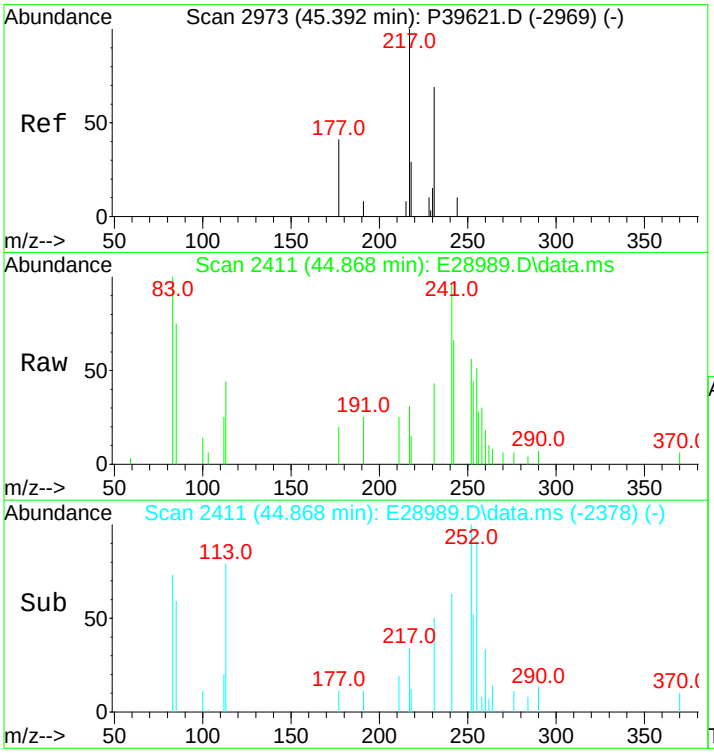




#128
Pentakishomohopane-22R (T35)
Concen: 84.32 ng/ml m
RT: 63.752 min Scan# 3665
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

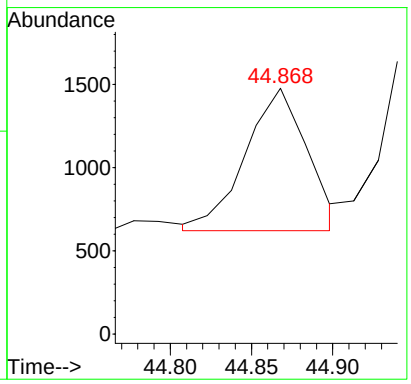
Tgt Ion:191 Resp: 3675

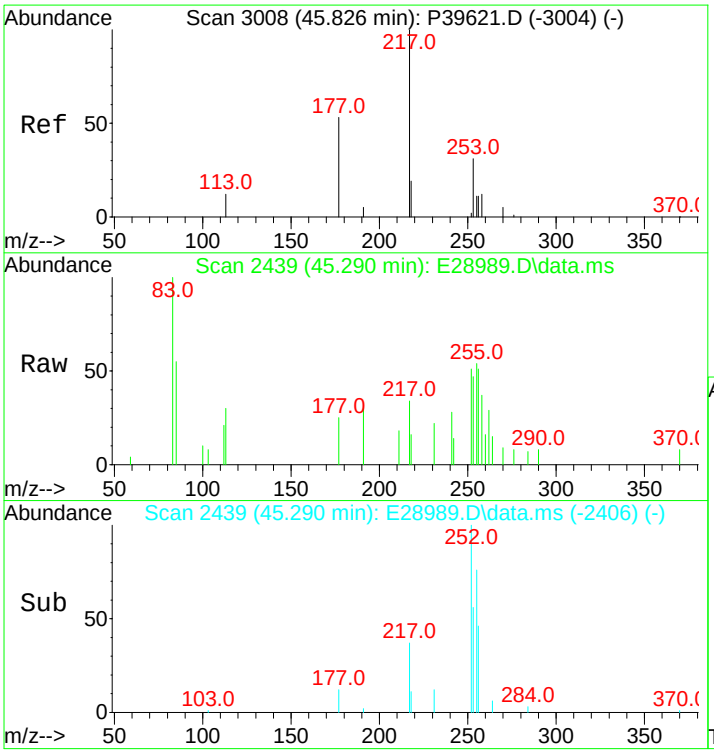




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 99.17 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

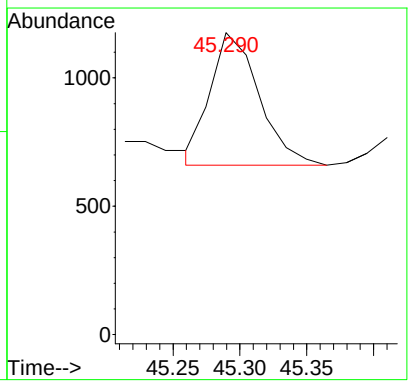
Tgt Ion:217 Resp: 2270

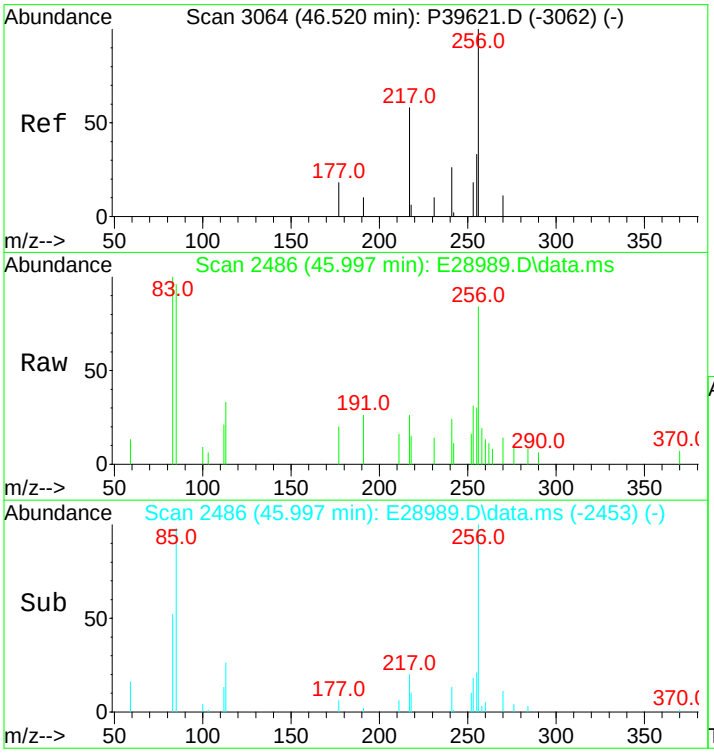




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 57.28 ng/ml
RT: 45.290 min Scan# 2439
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

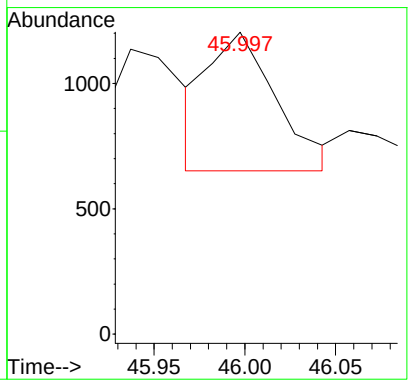
Tgt Ion:217 Resp: 1311

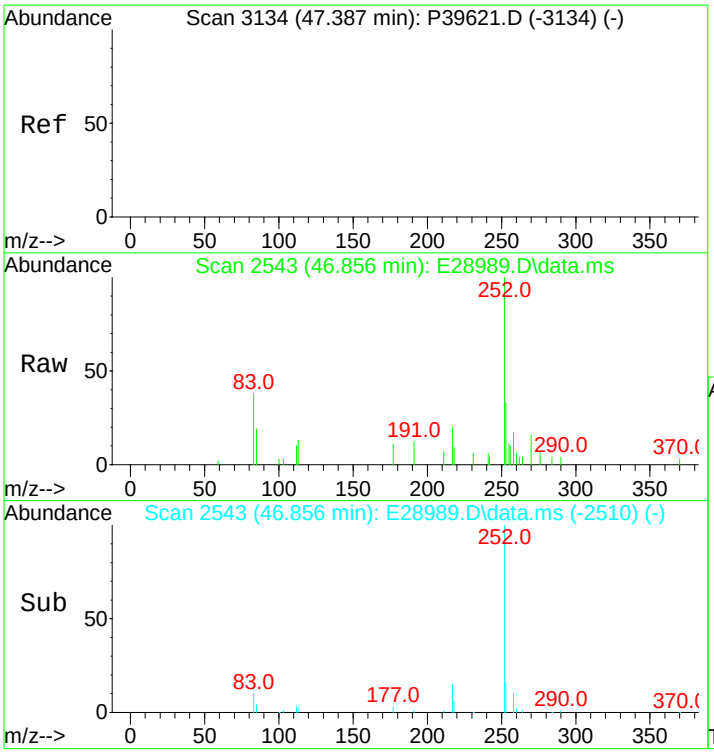




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 62.69 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

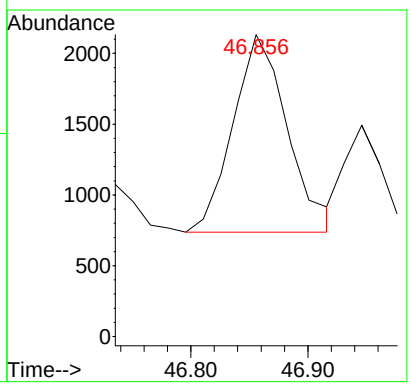
Tgt Ion:217 Resp: 1435

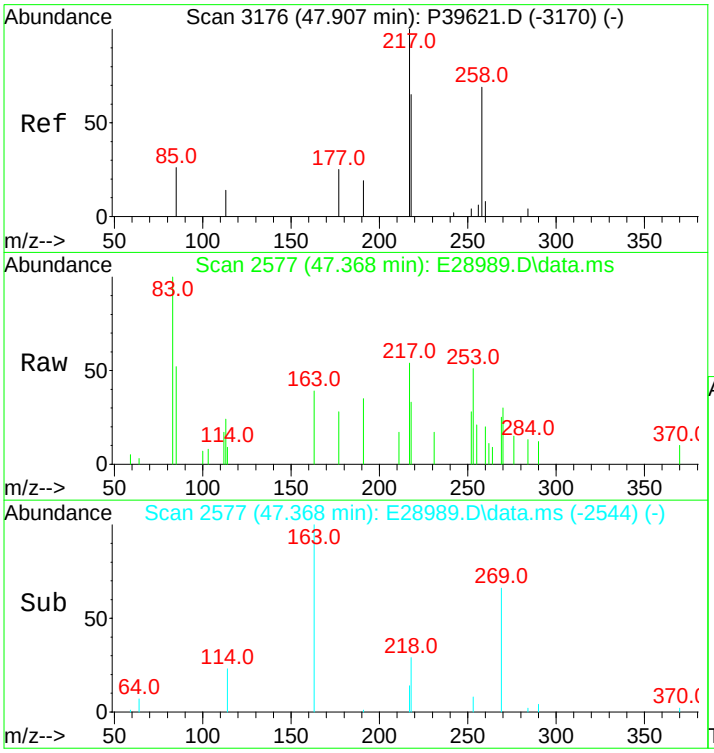




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 196.82 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

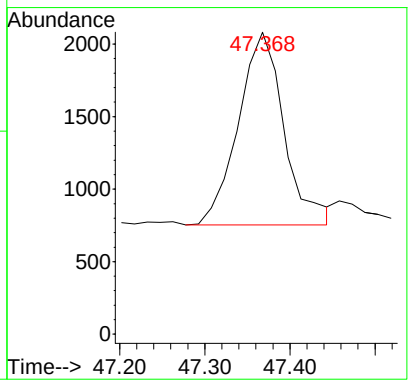
Tgt Ion:217 Resp: 4505

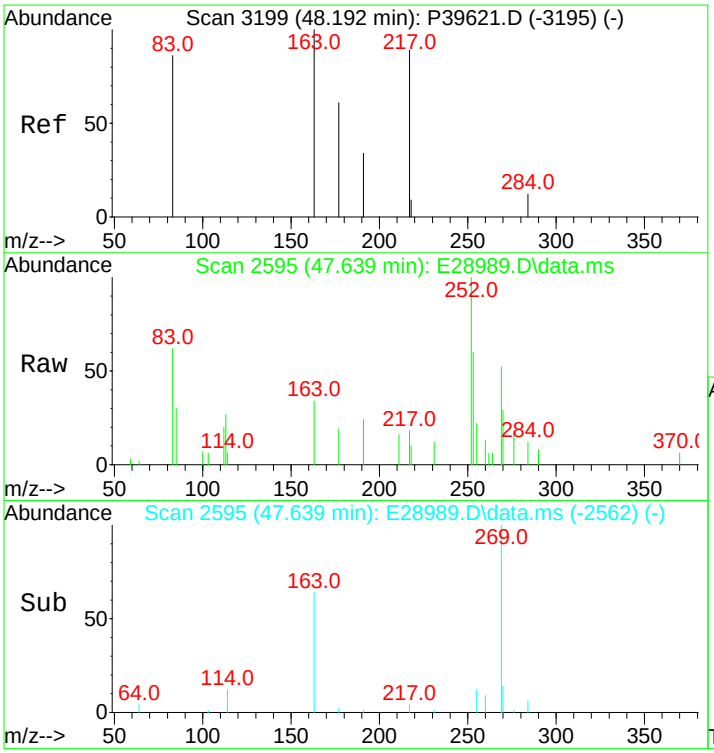




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 216.96 ng/ml
RT: 47.368 min Scan# 2577
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

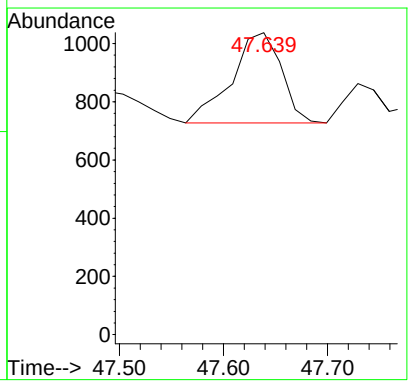
Tgt Ion:217 Resp: 4966

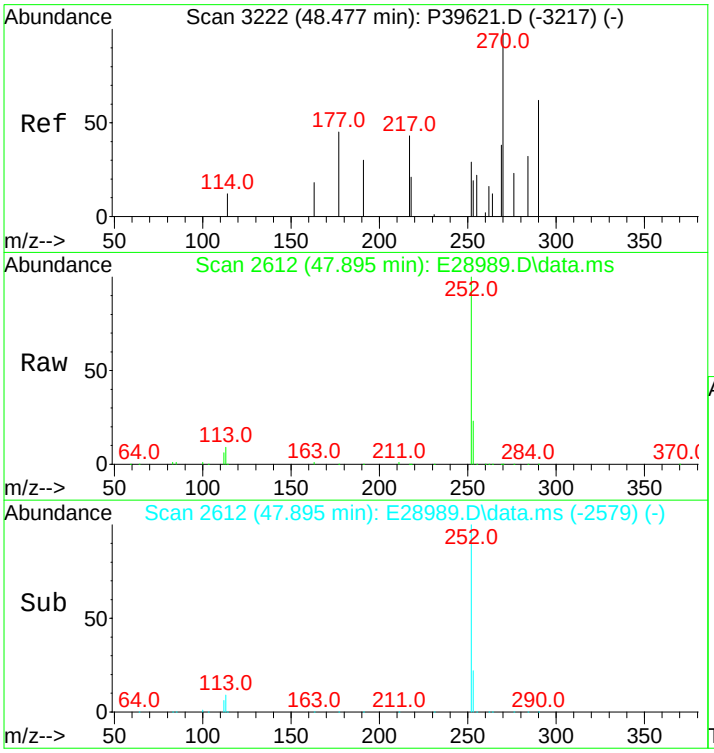




#135
Unknown Sterane (S18)
Concen: 45.48 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

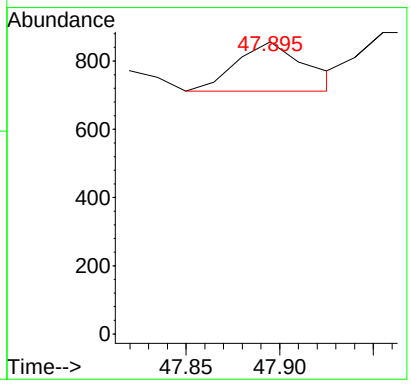
Tgt Ion:217 Resp: 1041

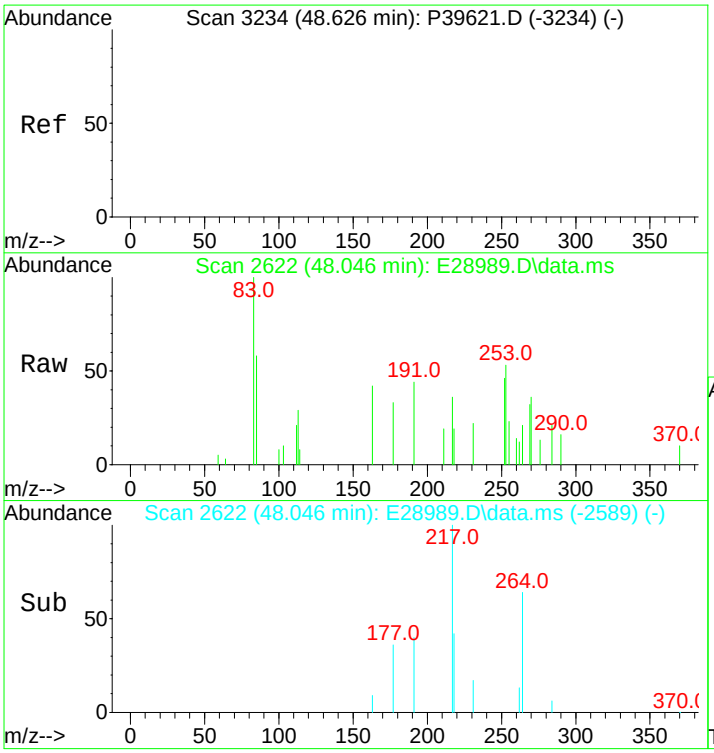




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 16.34 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

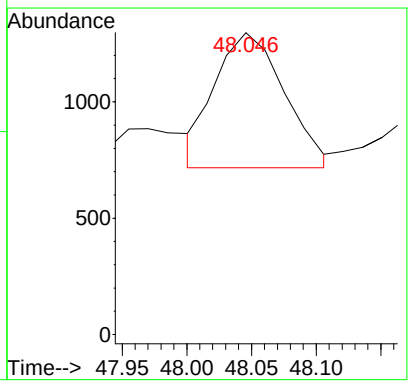
Tgt Ion:217 Resp: 374

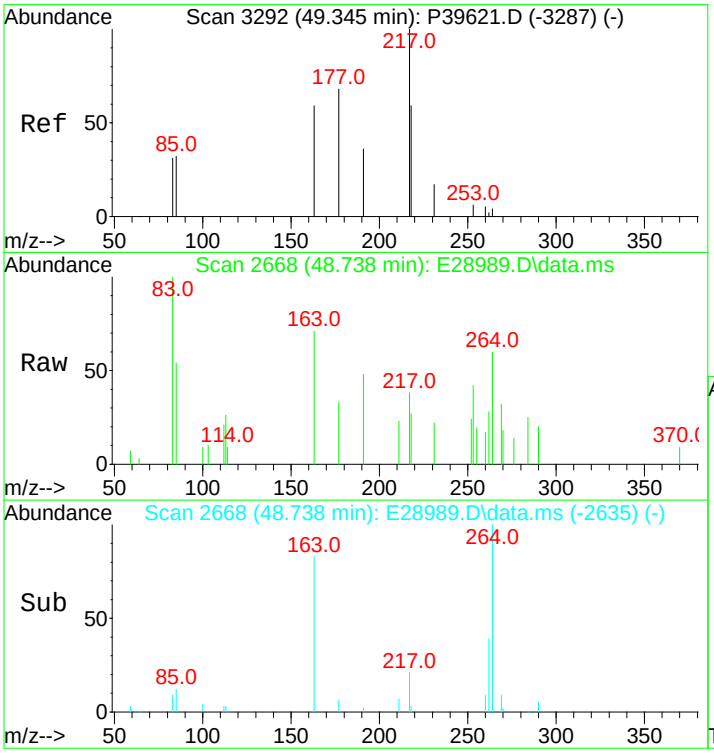




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 94.37 ng/ml m
RT: 48.046 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

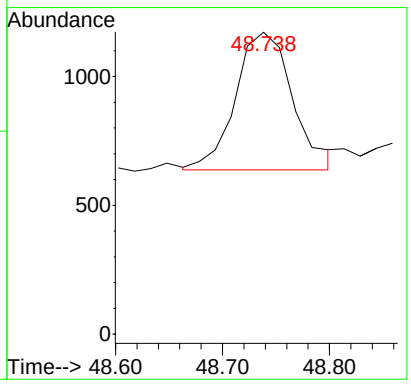
Tgt Ion:217 Resp: 2160

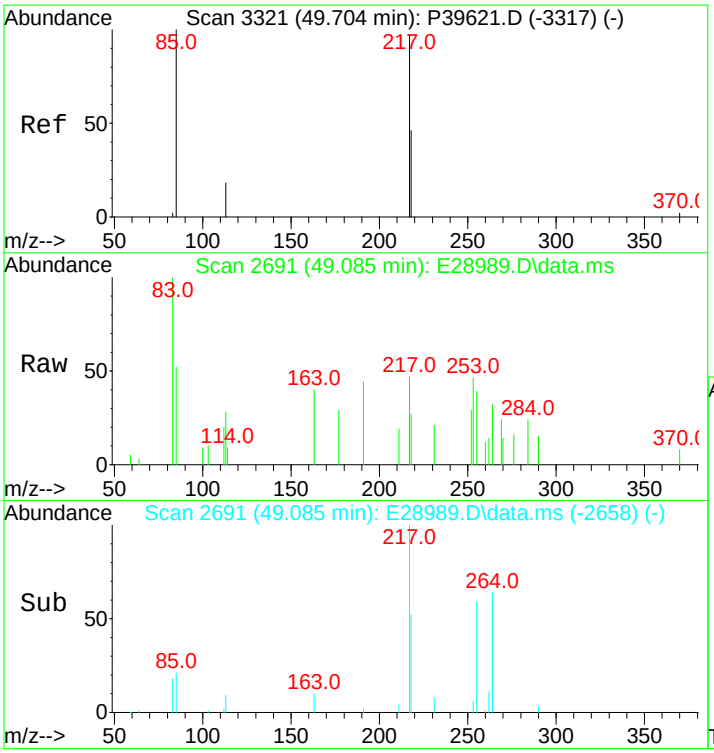




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 86.55 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

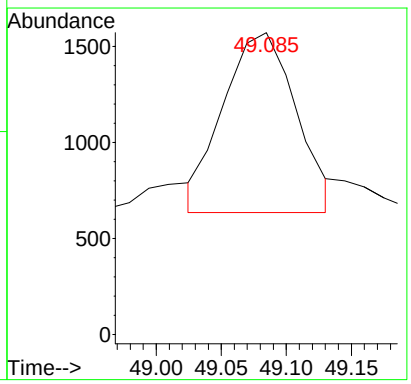
Tgt Ion:217 Resp: 1981

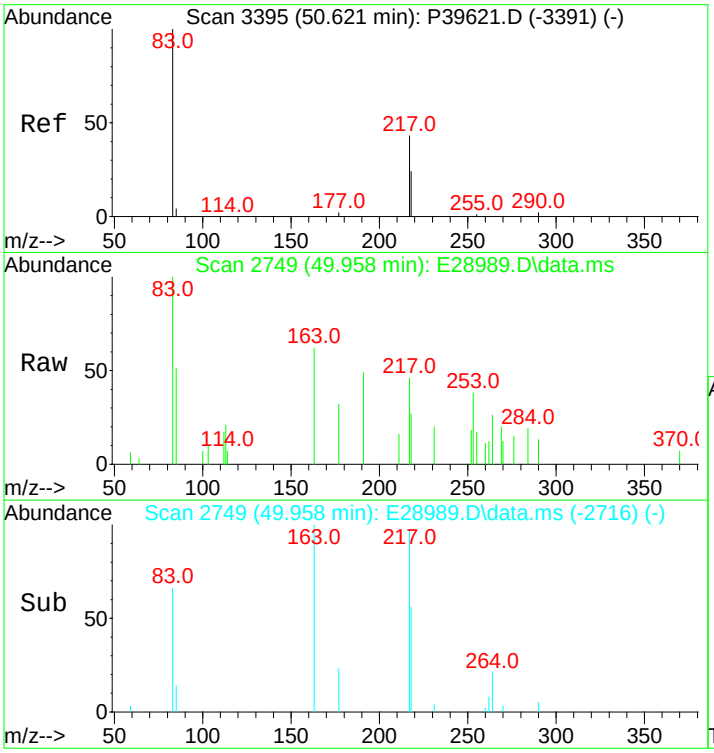




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 159.38 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

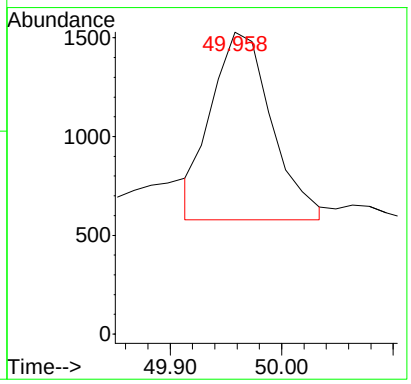
Tgt Ion:217 Resp: 3648

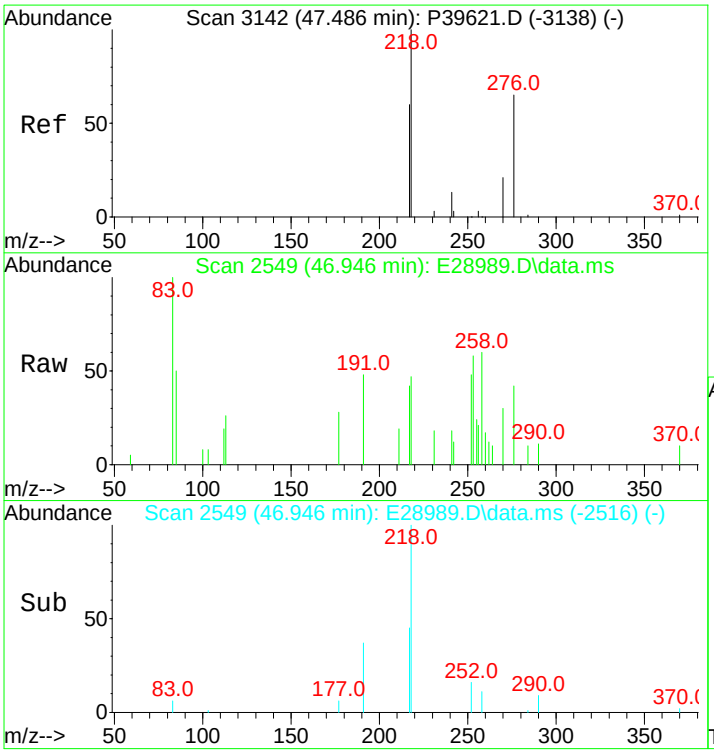




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 156.06 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

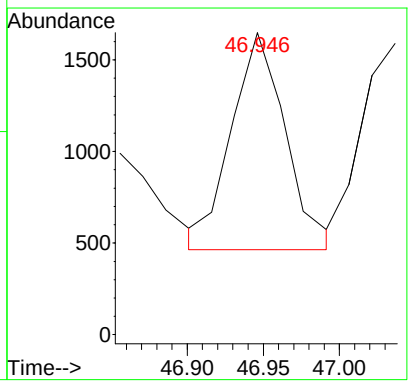
Tgt Ion:217 Resp: 3572

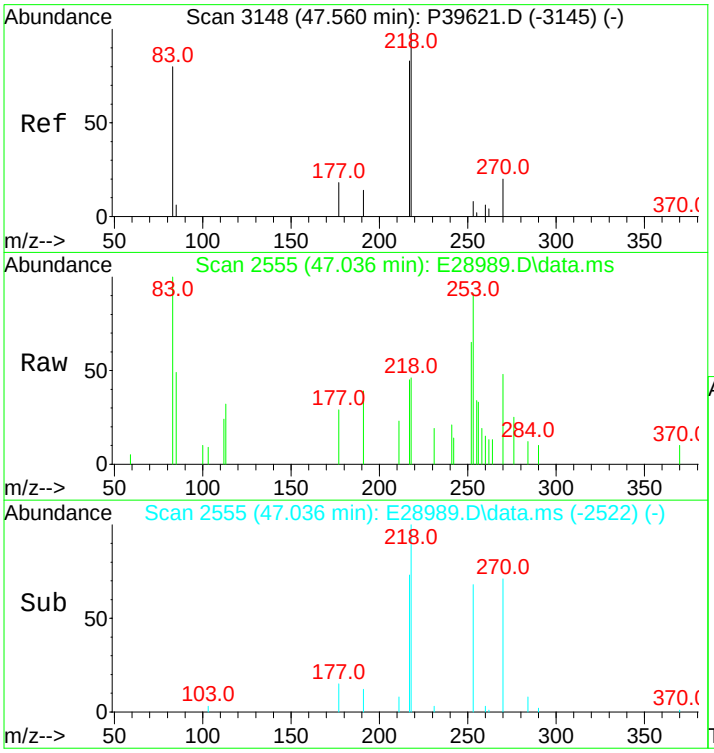




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 127.62 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

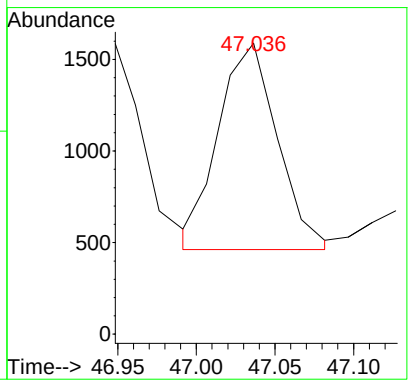
Tgt Ion:218 Resp: 2921

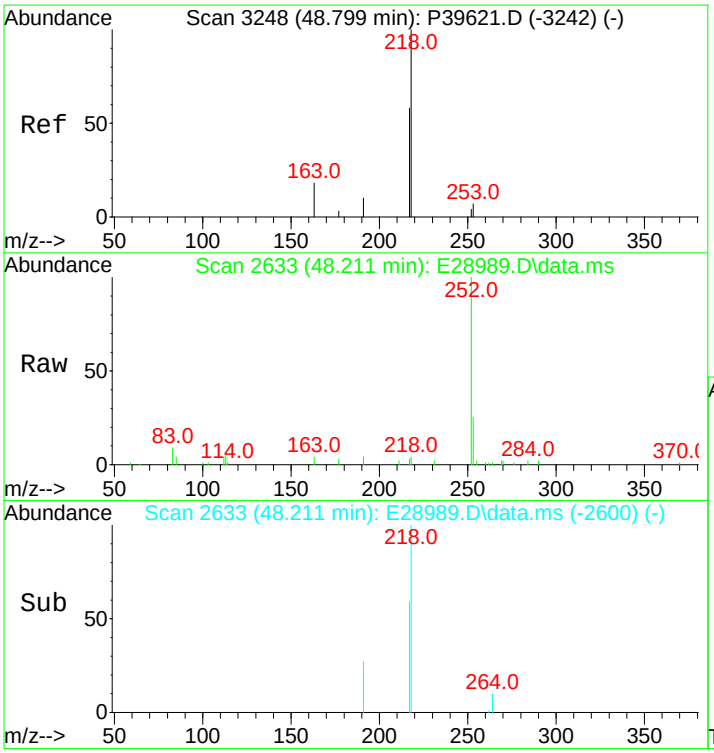




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 128.58 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

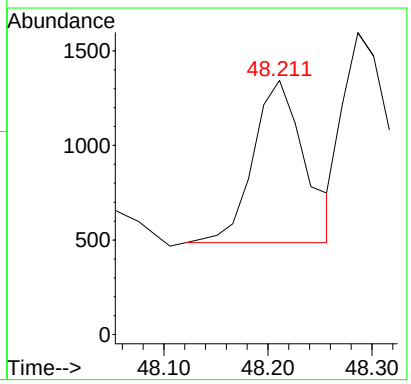
Tgt Ion:218 Resp: 2943

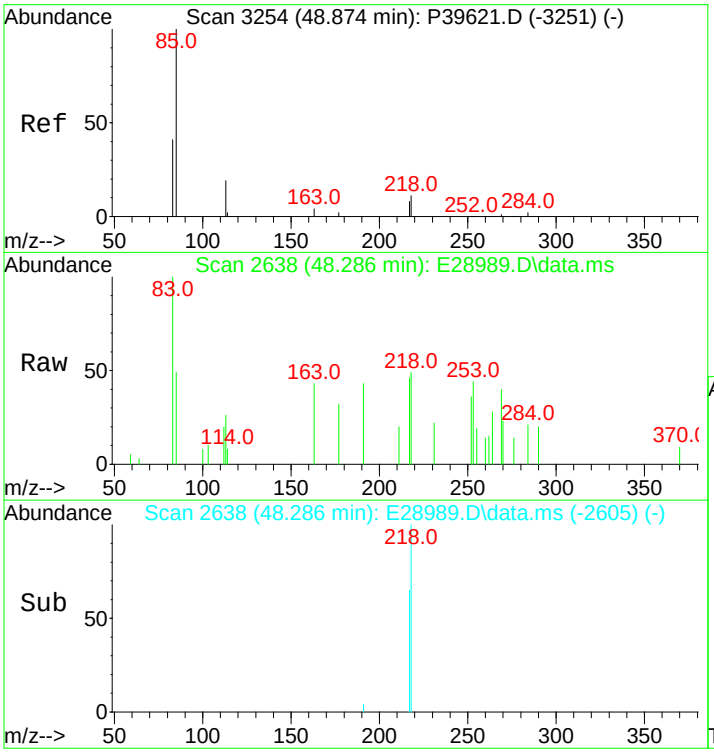




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 129.10 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

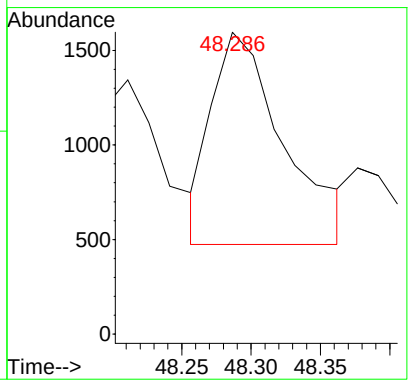
Tgt Ion:218 Resp: 2955

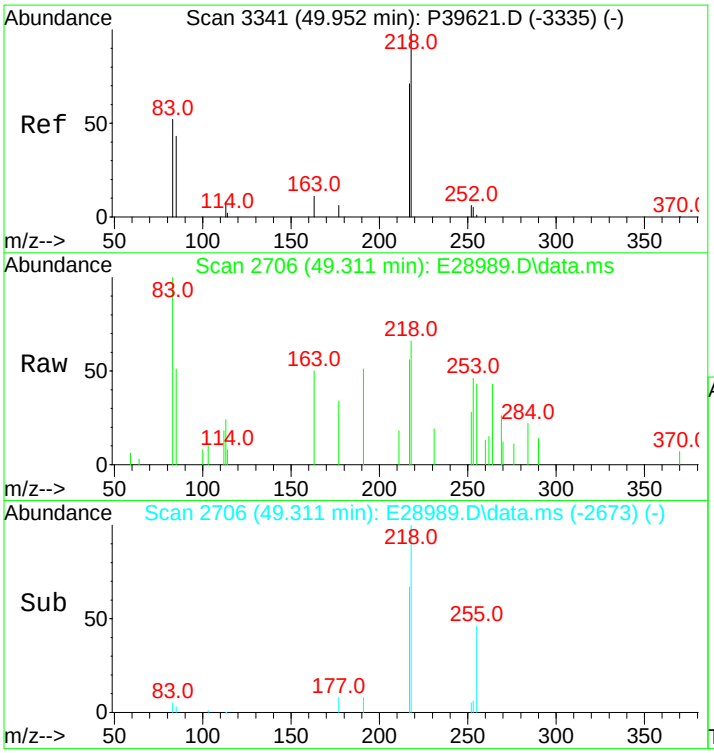




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 177.25 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

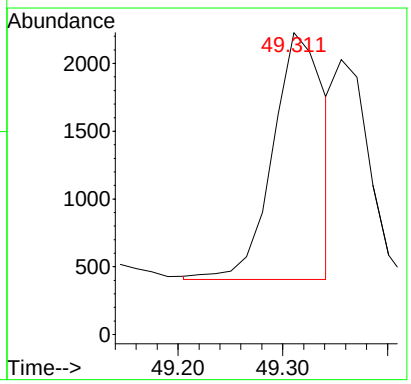
Tgt Ion:218 Resp: 4057

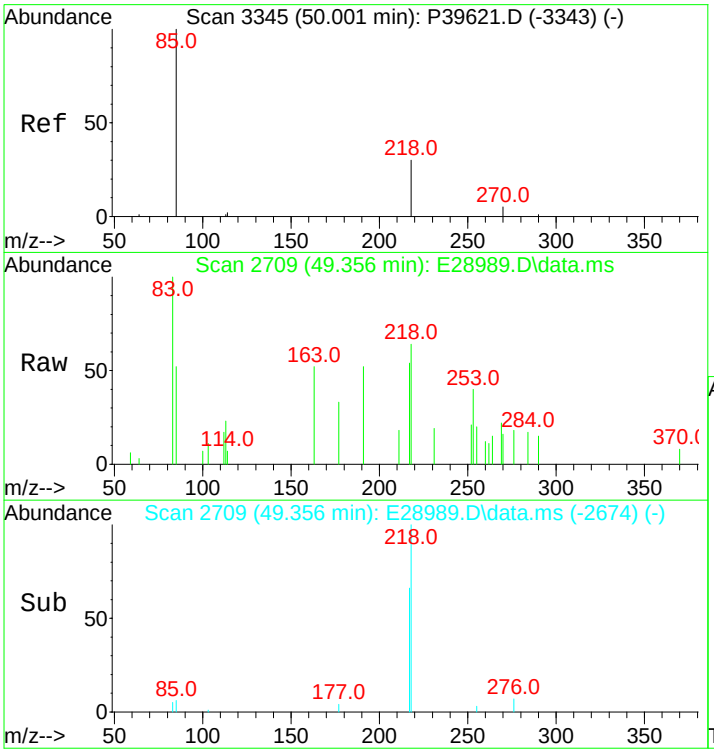




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 271.13 ng/ml m
RT: 49.311 min Scan# 2706
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

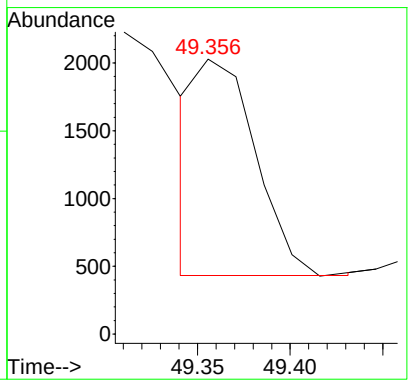
Tgt Ion:218 Resp: 6206

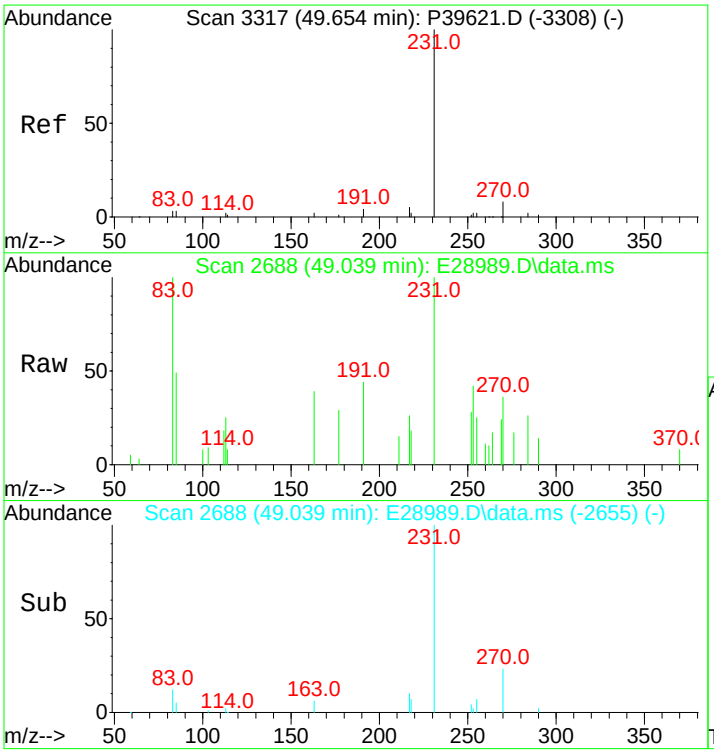




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 154.05 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

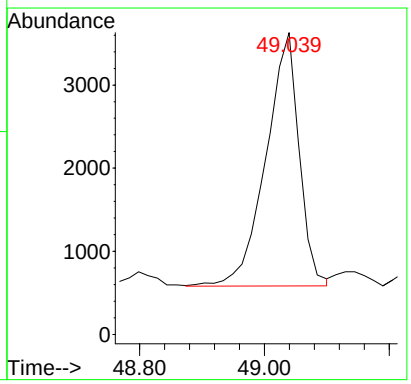
Tgt Ion:218 Resp: 3526

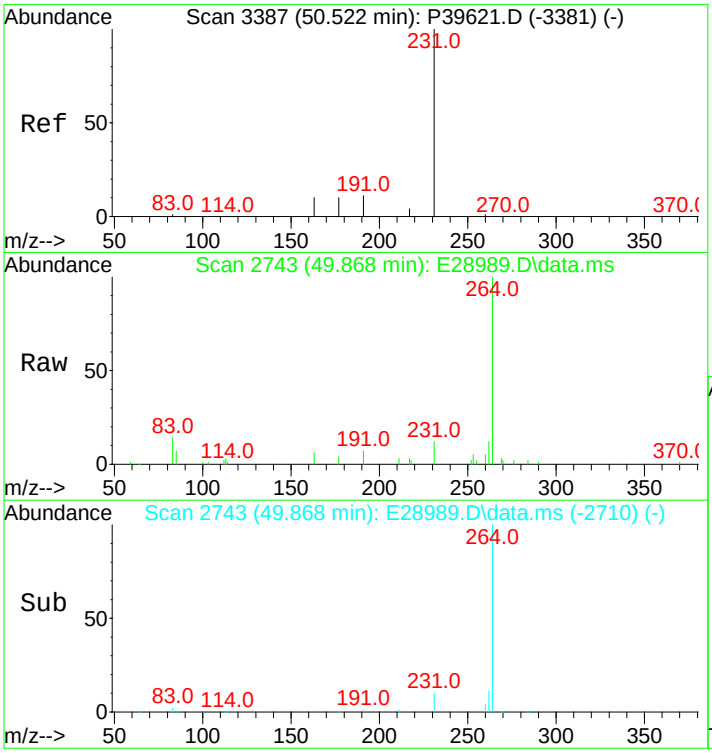




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 490.72 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

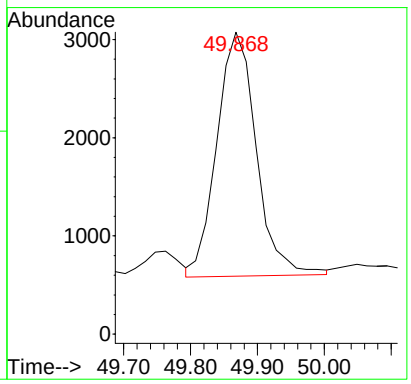
Tgt Ion:231 Resp: 11232

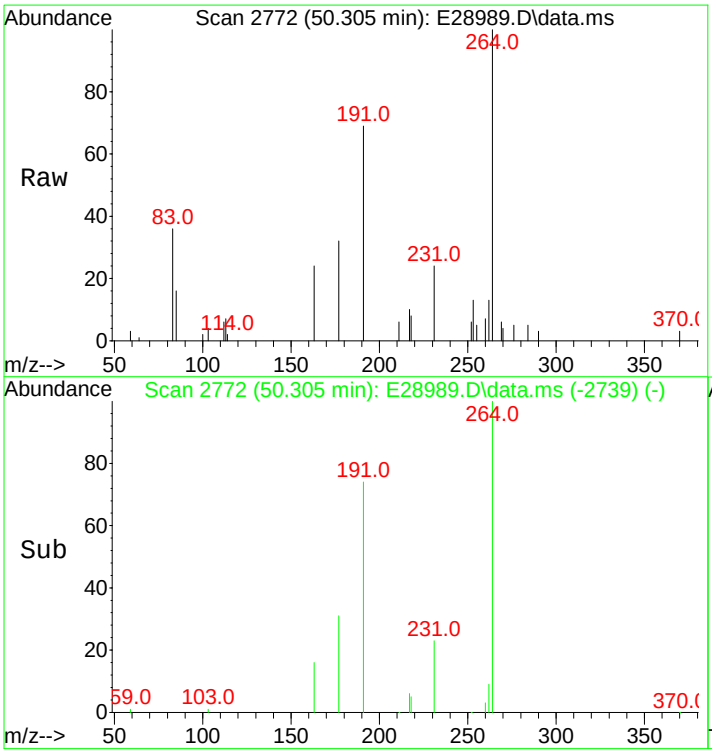




#148
C28,20S-triaromatic steroid
Concen: 445.58 ng/mL
RT: 49.868 min Scan# 2743
Delta R.T. 0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

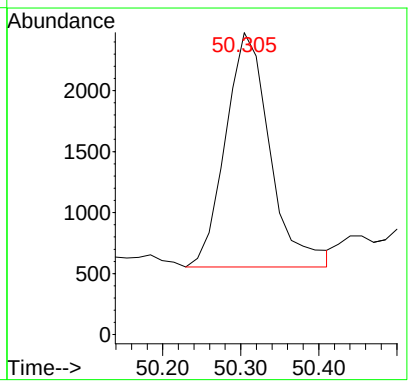
Tgt Ion:231 Resp: 10199

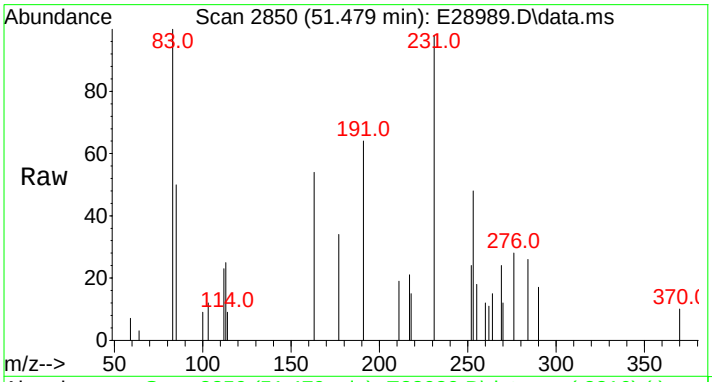




#149
C27,20R-triaromatic steroid
Concen: 333.48 ng/mL
RT: 50.305 min Scan# 2772
Delta R.T. -0.000 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

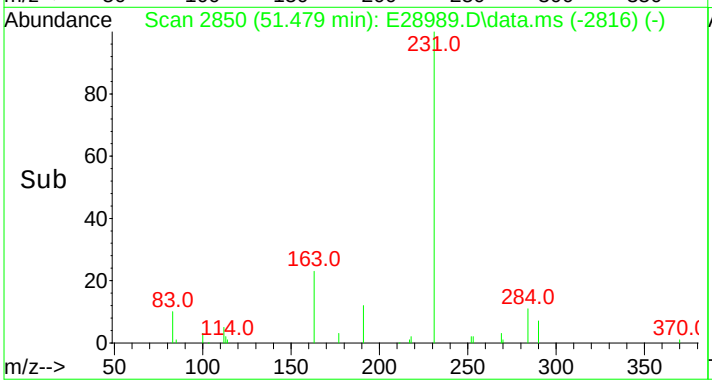
Tgt Ion:231 Resp: 7633

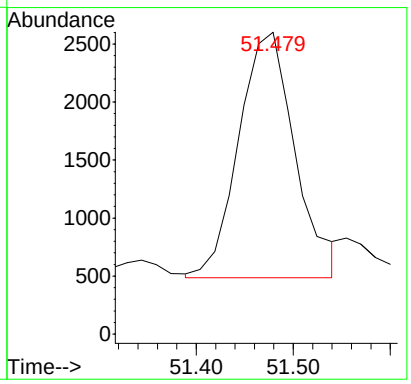




#150
C28,20R-triaromatic steroid
Concen: 373.32 ng/mL m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28989.D
Acq: 15 Nov 2012 12:09 pm

Tgt Ion:231 Resp: 8545





Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	28266	500.000	ng/mL	0.00
74) Chrysene-d12	42.730	240	71540	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	34797	349.989	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.00%#			
42) Phenanthrene-d10	32.085	188	46719	458.650	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.87%#			
83) Benzo[b]fluoranthene-d12	46.660	264	64954	441.984	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.20%#			
88) Benzo[a]pyrene-d12	47.805	264	61414	431.292	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.13%#			
129) 5B(H)Cholane - Surr	43.347	217	13037	462.379	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.24%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	126	5.573	ng/mL	100
5) C1-Decalins	17.814	152	535M5	23.662	ng/mL	
6) C2-Decalins	20.298	166	1735m	76.735	ng/mL	
7) C3-Decalins	21.623	180	3108m	137.460	ng/mL	
8) C4-Decalins	24.995	194	8607M5	380.669	ng/mL	
10) Naphthalene	19.304	128	50255	451.994	ng/mL#	100
11) C1-Naphthalenes	21.999	142	29244M5	263.021	ng/mL	
12) C2-Naphthalenes	24.844	156	98120M5	882.492	ng/mL	
13) C3-Naphthalenes	27.193	170	146317m	1315.977	ng/mL	
14) C4-Naphthalenes	29.963	184	115351M5	1037.468	ng/mL	
16) 2-Methylnaphthalene	21.999	142	17285	244.087	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	11922	173.261	ng/mL#	100
18) Benzothiophene	19.530	134	2489	27.079	ng/mL	100
19) C1-Benzo(b)thiophenes	22.390	148	2672M5	29.070	ng/mL	
20) C2-Benzo(b)thiophenes	24.558	162	9613m	104.585	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	22951m	249.696	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	28186M5	306.650	ng/mL	
23) Biphenyl	23.881	154	8339	93.175	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	23649	370.500	ng/mL#	100
25) Dibenzofuran	26.967	168	41328	417.097	ng/mL	96
26) Acenaphthylene	25.582	152	84721	764.276	ng/mL#	100
27) Acenaphthene	26.320	153	33095M3	463.814	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	9393M3	157.287	ng/mL	
29) Fluorene	28.352	166	56462M3	709.484	ng/mL	
30) C1-Fluorenes	30.580	180	53608M5	673.621	ng/mL	
31) C2-Fluorenes	32.928	194	71581M5	899.464	ng/mL	
32) C3-Fluorenes	35.458	208	63304m	795.458	ng/mL	
33) Dibenzothiophene	31.679	184	66997	613.478	ng/mL#	89
34) 4-Methyldibenzothiophene(	33.455	198	34241	313.538	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.771	198	33528M3	307.009	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	15704	143.798	ng/mL#	100
37) OTP	33.877	198	4300M3	39.374	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	101457m	929.022	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	142290M5	1302.922	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	133634m	1223.660	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	82278M5	753.403	ng/mL	
43) Phenanthrene	32.176	178	958032	8622.560	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.148	192	123553	1112.012	ng/mL	97
45) 2-Methylphenanthrene(2MP)	34.253	192	143174	1288.607	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	59119M3	532.088	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.599	192	135203M3	1216.865	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.690	192	93056	837.530	ng/mL	97
49) C1-Phenanthrenes/Anthrace	34.253	192	561009M5	5049.240	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.436	206	391536M5	3523.935	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
52)	C3-Phenanthrenes/Anthrace	38.288	220	192958M5	1736.677	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.471	234	72104M5	648.956	ng/mL	
55)	Anthracene	32.356	178	234070M3	2437.311	ng/mL	
56)	Carbazole	33.034	167	44922M3	454.500	ng/mL	
57)	1-Methylphenanthrene	34.690	192	93056	1097.799	ng/mL	99
58)	Fluoranthene	36.993	202	2429395M3	19799.216	ng/mL	
59)	Benzo(b)fluorene	39.508	216	226829M3	2774.245	ng/mL	
60)	Pyrene	37.867	202	2192672	17581.357	ng/mL	96
61)	C1-Fluoranthenes/Pyrenes	39.267	216	1221867m	9797.215	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.330	230	459083M5	3681.035	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.227	244	199824m	1602.236	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.522	258	153704M5	1232.435	ng/mL	
66)	Naphthobenzothiophene	41.721	234	151752	1233.697	ng/ml#	66
67)	Naphthobenzothiophene-2,1	41.721	234	151752	1233.697	ng/mL#	66
68)	Naphthobenzothiophene-1,2	42.067	234	33715	274.092	ng/mL#	16
69)	Naphthobenzothiophene-2,3	42.368	234	56251M3	457.303	ng/mL	
70)	C1-Naphthobenzothiophenes	43.136	248	144861M5	1177.675	ng/ml	
71)	C2-Naphthobenzothiophenes	44.657	262	112122M5	911.517	ng/ml	
72)	C3-Naphthobenzothiophenes	46.780	276	82381M5	669.732	ng/ml	
73)	C4-Naphthobenzothiophenes	47.820	290	60266M5	489.944	ng/mL	
75)	Benz[a]anthracene	42.670	228	1224970M3	8793.091	ng/mL	
77)	Chrysene/Triphenylene	42.835	228	1265525	8823.739	ng/mL	99
78)	C1-Chrysenes	44.311	242	523031M5	3646.778	ng/mL	
79)	C2-Chrysenes	46.027	256	248629M5	1733.539	ng/mL	
80)	BBF-D12 Surr BKGD	46.660	256	2407	16.783	ng/mL	100
81)	C3-Chrysenes	47.067	270	168054M5	1171.739	ng/mL	
82)	C4-Chrysenes	48.573	284	82652M5	576.282	ng/mL	
84)	Benzo[b]fluoranthene	46.750	252	1304377	8055.416	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	46.826	252	1216183M3	7300.318	ng/mL	
86)	Benzo[a]fluoranthene	47.112	252	319758M3	1919.395	ng/mL	
87)	Benzo[e]pyrene	47.729	252	964060	6097.465	ng/mL	93
89)	Benzo[a]pyrene	47.910	252	1473854	9741.985	ng/mL	93
90)	Perylene	48.196	252	400605	2504.111	ng/mL	92
91)	Indeno[1,2,3-cd]pyrene	52.594	276	1168748M3	6564.232	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.609	278	325730M3	1718.143	ng/mL	
93)	Benzo[g,h,i]perylene	53.859	276	1110971	5786.924	ng/mL	99
94)	Hopane (T19)	51.645	191	42675M3	794.843	ng/mL	
96)	C23 Tricyclic Terpane (T4	40.351	191	10357	192.904	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.089	191	6519	121.420	ng/ml	100
98)	C25 Tricyclic Terpane (T6	42.624	191	6877M3	128.088	ng/ml	
99)	C24 Tetracyclic Terpane (	43.889	191	2941	54.778	ng/ml	100
100)	C26 Tricyclic Terpane-22S	43.648	191	2896M3	53.939	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.754	191	2383	44.385	ng/ml	100
102)	C28 Tricyclic Terpane-22S	46.058	191	2589M3	48.221	ng/ml	
103)	C28 Tricyclic Terpane-22R	46.223	191	3013M3	56.119	ng/ml	
104)	C29 Tricyclic Terpane-22S	46.735	191	3371	62.787	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.931	191	2858	53.232	ng/ml	100
106)	18a-22,29,30-Trisnorneoho	48.000	191	5635	104.955	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.121	191	2944M3	54.833	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.347	191	3832	71.373	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	48.527	191	10256M3	191.023	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	49.687	191	5262M3	98.007	ng/ml	
111)	17a(H),21b(H)-25-Norhopan	49.506	191	4127	76.867	ng/ml	100
112)	30-Norhopane (T15)	50.335	191	32680	608.681	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	50.425	191	5802M3	108.065	ng/ml	
114)	17a(H)-Diahopane (X)	50.561	191	2054M3	38.257	ng/ml	
115)	30-Normoretane (T17)	51.088	191	3709	69.082	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	51.479	191	1338M3	24.921	ng/ml	
117)	Moretane (T20)	52.323	191	4848M3	90.296	ng/ml	
118)	30-Homohopane-22S (T21)	53.392	191	20381	379.606	ng/ml	100
119)	30-Homohopane-22R (T22)	53.618	191	15592	290.409	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120) Gammacerane/C32-diahopane	54.130	191	6775	126.188	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.852	191G	25086M3	467.239	ng/ml	
122) 30,31-Bishomohopane-22R (	55.259	191	9858	183.610	ng/ml	100
123) 30,31-Trishomohopane-22S	56.946	191	11878	221.234	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	6257	116.540	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	9869	183.815	ng/ml	100
126) Tetrakishomohopane-22R (T	60.334	191	3513M3	65.431	ng/ml	
127) Pentakishomohopane-22S (T	62.517	191	8897	165.711	ng/ml	100
128) Pentakishomohopane-22R (T	63.767	191	5922	110.300	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	2847M3	100.974	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.305	217	1507	53.448	ng/ml	100
132) 13b,17a-20S-Methyldiachol	45.997	217	1422M3	50.434	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.871	217	5744	203.720	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.383	217	6476	229.682	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1133	40.184	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	443	15.712	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2626M3	93.135	ng/ml	
138) 14a,17a-20R-Methylcholest	48.753	217	2474M3	87.744	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	4521M3	160.345	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	4550M3	161.373	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	3718	131.865	ng/ml	100
142) 14b(H),17b(H)-20S-Cholest	47.036	218	3701M3	131.262	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	3630	128.744	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.301	218	5086M3	180.383	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	6964M3	246.990	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.371	218	5435M3	192.761	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	14171	502.598	ng/mL	100
148) C28,20S-triaromatic stero	49.883	231	12773M3	453.015	ng/mL	
149) C27,20R-triaromatic stero	50.320	231	9502	337.004	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	10659M3	378.039	ng/mL	

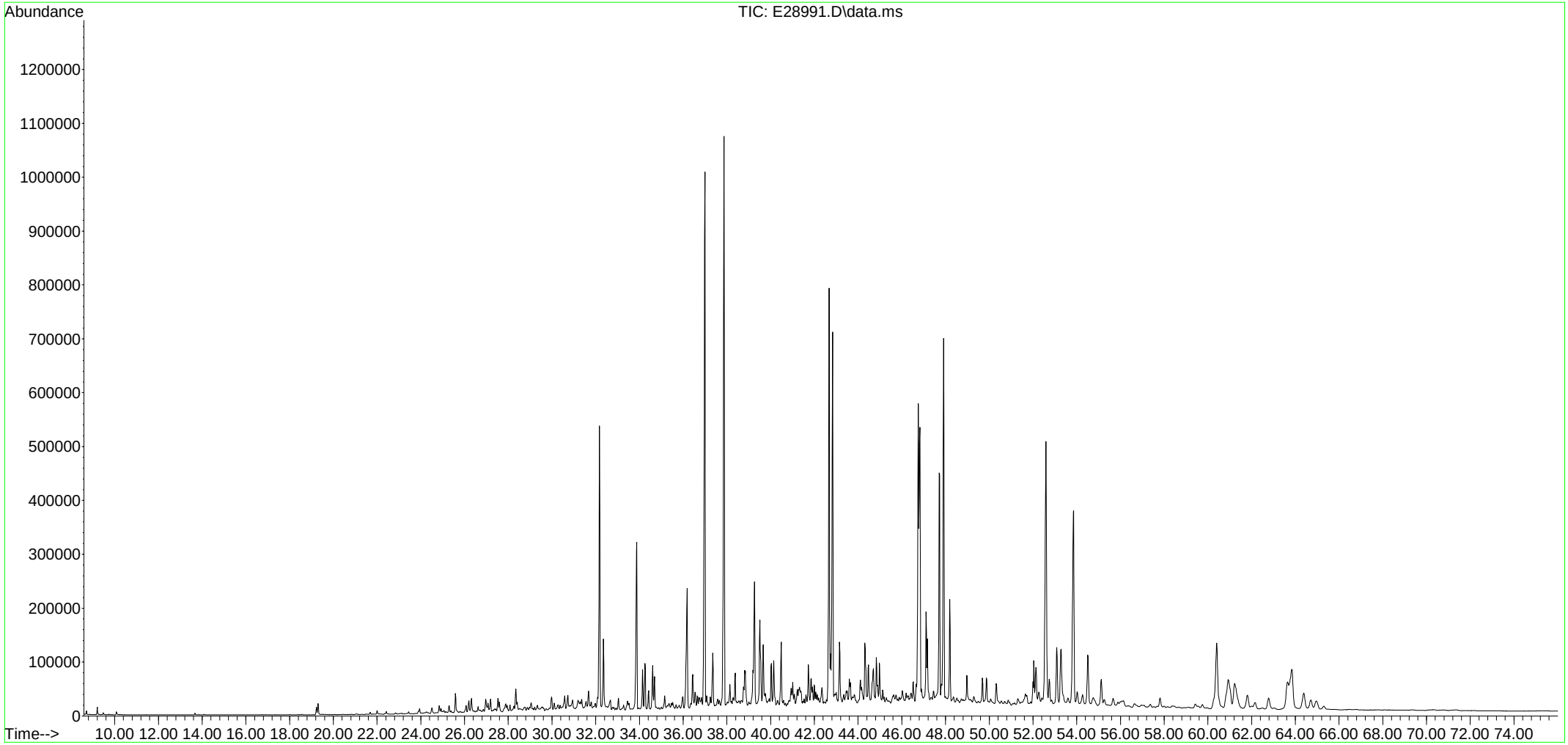
(#) = qualifier out of range (m) = manual integration (+) = signals summed

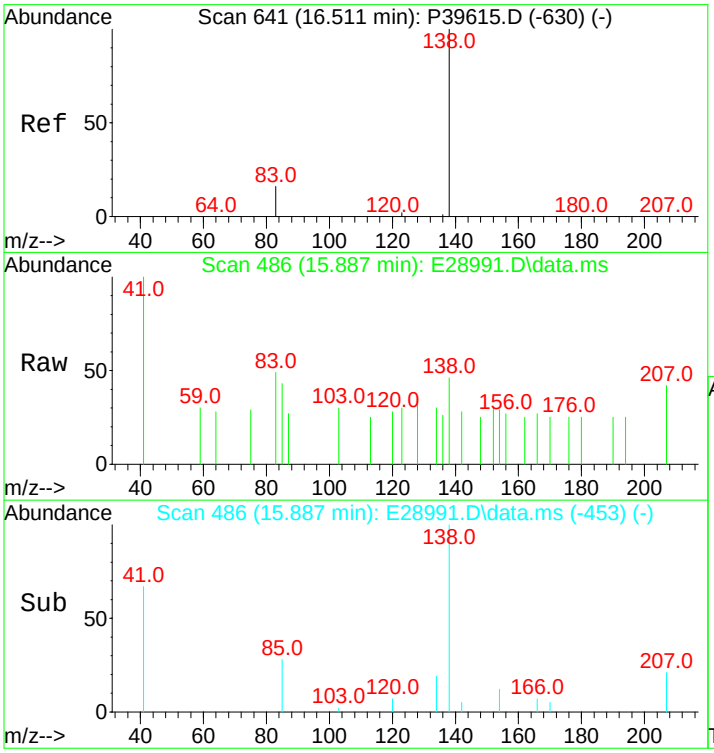
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28991.D
Acq On : 15 Nov 2012 1:47 pm
Operator : AC
Sample : 1210081-07
Misc : 1X
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 16 13:34:06 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

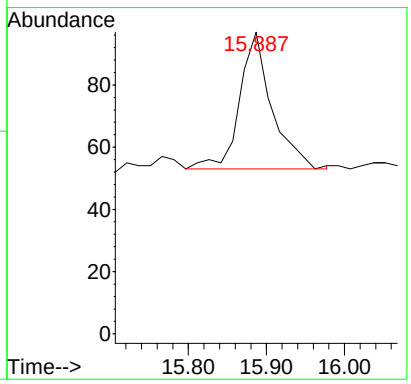
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

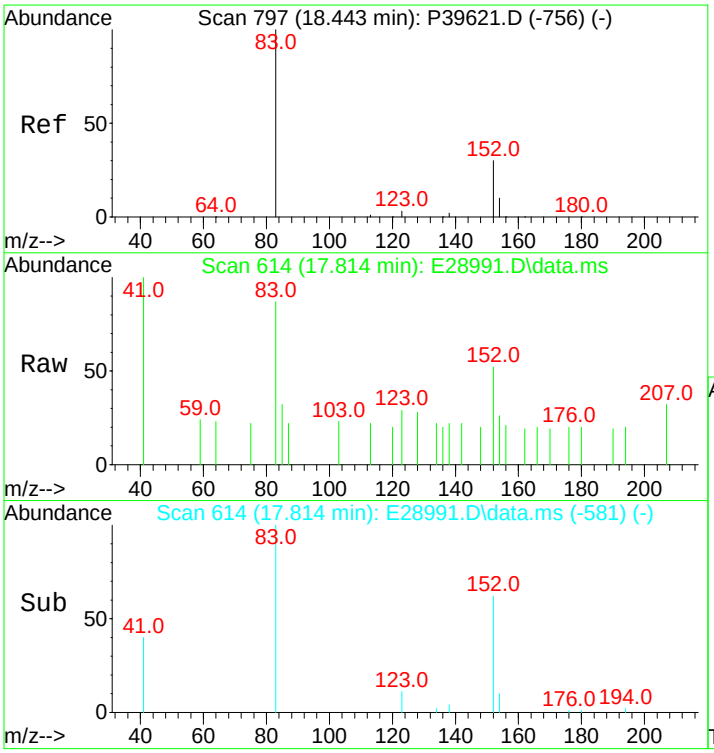




#3
trans-Decalin
Concen: 5.57 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

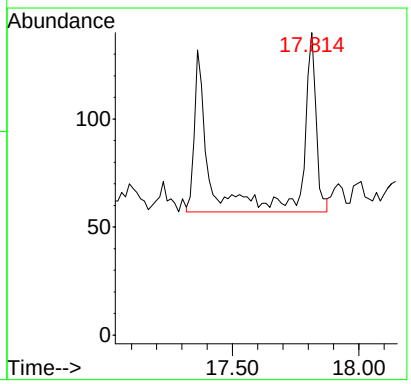
Tgt Ion:138 Resp: 126

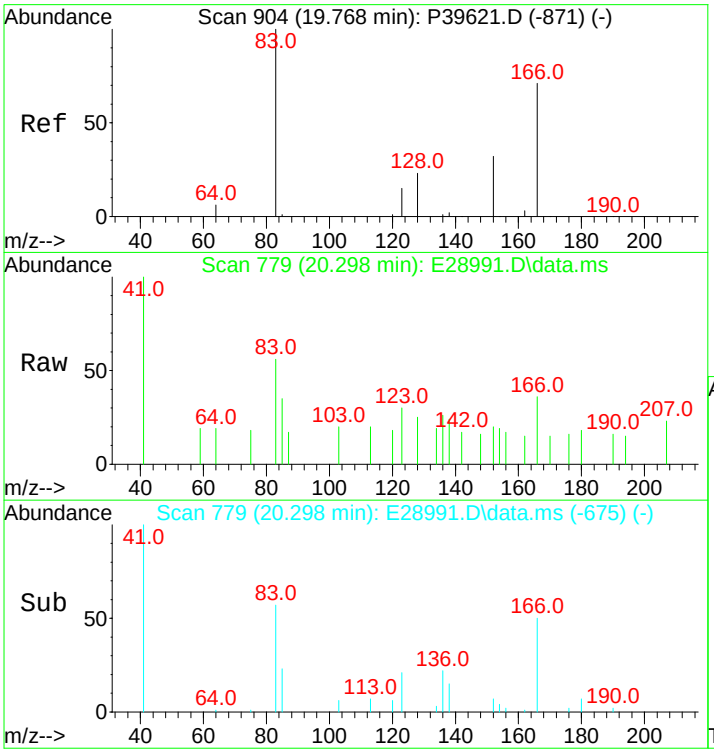




#5
C1-Decalins
Concen: 23.66 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

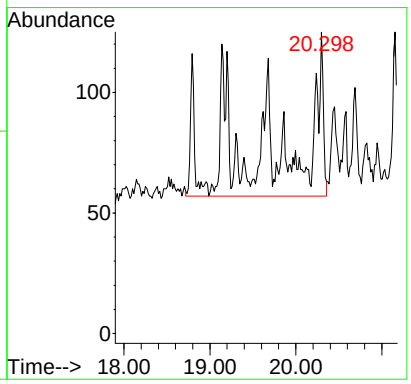
Tgt Ion:152 Resp: 535

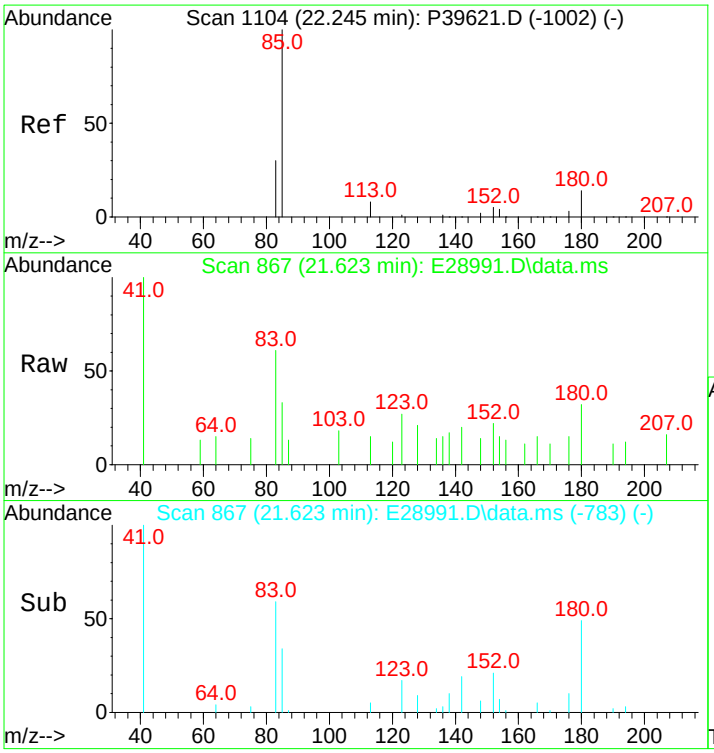




#6
C2-Decalins
Concen: 76.74 ng/mL m
RT: 20.298 min Scan# 779
Delta R.T. 0.955 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

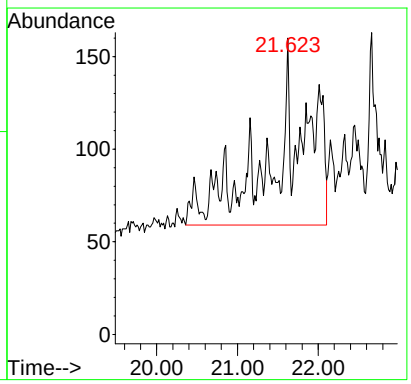
Tgt Ion:166 Resp: 1735

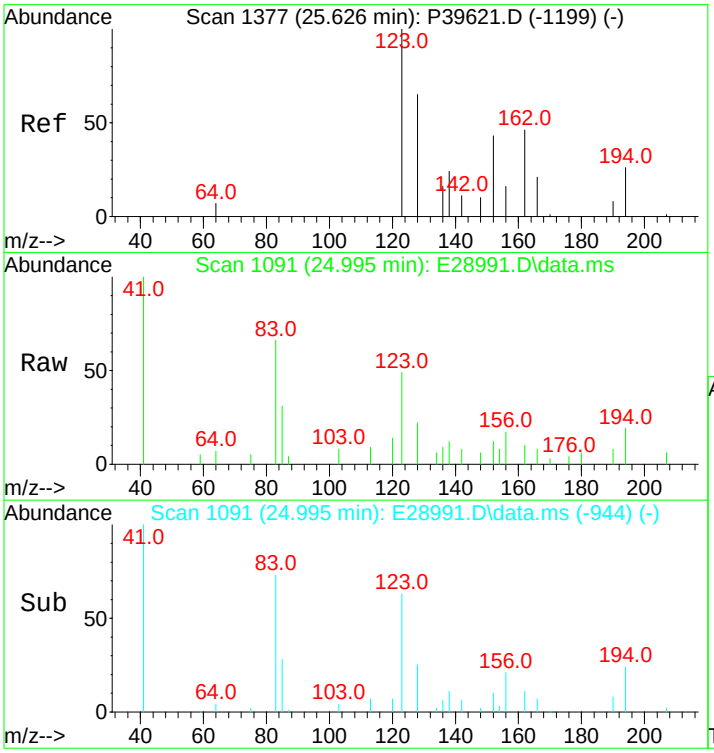




#7
C3-Decalins
Concen: 137.46 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

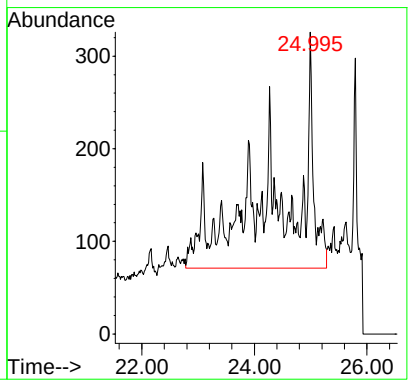
Tgt Ion:180 Resp: 3108

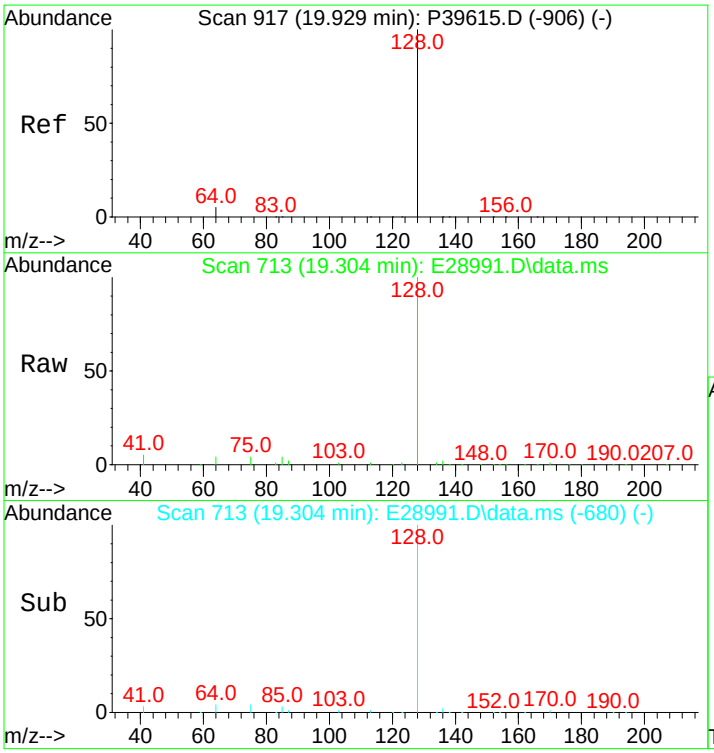




#8
C4-Decalins
Concen: 380.67 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:194 Resp: 8607

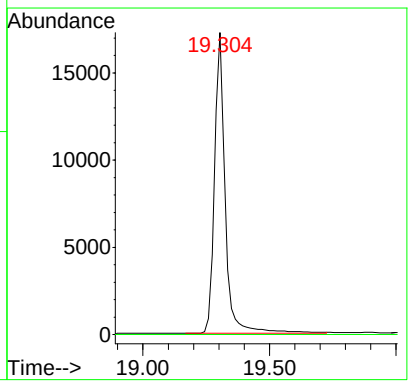


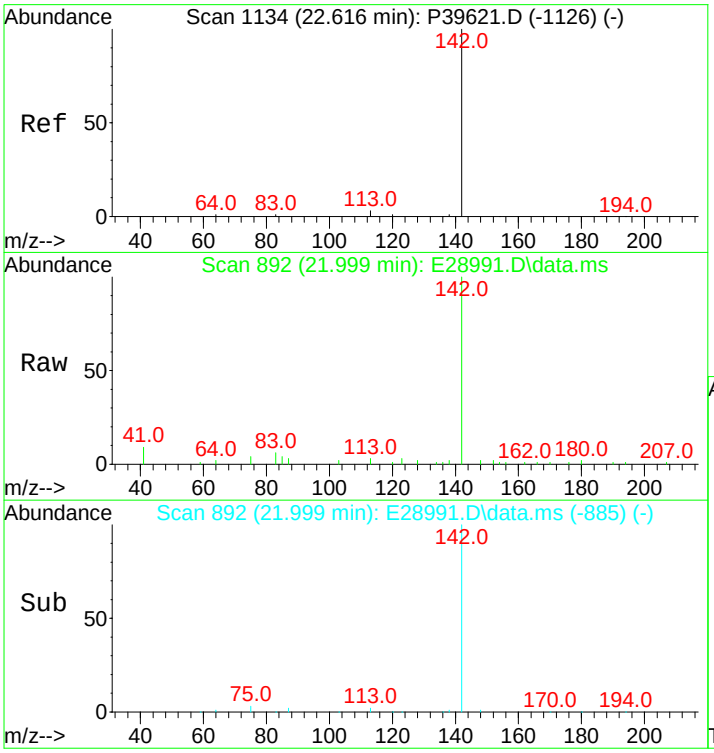


#10
Naphthalene
Concen: 451.99 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:128 Resp: 50255

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

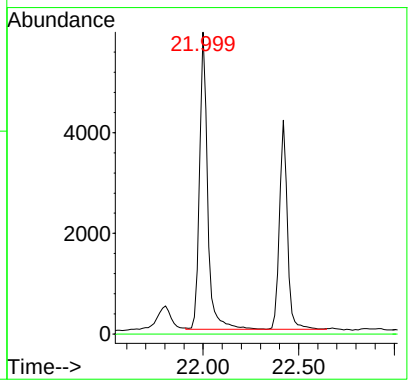


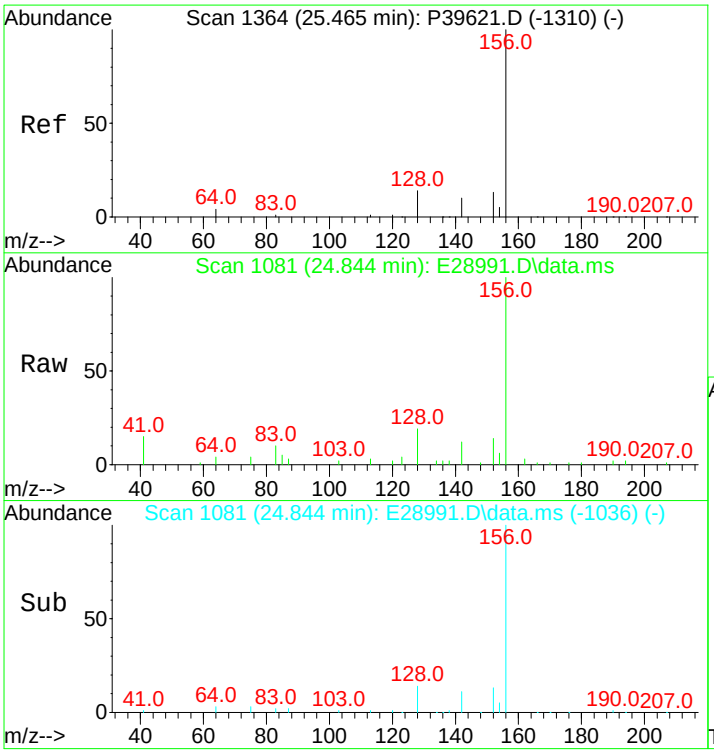


#11
C1-Naphthalenes
Concen: 263.02 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:142 Resp: 29244

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

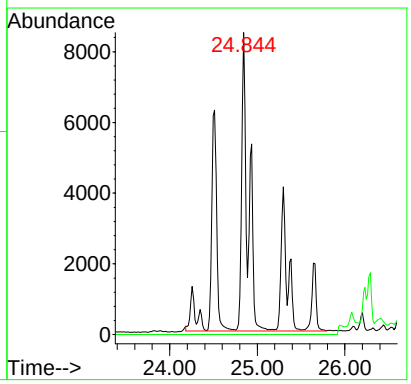


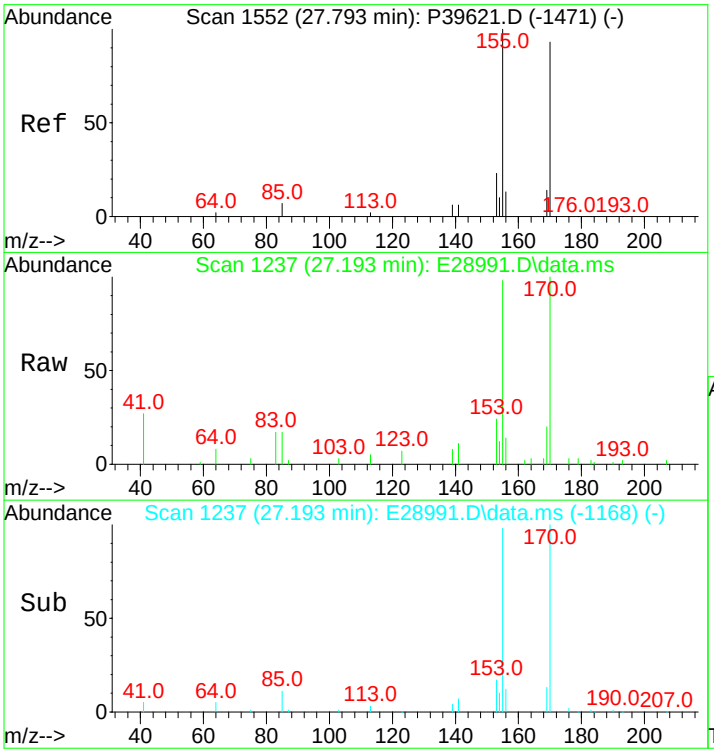


#12
C2-Naphthalenes
Concen: 882.49 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:156 Resp: 98120

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

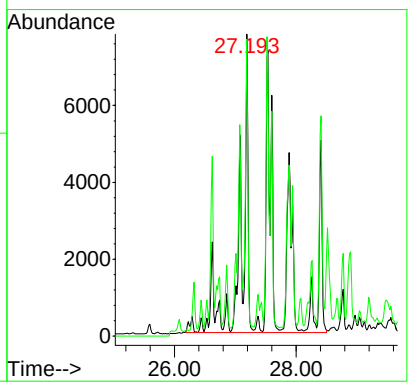


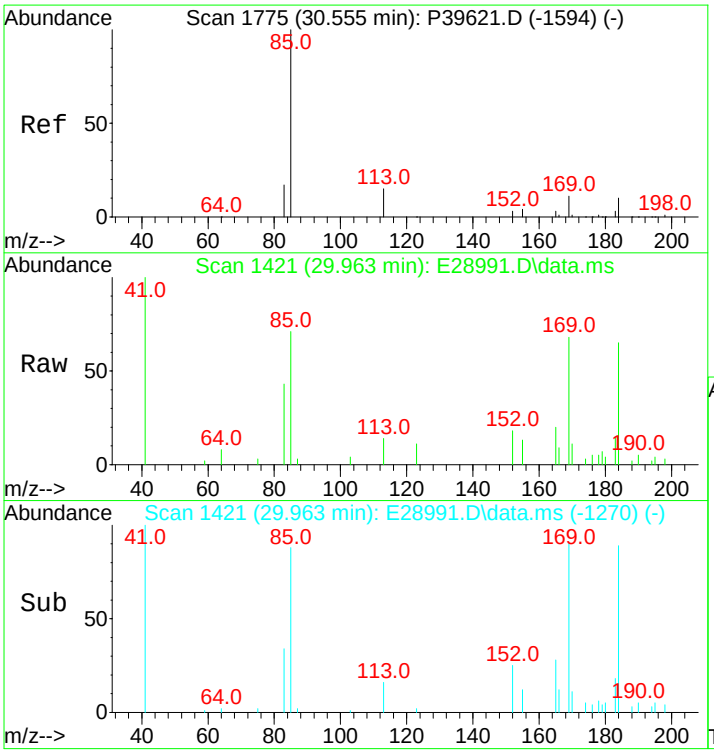


#13
C3-Naphthalenes
Concen: 1315.98 ng/mL m
RT: 27.193 min Scan# 1237
Delta R.T. 0.013 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:170 Resp: 146317

Ion	Ratio	Lower	Upper
170	100		
155	15.8	66.8	100.2#

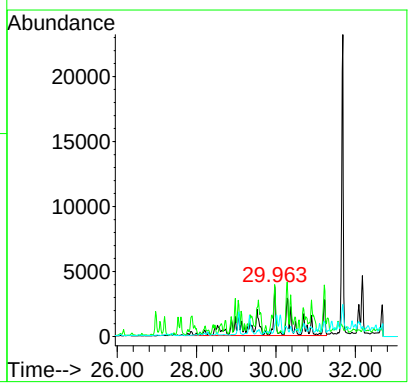


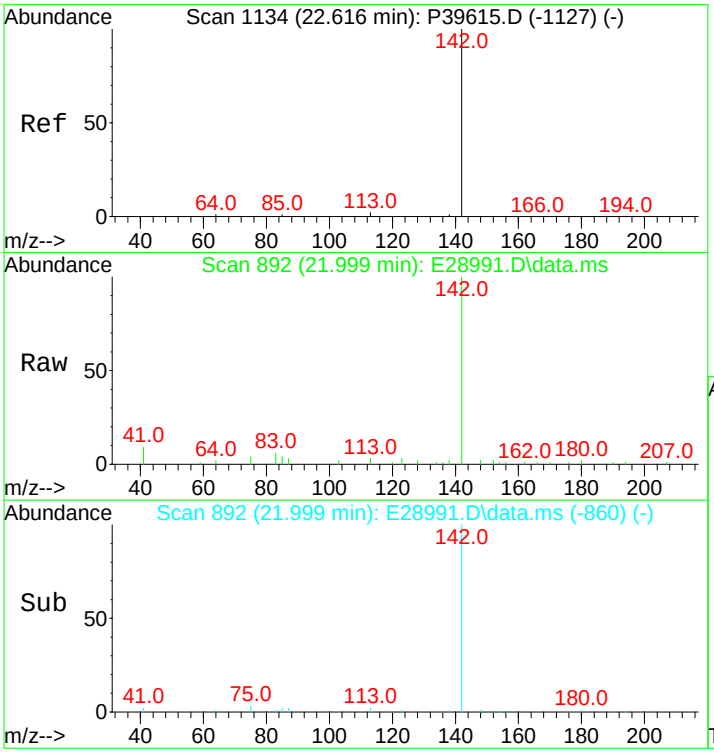


#14
C4-Naphthalenes
Concen: 1037.47 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:184 Resp: 115351

Ion	Ratio	Lower	Upper
184	100		
169	16.3	78.7	118.1#
183	0.0	26.7	40.1#

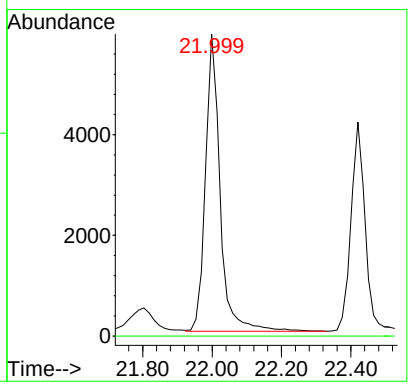


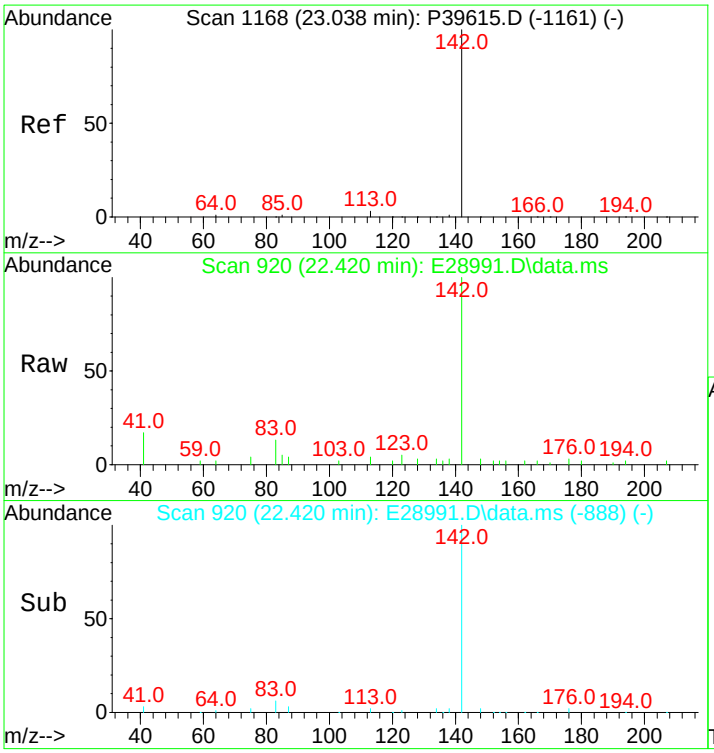


#16
2-Methylnaphthalene
Concen: 244.09 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:142 Resp: 17285

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

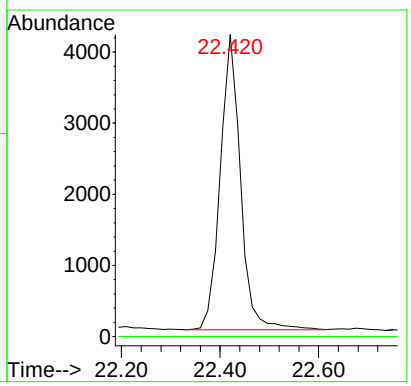


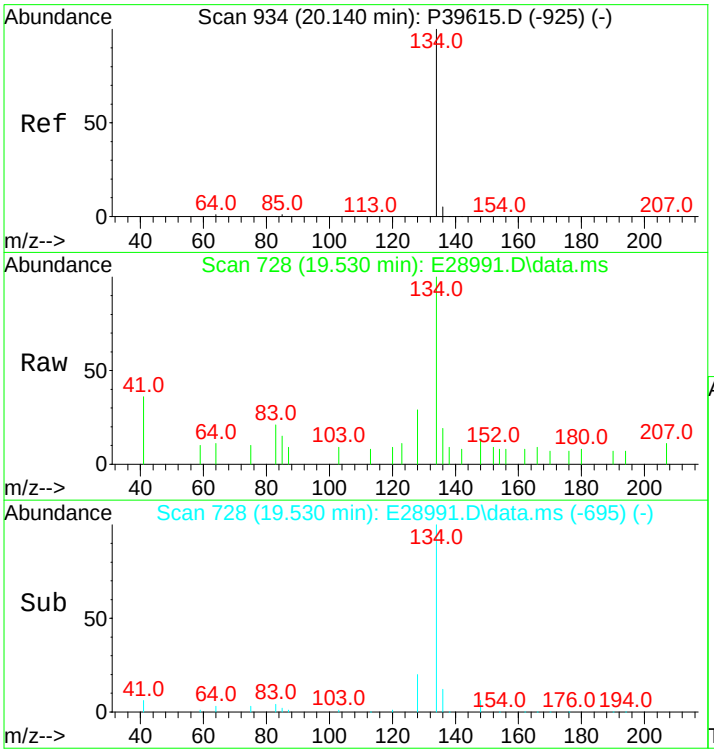


#17
1-Methylnaphthalene
Concen: 173.26 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:142 Resp: 11922

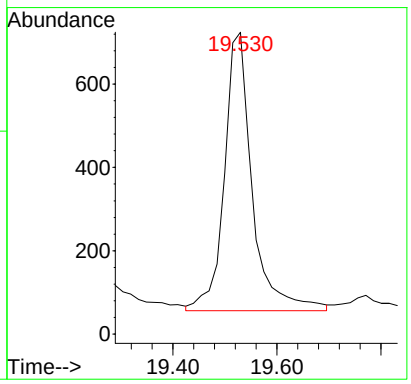
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

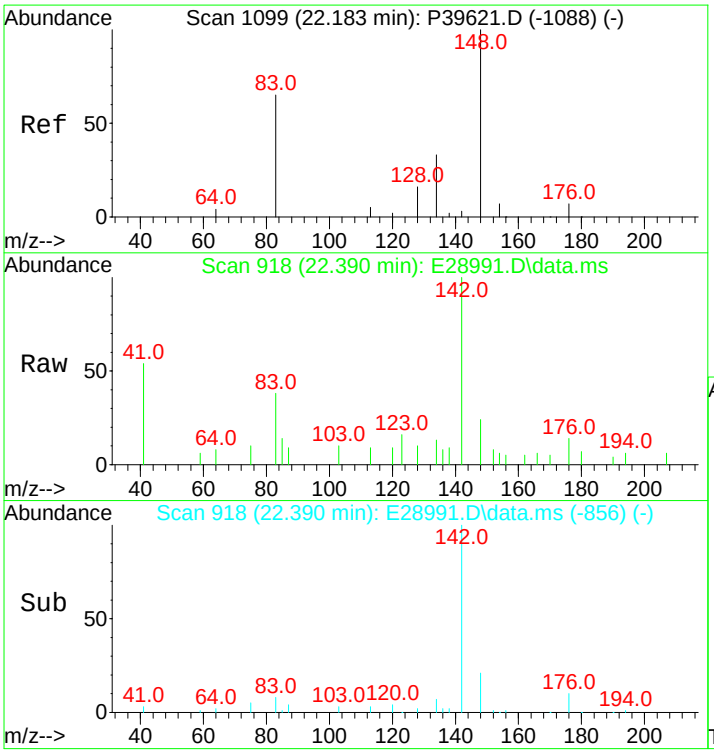




#18
Benzothiophene
Concen: 27.08 ng/mL
RT: 19.530 min Scan# 728
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

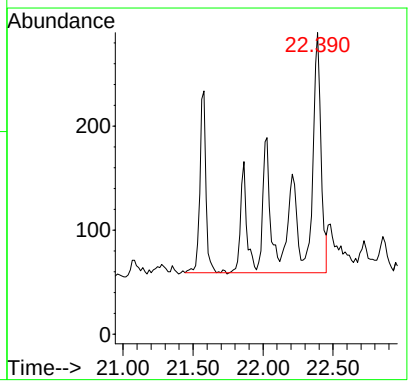
Tgt Ion:134 Resp: 2489

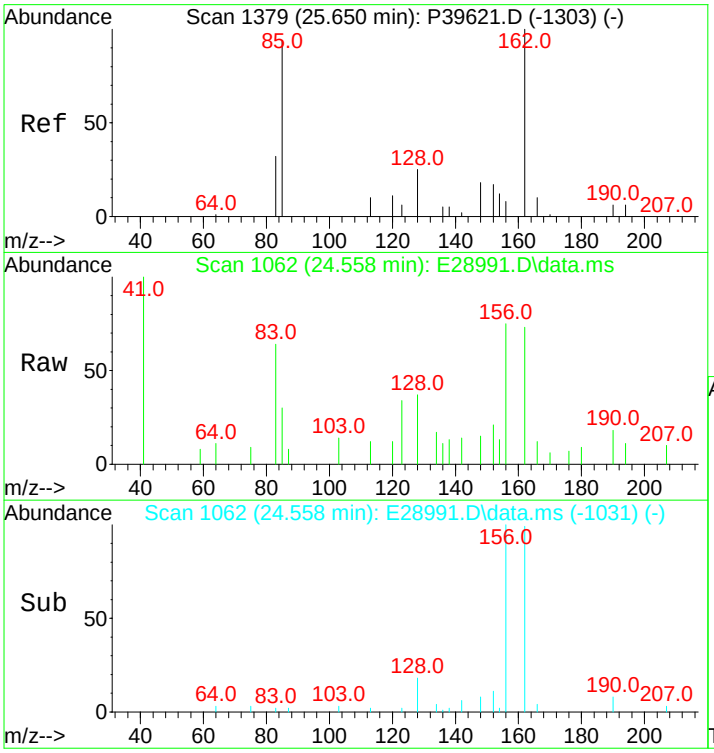




#19
C1-Benzo(b)thiophenes
Concen: 29.07 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.689 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

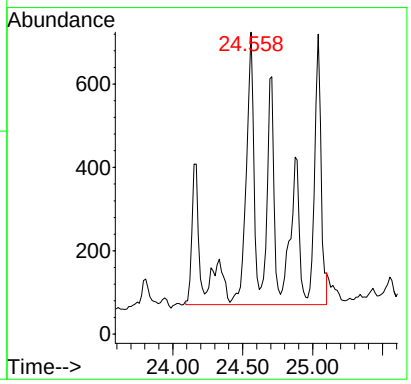
Tgt Ion:148 Resp: 2672

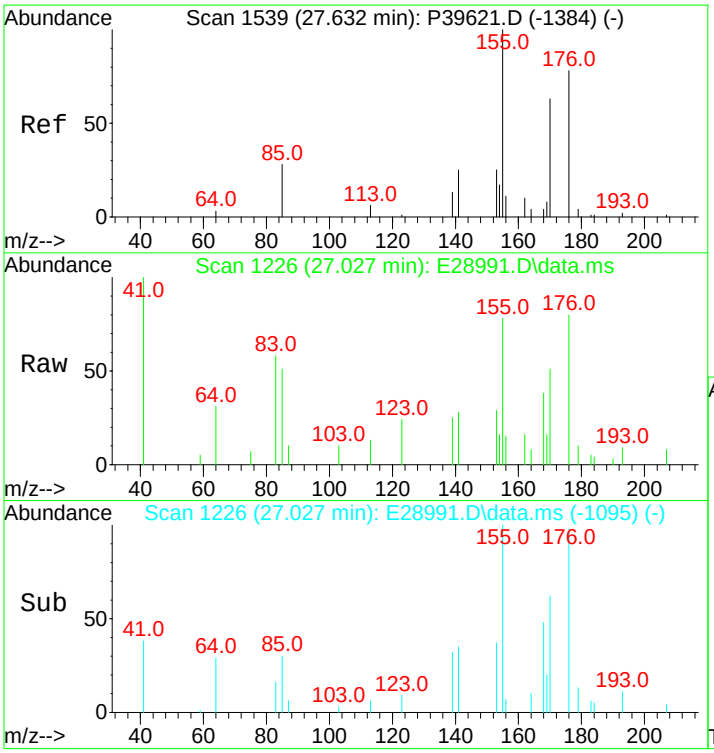




#20
C2-Benzo(b)thiophenes
Concen: 104.58 ng/mL m
RT: 24.558 min Scan# 1062
Delta R.T. -0.527 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

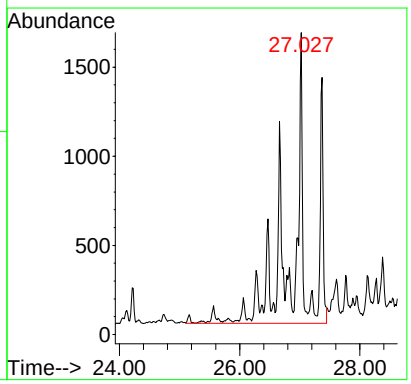
Tgt Ion:162 Resp: 9613

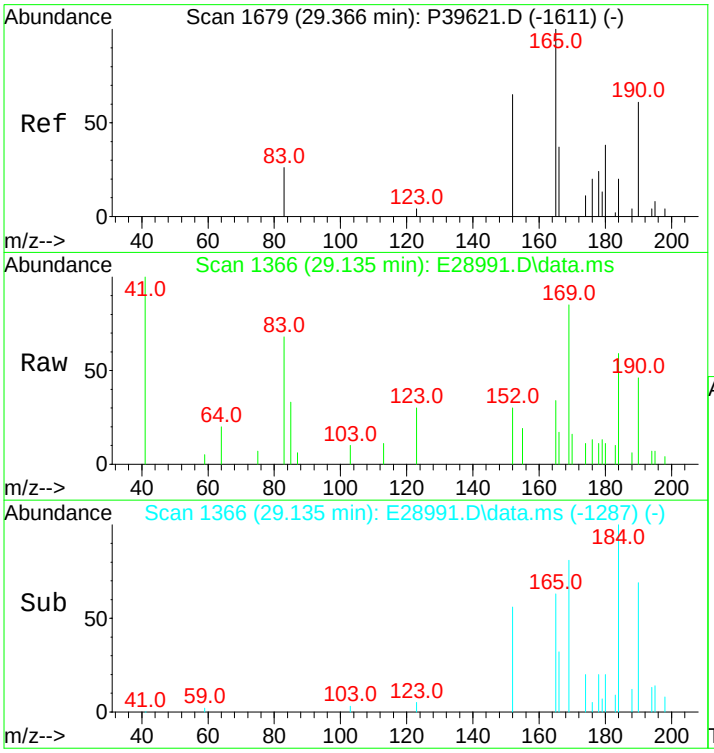




#21
C3-Benzo(b)thiophenes
Concen: 249.70 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

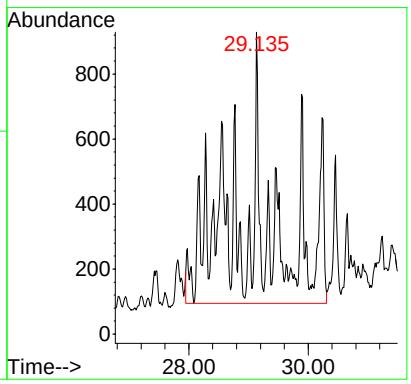
Tgt Ion:176 Resp: 22951

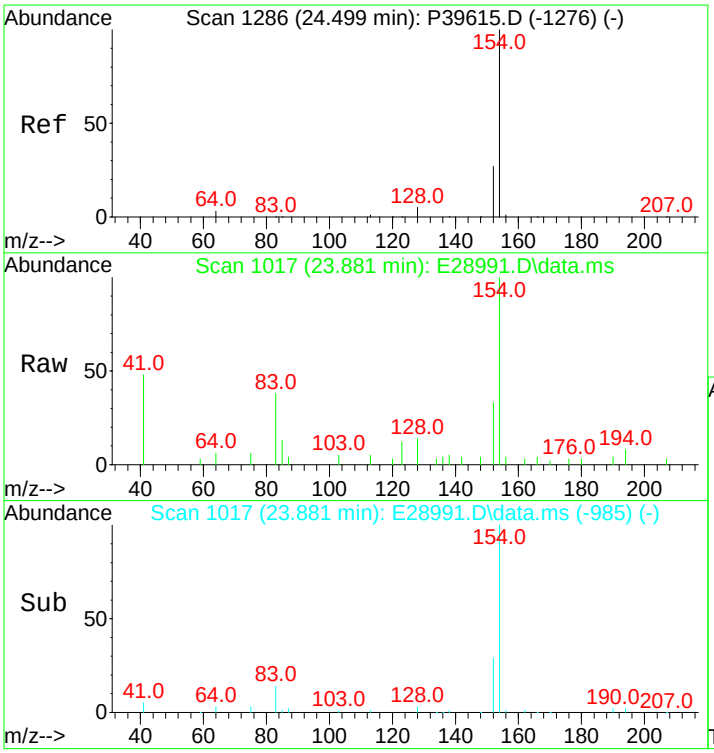




#22
C4-Benzo(b)thiophenes
Concen: 306.65 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:190 Resp: 28186

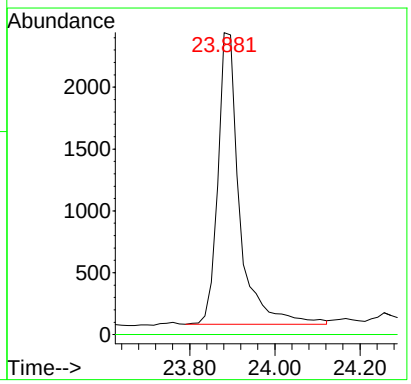


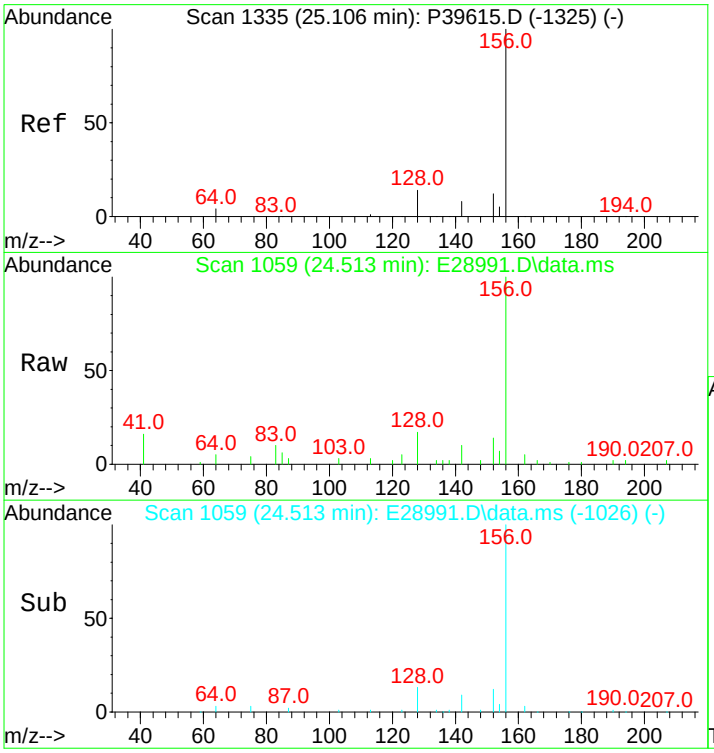


#23
Biphenyl
Concen: 93.17 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:154 Resp: 8339

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

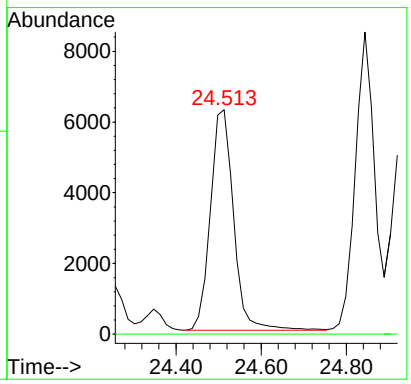


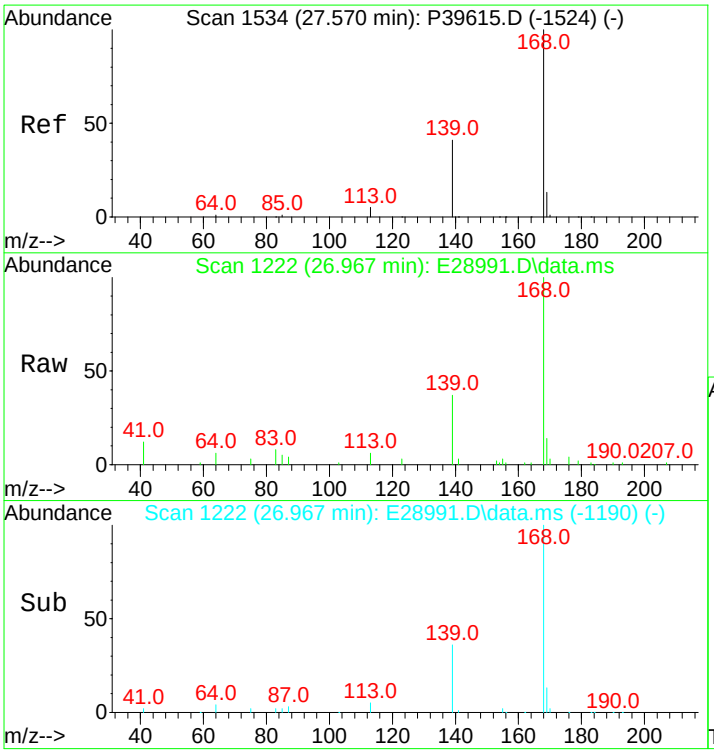


#24
2,6-Dimethylnaphthalene
Concen: 370.50 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:156 Resp: 23649

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

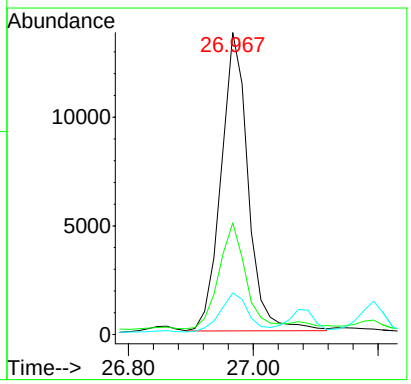


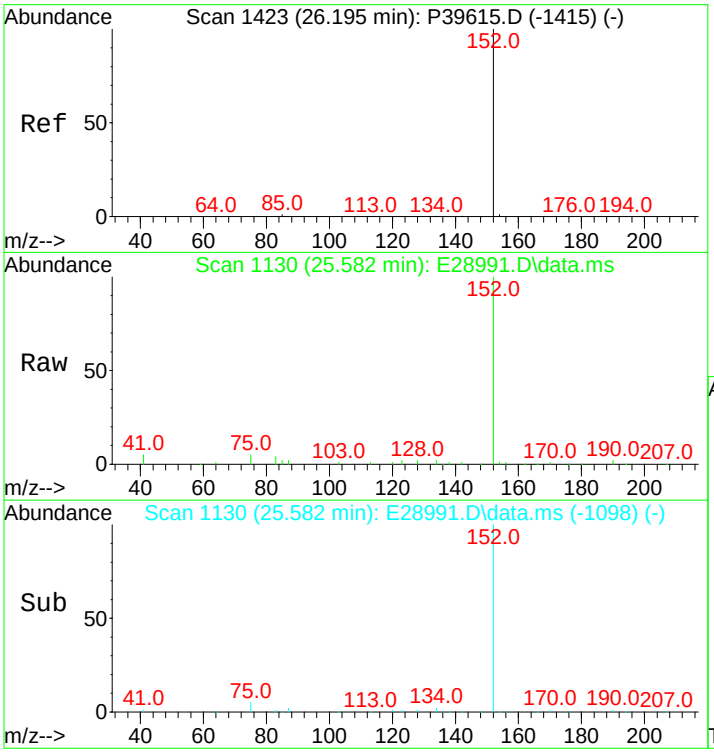


#25
Dibenzofuran
Concen: 417.10 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:168 Resp: 41328

Ion	Ratio	Lower	Upper
168	100		
139	35.0	26.0	39.0
169	13.9	10.6	16.0

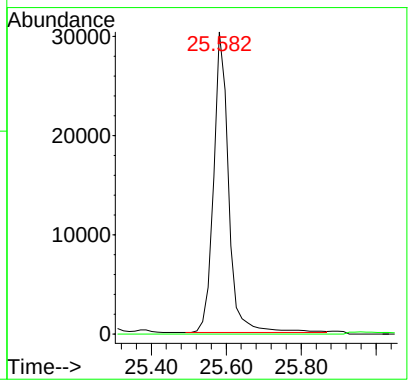


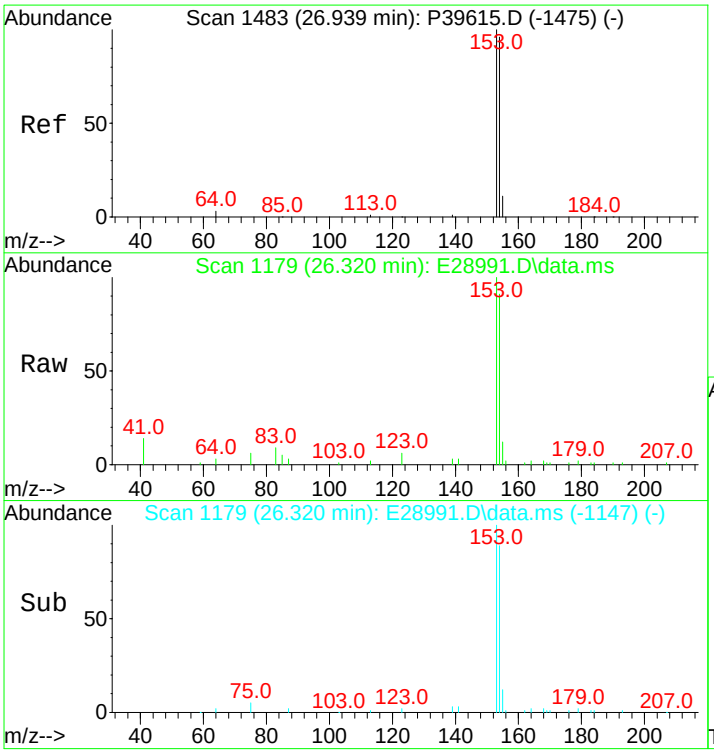


#26
Acenaphthylene
Concen: 764.28 ng/mL
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:152 Resp: 84721

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

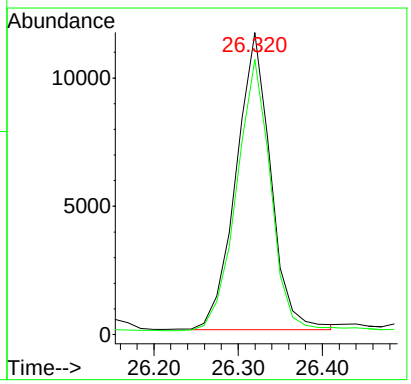


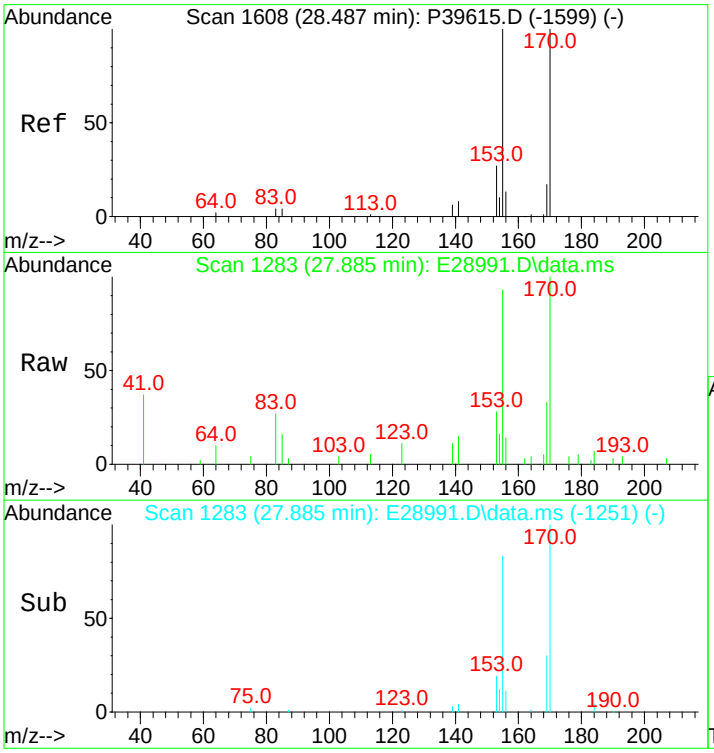


#27
Acenaphthene
Concen: 463.81 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:153 Resp: 33095

Ion	Ratio	Lower	Upper
153	100		
154	90.7	74.1	111.1

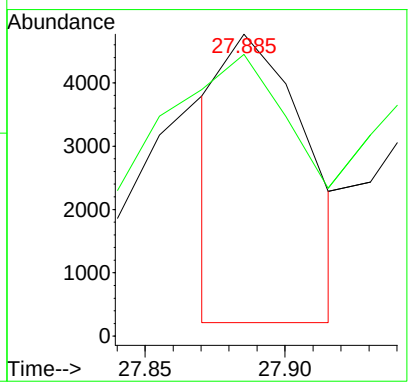


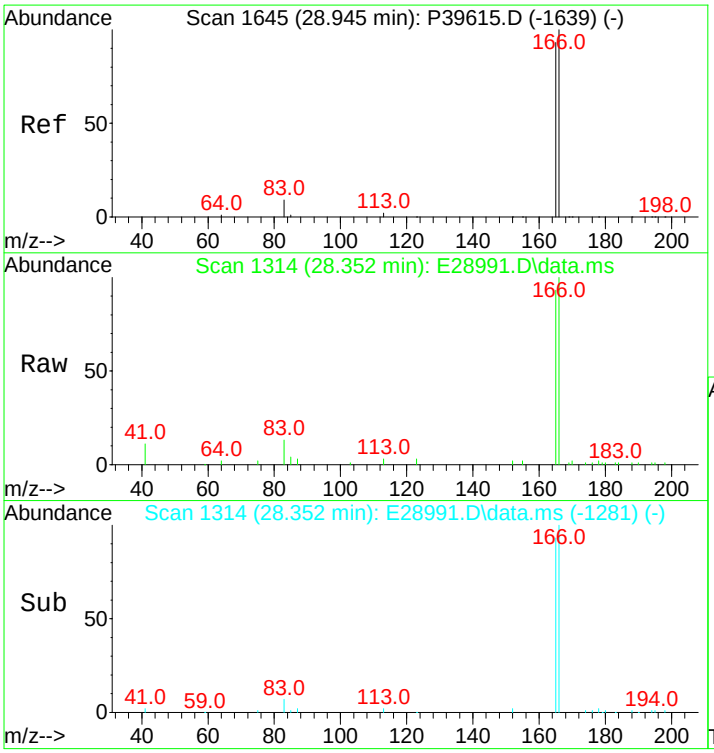


#28
2,3,5-Trimethylnaphthalene
Concen: 157.29 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:170 Resp: 9393

Ion	Ratio	Lower	Upper
170	100		
155	135.5	70.7	106.1#

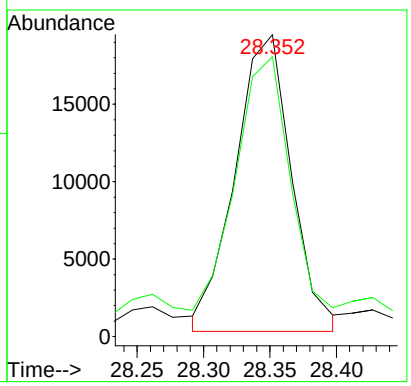


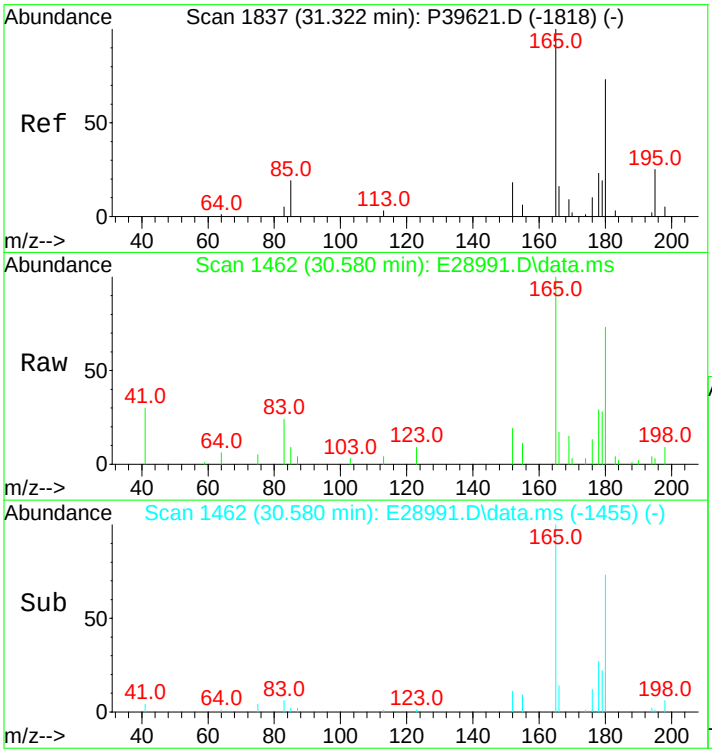


#29
Fluorene
Concen: 709.48 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:166 Resp: 56462

Ion	Ratio	Lower	Upper
166	100		
165	104.8	74.7	112.1

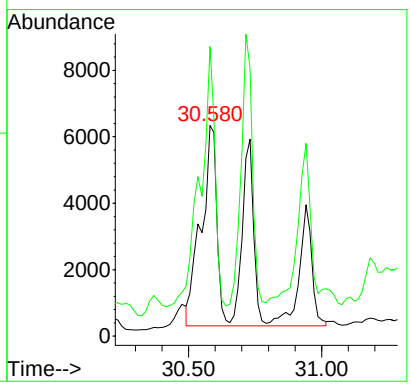


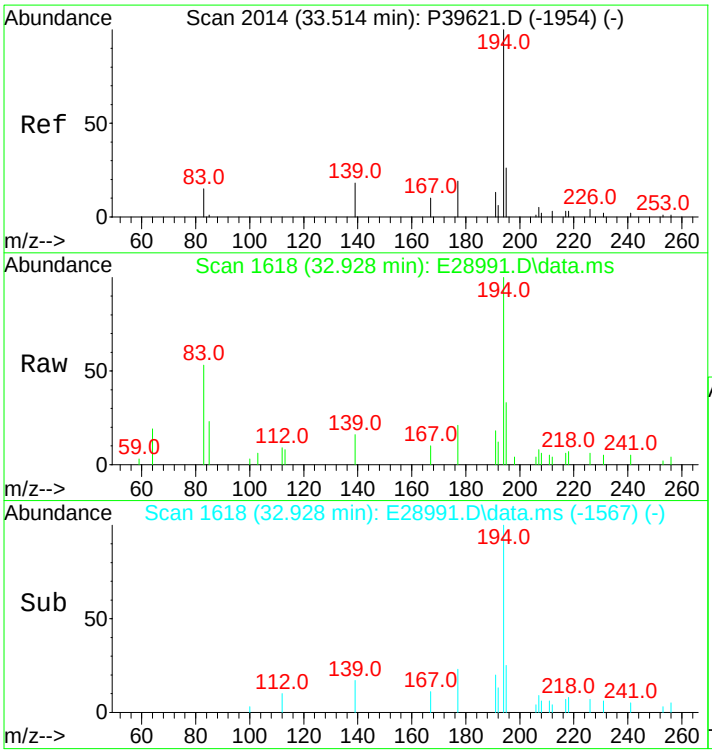


#30
C1-Fluorenes
Concen: 673.62 ng/mL m
RT: 30.580 min Scan# 1462
Delta R.T. -0.043 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:180 Resp: 53608

Ion	Ratio	Lower	Upper
180	100		
165	51.1	94.3	141.5#

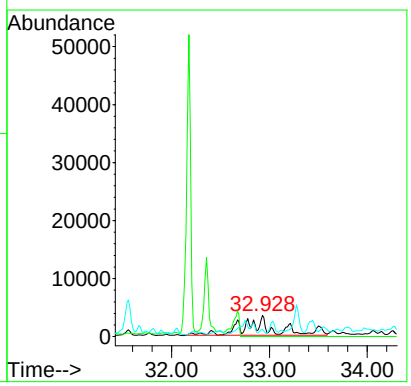


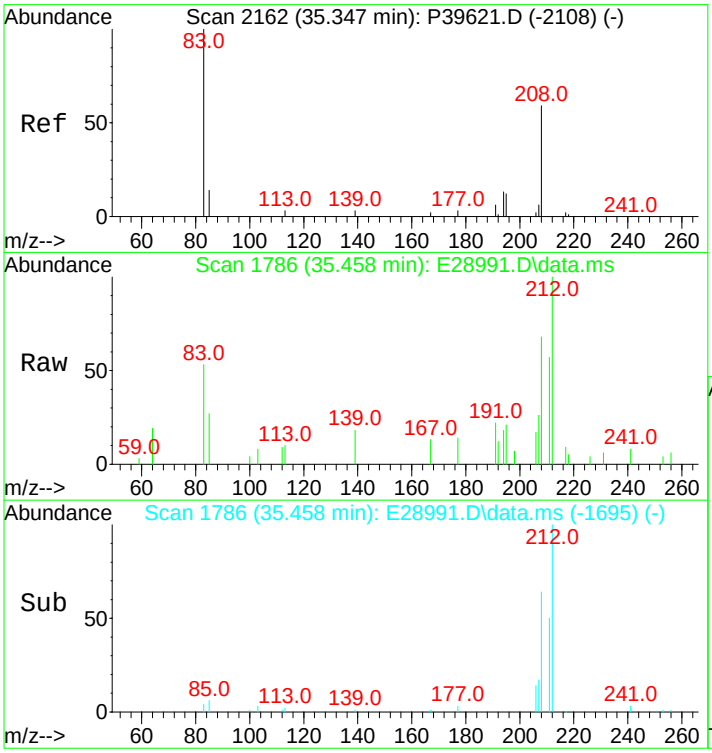


#31
C2-Fluorenes
Concen: 899.46 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:194 Resp: 71581

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.0	40.4#

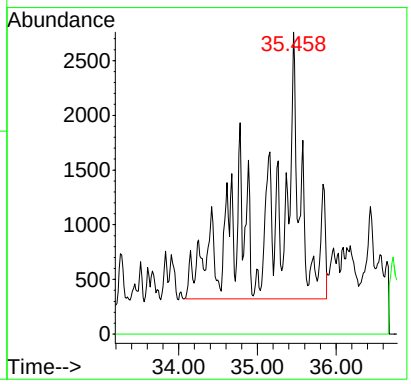


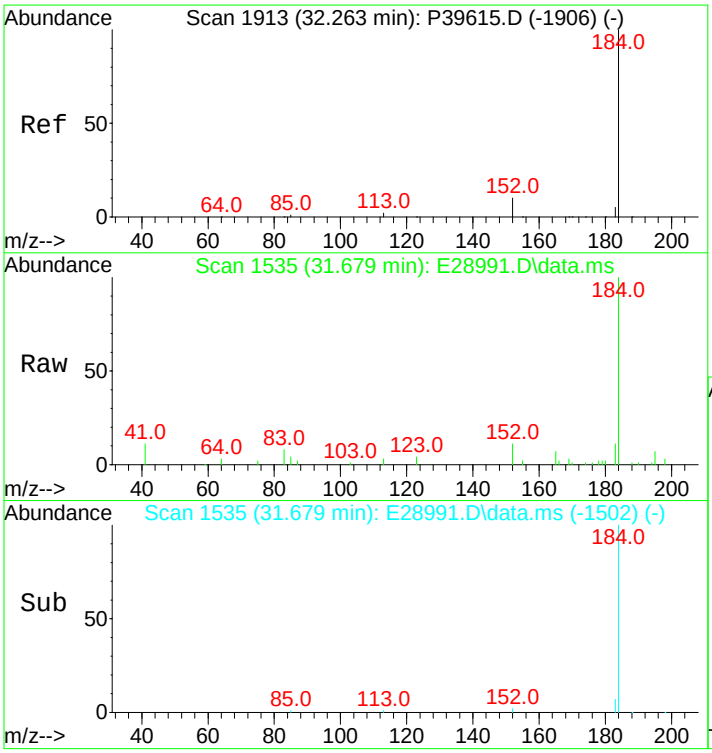


#32
C3-Fluorenes
Concen: 795.46 ng/mL m
RT: 35.458 min Scan# 1786
Delta R.T. 0.909 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:208 Resp: 63304

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

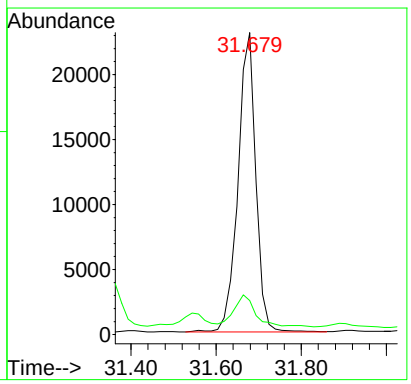


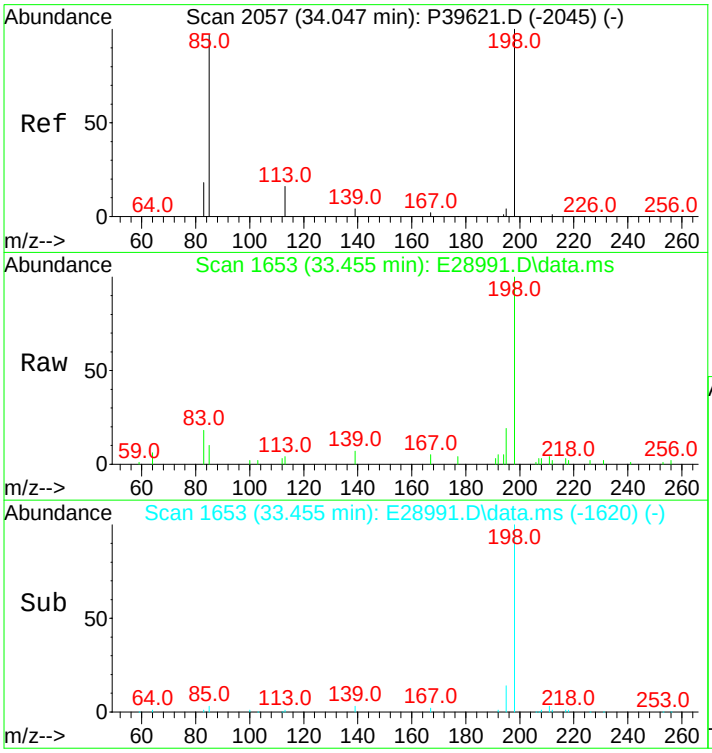


#33
Dibenzothiophene
Concen: 613.48 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:184 Resp: 66997

Ion	Ratio	Lower	Upper
184	100		
152	12.9	7.0	10.6#

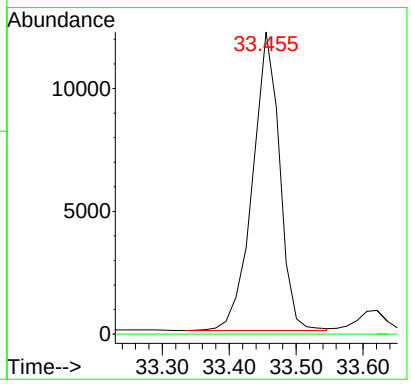


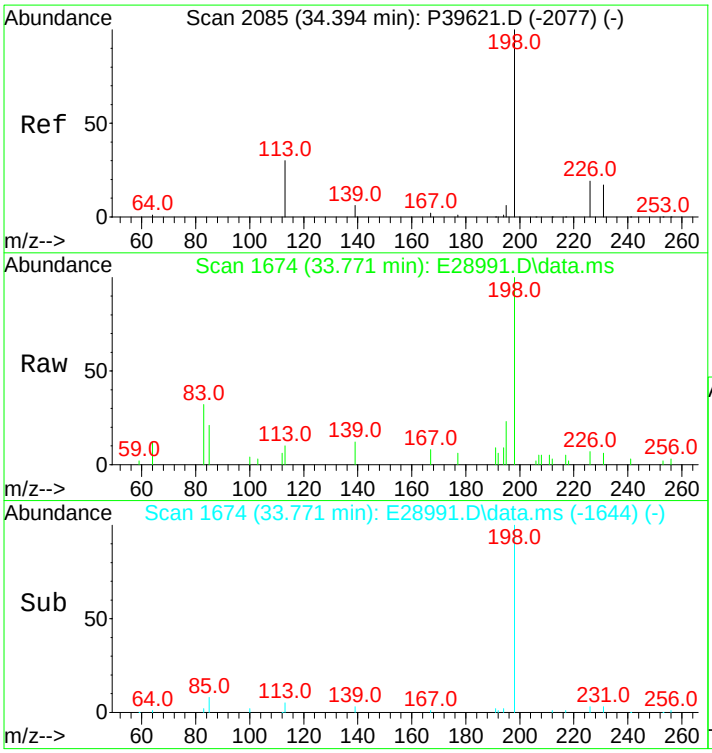


#34
4-Methyldibenzothiophene(4MDT)
Concen: 313.54 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:198 Resp: 34241

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

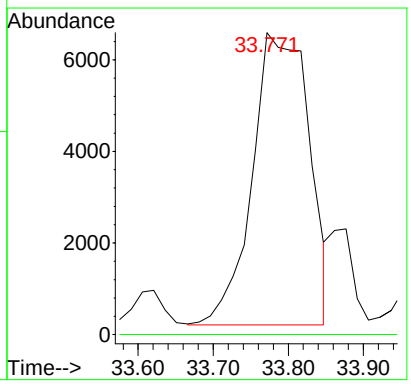


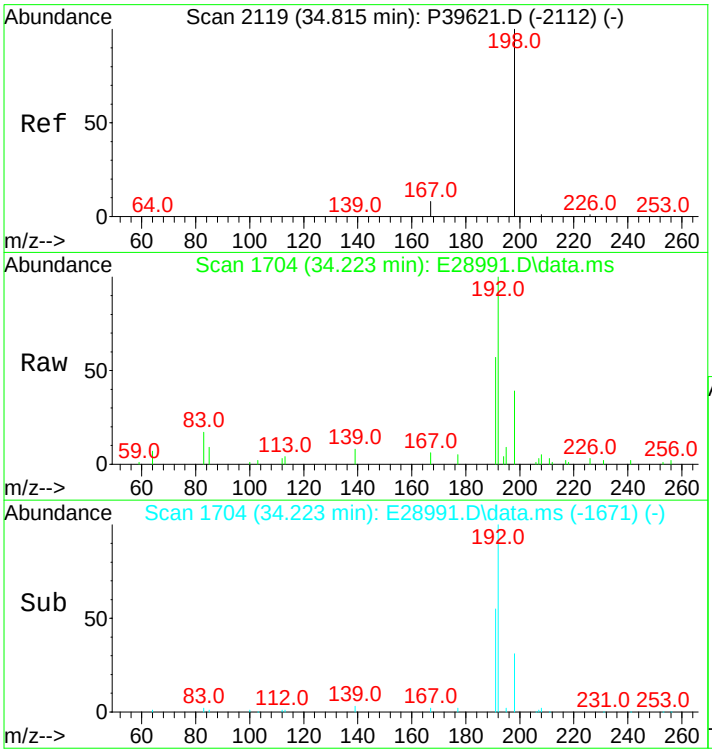


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 307.01 ng/mL m
RT: 33.771 min Scan# 1674
Delta R.T. -0.045 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:198 Resp: 33528

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

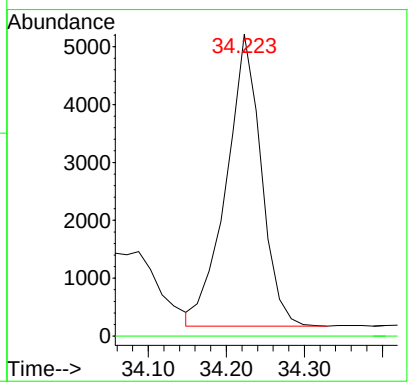


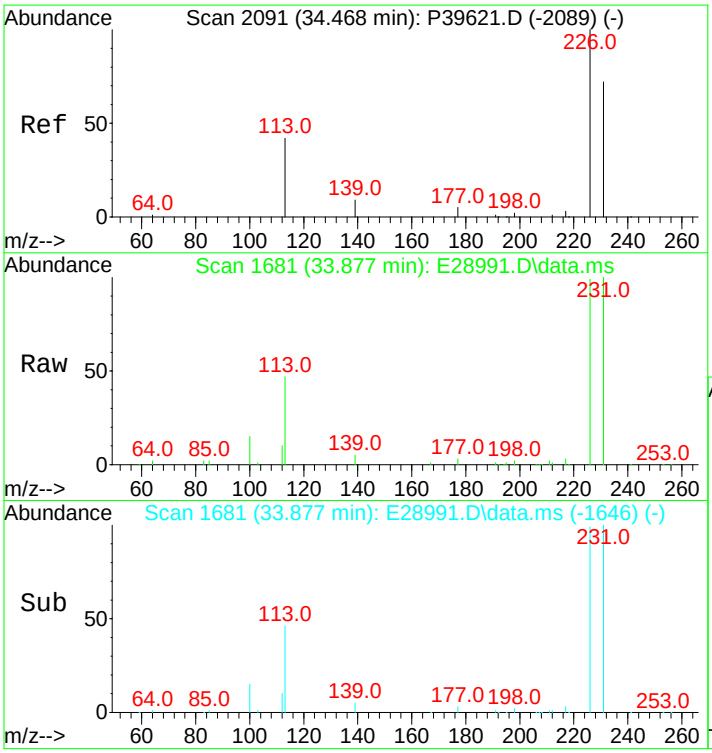


#36
1-Methyldibenzothiophene(1MDT)
Concen: 143.80 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:198 Resp: 15704

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

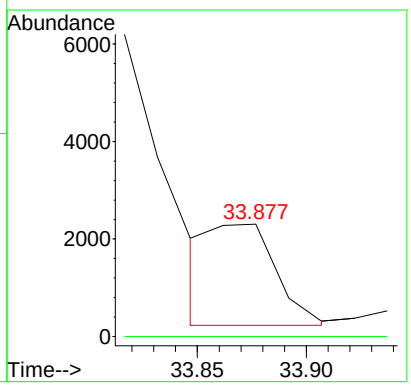


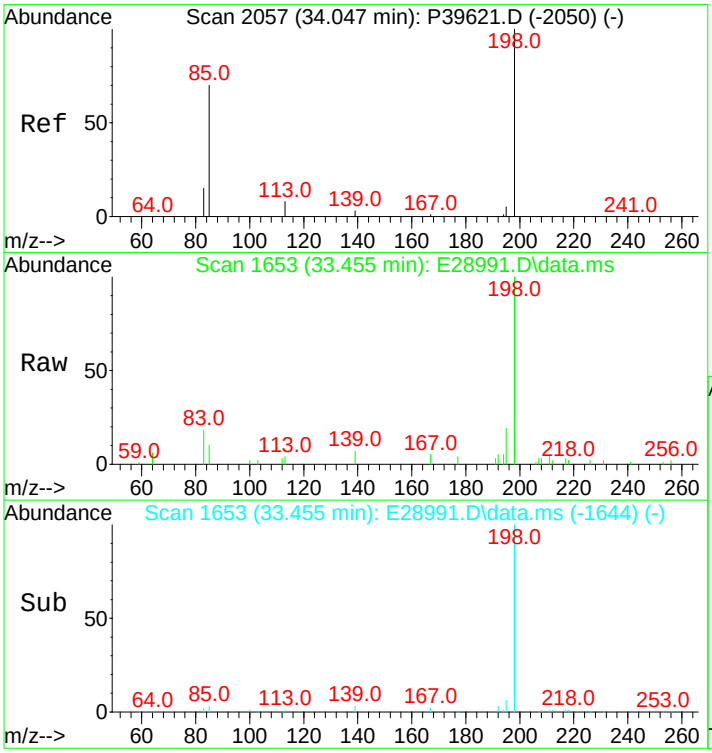


#37
OTP
Concen: 39.37 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:198 Resp: 4300

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

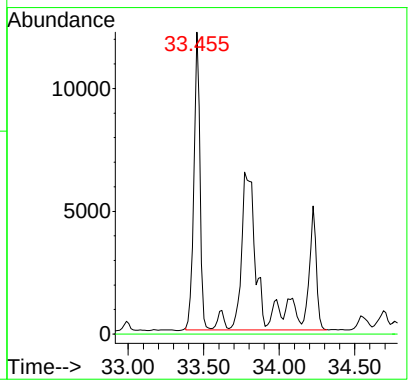


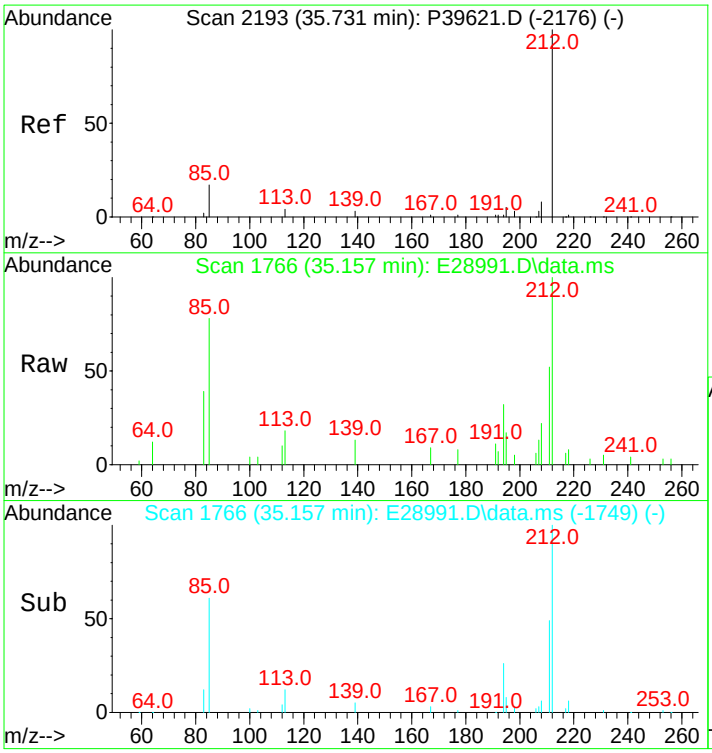


#38
C1-Dibenzothiophenes
Concen: 929.02 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:198 Resp: 101457

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

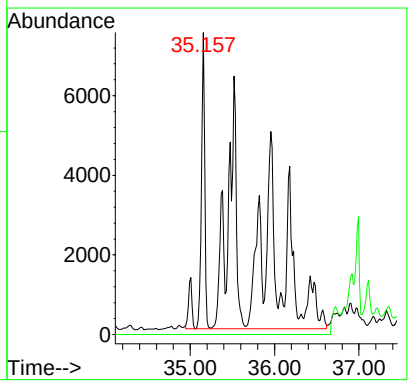


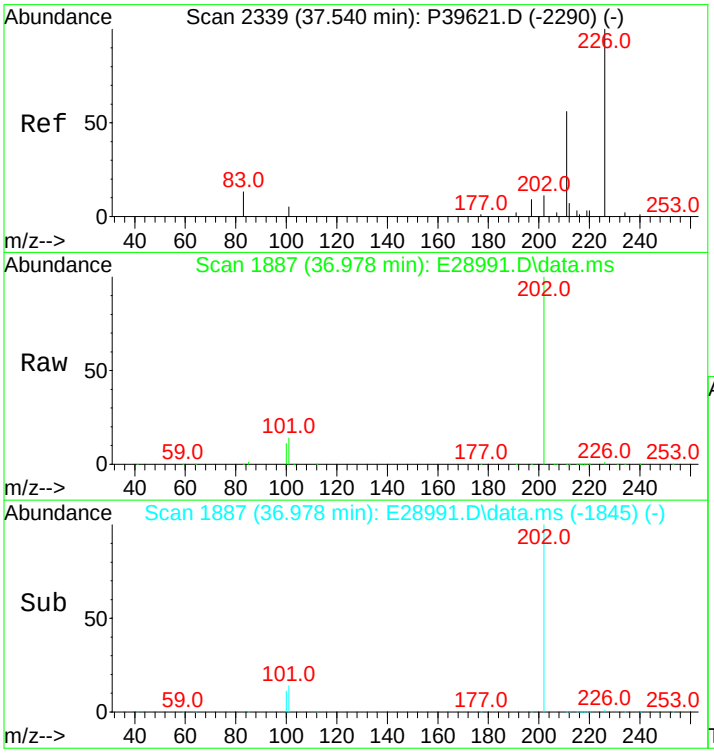


#39
C2-Dibenzothiophenes
Concen: 1302.92 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:212 Resp: 142290

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

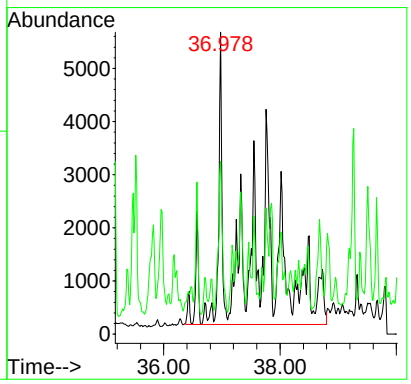


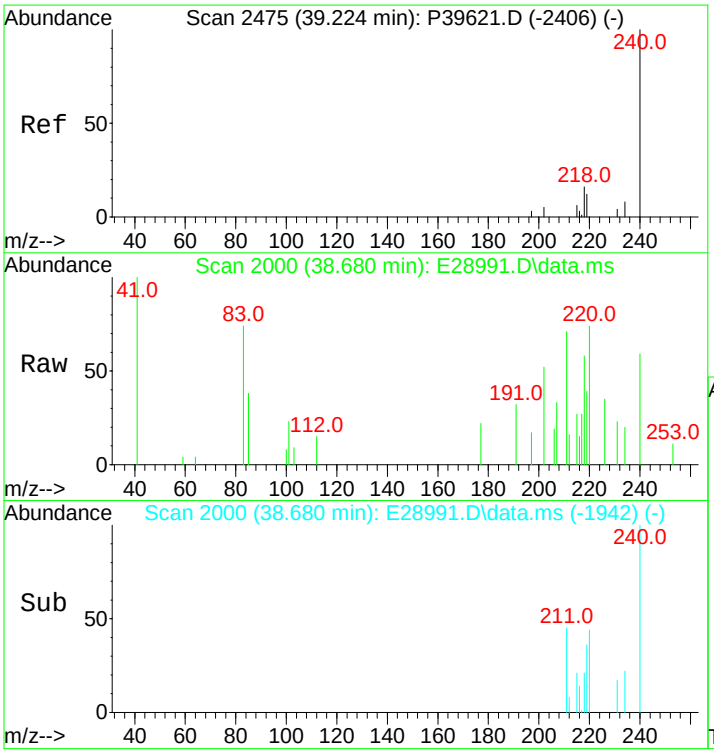


#40
C3-Dibenzothiophenes
Concen: 1223.66 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.290 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:226 Resp: 133634

Ion	Ratio	Lower	Upper
226	100		
211	1.9	44.1	66.1#

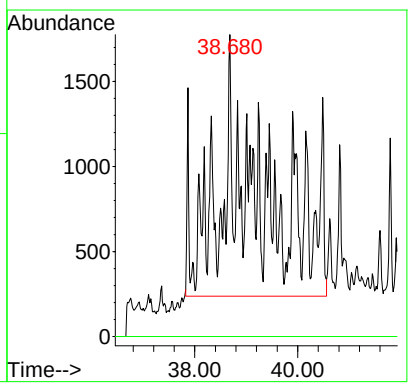


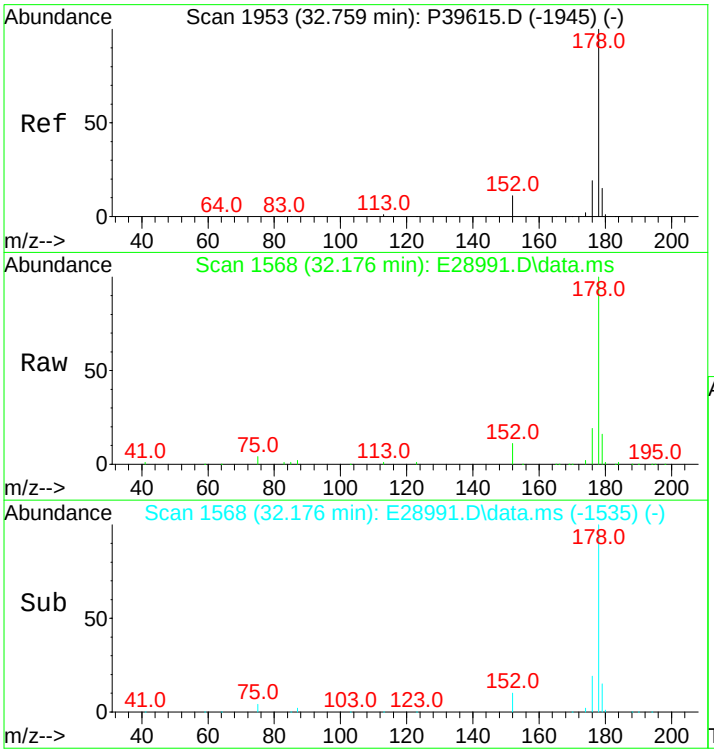


#41
C4-Dibenzothiophenes
Concen: 753.40 ng/mL m
RT: 38.680 min Scan# 2000
Delta R.T. 0.335 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:240 Resp: 82278

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

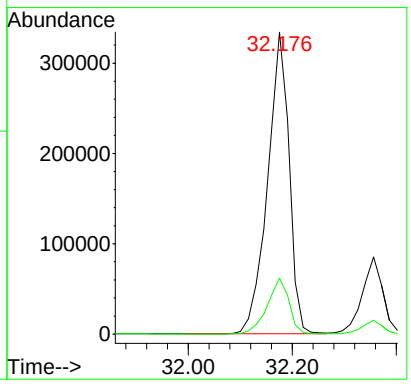


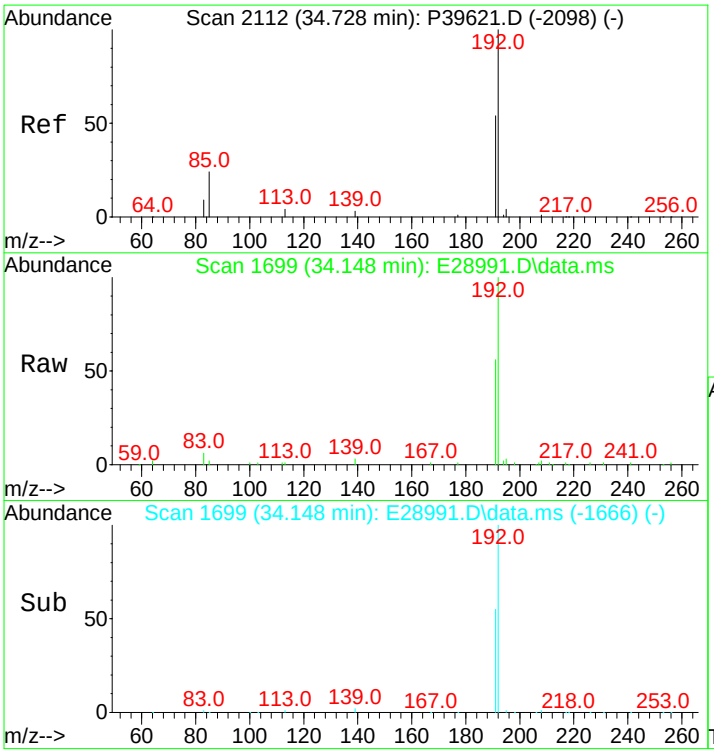


#43
Phenanthrene
Concen: 8622.56 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:178 Resp: 958032

Ion	Ratio	Lower	Upper
178	100		
176	18.6	15.0	22.4

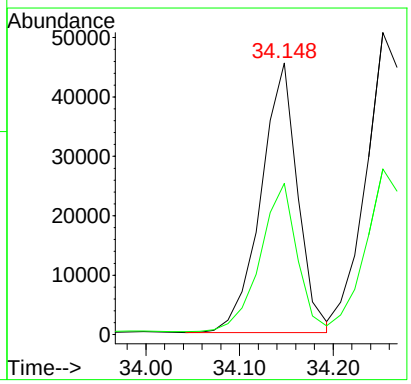


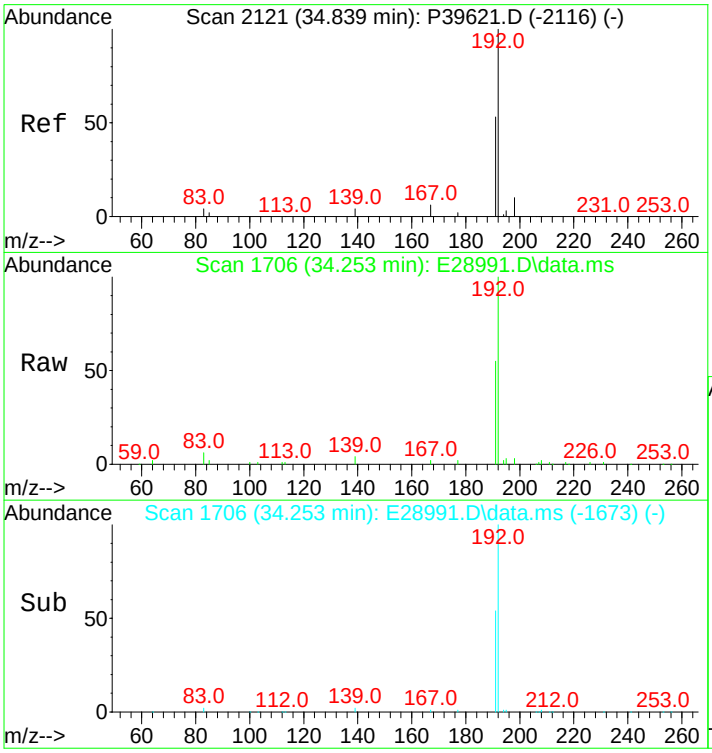


#44
3-Methylphenanthrene(3MP)
Concen: 1112.01 ng/mL
RT: 34.148 min Scan# 1699
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 123553

Ion	Ratio	Lower	Upper
192	100		
191	55.5	45.9	68.9

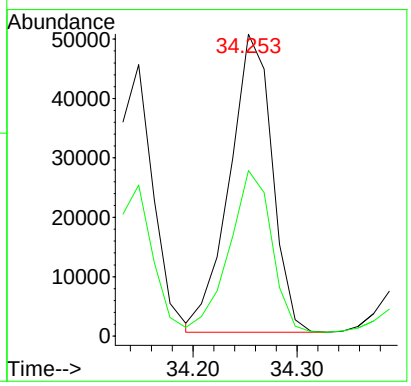


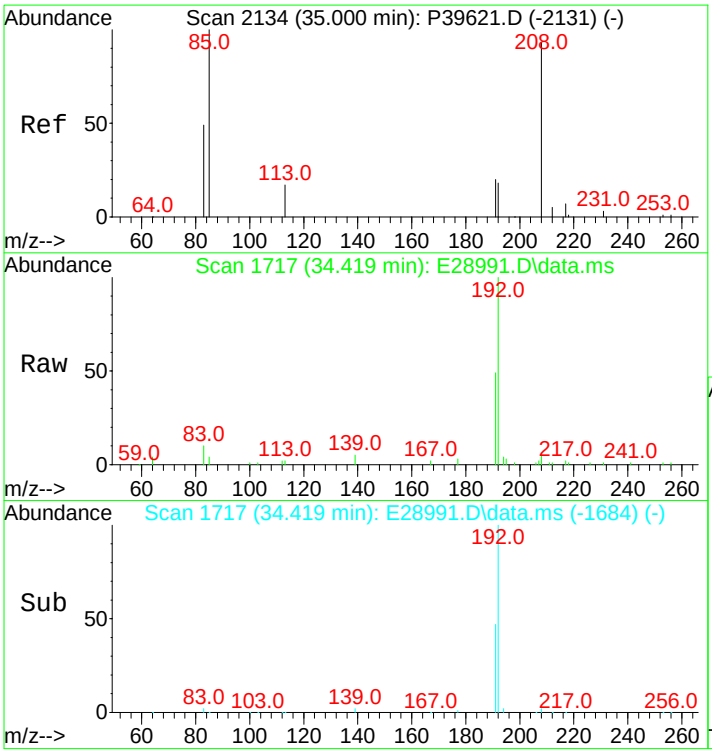


#45
2-Methylphenanthrene(2MP)
Concen: 1288.61 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 143174

Ion	Ratio	Lower	Upper
192	100		
191	53.7	45.4	68.0

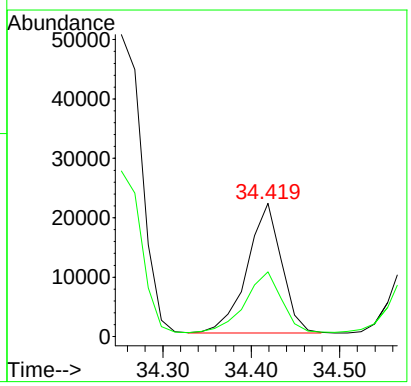


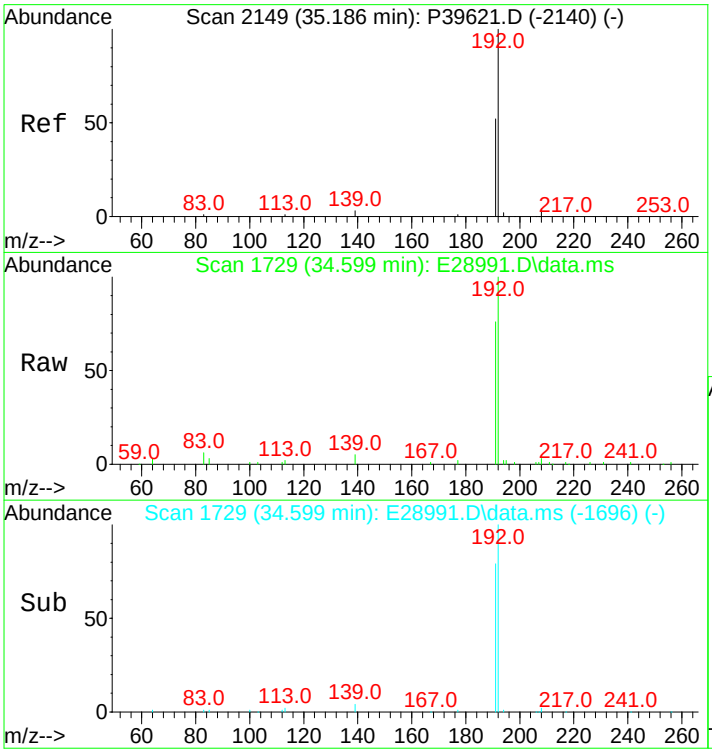


#46
2-Methylanthracene(2MA)
Concen: 532.09 ng/mL m
RT: 34.419 min Scan# 1717
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 59119

Ion	Ratio	Lower	Upper
192	100		
191	0.7	95.4	143.0#

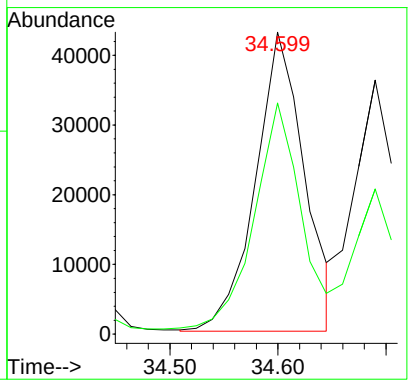


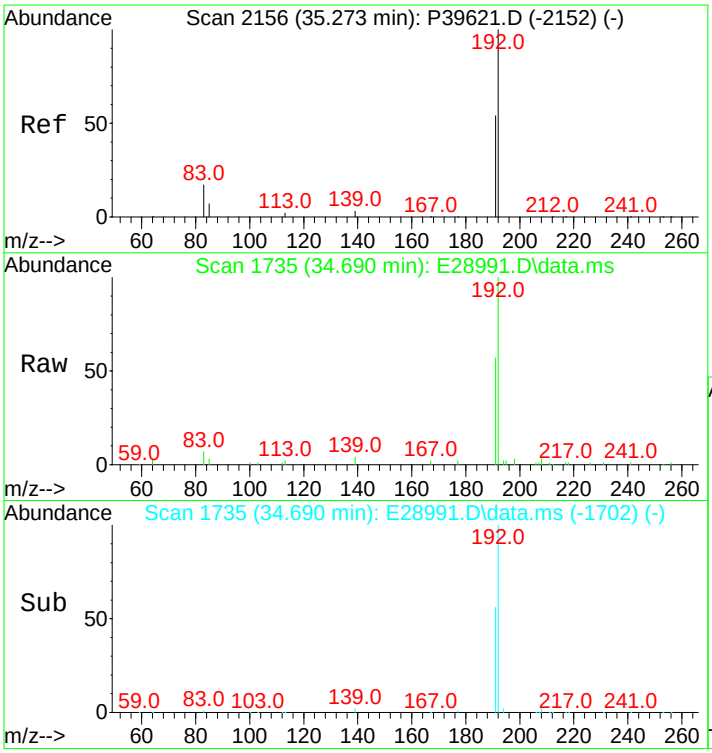


#47
9/4-Methylphenanthrene(9MP)
Concen: 1216.87 ng/mL m
RT: 34.599 min Scan# 1729
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 135203

Ion	Ratio	Lower	Upper
192	100		
191	38.8	44.3	66.5#

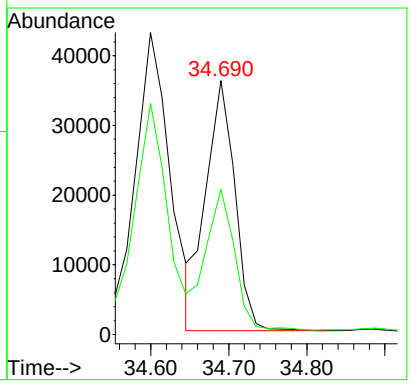


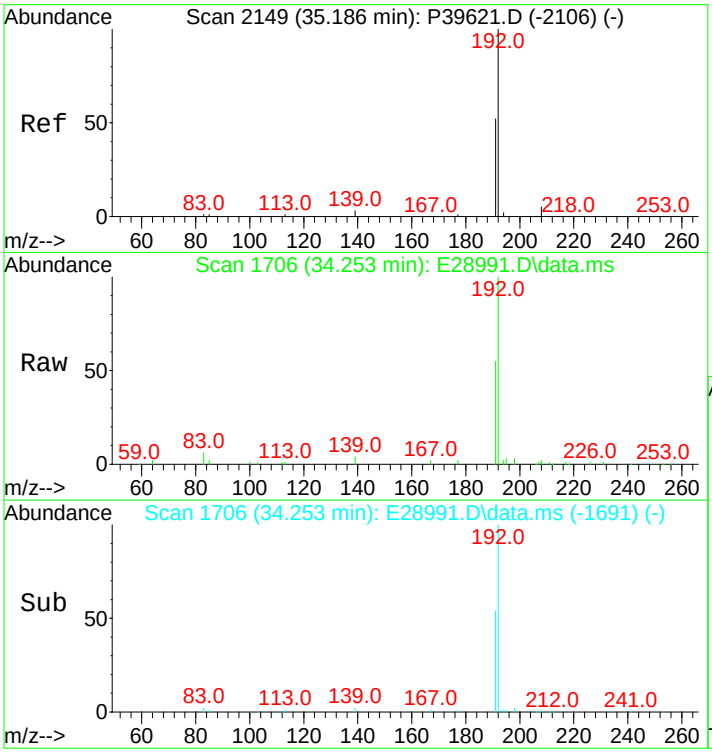


#48
1-Methylphenanthrene(1MP)
Concen: 837.53 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 93056

Ion	Ratio	Lower	Upper
192	100		
191	56.3	46.7	70.1

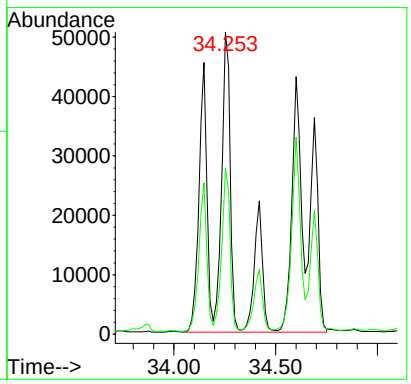


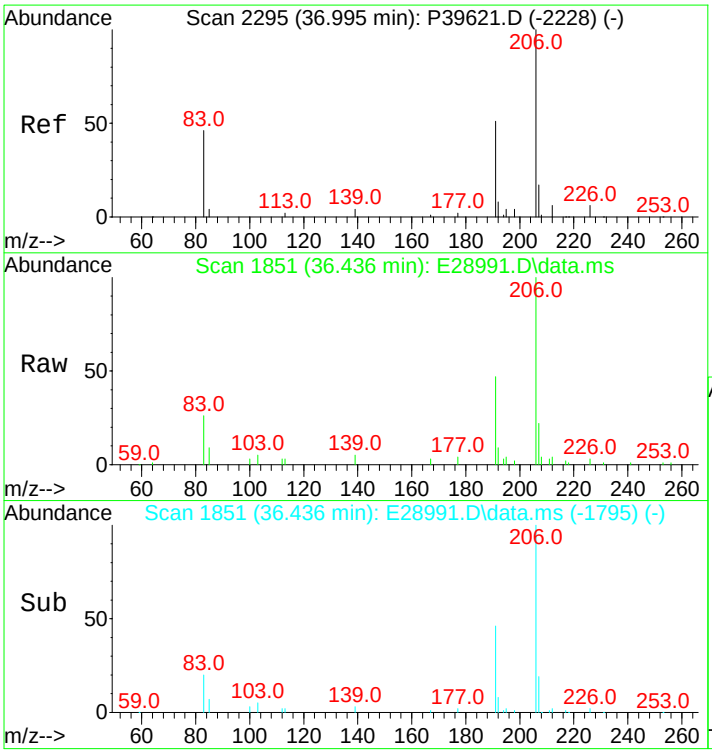


#49
C1-Phenanthrenes/Anthracenes
Concen: 5049.24 ng/mL m
RT: 34.253 min Scan# 1706
Delta R.T. -0.150 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 561009

Ion	Ratio	Lower	Upper
192	100		
191	5.3	44.0	66.0#

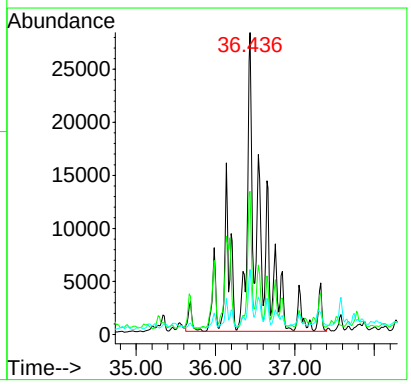


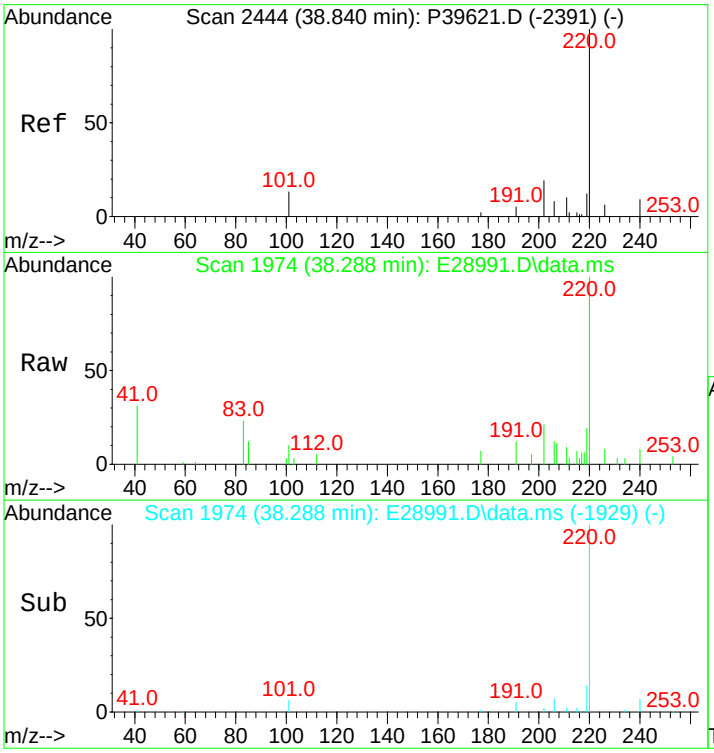


#50
C2-Phenanthrenes/Anthracenes
Concen: 3523.94 ng/mL m
RT: 36.436 min Scan# 1851
Delta R.T. 0.275 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:206 Resp: 391536

Ion	Ratio	Lower	Upper
206	100		
191	12.3	35.7	53.5#
207	1.9	16.5	24.7#

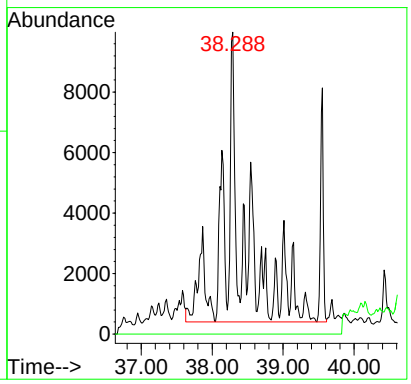


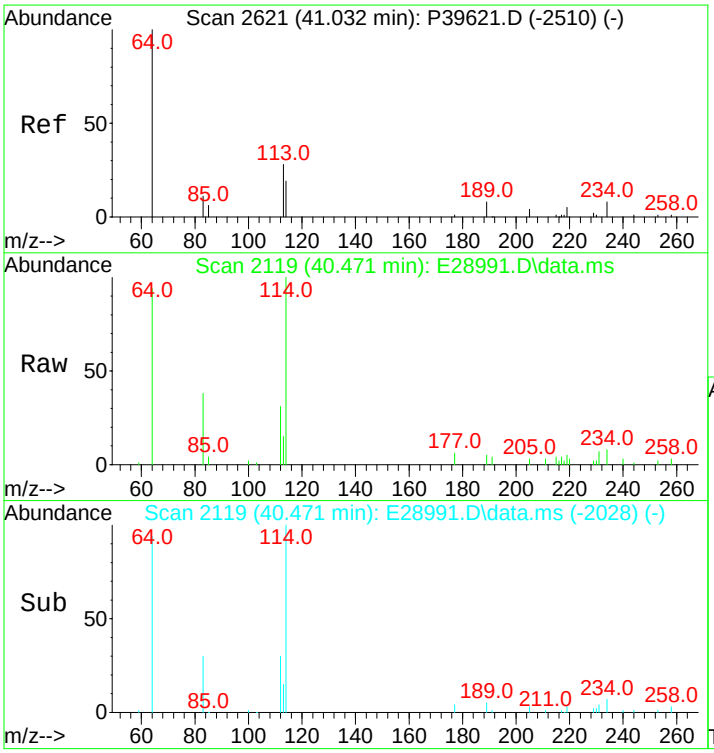


#52
C3-Phenanthrenes/Anthracenes
Concen: 1736.68 ng/mL m
RT: 38.288 min Scan# 1974
Delta R.T. 0.325 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:220 Resp: 192958

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

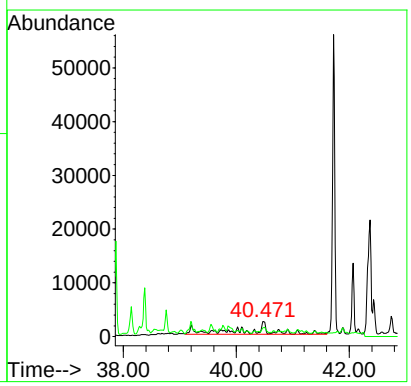


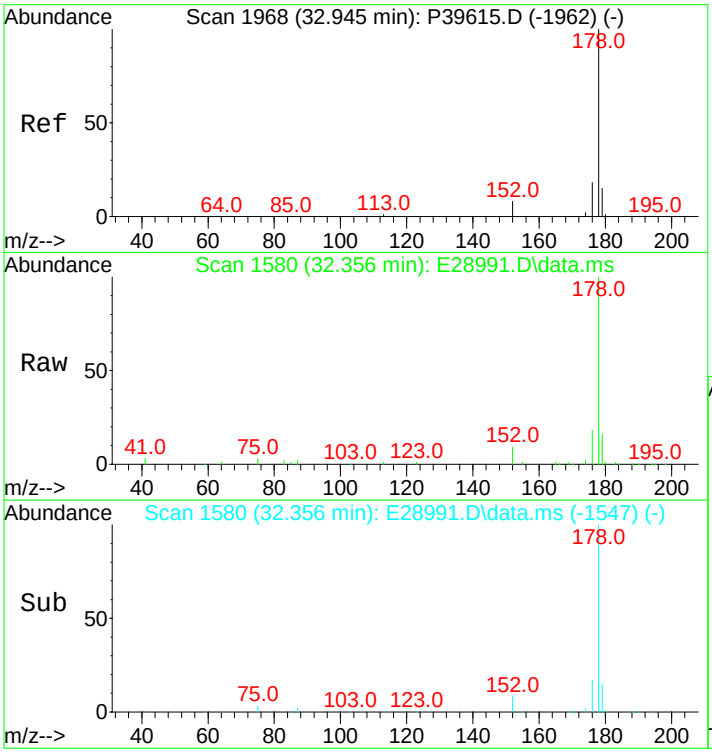


#53
C4-Phenanthrenes/Anthracenes
Concen: 648.96 ng/mL m
RT: 40.471 min Scan# 2119
Delta R.T. 0.384 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:234 Resp: 72104

Ion	Ratio	Lower	Upper
234	100		
219	2.3	46.6	70.0#

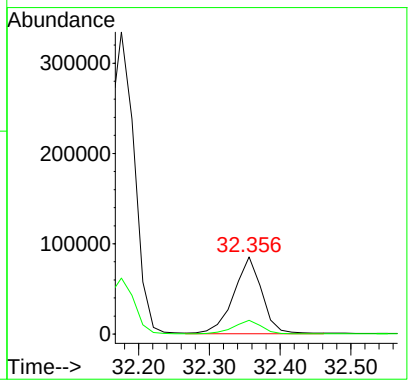


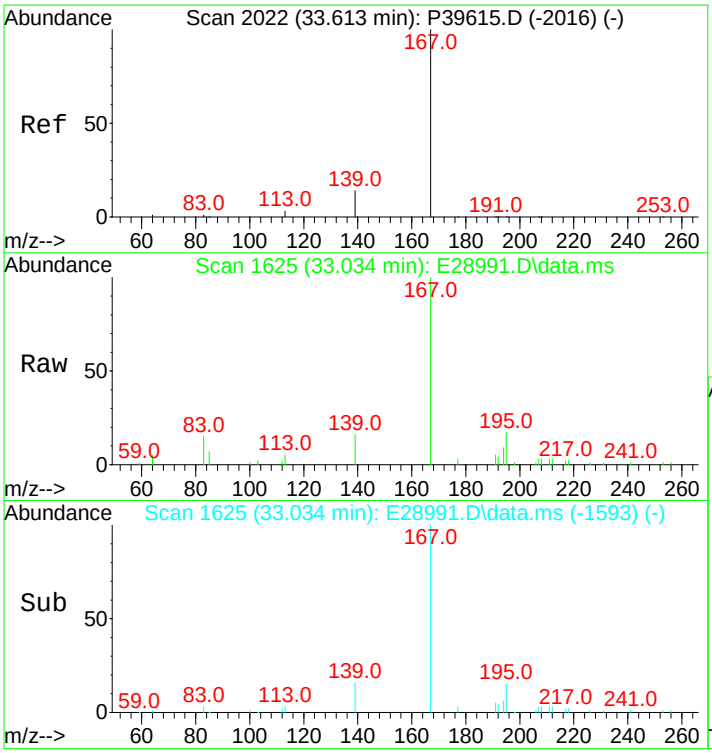


#55
Anthracene
Concen: 2437.31 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:178 Resp: 234070

Ion	Ratio	Lower	Upper
178	100		
176	17.4	14.3	21.5

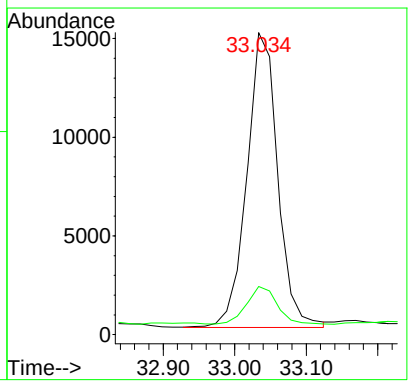


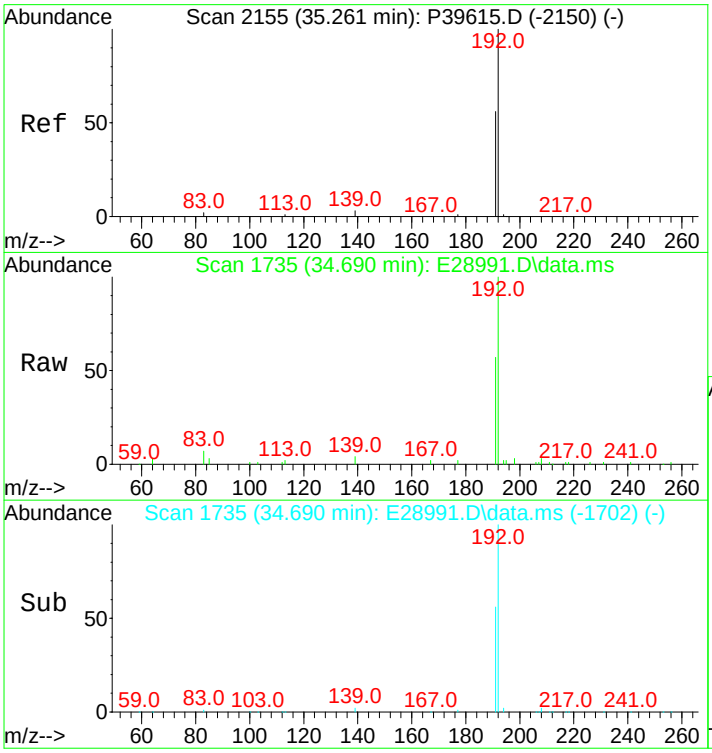


#56
Carbazole
Concen: 454.50 ng/mL m
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:167 Resp: 44922

Ion	Ratio	Lower	Upper
167	100		
139	12.6	10.1	15.1

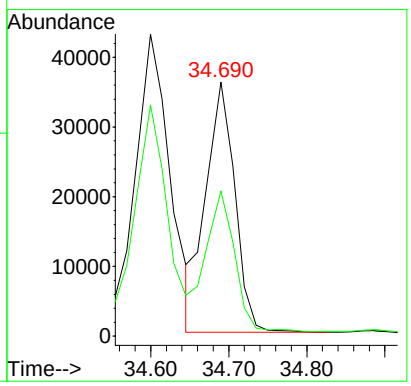


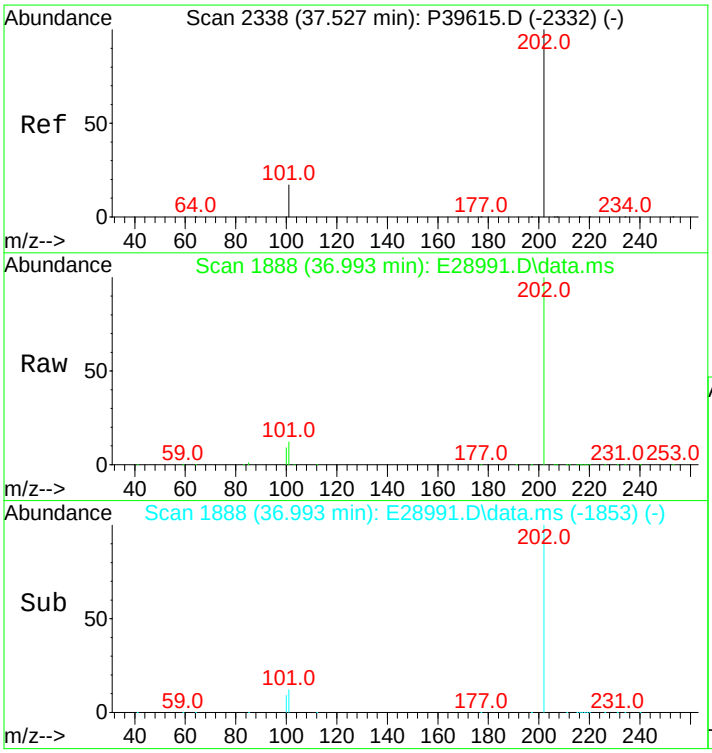


#57
1-Methylphenanthrene
Concen: 1097.80 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:192 Resp: 93056

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

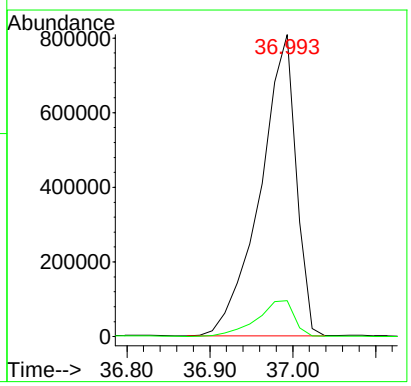


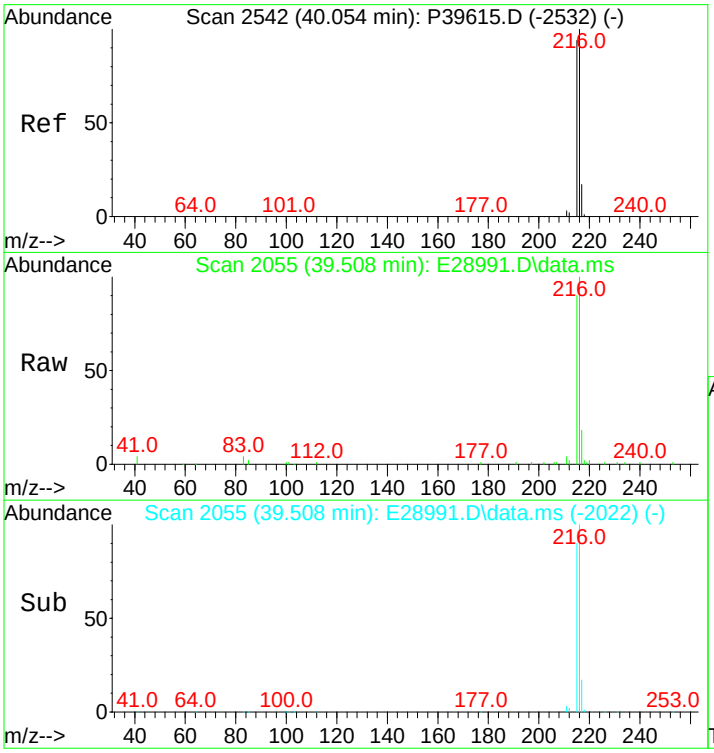


#58
Fluoranthene
Concen: 19799.22 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:202 Resp: 2429395

Ion	Ratio	Lower	Upper
202	100		
101	12.7	10.4	15.6

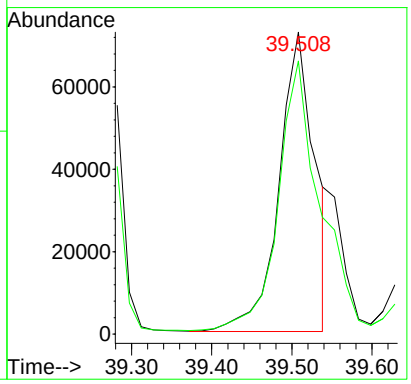


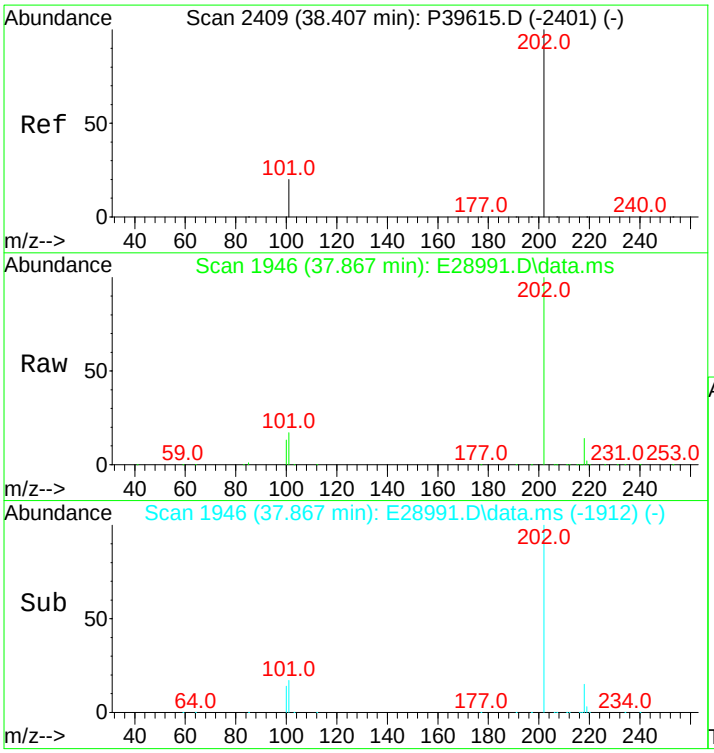


#59
Benzo(b)fluorene
Concen: 2774.24 ng/mL m
RT: 39.508 min Scan# 2055
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:216 Resp: 226829

Ion	Ratio	Lower	Upper
216	100		
215	104.1	72.6	109.0

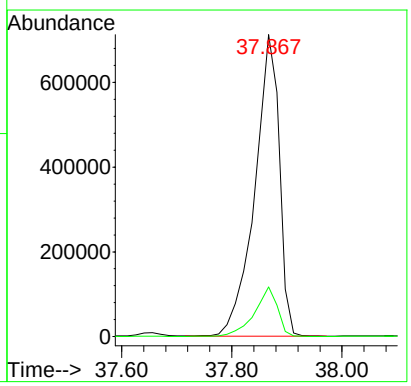


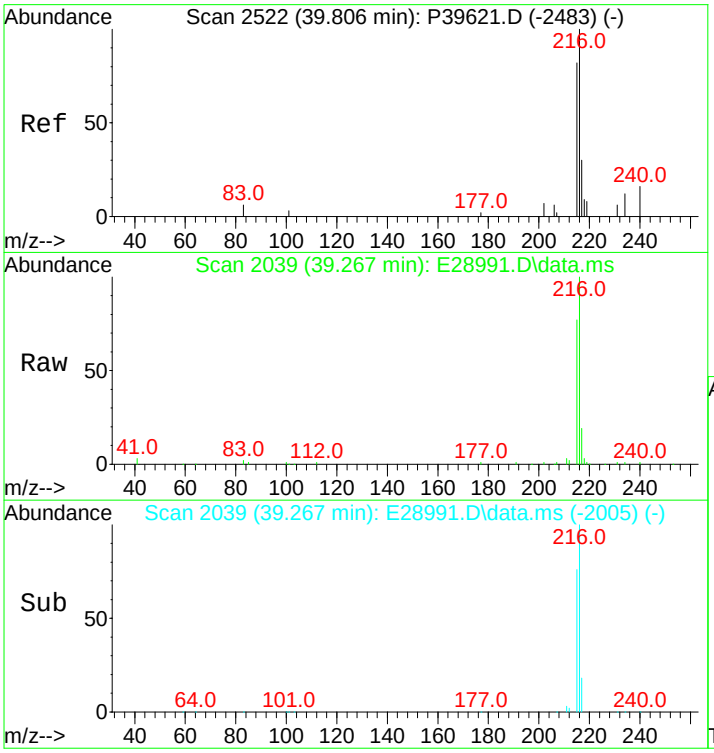


#60
Pyrene
Concen: 17581.36 ng/mL
RT: 37.867 min Scan# 1946
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:202 Resp: 2192672

Ion	Ratio	Lower	Upper
202	100		
101	15.4	11.0	16.4

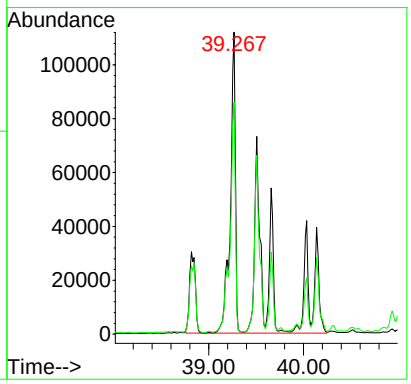


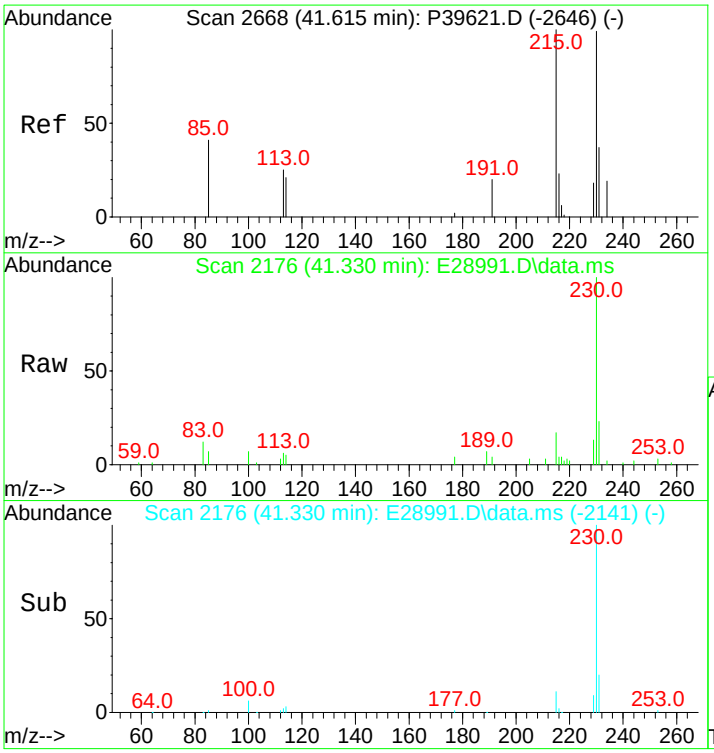


#61
C1-Fluoranthenes/Pyrenes
Concen: 9797.22 ng/mL m
RT: 39.267 min Scan# 2039
Delta R.T. 0.352 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:216 Resp: 1221867

Ion	Ratio	Lower	Upper
216	100		
215	27.1	73.4	110.2#

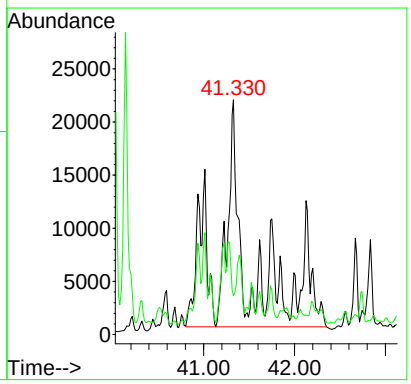


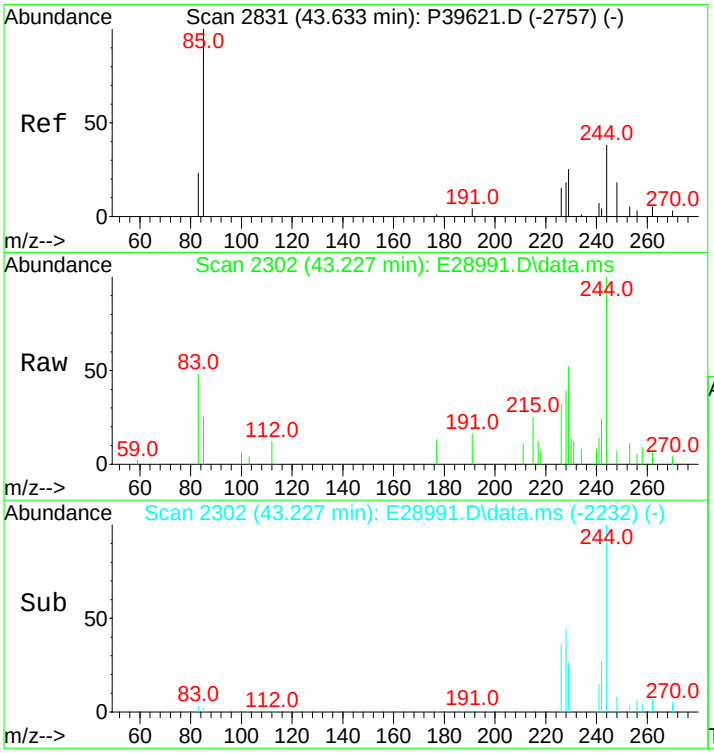


#62
C2-Fluoranthenes/Pyrenes
Concen: 3681.03 ng/mL m
RT: 41.330 min Scan# 2176
Delta R.T. 0.450 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:230 Resp: 459083

Ion	Ratio	Lower	Upper
230	100		
215	1.6	93.8	140.8#

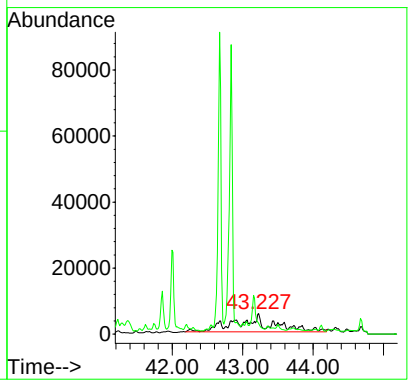


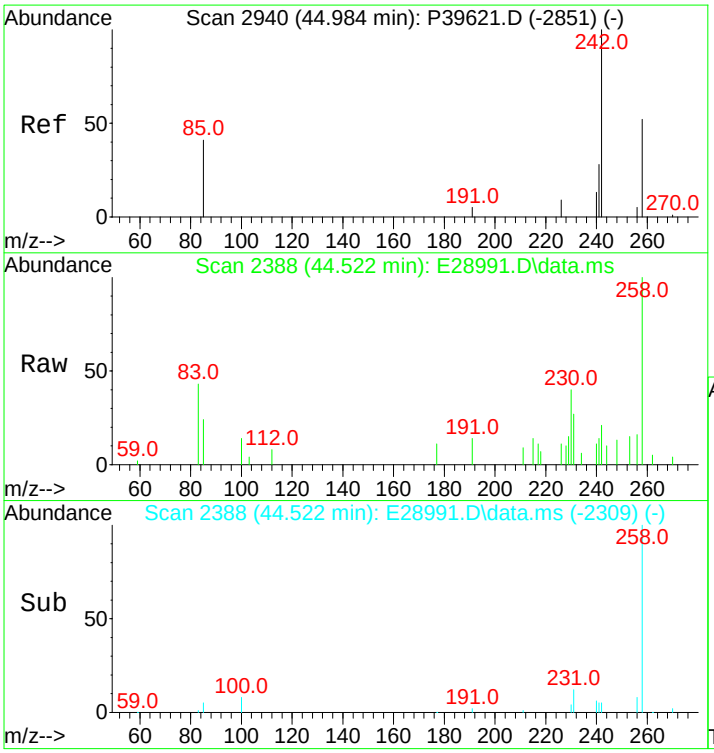


#63
C3-Fluoranthenes/Pyrenes
Concen: 1602.24 ng/mL m
RT: 43.227 min Scan# 2302
Delta R.T. 0.575 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:244 Resp: 199824

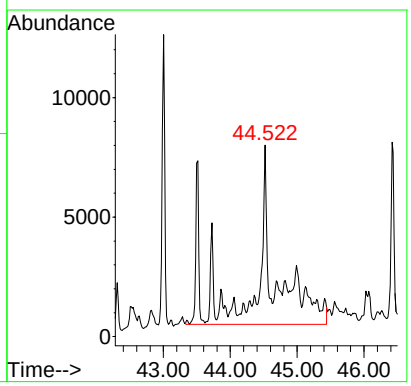
Ion	Ratio	Lower	Upper
244	100		
229	1.4	72.2	108.2#

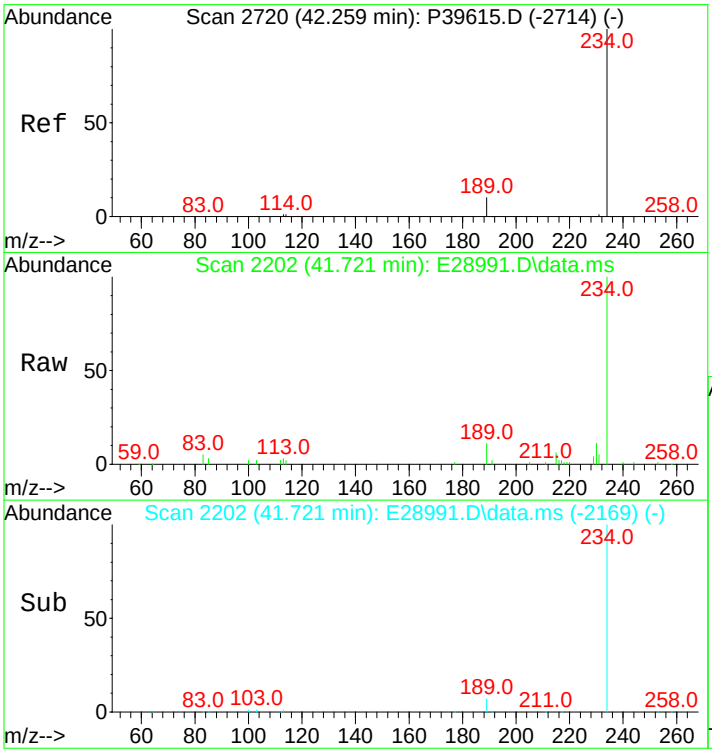




#64
C4-Fluoranthenes/Pyrenes
Concen: 1232.43 ng/mL m
RT: 44.522 min Scan# 2388
Delta R.T. 0.551 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:258 Resp: 153704

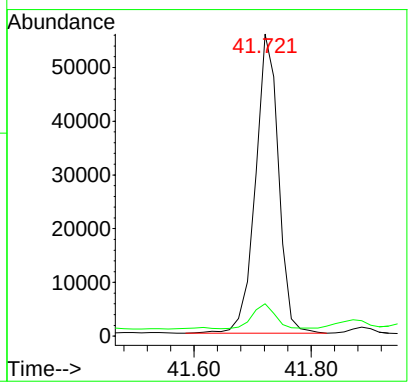


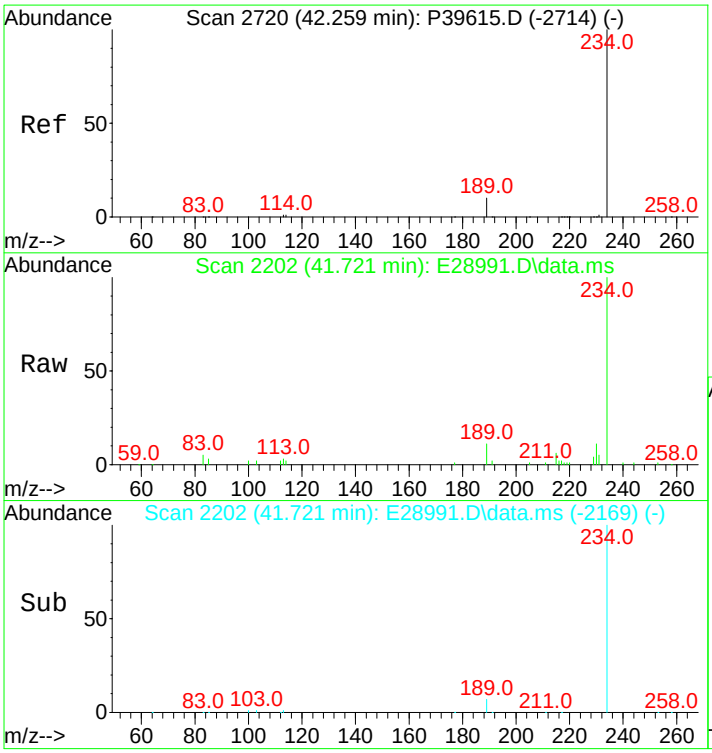


#66
Naphthobenzothiophene
Concen: 1233.70 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:234 Resp: 151752

Ion	Ratio	Lower	Upper
234	100		
189	8.7	21.1	31.7#

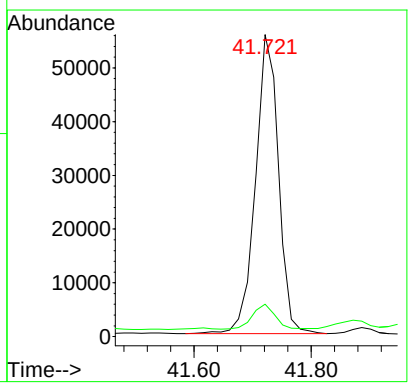


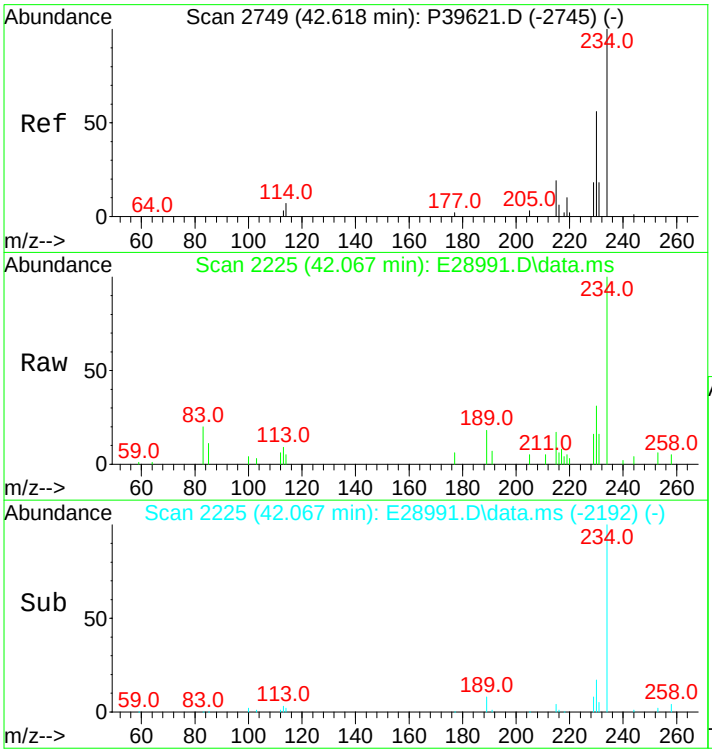


#67
Naphthobenzothiophene-2,1-D
Concen: 1233.70 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:234 Resp: 151752

Ion	Ratio	Lower	Upper
234	100		
189	8.7	21.1	31.7#

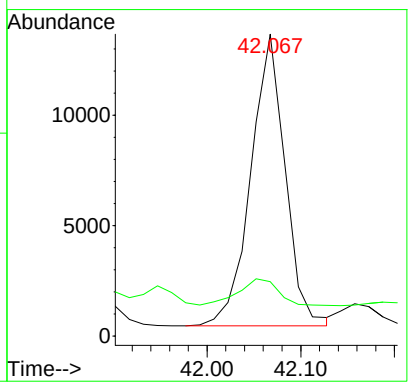


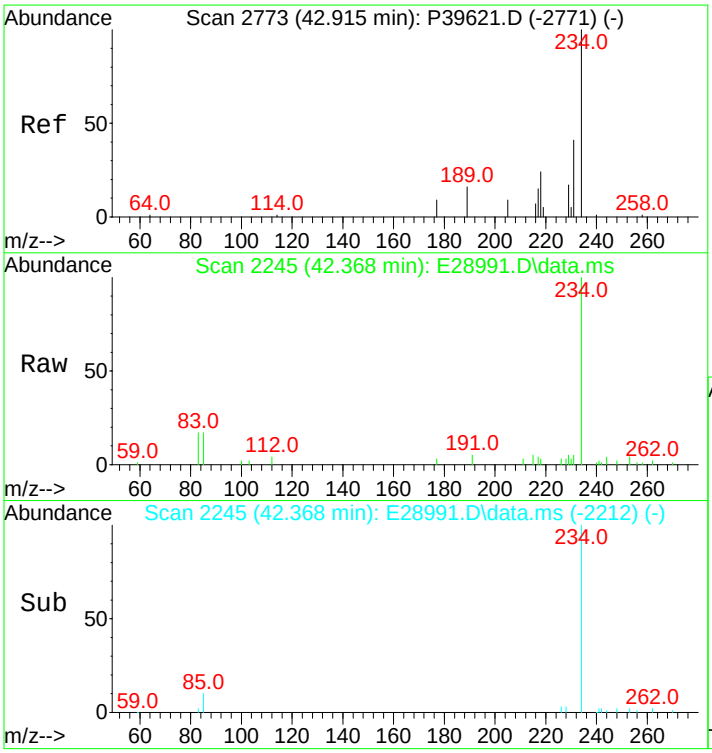


#68
Naphthobenzothiophene-1,2-D
Concen: 274.09 ng/mL
RT: 42.067 min Scan# 2225
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:234 Resp: 33715

Ion	Ratio	Lower	Upper
234	100		
189	10.8	71.9	107.9#

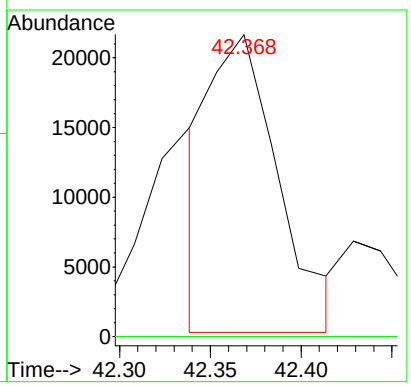


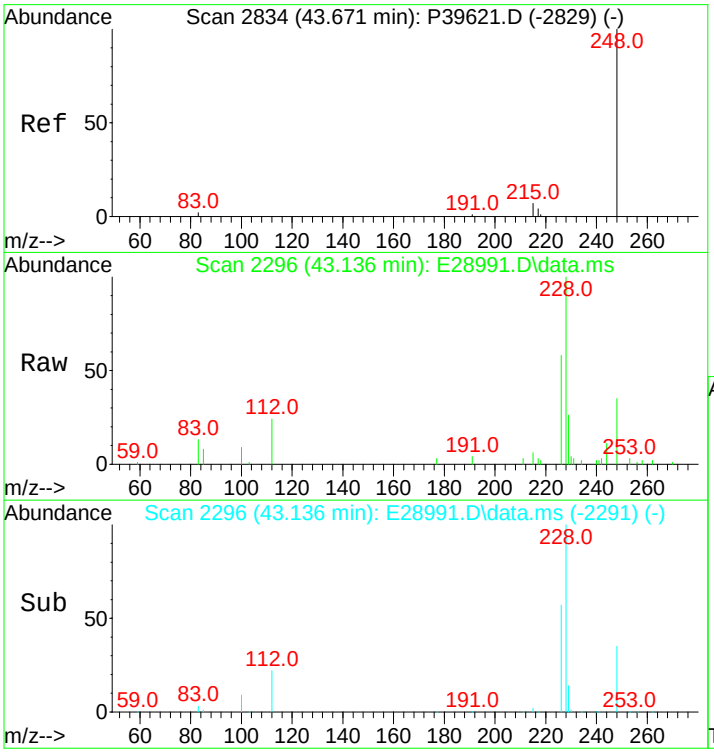


#69
Naphthobenzothiophene-2,3-D
Concen: 457.30 ng/mL m
RT: 42.368 min Scan# 2245
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:234 Resp: 56251

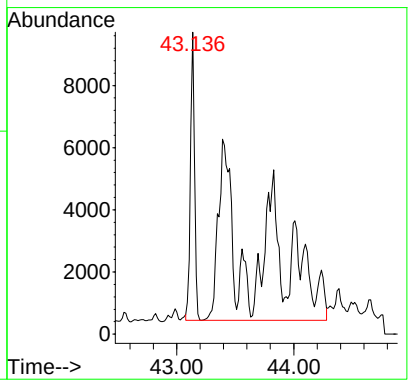
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

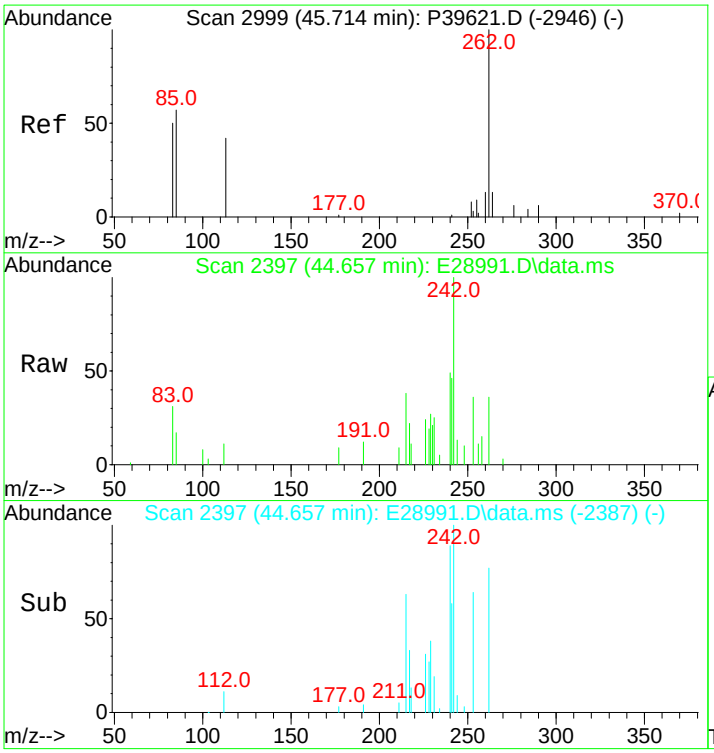




#70
C1-Naphthobenzothiophenes
Concen: 1177.67 ng/ml m
RT: 43.136 min Scan# 2296
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

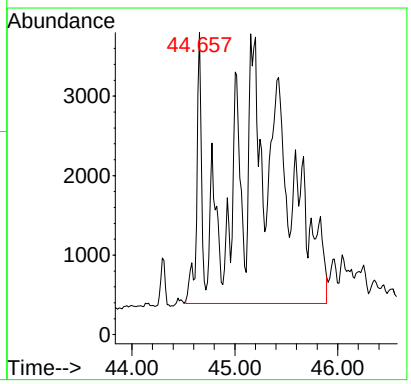
Tgt Ion:248 Resp: 144861

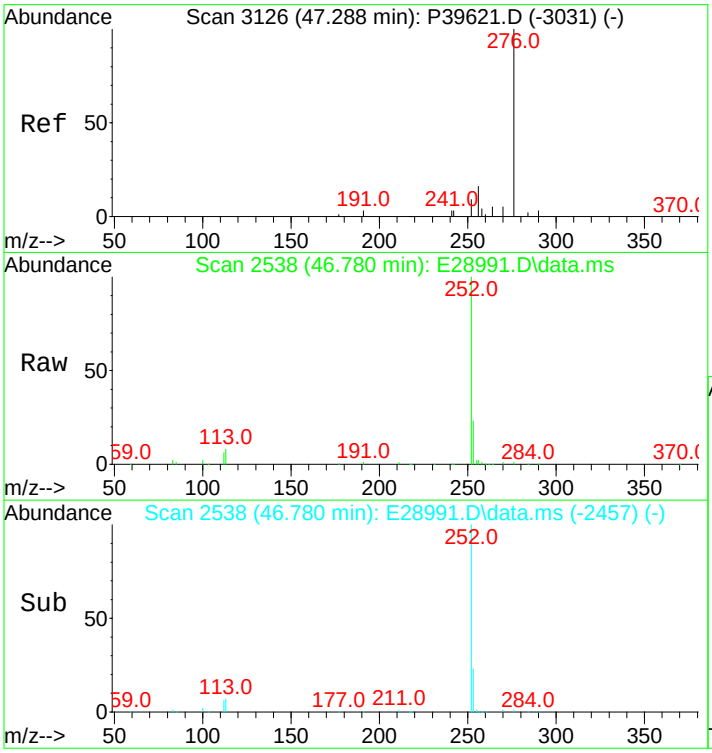




#71
C2-Naphthobenzothiophenes
Concen: 911.52 ng/ml m
RT: 44.657 min Scan# 2397
Delta R.T. 0.012 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

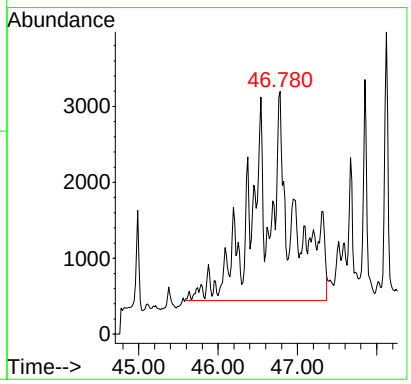
Tgt Ion:262 Resp: 112122

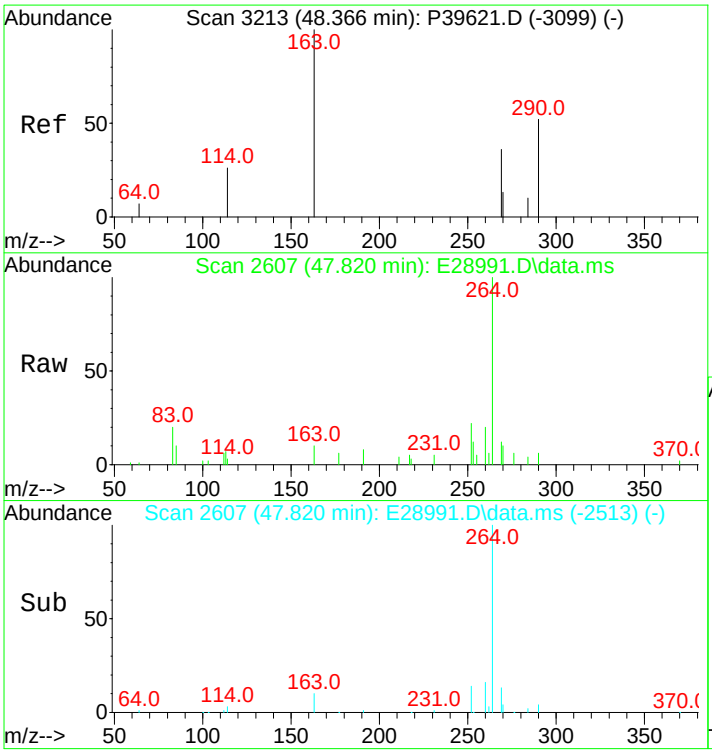




#72
C3-Naphthobenzothiophenes
Concen: 669.73 ng/ml m
RT: 46.780 min Scan# 2538
Delta R.T. 0.553 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

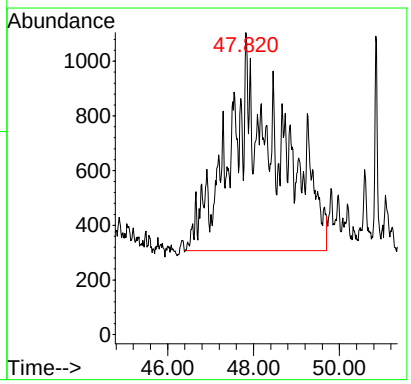
Tgt Ion:276 Resp: 82381

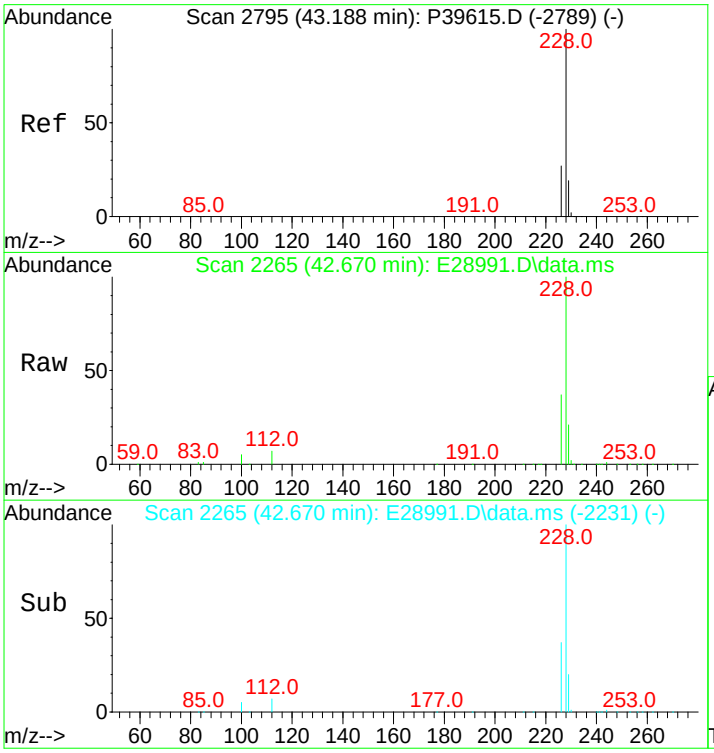




#73
C4-Naphthobenzothiophenes
Concen: 489.94 ng/mL m
RT: 47.820 min Scan# 2607
Delta R.T. 0.523 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:290 Resp: 60266

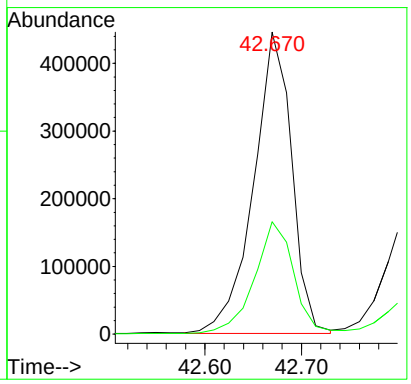


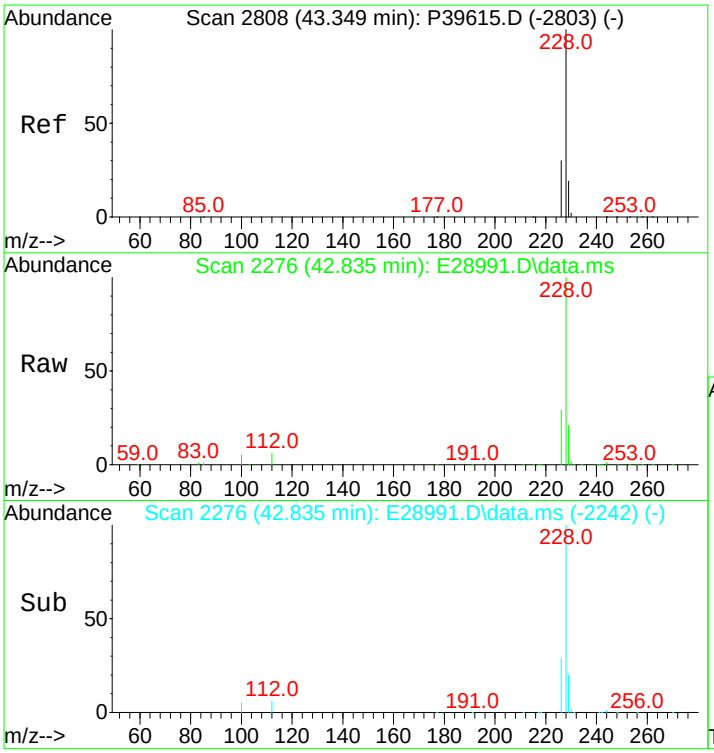


#75
Benz[a]anthracene
Concen: 8793.09 ng/mL m
RT: 42.670 min Scan# 2265
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:228 Resp: 1224970

Ion	Ratio	Lower	Upper
228	100		
226	29.8	20.7	31.1

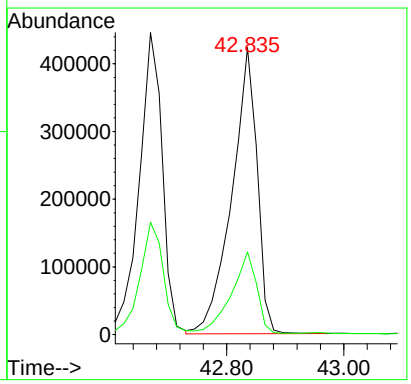


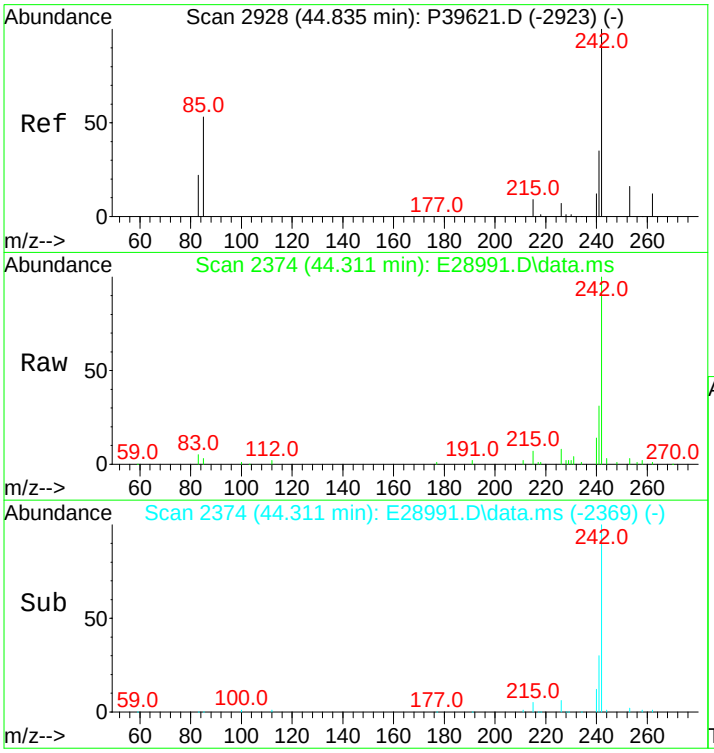


#77
Chrysene/Triphenylene
Concen: 8823.74 ng/mL
RT: 42.835 min Scan# 2276
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:228 Resp: 1265525

Ion	Ratio	Lower	Upper
228	100		
226	29.0	22.6	34.0

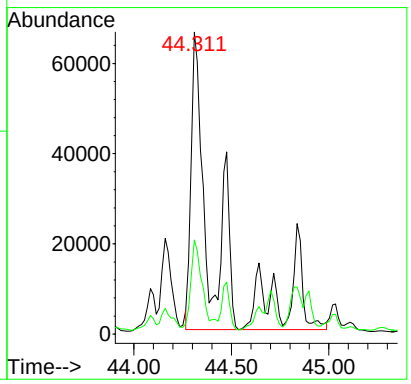


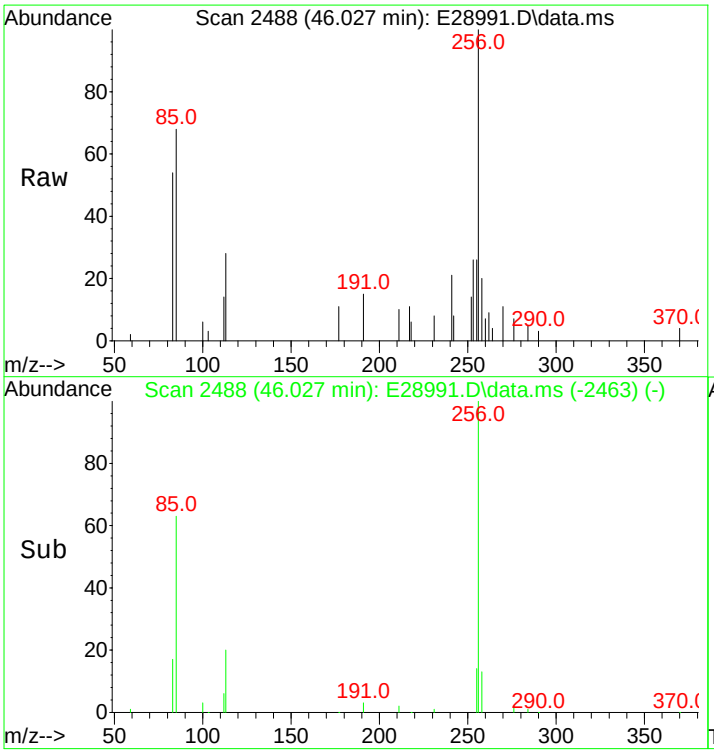


#78
C1-Chrysenes
Concen: 3646.78 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:242 Resp: 523031

Ion	Ratio	Lower	Upper
242	100		
241	3.7	32.2	48.4#

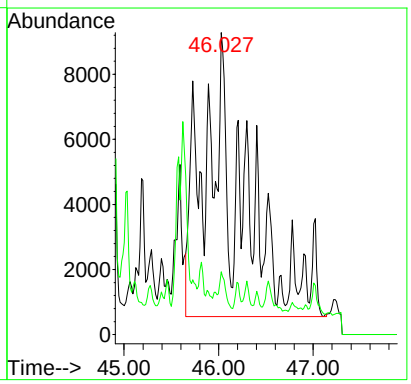


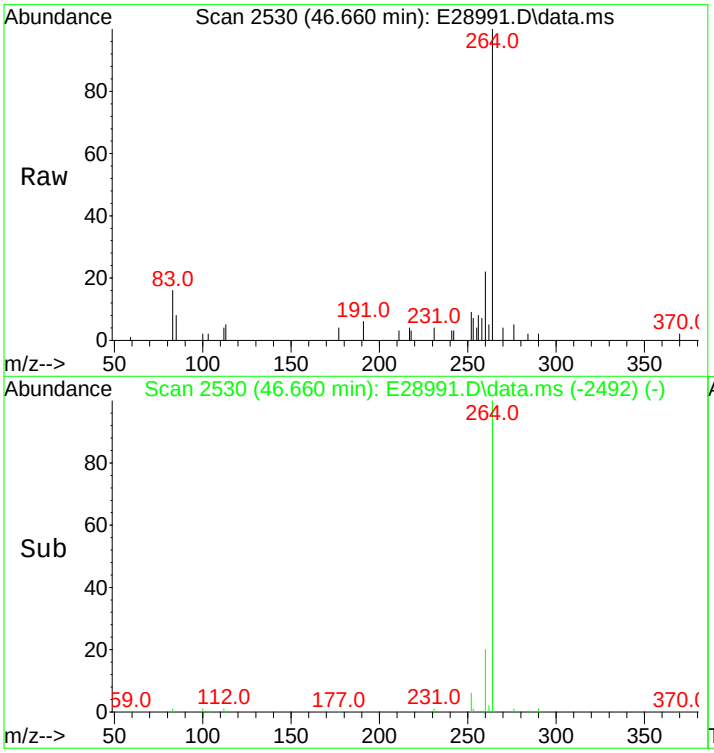


#79
C2-Chrysenes
Concen: 1733.54 ng/mL m
RT: 46.027 min Scan# 2488
Delta R.T. -0.316 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:256 Resp: 248629

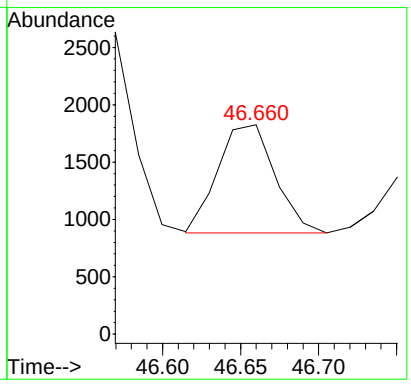
Ion	Ratio	Lower	Upper
256	100		
241	1.6	25.3	37.9#

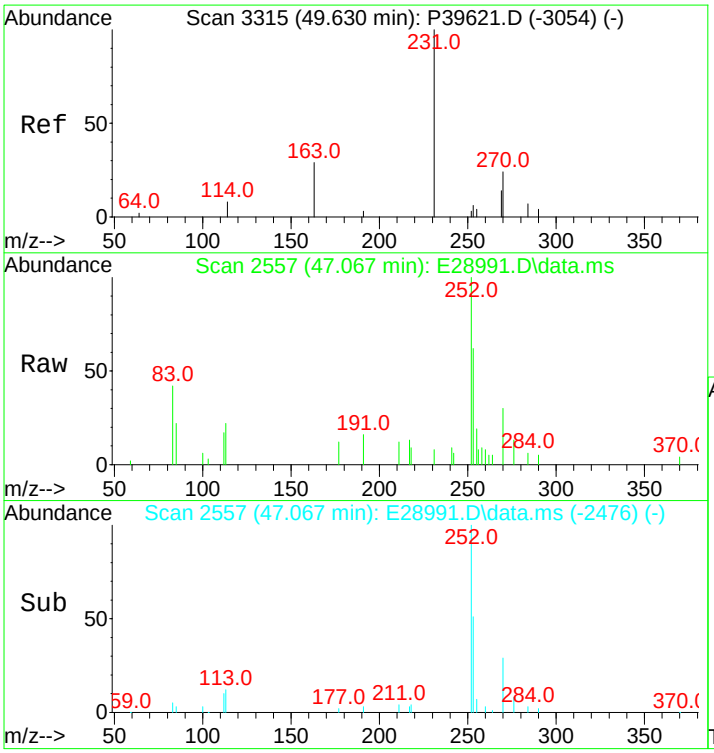




#80
BBF-D12 Surr BKGD
Concen: 16.78 ng/mL
RT: 46.660 min Scan# 2530
Delta R.T. 0.065 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:256 Resp: 2407

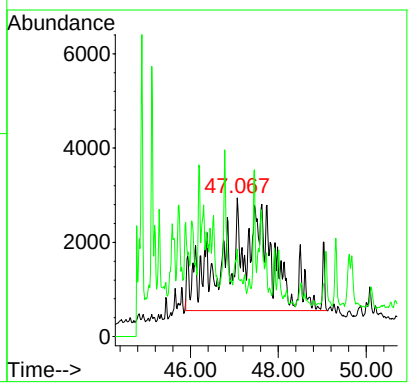


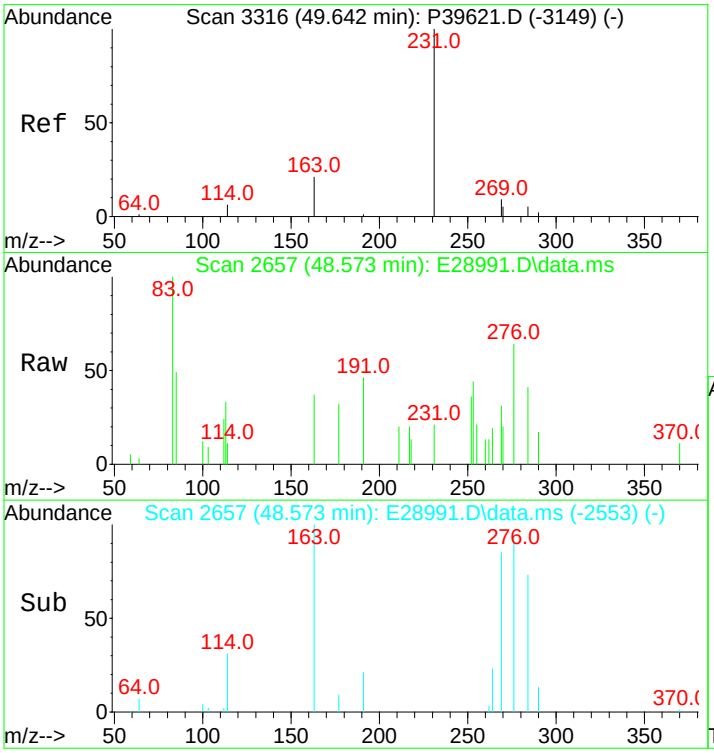


#81
C3-Chrysenes
Concen: 1171.74 ng/mL m
RT: 47.067 min Scan# 2557
Delta R.T. -2.002 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:270 Resp: 168054

Ion	Ratio	Lower	Upper
270	100		
255	0.2	38.0	57.0#

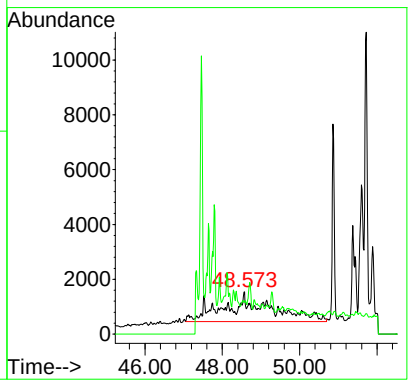


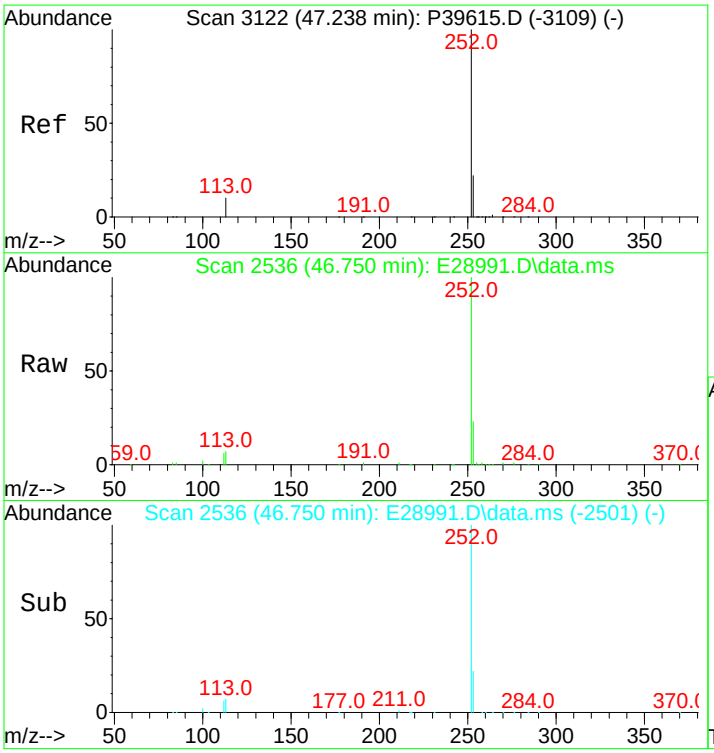


#82
C4-Chrysenes
Concen: 576.28 ng/mL m
RT: 48.573 min Scan# 2657
Delta R.T. -0.613 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:284 Resp: 82652

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

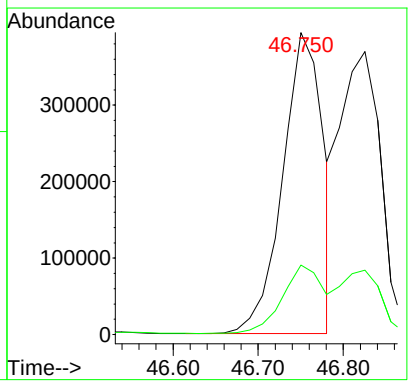


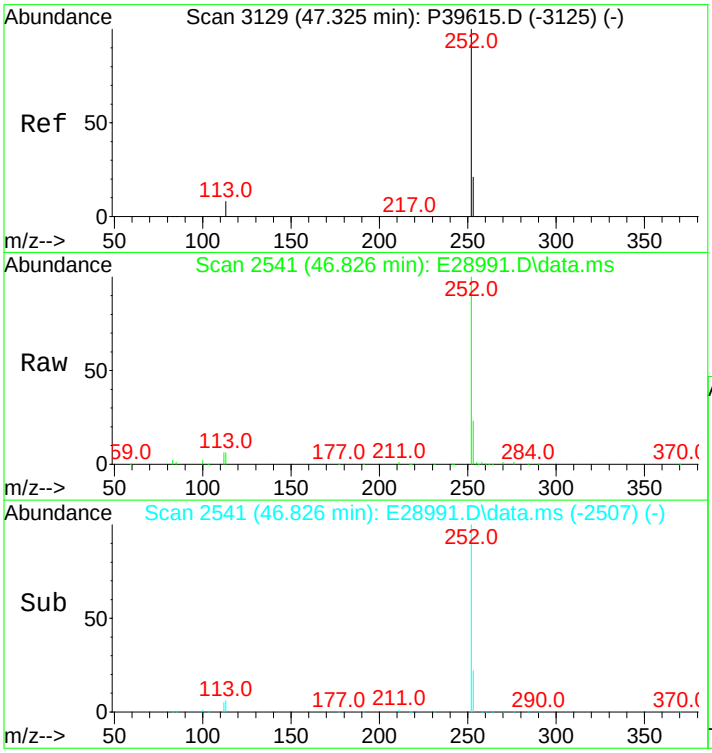


#84
Benzo[b]fluoranthene
Concen: 8055.42 ng/mL
RT: 46.750 min Scan# 2536
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:252 Resp: 1304377

Ion	Ratio	Lower	Upper
252	100		
253	22.8	19.5	29.3

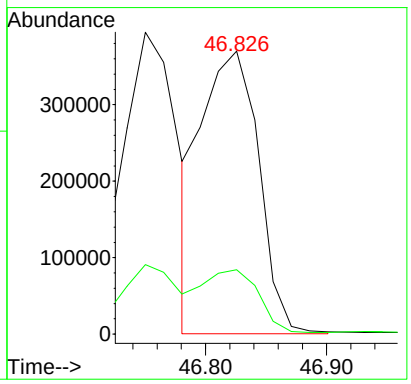


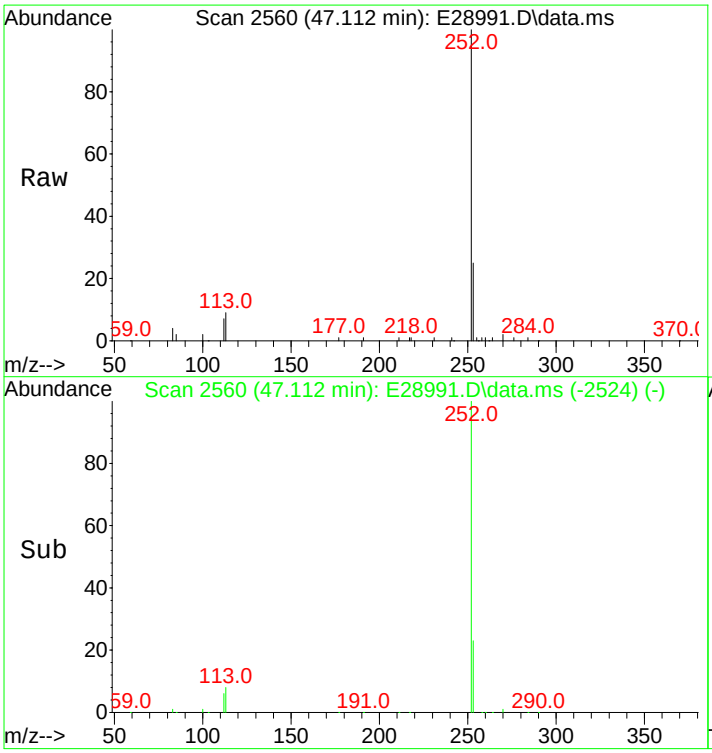


#85
Benzo[j]+[k]fluoranthene
Concen: 7300.32 ng/mL m
RT: 46.826 min Scan# 2541
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:252 Resp: 1216183

Ion	Ratio	Lower	Upper
252	100		
253	17.7	19.7	29.5#

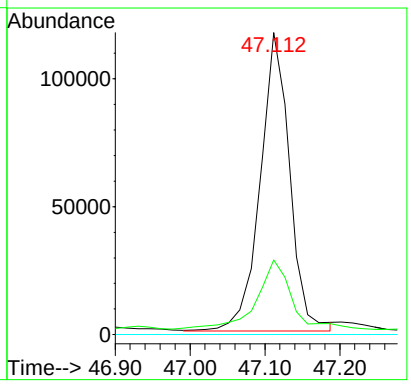


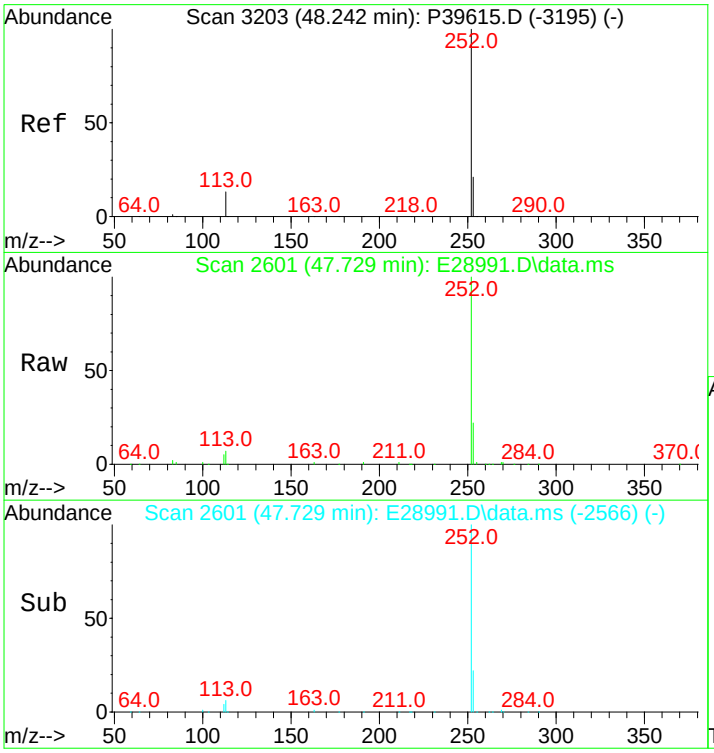


#86
Benzo[a]fluoranthene
Concen: 1919.39 ng/mL m
RT: 47.112 min Scan# 2560
Delta R.T. 0.040 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:252 Resp: 319758

Ion	Ratio	Lower	Upper
252	100		
253	29.3	456.0	684.0#
125	0.0	0.0	0.0

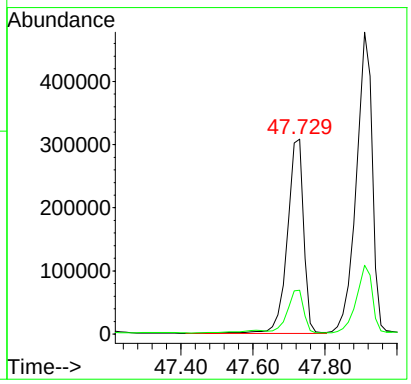


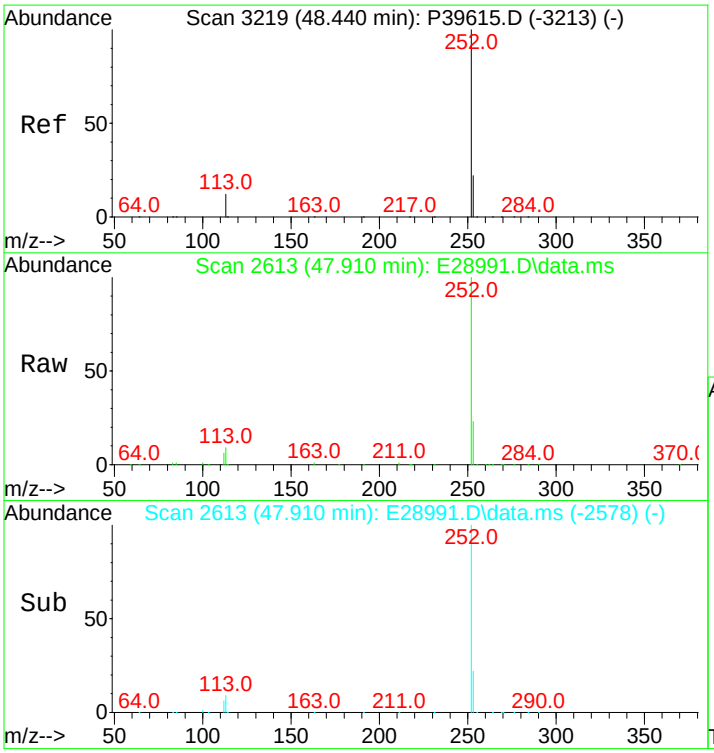


#87
Benzo[e]pyrene
Concen: 6097.46 ng/mL
RT: 47.729 min Scan# 2601
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:252 Resp: 964060

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.6	31.0

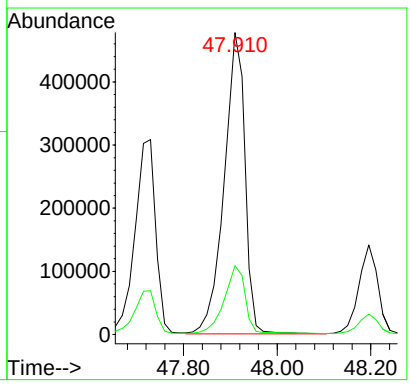


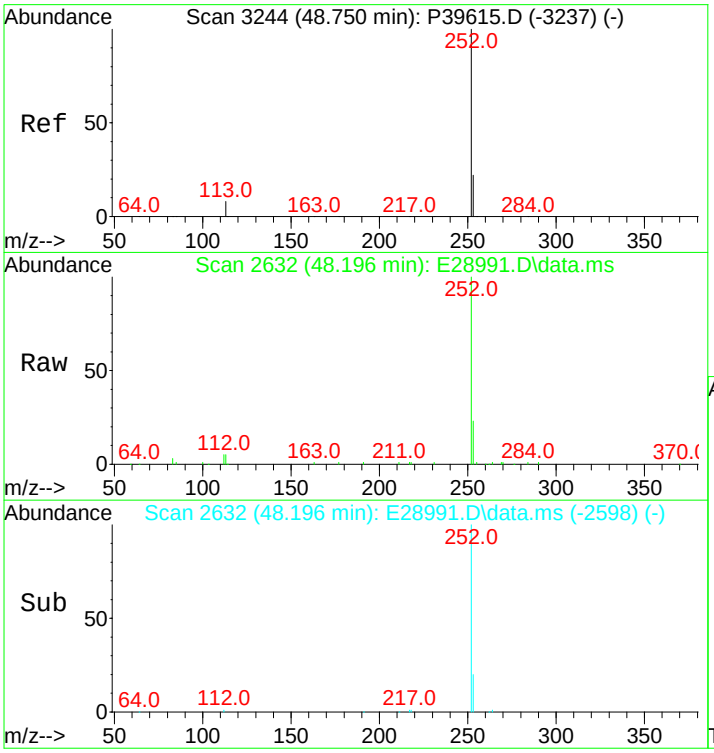


#89
Benzo[a]pyrene
Concen: 9741.98 ng/mL
RT: 47.910 min Scan# 2613
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:252 Resp: 1473854

Ion	Ratio	Lower	Upper
252	100		
253	22.7	20.8	31.2

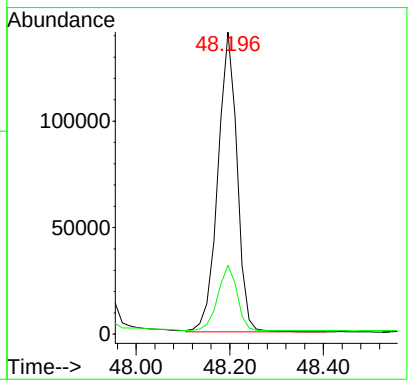


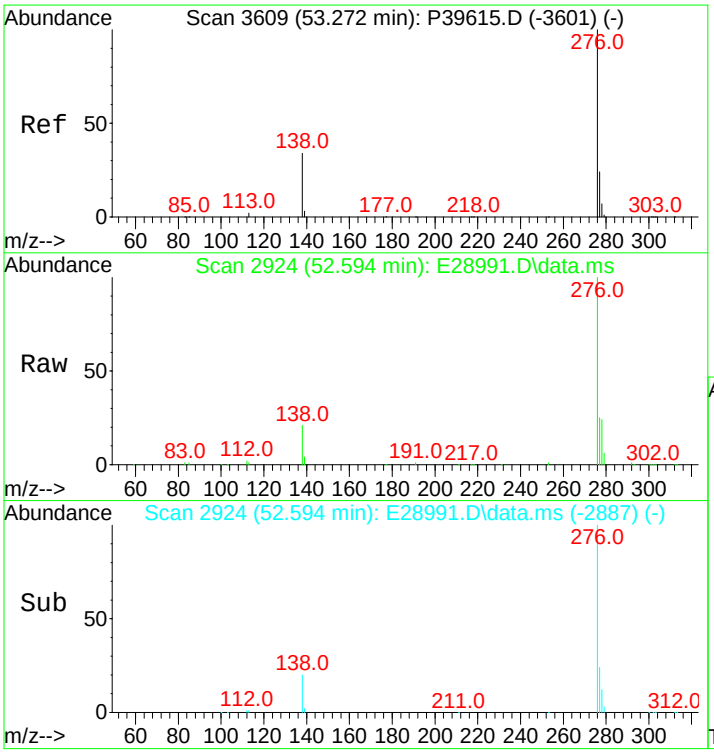


#90
Perylene
Concen: 2504.11 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:252 Resp: 400605

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.7	31.1

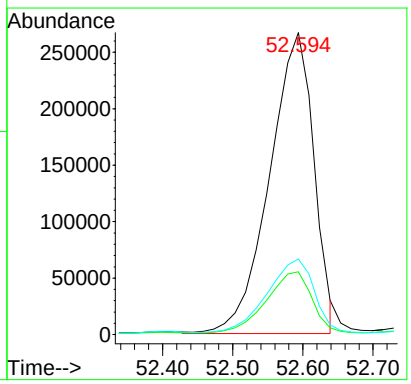


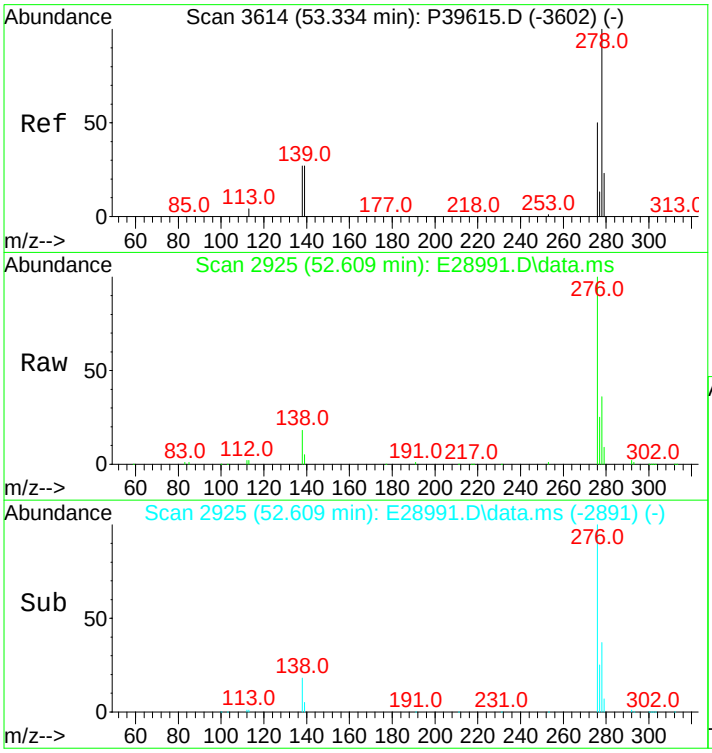


#91
Indeno[1,2,3-cd]pyrene
Concen: 6564.23 ng/mL m
RT: 52.594 min Scan# 2924
Delta R.T. 0.060 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:276 Resp: 1168748

Ion	Ratio	Lower	Upper
276	100		
138	21.4	16.3	24.5
277	26.6	19.4	29.2

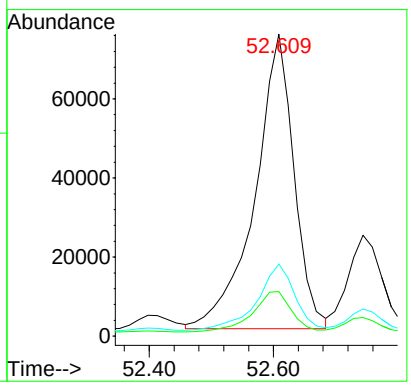


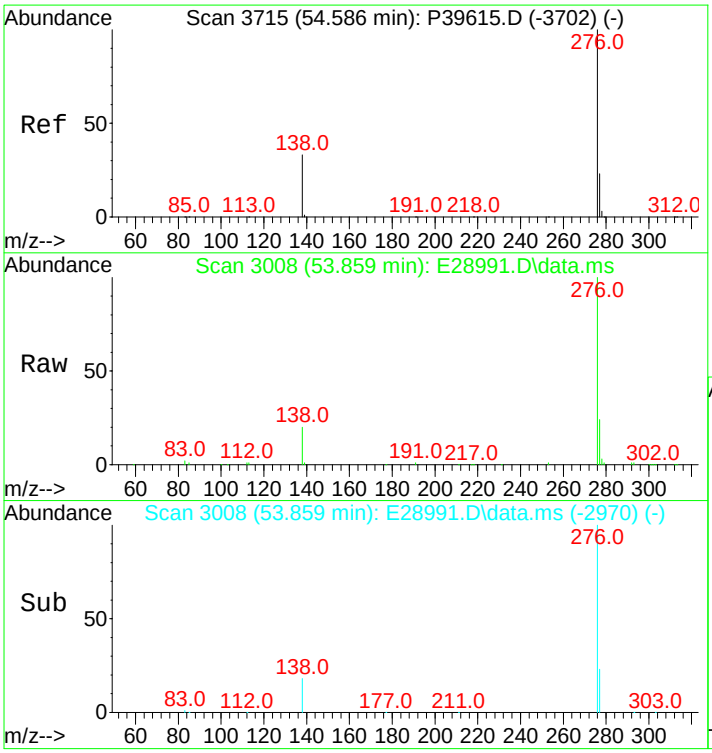


#92
Dibenz[ah]+[ac]anthracene
Concen: 1718.14 ng/mL m
RT: 52.609 min Scan# 2925
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:278 Resp: 325730

Ion	Ratio	Lower	Upper
278	100		
139	13.9	11.6	17.4
279	21.9	19.3	28.9

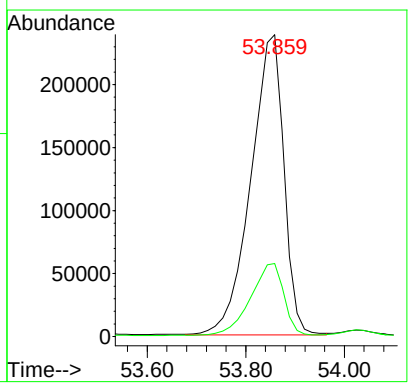


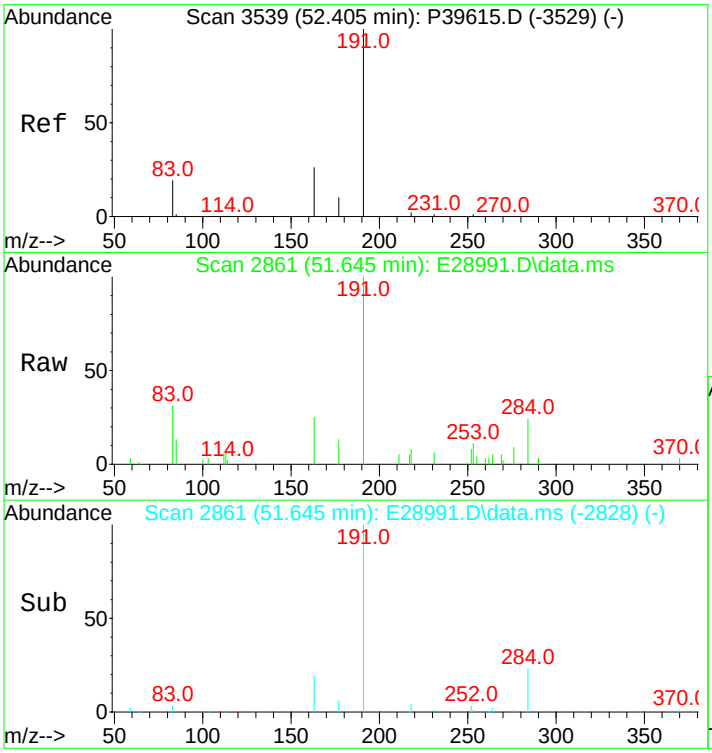


#93
Benzo[g,h,i]perylene
Concen: 5786.92 ng/mL
RT: 53.859 min Scan# 3008
Delta R.T. 0.075 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:276 Resp: 1110971

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.1	28.7

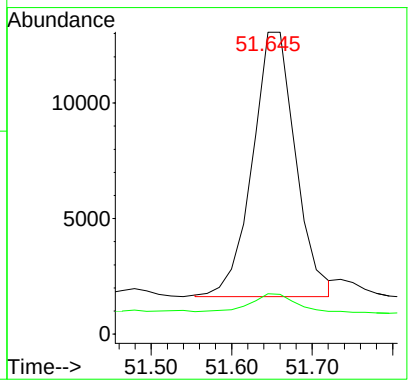


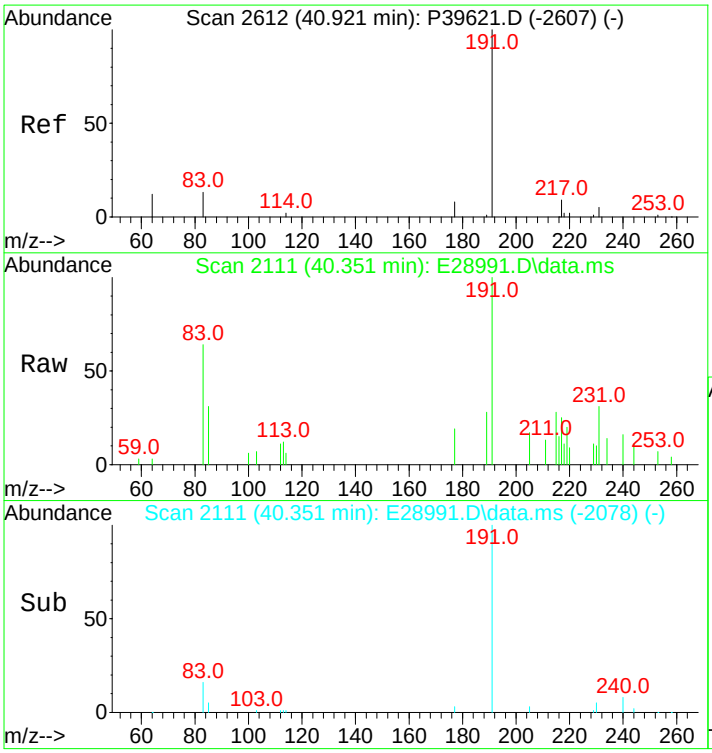


#94
Hopane (T19)
Concen: 794.84 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:191 Resp: 42675

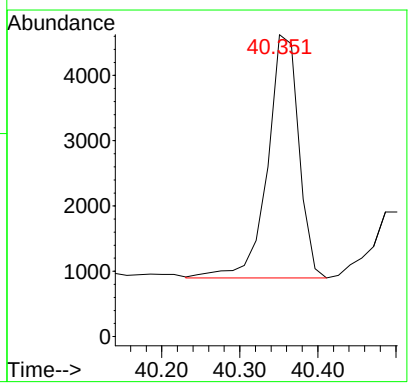
Ion	Ratio	Lower	Upper
191	100		
177	8.8	11.6	17.4#

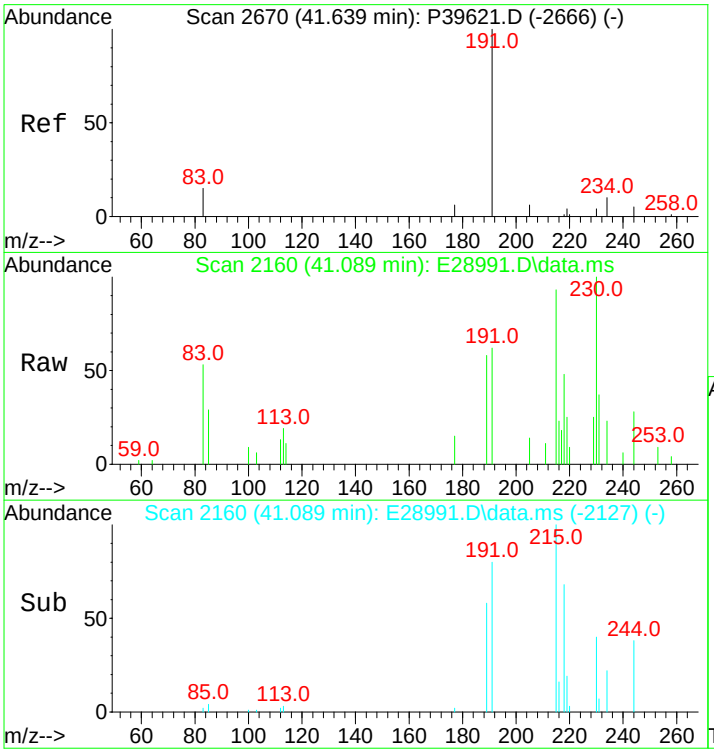




#96
C23 Tricyclic Terpane (T4)
Concen: 192.90 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

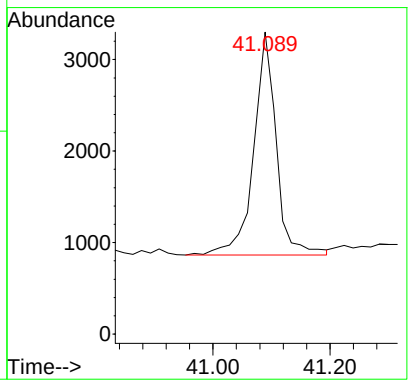
Tgt Ion:191 Resp: 10357

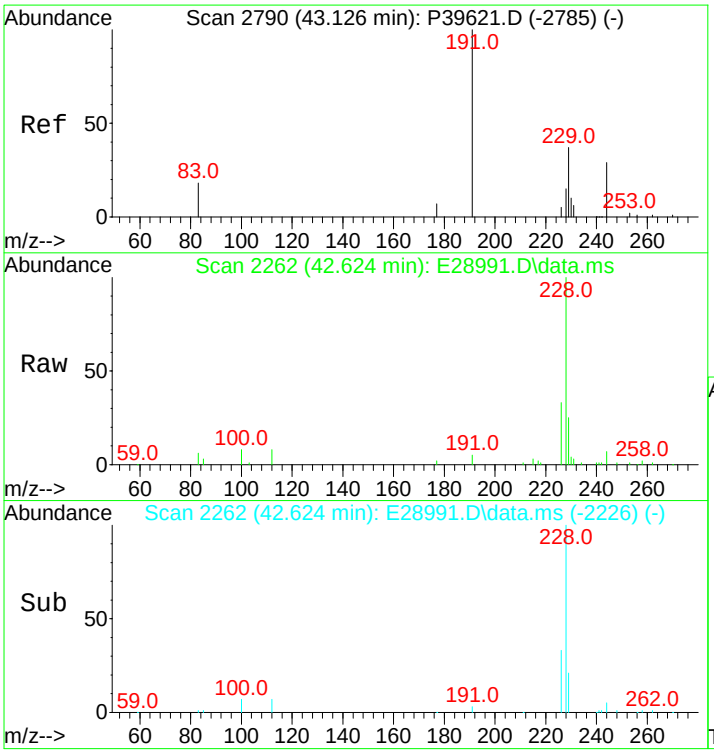




#97
C24 Tricyclic Terpane (T5)
Concen: 121.42 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

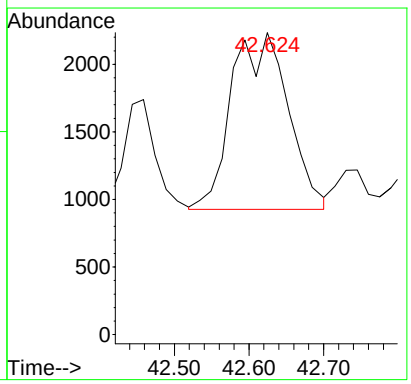
Tgt Ion:191 Resp: 6519

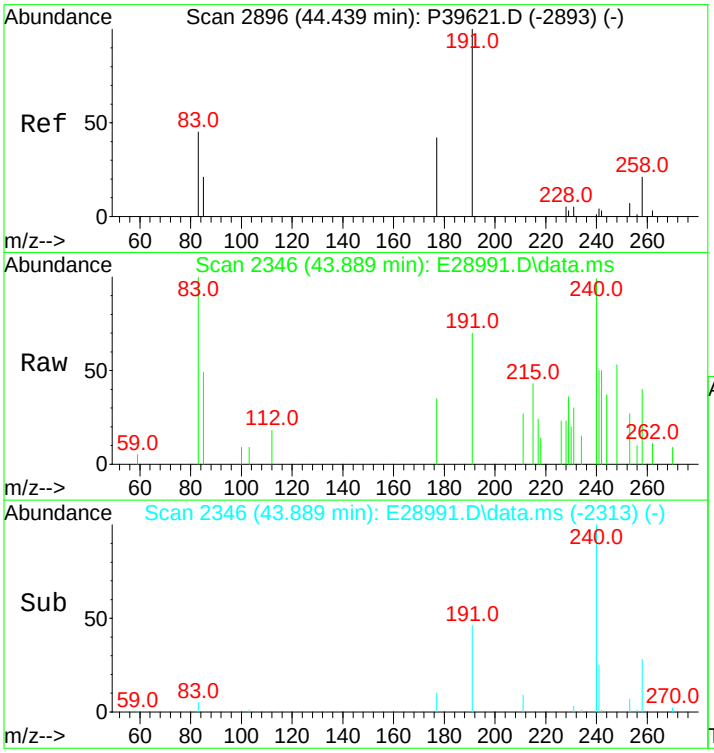




#98
C25 Tricyclic Terpane (T6)
Concen: 128.09 ng/ml m
RT: 42.624 min Scan# 2262
Delta R.T. 0.045 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

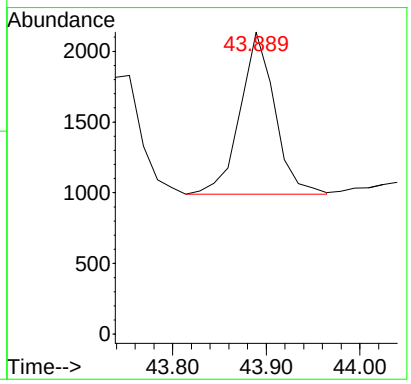
Tgt Ion:191 Resp: 6877

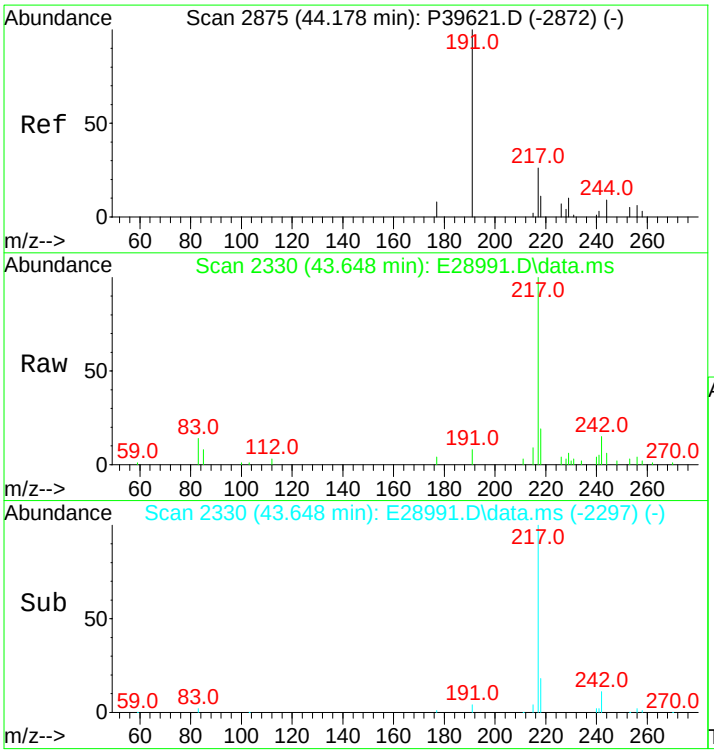




#99
C24 Tetracyclic Terpane (T6a)
Concen: 54.78 ng/ml
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

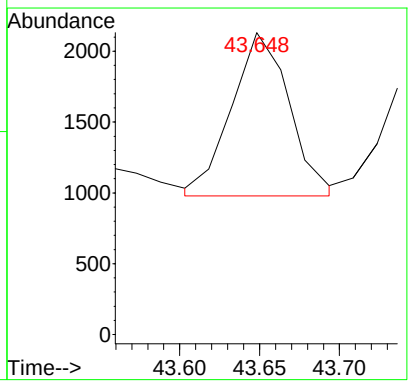
Tgt Ion:191 Resp: 2941

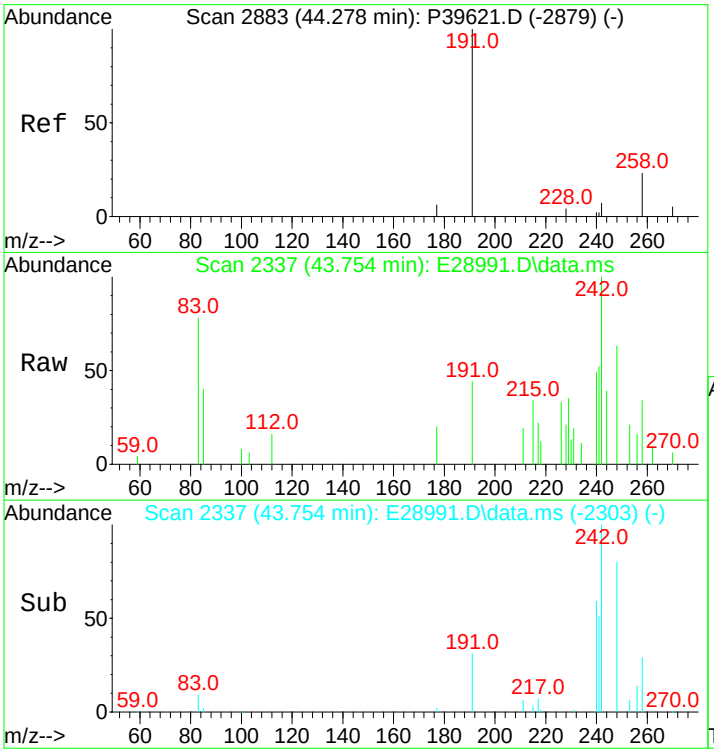




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 53.94 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

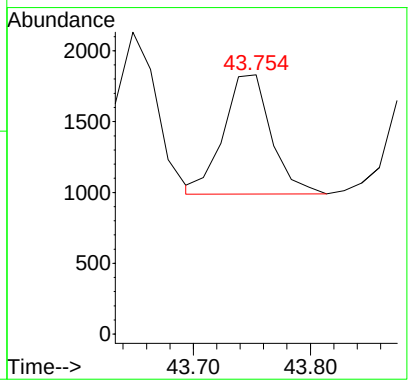
Tgt Ion:191 Resp: 2896

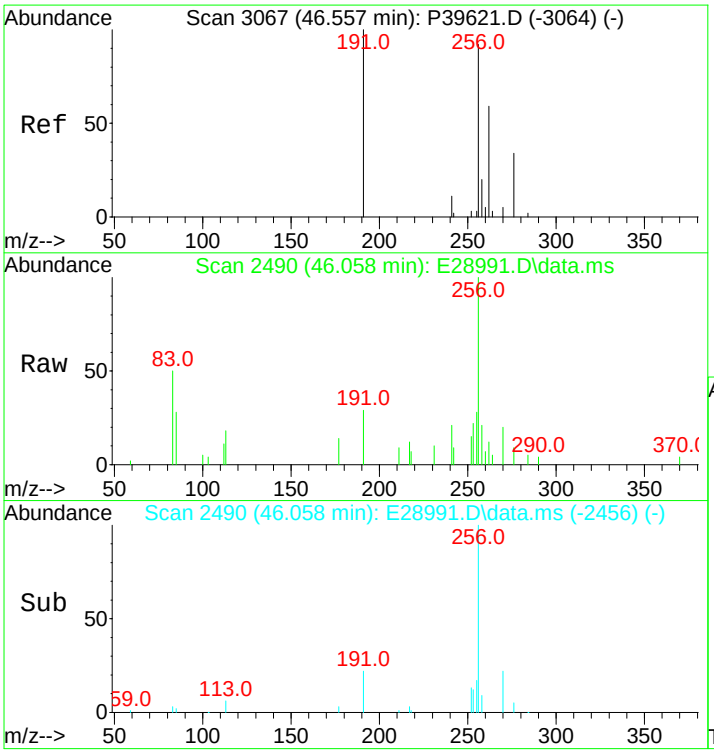




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 44.38 ng/ml
RT: 43.754 min Scan# 2337
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

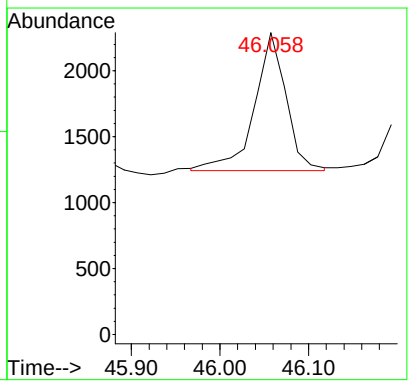
Tgt Ion:191 Resp: 2383

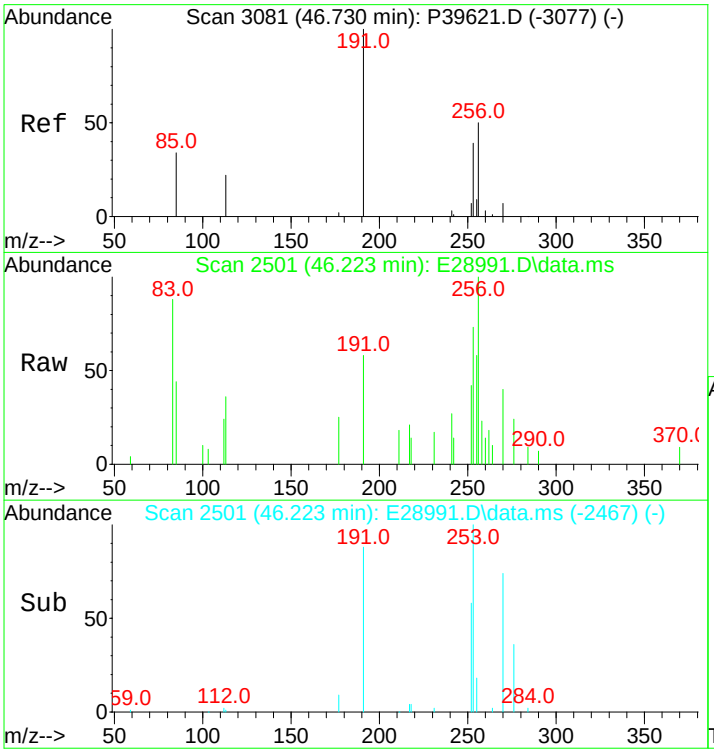




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 48.22 ng/ml m
RT: 46.058 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

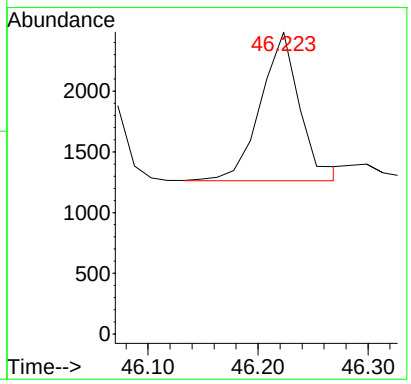
Tgt Ion:191 Resp: 2589

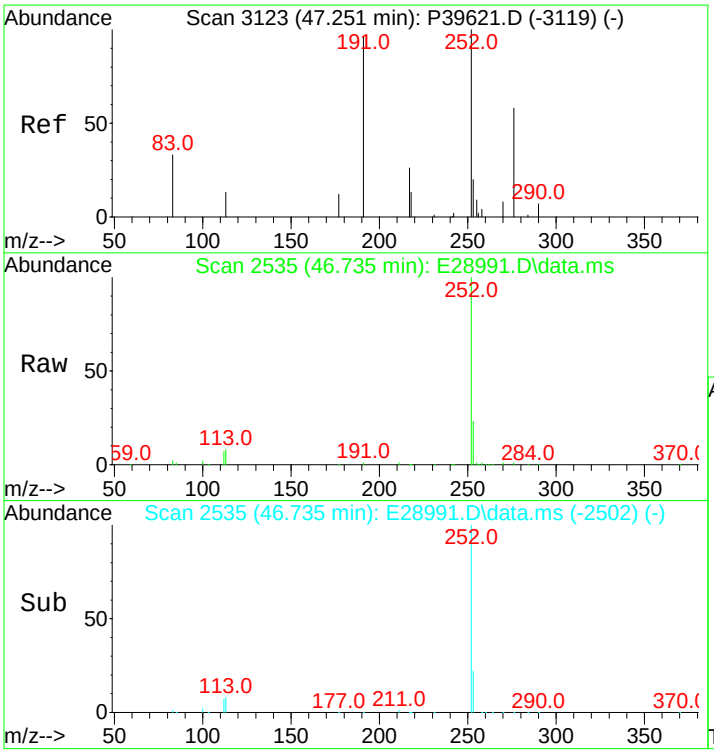




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 56.12 ng/ml m
RT: 46.223 min Scan# 2501
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

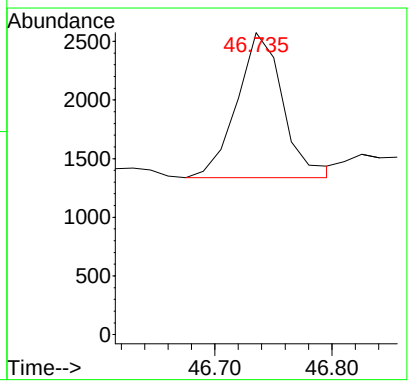
Tgt Ion:191 Resp: 3013

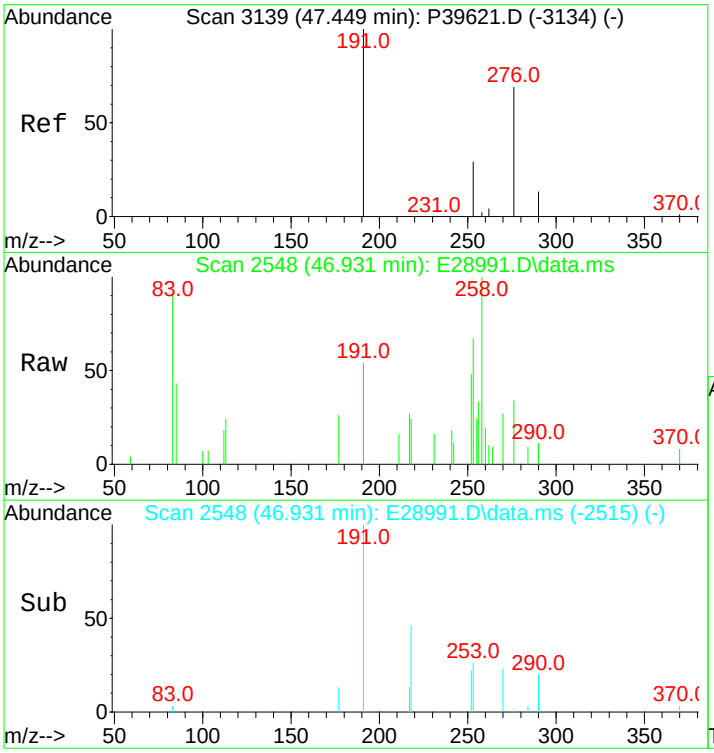




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 62.79 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

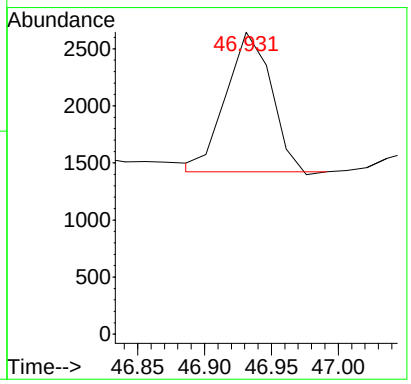
Tgt Ion:191 Resp: 3371

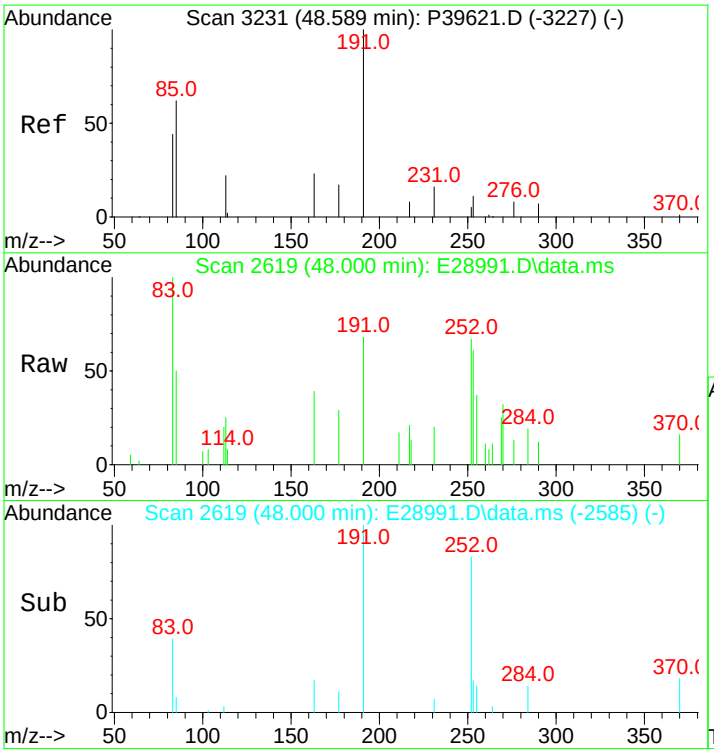




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 53.23 ng/ml
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

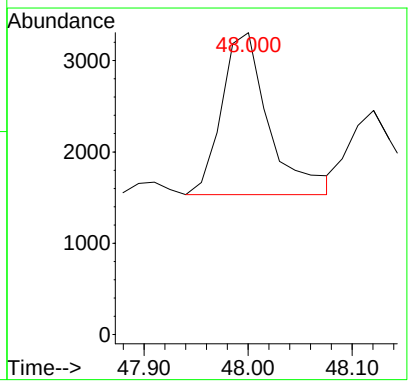
Tgt Ion:191 Resp: 2858

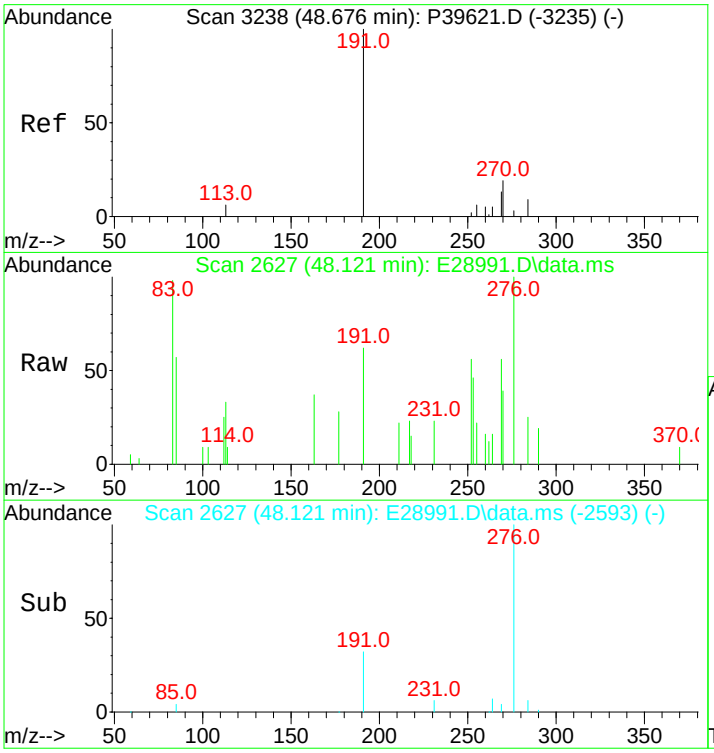




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 104.95 ng/ml
RT: 48.000 min Scan# 2619
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

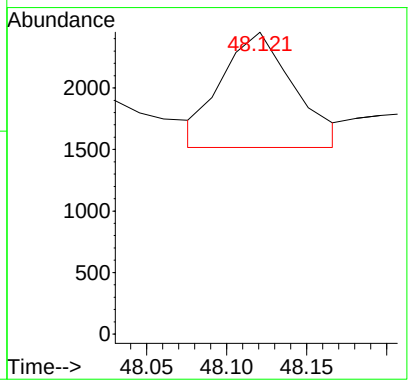
Tgt Ion:191 Resp: 5635

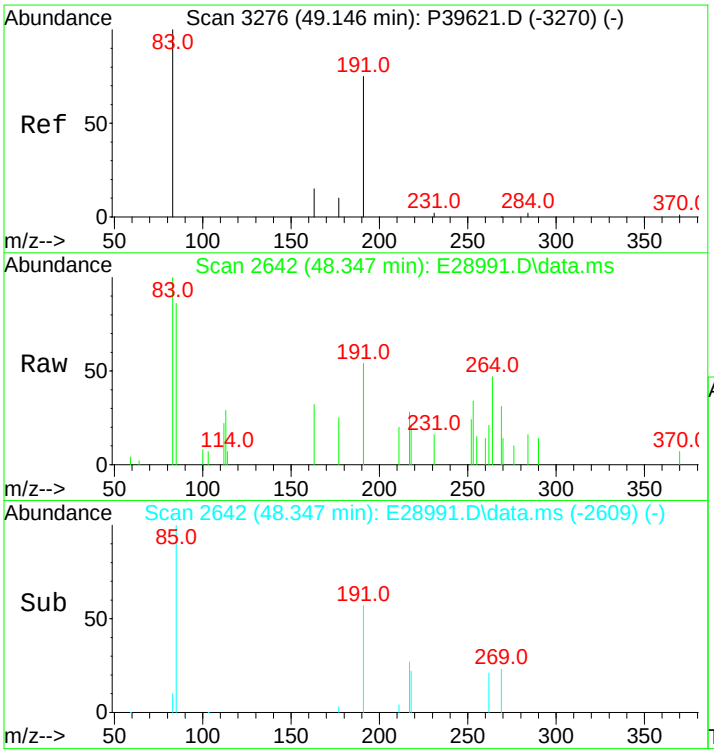




#107
C30 Tricyclic Terpane-22S
Concen: 54.83 ng/mL m
RT: 48.121 min Scan# 2627
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

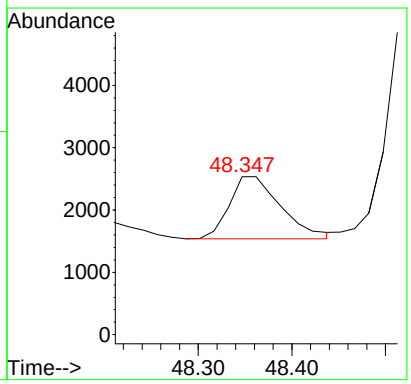
Tgt Ion:191 Resp: 2944

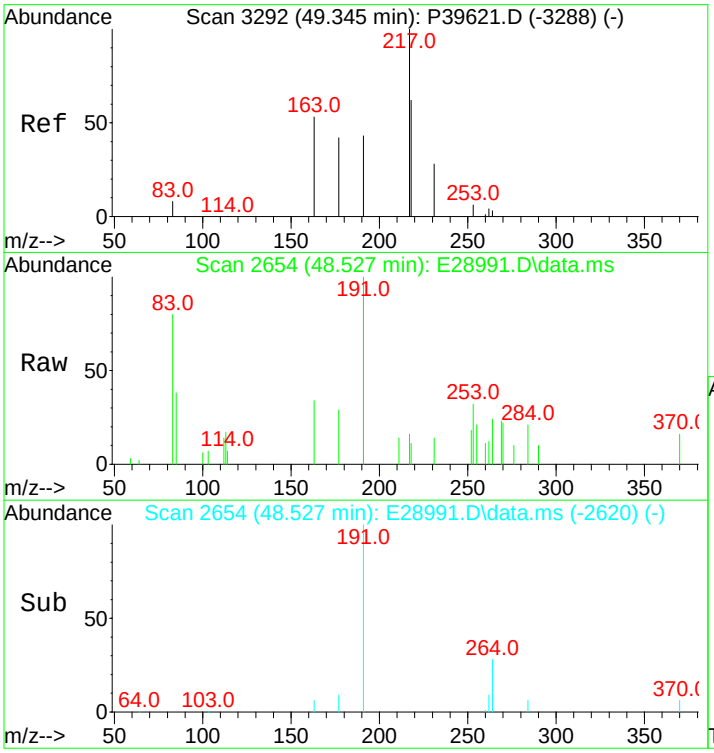




#108
C30 Tricyclic Terpane-22R
Concen: 71.37 ng/mL
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

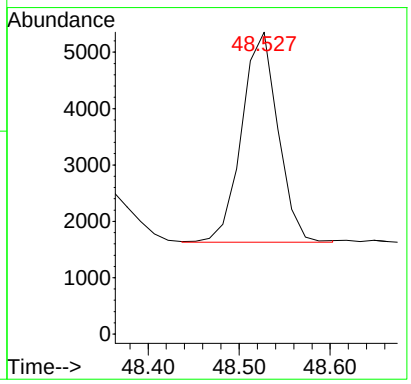
Tgt Ion:191 Resp: 3832

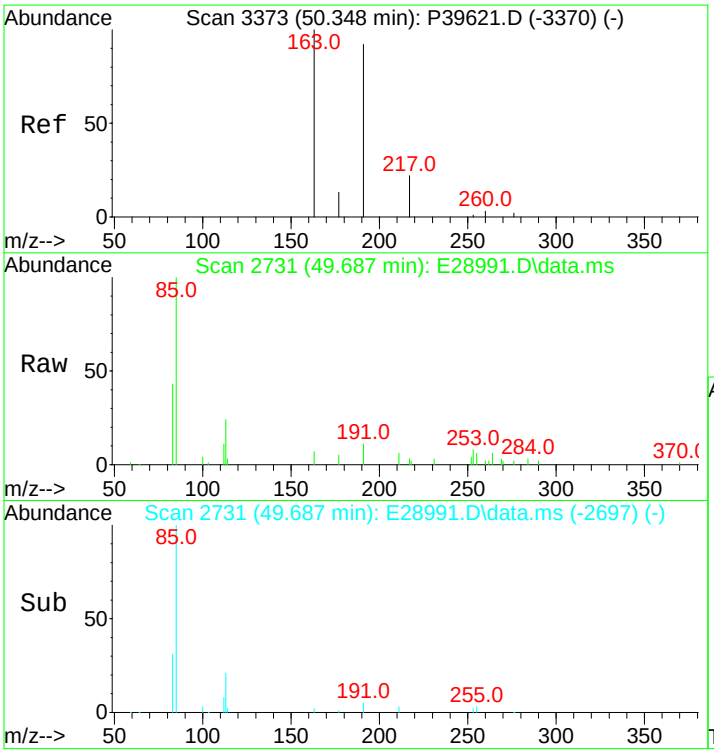




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 191.02 ng/ml m
RT: 48.527 min Scan# 2654
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

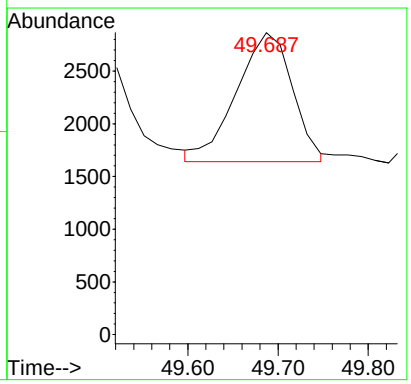
Tgt Ion:191 Resp: 10256

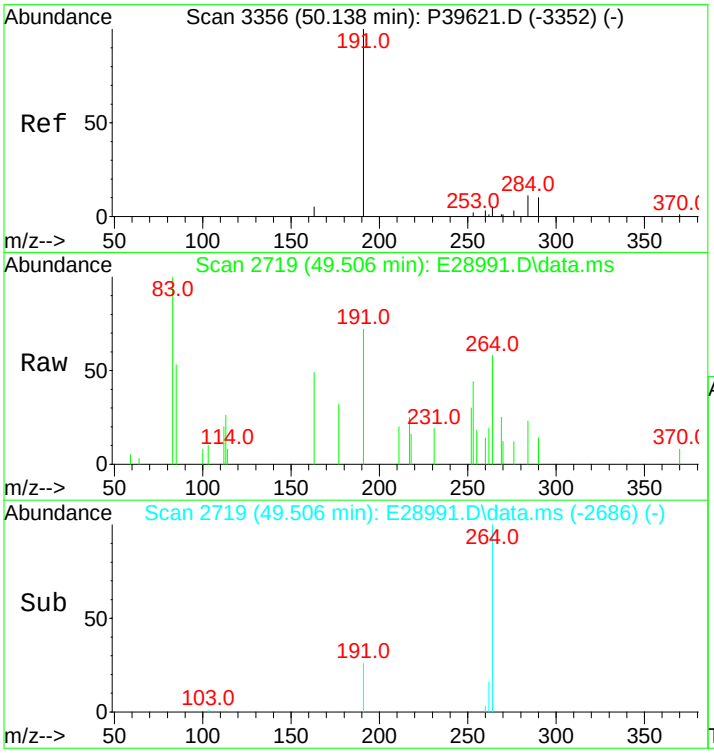




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 98.01 ng/ml m
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

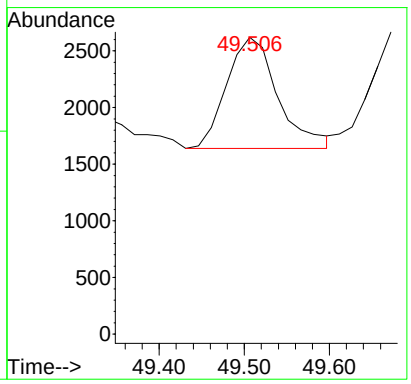
Tgt Ion:191 Resp: 5262

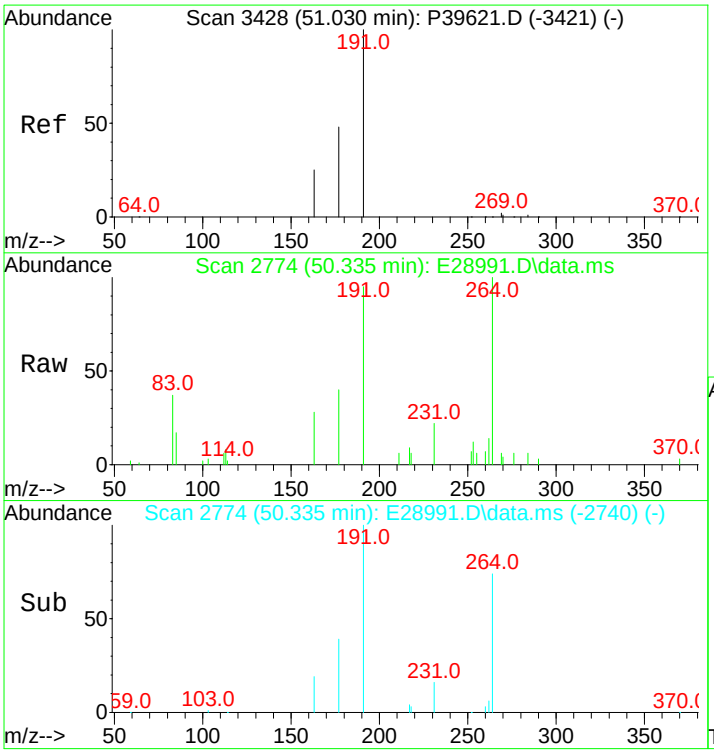




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 76.87 ng/ml
RT: 49.506 min Scan# 2719
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

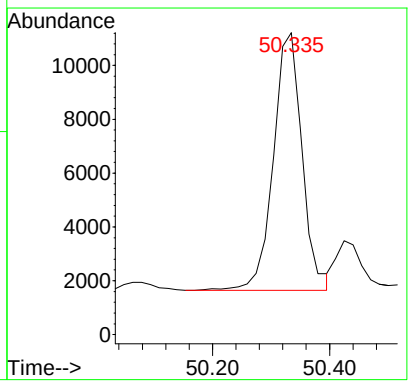
Tgt Ion:191 Resp: 4127

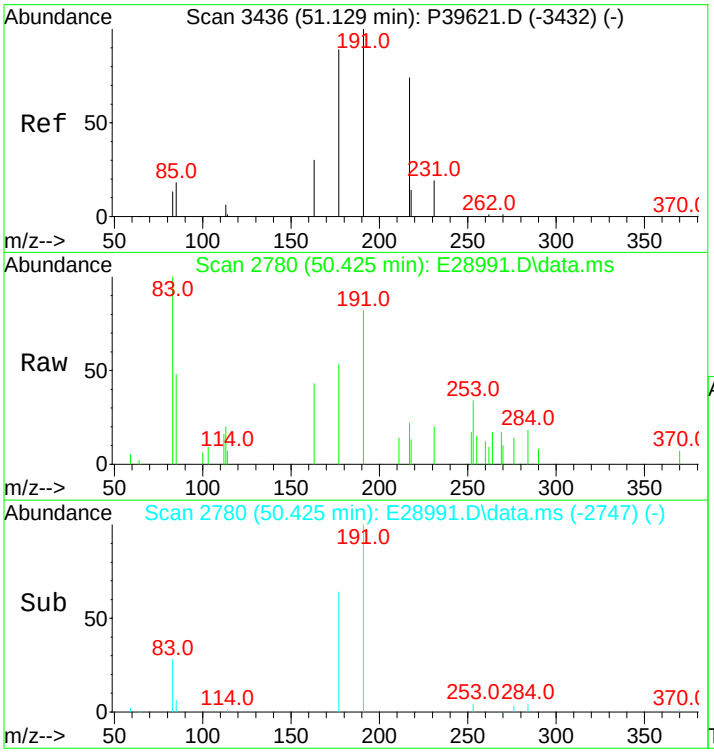




#112
30-Norhopane (T15)
Concen: 608.68 ng/ml
RT: 50.335 min Scan# 2774
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

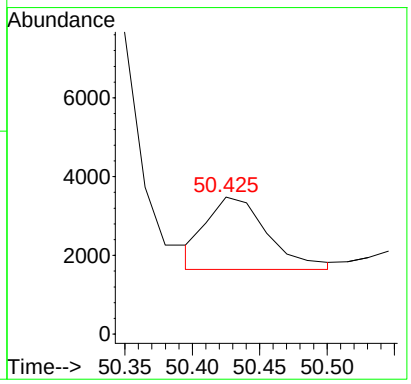
Tgt Ion:191 Resp: 32680

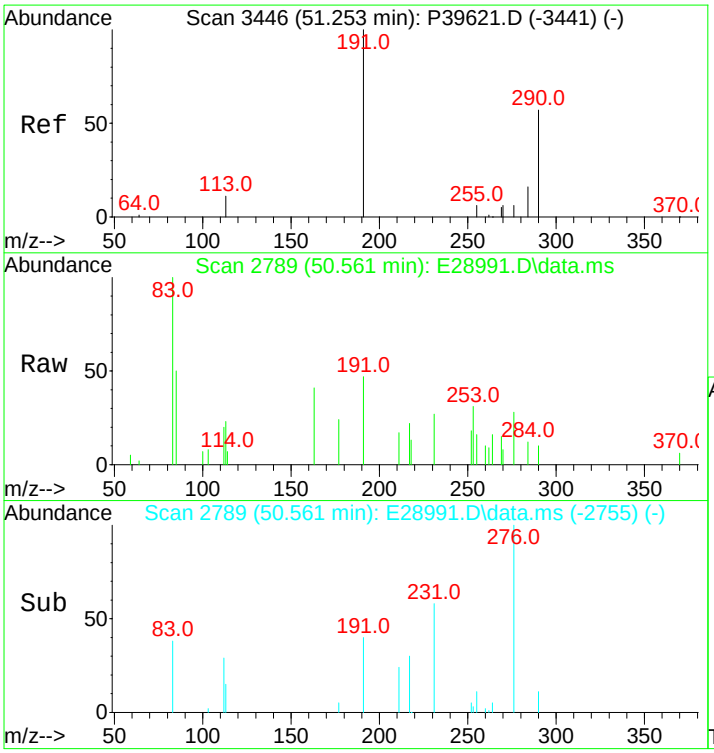




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 108.07 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

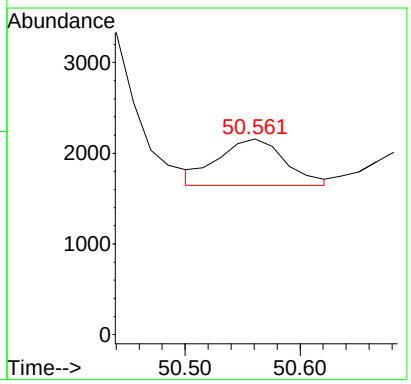
Tgt Ion:191 Resp: 5802

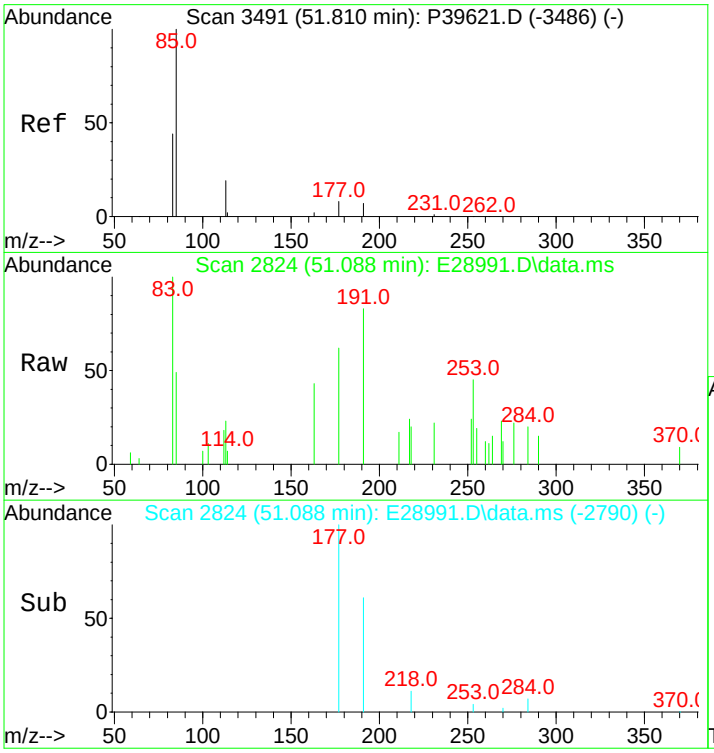




#114
17a(H)-Diahopane (X)
Concen: 38.26 ng/ml m
RT: 50.561 min Scan# 2789
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

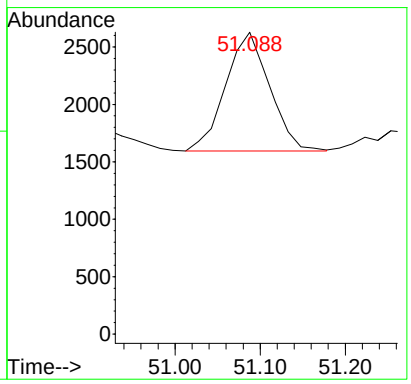
Tgt Ion:191 Resp: 2054

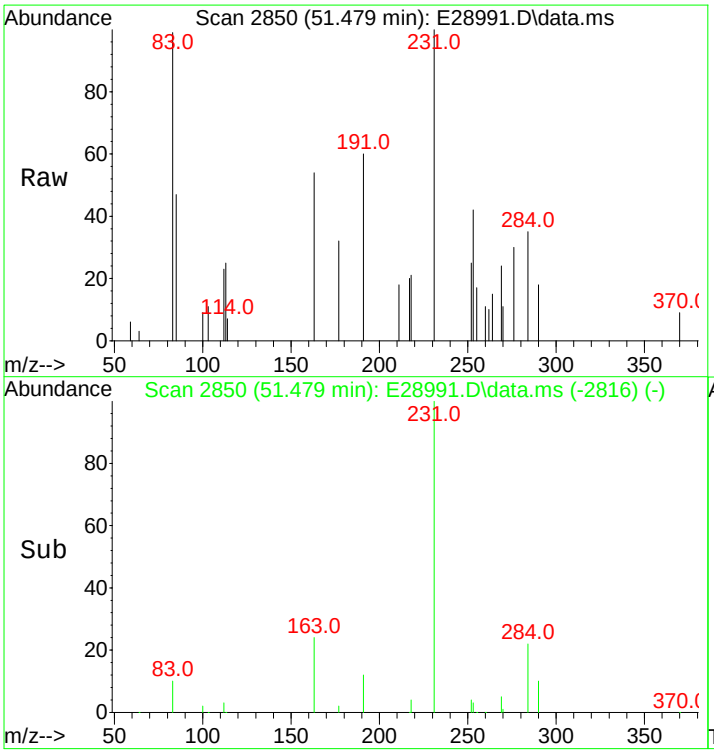




#115
30-Normoretane (T17)
Concen: 69.08 ng/ml
RT: 51.088 min Scan# 2824
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

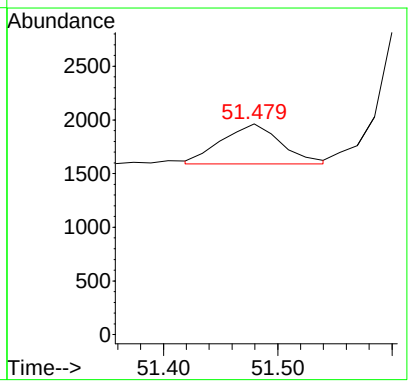
Tgt Ion:191 Resp: 3709

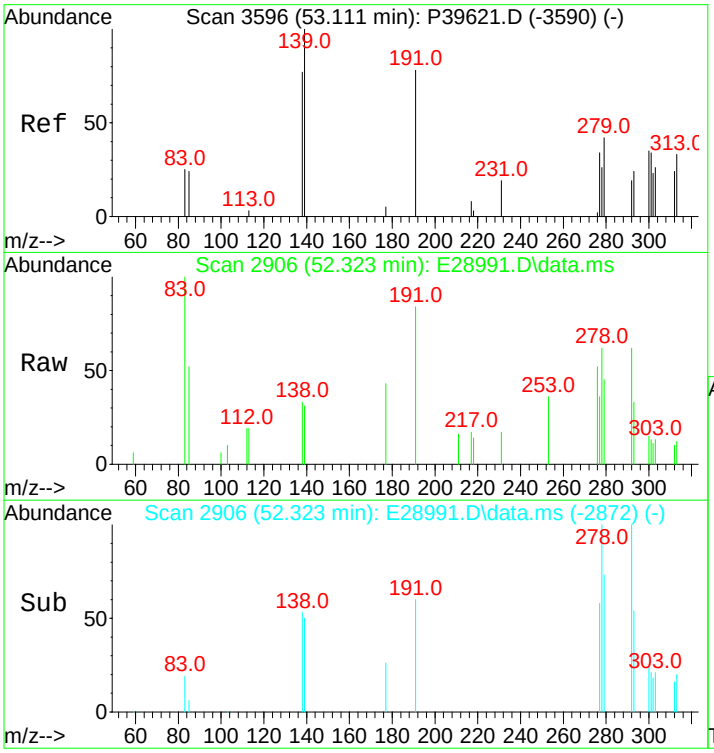




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 24.92 ng/ml m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

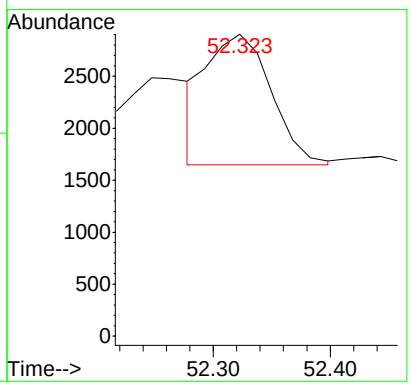
Tgt Ion:191 Resp: 1338

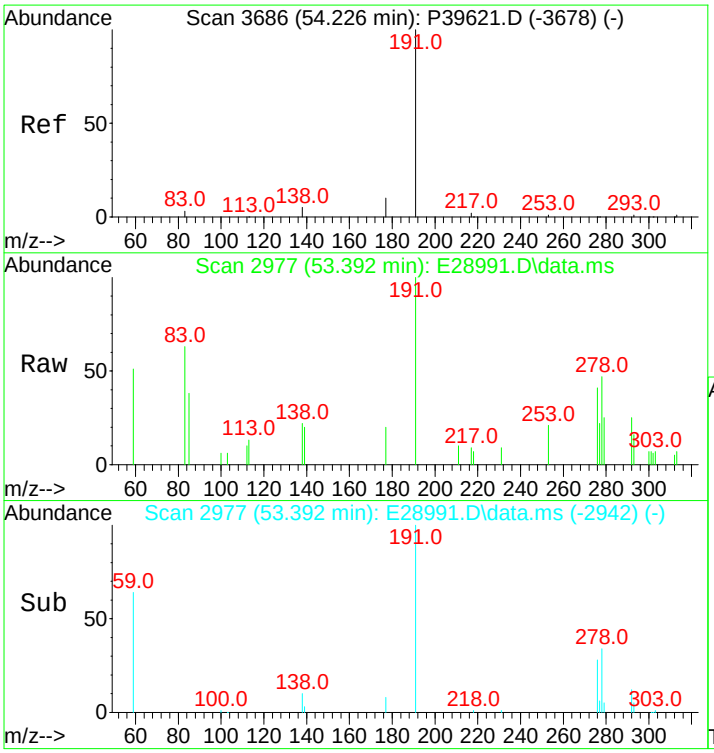




#117
Moretane (T20)
Concen: 90.30 ng/ml m
RT: 52.323 min Scan# 2906
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

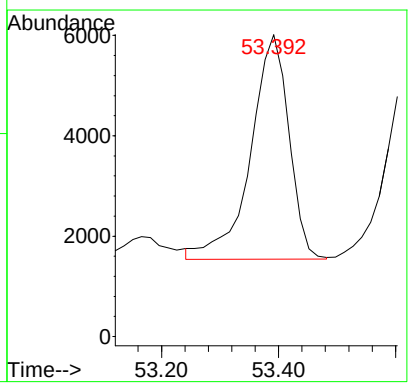
Tgt Ion:191 Resp: 4848

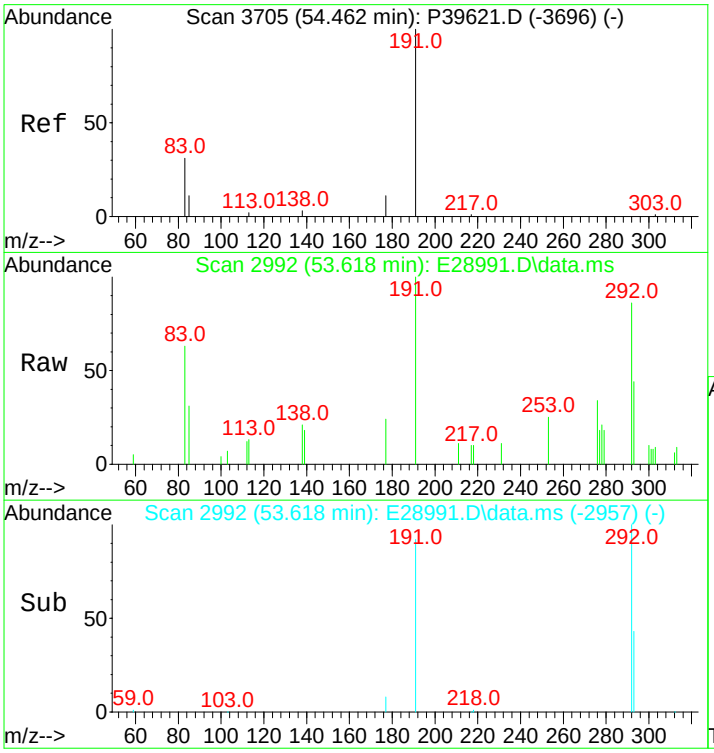




#118
30-Homohopane-22S (T21)
Concen: 379.61 ng/ml
RT: 53.392 min Scan# 2977
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

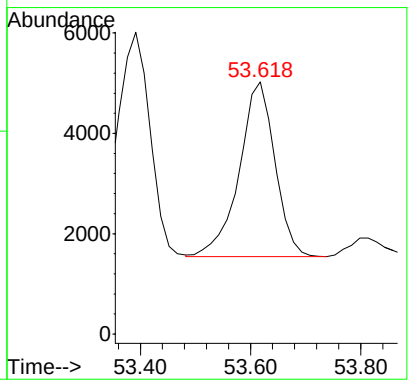
Tgt Ion:191 Resp: 20381

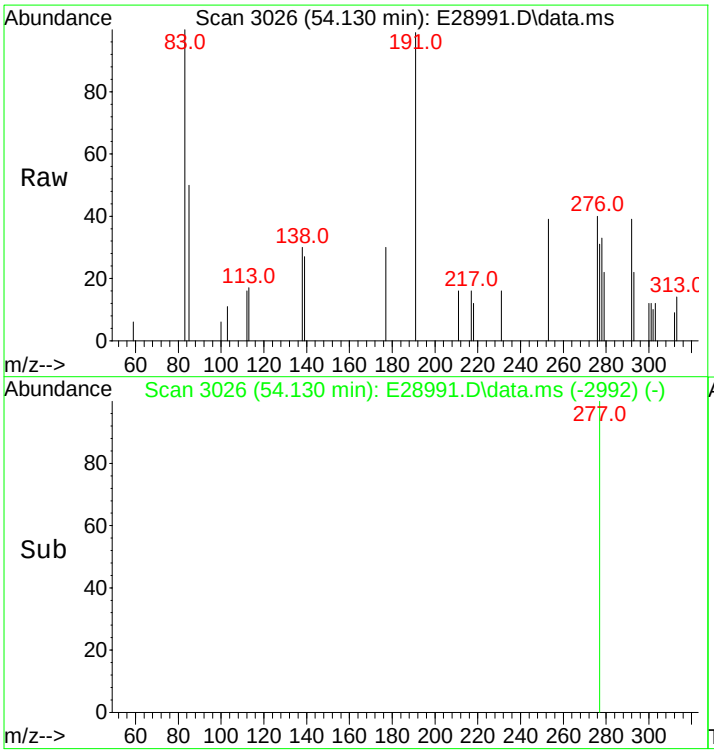




#119
30-Homohopane-22R (T22)
Concen: 290.41 ng/ml
RT: 53.618 min Scan# 2992
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

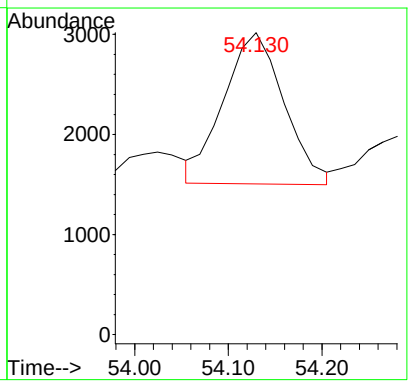
Tgt Ion:191 Resp: 15592

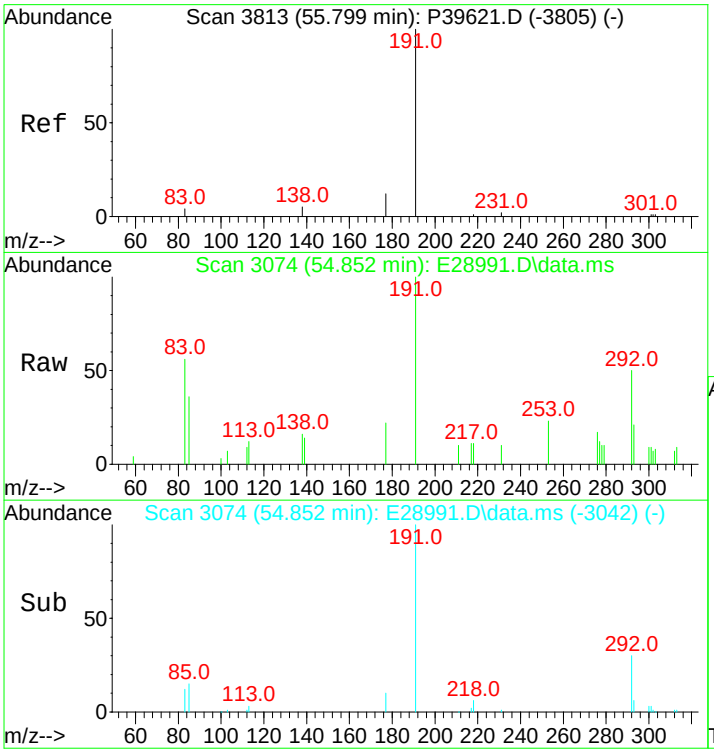




#120
Gammacerane/C32-diahopane
Concen: 126.19 ng/mL
RT: 54.130 min Scan# 3026
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

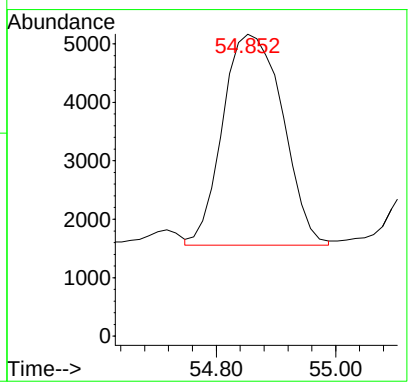
Tgt Ion:191 Resp: 6775

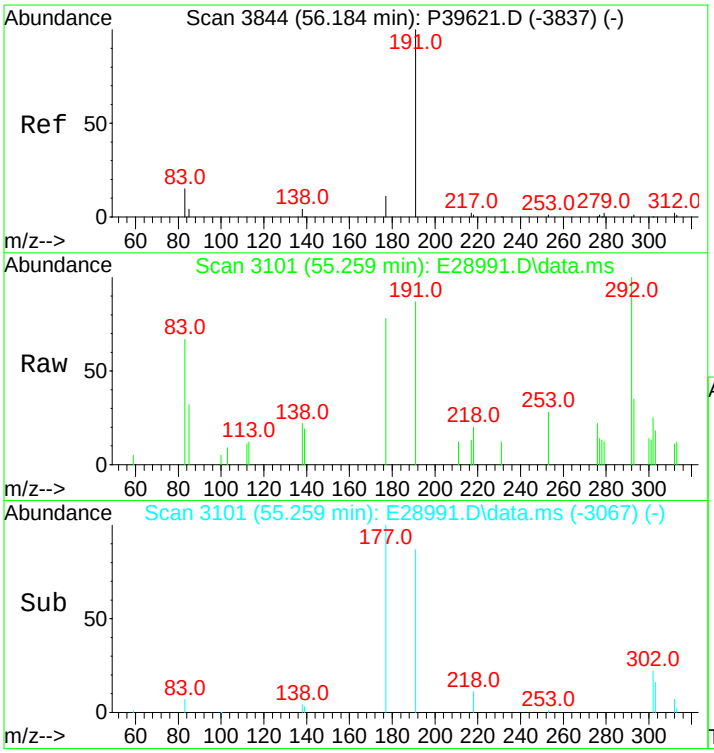




#121
30,31-Bishomohopane-22S (T26)
Concen: 467.24 ng/ml m
RT: 54.852 min Scan# 3074
Delta R.T. -0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

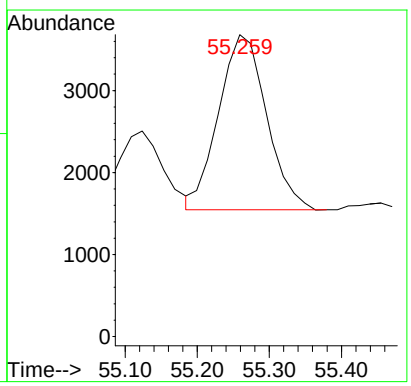
Tgt Ion:191 Resp: 25086

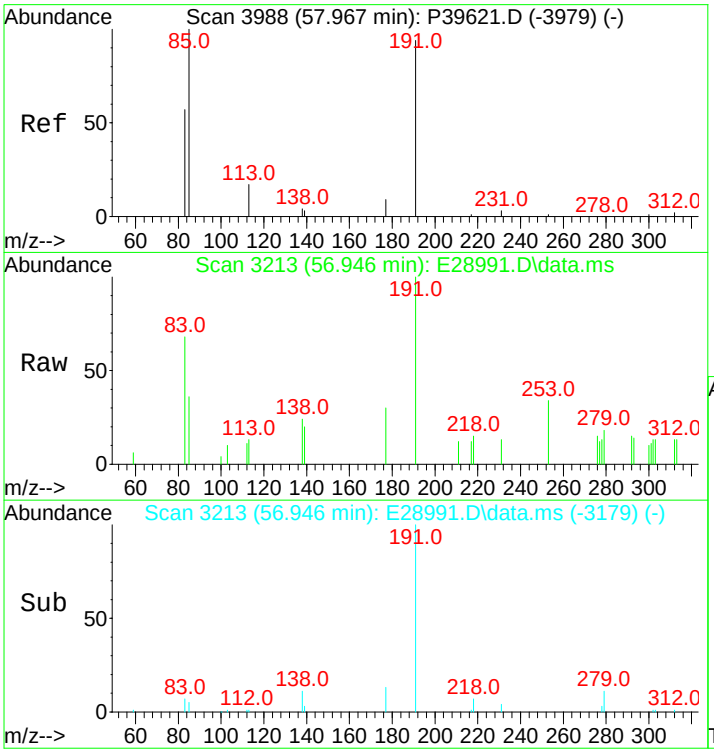




#122
30,31-Bishomohopane-22R (T27)
Concen: 183.61 ng/ml
RT: 55.259 min Scan# 3101
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

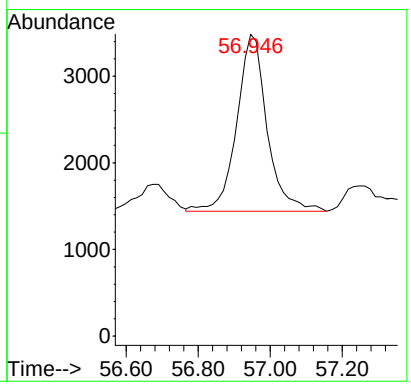
Tgt Ion:191 Resp: 9858

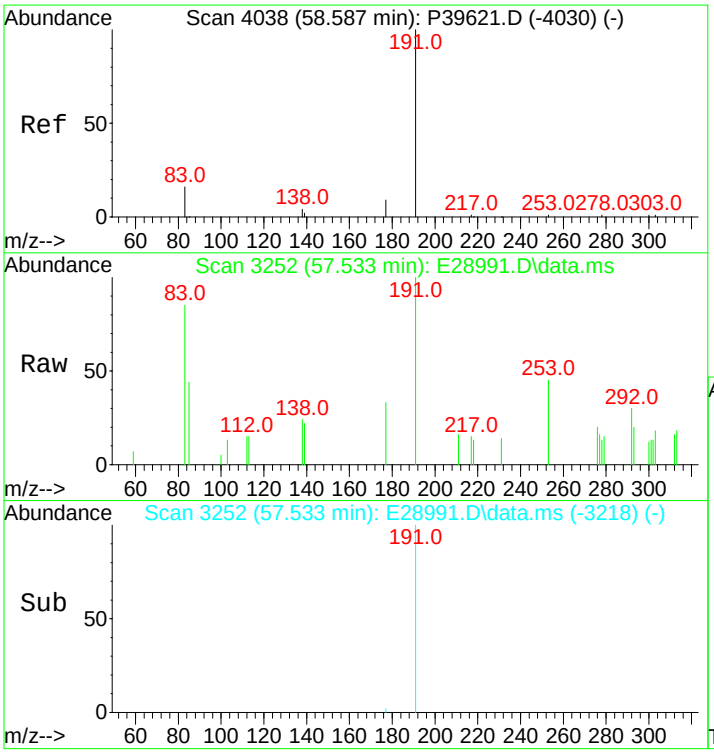




#123
30,31-Trishomohopane-22S (T30)
Concen: 221.23 ng/ml
RT: 56.946 min Scan# 3213
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

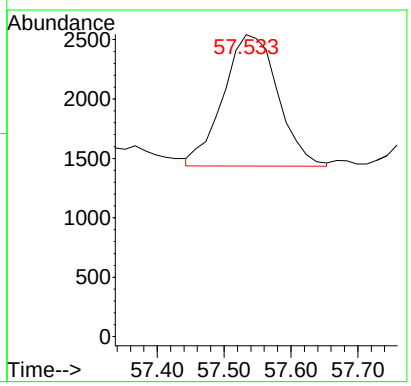
Tgt Ion:191 Resp: 11878

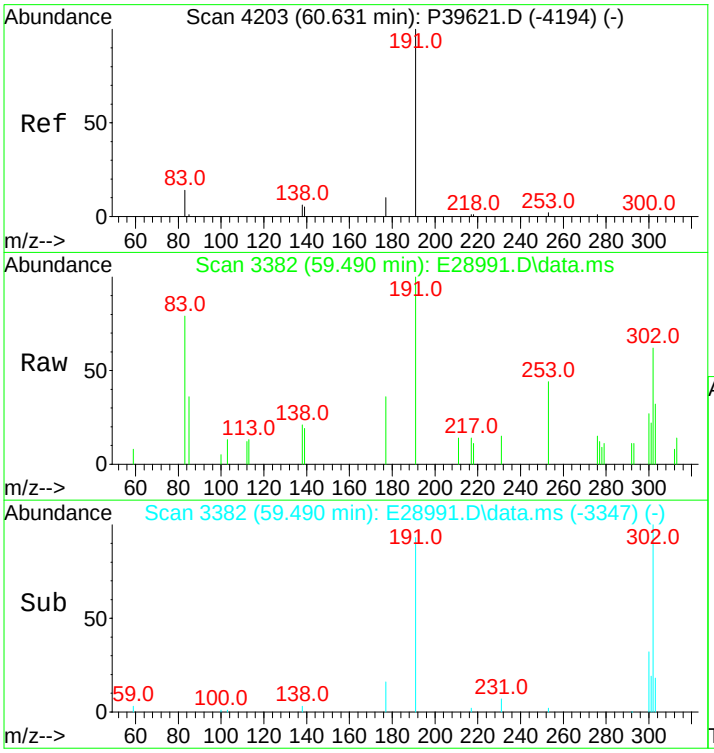




#124
30,31-Trishomohopane-22R (T31)
Concen: 116.54 ng/ml
RT: 57.533 min Scan# 3252
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

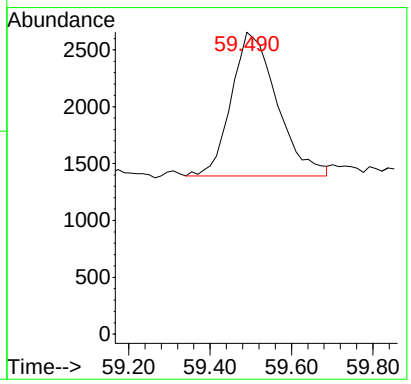
Tgt Ion:191 Resp: 6257

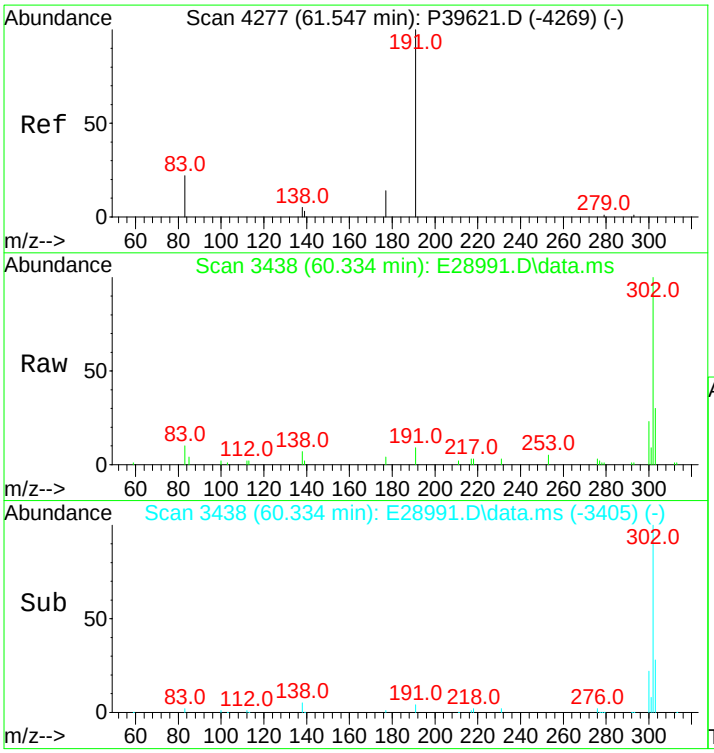




#125
Tetrakishomohopane-22S (T32)
Concen: 183.81 ng/ml
RT: 59.490 min Scan# 3382
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

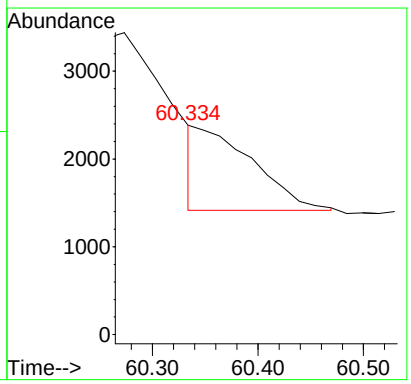
Tgt Ion:191 Resp: 9869

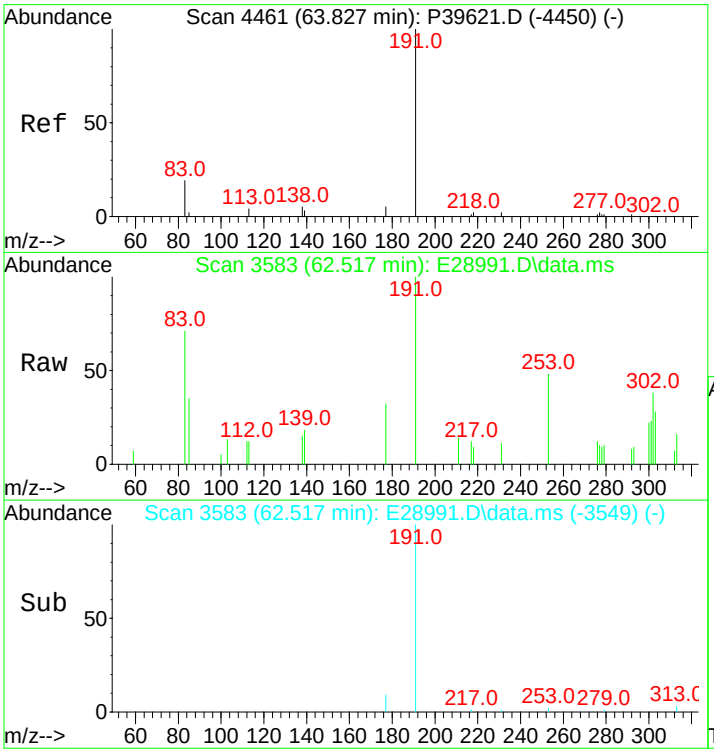




#126
Tetrakishomohopane-22R (T33)
Concen: 65.43 ng/ml m
RT: 60.334 min Scan# 3438
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

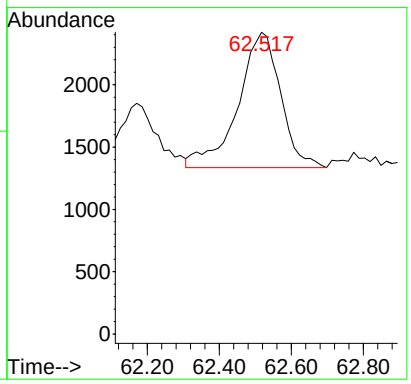
Tgt Ion:191 Resp: 3513

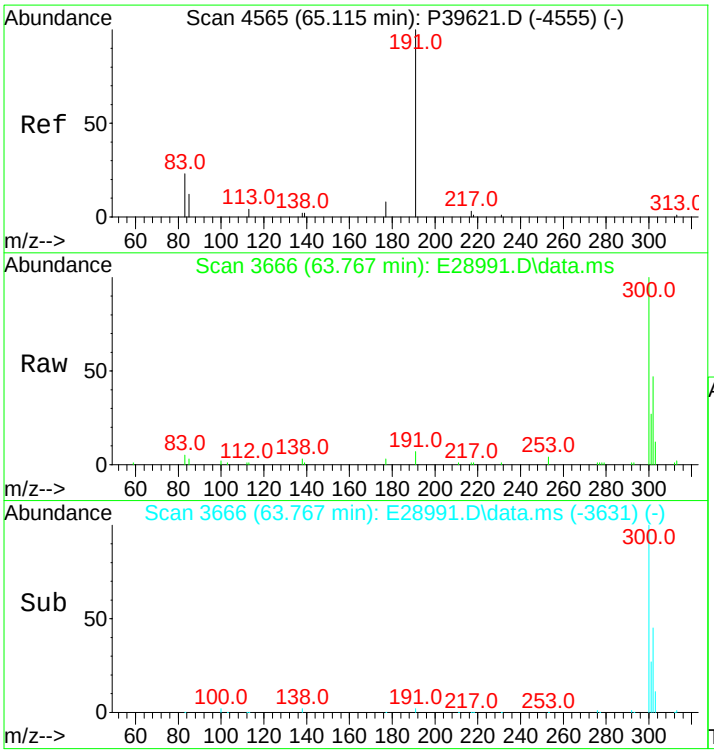




#127
Pentakishomohopane-22S (T34)
Concen: 165.71 ng/ml
RT: 62.517 min Scan# 3583
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

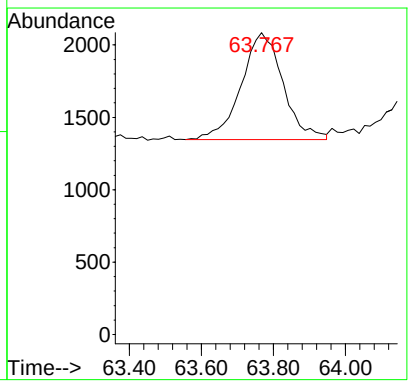
Tgt Ion:191 Resp: 8897

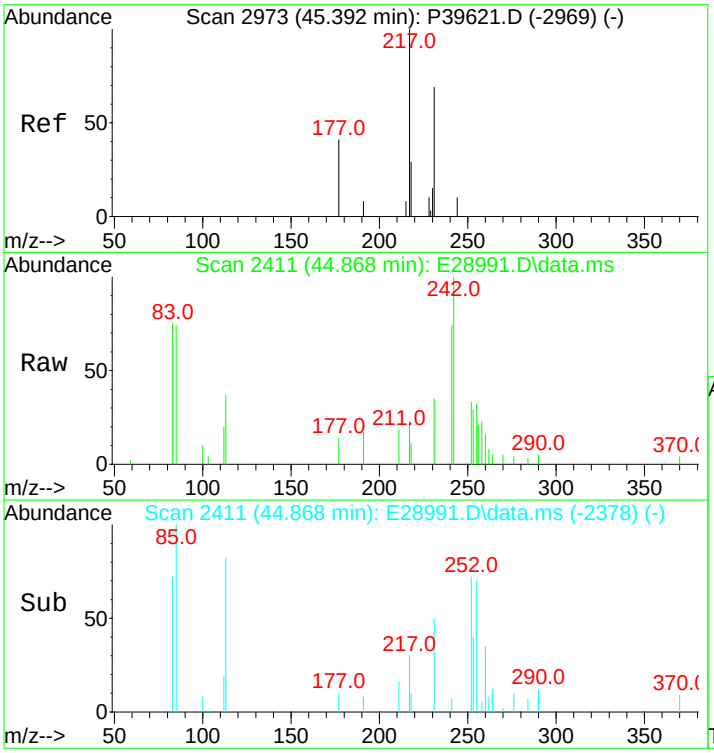




#128
Pentakishomohopane-22R (T35)
Concen: 110.30 ng/ml
RT: 63.767 min Scan# 3666
Delta R.T. 0.030 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

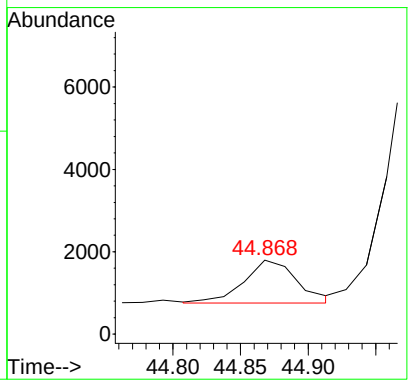
Tgt Ion:191 Resp: 5922

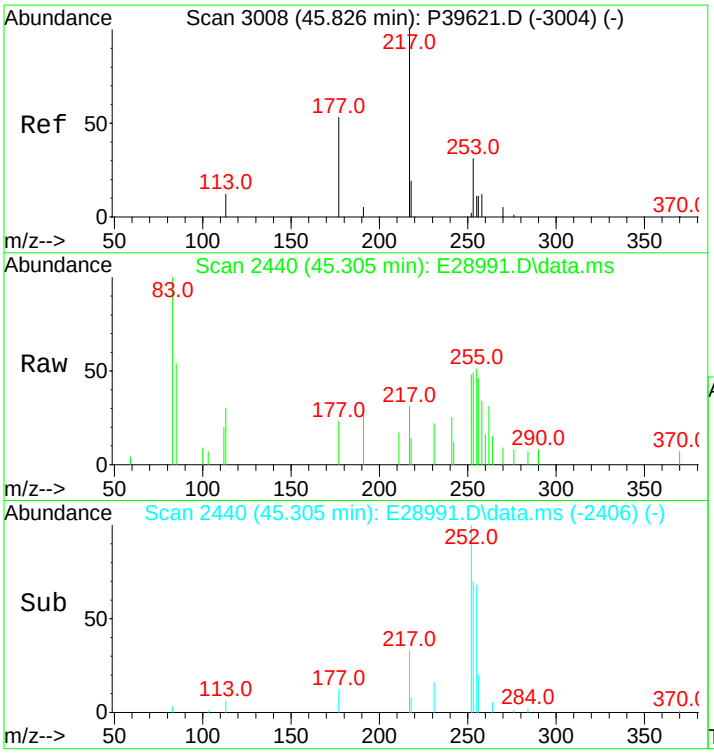




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 100.97 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

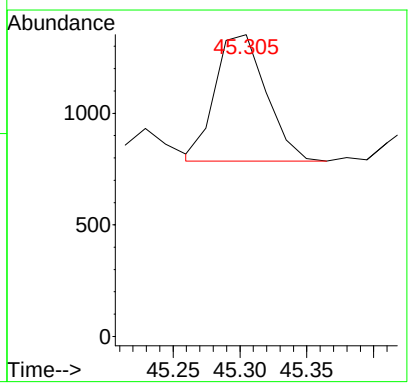
Tgt Ion:217 Resp: 2847

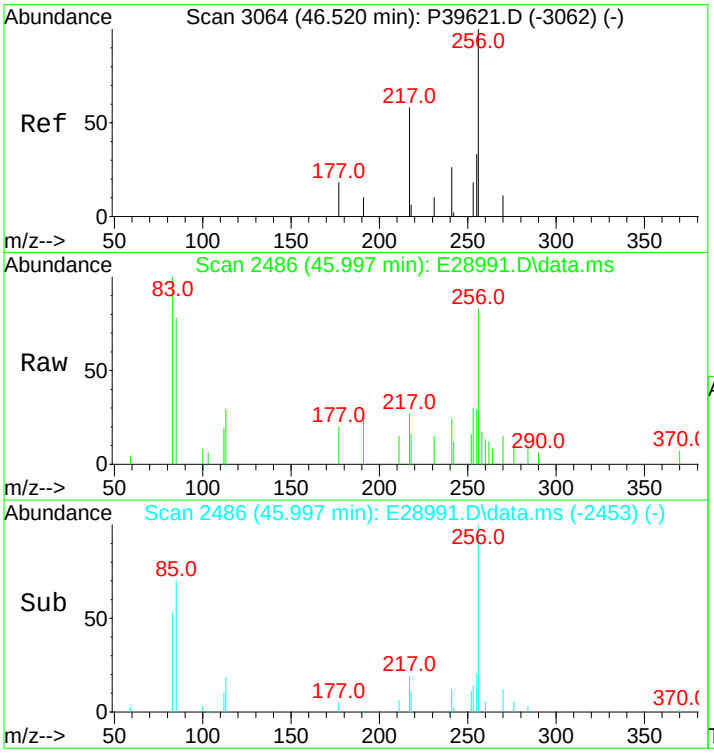




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 53.45 ng/ml
RT: 45.305 min Scan# 2440
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

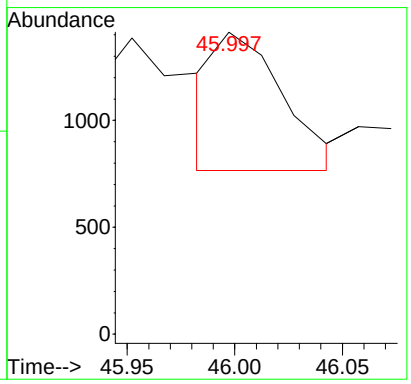
Tgt Ion:217 Resp: 1507

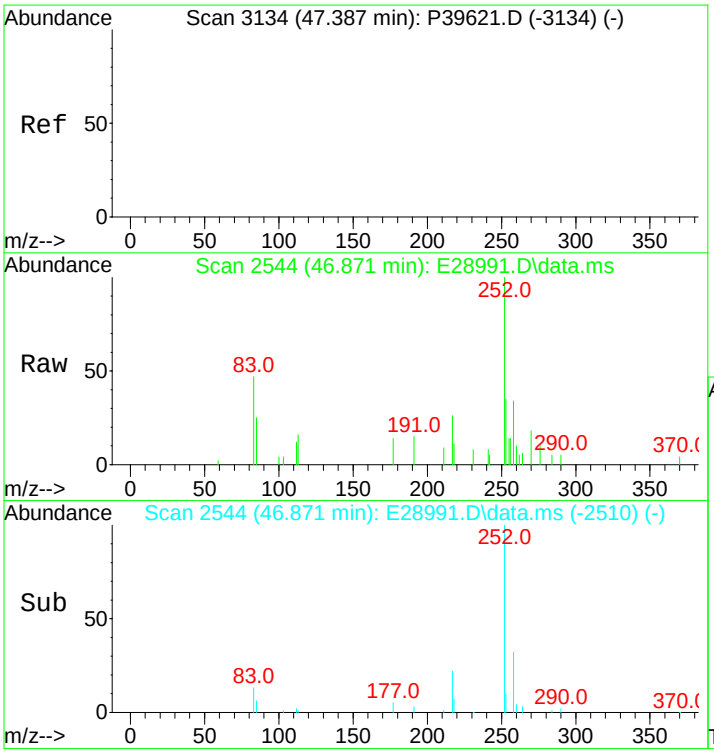




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 50.43 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

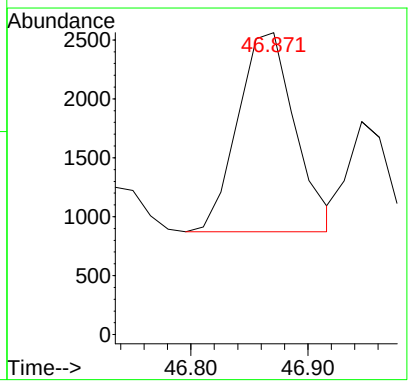
Tgt Ion:217 Resp: 1422

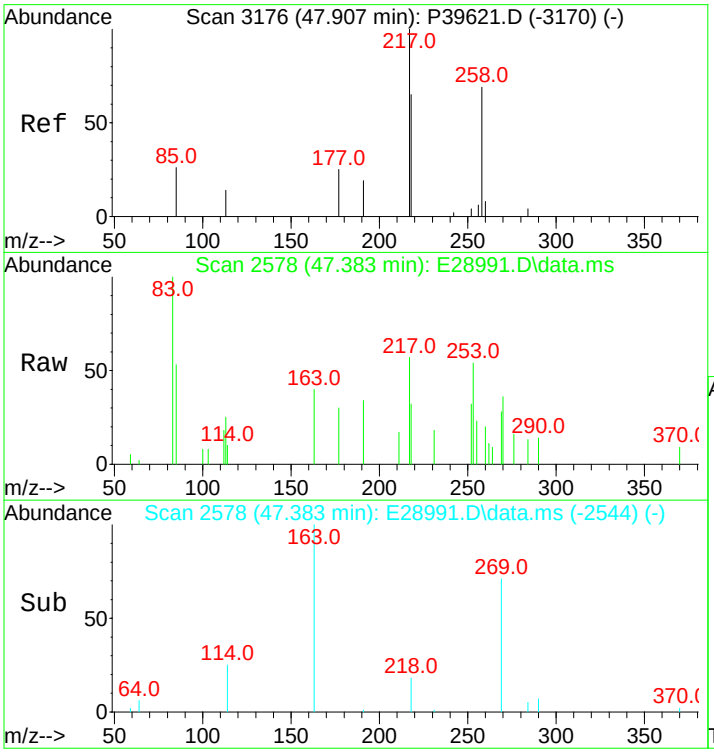




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 203.72 ng/ml
RT: 46.871 min Scan# 2544
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

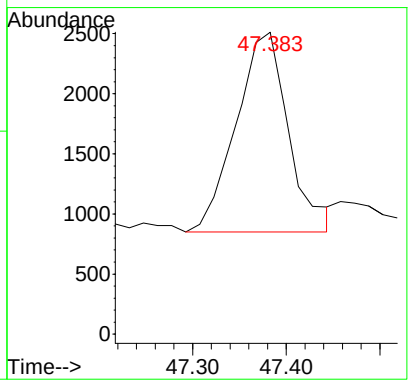
Tgt Ion:217 Resp: 5744

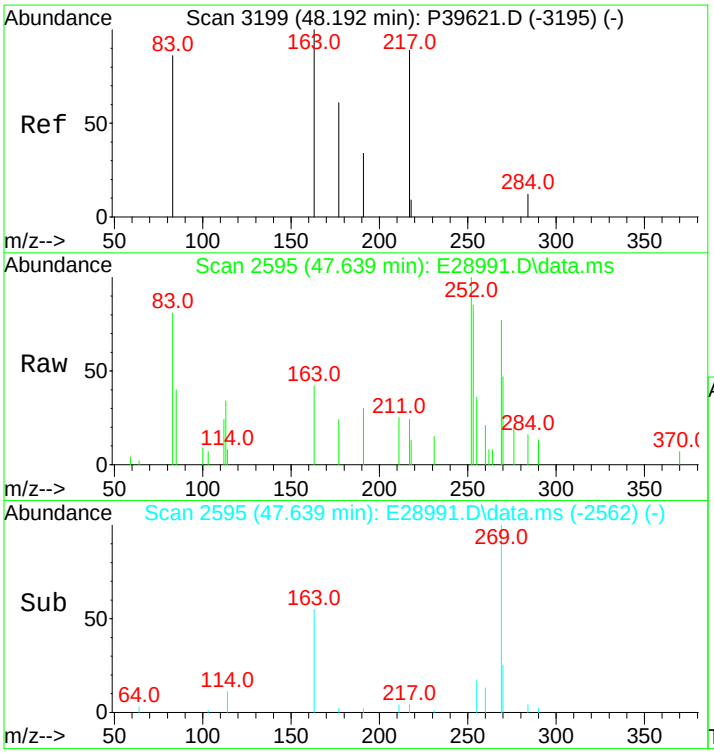




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 229.68 ng/ml
RT: 47.383 min Scan# 2578
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

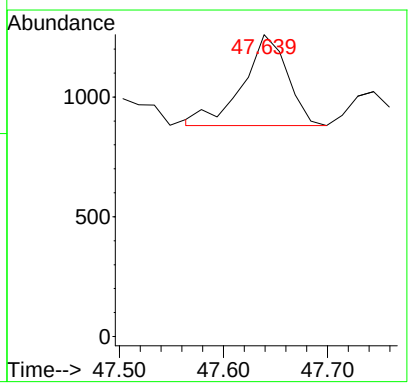
Tgt Ion:217 Resp: 6476

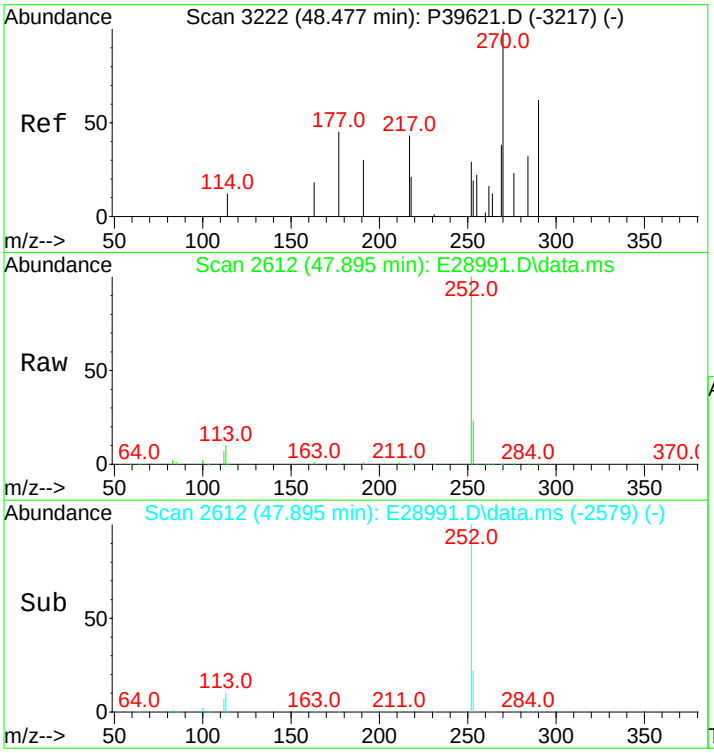




#135
Unknown Sterane (S18)
Concen: 40.18 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

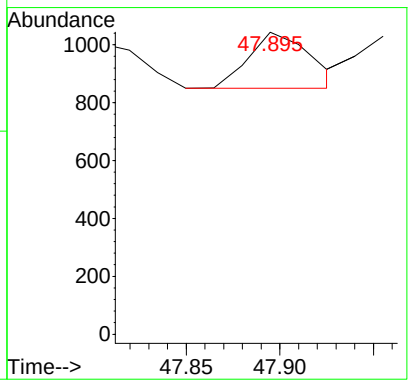
Tgt Ion:217 Resp: 1133

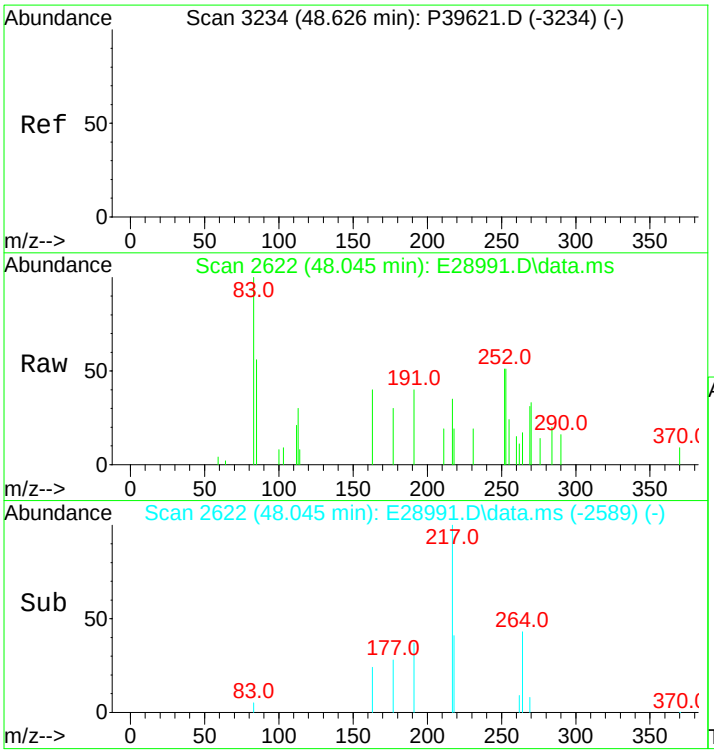




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 15.71 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

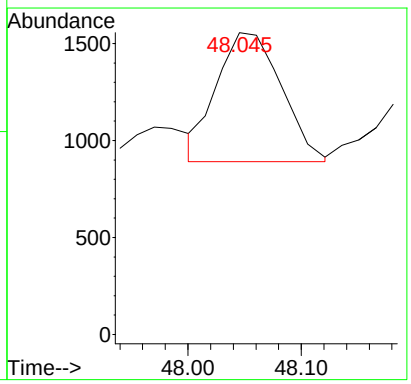
Tgt Ion:217 Resp: 443

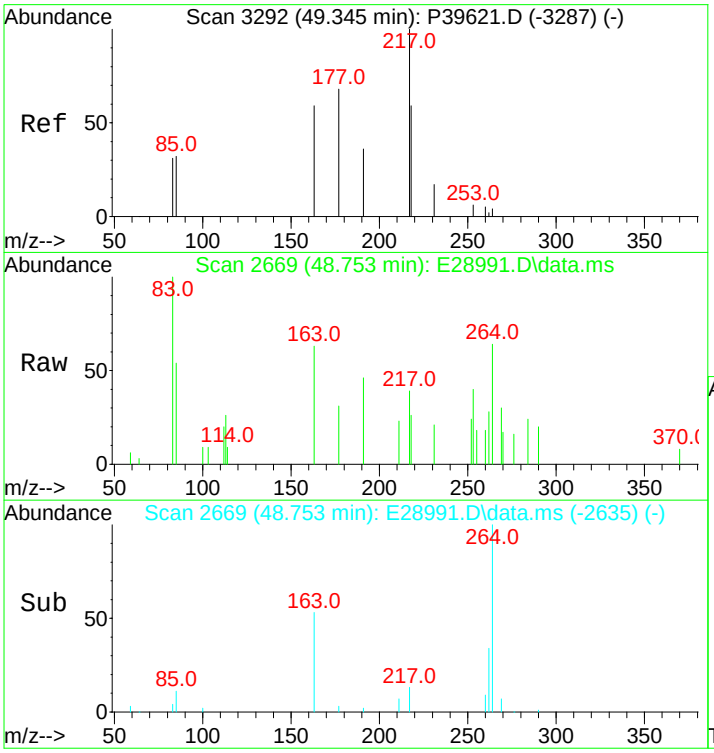




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 93.14 ng/ml m
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

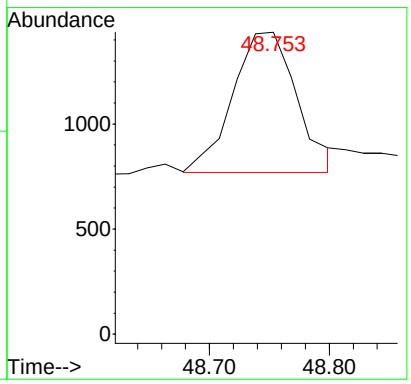
Tgt Ion:217 Resp: 2626

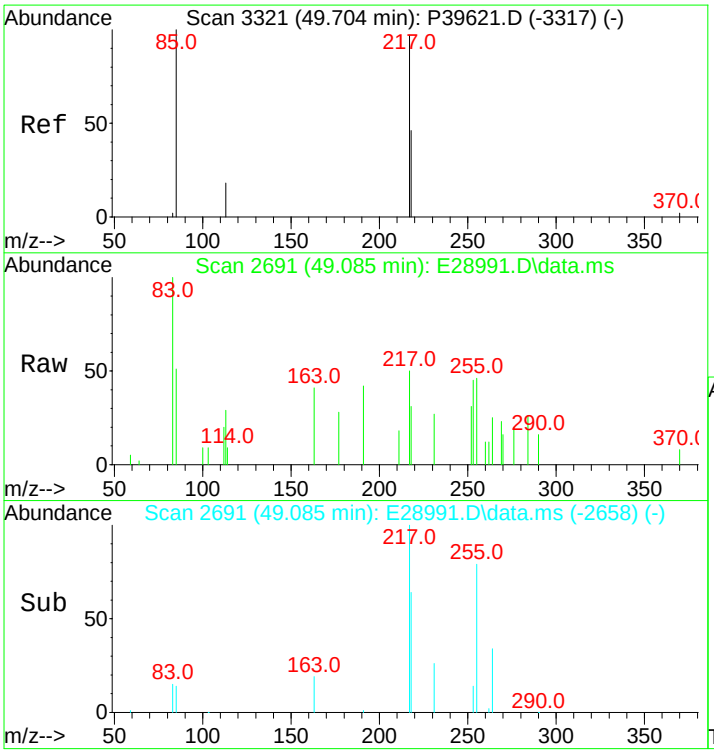




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 87.74 ng/ml m
RT: 48.753 min Scan# 2669
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

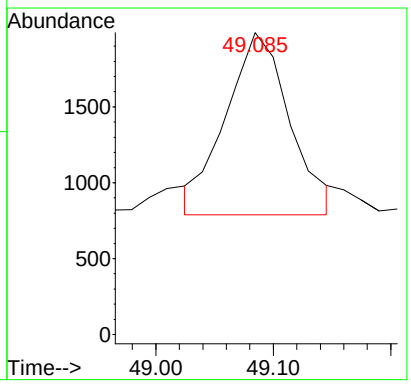
Tgt Ion:217 Resp: 2474

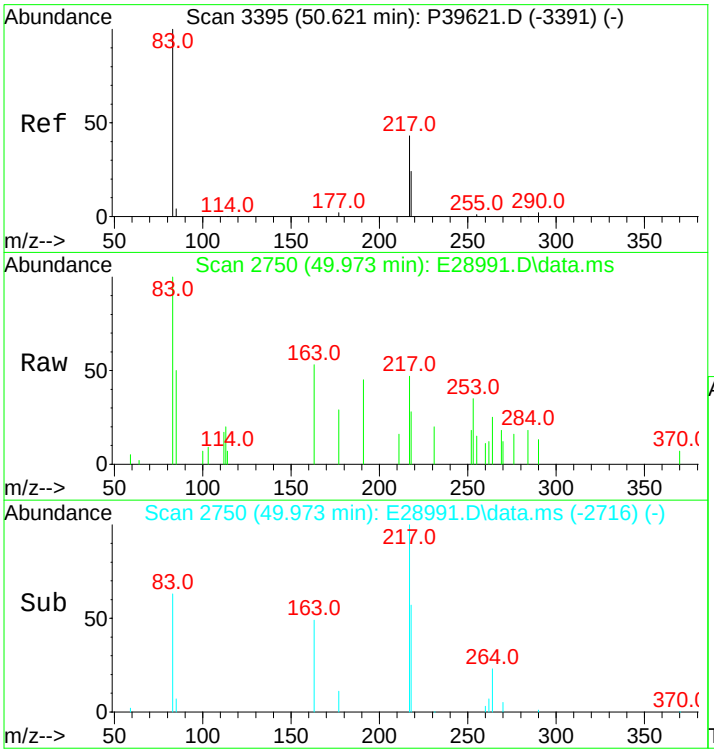




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 160.34 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

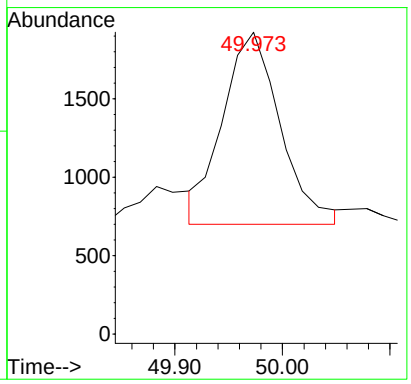
Tgt Ion:217 Resp: 4521

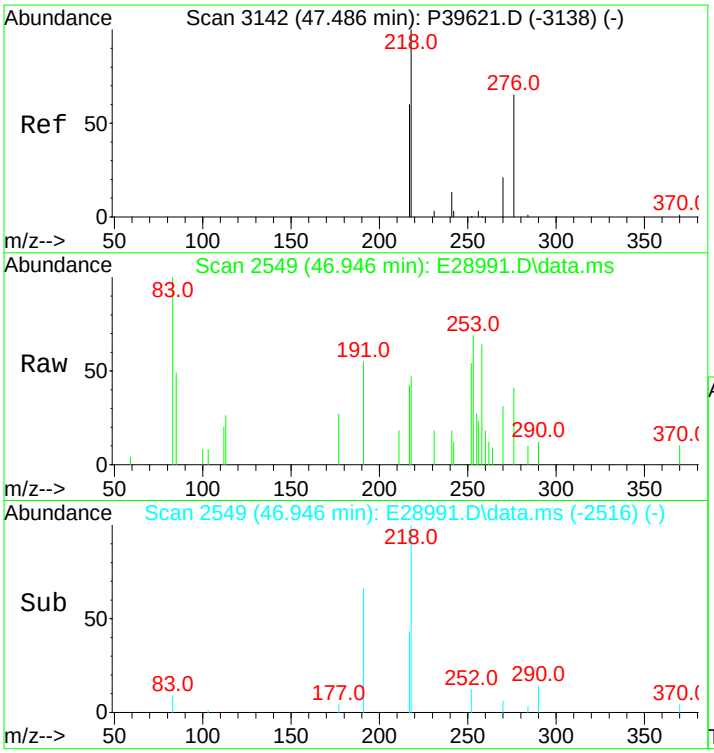




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 161.37 ng/ml m
RT: 49.973 min Scan# 2750
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

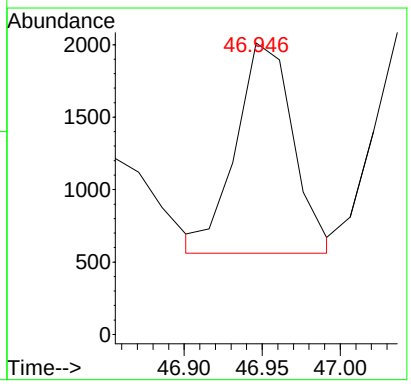
Tgt Ion:217 Resp: 4550

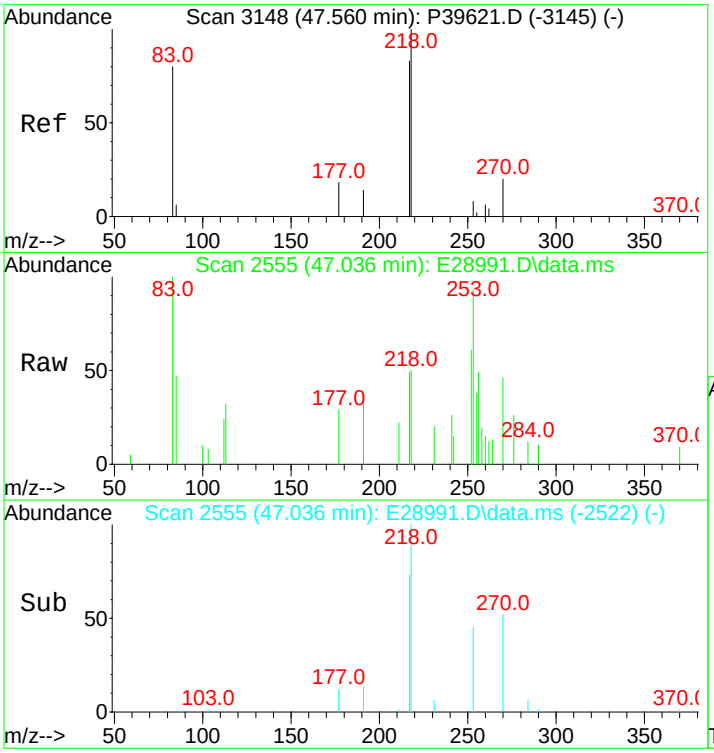




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 131.86 ng/ml
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

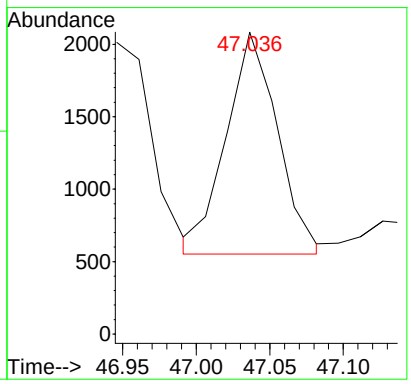
Tgt Ion:218 Resp: 3718

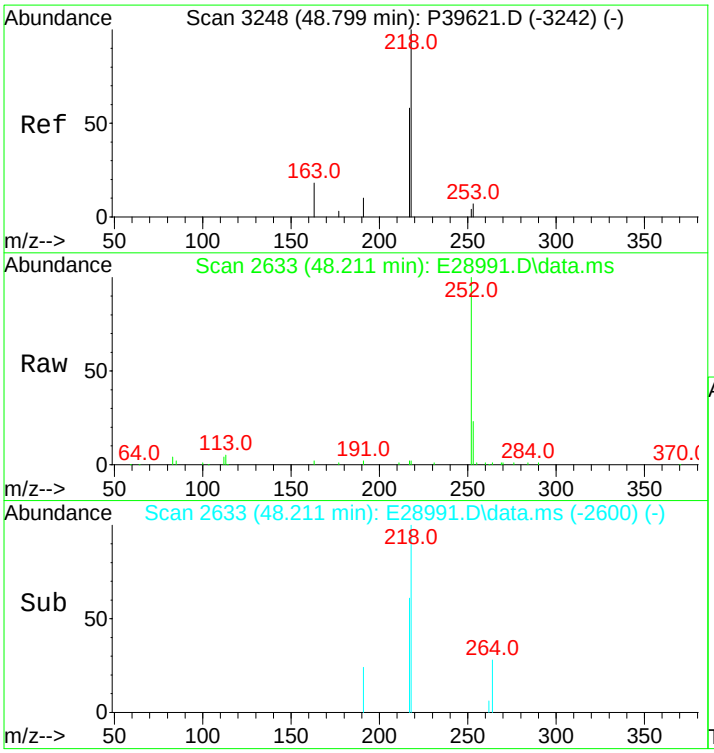




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 131.26 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

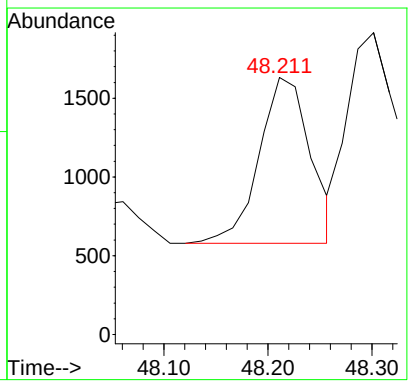
Tgt Ion:218 Resp: 3701

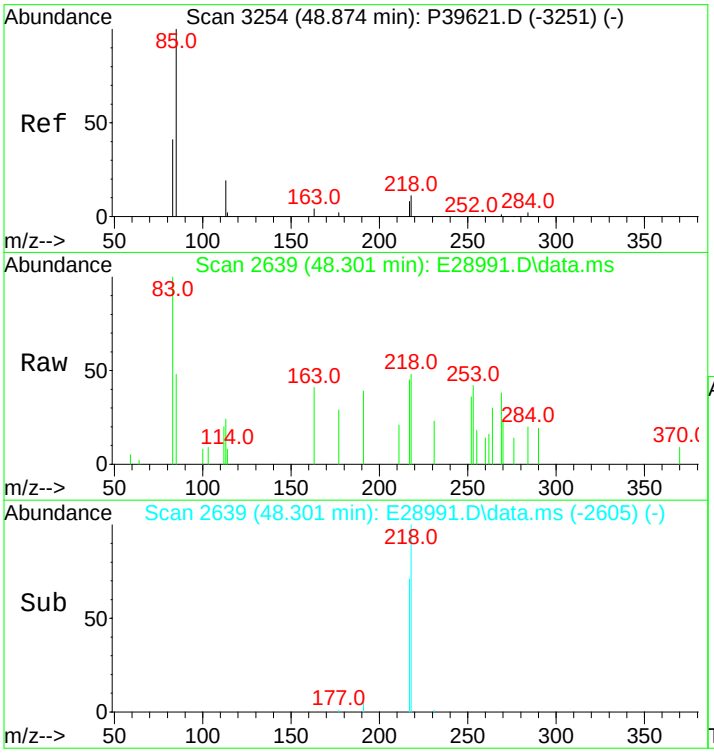




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 128.74 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

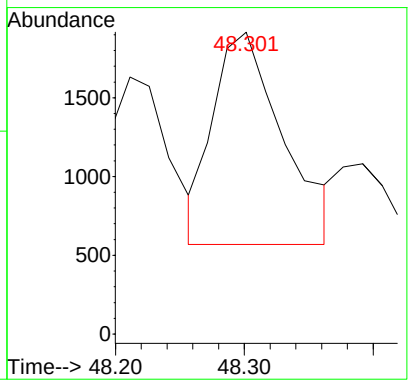
Tgt Ion:218 Resp: 3630

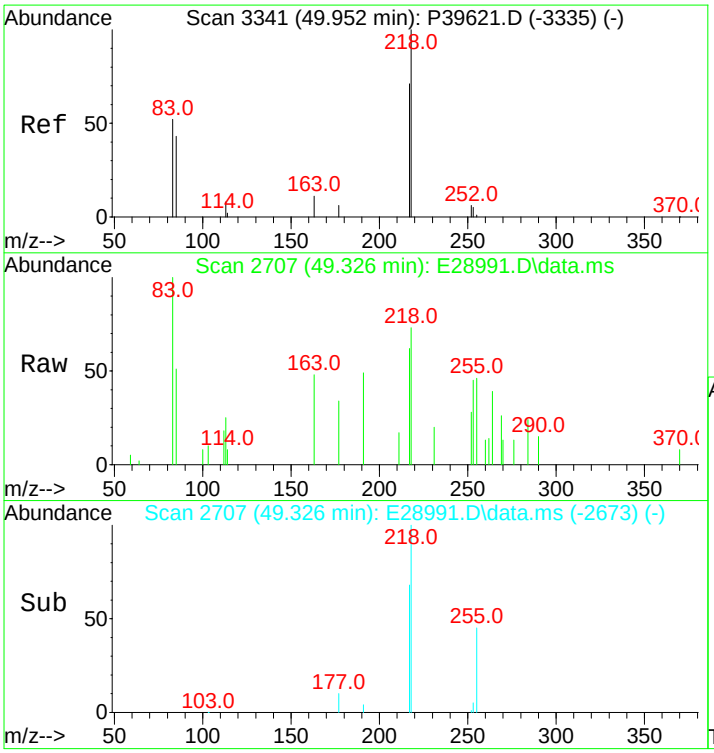




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 180.38 ng/ml m
RT: 48.301 min Scan# 2639
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

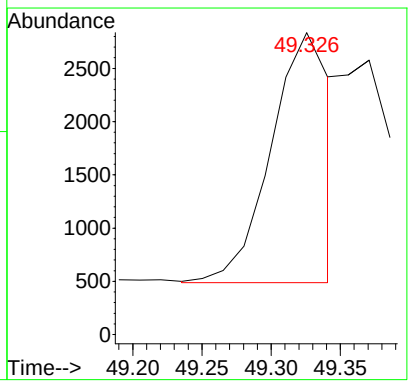
Tgt Ion:218 Resp: 5086

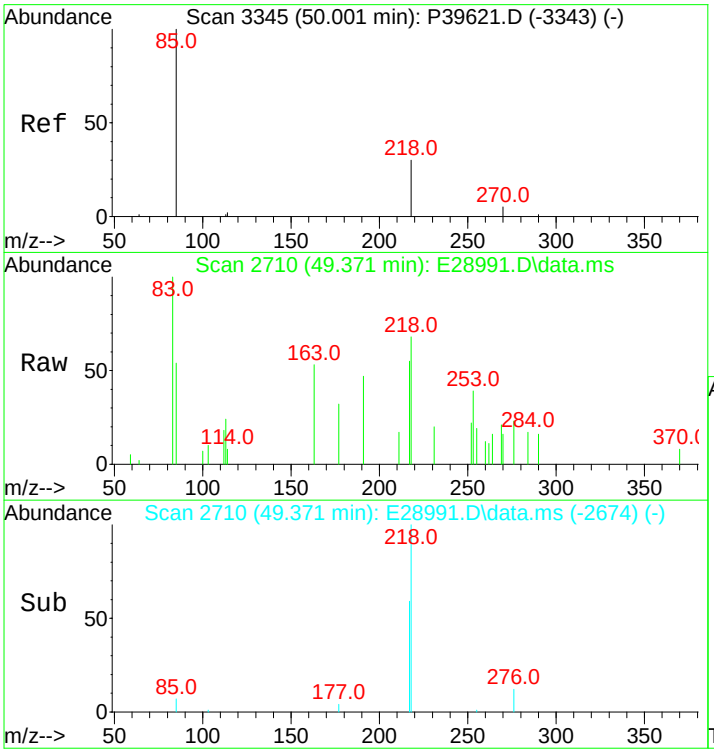




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 246.99 ng/ml m
RT: 49.326 min Scan# 2707
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

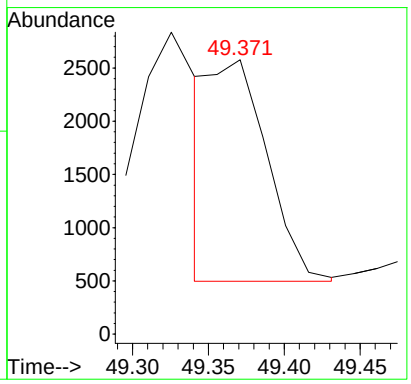
Tgt Ion:218 Resp: 6964

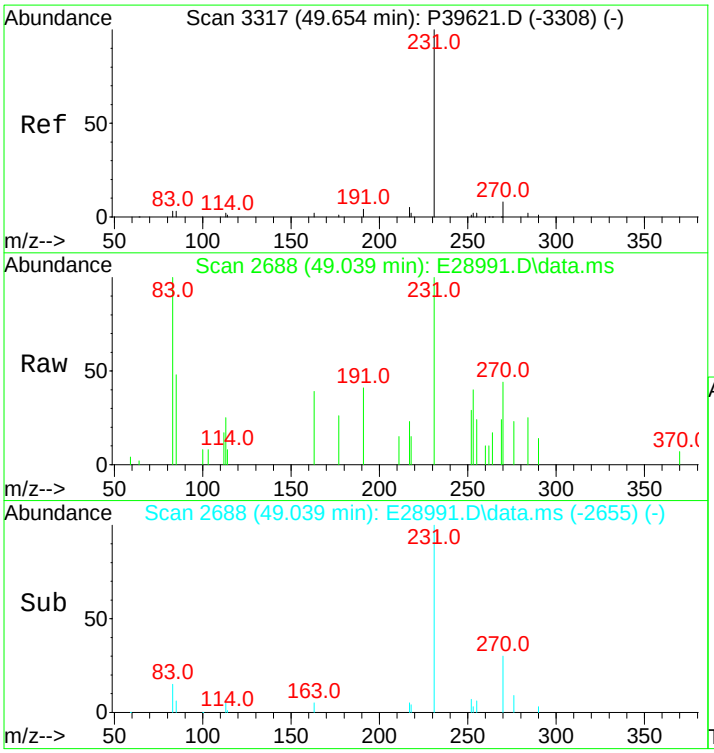




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 192.76 ng/ml m
RT: 49.371 min Scan# 2710
Delta R.T. 0.045 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

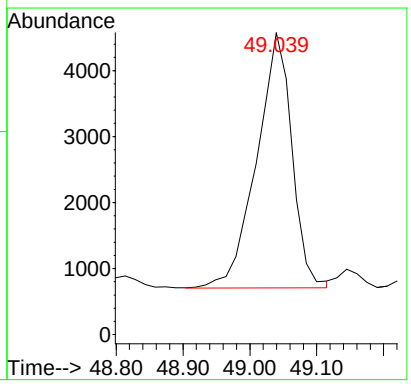
Tgt Ion:218 Resp: 5435

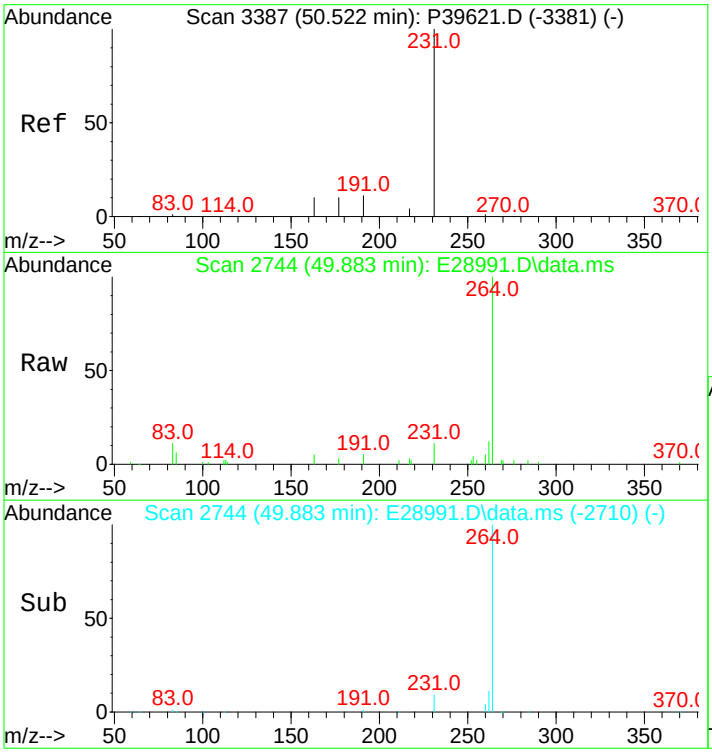




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 502.60 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

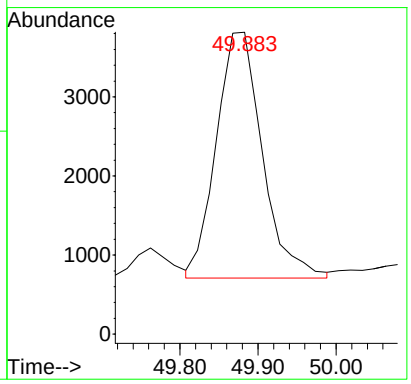
Tgt Ion:231 Resp: 14171

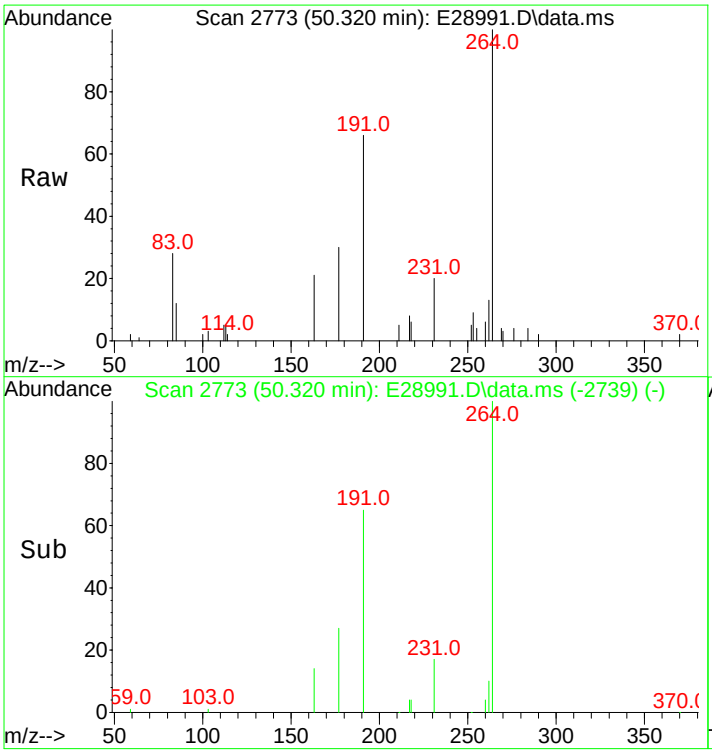




#148
C28,20S-triaromatic steroid
Concen: 453.02 ng/mL m
RT: 49.883 min Scan# 2744
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

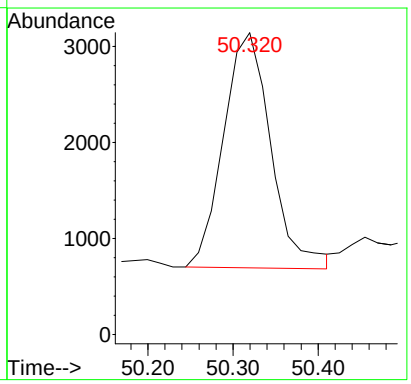
Tgt Ion:231 Resp: 12773

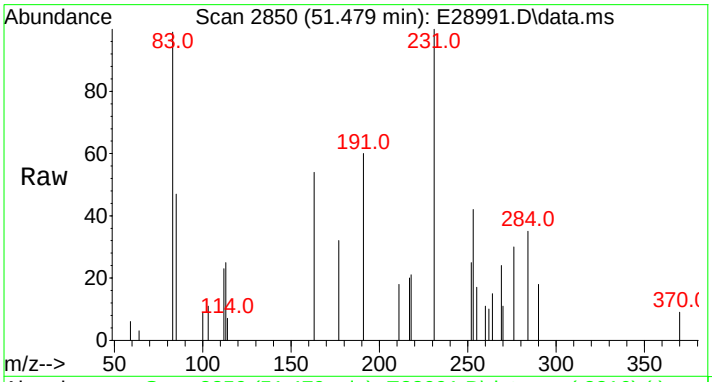




#149
C27,20R-triaromatic steroid
Concen: 337.00 ng/mL
RT: 50.320 min Scan# 2773
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

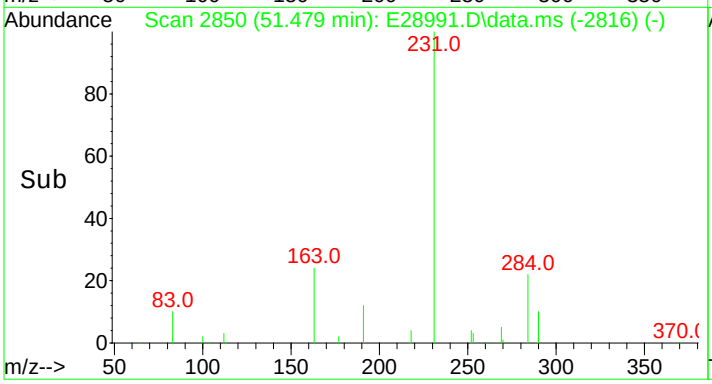
Tgt Ion:231 Resp: 9502

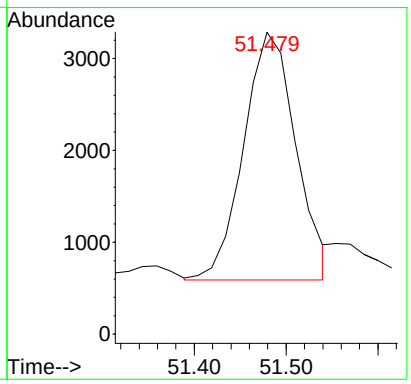




#150
C28,20R-triaromatic steroid
Concen: 378.04 ng/mL m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28991.D
Acq: 15 Nov 2012 1:47 pm

Tgt Ion:231 Resp: 10659





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	21842M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	51901	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	75122	977.804	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.78%			
42) Phenanthrene-d10	32.085	188	83311	1058.430	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 105.84%			
83) Benzo[b]fluoranthene-d12	46.660	264	111635	1047.066	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.71%			
88) Benzo[a]pyrene-d12	47.804	264	110822	1072.760	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.28%			
129) 5B(H)Cholane - Surr	43.347	217	22186	1084.607	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.46%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	13052	747.041	ng/mL	100
4) cis-Decalin	17.091	138	1124	84.676	ng/mL	100
5) C1-Decalins	17.362	152	29663M5	1697.785	ng/mL	
6) C2-Decalins	18.792	166	42504m	2432.750	ng/mL	
7) C3-Decalins	21.622	180	33554m	1920.489	ng/mL	
8) C4-Decalins	24.995	194	37420M5	2141.763	ng/mL	
10) Naphthalene	19.304	128	31606	367.870	ng/mL#	100
11) C1-Naphthalenes	21.999	142	90373M5	1051.875	ng/mL	
12) C2-Naphthalenes	24.844	156	222589m	2590.771	ng/mL	
13) C3-Naphthalenes	27.193	170	265450m	3089.642	ng/mL	
14) C4-Naphthalenes	29.963	184	209560M5	2439.123	ng/mL	
16) 2-Methylnaphthalene	21.999	142	55769	1019.155	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	34727	653.116	ng/mL#	100
18) Benzothiophene	19.515	134	2602	36.634	ng/mL	100
19) C1-Benzo(b)thiophenes	21.562	148	13786M5	194.098	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	23346m	328.696	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49201m	692.717	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	52800M5	743.389	ng/mL	
23) Biphenyl	23.881	154	5881M3	85.037	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	55634	1127.945	ng/mL#	100
25) Dibenzofuran	26.967	168	3329	43.479	ng/mL#	50
26) Acenaphthylene	25.597	152	1987	23.197	ng/mL#	100
27) Acenaphthene	26.320	153	3961M3	71.839	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	19874M3	430.671	ng/mL	
29) Fluorene	28.352	166	10777M3	175.249	ng/mL	
30) C1-Fluorenes	30.730	180	28376M5	461.434	ng/mL	
31) C2-Fluorenes	32.928	194	68351M5	1111.483	ng/mL	
32) C3-Fluorenes	34.780	208	76967m	1251.591	ng/mL	
33) Dibenzothiophene	31.679	184	27741	328.729	ng/mL#	65
34) 4-Methyldibenzothiophene(	33.455	198	37118	439.846	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	31892M3	377.918	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	19883	235.612	ng/mL#	100
37) OTP	33.877	198	8252M3	97.786	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	101204m	1199.260	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	92952m	1101.475	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	179953M5	2132.431	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	194163m	2300.818	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	133970M5	1587.535	ng/mL	
43) Phenanthrene	32.176	178	39318M3	457.952	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
44) 3-Methylphenanthrene(3MP)	34.148	192	22758	265.071	ng/mL	91
45) 2-Methylphenanthrene(2MP)	34.253	192	25392	295.750	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1724M3	20.080	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.599	192	37285	434.272	ng/mL	98
48) 1-Methylphenanthrene(1MP)	34.690	192	21928M3	255.404	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.599	192	111975M5	1304.215	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	167293M5	1948.525	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	167293m	1948.525	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.538	220	155088M5	1806.369	ng/mL	
53) C4-Phenanthrenes/Anthrace	39.192	234	82125M5	956.541	ng/mL	
54) Retene	39.192	234	9360M3	338.791	ng/mL	
55) Anthracene	32.401	178	2120M3	28.568	ng/mL	
56) Carbazole	33.019	167	2417M3	31.646	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21795M3	332.742	ng/mL	
58) Fluoranthene	36.963	202	3417M3	36.039	ng/mL	
60) Pyrene	37.852	202	12034	124.871	ng/mL#	72
61) C1-Fluoranthenes/Pyrenes	39.252	216	42027m	436.093	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.736	230	61979M5	643.125	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	72727m	754.651	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.461	258	74298M5	770.953	ng/mL	
66) Naphthobenzothiophene	41.721	234	13161M3	138.463	ng/ml	
67) Naphthobenzothiophene-2,1	41.721	234	12820M3	134.876	ng/mL	
68) Naphthobenzothiophene-1,2	42.067	234	3370M3	35.455	ng/mL	
69) Naphthobenzothiophene-2,3	42.368	234	2267M3	23.850	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	64936M5	683.174	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	105816M5	1113.262	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	87977M5	925.582	ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	74820M5	787.161	ng/mL	
75) Benz[a]anthracene	42.655	228	2315M3	22.906	ng/mL	
77) Chrysene/Triphenylene	42.805	228	12114M3	116.424	ng/mL	
78) C1-Chrysenes	44.311	242	33434M5	321.324	ng/mL	
79) C2-Chrysenes	46.404	256	57755M5	555.066	ng/mL	
79) C2-Chrysenes BS	46.404	256	54167m	520.583	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3588M6	34.483	ng/mL	
81) C3-Chrysenes	47.729	270	72854M5	700.178	ng/mL	
82) C4-Chrysenes	49.130	284	47325M5	454.826	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	4119M3	35.063	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1239M3	10.251	ng/mL	
87) Benzo[e]pyrene	47.699	252	6166M3	53.755	ng/mL	
89) Benzo[a]pyrene	47.895	252	3378M3	30.777	ng/mL	
90) Perylene	48.196	252	7151	61.614	ng/mL#	74
91) Indeno[1,2,3-cd]pyrene	52.563	276	2214M3	17.140	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	1098M3	7.983	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	5879	42.211	ng/mL#	86
94) Hopane (T19)	51.645	191	48000M3	1232.316	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19756	507.201	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10718	275.166	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.579	191	9782M3	251.136	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3461M3	88.855	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3617M3	92.860	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3620M3	92.937	ng/ml	
102) C28 Tricyclic Terpane-22S	46.057	191	3973M3	102.000	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	4617M3	118.533	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5151	132.243	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5229M3	134.245	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5523	141.793	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.106	191	4143M3	106.364	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4289M3	110.113	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.512	191	12637	324.433	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8237M3	211.471	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	2402	61.667	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	35007M3	898.744	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5508M3	141.408	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1793M3	46.032	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3674	94.324	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.479	191	401M3	10.295	ng/ml	
117) Moretane (T20)	52.308	191	3900M3	100.126	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	21315	547.225	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17506	449.436	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8063	207.003	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.882	191	14103	362.070	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10222	262.432	ng/ml	100
123) 30,31-Trishomohopane-22S	56.945	191	11269	289.312	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	7735	198.583	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	7464	191.625	ng/ml	100
126) Tetrakishomohopane-22R (T	60.349	191	5563	142.820	ng/ml	100
127) Pentakishomohopane-22S (T	62.517	191	9828	252.317	ng/ml	100
128) Pentakishomohopane-22R (T	63.752	191	6771M3	173.834	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	4167	203.712	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1740M3	85.063	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1973M3	96.454	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6392	312.486	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7357	359.662	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1488	72.744	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	613	29.968	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2720	132.973	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2868M3	140.208	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5917M3	289.264	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5030M3	245.902	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5183M3	253.381	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	4969M3	242.919	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4326	211.485	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	5806M3	283.838	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7623M3	372.666	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	5312M3	259.688	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23942	1170.452	ng/mL	100
148) C28,20S-triaromatic stero	49.883	231	20094M3	982.335	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	15473	756.428	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17191M3	840.416	ng/mL	

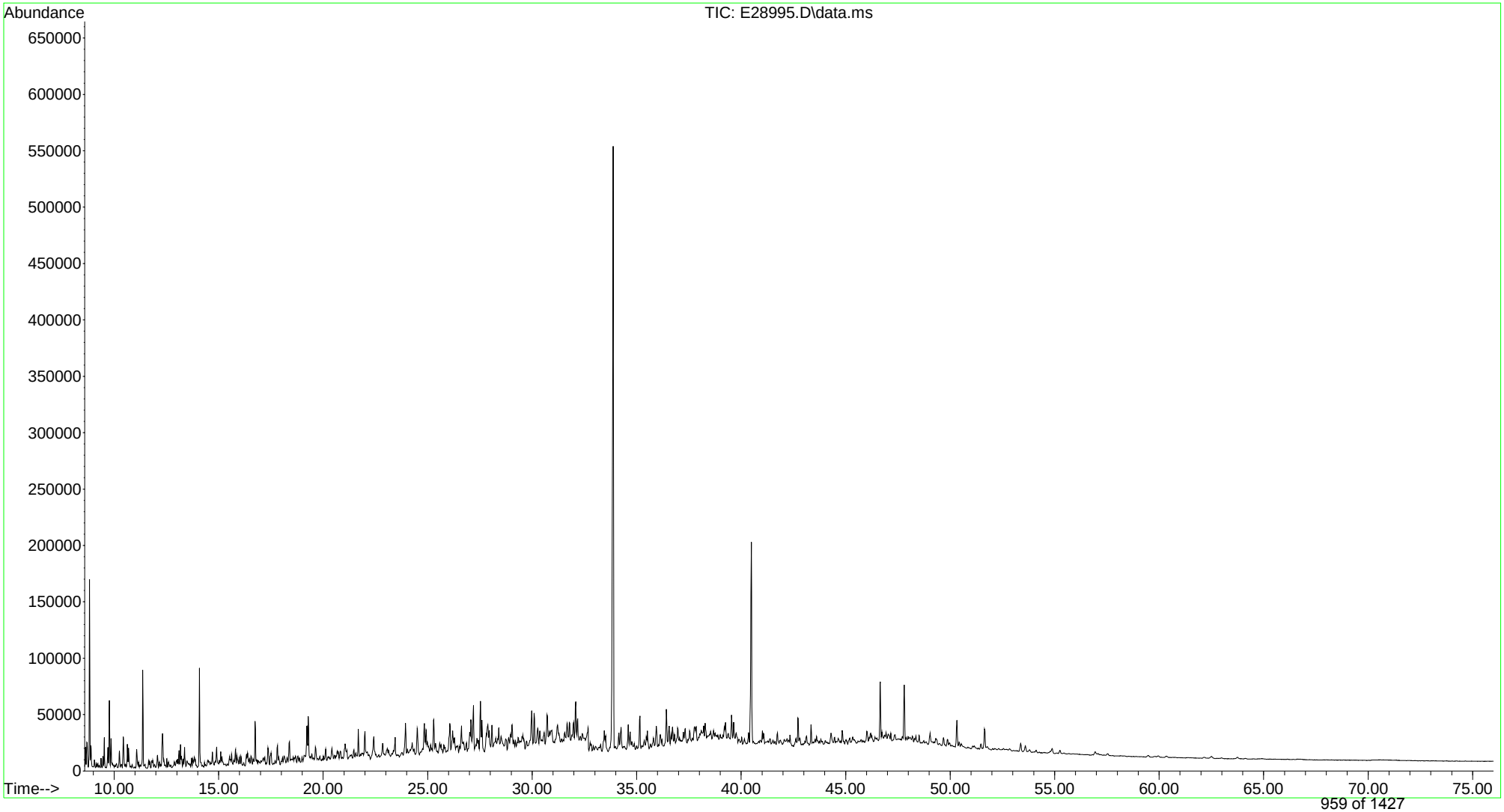
(#) = qualifier out of range (m) = manual integration (+) = signals summed

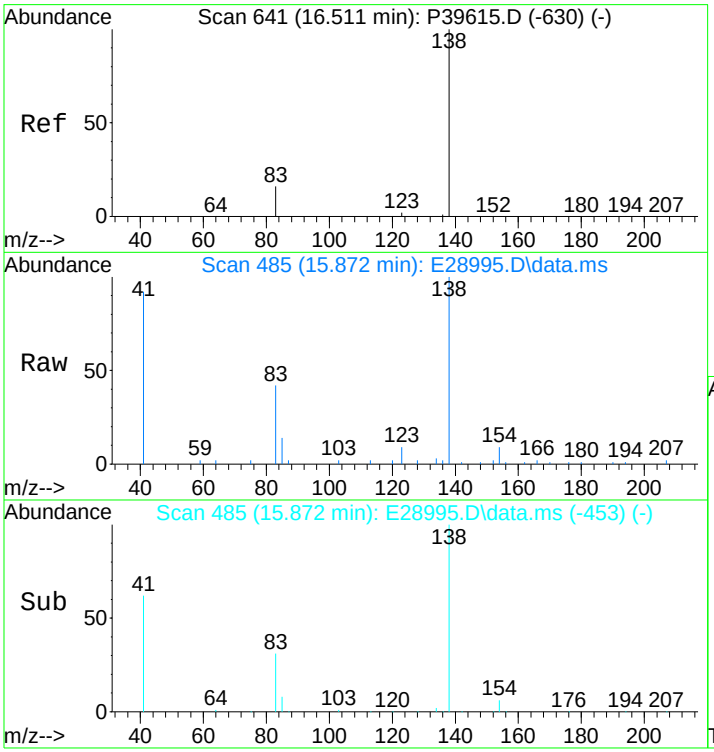
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

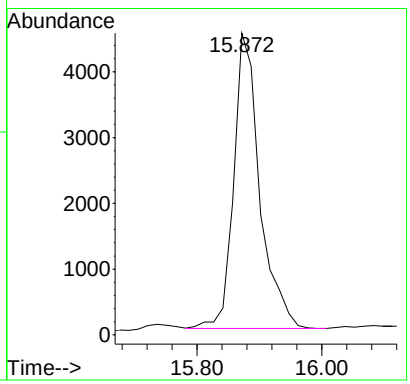
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

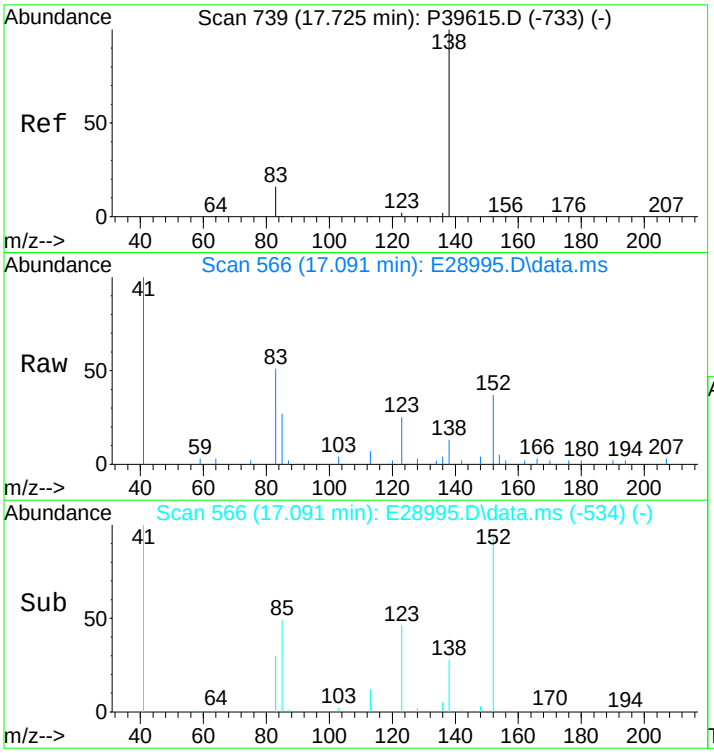




#3
trans-Decalin
Concen: 747.04 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

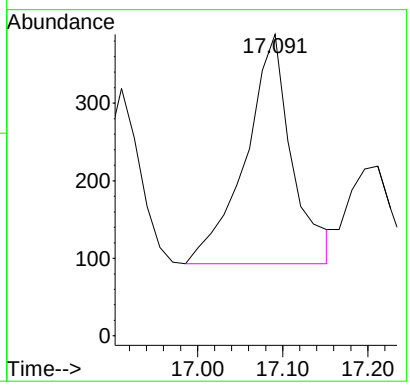
Tgt Ion:138 Resp: 13052

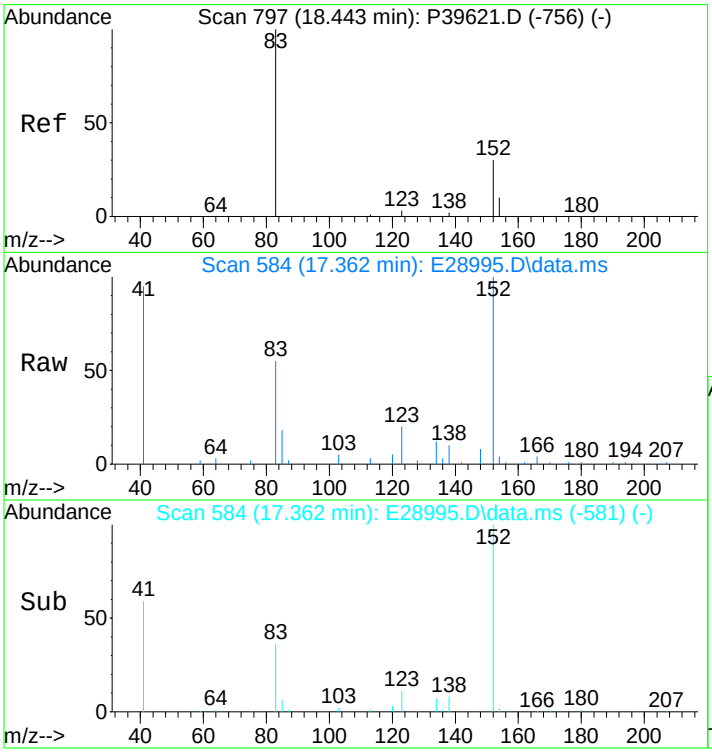




#4
cis-Decalin
Concen: 84.68 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

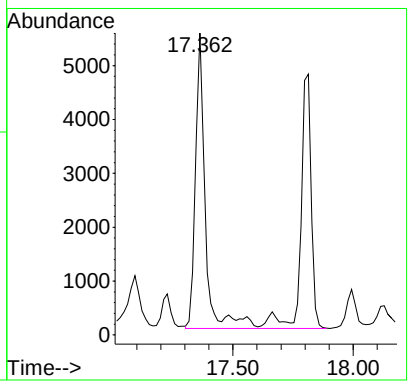
Tgt Ion:138 Resp: 1124

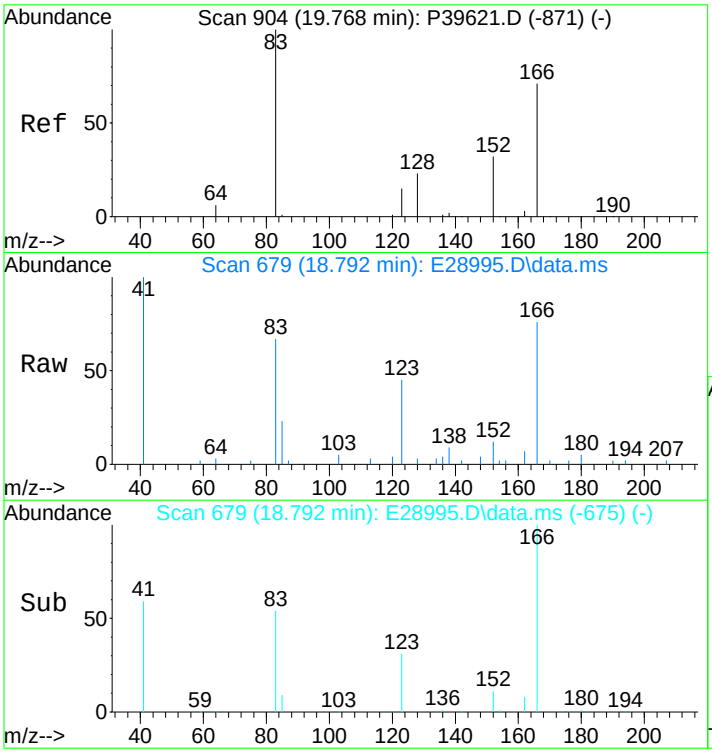




#5
C1-Decalins
Concen: 1697.78 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

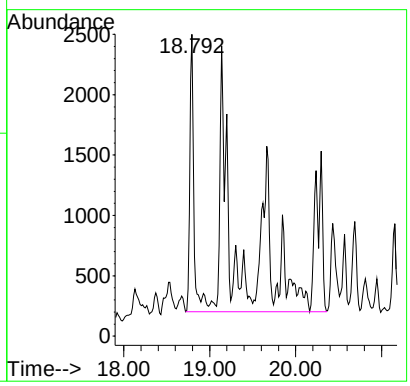
Tgt Ion:152 Resp: 29663

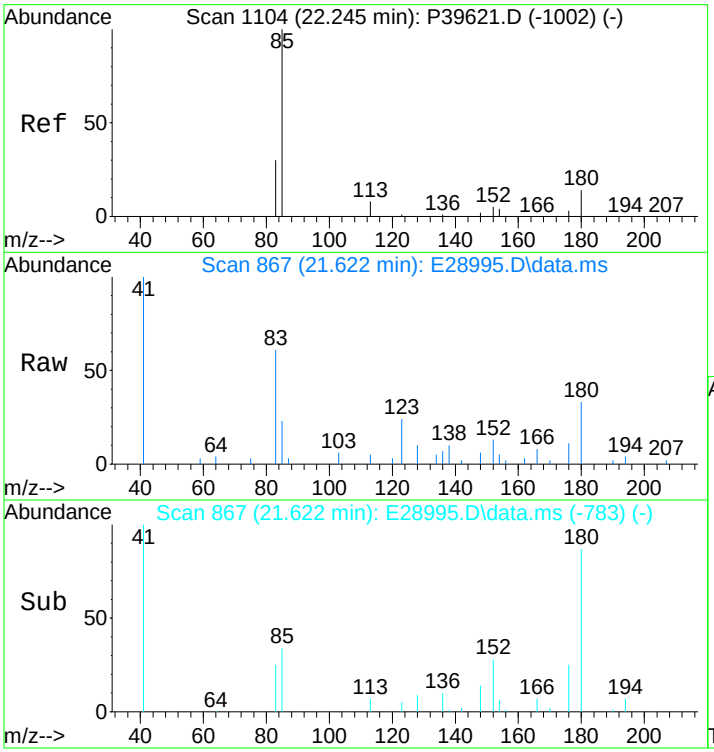




#6
C2-Decalins
Concen: 2432.75 ng/mL m
RT: 18.792 min Scan# 679
Delta R.T. -0.551 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

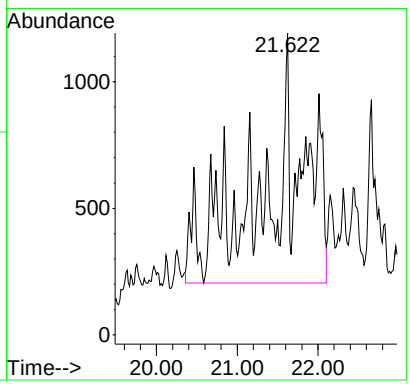
Tgt Ion:166 Resp: 42504

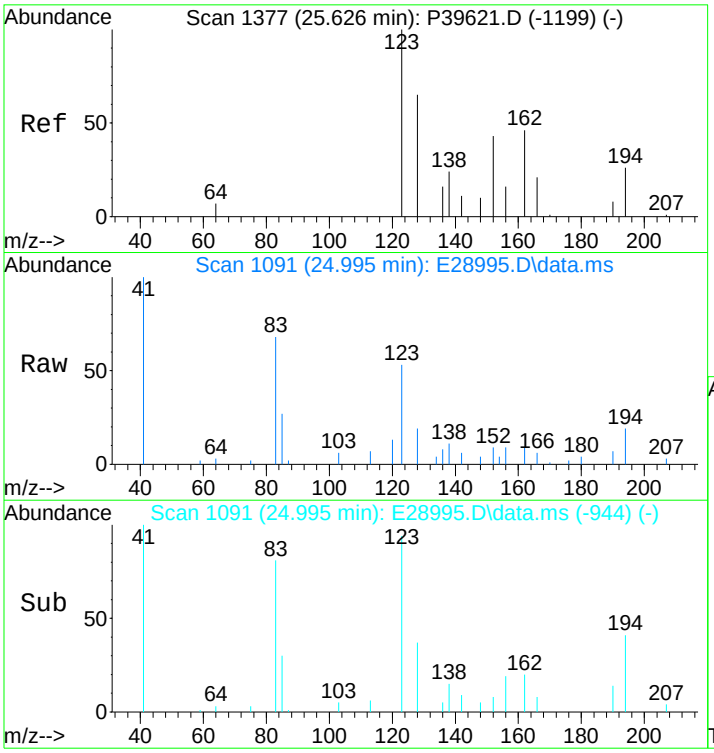




#7
C3-Decalins
Concen: 1920.49 ng/mL m
RT: 21.622 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

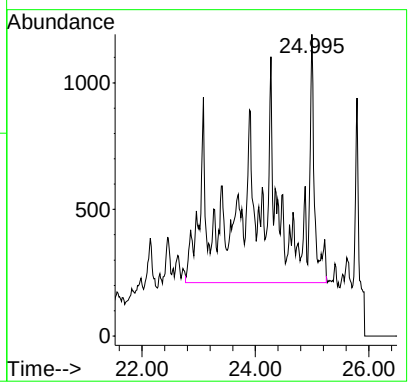
Tgt Ion:180 Resp: 33554

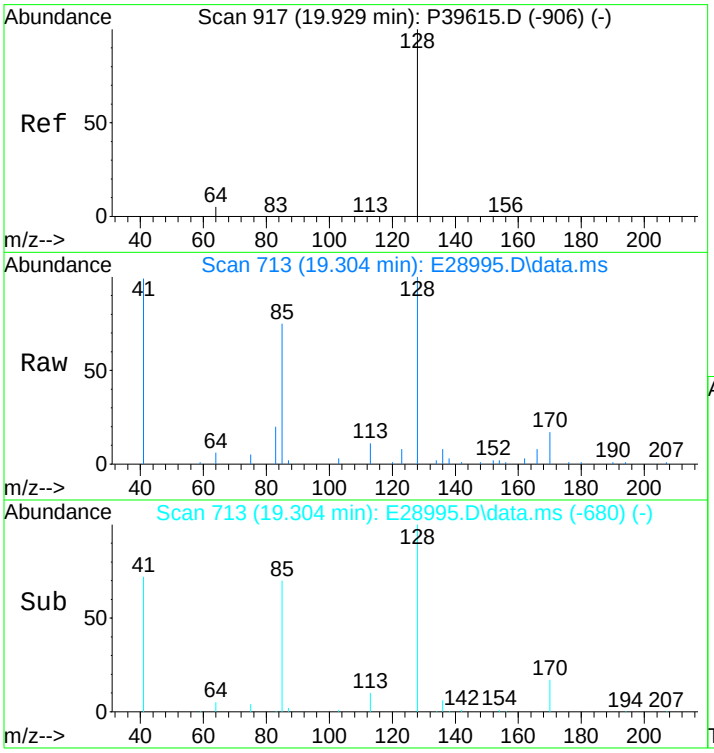




#8
C4-Decalins
Concen: 2141.76 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:194 Resp: 37420

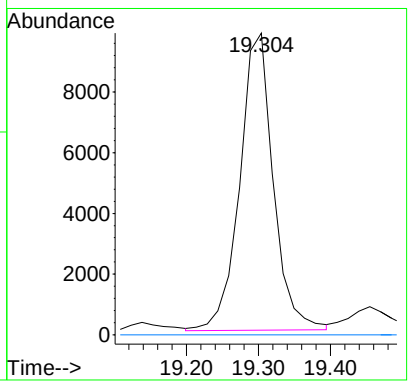


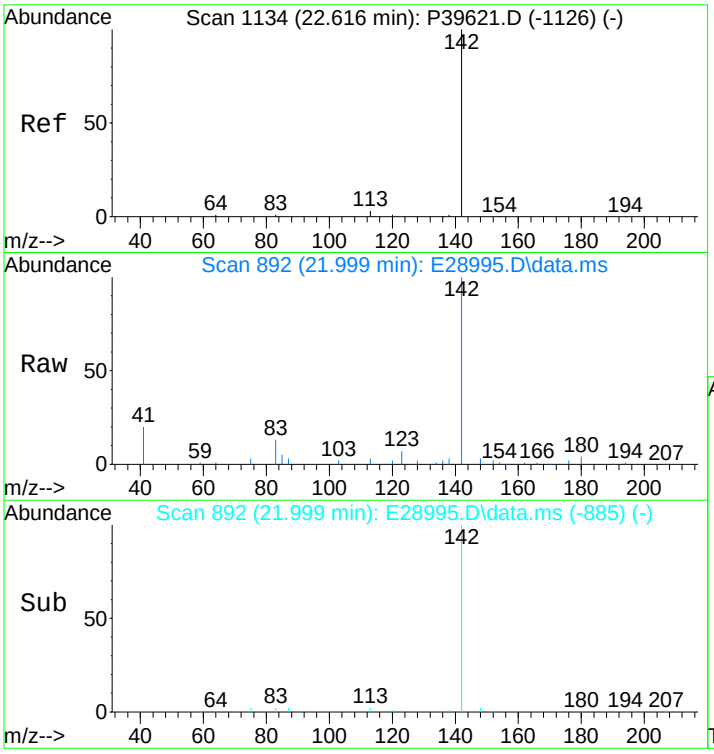


#10
Naphthalene
Concen: 367.87 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:128 Resp: 31606

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

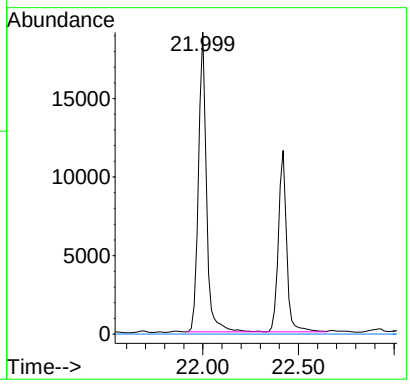


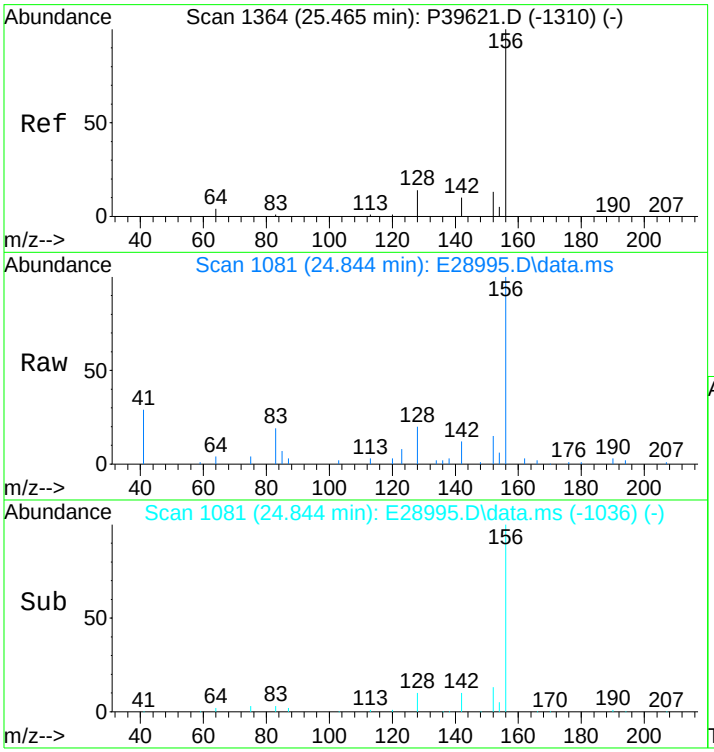


#11
C1-Naphthalenes
Concen: 1051.87 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:142 Resp: 90373

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

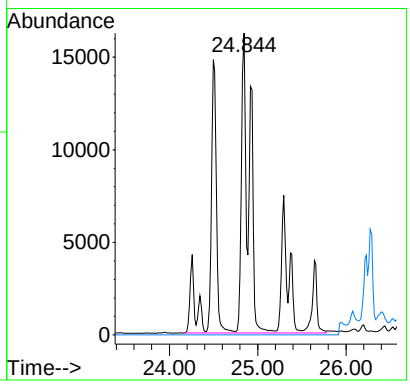


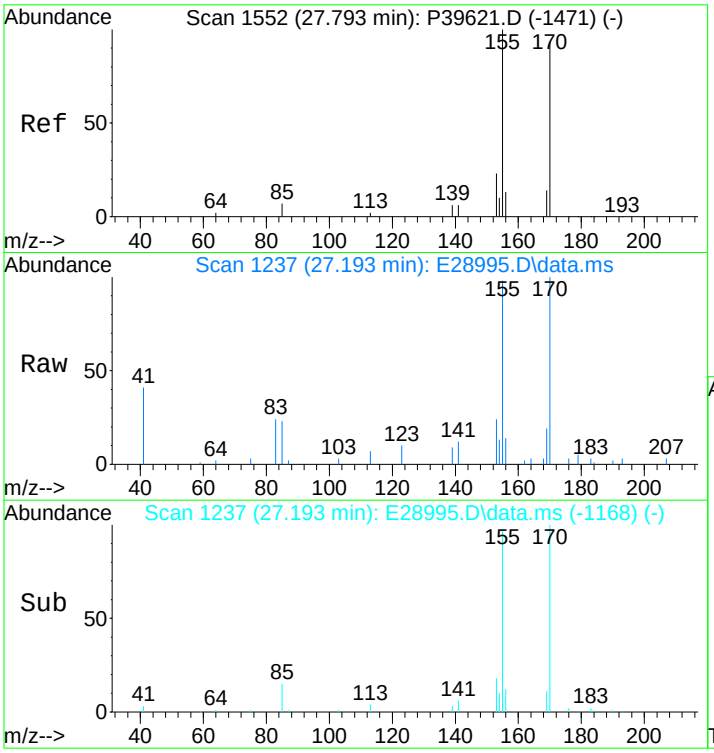


#12
C2-Naphthalenes
Concen: 2590.77 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:156 Resp: 222589

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

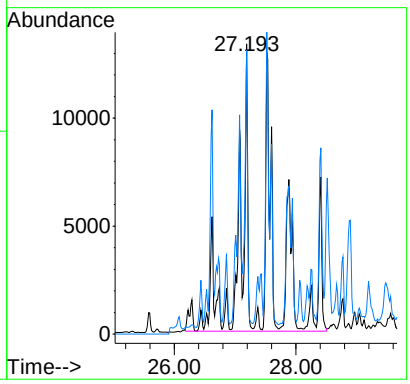


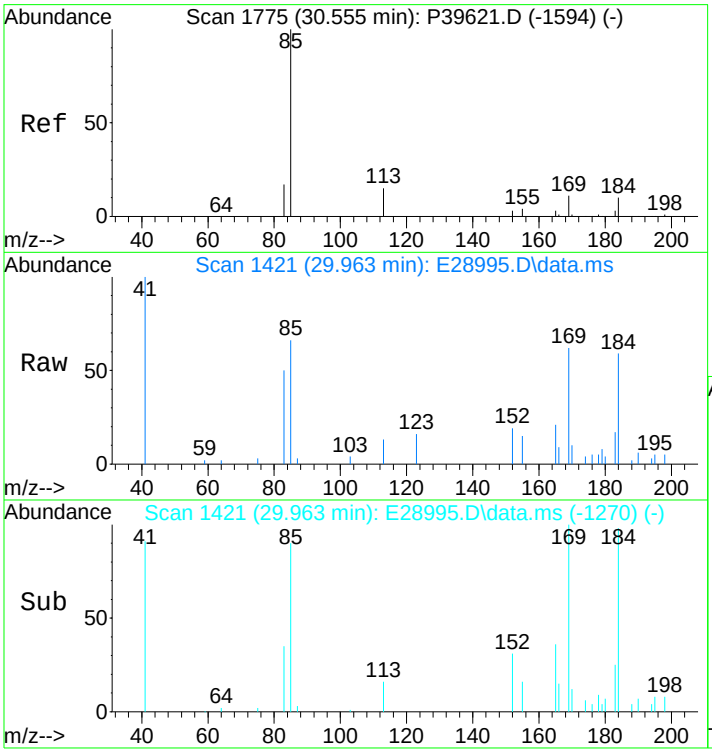


#13
C3-Naphthalenes
Concen: 3089.64 ng/mL m
RT: 27.193 min Scan# 1237
Delta R.T. 0.013 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:170 Resp: 265450

Ion	Ratio	Lower	Upper
170	100		
155	15.2	66.8	100.2#

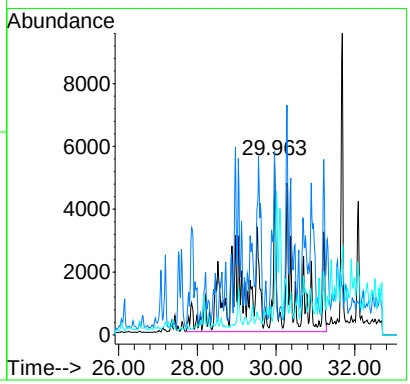


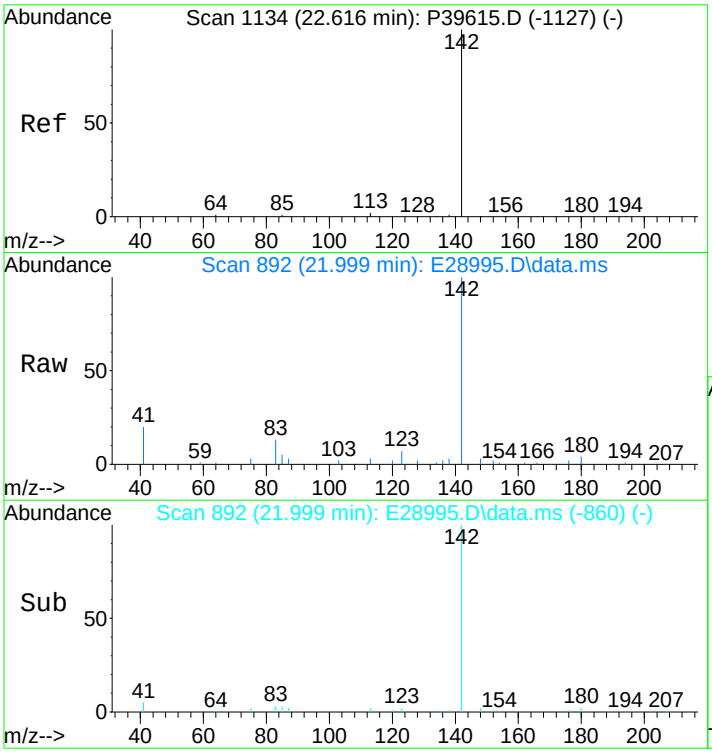


#14
C4-Naphthalenes
Concen: 2439.12 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:184 Resp: 209560

Ion	Ratio	Lower	Upper
184	100		
169	4.1	78.7	118.1#
183	1.3	26.7	40.1#

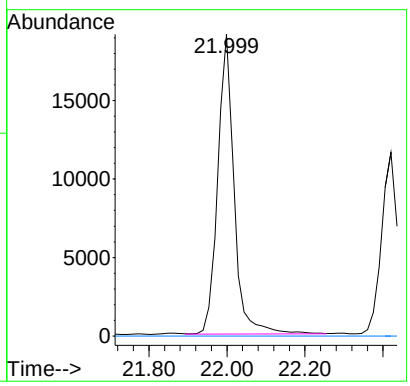


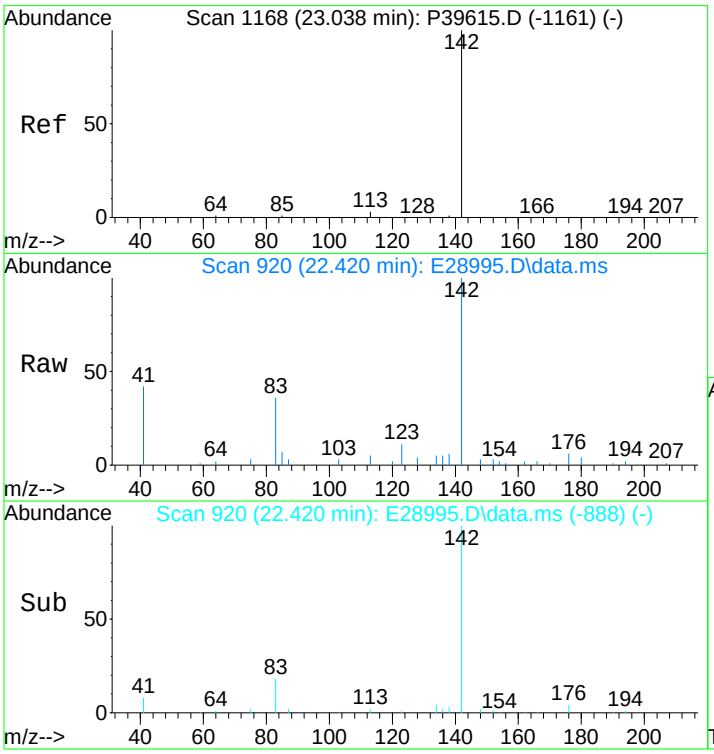


#16
2-Methylnaphthalene
Concen: 1019.15 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:142 Resp: 55769

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

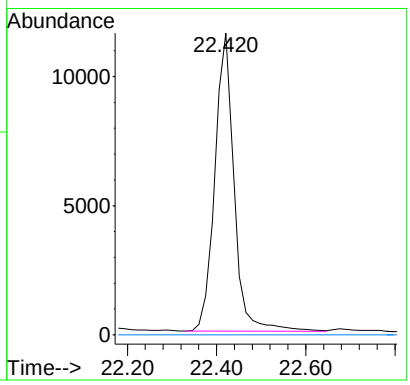


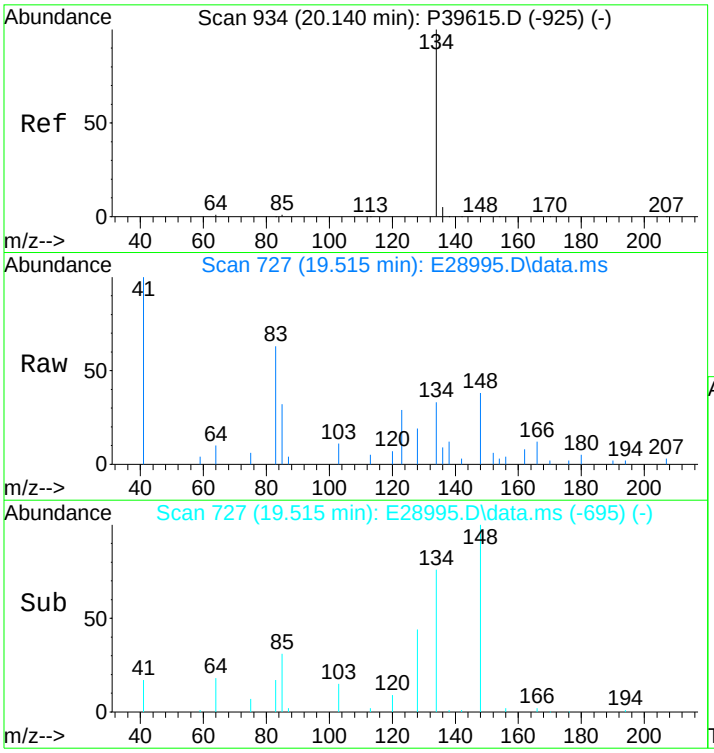


#17
1-Methylnaphthalene
Concen: 653.12 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:142 Resp: 34727

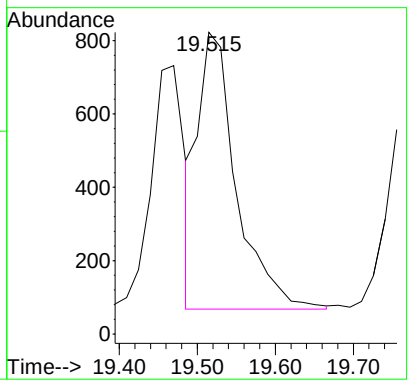
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

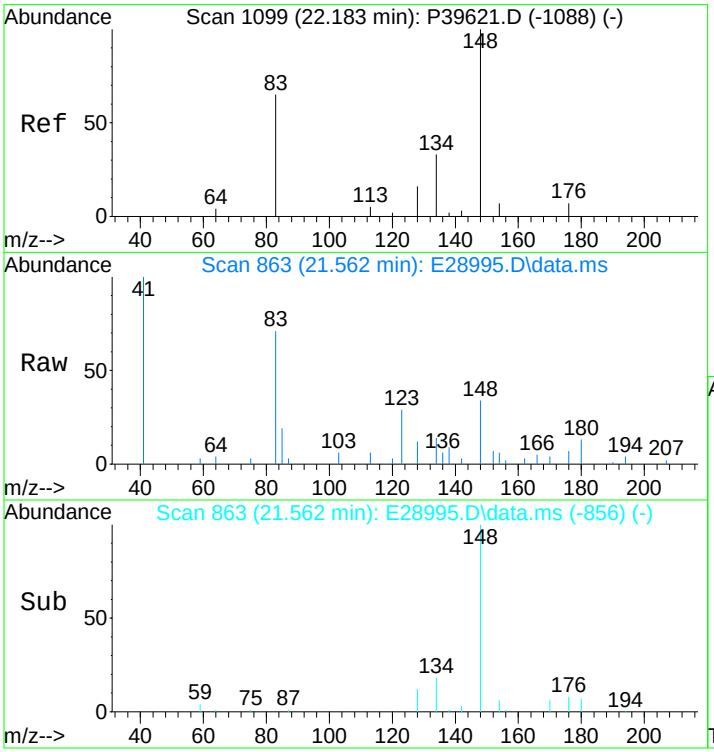




#18
Benzothiophene
Concen: 36.63 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

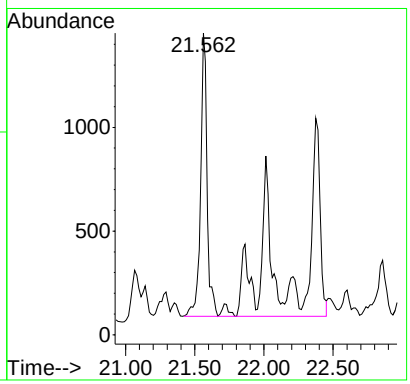
Tgt Ion:134 Resp: 2602

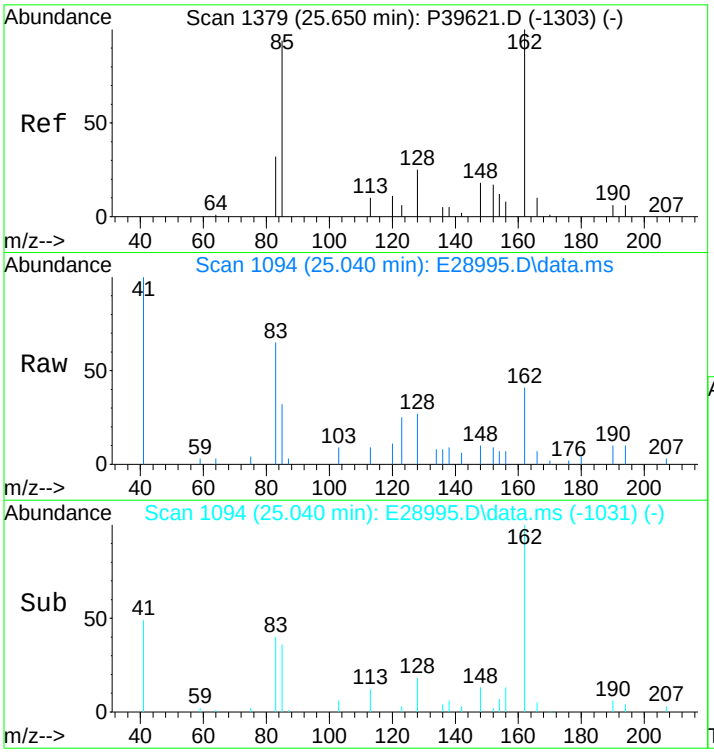




#19
C1-Benzo(b)thiophenes
Concen: 194.10 ng/mL m
RT: 21.562 min Scan# 863
Delta R.T. -0.139 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

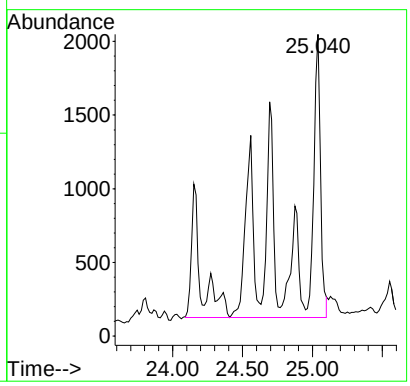
Tgt Ion:148 Resp: 13786

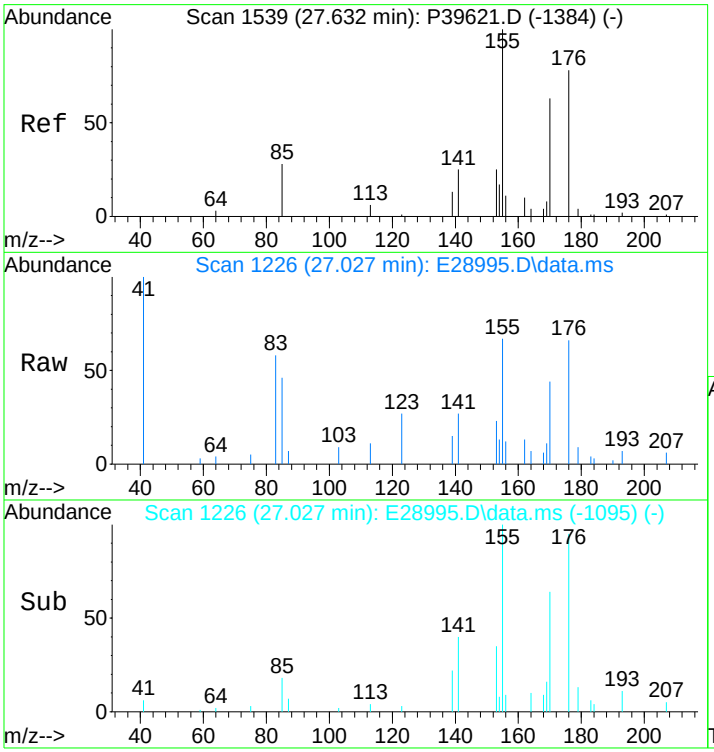




#20
C2-Benzo(b)thiophenes
Concen: 328.70 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

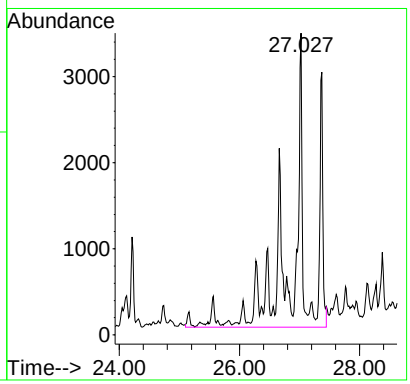
Tgt Ion:162 Resp: 23346

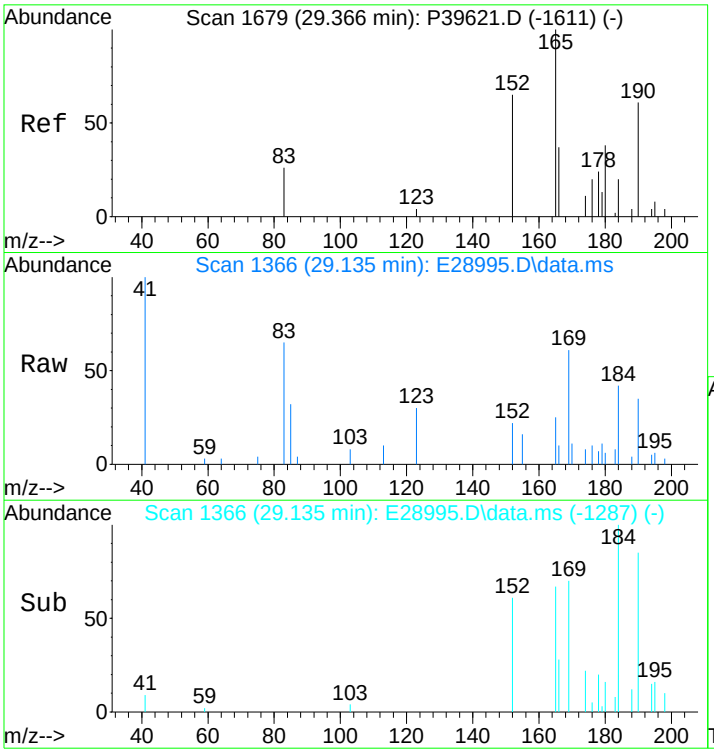




#21
C3-Benzo(b)thiophenes
Concen: 692.72 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

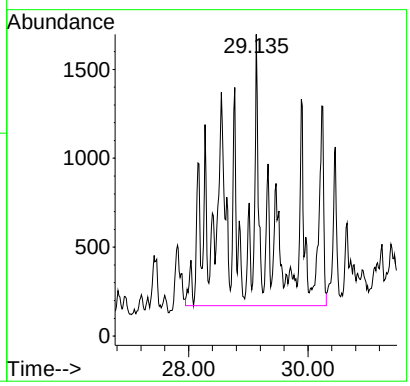
Tgt Ion:176 Resp: 49201

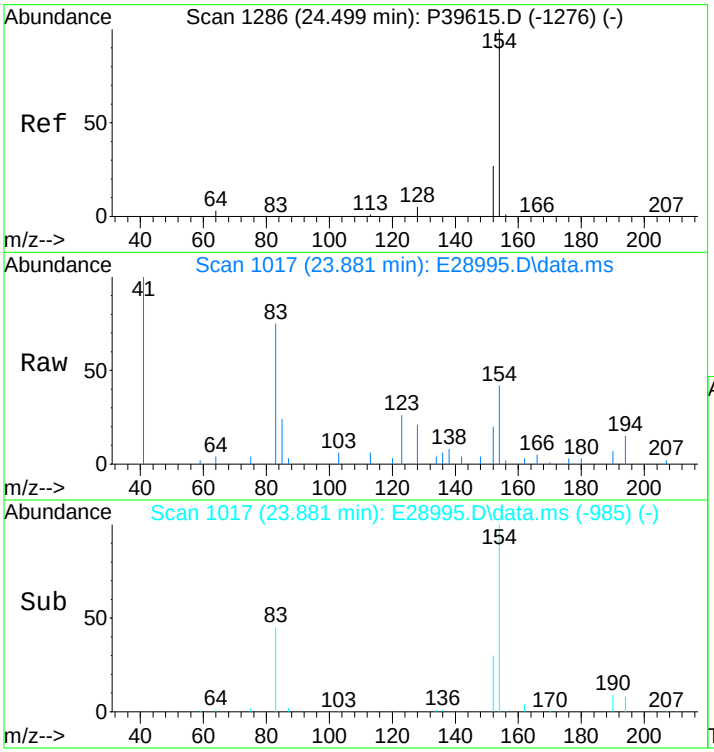




#22
C4-Benzo(b)thiophenes
Concen: 743.39 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:190 Resp: 52800

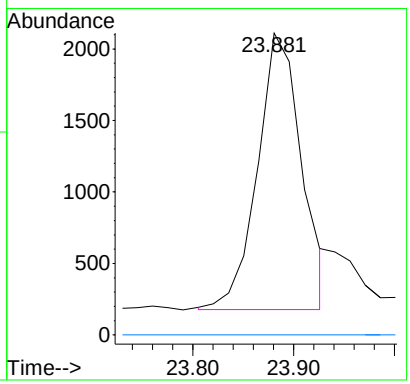


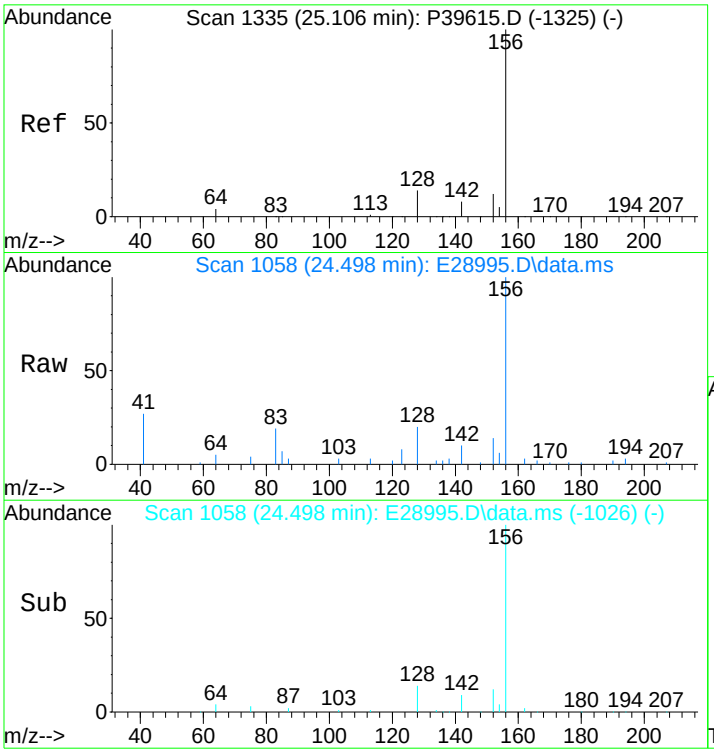


#23
Biphenyl
Concen: 85.04 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:154 Resp: 5881

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

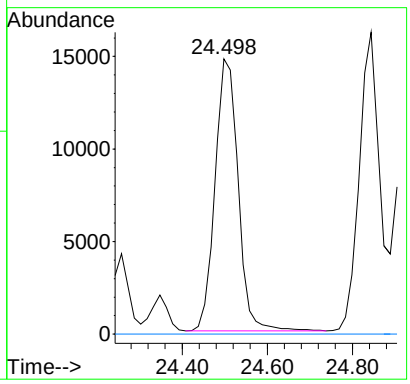


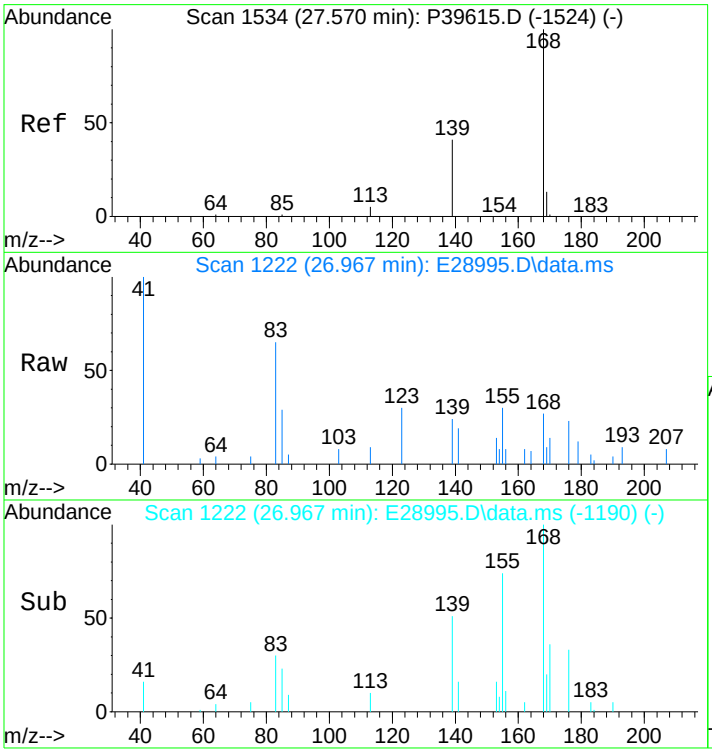


#24
2,6-Dimethylnaphthalene
Concen: 1127.95 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:156 Resp: 55634

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

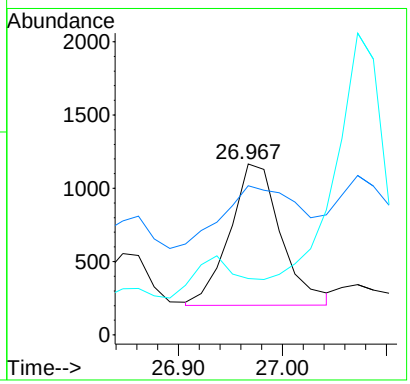


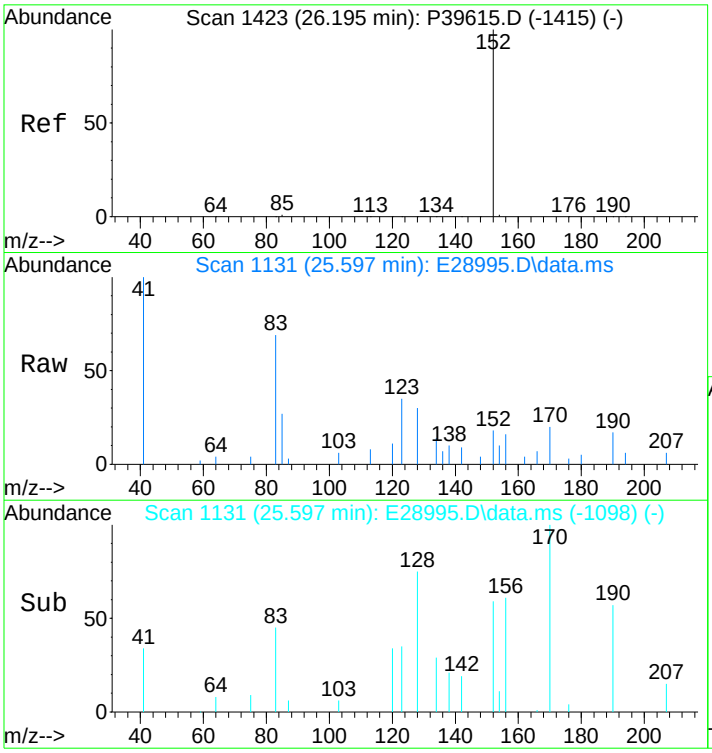


#25
Dibenzofuran
Concen: 43.48 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:168 Resp: 3329

Ion	Ratio	Lower	Upper
168	100		
139	64.1	26.0	39.0#
169	0.0	10.6	16.0#

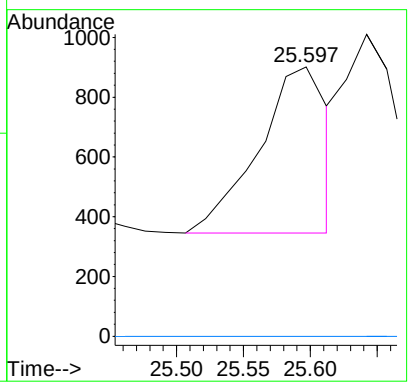


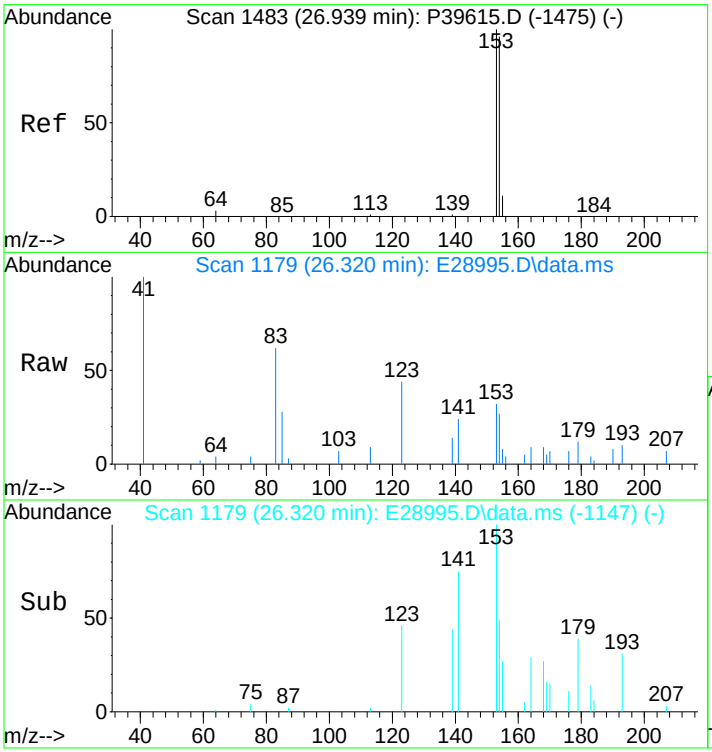


#26
Acenaphthylene
Concen: 23.20 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:152 Resp: 1987

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

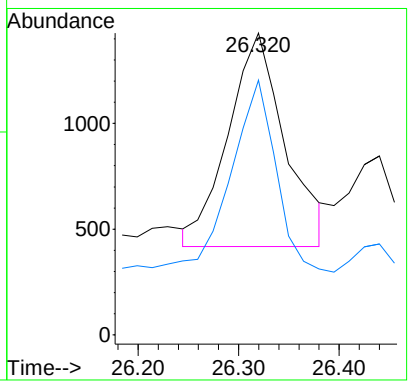


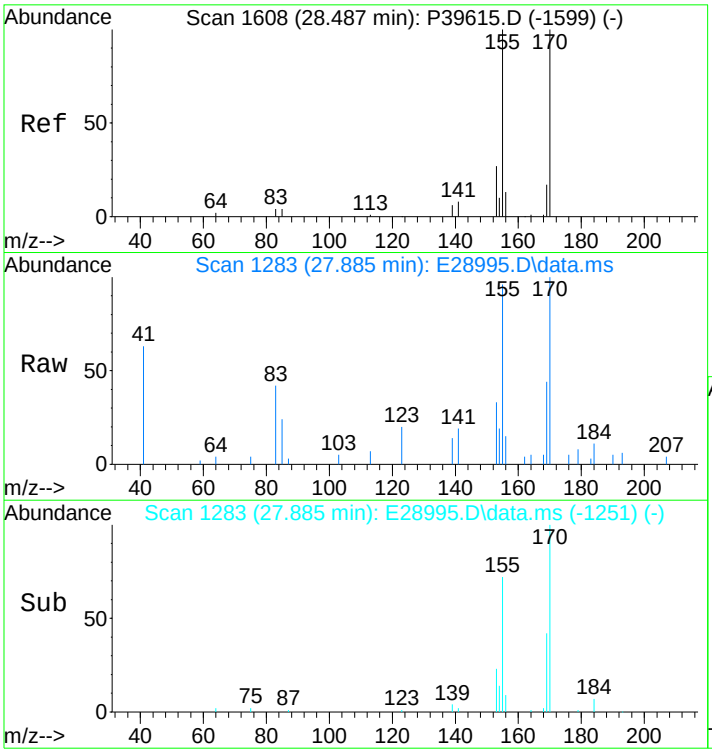


#27
Acenaphthene
Concen: 71.84 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:153 Resp: 3961

Ion	Ratio	Lower	Upper
153	100		
154	79.1	74.1	111.1

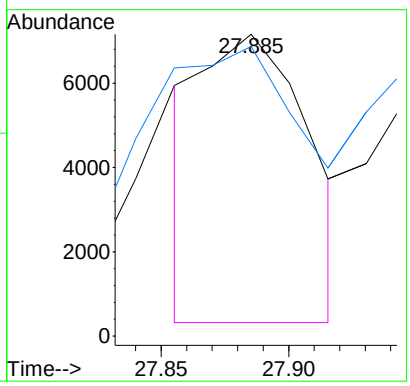


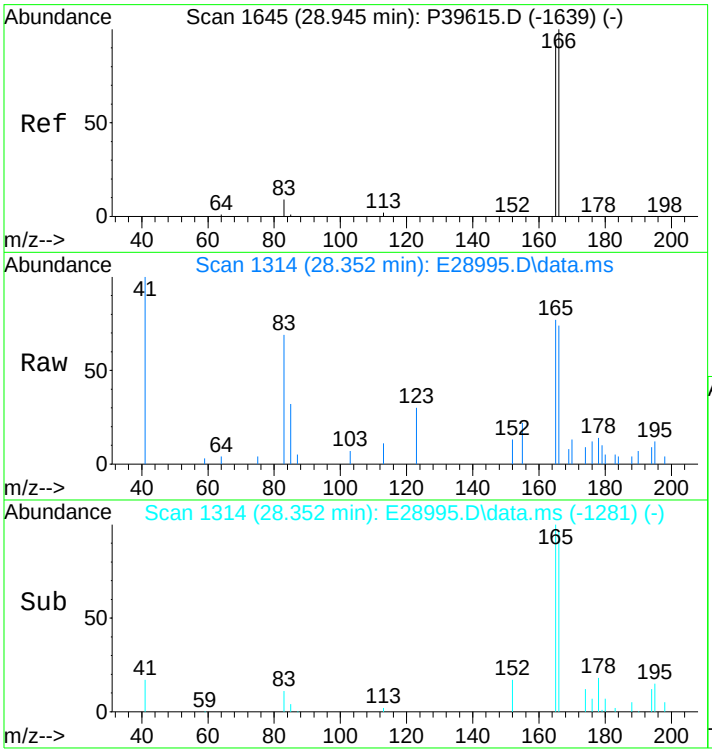


#28
2,3,5-Trimethylnaphthalene
Concen: 430.67 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:170 Resp: 19874

Ion	Ratio	Lower	Upper
170	100		
155	96.2	70.7	106.1

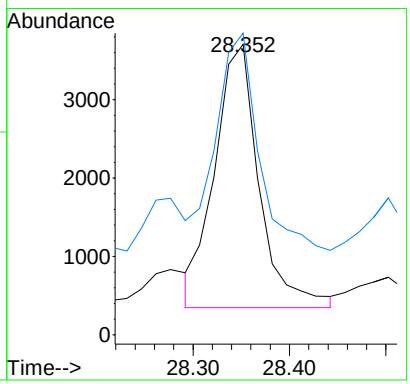


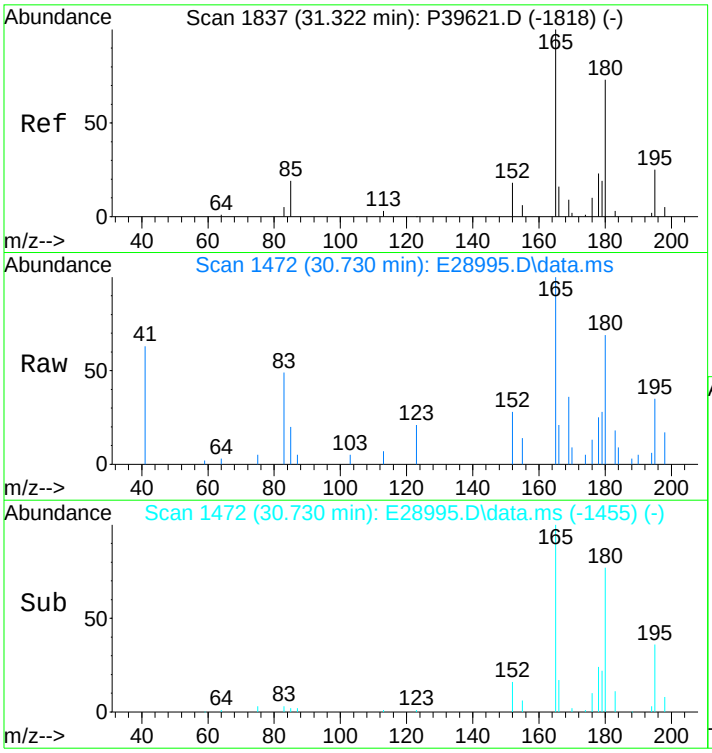


#29
Fluorene
Concen: 175.25 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:166 Resp: 10777

Ion	Ratio	Lower	Upper
166	100		
165	132.3	74.7	112.1#

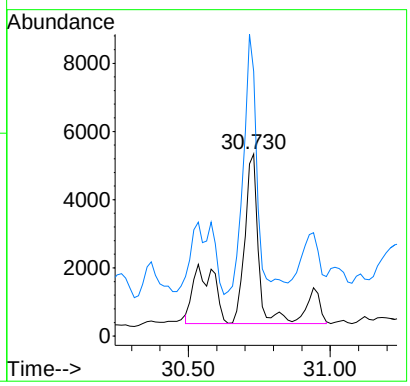


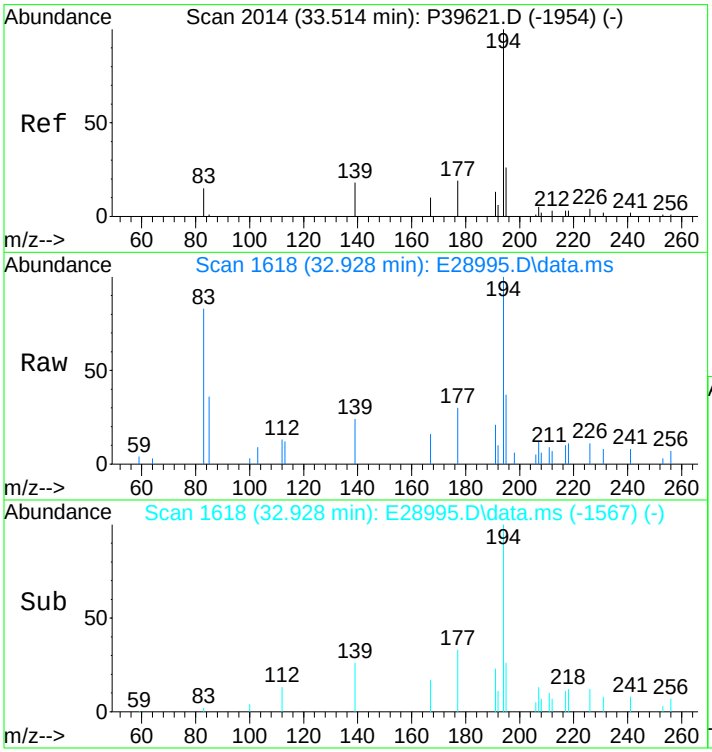


#30
C1-Fluorenes
Concen: 461.43 ng/mL m
RT: 30.730 min Scan# 1472
Delta R.T. 0.108 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:180 Resp: 28376

Ion	Ratio	Lower	Upper
180	100		
165	0.0	94.3	141.5#

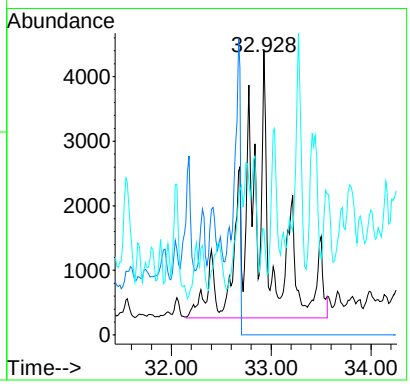


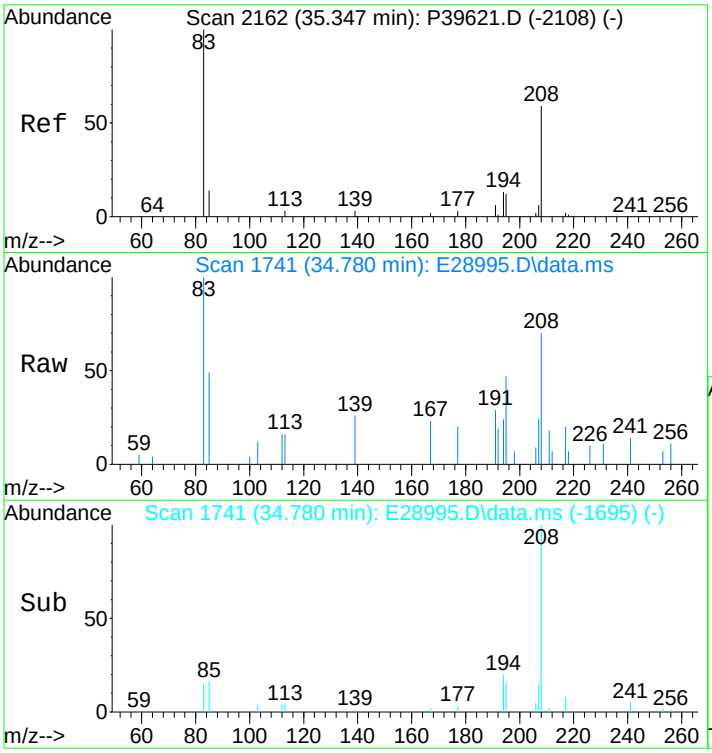


#31
C2-Fluorenes
Concen: 1111.48 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:194 Resp: 68351

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.0	40.4#

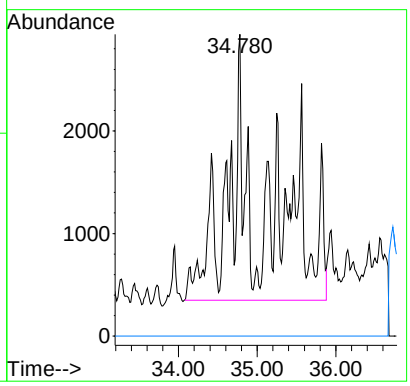


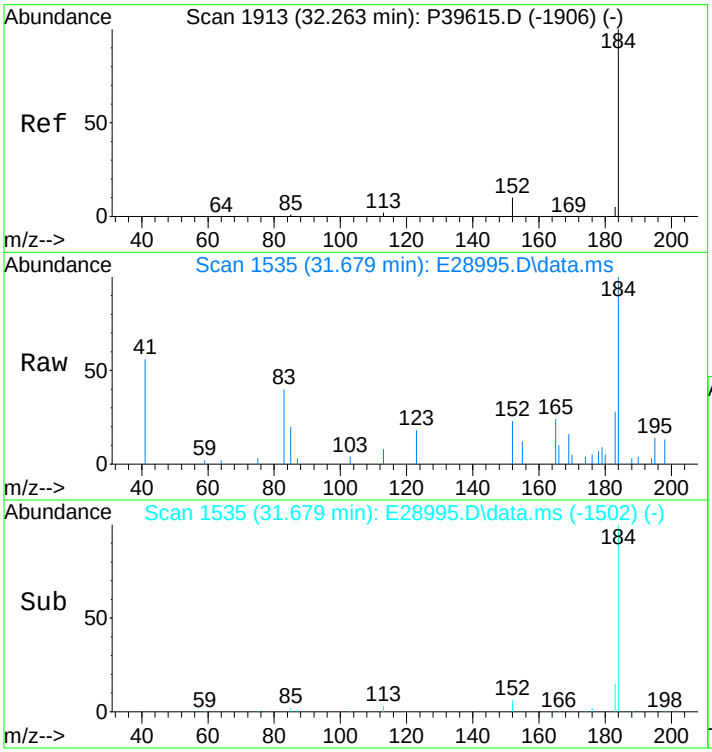


#32
C3-Fluorenes
Concen: 1251.59 ng/mL m
RT: 34.780 min Scan# 1741
Delta R.T. 0.231 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:208 Resp: 76967

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

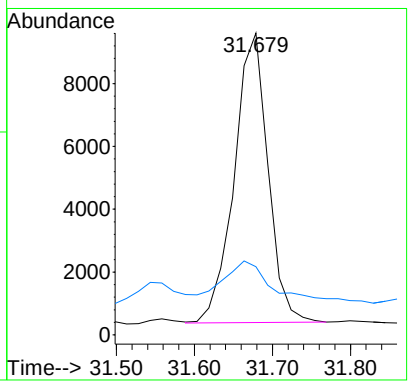


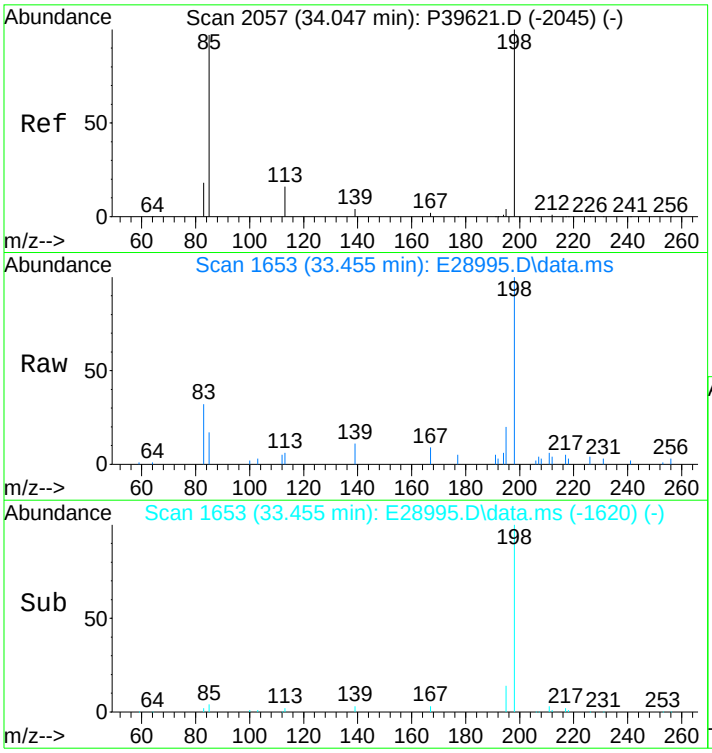


#33
Dibenzothiophene
Concen: 328.73 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:184 Resp: 27741

Ion	Ratio	Lower	Upper
184	100		
152	21.5	7.0	10.6#

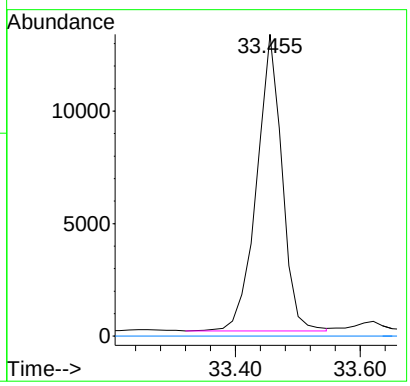


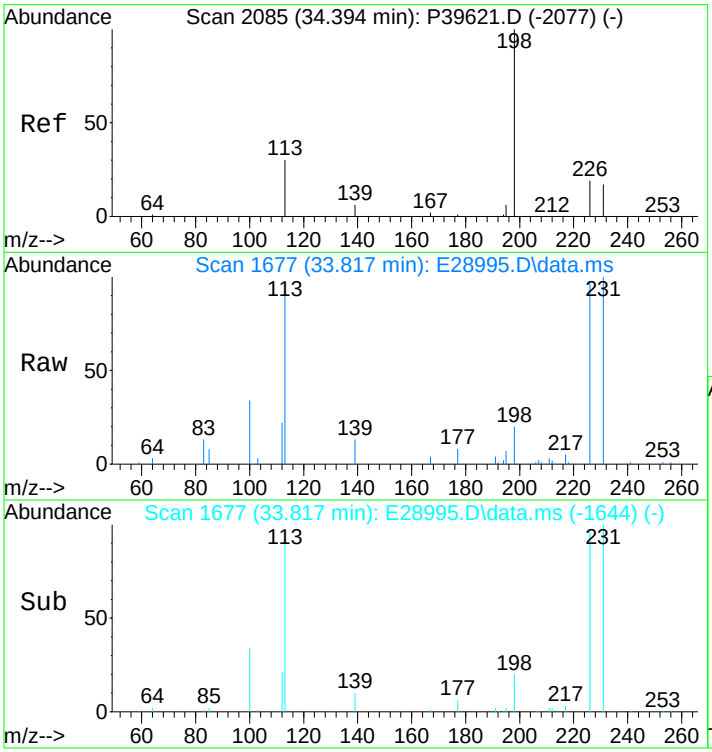


#34
4-Methyldibenzothiophene(4MDT)
Concen: 439.85 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 37118

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

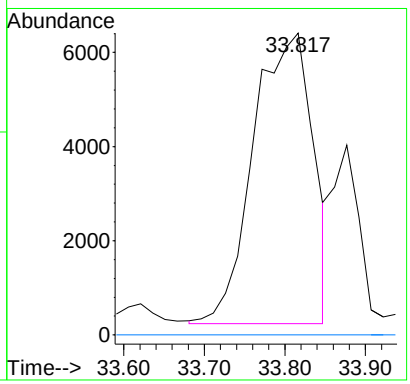


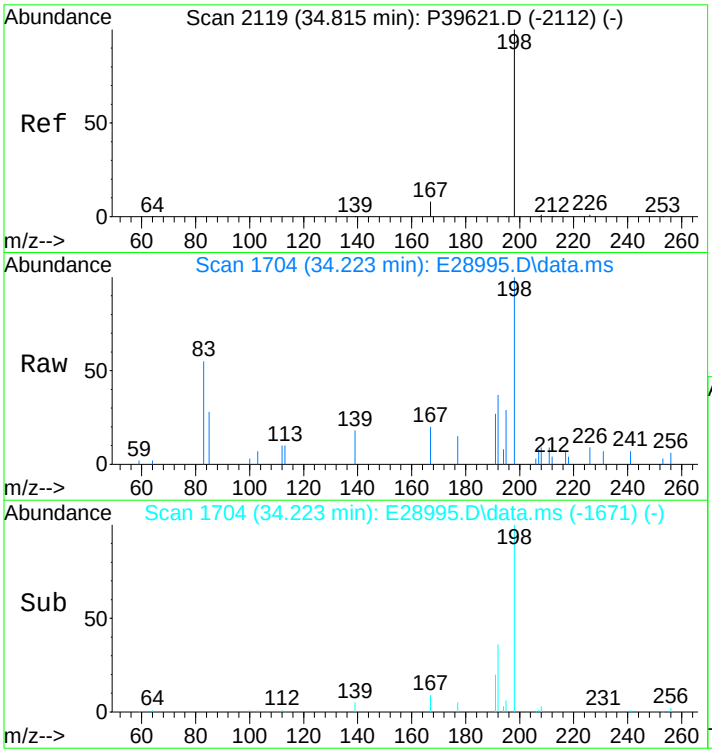


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 377.92 ng/mL m
RT: 33.817 min Scan# 1677
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 31892

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

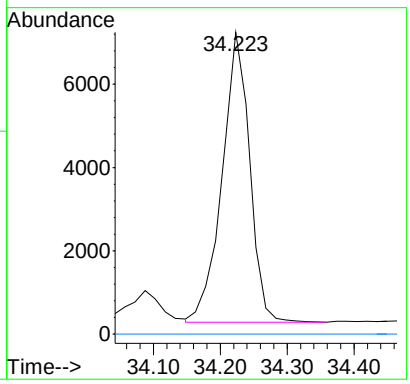


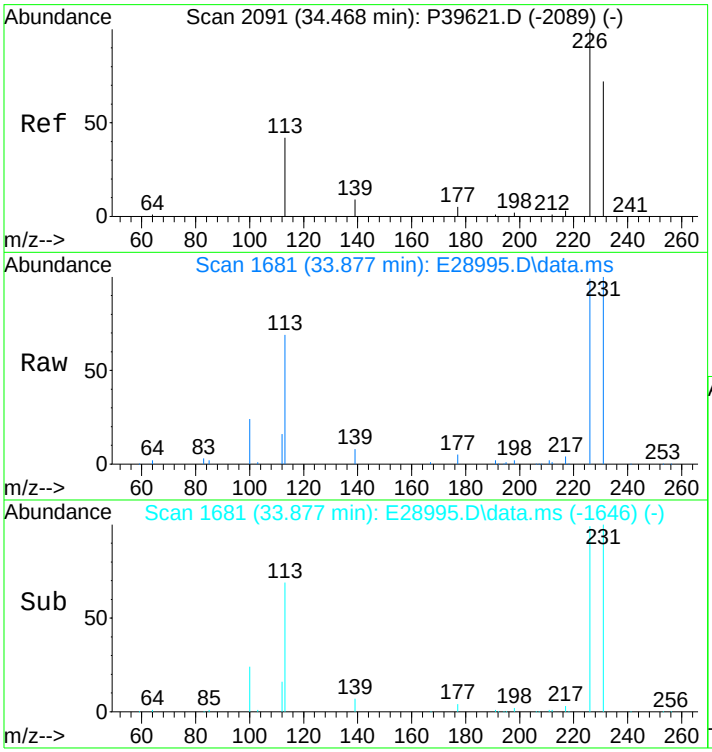


#36
1-Methyldibenzothiophene(1MDT)
Concen: 235.61 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 19883

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

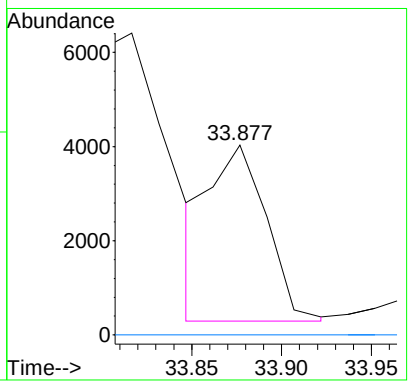


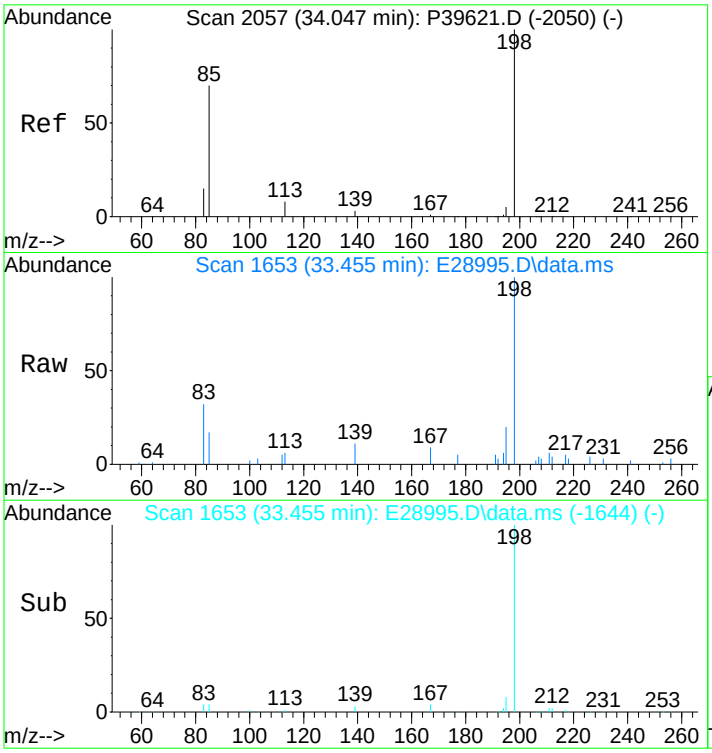


#37
OTP
Concen: 97.79 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 8252

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

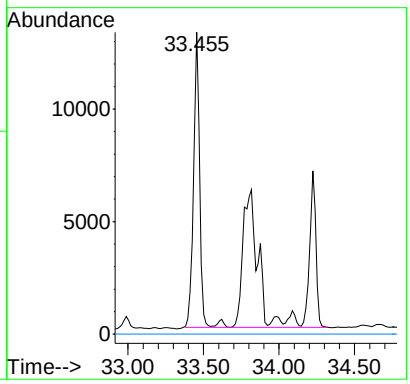


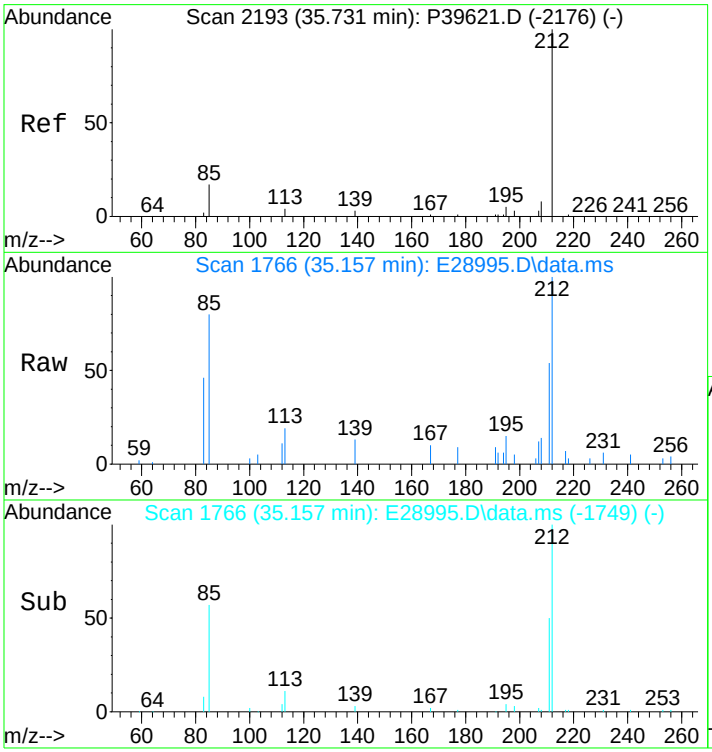


#38
C1-Dibenzothiophenes
Concen: 1199.26 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 101204

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

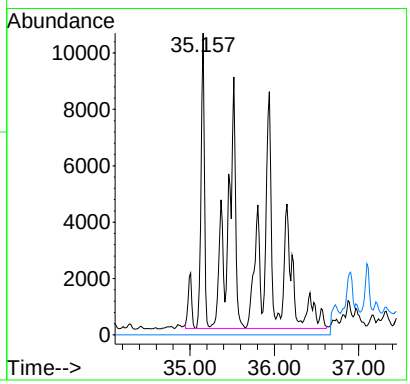


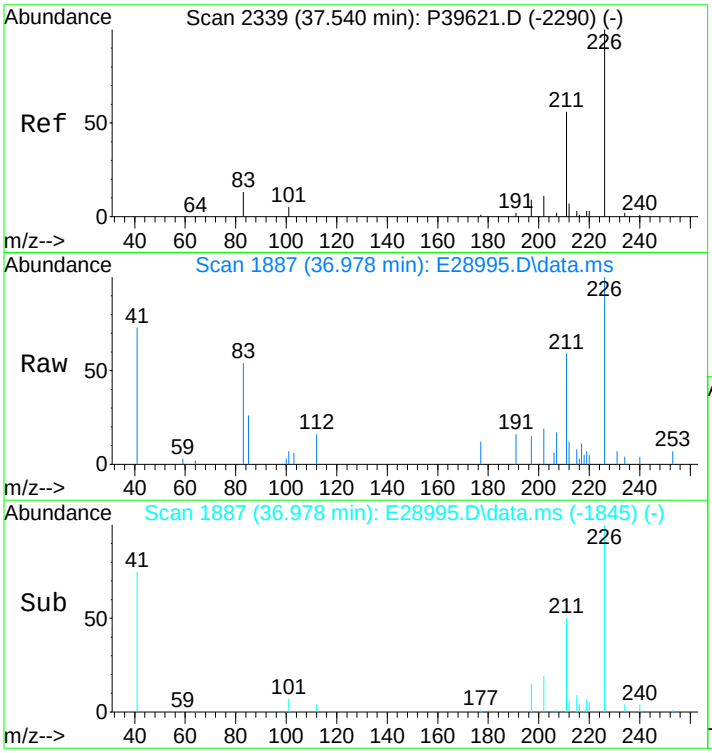


#39
C2-Dibenzothiophenes
Concen: 2132.43 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:212 Resp: 179953

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

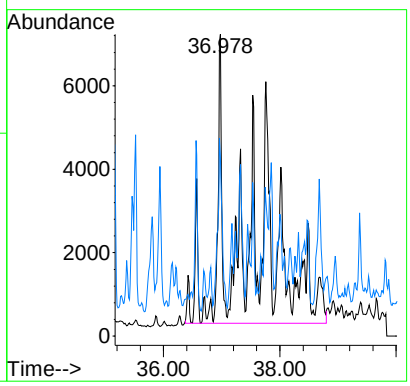


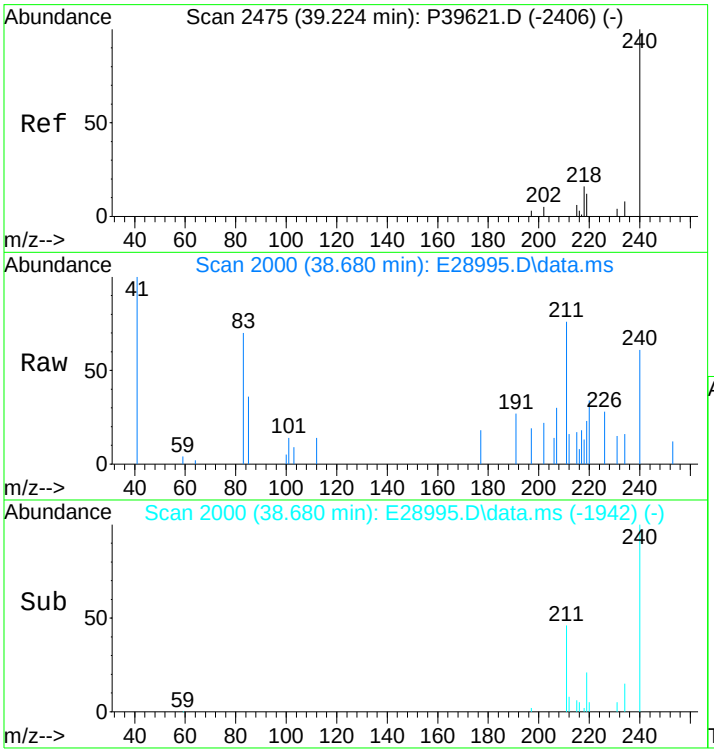


#40
C3-Dibenzothiophenes
Concen: 2300.82 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.290 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:226 Resp: 194163

Ion	Ratio	Lower	Upper
226	100		
211	1.7	44.1	66.1#

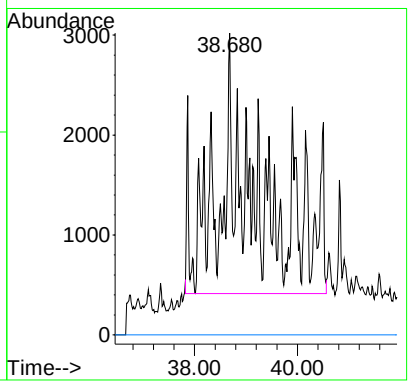


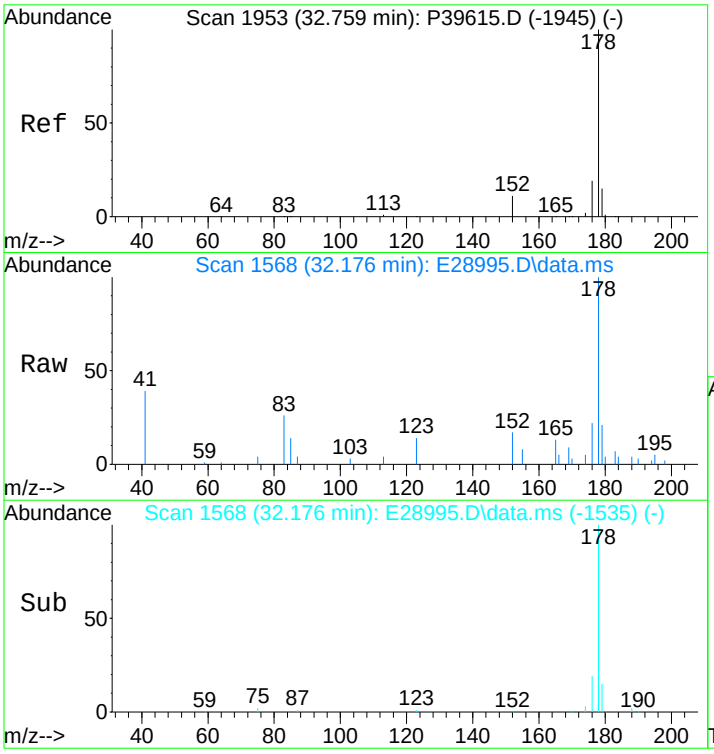


#41
C4-Dibenzothiophenes
Concen: 1587.54 ng/mL m
RT: 38.680 min Scan# 2000
Delta R.T. 0.335 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:240 Resp: 133970

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

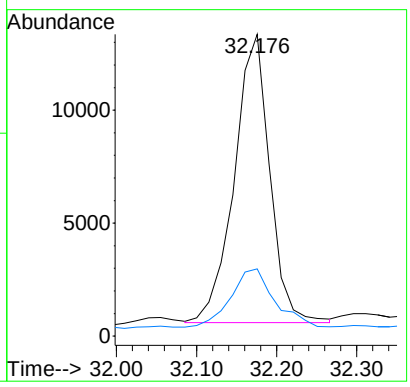


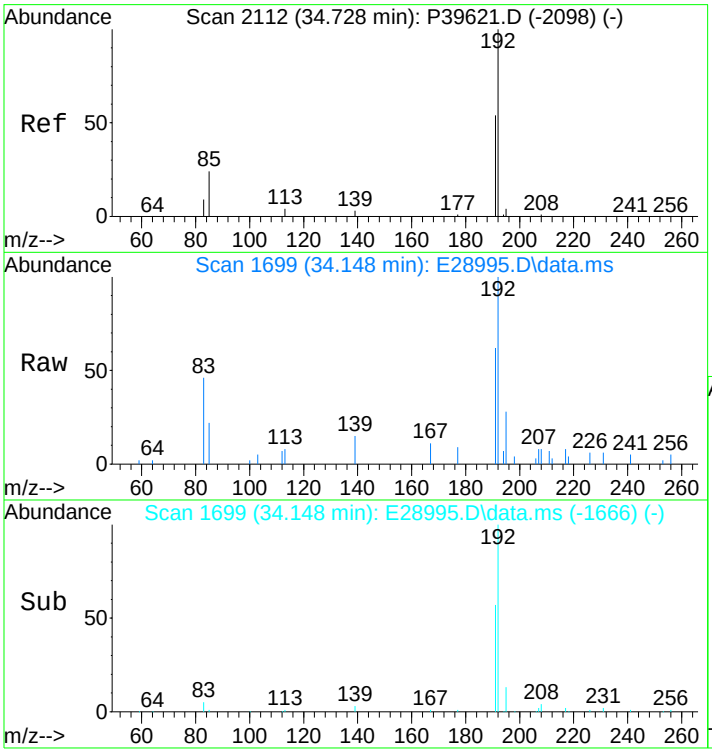


#43
Phenanthrene
Concen: 457.95 ng/mL m
RT: 32.176 min Scan# 1568
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:178 Resp: 39318

Ion	Ratio	Lower	Upper
178	100		
176	0.6	15.0	22.4#

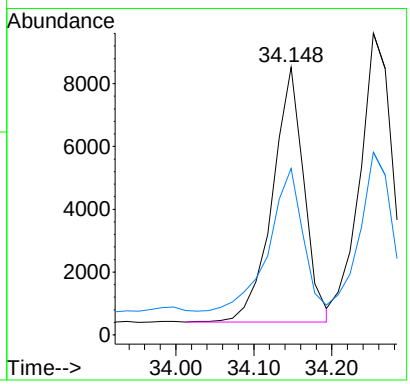


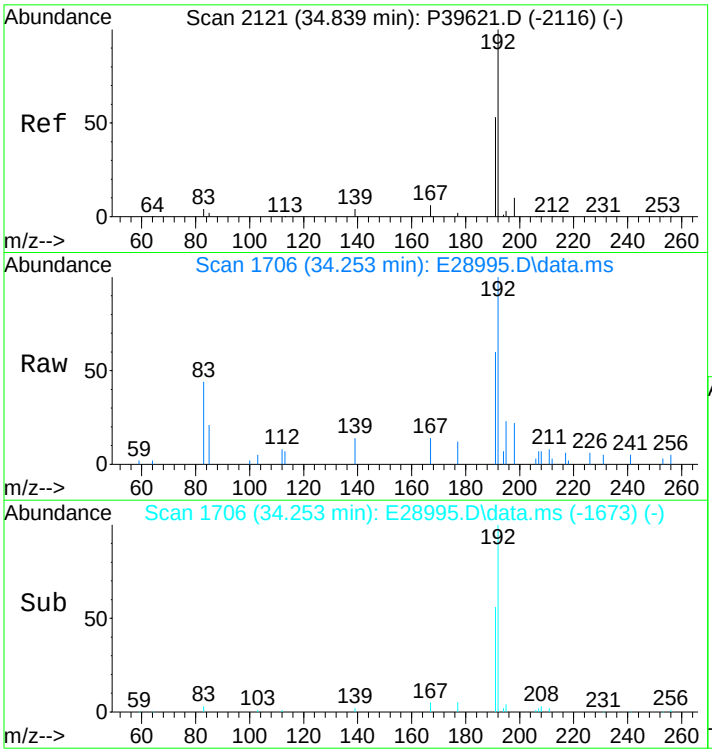


#44
3-Methylphenanthrene(3MP)
Concen: 265.07 ng/mL
RT: 34.148 min Scan# 1699
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 22758

Ion	Ratio	Lower	Upper
192	100		
191	63.7	45.9	68.9

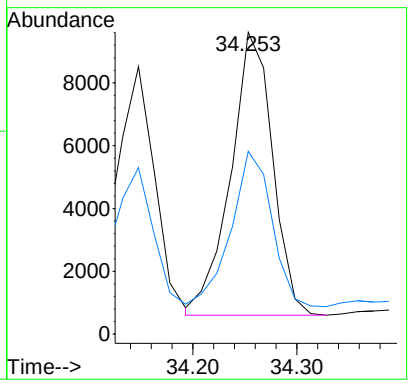


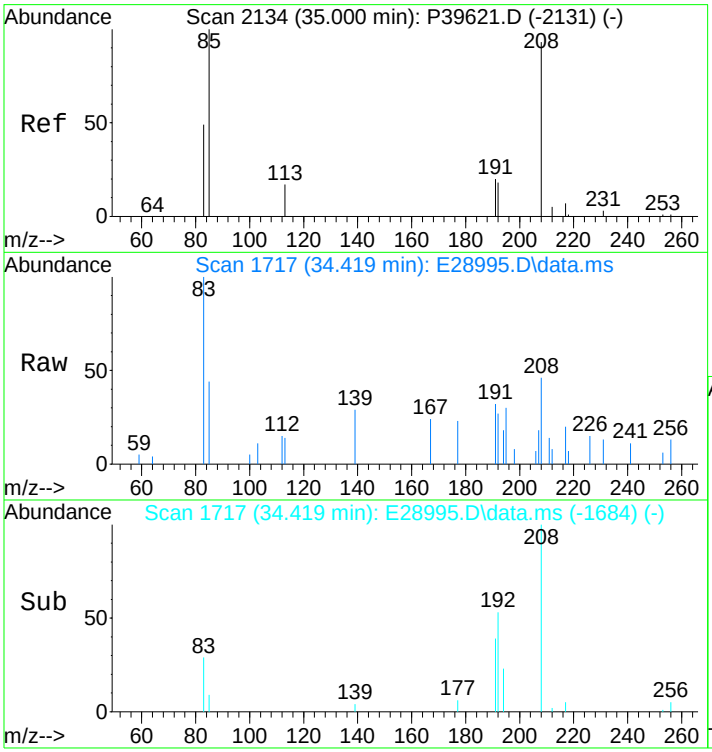


#45
2-Methylphenanthrene(2MP)
Concen: 295.75 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 25392

Ion	Ratio	Lower	Upper
192	100		
191	53.4	45.4	68.0

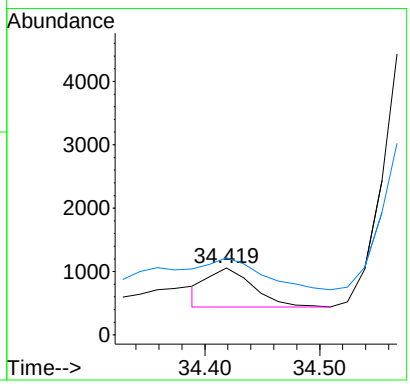


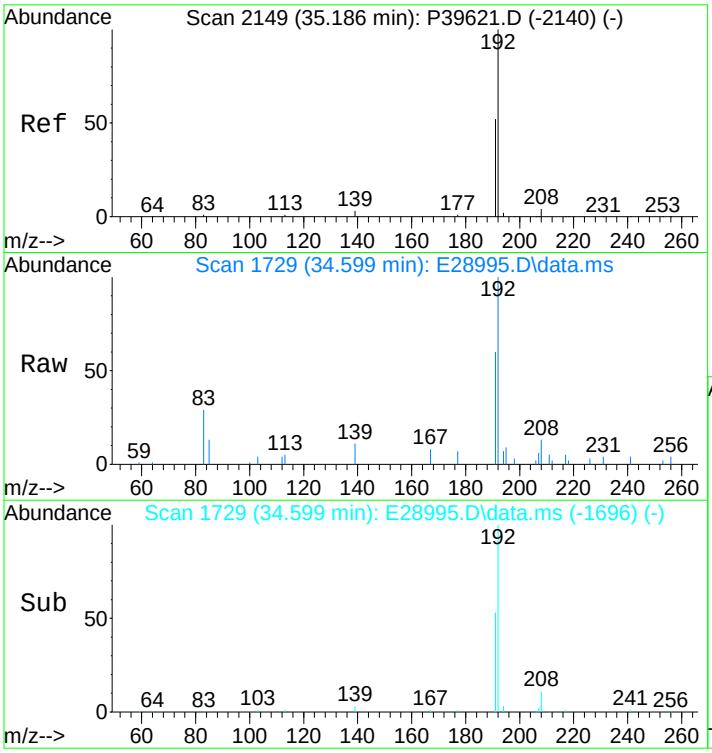


#46
2-Methylanthracene(2MA)
Concen: 20.08 ng/mL m
RT: 34.419 min Scan# 1717
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 1724

Ion	Ratio	Lower	Upper
192	100		
191	161.3	95.4	143.0#

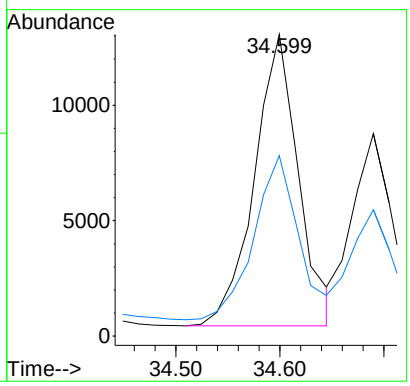


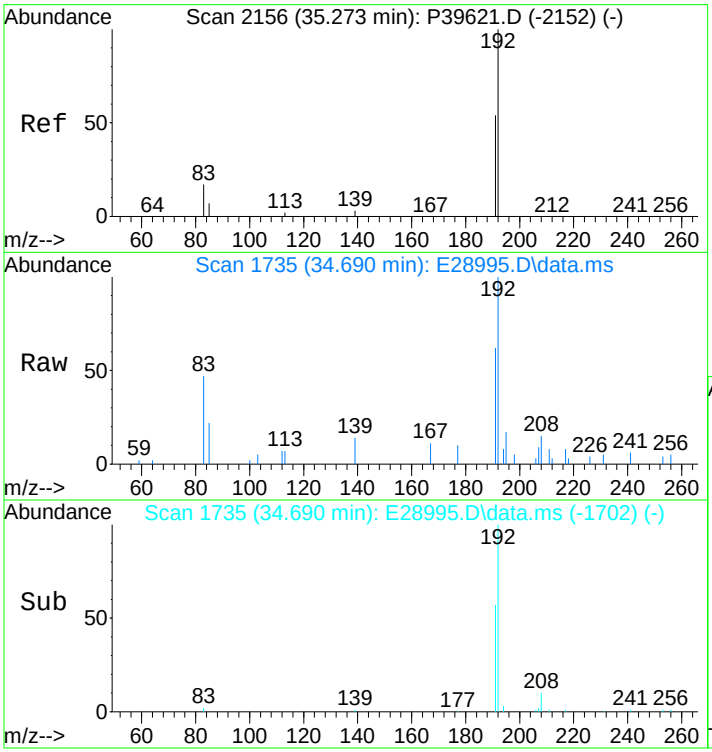


#47
9/4-Methylphenanthrene(9MP)
Concen: 434.27 ng/mL
RT: 34.599 min Scan# 1729
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 37285

Ion	Ratio	Lower	Upper
192	100		
191	57.0	44.3	66.5

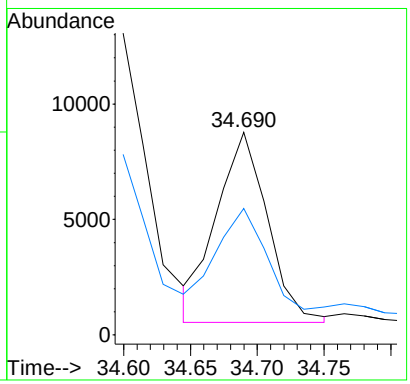


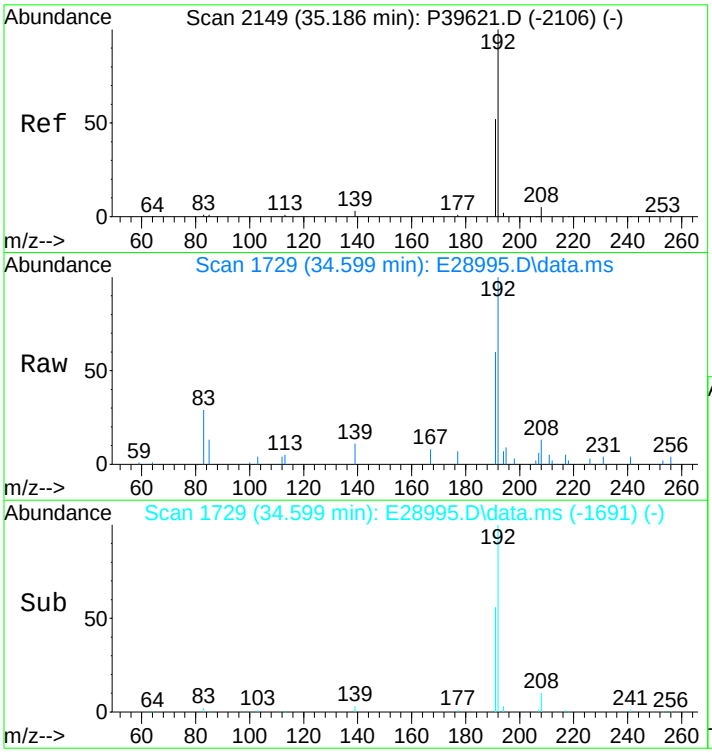


#48
1-Methylphenanthrene(1MP)
Concen: 255.40 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 21928

Ion	Ratio	Lower	Upper
192	100		
191	53.4	46.7	70.1

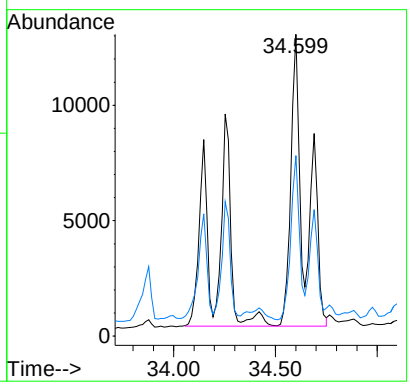


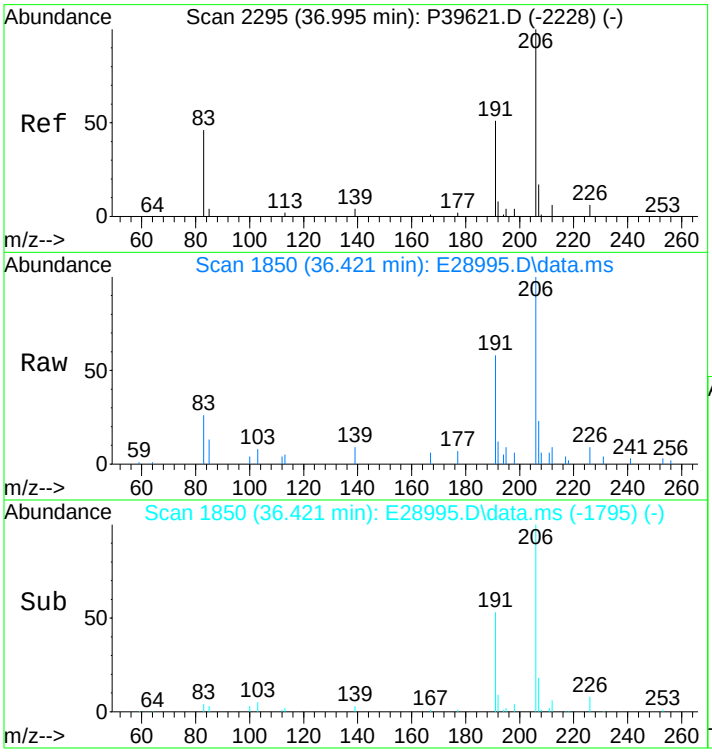


#49
C1-Phenanthrenes/Anthracenes
Concen: 1304.22 ng/mL m
RT: 34.599 min Scan# 1729
Delta R.T. 0.196 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 111975

Ion	Ratio	Lower	Upper
192	100		
191	12.1	44.0	66.0#

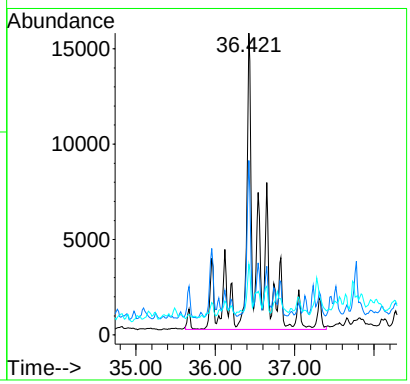


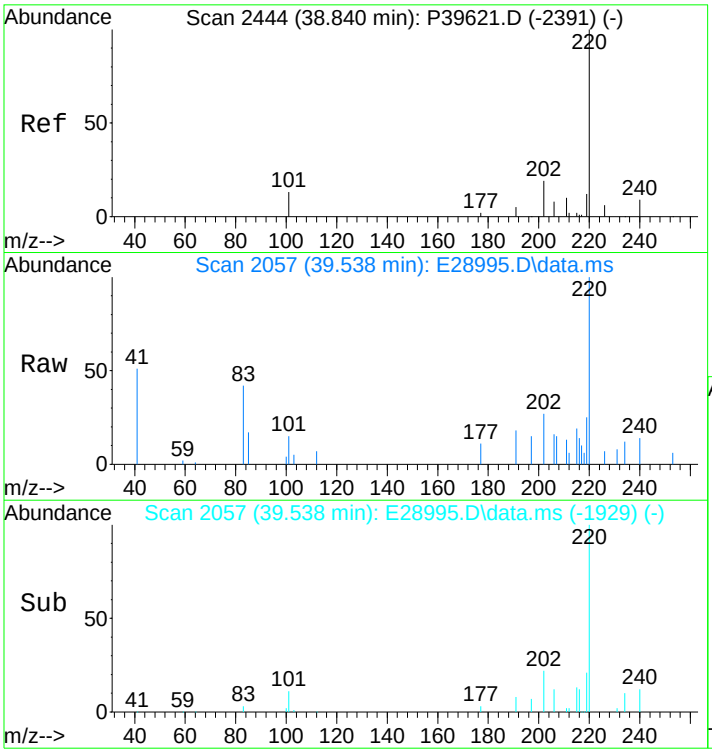


#50
C2-Phenanthrenes/Anthracenes
Concen: 1948.52 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:206 Resp: 167293

Ion	Ratio	Lower	Upper
206	100		
191	1.4	35.7	53.5#
207	0.9	16.5	24.7#

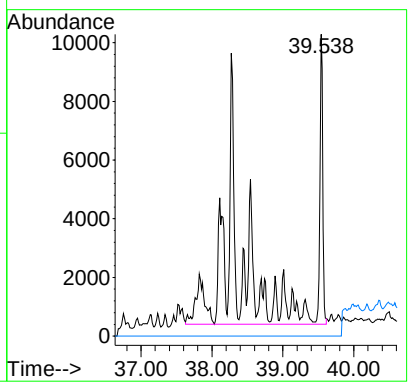


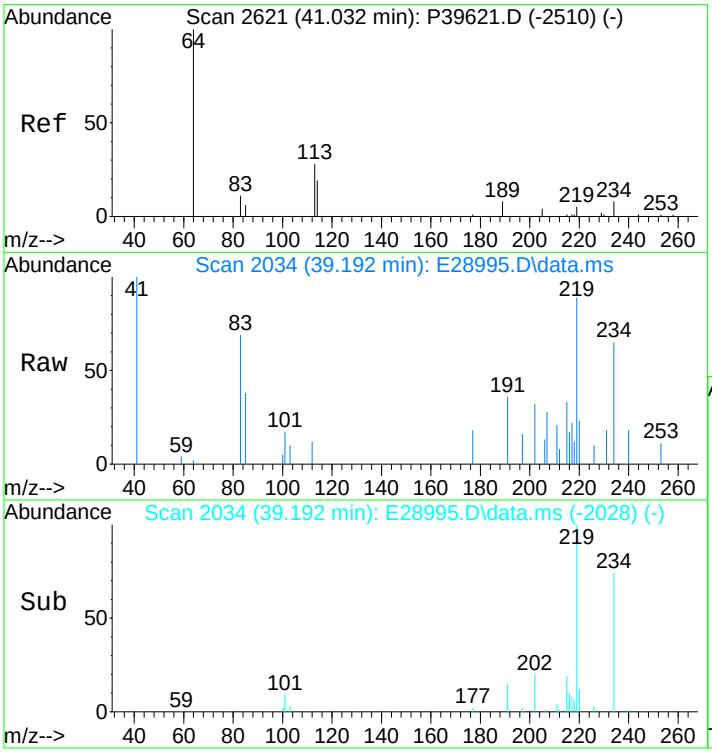


#52
C3-Phenanthrenes/Anthracenes
Concen: 1806.37 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 1.575 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:220 Resp: 155088

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

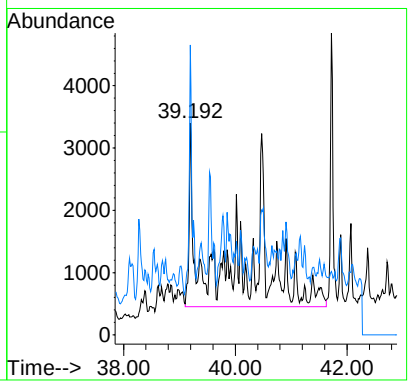


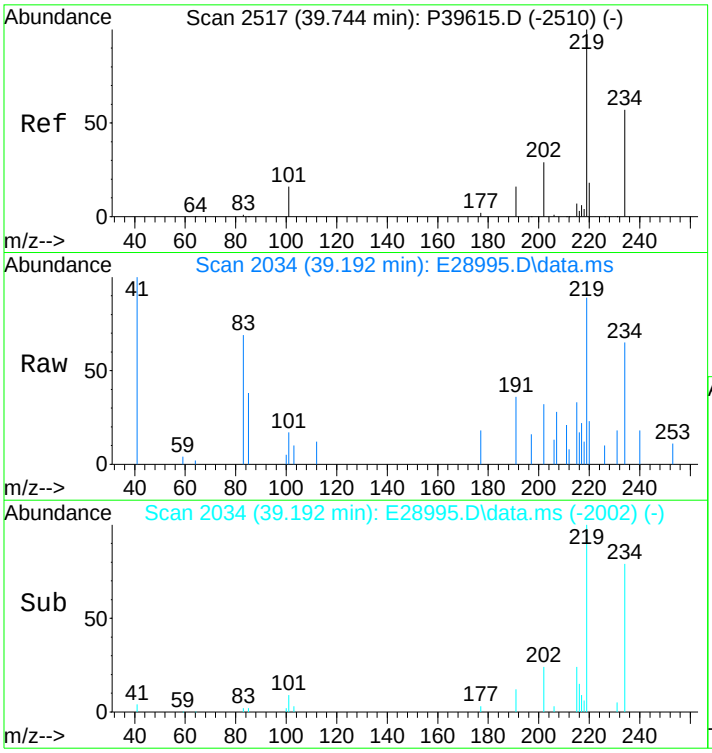


#53
C4-Phenanthrenes/Anthracenes
Concen: 956.54 ng/mL m
RT: 39.192 min Scan# 2034
Delta R.T. -0.896 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 82125

Ion	Ratio	Lower	Upper
234	100		
219	2.1	46.6	70.0#

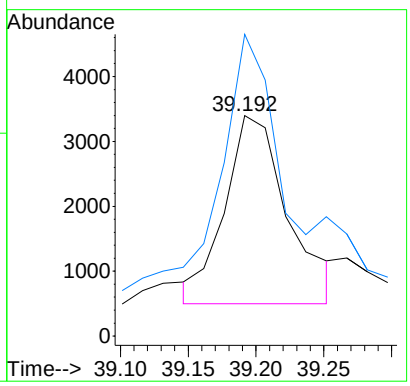


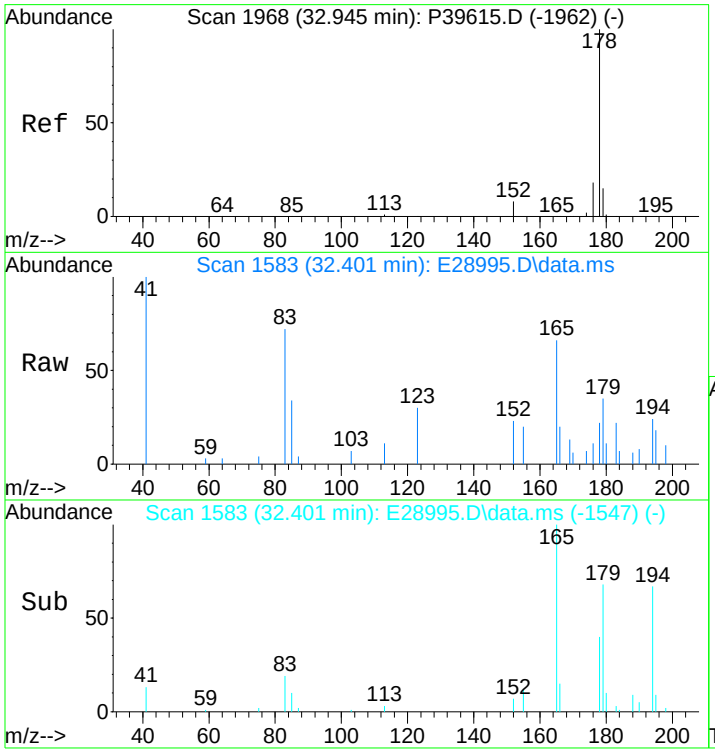


#54
Retene
Concen: 338.79 ng/mL m
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 9360

Ion	Ratio	Lower	Upper
234	100		
219	155.4	115.3	172.9

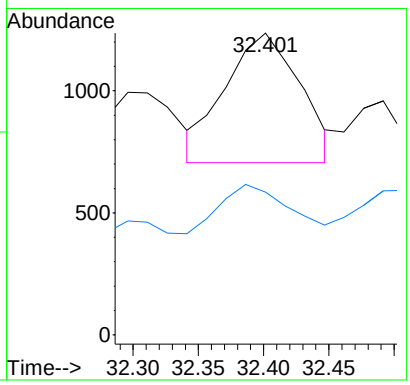


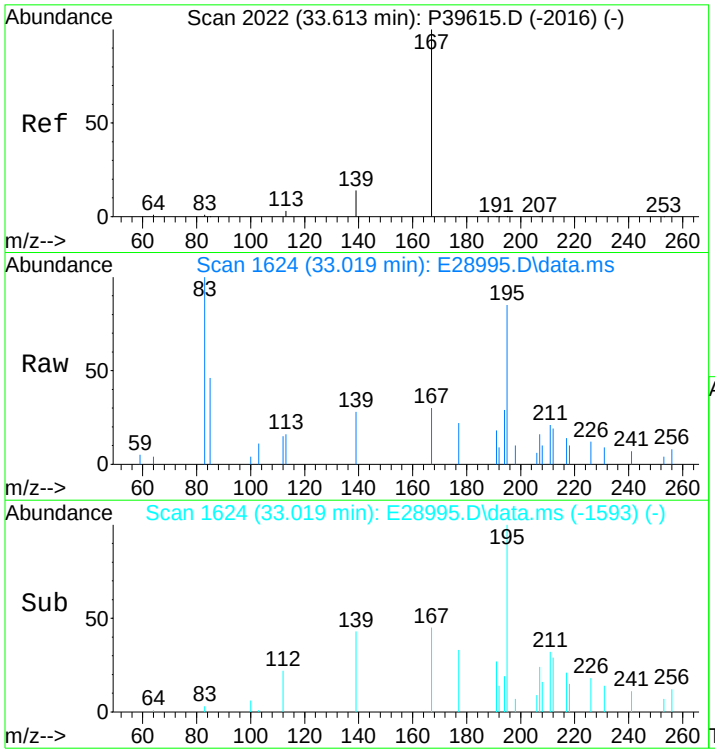


#55
Anthracene
Concen: 28.57 ng/mL m
RT: 32.401 min Scan# 1583
Delta R.T. 0.045 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:178 Resp: 2120

Ion	Ratio	Lower	Upper
178	100		
176	33.9	14.3	21.5#

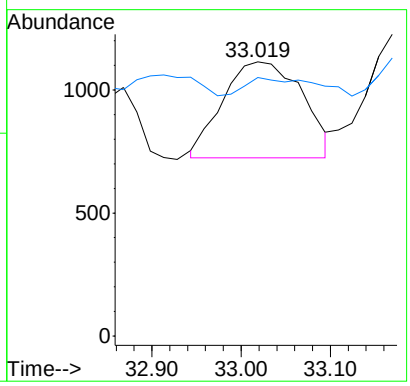


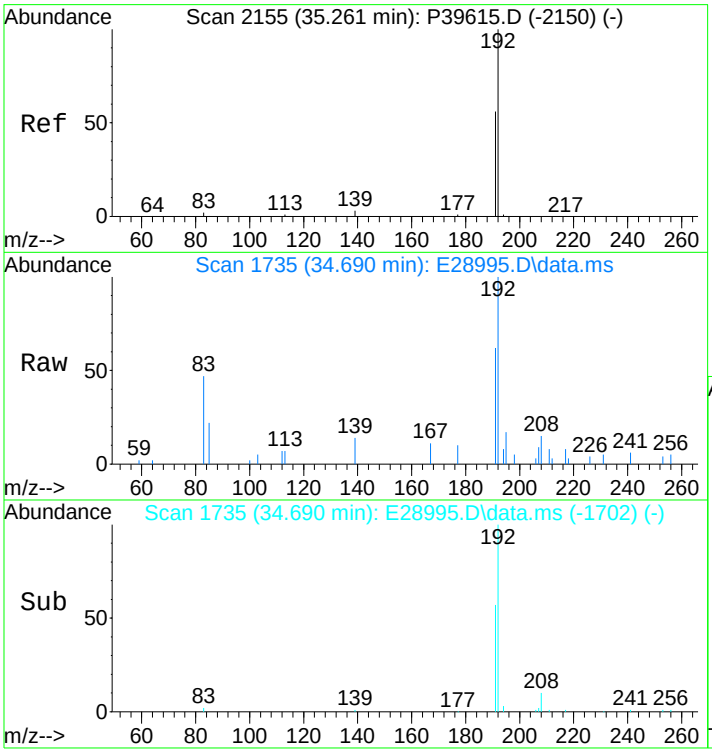


#56
Carbazole
Concen: 31.65 ng/mL m
RT: 33.019 min Scan# 1624
Delta R.T. -0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:167 Resp: 2417

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.1	15.1#

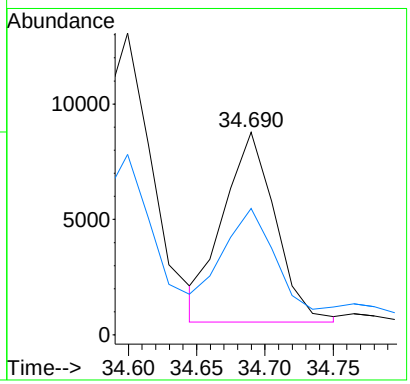


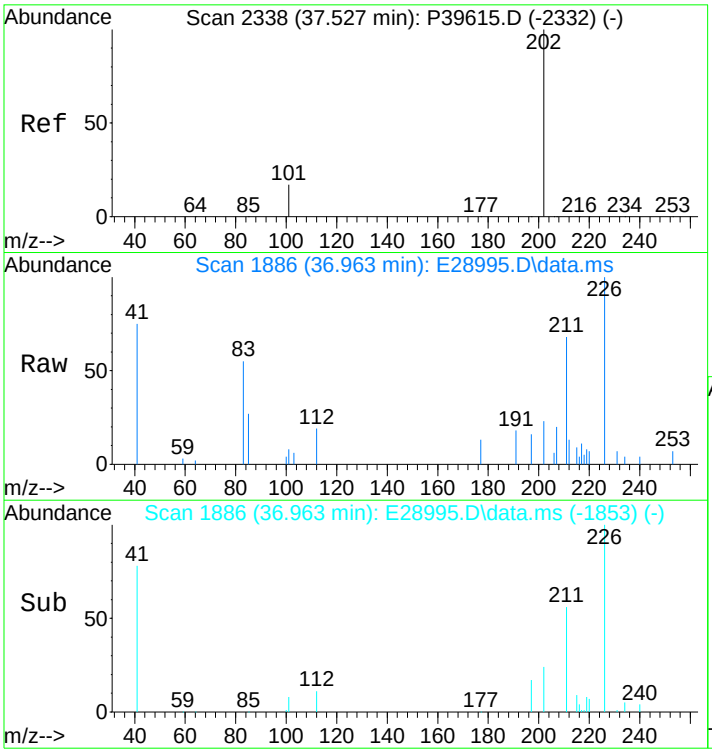


#57
1-Methylphenanthrene
Concen: 332.74 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 21795

Ion	Ratio	Lower	Upper
192	100		
191	53.8	45.4	68.2

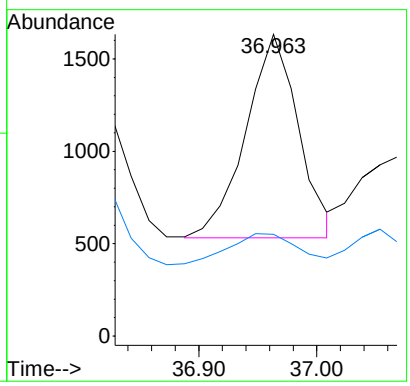


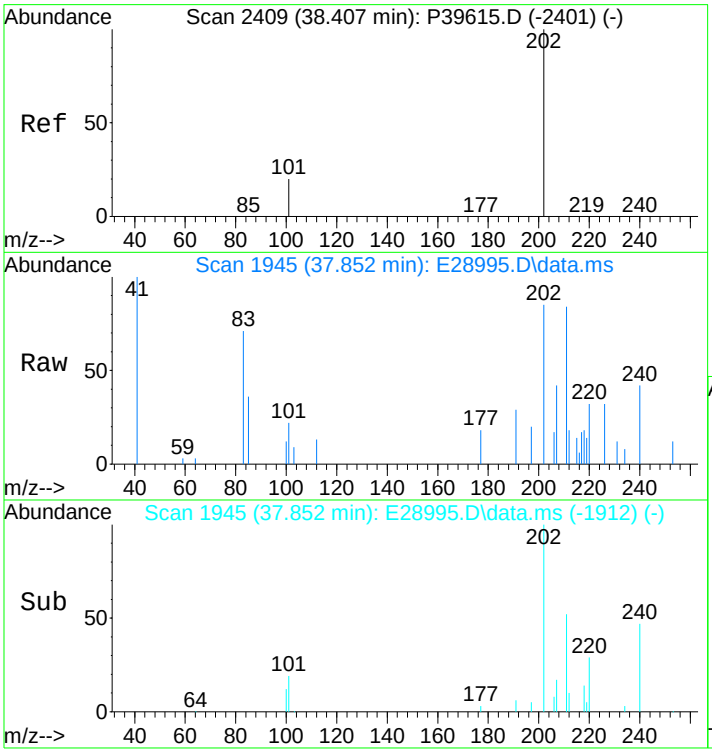


#58
Fluoranthene
Concen: 36.04 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:202 Resp: 3417

Ion	Ratio	Lower	Upper
202	100		
101	32.8	10.4	15.6#

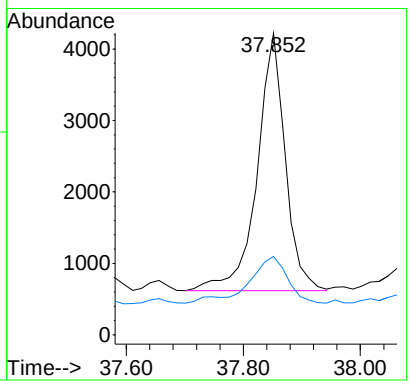


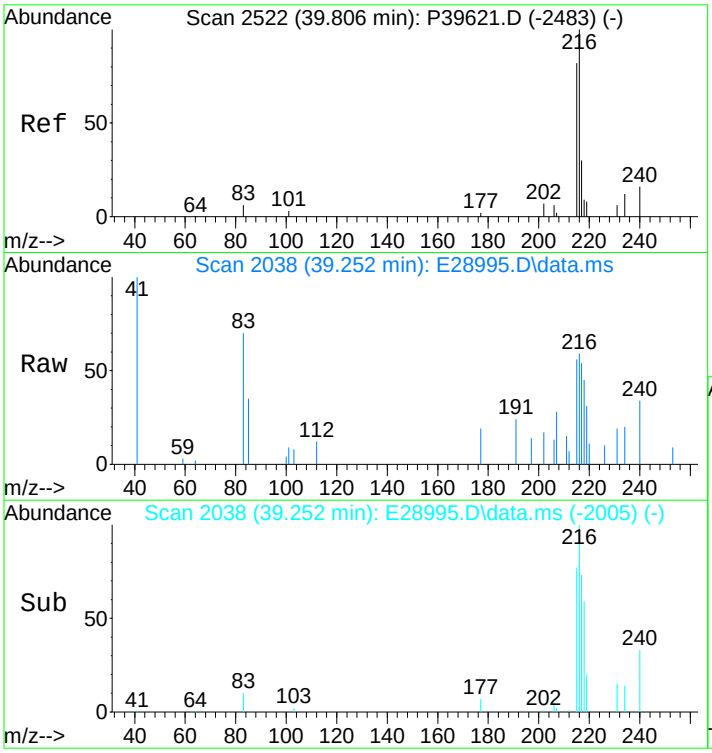


#60
Pyrene
Concen: 124.87 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:202 Resp: 12034

Ion	Ratio	Lower	Upper
202	100		
101	25.0	11.0	16.4#

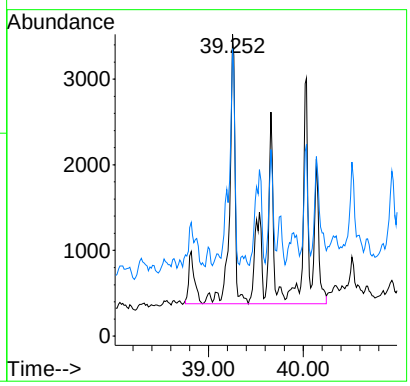


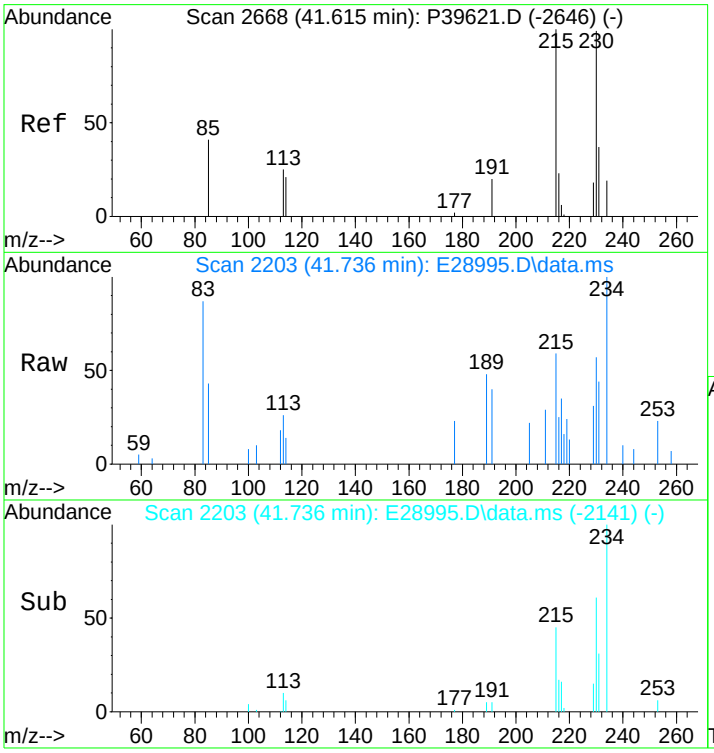


#61
C1-Fluoranthenes/Pyrenes
Concen: 436.09 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:216 Resp: 42027

Ion	Ratio	Lower	Upper
216	100		
215	5.6	73.4	110.2#

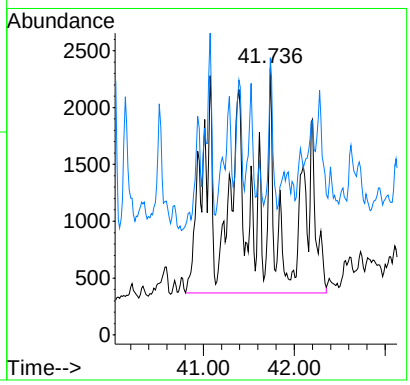


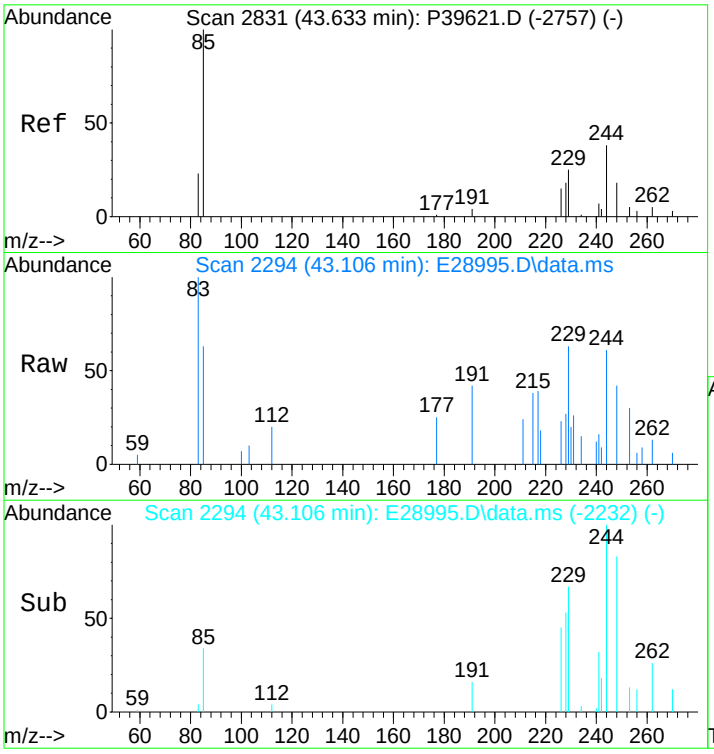


#62
C2-Fluoranthenes/Pyrenes
Concen: 643.12 ng/mL m
RT: 41.736 min Scan# 2203
Delta R.T. 0.856 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:230 Resp: 61979

Ion	Ratio	Lower	Upper
230	100		
215	9.8	93.8	140.8#

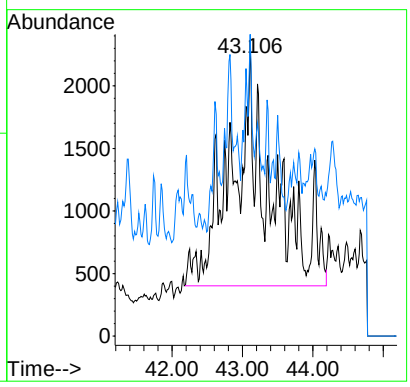


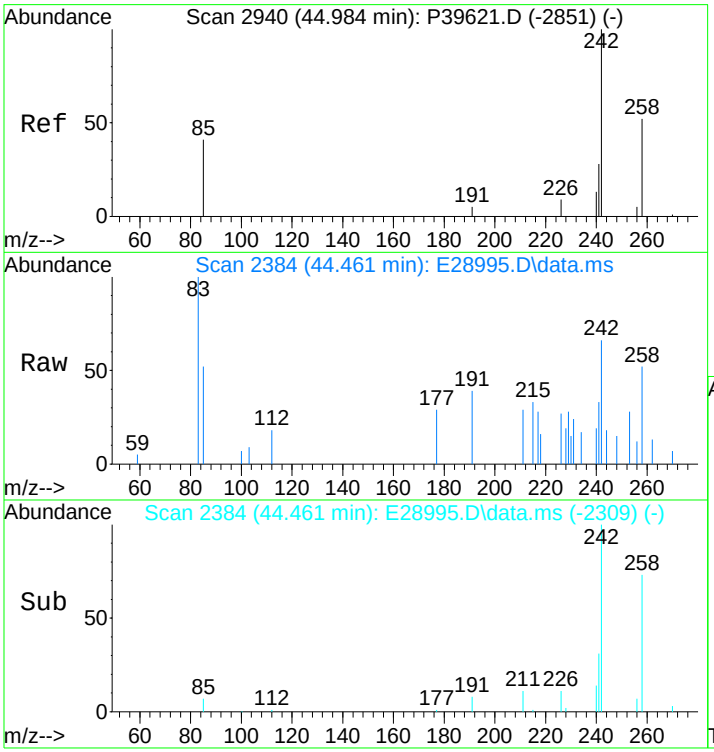


#63
C3-Fluoranthenes/Pyrenes
Concen: 754.65 ng/mL m
RT: 43.106 min Scan# 2294
Delta R.T. 0.455 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:244 Resp: 72727

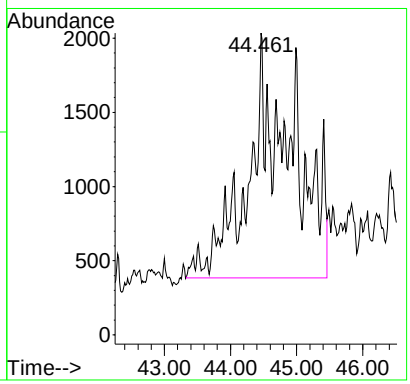
Ion	Ratio	Lower	Upper
244	100		
229	8.3	72.2	108.2#

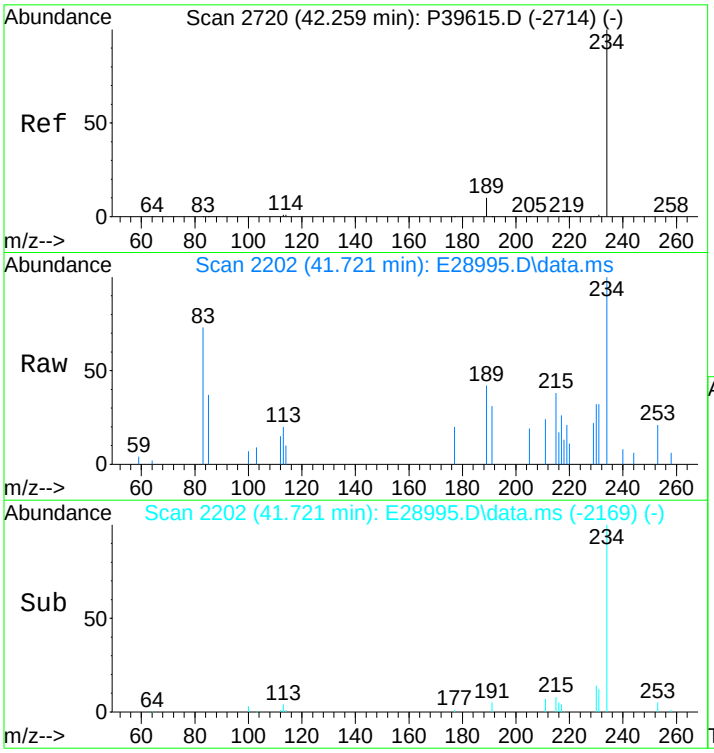




#64
C4-Fluoranthenes/Pyrenes
Concen: 770.95 ng/mL m
RT: 44.461 min Scan# 2384
Delta R.T. 0.491 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:258 Resp: 74298

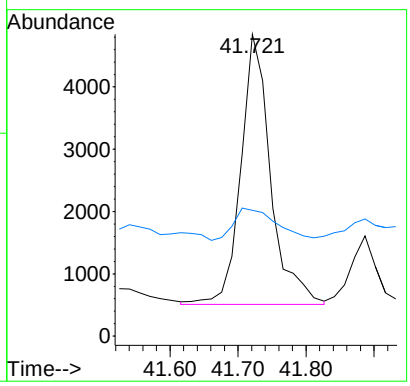


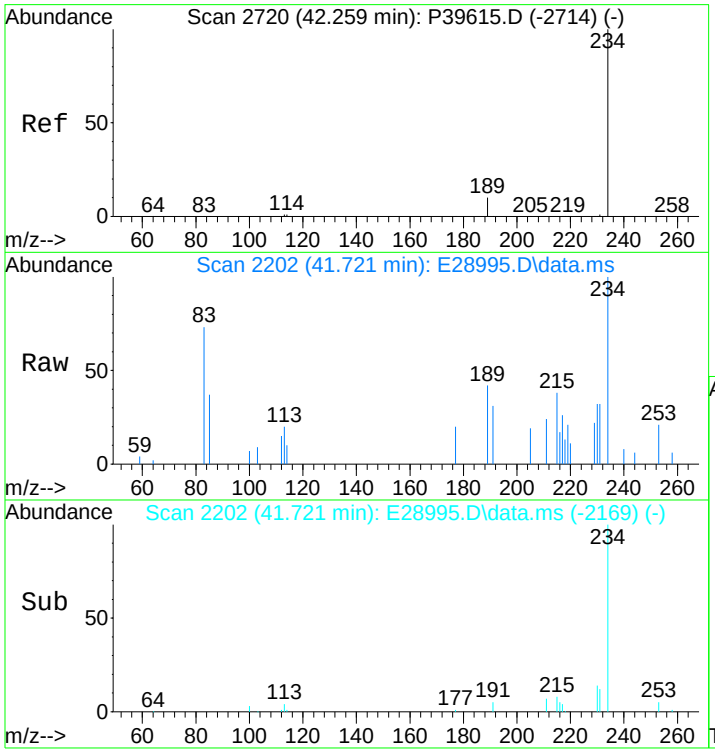


#66
Naphthobenzothiophene
Concen: 138.46 ng/ml m
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 13161

Ion	Ratio	Lower	Upper
234	100		
189	17.2	21.1	31.7#

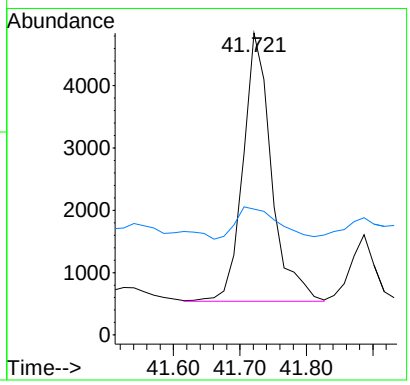


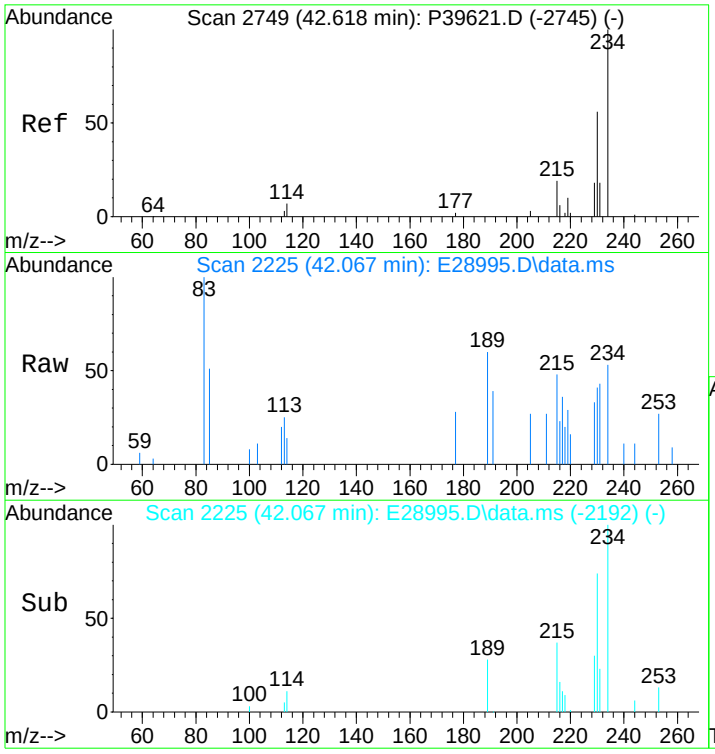


#67
Naphthobenzothiophene-2,1-D
Concen: 134.88 ng/mL m
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 12820

Ion	Ratio	Lower	Upper
234	100		
189	17.7	21.1	31.7#

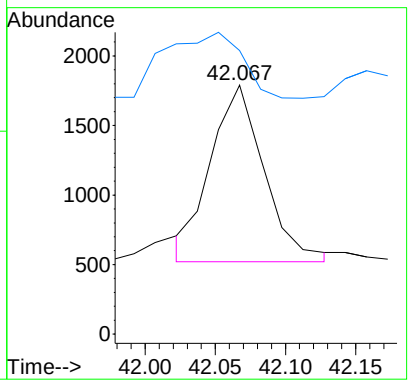


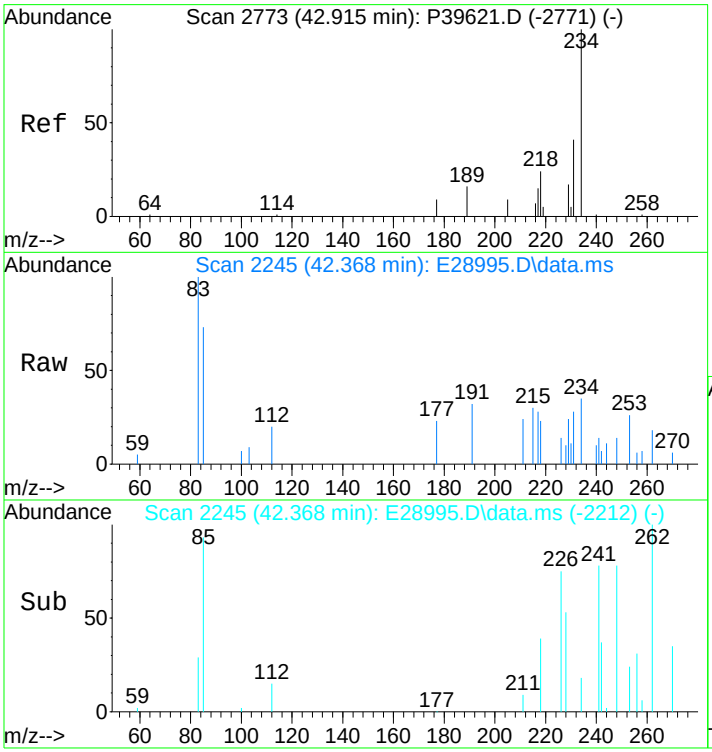


#68
Naphthobenzothiophene-1,2-D
Concen: 35.45 ng/mL m
RT: 42.067 min Scan# 2225
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 3370

Ion	Ratio	Lower	Upper
234	100		
189	53.6	71.9	107.9#

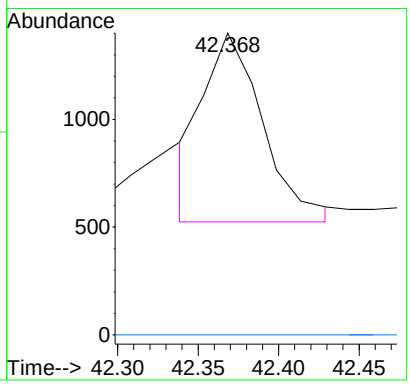


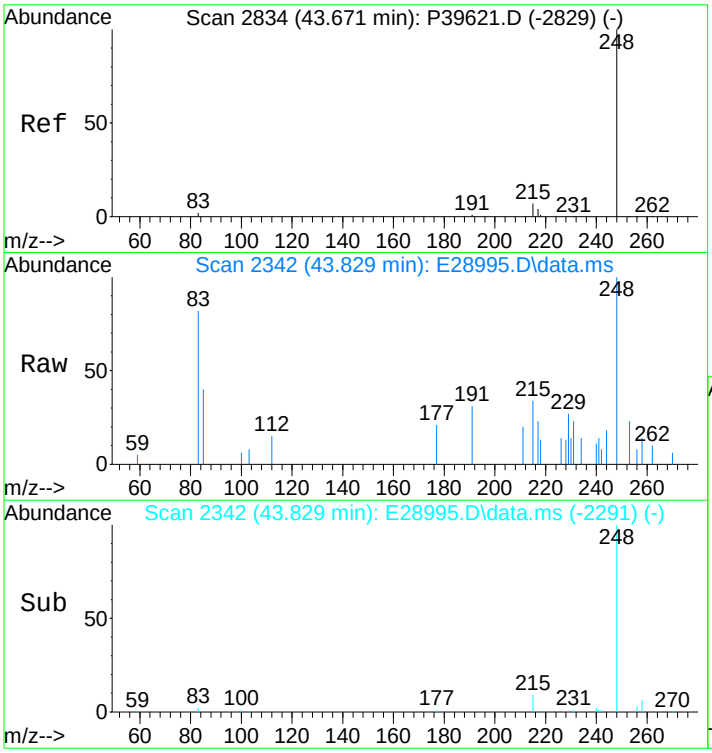


#69
Naphthobenzothiophene-2,3-D
Concen: 23.85 ng/mL m
RT: 42.368 min Scan# 2245
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 2267

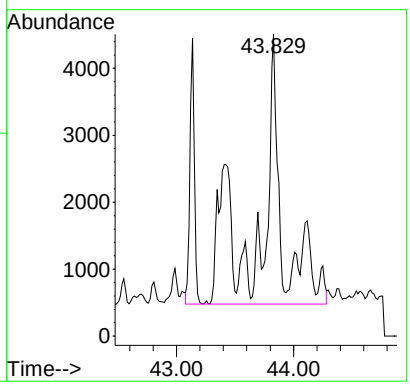
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

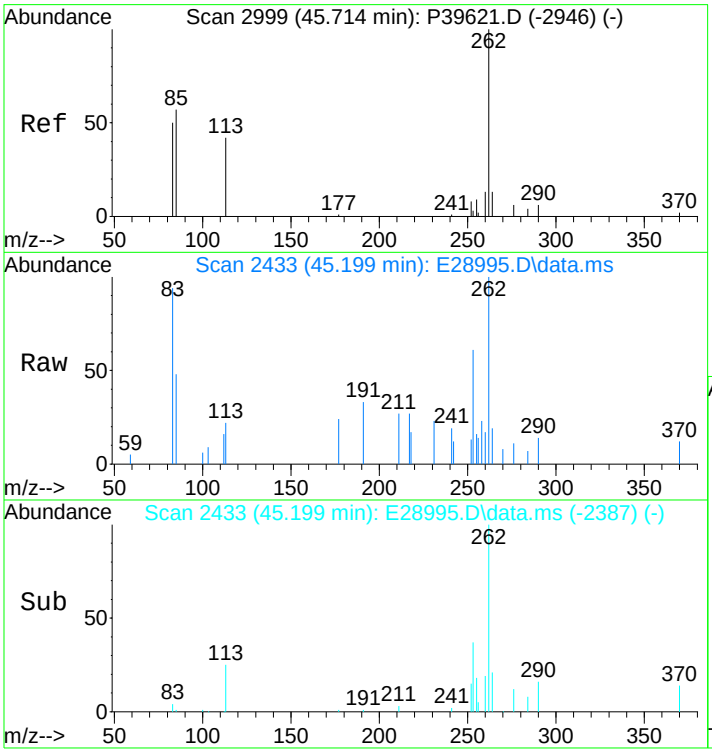




#70
C1-Naphthobenzothiophenes
Concen: 683.17 ng/ml m
RT: 43.829 min Scan# 2342
Delta R.T. 0.708 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

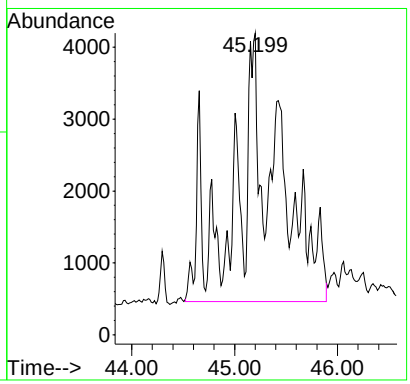
Tgt Ion:248 Resp: 64936

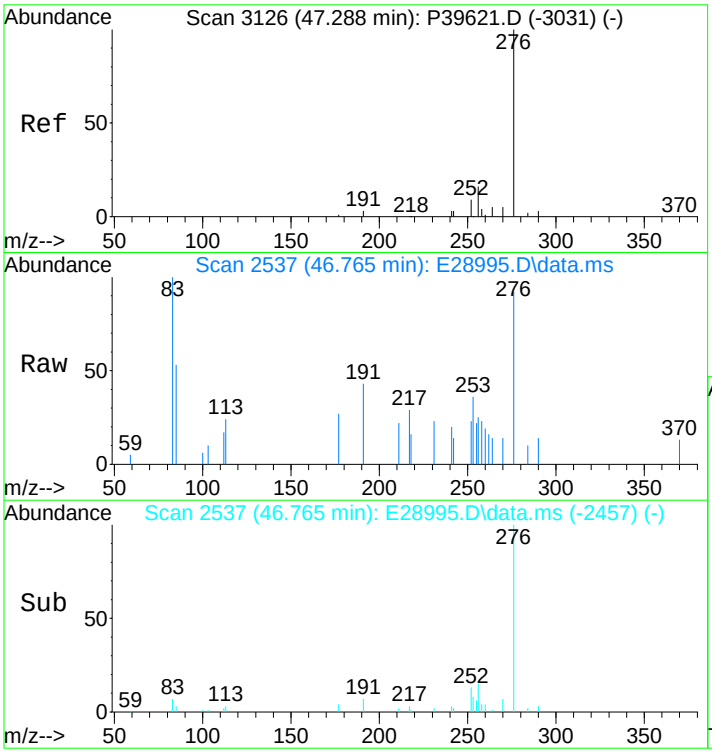




#71
C2-Naphthobenzothiophenes
Concen: 1113.26 ng/ml m
RT: 45.199 min Scan# 2433
Delta R.T. 0.554 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

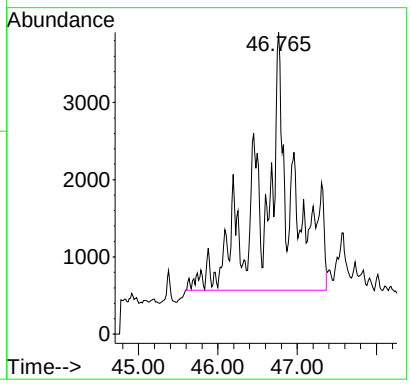
Tgt Ion:262 Resp: 105816

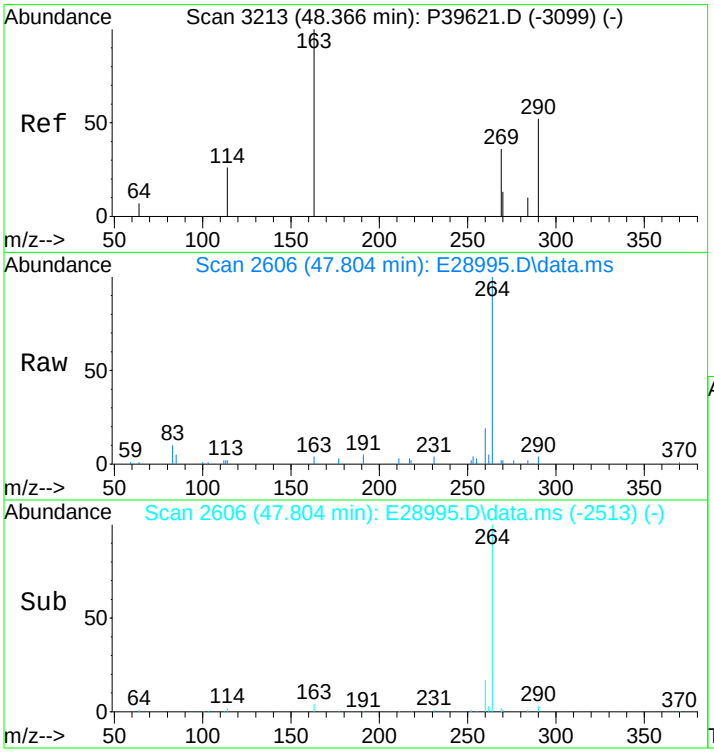




#72
C3-Naphthobenzothiophenes
Concen: 925.58 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

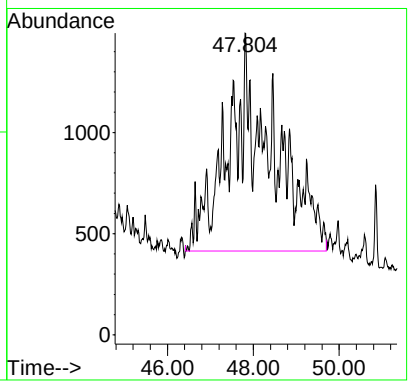
Tgt Ion:276 Resp: 87977

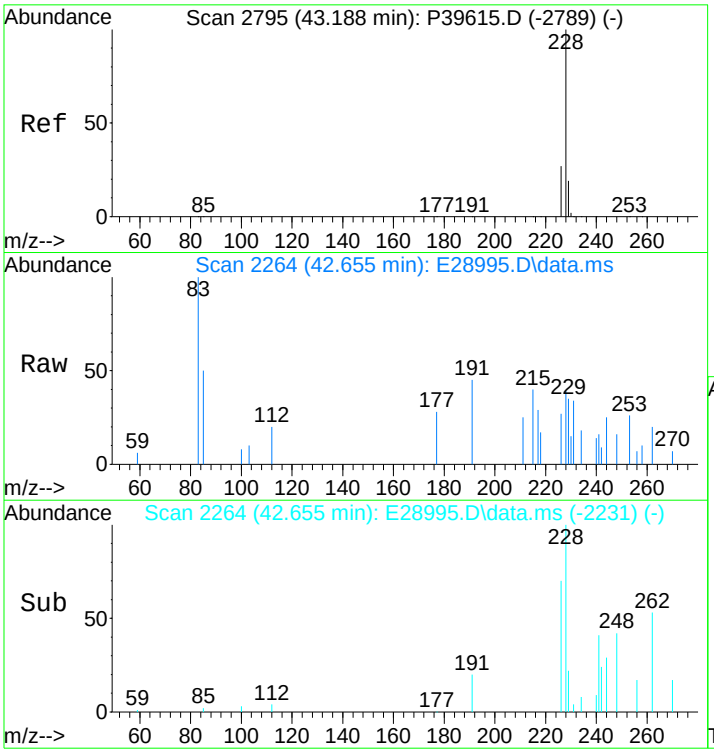




#73
C4-Naphthobenzothiophenes
Concen: 787.16 ng/mL m
RT: 47.804 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:290 Resp: 74820

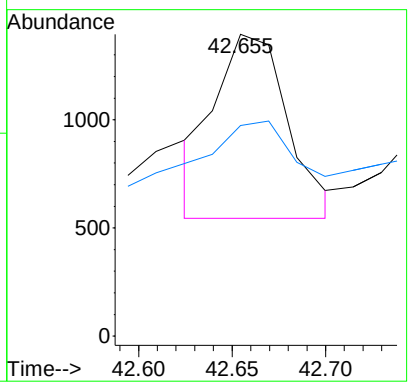


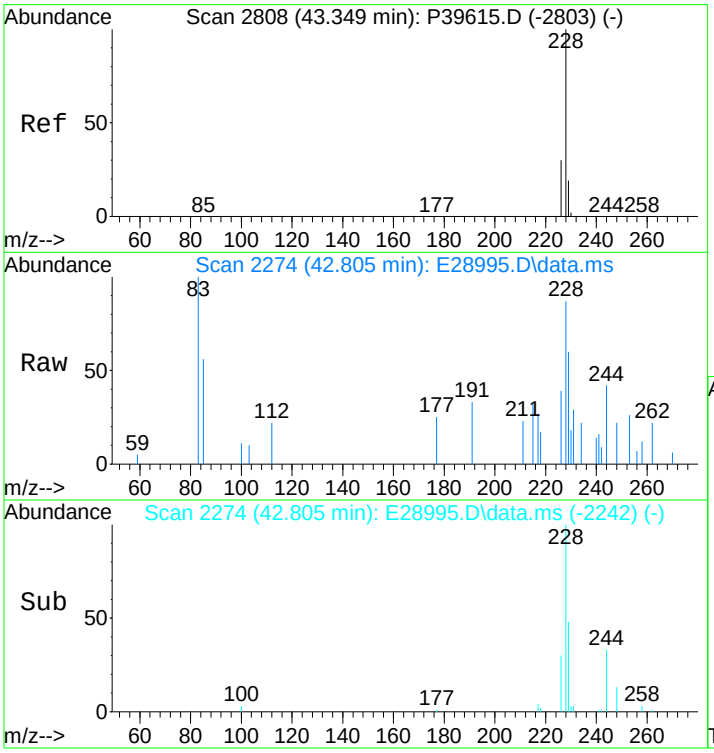


#75
Benz[a]anthracene
Concen: 22.91 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:228 Resp: 2315

Ion	Ratio	Lower	Upper
228	100		
226	54.0	20.7	31.1#

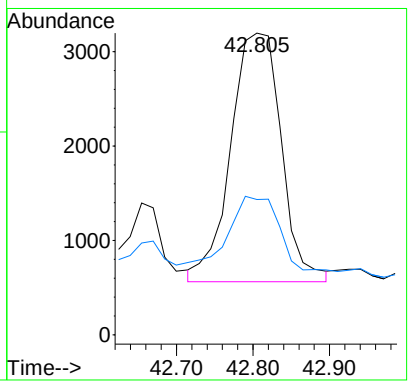


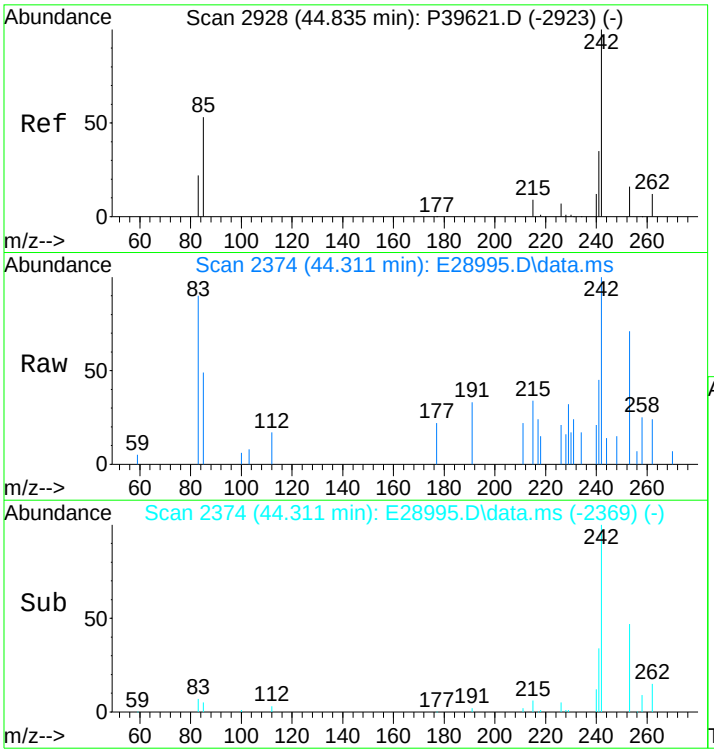


#77
Chrysene/Triphenylene
Concen: 116.42 ng/mL m
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:228 Resp: 12114

Ion	Ratio	Lower	Upper
228	100		
226	32.3	22.6	34.0

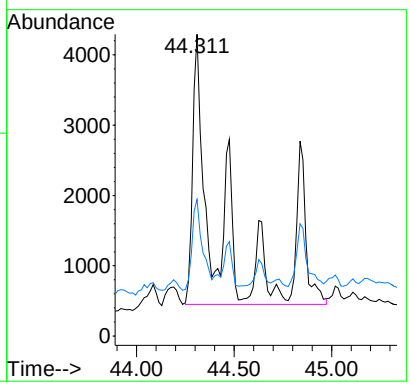


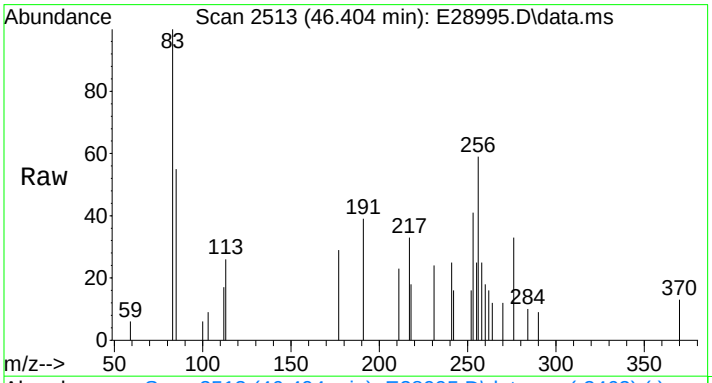


#78
C1-Chrysenes
Concen: 321.32 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:242 Resp: 33434

Ion	Ratio	Lower	Upper
242	100		
241	3.2	32.2	48.4#

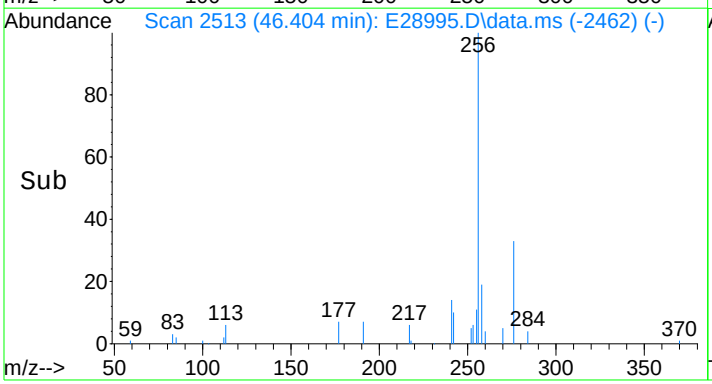


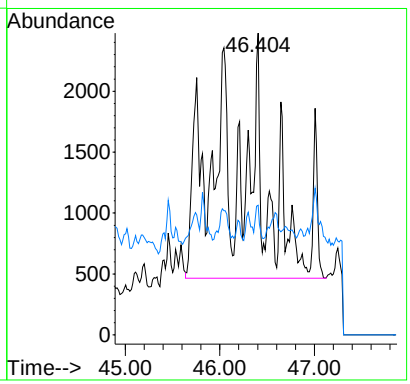


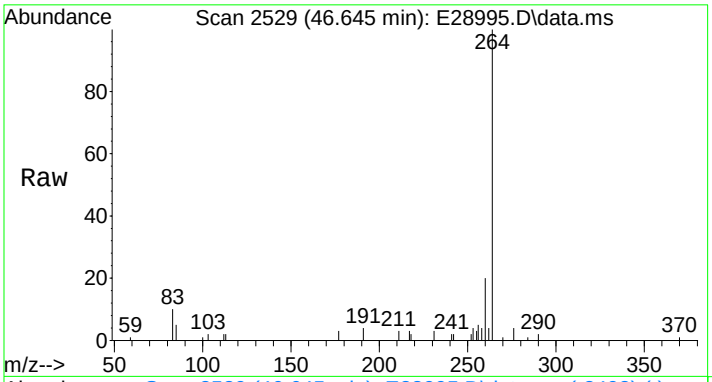
#79
C2-Chrysenes
Concen: 555.07 ng/mL m
RT: 46.404 min Scan# 2513
Delta R.T. 0.061 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:256 Resp: 57755

Ion	Ratio	Lower	Upper
256	100		
241	1.5	25.3	37.9#

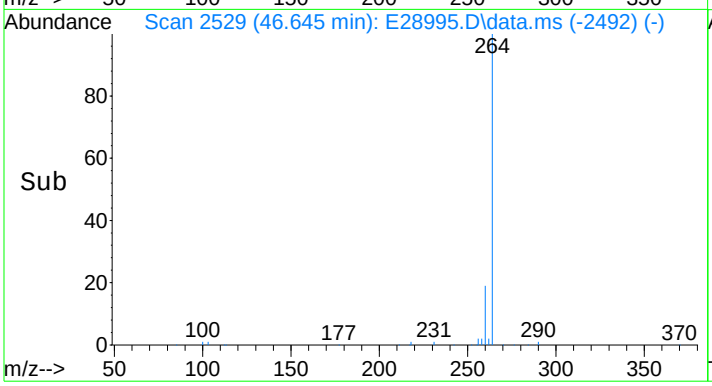


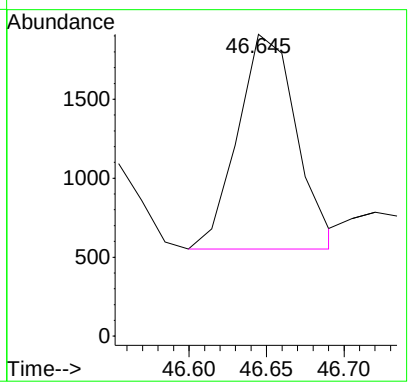


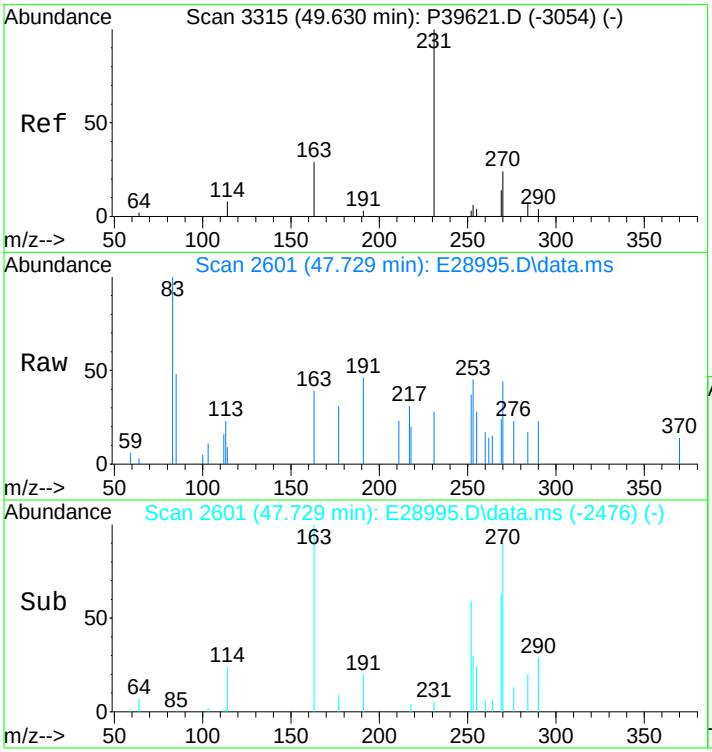


#80
BBF-D12 Surr BKGD
Concen: 34.48 ng/mL m
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:256 Resp: 3588



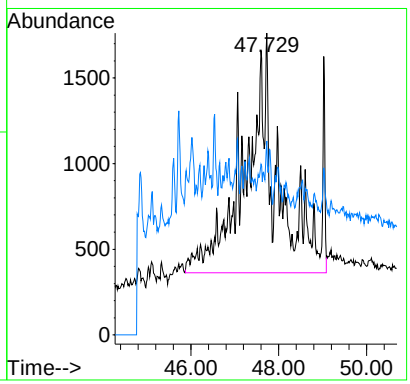


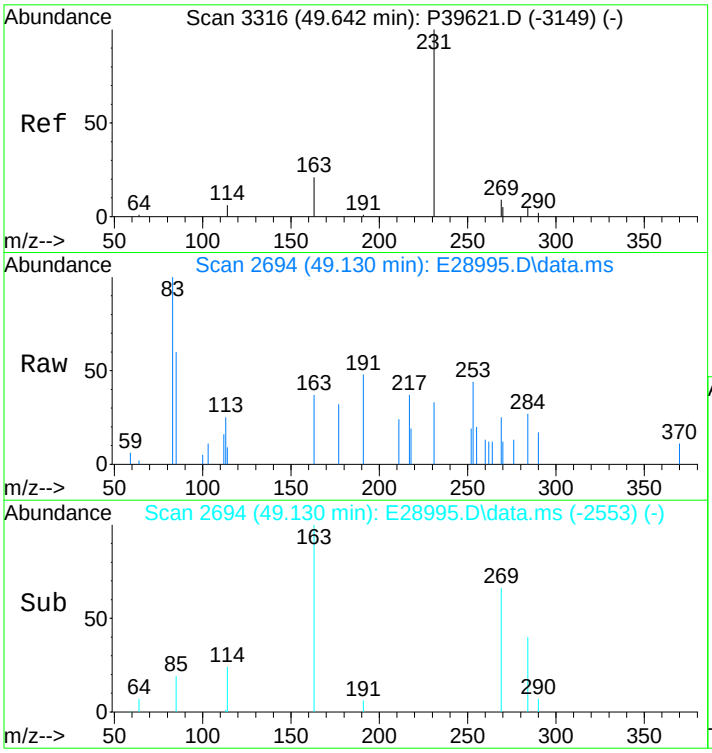


#81
C3-Chrysenes
Concen: 700.18 ng/mL m
RT: 47.729 min Scan# 2601
Delta R.T. -1.339 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:270 Resp: 72854

Ion	Ratio	Lower	Upper
270	100		
255	0.7	38.0	57.0#

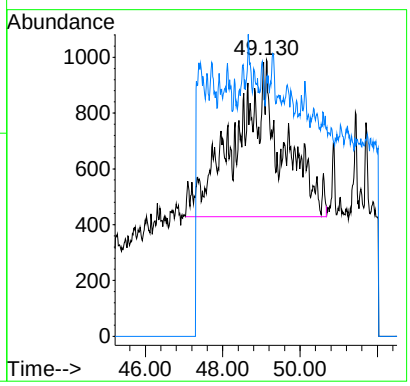


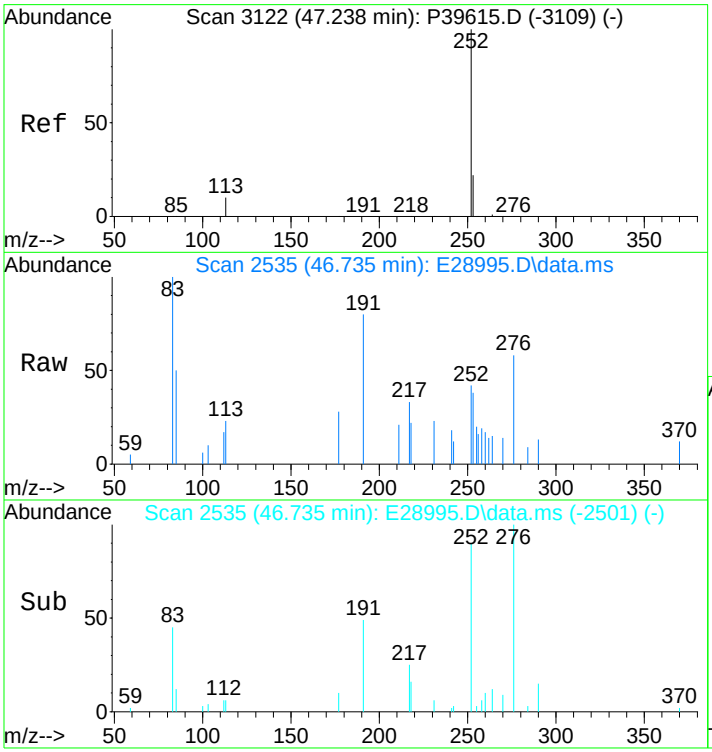


#82
C4-Chrysenes
Concen: 454.83 ng/mL m
RT: 49.130 min Scan# 2694
Delta R.T. -0.056 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:284 Resp: 47325

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

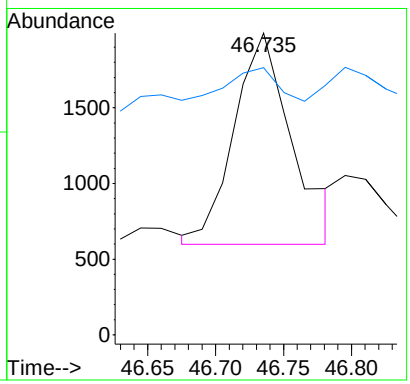


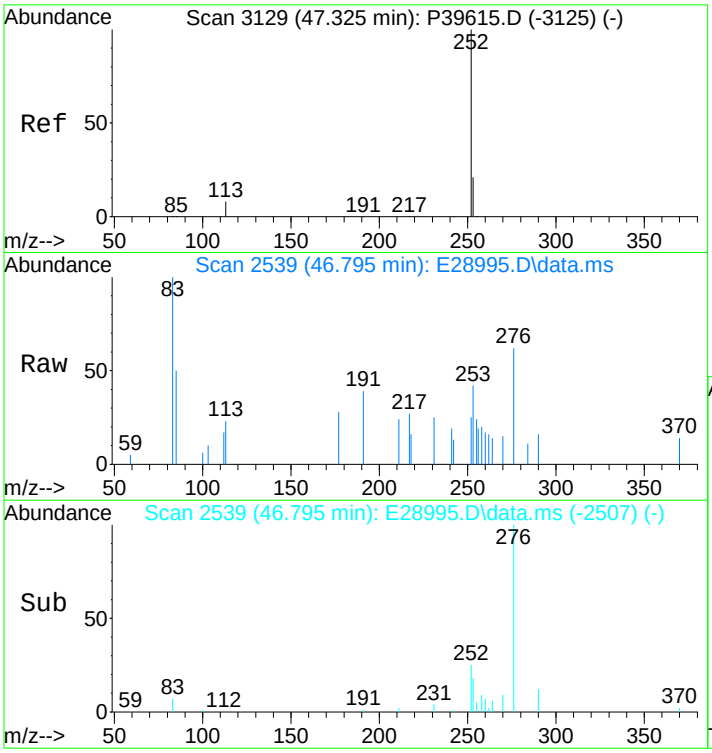


#84
Benzo[b]fluoranthene
Concen: 35.06 ng/mL m
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 4119

Ion	Ratio	Lower	Upper
252	100		
253	12.9	19.5	29.3#

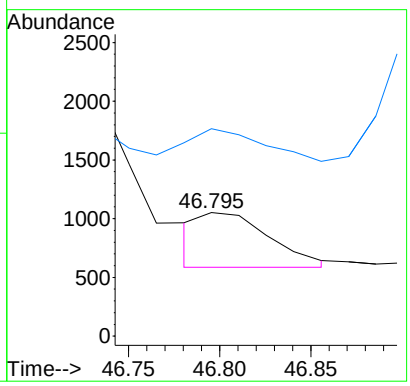


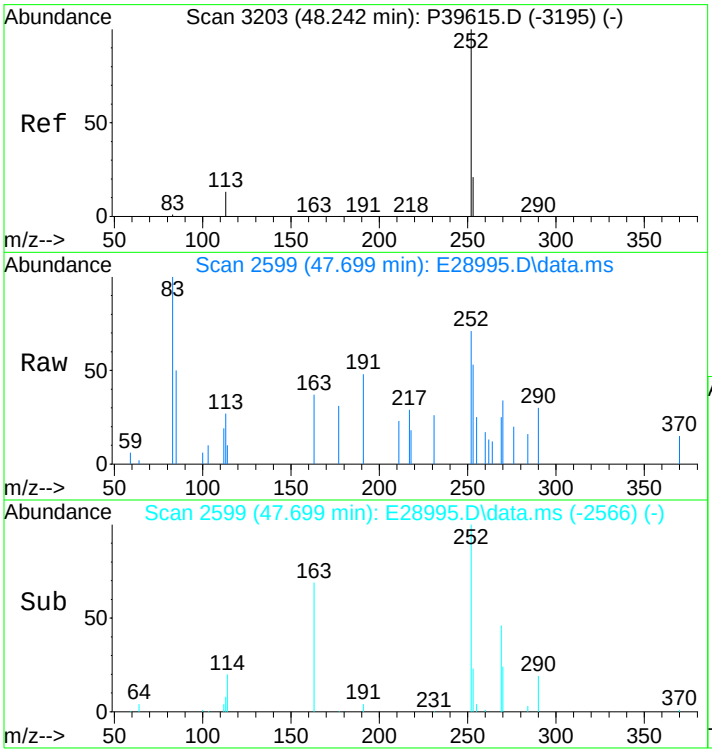


#85
Benzo[j]+[k]fluoranthene
Concen: 10.25 ng/mL m
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 1239

Ion	Ratio	Lower	Upper
252	100		
253	65.8	19.7	29.5#

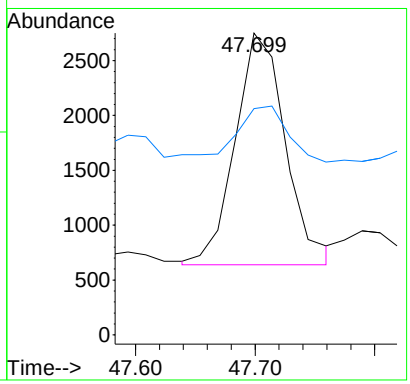


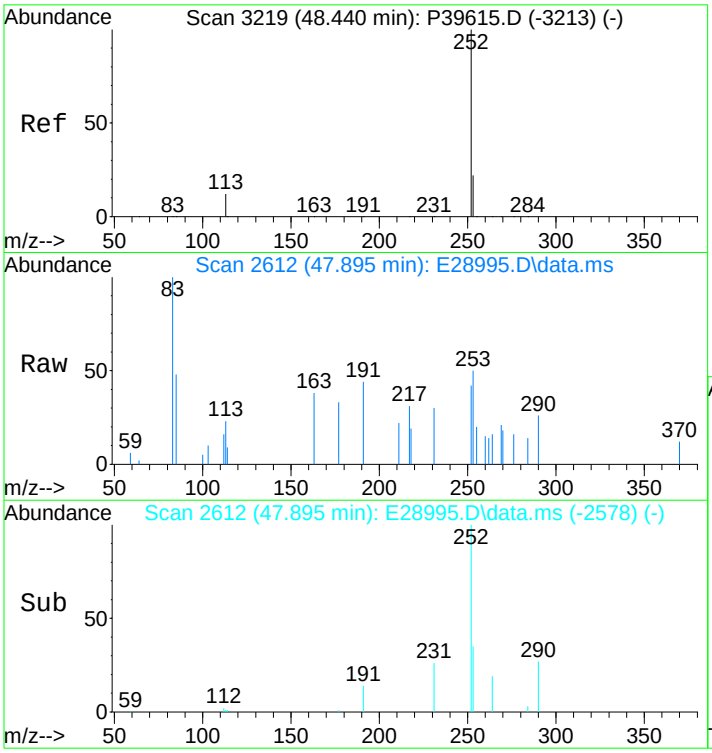


#87
Benzo[e]pyrene
Concen: 53.76 ng/mL m
RT: 47.699 min Scan# 2599
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 6166

Ion	Ratio	Lower	Upper
252	100		
253	30.4	20.6	31.0

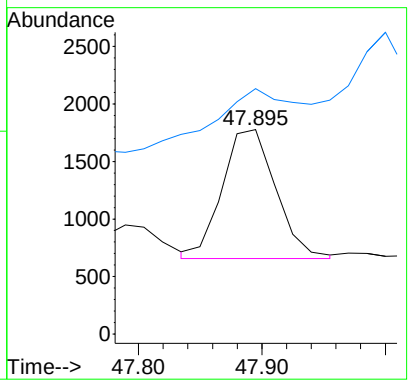


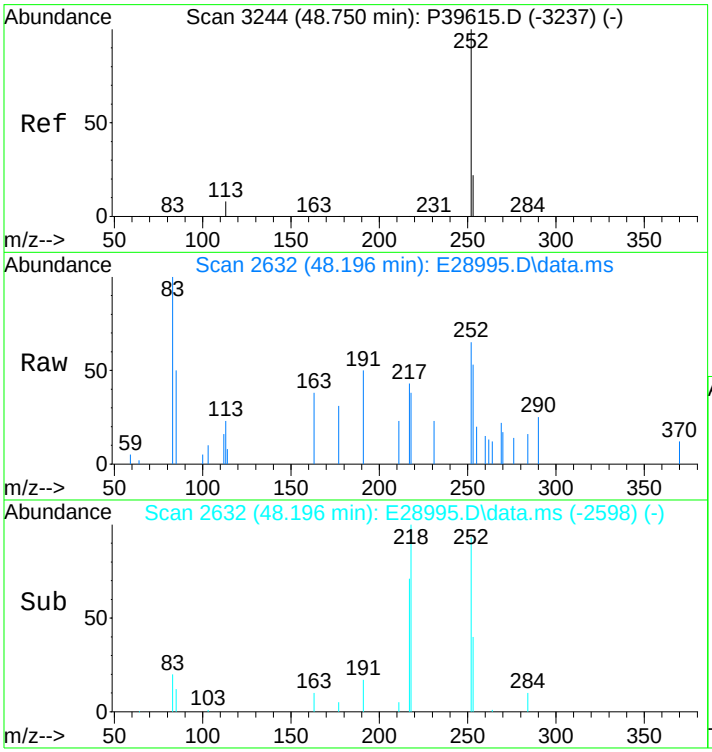


#89
Benzo[a]pyrene
Concen: 30.78 ng/mL m
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 3378

Ion	Ratio	Lower	Upper
252	100		
253	55.3	20.8	31.2#

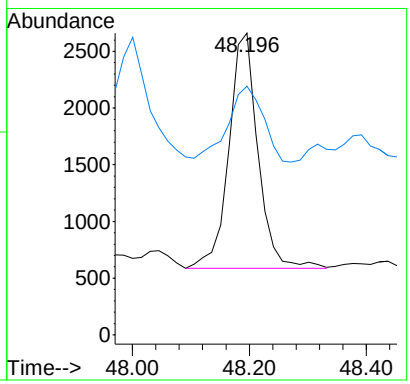


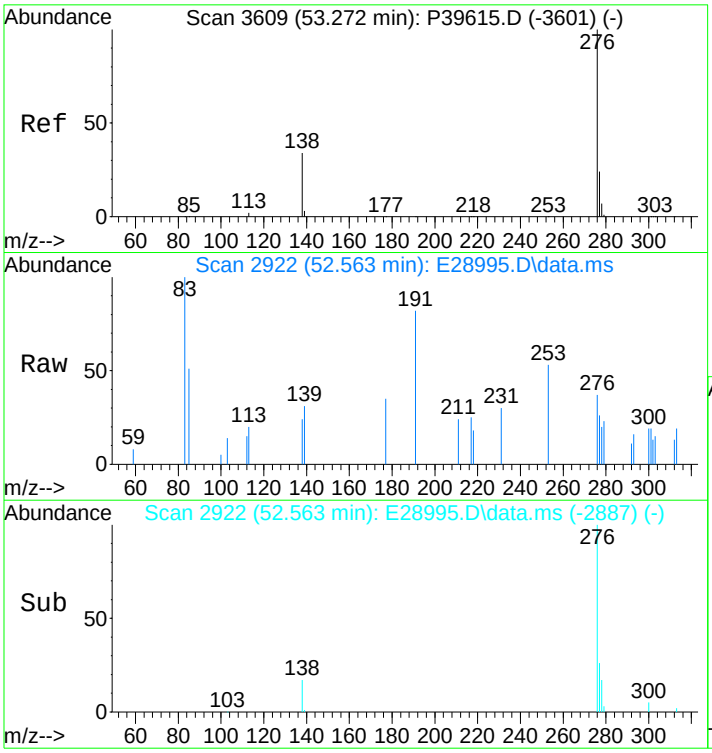


#90
Perylene
Concen: 61.61 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 7151

Ion	Ratio	Lower	Upper
252	100		
253	39.0	20.7	31.1#

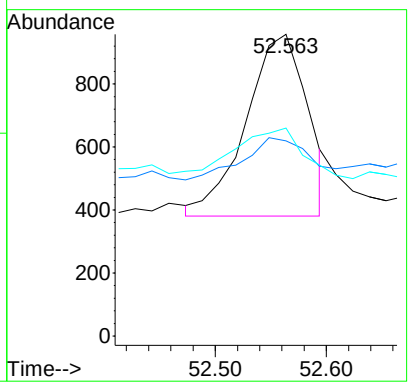


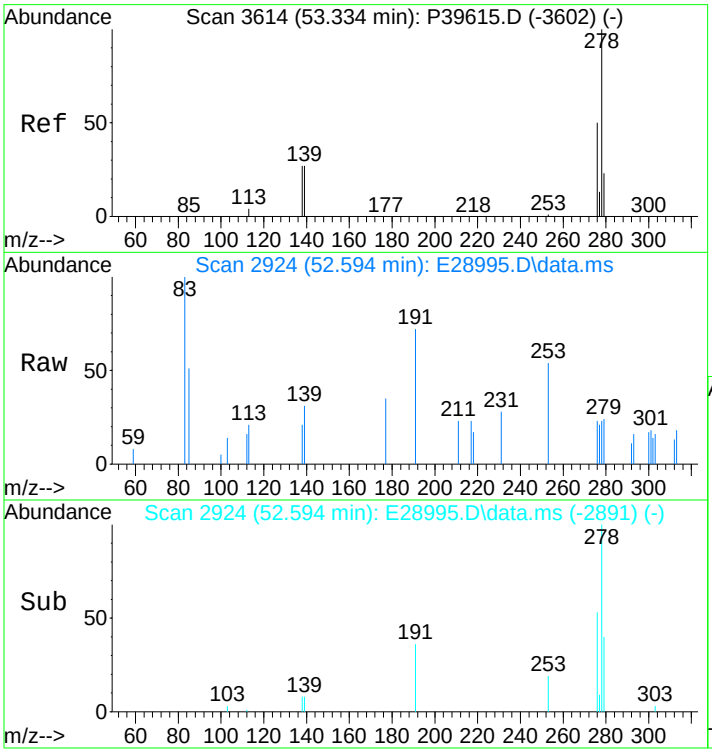


#91
Indeno[1,2,3-cd]pyrene
Concen: 17.14 ng/mL m
RT: 52.563 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:276 Resp: 2214

Ion	Ratio	Lower	Upper
276	100		
138	25.3	16.3	24.5#
277	31.3	19.4	29.2#

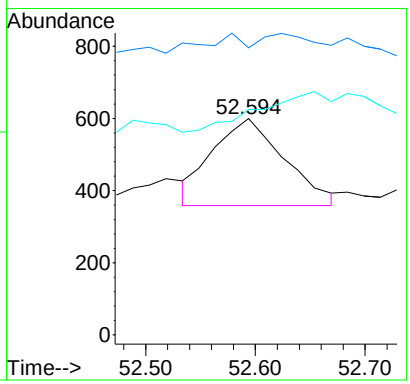


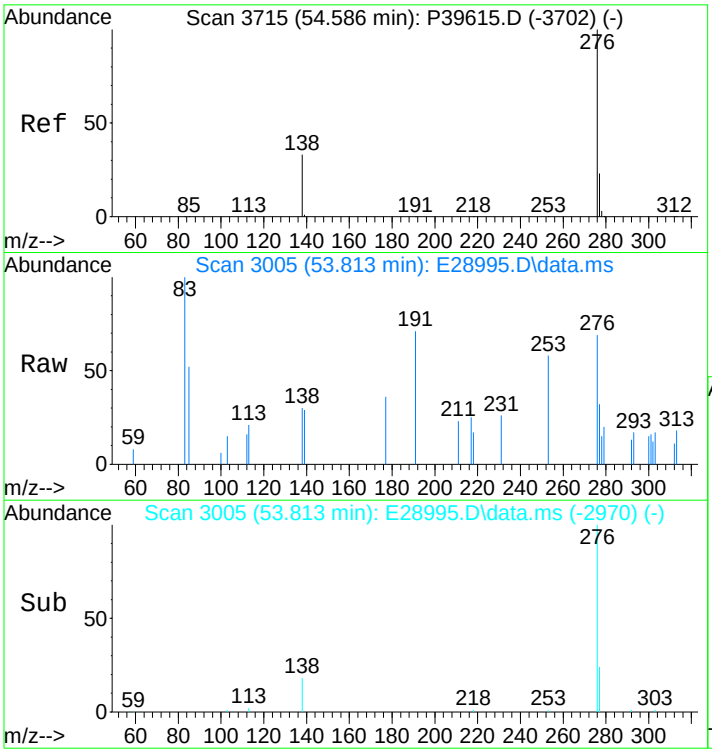


#92
Dibenz[ah]+[ac]anthracene
Concen: 7.98 ng/mL m
RT: 52.594 min Scan# 2924
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:278 Resp: 1098

Ion	Ratio	Lower	Upper
278	100		
139	11.8	11.6	17.4
279	0.0	19.3	28.9#

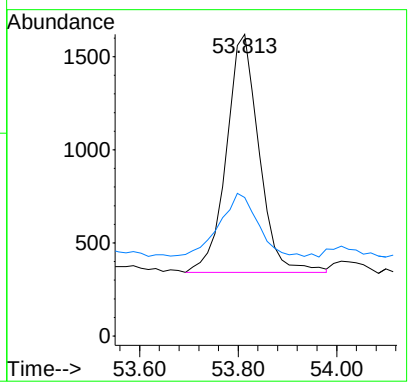


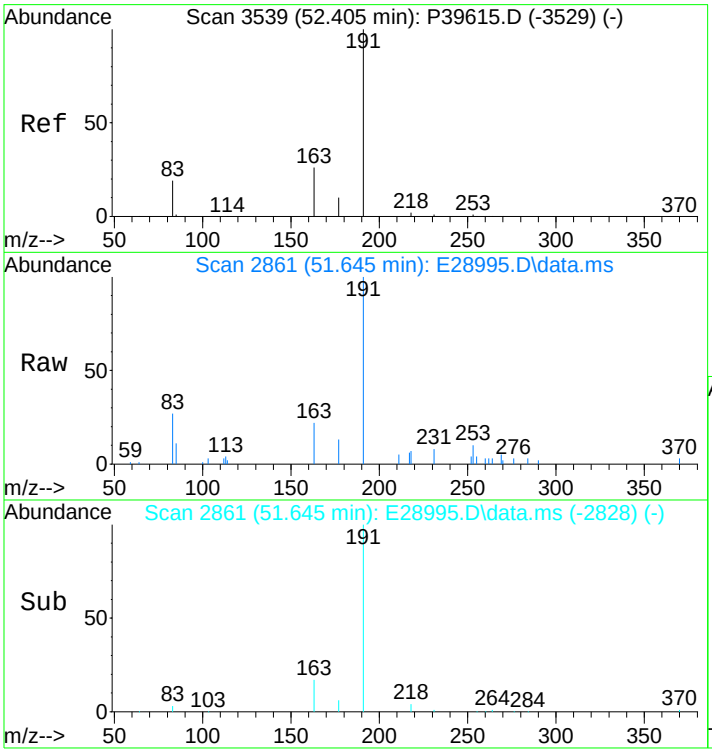


#93
Benzo[g,h,i]perylene
Concen: 42.21 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:276 Resp: 5879

Ion	Ratio	Lower	Upper
276	100		
277	31.0	19.1	28.7#

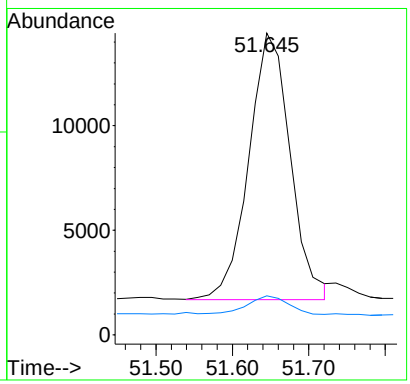


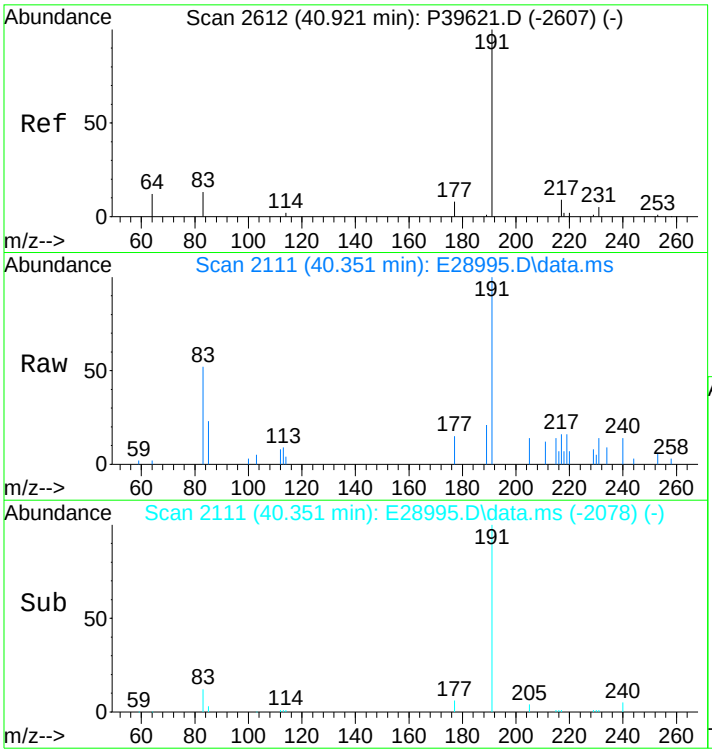


#94
Hopane (T19)
Concen: 1232.32 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:191 Resp: 48000

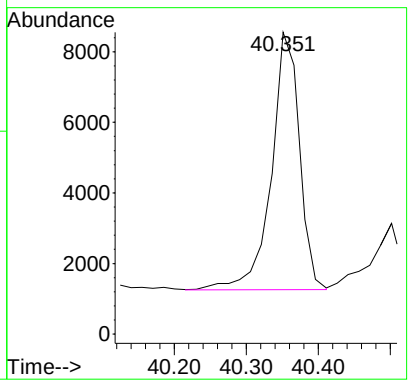
Ion	Ratio	Lower	Upper
191	100		
177	0.6	11.6	17.4#

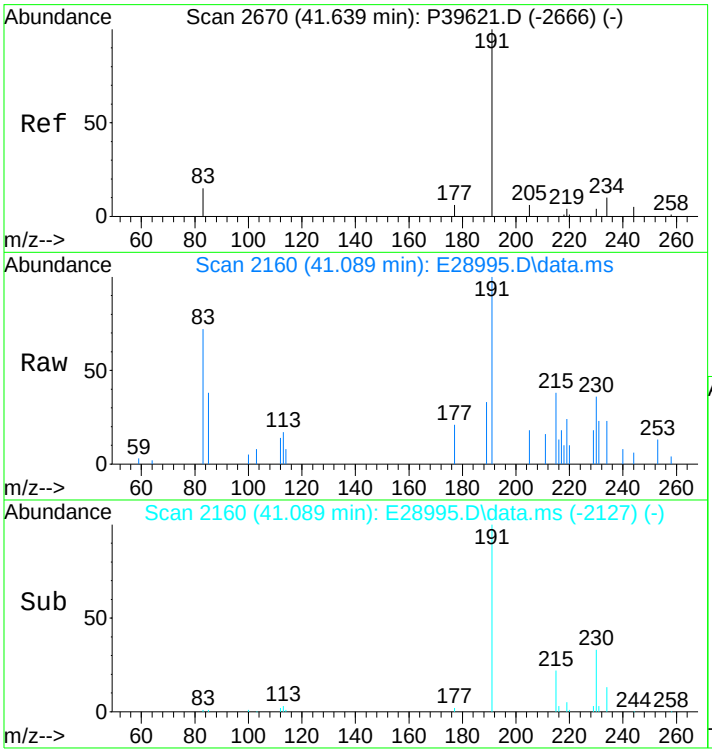




#96
C23 Tricyclic Terpane (T4)
Concen: 507.20 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

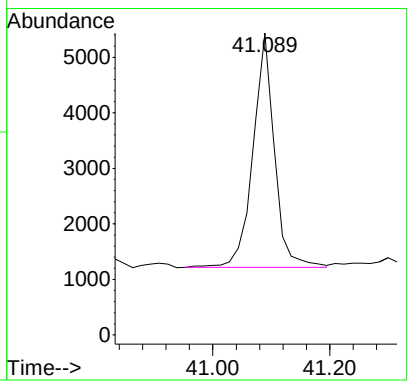
Tgt Ion:191 Resp: 19756

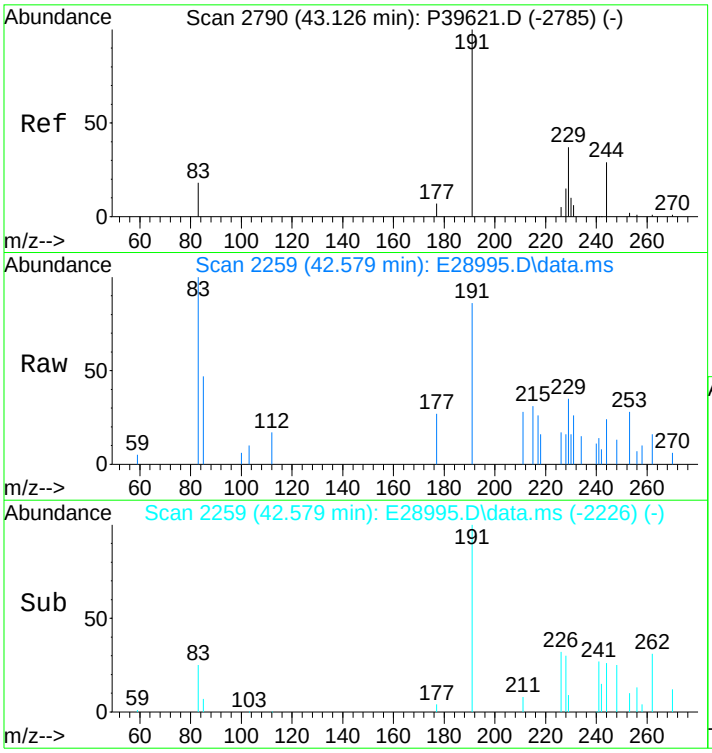




#97
C24 Tricyclic Terpane (T5)
Concen: 275.17 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

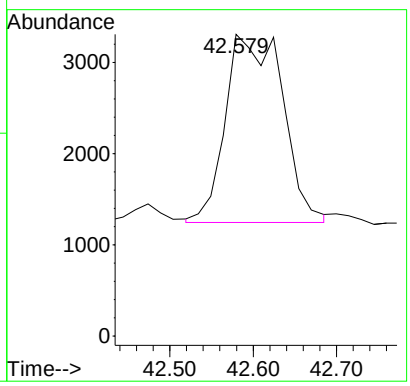
Tgt Ion:191 Resp: 10718

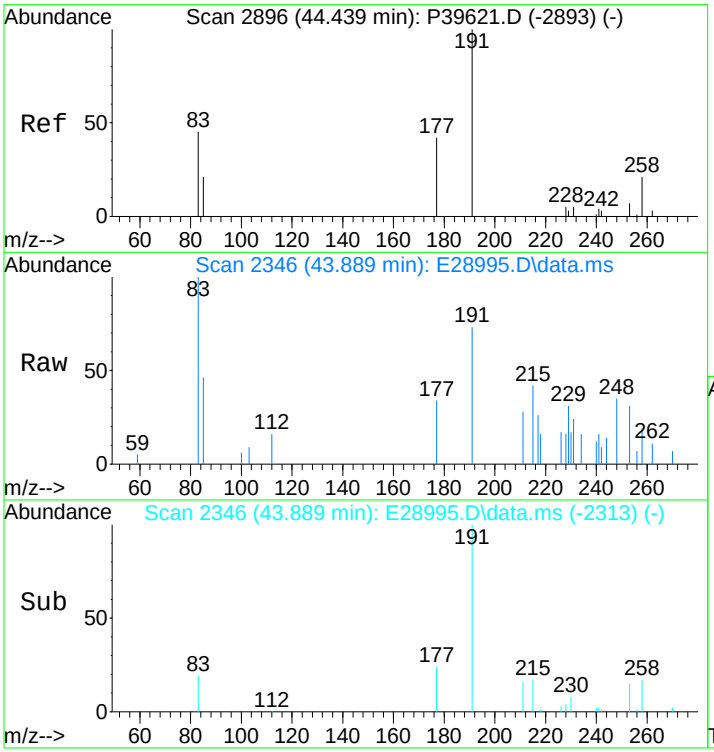




#98
C25 Tricyclic Terpane (T6)
Concen: 251.14 ng/ml m
RT: 42.579 min Scan# 2259
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

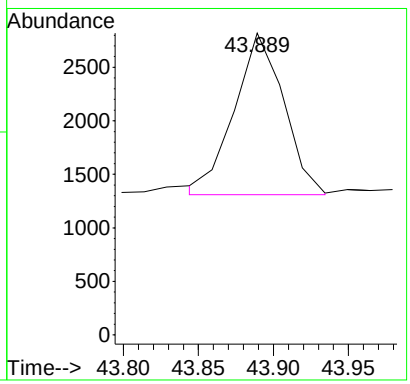
Tgt Ion:191 Resp: 9782

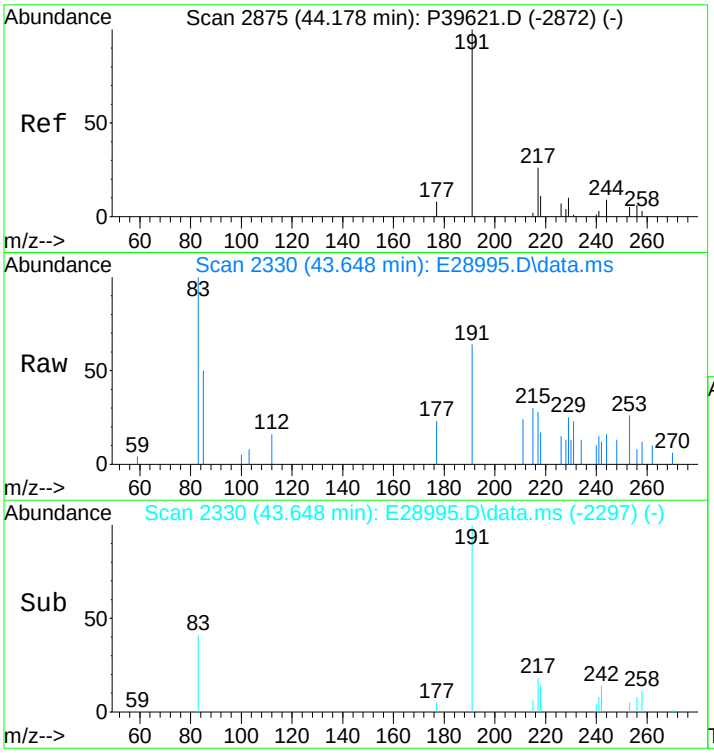




#99
C24 Tetracyclic Terpane (T6a)
Concen: 88.86 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

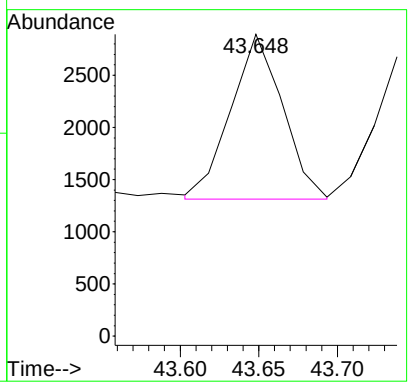
Tgt Ion:191 Resp: 3461

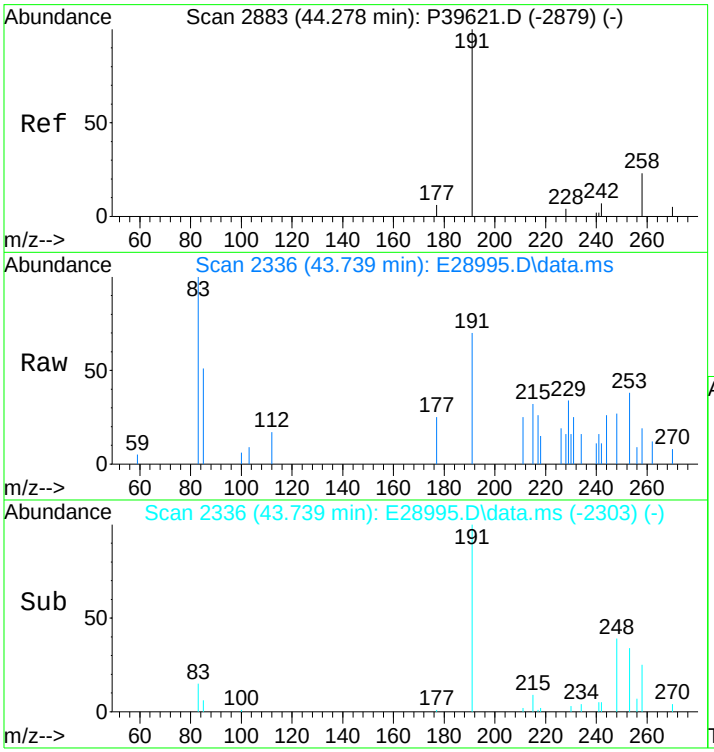




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 92.86 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

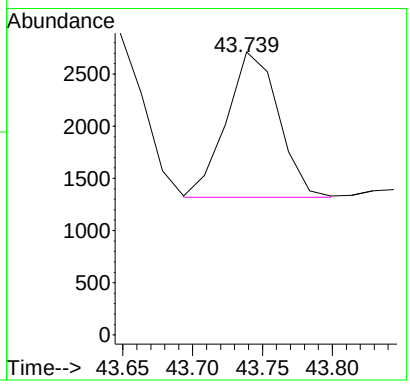
Tgt Ion:191 Resp: 3617

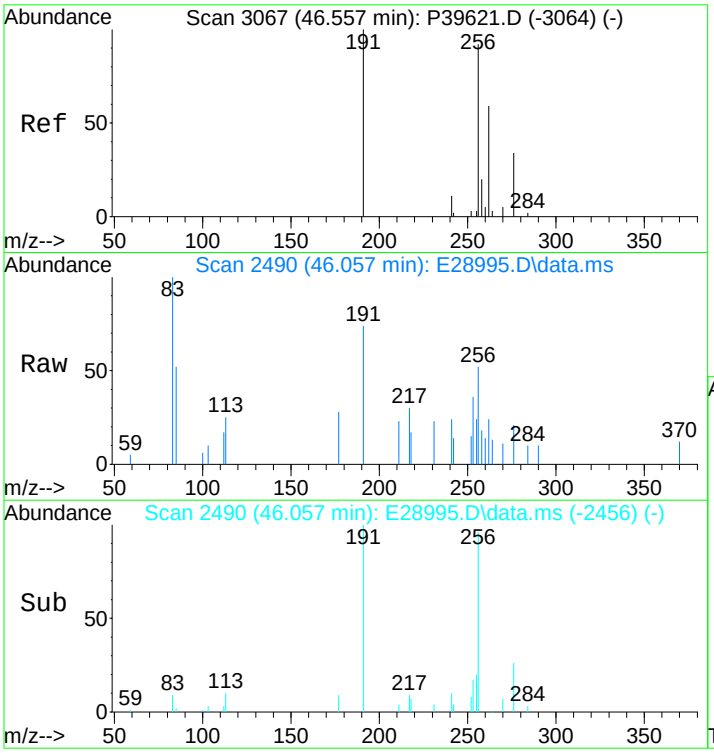




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 92.94 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

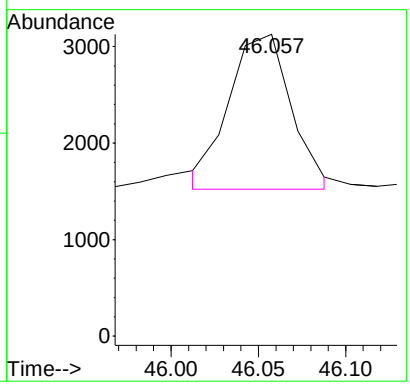
Tgt Ion:191 Resp: 3620

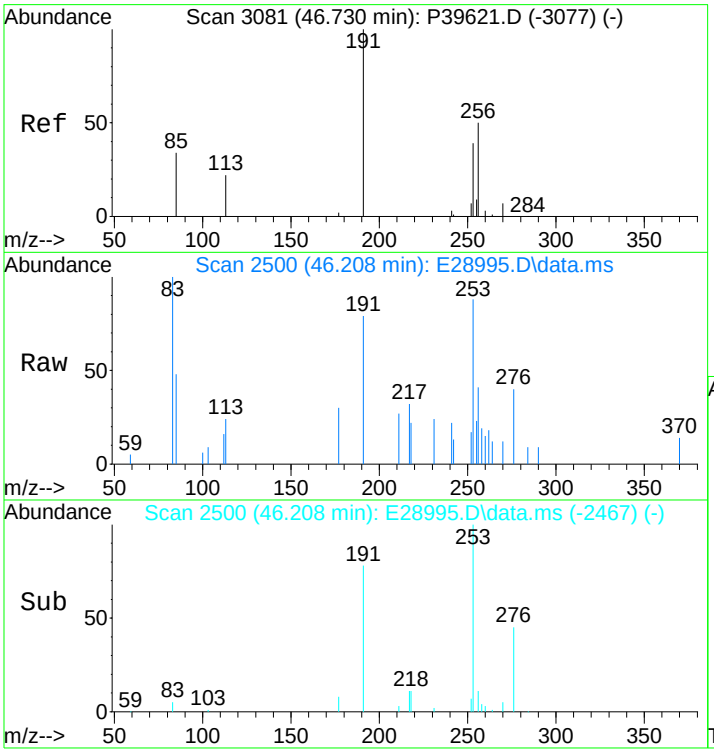




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 102.00 ng/ml m
RT: 46.057 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

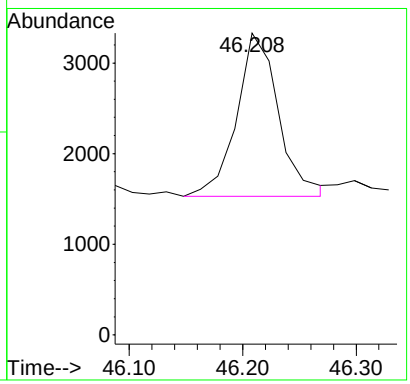
Tgt Ion:191 Resp: 3973

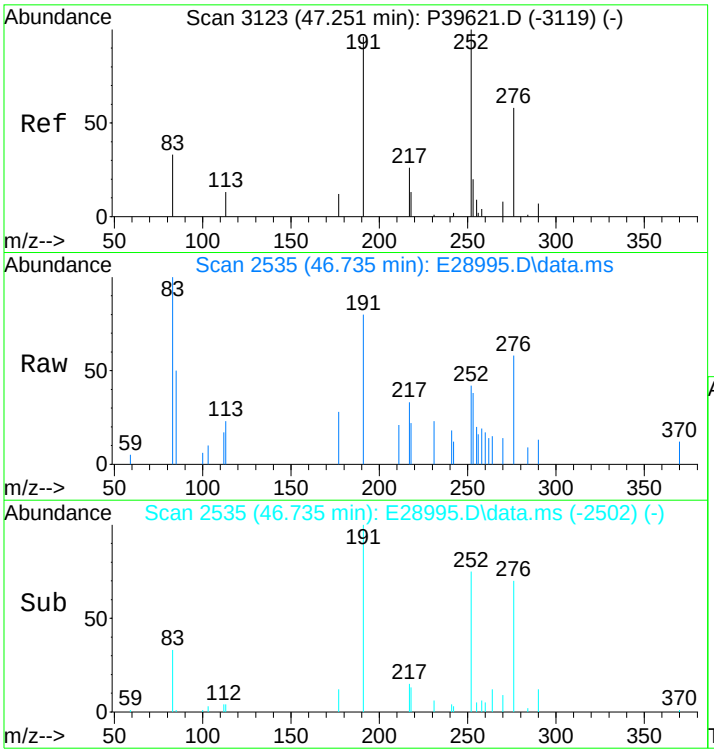




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 118.53 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

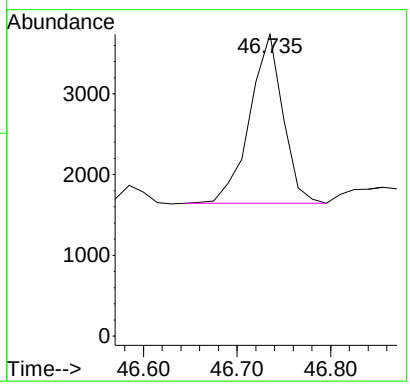
Tgt Ion:191 Resp: 4617

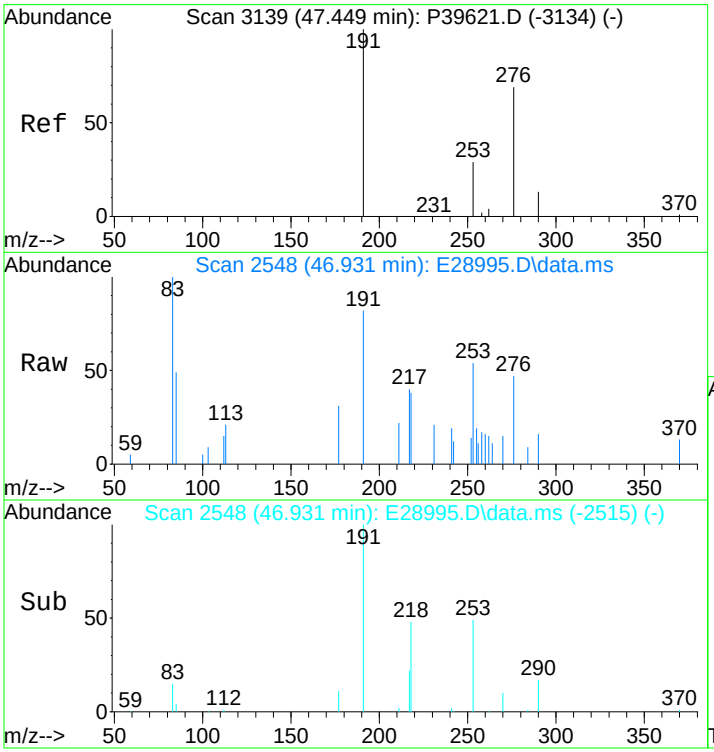




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 132.24 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

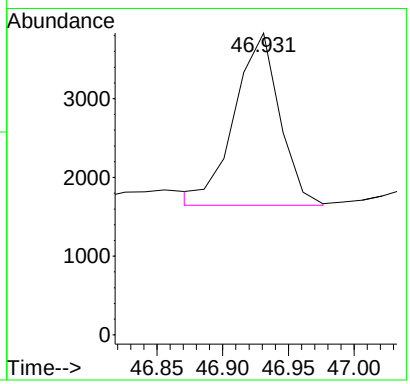
Tgt Ion:191 Resp: 5151

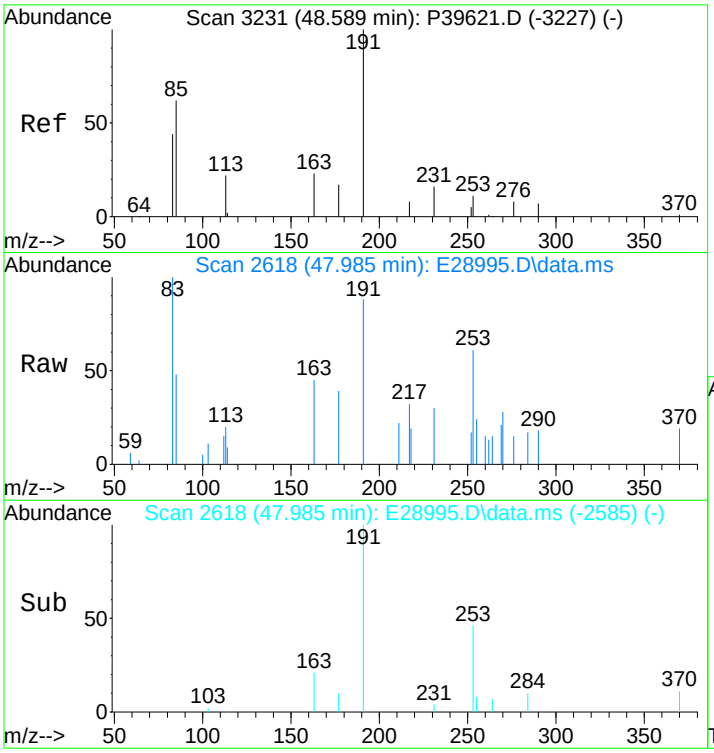




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 134.25 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

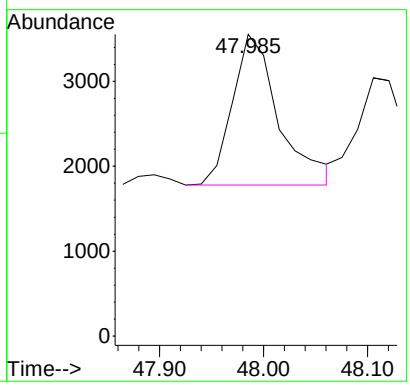
Tgt Ion:191 Resp: 5229

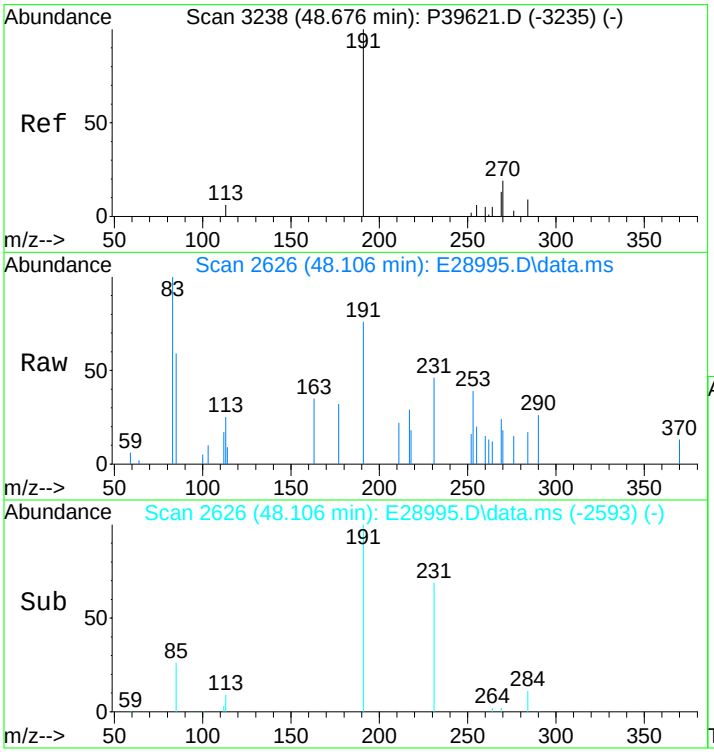




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 141.79 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

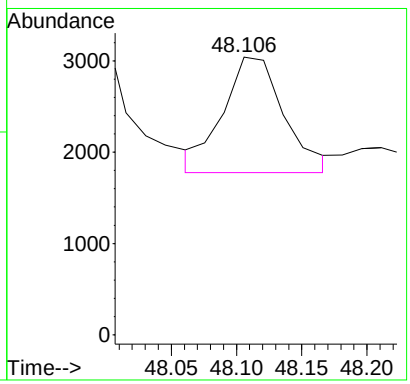
Tgt Ion:191 Resp: 5523

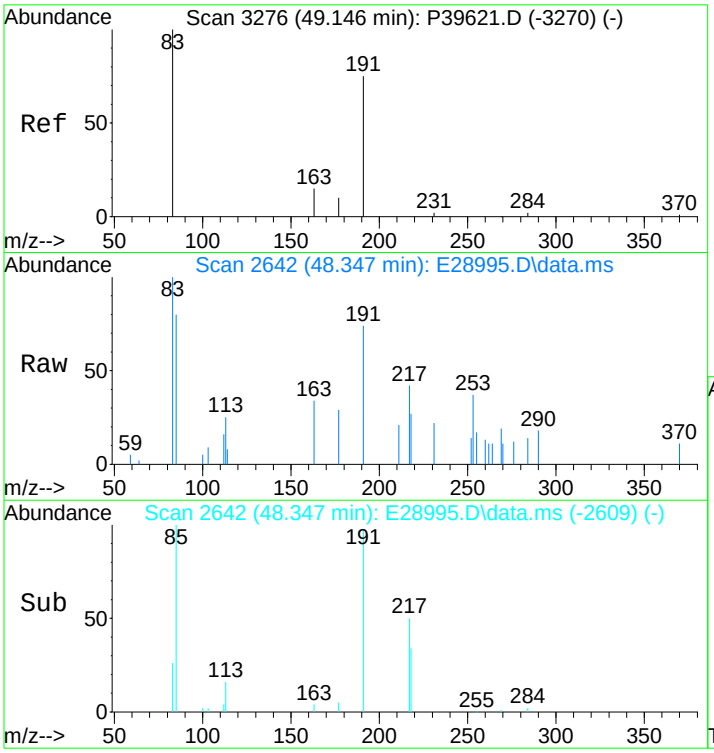




#107
C30 Tricyclic Terpane-22S
Concen: 106.36 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

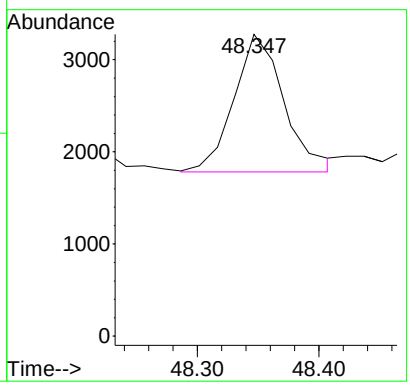
Tgt Ion:191 Resp: 4143

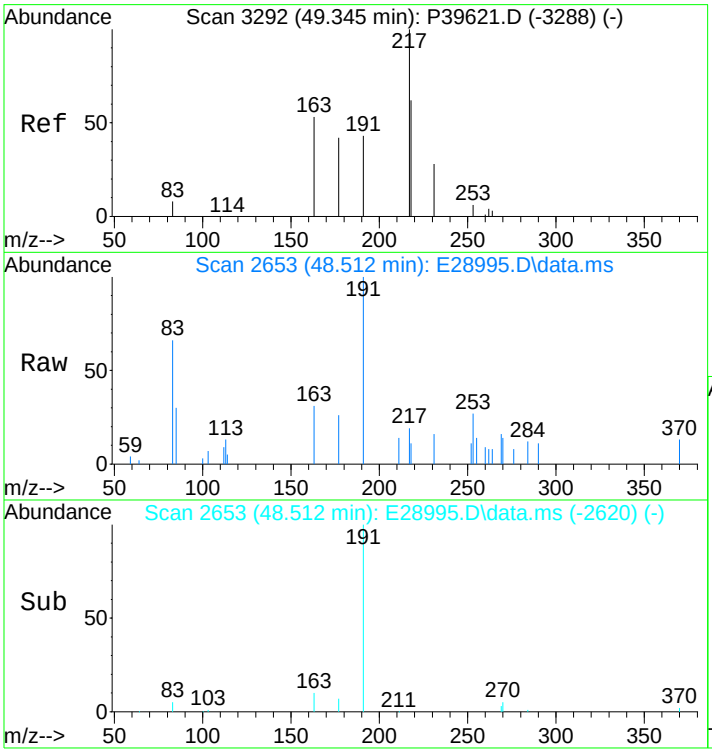




#108
C30 Tricyclic Terpane-22R
Concen: 110.11 ng/mL m
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

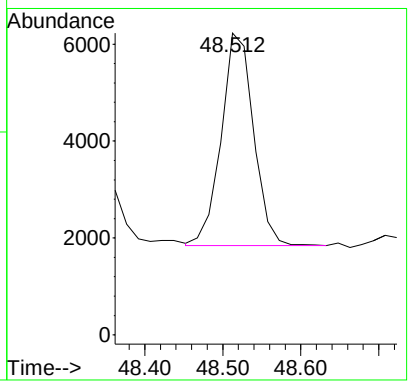
Tgt Ion:191 Resp: 4289

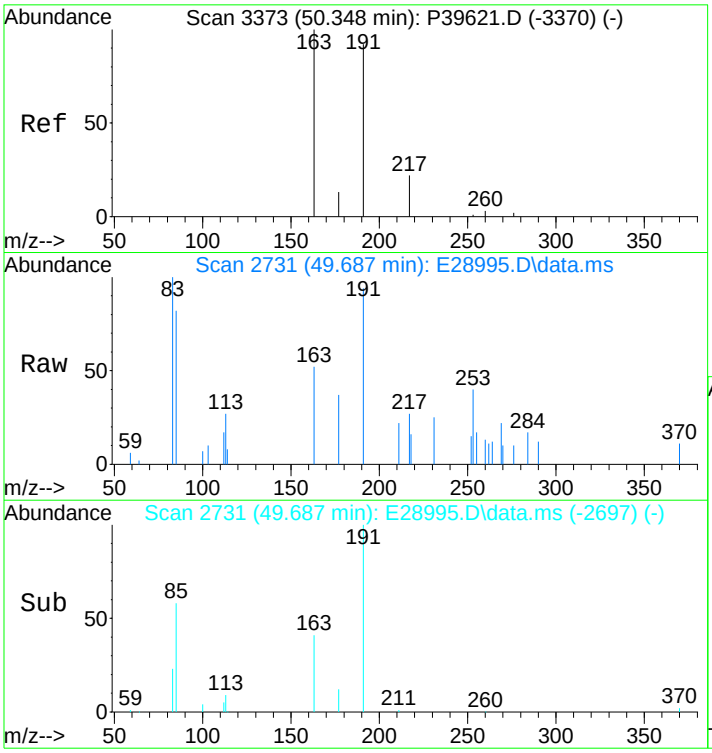




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 324.43 ng/ml
RT: 48.512 min Scan# 2653
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

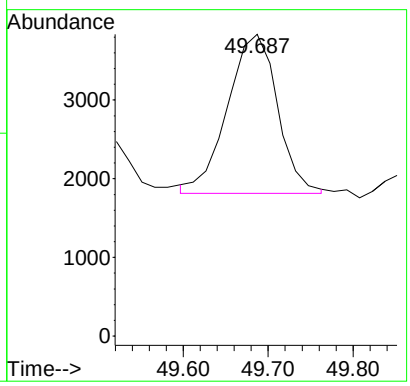
Tgt Ion:191 Resp: 12637

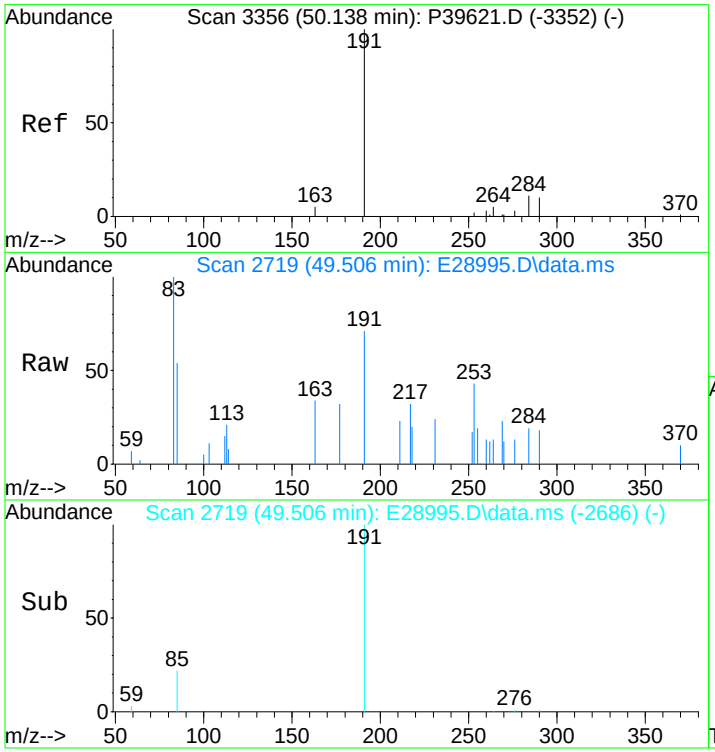




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 211.47 ng/ml m
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

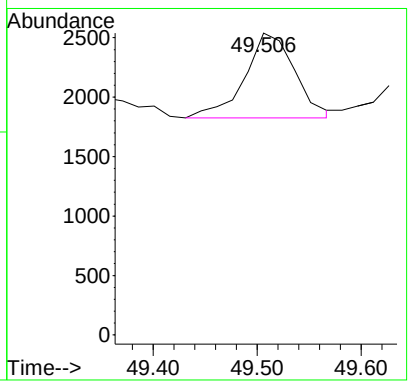
Tgt Ion:191 Resp: 8237

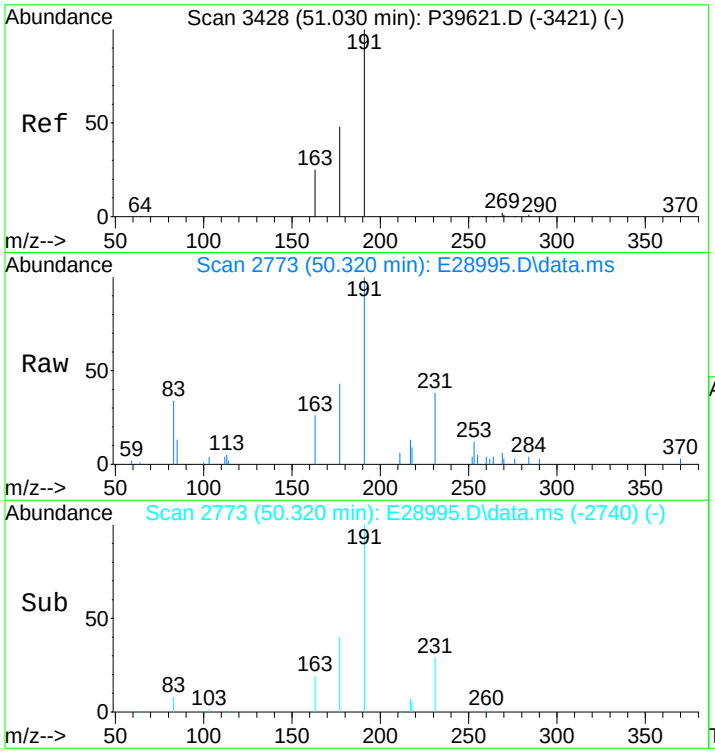




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 61.67 ng/ml
RT: 49.506 min Scan# 2719
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

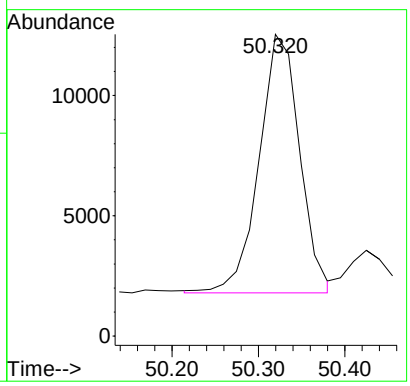
Tgt Ion:191 Resp: 2402

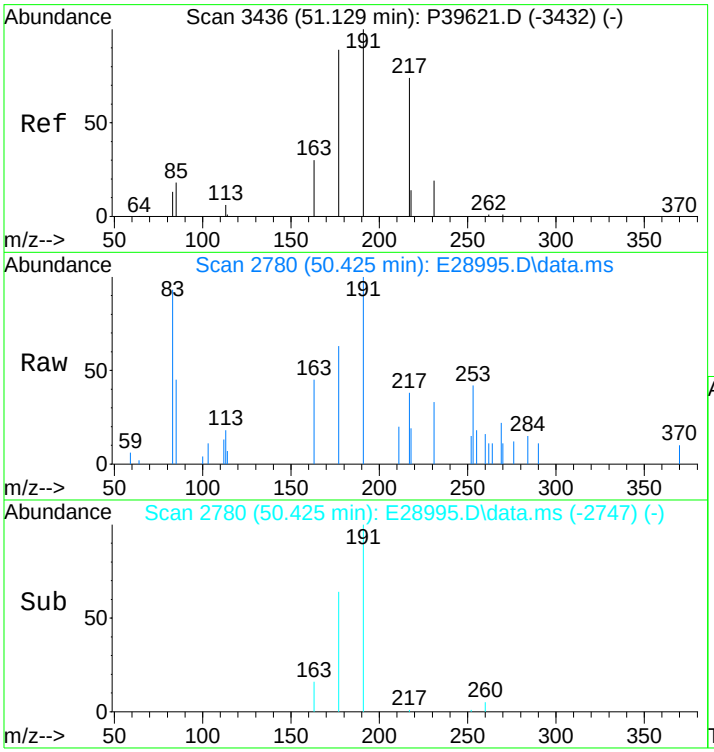




#112
30-Norhopane (T15)
Concen: 898.74 ng/ml m
RT: 50.320 min Scan# 2773
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

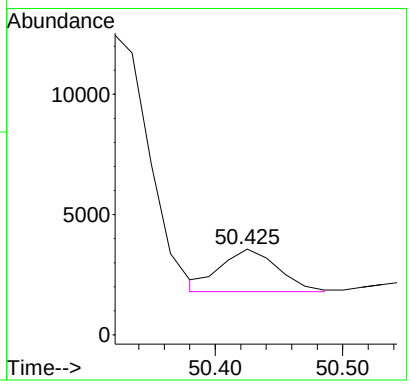
Tgt Ion:191 Resp: 35007

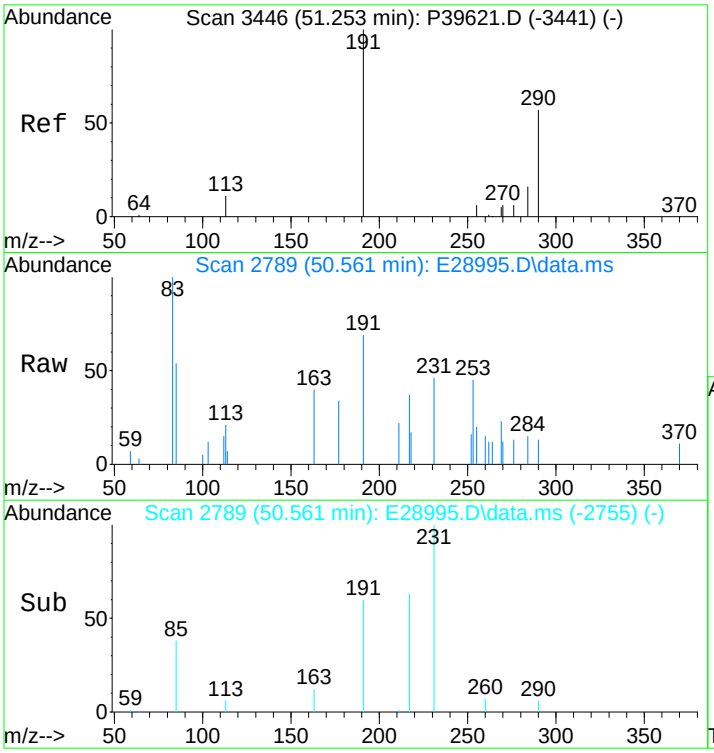




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 141.41 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

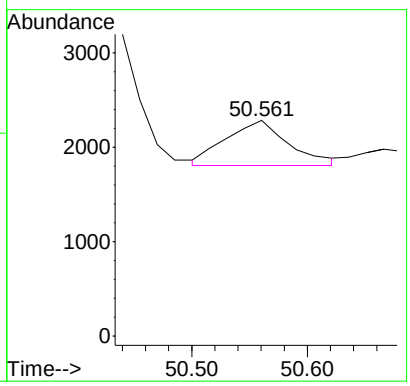
Tgt Ion:191 Resp: 5508

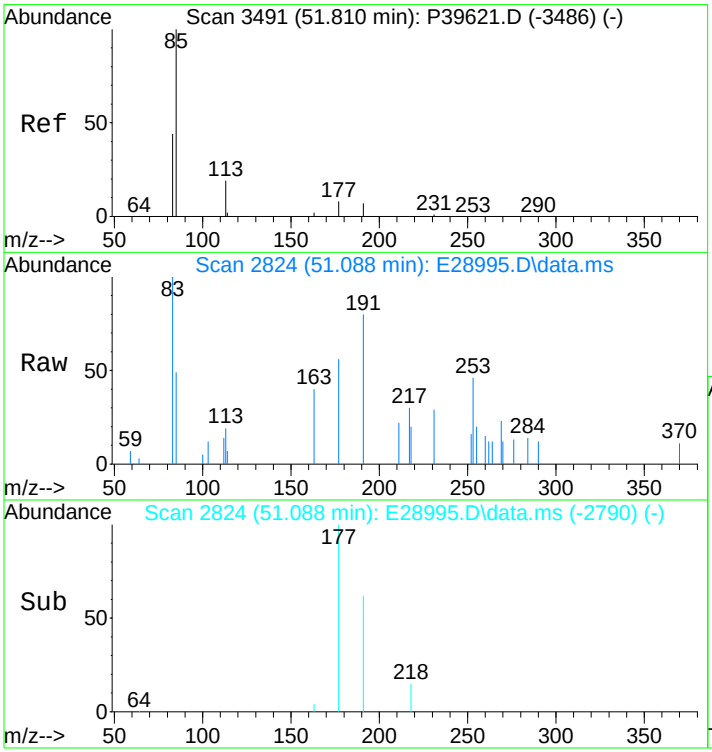




#114
17a(H)-Diahopane (X)
Concen: 46.03 ng/ml m
RT: 50.561 min Scan# 2789
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

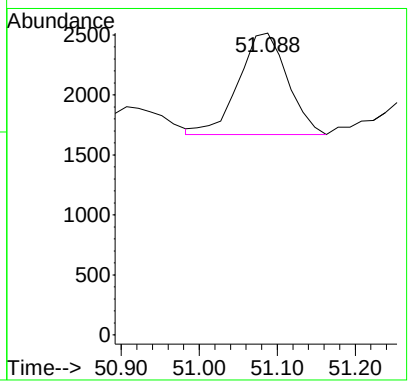
Tgt Ion:191 Resp: 1793

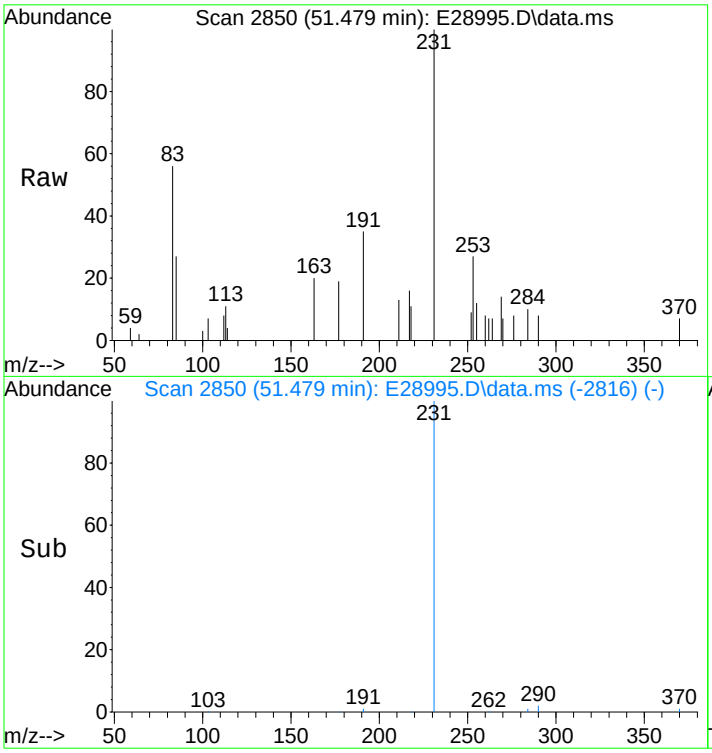




#115
30-Normoretane (T17)
Concen: 94.32 ng/ml
RT: 51.088 min Scan# 2824
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

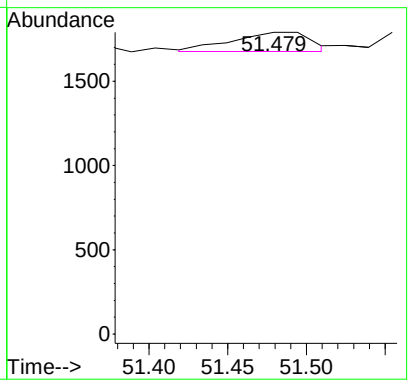
Tgt Ion:191 Resp: 3674

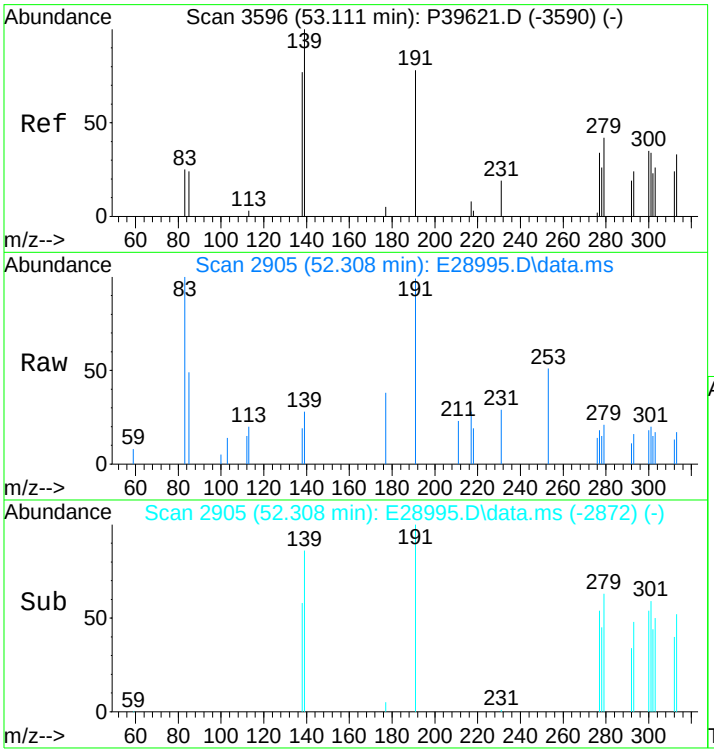




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 10.29 ng/ml m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

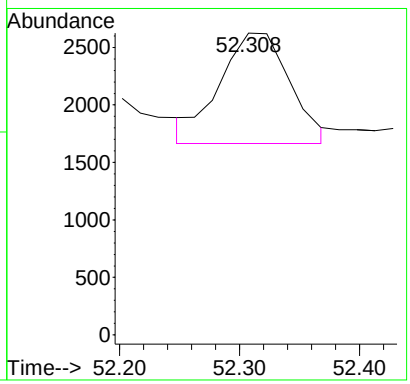
Tgt Ion:191 Resp: 401

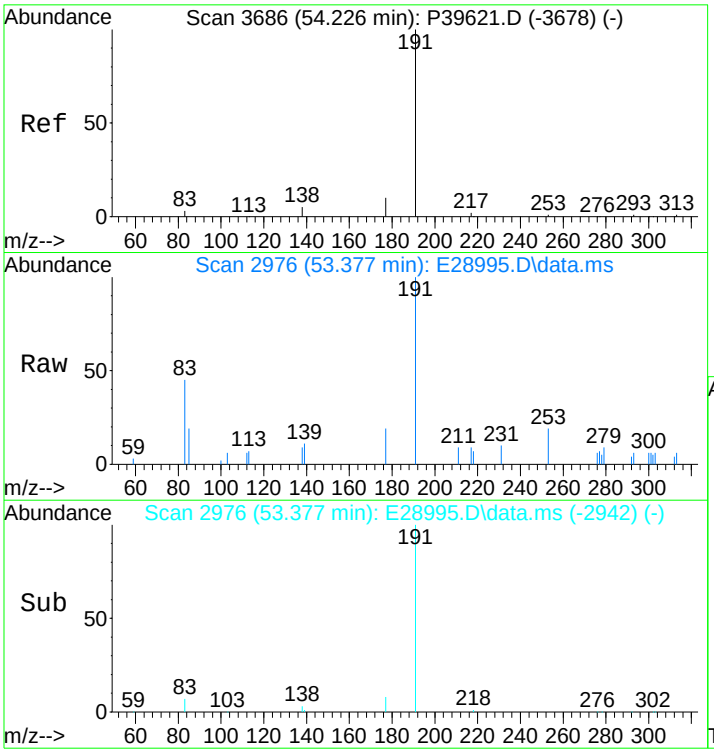




#117
Moretane (T20)
Concen: 100.13 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

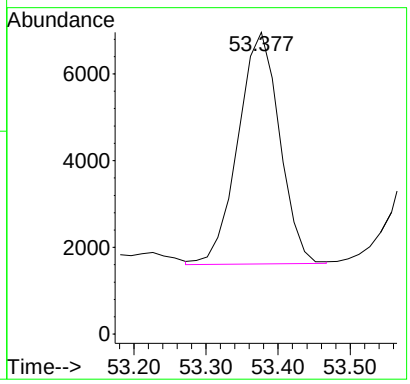
Tgt Ion:191 Resp: 3900

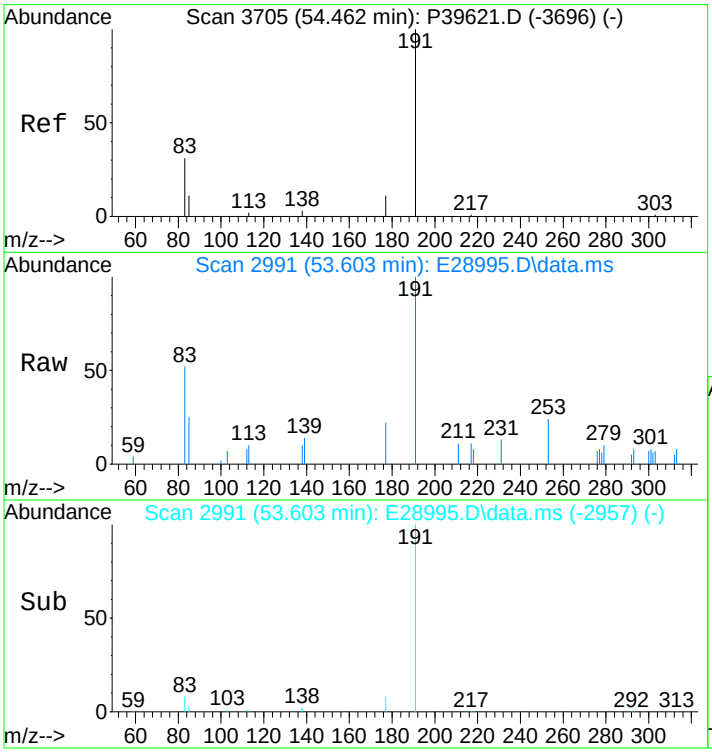




#118
30-Homohopane-22S (T21)
Concen: 547.23 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

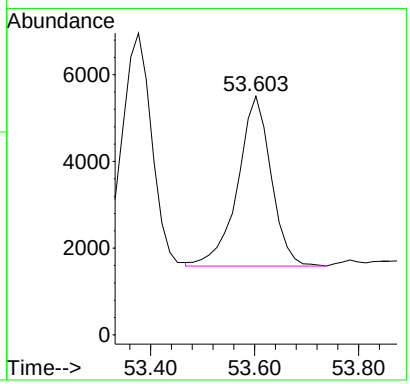
Tgt Ion:191 Resp: 21315

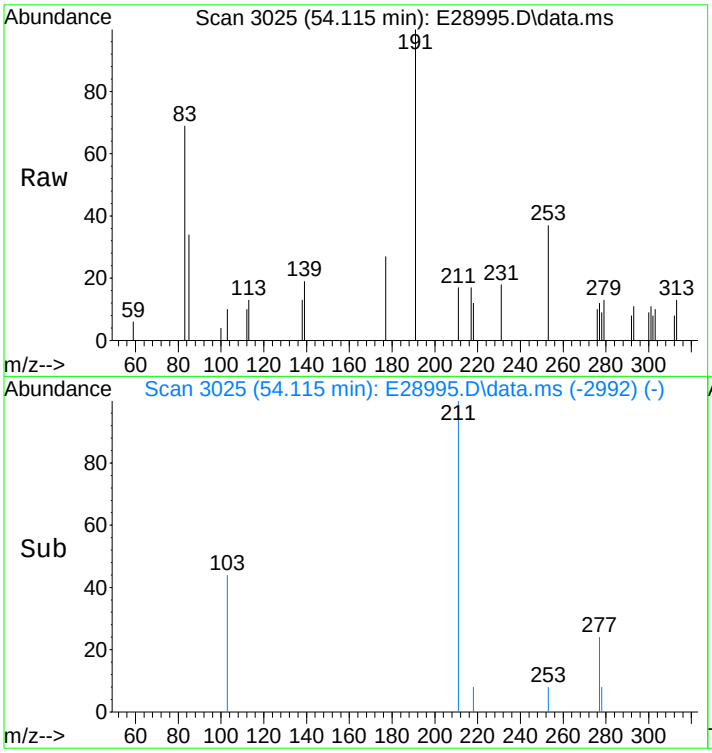




#119
30-Homohopane-22R (T22)
Concen: 449.44 ng/ml
RT: 53.603 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

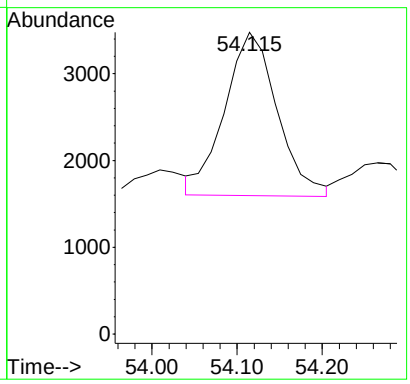
Tgt Ion:191 Resp: 17506

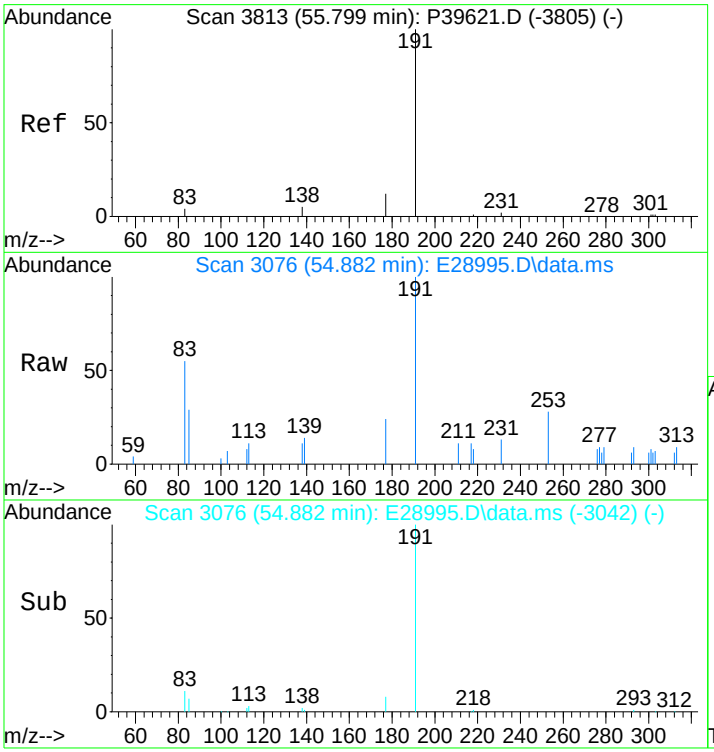




#120
Gammacerane/C32-diahopane
Concen: 207.00 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

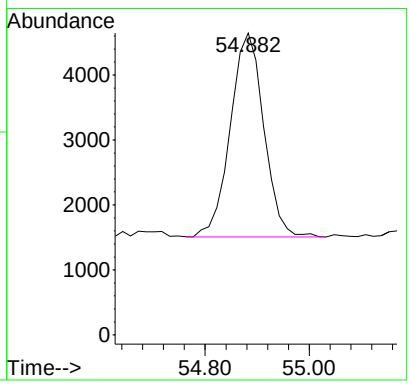
Tgt Ion:191 Resp: 8063

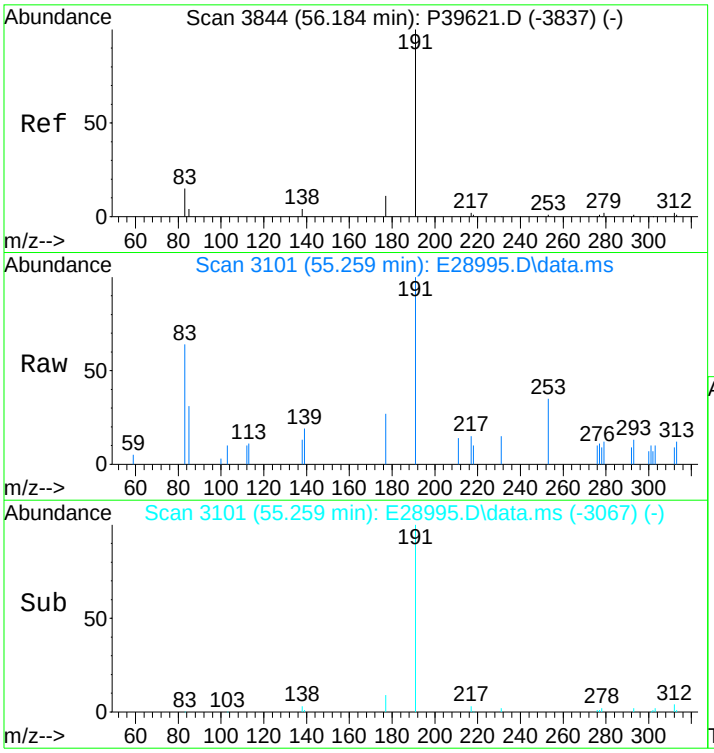




#121
30,31-Bishomohopane-22S (T26)
Concen: 362.07 ng/ml
RT: 54.882 min Scan# 3076
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

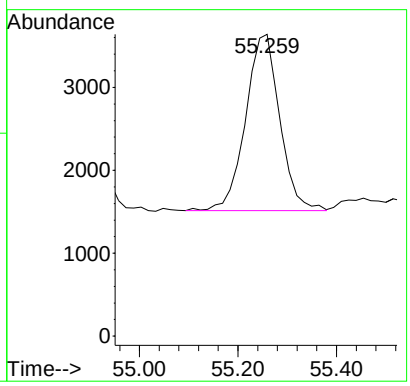
Tgt Ion:191 Resp: 14103

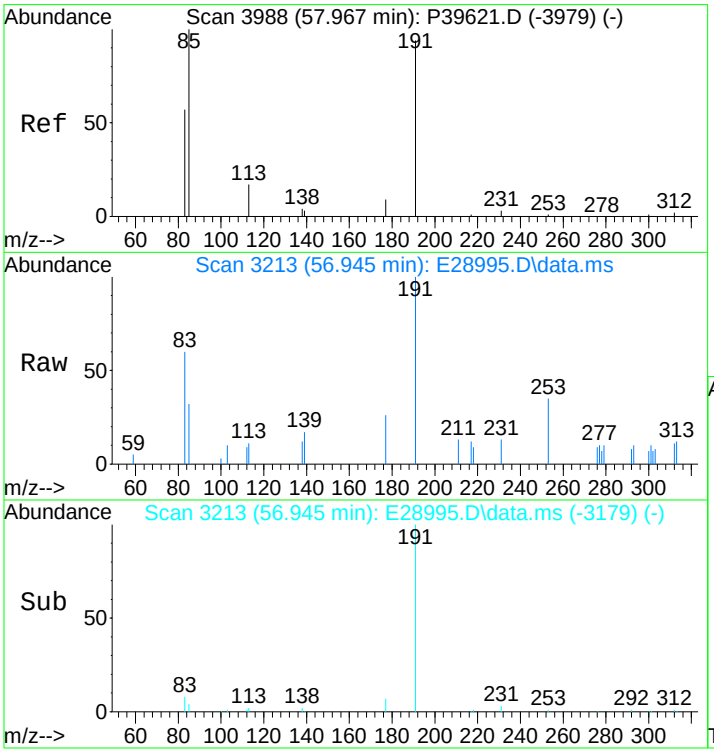




#122
30,31-Bishomohopane-22R (T27)
Concen: 262.43 ng/ml
RT: 55.259 min Scan# 3101
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

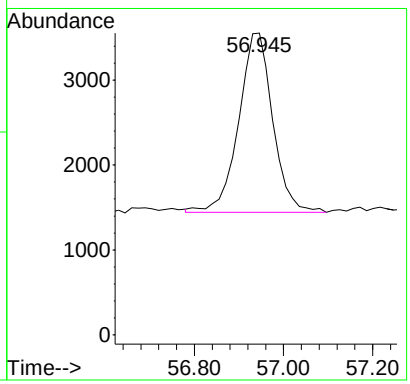
Tgt Ion:191 Resp: 10222

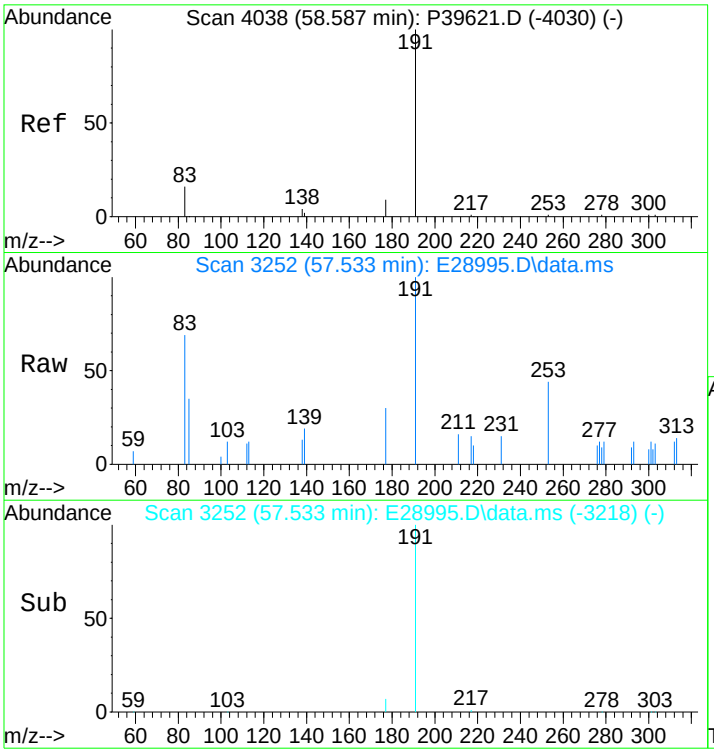




#123
30,31-Trishomohopane-22S (T30)
Concen: 289.31 ng/ml
RT: 56.945 min Scan# 3213
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

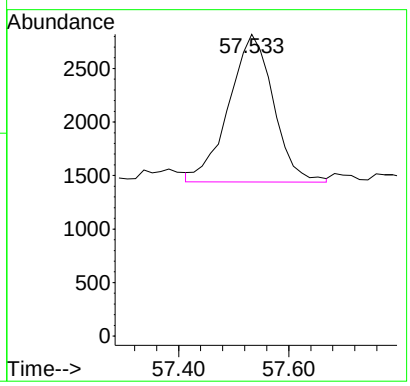
Tgt Ion:191 Resp: 11269

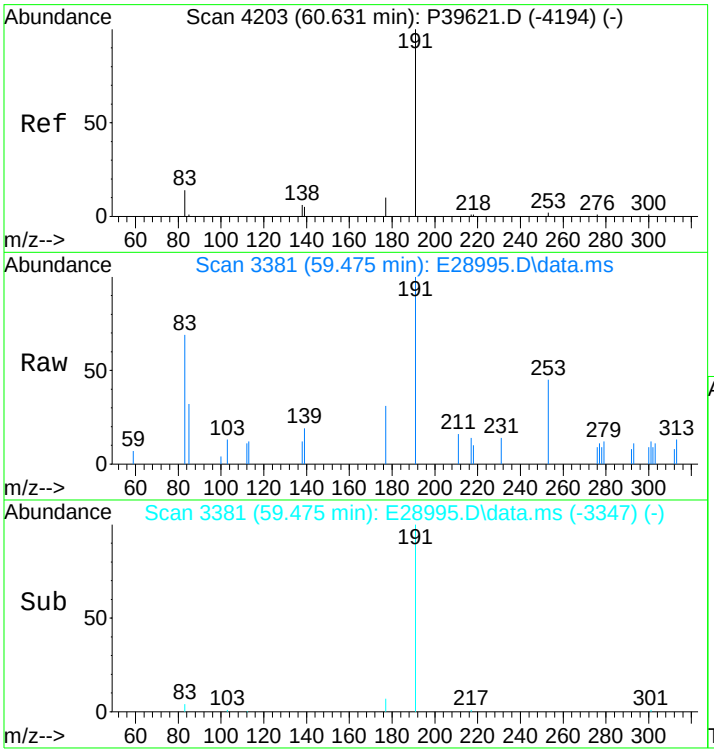




#124
30,31-Trishomohopane-22R (T31)
Concen: 198.58 ng/ml
RT: 57.533 min Scan# 3252
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

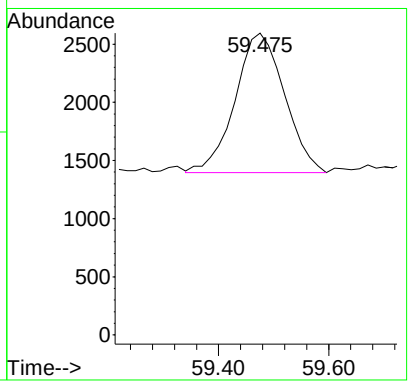
Tgt Ion:191 Resp: 7735

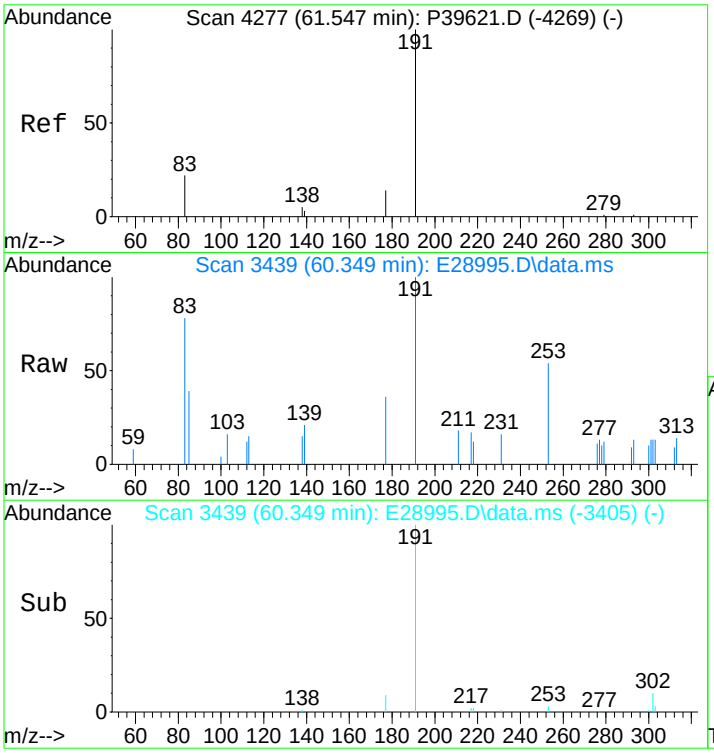




#125
Tetrakishomohopane-22S (T32)
Concen: 191.63 ng/ml
RT: 59.475 min Scan# 3381
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

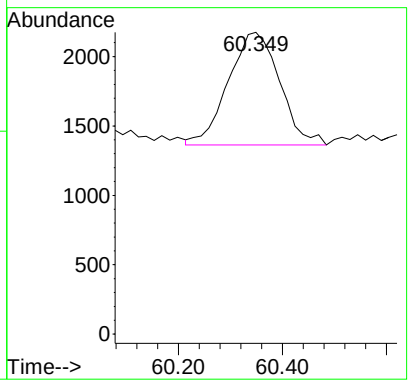
Tgt Ion:191 Resp: 7464

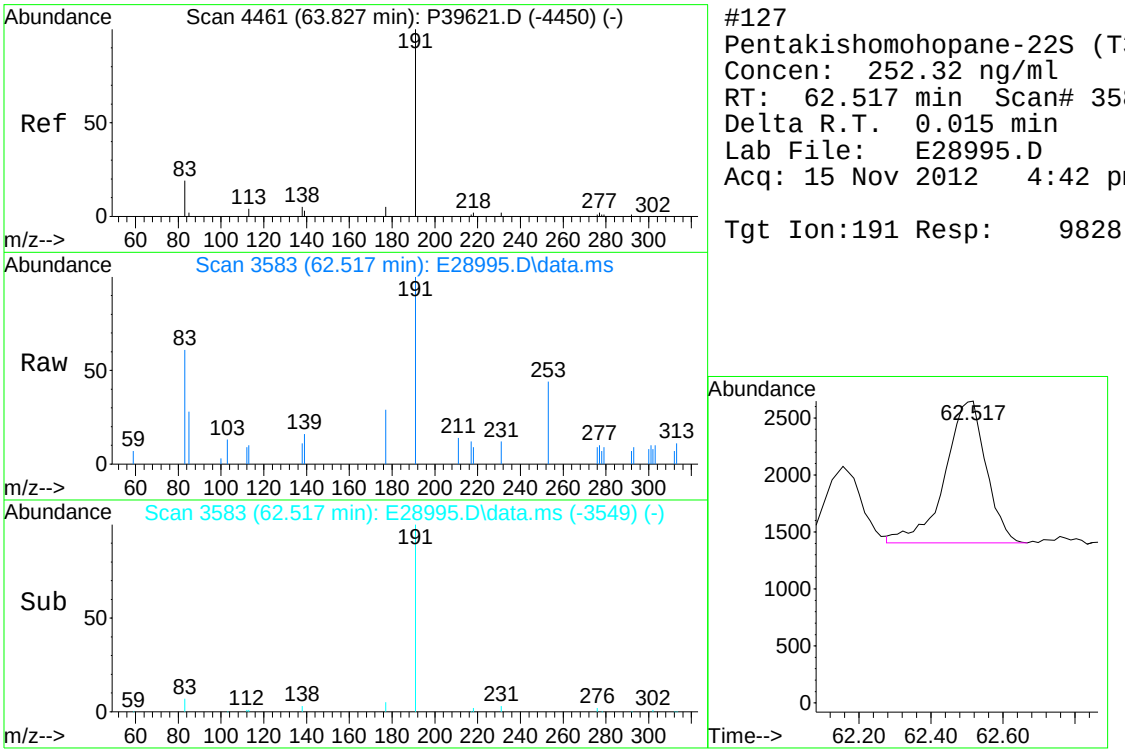




#126
Tetrakishomohopane-22R (T33)
Concen: 142.82 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

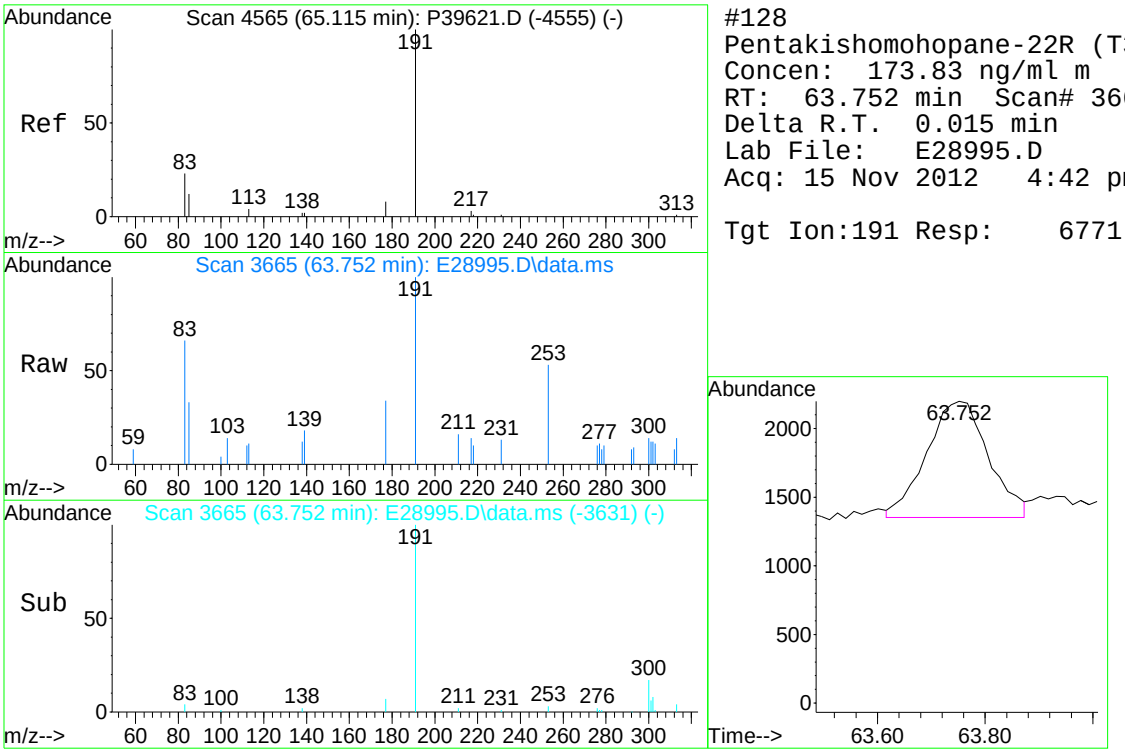
Tgt Ion:191 Resp: 5563





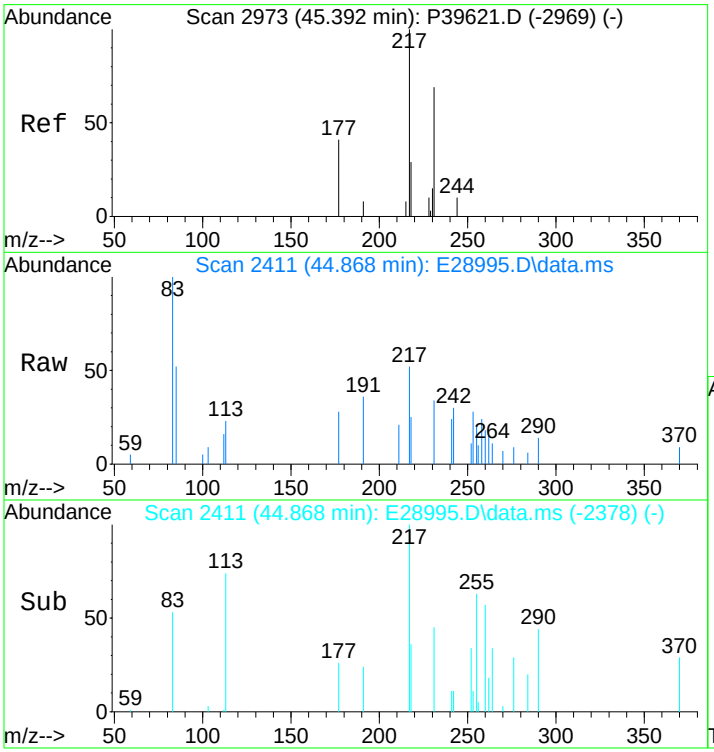
#127
Pentakishomohopane-22S (T34)
Concen: 252.32 ng/ml
RT: 62.517 min Scan# 3583
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:191 Resp: 9828



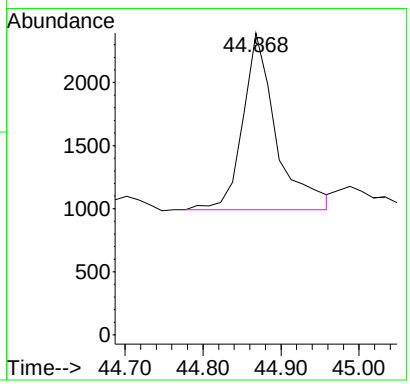
#128
Pentakishomohopane-22R (T35)
Concen: 173.83 ng/ml m
RT: 63.752 min Scan# 3665
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

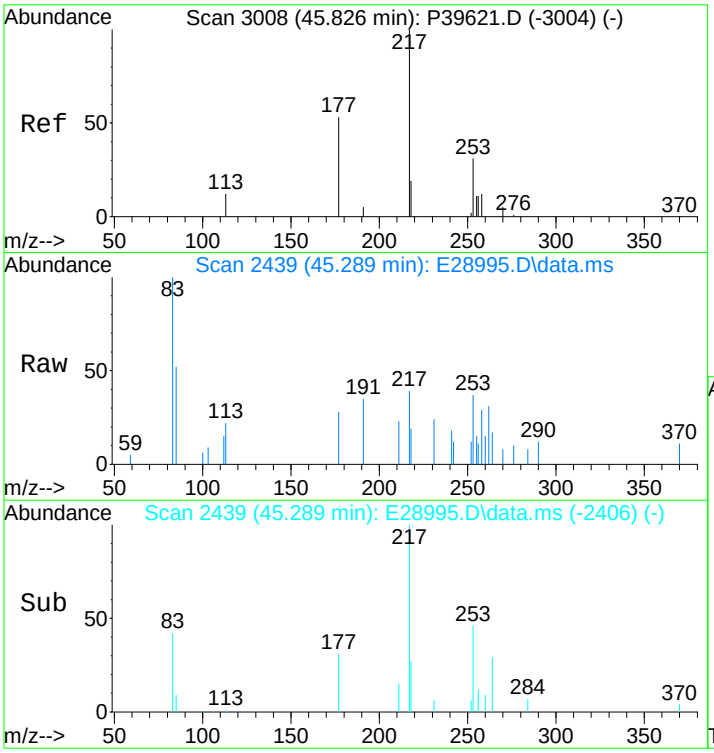
Tgt Ion:191 Resp: 6771



#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 203.71 ng/ml
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

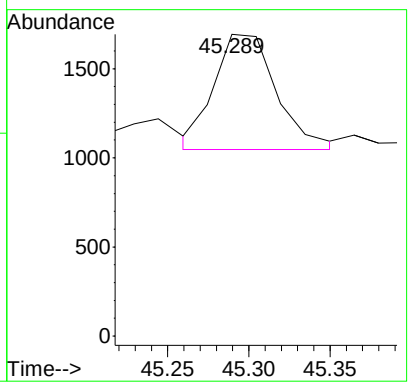
Tgt Ion:217 Resp: 4167

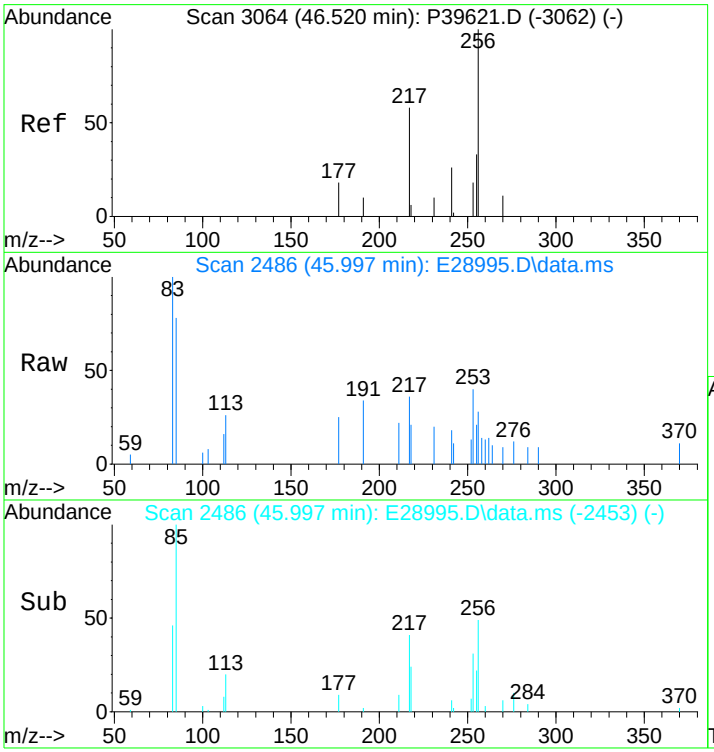




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 85.06 ng/ml m
RT: 45.289 min Scan# 2439
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

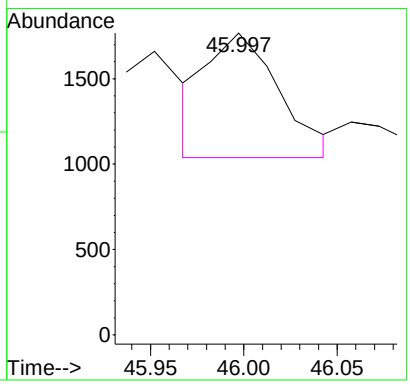
Tgt Ion:217 Resp: 1740

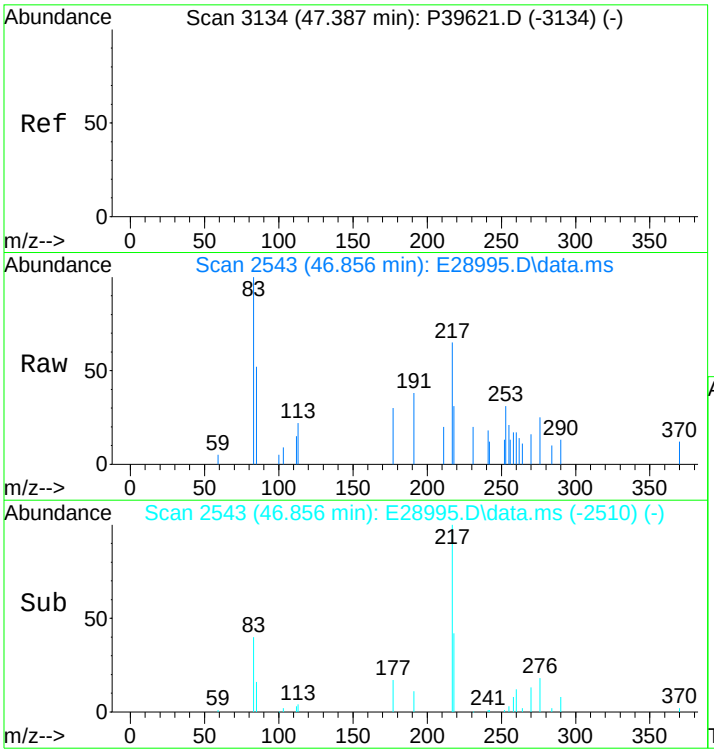




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 96.45 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

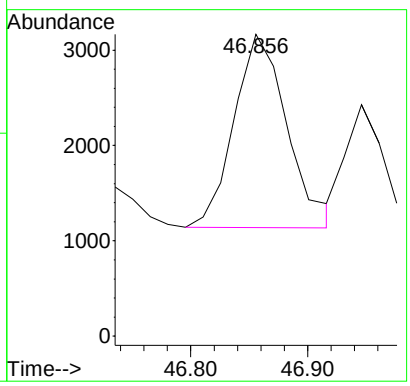
Tgt Ion:217 Resp: 1973

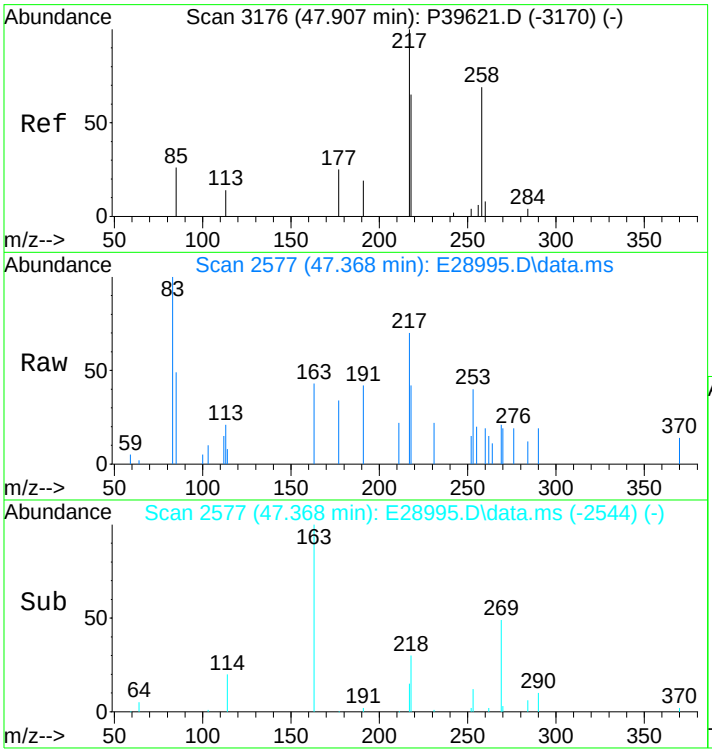




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 312.49 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

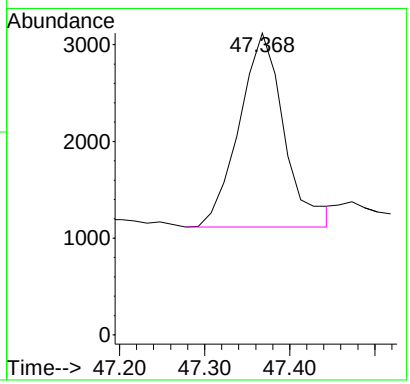
Tgt Ion:217 Resp: 6392

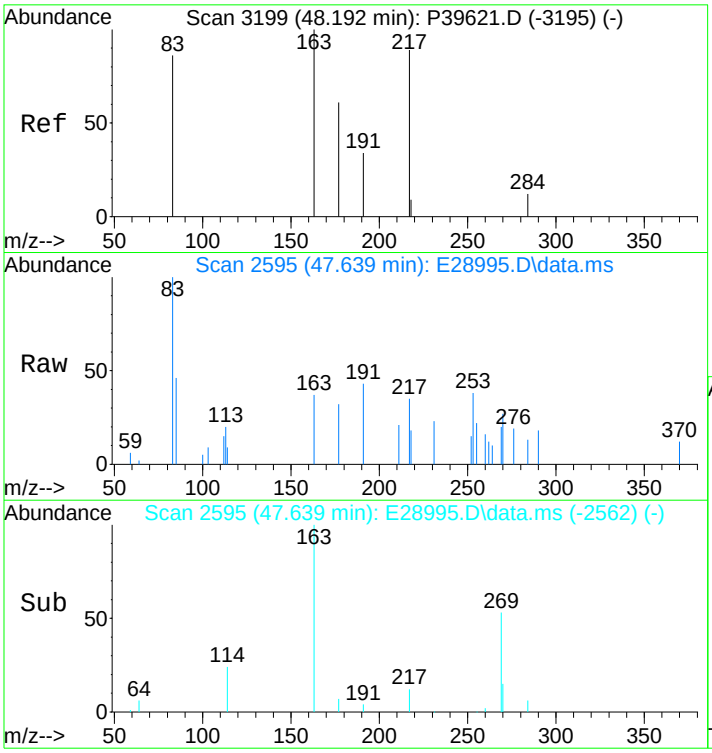




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 359.66 ng/ml
RT: 47.368 min Scan# 2577
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

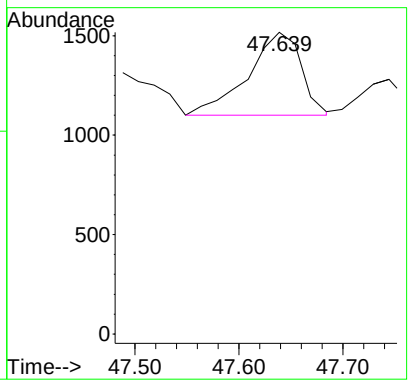
Tgt Ion:217 Resp: 7357

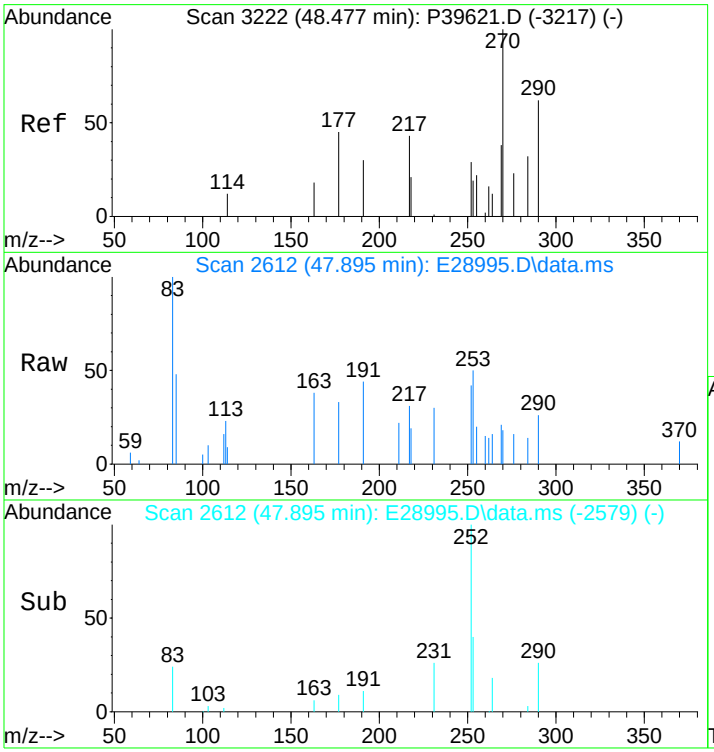




#135
Unknown Sterane (S18)
Concen: 72.74 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

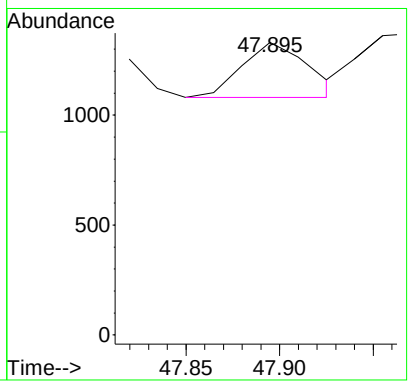
Tgt Ion:217 Resp: 1488

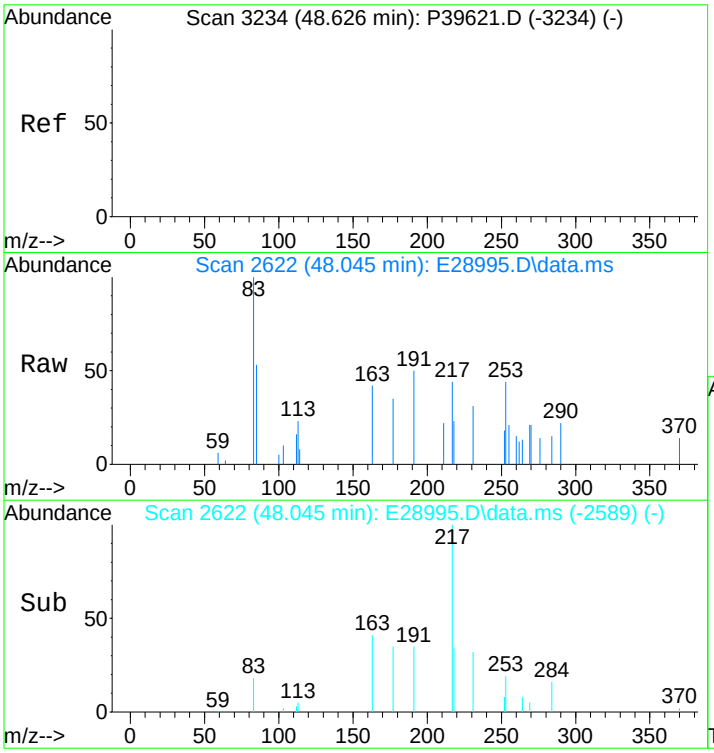




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 29.97 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

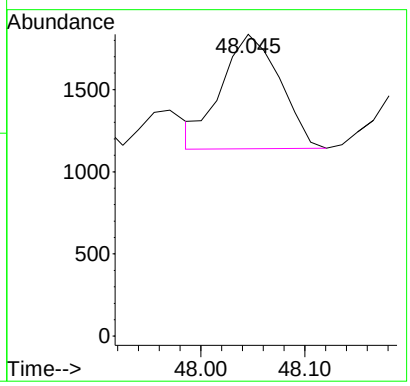
Tgt Ion:217 Resp: 613

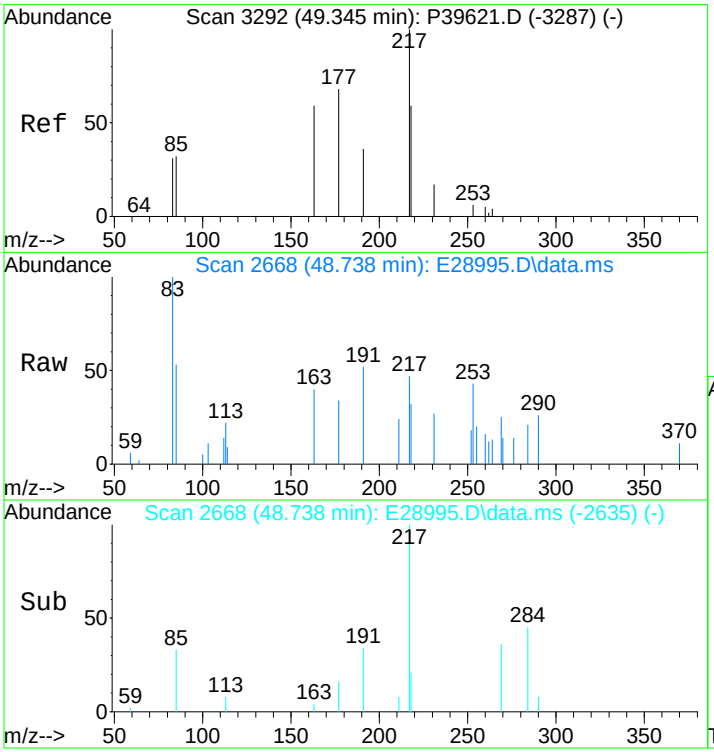




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 132.97 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

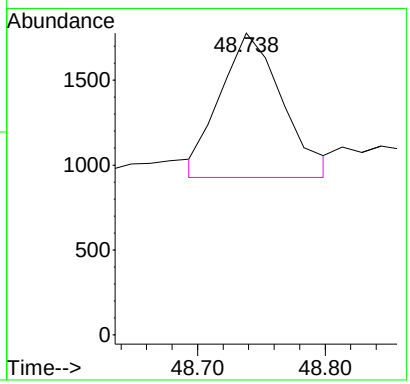
Tgt Ion:217 Resp: 2720

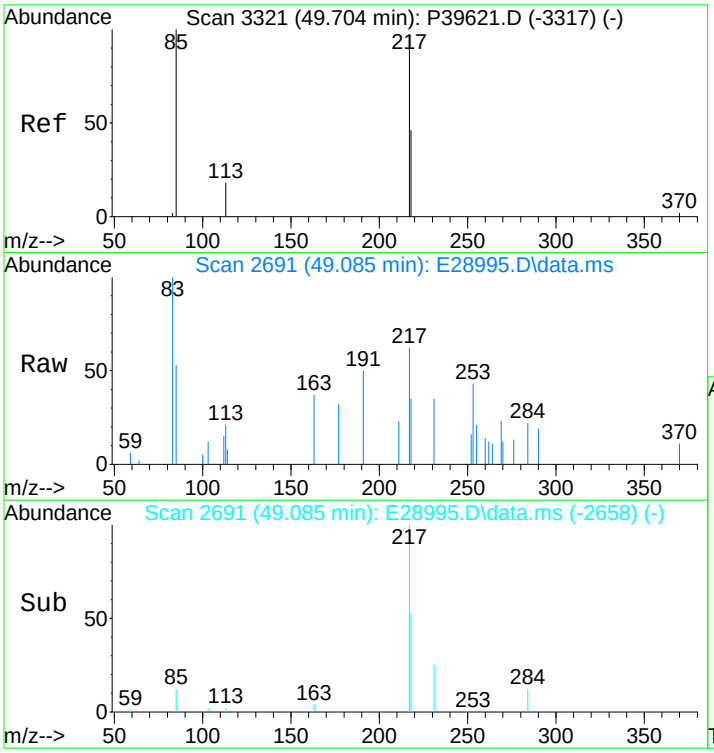




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 140.21 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

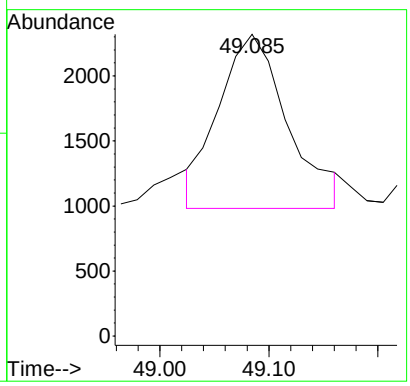
Tgt Ion:217 Resp: 2868

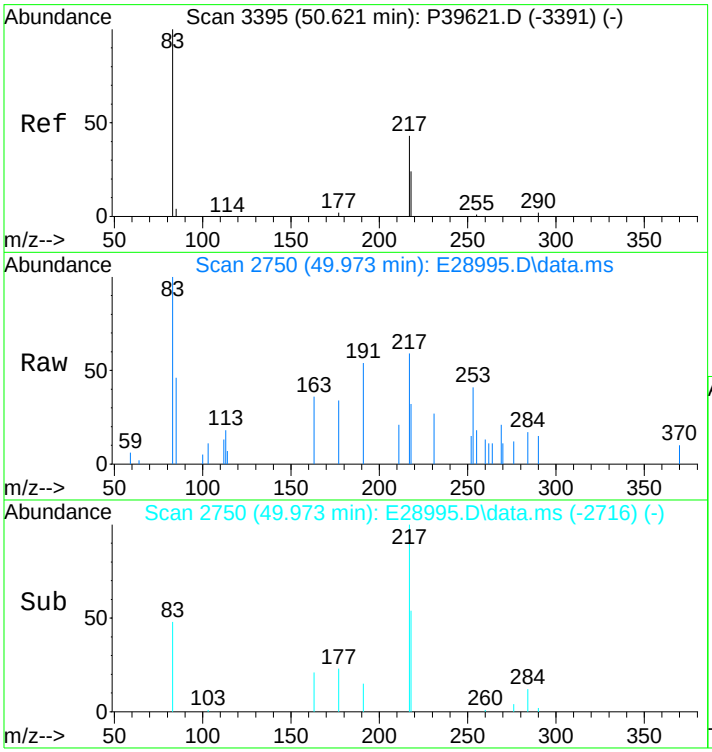




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 289.26 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

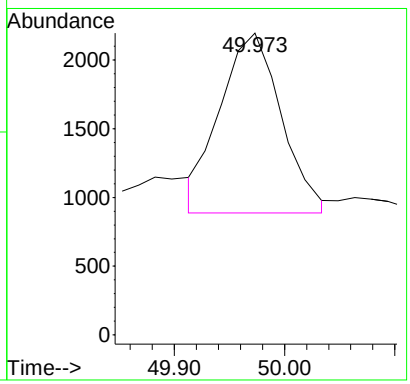
Tgt Ion:217 Resp: 5917

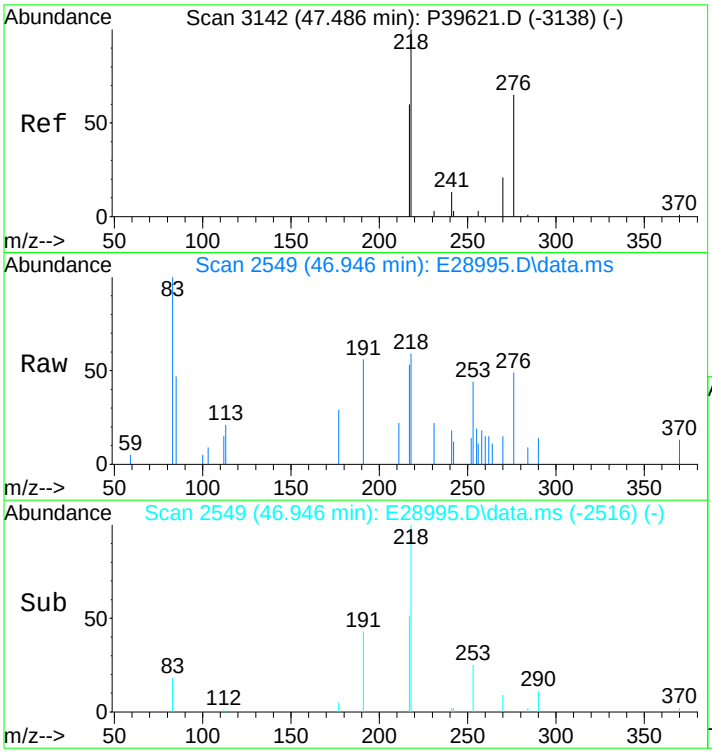




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 245.90 ng/ml m
RT: 49.973 min Scan# 2750
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

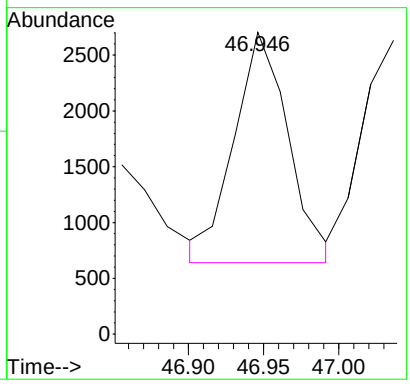
Tgt Ion:217 Resp: 5030

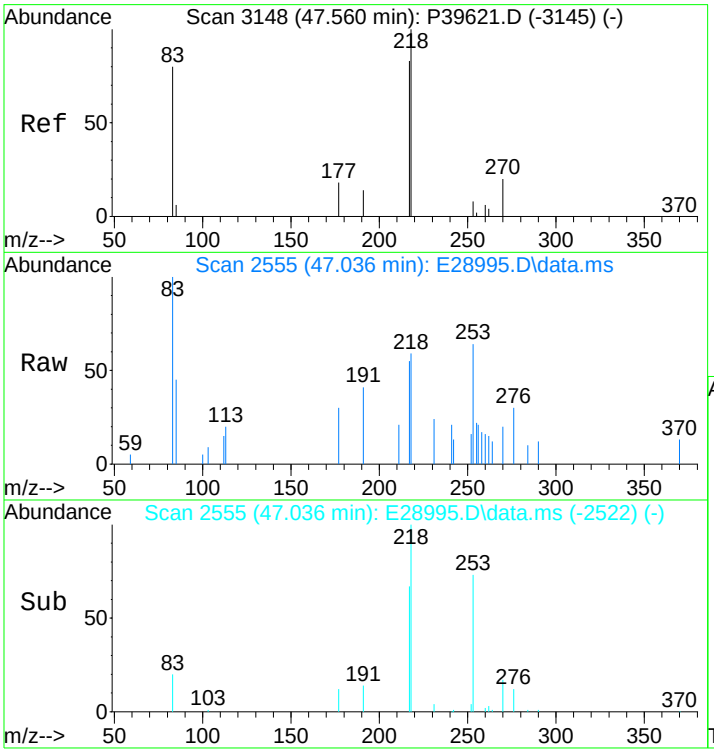




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 253.38 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

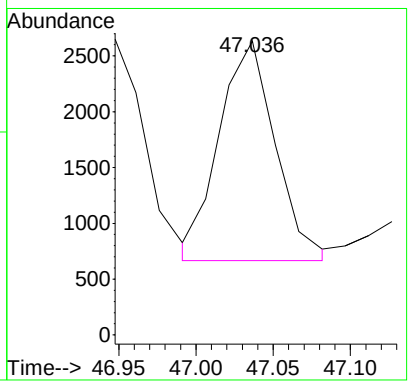
Tgt Ion:218 Resp: 5183

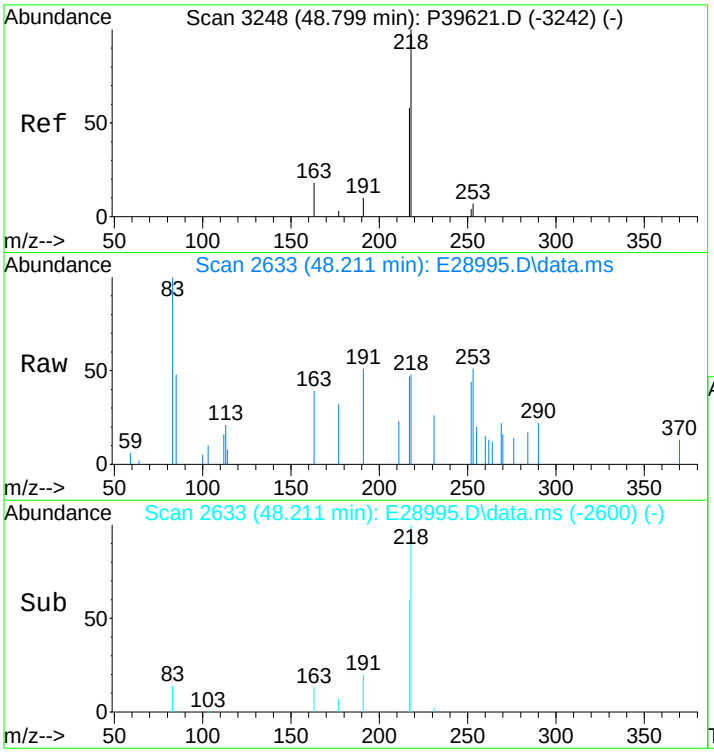




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 242.92 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

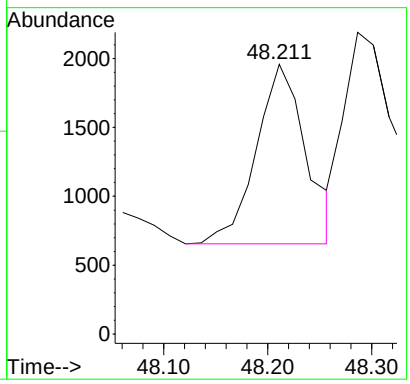
Tgt Ion:218 Resp: 4969

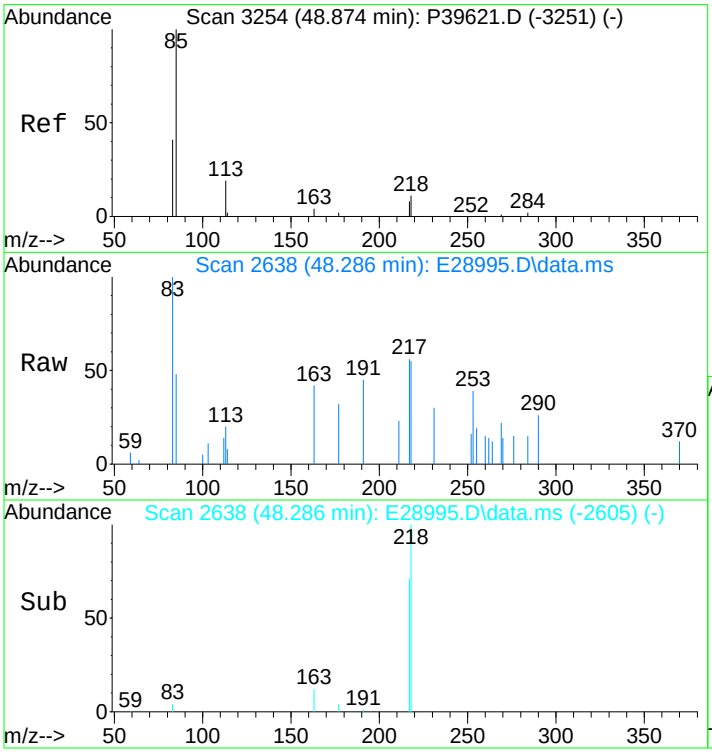




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 211.49 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

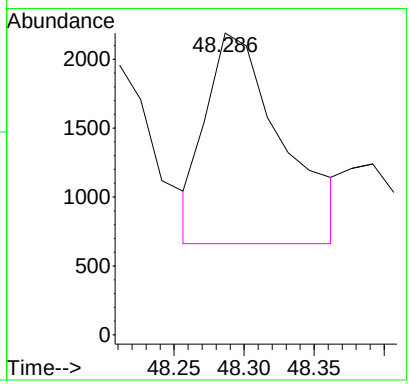
Tgt Ion:218 Resp: 4326

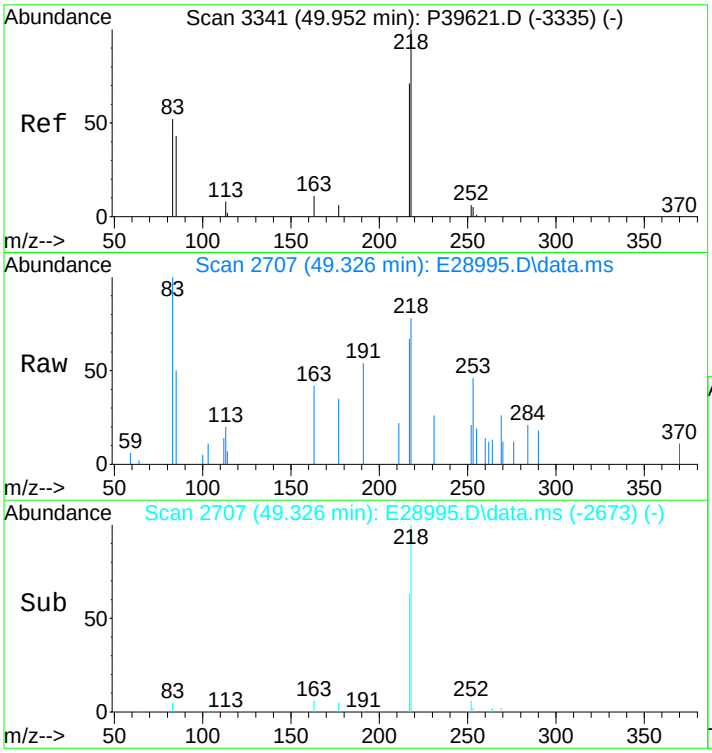




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 283.84 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

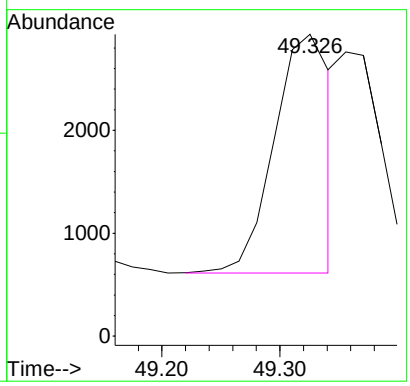
Tgt Ion:218 Resp: 5806

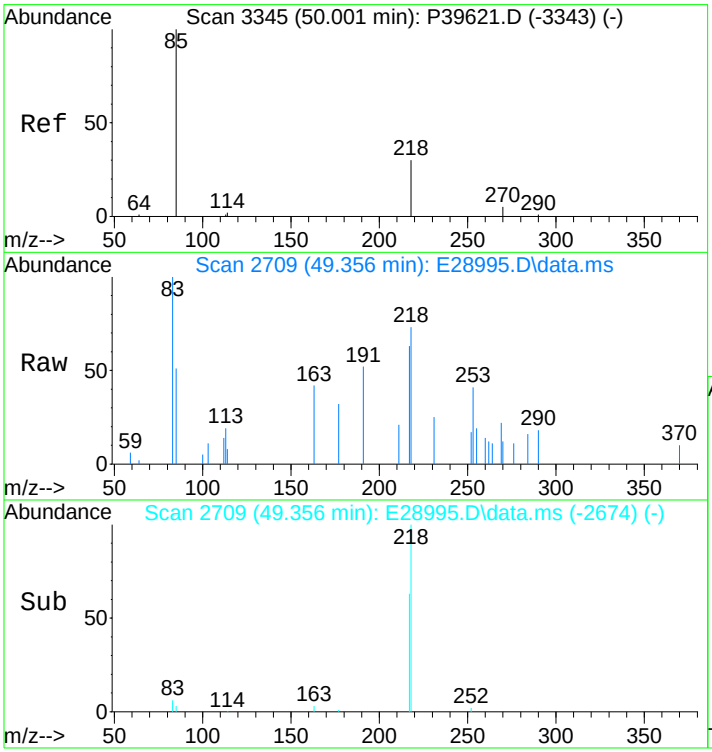




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 372.67 ng/ml m
RT: 49.326 min Scan# 2707
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

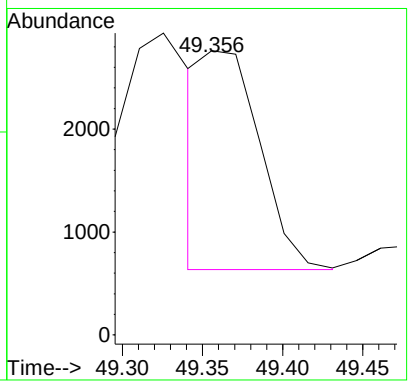
Tgt Ion:218 Resp: 7623

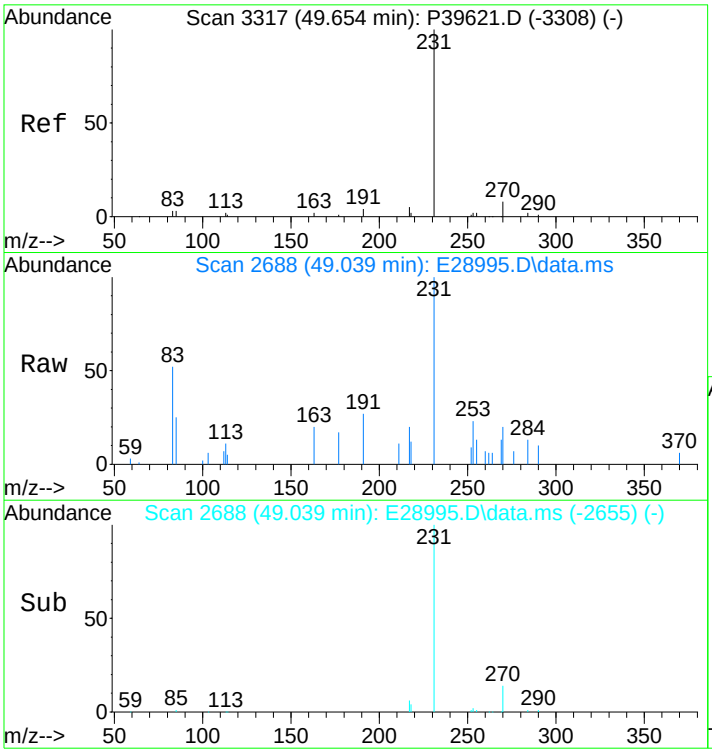




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 259.69 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

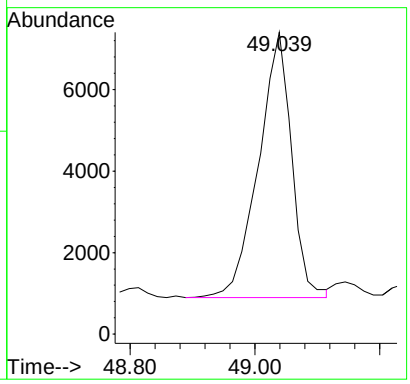
Tgt Ion:218 Resp: 5312

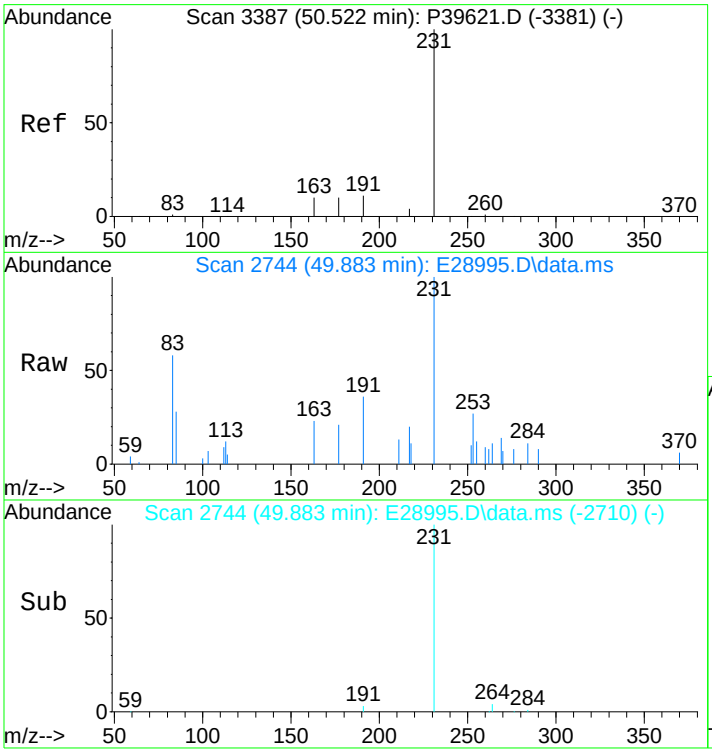




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1170.45 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

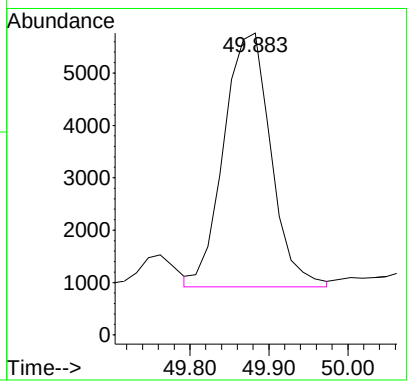
Tgt Ion:231 Resp: 23942

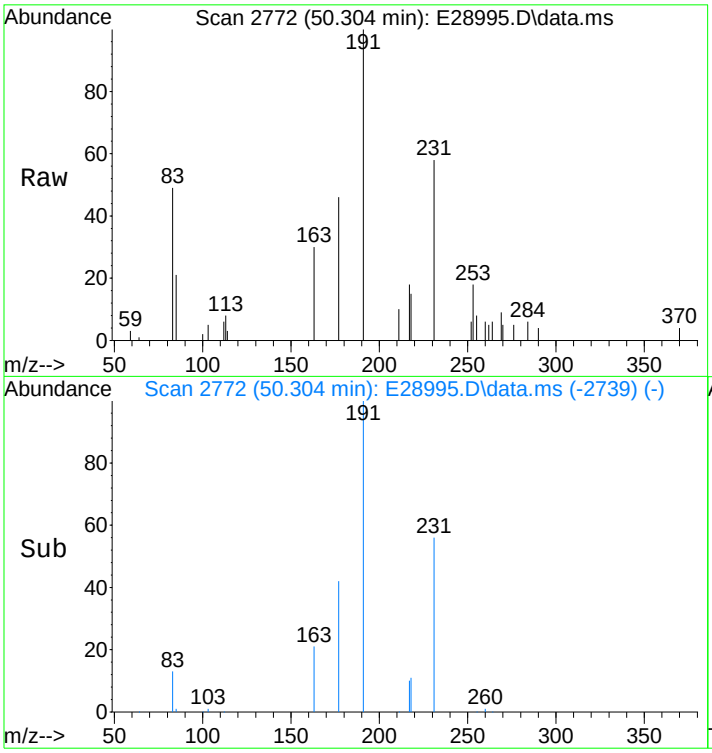




#148
C28,20S-triaromatic steroid
Concen: 982.34 ng/mL m
RT: 49.883 min Scan# 2744
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

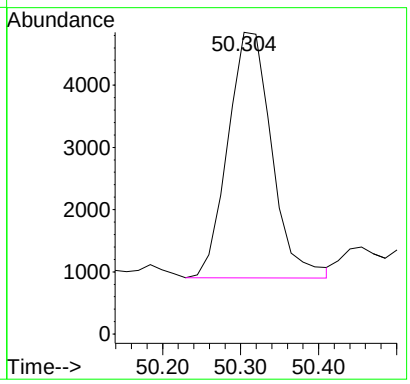
Tgt Ion:231 Resp: 20094

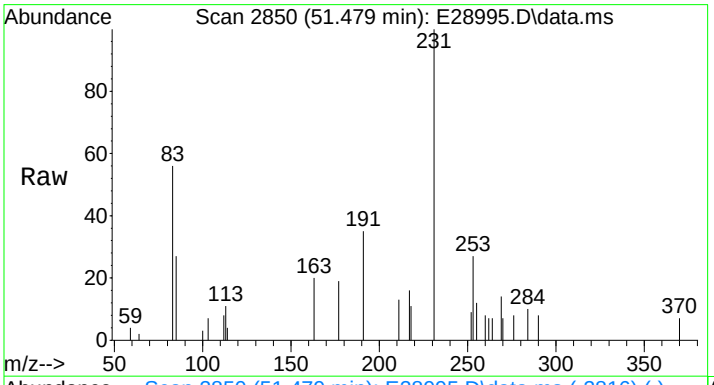




#149
C27,20R-triaromatic steroid
Concen: 756.43 ng/mL
RT: 50.304 min Scan# 2772
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

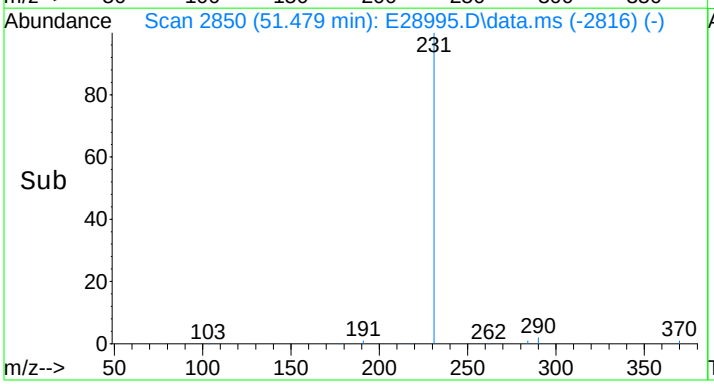
Tgt Ion:231 Resp: 15473

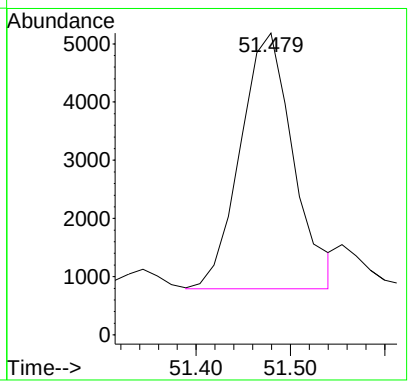




#150
C28,20R-triaromatic steroid
Concen: 840.42 ng/mL m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:231 Resp: 17191





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22488M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.730	240	52371	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	75708	957.123	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.71%			
42) Phenanthrene-d10	32.085	188	83705	1032.886	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.29%			
83) Benzo[b]fluoranthene-d12	46.660	264	112882	1049.260	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.93%			
88) Benzo[a]pyrene-d12	47.805	264	108509	1040.944	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.09%			
129) 5B(H)Cholane - Surr	43.347	217	22224	1076.714	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.67%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	11487	638.581	ng/mL	100
4) cis-Decalin	17.091	138	961	70.317	ng/mL	100
5) C1-Decalins	17.362	152	27034M5	1502.863	ng/mL	
6) C2-Decalins	18.792	166	41962m	2332.735	ng/mL	
7) C3-Decalins	21.623	180	32282m	1794.608	ng/mL	
8) C4-Decalins	24.272	194	34396M5	1912.129	ng/mL	
10) Naphthalene	19.304	128	29886	337.858	ng/mL#	100
11) C1-Naphthalenes	21.999	142	84491M5	955.163	ng/mL	
12) C2-Naphthalenes	24.844	156	181124m	2047.590	ng/mL	
13) C3-Naphthalenes	27.539	170	227398m	2570.713	ng/mL	
14) C4-Naphthalenes	29.963	184	192482M5	2175.991	ng/mL	
16) 2-Methylnaphthalene	21.999	142	50808	901.822	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	33707	615.722	ng/mL#	100
18) Benzothiophene	19.515	134	3555M3	48.614	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	18443M5	252.206	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	34386m	470.225	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	61203m	836.944	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	65139M5	890.768	ng/mL	
23) Biphenyl	23.881	154	5778M3	81.148	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	44230	870.976	ng/mL#	100
25) Dibenzofuran	26.982	168	3377M4	42.839	ng/mL	
26) Acenaphthylene	25.597	152	1589M3	18.018	ng/mL	
27) Acenaphthene	26.320	153	3771M3	66.428	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	11977M3	252.087	ng/mL	
29) Fluorene	28.352	166	9231M3	145.797	ng/mL	
30) C1-Fluorenes	30.730	180	26347M5	416.132	ng/mL	
31) C2-Fluorenes	32.928	194	61879M5	977.334	ng/mL	
32) C3-Fluorenes	34.780	208	74460m	1176.041	ng/mL	
33) Dibenzothiophene	31.679	184	30776	354.217	ng/mL#	69
34) 4-Methyldibenzothiophene(	33.455	198	41863	481.823	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	35209M3	405.239	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	22874	263.269	ng/mL#	100
37) OTP	33.877	198	8248M3	94.931	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	115363m	1327.773	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	107115m	1232.843	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	202640M5	2332.290	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	222481m	2560.651	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	154353M5	1776.530	ng/mL	
43) Phenanthrene	32.176	178	37460M3	423.777	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
44) 3-Methylphenanthrene(3MP)	34.148	192	21283M3	240.770	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.268	192	24068	272.276	ng/mL	93
46) 2-Methylanthracene(2MA)	34.419	192	2262M3	25.590	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	37627	425.666	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	21311M3	241.087	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	110226M5	1246.964	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	166742M5	1886.317	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	166742m	1886.317	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.553	220	159437M5	1803.677	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	73850M5	835.450	ng/mL	
55) Anthracene	32.386	178	2138M3	27.982	ng/mL	
56) Carbazole	33.034	167	2907M3	36.969	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21431M3	317.786	ng/mL	
58) Fluoranthene	36.963	202	3019M3	30.926	ng/mL	
59) Benzo(b)fluorene	39.508	216	2540M3	39.048	ng/mL	
60) Pyrene	37.852	202	9821	98.980	ng/mL#	58
61) C1-Fluoranthenes/Pyrenes	39.267	216	37164m	374.554	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.074	230	57475M5	579.257	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	70060m	706.094	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.476	258	71175M5	717.331	ng/mL	
66) Naphthobenzothiophene	41.721	234	14696	150.171	ng/ml#	83
67) Naphthobenzothiophene-2,1	41.721	234	14696	150.171	ng/mL#	83
68) Naphthobenzothiophene-1,2	42.067	234	3816M3	38.994	ng/mL	
69) Naphthobenzothiophene-2,3	42.369	234	2452M3	25.056	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	72458M5	740.413	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	115439M5	1179.614	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	97784M5	999.206	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	79999M5	817.470	ng/mL	
75) Benz[a]anthracene	42.670	228	1916M3	18.788	ng/mL	
77) Chrysene/Triphenylene	42.790	228	11966M3	113.970	ng/mL	
78) C1-Chrysenes	44.311	242	33088M5	315.145	ng/mL	
79) C2-Chrysenes	46.404	256	57413M5	546.827	ng/mL	
79) C2-Chrysenes BS	46.404	256	53727m	511.720	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3686	35.107	ng/mL	100
81) C3-Chrysenes	49.039	270	63858M5	608.212	ng/mL	
82) C4-Chrysenes	49.145	284	42938M5	408.961	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	3474M3	29.307	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1089M3	8.930	ng/mL	
87) Benzo[e]pyrene	47.699	252	5445	47.044	ng/mL#	86
89) Benzo[a]pyrene	47.895	252	2983M3	26.934	ng/mL	
90) Perylene	48.196	252	6676	57.005	ng/mL#	65
91) Indeno[1,2,3-cd]pyrene	52.564	276	2135M3	16.380	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	861M3	6.204	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	4854	34.538	ng/mL#	80
94) Hopane (T19)	51.645	191	50509M3	1285.093	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19859	505.270	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10693	272.060	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	10049M3	255.675	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3791M3	96.454	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3812M3	96.988	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3647M3	92.790	ng/ml	
102) C28 Tricyclic Terpane-22S	46.058	191	4407M3	112.127	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	4541M3	115.536	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5414	137.748	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5133M3	130.598	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5539	140.928	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.121	191	4416M3	112.356	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4472M3	113.780	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.527	191	13579	345.488	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8803	223.973	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.521	191	2536	64.523	ng/ml	100
112) 30-Norhopane (T15)	50.335	191	37394M3	951.410	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5112M3	130.064	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1765M3	44.907	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3598	91.543	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.494	191	251	6.386	ng/ml	100
117) Moretane (T20)	52.308	191	4056M3	103.196	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	22831	580.886	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17916	455.834	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8524	216.875	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.883	191	14956	380.523	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10789	274.503	ng/ml	100
123) 30,31-Trishomohopane-22S	56.946	191	11804	300.327	ng/ml	100
124) 30,31-Trishomohopane-22R	57.548	191	7741	196.953	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	7651M3	194.663	ng/ml	
126) Tetrakishomohopane-22R (T	60.349	191	5366	136.526	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	10288	261.756	ng/ml	100
128) Pentakishomohopane-22R (T	63.767	191	6944	176.675	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	3728M3	180.615	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.305	217	1746M3	84.591	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1405M3	68.070	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6470	313.460	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7592M3	367.819	ng/ml	
135) Unknown Sterane (S18)	47.639	217	1270	61.529	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	823	39.873	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2543	123.204	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2819M2	136.576	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5989M3	290.157	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5879M3	284.827	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5640M3	273.248	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	5501M3	266.514	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4708	228.094	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6238M3	302.220	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7915M3	383.468	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.371	218	6112M3	296.116	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23951	1160.384	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	20900	1012.569	ng/mL	100
149) C27,20R-triaromatic stero	50.320	231	15762	763.641	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17097M3	828.320	ng/mL	

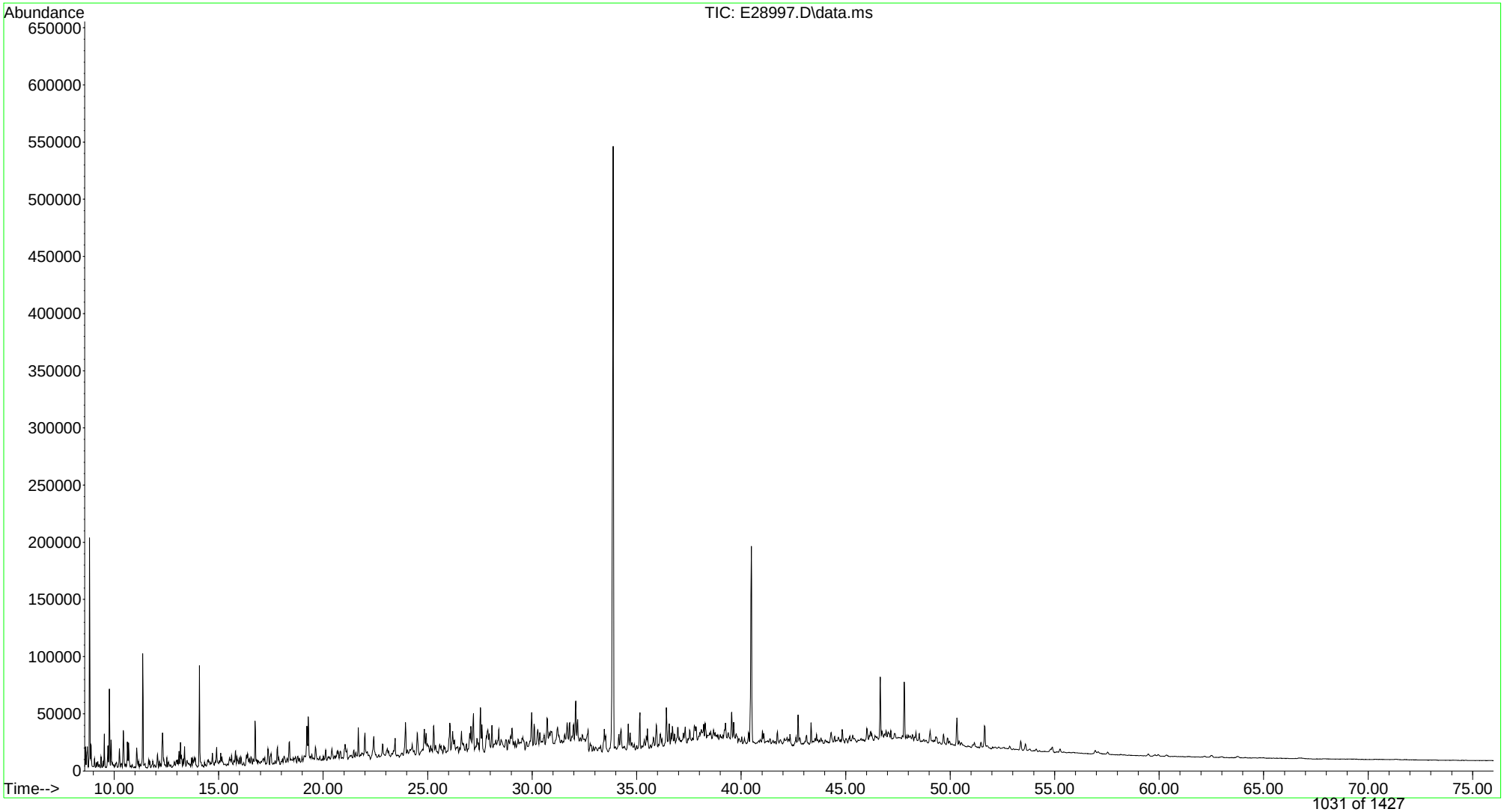
(#) = qualifier out of range (m) = manual integration (+) = signals summed

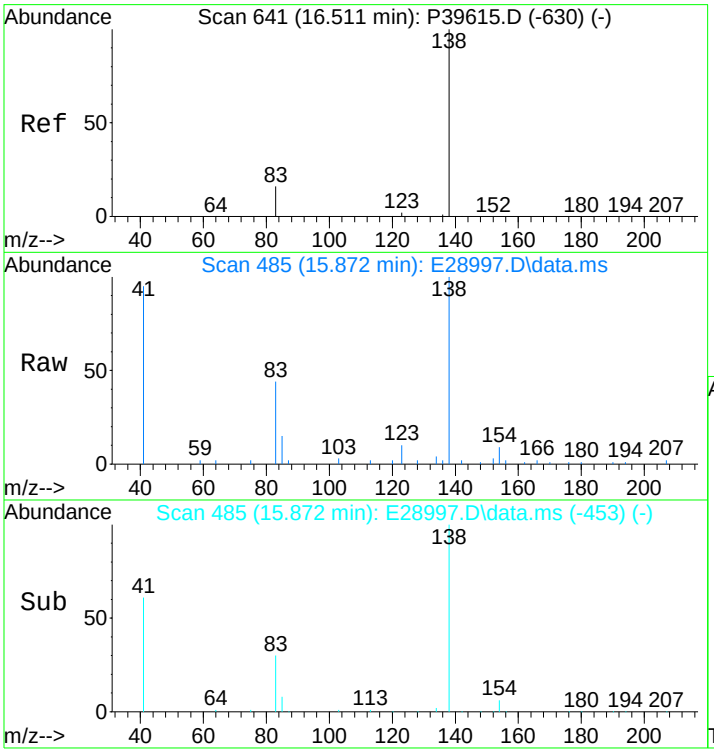
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

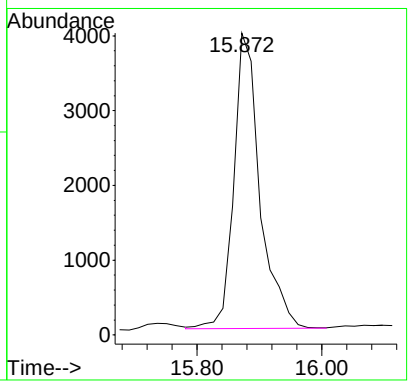
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

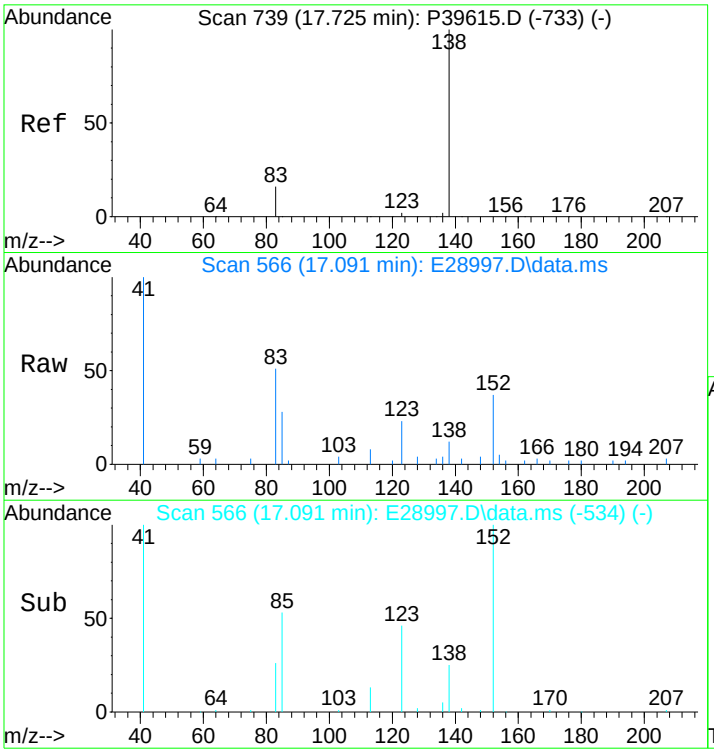




#3
trans-Decalin
Concen: 638.58 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

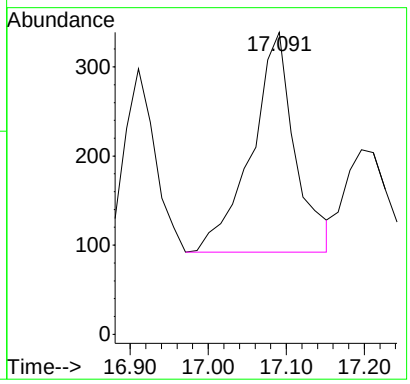
Tgt Ion:138 Resp: 11487

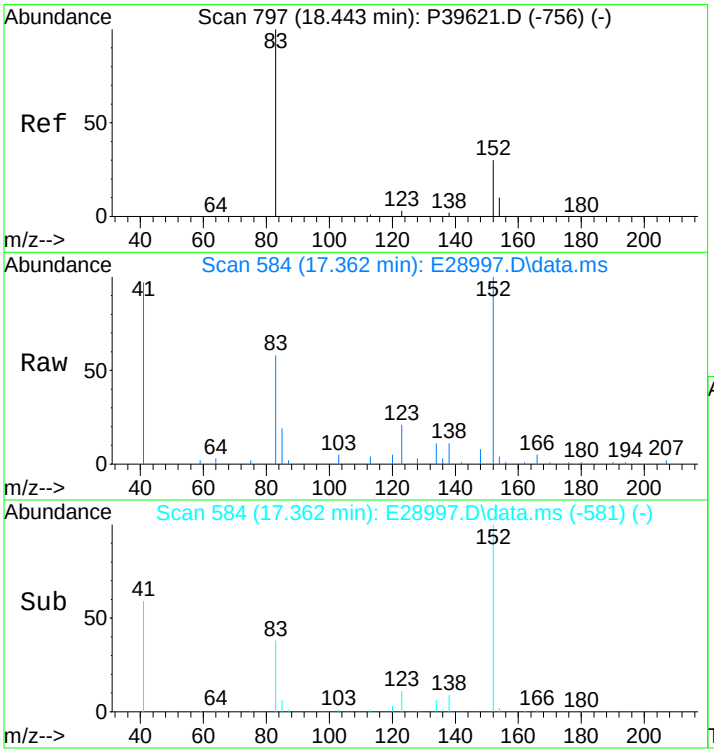




#4
cis-Decalin
Concen: 70.32 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

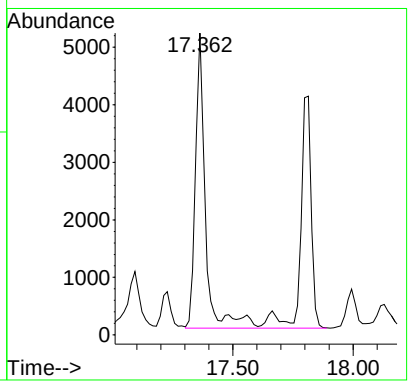
Tgt Ion:138 Resp: 961

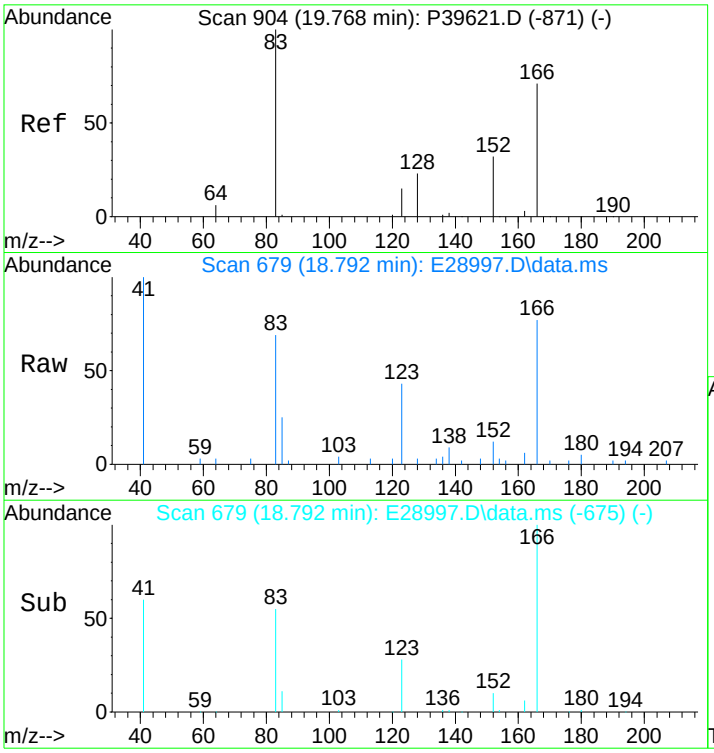




#5
C1-Decalins
Concen: 1502.86 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

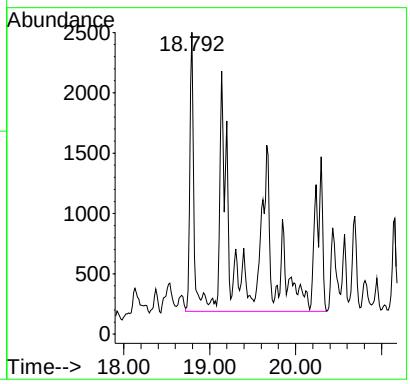
Tgt Ion:152 Resp: 27034

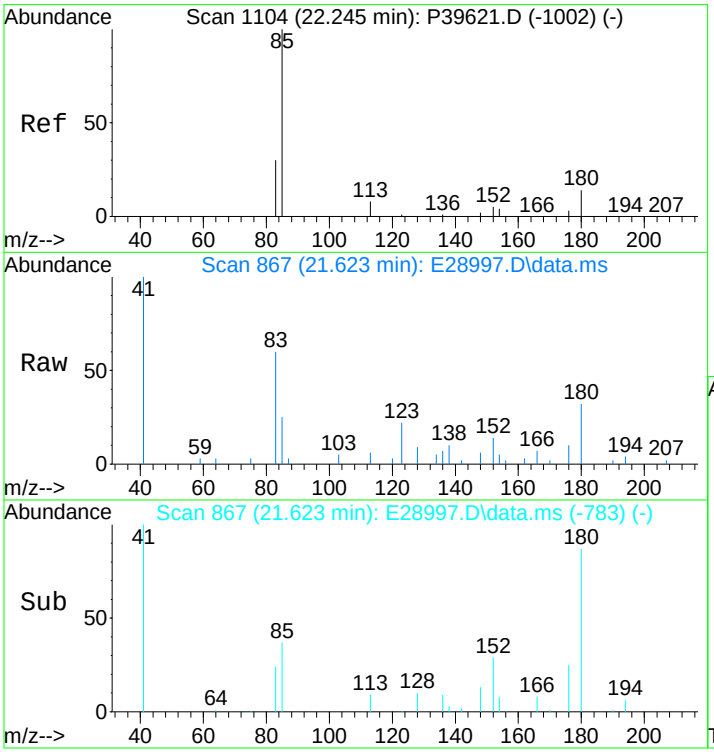




#6
C2-Decalins
Concen: 2332.73 ng/mL m
RT: 18.792 min Scan# 679
Delta R.T. -0.550 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

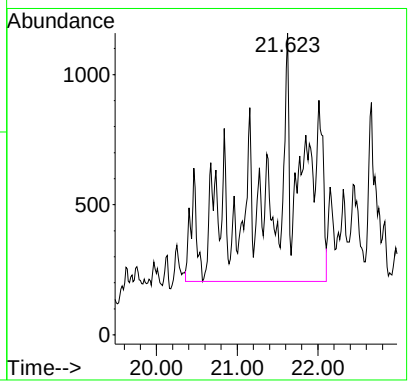
Tgt Ion:166 Resp: 41962

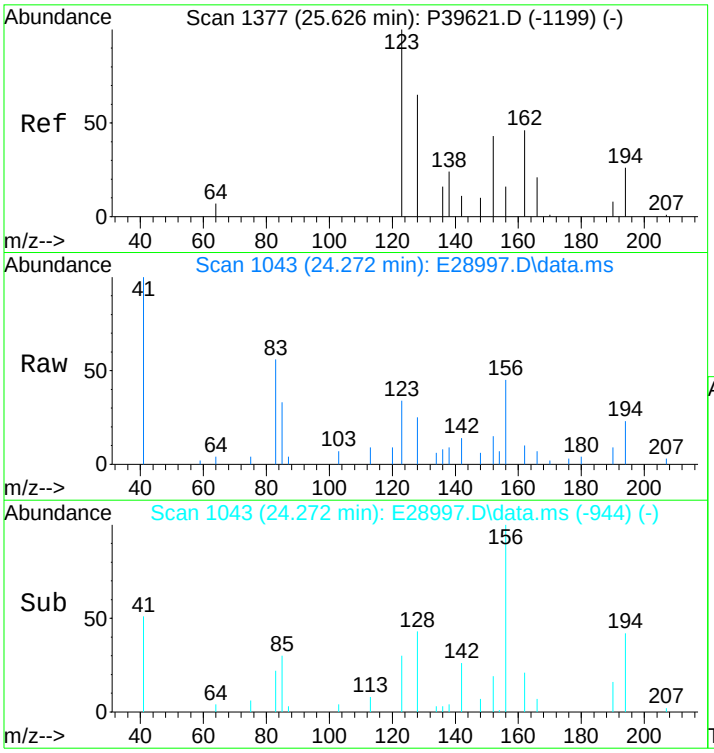




#7
C3-Decalins
Concen: 1794.61 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

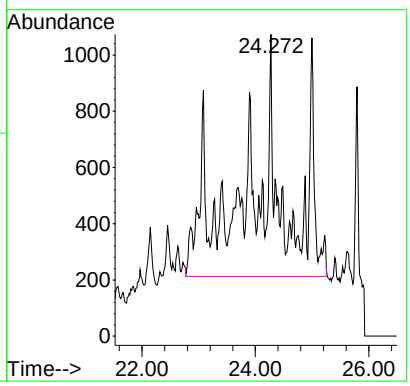
Tgt Ion:180 Resp: 32282

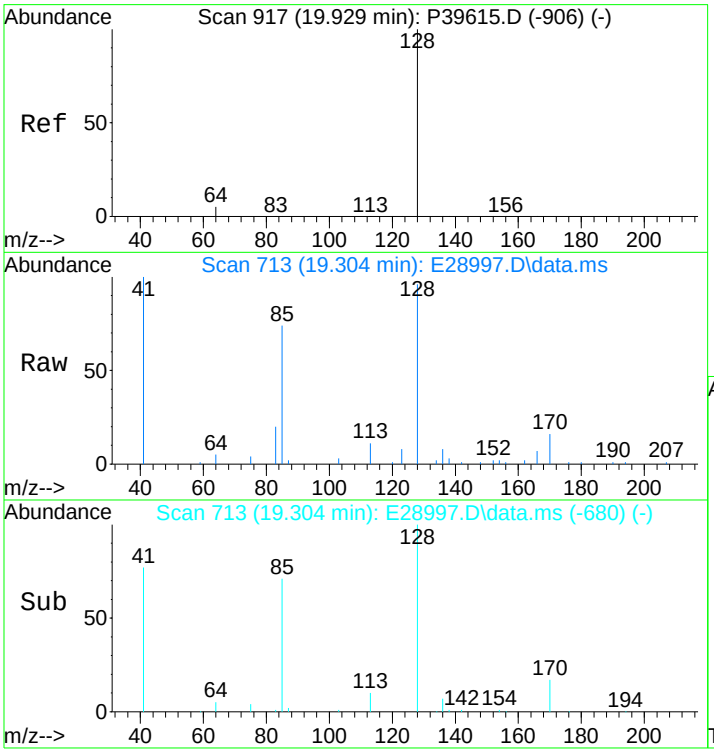




#8
C4-Decalins
Concen: 1912.13 ng/mL m
RT: 24.272 min Scan# 1043
Delta R.T. -0.783 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:194 Resp: 34396

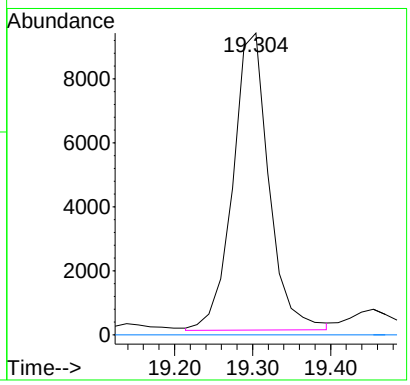


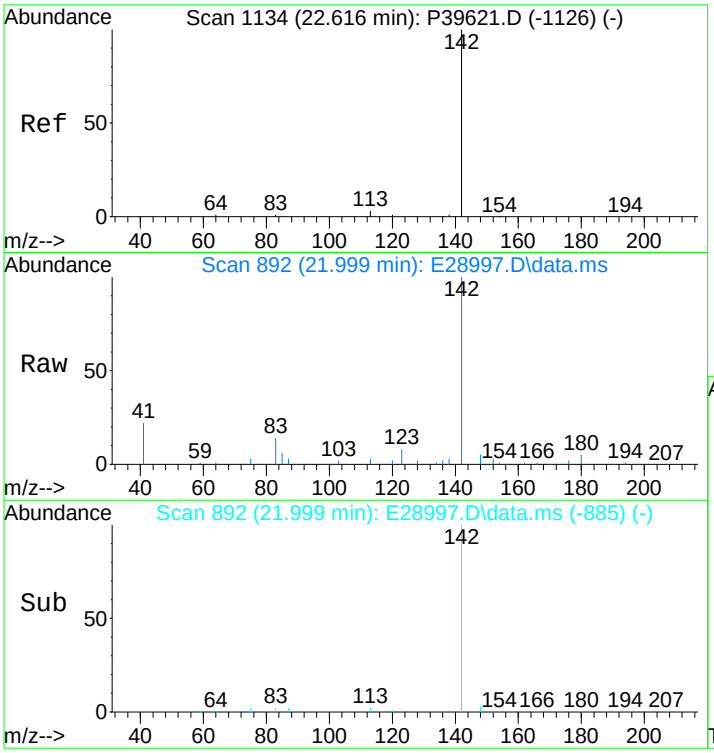


#10
Naphthalene
Concen: 337.86 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:128 Resp: 29886

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

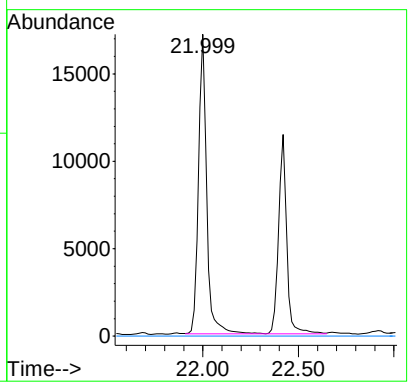


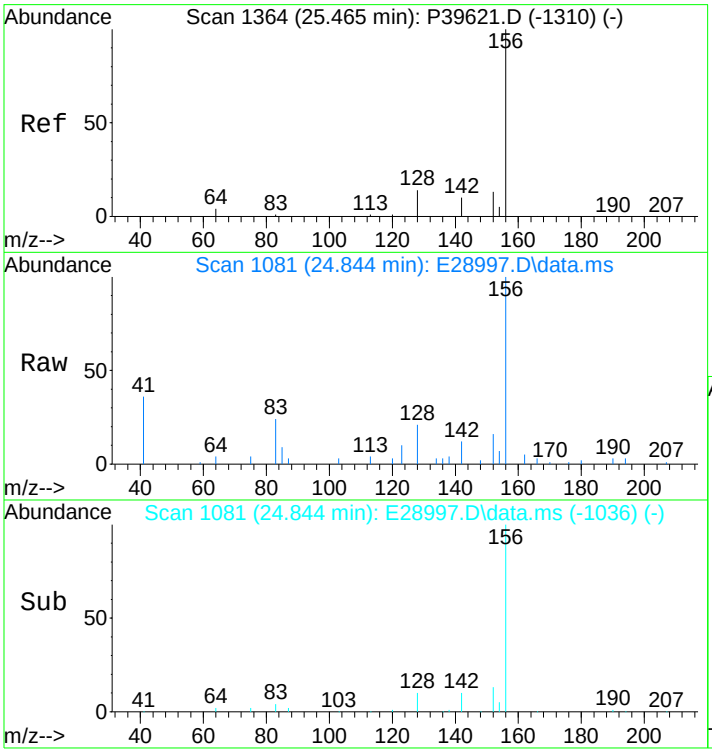


#11
C1-Naphthalenes
Concen: 955.16 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:142 Resp: 84491

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

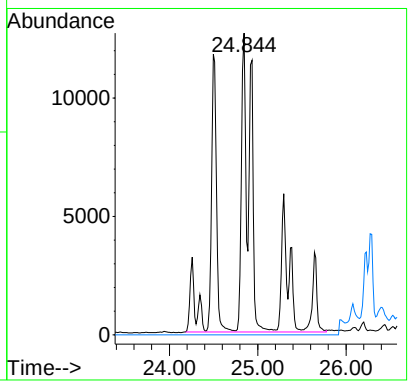


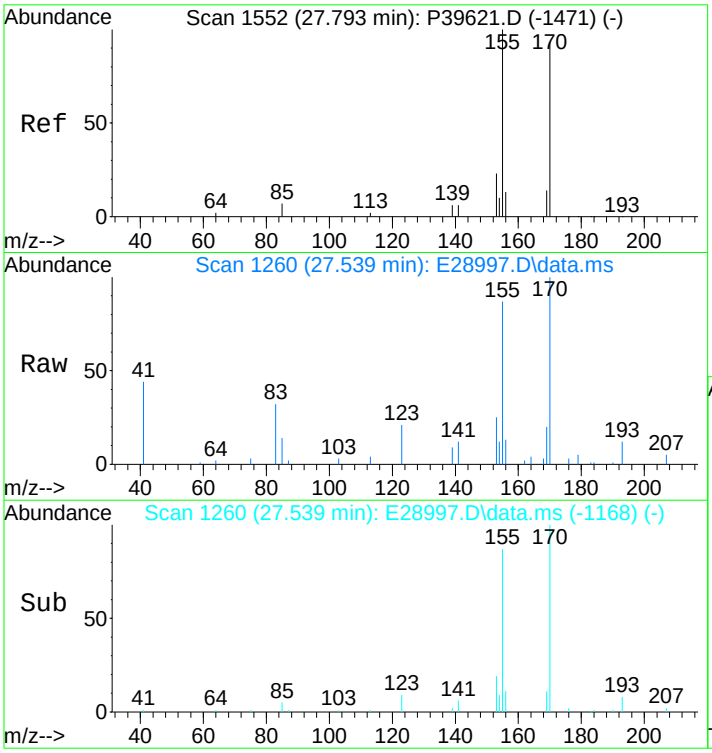


#12
C2-Naphthalenes
Concen: 2047.59 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:156 Resp: 181124

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

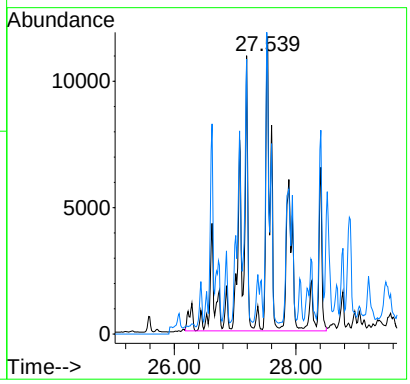


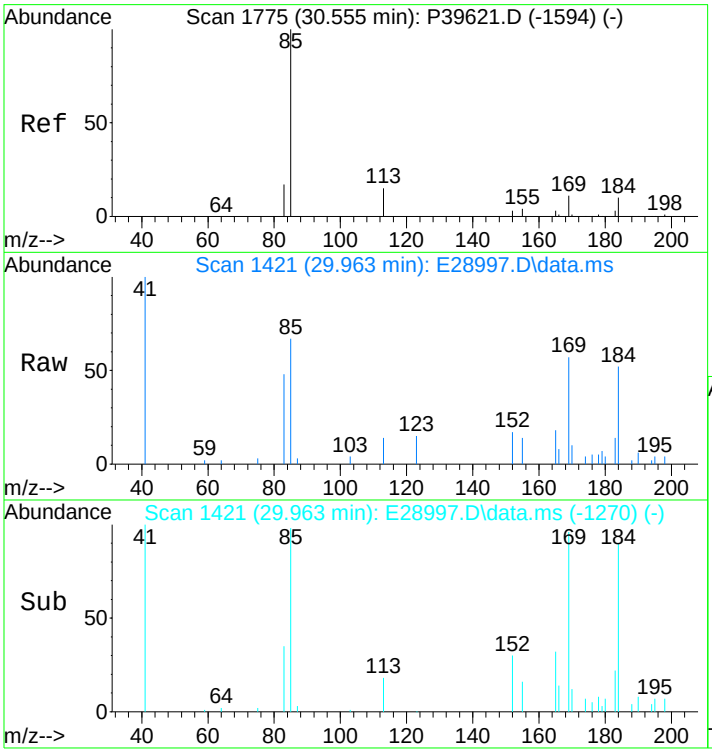


#13
C3-Naphthalenes
Concen: 2570.71 ng/mL m
RT: 27.539 min Scan# 1260
Delta R.T. 0.359 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:170 Resp: 227398

Ion	Ratio	Lower	Upper
170	100		
155	15.7	66.8	100.2#

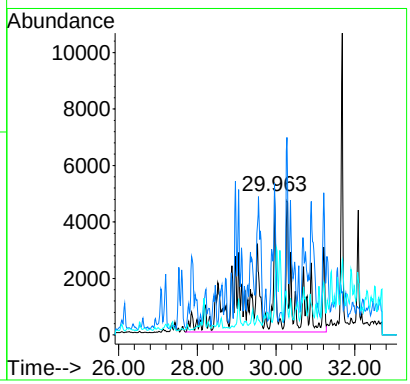


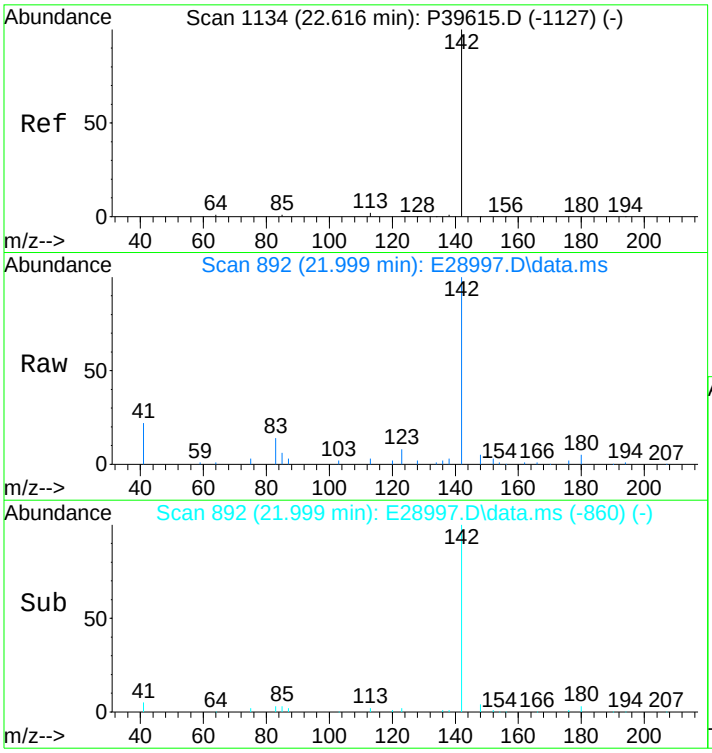


#14
C4-Naphthalenes
Concen: 2175.99 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:184 Resp: 192482

Ion	Ratio	Lower	Upper
184	100		
169	4.4	78.7	118.1#
183	1.3	26.7	40.1#

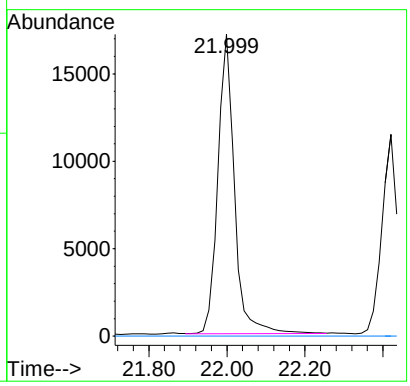


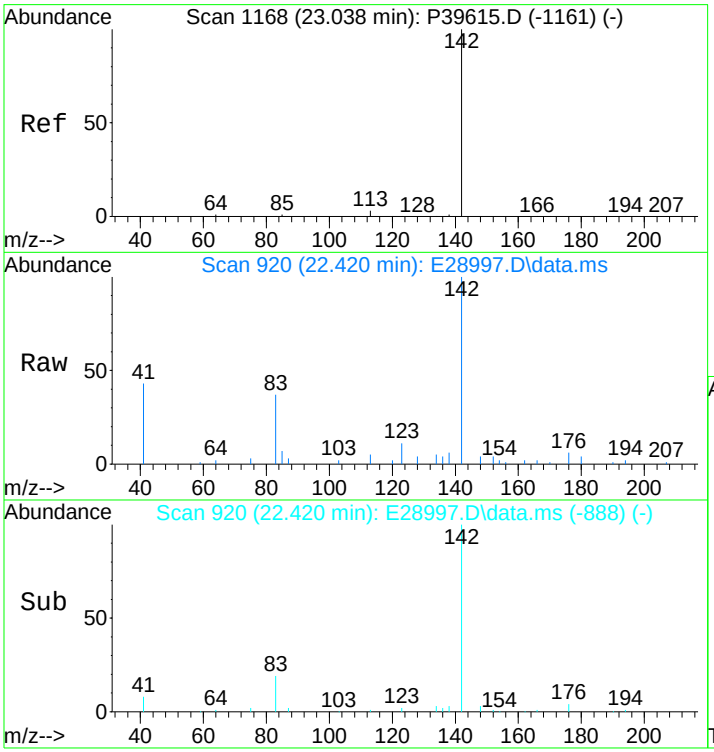


#16
2-Methylnaphthalene
Concen: 901.82 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:142 Resp: 50808

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

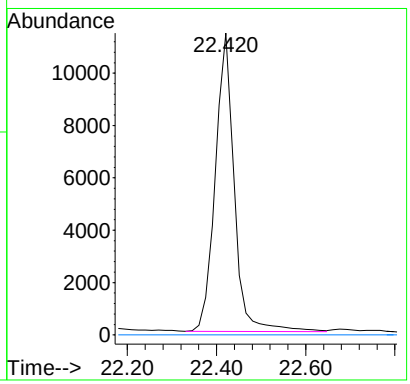


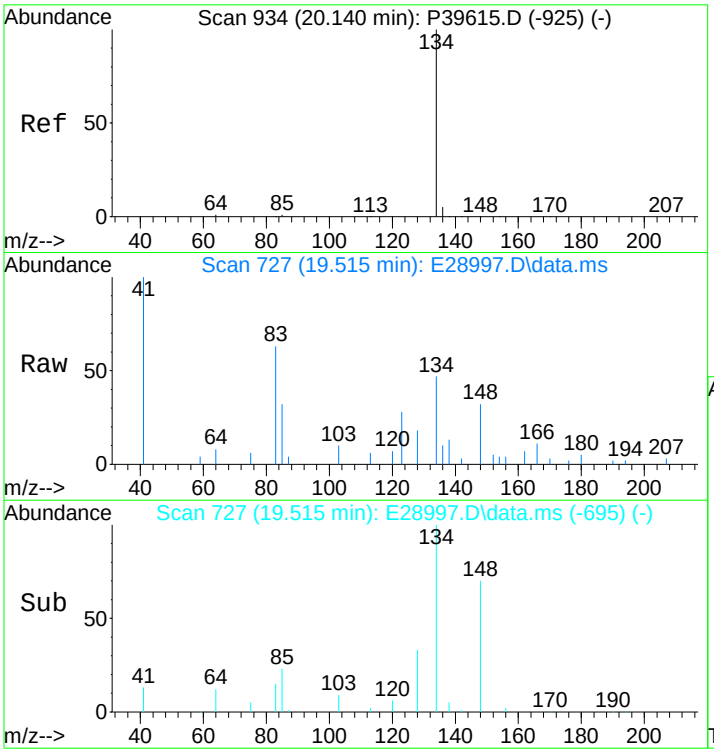


#17
1-Methylnaphthalene
Concen: 615.72 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:142 Resp: 33707

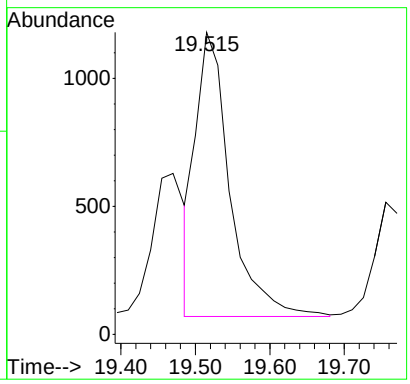
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

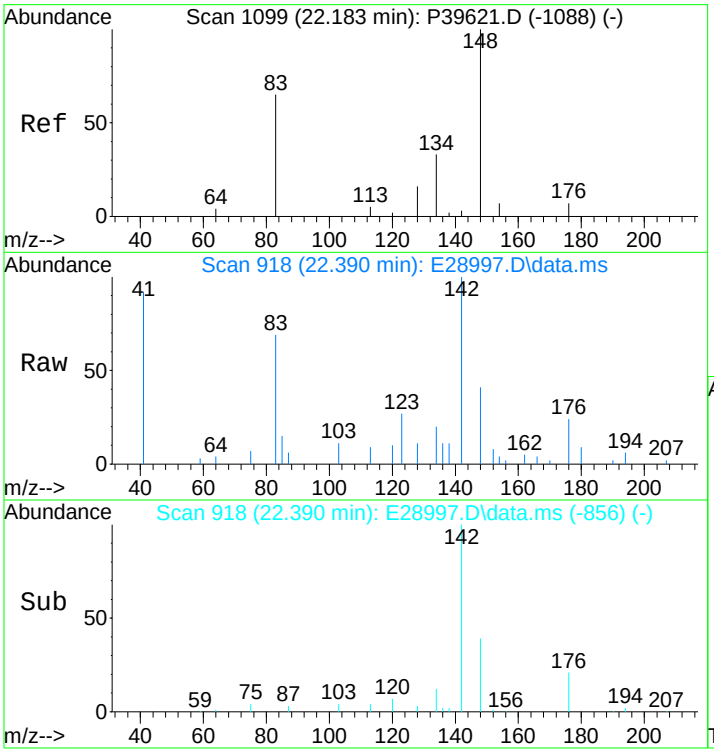




#18
Benzothiophene
Concen: 48.61 ng/mL m
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

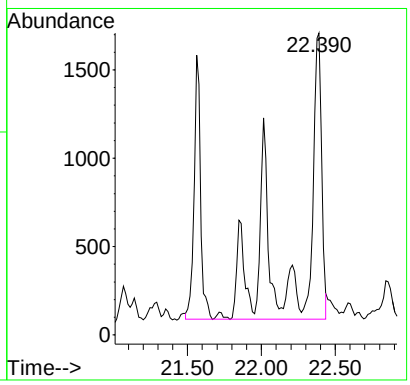
Tgt Ion:134 Resp: 3555

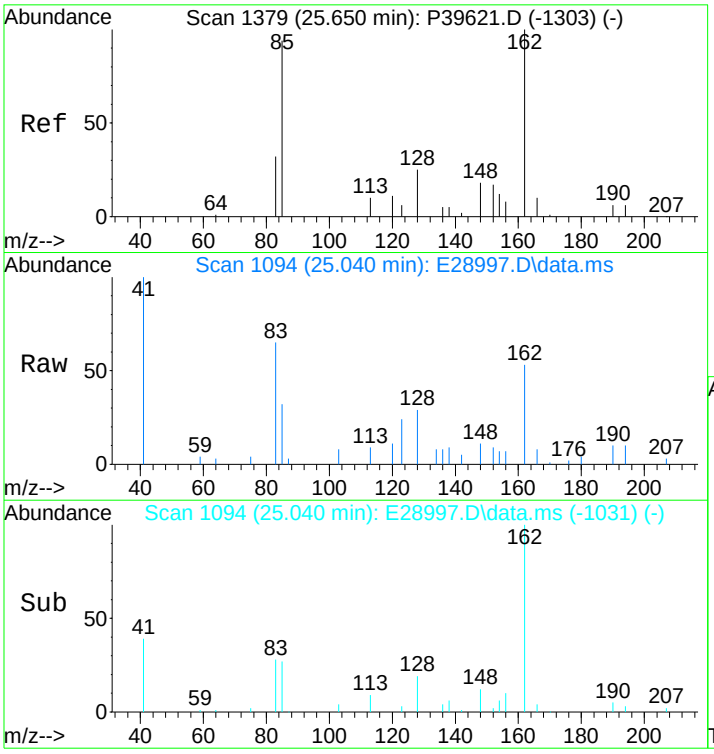




#19
C1-Benzo(b)thiophenes
Concen: 252.21 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.689 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

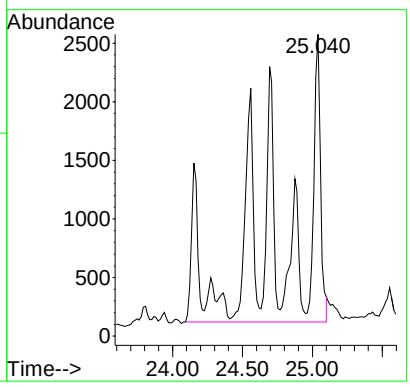
Tgt Ion:148 Resp: 18443

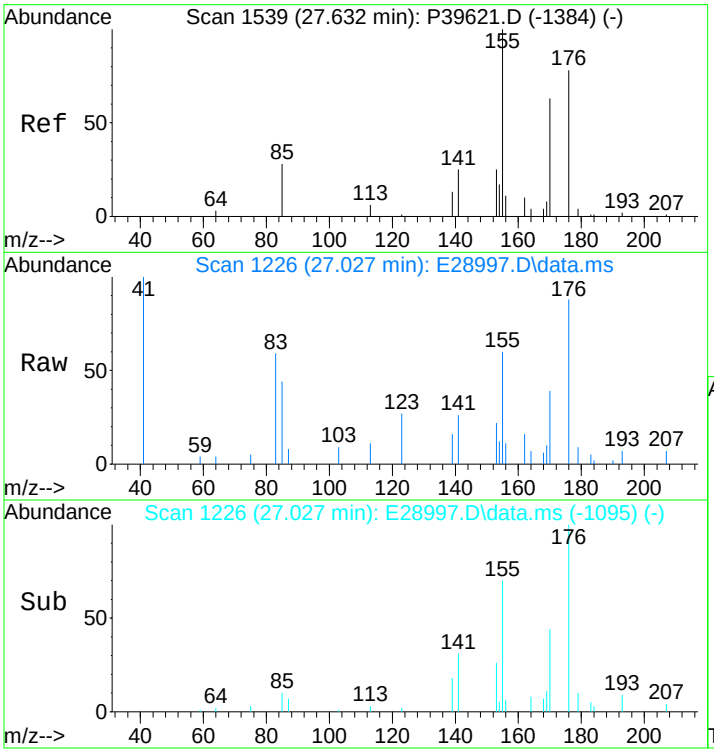




#20
C2-Benzo(b)thiophenes
Concen: 470.22 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

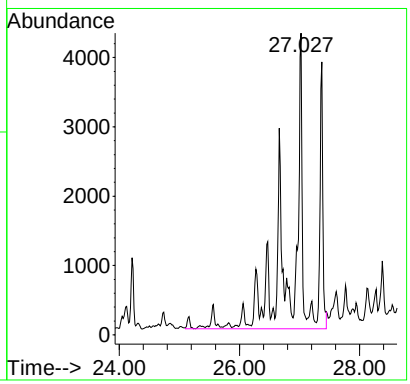
Tgt Ion:162 Resp: 34386

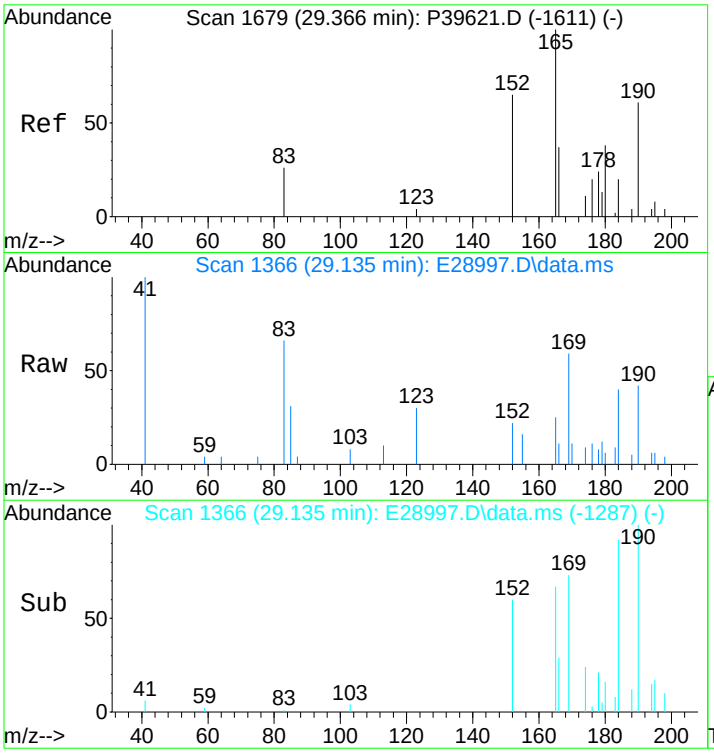




#21
C3-Benzo(b)thiophenes
Concen: 836.94 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

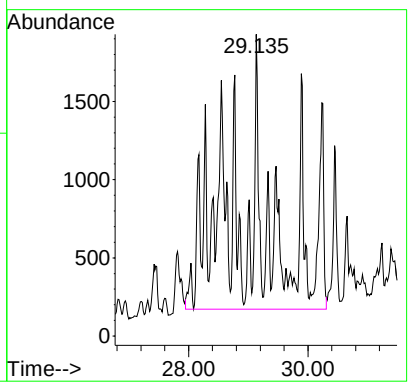
Tgt Ion:176 Resp: 61203

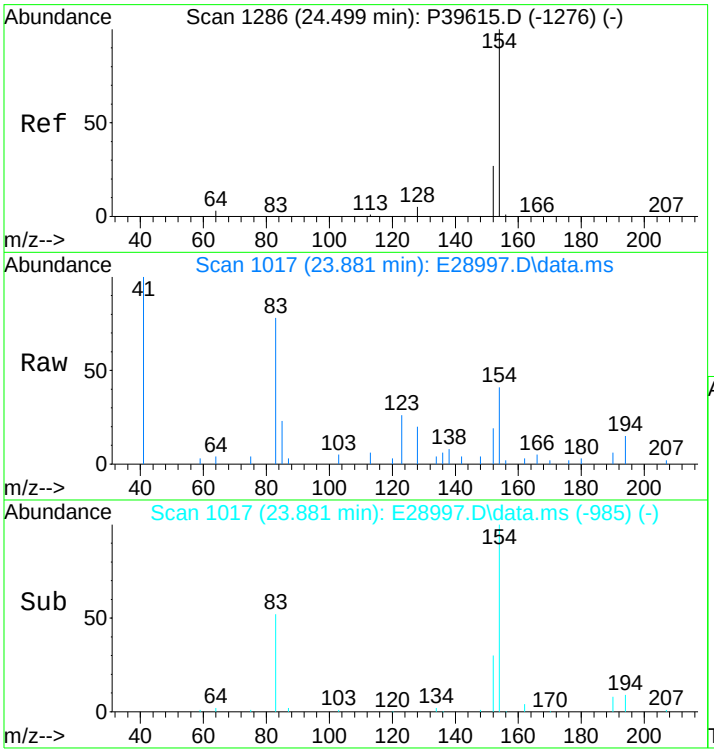




#22
C4-Benzo(b)thiophenes
Concen: 890.77 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:190 Resp: 65139

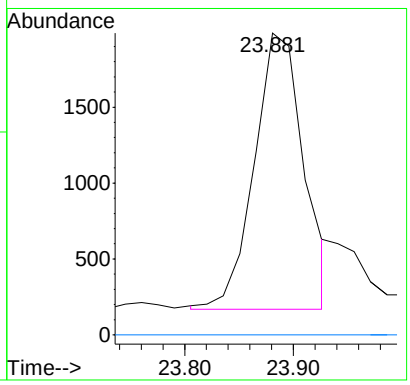


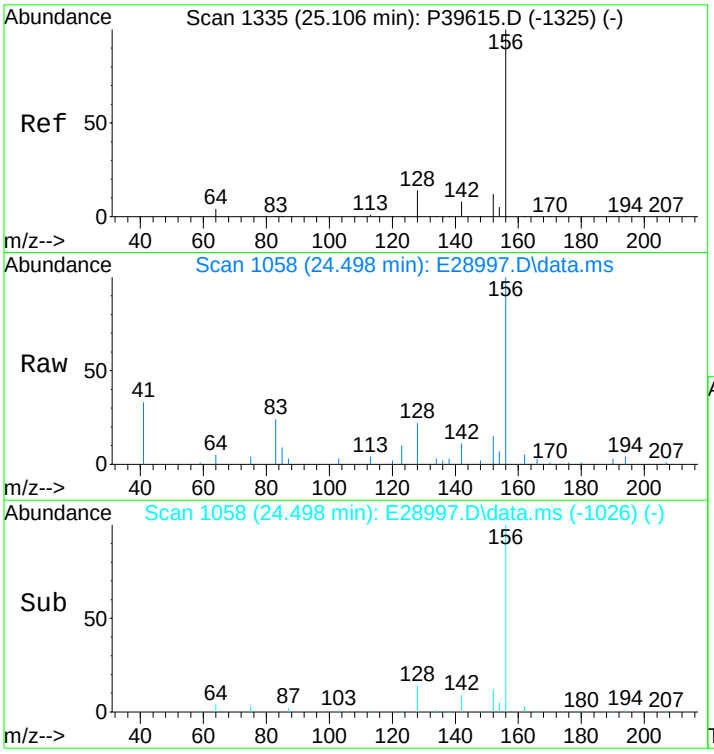


#23
Biphenyl
Concen: 81.15 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:154 Resp: 5778

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

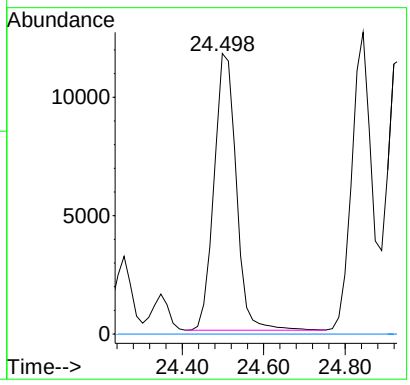


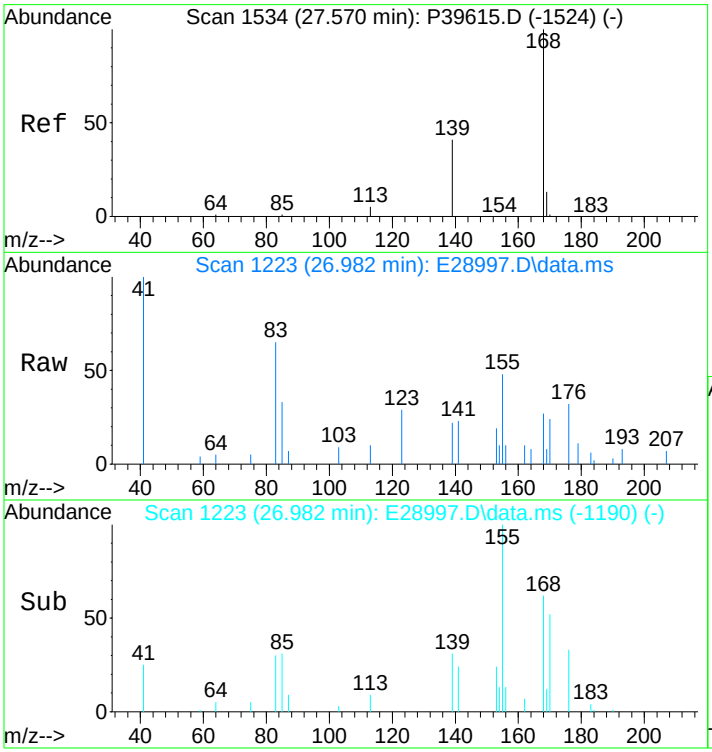


#24
2,6-Dimethylnaphthalene
Concen: 870.98 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:156 Resp: 44230

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

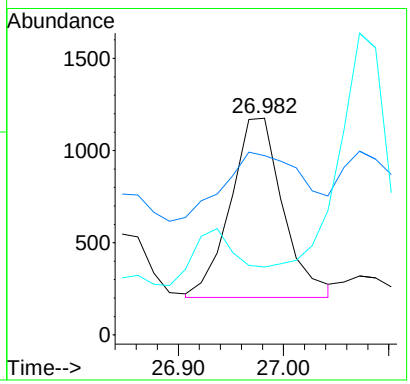


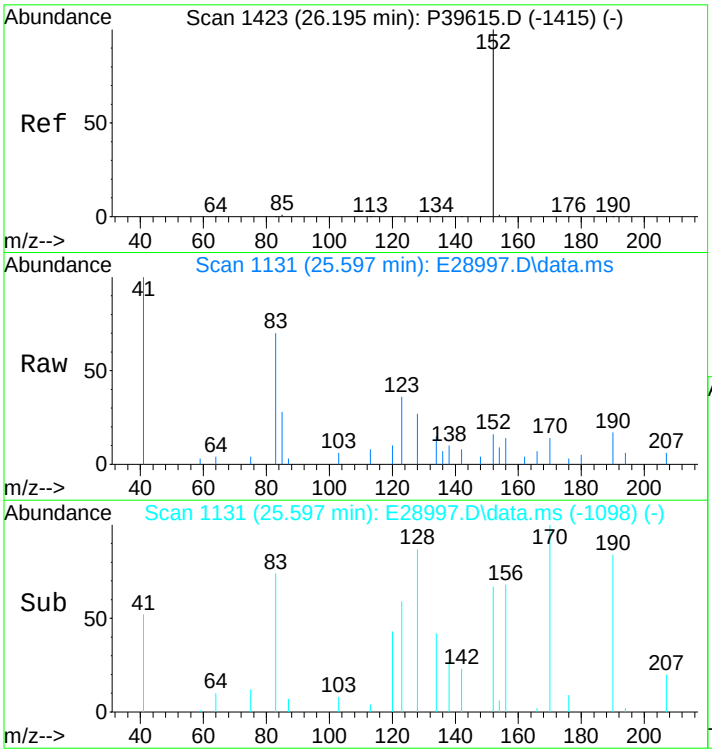


#25
Dibenzofuran
Concen: 42.84 ng/mL m
RT: 26.982 min Scan# 1223
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:168 Resp: 3377

Ion	Ratio	Lower	Upper
168	100		
139	58.5	26.0	39.0#
169	0.0	10.6	16.0#

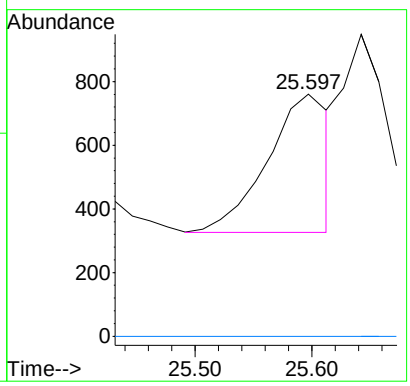


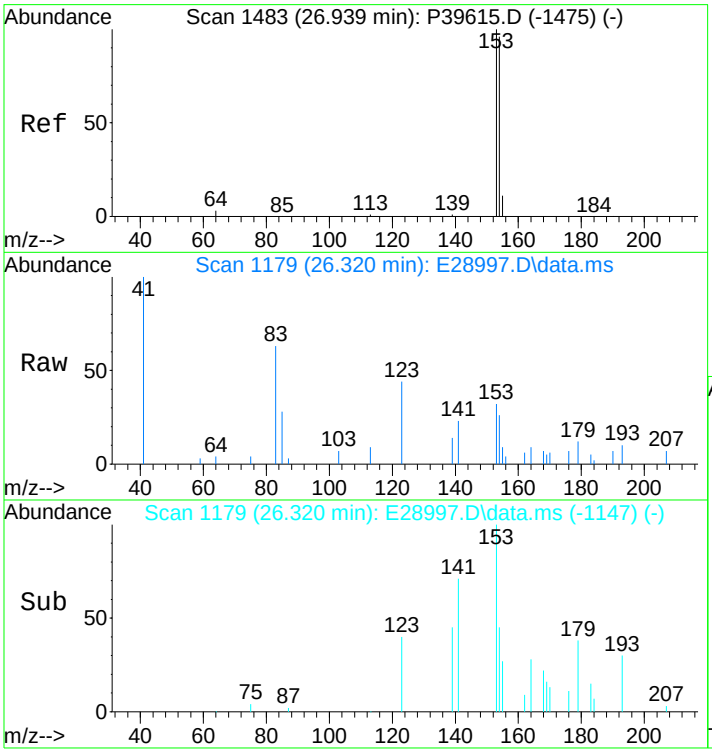


#26
Acenaphthylene
Concen: 18.02 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:152 Resp: 1589

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

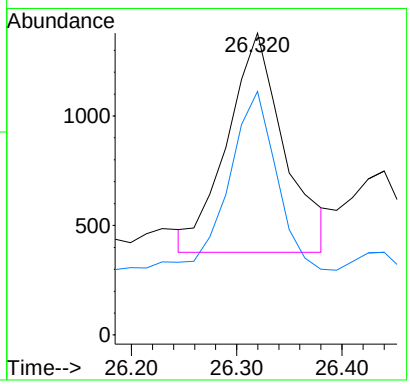


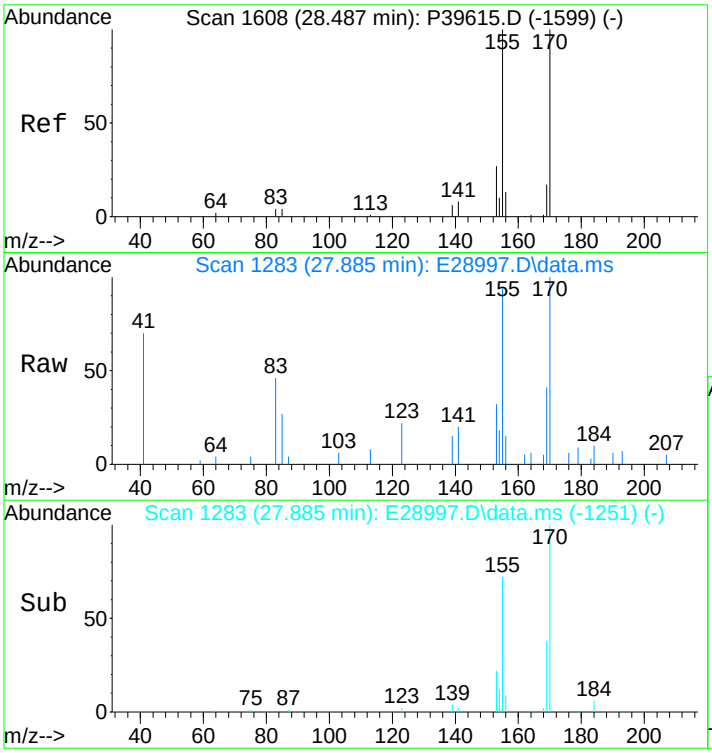


#27
Acenaphthene
Concen: 66.43 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:153 Resp: 3771

Ion	Ratio	Lower	Upper
153	100		
154	79.9	74.1	111.1

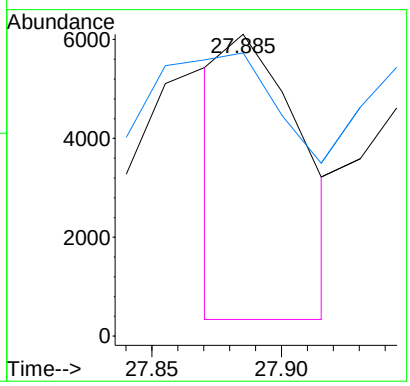


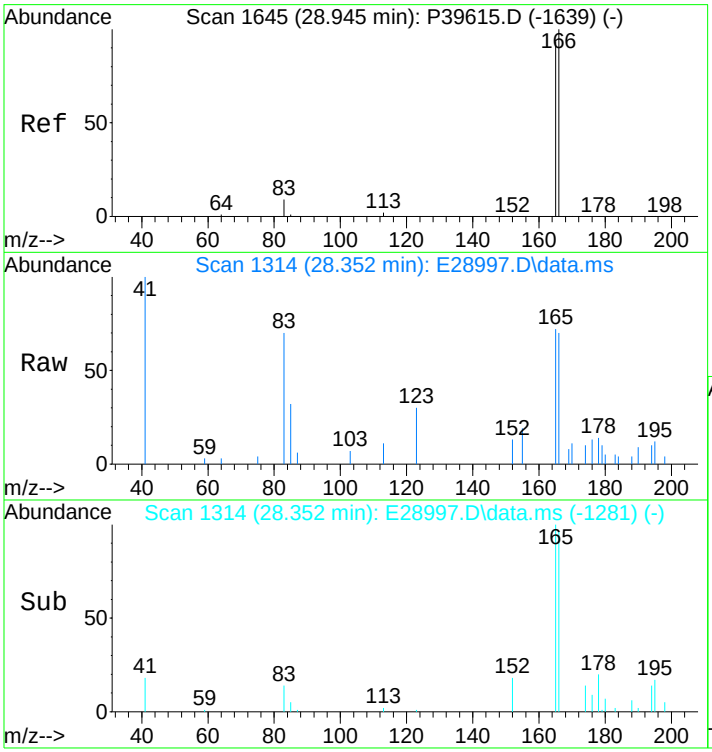


#28
2,3,5-Trimethylnaphthalene
Concen: 252.09 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:170 Resp: 11977

Ion	Ratio	Lower	Upper
170	100		
155	139.2	70.7	106.1#

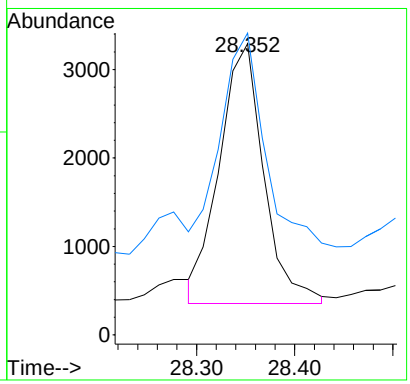


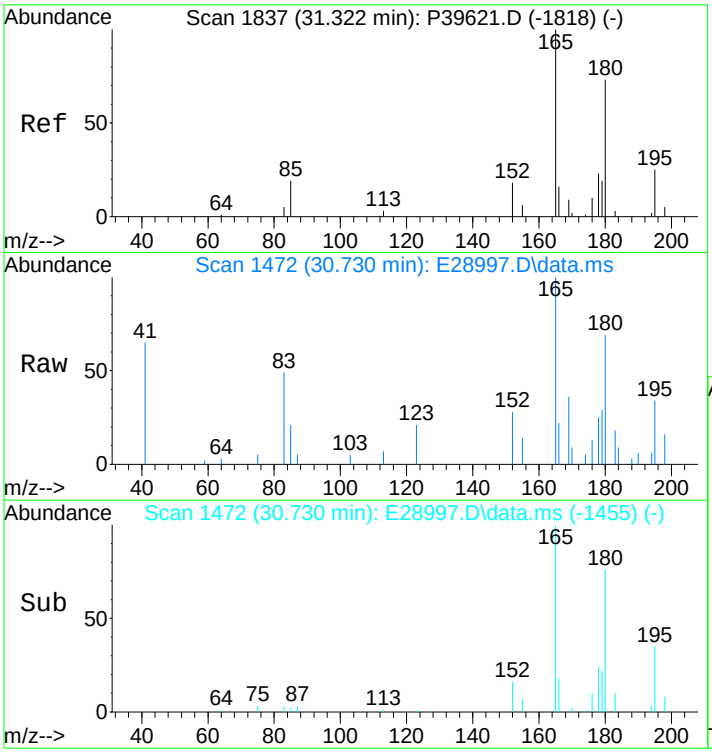


#29
Fluorene
Concen: 145.80 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:166 Resp: 9231

Ion	Ratio	Lower	Upper
166	100		
165	176.7	74.7	112.1#

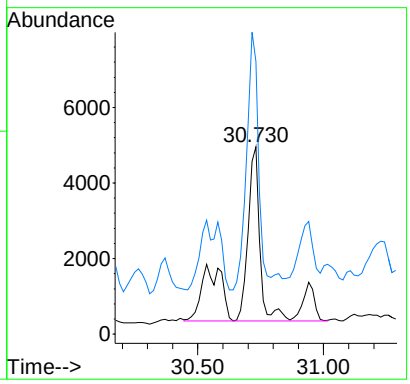


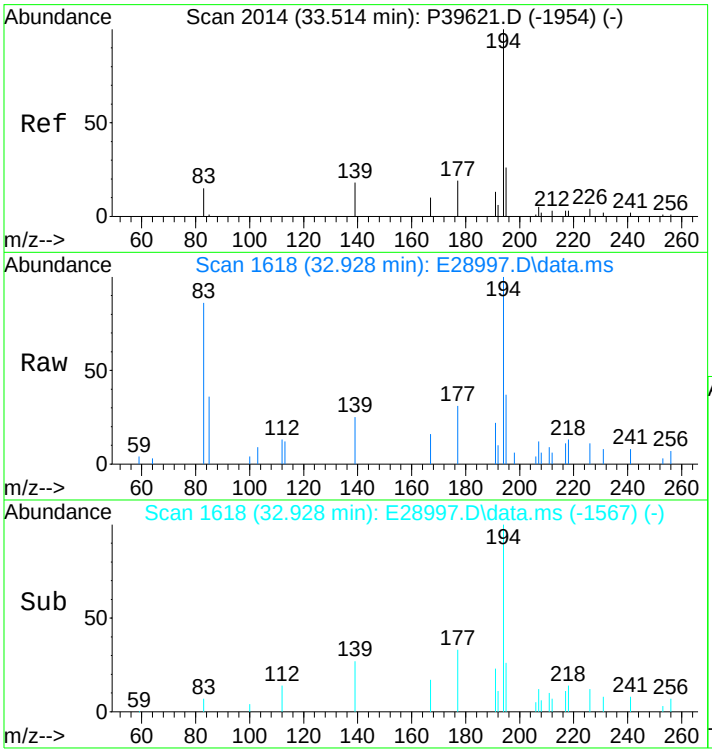


#30
C1-Fluorenes
Concen: 416.13 ng/mL m
RT: 30.730 min Scan# 1472
Delta R.T. 0.108 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:180 Resp: 26347

Ion	Ratio	Lower	Upper
180	100		
165	32.5	94.3	141.5#

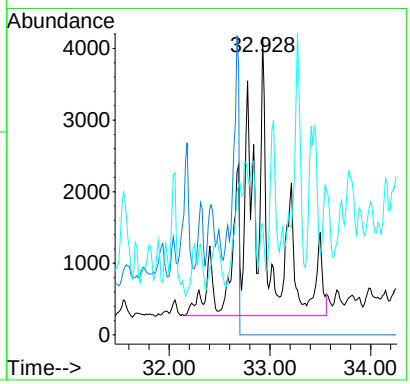


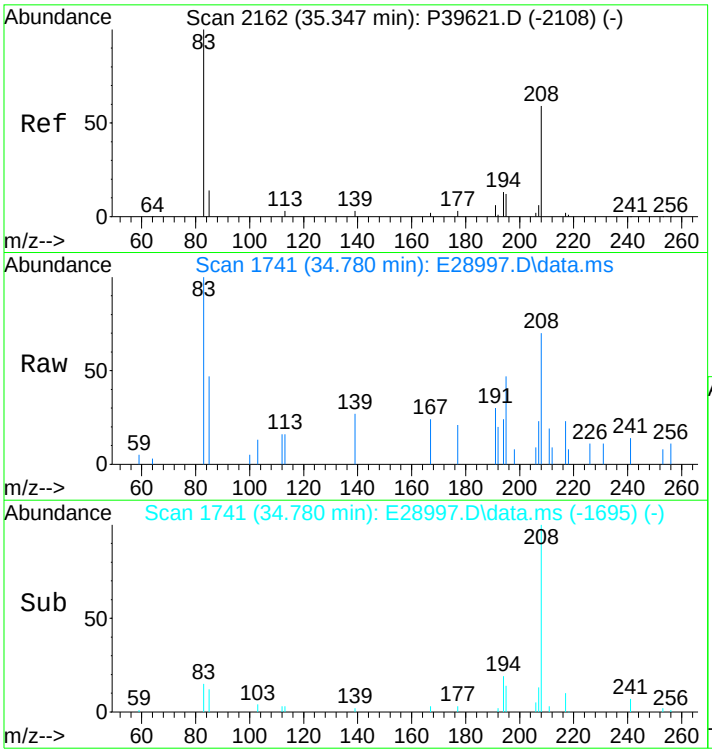


#31
C2-Fluorenes
Concen: 977.33 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:194 Resp: 61879

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	1.9	27.0	40.4#

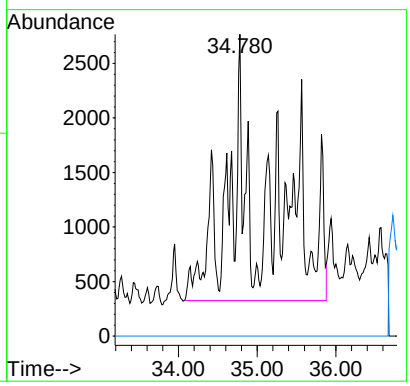


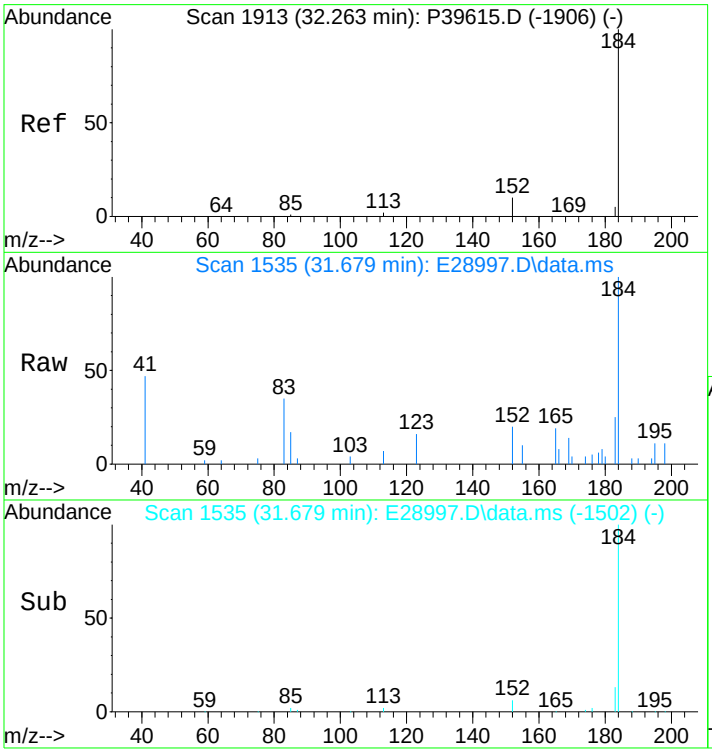


#32
C3-Fluorenes
Concen: 1176.04 ng/mL m
RT: 34.780 min Scan# 1741
Delta R.T. 0.231 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:208 Resp: 74460

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

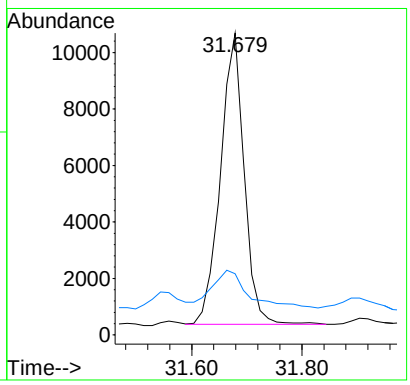


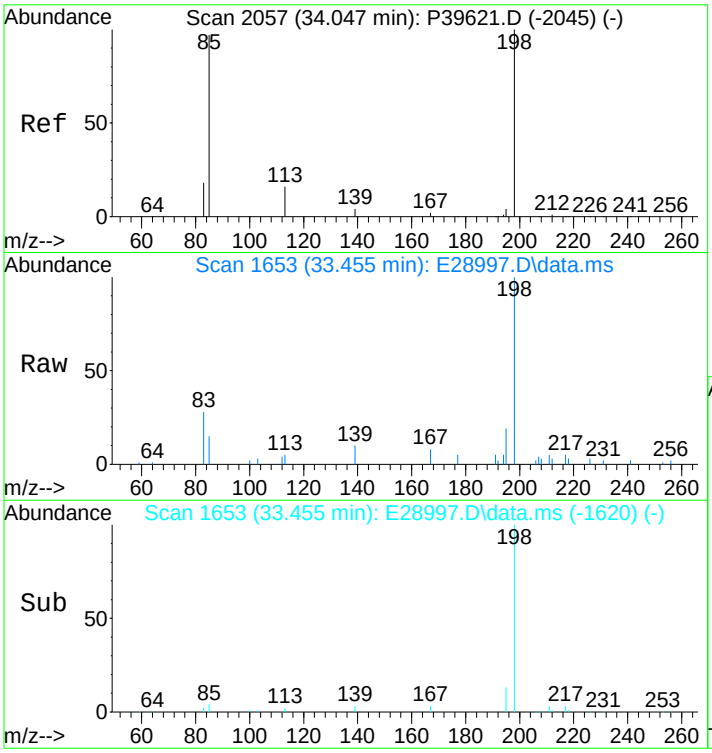


#33
Dibenzothiophene
Concen: 354.22 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:184 Resp: 30776

Ion	Ratio	Lower	Upper
184	100		
152	20.1	7.0	10.6#

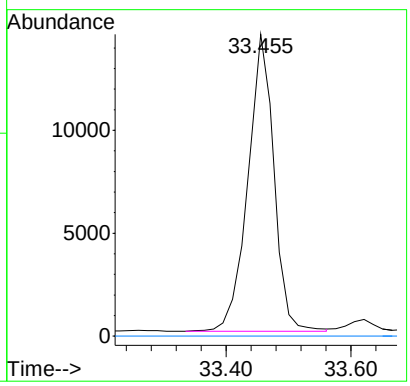


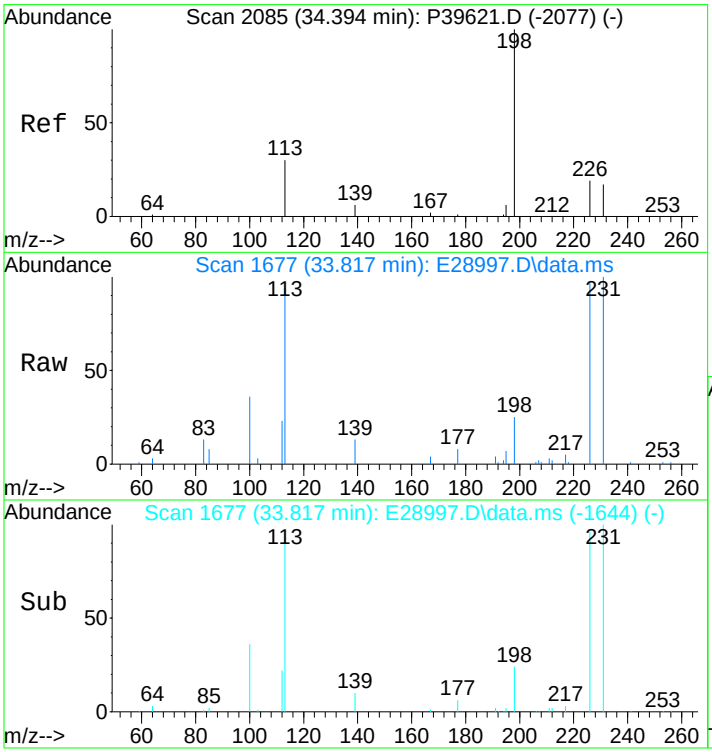


#34
4-Methyldibenzothiophene(4MDT)
Concen: 481.82 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 41863

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

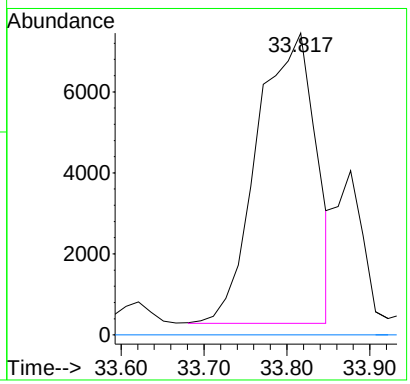


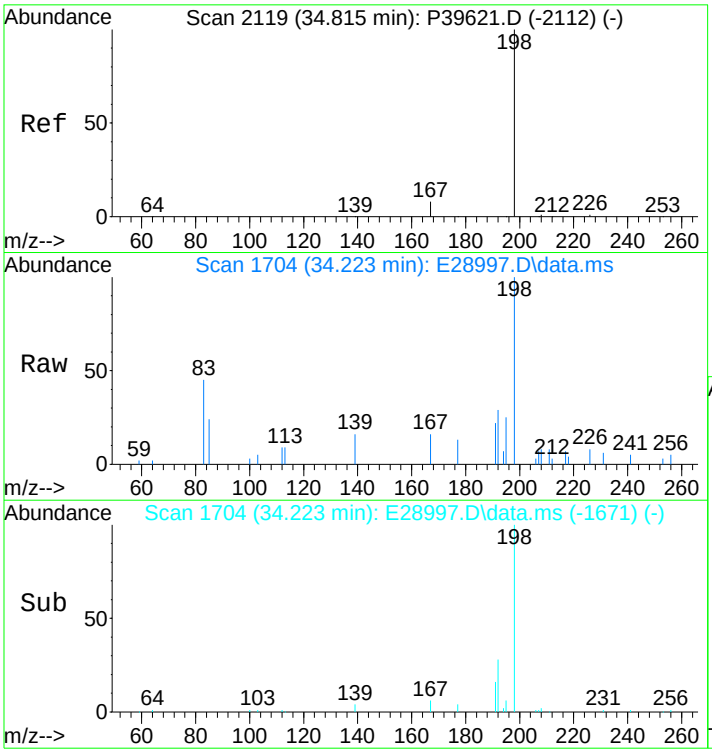


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 405.24 ng/mL m
RT: 33.817 min Scan# 1677
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 35209

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

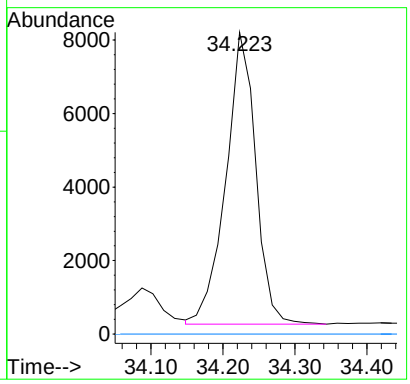


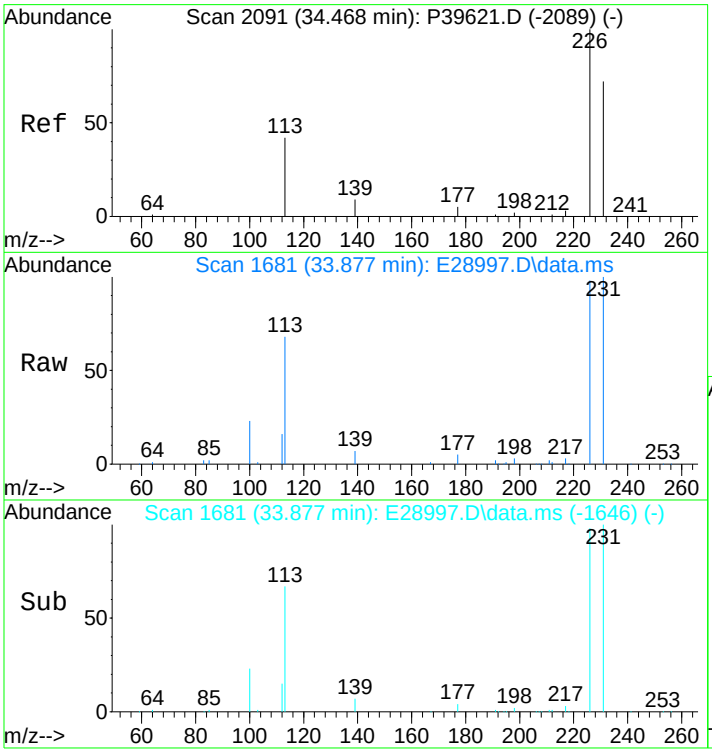


#36
1-Methyldibenzothiophene(1MDT)
Concen: 263.27 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 22874

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

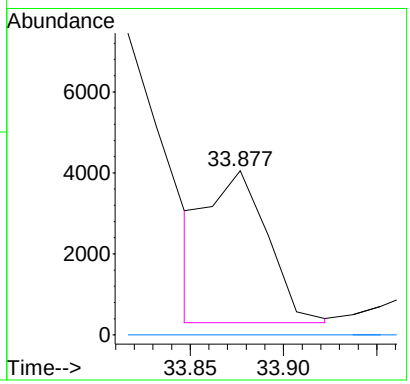


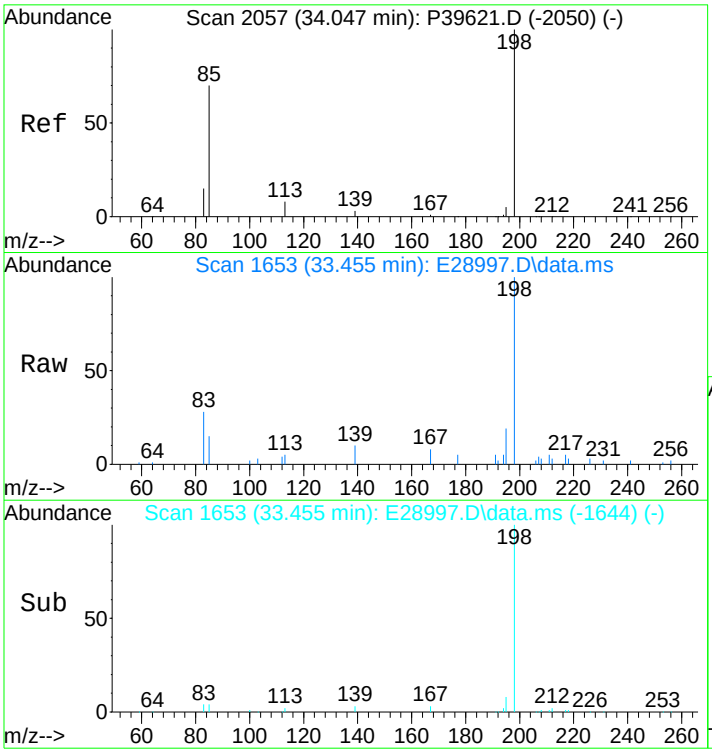


#37
OTP
Concen: 94.93 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 8248

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

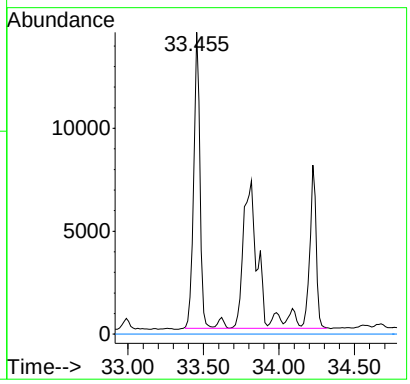


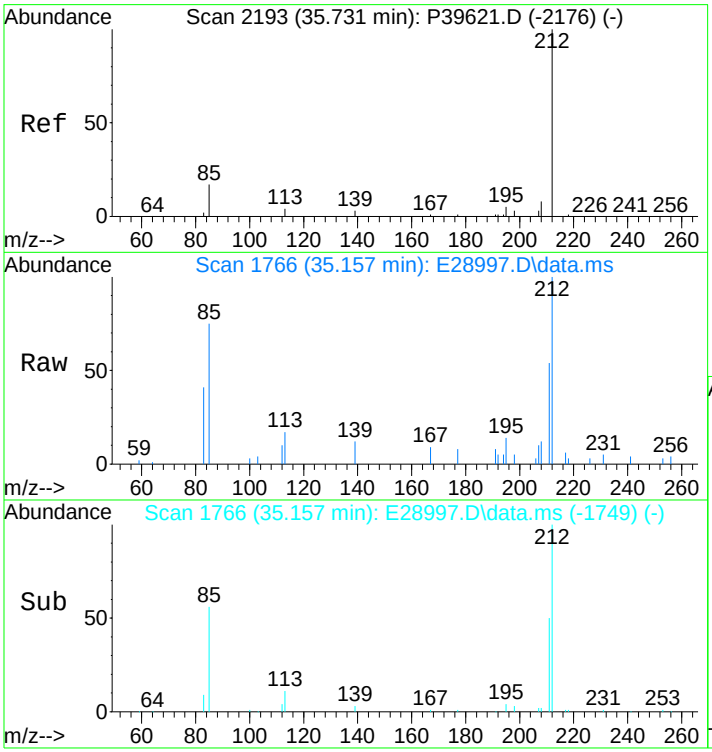


#38
C1-Dibenzothiophenes
Concen: 1327.77 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 115363

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

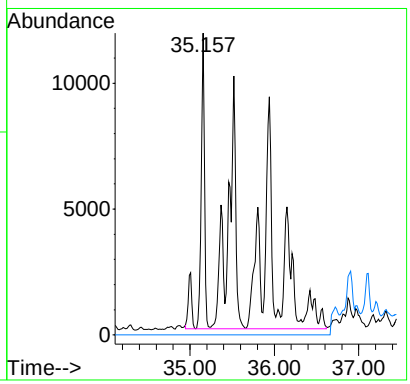


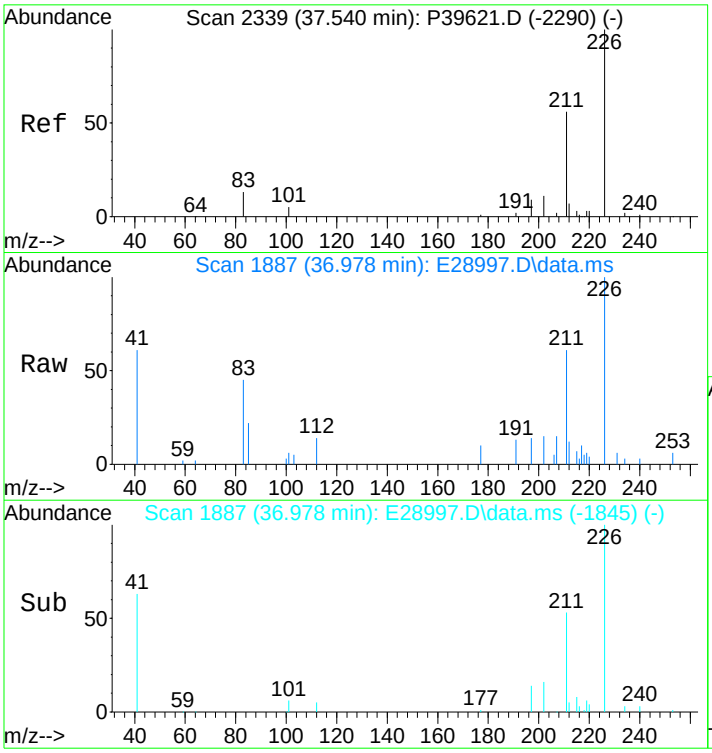


#39
C2-Dibenzothiophenes
Concen: 2332.29 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:212 Resp: 202640

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

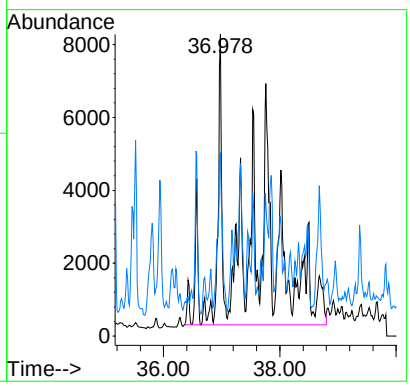


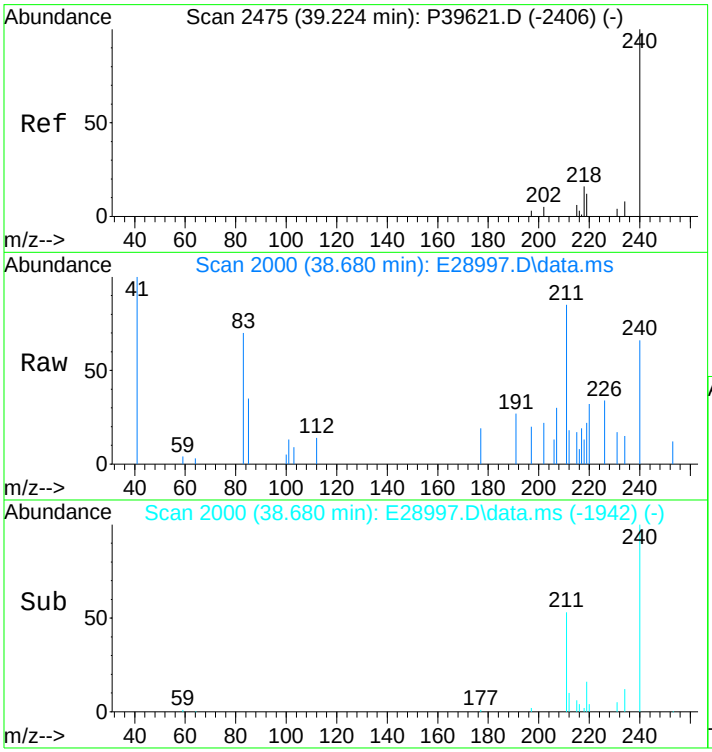


#40
C3-Dibenzothiophenes
Concen: 2560.65 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.290 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:226 Resp: 222481

Ion	Ratio	Lower	Upper
226	100		
211	1.6	44.1	66.1#

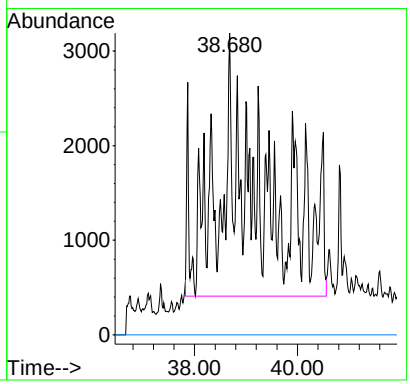


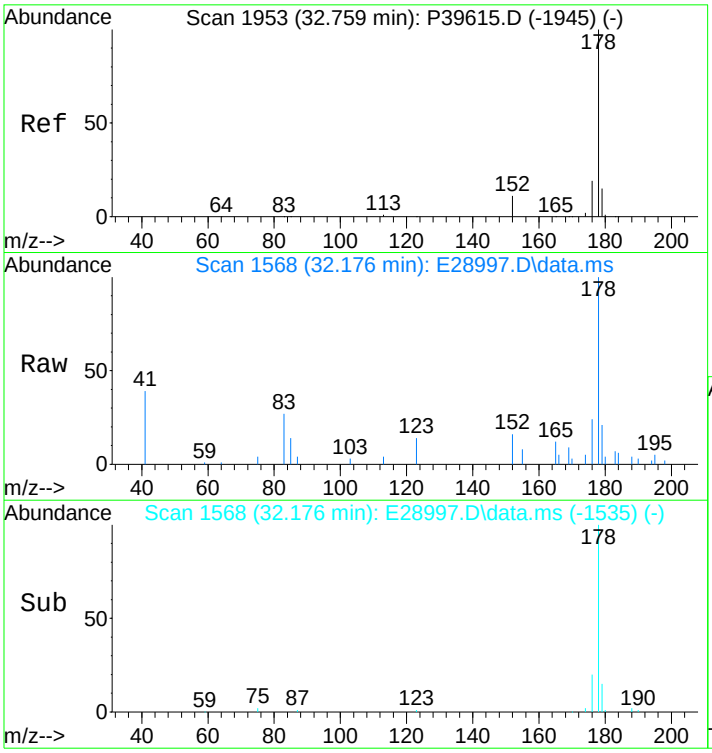


#41
C4-Dibenzothiophenes
Concen: 1776.53 ng/mL m
RT: 38.680 min Scan# 2000
Delta R.T. 0.335 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:240 Resp: 154353

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

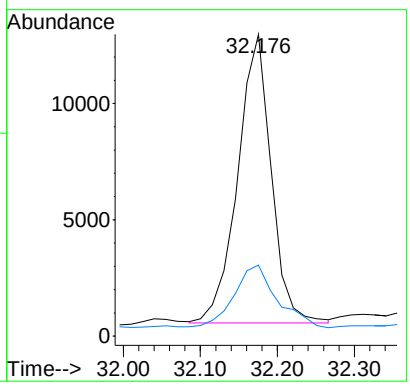


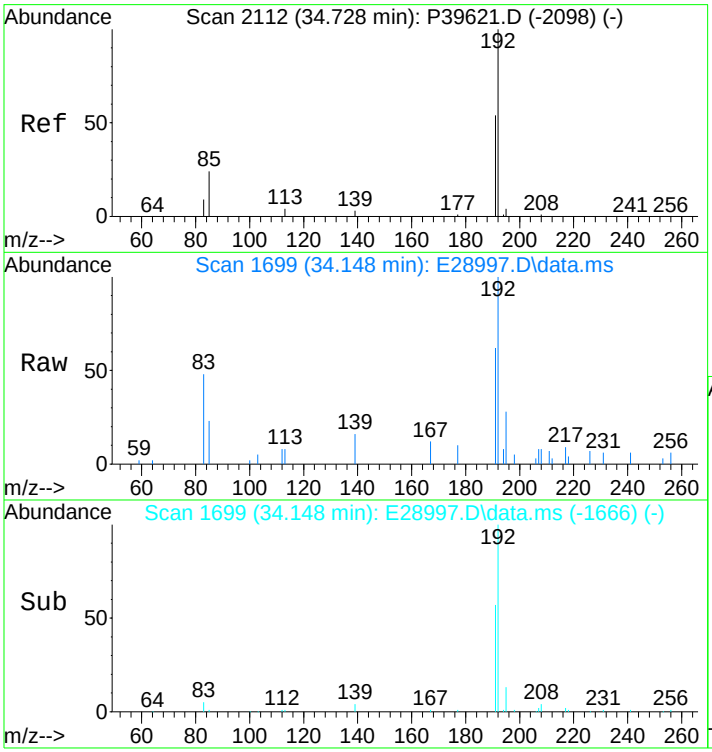


#43
Phenanthrene
Concen: 423.78 ng/mL m
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:178 Resp: 37460

Ion	Ratio	Lower	Upper
178	100		
176	0.4	15.0	22.4#

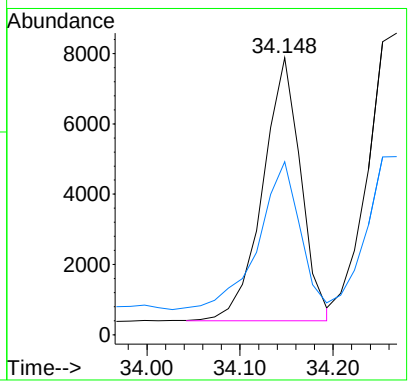


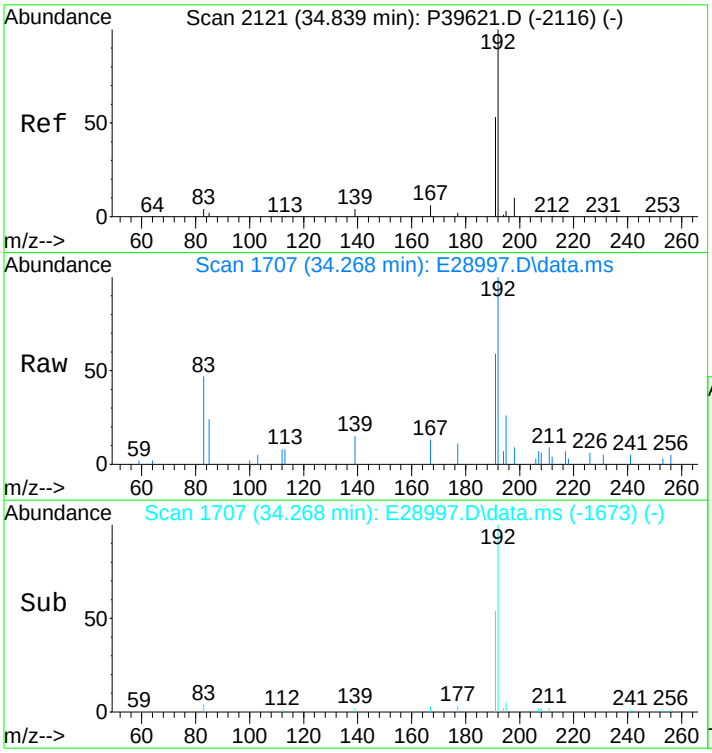


#44
3-Methylphenanthrene(3MP)
Concen: 240.77 ng/mL m
RT: 34.148 min Scan# 1699
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 21283

Ion	Ratio	Lower	Upper
192	100		
191	64.4	45.9	68.9

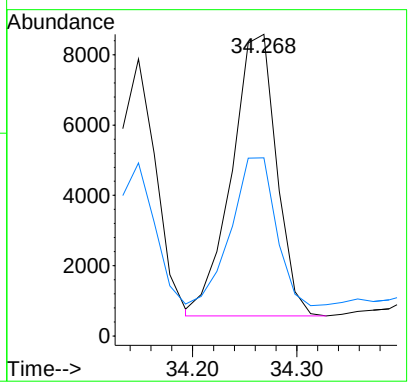


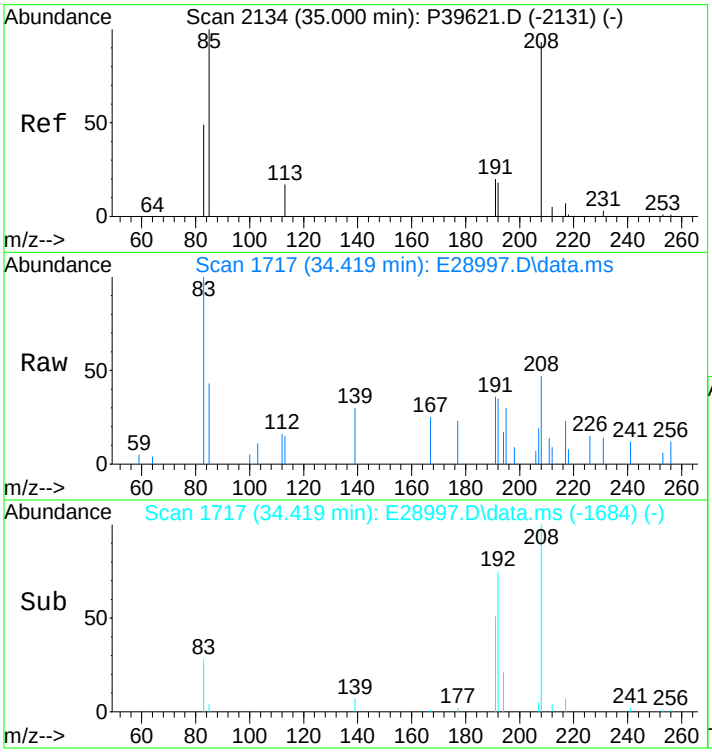


#45
2-Methylphenanthrene(2MP)
Concen: 272.28 ng/mL
RT: 34.268 min Scan# 1707
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 24068

Ion	Ratio	Lower	Upper
192	100		
191	51.5	45.4	68.0

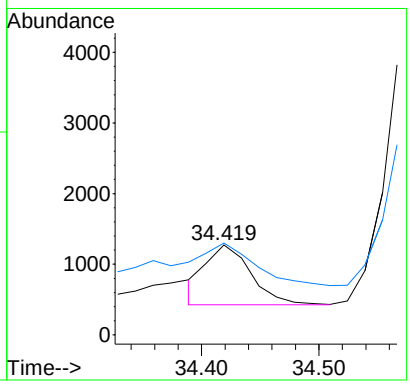


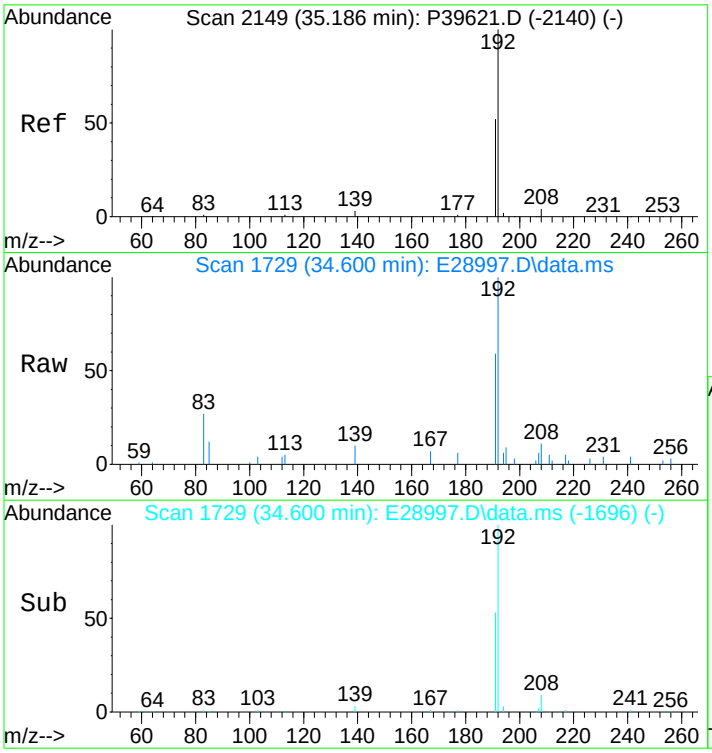


#46
2-Methylanthracene(2MA)
Concen: 25.59 ng/mL m
RT: 34.419 min Scan# 1717
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 2262

Ion	Ratio	Lower	Upper
192	100		
191	128.0	95.4	143.0

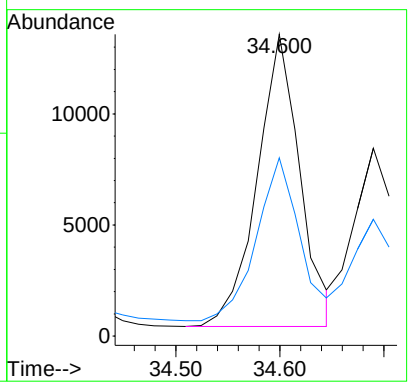


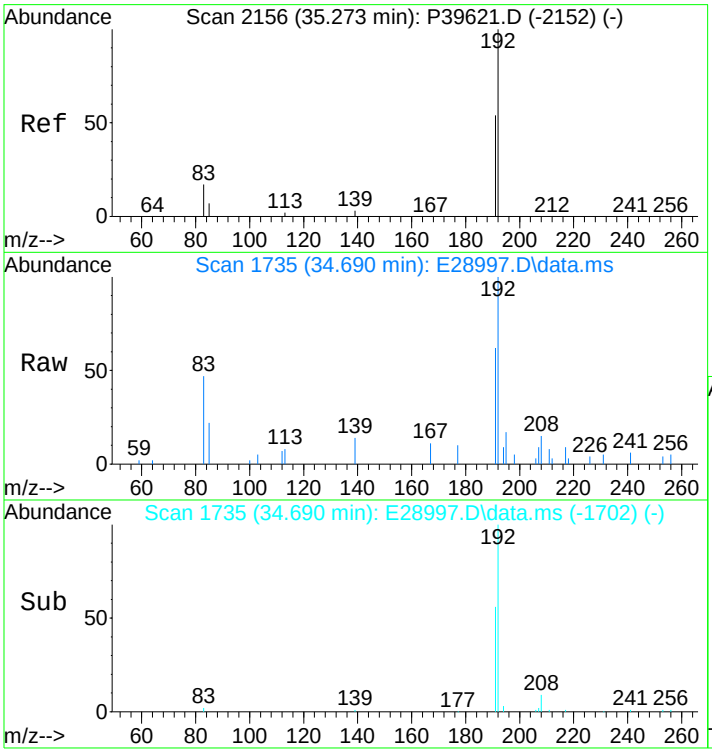


#47
9/4-Methylphenanthrene(9MP)
Concen: 425.67 ng/mL
RT: 34.600 min Scan# 1729
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 37627

Ion	Ratio	Lower	Upper
192	100		
191	56.3	44.3	66.5

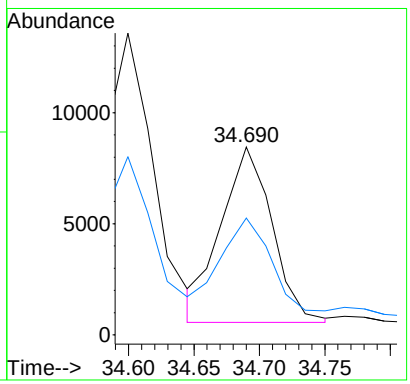


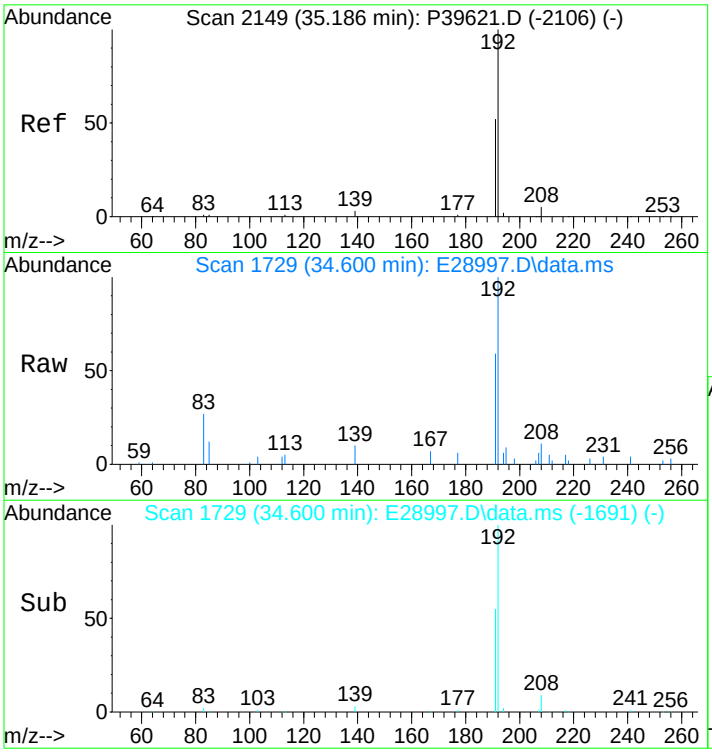


#48
1-Methylphenanthrene(1MP)
Concen: 241.09 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 21311

Ion	Ratio	Lower	Upper
192	100		
191	53.1	46.7	70.1

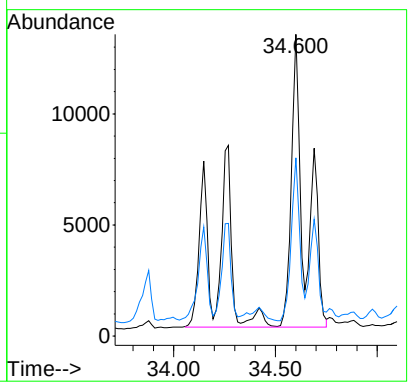


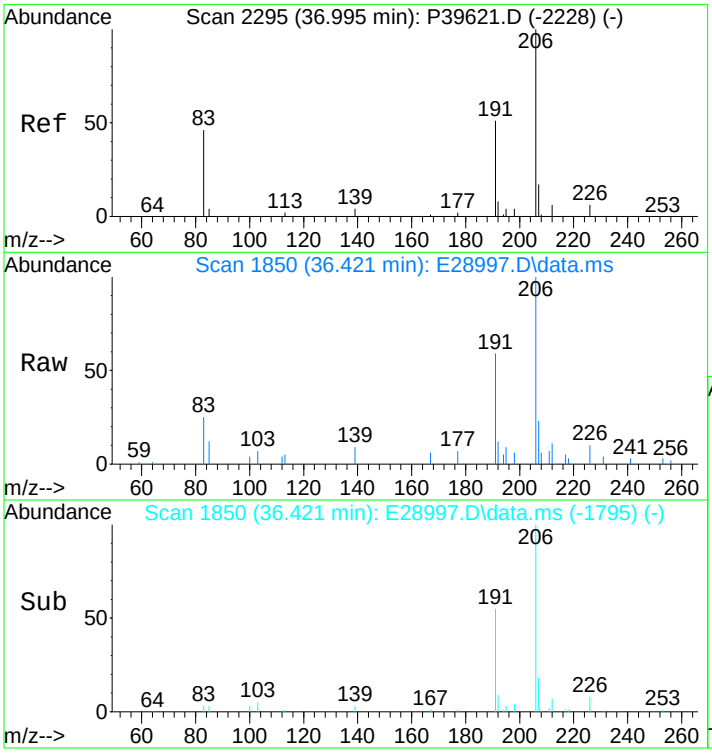


#49
C1-Phenanthrenes/Anthracenes
Concen: 1246.96 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.196 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 110226

Ion	Ratio	Lower	Upper
192	100		
191	11.2	44.0	66.0#

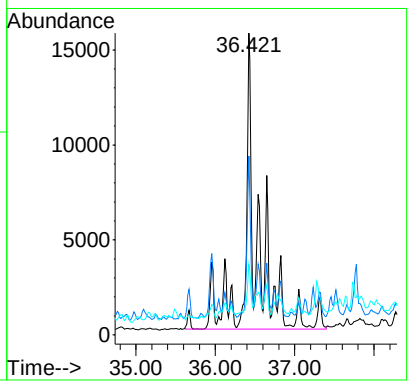


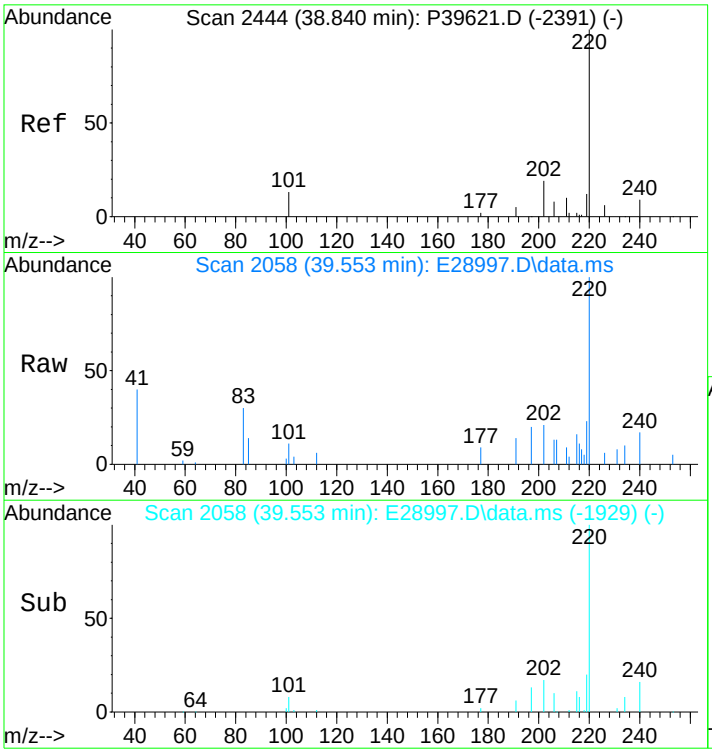


#50
C2-Phenanthrenes/Anthracenes
Concen: 1886.32 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:206 Resp: 166742

Ion	Ratio	Lower	Upper
206	100		
191	16.0	35.7	53.5#
207	5.6	16.5	24.7#

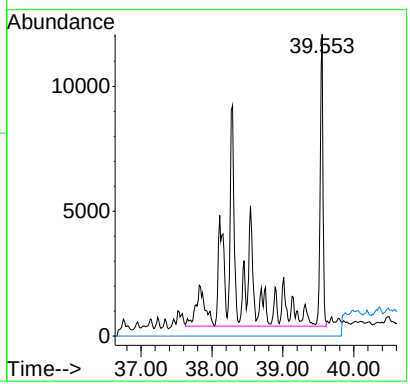


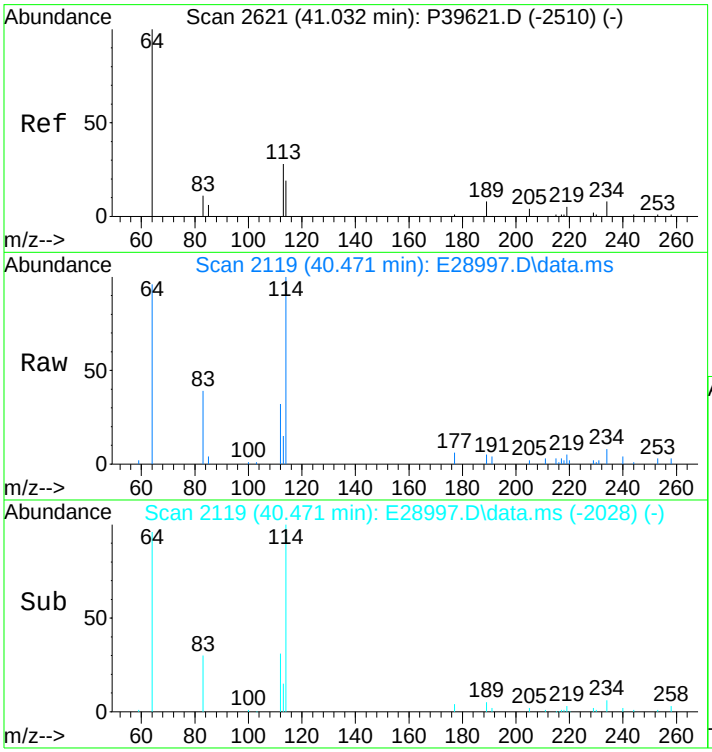


#52
C3-Phenanthrenes/Anthracenes
Concen: 1803.68 ng/mL m
RT: 39.553 min Scan# 2058
Delta R.T. 1.590 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:220 Resp: 159437

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

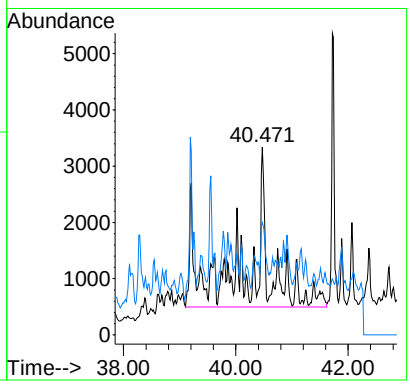


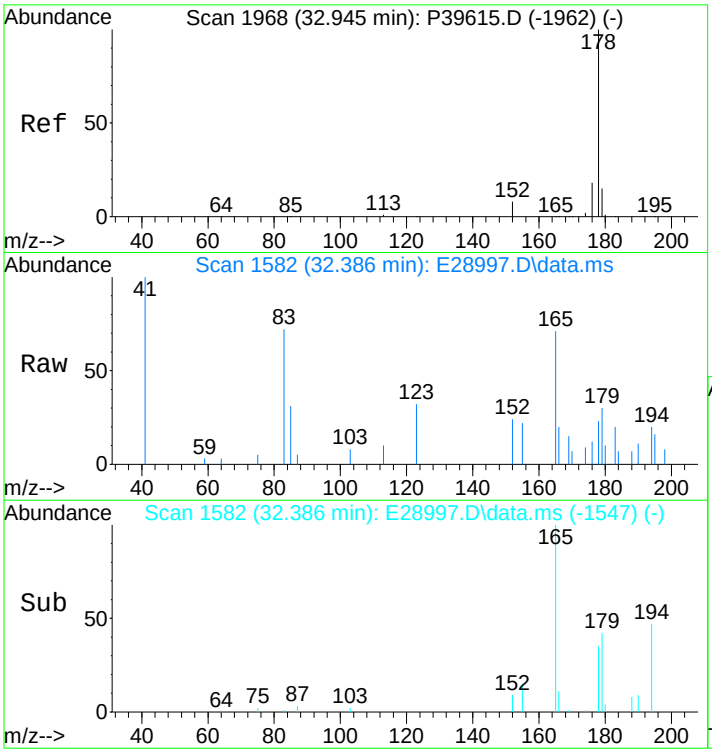


#53
C4-Phenanthrenes/Anthracenes
Concen: 835.45 ng/mL m
RT: 40.471 min Scan# 2119
Delta R.T. 0.384 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 73850

Ion	Ratio	Lower	Upper
234	100		
219	2.1	46.6	70.0#

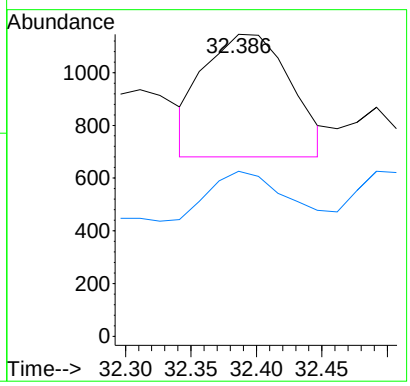


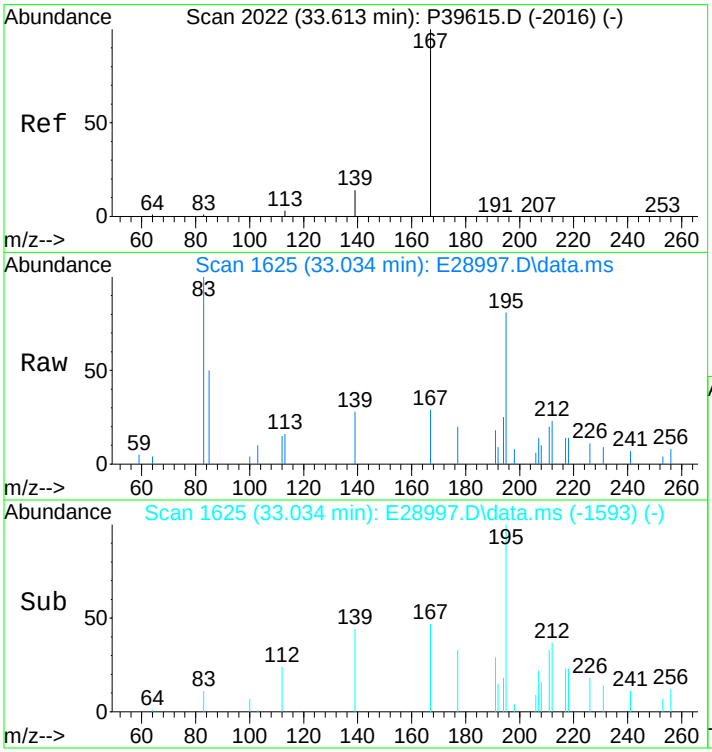


#55
Anthracene
Concen: 27.98 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:178 Resp: 2138

Ion	Ratio	Lower	Upper
178	100		
176	0.0	14.3	21.5#

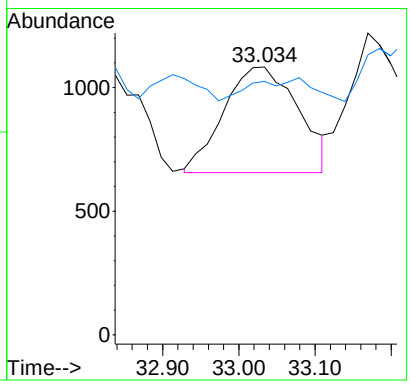


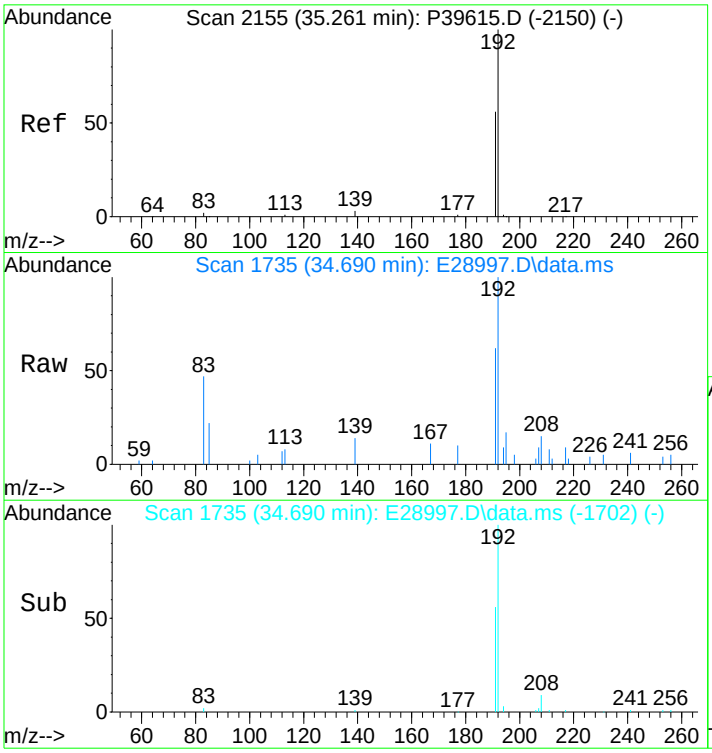


#56
Carbazole
Concen: 36.97 ng/mL m
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:167 Resp: 2907

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.1	15.1#

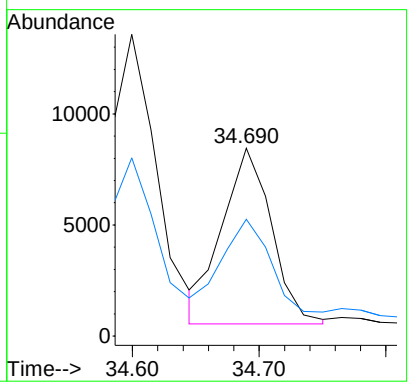


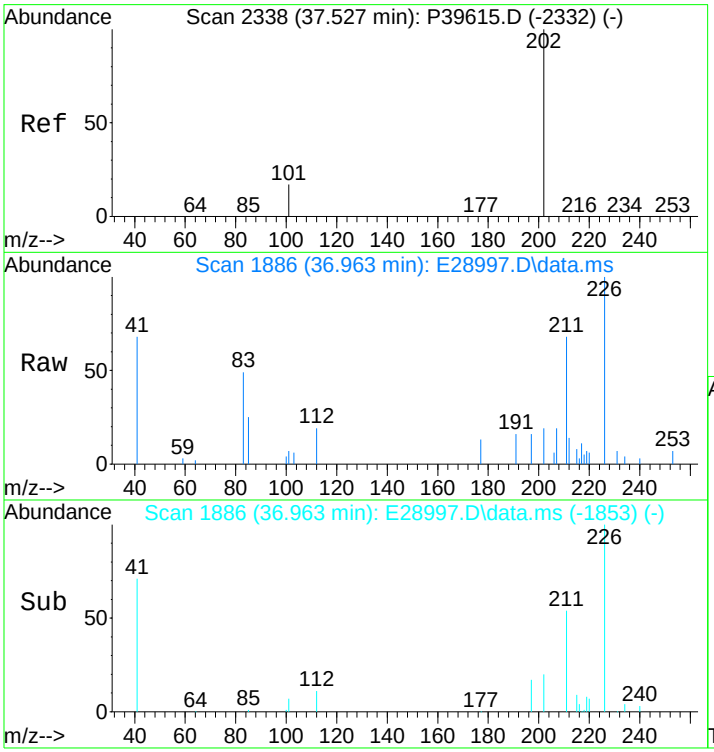


#57
1-Methylphenanthrene
Concen: 317.79 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 21431

Ion	Ratio	Lower	Upper
192	100		
191	52.8	45.4	68.2

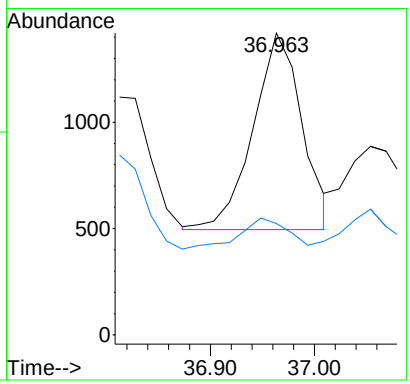


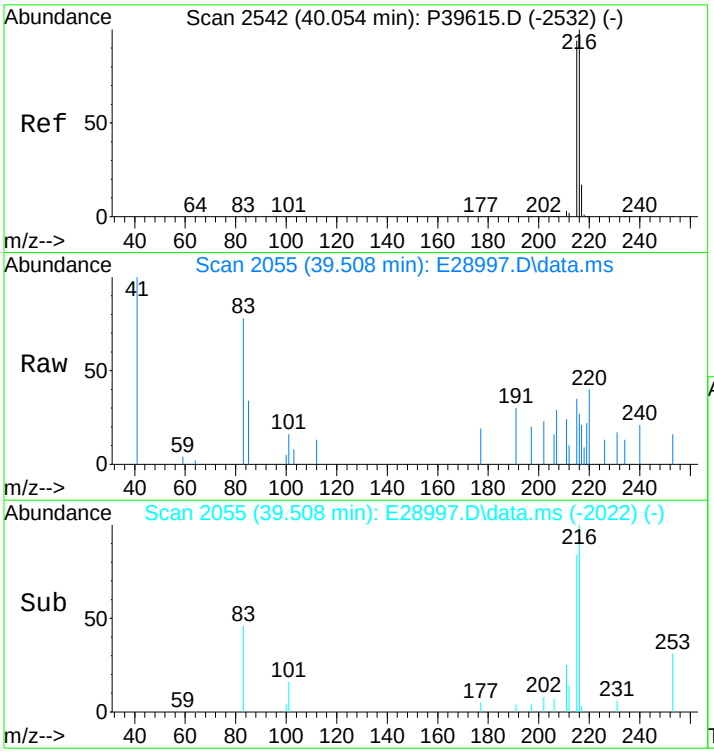


#58
Fluoranthene
Concen: 30.93 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:202 Resp: 3019

Ion	Ratio	Lower	Upper
202	100		
101	29.6	10.4	15.6#

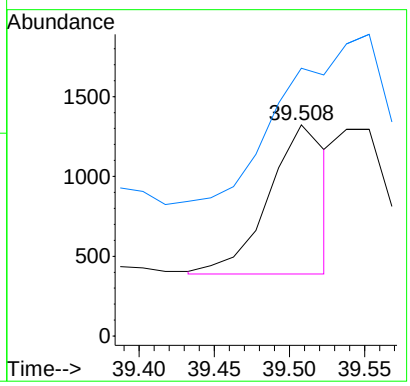


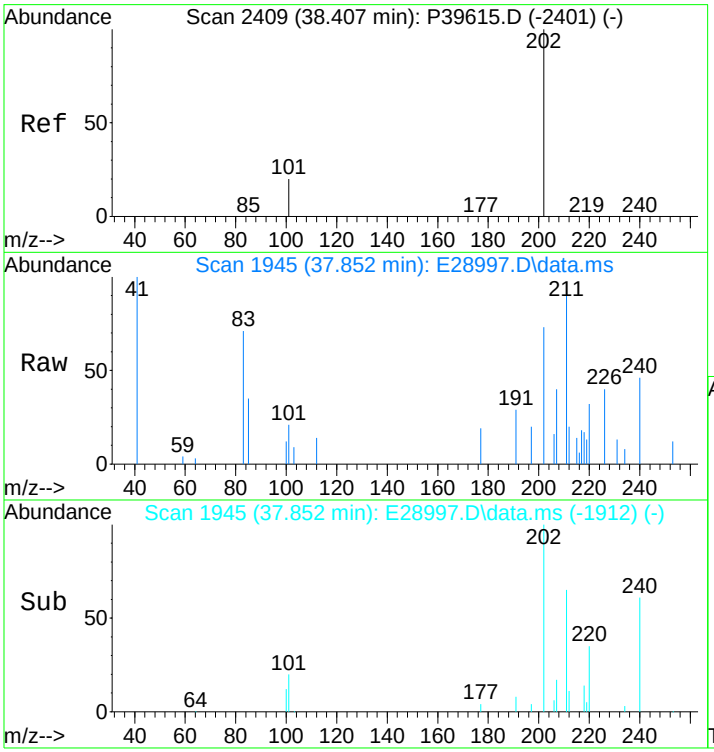


#59
Benzo(b)fluorene
Concen: 39.05 ng/mL m
RT: 39.508 min Scan# 2055
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:216 Resp: 2540

Ion	Ratio	Lower	Upper
216	100		
215	125.6	72.6	109.0#

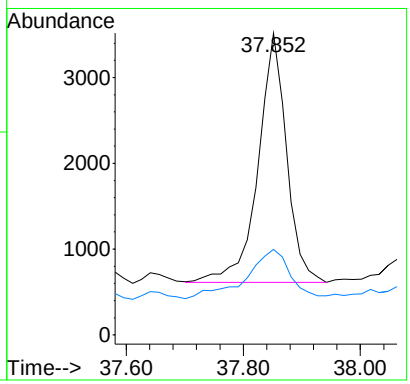


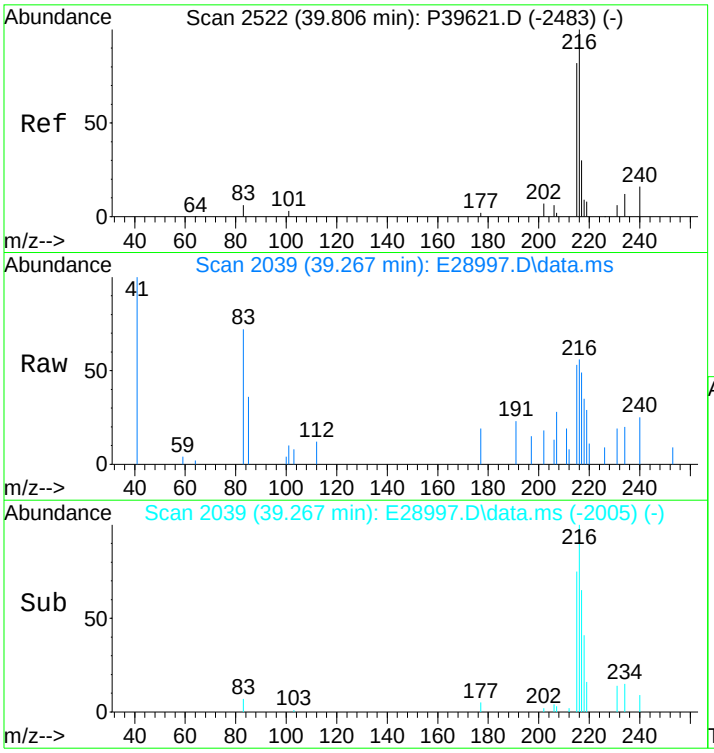


#60
Pyrene
Concen: 98.98 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:202 Resp: 9821

Ion	Ratio	Lower	Upper
202	100		
101	30.8	11.0	16.4#

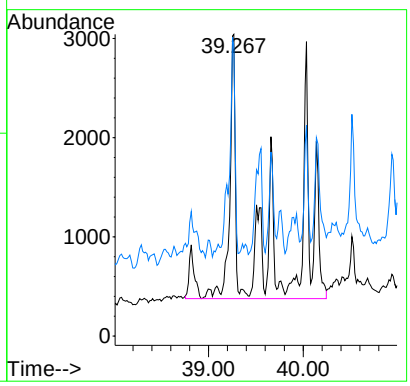


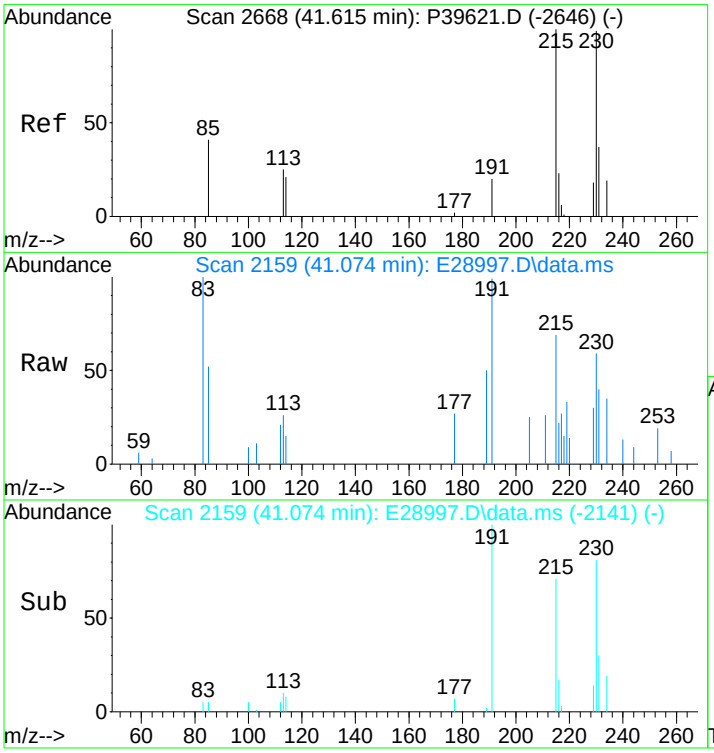


#61
C1-Fluoranthenes/Pyrenes
Concen: 374.55 ng/mL m
RT: 39.267 min Scan# 2039
Delta R.T. 0.352 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:216 Resp: 37164

Ion	Ratio	Lower	Upper
216	100		
215	23.8	73.4	110.2#

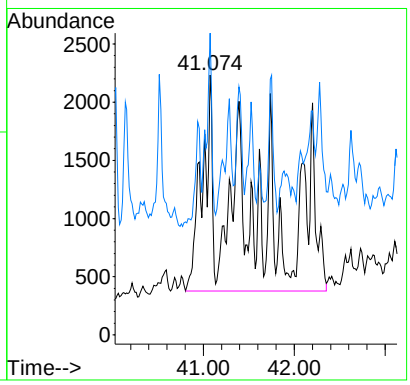


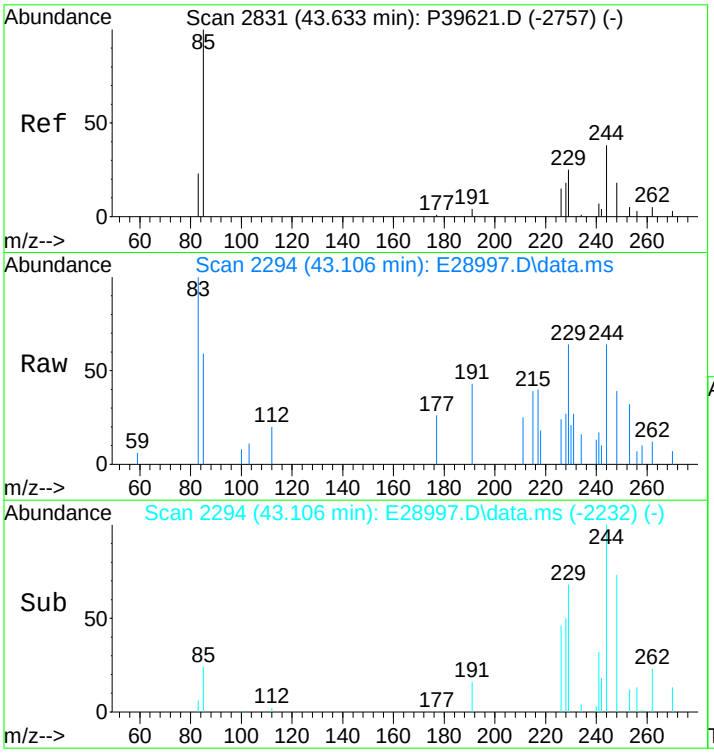


#62
C2-Fluoranthenes/Pyrenes
Concen: 579.26 ng/mL m
RT: 41.074 min Scan# 2159
Delta R.T. 0.194 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:230 Resp: 57475

Ion	Ratio	Lower	Upper
230	100		
215	10.2	93.8	140.8#

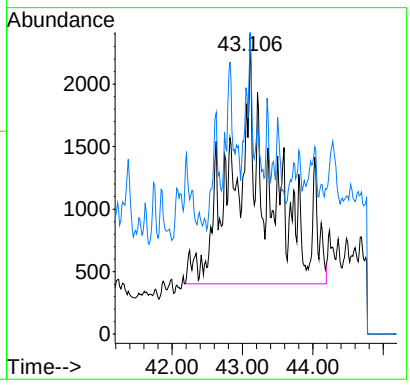


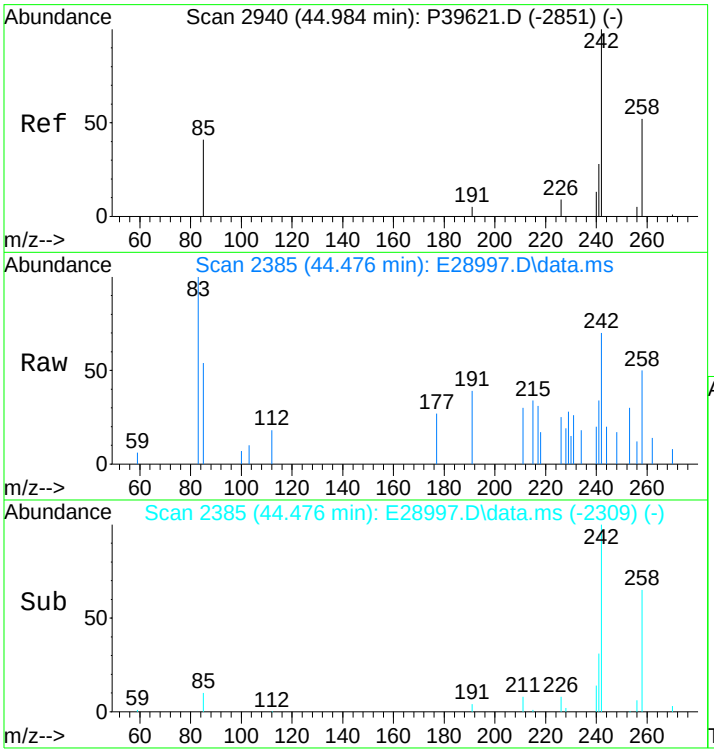


#63
C3-Fluoranthenes/Pyrenes
Concen: 706.09 ng/mL m
RT: 43.106 min Scan# 2294
Delta R.T. 0.455 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:244 Resp: 70060

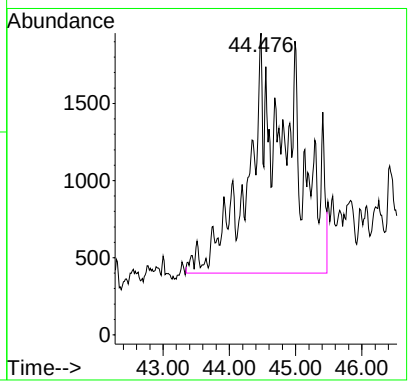
Ion	Ratio	Lower	Upper
244	100		
229	8.0	72.2	108.2#

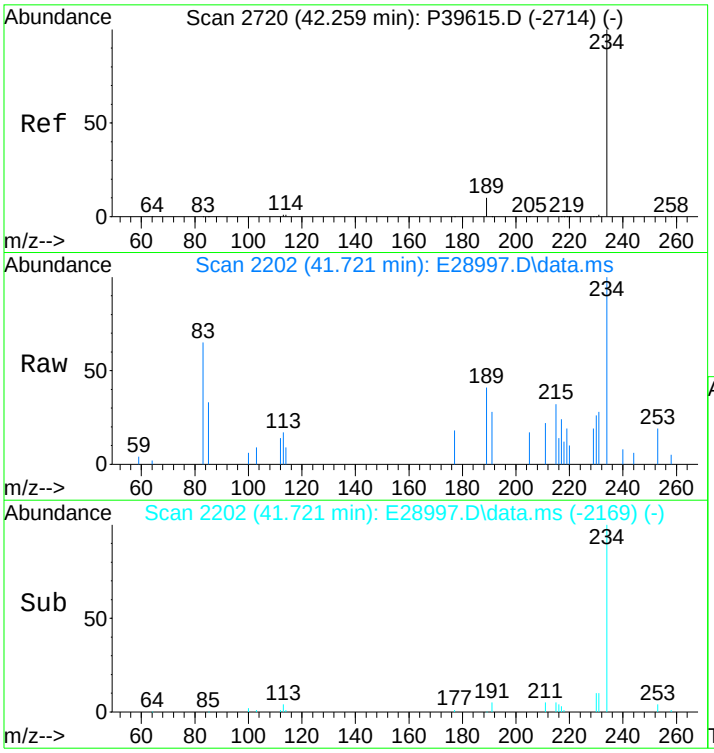




#64
C4-Fluoranthenes/Pyrenes
Concen: 717.33 ng/mL m
RT: 44.476 min Scan# 2385
Delta R.T. 0.506 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:258 Resp: 71175

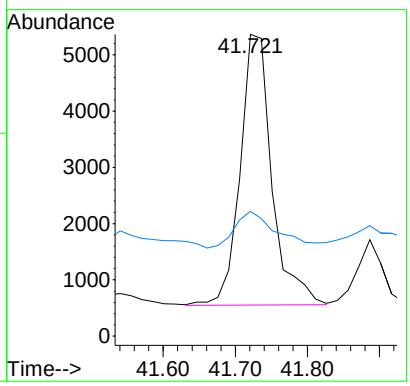


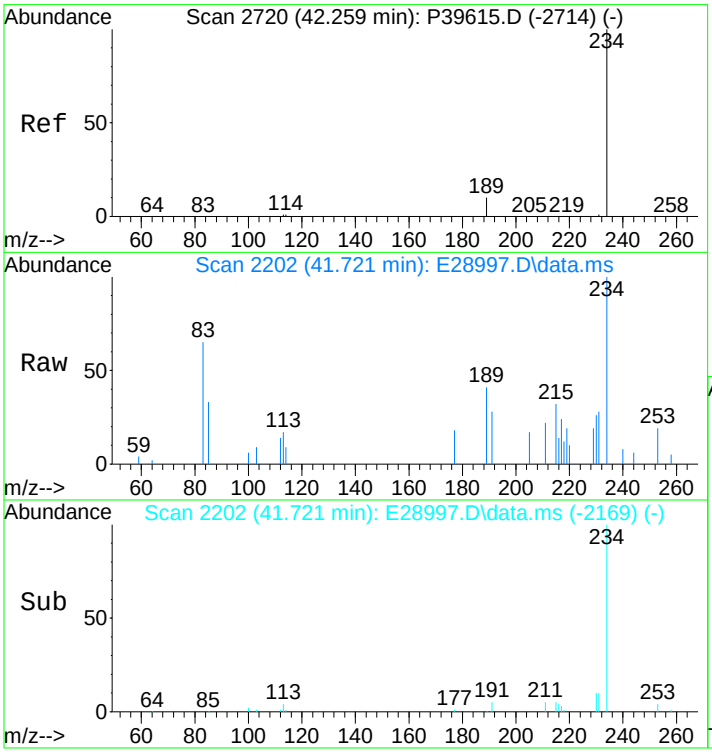


#66
Naphthobenzothiophene
Concen: 150.17 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 14696

Ion	Ratio	Lower	Upper
234	100		
189	17.6	21.1	31.7#

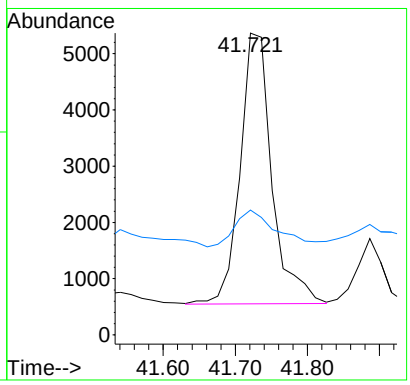


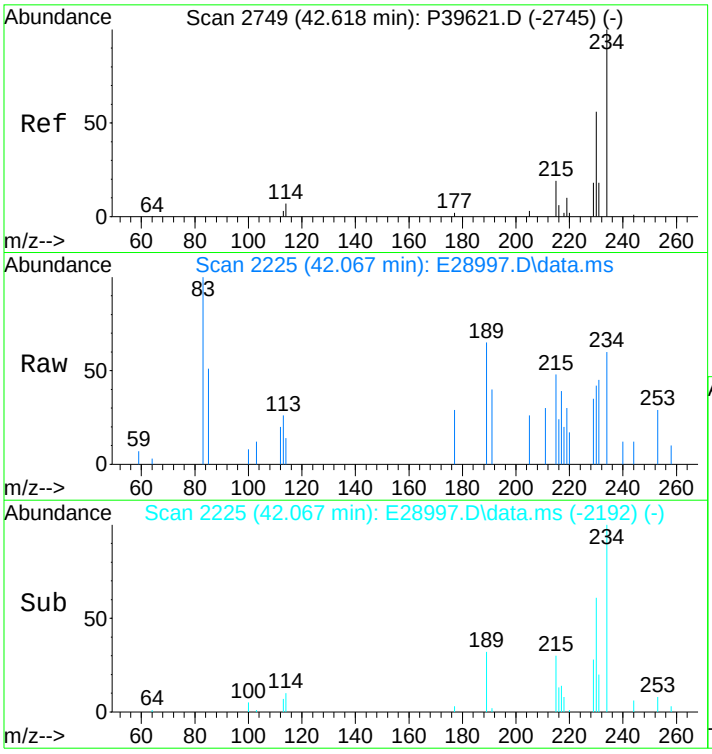


#67
Naphthobenzothiophene-2,1-D
Concen: 150.17 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 14696

Ion	Ratio	Lower	Upper
234	100		
189	17.6	21.1	31.7#

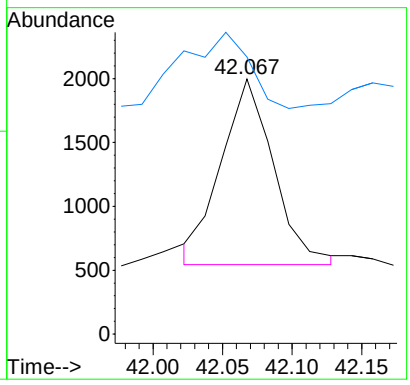


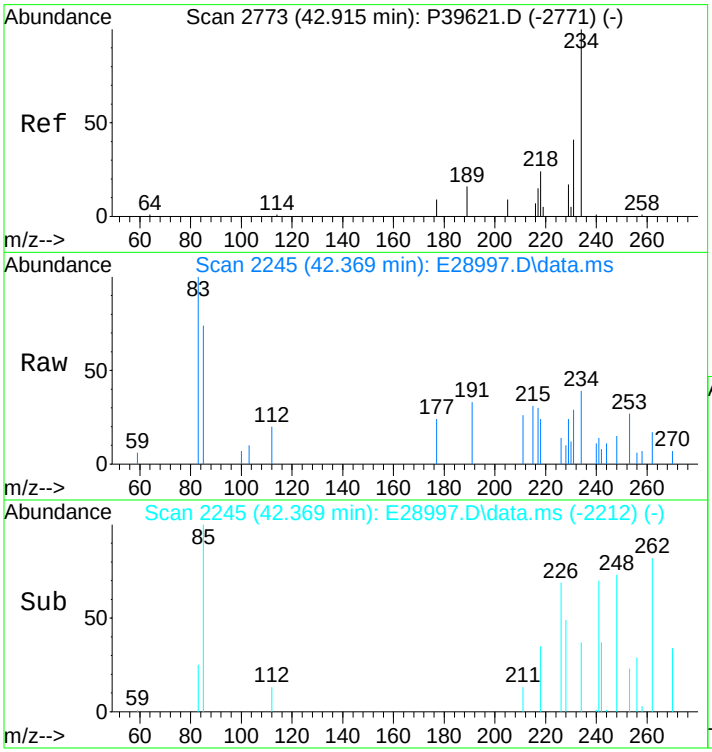


#68
Naphthobenzothiophene-1,2-D
Concen: 38.99 ng/mL m
RT: 42.067 min Scan# 2225
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 3816

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

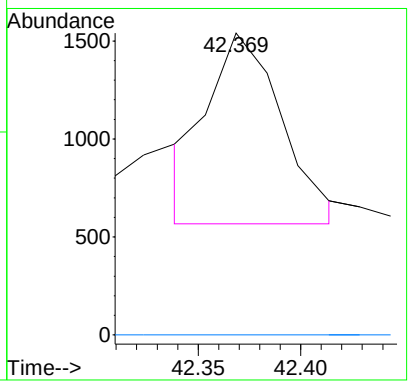


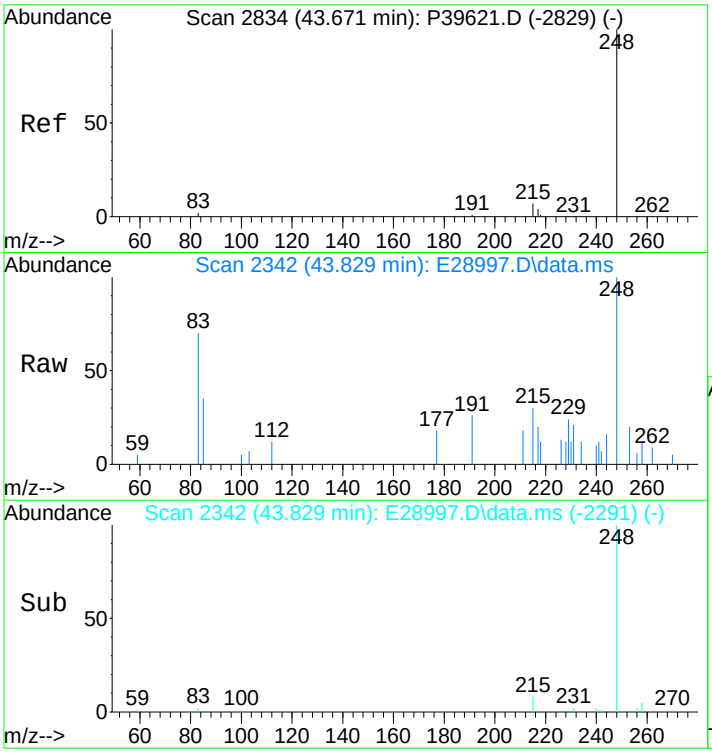


#69
Naphthobenzothiophene-2,3-D
Concen: 25.06 ng/mL m
RT: 42.369 min Scan# 2245
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 2452

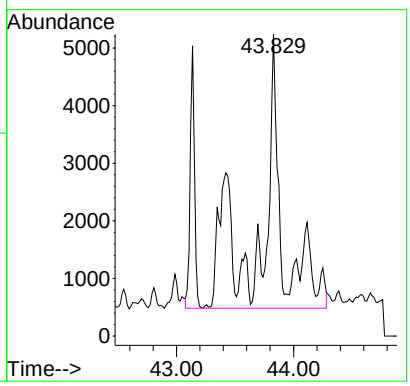
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

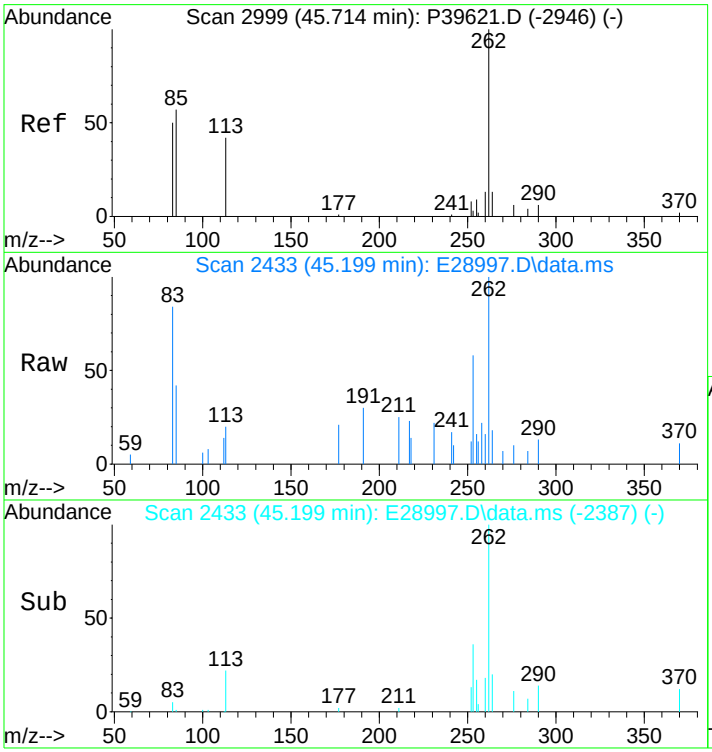




#70
C1-Naphthobenzothiophenes
Concen: 740.41 ng/ml m
RT: 43.829 min Scan# 2342
Delta R.T. 0.708 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

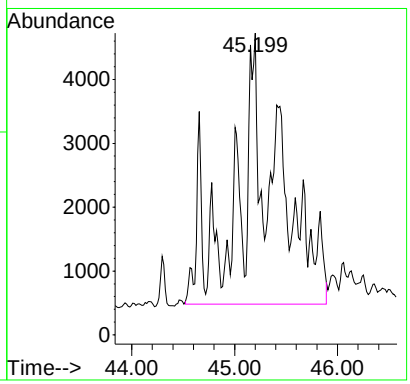
Tgt Ion:248 Resp: 72458

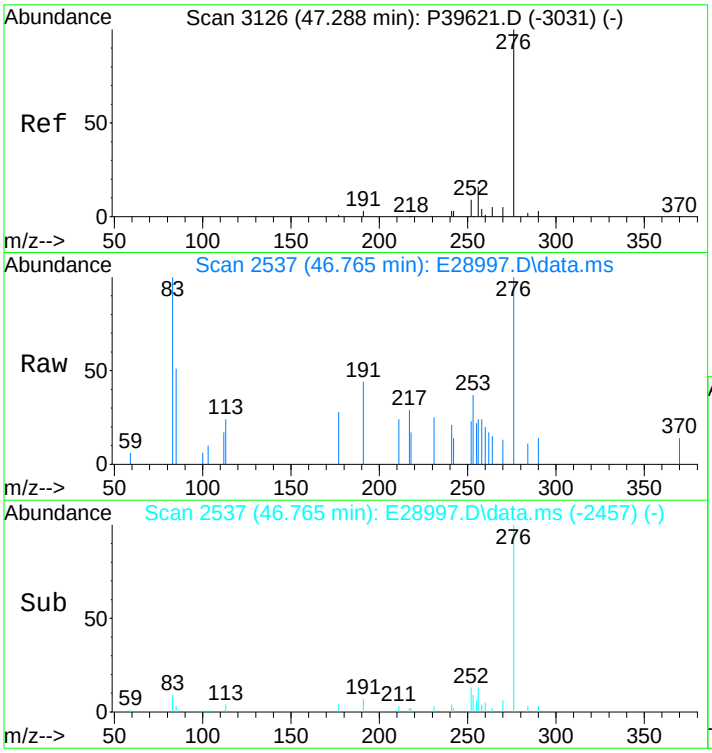




#71
C2-Naphthobenzothiophenes
Concen: 1179.61 ng/ml m
RT: 45.199 min Scan# 2433
Delta R.T. 0.554 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

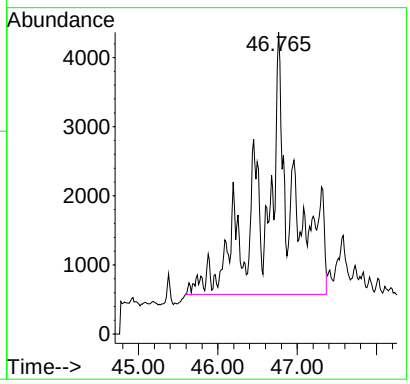
Tgt Ion:262 Resp: 115439

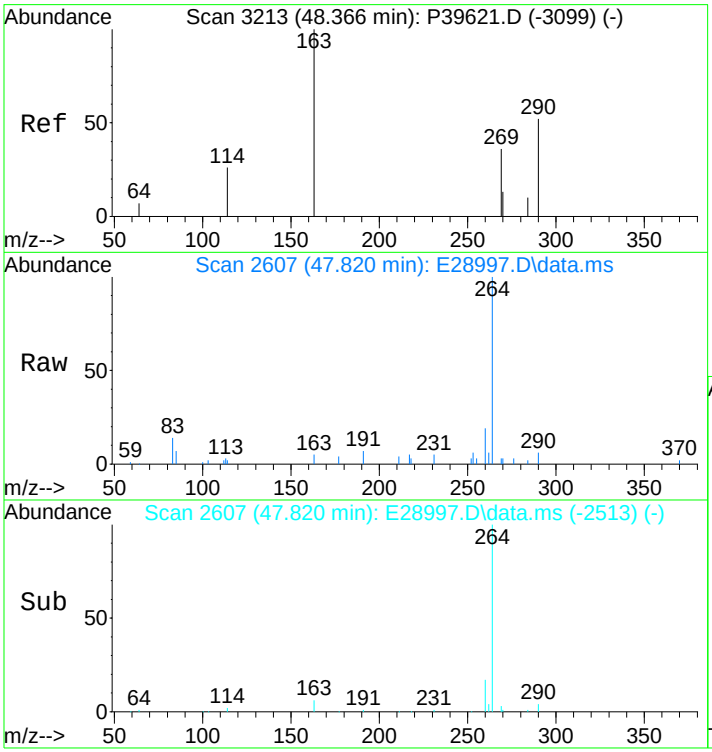




#72
C3-Naphthobenzothiophenes
Concen: 999.21 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

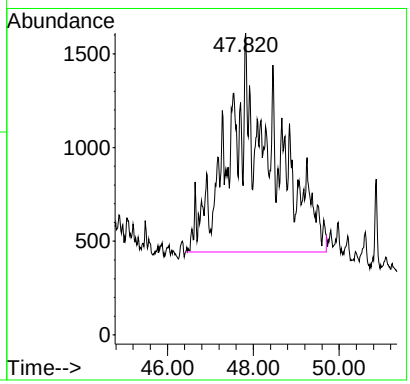
Tgt Ion:276 Resp: 97784

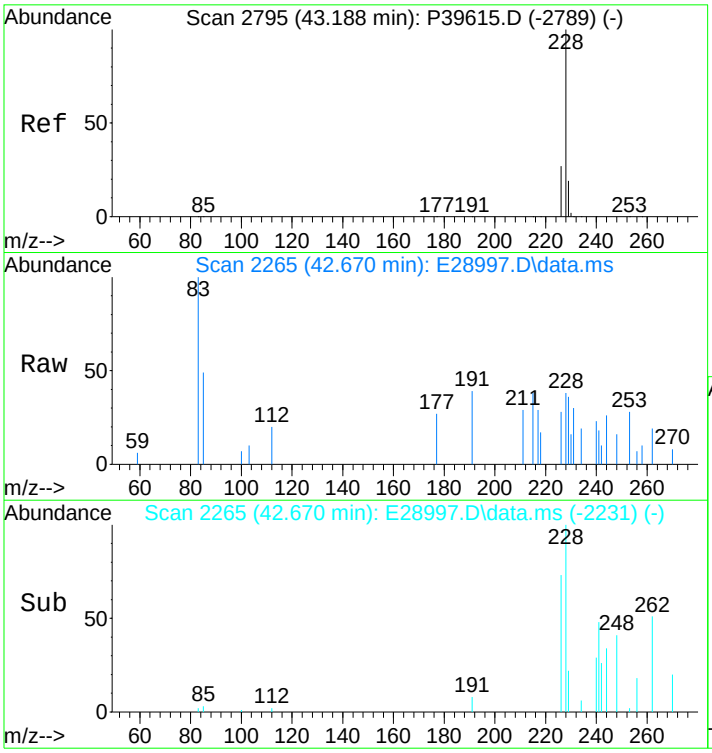




#73
C4-Naphthobenzothiophenes
Concen: 817.47 ng/mL m
RT: 47.820 min Scan# 2607
Delta R.T. 0.523 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:290 Resp: 79999

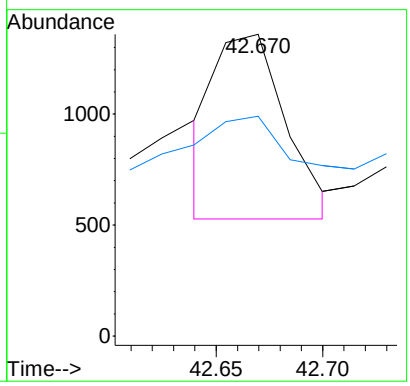


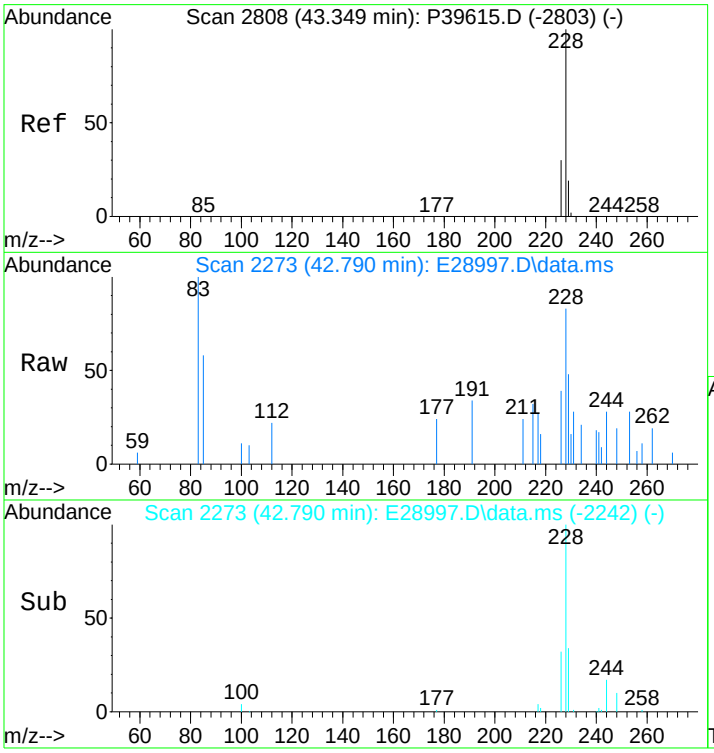


#75
Benz[a]anthracene
Concen: 18.79 ng/mL m
RT: 42.670 min Scan# 2265
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:228 Resp: 1916

Ion	Ratio	Lower	Upper
228	100		
226	88.5	20.7	31.1#

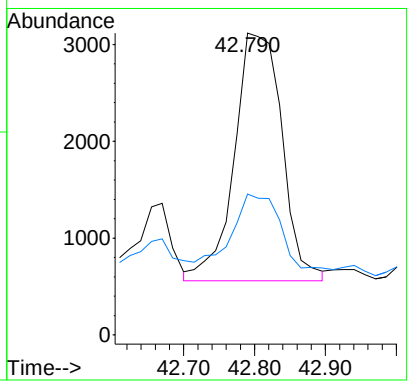


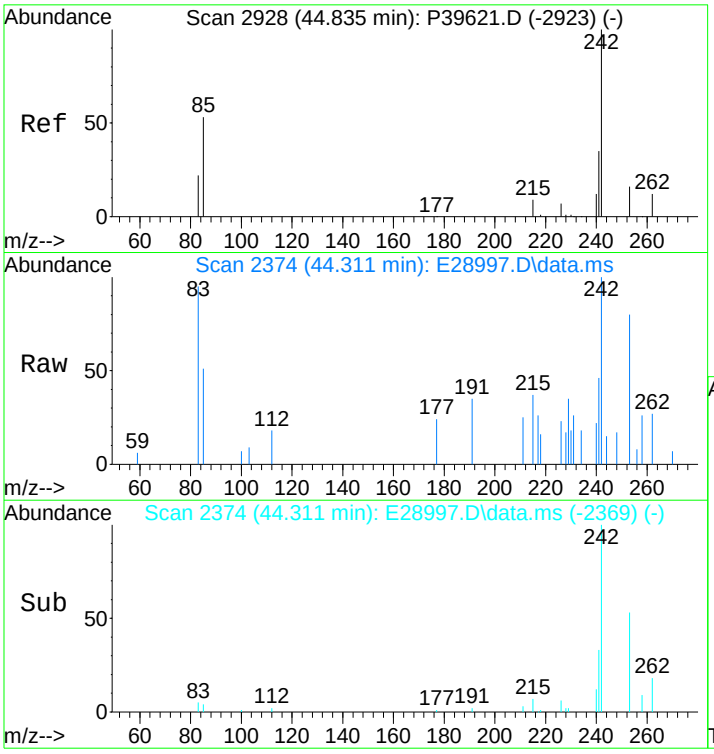


#77
Chrysene/Triphenylene
Concen: 113.97 ng/mL m
RT: 42.790 min Scan# 2273
Delta R.T. -0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:228 Resp: 11966

Ion	Ratio	Lower	Upper
228	100		
226	36.2	22.6	34.0#

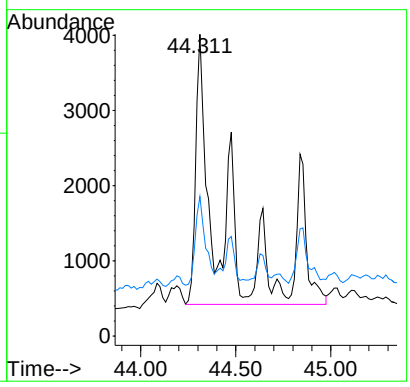


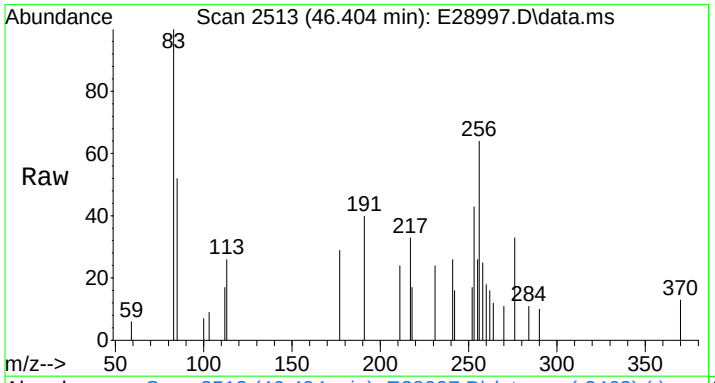


#78
C1-Chrysenes
Concen: 315.15 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:242 Resp: 33088

Ion	Ratio	Lower	Upper
242	100		
241	8.7	32.2	48.4#

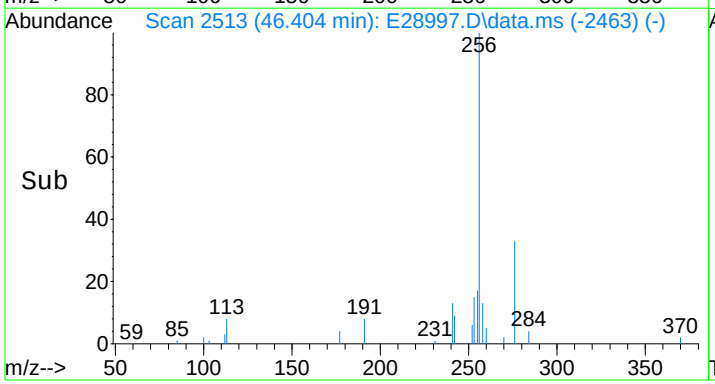


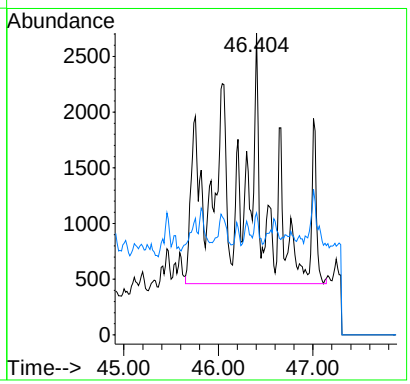


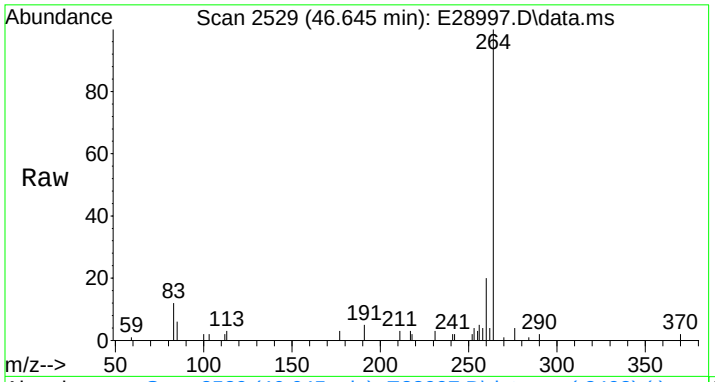
#79
C2-Chrysenes
Concen: 546.83 ng/mL m
RT: 46.404 min Scan# 2513
Delta R.T. 0.061 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:256 Resp: 57413

Ion	Ratio	Lower	Upper
256	100		
241	1.5	25.3	37.9#

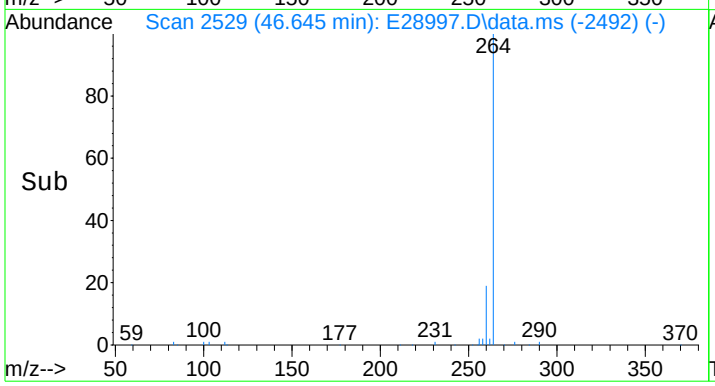


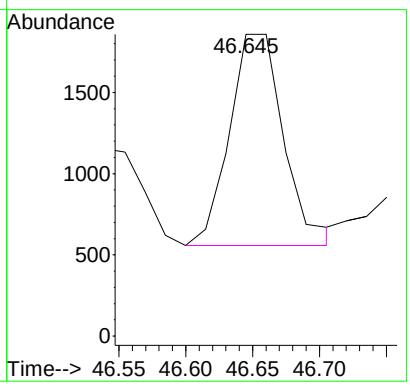


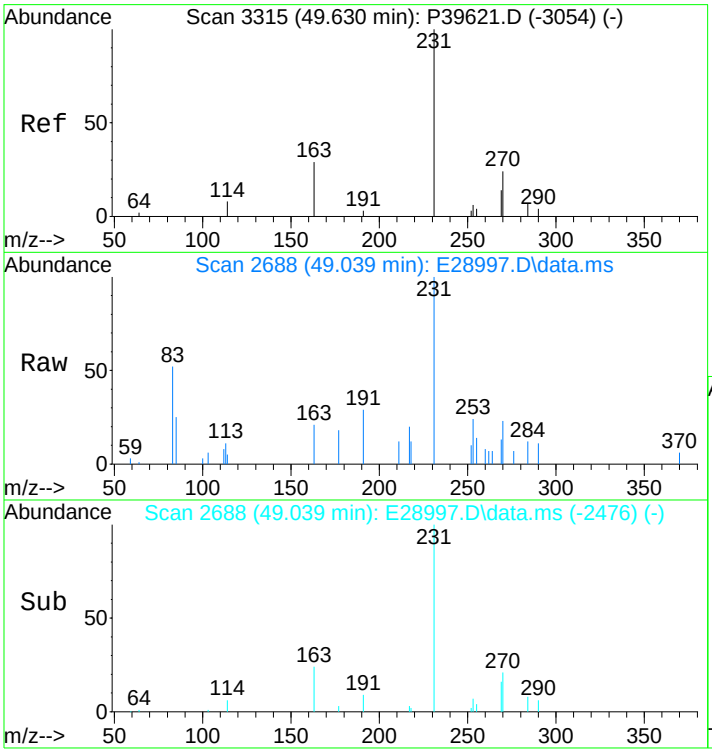


#80
BBF-D12 Surr BKGD
Concen: 35.11 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:256 Resp: 3686



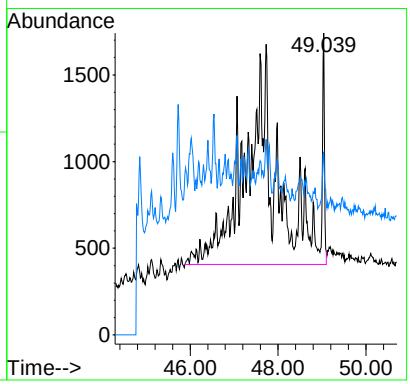


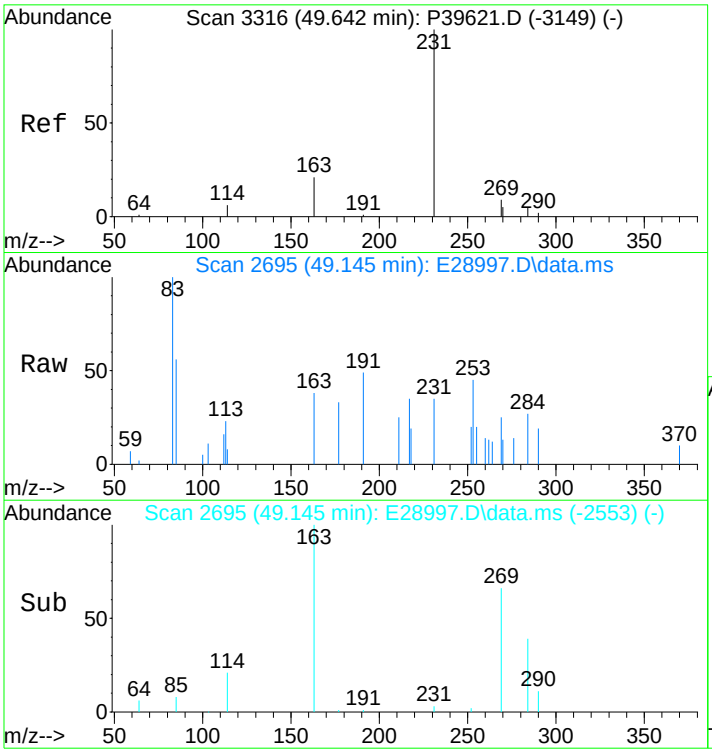


#81
C3-Chrysenes
Concen: 608.21 ng/mL m
RT: 49.039 min Scan# 2688
Delta R.T. -0.029 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:270 Resp: 63858

Ion	Ratio	Lower	Upper
270	100		
255	1.6	38.0	57.0#

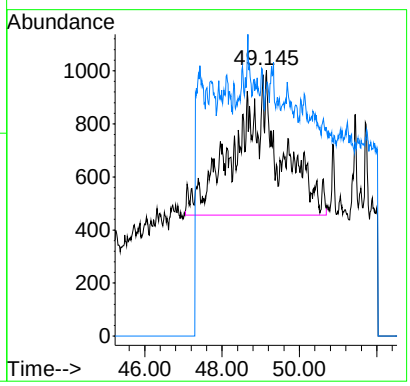


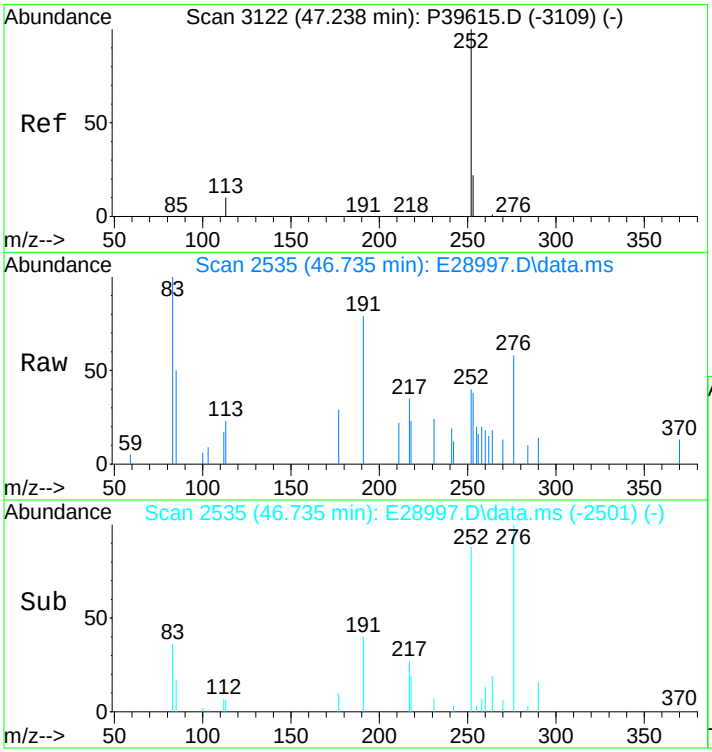


#82
C4-Chrysenes
Concen: 408.96 ng/mL m
RT: 49.145 min Scan# 2695
Delta R.T. -0.041 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:284 Resp: 42938

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

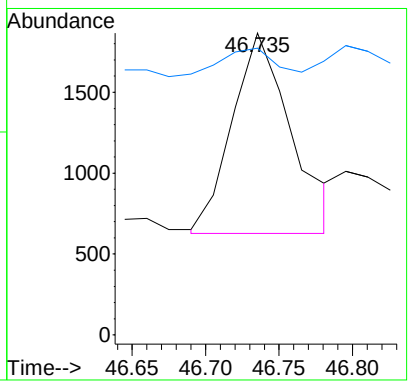


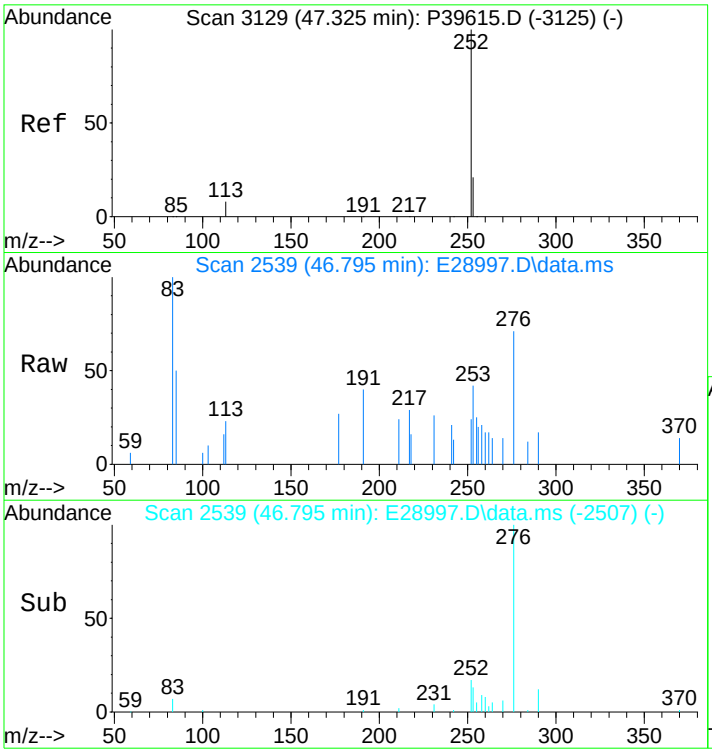


#84
Benzo[b]fluoranthene
Concen: 29.31 ng/mL m
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 3474

Ion	Ratio	Lower	Upper
252	100		
253	13.1	19.5	29.3#

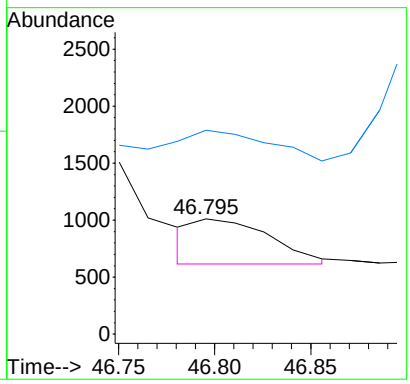


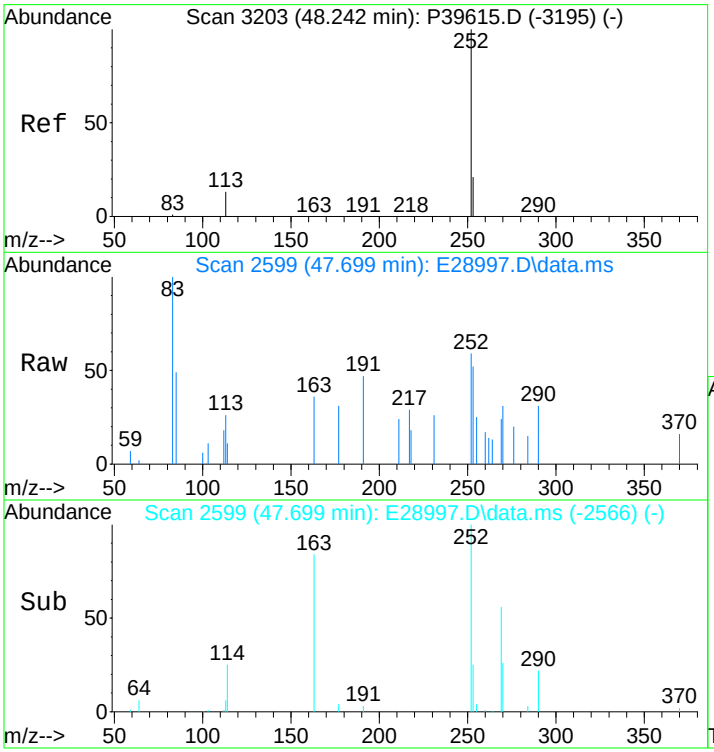


#85
Benzo[j]+[k]fluoranthene
Concen: 8.93 ng/mL m
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 1089

Ion	Ratio	Lower	Upper
252	100		
253	459.2	19.7	29.5#

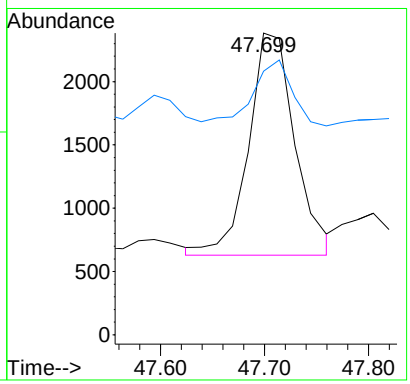


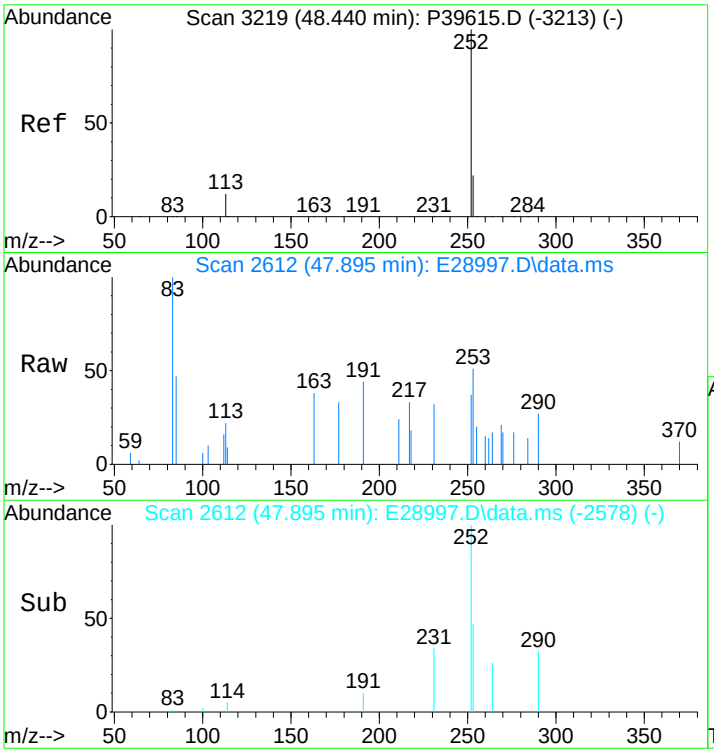


#87
Benzo[e]pyrene
Concen: 47.04 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 5445

Ion	Ratio	Lower	Upper
252	100		
253	32.7	20.6	31.0#

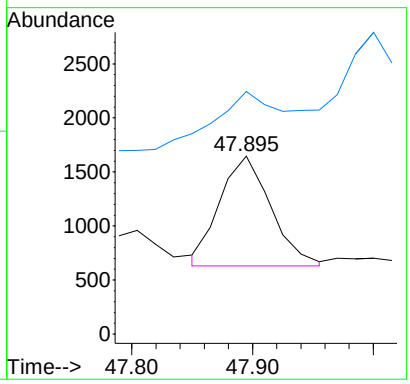


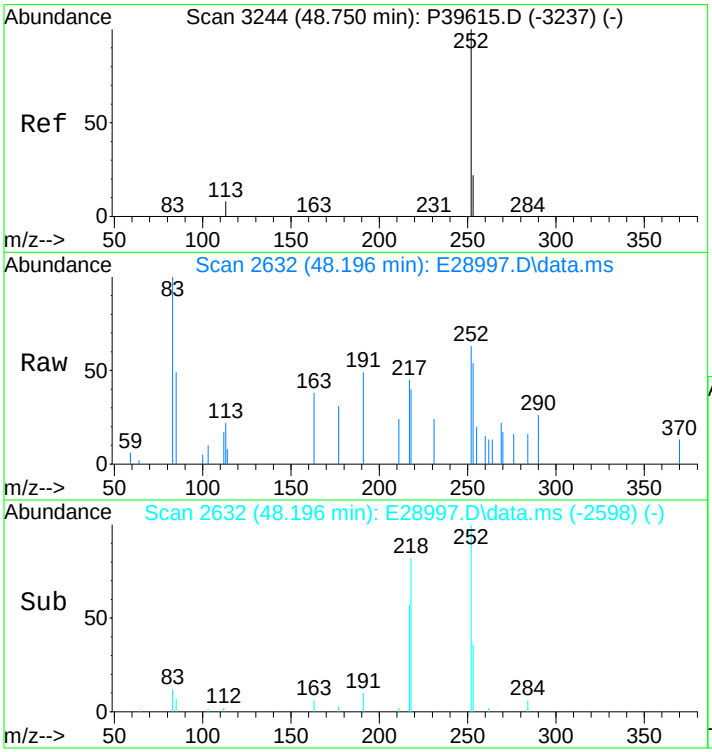


#89
Benzo[a]pyrene
Concen: 26.93 ng/mL m
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 2983

Ion	Ratio	Lower	Upper
252	100		
253	51.7	20.8	31.2#

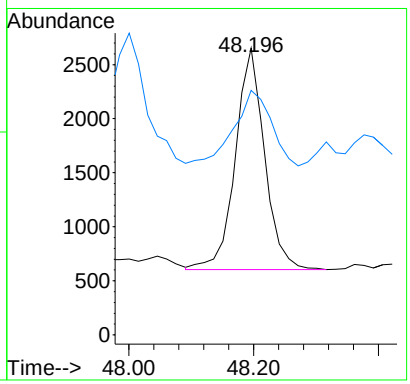


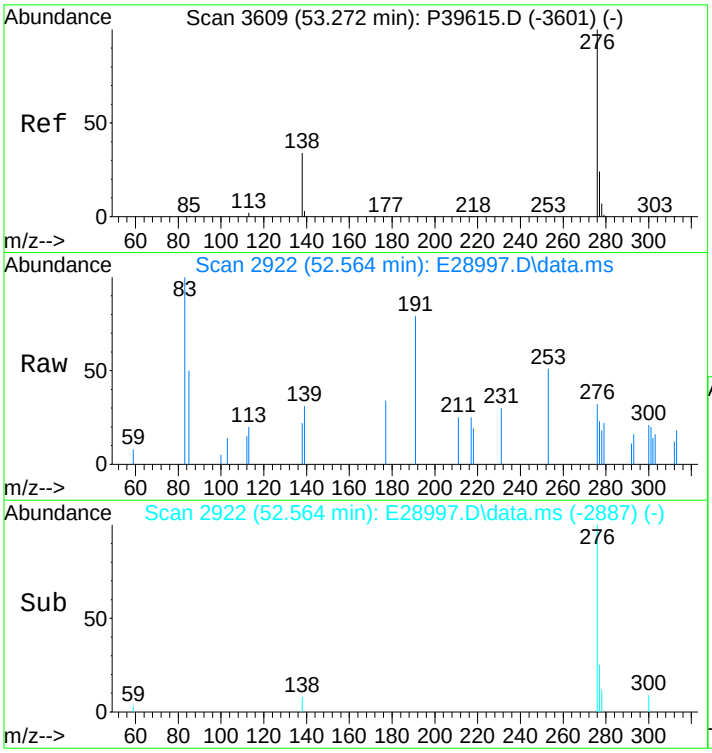


#90
Perylene
Concen: 57.00 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 6676

Ion	Ratio	Lower	Upper
252	100		
253	43.7	20.7	31.1#

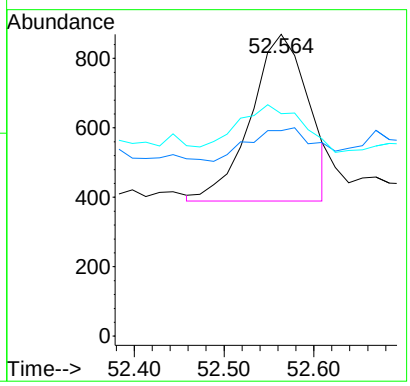


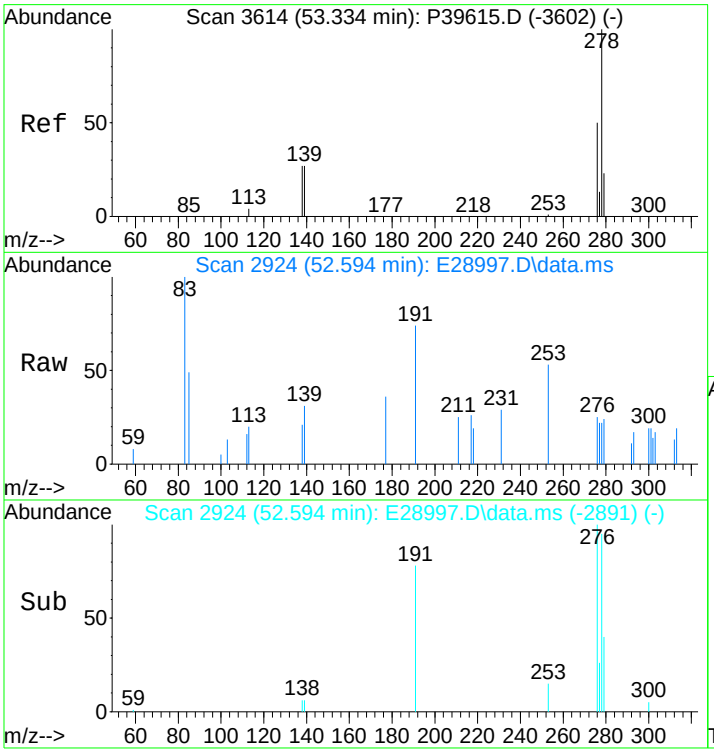


#91
Indeno[1,2,3-cd]pyrene
Concen: 16.38 ng/mL m
RT: 52.564 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:276 Resp: 2135

Ion	Ratio	Lower	Upper
276	100		
138	23.4	16.3	24.5
277	0.0	19.4	29.2#

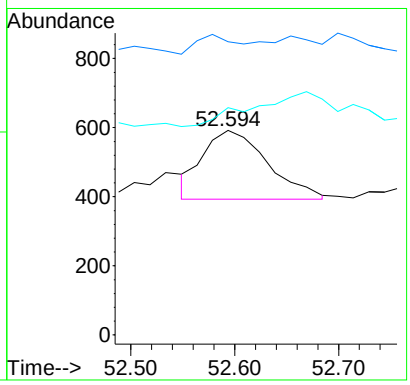


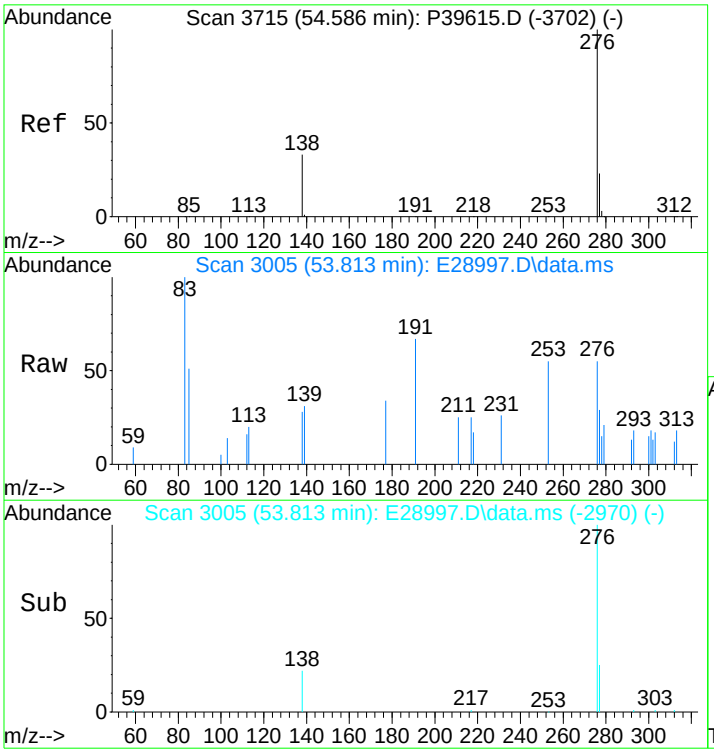


#92
Dibenz[ah]+[ac]anthracene
Concen: 6.20 ng/mL m
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:278 Resp: 861

Ion	Ratio	Lower	Upper
278	100		
139	17.2	11.6	17.4
279	0.0	19.3	28.9#

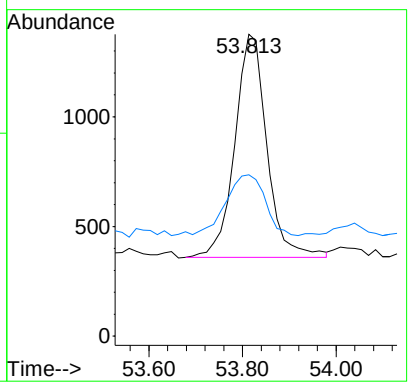


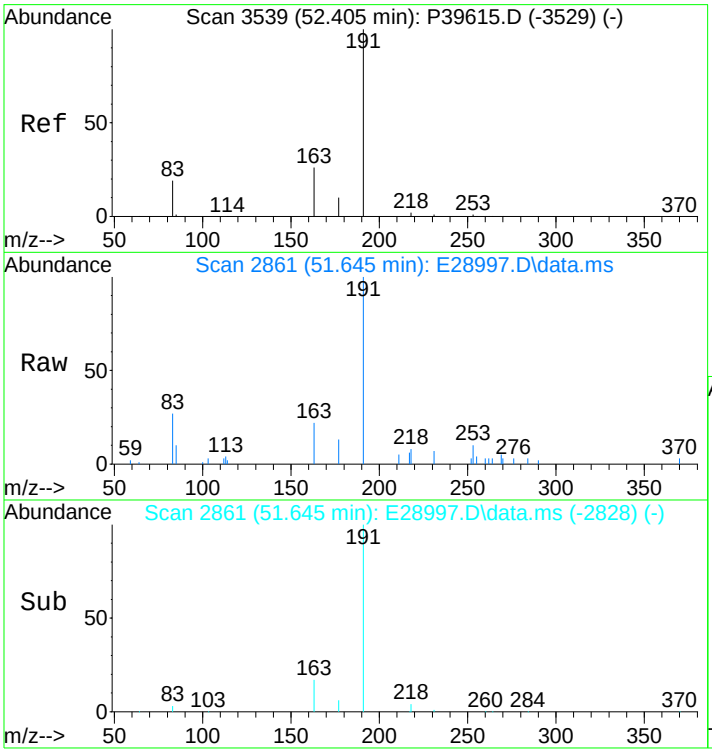


#93
Benzo[g,h,i]perylene
Concen: 34.54 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:276 Resp: 4854

Ion	Ratio	Lower	Upper
276	100		
277	33.7	19.1	28.7#

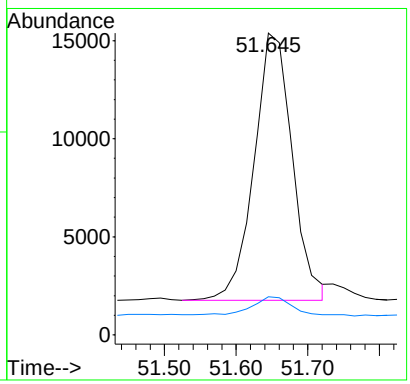


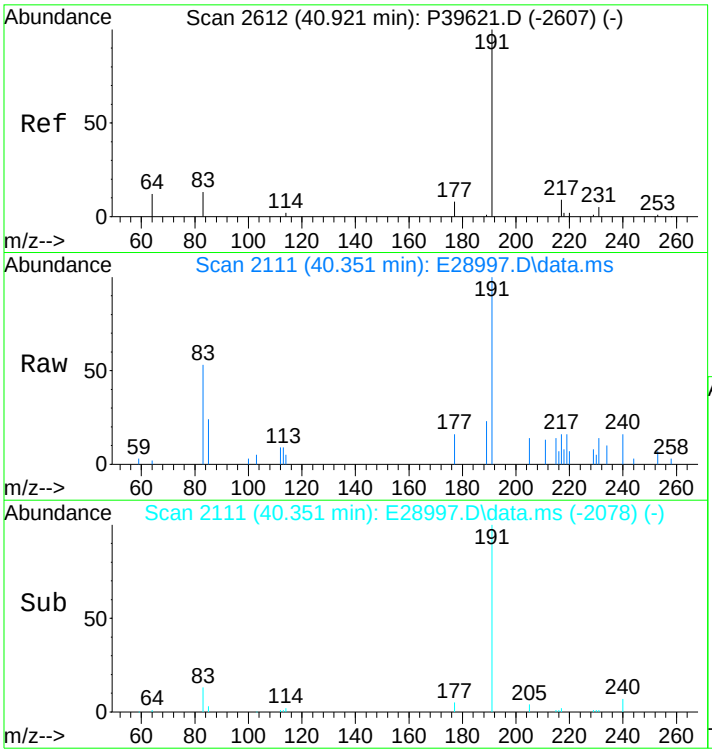


#94
Hopane (T19)
Concen: 1285.09 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:191 Resp: 50509

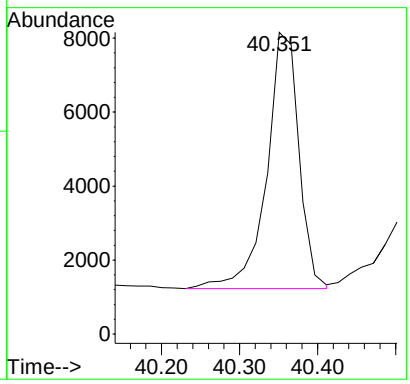
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.6	17.4#

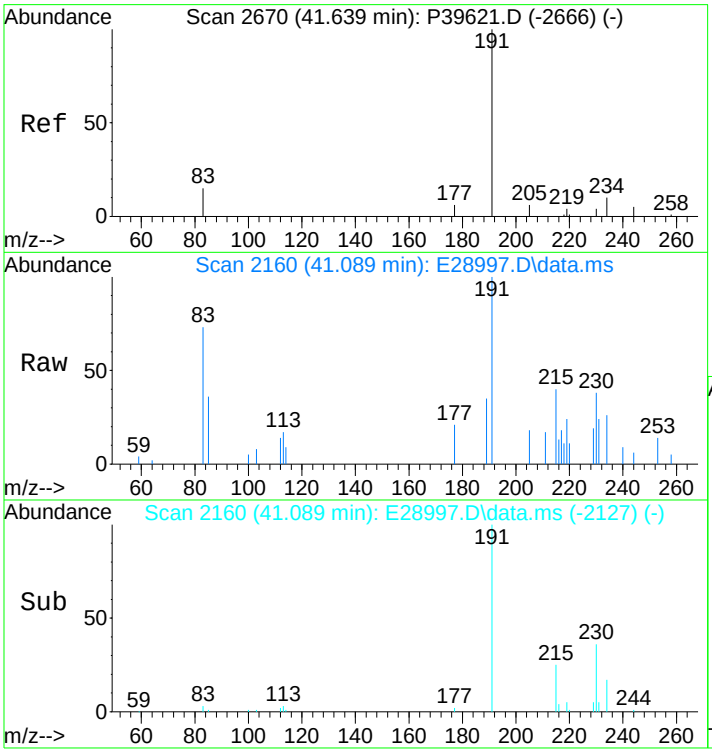




#96
C23 Tricyclic Terpane (T4)
Concen: 505.27 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

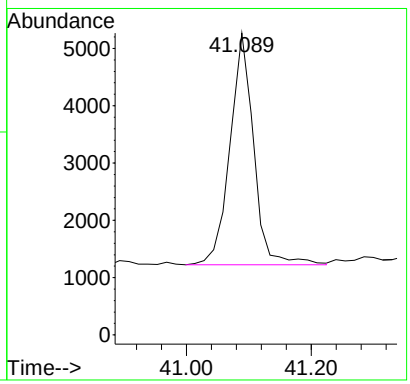
Tgt Ion:191 Resp: 19859

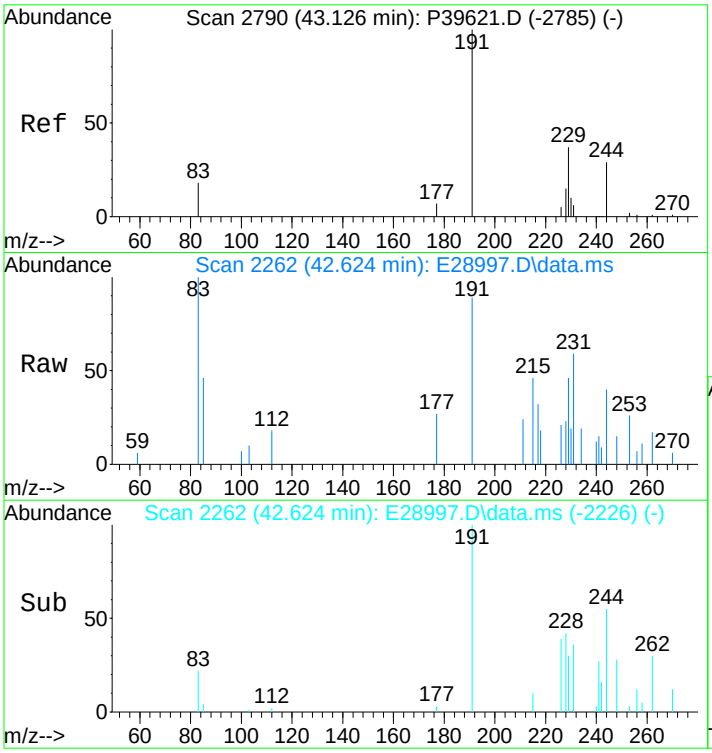




#97
C24 Tricyclic Terpane (T5)
Concen: 272.06 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

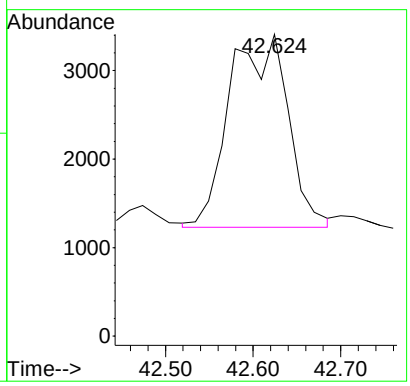
Tgt Ion:191 Resp: 10693

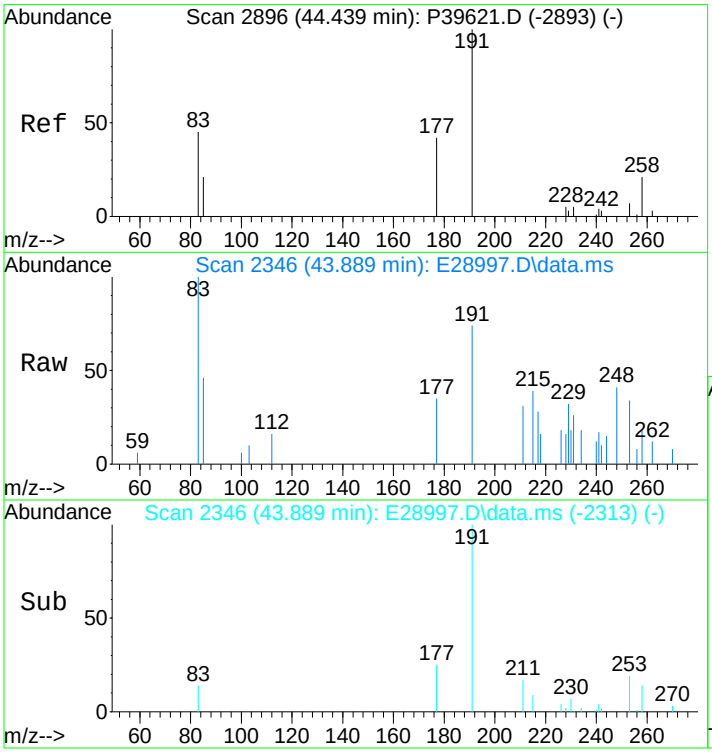




#98
C25 Tricyclic Terpane (T6)
Concen: 255.68 ng/ml m
RT: 42.624 min Scan# 2262
Delta R.T. 0.045 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

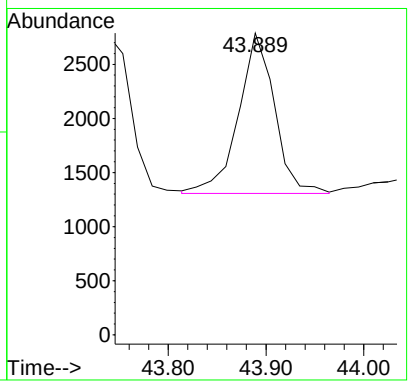
Tgt Ion:191 Resp: 10049

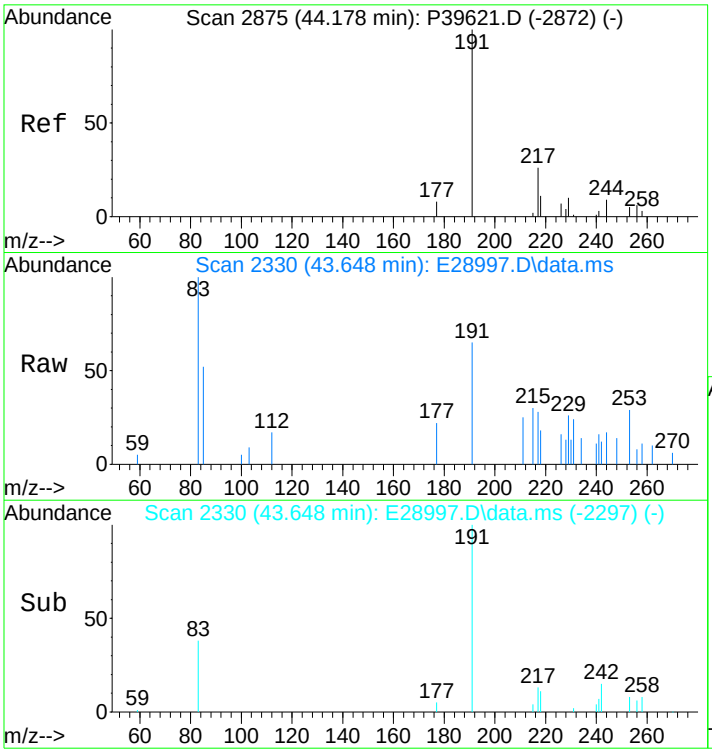




#99
C24 Tetracyclic Terpane (T6a)
Concen: 96.45 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

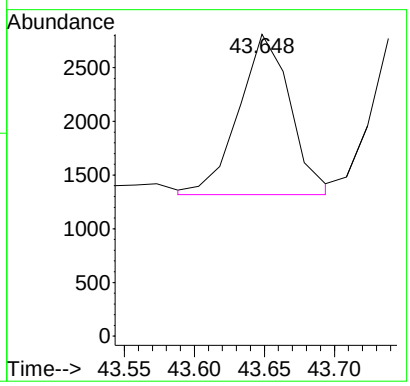
Tgt Ion:191 Resp: 3791

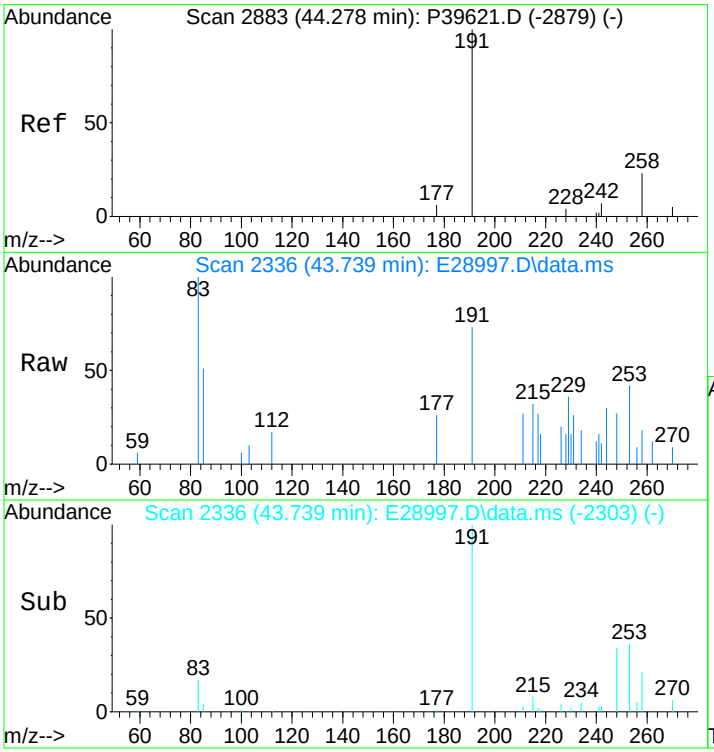




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 96.99 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

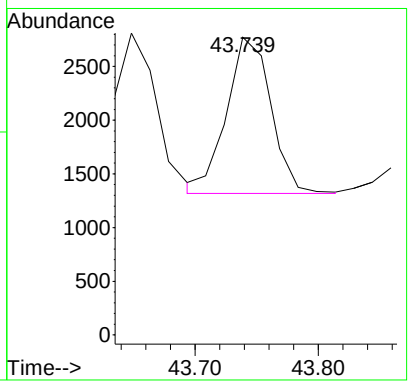
Tgt Ion:191 Resp: 3812

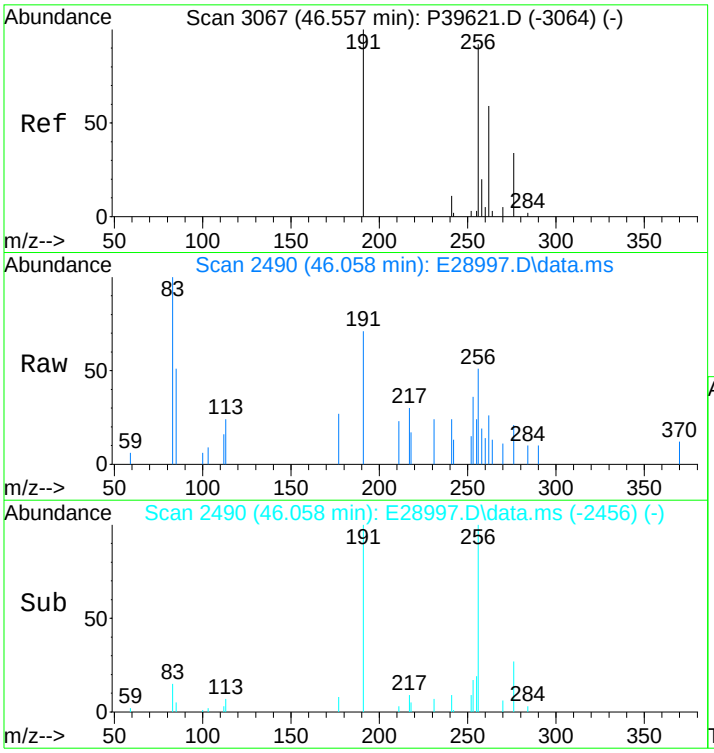




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 92.79 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

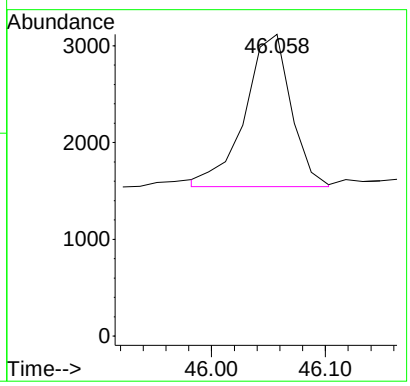
Tgt Ion:191 Resp: 3647

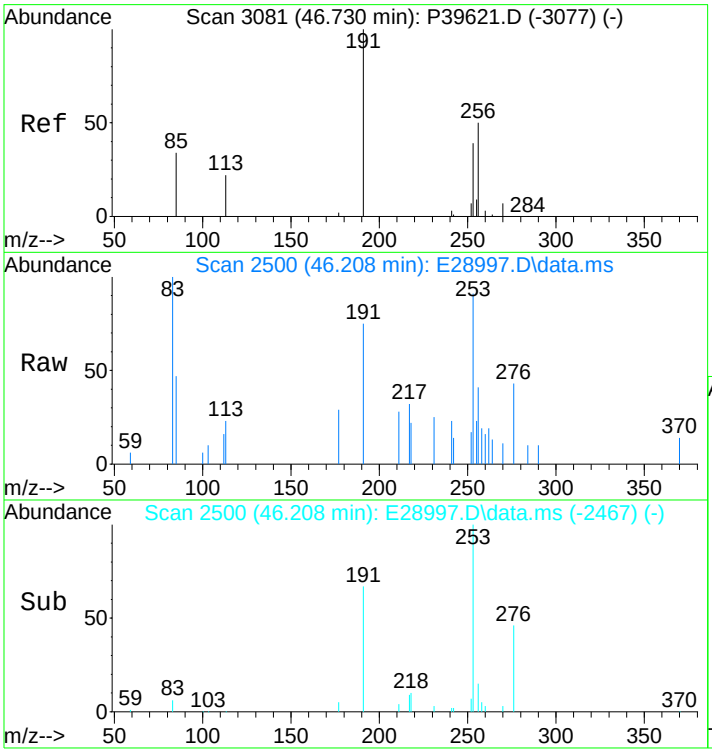




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 112.13 ng/ml m
RT: 46.058 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

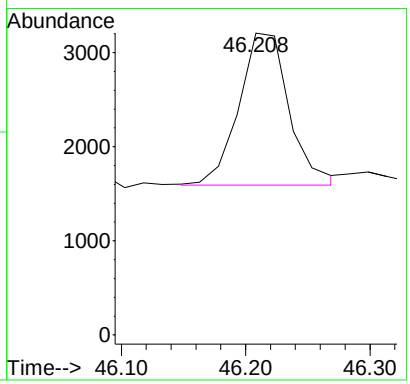
Tgt Ion:191 Resp: 4407

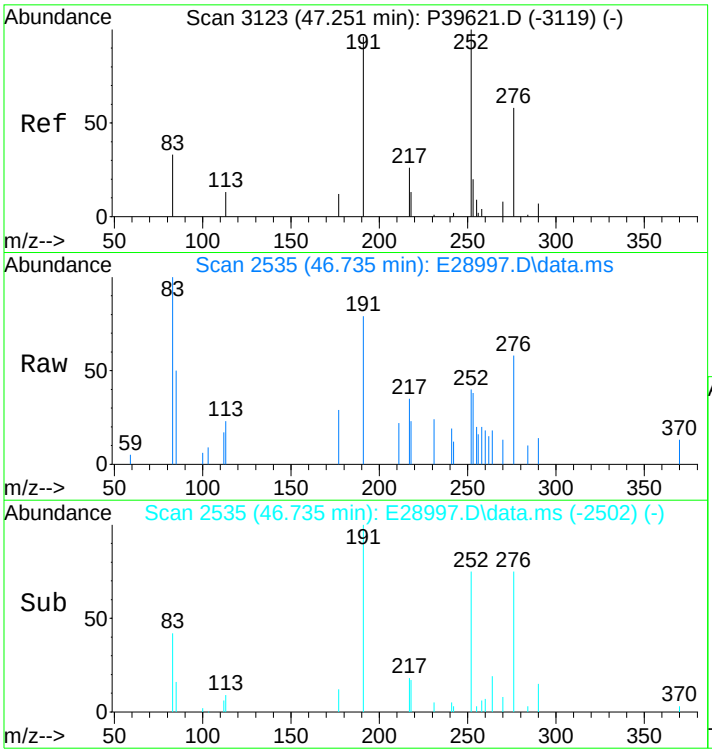




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 115.54 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

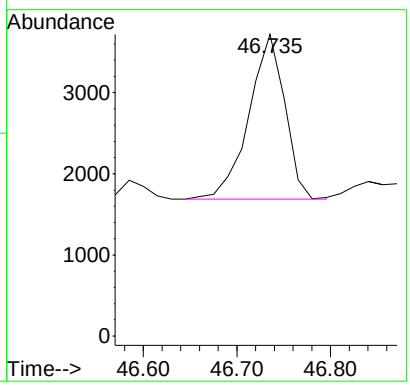
Tgt Ion:191 Resp: 4541

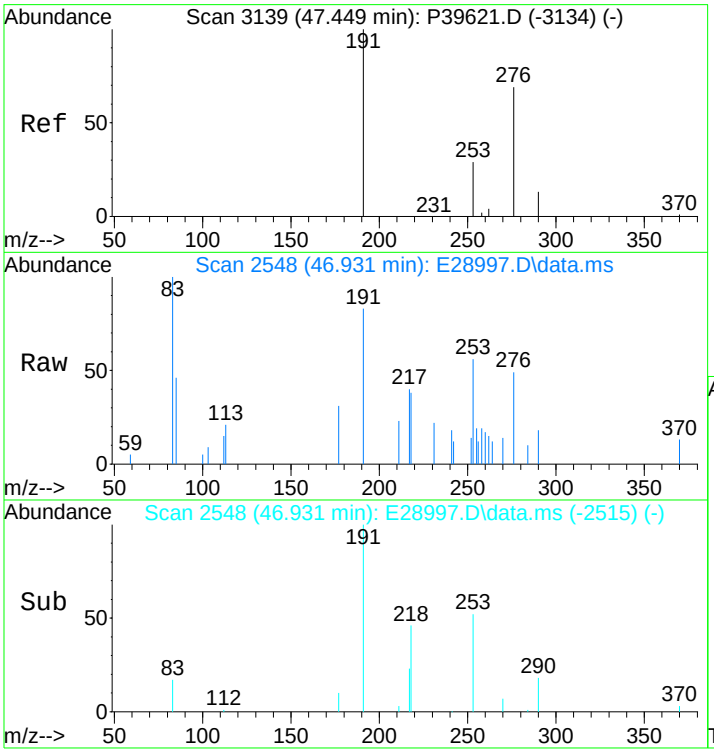




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 137.75 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

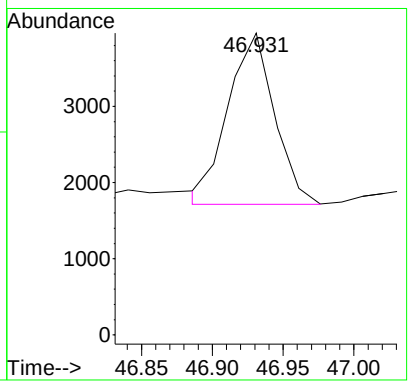
Tgt Ion:191 Resp: 5414

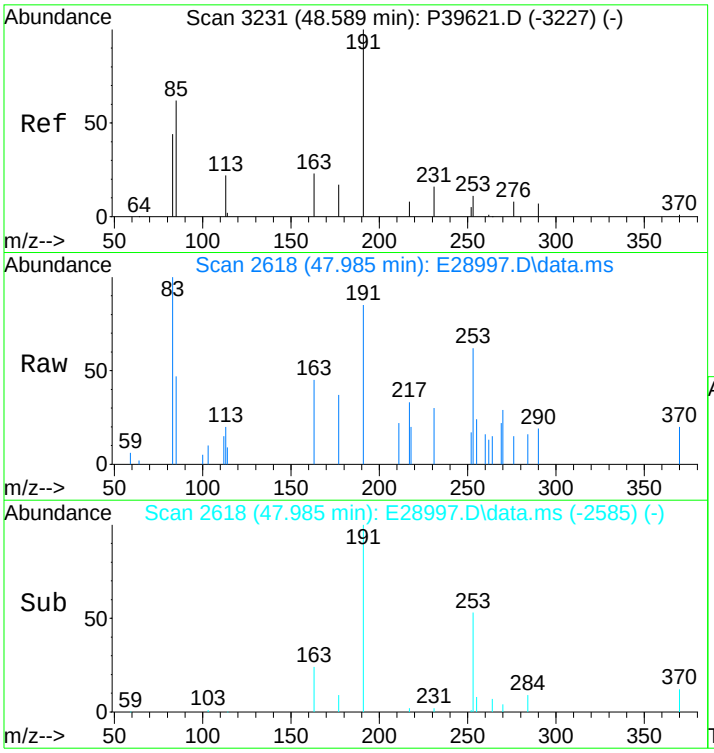




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 130.60 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

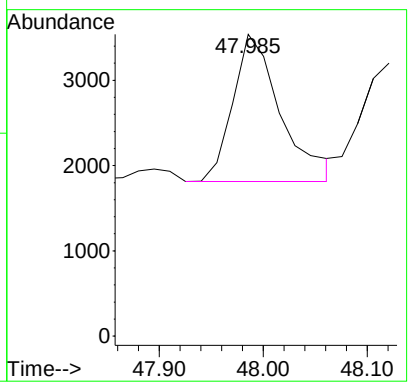
Tgt Ion:191 Resp: 5133

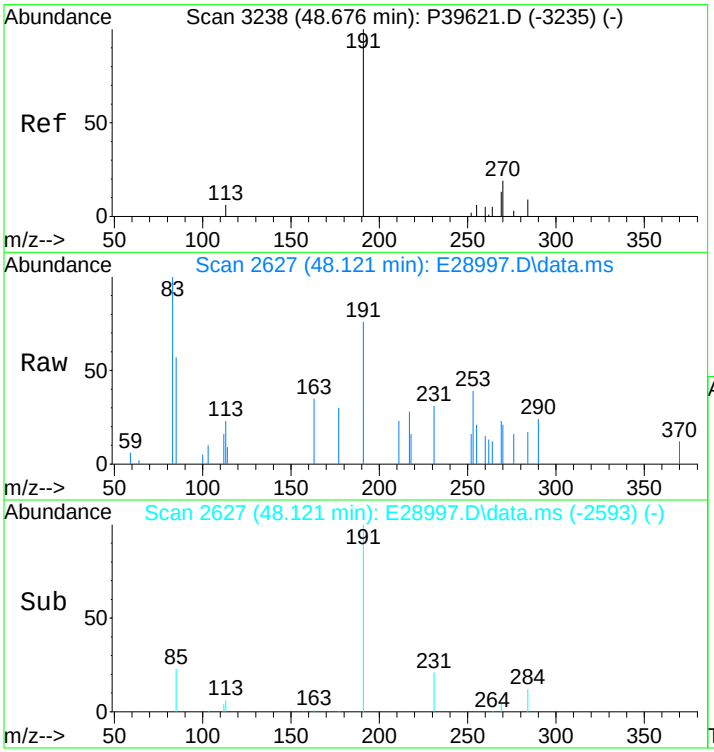




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 140.93 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

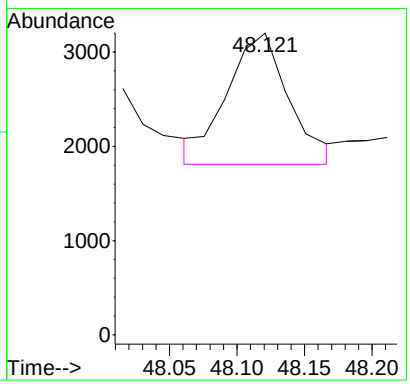
Tgt Ion:191 Resp: 5539

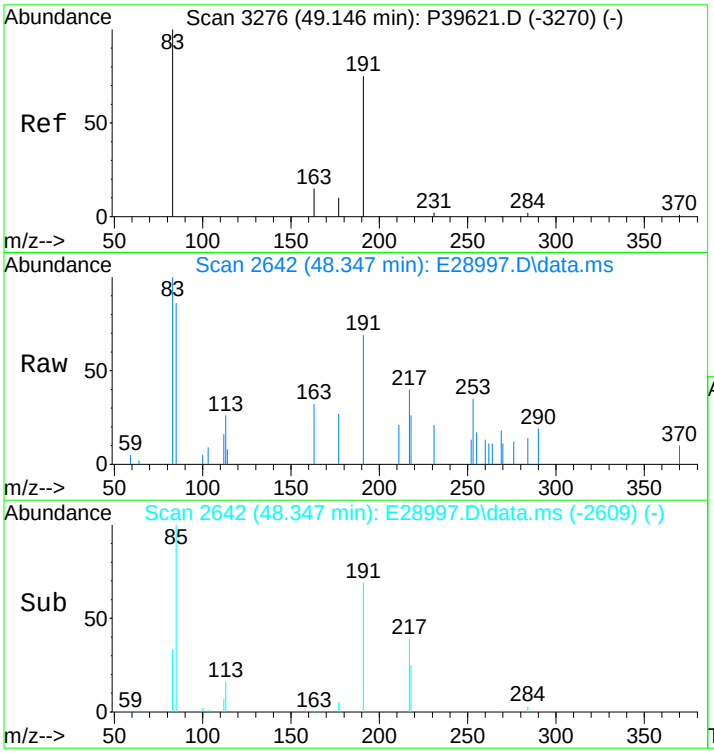




#107
C30 Tricyclic Terpane-22S
Concen: 112.36 ng/mL m
RT: 48.121 min Scan# 2627
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

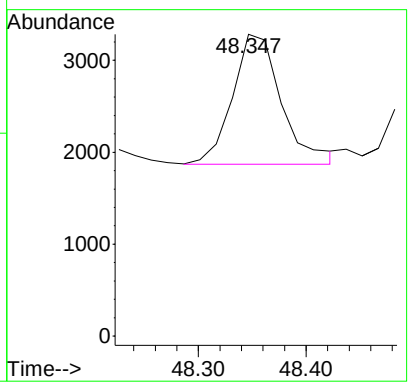
Tgt Ion:191 Resp: 4416

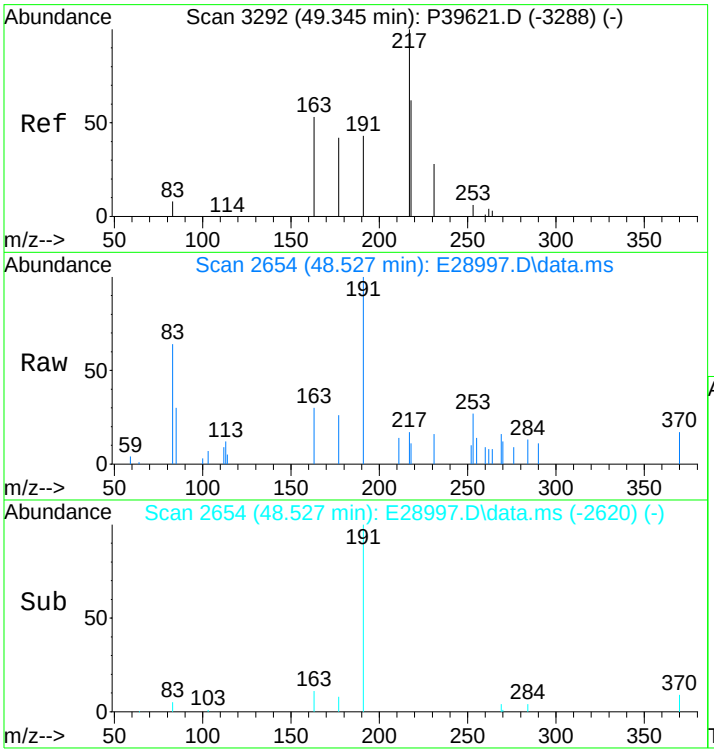




#108
C30 Tricyclic Terpane-22R
Concen: 113.78 ng/mL m
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

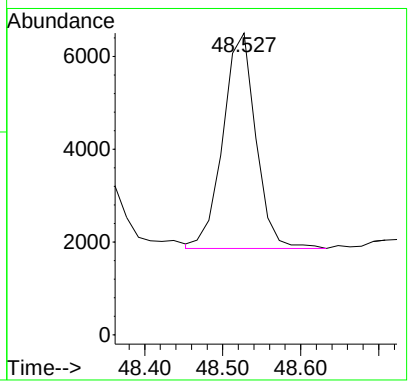
Tgt Ion:191 Resp: 4472

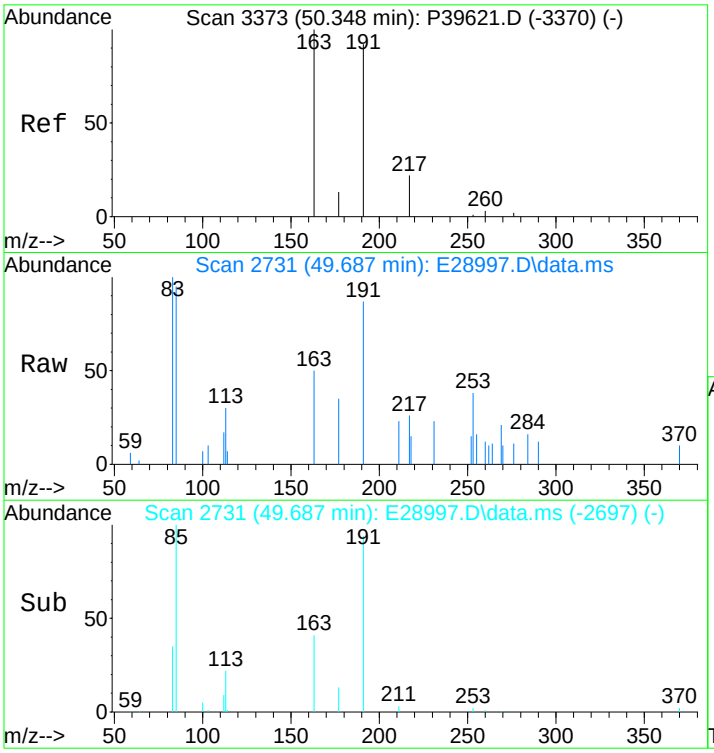




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 345.49 ng/ml
RT: 48.527 min Scan# 2654
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

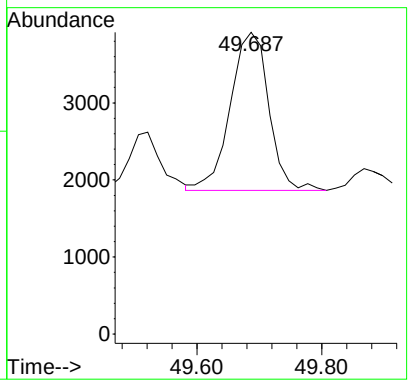
Tgt Ion:191 Resp: 13579

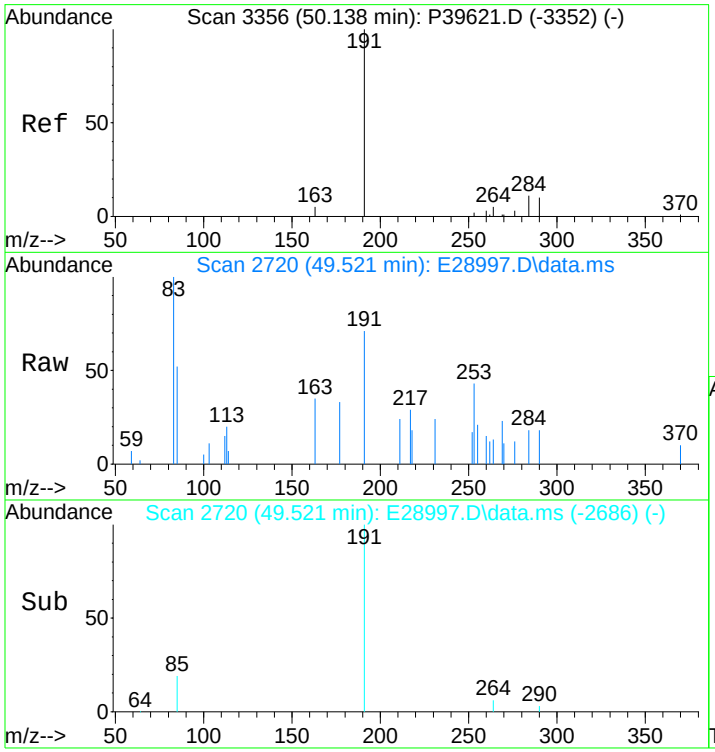




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 223.97 ng/ml
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

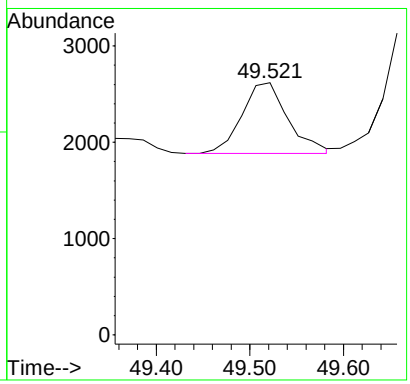
Tgt Ion:191 Resp: 8803

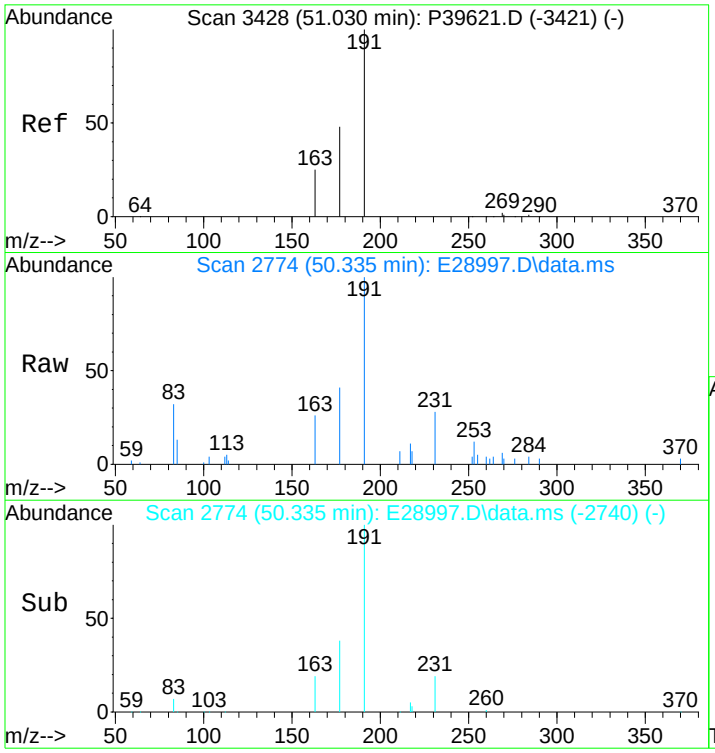




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 64.52 ng/ml
RT: 49.521 min Scan# 2720
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

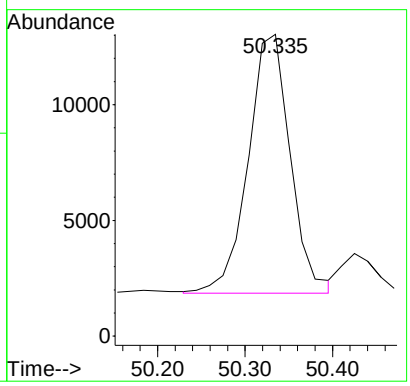
Tgt Ion:191 Resp: 2536

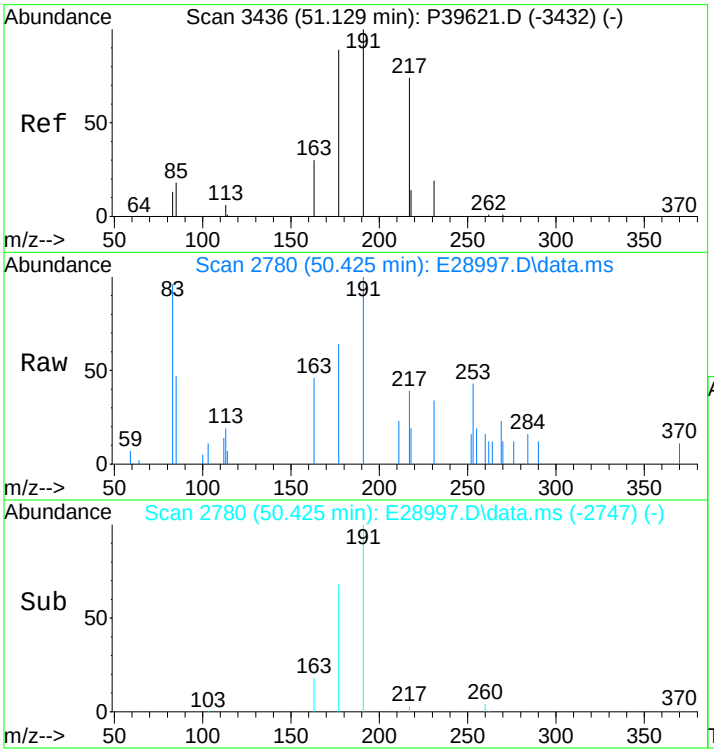




#112
30-Norhopane (T15)
Concen: 951.41 ng/ml m
RT: 50.335 min Scan# 2774
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

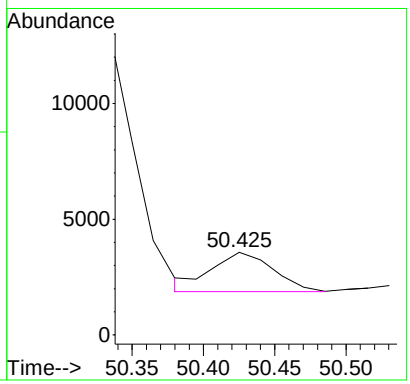
Tgt Ion:191 Resp: 37394

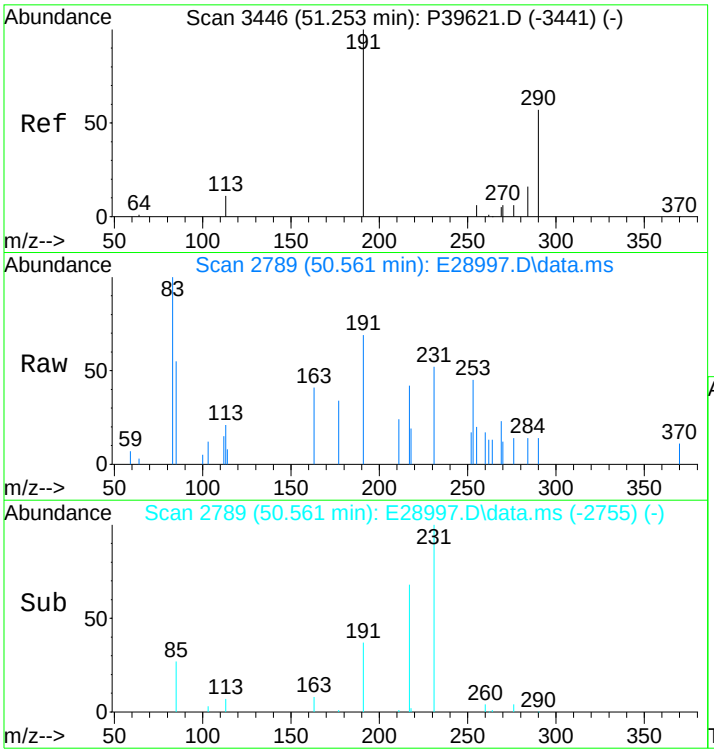




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 130.06 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

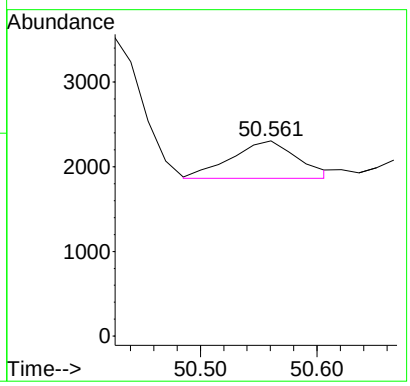
Tgt Ion:191 Resp: 5112

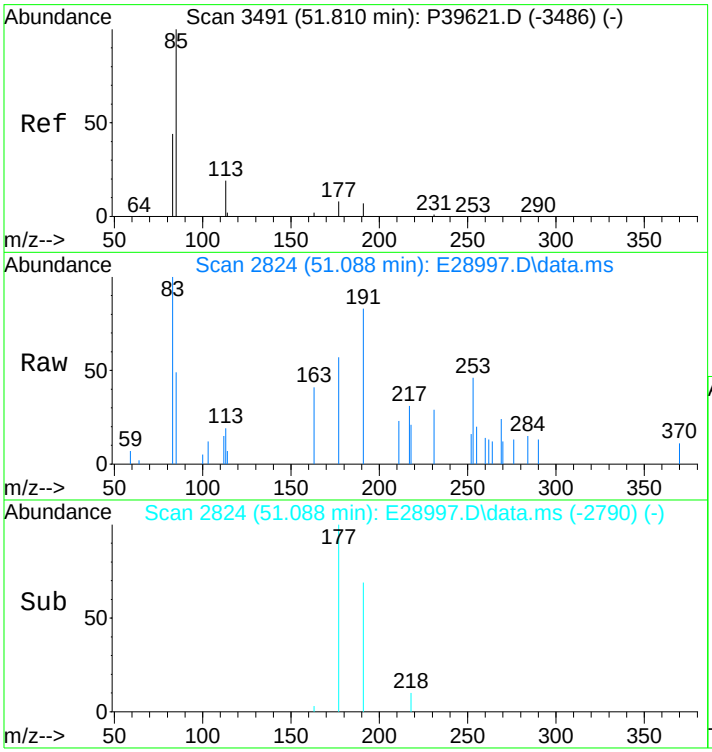




#114
17a(H)-Diahopane (X)
Concen: 44.91 ng/ml m
RT: 50.561 min Scan# 2789
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

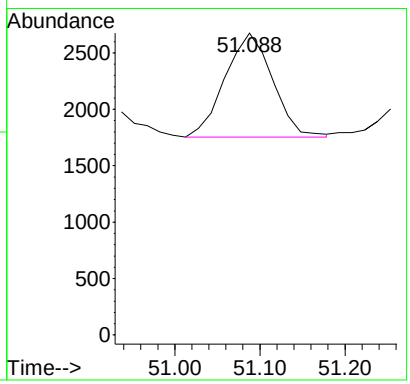
Tgt Ion:191 Resp: 1765

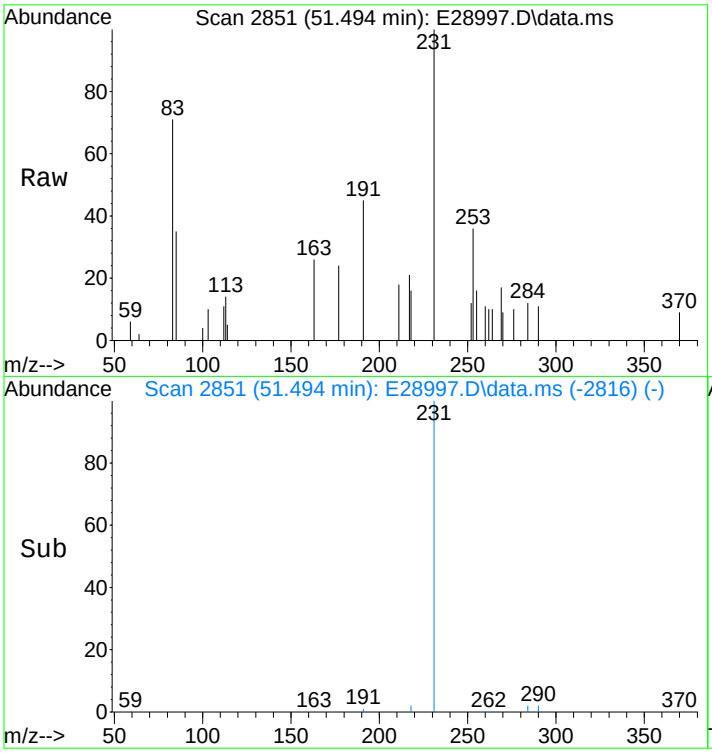




#115
30-Normoretane (T17)
Concen: 91.54 ng/ml
RT: 51.088 min Scan# 2824
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

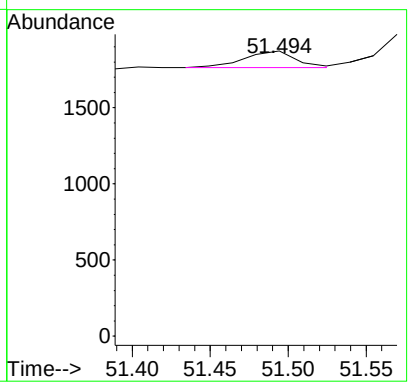
Tgt Ion:191 Resp: 3598

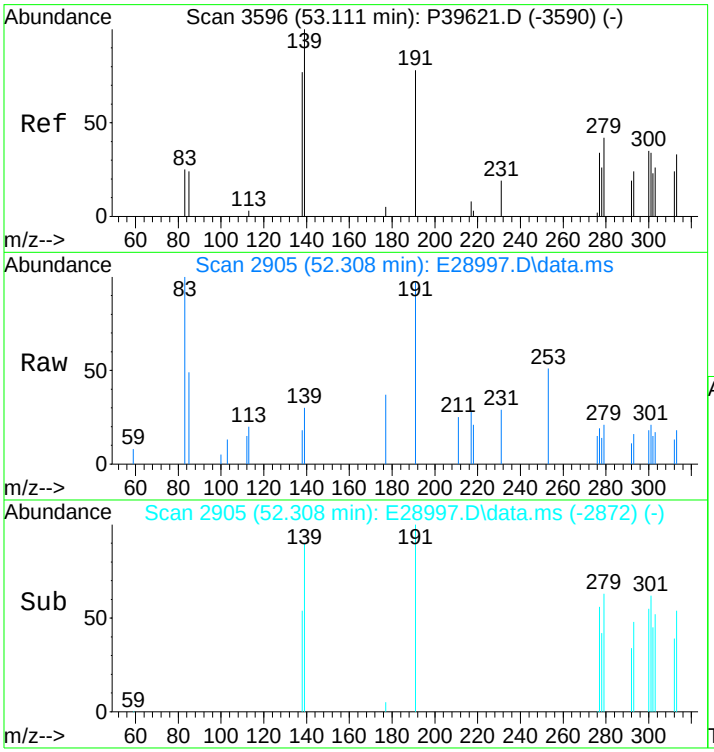




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 6.39 ng/ml
RT: 51.494 min Scan# 2851
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

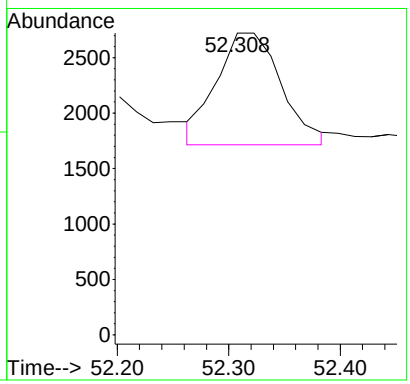
Tgt Ion:191 Resp: 251

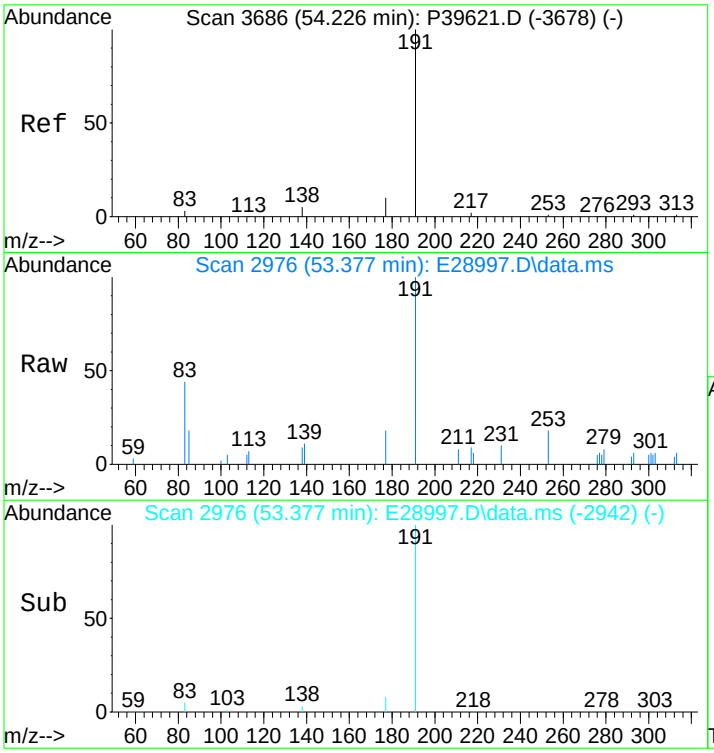




#117
Moretane (T20)
Concen: 103.20 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

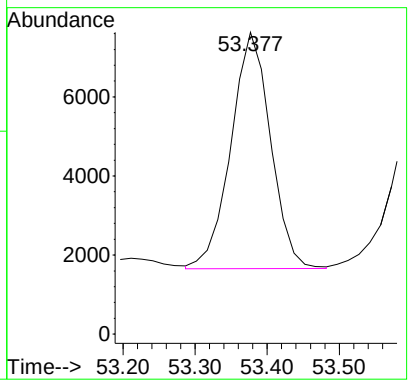
Tgt Ion:191 Resp: 4056

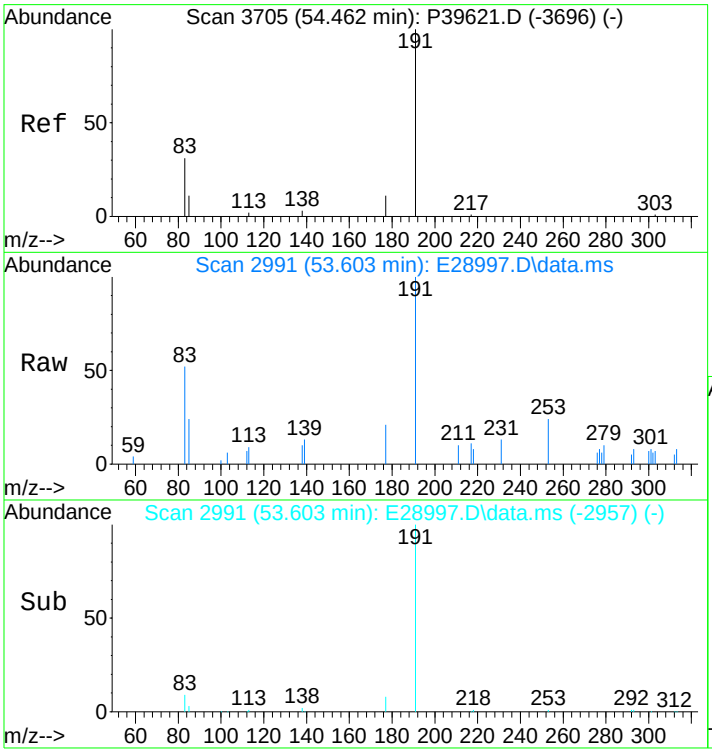




#118
30-Homohopane-22S (T21)
Concen: 580.89 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

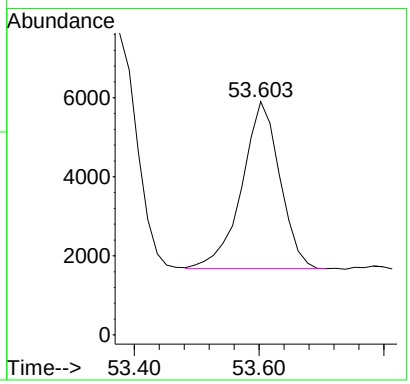
Tgt Ion:191 Resp: 22831

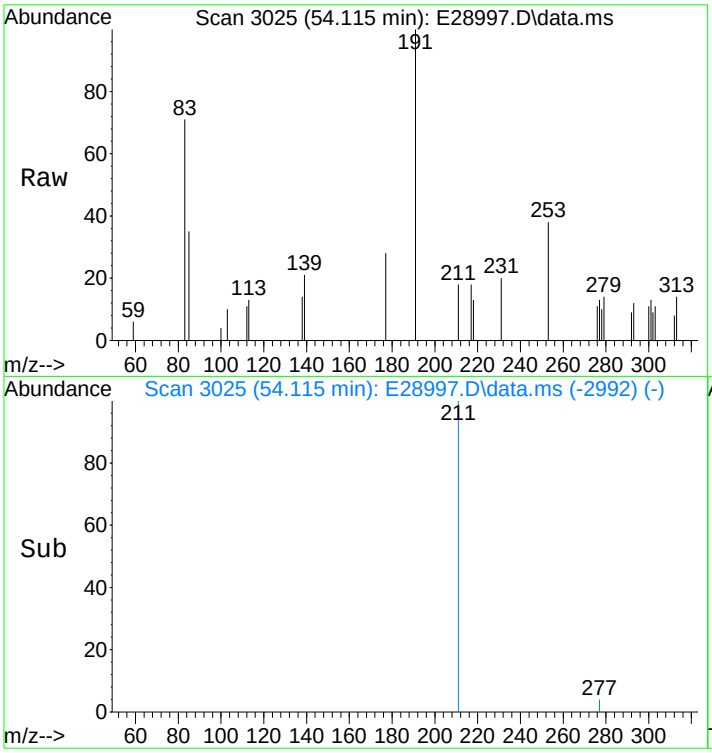




#119
30-Homohopane-22R (T22)
Concen: 455.83 ng/ml
RT: 53.603 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

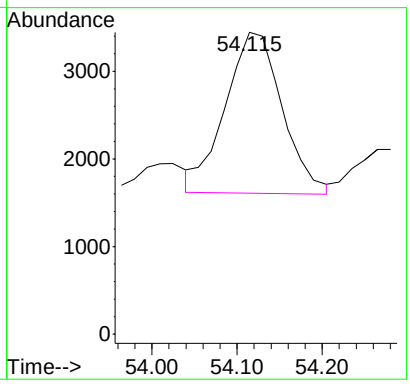
Tgt Ion:191 Resp: 17916

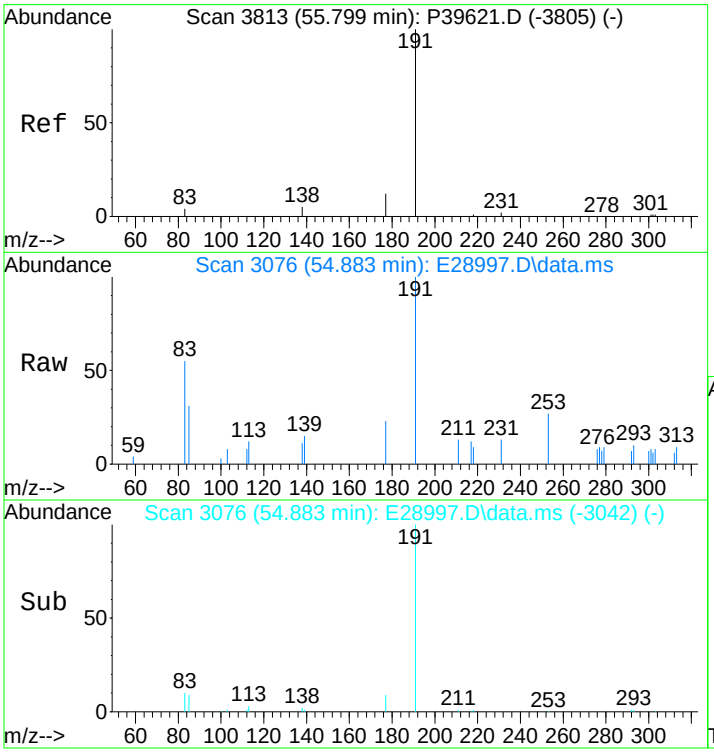




#120
Gammacerane/C32-diahopane
Concen: 216.87 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

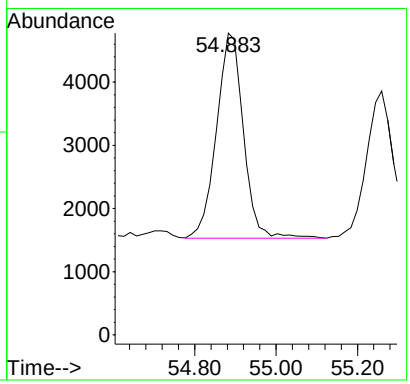
Tgt Ion:191 Resp: 8524

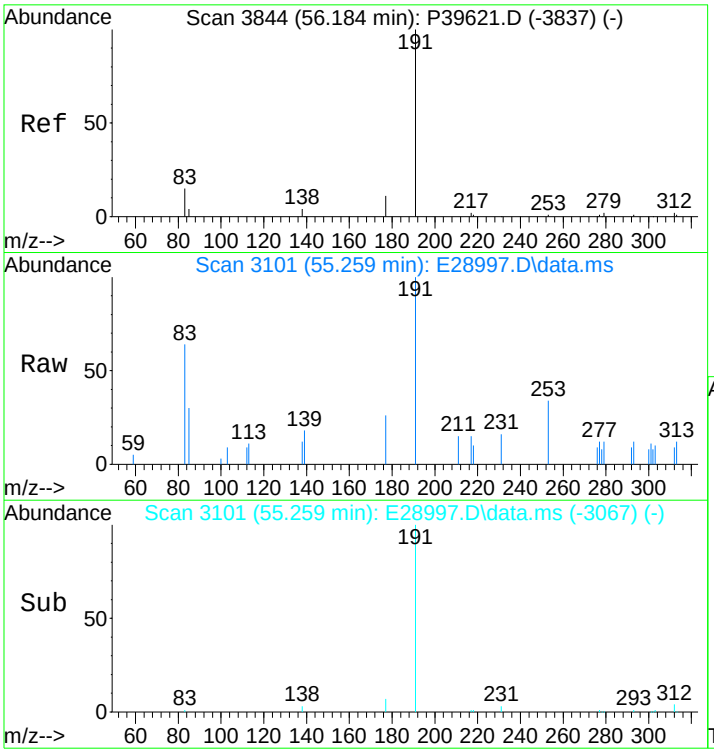




#121
30,31-Bishomohopane-22S (T26)
Concen: 380.52 ng/ml
RT: 54.883 min Scan# 3076
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

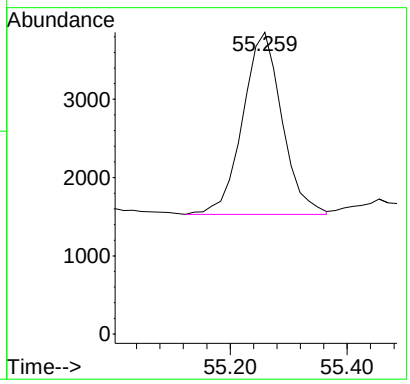
Tgt Ion:191 Resp: 14956

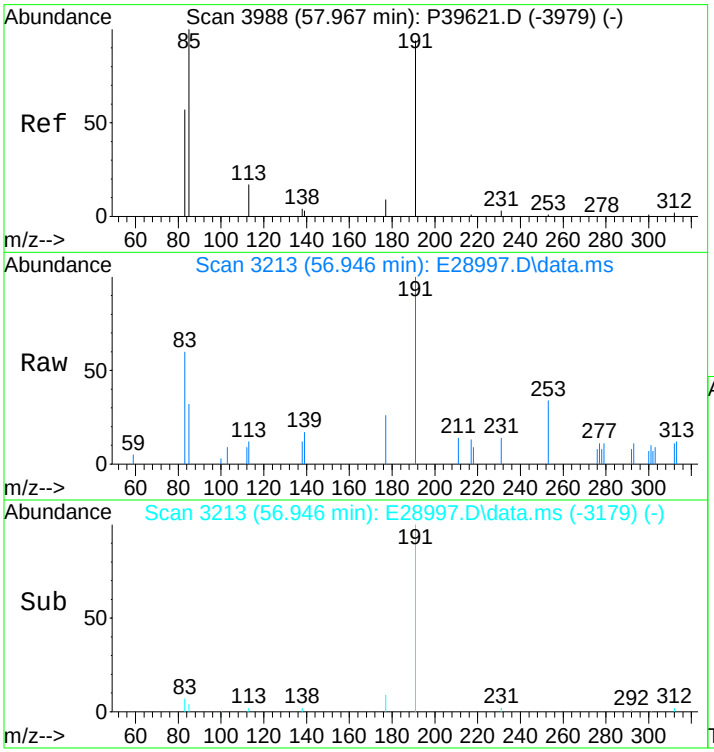




#122
30,31-Bishomohopane-22R (T27)
Concen: 274.50 ng/ml
RT: 55.259 min Scan# 3101
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

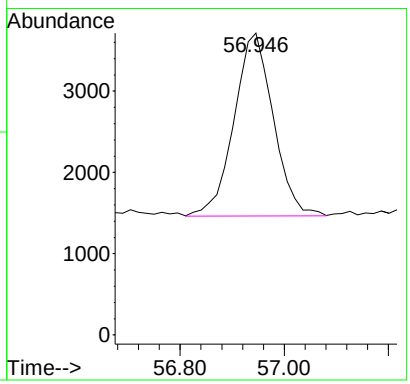
Tgt Ion:191 Resp: 10789

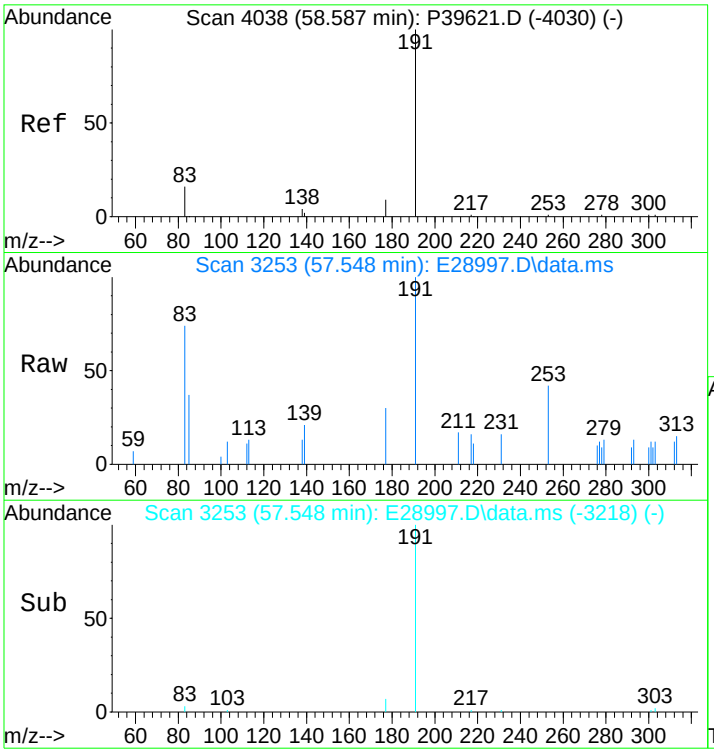




#123
30,31-Trishomohopane-22S (T30)
Concen: 300.33 ng/ml
RT: 56.946 min Scan# 3213
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

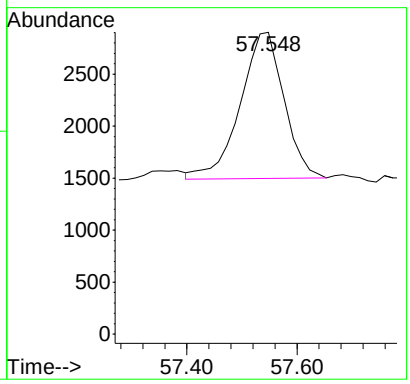
Tgt Ion:191 Resp: 11804

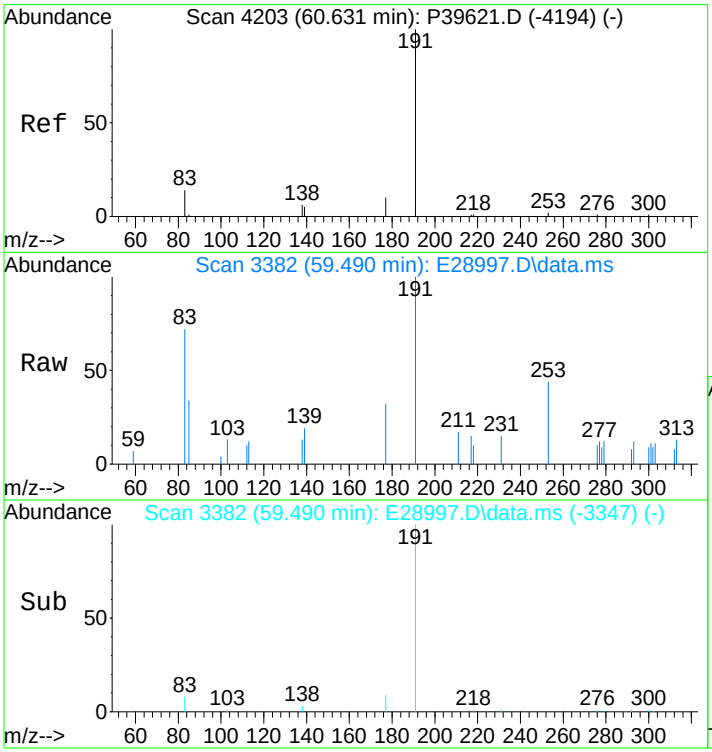




#124
30,31-Trishomohopane-22R (T31)
Concen: 196.95 ng/ml
RT: 57.548 min Scan# 3253
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

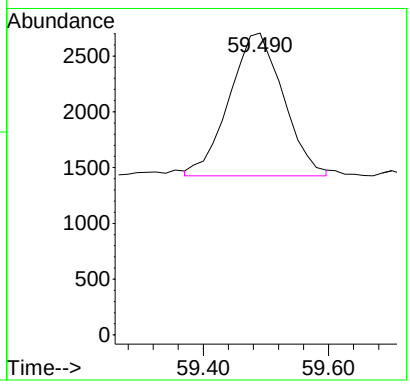
Tgt Ion:191 Resp: 7741

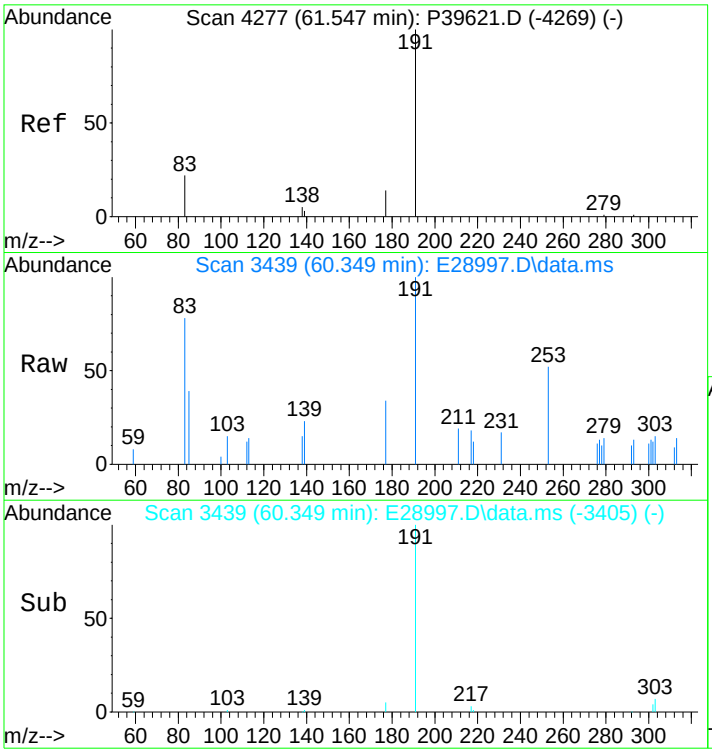




#125
Tetrakishomohopane-22S (T32)
Concen: 194.66 ng/ml m
RT: 59.490 min Scan# 3382
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

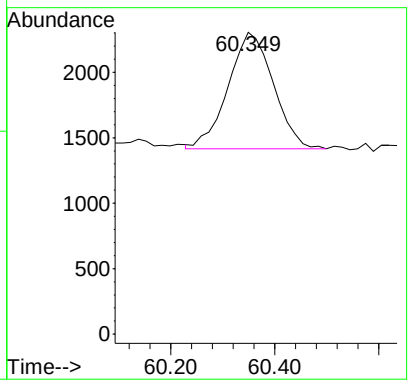
Tgt Ion:191 Resp: 7651

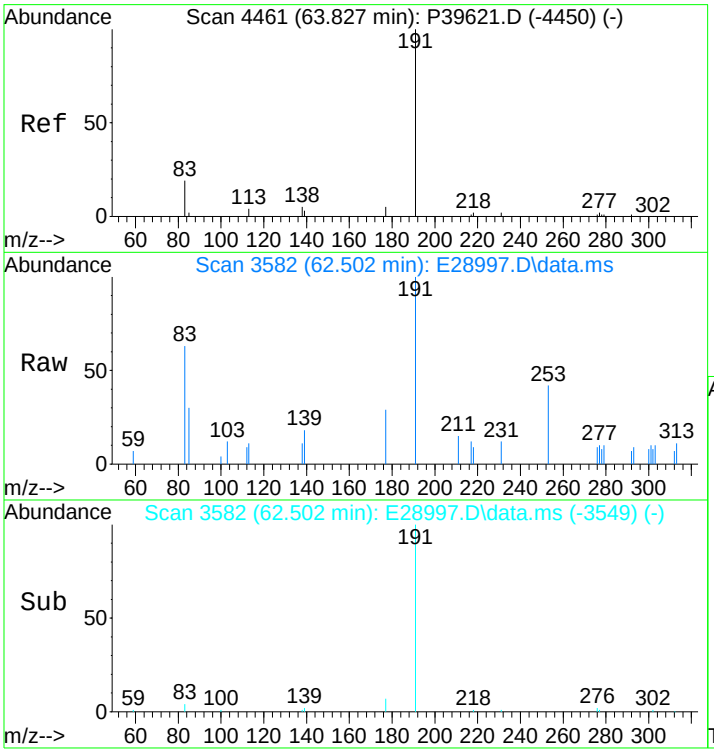




#126
Tetrakishomohopane-22R (T33)
Concen: 136.53 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

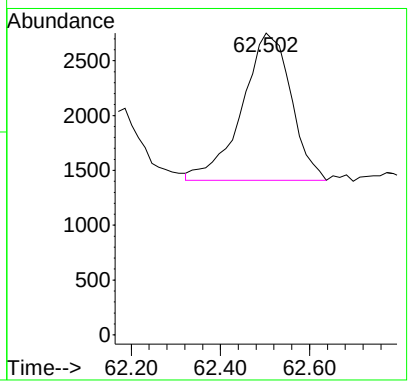
Tgt Ion:191 Resp: 5366

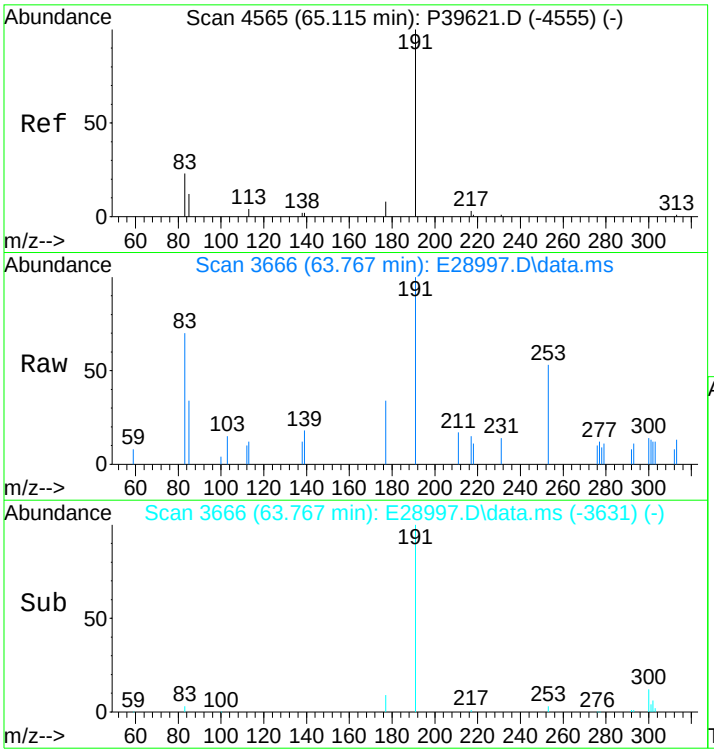




#127
Pentakishomohopane-22S (T34)
Concen: 261.76 ng/ml
RT: 62.502 min Scan# 3582
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

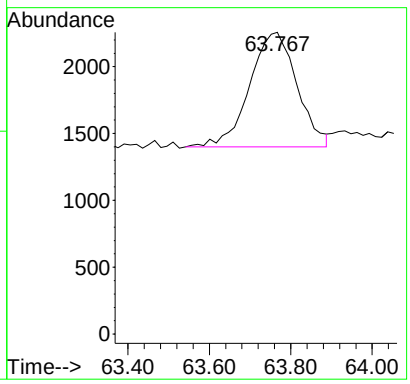
Tgt Ion:191 Resp: 10288

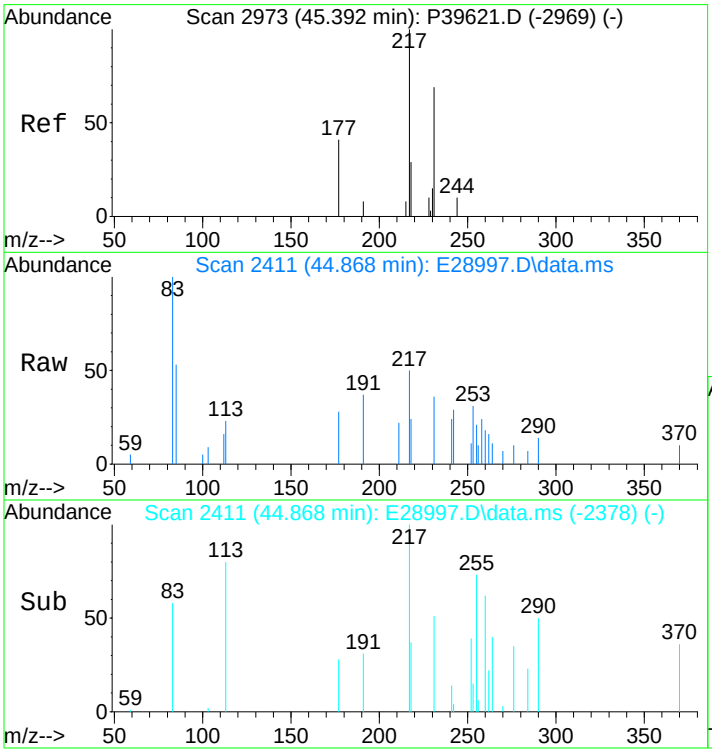




#128
Pentakishomohopane-22R (T35)
Concen: 176.68 ng/ml
RT: 63.767 min Scan# 3666
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

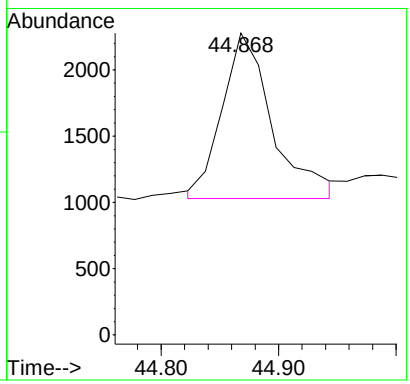
Tgt Ion:191 Resp: 6944

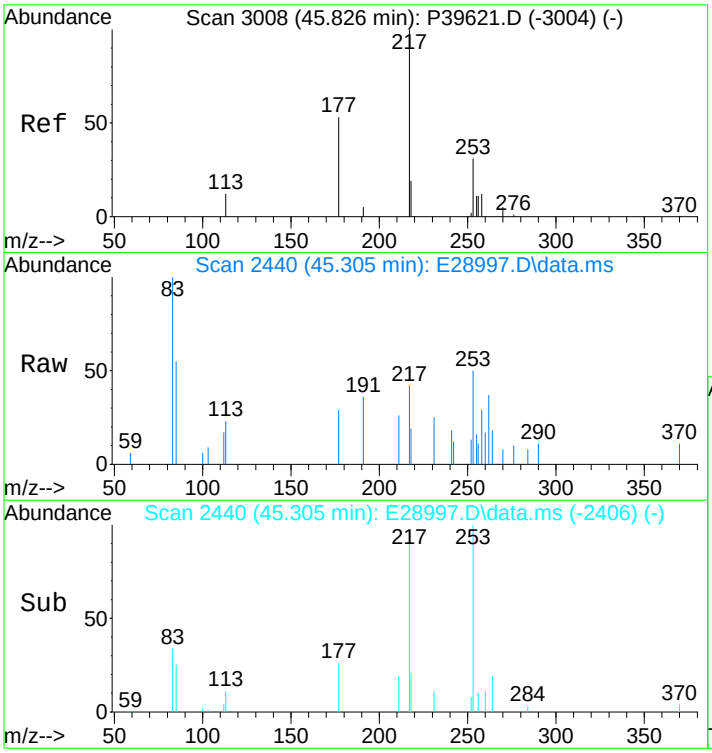




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 180.62 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

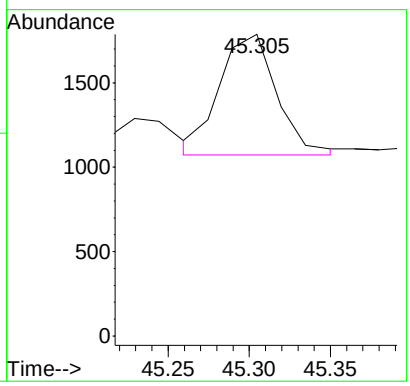
Tgt Ion:217 Resp: 3728

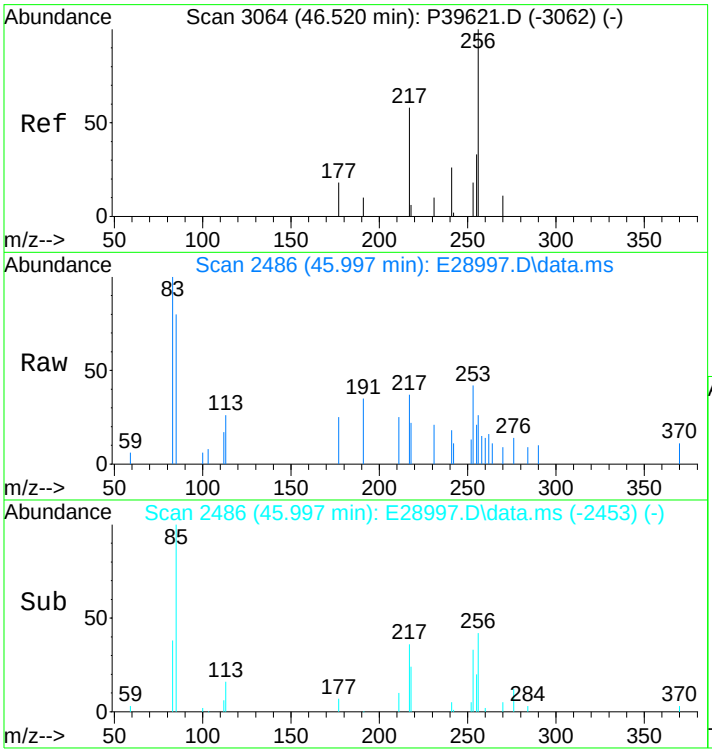




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 84.59 ng/ml m
RT: 45.305 min Scan# 2440
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

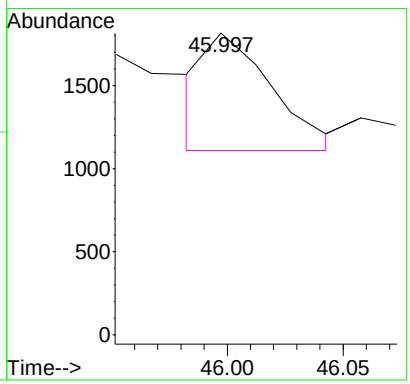
Tgt Ion:217 Resp: 1746

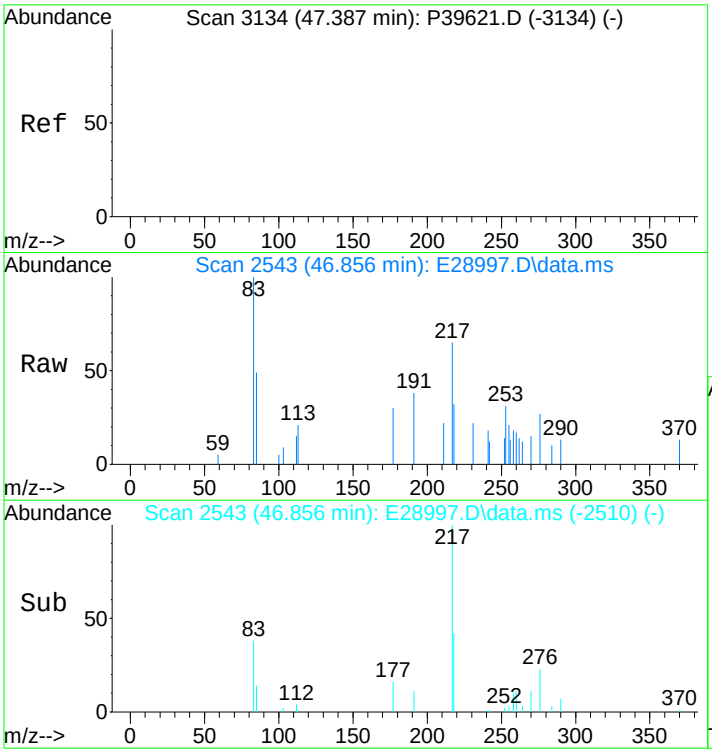




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 68.07 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

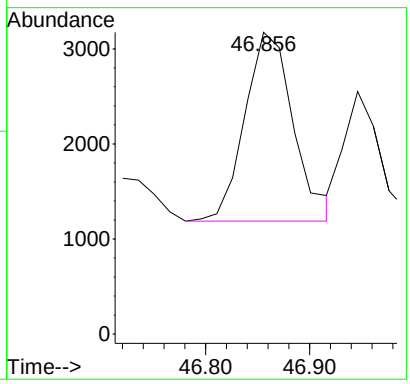
Tgt Ion:217 Resp: 1405

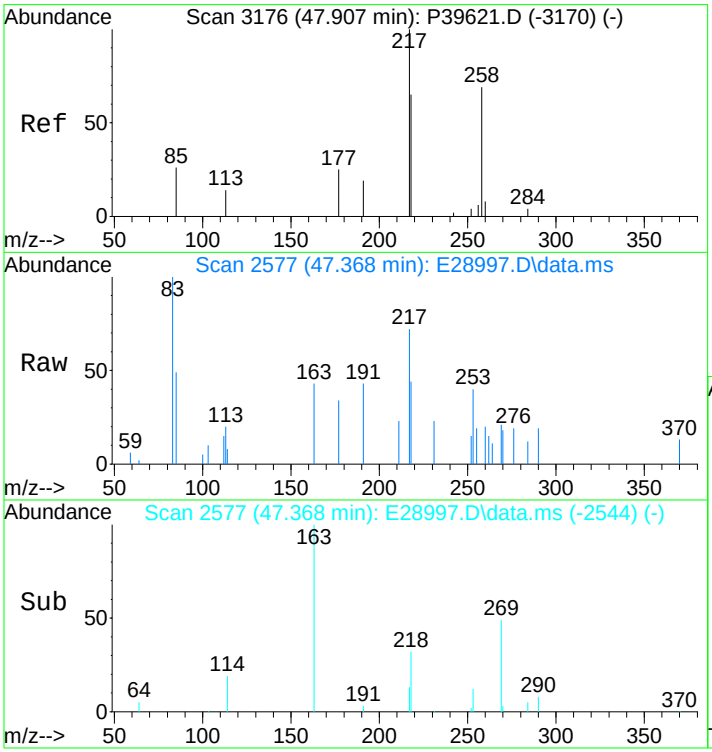




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 313.46 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

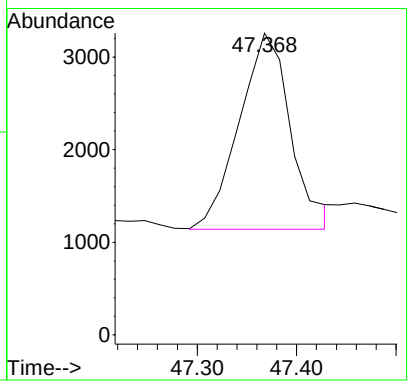
Tgt Ion:217 Resp: 6470

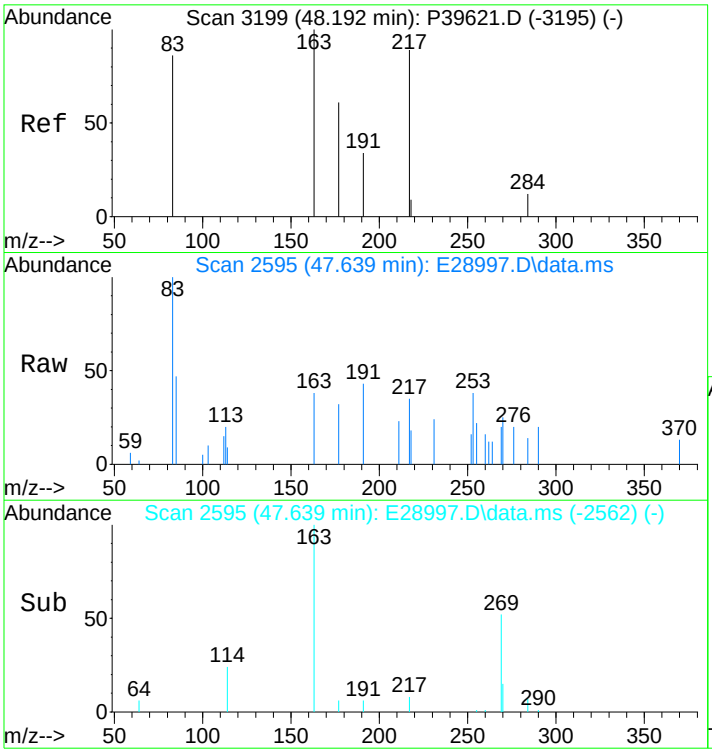




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 367.82 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

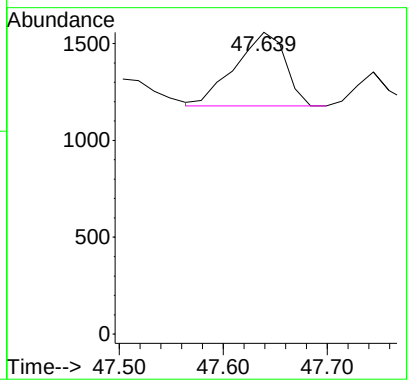
Tgt Ion:217 Resp: 7592

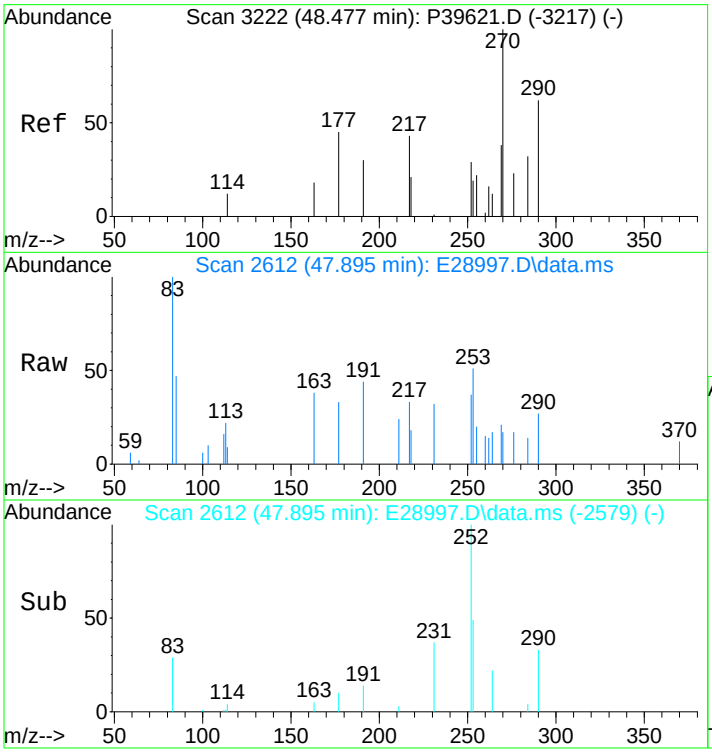




#135
Unknown Sterane (S18)
Concen: 61.53 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

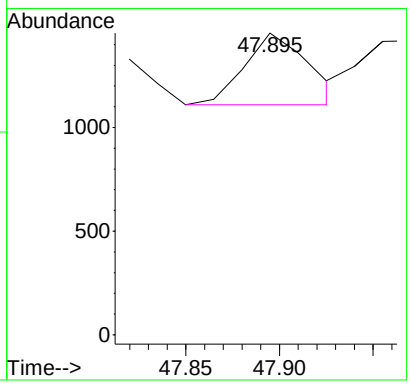
Tgt Ion:217 Resp: 1270

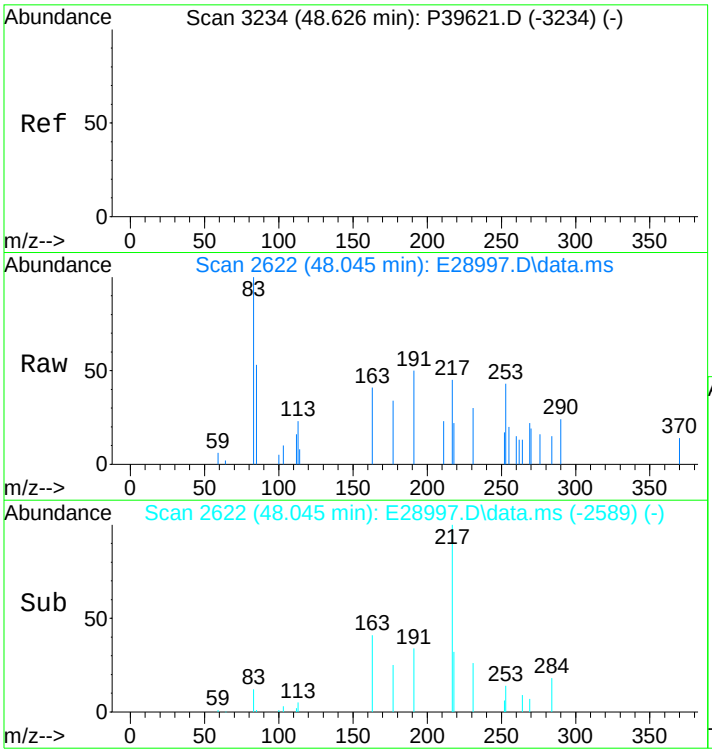




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 39.87 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

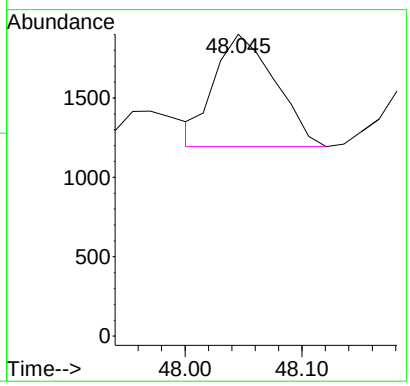
Tgt Ion:217 Resp: 823

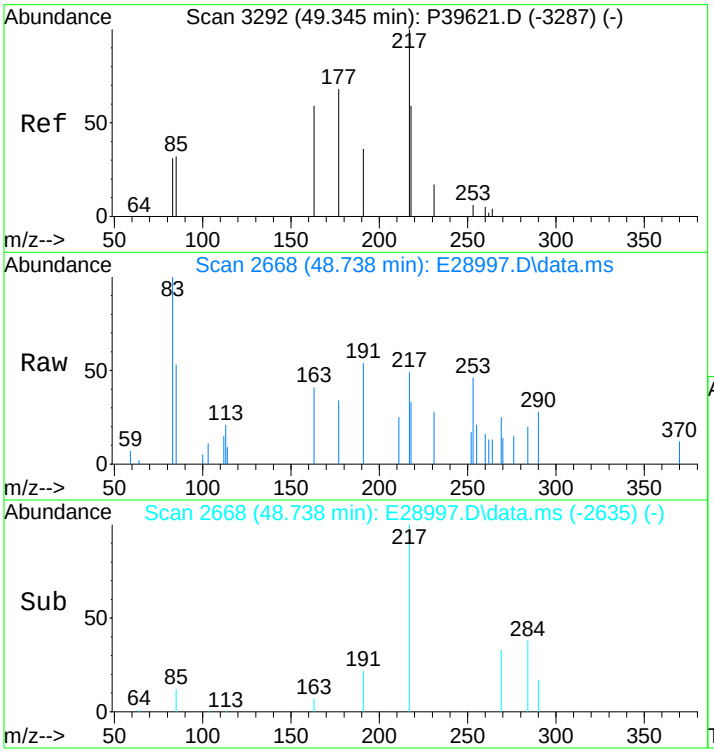




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 123.20 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

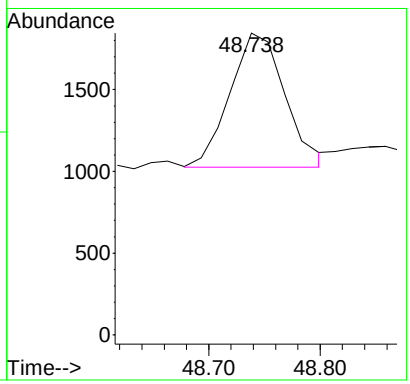
Tgt Ion:217 Resp: 2543

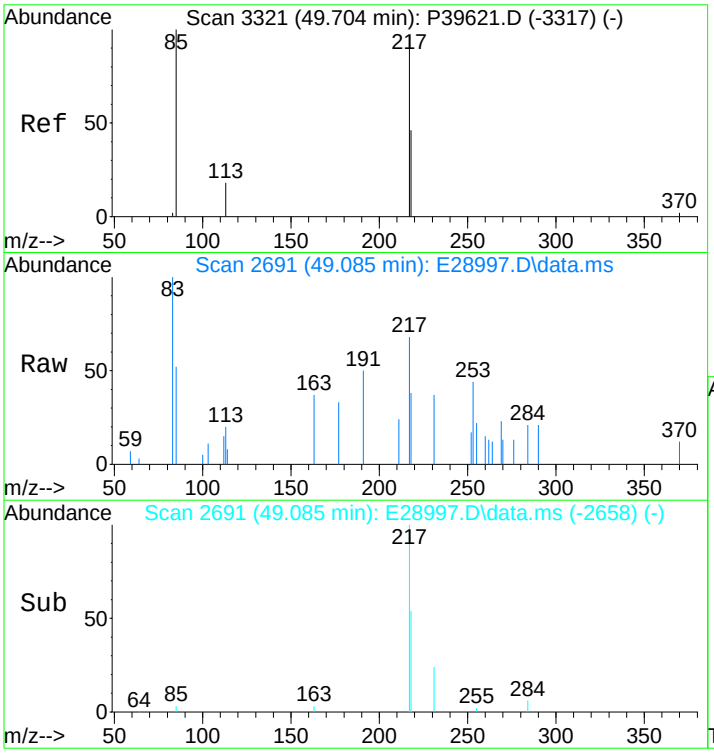




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 136.58 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

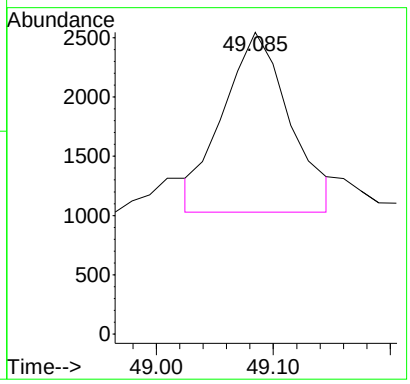
Tgt Ion:217 Resp: 2819

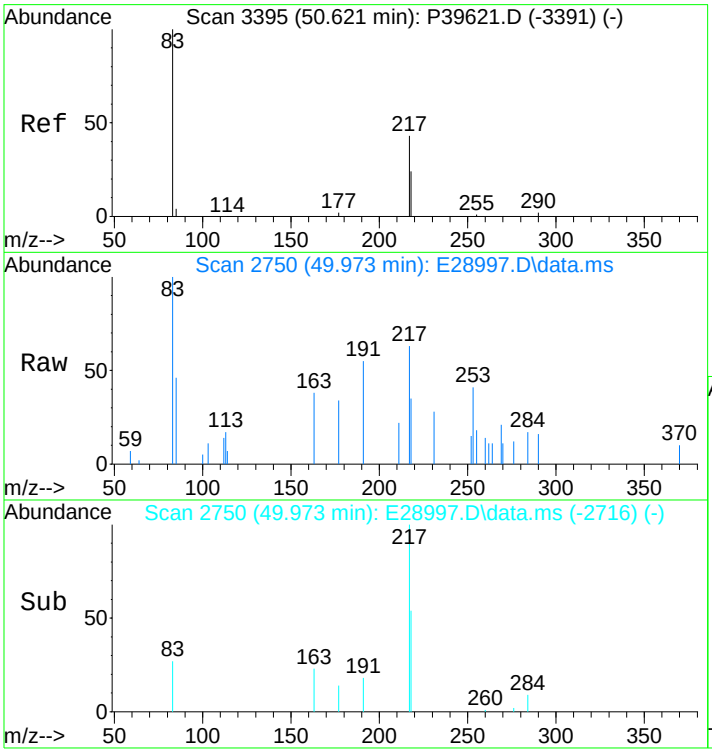




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 290.16 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

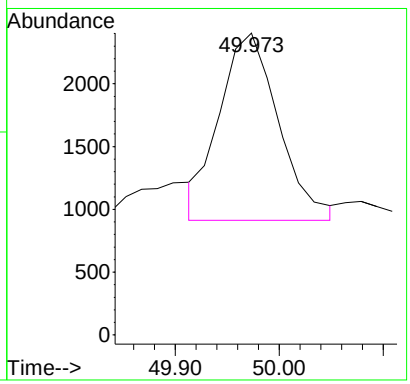
Tgt Ion:217 Resp: 5989

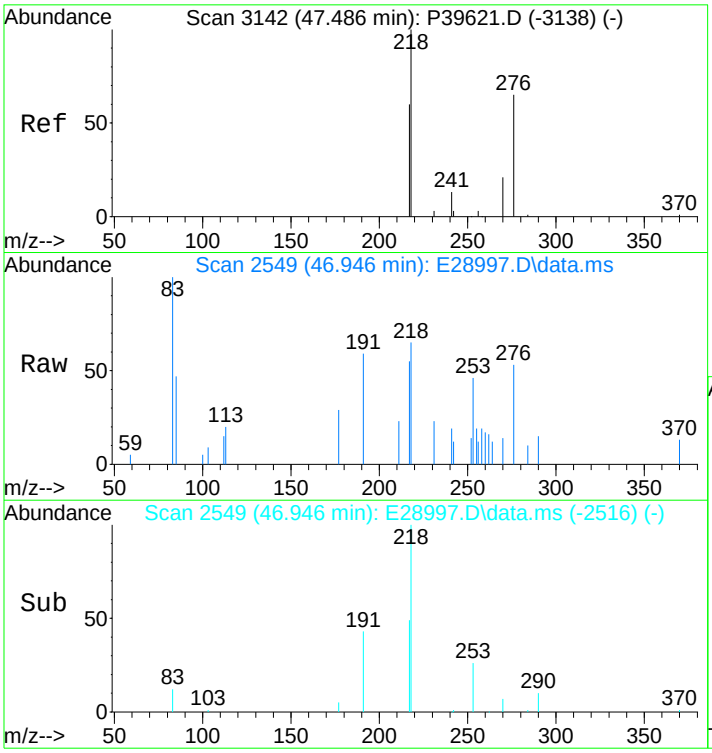




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 284.83 ng/ml m
RT: 49.973 min Scan# 2750
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

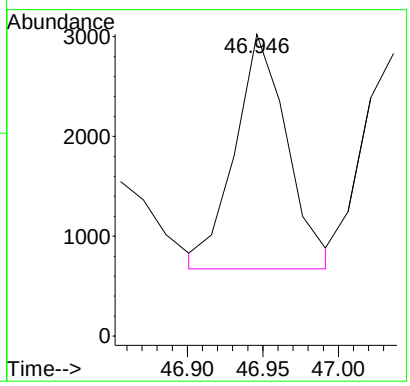
Tgt Ion:217 Resp: 5879

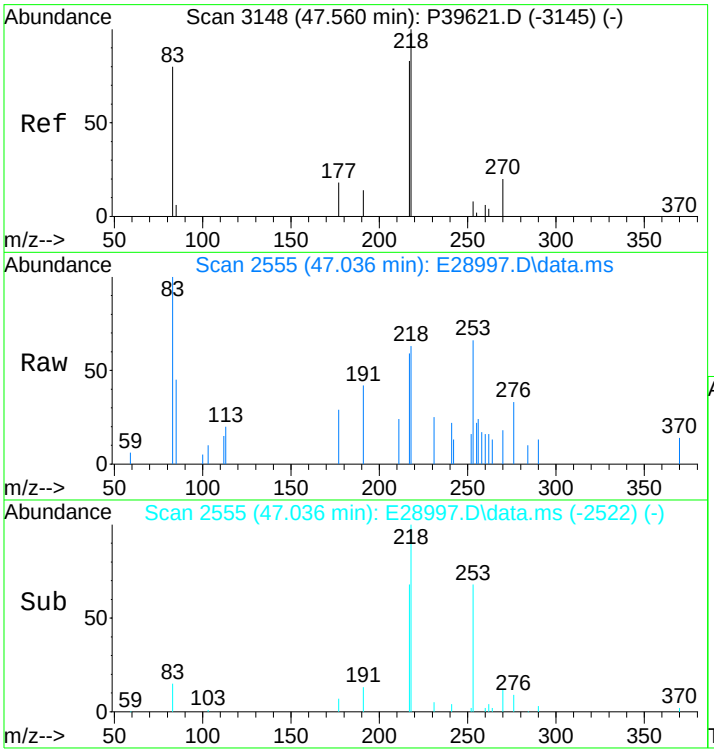




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 273.25 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

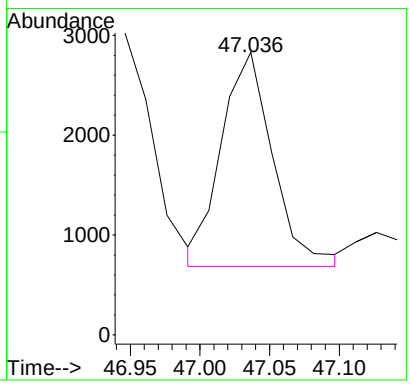
Tgt Ion:218 Resp: 5640

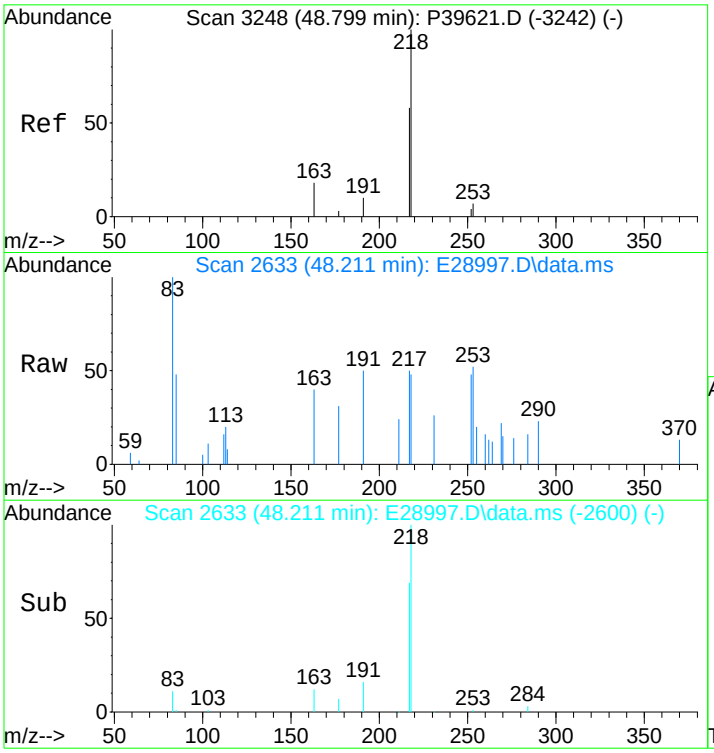




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 266.51 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

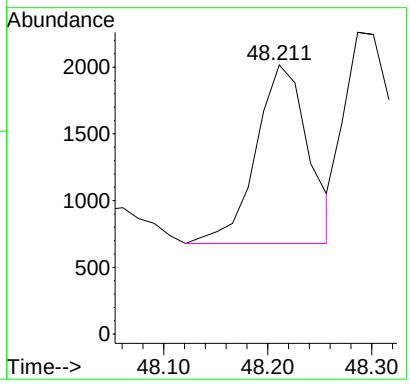
Tgt Ion:218 Resp: 5501

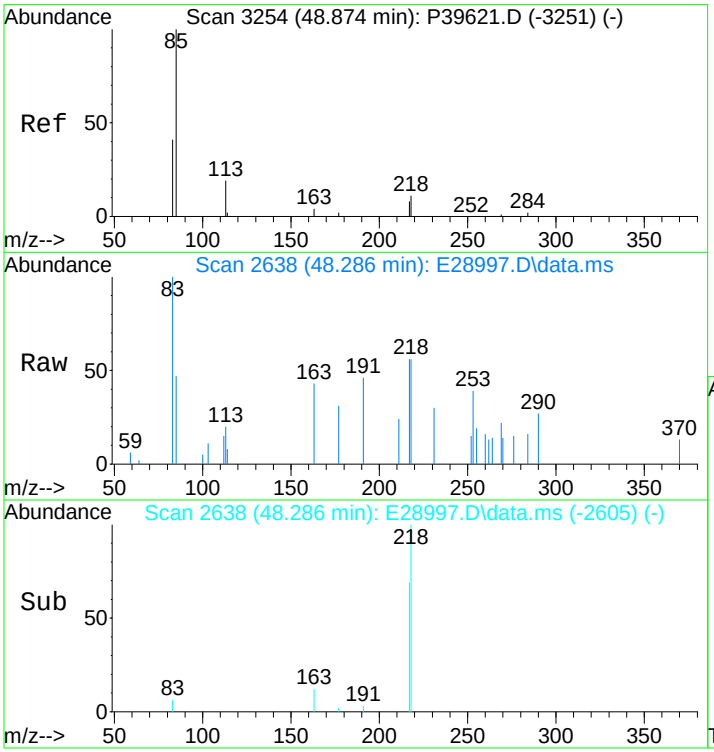




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 228.09 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

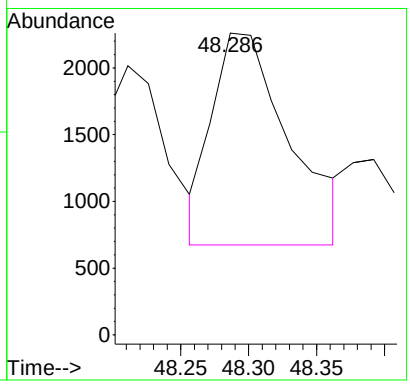
Tgt Ion:218 Resp: 4708

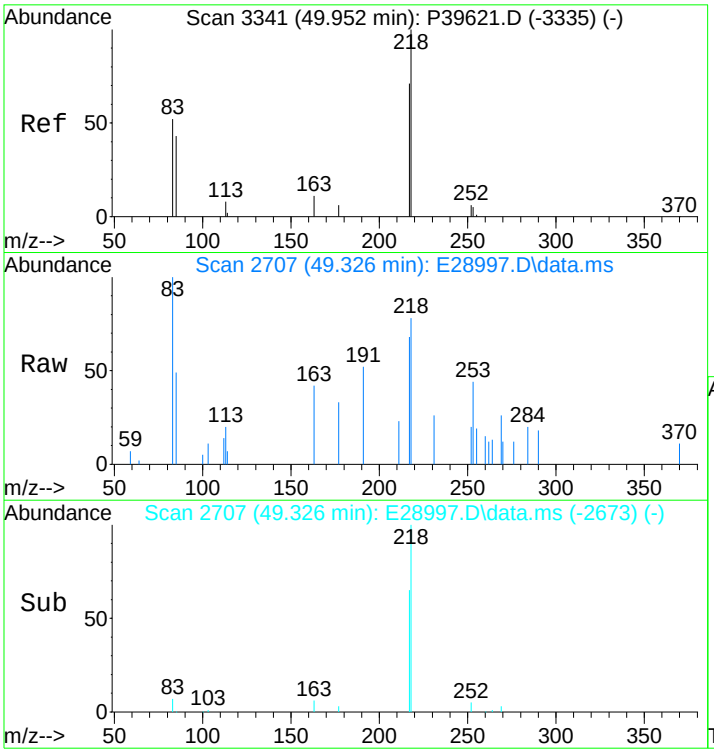




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 302.22 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

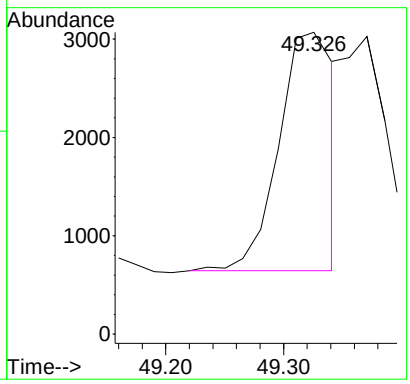
Tgt Ion:218 Resp: 6238

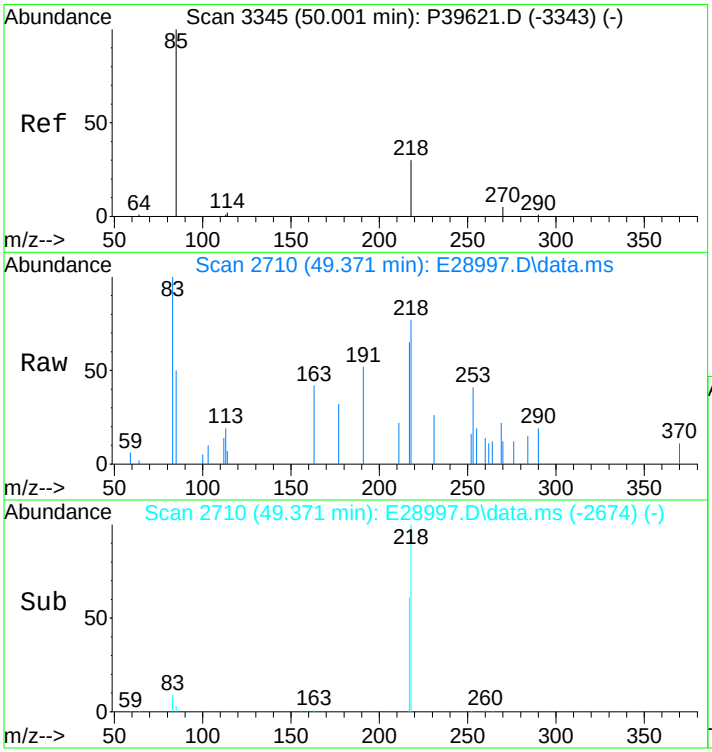




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 383.47 ng/ml m
RT: 49.326 min Scan# 2707
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

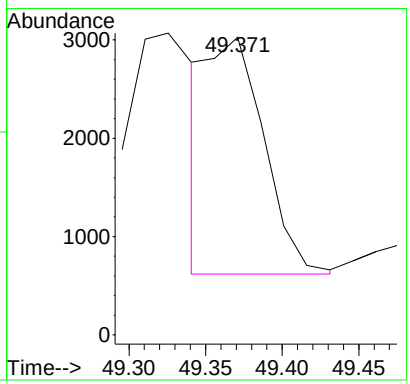
Tgt Ion:218 Resp: 7915

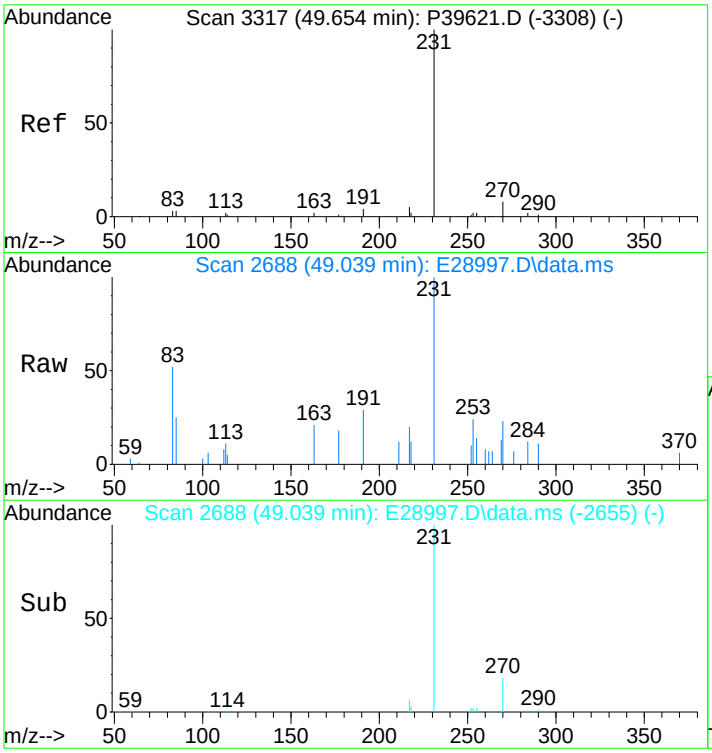




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 296.12 ng/ml m
RT: 49.371 min Scan# 2710
Delta R.T. 0.045 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

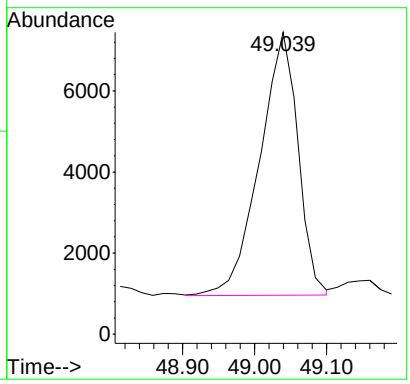
Tgt Ion:218 Resp: 6112

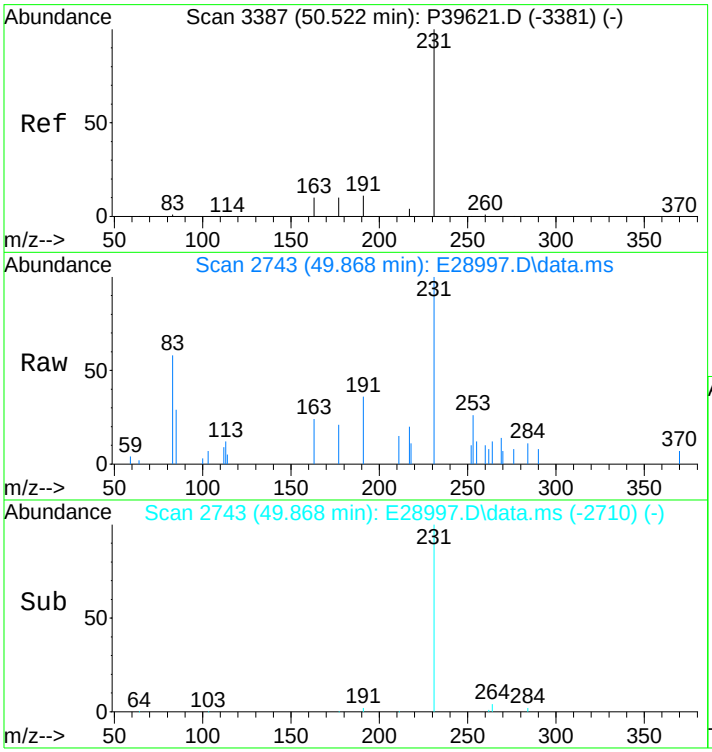




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1160.38 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

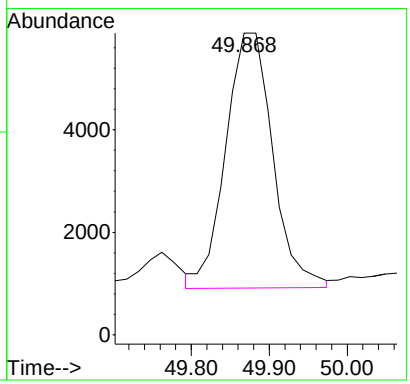
Tgt Ion:231 Resp: 23951

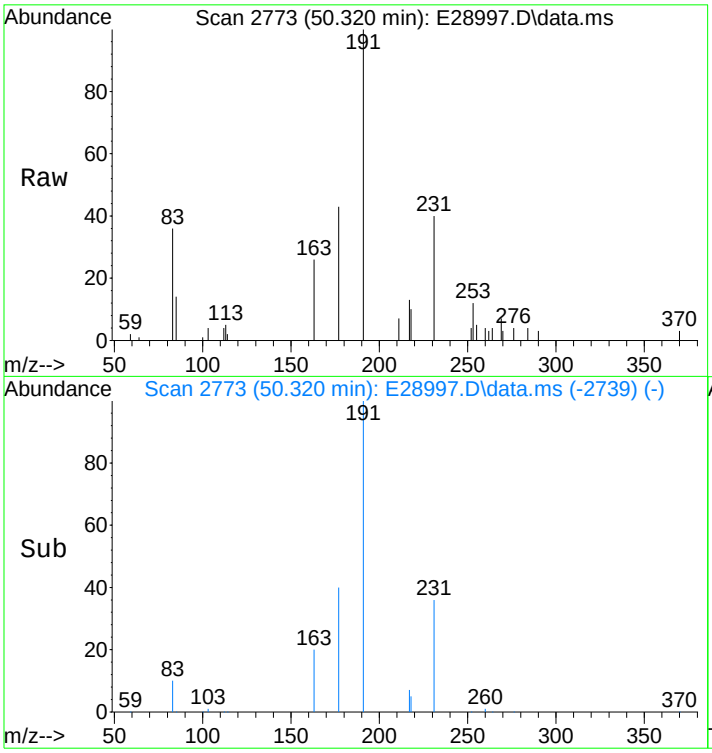




#148
C28,20S-triaromatic steroid
Concen: 1012.57 ng/mL
RT: 49.868 min Scan# 2743
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

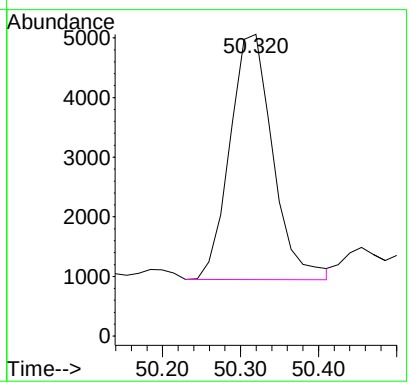
Tgt Ion:231 Resp: 20900

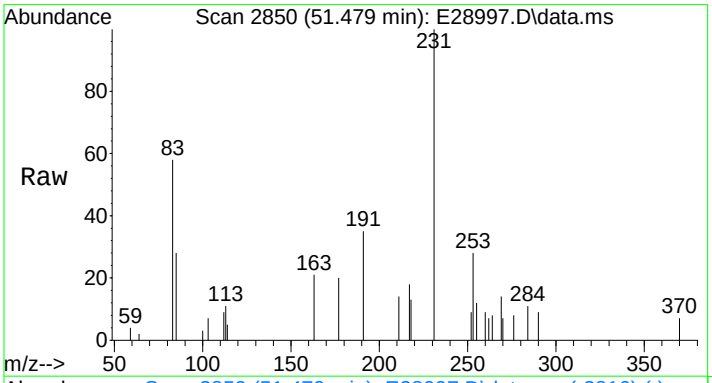




#149
C27,20R-triaromatic steroid
Concen: 763.64 ng/mL
RT: 50.320 min Scan# 2773
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

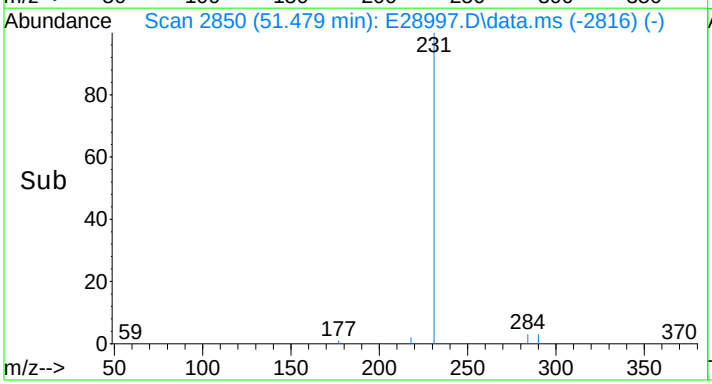
Tgt Ion:231 Resp: 15762

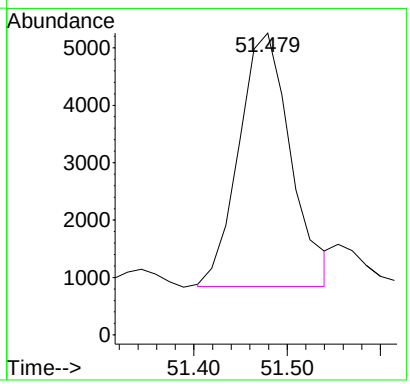




#150
C28,20R-triaromatic steroid
Concen: 828.32 ng/mL m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:231 Resp: 17097





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 12:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
	Internal Standards						
1)	Acenaphthene-d10	26.576	164	25956	500.000	ng/mL	0.00
74)	Chrysene-d12	43.076	240	51989	500.000	ng/mL	0.00
	System Monitoring Compounds						
9)	Naphthalene-d8	19.620	136	902	9.329	ng/mL	0.02
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.93%#		
42)	Phenanthrene-d10	32.462	188	853	8.754	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.88%#		
83)	Benzo[b]fluoranthene-d12	46.991	264	1104	11.216	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	1.12%#		
88)	Benzo[a]pyrene-d12	48.166	264	1071	11.998	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	1.20%#		
129)	5B(H)Cholane - Surr	43.724	217	197	10.279	ng/ml	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	1.03%#		
	Target Compounds						Qvalue
3)	trans-Decalin	16.263	138	115	5.322	ng/mL	100
4)	cis-Decalin	17.483	138	86M2	5.240	ng/mL	
10)	Naphthalene	19.696	128	1087	10.481	ng/mL#	100
16)	2-Methylnaphthalene	22.390	142	682	10.161	ng/mL#	100
17)	1-Methylnaphthalene	22.812	142	646	10.036	ng/mL#	100
18)	Benzothiophene	19.906	134	848	10.023	ng/mL	100
23)	Biphenyl	24.272	154	861	10.128	ng/mL#	100
24)	2,6-Dimethylnaphthalene	24.875	156	578	9.446	ng/mL#	100
25)	Dibenzofuran	27.358	168	873	9.503	ng/mL#	90
26)	Acenaphthylene	25.973	152	985	9.620	ng/mL#	100
27)	Acenaphthene	26.711	153	670	10.499	ng/mL	98
28)	2,3,5-Trimethylnaphtha...	28.277	170	527	9.528	ng/mL	94
29)	Fluorene	28.728	166	672	9.057	ng/mL	98
33)	Dibenzothiophene	32.055	184	919	8.846	ng/mL#	81
43)	Phenanthrene	32.552	178	923	8.519	ng/mL	99
54)	Retene	39.568	234	303	9.135	ng/mL	99
55)	Anthracene	32.733	178	820M3	8.076	ng/mL	
56)	Carbazole	33.425	167	765	7.978	ng/mL	96
57)	1-Methylphenanthrene	35.066	192	683M3	8.463	ng/mL	
58)	Fluoranthene	37.340	202	989	8.376	ng/mL	97
59)	Benzo(b)fluorene	39.869	216	626	8.335	ng/mL	99
60)	Pyrene	38.213	202	1069	8.993	ng/mL	97
66)	Naphthobenzothiophene	42.083	234	993	8.854	ng/ml#	86
67)	Naphthobenzothiophene-...	42.083	234	993	8.854	ng/mL#	86
75)	Benz[a]anthracene	43.016	228	956M3	8.294	ng/mL	
76)	Chrysene	43.167	228	1070	9.484	ng/mL	100
77)	Chrysene/Triphenylene	43.167	228	1070	9.484	ng/mL	100
84)	Benzo[b]fluoranthene	47.082	252	1183	9.748	ng/mL#	84
85)	Benzo[j]+[k]fluoranthene	47.157	252	1204	10.543	ng/mL#	88
87)	Benzo[e]pyrene	48.076	252	1263	11.728	ng/mL#	84
89)	Benzo[a]pyrene	48.256	252	1201	11.796	ng/mL#	77
90)	Perylene	48.573	252	1215	11.213	ng/mL#	84
91)	Indeno[1,2,3-cd]pyrene	53.045	276	1314M3	10.690	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.121	278	1404	11.876	ng/mL	97
93)	Benzo[g,h,i]perylene	54.325	276	1563	12.940	ng/mL	100
94)	Hopane (T19)	52.187	191	427M3	14.965	ng/mL	
95)	17a(H),21B(H)-hopane -...	52.187	191	416M3	14.579	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 12:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

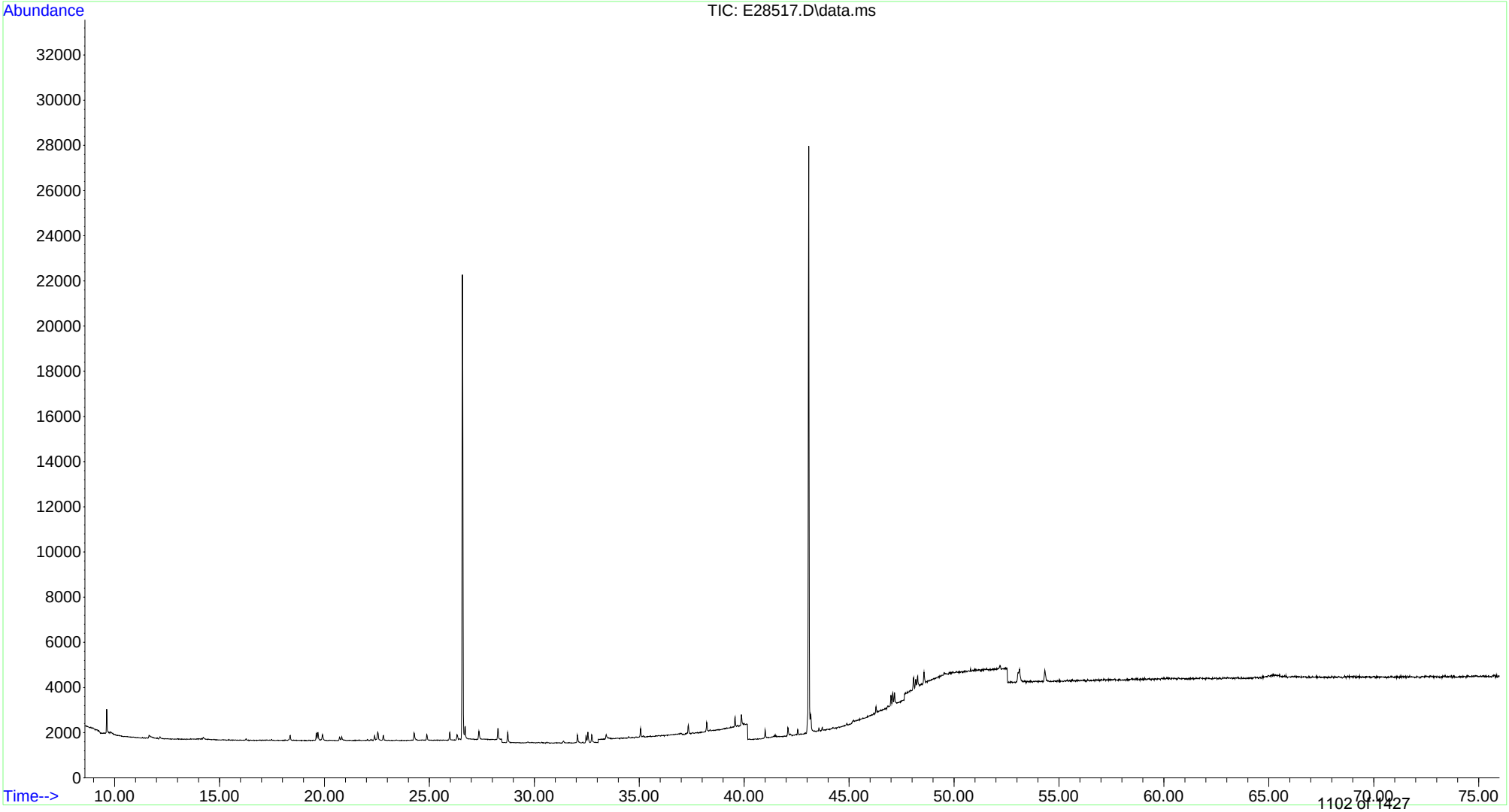
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

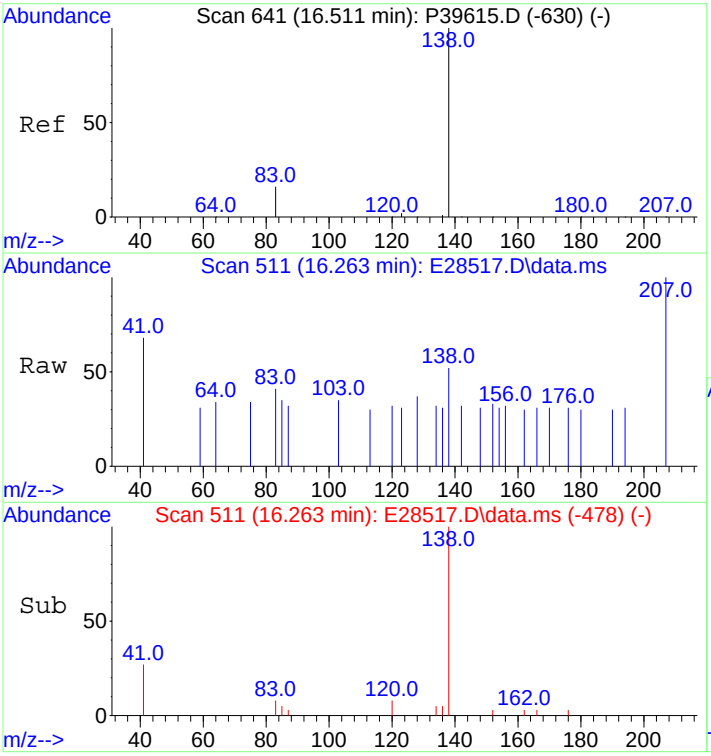
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

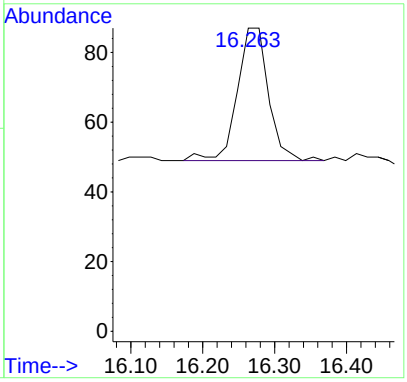
Quant Time: Oct 31 12:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

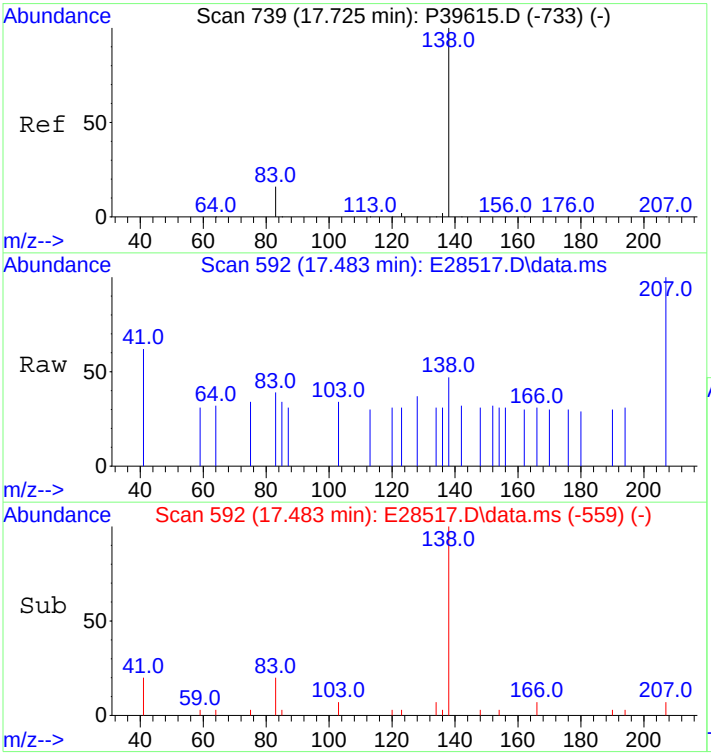




#3
trans-Decalin
Concen: 5.32 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

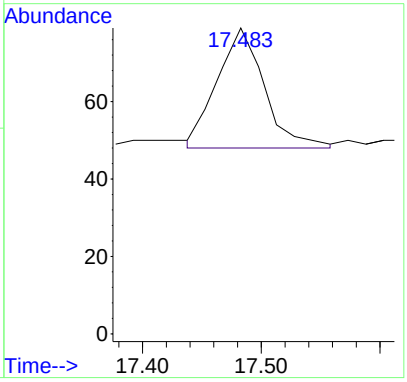
Tgt Ion:138 Resp: 115

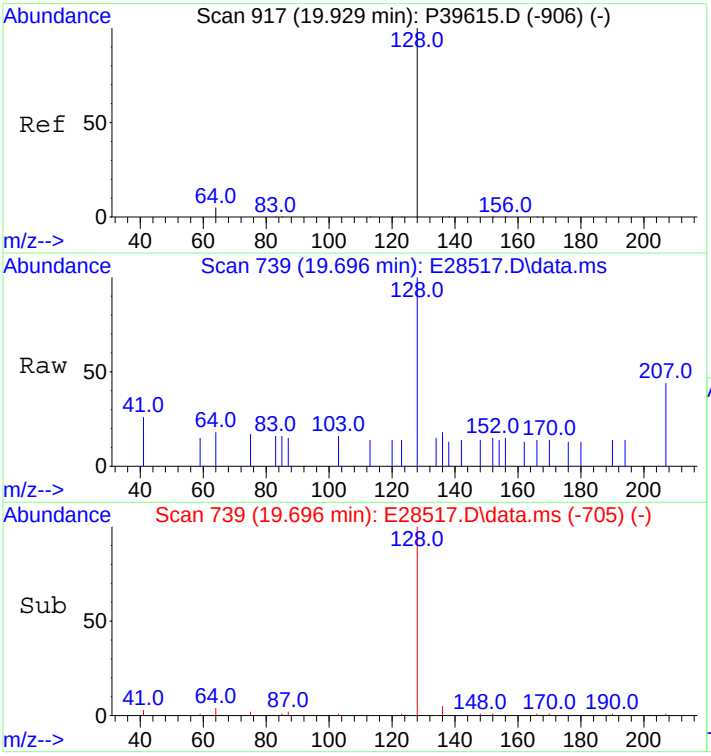




#4
cis-Decalin
Concen: 5.24 ng/mL m
RT: 17.483 min Scan# 592
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:138 Resp: 86

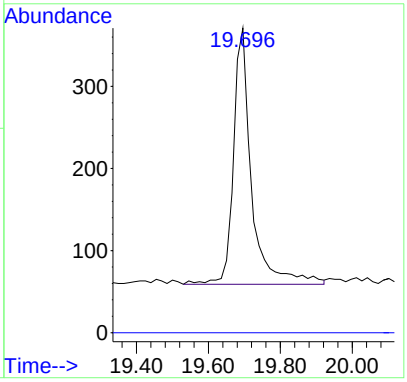


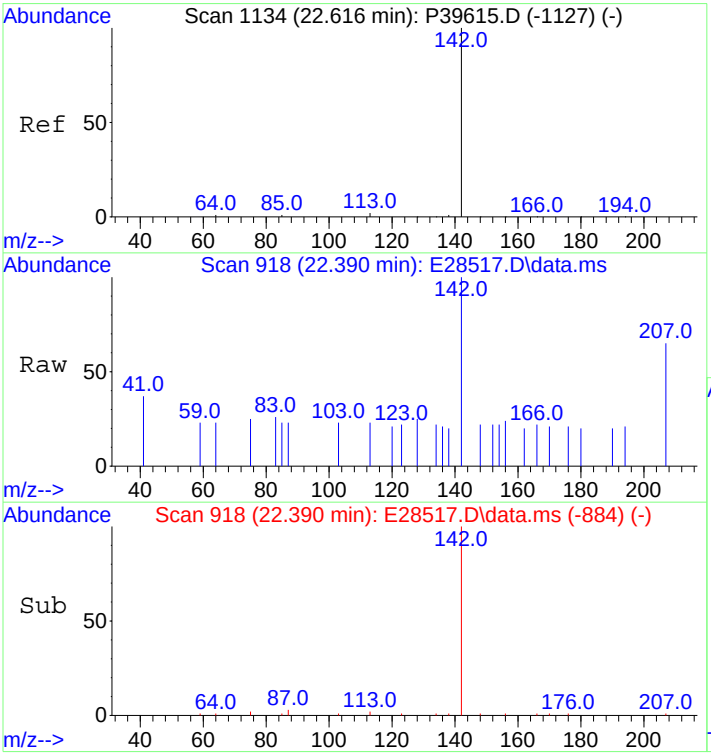


#10
Naphthalene
Concen: 10.48 ng/mL
RT: 19.696 min Scan# 739
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:128 Resp: 1087

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

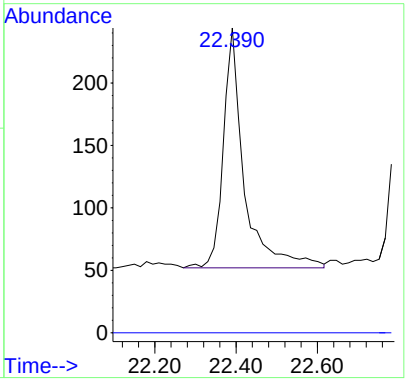


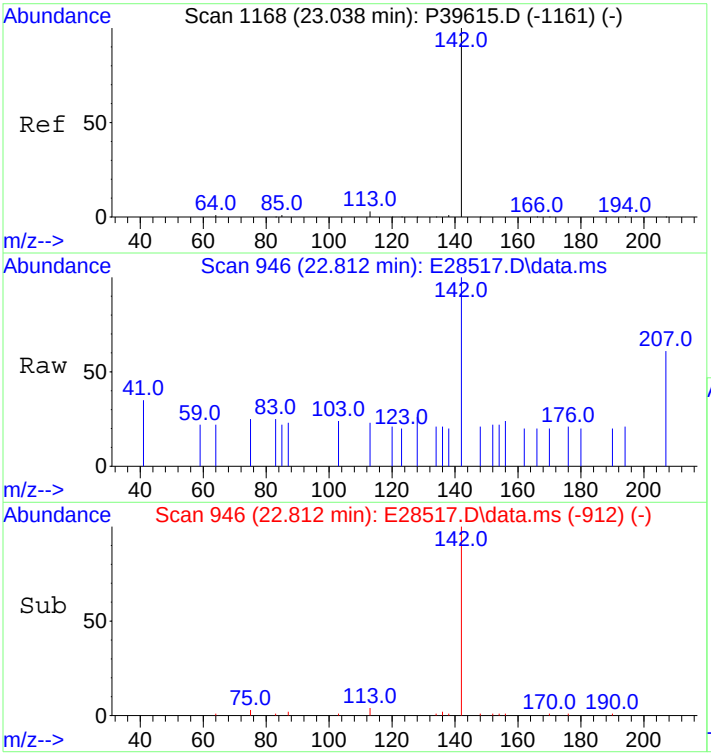


#16
2-Methylnaphthalene
Concen: 10.16 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:142 Resp: 682

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

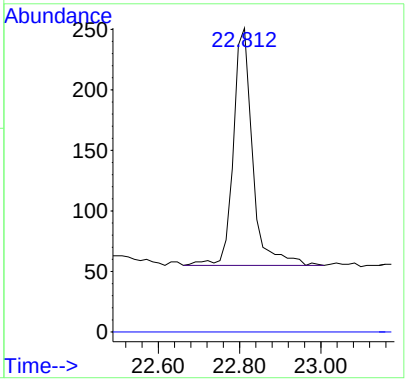


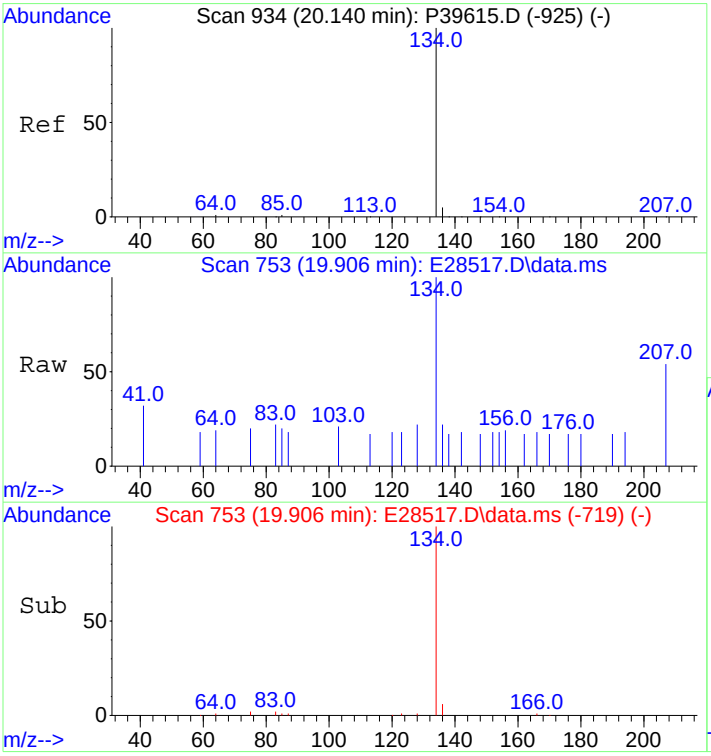


#17
1-Methylnaphthalene
Concen: 10.04 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:142 Resp: 646

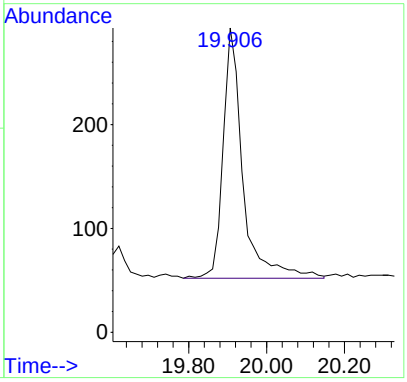
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

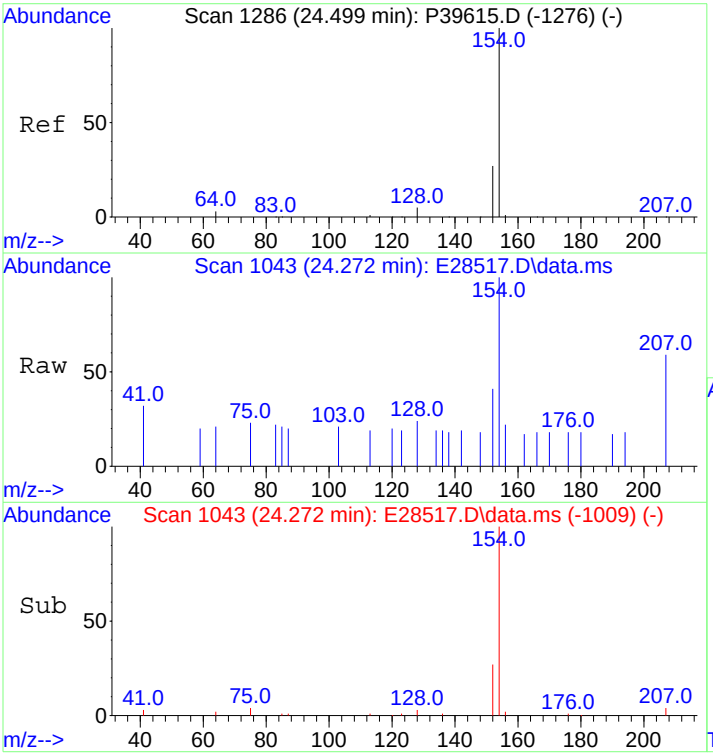




#18
Benzothiophene
Concen: 10.02 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:134 Resp: 848

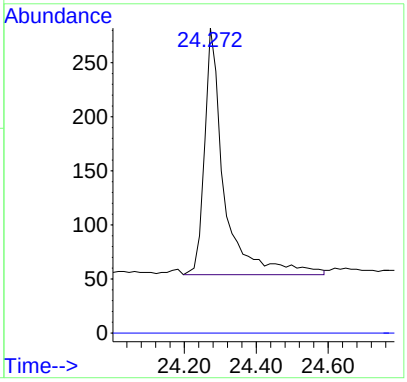


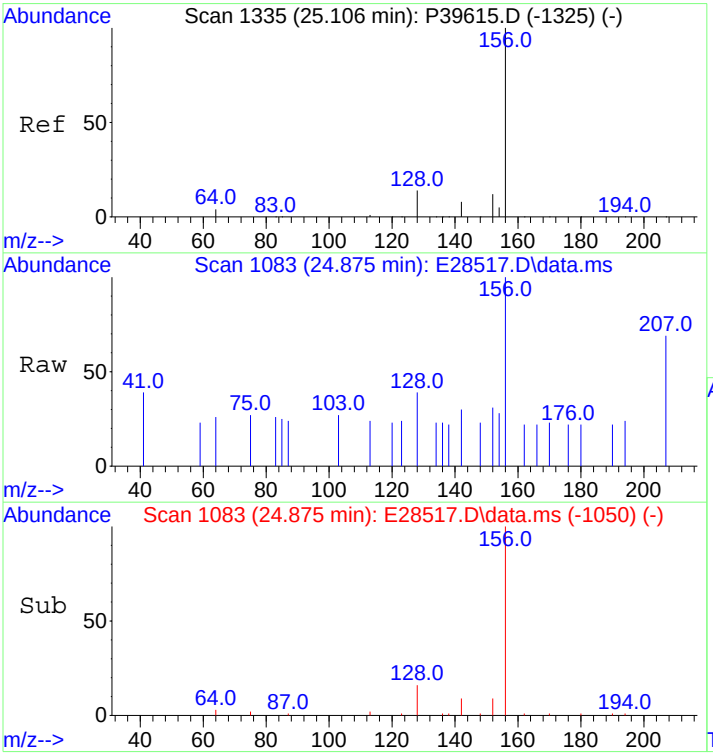


#23
Biphenyl
Concen: 10.13 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:154 Resp: 861

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

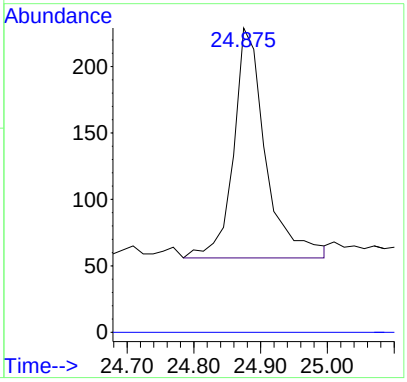


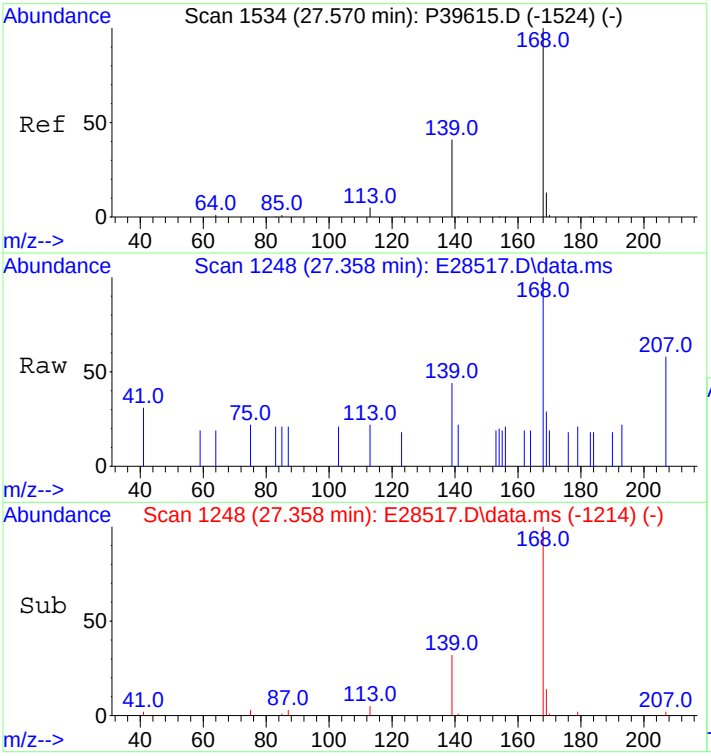


#24
2,6-Dimethylnaphthalene
Concen: 9.45 ng/mL
RT: 24.875 min Scan# 1083
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:156 Resp: 578

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

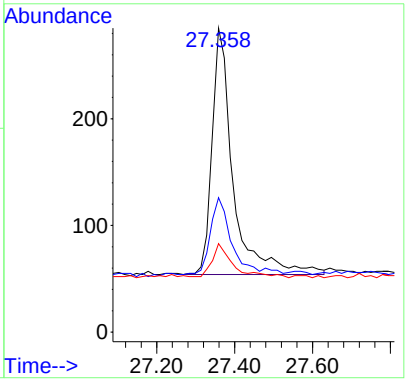


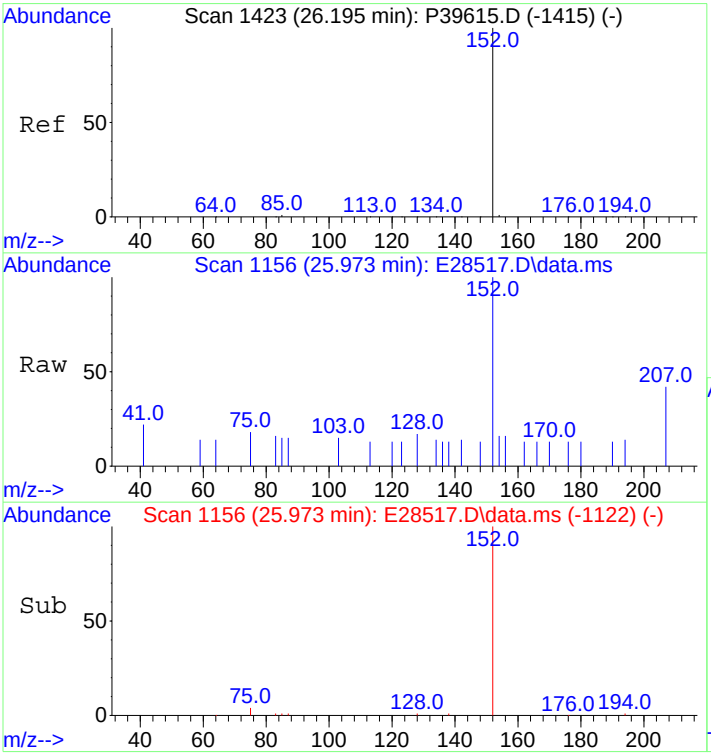


#25
Dibenzofuran
Concen: 9.50 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:168 Resp: 873

Ion	Ratio	Lower	Upper
168	100		
139	30.0	30.6	45.8#
169	13.9	10.6	16.0

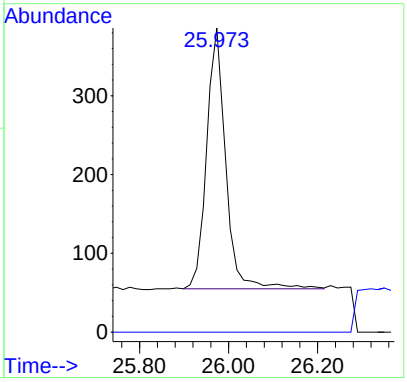


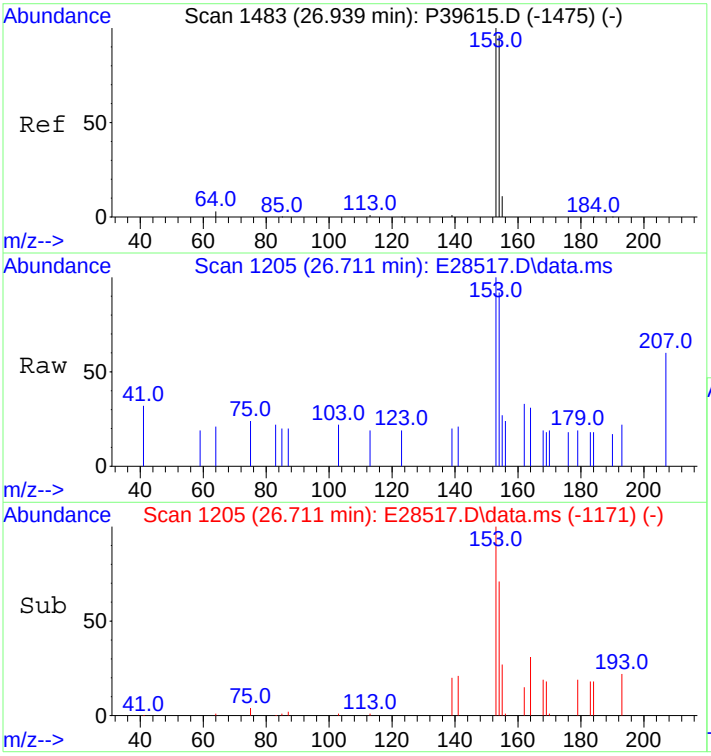


#26
Acenaphthylene
Concen: 9.62 ng/mL
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:152 Resp: 985

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

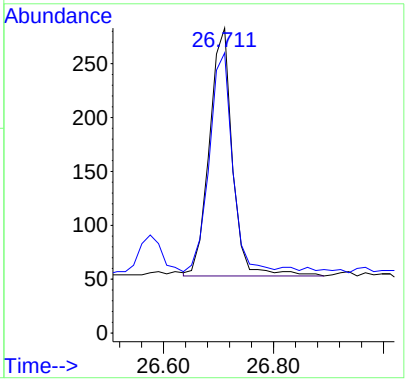


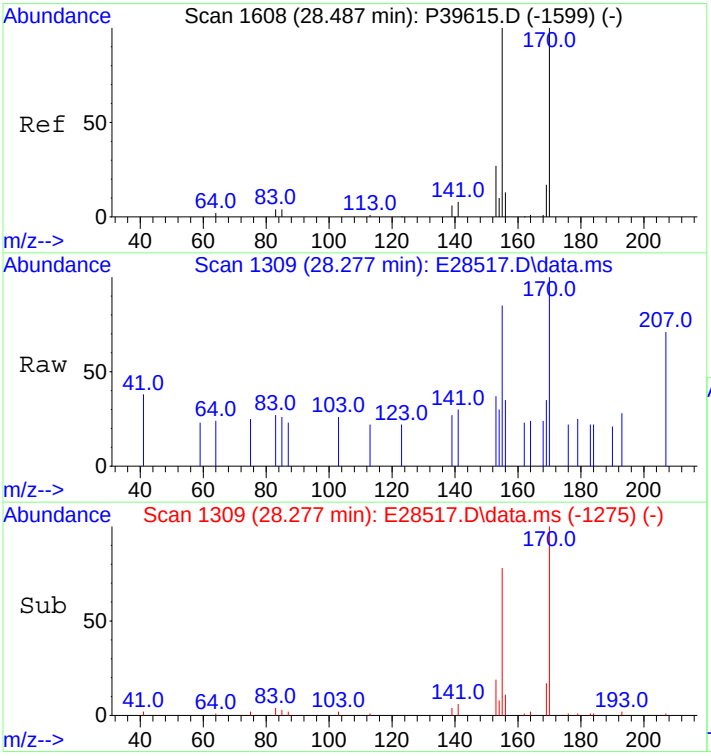


#27
Acenaphthene
Concen: 10.50 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:153 Resp: 670

Ion	Ratio	Lower	Upper
153	100		
154	88.4	72.3	108.5

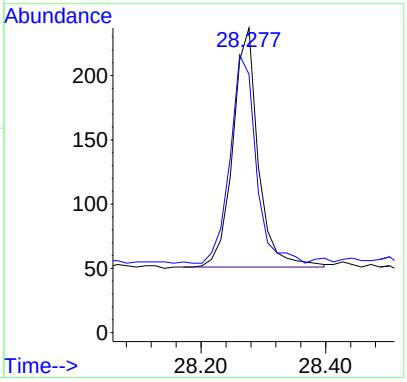


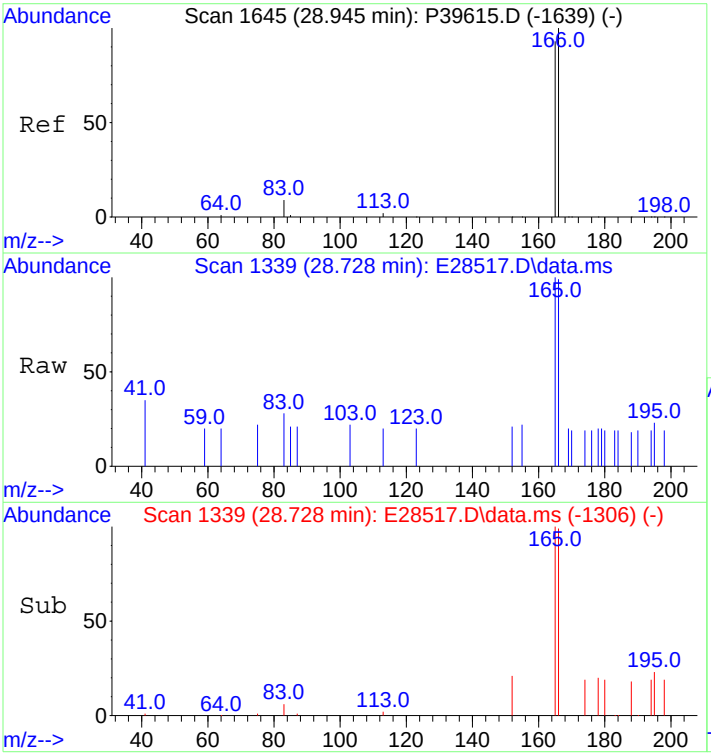


#28
2,3,5-Trimethylnaphthalene
Concen: 9.53 ng/mL
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:170 Resp: 527

Ion	Ratio	Lower	Upper
170	100		
155	88.8	75.9	113.9

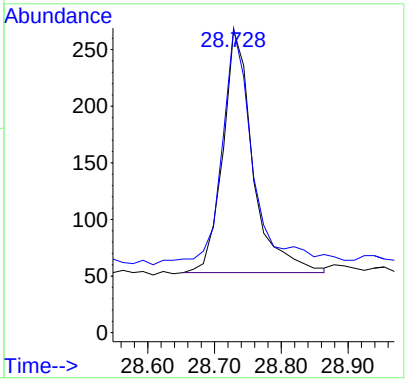


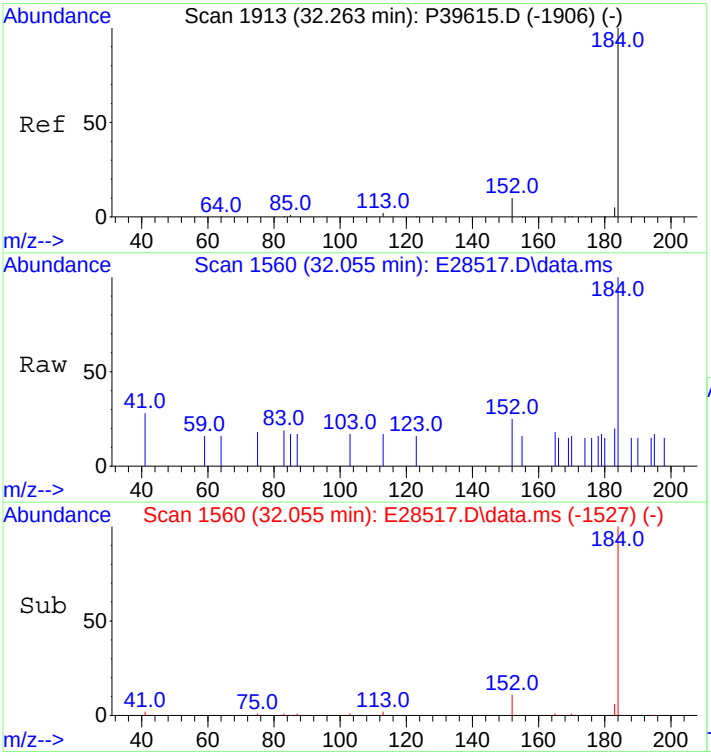


#29
Fluorene
Concen: 9.06 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:166 Resp: 672

Ion	Ratio	Lower	Upper
166	100		
165	90.5	73.8	110.6

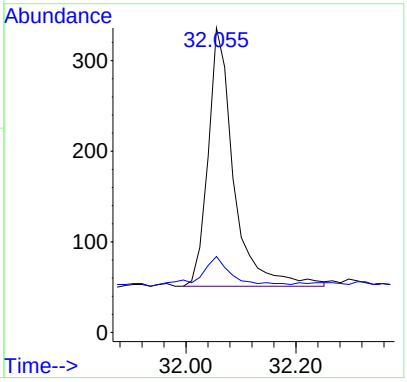


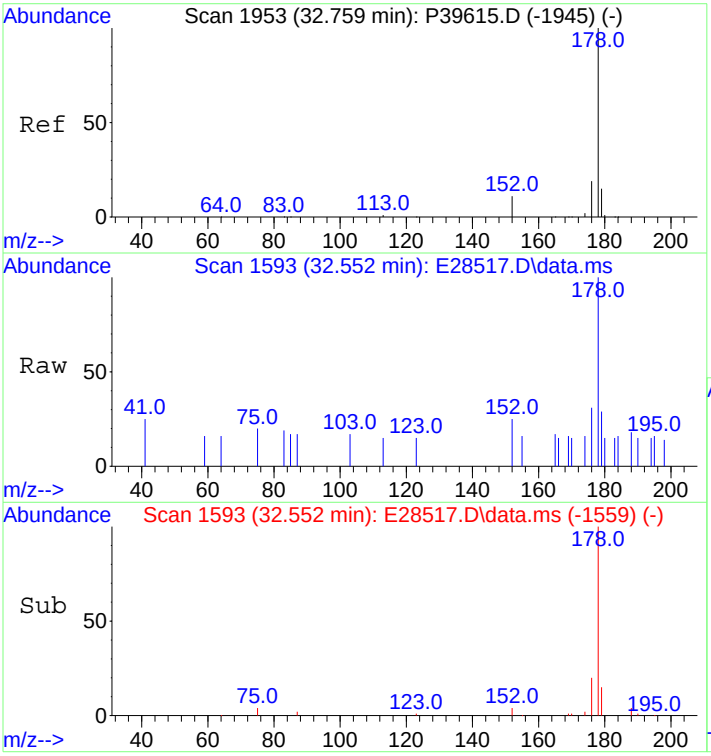


#33
Dibenzothiophene
Concen: 8.85 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:184 Resp: 919

Ion	Ratio	Lower	Upper
184	100		
152	14.5	6.2	9.2#

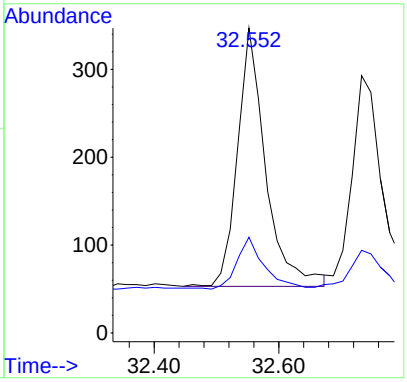


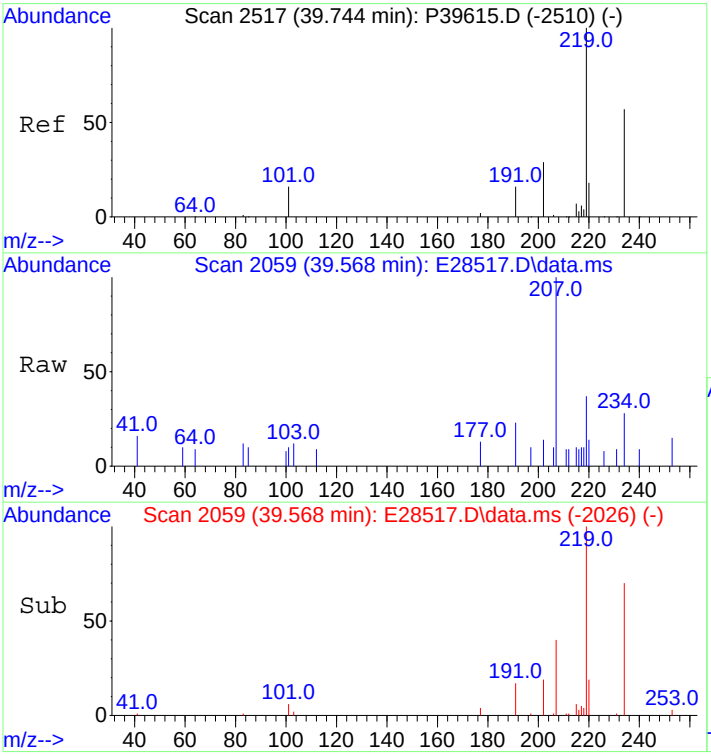


#43
Phenanthrene
Concen: 8.52 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:178 Resp: 923

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.6

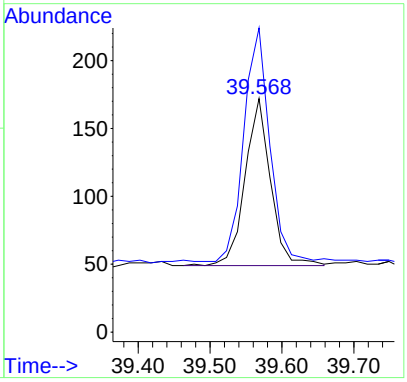


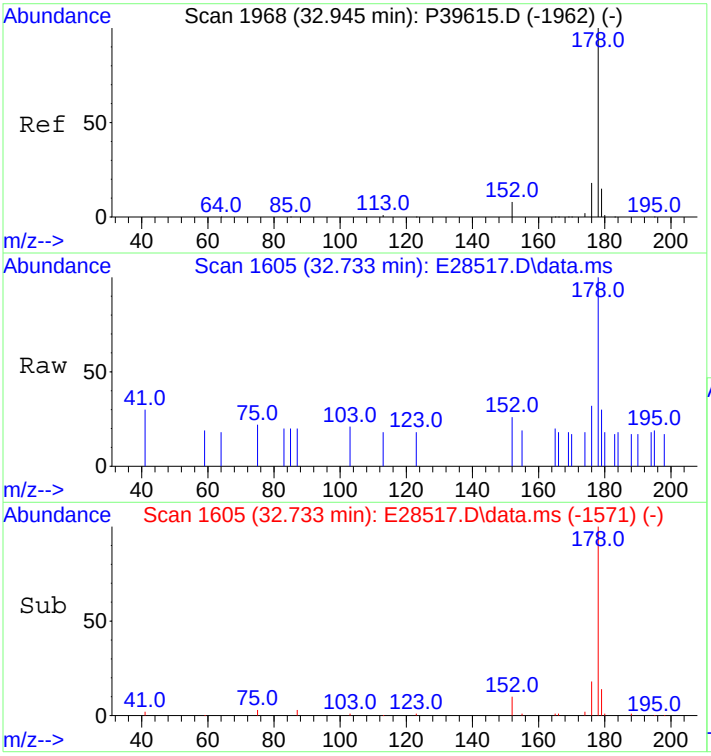


#54
Retene
Concen: 9.14 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:234 Resp: 303

Ion	Ratio	Lower	Upper
234	100		
219	141.9	113.0	169.4

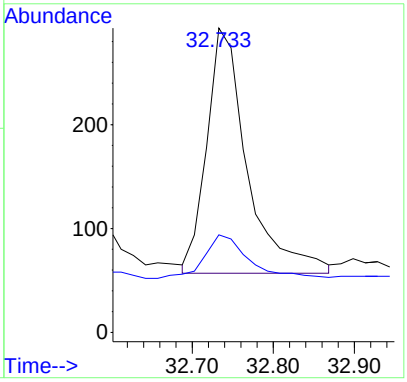


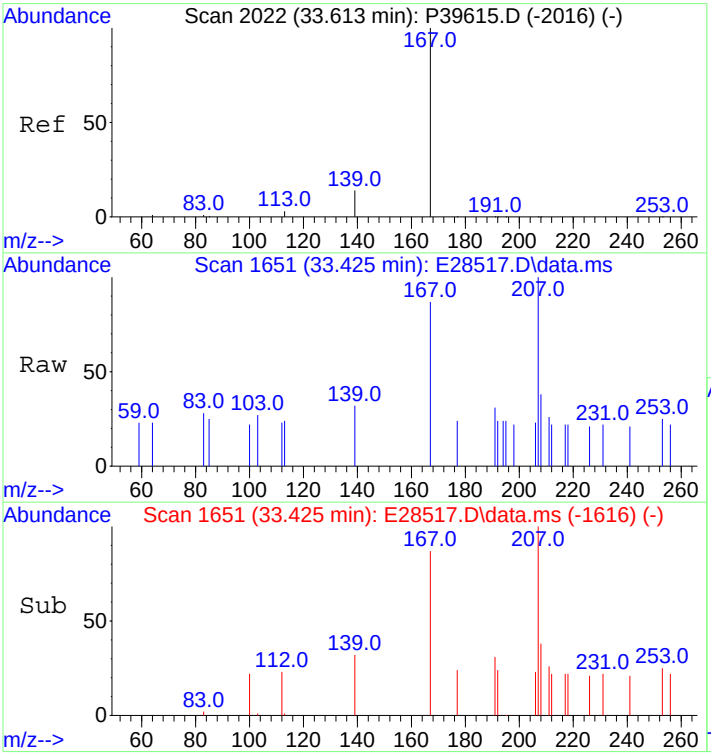


#55
Anthracene
Concen: 8.08 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:178 Resp: 820

Ion	Ratio	Lower	Upper
178	100		
176	18.0	14.5	21.7

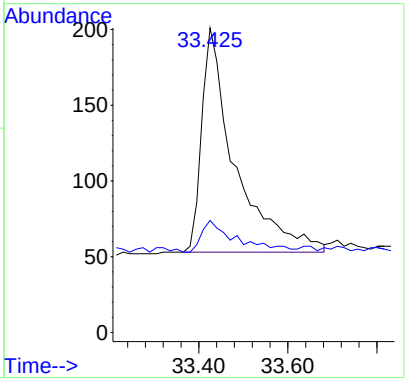


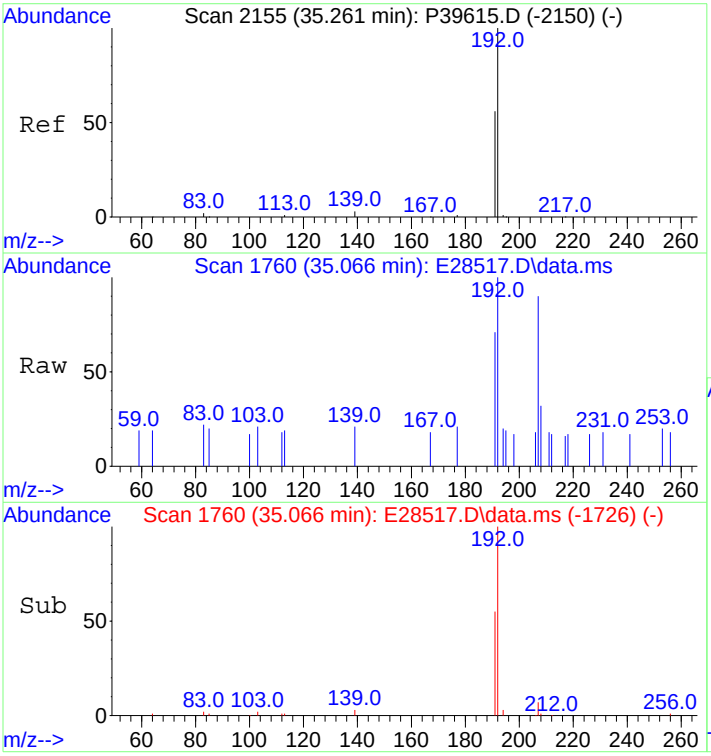


#56
Carbazole
Concen: 7.98 ng/mL
RT: 33.425 min Scan# 1651
Delta R.T. 0.030 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:167 Resp: 765

Ion	Ratio	Lower	Upper
167	100		
139	14.8	10.5	15.7

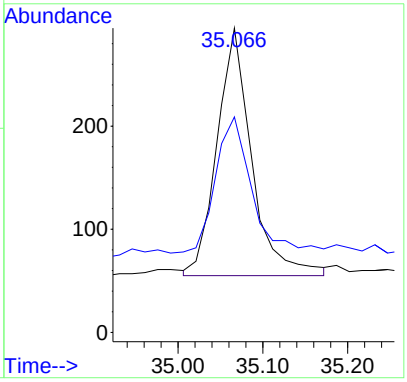


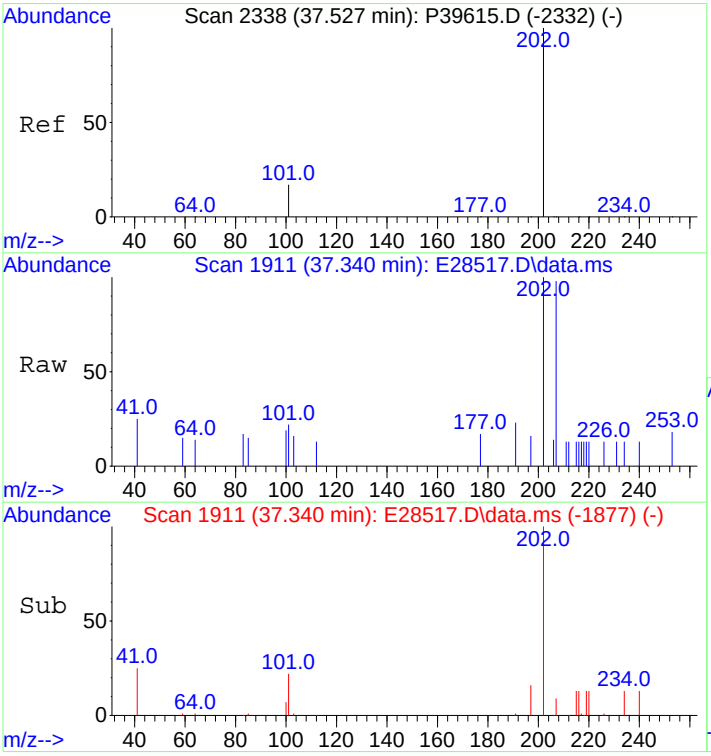


#57
1-Methylphenanthrene
Concen: 8.46 ng/mL m
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:192 Resp: 683

Ion	Ratio	Lower	Upper
192	100		
191	57.2	45.5	68.3

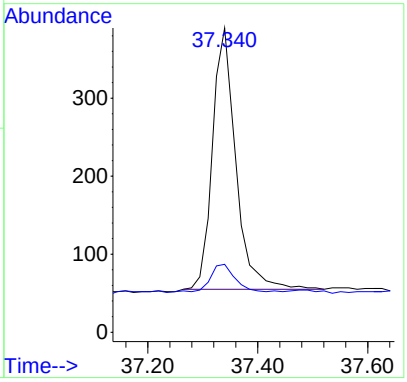


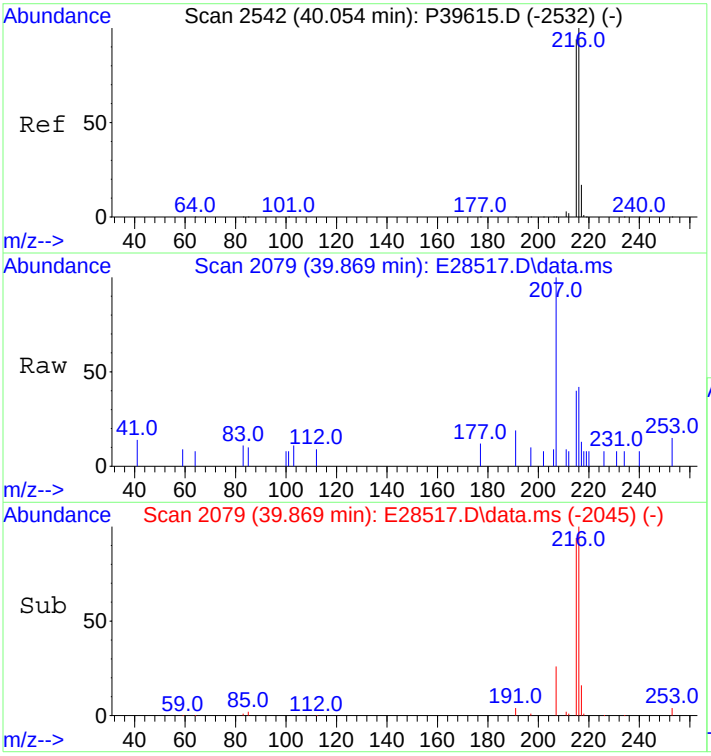


#58
Fluoranthene
Concen: 8.38 ng/mL
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:202 Resp: 989

Ion	Ratio	Lower	Upper
202	100		
101	10.5	9.2	13.8

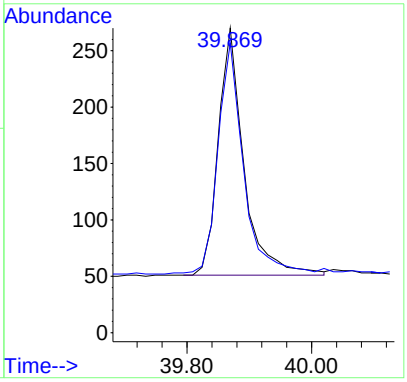


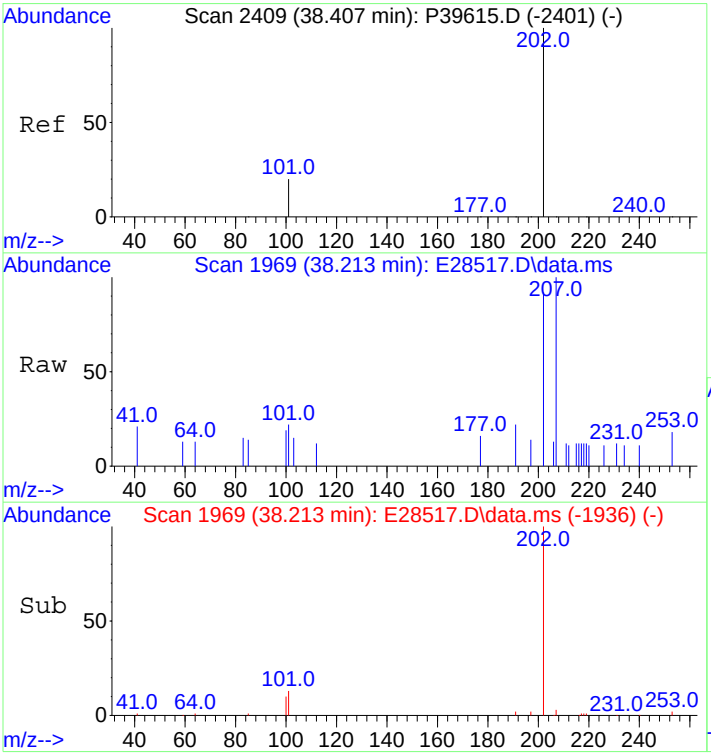


#59
Benzo(b)fluorene
Concen: 8.33 ng/mL
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:216 Resp: 626

Ion	Ratio	Lower	Upper
216	100		
215	93.0	73.8	110.8

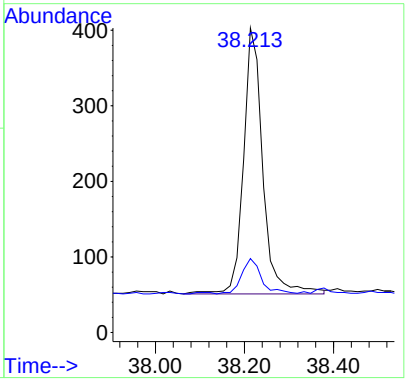


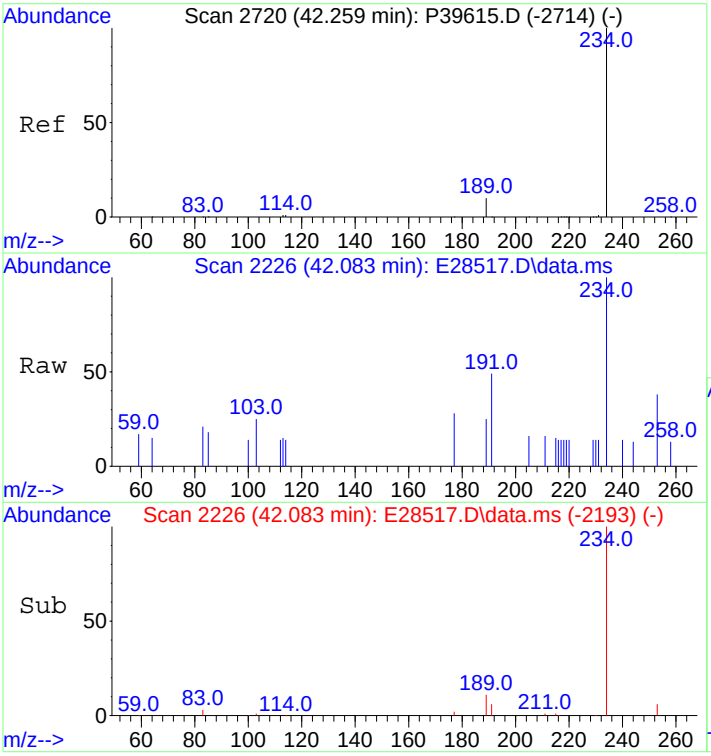


#60
Pyrene
Concen: 8.99 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:202 Resp: 1069

Ion	Ratio	Lower	Upper
202	100		
101	13.7	9.8	14.8

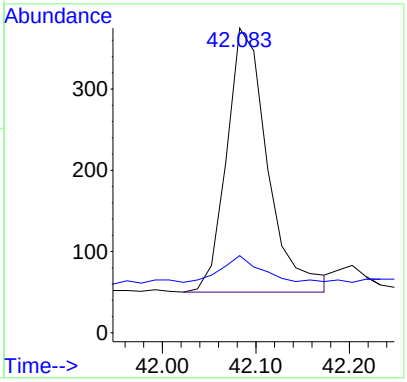


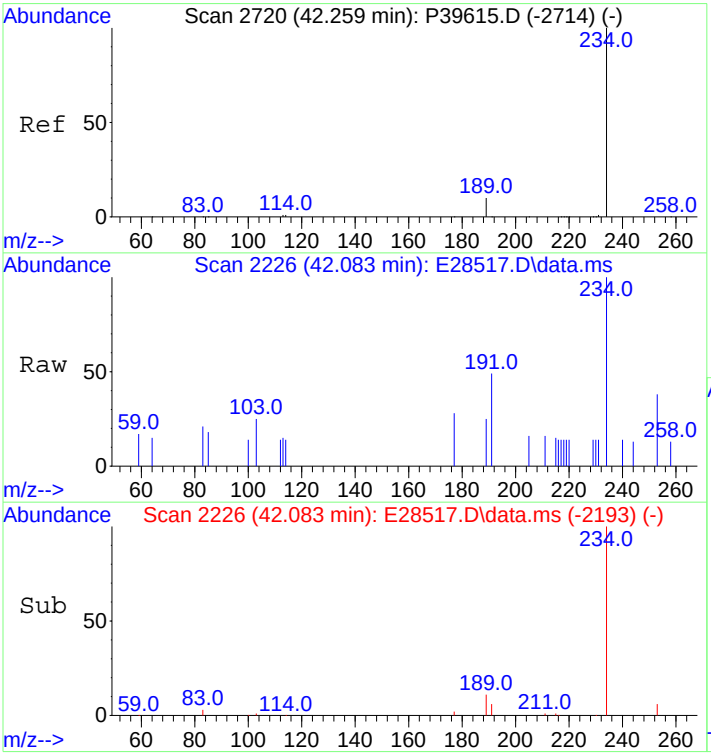


#66
Naphthobenzothiophene
Concen: 8.85 ng/ml
RT: 42.083 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:234 Resp: 993

Ion	Ratio	Lower	Upper
234	100		
189	11.8	5.5	8.3#

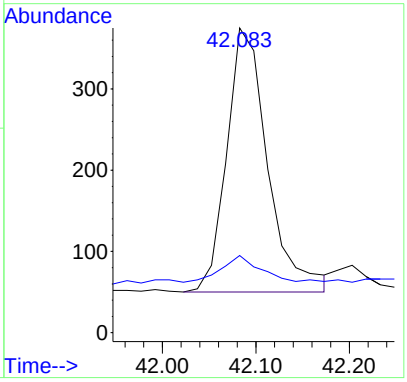


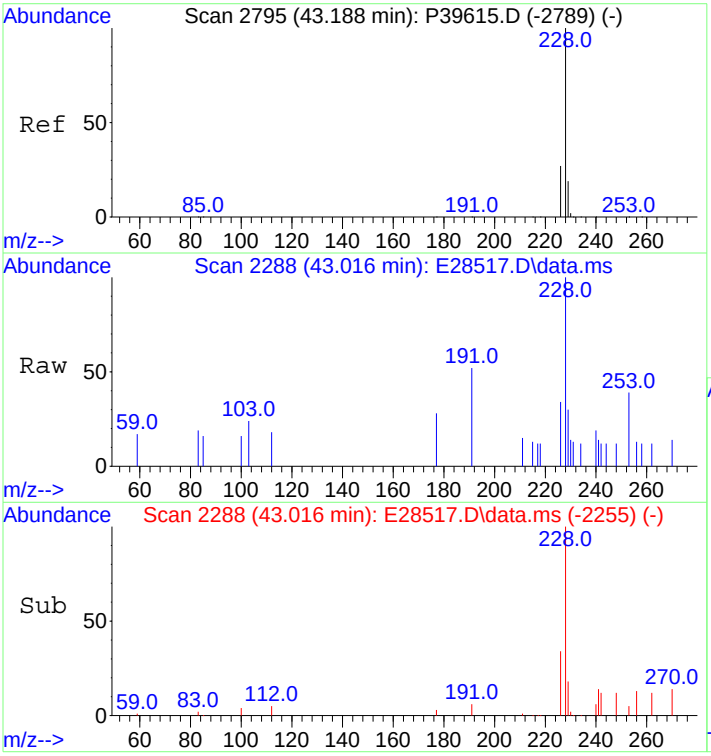


#67
Naphthobenzothiophene-2,1-D
Concen: 8.85 ng/mL
RT: 42.083 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:234 Resp: 993

Ion	Ratio	Lower	Upper
234	100		
189	11.8	5.5	8.3#

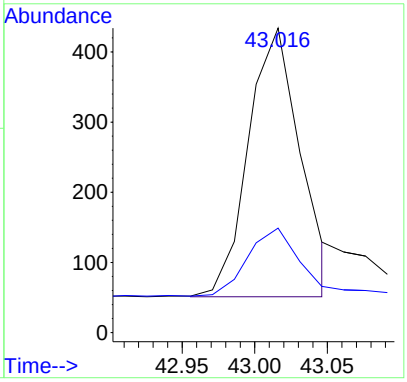


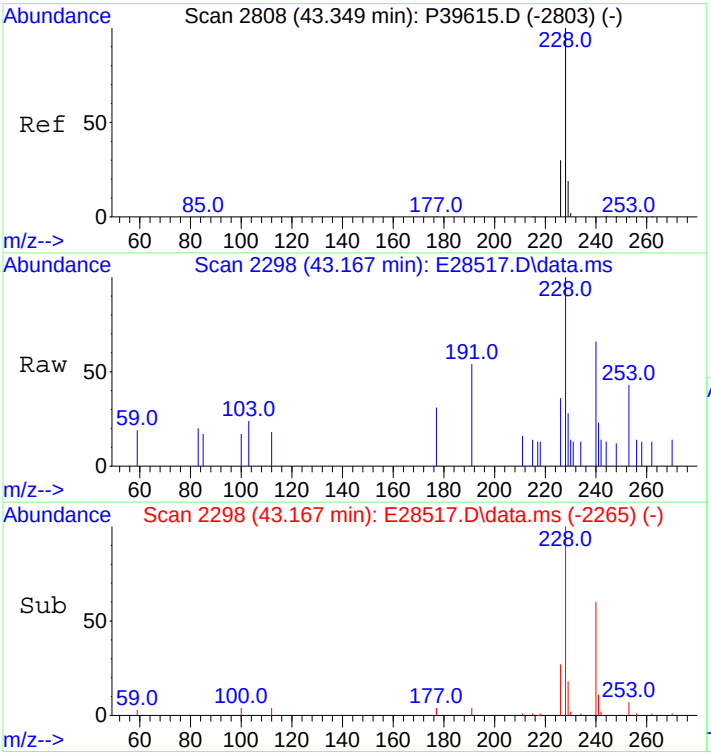


#75
Benz[a]anthracene
Concen: 8.29 ng/mL m
RT: 43.016 min Scan# 2288
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:228 Resp: 956

Ion	Ratio	Lower	Upper
228	100		
226	27.0	20.2	30.4

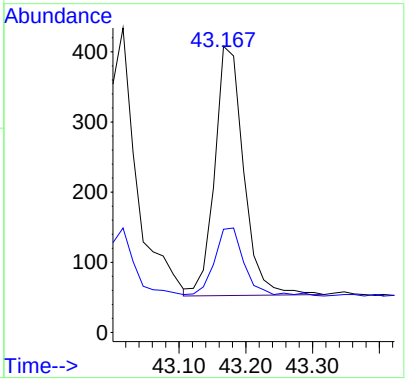


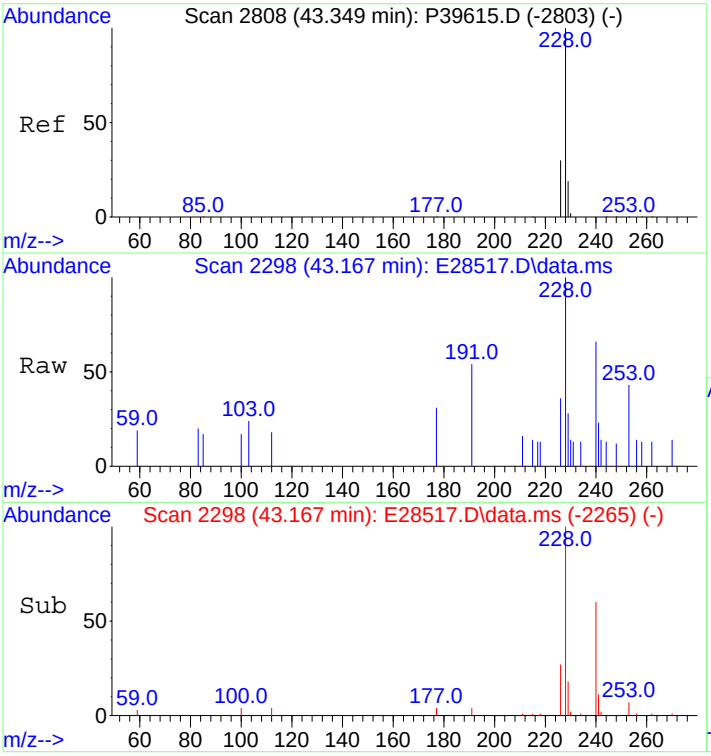


#76
Chrysene
Concen: 9.48 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:228 Resp: 1070

Ion	Ratio	Lower	Upper
228	100		
226	28.5	22.6	34.0

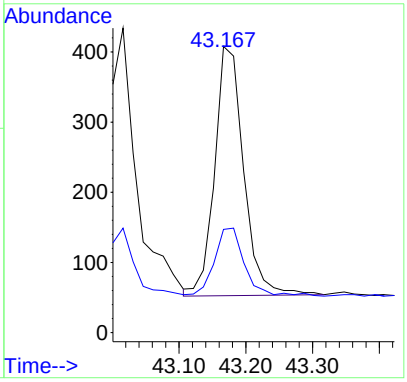


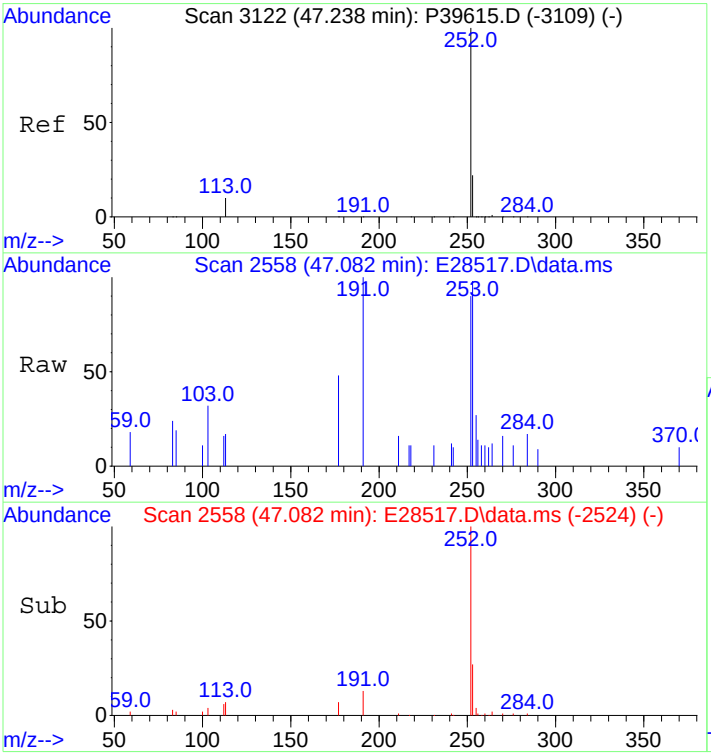


#77
Chrysene/Triphenylene
Concen: 9.48 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:228 Resp: 1070

Ion	Ratio	Lower	Upper
228	100		
226	28.5	22.6	34.0

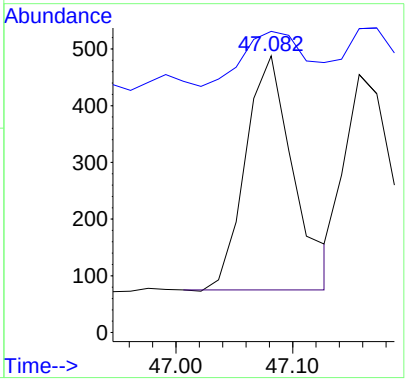


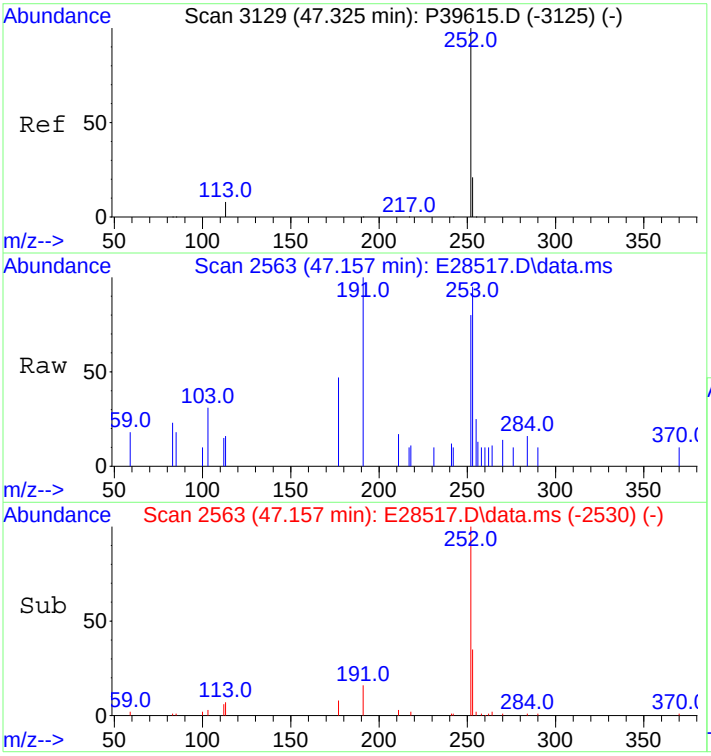


#84
Benzo[b]fluoranthene
Concen: 9.75 ng/mL
RT: 47.082 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1183

Ion	Ratio	Lower	Upper
252	100		
253	30.9	18.3	27.5#

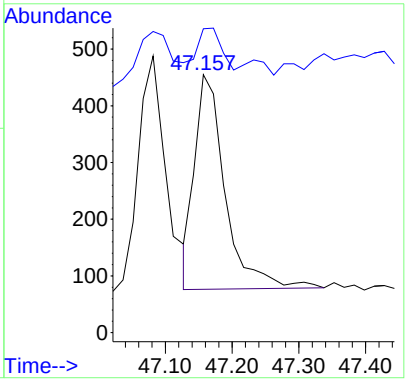


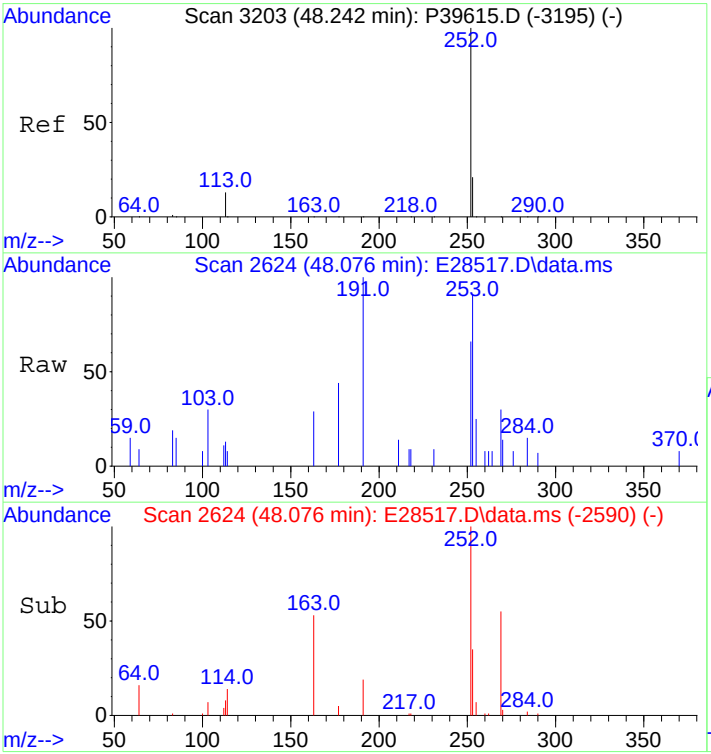


#85
Benzo[j]+[k]fluoranthene
Concen: 10.54 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1204

Ion	Ratio	Lower	Upper
252	100		
253	16.9	18.3	27.5#

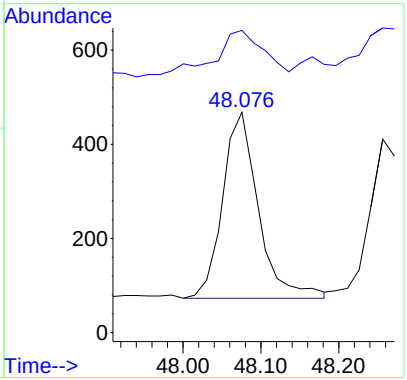


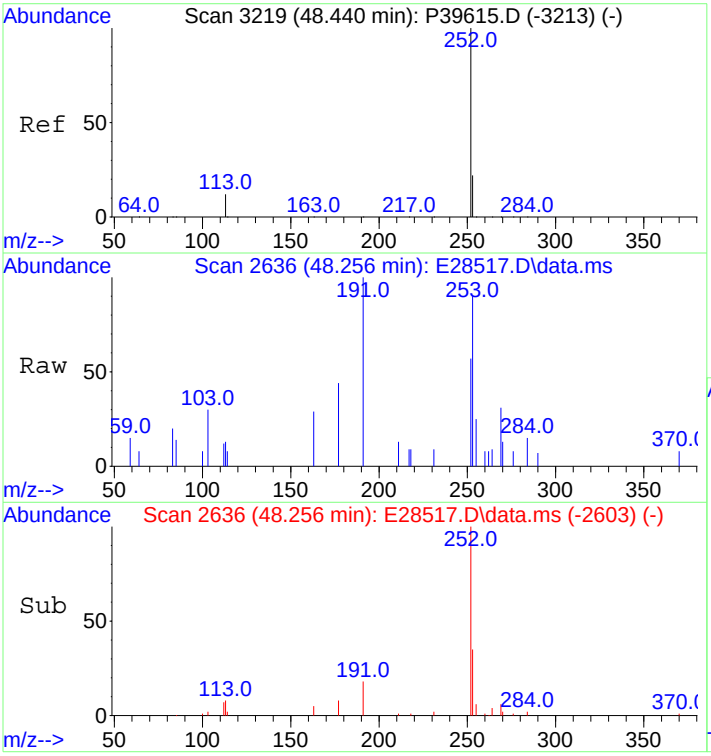


#87
Benzo[e]pyrene
Concen: 11.73 ng/mL
RT: 48.076 min Scan# 2624
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1263

Ion	Ratio	Lower	Upper
252	100		
253	30.9	18.6	28.0#

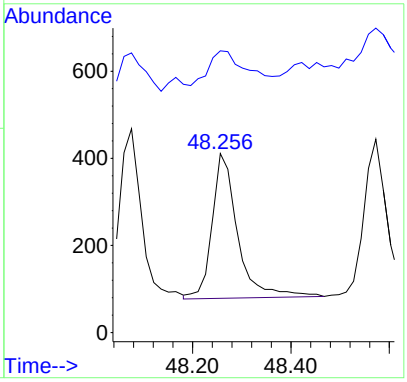


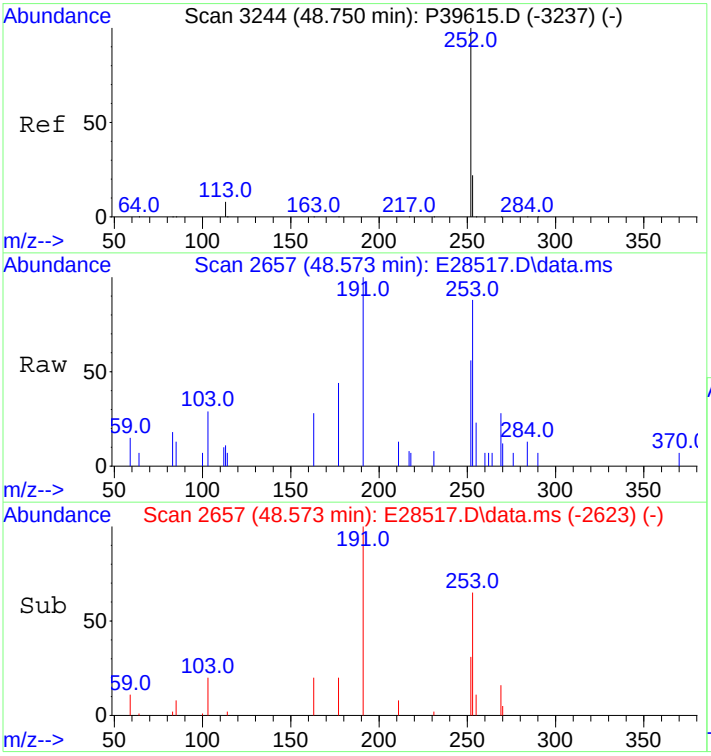


#89
Benzo[a]pyrene
Concen: 11.80 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1201

Ion	Ratio	Lower	Upper
252	100		
253	34.7	18.8	28.2#

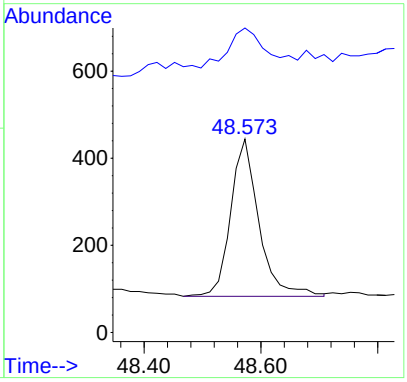


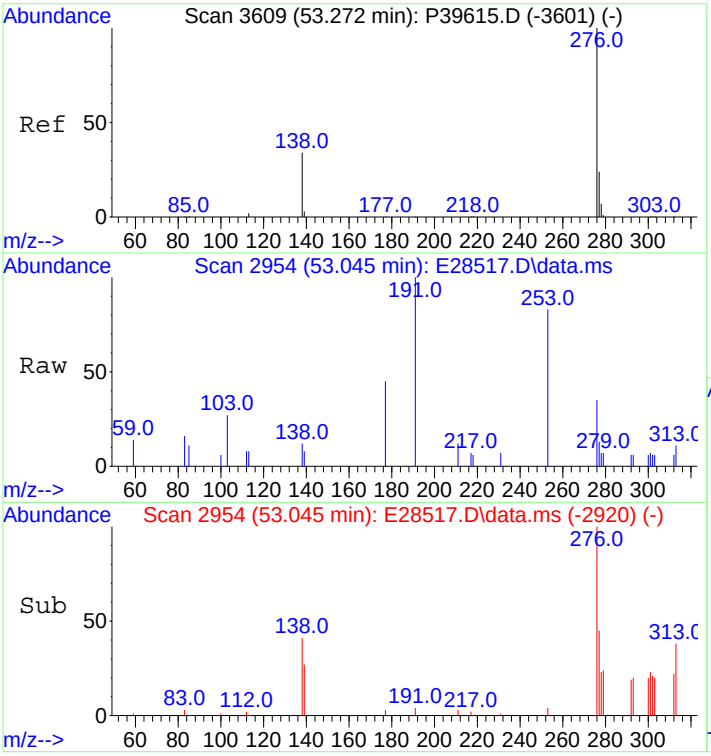


#90
Perylene
Concen: 11.21 ng/mL
RT: 48.573 min Scan# 2657
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1215

Ion	Ratio	Lower	Upper
252	100		
253	31.3	18.8	28.2#

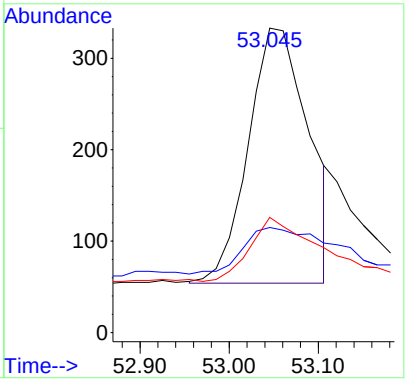


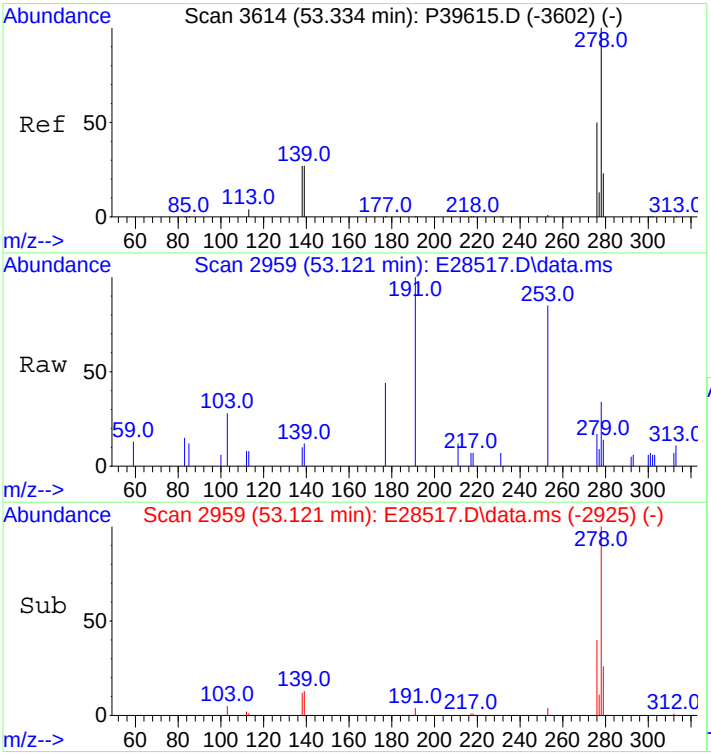


#91
Indeno[1,2,3-cd]pyrene
Concen: 10.69 ng/mL m
RT: 53.045 min Scan# 2954
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:276 Resp: 1314

Ion	Ratio	Lower	Upper
276	100		
138	26.4	15.4	23.2#
277	30.7	19.1	28.7#

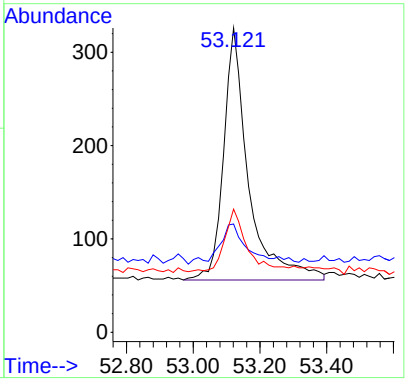


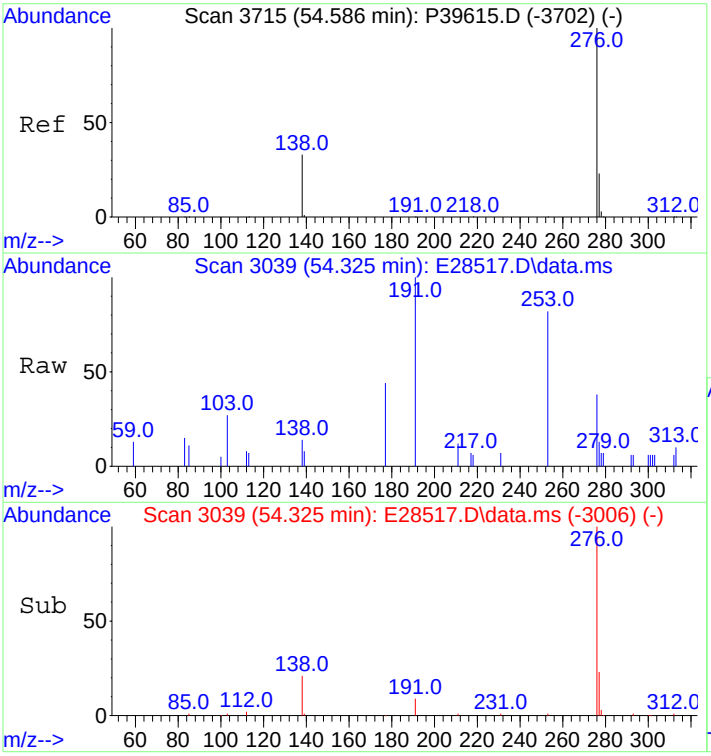


#92
Dibenz[ah]+[ac]anthracene
Concen: 11.88 ng/mL
RT: 53.121 min Scan# 2959
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:278 Resp: 1404

Ion	Ratio	Lower	Upper
278	100		
139	13.6	11.1	16.7
279	22.0	19.4	29.0

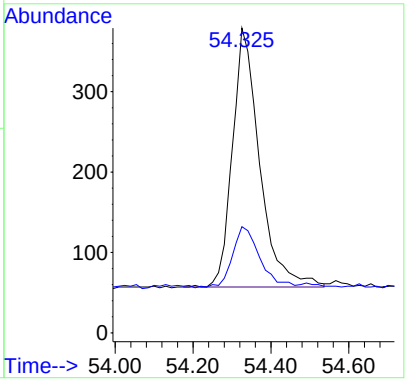


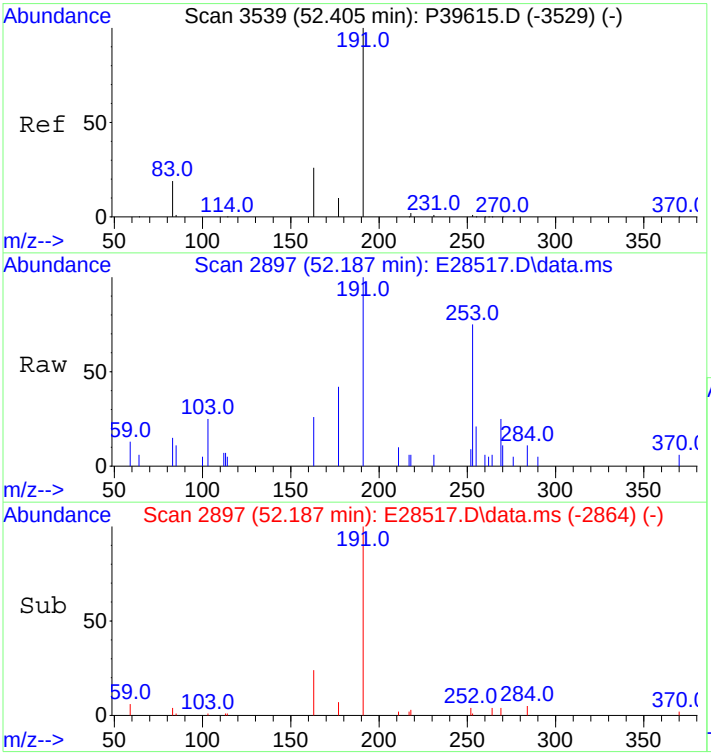


#93
Benzo[g,h,i]perylene
Concen: 12.94 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:276 Resp: 1563

Ion	Ratio	Lower	Upper
276	100		
277	23.9	19.1	28.7

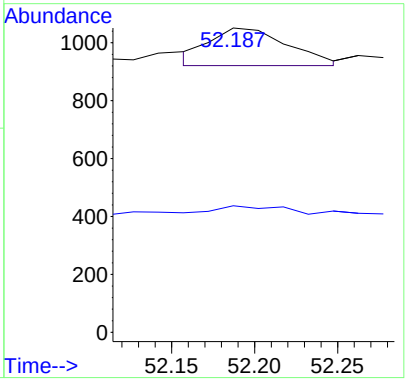


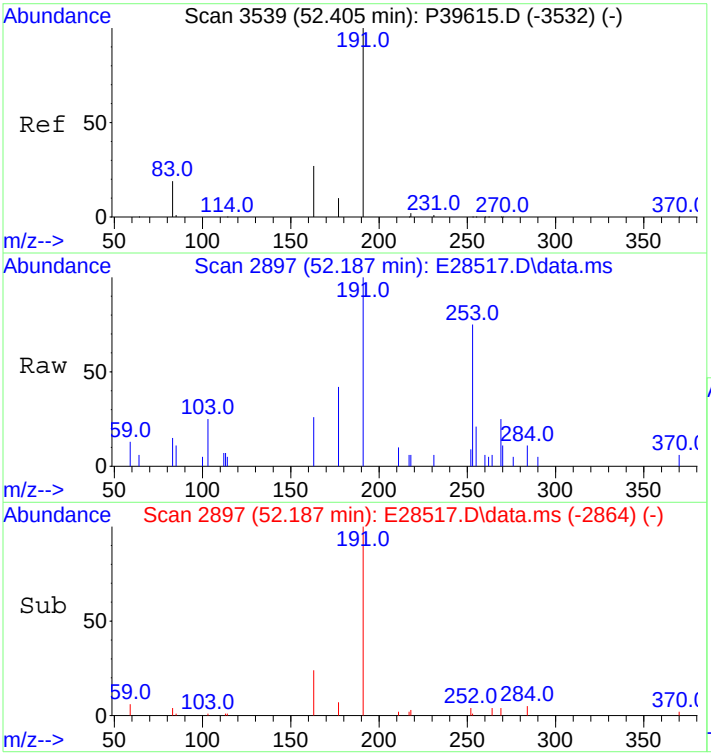


#94
Hopane (T19)
Concen: 14.96 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:191 Resp: 427

Ion	Ratio	Lower	Upper
191	100		
177	42.9	8.7	13.1#

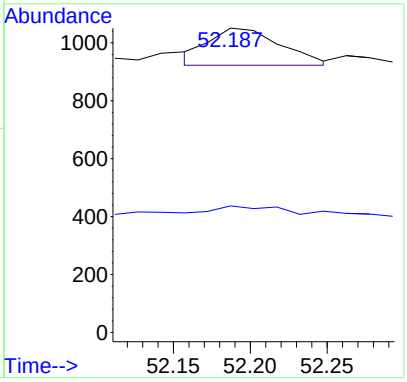




#95
17a(H),21B(H)-hopane - C30H52
Concen: 14.58 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:191 Resp: 416

Ion	Ratio	Lower	Upper
191	100		
177	44.0	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 12:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	25519	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51858	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	2312	24.321	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.43%#		
42) Phenanthrene-d10	32.462	188	2181	22.766	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.28%#		
83) Benzo[b]fluoranthene-d12	46.991	264	2711	27.613	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.76%#		
88) Benzo[a]pyrene-d12	48.166	264	2513	28.222	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.82%#		
129) 5B(H)Cholane - Surr	43.723	217	514	26.886	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.69%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	284	13.369	ng/mL	100
4) cis-Decalin	17.482	138	201	12.456	ng/mL	100
10) Naphthalene	19.680	128	2586	25.362	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1595	24.170	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1551	24.508	ng/mL#	100
18) Benzothiophene	19.906	134	2072	24.909	ng/mL	100
23) Biphenyl	24.272	154	1956	23.403	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	1382	22.973	ng/mL#	100
25) Dibenzofuran	27.358	168	2140	23.693	ng/mL	94
26) Acenaphthylene	25.973	152	2386	23.701	ng/mL#	100
27) Acenaphthene	26.696	153	1598	25.471	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.262	170	1297	23.852	ng/mL	98
29) Fluorene	28.728	166	1748	23.964	ng/mL	97
33) Dibenzothiophene	32.055	184	2342	22.930	ng/mL#	94
43) Phenanthrene	32.552	178	2302	21.610	ng/mL	100
54) Retene	39.568	234	719	22.048	ng/mL	93
55) Anthracene	32.733	178	2199M3	22.030	ng/mL	
56) Carbazole	33.425	167	1973	20.927	ng/mL	98
57) 1-Methylphenanthrene	35.066	192	1799	22.673	ng/mL	100
58) Fluoranthene	37.340	202	2616	22.534	ng/mL	98
59) Benzo(b)fluorene	39.869	216	1614	21.858	ng/mL	100
60) Pyrene	38.213	202	2618	22.402	ng/mL	95
66) Naphthobenzothiophene	42.082	234	2577	23.370	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	2577	23.370	ng/mL#	95
75) Benz[a]anthracene	43.016	228	2460M3	21.396	ng/mL	
76) Chrysene	43.166	228	2669	23.716	ng/mL	98
77) Chrysene/Triphenylene	43.166	228	2669	23.716	ng/mL	98
84) Benzo[b]fluoranthene	47.081	252	2739	22.626	ng/mL	92
85) Benzo[j]+[k]fluoranthene	47.157	252	3051	26.783	ng/mL	97
87) Benzo[e]pyrene	48.075	252	2868M3	26.699	ng/mL	
89) Benzo[a]pyrene	48.256	252	2653	26.124	ng/mL	94
90) Perylene	48.572	252	2810	25.999	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.045	276	3010M3	24.550	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	3309	28.060	ng/mL	97
93) Benzo[g,h,i]perylene	54.325	276	3613	29.988	ng/mL	98
94) Hopane (T19)	52.187	191	1010M3	35.486	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.187	191	1032M3	36.259	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 12:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

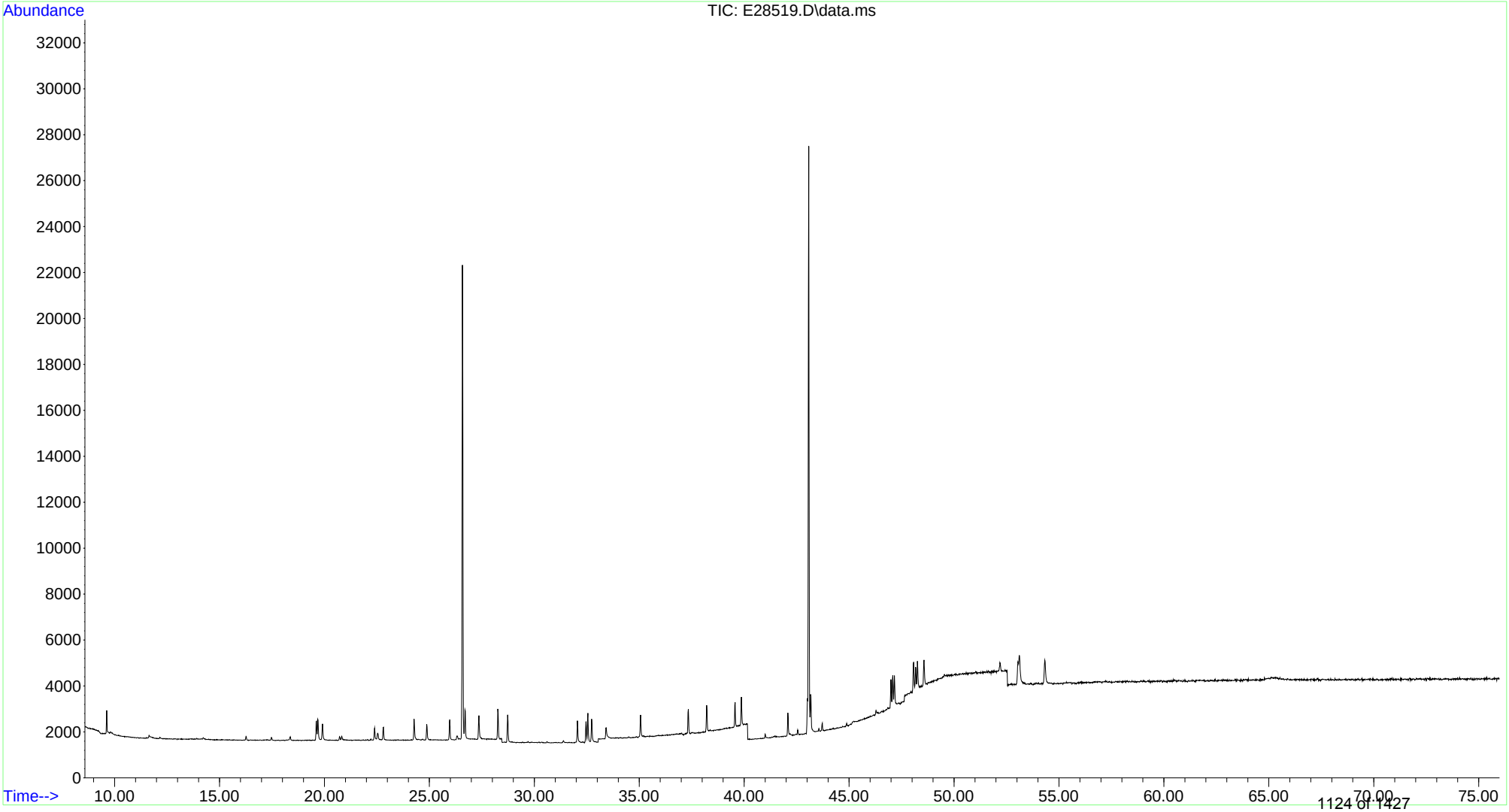
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

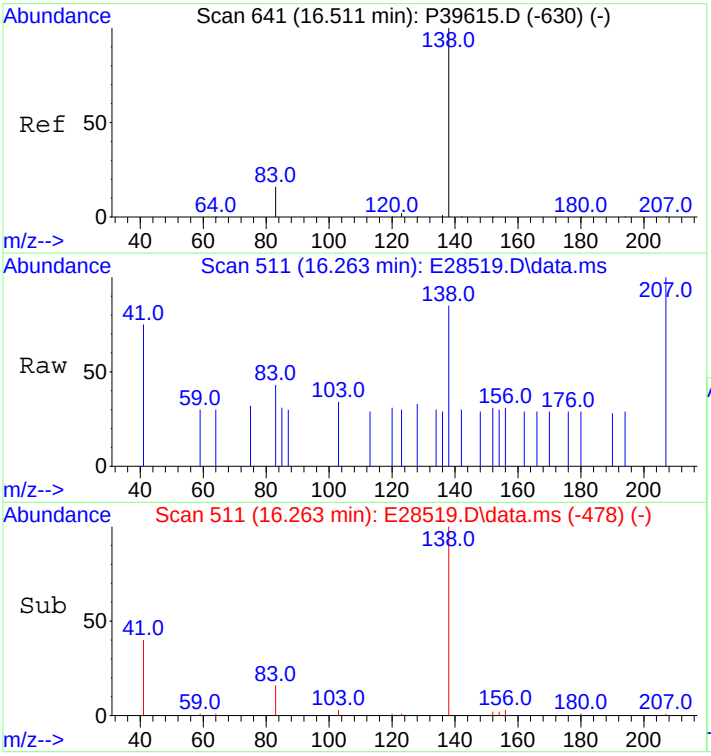
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

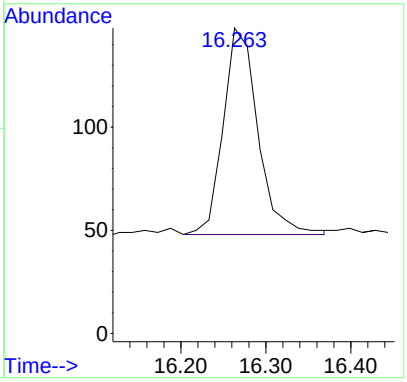
Quant Time: Oct 31 12:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

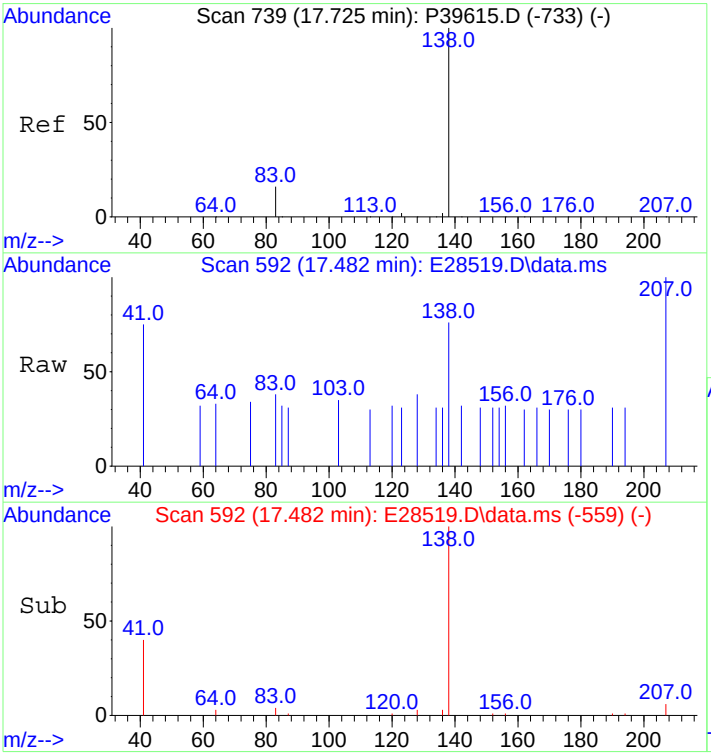




#3
trans-Decalin
Concen: 13.37 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

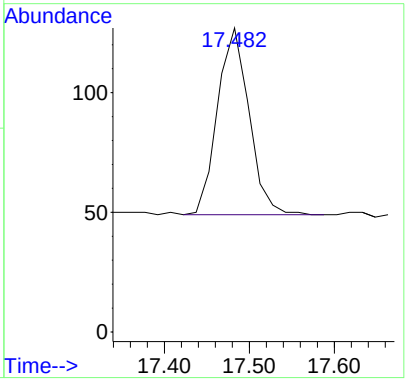
Tgt Ion:138 Resp: 284

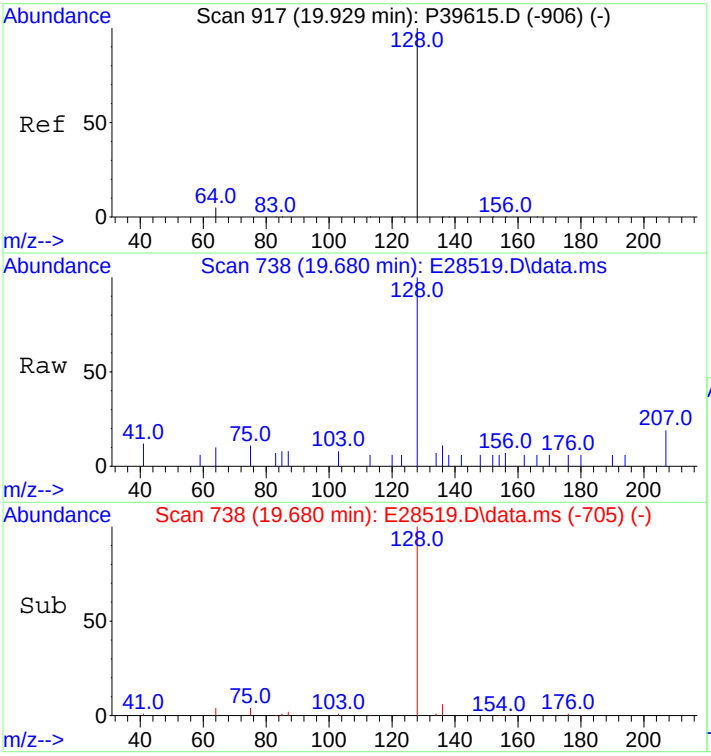




#4
cis-Decalin
Concen: 12.46 ng/mL
RT: 17.482 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:138 Resp: 201

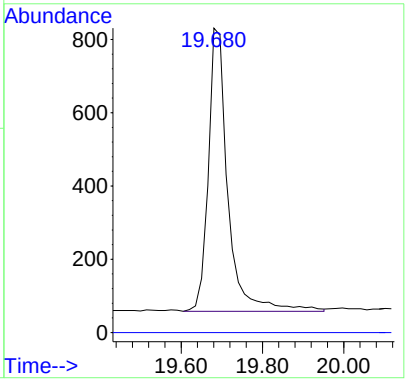


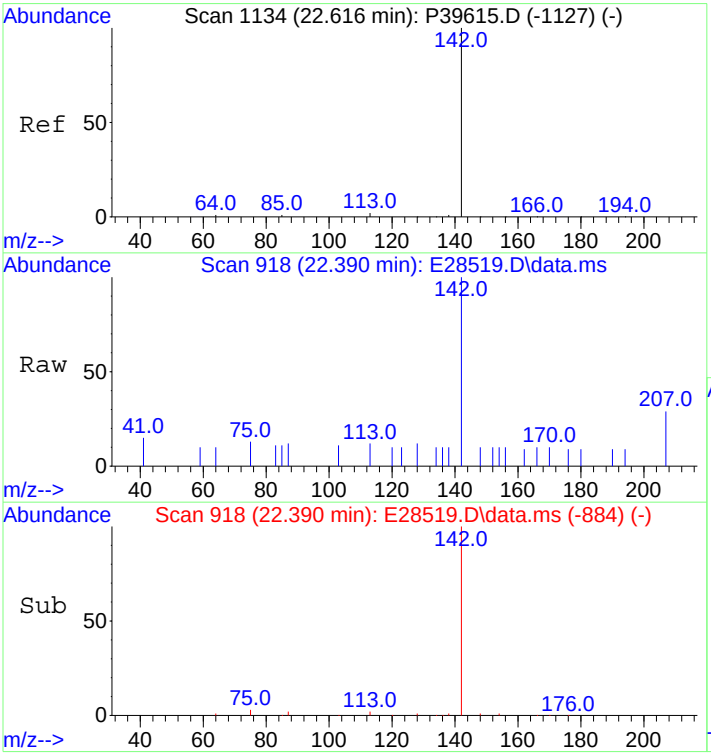


#10
Naphthalene
Concen: 25.36 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:128 Resp: 2586

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

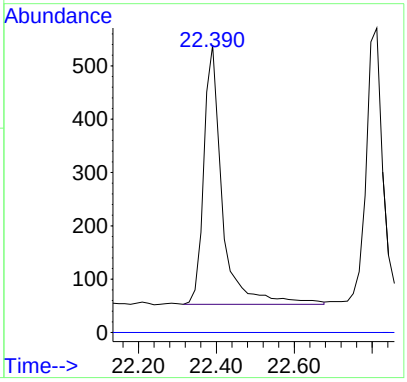


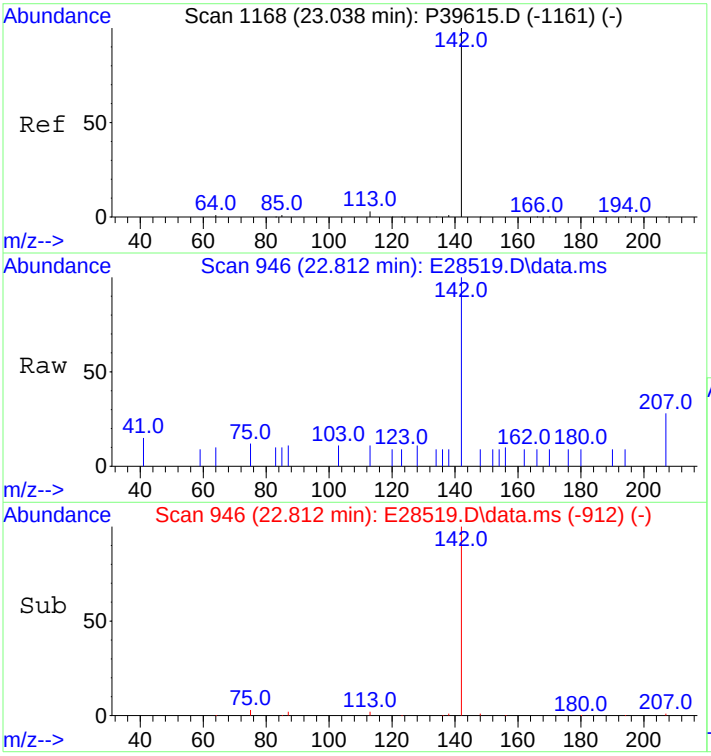


#16
2-Methylnaphthalene
Concen: 24.17 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:142 Resp: 1595

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

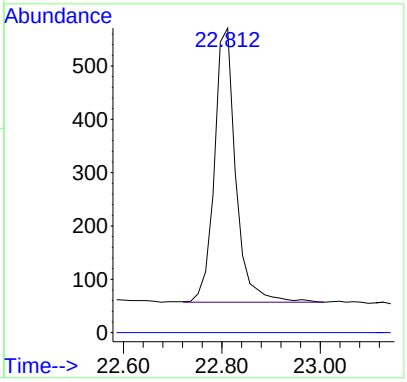


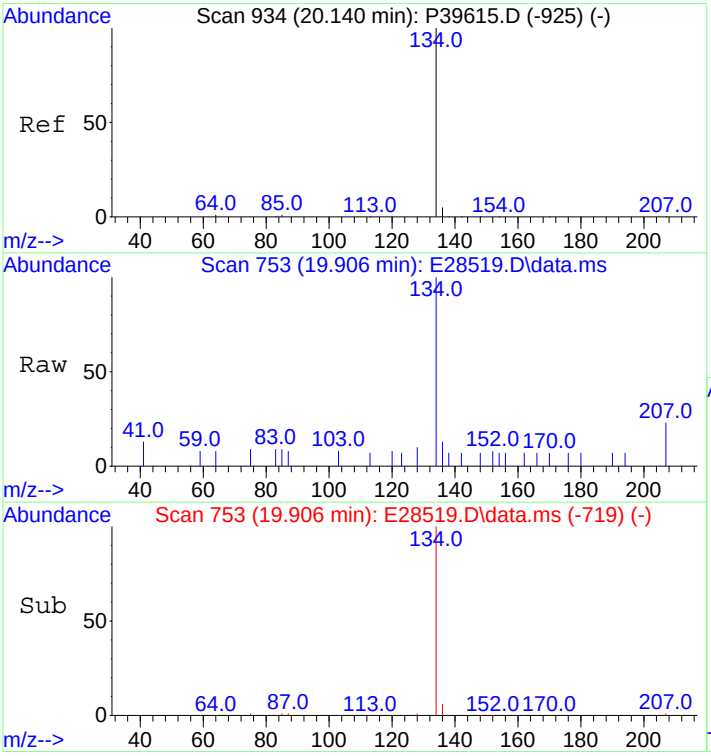


#17
1-Methylnaphthalene
Concen: 24.51 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:142 Resp: 1551

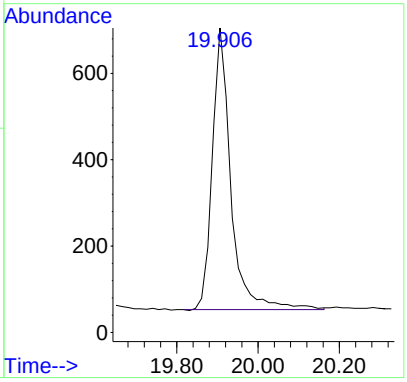
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

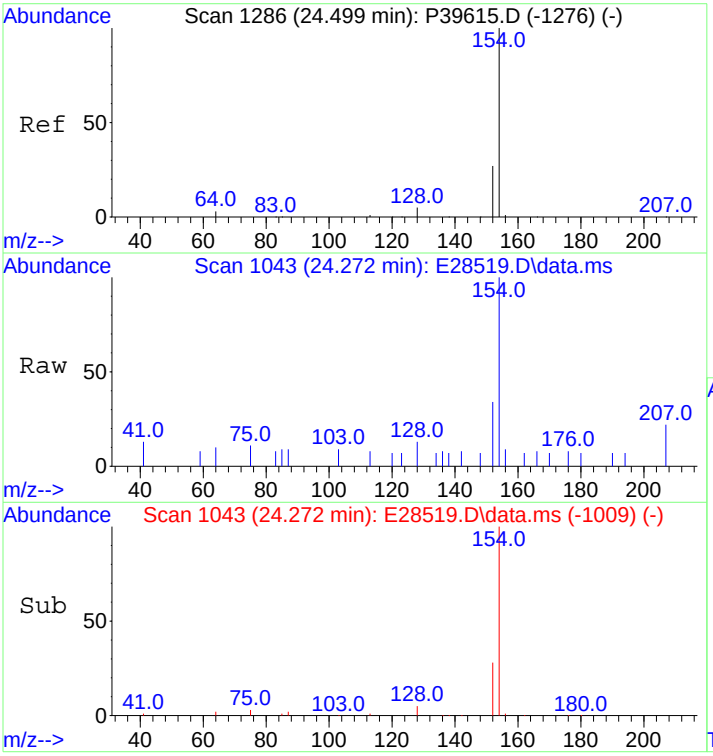




#18
Benzothiophene
Concen: 24.91 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:134 Resp: 2072

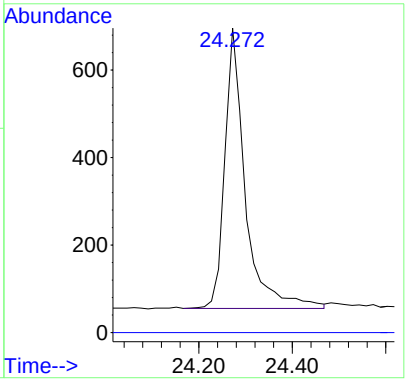


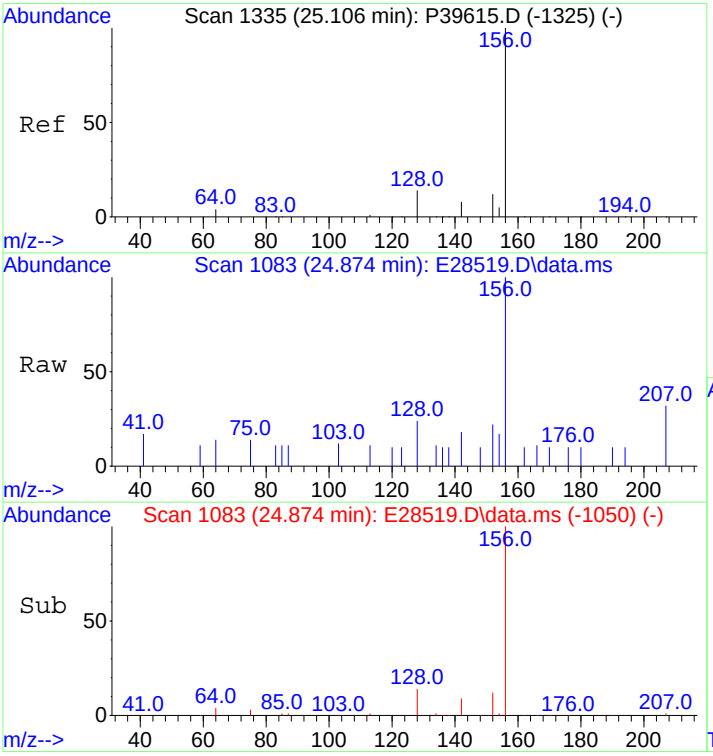


#23
Biphenyl
Concen: 23.40 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:154 Resp: 1956

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

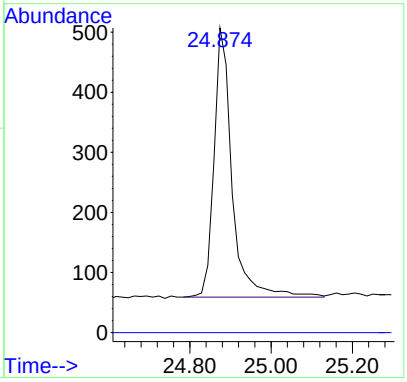


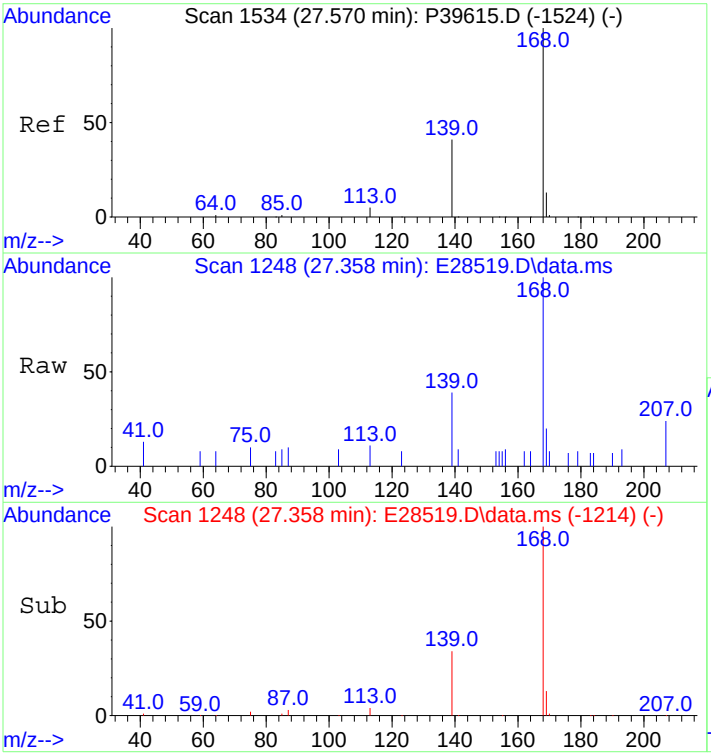


#24
2,6-Dimethylnaphthalene
Concen: 22.97 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:156 Resp: 1382

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

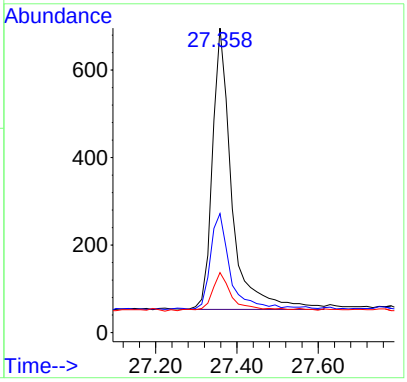


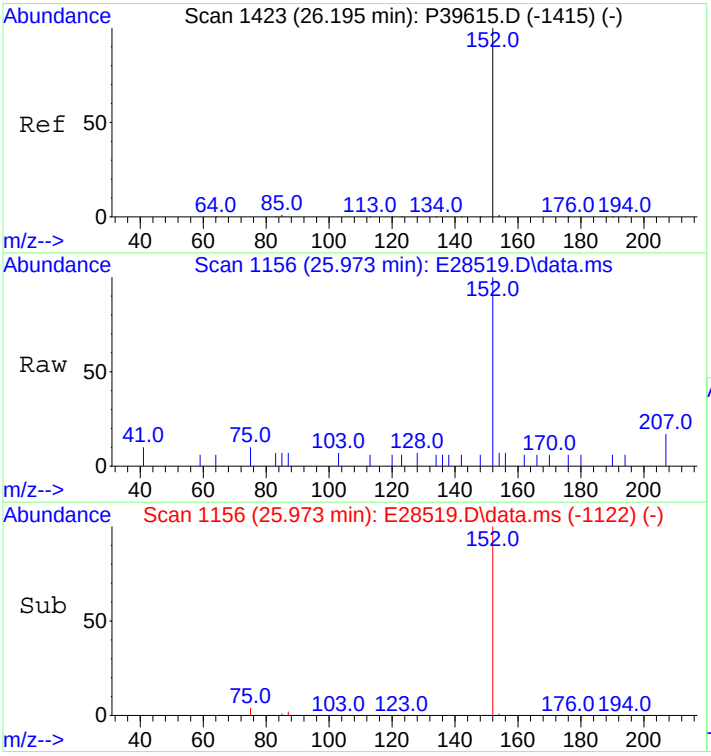


#25
Dibenzofuran
Concen: 23.69 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:168 Resp: 2140

Ion	Ratio	Lower	Upper
168	100		
139	34.6	30.6	45.8
169	15.0	10.6	16.0

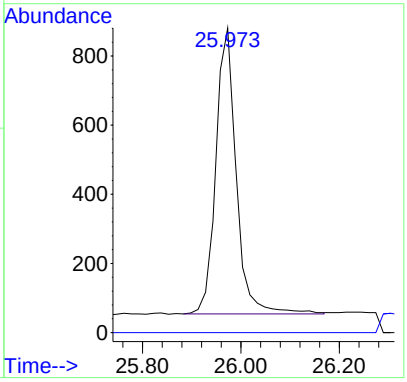


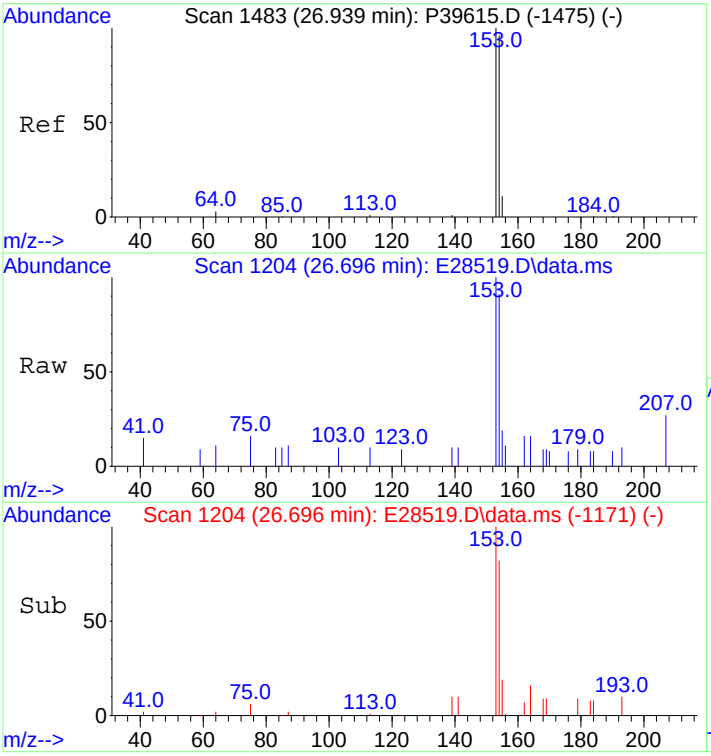


#26
Acenaphthylene
Concen: 23.70 ng/mL
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:152 Resp: 2386

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

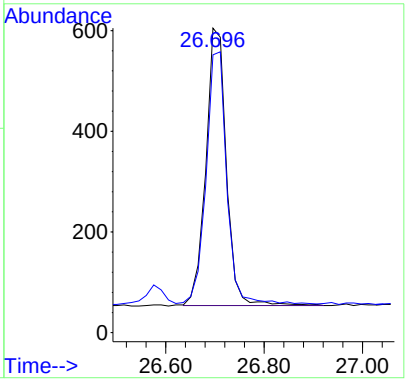


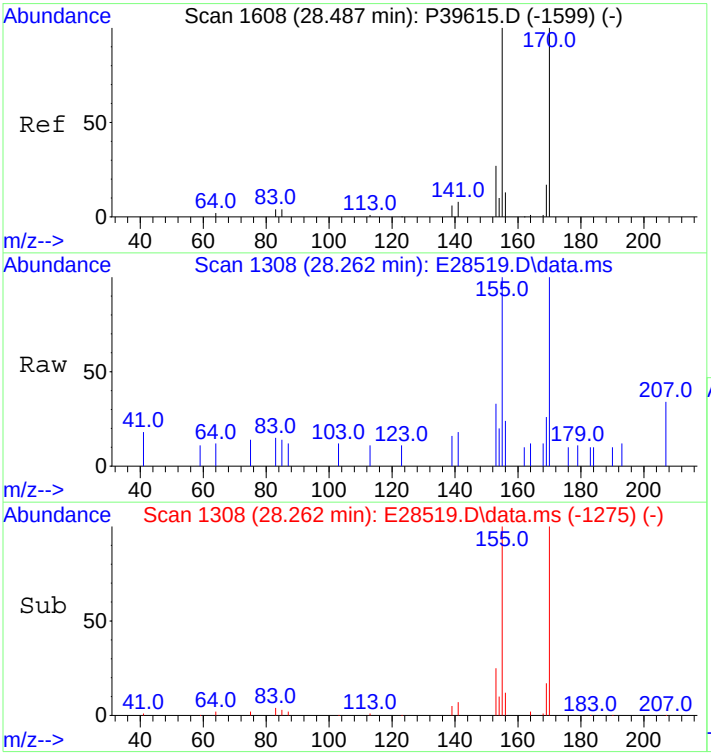


#27
Acenaphthene
Concen: 25.47 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:153 Resp: 1598

Ion	Ratio	Lower	Upper
153	100		
154	91.9	72.3	108.5

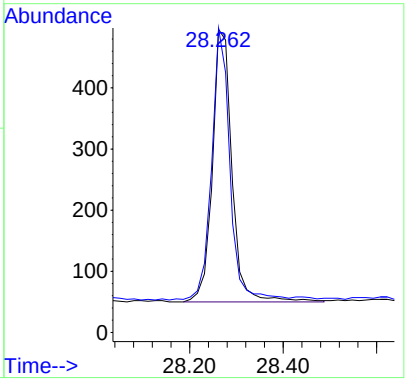


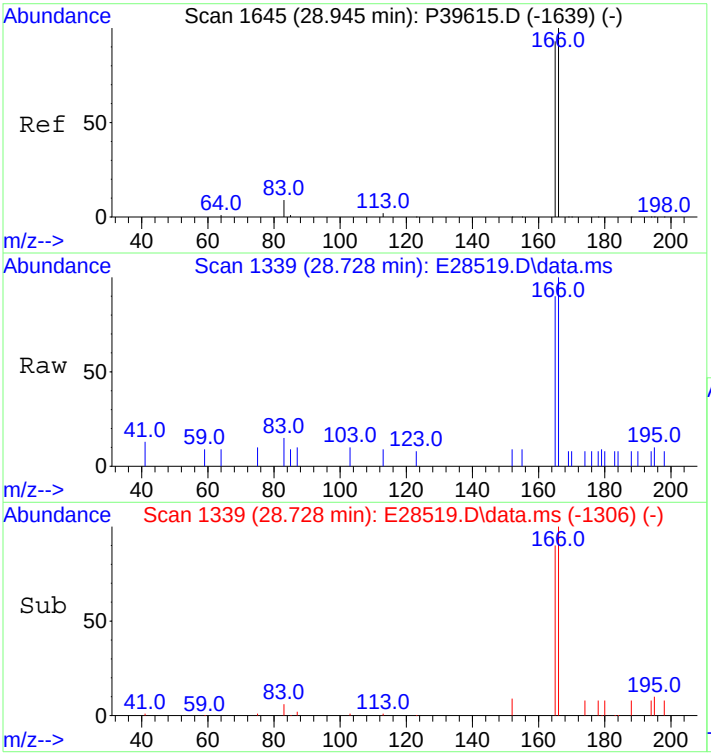


#28
2,3,5-Trimethylnaphthalene
Concen: 23.85 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:170 Resp: 1297

Ion	Ratio	Lower	Upper
170	100		
155	92.6	75.9	113.9

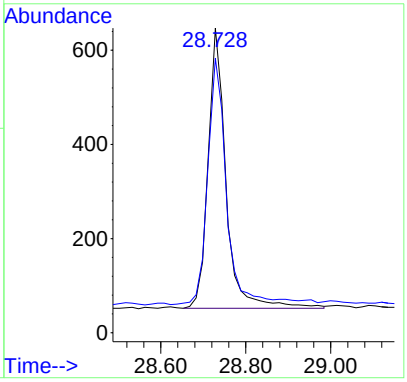


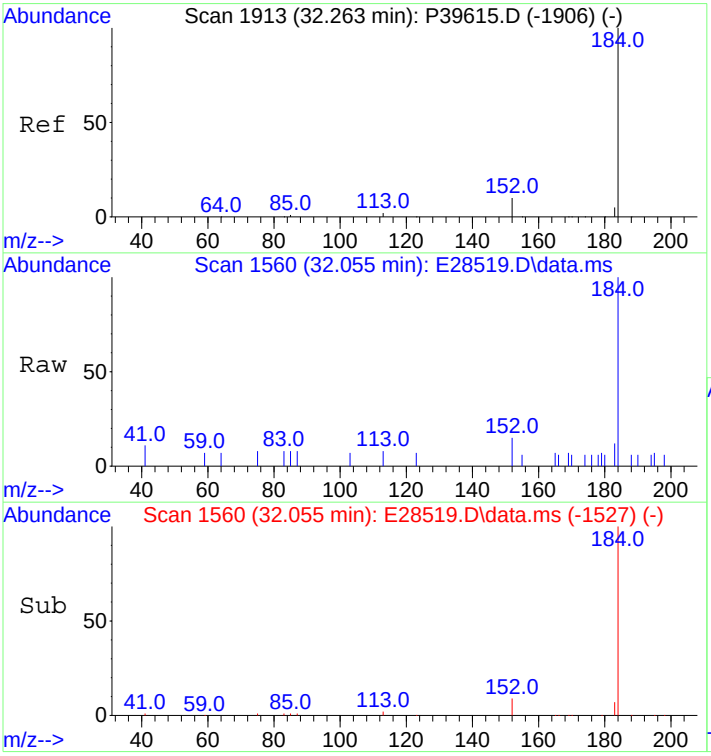


#29
Fluorene
Concen: 23.96 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:166 Resp: 1748

Ion	Ratio	Lower	Upper
166	100		
165	89.5	73.8	110.6

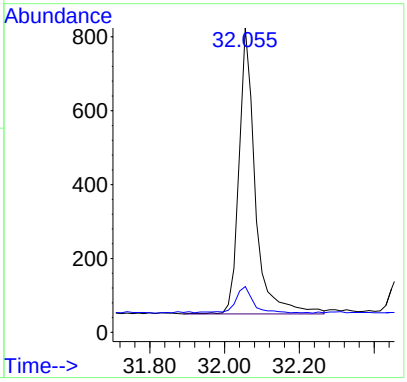


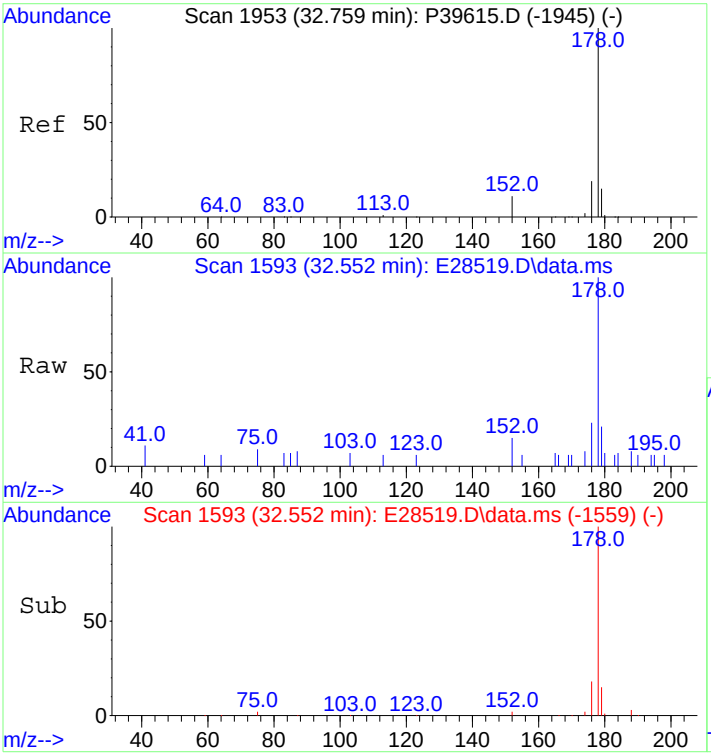


#33
Dibenzothiophene
Concen: 22.93 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:184 Resp: 2342

Ion	Ratio	Lower	Upper
184	100		
152	9.7	6.2	9.2#

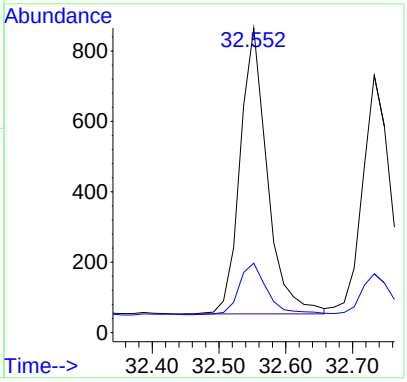


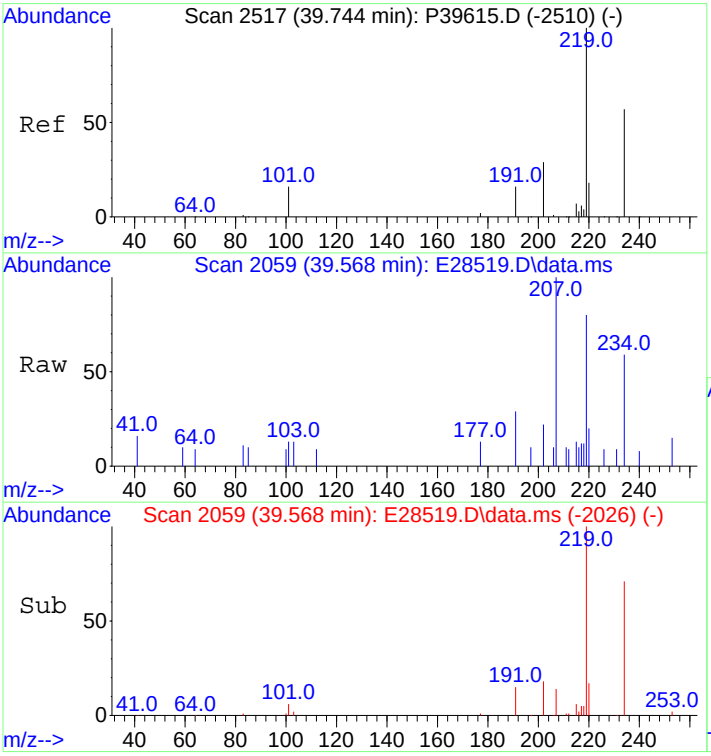


#43
Phenanthrene
Concen: 21.61 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:178 Resp: 2302

Ion	Ratio	Lower	Upper
178	100		
176	18.9	15.0	22.6

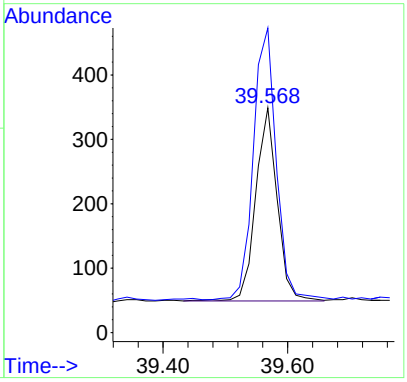


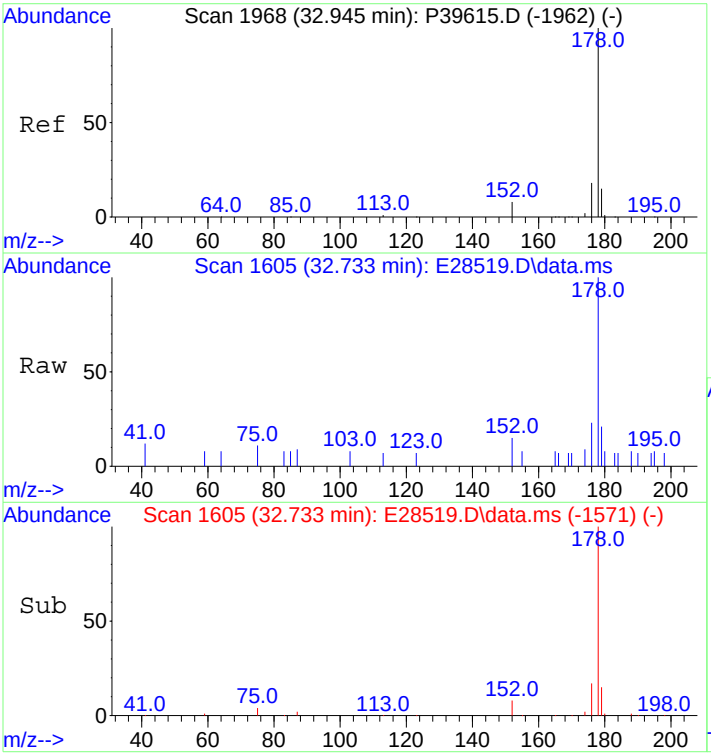


#54
Retene
Concen: 22.05 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:234 Resp: 719

Ion	Ratio	Lower	Upper
234	100		
219	149.4	113.0	169.4

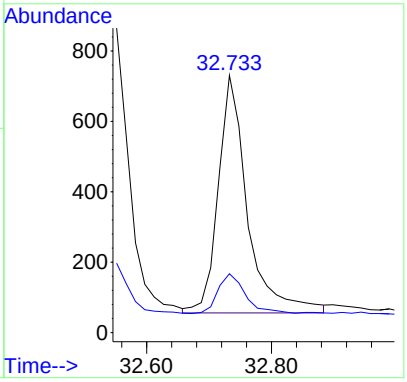


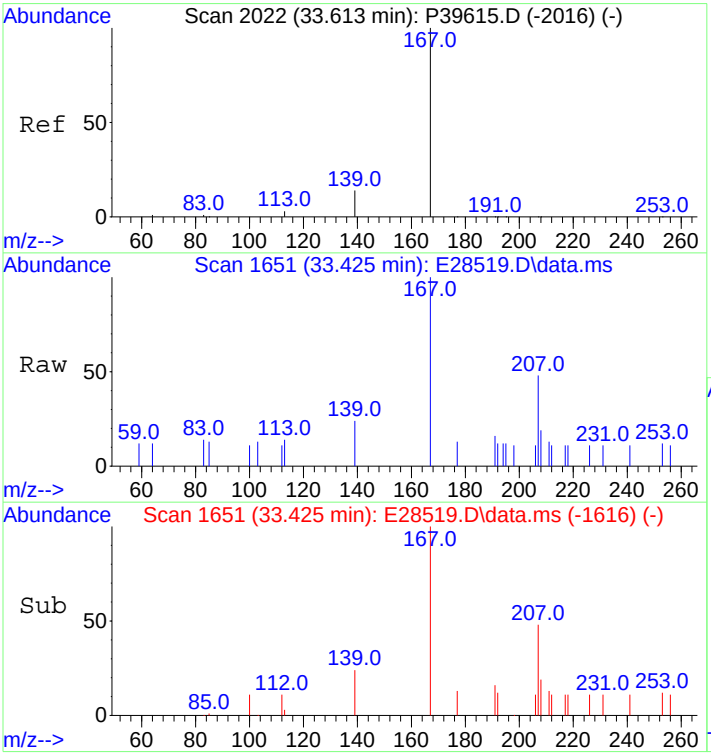


#55
Anthracene
Concen: 22.03 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:178 Resp: 2199

Ion	Ratio	Lower	Upper
178	100		
176	15.7	14.5	21.7

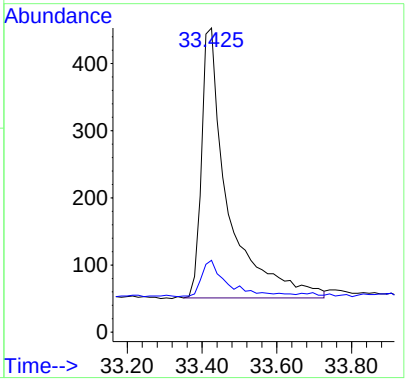


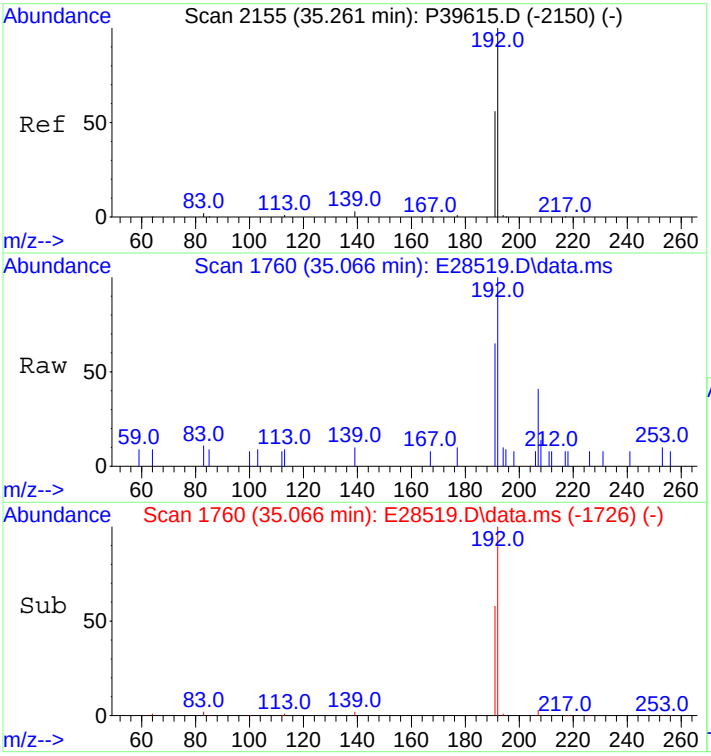


#56
Carbazole
Concen: 20.93 ng/mL
RT: 33.425 min Scan# 1651
Delta R.T. 0.030 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:167 Resp: 1973

Ion	Ratio	Lower	Upper
167	100		
139	12.4	10.5	15.7

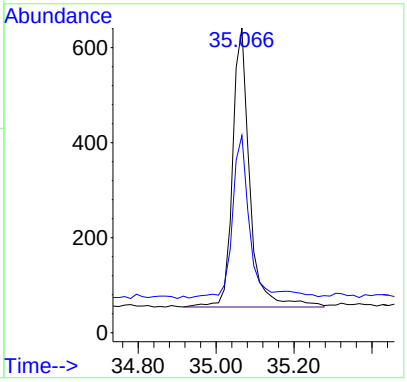


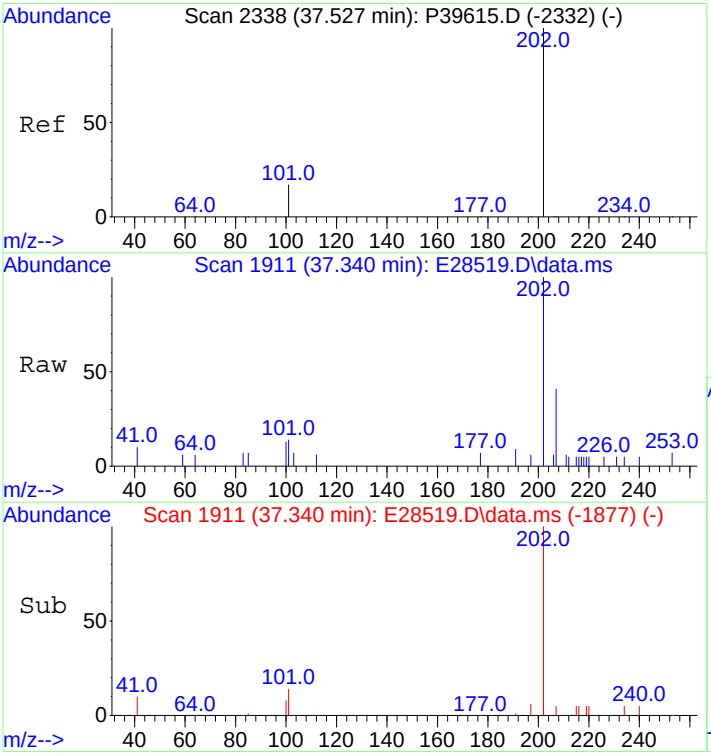


#57
1-Methylphenanthrene
Concen: 22.67 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:192 Resp: 1799

Ion	Ratio	Lower	Upper
192	100		
191	57.3	45.5	68.3

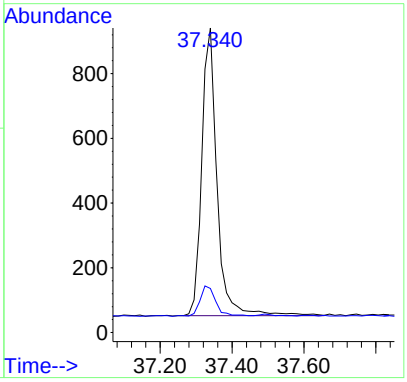


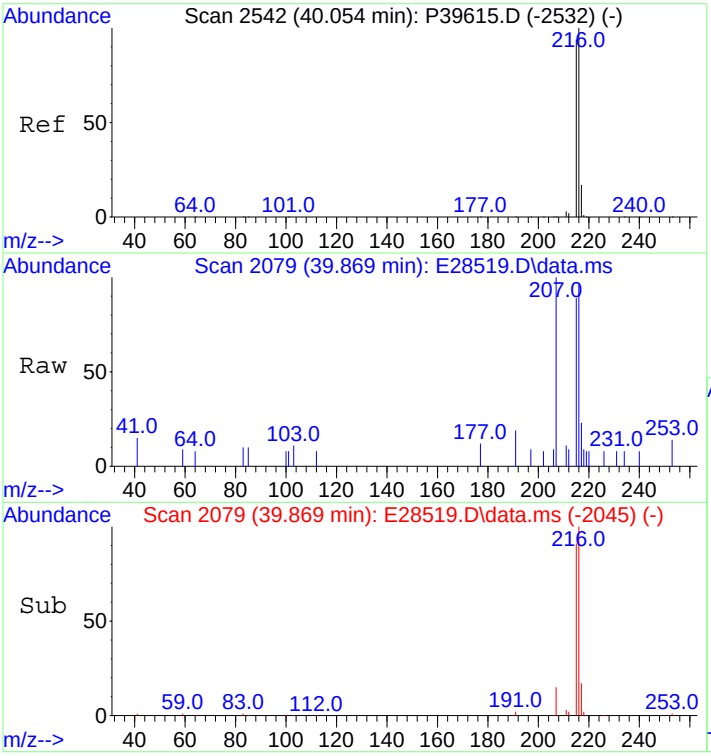


#58
Fluoranthene
Concen: 22.53 ng/mL
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:202 Resp: 2616

Ion	Ratio	Lower	Upper
202	100		
101	10.6	9.2	13.8

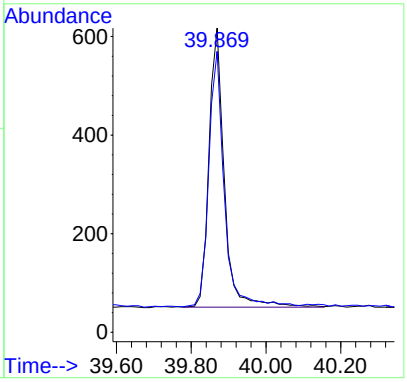


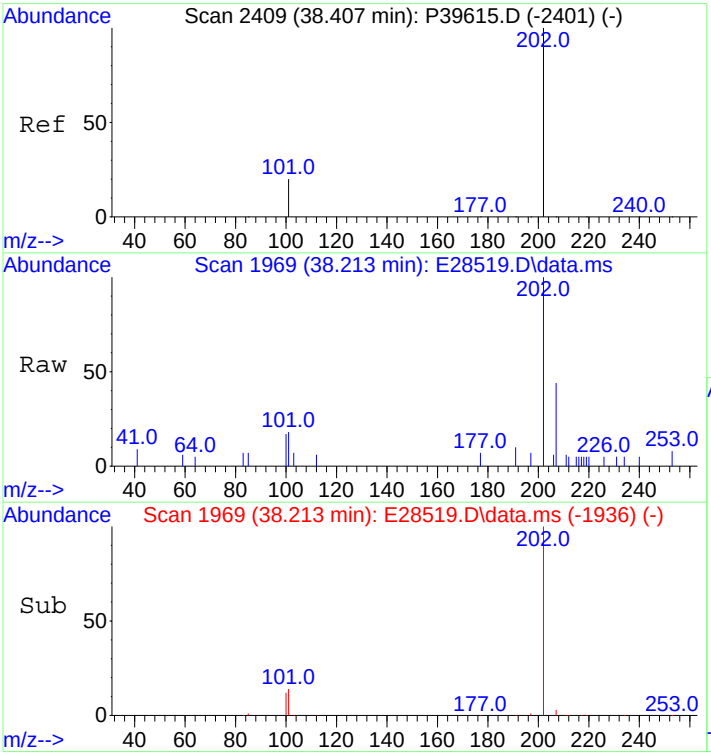


#59
Benzo(b)fluorene
Concen: 21.86 ng/mL
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:216 Resp: 1614

Ion	Ratio	Lower	Upper
216	100		
215	92.1	73.8	110.8

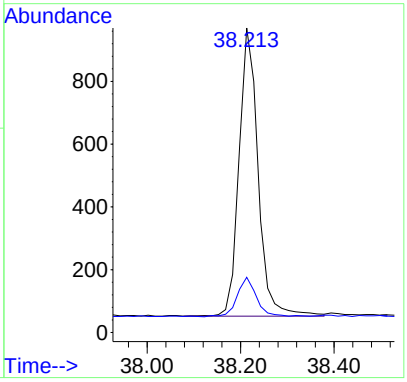


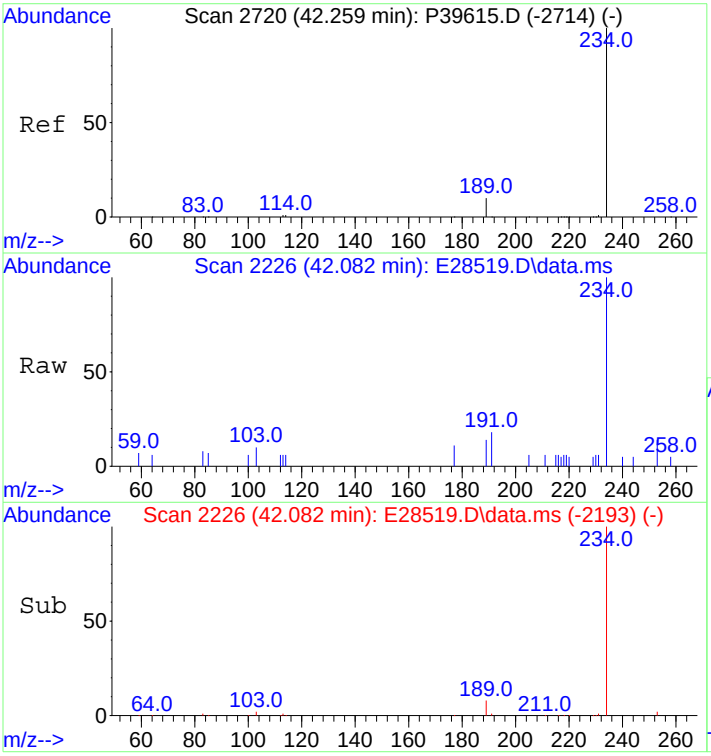


#60
Pyrene
Concen: 22.40 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:202 Resp: 2618

Ion	Ratio	Lower	Upper
202	100		
101	14.1	9.8	14.8

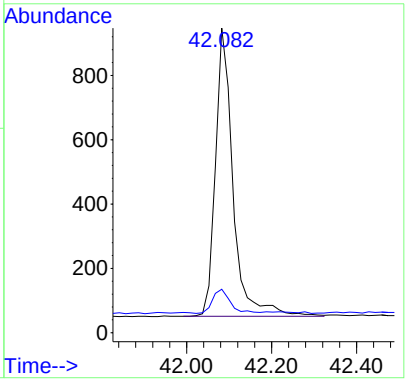


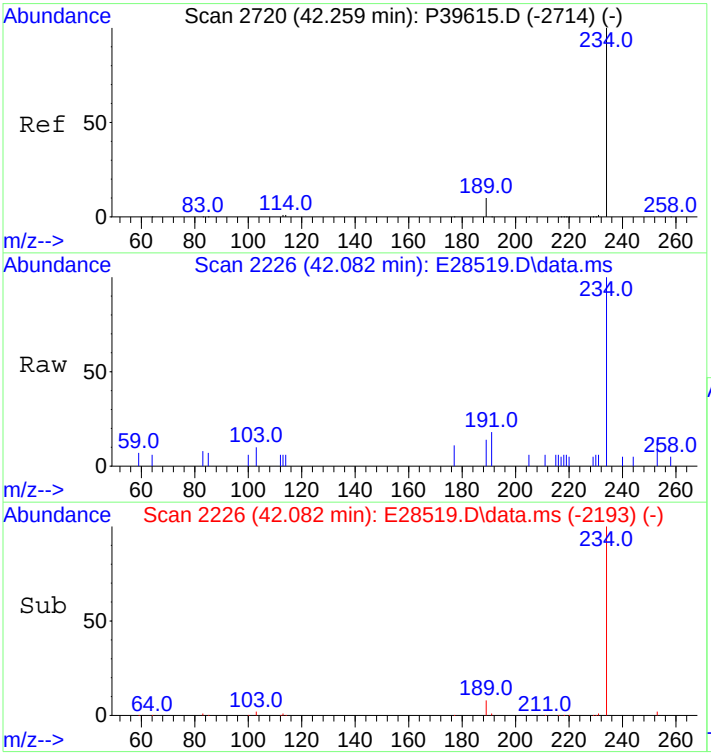


#66
Naphthobenzothiophene
Concen: 23.37 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:234 Resp: 2577

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

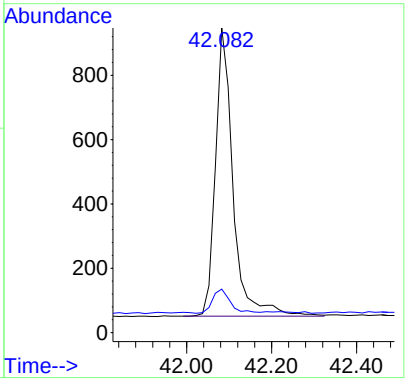


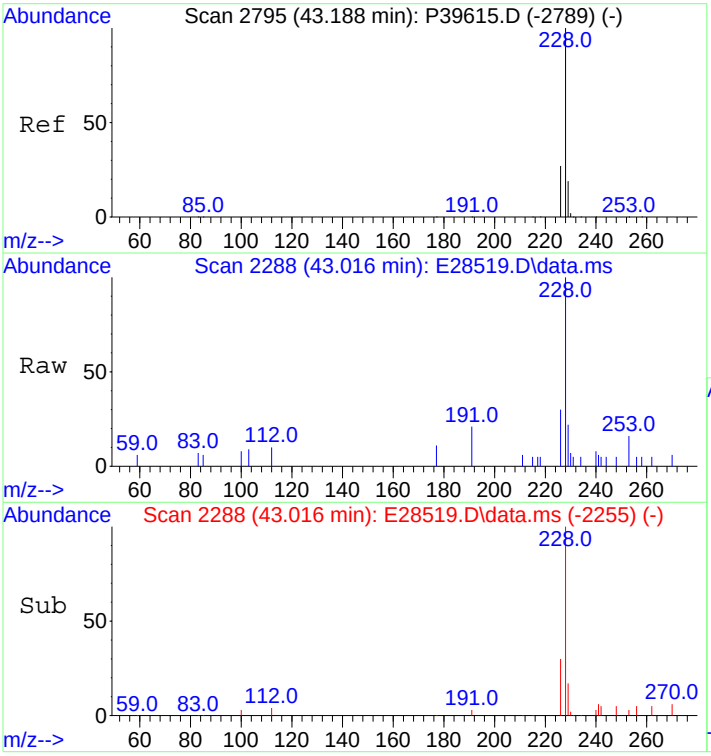


#67
Naphthobenzothiophene-2,1-D
Concen: 23.37 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:234 Resp: 2577

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

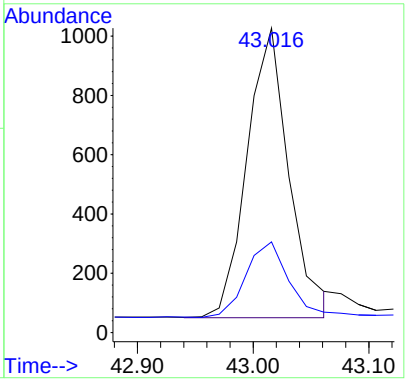


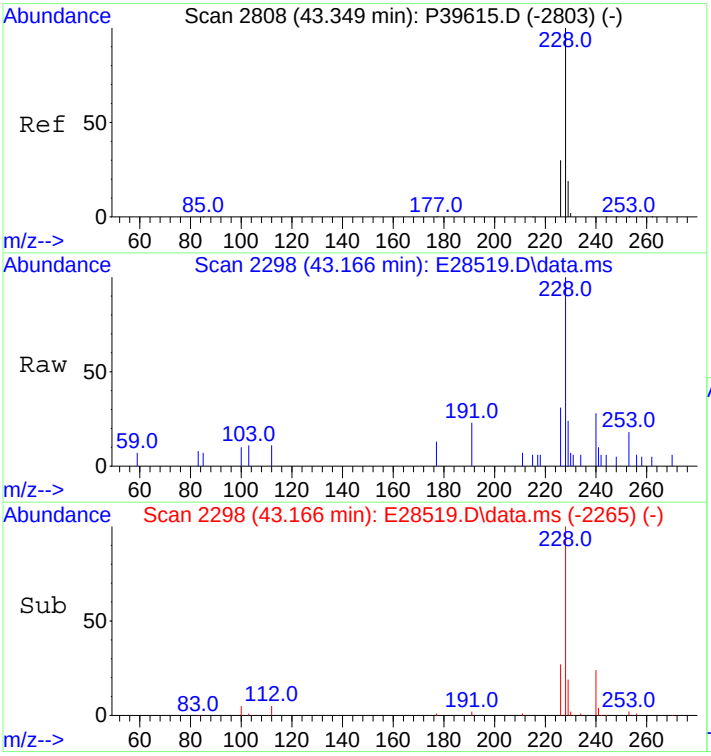


#75
Benz[a]anthracene
Concen: 21.40 ng/mL m
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:228 Resp: 2460

Ion	Ratio	Lower	Upper
228	100		
226	27.5	20.2	30.4

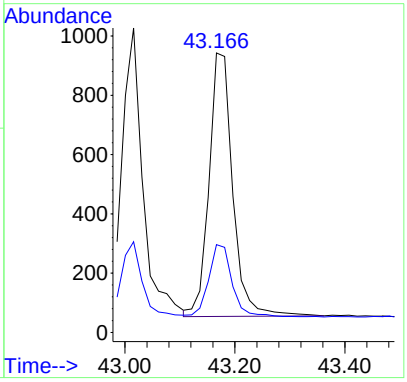


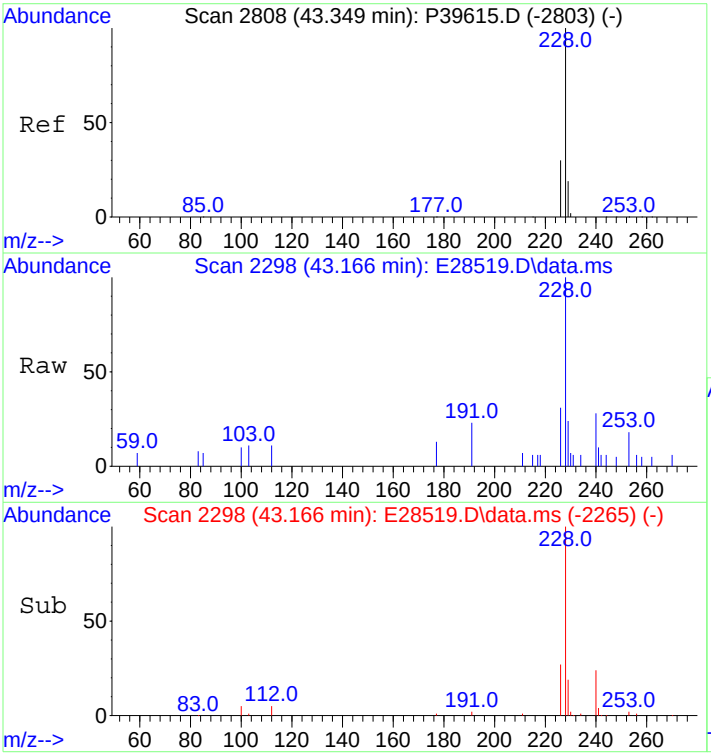


#76
Chrysene
Concen: 23.72 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:228 Resp: 2669

Ion	Ratio	Lower	Upper
228	100		
226	27.1	22.6	34.0

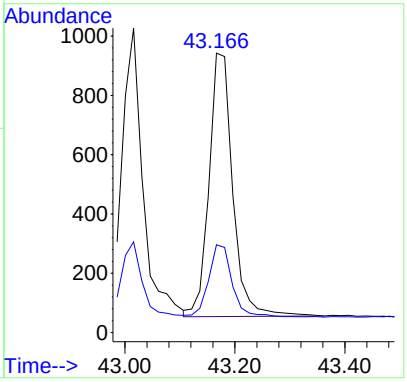


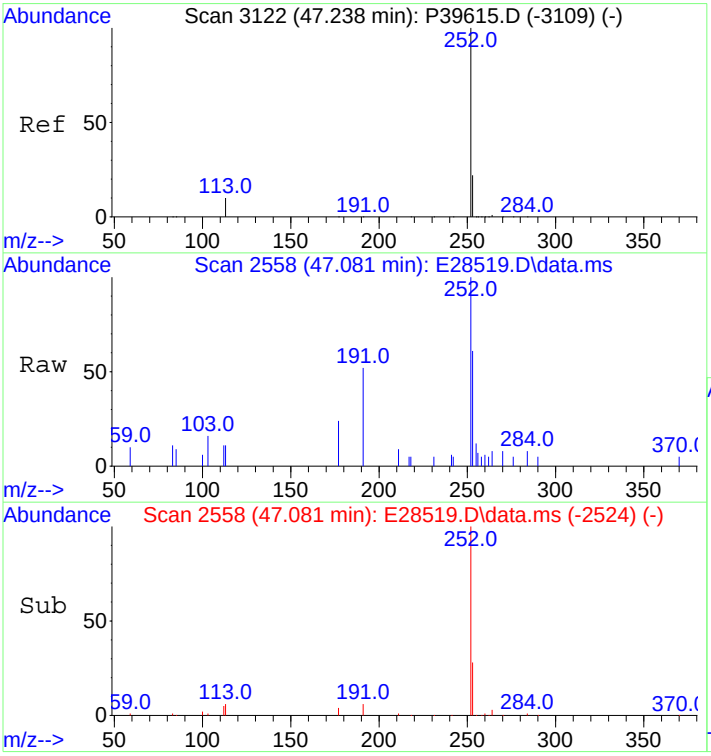


#77
Chrysene/Triphenylene
Concen: 23.72 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:228 Resp: 2669

Ion	Ratio	Lower	Upper
228	100		
226	27.1	22.6	34.0

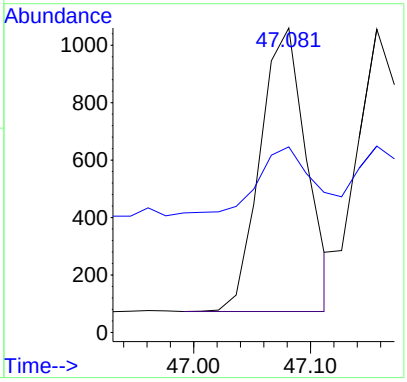


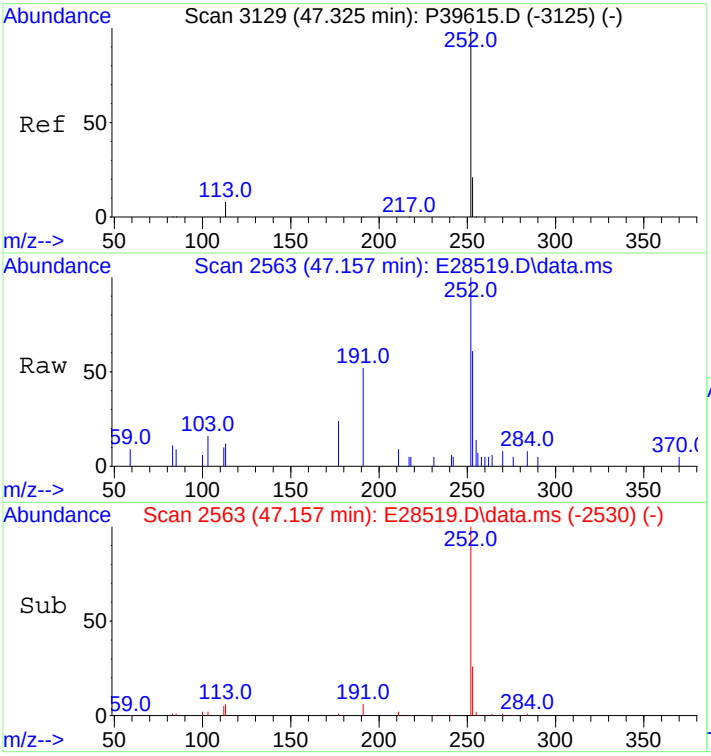


#84
Benzo[b]fluoranthene
Concen: 22.63 ng/mL
RT: 47.081 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2739

Ion	Ratio	Lower	Upper
252	100		
253	26.7	18.3	27.5

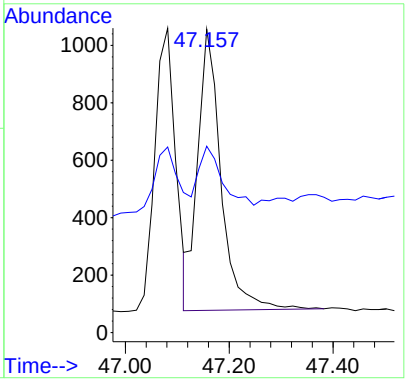


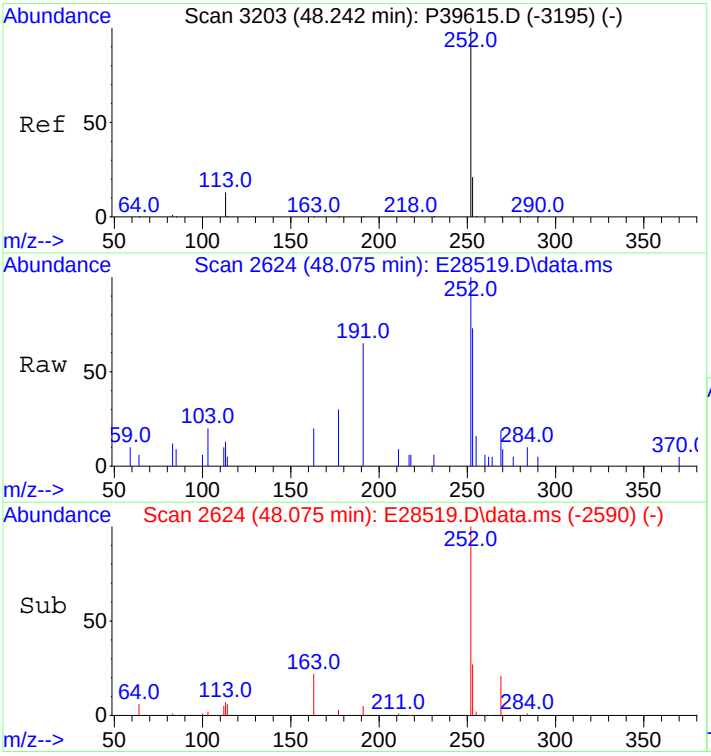


#85
Benzo[j]+[k]fluoranthene
Concen: 26.78 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 3051

Ion	Ratio	Lower	Upper
252	100		
253	21.4	18.3	27.5

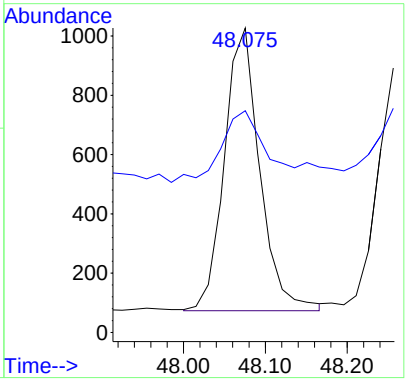


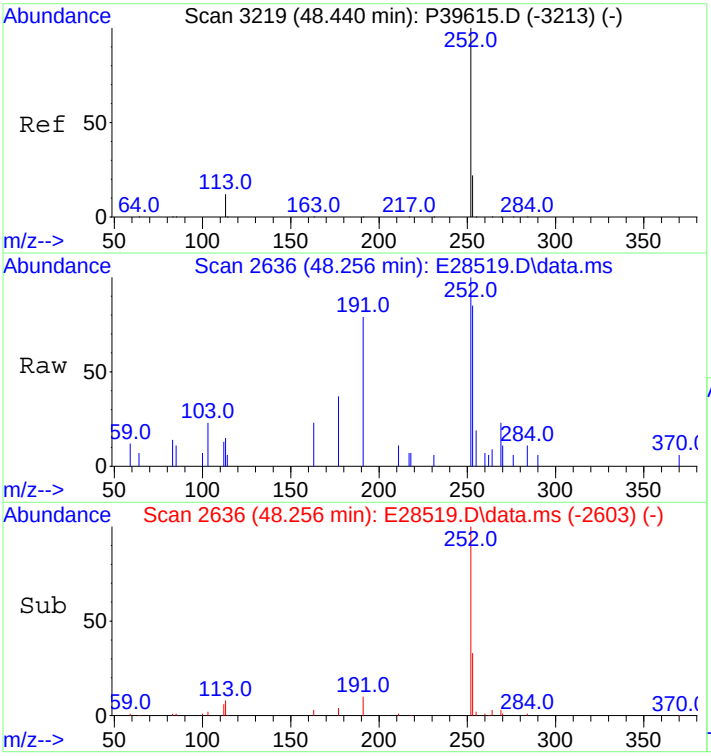


#87
Benzo[e]pyrene
Concen: 26.70 ng/mL m
RT: 48.075 min Scan# 2624
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2868

Ion	Ratio	Lower	Upper
252	100		
253	24.3	18.6	28.0

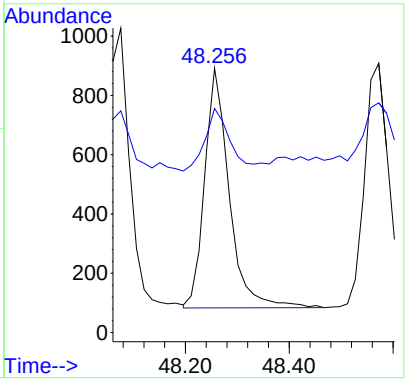


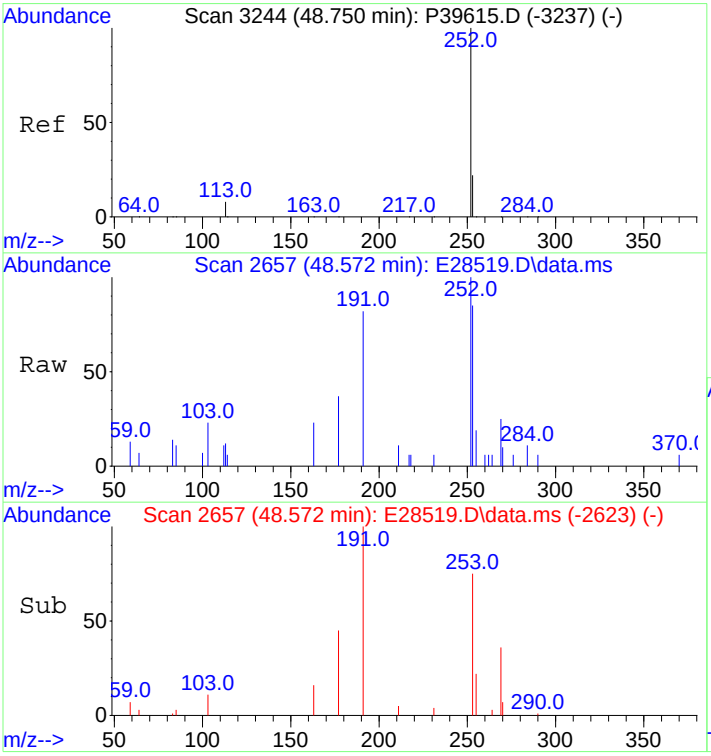


#89
Benzo[a]pyrene
Concen: 26.12 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2653

Ion	Ratio	Lower	Upper
252	100		
253	26.2	18.8	28.2

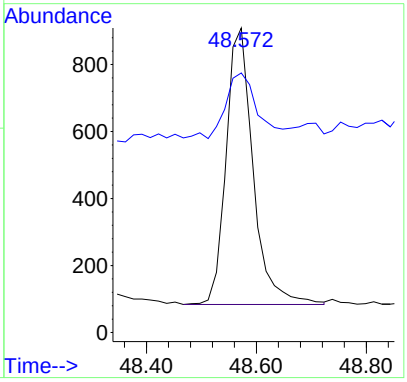


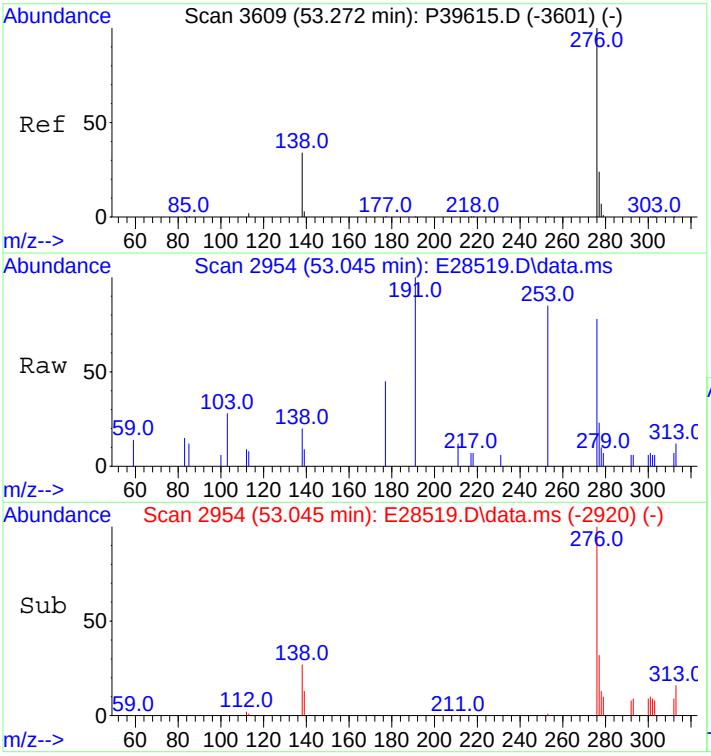


#90
Perylene
Concen: 26.00 ng/mL
RT: 48.572 min Scan# 2657
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2810

Ion	Ratio	Lower	Upper
252	100		
253	25.2	18.8	28.2

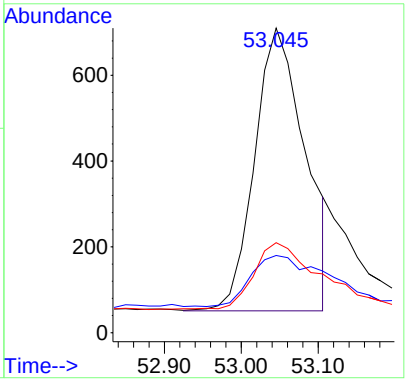


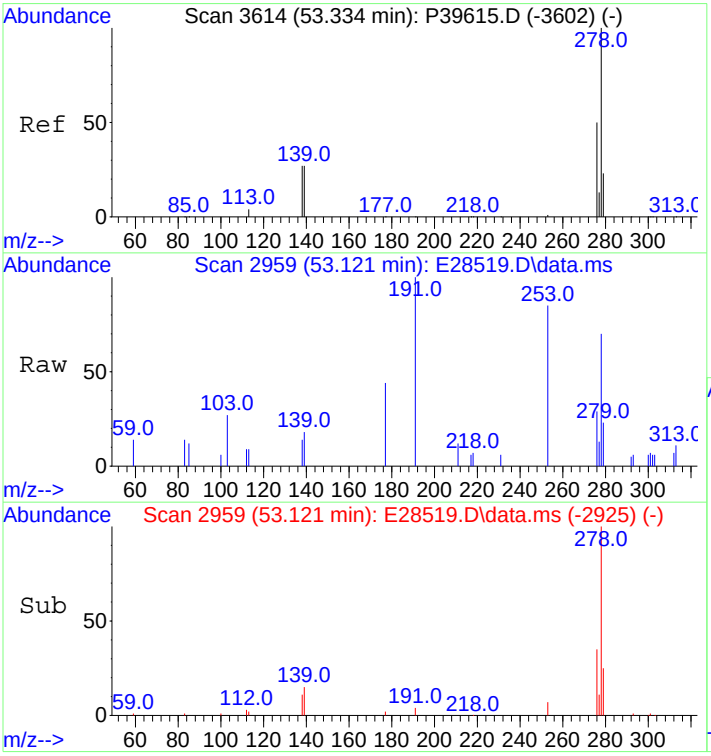


#91
Indeno[1,2,3-cd]pyrene
Concen: 24.55 ng/mL m
RT: 53.045 min Scan# 2954
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:276 Resp: 3010

Ion	Ratio	Lower	Upper
276	100		
138	29.8	15.4	23.2#
277	31.1	19.1	28.7#

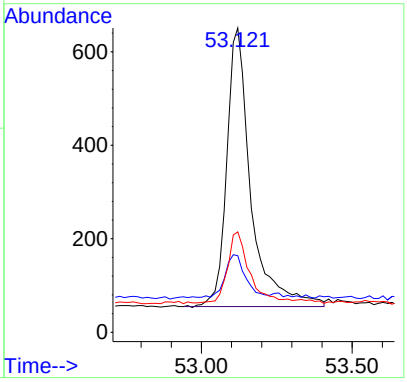


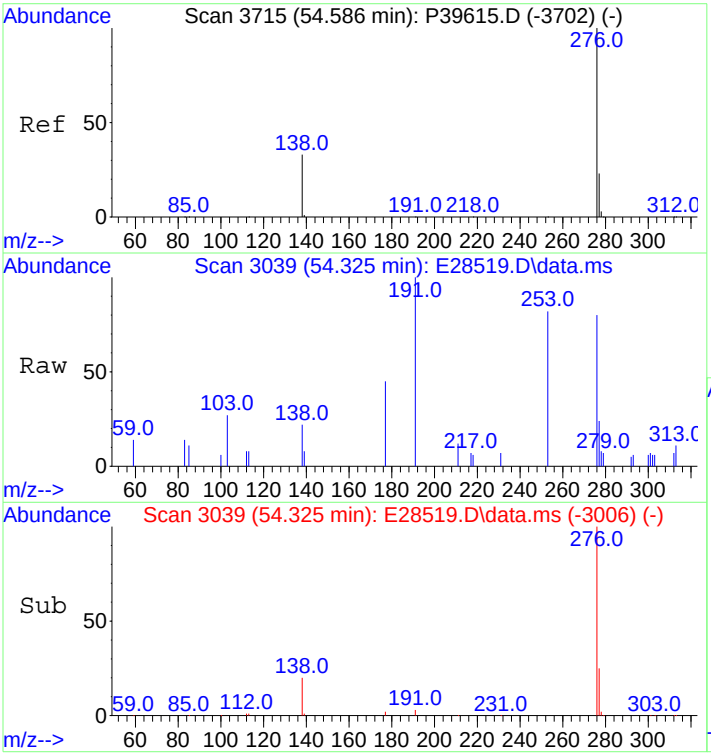


#92
Dibenz[ah]+[ac]anthracene
Concen: 28.06 ng/mL
RT: 53.121 min Scan# 2959
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:278 Resp: 3309

Ion	Ratio	Lower	Upper
278	100		
139	12.7	11.1	16.7
279	23.1	19.4	29.0

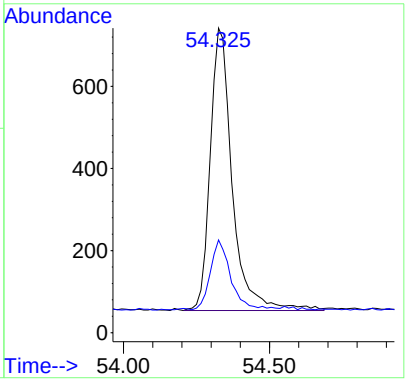


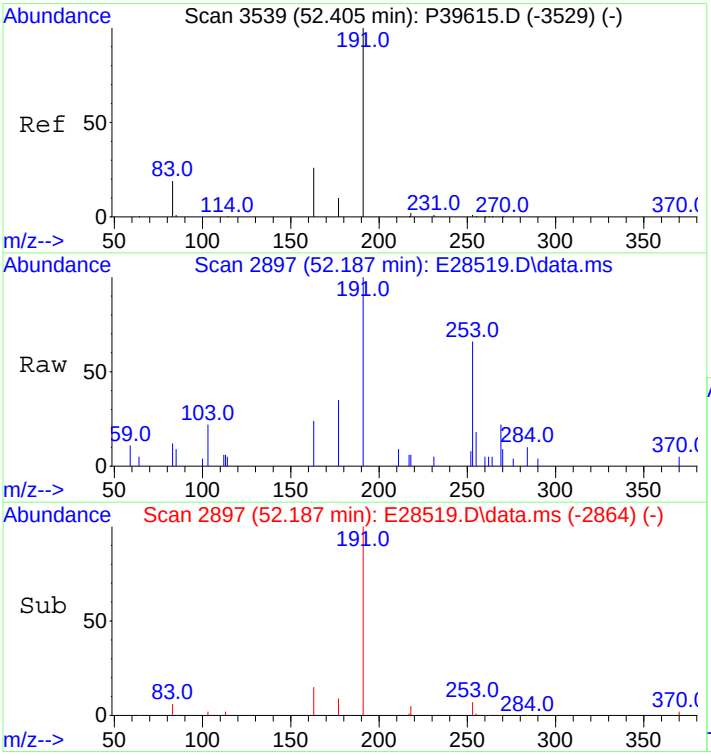


#93
Benzo[g,h,i]perylene
Concen: 29.99 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:276 Resp: 3613

Ion	Ratio	Lower	Upper
276	100		
277	22.9	19.1	28.7

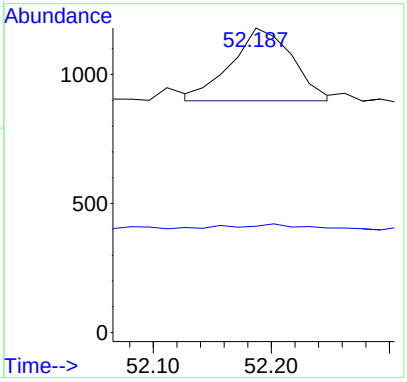


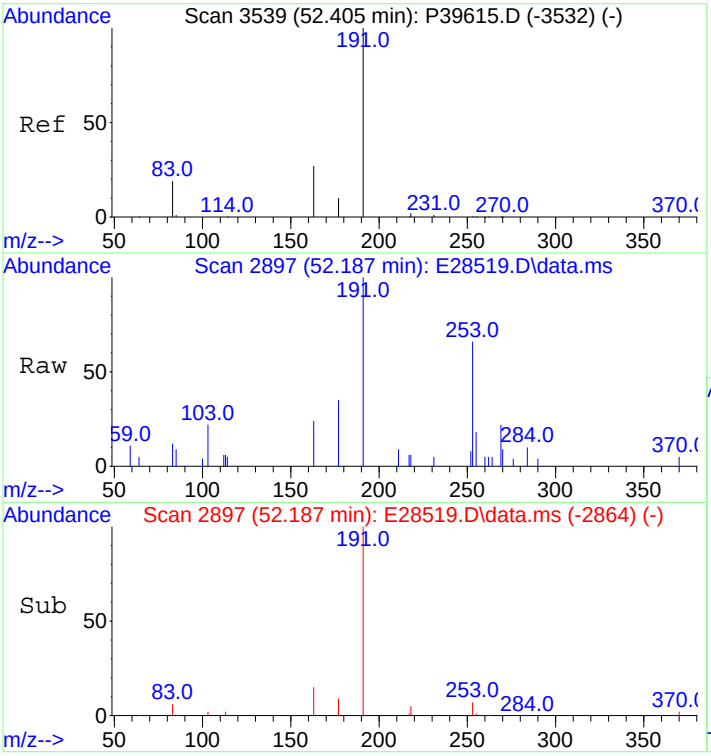


#94
Hopane (T19)
Concen: 35.49 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:191 Resp: 1010

Ion	Ratio	Lower	Upper
191	100		
177	0.0	8.7	13.1#

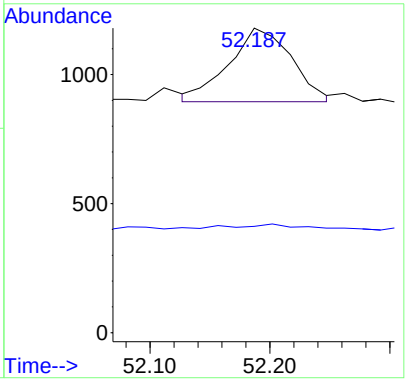




#95
17a(H),21B(H)-hopane - C30H52
Concen: 36.26 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:191 Resp: 1032

Ion	Ratio	Lower	Upper
191	100		
177	0.0	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 12:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
	Internal Standards						
1)	Acenaphthene-d10	26.575	164	23755M3	500.000	ng/mL	0.00
74)	Chrysene-d12	43.076	240	50831	500.000	ng/mL	0.00
	System Monitoring Compounds						
9)	Naphthalene-d8	19.605	136	9092	102.746	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.27%#			
42)	Phenanthrene-d10	32.462	188	8686	97.402	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.74%#			
83)	Benzo[b]fluoranthene-d12	46.991	264	10225	106.250	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.63%#			
88)	Benzo[a]pyrene-d12	48.166	264	9905	113.485	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 11.35%#			
129)	5B(H)Cholane - Surr	43.708	217	1989	106.142	ng/ml	-0.02
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.61%#			
	Target Compounds						Qvalue
3)	trans-Decalin	16.263	138	1011	51.127	ng/mL	100
4)	cis-Decalin	17.482	138	780	51.928	ng/mL	100
10)	Naphthalene	19.680	128	9972	105.060	ng/mL#	100
16)	2-Methylnaphthalene	22.375	142	6102	99.335	ng/mL#	100
17)	1-Methylnaphthalene	22.797	142	6090	103.378	ng/mL#	100
18)	Benzothiophene	19.906	134	8289	107.049	ng/mL	100
23)	Biphenyl	24.272	154	7767	99.833	ng/mL#	100
24)	2,6-Dimethylnaphthalene	24.874	156	5433	97.018	ng/mL#	100
25)	Dibenzofuran	27.358	168	8518	101.311	ng/mL	97
26)	Acenaphthylene	25.973	152	9493M3	101.299	ng/mL	
27)	Acenaphthene	26.696	153	6196	106.092	ng/mL	99
28)	2,3,5-Trimethylnaphtha...	28.262	170	5064	100.043	ng/mL	95
29)	Fluorene	28.728	166	6771	99.718	ng/mL	99
33)	Dibenzothiophene	32.055	184	9356	98.404	ng/mL#	96
43)	Phenanthrene	32.552	178	9481	95.610	ng/mL	99
54)	Retene	39.568	234	2793	92.007	ng/mL	90
55)	Anthracene	32.733	178	9206M3	99.074	ng/mL	
56)	Carbazole	33.410	167	7855	89.504	ng/mL	100
57)	1-Methylphenanthrene	35.066	192	7075	95.788	ng/mL	98
58)	Fluoranthene	37.325	202	10218	94.551	ng/mL	99
59)	Benzo(b)fluorene	39.854	216	6491	94.432	ng/mL	100
60)	Pyrene	38.213	202	10358	95.214	ng/mL	99
66)	Naphthobenzothiophene	42.082	234	10119	98.581	ng/ml	96
67)	Naphthobenzothiophene-...	42.082	234	10119	98.581	ng/mL	96
75)	Benz[a]anthracene	43.016	228	9939	88.192	ng/mL	99
76)	Chrysene	43.166	228	10414	94.407	ng/mL	99
77)	Chrysene/Triphenylene	43.166	228	10414	94.407	ng/mL	99
84)	Benzo[b]fluoranthene	47.066	252	11264	94.928	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	47.157	252	12115	108.499	ng/mL	97
87)	Benzo[e]pyrene	48.060	252	11009	104.557	ng/mL	98
89)	Benzo[a]pyrene	48.256	252	10439	104.868	ng/mL	100
90)	Perylene	48.557	252	11087	104.654	ng/mL	99
91)	Indeno[1,2,3-cd]pyrene	53.045	276	11305M3	94.067	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.106	278	12888	111.498	ng/mL	100
93)	Benzo[g,h,i]perylene	54.325	276	13189	111.682	ng/mL	99
94)	Hopane (T19)	52.187	191	3549M3	127.214	ng/mL	
95)	17a(H),21B(H)-hopane -...	52.187	191	3538M3	126.820	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 12:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

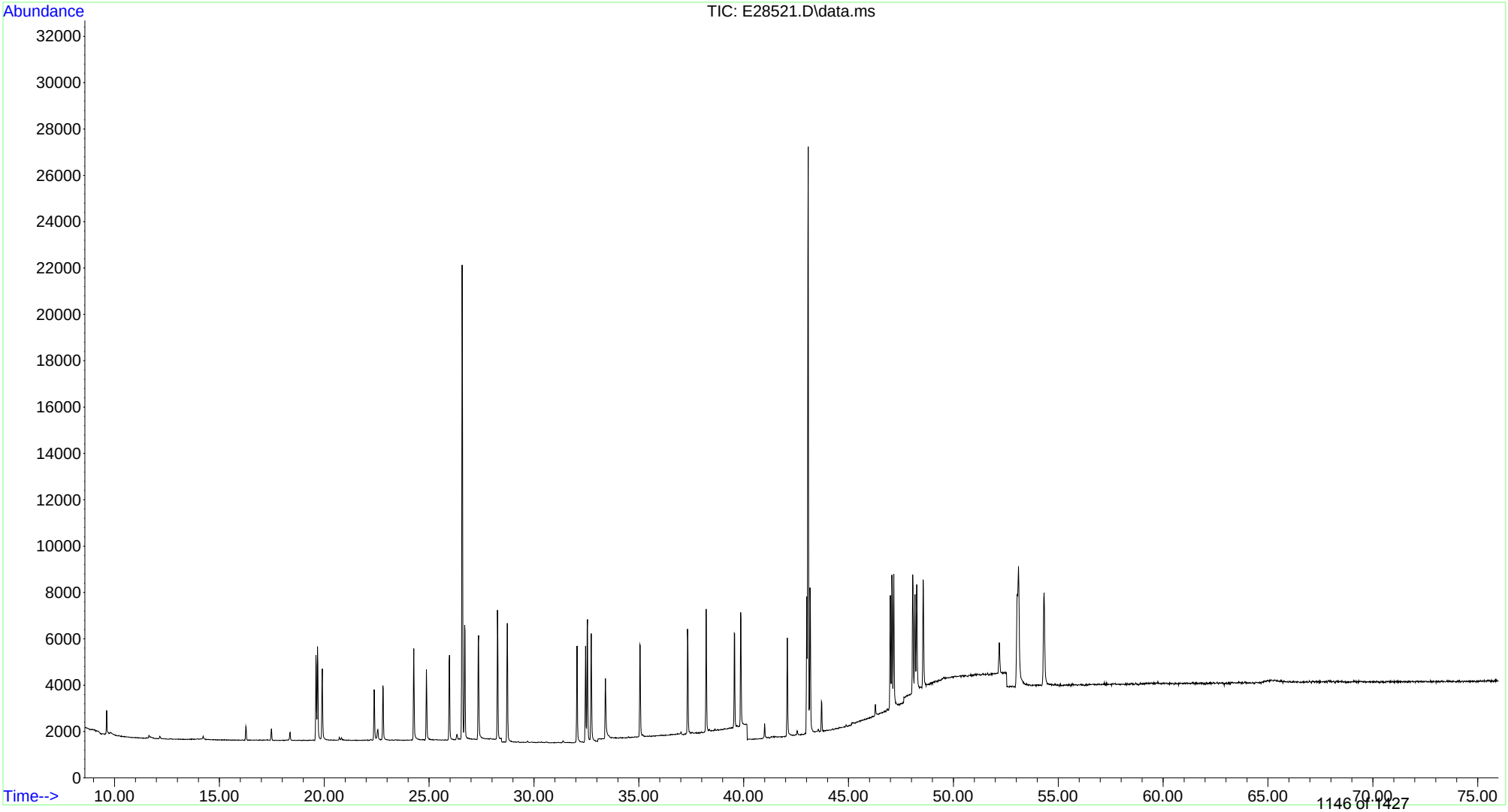
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

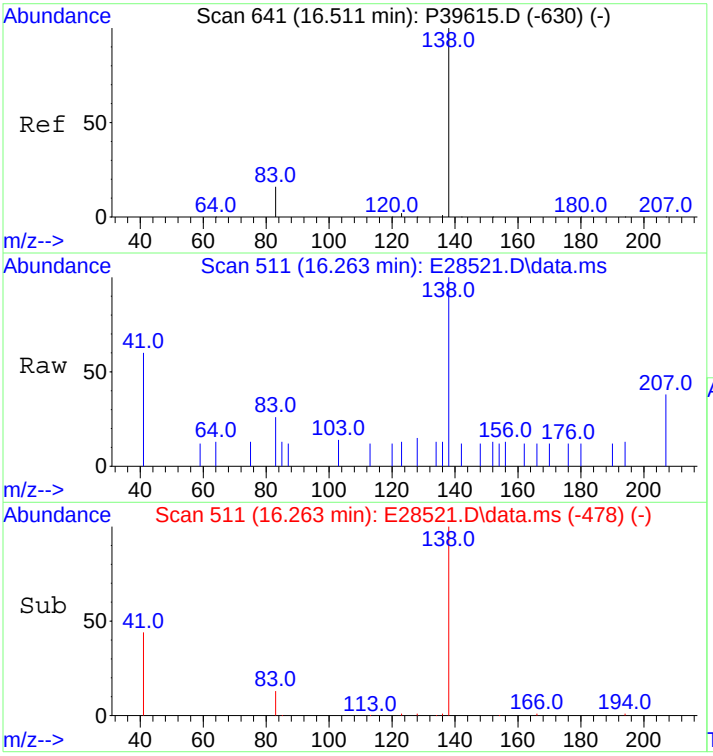
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

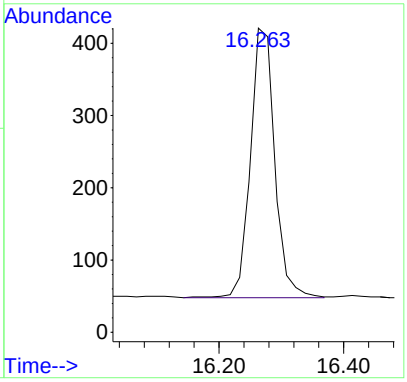
Quant Time: Oct 31 12:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

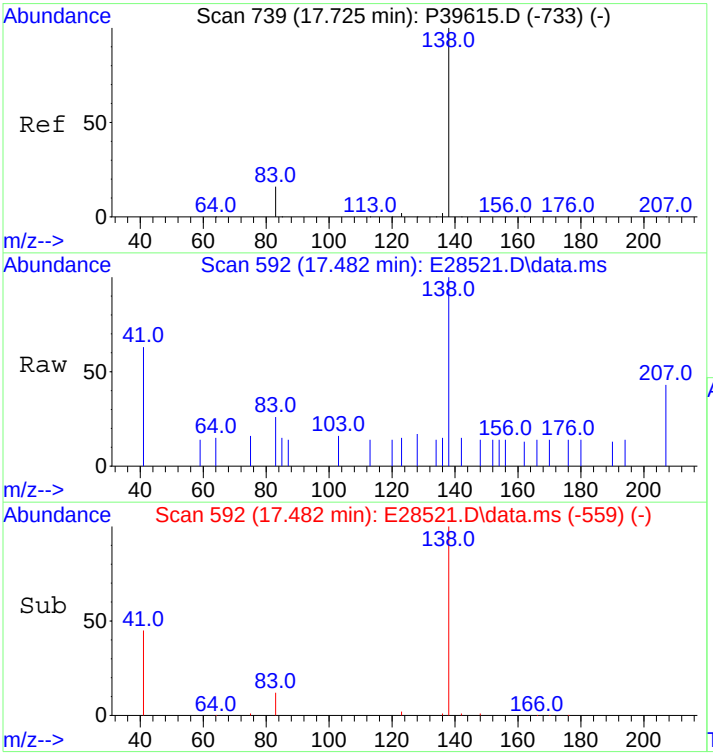




#3
trans-Decalin
Concen: 51.13 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

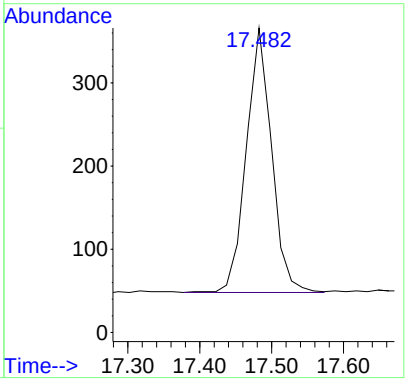
Tgt Ion:138 Resp: 1011

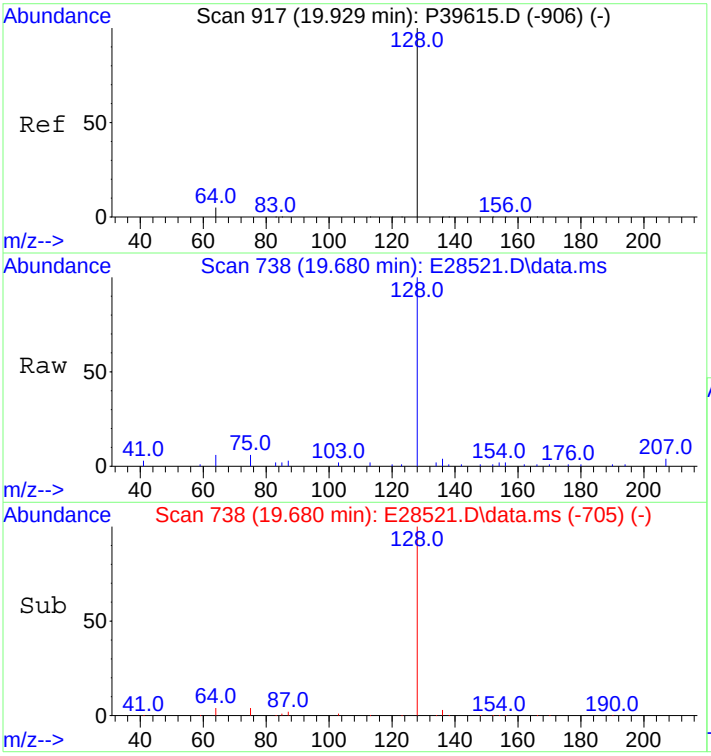




#4
cis-Decalin
Concen: 51.93 ng/mL
RT: 17.482 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:138 Resp: 780

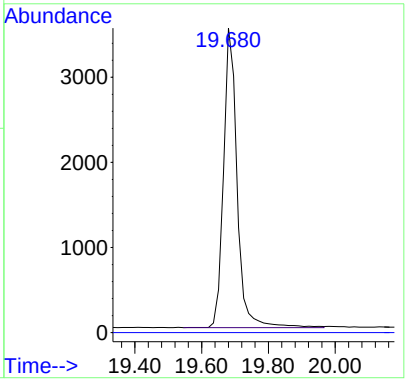


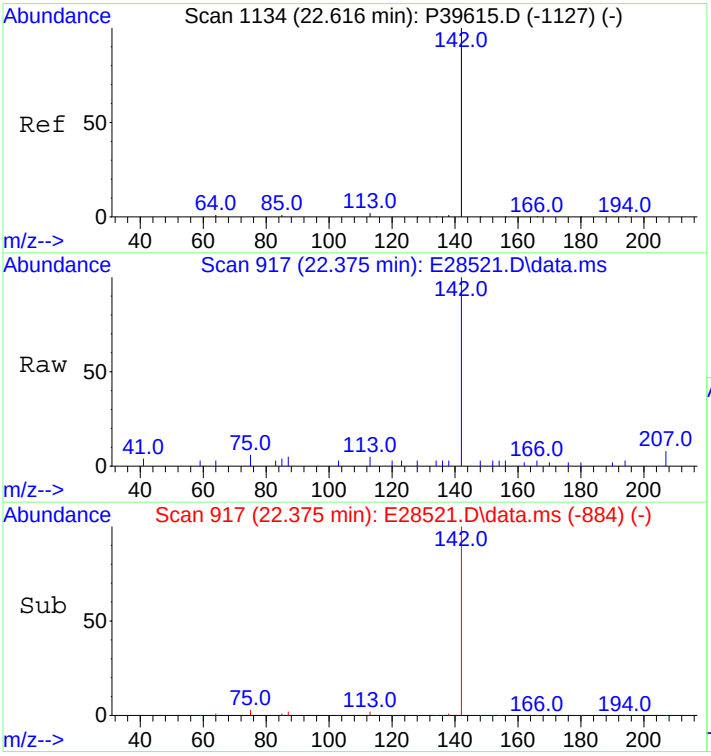


#10
Naphthalene
Concen: 105.06 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:128 Resp: 9972

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

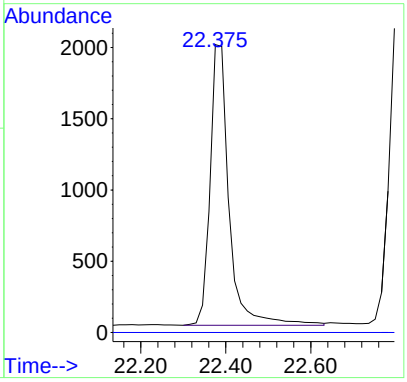


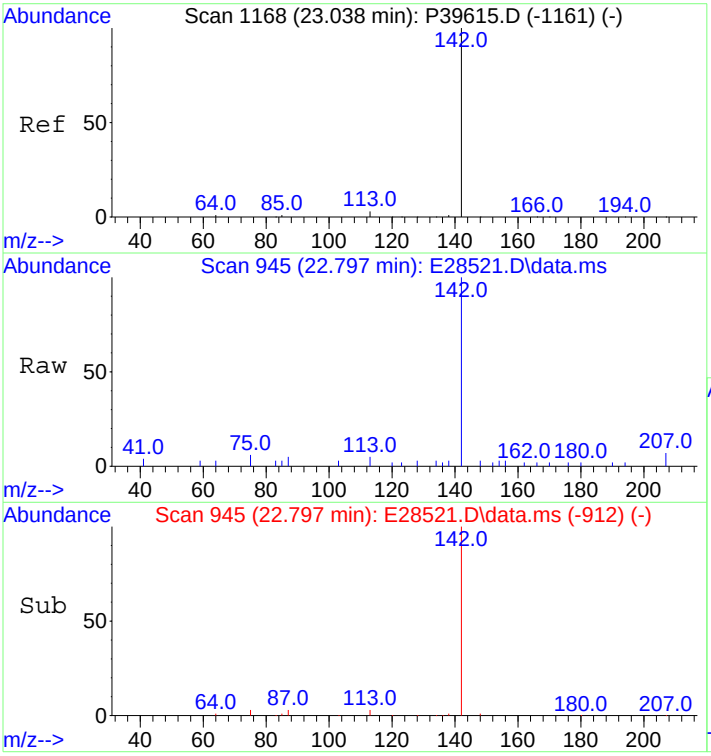


#16
2-Methylnaphthalene
Concen: 99.34 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:142 Resp: 6102

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

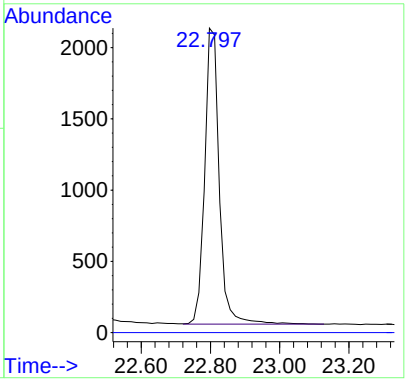


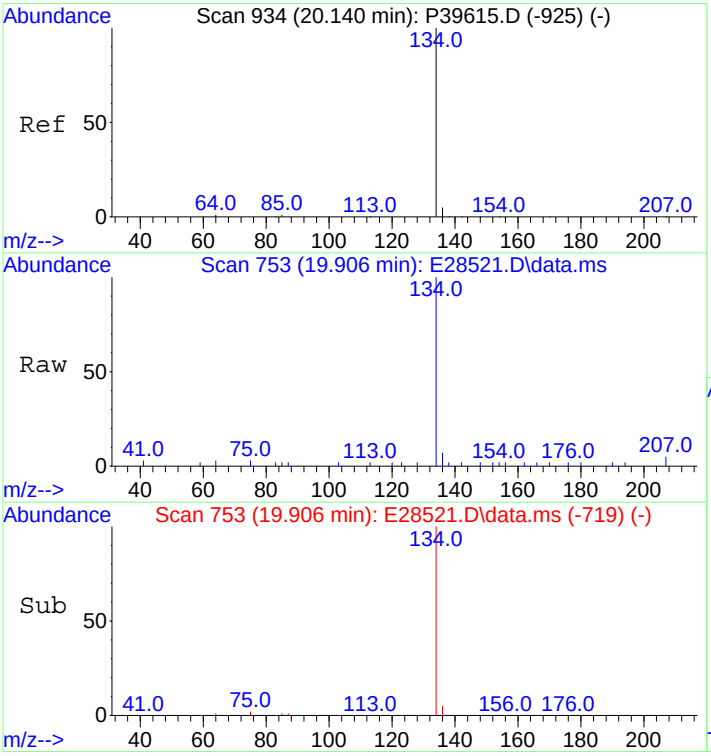


#17
1-Methylnaphthalene
Concen: 103.38 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:142 Resp: 6090

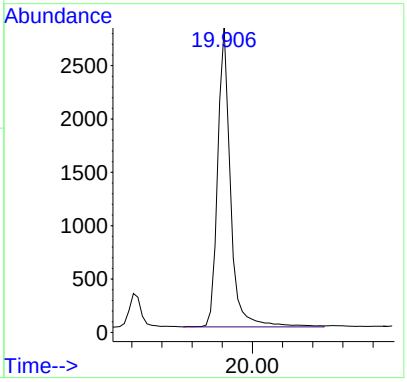
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

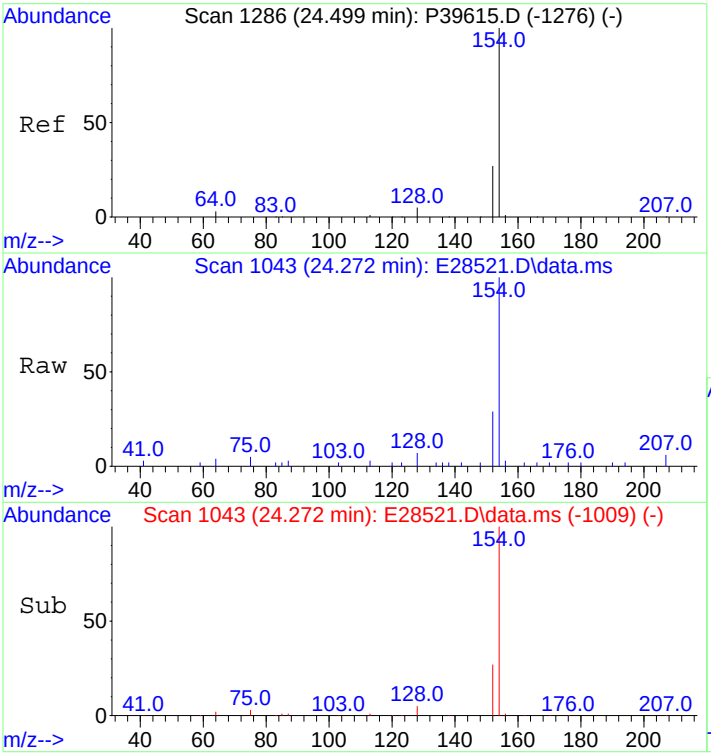




#18
Benzothiophene
Concen: 107.05 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:134 Resp: 8289

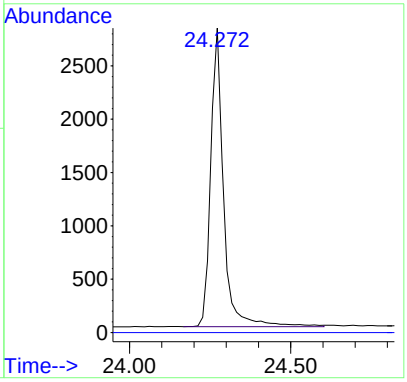


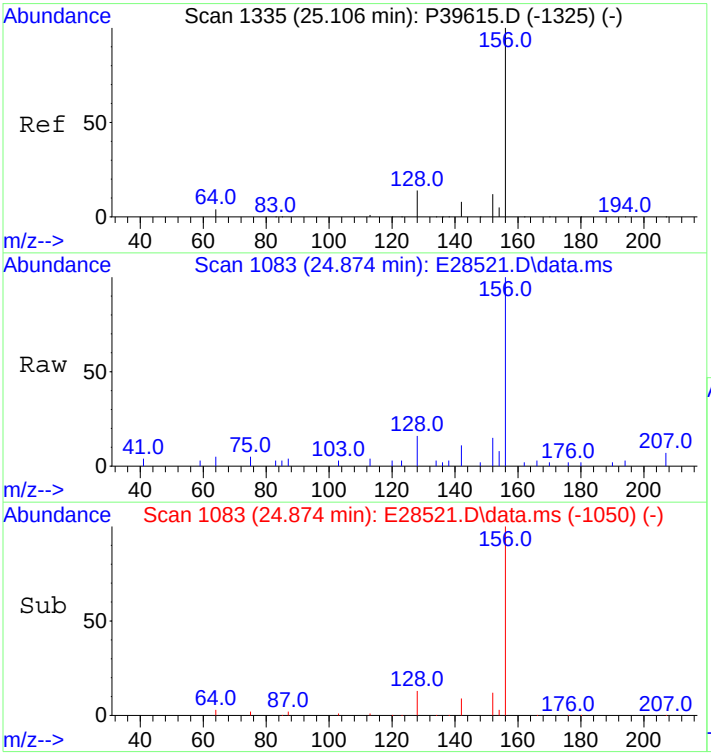


#23
Biphenyl
Concen: 99.83 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:154 Resp: 7767

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

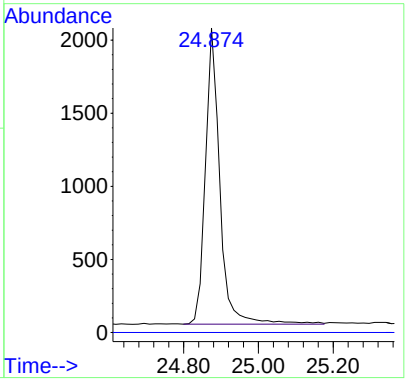


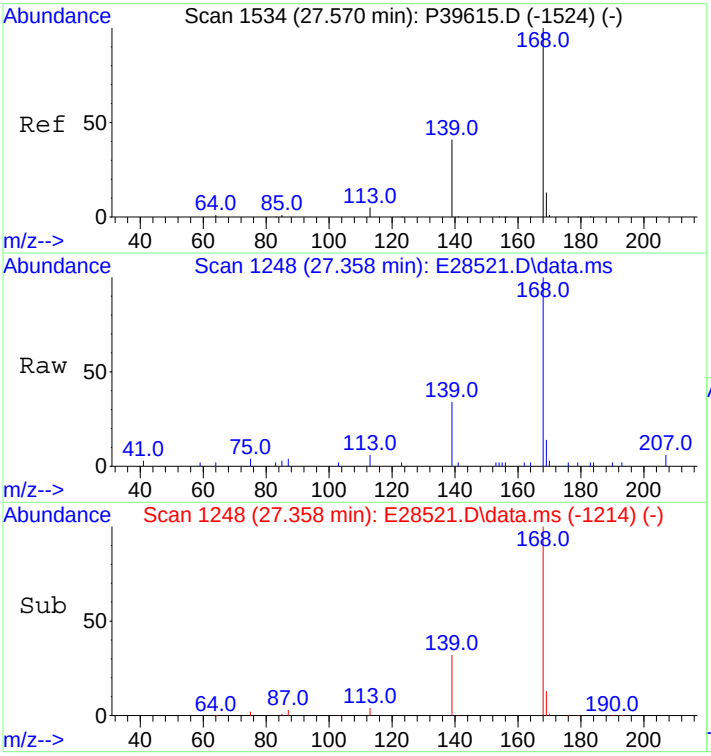


#24
2,6-Dimethylnaphthalene
Concen: 97.02 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:156 Resp: 5433

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

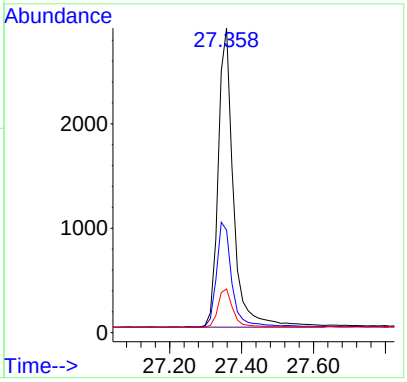


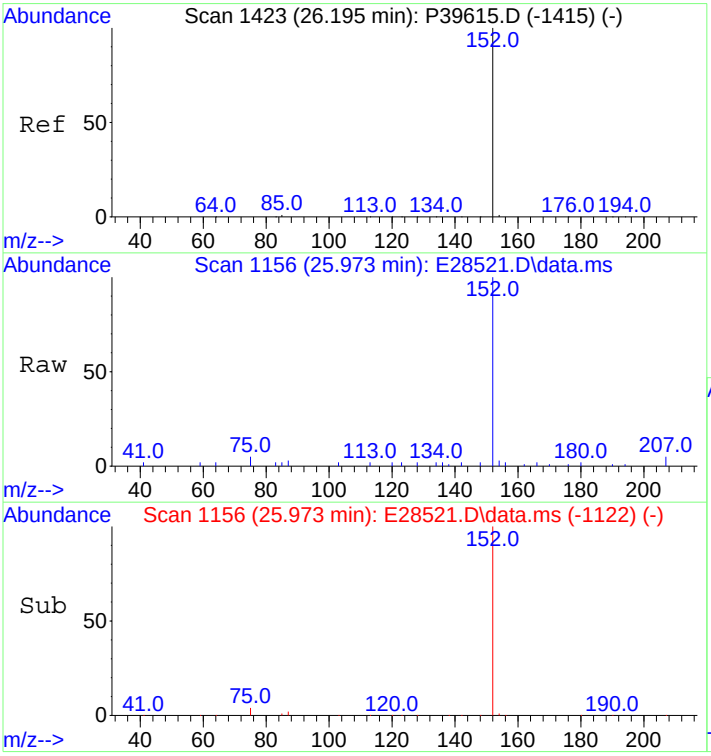


#25
Dibenzofuran
Concen: 101.31 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:168 Resp: 8518

Ion	Ratio	Lower	Upper
168	100		
139	36.1	30.6	45.8
169	12.8	10.6	16.0

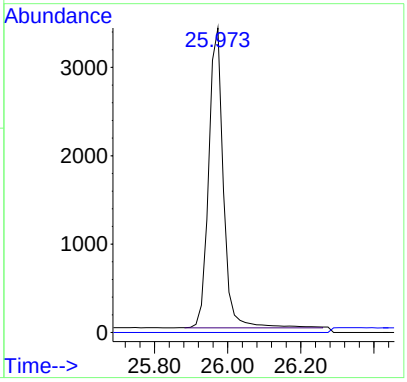


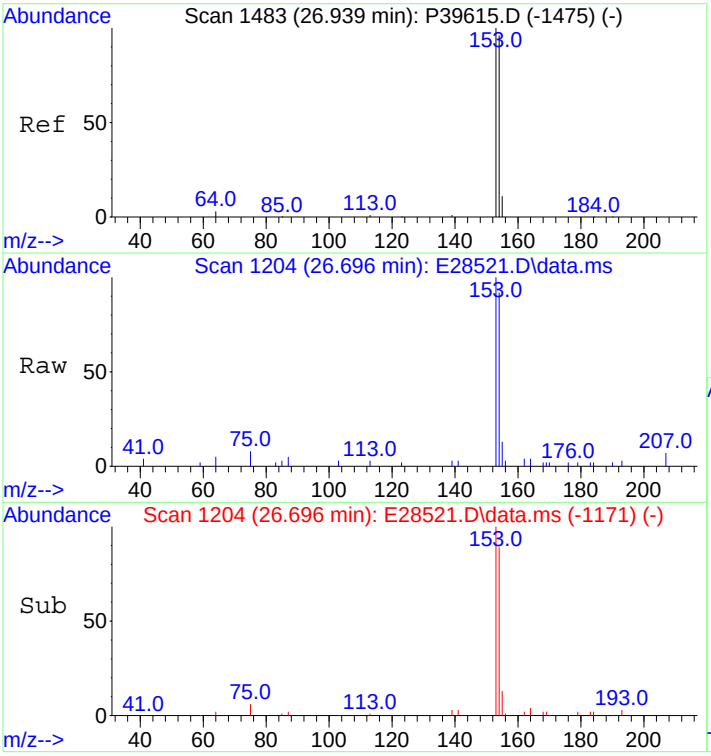


#26
Acenaphthylene
Concen: 101.30 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:152 Resp: 9493

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

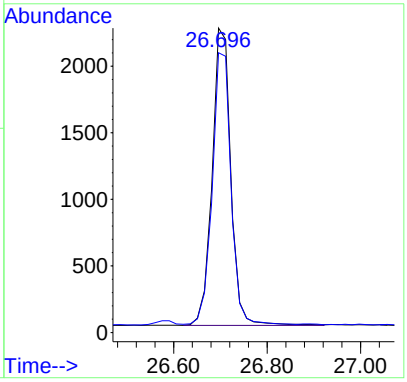


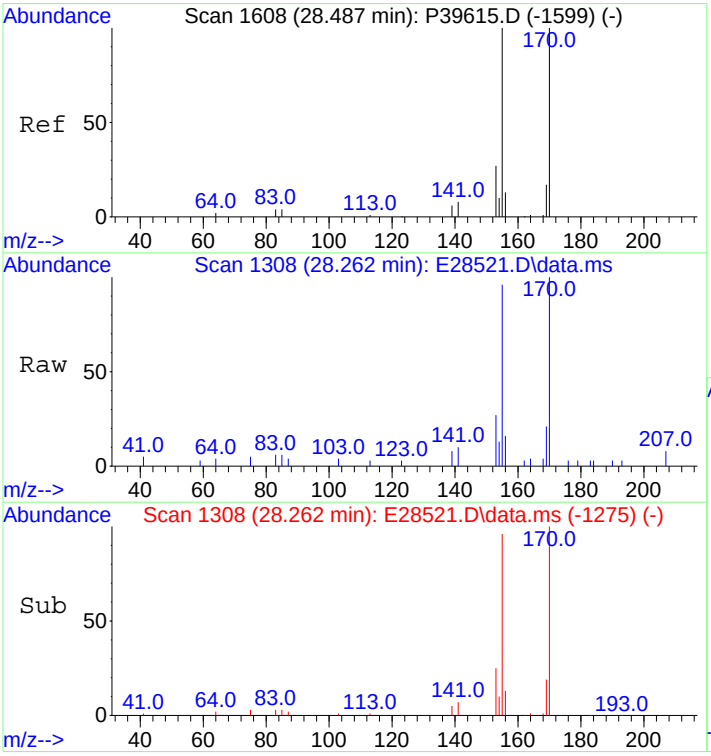


#27
Acenaphthene
Concen: 106.09 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:153 Resp: 6196

Ion	Ratio	Lower	Upper
153	100		
154	91.4	72.3	108.5

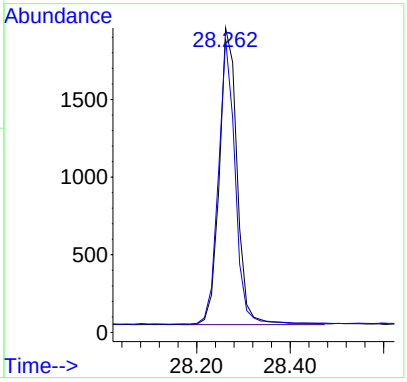


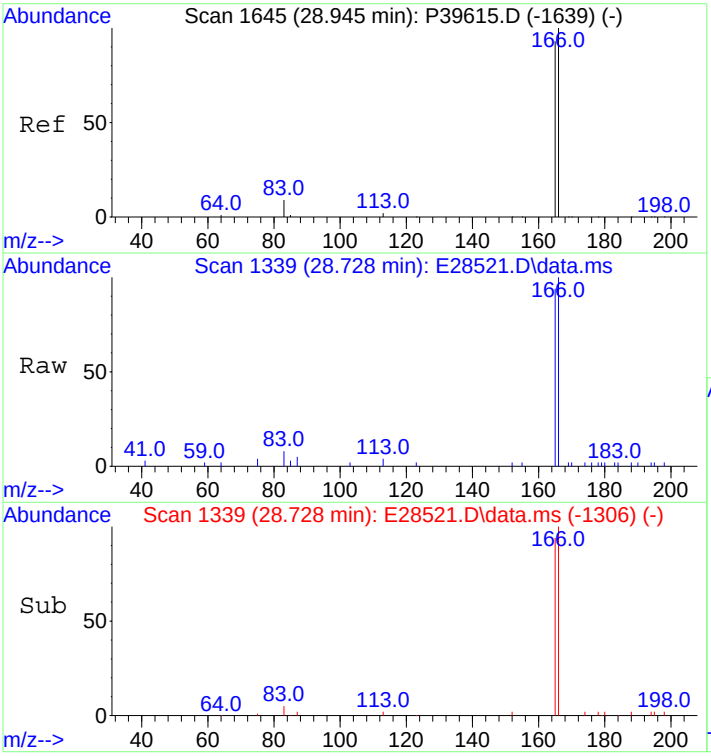


#28
2,3,5-Trimethylnaphthalene
Concen: 100.04 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:170 Resp: 5064

Ion	Ratio	Lower	Upper
170	100		
155	90.4	75.9	113.9

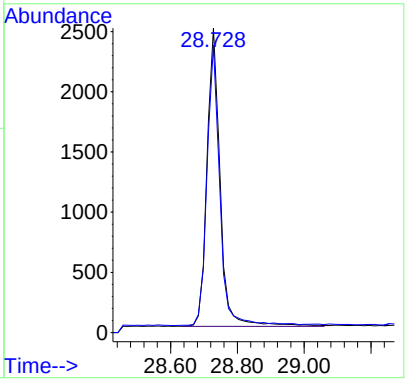


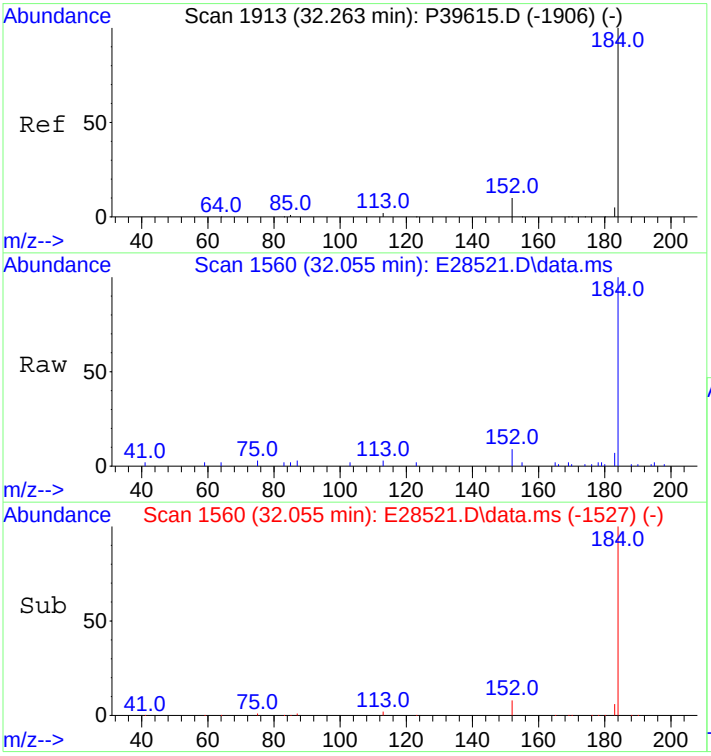


#29
Fluorene
Concen: 99.72 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:166 Resp: 6771

Ion	Ratio	Lower	Upper
166	100		
165	91.0	73.8	110.6

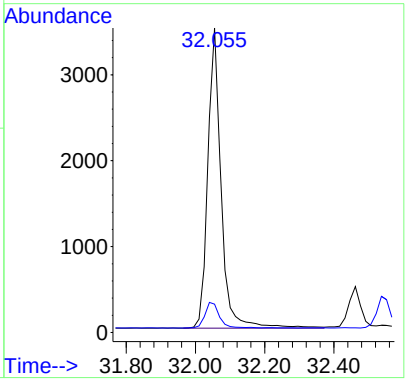


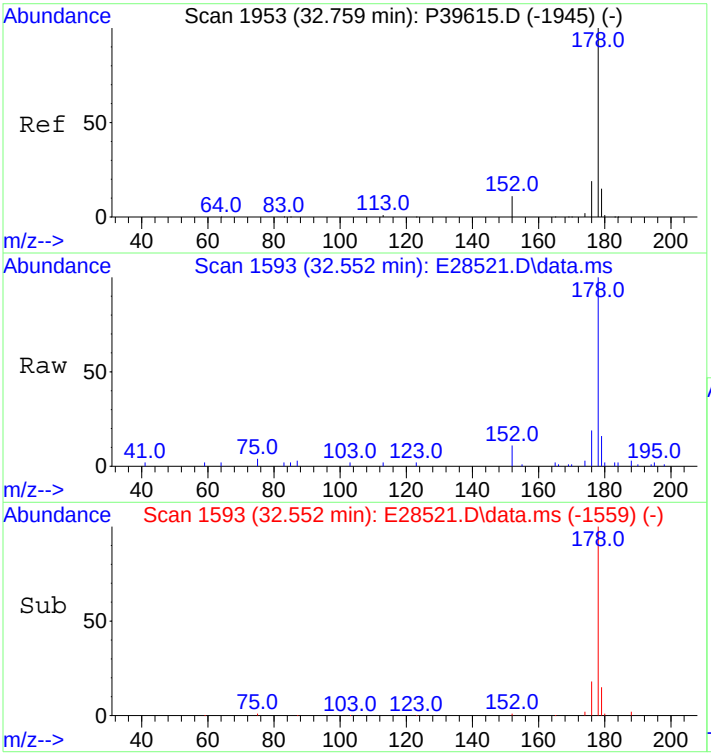


#33
Dibenzothiophene
Concen: 98.40 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:184 Resp: 9356

Ion	Ratio	Lower	Upper
184	100		
152	9.3	6.2	9.2#

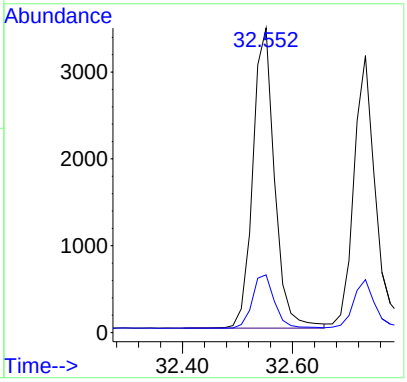


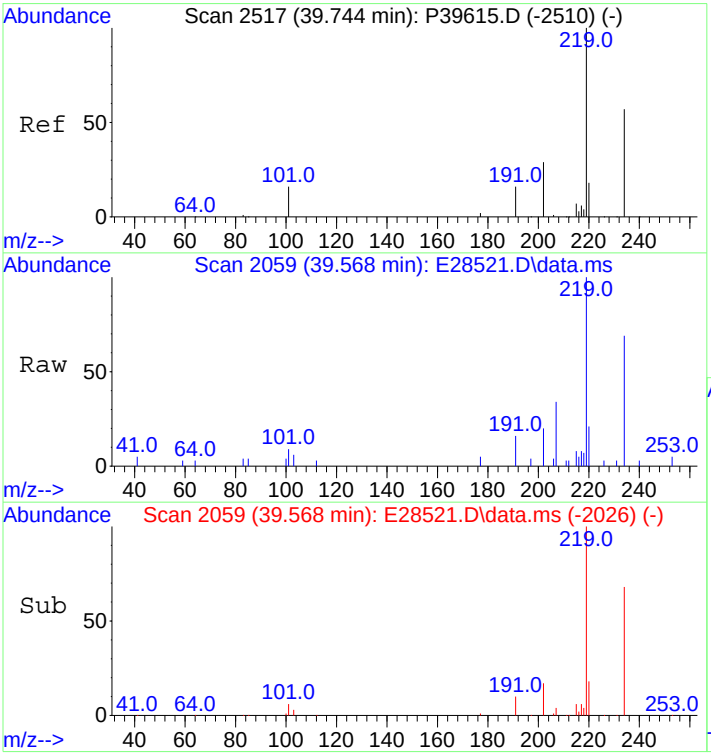


#43
Phenanthrene
Concen: 95.61 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:178 Resp: 9481

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.6

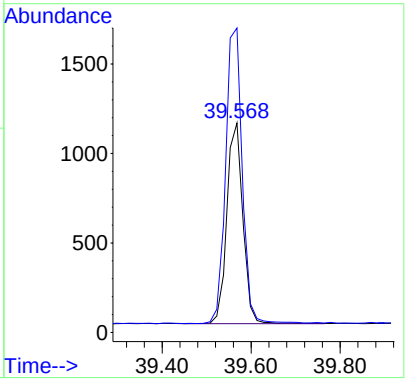


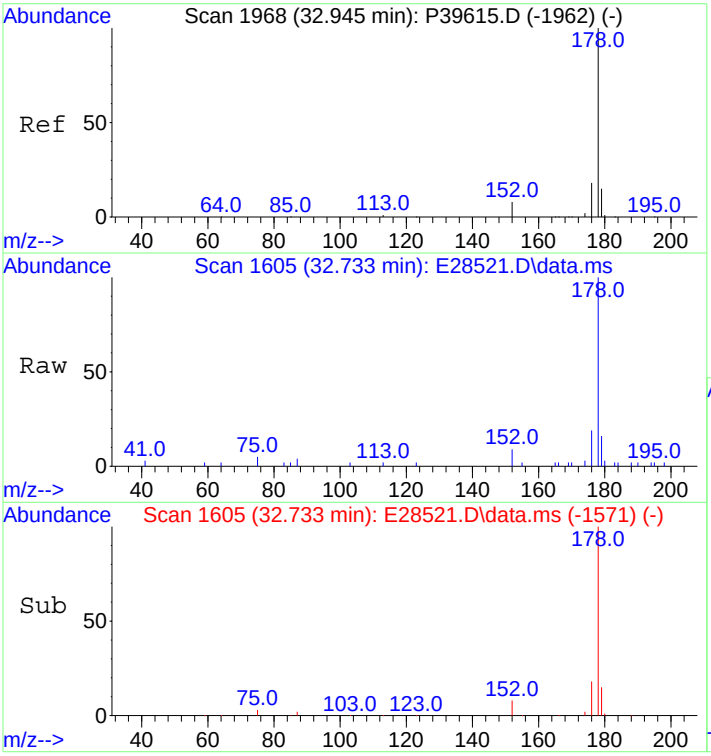


#54
Retene
Concen: 92.01 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:234 Resp: 2793

Ion	Ratio	Lower	Upper
234	100		
219	153.1	113.0	169.4

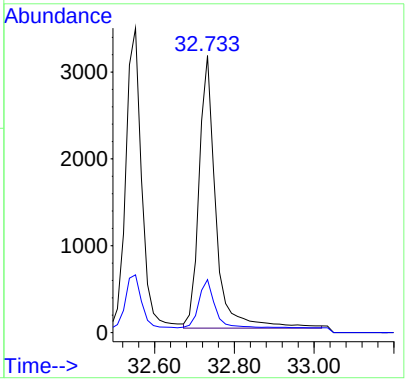


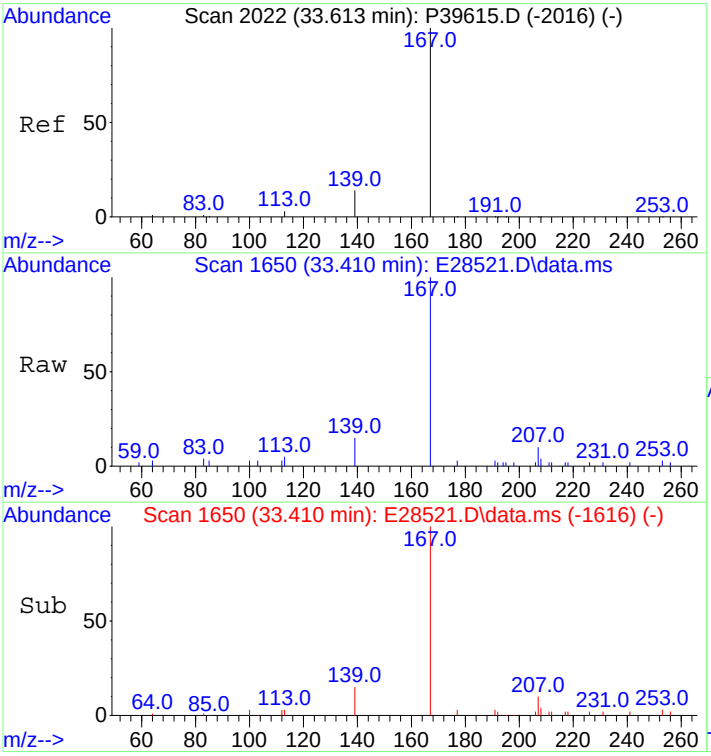


#55
Anthracene
Concen: 99.07 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:178 Resp: 9206

Ion	Ratio	Lower	Upper
178	100		
176	16.5	14.5	21.7

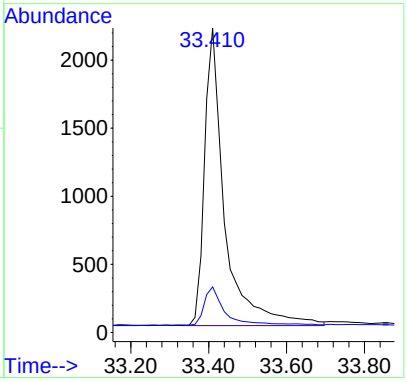


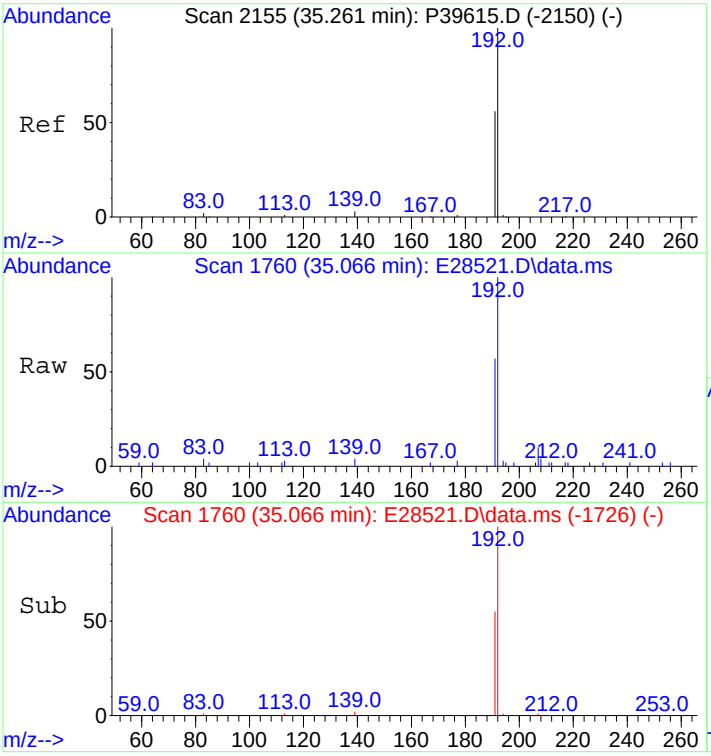


#56
Carbazole
Concen: 89.50 ng/mL
RT: 33.410 min Scan# 1650
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:167 Resp: 7855

Ion	Ratio	Lower	Upper
167	100		
139	13.0	10.5	15.7

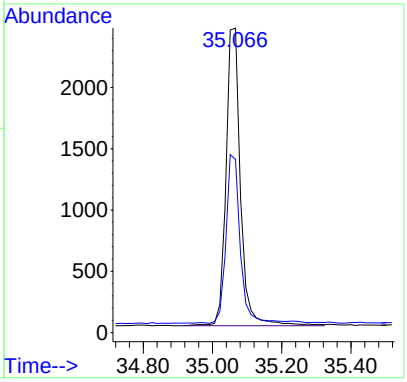


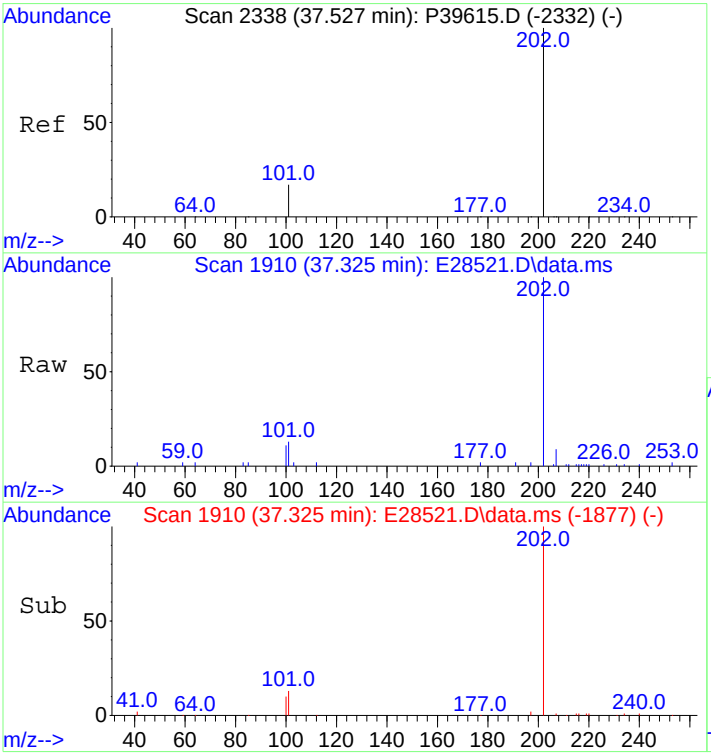


#57
1-Methylphenanthrene
Concen: 95.79 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:192 Resp: 7075

Ion	Ratio	Lower	Upper
192	100		
191	55.5	45.5	68.3

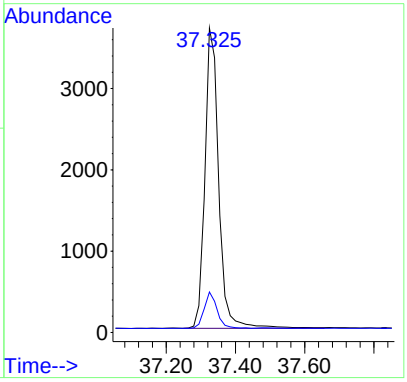


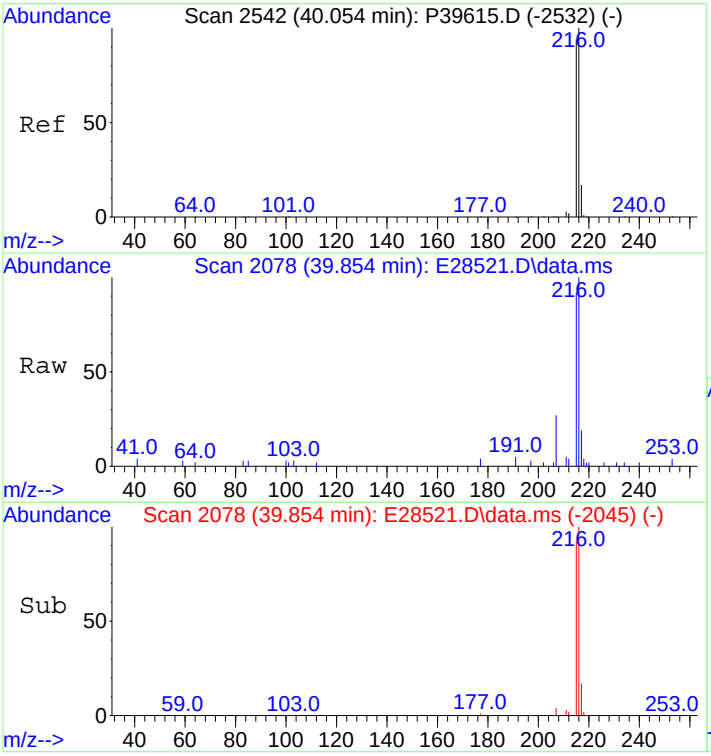


#58
Fluoranthene
Concen: 94.55 ng/mL
RT: 37.325 min Scan# 1910
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:202 Resp: 10218

Ion	Ratio	Lower	Upper
202	100		
101	11.3	9.2	13.8

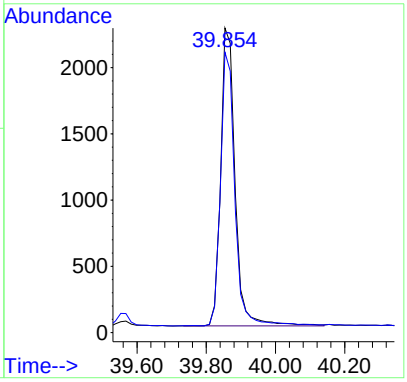


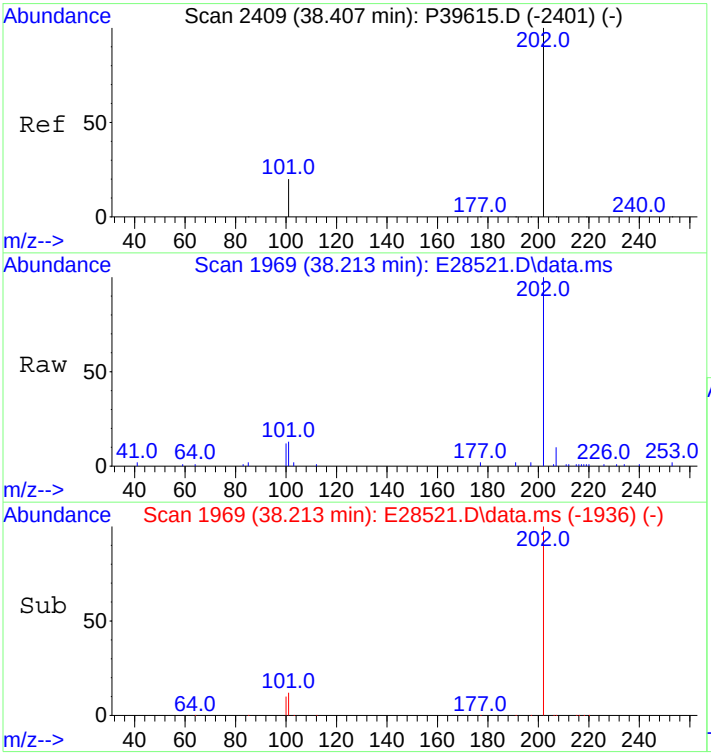


#59
Benzo(b)fluorene
Concen: 94.43 ng/mL
RT: 39.854 min Scan# 2078
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:216 Resp: 6491

Ion	Ratio	Lower	Upper
216	100		
215	92.0	73.8	110.8

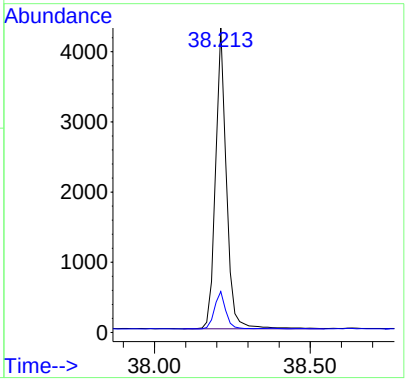


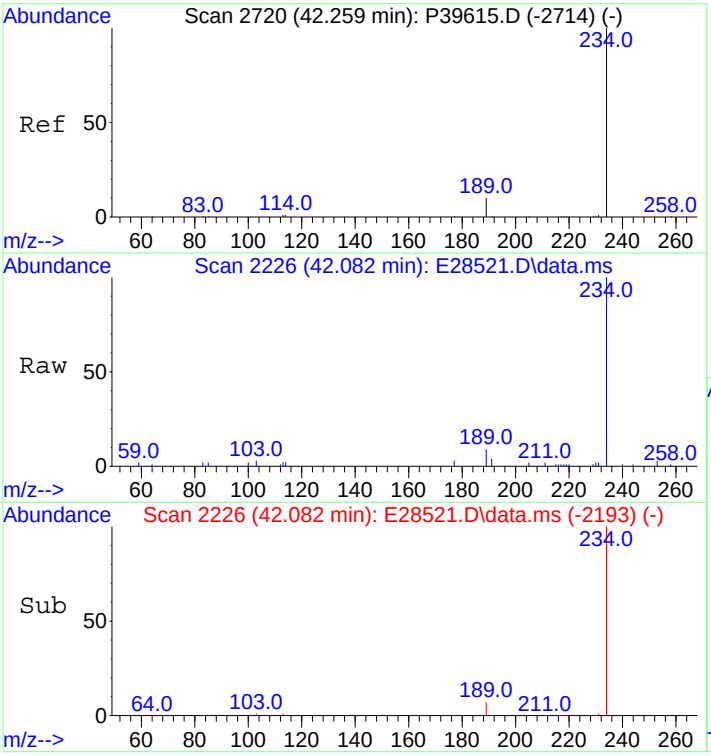


#60
Pyrene
Concen: 95.21 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:202 Resp: 10358

Ion	Ratio	Lower	Upper
202	100		
101	12.9	9.8	14.8

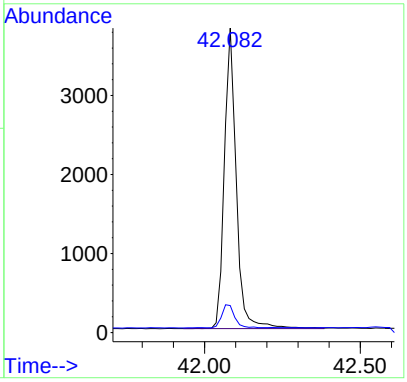


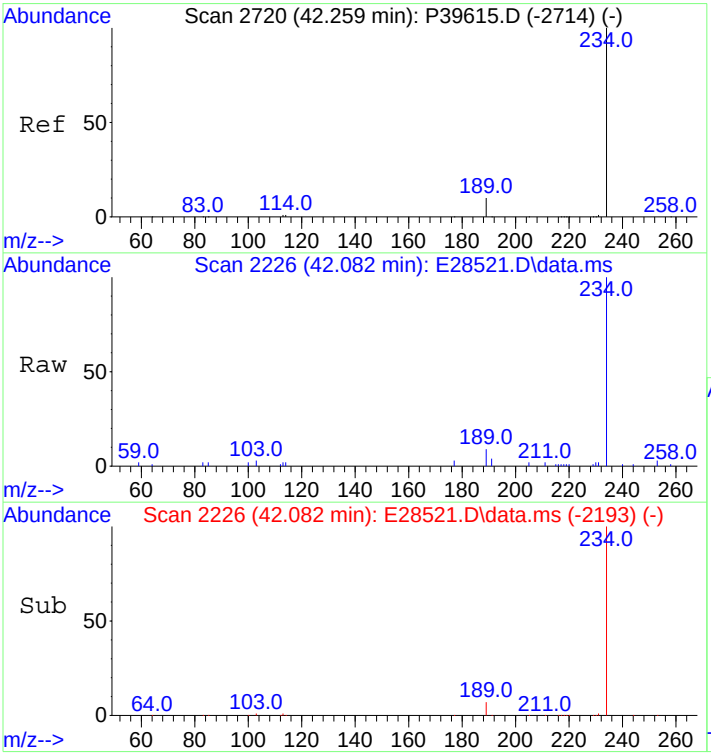


#66
Naphthobenzothiophene
Concen: 98.58 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:234 Resp: 10119

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3

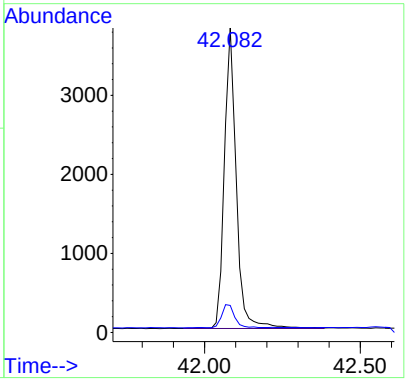


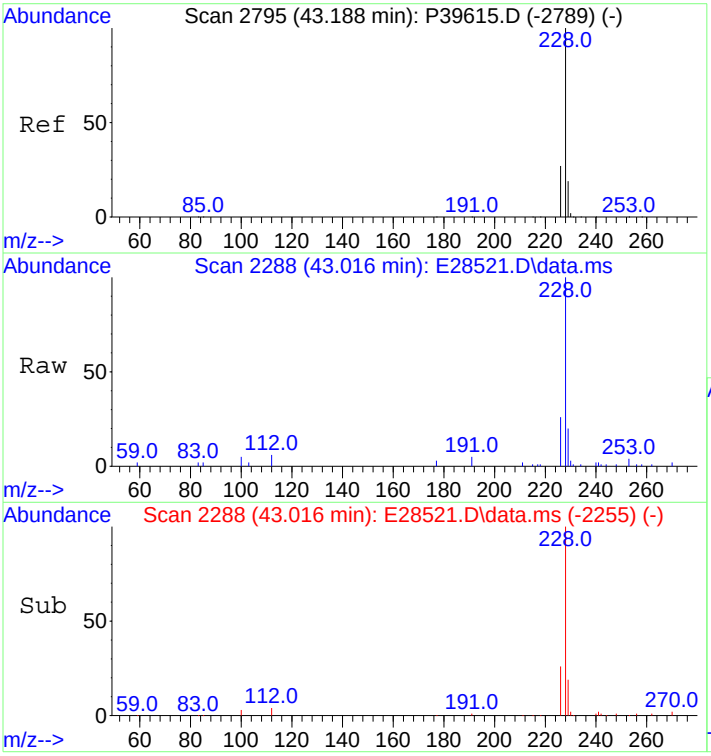


#67
Naphthobenzothiophene-2,1-D
Concen: 98.58 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:234 Resp: 10119

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3

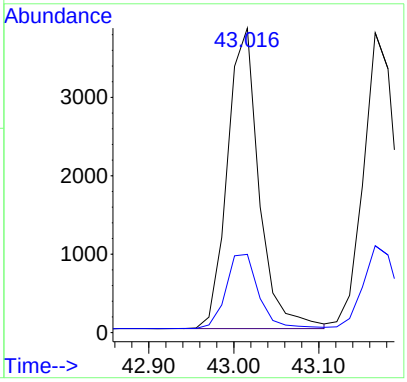


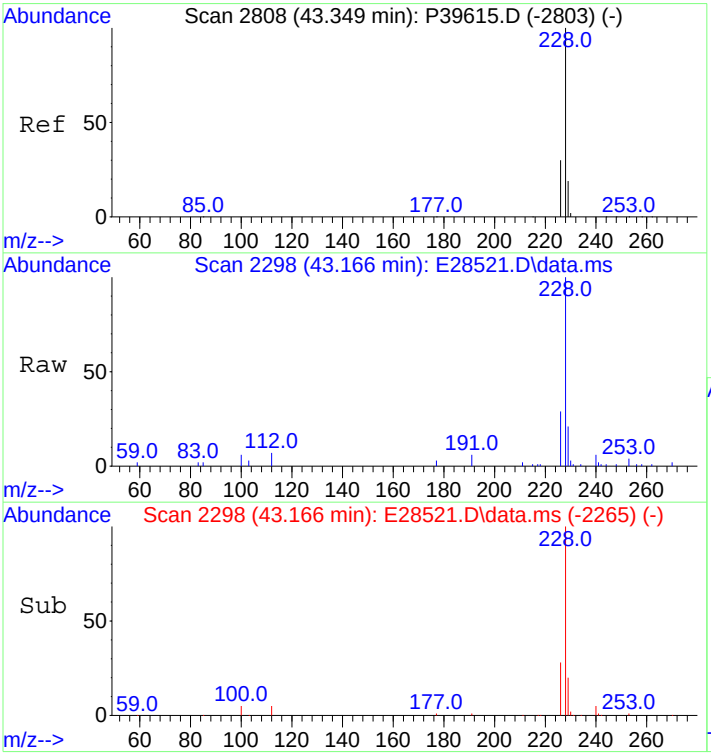


#75
Benz[a]anthracene
Concen: 88.19 ng/mL
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:228 Resp: 9939

Ion	Ratio	Lower	Upper
228	100		
226	25.7	20.2	30.4

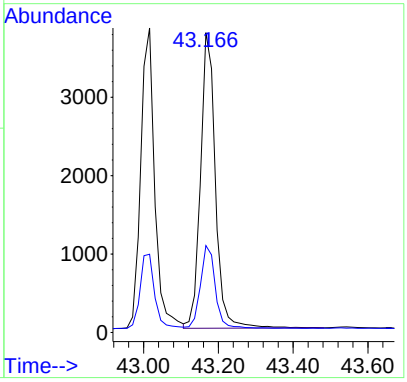


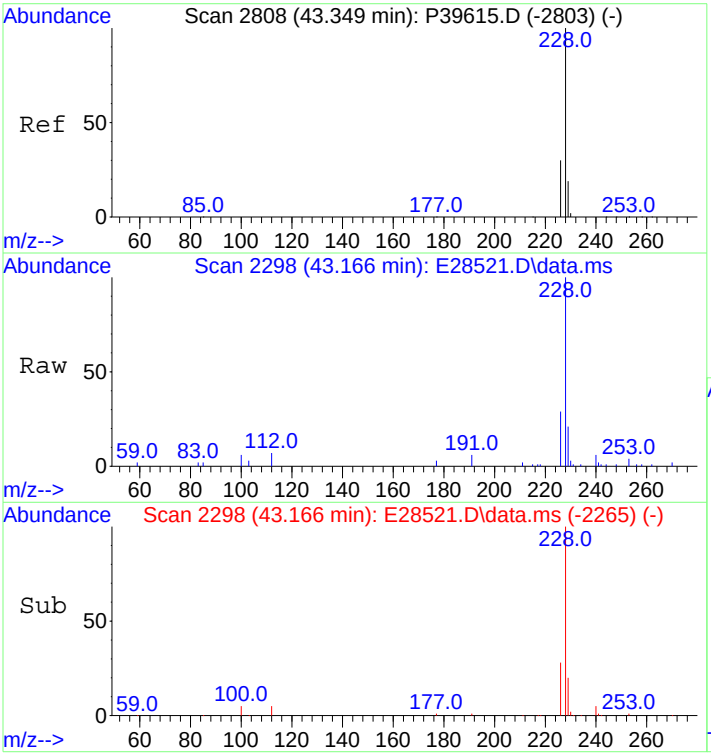


#76
Chrysene
Concen: 94.41 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:228 Resp: 10414

Ion	Ratio	Lower	Upper
228	100		
226	27.7	22.6	34.0

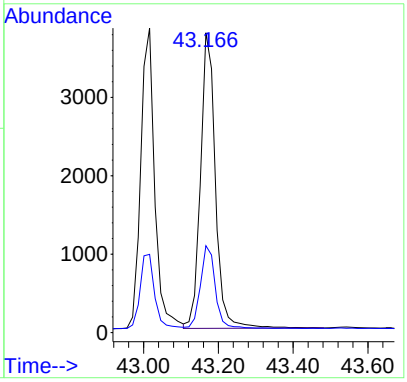


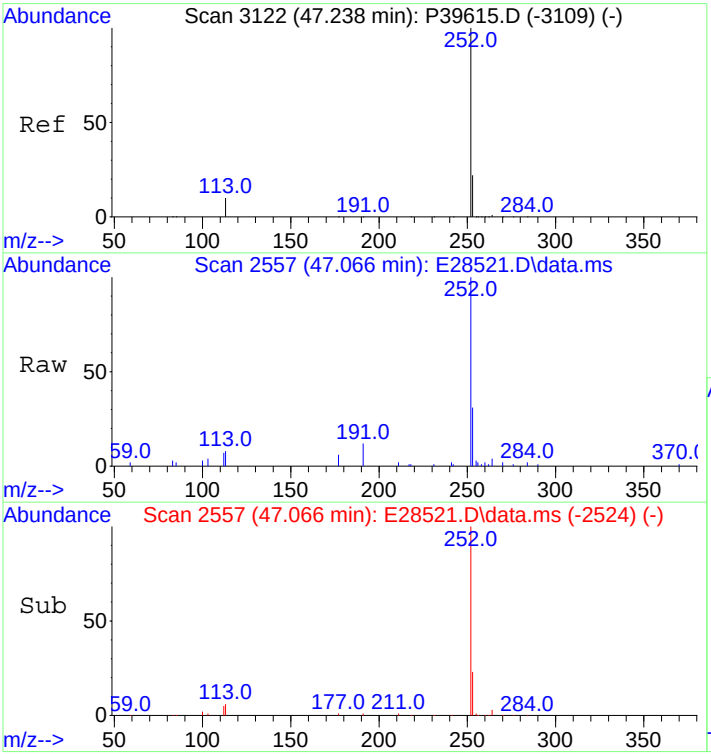


#77
Chrysene/Triphenylene
Concen: 94.41 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:228 Resp: 10414

Ion	Ratio	Lower	Upper
228	100		
226	27.7	22.6	34.0

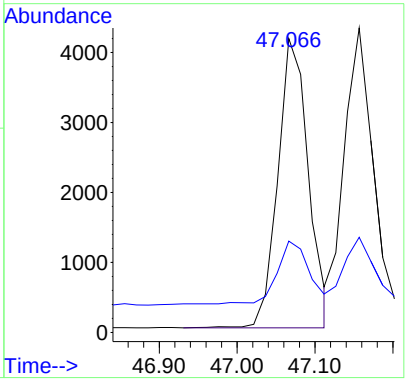


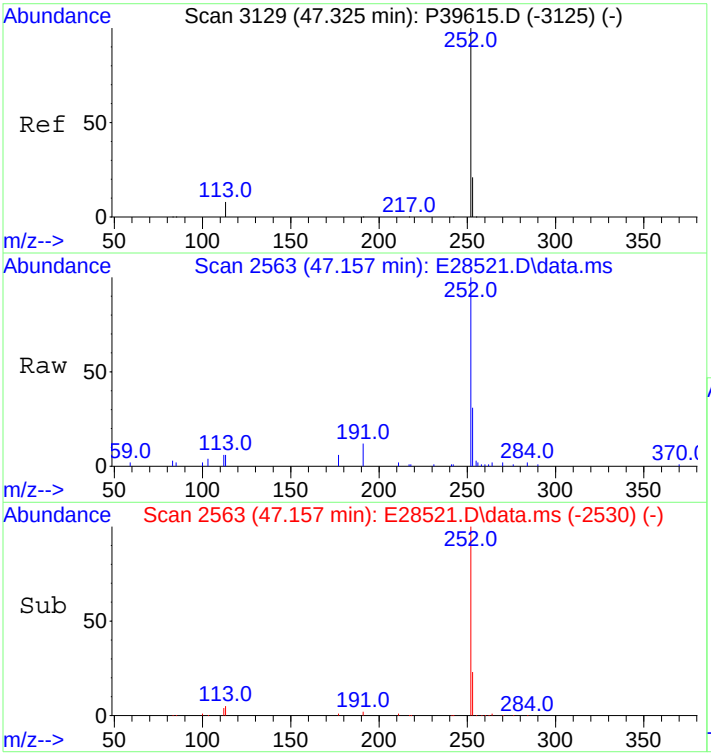


#84
Benzo[b]fluoranthene
Concen: 94.93 ng/mL
RT: 47.066 min Scan# 2557
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 11264

Ion	Ratio	Lower	Upper
252	100		
253	24.5	18.3	27.5

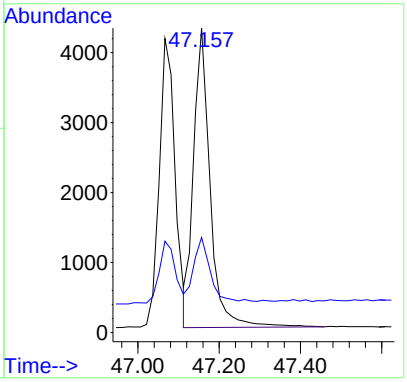


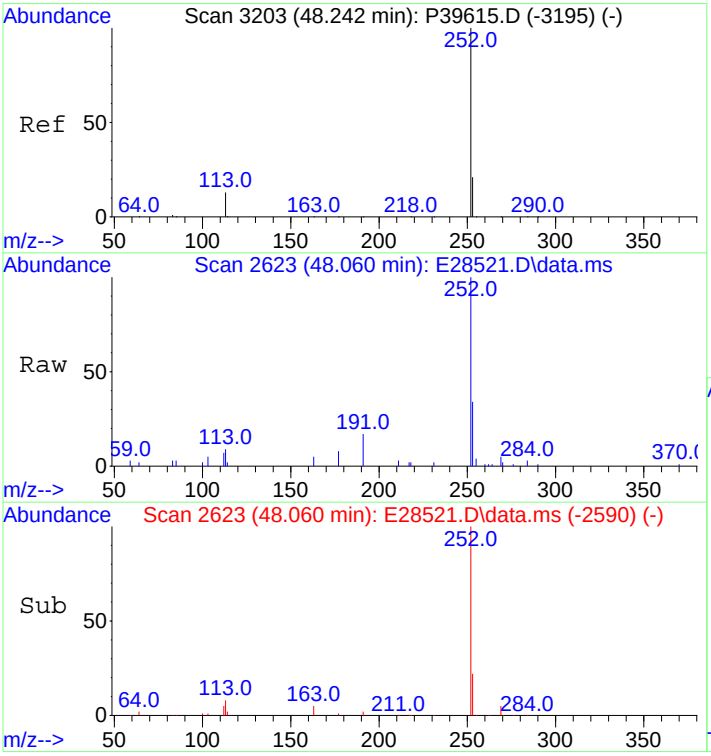


#85
Benzo[j]+[k]fluoranthene
Concen: 108.50 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 12115

Ion	Ratio	Lower	Upper
252	100		
253	21.6	18.3	27.5

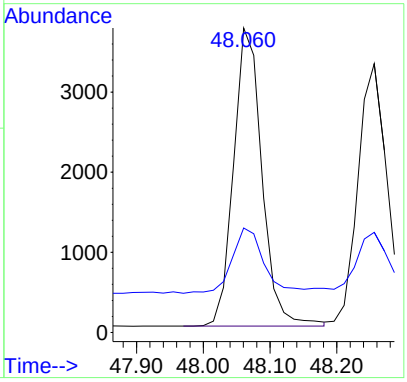


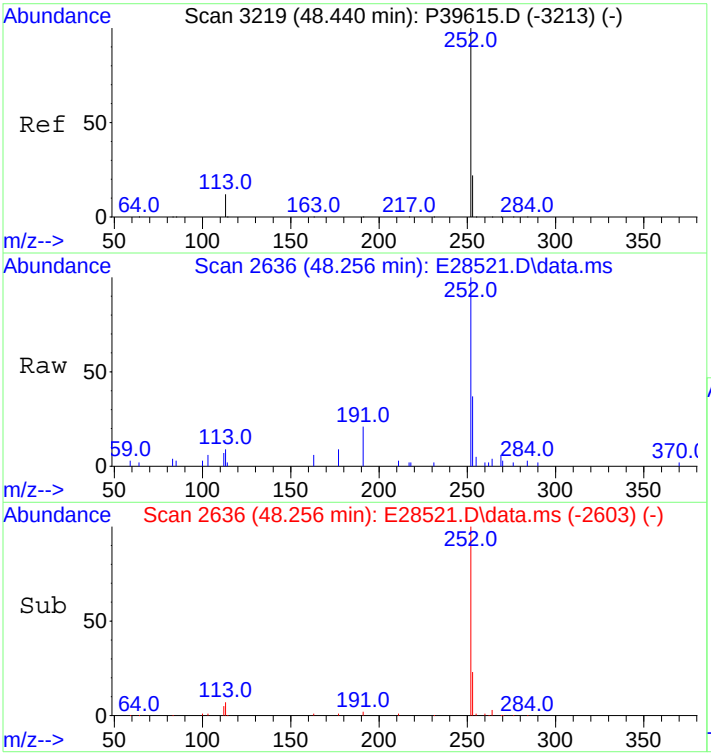


#87
Benzo[e]pyrene
Concen: 104.56 ng/mL
RT: 48.060 min Scan# 2623
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 11009

Ion	Ratio	Lower	Upper
252	100		
253	24.3	18.6	28.0

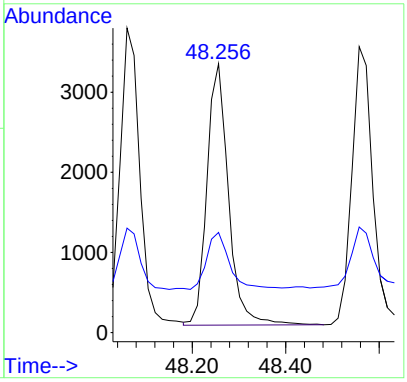


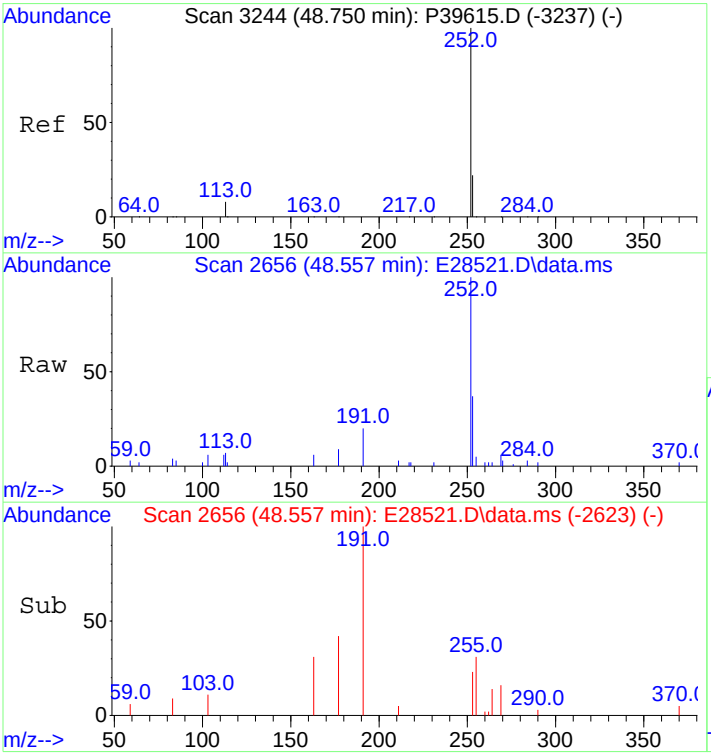


#89
Benzo[a]pyrene
Concen: 104.87 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 10439

Ion	Ratio	Lower	Upper
252	100		
253	23.3	18.8	28.2

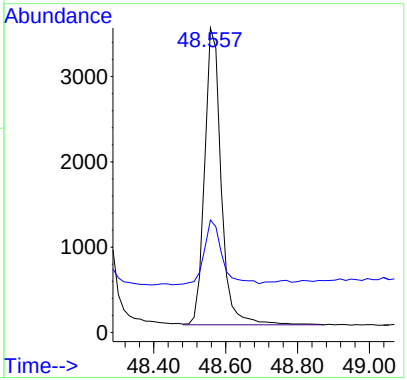


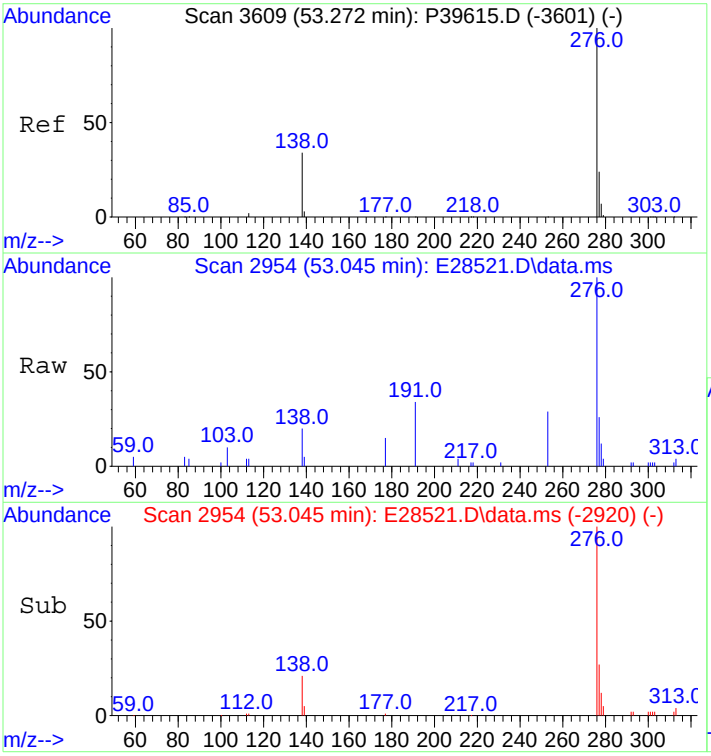


#90
Perylene
Concen: 104.65 ng/mL
RT: 48.557 min Scan# 2656
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 11087

Ion	Ratio	Lower	Upper
252	100		
253	24.0	18.8	28.2

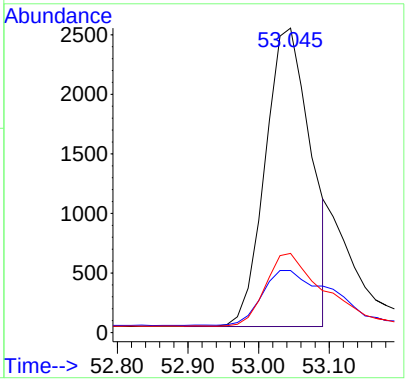


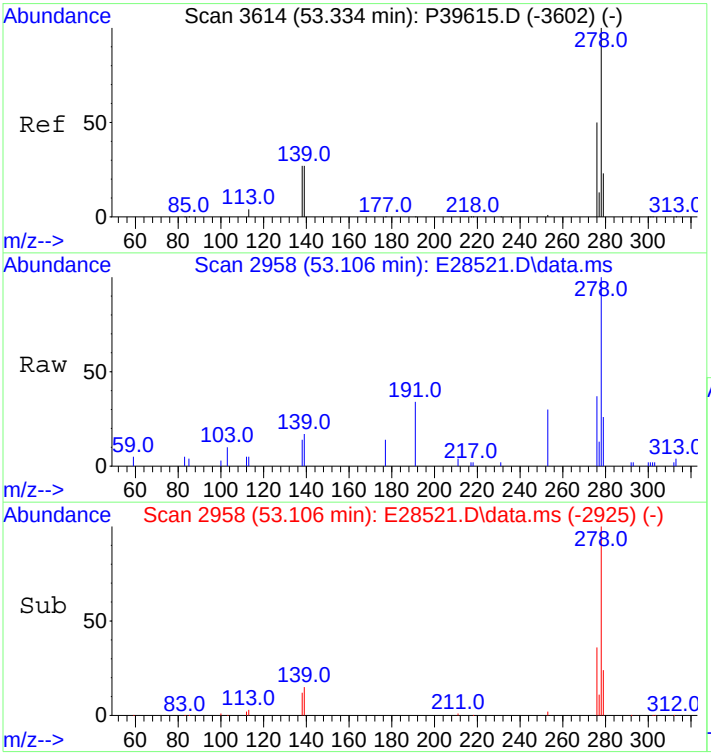


#91
Indeno[1,2,3-cd]pyrene
Concen: 94.07 ng/mL m
RT: 53.045 min Scan# 2954
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:276 Resp: 11305

Ion	Ratio	Lower	Upper
276	100		
138	29.7	15.4	23.2#
277	33.2	19.1	28.7#

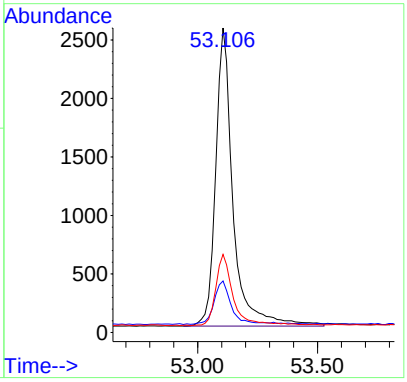


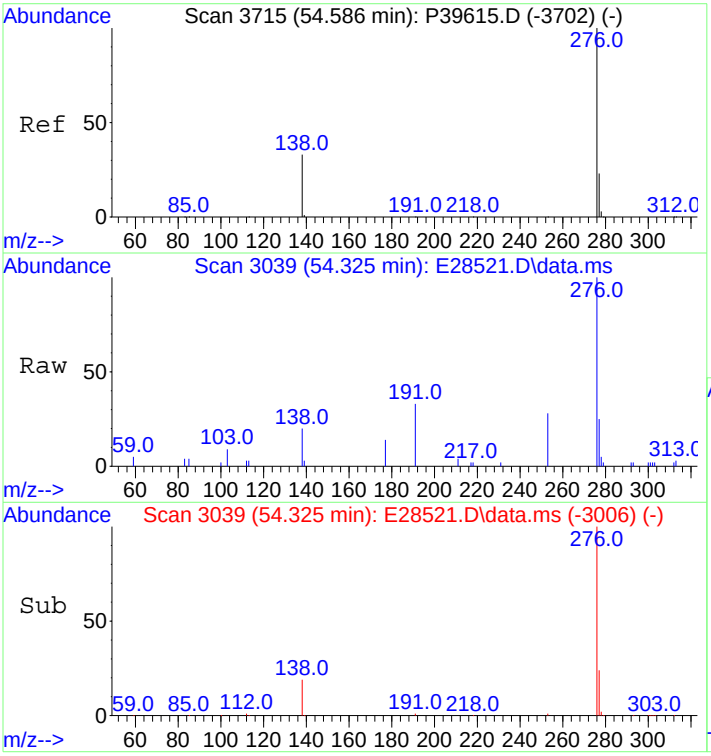


#92
Dibenz[ah]+[ac]anthracene
Concen: 111.50 ng/mL
RT: 53.106 min Scan# 2958
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:278 Resp: 12888

Ion	Ratio	Lower	Upper
278	100		
139	13.9	11.1	16.7
279	24.0	19.4	29.0

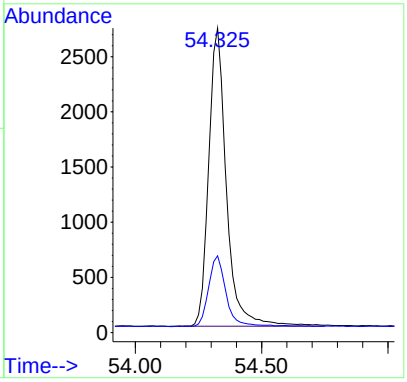


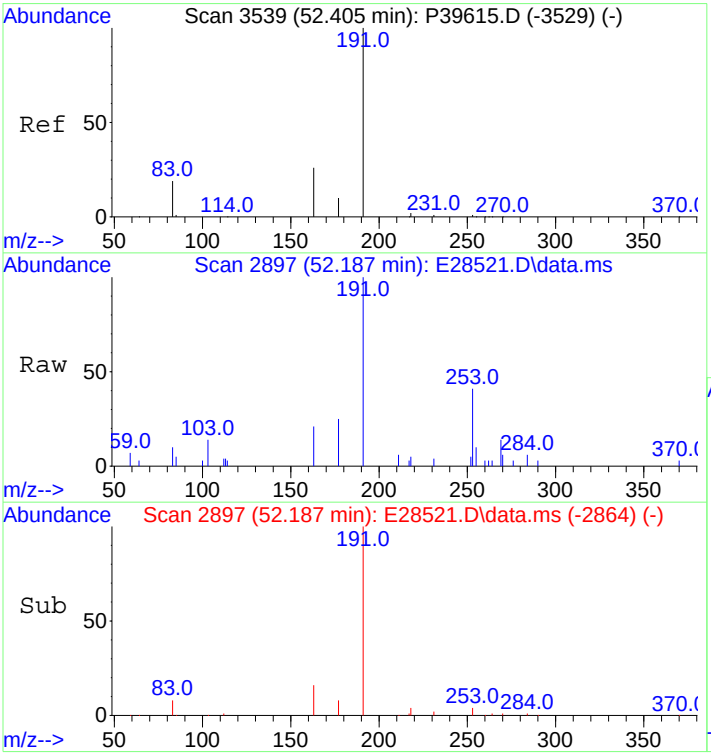


#93
Benzo[g,h,i]perylene
Concen: 111.68 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:276 Resp: 13189

Ion	Ratio	Lower	Upper
276	100		
277	23.6	19.1	28.7

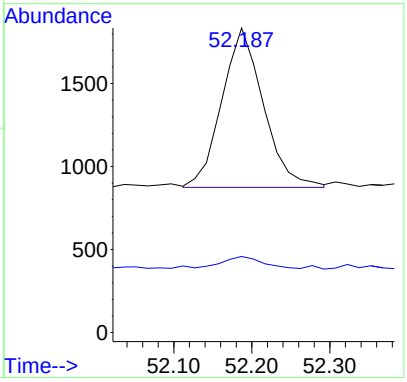


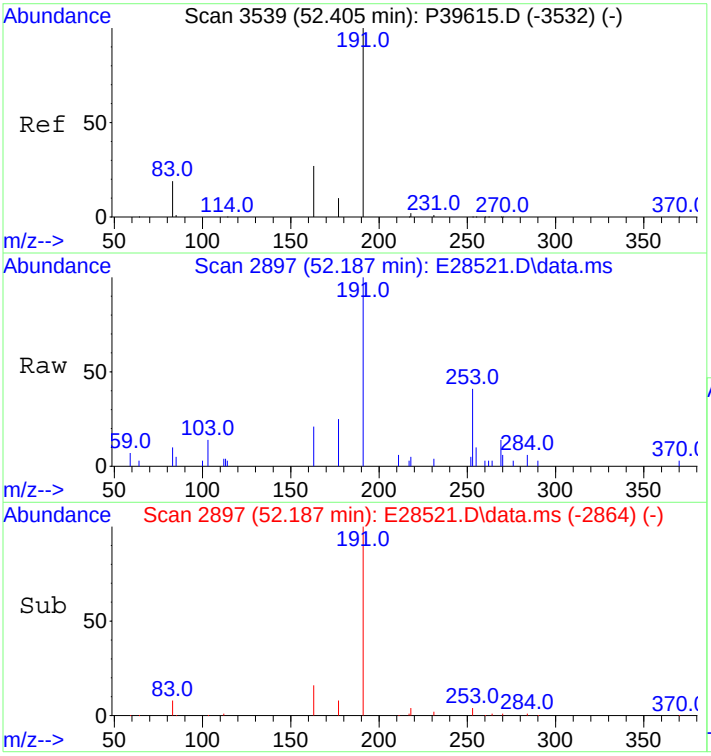


#94
Hopane (T19)
Concen: 127.21 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:191 Resp: 3549

Ion	Ratio	Lower	Upper
191	100		
177	7.4	8.7	13.1#

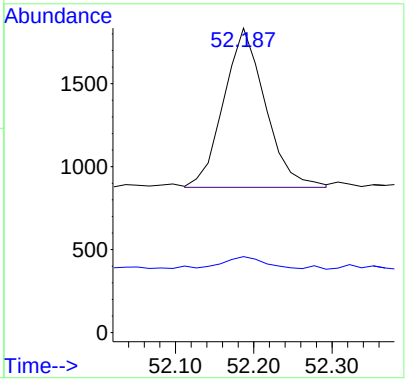




#95
17a(H),21B(H)-hopane - C30H52
Concen: 126.82 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:191 Resp: 3538

Ion	Ratio	Lower	Upper
191	100		
177	7.5	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 12:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	36682	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	77083	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	68946	504.564	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.46%			
42) Phenanthrene-d10	32.462	188	70047	508.673	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.87%			
83) Benzo[b]fluoranthene-d12	46.991	264	83676	573.370	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.34%			
88) Benzo[a]pyrene-d12	48.166	264	78237	591.107	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 59.11%			
129) 5B(H)Cholane - Surr	43.724	217	14895	524.160	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.42%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	6961	227.966	ng/mL	100
4) cis-Decalin	17.483	138	5393	232.508	ng/mL	100
10) Naphthalene	19.681	128	72826	496.872	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	45351	478.102	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	44682	491.184	ng/mL#	100
18) Benzothiophene	19.891	134	60586	506.706	ng/mL	100
23) Biphenyl	24.257	154	57808	481.183	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	41569	480.711	ng/mL#	100
25) Dibenzofuran	27.343	168	64736	498.617	ng/mL	98
26) Acenaphthylene	25.958	152	71193M3	491.972	ng/mL	
27) Acenaphthene	26.696	153	45899	508.953	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.262	170	38267	489.576	ng/mL	96
29) Fluorene	28.728	166	51400	490.213	ng/mL	99
33) Dibenzothiophene	32.055	184	71389	486.246	ng/mL#	95
43) Phenanthrene	32.537	178	74232	484.778	ng/mL	99
54) Retene	39.568	234	22141	472.333	ng/mL	92
55) Anthracene	32.718	178	66927M3	466.436	ng/mL	
56) Carbazole	33.395	167	64221	473.886	ng/mL	100
57) 1-Methylphenanthrene	35.051	192	54645	479.112	ng/mL	99
58) Fluoranthene	37.325	202	79475	476.249	ng/mL	99
59) Benzo(b)fluorene	39.854	216	52291	492.646	ng/mL	99
60) Pyrene	38.213	202	80681	480.284	ng/mL	99
66) Naphthobenzothiophene	42.082	234	79024	498.558	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	79024	498.558	ng/mL#	95
75) Benz[a]anthracene	43.016	228	77932	456.006	ng/mL	100
76) Chrysene	43.167	228	79635	476.059	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	79635	476.059	ng/mL	100
84) Benzo[b]fluoranthene	47.067	252	89104	495.187	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	93062	549.600	ng/mL	98
87) Benzo[e]pyrene	48.060	252	84646	530.127	ng/mL	97
89) Benzo[a]pyrene	48.256	252	79782	528.520	ng/mL	97
90) Perylene	48.557	252	84830	528.035	ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.030	276	93871M3	515.074	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.106	278	102096	582.452	ng/mL	99
93) Benzo[g,h,i]perylene	54.325	276	100489	561.124	ng/mL	100
94) Hopane (T19)	52.187	191	28585	675.673	ng/mL#	91
95) 17a(H),21B(H)-hopane -...	52.187	191	28585	675.673	ng/mL#	91

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 12:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

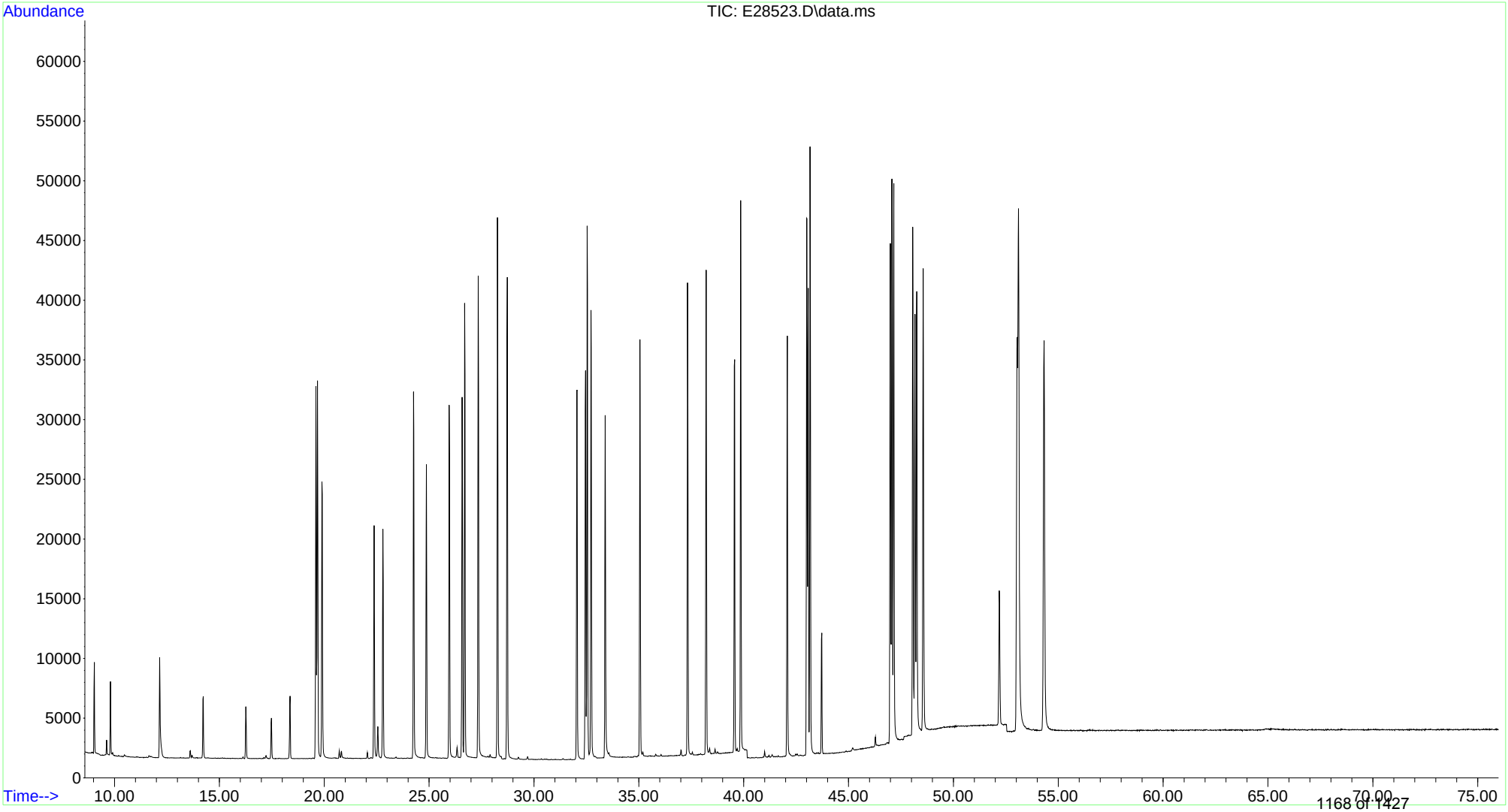
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

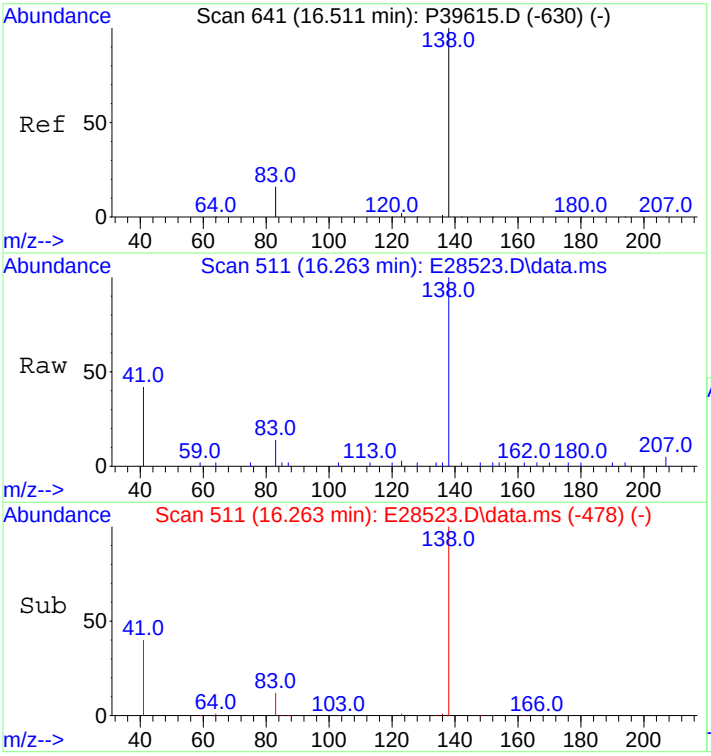
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

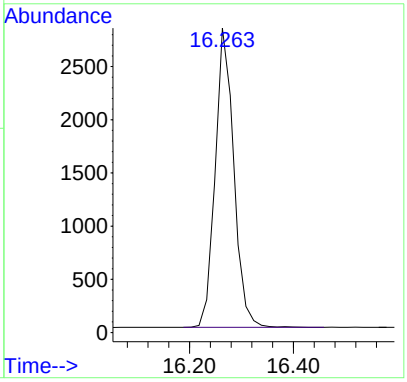
Quant Time: Oct 31 12:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

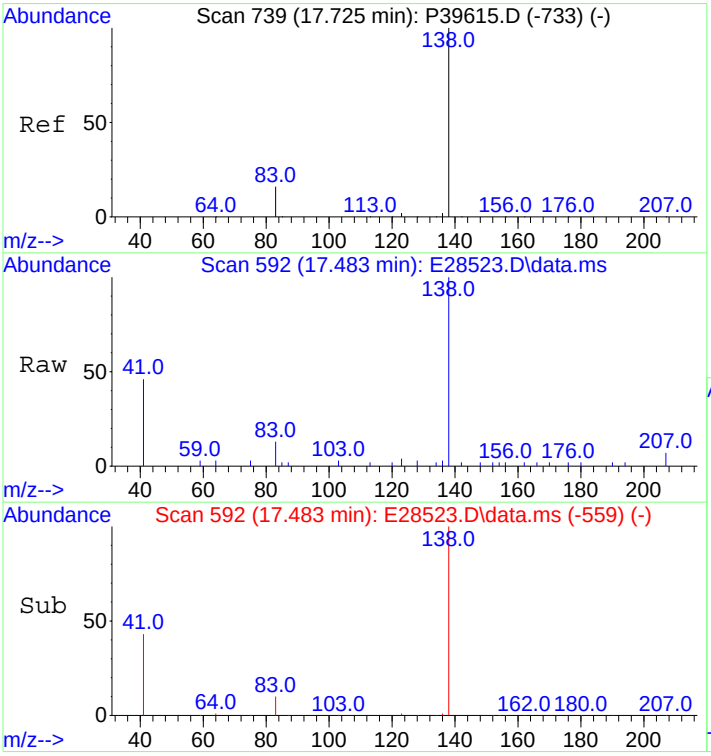




#3
trans-Decalin
Concen: 227.97 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

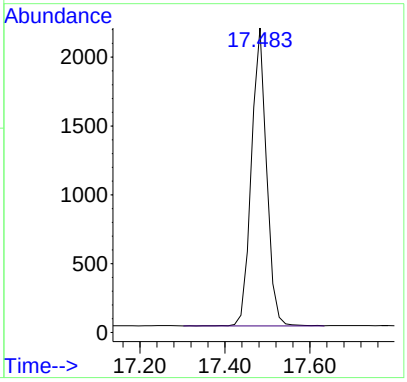
Tgt Ion:138 Resp: 6961

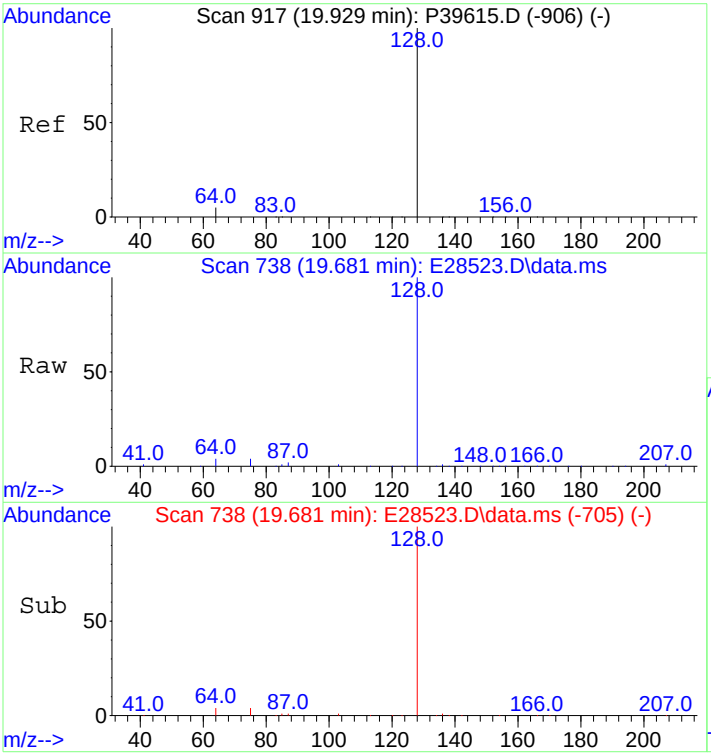




#4
cis-Decalin
Concen: 232.51 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:138 Resp: 5393

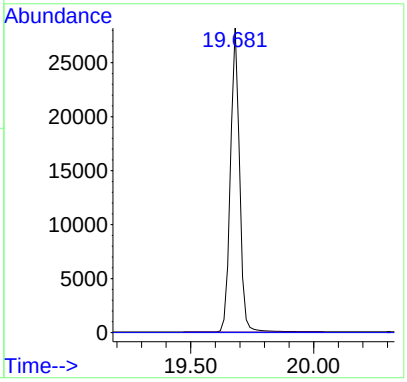


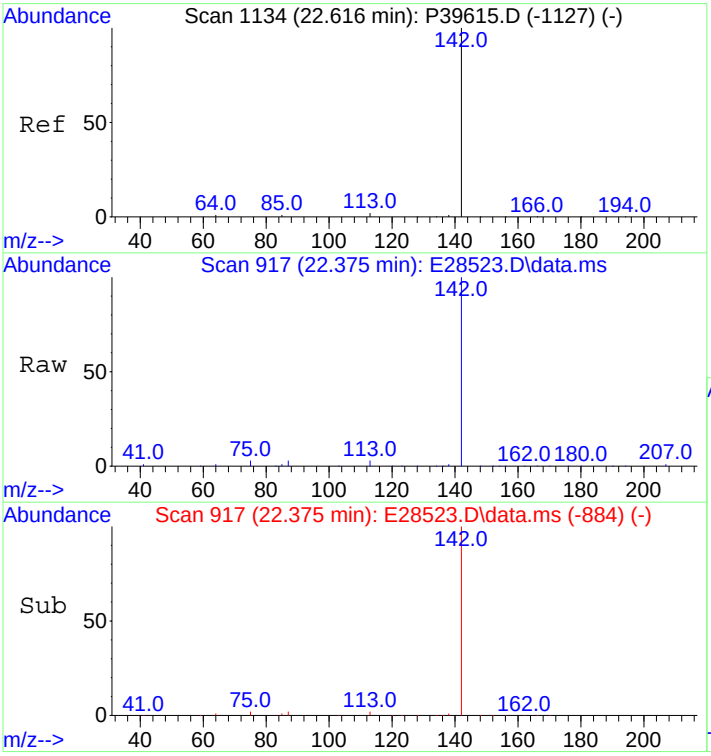


#10
Naphthalene
Concen: 496.87 ng/mL
RT: 19.681 min Scan# 738
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:128 Resp: 72826

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

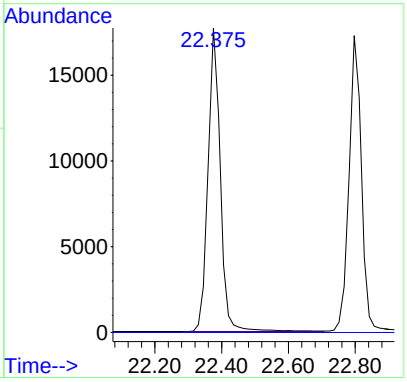


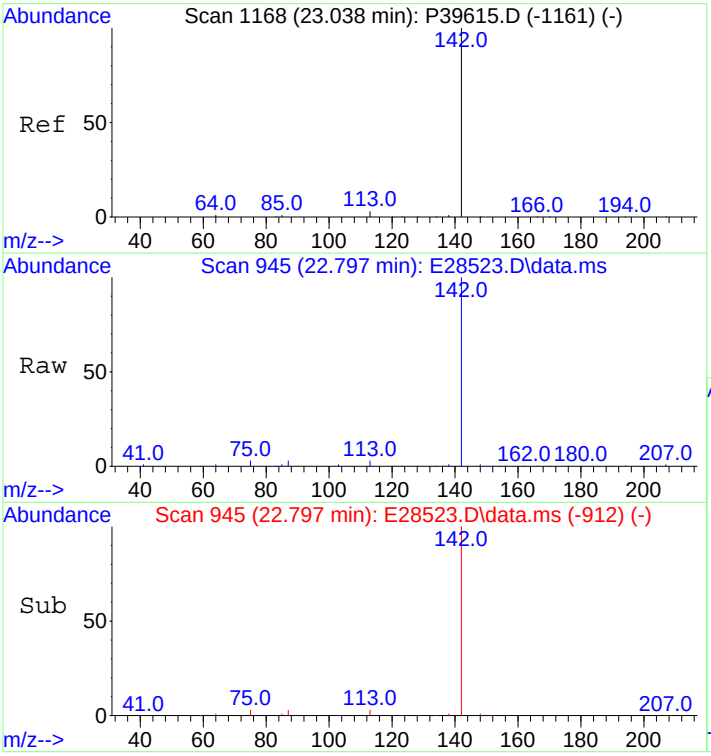


#16
2-Methylnaphthalene
Concen: 478.10 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:142 Resp: 45351

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

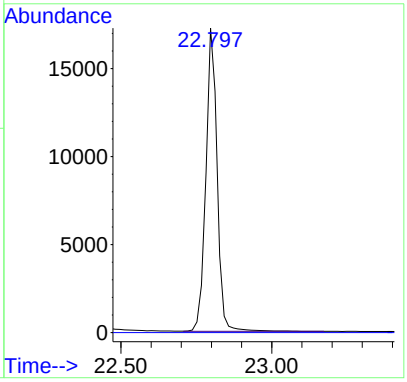


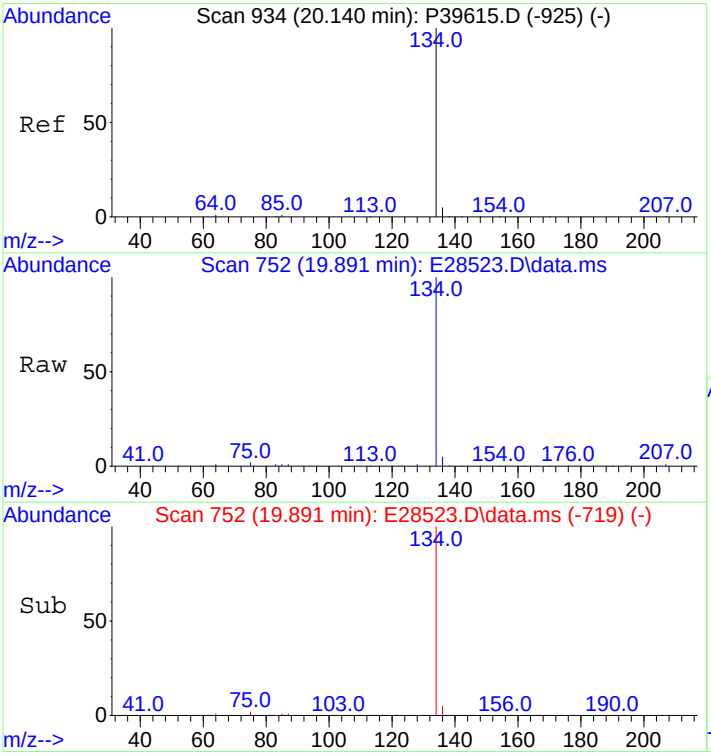


#17
1-Methylnaphthalene
Concen: 491.18 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:142 Resp: 44682

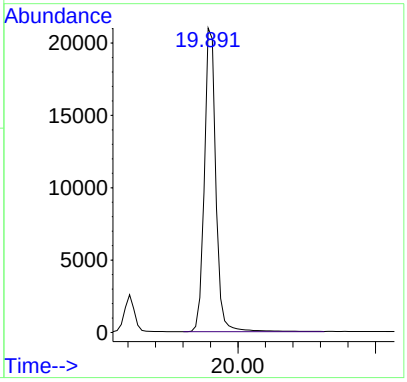
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

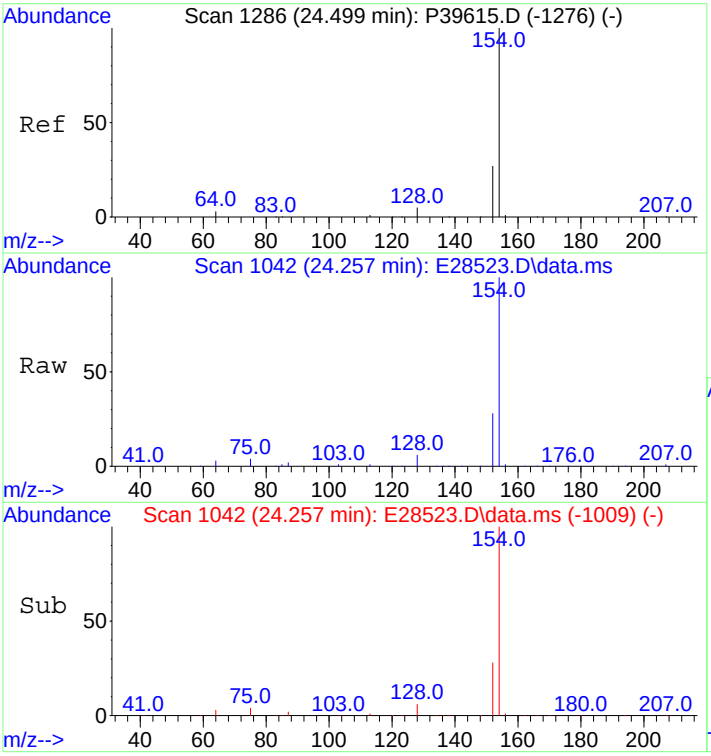




#18
Benzothiophene
Concen: 506.71 ng/mL
RT: 19.891 min Scan# 752
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:134 Resp: 60586

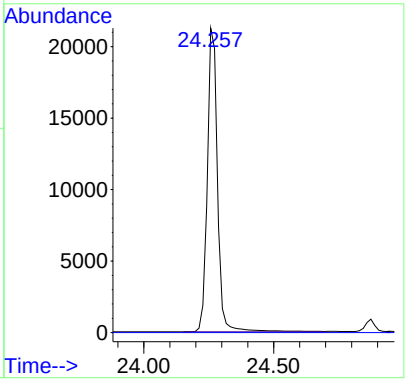


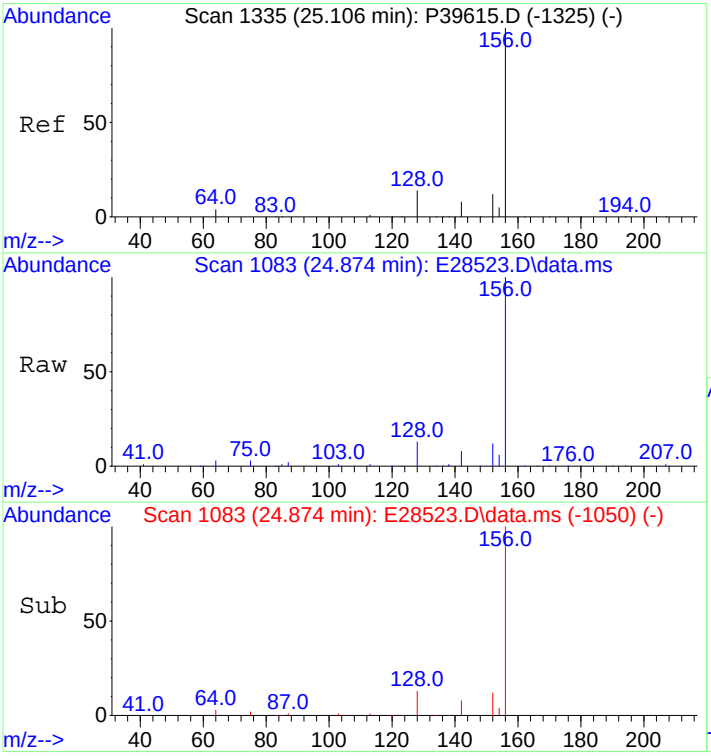


#23
Biphenyl
Concen: 481.18 ng/mL
RT: 24.257 min Scan# 1042
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:154 Resp: 57808

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

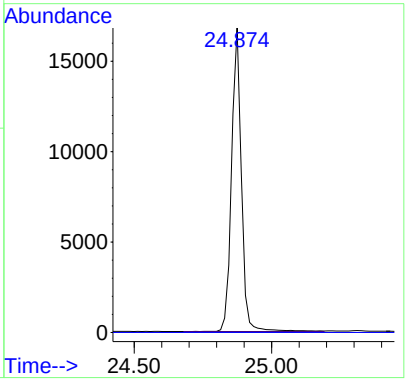


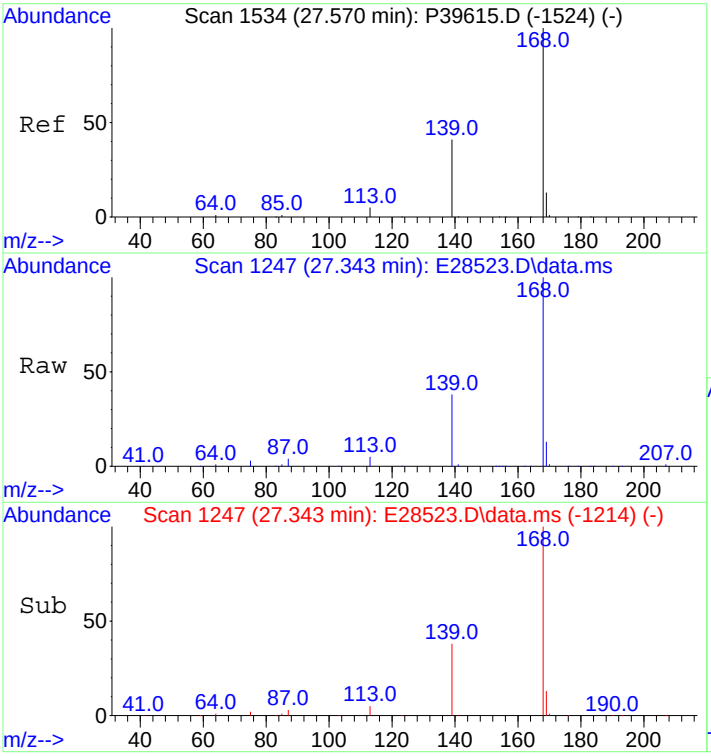


#24
2,6-Dimethylnaphthalene
Concen: 480.71 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:156 Resp: 41569

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

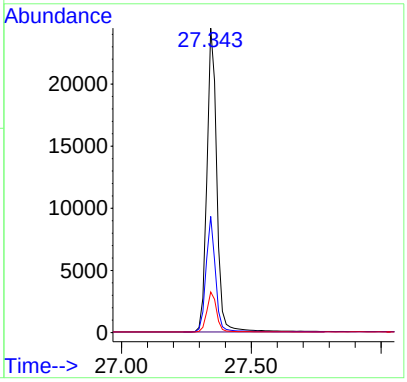


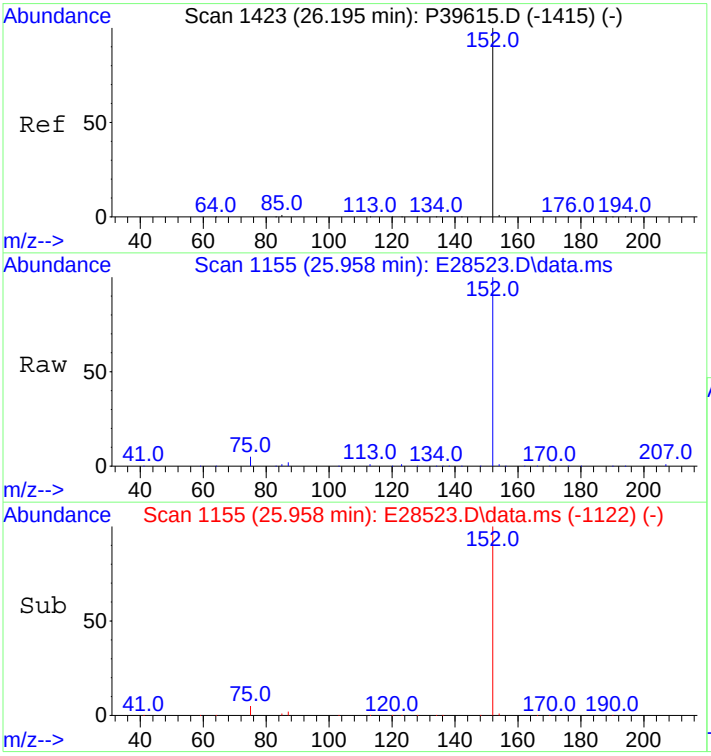


#25
Dibenzofuran
Concen: 498.62 ng/mL
RT: 27.343 min Scan# 1247
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:168 Resp: 64736

Ion	Ratio	Lower	Upper
168	100		
139	36.5	30.6	45.8
169	13.1	10.6	16.0

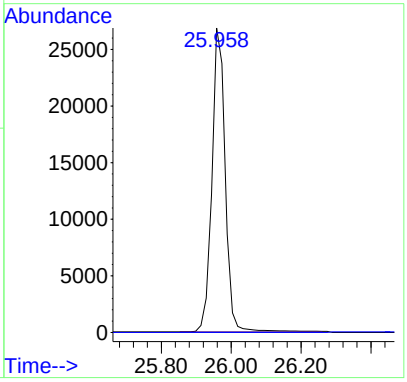


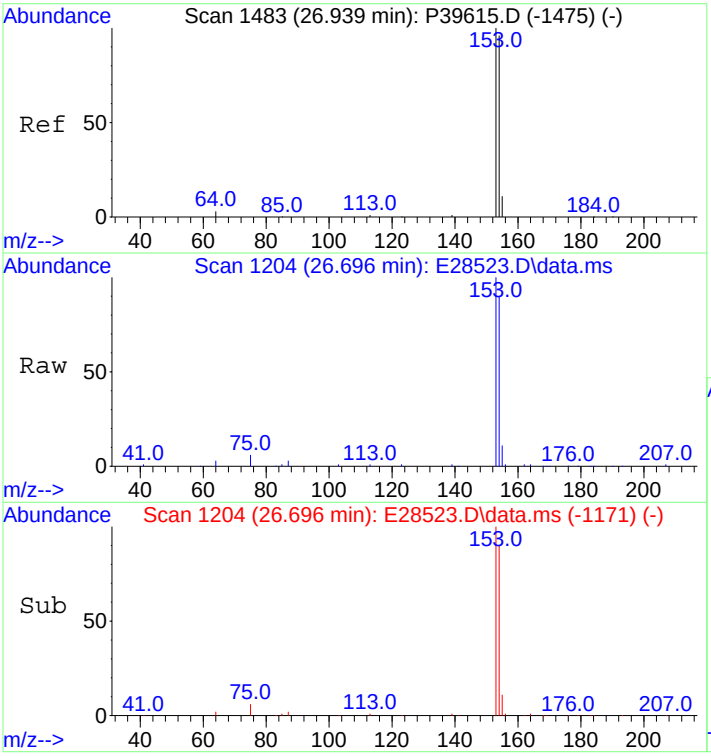


#26
Acenaphthylene
Concen: 491.97 ng/mL m
RT: 25.958 min Scan# 1155
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:152 Resp: 71193

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

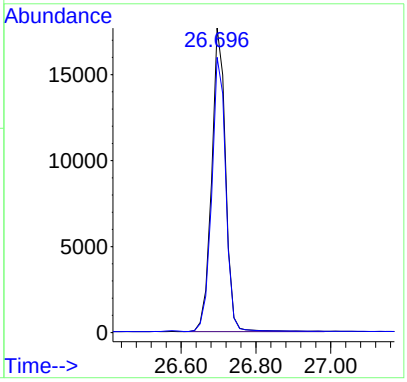


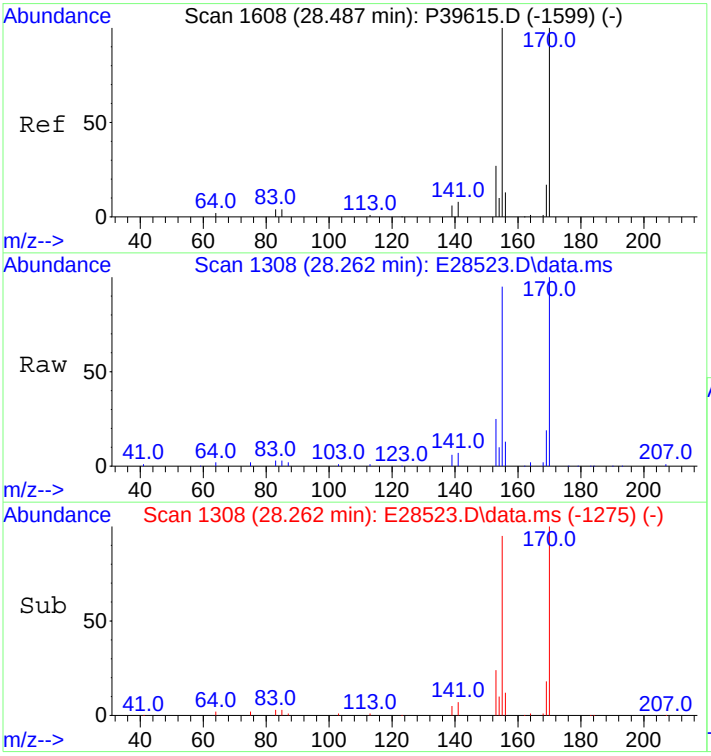


#27
Acenaphthene
Concen: 508.95 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:153 Resp: 45899

Ion	Ratio	Lower	Upper
153	100		
154	91.3	72.3	108.5

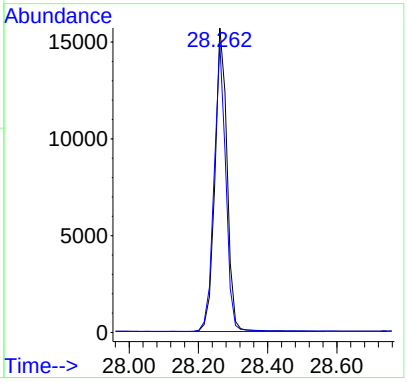


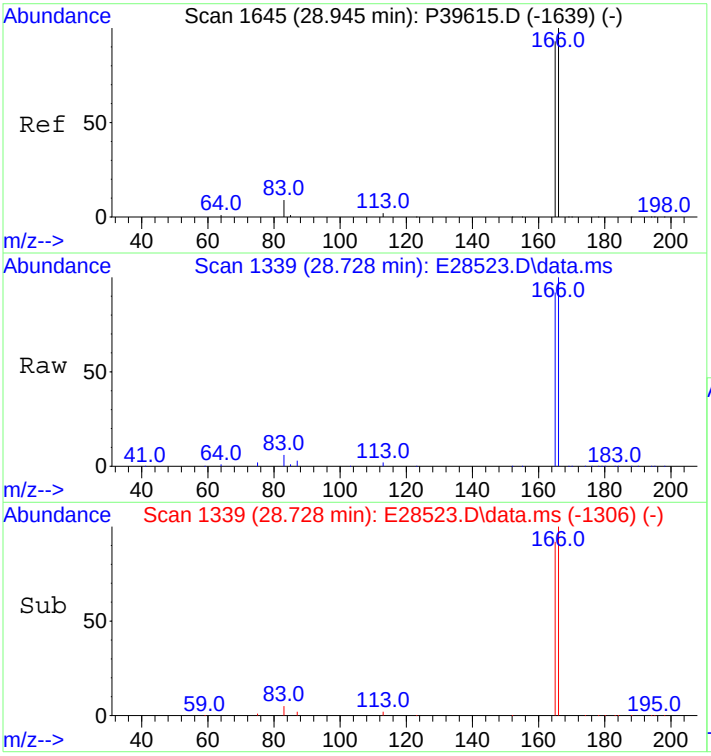


#28
2,3,5-Trimethylnaphthalene
Concen: 489.58 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:170 Resp: 38267

Ion	Ratio	Lower	Upper
170	100		
155	91.4	75.9	113.9

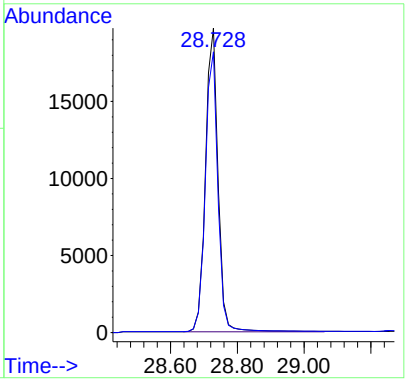


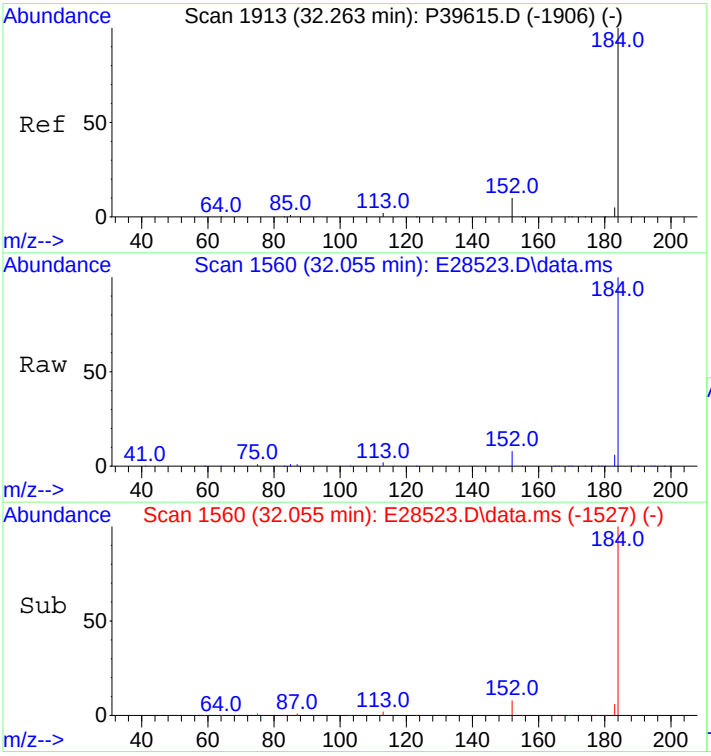


#29
Fluorene
Concen: 490.21 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:166 Resp: 51400

Ion	Ratio	Lower	Upper
166	100		
165	93.6	73.8	110.6

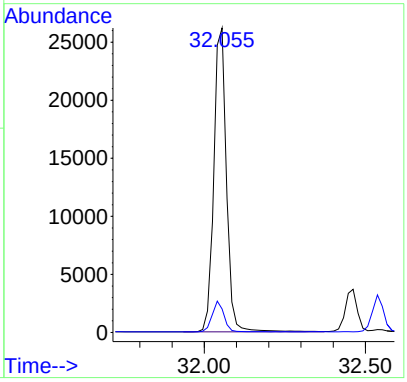


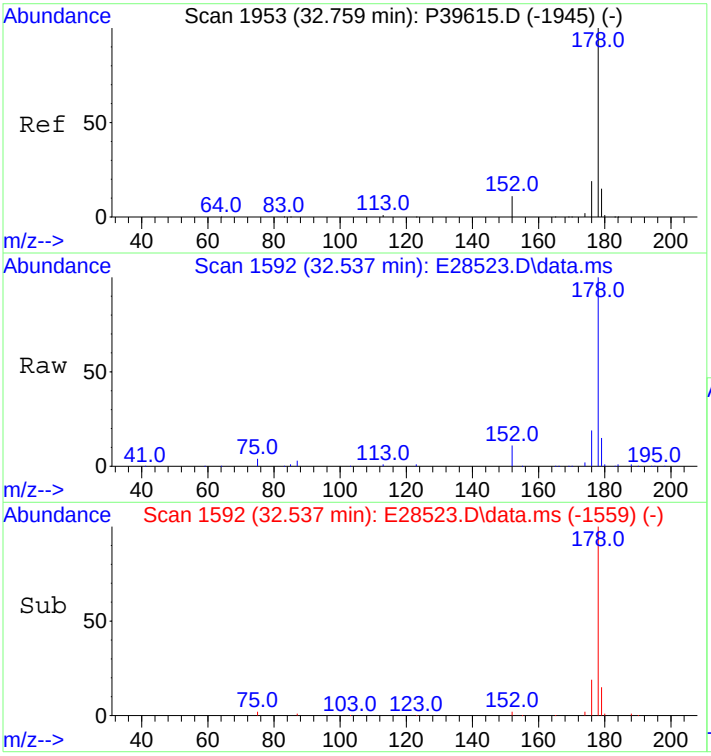


#33
Dibenzothiophene
Concen: 486.25 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:184 Resp: 71389

Ion	Ratio	Lower	Upper
184	100		
152	9.4	6.2	9.2#

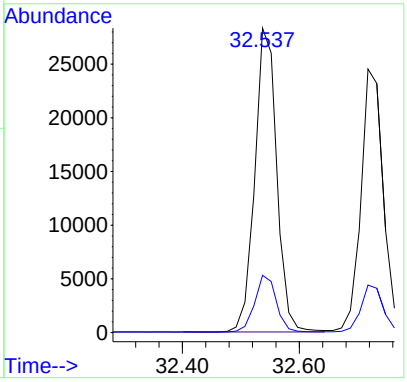


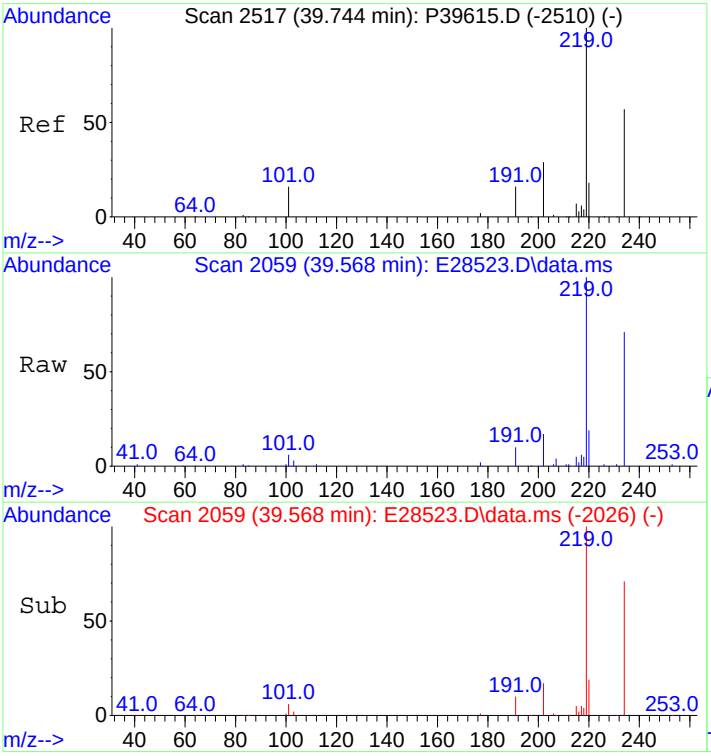


#43
Phenanthrene
Concen: 484.78 ng/mL
RT: 32.537 min Scan# 1592
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:178 Resp: 74232

Ion	Ratio	Lower	Upper
178	100		
176	18.4	15.0	22.6

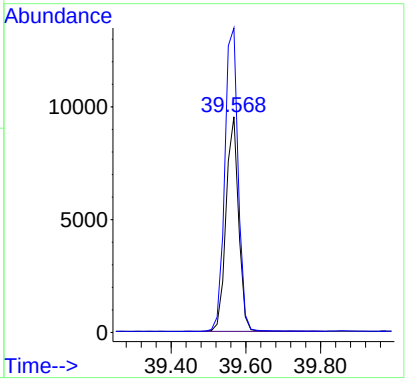


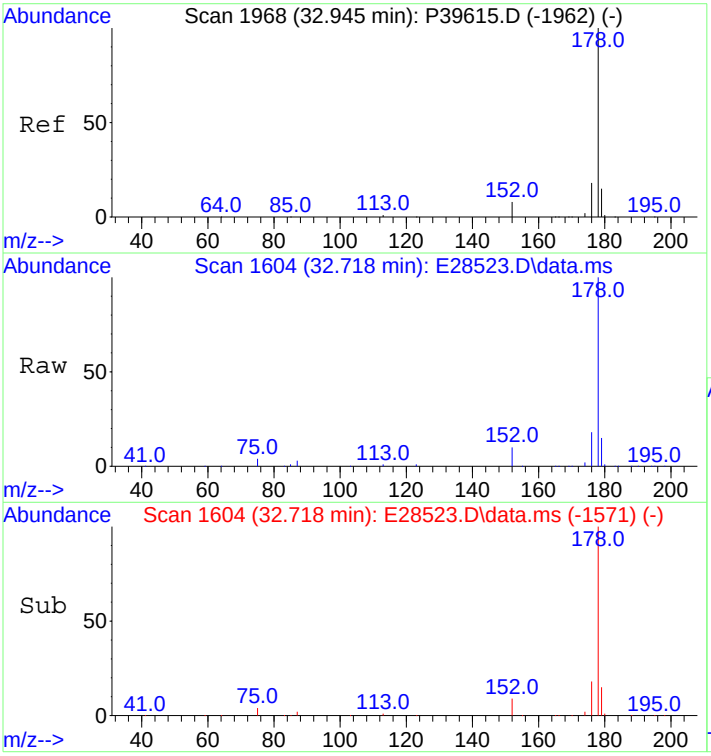


#54
Retene
Concen: 472.33 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:234 Resp: 22141

Ion	Ratio	Lower	Upper
234	100		
219	151.1	113.0	169.4

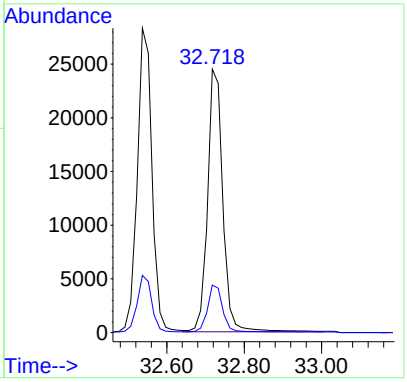


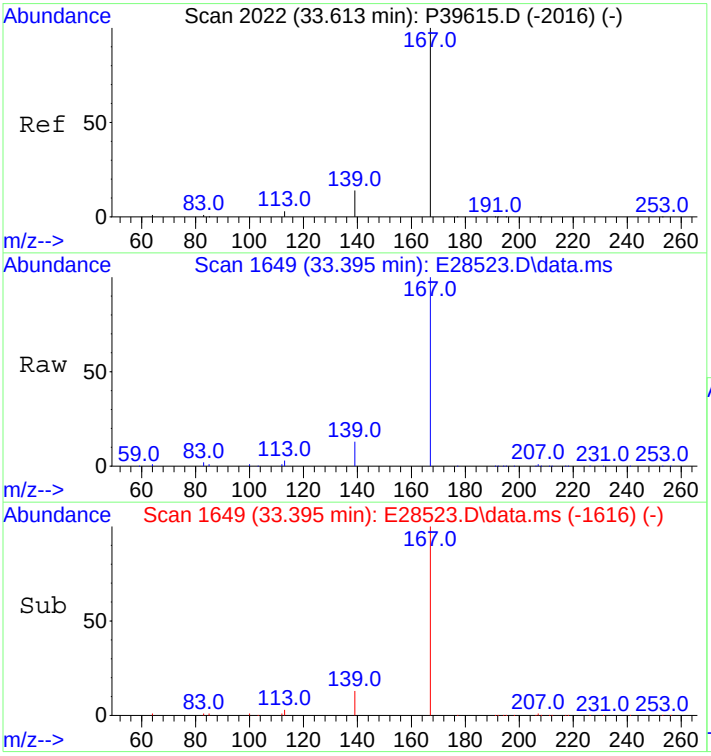


#55
Anthracene
Concen: 466.44 ng/mL m
RT: 32.718 min Scan# 1604
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:178 Resp: 66927

Ion	Ratio	Lower	Upper
178	100		
176	19.7	14.5	21.7

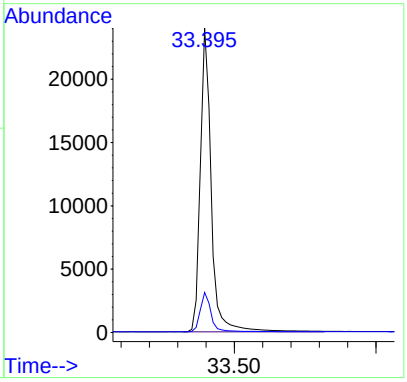


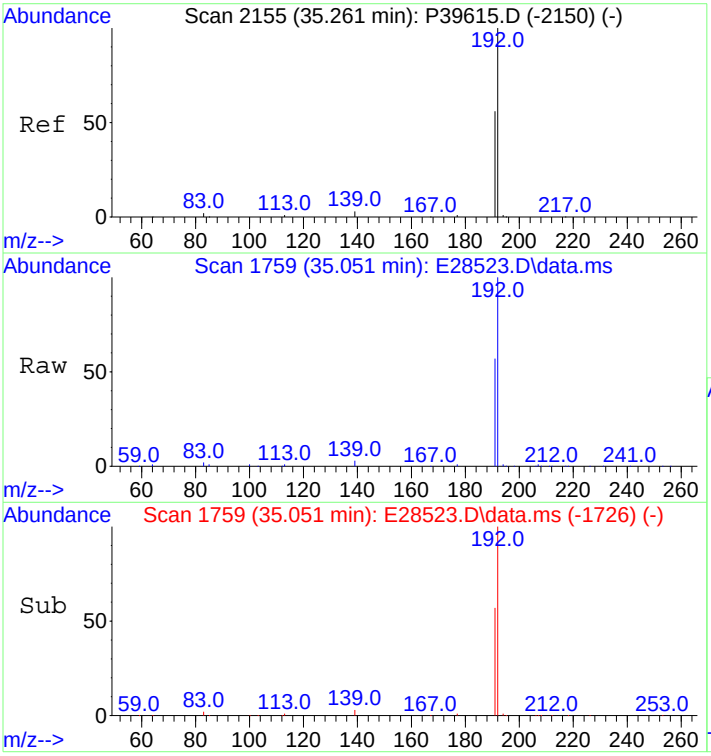


#56
Carbazole
Concen: 473.89 ng/mL
RT: 33.395 min Scan# 1649
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:167 Resp: 64221

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.5	15.7

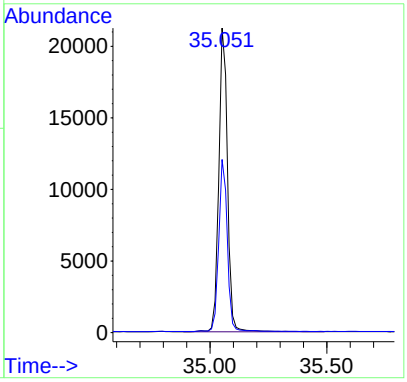


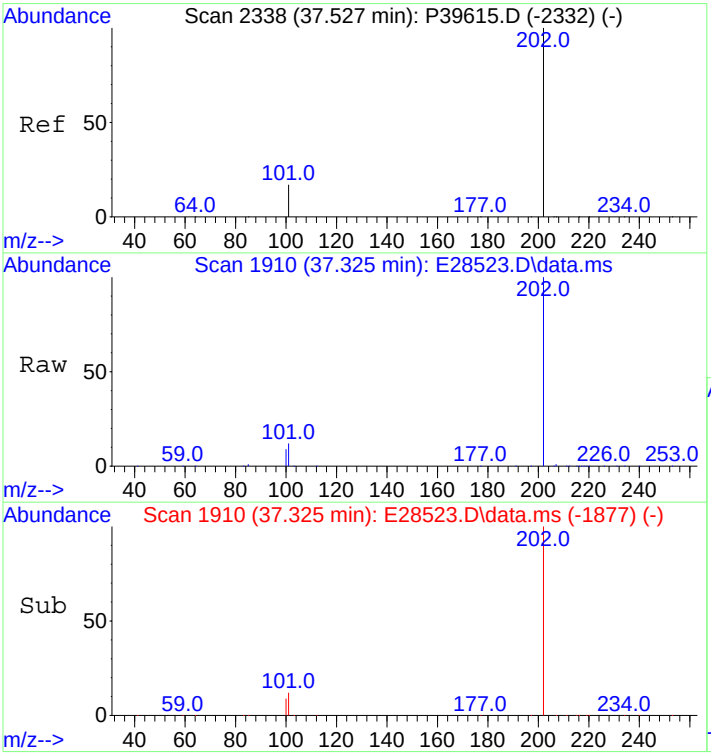


#57
1-Methylphenanthrene
Concen: 479.11 ng/mL
RT: 35.051 min Scan# 1759
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:192 Resp: 54645

Ion	Ratio	Lower	Upper
192	100		
191	56.2	45.5	68.3

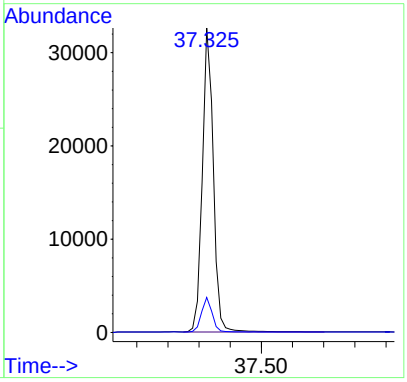


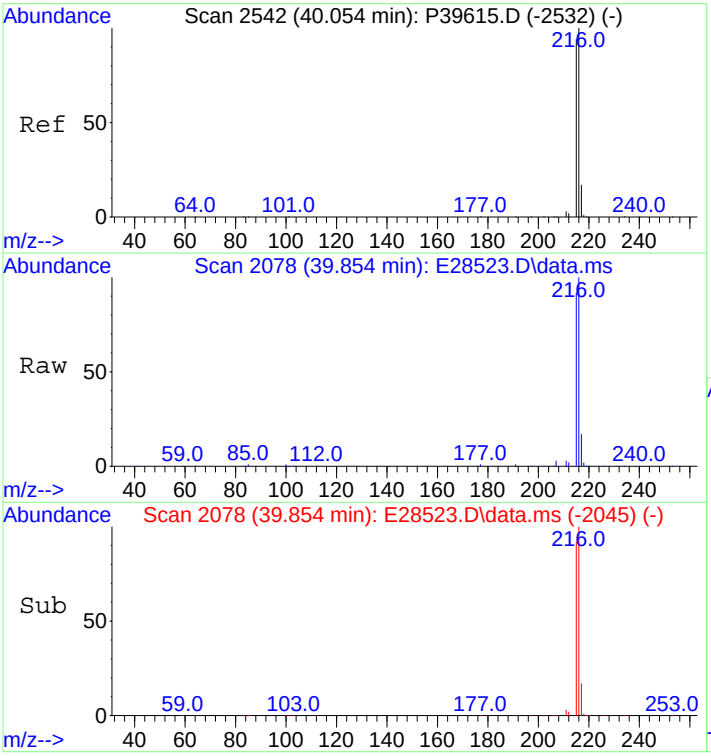


#58
Fluoranthene
Concen: 476.25 ng/mL
RT: 37.325 min Scan# 1910
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:202 Resp: 79475

Ion	Ratio	Lower	Upper
202	100		
101	11.1	9.2	13.8

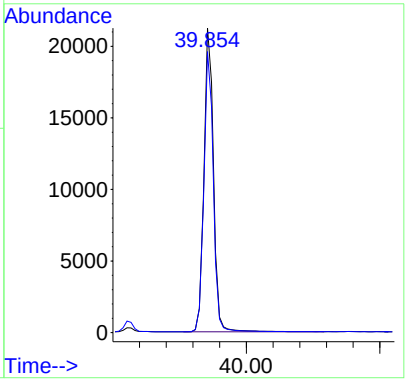


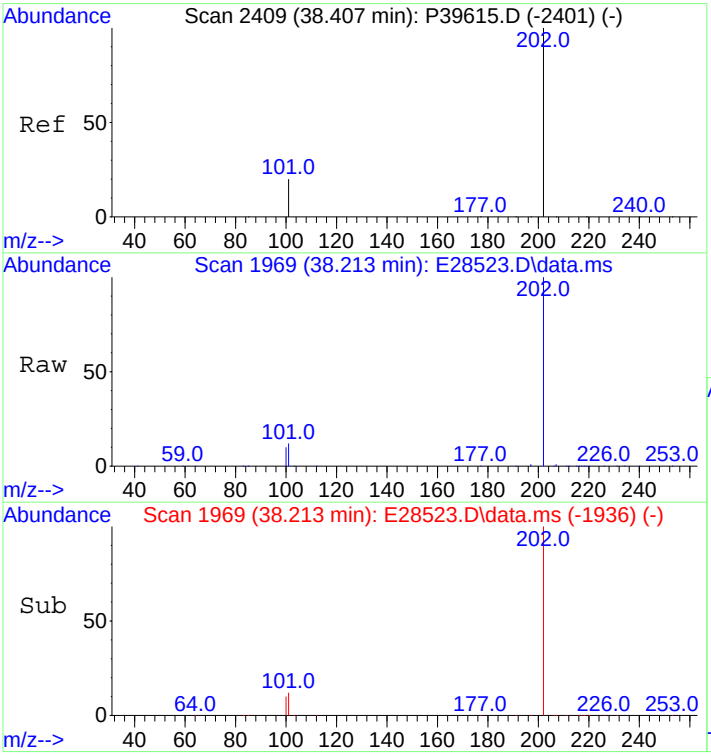


#59
Benzo(b)fluorene
Concen: 492.65 ng/mL
RT: 39.854 min Scan# 2078
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:216 Resp: 52291

Ion	Ratio	Lower	Upper
216	100		
215	91.7	73.8	110.8

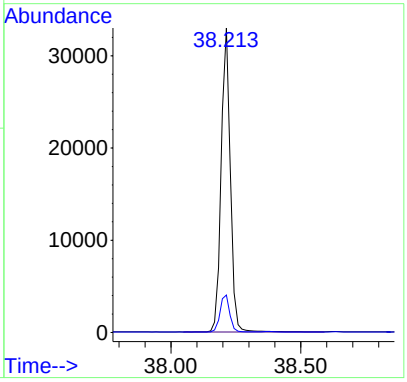


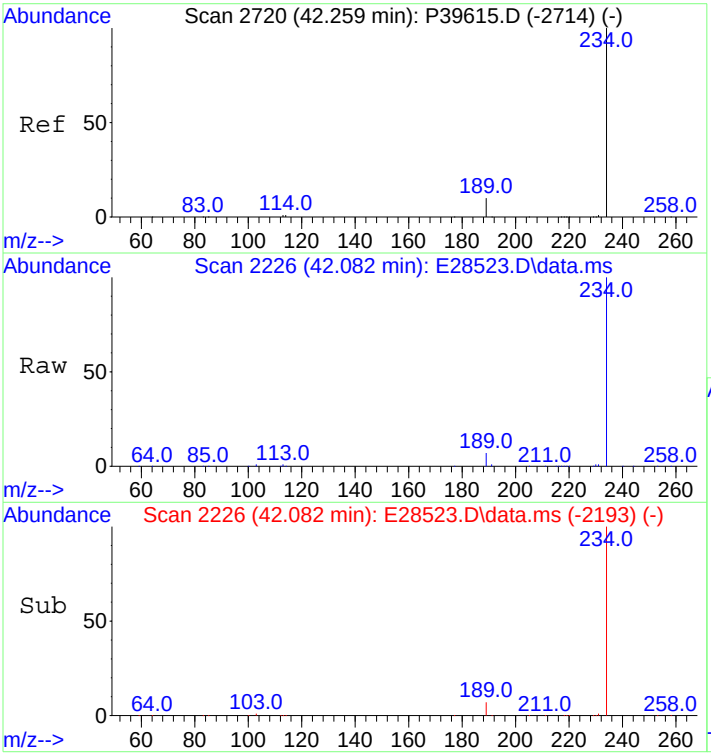


#60
Pyrene
Concen: 480.28 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:202 Resp: 80681

Ion	Ratio	Lower	Upper
202	100		
101	12.8	9.8	14.8

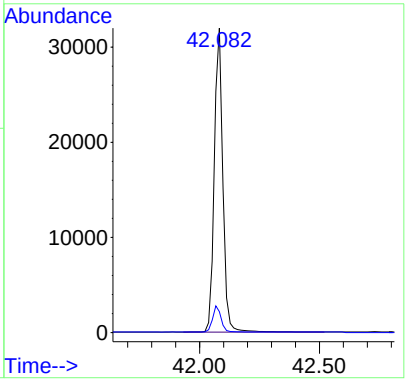


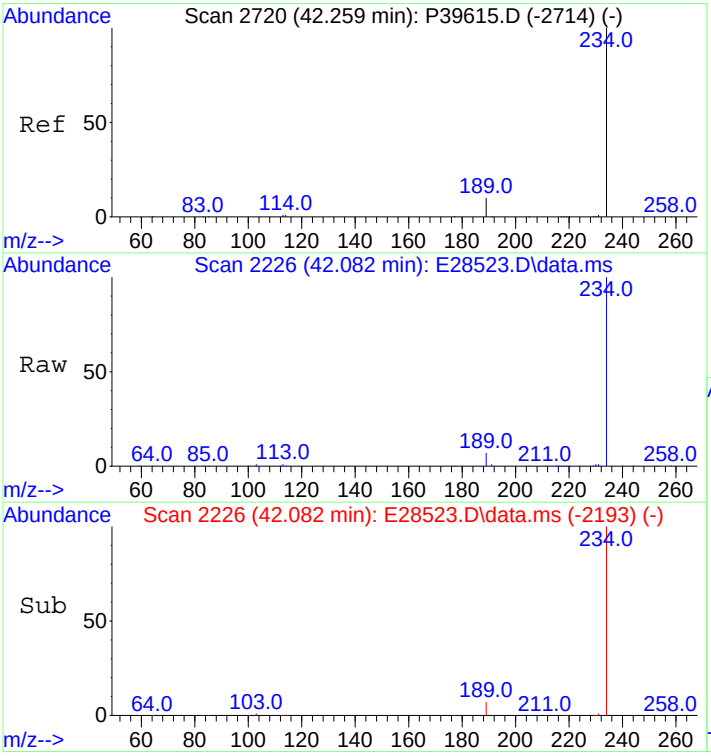


#66
Naphthobenzothiophene
Concen: 498.56 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:234 Resp: 79024

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

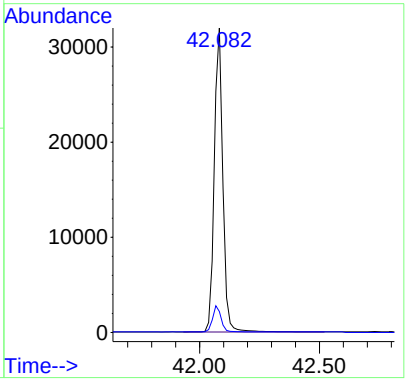


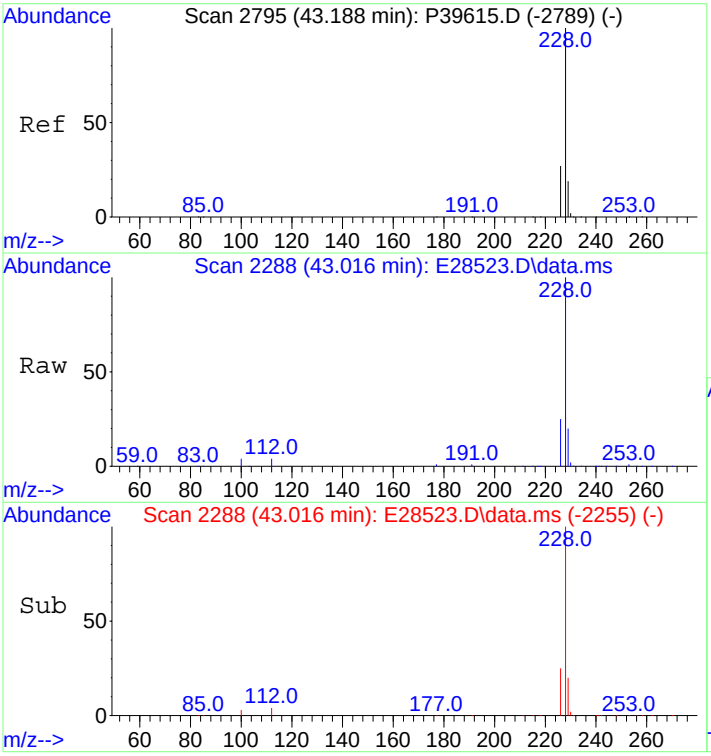


#67
Naphthobenzothiophene-2,1-D
Concen: 498.56 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:234 Resp: 79024

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

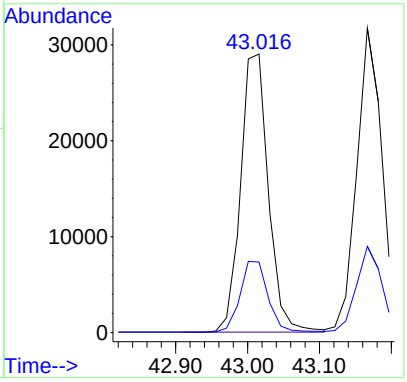


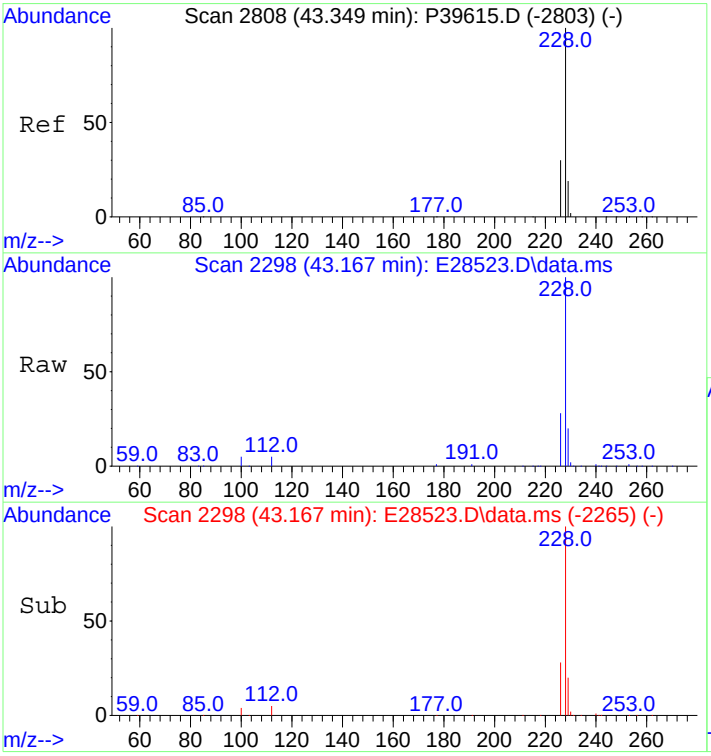


#75
Benz[a]anthracene
Concen: 456.01 ng/mL
RT: 43.016 min Scan# 2288
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:228 Resp: 77932

Ion	Ratio	Lower	Upper
228	100		
226	25.5	20.2	30.4

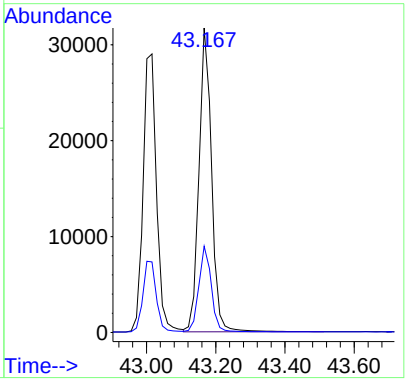


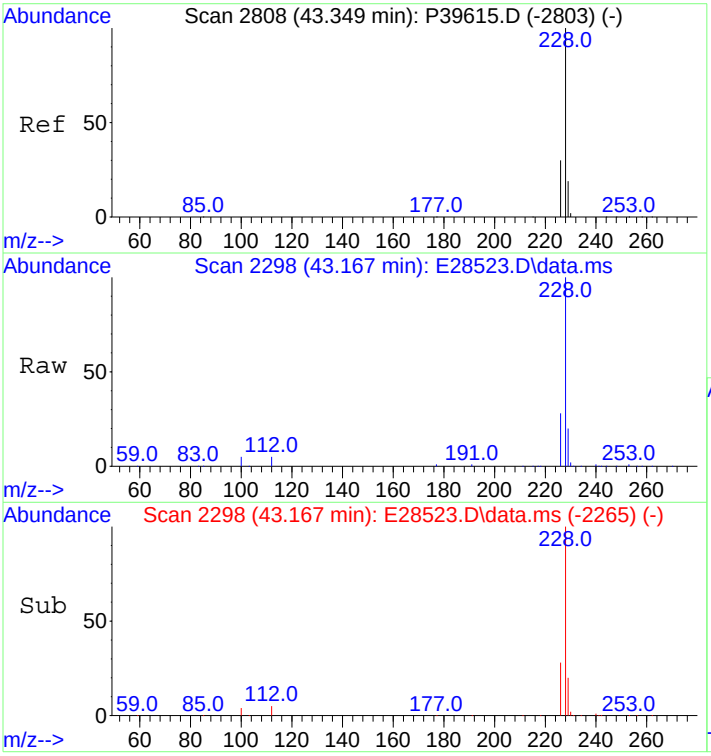


#76
Chrysene
Concen: 476.06 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:228 Resp: 79635

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

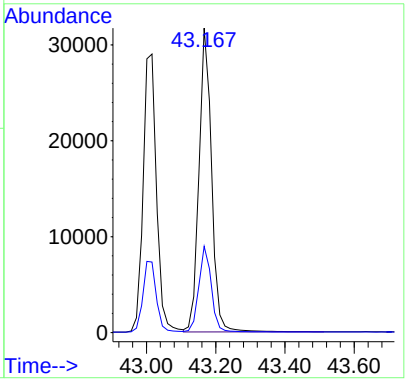


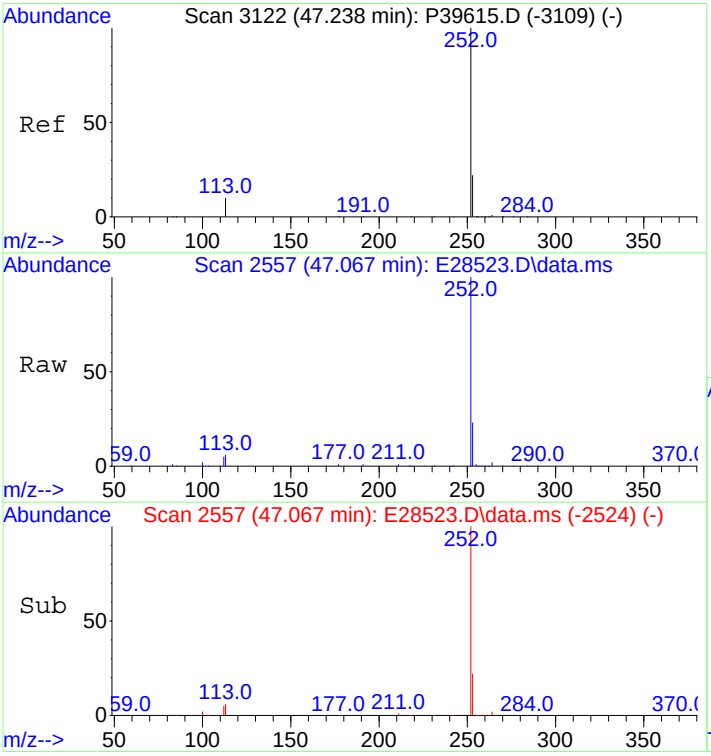


#77
Chrysene/Triphenylene
Concen: 476.06 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:228 Resp: 79635

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

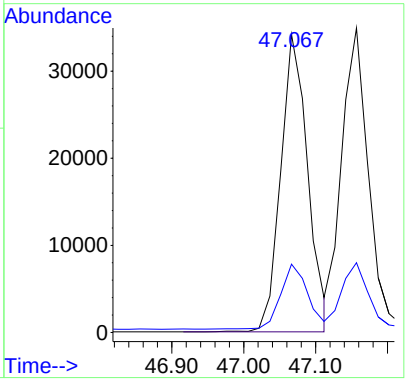


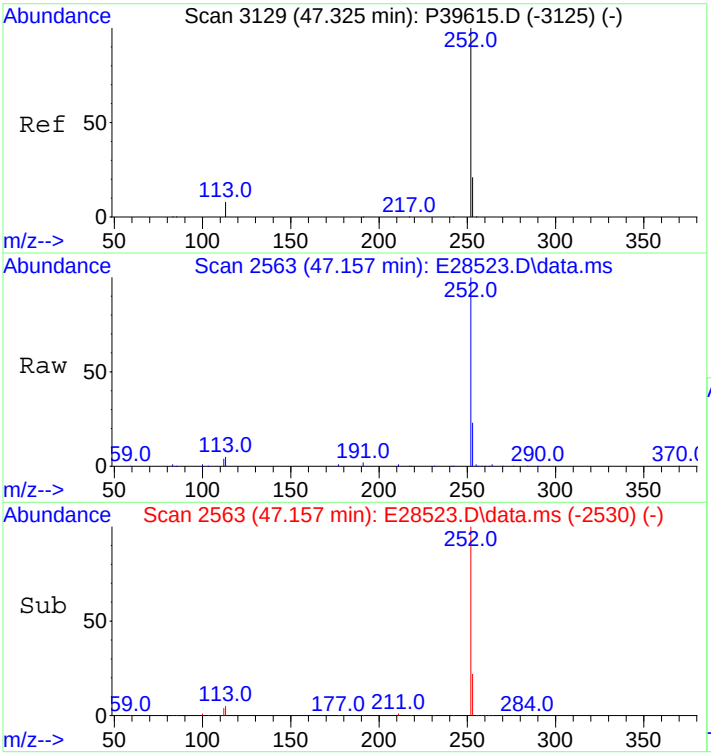


#84
Benzo[b]fluoranthene
Concen: 495.19 ng/mL
RT: 47.067 min Scan# 2557
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 89104

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.3	27.5

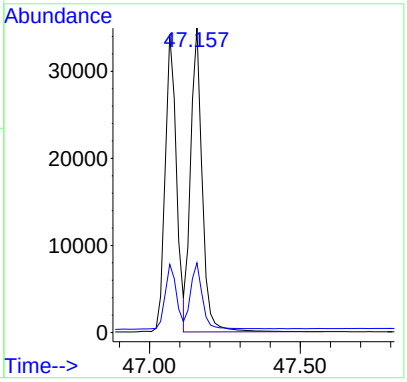


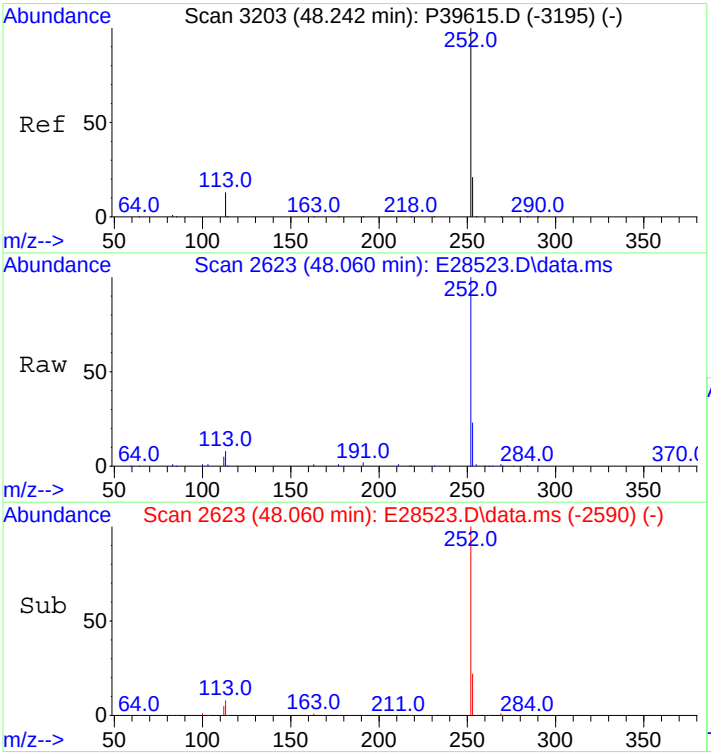


#85
Benzo[j]+[k]fluoranthene
Concen: 549.60 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 93062

Ion	Ratio	Lower	Upper
252	100		
253	21.8	18.3	27.5

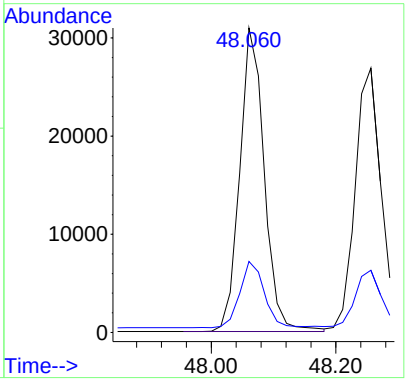


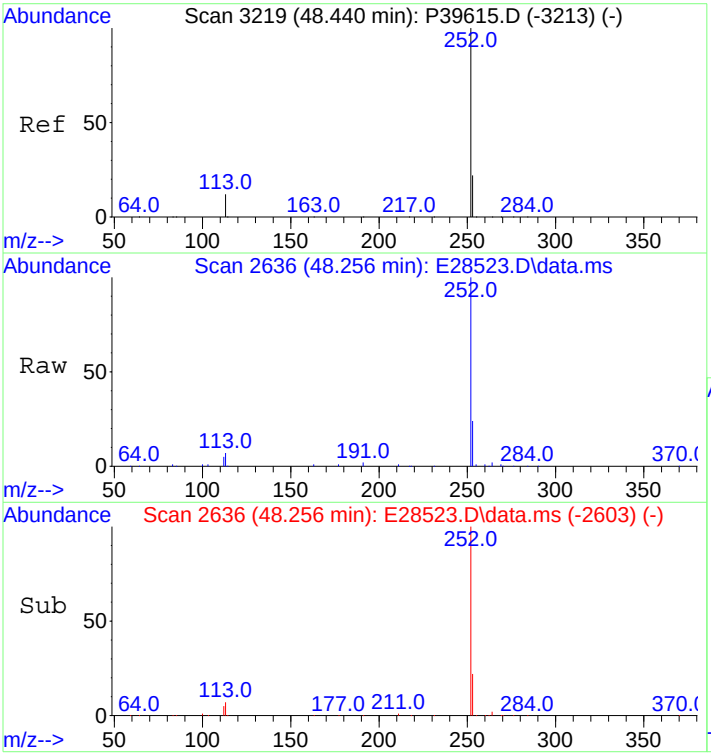


#87
Benzo[e]pyrene
Concen: 530.13 ng/mL
RT: 48.060 min Scan# 2623
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 84646

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.6	28.0

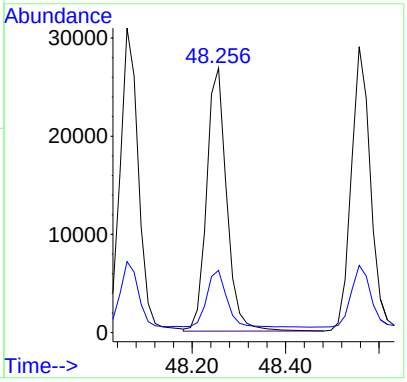


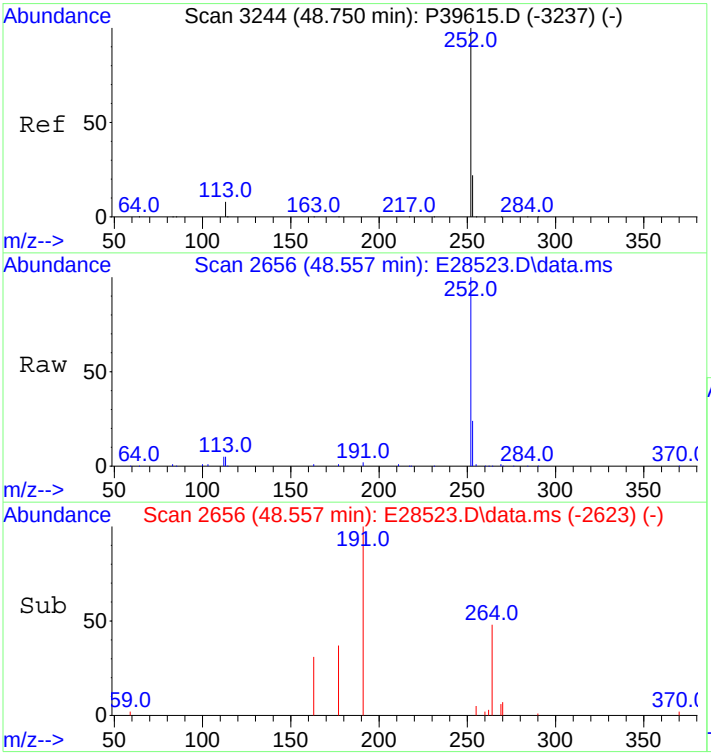


#89
Benzo[a]pyrene
Concen: 528.52 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 79782

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

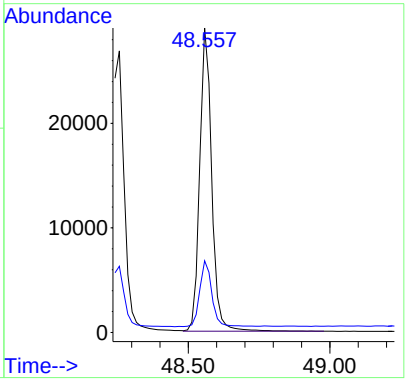


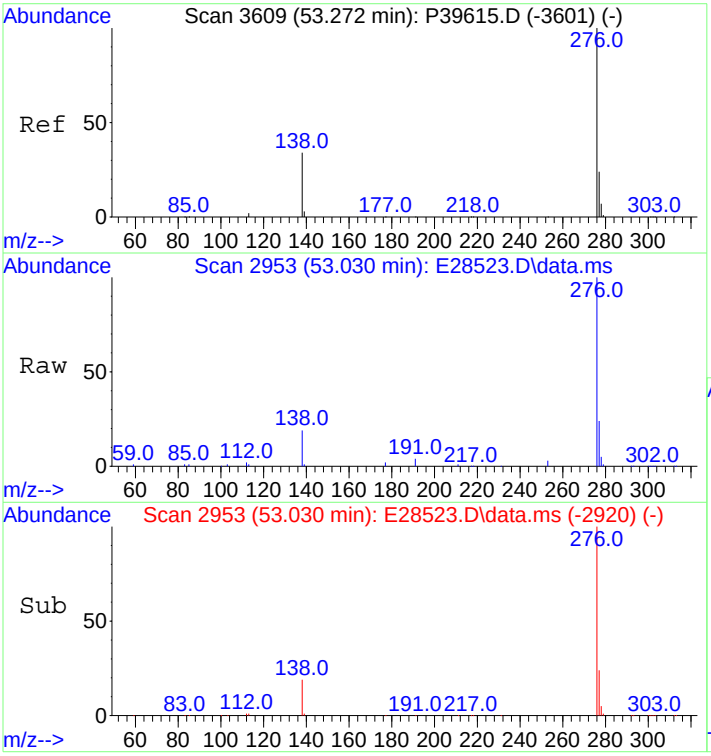


#90
Perylene
Concen: 528.03 ng/mL
RT: 48.557 min Scan# 2656
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 84830

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.8	28.2

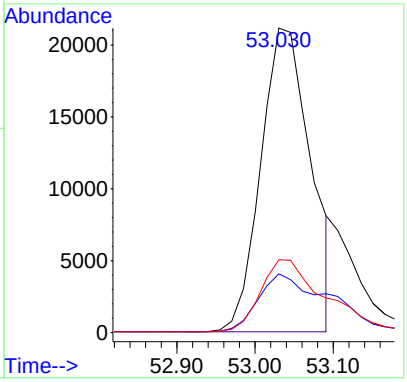


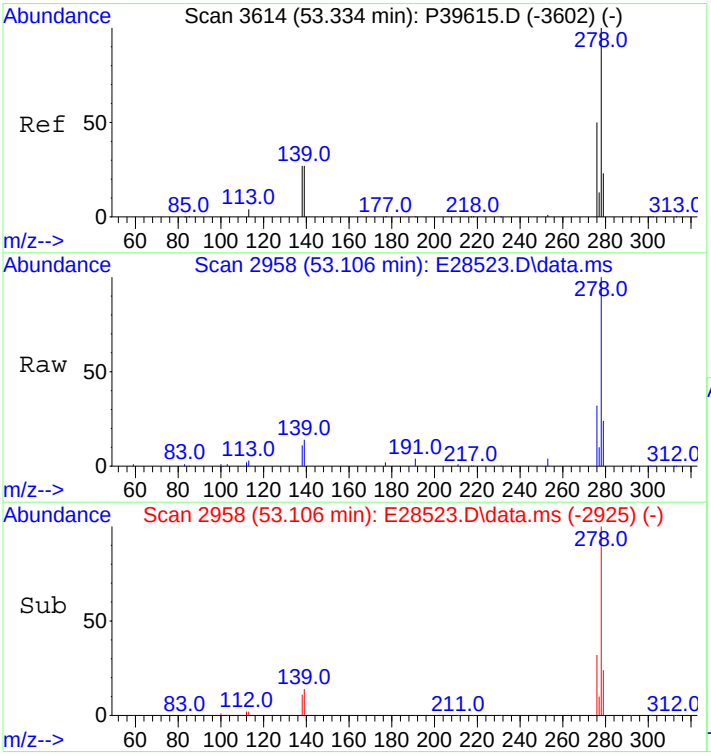


#91
Indeno[1,2,3-cd]pyrene
Concen: 515.07 ng/mL m
RT: 53.030 min Scan# 2953
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:276 Resp: 93871

Ion	Ratio	Lower	Upper
276	100		
138	28.2	15.4	23.2#
277	31.7	19.1	28.7#

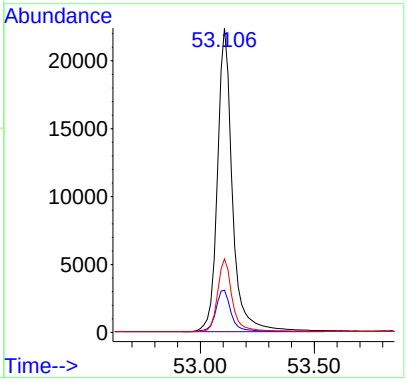


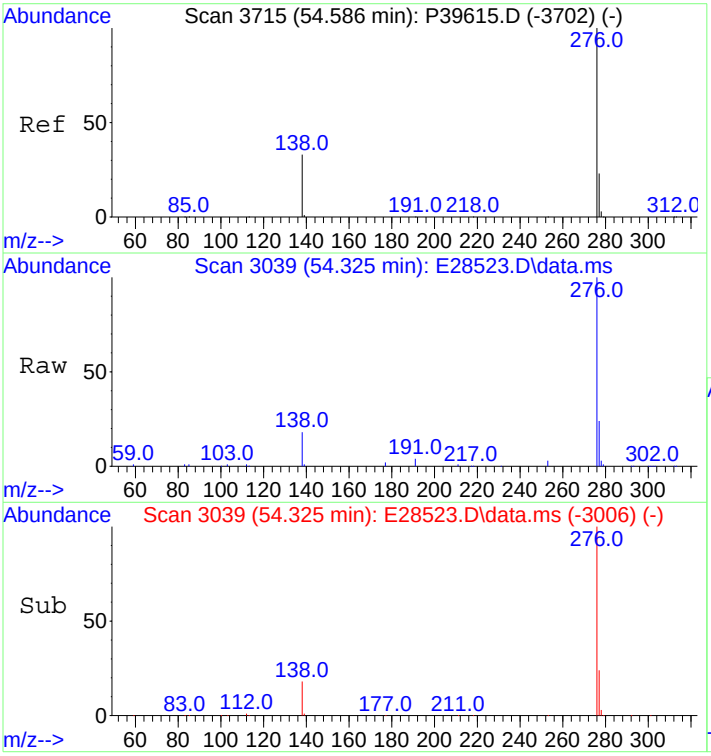


#92
Dibenz[ah]+[ac]anthracene
Concen: 582.45 ng/mL
RT: 53.106 min Scan# 2958
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:278 Resp: 102096

Ion	Ratio	Lower	Upper
278	100		
139	14.1	11.1	16.7
279	23.7	19.4	29.0

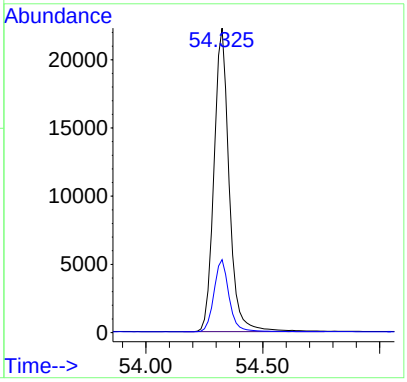


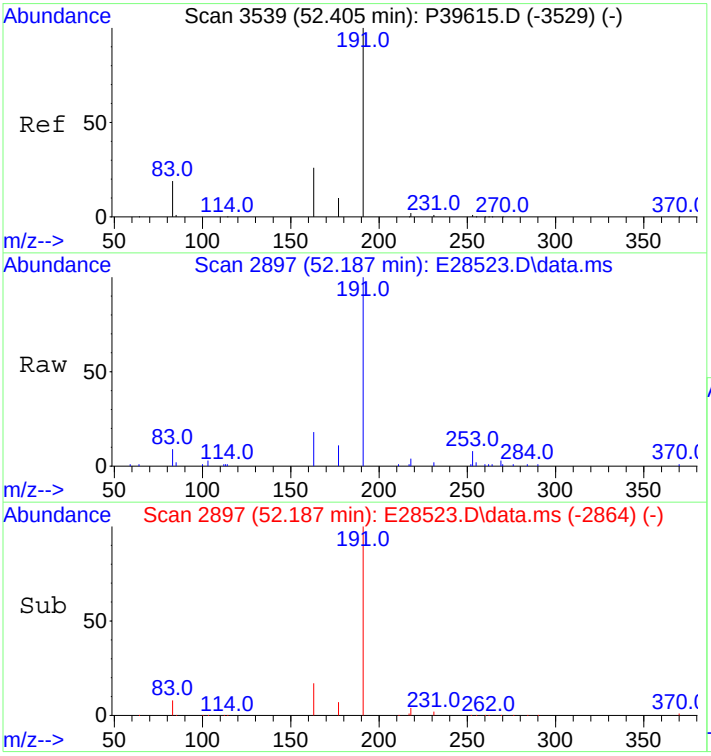


#93
Benzo[g,h,i]perylene
Concen: 561.12 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:276 Resp: 100489

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

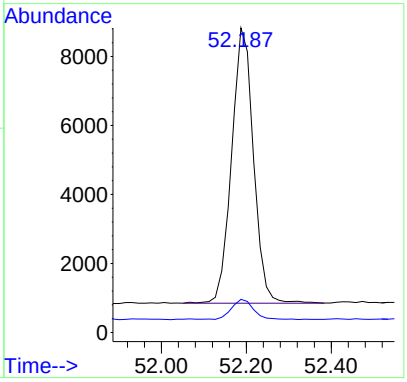


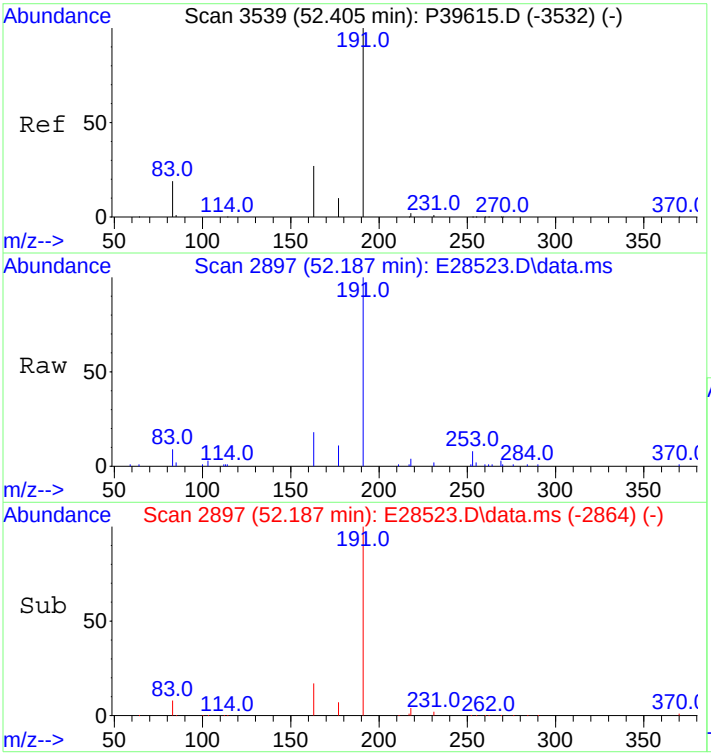


#94
Hopane (T19)
Concen: 675.67 ng/mL
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:191 Resp: 28585

Ion	Ratio	Lower	Upper
191	100		
177	7.5	8.7	13.1#

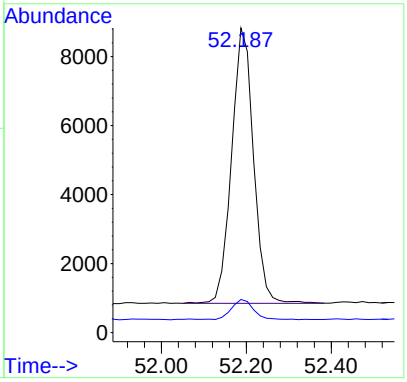




#95
17a(H),21B(H)-hopane - C30H52
Concen: 675.67 ng/mL
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:191 Resp: 28585

Ion	Ratio	Lower	Upper
191	100		
177	7.5	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 12:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	33843	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	78030	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	551490	4374.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 437.45%#			
42) Phenanthrene-d10	32.462	188	591656	4656.961	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 465.70%#			
83) Benzo[b]fluoranthene-d12	47.006	264	757059	5124.613	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 512.46%#			
88) Benzo[a]pyrene-d12	48.181	264	754524	5631.502	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 563.15%#			
129) 5B(H)Cholane - Surr	43.723	217	164748	5727.173	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 572.72%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	65353	2319.785	ng/mL	100
4) cis-Decalin	17.482	138	50652	2366.946	ng/mL	100
10) Naphthalene	19.680	128	666336	4927.599	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	434650	4966.577	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	418300	4984.067	ng/mL#	100
18) Benzothiophene	19.891	134	560368	5079.742	ng/mL	100
23) Biphenyl	24.272	154	550566	4967.246	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	400289	5017.330	ng/mL#	100
25) Dibenzofuran	27.343	168	624188	5210.994	ng/mL	98
26) Acenaphthylene	25.958	152	705912M3	5287.347	ng/mL	
27) Acenaphthene	26.711	153	436058	5240.867	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	376690	5223.527	ng/mL	97
29) Fluorene	28.728	166	508103	5252.399	ng/mL	100
33) Dibenzothiophene	32.055	184	701873	5181.642	ng/mL#	95
43) Phenanthrene	32.552	178	715454	5064.281	ng/mL	99
54) Retene	39.568	234	240302	5556.394	ng/mL	93
55) Anthracene	32.733	178	623046M3	4706.465	ng/mL	
56) Carbazole	33.395	167	672100	5375.448	ng/mL	99
57) 1-Methylphenanthrene	35.066	192	557136	5294.589	ng/mL	99
58) Fluoranthene	37.340	202	812711M3	5278.661	ng/mL	
59) Benzo(b)fluorene	39.869	216	563733	5756.591	ng/mL	99
60) Pyrene	38.213	202	811273	5234.531	ng/mL	98
66) Naphthobenzothiophene	42.082	234	818126	5594.497	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	818126	5594.497	ng/mL#	95
75) Benz[a]anthracene	43.016	228	819446	4736.655	ng/mL	99
76) Chrysene	43.181	228	799496	4721.396	ng/mL	100
77) Chrysene/Triphenylene	43.181	228	799496	4721.396	ng/mL	100
84) Benzo[b]fluoranthene	47.081	252	948454	5206.972	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.172	252	946512	5522.013	ng/mL	98
87) Benzo[e]pyrene	48.075	252	890237	5507.774	ng/mL	97
89) Benzo[a]pyrene	48.271	252	873584	5716.864	ng/mL	97
90) Perylene	48.572	252	935392	5751.798	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.060	276	1049897M3	5690.915	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	1111133	6262.016	ng/mL	99
93) Benzo[g,h,i]perylene	54.355	276	1070138	5903.057	ng/mL	100
94) Hopane (T19)	52.202	191	293886	6862.372	ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	293886	6862.372	ng/mL#	90

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 12:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 12:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
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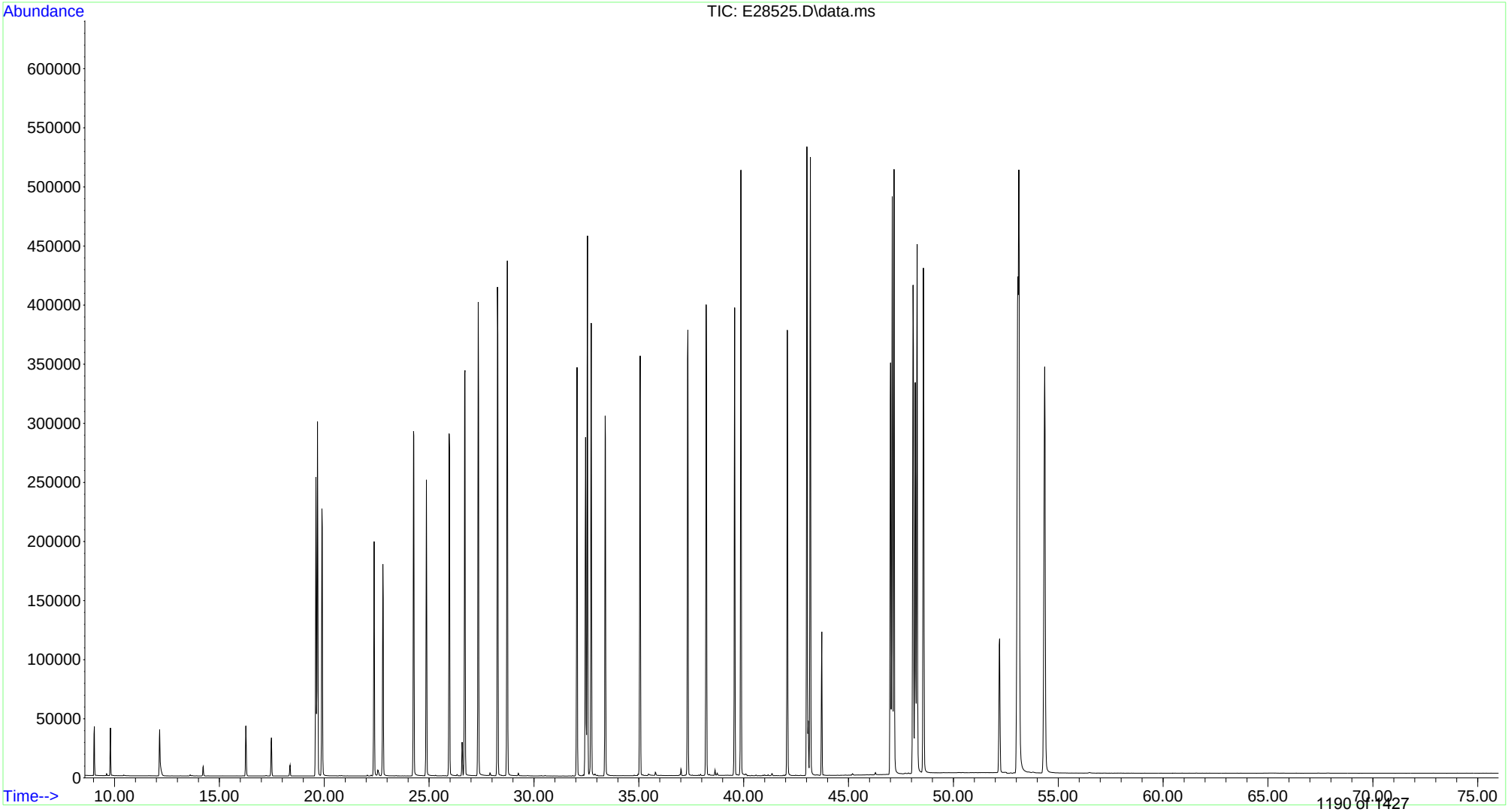
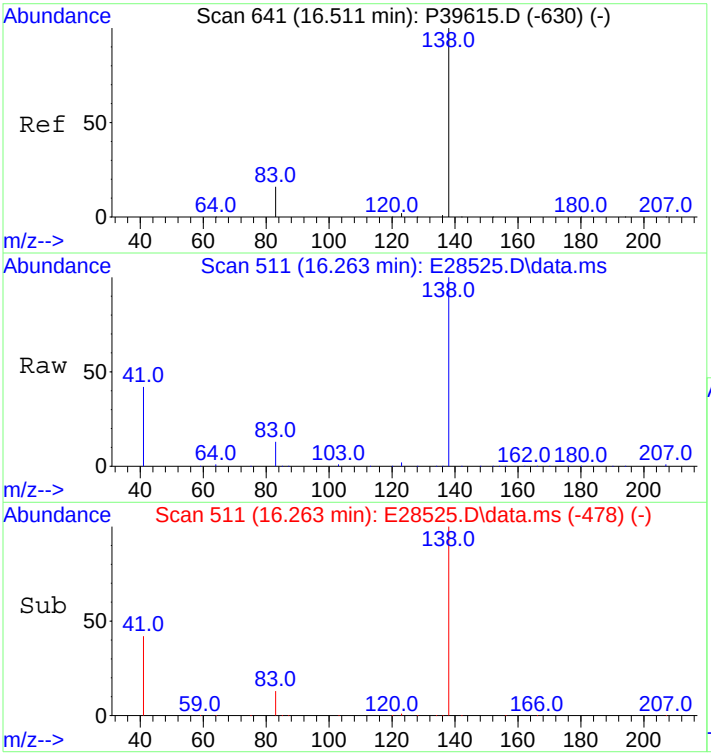
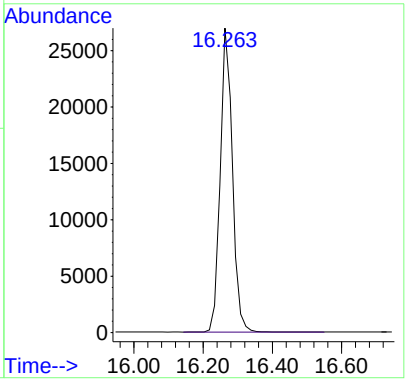
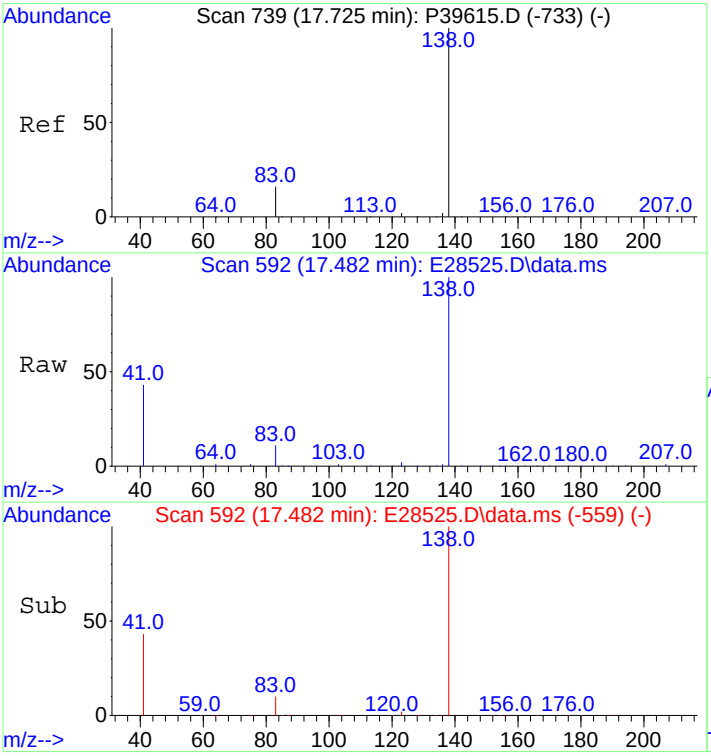




#3
trans-Decalin
Concen: 2319.79 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

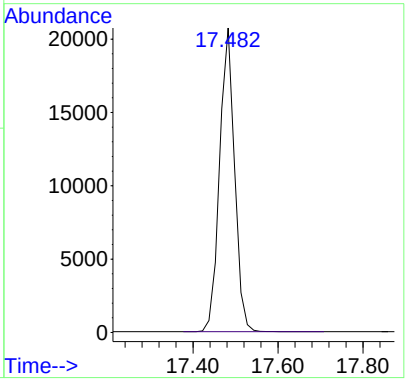
Tgt Ion:138 Resp: 65353

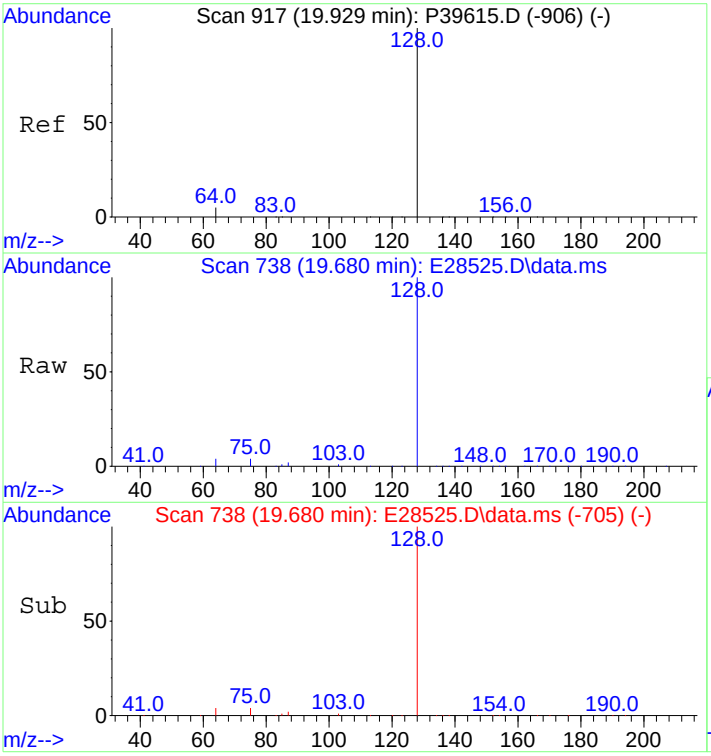




#4
cis-Decalin
Concen: 2366.95 ng/mL
RT: 17.482 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:138 Resp: 50652

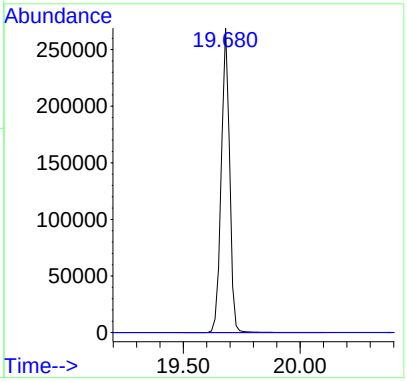


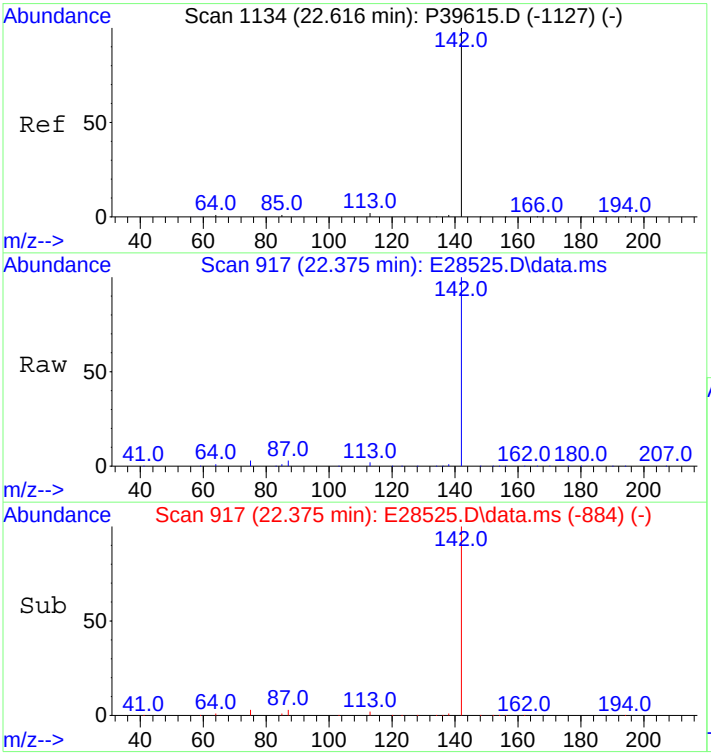


#10
Naphthalene
Concen: 4927.60 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:128 Resp: 666336

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

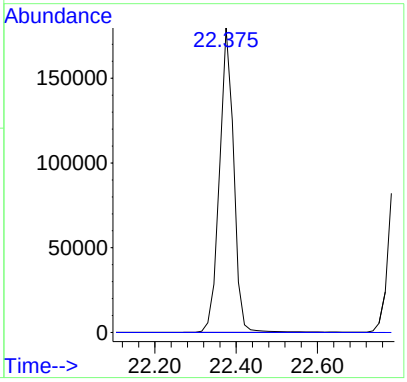


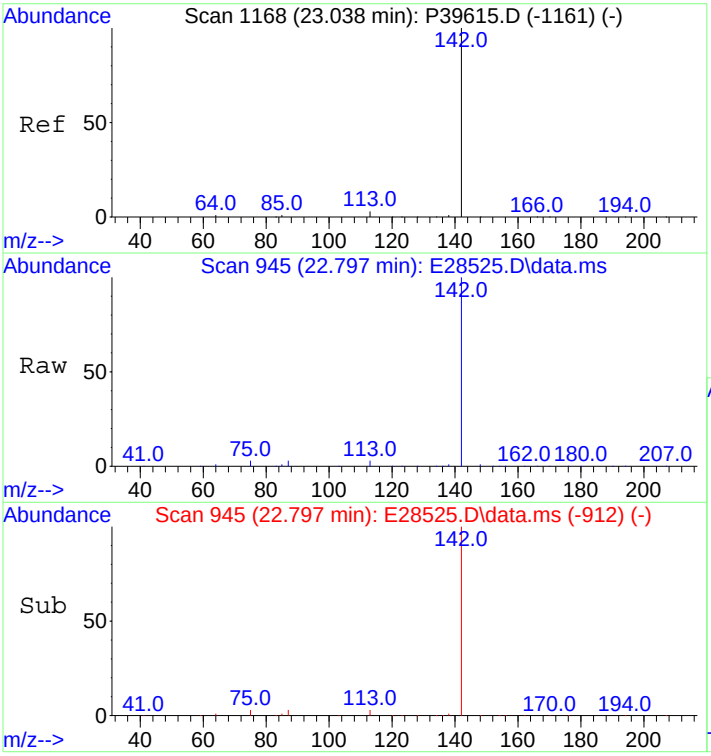


#16
2-Methylnaphthalene
Concen: 4966.58 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:142 Resp: 434650

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

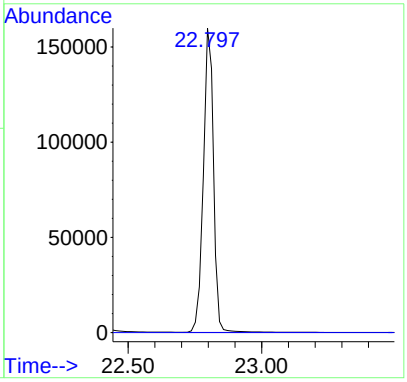


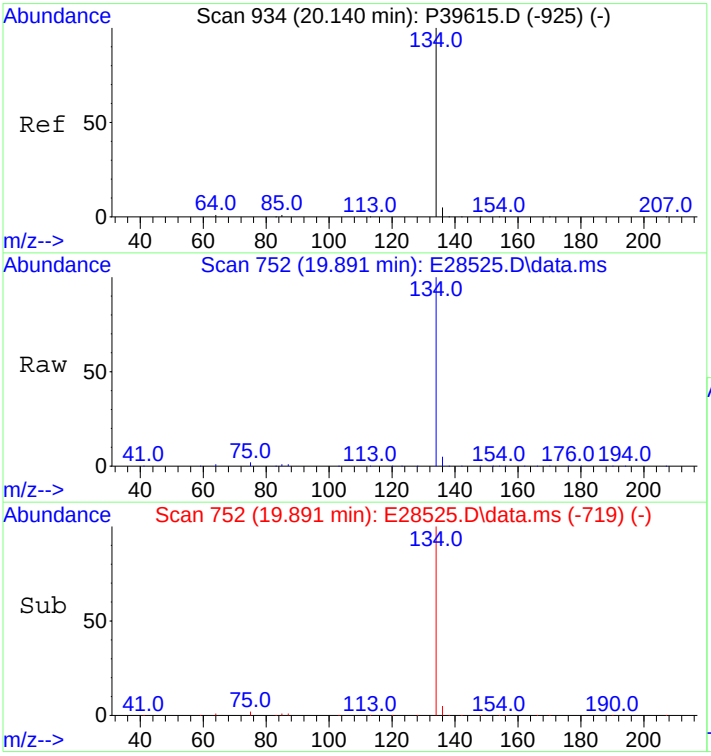


#17
1-Methylnaphthalene
Concen: 4984.07 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:142 Resp: 418300

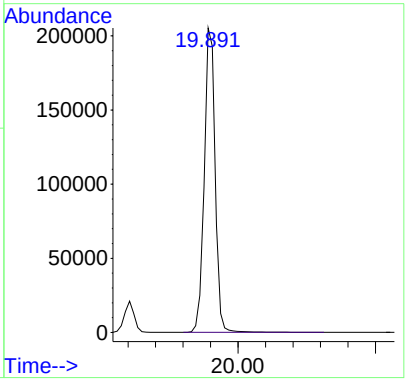
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

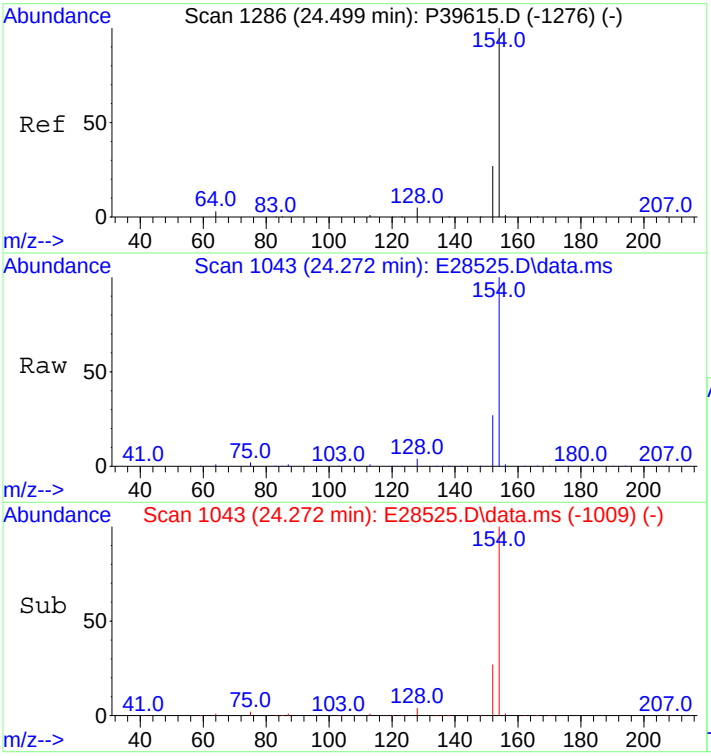




#18
Benzothiophene
Concen: 5079.74 ng/mL
RT: 19.891 min Scan# 752
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:134 Resp: 560368

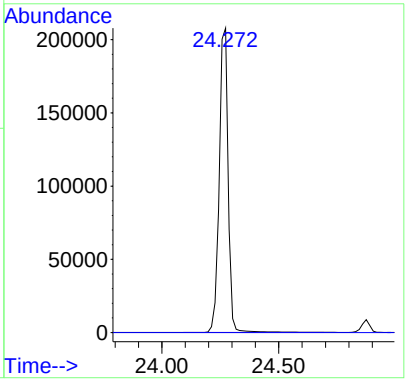


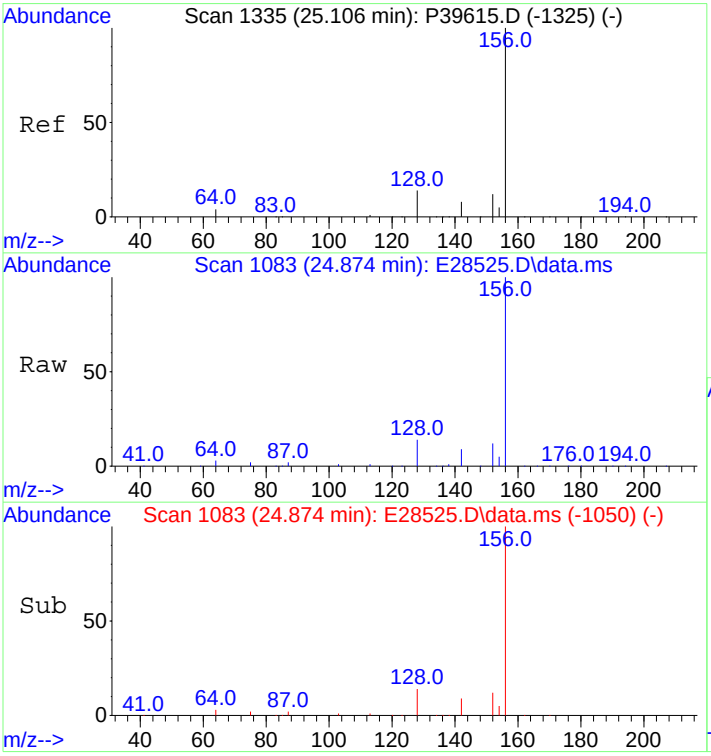


#23
Biphenyl
Concen: 4967.25 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:154 Resp: 550566

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

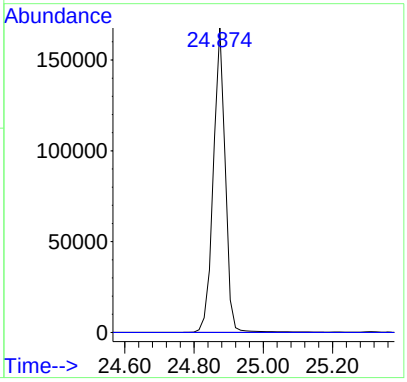


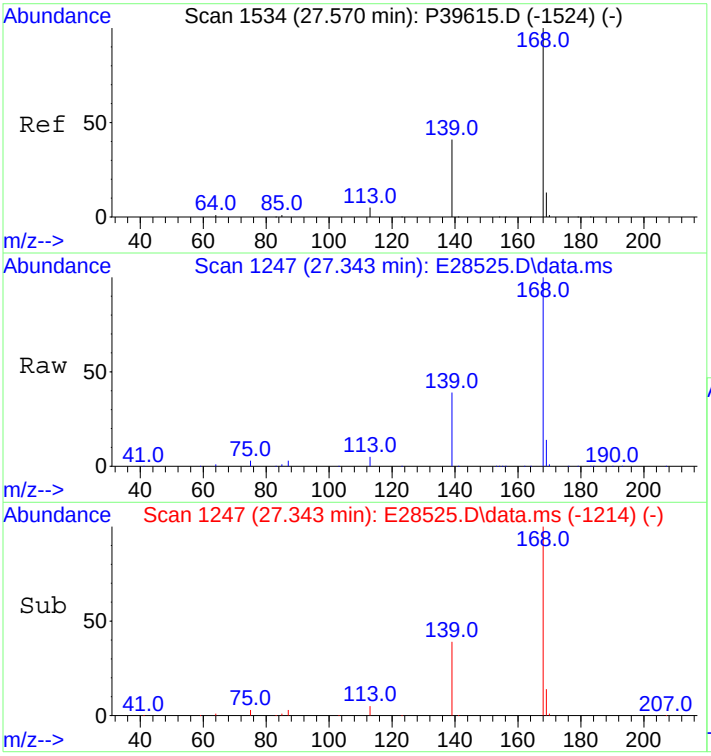


#24
2,6-Dimethylnaphthalene
Concen: 5017.33 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:156 Resp: 400289

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

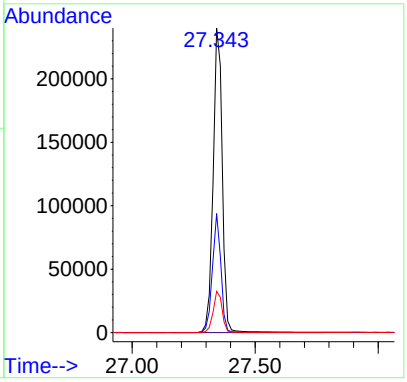


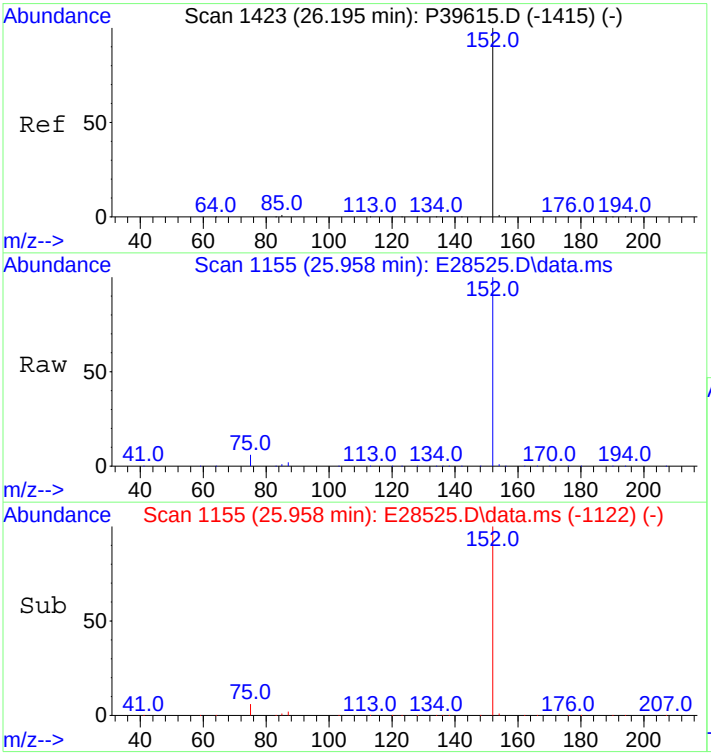


#25
Dibenzofuran
Concen: 5210.99 ng/mL
RT: 27.343 min Scan# 1247
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:168 Resp: 624188

Ion	Ratio	Lower	Upper
168	100		
139	36.4	30.6	45.8
169	13.4	10.6	16.0

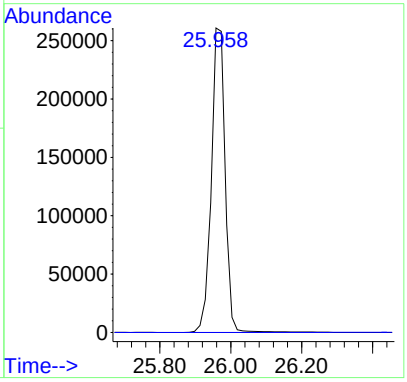


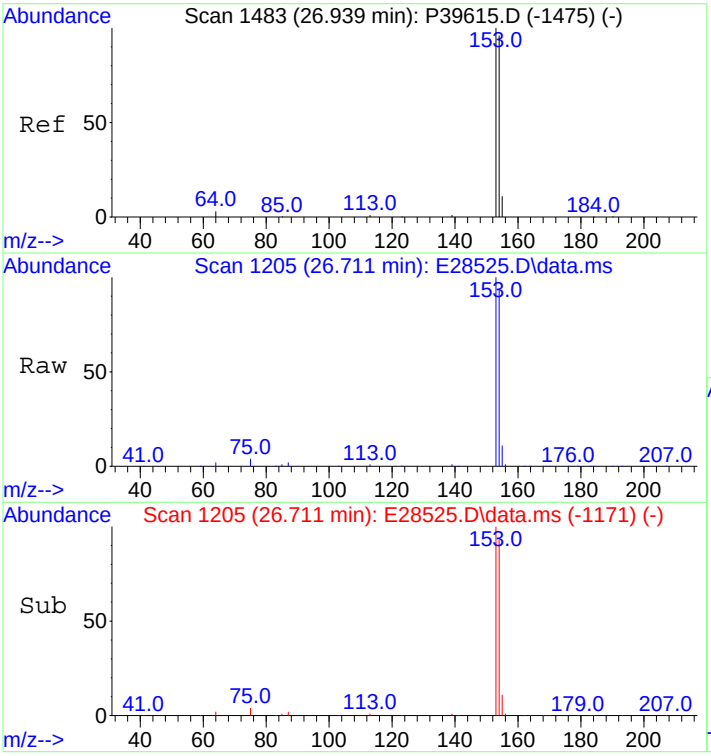


#26
Acenaphthylene
Concen: 5287.35 ng/mL m
RT: 25.958 min Scan# 1155
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:152 Resp: 705912

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

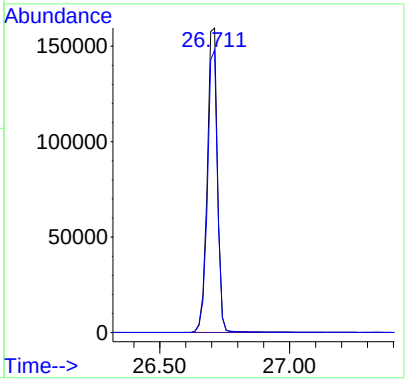


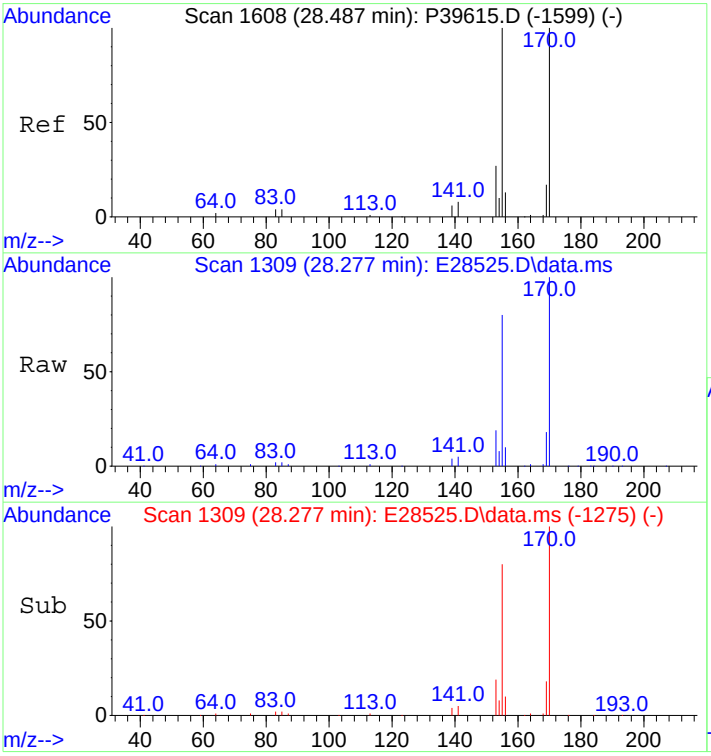


#27
Acenaphthene
Concen: 5240.87 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:153 Resp: 436058

Ion	Ratio	Lower	Upper
153	100		
154	91.4	72.3	108.5

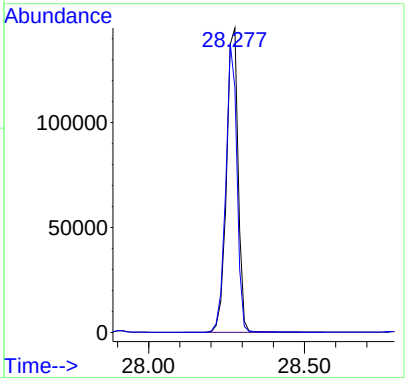


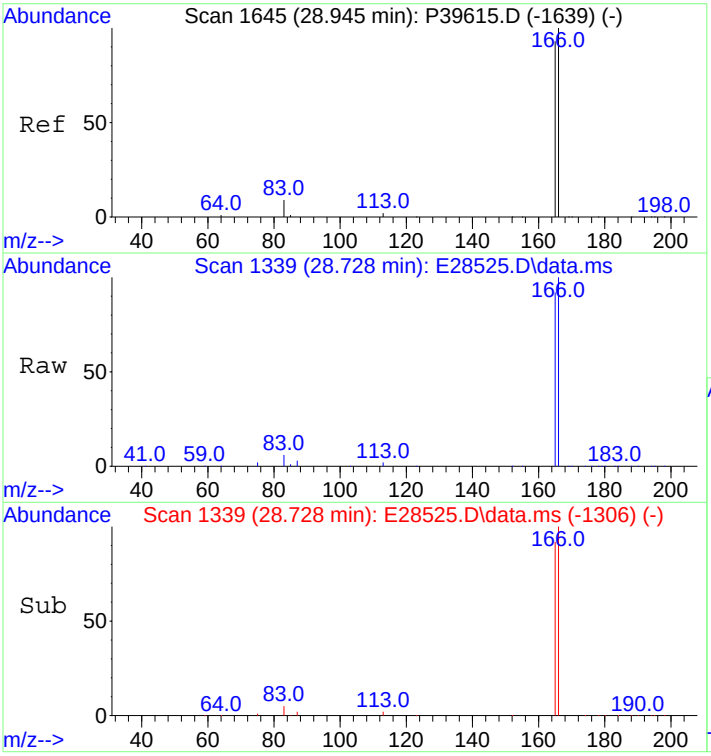


#28
2,3,5-Trimethylnaphthalene
Concen: 5223.53 ng/mL
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:170 Resp: 376690

Ion	Ratio	Lower	Upper
170	100		
155	91.5	75.9	113.9

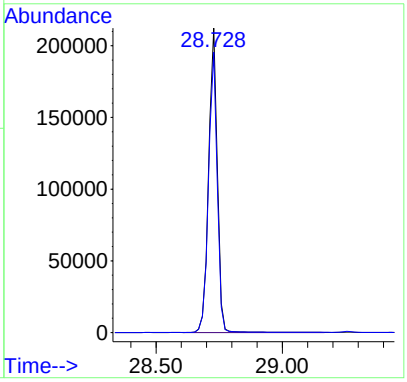


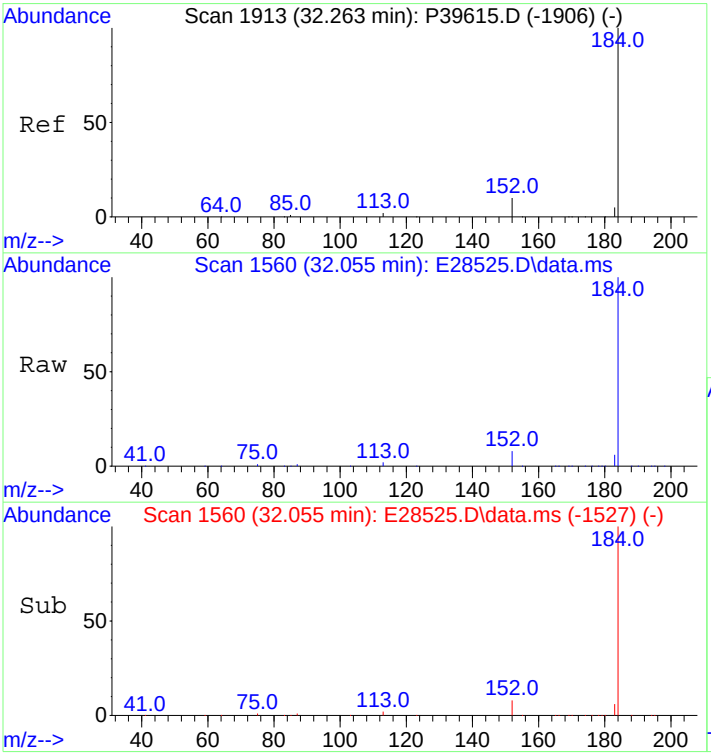


#29
Fluorene
Concen: 5252.40 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:166 Resp: 508103

Ion	Ratio	Lower	Upper
166	100		
165	92.4	73.8	110.6

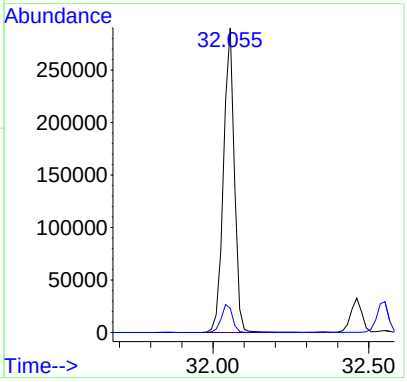


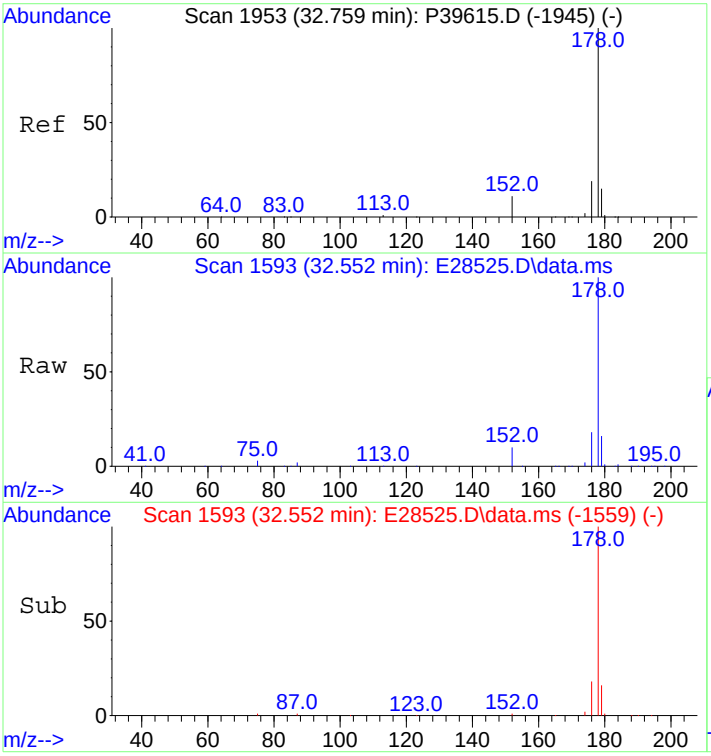


#33
Dibenzothiophene
Concen: 5181.64 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:184 Resp: 701873

Ion	Ratio	Lower	Upper
184	100		
152	9.5	6.2	9.2#

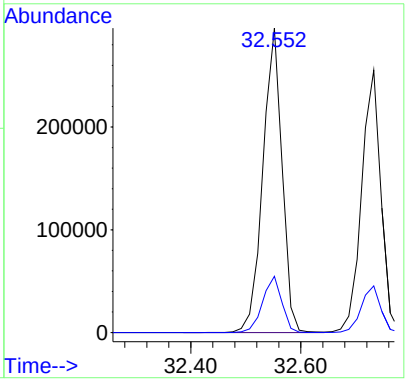


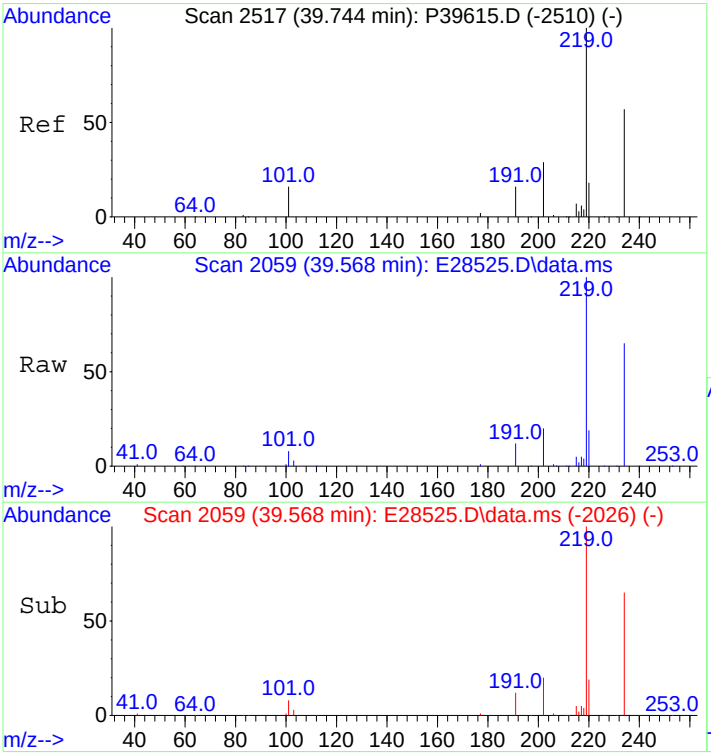


#43
Phenanthrene
Concen: 5064.28 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:178 Resp: 715454

Ion	Ratio	Lower	Upper
178	100		
176	18.5	15.0	22.6

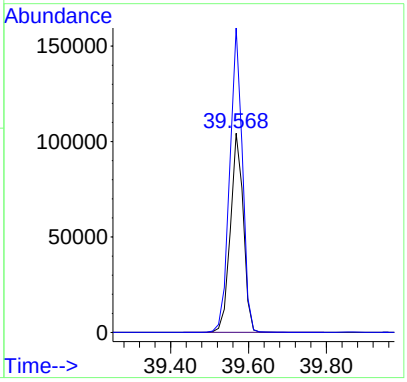


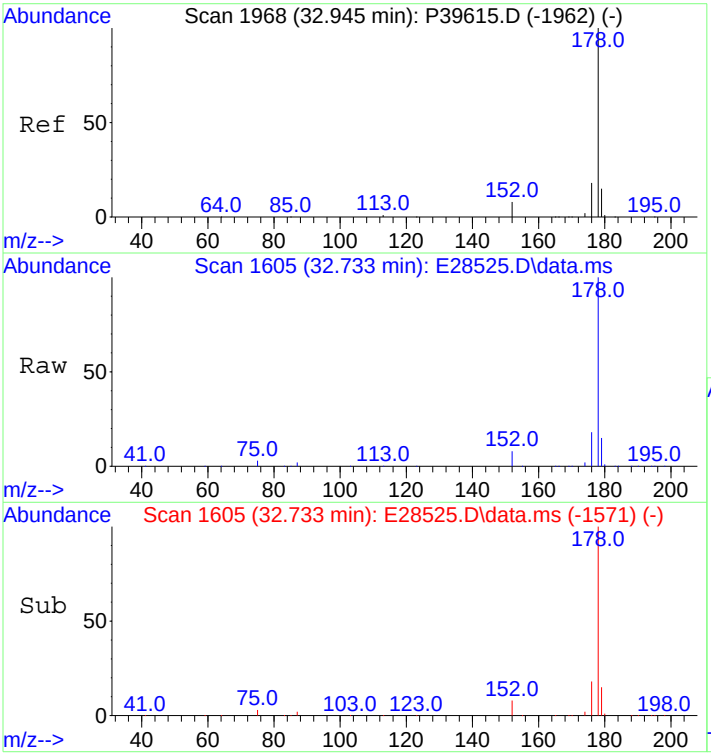


#54
Retene
Concen: 5556.39 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:234 Resp: 240302

Ion	Ratio	Lower	Upper
234	100		
219	149.9	113.0	169.4

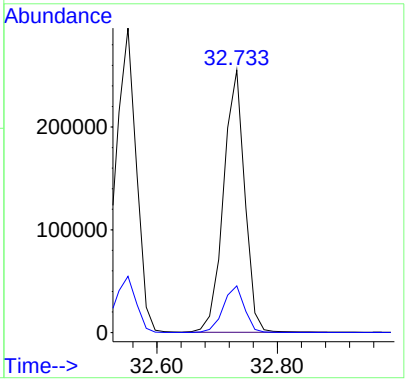


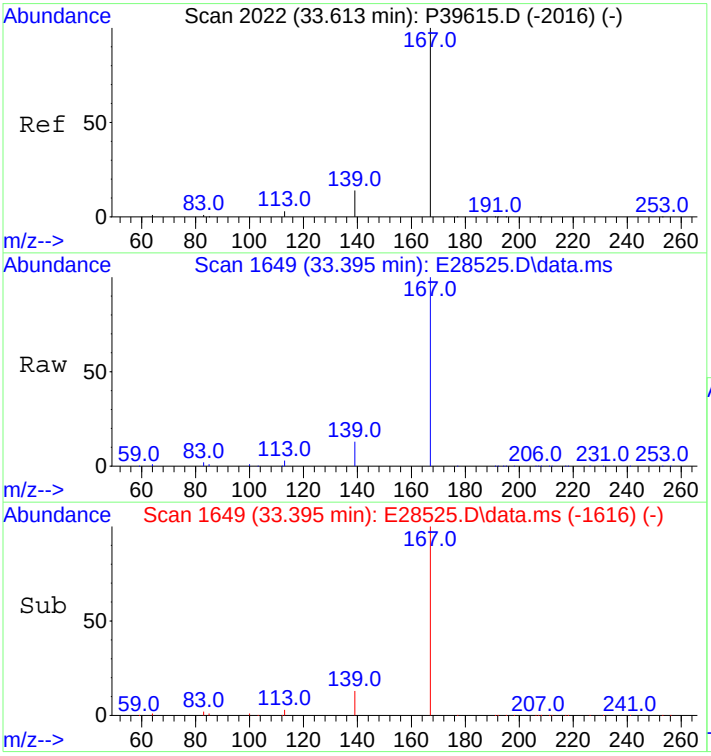


#55
Anthracene
Concen: 4706.47 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:178 Resp: 623046

Ion	Ratio	Lower	Upper
178	100		
176	18.2	14.5	21.7

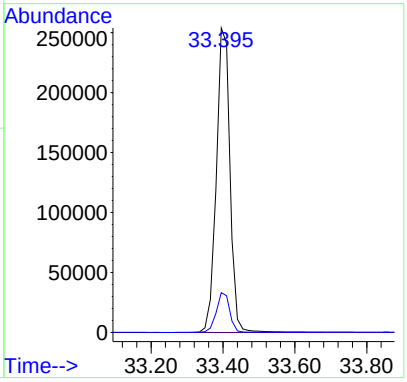


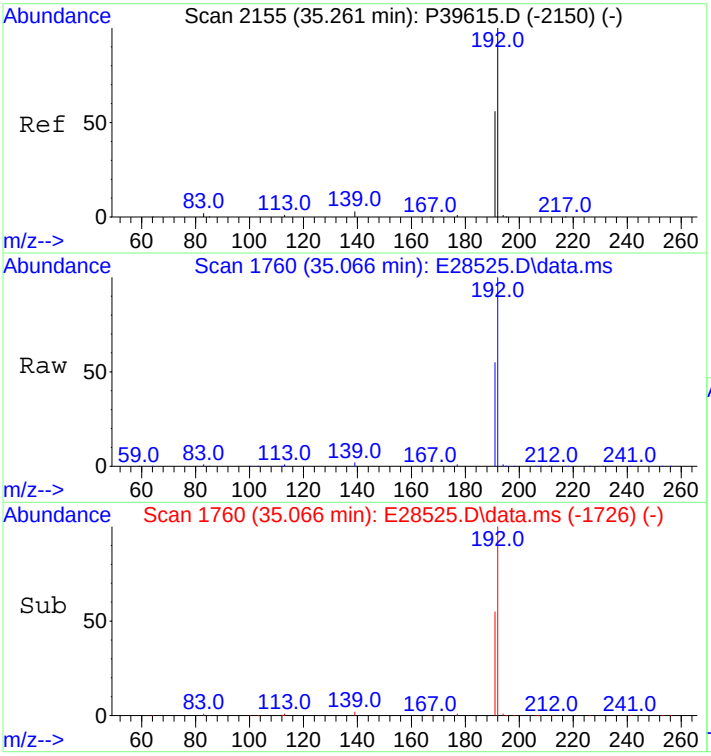


#56
Carbazole
Concen: 5375.45 ng/mL
RT: 33.395 min Scan# 1649
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:167 Resp: 672100

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.5	15.7

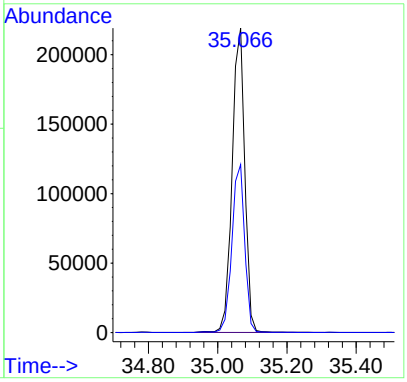


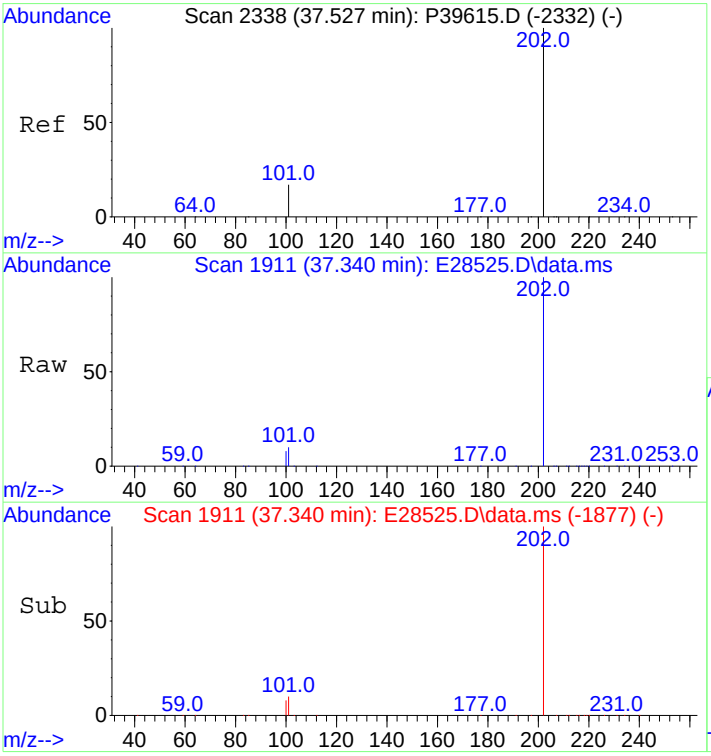


#57
1-Methylphenanthrene
Concen: 5294.59 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:192 Resp: 557136

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.5	68.3

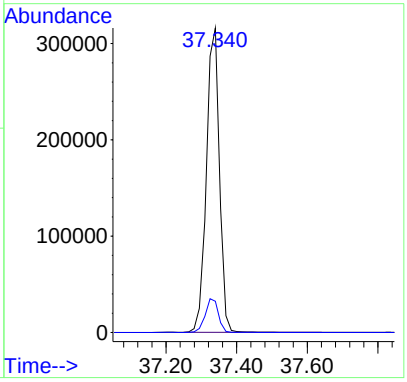


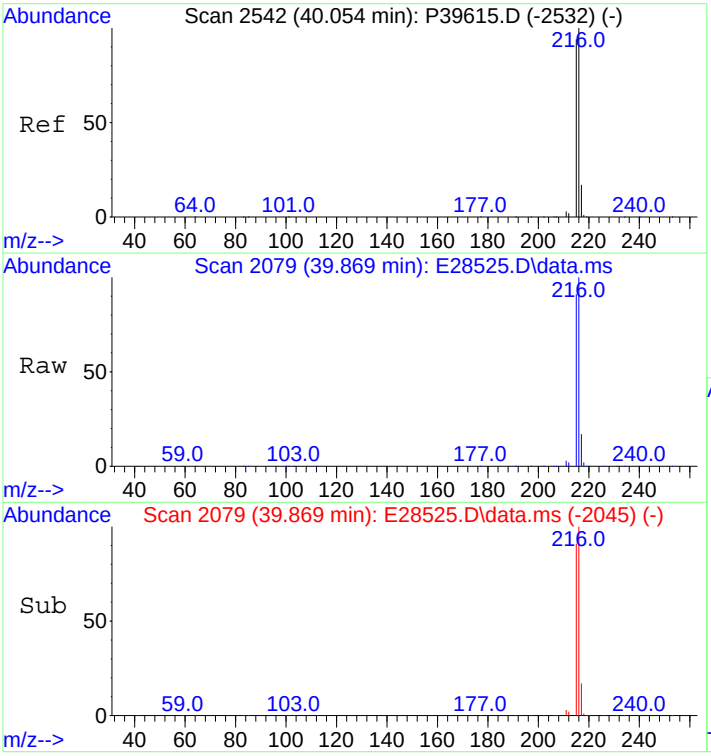


#58
Fluoranthene
Concen: 5278.66 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:202 Resp: 812711

Ion	Ratio	Lower	Upper
202	100		
101	11.2	9.2	13.8

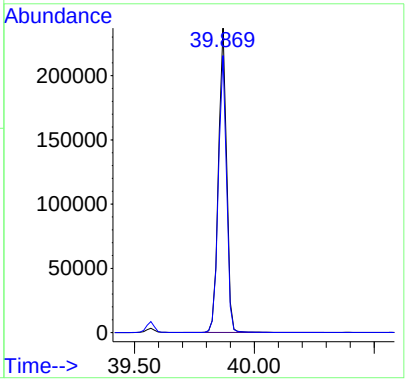


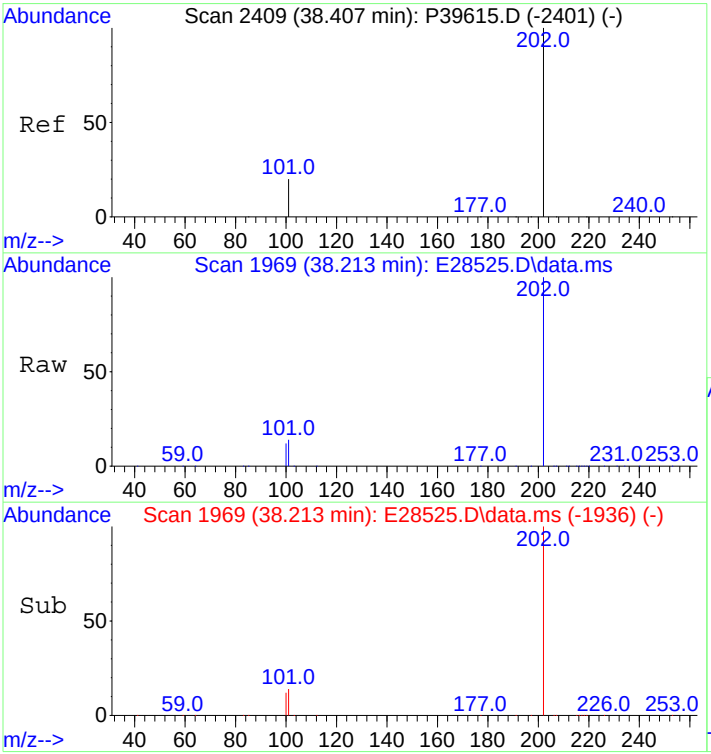


#59
Benzo(b)fluorene
Concen: 5756.59 ng/mL
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:216 Resp: 563733

Ion	Ratio	Lower	Upper
216	100		
215	91.2	73.8	110.8

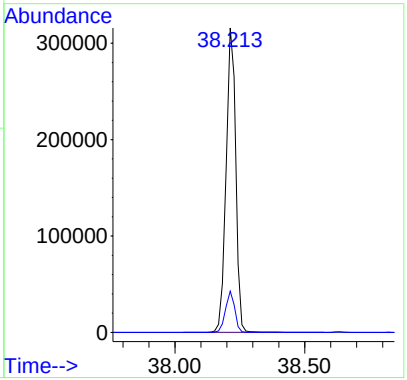


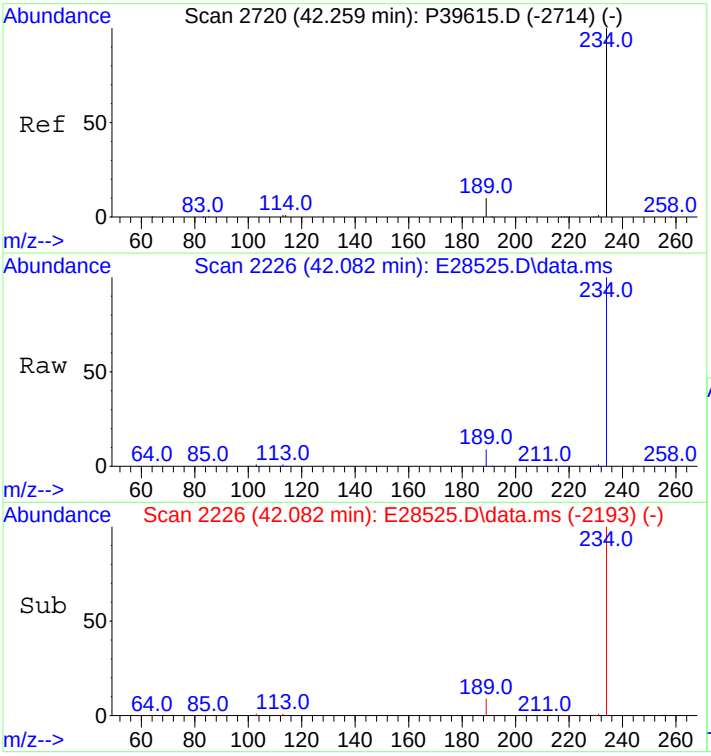


#60
Pyrene
Concen: 5234.53 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:202 Resp: 811273

Ion	Ratio	Lower	Upper
202	100		
101	13.0	9.8	14.8

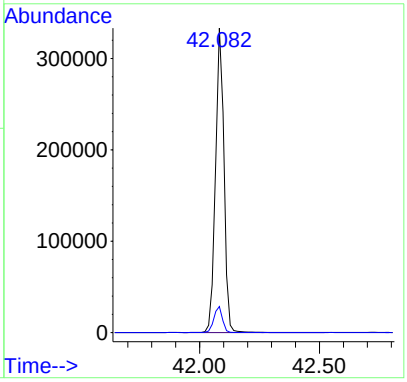


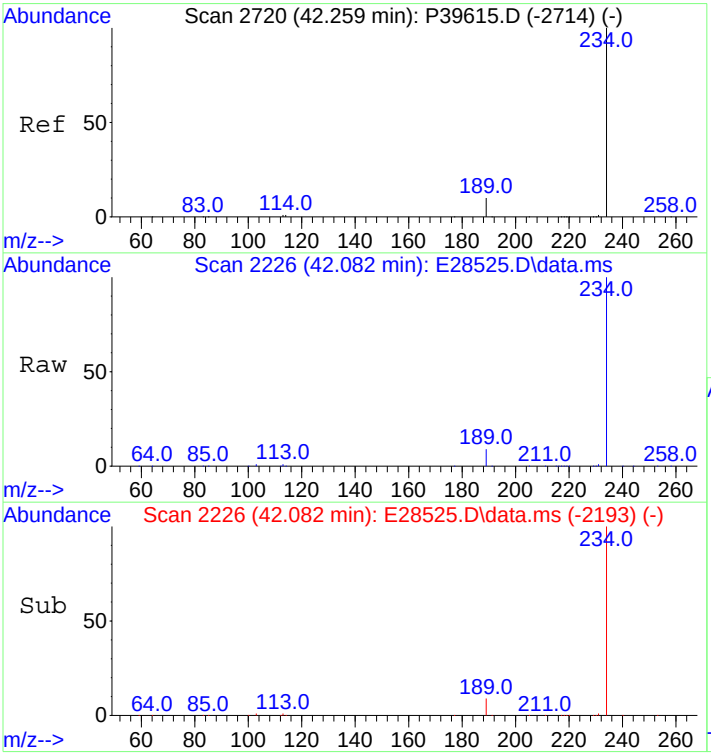


#66
Naphthobenzothiophene
Concen: 5594.50 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:234 Resp: 818126

Ion	Ratio	Lower	Upper
234	100		
189	8.7	5.5	8.3#

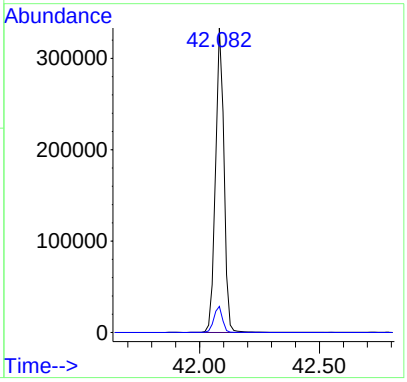


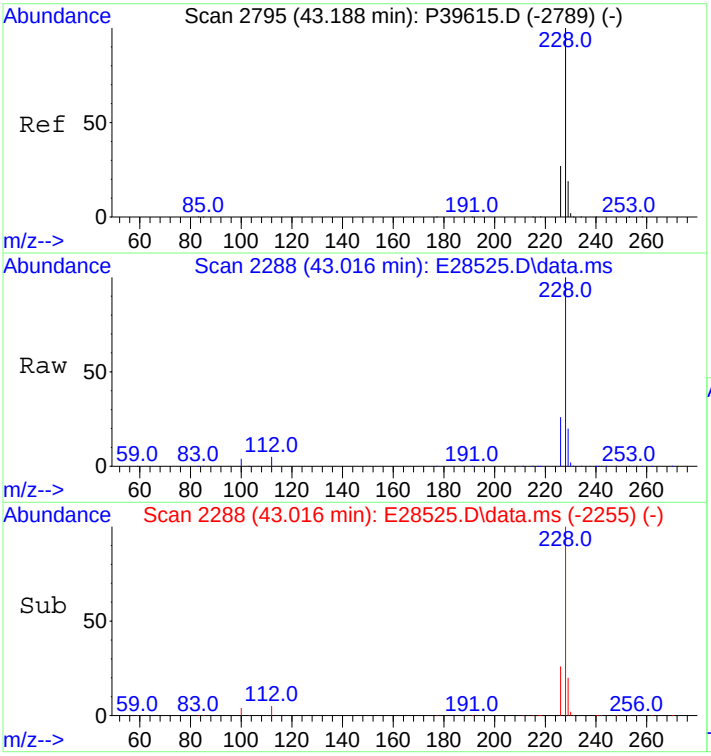


#67
Naphthobenzothiophene-2,1-D
Concen: 5594.50 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:234 Resp: 818126

Ion	Ratio	Lower	Upper
234	100		
189	8.7	5.5	8.3#

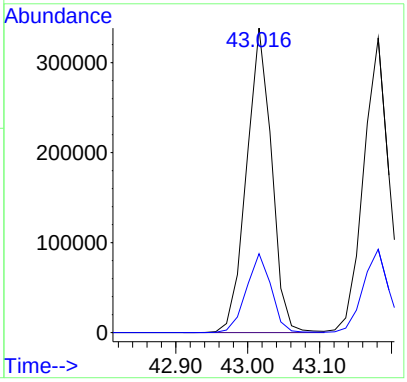


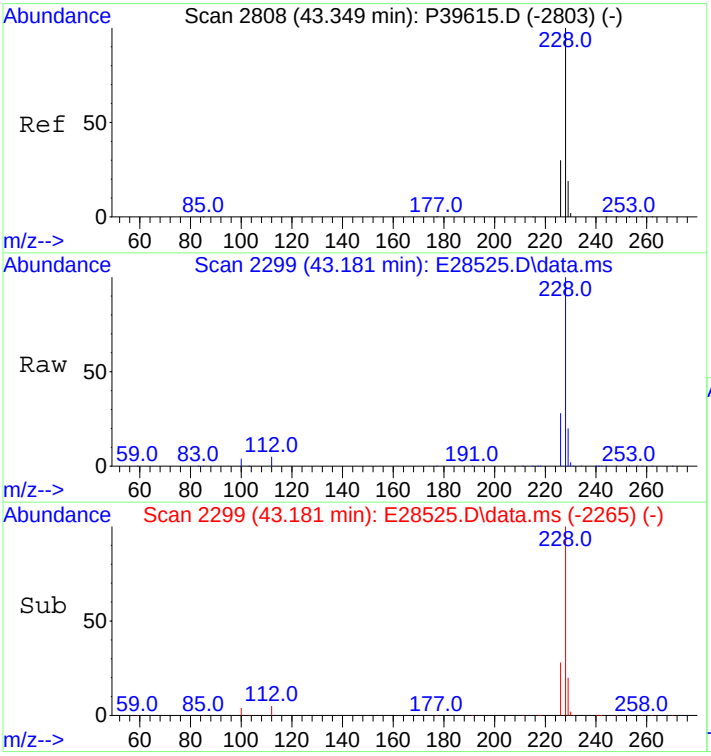


#75
Benz[a]anthracene
Concen: 4736.66 ng/mL
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:228 Resp: 819446

Ion	Ratio	Lower	Upper
228	100		
226	25.8	20.2	30.4

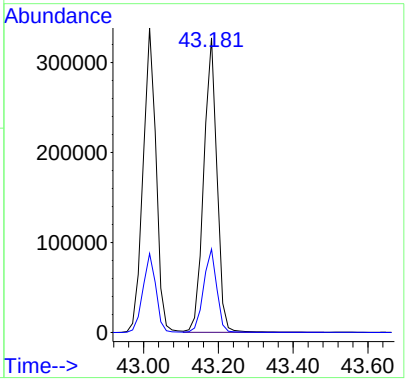


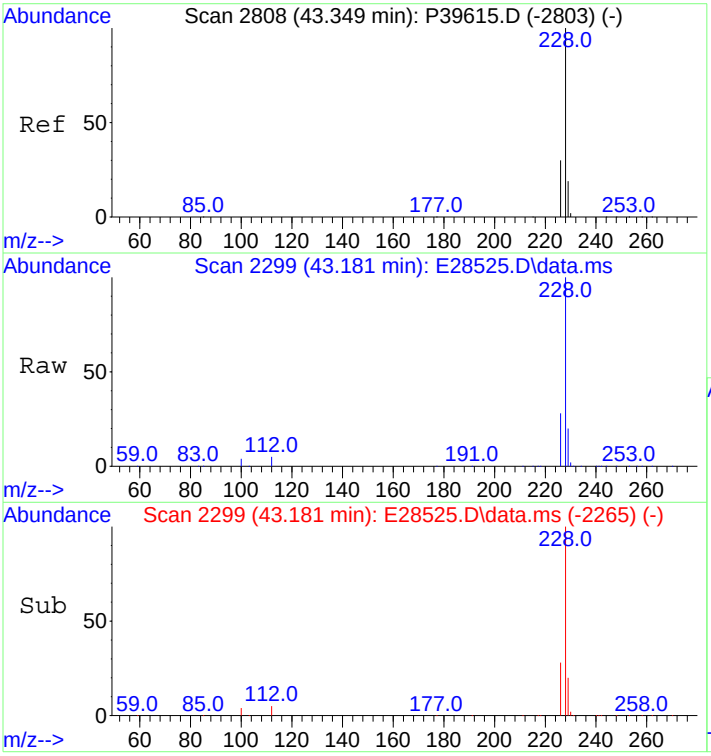


#76
Chrysene
Concen: 4721.40 ng/mL
RT: 43.181 min Scan# 2299
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:228 Resp: 799496

Ion	Ratio	Lower	Upper
228	100		
226	28.3	22.6	34.0

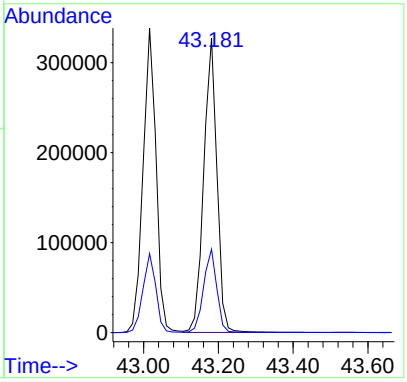


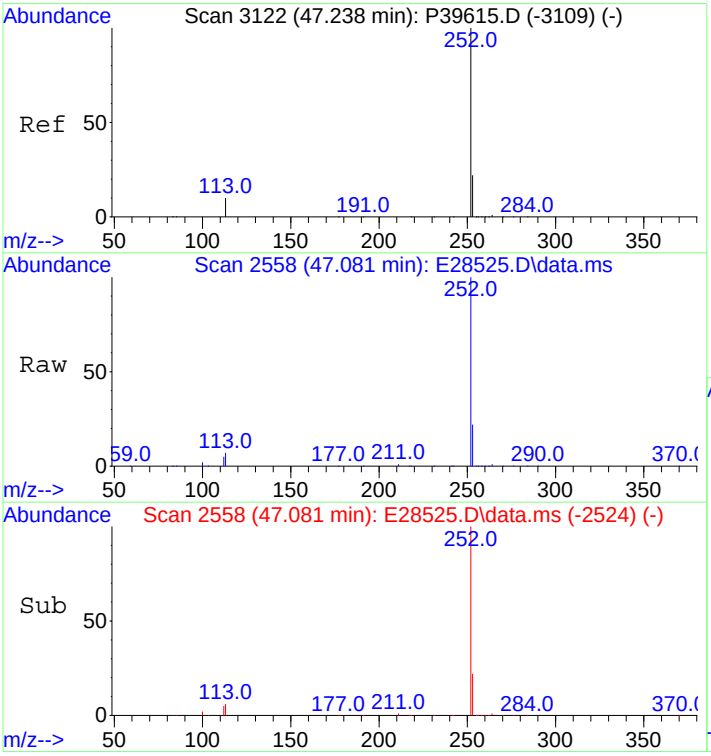


#77
Chrysene/Triphenylene
Concen: 4721.40 ng/mL
RT: 43.181 min Scan# 2299
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:228 Resp: 799496

Ion	Ratio	Lower	Upper
228	100		
226	28.3	22.6	34.0

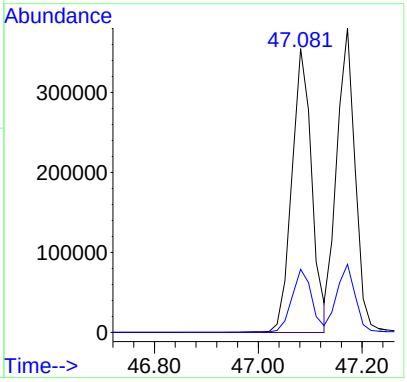


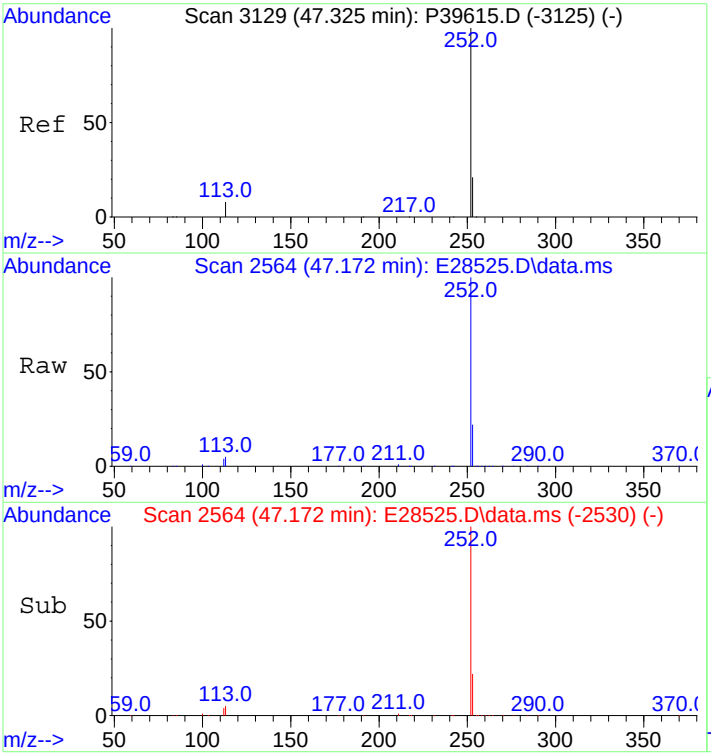


#84
Benzo[b]fluoranthene
Concen: 5206.97 ng/mL
RT: 47.081 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 948454

Ion	Ratio	Lower	Upper
252	100		
253	22.2	18.3	27.5

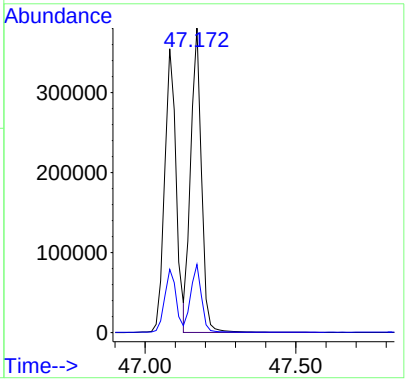


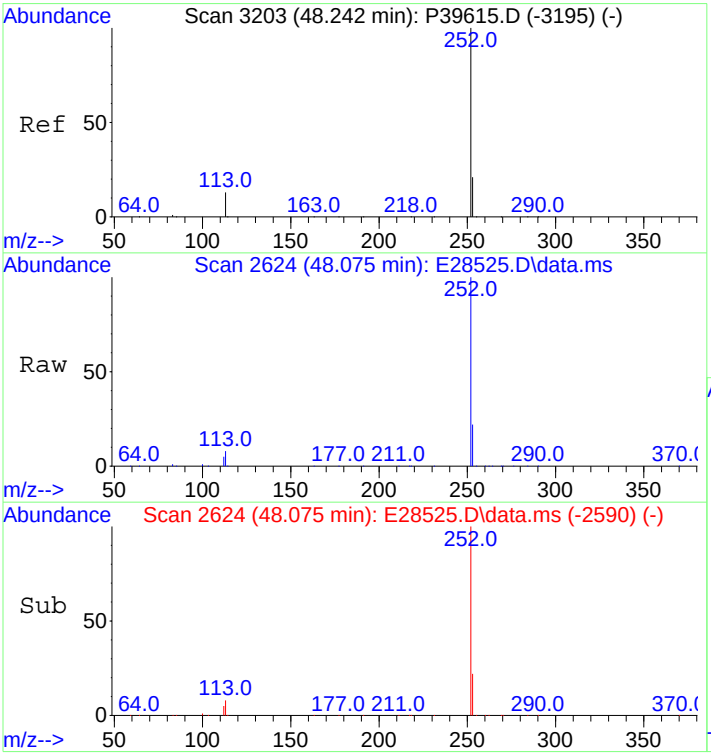


#85
Benzo[j]+[k]fluoranthene
Concen: 5522.01 ng/mL
RT: 47.172 min Scan# 2564
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 946512

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.3	27.5

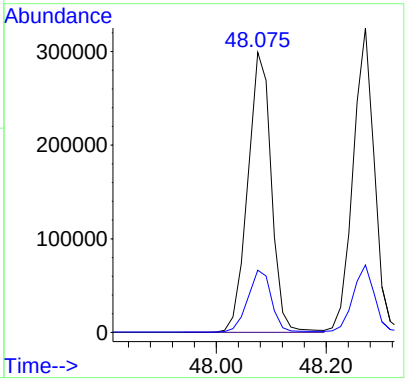


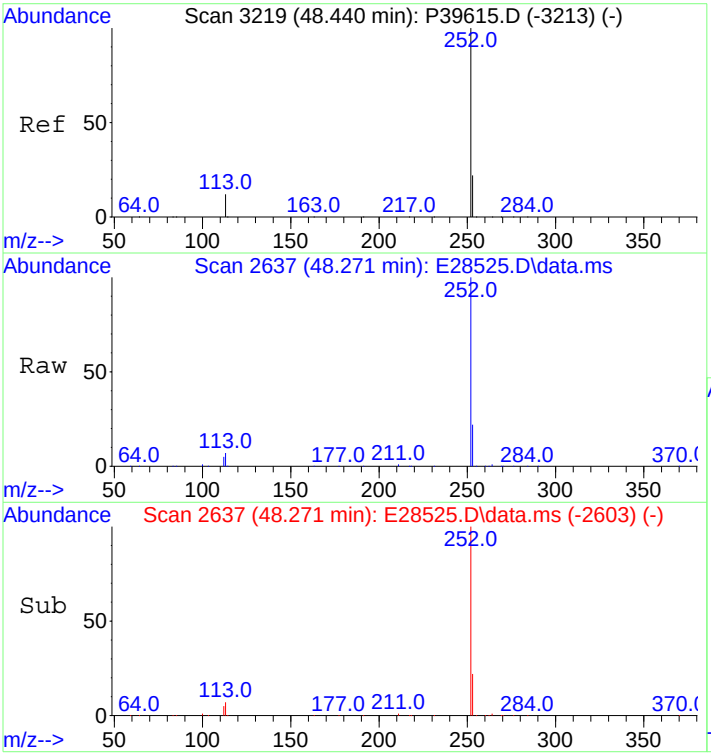


#87
Benzo[e]pyrene
Concen: 5507.77 ng/mL
RT: 48.075 min Scan# 2624
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 890237

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.6	28.0

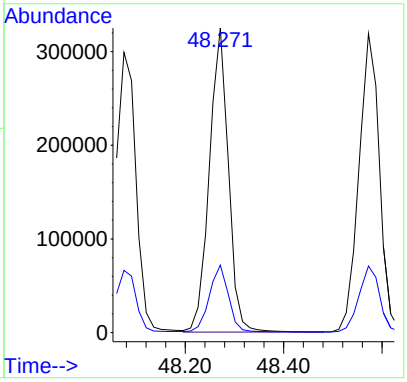


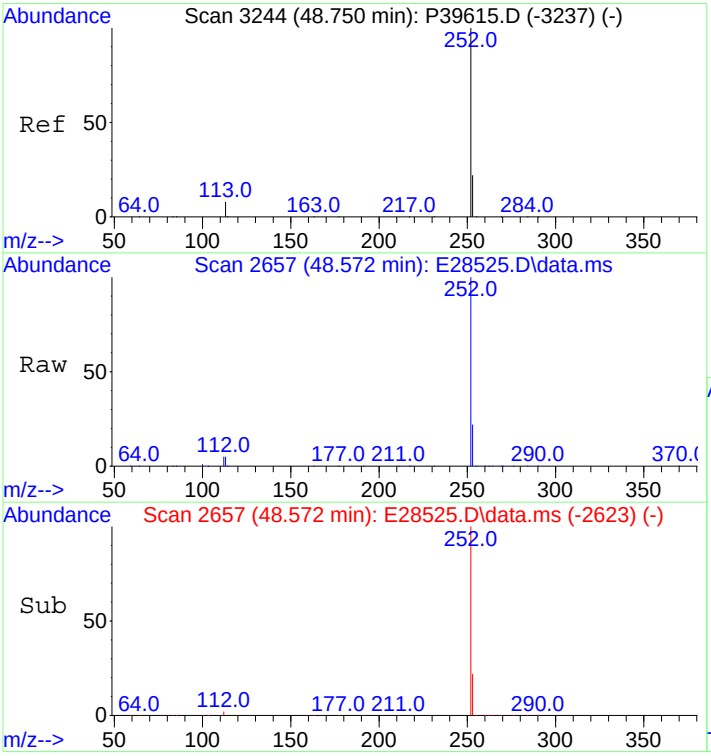


#89
Benzo[a]pyrene
Concen: 5716.86 ng/mL
RT: 48.271 min Scan# 2637
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 873584

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

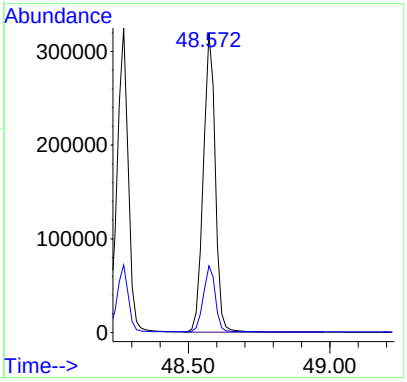


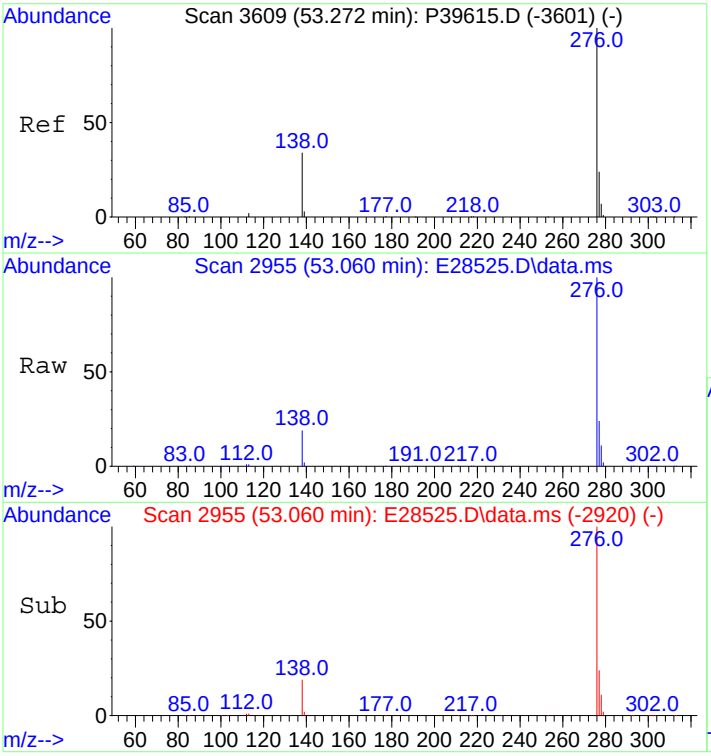


#90
Perylene
Concen: 5751.80 ng/mL
RT: 48.572 min Scan# 2657
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 935392

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

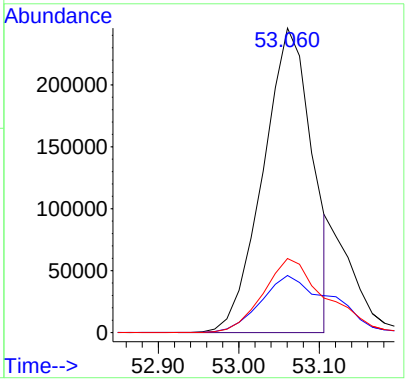


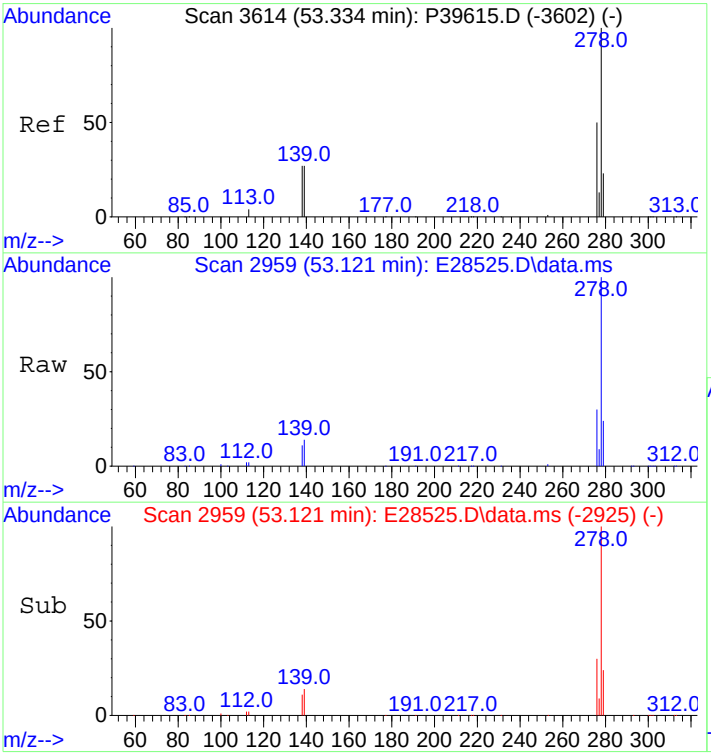


#91
Indeno[1,2,3-cd]pyrene
Concen: 5690.92 ng/mL m
RT: 53.060 min Scan# 2955
Delta R.T. 0.030 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:276 Resp: 1049897

Ion	Ratio	Lower	Upper
276	100		
138	27.1	15.4	23.2#
277	31.1	19.1	28.7#

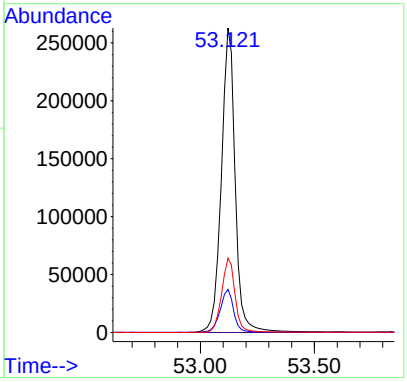


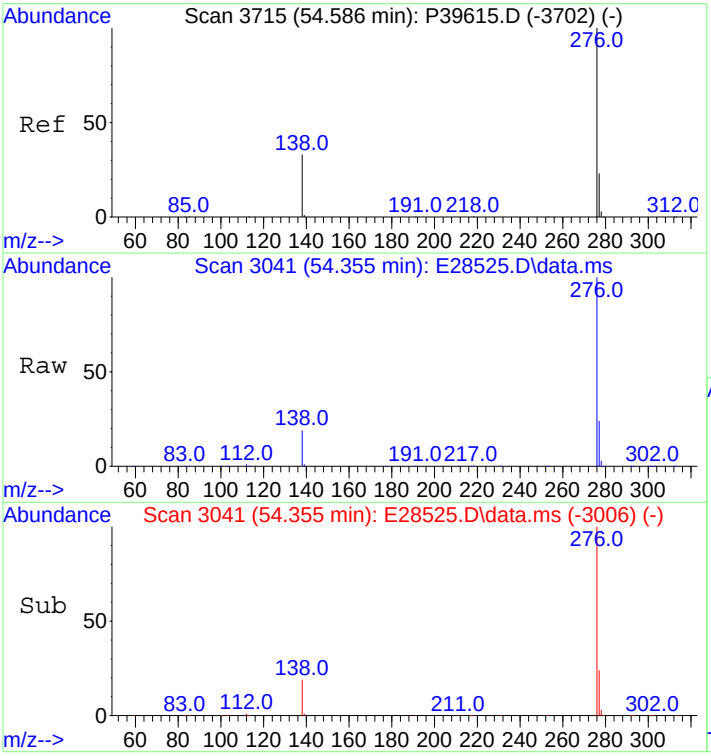


#92
Dibenz[ah]+[ac]anthracene
Concen: 6262.02 ng/mL
RT: 53.121 min Scan# 2959
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:278 Resp: 1111133

Ion	Ratio	Lower	Upper
278	100		
139	14.0	11.1	16.7
279	23.8	19.4	29.0

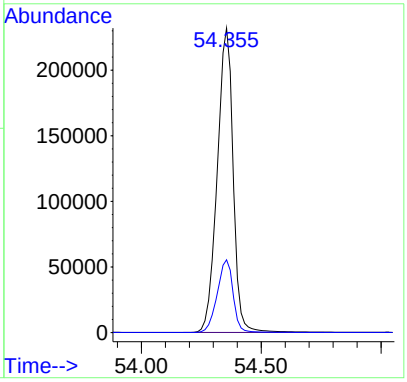


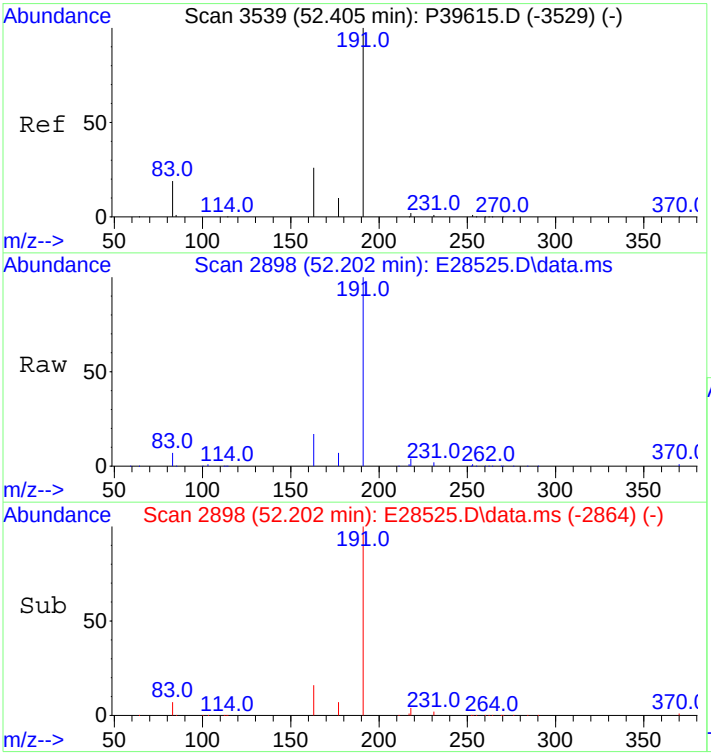


#93
Benzo[g,h,i]perylene
Concen: 5903.06 ng/mL
RT: 54.355 min Scan# 3041
Delta R.T. 0.030 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:276 Resp: 1070138

Ion	Ratio	Lower	Upper
276	100		
277	24.0	19.1	28.7

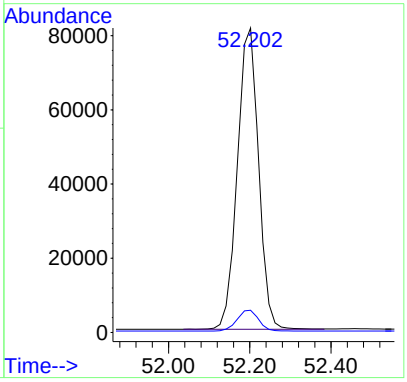


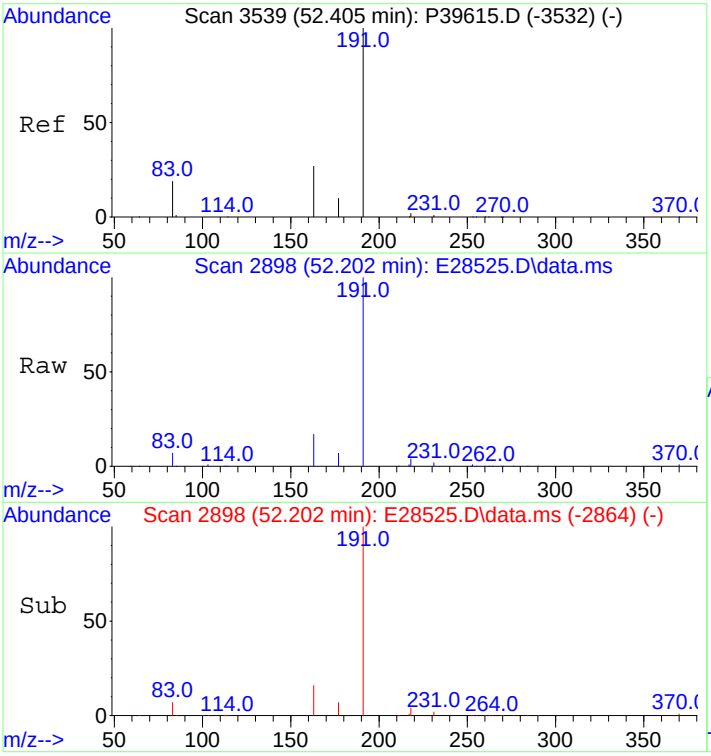


#94
Hopane (T19)
Concen: 6862.37 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:191 Resp: 293886

Ion	Ratio	Lower	Upper
191	100		
177	7.1	8.7	13.1#

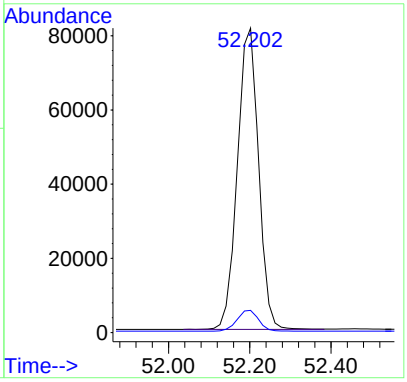




#95
17a(H),21B(H)-hopane - C30H52
Concen: 6862.37 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:191 Resp: 293886

Ion	Ratio	Lower	Upper
191	100		
177	7.1	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 12:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.575	164	34237M3	500.000 ng/mL	0.00
74) Chrysene-d12	43.076	240	83845	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.605	136	1249184	9794.704 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 979.47%#		
42) Phenanthrene-d10	32.462	188	1381837	10751.358 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1075.14%#		
83) Benzo[b]fluoranthene-d12	47.021	264	1786107	11251.833 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1125.18%#		
88) Benzo[a]pyrene-d12	48.196	264	1750732	12160.609 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1216.06%#		
129) 5B(H)Cholane - Surr	43.723	217	325906	10543.794 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1054.38%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	128304	4501.898 ng/mL	100
4) cis-Decalin	17.483	138	99422	4592.482 ng/mL	100
10) Naphthalene	19.680	128	1288199	9416.689 ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	853166	9636.608 ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	824452	9710.342 ng/mL#	100
18) Benzothiophene	19.906	134	1095341	9815.012 ng/mL	100
23) Biphenyl	24.272	154	1084695	9673.576 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	792979	9825.029 ng/mL#	100
25) Dibenzofuran	27.358	168	1242869	10256.606 ng/mL	97
26) Acenaphthylene	25.973	152	1390024M3	10291.595 ng/mL	
27) Acenaphthene	26.711	153	862774	10250.123 ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	754332	10339.879 ng/mL	95
29) Fluorene	28.728	166	1008743	10307.649 ng/mL	100
33) Dibenzothiophene	32.055	184	1394373	10175.622 ng/mL#	95
43) Phenanthrene	32.552	178	1429622	10003.004 ng/mL	100
54) Retene	39.583	234	485174	11089.355 ng/mL	94
55) Anthracene	32.733	178	1096223M3	8185.530 ng/mL	
56) Carbazole	33.410	167	1356581	10725.058 ng/mL	99
57) 1-Methylphenanthrene	35.066	192	1115333	10477.285 ng/mL	99
58) Fluoranthene	37.340	202	1611679M3	10347.593 ng/mL	
59) Benzo(b)fluorene	39.884	216	1126932	11375.299 ng/mL	99
60) Pyrene	38.228	202	1624916	10363.699 ng/mL	98
66) Naphthobenzothiophene	42.097	234	1632867	11037.350 ng/ml#	95
67) Naphthobenzothiophene-...	42.097	234	1632867	11037.350 ng/mL#	95
75) Benz[a]anthracene	43.031	228	1626986M3	8752.250 ng/mL	
76) Chrysene	43.197	228	1589503	8735.745 ng/mL	99
77) Chrysene/Triphenylene	43.197	228	1589503	8735.745 ng/mL	99
84) Benzo[b]fluoranthene	47.097	252	1921388	9816.767 ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.187	252	1850530	10047.358 ng/mL	99
87) Benzo[e]pyrene	48.090	252	1770929	10196.616 ng/mL	98
89) Benzo[a]pyrene	48.286	252	1716035	10451.142 ng/mL	98
90) Perylene	48.587	252	1845721	10562.348 ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.090	276	2185546M3	11025.031 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.151	278	2240598	11751.587 ng/mL	100
93) Benzo[g,h,i]perylene	54.386	276	2141401	10993.087 ng/mL	99
94) Hopane (T19)	52.202	191	594811	12925.841 ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	594811	12925.841 ng/mL#	90

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 12:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

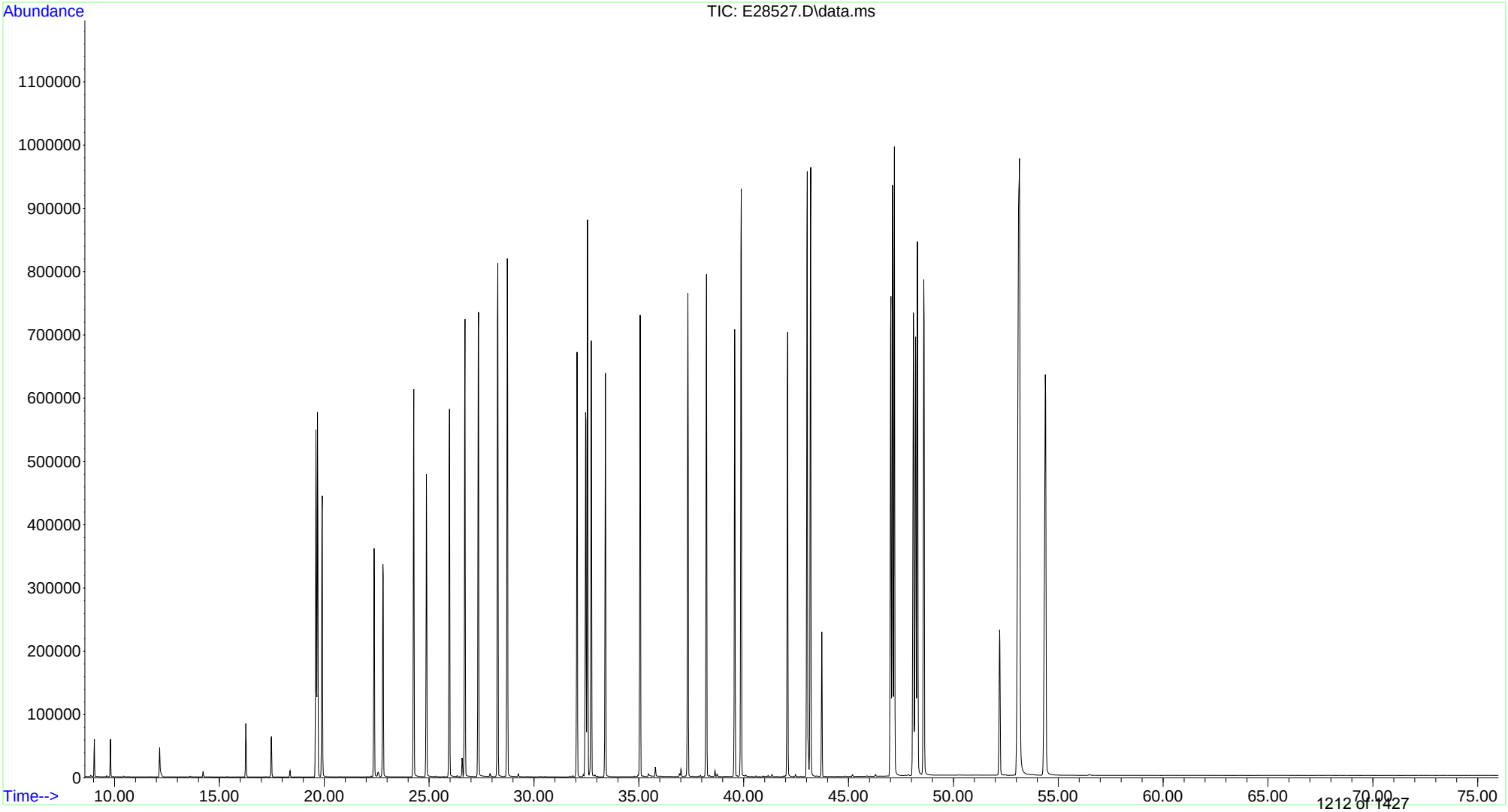
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

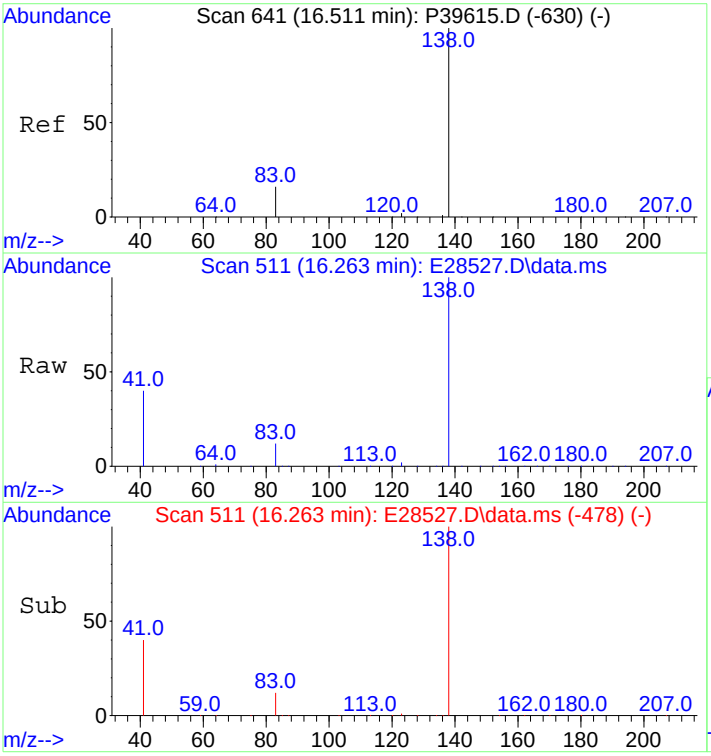
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

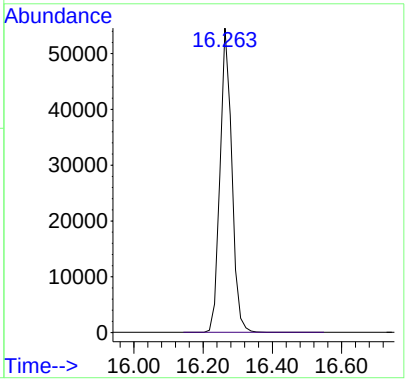
Quant Time: Oct 31 12:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

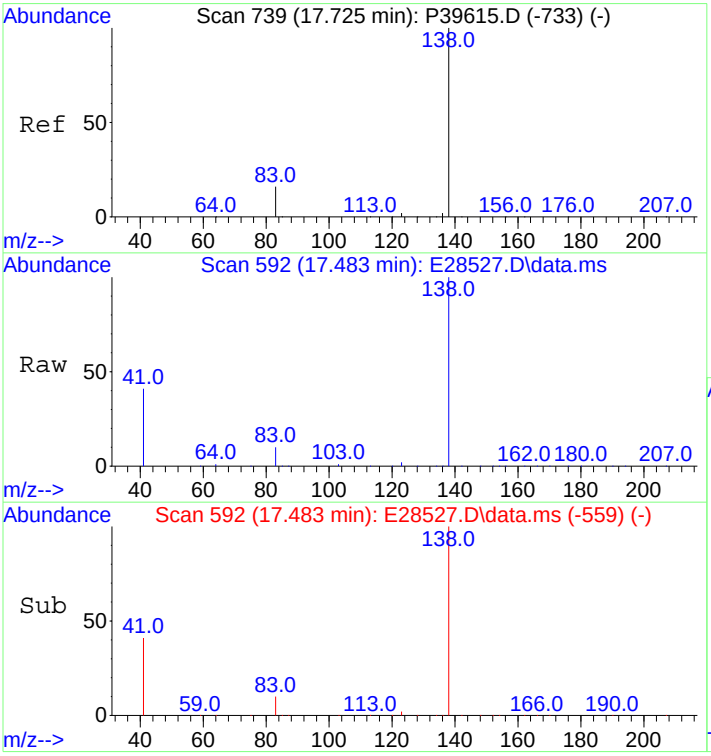




#3
trans-Decalin
Concen: 4501.90 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

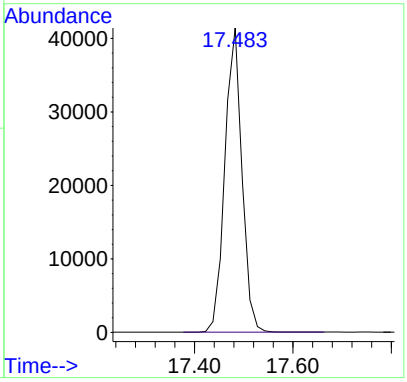
Tgt Ion:138 Resp: 128304

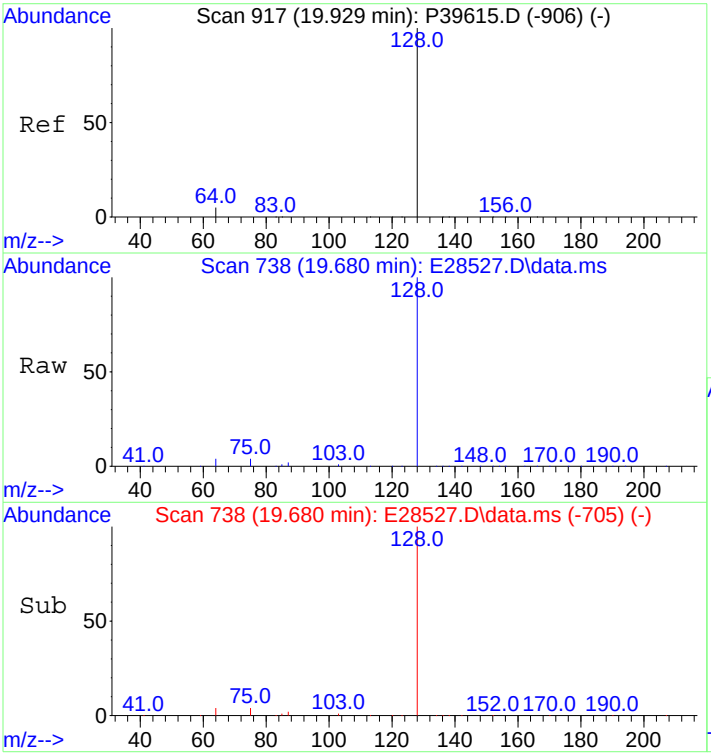




#4
cis-Decalin
Concen: 4592.48 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:138 Resp: 99422

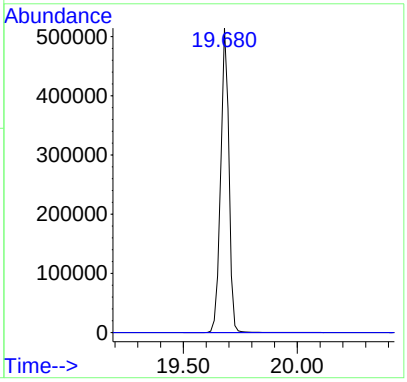


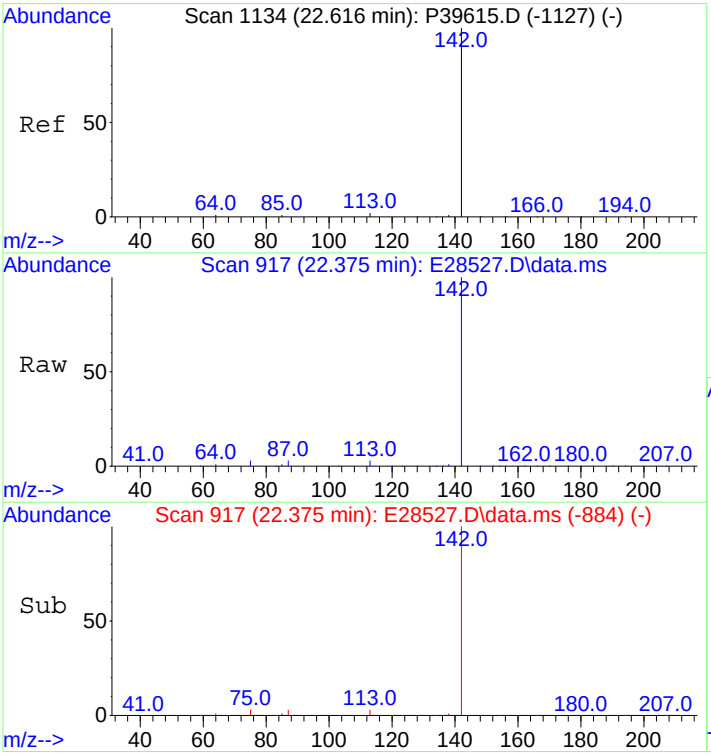


#10
Naphthalene
Concen: 9416.69 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:128 Resp: 1288199

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

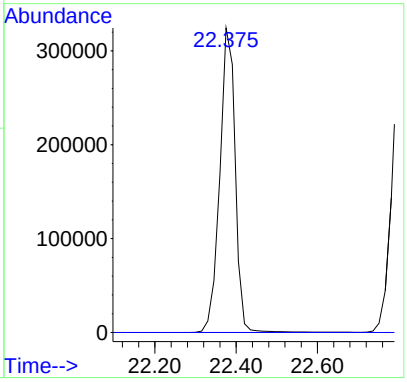


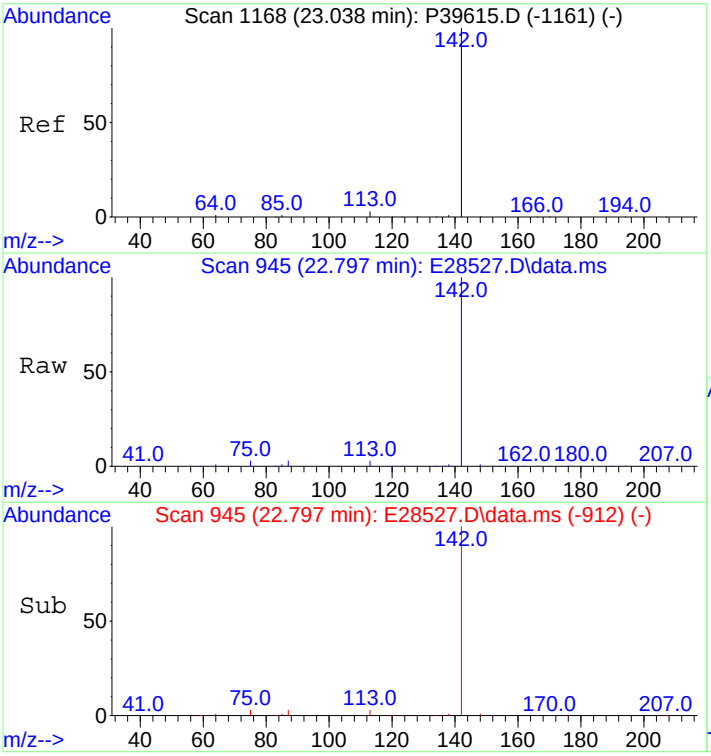


#16
2-Methylnaphthalene
Concen: 9636.61 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:142 Resp: 853166

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

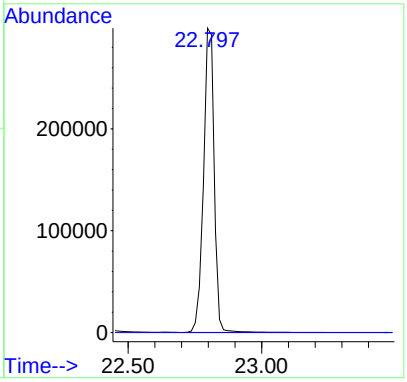


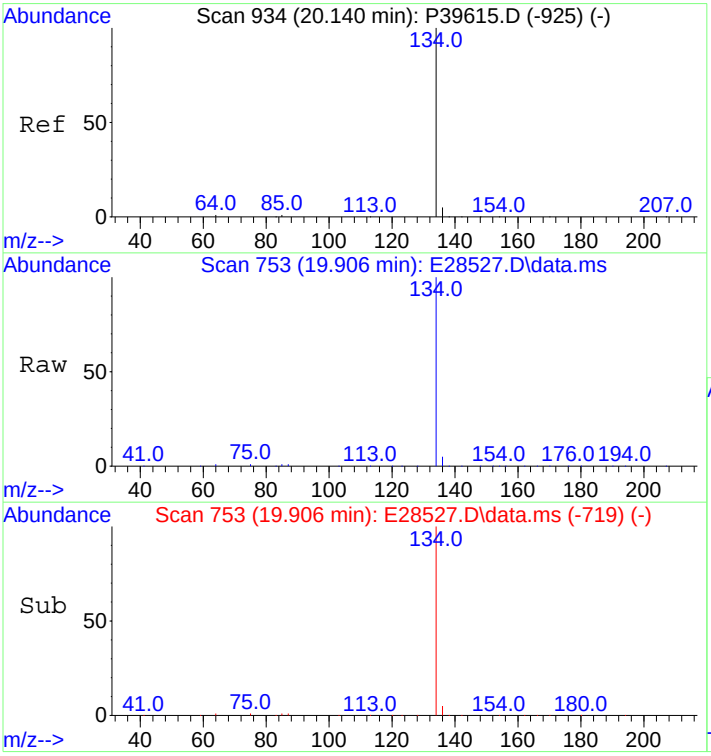


#17
1-Methylnaphthalene
Concen: 9710.34 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:142 Resp: 824452

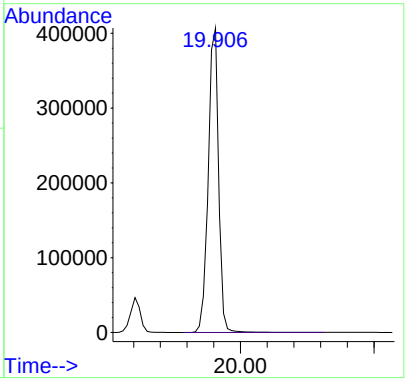
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

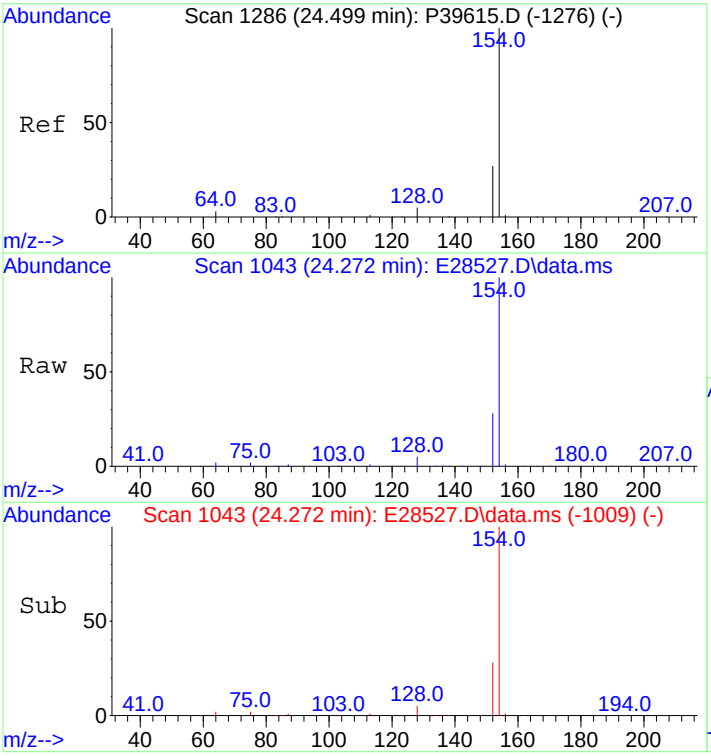




#18
Benzothiophene
Concen: 9815.01 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:134 Resp: 1095341

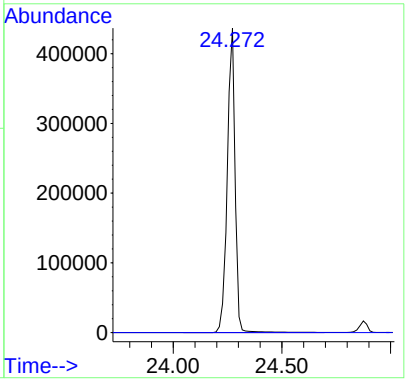


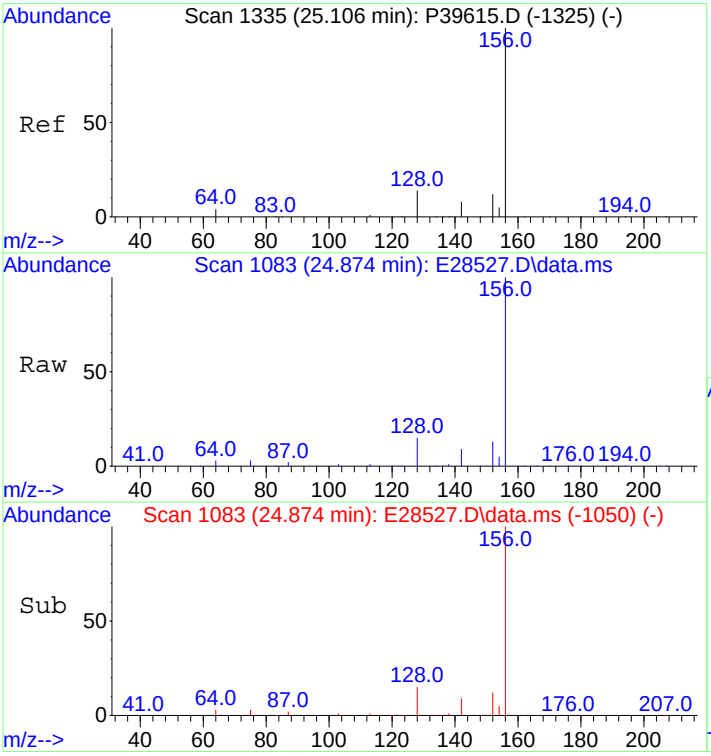


#23
Biphenyl
Concen: 9673.58 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:154 Resp: 1084695

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

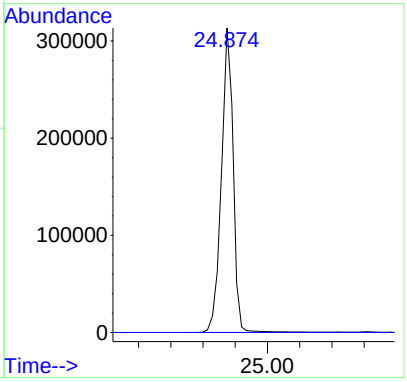


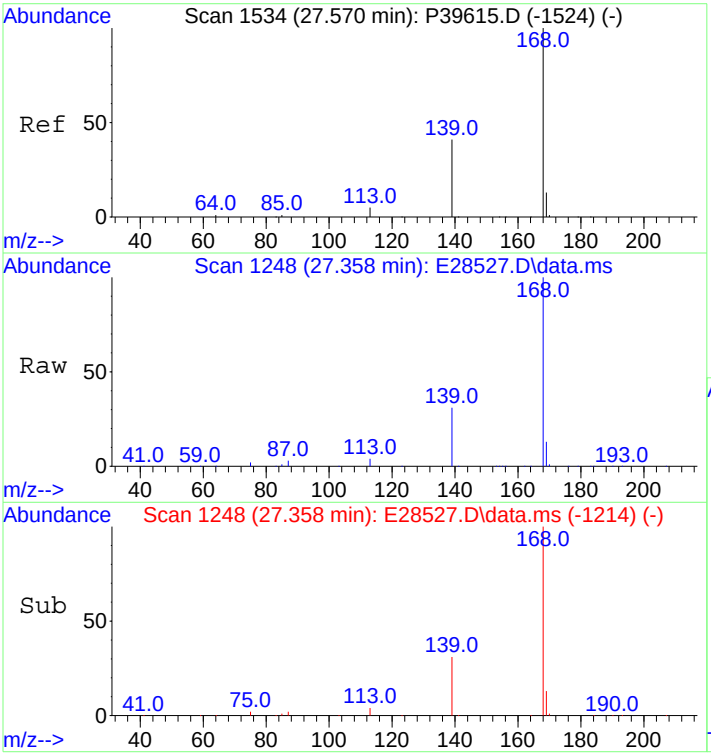


#24
2,6-Dimethylnaphthalene
Concen: 9825.03 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:156 Resp: 792979

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

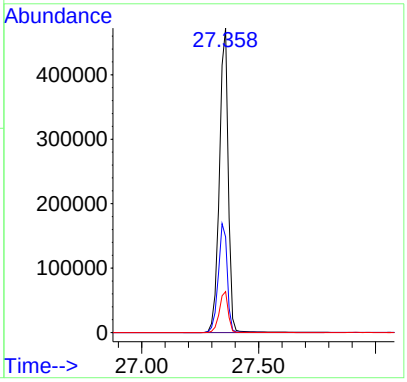


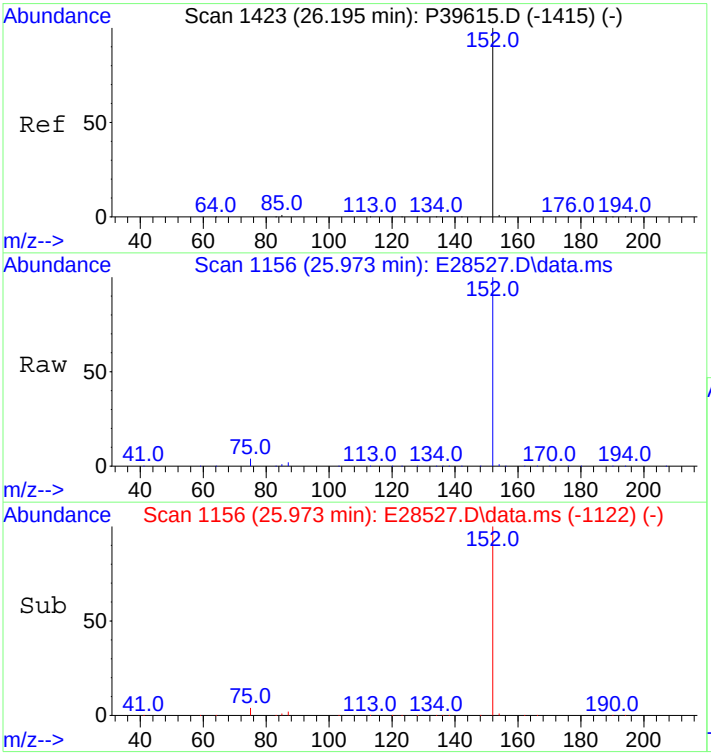


#25
Dibenzofuran
Concen: 10256.61 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:168 Resp: 1242869

Ion	Ratio	Lower	Upper
168	100		
139	36.2	30.6	45.8
169	13.5	10.6	16.0

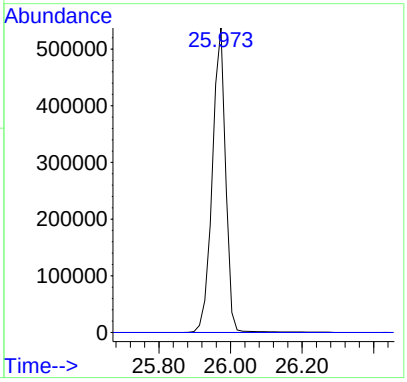


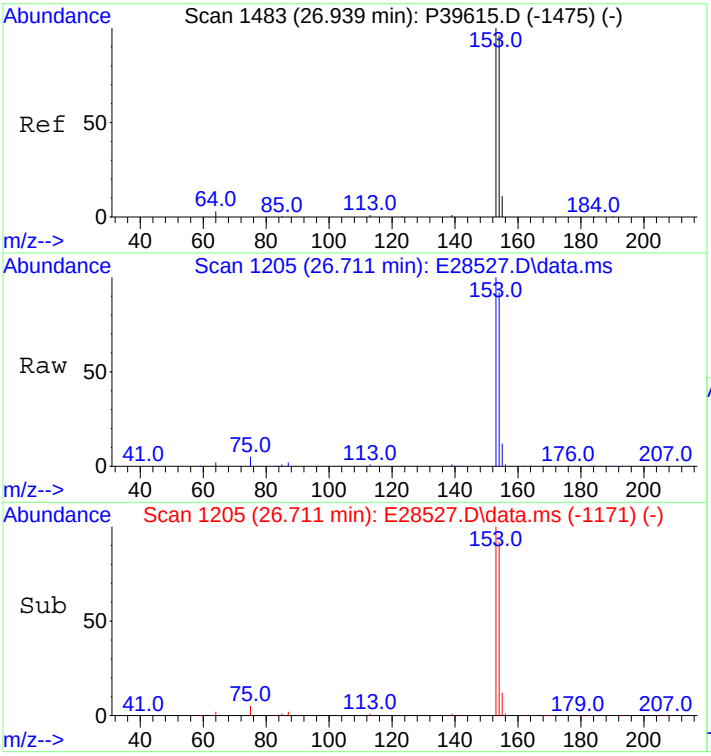


#26
Acenaphthylene
Concen: 10291.60 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:152 Resp: 1390024

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

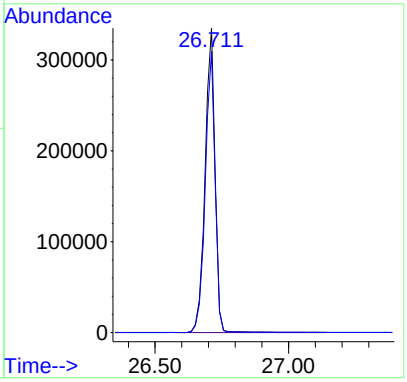


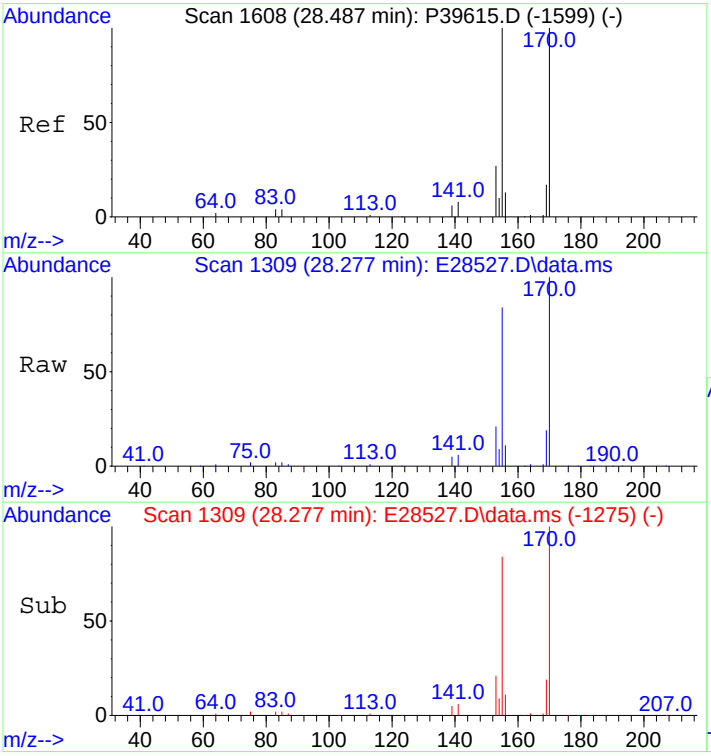


#27
Acenaphthene
Concen: 10250.12 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:153 Resp: 862774

Ion	Ratio	Lower	Upper
153	100		
154	91.8	72.3	108.5

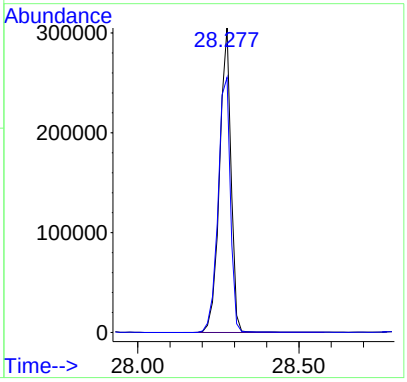


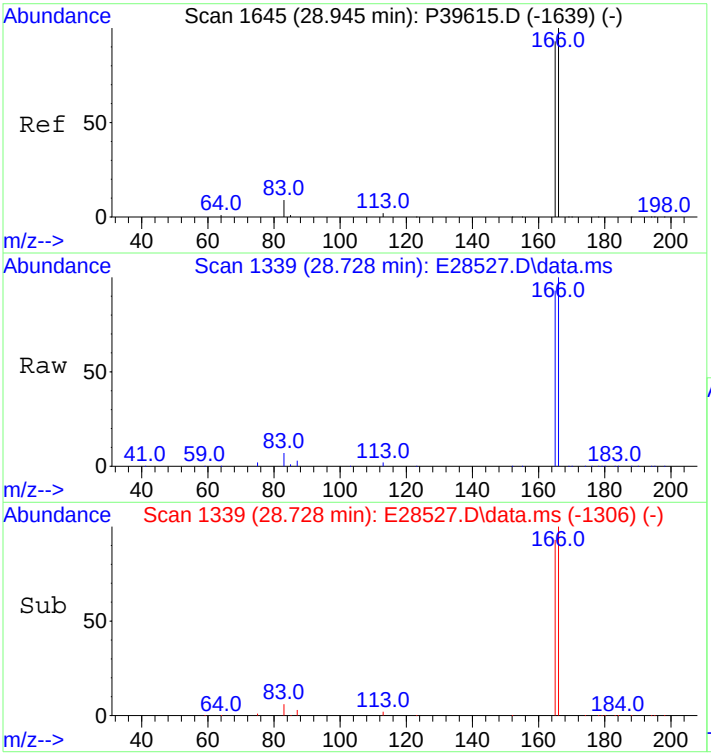


#28
2,3,5-Trimethylnaphthalene
Concen: 10339.88 ng/mL
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:170 Resp: 754332

Ion	Ratio	Lower	Upper
170	100		
155	90.1	75.9	113.9

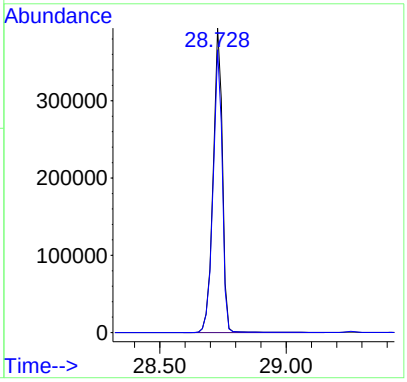


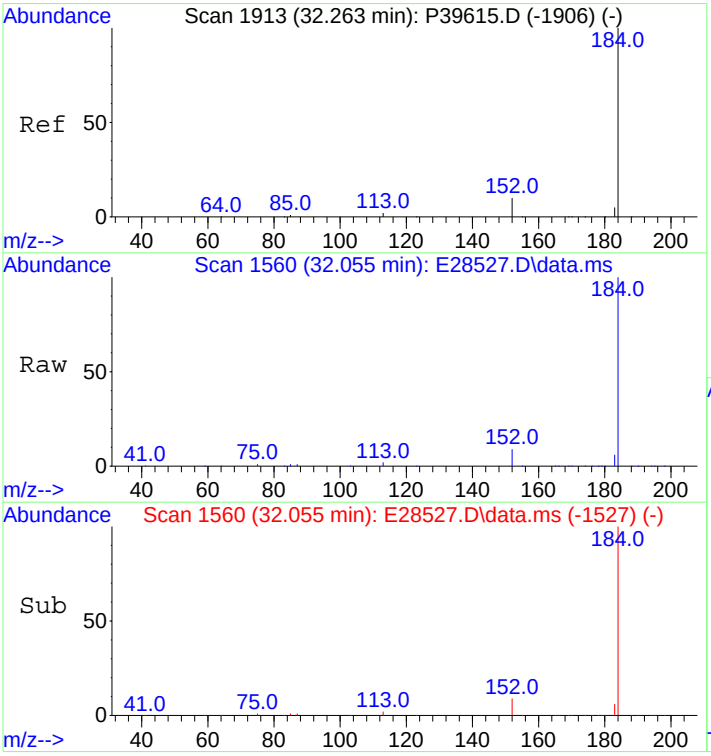


#29
Fluorene
Concen: 10307.65 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:166 Resp: 1008743

Ion	Ratio	Lower	Upper
166	100		
165	92.3	73.8	110.6

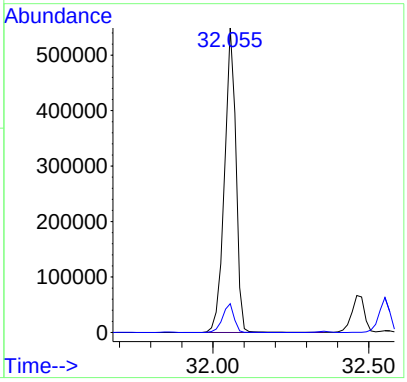


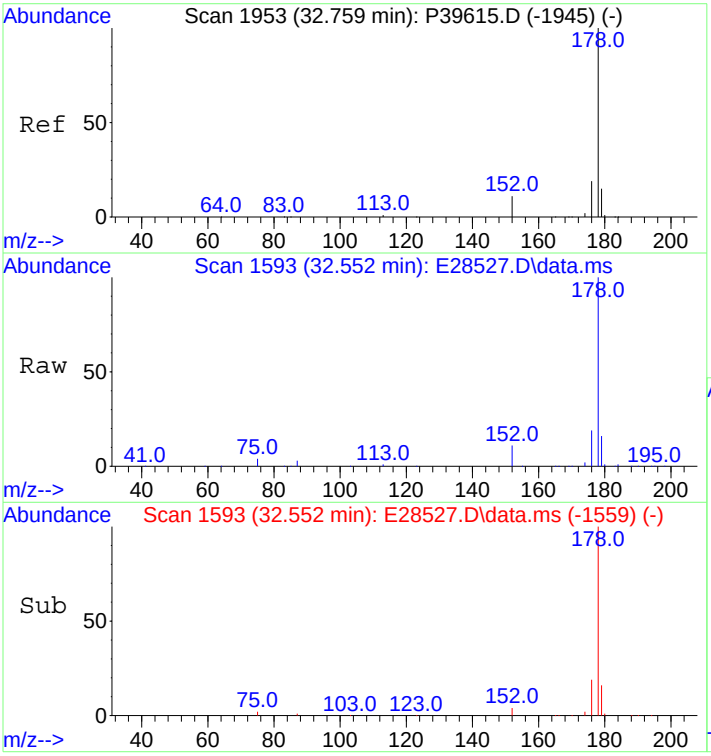


#33
Dibenzothiophene
Concen: 10175.62 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:184 Resp: 1394373

Ion	Ratio	Lower	Upper
184	100		
152	9.5	6.2	9.2#

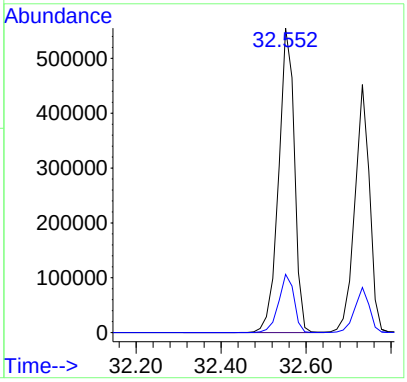


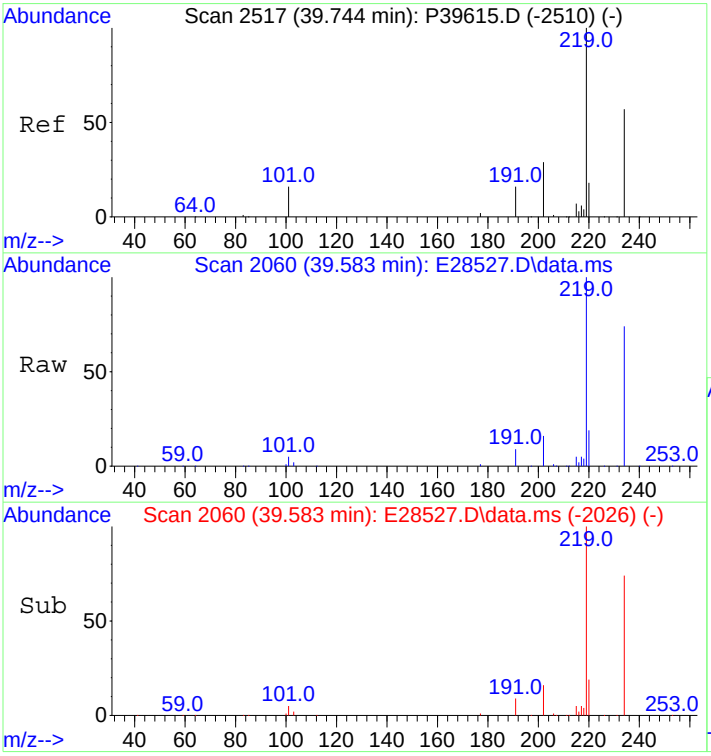


#43
Phenanthrene
Concen: 10003.00 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:178 Resp: 1429622

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.0	22.6

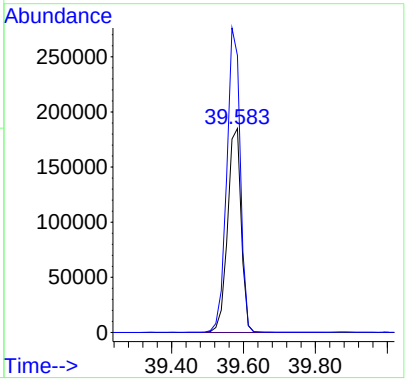


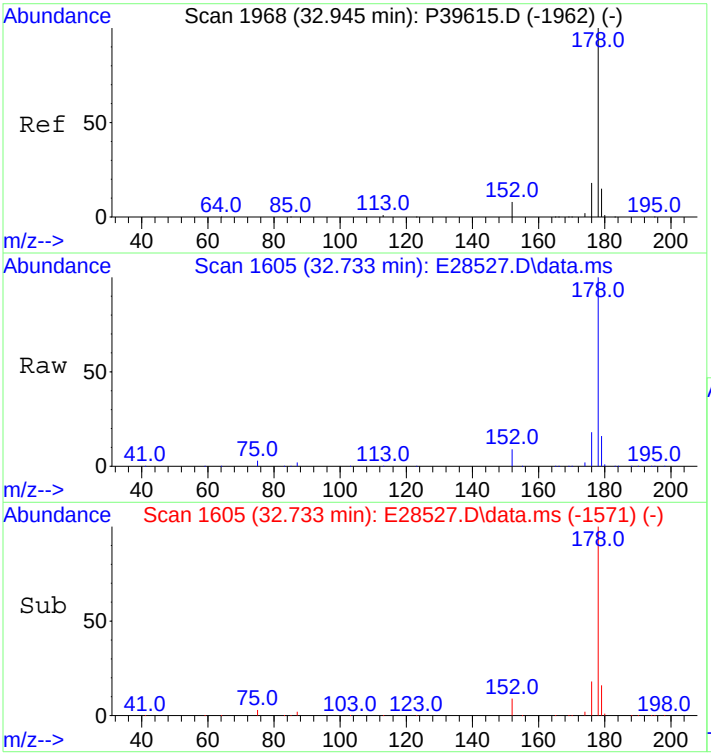


#54
Retene
Concen: 11089.35 ng/mL
RT: 39.583 min Scan# 2060
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:234 Resp: 485174

Ion	Ratio	Lower	Upper
234	100		
219	148.3	113.0	169.4

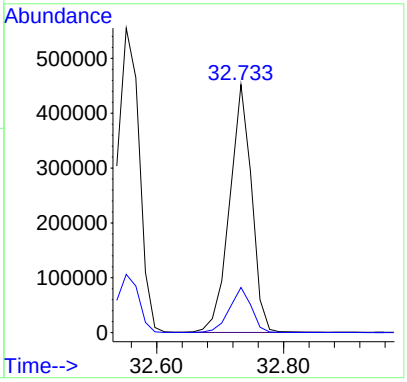


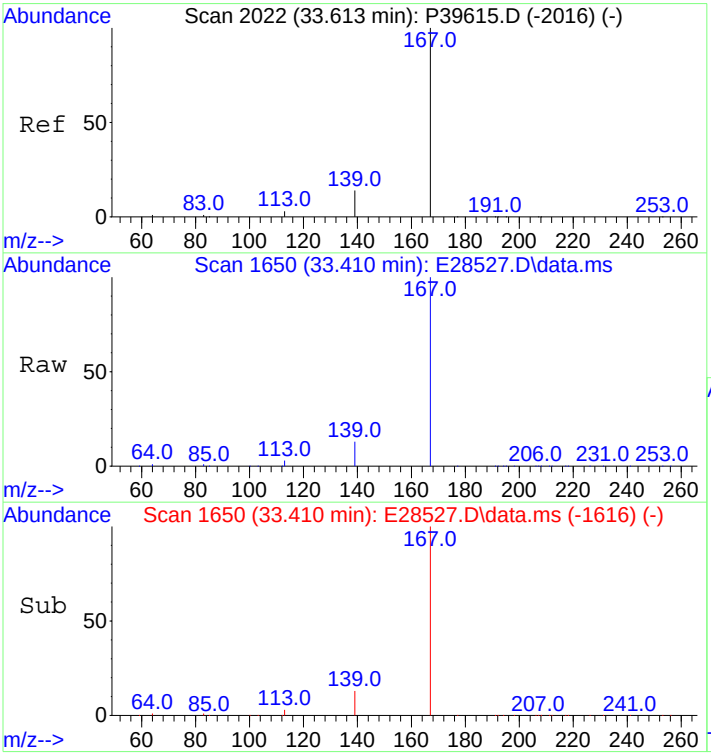


#55
Anthracene
Concen: 8185.53 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:178 Resp: 1096223

Ion	Ratio	Lower	Upper
178	100		
176	18.2	14.5	21.7

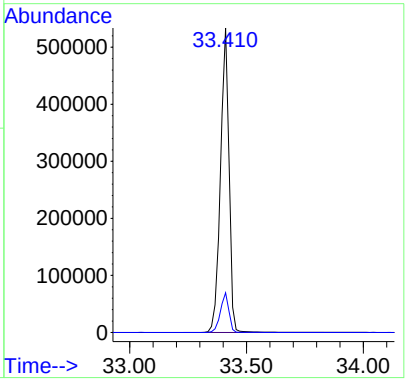


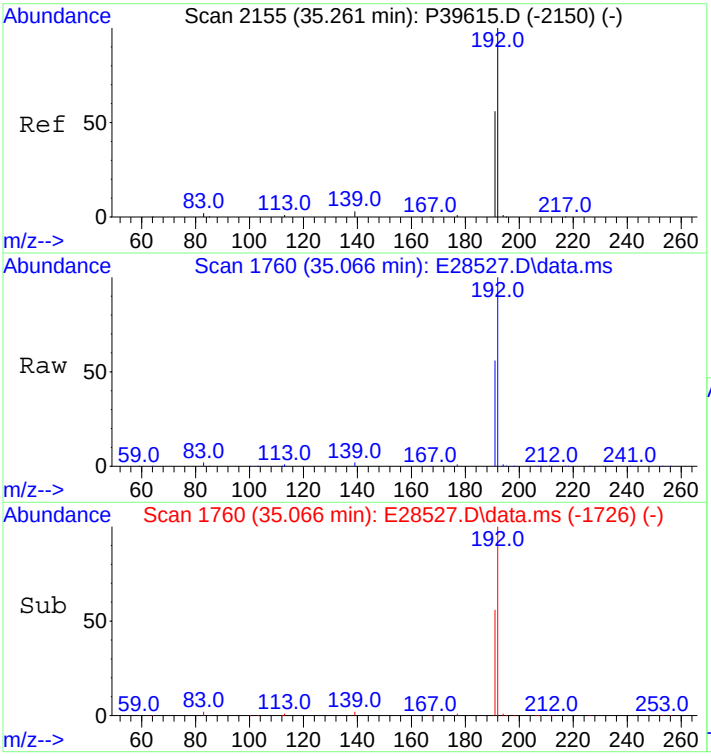


#56
Carbazole
Concen: 10725.06 ng/mL
RT: 33.410 min Scan# 1650
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:167 Resp: 1356581

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.5	15.7

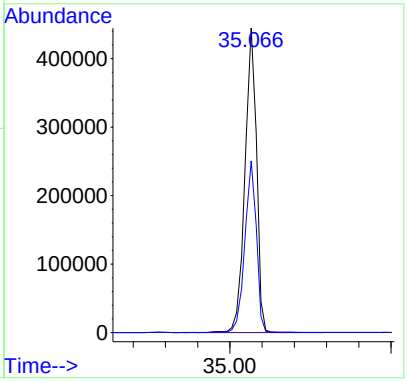


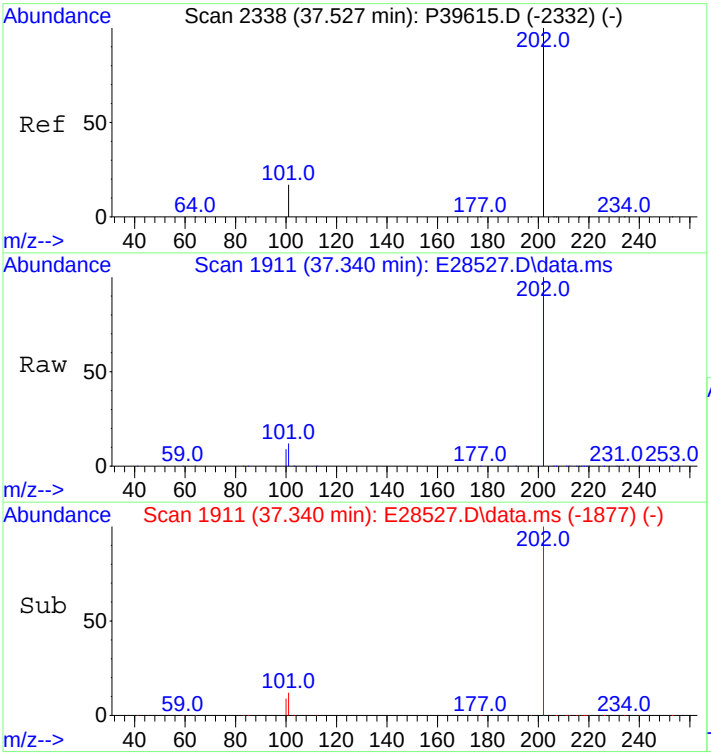


#57
1-Methylphenanthrene
Concen: 10477.28 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:192 Resp: 1115333

Ion	Ratio	Lower	Upper
192	100		
191	56.0	45.5	68.3

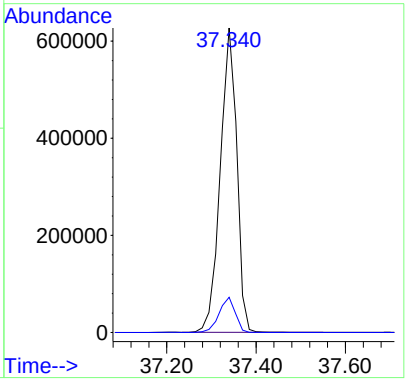


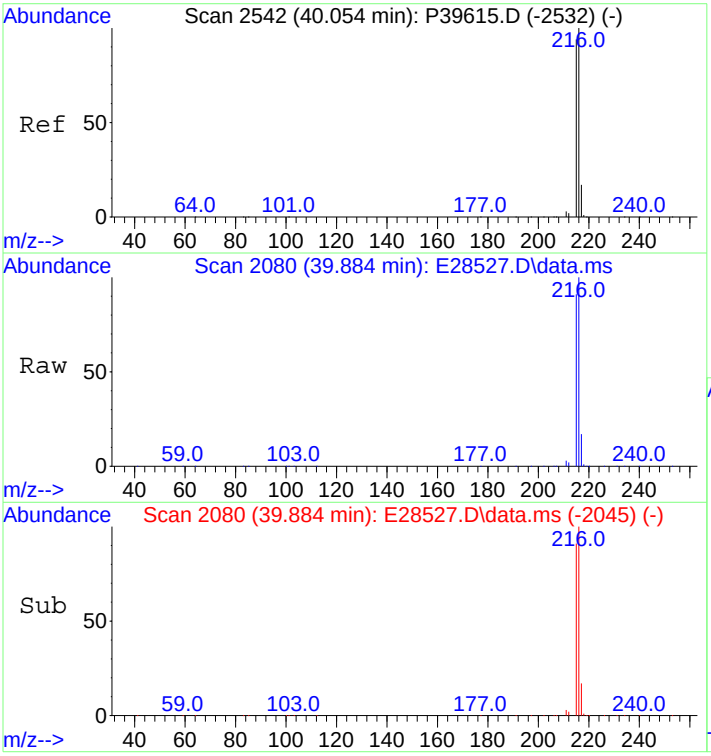


#58
Fluoranthene
Concen: 10347.59 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:202 Resp: 1611679

Ion	Ratio	Lower	Upper
202	100		
101	11.3	9.2	13.8

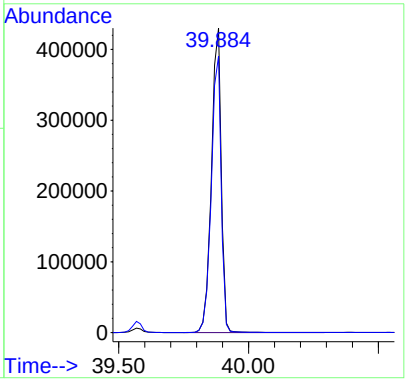


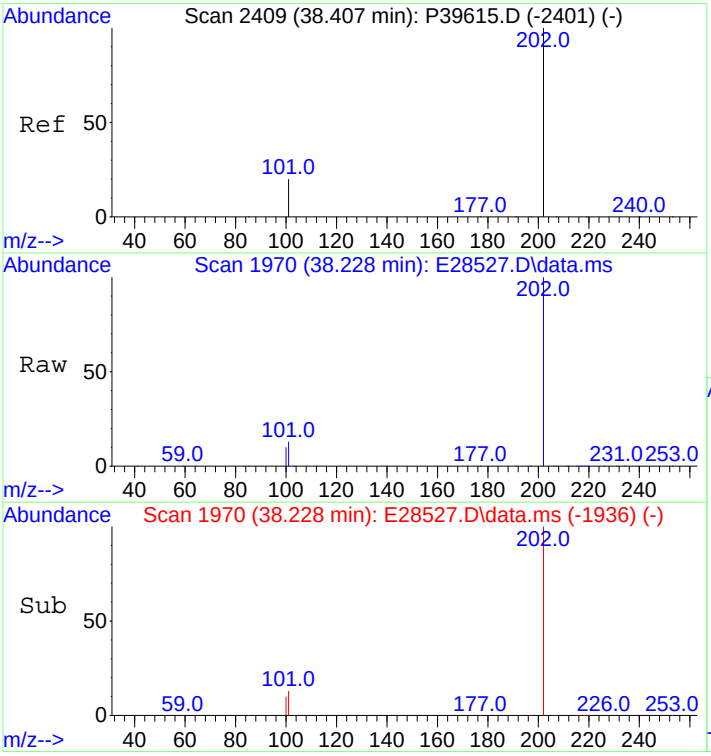


#59
Benzo(b)fluorene
Concen: 11375.30 ng/mL
RT: 39.884 min Scan# 2080
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:216 Resp: 1126932

Ion	Ratio	Lower	Upper
216	100		
215	91.5	73.8	110.8

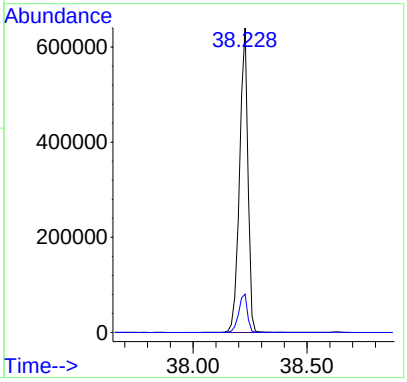


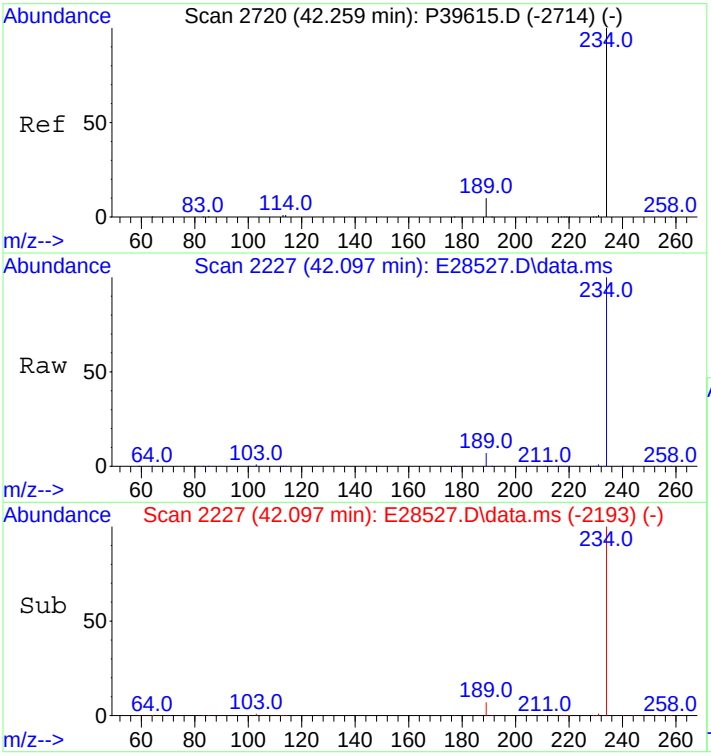


#60
Pyrene
Concen: 10363.70 ng/mL
RT: 38.228 min Scan# 1970
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:202 Resp: 1624916

Ion	Ratio	Lower	Upper
202	100		
101	13.1	9.8	14.8

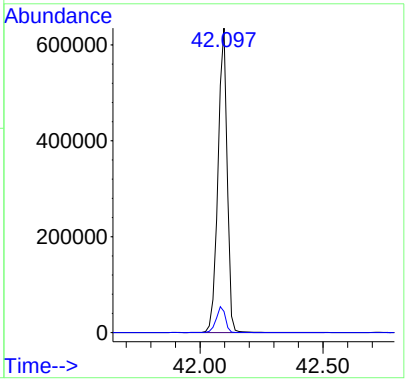


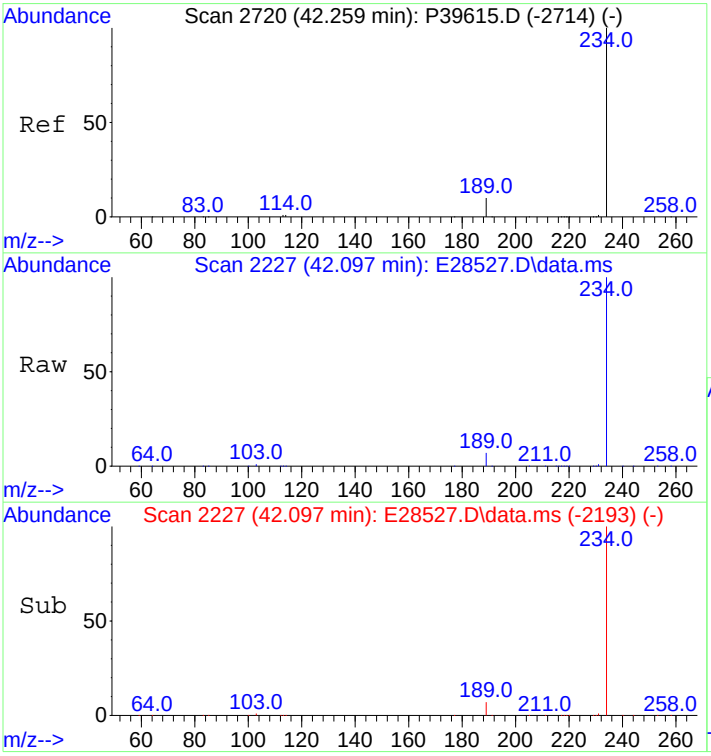


#66
Naphthobenzothiophene
Concen: 11037.35 ng/ml
RT: 42.097 min Scan# 2227
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:234 Resp: 1632867

Ion	Ratio	Lower	Upper
234	100		
189	8.6	5.5	8.3#

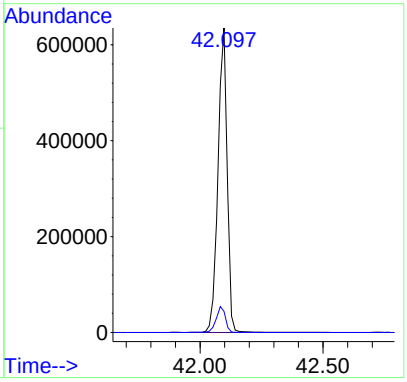


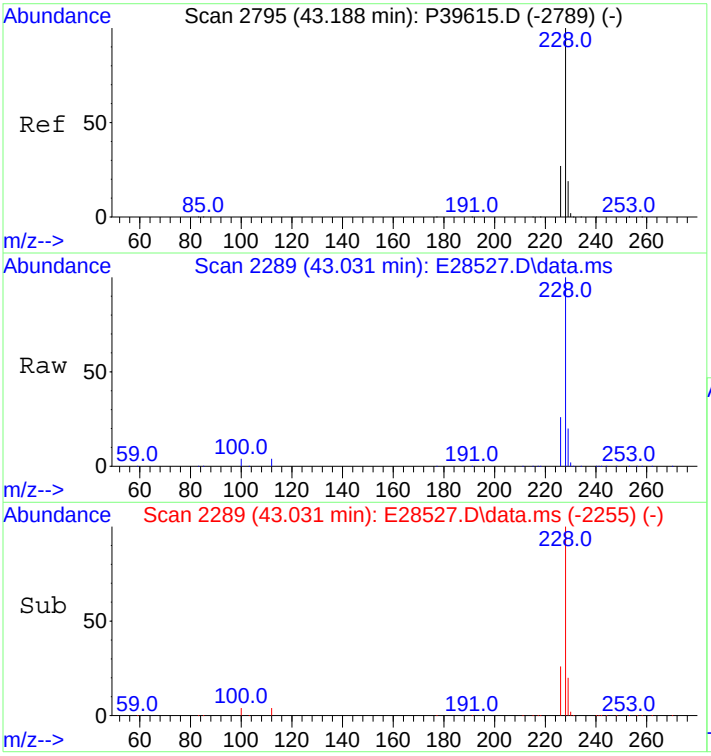


#67
Naphthobenzothiophene-2,1-D
Concen: 11037.35 ng/mL
RT: 42.097 min Scan# 2227
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:234 Resp: 1632867

Ion	Ratio	Lower	Upper
234	100		
189	8.6	5.5	8.3#

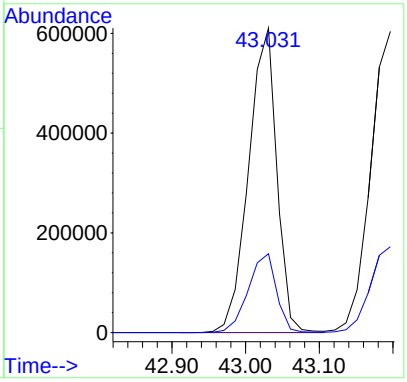


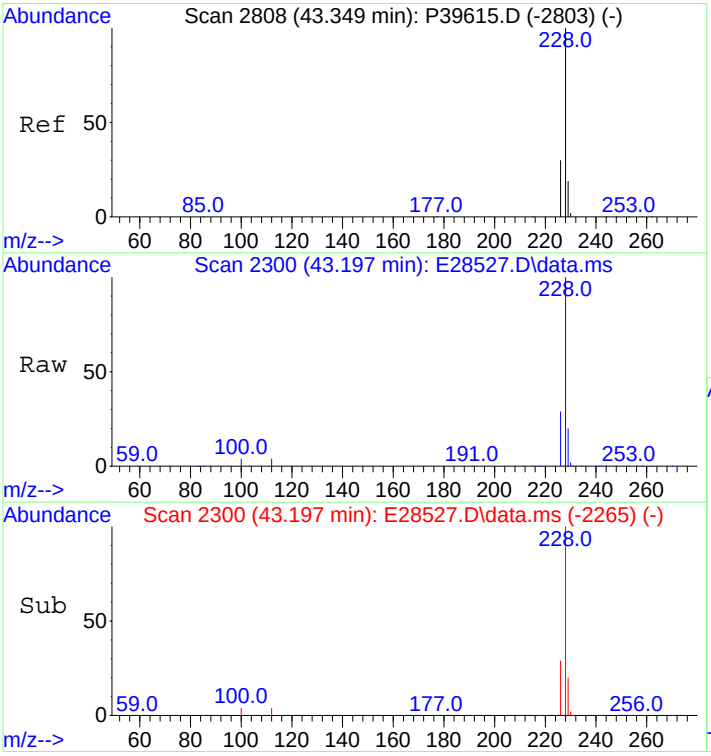


#75
Benz[a]anthracene
Concen: 8752.25 ng/mL m
RT: 43.031 min Scan# 2289
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:228 Resp: 1626986

Ion	Ratio	Lower	Upper
228	100		
226	25.9	20.2	30.4

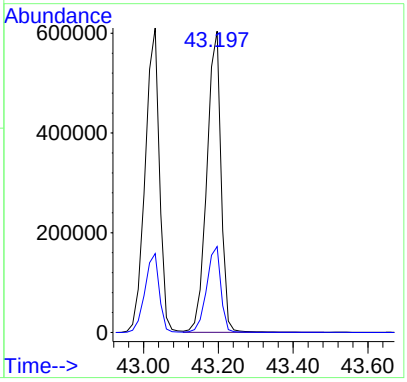


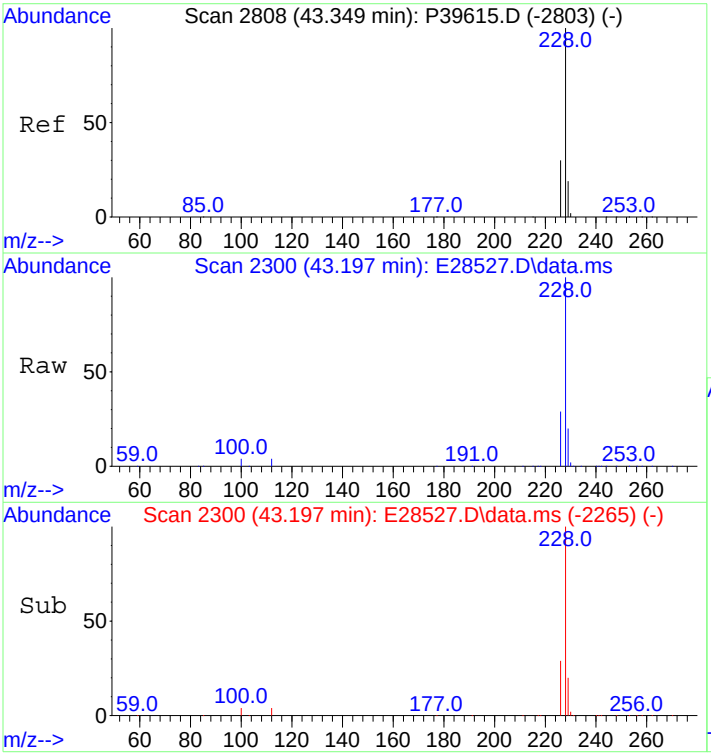


#76
Chrysene
Concen: 8735.75 ng/mL
RT: 43.197 min Scan# 2300
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:228 Resp: 1589503

Ion	Ratio	Lower	Upper
228	100		
226	28.6	22.6	34.0

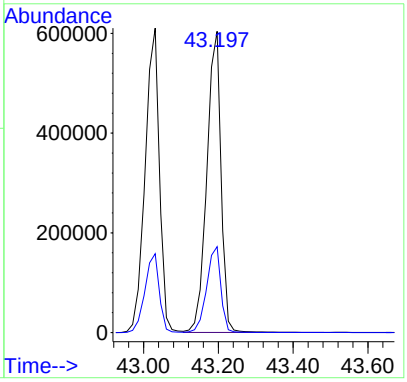


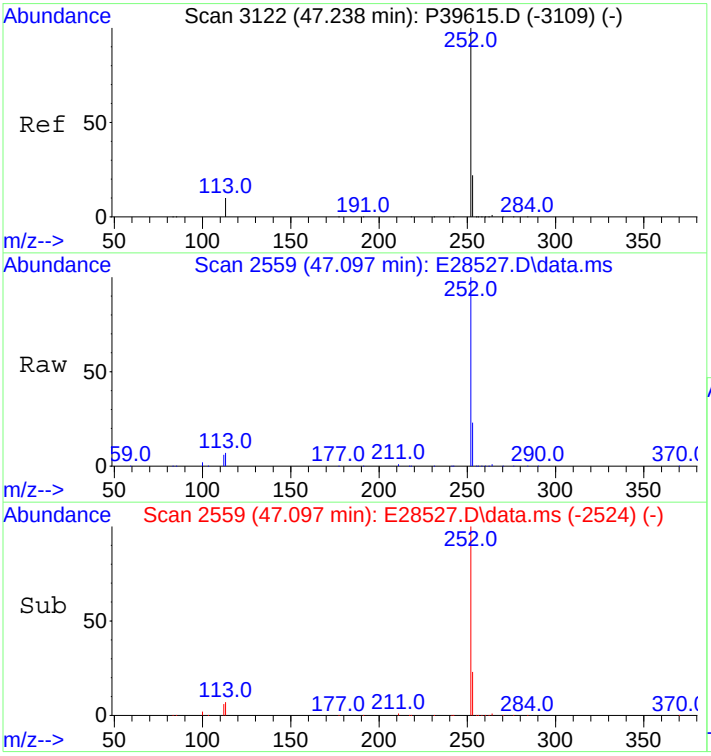


#77
Chrysene/Triphenylene
Concen: 8735.75 ng/mL
RT: 43.197 min Scan# 2300
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:228 Resp: 1589503

Ion	Ratio	Lower	Upper
228	100		
226	28.6	22.6	34.0

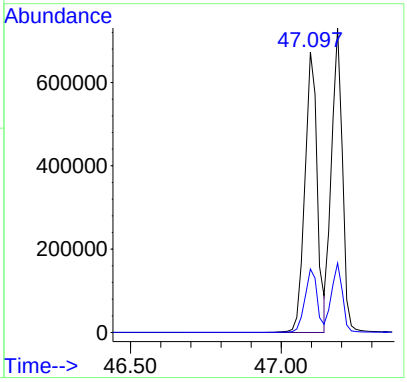


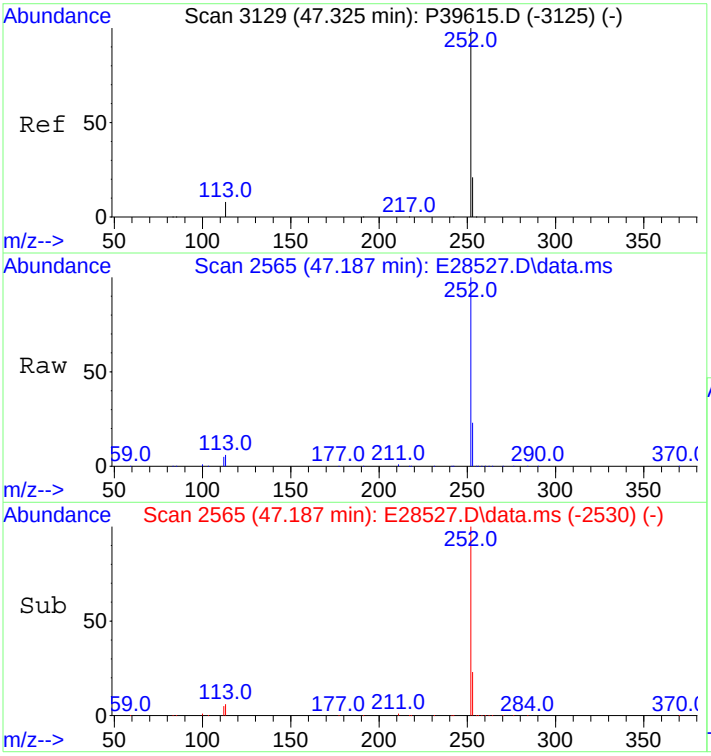


#84
Benzo[b]fluoranthene
Concen: 9816.77 ng/mL
RT: 47.097 min Scan# 2559
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1921388

Ion	Ratio	Lower	Upper
252	100		
253	22.5	18.3	27.5

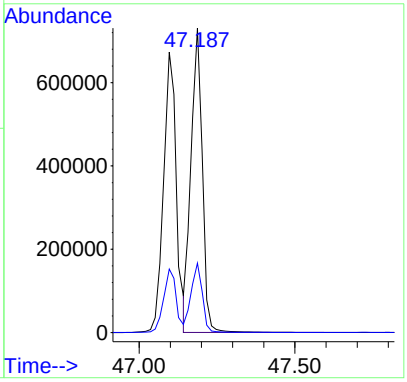


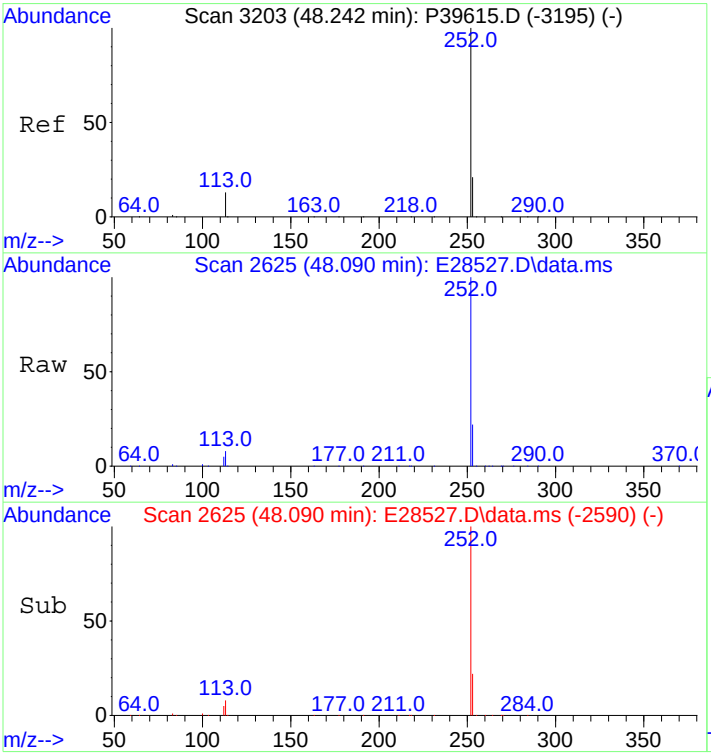


#85
Benzo[j]+[k]fluoranthene
Concen: 10047.36 ng/mL
RT: 47.187 min Scan# 2565
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1850530

Ion	Ratio	Lower	Upper
252	100		
253	22.6	18.3	27.5

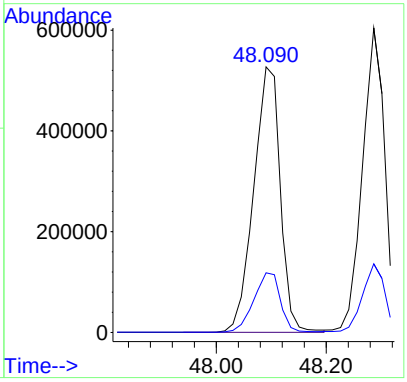


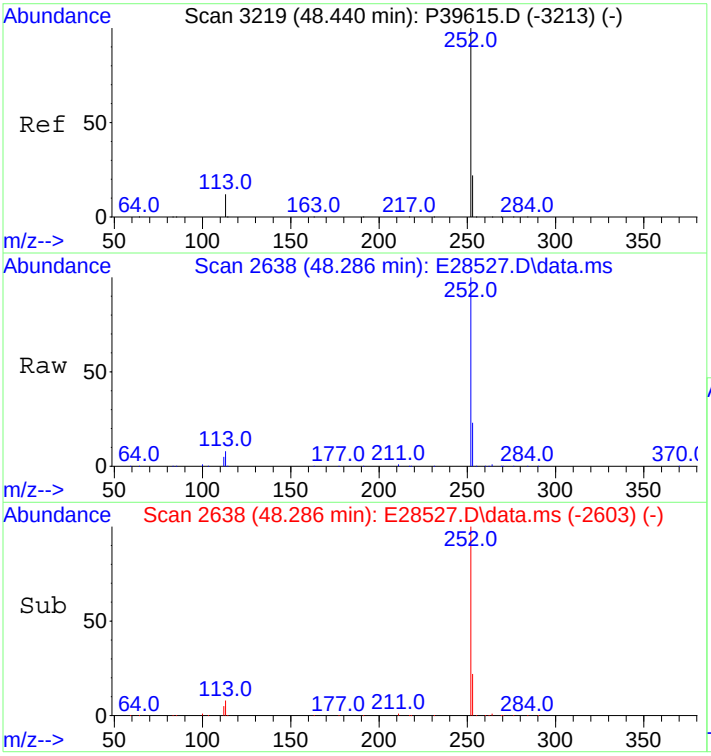


#87
Benzo[e]pyrene
Concen: 10196.62 ng/mL
RT: 48.090 min Scan# 2625
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1770929

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.6	28.0

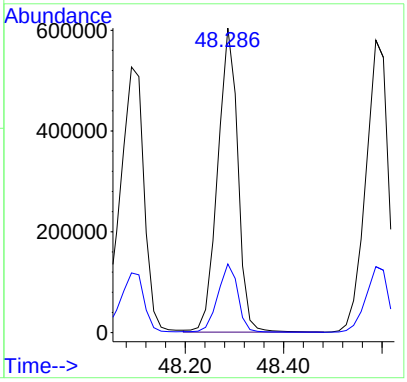


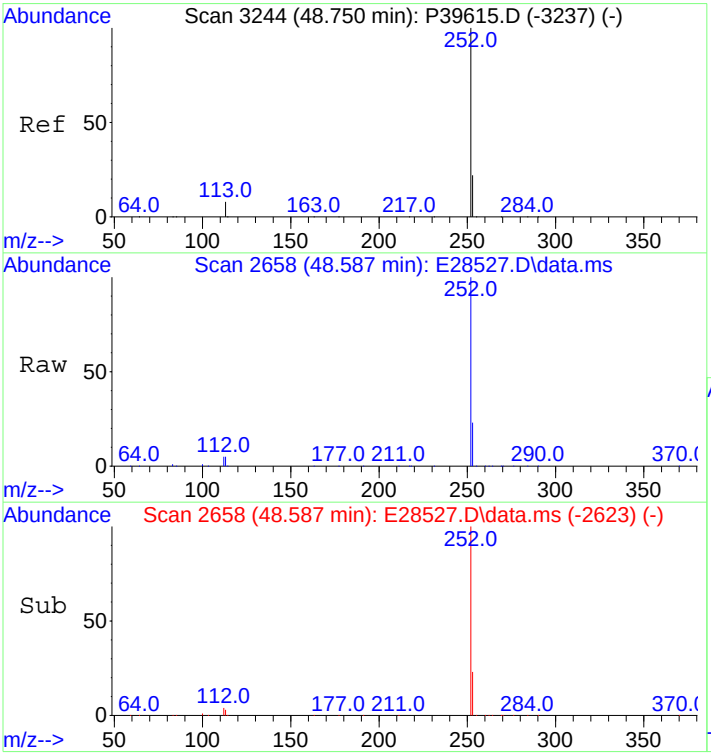


#89
Benzo[a]pyrene
Concen: 10451.14 ng/mL
RT: 48.286 min Scan# 2638
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1716035

Ion	Ratio	Lower	Upper
252	100		
253	22.4	18.8	28.2

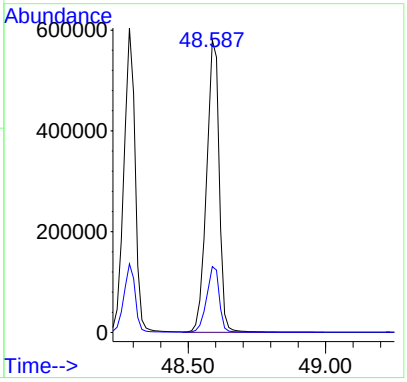


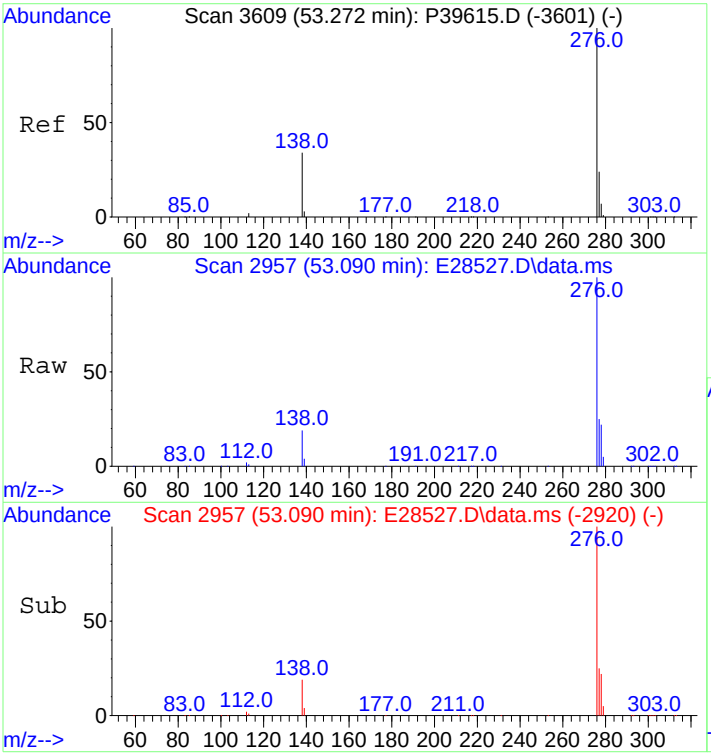


#90
Perylene
Concen: 10562.35 ng/mL
RT: 48.587 min Scan# 2658
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1845721

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.8	28.2

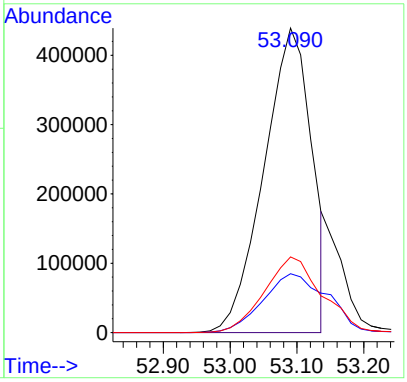


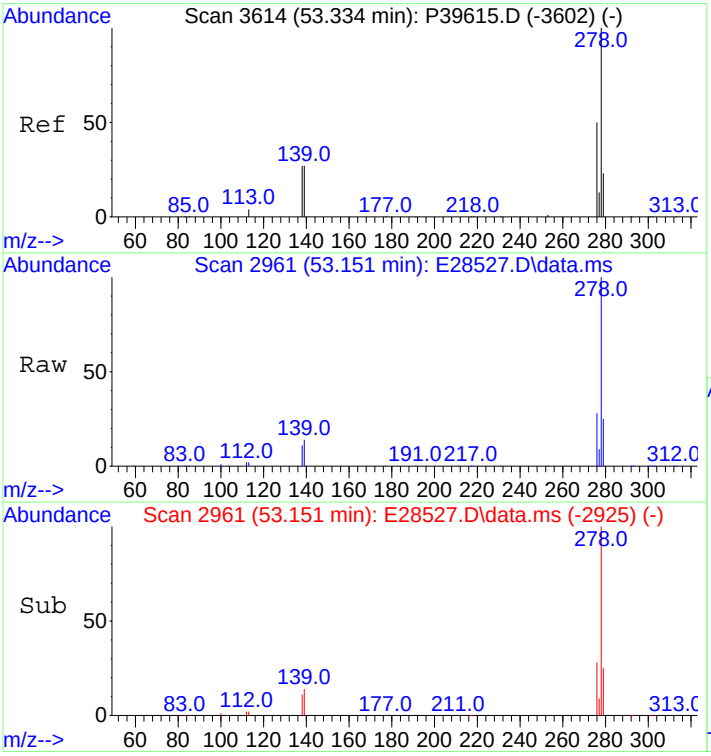


#91
Indeno[1,2,3-cd]pyrene
Concen: 11025.03 ng/mL m
RT: 53.090 min Scan# 2957
Delta R.T. 0.060 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:276 Resp: 2185546

Ion	Ratio	Lower	Upper
276	100		
138	26.3	15.4	23.2#
277	30.2	19.1	28.7#

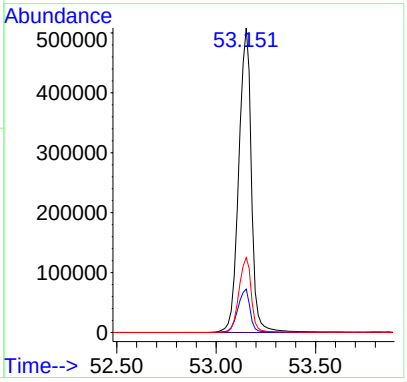


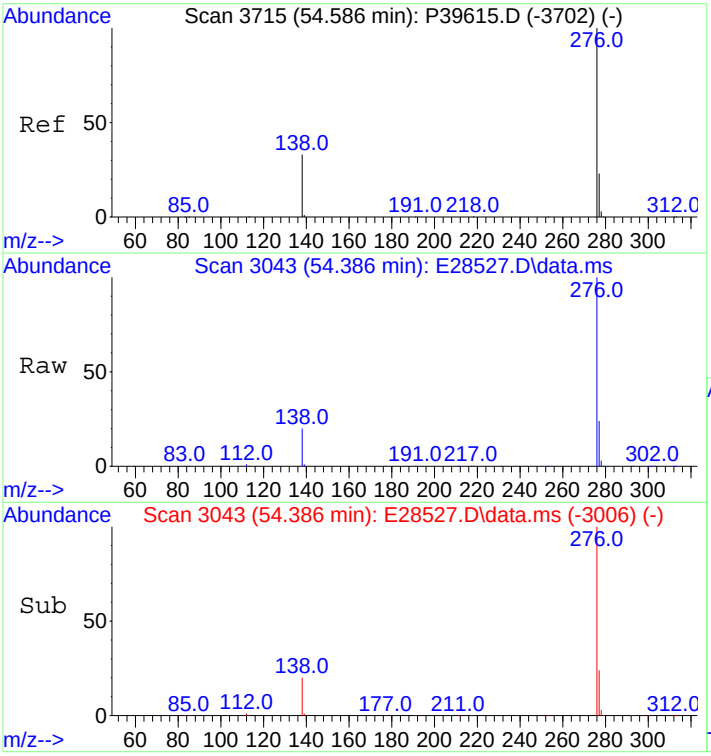


#92
Dibenz[ah]+[ac]anthracene
Concen: 11751.59 ng/mL
RT: 53.151 min Scan# 2961
Delta R.T. 0.045 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:278 Resp: 2240598

Ion	Ratio	Lower	Upper
278	100		
139	14.0	11.1	16.7
279	24.1	19.4	29.0

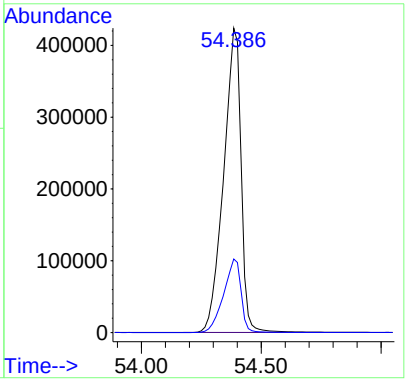


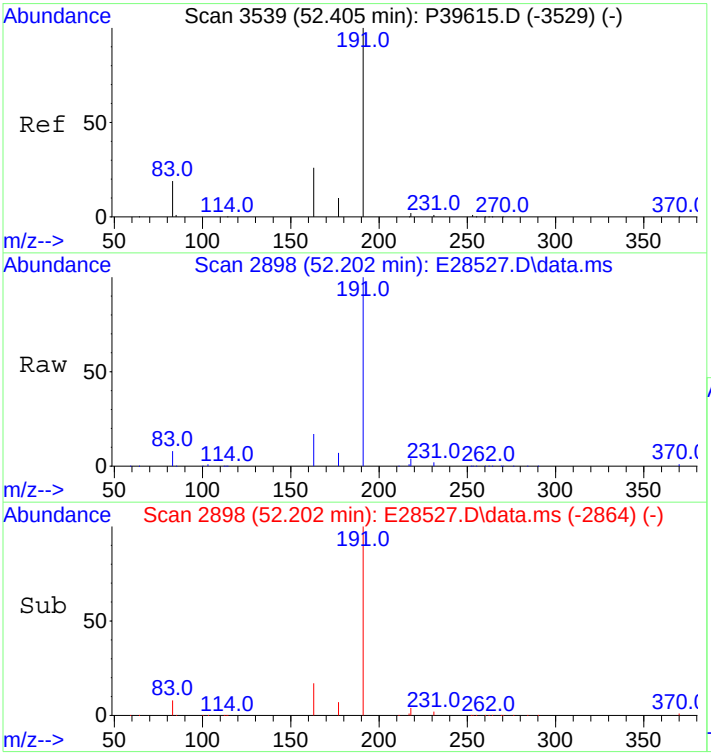


#93
Benzo[g,h,i]perylene
Concen: 10993.09 ng/mL
RT: 54.386 min Scan# 3043
Delta R.T. 0.060 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:276 Resp: 2141401

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.1	28.7

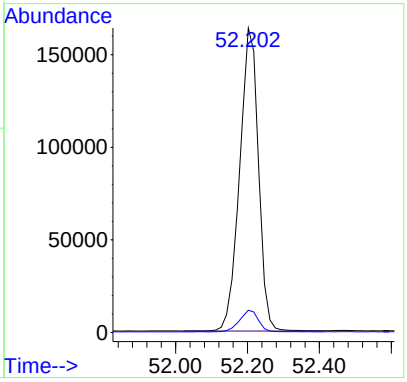


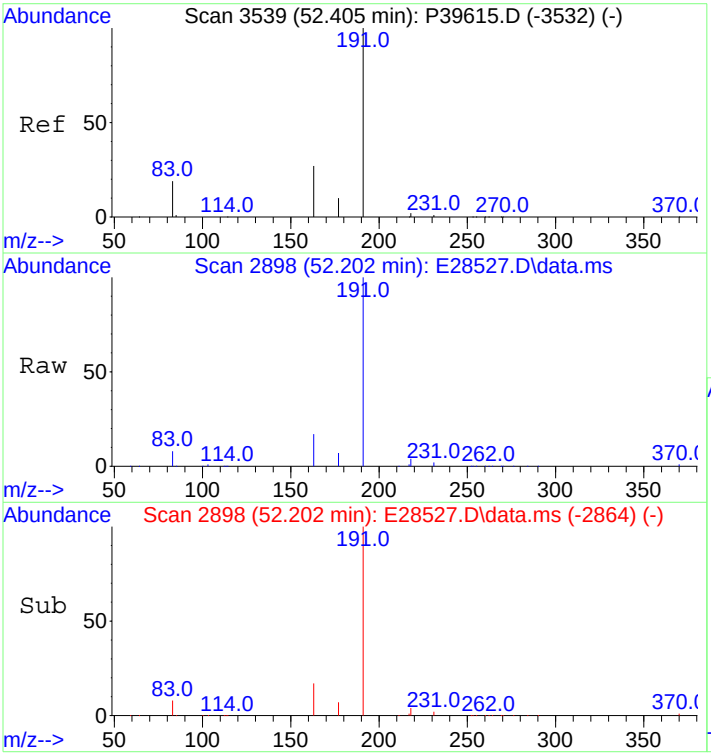


#94
Hopane (T19)
Concen: 12925.84 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:191 Resp: 594811

Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#

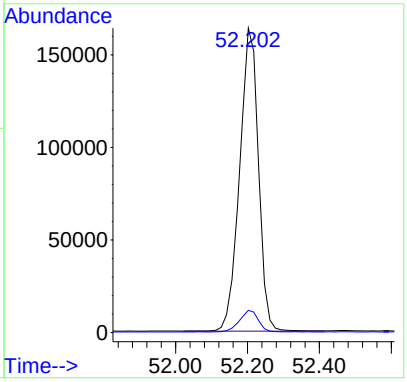




#95
17a(H),21B(H)-hopane - C30H52
Concen: 12925.84 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:191 Resp: 594811

Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 31 12:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

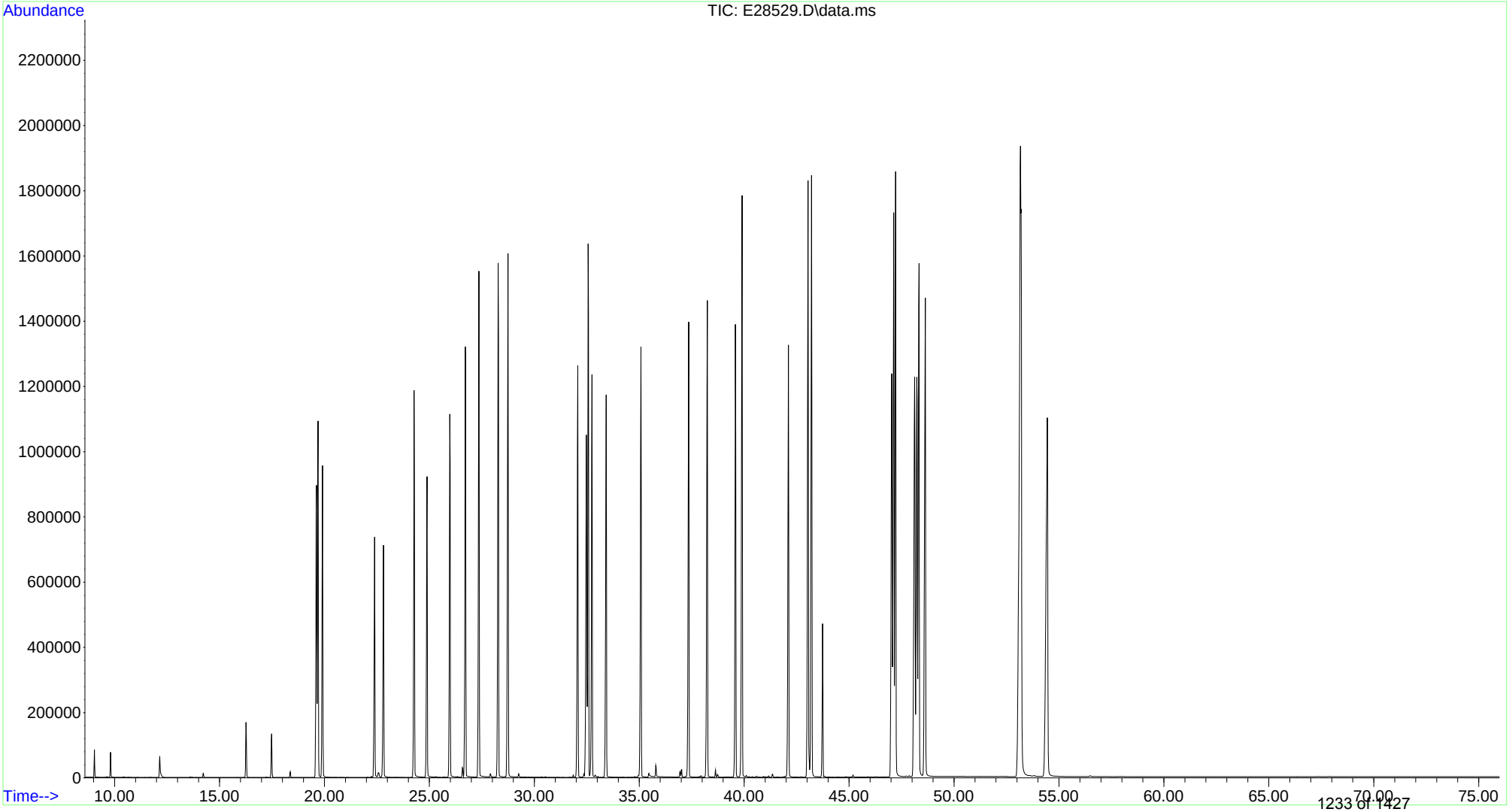
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.576	164	37912	500.000 ng/mL	0.00
74) Chrysene-d12	43.091	240	88160	500.000 ng/mL	0.01
System Monitoring Compounds					
9) Naphthalene-d8	19.620	136	2296353	16260.075 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1626.01%#	
42) Phenanthrene-d10	32.477	188	2663465	18714.253 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1871.43%#	
83) Benzo[b]fluoranthene-d12	47.036	264	3370773	20195.327 ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2019.53%#	
88) Benzo[a]pyrene-d12	48.226	264	3410139	22527.516 ng/mL	0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2252.75%#	
129) 5B(H)Cholane - Surr	43.739	217	695988	21414.696 ng/ml	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2141.47%#	
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	261873	8297.842 ng/mL	100
4) cis-Decalin	17.483	138	203630	8494.264 ng/mL	100
10) Naphthalene	19.696	128	2596569	17140.920 ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1749682	17847.146 ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1698936	18070.292 ng/mL#	100
18) Benzothiophene	19.906	134	2232488	18065.485 ng/mL	100
23) Biphenyl	24.272	154	2227434	17939.207 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.889	156	1652186	18486.304 ng/mL#	100
25) Dibenzofuran	27.358	168	2567457	19133.769 ng/mL	98
26) Acenaphthylene	25.973	152	2887125M3	19303.898 ng/mL	
27) Acenaphthene	26.711	153	1802150	19334.902 ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.292	170	1575864	19507.008 ng/mL	94
29) Fluorene	28.743	166	2105968	19433.448 ng/mL	100
33) Dibenzothiophene	32.070	184	2867812	18899.560 ng/mL#	95
43) Phenanthrene	32.567	178	2963936	18728.244 ng/mL	99
54) Retene	39.583	234	1015806	20967.109 ng/mL	96
55) Anthracene	32.748	178	2099409M3	14156.763 ng/mL	
56) Carbazole	33.425	167	2801542M3	20001.846 ng/mL	
57) 1-Methylphenanthrene	35.081	192	2299712	19509.074 ng/mL	99
58) Fluoranthene	37.355	202	3284016M3	19040.795 ng/mL	
59) Benzo(b)fluorene	39.899	216	2350585	21426.936 ng/mL	99
60) Pyrene	38.243	202	3308735	19057.454 ng/mL	97
66) Naphthobenzothiophene	42.112	234	3354891	20479.127 ng/ml#	94
67) Naphthobenzothiophene-...	42.112	234	3354891	20479.127 ng/mL#	94
75) Benz[a]anthracene	43.046	228	3308979	16929.163 ng/mL	98
76) Chrysene	43.212	228	3273879	17112.238 ng/mL	98
77) Chrysene/Triphenylene	43.212	228	3273879	17112.238 ng/mL	98
84) Benzo[b]fluoranthene	47.127	252	3888463	18894.567 ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.217	252	3879730	20033.777 ng/mL	99
87) Benzo[e]pyrene	48.121	252	3655053	20014.936 ng/mL	99
89) Benzo[a]pyrene	48.331	252	3592144	20806.399 ng/mL	99
90) Perylene	48.633	252	3822620	20804.685 ng/mL	99
91) Indeno[1,2,3-cd]pyrene	53.136	276	4610873M3	22121.197 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.196	278	4571116	22801.341 ng/mL	99
93) Benzo[g,h,i]perylene	54.446	276	4394931	21457.509 ng/mL	99

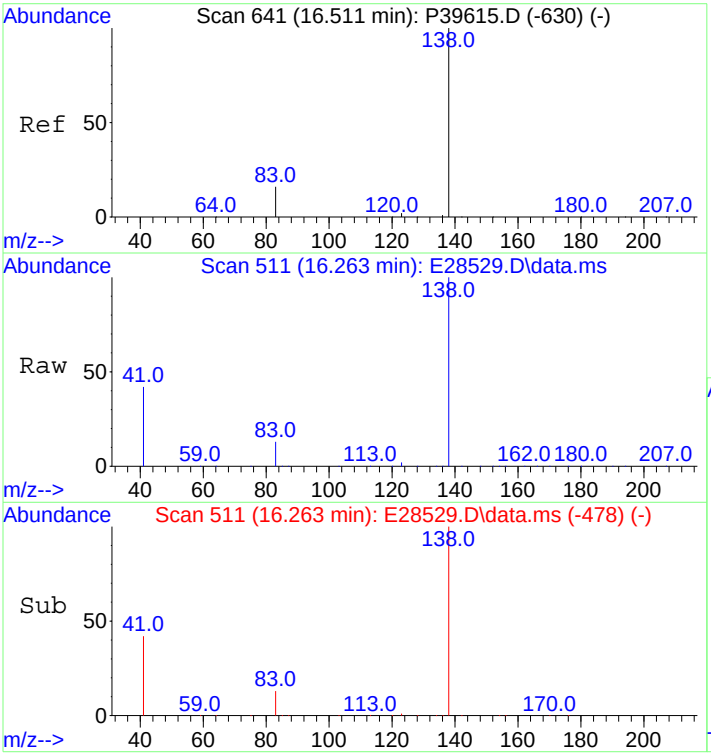
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

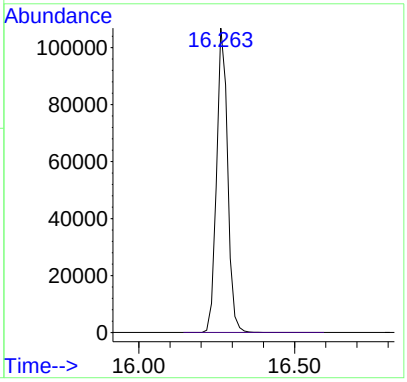
Quant Time: Oct 31 12:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

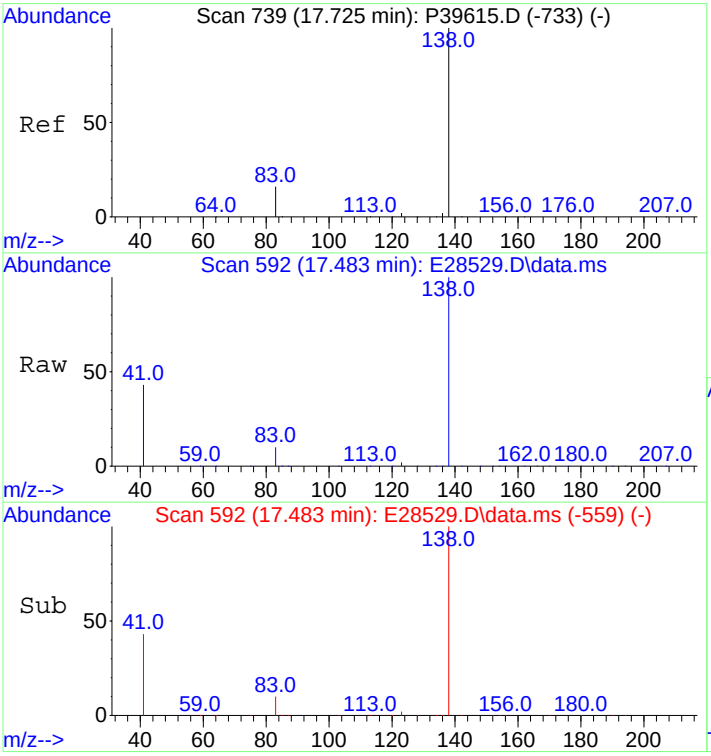




#3
trans-Decalin
Concen: 8297.84 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

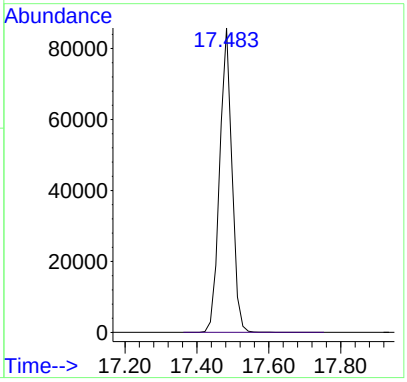
Tgt Ion:138 Resp: 261873

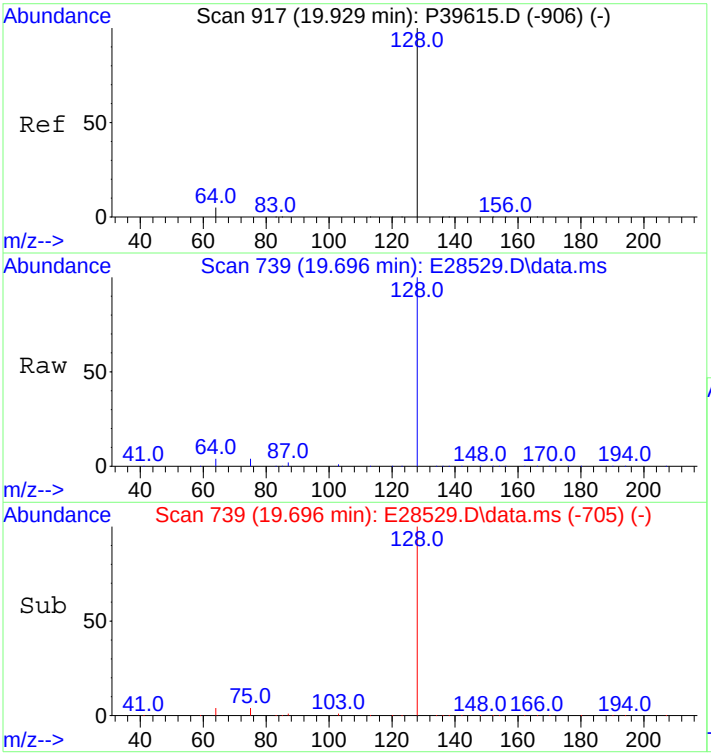




#4
cis-Decalin
Concen: 8494.26 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:138 Resp: 203630

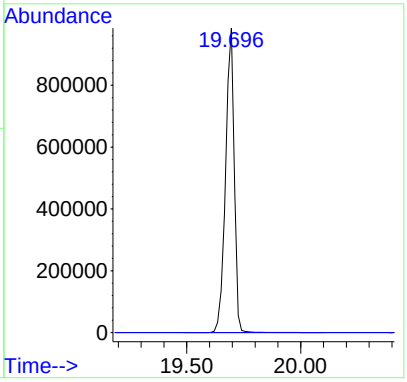


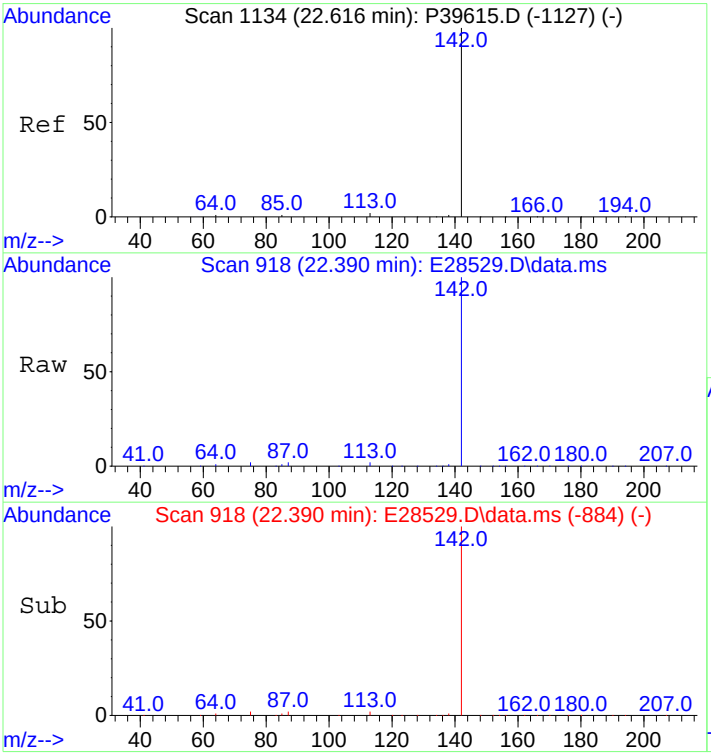


#10
Naphthalene
Concen: 17140.92 ng/mL
RT: 19.696 min Scan# 739
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:128 Resp: 2596569

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

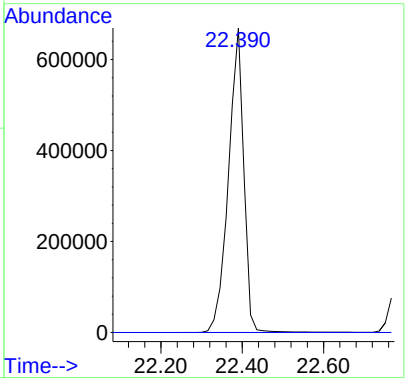


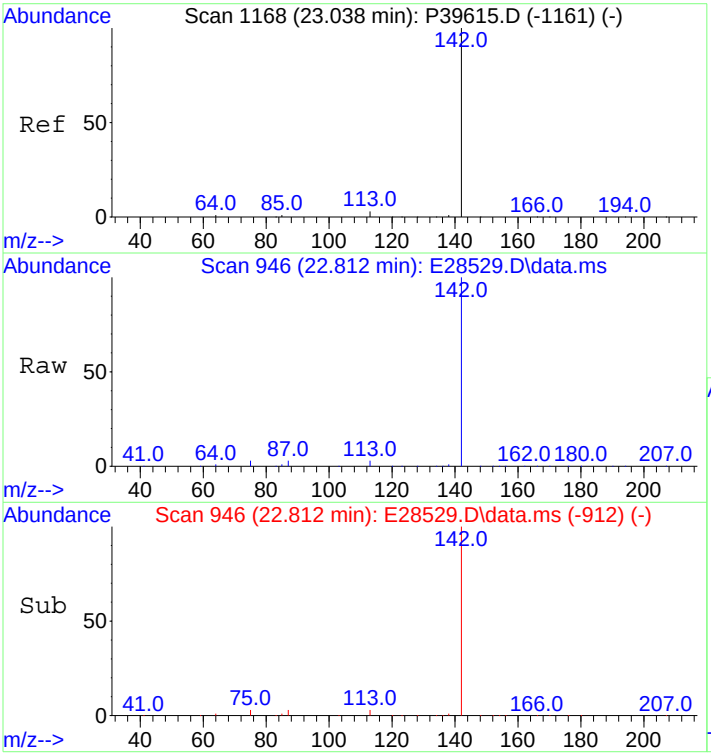


#16
2-Methylnaphthalene
Concen: 17847.15 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:142 Resp: 1749682

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

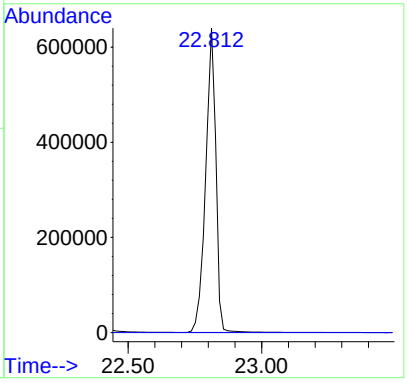


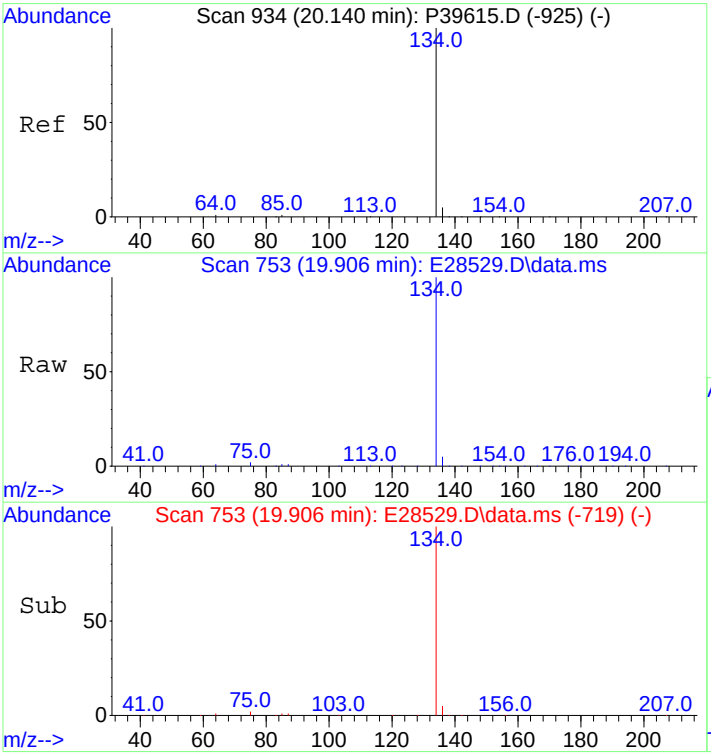


#17
1-Methylnaphthalene
Concen: 18070.29 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:142 Resp: 1698936

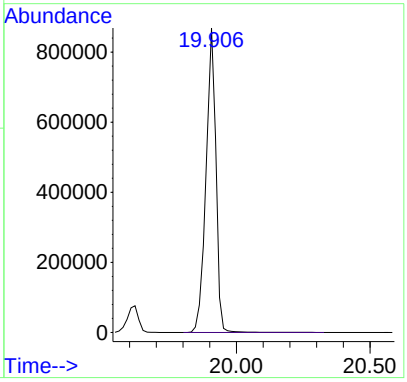
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

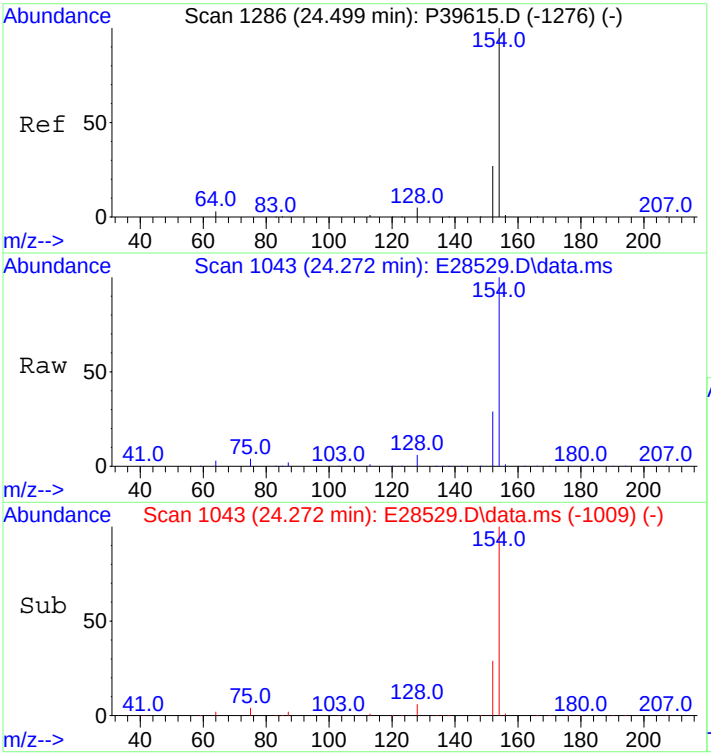




#18
Benzothiophene
Concen: 18065.48 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:134 Resp: 2232488

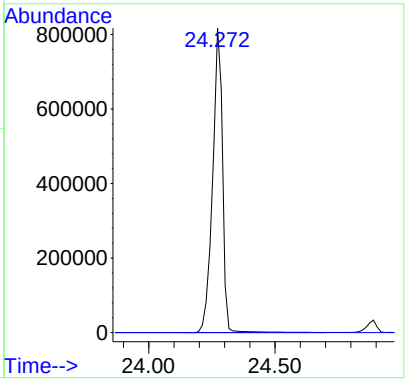


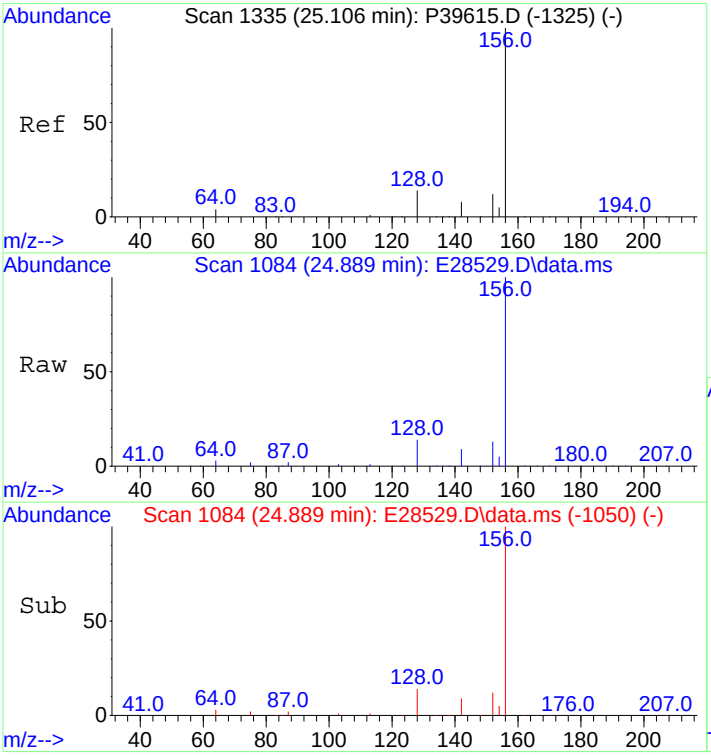


#23
Biphenyl
Concen: 17939.21 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:154 Resp: 2227434

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

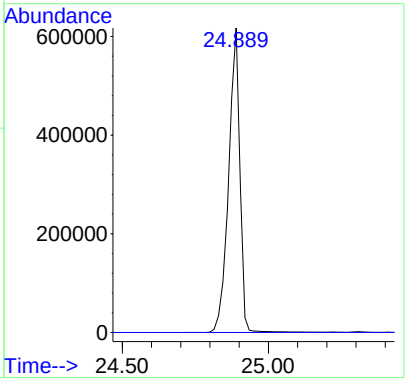


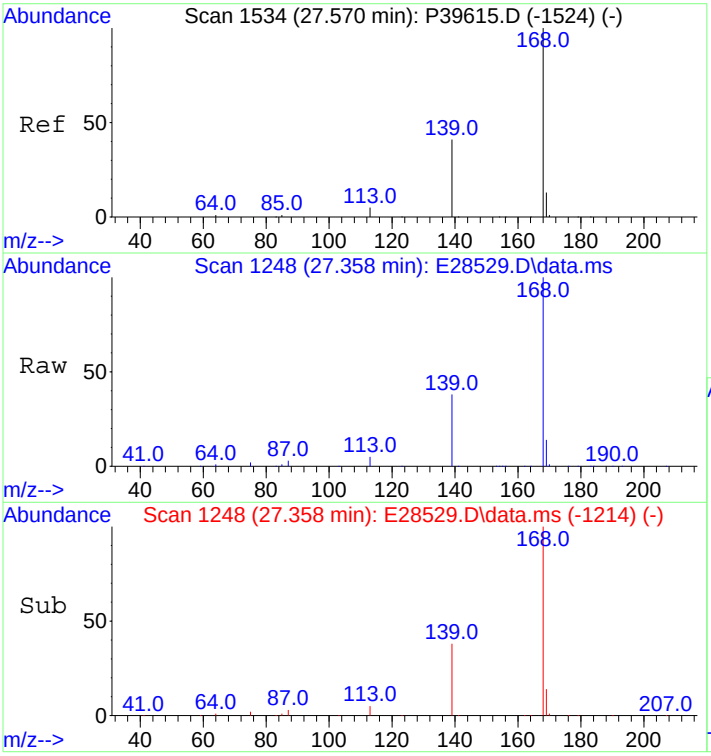


#24
2,6-Dimethylnaphthalene
Concen: 18486.30 ng/mL
RT: 24.889 min Scan# 1084
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:156 Resp: 1652186

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

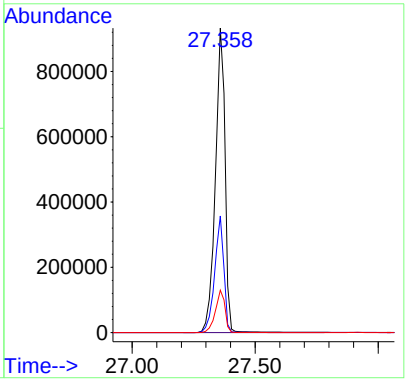


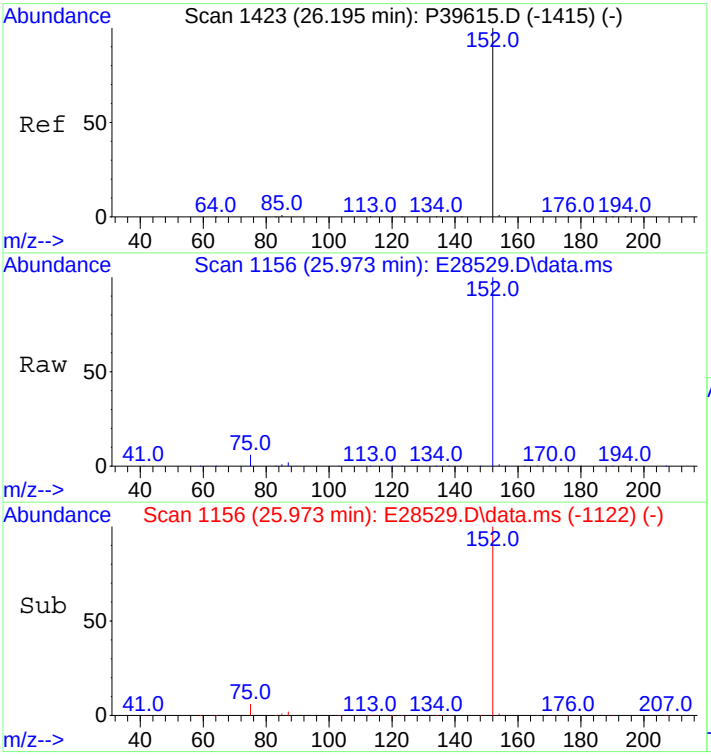


#25
Dibenzofuran
Concen: 19133.77 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:168 Resp: 2567457

Ion	Ratio	Lower	Upper
168	100		
139	36.6	30.6	45.8
169	13.8	10.6	16.0

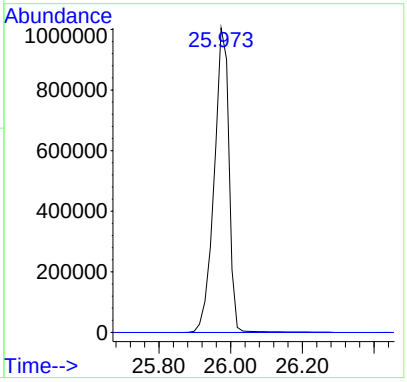


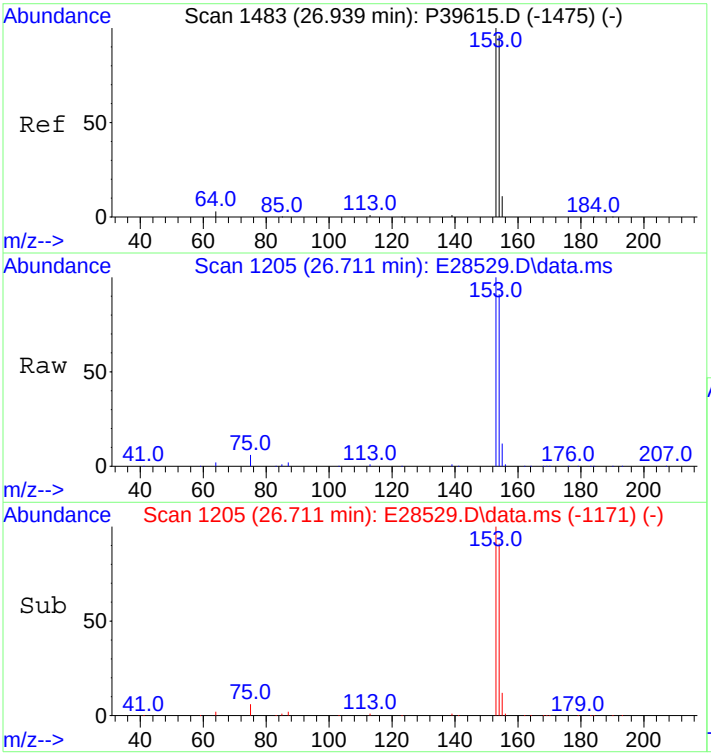


#26
Acenaphthylene
Concen: 19303.90 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:152 Resp: 2887125

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

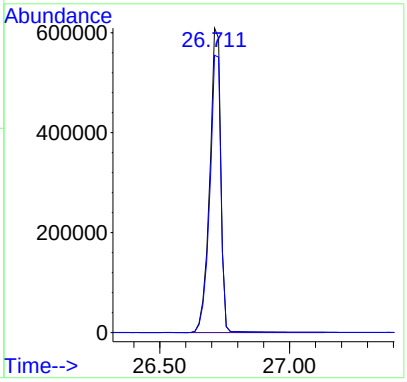


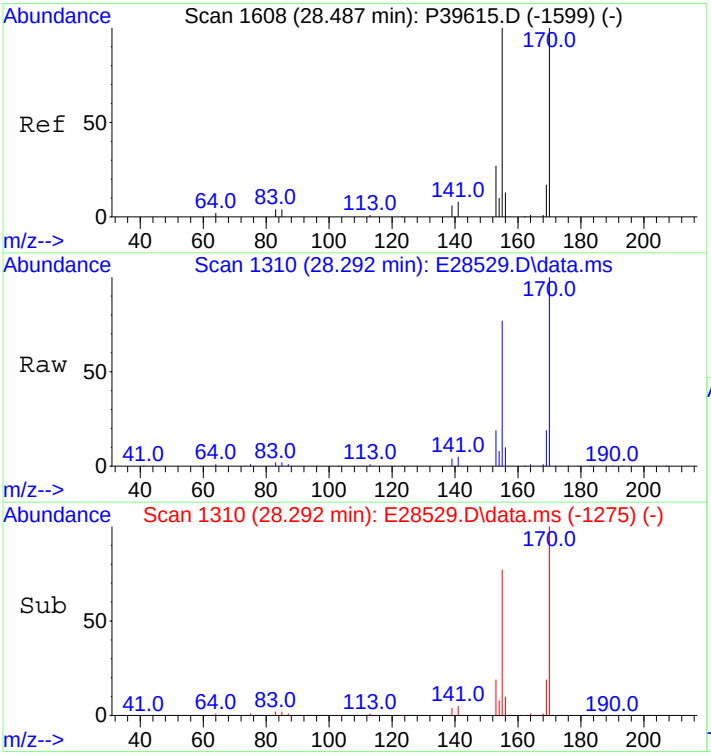


#27
Acenaphthene
Concen: 19334.90 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:153 Resp: 1802150

Ion	Ratio	Lower	Upper
153	100		
154	92.0	72.3	108.5

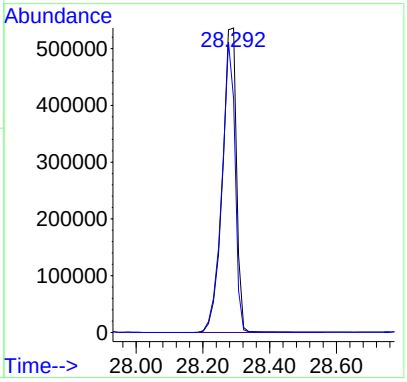


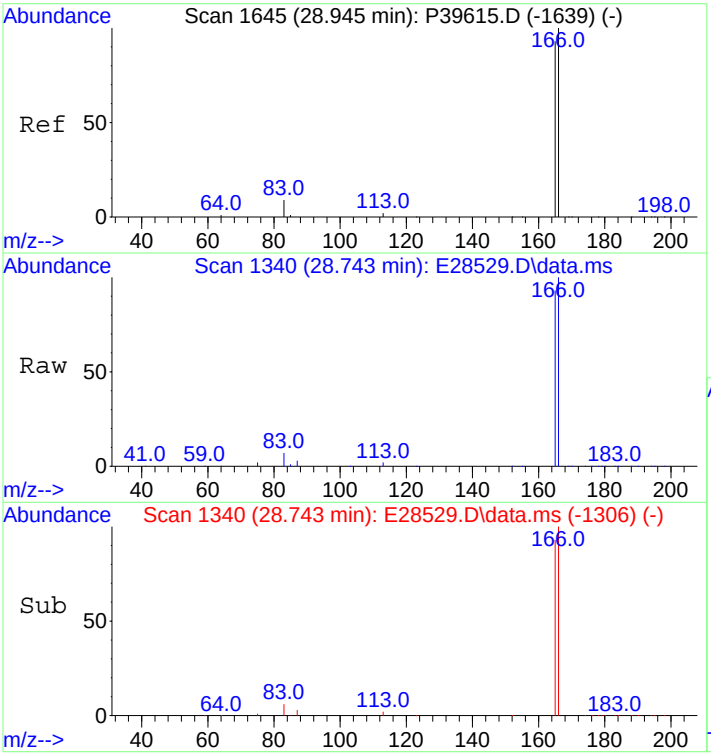


#28
2,3,5-Trimethylnaphthalene
Concen: 19507.01 ng/mL
RT: 28.292 min Scan# 1310
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:170 Resp: 1575864

Ion	Ratio	Lower	Upper
170	100		
155	89.4	75.9	113.9

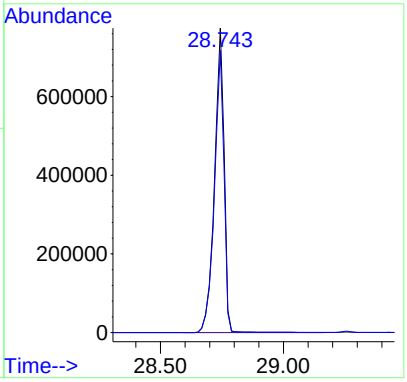


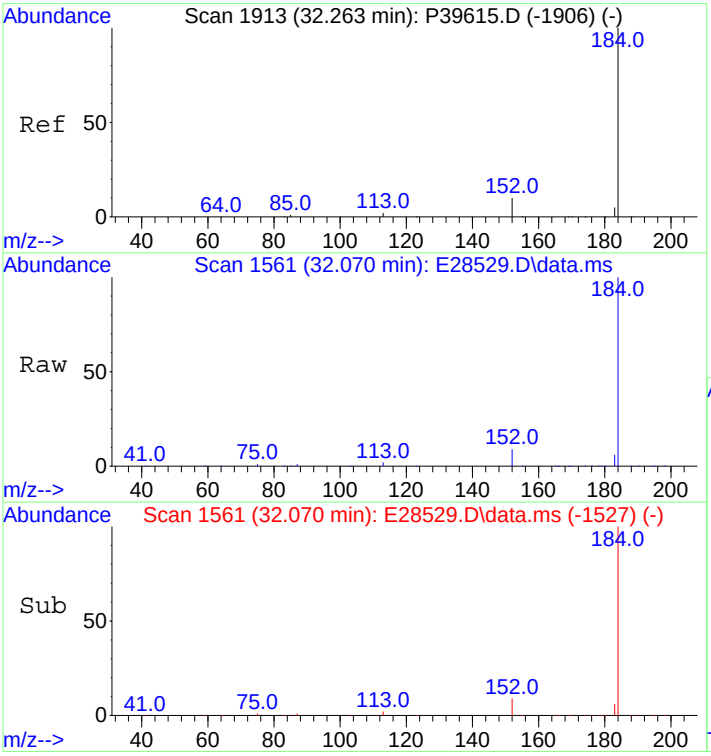


#29
Fluorene
Concen: 19433.45 ng/mL
RT: 28.743 min Scan# 1340
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:166 Resp: 2105968

Ion	Ratio	Lower	Upper
166	100		
165	92.1	73.8	110.6

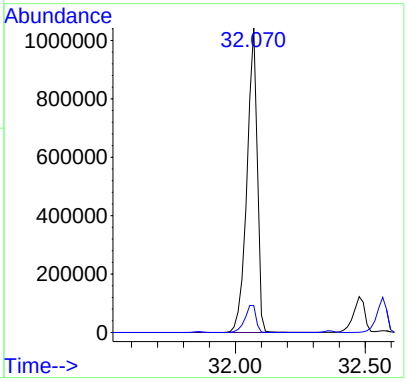


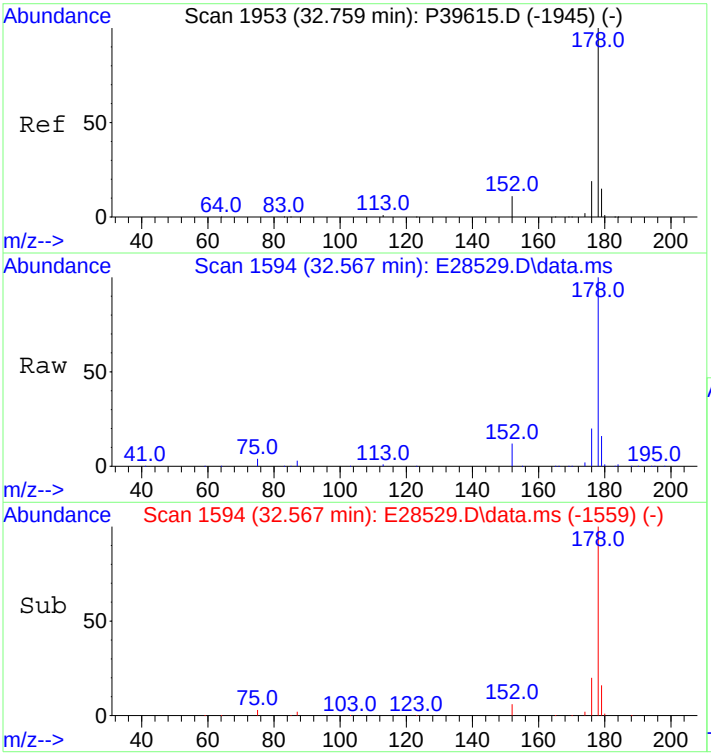


#33
Dibenzothiophene
Concen: 18899.56 ng/mL
RT: 32.070 min Scan# 1561
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:184 Resp: 2867812

Ion	Ratio	Lower	Upper
184	100		
152	9.6	6.2	9.2#

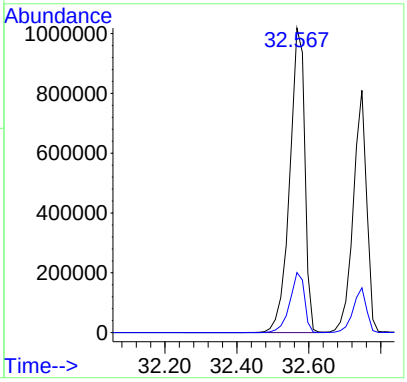


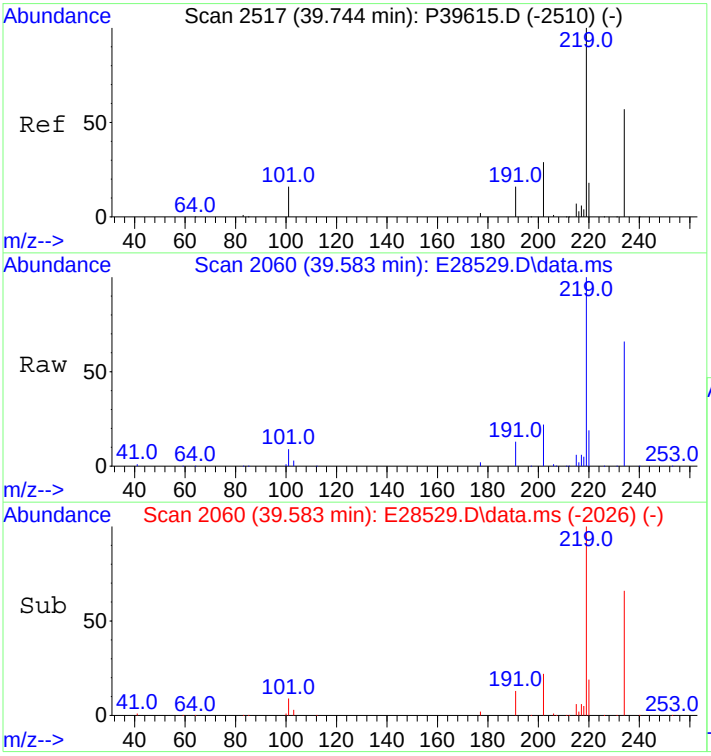


#43
Phenanthrene
Concen: 18728.24 ng/mL
RT: 32.567 min Scan# 1594
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:178 Resp: 2963936

Ion	Ratio	Lower	Upper
178	100		
176	19.2	15.0	22.6

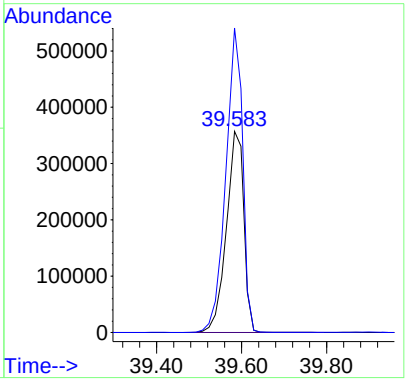


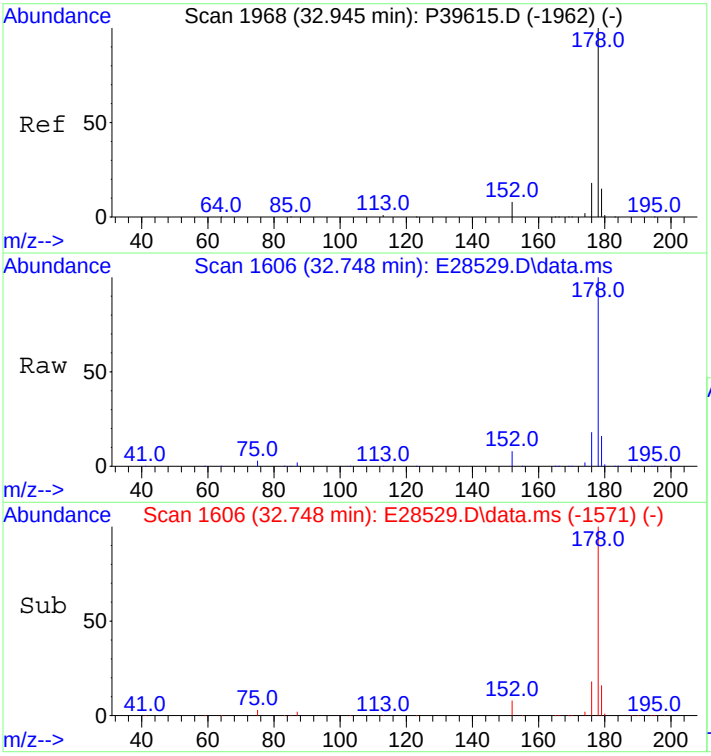


#54
Retene
Concen: 20967.11 ng/mL
RT: 39.583 min Scan# 2060
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:234 Resp: 1015806

Ion	Ratio	Lower	Upper
234	100		
219	146.5	113.0	169.4

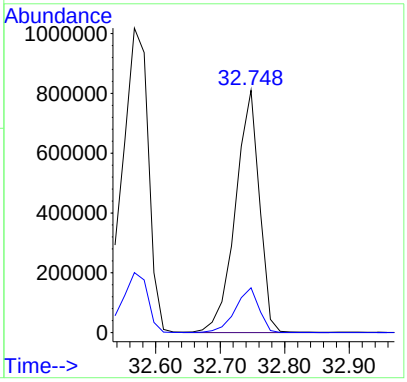


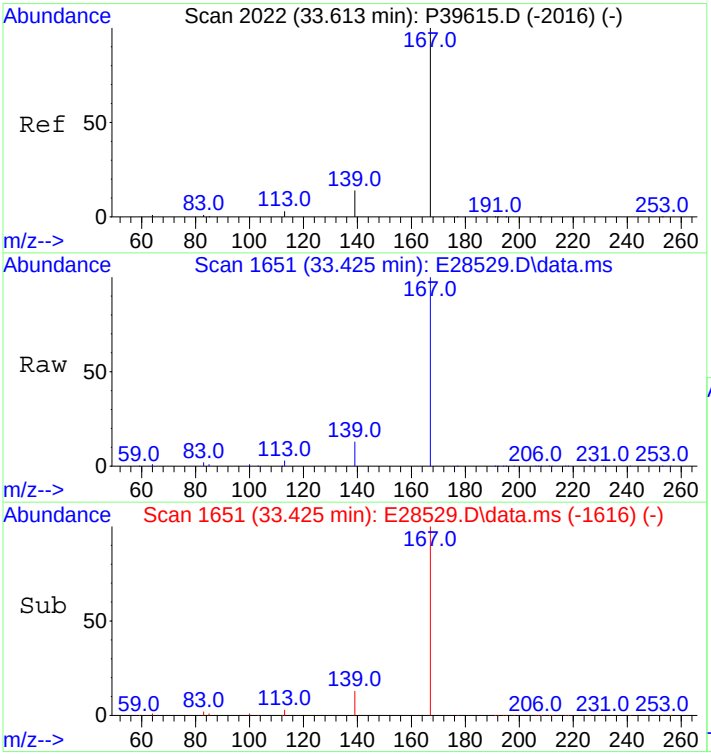


#55
Anthracene
Concen: 14156.76 ng/mL m
RT: 32.748 min Scan# 1606
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:178 Resp: 2099409

Ion	Ratio	Lower	Upper
178	100		
176	18.4	14.5	21.7

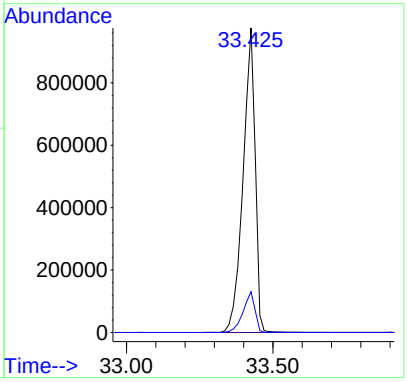


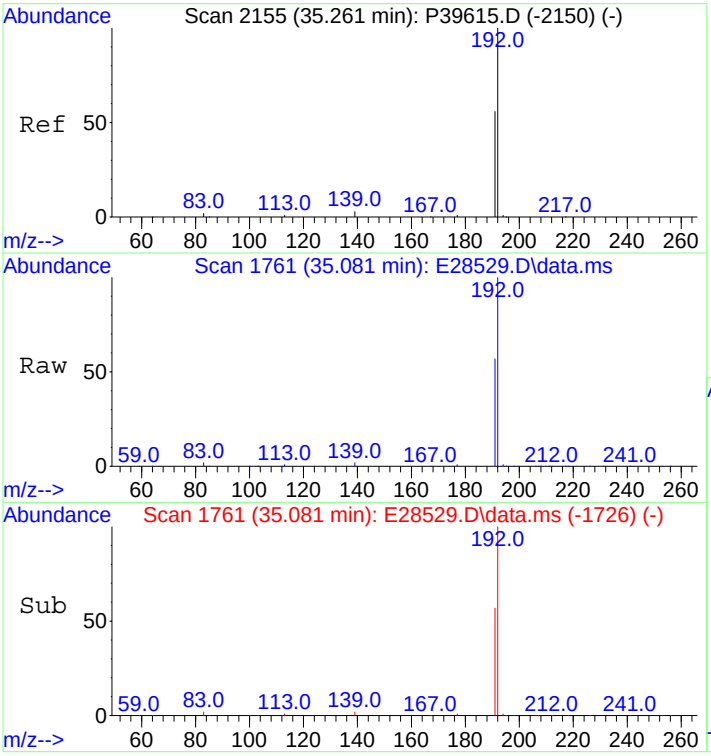


#56
Carbazole
Concen: 20001.85 ng/mL m
RT: 33.425 min Scan# 1651
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:167 Resp: 2801542

Ion	Ratio	Lower	Upper
167	100		
139	13.0	10.5	15.7

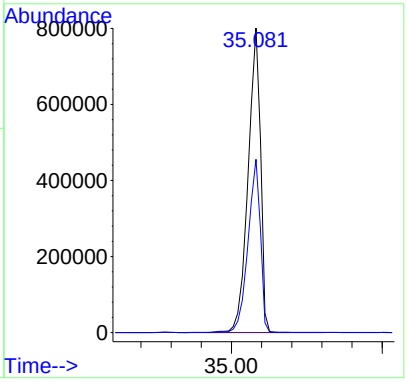


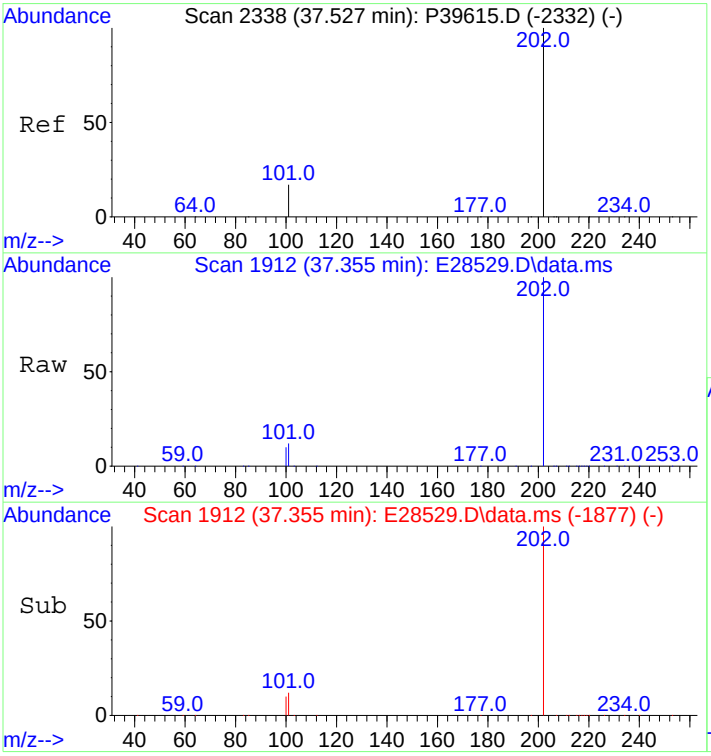


#57
1-Methylphenanthrene
Concen: 19509.07 ng/mL
RT: 35.081 min Scan# 1761
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:192 Resp: 2299712

Ion	Ratio	Lower	Upper
192	100		
191	56.4	45.5	68.3

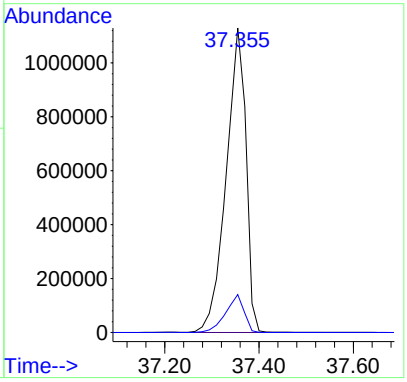


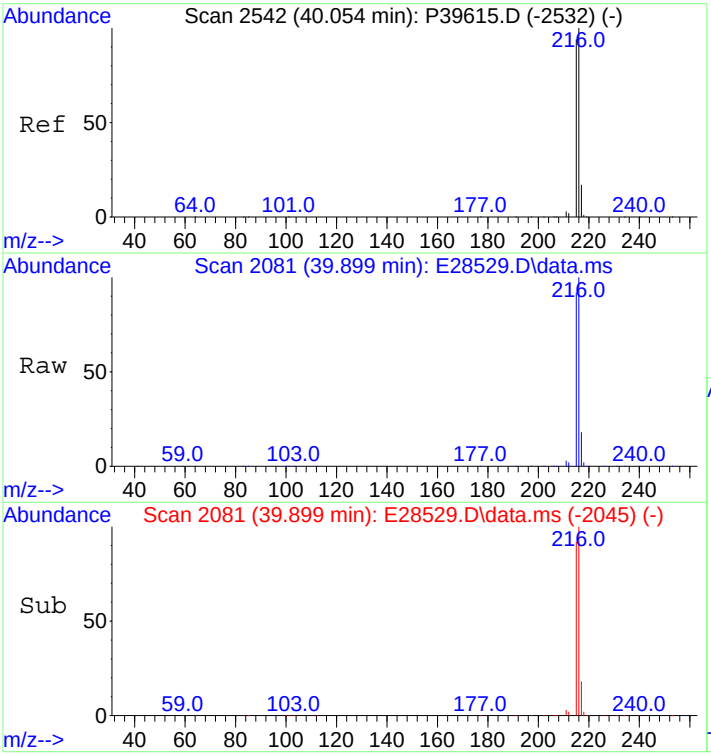


#58
Fluoranthene
Concen: 19040.79 ng/mL m
RT: 37.355 min Scan# 1912
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:202 Resp: 3284016

Ion	Ratio	Lower	Upper
202	100		
101	11.6	9.2	13.8

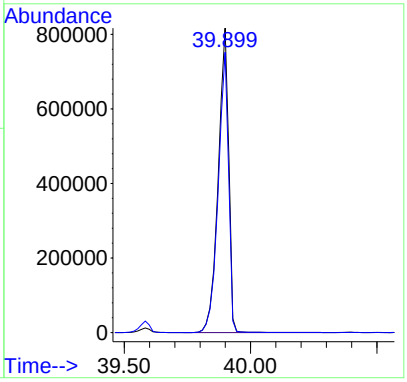


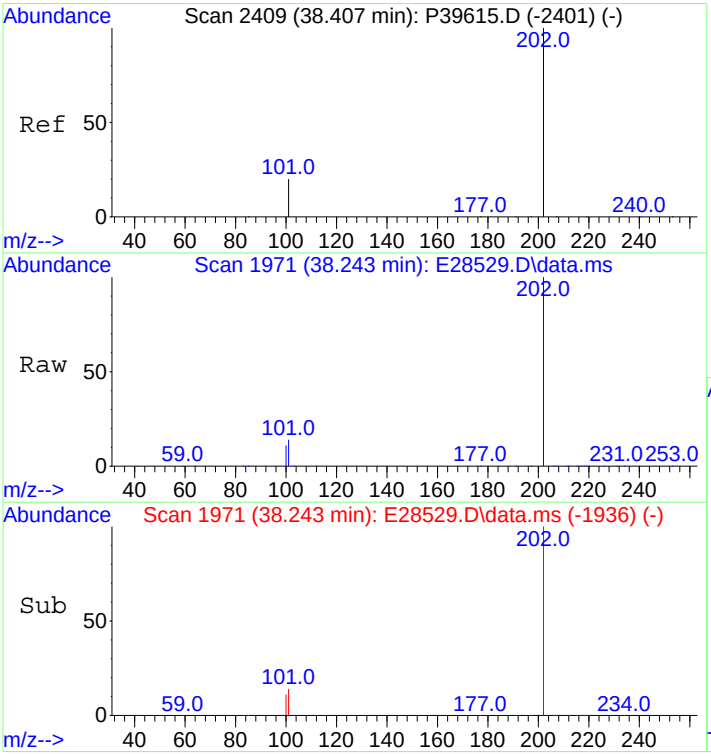


#59
Benzo(b)fluorene
Concen: 21426.94 ng/mL
RT: 39.899 min Scan# 2081
Delta R.T. 0.045 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:216 Resp: 2350585

Ion	Ratio	Lower	Upper
216	100		
215	91.2	73.8	110.8

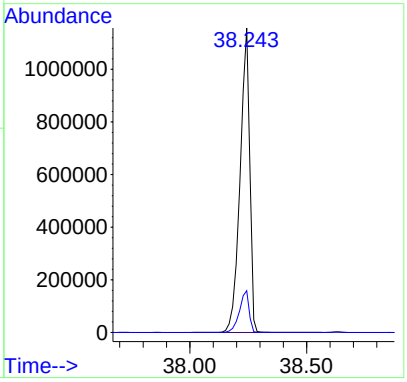


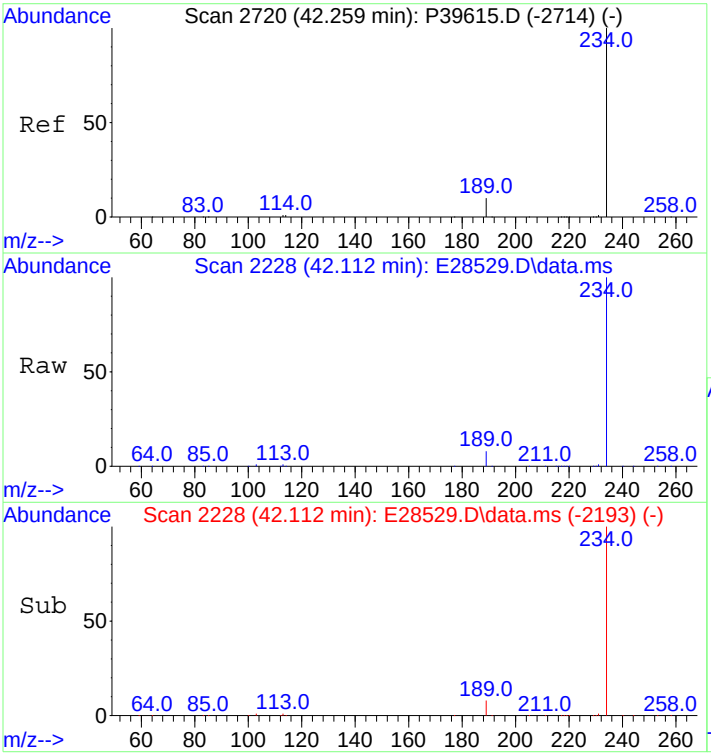


#60
Pyrene
Concen: 19057.45 ng/mL
RT: 38.243 min Scan# 1971
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:202 Resp: 3308735

Ion	Ratio	Lower	Upper
202	100		
101	13.7	9.8	14.8

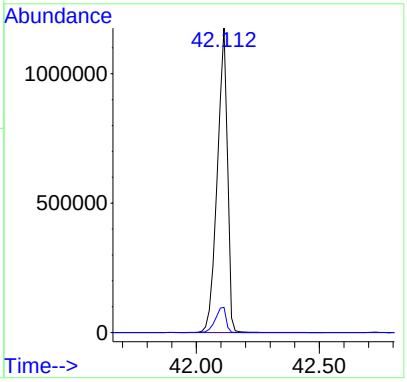


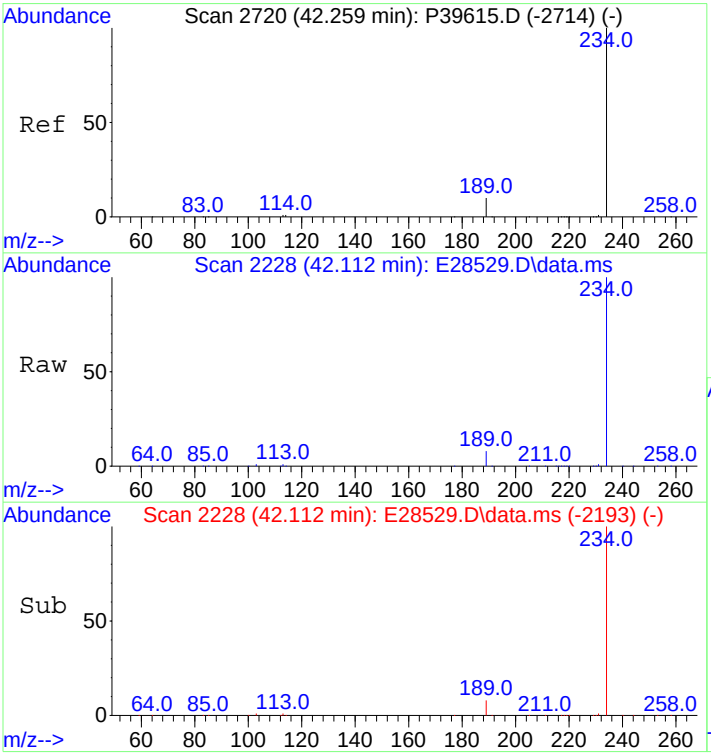


#66
Naphthobenzothiophene
Concen: 20479.13 ng/ml
RT: 42.112 min Scan# 2228
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:234 Resp: 3354891

Ion	Ratio	Lower	Upper
234	100		
189	8.8	5.5	8.3#

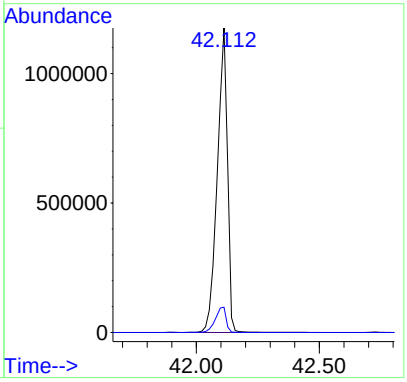


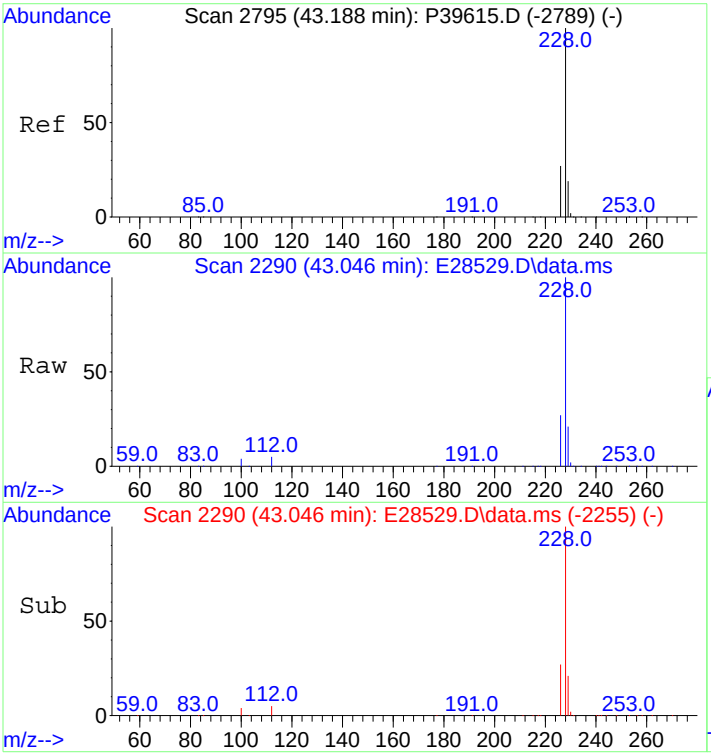


#67
Naphthobenzothiophene-2,1-D
Concen: 20479.13 ng/mL
RT: 42.112 min Scan# 2228
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:234 Resp: 3354891

Ion	Ratio	Lower	Upper
234	100		
189	8.8	5.5	8.3#

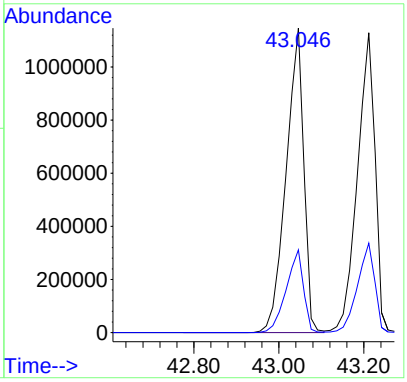


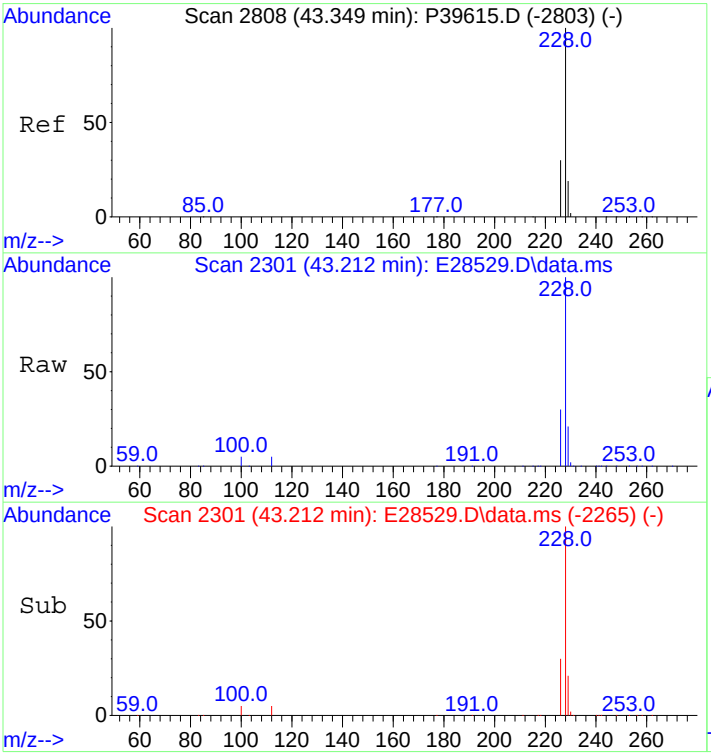


#75
Benz[a]anthracene
Concen: 16929.16 ng/mL
RT: 43.046 min Scan# 2290
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:228 Resp: 3308979

Ion	Ratio	Lower	Upper
228	100		
226	26.5	20.2	30.4

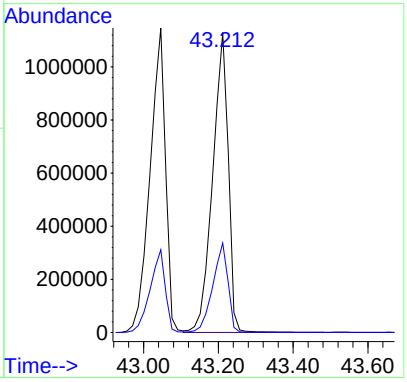


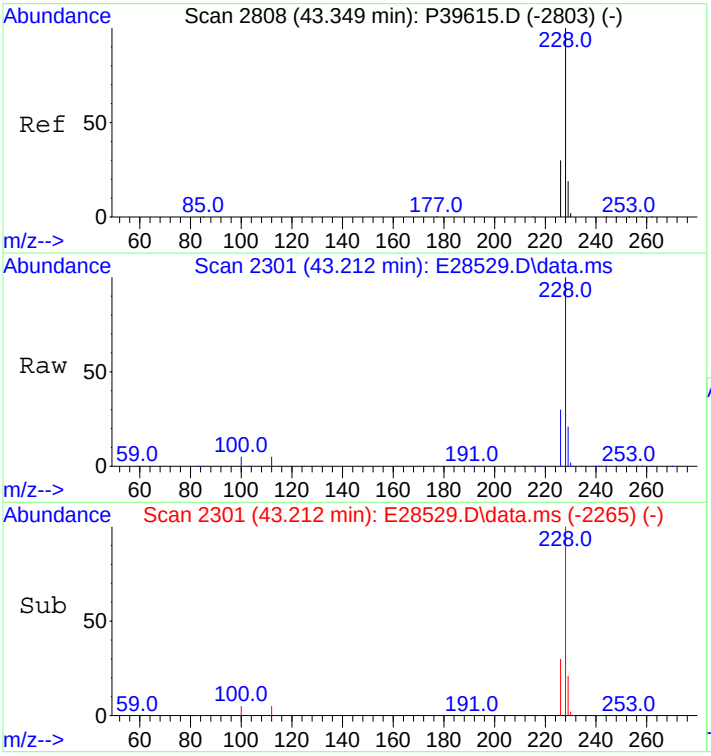


#76
Chrysene
Concen: 17112.24 ng/mL
RT: 43.212 min Scan# 2301
Delta R.T. 0.045 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:228 Resp: 3273879

Ion	Ratio	Lower	Upper
228	100		
226	29.1	22.6	34.0

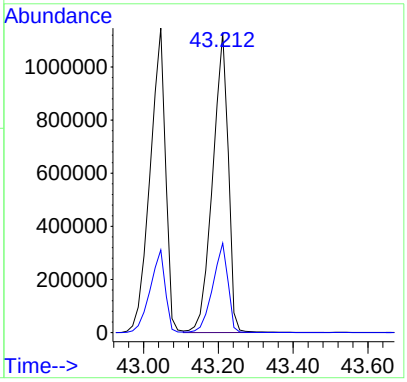


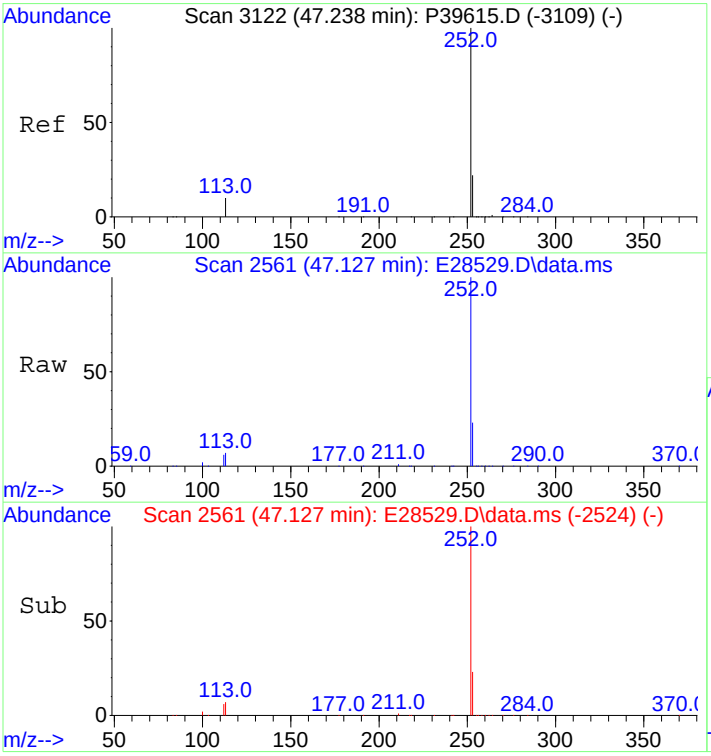


#77
Chrysene/Triphenylene
Concen: 17112.24 ng/mL
RT: 43.212 min Scan# 2301
Delta R.T. 0.045 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:228 Resp: 3273879

Ion	Ratio	Lower	Upper
228	100		
226	29.1	22.6	34.0

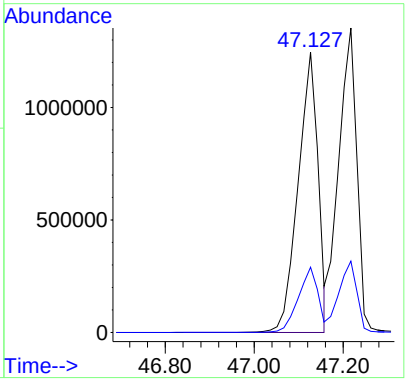


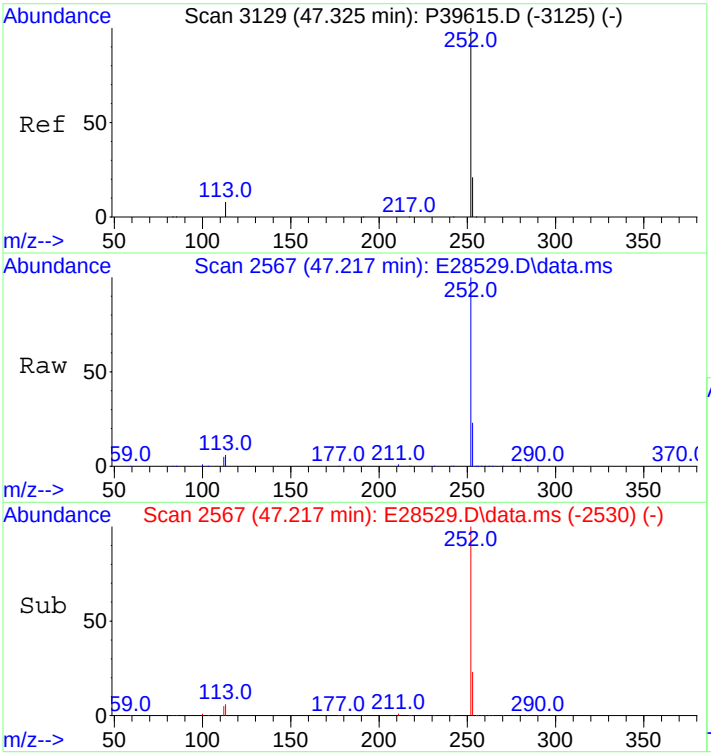


#84
Benzo[b]fluoranthene
Concen: 18894.57 ng/mL
RT: 47.127 min Scan# 2561
Delta R.T. 0.060 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3888463

Ion	Ratio	Lower	Upper
252	100		
253	23.1	18.3	27.5

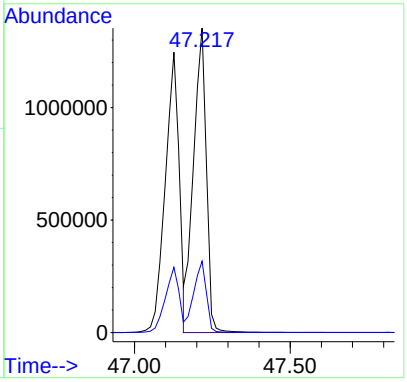


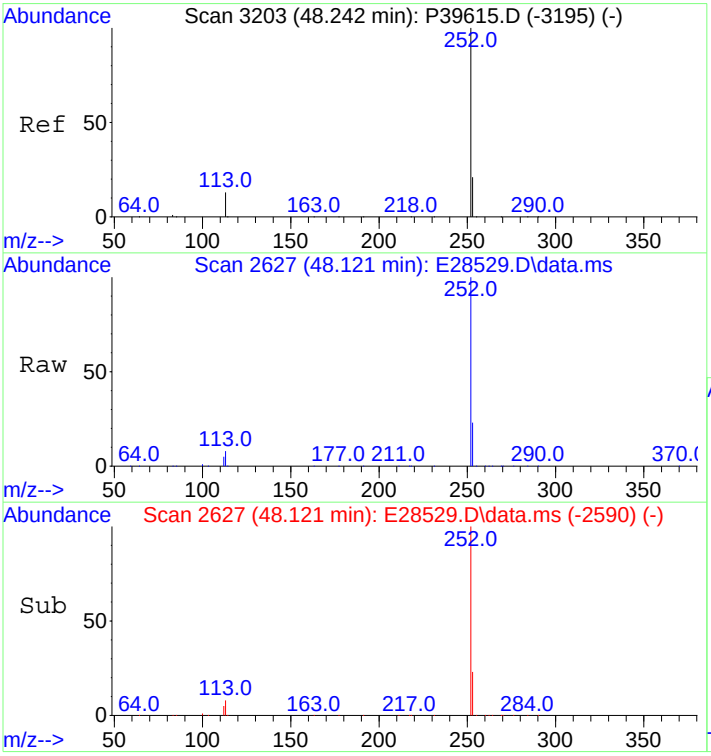


#85
Benzo[j]+[k]fluoranthene
Concen: 20033.78 ng/mL
RT: 47.217 min Scan# 2567
Delta R.T. 0.060 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3879730

Ion	Ratio	Lower	Upper
252	100		
253	23.2	18.3	27.5

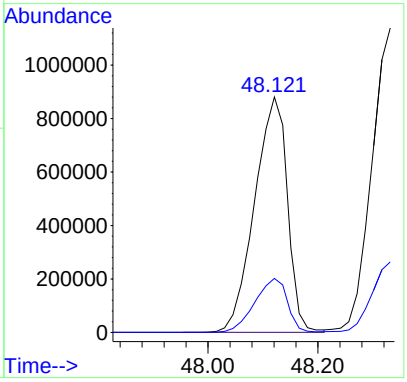


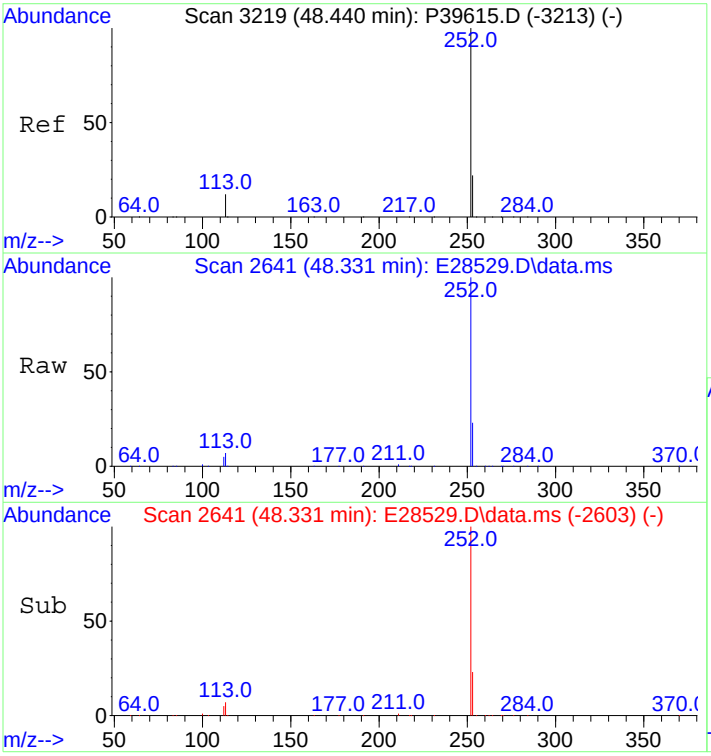


#87
Benzo[e]pyrene
Concen: 20014.94 ng/mL
RT: 48.121 min Scan# 2627
Delta R.T. 0.060 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3655053

Ion	Ratio	Lower	Upper
252	100		
253	22.7	18.6	28.0

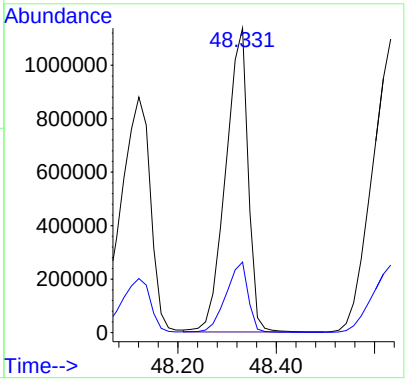


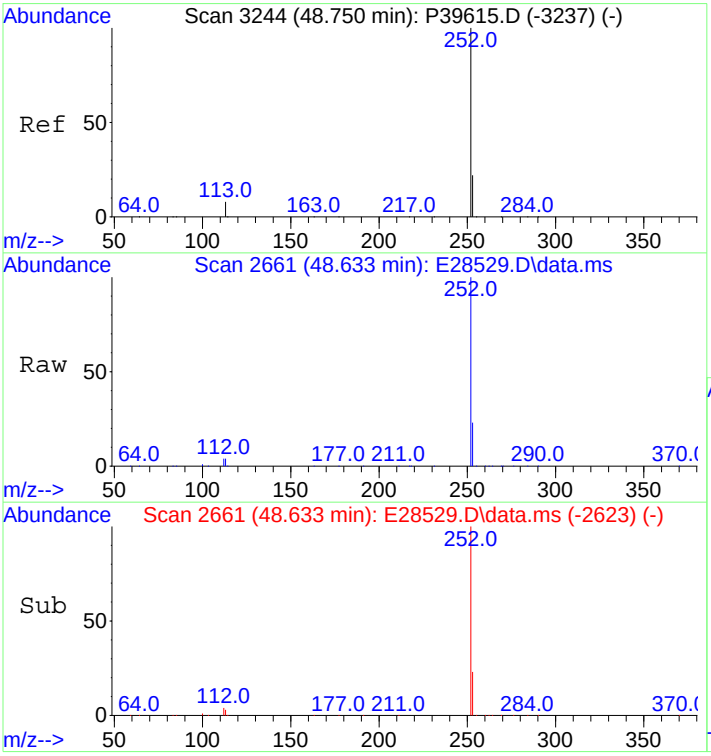


#89
Benzo[a]pyrene
Concen: 20806.40 ng/mL
RT: 48.331 min Scan# 2641
Delta R.T. 0.075 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3592144

Ion	Ratio	Lower	Upper
252	100		
253	22.9	18.8	28.2

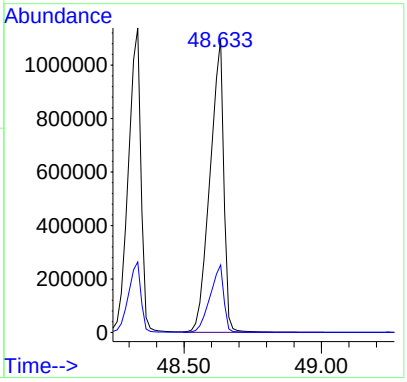


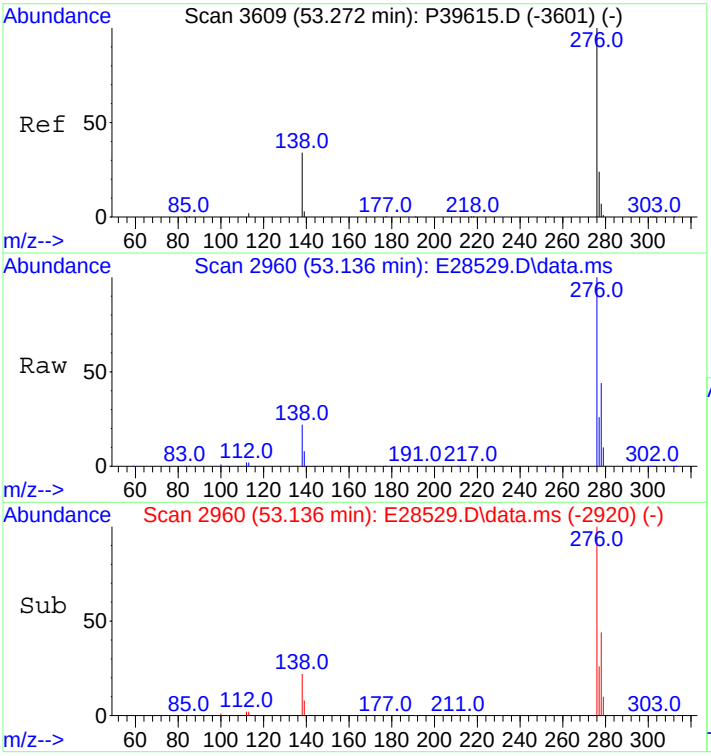


#90
Perylene
Concen: 20804.69 ng/mL
RT: 48.633 min Scan# 2661
Delta R.T. 0.075 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3822620

Ion	Ratio	Lower	Upper
252	100		
253	22.8	18.8	28.2

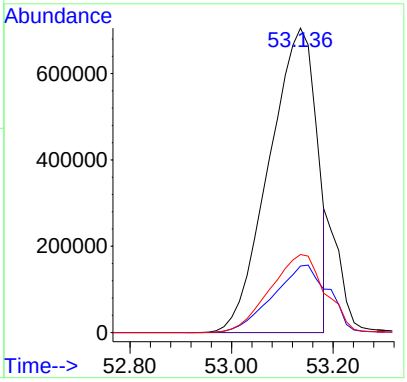


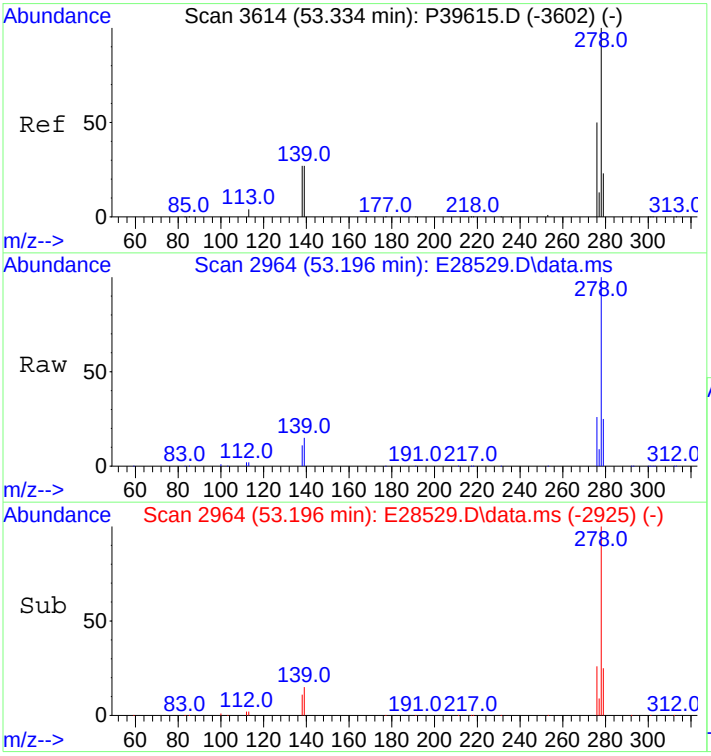


#91
Indeno[1,2,3-cd]pyrene
Concen: 22121.20 ng/mL m
RT: 53.136 min Scan# 2960
Delta R.T. 0.105 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:276 Resp: 4610873

Ion	Ratio	Lower	Upper
276	100		
138	26.0	15.4	23.2#
277	29.7	19.1	28.7#

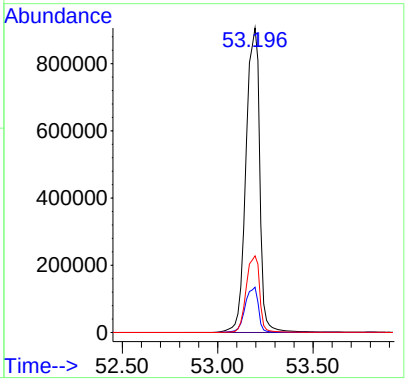


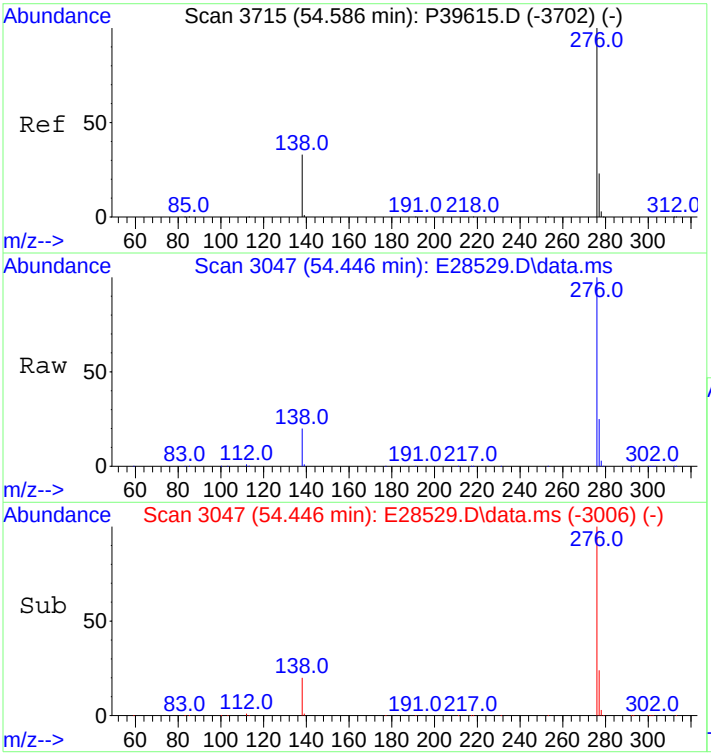


#92
Dibenz[ah]+[ac]anthracene
Concen: 22801.34 ng/mL
RT: 53.196 min Scan# 2964
Delta R.T. 0.090 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:278 Resp: 4571116

Ion	Ratio	Lower	Upper
278	100		
139	14.5	11.1	16.7
279	24.7	19.4	29.0

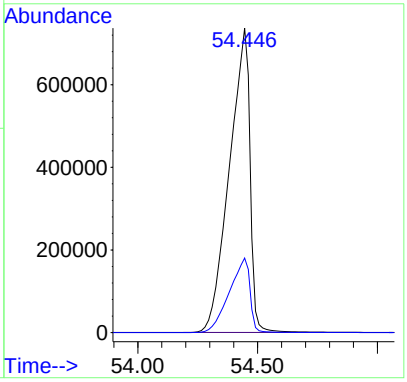




#93
Benzo[g,h,i]perylene
Concen: 21457.51 ng/mL
RT: 54.446 min Scan# 3047
Delta R.T. 0.120 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:276 Resp: 4394931

Ion	Ratio	Lower	Upper
276	100		
277	24.6	19.1	28.7



Quantitation Report (QT Reviewed)

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Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.591	164	47144M3	500.000	ng/mL	0.01
74) Chrysene-d12	43.091	240	105852	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	140871	849.517	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 84.95%			
42) Phenanthrene-d10	32.462	188	163907	964.768	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.48%			
83) Benzo[b]fluoranthene-d12	47.006	264	220790	1015.382	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.54%			
88) Benzo[a]pyrene-d12	48.181	264	210972	1001.332	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 100.13%			
129) 5B(H)Cholane - Surr	43.724	217	46433	1113.004	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.30%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	71200	1888.050	ng/mL	100
4) cis-Decalin	17.483	138	3514	122.649	ng/mL	100
5) C1-Decalins	18.205	152	138309M5	3667.617	ng/mL	
6) C2-Decalins	19.530	166	133037M5	3527.817	ng/mL	
7) C3-Decalins	22.014	180	72889M5	1932.839	ng/mL	
8) C4-Decalins	25.401	194	83324M5	2209.549	ng/mL	
10) Naphthalene	19.681	128	487082	2626.597	ng/mL#	100
11) C1-Naphthalenes	22.390	142	1071394M5	5777.508	ng/mL	
12) C2-Naphthalenes	25.236	156	1371191M5	7394.168	ng/mL	
13) C3-Naphthalenes	27.569	170	1083568M5	5843.156	ng/mL	
14) C4-Naphthalenes	30.339	184	632028M5	3408.220	ng/mL	
16) 2-Methylnaphthalene	22.390	142	627593	5313.630	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	441379	3845.923	ng/mL#	100
18) Benzothiophene	19.906	134	4341M3	28.316	ng/mL	
19) C1-Benzo(b)thiophenes	21.954	148	23978M5	156.409	ng/mL	
20) C2-Benzo(b)thiophenes	25.431	162	40049M5	261.240	ng/mL	
21) C3-Benzo(b)thiophenes	27.404	176	84299M5	549.883	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	78691M5	513.302	ng/mL	
23) Biphenyl	24.272	154	102541	686.942	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.890	156	337170	3167.106	ng/mL#	100
25) Dibenzofuran	27.358	168	42393	256.522	ng/mL	89
26) Acenaphthylene	25.973	152	6691M3	36.190	ng/mL	
27) Acenaphthene	26.741	153	10860M3	91.253	ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.277	170	83122M3	834.531	ng/mL	
29) Fluorene	28.728	166	48225M3	363.326	ng/mL	
30) C1-Fluorenes	31.107	180	118539M5	893.069	ng/mL	
31) C2-Fluorenes	33.305	194	193676M5	1459.150	ng/mL	
32) C3-Fluorenes	35.142	208	189287M5	1426.083	ng/mL	
33) Dibenzothiophene	32.055	184	127296	698.870	ng/mL#	71
34) 4-Methyldibenzothiophe...	33.832	198	131601	722.505	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.193	198	95587	524.784	ng/mL#	100
36) 1-Methyldibenzothiophe...	34.615	198	43667	239.737	ng/mL#	100
37) OTP	34.283	198	18036	99.020	ng/mL#	100
38) C1-Dibenzothiophenes	33.832	198	294951M5	1619.316	ng/mL	
39) C2-Dibenzothiophenes	35.533	212	404348M5	2219.919	ng/mL	
40) C3-Dibenzothiophenes	37.340	226	379093M5	2081.266	ng/mL	
41) C4-Dibenzothiophenes	39.041	240	214446M5	1177.334	ng/mL	
43) Phenanthrene	32.552	178	195639	1055.722	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.524	192	93705	505.658	ng/mL	98

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.645	192	101546	547.970 ng/mL	97
46) 2-Methylanthracene(2MA)	34.795	192	2266M3	12.228 ng/mL	
47) 9/4-Methylphenanthrene...	34.976	192	143377	773.702 ng/mL	97
48) 1-Methylphenanthrene(1MP)	35.066	192	100277M3	541.122 ng/mL	
49) C1-Phenanthrenes/Anthr...	34.976	192	441690M5	2383.481 ng/mL	
50) C2-Phenanthrenes/Anthr...	36.798	206	510520M5	2754.907 ng/mL	
52) C3-Phenanthrenes/Anthr...	38.650	220	375728M5	2027.532 ng/mL	
53) C4-Phenanthrenes/Anthr...	40.833	234	154244M5	832.343 ng/mL	
56) Carbazole	33.410	167	6647M3	40.322 ng/mL	
57) 1-Methylphenanthrene	35.066	192	100650M3	711.918 ng/mL	
58) Fluoranthene	37.340	202	4201M3	20.528 ng/mL	
59) Benzo(b)fluorene	39.869	216	5205M3	38.168 ng/mL	
60) Pyrene	38.228	202	15722M3	75.583 ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.628	216	77003M5	370.190 ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.435	230	124873M5	600.323 ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.468	244	153640M5	738.620 ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.823	258	140363M5	674.791 ng/mL	
66) Naphthobenzothiophene	42.098	234	34132	166.369 ng/ml#	72
67) Naphthobenzothiophene-...	42.098	234	34132	166.369 ng/mL#	72
68) Naphthobenzothiophene-...	42.429	234	8220	40.067 ng/mL#	5
69) Naphthobenzothiophene-...	42.730	234	3653M3	17.806 ng/mL	
70) C1-Naphthobenzothiophenes	43.498	248	127630M5	622.106 ng/ml	
71) C2-Naphthobenzothiophenes	45.515	262	185905M5	906.156 ng/ml	
72) C3-Naphthobenzothiophenes	47.112	276	152145M5	741.600 ng/ml	
73) C4-Naphthobenzothiophenes	48.196	290	114807M5	559.603 ng/mL	
75) Benz[a]anthracene	43.016	228	2301M3	11.163 ng/mL	
76) Chrysene	43.151	228	39715M3	187.149 ng/mL	
77) Chrysene/Triphenylene	43.151	228	40725M3	191.908 ng/mL	
78) C1-Chrysenes	44.672	242	75676M5	356.607 ng/mL	
79) C2-Chrysenes	46.750	256	109371M5	515.388 ng/mL	
80) BBF-D12 Surr BKGD	47.006	256	6935	32.680 ng/mL	100
81) C3-Chrysenes	49.446	270	124142M5	584.993 ng/mL	
82) C4-Chrysenes	49.567	284	79808M5	376.078 ng/mL	
84) Benzo[b]fluoranthene	47.082	252	6298M3	26.287 ng/mL	
85) Benzo[j]+[k]fluoranthene	47.142	252	550M3	2.231 ng/mL	
87) Benzo[e]pyrene	48.076	252	11528	49.278 ng/mL	91
89) Benzo[a]pyrene	48.271	252	1881M3	8.403 ng/mL	
90) Perylene	48.588	252	3561M3	15.044 ng/mL	
91) Indeno[1,2,3-cd]pyrene	53.076	276	1091M3	4.141 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.106	278	1624M3	5.789 ng/mL	
93) Benzo[g,h,i]perylene	54.340	276	4537	15.972 ng/mL#	68
94) Hopane (T19)	52.202	191	61269	771.256 ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	61269	771.256 ng/mL#	90
96) C23 Tricyclic Terpane ...	40.743	191	23215	292.231 ng/ml	100
97) C24 Tricyclic Terpane ...	41.480	191	14405M3	181.331 ng/ml	
98) C25 Tricyclic Terpane ...	42.971	191	14231M3	179.140 ng/ml	
99) C24 Tetracyclic Terpan...	44.281	191	4971M3	62.575 ng/ml	
100) C26 Tricyclic Terpane-...	44.025	191	5793M3	72.922 ng/ml	
101) C26 Tricyclic Terpane-...	44.130	191	5231	65.848 ng/ml	100
102) C28 Tricyclic Terpane-...	46.419	191	5851M3	73.653 ng/ml	
103) C28 Tricyclic Terpane-...	46.585	191	6386M3	80.387 ng/ml	
104) C29 Tricyclic Terpane-...	47.112	191	7224	90.936 ng/ml	100
105) C29 Tricyclic Terpane-...	47.307	191	7284M3	91.691 ng/ml	
106) 18a-22,29,30-Trisnorne...	48.422	191	10760	135.447 ng/ml	100
107) C30 Tricyclic Terpane-22S	48.527	191	5804M3	73.061 ng/mL	
108) C30 Tricyclic Terpane-22R	48.768	191	5992M3	75.427 ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

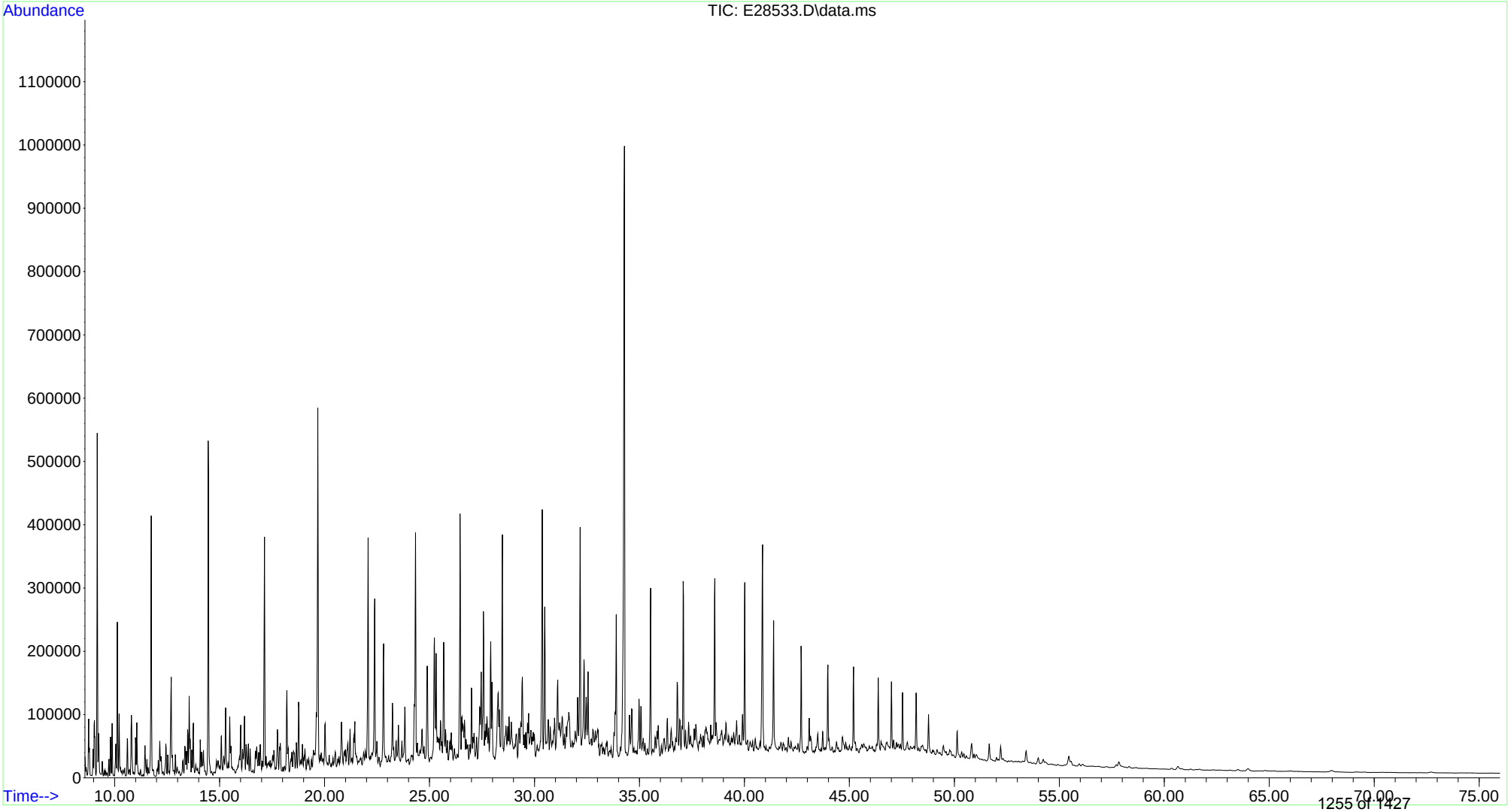
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
109) 17a(H)-22,29,30-Trisno...	48.964	191	12728M3	160.220	ng/ml	
110) 17a/b,21b/a 28,30-Bisn...	50.154	191	2831	35.637	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	49.973	191	3191	40.168	ng/ml	100
112) 30-Norhopane (T15)	50.832	191	35454	446.296	ng/ml	100
113) 18a(H)-30-Norneohopane...	50.937	191	9313M3	117.232	ng/ml	
114) 17a(H)-Diahopane (X)	51.073	191	5508M3	69.335	ng/ml	
115) 30-Normoretane (T17)	51.615	191	3970	49.974	ng/ml	100
117) Moretane (T20)	52.895	191	6020M3	75.780	ng/ml	
118) 30-Homohopane-22S (T21)	53.994	191	25836	325.224	ng/ml	100
119) 30-Homohopane-22R (T22)	54.235	191	21801	274.432	ng/ml	100
120) Gammacerane/C32-diahopane	54.777	191	4499	56.634	ng/mL	100
121) 30,31-Bishomohopane-22...	55.575	191	18579	233.873	ng/ml	100
122) 30,31-Bishomohopane-22...	55.952	191	13513	170.102	ng/ml	100
123) 30,31-Trishomohopane-2...	57.714	191	14906	187.637	ng/ml	100
124) 30,31-Trishomohopane-2...	58.331	191	9896M3	124.571	ng/ml	
125) Tetrakishomohopane-22S...	60.349	191	10857	136.668	ng/ml	100
126) Tetrakishomohopane-22R...	61.252	191	7957	100.163	ng/ml	100
127) Pentakishomohopane-22S...	63.511	191	11110	139.853	ng/ml	100
128) Pentakishomohopane-22R...	64.806	191	9965	125.440	ng/ml	100
130) 13b(H),17a(H)-20S-Diac...	45.244	217	10733M3	257.271	ng/ml	
131) 13b(H),17a(H)-20R-Diac...	45.681	217	5589M3	133.969	ng/ml	
132) 13b,17a-20S-Methyldiac...	46.374	217	4399M3	105.445	ng/ml	
133) 14a,17a-20S-Chol/13b,1...	47.247	217	12966	310.796	ng/ml	100
134) 14a,17a-20R-Chol/13b,1...	47.759	217	15015M3	359.911	ng/ml	
135) Unknown Sterane (S18)	48.045	217	4124	98.853	ng/ml	100
136) 13a,17b-20S-Ethyldiach...	48.317	217	1011	24.234	ng/ml	100
137) 14a,17a-20S-Methylchol...	48.467	217	6766M3	162.182	ng/ml	
138) 14a,17a-20R-Methylchol...	49.190	217	7334M3	175.797	ng/ml	
139) 14a(H),17a(H)-20S-Ethy...	49.536	217	9103M3	218.200	ng/ml	
140) 14a(H),17a(H)-20R-Ethy...	50.455	217	8734M3	209.355	ng/ml	
141) 14b(H),17b(H)-20R-Chol...	47.338	218	8433M3	202.140	ng/ml	
142) 14b(H),17b(H)-20S-Chol...	47.413	218	8412M3	201.637	ng/ml	
143) 14b,17b-20R-Methylchol...	48.633	218	9575	229.514	ng/ml	100
144) 14b,17b-20S-Methylchol...	48.723	218	11768M3	282.080	ng/ml	
145) 14b(H),17b(H)-20R-Ethy...	49.777	218	13230M3	317.125	ng/ml	
146) 14b(H),17b(H)-20S-Ethy...	49.823	218	8678M3	208.013	ng/ml	
147) C26,20R- +C27,20S- tri...	49.476	231	48173	1154.712	ng/mL	100
148) C28,20S-triaromatic st...	50.350	231	31642	758.462	ng/mL	100
149) C27,20R-triaromatic st...	50.801	231	29597	709.443	ng/mL	100
150) C28,20R-triaromatic st...	52.006	231	25116M3	602.033	ng/mL	

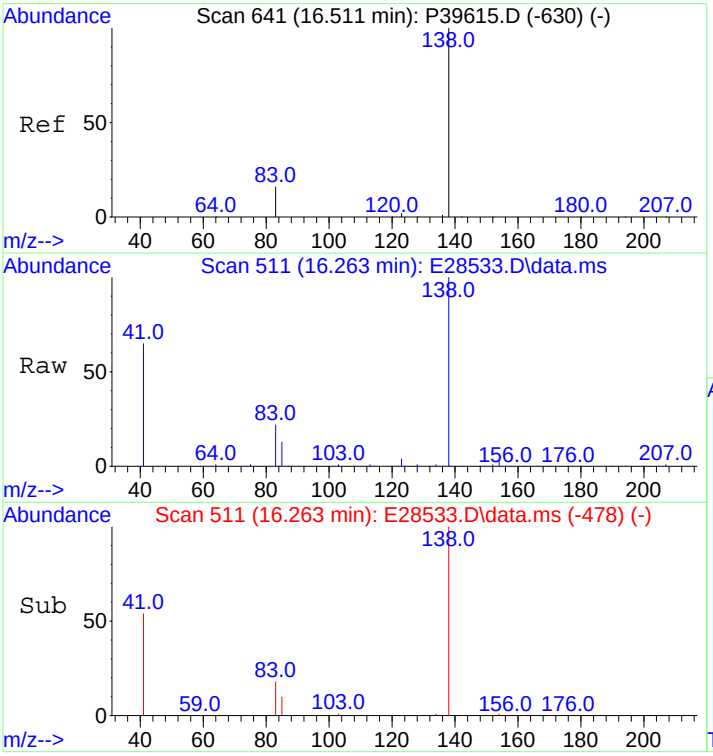
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : Default - All compounds listedport (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

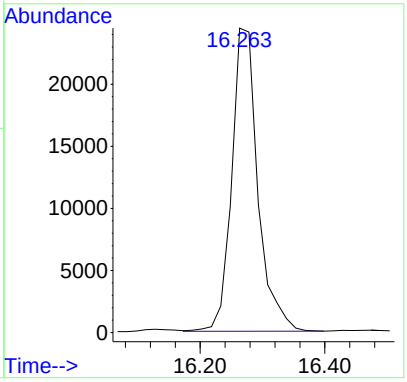
Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

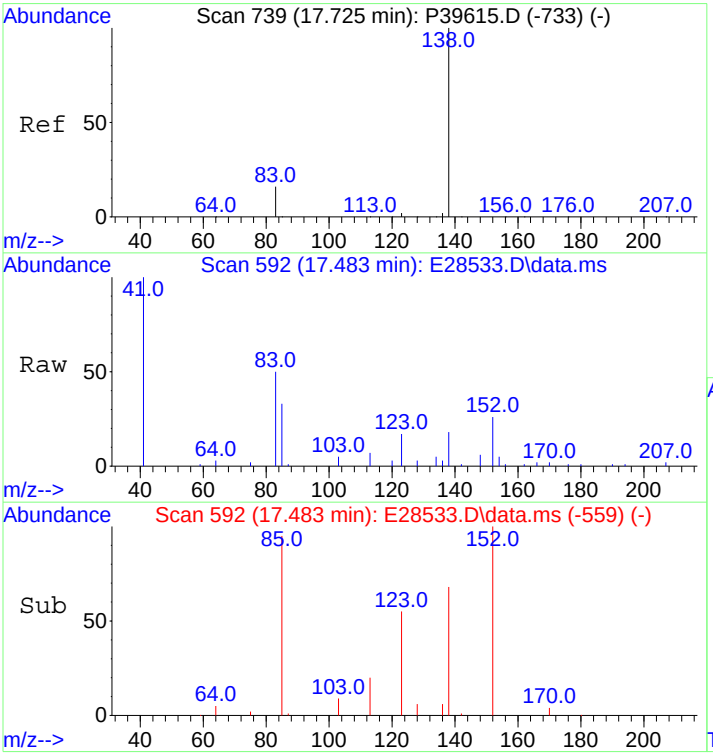




#3
trans-Decalin
Concen: 1888.05 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

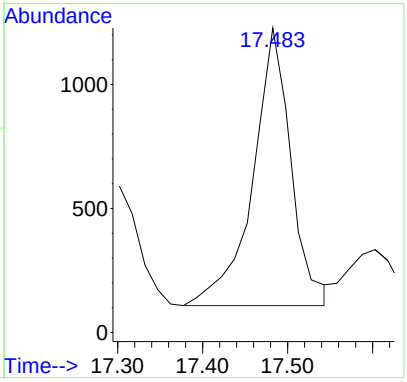
Tgt Ion:138 Resp: 71200

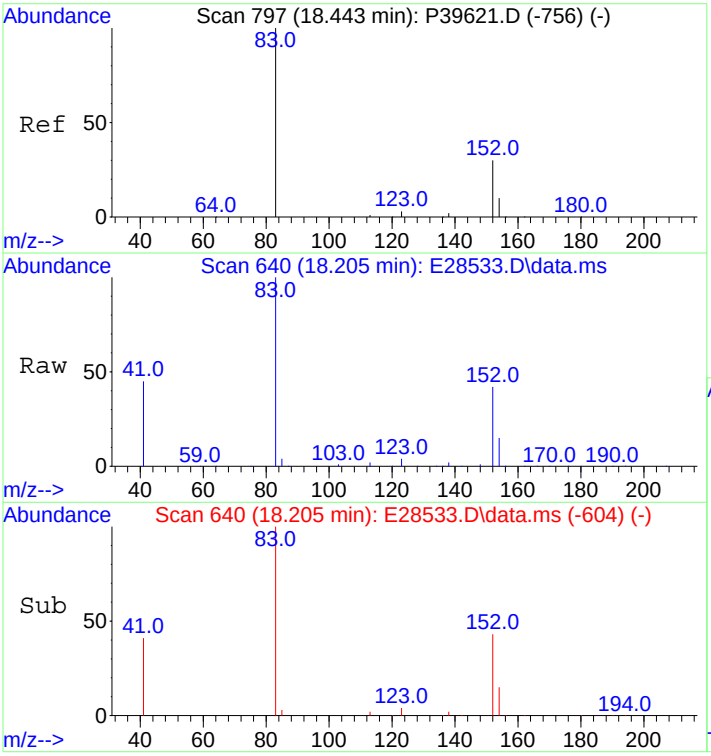




#4
cis-Decalin
Concen: 122.65 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

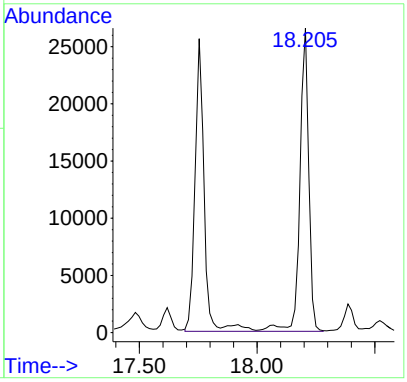
Tgt Ion:138 Resp: 3514

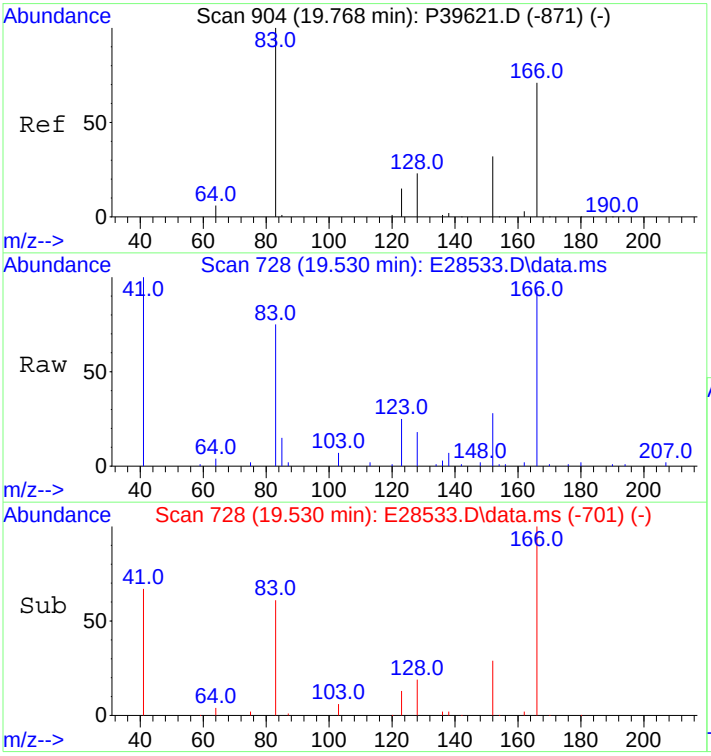




#5
C1-Decalins
Concen: 3667.62 ng/mL m
RT: 18.205 min Scan# 640
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

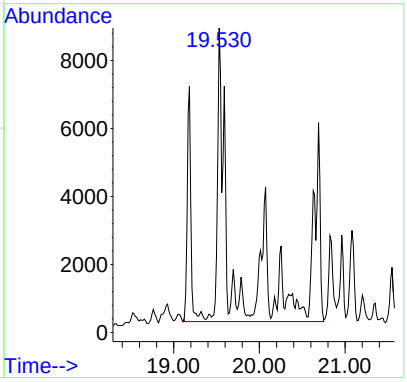
Tgt Ion:152 Resp: 138309

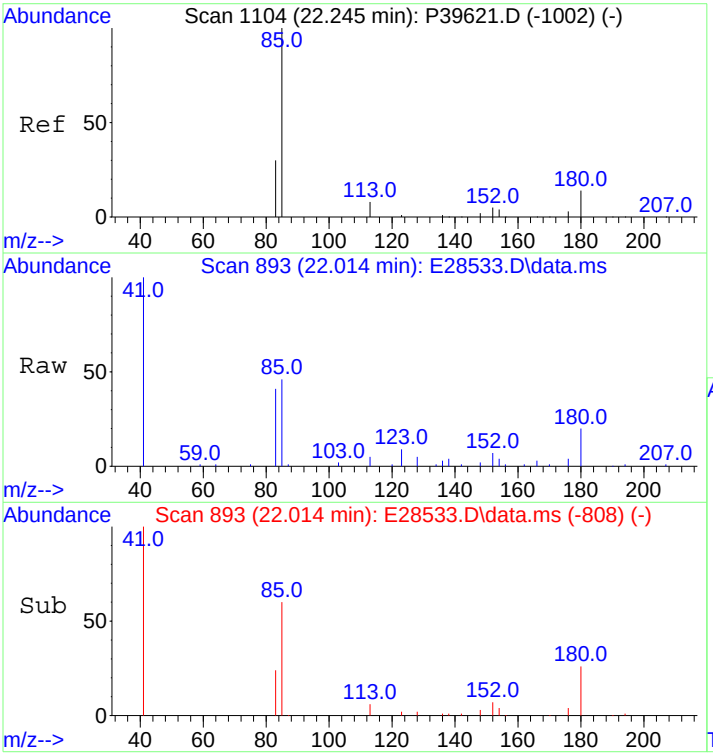




#6
C2-Decalins
Concen: 3527.82 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. -0.091 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

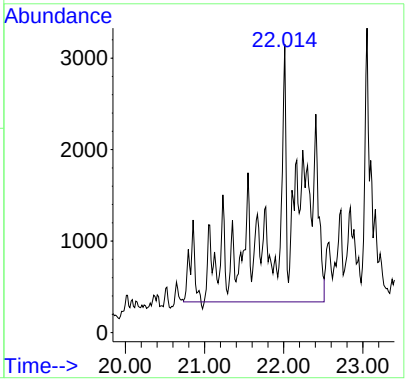
Tgt Ion:166 Resp: 133037

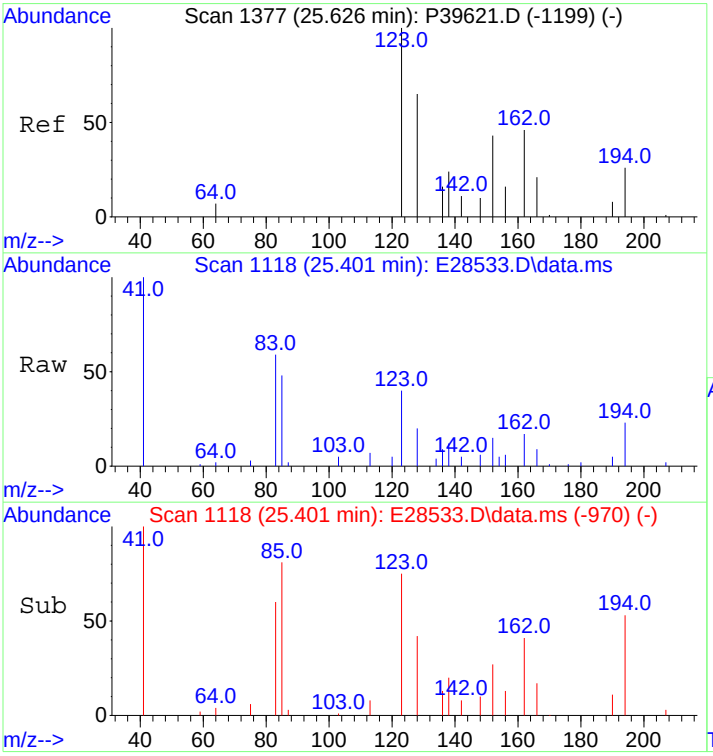




#7
C3-Decalins
Concen: 1932.84 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.044 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

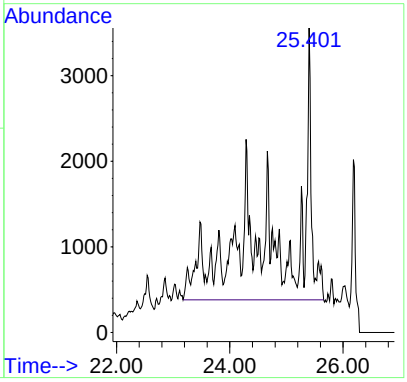
Tgt Ion:180 Resp: 72889

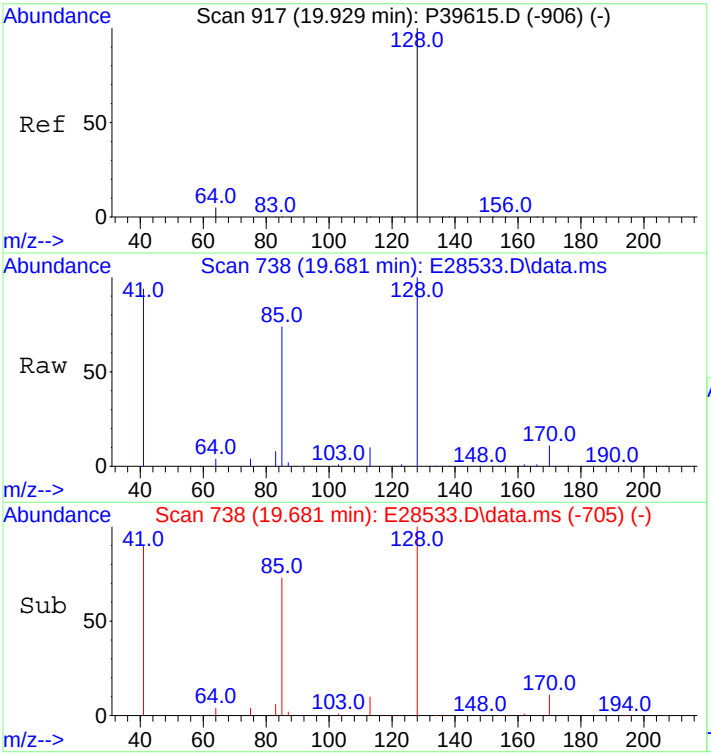




#8
C4-Decalins
Concen: 2209.55 ng/mL m
RT: 25.401 min Scan# 1118
Delta R.T. -0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:194 Resp: 83324

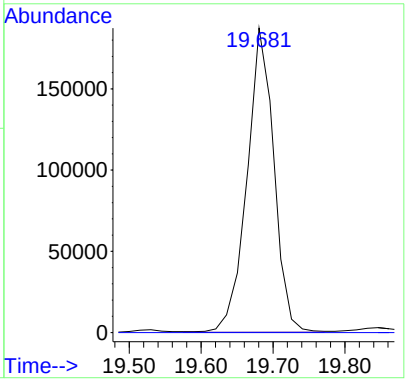


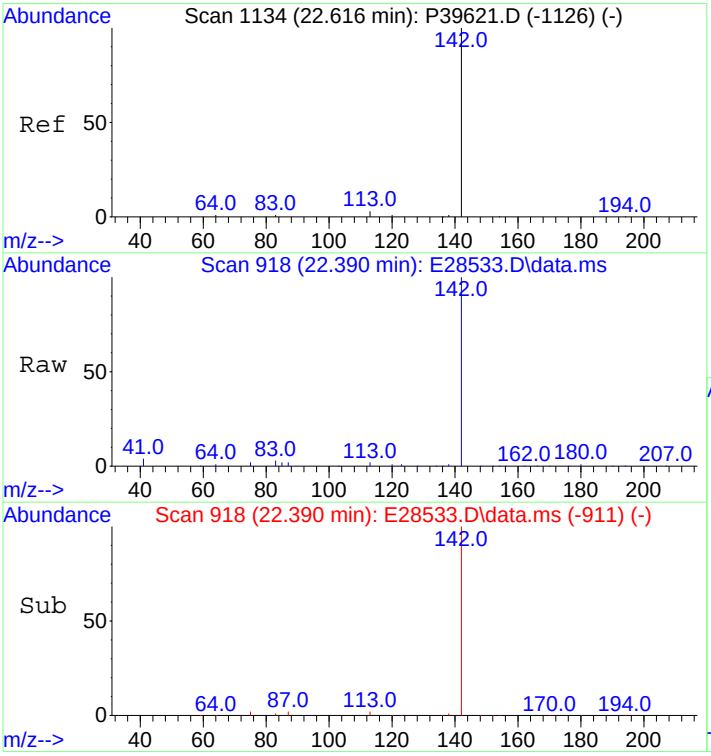


#10
Naphthalene
Concen: 2626.60 ng/mL
RT: 19.681 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:128 Resp: 487082

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

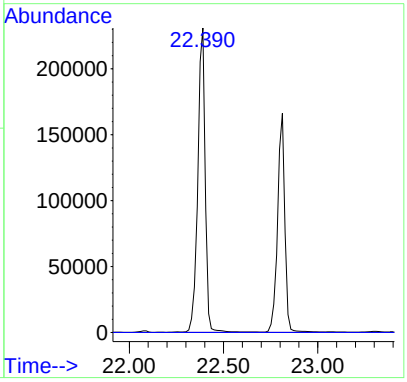


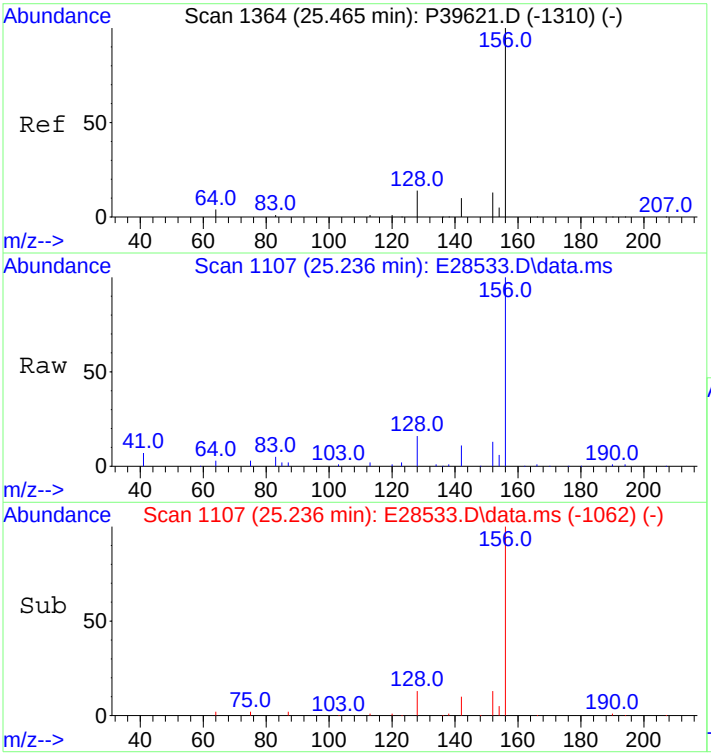


#11
C1-Naphthalenes
Concen: 5777.51 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. -0.054 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:142 Resp: 1071394

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

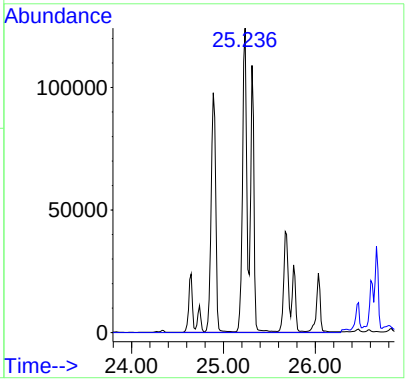


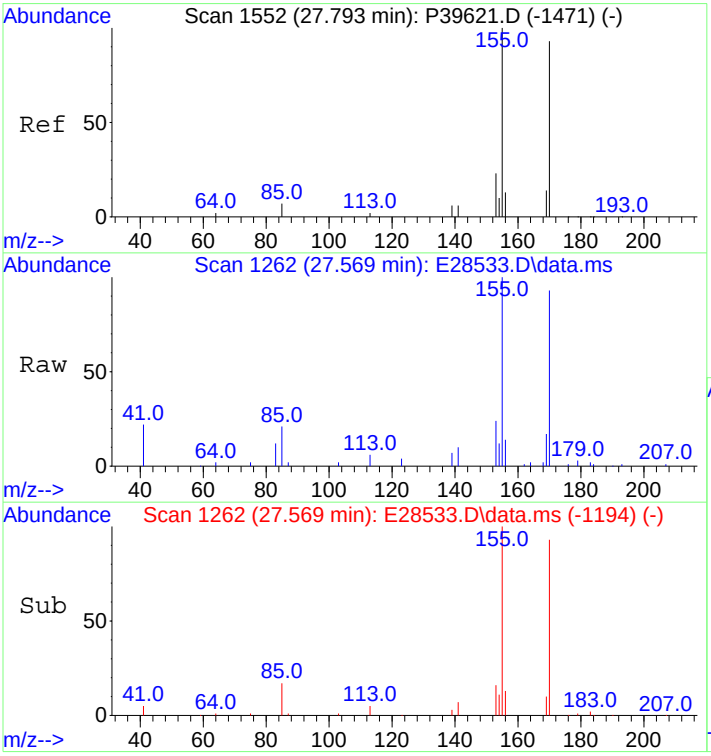


#12
C2-Naphthalenes
Concen: 7394.17 ng/mL m
RT: 25.236 min Scan# 1107
Delta R.T. -0.017 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:156 Resp: 1371191

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

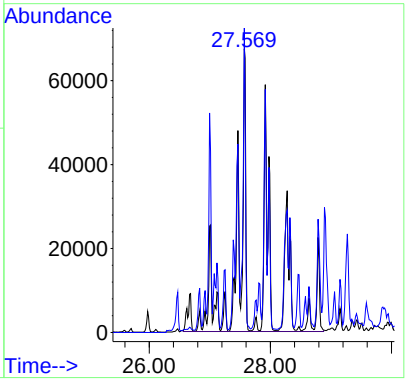


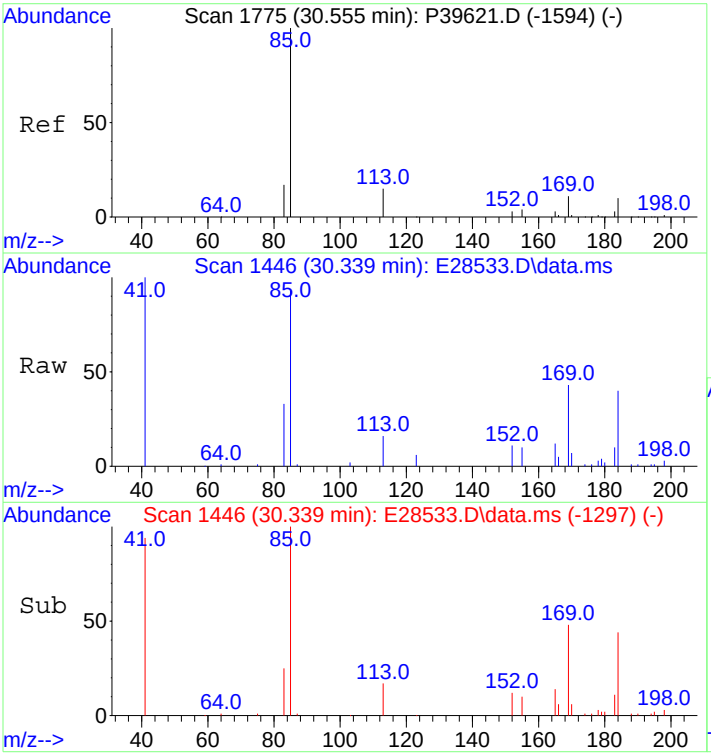


#13
C3-Naphthalenes
Concen: 5843.16 ng/mL m
RT: 27.569 min Scan# 1262
Delta R.T. -0.002 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:170 Resp: 1083568

Ion	Ratio	Lower	Upper
170	100		
155	12.6	66.8	100.2#

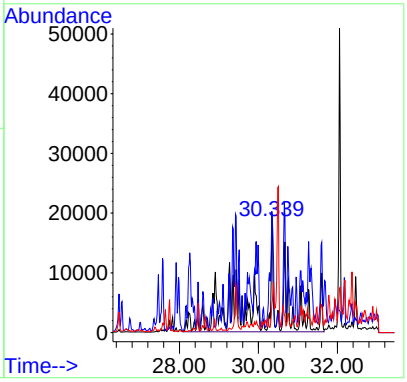


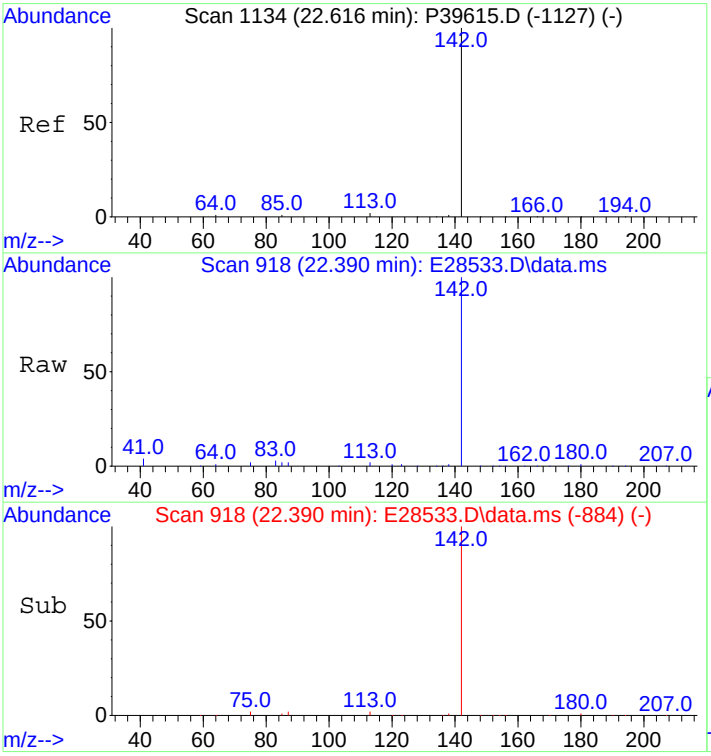


#14
C4-Naphthalenes
Concen: 3408.22 ng/mL m
RT: 30.339 min Scan# 1446
Delta R.T. 0.033 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:184 Resp: 632028

Ion	Ratio	Lower	Upper
184	100		
169	17.2	78.7	118.1#
183	0.0	26.7	40.1#

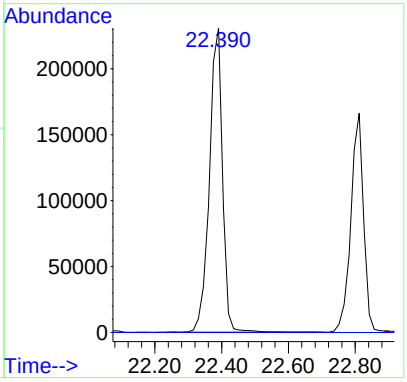


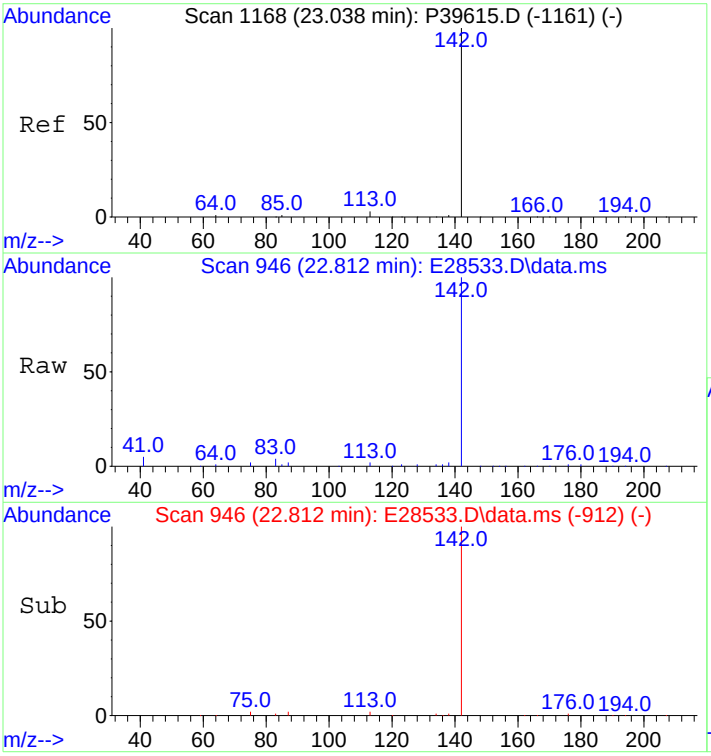


#16
2-Methylnaphthalene
Concen: 5313.63 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:142 Resp: 627593

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

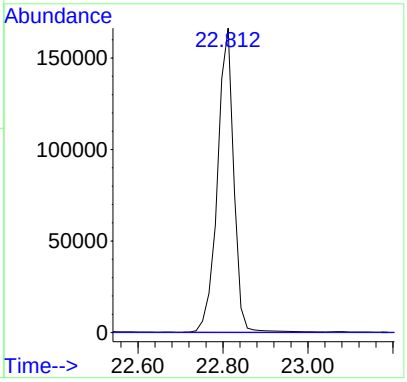


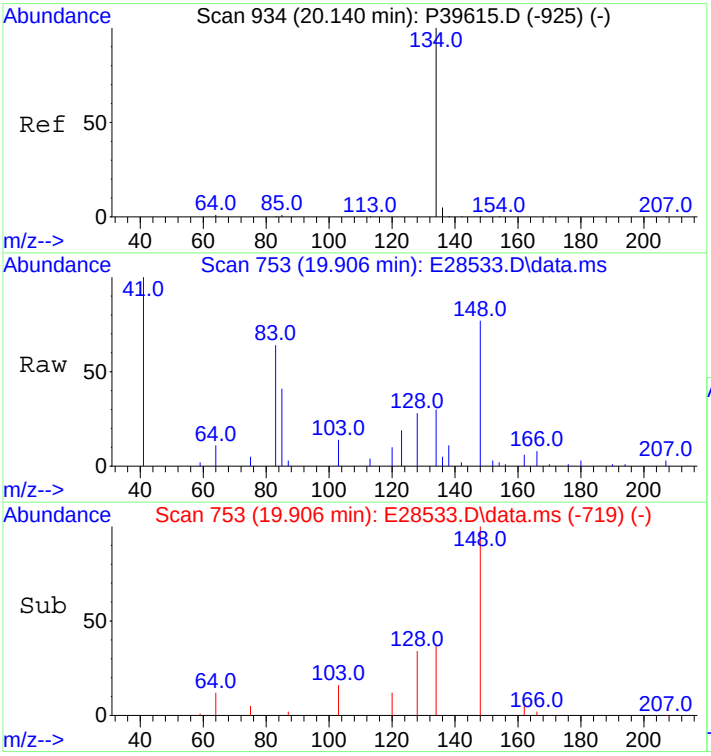


#17
1-Methylnaphthalene
Concen: 3845.92 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:142 Resp: 441379

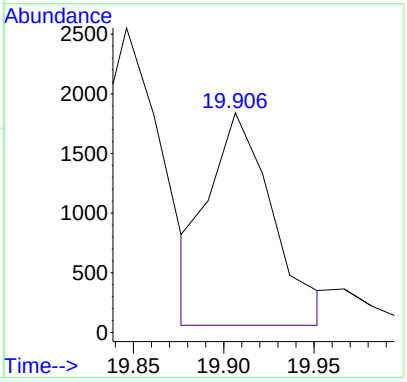
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

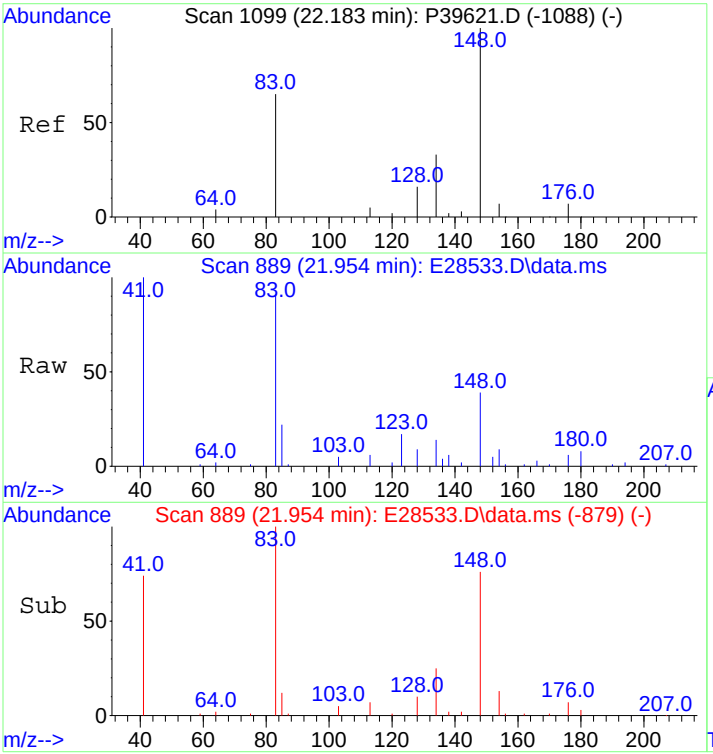




#18
Benzothiophene
Concen: 28.32 ng/mL m
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

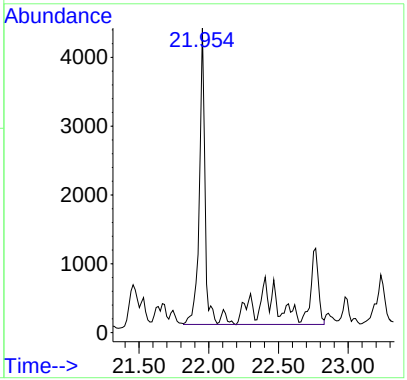
Tgt Ion:134 Resp: 4341

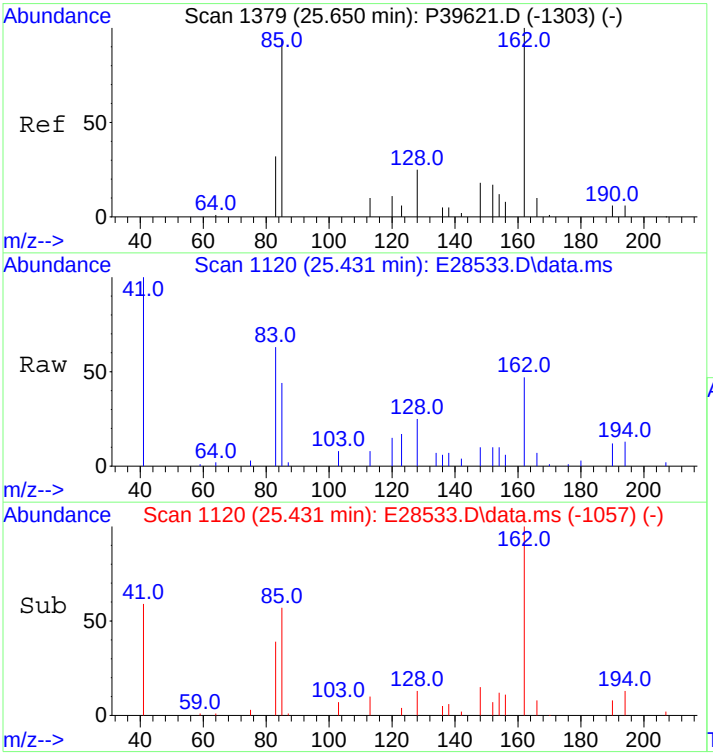




#19
C1-Benzo(b)thiophenes
Concen: 156.41 ng/mL m
RT: 21.954 min Scan# 889
Delta R.T. -0.059 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

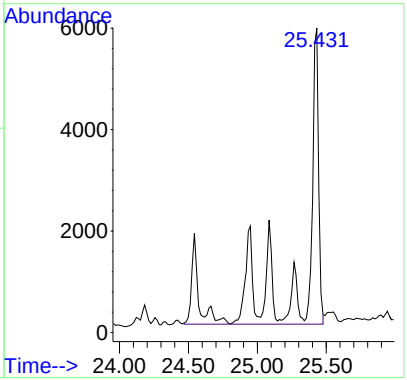
Tgt Ion:148 Resp: 23978

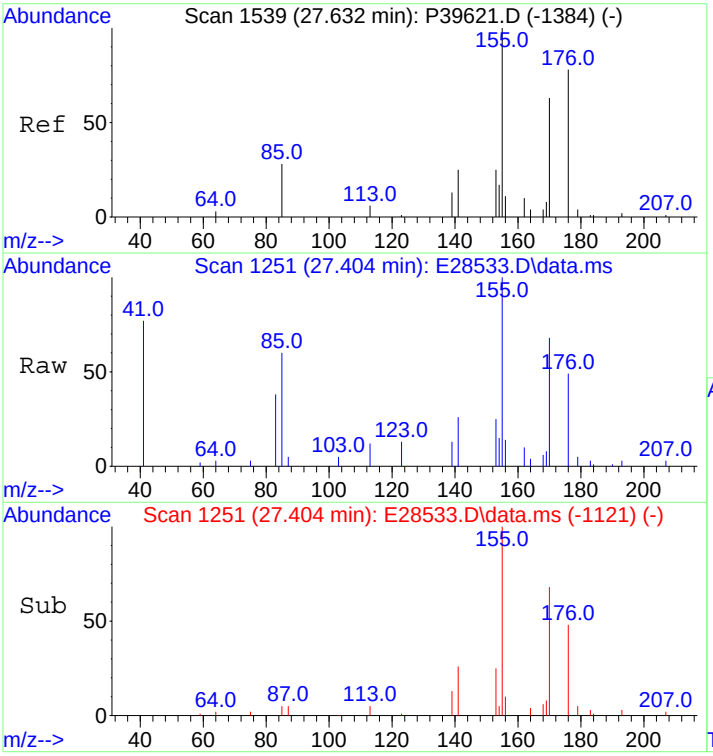




#20
C2-Benzo(b)thiophenes
Concen: 261.24 ng/mL m
RT: 25.431 min Scan# 1120
Delta R.T. -0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

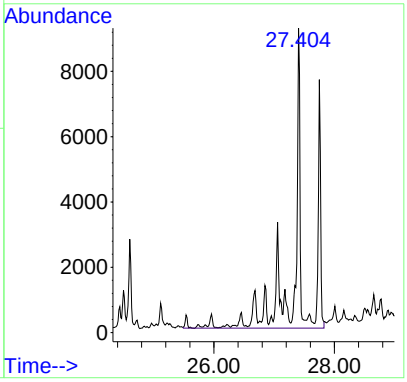
Tgt Ion:162 Resp: 40049

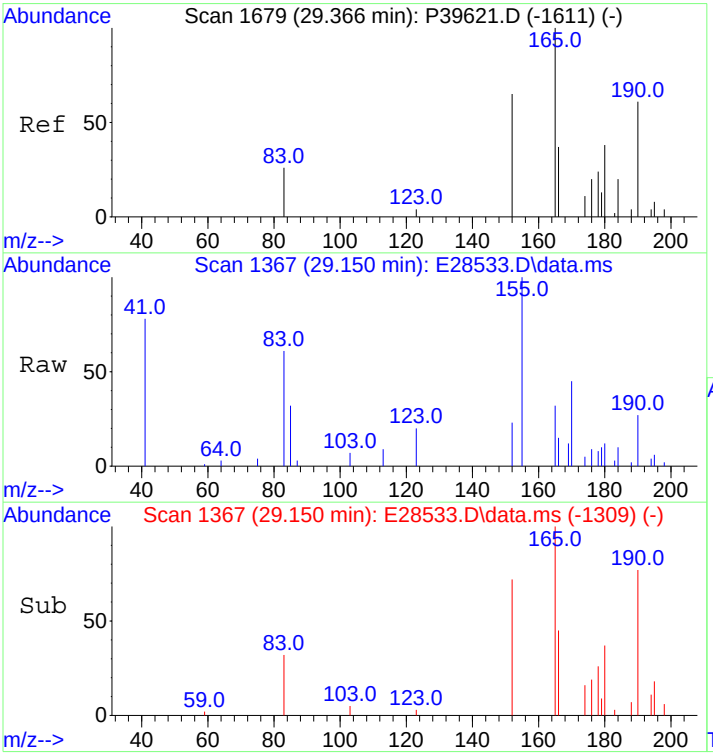




#21
C3-Benzo(b)thiophenes
Concen: 549.88 ng/mL m
RT: 27.404 min Scan# 1251
Delta R.T. -0.004 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

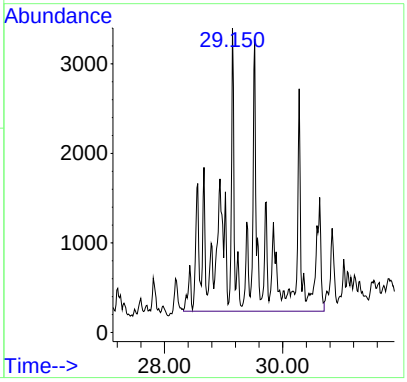
Tgt Ion:176 Resp: 84299

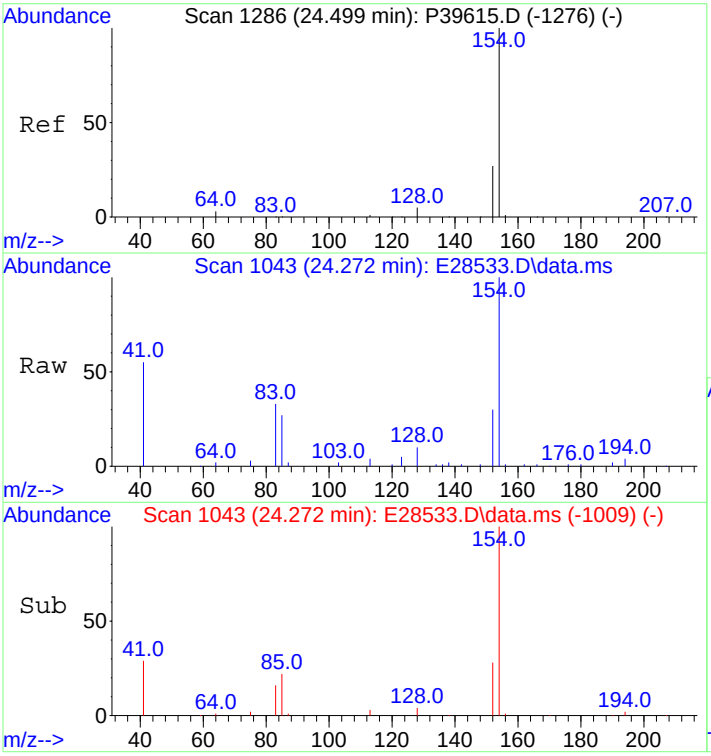




#22
C4-Benzo(b)thiophenes
Concen: 513.30 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. -0.338 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:190 Resp: 78691

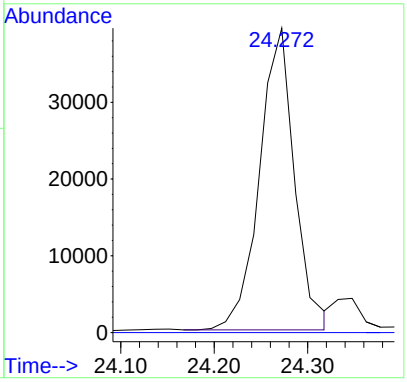


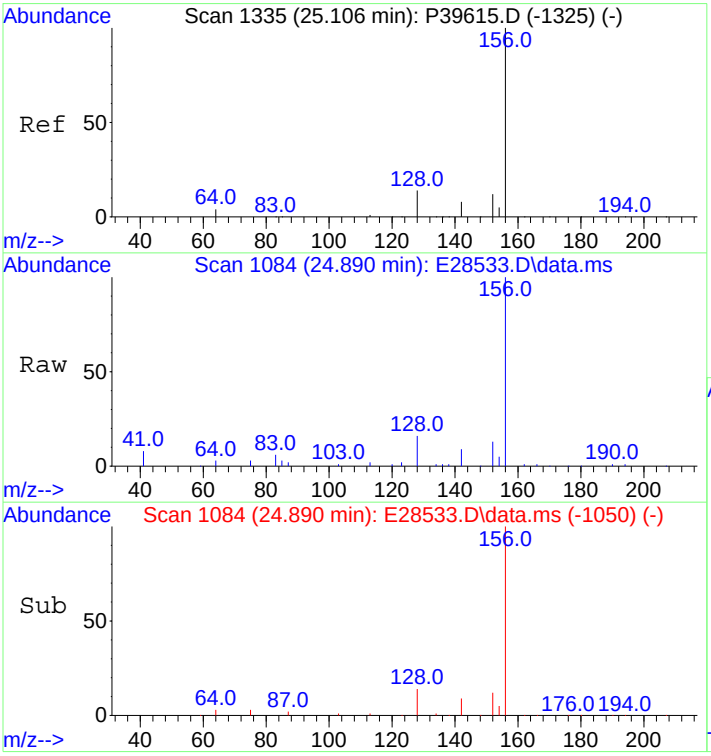


#23
Biphenyl
Concen: 686.94 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:154 Resp: 102541

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

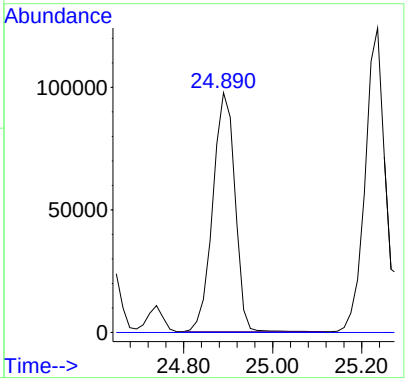


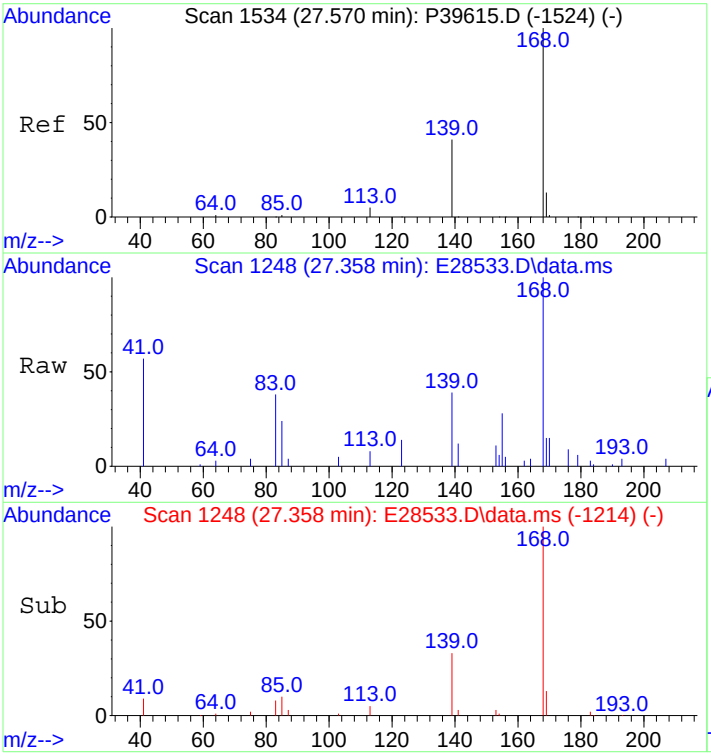


#24
2,6-Dimethylnaphthalene
Concen: 3167.11 ng/mL
RT: 24.890 min Scan# 1084
Delta R.T. 0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:156 Resp: 337170

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

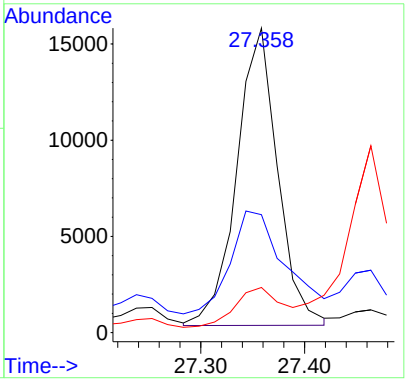


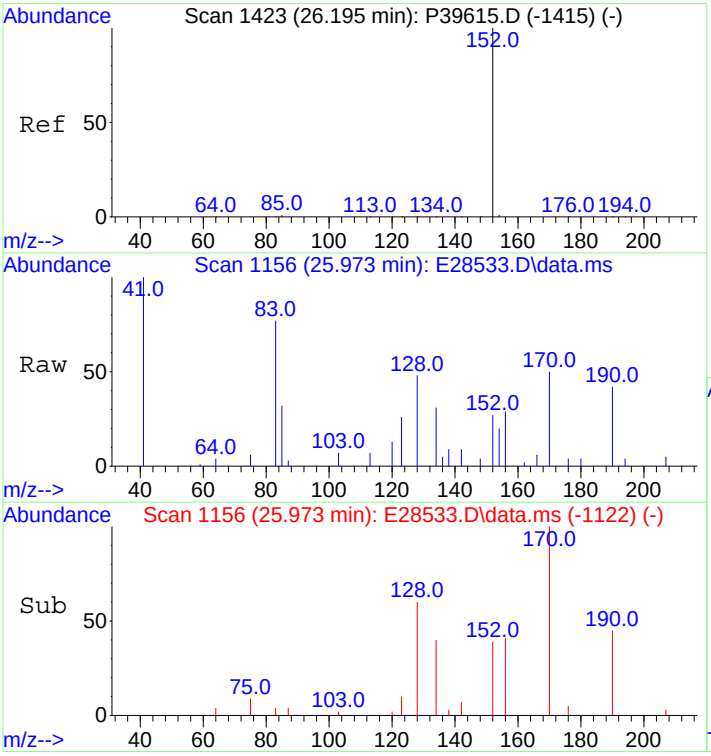


#25
Dibenzofuran
Concen: 256.52 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:168 Resp: 42393

Ion	Ratio	Lower	Upper
168	100		
139	45.7	30.6	45.8
169	15.6	10.6	16.0

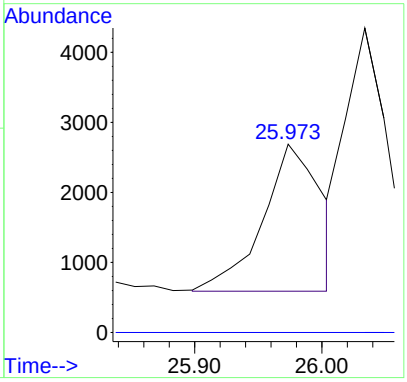


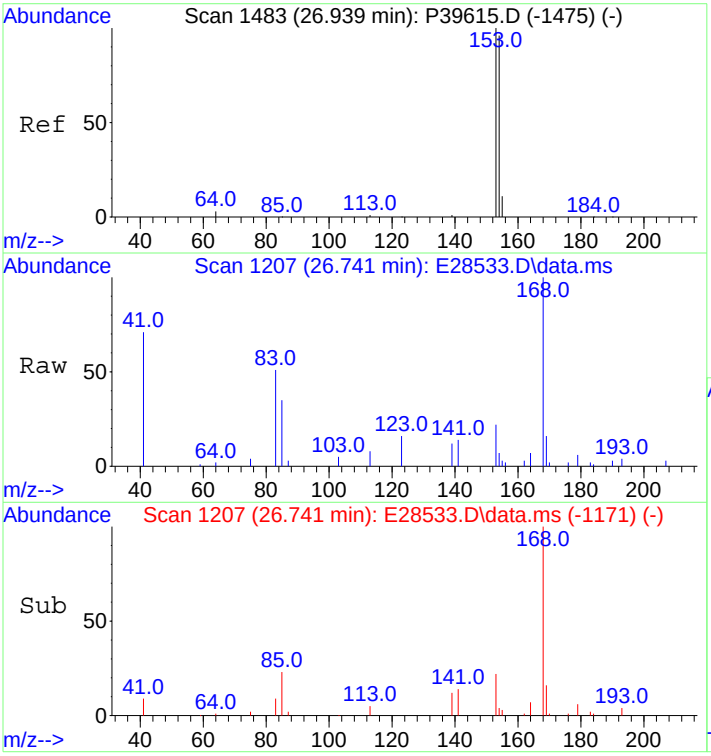


#26
Acenaphthylene
Concen: 36.19 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:152 Resp: 6691

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

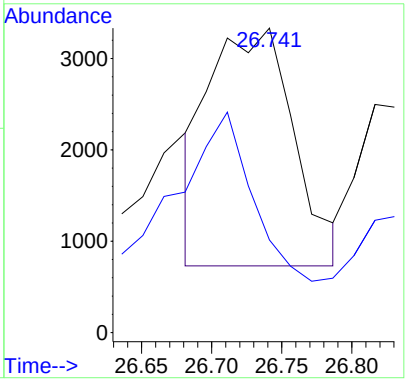


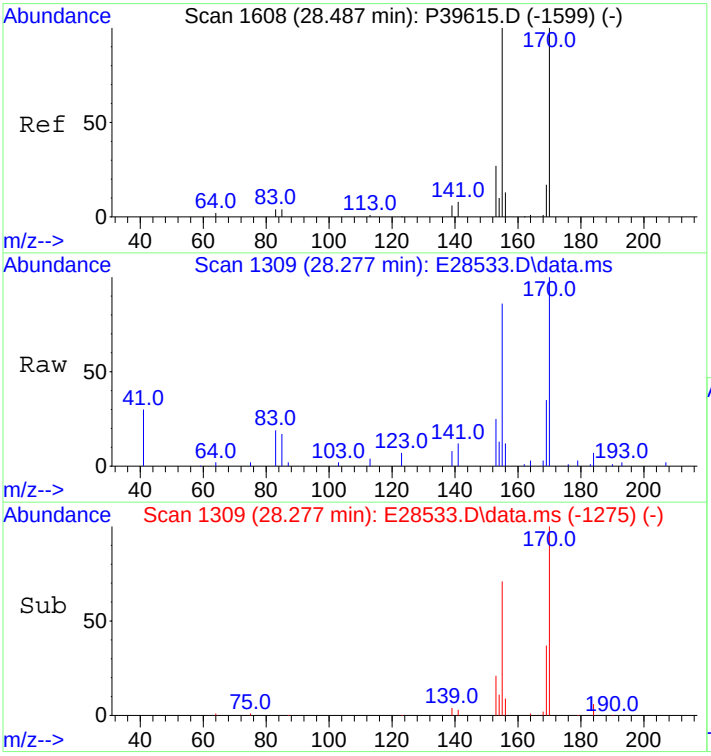


#27
Acenaphthene
Concen: 91.25 ng/mL m
RT: 26.741 min Scan# 1207
Delta R.T. 0.045 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:153 Resp: 10860

Ion	Ratio	Lower	Upper
153	100		
154	0.0	72.3	108.5#

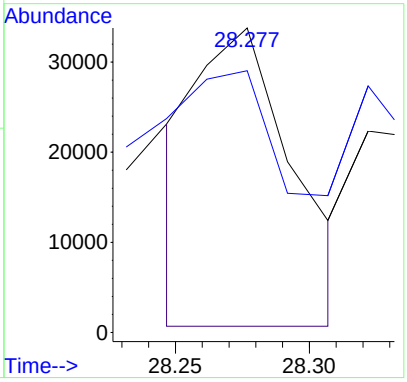


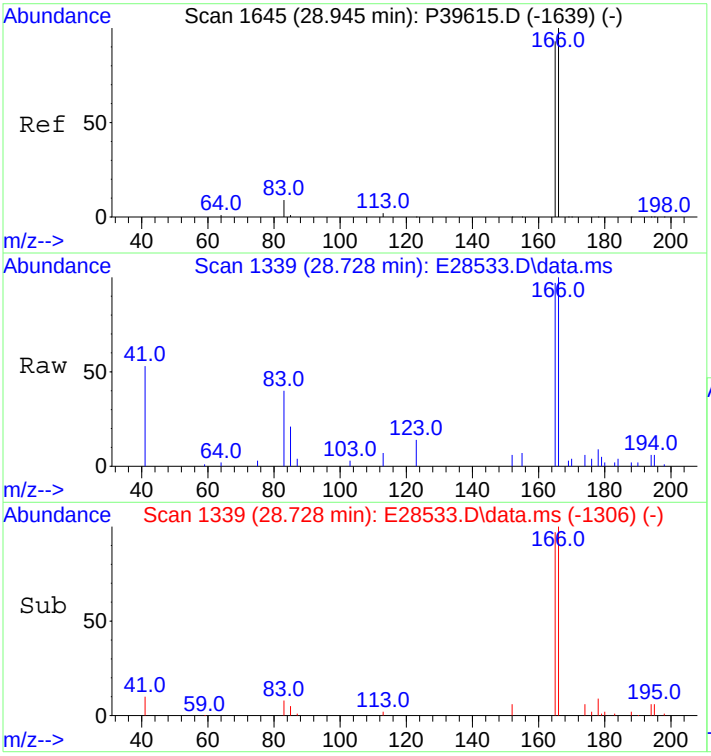


#28
2,3,5-Trimethylnaphthalene
Concen: 834.53 ng/mL m
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:170 Resp: 83122

Ion	Ratio	Lower	Upper
170	100		
155	155.1	75.9	113.9#

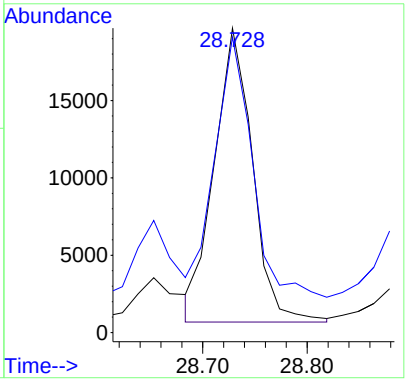


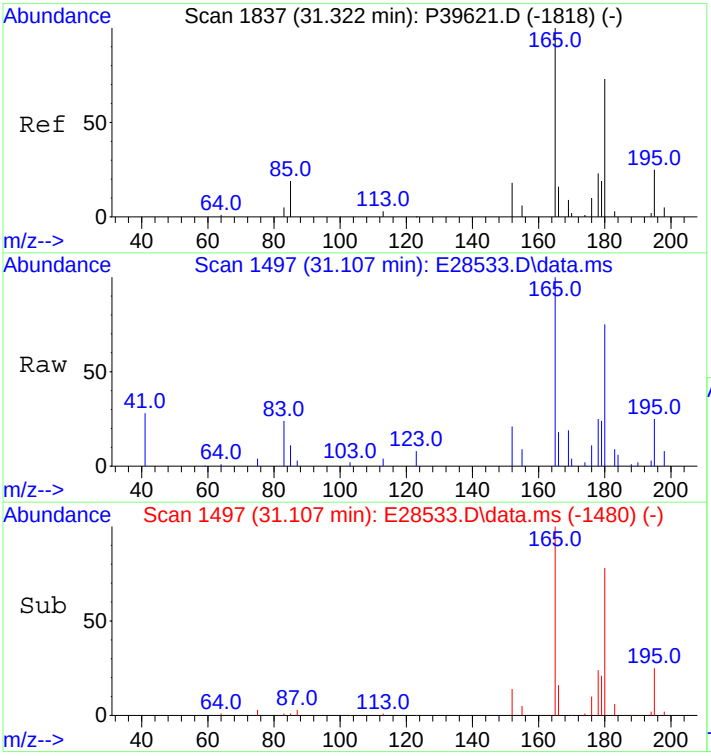


#29
Fluorene
Concen: 363.33 ng/mL m
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:166 Resp: 48225

Ion	Ratio	Lower	Upper
166	100		
165	112.3	73.8	110.6#

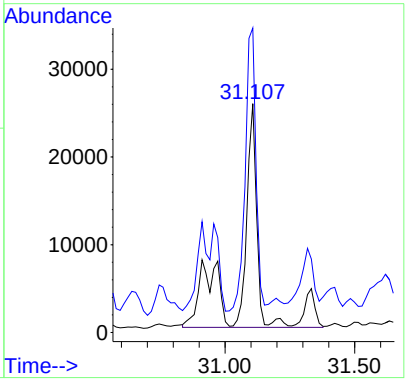


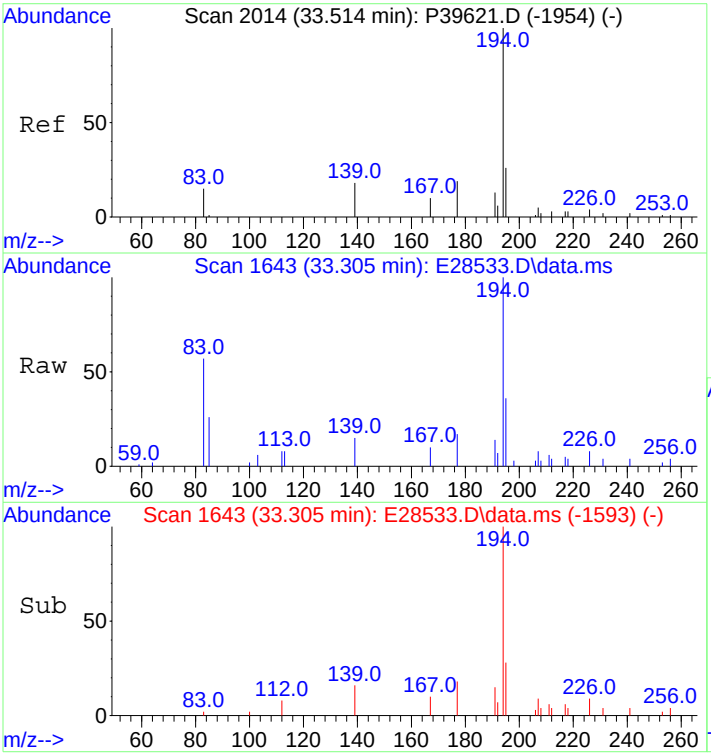


#30
C1-Fluorenes
Concen: 893.07 ng/mL m
RT: 31.107 min Scan# 1497
Delta R.T. 0.044 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:180 Resp: 118539

Ion	Ratio	Lower	Upper
180	100		
165	78.7	94.3	141.5#

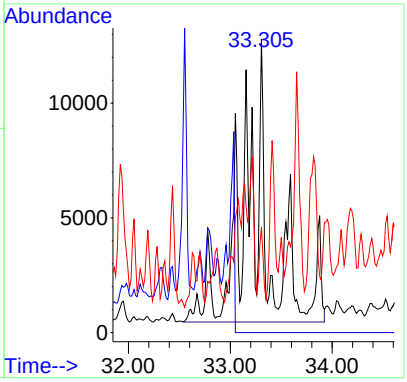


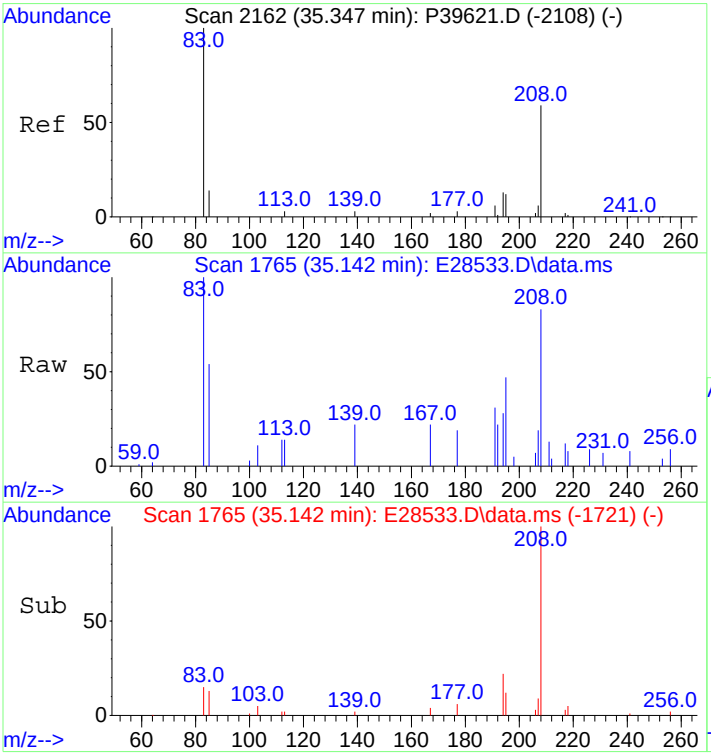


#31
C2-Fluorenes
Concen: 1459.15 ng/mL m
RT: 33.305 min Scan# 1643
Delta R.T. 0.072 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:194 Resp: 193676

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	9.0	27.0	40.4#

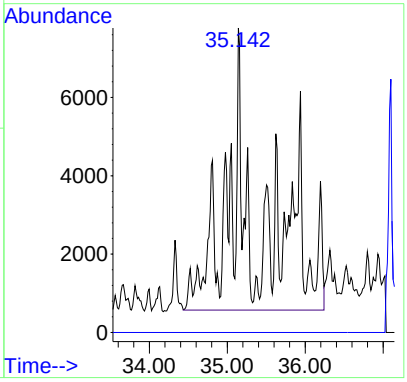


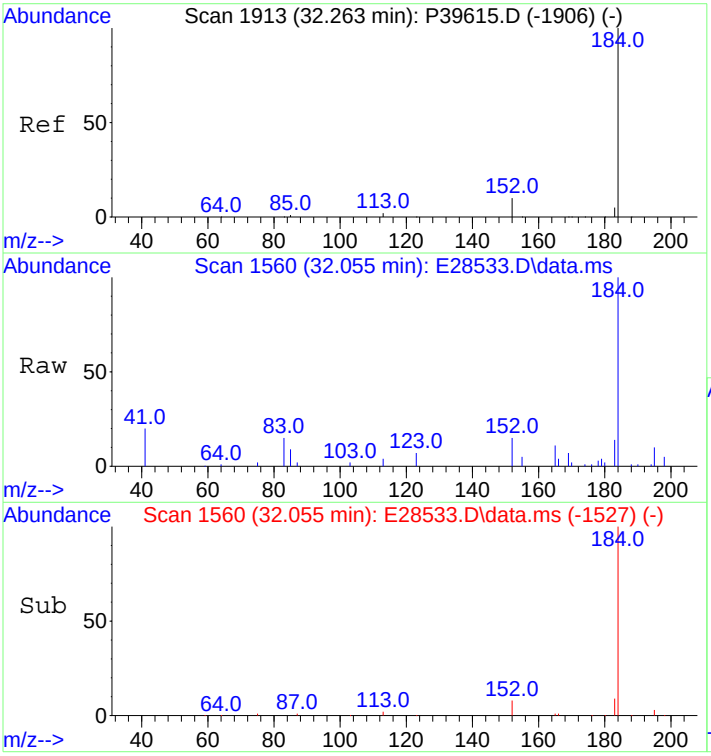


#32
C3-Fluorenes
Concen: 1426.08 ng/mL m
RT: 35.142 min Scan# 1765
Delta R.T. 0.096 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:208 Resp: 189287

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

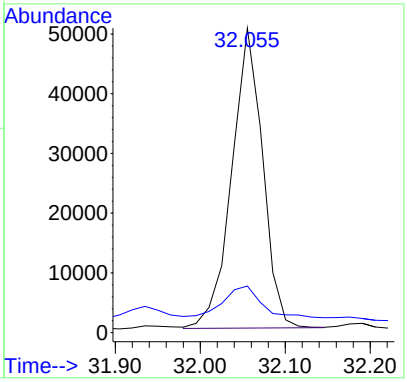


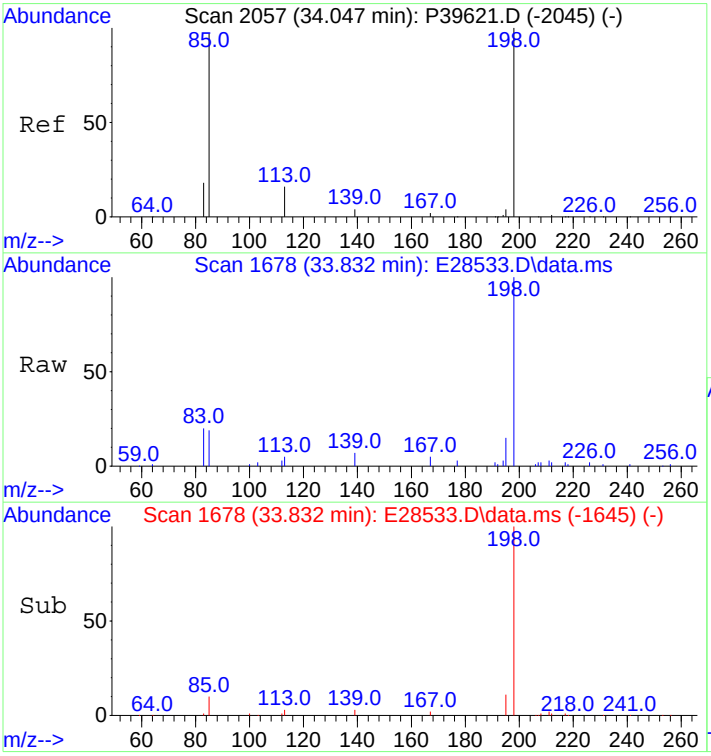


#33
Dibenzothiophene
Concen: 698.87 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:184 Resp: 127296

Ion	Ratio	Lower	Upper
184	100		
152	17.7	6.2	9.2#

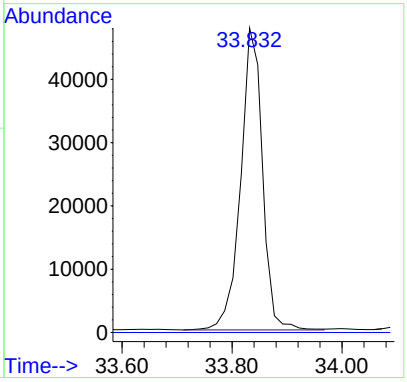


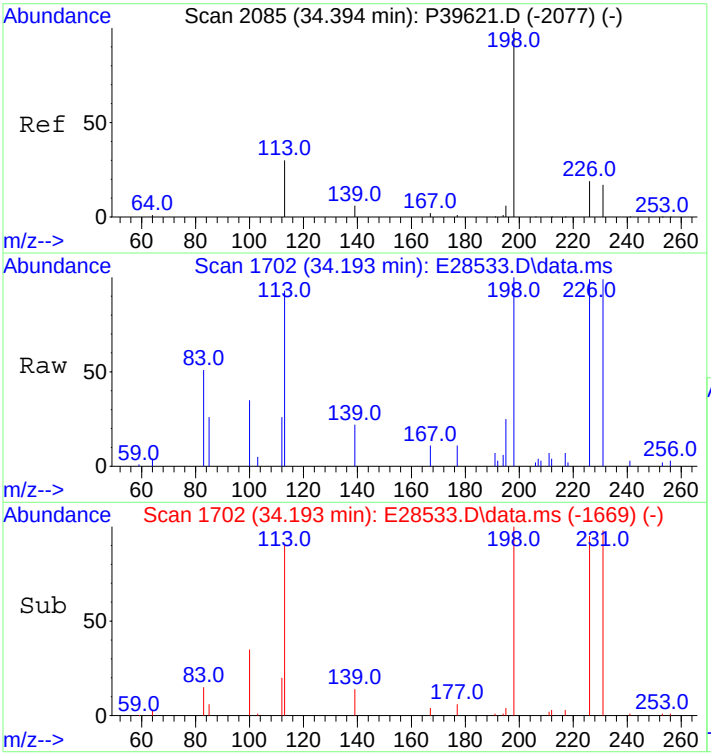


#34
4-Methyldibenzothiophene(4MDT)
Concen: 722.51 ng/mL
RT: 33.832 min Scan# 1678
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 131601

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

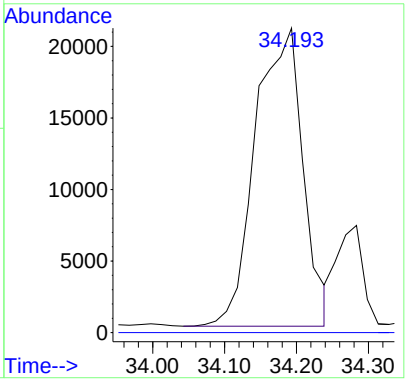


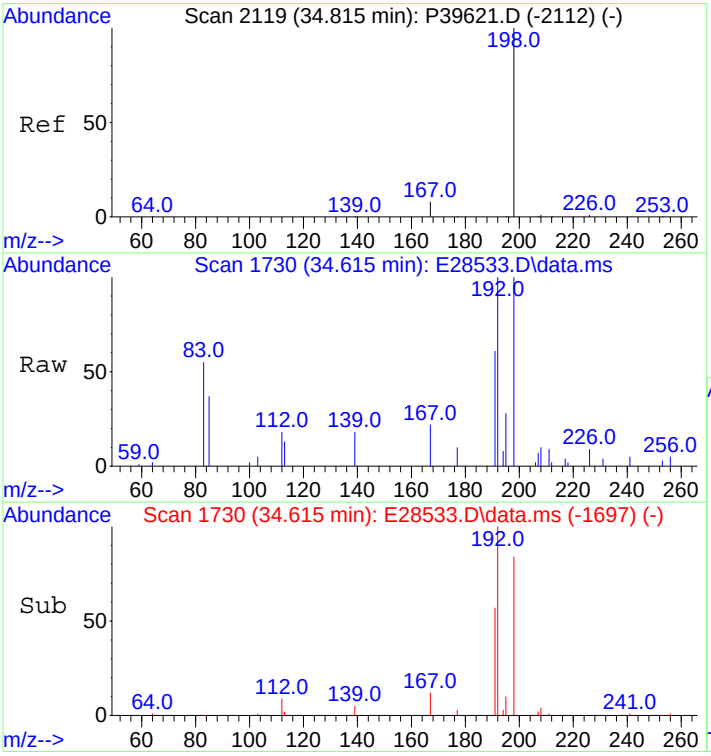


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 524.78 ng/mL
RT: 34.193 min Scan# 1702
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 95587

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

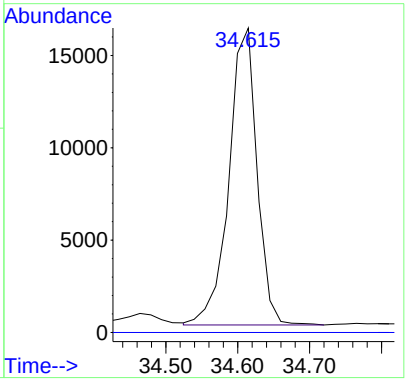


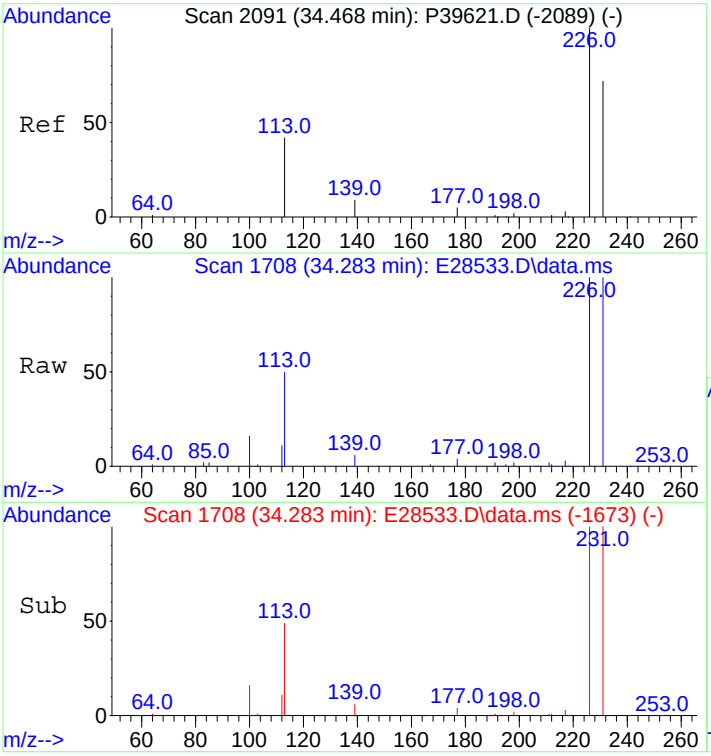


#36
1-Methyldibenzothiophene(1MDT)
Concen: 239.74 ng/mL
RT: 34.615 min Scan# 1730
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 43667

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

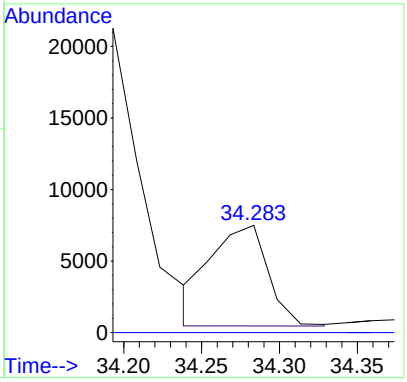


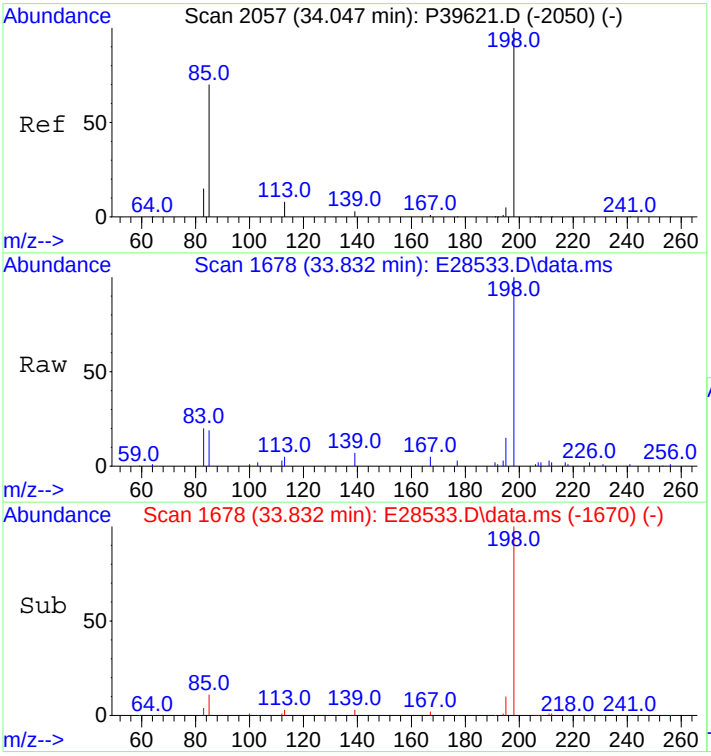


#37
OTP
Concen: 99.02 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 18036

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

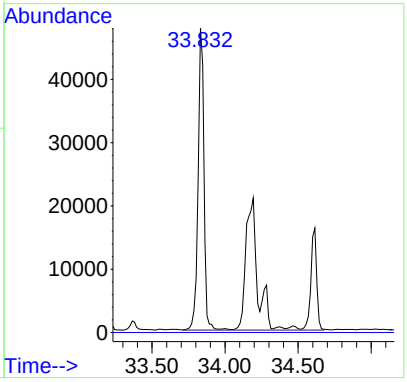


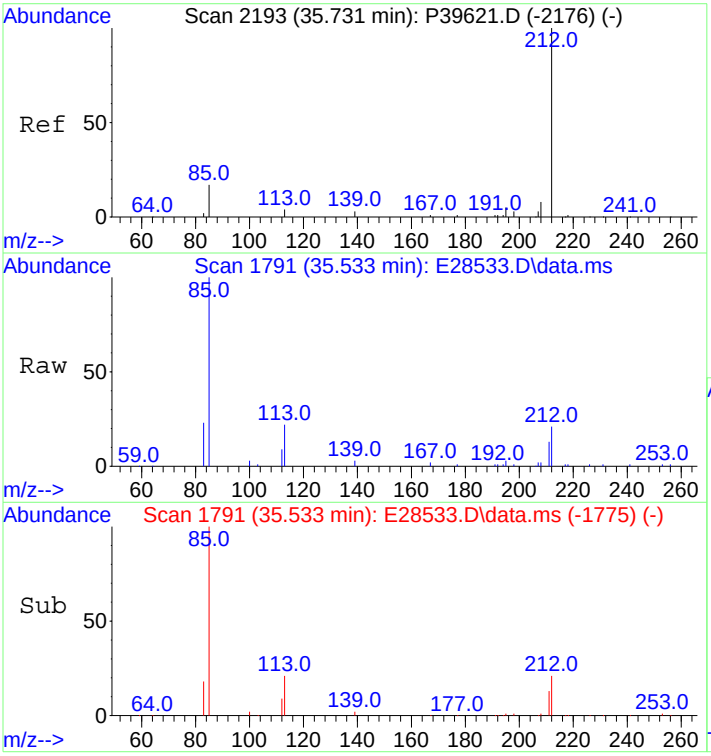


#38
C1-Dibenzothiophenes
Concen: 1619.32 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. 0.079 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 294951

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

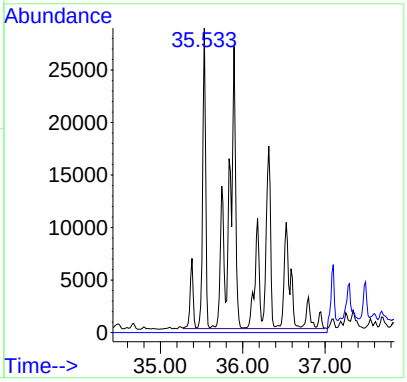


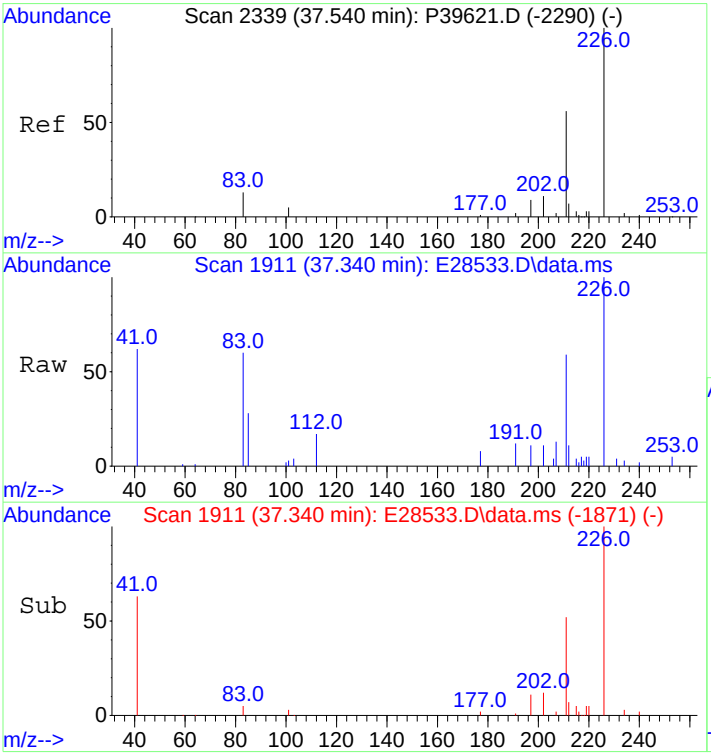


#39
C2-Dibenzothiophenes
Concen: 2219.92 ng/mL m
RT: 35.533 min Scan# 1791
Delta R.T. 0.100 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:212 Resp: 404348

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

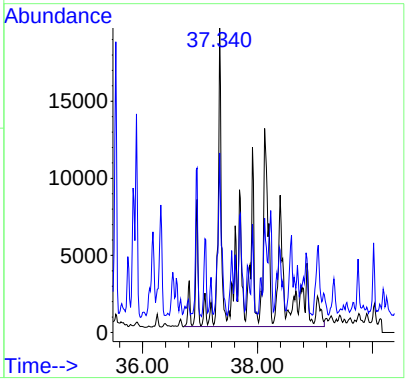


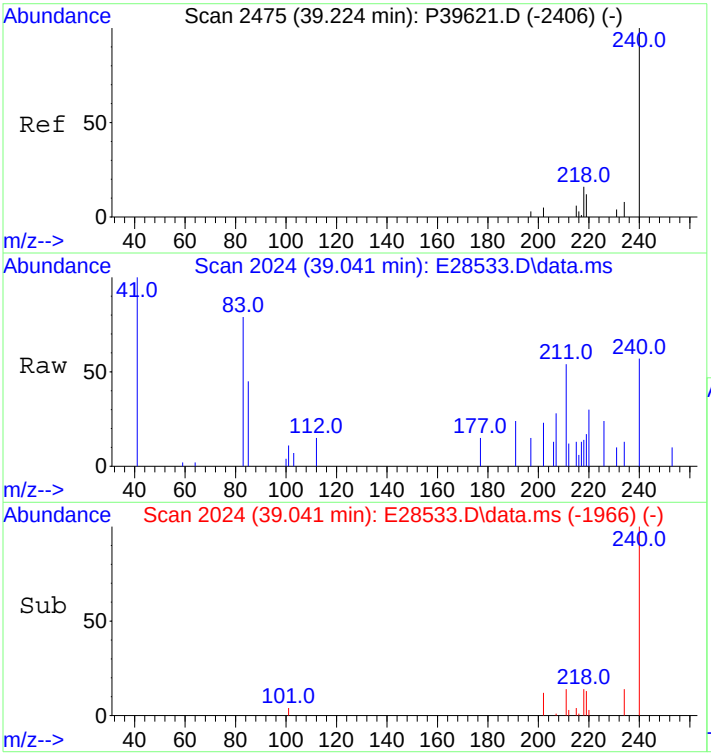


#40
C3-Dibenzothiophenes
Concen: 2081.27 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.124 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:226 Resp: 379093

Ion	Ratio	Lower	Upper
226	100		
211	1.3	44.1	66.1#

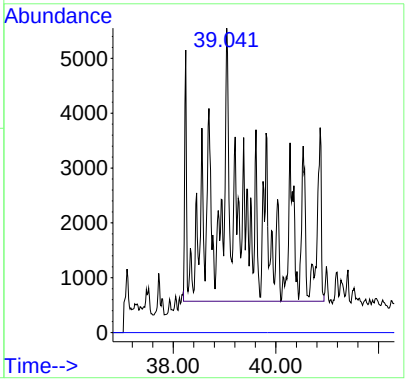


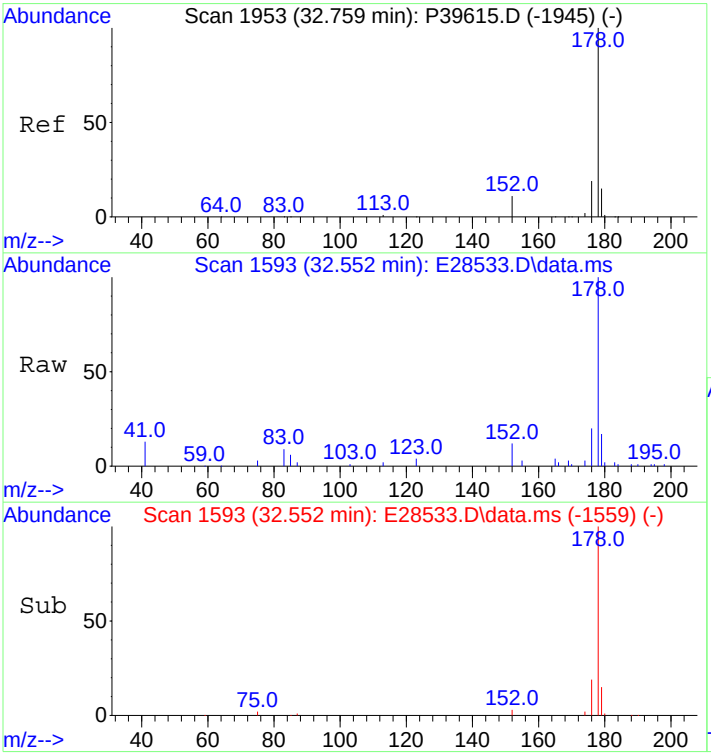


#41
C4-Dibenzothiophenes
Concen: 1177.33 ng/mL m
RT: 39.041 min Scan# 2024
Delta R.T. 0.145 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:240 Resp: 214446

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

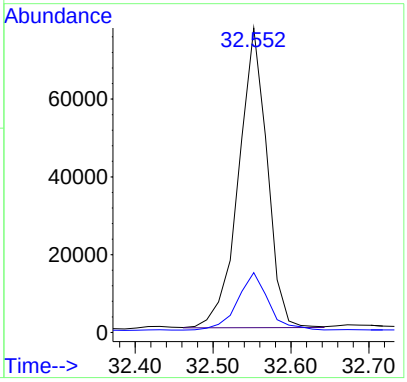


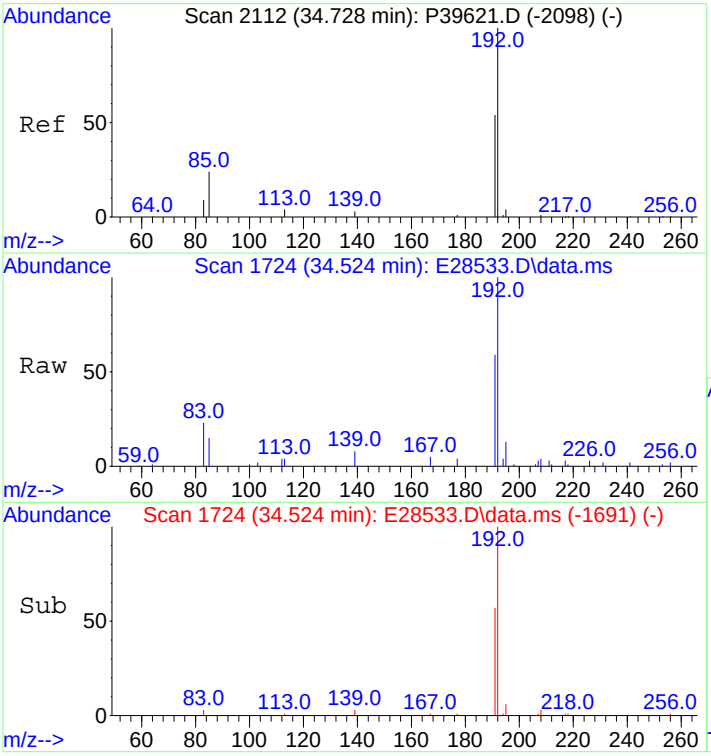


#43
Phenanthrene
Concen: 1055.72 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:178 Resp: 195639

Ion	Ratio	Lower	Upper
178	100		
176	20.8	15.0	22.6

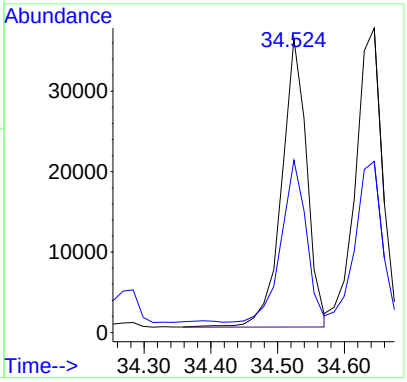


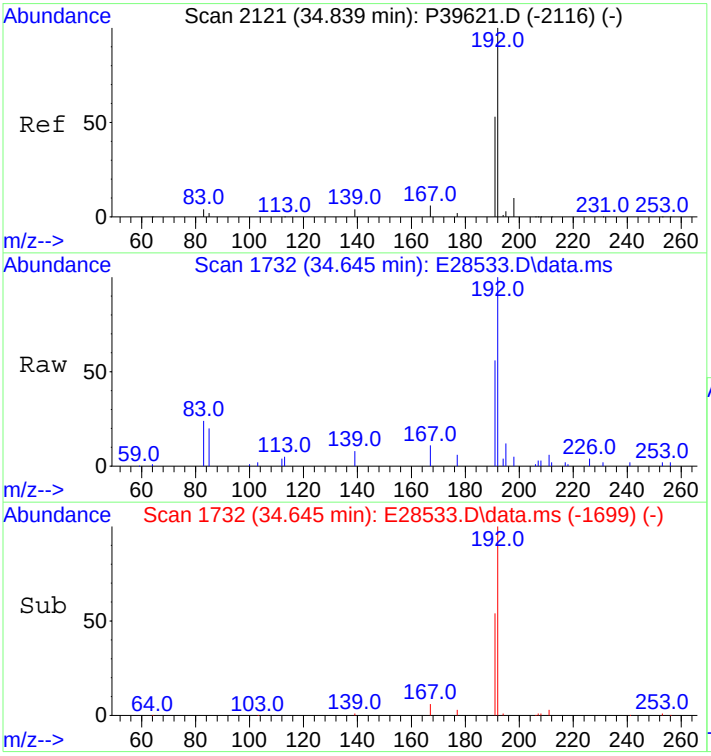


#44
3-Methylphenanthrene(3MP)
Concen: 505.66 ng/mL
RT: 34.524 min Scan# 1724
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 93705

Ion	Ratio	Lower	Upper
192	100		
191	57.0	46.9	70.3

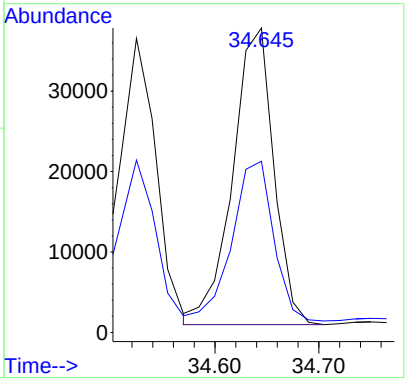


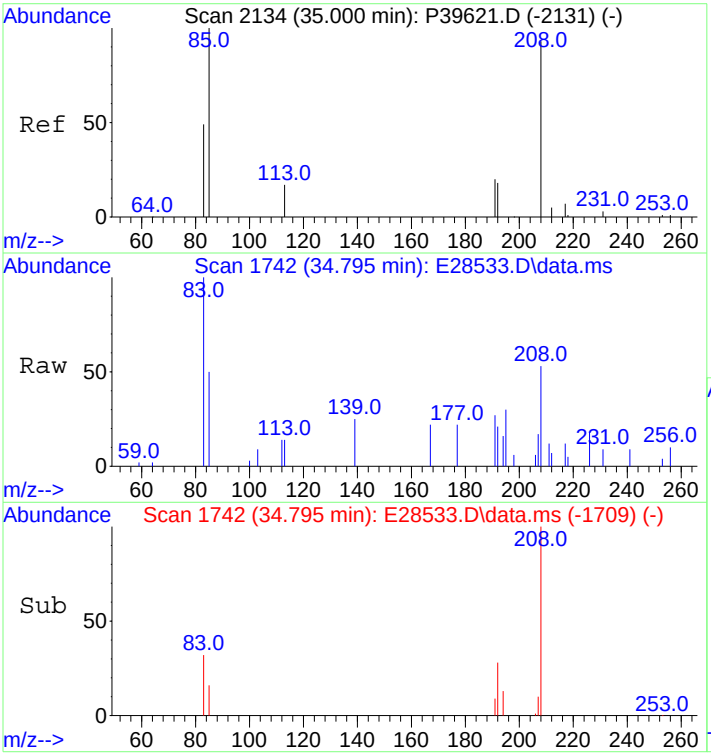


#45
2-Methylphenanthrene(2MP)
Concen: 547.97 ng/mL
RT: 34.645 min Scan# 1732
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 101546

Ion	Ratio	Lower	Upper
192	100		
191	54.3	45.0	67.4

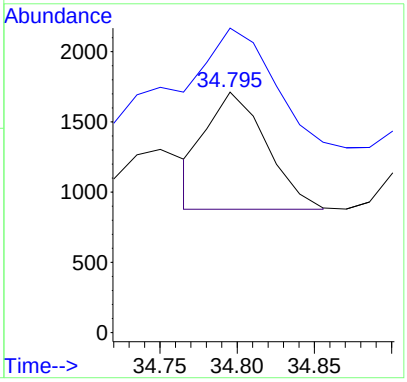


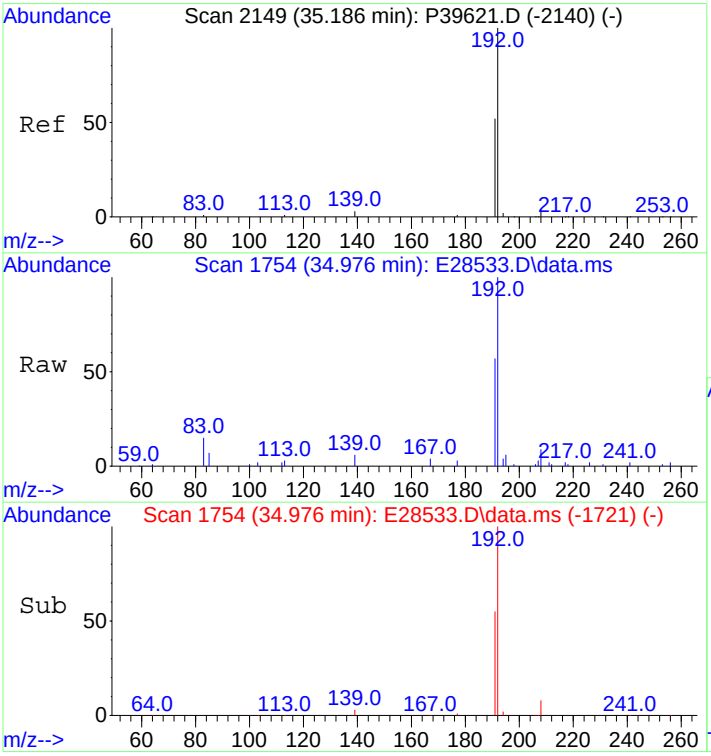


#46
2-Methylanthracene(2MA)
Concen: 12.23 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 2266

Ion	Ratio	Lower	Upper
192	100		
191	168.6	101.3	151.9#

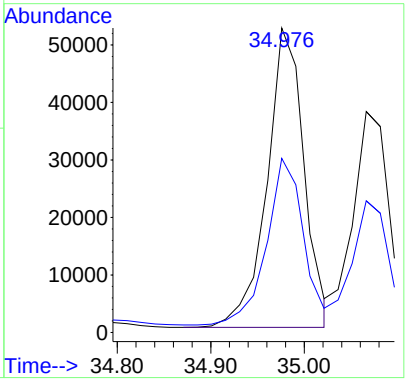


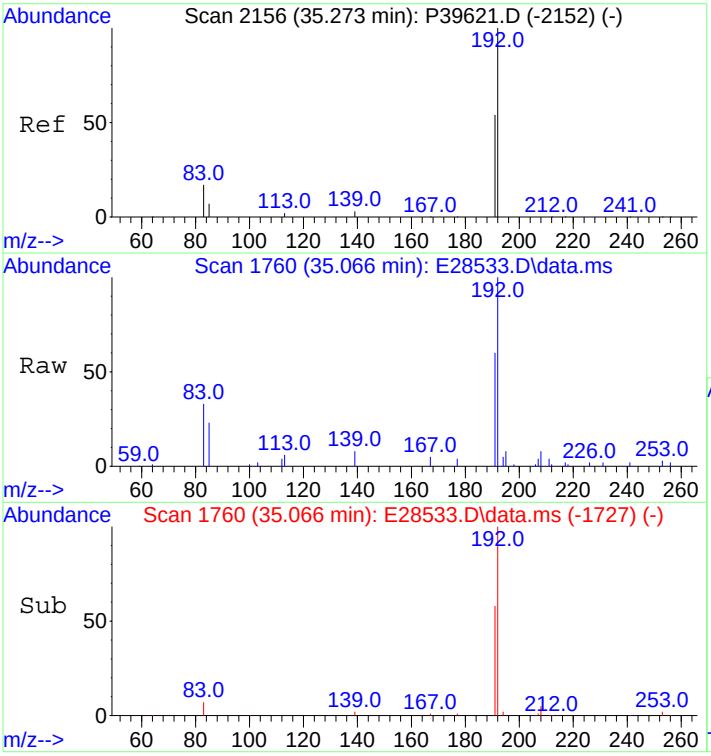


#47
9/4-Methylphenanthrene(9MP)
Concen: 773.70 ng/mL
RT: 34.976 min Scan# 1754
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 143377

Ion	Ratio	Lower	Upper
192	100		
191	55.3	45.8	68.6

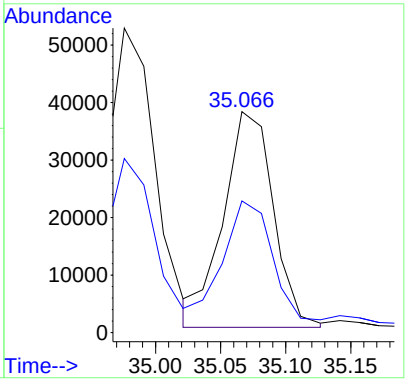


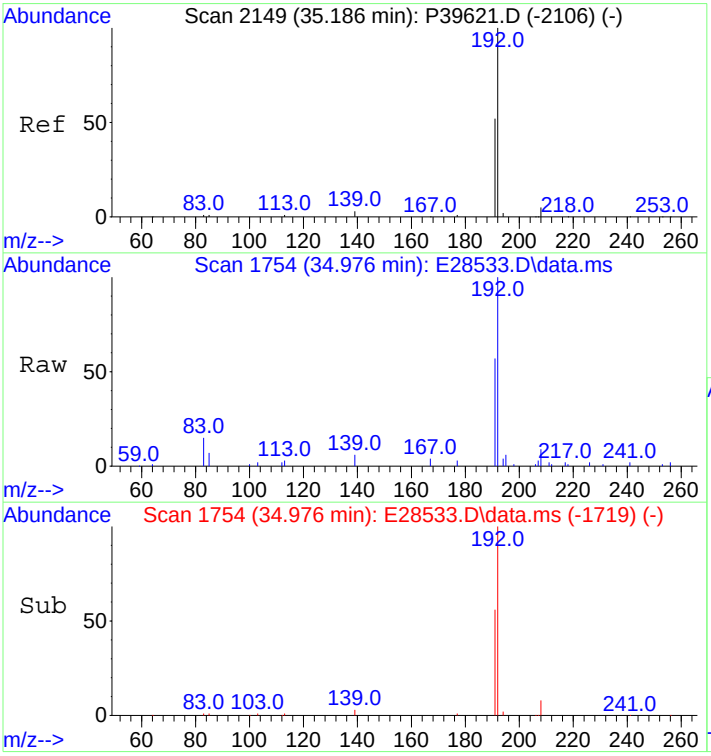


#48
1-Methylphenanthrene(1MP)
Concen: 541.12 ng/mL m
RT: 35.066 min Scan# 1760
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 100277

Ion	Ratio	Lower	Upper
192	100		
191	56.7	47.7	71.5

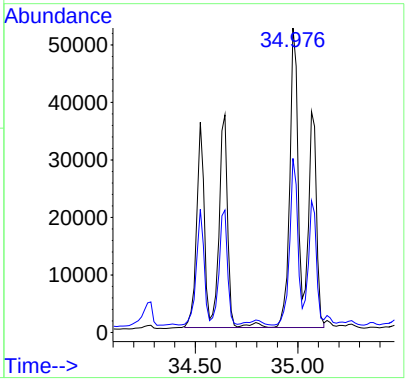


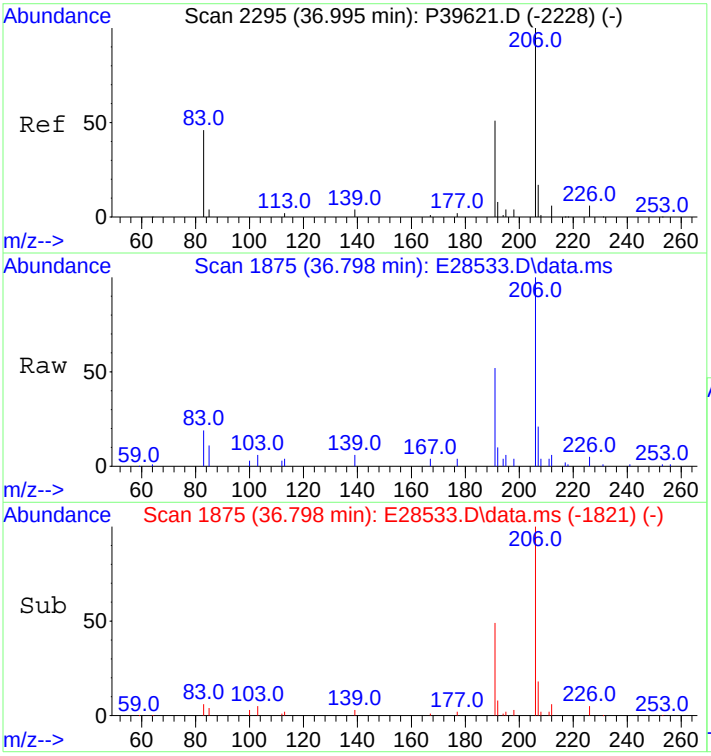


#49
C1-Phenanthrenes/Anthracenes
Concen: 2383.48 ng/mL m
RT: 34.976 min Scan# 1754
Delta R.T. 0.078 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 441690

Ion	Ratio	Lower	Upper
192	100		
191	17.9	44.0	66.0#

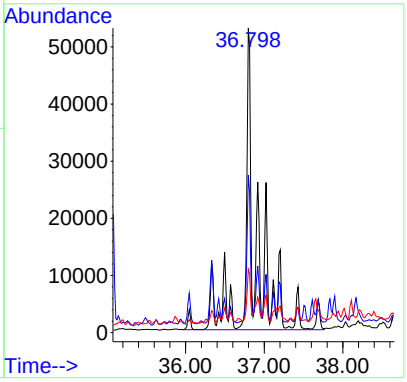


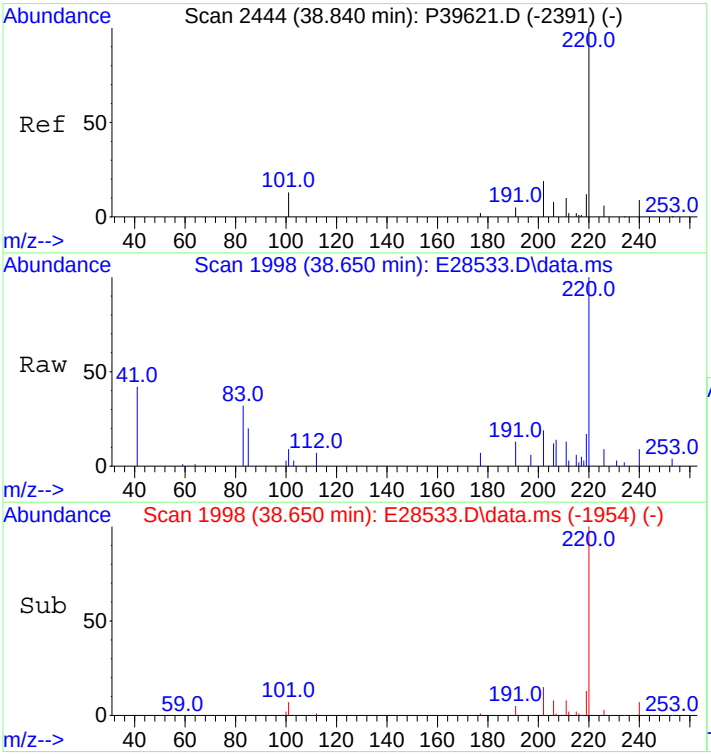


#50
C2-Phenanthrenes/Anthracenes
Concen: 2754.91 ng/mL m
RT: 36.798 min Scan# 1875
Delta R.T. 0.117 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:206 Resp: 510520

Ion	Ratio	Lower	Upper
206	100		
191	15.5	35.7	53.5#
207	5.5	16.5	24.7#

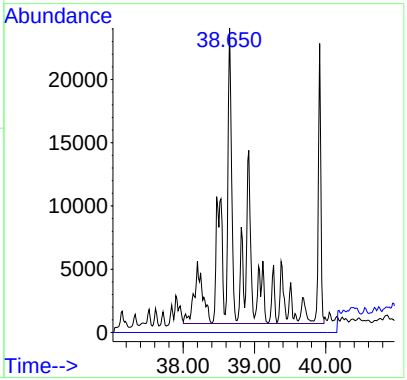


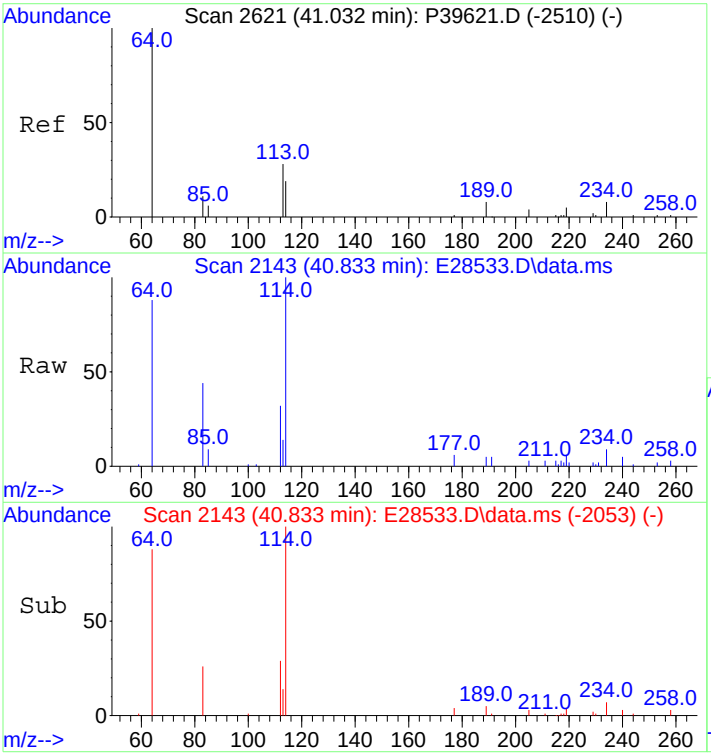


#52
C3-Phenanthrenes/Anthracenes
Concen: 2027.53 ng/mL m
RT: 38.650 min Scan# 1998
Delta R.T. 0.141 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:220 Resp: 375728

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

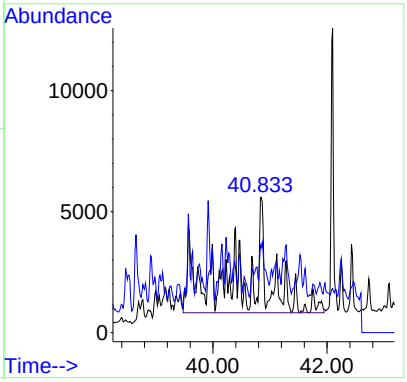


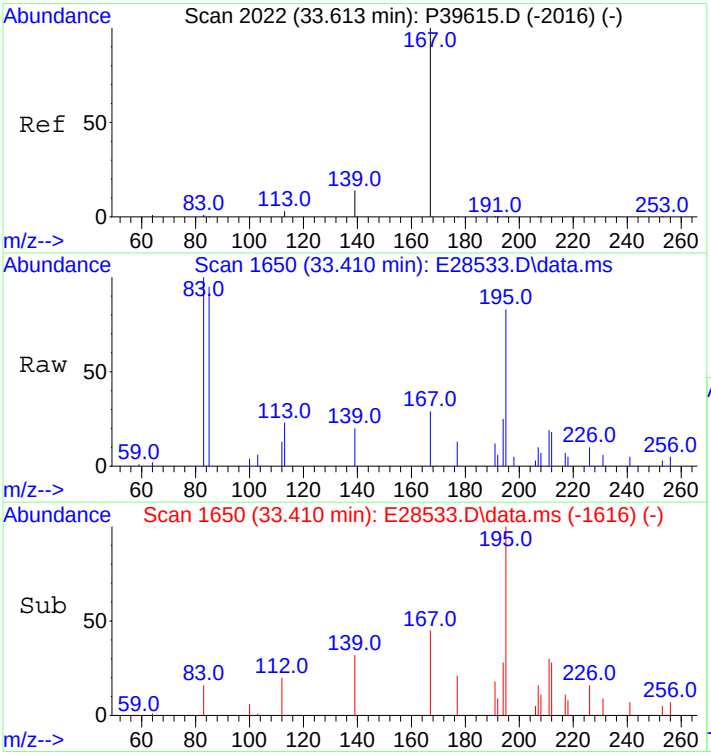


#53
C4-Phenanthrenes/Anthracenes
Concen: 832.34 ng/mL m
RT: 40.833 min Scan# 2143
Delta R.T. 0.169 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 154244

Ion	Ratio	Lower	Upper
234	100		
219	2.3	46.6	70.0#

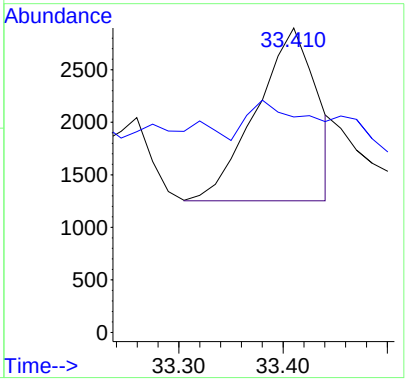


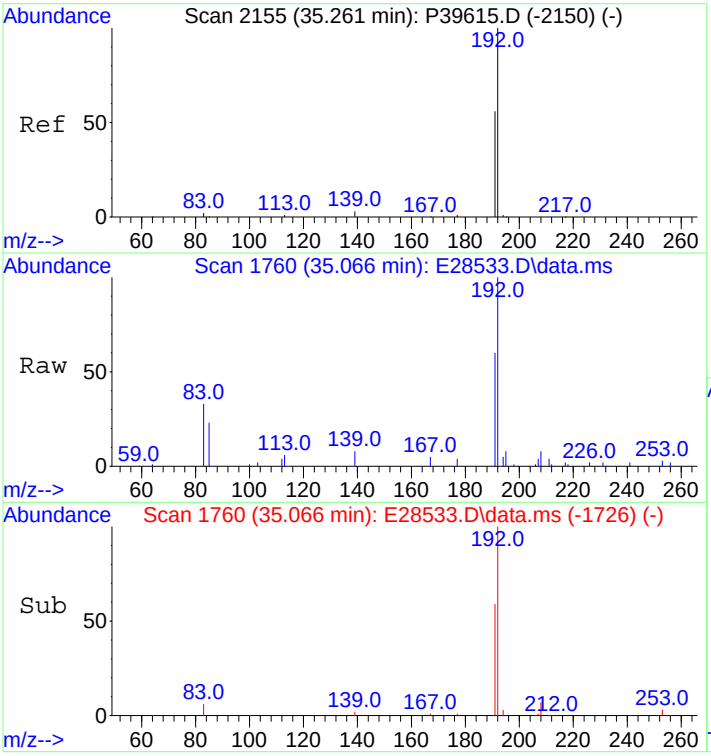


#56
Carbazole
Concen: 40.32 ng/mL m
RT: 33.410 min Scan# 1650
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:167 Resp: 6647

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.5	15.7#

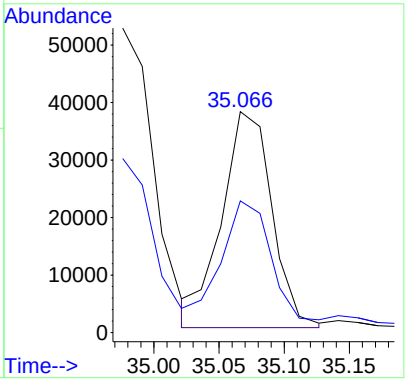


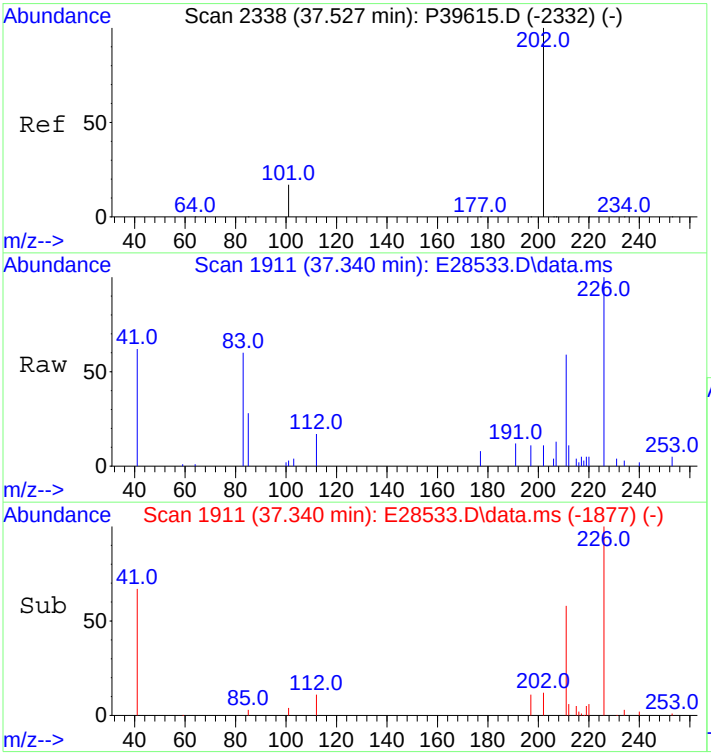


#57
1-Methylphenanthrene
Concen: 711.92 ng/mL m
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 100650

Ion	Ratio	Lower	Upper
192	100		
191	54.2	45.5	68.3

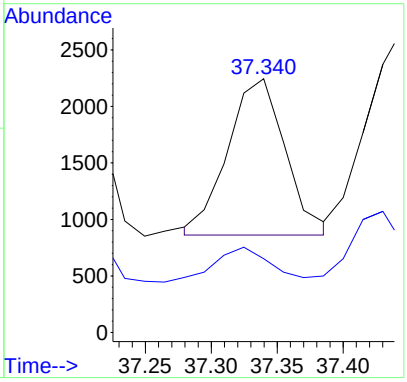


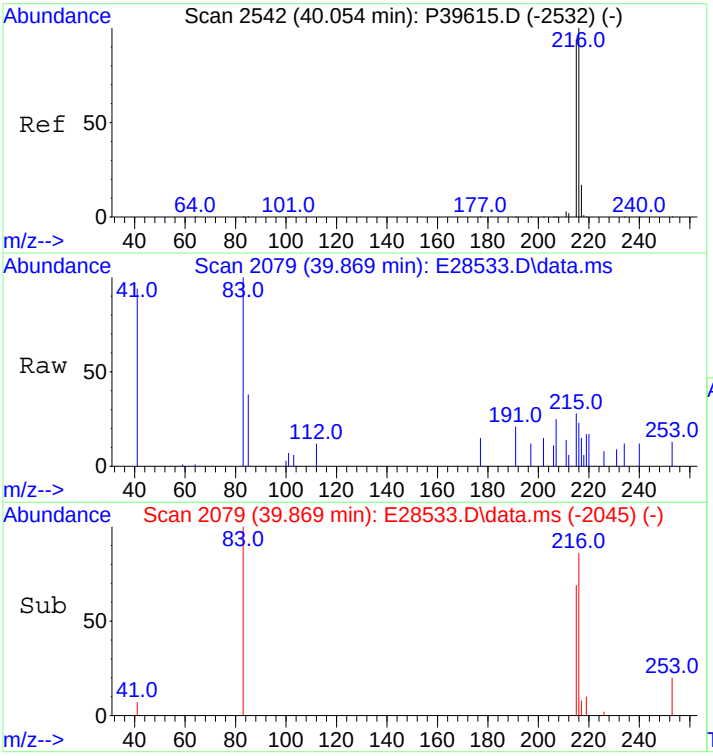


#58
Fluoranthene
Concen: 20.53 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:202 Resp: 4201

Ion	Ratio	Lower	Upper
202	100		
101	65.6	9.2	13.8#

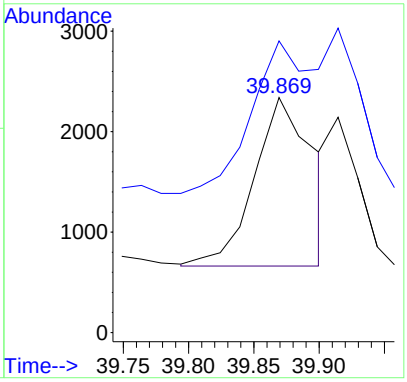


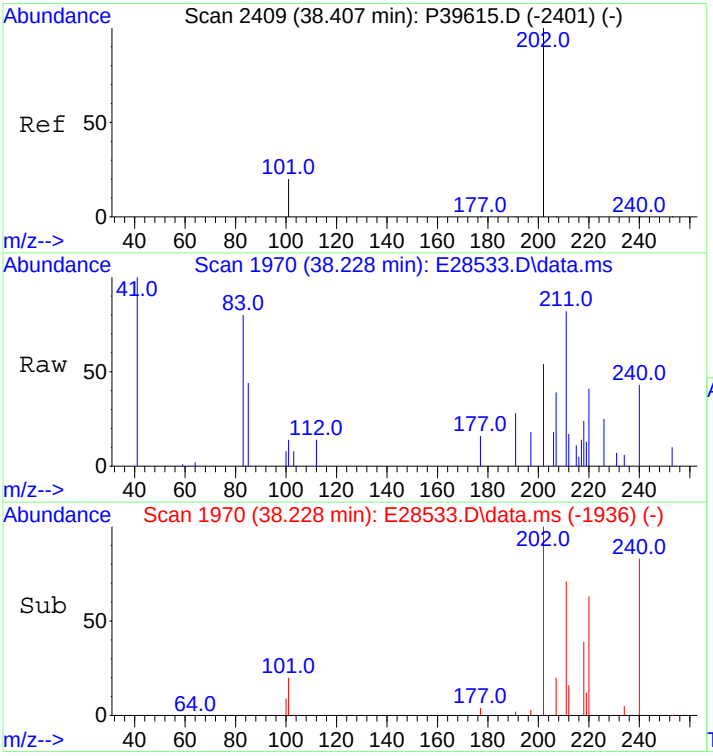


#59
Benzo(b)fluorene
Concen: 38.17 ng/mL m
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:216 Resp: 5205

Ion	Ratio	Lower	Upper
216	100		
215	427.7	73.8	110.8#

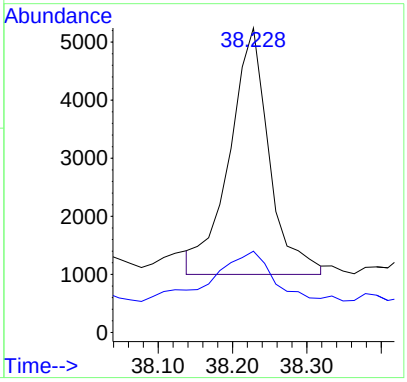


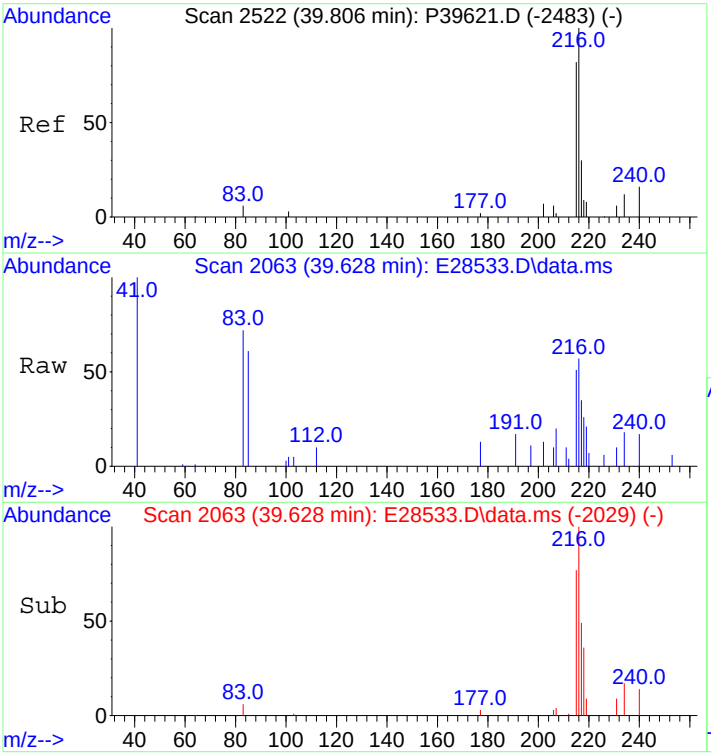


#60
Pyrene
Concen: 75.58 ng/mL m
RT: 38.228 min Scan# 1970
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:202 Resp: 15722

Ion	Ratio	Lower	Upper
202	100		
101	31.4	9.8	14.8#

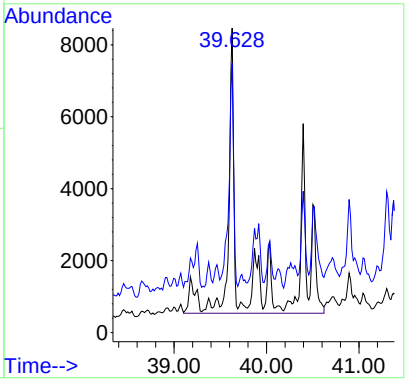


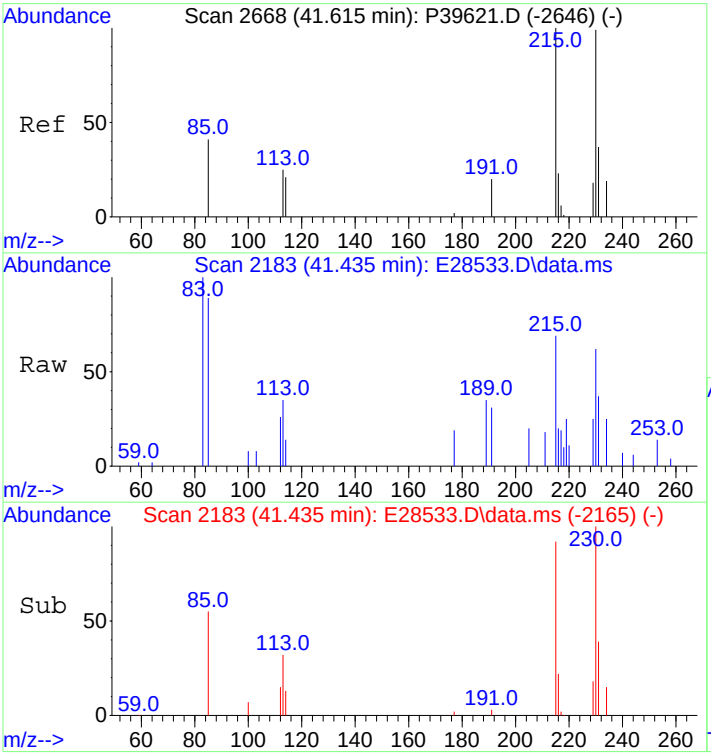


#61
C1-Fluoranthenes/Pyrenes
Concen: 370.19 ng/mL m
RT: 39.628 min Scan# 2063
Delta R.T. 0.153 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:216 Resp: 77003

Ion	Ratio	Lower	Upper
216	100		
215	28.9	73.4	110.2#

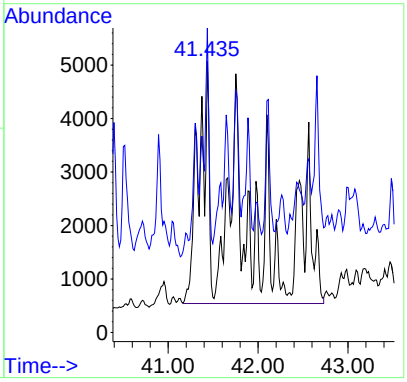


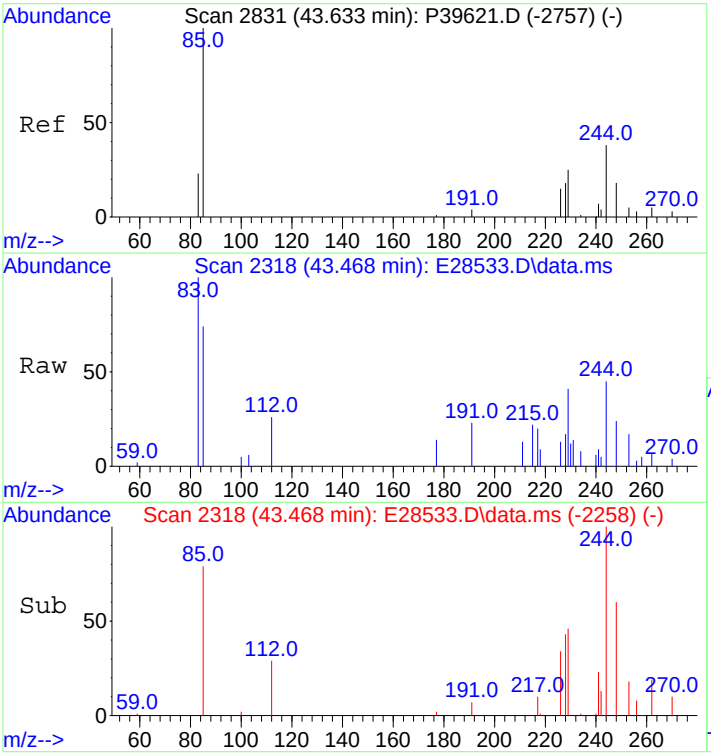


#62
C2-Fluoranthenes/Pyrenes
Concen: 600.32 ng/mL m
RT: 41.435 min Scan# 2183
Delta R.T. 0.236 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:230 Resp: 124873

Ion	Ratio	Lower	Upper
230	100		
215	6.2	62.3	93.5#

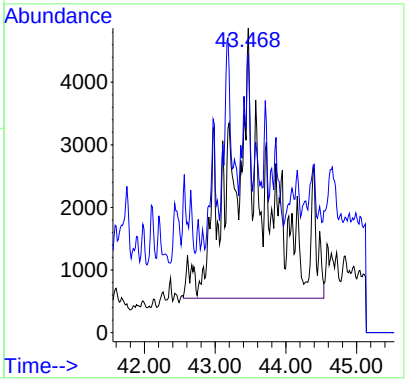


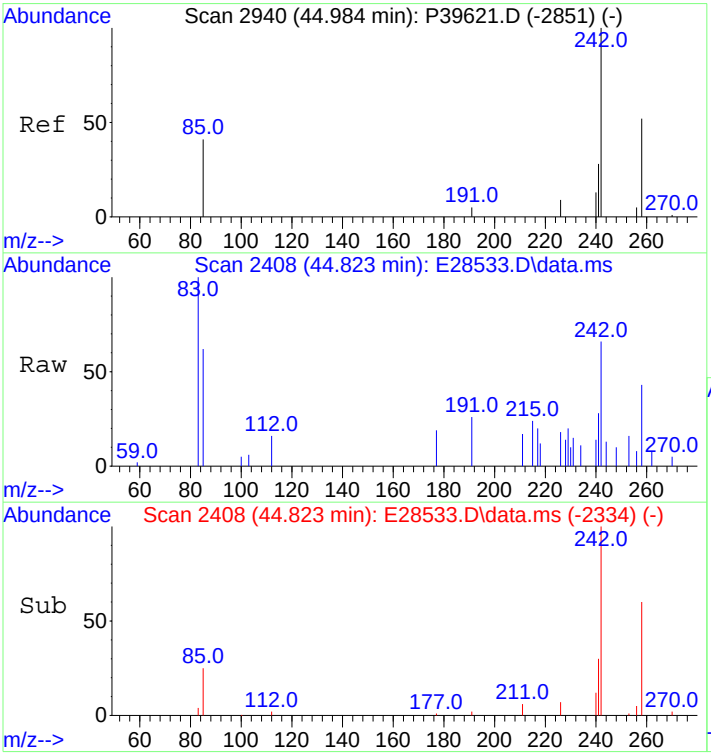


#63
C3-Fluoranthenes/Pyrenes
Concen: 738.62 ng/mL m
RT: 43.468 min Scan# 2318
Delta R.T. 0.203 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:244 Resp: 153640

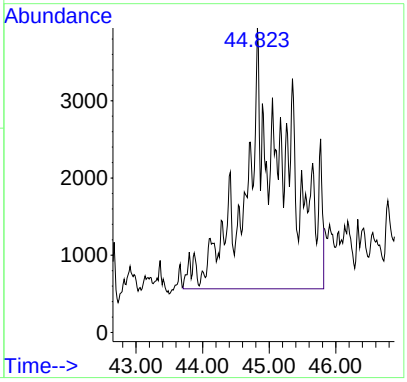
Ion	Ratio	Lower	Upper
244	100		
229	11.2	72.2	108.2#

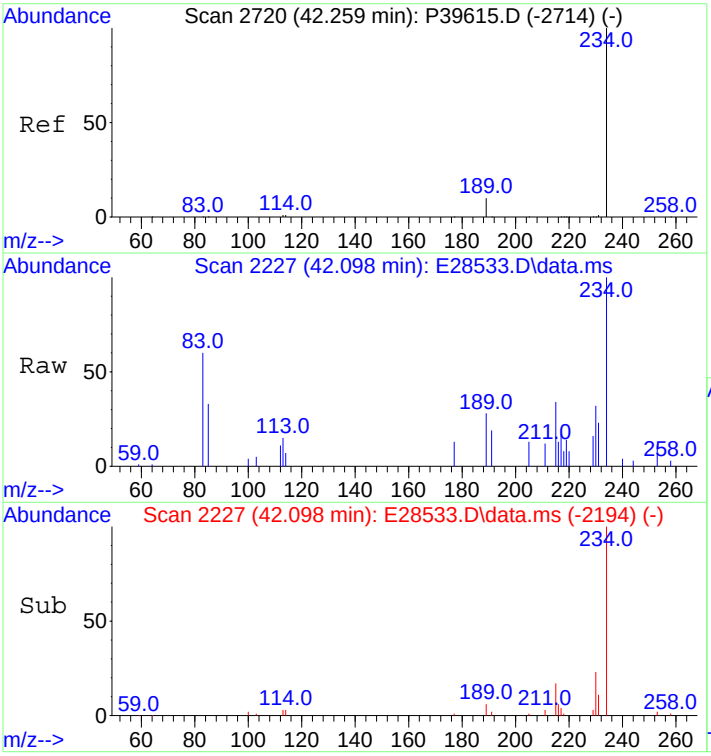




#64
C4-Fluoranthenes/Pyrenes
Concen: 674.79 ng/mL m
RT: 44.823 min Scan# 2408
Delta R.T. 0.220 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:258 Resp: 140363

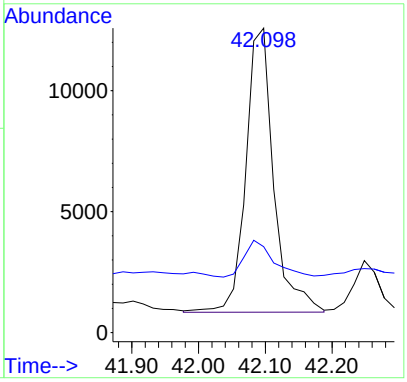


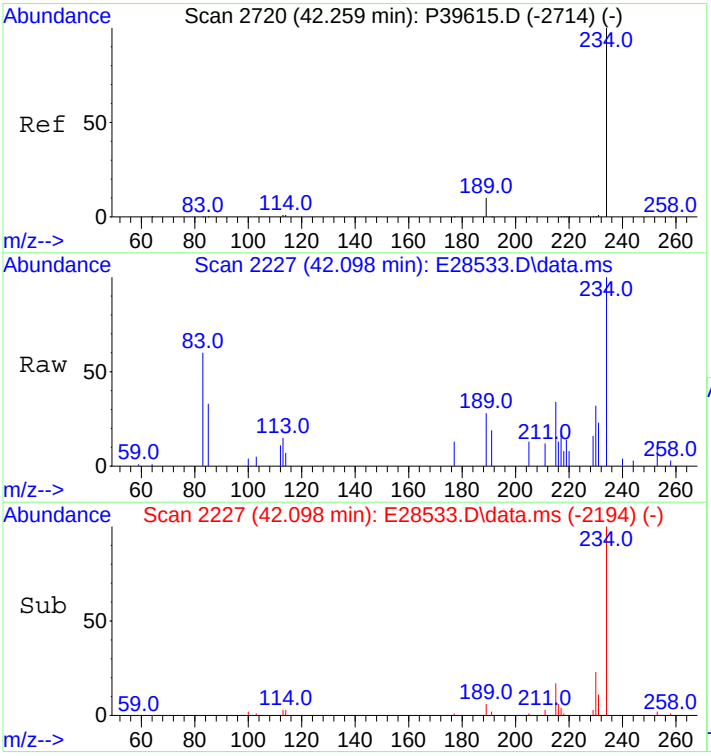


#66
Naphthobenzothiophene
Concen: 166.37 ng/ml
RT: 42.098 min Scan# 2227
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 34132

Ion	Ratio	Lower	Upper
234	100		
189	13.5	22.6	33.8#

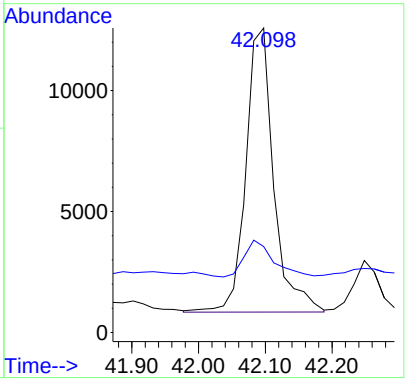


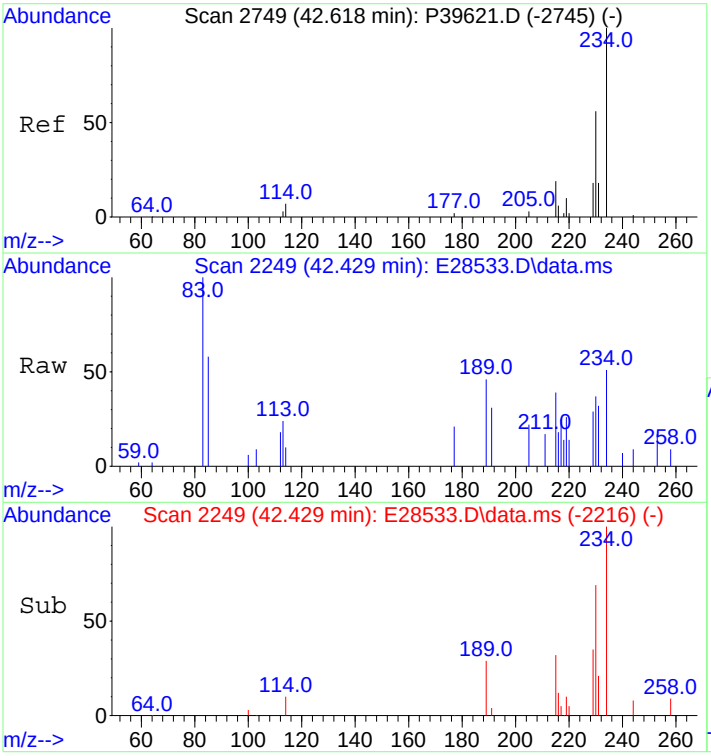


#67
Naphthobenzothiophene-2,1-D
Concen: 166.37 ng/mL
RT: 42.098 min Scan# 2227
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 34132

Ion	Ratio	Lower	Upper
234	100		
189	13.5	22.6	33.8#

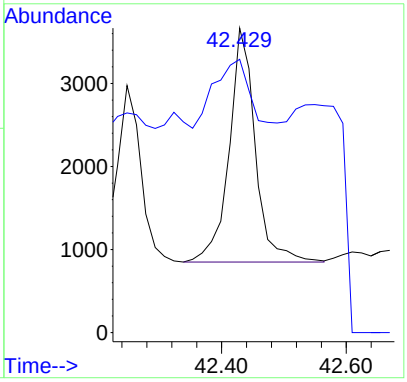


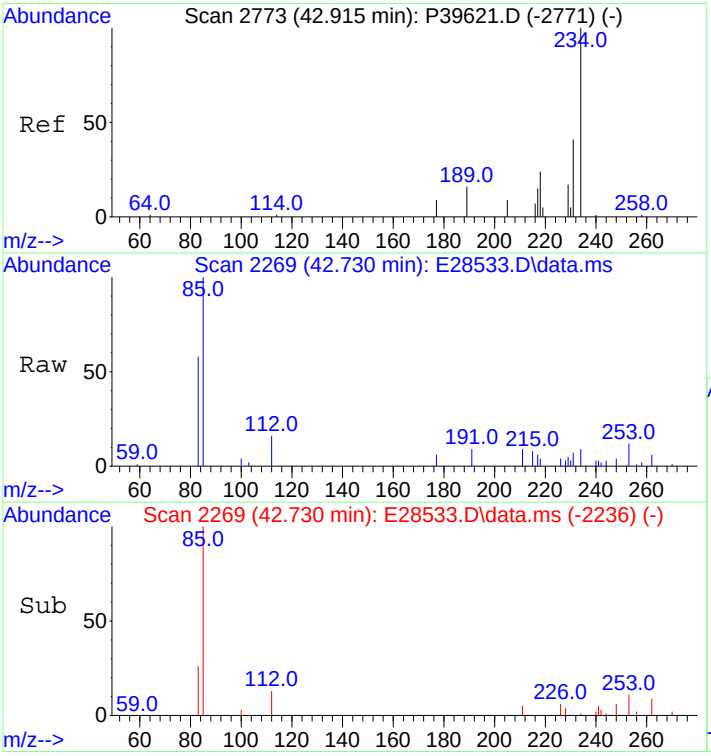


#68
Naphthobenzothiophene-1,2-D
Concen: 40.07 ng/mL
RT: 42.429 min Scan# 2249
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 8220

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.8	107.8#

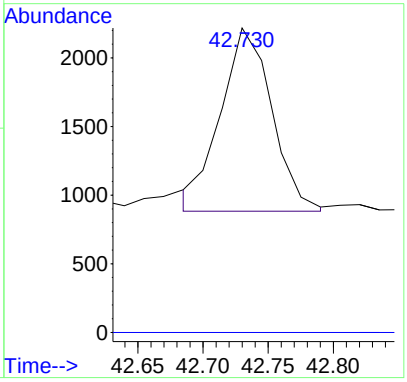


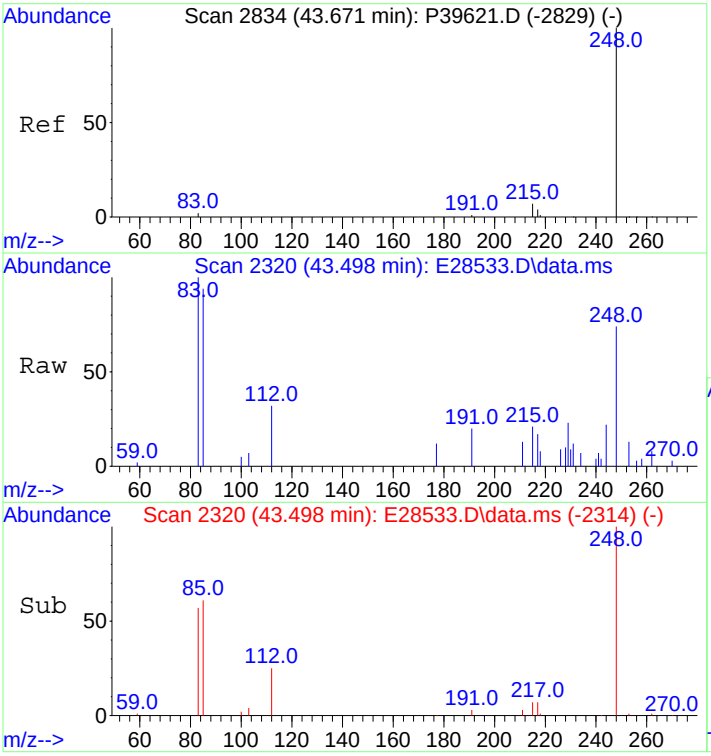


#69
Naphthobenzothiophene-2,3-D
Concen: 17.81 ng/mL m
RT: 42.730 min Scan# 2269
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 3653

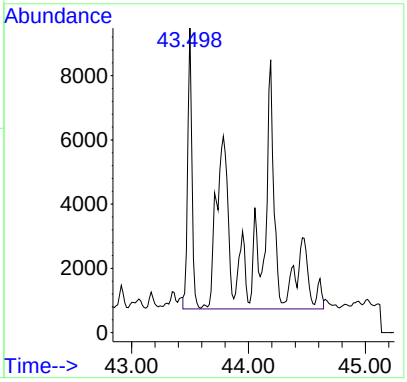
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

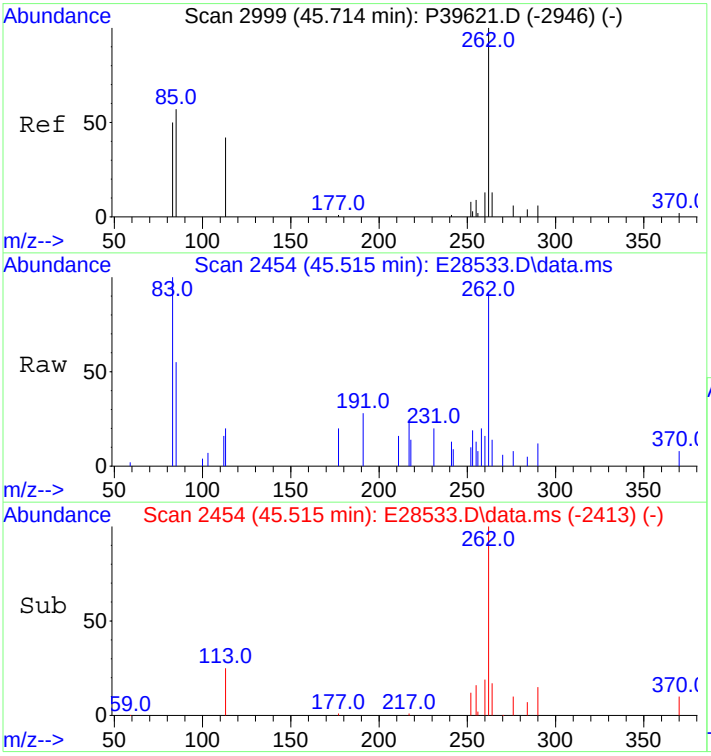




#70
C1-Naphthobenzothiophenes
Concen: 622.11 ng/ml m
RT: 43.498 min Scan# 2320
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

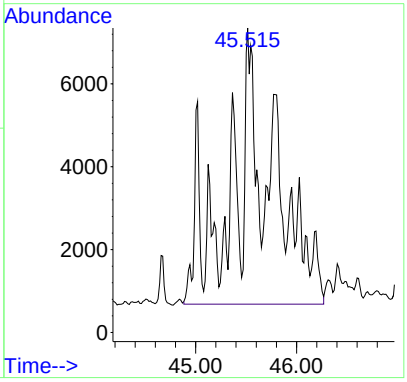
Tgt Ion:248 Resp: 127630

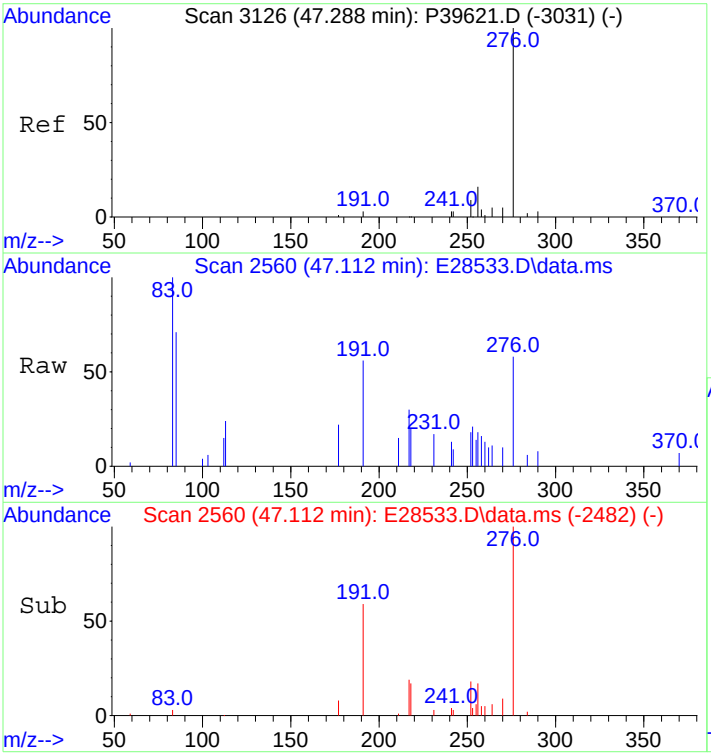




#71
C2-Naphthobenzothiophenes
Concen: 906.16 ng/ml m
RT: 45.515 min Scan# 2454
Delta R.T. 0.228 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

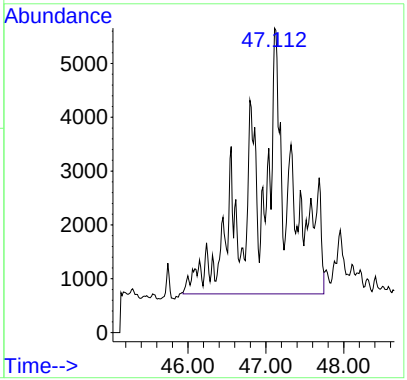
Tgt Ion:262 Resp: 185905

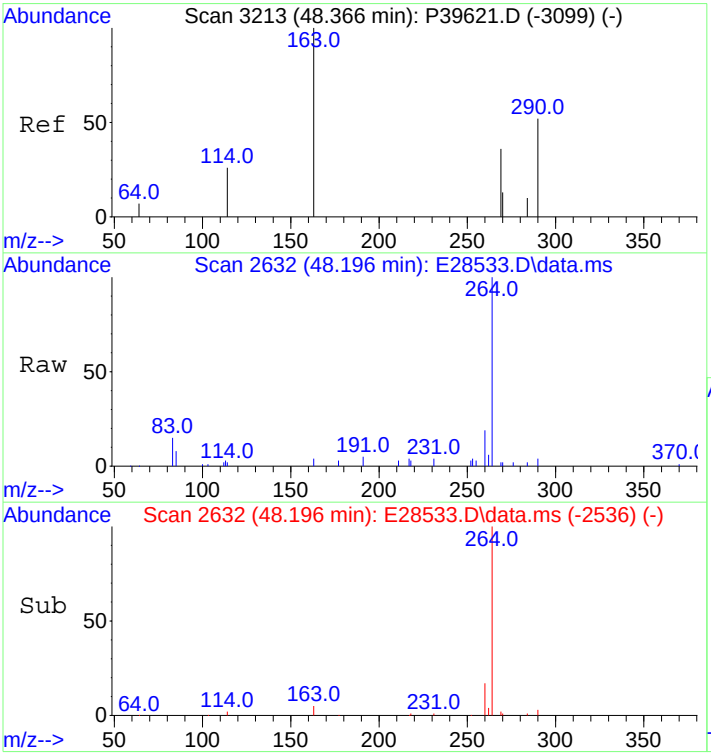




#72
C3-Naphthobenzothiophenes
Concen: 741.60 ng/ml m
RT: 47.112 min Scan# 2560
Delta R.T. 0.220 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

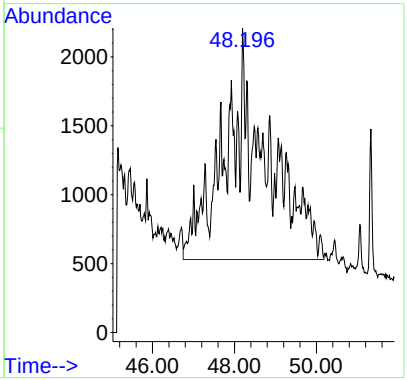
Tgt Ion:276 Resp: 152145

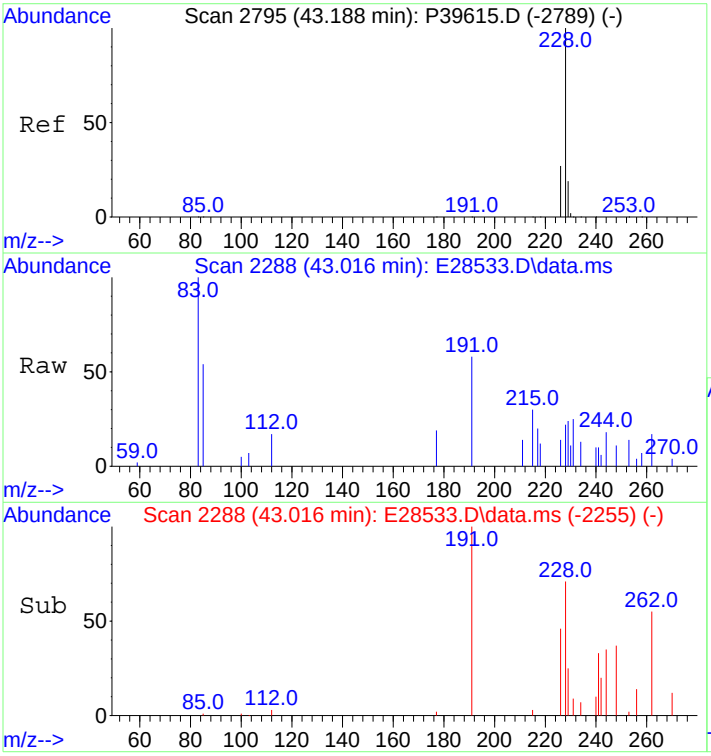




#73
C4-Naphthobenzothiophenes
Concen: 559.60 ng/mL m
RT: 48.196 min Scan# 2632
Delta R.T. 0.219 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:290 Resp: 114807

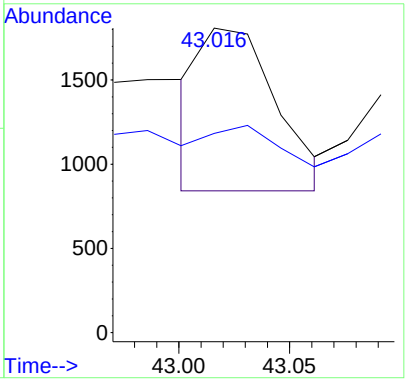


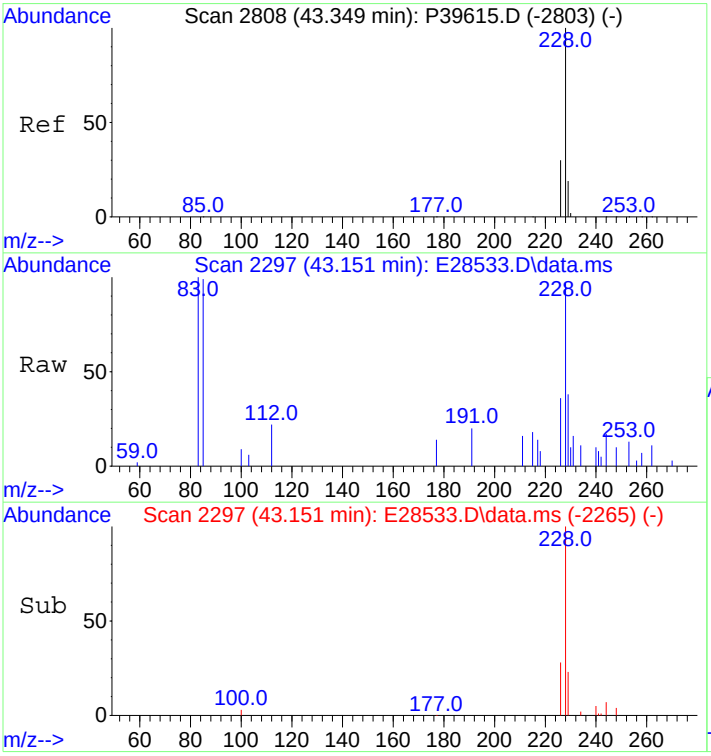


#75
Benz[a]anthracene
Concen: 11.16 ng/mL m
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:228 Resp: 2301

Ion	Ratio	Lower	Upper
228	100		
226	532.8	20.2	30.4#

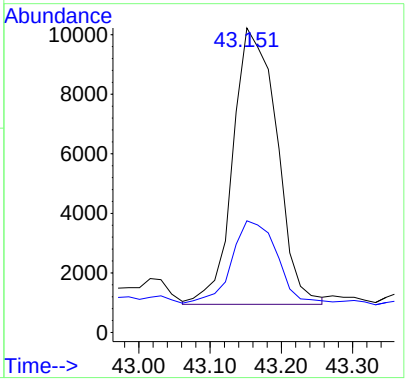


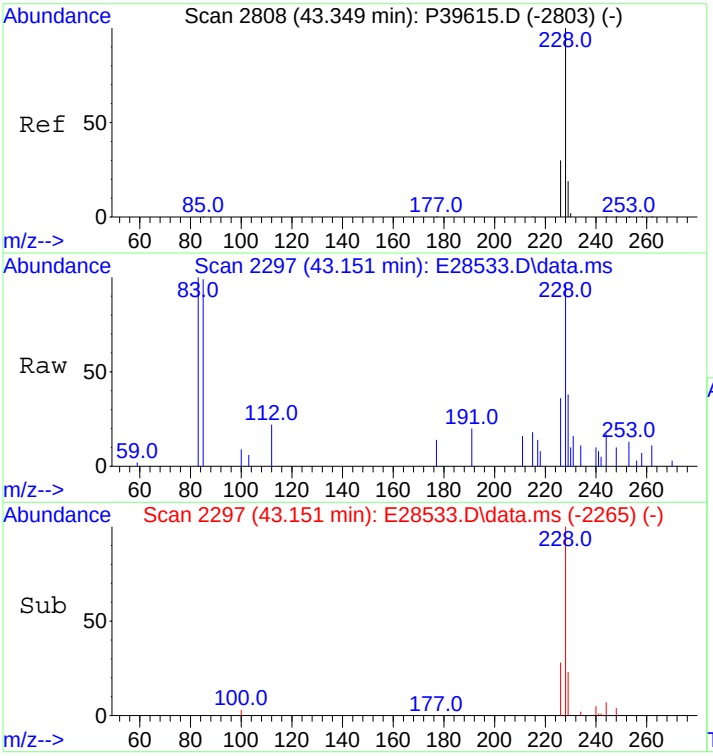


#76
Chrysene
Concen: 187.15 ng/mL m
RT: 43.151 min Scan# 2297
Delta R.T. -0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:228 Resp: 39715

Ion	Ratio	Lower	Upper
228	100		
226	34.1	22.6	34.0#

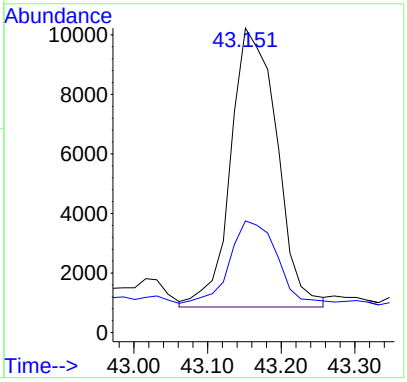


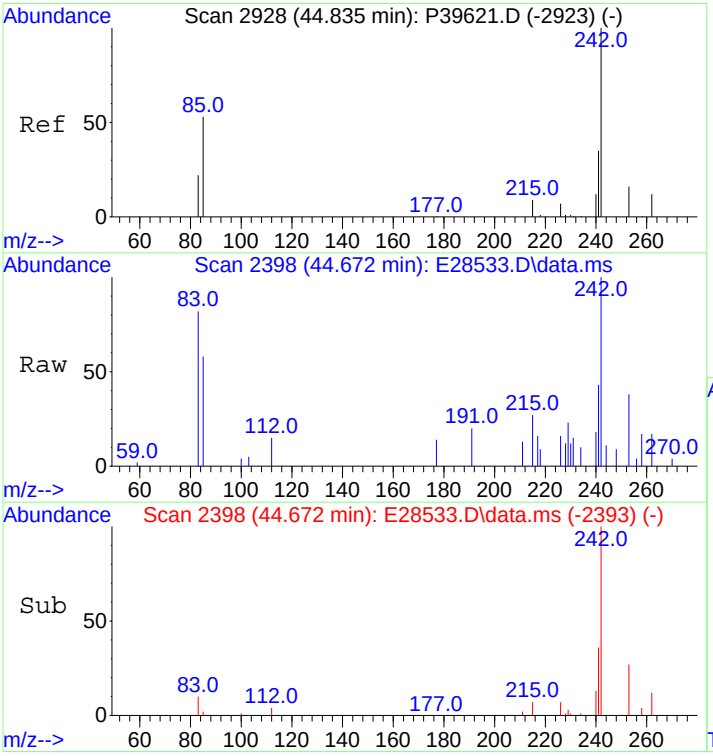


#77
Chrysene/Triphenylene
Concen: 191.91 ng/mL m
RT: 43.151 min Scan# 2297
Delta R.T. -0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:228 Resp: 40725

Ion	Ratio	Lower	Upper
228	100		
226	33.3	22.6	34.0

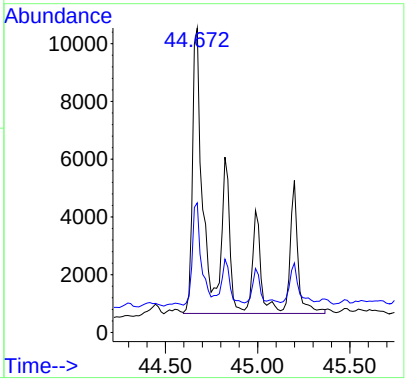


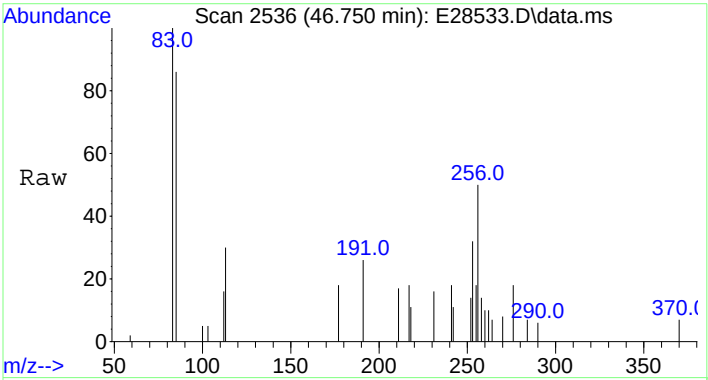


#78
C1-Chrysenes
Concen: 356.61 ng/mL m
RT: 44.672 min Scan# 2398
Delta R.T. 0.013 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:242 Resp: 75676

Ion	Ratio	Lower	Upper
242	100		
241	10.9	32.2	48.4#

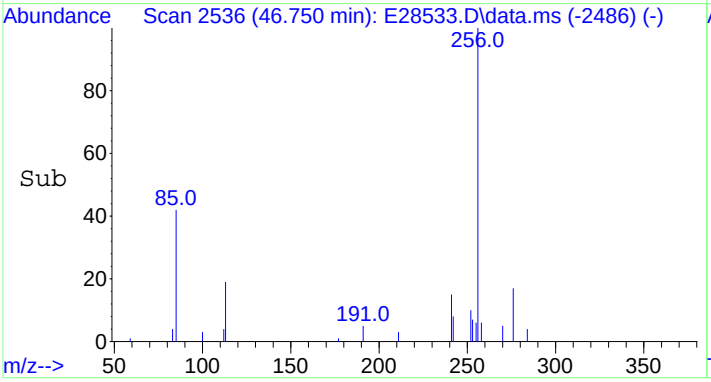


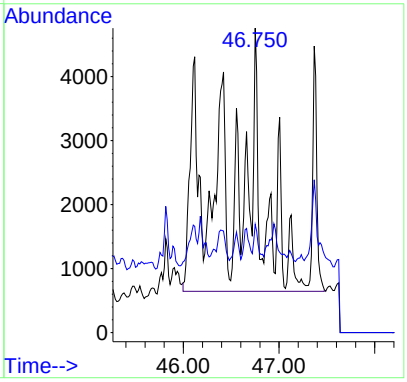


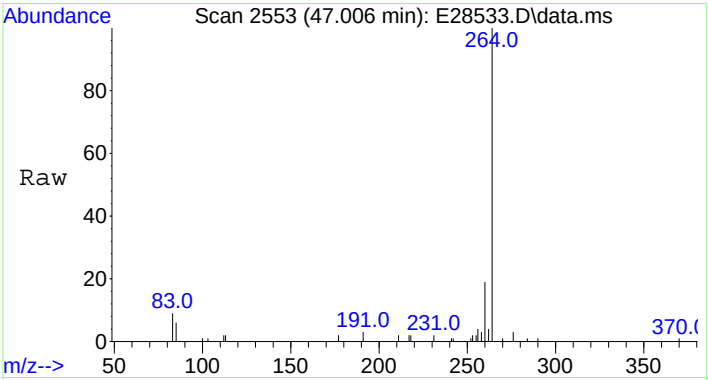
#79
C2-Chrysenes
Concen: 515.39 ng/mL m
RT: 46.750 min Scan# 2536
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:256 Resp: 109371

Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

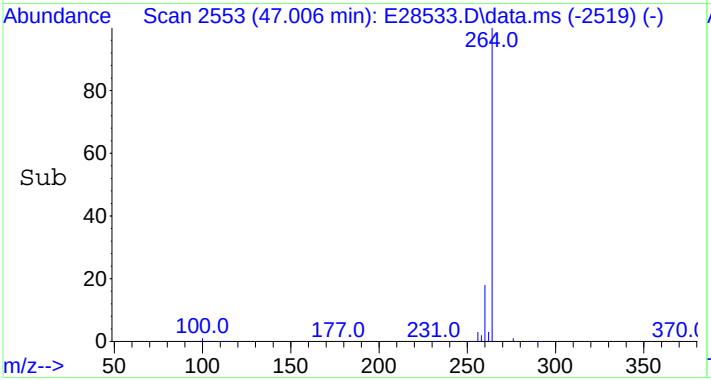


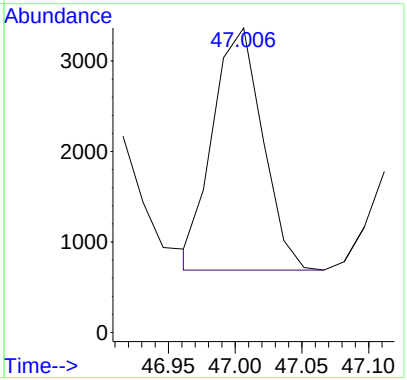


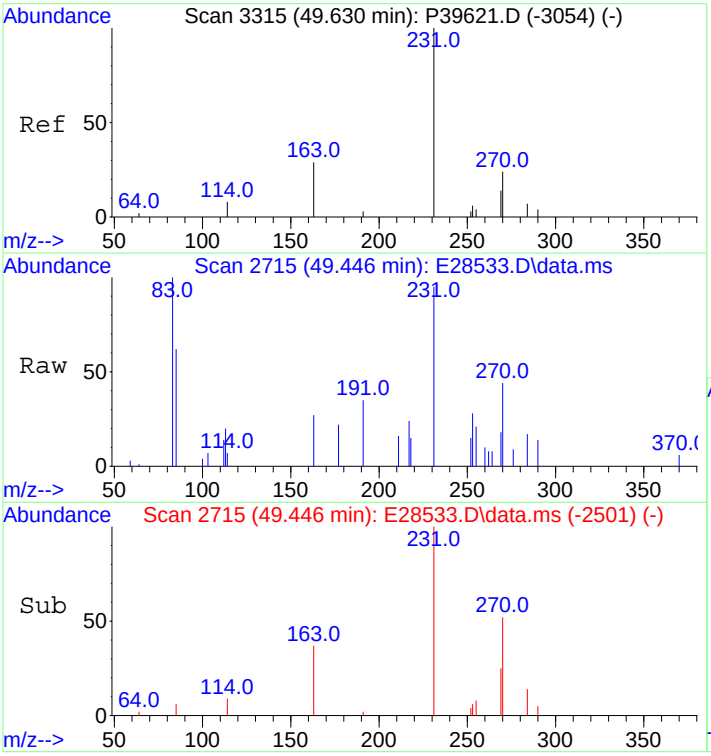


#80
BBF-D12 Surr BKGD
Concen: 32.68 ng/mL
RT: 47.006 min Scan# 2553
Delta R.T. 0.017 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:256 Resp: 6935



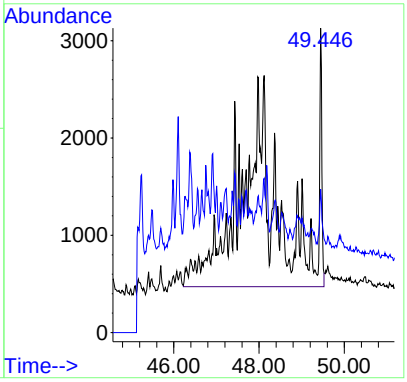


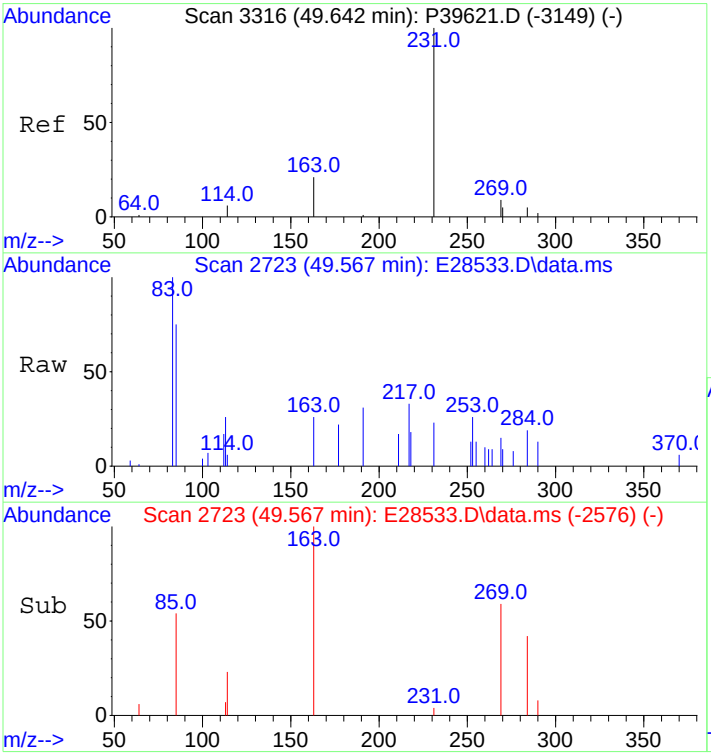


#81
C3-Chrysenes
Concen: 584.99 ng/mL m
RT: 49.446 min Scan# 2715
Delta R.T. -0.037 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:270 Resp: 124142

Ion	Ratio	Lower	Upper
270	100		
255	1.7	38.0	57.0#

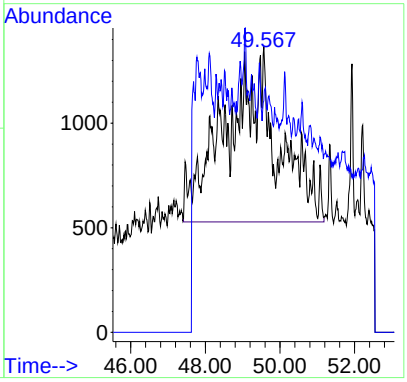


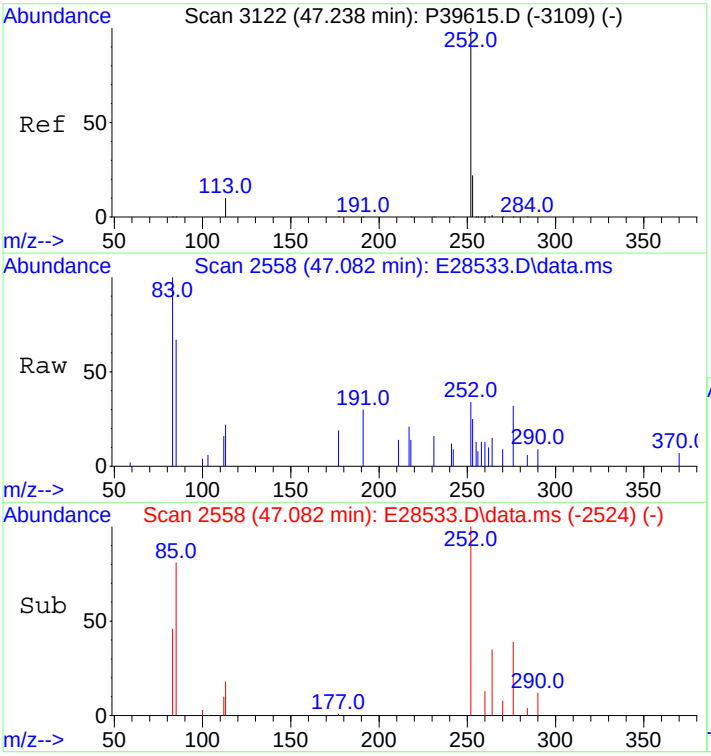


#82
C4-Chrysenes
Concen: 376.08 ng/mL m
RT: 49.567 min Scan# 2723
Delta R.T. -0.035 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:284 Resp: 79808

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

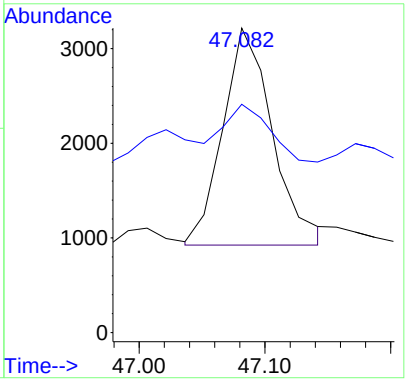


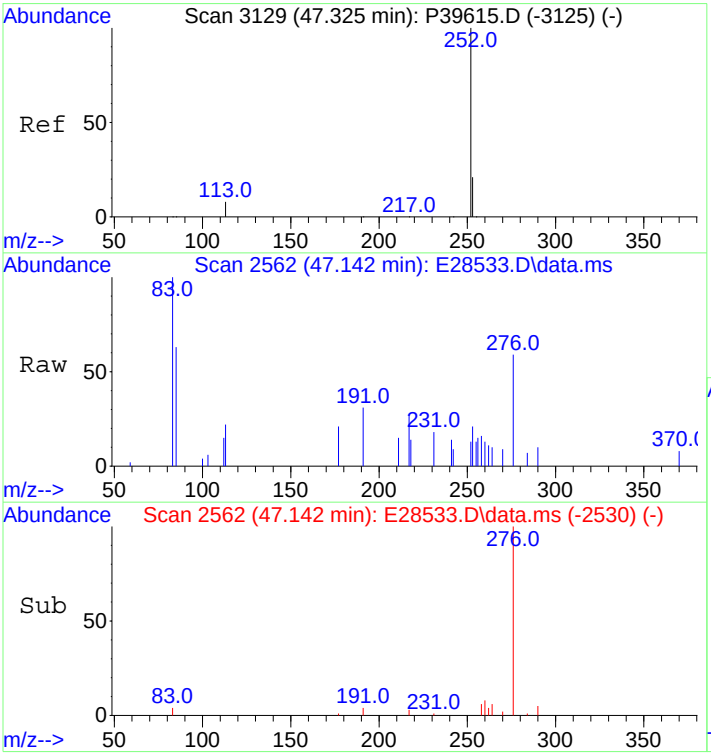


#84
Benzo[b]fluoranthene
Concen: 26.29 ng/mL m
RT: 47.082 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 6298

Ion	Ratio	Lower	Upper
252	100		
253	24.1	18.3	27.5

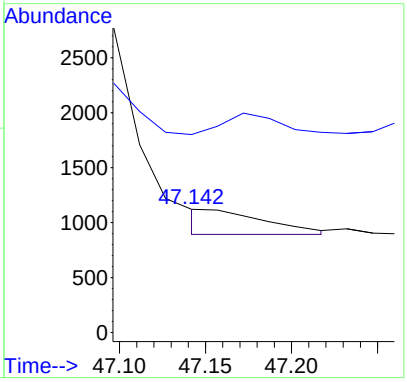


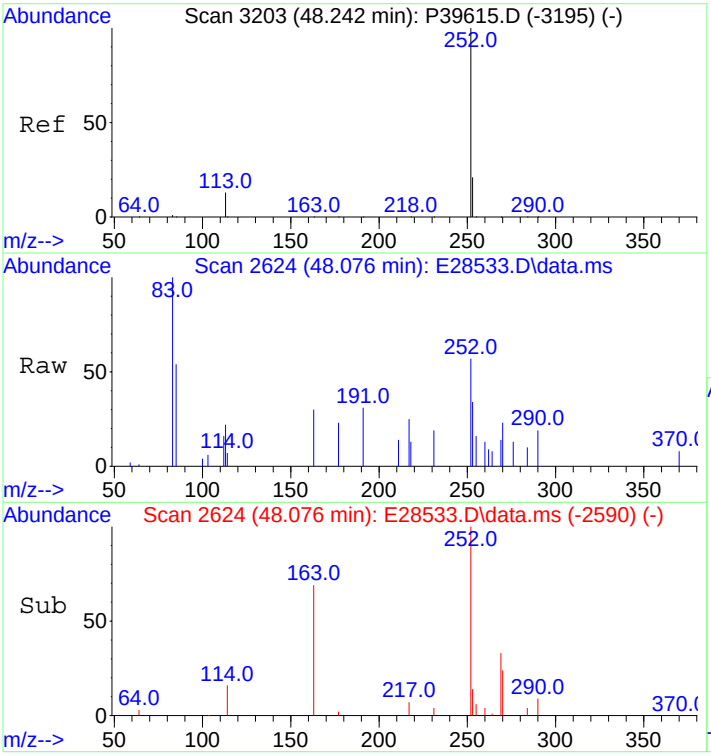


#85
Benzo[j]+[k]fluoranthene
Concen: 2.23 ng/mL m
RT: 47.142 min Scan# 2562
Delta R.T. -0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 550

Ion	Ratio	Lower	Upper
252	100		
253	276.2	18.3	27.5#

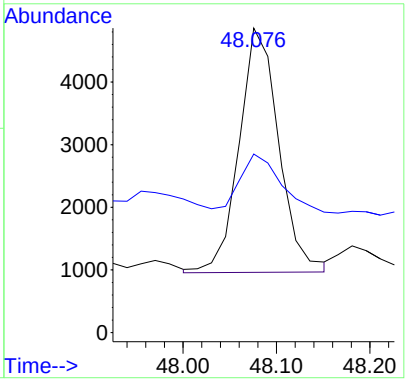


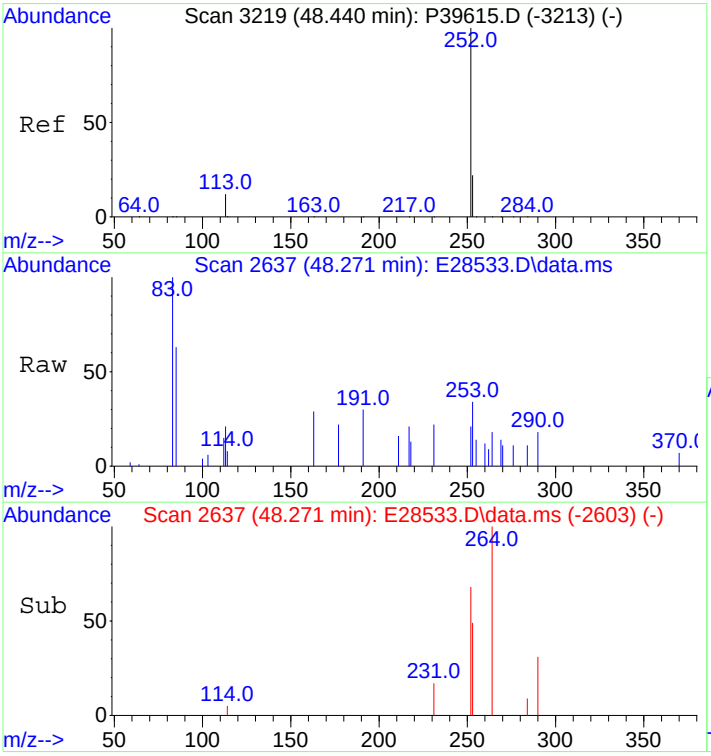


#87
Benzo[e]pyrene
Concen: 49.28 ng/mL
RT: 48.076 min Scan# 2624
Delta R.T. 0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 11528

Ion	Ratio	Lower	Upper
252	100		
253	27.6	18.6	28.0

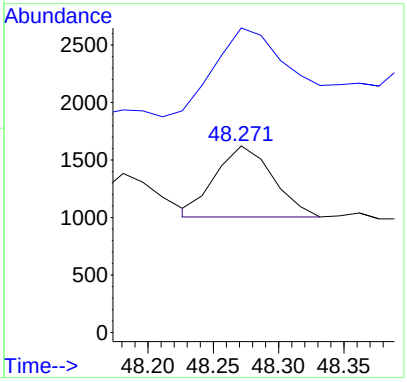


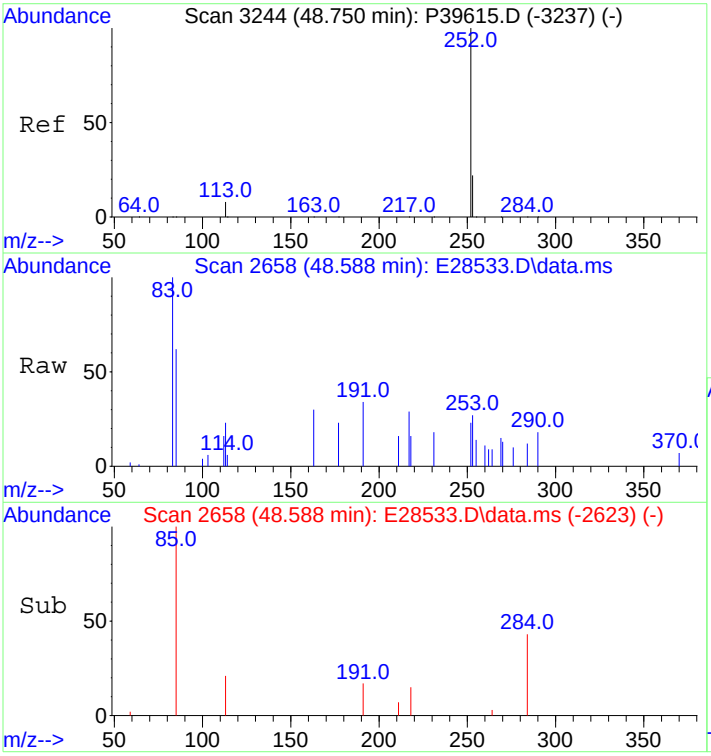


#89
Benzo[a]pyrene
Concen: 8.40 ng/mL m
RT: 48.271 min Scan# 2637
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 1881

Ion	Ratio	Lower	Upper
252	100		
253	152.6	18.8	28.2#

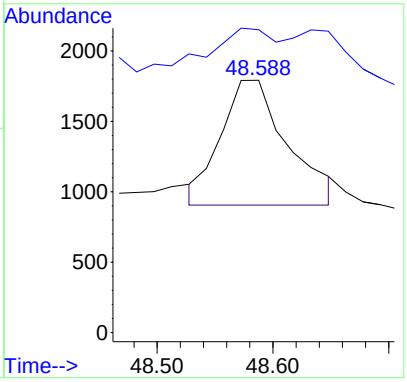


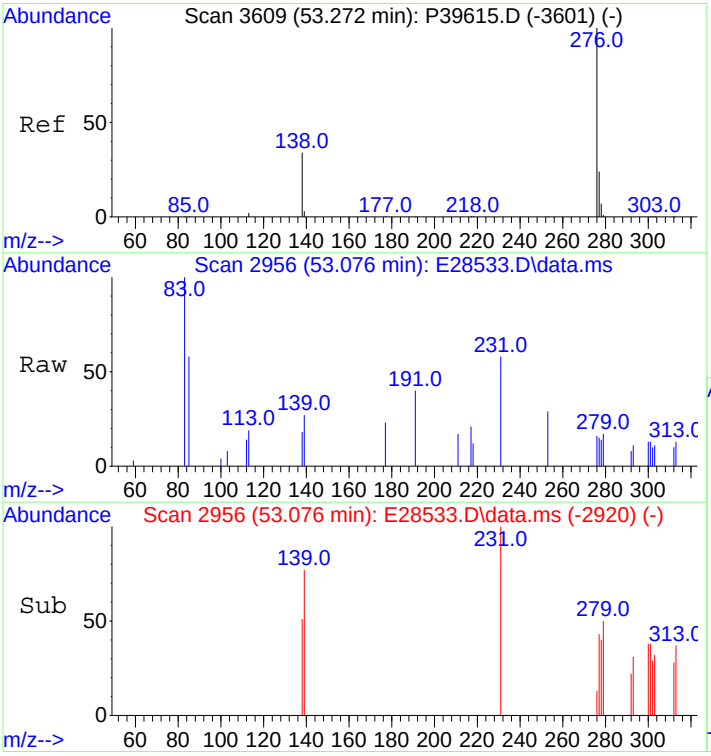


#90
Perylene
Concen: 15.04 ng/mL m
RT: 48.588 min Scan# 2658
Delta R.T. 0.031 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 3561

Ion	Ratio	Lower	Upper
252	100		
253	25.4	18.8	28.2

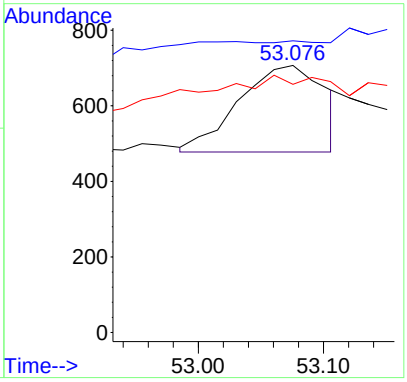


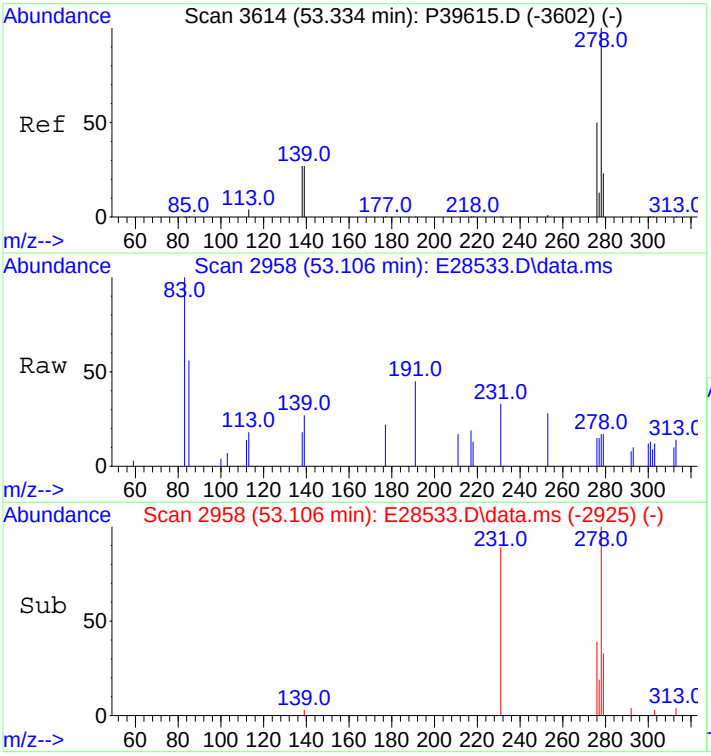


#91
Indeno[1,2,3-cd]pyrene
Concen: 4.14 ng/mL m
RT: 53.076 min Scan# 2956
Delta R.T. 0.046 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:276 Resp: 1091

Ion	Ratio	Lower	Upper
276	100		
138	0.0	15.4	23.2#
277	58.5	19.1	28.7#

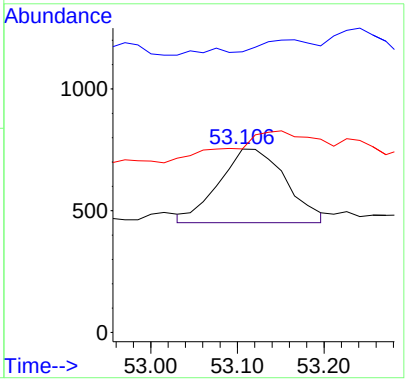


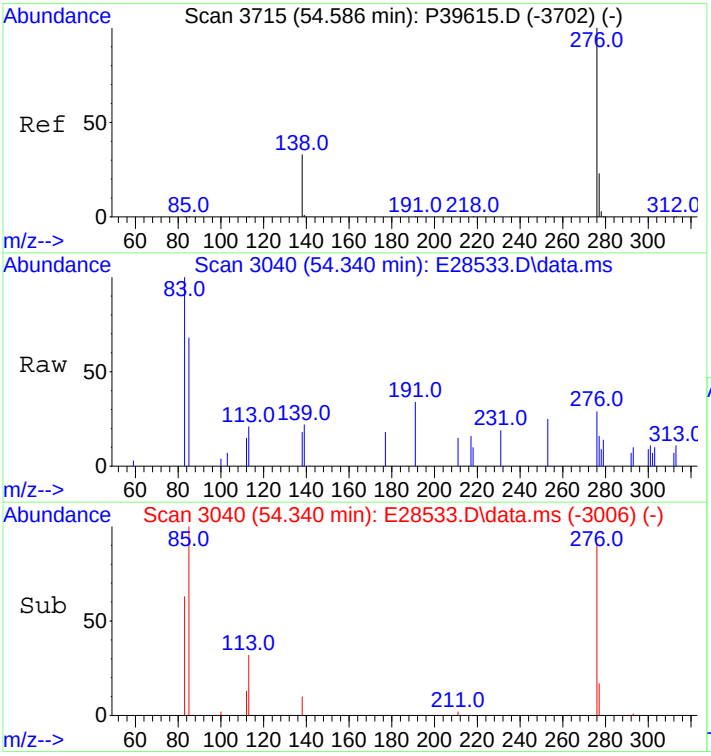


#92
Dibenz[ah]+[ac]anthracene
Concen: 5.79 ng/mL m
RT: 53.106 min Scan# 2958
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:278 Resp: 1624

Ion	Ratio	Lower	Upper
278	100		
139	0.0	11.1	16.7#
279	0.0	19.4	29.0#

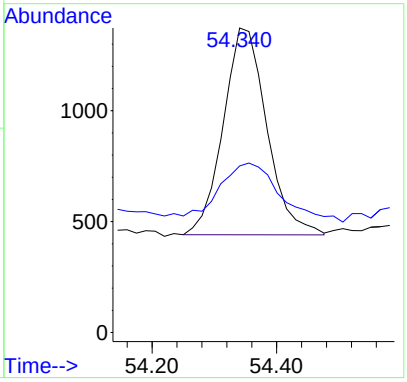


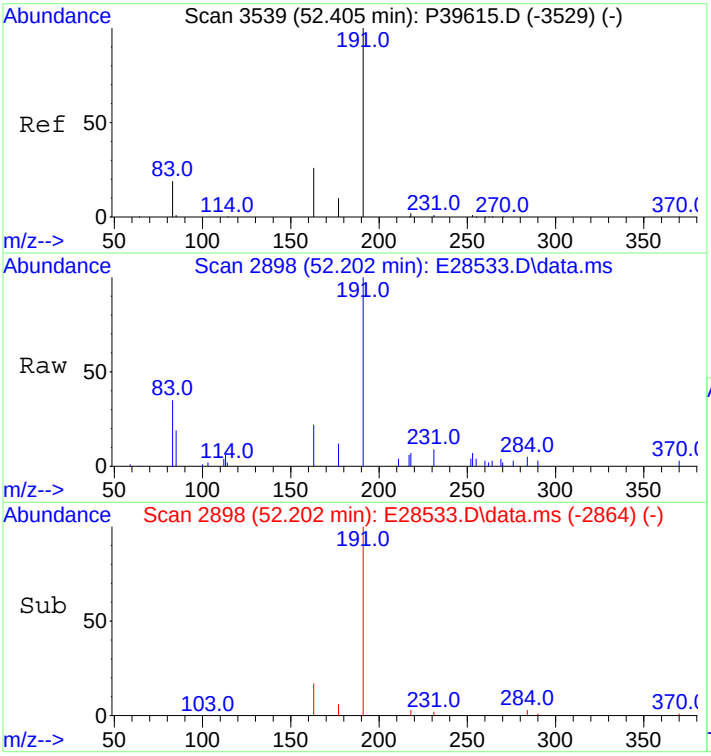


#93
Benzo[g,h,i]perylene
Concen: 15.97 ng/mL
RT: 54.340 min Scan# 3040
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:276 Resp: 4537

Ion	Ratio	Lower	Upper
276	100		
277	39.6	19.1	28.7#

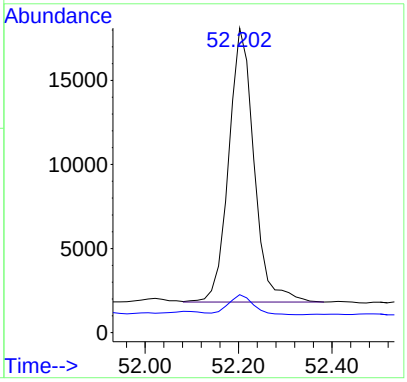


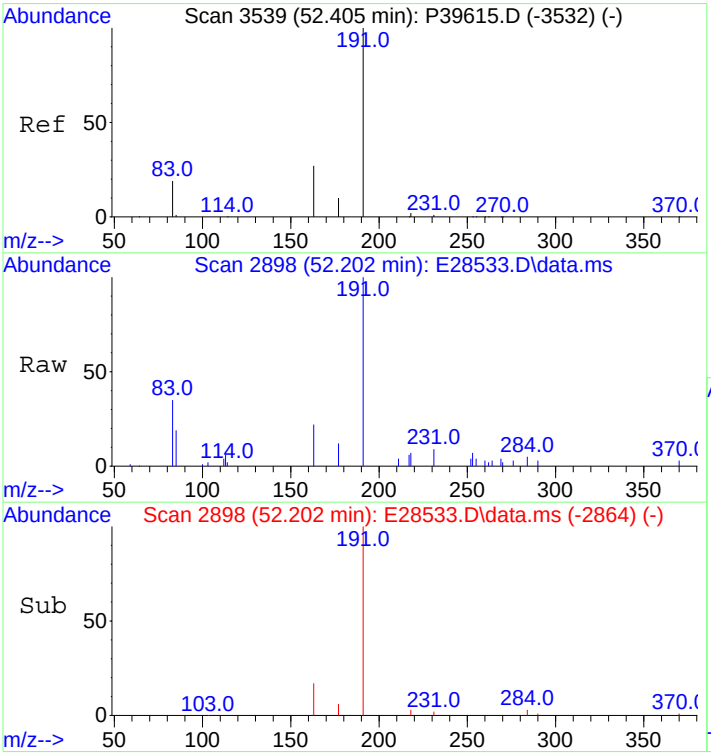


#94
Hopane (T19)
Concen: 771.26 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:191 Resp: 61269

Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#

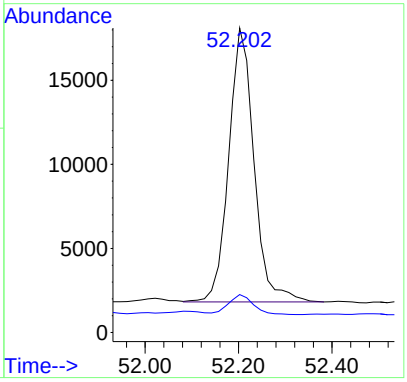


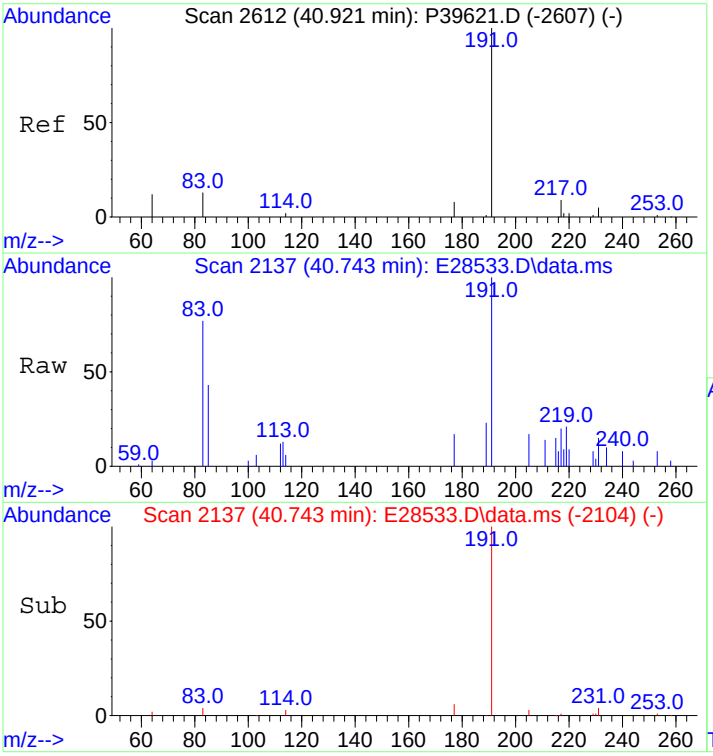


#95
17a(H),21B(H)-hopane - C30H52
Concen: 771.26 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:191 Resp: 61269

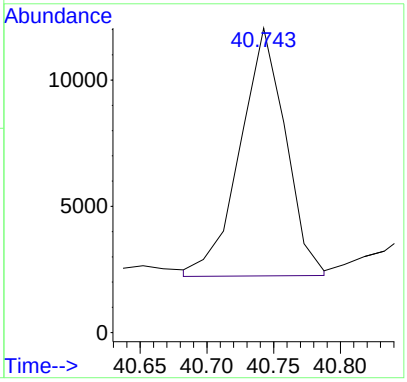
Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#

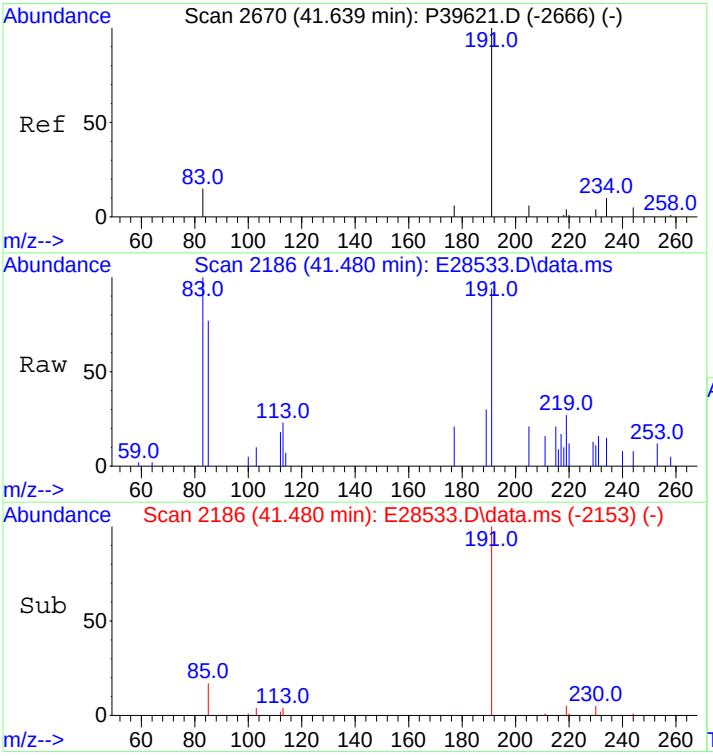




#96
C23 Tricyclic Terpane (T4)
Concen: 292.23 ng/ml
RT: 40.743 min Scan# 2137
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

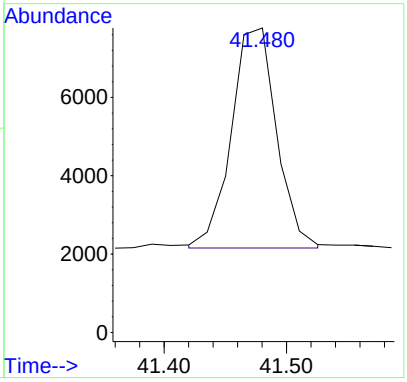
Tgt Ion:191 Resp: 23215

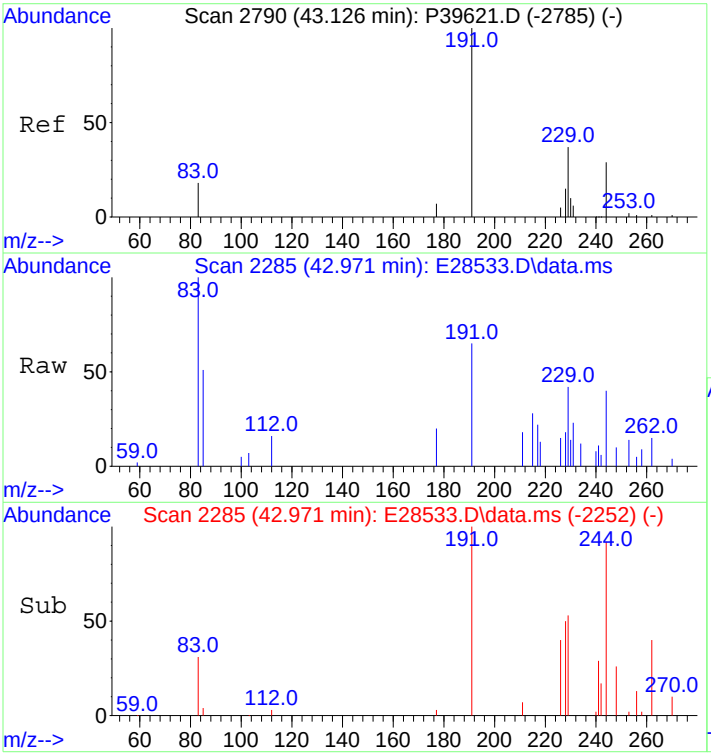




#97
C24 Tricyclic Terpane (T5)
Concen: 181.33 ng/ml m
RT: 41.480 min Scan# 2186
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

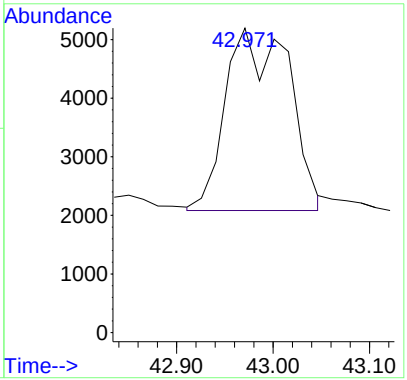
Tgt Ion:191 Resp: 14405

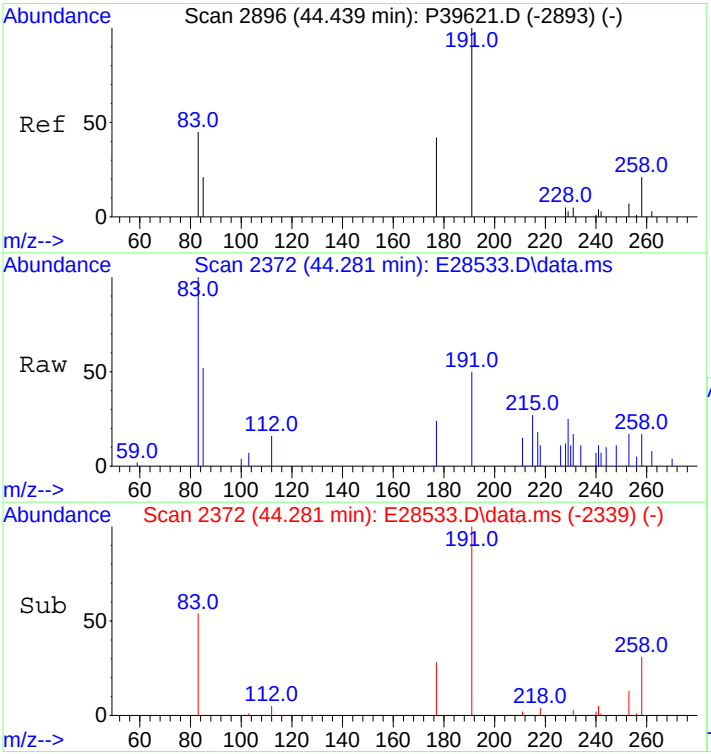




#98
C25 Tricyclic Terpane (T6)
Concen: 179.14 ng/ml m
RT: 42.971 min Scan# 2285
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

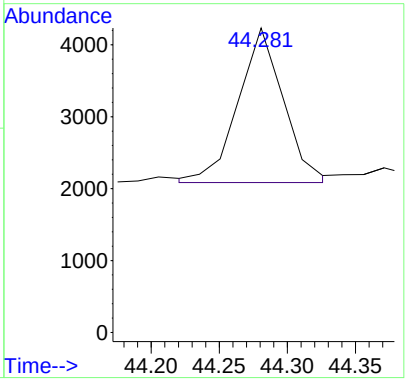
Tgt Ion:191 Resp: 14231

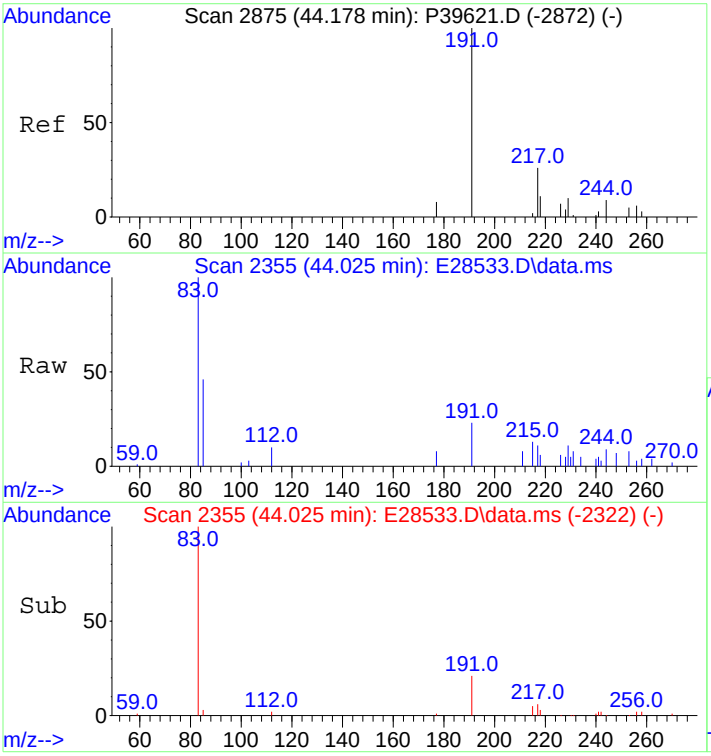




#99
C24 Tetracyclic Terpane (T6a)
Concen: 62.58 ng/ml m
RT: 44.281 min Scan# 2372
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

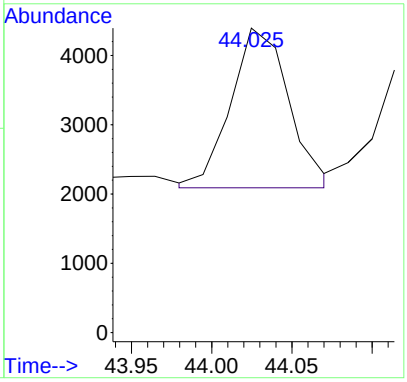
Tgt Ion:191 Resp: 4971

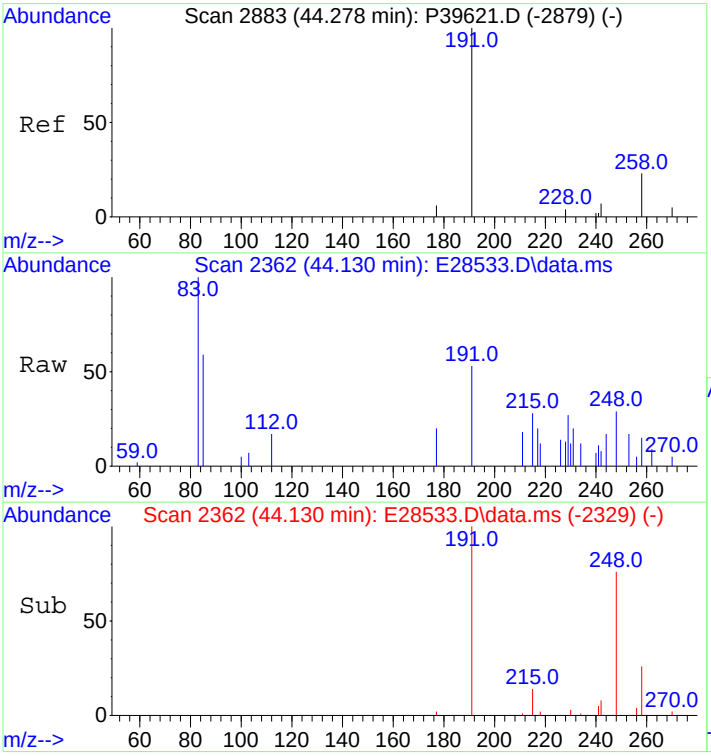




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 72.92 ng/ml m
RT: 44.025 min Scan# 2355
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

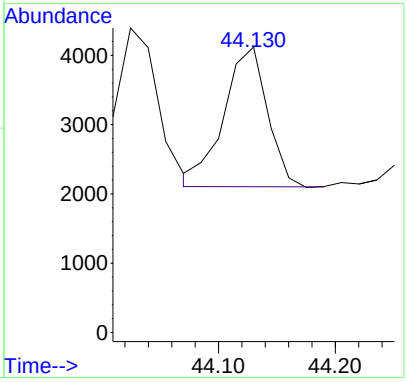
Tgt Ion:191 Resp: 5793

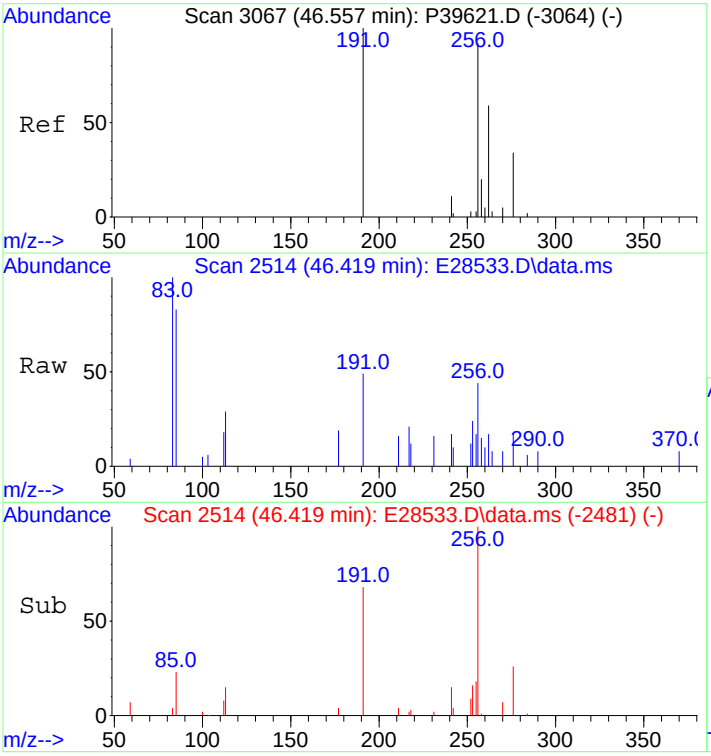




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 65.85 ng/ml
RT: 44.130 min Scan# 2362
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

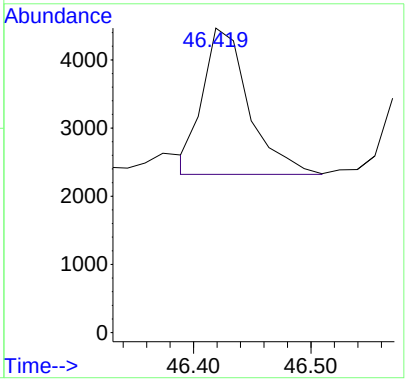
Tgt Ion:191 Resp: 5231

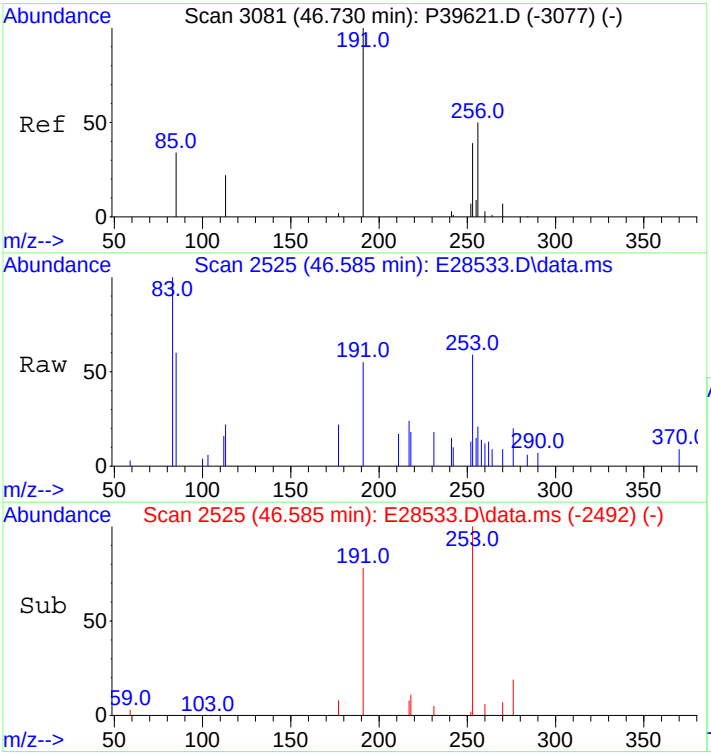




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 73.65 ng/ml m
RT: 46.419 min Scan# 2514
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

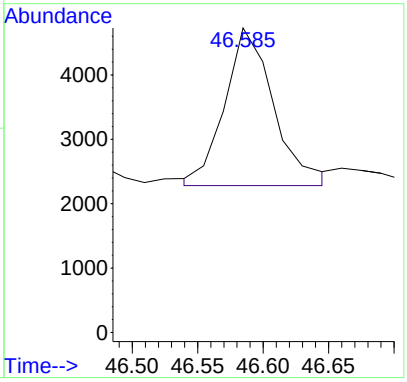
Tgt Ion:191 Resp: 5851

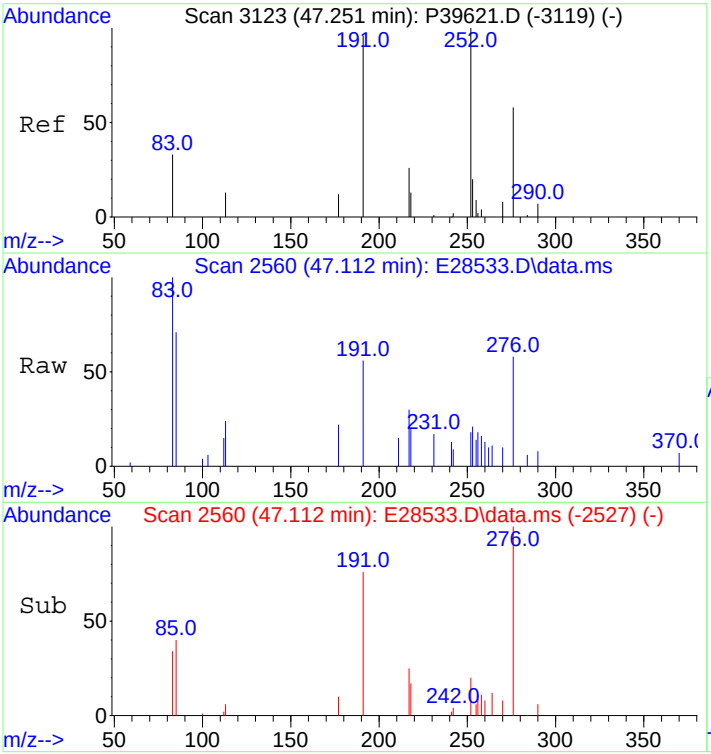




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 80.39 ng/ml m
RT: 46.585 min Scan# 2525
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

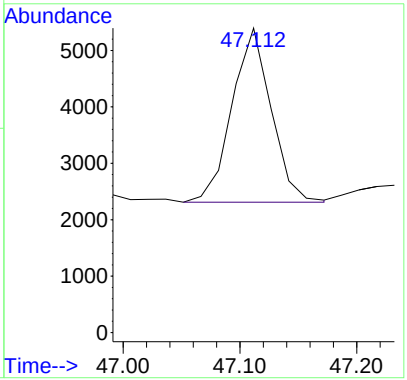
Tgt Ion:191 Resp: 6386

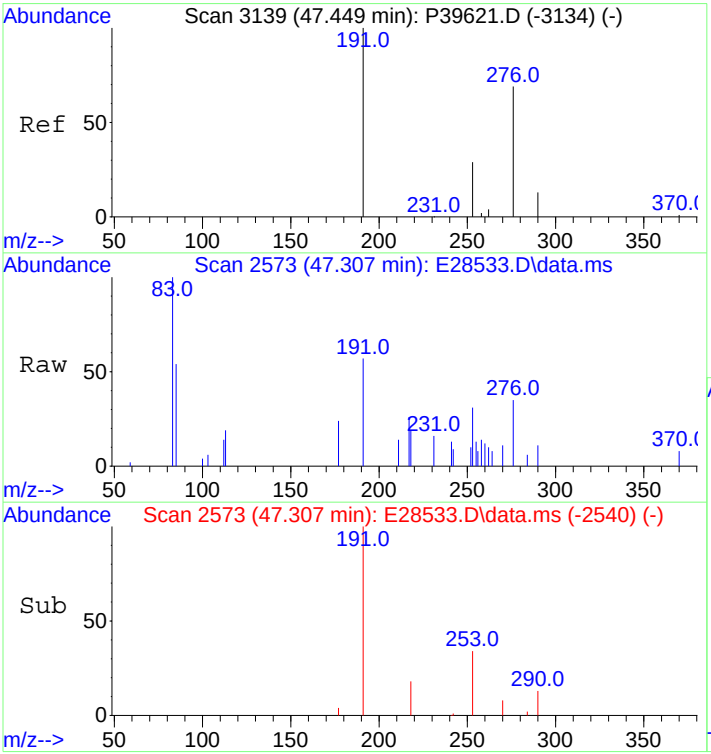




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 90.94 ng/ml
RT: 47.112 min Scan# 2560
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

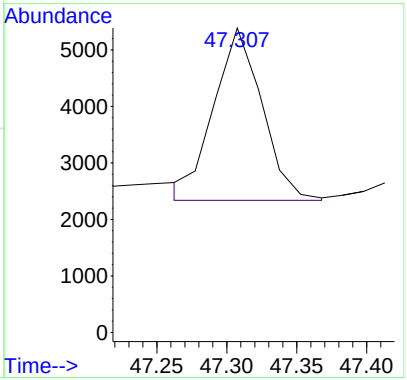
Tgt Ion:191 Resp: 7224

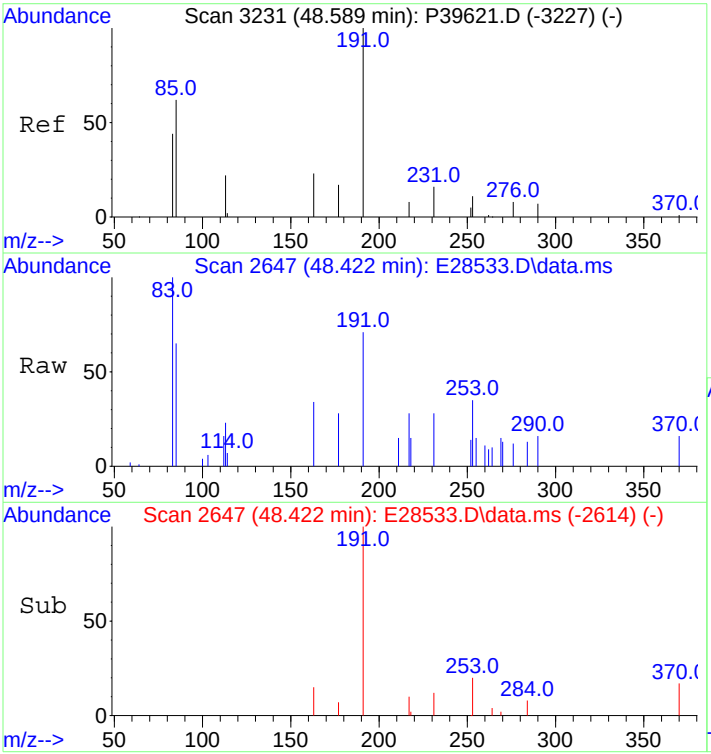




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 91.69 ng/ml m
RT: 47.307 min Scan# 2573
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

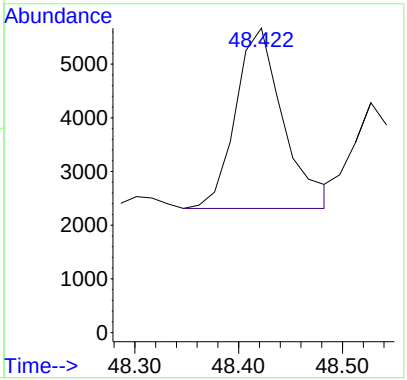
Tgt Ion:191 Resp: 7284

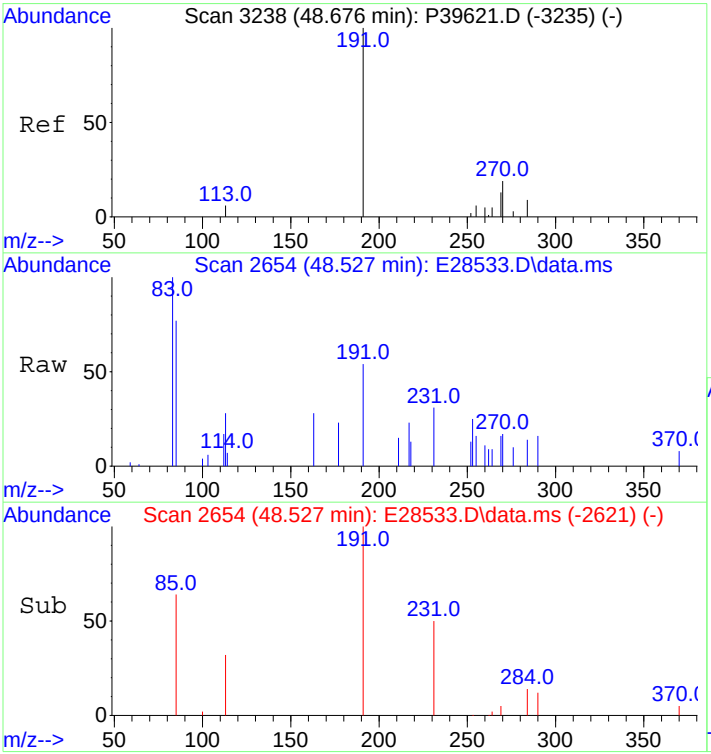




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 135.45 ng/ml
RT: 48.422 min Scan# 2647
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

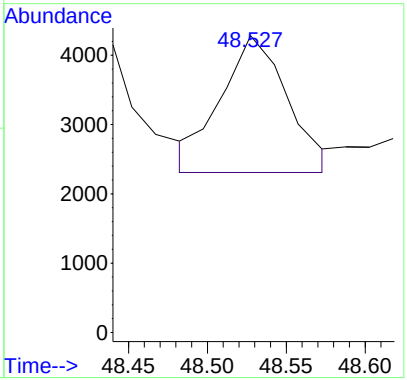
Tgt Ion:191 Resp: 10760

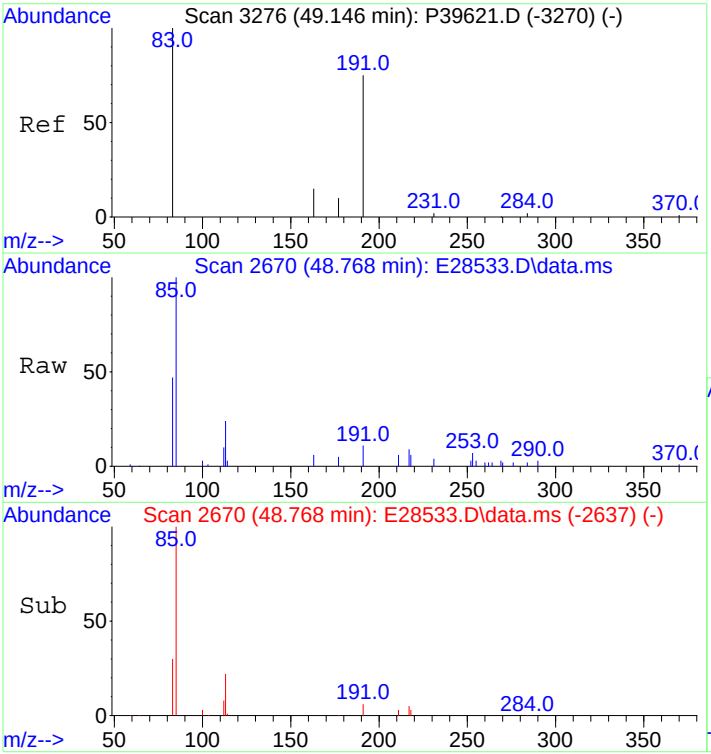




#107
C30 Tricyclic Terpane-22S
Concen: 73.06 ng/mL m
RT: 48.527 min Scan# 2654
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

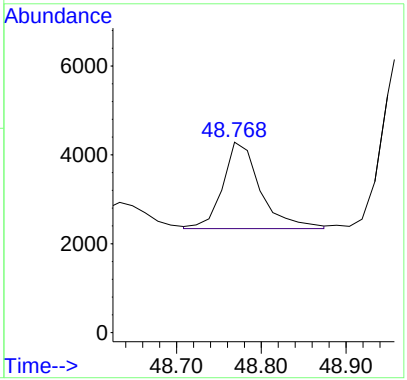
Tgt Ion:191 Resp: 5804

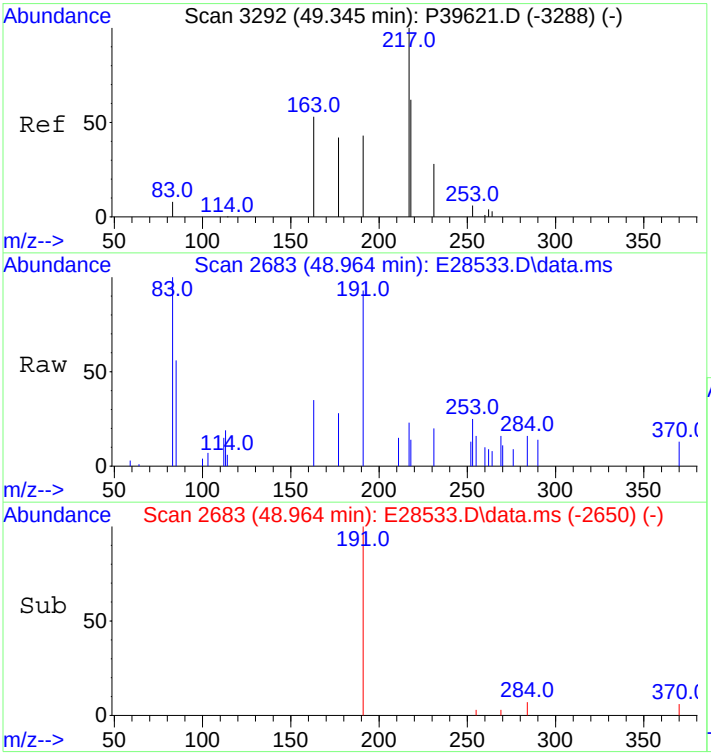




#108
C30 Tricyclic Terpane-22R
Concen: 75.43 ng/mL m
RT: 48.768 min Scan# 2670
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

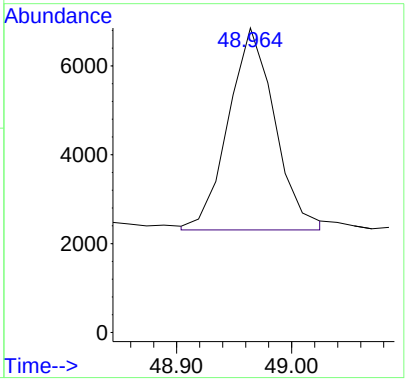
Tgt Ion:191 Resp: 5992

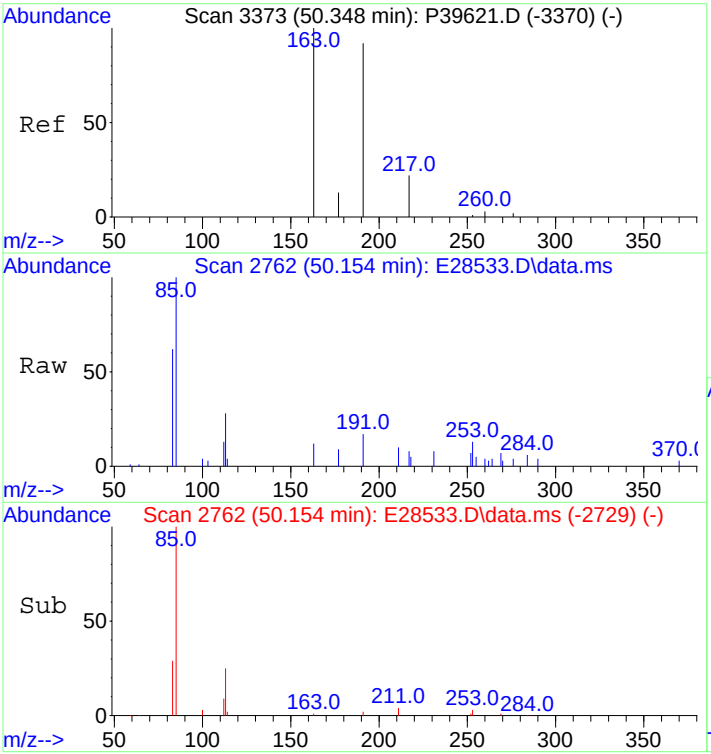




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 160.22 ng/ml m
RT: 48.964 min Scan# 2683
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

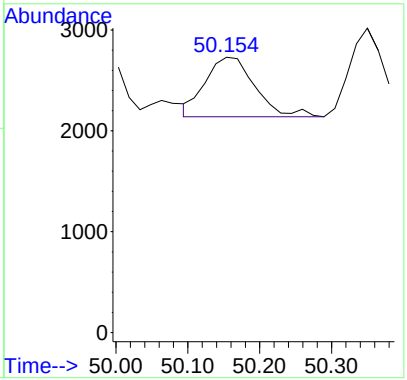
Tgt Ion:191 Resp: 12728

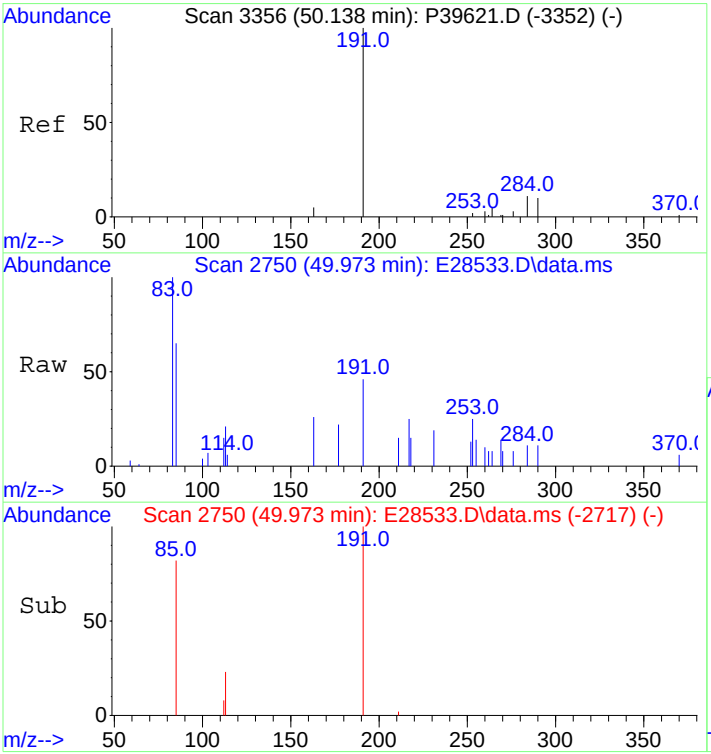




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 35.64 ng/ml
RT: 50.154 min Scan# 2762
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

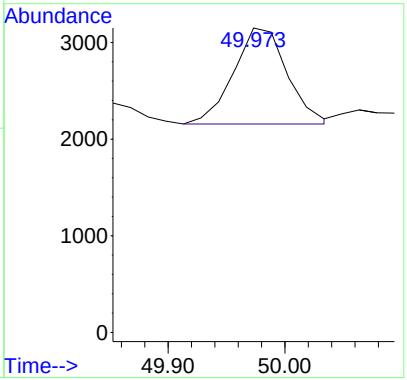
Tgt Ion:191 Resp: 2831

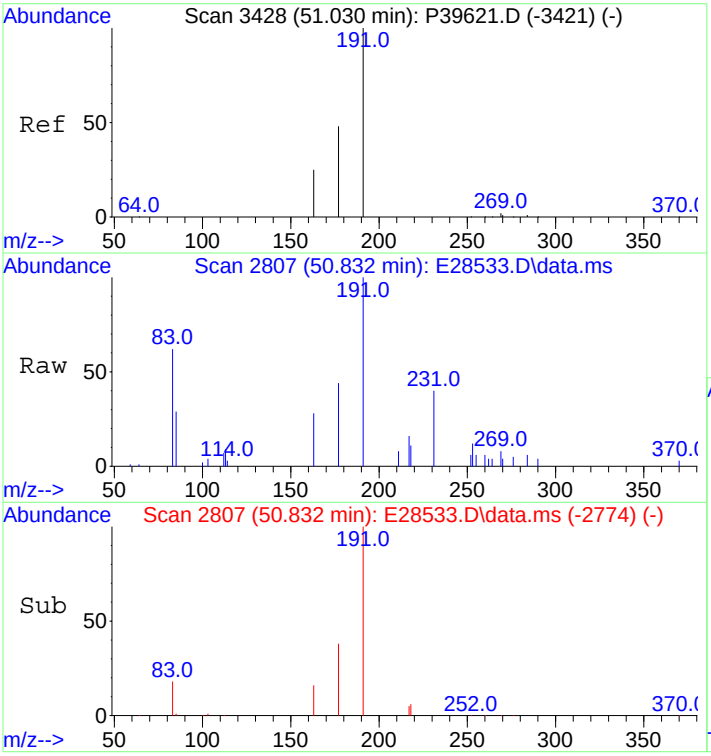




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 40.17 ng/ml
RT: 49.973 min Scan# 2750
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

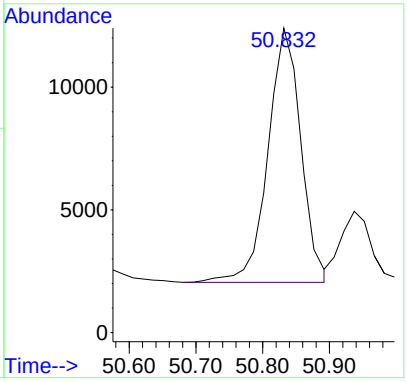
Tgt Ion:191 Resp: 3191

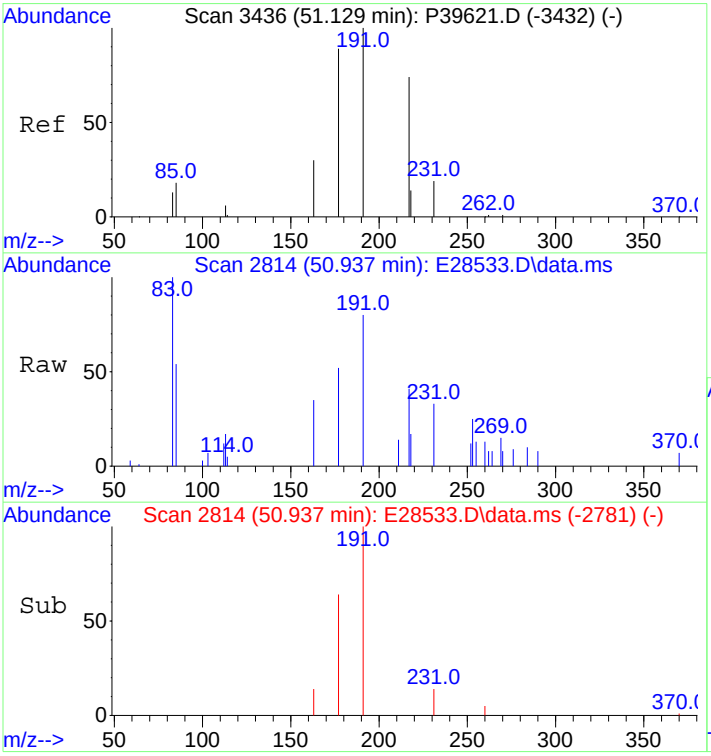




#112
30-Norhopane (T15)
Concen: 446.30 ng/ml
RT: 50.832 min Scan# 2807
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

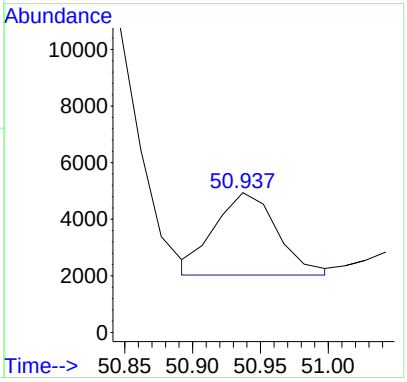
Tgt Ion:191 Resp: 35454

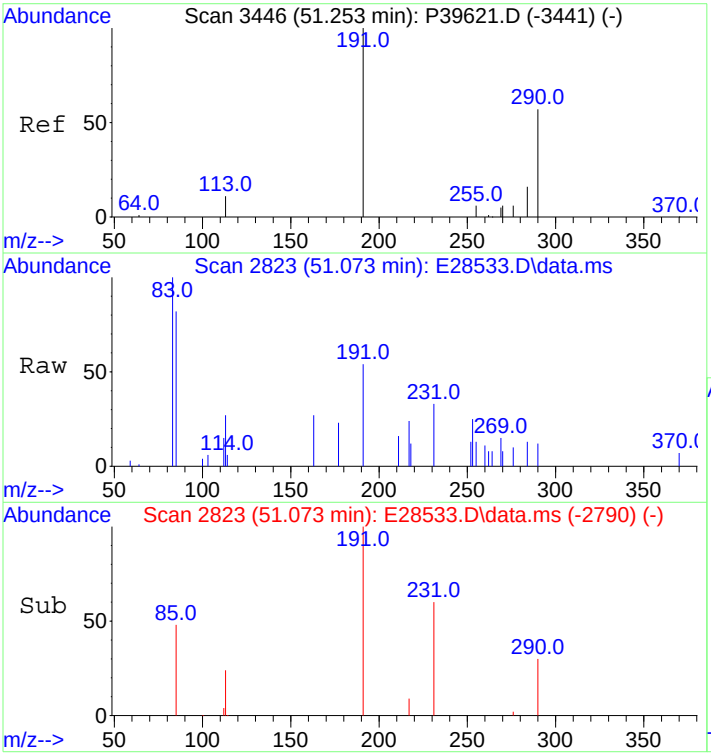




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 117.23 ng/ml m
RT: 50.937 min Scan# 2814
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

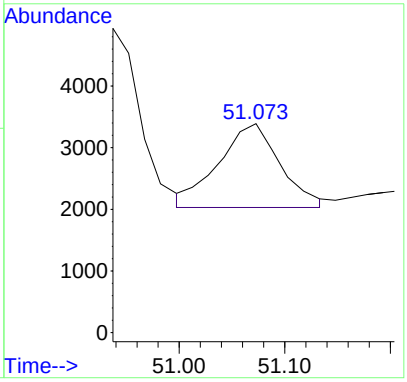
Tgt Ion:191 Resp: 9313

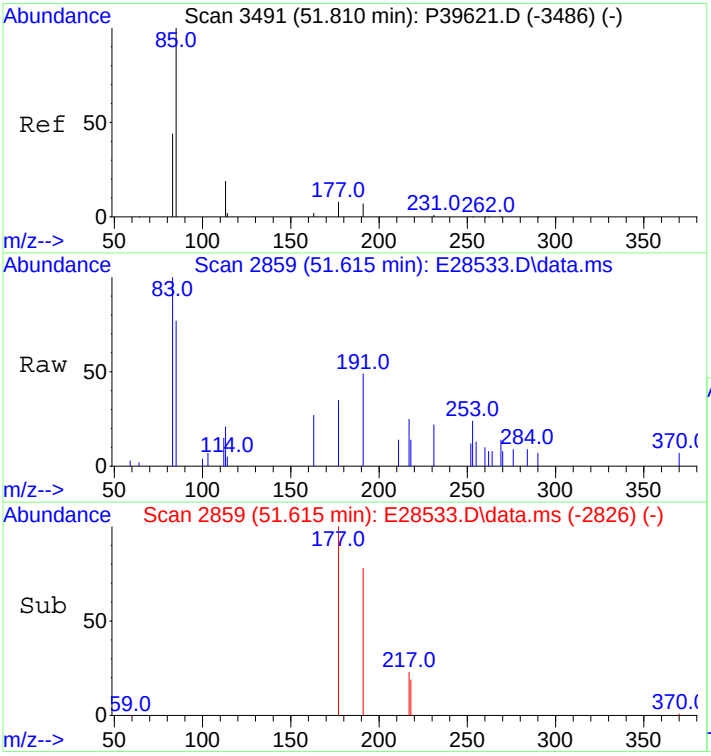




#114
17a(H)-Diahopane (X)
Concen: 69.33 ng/ml m
RT: 51.073 min Scan# 2823
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

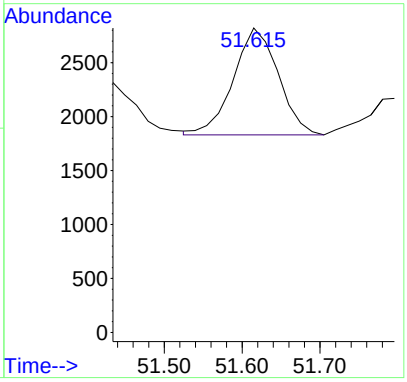
Tgt Ion:191 Resp: 5508

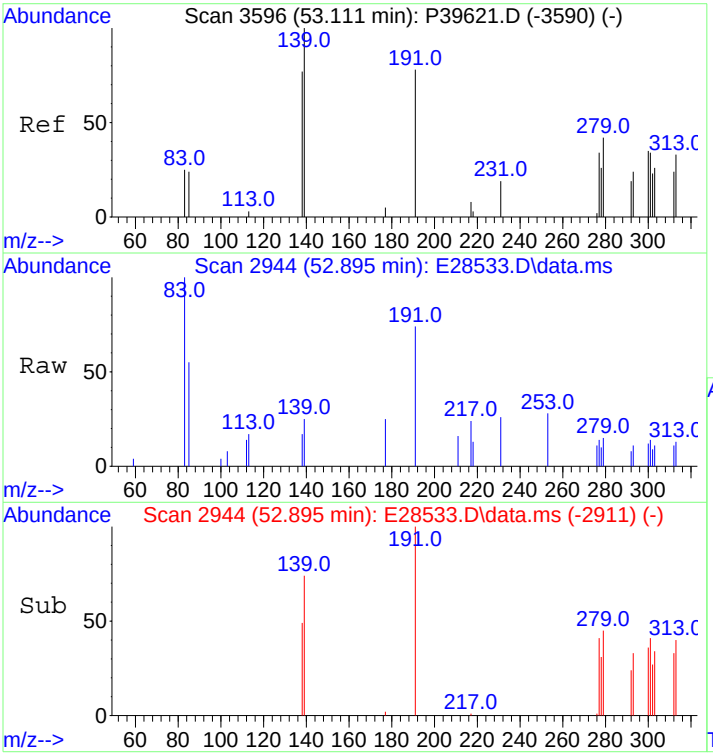




#115
30-Normoretane (T17)
Concen: 49.97 ng/ml
RT: 51.615 min Scan# 2859
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

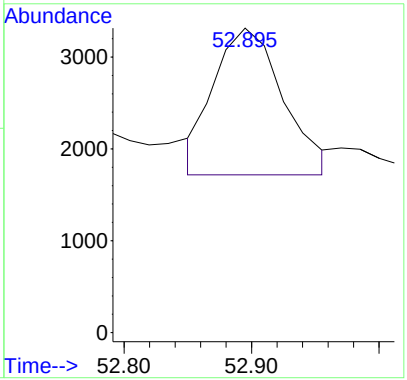
Tgt Ion:191 Resp: 3970

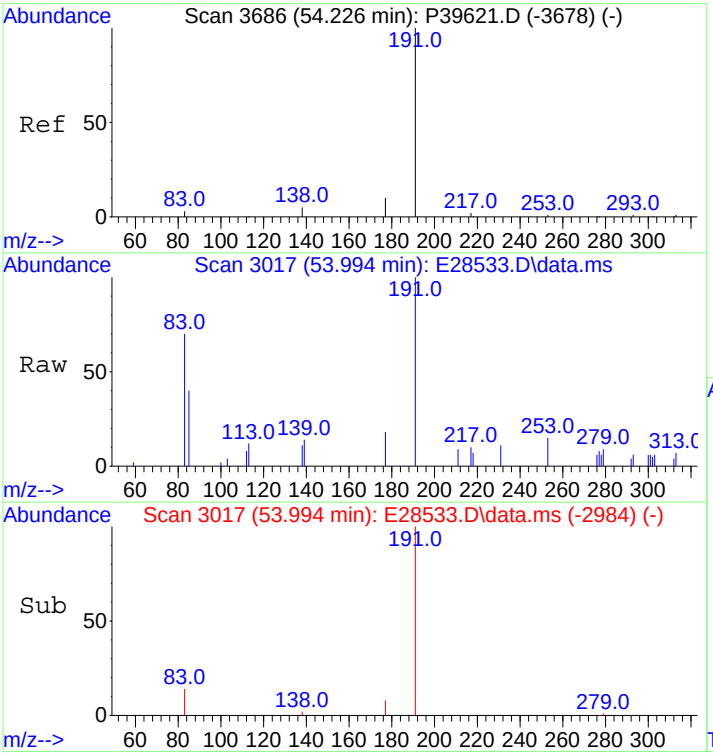




#117
Moretane (T20)
Concen: 75.78 ng/ml m
RT: 52.895 min Scan# 2944
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

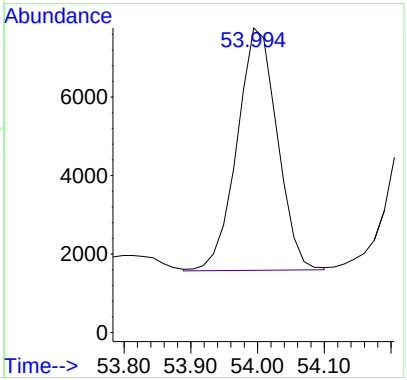
Tgt Ion:191 Resp: 6020

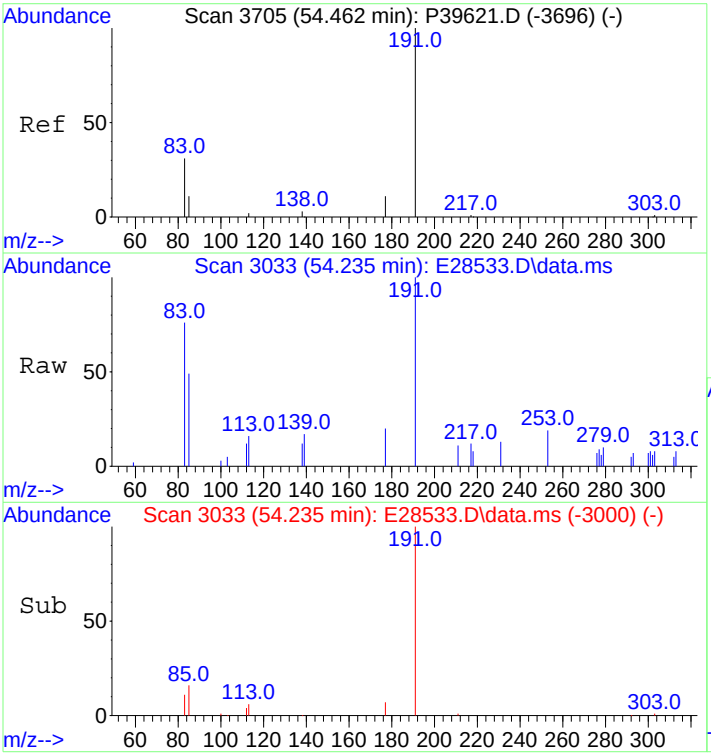




#118
30-Homohopane-22S (T21)
Concen: 325.22 ng/ml
RT: 53.994 min Scan# 3017
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

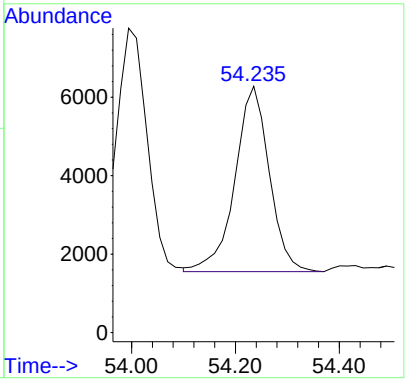
Tgt Ion:191 Resp: 25836

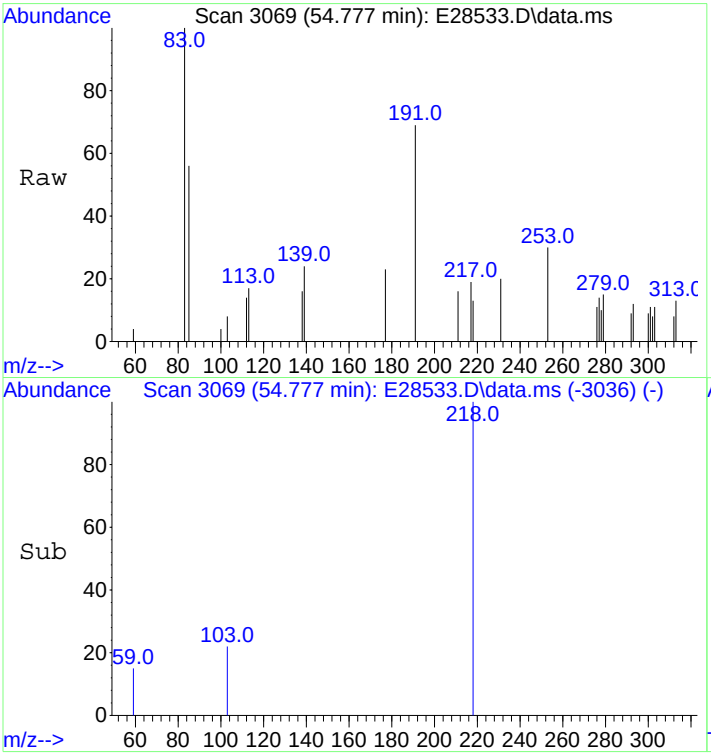




#119
30-Homohopane-22R (T22)
Concen: 274.43 ng/ml
RT: 54.235 min Scan# 3033
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

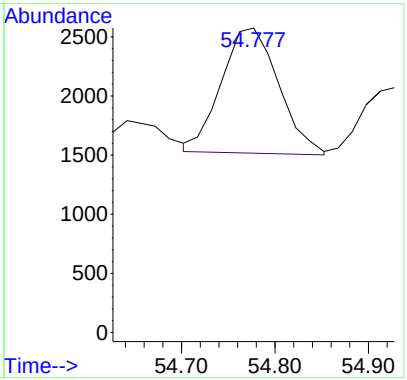
Tgt Ion:191 Resp: 21801

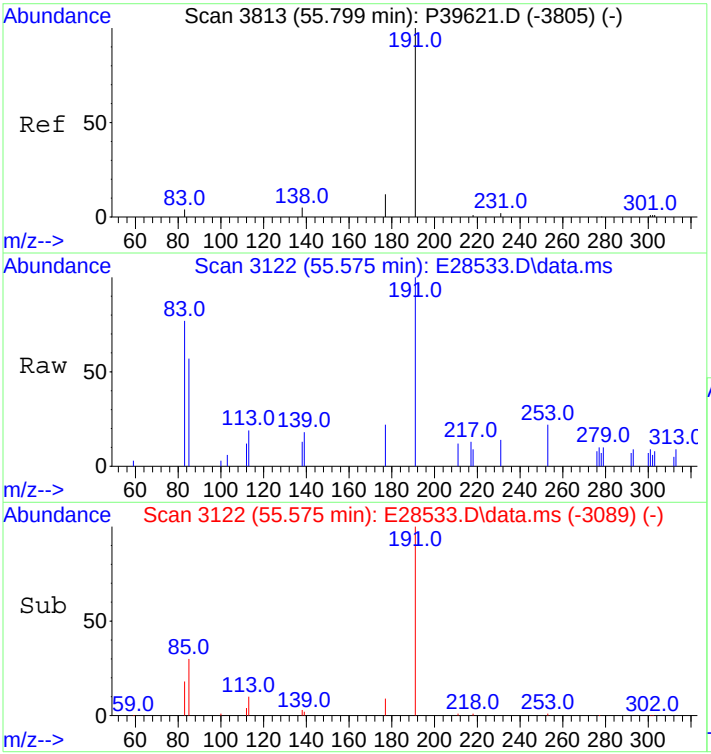




#120
Gammacerane/C32-diahopane
Concen: 56.63 ng/mL
RT: 54.777 min Scan# 3069
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

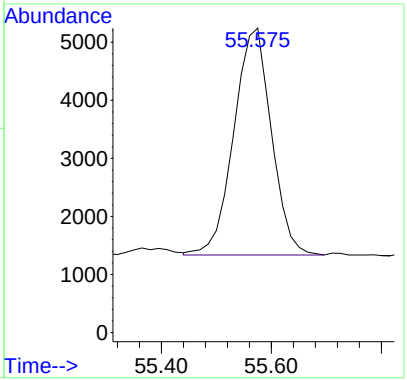
Tgt Ion:191 Resp: 4499

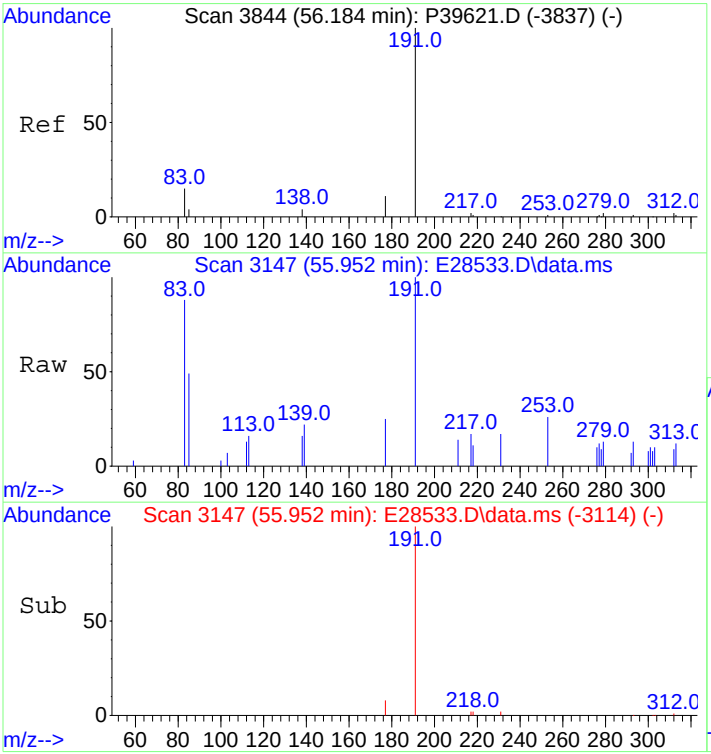




#121
30,31-Bishomohopane-22S (T26)
Concen: 233.87 ng/ml
RT: 55.575 min Scan# 3122
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

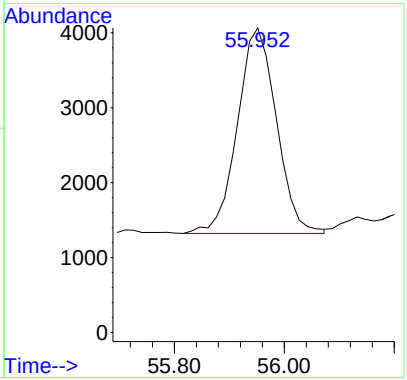
Tgt Ion:191 Resp: 18579

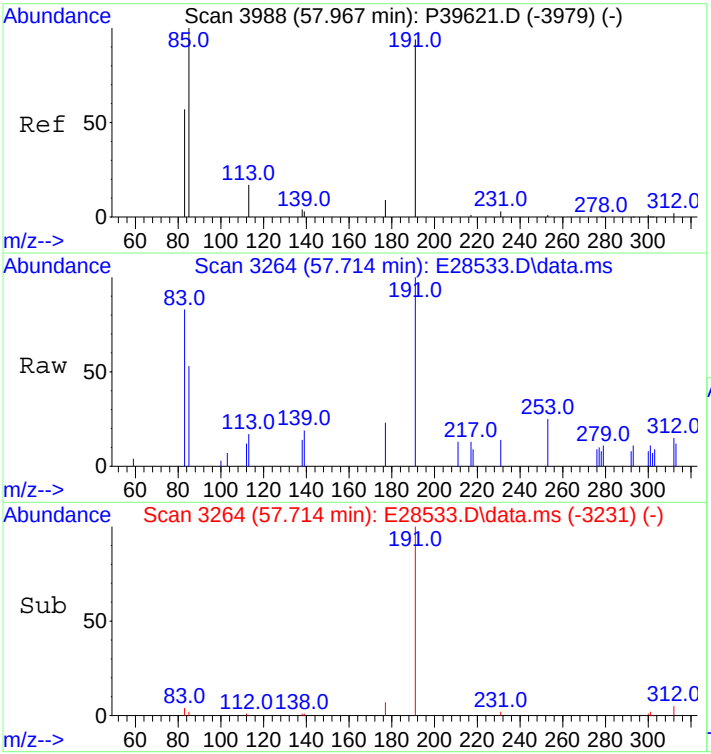




#122
30,31-Bishomohopane-22R (T27)
Concen: 170.10 ng/ml
RT: 55.952 min Scan# 3147
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

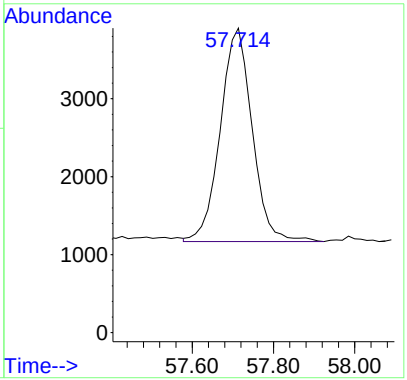
Tgt Ion:191 Resp: 13513

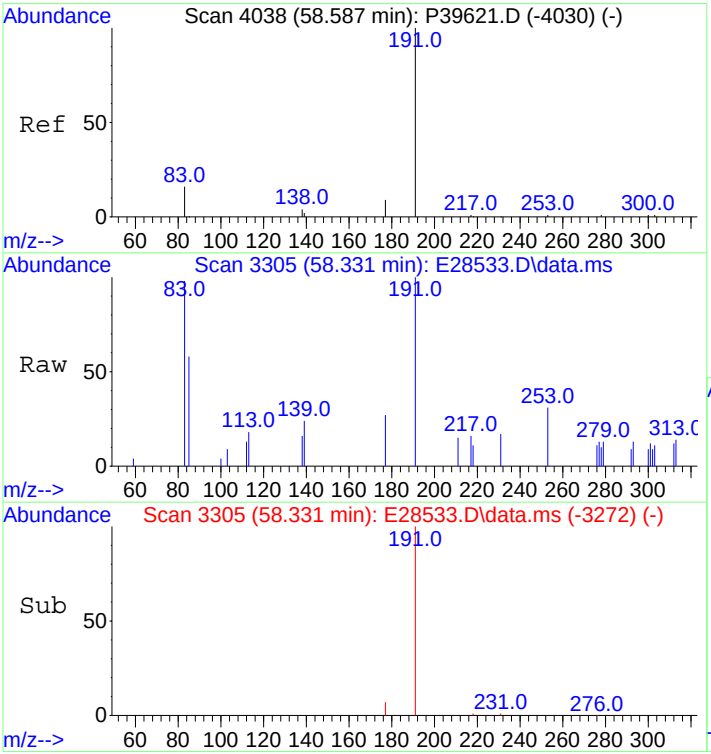




#123
30,31-Trishomohopane-22S (T30)
Concen: 187.64 ng/ml
RT: 57.714 min Scan# 3264
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

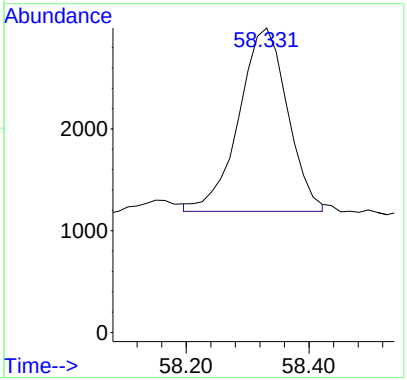
Tgt Ion:191 Resp: 14906

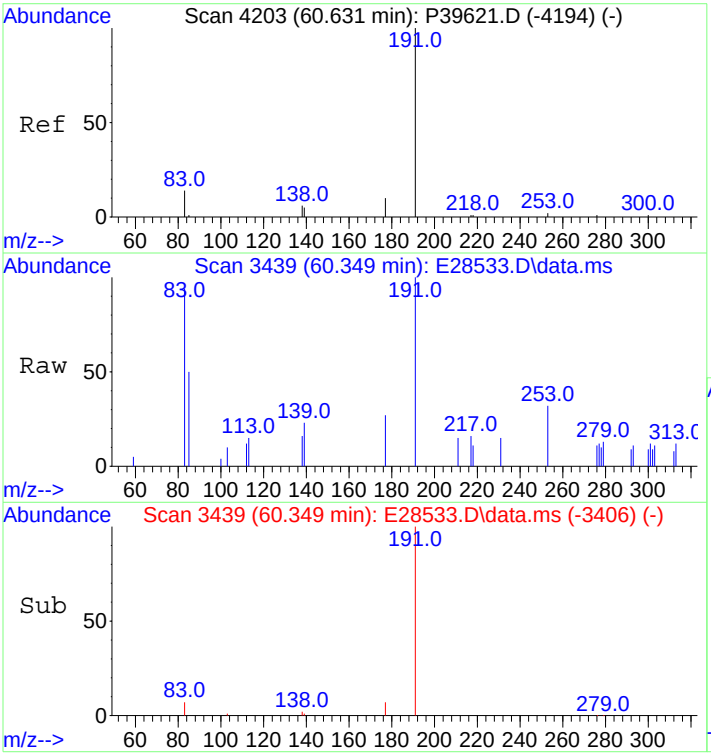




#124
30,31-Trishomohopane-22R (T31)
Concen: 124.57 ng/ml m
RT: 58.331 min Scan# 3305
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

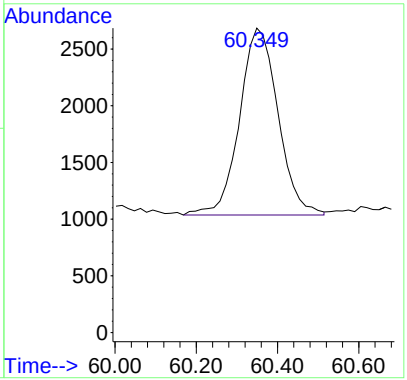
Tgt Ion:191 Resp: 9896

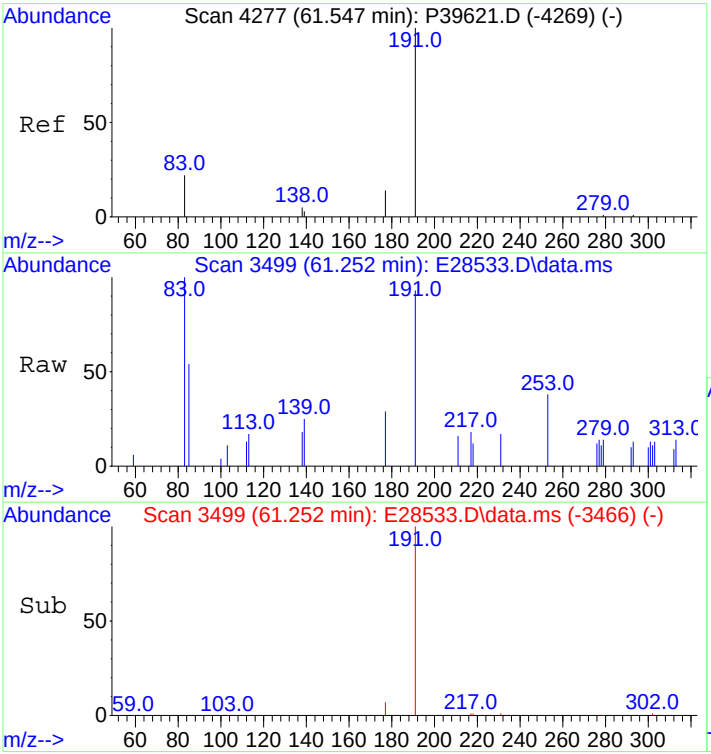




#125
Tetrakishomohopane-22S (T32)
Concen: 136.67 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

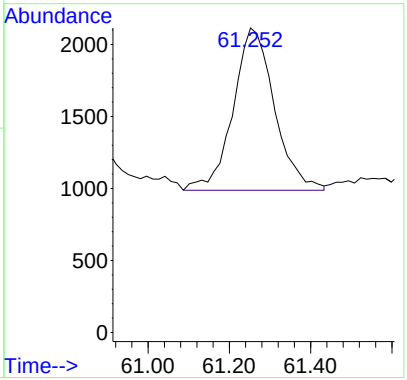
Tgt Ion:191 Resp: 10857

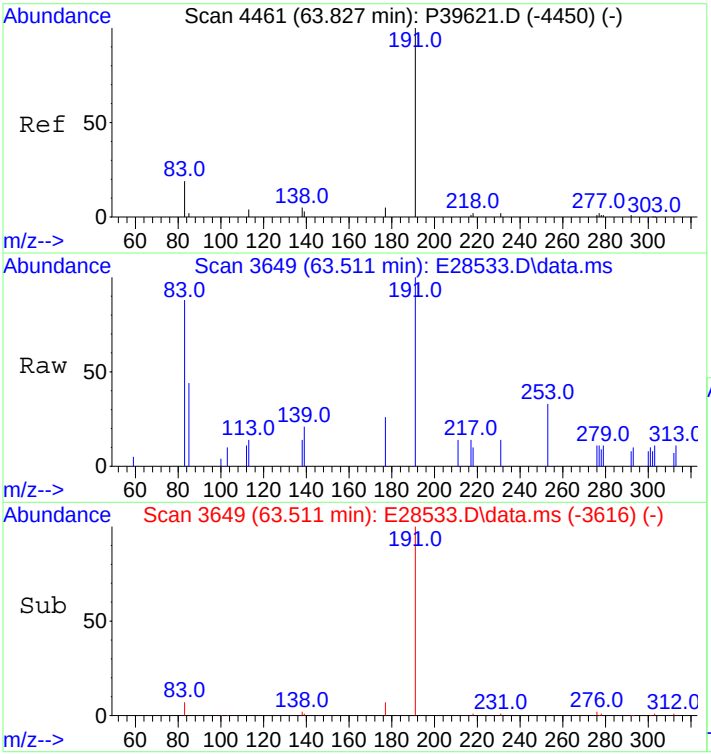




#126
Tetrakishomohopane-22R (T33)
Concen: 100.16 ng/ml
RT: 61.252 min Scan# 3499
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

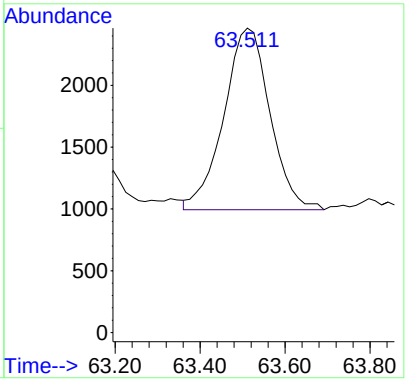
Tgt Ion:191 Resp: 7957

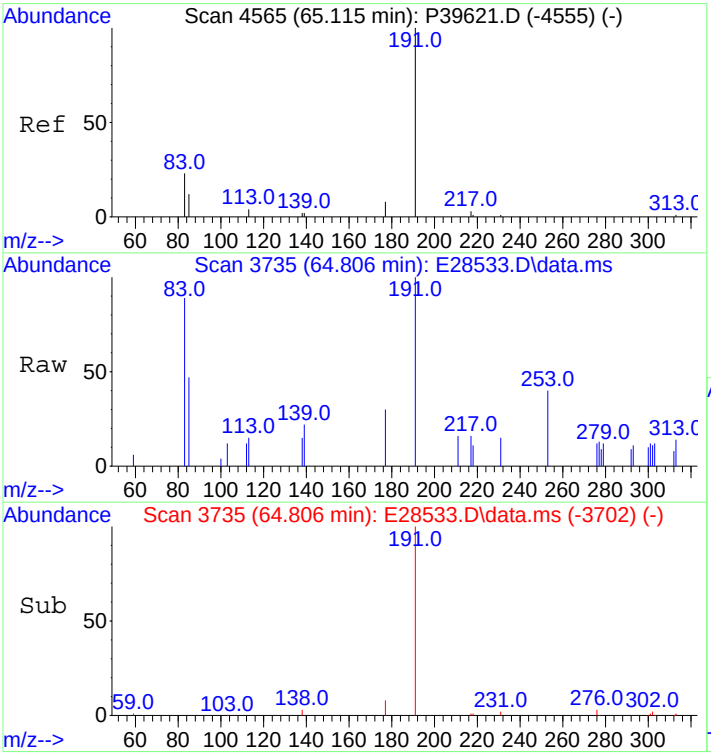




#127
Pentakishomohopane-22S (T34)
Concen: 139.85 ng/ml
RT: 63.511 min Scan# 3649
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

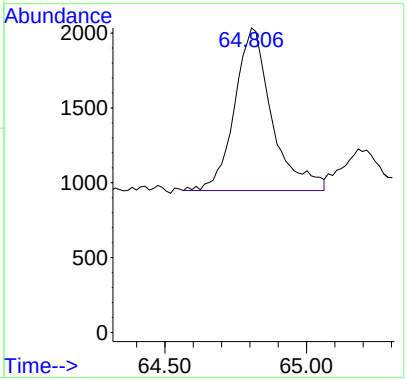
Tgt Ion:191 Resp: 11110

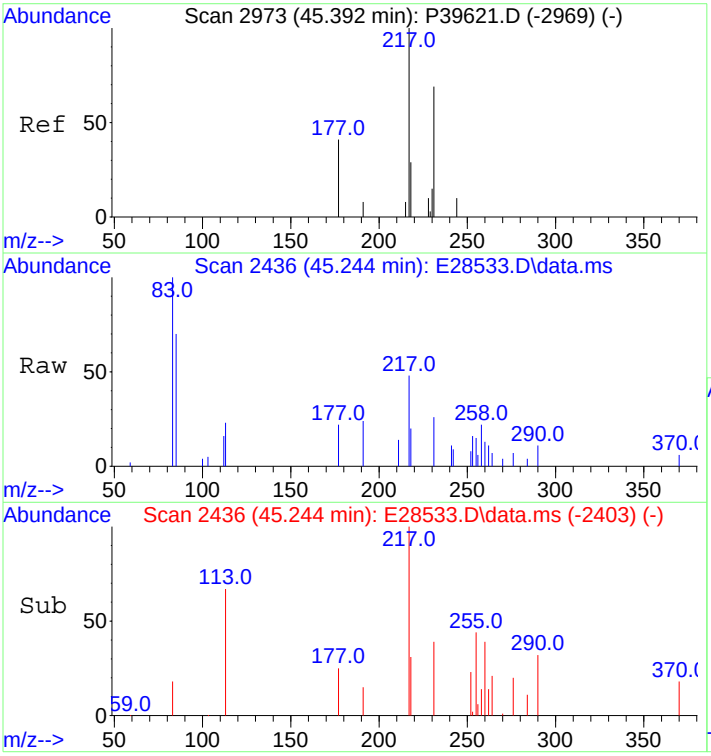




#128
Pentakishomohopane-22R (T35)
Concen: 125.44 ng/ml
RT: 64.806 min Scan# 3735
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

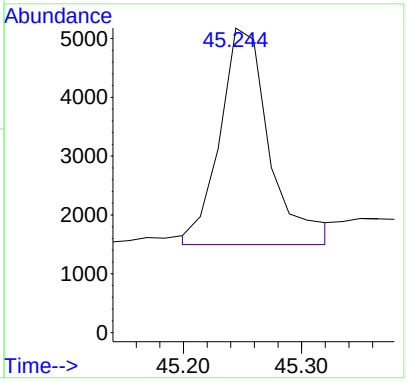
Tgt Ion:191 Resp: 9965

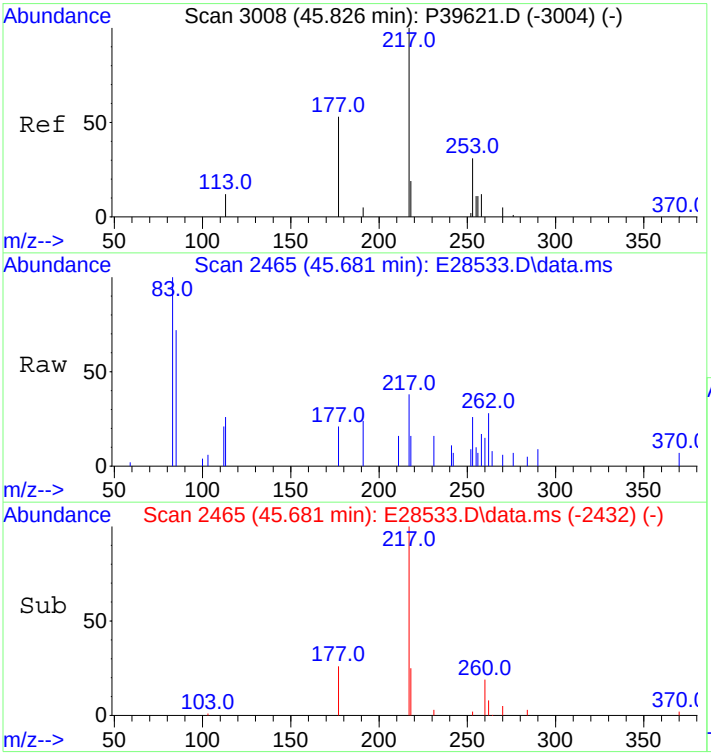




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 257.27 ng/ml m
RT: 45.244 min Scan# 2436
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

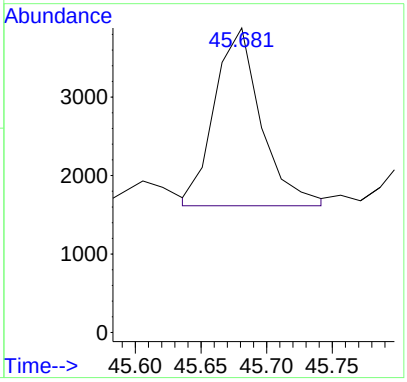
Tgt Ion:217 Resp: 10733

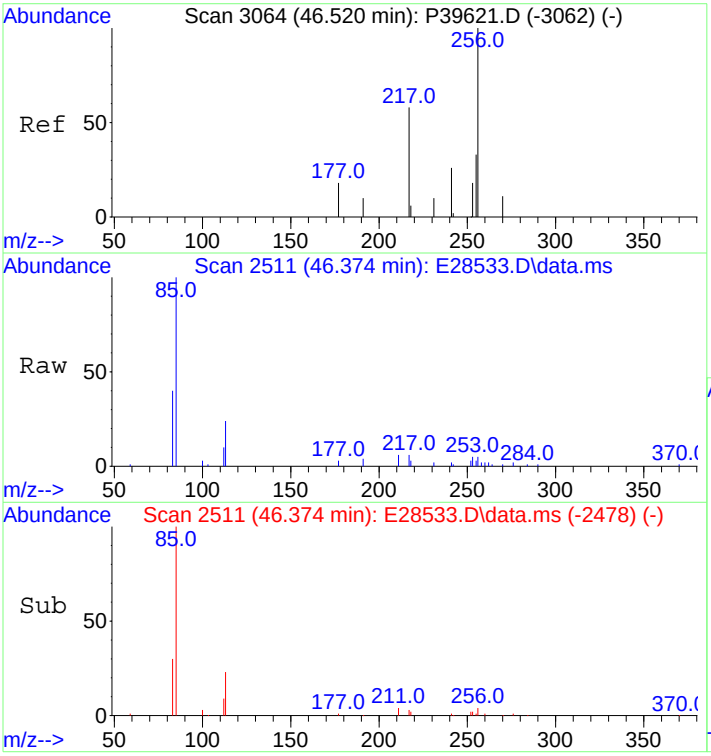




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 133.97 ng/ml m
RT: 45.681 min Scan# 2465
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

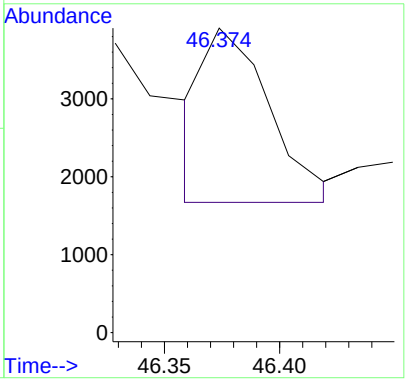
Tgt Ion:217 Resp: 5589

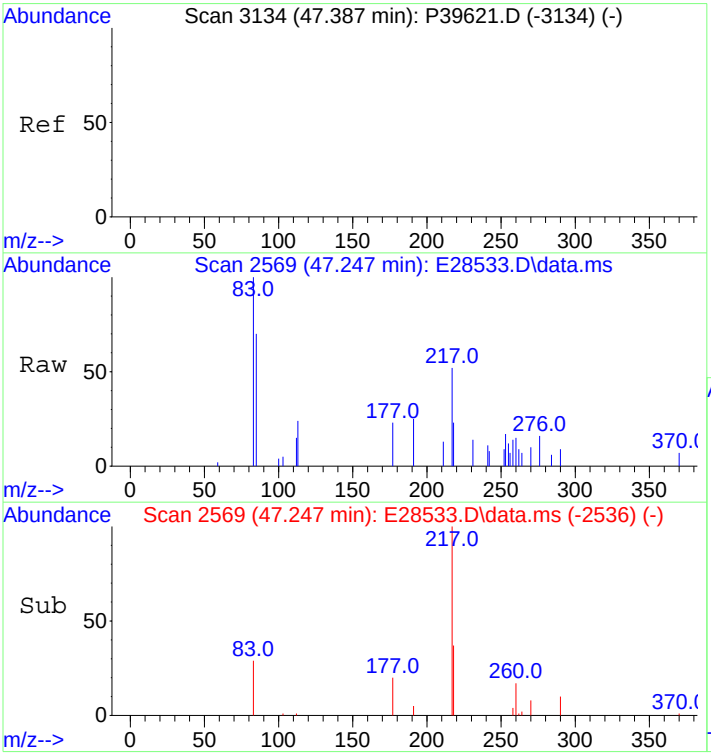




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 105.44 ng/ml m
RT: 46.374 min Scan# 2511
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

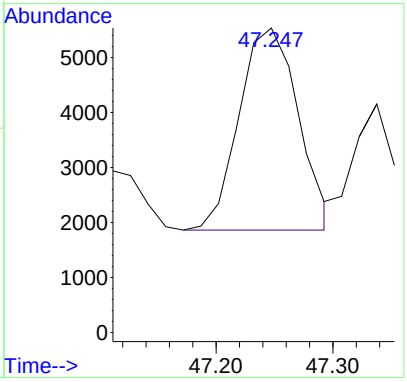
Tgt Ion:217 Resp: 4399

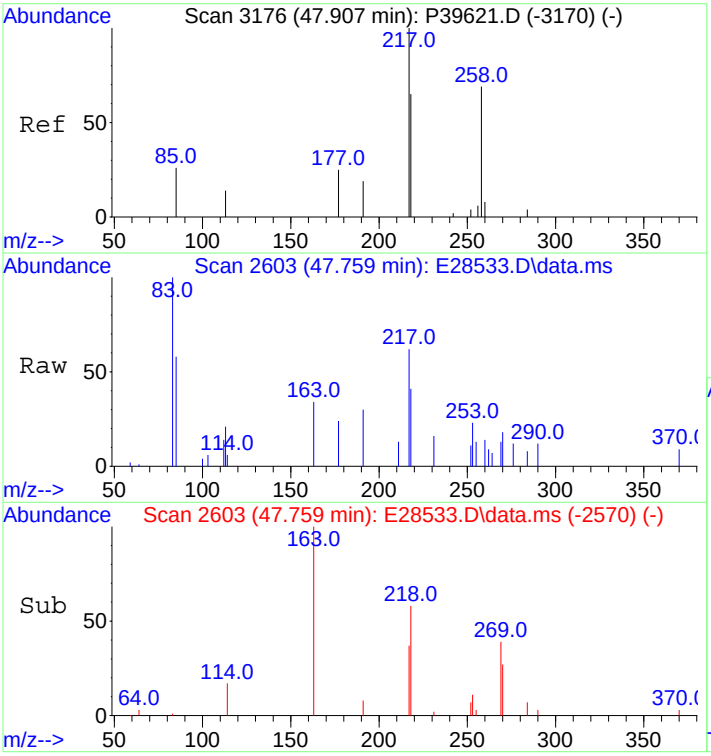




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 310.80 ng/ml
RT: 47.247 min Scan# 2569
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

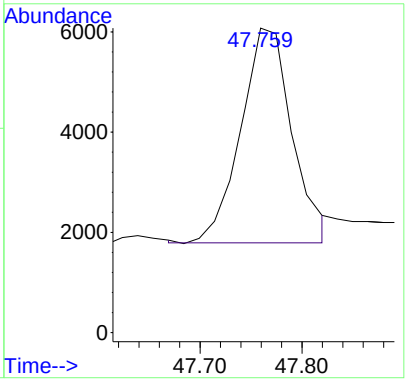
Tgt Ion:217 Resp: 12966

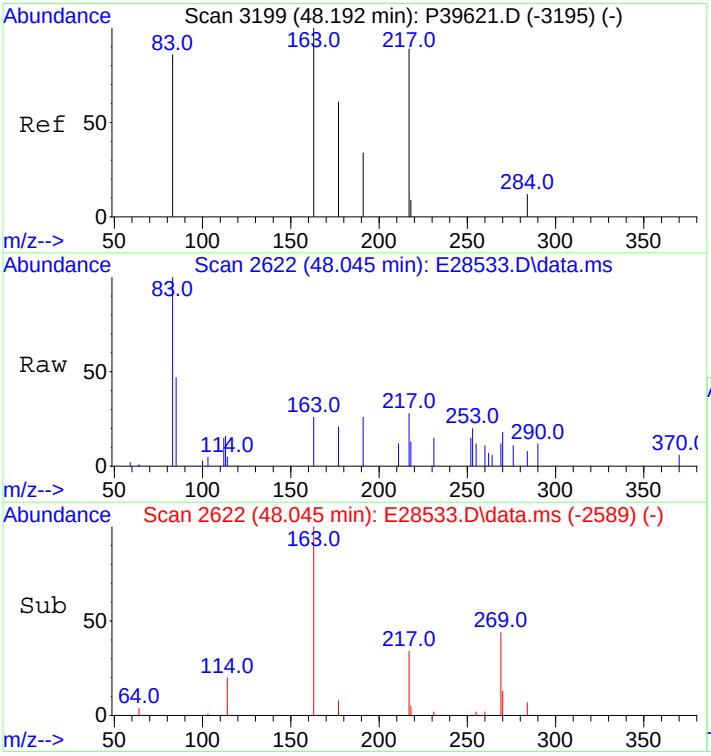




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 359.91 ng/ml m
RT: 47.759 min Scan# 2603
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

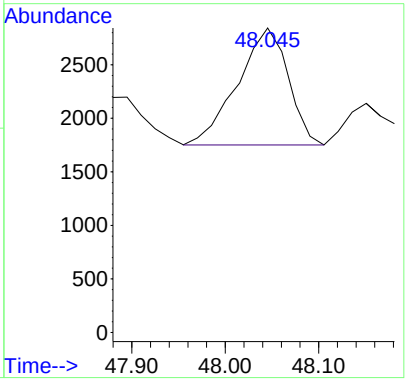
Tgt Ion:217 Resp: 15015

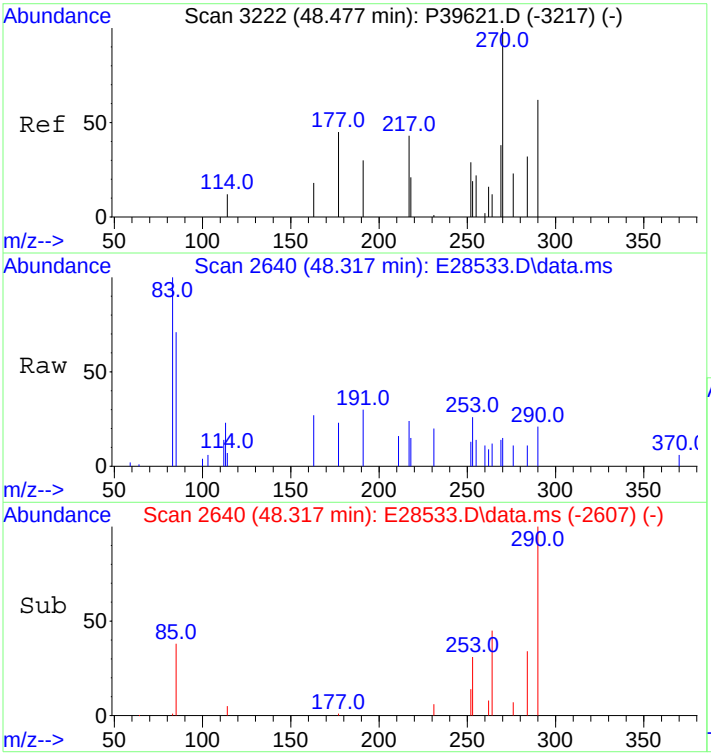




#135
Unknown Sterane (S18)
Concen: 98.85 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

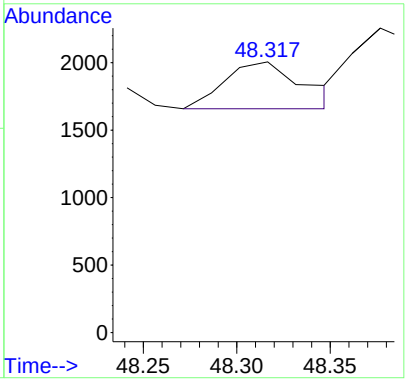
Tgt Ion:217 Resp: 4124

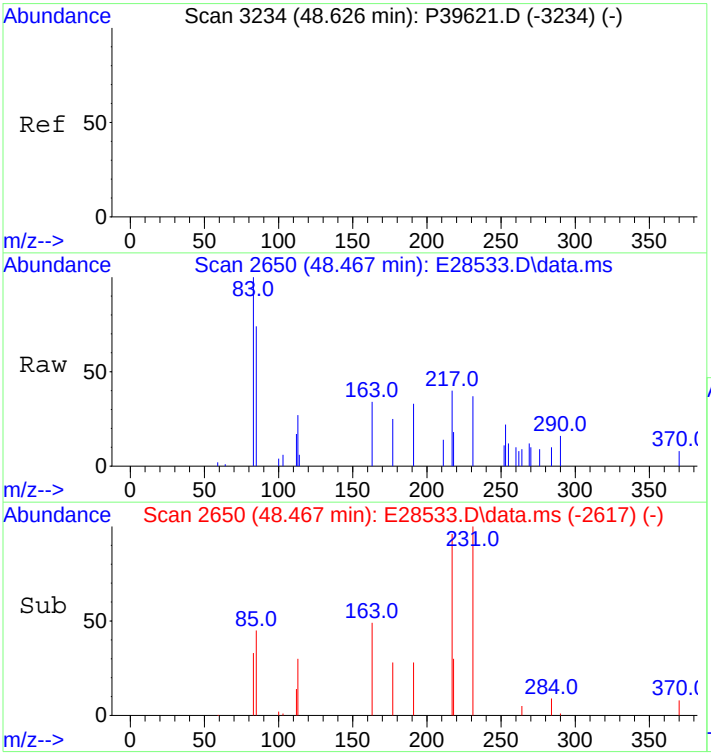




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 24.23 ng/ml
RT: 48.317 min Scan# 2640
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

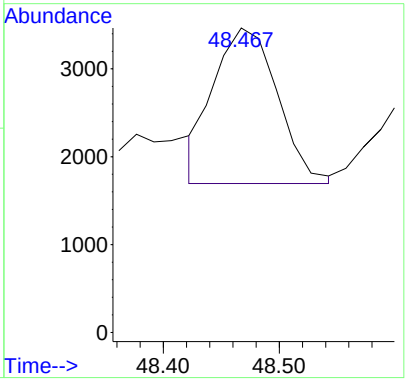
Tgt Ion:217 Resp: 1011

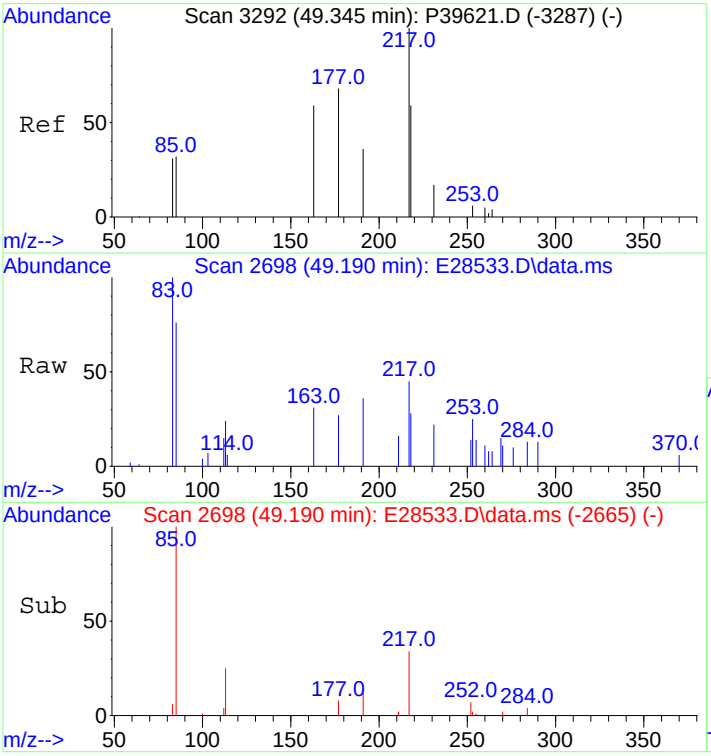




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 162.18 ng/ml m
RT: 48.467 min Scan# 2650
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

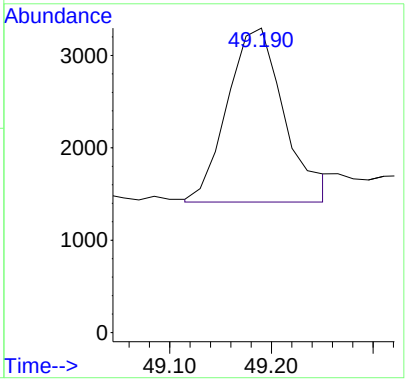
Tgt Ion:217 Resp: 6766

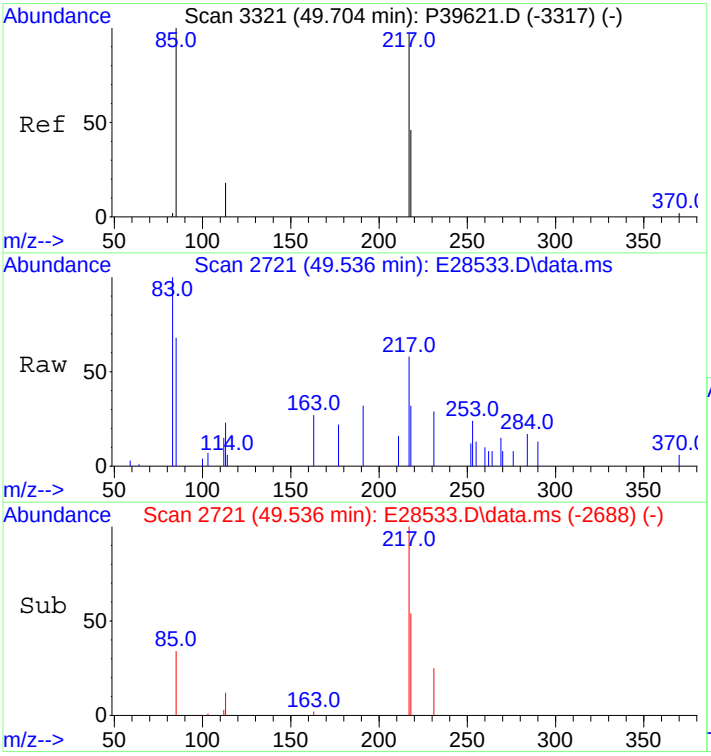




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 175.80 ng/ml m
RT: 49.190 min Scan# 2698
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

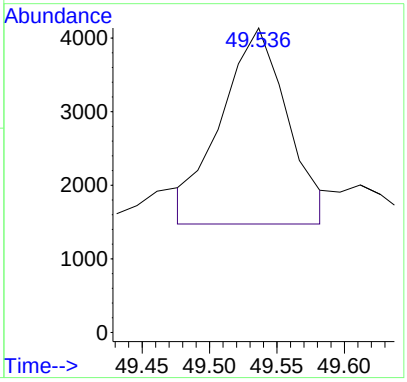
Tgt Ion:217 Resp: 7334

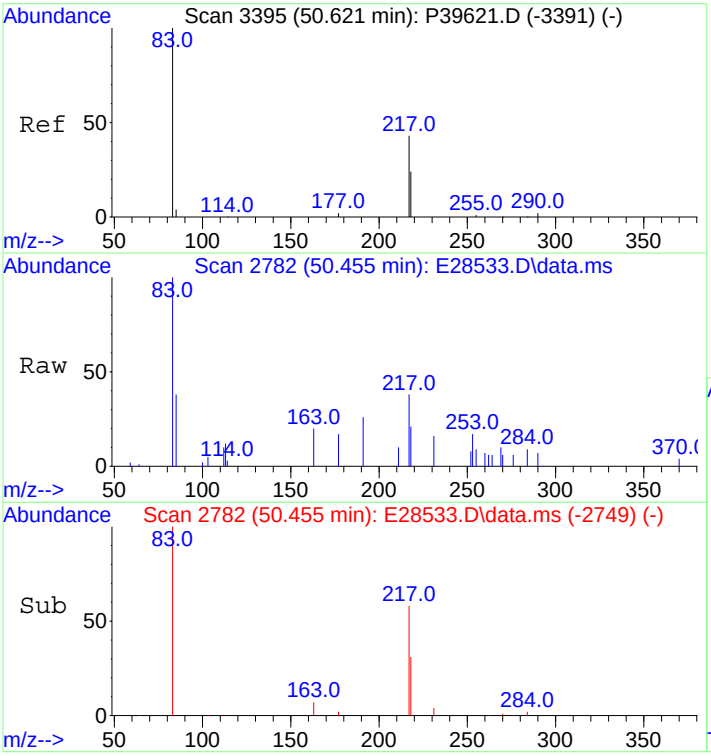




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 218.20 ng/ml m
RT: 49.536 min Scan# 2721
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

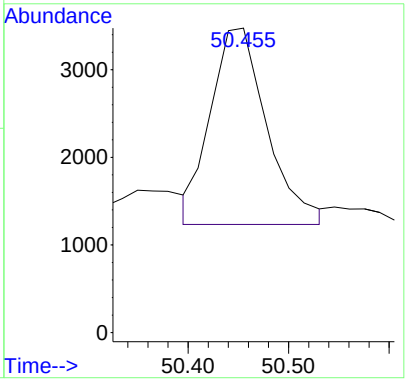
Tgt Ion:217 Resp: 9103

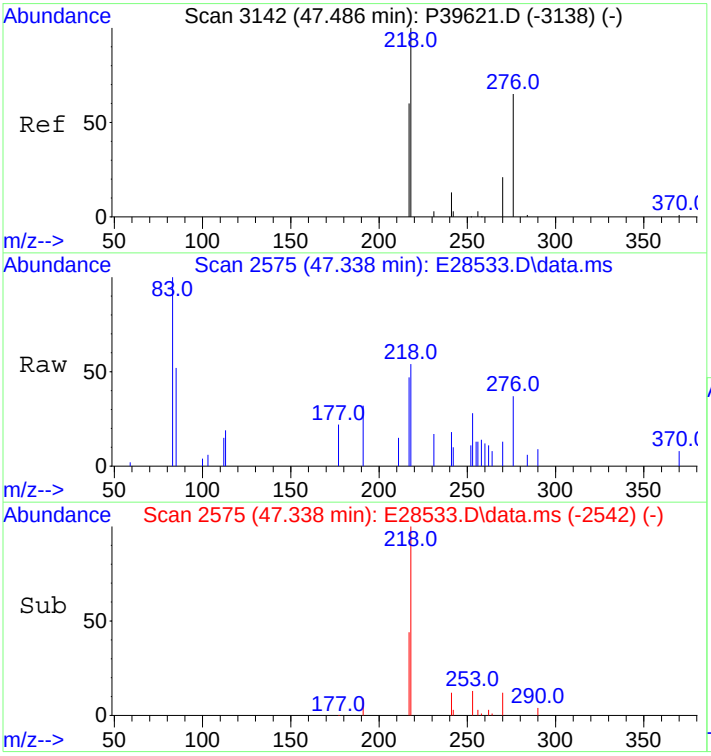




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 209.35 ng/ml m
RT: 50.455 min Scan# 2782
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

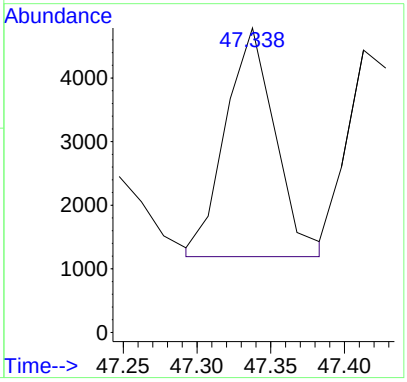
Tgt Ion:217 Resp: 8734

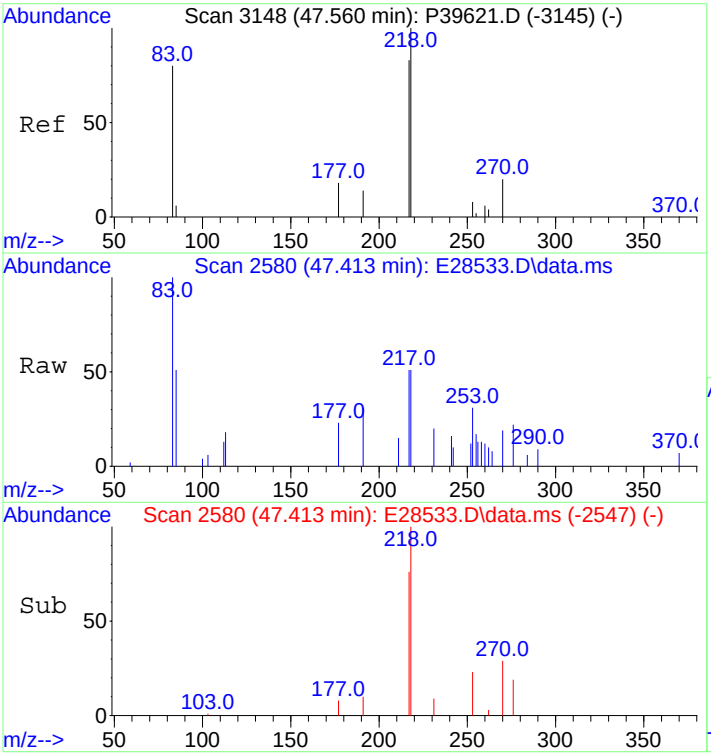




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 202.14 ng/ml m
RT: 47.338 min Scan# 2575
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

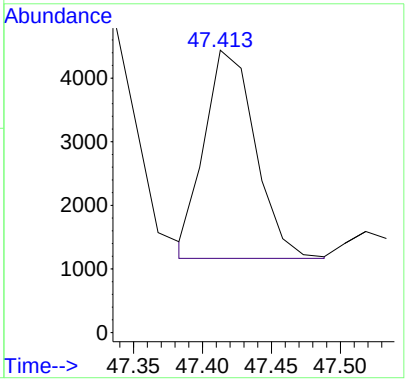
Tgt Ion:218 Resp: 8433

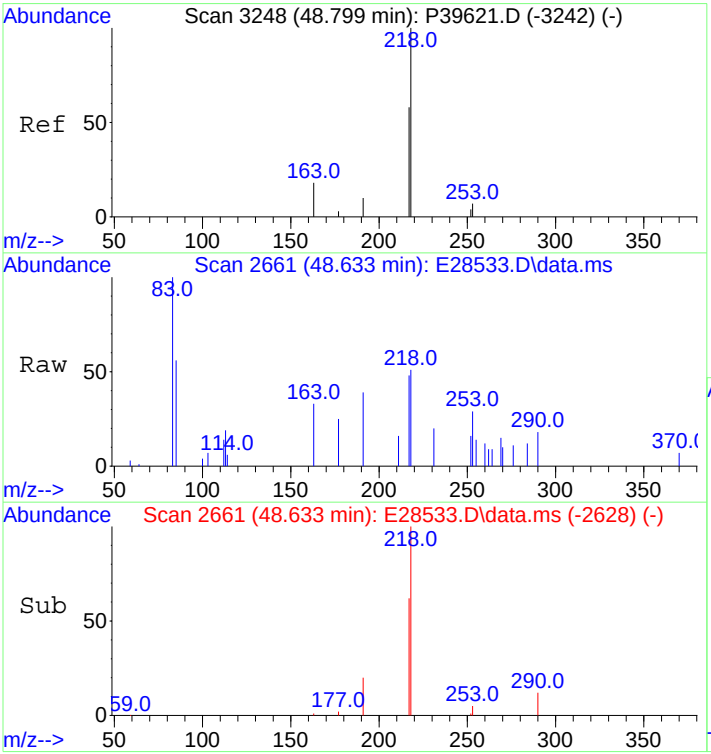




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 201.64 ng/ml m
RT: 47.413 min Scan# 2580
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

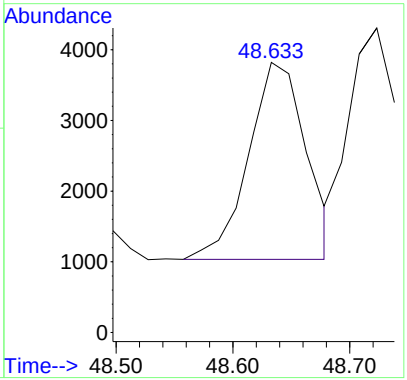
Tgt Ion:218 Resp: 8412

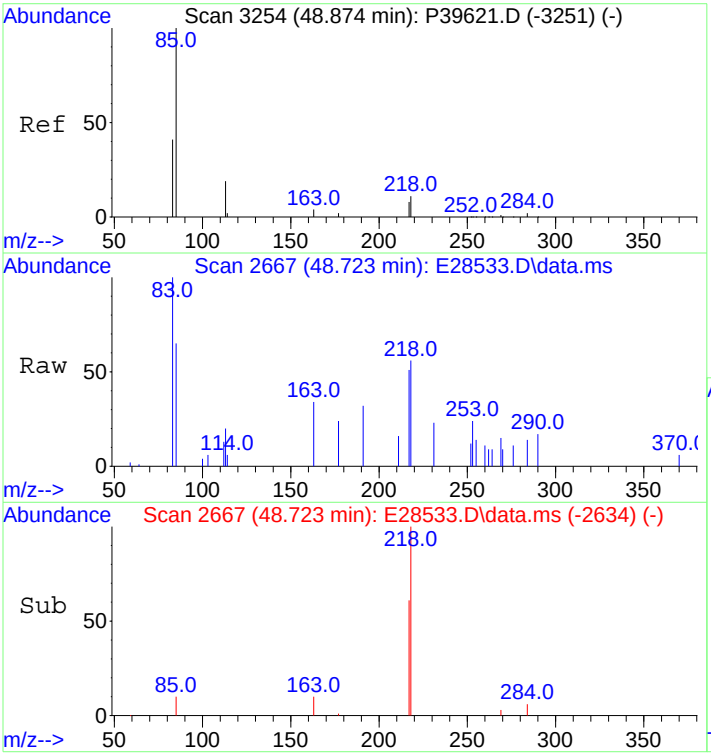




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 229.51 ng/ml
RT: 48.633 min Scan# 2661
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

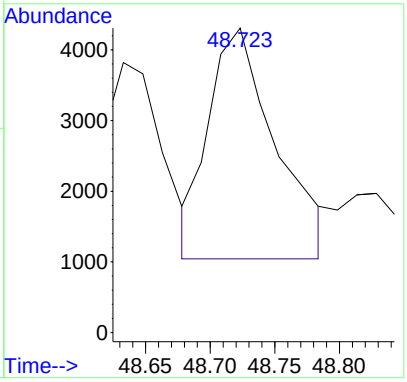
Tgt Ion:218 Resp: 9575

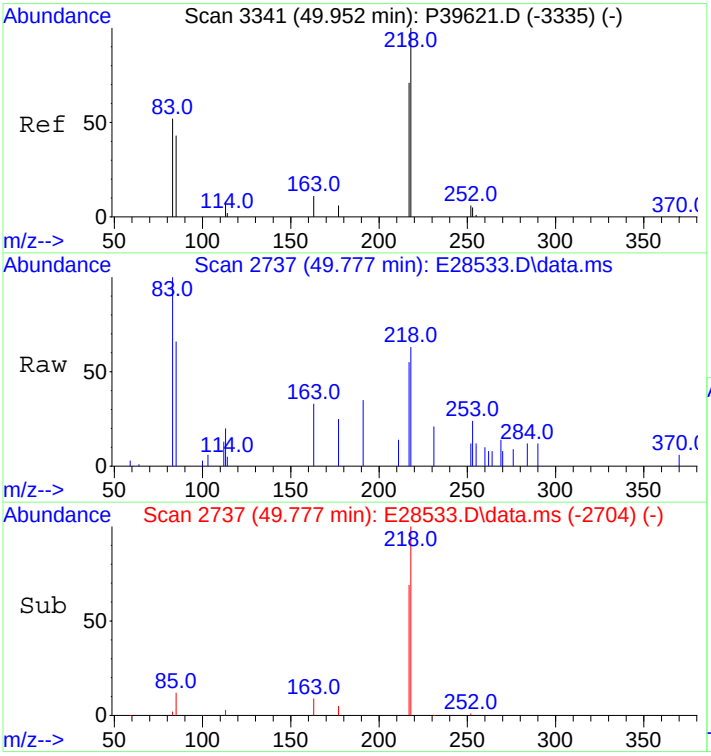




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 282.08 ng/ml m
RT: 48.723 min Scan# 2667
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

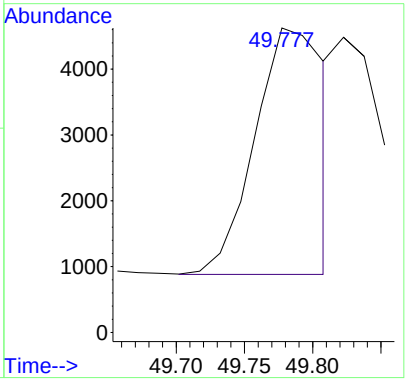
Tgt Ion:218 Resp: 11768

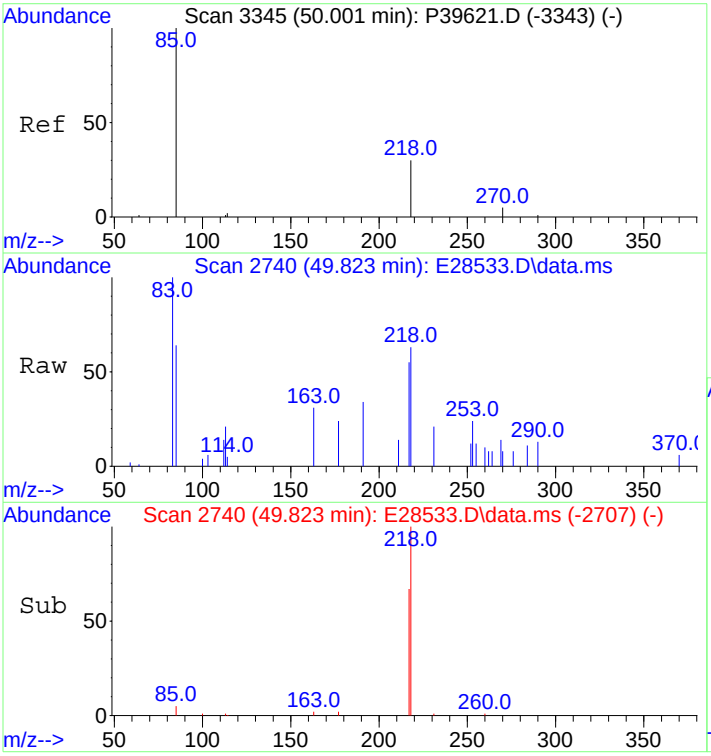




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 317.12 ng/ml m
RT: 49.777 min Scan# 2737
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

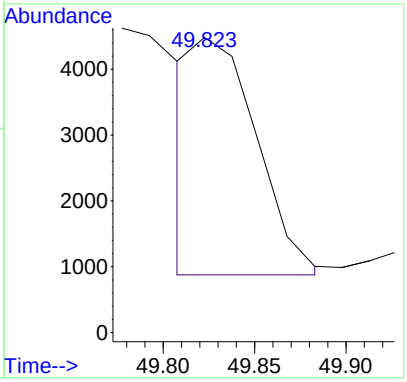
Tgt Ion:218 Resp: 13230

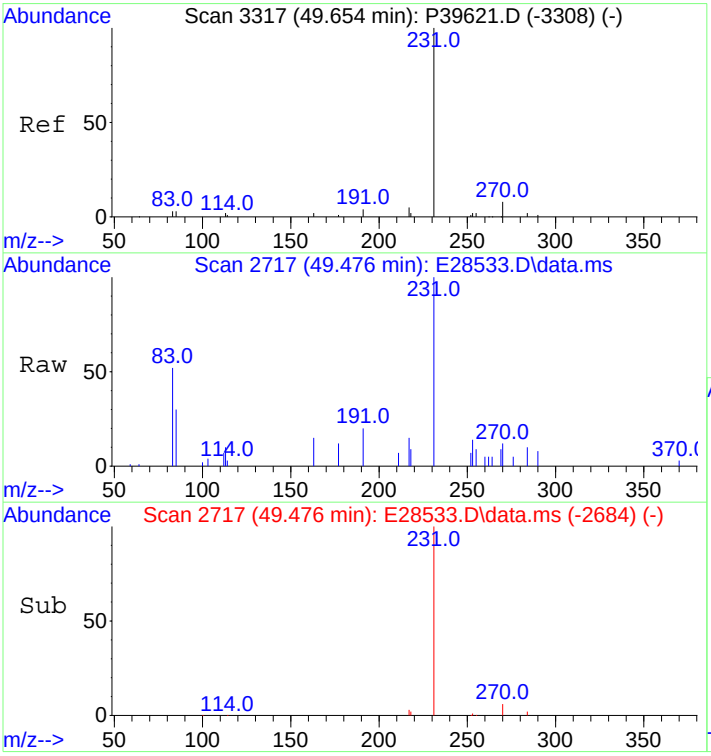




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 208.01 ng/ml m
RT: 49.823 min Scan# 2740
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

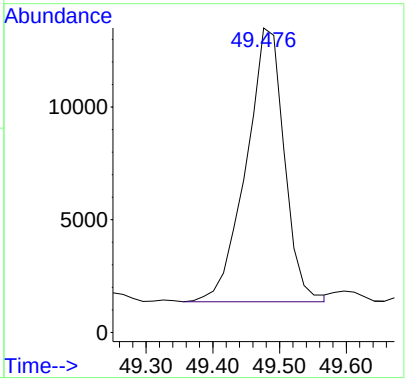
Tgt Ion:218 Resp: 8678

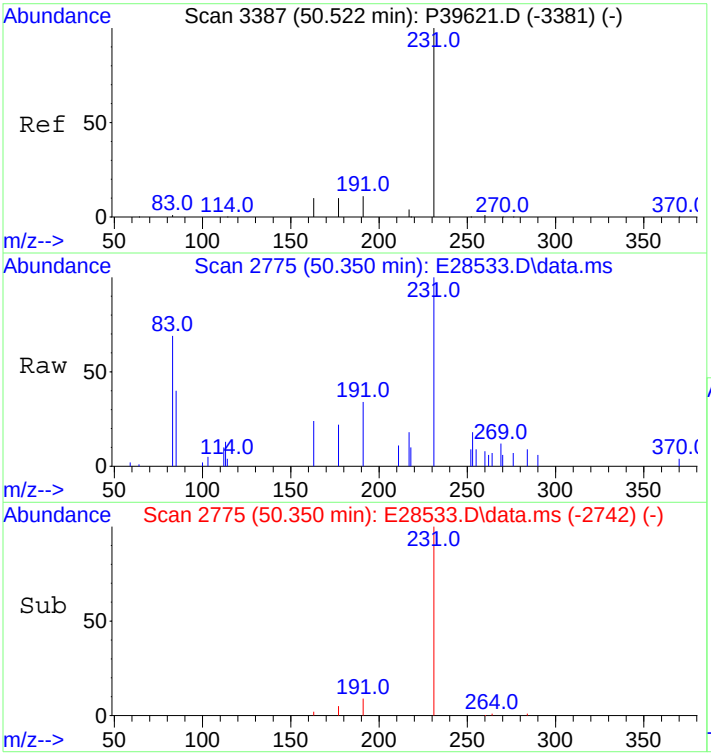




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1154.71 ng/mL
RT: 49.476 min Scan# 2717
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

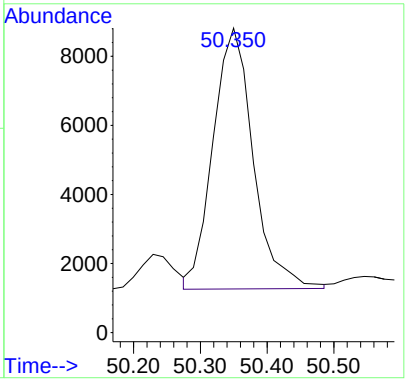
Tgt Ion:231 Resp: 48173

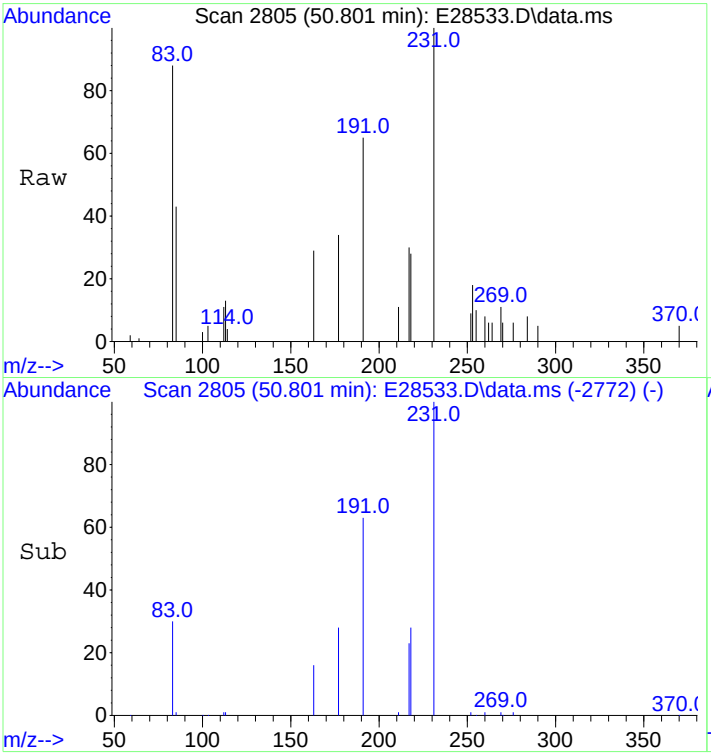




#148
C28,20S-triaromatic steroid
Concen: 758.46 ng/mL
RT: 50.350 min Scan# 2775
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

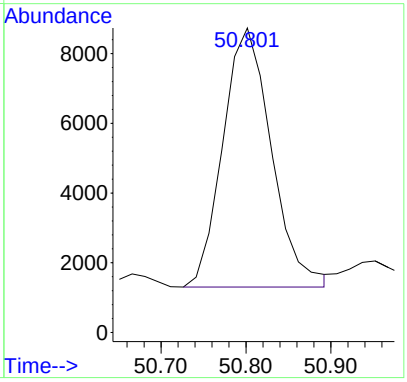
Tgt Ion:231 Resp: 31642

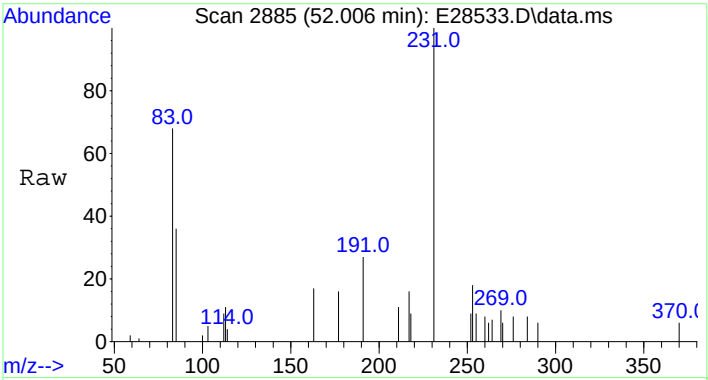




#149
C27,20R-triaromatic steroid
Concen: 709.44 ng/mL
RT: 50.801 min Scan# 2805
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

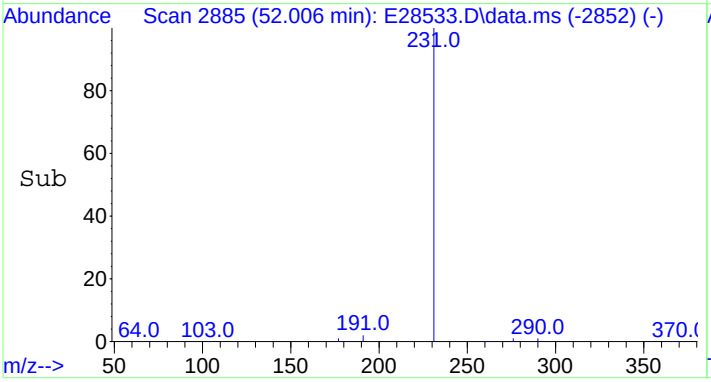
Tgt Ion:231 Resp: 29597

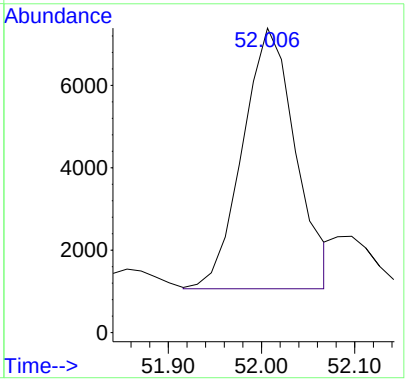




#150
C28,20R-triaromatic steroid
Concen: 602.03 ng/mL m
RT: 52.006 min Scan# 2885
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:231 Resp: 25116





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

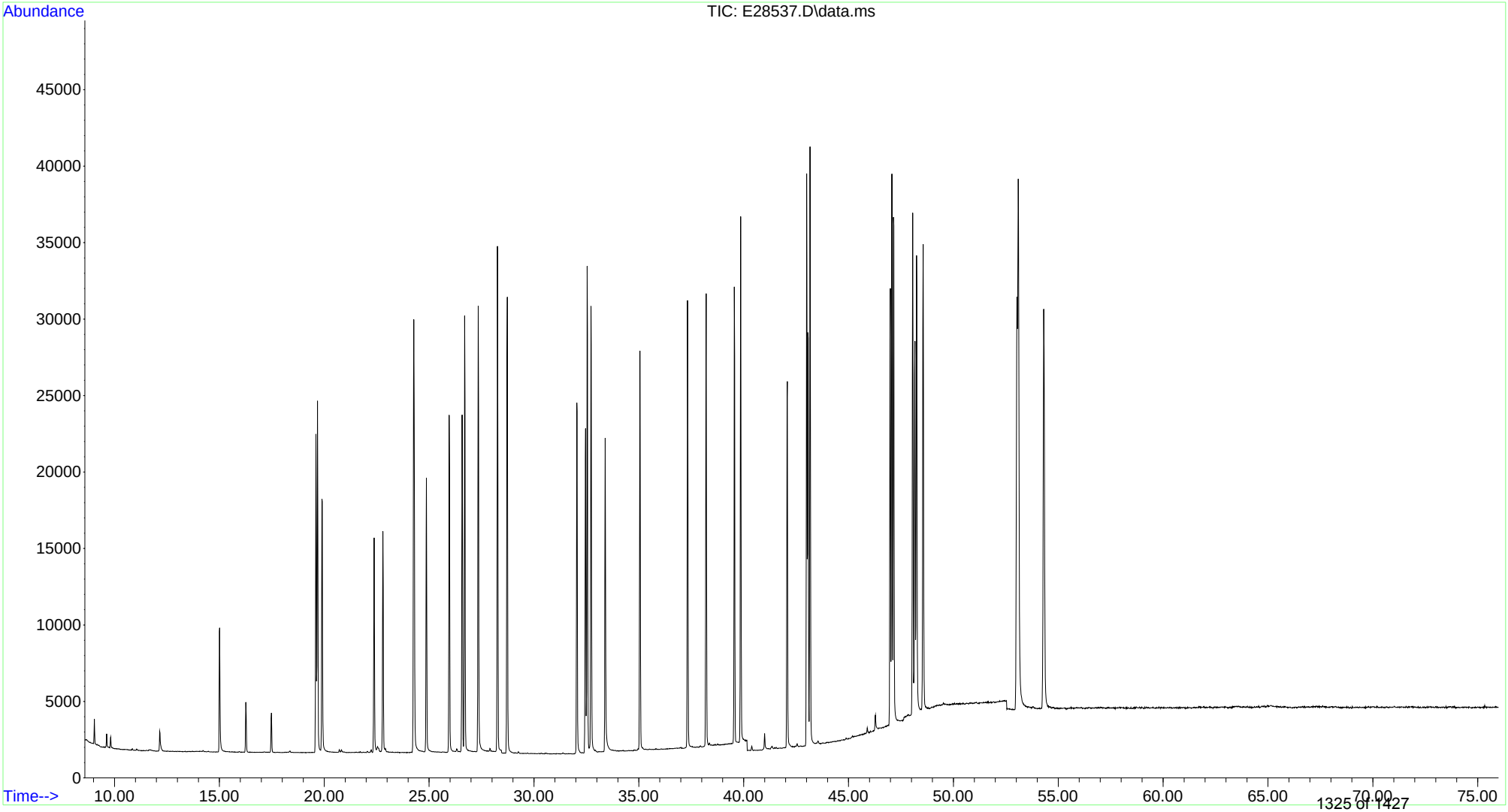
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	27127M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	56880	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	46123	483.384	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.34%#			
42) Phenanthrene-d10	32.462	188	46524	475.913	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.59%#			
83) Benzo[b]fluoranthene-d12	46.991	264	57405	491.292	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.13%#			
88) Benzo[a]pyrene-d12	48.166	264	56528	499.294	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.93%#			
129) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	5245	241.715	ng/mL	100
4) cis-Decalin	17.483	138	4006	242.994	ng/mL	100
10) Naphthalene	19.681	128	53569	502.030	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	32688	480.979	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	33765	511.305	ng/mL#	100
18) Benzothiophene	19.906	134	44511	504.592	ng/mL	100
23) Biphenyl	24.257	154	43356	504.773	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	30856	503.707	ng/mL#	100
25) Dibenzofuran	27.343	168	47975	504.511	ng/mL	96
26) Acenaphthylene	25.958	152	53359M3	501.567	ng/mL	
27) Acenaphthene	26.696	153	33896	494.986	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.262	170	28417	495.826	ng/mL	96
29) Fluorene	28.728	166	38522	504.380	ng/mL	100
33) Dibenzothiophene	32.055	184	52969	505.392	ng/mL#	95
43) Phenanthrene	32.537	178	53667	503.299	ng/mL	99
54) Retene	39.568	234	18816	548.371	ng/mL	91
55) Anthracene	32.718	178	53410M3	579.496	ng/mL	
56) Carbazole	33.395	167	48151	507.624	ng/mL	99
57) 1-Methylphenanthrene	35.051	192	40451	497.245	ng/mL	99
58) Fluoranthene	37.325	202	59089	501.787	ng/mL	100
59) Benzo(b)fluorene	39.854	216	38785	494.279	ng/mL	100
60) Pyrene	38.213	202	59885	500.333	ng/mL	98
66) Naphthobenzothiophene	42.082	234	59101	500.647	ng/ml#	96
67) Naphthobenzothiophene-...	42.082	234	59101	500.647	ng/mL#	96
75) Benz[a]anthracene	43.001	228	59298	535.360	ng/mL	100
76) Chrysene	43.166	228	59717	523.684	ng/mL	99
77) Chrysene/Triphenylene	43.166	228	59717	523.684	ng/mL	99
84) Benzo[b]fluoranthene	47.066	252	67639	525.377	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	69005	520.970	ng/mL	97
87) Benzo[e]pyrene	48.060	252	63965	508.835	ng/mL	98
89) Benzo[a]pyrene	48.241	252	64274	534.340	ng/mL	96
90) Perylene	48.557	252	67099	527.525	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.030	276	72058M3	509.020	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.091	278	80373	533.213	ng/mL	99
93) Benzo[g,h,i]perylene	54.310	276	79347	519.834	ng/mL	99

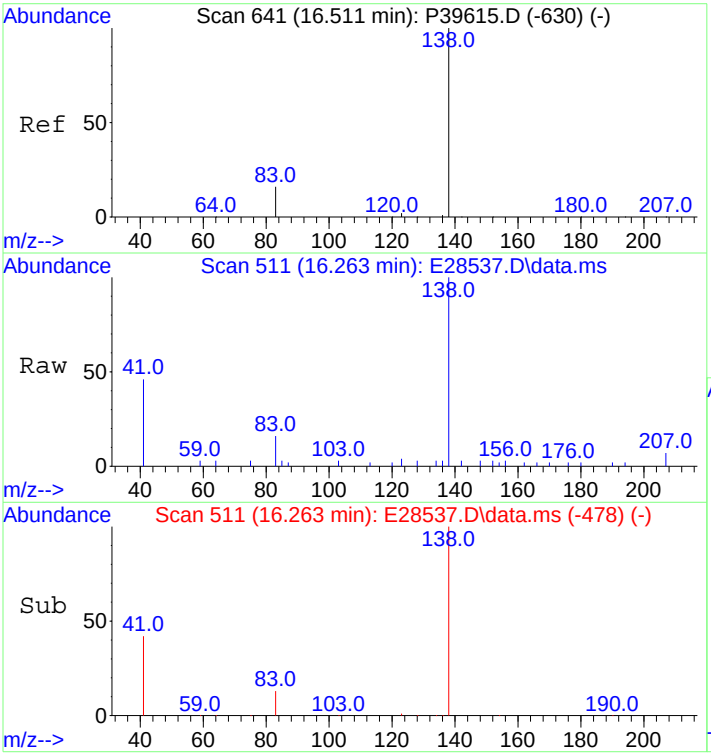
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

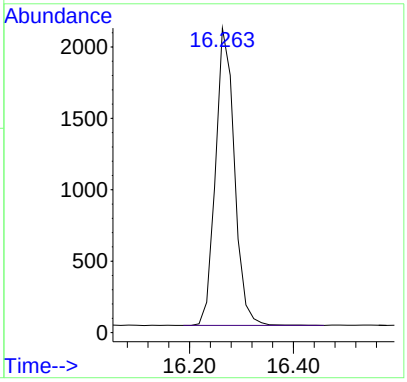
Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

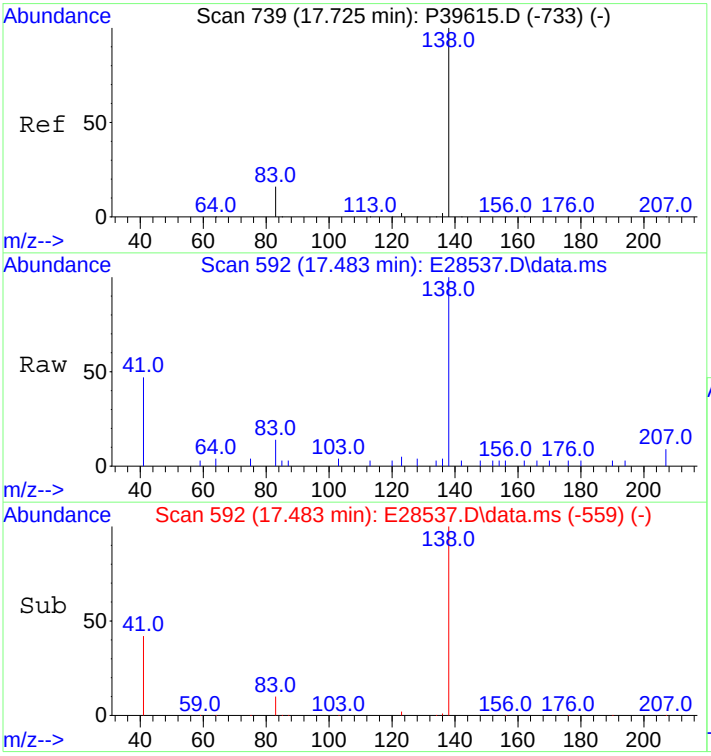




#3
trans-Decalin
Concen: 241.72 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

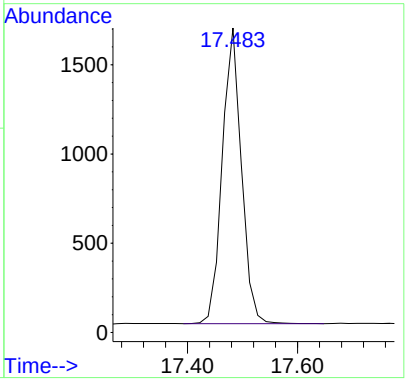
Tgt Ion:138 Resp: 5245

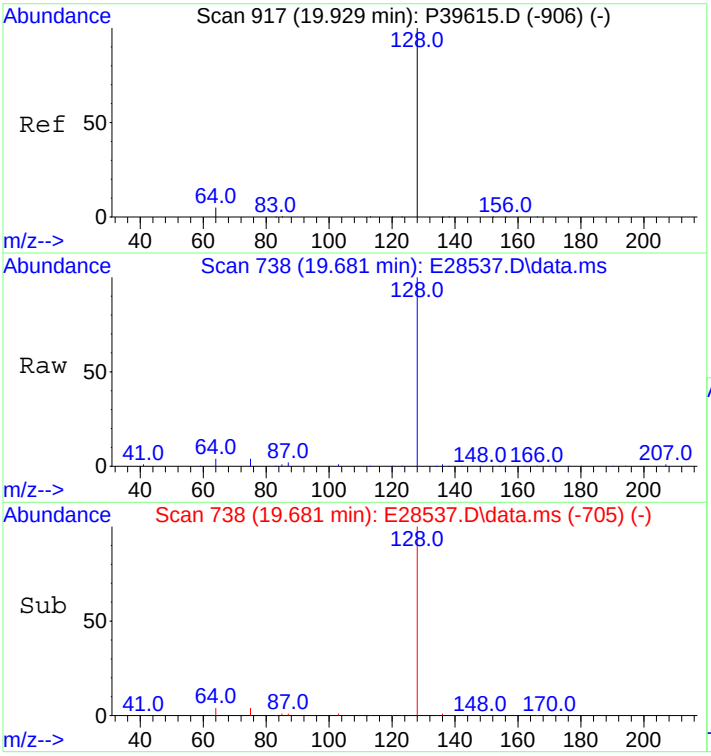




#4
cis-Decalin
Concen: 242.99 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:138 Resp: 4006

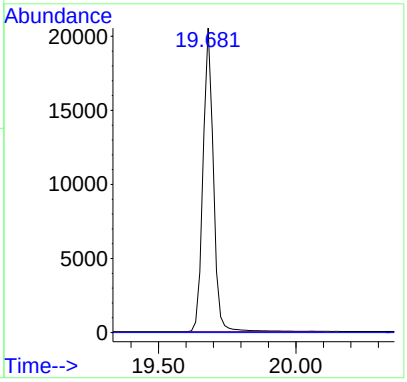


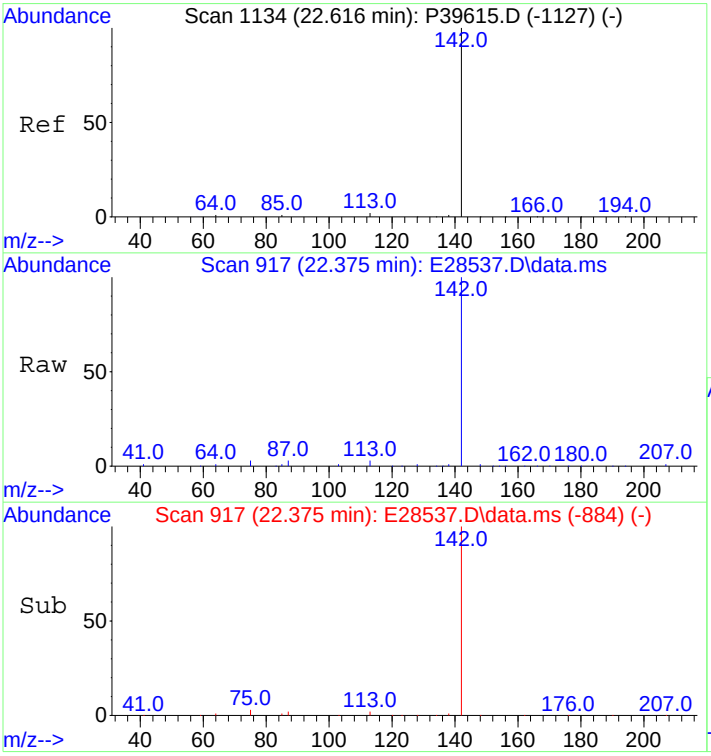


#10
Naphthalene
Concen: 502.03 ng/mL
RT: 19.681 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:128 Resp: 53569

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

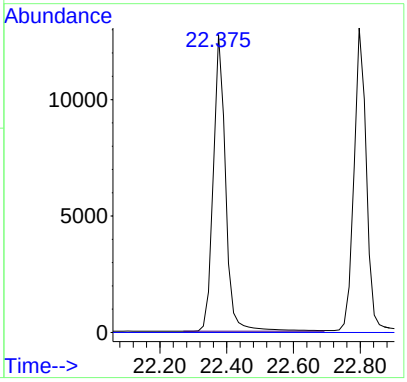


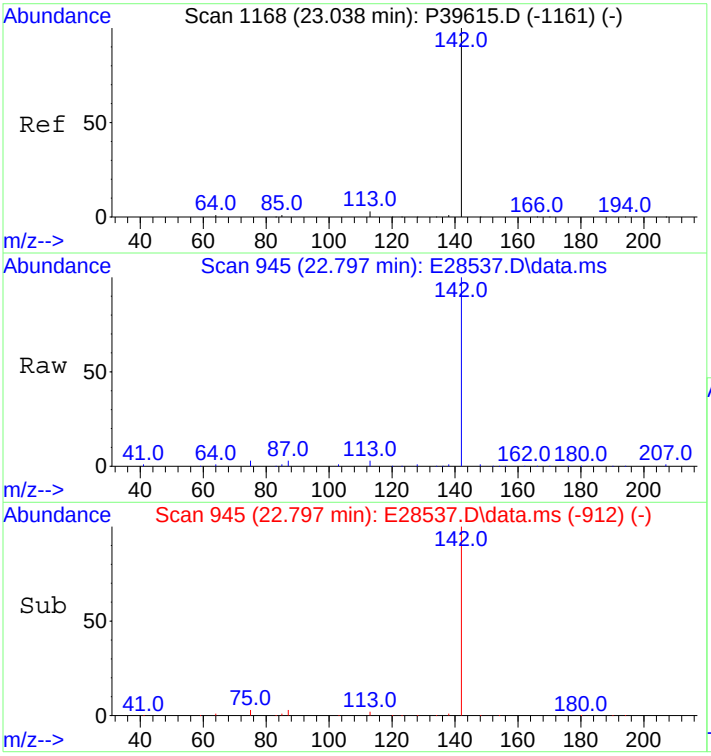


#16
2-Methylnaphthalene
Concen: 480.98 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:142 Resp: 32688

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

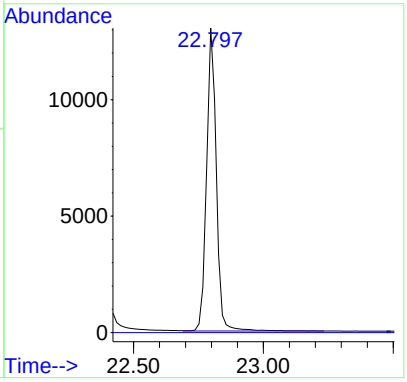


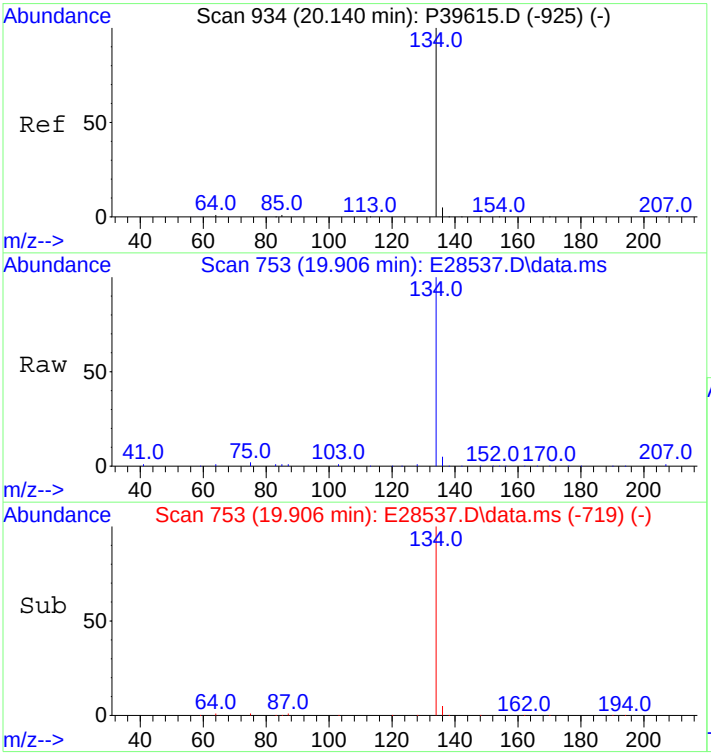


#17
1-Methylnaphthalene
Concen: 511.31 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:142 Resp: 33765

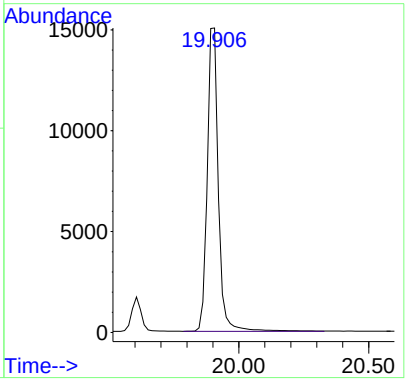
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

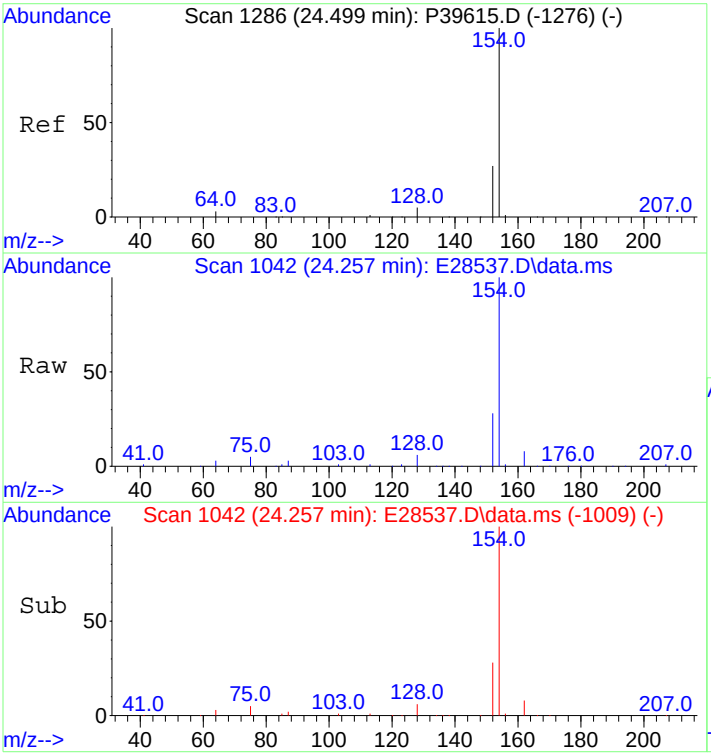




#18
Benzothiophene
Concen: 504.59 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:134 Resp: 44511

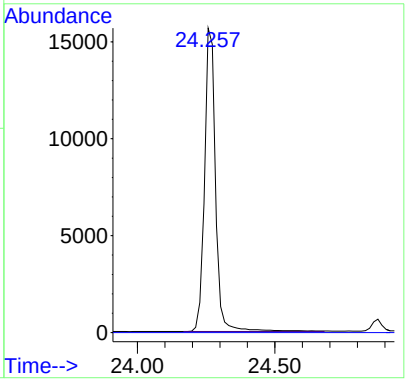


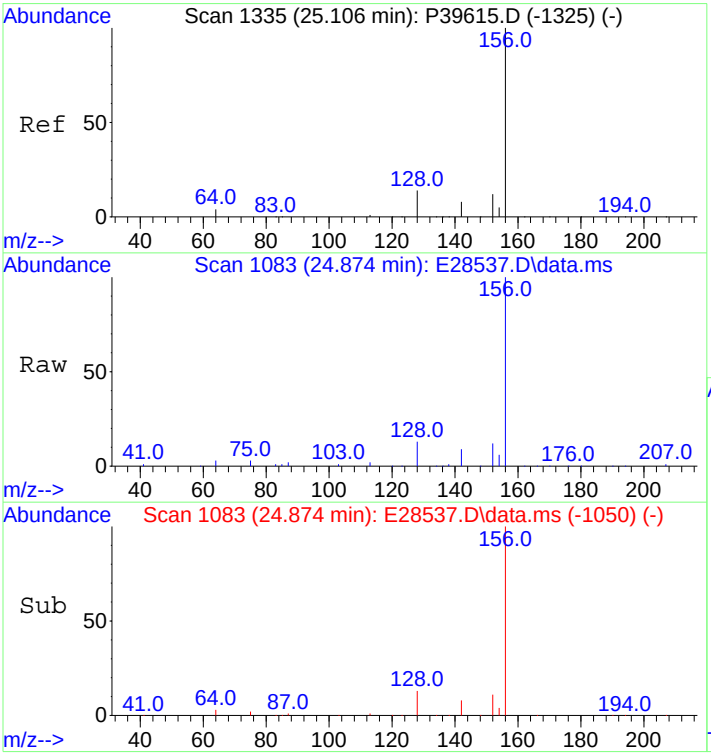


#23
Biphenyl
Concen: 504.77 ng/mL
RT: 24.257 min Scan# 1042
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:154 Resp: 43356

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

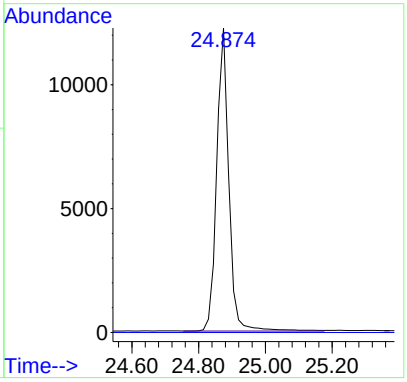


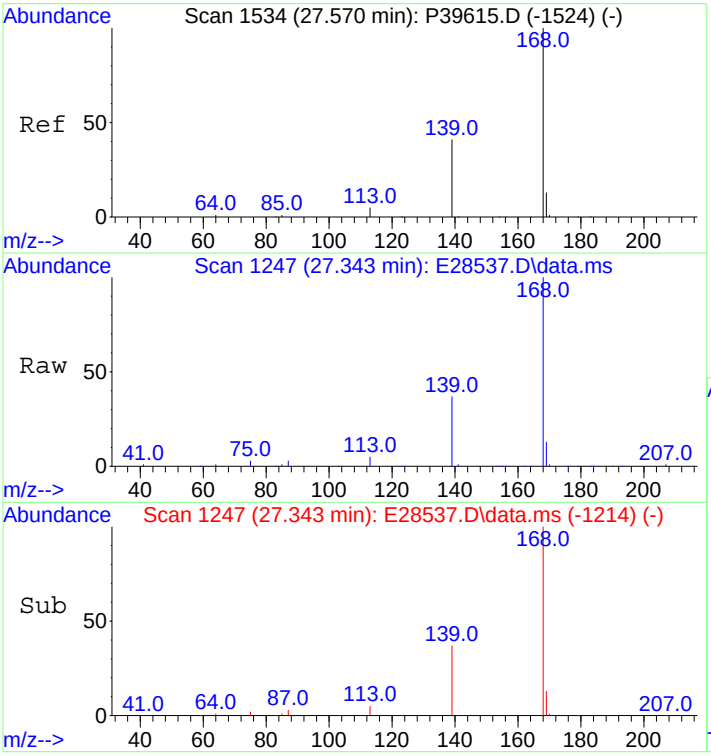


#24
2,6-Dimethylnaphthalene
Concen: 503.71 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:156 Resp: 30856

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

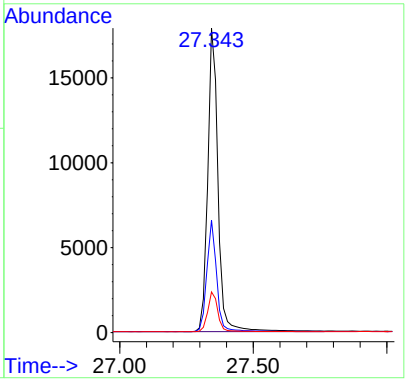


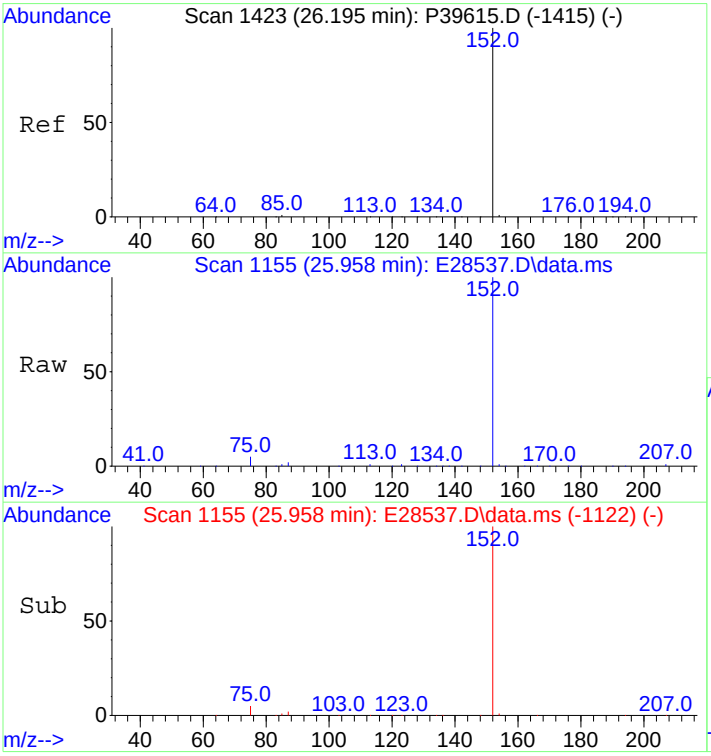


#25
Dibenzofuran
Concen: 504.51 ng/mL
RT: 27.343 min Scan# 1247
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:168 Resp: 47975

Ion	Ratio	Lower	Upper
168	100		
139	35.2	30.6	45.8
169	13.1	10.6	16.0

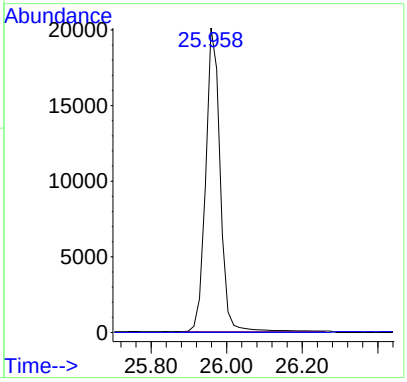


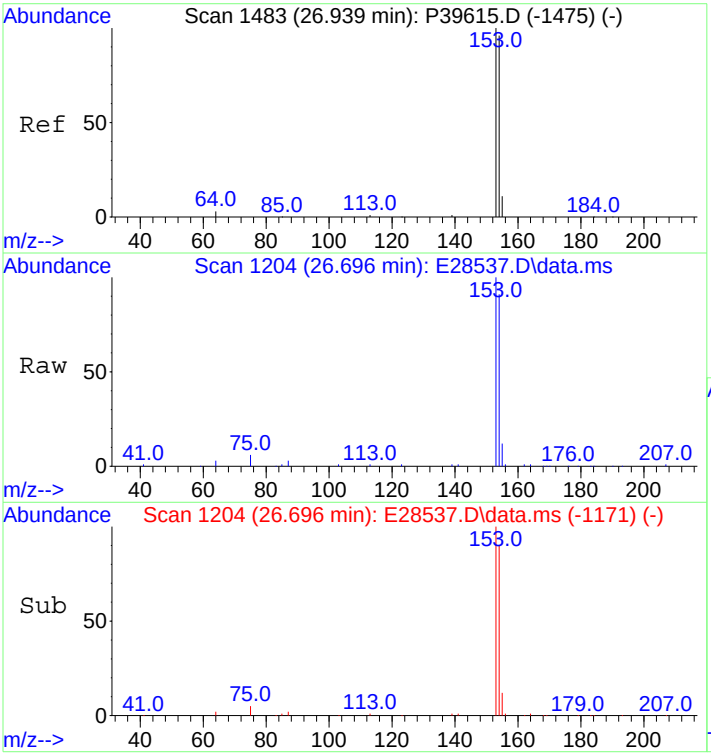


#26
Acenaphthylene
Concen: 501.57 ng/mL m
RT: 25.958 min Scan# 1155
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:152 Resp: 53359

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

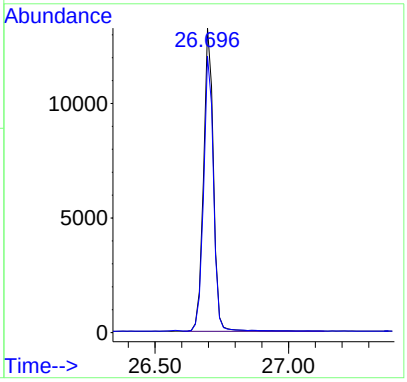


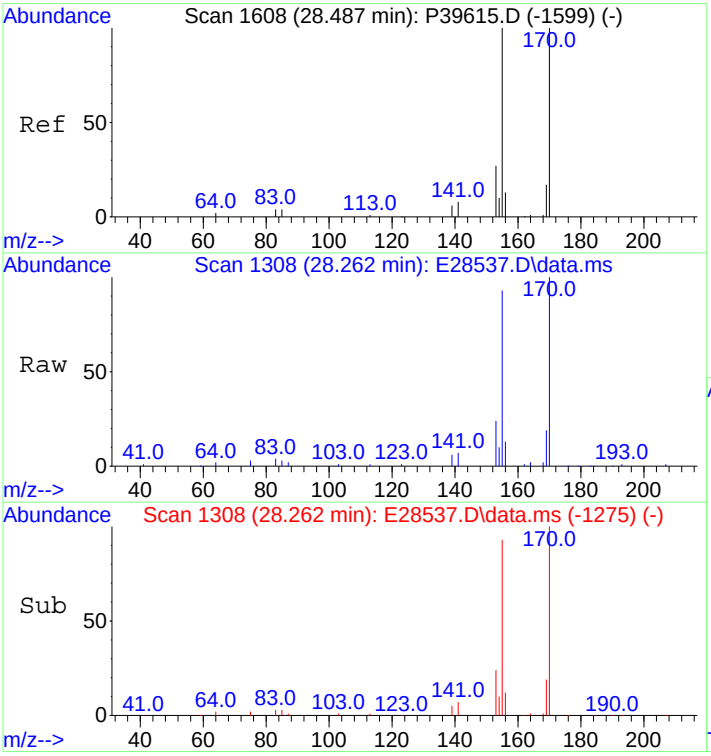


#27
Acenaphthene
Concen: 494.99 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:153 Resp: 33896

Ion	Ratio	Lower	Upper
153	100		
154	90.7	72.3	108.5

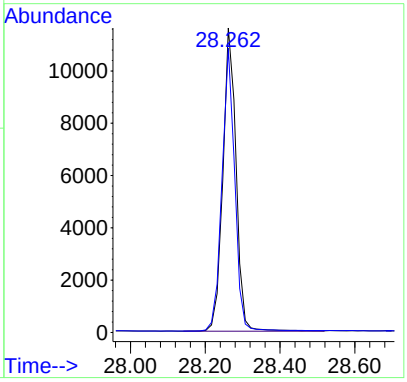


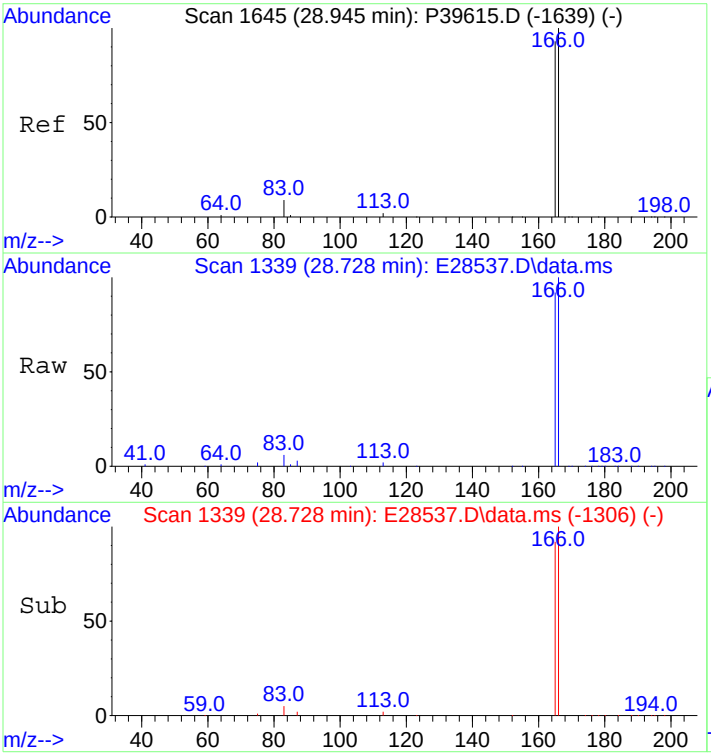


#28
2,3,5-Trimethylnaphthalene
Concen: 495.83 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:170 Resp: 28417

Ion	Ratio	Lower	Upper
170	100		
155	90.6	75.9	113.9

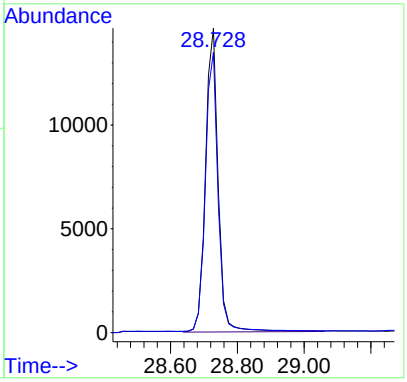


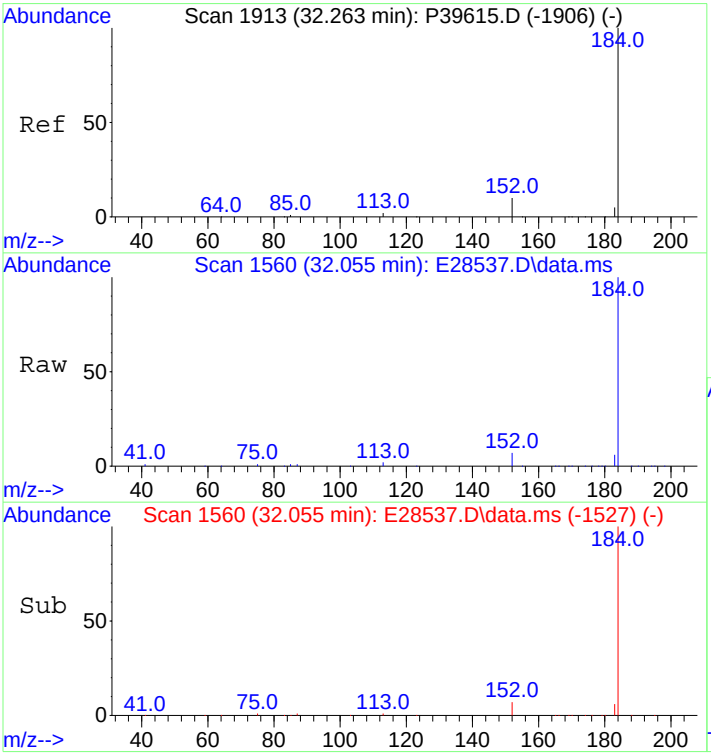


#29
Fluorene
Concen: 504.38 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:166 Resp: 38522

Ion	Ratio	Lower	Upper
166	100		
165	91.9	73.8	110.6

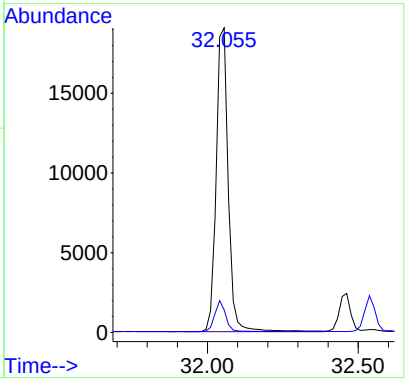


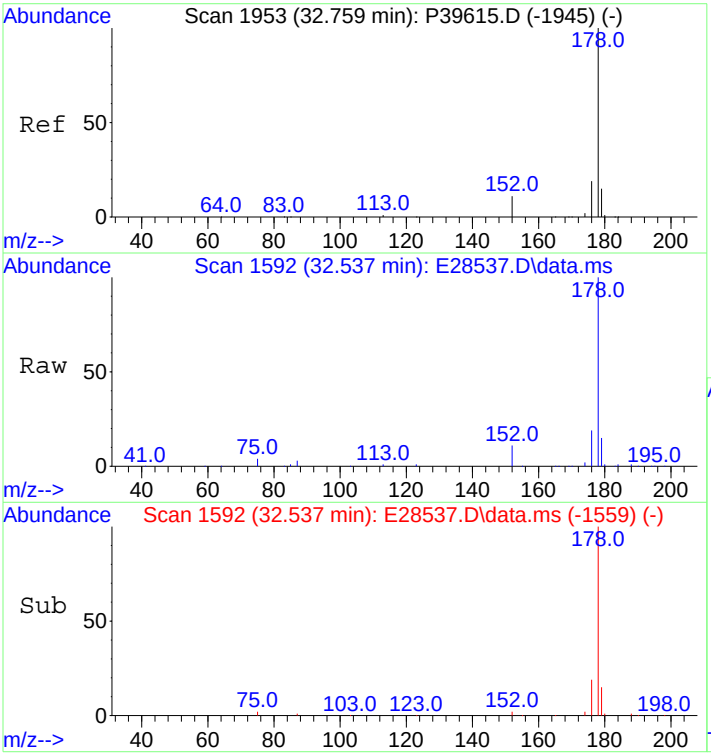


#33
Dibenzothiophene
Concen: 505.39 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:184 Resp: 52969

Ion	Ratio	Lower	Upper
184	100		
152	9.3	6.2	9.2#

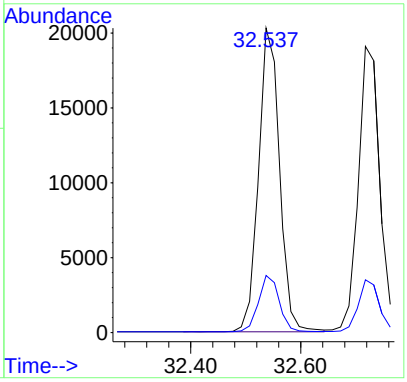


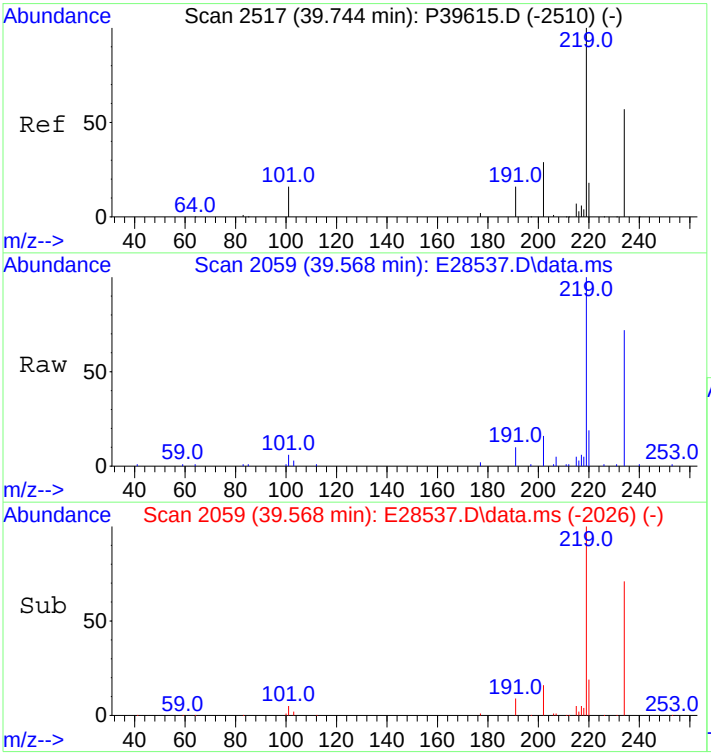


#43
Phenanthrene
Concen: 503.30 ng/mL
RT: 32.537 min Scan# 1592
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:178 Resp: 53667

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.6

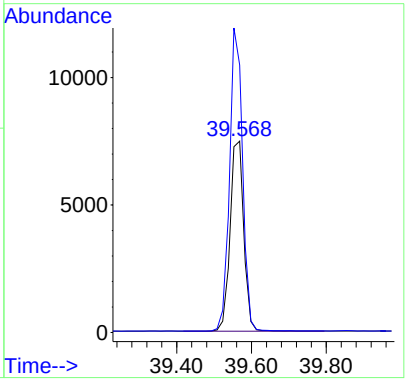


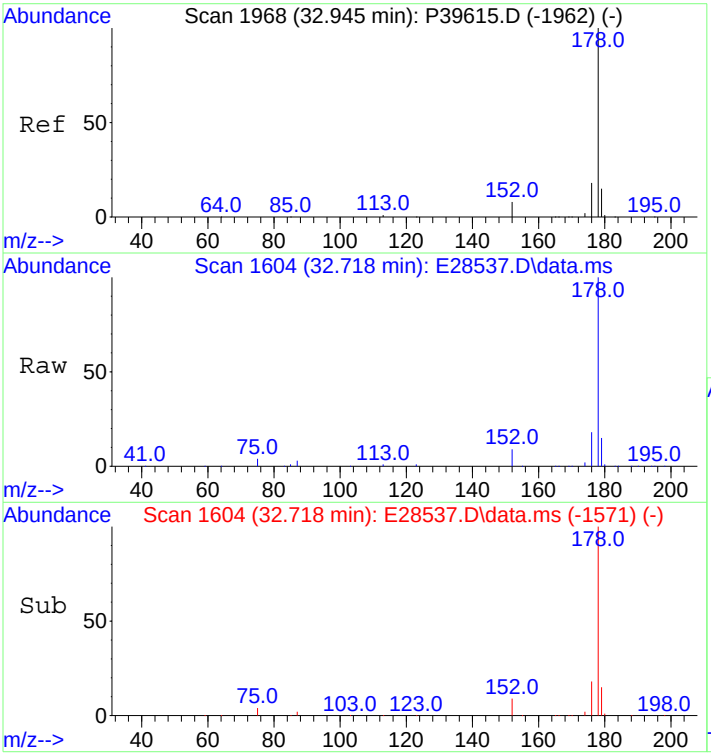


#54
Retene
Concen: 548.37 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:234 Resp: 18816

Ion	Ratio	Lower	Upper
234	100		
219	152.1	113.0	169.4

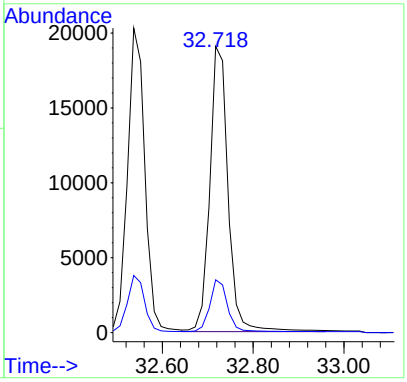


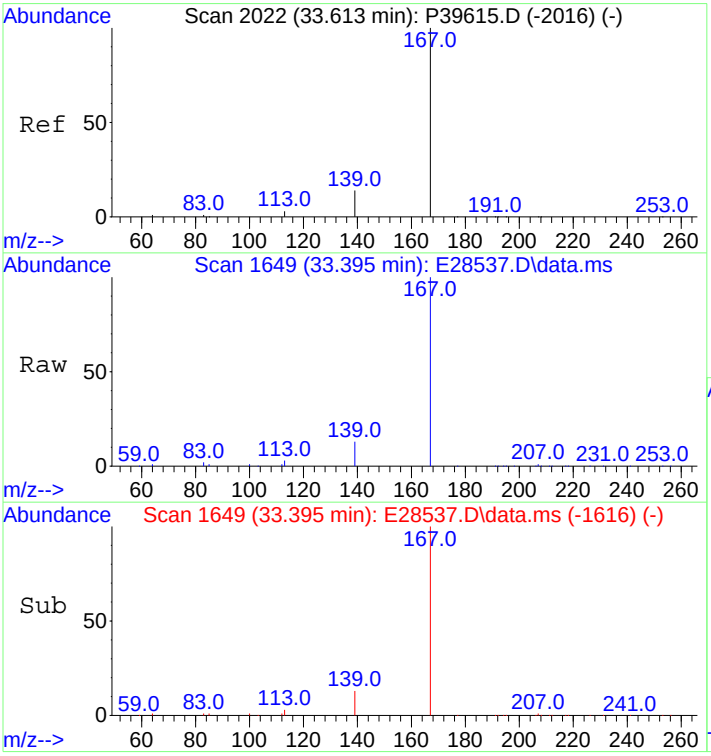


#55
Anthracene
Concen: 579.50 ng/mL m
RT: 32.718 min Scan# 1604
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:178 Resp: 53410

Ion	Ratio	Lower	Upper
178	100		
176	20.2	14.5	21.7

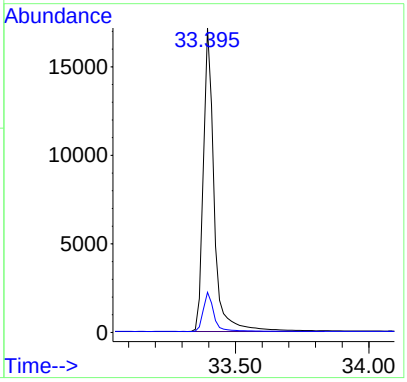


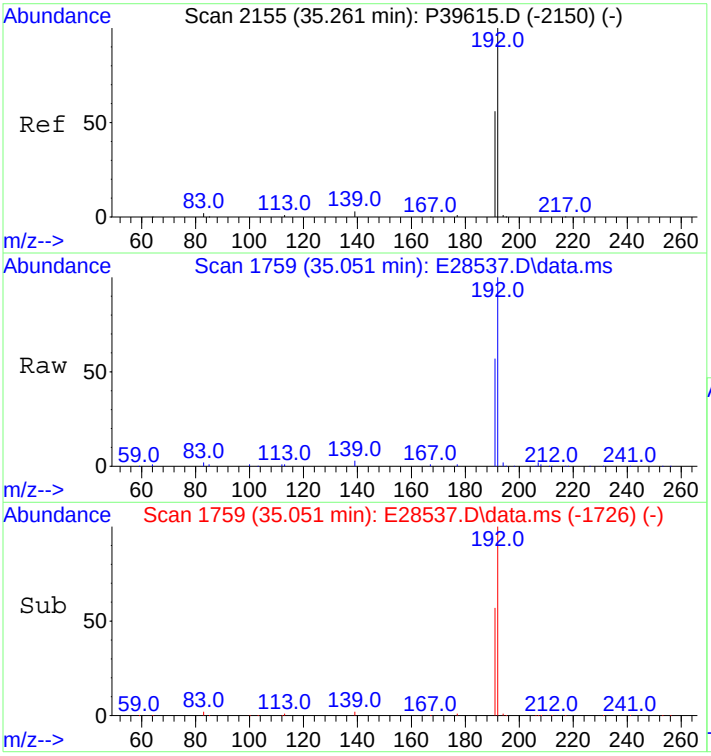


#56
Carbazole
Concen: 507.62 ng/mL
RT: 33.395 min Scan# 1649
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:167 Resp: 48151

Ion	Ratio	Lower	Upper
167	100		
139	12.8	10.5	15.7

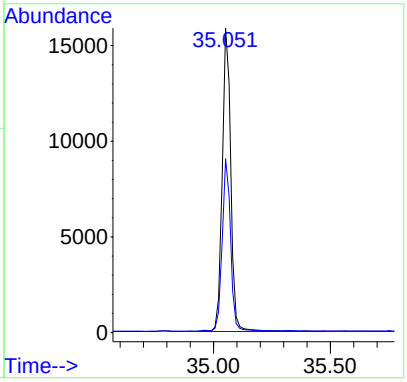


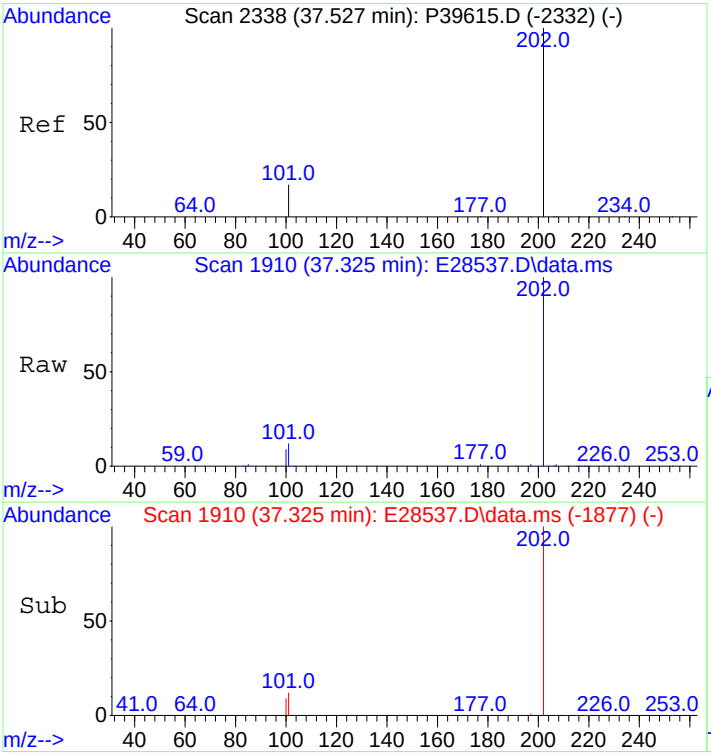


#57
1-Methylphenanthrene
Concen: 497.24 ng/mL
RT: 35.051 min Scan# 1759
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:192 Resp: 40451

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.5	68.3

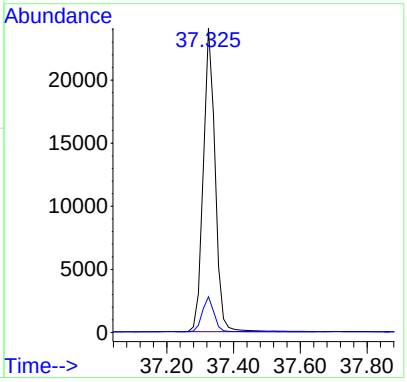


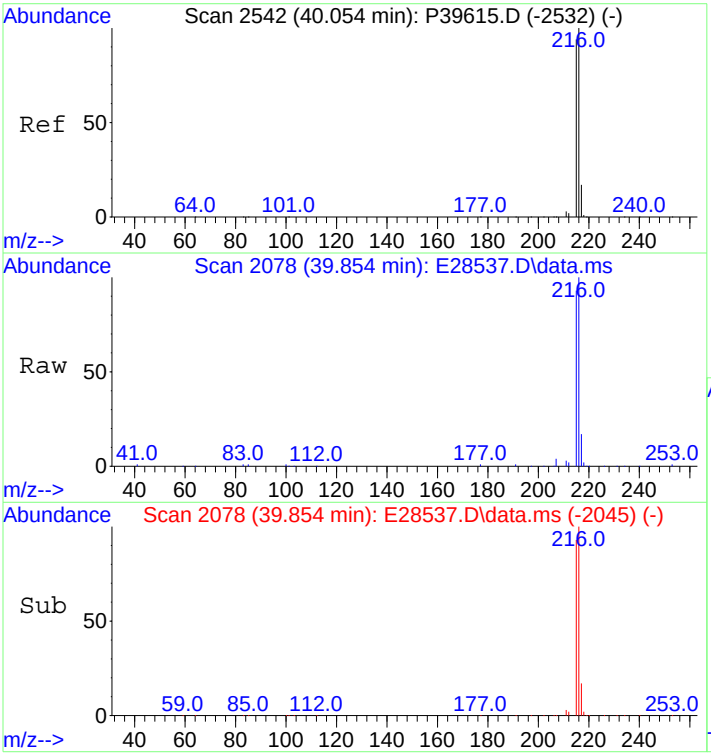


#58
Fluoranthene
Concen: 501.79 ng/mL
RT: 37.325 min Scan# 1910
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:202 Resp: 59089

Ion	Ratio	Lower	Upper
202	100		
101	11.4	9.2	13.8

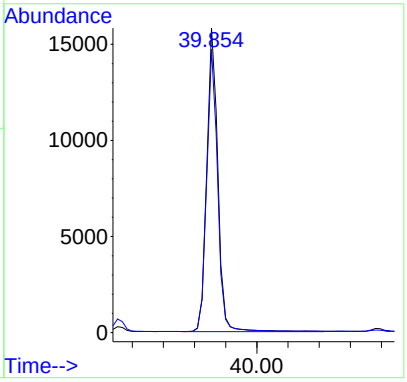


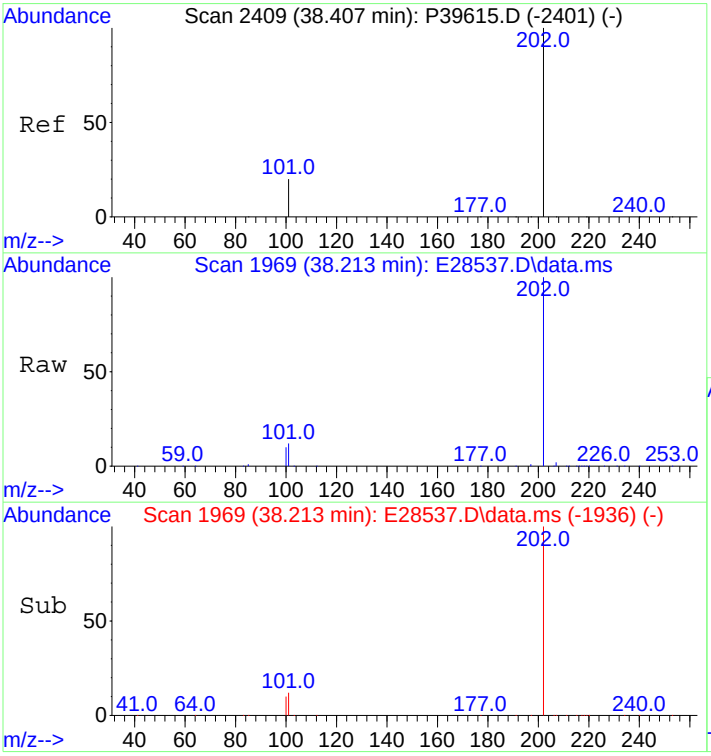


#59
Benzo(b)fluorene
Concen: 494.28 ng/mL
RT: 39.854 min Scan# 2078
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:216 Resp: 38785

Ion	Ratio	Lower	Upper
216	100		
215	92.2	73.8	110.8

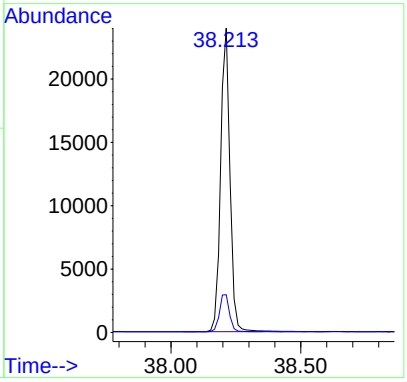


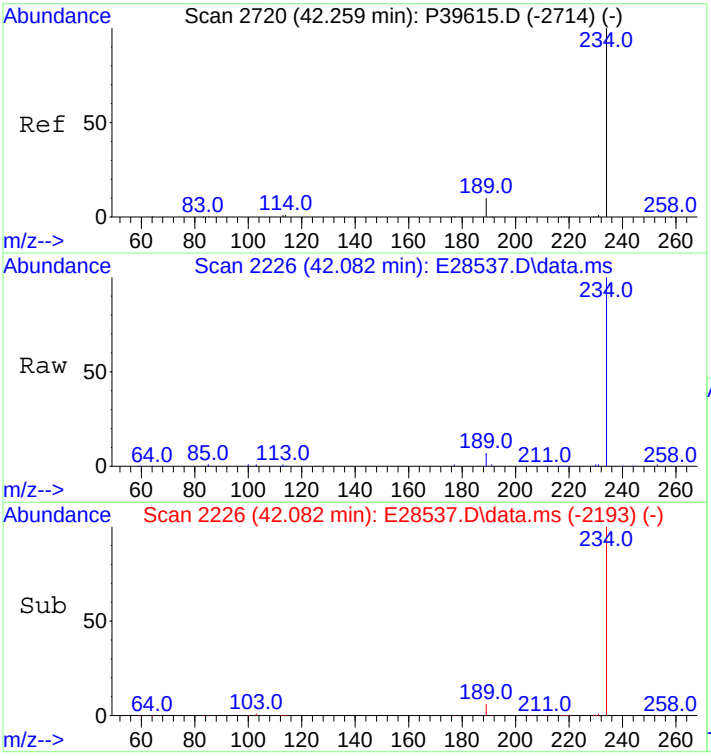


#60
Pyrene
Concen: 500.33 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:202 Resp: 59885

Ion	Ratio	Lower	Upper
202	100		
101	13.2	9.8	14.8

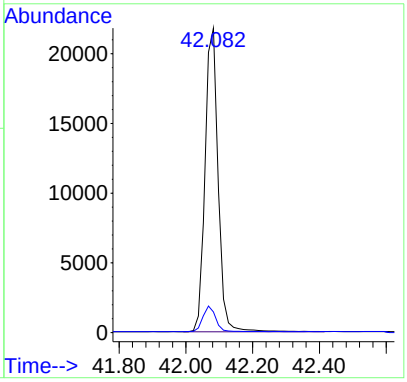


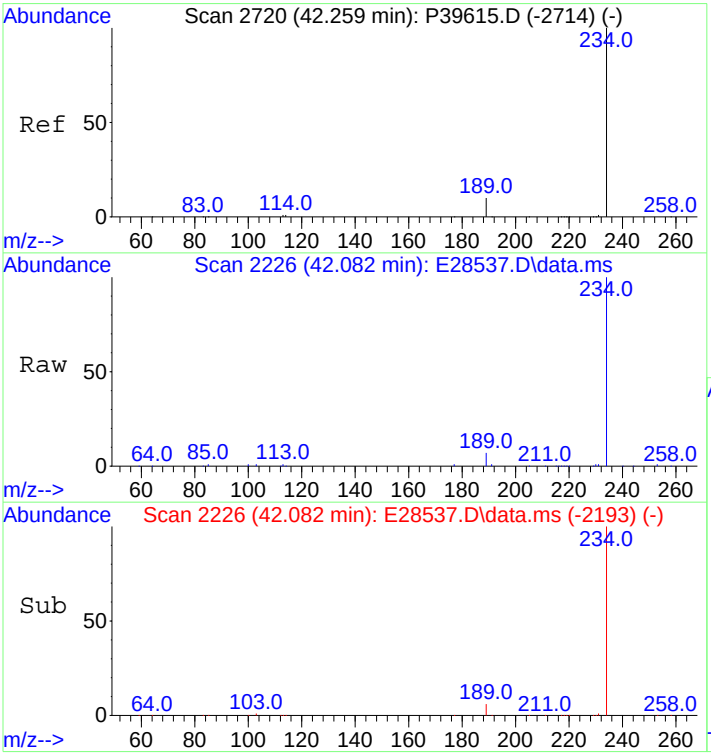


#66
Naphthobenzothiophene
Concen: 500.65 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:234 Resp: 59101

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3#

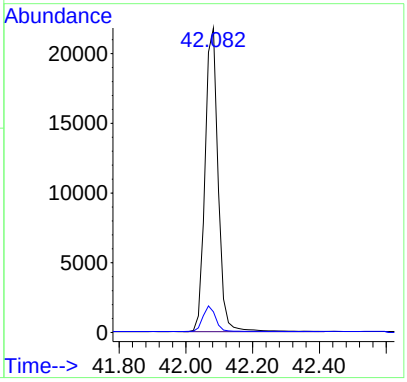


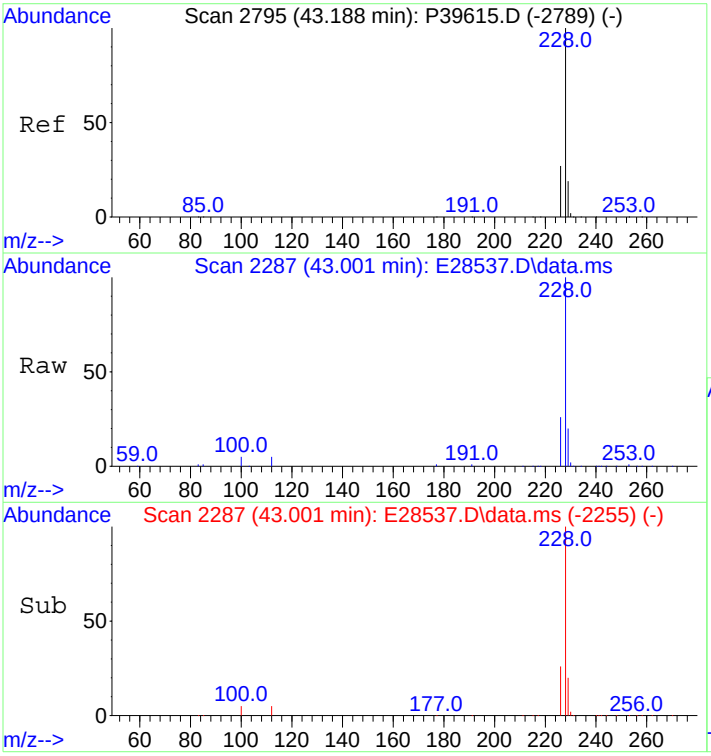


#67
Naphthobenzothiophene-2,1-D
Concen: 500.65 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:234 Resp: 59101

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3#

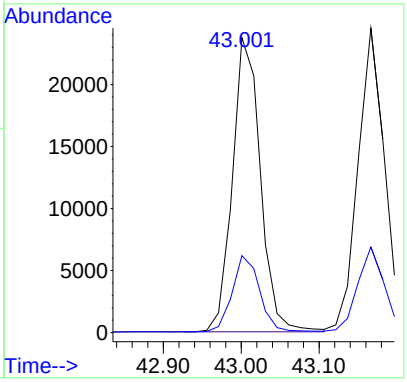


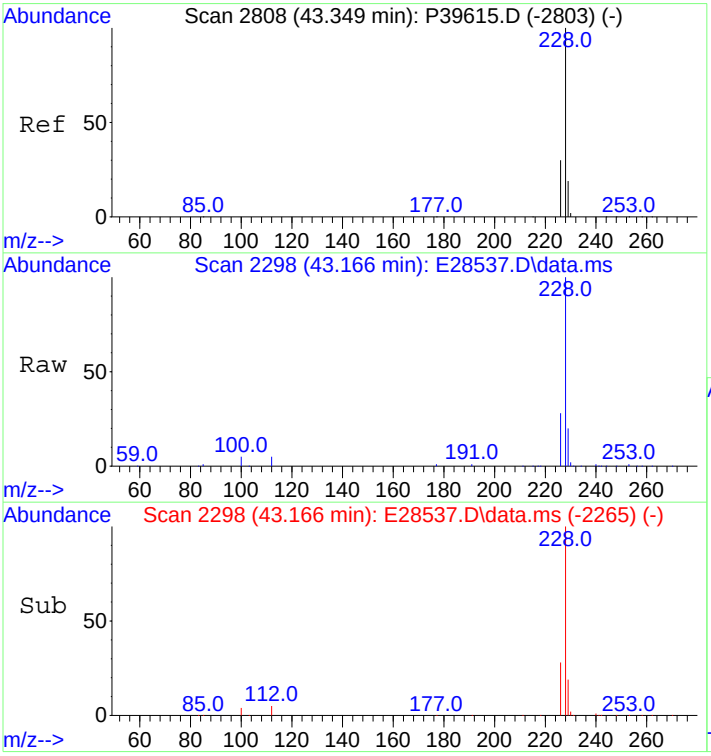


#75
Benz[a]anthracene
Concen: 535.36 ng/mL
RT: 43.001 min Scan# 2287
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:228 Resp: 59298

Ion	Ratio	Lower	Upper
228	100		
226	25.4	20.2	30.4

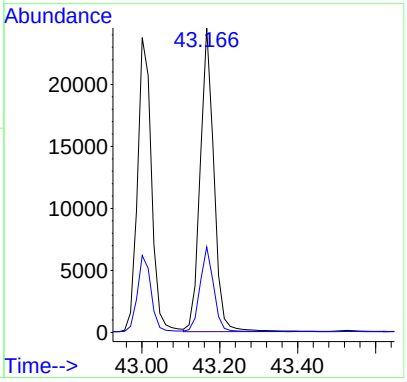


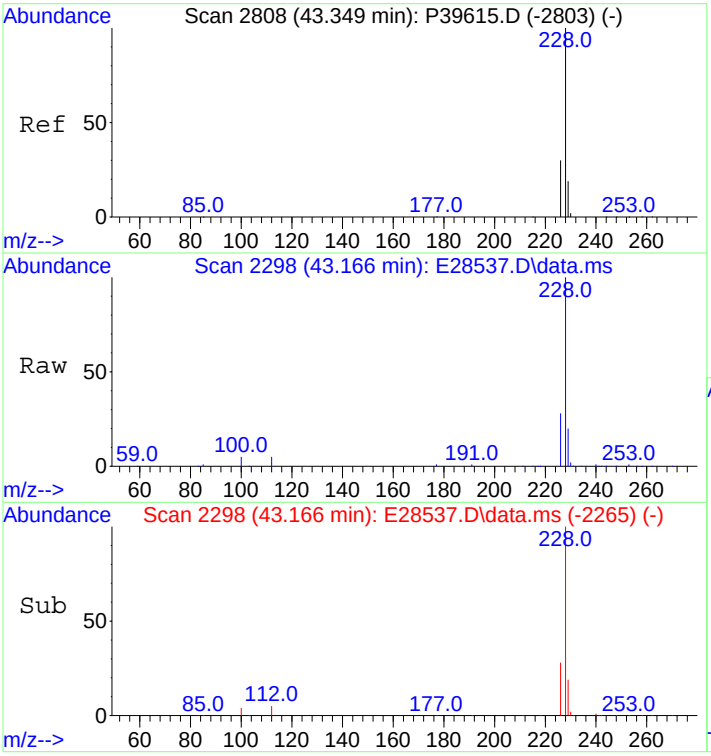


#76
Chrysene
Concen: 523.68 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.001 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:228 Resp: 59717

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.6	34.0

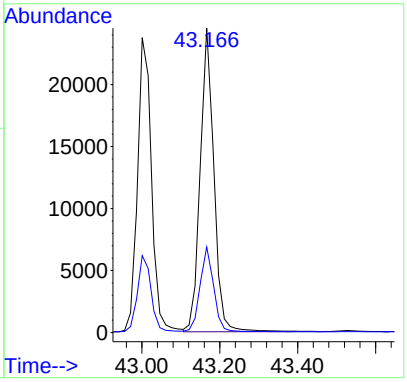


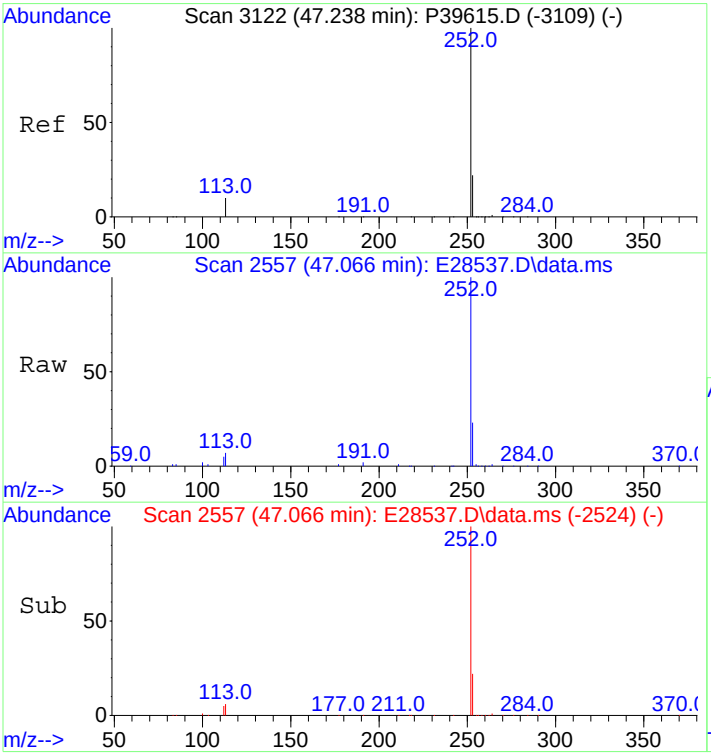


#77
Chrysene/Triphenylene
Concen: 523.68 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.001 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:228 Resp: 59717

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.6	34.0

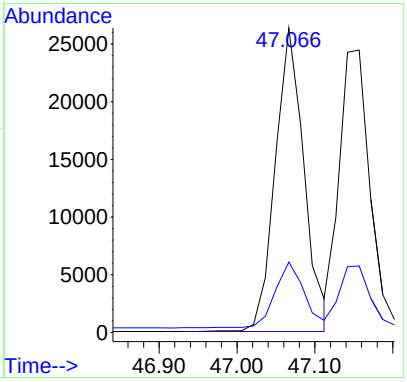


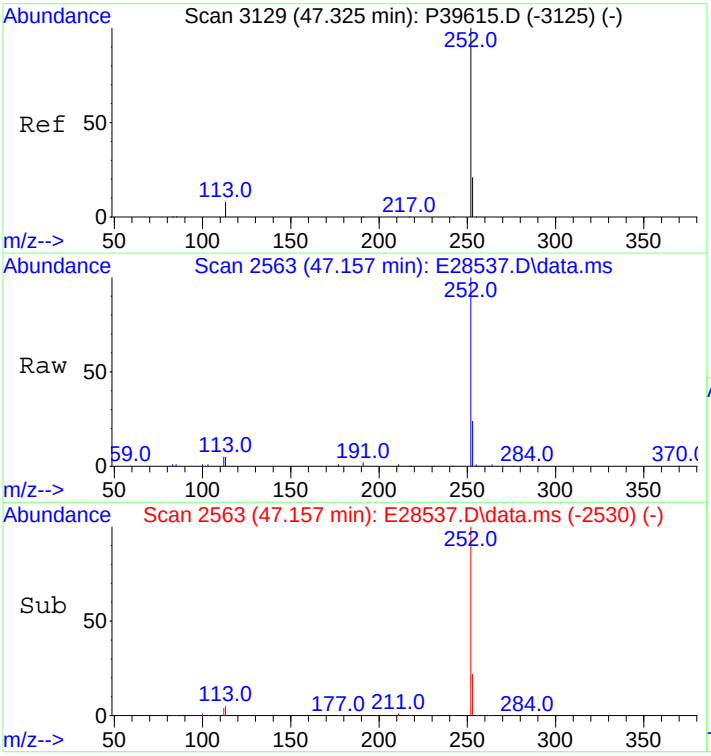


#84
Benzo[b]fluoranthene
Concen: 525.38 ng/mL
RT: 47.066 min Scan# 2557
Delta R.T. -0.001 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 67639

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.3	27.5

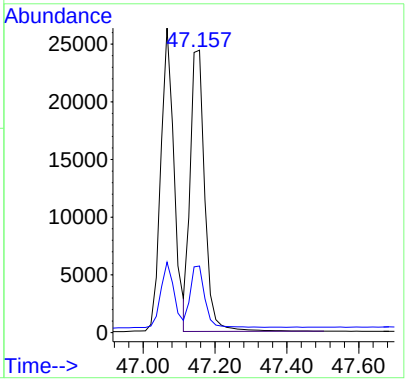


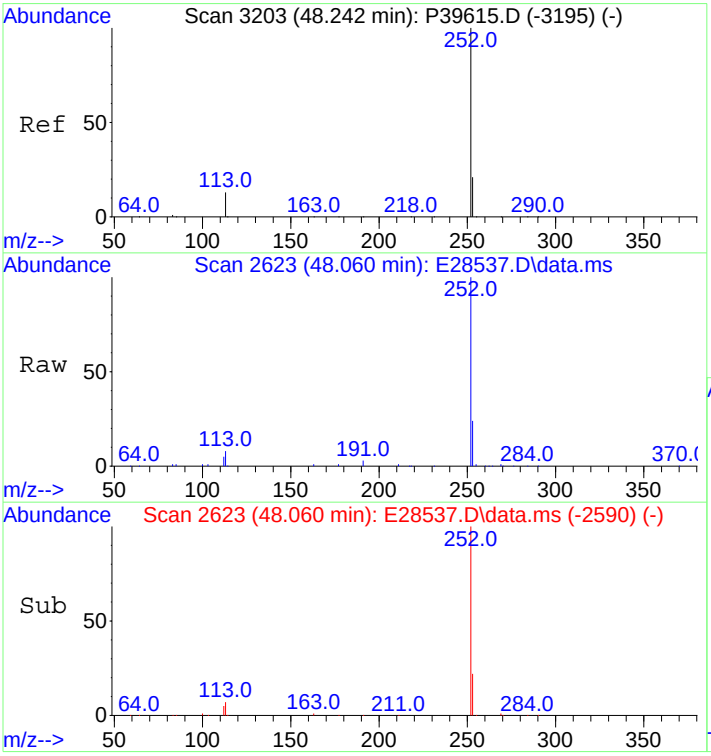


#85
Benzo[j]+[k]fluoranthene
Concen: 520.97 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 69005

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.3	27.5

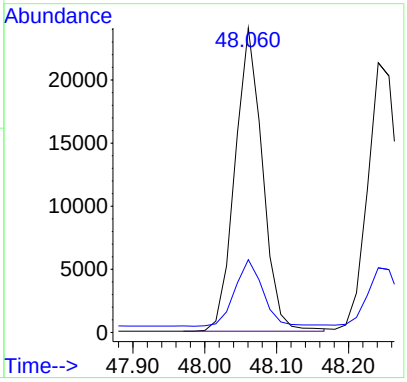


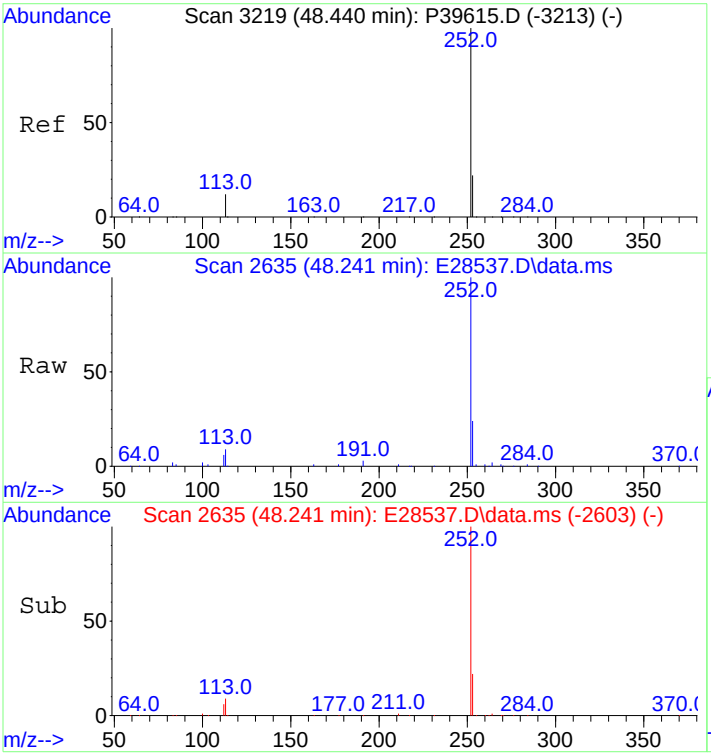


#87
Benzo[e]pyrene
Concen: 508.84 ng/mL
RT: 48.060 min Scan# 2623
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 63965

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.6	28.0

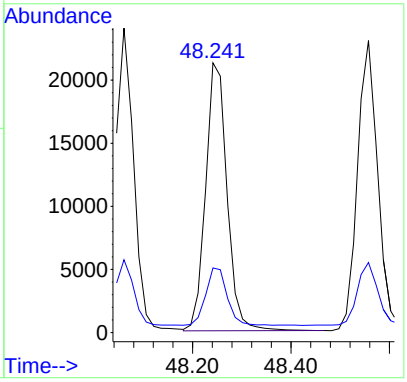


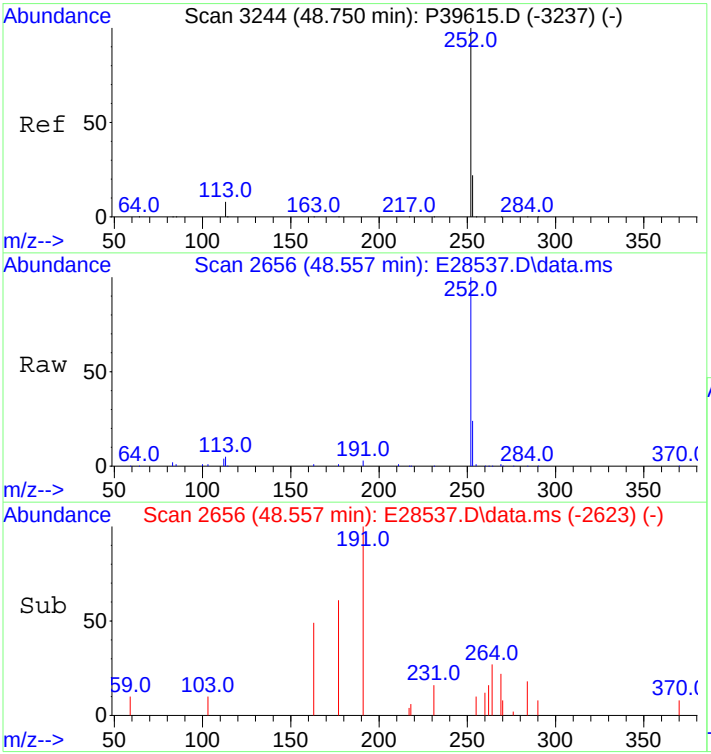


#89
Benzo[a]pyrene
Concen: 534.34 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 64274

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.8	28.2

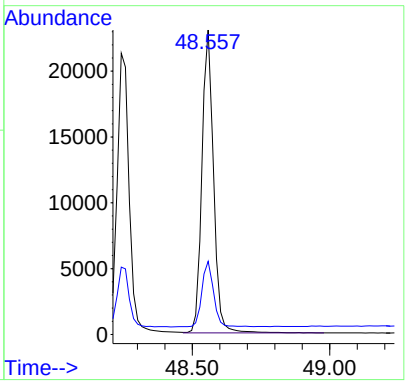


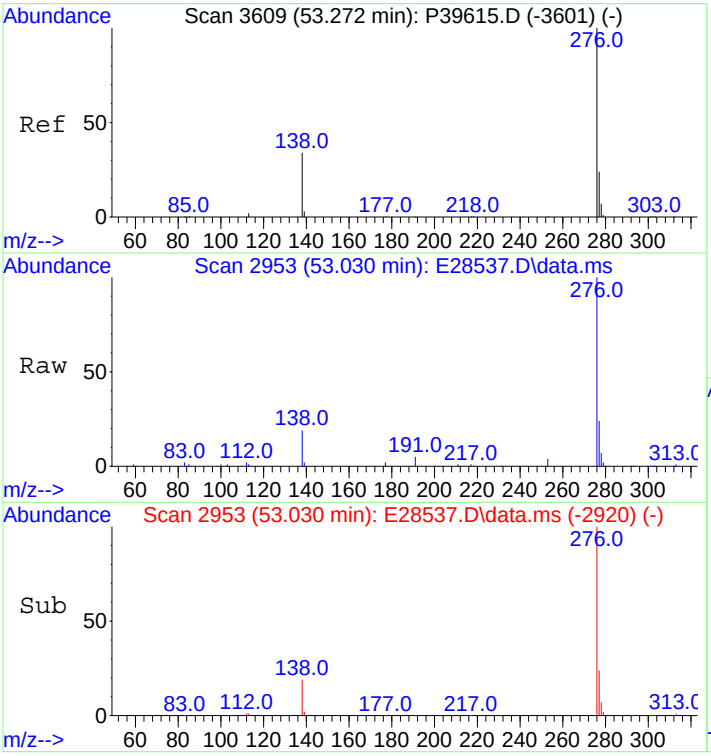


#90
Perylene
Concen: 527.52 ng/mL
RT: 48.557 min Scan# 2656
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 67099

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

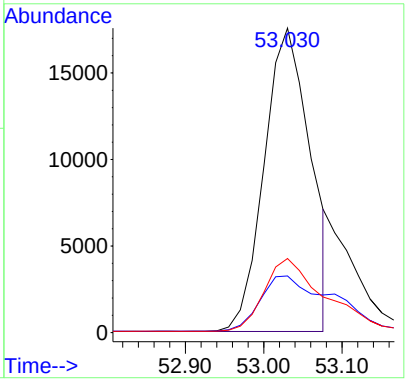


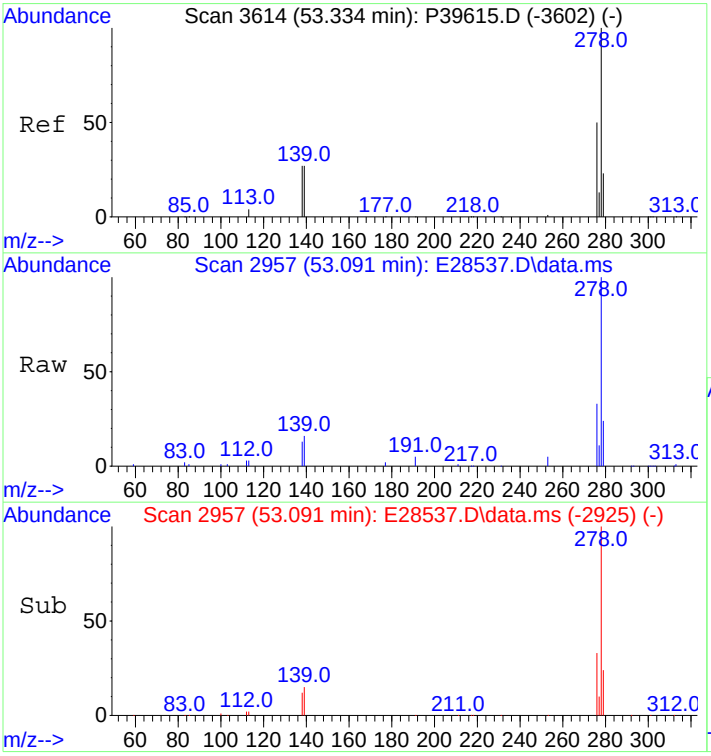


#91
Indeno[1,2,3-cd]pyrene
Concen: 509.02 ng/mL m
RT: 53.030 min Scan# 2953
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:276 Resp: 72058

Ion	Ratio	Lower	Upper
276	100		
138	29.7	15.4	23.2#
277	32.6	19.1	28.7#

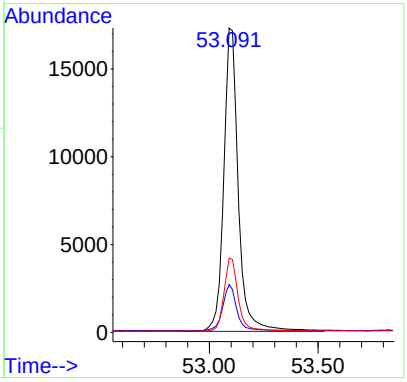


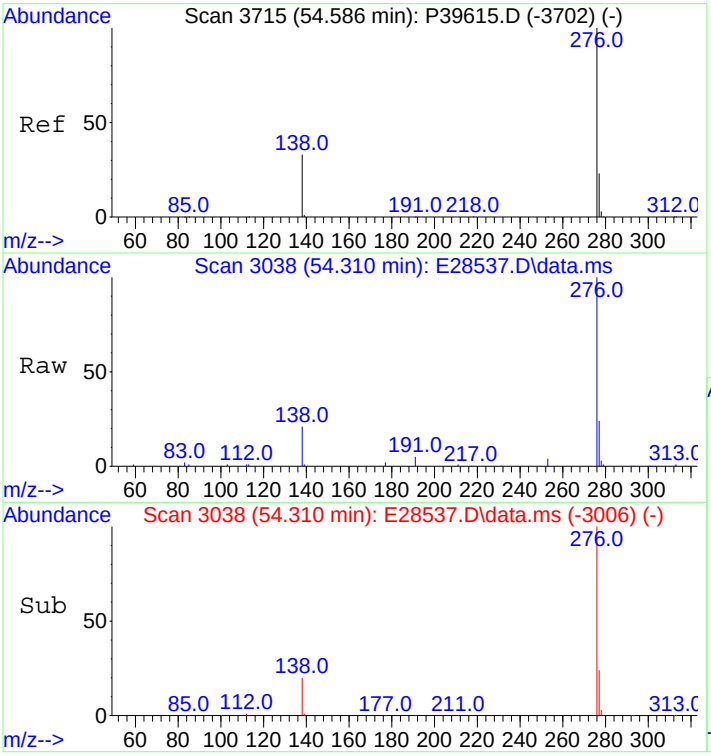


#92
Dibenz[ah]+[ac]anthracene
Concen: 533.21 ng/mL
RT: 53.091 min Scan# 2957
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:278 Resp: 80373

Ion	Ratio	Lower	Upper
278	100		
139	14.6	11.1	16.7
279	23.6	19.4	29.0

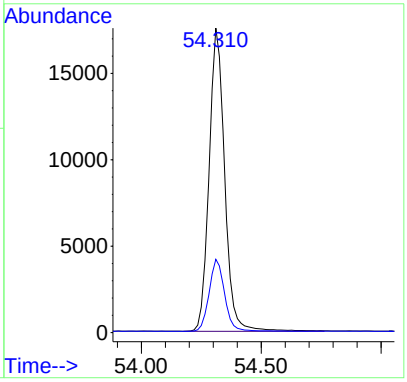




#93
Benzo[g,h,i]perylene
Concen: 519.83 ng/mL
RT: 54.310 min Scan# 3038
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:276 Resp: 79347

Ion	Ratio	Lower	Upper
276	100		
277	23.6	19.1	28.7



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22394	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	45130	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	40509	514.277	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.43%			
42) Phenanthrene-d10	32.085	188	38736	479.993	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.00%#			
83) Benzo[b]fluoranthene-d12	46.630	264	44824	483.498	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.35%#			
88) Benzo[a]pyrene-d12	47.774	264	43715	486.651	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.67%#			
129) 5B(H)Cholane - Surr	43.332	217	9128	513.191	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.32%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4605	257.074	ng/mL	100
4) cis-Decalin	17.091	138	3538	259.964	ng/mL	100
10) Naphthalene	19.304	128	49129	557.730	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	30072	536.007	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	29611	543.171	ng/mL#	100
18) Benzothiophene	19.515	134	40900	561.650	ng/mL	100
23) Biphenyl	23.881	154	38319	540.420	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	26701	528.002	ng/mL#	100
25) Dibenzofuran	26.967	168	43064	548.580	ng/mL	97
26) Acenaphthylene	25.582	152	48407M3	551.188	ng/mL	
27) Acenaphthene	26.320	153	30245	535.018	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	24255	512.652	ng/mL	96
29) Fluorene	28.352	166	33635	533.470	ng/mL	98
33) Dibenzothiophene	31.664	184	46858	541.577	ng/mL	98
43) Phenanthrene	32.161	178	47604	540.795	ng/mL	99
54) Retene	39.192	234	13249	467.736	ng/mL	88
55) Anthracene	32.356	178	45383M3	596.473	ng/mL	
56) Carbazole	33.034	167	42309	540.306	ng/mL	99
57) 1-Methylphenanthrene	34.690	192	34717	516.956	ng/mL	99
58) Fluoranthene	36.963	202	51557	530.359	ng/mL	98
59) Benzo(b)fluorene	39.493	216	33310	514.225	ng/mL	99
60) Pyrene	37.837	202	51369	519.891	ng/mL	98
66) Naphthobenzothiophene	41.706	234	50698	520.232	ng/ml	98
67) Naphthobenzothiophene-2,1	41.706	234	50698	520.232	ng/mL	98
75) Benz[a]anthracene	42.640	228	48820	555.517	ng/mL	99
76) Chrysene	42.805	228	49206	543.856	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	49206	543.856	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	55487	543.200	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.796	252	57848	550.446	ng/mL	95
87) Benzo[e]pyrene	47.684	252	53477	536.162	ng/mL	93
89) Benzo[a]pyrene	47.865	252	51512	539.740	ng/mL	93
90) Perylene	48.166	252	55381	548.759	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.518	276	68575M3	610.538	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	67308	562.797	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	66993	553.169	ng/mL	100
94) Hopane (T19)	51.630	191	16129	476.210	ng/mL#	83
95) 17a(H),21B(H)-hopane - C3	51.630	191	16129	476.210	ng/mL#	83

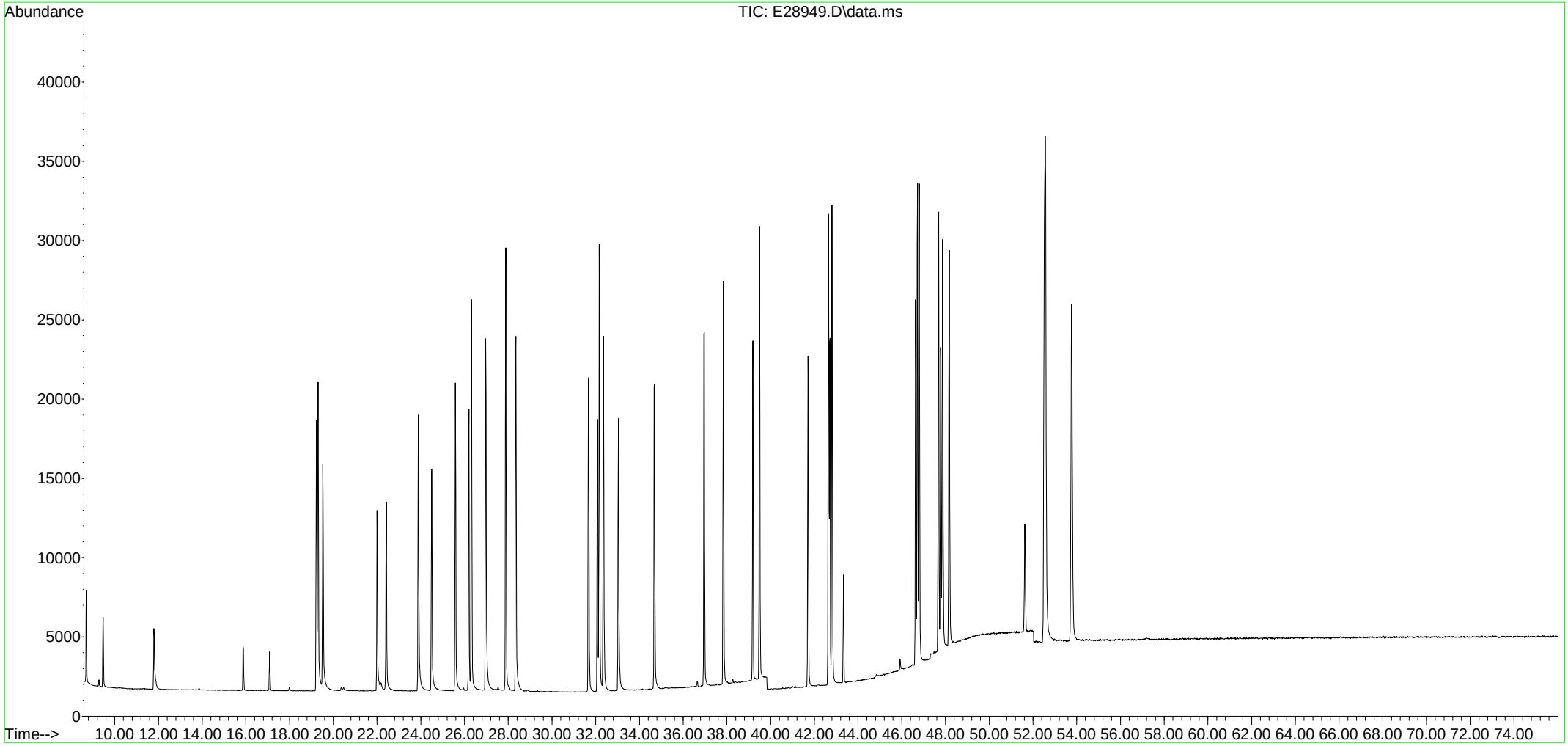
(#) = qualifier out of range (m) = manual integration (+) = signals summed

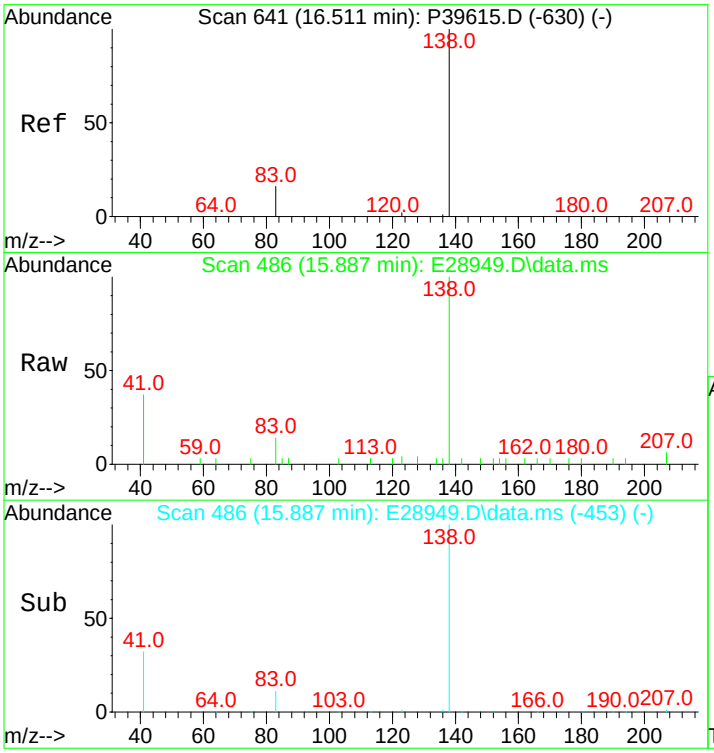
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

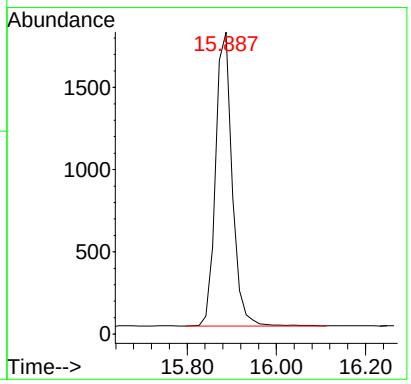
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

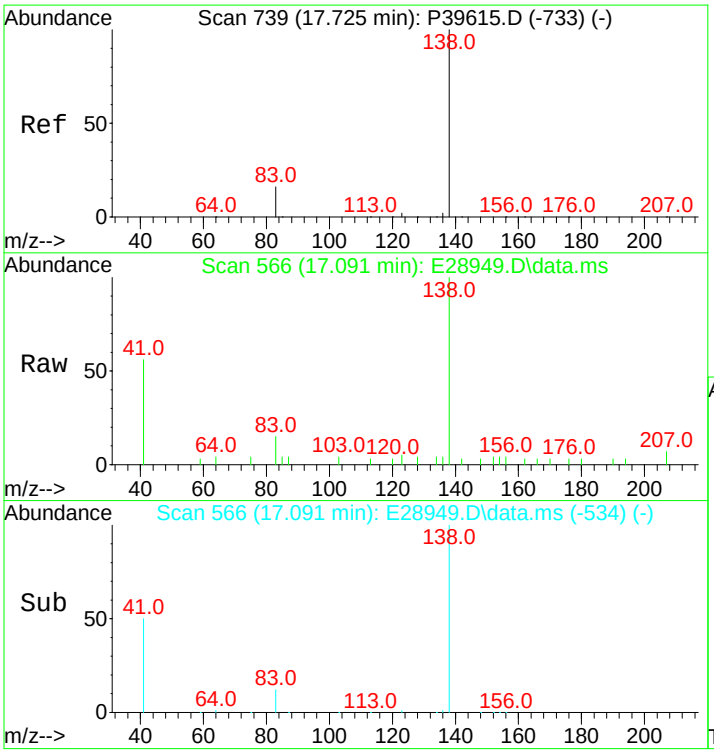




#3
trans-Decalin
Concen: 257.07 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

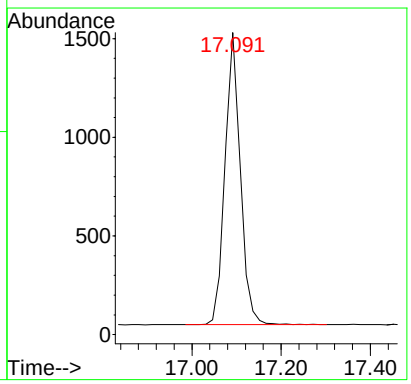
Tgt Ion:138 Resp: 4605

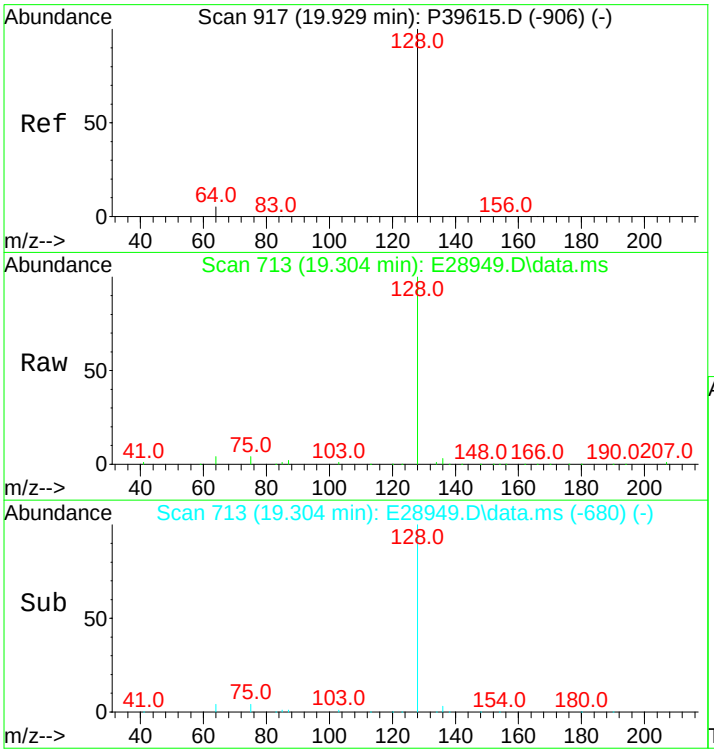




#4
cis-Decalin
Concen: 259.96 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:138 Resp: 3538

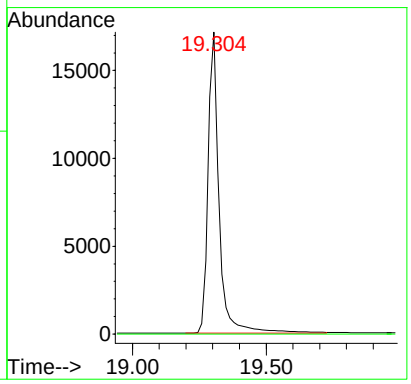


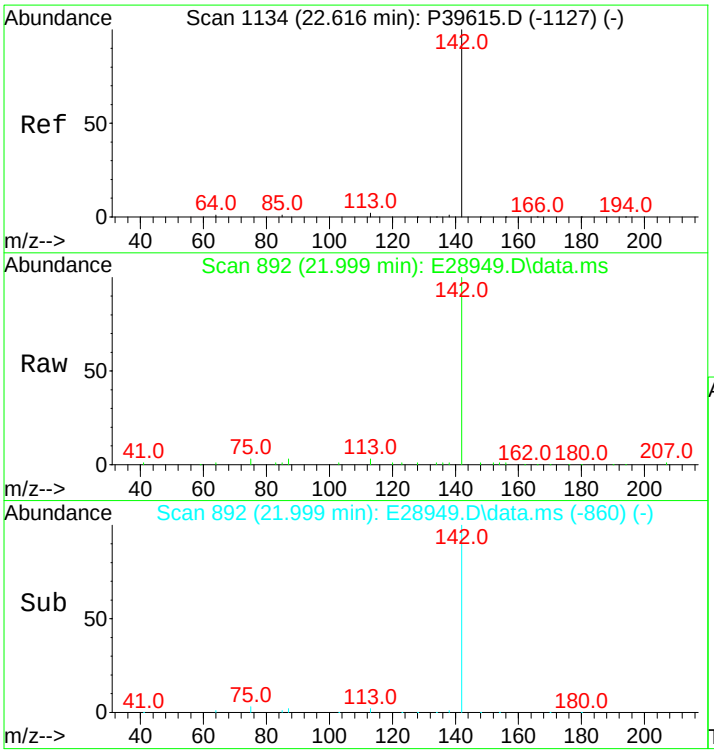


#10
Naphthalene
Concen: 557.73 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:128 Resp: 49129

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

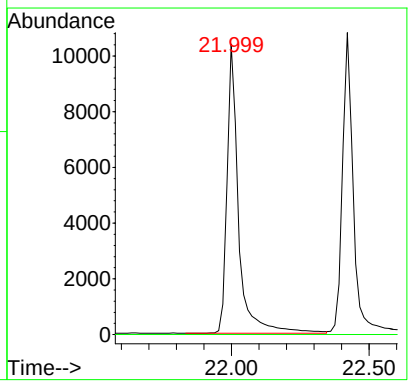


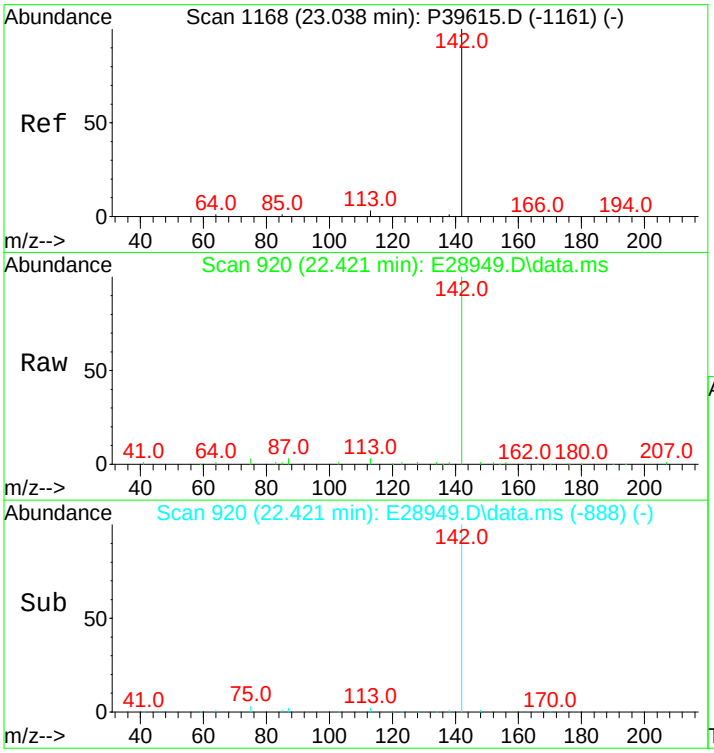


#16
2-Methylnaphthalene
Concen: 536.01 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:142 Resp: 30072

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

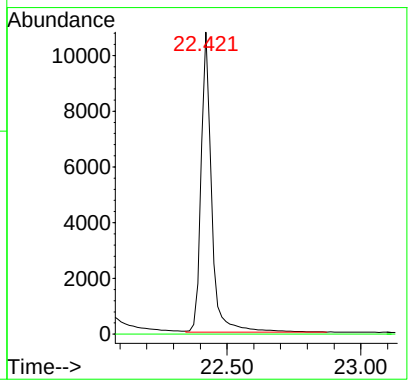


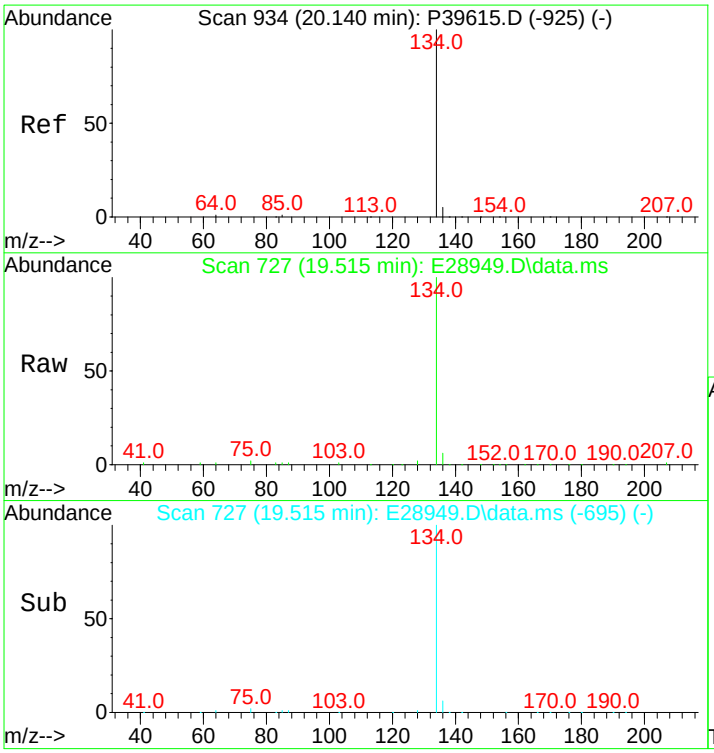


#17
1-Methylnaphthalene
Concen: 543.17 ng/mL
RT: 22.421 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:142 Resp: 29611

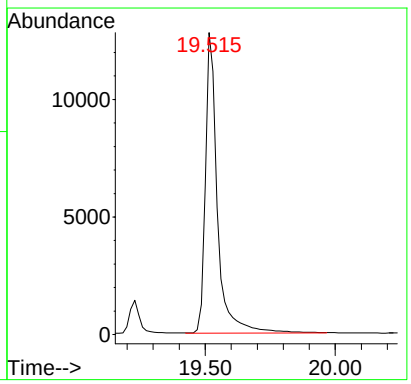
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

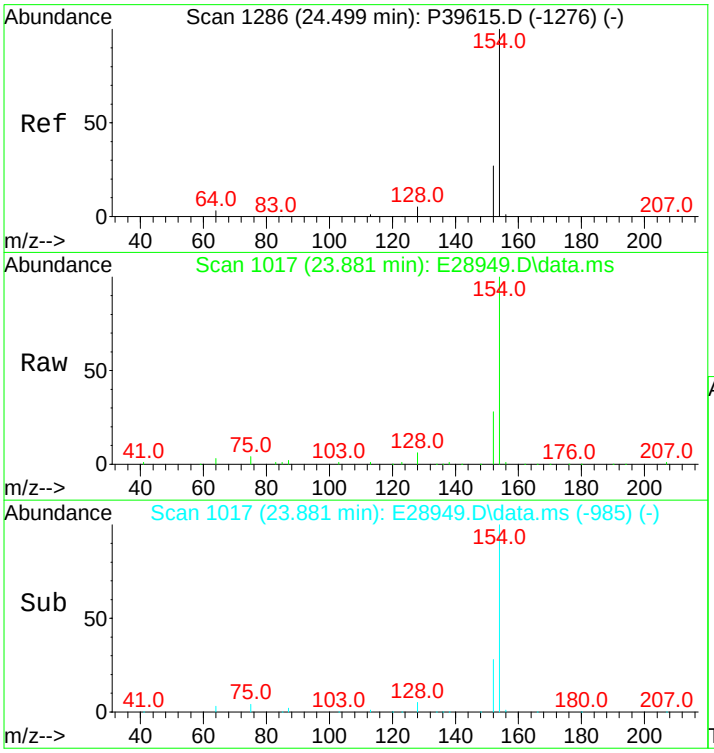




#18
Benzothiophene
Concen: 561.65 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:134 Resp: 40900

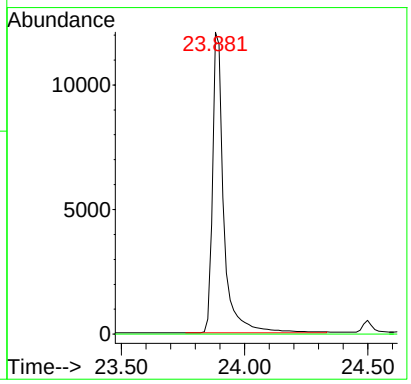


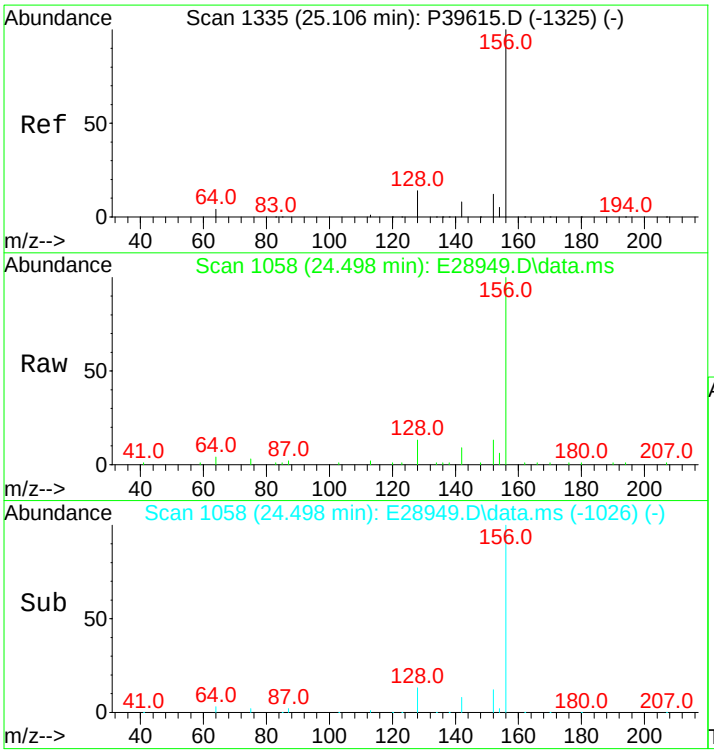


#23
Biphenyl
Concen: 540.42 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:154 Resp: 38319

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

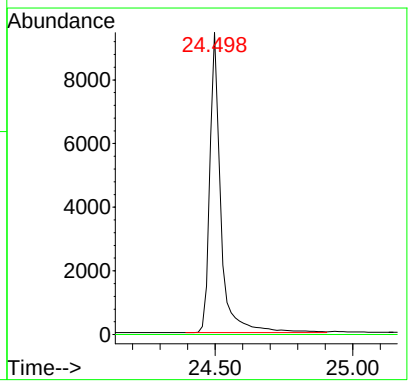


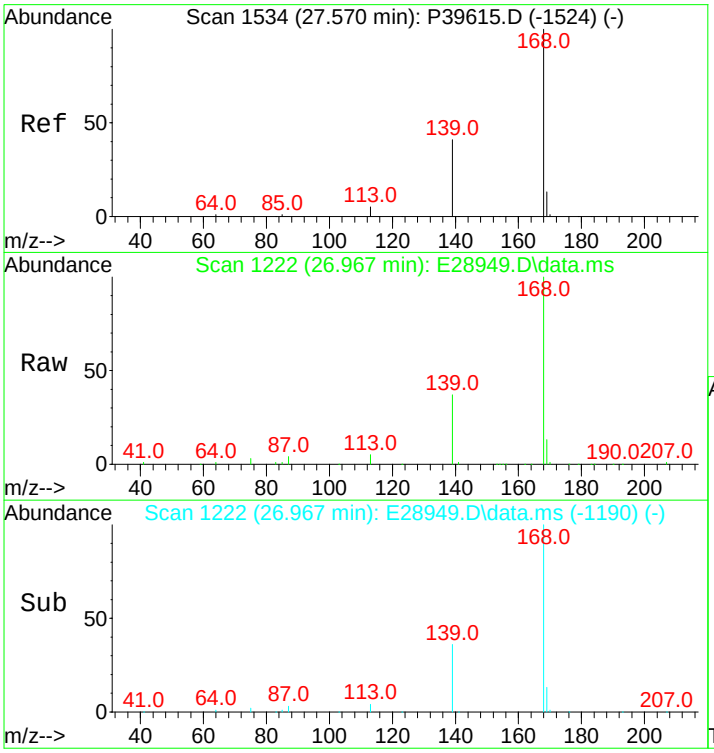


#24
2,6-Dimethylnaphthalene
Concen: 528.00 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:156 Resp: 26701

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

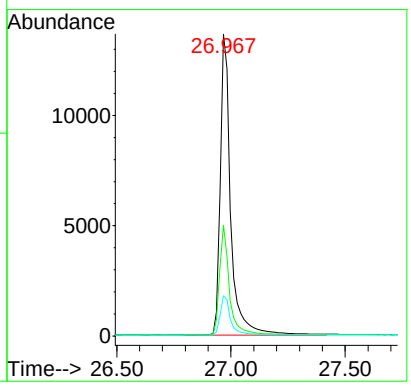


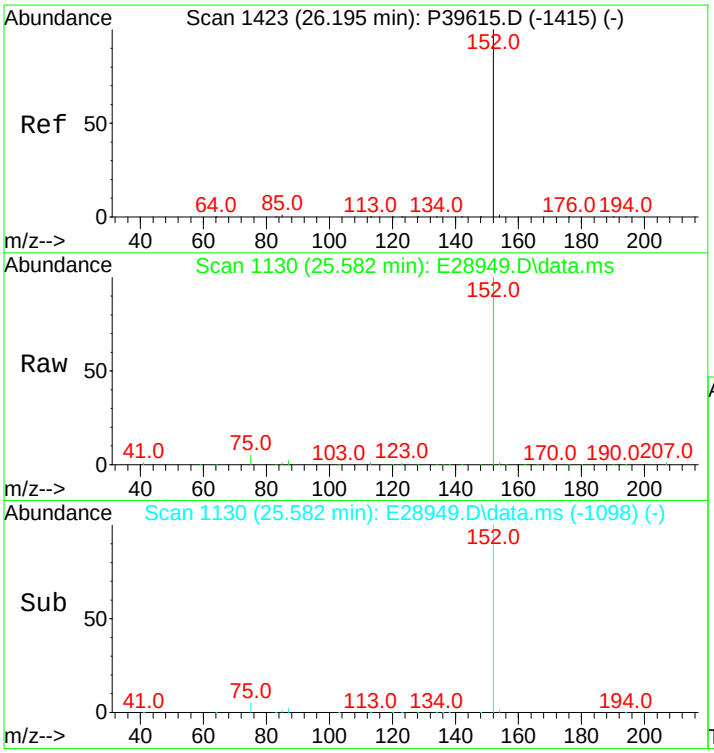


#25
Dibenzofuran
Concen: 548.58 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:168 Resp: 43064

Ion	Ratio	Lower	Upper
168	100		
139	35.1	26.0	39.0
169	13.1	10.6	16.0

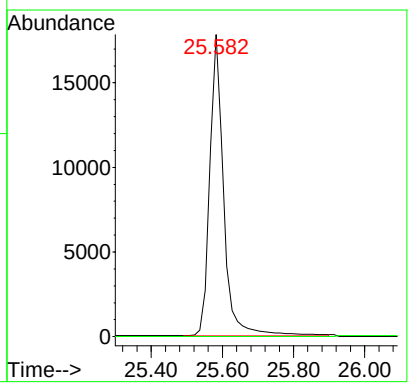


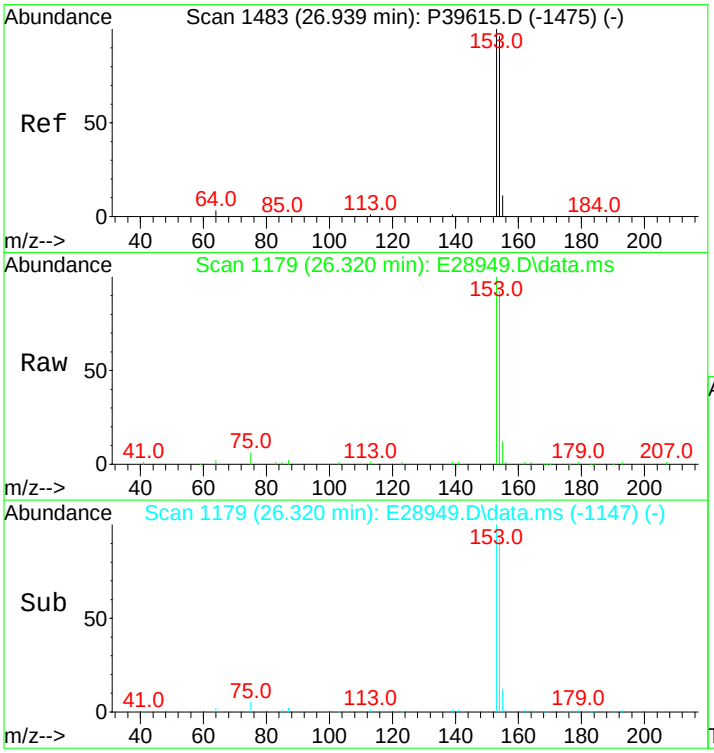


#26
Acenaphthylene
Concen: 551.19 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:152 Resp: 48407

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

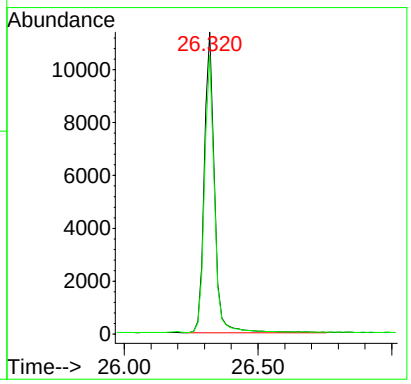


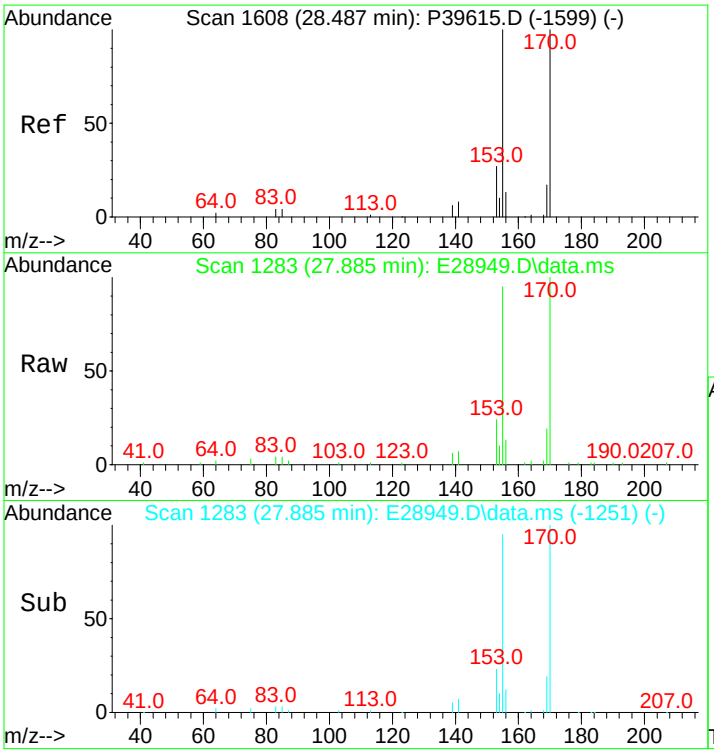


#27
Acenaphthene
Concen: 535.02 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:153 Resp: 30245

Ion	Ratio	Lower	Upper
153	100		
154	90.5	74.1	111.1

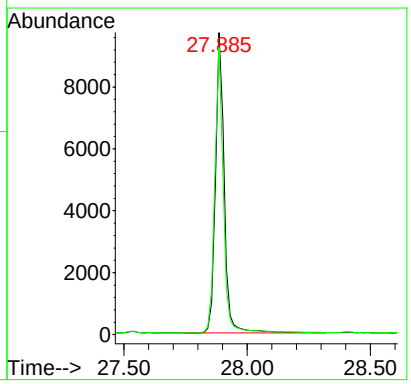


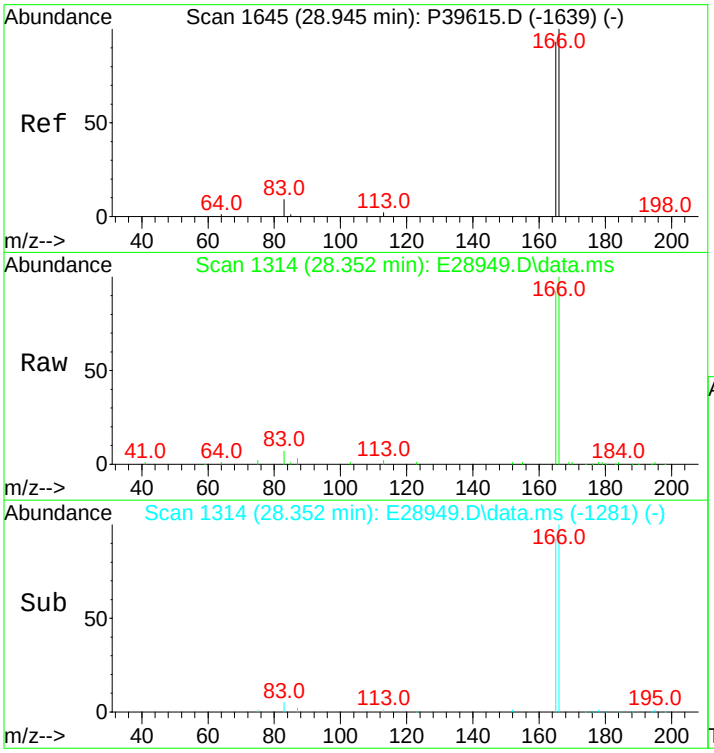


#28
2,3,5-Trimethylnaphthalene
Concen: 512.65 ng/mL
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:170 Resp: 24255

Ion	Ratio	Lower	Upper
170	100		
155	92.4	70.7	106.1

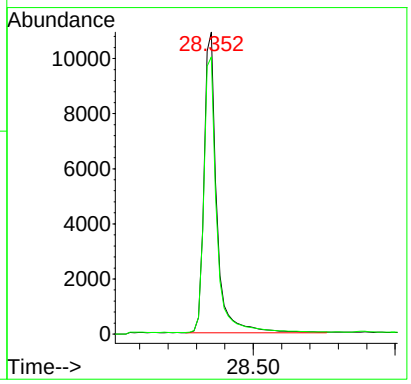


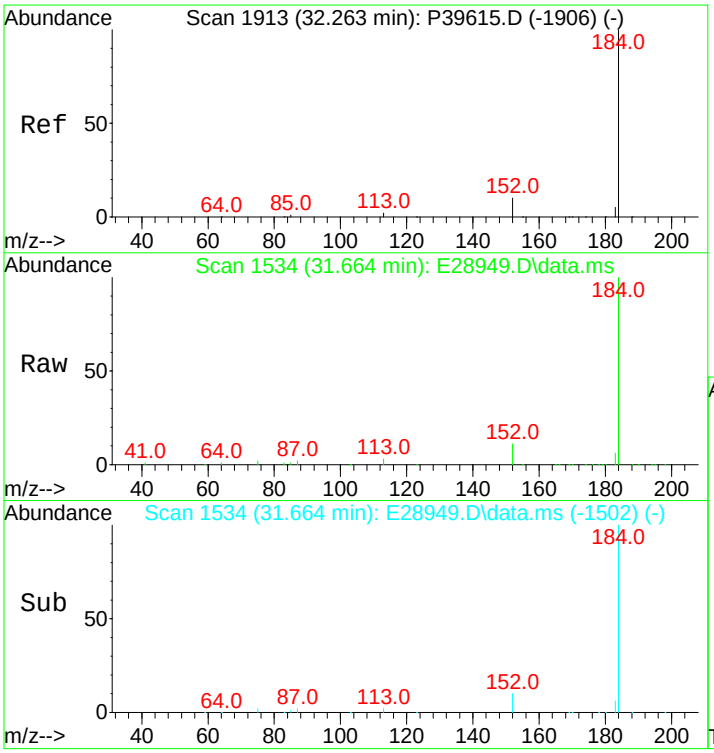


#29
Fluorene
Concen: 533.47 ng/mL
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:166 Resp: 33635

Ion	Ratio	Lower	Upper
166	100		
165	95.1	74.7	112.1

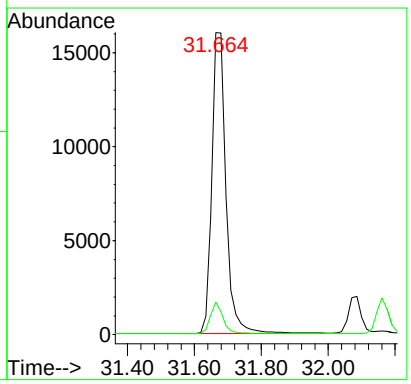


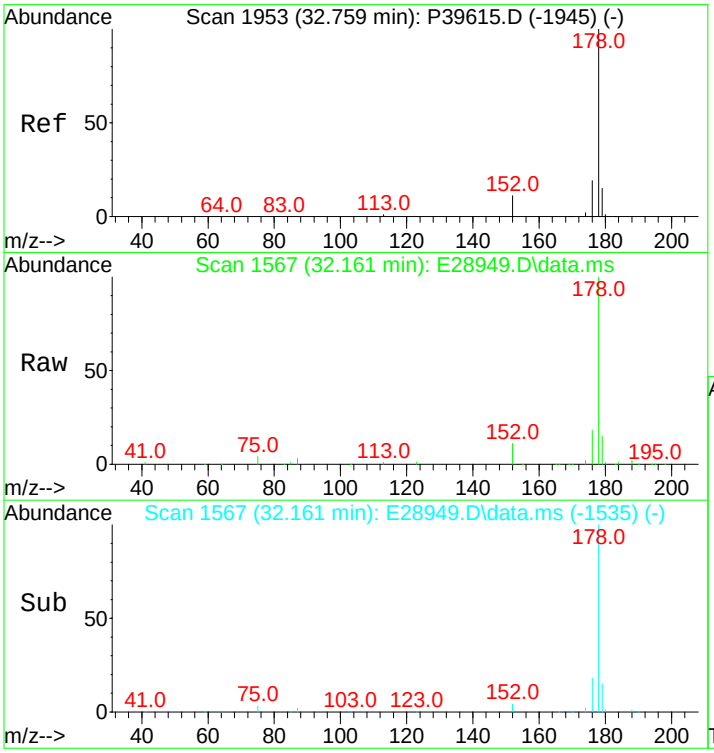


#33
Dibenzothiophene
Concen: 541.58 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:184 Resp: 46858

Ion	Ratio	Lower	Upper
184	100		
152	9.3	7.0	10.6

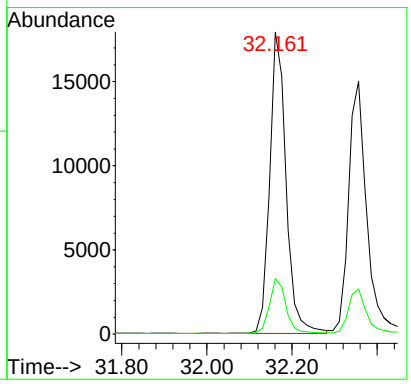


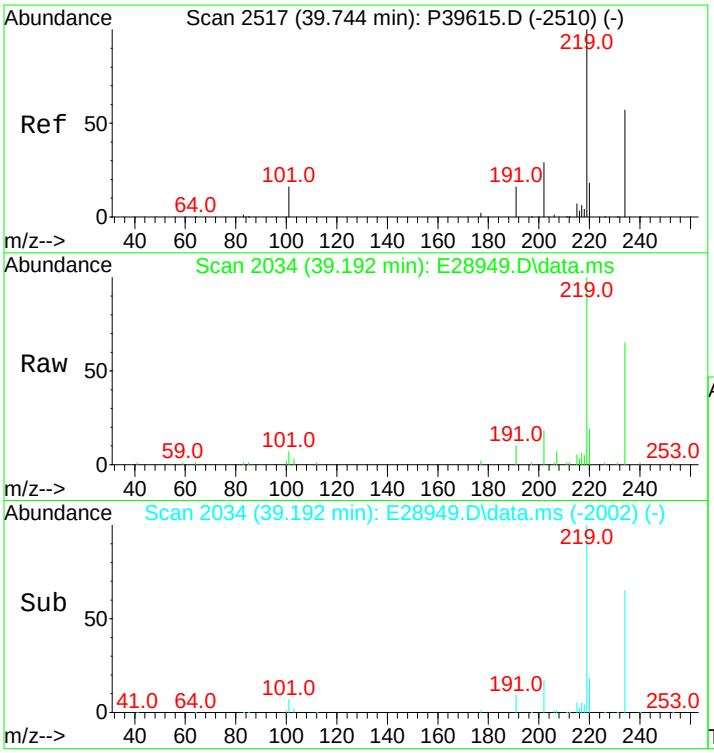


#43
Phenanthrene
Concen: 540.79 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:178 Resp: 47604

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.4

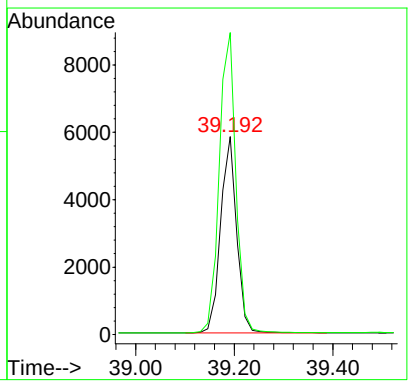


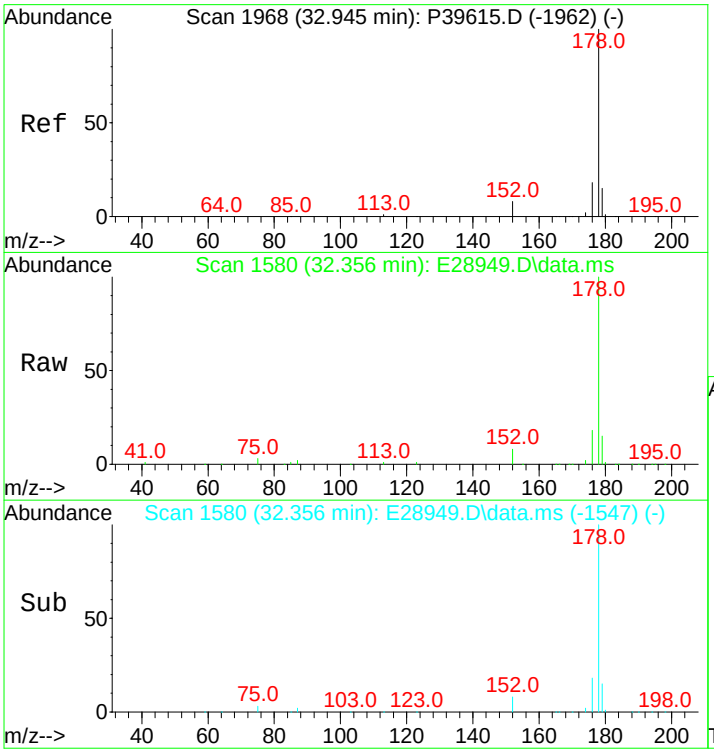


#54
Retene
Concen: 467.74 ng/mL
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:234 Resp: 13249

Ion	Ratio	Lower	Upper
234	100		
219	158.9	115.3	172.9

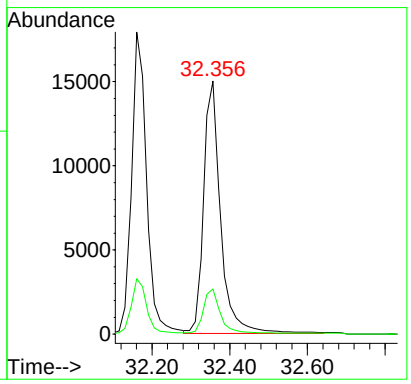


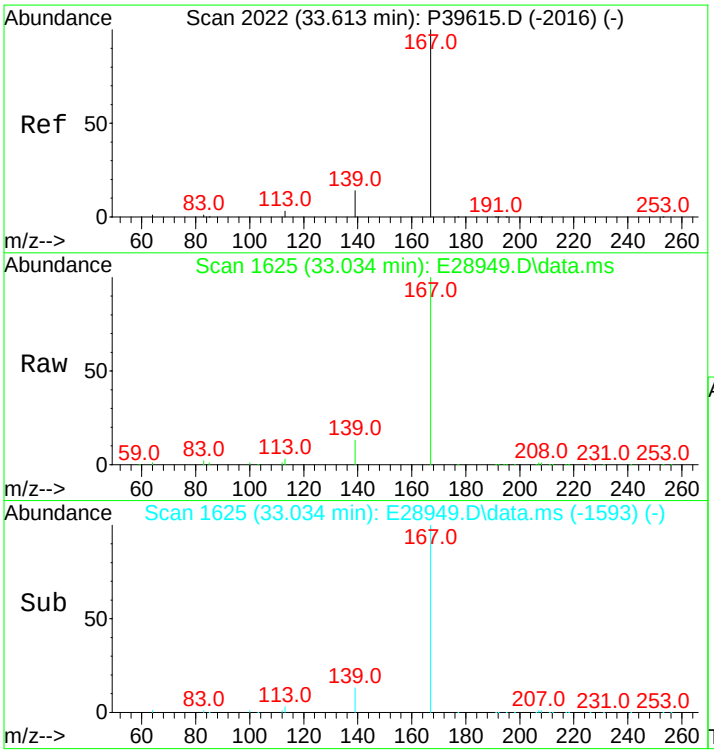


#55
Anthracene
Concen: 596.47 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:178 Resp: 45383

Ion	Ratio	Lower	Upper
178	100		
176	17.3	14.3	21.5

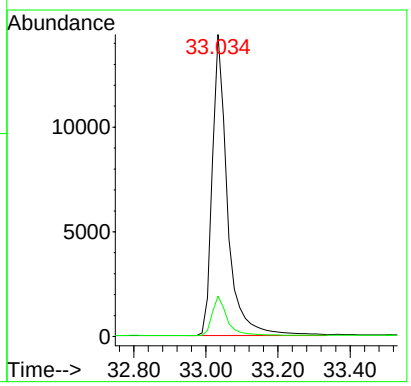


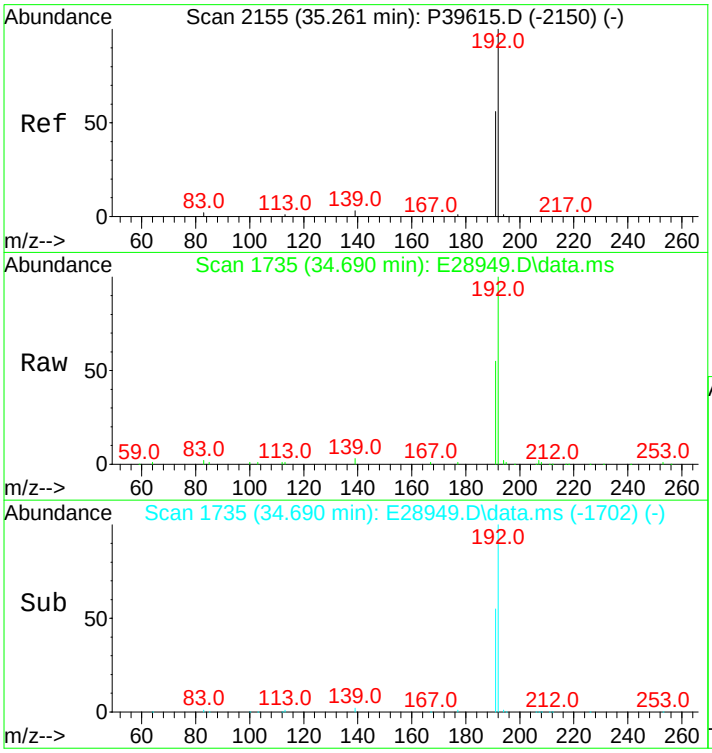


#56
Carbazole
Concen: 540.31 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:167 Resp: 42309

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.1	15.1

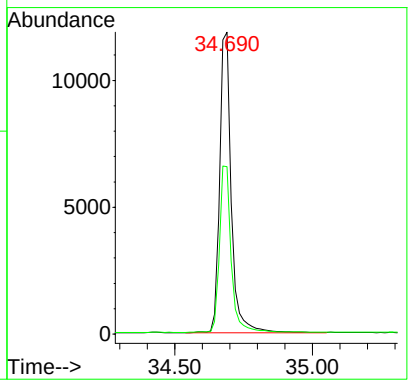


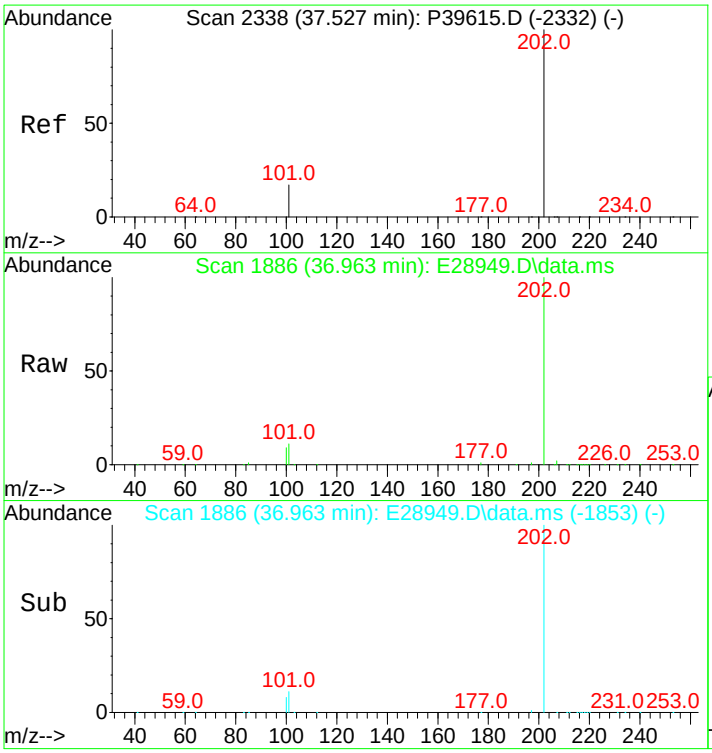


#57
1-Methylphenanthrene
Concen: 516.96 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:192 Resp: 34717

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

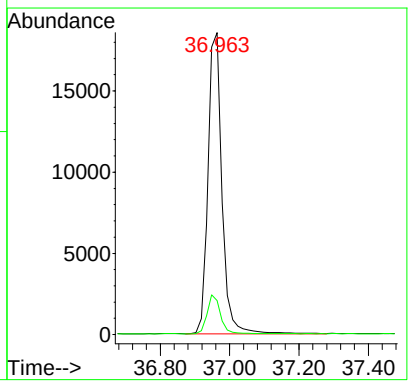


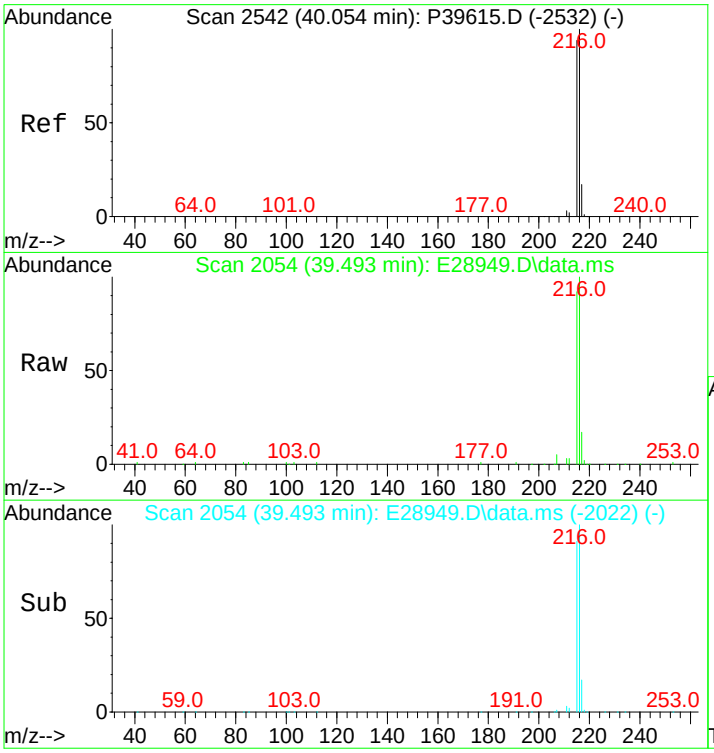


#58
Fluoranthene
Concen: 530.36 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:202 Resp: 51557

Ion	Ratio	Lower	Upper
202	100		
101	12.3	10.4	15.6

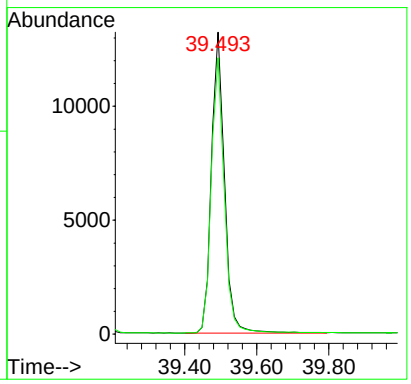


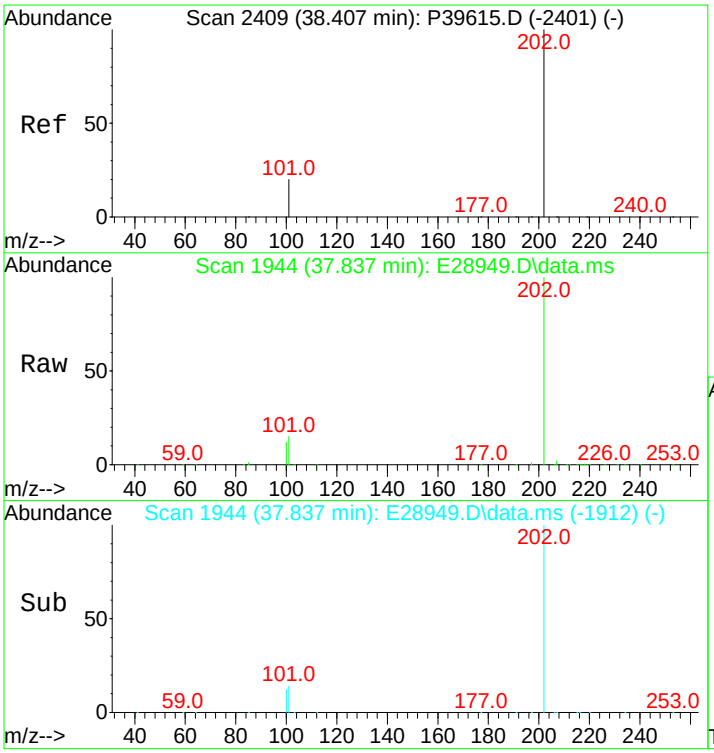


#59
Benzo(b)fluorene
Concen: 514.23 ng/mL
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:216 Resp: 33310

Ion	Ratio	Lower	Upper
216	100		
215	92.2	72.6	109.0

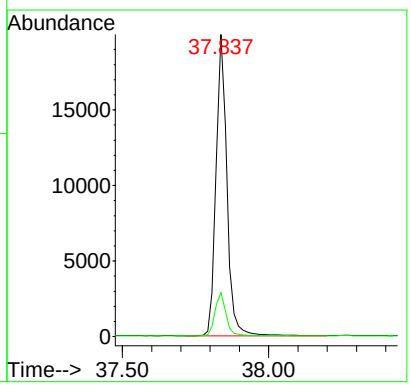


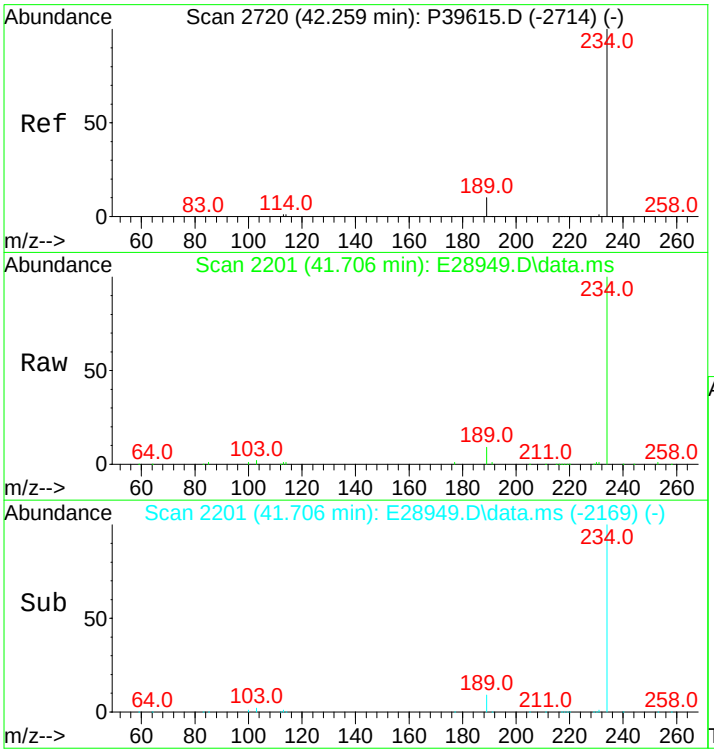


#60
Pyrene
Concen: 519.89 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:202 Resp: 51369

Ion	Ratio	Lower	Upper
202	100		
101	14.5	11.0	16.4

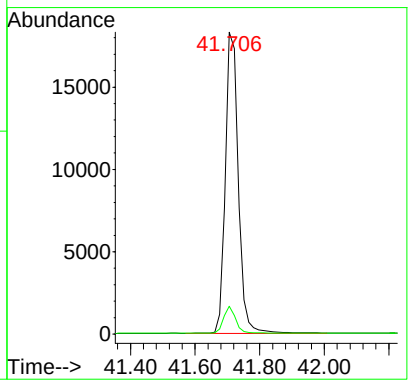


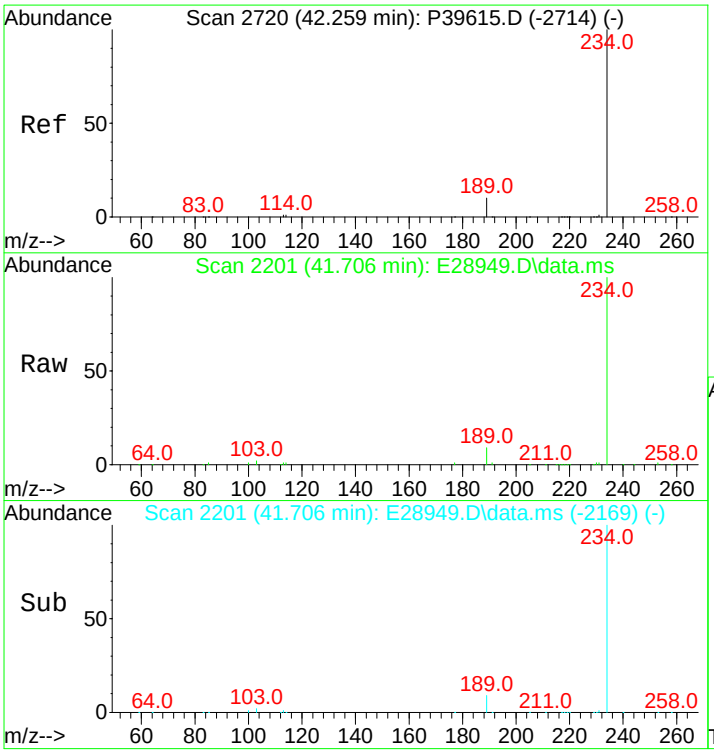


#66
Naphthobenzothiophene
Concen: 520.23 ng/ml
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:234 Resp: 50698

Ion	Ratio	Lower	Upper
234	100		
189	8.3	6.2	9.2

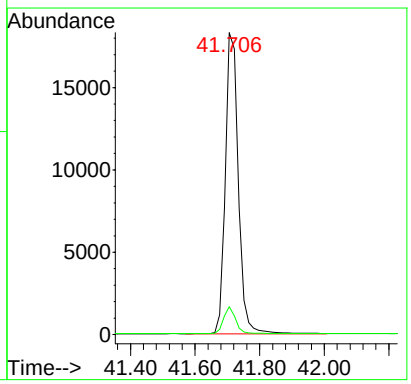


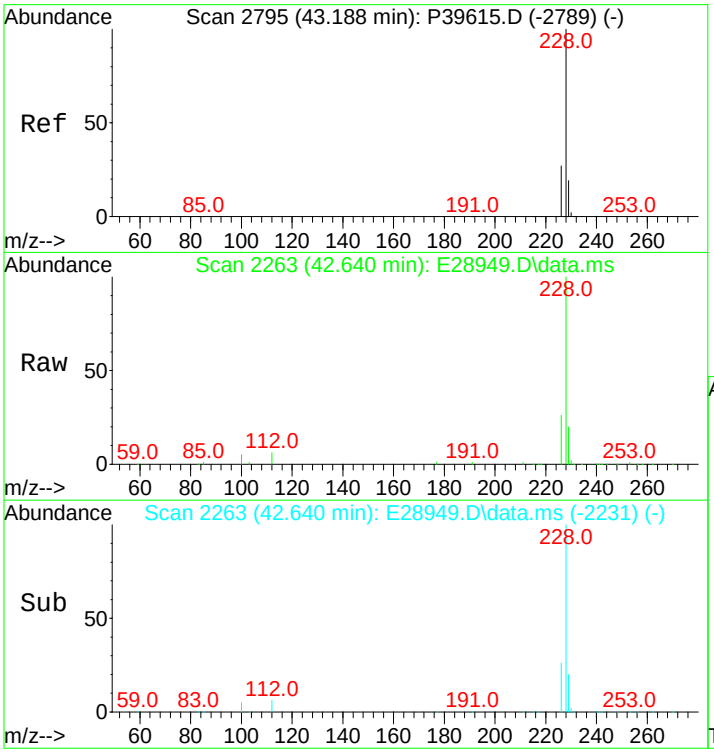


#67
Naphthobenzothiophene-2,1-D
Concen: 520.23 ng/mL
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:234 Resp: 50698

Ion	Ratio	Lower	Upper
234	100		
189	8.3	6.2	9.2

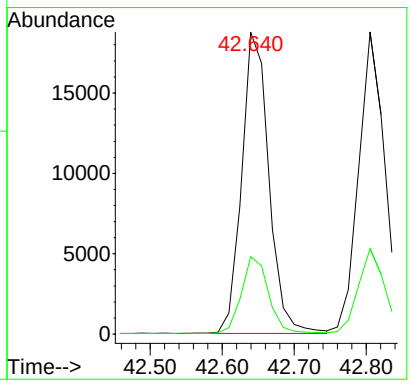


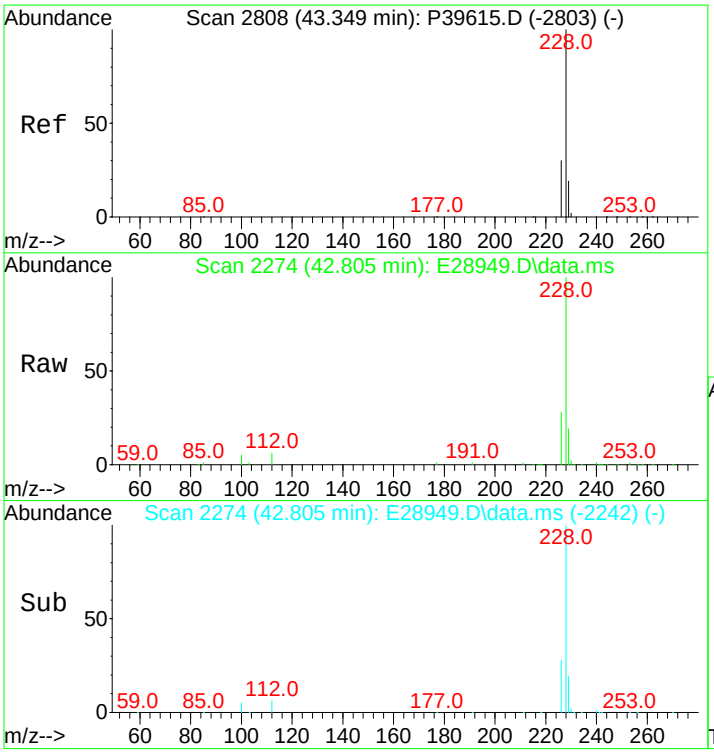


#75
Benz[a]anthracene
Concen: 555.52 ng/mL
RT: 42.640 min Scan# 2263
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:228 Resp: 48820

Ion	Ratio	Lower	Upper
228	100		
226	25.4	20.7	31.1

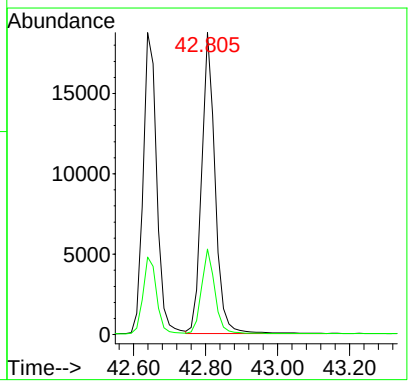


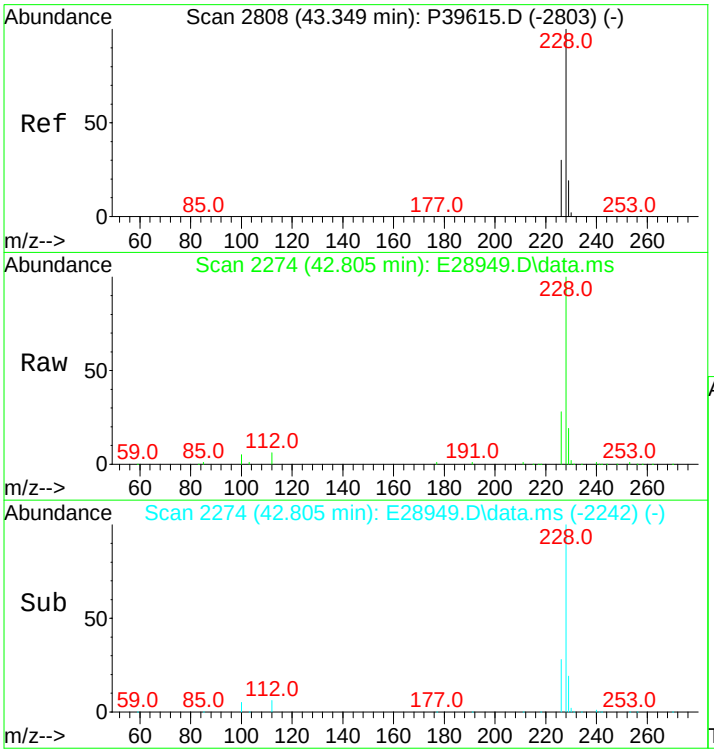


#76
Chrysene
Concen: 543.86 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:228 Resp: 49206

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

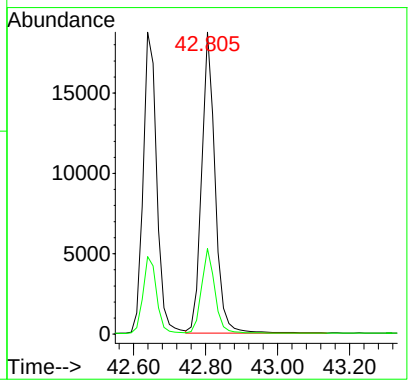


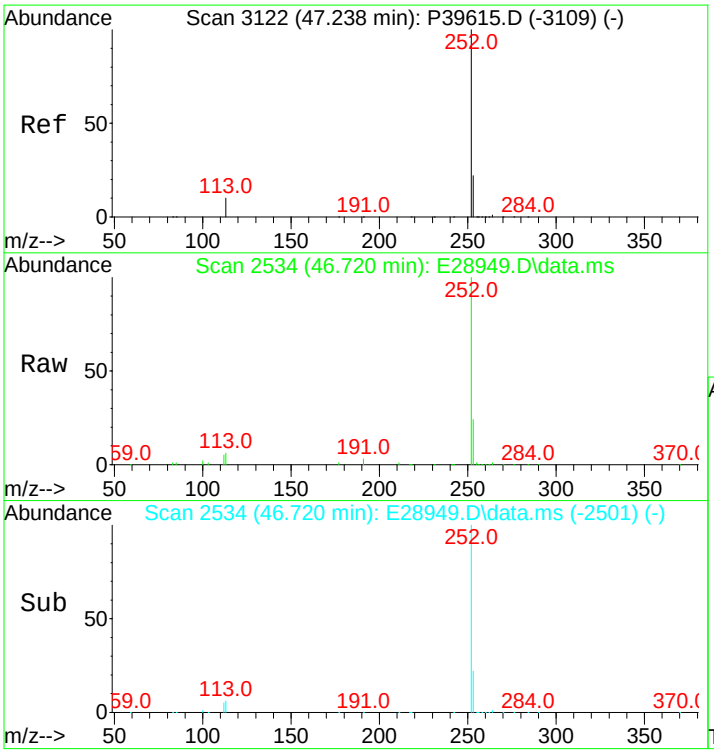


#77
Chrysene/Triphenylene
Concen: 543.86 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:228 Resp: 49206

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

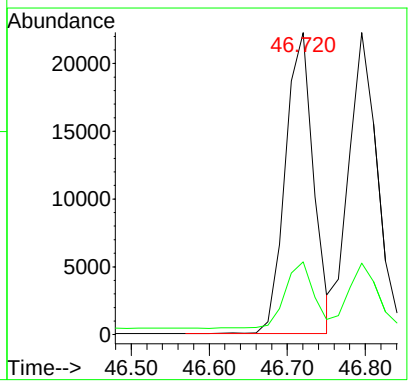


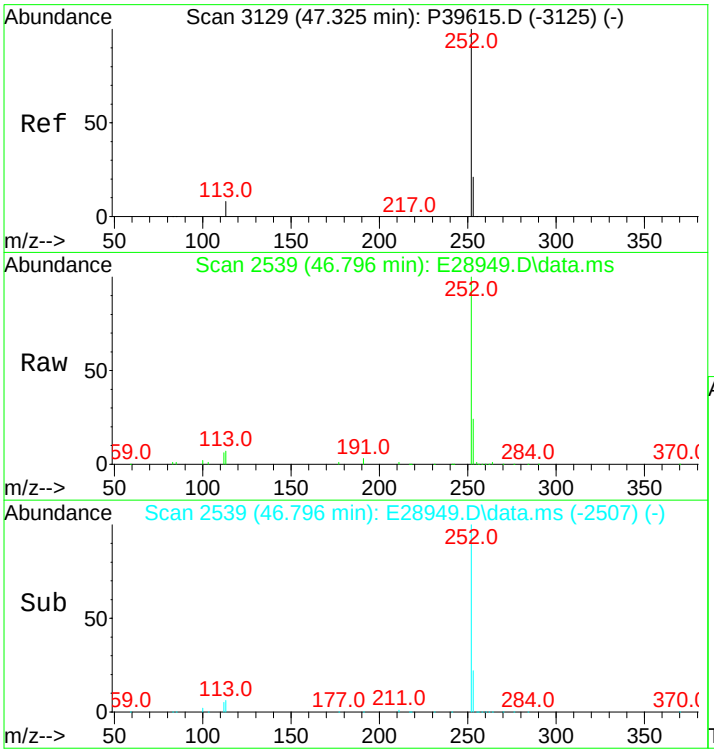


#84
Benzo[b]fluoranthene
Concen: 543.20 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 55487

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.5	29.3

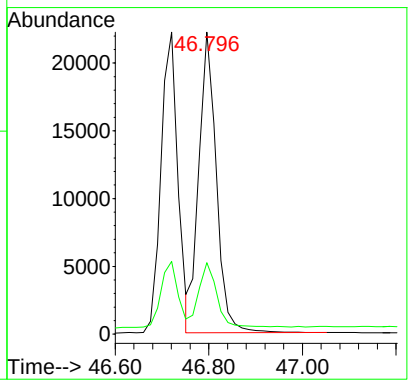


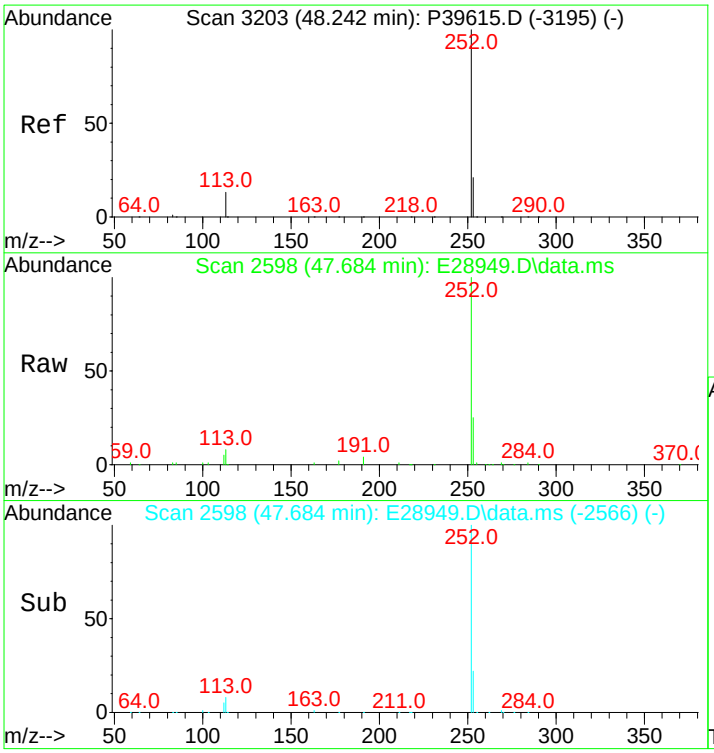


#85
Benzo[j]+[k]fluoranthene
Concen: 550.45 ng/mL
RT: 46.796 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 57848

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.7	29.5

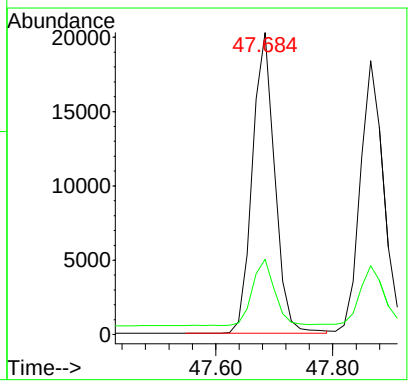


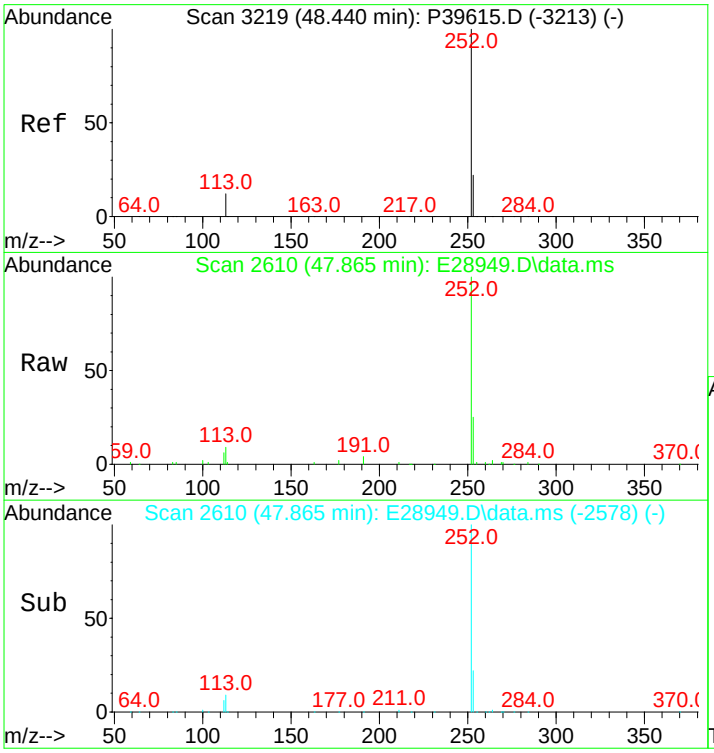


#87
Benzo[e]pyrene
Concen: 536.16 ng/mL
RT: 47.684 min Scan# 2598
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 53477

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.6	31.0

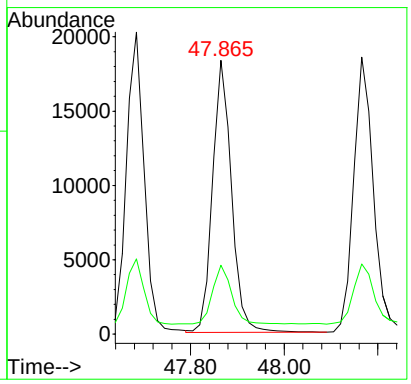


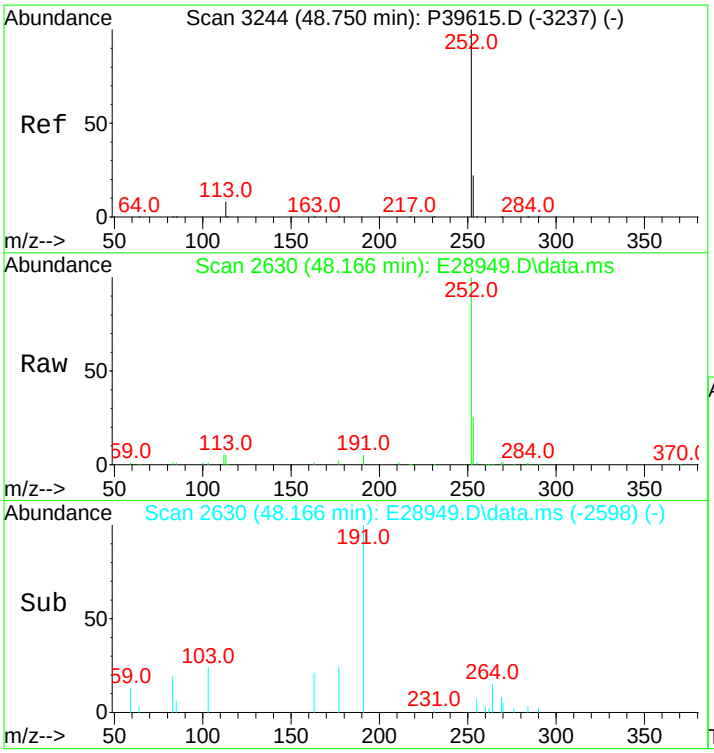


#89
Benzo[a]pyrene
Concen: 539.74 ng/mL
RT: 47.865 min Scan# 2610
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 51512

Ion	Ratio	Lower	Upper
252	100		
253	22.3	20.8	31.2

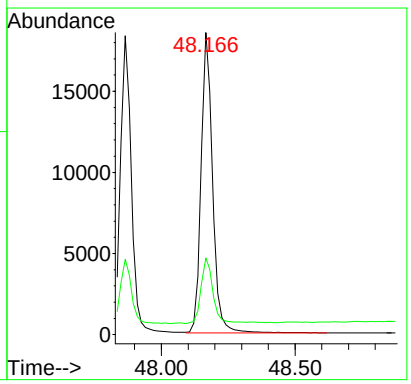


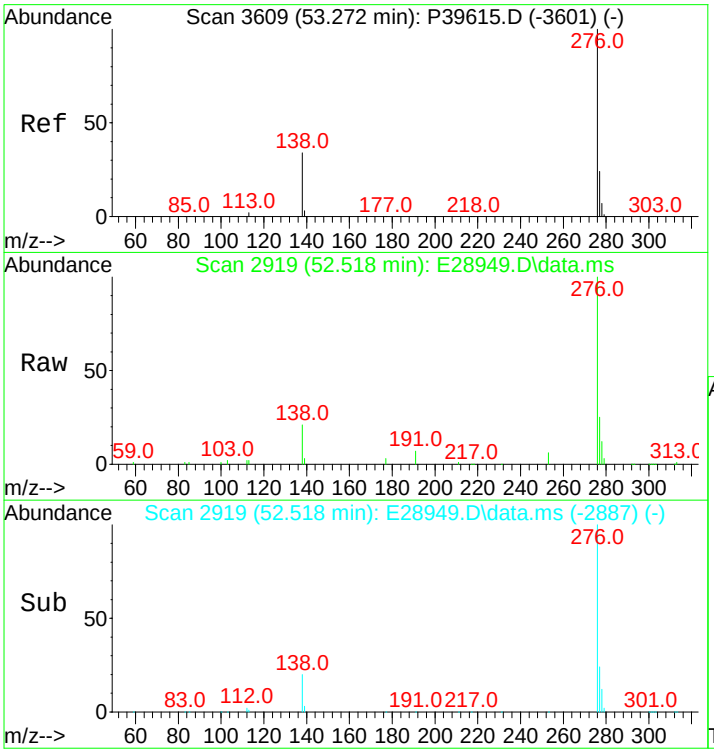


#90
Perylene
Concen: 548.76 ng/mL
RT: 48.166 min Scan# 2630
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 55381

Ion	Ratio	Lower	Upper
252	100		
253	22.7	20.7	31.1

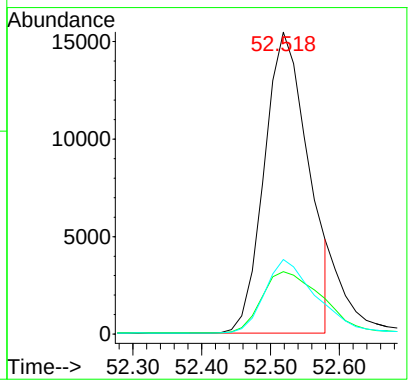


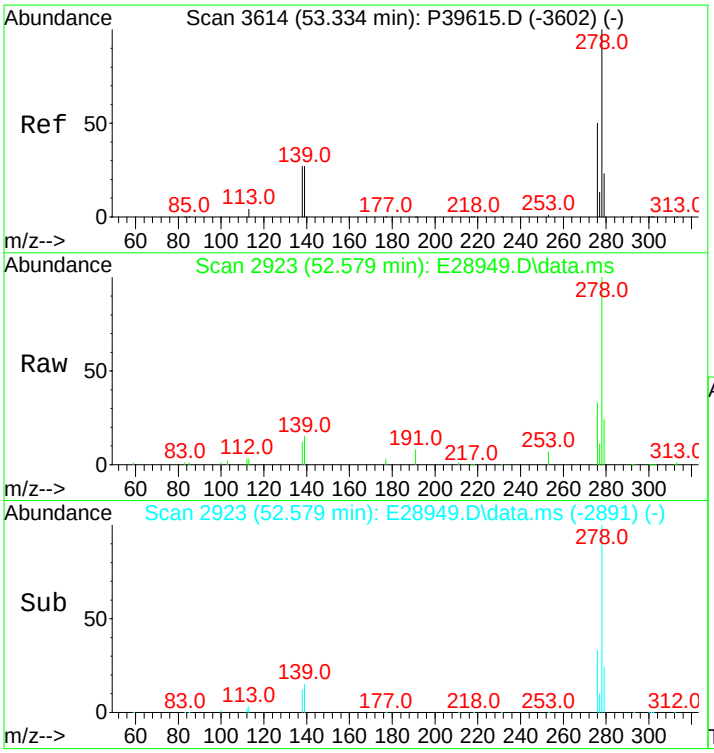


#91
Indeno[1,2,3-cd]pyrene
Concen: 610.54 ng/mL m
RT: 52.518 min Scan# 2919
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:276 Resp: 68575

Ion	Ratio	Lower	Upper
276	100		
138	28.6	16.3	24.5#
277	29.1	19.4	29.2

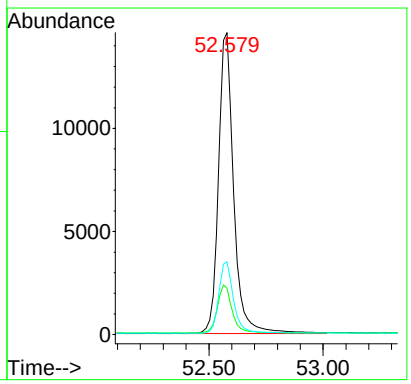


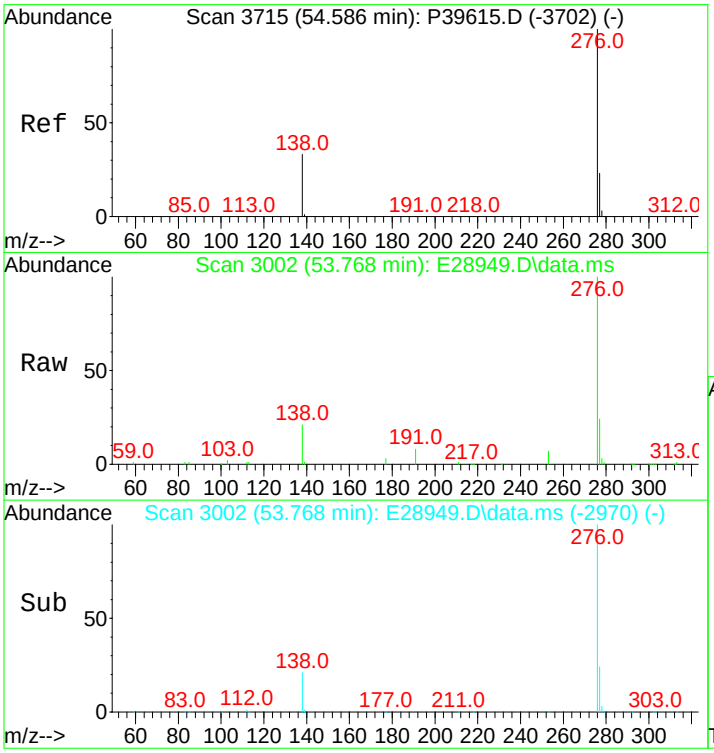


#92
Dibenz[ah]+[ac]anthracene
Concen: 562.80 ng/mL
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:278 Resp: 67308

Ion	Ratio	Lower	Upper
278	100		
139	15.7	11.6	17.4
279	23.2	19.3	28.9

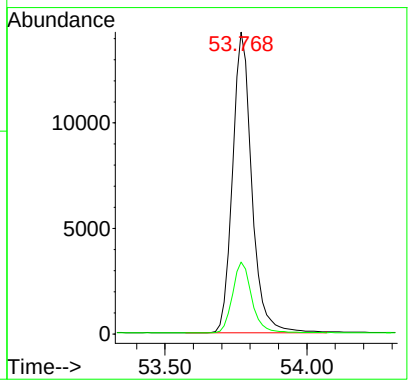


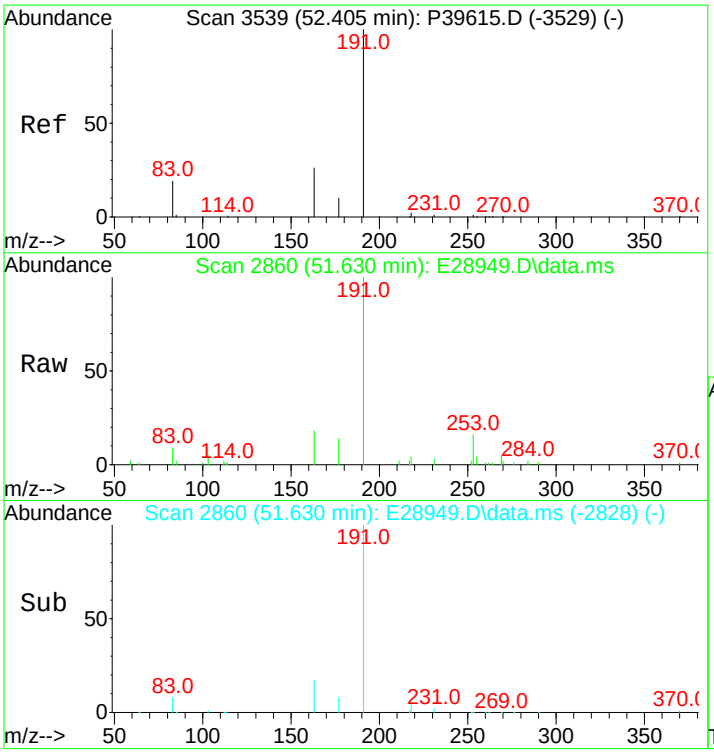


#93
Benzo[g,h,i]perylene
Concen: 553.17 ng/mL
RT: 53.768 min Scan# 3002
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:276 Resp: 66993

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

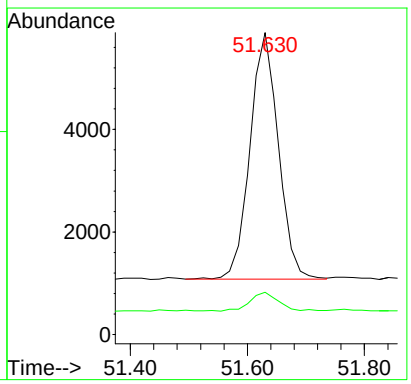


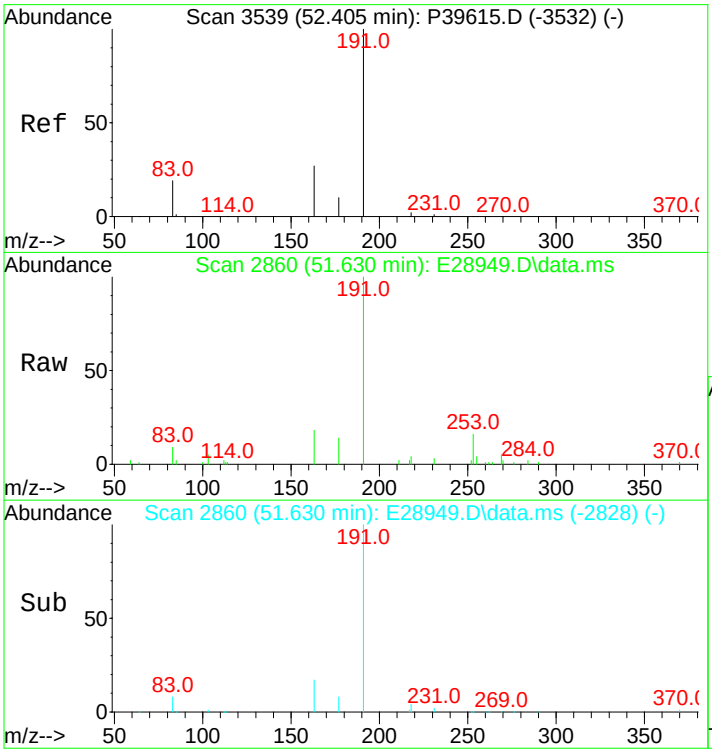


#94
Hopane (T19)
Concen: 476.21 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:191 Resp: 16129

Ion	Ratio	Lower	Upper
191	100		
177	7.6	11.6	17.4#

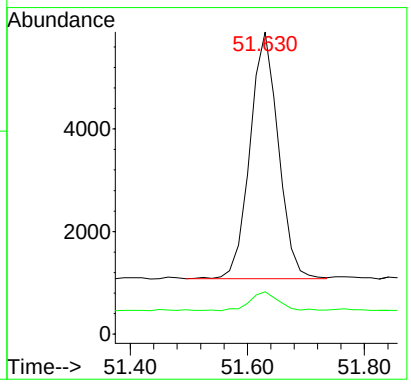




#95
17a(H),21B(H)-hopane - C30H52
Concen: 476.21 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:191 Resp: 16129

Ion	Ratio	Lower	Upper
191	100		
177	7.6	11.6	17.4#



Quantitation Report (QT Reviewed)

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Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24365	500.000	ng/mL	0.00
74) Chrysene-d12	42.700	240	52429	500.000	ng/mL	-0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43806	511.145	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
42) Phenanthrene-d10	32.070	188	42246	481.140	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.11%#			
83) Benzo[b]fluoranthene-d12	46.630	264	55562	515.888	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.59%			
88) Benzo[a]pyrene-d12	47.774	264	54860	525.698	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.57%			
129) 5B(H)Cholane - Surr	43.332	217	11210	542.504	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.25%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4924	252.646	ng/mL	100
4) cis-Decalin	17.091	138	3820	257.979	ng/mL	100
10) Naphthalene	19.304	128	53459	557.792	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32688	535.503	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	32095	541.111	ng/mL#	100
18) Benzothiophene	19.515	134	44435	560.833	ng/mL	100
23) Biphenyl	23.881	154	41378	536.354	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	29119	529.237	ng/mL#	100
25) Dibenzofuran	26.967	168	46406	543.332	ng/mL	98
26) Acenaphthylene	25.582	152	53648M3	561.449	ng/mL	
27) Acenaphthene	26.320	153	32791	533.132	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	26457	513.957	ng/mL	96
29) Fluorene	28.337	166	36791	536.322	ng/mL	99
33) Dibenzothiophene	31.664	184	51254	544.465	ng/mL	99
43) Phenanthrene	32.161	178	51355	536.212	ng/mL	99
54) Retene	39.192	234	15584	505.663	ng/mL	91
55) Anthracene	32.356	178	49682M3	600.153	ng/mL	
56) Carbazole	33.034	167	47641	559.182	ng/mL	100
57) 1-Methylphenanthrene	34.675	192	38623	528.594	ng/mL	99
58) Fluoranthene	36.948	202	57063	539.514	ng/mL	99
59) Benzo(b)fluorene	39.493	216	38675	548.750	ng/mL	99
60) Pyrene	37.837	202	57901	538.596	ng/mL	98
66) Naphthobenzothiophene	41.706	234	59037	556.796	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.706	234	59037	556.796	ng/mL#	64
75) Benz[a]anthracene	42.639	228	57961	567.714	ng/mL	99
76) Chrysene	42.805	228	56830	540.676	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	56830	540.676	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	67802	571.353	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.795	252	70705	579.122	ng/mL	93
87) Benzo[e]pyrene	47.684	252	64947	560.508	ng/mL	94
89) Benzo[a]pyrene	47.865	252	63567	573.327	ng/mL	92
90) Perylene	48.166	252	68142	581.205	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.518	276	79882M3	612.194	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	82188	591.544	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	80391	571.386	ng/mL	100
94) Hopane (T19)	51.630	191	19942	506.820	ng/mL#	82
95) 17a(H),21B(H)-hopane - C3	51.630	191	19942	506.820	ng/mL#	82

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
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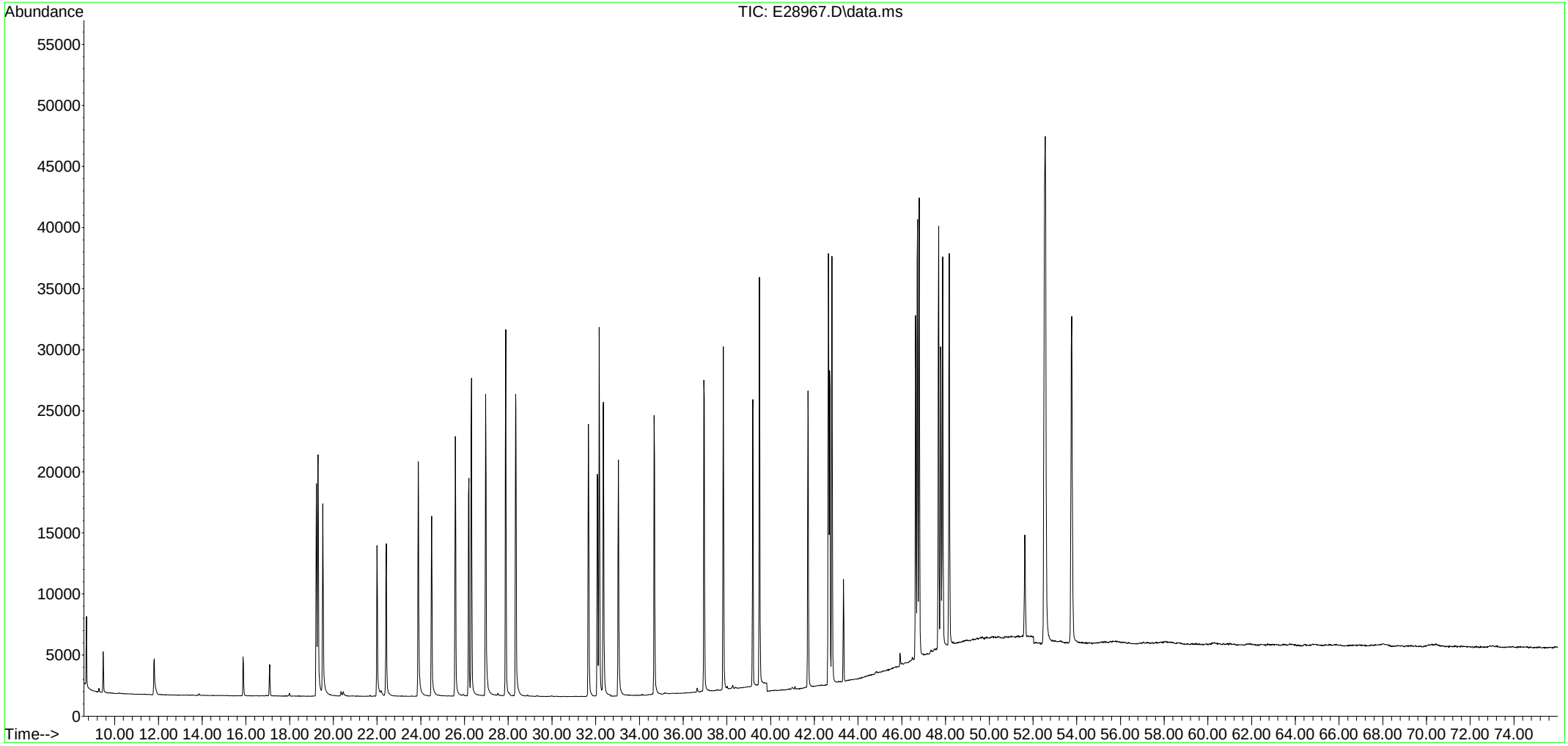
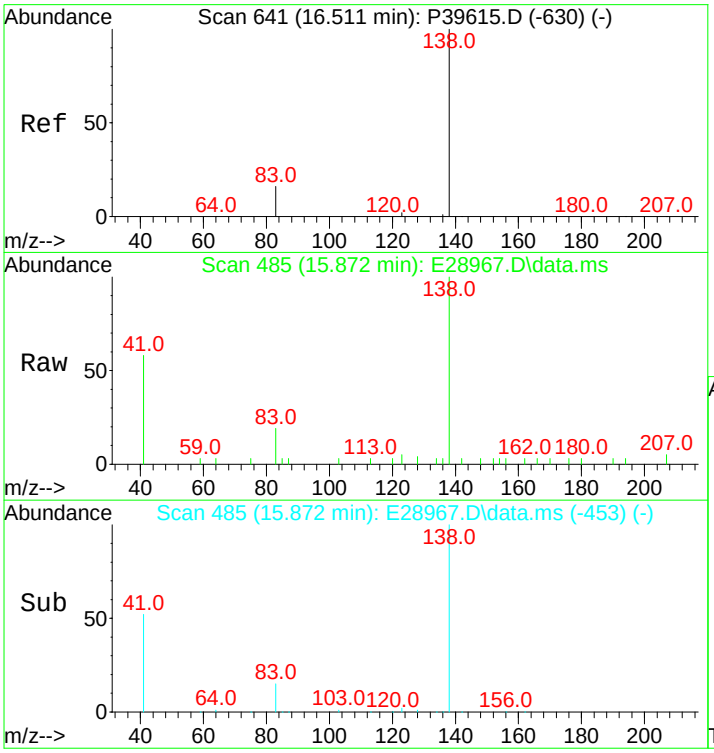
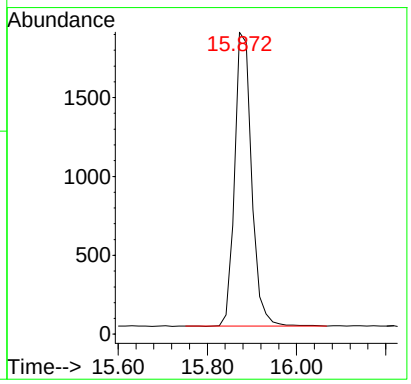
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

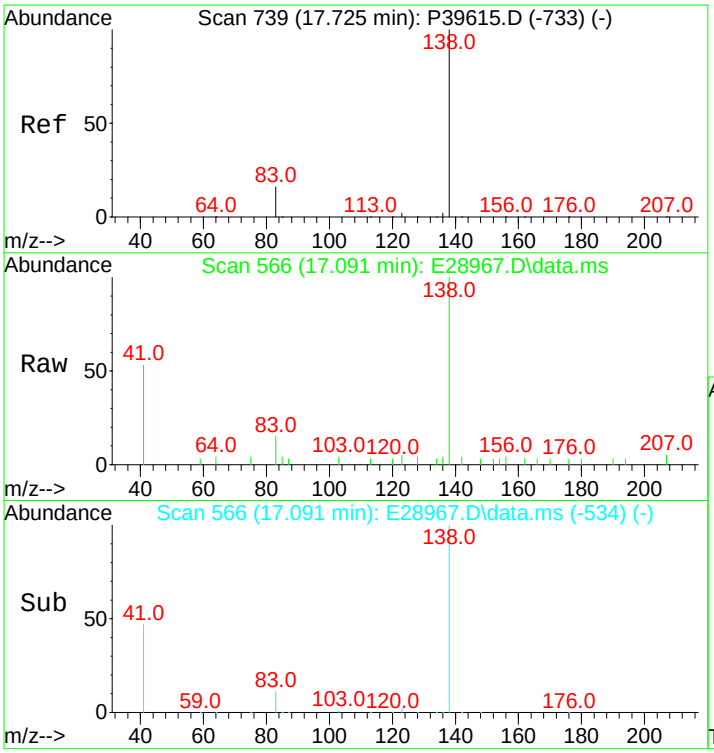




#3
trans-Decalin
Concen: 252.65 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

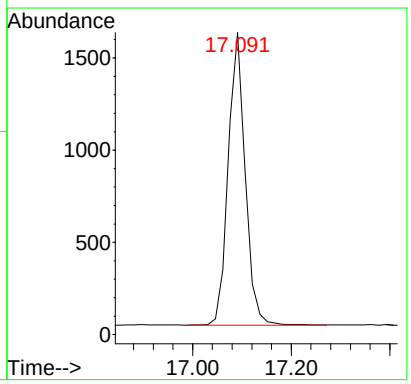
Tgt Ion:138 Resp: 4924

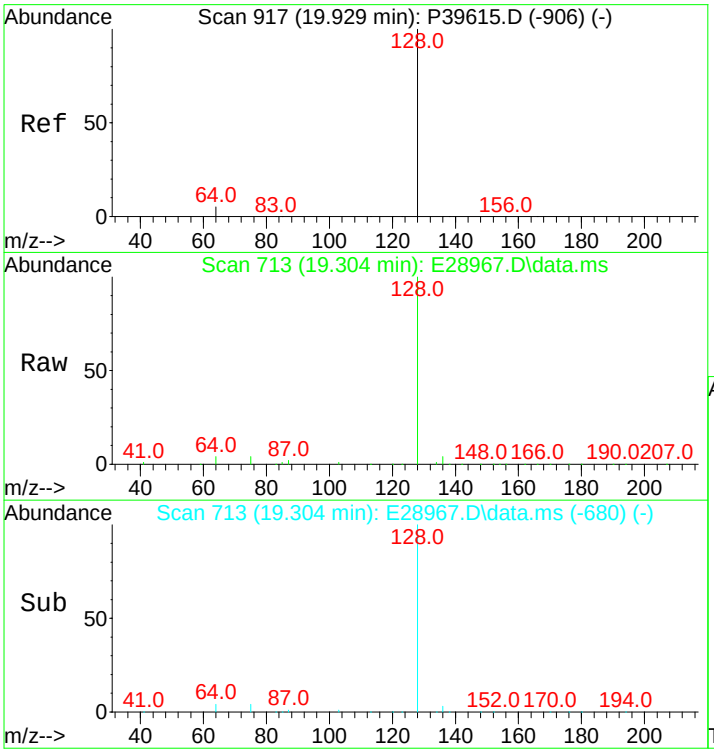




#4
cis-Decalin
Concen: 257.98 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:138 Resp: 3820

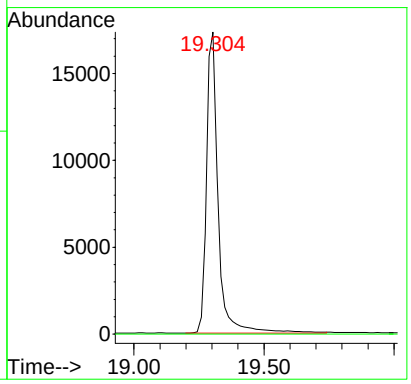


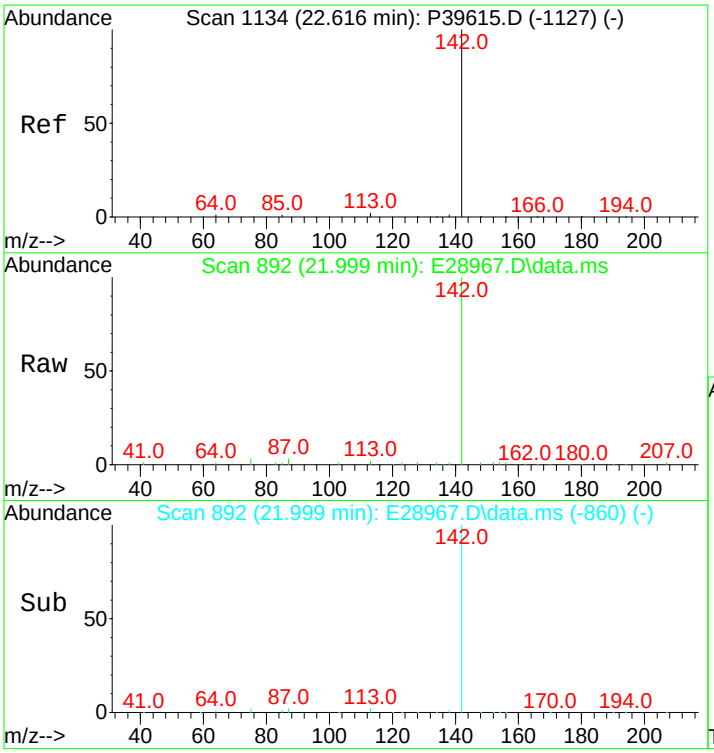


#10
Naphthalene
Concen: 557.79 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:128 Resp: 53459

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

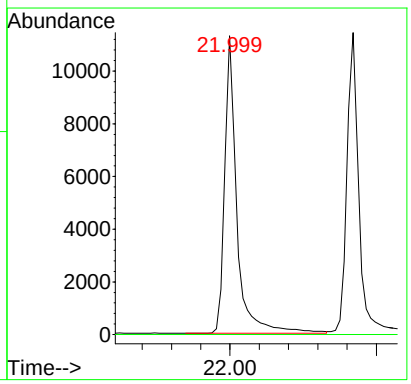


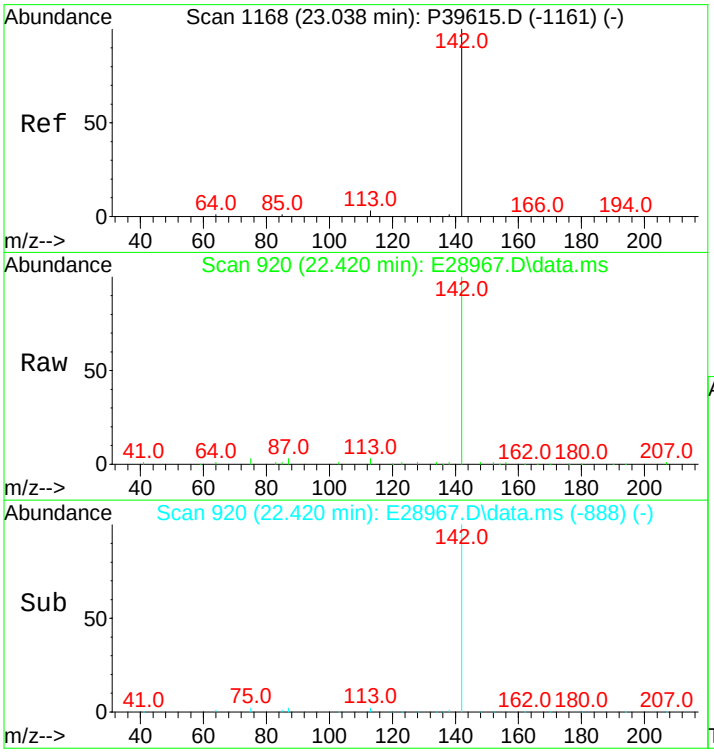


#16
2-Methylnaphthalene
Concen: 535.50 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:142 Resp: 32688

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

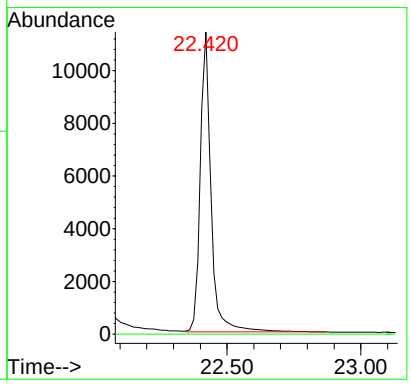


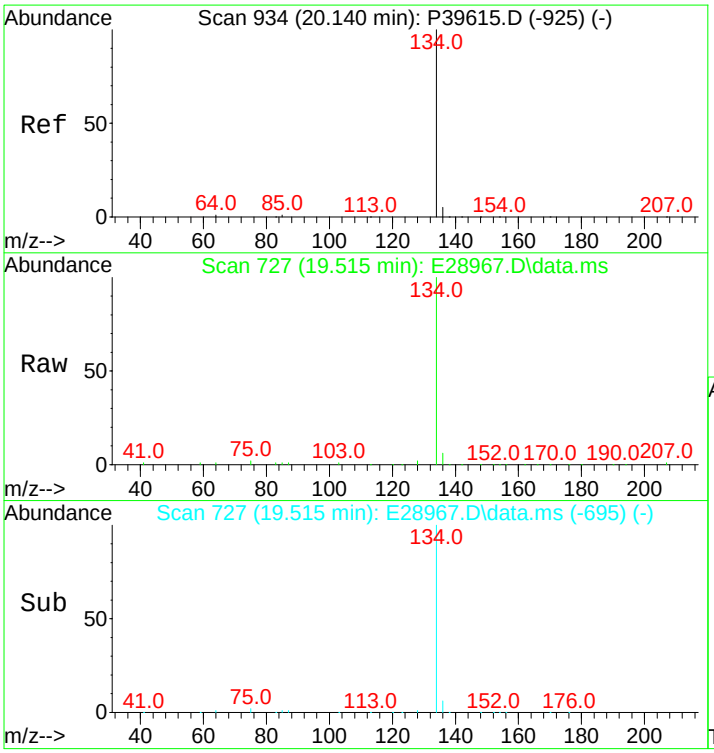


#17
1-Methylnaphthalene
Concen: 541.11 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:142 Resp: 32095

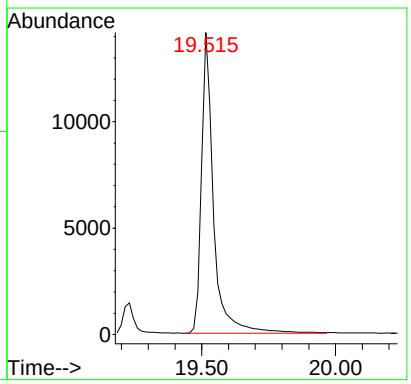
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

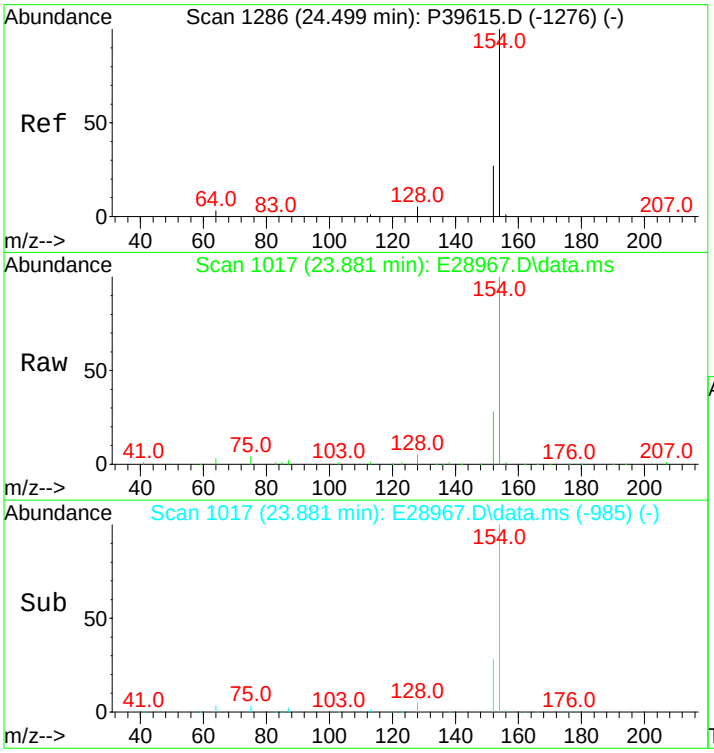




#18
Benzothiophene
Concen: 560.83 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:134 Resp: 44435

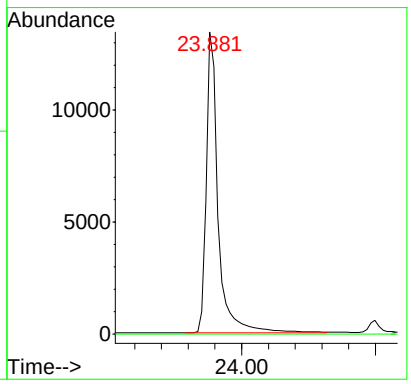


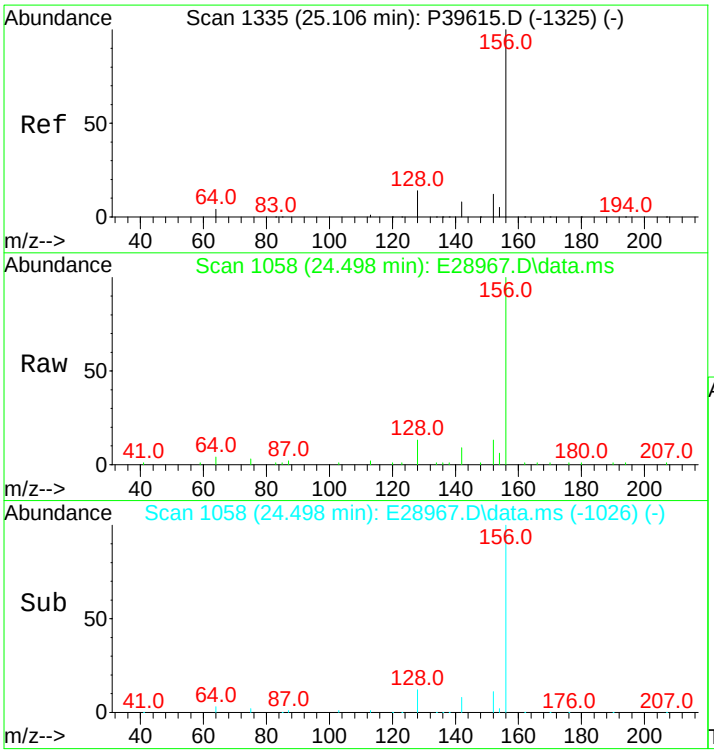


#23
Biphenyl
Concen: 536.35 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:154 Resp: 41378

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

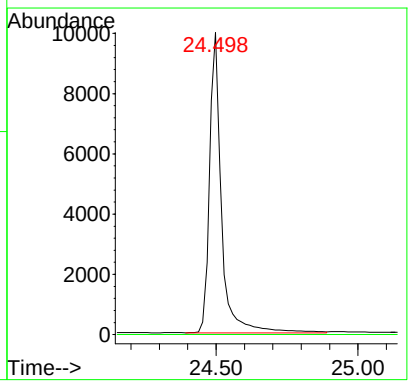


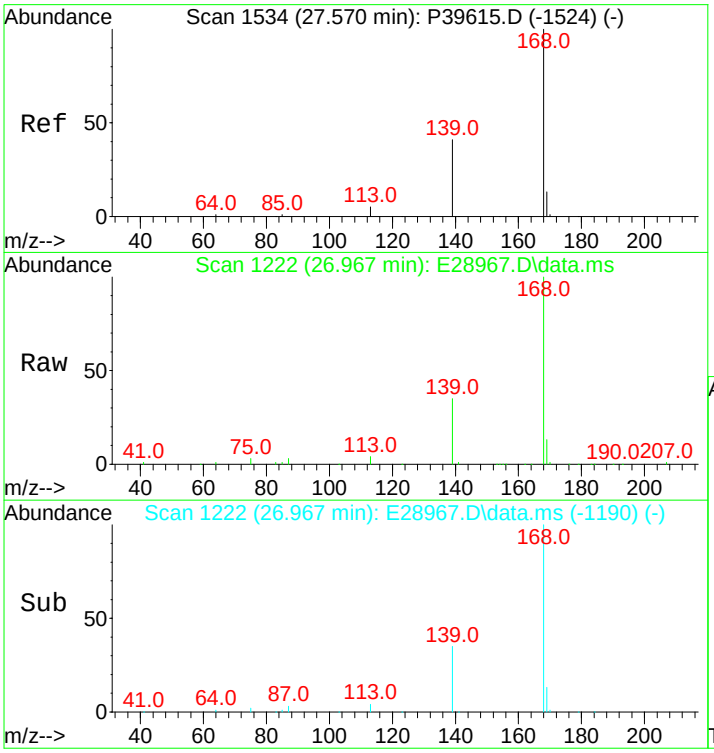


#24
2,6-Dimethylnaphthalene
Concen: 529.24 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:156 Resp: 29119

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

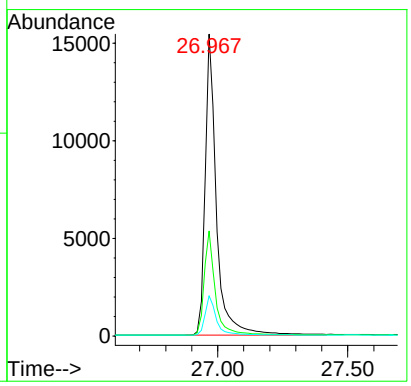


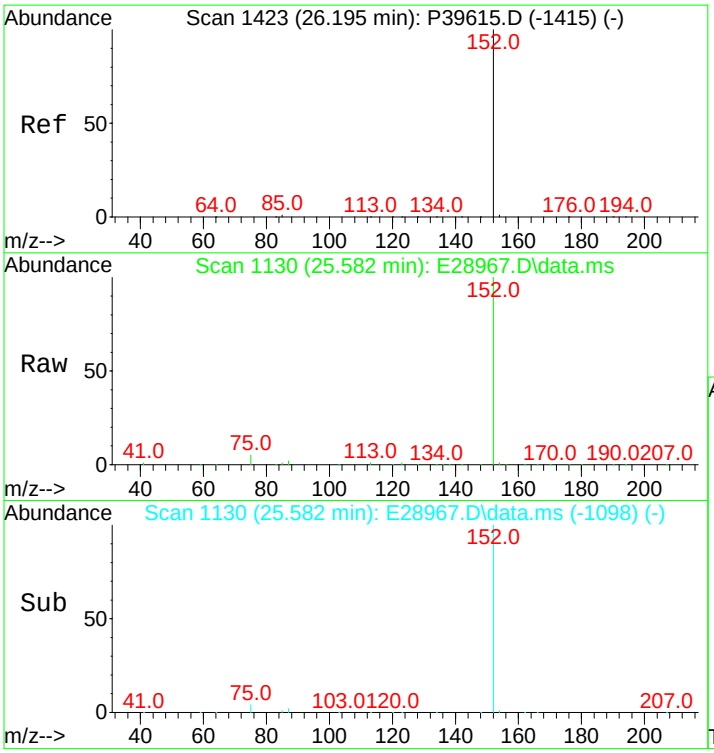


#25
Dibenzofuran
Concen: 543.33 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:168 Resp: 46406

Ion	Ratio	Lower	Upper
168	100		
139	34.2	26.0	39.0
169	13.2	10.6	16.0

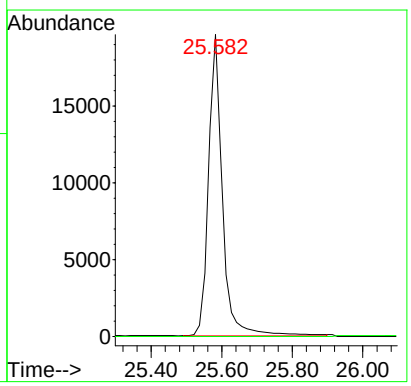


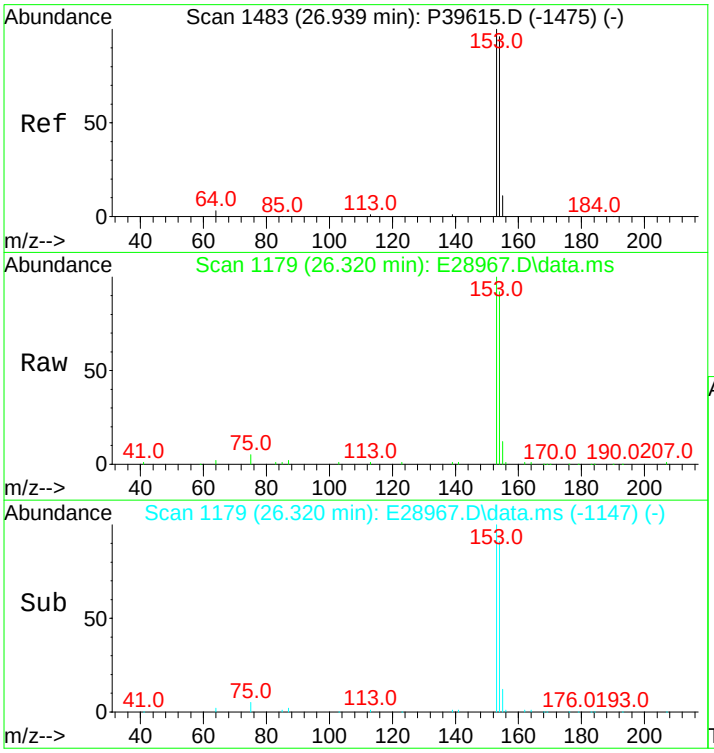


#26
Acenaphthylene
Concen: 561.45 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:152 Resp: 53648

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

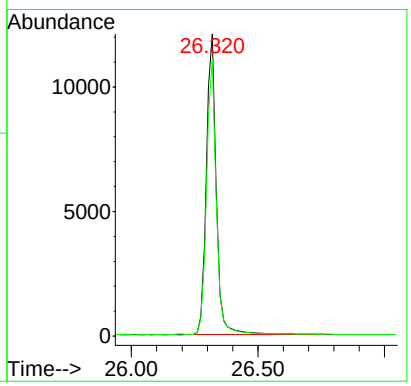


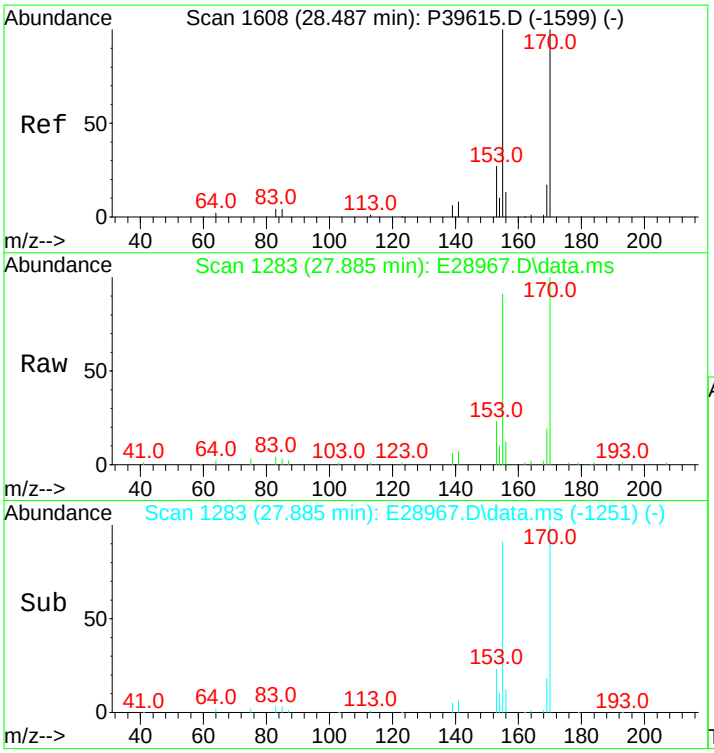


#27
Acenaphthene
Concen: 533.13 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:153 Resp: 32791

Ion	Ratio	Lower	Upper
153	100		
154	90.9	74.1	111.1

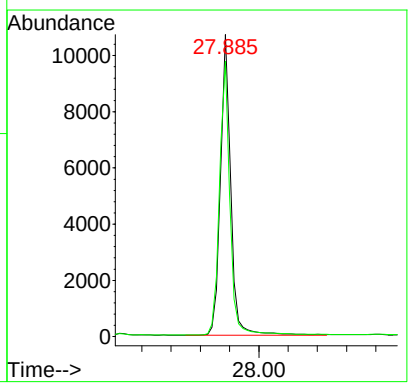


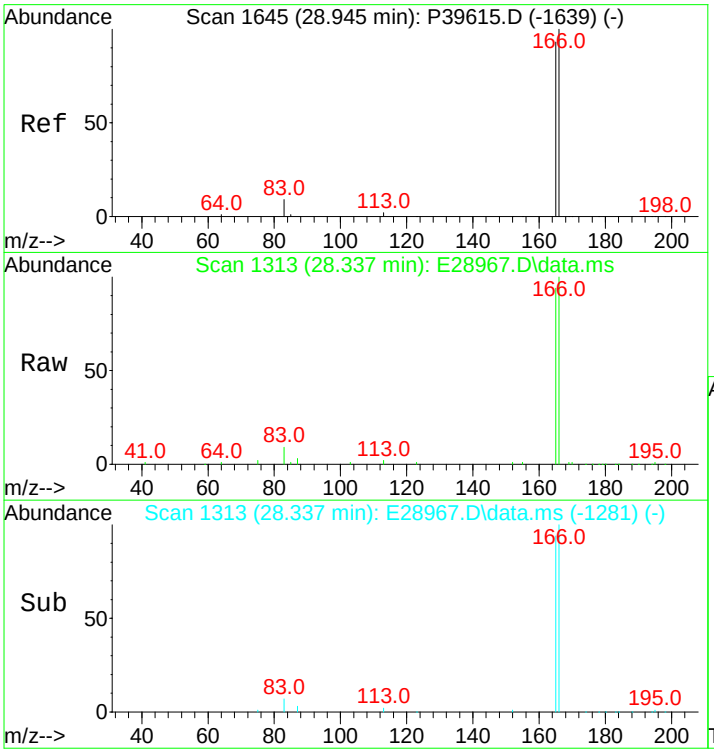


#28
2,3,5-Trimethylnaphthalene
Concen: 513.96 ng/mL
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:170 Resp: 26457

Ion	Ratio	Lower	Upper
170	100		
155	91.8	70.7	106.1

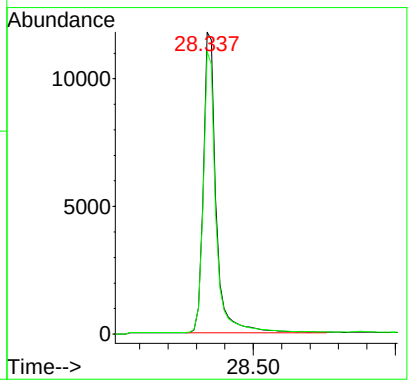


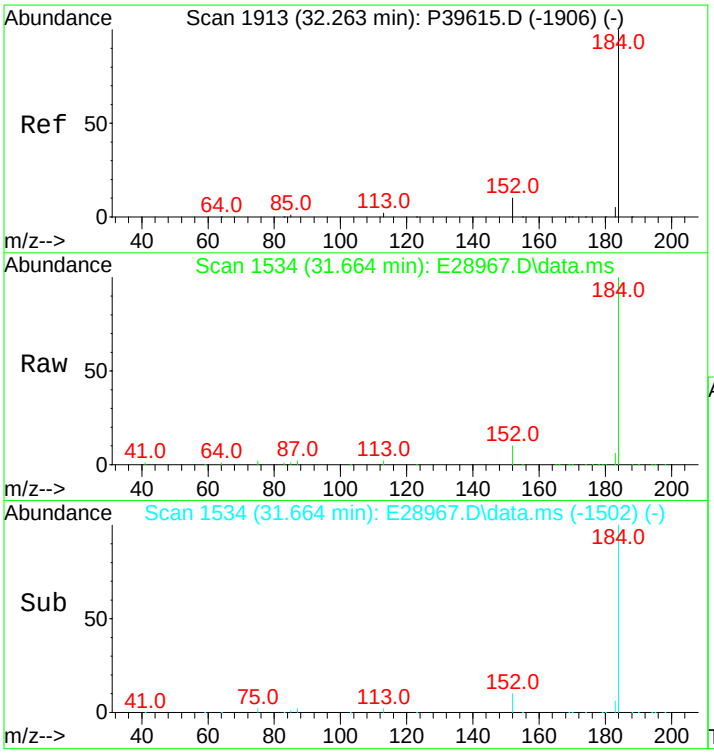


#29
Fluorene
Concen: 536.32 ng/mL
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:166 Resp: 36791

Ion	Ratio	Lower	Upper
166	100		
165	92.0	74.7	112.1

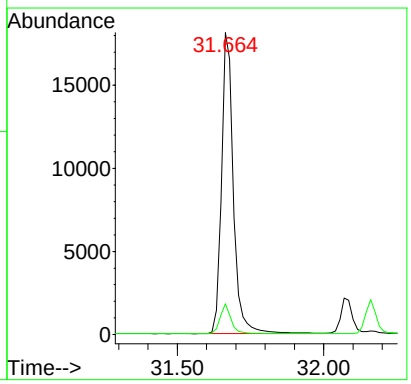


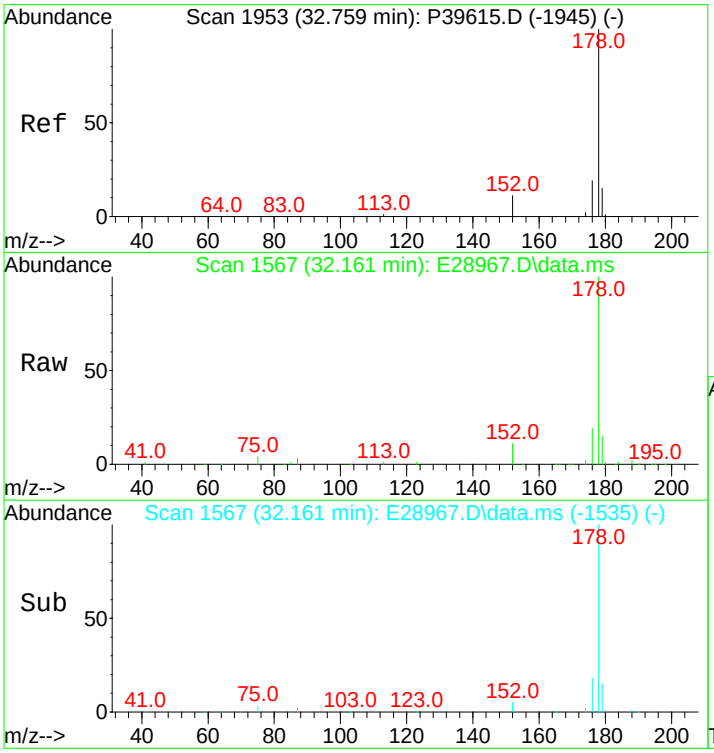


#33
Dibenzothiophene
Concen: 544.46 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:184 Resp: 51254

Ion	Ratio	Lower	Upper
184	100		
152	9.2	7.0	10.6

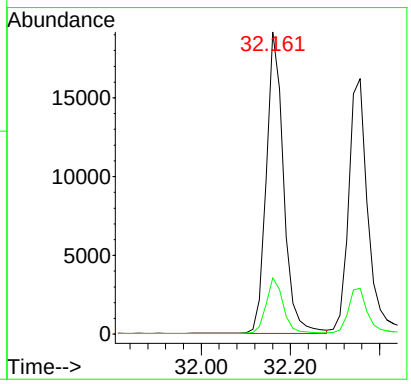


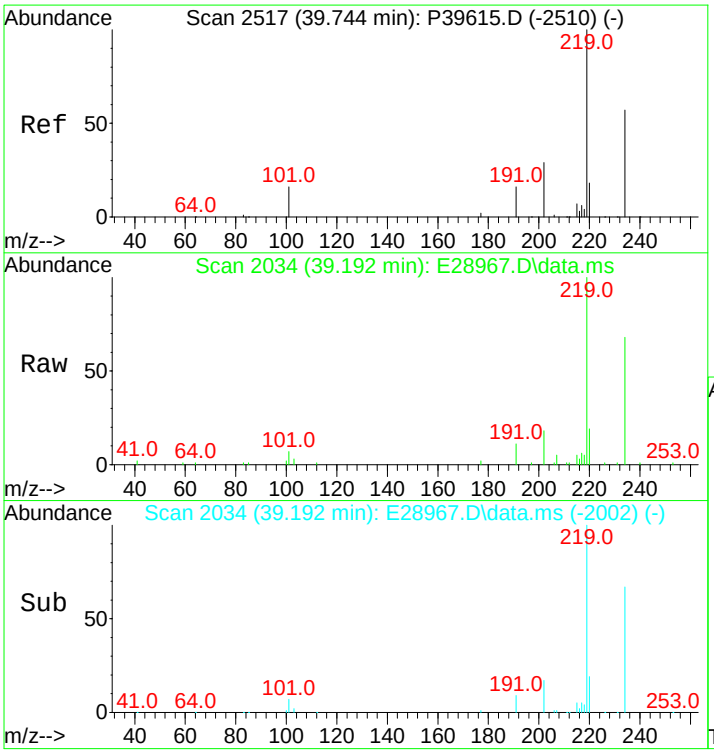


#43
Phenanthrene
Concen: 536.21 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:178 Resp: 51355

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.4

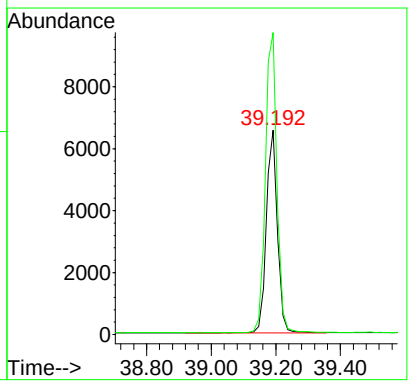


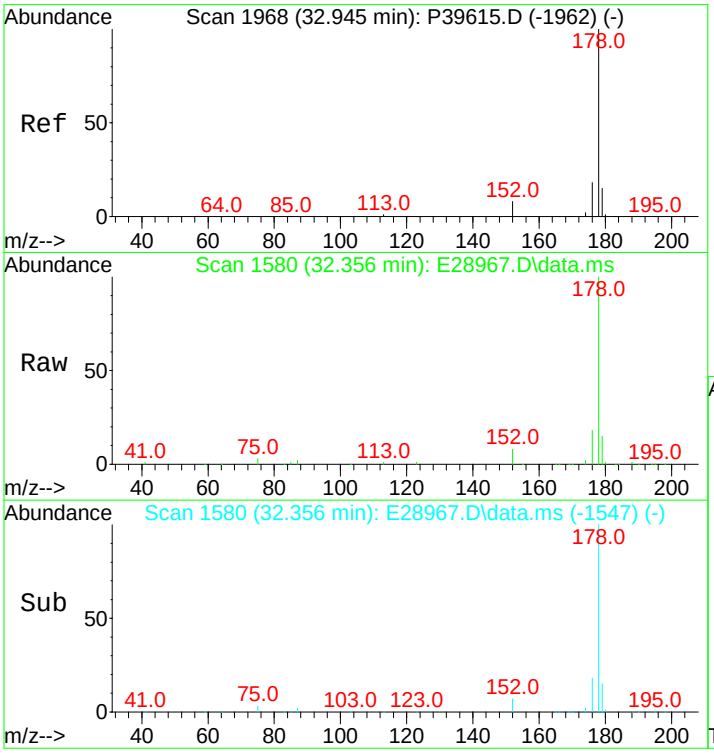


#54
Retene
Concen: 505.66 ng/mL
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:234 Resp: 15584

Ion	Ratio	Lower	Upper
234	100		
219	155.1	115.3	172.9

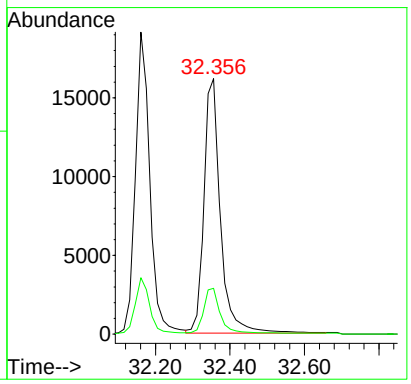


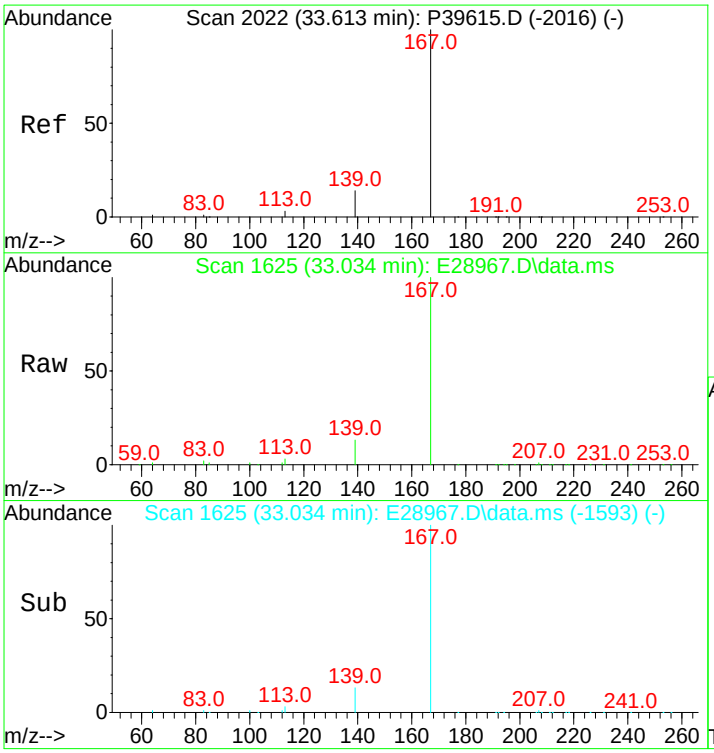


#55
Anthracene
Concen: 600.15 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. -0.000 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:178 Resp: 49682

Ion	Ratio	Lower	Upper
178	100		
176	17.6	14.3	21.5

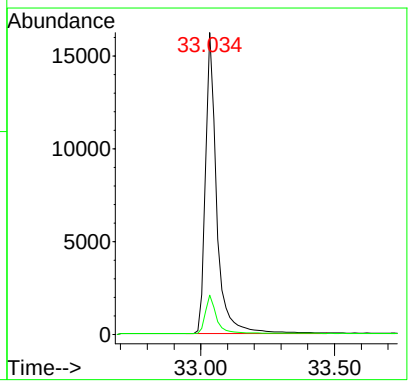


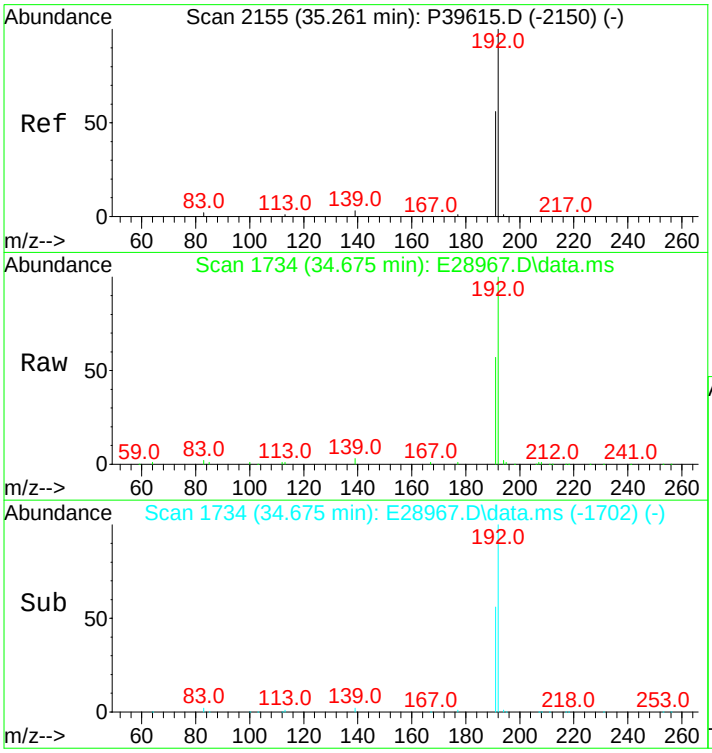


#56
Carbazole
Concen: 559.18 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:167 Resp: 47641

Ion	Ratio	Lower	Upper
167	100		
139	12.5	10.1	15.1

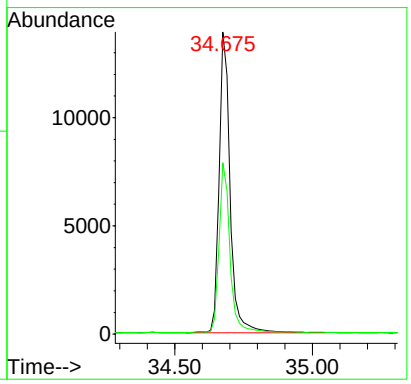


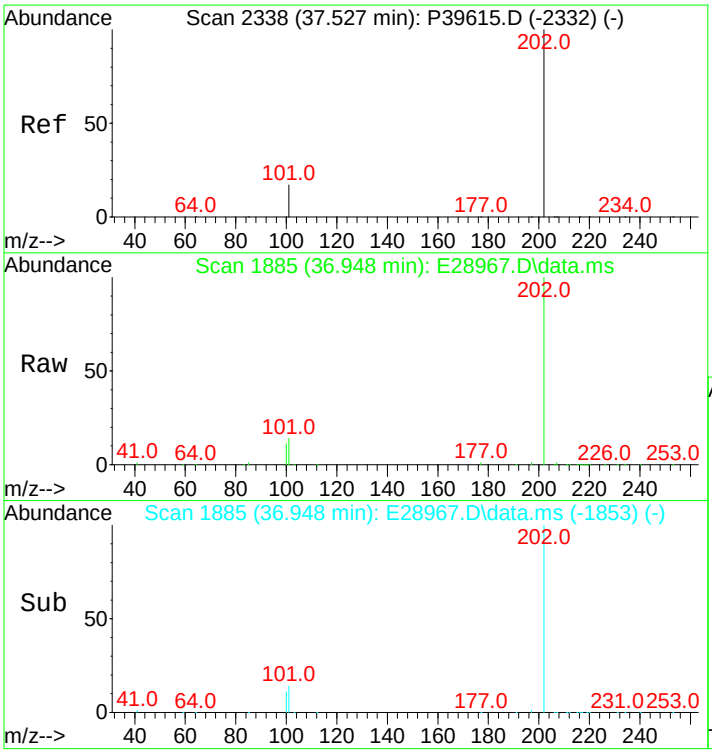


#57
1-Methylphenanthrene
Concen: 528.59 ng/mL
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:192 Resp: 38623

Ion	Ratio	Lower	Upper
192	100		
191	56.0	45.4	68.2

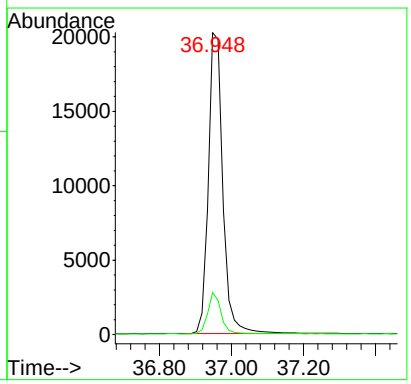


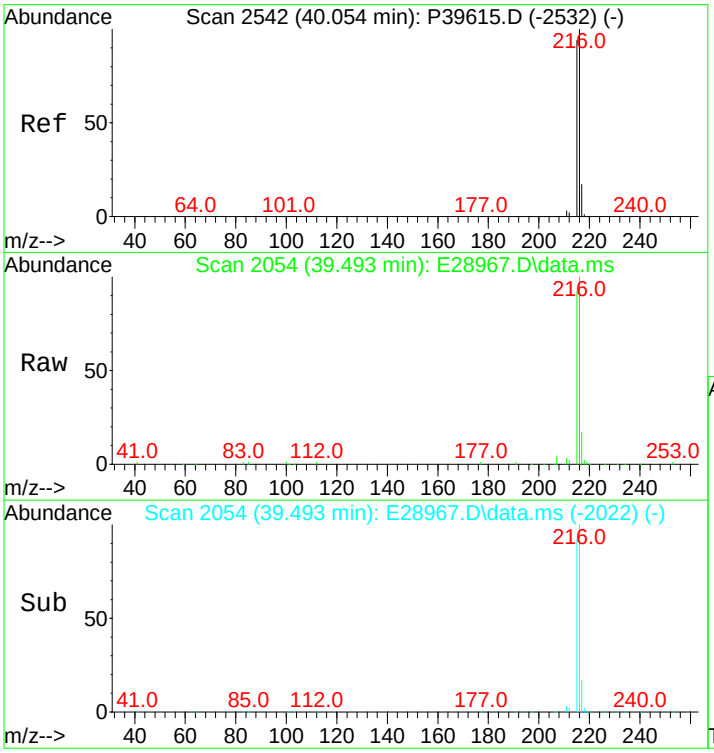


#58
Fluoranthene
Concen: 539.51 ng/mL
RT: 36.948 min Scan# 1885
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:202 Resp: 57063

Ion	Ratio	Lower	Upper
202	100		
101	12.6	10.4	15.6

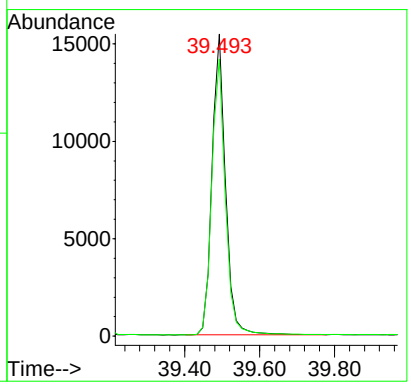


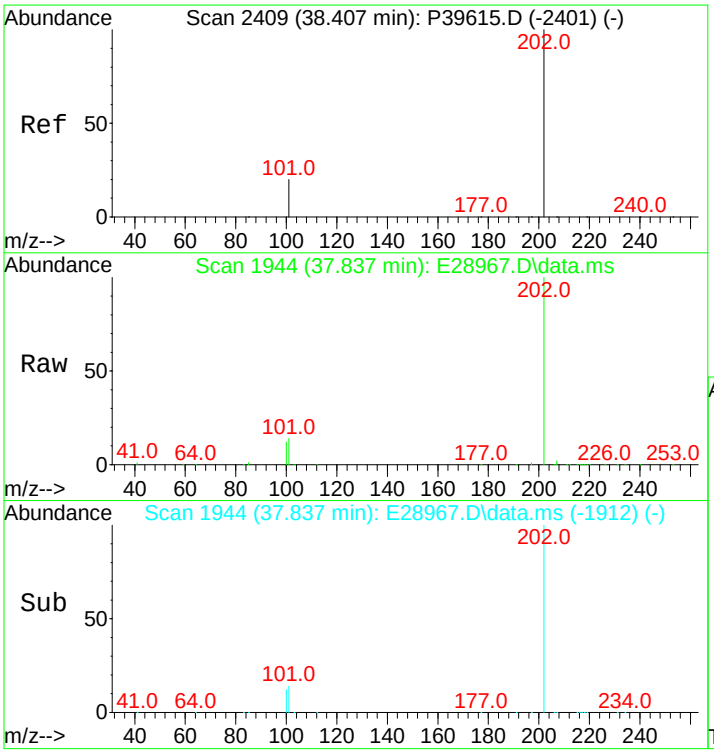


#59
Benzo(b)fluorene
Concen: 548.75 ng/mL
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:216 Resp: 38675

Ion	Ratio	Lower	Upper
216	100		
215	92.0	72.6	109.0

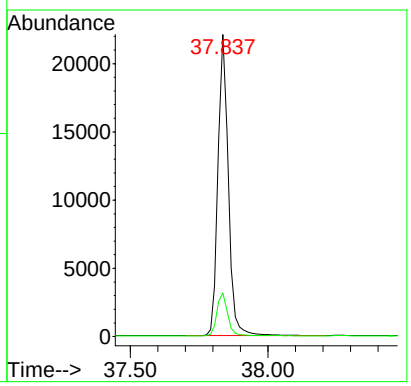


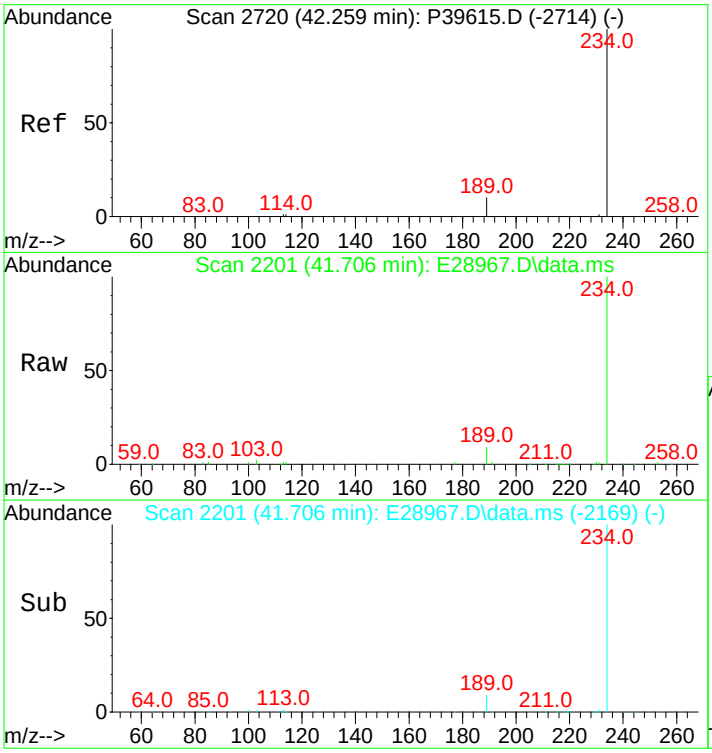


#60
Pyrene
Concen: 538.60 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:202 Resp: 57901

Ion	Ratio	Lower	Upper
202	100		
101	14.6	11.0	16.4

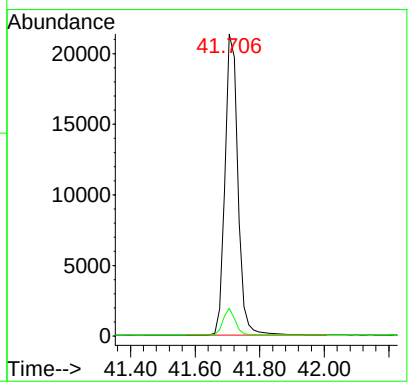


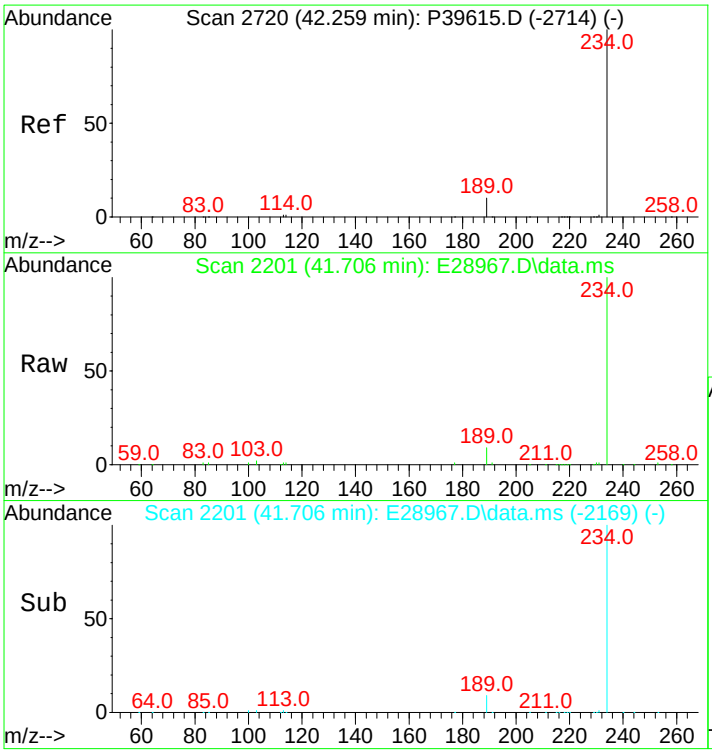


#66
Naphthobenzothiophene
Concen: 556.80 ng/ml
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:234 Resp: 59037

Ion	Ratio	Lower	Upper
234	100		
189	8.1	21.1	31.7#

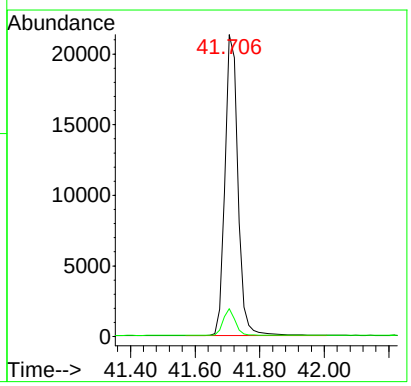


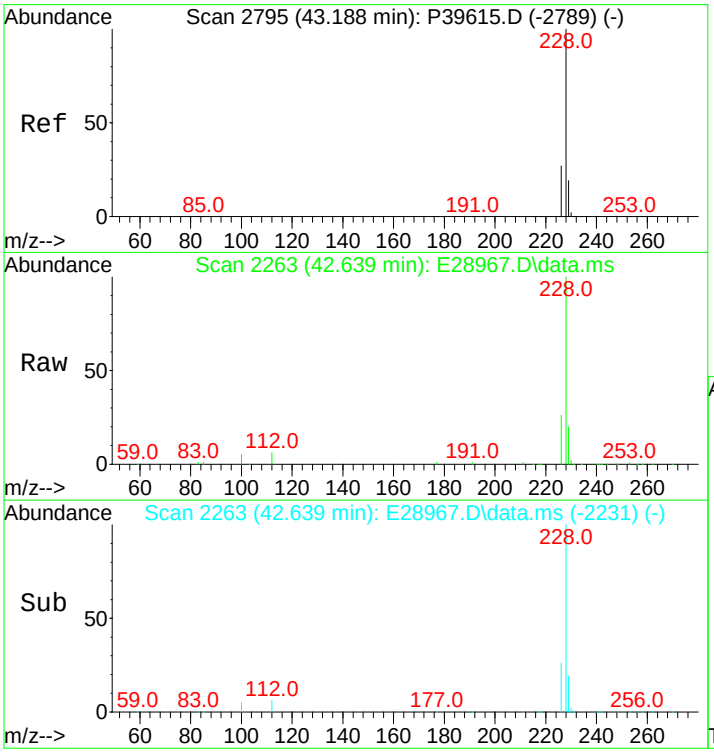


#67
Naphthobenzothiophene-2,1-D
Concen: 556.80 ng/mL
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:234 Resp: 59037

Ion	Ratio	Lower	Upper
234	100		
189	8.1	21.1	31.7#

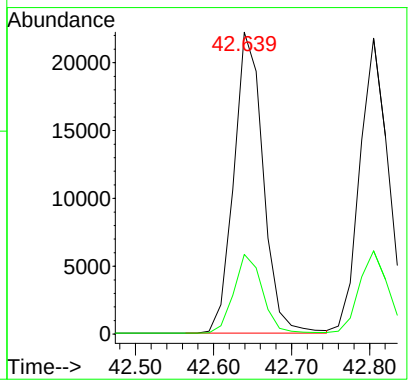


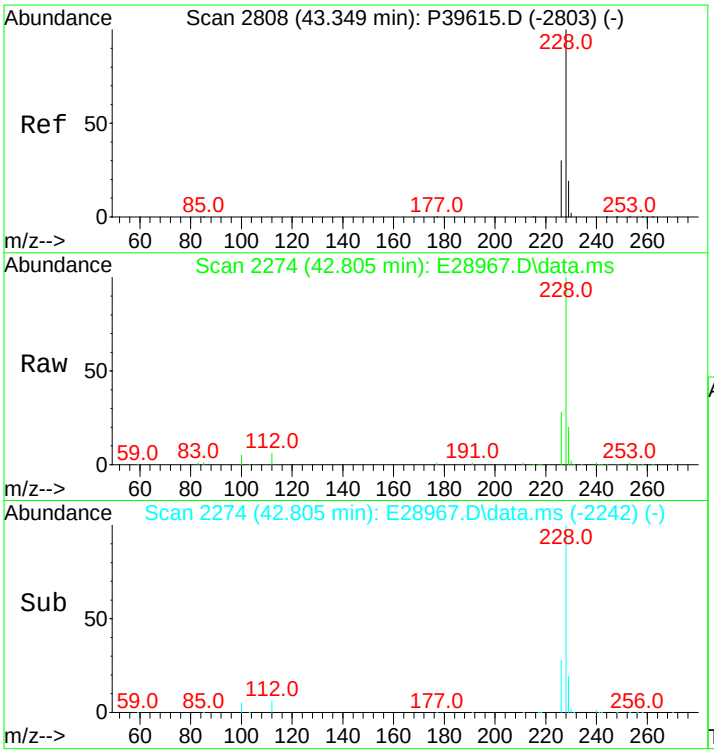


#75
Benz[a]anthracene
Concen: 567.71 ng/mL
RT: 42.639 min Scan# 2263
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:228 Resp: 57961

Ion	Ratio	Lower	Upper
228	100		
226	25.6	20.7	31.1

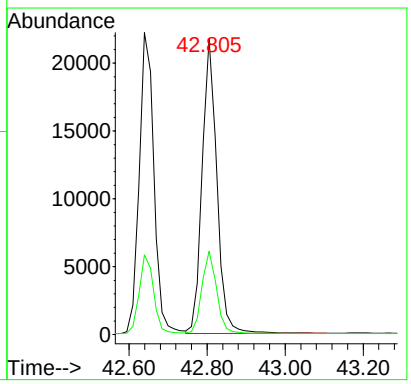


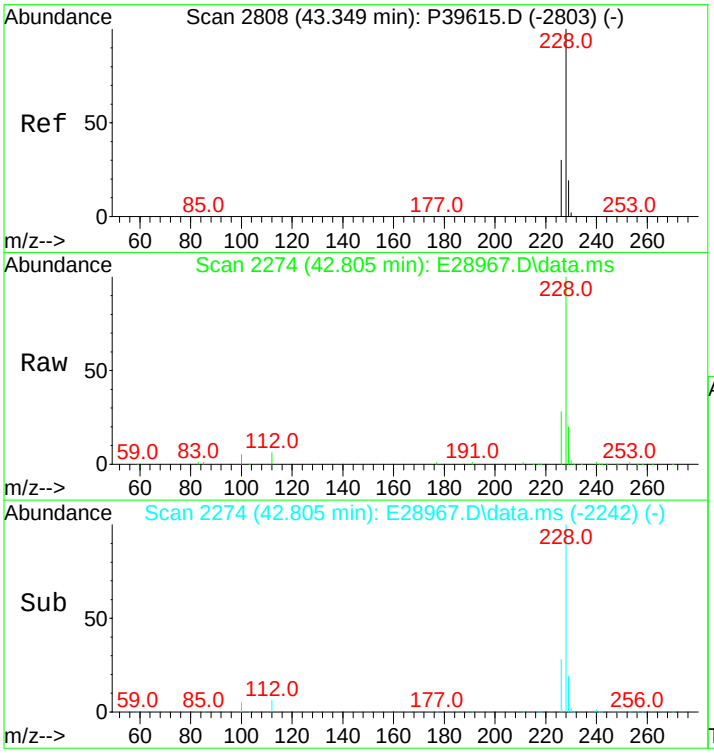


#76
Chrysene
Concen: 540.68 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:228 Resp: 56830

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

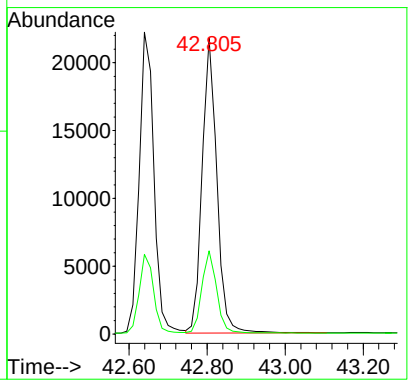


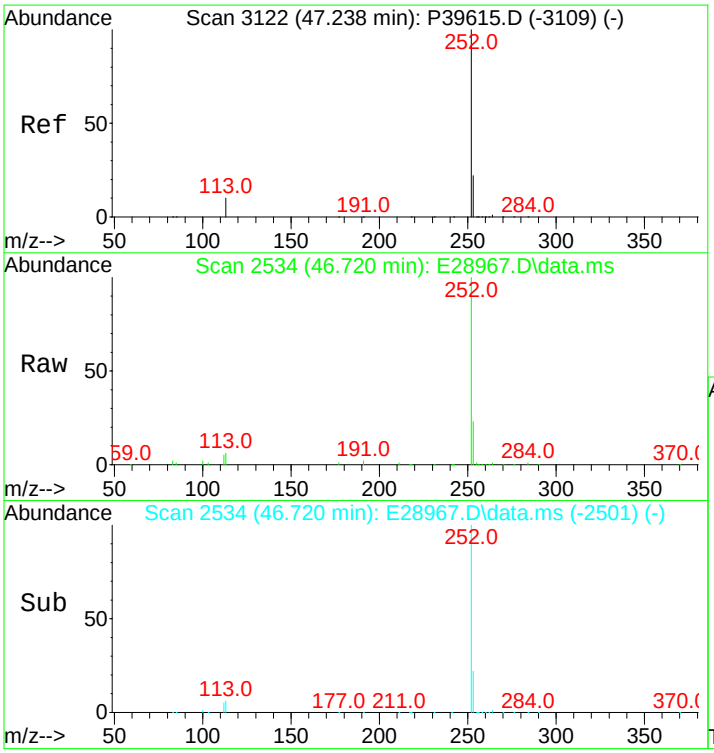


#77
Chrysene/Triphenylene
Concen: 540.68 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:228 Resp: 56830

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

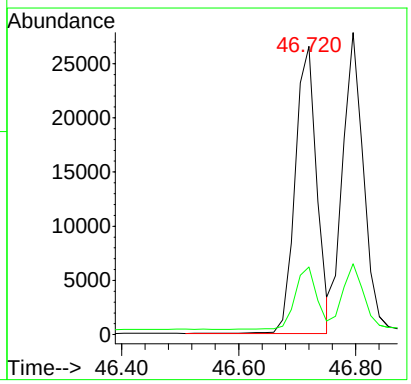


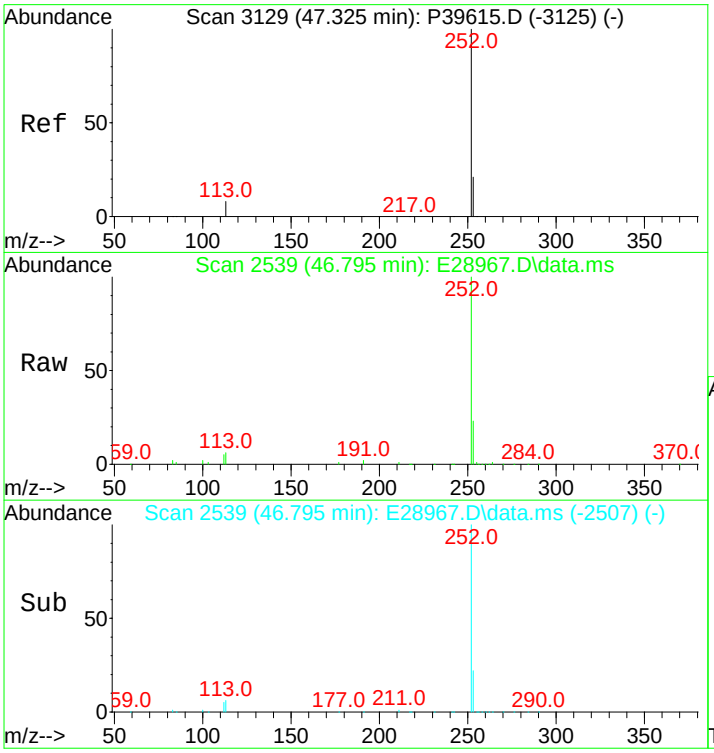


#84
Benzo[b]fluoranthene
Concen: 571.35 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. -0.000 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 67802

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.5	29.3

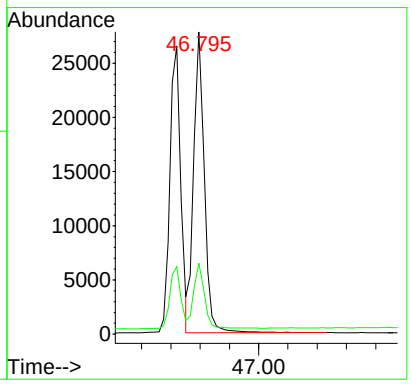


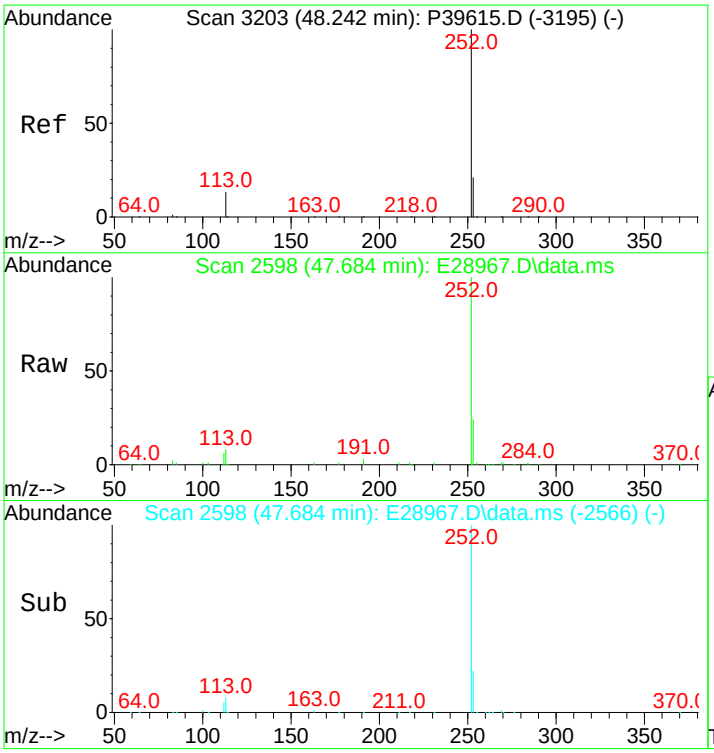


#85
Benzo[j]+[k]fluoranthene
Concen: 579.12 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 70705

Ion	Ratio	Lower	Upper
252	100		
253	21.2	19.7	29.5

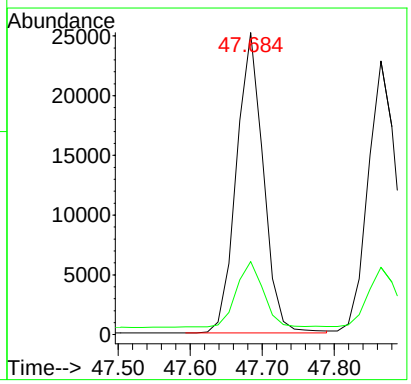


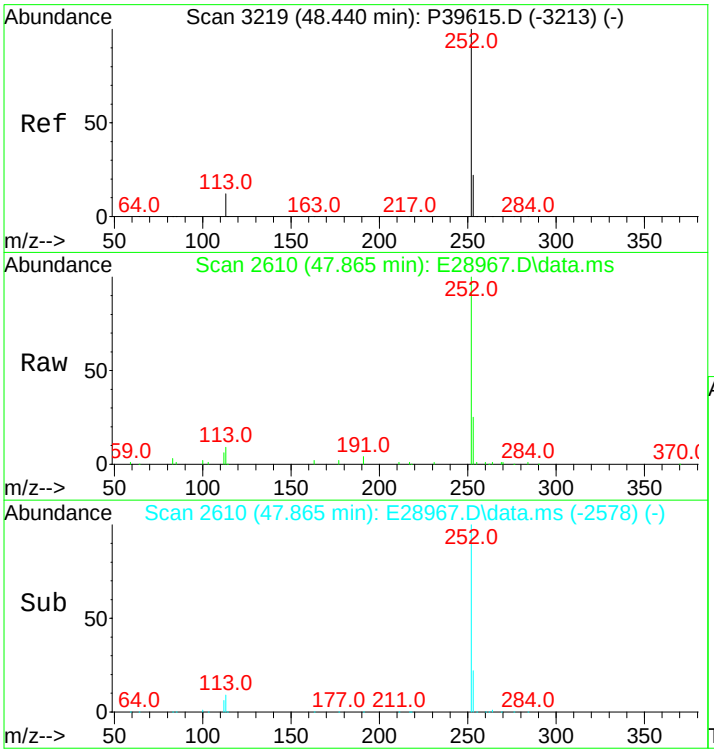


#87
Benzo[e]pyrene
Concen: 560.51 ng/mL
RT: 47.684 min Scan# 2598
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 64947

Ion	Ratio	Lower	Upper
252	100		
253	22.5	20.6	31.0

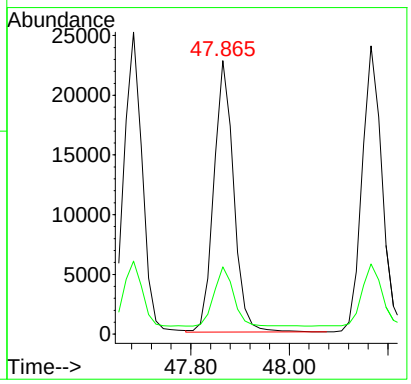


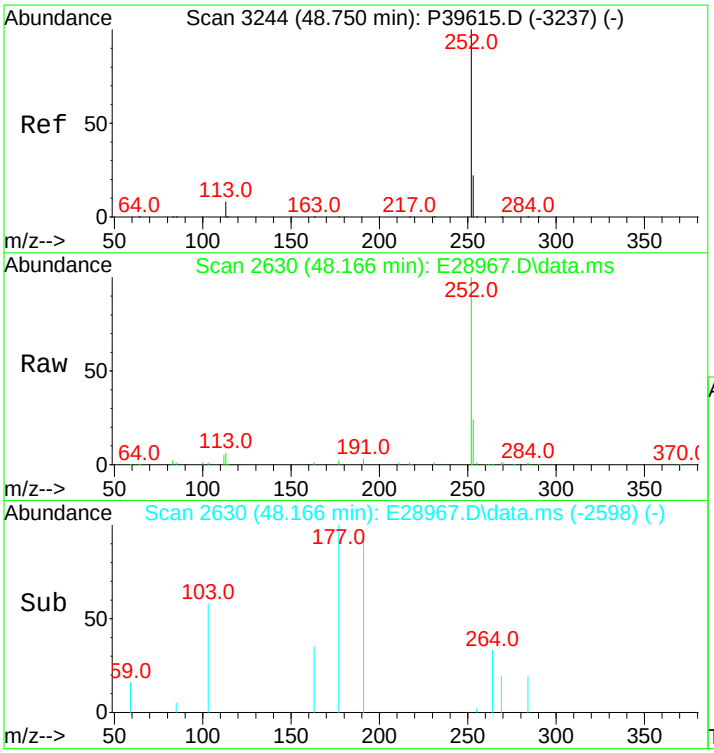


#89
Benzo[a]pyrene
Concen: 573.33 ng/mL
RT: 47.865 min Scan# 2610
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 63567

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.8	31.2

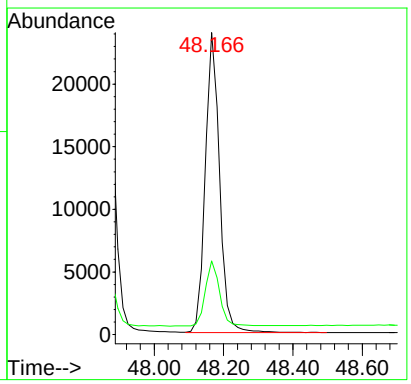


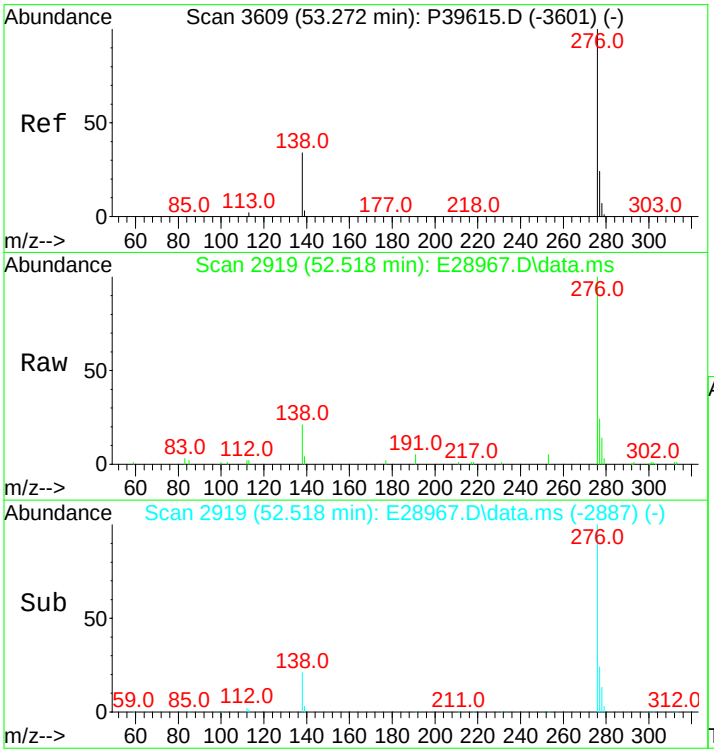


#90
Perylene
Concen: 581.21 ng/mL
RT: 48.166 min Scan# 2630
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 68142

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.7	31.1

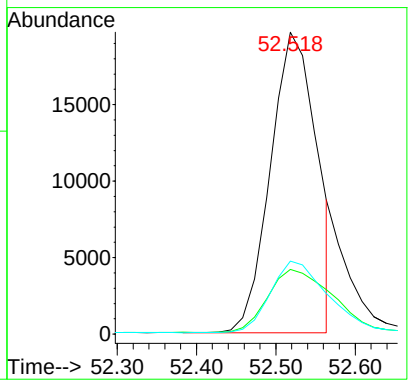


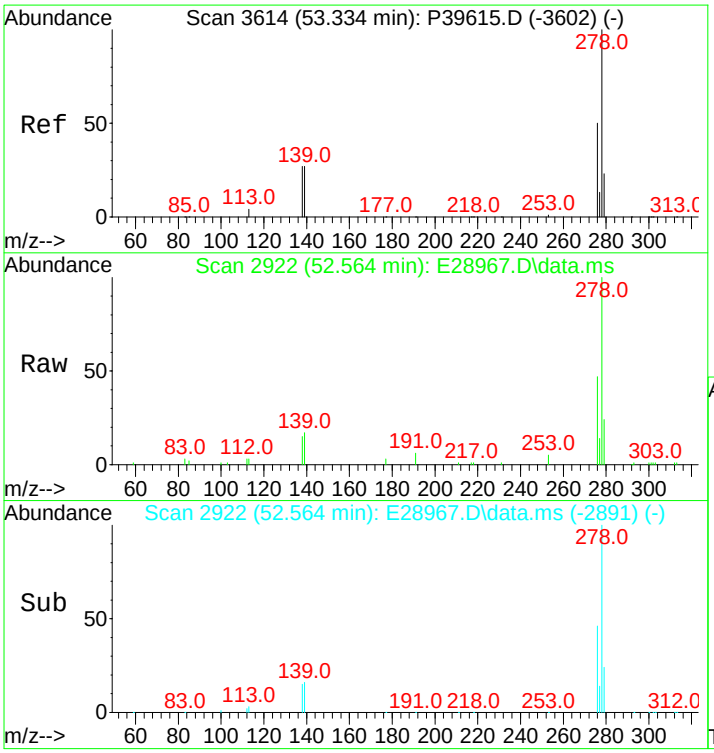


#91
Indeno[1,2,3-cd]pyrene
Concen: 612.19 ng/mL m
RT: 52.518 min Scan# 2919
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:276 Resp: 79882

Ion	Ratio	Lower	Upper
276	100		
138	29.9	16.3	24.5#
277	29.9	19.4	29.2#

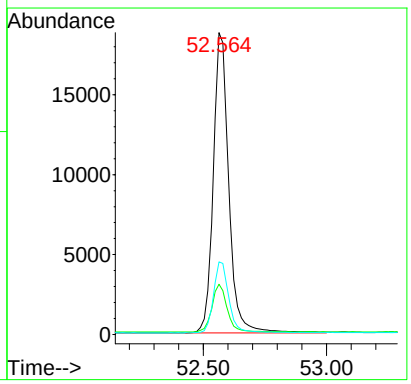


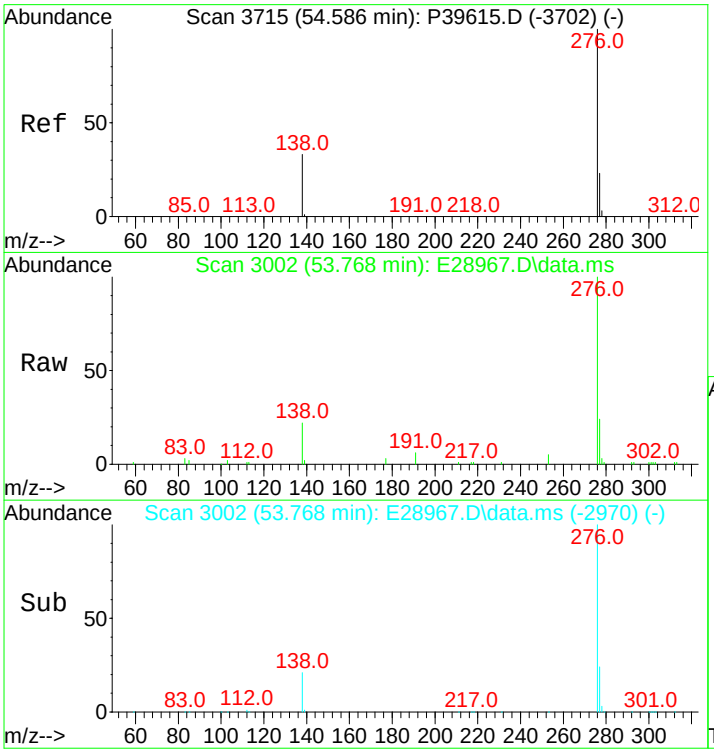


#92
Dibenz[ah]+[ac]anthracene
Concen: 591.54 ng/mL
RT: 52.564 min Scan# 2922
Delta R.T. -0.030 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:278 Resp: 82188

Ion	Ratio	Lower	Upper
278	100		
139	15.4	11.6	17.4
279	23.5	19.3	28.9

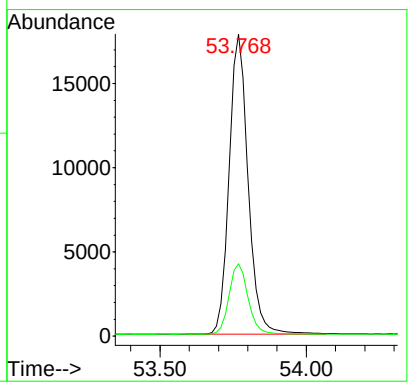


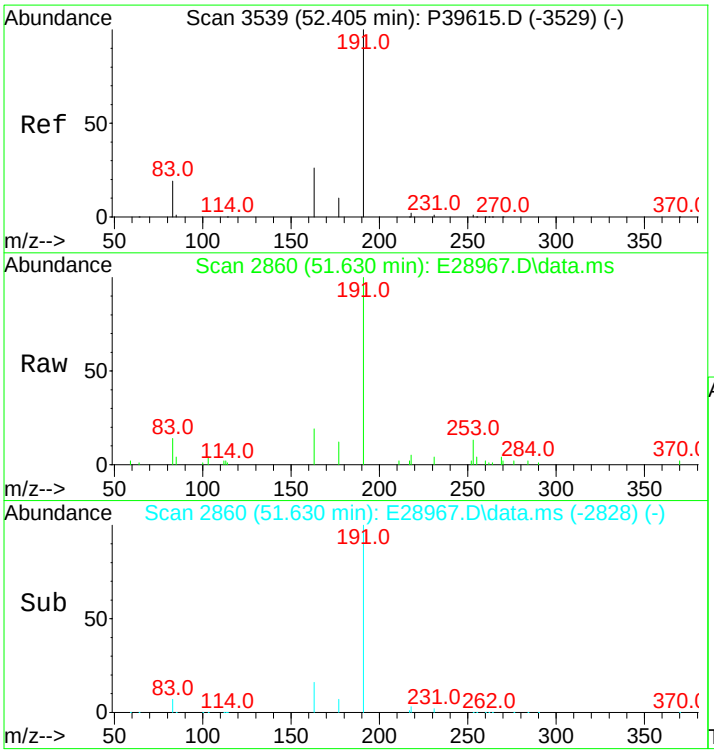


#93
Benzo[g,h,i]perylene
Concen: 571.39 ng/mL
RT: 53.768 min Scan# 3002
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:276 Resp: 80391

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

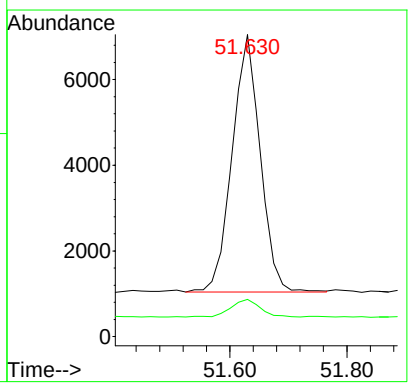


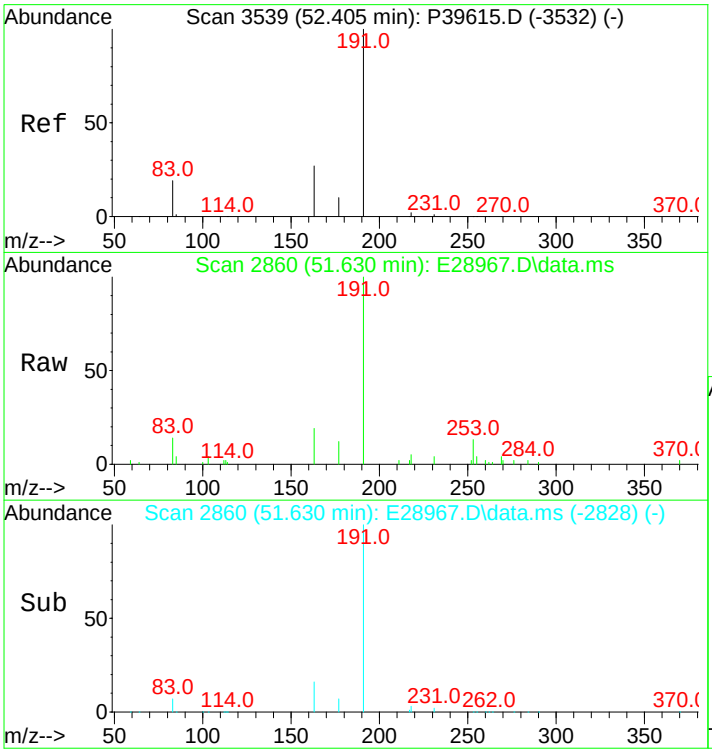


#94
Hopane (T19)
Concen: 506.82 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:191 Resp: 19942

Ion	Ratio	Lower	Upper
191	100		
177	7.2	11.6	17.4#

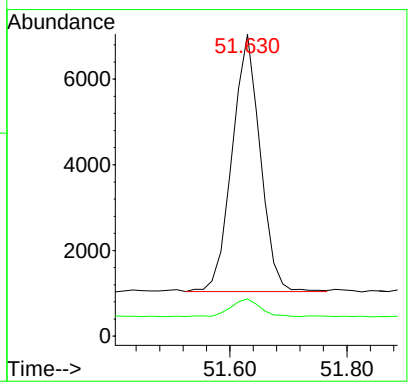




#95
17a(H),21B(H)-hopane - C30H52
Concen: 506.82 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:191 Resp: 19942

Ion	Ratio	Lower	Upper
191	100		
177	7.2	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24064M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	52839	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43136	509.623	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.96%			
42) Phenanthrene-d10	32.085	188	42450	489.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.95%#			
83) Benzo[b]fluoranthene-d12	46.645	264	56634	521.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.18%			
88) Benzo[a]pyrene-d12	47.790	264	56653	538.668	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.87%			
129) 5B(H)Cholane - Surr	43.332	217	11232	539.351	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.94%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4966	257.988	ng/mL	100
4) cis-Decalin	17.091	138	3762	257.240	ng/mL	100
10) Naphthalene	19.304	128	52132	550.750	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32089	532.265	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	31273	533.847	ng/mL#	100
18) Benzothiophene	19.515	134	43328	553.701	ng/mL	100
23) Biphenyl	23.896	154	40583	532.629	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	28488	524.245	ng/mL#	100
25) Dibenzofuran	26.967	168	45217	536.033	ng/mL	97
26) Acenaphthylene	25.582	152	52457M3	555.852	ng/mL	
27) Acenaphthene	26.320	153	32046	527.536	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	27.885	170	26065	512.676	ng/mL	97
29) Fluorene	28.352	166	36253	535.090	ng/mL	100
33) Dibenzothiophene	31.679	184	50924	547.725	ng/mL	99
43) Phenanthrene	32.176	178	50714	536.143	ng/mL	99
54) Retene	39.192	234	15693	515.569	ng/mL	94
55) Anthracene	32.356	178	48591M3	594.316	ng/mL	
56) Carbazole	33.034	167	46813	556.336	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38281	530.467	ng/mL	99
58) Fluoranthene	36.963	202	56975	545.420	ng/mL	98
59) Benzo(b)fluorene	39.493	216	38424	552.008	ng/mL	99
60) Pyrene	37.837	202	57258	539.276	ng/mL	99
66) Naphthobenzothiophene	41.721	234	58939	562.825	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.721	234	58939	562.825	ng/mL#	64
75) Benz[a]anthracene	42.655	228	58810	571.560	ng/mL	99
76) Chrysene	42.805	228	57925	546.817	ng/mL	100
77) Chrysene/Triphenylene	42.805	228	57925	546.817	ng/mL	100
84) Benzo[b]fluoranthene	46.720	252	70856	592.456	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.811	252	69397	563.998	ng/mL	93
87) Benzo[e]pyrene	47.699	252	66232	567.162	ng/mL	94
89) Benzo[a]pyrene	47.880	252	64662	578.677	ng/mL	92
90) Perylene	48.181	252	69214	585.768	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	52.533	276	82316M2	625.953	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	84503	603.487	ng/mL	99
93) Benzo[g,h,i]perylene	53.783	276	82167	579.478	ng/mL	100
94) Hopane (T19)	51.630	191	20233	510.226	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.630	191	20233	510.226	ng/mL#	84

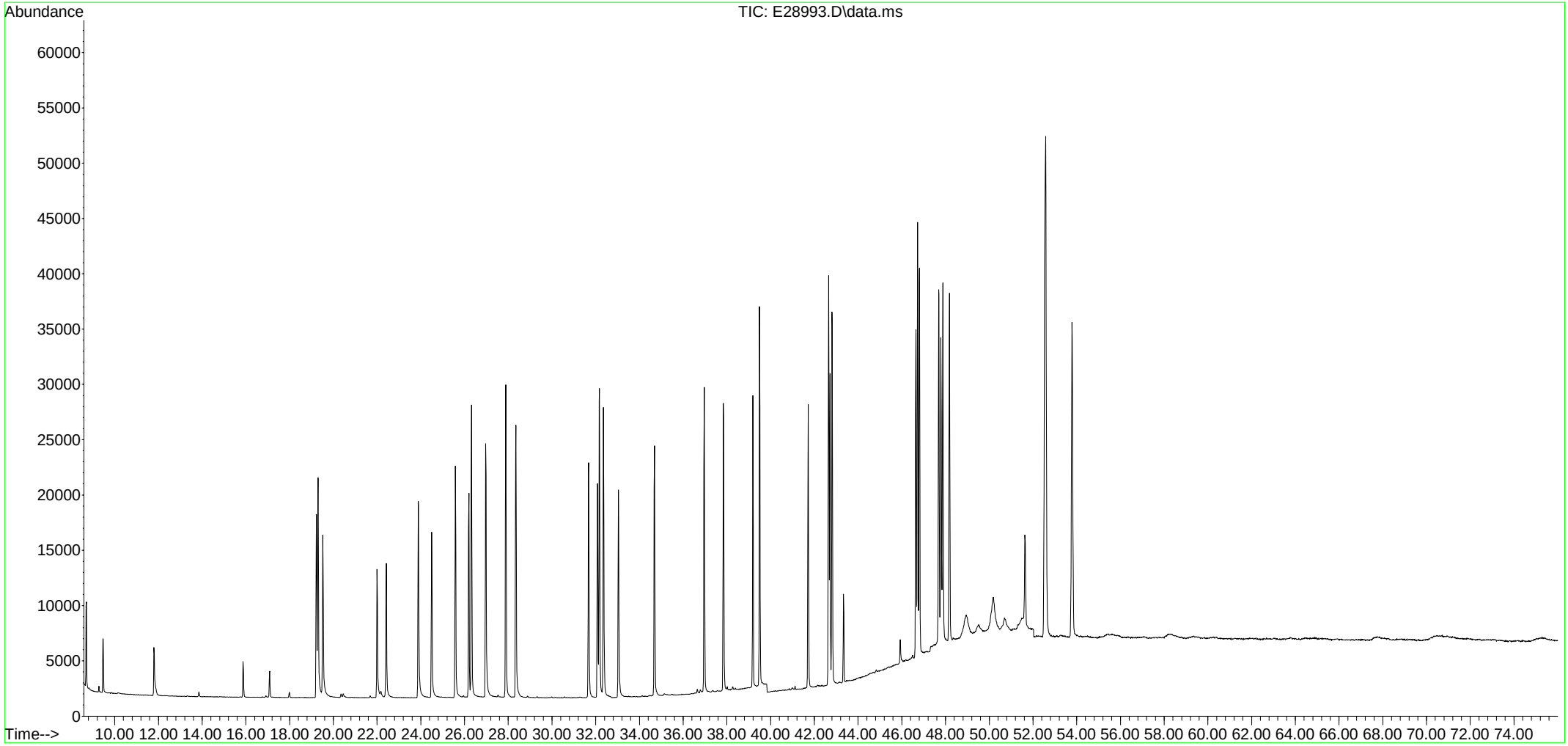
(#) = qualifier out of range (m) = manual integration (+) = signals summed

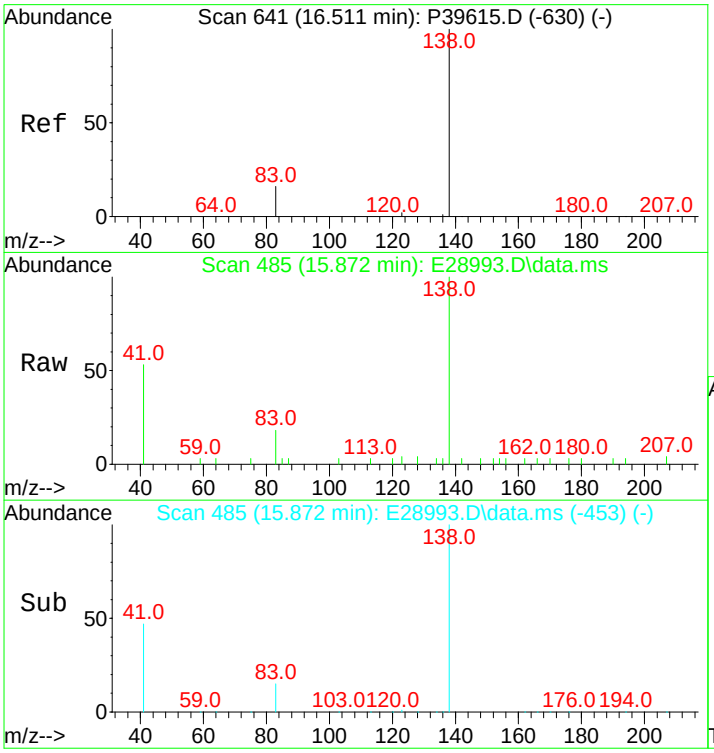
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

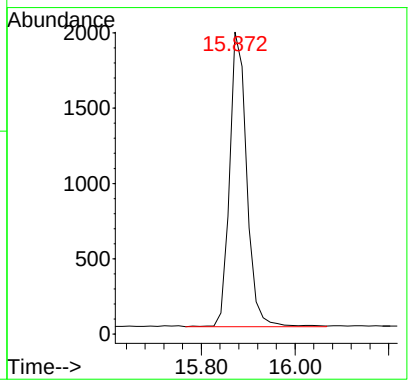
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

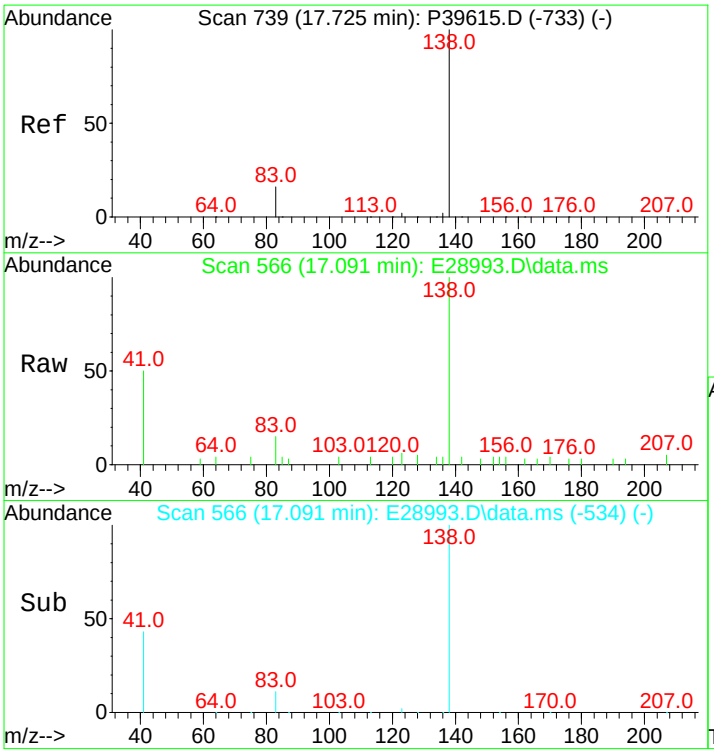




#3
trans-Decalin
Concen: 257.99 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

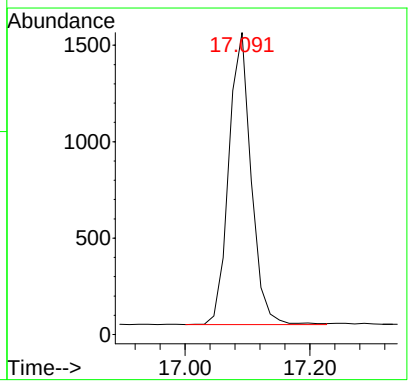
Tgt Ion:138 Resp: 4966

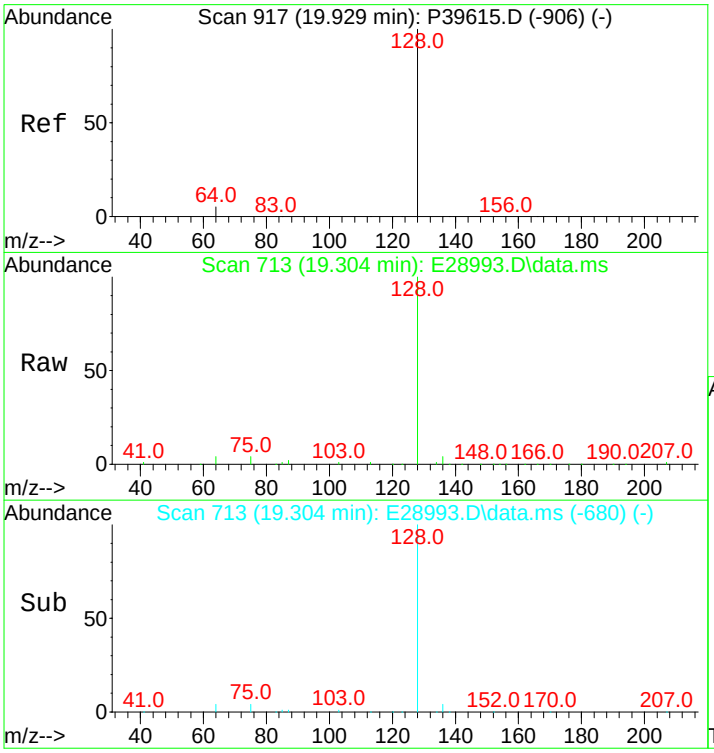




#4
cis-Decalin
Concen: 257.24 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:138 Resp: 3762

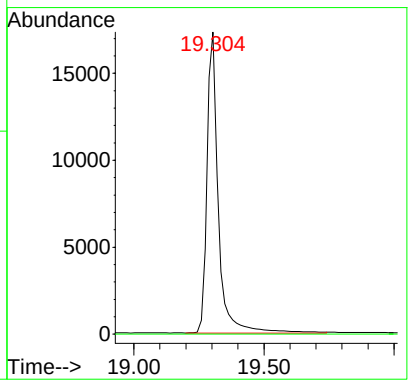


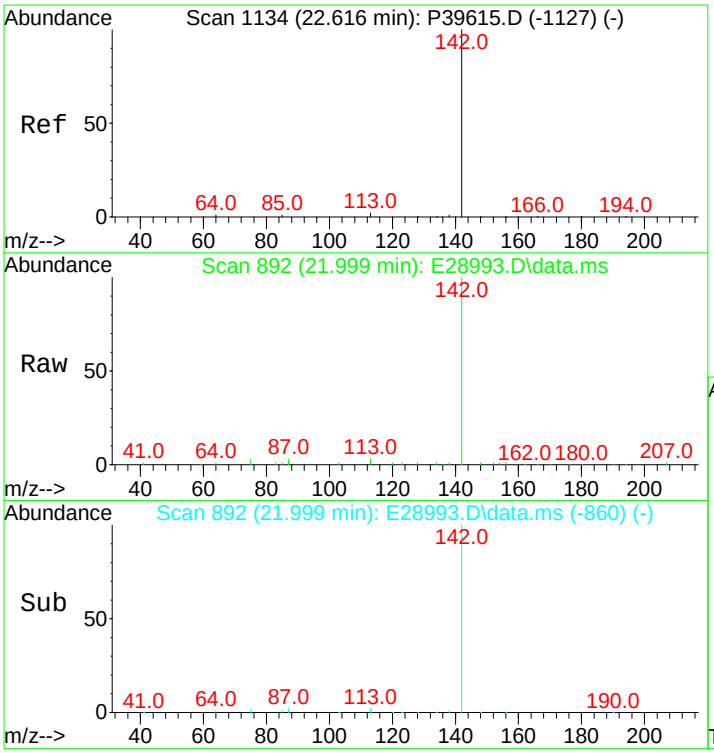


#10
Naphthalene
Concen: 550.75 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:128 Resp: 52132

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

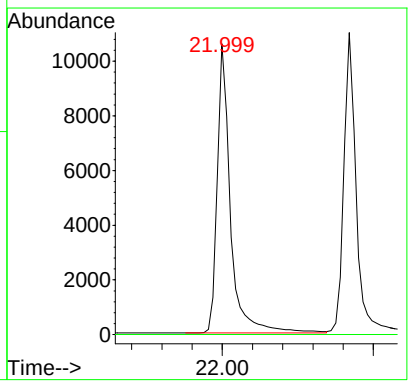


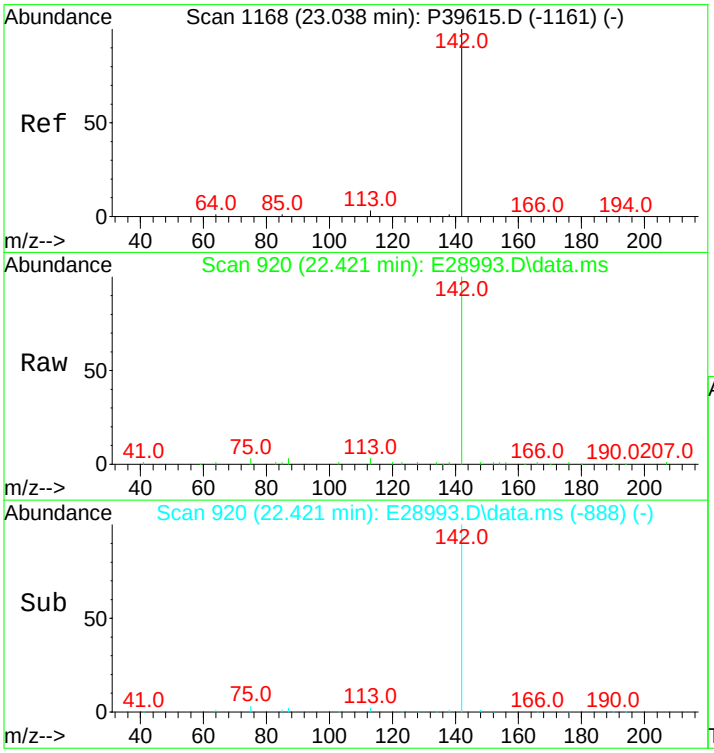


#16
2-Methylnaphthalene
Concen: 532.27 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:142 Resp: 32089

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

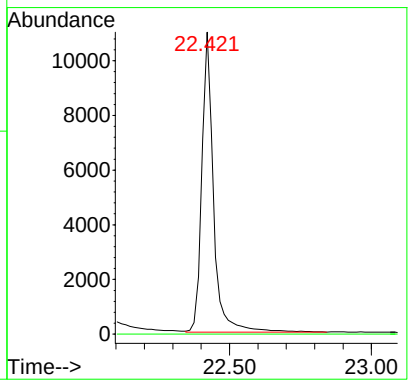


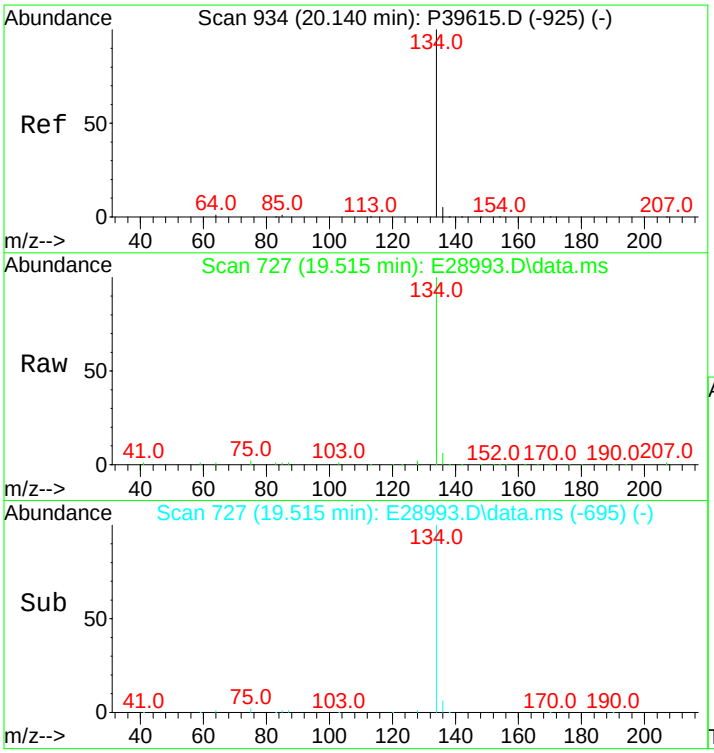


#17
1-Methylnaphthalene
Concen: 533.85 ng/mL
RT: 22.421 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:142 Resp: 31273

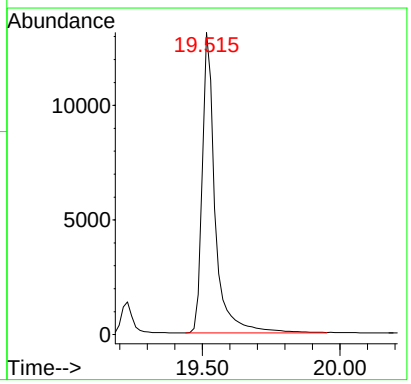
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

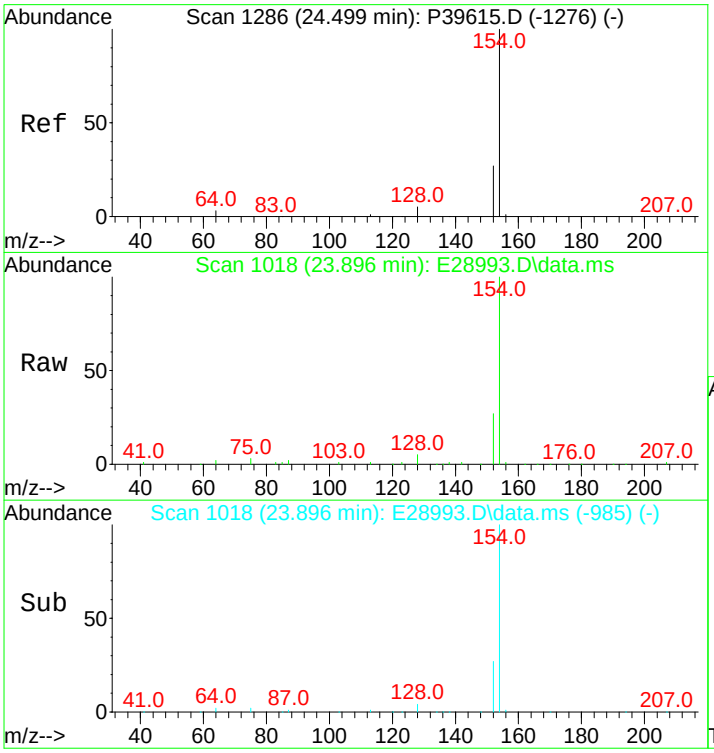




#18
Benzothiophene
Concen: 553.70 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:134 Resp: 43328

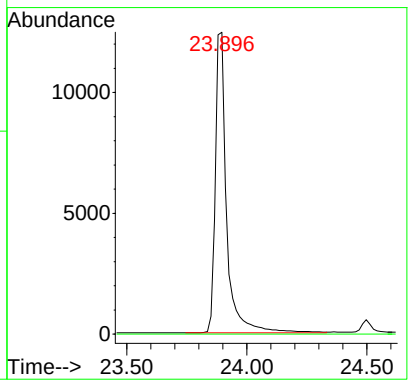


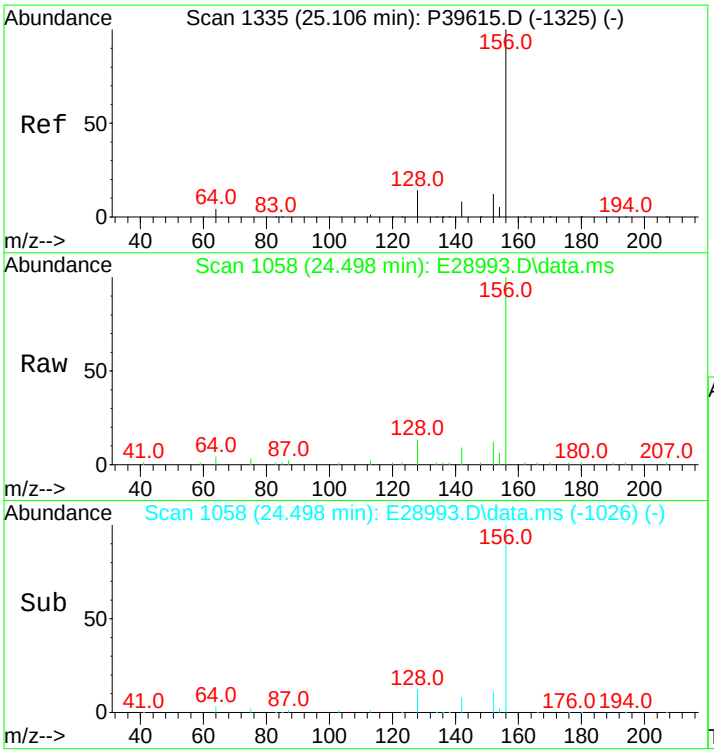


#23
Biphenyl
Concen: 532.63 ng/mL
RT: 23.896 min Scan# 1018
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:154 Resp: 40583

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

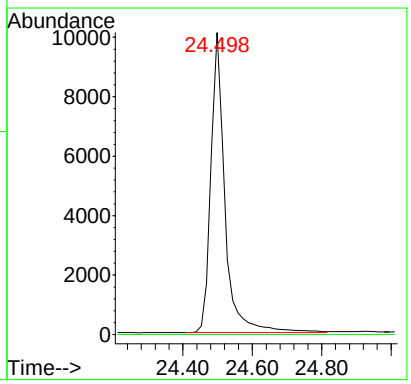


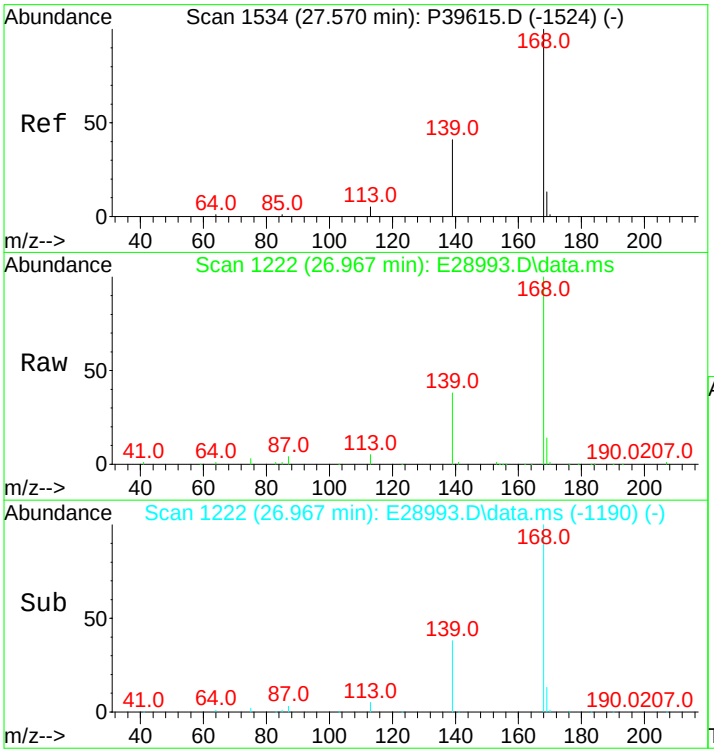


#24
2,6-Dimethylnaphthalene
Concen: 524.24 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:156 Resp: 28488

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

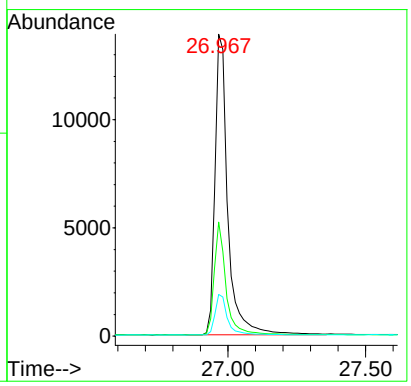


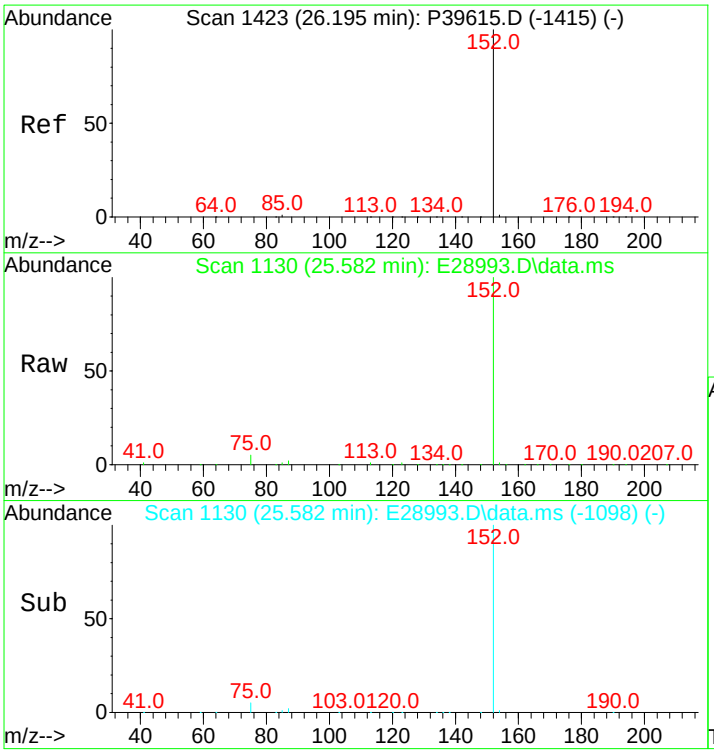


#25
Dibenzofuran
Concen: 536.03 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:168 Resp: 45217

Ion	Ratio	Lower	Upper
168	100		
139	34.8	26.0	39.0
169	13.2	10.6	16.0

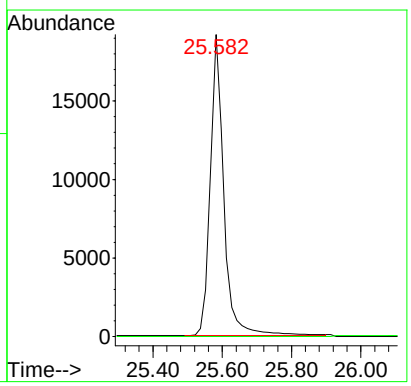


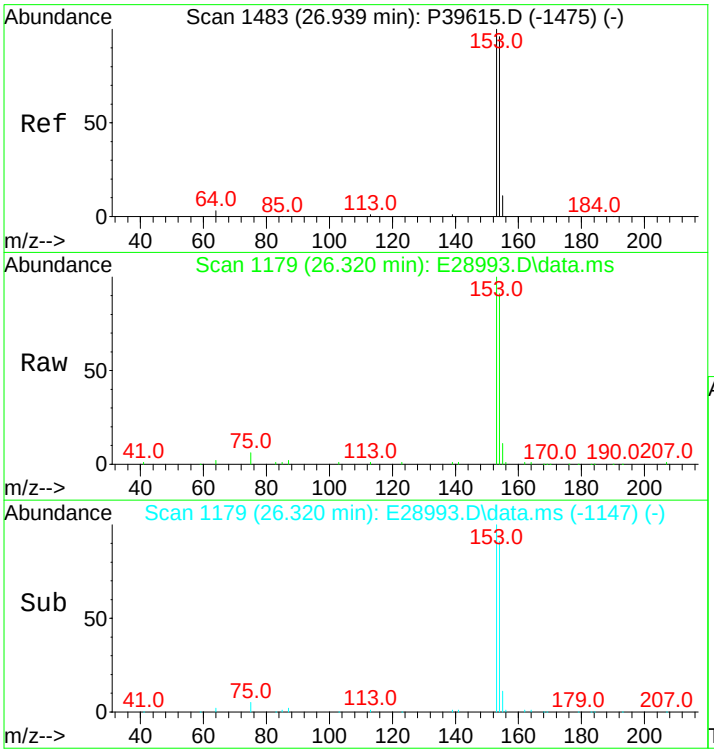


#26
Acenaphthylene
Concen: 555.85 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:152 Resp: 52457

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

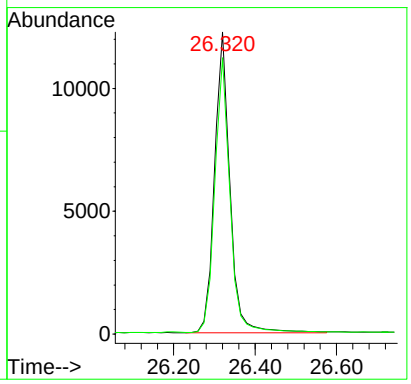


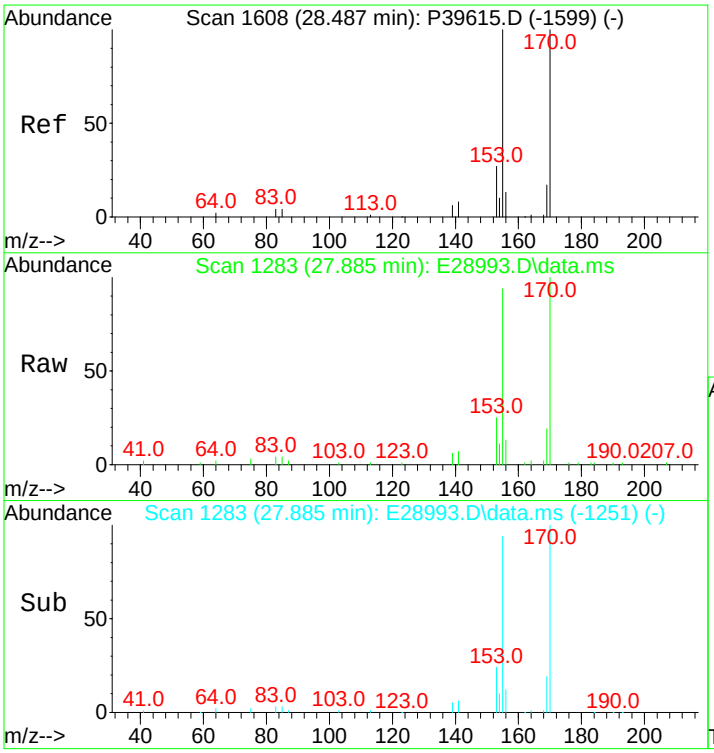


#27
Acenaphthene
Concen: 527.54 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:153 Resp: 32046

Ion	Ratio	Lower	Upper
153	100		
154	91.2	74.1	111.1

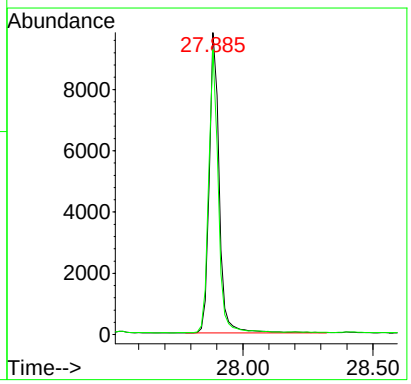


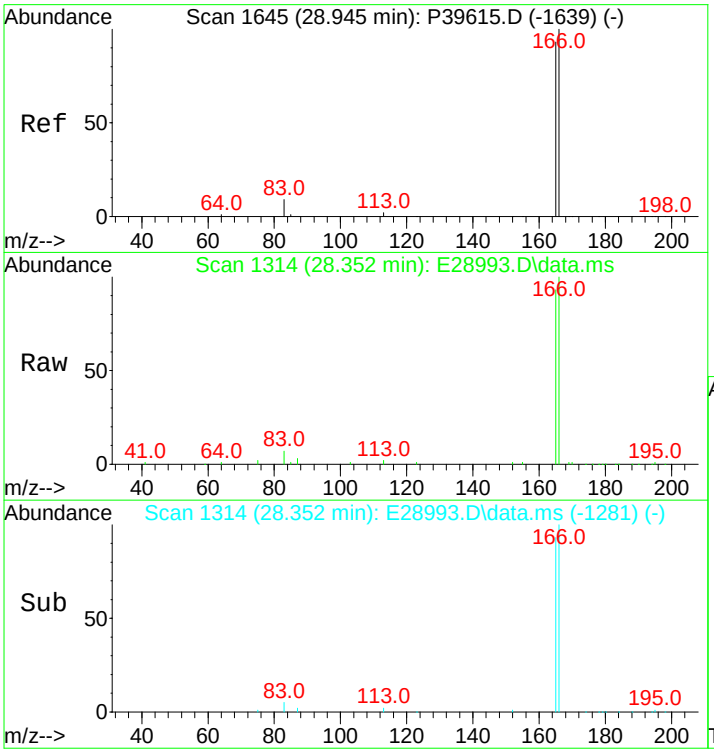


#28
2,3,5-Trimethylnaphthalene
Concen: 512.68 ng/mL
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:170 Resp: 26065

Ion	Ratio	Lower	Upper
170	100		
155	91.4	70.7	106.1

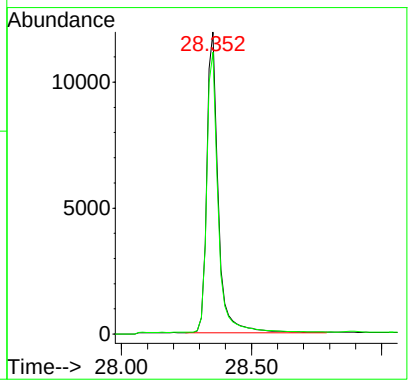


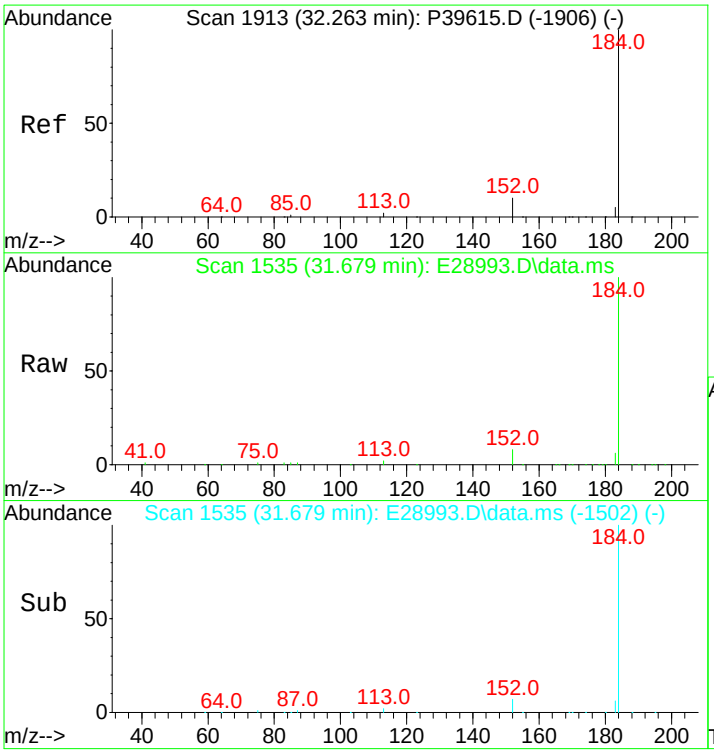


#29
Fluorene
Concen: 535.09 ng/mL
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:166 Resp: 36253

Ion	Ratio	Lower	Upper
166	100		
165	93.0	74.7	112.1

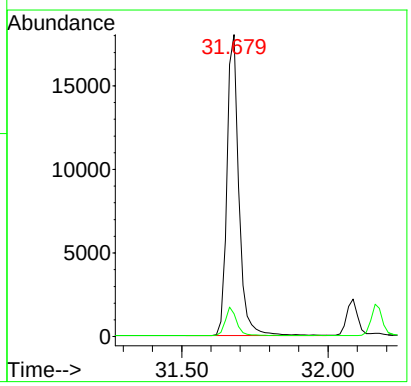


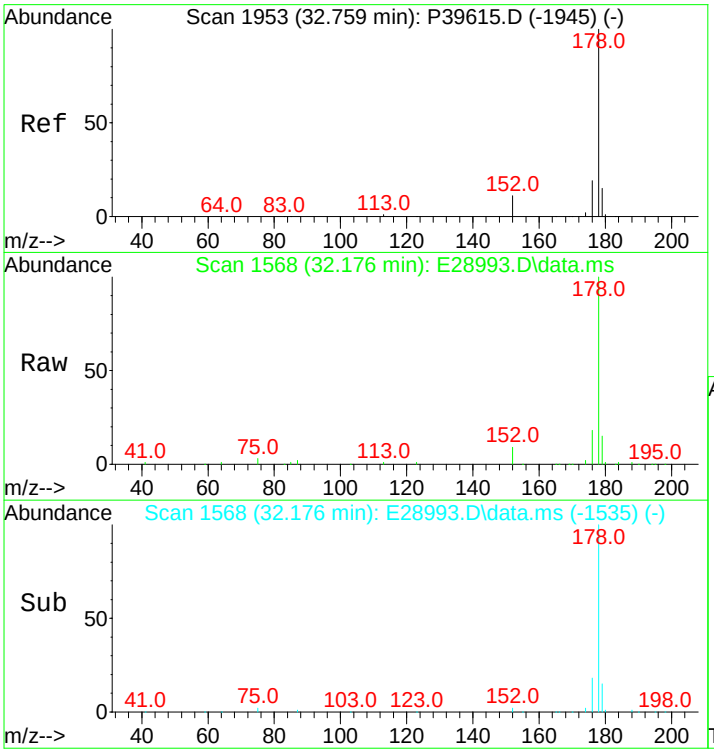


#33
Dibenzothiophene
Concen: 547.73 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:184 Resp: 50924

Ion	Ratio	Lower	Upper
184	100		
152	9.0	7.0	10.6

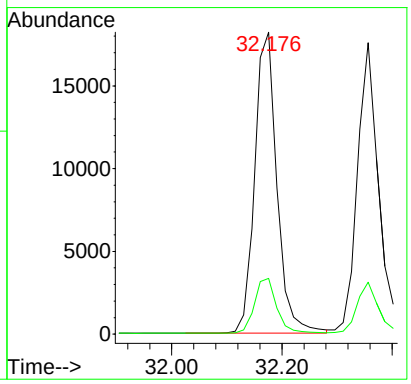


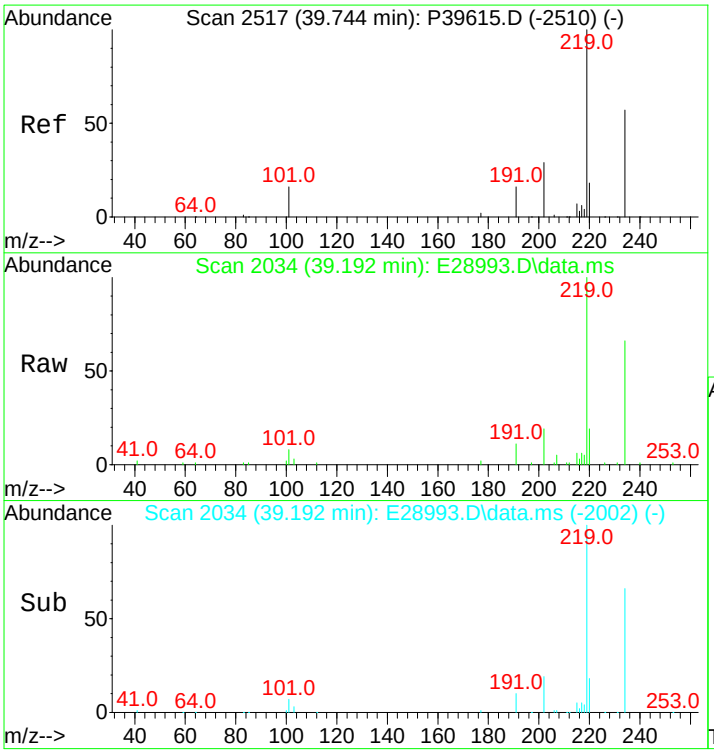


#43
Phenanthrene
Concen: 536.14 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:178 Resp: 50714

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.4

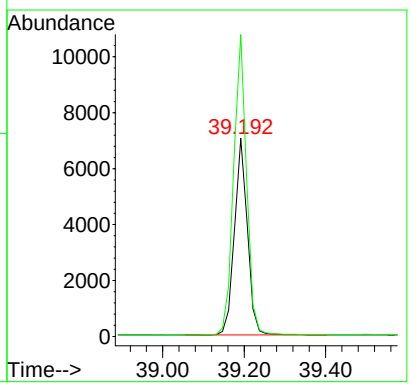


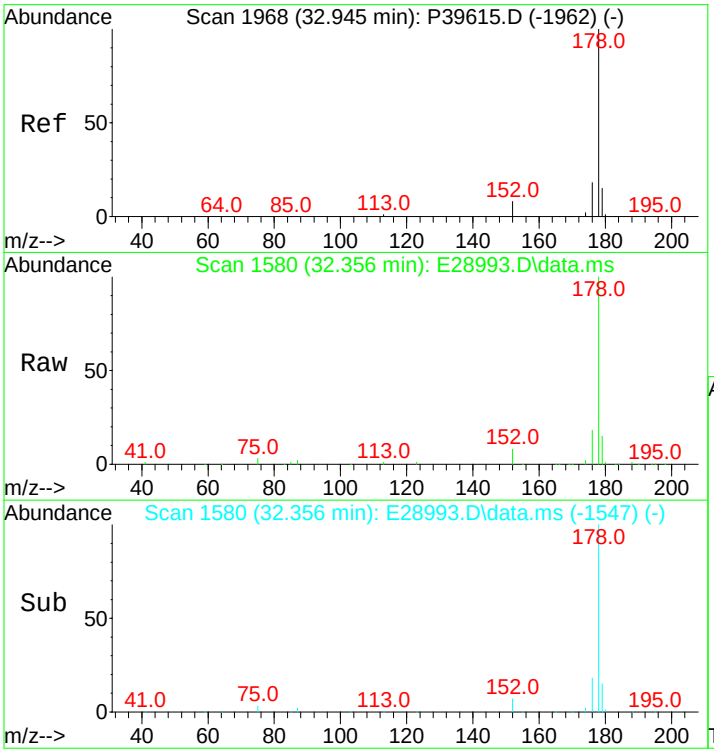


#54
Retene
Concen: 515.57 ng/mL
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:234 Resp: 15693

Ion	Ratio	Lower	Upper
234	100		
219	152.2	115.3	172.9

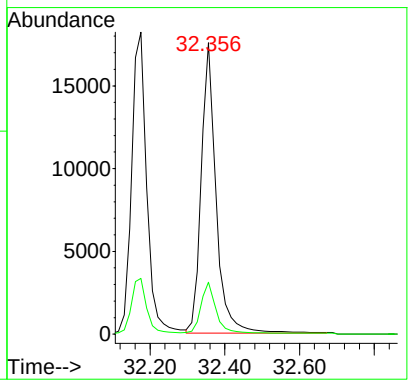


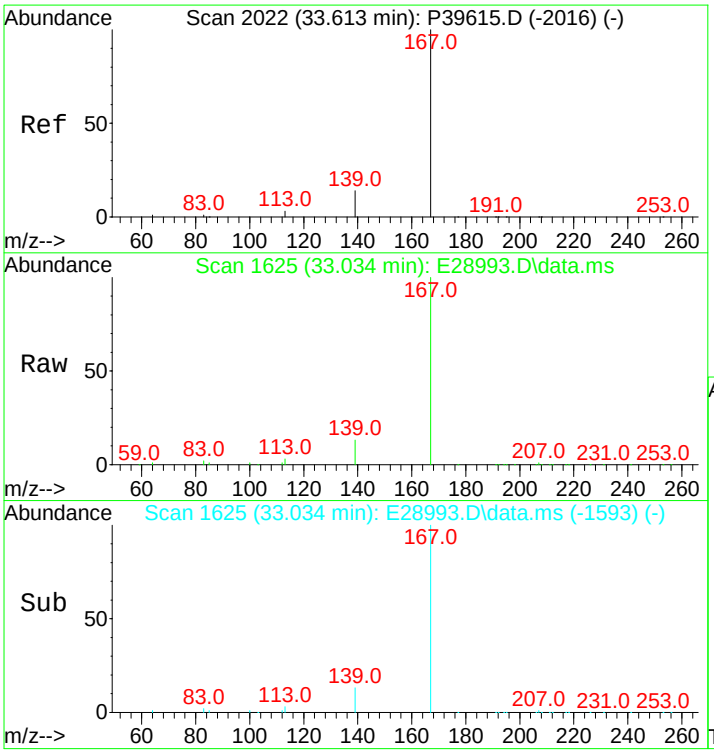


#55
Anthracene
Concen: 594.32 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:178 Resp: 48591

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

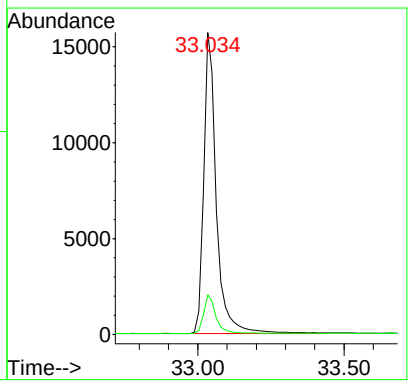


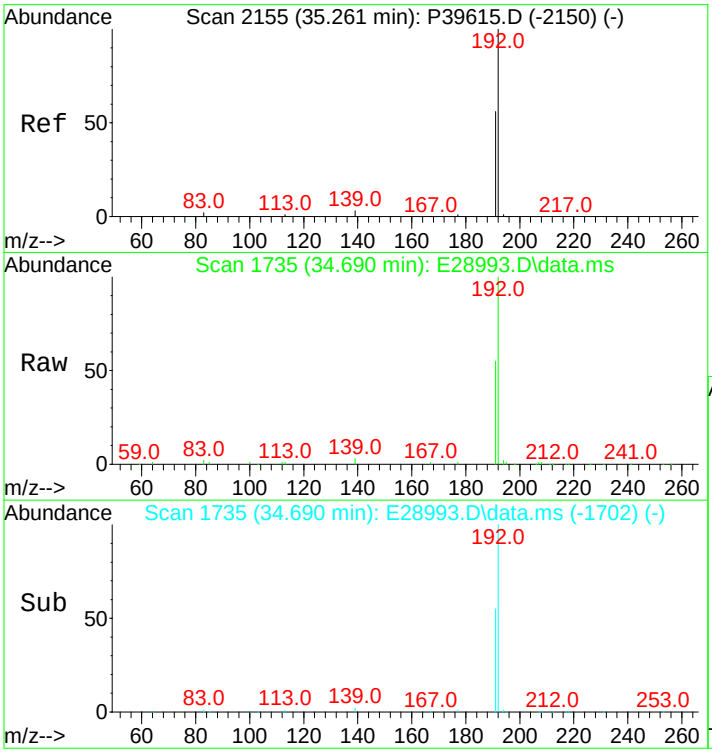


#56
Carbazole
Concen: 556.34 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:167 Resp: 46813

Ion	Ratio	Lower	Upper
167	100		
139	12.5	10.1	15.1

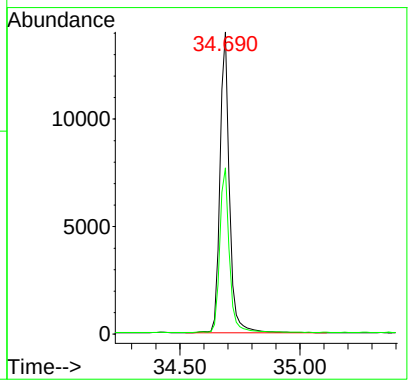


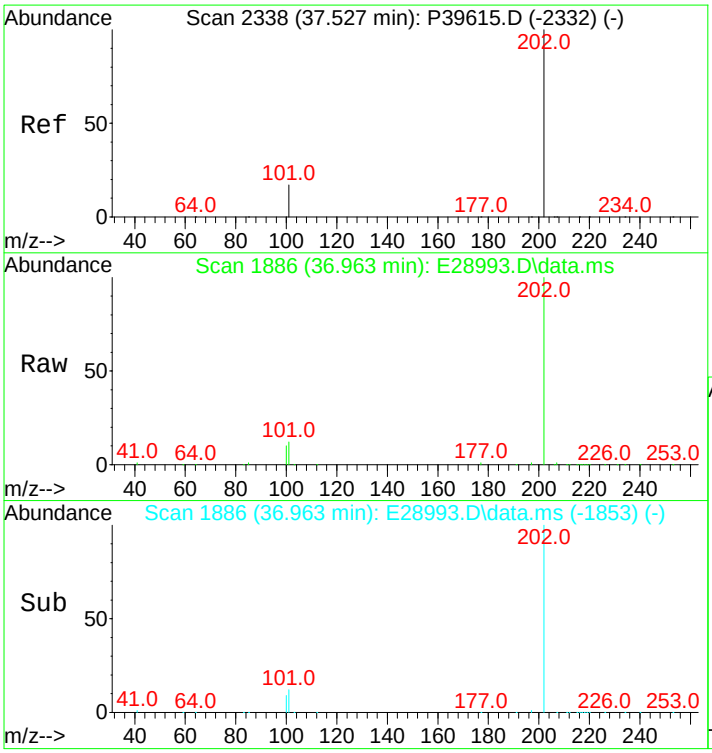


#57
1-Methylphenanthrene
Concen: 530.47 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:192 Resp: 38281

Ion	Ratio	Lower	Upper
192	100		
191	56.2	45.4	68.2

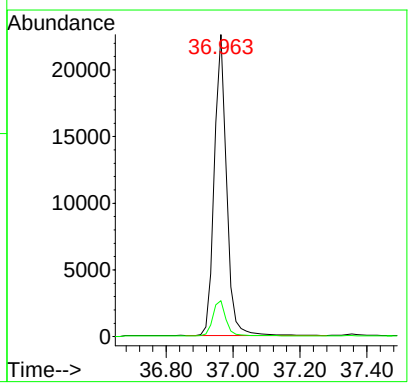


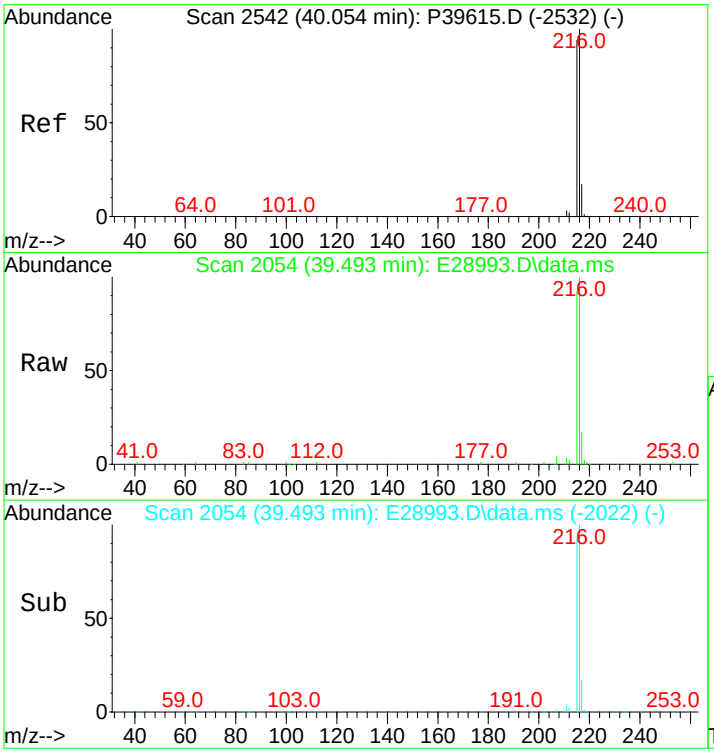


#58
Fluoranthene
Concen: 545.42 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:202 Resp: 56975

Ion	Ratio	Lower	Upper
202	100		
101	12.3	10.4	15.6

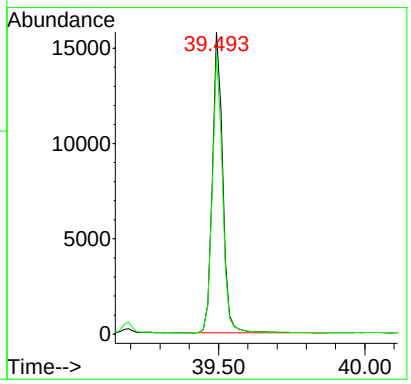


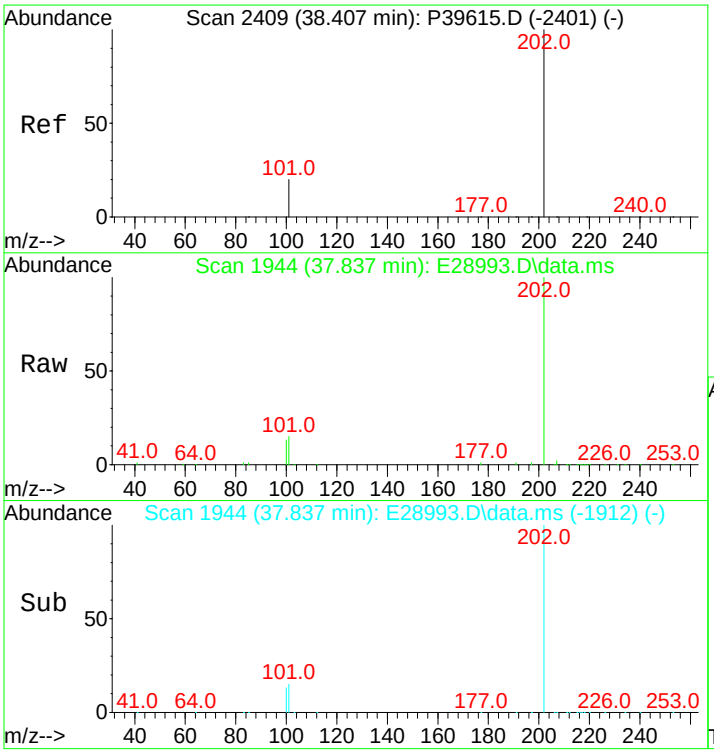


#59
Benzo(b)fluorene
Concen: 552.01 ng/mL
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:216 Resp: 38424

Ion	Ratio	Lower	Upper
216	100		
215	92.0	72.6	109.0

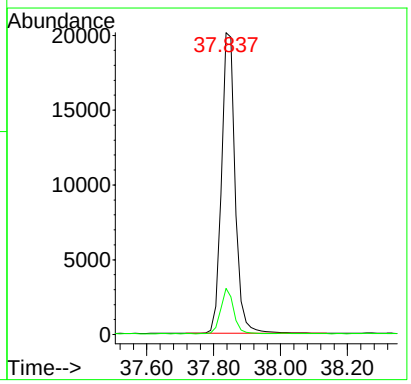


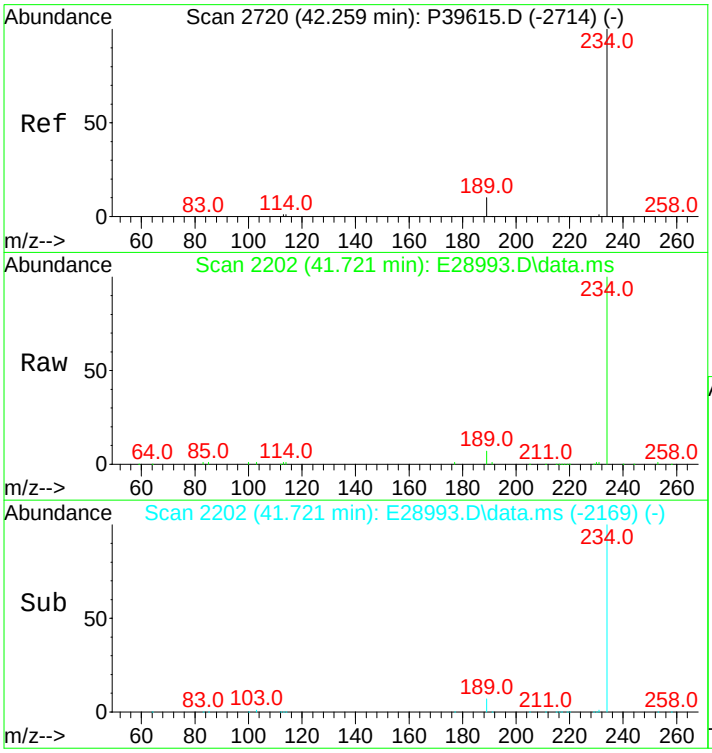


#60
Pyrene
Concen: 539.28 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:202 Resp: 57258

Ion	Ratio	Lower	Upper
202	100		
101	14.3	11.0	16.4

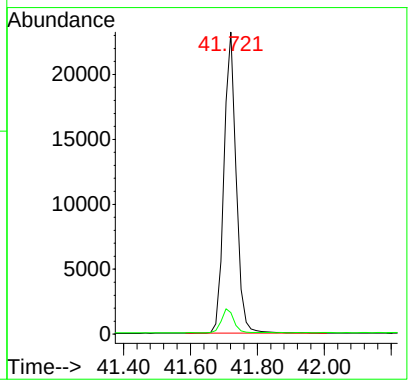


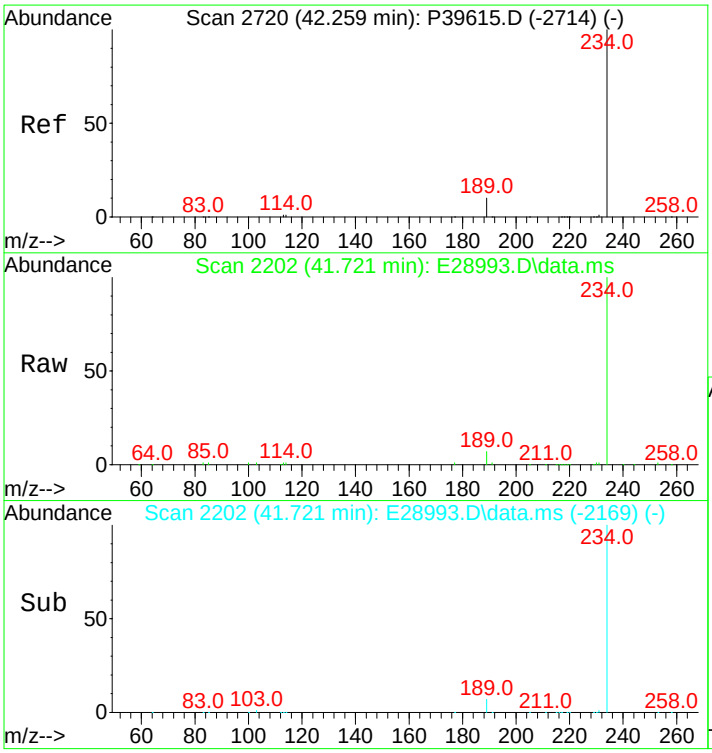


#66
Naphthobenzothiophene
Concen: 562.82 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:234 Resp: 58939

Ion	Ratio	Lower	Upper
234	100		
189	8.2	21.1	31.7#

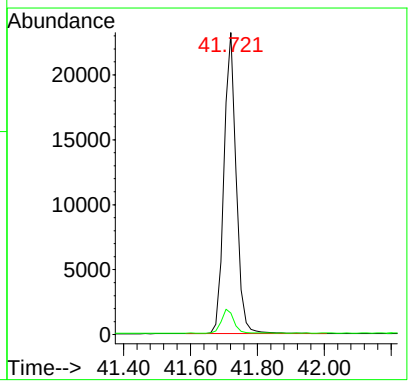


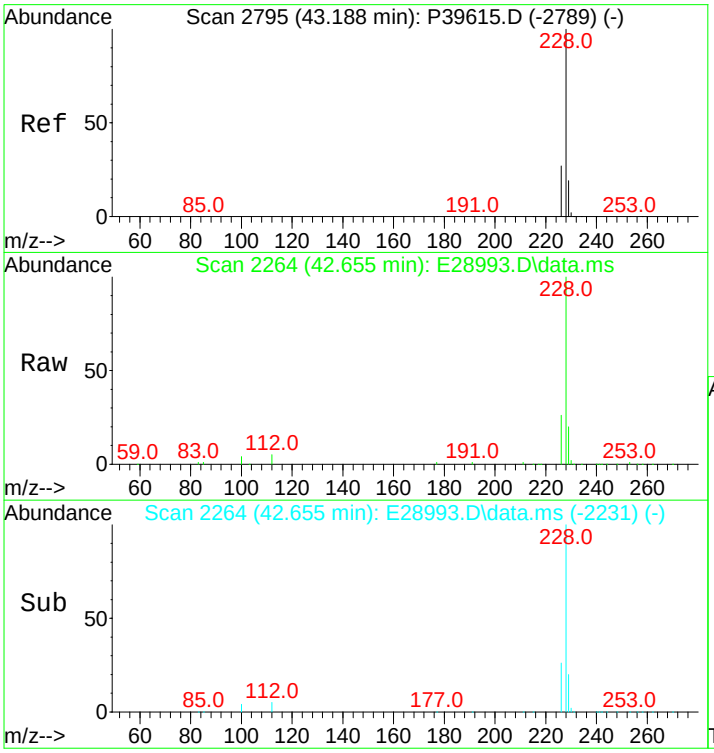


#67
Naphthobenzothiophene-2,1-D
Concen: 562.82 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:234 Resp: 58939

Ion	Ratio	Lower	Upper
234	100		
189	8.2	21.1	31.7#

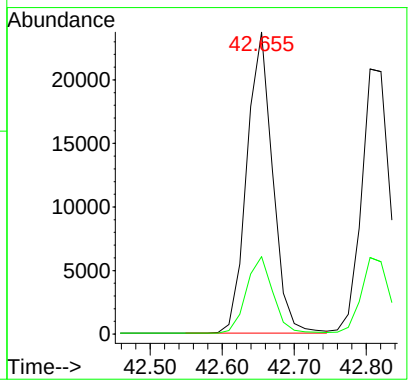


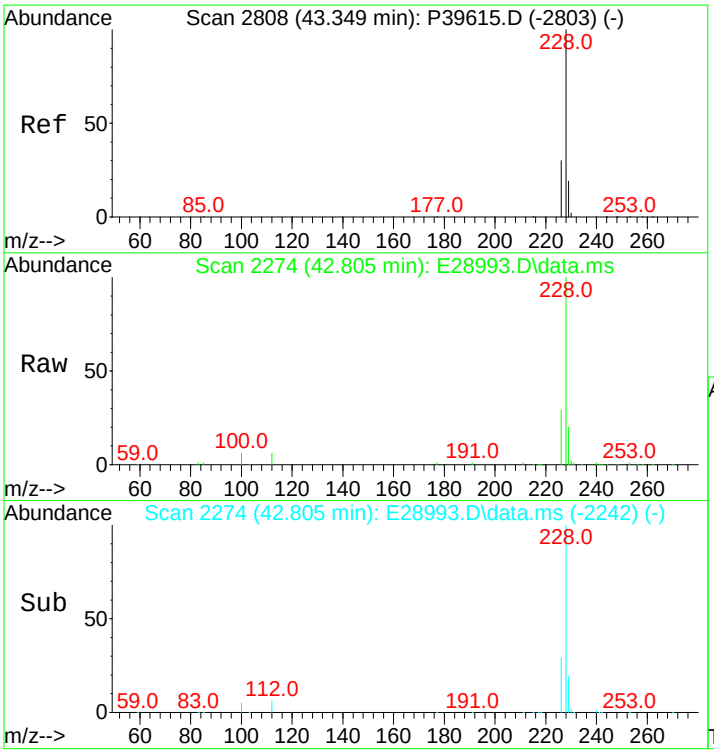


#75
Benz[a]anthracene
Concen: 571.56 ng/mL
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:228 Resp: 58810

Ion	Ratio	Lower	Upper
228	100		
226	26.2	20.7	31.1

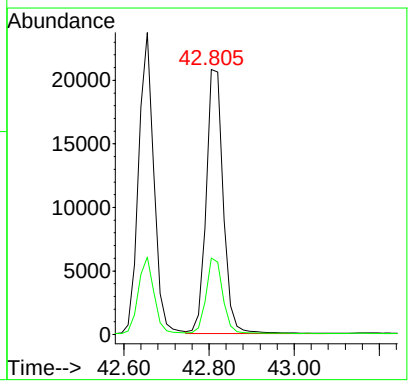


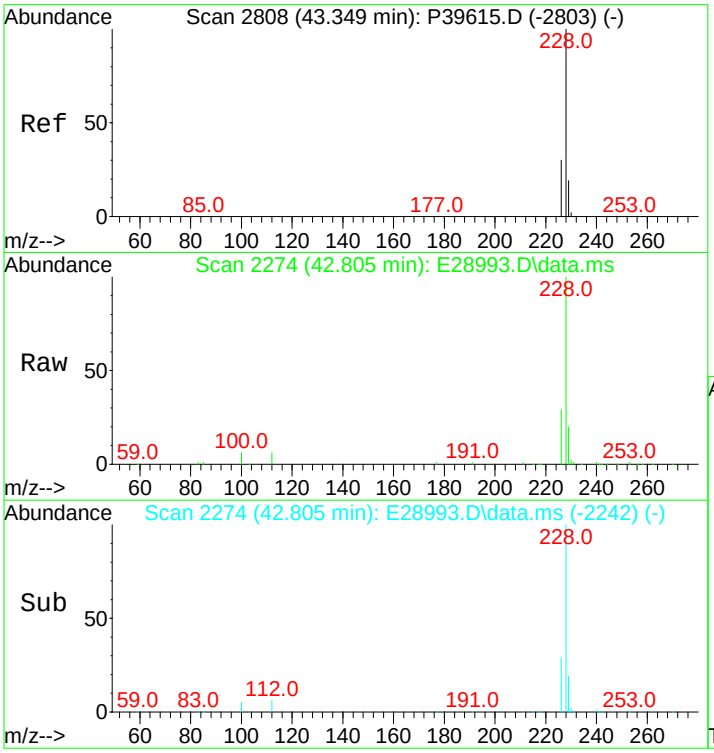


#76
Chrysene
Concen: 546.82 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:228 Resp: 57925

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

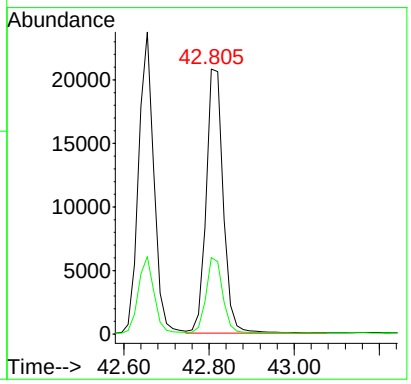


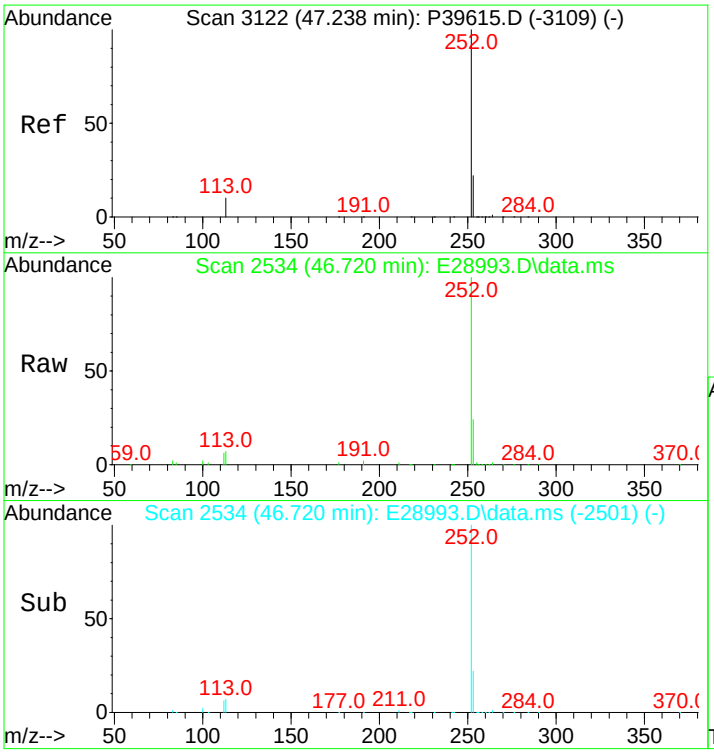


#77
Chrysene/Triphenylene
Concen: 546.82 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:228 Resp: 57925

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

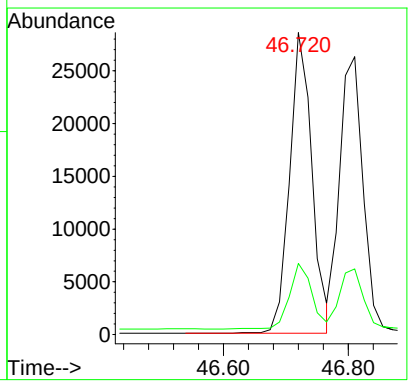


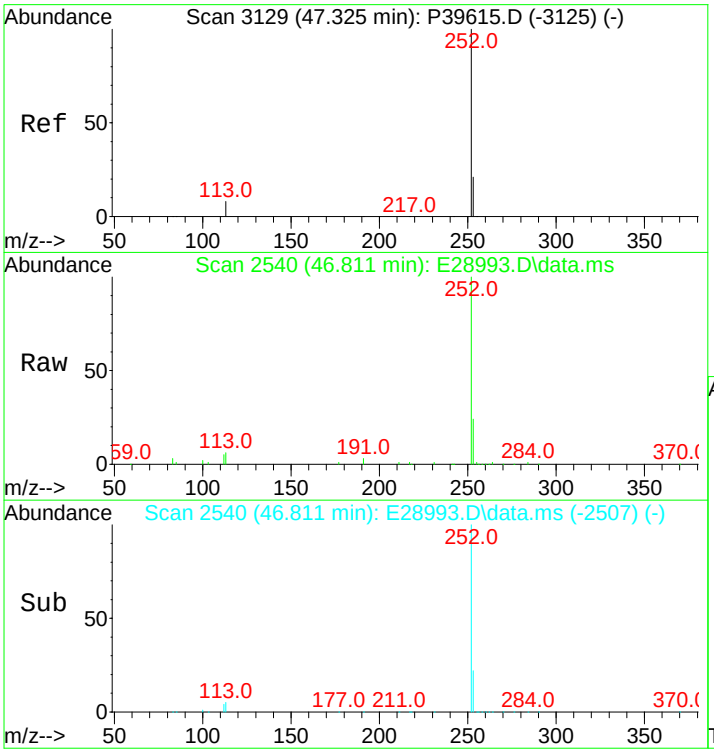


#84
Benzo[b]fluoranthene
Concen: 592.46 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 70856

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.5	29.3

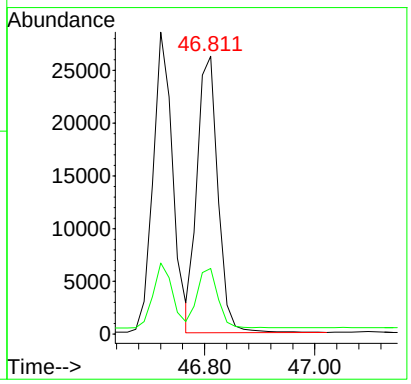


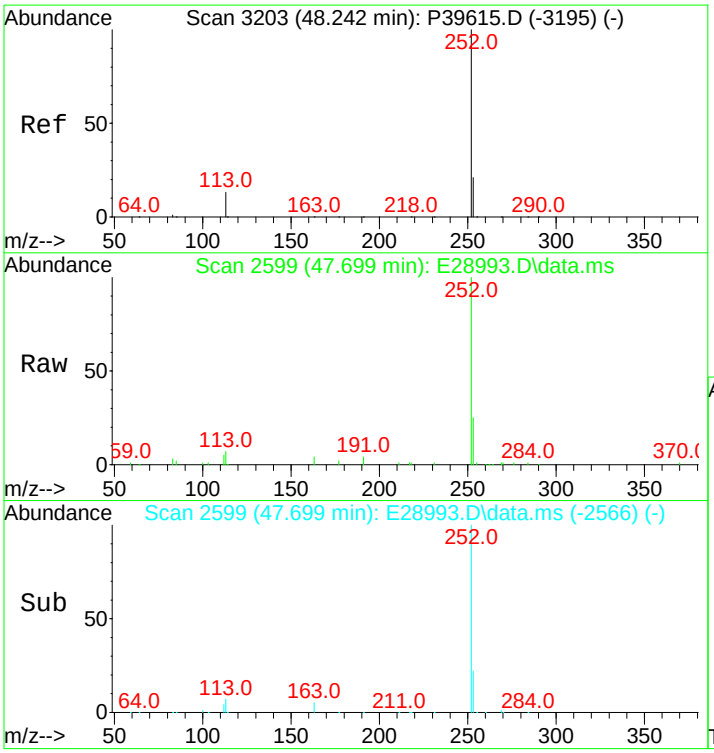


#85
Benzo[j]+[k]fluoranthene
Concen: 564.00 ng/mL
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 69397

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.7	29.5

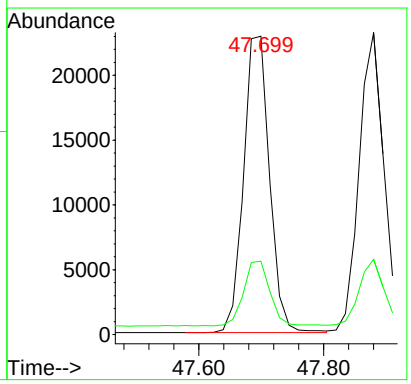


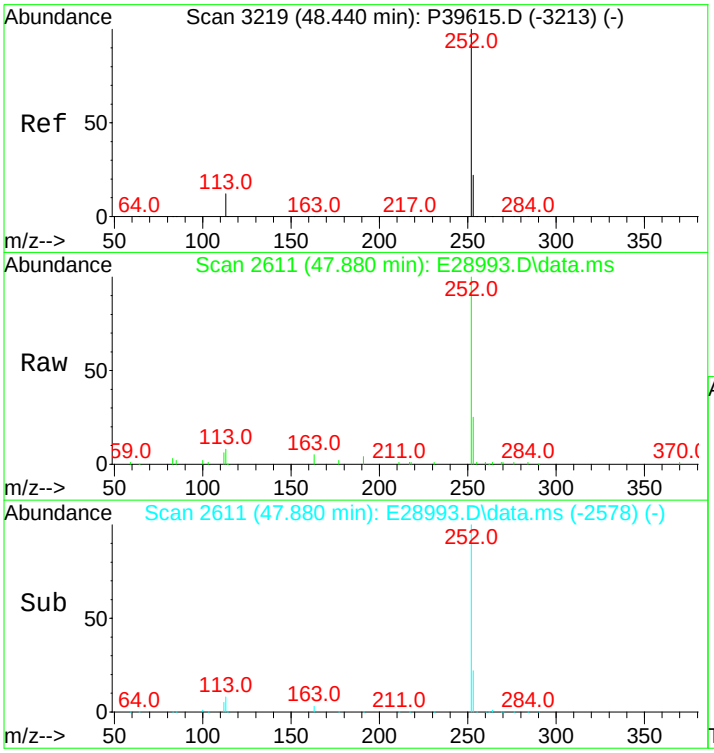


#87
Benzo[e]pyrene
Concen: 567.16 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 66232

Ion	Ratio	Lower	Upper
252	100		
253	22.7	20.6	31.0

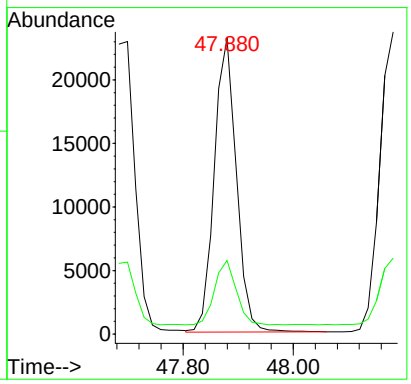


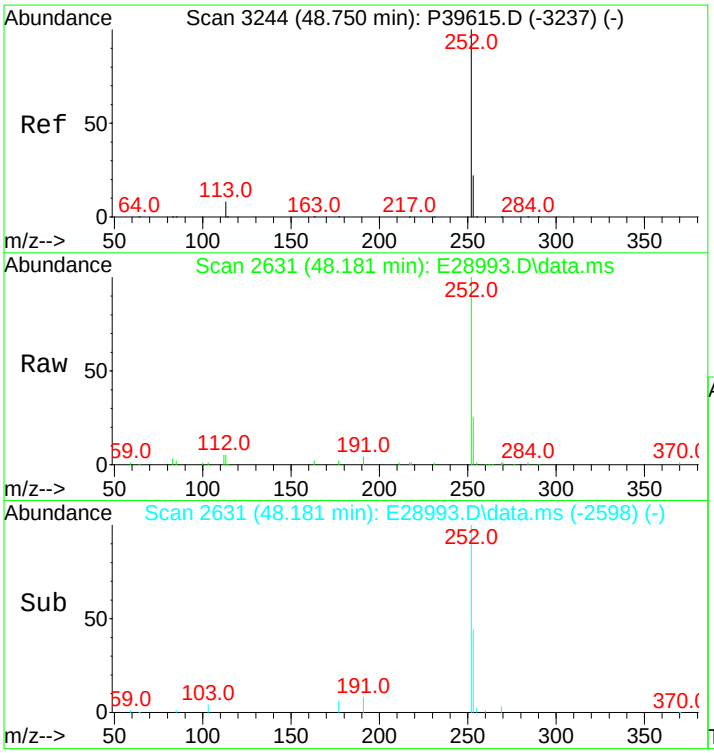


#89
Benzo[a]pyrene
Concen: 578.68 ng/mL
RT: 47.880 min Scan# 2611
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 64662

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.8	31.2

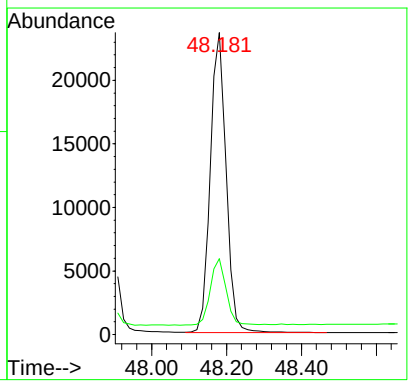


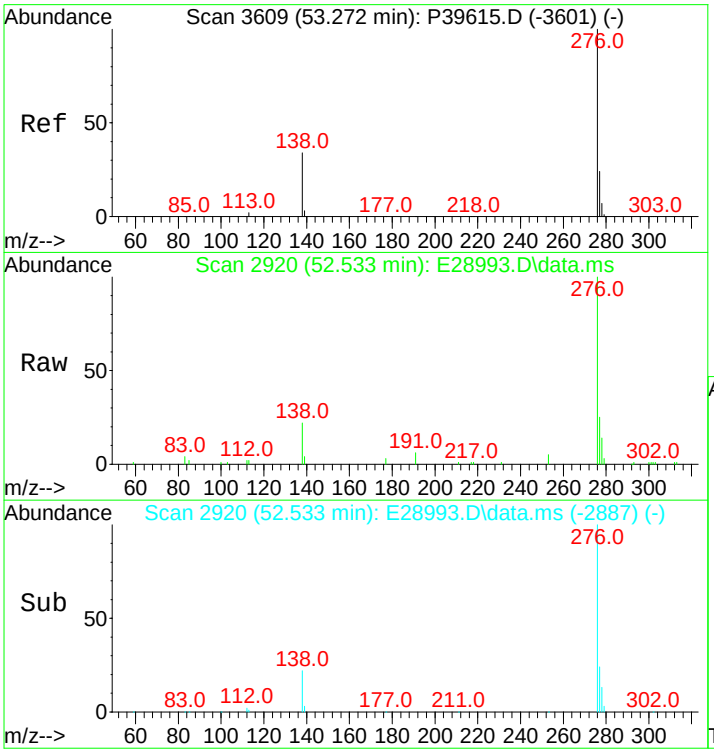


#90
Perylene
Concen: 585.77 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 69214

Ion	Ratio	Lower	Upper
252	100		
253	22.3	20.7	31.1

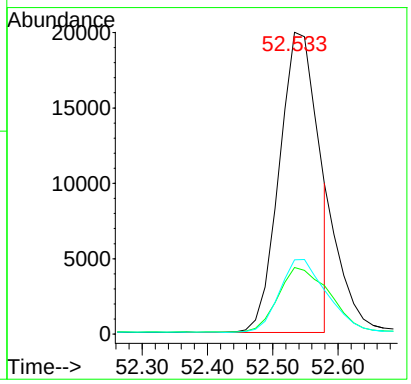


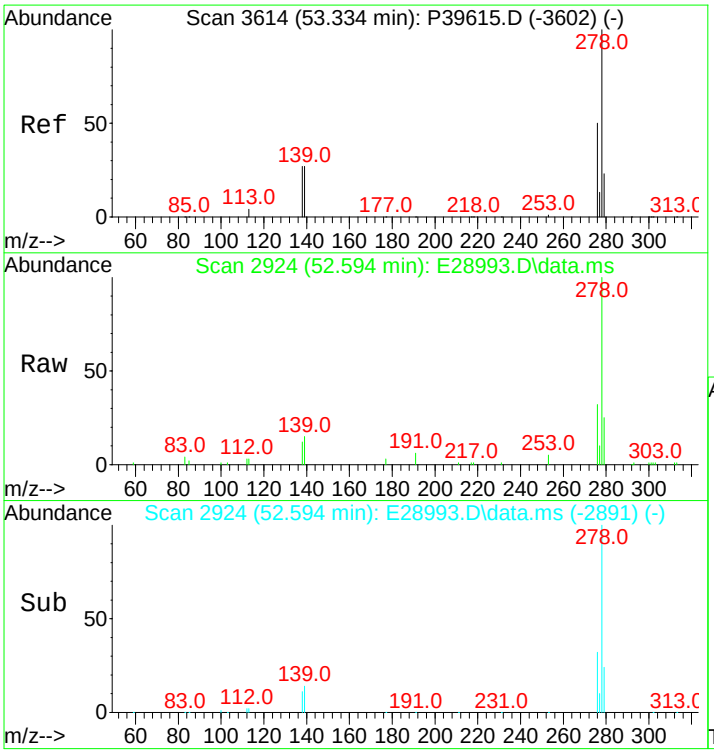


#91
Indeno[1,2,3-cd]pyrene
Concen: 625.95 ng/mL m
RT: 52.533 min Scan# 2920
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:276 Resp: 82316

Ion	Ratio	Lower	Upper
276	100		
138	28.8	16.3	24.5#
277	30.0	19.4	29.2#

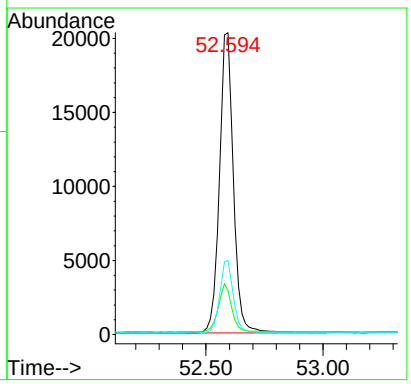


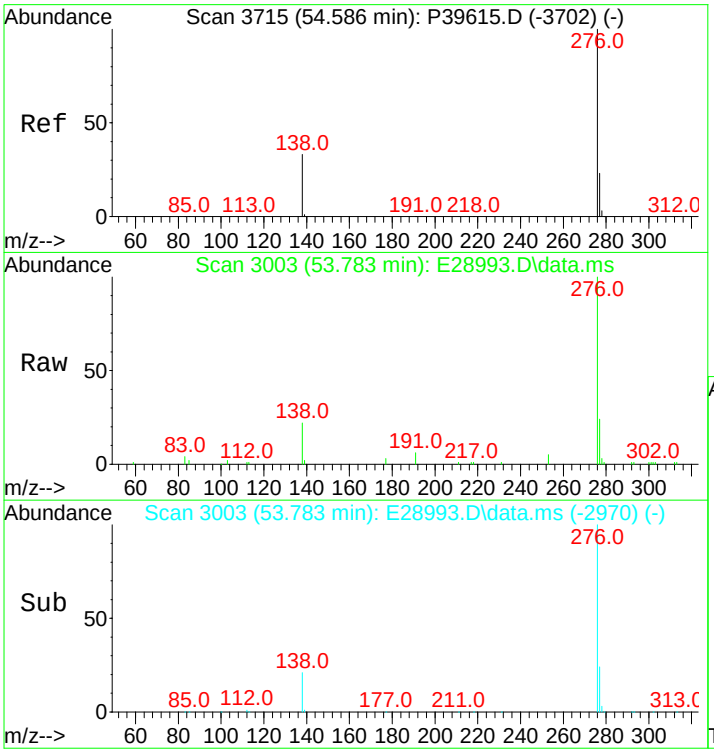


#92
Dibenz[ah]+[ac]anthracene
Concen: 603.49 ng/mL
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:278 Resp: 84503

Ion	Ratio	Lower	Upper
278	100		
139	15.1	11.6	17.4
279	23.5	19.3	28.9

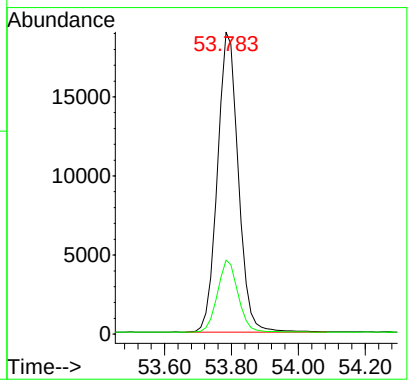


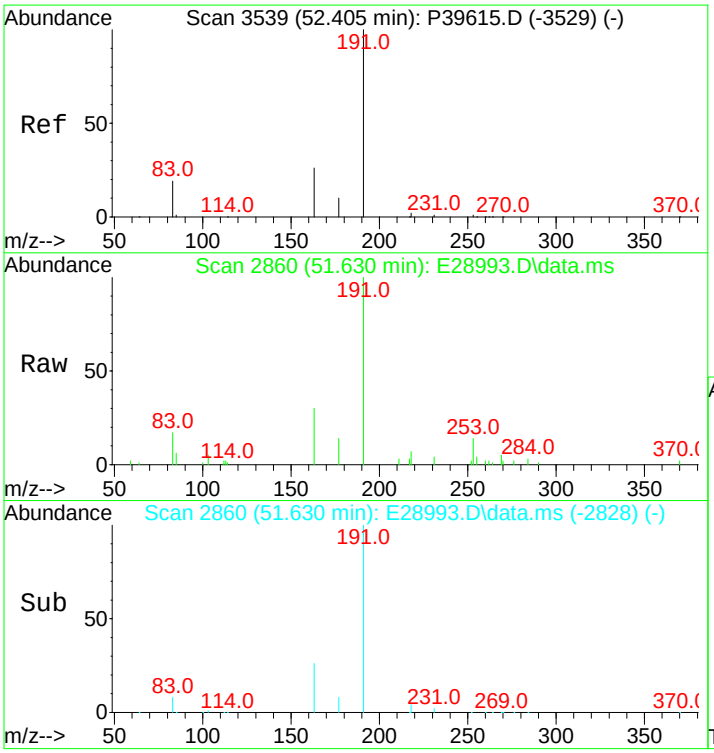


#93
Benzo[g,h,i]perylene
Concen: 579.48 ng/mL
RT: 53.783 min Scan# 3003
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:276 Resp: 82167

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

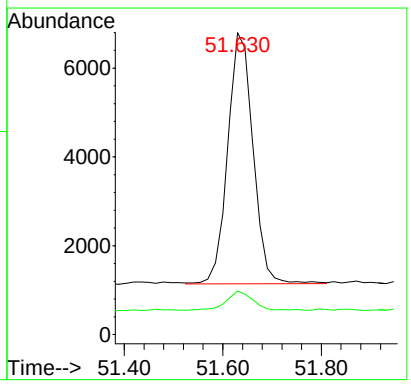


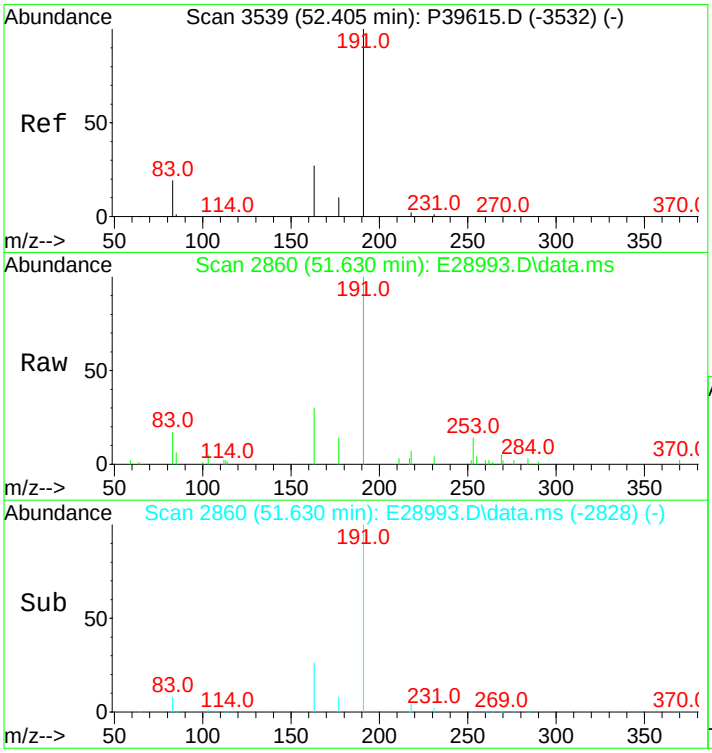


#94
Hopane (T19)
Concen: 510.23 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:191 Resp: 20233

Ion	Ratio	Lower	Upper
191	100		
177	8.0	11.6	17.4#

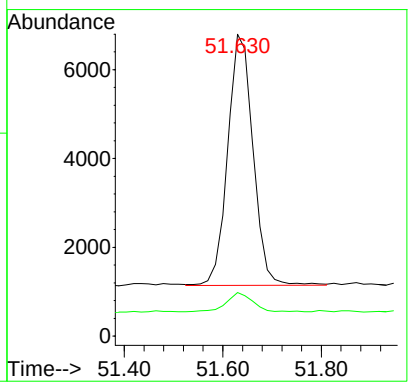




#95
17a(H),21B(H)-hopane - C30H52
Concen: 510.23 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:191 Resp: 20233

Ion	Ratio	Lower	Upper
191	100		
177	8.0	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	24018	500.000	ng/mL	0.02
74) Chrysene-d12	42.730	240	51970	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	42087	498.182	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.82%#			
42) Phenanthrene-d10	32.085	188	42292	488.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.86%#			
83) Benzo[b]fluoranthene-d12	46.645	264	53512	501.242	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.12%			
88) Benzo[a]pyrene-d12	47.805	264	52874	511.142	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
129) 5B(H)Cholane - Surr	43.347	217	10939	534.065	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.41%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4810	250.362	ng/mL	100
4) cis-Decalin	17.106	138	3688	252.663	ng/mL	100
10) Naphthalene	19.319	128	50662	536.245	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	31345	520.920	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	30282	517.920	ng/mL#	100
18) Benzothiophene	19.530	134	42828	548.360	ng/mL	100
23) Biphenyl	23.896	154	39765	522.893	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	28258	521.008	ng/mL#	100
25) Dibenzofuran	26.982	168	45112	535.812	ng/mL	96
26) Acenaphthylene	25.597	152	51113M3	542.648	ng/mL	
27) Acenaphthene	26.335	153	31260	515.583	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.900	170	26129	514.919	ng/mL	96
29) Fluorene	28.352	166	35474	524.595	ng/mL	99
33) Dibenzothiophene	31.679	184	51505	555.036	ng/mL	98
43) Phenanthrene	32.176	178	50492	534.818	ng/mL	99
54) Retene	39.207	234	15591	513.199	ng/mL	92
55) Anthracene	32.371	178	48471M3	593.984	ng/mL	
56) Carbazole	33.049	167	46782	557.033	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38225	530.705	ng/mL	99
58) Fluoranthene	36.963	202	56249	539.501	ng/mL	98
59) Benzo(b)fluorene	39.508	216	38135	548.905	ng/mL	99
60) Pyrene	37.852	202	57209	539.847	ng/mL	99
66) Naphthobenzothiophene	41.736	234	57263	547.867	ng/ml#	65
67) Naphthobenzothiophene-2,1	41.736	234	57263	547.867	ng/mL#	65
75) Benz[a]anthracene	42.655	228	56552	558.805	ng/mL	100
76) Chrysene	42.820	228	55852	536.064	ng/mL	99
77) Chrysene/Triphenylene	42.820	228	55852	536.064	ng/mL	99
84) Benzo[b]fluoranthene	46.735	252	68060	578.593	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.811	252	65403	540.427	ng/mL	94
87) Benzo[e]pyrene	47.699	252	63310	551.206	ng/mL	92
89) Benzo[a]pyrene	47.895	252	61523	559.792	ng/mL	92
90) Perylene	48.196	252	65712	565.429	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.548	276	82475M3	637.649	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	80707	586.015	ng/mL	98
93) Benzo[g,h,i]perylene	53.813	276	79225	568.072	ng/mL	99
94) Hopane (T19)	51.645	191	20115	515.732	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.645	191	20115	515.732	ng/mL#	84

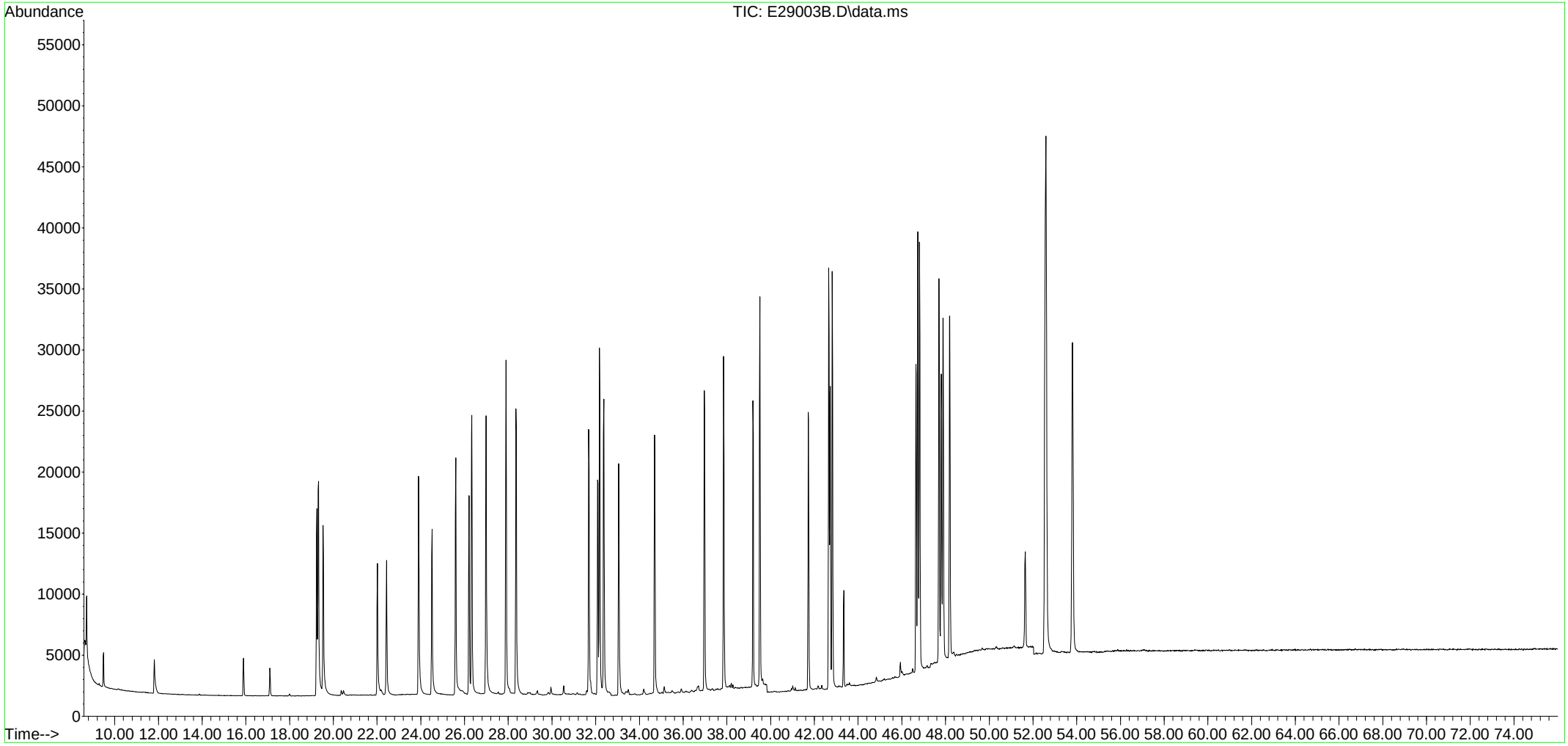
(#) = qualifier out of range (m) = manual integration (+) = signals summed

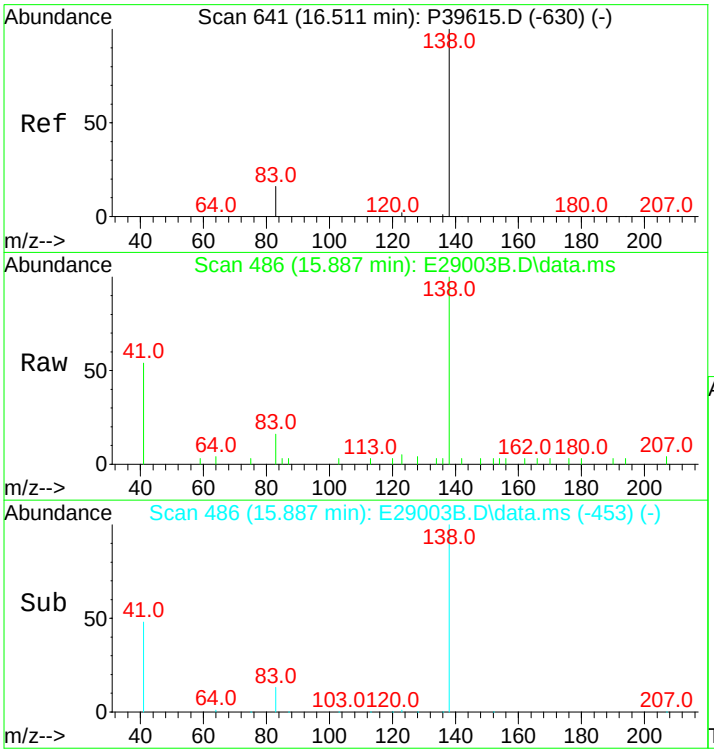
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

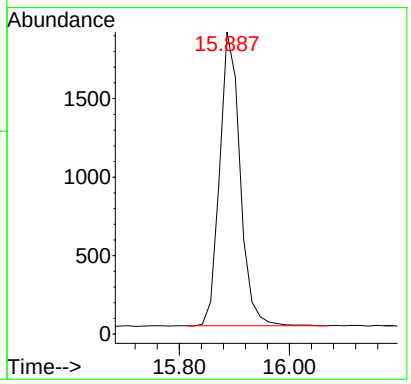
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

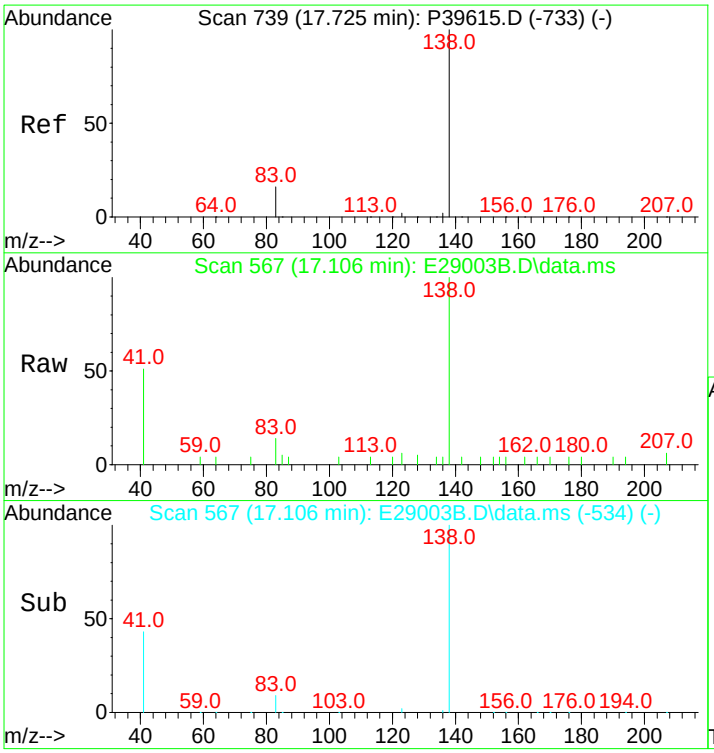




#3
trans-Decalin
Concen: 250.36 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

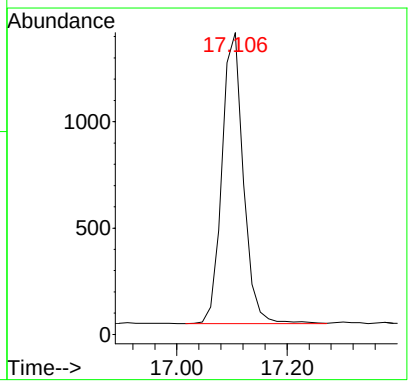
Tgt Ion:138 Resp: 4810

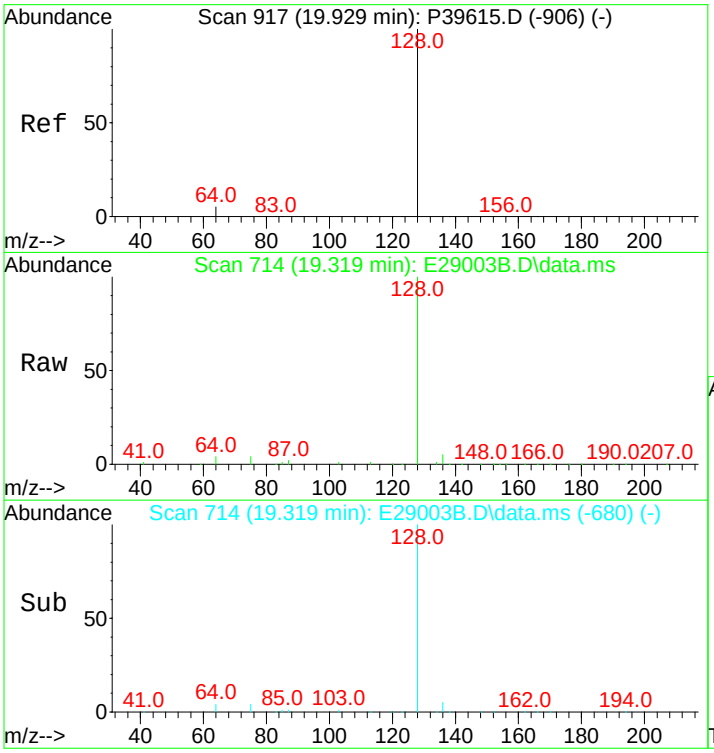




#4
cis-Decalin
Concen: 252.66 ng/mL
RT: 17.106 min Scan# 567
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:138 Resp: 3688

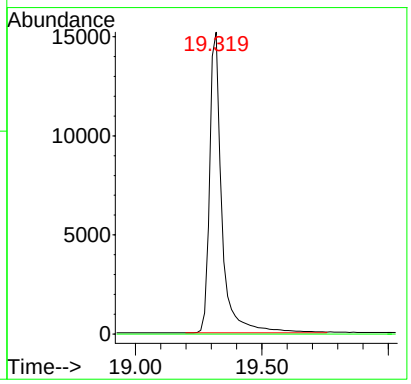


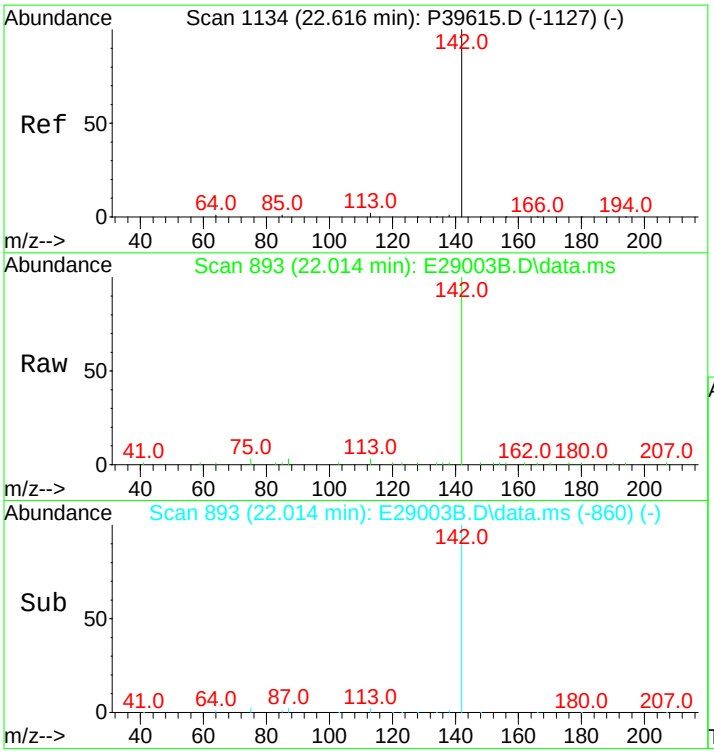


#10
Naphthalene
Concen: 536.25 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:128 Resp: 50662

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

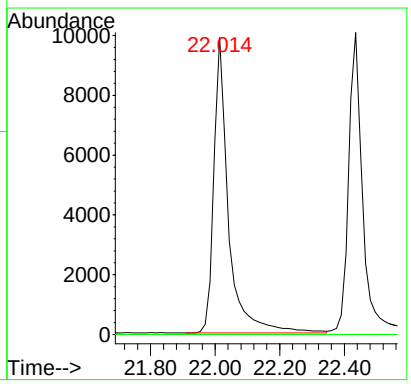


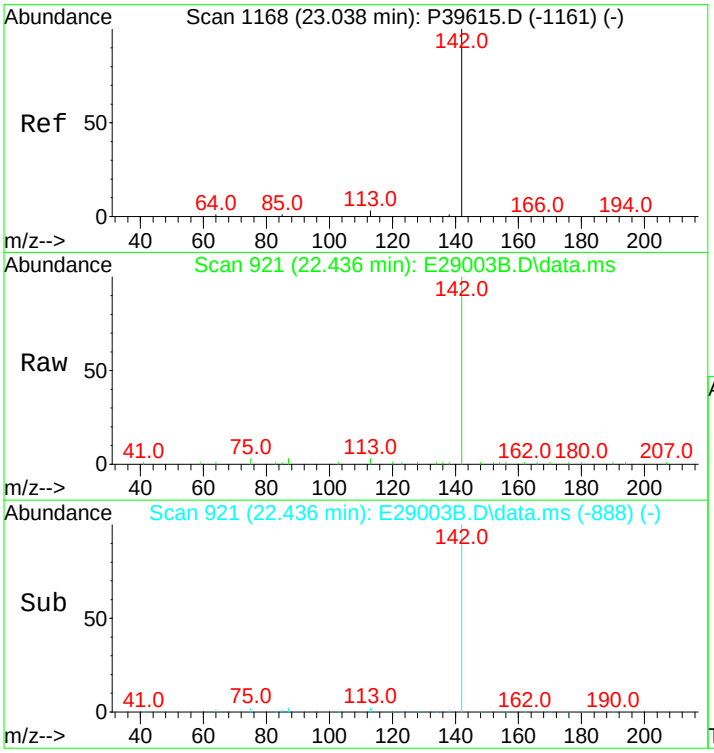


#16
2-Methylnaphthalene
Concen: 520.92 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:142 Resp: 31345

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

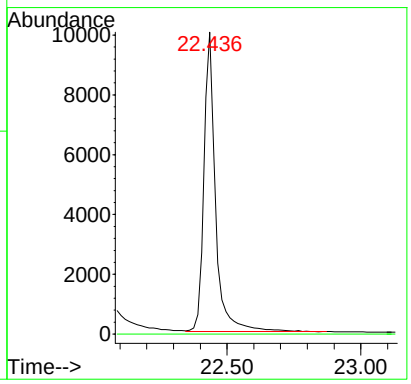


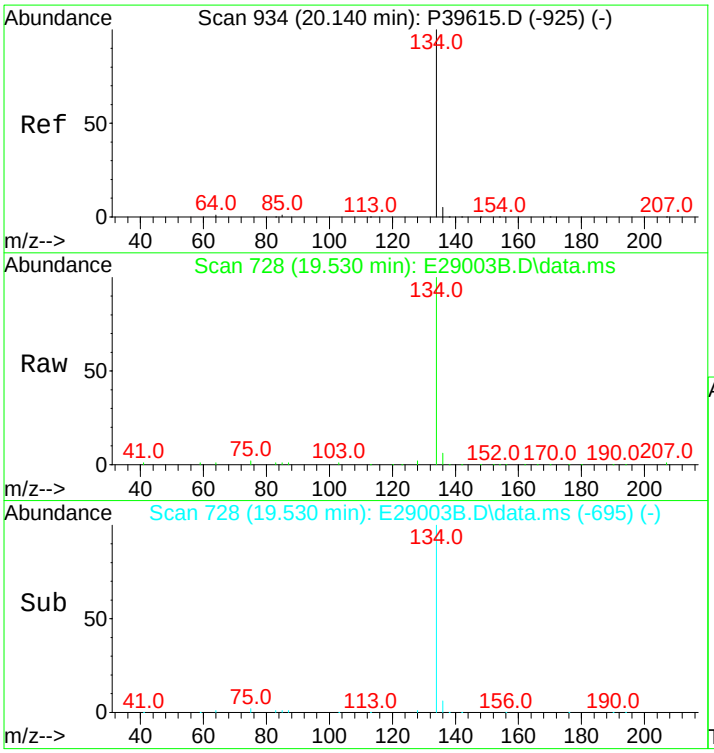


#17
1-Methylnaphthalene
Concen: 517.92 ng/mL
RT: 22.436 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:142 Resp: 30282

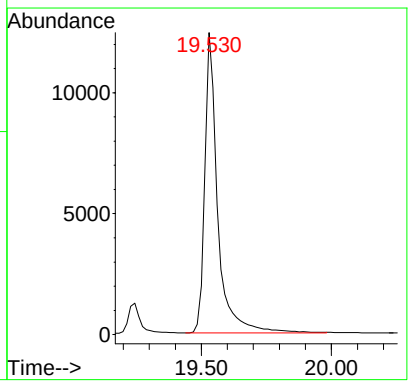
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

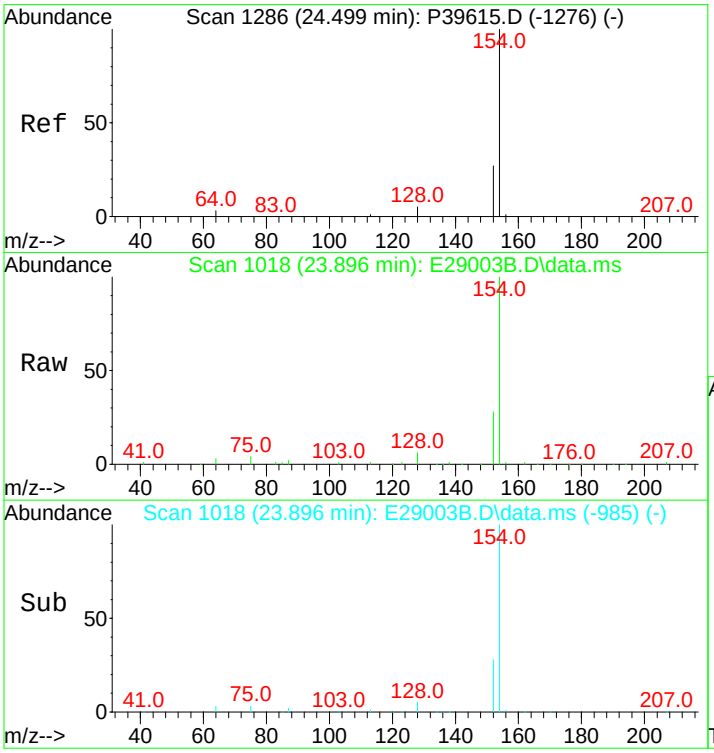




#18
Benzothiophene
Concen: 548.36 ng/mL
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:134 Resp: 42828

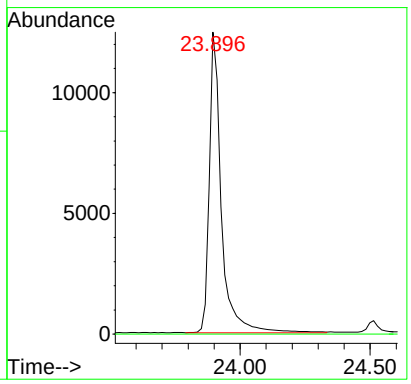


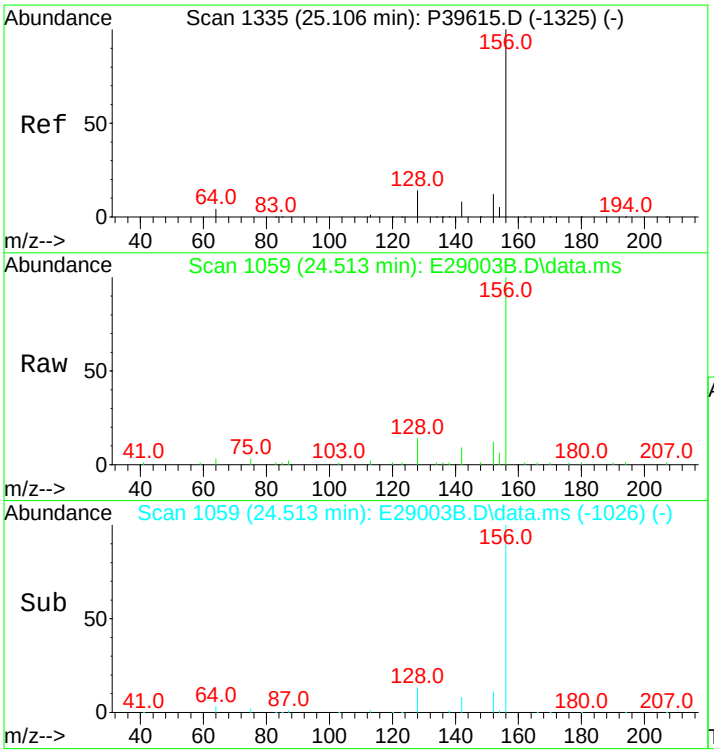


#23
Biphenyl
Concen: 522.89 ng/mL
RT: 23.896 min Scan# 1018
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:154 Resp: 39765

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

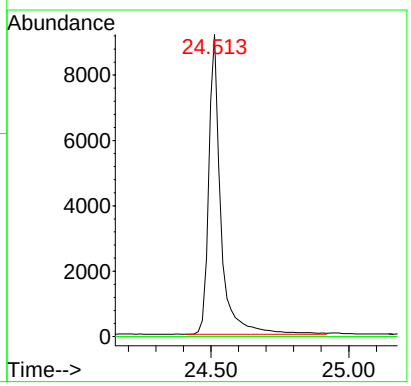


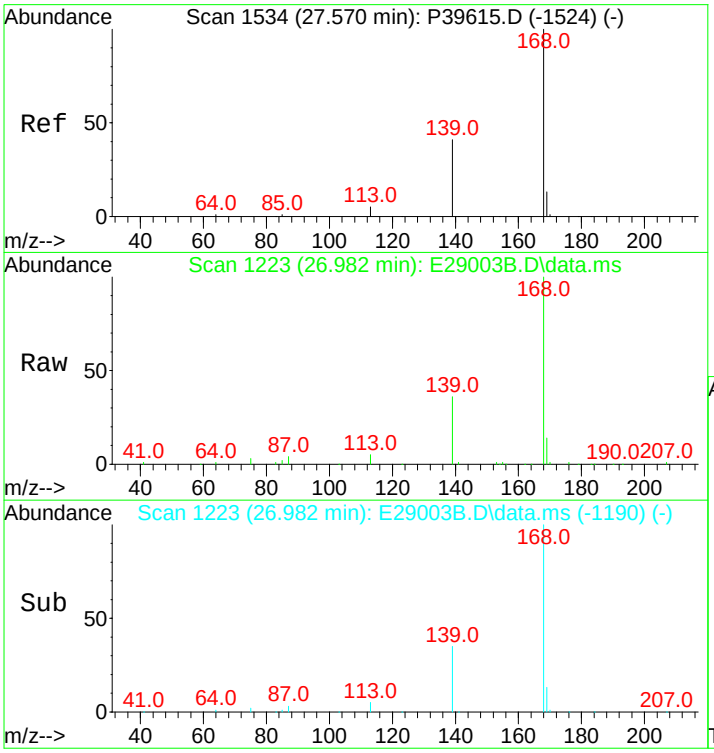


#24
2,6-Dimethylnaphthalene
Concen: 521.01 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:156 Resp: 28258

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

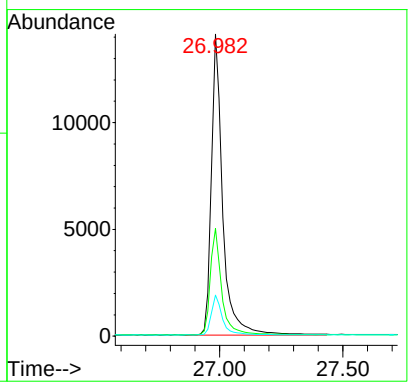


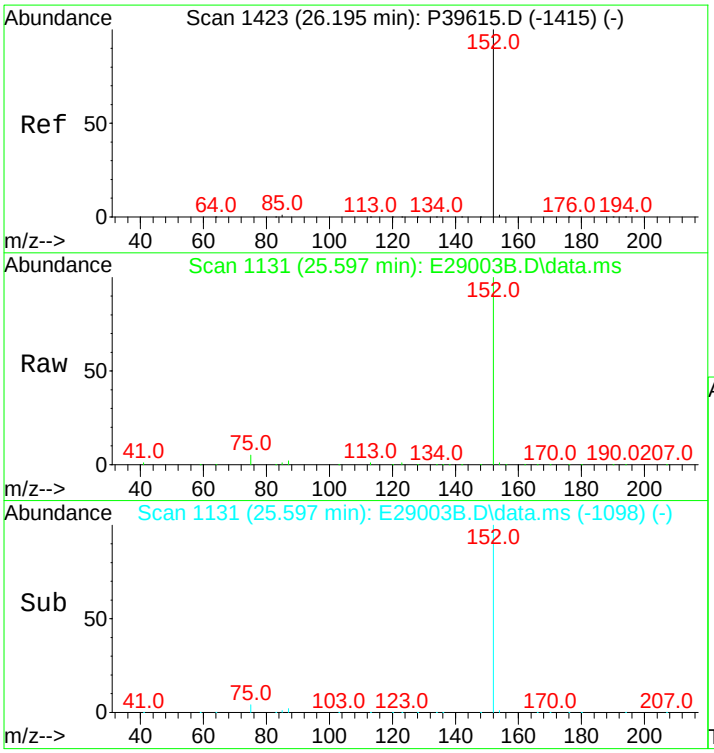


#25
Dibenzofuran
Concen: 535.81 ng/mL
RT: 26.982 min Scan# 1223
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:168 Resp: 45112

Ion	Ratio	Lower	Upper
168	100		
139	35.5	26.0	39.0
169	13.0	10.6	16.0

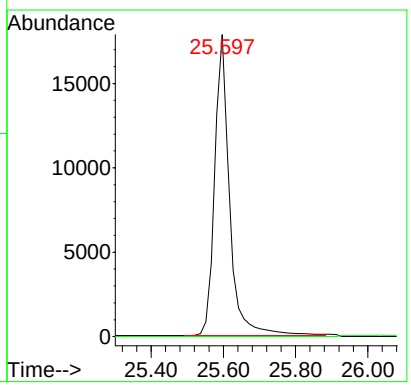


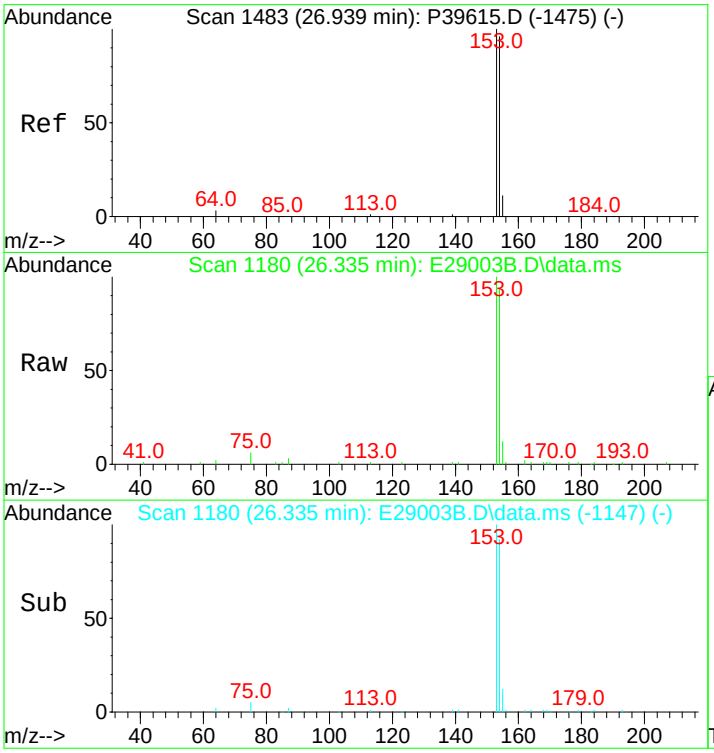


#26
Acenaphthylene
Concen: 542.65 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:152 Resp: 51113

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

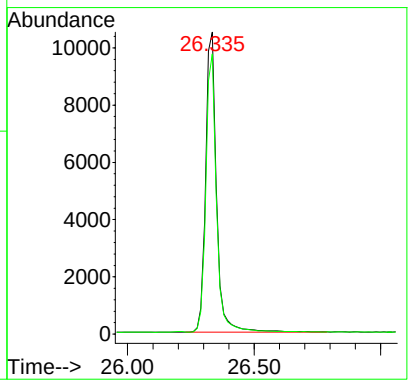


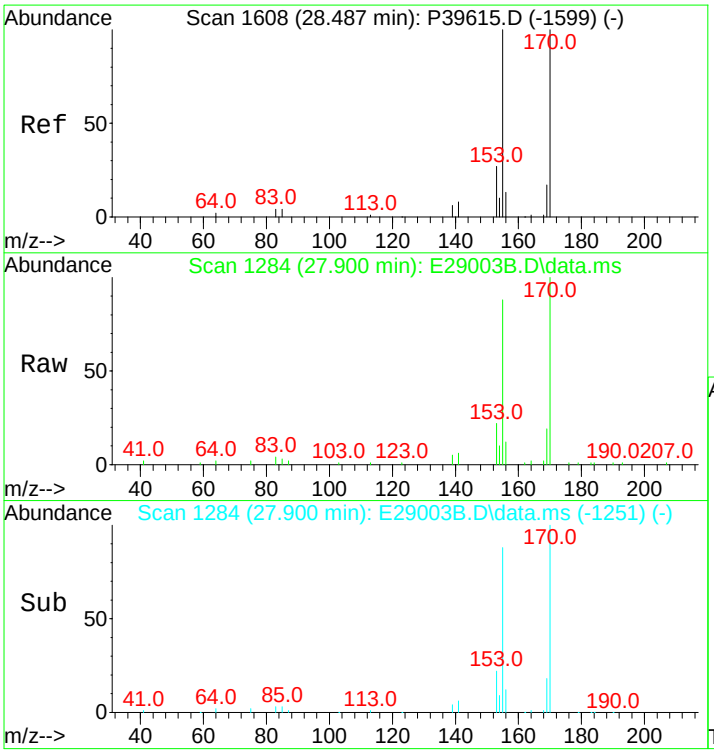


#27
Acenaphthene
Concen: 515.58 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:153 Resp: 31260

Ion	Ratio	Lower	Upper
153	100		
154	90.8	74.1	111.1

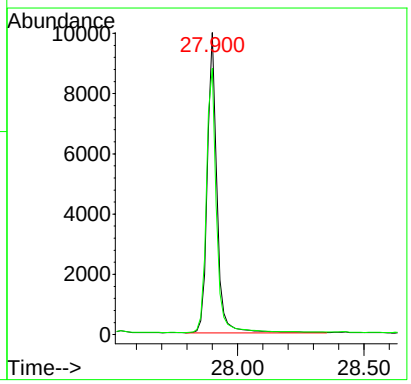


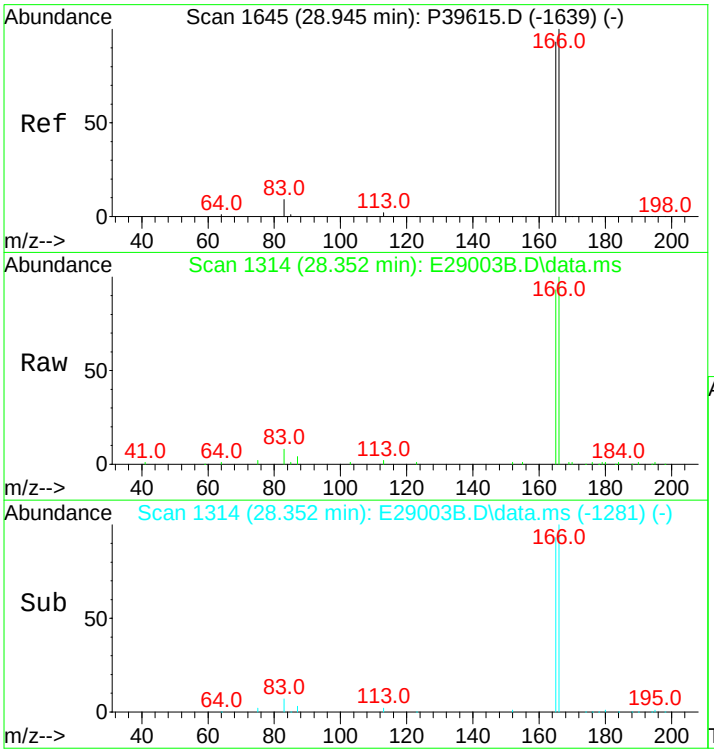


#28
2,3,5-Trimethylnaphthalene
Concen: 514.92 ng/mL
RT: 27.900 min Scan# 1284
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:170 Resp: 26129

Ion	Ratio	Lower	Upper
170	100		
155	91.9	70.7	106.1

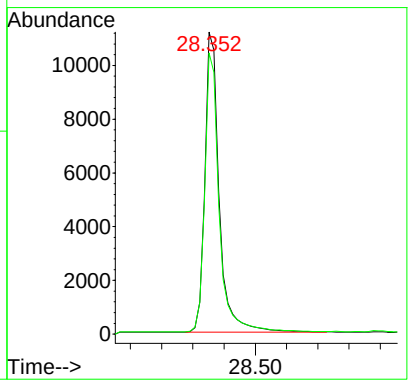


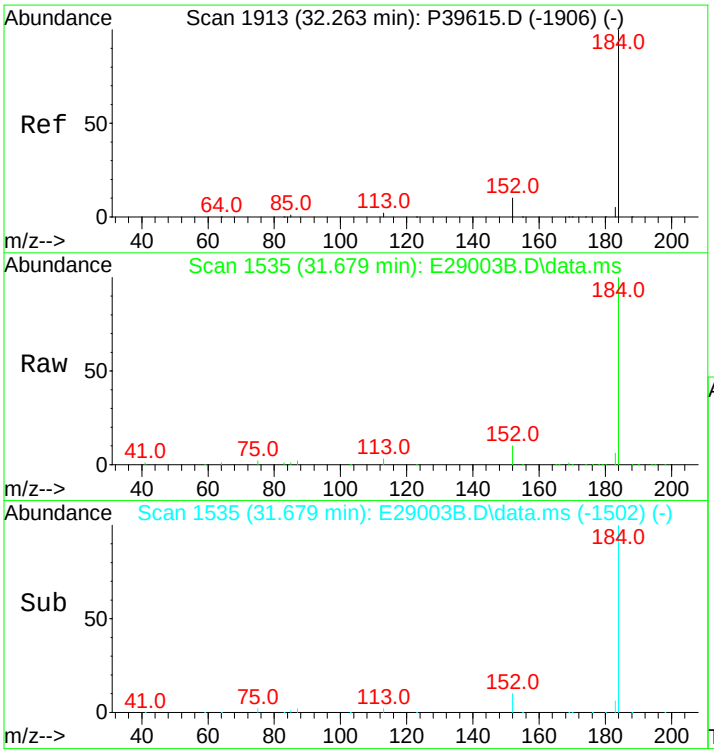


#29
Fluorene
Concen: 524.59 ng/mL
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:166 Resp: 35474

Ion	Ratio	Lower	Upper
166	100		
165	92.9	74.7	112.1

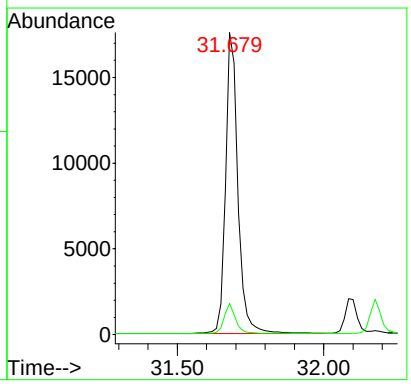


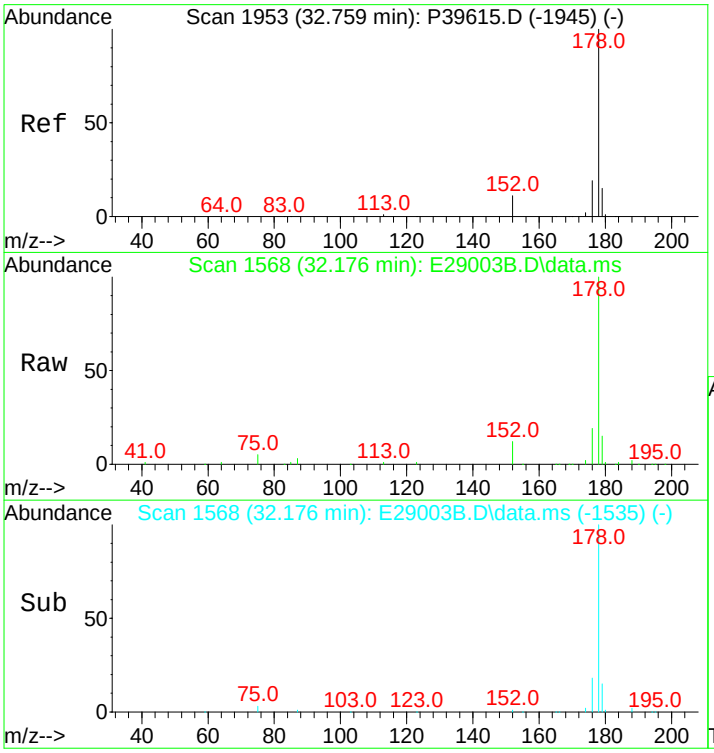


#33
Dibenzothiophene
Concen: 555.04 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:184 Resp: 51505

Ion	Ratio	Lower	Upper
184	100		
152	9.4	7.0	10.6

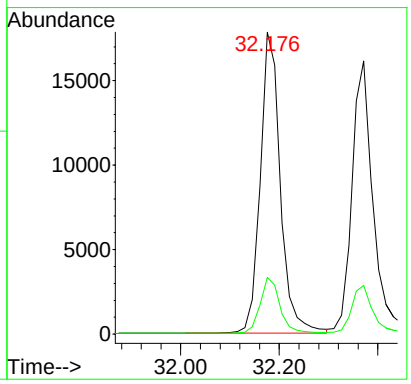


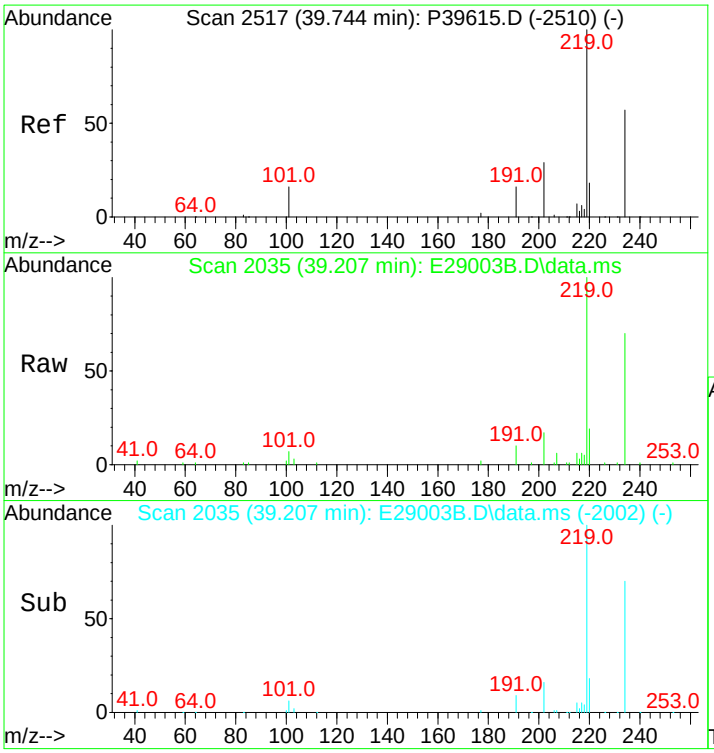


#43
Phenanthrene
Concen: 534.82 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:178 Resp: 50492

Ion	Ratio	Lower	Upper
178	100		
176	18.4	15.0	22.4

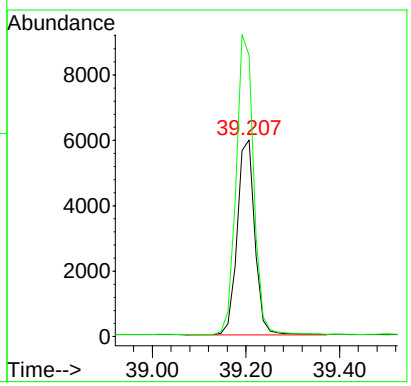


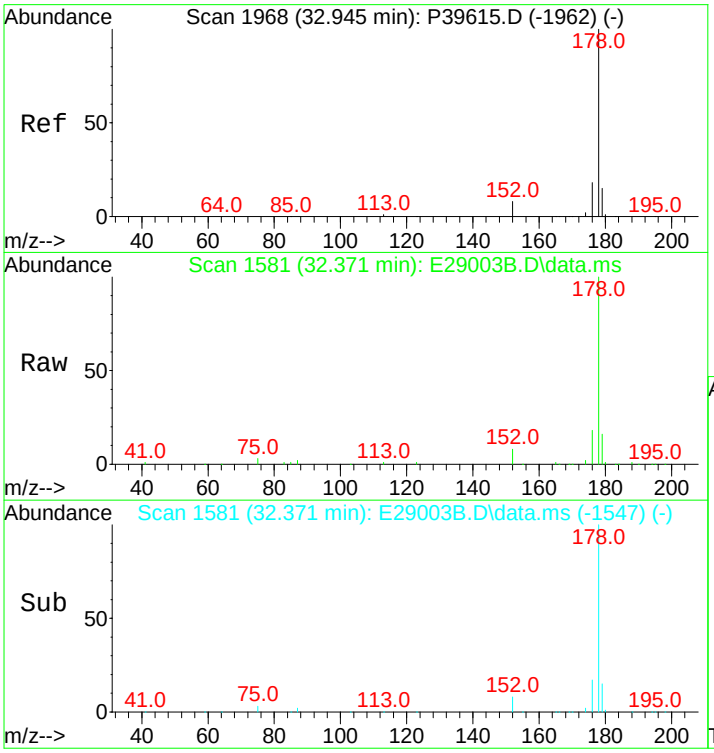


#54
Retene
Concen: 513.20 ng/mL
RT: 39.207 min Scan# 2035
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:234 Resp: 15591

Ion	Ratio	Lower	Upper
234	100		
219	153.6	115.3	172.9

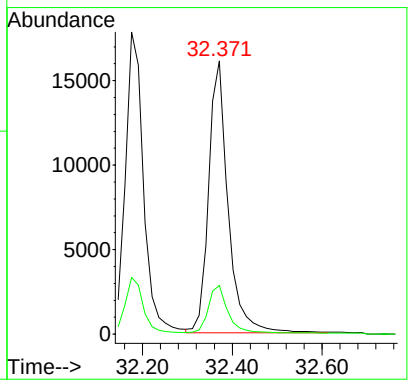


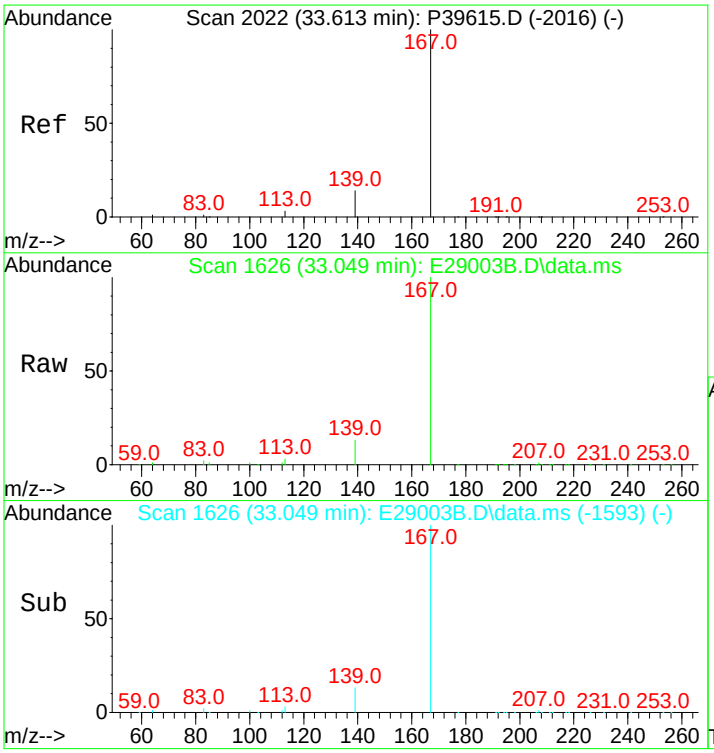


#55
Anthracene
Concen: 593.98 ng/mL m
RT: 32.371 min Scan# 1581
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:178 Resp: 48471

Ion	Ratio	Lower	Upper
178	100		
176	20.7	14.3	21.5

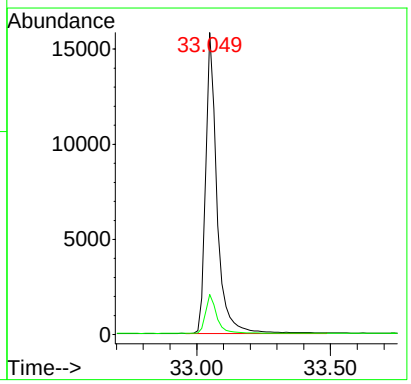


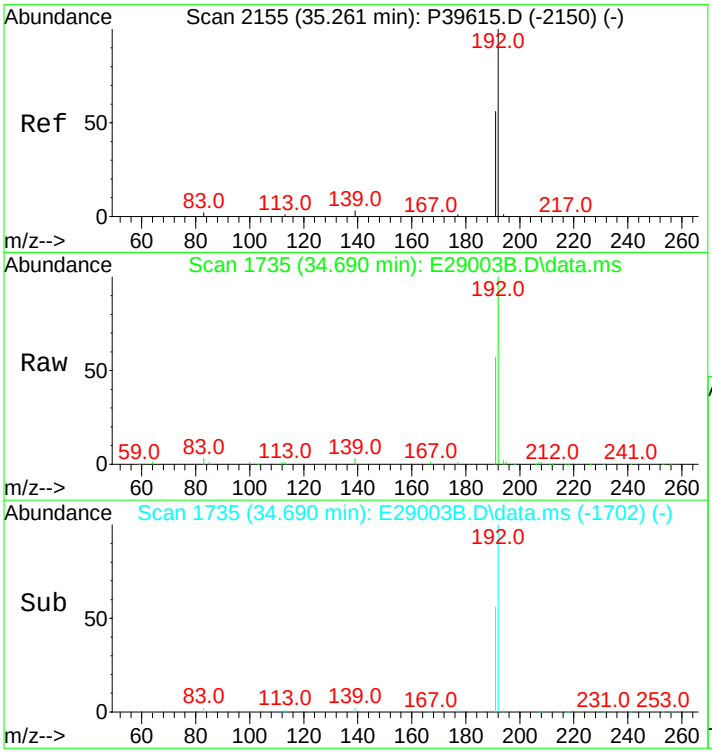


#56
Carbazole
Concen: 557.03 ng/mL
RT: 33.049 min Scan# 1626
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:167 Resp: 46782

Ion	Ratio	Lower	Upper
167	100		
139	12.8	10.1	15.1

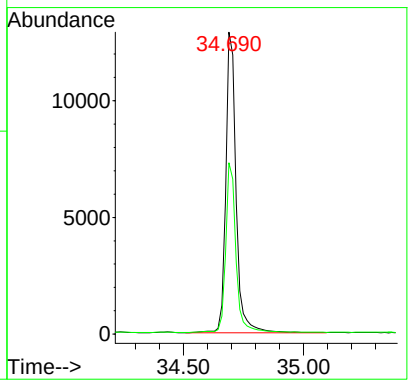


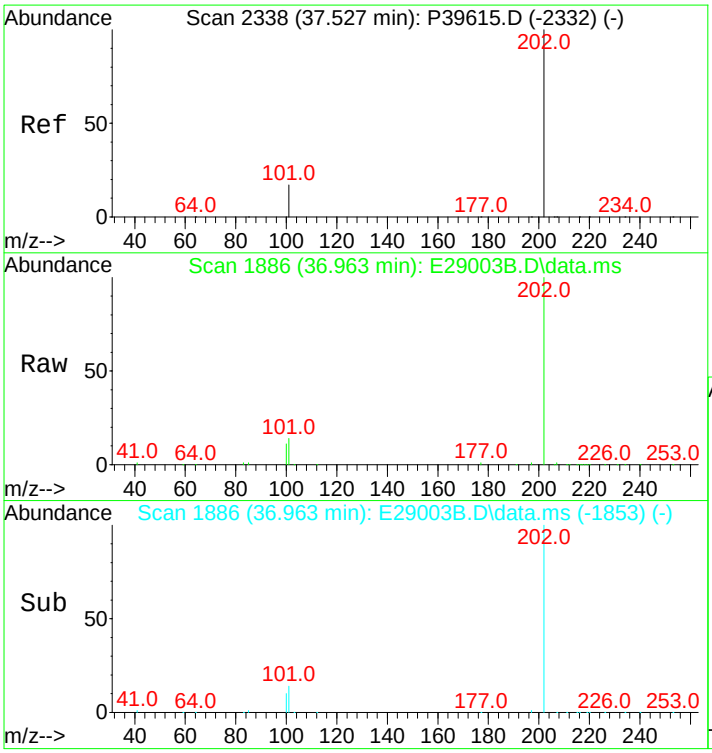


#57
1-Methylphenanthrene
Concen: 530.71 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:192 Resp: 38225

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

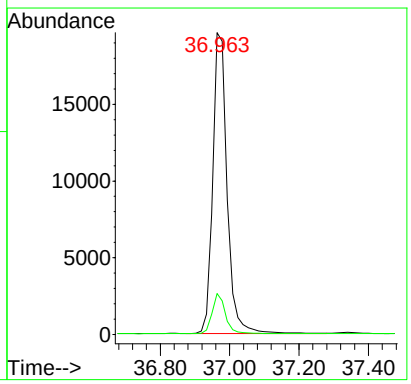


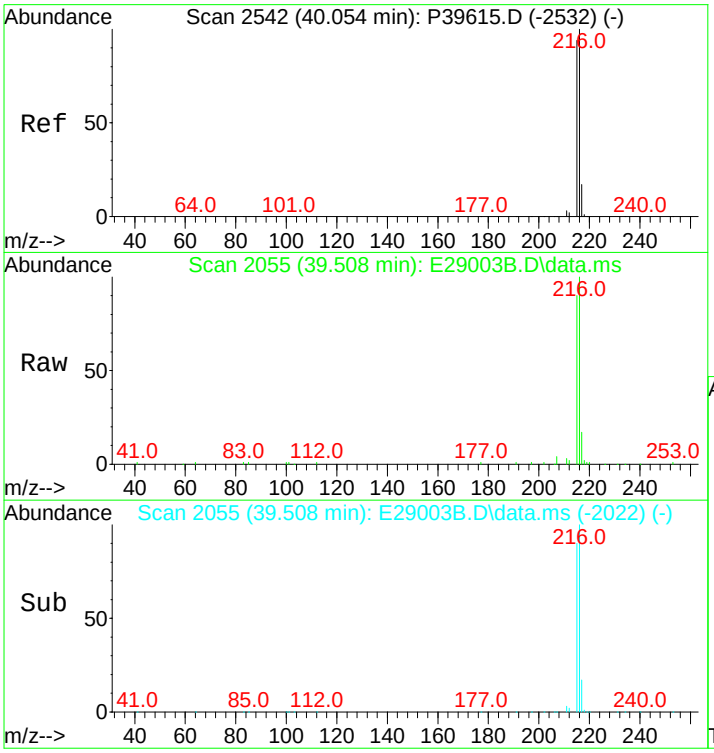


#58
Fluoranthene
Concen: 539.50 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:202 Resp: 56249

Ion	Ratio	Lower	Upper
202	100		
101	12.4	10.4	15.6

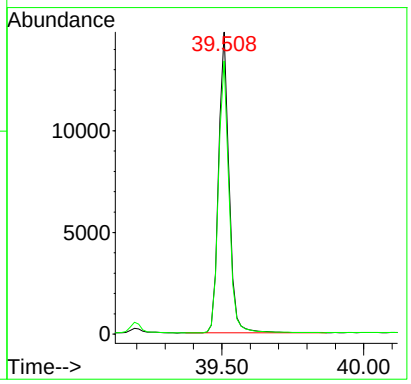


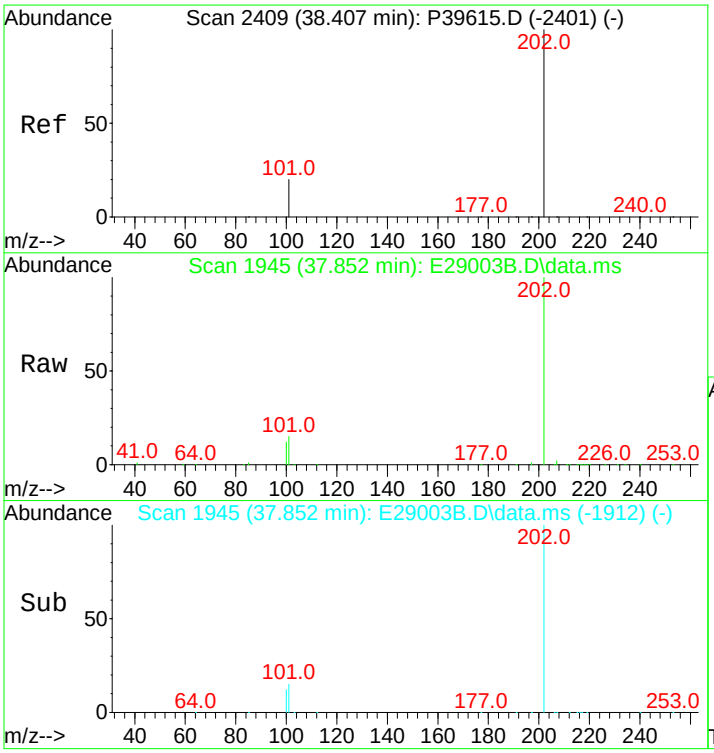


#59
Benzo(b)fluorene
Concen: 548.91 ng/mL
RT: 39.508 min Scan# 2055
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:216 Resp: 38135

Ion	Ratio	Lower	Upper
216	100		
215	91.6	72.6	109.0

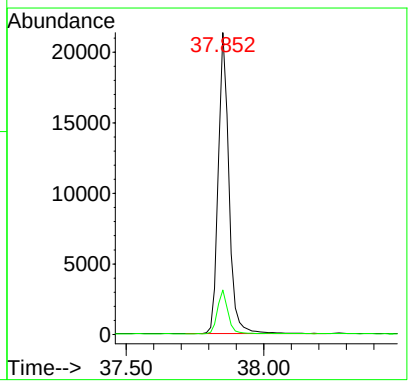


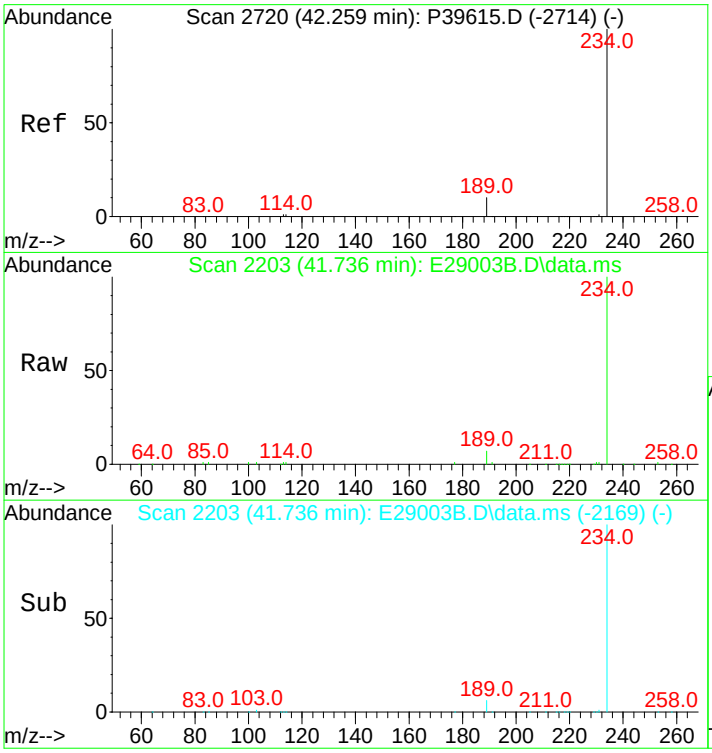


#60
Pyrene
Concen: 539.85 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:202 Resp: 57209

Ion	Ratio	Lower	Upper
202	100		
101	14.3	11.0	16.4

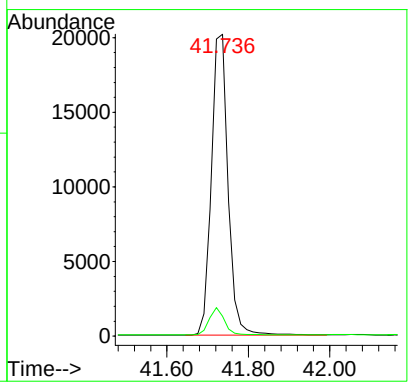


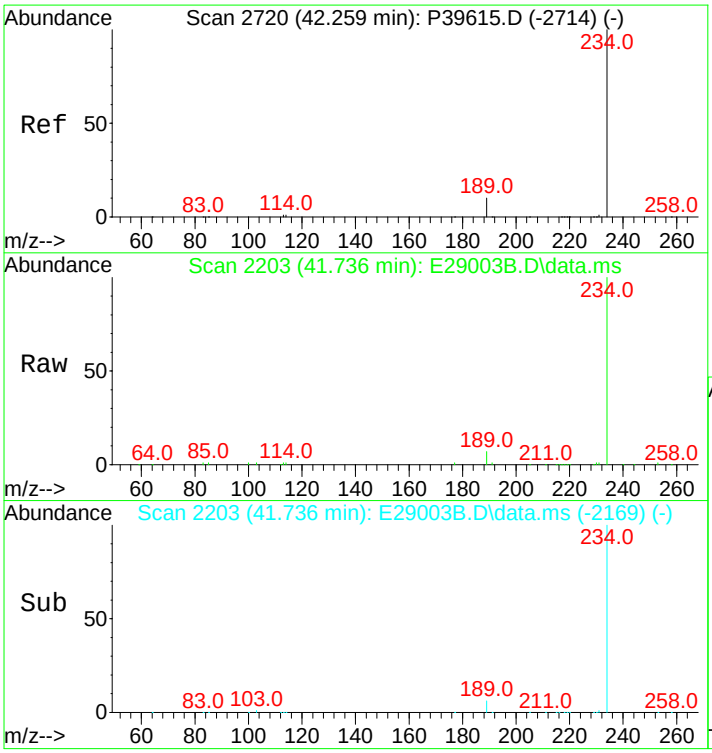


#66
Naphthobenzothiophene
Concen: 547.87 ng/ml
RT: 41.736 min Scan# 2203
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:234 Resp: 57263

Ion	Ratio	Lower	Upper
234	100		
189	8.4	21.1	31.7#

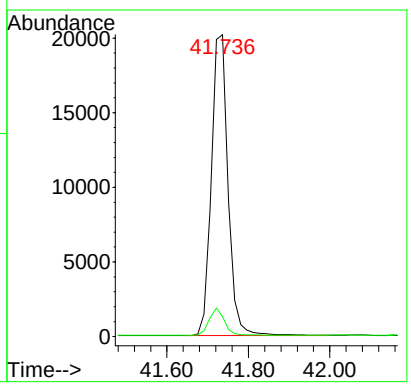


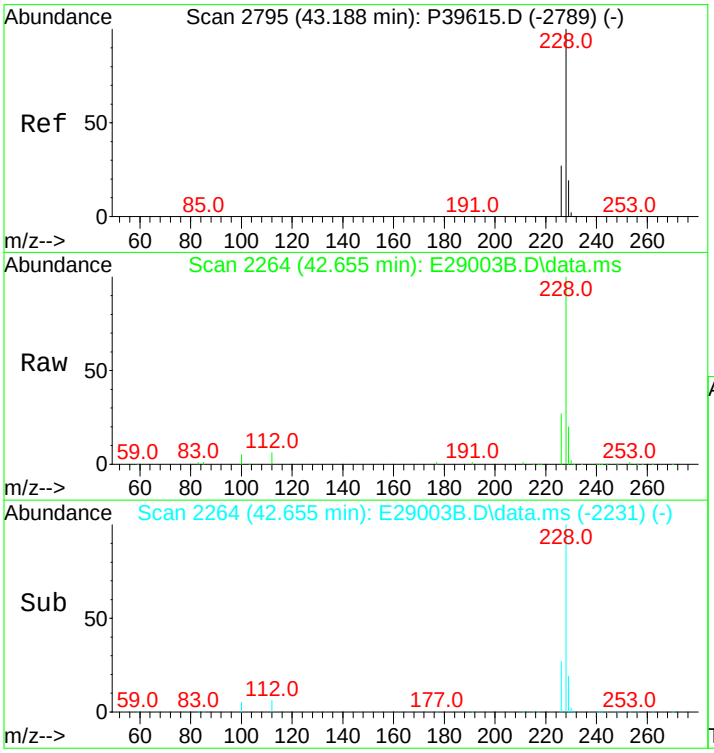


#67
Naphthobenzothiophene-2,1-D
Concen: 547.87 ng/mL
RT: 41.736 min Scan# 2203
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:234 Resp: 57263

Ion	Ratio	Lower	Upper
234	100		
189	8.4	21.1	31.7#

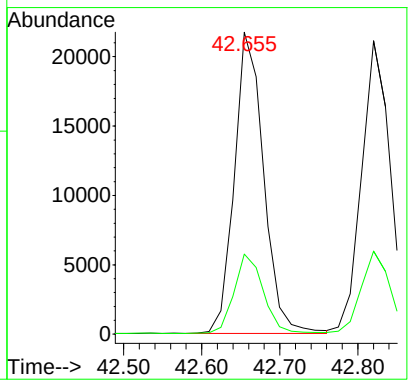


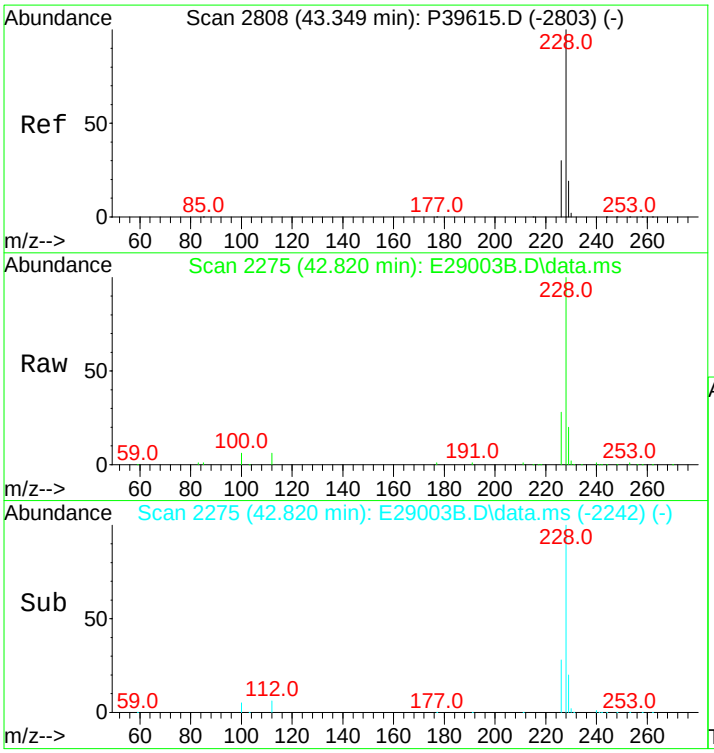


#75
Benz[a]anthracene
Concen: 558.81 ng/mL
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:228 Resp: 56552

Ion	Ratio	Lower	Upper
228	100		
226	26.1	20.7	31.1

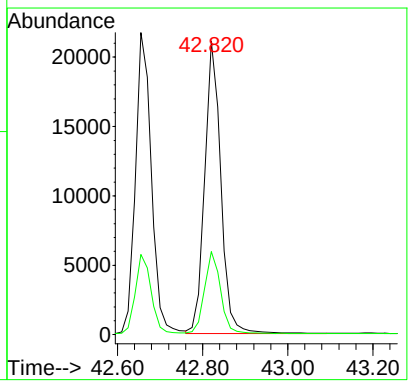


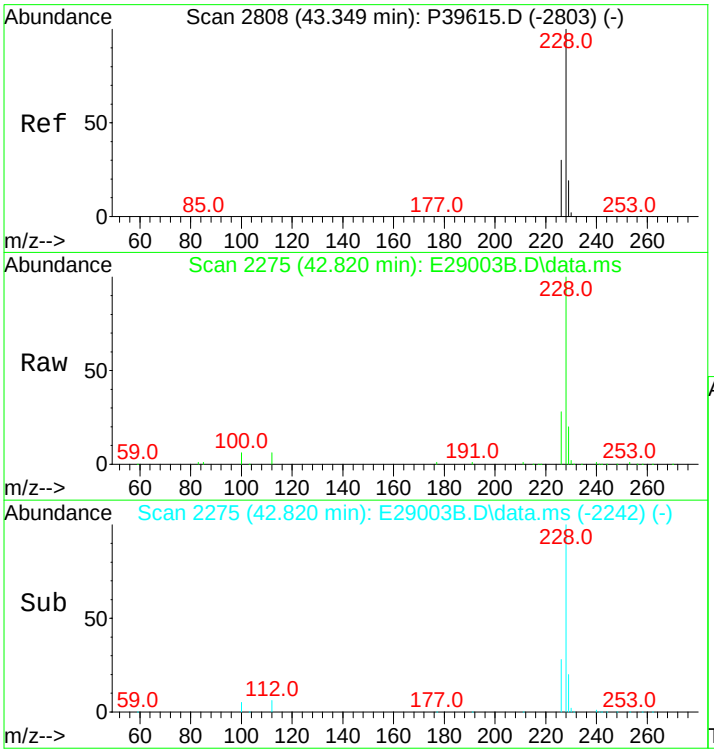


#76
Chrysene
Concen: 536.06 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:228 Resp: 55852

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

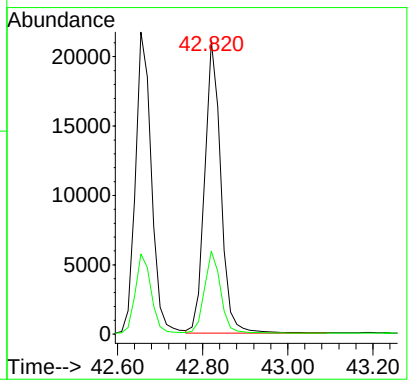


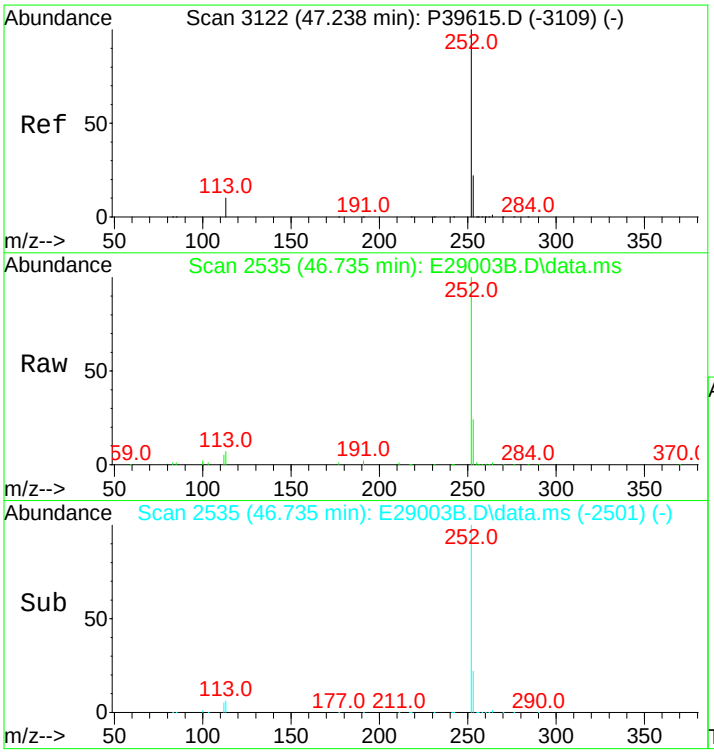


#77
Chrysene/Triphenylene
Concen: 536.06 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:228 Resp: 55852

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

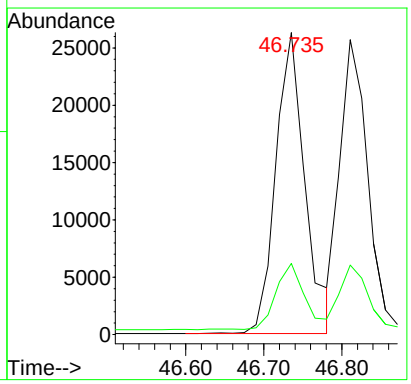


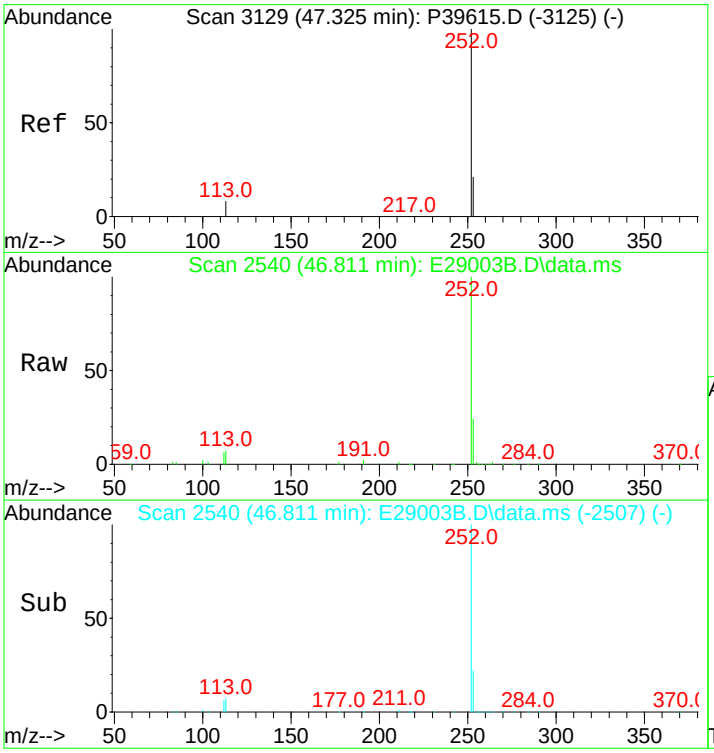


#84
Benzo[b]fluoranthene
Concen: 578.59 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 68060

Ion	Ratio	Lower	Upper
252	100		
253	22.2	19.5	29.3

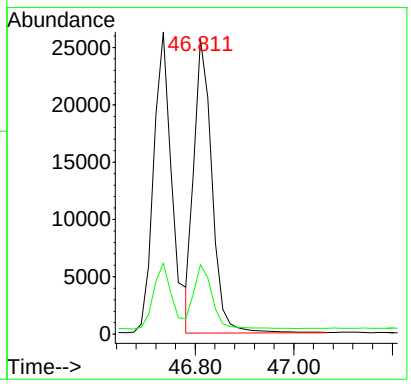


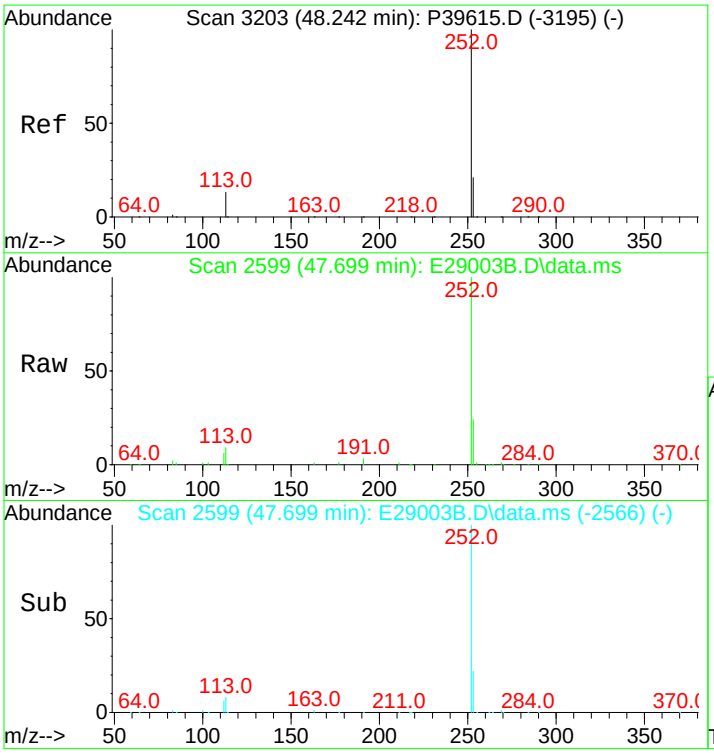


#85
Benzo[j]+[k]fluoranthene
Concen: 540.43 ng/mL
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 65403

Ion	Ratio	Lower	Upper
252	100		
253	21.8	19.7	29.5

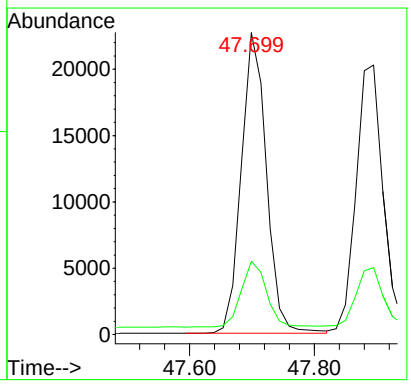


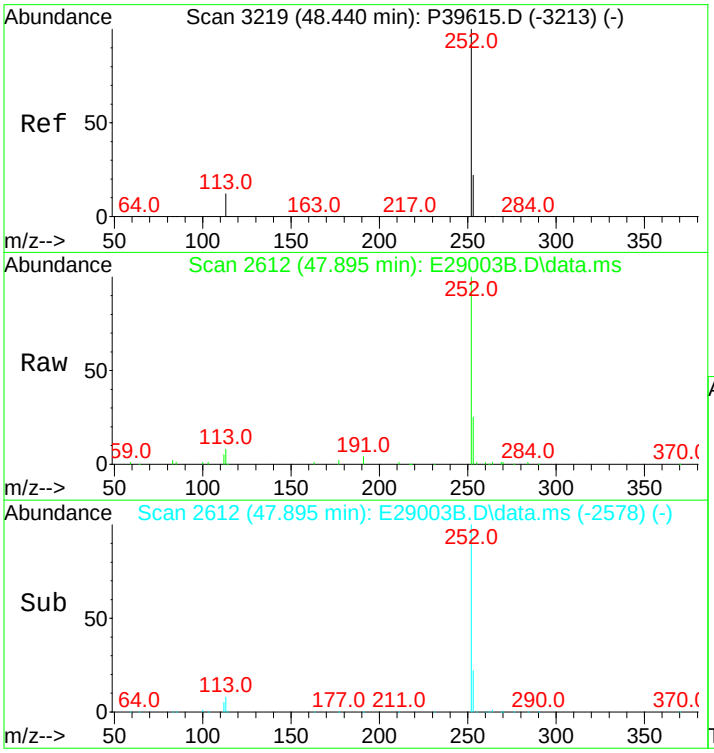


#87
Benzo[e]pyrene
Concen: 551.21 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 63310

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.6	31.0

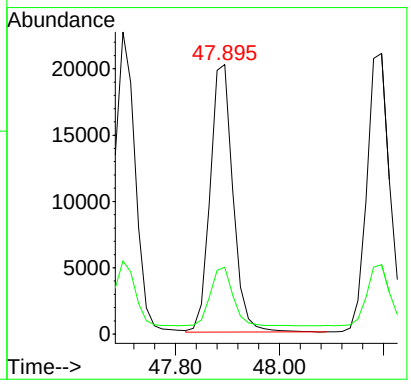


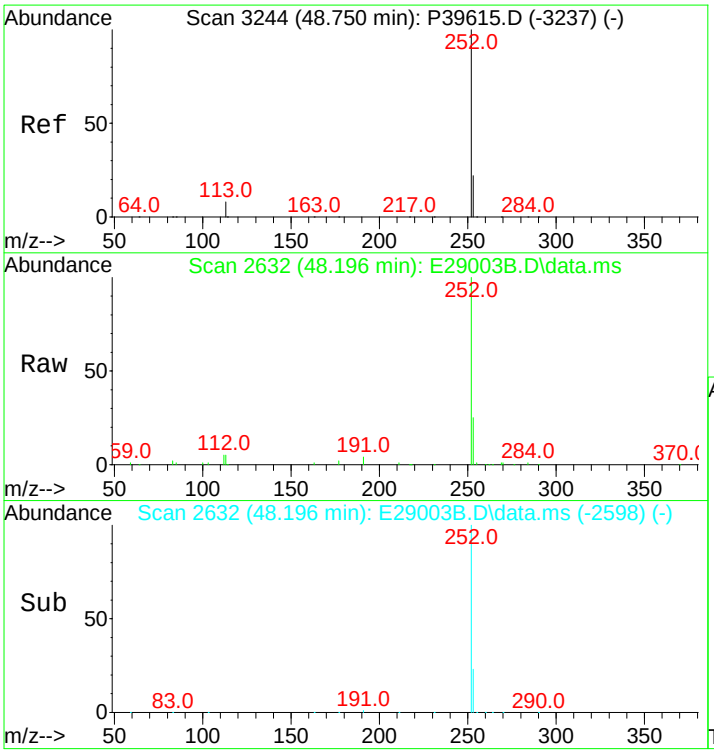


#89
Benzo[a]pyrene
Concen: 559.79 ng/mL
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 61523

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.8	31.2

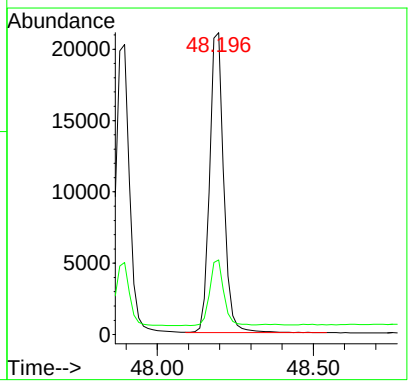


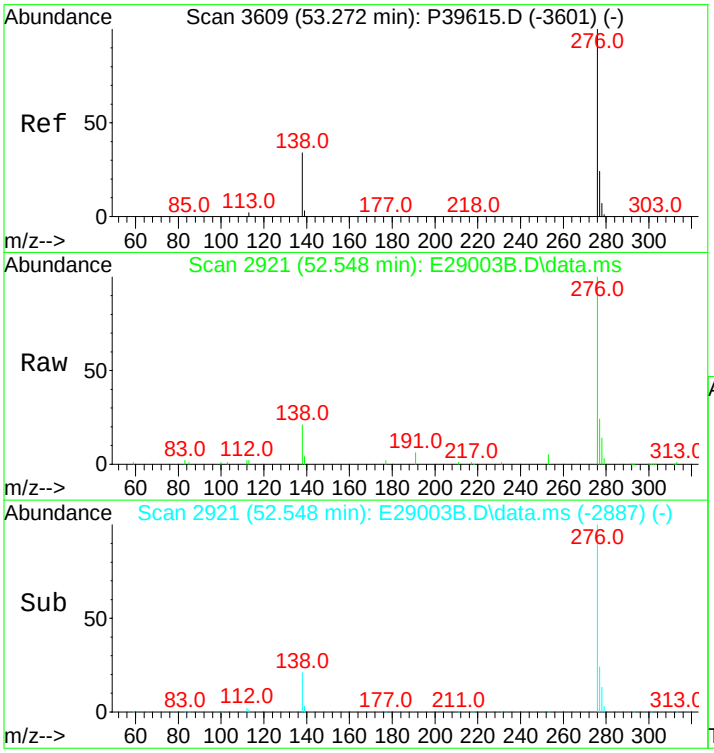


#90
Perylene
Concen: 565.43 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 65712

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.7	31.1

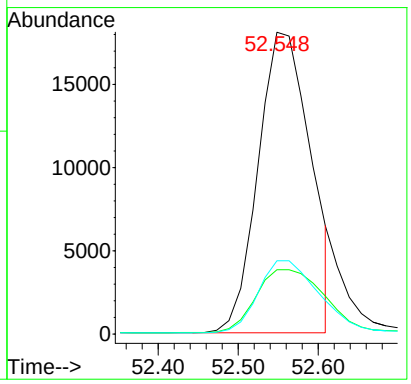


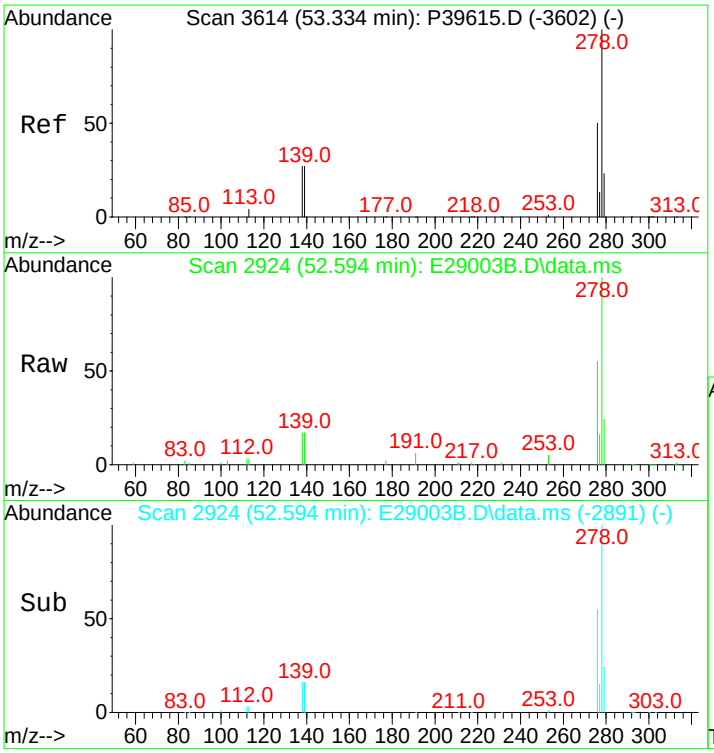


#91
Indeno[1,2,3-cd]pyrene
Concen: 637.65 ng/mL m
RT: 52.548 min Scan# 2921
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:276 Resp: 82475

Ion	Ratio	Lower	Upper
276	100		
138	28.1	16.3	24.5#
277	28.6	19.4	29.2

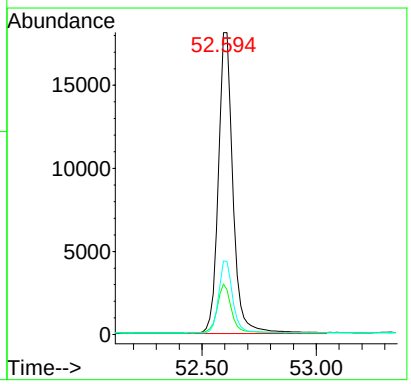


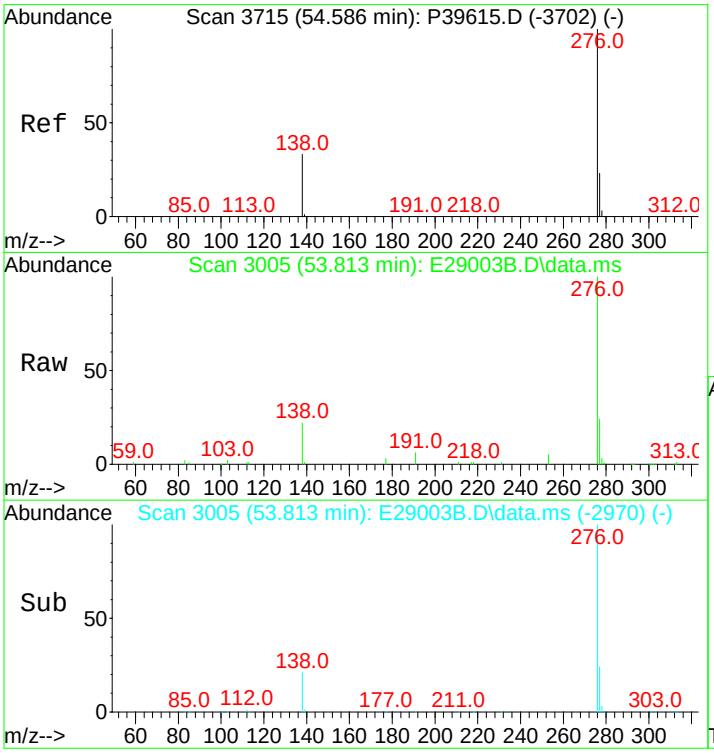


#92
Dibenz[ah]+[ac]anthracene
Concen: 586.02 ng/mL
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:278 Resp: 80707

Ion	Ratio	Lower	Upper
278	100		
139	15.5	11.6	17.4
279	23.3	19.3	28.9

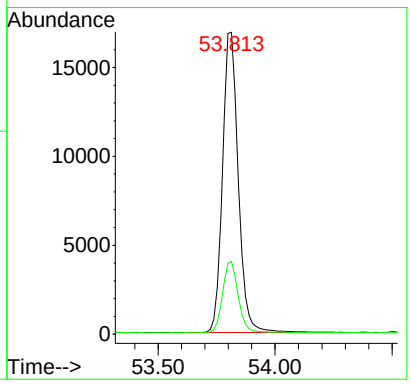


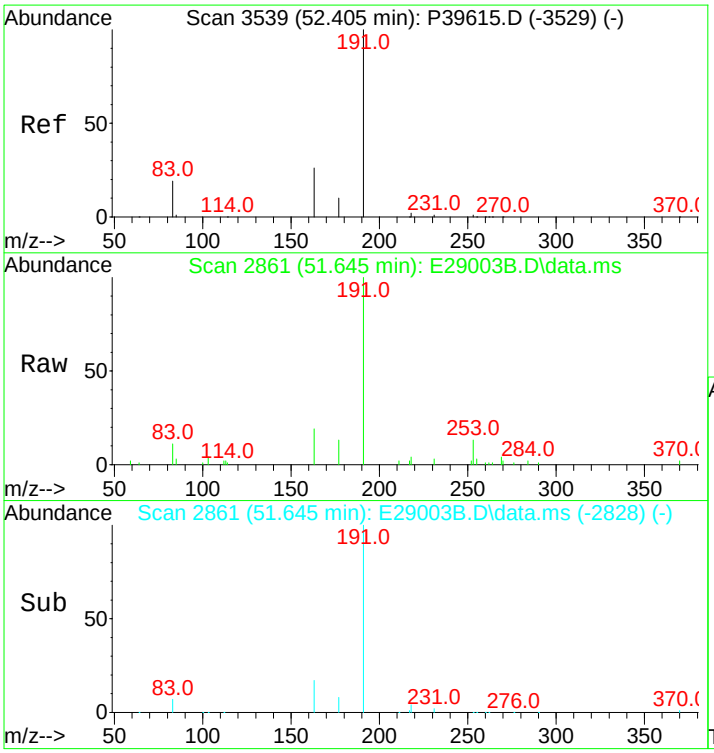


#93
Benzo[g,h,i]perylene
Concen: 568.07 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:276 Resp: 79225

Ion	Ratio	Lower	Upper
276	100		
277	23.4	19.1	28.7

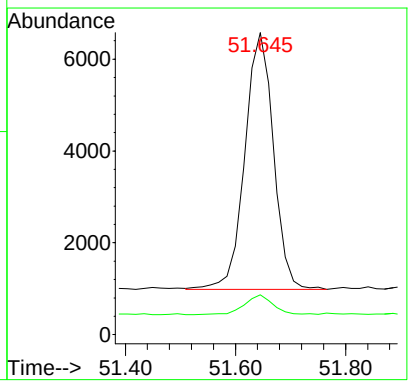


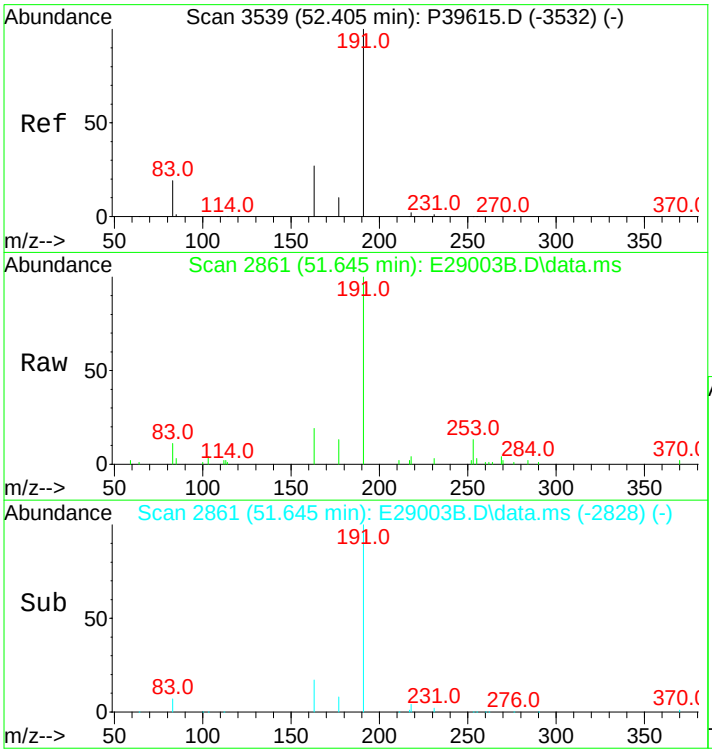


#94
Hopane (T19)
Concen: 515.73 ng/mL
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:191 Resp: 20115

Ion	Ratio	Lower	Upper
191	100		
177	7.7	11.6	17.4#

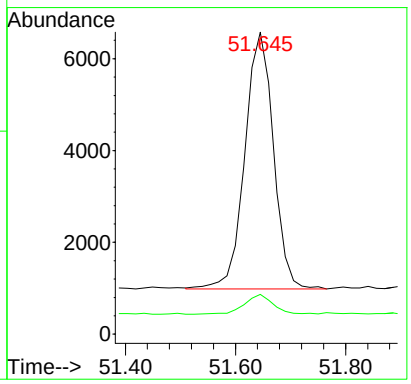




#95
17a(H),21B(H)-hopane - C30H52
Concen: 515.73 ng/mL
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:191 Resp: 20115

Ion	Ratio	Lower	Upper
191	100		
177	7.7	11.6	17.4#



ANALYTICAL REPORT

Prepared for:
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Project:	Enbridge Line 6B MP 608
ETR:	1210082
Report Date:	November 21, 2012

Certifications and Accreditations
Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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Sample ID Cross Reference

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210082**

Lab Sample ID	Client Sample ID	Matrix
1210082-01	SEBC0000L012S092112D004_MDL1	Sediment
1210082-02	SEBC0000L012S092112D004_MDL2	Sediment
1210082-03	SEBC0000L012S092112D004_MDL3	Sediment
1210082-04	SEBC0000L012S092112D004_MDL4	Sediment
1210082-05	SEBC0000L012S092112D004_MDL5	Sediment
1210082-06	SEBC0000L012S092112D004_MDL6	Sediment
1210082-07	SEBC0000L012S092112D004_MDL7	Sediment

Certificate/Approval Program Summary

Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID : PH-0141 - *Wastewater* (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) *Solid Waste/Soil* (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID : E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID : 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Solid and Hazardous Waste* (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID : MA0030 - *Wastewater* (General Chemistry: EPA 120.1/ SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624).

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID : MA015 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). *Solid & Hazardous Waste* (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID : 11627 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: EPA 1010, 1311; : 245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID : LAO00289 - Chemistry: *Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil* (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy

CASE NARRATIVE
Alpha Analytical

ETR: 1210082
Project: Enbridge Line 6B MP 608

All analyses were performed according to the Alpha Analytical quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Alpha Analytical certifies that the test results within meet all of the requirements of NELAC, for all NELAC accredited parameters.

Sample Receipt

The background sediment sample SEBC0000L012S092112D004 was received in good condition, between 2° and 6°C, and without discrepancies.

The sample received was logged into ETR 1209034 as sample (1209034-02). The jars received were homogenized and aliquots were removed to create samples (1210082-01 through -07).

Samples were released for analysis on 10-30-2012. Samples were frozen until scheduled for analysis. Per the customer's request, all samples (1210082-01 through -07) were analyzed for PAH, BIO and SHC.

Sample Preparation and Extraction

Samples were extracted on 11-06-2012 (prep batch 1210082). The extraction and preparation procedure was performed according to the Alpha Analytical SOP (stated below) with the following deviations:

1. Samples were prepared according to the MDL Range Finding Procedure provided by AECOM.

2. Prior to extraction the Cold Lake Crude was artificially weathered through evaporation using a "Topping" procedure provided by the client. Each selected sediment sample is spiked with 300uL of this topped oil and extracted as stated below.

3. Sample SEKR3510R018S092112D004 was originally logged into ETR 1210003 as sample 1210003-01. A percent solid determination was performed on this sample (1210003-01) and was used for samples (1210082-01 through -07).

4. It was noted during the initial concentration procedure that sample 1210082-03 was concentrated to a low final volume.

The observations noted on the *Forensic Preparation Checklist* should neither have any adverse affect on the analysis nor should they impact data quality for samples in this ETR.

Alkylated Polynuclear Aromatic Hydrocarbons, Steranes, Triterpanes, and Triaromatic Steroids – Sediments

Polynuclear aromatic hydrocarbons and geochemical biomarkers were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP O-008, Issue No. 7, 07/07/2011)*. Sediment samples are spiked with surrogate compounds and extracted by *Shaker Table Extraction (SOP OP-*

013, Issue No. 5, 07/14/2011). Solvent extracts are dried over sodium sulfate and concentrated to a 4mL volume. A 2mL aliquot of the extract is processed through a silica column (*Silica Gel Cleanup Preparation (Manual), SOP 2267, Rev. 2, 03/21/2012*) and concentrated to a 900uL volume. A 450uL aliquot is taken and spiked with internal standard for instrument analysis. The average weight of all samples included in the extraction batch is used as the weight for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples, comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Alkyl homologues are quantified using the response factor of the parent PAH compound. Target triterpane biomarker concentrations are quantified using the response factor of Hopane and the steranes and steroids are quantified using the response factor of 5β(H)Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific method detection limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensics Preparation Checklist* located in the sample preparation document.

1. The method blank SS110612B08 contained low-level target compounds. The single component compounds were detected at less than 5x the sample specific method detection limit (MDL), the multi-component compounds were detected at less than 10x the MDL of the associated single component compound with the exception of C2-Dibenzothiophenes which is "B" qualified on the Quantitation Report. The method blank met the acceptance criteria (with no more than two compounds outside criteria) therefore no corrective action was required. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10x the concentration in the blank.

2. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

Total Saturated Hydrocarbons and Total Petroleum Hydrocarbons by GC/FID – Sediments

Samples for total saturated hydrocarbons and total petroleum hydrocarbons were analyzed following the procedures in Alpha Analytical SOP *Total Petroleum and Saturated Hydrocarbons by Gas Chromatography/Flame Ionization Detector (SOP O-003, Issue No.7, 08/15/2011)* Method 8100/8015mod. Samples were prepared as stated above for the PAH analysis. A portion of the final extract was analyzed for GC/FID (gas chromatography with flame ionization detection). A multi-level initial calibration over the n-alkane range from C9-C40 was evaluated and quantified using internal standard techniques prior to sample analysis. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific method detection limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensics Preparation Checklist* located in the sample preparation document.

The following compounds co-elute with PAH surrogates and/or internal standards which potentially bias the results high: n-Octadecane (Cl8) - Phenanthrene-d10, n-Pentacosane (C25) - Chrysene-d12 and n-Nonacosane (C29) - Benzo(a)pyrene-d12. If a positive bias is determined to be present the compounds will be reported with a "C" qualifier.

1. The method blank SS110612B08 contained low-level target compounds detected at less than 5x the sample specific method detection limit (MDL) with the exception of n-Octadecane (C18) which is "B" qualified on the Quantitation Report. The method blank met the acceptance criteria (with no more than two compounds outside criteria) therefore no corrective action was required. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10x the concentration in the blank.

2. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Analytical makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Analytical. To the best of my knowledge, the information contained in this report is accurate and complete. For any questions regarding this report, please contact the signatory below at 508-822-9300.

Approved by: _____ Title: **Technical Representative** Date: 11/21/2012

Normand Lauriannio Jr.

Alkylated Polynuclear Aromatic Hydrocarbons, Steranes, Triterpanes, and Triaromatic Steroids By GC/MS-SIM

Form II
Surrogate Recovery
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210082**
Matrix: **Sediment**

Case: **N/A** SDG: **N/A**

Client ID	Lab ID	Naphthalene-d8	Phenanthrene-d10	Benzo[a]pyrene-d12	5B(H)Cholane
Blank	SS110612B08	79	91	83	88
LCS	SS110612LCS04	93	96	89	92
LCSD	SS110612LCSD04	89	90	83	86
SEBC0000L012S092112D004_MDL1	1210082-01	74	91	85	110
SEBC0000L012S092112D004_MDL2	1210082-02	74	93	92	113
SEBC0000L012S092112D004_MDL3	1210082-03	80	94	82	112
SEBC0000L012S092112D004_MDL4	1210082-04	79	91	82	111
SEBC0000L012S092112D004_MDL5	1210082-05	75	94	93	116
SEBC0000L012S092112D004_MDL6	1210082-06	77	97	83	114
SEBC0000L012S092112D004_MDL7	1210082-07	80	98	83	114

N/A - Not Applicable

Surrogate	QC Limit
Naphthalene-d8	40-120
Phenanthrene-d10	40-120
Benzo[a]pyrene-d12	40-120
5B(H)Cholane	50-130

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **See Below**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/06/12	100	AC

Lab ID: SS110612B08 SS110612LCS04 SS110612LCSD04

Parameter	Blank Conc.		LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
Naphthalene	0.130	U	61.4	92	57.3	86	7	30	50-125
Acenaphthylene	0.0455	U	62.2	93	59.8	90	4	30	50-125
Acenaphthene	0.0537	U	63.4	95	60.3	90	5	30	50-125
Fluorene	0.103		61.3	92	59.1	89	4	30	50-125
Anthracene	0.0936	U	64.8	97	59.7	90	8	30	50-125
Phenanthrene	0.0779		63.0	95	58.7	88	7	30	50-125
Fluoranthene	0.0681		64.5	97	62.1	93	4	30	50-125
Pyrene	0.0700		66.4	100	64.2	96	3	30	50-125
Benz[a]anthracene	0.0303		64.7	97	61.3	92	5	30	50-125
Chrysene/Triphenylene	0.0701		62.8	94	60.0	90	5	30	50-125
Benzo[b]fluoranthene	0.168	U	64.4	97	59.5	89	8	30	50-125
Benzo[j]fluoranthene/ Benzo[k]fluoranthene	0.119	U	64.5	97	62.8	94	3	30	50-125
Benzo[a]pyrene	0.137	U	65.5	98	62.1	93	5	30	50-125
Indeno[1,2,3-cd]pyrene	0.0733		65.1	98	62.1	93	5	30	50-125
Dibenz[ah]anthracene/ Dibenz[ac]anthracene	0.0831		60.6	91	62.4	94	3	30	50-125
Benzo[g,h,i]perylene	0.104		56.2	84	57.6	86	3	30	50-125

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	93	89	40-120
Phenanthrene-d10	96	90	40-120
Benzo[a]pyrene-d12	89	83	40-120
5B(H)Cholane	92	86	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

11/21/12 09:11

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
cis/trans-Decalin	479.2	418	87	65-135
C1-Decalins	728.9	633	87	65-135
C2-Decalins	635.5	556	87	65-135
C3-Decalins	329.8	244	74	65-135
C4-Decalins	326.5	276	85	65-135
Benzothiophene	5.4	5.09	94	65-135
C1-Benzo(b)thiophenes	28.9	26.7	92	65-135
C2-Benzo(b)thiophenes	49.6	49.2	99	65-135
C3-Benzo(b)thiophenes	99.0	94.8	96	65-135
C4-Benzo(b)thiophenes	87.1	82.7	95	65-135
Naphthalene	555.8	491	88	65-135
C1-Naphthalenes	1167.3	1040	89	65-135
C2-Naphthalenes	1409.7	1340	95	65-135
C3-Naphthalenes	1035.9	979	94	65-135
C4-Naphthalenes	561.1	510	91	65-135
Biphenyl	145.7	136	93	65-135
Dibenzofuran	51.2	52.2	102	65-135
Acenaphthylene	6.5	6.67	103	65-135
Acenaphthene	18.7	18.5	99	65-135
Fluorene	74.6	77.6	104	65-135
C1-Fluorenes	170.2	167	98	65-135
C2-Fluorenes	255.4	252	99	65-135
C3-Fluorenes	238.5	249	104	65-135
Phenanthrene	212.2	217	102	65-135
C1-Phenanthrenes/Anthracenes	432.7	484	112	65-135
C2-Phenanthrenes/Anthracenes	465.9	516	111	65-135
C3-Phenanthrenes/Anthracenes	317.4	331	104	65-135
C4-Phenanthrenes/Anthracenes	129	138	107	65-135
Dibenzothiophene	138.9	140	101	65-135
C1-Dibenzothiophenes	278.6	285	102	65-135
C2-Dibenzothiophenes	377.5	414	110	65-135
C3-Dibenzothiophenes	341.4	357	105	65-135
C4-Dibenzothiophenes	183.4	197	108	65-135

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Fluoranthene	4.00	4.18	104	65-135
Pyrene	13.0	12.6	97	65-135
C1-Fluoranthenes/Pyrenes	63.1	70.9	112	65-135
C2-Fluoranthenes/Pyrenes	102.2	111	109	65-135
C3-Fluoranthenes/Pyrenes	119.6	128	107	65-135
C4-Fluoranthenes/Pyrenes	104	102	98	65-135
Naphthobenzothiophenes	43.8	47.9	109	65-135
C1-Naphthobenzothiophenes	117.2	118	101	65-135
C2-Naphthobenzothiophenes	163.3	176	108	65-135
C3-Naphthobenzothiophenes	128.7	128	100	65-135
C4-Naphthobenzothiophenes	89.0	86.6	97	65-135
Benz[a]anthracene	2.1	2.34	111	65-135
Chrysene/Triphenylene	35.2	38.3	109	65-135
C1-Chrysenes	62.8	67.0	107	65-135
C2-Chrysenes	86.0	88.2	103	65-135
C3-Chrysenes	97.6	97.7	100	65-135
C4-Chrysenes	59.4	60.0	101	65-135
Benzo[b]fluoranthene	5.2	5.34	103	65-135
Benzo[e]pyrene	9.8	10.0	102	65-135
Benzo[a]pyrene	1.9	2.06	109	65-135
Perylene	2.8	2.77	99	65-135
Benzo[g,h,i]perylene	3.1	3.13	101	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Carbazole	6.00	6.36	106	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
4-Methyldibenzothiophene	131.8	129	98	65-135
2/3-Methyldibenzothiophene	97.5	102	105	65-135
1-Methyldibenzothiophene	44.2	48.1	109	65-135
3-Methylphenanthrene	89.4	100	112	65-135
2-Methylphenanthrene	97.7	106	109	65-135
2-Methylanthracene	3.2	3.43	107	65-135
9/4-Methylphenanthrene	141.2	162	115	65-135
1-Methylphenanthrene	97.4	103	106	65-135
2-Methylnaphthalene	1081.8	1010	94	65-135
1-Methylnaphthalene	784.8	785	100	65-135
2,6-Dimethylnaphthalene	649.9	653	101	65-135
2,3,5-Trimethylnaphthalene	152	156	102	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C23 Tricyclic Terpane	67.3	63.7	95	65-135
C24 Tricyclic Terpane	43.0	43.4	101	65-135
C25 Tricyclic Terpane	42.0	38.9	93	65-135
C24 Tetracyclic Terpane	14.8	12.9	87	65-135
C26 Tricyclic Terpane-22S	17.7	14.3	81	65-135
C26 Tricyclic Terpane-22R	15.4	13.2	86	65-135
C28 Tricyclic Terpane-22S	16.8	15.8	94	65-135
C28 Tricyclic Terpane-22R	18.1	16.2	90	65-135
C29 Tricyclic Terpane-22S	20.8	17.3	83	65-135
C29 Tricyclic Terpane-22R	22.6	18.4	82	65-135
18a-22,29,30-Trisnorneohopane-TS	31.3	26.8	86	65-135
C30 Tricyclic Terpane-22S	16.2	15.3	95	65-135
C30 Tricyclic Terpane-22R	16.4	13.8	84	65-135
17a(H)-22,29,30-Trisnorhopane-TM	37.8	34.1	90	65-135
17a/b,21b/a 28,30-Bisnorhopane	7.00	6.34	91	65-135
17a(H),21b(H)-25-Norhopane	8.7	7.44	86	65-135
30-Norhopane	99.7	91.0	91	65-135
18a(H)-30-Norneohopane-C29Ts	25.2	22.0	87	65-135
17a(H)-Diahopane	14.2	13.4	94	65-135
30-Normoretane	11.6	11.1	95	65-135
Hopane	173.6	162	93	65-135
Moretane	17.5	17.6	100	65-135
30-Homohopane-22S	75.1	66.8	89	65-135
30-Homohopane-22R	64.1	55.9	87	65-135
30,31-Bishomohopane-22S	53.6	47.6	89	65-135
30,31-Bishomohopane-22R	39.6	34.6	87	65-135
30,31-Trishomohopane-22S	41.8	36.2	87	65-135
30,31-Trishomohopane-22R	27.2	24.8	91	65-135
Tetrakishomohopane-22S	29.8	27.4	92	65-135
Tetrakishomohopane-22R	21.2	17.6	83	65-135
Pentakishomohopane-22S	30.2	27.0	89	65-135
Pentakishomohopane-22R	23.5	22.0	94	65-135
13b(H),17a(H)-20S-Diacholestane	50.0	50.5	101	65-135

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
13b(H),17a(H)-20R-Diacholestane	26.3	25.3	96	65-135
13b,17a-20S-Methyldiacholestane	25.7	22.7	88	65-135
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	65.0	58.2	89	65-135
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	75.8	71.2	94	65-135
Unknown Sterane (S18)	21.3	18.8	88	65-135
13a,17b-20S-Ethyldiacholestane	3.9	3.54	91	65-135
14a,17a-20S-Methylcholestane	37.3	36.1	97	65-135
14a,17a-20R-Methylcholestane	34.5	31.9	92	65-135
14a(H),17a(H)-20S-Ethylcholestane	51.0	51.6	101	65-135
14a(H),17a(H)-20R-Ethylcholestane	39.5	39.1	99	65-135
14b(H),17b(H)-20R-Cholestane	41.5	38.3	92	65-135
14b(H),17b(H)-20S-Cholestane	42.5	38.5	91	65-135
14b,17b-20R-Methylcholestane	44.8	41.6	93	65-135
14b,17b-20S-Methylcholestane	55.4	53.3	96	65-135
14b(H),17b(H)-20R-Ethylcholestane	60.9	54.6	90	65-135
14b(H),17b(H)-20S-Ethylcholestane	40.3	40.2	100	65-135
C26,20R- +C27,20S- triaromatic steroid	293.9	266	90	65-135
C28,20S-triaromatic steroid	187.6	169	90	65-135
C27,20R-triaromatic steroid	180.2	167	92	65-135
C28,20R-triaromatic steroid	150.5	136	90	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form IV
Method Blank Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Date Analyzed: **11/19/12 17:23**

Client ID	Lab ID	Date/Time Analyzed
LCS	SS110612LCS04	11/19/12 18:48
LCSD	SS110612LCSD04	11/19/12 20:12
SEBC0000L012S092112D004_MDL1	1210082-01	11/19/12 21:36
SEBC0000L012S092112D004_MDL2	1210082-02	11/19/12 23:00
SEBC0000L012S092112D004_MDL3	1210082-03	11/20/12 01:48
SEBC0000L012S092112D004_MDL4	1210082-04	11/20/12 03:12
SEBC0000L012S092112D004_MDL5	1210082-05	11/20/12 04:36
SEBC0000L012S092112D004_MDL6	1210082-06	11/20/12 06:00
SEBC0000L012S092112D004_MDL7	1210082-07	11/20/12 07:25

N/A - Not Applicable

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **C811181202**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	RT	Area	RT
Standard:		111004	43.42	76819	26.99
Upper Limit:		222008	43.92	153638	27.49
Lower Limit:		55502	42.92	38410	26.49
Client ID	**Lab ID**				
Blank	SS110612B08	76269	43.44	52112	26.99
LCS	SS110612LCS04	87473	43.43	56119	26.99
LCSD	SS110612LCSD04	82484	43.43	56192	26.99
SEBC0000L012S092112D004_MDL1	1210082-01	84247	43.43	54031	26.98
SEBC0000L012S092112D004_MDL2	1210082-02	91232	43.43	59571	26.98
CCV	C811181203	85651	43.44	58340	27.00

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **C811181203**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	RT	Area	RT
Standard:		85651	43.44	58340	27.00
Upper Limit:		171302	43.94	116680	27.50
Lower Limit:		42826	42.94	29170	26.50
Client ID	**Lab ID**				
SEBC0000L012S092112D004_MDL3	1210082-03	96579	43.43	59391	26.98
SEBC0000L012S092112D004_MDL4	1210082-04	91681	43.44	57093	26.98
SEBC0000L012S092112D004_MDL5	1210082-05	91275	43.44	61412	26.99
SEBC0000L012S092112D004_MDL6	1210082-06	95617	43.45	59013	26.99
SEBC0000L012S092112D004_MDL7	1210082-07	102645	43.45	62156	26.99
CCV	C811181205	99128	43.45	64940	27.00

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-01**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.00	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**9.47**		C3-Dibenzothiophenes	**394**
C1-Decalins	**18.3**		C4-Dibenzothiophenes	**255**
C2-Decalins	**31.1**		Benzo(b)fluorene	**174**
C3-Decalins	**39.7**		Fluoranthene	**1630**
C4-Decalins	**79.2**		Pyrene	**1400**
Benzothiophene	**3.56**		C1-Fluoranthenes/Pyrenes	**698**
C1-Benzo(b)thiophenes	**10.8**		C2-Fluoranthenes/Pyrenes	**441**
C2-Benzo(b)thiophenes	**28.6**		C3-Fluoranthenes/Pyrenes	**266**
C3-Benzo(b)thiophenes	**63.4**		C4-Fluoranthenes/Pyrenes	**245**
C4-Benzo(b)thiophenes	**74.3**		Naphthobenzothiophenes	**217**
Naphthalene	**75.7**		C1-Naphthobenzothiophenes	**183**
C1-Naphthalenes	**106**		C2-Naphthobenzothiophenes	**242**
C2-Naphthalenes	**232**		C3-Naphthobenzothiophenes	**183**
C3-Naphthalenes	**358**		C4-Naphthobenzothiophenes	**126**
C4-Naphthalenes	**334**		Benz[a]anthracene	**613**
Biphenyl	**17.9**		Chrysene/Triphenylene	**765**
Dibenzofuran	**61.8**		C1-Chrysenes	**352**
Acenaphthylene	**28.1**		C2-Chrysenes	**269**
Acenaphthene	**84.4**		C3-Chrysenes	**230**
Fluorene	**113**		C4-Chrysenes	**124**
C1-Fluorenes	**96.9**		Benzo[b]fluoranthene	**744**
C2-Fluorenes	**224**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**612**
C3-Fluorenes	**274**		Benzo[a]fluoranthene	**111**
Anthracene	**210**		Benzo[e]pyrene	**540**
Phenanthrene	**993**		Benzo[a]pyrene	**695**
C1-Phenanthrenes/Anthracenes	**616**		Perylene	**204**
C2-Phenanthrenes/Anthracenes	**607**		Indeno[1,2,3-cd]pyrene	**460**
C3-Phenanthrenes/Anthracenes	**423**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**110**
C4-Phenanthrenes/Anthracenes	**220**		Benzo[g,h,i]perylene	**499**
Retene	0.171 U			
Dibenzothiophene	**90.2**			
C1-Dibenzothiophenes	**205**			
C2-Dibenzothiophenes	**369**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	74	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	85	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-01**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.00	2	1	AC

Parameter	Result
Carbazole	**121**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	74	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	85	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-01**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**81.6**
2/3-Methyldibenzothiophene	**69.3**
1-Methyldibenzothiophene	**33.1**
3-Methylphenanthrene	**136**
2-Methylphenanthrene	**157**
2-Methylanthracene	**47.4**
9/4-Methylphenanthrene	**161**
1-Methylphenanthrene	**104**
2-Methylnaphthalene	**101**
1-Methylnaphthalene	**81.1**
2,6-Dimethylnaphthalene	**101**
2,3,5-Trimethylnaphthalene	**51.5**
Naphthobenzothiophene-2,1-D	**146**
Naphthobenzothiophene-1,2-D	**32.4**
Naphthobenzothiophene-2,3-D	**38.7**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	74	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	85	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-01**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**78.9**	
C24 Tricyclic Terpane	**48.9**	
C25 Tricyclic Terpane	**62.8**	
C24 Tetracyclic Terpane	**28.4**	
C26 Tricyclic Terpane-22S	**26.1**	
C26 Tricyclic Terpane-22R	**21.4**	
C28 Tricyclic Terpane-22S	**26.5**	
C28 Tricyclic Terpane-22R	**27.8**	
C29 Tricyclic Terpane-22S	**26.0**	
C29 Tricyclic Terpane-22R	**27.7**	
18a-22,29,30-Trisnorneohopane-TS	**68.9**	
C30 Tricyclic Terpane-22S	**26.1**	
C30 Tricyclic Terpane-22R	**21.8**	
17a(H)-22,29,30-Trisnorhopane-TM	**95.9**	
17a/b,21b/a 28,30-Bisnorhopane	**28.0**	
17a(H),21b(H)-25-Norhopane	**15.8**	
30-Norhopane	**265**	
18a(H)-30-Norneohopane-C29Ts	**74.7**	
17a(H)-Diahopane	**21.1**	
30-Normoretane	**41.2**	
18a(H)&18b(H)-Oleananes	**27.1**	
Hopane	**401**	
Moretane	**70.7**	
30-Homohopane-22S	**136**	
30-Homohopane-22R	**132**	
T22a-Gammacerane/C32-diahopane	**46.6**	
30,31-Bishomohopane-22S	**168**	G
30,31-Bishomohopane-22R	**72.6**	

Parameter	Result	
30,31-Trishomohopane-22S	**83.8**	
30,31-Trishomohopane-22R	**43.3**	
Tetrakishomohopane-22S	**65.9**	
Tetrakishomohopane-22R	**78.0**	G
Pentakishomohopane-22S	**44.8**	
Pentakishomohopane-22R	**35.9**	
13b(H),17a(H)-20S-Diacholestane	**62.0**	
13b(H),17a(H)-20R-Diacholestane	**35.0**	
13b,17a-20S-Methyldiacholestane	**35.4**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**118**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**126**	
Unknown Sterane (S18)	**31.7**	
13a,17b-20S-Ethyldiacholestane	**3.53**	
14a,17a-20S-Methylcholestane	**61.5**	
14a,17a-20R-Methylcholestane	**43.2**	
14a(H),17a(H)-20S-Ethylcholestane	**83.8**	
14a(H),17a(H)-20R-Ethylcholestane	**72.5**	
14b(H),17b(H)-20R-Cholestane	**61.1**	
14b(H),17b(H)-20S-Cholestane	**66.5**	
14b,17b-20R-Methylcholestane	**57.0**	
14b,17b-20S-Methylcholestane	**92.5**	
14b(H),17b(H)-20R-Ethylcholestane	**136**	
14b(H),17b(H)-20S-Ethylcholestane	**80.6**	
C26,20R- +C27,20S- triaromatic steroid	**203**	
C28,20S-triaromatic steroid	**219**	
C27,20R-triaromatic steroid	**131**	
C28,20R-triaromatic steroid	**170**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	110	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	54031	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	84247	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	78847	368.226	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.82%#			
42) Phenanthrene-d10	32.843	188	75344	453.101	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.31%#			
83) Benzo[b]fluoranthene-d12	47.335	264	75507	470.266	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.03%#			
88) Benzo[a]pyrene-d12	48.543	264	67676	426.624	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.66%#			
129) 5B(H)Cholane - Surr	44.045	217	16957	550.447	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.04%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2025	42.174	ng/mL	100
4) cis-Decalin	17.879	138	104M3	2.957	ng/mL	
5) C1-Decalins	18.134	152	4191M5	87.284	ng/mL	
6) C2-Decalins	19.914	166	7118M5	148.244	ng/mL	
7) C3-Decalins	22.387	180	9084M5	189.189	ng/mL	
8) C4-Decalins	25.781	194	18118M5	377.337	ng/mL	
10) Naphthalene	20.078	128	88401	360.868	ng/mL#	100
11) C1-Naphthalenes	22.779	142	123793M5	505.345	ng/mL	
12) C2-Naphthalenes	25.617	156	271156M5	1106.906	ng/mL	
13) C3-Naphthalenes	27.953	170	417427M5	1704.010	ng/mL	
14) C4-Naphthalenes	30.718	184	390026M5	1592.154	ng/mL	
16) 2-Methylnaphthalene	22.779	142	70018	479.828	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	52843	386.725	ng/mL#	100
18) Benzothiophene	20.297	134	3362	16.979	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	10158M5	51.302	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	26980M5	136.259	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	59855M5	302.290	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	70102M5	354.041	ng/mL	
23) Biphenyl	24.659	154	15802	85.115	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	60146	481.608	ng/mL#	100
25) Dibenzofuran	27.743	168	57740	294.800	ng/mL	95
26) Acenaphthylene	26.365	152	29803	134.034	ng/mL#	100
27) Acenaphthene	27.105	153	53383	402.228	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	28.656	170	26384M3	245.295	ng/mL	
29) Fluorene	29.121	166	79915M3	536.864	ng/mL	
30) C1-Fluorenes	31.484	180	68760M5	461.926	ng/mL	
31) C2-Fluorenes	33.674	194	159235M5	1069.732	ng/mL	
32) C3-Fluorenes	35.508	208	194582M5	1307.191	ng/mL	
33) Dibenzothiophene	32.442	184	87997	429.895	ng/mL#	70
34) 4-Methyldibenzothiophene(	34.212	198	79630	389.019	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.559	198	67589M3	330.195	ng/mL	
36) 1-Methyldibenzothiophene(	34.979	198	32319	157.889	ng/mL#	100
37) OTP	34.596	198	5876M3	28.706	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	206054M5	1006.643	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	359643M5	1756.977	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	384448M5	1878.158	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	39.379	240	248407M5	1213.552	ng/mL	
43) Phenanthrene	32.935	178	932602	4733.620	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.897	192	127767	648.509	ng/mL	98
45) 2-Methylphenanthrene(2MP)	35.006	192	147620	749.277	ng/mL	97
46) 2-Methylanthracene(2MA)	35.162	192	44558M3	226.164	ng/mL	
47) 9/4-Methylphenanthrene(9M	35.344	192	151182	767.356	ng/mL	86
48) 1-Methylphenanthrene(1MP)	35.445	192	97573M3	495.253	ng/mL	
49) C1-Phenanthrenes/Anthrace	35.006	192	578644M5	2937.031	ng/mL	
50) C2-Phenanthrenes/Anthrace	37.161	206	570296M5	2894.659	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.996	220	397250M5	2016.327	ng/mL	
53) C4-Phenanthrenes/Anthrace	41.169	234	206207M5	1046.647	ng/mL	
55) Anthracene	33.117	178	183731M3	1001.006	ng/mL	
56) Carbazole	33.783	167	110743M3	578.235	ng/mL	
57) 1-Methylphenanthrene	35.445	192	98708M3	706.786	ng/mL	
58) Fluoranthene	37.708	202	1579837M3	7784.813	ng/mL	
59) Benzo(b)fluorene	40.229	216	97101M3	827.139	ng/mL	
60) Pyrene	38.594	202	1368079	6664.848	ng/mL	95
61) C1-Fluoranthenes/Pyrenes	39.982	216	683432M5	3329.464	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.027	230	431352M5	2101.410	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.908	244	259839M5	1265.853	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.196	258	239600M5	1167.255	ng/mL	
66) Naphthobenzothiophene	42.438	234	132983	697.893	ng/ml#	68
67) Naphthobenzothiophene-2,1	42.438	234	132983	697.893	ng/mL#	68
68) Naphthobenzothiophene-1,2	42.776	234	29401	154.296	ng/mL#	10
69) Naphthobenzothiophene-2,3	43.077	234	35107M3	184.241	ng/mL	
70) C1-Naphthobenzothiophenes	43.835	248	165809M5	870.163	ng/ml	
71) C2-Naphthobenzothiophenes	45.845	262	219383M5	1151.318	ng/ml	
72) C3-Naphthobenzothiophenes	47.445	276	166485M5	873.710	ng/ml	
73) C4-Naphthobenzothiophenes	48.543	290	114108M5	598.837	ng/mL	
75) Benz[a]anthracene	43.369	228	539844	2922.990	ng/mL	98
77) Chrysene/Triphenylene	43.534	228	681750	3646.728	ng/mL	99
78) C1-Chrysenes	45.004	242	313517M5	1677.024	ng/mL	
79) C2-Chrysenes	46.704	256	242950M5	1299.556	ng/mL	
80) BBF-D12 Surr BKGD	47.335	256	3438	18.390	ng/mL	100
81) C3-Chrysenes	47.765	270	204663M5	1094.757	ng/mL	
82) C4-Chrysenes	49.933	284	110164M5	589.275	ng/mL	
84) Benzo[b]fluoranthene	47.427	252	702973	3544.033	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.500	252	631554	2918.119	ng/mL	95
86) Benzo[a]fluoranthene	47.811	252	114450	528.820	ng/mL#	1
87) Benzo[e]pyrene	48.451	252	525502	2571.234	ng/mL	97
89) Benzo[a]pyrene	48.643	252	625926	3310.823	ng/mL	97
90) Perylene	48.954	252	200539	971.105	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.564	276	439902M3	2190.463	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	102803M6	522.233	ng/mL	
93) Benzo[g,h,i]perylene	54.898	276	542201	2379.050	ng/mL	100
94) Hopane (T19)	52.640	191	120994	1912.323	ng/mL#	89
96) C23 Tricyclic Terpane (T4	41.078	191	23792M3	376.035	ng/ml	
97) C24 Tricyclic Terpane (T5	41.799	191	14739M3	232.951	ng/ml	
98) C25 Tricyclic Terpane (T6	43.324	191	18925M3	299.112	ng/ml	
99) C24 Tetracyclic Terpane (	44.602	191	8549	135.118	ng/ml	100
100) C26 Tricyclic Terpane-22S	44.337	191	7884M3	124.607	ng/ml	
101) C26 Tricyclic Terpane-22R	44.438	191	6444M3	101.848	ng/ml	
102) C28 Tricyclic Terpane-22S	46.713	191	7991M3	126.299	ng/ml	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.878	191	8380	132.447	ng/ml	100
104)	C29 Tricyclic Terpane-22S	47.409	191	7857	124.181	ng/ml	100
105)	C29 Tricyclic Terpane-22R	47.610	191	8348M3	131.941	ng/ml	
106)	18a-22,29,30-Trisnorneoho	48.771	191	20767	328.225	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.854	191	7867M3	124.339	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.101	191	6582	104.029	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	49.329	191	28930	457.242	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	50.546	191	8459	133.695	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	50.326	191	4749M3	75.058	ng/ml	
112)	30-Norhopane (T15)	51.232	191	79876	1262.449	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	51.342	191	22540M3	356.247	ng/ml	
114)	17a(H)-Diahopane (X)	51.470	191	6357M3	100.473	ng/ml	
115)	30-Normoretane (T17)	52.037	191	12424	196.363	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	52.457	191	8160	128.970	ng/ml	100
117)	Moretane (T20)	53.353	191	21315M3	336.886	ng/ml	
118)	30-Homohopane-22S (T21)	54.487	191	40933	646.950	ng/ml	100
119)	30-Homohopane-22R (T22)	54.724	191	39778	628.696	ng/ml	100
120)	Gammacerane/C32-diahopane	55.291	191	14057M4	222.172	ng/mL	
121)	30,31-Bishomohopane-22S (	56.077	191G	50501	798.174	ng/ml	100
122)	30,31-Bishomohopane-22R (	56.488	191	21888	345.942	ng/ml	100
123)	30,31-Trishomohopane-22S	58.297	191	25286M3	399.648	ng/ml	
124)	30,31-Trishomohopane-22R	58.928	191	13058	206.383	ng/ml	100
125)	Tetrakishomohopane-22S (T	61.029	191	19874	314.111	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.870	191G	23513	371.625	ng/ml	100
127)	Pentakishomohopane-22S (T	64.264	191	13519	213.669	ng/ml	100
128)	Pentakishomohopane-22R (T	65.589	191	10818	170.980	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	45.552	217	9098	295.333	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.973	217	5146	167.046	ng/ml	100
132)	13b,17a-20S-Methyldiachol	46.677	217	5204M3	168.929	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.555	217	17302	561.646	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	48.086	217	18555	602.320	ng/ml	100
135)	Unknown Sterane (S18)	48.369	217	4651	150.978	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.634	217	518	16.815	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.799	217	9026M3	292.996	ng/ml	
138)	14a,17a-20R-Methylcholest	49.531	217	6342	205.870	ng/ml	100
139)	14a(H),17a(H)-20S-Ethylch	49.887	217	12305M3	399.437	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.829	217	10642M3	345.453	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	47.646	218	8965M3	291.016	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.729	218	9770M3	317.147	ng/ml	
143)	14b,17b-20R-Methylcholest	48.973	218	8362M3	271.442	ng/ml	
144)	14b,17b-20S-Methylcholest	49.055	218	13584M3	440.955	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	50.143	218	19891	645.688	ng/ml	100
146)	14b(H),17b(H)-20S-Ethylch	50.180	218	11835M3	384.180	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.842	231	29794	967.153	ng/mL	100
148)	C28,20S-triaromatic stero	50.729	231	32156	1043.826	ng/mL	100
149)	C27,20R-triaromatic stero	51.186	231	19217M3	623.809	ng/mL	
150)	C28,20R-triaromatic stero	52.421	231	25034M3	812.637	ng/mL	

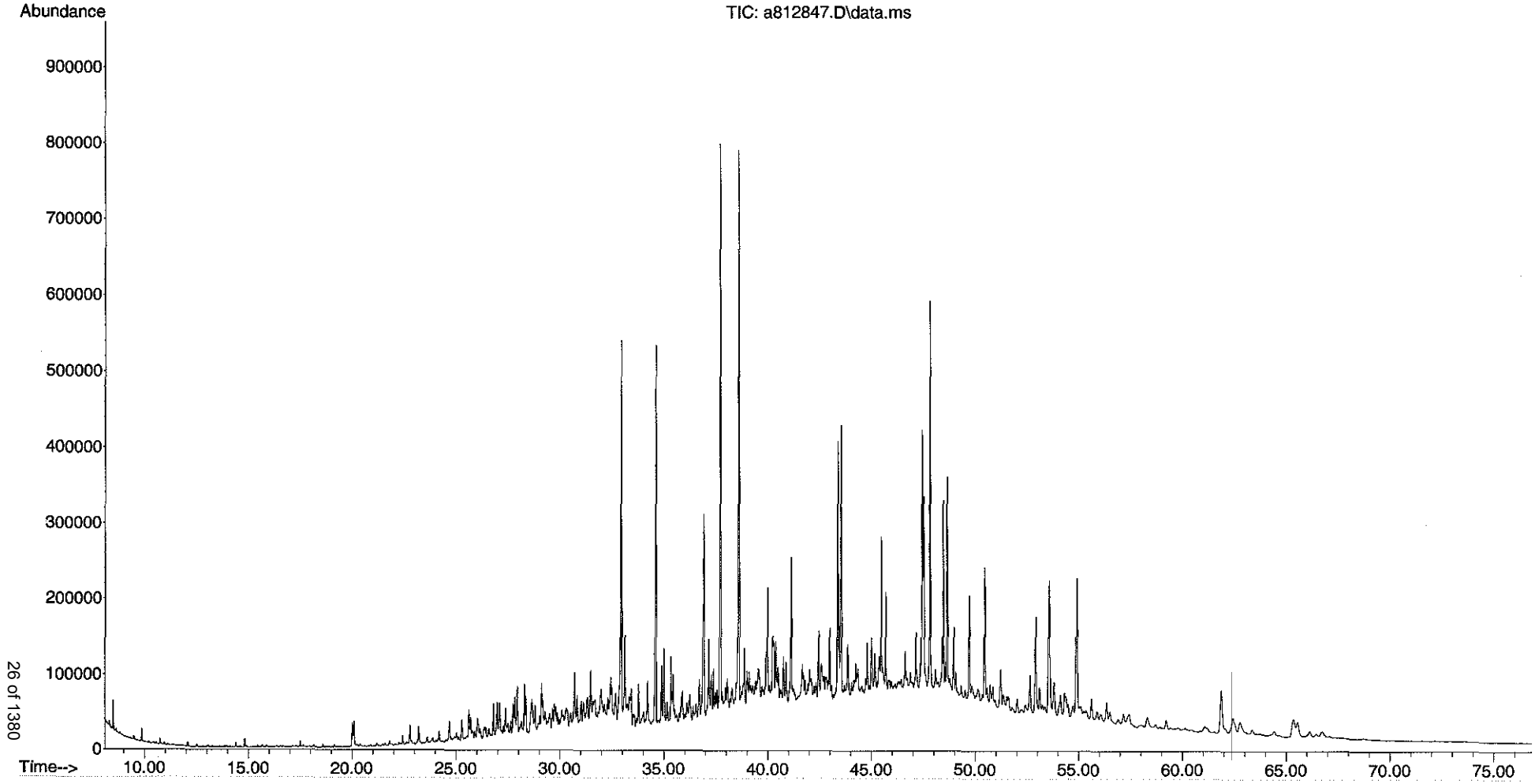
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-02**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.02	2	1	AC

Parameter	Result	
cis/trans-Decalin	**8.50**	
C1-Decalins	**17.0**	
C2-Decalins	**31.6**	
C3-Decalins	**41.3**	
C4-Decalins	**80.2**	
Benzothiophene	**4.54**	
C1-Benzo(b)thiophenes	**11.0**	
C2-Benzo(b)thiophenes	**28.0**	
C3-Benzo(b)thiophenes	**64.2**	
C4-Benzo(b)thiophenes	**76.4**	
Naphthalene	**123**	
C1-Naphthalenes	**130**	
C2-Naphthalenes	**240**	
C3-Naphthalenes	**364**	
C4-Naphthalenes	**340**	
Biphenyl	**21.4**	
Dibenzofuran	**84.4**	
Acenaphthylene	**32.9**	
Acenaphthene	**97.3**	
Fluorene	**135**	
C1-Fluorenes	**99.4**	
C2-Fluorenes	**224**	
C3-Fluorenes	**271**	
Anthracene	**231**	
Phenanthrene	**1170**	
C1-Phenanthrenes/Anthracenes	**659**	
C2-Phenanthrenes/Anthracenes	**610**	
C3-Phenanthrenes/Anthracenes	**425**	
C4-Phenanthrenes/Anthracenes	**237**	
Retene	0.171	U
Dibenzothiophene	**96.3**	
C1-Dibenzothiophenes	**198**	
C2-Dibenzothiophenes	**355**	

Parameter	Result
C3-Dibenzothiophenes	**378**
C4-Dibenzothiophenes	**264**
Benzo(b)fluorene	**192**
Fluoranthene	**1830**
Pyrene	**1550**
C1-Fluoranthenes/Pyrenes	**815**
C2-Fluoranthenes/Pyrenes	**537**
C3-Fluoranthenes/Pyrenes	**313**
C4-Fluoranthenes/Pyrenes	**277**
Naphthobenzothiophenes	**244**
C1-Naphthobenzothiophenes	**200**
C2-Naphthobenzothiophenes	**245**
C3-Naphthobenzothiophenes	**187**
C4-Naphthobenzothiophenes	**139**
Benz[a]anthracene	**745**
Chrysene/Triphenylene	**913**
C1-Chrysenes	**404**
C2-Chrysenes	**301**
C3-Chrysenes	**283**
C4-Chrysenes	**161**
Benzo[b]fluoranthene	**805**
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**679**
Benzo[a]fluoranthene	**122**
Benzo[e]pyrene	**655**
Benzo[a]pyrene	**852**
Perylene	**241**
Indeno[1,2,3-cd]pyrene	**592**
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**142**
Benzo[g,h,i]perylene	**542**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	74	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-02**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.02	2	1	AC

Parameter	Result
Carbazole	136

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	74	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-02**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.02	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**79.0**
2/3-Methyldibenzothiophene	**67.0**
1-Methyldibenzothiophene	**31.8**
3-Methylphenanthrene	**148**
2-Methylphenanthrene	**176**
2-Methylanthracene	**45.0**
9/4-Methylphenanthrene	**164**
1-Methylphenanthrene	**115**
2-Methylnaphthalene	**125**
1-Methylnaphthalene	**98.8**
2,6-Dimethylnaphthalene	**104**
2,3,5-Trimethylnaphthalene	**53.5**
Naphthobenzothiophene-2,1-D	**167**
Naphthobenzothiophene-1,2-D	**35.4**
Naphthobenzothiophene-2,3-D	**41.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	74	40-120
Phenanthrene-d10	93	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-02**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/19/12	63.6	15.02	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**84.2**	
C24 Tricyclic Terpane	**56.5**	
C25 Tricyclic Terpane	**64.3**	
C24 Tetracyclic Terpane	**32.7**	
C26 Tricyclic Terpane-22S	**28.4**	
C26 Tricyclic Terpane-22R	**23.2**	
C28 Tricyclic Terpane-22S	**27.2**	
C28 Tricyclic Terpane-22R	**30.3**	
C29 Tricyclic Terpane-22S	**26.0**	
C29 Tricyclic Terpane-22R	**29.1**	
18a-22,29,30-Trisnorneohopane-TS	**80.4**	
C30 Tricyclic Terpane-22S	**31.2**	
C30 Tricyclic Terpane-22R	**23.2**	
17a(H)-22,29,30-Trisnorhopane-TM	**106**	
17a/b,21b/a 28,30-Bisnorhopane	**29.3**	
17a(H),21b(H)-25-Norhopane	**19.2**	
30-Norhopane	**287**	
18a(H)-30-Norneohopane-C29Ts	**82.9**	
17a(H)-Diahopane	**25.8**	
30-Normoretane	**43.3**	
18a(H)&18b(H)-Oleananes	**29.1**	
Hopane	**436**	
Moretane	**82.1**	
30-Homohopane-22S	**149**	
30-Homohopane-22R	**133**	
T22a-Gammacerane/C32-diahopane	**45.4**	
30,31-Bishomohopane-22S	**167**	G
30,31-Bishomohopane-22R	**74.2**	

Parameter	Result	
30,31-Trishomohopane-22S	**86.1**	
30,31-Trishomohopane-22R	**44.3**	
Tetrakishomohopane-22S	**78.9**	
Tetrakishomohopane-22R	**87.9**	G
Pentakishomohopane-22S	**51.1**	
Pentakishomohopane-22R	**39.5**	
13b(H),17a(H)-20S-Diacholestane	**61.5**	
13b(H),17a(H)-20R-Diacholestane	**31.8**	
13b,17a-20S-Methyldiacholestane	**37.5**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**121**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**131**	
Unknown Sterane (S18)	**36.0**	
13a,17b-20S-Ethyldiacholestane	**2.81**	
14a,17a-20S-Methylcholestane	**59.6**	
14a,17a-20R-Methylcholestane	**47.4**	
14a(H),17a(H)-20S-Ethylcholestane	**90.9**	
14a(H),17a(H)-20R-Ethylcholestane	**82.6**	
14b(H),17b(H)-20R-Cholestane	**64.4**	
14b(H),17b(H)-20S-Cholestane	**66.6**	
14b,17b-20R-Methylcholestane	**66.2**	
14b,17b-20S-Methylcholestane	**97.6**	
14b(H),17b(H)-20R-Ethylcholestane	**133**	
14b(H),17b(H)-20S-Ethylcholestane	**101**	
C26,20R- +C27,20S- triaromatic steroid	**221**	
C28,20S-triaromatic steroid	**247**	
C27,20R-triaromatic steroid	**144**	
C28,20R-triaromatic steroid	**185**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	113	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

D 11/20/12

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	59571	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	91232	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	87289	369.741	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.97%#			
42) Phenanthrene-d10	32.843	188	85663	467.248	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.72%#			
83) Benzo[b]fluoranthene-d12	47.345	264	81068	466.244	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.62%#			
88) Benzo[a]pyrene-d12	48.552	264	79119	460.573	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.06%#			
129) 5B(H)Cholane - Surr	44.054	217	18910	566.846	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 56.68%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	1980	37.402	ng/mL	100
4) cis-Decalin	17.879	138	123	3.172	ng/mL	100
5) C1-Decalins	18.143	152	4287M5	80.981	ng/mL	
6) C2-Decalins	19.914	166	7997M5	151.062	ng/mL	
7) C3-Decalins	22.387	180	10428M5	196.983	ng/mL	
8) C4-Decalins	25.781	194	20269M5	382.877	ng/mL	
10) Naphthalene	20.087	128	158079	585.294	ng/mL#	100
11) C1-Naphthalenes	22.779	142	168165M5	622.638	ng/mL	
12) C2-Naphthalenes	25.617	156	309035M5	1144.214	ng/mL	
13) C3-Naphthalenes	27.953	170	469007M5	1736.517	ng/mL	
14) C4-Naphthalenes	30.718	184	438564M5	1623.800	ng/mL	
16) 2-Methylnaphthalene	22.779	142	95630	594.399	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	71031	471.489	ng/mL#	100
18) Benzothiophene	20.306	134	4725	21.644	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	11449M5	52.444	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	29188M5	133.701	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	66878M5	306.347	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	79573M5	364.499	ng/mL	
23) Biphenyl	24.659	154	20910	102.154	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	68466	497.245	ng/mL#	100
25) Dibenzofuran	27.743	168	87040	403.068	ng/mL	98
26) Acenaphthylene	26.375	152	38544	157.224	ng/mL#	100
27) Acenaphthene	27.105	153	67956	464.414	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	28.656	170	30267M3	255.226	ng/mL	
29) Fluorene	29.121	166	105724M3	644.196	ng/mL	
30) C1-Fluorenes	31.484	180	77848M5	474.342	ng/mL	
31) C2-Fluorenes	33.683	194	175360M5	1068.501	ng/mL	
32) C3-Fluorenes	35.509	208	212164M5	1292.755	ng/mL	
33) Dibenzothiophene	32.442	184	103685	459.429	ng/mL#	71
34) 4-Methyldibenzothiophene(	34.212	198	85095	377.057	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.559	198	72202M3	319.928	ng/mL	
36) 1-Methyldibenzothiophene(	34.988	198	34204	151.558	ng/mL#	100
37) OTP	34.596	198	6410M3	28.403	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	220219M5	975.792	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	382199M5	1693.527	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	406551M5	1801.431	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	39.389	240	284199M5	1259.288	ng/mL	
43) Phenanthrene	32.935	178	1215736	5596.860	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.897	192	153433	706.356	ng/mL	98
45) 2-Methylphenanthrene(2MP)	35.007	192	182718	841.175	ng/mL	96
46) 2-Methylanthracene(2MA)	35.171	192	46598M3	214.522	ng/mL	
47) 9/4-Methylphenanthrene(9M	35.353	192	169839	781.884	ng/mL	85
48) 1-Methylphenanthrene(1MP)	35.445	192	118854M3	547.166	ng/mL	
49) C1-Phenanthrenes/Anthrace	35.007	192	683283M5	3145.616	ng/mL	
50) C2-Phenanthrenes/Anthrace	37.170	206	632113M5	2910.046	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.005	220	440464M5	2027.755	ng/mL	
53) C4-Phenanthrenes/Anthrace	41.178	234	245269M5	1129.140	ng/mL	
55) Anthracene	33.117	178	223168M3	1102.793	ng/mL	
56) Carbazole	33.783	167	136607M3	646.948	ng/mL	
57) 1-Methylphenanthrene	35.445	192	117777M3	764.899	ng/mL	
58) Fluoranthene	37.718	202	1954912M3	8737.179	ng/mL	
59) Benzo(b)fluorene	40.229	216	118461M3	915.246	ng/mL	
60) Pyrene	38.603	202	1674940	7400.933	ng/mL	94
61) C1-Fluoranthenes/Pyrenes	39.982	216	880142M5	3889.018	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.027	230	580334M5	2564.279	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.908	244	338280M5	1494.733	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.196	258	298750M5	1320.064	ng/mL	
66) Naphthobenzothiophene	42.447	234	168490M3	802.001	ng/ml	
67) Naphthobenzothiophene-2,1	42.447	234	167570M3	797.621	ng/mL	
68) Naphthobenzothiophene-1,2	42.785	234	35472M3	168.844	ng/mL	
69) Naphthobenzothiophene-2,3	43.077	234	41242M3	196.309	ng/mL	
70) C1-Naphthobenzothiophenes	43.844	248	200489M5	954.314	ng/ml	
71) C2-Naphthobenzothiophenes	45.845	262	245867M5	1170.310	ng/ml	
72) C3-Naphthobenzothiophenes	47.454	276	187862M5	894.210	ng/ml	
73) C4-Naphthobenzothiophenes	48.552	290	139022M5	661.735	ng/mL	
75) Benz[a]anthracene	43.379	228	710979	3554.865	ng/mL	98
77) Chrysene/Triphenylene	43.534	228	882328	4358.284	ng/mL	99
78) C1-Chrysenes	45.004	242	390070M5	1926.762	ng/mL	
79) C2-Chrysenes	46.714	256	294910M5	1456.716	ng/mL	
80) BBF-D12 Surr BKGD	47.336	256	4103	20.267	ng/mL	100
81) C3-Chrysenes	48.333	270	273690M5	1351.899	ng/mL	
82) C4-Chrysenes	49.320	284	155412M5	767.662	ng/mL	
84) Benzo[b]fluoranthene	47.436	252	825421	3842.748	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.509	252	759761	3241.729	ng/mL	96
86) Benzo[a]fluoranthene	47.820	252	136674	583.157	ng/mL#	1
87) Benzo[e]pyrene	48.451	252	691472	3124.274	ng/mL	96
89) Benzo[a]pyrene	48.653	252	832163	4064.701	ng/mL	94
90) Perylene	48.964	252	257226	1150.243	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.573	276	614814M3	2827.034	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.618	278	144807M6	679.290	ng/mL	
93) Benzo[g,h,i]perylene	54.916	276	637790	2584.212	ng/mL	100
94) Hopane (T19)	52.649	191	142436	2078.856	ng/mL#	88
96) C23 Tricyclic Terpane (T4	41.078	191	27542	401.976	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.799	191	18478	269.687	ng/ml	100
98) C25 Tricyclic Terpane (T6	43.287	191	21037M3	307.035	ng/ml	
99) C24 Tetracyclic Terpane (	44.611	191	10692M3	156.050	ng/ml	
100) C26 Tricyclic Terpane-22S	44.346	191	9276M3	135.383	ng/ml	
101) C26 Tricyclic Terpane-22R	44.438	191	7582M3	110.659	ng/ml	
102) C28 Tricyclic Terpane-22S	46.723	191	8885M4	129.677	ng/ml	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.887	191	9918	144.753	ng/ml	100
104)	C29 Tricyclic Terpane-22S	47.409	191	8511	124.218	ng/ml	100
105)	C29 Tricyclic Terpane-22R	47.619	191	9527M3	139.047	ng/ml	
106)	18a-22,29,30-Trisnorneoho	48.781	191	26301	383.864	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.863	191	10197M3	148.825	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.110	191	7592	110.805	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	49.339	191	34486M3	503.324	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	50.555	191	9582	139.849	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	50.336	191	6272M3	91.540	ng/ml	
112)	30-Norhopane (T15)	51.241	191	93810	1369.159	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	51.351	191	27095M3	395.452	ng/ml	
114)	17a(H)-Diahopane (X)	51.479	191	8431M3	123.051	ng/ml	
115)	30-Normoretane (T17)	52.046	191	14154	206.578	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	52.457	191	9511	138.813	ng/ml	100
117)	Moretane (T20)	53.363	191	26857M3	391.978	ng/ml	
118)	30-Homohopane-22S (T21)	54.496	191	48832	712.704	ng/ml	100
119)	30-Homohopane-22R (T22)	54.733	191	43621	636.649	ng/ml	100
120)	Gammacerane/C32-diahopane	55.300	191	14855M4	216.809	ng/mL	
121)	30,31-Bishomohopane-22S (	56.077	191G	54641	797.486	ng/ml	100
122)	30,31-Bishomohopane-22R (	56.497	191	24254	353.988	ng/ml	100
123)	30,31-Trishomohopane-22S	58.297	191	28148	410.821	ng/ml	100
124)	30,31-Trishomohopane-22R	58.937	191	14500	211.628	ng/ml	100
125)	Tetrakishomohopane-22S (T	61.048	191	25813	376.741	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.888	191G	28754	419.665	ng/ml	100
127)	Pentakishomohopane-22S (T	64.273	191	16708M3	243.854	ng/ml	
128)	Pentakishomohopane-22R (T	65.608	191	12910M4	188.422	ng/ml	
130)	13b(H),17a(H)-20S-Diachol	45.552	217	9794	293.585	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.982	217	5059M3	151.648	ng/ml	
132)	13b,17a-20S-Methyldiachol	46.677	217	5976M3	179.136	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.555	217	19257	577.247	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	48.086	217	20885	626.048	ng/ml	100
135)	Unknown Sterane (S18)	48.369	217	5727	171.672	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.644	217	447	13.399	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.799	217	9494	284.592	ng/ml	100
138)	14a,17a-20R-Methylcholest	49.540	217	7545M3	226.169	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.887	217	14465M3	433.603	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.829	217	13148M3	394.124	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	47.647	218	10256M3	307.434	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.738	218	10601M3	317.775	ng/ml	
143)	14b,17b-20R-Methylcholest	48.982	218	10533M3	315.737	ng/ml	
144)	14b,17b-20S-Methylcholest	49.064	218	15547M3	466.037	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	50.153	218	21128	633.333	ng/ml	100
146)	14b(H),17b(H)-20S-Ethylch	50.189	218	16131M3	483.543	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.851	231	35191	1054.885	ng/mL	100
148)	C28,20S-triaromatic stero	50.729	231	39346M4	1179.435	ng/mL	
149)	C27,20R-triaromatic stero	51.195	231	22986M4	689.028	ng/mL	
150)	C28,20R-triaromatic stero	52.430	231	29445M3	882.643	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
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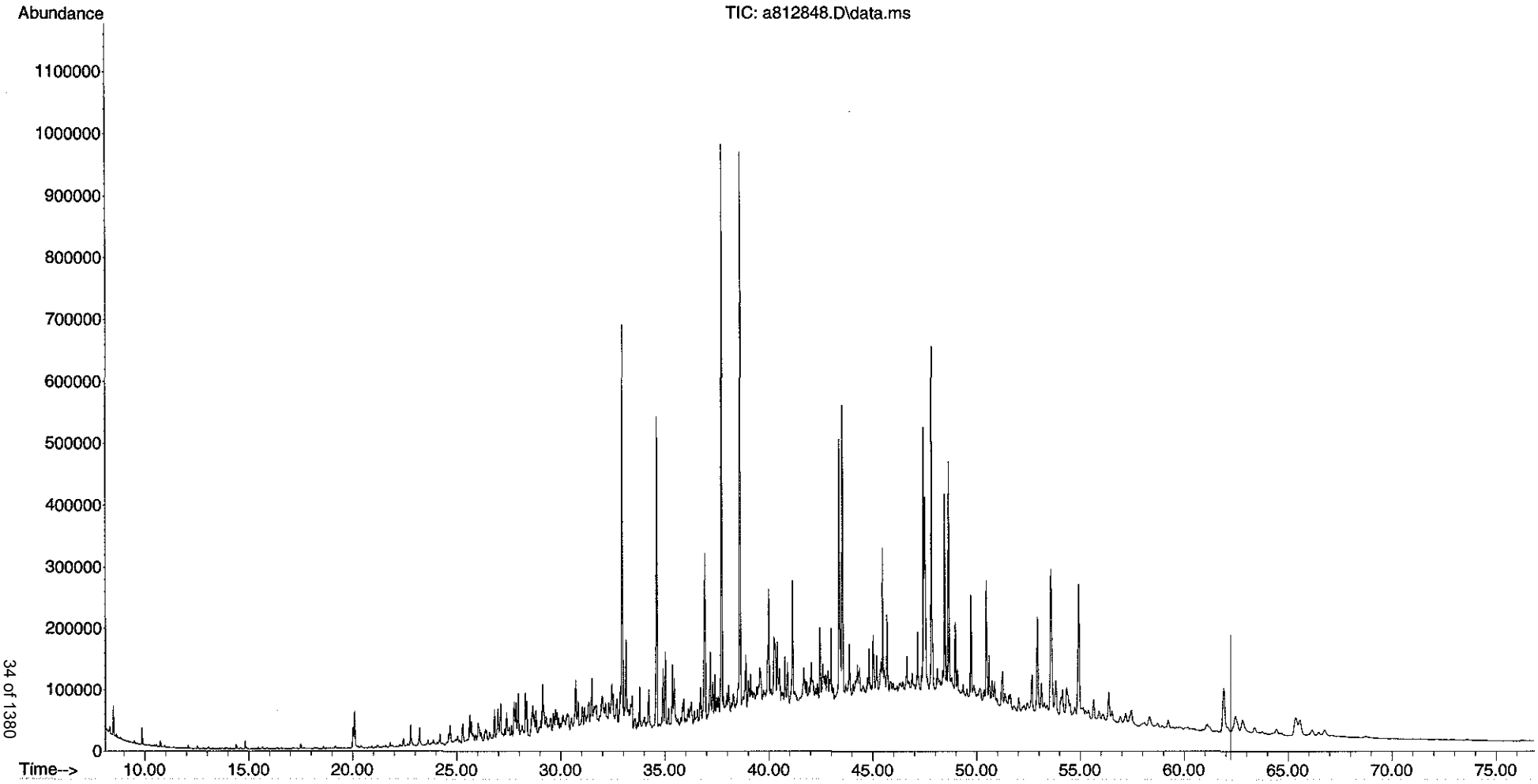
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-03**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**8.61**		C3-Dibenzothiophenes	**382**
C1-Decalins	**18.9**		C4-Dibenzothiophenes	**251**
C2-Decalins	**36.9**		Benzo(b)fluorene	**124**
C3-Decalins	**44.7**		Fluoranthene	**1470**
C4-Decalins	**84.9**		Pyrene	**1240**
Benzothiophene	**3.85**		C1-Fluoranthenes/Pyrenes	**597**
C1-Benzo(b)thiophenes	**11.3**		C2-Fluoranthenes/Pyrenes	**431**
C2-Benzo(b)thiophenes	**28.9**		C3-Fluoranthenes/Pyrenes	**268**
C3-Benzo(b)thiophenes	**65.6**		C4-Fluoranthenes/Pyrenes	**245**
C4-Benzo(b)thiophenes	**75.2**		Naphthobenzothiophenes	**208**
Naphthalene	**84.4**		C1-Naphthobenzothiophenes	**187**
C1-Naphthalenes	**111**		C2-Naphthobenzothiophenes	**236**
C2-Naphthalenes	**229**		C3-Naphthobenzothiophenes	**184**
C3-Naphthalenes	**354**		C4-Naphthobenzothiophenes	**120**
C4-Naphthalenes	**333**		Benz[a]anthracene	**519**
Biphenyl	**17.8**		Chrysene/Triphenylene	**690**
Dibenzofuran	**57.8**		C1-Chrysenes	**306**
Acenaphthylene	**30.2**		C2-Chrysenes	**245**
Acenaphthene	**61.8**		C3-Chrysenes	**207**
Fluorene	**91.0**		C4-Chrysenes	**116**
C1-Fluorenes	**87.1**		Benzo[b]fluoranthene	**603**
C2-Fluorenes	**205**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**501**
C3-Fluorenes	**257**		Benzo[a]fluoranthene	**83.8**
Anthracene	**144**		Benzo[e]pyrene	**461**
Phenanthrene	**844**		Benzo[a]pyrene	**568**
C1-Phenanthrenes/Anthracenes	**526**		Perylene	**170**
C2-Phenanthrenes/Anthracenes	**553**		Indeno[1,2,3-cd]pyrene	**388**
C3-Phenanthrenes/Anthracenes	**400**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**99.9**
C4-Phenanthrenes/Anthracenes	**221**		Benzo[g,h,i]perylene	**415**
Retene	0.171 U			
Dibenzothiophene	**84.6**			
C1-Dibenzothiophenes	**190**			
C2-Dibenzothiophenes	**343**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	80	40-120
Phenanthrene-d10	94	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-03**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result
Carbazole	**102**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	80	40-120
Phenanthrene-d10	94	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-03**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**75.5**
2/3-Methyldibenzothiophene	**65.7**
1-Methyldibenzothiophene	**30.6**
3-Methylphenanthrene	**120**
2-Methylphenanthrene	**138**
2-Methylanthracene	**33.3**
9/4-Methylphenanthrene	**136**
1-Methylphenanthrene	**92.3**
2-Methylnaphthalene	**105**
1-Methylnaphthalene	**83.5**
2,6-Dimethylnaphthalene	**101**
2,3,5-Trimethylnaphthalene	**51.3**
Naphthobenzothiophene-2,1-D	**138**
Naphthobenzothiophene-1,2-D	**29.7**
Naphthobenzothiophene-2,3-D	**39.6**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	80	40-120
Phenanthrene-d10	94	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-03**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	73.2	
C24 Tricyclic Terpane	51.9	
C25 Tricyclic Terpane	62.3	
C24 Tetracyclic Terpane	30.3	
C26 Tricyclic Terpane-22S	27.2	
C26 Tricyclic Terpane-22R	22.8	
C28 Tricyclic Terpane-22S	26.8	
C28 Tricyclic Terpane-22R	26.8	
C29 Tricyclic Terpane-22S	24.8	
C29 Tricyclic Terpane-22R	29.9	
18a-22,29,30-Trisnorneohopane-TS	69.3	
C30 Tricyclic Terpane-22S	24.9	
C30 Tricyclic Terpane-22R	20.5	
17a(H)-22,29,30-Trisnorhopane-TM	96.7	
17a/b,21b/a 28,30-Bisnorhopane	27.3	
17a(H),21b(H)-25-Norhopane	18.0	
30-Norhopane	260	
18a(H)-30-Norneohopane-C29Ts	73.2	
17a(H)-Diahopane	23.1	
30-Normoretane	42.2	
18a(H)&18b(H)-Oleananes	26.6	
Hopane	390	
Moretane	68.2	
30-Homohopane-22S	144	
30-Homohopane-22R	125	
T22a-Gammacerane/C32-diahopane	46.1	
30,31-Bishomohopane-22S	158	G
30,31-Bishomohopane-22R	67.8	

Parameter	Result	
30,31-Trishomohopane-22S	80.0	
30,31-Trishomohopane-22R	42.7	
Tetrakishomohopane-22S	54.6	
Tetrakishomohopane-22R	54.7	G
Pentakishomohopane-22S	46.4	
Pentakishomohopane-22R	34.5	
13b(H),17a(H)-20S-Diacholestane	58.8	
13b(H),17a(H)-20R-Diacholestane	29.8	
13b,17a-20S-Methyldiacholestane	29.0	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	114	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	119	
Unknown Sterane (S18)	29.7	
13a,17b-20S-Ethyldiacholestane	3.59	
14a,17a-20S-Methylcholestane	53.2	
14a,17a-20R-Methylcholestane	46.9	
14a(H),17a(H)-20S-Ethylcholestane	83.5	
14a(H),17a(H)-20R-Ethylcholestane	74.6	
14b(H),17b(H)-20R-Cholestane	59.4	
14b(H),17b(H)-20S-Cholestane	63.6	
14b,17b-20R-Methylcholestane	57.7	
14b,17b-20S-Methylcholestane	86.4	
14b(H),17b(H)-20R-Ethylcholestane	117	
14b(H),17b(H)-20S-Ethylcholestane	92.7	
C26,20R- +C27,20S- triaromatic steroid	205	
C28,20S-triaromatic steroid	226	
C27,20R-triaromatic steroid	129	
C28,20R-triaromatic steroid	173	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	112	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	59391	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	96579	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	94205	400.245	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 40.02%#			
42) Phenanthrene-d10	32.853	188	85569	468.150	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.81%#			
83) Benzo[b]fluoranthene-d12	47.345	264	82949	450.650	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.06%#			
88) Benzo[a]pyrene-d12	48.552	264	74278	408.453	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 40.85%#			
129) 5B(H)Cholane - Surr	44.054	217	19720	558.399	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.84%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2035	38.557	ng/mL	100
4) cis-Decalin	17.879	138	96M3	2.483	ng/mL	
5) C1-Decalins	18.591	152	4752M5	90.036	ng/mL	
6) C2-Decalins	19.914	166	9287M5	175.961	ng/mL	
7) C3-Decalins	22.396	180	11242M5	213.003	ng/mL	
8) C4-Decalins	25.781	194	21349M5	404.501	ng/mL	
10) Naphthalene	20.087	128	108372	402.468	ng/mL#	100
11) C1-Naphthalenes	22.779	142	142083M5	527.662	ng/mL	
12) C2-Naphthalenes	25.617	156	293591M5	1090.327	ng/mL	
13) C3-Naphthalenes	28.300	170	454967M5	1689.639	ng/mL	
14) C4-Naphthalenes	30.718	184	426803M5	1585.044	ng/mL	
16) 2-Methylnaphthalene	22.779	142	80492	501.823	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	59738	397.730	ng/mL#	100
18) Benzothiophene	20.306	134	3998	18.369	ng/mL	100
19) C1-Benzo(b)thiophenes	23.172	148	11690M5	53.711	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	29953M5	137.621	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	68039M5	312.610	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	78055M5	358.629	ng/mL	
23) Biphenyl	24.659	154	17277	84.661	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	65987	480.693	ng/mL#	100
25) Dibenzofuran	27.743	168	59306	275.468	ng/mL	98
26) Acenaphthylene	26.375	152	35237	144.171	ng/mL#	100
27) Acenaphthene	27.105	153	42971	294.556	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	28.656	170	28916M3	244.573	ng/mL	
29) Fluorene	29.121	166	70947M3	433.603	ng/mL	
30) C1-Fluorenes	31.484	180	67916M5	415.079	ng/mL	
31) C2-Fluorenes	33.683	194	159581M5	975.304	ng/mL	
32) C3-Fluorenes	35.509	208	200153M5	1223.266	ng/mL	
33) Dibenzothiophene	32.442	184	90715	403.177	ng/mL#	70
34) 4-Methyldibenzothiophene(	34.222	198	81014	360.062	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.568	198	70502M3	313.342	ng/mL	
36) 1-Methyldibenzothiophene(	34.988	198	32794	145.751	ng/mL#	100
37) OTP	34.605	198	4560M3	20.267	ng/mL	
38) C1-Dibenzothiophenes	34.222	198	208341M5	925.959	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	367992M5	1635.517	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	409653M5	1820.677	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	39.389	240	269283M5	1196.811	ng/mL	
43) Phenanthrene	32.944	178	871349	4023.570	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.897	192	124131	573.191	ng/mL	97
45) 2-Methylphenanthrene(2MP)	35.016	192	141899	655.237	ng/mL	96
46) 2-Methylanthracene(2MA)	35.171	192	34402	158.856	ng/mL#	41
47) 9/4-Methylphenanthrene(9M	35.353	192	140602	649.248	ng/mL	86
48) 1-Methylphenanthrene(1MP)	35.445	192	95242	439.793	ng/mL	99
49) C1-Phenanthrenes/Anthrace	35.016	192	542896M5	2506.894	ng/mL	
50) C2-Phenanthrenes/Anthrace	37.170	206	570889M5	2636.156	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.005	220	413067M5	1907.392	ng/mL	
53) C4-Phenanthrenes/Anthrace	41.178	234	228194M5	1053.716	ng/mL	
55) Anthracene	33.117	178	138721M3	687.573	ng/mL	
56) Carbazole	33.783	167	102645M3	487.583	ng/mL	
57) 1-Methylphenanthrene	35.445	192	94321M3	614.421	ng/mL	
58) Fluoranthene	37.718	202	1560148	6993.975	ng/mL	100
59) Benzo(b)fluorene	40.229	216	76294M3	591.245	ng/mL	
60) Pyrene	38.603	202	1334690	5915.369	ng/mL	94
61) C1-Fluoranthenes/Pyrenes	39.991	216	641883M5	2844.837	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.036	230	463748M5	2055.339	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.917	244	288700M5	1279.523	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.196	258	263048M5	1165.833	ng/mL	
66) Naphthobenzothiophene	42.447	234	138533M3	661.406	ng/ml	
67) Naphthobenzothiophene-2,1	42.447	234	138148M3	659.568	ng/mL	
68) Naphthobenzothiophene-1,2	42.785	234	29689M3	141.746	ng/mL	
69) Naphthobenzothiophene-2,3	43.086	234	39507M3	188.620	ng/mL	
70) C1-Naphthobenzothiophenes	43.844	248	186621M5	890.995	ng/ml	
71) C2-Naphthobenzothiophenes	45.845	262	235697M5	1125.301	ng/ml	
72) C3-Naphthobenzothiophenes	47.455	276	183746M5	877.269	ng/ml	
73) C4-Naphthobenzothiophenes	48.543	290	119761M5	571.782	ng/mL	
75) Benz[a]anthracene	43.379	228	523821	2474.080	ng/mL	97
77) Chrysene/Triphenylene	43.534	228	704782	3288.552	ng/mL	100
78) C1-Chrysenes	45.004	242	312469M5	1457.998	ng/mL	
79) C2-Chrysenes	46.714	256	254244M5	1186.317	ng/mL	
80) BBF-D12 Surr BKGD	47.345	256	3755	17.521	ng/mL	100
81) C3-Chrysenes	47.766	270	211282M5	985.854	ng/mL	
82) C4-Chrysenes	49.942	284	118309M5	552.036	ng/mL	
84) Benzo[b]fluoranthene	47.436	252	653196	2872.595	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.509	252	592918	2389.785	ng/mL	96
86) Benzo[a]fluoranthene	47.820	252	99101	399.431	ng/mL#	1
87) Benzo[e]pyrene	48.461	252	515182	2198.871	ng/mL	96
89) Benzo[a]pyrene	48.653	252	586596	2706.598	ng/mL	94
90) Perylene	48.964	252	191311	808.126	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.573	276	425842M3	1849.695	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.619	278	107415M6	475.987	ng/mL	
93) Benzo[g,h,i]perylene	54.916	276	517268	1979.842	ng/mL	100
94) Hopane (T19)	52.650	191	134946M3	1860.498	ng/mL	
96) C23 Tricyclic Terpane (T4	41.078	191	25318M3	349.059	ng/ml	
97) C24 Tricyclic Terpane (T5	41.799	191	17950	247.476	ng/ml	100
98) C25 Tricyclic Terpane (T6	43.287	191	21526M3	296.779	ng/ml	
99) C24 Tetracyclic Terpane (	44.611	191	10489M3	144.612	ng/ml	
100) C26 Tricyclic Terpane-22S	44.337	191	9414M3	129.791	ng/ml	
101) C26 Tricyclic Terpane-22R	44.438	191	7898M3	108.890	ng/ml	
102) C28 Tricyclic Terpane-22S	46.723	191	9282	127.971	ng/ml	100

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.887	191	9257	127.626	ng/ml	100
104) C29 Tricyclic Terpane-22S	47.409	191	8568	118.127	ng/ml	100
105) C29 Tricyclic Terpane-22R	47.619	191	10352M3	142.723	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.781	191	23962	330.364	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.863	191	8597M3	118.527	ng/mL	
108) C30 Tricyclic Terpane-22R	49.110	191	7094	97.805	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	49.339	191	33433	460.940	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	50.555	191	9432	130.039	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	50.336	191	6204M3	85.534	ng/ml	
112) 30-Norhopane (T15)	51.250	191	89859	1238.884	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	51.351	191	25308M3	348.921	ng/ml	
114) 17a(H)-Diahopane (X)	51.479	191	7970M3	109.882	ng/ml	
115) 30-Normoretane (T17)	52.046	191	14602	201.317	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	52.467	191	9184M4	126.620	ng/ml	
117) Moretane (T20)	53.363	191	23589	325.221	ng/ml	100
118) 30-Homohopane-22S (T21)	54.496	191	49690M3	685.075	ng/ml	
119) 30-Homohopane-22R (T22)	54.733	191	43348	597.638	ng/ml	100
120) Gammacerane/C32-diahopane	55.309	191	15926M4	219.571	ng/mL	
121) 30,31-Bishomohopane-22S (	56.095	191G	54592	752.659	ng/ml	100
122) 30,31-Bishomohopane-22R (	56.497	191	23437	323.125	ng/ml	100
123) 30,31-Trishomohopane-22S	58.306	191	27664	381.403	ng/ml	100
124) 30,31-Trishomohopane-22R	58.946	191	14775	203.703	ng/ml	100
125) Tetrakishomohopane-22S (T	61.030	191	18879	260.284	ng/ml	100
126) Tetrakishomohopane-22R (T	61.925	191G	18908M3	260.684	ng/ml	
127) Pentakishomohopane-22S (T	64.274	191	16042M4	221.171	ng/ml	
128) Pentakishomohopane-22R (T	65.635	191	11931M3	164.492	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	45.561	217	9906	280.502	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.982	217	5023M4	142.233	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.677	217	4874M3	138.014	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	47.555	217	19130	541.693	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	48.086	217	20026	567.064	ng/ml	100
135) Unknown Sterane (S18)	48.378	217	5005	141.724	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	48.634	217	605	17.131	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.799	217	8949	253.403	ng/ml	100
138) 14a,17a-20R-Methylcholest	49.531	217	7898M3	223.643	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.897	217	14058M3	398.072	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.829	217	12555M3	355.512	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	47.647	218	10005M3	283.305	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.738	218	10708M3	303.212	ng/ml	
143) 14b,17b-20R-Methylcholest	48.982	218	9715M3	275.094	ng/ml	
144) 14b,17b-20S-Methylcholest	49.064	218	14539M3	411.692	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	50.153	218	19763	559.617	ng/ml	100
146) 14b(H),17b(H)-20S-Ethylch	50.189	218	15607M3	441.934	ng/ml	
147) C26,20R- +C27,20S- triaro	49.851	231	34445	975.358	ng/mL	100
148) C28,20S-triaromatic stero	50.729	231	38108M4	1079.081	ng/mL	
149) C27,20R-triaromatic stero	51.195	231	21678M3	613.843	ng/mL	
150) C28,20R-triaromatic stero	52.439	231	29062	822.931	ng/mL	100

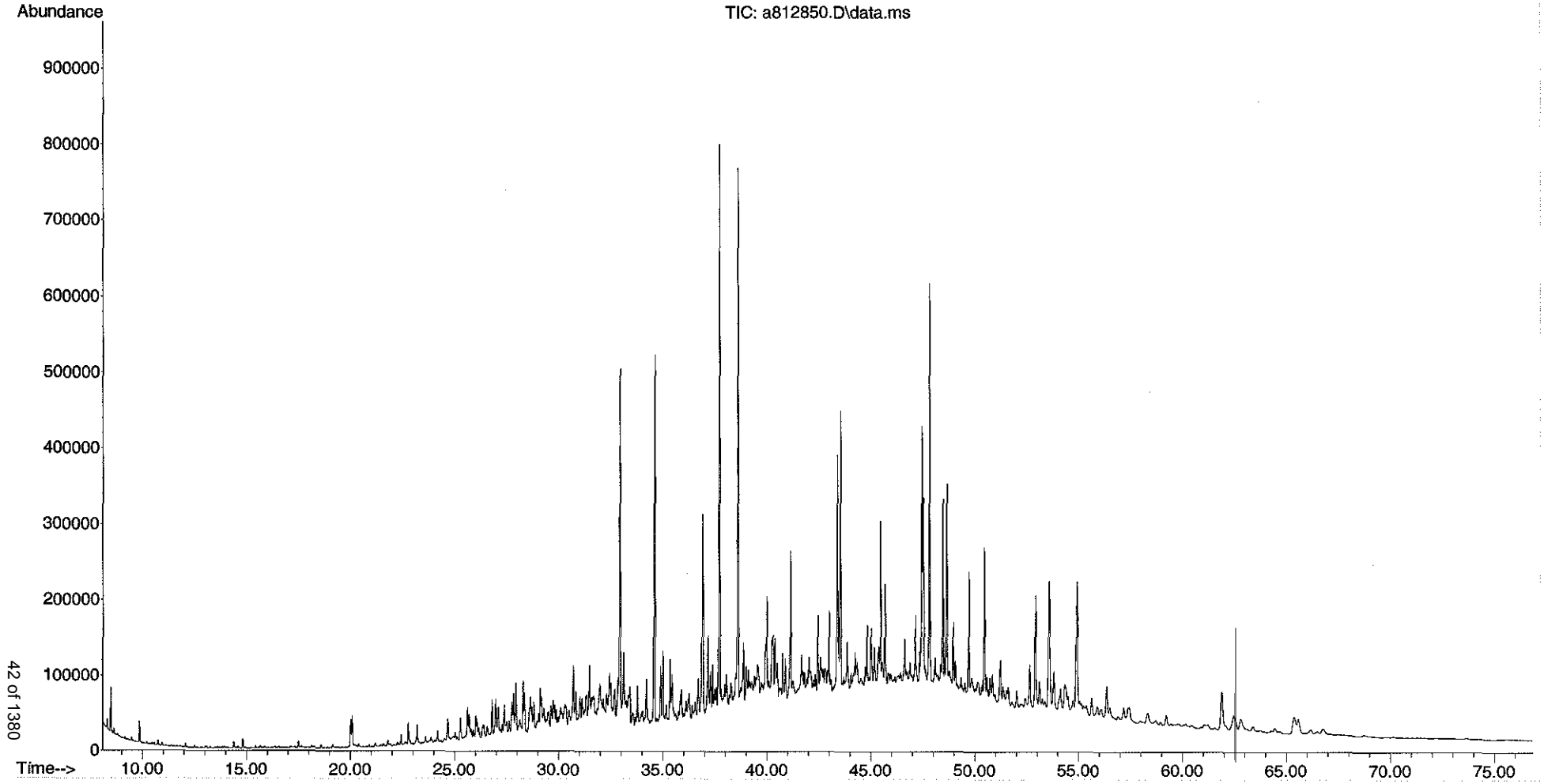
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.03	2	1	AC

Parameter	Result	Parameter	Result
cis/trans-Decalin	9.27	C3-Dibenzothiophenes	376
C1-Decalins	21.0	C4-Dibenzothiophenes	252
C2-Decalins	33.8	Benzo(b)fluorene	160
C3-Decalins	41.8	Fluoranthene	1910
C4-Decalins	83.0	Pyrene	1640
Benzothiophene	4.68	C1-Fluoranthenes/Pyrenes	784
C1-Benzo(b)thiophenes	11.5	C2-Fluoranthenes/Pyrenes	613
C2-Benzo(b)thiophenes	29.2	C3-Fluoranthenes/Pyrenes	329
C3-Benzo(b)thiophenes	63.5	C4-Fluoranthenes/Pyrenes	275
C4-Benzo(b)thiophenes	75.2	Naphthobenzothiophenes	252
Naphthalene	107	C1-Naphthobenzothiophenes	210
C1-Naphthalenes	123	C2-Naphthobenzothiophenes	249
C2-Naphthalenes	252	C3-Naphthobenzothiophenes	188
C3-Naphthalenes	375	C4-Naphthobenzothiophenes	121
C4-Naphthalenes	337	Benz[a]anthracene	746
Biphenyl	19.6	Chrysene/Triphenylene	917
Dibenzofuran	81.9	C1-Chrysenes	414
Acenaphthylene	34.5	C2-Chrysenes	298
Acenaphthene	106	C3-Chrysenes	246
Fluorene	140	C4-Chrysenes	130
C1-Fluorenes	103	Benzo[b]fluoranthene	818
C2-Fluorenes	217	Benzo[j]fluoranthene/Benzo[k]fluoranthene	647
C3-Fluorenes	288	Benzo[a]fluoranthene	114
Anthracene	228	Benzo[e]pyrene	616
Phenanthrene	1290	Benzo[a]pyrene	778
C1-Phenanthrenes/Anthracenes	751	Perylene	219
C2-Phenanthrenes/Anthracenes	648	Indeno[1,2,3-cd]pyrene	533
C3-Phenanthrenes/Anthracenes	433	Dibenz[ah]anthracene/Dibenz[ac]anthracene	130
C4-Phenanthrenes/Anthracenes	230	Benzo[g,h,i]perylene	507
Retene	0.171 U		
Dibenzothiophene	110		
C1-Dibenzothiophenes	213		
C2-Dibenzothiophenes	365		

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	79	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.03	2	1	AC

Parameter	Result
Carbazole	**157**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	79	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.03	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**84.0**
2/3-Methyldibenzothiophene	**72.6**
1-Methyldibenzothiophene	**34.1**
3-Methylphenanthrene	**172**
2-Methylphenanthrene	**196**
2-Methylanthracene	**50.3**
9/4-Methylphenanthrene	**186**
1-Methylphenanthrene	**136**
2-Methylnaphthalene	**115**
1-Methylnaphthalene	**95.1**
2,6-Dimethylnaphthalene	**105**
2,3,5-Trimethylnaphthalene	**63.7**
Naphthobenzothiophene-2,1-D	**173**
Naphthobenzothiophene-1,2-D	**38.2**
Naphthobenzothiophene-2,3-D	**40.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	79	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.03	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**75.6**	
C24 Tricyclic Terpane	**53.0**	
C25 Tricyclic Terpane	**63.3**	
C24 Tetracyclic Terpane	**29.6**	
C26 Tricyclic Terpane-22S	**26.2**	
C26 Tricyclic Terpane-22R	**21.1**	
C28 Tricyclic Terpane-22S	**27.3**	
C28 Tricyclic Terpane-22R	**30.5**	
C29 Tricyclic Terpane-22S	**27.2**	
C29 Tricyclic Terpane-22R	**33.4**	
18a-22,29,30-Trisnorneohopane-TS	**71.0**	
C30 Tricyclic Terpane-22S	**25.7**	
C30 Tricyclic Terpane-22R	**20.7**	
17a(H)-22,29,30-Trisnorhopane-TM	**94.4**	
17a/b,21b/a 28,30-Bisnorhopane	**27.3**	
17a(H),21b(H)-25-Norhopane	**12.8**	
30-Norhopane	**260**	
18a(H)-30-Norneohopane-C29Ts	**72.2**	
17a(H)-Diahopane	**22.0**	
30-Normoretane	**40.8**	
18a(H)&18b(H)-Oleananes	**23.6**	
Hopane	**393**	
Moretane	**78.7**	
30-Homohopane-22S	**138**	
30-Homohopane-22R	**120**	
T22a-Gammacerane/C32-diahopane	**43.0**	
30,31-Bishomohopane-22S	**166**	G
30,31-Bishomohopane-22R	**72.8**	

Parameter	Result	
30,31-Trishomohopane-22S	**82.3**	
30,31-Trishomohopane-22R	**42.0**	
Tetrakishomohopane-22S	**77.1**	
Tetrakishomohopane-22R	**91.3**	G
Pentakishomohopane-22S	**47.7**	
Pentakishomohopane-22R	**31.6**	
13b(H),17a(H)-20S-Diacholestane	**58.0**	
13b(H),17a(H)-20R-Diacholestane	**32.0**	
13b,17a-20S-Methyldiacholestane	**33.5**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**113**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**116**	
Unknown Sterane (S18)	**28.5**	
13a,17b-20S-Ethyldiacholestane	**4.00**	
14a,17a-20S-Methylcholestane	**53.7**	
14a,17a-20R-Methylcholestane	**42.3**	
14a(H),17a(H)-20S-Ethylcholestane	**85.8**	
14a(H),17a(H)-20R-Ethylcholestane	**76.0**	
14b(H),17b(H)-20R-Cholestane	**63.3**	
14b(H),17b(H)-20S-Cholestane	**64.5**	
14b,17b-20R-Methylcholestane	**58.7**	
14b,17b-20S-Methylcholestane	**87.1**	
14b(H),17b(H)-20R-Ethylcholestane	**126**	
14b(H),17b(H)-20S-Ethylcholestane	**83.3**	
C26,20R- +C27,20S- triaromatic steroid	**204**	
C28,20S-triaromatic steroid	**229**	
C27,20R-triaromatic steroid	**134**	
C28,20R-triaromatic steroid	**168**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	111	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	57093	500.000	ng/mL	0.00
74) Chrysene-d12	43.442	240	91681	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	89067	393.647	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.36%#			
42) Phenanthrene-d10	32.852	188	80311	457.068	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.71%#			
83) Benzo[b]fluoranthene-d12	47.354	264	79694	456.097	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.61%#			
88) Benzo[a]pyrene-d12	48.561	264	70448	408.088	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 40.81%#			
129) 5B(H)Cholane - Surr	44.054	217	18529	552.705	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.27%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2154	42.455	ng/mL	100
4) cis-Decalin	17.869	138	67M3	1.803	ng/mL	
5) C1-Decalins	18.143	152	5079M5	100.105	ng/mL	
6) C2-Decalins	19.923	166	8188M5	161.383	ng/mL	
7) C3-Decalins	22.396	180	10130M5	199.659	ng/mL	
8) C4-Decalins	25.781	194	20124M5	396.637	ng/mL	
10) Naphthalene	20.087	128	131772	509.067	ng/mL#	100
11) C1-Naphthalenes	22.779	142	151698M5	586.046	ng/mL	
12) C2-Naphthalenes	25.617	156	310927M5	1201.186	ng/mL	
13) C3-Naphthalenes	27.962	170	464061M5	1792.779	ng/mL	
14) C4-Naphthalenes	30.727	184	417023M5	1611.060	ng/mL	
16) 2-Methylnaphthalene	22.779	142	84818	550.078	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	65547	453.971	ng/mL#	100
18) Benzothiophene	20.306	134	4675	22.344	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	11523M5	55.074	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	29180M5	139.466	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	63471M5	303.360	ng/mL	
22) C4-Benzo(b)thiophenes	29.896	190	75136M5	359.113	ng/mL	
23) Biphenyl	24.659	154	18388	93.732	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	66139	501.193	ng/mL#	100
25) Dibenzofuran	27.752	168	80914	390.962	ng/mL	98
26) Acenaphthylene	26.374	152	38714	164.772	ng/mL#	100
27) Acenaphthene	27.104	153	70704	504.166	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	28.656	170	34586M3	304.305	ng/mL	
29) Fluorene	29.121	166	105213M3	668.907	ng/mL	
30) C1-Fluorenes	31.493	180	77739M5	494.237	ng/mL	
31) C2-Fluorenes	33.683	194	162934M5	1035.877	ng/mL	
32) C3-Fluorenes	36.193	208	216524M5	1376.583	ng/mL	
33) Dibenzothiophene	32.451	184	113605	525.233	ng/mL#	76
34) 4-Methyldibenzothiophene(	34.221	198	86820	401.397	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.541	198	74942M3	346.481	ng/mL	
36) 1-Methyldibenzothiophene(	34.988	198	35208	162.778	ng/mL#	100
37) OTP	34.605	198	4635M3	21.429	ng/mL	
38) C1-Dibenzothiophenes	34.221	198	225040M5	1040.433	ng/mL	
39) C2-Dibenzothiophenes	35.910	212	377059M5	1743.267	ng/mL	
40) C3-Dibenzothiophenes	37.708	226	387952M5	1793.629	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
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Acq On : 20 Nov 2012 3:12 am
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ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41)	C4-Dibenzothiophenes	39.398	240	259861M5	1201.422	ng/mL	
43)	Phenanthrene	32.944	178	1282353	6159.774	ng/mL	100
44)	3-Methylphenanthrene(3MP)	34.906	192	170578	819.370	ng/mL	99
45)	2-Methylphenanthrene(2MP)	35.016	192	195308	938.161	ng/mL	97
46)	2-Methylanthracene(2MA)	35.171	192	49974	240.050	ng/mL#	39
47)	9/4-Methylphenanthrene(9M	35.353	192	184679M3	887.104	ng/mL	
48)	1-Methylphenanthrene(1MP)	35.445	192	135091	648.909	ng/mL	95
49)	C1-Phenanthrenes/Anthrace	35.016	192	746436M5	3585.500	ng/mL	
50)	C2-Phenanthrenes/Anthrace	37.170	206	644459M5	3095.654	ng/mL	
52)	C3-Phenanthrenes/Anthrace	39.005	220	430406M5	2067.452	ng/mL	
53)	C4-Phenanthrenes/Anthrace	41.178	234	228424M5	1097.233	ng/mL	
55)	Anthracene	33.126	178	210944M3	1087.631	ng/mL	
56)	Carbazole	33.792	167	151417	748.209	ng/mL	98
57)	1-Methylphenanthrene	35.445	192	134600M3	912.096	ng/mL	
58)	Fluoranthene	37.727	202	1960043	9140.325	ng/mL	100
59)	Benzo(b)fluorene	40.238	216	94499M3	761.802	ng/mL	
60)	Pyrene	38.612	202	1703369	7853.224	ng/mL	94
61)	C1-Fluoranthenes/Pyrenes	39.991	216	811996M5	3743.632	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.036	230	634686M5	2926.160	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.917	244	340743M5	1570.964	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.205	258	284885M5	1313.436	ng/mL	
66)	Naphthobenzothiophene	42.447	234	167336M3	831.078	ng/ml	
67)	Naphthobenzothiophene-2,1	42.447	234	166645M3	827.646	ng/mL	
68)	Naphthobenzothiophene-1,2	42.794	234	36732	182.430	ng/mL#	10
69)	Naphthobenzothiophene-2,3	43.086	234	38805M3	192.726	ng/mL	
70)	C1-Naphthobenzothiophenes	43.844	248	201979M5	1003.134	ng/ml	
71)	C2-Naphthobenzothiophenes	45.844	262	239548M5	1189.721	ng/ml	
72)	C3-Naphthobenzothiophenes	47.463	276	180714M5	897.521	ng/ml	
73)	C4-Naphthobenzothiophenes	48.561	290	116138M5	576.802	ng/mL	
75)	Benz[a]anthracene	43.378	228	715905	3561.964	ng/mL	98
77)	Chrysene/Triphenylene	43.543	228	890775	4378.459	ng/mL	99
78)	C1-Chrysenes	45.013	242	402164M5	1976.772	ng/mL	
79)	C2-Chrysenes	46.723	256	293824M5	1444.244	ng/mL	
80)	BBF-D12 Surr BKGD	47.345	256	4070	20.005	ng/mL	100
81)	C3-Chrysenes	47.774	270	238985M5	1174.692	ng/mL	
82)	C4-Chrysenes	49.338	284	126279M5	620.704	ng/mL	
84)	Benzo[b]fluoranthene	47.445	252	843665	3908.448	ng/mL	99
85)	Benzo[j]+[k]fluoranthene	47.518	252	728040	3091.170	ng/mL	99
86)	Benzo[a]fluoranthene	47.829	252	128404	545.188	ng/mL#	1
87)	Benzo[e]pyrene	48.460	252	654434	2942.444	ng/mL	97
89)	Benzo[a]pyrene	48.653	252	764069	3713.818	ng/mL	97
90)	Perylene	48.973	252	234923	1045.366	ng/mL	94
91)	Indeno[1,2,3-cd]pyrene	53.582	276	556061M3	2544.354	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.627	278	132520M6	618.607	ng/mL	
93)	Benzo[g,h,i]perylene	54.925	276	599895	2418.764	ng/mL	100
94)	Hopane (T19)	52.658	191	129083M3	1874.742	ng/mL	
96)	C23 Tricyclic Terpane (T4	41.087	191	24854	360.968	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.808	191	17429	253.131	ng/ml	100
98)	C25 Tricyclic Terpane (T6	43.296	191	20823M3	302.424	ng/ml	
99)	C24 Tetracyclic Terpane (	44.620	191	9740M3	141.459	ng/ml	
100)	C26 Tricyclic Terpane-22S	44.346	191	8609M3	125.033	ng/ml	
101)	C26 Tricyclic Terpane-22R	44.438	191	6940M3	100.793	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.732	191	8973	130.320	ng/ml	100

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.887	191	10034	145.729	ng/ml	100
104)	C29 Tricyclic Terpane-22S	47.418	191	8951	130.000	ng/ml	100
105)	C29 Tricyclic Terpane-22R	47.619	191	10971M3	159.338	ng/ml	
106)	18a-22,29,30-Trisnorneoho	48.781	191	23329	338.820	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.863	191	8457M3	122.826	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.110	191	6798	98.731	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	49.338	191	31040M3	450.811	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	50.564	191	8975	130.349	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	50.335	191	4209	61.130	ng/ml	100
112)	30-Norhopane (T15)	51.250	191	85663	1244.130	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	51.360	191	23754M3	344.992	ng/ml	
114)	17a(H)-Diahopane (X)	51.488	191	7249M3	105.281	ng/ml	
115)	30-Normoretane (T17)	52.046	191	13407	194.717	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	52.466	191	7752M4	112.586	ng/ml	
117)	Moretane (T20)	53.372	191	25870M4	375.724	ng/ml	
118)	30-Homohopane-22S (T21)	54.505	191	45422M3	659.688	ng/ml	
119)	30-Homohopane-22R (T22)	54.742	191	39390	572.082	ng/ml	100
120)	Gammacerane/C32-diahopane	55.309	191	14136M4	205.305	ng/mL	
121)	30,31-Bishomohopane-22S (	56.104	191G	54586	792.782	ng/ml	100
122)	30,31-Bishomohopane-22R (	56.515	191	23936	347.635	ng/ml	100
123)	30,31-Trishomohopane-22S	58.315	191	27052	392.891	ng/ml	100
124)	30,31-Trishomohopane-22R	58.955	191	13818	200.686	ng/ml	100
125)	Tetrakishomohopane-22S (T	61.057	191	25342	368.056	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.897	191G	30020	435.997	ng/ml	100
127)	Pentakishomohopane-22S (T	64.292	191	15698	227.991	ng/ml	100
128)	Pentakishomohopane-22R (T	65.644	191	10393M3	150.943	ng/ml	
130)	13b(H),17a(H)-20S-Diachol	45.561	217	9289	277.083	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.982	217	5126	152.904	ng/ml	100
132)	13b,17a-20S-Methyldiachol	46.686	217	5362M3	159.944	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.564	217	18028	537.760	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	48.095	217	18591	554.554	ng/ml	100
135)	Unknown Sterane (S18)	48.378	217	4568	136.260	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.643	217	641	19.121	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.799	217	8604	256.650	ng/ml	100
138)	14a,17a-20R-Methylcholest	49.540	217	6766M3	201.824	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.896	217	13741M3	409.883	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.838	217	12173M3	363.111	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	47.656	218	10136M3	302.349	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.738	218	10322M3	307.897	ng/ml	
143)	14b,17b-20R-Methylcholest	48.991	218	9393M3	280.185	ng/ml	
144)	14b,17b-20S-Methylcholest	49.073	218	13938M3	415.759	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	50.162	218	20245M3	603.892	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	50.198	218	13330M3	397.623	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.851	231	32749	976.876	ng/mL	100
148)	C28,20S-triaromatic stero	50.738	231	36647	1093.150	ng/mL	100
149)	C27,20R-triaromatic stero	51.204	231	21493M4	641.118	ng/mL	
150)	C28,20R-triaromatic stero	52.439	231	26897M3	802.315	ng/mL	

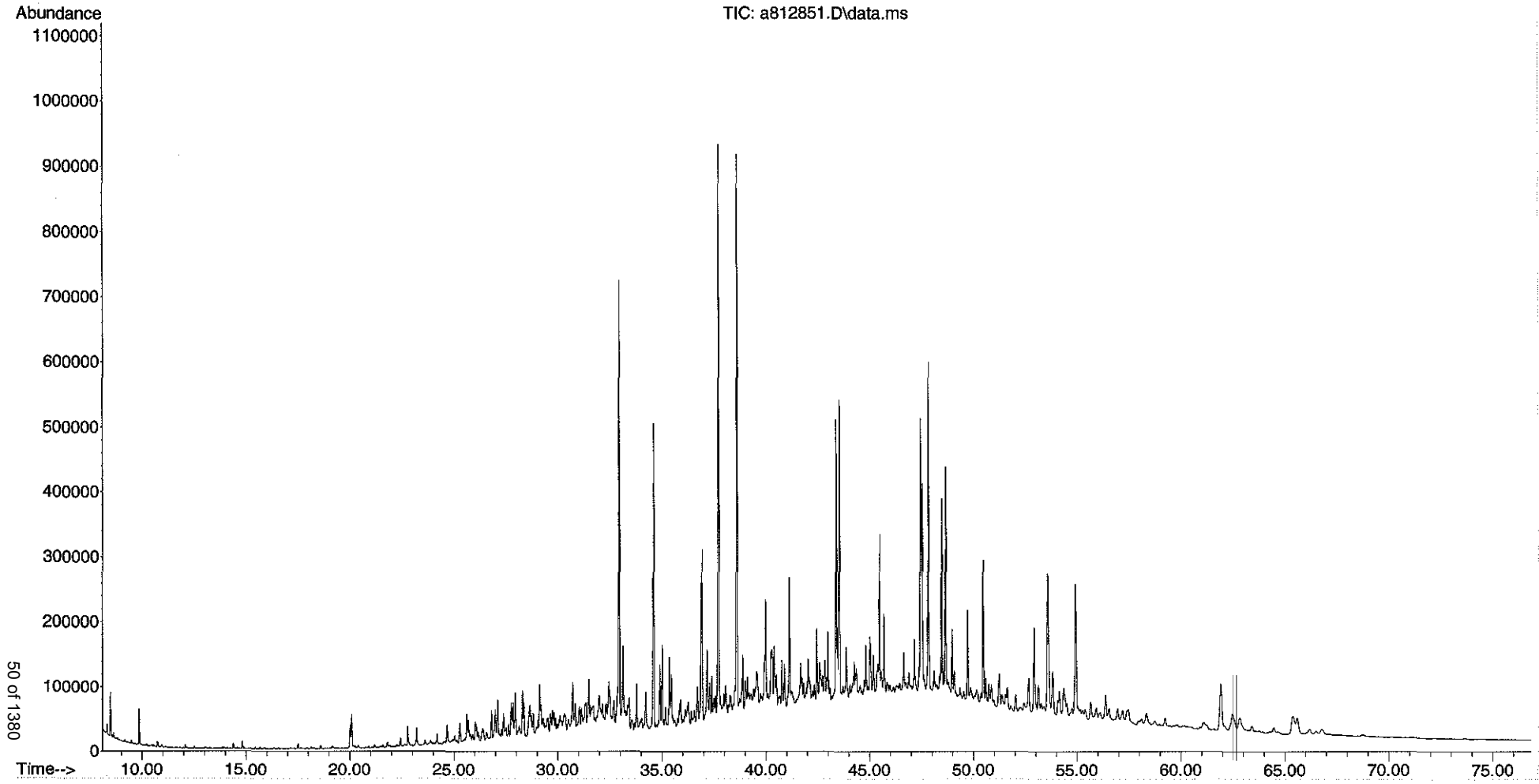
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-05**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.01	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**8.91**		C3-Dibenzothiophenes	**380**
C1-Decalins	**18.6**		C4-Dibenzothiophenes	**254**
C2-Decalins	**33.1**		Benzo(b)fluorene	**164**
C3-Decalins	**39.2**		Fluoranthene	**1960**
C4-Decalins	**82.4**		Pyrene	**1660**
Benzothiophene	**4.79**		C1-Fluoranthenes/Pyrenes	**811**
C1-Benzo(b)thiophenes	**11.5**		C2-Fluoranthenes/Pyrenes	**595**
C2-Benzo(b)thiophenes	**29.7**		C3-Fluoranthenes/Pyrenes	**318**
C3-Benzo(b)thiophenes	**64.9**		C4-Fluoranthenes/Pyrenes	**286**
C4-Benzo(b)thiophenes	**75.9**		Naphthobenzothiophenes	**252**
Naphthalene	**128**		C1-Naphthobenzothiophenes	**205**
C1-Naphthalenes	**128**		C2-Naphthobenzothiophenes	**252**
C2-Naphthalenes	**247**		C3-Naphthobenzothiophenes	**195**
C3-Naphthalenes	**362**		C4-Naphthobenzothiophenes	**128**
C4-Naphthalenes	**341**		Benz[a]anthracene	**819**
Biphenyl	**21.7**		Chrysene/Triphenylene	**987**
Dibenzofuran	**92.1**		C1-Chrysenes	**443**
Acenaphthylene	**37.4**		C2-Chrysenes	**344**
Acenaphthene	**119**		C3-Chrysenes	**276**
Fluorene	**148**		C4-Chrysenes	**146**
C1-Fluorenes	**102**		Benzo[b]fluoranthene	**1000**
C2-Fluorenes	**227**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**818**
C3-Fluorenes	**283**		Benzo[a]fluoranthene	**146**
Anthracene	**233**		Benzo[e]pyrene	**720**
Phenanthrene	**1340**		Benzo[a]pyrene	**954**
C1-Phenanthrenes/Anthracenes	**711**		Perylene	**264**
C2-Phenanthrenes/Anthracenes	**631**		Indeno[1,2,3-cd]pyrene	**633**
C3-Phenanthrenes/Anthracenes	**430**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**165**
C4-Phenanthrenes/Anthracenes	**228**		Benzo[g,h,i]perylene	**607**
Retene	0.171 U			
Dibenzothiophene	**107**			
C1-Dibenzothiophenes	**204**			
C2-Dibenzothiophenes	**357**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	75	40-120
Phenanthrene-d10	94	40-120
Benzo[a]pyrene-d12	93	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-05**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.01	2	1	AC

Parameter	Result
Carbazole	**189**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	75	40-120
Phenanthrene-d10	94	40-120
Benzo[a]pyrene-d12	93	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-05**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.01	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**80.0**
2/3-Methyldibenzothiophene	**69.7**
1-Methyldibenzothiophene	**32.9**
3-Methylphenanthrene	**164**
2-Methylphenanthrene	**190**
2-Methylanthracene	**48.7**
9/4-Methylphenanthrene	**178**
1-Methylphenanthrene	**122**
2-Methylnaphthalene	**122**
1-Methylnaphthalene	**98.4**
2,6-Dimethylnaphthalene	**108**
2,3,5-Trimethylnaphthalene	**50.0**
Naphthobenzothiophene-2,1-D	**168**
Naphthobenzothiophene-1,2-D	**36.9**
Naphthobenzothiophene-2,3-D	**47.0**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	75	40-120
Phenanthrene-d10	94	40-120
Benzo[a]pyrene-d12	93	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-05**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.01	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**83.0**	
C24 Tricyclic Terpane	**53.9**	
C25 Tricyclic Terpane	**61.5**	
C24 Tetracyclic Terpane	**32.6**	
C26 Tricyclic Terpane-22S	**27.6**	
C26 Tricyclic Terpane-22R	**21.7**	
C28 Tricyclic Terpane-22S	**29.0**	
C28 Tricyclic Terpane-22R	**29.3**	
C29 Tricyclic Terpane-22S	**29.0**	
C29 Tricyclic Terpane-22R	**33.1**	
18a-22,29,30-Trisnorneohopane-TS	**81.2**	
C30 Tricyclic Terpane-22S	**30.4**	
C30 Tricyclic Terpane-22R	**24.4**	
17a(H)-22,29,30-Trisnorhopane-TM	**107**	
17a/b,21b/a 28,30-Bisnorhopane	**31.0**	
17a(H),21b(H)-25-Norhopane	**20.9**	
30-Norhopane	**296**	
18a(H)-30-Norneohopane-C29Ts	**81.9**	
17a(H)-Diahopane	**24.4**	
30-Normoretane	**45.5**	
18a(H)&18b(H)-Oleananes	**29.6**	
Hopane	**451**	
Moretane	**84.3**	
30-Homohopane-22S	**161**	
30-Homohopane-22R	**139**	
T22a-Gammacerane/C32-diahopane	**55.5**	
30,31-Bishomohopane-22S	**173**	G
30,31-Bishomohopane-22R	**77.9**	

Parameter	Result	
30,31-Trishomohopane-22S	**94.3**	
30,31-Trishomohopane-22R	**48.1**	
Tetrakishomohopane-22S	**81.7**	
Tetrakishomohopane-22R	**99.2**	G
Pentakishomohopane-22S	**60.3**	
Pentakishomohopane-22R	**45.8**	
13b(H),17a(H)-20S-Diacholestane	**61.4**	
13b(H),17a(H)-20R-Diacholestane	**40.2**	
13b,17a-20S-Methyldiacholestane	**35.4**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**126**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**128**	
Unknown Sterane (S18)	**33.5**	
13a,17b-20S-Ethyldiacholestane	**2.52**	
14a,17a-20S-Methylcholestane	**56.7**	
14a,17a-20R-Methylcholestane	**52.2**	
14a(H),17a(H)-20S-Ethylcholestane	**94.9**	
14a(H),17a(H)-20R-Ethylcholestane	**80.7**	
14b(H),17b(H)-20R-Cholestane	**69.5**	
14b(H),17b(H)-20S-Cholestane	**73.3**	
14b,17b-20R-Methylcholestane	**69.1**	
14b,17b-20S-Methylcholestane	**99.5**	
14b(H),17b(H)-20R-Ethylcholestane	**139**	
14b(H),17b(H)-20S-Ethylcholestane	**106**	
C26,20R- +C27,20S- triaromatic steroid	**227**	
C28,20S-triaromatic steroid	**257**	
C27,20R-triaromatic steroid	**148**	
C28,20R-triaromatic steroid	**189**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	116	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	61412	500.000	ng/mL	0.00
74) Chrysene-d12	43.443	240	91275	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	91344	375.318	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 37.53%#			
42) Phenanthrene-d10	32.853	188	88671	469.156	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.92%#			
83) Benzo[b]fluoranthene-d12	47.354	264	89253	513.076	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.31%			
88) Benzo[a]pyrene-d12	48.561	264	79492	462.526	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.25%#			
129) 5B(H)Cholane - Surr	44.063	217	19333	579.253	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.93%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2184	40.019	ng/mL	100
4) cis-Decalin	17.879	138	100	2.501	ng/mL	100
5) C1-Decalins	18.143	152	4831M5	88.521	ng/mL	
6) C2-Decalins	19.923	166	8609M5	157.747	ng/mL	
7) C3-Decalins	22.396	180	10213M5	187.138	ng/mL	
8) C4-Decalins	25.781	194	21439M5	392.838	ng/mL	
10) Naphthalene	20.087	128	169619	609.194	ng/mL#	100
11) C1-Naphthalenes	22.779	142	170144M5	611.080	ng/mL	
12) C2-Naphthalenes	25.626	156	328482M5	1179.758	ng/mL	
13) C3-Naphthalenes	27.962	170	481324M5	1728.697	ng/mL	
14) C4-Naphthalenes	30.727	184	453086M5	1627.279	ng/mL	
16) 2-Methylnaphthalene	22.779	142	96102	579.426	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	72860	469.131	ng/mL#	100
18) Benzothiophene	20.306	134	5144	22.857	ng/mL	100
19) C1-Benzo(b)thiophenes	23.172	148	12327M5	54.773	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	31837M5	141.464	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	69661M5	309.530	ng/mL	
22) C4-Benzo(b)thiophenes	29.906	190	81443M5	361.881	ng/mL	
23) Biphenyl	24.659	154	21823	103.419	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	72793	512.822	ng/mL#	100
25) Dibenzofuran	27.753	168	97743	439.062	ng/mL	98
26) Acenaphthylene	26.375	152	45062	178.302	ng/mL#	100
27) Acenaphthene	27.105	153	85566	567.232	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	28.656	170	29179M3	238.676	ng/mL	
29) Fluorene	29.130	166	119308M3	705.173	ng/mL	
30) C1-Fluorenes	31.493	180	82616M5	488.304	ng/mL	
31) C2-Fluorenes	33.683	194	182886M5	1080.952	ng/mL	
32) C3-Fluorenes	35.518	208	228316M5	1349.467	ng/mL	
33) Dibenzothiophene	32.451	184	119014	511.543	ng/mL#	75
34) 4-Methyldibenzothiophene(	34.222	198	88787	381.622	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.541	198	77387M3	332.623	ng/mL	
36) 1-Methyldibenzothiophene(	34.988	198	36465	156.733	ng/mL#	100
37) OTP	34.605	198	5198M3	22.342	ng/mL	
38) C1-Dibenzothiophenes	34.222	198	231914M5	996.807	ng/mL	
39) C2-Dibenzothiophenes	35.910	212	396632M5	1704.794	ng/mL	
40) C3-Dibenzothiophenes	37.709	226	421712M5	1812.592	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41)	C4-Dibenzothiophenes	39.398	240	281906M5	1211.682	ng/mL	
43)	Phenanthrene	32.944	178	1431255	6391.515	ng/mL	100
44)	3-Methylphenanthrene(3MP)	34.906	192	174606	779.733	ng/mL	98
45)	2-Methylphenanthrene(2MP)	35.016	192	202970	906.397	ng/mL	97
46)	2-Methylanthracene(2MA)	35.171	192	51972M3	232.090	ng/mL	
47)	9/4-Methylphenanthrene(9M	35.363	192	190501M3	850.715	ng/mL	
48)	1-Methylphenanthrene(1MP)	35.454	192	130101	580.988	ng/mL	98
49)	C1-Phenanthrenes/Anthrace	35.016	192	759808M5	3393.053	ng/mL	
50)	C2-Phenanthrenes/Anthrace	37.170	206	673467M5	3007.482	ng/mL	
52)	C3-Phenanthrenes/Anthrace	39.005	220	459330M5	2051.217	ng/mL	
53)	C4-Phenanthrenes/Anthrace	41.187	234	243079M5	1085.511	ng/mL	
55)	Anthracene	33.126	178	232271M3	1113.368	ng/mL	
56)	Carbazole	33.793	167	196625M3	903.268	ng/mL	
57)	1-Methylphenanthrene	35.454	192	129654M3	816.791	ng/mL	
58)	Fluoranthene	37.727	202	2157368	9352.978	ng/mL	100
59)	Benzo(b)fluorene	40.238	216	104367M3	782.181	ng/mL	
60)	Pyrene	38.613	202	1845099	7908.398	ng/mL	94
61)	C1-Fluoranthenes/Pyrenes	39.991	216	902654M5	3868.924	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.036	230	661822M5	2836.678	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.926	244	353475M5	1515.052	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.205	258	318084M5	1363.360	ng/mL	
66)	Naphthobenzothiophene	42.456	234	174199M3	804.318	ng/ml	
67)	Naphthobenzothiophene-2,1	42.456	234	173996M3	803.381	ng/mL	
68)	Naphthobenzothiophene-1,2	42.794	234	38147	176.134	ng/mL#	10
69)	Naphthobenzothiophene-2,3	43.086	234	48532M3	224.084	ng/mL	
70)	C1-Naphthobenzothiophenes	43.853	248	211561M5	976.827	ng/ml	
71)	C2-Naphthobenzothiophenes	45.854	262	260860M5	1204.453	ng/ml	
72)	C3-Naphthobenzothiophenes	47.464	276	201302M5	929.459	ng/ml	
73)	C4-Naphthobenzothiophenes	48.561	290	132712M5	612.763	ng/mL	
75)	Benz[a]anthracene	43.388	228	781393	3905.091	ng/mL	97
77)	Chrysene/Triphenylene	43.543	228	953686	4708.539	ng/mL	99
78)	C1-Chrysenes	45.013	242	428355M5	2114.875	ng/mL	
79)	C2-Chrysenes	46.723	256	336283M5	1660.297	ng/mL	
80)	BBF-D12 Surr BKGD	47.354	256	4099	20.238	ng/mL	100
81)	C3-Chrysenes	47.775	270	266603M5	1316.273	ng/mL	
82)	C4-Chrysenes	49.339	284	140905M5	695.676	ng/mL	
84)	Benzo[b]fluoranthene	47.445	252	1025553	4772.214	ng/mL	99
85)	Benzo[j]+[k]fluoranthene	47.519	252	914583	3900.481	ng/mL	97
86)	Benzo[a]fluoranthene	47.830	252	163418	696.939	ng/mL#	1
87)	Benzo[e]pyrene	48.470	252	760086	3432.674	ng/mL	97
89)	Benzo[a]pyrene	48.662	252	931671	4548.604	ng/mL	97
90)	Perylene	48.973	252	281179	1256.762	ng/mL	95
91)	Indeno[1,2,3-cd]pyrene	53.591	276	656666M3	3018.055	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.637	278	167681M6	786.221	ng/mL	
93)	Benzo[g,h,i]perylene	54.934	276	715222	2896.588	ng/mL	99
94)	Hopane (T19)	52.668	191	147396	2150.234	ng/mL#	89
96)	C23 Tricyclic Terpane (T4	41.087	191	27143	395.966	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.808	191	17628	257.160	ng/ml	100
98)	C25 Tricyclic Terpane (T6	43.296	191	20092M3	293.105	ng/ml	
99)	C24 Tetracyclic Terpane (	44.620	191	10664	155.568	ng/ml	100
100)	C26 Tricyclic Terpane-22S	44.347	191	9017M3	131.541	ng/ml	
101)	C26 Tricyclic Terpane-22R	44.447	191	7097M3	103.532	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.732	191	9493M3	138.485	ng/ml	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.897	191	9588	139.871	ng/ml	100
104) C29 Tricyclic Terpane-22S	47.418	191	9480	138.296	ng/ml	100
105) C29 Tricyclic Terpane-22R	47.619	191	10829M4	157.975	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.781	191	26565	387.534	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.872	191	9949M3	145.137	ng/mL	
108) C30 Tricyclic Terpane-22R	49.119	191	7978M3	116.384	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	49.348	191	35079	511.738	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	50.564	191	10122	147.661	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	50.336	191	6845M3	99.856	ng/ml	
112) 30-Norhopane (T15)	51.250	191	96910	1413.737	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	51.360	191	26782M3	390.700	ng/ml	
114) 17a(H)-Diahopane (X)	51.488	191	7979M3	116.399	ng/ml	
115) 30-Normoretane (T17)	52.055	191	14875	216.999	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	52.476	191	9672	141.097	ng/ml	100
117) Moretane (T20)	53.372	191	27546	401.845	ng/ml	100
118) 30-Homohopane-22S (T21)	54.505	191	52633	767.818	ng/ml	100
119) 30-Homohopane-22R (T22)	54.743	191	45303	660.887	ng/ml	100
120) Gammacerane/C32-diahopane	55.309	191	18141	264.644	ng/mL	100
121) 30,31-Bishomohopane-22S (	56.104	191G	56664	826.623	ng/ml	100
122) 30,31-Bishomohopane-22R (	56.515	191	25479	371.691	ng/ml	100
123) 30,31-Trishomohopane-22S	58.325	191	30840	449.898	ng/ml	100
124) 30,31-Trishomohopane-22R	58.955	191	15740	229.617	ng/ml	100
125) Tetrakishomohopane-22S (T	61.066	191	26724	389.854	ng/ml	100
126) Tetrakishomohopane-22R (T	61.907	191G	32427	473.050	ng/ml	100
127) Pentakishomohopane-22S (T	64.310	191	19706	287.474	ng/ml	100
128) Pentakishomohopane-22R (T	65.626	191	14980	218.530	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	45.561	217	9770	292.727	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.982	217	6400	191.756	ng/ml	100
132) 13b,17a-20S-Methyldiachol	46.686	217	5643M3	169.075	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	47.564	217	20063	601.125	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	48.095	217	20416M3	611.701	ng/ml	
135) Unknown Sterane (S18)	48.387	217	5331	159.727	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	48.644	217	401	12.015	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.808	217	9021	270.286	ng/ml	100
138) 14a,17a-20R-Methylcholest	49.549	217	8306M3	248.863	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.906	217	15105M3	452.574	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.839	217	12850M3	385.010	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	47.656	218	11061M3	331.408	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.747	218	11662M3	349.415	ng/ml	
143) 14b,17b-20R-Methylcholest	48.991	218	10993	329.371	ng/ml	100
144) 14b,17b-20S-Methylcholest	49.073	218	15834M3	474.416	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	50.162	218	22163	664.045	ng/ml	100
146) 14b(H),17b(H)-20S-Ethylch	50.198	218	16824M3	504.078	ng/ml	
147) C26,20R- +C27,20S- triaro	49.860	231	36172	1083.780	ng/mL	100
148) C28,20S-triaromatic stero	50.738	231	40915	1225.889	ng/mL	100
149) C27,20R-triaromatic stero	51.204	231	23580	706.501	ng/mL	100
150) C28,20R-triaromatic stero	52.448	231	30154	903.470	ng/mL	100

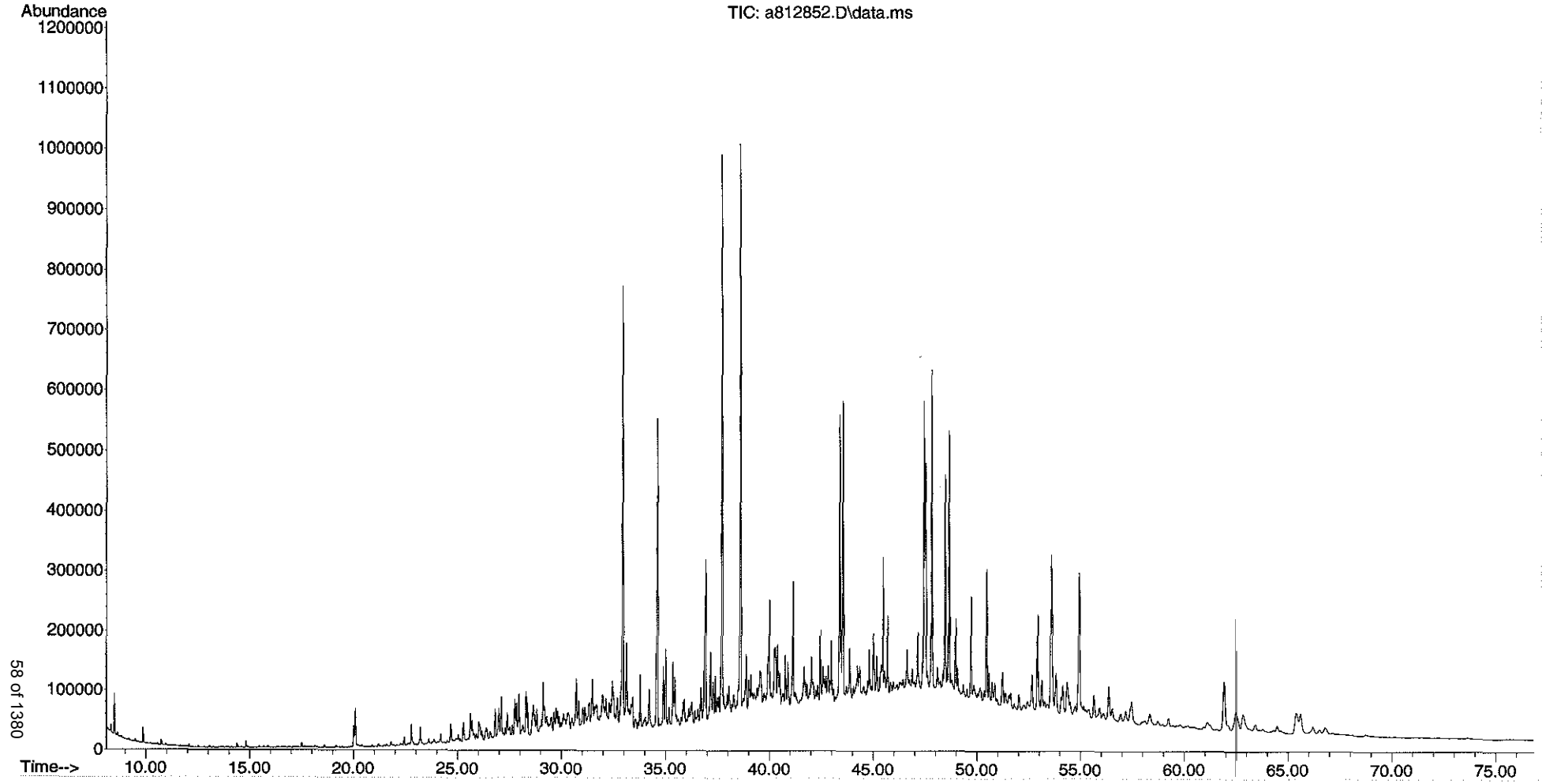
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-06**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.02	2	1	AC

Parameter	Result	
cis/trans-Decalin	**9.47**	
C1-Decalins	**18.5**	
C2-Decalins	**33.0**	
C3-Decalins	**39.2**	
C4-Decalins	**89.2**	
Benzothiophene	**3.69**	
C1-Benzo(b)thiophenes	**11.6**	
C2-Benzo(b)thiophenes	**29.8**	
C3-Benzo(b)thiophenes	**66.9**	
C4-Benzo(b)thiophenes	**78.5**	
Naphthalene	**103**	
C1-Naphthalenes	**135**	
C2-Naphthalenes	**255**	
C3-Naphthalenes	**372**	
C4-Naphthalenes	**347**	
Biphenyl	**19.9**	
Dibenzofuran	**69.6**	
Acenaphthylene	**25.9**	
Acenaphthene	**76.7**	
Fluorene	**117**	
C1-Fluorenes	**97.2**	
C2-Fluorenes	**219**	
C3-Fluorenes	**271**	
Anthracene	**182**	
Phenanthrene	**945**	
C1-Phenanthrenes/Anthracenes	**594**	
C2-Phenanthrenes/Anthracenes	**632**	
C3-Phenanthrenes/Anthracenes	**446**	
C4-Phenanthrenes/Anthracenes	**242**	
Retene	0.171	U
Dibenzothiophene	**91.2**	
C1-Dibenzothiophenes	**201**	
C2-Dibenzothiophenes	**369**	

Parameter	Result
C3-Dibenzothiophenes	**418**
C4-Dibenzothiophenes	**279**
Benzo(b)fluorene	**159**
Fluoranthene	**1610**
Pyrene	**1350**
C1-Fluoranthenes/Pyrenes	**712**
C2-Fluoranthenes/Pyrenes	**479**
C3-Fluoranthenes/Pyrenes	**291**
C4-Fluoranthenes/Pyrenes	**258**
Naphthobenzothiophenes	**212**
C1-Naphthobenzothiophenes	**196**
C2-Naphthobenzothiophenes	**245**
C3-Naphthobenzothiophenes	**191**
C4-Naphthobenzothiophenes	**120**
Benz[a]anthracene	**582**
Chrysene/Triphenylene	**730**
C1-Chrysenes	**350**
C2-Chrysenes	**269**
C3-Chrysenes	**222**
C4-Chrysenes	**124**
Benzo[b]fluoranthene	**659**
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**566**
Benzo[a]fluoranthene	**94.8**
Benzo[e]pyrene	**486**
Benzo[a]pyrene	**613**
Perylene	**181**
Indeno[1,2,3-cd]pyrene	**436**
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**111**
Benzo[g,h,i]perylene	**422**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	77	40-120
Phenanthrene-d10	97	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-06**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.02	2	1	AC

Parameter	Result
Carbazole	**109**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	77	40-120
Phenanthrene-d10	97	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-06**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.02	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**80.1**
2/3-Methyldibenzothiophene	**70.4**
1-Methyldibenzothiophene	**32.2**
3-Methylphenanthrene	**132**
2-Methylphenanthrene	**155**
2-Methylanthracene	**40.5**
9/4-Methylphenanthrene	**152**
1-Methylphenanthrene	**104**
2-Methylnaphthalene	**128**
1-Methylnaphthalene	**103**
2,6-Dimethylnaphthalene	**109**
2,3,5-Trimethylnaphthalene	**53.8**
Naphthobenzothiophene-2,1-D	**143**
Naphthobenzothiophene-1,2-D	**31.3**
Naphthobenzothiophene-2,3-D	**37.7**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	77	40-120
Phenanthrene-d10	97	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-06**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.02	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**80.9**	
C24 Tricyclic Terpane	**53.2**	
C25 Tricyclic Terpane	**66.2**	
C24 Tetracyclic Terpane	**30.1**	
C26 Tricyclic Terpane-22S	**26.3**	
C26 Tricyclic Terpane-22R	**21.2**	
C28 Tricyclic Terpane-22S	**28.0**	
C28 Tricyclic Terpane-22R	**25.4**	
C29 Tricyclic Terpane-22S	**28.0**	
C29 Tricyclic Terpane-22R	**29.2**	
18a-22,29,30-Trisnorneohopane-TS	**69.2**	
C30 Tricyclic Terpane-22S	**27.4**	
C30 Tricyclic Terpane-22R	**21.7**	
17a(H)-22,29,30-Trisnorhopane-TM	**93.7**	
17a/b,21b/a 28,30-Bisnorhopane	**29.3**	
17a(H),21b(H)-25-Norhopane	**16.3**	
30-Norhopane	**266**	
18a(H)-30-Norneohopane-C29Ts	**71.9**	
17a(H)-Diahopane	**22.4**	
30-Normoretane	**40.9**	
18a(H)&18b(H)-Oleananes	**26.0**	
Hopane	**396**	
Moretane	**71.4**	
30-Homohopane-22S	**143**	
30-Homohopane-22R	**124**	
T22a-Gammacerane/C32-diahopane	**50.0**	
30,31-Bishomohopane-22S	**155**	G
30,31-Bishomohopane-22R	**66.3**	

Parameter	Result	
30,31-Trishomohopane-22S	**84.5**	
30,31-Trishomohopane-22R	**45.8**	
Tetrakishomohopane-22S	**72.7**	
Tetrakishomohopane-22R	**97.5**	G
Pentakishomohopane-22S	**49.4**	
Pentakishomohopane-22R	**39.2**	
13b(H),17a(H)-20S-Diacholestane	**59.9**	
13b(H),17a(H)-20R-Diacholestane	**28.1**	
13b,17a-20S-Methyldiacholestane	**36.2**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**114**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**117**	
Unknown Sterane (S18)	**29.5**	
13a,17b-20S-Ethyldiacholestane	**3.43**	
14a,17a-20S-Methylcholestane	**54.2**	
14a,17a-20R-Methylcholestane	**43.7**	
14a(H),17a(H)-20S-Ethylcholestane	**86.6**	
14a(H),17a(H)-20R-Ethylcholestane	**76.4**	
14b(H),17b(H)-20R-Cholestane	**60.8**	
14b(H),17b(H)-20S-Cholestane	**65.3**	
14b,17b-20R-Methylcholestane	**59.4**	
14b,17b-20S-Methylcholestane	**92.4**	
14b(H),17b(H)-20R-Ethylcholestane	**132**	
14b(H),17b(H)-20S-Ethylcholestane	**82.3**	
C26,20R- +C27,20S- triaromatic steroid	**208**	
C28,20S-triaromatic steroid	**248**	
C27,20R-triaromatic steroid	**140**	
C28,20R-triaromatic steroid	**174**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	114	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	59013	500.000	ng/mL	0.00
74) Chrysene-d12	43.452	240	95617	500.000	ng/mL	0.04
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	89944	384.589	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 38.46%#			
42) Phenanthrene-d10	32.862	188	88019	484.638	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.46%#			
83) Benzo[b]fluoranthene-d12	47.363	264	84666	464.606	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.46%#			
88) Benzo[a]pyrene-d12	48.570	264	75021	416.689	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.67%#			
129) 5B(H)Cholane - Surr	44.063	217	19995	571.883	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.19%			
Target Compounds						Qvalue
3) trans-Decalin	16.665	138	2213	42.198	ng/mL	100
4) cis-Decalin	17.888	138	116M3	3.019	ng/mL	
5) C1-Decalins	18.143	152	4624M5	88.172	ng/mL	
6) C2-Decalins	19.923	166	8261M5	157.524	ng/mL	
7) C3-Decalins	22.405	180	9824M5	187.328	ng/mL	
8) C4-Decalins	25.791	194	22337M5	425.931	ng/mL	
10) Naphthalene	20.087	128	131796	492.594	ng/mL#	100
11) C1-Naphthalenes	22.779	142	172079M5	643.154	ng/mL	
12) C2-Naphthalenes	25.626	156	325325M5	1215.918	ng/mL	
13) C3-Naphthalenes	28.309	170	475535M5	1777.335	ng/mL	
14) C4-Naphthalenes	30.727	184	442646M5	1654.411	ng/mL	
16) 2-Methylnaphthalene	22.779	142	97033	608.822	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	73090	489.743	ng/mL#	100
18) Benzothiophene	20.306	134	3807M3	17.604	ng/mL	
19) C1-Benzo(b)thiophenes	23.172	148	11930M5	55.164	ng/mL	
20) C2-Benzo(b)thiophenes	25.343	162	30789M5	142.368	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	69096M5	319.500	ng/mL	
22) C4-Benzo(b)thiophenes	29.906	190	81019M5	374.632	ng/mL	
23) Biphenyl	24.668	154	19219	94.781	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.289	156	70815	519.168	ng/mL#	100
25) Dibenzofuran	27.752	168	71092	332.328	ng/mL	98
26) Acenaphthylene	26.384	152	29978	123.439	ng/mL#	100
27) Acenaphthene	27.114	153	53055	366.008	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	28.665	170	30152M3	256.661	ng/mL	
29) Fluorene	29.130	166	90655M3	557.601	ng/mL	
30) C1-Fluorenes	31.493	180	75408M5	463.820	ng/mL	
31) C2-Fluorenes	33.692	194	170265M5	1047.266	ng/mL	
32) C3-Fluorenes	35.518	208	210438M5	1294.362	ng/mL	
33) Dibenzothiophene	32.451	184	97297	435.200	ng/mL#	71
34) 4-Methyldibenzothiophene(	34.231	198	85448	382.201	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.541	198	75130M3	336.049	ng/mL	
36) 1-Methyldibenzothiophene(	34.997	198	34355	153.667	ng/mL#	100
37) OTP	34.605	198	6300M3	28.179	ng/mL	
38) C1-Dibenzothiophenes	34.231	198	220702M5	987.179	ng/mL	
39) C2-Dibenzothiophenes	35.910	212	393967M5	1762.177	ng/mL	
40) C3-Dibenzothiophenes	37.718	226	446236M5	1995.972	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41)	C4-Dibenzothiophenes	39.398	240	297796M5	1332.013	ng/mL	
43)	Phenanthrene	32.953	178	970874	4511.856	ng/mL	100
44)	3-Methylphenanthrene(3MP)	34.906	192	135121	627.936	ng/mL	99
45)	2-Methylphenanthrene(2MP)	35.025	192	159004	738.925	ng/mL	96
46)	2-Methylanthracene(2MA)	35.180	192	41629M3	193.459	ng/mL	
47)	9/4-Methylphenanthrene(9M	35.363	192	155676	723.459	ng/mL	86
48)	1-Methylphenanthrene(1MP)	35.454	192	106881M3	496.698	ng/mL	
49)	C1-Phenanthrenes/Anthrace	35.025	192	609937M5	2834.506	ng/mL	
50)	C2-Phenanthrenes/Anthrace	37.179	206	648533M5	3013.869	ng/mL	
52)	C3-Phenanthrenes/Anthrace	39.014	220	458067M5	2128.734	ng/mL	
53)	C4-Phenanthrenes/Anthrace	41.187	234	248698M5	1155.752	ng/mL	
55)	Anthracene	33.126	178	173659M3	866.257	ng/mL	
56)	Carbazole	33.792	167	109214	522.110	ng/mL	98
57)	1-Methylphenanthrene	35.454	192	107424M3	704.259	ng/mL	
58)	Fluoranthene	37.727	202	1701619	7677.035	ng/mL	99
59)	Benzo(b)fluorene	40.238	216	97118M3	757.442	ng/mL	
60)	Pyrene	38.613	202	1446146	6450.398	ng/mL	95
61)	C1-Fluoranthenes/Pyrenes	40.000	216	761545M5	3396.800	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.046	230	512338M5	2285.235	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.926	244	311328M5	1388.649	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.214	258	275703M5	1229.747	ng/mL	
66)	Naphthobenzothiophene	42.456	234	140821M3	676.636	ng/ml	
67)	Naphthobenzothiophene-2,1	42.456	234	141707M3	680.893	ng/mL	
68)	Naphthobenzothiophene-1,2	42.794	234	31063M3	149.256	ng/mL	
69)	Naphthobenzothiophene-2,3	43.095	234	37487M3	180.123	ng/mL	
70)	C1-Naphthobenzothiophenes	43.853	248	194966M5	936.799	ng/ml	
71)	C2-Naphthobenzothiophenes	45.863	262	243371M5	1169.382	ng/ml	
72)	C3-Naphthobenzothiophenes	47.473	276	189424M5	910.171	ng/ml	
73)	C4-Naphthobenzothiophenes	48.561	290	118906M5	571.336	ng/mL	
75)	Benz[a]anthracene	43.388	228	582167	2777.320	ng/mL	98
77)	Chrysene/Triphenylene	43.552	228	739462	3485.085	ng/mL	99
78)	C1-Chrysenes	45.022	242	354082M5	1668.789	ng/mL	
79)	C2-Chrysenes	46.723	256	276309M5	1302.245	ng/mL	
80)	BBF-D12 Surr BKGD	47.354	256	3785	17.839	ng/mL	100
81)	C3-Chrysenes	47.784	270	224423M5	1057.706	ng/mL	
82)	C4-Chrysenes	49.860	284	125419M5	591.100	ng/mL	
84)	Benzo[b]fluoranthene	47.454	252	707669	3143.465	ng/mL	99
85)	Benzo[j]+[k]fluoranthene	47.518	252	663886	2702.747	ng/mL	96
86)	Benzo[a]fluoranthene	47.839	252	111086	452.242	ng/mL#	1
87)	Benzo[e]pyrene	48.470	252	538631	2322.084	ng/mL	96
89)	Benzo[a]pyrene	48.662	252	627456	2924.257	ng/mL	94
90)	Perylene	48.982	252	202628	864.542	ng/mL	95
91)	Indeno[1,2,3-cd]pyrene	53.600	276	473828M3	2078.835	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.646	278	118358M6	529.755	ng/mL	
93)	Benzo[g,h,i]perylene	54.944	276	520763	2013.273	ng/mL	100
94)	Hopane (T19)	52.677	191	135884	1892.279	ng/mL#	88
96)	C23 Tricyclic Terpane (T4	41.087	191	27730	386.159	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.808	191	18248	254.116	ng/ml	100
98)	C25 Tricyclic Terpane (T6	43.296	191	22689M3	315.960	ng/ml	
99)	C24 Tetracyclic Terpane (	44.620	191	10311M3	143.588	ng/ml	
100)	C26 Tricyclic Terpane-22S	44.356	191	9012M3	125.498	ng/ml	
101)	C26 Tricyclic Terpane-22R	44.447	191	7265M3	101.170	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.732	191	9606	133.770	ng/ml	100

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.897	191	8694	121.070	ng/ml	100
104)	C29 Tricyclic Terpane-22S	47.427	191	9603	133.728	ng/ml	100
105)	C29 Tricyclic Terpane-22R	47.628	191	9997M3	139.215	ng/ml	
106)	18a-22,29,30-Trisnorneoho	48.790	191	23728	330.429	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.872	191	9406M3	130.985	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.119	191	7441M3	103.621	ng/mL	
109)	17a(H)-22,29,30-Trisnorho	49.348	191	32127M3	447.391	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	50.573	191	10052	139.981	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	50.354	191	5588M3	77.817	ng/ml	
112)	30-Norhopane (T15)	51.259	191	91294	1271.332	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	51.369	191	24645M3	343.199	ng/ml	
114)	17a(H)-Diahopane (X)	51.497	191	7688M3	107.061	ng/ml	
115)	30-Normoretane (T17)	52.064	191	14021	195.252	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	52.485	191	8901	123.953	ng/ml	100
117)	Moretane (T20)	53.381	191	24485M3	340.971	ng/ml	
118)	30-Homohopane-22S (T21)	54.514	191	49018	682.610	ng/ml	100
119)	30-Homohopane-22R (T22)	54.752	191	42513	592.023	ng/ml	100
120)	Gammacerane/C32-diahopane	55.318	191	17140	238.686	ng/mL	100
121)	30,31-Bishomohopane-22S (	56.104	191G	53216	741.070	ng/ml	100
122)	30,31-Bishomohopane-22R (	56.524	191	22715	316.322	ng/ml	100
123)	30,31-Trishomohopane-22S	58.334	191	28945	403.079	ng/ml	100
124)	30,31-Trishomohopane-22R	58.973	191	15686	218.438	ng/ml	100
125)	Tetrakishomohopane-22S (T	61.075	191	24904	346.805	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.925	191G	33418	465.369	ng/ml	100
127)	Pentakishomohopane-22S (T	64.328	191	16922	235.651	ng/ml	100
128)	Pentakishomohopane-22R (T	65.653	191	13420	186.883	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	45.570	217	9991	285.755	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.991	217	4694M3	134.254	ng/ml	
132)	13b,17a-20S-Methyldiachol	46.686	217	6045M3	172.895	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.564	217	19112	546.628	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	48.104	217	19552	559.212	ng/ml	100
135)	Unknown Sterane (S18)	48.387	217	4924	140.833	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.653	217	573	16.389	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.817	217	9051	258.870	ng/ml	100
138)	14a,17a-20R-Methylcholest	49.549	217	7296M3	208.675	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.915	217	14450M3	413.289	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.848	217	12744M3	364.495	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	47.665	218	10145M3	290.160	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.747	218	10898M3	311.697	ng/ml	
143)	14b,17b-20R-Methylcholest	48.991	218	9916	283.610	ng/ml	100
144)	14b,17b-20S-Methylcholest	49.073	218	15421	441.060	ng/ml	100
145)	14b(H),17b(H)-20R-Ethylch	50.162	218	21973M3	628.456	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	50.198	218	13727M3	392.610	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.860	231	34685	992.035	ng/mL	100
148)	C28,20S-triaromatic stero	50.747	231	41293	1181.033	ng/mL	100
149)	C27,20R-triaromatic stero	51.214	231	23375M3	668.555	ng/mL	
150)	C28,20R-triaromatic stero	52.448	231	29065M3	831.296	ng/mL	

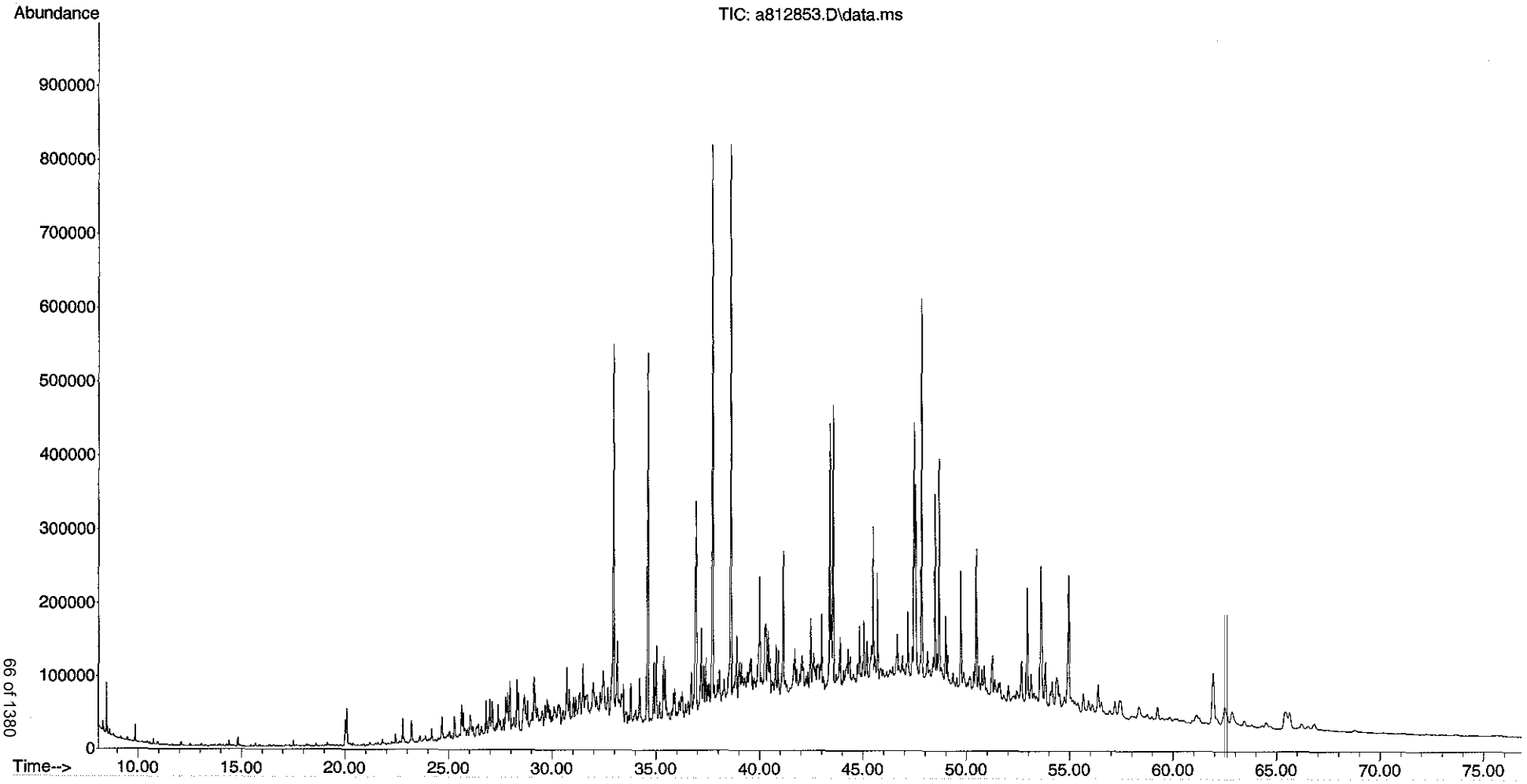
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-07**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result	Parameter	Result
cis/trans-Decalin	**9.46**	C3-Dibenzothiophenes	**401**
C1-Decalins	**19.1**	C4-Dibenzothiophenes	**265**
C2-Decalins	**33.0**	Benzo(b)fluorene	**133**
C3-Decalins	**42.2**	Fluoranthene	**1500**
C4-Decalins	**87.1**	Pyrene	**1260**
Benzothiophene	**4.32**	C1-Fluoranthenes/Pyrenes	**646**
C1-Benzo(b)thiophenes	**12.1**	C2-Fluoranthenes/Pyrenes	**470**
C2-Benzo(b)thiophenes	**29.9**	C3-Fluoranthenes/Pyrenes	**308**
C3-Benzo(b)thiophenes	**64.8**	C4-Fluoranthenes/Pyrenes	**269**
C4-Benzo(b)thiophenes	**75.4**	Naphthobenzothiophenes	**200**
Naphthalene	**84.6**	C1-Naphthobenzothiophenes	**198**
C1-Naphthalenes	**114**	C2-Naphthobenzothiophenes	**253**
C2-Naphthalenes	**239**	C3-Naphthobenzothiophenes	**197**
C3-Naphthalenes	**357**	C4-Naphthobenzothiophenes	**134**
C4-Naphthalenes	**337**	Benz[a]anthracene	**534**
Biphenyl	**18.0**	Chrysene/Triphenylene	**704**
Dibenzofuran	**63.6**	C1-Chrysenes	**339**
Acenaphthylene	**29.5**	C2-Chrysenes	**269**
Acenaphthene	**78.3**	C3-Chrysenes	**227**
Fluorene	**98.1**	C4-Chrysenes	**125**
C1-Fluorenes	**92.4**	Benzo[b]fluoranthene	**654**
C2-Fluorenes	**225**	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**510**
C3-Fluorenes	**287**	Benzo[a]fluoranthene	**84.7**
Anthracene	**156**	Benzo[e]pyrene	**466**
Phenanthrene	**985**	Benzo[a]pyrene	**570**
C1-Phenanthrenes/Anthracenes	**610**	Perylene	**166**
C2-Phenanthrenes/Anthracenes	**604**	Indeno[1,2,3-cd]pyrene	**416**
C3-Phenanthrenes/Anthracenes	**431**	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**102**
C4-Phenanthrenes/Anthracenes	**229**	Benzo[g,h,i]perylene	**388**
Retene	0.171 U		
Dibenzothiophene	**89.5**		
C1-Dibenzothiophenes	**206**		
C2-Dibenzothiophenes	**372**		

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	80	40-120
Phenanthrene-d10	98	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-07**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result
Carbazole	**114**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	80	40-120
Phenanthrene-d10	98	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-07**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**81.6**
2/3-Methyldibenzothiophene	**69.1**
1-Methyldibenzothiophene	**32.9**
3-Methylphenanthrene	**139**
2-Methylphenanthrene	**160**
2-Methylanthracene	**36.6**
9/4-Methylphenanthrene	**159**
1-Methylphenanthrene	**106**
2-Methylnaphthalene	**110**
1-Methylnaphthalene	**85.0**
2,6-Dimethylnaphthalene	**106**
2,3,5-Trimethylnaphthalene	**59.5**
Naphthobenzothiophene-2,1-D	**131**
Naphthobenzothiophene-1,2-D	**30.1**
Naphthobenzothiophene-2,3-D	**38.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	80	40-120
Phenanthrene-d10	98	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-07**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/20/12	63.6	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	79.1	
C24 Tricyclic Terpane	51.0	
C25 Tricyclic Terpane	67.2	
C24 Tetracyclic Terpane	31.0	
C26 Tricyclic Terpane-22S	27.3	
C26 Tricyclic Terpane-22R	22.3	
C28 Tricyclic Terpane-22S	24.6	
C28 Tricyclic Terpane-22R	26.6	
C29 Tricyclic Terpane-22S	26.5	
C29 Tricyclic Terpane-22R	28.7	
18a-22,29,30-Trisnorneohopane-TS	73.5	
C30 Tricyclic Terpane-22S	27.8	
C30 Tricyclic Terpane-22R	21.3	
17a(H)-22,29,30-Trisnorhopane-TM	93.3	
17a/b,21b/a 28,30-Bisnorhopane	27.2	
17a(H),21b(H)-25-Norhopane	14.2	
30-Norhopane	264	
18a(H)-30-Norneohopane-C29Ts	74.4	
17a(H)-Diahopane	22.5	
30-Normoretane	40.8	
18a(H)&18b(H)-Oleananes	27.3	
Hopane	407	
Moretane	76.7	
30-Homohopane-22S	141	
30-Homohopane-22R	122	
T22a-Gammacerane/C32-diahopane	47.1	
30,31-Bishomohopane-22S	155	G
30,31-Bishomohopane-22R	69.8	

Parameter	Result	
30,31-Trishomohopane-22S	80.3	
30,31-Trishomohopane-22R	44.3	
Tetrakishomohopane-22S	70.7	
Tetrakishomohopane-22R	86.4	G
Pentakishomohopane-22S	49.5	
Pentakishomohopane-22R	39.9	
13b(H),17a(H)-20S-Diacholestane	62.4	
13b(H),17a(H)-20R-Diacholestane	29.3	
13b,17a-20S-Methyldiacholestane	33.4	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	119	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	124	
Unknown Sterane (S18)	30.0	
13a,17b-20S-Ethyldiacholestane	2.91	
14a,17a-20S-Methylcholestane	54.3	
14a,17a-20R-Methylcholestane	45.7	
14a(H),17a(H)-20S-Ethylcholestane	85.7	
14a(H),17a(H)-20R-Ethylcholestane	74.4	
14b(H),17b(H)-20R-Cholestane	62.4	
14b(H),17b(H)-20S-Cholestane	60.4	
14b,17b-20R-Methylcholestane	62.6	
14b,17b-20S-Methylcholestane	91.3	
14b(H),17b(H)-20R-Ethylcholestane	126	
14b(H),17b(H)-20S-Ethylcholestane	96.6	
C26,20R- +C27,20S- triaromatic steroid	215	
C28,20S-triaromatic steroid	245	
C27,20R-triaromatic steroid	140	
C28,20R-triaromatic steroid	183	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	114	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812854.D
Acq On : 20 Nov 2012 7:25 am
Operator : AC
Sample : 1210082-07
Misc : 1x
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 20 15:16:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	62156	500.000	ng/mL	0.00
74) Chrysene-d12	43.451	240	102645	500.000	ng/mL	0.04
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	98330	399.186	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.92%#			
42) Phenanthrene-d10	32.861	188	93430	488.419	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.84%#			
83) Benzo[b]fluoranthene-d12	47.363	264	89285	456.406	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.64%#			
88) Benzo[a]pyrene-d12	48.579	264	80449	416.244	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.62%#			
129) 5B(H)Cholane - Surr	44.063	217	21476	572.185	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.22%			
Target Compounds						Qvalue
3) trans-Decalin	16.665	138	2331	42.201	ng/mL	100
4) cis-Decalin	17.878	138	116M3	2.867	ng/mL	
5) C1-Decalins	18.143	152	5029M5	91.046	ng/mL	
6) C2-Decalins	19.923	166	8694M5	157.398	ng/mL	
7) C3-Decalins	22.396	180	11112M5	201.174	ng/mL	
8) C4-Decalins	25.790	194	22938M5	415.274	ng/mL	
10) Naphthalene	20.087	128	113612	403.158	ng/mL#	100
11) C1-Naphthalenes	22.788	142	153035M5	543.053	ng/mL	
12) C2-Naphthalenes	25.626	156	320858M5	1138.582	ng/mL	
13) C3-Naphthalenes	28.309	170	479323M5	1700.904	ng/mL	
14) C4-Naphthalenes	30.736	184	452338M5	1605.146	ng/mL	
16) 2-Methylnaphthalene	22.788	142	87703	522.457	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	63713	405.325	ng/mL#	100
18) Benzothiophene	20.306	134	4689	20.586	ng/mL	100
19) C1-Benzo(b)thiophenes	23.180	148	13169M5	57.814	ng/mL	
20) C2-Benzo(b)thiophenes	25.827	162	32414M5	142.303	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	70293M5	308.599	ng/mL	
22) C4-Benzo(b)thiophenes	29.906	190	81859M5	359.376	ng/mL	
23) Biphenyl	24.668	154	18342	85.882	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.288	156	72317	503.370	ng/mL#	100
25) Dibenzofuran	27.752	168	68329	303.261	ng/mL	98
26) Acenaphthylene	26.384	152	35986	140.685	ng/mL#	100
27) Acenaphthene	27.114	153	57009	373.399	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	28.665	170	35102M3	283.687	ng/mL	
29) Fluorene	29.130	166	80061M3	467.538	ng/mL	
30) C1-Fluorenes	31.493	180	75433M5	440.512	ng/mL	
31) C2-Fluorenes	33.692	194	183679M5	1072.644	ng/mL	
32) C3-Fluorenes	35.527	208	234035M5	1366.712	ng/mL	
33) Dibenzothiophene	32.460	184	100404	426.388	ng/mL#	74
34) 4-Methyldibenzothiophene(	34.230	198	91593	388.971	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.550	198	77603M3	329.559	ng/mL	
36) 1-Methyldibenzothiophene(	34.997	198	36928	156.823	ng/mL#	100
37) OTP	34.614	198	4996M3	21.217	ng/mL	
38) C1-Dibenzothiophenes	34.230	198	236036M5	1002.381	ng/mL	
39) C2-Dibenzothiophenes	35.919	212	417270M5	1772.032	ng/mL	
40) C3-Dibenzothiophenes	37.718	226	450605M5	1913.597	ng/mL	

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	39.407	240	297280M5	1262.467	ng/mL	
43) Phenanthrene	32.953	178	1063687	4693.219	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.906	192	150353	663.390	ng/mL	99
45) 2-Methylphenanthrene(2MP)	35.025	192	172781	762.347	ng/mL	96
46) 2-Methylanthracene(2MA)	35.180	192	39498	174.274	ng/mL#	42
47) 9/4-Methylphenanthrene(9M	35.362	192	171583	757.062	ng/mL	87
48) 1-Methylphenanthrene(1MP)	35.454	192	114746M3	506.284	ng/mL	
49) C1-Phenanthrenes/Anthrace	35.025	192	659480M5	2909.770	ng/mL	
50) C2-Phenanthrenes/Anthrace	37.179	206	651966M5	2876.616	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.014	220	465146M5	2052.326	ng/mL	
53) C4-Phenanthrenes/Anthrace	41.196	234	247513M5	1092.081	ng/mL	
55) Anthracene	33.135	178	157227M3	744.631	ng/mL	
56) Carbazole	33.801	167	119932	544.356	ng/mL	99
57) 1-Methylphenanthrene	35.454	192	113276M3	705.072	ng/mL	
58) Fluoranthene	37.736	202	1666563	7138.675	ng/mL	99
59) Benzo(b)fluorene	40.247	216	85607M3	633.904	ng/mL	
60) Pyrene	38.612	202	1419770	6012.527	ng/mL	95
61) C1-Fluoranthenes/Pyrenes	40.000	216	727521M5	3080.949	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.045	230	528945M5	2240.008	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.935	244	346838M5	1468.810	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.214	258	302951M5	1282.955	ng/mL	
66) Naphthobenzothiophene	42.456	234	137261M3	626.181	ng/ml	
67) Naphthobenzothiophene-2,1	42.456	234	137146M3	625.656	ng/mL	
68) Naphthobenzothiophene-1,2	42.803	234	31479M3	143.606	ng/mL	
69) Naphthobenzothiophene-2,3	43.095	234	40100M3	182.935	ng/mL	
70) C1-Naphthobenzothiophenes	43.862	248	206299M5	941.130	ng/ml	
71) C2-Naphthobenzothiophenes	45.863	262	264039M5	1204.538	ng/ml	
72) C3-Naphthobenzothiophenes	47.473	276	205663M5	938.228	ng/ml	
73) C4-Naphthobenzothiophenes	48.570	290	139873M5	638.096	ng/mL	
75) Benz[a]anthracene	43.397	228	573274	2547.639	ng/mL	98
77) Chrysene/Triphenylene	43.552	228	764335	3355.665	ng/mL	99
78) C1-Chrysenes	45.022	242	368469M5	1617.692	ng/mL	
79) C2-Chrysenes	46.732	256	296397M5	1301.274	ng/mL	
80) BBF-D12 Surr BKGD	47.363	256	3902	17.131	ng/mL	100
81) C3-Chrysenes	47.793	270	246179M5	1080.801	ng/mL	
82) C4-Chrysenes	49.960	284	135831M5	596.340	ng/mL	
84) Benzo[b]fluoranthene	47.454	252	753915	3119.595	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.527	252	640778	2430.058	ng/mL	96
86) Benzo[a]fluoranthene	47.848	252	106426	403.605	ng/mL#	1
87) Benzo[e]pyrene	48.479	252	552934	2220.533	ng/mL	97
89) Benzo[a]pyrene	48.671	252	626364	2719.295	ng/mL	97
90) Perylene	48.982	252	198762	789.983	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.609	276	485119M3	1982.645	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.655	278	116178M6	484.394	ng/mL	
93) Benzo[g,h,i]perylene	54.952	276	513037	1847.603	ng/mL	100
94) Hopane (T19)	52.677	191	149371M3	1937.672	ng/mL	
96) C23 Tricyclic Terpane (T4	41.087	191	29076	377.180	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.817	191	18733	243.008	ng/ml	100
98) C25 Tricyclic Terpane (T6	43.305	191	24683M3	320.193	ng/ml	
99) C24 Tetracyclic Terpane (	44.629	191	11391M3	147.766	ng/ml	
100) C26 Tricyclic Terpane-22S	44.355	191	10021M3	129.995	ng/ml	
101) C26 Tricyclic Terpane-22R	44.447	191	8200M3	106.372	ng/ml	
102) C28 Tricyclic Terpane-22S	46.741	191	9049M3	117.386	ng/ml	

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QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.896	191	9777	126.829	ng/ml	100
104)	C29 Tricyclic Terpane-22S	47.427	191	9751	126.492	ng/ml	100
105)	C29 Tricyclic Terpane-22R	47.628	191	10532M3	136.623	ng/ml	
106)	18a-22,29,30-Trisnorneoho	48.790	191	26999	350.237	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.881	191	10213M3	132.485	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.128	191	7814	101.365	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	49.357	191	34276	444.636	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	50.573	191	9999	129.709	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	50.354	191	5233	67.884	ng/ml	100
112)	30-Norhopane (T15)	51.268	191	96899	1256.994	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	51.369	191	27327M3	354.492	ng/ml	
114)	17a(H)-Diahopane (X)	51.497	191	8261M3	107.163	ng/ml	
115)	30-Normoretane (T17)	52.064	191	14997	194.544	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	52.485	191	10014M3	129.904	ng/ml	
117)	Moretane (T20)	53.381	191	28183	365.596	ng/ml	100
118)	30-Homohopane-22S (T21)	54.523	191	51651	670.028	ng/ml	100
119)	30-Homohopane-22R (T22)	54.761	191	44740	580.377	ng/ml	100
120)	Gammacerane/C32-diahopane	55.327	191	17299M3	224.406	ng/mL	
121)	30,31-Bishomohopane-22S (	56.113	191G	56888	737.963	ng/ml	100
122)	30,31-Bishomohopane-22R (	56.533	191	25657M3	332.828	ng/ml	
123)	30,31-Trishomohopane-22S	58.343	191	29496M3	382.628	ng/ml	
124)	30,31-Trishomohopane-22R	58.982	191	16269	211.045	ng/ml	100
125)	Tetrakishomohopane-22S (T	61.084	191	25969	336.875	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.943	191G	31755	411.933	ng/ml	100
127)	Pentakishomohopane-22S (T	64.328	191	18180	235.835	ng/ml	100
128)	Pentakishomohopane-22R (T	65.671	191	14653M3	190.082	ng/ml	
130)	13b(H),17a(H)-20S-Diachol	45.570	217	11162	297.389	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.991	217	5244M3	139.716	ng/ml	
132)	13b,17a-20S-Methyldiachol	46.695	217	5967M3	158.979	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.573	217	21239	565.870	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	48.104	217	22127	589.529	ng/ml	100
135)	Unknown Sterane (S18)	48.387	217	5370	143.073	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.652	217	521	13.881	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.817	217	9721	258.996	ng/ml	100
138)	14a,17a-20R-Methylcholest	49.558	217	8173M3	217.753	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.915	217	15328M3	408.384	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.857	217	13316	354.778	ng/ml	100
141)	14b(H),17b(H)-20R-Cholest	47.665	218	11167M3	297.522	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.747	218	10801	287.771	ng/ml	100
143)	14b,17b-20R-Methylcholest	49.000	218	11194M3	298.242	ng/ml	
144)	14b,17b-20S-Methylcholest	49.082	218	16330M3	435.080	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	50.171	218	22623	602.744	ng/ml	100
146)	14b(H),17b(H)-20S-Ethylch	50.207	218	17290M3	460.657	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.869	231	38486	1025.382	ng/mL	100
148)	C28,20S-triaromatic stero	50.747	231	43906	1169.787	ng/mL	100
149)	C27,20R-triaromatic stero	51.213	231	25081	668.233	ng/mL	100
150)	C28,20R-triaromatic stero	52.457	231	32754M3	872.664	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

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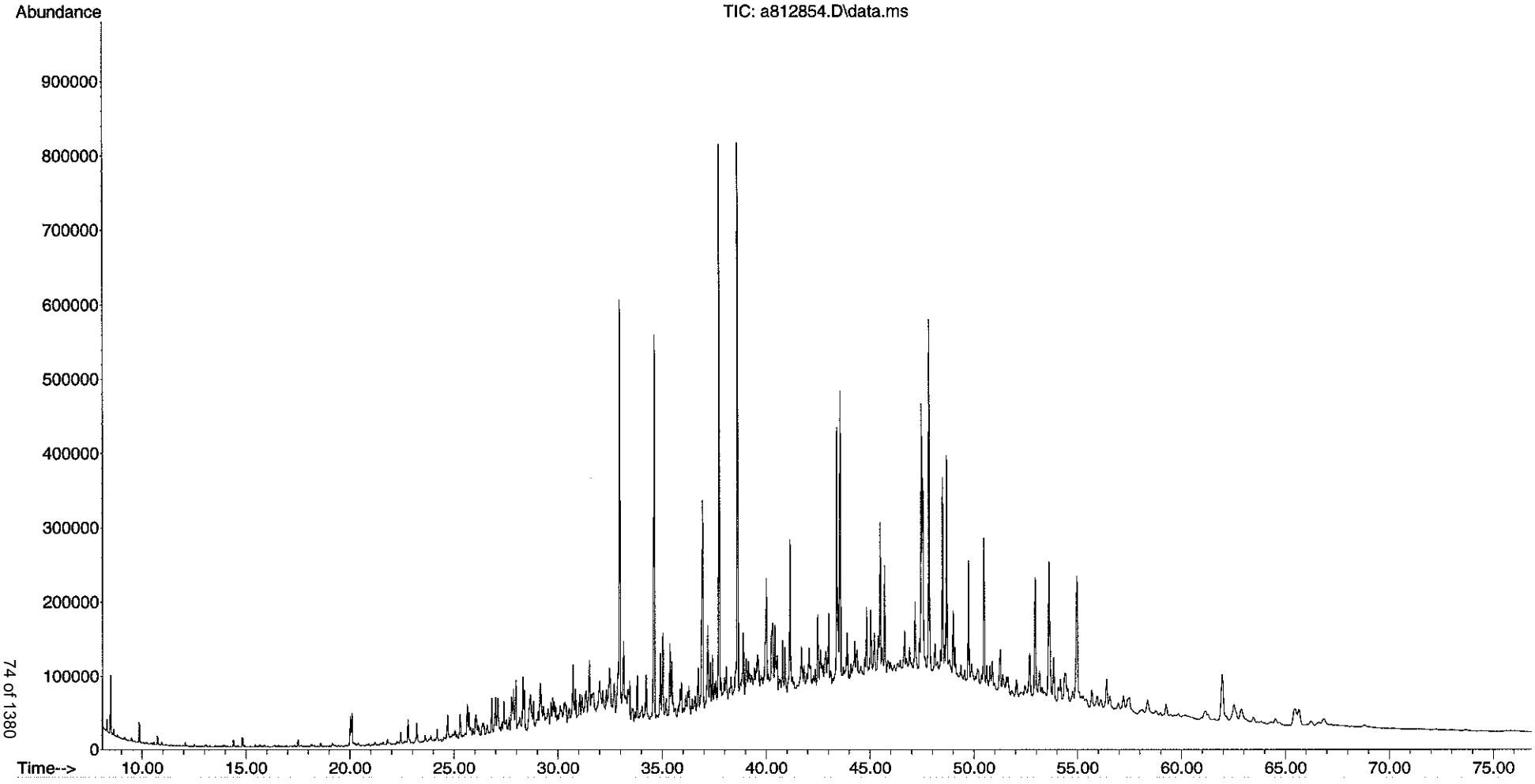

Response Factor Report PAH8

Method Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Method File : PAH8111812.M
Title : Decalins & Alkylated PAH's
Last Update : Mon Nov 19 09:36:09 2012
Response Via : Initial Calibration

JGK (11/21/12)

Calibration Files
10 =A812823.D 25 =a812824.D 100 =a812825.D 500 =a812826.D 5000=a812827.D 1e4 =a812828.D 2e4 =a812829.D

		Compound	10	25	100	500	5000	1e4	2e4	Avg	%RSD
1)	i	Acenaphthene-d10	----------ISTD----------								
2)	t	2-butoxyethanol	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
3)	A1	trans-Decalin	0.470	0.486	0.430	0.422	0.467	0.435	0.401	0.444	6.85
4)	t	cis-Decalin	0.367	0.325	0.304	0.310	0.345	0.326	0.302	0.326	7.29
5)	A2	C1-Decalins	0.470	0.486	0.430	0.422	0.467	0.435	0.401	0.444	6.85
6)	A2	C2-Decalins	0.470	0.486	0.430	0.422	0.467	0.435	0.401	0.444	6.85
7)	A2	C3-Decalins	0.470	0.486	0.430	0.422	0.467	0.435	0.401	0.444	6.85
8)	A2	C4-Decalins	0.470	0.486	0.430	0.422	0.467	0.435	0.401	0.444	6.85
9)	s	Naphthalene-d8	2.060	2.139	2.132	2.230	1.930	1.788	1.592	1.982	11.41
10)	A1	Naphthalene	2.391	2.504	2.509	2.516	2.303	1.980	1.664	2.267	14.40
11)	A2	C1-Naphthalenes	2.391	2.504	2.509	2.516	2.303	1.980	1.664	2.267	14.40
12)	A2	C2-Naphthalenes	2.391	2.504	2.509	2.516	2.303	1.980	1.664	2.267	14.40
13)	A2	C3-Naphthalenes	2.391	2.504	2.509	2.516	2.303	1.980	1.664	2.267	14.40
14)	A2	C4-Naphthalenes	2.391	2.504	2.509	2.516	2.303	1.980	1.664	2.267	14.40
15)	t	Glycol Ether I...	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
16)	t	2-Methylnaphth...	1.285	1.347	1.384	1.459	1.500	1.340	1.137	1.350	8.83
17)	t	1-Methylnaphth...	1.204	1.222	1.323	1.400	1.390	1.247	1.066	1.264	9.30
18)	A1	Benzothiophene	1.967	1.921	1.967	1.966	1.880	1.677	1.448	1.832	10.83
19)	A2	C1-Benzo(b)thi...	1.967	1.921	1.967	1.966	1.880	1.677	1.448	1.832	10.83
20)	A2	C2-Benzo(b)thi...	1.967	1.921	1.967	1.966	1.880	1.677	1.448	1.832	10.83
21)	A2	C3-Benzo(b)thi...	1.967	1.921	1.967	1.966	1.880	1.677	1.448	1.832	10.83
22)	A2	C4-Benzo(b)thi...	1.967	1.921	1.967	1.966	1.880	1.677	1.448	1.832	10.83
23)	t	Biphenyl	1.826	1.801	1.824	1.845	1.792	1.585	1.354	1.718	10.67
24)	t	2,6-Dimethylna...	1.052	1.213	1.186	1.252	1.269	1.134	0.984	1.156	9.14
25)	t	Dibenzofuran	1.954	1.945	1.904	1.929	1.853	1.665	1.437	1.812	10.66
26)	t	Acenaphthylene	1.889	2.149	2.114	2.232	2.262	2.022	1.735	2.058	9.26
27)	t	Acenaphthene	1.202	1.322	1.308	1.335	1.302	1.150	0.978	1.228	10.58
28)	t	2,3,5-Trimethy...	1.024	1.036	1.006	1.054	1.067	0.953	0.829	0.995	8.26
29)	A1	Fluorene	1.374	1.418	1.430	1.467	1.479	1.322	1.152	1.377	8.20
30)	A2	C1-Fluorenes	1.374	1.418	1.430	1.467	1.479	1.322	1.152	1.377	8.20
31)	A2	C2-Fluorenes	1.374	1.418	1.430	1.467	1.479	1.322	1.152	1.377	8.20
32)	A2	C3-Fluorenes	1.374	1.418	1.430	1.467	1.479	1.322	1.152	1.377	8.20
33)	A1	Dibenzothiophene	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
34)	A2	4-Methyldibenz...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
35)	A2	2/3-Methyldibe...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
36)	A2	1-Methyldibenz...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
37)	A2	OTP	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
38)	A2	C1-Dibenzothio...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
39)	A2	C2-Dibenzothio...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
40)	A2	C3-Dibenzothio...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19
41)	A2	C4-Dibenzothio...	1.982	2.019	1.918	1.994	2.012	1.793	1.542	1.894	9.19

1502

Method Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Method File : PAH8111812.M

42)	s	Phenanthrene-d10	1.606	1.697	1.611	1.702	1.453	1.395	1.308	1.539	10.01
43)	A1	Phenanthrene	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
44)	A2	3-Methylphenan...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
45)	A2	2-Methylphenan...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
46)	A2	2-Methylanthra...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
47)	A2	9/4-Methylphen...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
48)	A2	1-Methylphenan...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
49)	A2	C1-Phenanthren...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
50)	A2	C2-Phenanthren...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
51)	A2	5AA IS BKGD	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
52)	A2	C3-Phenanthren...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
53)	A2	C4-Phenanthren...	1.890	1.966	1.905	1.982	1.872	1.670	1.478	1.823	10.05
54)	t	Retene	0.376	0.386	0.380	0.429	0.500	0.454	0.434	0.423	10.76
55)	t	Anthracene	1.792	1.835	1.801	1.879	1.728	1.548	1.307	1.699	11.96
56)	t	Carbazole	1.705	1.746	1.706	1.859	1.967	1.835	1.589	1.772	7.02
57)	t	1-Methylphenan...	1.278	1.304	1.259	1.354	1.428	1.317	1.108	1.292	7.63
58)	A1	Fluoranthene	1.824	1.904	1.839	2.008	2.087	1.897	1.586	1.878	8.44
59)	t	Benzo(b)fluorene	0.926	1.010	0.994	1.117	1.284	1.167	1.107	1.086	11.08
60)	A1	Pyrene	1.888	1.928	1.858	2.013	2.066	1.890	1.655	1.900	6.90
61)	A2	C1-Fluoranthen...	1.888	1.928	1.858	2.013	2.066	1.890	1.655	1.900	6.90
62)	A2	C2-Fluoranthen...	1.888	1.928	1.858	2.013	2.066	1.890	1.655	1.900	6.90
63)	A2	C3-Fluoranthen...	1.888	1.928	1.858	2.013	2.066	1.890	1.655	1.900	6.90
64)	A2	C4-Fluoranthen...	1.888	1.928	1.858	2.013	2.066	1.890	1.655	1.900	6.90
65)	t	Bis-(2-ethylhe...	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
66)	A1	Naphthobenzoth...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
67)	A2	Naphthobenzoth...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
68)	A2	Naphthobenzoth...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
69)	A2	Naphthobenzoth...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
70)	A2	C1-Naphthobenz...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
71)	A2	C2-Naphthobenz...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
72)	A2	C3-Naphthobenz...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
73)	A2	C4-Naphthobenz...	1.742	1.673	1.626	1.825	1.986	1.813	1.678	1.763	6.96
74)	i	Chrysene-d12	----------ISTD----------								
75)	t	Benz[a]anthracene	1.021	0.999	1.059	1.145	1.279	1.163	1.007	1.096	9.48
76)	A1	Chrysene	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
77)	A2	Chrysene/Triph...	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
78)	A2	C1-Chrysenes	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
79)	A2	C2-Chrysenes	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
80)	A2	BBF-D12 Surr BKGD	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
81)	A2	C3-Chrysenes	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
82)	A2	C4-Chrysenes	1.123	1.073	1.112	1.154	1.219	1.108	0.978	1.110	6.65
83)	s	Benzo[b]fluora...	0.924	0.866	0.931	0.967	0.983	1.064	0.935	0.953	6.44
84)	t	Benzo[b]fluora...	1.127	1.067	1.091	1.187	1.347	1.327	1.095	1.177	9.82
85)	A1	Benzo[j]+[k]fl...	1.186	1.162	1.260	1.338	1.432	1.441	1.172	1.284	9.39
86)	A2	Benzo[a]fluora...	1.186	1.162	1.260	1.338	1.432	1.441	1.172	1.284	9.39
87)	t	Benzo[e]pyrene	1.170	1.179	1.130	1.179	1.347	1.351	1.135	1.213	7.83
88)	s	Benzo[a]pyrene...	0.866	0.863	0.855	0.974	0.978	1.083	0.972	0.941	8.96
89)	t	Benzo[a]pyrene	1.026	1.069	1.038	1.103	1.266	1.294	1.058	1.122	9.90
90)	t	Perylene	1.140	1.132	1.112	1.175	1.404	1.433	1.183	1.226	10.95
91)	t	Indeno[1,2,3-c...	1.033	1.015	1.058	1.096	1.457	1.442	1.241	1.192	16.03

JGK (11/21/12)

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Method Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Method File : PAH8111812.M

92)	t	Dibenz[ah]+[ac...	1.013	0.985	1.033	1.212	1.433	1.373	1.130	1.168	15.28
93)	t	Benzo[g,h,i]pe...	1.233	1.236	1.291	1.351	1.584	1.503	1.270	1.353	10.22
94)	A1	Hopane (T19)	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
95)	A2	17a(H),21B(H)-...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
96)	A2	C23 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
97)	A2	C24 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
98)	A2	C25 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
99)	A2	C24 Tetracycli...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
100)	A2	C26 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
101)	A2	C26 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
102)	A2	C28 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
103)	A2	C28 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
104)	A2	C29 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
105)	A2	C29 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
106)	A2	18a-22,29,30-T...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
107)	A2	C30 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
108)	A2	C30 Tricyclic ...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
109)	A2	17a(H)-22,29,3...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
110)	A2	17a/b,21b/a 28...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
111)	A2	17a(H),21b(H)-...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
112)	A2	30-Norhopane (...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
113)	A2	18a(H)-30-Norn...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
114)	A2	17a(H)-Diahopa...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
115)	A2	30-Normoretane...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
116)	A2	18a(H)&18b(H)-...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
117)	A2	Moretane (T20)	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
118)	A2	30-Homohopane-...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
119)	A2	30-Homohopane-...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
120)	A2	Gammacerane/C3...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
121)	A2	30,31-Bishomoh...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
122)	A2	30,31-Bishomoh...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
123)	A2	30,31-Trishomo...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
124)	A2	30,31-Trishomo...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
125)	A2	Tetrakishomoho...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
126)	A2	Tetrakishomoho...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
127)	A2	Pentakishomoho...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
128)	A2	Pentakishomoho...	0.371	0.348	0.322	0.355	0.423	0.433		0.376	11.65
129)	SA1	5B(H)Cholane -...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
130)	A2	13b(H),17a(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
131)	A2	13b(H),17a(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
132)	A2	13b,17a-20S-Me...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
133)	A2	14a,17a-20S-Ch...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
134)	A2	14a,17a-20R-Ch...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
135)	A2	Unknown Steran...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
136)	A2	13a,17b-20S-Et...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
137)	A2	14a,17a-20S-Me...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
138)	A2	14a,17a-20R-Me...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
139)	A2	14a(H),17a(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
140)	A2	14a(H),17a(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
141)	A2	14b(H),17b(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
142)	A2	14b(H),17b(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54

JJK (11/21/12)

Method Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Method File : PAH8111812.M

143)	A2	14b,17b-20R-Me...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
144)	A2	14b,17b-20S-Me...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
145)	A2	14b(H),17b(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
146)	A2	14b(H),17b(H)-...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
147)	A2	C26,20R- +C27,...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
148)	A2	C28,20S-triaro...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
149)	A2	C27,20R-triaro...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54
150)	A2	C28,20R-triaro...	0.181	0.162	0.162	0.175	0.204	0.202	0.192	0.183	9.54

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812823.D
Acq On : 18 Nov 2012 9:44 am
Operator : AC
Sample : i811181201
Misc : 11 whaq83
ALS Vial : 4 Sample Multiplier: 1

BJ 11/20/12

Quant Time: Nov 19 12:13:28 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Sep 08 09:01:35 2012
Response via : Initial Calibration

JGK (11/21/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
	Internal Standards						
1)	Acenaphthene-d10	26.986	164	52596	500.000	ng/mL	0.00
74)	Chrysene-d12	43.424	240	71970	500.000	ng/mL	0.00
	System Monitoring Compounds						
9)	Naphthalene-d8	20.041	136	2167	9.504	ng/mL	0.03
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.95%#		
42)	Phenanthrene-d10	32.880	188	1689	9.895	ng/mL	0.03
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.99%#		
83)	Benzo[b]fluoranthene-d12	47.335	264	1330	8.644	ng/mL	0.02
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.86%#		
88)	Benzo[a]pyrene-d12	48.543	264	1246	8.701	ng/mL	0.02
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.87%#		
129)	5B(H)Cholane - Surr	44.036	217	261	9.186	ng/ml	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.92%#		
	Target Compounds						Qvalue
3)	trans-Decalin	16.656	138	247	5.132	ng/mL	100
4)	cis-Decalin	17.870	138	193	5.369	ng/mL	100
10)	Naphthalene	20.124	128	2515	9.409	ng/mL#	100
16)	2-Methylnaphthalene	22.843	142	1352	8.584	ng/mL#	100
17)	1-Methylnaphthalene	23.244	142	1266	8.421	ng/mL#	100
18)	Benzothiophene	20.333	134	2069	9.733	ng/mL	100
23)	Biphenyl	24.705	154	1921	9.870	ng/mL#	100
24)	2,6-Dimethylnaphthalene	25.325	156	1107	8.384	ng/mL#	100
25)	Dibenzofuran	27.798	168	2055	10.069	ng/mL	96
26)	Acenaphthylene	26.384	152	1987	8.224	ng/mL#	100
27)	Acenaphthene	27.114	153	1264	8.847	ng/mL	95
28)	2,3,5-Trimethylnaphthalen	28.692	170	1077	9.696	ng/mL	95
29)	Fluorene	29.167	166	1445M3	9.263	ng/mL	
33)	Dibenzothiophene	32.478	184	2085	9.333	ng/mL	99
43)	Phenanthrene	32.971	178	1988	9.226	ng/mL	94
54)	Retene	39.927	234	396	8.634	ng/mL	87
55)	Anthracene	33.154	178	1885M3	9.280	ng/mL	
56)	Carbazole	33.820	167	1793	8.825	ng/mL	99
57)	1-Methylphenanthrene	35.463	192	1344	8.980	ng/mL	94
58)	Fluoranthene	37.718	202	1919	8.676	ng/mL	99
59)	Benzo(b)fluorene	40.238	216	974	7.792	ng/mL	100
60)	Pyrene	38.603	202	1986	8.917	ng/mL	98
66)	Naphthobenzothiophene	42.438	234	1832	8.916	ng/ml	100
67)	Naphthobenzothiophene-2,1	42.438	234	1832	8.916	ng/mL	100
75)	Benz[a]anthracene	43.360	228	1470M3	7.658	ng/mL	
76)	Chrysene	43.525	228	1616	8.665	ng/mL	98
77)	Chrysene/Triphenylene	43.525	228	1616	8.665	ng/mL	98
84)	Benzo[b]fluoranthene	47.418	252	1622M3	7.755	ng/mL	
85)	Benzo[j]+[k]fluoranthene	47.500	252	1707M3	7.927	ng/mL	
87)	Benzo[e]pyrene	48.433	252	1684	8.118	ng/mL	95
89)	Benzo[a]pyrene	48.625	252	1477	7.820	ng/mL	95
90)	Perylene	48.945	252	1641	7.953	ng/mL	94
91)	Indeno[1,2,3-cd]pyrene	53.545	276	1487M3	7.057	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.591	278	1458	7.656	ng/mL	97
93)	Benzo[g,h,i]perylene	54.861	276	1775	7.906	ng/mL	95
94)	Hopane (T19)	52.613	191	534M3	8.110	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812823.D
Acq On : 18 Nov 2012 9:44 am
Operator : AC
Sample : i811181201
Misc : 11 whaq83
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 19 12:13:28 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Sep 08 09:01:35 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.613	191	519M3	7.882	ng/mL	

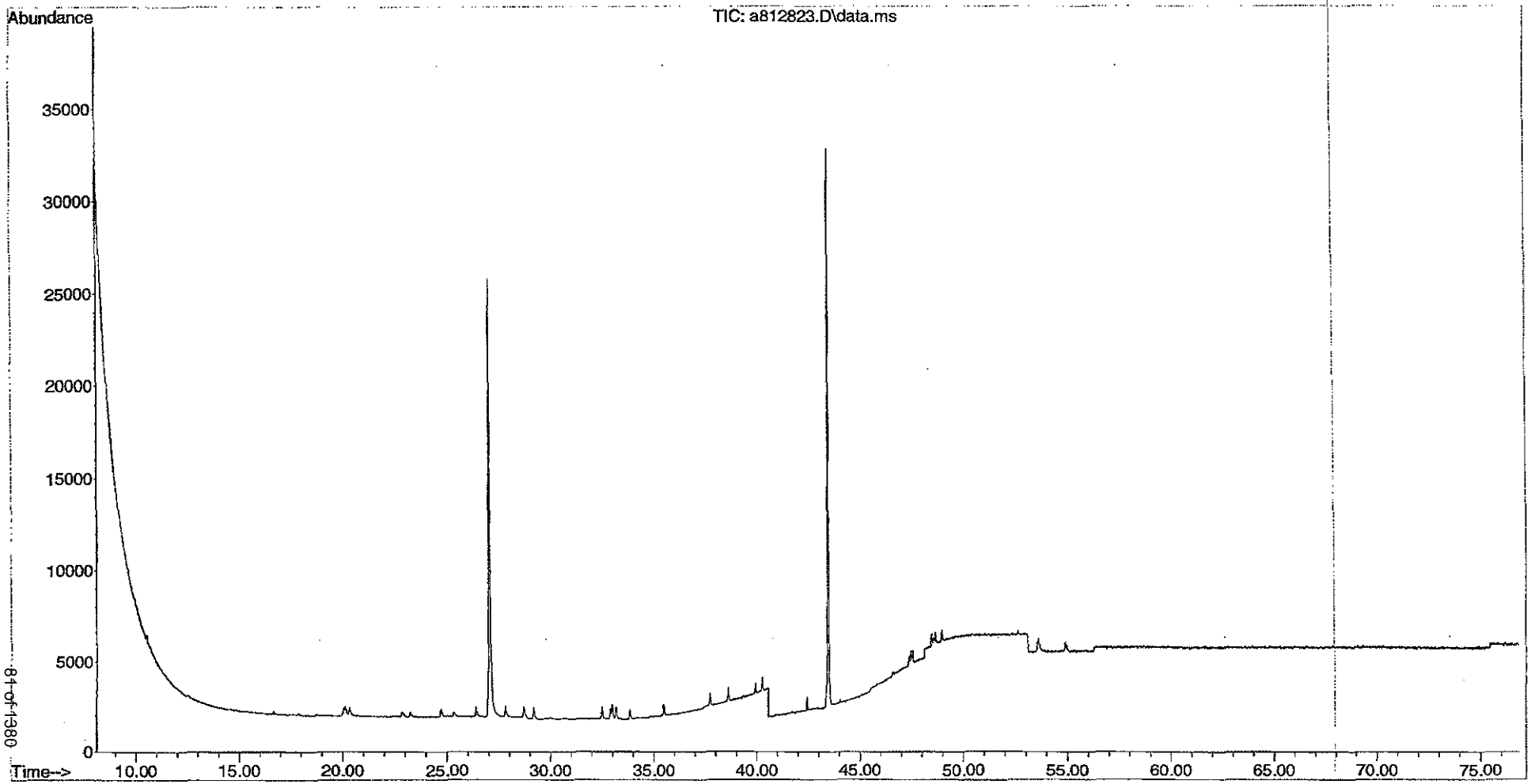
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812823.D
Acq On : 18 Nov 2012 9:44 am
Operator : AC
Sample : i811181201
Misc : 11 whaq83
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 19 12:13:28 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Sep 08 09:01:35 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812824.D
Acq On : 18 Nov 2012 11:08 am
Operator : AC
Sample : i811181202
Misc : 12 whaq84
ALS Vial : 5 Sample Multiplier: 1

BZ 11/20/12

Quant Time: Nov 19 12:13:33 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

JJK (11/21/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	50747M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	71340	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.041	136	5427	24.670	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.47%#			
42) Phenanthrene-d10	32.880	188	4305	26.140	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.61%#			
83) Benzo[b]fluoranthene-d12	47.336	264	3090	20.261	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.03%#			
88) Benzo[a]pyrene-d12	48.534	264	3078	21.683	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.17%#			
129) 5B(H)Cholane - Surr	44.036	217	578	20.523	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.05%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	617	13.288	ng/mL	100
4) cis-Decalin	17.870	138	412	11.878	ng/mL	100
10) Naphthalene	20.115	128	6354M3	24.637	ng/mL	
16) 2-Methylnaphthalene	22.843	142	3419	22.498	ng/mL#	100
17) 1-Methylnaphthalene	23.245	142	3101	21.378	ng/mL#	100
18) Benzothiophene	20.334	134	4874	23.764	ng/mL	100
23) Biphenyl	24.705	154	4569	24.331	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.316	156	3077	24.152	ng/mL#	100
25) Dibenzofuran	27.798	168	4936	25.066	ng/mL	98
26) Acenaphthylene	26.384	152	5454M3	23.395	ng/mL	
27) Acenaphthene	27.114	153	3354	24.332	ng/mL	96
28) 2,3,5-Trimethylnaphthalen	28.692	170	2628	24.521	ng/mL	97
29) Fluorene	29.176	166	3597	23.898	ng/mL	100
33) Dibenzothiophene	32.469	184	5122	23.763	ng/mL	97
43) Phenanthrene	32.971	178	4989	23.996	ng/mL	96
54) Retene	39.918	234	980	22.145	ng/mL	97
55) Anthracene	33.154	178	4656M3	23.758	ng/mL	
56) Carbazole	33.820	167	4429	22.594	ng/mL	98
57) 1-Methylphenanthrene	35.463	192	3308	22.907	ng/mL	97
58) Fluoranthene	37.727	202	4832	22.642	ng/mL	99
59) Benzo(b)fluorene	40.238	216	2562	21.242	ng/mL	98
60) Pyrene	38.603	202	4891	22.761	ng/mL	99
66) Naphthobenzothiophene	42.438	234	4245	21.412	ng/ml	99
67) Naphthobenzothiophene-2,1	42.438	234	4245	21.412	ng/mL	99
75) Benz[a]anthracene	43.360	228	3562M3	18.721	ng/mL	
76) Chrysene	43.525	228	3829	20.712	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	3829	20.712	ng/mL	100
84) Benzo[b]fluoranthene	47.418	252	3806	18.357	ng/mL	91
85) Benzo[j]+[k]fluoranthene	47.500	252	4145	19.417	ng/mL	93
87) Benzo[e]pyrene	48.433	252	4206	20.455	ng/mL	99
89) Benzo[a]pyrene	48.625	252	3814	20.373	ng/mL	98
90) Perylene	48.945	252	4038	19.742	ng/mL	96
91) Indeno[1,2,3-cd]pyrene	53.545	276	3622M3	17.340	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	3514	18.615	ng/mL	96
93) Benzo[g,h,i]perylene	54.870	276	4408	19.807	ng/mL	98
94) Hopane (T19)	52.604	191	1243M3	19.044	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812824.D
Acq On : 18 Nov 2012 11:08 am
Operator : AC
Sample : i811181202
Misc : 12 whaq84
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 19 12:13:33 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.604	191	1279M3	19.596	ng/mL	

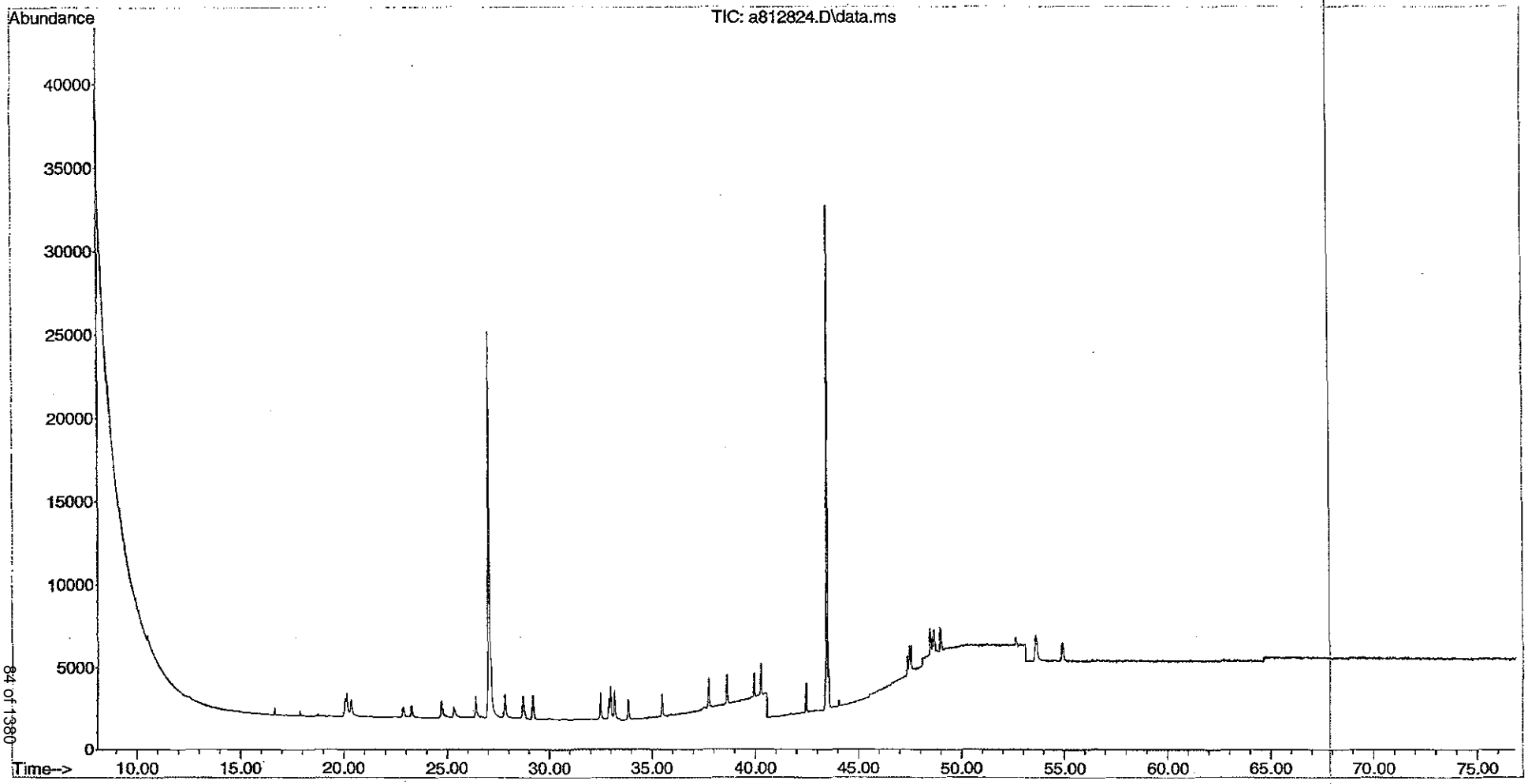
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812824.D
Acq On : 18 Nov 2012 11:08 am
Operator : AC
Sample : i811181202
Misc : 12 whaq84
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 19 12:13:33 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



84 of 1380

1511

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812825.D
Acq On : 18 Nov 2012 12:33 pm
Operator : AC
Sample : i811181203
Misc : 13 whaq85
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 12:13:38 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	54704	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	73711	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.032	136	23323	98.353	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	9.84%#		
42) Phenanthrene-d10	32.871	188	17622	99.261	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	9.93%#		
83) Benzo[b]fluoranthene-d12	47.326	264	13723	87.087	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	8.71%#		
88) Benzo[a]pyrene-d12	48.534	264	12604	85.933	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	8.59%#		
129) 5B(H)Cholane - Surr	44.036	217	2394	82.270	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	8.23%#		
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2350	46.948	ng/mL	100
4) cis-Decalin	17.869	138	1662	44.451	ng/mL	100
10) Naphthalene	20.105	128	27453	98.745	ng/mL#	100
16) 2-Methylnaphthalene	22.825	142	15141	92.427	ng/mL#	100
17) 1-Methylnaphthalene	23.235	142	14478	92.589	ng/mL#	100
18) Benzothiophene	20.324	134	21521	97.337	ng/mL	100
23) Biphenyl	24.695	154	19957	98.587	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.298	156	12975	94.478	ng/mL#	100
25) Dibenzofuran	27.789	168	20833	98.141	ng/mL	97
26) Acenaphthylene	26.384	152	23128M3	92.032	ng/mL	
27) Acenaphthene	27.114	153	14315	96.336	ng/mL	96
28) 2,3,5-Trimethylnaphthalen	28.683	170	11003	95.237	ng/mL	96
29) Fluorene	29.167	166	15645	96.426	ng/mL	100
33) Dibenzothiophene	32.460	184	20981	90.298	ng/mL	100
43) Phenanthrene	32.962	178	20842	92.993	ng/mL	99
54) Retene	39.918	234	4154	87.078	ng/mL	98
55) Anthracene	33.144	178	19707M3	93.285	ng/mL	
56) Carbazole	33.811	167	18663	88.319	ng/mL	100
57) 1-Methylphenanthrene	35.463	192	13779	88.513	ng/mL	100
58) Fluoranthene	37.727	202	20124	87.475	ng/mL	100
59) Benzo(b)fluorene	40.238	216	10877	83.661	ng/mL	99
60) Pyrene	38.603	202	20326	87.749	ng/mL	98
66) Naphthobenzothiophene	42.438	234	17795	83.268	ng/ml	100
67) Naphthobenzothiophene-2,1	42.438	234	17795	83.268	ng/mL	100
75) Benz[a]anthracene	43.369	228	15605	79.377	ng/mL	100
76) Chrysene	43.525	228	16391	85.811	ng/mL	98
77) Chrysene/Triphenylene	43.525	228	16391	85.811	ng/mL	98
84) Benzo[b]fluoranthene	47.409	252	16084	75.082	ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.500	252	18571	84.198	ng/mL	97
87) Benzo[e]pyrene	48.433	252	16666	78.444	ng/mL	100
89) Benzo[a]pyrene	48.625	252	15297	79.082	ng/mL	99
90) Perylene	48.945	252	16399	77.595	ng/mL	100
91) Indeno[1,2,3-cd]pyrene	53.536	276	15591M3	72.240	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	15225	78.059	ng/mL	98
93) Benzo[g,h,i]perylene	54.870	276	19038	82.793	ng/mL	100
94) Hopane (T19)	52.622	191	4748M3	70.405	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812825.D
Acq On : 18 Nov 2012 12:33 pm
Operator : AC
Sample : i811181203
Misc : 13 whaq85
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 12:13:38 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.622	191	4728M3	70.108	ng/mL	

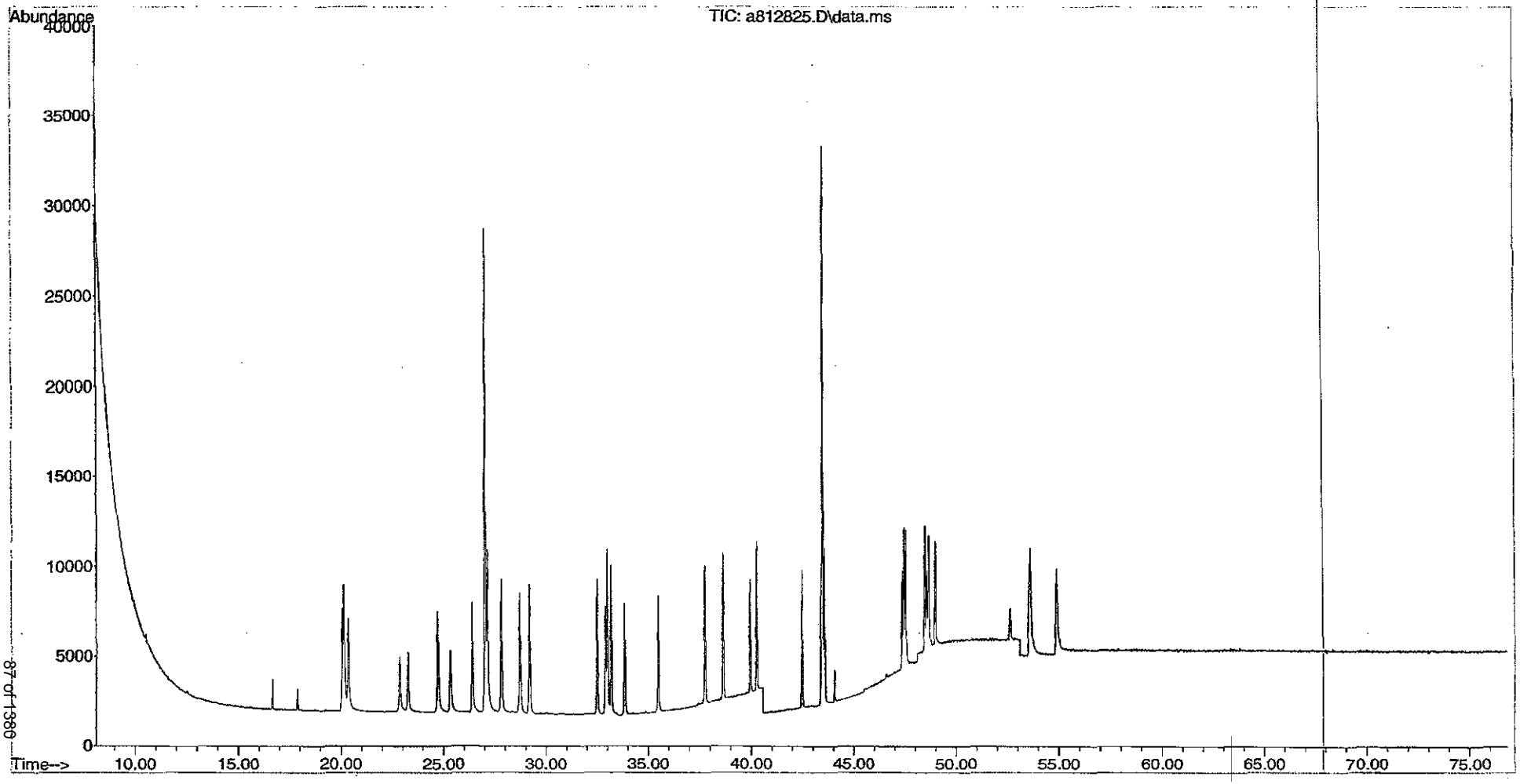
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812825.D
Acq On : 18 Nov 2012 12:33 pm
Operator : AC
Sample : i811181203
Misc : 13 whaq85
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 12:13:38 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812826.D
Acq On : 18 Nov 2012 1:58 pm
Operator : AC
Sample : i811181204
Misc : 14 whaq86
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 12:13:45 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	67006	500.000	ng/mL	0.00
74) Chrysene-d12	43.415	240	93688	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	149390	514.314	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	51.43%		
42) Phenanthrene-d10	32.853	188	114047	524.462	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	52.45%		
83) Benzo[b]fluoranthene-d12	47.317	264	90585	452.281	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	45.23%#		
88) Benzo[a]pyrene-d12	48.525	264	91270	489.583	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	48.96%#		
129) 5B(H)Cholane - Surr	44.036	217	16432	444.281	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	44.43%#		
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	14140	230.625	ng/mL	100
4) cis-Decalin	17.870	138	10387	226.803	ng/mL	100
10) Naphthalene	20.087	128	168604	495.107	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	97786	487.334	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	93781	489.635	ng/mL#	100
18) Benzothiophene	20.306	134	131744	486.467	ng/mL	100
23) Biphenyl	24.668	154	123610	498.520	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	83899	498.753	ng/mL#	100
25) Dibenzofuran	27.762	168	129248	497.081	ng/mL	98
26) Acenaphthylene	26.375	152	149554M3	485.855	ng/mL	
27) Acenaphthene	27.105	153	89436	491.377	ng/mL	100
28) 2,3,5-Trimethylnaphthalen	28.665	170	70621	499.040	ng/mL	97
29) Fluorene	29.130	166	98319	494.725	ng/mL	100
33) Dibenzothiophene	32.442	184	133621	469.495	ng/mL	100
43) Phenanthrene	32.935	178	132785	483.690	ng/mL	100
54) Retene	39.909	234	28750	492.024	ng/mL	98
55) Anthracene	33.126	178	125886M3	486.488	ng/mL	
56) Carbazole	33.793	167	124597	481.379	ng/mL	100
57) 1-Methylphenanthrene	35.445	192	90715	475.743	ng/mL	100
58) Fluoranthene	37.709	202	134559M3	477.517	ng/mL	
59) Benzo(b)fluorene	40.220	216	74840	469.953	ng/mL	100
60) Pyrene	38.594	202	134856	475.297	ng/mL	99
66) Naphthobenzothiophene	42.429	234	122309	467.242	ng/ml	100
67) Naphthobenzothiophene-2,1	42.429	234	122309	467.242	ng/mL	100
75) Benz[a]anthracene	43.360	228	107258	429.248	ng/mL	100
76) Chrysene	43.516	228	108112	445.310	ng/mL	99
77) Chrysene/Triphenylene	43.516	228	108112	445.310	ng/mL	99
84) Benzo[b]fluoranthene	47.400	252	111215	408.464	ng/mL	97
85) Benzo[j]+[k]fluoranthene	47.491	252	125366	447.193	ng/mL	95
87) Benzo[e]pyrene	48.424	252	110422	408.915	ng/mL	97
89) Benzo[a]pyrene	48.616	252	103362M3	420.418	ng/mL	
90) Perylene	48.936	252	110108	409.905	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.518	276	102713M3	374.436	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.582	278	113568	458.112	ng/mL	99
93) Benzo[g,h,i]perylene	54.852	276	126588	433.125	ng/mL	99
94) Hopane (T19)	52.613	191	33302	388.516	ng/mL#	90

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812826.D
Acq On : 18 Nov 2012 1:58 pm
Operator : AC
Sample : i811181204
Misc : 14 whaq86
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 12:13:45 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.613	191	33302	388.516	ng/mL#	90

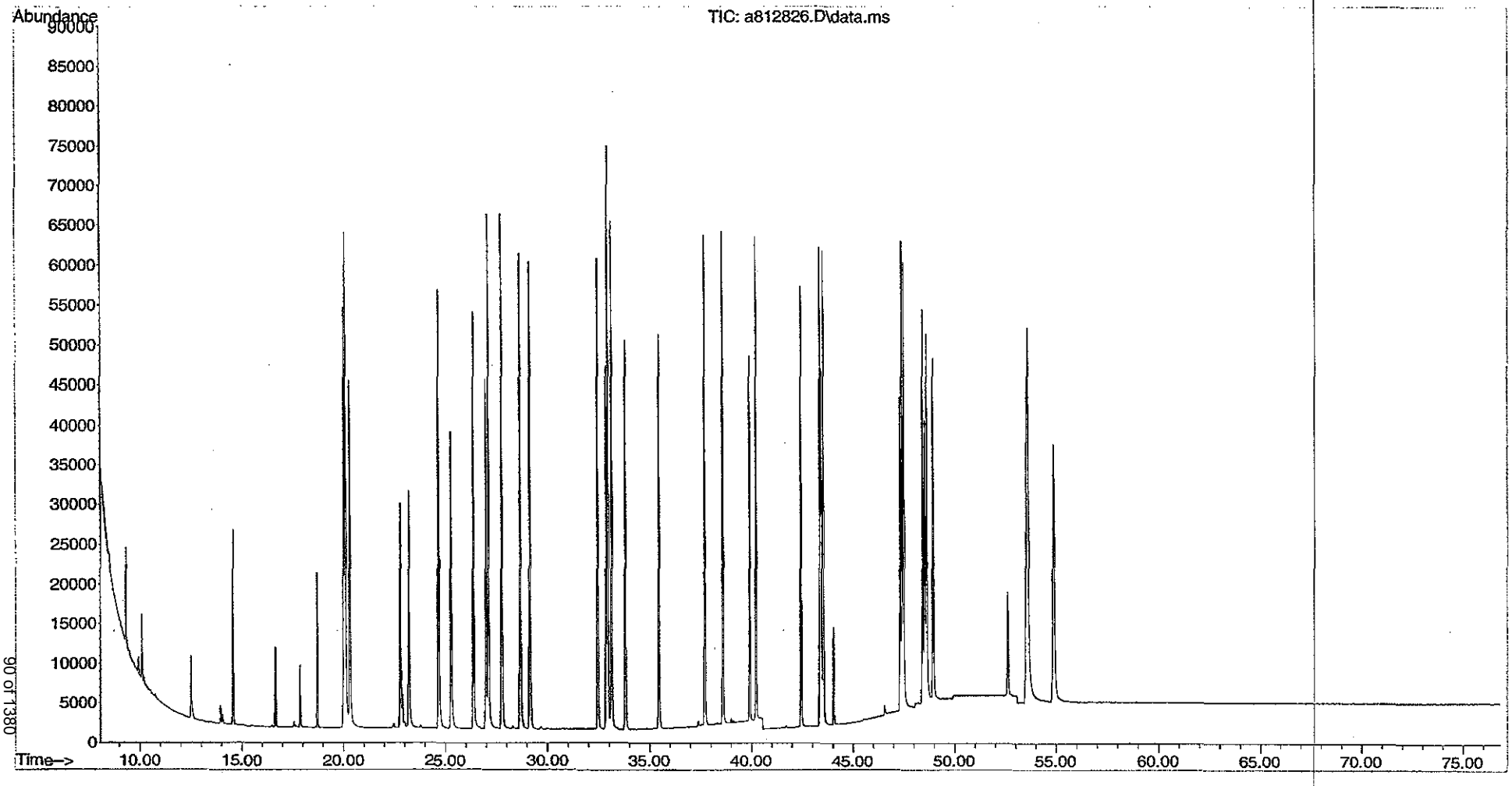
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812826.D
Acq On : 18 Nov 2012 1:58 pm
Operator : AC
Sample : i811181204
Misc : 14 whaq86
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 12:13:45 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812827.D
Acq On : 18 Nov 2012 3:23 pm
Operator : AC
Sample : i811181205
Misc : 15 whaq87
ALS Vial : 8 Sample Multiplier: 1

BH 11/21/12

Quant Time: Nov 19 12:13:51 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

JJK (11/21/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.977	164	63957	500.000 ng/mL	0.00
74) Chrysene-d12	43.415	240	86989	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	20.005	136	1234387	4452.292 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 445.23%#		
42) Phenanthrene-d10	32.843	188	929087	4476.226 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 447.62%#		
83) Benzo[b]fluoranthene-d12	47.326	264	855160	4598.526 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 459.85%#		
88) Benzo[a]pyrene-d12	48.534	264	850933	4916.016 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 491.60%#		
129) 5B(H)Cholane - Surr	44.036	217	177415	5166.275 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 516.63%#		
Target Compounds					Qvalue
3) trans-Decalin	16.656	138	149209	2549.632 ng/mL	100
4) cis-Decalin	17.869	138	110452	2526.728 ng/mL	100
10) Naphthalene	20.078	128	1473117	4532.047 ng/mL#	100
16) 2-Methylnaphthalene	22.770	142	959169	5008.078 ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	889143	4863.570 ng/mL#	100
18) Benzothiophene	20.297	134	1202701	4652.709 ng/mL	100
23) Biphenyl	24.650	154	1145791	4841.280 ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.261	156	811582	5054.602 ng/mL#	100
25) Dibenzofuran	27.743	168	1185404	4776.342 ng/mL	97
26) Acenaphthylene	26.365	152	1446981M3	4924.891 ng/mL	
27) Acenaphthene	27.095	153	832819	4793.789 ng/mL	98
28) 2,3,5-Trimethylnaphthalen	28.647	170	682182	5050.417 ng/mL	97
29) Fluorene	29.112	166	946001	4987.046 ng/mL	98
33) Dibenzothiophene	32.433	184	1286658	4736.360 ng/mL	100
43) Phenanthrene	32.935	178	1197020	4568.202 ng/mL	100
54) Retene	39.909	234	319619	5730.692 ng/mL	96
55) Anthracene	33.108	178	1105404M3	4475.500 ng/mL	
56) Carbazole	33.774	167	1258155	5092.597 ng/mL	100
57) 1-Methylphenanthrene	35.435	192	913044	5016.618 ng/mL	99
58) Fluoranthene	37.699	202	1334604M3	4961.972 ng/mL	
59) Benzo(b)fluorene	40.220	216	821132	5402.055 ng/mL	98
60) Pyrene	38.585	202	1321312	4878.942 ng/mL	98
66) Naphthobenzothiophene	42.429	234	1270197	5083.707 ng/ml	100
67) Naphthobenzothiophene-2,1	42.429	234	1270197	5083.707 ng/mL	100
75) Benz[a]anthracene	43.351	228	1112740	4796.146 ng/mL	100
76) Chrysene	43.515	228	1060150	4703.001 ng/mL	100
77) Chrysene/Triphenylene	43.515	228	1060150	4703.001 ng/mL	100
84) Benzo[b]fluoranthene	47.409	252	1171928	4635.656 ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.500	252	1245688	4785.689 ng/mL	97
87) Benzo[e]pyrene	48.433	252	1171423	4672.085 ng/mL	97
89) Benzo[a]pyrene	48.625	252	1101087	4823.492 ng/mL	96
90) Perylene	48.936	252	1221343	4896.910 ng/mL	96
91) Indeno[1,2,3-cd]pyrene	53.536	276	1267773M3	4977.518 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.591	278	1246307	5414.522 ng/mL	99
93) Benzo[g,h,i]perylene	54.870	276	1377844	5077.388 ng/mL	100
94) Hopane (T19)	52.622	191	368264	4627.197 ng/mL#	88

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812827.D
Acq On : 18 Nov 2012 3:23 pm
Operator : AC
Sample : i811181205
Misc : 15 whaq87
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 12:13:51 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.622	191	368264	4627.197 ng/mL#	88

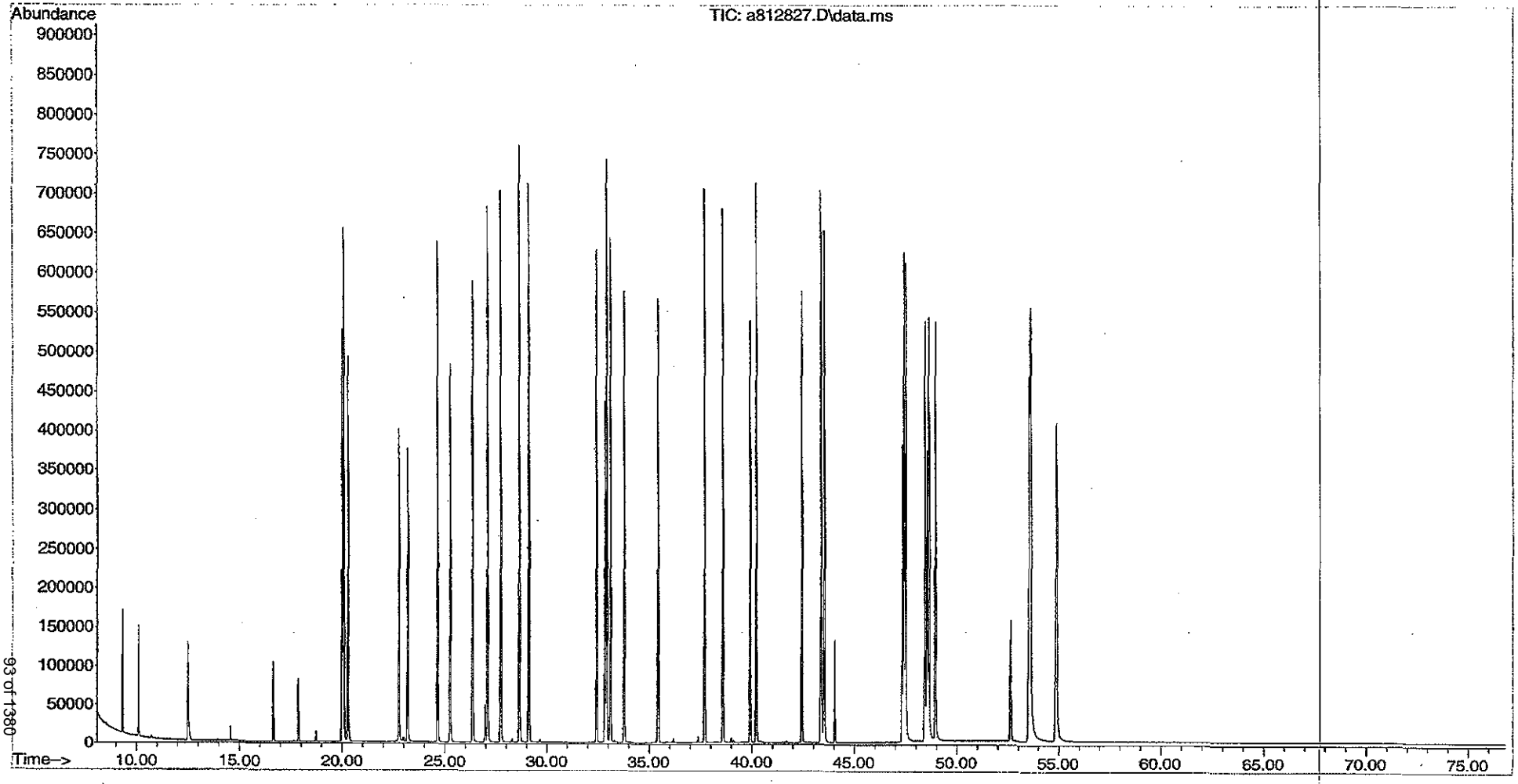
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812827.D
Acq On : 18 Nov 2012 3:23 pm
Operator : AC
Sample : i811181205
Misc : 15 whaq87
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 12:13:51 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812828.D
Acq On : 18 Nov 2012 4:48 pm
Operator : AC
Sample : i811181206
Misc : 16 whaq88
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 12:13:56 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.977	164	62717	500.000 ng/mL	0.00
74) Chrysene-d12	43.424	240	84324	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	20.005	136	2243293	8251.275 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 825.13%#	
42) Phenanthrene-d10	32.843	188	1750382	8599.859 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 859.99%#	
83) Benzo[b]fluoranthene-d12	47.336	264	1794384	9954.050 ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 995.40%#	
88) Benzo[a]pyrene-d12	48.552	264	1825875	10881.834 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1088.18%#	
129) 5B(H)Cholane - Surr	44.045	217	341307	10252.871 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1025.29%#	
Target Compounds					Qvalue
3) trans-Decalin	16.656	138	272687	4751.709 ng/mL	100
4) cis-Decalin	17.870	138	204233	4764.459 ng/mL	100
10) Naphthalene	20.078	128	2483855	7792.668 ng/mL#	100
16) 2-Methylnaphthalene	22.779	142	1680763	8949.222 ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	1564208	8725.310 ng/mL#	100
18) Benzothiophene	20.297	134	2103031	8296.534 ng/mL	100
23) Biphenyl	24.659	154	1988254	8567.014 ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	1422008	9031.489 ng/mL#	100
25) Dibenzofuran	27.743	168	2088843	8582.971 ng/mL	97
26) Acenaphthylene	26.365	152	2536226M3	8802.876 ng/mL	
27) Acenaphthene	27.105	153	1443026	8470.425 ng/mL	97
28) 2,3,5-Trimethylnaphthalen	28.656	170	1195174	9023.207 ng/mL	97
29) Fluorene	29.121	166	1658711	8917.135 ng/mL	97
33) Dibenzothiophene	32.442	184	2249309	8443.714 ng/mL	99
43) Phenanthrene	32.935	178	2094328	8150.635 ng/mL	100
54) Retene	39.918	234	569687	10416.303 ng/mL	96
55) Anthracene	33.117	178	1941491M3	8016.019 ng/mL	
56) Carbazole	33.783	167	2301555	9500.125 ng/mL	100
57) 1-Methylphenanthrene	35.436	192	1651894	9255.595 ng/mL	99
58) Fluoranthene	37.709	202	2378887M3	9019.418 ng/mL	
59) Benzo(b)fluorene	40.229	216	1463342	9817.360 ng/mL	97
60) Pyrene	38.585	202	2370763	8927.118 ng/mL	97
66) Naphthobenzothiophene	42.438	234	2273683	9279.875 ng/ml	100
67) Naphthobenzothiophene-2,1	42.438	234	2273683	9279.875 ng/mL	100
75) Benz[a]anthracene	43.360	228	1961481	8721.595 ng/mL	100
76) Chrysene	43.525	228	1868807	8552.347 ng/mL	100
77) Chrysene/Triphenylene	43.525	228	1868807	8552.347 ng/mL	100
84) Benzo[b]fluoranthene	47.427	252	2237296	9129.497 ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.509	252	2431044	9634.766 ng/mL	99
87) Benzo[e]pyrene	48.442	252	2278975	9376.692 ng/mL	98
89) Benzo[a]pyrene	48.643	252	2183012	9865.275 ng/mL	97
90) Perylene	48.954	252	2416323	9994.305 ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.564	276	2431926M3	9849.968 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.618	278	2315295	10376.588 ng/mL	100
93) Benzo[g,h,i]perylene	54.898	276	2534537	9635.008 ng/mL	99
94) Hopane (T19)	52.622	191	729760M3	9459.147 ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812828.D
Acq On : 18 Nov 2012 4:48 pm
Operator : AC
Sample : i811181206
Misc : 16 whaq88
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 12:13:56 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.622	191	729556M3	9456.503	ng/mL	

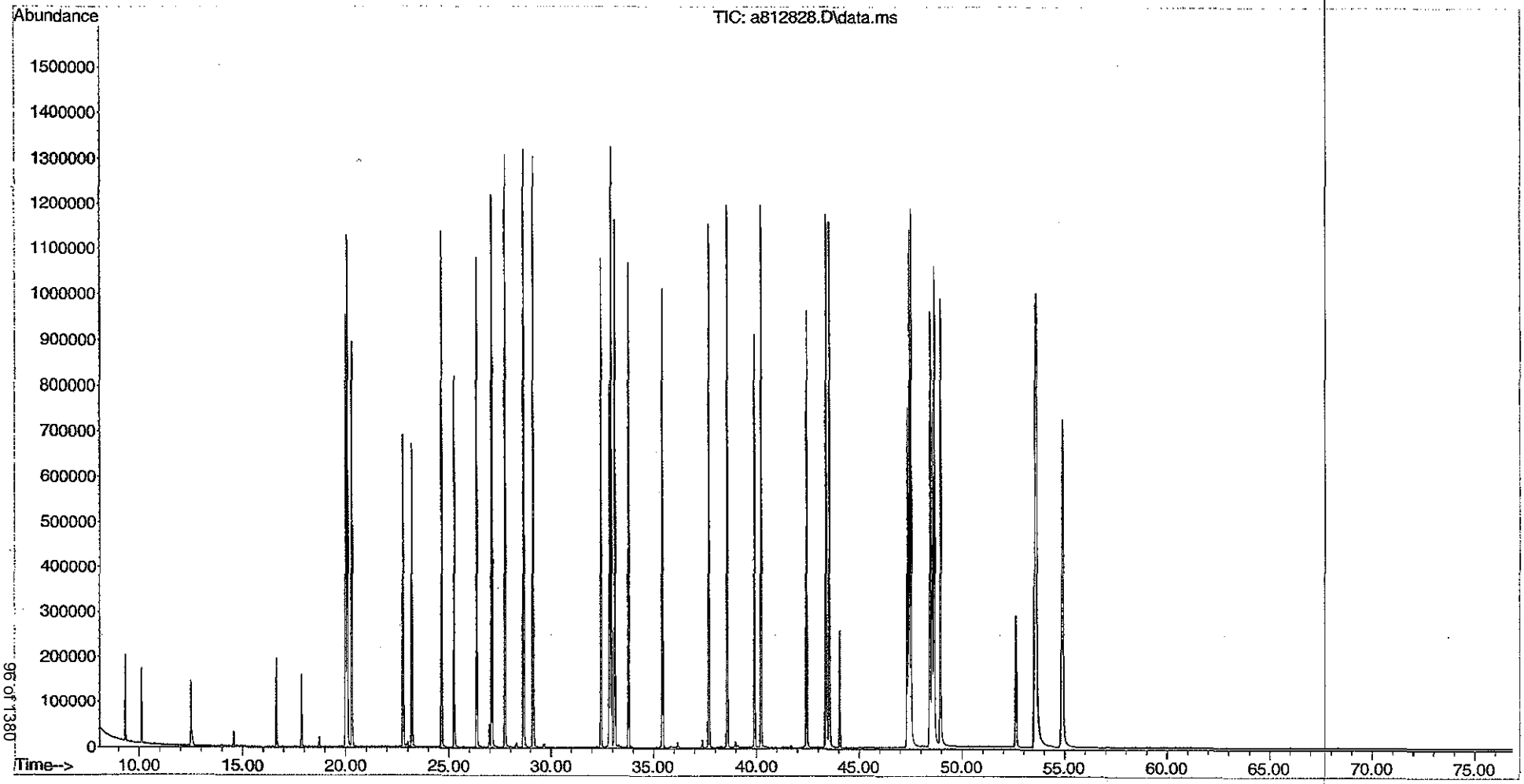
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812828.D
Acq On : 18 Nov 2012 4:48 pm
Operator : AC
Sample : i811181206
Misc : 16 whaq88
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 12:13:56 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812829.D
Acq On : 18 Nov 2012 6:13 pm
Operator : AC
Sample : i811181207
Misc : 17 whaq89
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 12:14:02 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.977	164	70560	500.000 ng/mL	0.00
74) Chrysene-d12	43.433	240	100672	500.000 ng/mL	0.02
System Monitoring Compounds					
9) Naphthalene-d8	20.005	136	4493321	14690.252 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1469.03%#	
42) Phenanthrene-d10	32.862	188	3692936	16127.125 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1612.71%#	
83) Benzo[b]fluoranthene-d12	47.354	264	3766833	17502.629 ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1750.26%#	
88) Benzo[a]pyrene-d12	48.579	264	3912959	19533.446 ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1953.34%#	
129) 5B(H)Cholane - Surr	44.054	217	774523	19488.443 ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1948.84%#	
Target Compounds					Qvalue
3) trans-Decalin	16.647	138	566393	8772.633 ng/mL	100
4) cis-Decalin	17.870	138	426164	8836.722 ng/mL	100
10) Naphthalene	20.087	128	4697526	13099.534 ng/mL#	100
16) 2-Methylnaphthalene	22.779	142	3208746	15185.911 ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	3007405	14910.938 ng/mL#	100
18) Benzothiophene	20.306	134	4087586	14333.249 ng/mL	100
23) Biphenyl	24.659	154	3821313	14635.142 ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	2777523	15679.843 ng/mL#	100
25) Dibenzofuran	27.752	168	4055074	14810.078 ng/mL	96
26) Acenaphthylene	26.375	152	4896532M3	15106.085 ng/mL	
27) Acenaphthene	27.105	153	2760237	14401.381 ng/mL	95
28) 2,3,5-Trimethylnaphthalen	28.665	170	2339310	15697.998 ng/mL	98
29) Fluorene	29.130	166	3252529	15541.842 ng/mL	95
33) Dibenzothiophene	32.451	184	4352279	14522.047 ng/mL	98
43) Phenanthrene	32.953	178	4172174	14432.310 ng/mL	100
54) Retene	39.927	234	1225939	19923.832 ng/mL	94
55) Anthracene	33.126	178	3687788M3	13533.684 ng/mL	
56) Carbazole	33.802	167	4484087	16451.620 ng/mL	100
57) 1-Methylphenanthrene	35.454	192	3125863	15567.497 ng/mL	98
58) Fluoranthene	37.718	202	4477650M3	15089.732 ng/mL	
59) Benzo(b)fluorene	40.247	216	3125153	18635.749 ng/mL	95
60) Pyrene	38.603	202	4670472	15631.858 ng/mL	95
66) Naphthobenzothiophene	42.456	234	4736721	17183.701 ng/ml	99
67) Naphthobenzothiophene-2,1	42.456	234	4736721	17183.701 ng/mL	99
75) Benz[a]anthracene	43.378	228	4056482	15107.893 ng/mL	99
76) Chrysene	43.552	228	3937928	15094.932 ng/mL	100
77) Chrysene/Triphenylene	43.552	228	3937928	15094.932 ng/mL	100
84) Benzo[b]fluoranthene	47.454	252	4408379	15067.626 ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.546	252	4719440	15666.836 ng/mL	99
87) Benzo[e]pyrene	48.470	252	4568966	15746.010 ng/mL	99
89) Benzo[a]pyrene	48.680	252	4259318	16122.620 ng/mL	99
90) Perylene	48.982	252	4762410	16499.352 ng/mL	99
91) Indeno[1,2,3-cd]pyrene	53.600	276	4999033M3	16959.496 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.655	278	4548665	17075.550 ng/mL	97
93) Benzo[g,h,i]perylene	54.953	276	5114113	16284.193 ng/mL	98

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812829.D
Acq On : 18 Nov 2012 6:13 pm
Operator : AC
Sample : i811181207
Misc : 17 whaq89
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 12:14:02 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

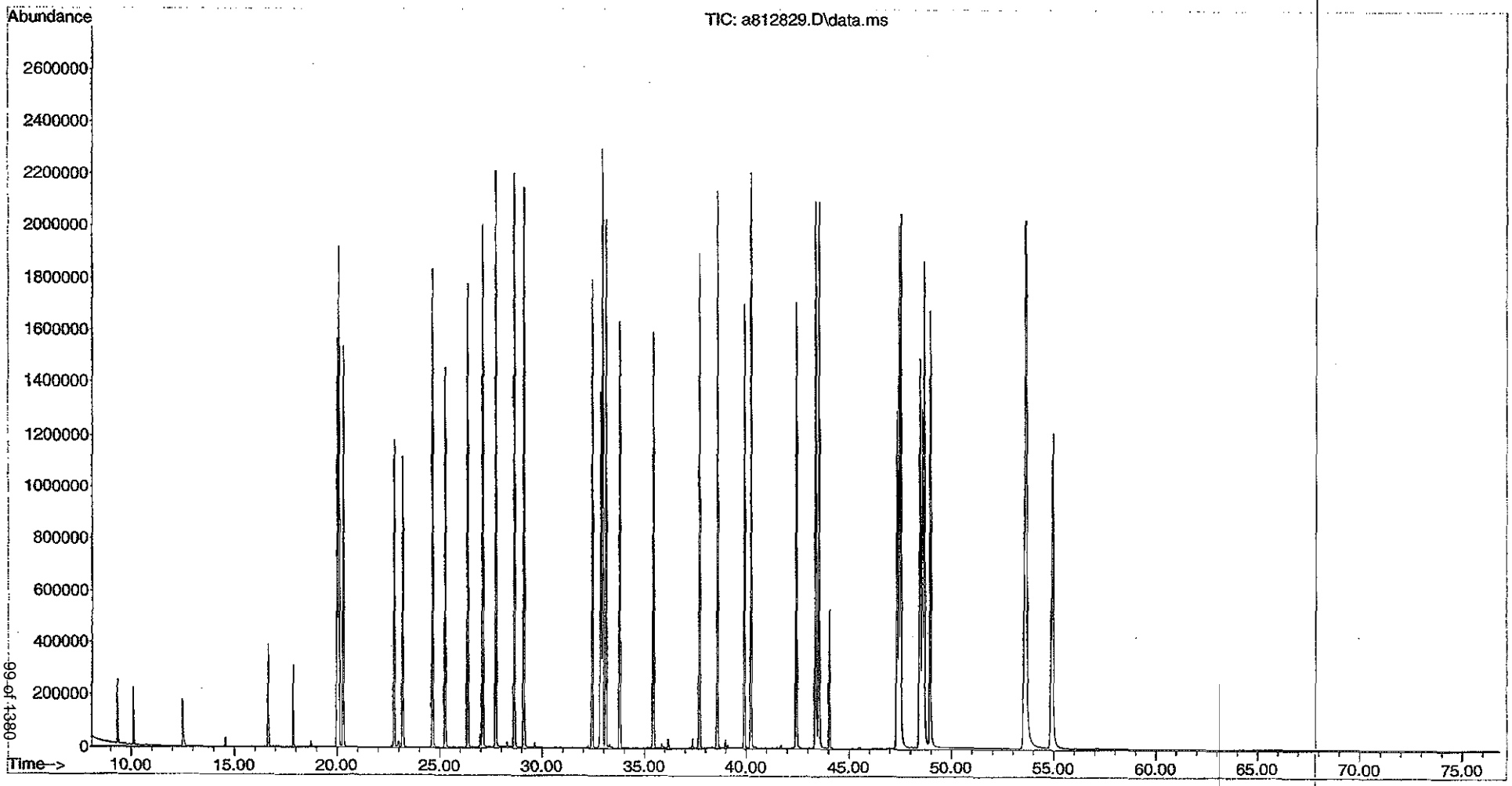
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812829.D
Acq On : 18 Nov 2012 6:13 pm
Operator : AC
Sample : i811181207
Misc : 17 whaq89
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 12:14:02 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



99 of 1380

1526

Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

JGK (11/21/12)

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	114	0.00
3	A1	trans-Decalin	0.444	0.398	10.4	107	0.00
4	t	cis-Decalin	0.326	0.298	8.6	109	0.00
9	s	Naphthalene-d8	1.982	1.965	0.9	100	0.00
10	A1	Naphthalene	2.267	2.409	-6.3	109	0.00
16	t	2-Methylnaphthalene	1.350	1.377	-2.0	107	0.00
17	t	1-Methylnaphthalene	1.264	1.386	-9.7	113	0.00
18	A1	Benzothiophene	1.832	1.872	-2.2	108	0.00
23	t	Biphenyl	1.718	1.793	-4.4	111	0.00
24	t	2,6-Dimethylnaphthalene	1.156	1.208	-4.5	110	0.00
25	t	Dibenzofuran	1.812	1.866	-3.0	110	0.00
26	t	Acenaphthylene	2.058	2.150	-4.5	110	0.00
27	t	Acenaphthene	1.228	1.293	-5.3	110	0.00
28	t	2,3,5-Trimethylnaphthalene	0.995	1.027	-3.2	111	0.00
29	A1	Fluorene	1.377	1.437	-4.4	111	0.00
33	A1	Dibenzothiophene	1.894	1.999	-5.5	114	0.00
42	s	Phenanthrene-d10	1.539	1.564	-1.6	105	0.00
43	A1	Phenanthrene	1.823	1.949	-6.9	112	0.00
54	t	Retene	0.423	0.505	-19.4	134	0.00
55	t	Anthracene	1.699	1.918	-12.9	116	0.00
56	t	Carbazole	1.772	1.903	-7.4	116	0.00
57	t	1-Methylphenanthrene	1.292	1.378	-6.7	116	0.00
58	A1	Fluoranthene	1.878	2.050	-9.2	116	0.00
59	t	Benzo(b)fluorene	1.086	1.174	-8.1	120	0.00
60	A1	Pyrene	1.900	2.050	-7.9	116	0.00
66	A1	Naphthobenzothiophene	1.763	1.831	-3.9	114	0.00
67	A2	Naphthobenzothiophene-2,1-D	1.763	1.831	-3.9	114	0.00
74	i	Chrysene-d12	1.000	1.000	0.0	115	0.00
75	t	Benz[a]anthracene	1.096	1.154	-5.3	116	0.00
76	A1	Chrysene	1.110	1.157	-4.2	116	0.00
77	A2	Chrysene/Triphenylene	1.110	1.157	-4.2	116	0.00
83	s	Benzo[b]fluoranthene-d12	0.953	1.006	-5.6	120	0.00
84	t	Benzo[b]fluoranthene	1.177	1.292	-9.8	126	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.284	1.426	-11.1	123	0.00
87	t	Benzo[e]pyrene	1.213	1.273	-4.9	125	0.00
88	s	Benzo[a]pyrene-d12	0.941	0.943	-0.2	112	0.00
89	t	Benzo[a]pyrene	1.122	1.232	-9.8	129	0.00
90	t	Perylene	1.226	1.290	-5.2	127	0.00
91	t	Indeno[1,2,3-cd]pyrene	1.192	1.282	-7.6	135	0.00
92	t	Dibenz[ah]+[ac]anthracene	1.168	1.273	-9.0	121	0.00
93	t	Benzo[g,h,i]perylene	1.353	1.399	-3.4	119	0.00
94	A1	Hopane (T19)	0.376	0.000#	100.0#	0#	-52.61#
95	A2	17a(H),21B(H)-hopane - C30H	0.376	0.000#	100.0#	0#	-52.61#
129	SA1	5B(H)Cholane - Surr	0.183	0.000#	100.0#	0#	-44.04#

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			0.97	0.70 - 1.30	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

JJK (11/21/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	76200	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	108107	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	149700	495.723	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.57%#			
42) Phenanthrene-d10	32.852	188	119182	508.212	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.82%			
83) Benzo[b]fluoranthene-d12	47.317	264	108723	527.689	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.77%			
88) Benzo[a]pyrene-d12	48.524	264	101902	500.603	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.06%			
129) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	15182	224.200	ng/mL	100
4) cis-Decalin	17.869	138	11364	229.077	ng/mL	100
10) Naphthalene	20.087	128	183554	531.304	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	104911	509.782	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	105607	548.020	ng/mL#	100
18) Benzothiophene	20.306	134	142658	510.866	ng/mL	100
23) Biphenyl	24.668	154	136659	521.940	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	92071	522.755	ng/mL#	100
25) Dibenzofuran	27.761	168	142154	514.633	ng/mL	98
26) Acenaphthylene	26.365	152	163856M3	522.523	ng/mL	
27) Acenaphthene	27.104	153	98512	526.316	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	28.665	170	78294	516.137	ng/mL	96
29) Fluorene	29.130	166	109490	521.553	ng/mL	100
33) Dibenzothiophene	32.442	184	152334	527.691	ng/mL	100
43) Phenanthrene	32.935	178	148490	534.419	ng/mL	100
54) Retene	39.909	234	38463	596.909	ng/mL	98
55) Anthracene	33.126	178	146151M3	564.604	ng/mL	
56) Carbazole	33.792	167	144987	536.791	ng/mL	100
57) 1-Methylphenanthrene	35.445	192	105021	533.212	ng/mL	99
58) Fluoranthene	37.708	202	156178	545.687	ng/mL	100
59) Benzo(b)fluorene	40.219	216	89486	540.502	ng/mL	99
60) Pyrene	38.585	202	156214	539.619	ng/mL	98
66) Naphthobenzothiophene	42.429	234	139506	519.127	ng/ml#	64
67) Naphthobenzothiophene-2,1	42.429	234	139506	519.127	ng/mL#	64
75) Benz[a]anthracene	43.360	228	124735	526.318	ng/mL	100
76) Chrysene	43.524	228	125061	521.316	ng/mL	100
77) Chrysene/Triphenylene	43.524	228	125061	521.316	ng/mL	100
84) Benzo[b]fluoranthene	47.399	252	139628	548.570	ng/mL	97
85) Benzo[j]+[k]fluoranthene	47.482	252	154164	555.106	ng/mL	95
87) Benzo[e]pyrene	48.424	252	137633	524.796	ng/mL	96
89) Benzo[a]pyrene	48.616	252	133173	548.946	ng/mL	95
90) Perylene	48.927	252	139465	526.300	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.518	276	138611M3	537.871	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.582	278	137662	544.970	ng/mL	99
93) Benzo[g,h,i]perylene	54.852	276	151193	516.982	ng/mL	99

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

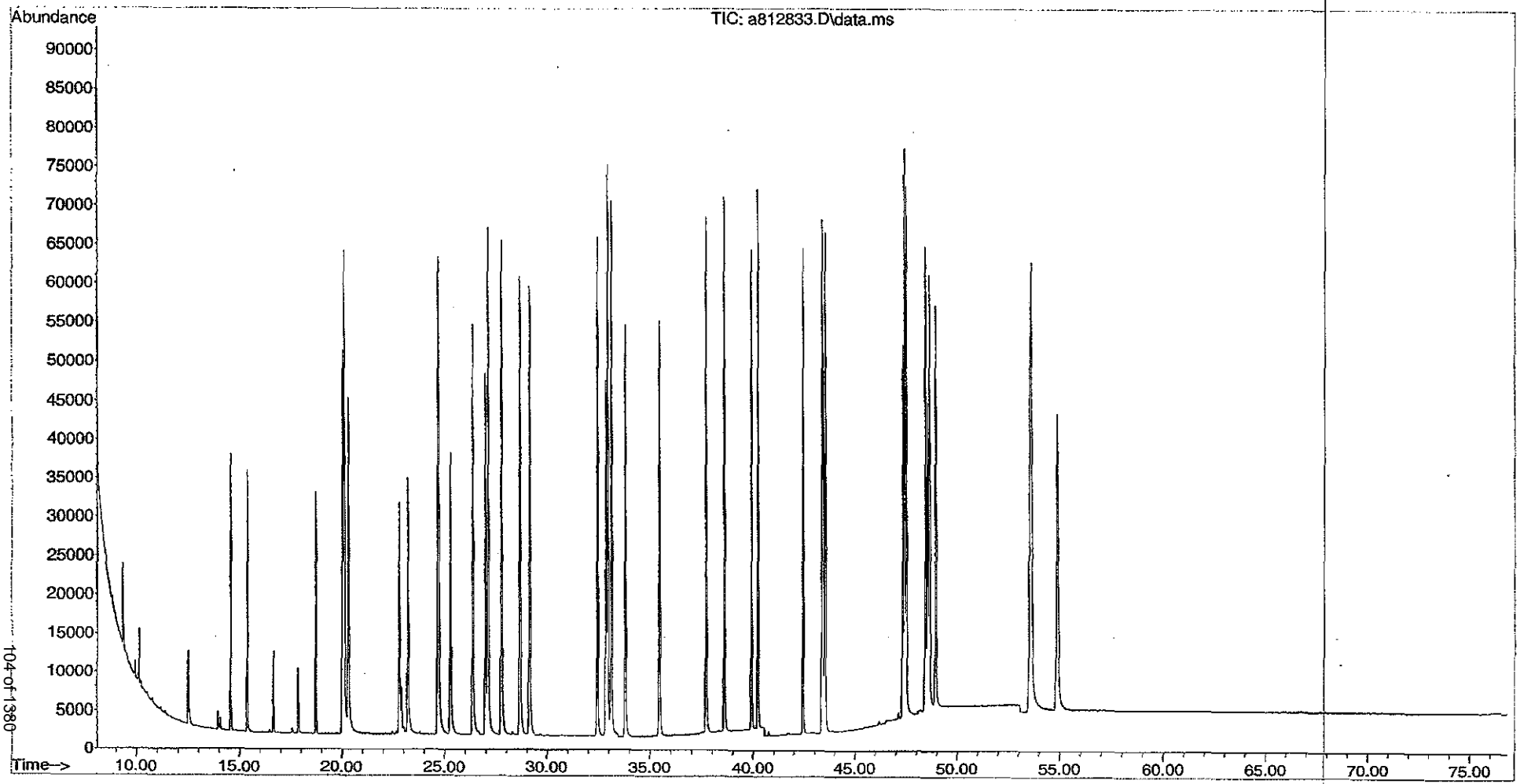
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812839.D
Acq On : 19 Nov 2012 10:00 am
Operator : AC
Sample : c811181202
Misc : cc whaq86 500ng/ml
ALS Vial : 20 Sample Multiplier: 1

Quant Time: Nov 20 14:45:06 2012
Quant Method : O:\Forensics\Data\PAH8\Nov12\nov18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 10:01:17 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	115	0.00
3	A1	trans-Decalin	0.444	0.406	8.6	110	0.00
4	t	cis-Decalin	0.326	0.305	6.4	113	0.00
9	s	Naphthalene-d8	1.982	2.146	-8.3	110	0.00
10	A1	Naphthalene	2.267	2.445	-7.9	111	0.00
16	t	2-Methylnaphthalene	1.350	1.436	-6.4	113	0.00
17	t	1-Methylnaphthalene	1.264	1.375	-8.8	113	0.00
18	A1	Benzothiophene	1.832	1.912	-4.4	111	0.00
23	t	Biphenyl	1.718	1.813	-5.5	113	0.00
24	t	2,6-Dimethylnaphthalene	1.156	1.248	-8.0	114	0.00
25	t	Dibenzofuran	1.812	1.908	-5.3	113	0.00
26	t	Acenaphthylene	2.058	2.232	-8.5	115	0.00
27	t	Acenaphthene	1.228	1.332	-8.5	114	0.00
28	t	2,3,5-Trimethylnaphthalene	0.995	1.063	-6.8	116	0.00
29	A1	Fluorene	1.377	1.481	-7.6	116	0.00
33	A1	Dibenzothiophene	1.894	2.008	-6.0	115	0.00
42	s	Phenanthrene-d10	1.539	1.692	-9.9	114	0.00
43	A1	Phenanthrene	1.823	1.956	-7.3	113	0.00
54	t	Retene	0.423	0.452	-6.9	121	0.00
55	t	Anthracene	1.699	1.925	-13.3	117	0.00
56	t	Carbazole	1.772	1.903	-7.4	117	0.00
57	t	1-Methylphenanthrene	1.292	1.372	-6.2	116	0.00
58	A1	Fluoranthene	1.878	2.049	-9.1	117	0.00
59	t	Benzo(b)fluorene	1.086	1.180	-8.7	121	0.00
60	A1	Pyrene	1.900	2.050	-7.9	117	0.00
66	A1	Naphthobenzothiophene	1.763	1.944	-10.3	122	0.00
67	A2	Naphthobenzothiophene-2,1-D	1.763	1.944	-10.3	122	0.00
74	i	Chrysene-d12	1.000	1.000	0.0	118	0.00
75	t	Benz[a]anthracene	1.096	1.197	-9.2	124	0.00
76	A1	Chrysene	1.110	1.170	-5.4	120	0.00
77	A2	Chrysene/Triphenylene	1.110	1.170	-5.4	120	0.00
83	s	Benzo[b]fluoranthene-d12	0.953	1.014	-6.4	124	0.00
84	t	Benzo[b]fluoranthene	1.177	1.273	-8.2	127	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.284	1.357	-5.7	120	0.00
87	t	Benzo[e]pyrene	1.213	1.225	-1.0	123	0.00
88	s	Benzo[a]pyrene-d12	0.941	1.038	-10.3	126	0.00
89	t	Benzo[a]pyrene	1.122	1.156	-3.0	124	0.00
90	t	Perylene	1.226	1.251	-2.0	126	0.00
91	t	Indeno[1,2,3-cd]pyrene	1.192	1.283	-7.6	139	0.00
92	t	Dibenz[ah]+[ac]anthracene	1.168	1.277	-9.3	125	0.00
93	t	Benzo[g,h,i]perylene	1.353	1.448	-7.0	127	0.02
94	A1	Hopane (T19)	0.376	0.357	5.1	119	0.00
95	A2	17a(H),21B(H)-hopane - C30H	0.376	0.357	5.1	119	0.00
129	SA1	5B(H)Cholane - Surr	0.183	0.181	1.1	122	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812839.D
Acq On : 19 Nov 2012 10:00 am
Operator : AC
Sample : c811181202
Misc : cc whaq86 500ng/ml
ALS Vial : 20 Sample Multiplier: 1

Quant Time: Nov 20 14:45:06 2012
Quant Method : O:\Forensics\Data\PAH8\Nov12\nov18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 10:01:17 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area% Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			1.00	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812839.D
Acq On : 19 Nov 2012 10:00 am
Operator : AC
Sample : c811181202
Misc : cc whaq86 500ng/ml
ALS Vial : 20 Sample Multiplier: 1

Quant Time: Nov 20 14:45:06 2012
Quant Method : O:\Forensics\Data\PAH8\Nov12\nov18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 10:01:17 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	76819	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	111004	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	164833	541.437	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.14%			
42) Phenanthrene-d10	32.853	188	129983	549.803	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.98%			
83) Benzo[b]fluoranthene-d12	47.327	264	112537	531.946	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.19%			
88) Benzo[a]pyrene-d12	48.534	264	115194	551.132	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.11%			
129) 5B(H)Cholane - Surr	44.036	217	20114	495.542	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.55%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	15577	228.180	ng/mL	100
4) cis-Decalin	17.870	138	11714	234.230	ng/mL	100
10) Naphthalene	20.087	128	187811	539.246	ng/mL#	100
16) 2-Methylnaphthalene	22.798	142	110333	531.809	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	105662	543.887	ng/mL#	100
18) Benzothiophene	20.306	134	146876	521.733	ng/mL	100
23) Biphenyl	24.677	154	139248	527.543	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	95834	539.736	ng/mL#	100
25) Dibenzofuran	27.762	168	146597	526.442	ng/mL	98
26) Acenaphthylene	26.375	152	171464M4	542.379	ng/mL	
27) Acenaphthene	27.105	153	102312	542.214	ng/mL	100
28) 2,3,5-Trimethylnaphthalen	28.665	170	81676	534.093	ng/mL	97
29) Fluorene	29.140	166	113786	537.650	ng/mL	99
33) Dibenzothiophene	32.451	184	154224	529.933	ng/mL	100
43) Phenanthrene	32.944	178	150243	536.371	ng/mL	99
54) Retene	39.918	234	34697	534.125	ng/mL	97
55) Anthracene	33.126	178	147846M4	566.550	ng/mL	
56) Carbazole	33.802	167	146205	536.939	ng/mL	100
57) 1-Methylphenanthrene	35.454	192	105376	530.703	ng/mL	100
58) Fluoranthene	37.709	202	157424	545.609	ng/mL	100
59) Benzo(b)fluorene	40.229	216	90642	543.073	ng/mL	99
60) Pyrene	38.594	202	157458	539.533	ng/mL	98
66) Naphthobenzothiophene	42.438	234	149335	551.224	ng/ml#	64
67) Naphthobenzothiophene-2,1	42.438	234	149335	551.224	ng/mL#	64
75) Benz[a]anthracene	43.360	228	132899	546.131	ng/mL	100
76) Chrysene	43.525	228	129866	527.217	ng/mL	99
77) Chrysene/Triphenylene	43.525	228	129866	527.217	ng/mL	99
84) Benzo[b]fluoranthene	47.409	252	141263	540.510	ng/mL	97
85) Benzo[j]+[k]fluoranthene	47.491	252	150617	528.180	ng/mL	95
87) Benzo[e]pyrene	48.424	252	135952	504.857	ng/mL	96
89) Benzo[a]pyrene	48.625	252	128333	515.190	ng/mL	95
90) Perylene	48.946	252	138893	510.462	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.527	276	142449M5	538.338	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.591	278	141777	546.613	ng/mL	99
93) Benzo[g,h,i]perylene	54.871	276	160700	535.149	ng/mL	99
94) Hopane (T19)	52.613	191	39676	475.928	ng/mL#	88

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812839.D
Acq On : 19 Nov 2012 10:00 am
Operator : AC
Sample : c811181202
Misc : cc whaq86 500ng/ml
ALS Vial : 20 Sample Multiplier: 1

Quant Time: Nov 20 14:45:06 2012
Quant Method : O:\Forensics\Data\PAH8\Nov12\nov18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 10:01:17 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.613	191	39676	475.928	ng/mL#	88

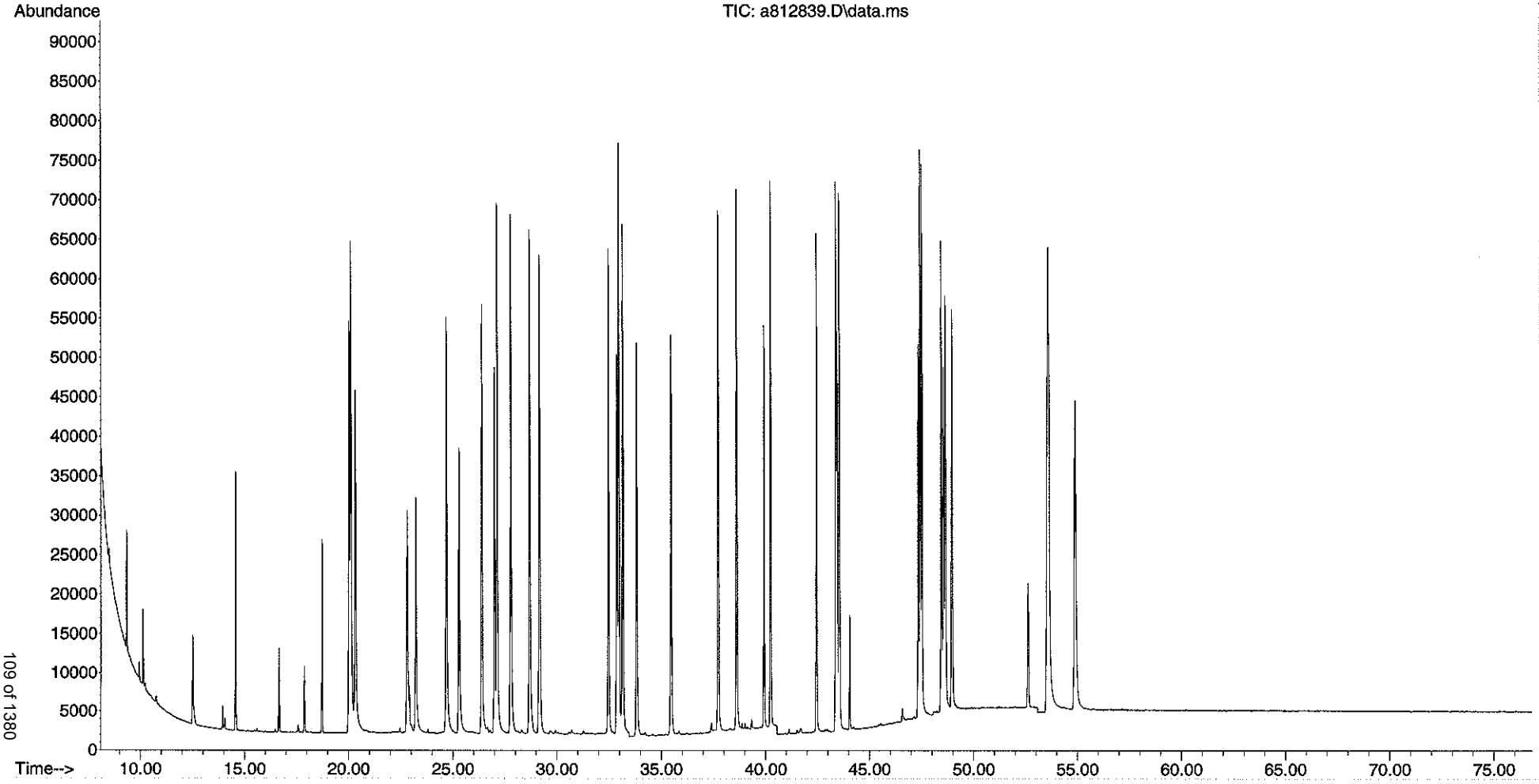
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812839.D
Acq On : 19 Nov 2012 10:00 am
Operator : AC
Sample : c811181202
Misc : cc whaq86 500ng/ml
ALS Vial : 20 Sample Multiplier: 1

Quant Time: Nov 20 14:45:06 2012
Quant Method : O:\Forensics\Data\PAH8\Nov12\nov18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 10:01:17 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	87	0.02
3	A1	trans-Decalin	0.444	0.416	6.3	86	0.00
4	t	cis-Decalin	0.326	0.303	7.1	85	0.00
9	s	Naphthalene-d8	1.982	2.034	-2.6	79	0.00
10	A1	Naphthalene	2.267	2.376	-4.8	82	0.00
16	t	2-Methylnaphthalene	1.350	1.383	-2.4	83	0.03
17	t	1-Methylnaphthalene	1.264	1.309	-3.6	81	0.02
18	A1	Benzothiophene	1.832	1.852	-1.1	82	0.02
23	t	Biphenyl	1.718	1.792	-4.3	85	0.02
24	t	2,6-Dimethylnaphthalene	1.156	1.240	-7.3	86	0.02
25	t	Dibenzofuran	1.812	1.912	-5.5	86	0.02
26	t	Acenaphthylene	2.058	2.209	-7.3	86	0.00
27	t	Acenaphthene	1.228	1.318	-7.3	86	0.00
28	t	2,3,5-Trimethylnaphthalene	0.995	1.059	-6.4	87	0.00
29	A1	Fluorene	1.377	1.490	-8.2	88	0.03
33	A1	Dibenzothiophene	1.894	1.988	-5.0	87	0.03
42	s	Phenanthrene-d10	1.539	1.682	-9.3	86	0.02
43	A1	Phenanthrene	1.823	1.916	-5.1	84	0.03
54	t	Retene	0.423	0.476	-12.5	97	0.02
55	t	Anthracene	1.699	2.019	-18.8	94	0.02
56	t	Carbazole	1.772	1.939	-9.4	91	0.03
57	t	1-Methylphenanthrene	1.292	1.392	-7.7	90	0.02
58	A1	Fluoranthene	1.878	2.086	-11.1	90	0.02
59	t	Benzo(b)fluorene	1.086	1.269	-16.9	99	0.03
60	A1	Pyrene	1.900	2.096	-10.3	91	0.00
66	A1	Naphthobenzothiophene	1.763	1.966	-11.5	94	0.03
67	A2	Naphthobenzothiophene-2,1-D	1.763	1.966	-11.5	94	0.03
74	i	Chrysene-d12	1.000	1.000	0.0	91	0.03
75	t	Benz[a]anthracene	1.096	1.226	-11.9	98	0.02
76	A1	Chrysene	1.110	1.180	-6.3	93	0.03
77	A2	Chrysene/Triphenylene	1.110	1.180	-6.3	93	0.03
83	s	Benzo[b]fluoranthene-d12	0.953	1.028	-7.9	97	0.02
84	t	Benzo[b]fluoranthene	1.177	1.310	-11.3	101	0.03
85	A1	Benzo[j]+[k]fluoranthene	1.284	1.374	-7.0	94	0.02
87	t	Benzo[e]pyrene	1.213	1.259	-3.8	98	0.03
88	s	Benzo[a]pyrene-d12	0.941	1.087	-15.5	102	0.03
89	t	Benzo[a]pyrene	1.122	1.226	-9.3	102	0.03
90	t	Perylene	1.226	1.319	-7.6	103	0.03
91	t	Indeno[1,2,3-cd]pyrene	1.192	1.423	-19.4	119	0.05
92	t	Dibenz[ah]+[ac]anthracene	1.168	1.446	-23.8	109	0.05
93	t	Benzo[g,h,i]perylene	1.353	1.535	-13.5	104	0.05
94	A1	Hopane (T19)	0.376	0.392	-4.3	101	0.02
95	A2	17a(H),21B(H)-hopane - C30H	0.376	0.392	-4.3	101	0.02
129	SA1	5B(H)Cholane - Surr	0.183	0.189	-3.3	99	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
Benzo[g,h,i]perylene to Phenanthrene			1.08	0.70 - 1.30	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

11/20/12

Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.995	164	58340	500.000	ng/mL	0.02
74) Chrysene-d12	43.442	240	85651	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.023	136	118675	513.293	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.33%			
42) Phenanthrene-d10	32.871	188	98130	546.543	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.65%			
83) Benzo[b]fluoranthene-d12	47.336	264	88067	539.500	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.95%			
88) Benzo[a]pyrene-d12	48.552	264	93140	577.522	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.75%			
129) 5B(H)Cholane - Surr	44.045	217	16203	517.349	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.73%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	12129	233.949	ng/mL	100
4) cis-Decalin	17.879	138	8852	233.067	ng/mL	100
10) Naphthalene	20.096	128	138614	524.053	ng/mL#	100
16) 2-Methylnaphthalene	22.816	142	80683	512.076	ng/mL#	100
17) 1-Methylnaphthalene	23.226	142	76391	517.767	ng/mL#	100
18) Benzothiophene	20.324	134	108070	505.481	ng/mL	100
23) Biphenyl	24.686	154	104527	521.434	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.298	156	72370	536.688	ng/mL#	100
25) Dibenzofuran	27.780	168	111571	527.568	ng/mL	98
26) Acenaphthylene	26.384	152	128850M3	536.681	ng/mL	
27) Acenaphthene	27.114	153	76915	536.731	ng/mL	100
28) 2,3,5-Trimethylnaphthalen	28.674	170	61753	531.720	ng/mL	97
29) Fluorene	29.158	166	86931	540.863	ng/mL	100
33) Dibenzothiophene	32.469	184	115967	524.693	ng/mL	100
43) Phenanthrene	32.962	178	111807	525.585	ng/mL	100
54) Retene	39.927	234	27799	563.485	ng/mL	96
55) Anthracene	33.145	178	117806M4	594.426	ng/mL	
56) Carbazole	33.820	167	113104	546.944	ng/mL	99
57) 1-Methylphenanthrene	35.463	192	81232	538.690	ng/mL	100
58) Fluoranthene	37.727	202	121670	555.259	ng/mL	100
59) Benzo(b)fluorene	40.247	216	74023	583.980	ng/mL	99
60) Pyrene	38.603	202	122261	551.625	ng/mL	99
66) Naphthobenzothiophene	42.456	234	114718	557.572	ng/ml#	63
67) Naphthobenzothiophene-2,1	42.456	234	114718	557.572	ng/mL#	63
75) Benz[a]anthracene	43.379	228	104982	559.108	ng/mL	100
76) Chrysene	43.543	228	101038	531.600	ng/mL	99
77) Chrysene/Triphenylene	43.543	228	101038	531.600	ng/mL	99
84) Benzo[b]fluoranthene	47.427	252	112219	556.477	ng/mL	95
85) Benzo[j]+[k]fluoranthene	47.509	252	117688	534.868	ng/mL	97
87) Benzo[e]pyrene	48.451	252	107811	518.863	ng/mL	96
89) Benzo[a]pyrene	48.644	252	105018	546.385	ng/mL	94
90) Perylene	48.964	252	112960	538.040	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.564	276	121870M3	596.896	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.628	278	123844	618.807	ng/mL	98
93) Benzo[g,h,i]perylene	54.898	276	131455	567.339	ng/mL	100
94) Hopane (T19)	52.631	191	33536	521.352	ng/mL#	89

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.631	191	33536	521.352	ng/mL#	89

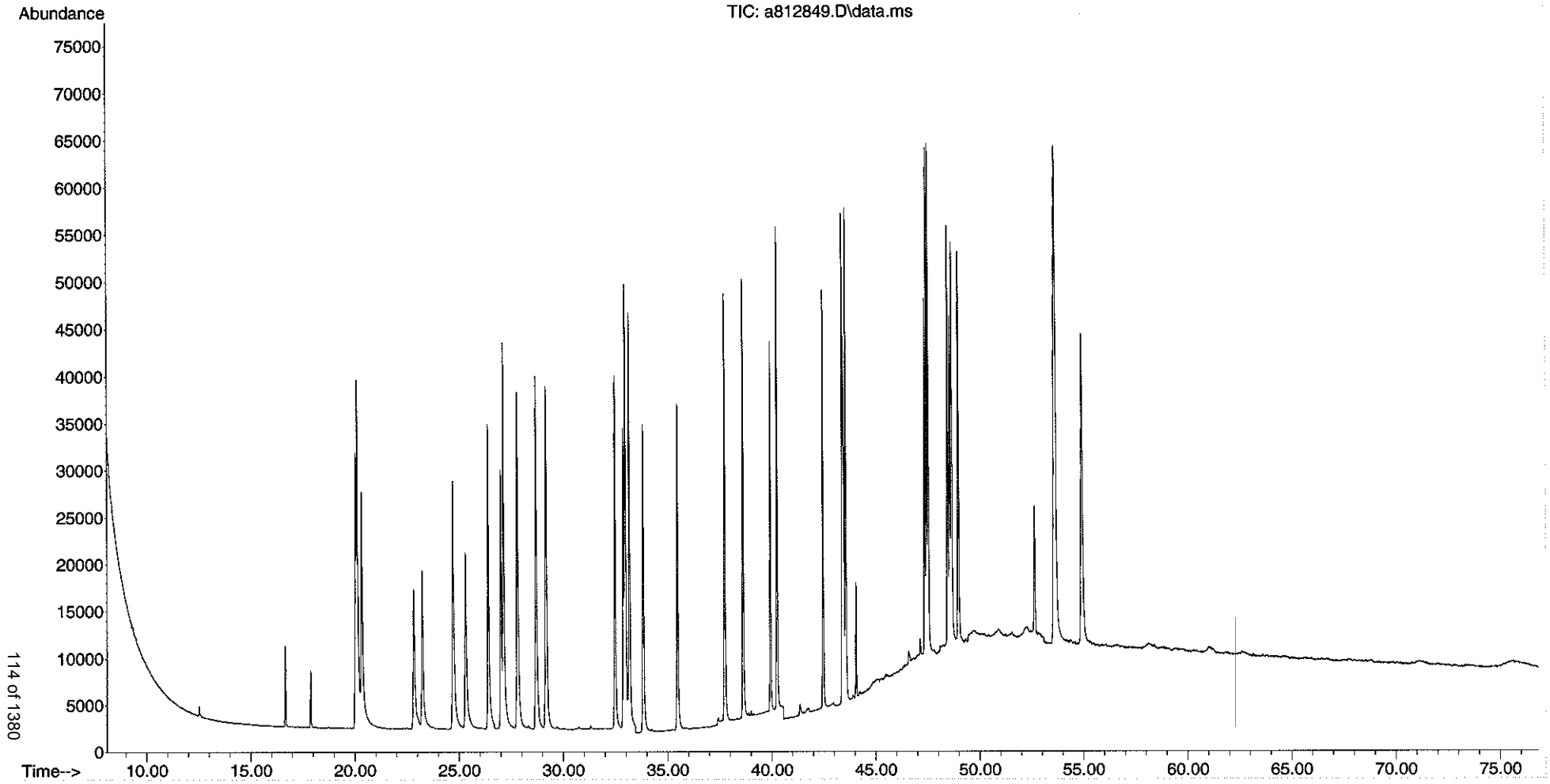
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	97	0.03
3	A1	trans-Decalin	0.444	0.412	7.2	95	0.00
4	t	cis-Decalin	0.326	0.307	5.8	96	0.00
9	s	Naphthalene-d8	1.982	1.984	-0.1	86	0.00
10	A1	Naphthalene	2.267	2.320	-2.3	89	0.02
16	t	2-Methylnaphthalene	1.350	1.364	-1.0	91	0.03
17	t	1-Methylnaphthalene	1.264	1.300	-2.8	90	0.02
18	A1	Benzothiophene	1.832	1.821	0.6	90	0.02
23	t	Biphenyl	1.718	1.783	-3.8	94	0.03
24	t	2,6-Dimethylnaphthalene	1.156	1.242	-7.4	96	0.03
25	t	Dibenzofuran	1.812	1.920	-6.0	96	0.03
26	t	Acenaphthylene	2.058	2.192	-6.5	95	0.02
27	t	Acenaphthene	1.228	1.323	-7.7	96	0.02
28	t	2,3,5-Trimethylnaphthalene	0.995	1.074	-7.9	99	0.02
29	A1	Fluorene	1.377	1.496	-8.6	99	0.04
33	A1	Dibenzothiophene	1.894	2.022	-6.8	98	0.04
42	s	Phenanthrene-d10	1.539	1.751	-13.8	100	0.03
43	A1	Phenanthrene	1.823	1.918	-5.2	94	0.04
54	t	Retene	0.423	0.511	-20.8	115	0.03
55	t	Anthracene	1.699	1.988	-17.0	103	0.04
56	t	Carbazole	1.772	1.968	-11.1	103	0.04
57	t	1-Methylphenanthrene	1.292	1.422	-10.1	102	0.03
58	A1	Fluoranthene	1.878	2.114	-12.6	102	0.03
59	t	Benzo(b)fluorene	1.086	1.350	-24.3	117	0.04
60	A1	Pyrene	1.900	2.129	-12.1	103	0.03
66	A1	Naphthobenzothiophene	1.763	2.032	-15.3	108	0.04
67	A2	Naphthobenzothiophene-2,1-D	1.763	2.032	-15.3	108	0.04
74	i	Chrysene-d12	1.000	1.000	0.0	106	0.04
75	t	Benz[a]anthracene	1.096	1.237	-12.9	114	0.04
76	A1	Chrysene	1.110	1.177	-6.0	108	0.04
77	A2	Chrysene/Triphenylene	1.110	1.177	-6.0	108	0.04
83	s	Benzo[b]fluoranthene-d12	0.953	1.042	-9.3	114	0.04
84	t	Benzo[b]fluoranthene	1.177	1.266	-7.6	113	0.05
85	A1	Benzo[j]+[k]fluoranthene	1.284	1.428	-11.2	113	0.04
87	t	Benzo[e]pyrene	1.213	1.261	-4.0	113	0.04
88	s	Benzo[a]pyrene-d12	0.941	1.099	-16.8	119	0.05
89	t	Benzo[a]pyrene	1.122	1.233	-9.9	118	0.05
90	t	Perylene	1.226	1.341	-9.4	121	0.05
91	t	Indeno[1,2,3-cd]pyrene	1.192	1.391	-16.7	134	0.07
92	t	Dibenz[ah]+[ac]anthracene	1.168	1.363	-16.7	119	0.07
93	t	Benzo[g,h,i]perylene	1.353	1.429	-5.6	112	0.08
94	A1	Hopane (T19)	0.376	0.367	2.4	109	0.04
95	A2	17a(H),21B(H)-hopane - C30H	0.376	0.367	2.4	109	0.04
129	SA1	5B(H)Cholane - Surr	0.183	0.188	-2.7	114	0.02

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
Benzo[g,h,i]perylene to Phenanthrene		1.00		0.70 - 1.30	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.004	164	64940	500.000	ng/mL	0.03
74) Chrysene-d12	43.452	240	99128	500.000	ng/mL	0.04
System Monitoring Compounds						
9) Naphthalene-d8	20.023	136	128810	500.507	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.05%			
42) Phenanthrene-d10	32.880	188	113702	568.912	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 56.89%			
83) Benzo[b]fluoranthene-d12	47.354	264	103295	546.756	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.68%			
88) Benzo[a]pyrene-d12	48.570	264	108978	583.858	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 58.39%			
129) 5B(H)Cholane - Surr	44.054	217	18666	514.962	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.50%			
Target Compounds						Qvalue
3) trans-Decalin	16.665	138	13369	231.659	ng/mL	100
4) cis-Decalin	17.879	138	9955	235.470	ng/mL	100
10) Naphthalene	20.105	128	150630	511.604	ng/mL#	100
16) 2-Methylnaphthalene	22.816	142	88546	504.865	ng/mL#	100
17) 1-Methylnaphthalene	23.226	142	84441	514.161	ng/mL#	100
18) Benzothiophene	20.324	134	118225	496.778	ng/mL	100
23) Biphenyl	24.696	154	115810	519.005	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.307	156	80624	537.133	ng/mL#	100
25) Dibenzofuran	27.789	168	124673	529.607	ng/mL	99
26) Acenaphthylene	26.393	152	142327M3	532.566	ng/mL	
27) Acenaphthene	27.123	153	85902	538.522	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	28.683	170	69755	539.578	ng/mL	97
29) Fluorene	29.167	166	97149	543.007	ng/mL	100
33) Dibenzothiophene	32.479	184	131301	533.695	ng/mL	99
43) Phenanthrene	32.971	178	124571	526.071	ng/mL	100
54) Retene	39.937	234	33166	603.950	ng/mL	97
55) Anthracene	33.163	178	129075M3	585.096	ng/mL	
56) Carbazole	33.829	167	127771	555.074	ng/mL	99
57) 1-Methylphenanthrene	35.472	192	92360	550.237	ng/mL	100
58) Fluoranthene	37.736	202	137280	562.826	ng/mL	99
59) Benzo(b)fluorene	40.256	216	87662	621.293	ng/mL	99
60) Pyrene	38.622	202	138267	560.439	ng/mL	99
66) Naphthobenzothiophene	42.466	234	131927	576.046	ng/ml#	63
67) Naphthobenzothiophene-2,1	42.466	234	131927	576.046	ng/mL#	63
75) Benz[a]anthracene	43.397	228	122582	564.084	ng/mL	100
76) Chrysene	43.552	228	116659	530.340	ng/mL	100
77) Chrysene/Triphenylene	43.552	228	116659	530.340	ng/mL	100
84) Benzo[b]fluoranthene	47.445	252	125543	537.910	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.528	252	141528	555.767	ng/mL	95
87) Benzo[e]pyrene	48.461	252	125030	519.924	ng/mL	96
89) Benzo[a]pyrene	48.662	252	122246	549.548	ng/mL	94
90) Perylene	48.982	252	132915	547.015	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.591	276	137867M3	583.443	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.655	278	135065	583.122	ng/mL	99
93) Benzo[g,h,i]perylene	54.934	276	141670	528.298	ng/mL	100
94) Hopane (T19)	52.650	191	36390	488.807	ng/mL#	88

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
95) 17a(H),21B(H)-hopane - C3	52.650	191	36390	488.807	ng/mL#	88

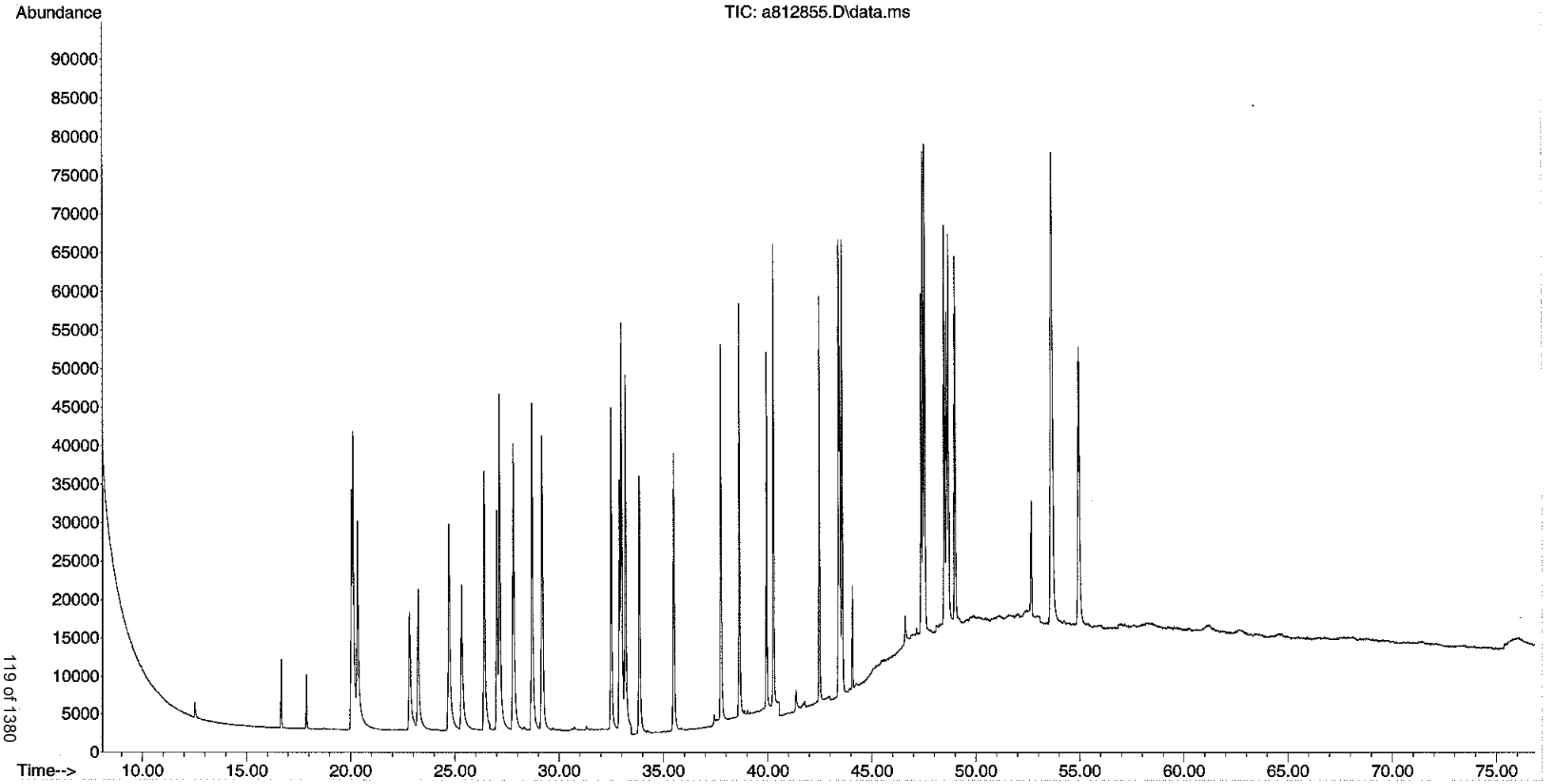
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

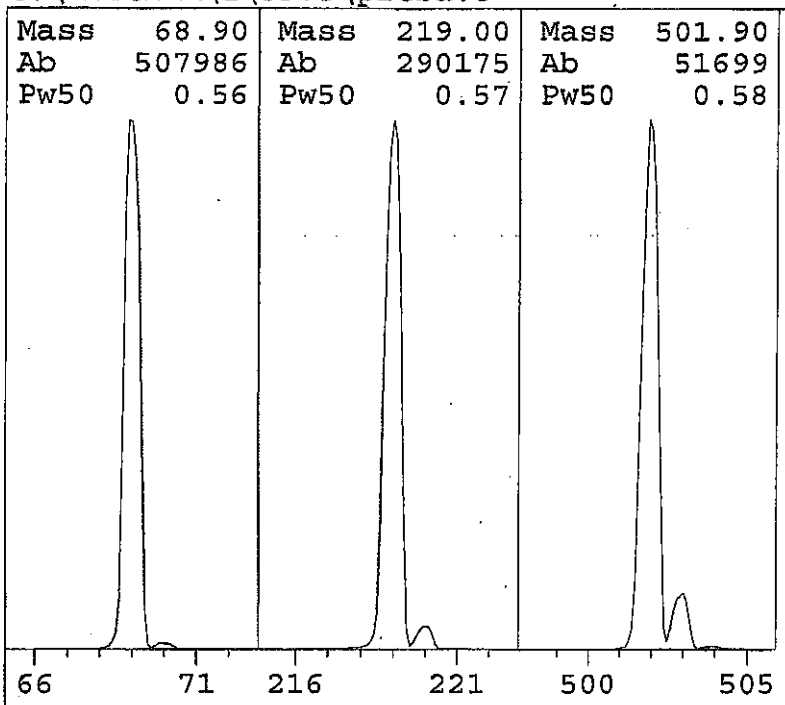


5975 Tune

9/18/12

Sun Nov 18 07:55:08 2012
C:\MSDCHEM\1\5975\pftba.U

Instrument: PAH8
US92012831

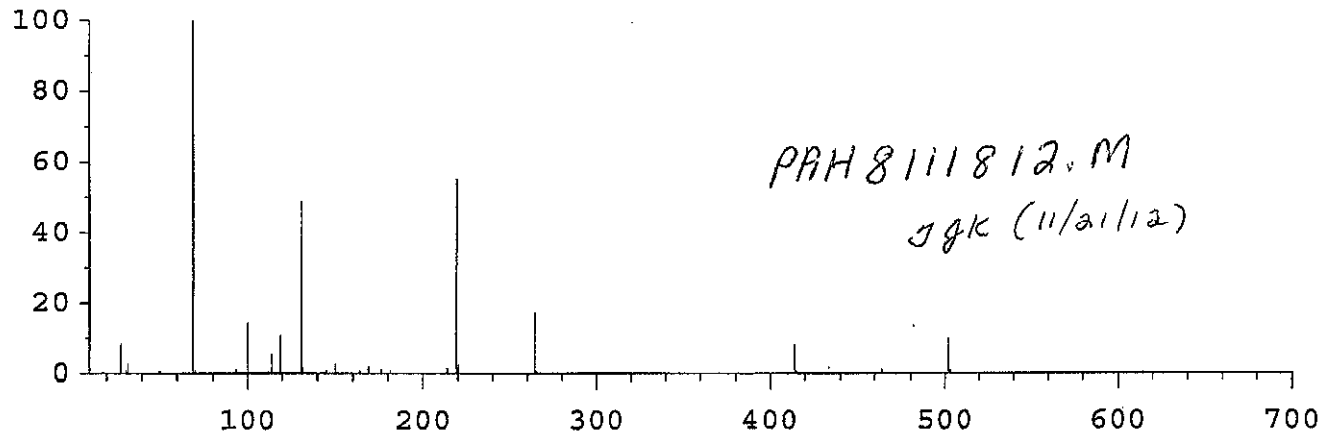


Ion Pol	Pos	MassGain	-497
		MassOffs	-40
Emission	34.6	AmuGain	2340
EIEnrgy	69.9	AmuOffs	125.19
Filament	1	Wid219	-0.011
		DC Pol	Pos
Repeller	29.79		
IonFcus	80.7	HEDEnab	On
EntLens	0.0	EMVolts	2306
EntOffs	Var		
		Samples	8
PFTBA	Open	Averages	3
		Stepsize	0.10

Temperatures and Pressures:

MS Source	230	Foreline	53.790
MS Quad	150	HiVac	0.00e+00

Scan: 10.00 - 701.00 Samples: 8 Thresh: 100 Step: 0.10
124 peaks Base: 69.00 Abundance: 482432



PAH8111812.M
JJK (11/21/12)

Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	482432	100.00	70.00	5295	1.10
219.00	266944	55.33	220.00	11940	4.47
502.00	48216	9.99	503.00	5013	10.40

Air/Water Check: H2O~0.53% N2~8.66% O2~2.74% CO2~0.35% N2/H2O~1628.06%

Ramp Criteria:
Ion Focus Maximum 90 volts using ion 502; EM Gain 91590
Repeller Maximum 30 volts using ion 219; Gain Factor 0.92

MassGain Values(Samples): -486(3) -480(2) -470(1) -445(0) -401(FS)

TARGET MASS:	50	69	131	219	414	502	1050
Amu Offset:	125.2	125.2	125.2	125.2	125.2	125.2	125.2
Entrance Lens Offset:	19.3	15.8	15.3	14.8	19.6	22.6	22.6
Target Abund(%):	1.0	100.0	45.0	50.0	7.0	8.0	
Actual Tune Abund(%):	0.9	100.0	49.0	55.3	8.3	10.0	

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	**0.112**	J	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**0.0681**	J
C4-Decalins	0.191	U	Pyrene	**0.0700**	J
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	**0.0464**	J
Naphthalene	0.130	U	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**0.0303**	J
Biphenyl	0.0604	U	Chrysene/Triphenylene	**0.0701**	J
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	0.0455	U	C2-Chrysenes	0.104	U
Acenaphthene	0.0537	U	C3-Chrysenes	0.104	U
Fluorene	**0.103**	J	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	0.168	U
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	0.119	U
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	0.0936	U	Benzo[e]pyrene	0.107	U
Phenanthrene	**0.0779**	J	Benzo[a]pyrene	0.137	U
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**0.0733**	J
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**0.0831**	J
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**0.104**	J
Retene	0.109	U			
Dibenzothiophene	**0.184**	J			
C1-Dibenzothiophenes	**0.461**	J			
C2-Dibenzothiophenes	**0.821**	J			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	79	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	79	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	**0.0905**	J
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	**0.182**	J
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	0.0863	U
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	**0.0464**	J
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	79	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	88	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812844.D
Acq On : 19 Nov 2012 5:23 pm
Operator : AC
Sample : ss110612b08
Misc : 1x etr1210082
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 20 14:18:00 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	52112M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.442	240	76269	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.023	136	81595M2	395.092	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.51%#			
42) Phenanthrene-d10	32.862	188	72757	453.655	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.37%#			
83) Benzo[b]fluoranthene-d12	47.345	264	65111	447.937	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.79%#			
88) Benzo[a]pyrene-d12	48.552	264	59277	412.765	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.28%#			
129) 5B(H)Cholane - Surr	44.045	217	12317	441.649	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.16%#			
Target Compounds						Qvalue
3) trans-Decalin	16.647	138	39M3	0.842	ng/mL	
29) Fluorene	29.121	166	111M3	0.773	ng/mL	
33) Dibenzothiophene	32.469	184	272	1.378	ng/mL#	73
34) 4-Methyldibenzothiophene(	34.230	198	134M3	0.679	ng/mL	
36) 1-Methyldibenzothiophene(	34.988	198	269	1.363	ng/mL#	100
37) OTP	34.605	198	9261	46.909	ng/mL#	100
38) C1-Dibenzothiophenes	34.605	198	9943M5	50.364	ng/mL	
39) C2-Dibenzothiophenes	36.704	212-B	1216M5	6.159	ng/mL	
43) Phenanthrene	32.953	178	111M3	0.584	ng/mL	
58) Fluoranthene	37.736	202	100M3	0.511	ng/mL	
60) Pyrene	38.631	202	104	0.525	ng/mL#	57
66) Naphthobenzothiophene	42.456	234	55M2	0.299	ng/ml	
67) Naphthobenzothiophene-2,1	42.456	234	64M2	0.348	ng/mL	
75) Benz[a]anthracene	43.378	228	38M3	0.227	ng/mL	
77) Chrysene/Triphenylene	43.543	228	89M3	0.526	ng/mL	
91) Indeno[1,2,3-cd]pyrene	53.609	276	100	0.550	ng/mL#	51
92) Dibenz[ah]+[ac]anthracene	53.646	278	111M3	0.623	ng/mL	
93) Benzo[g,h,i]perylene	54.925	276	161M3	0.780	ng/mL	

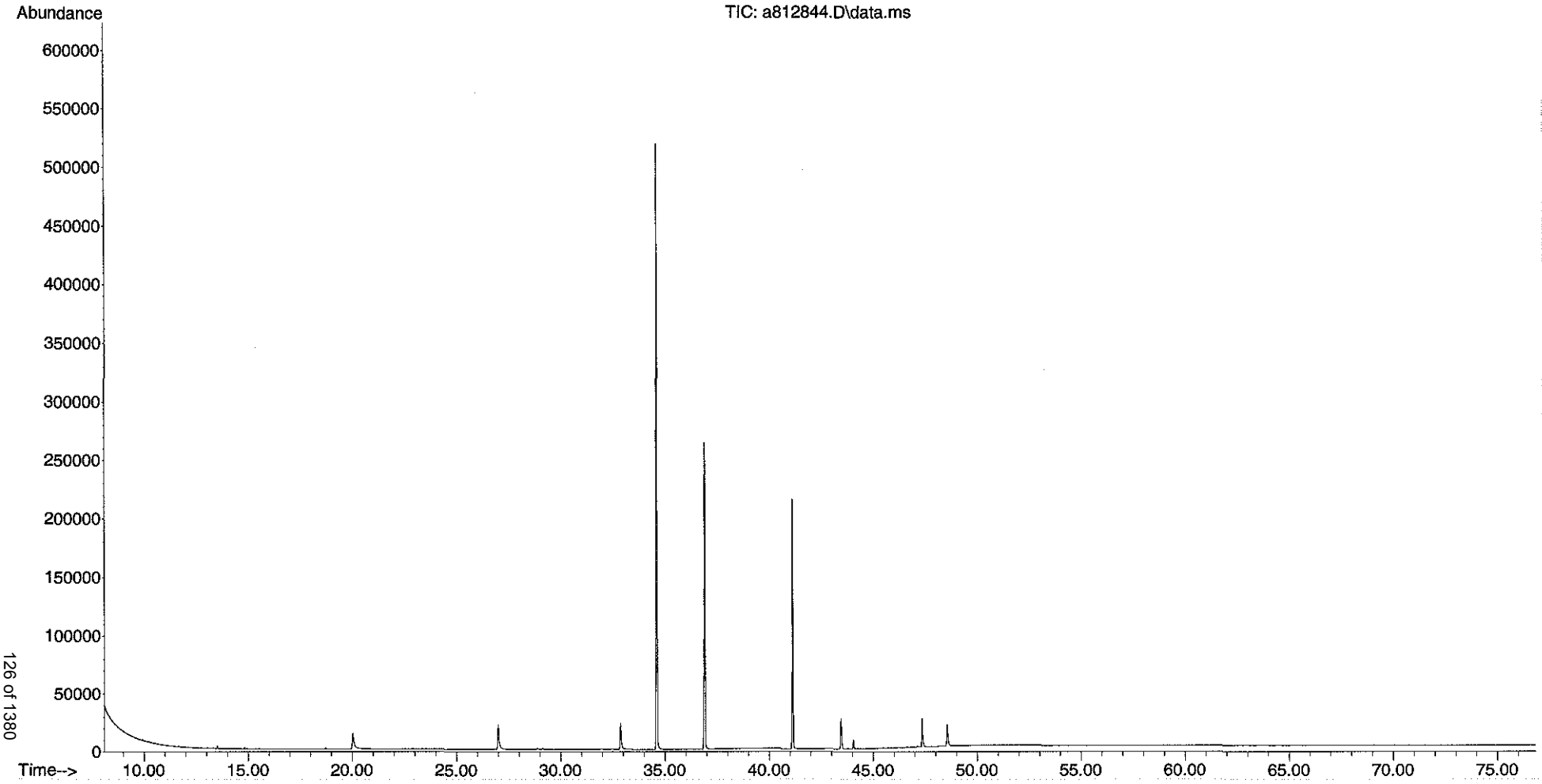
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812844.D
Acq On : 19 Nov 2012 5:23 pm
Operator : AC
Sample : ss110612b08
Misc : 1x etr1210082
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 20 14:18:00 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCS04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**64.5**	S
C4-Decalins	0.191	U	Pyrene	**66.4**	S
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**61.4**	S	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**64.7**	S
Biphenyl	0.0604	U	Chrysene/Triphenylene	**62.8**	S
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**62.2**	S	C2-Chrysenes	0.104	U
Acenaphthene	**63.4**	S	C3-Chrysenes	0.104	U
Fluorene	**61.3**	S	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**64.4**	S
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**64.5**	S
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	**64.8**	S	Benzo[e]pyrene	0.107	U
Phenanthrene	**63.0**	S	Benzo[a]pyrene	**65.5**	S
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**65.1**	S
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**60.6**	S
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**56.2**	S
Retene	0.109	U			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	93	40-120
Phenanthrene-d10	96	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCS04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	93	40-120
Phenanthrene-d10	96	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCS04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	**65.8**	
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	93	40-120
Phenanthrene-d10	96	40-120
Benzo[a]pyrene-d12	89	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCS04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	92	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812845.D
Acq On : 19 Nov 2012 6:48 pm
Operator : AC
Sample : ss1106121cs04
Misc : 1x etr1210082
ALS Vial : 26 Sample Multiplier: 1

11/20/12

Quant Time: Nov 20 14:18:07 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	56119	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	87473	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	103357	464.732	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.47%#			
42) Phenanthrene-d10	32.853	188	82998	480.559	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.06%#			
83) Benzo[b]fluoranthene-d12	47.336	264	80535	483.082	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.31%#			
88) Benzo[a]pyrene-d12	48.543	264	73524	446.396	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.64%#			
129) 5B(H)Cholane - Surr	44.045	217	14678	458.895	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.89%#			
Target Compounds						Qvalue
10) Naphthalene	20.087	128	117136	460.379	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	74848	493.843	ng/mL#	100
26) Acenaphthylene	26.375	152	107734M3	466.489	ng/mL	
27) Acenaphthene	27.105	153	65599	475.883	ng/mL	100
29) Fluorene	29.130	166	71055	459.583	ng/mL	99
43) Phenanthrene	32.944	178	96721	472.662	ng/mL	100
55) Anthracene	33.126	178	92696M3	486.237	ng/mL	
58) Fluoranthene	37.718	202	101912	483.498	ng/mL	100
60) Pyrene	38.603	202	106088	497.598	ng/mL	98
75) Benz[a]anthracene	43.360	228	93110	485.552	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	91450	471.132	ng/mL	100
84) Benzo[b]fluoranthene	47.418	252	99529	483.269	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.509	252	108671	483.600	ng/mL	95
89) Benzo[a]pyrene	48.634	252	96492	491.569	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.554	276	101746M3	487.953	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.609	278	92880	454.424	ng/mL	99
93) Benzo[g,h,i]perylene	54.889	276	99694	421.301	ng/mL	99

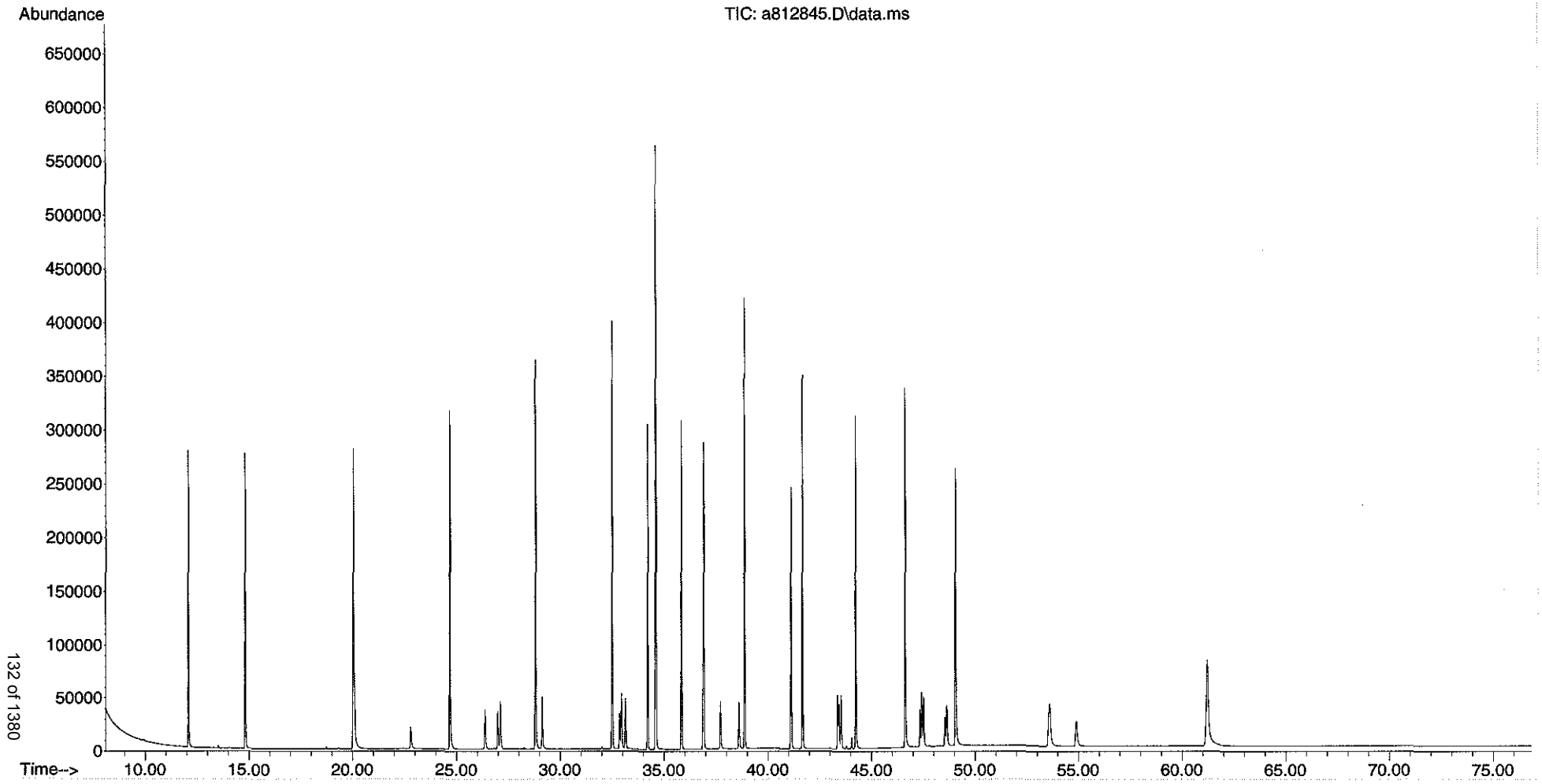
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812845.D
Acq On : 19 Nov 2012 6:48 pm
Operator : AC
Sample : ss1106121cs04
Misc : 1x etr1210082
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Nov 20 14:18:07 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCSD04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**62.1**	S
C4-Decalins	0.191	U	Pyrene	**64.2**	S
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**57.3**	S	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**61.3**	S
Biphenyl	0.0604	U	Chrysene/Triphenylene	**60.0**	S
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**59.8**	S	C2-Chrysenes	0.104	U
Acenaphthene	**60.3**	S	C3-Chrysenes	0.104	U
Fluorene	**59.1**	S	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**59.5**	S
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**62.8**	S
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	**59.7**	S	Benzo[e]pyrene	0.107	U
Phenanthrene	**58.7**	S	Benzo[a]pyrene	**62.1**	S
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**62.1**	S
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**62.4**	S
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**57.6**	S
Retene	0.109	U			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	89	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCSD04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	89	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCSD04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	**61.8**	
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	89	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCSD04**
Associated Blank: **SS110612B08**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/19/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	86	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812846.D
Acq On : 19 Nov 2012 8:12 pm
Operator : AC
Sample : ss110612lcsd04
Misc : 1x etr1210082
ALS Vial : 27 Sample Multiplier: 1

11/20/12

Quant Time: Nov 20 14:18:16 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	56192	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	82484	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	98961	444.388	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.44%#			
42) Phenanthrene-d10	32.853	188	77401	447.570	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.76%#			
83) Benzo[b]fluoranthene-d12	47.336	264	71181	452.798	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.28%#			
88) Benzo[a]pyrene-d12	48.543	264	64454	414.997	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.50%#			
129) 5B(H)Cholane - Surr	44.045	217	13003	431.116	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.11%#			
Target Compounds						Qvalue
10) Naphthalene	20.087	128	109552	430.012	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	70336	463.470	ng/mL#	100
26) Acenaphthylene	26.375	152	103671M3	448.313	ng/mL	
27) Acenaphthene	27.114	153	62448	452.435	ng/mL	99
29) Fluorene	29.130	166	68665	443.548	ng/mL	100
43) Phenanthrene	32.944	178	90235	440.393	ng/mL	100
55) Anthracene	33.126	178	85424M3	447.510	ng/mL	
58) Fluoranthene	37.718	202	98247	465.504	ng/mL	99
60) Pyrene	38.613	202	102715	481.151	ng/mL	99
75) Benz[a]anthracene	43.369	228	83128	459.718	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	82431	450.353	ng/mL	100
84) Benzo[b]fluoranthene	47.427	252	86662	446.244	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.509	252	99738	470.693	ng/mL	95
89) Benzo[a]pyrene	48.634	252	86267	466.061	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	53.555	276	91550M3	465.611	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.628	278	90274	468.388	ng/mL	98
93) Benzo[g,h,i]perylene	54.889	276	96412	432.075	ng/mL	99

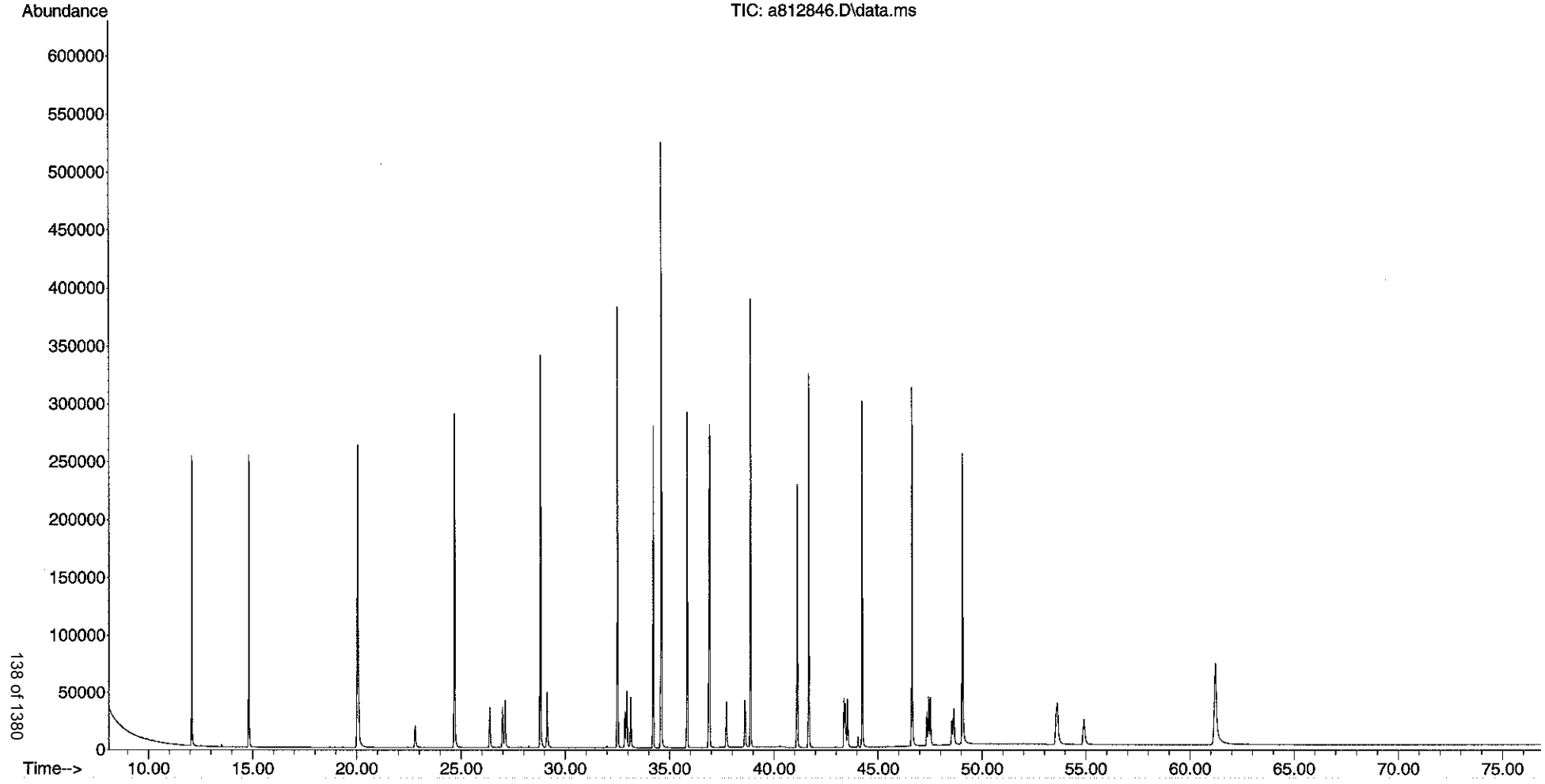
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812846.D
Acq On : 19 Nov 2012 8:12 pm
Operator : AC
Sample : ss1106121csd04
Misc : 1x etr1210082
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Nov 20 14:18:16 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Cold Lake Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05064	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	138		C3-Dibenzothiophenes	463	
C1-Decalins	289		C4-Dibenzothiophenes	316	
C2-Decalins	398		Benzo(b)fluorene	1.98	U
C3-Decalins	274		Fluoranthene	6.32	
C4-Decalins	259		Pyrene	21.0	
Benzothiophene	10.3		C1-Fluoranthenes/Pyrenes	77.5	
C1-Benzo(b)thiophenes	50.9		C2-Fluoranthenes/Pyrenes	110	
C2-Benzo(b)thiophenes	89.1		C3-Fluoranthenes/Pyrenes	118	
C3-Benzo(b)thiophenes	144		C4-Fluoranthenes/Pyrenes	116	
C4-Benzo(b)thiophenes	145		Naphthobenzothiophenes	47.4	
Naphthalene	71.4		C1-Naphthobenzothiophenes	145	
C1-Naphthalenes	186		C2-Naphthobenzothiophenes	222	
C2-Naphthalenes	383		C3-Naphthobenzothiophenes	194	
C3-Naphthalenes	446		C4-Naphthobenzothiophenes	152	
C4-Naphthalenes	352		Benz[a]anthracene	4.68	
Biphenyl	20.0		Chrysene/Triphenylene	21.5	
Dibenzofuran	8.69		C1-Chrysenes	57.4	
Acenaphthylene	2.91		C2-Chrysenes	89.6	
Acenaphthene	15.2		C3-Chrysenes	111	
Fluorene	32.4		C4-Chrysenes	68.1	
C1-Fluorenes	84.1		Benzo[b]fluoranthene	5.59	
C2-Fluorenes	178		Benzo[j]fluoranthene/Benzo[k]fluoranthene	1.68	J
C3-Fluorenes	222		Benzo[a]fluoranthene	1.98	U
Anthracene	6.23		Benzo[e]pyrene	8.94	
Phenanthrene	87.7		Benzo[a]pyrene	4.95	
C1-Phenanthrenes/Anthracenes	252		Perylene	10.3	
C2-Phenanthrenes/Anthracenes	371		Indeno[1,2,3-cd]pyrene	2.79	
C3-Phenanthrenes/Anthracenes	308		Dibenz[ah]anthracene/Dibenz[ac]anthracene	1.24	J
C4-Phenanthrenes/Anthracenes	146		Benzo[g,h,i]perylene	6.17	
Retene	59.2				
Dibenzothiophene	69.8				
C1-Dibenzothiophenes	239				
C2-Dibenzothiophenes	448				

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	102	40-120
Phenanthrene-d10	110	40-120
Benzo[a]pyrene-d12	108	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Cold Lake Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05064	10	1	AC

Parameter	Result
Carbazole	3.90

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	102	40-120
Phenanthrene-d10	110	40-120
Benzo[a]pyrene-d12	108	40-120

N/A - Not Applicable

Form I
Cold Lake Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05064	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**92.4**
2/3-Methyldibenzothiophene	**75.5**
1-Methyldibenzothiophene	**49.4**
3-Methylphenanthrene	**46.4**
2-Methylphenanthrene	**53.1**
2-Methylanthracene	**6.21**
9/4-Methylphenanthrene	**90.2**
1-Methylphenanthrene	**50.3**
2-Methylnaphthalene	**187**
1-Methylnaphthalene	**134**
2,6-Dimethylnaphthalene	**186**
2,3,5-Trimethylnaphthalene	**58.0**
Naphthobenzothiophene-2,1-D	**32.6**
Naphthobenzothiophene-1,2-D	**8.81**
Naphthobenzothiophene-2,3-D	**6.00**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	102	40-120
Phenanthrene-d10	110	40-120
Benzo[a]pyrene-d12	108	40-120

N/A - Not Applicable

Form I
Cold Lake Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05064	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	**108**
C24 Tricyclic Terpane	**60.6**
C25 Tricyclic Terpane	**53.8**
C24 Tetracyclic Terpane	**20.5**
C26 Tricyclic Terpane-22S	**21.8**
C26 Tricyclic Terpane-22R	**21.6**
C28 Tricyclic Terpane-22S	**22.8**
C28 Tricyclic Terpane-22R	**24.6**
C29 Tricyclic Terpane-22S	**29.7**
C29 Tricyclic Terpane-22R	**28.5**
18a-22,29,30-Trisnorneohopane-TS	**29.8**
C30 Tricyclic Terpane-22S	**22.7**
C30 Tricyclic Terpane-22R	**21.8**
17a(H)-22,29,30-Trisnorhopane-TM	**73.4**
17a/b,21b/a 28,30-Bisnorhopane	**45.8**
17a(H),21b(H)-25-Norhopane	**11.7**
30-Norhopane	**196**
18a(H)-30-Norneohopane-C29Ts	**26.5**
17a(H)-Diahopane	**8.43**
30-Normoretane	**19.5**
18a(H)&18b(H)-Oleananes	**3.56**
Hopane	**276**
Moretane	**20.5**
30-Homohopane-22S	**117**
30-Homohopane-22R	**94.3**
T22a-Gammacerane/C32-diahopane	**40.2**
30,31-Bishomohopane-22S	**74.1**
30,31-Bishomohopane-22R	**53.8**

Parameter	Result
30,31-Trishomohopane-22S	**55.7**
30,31-Trishomohopane-22R	**34.8**
Tetrakishomohopane-22S	**39.1**
Tetrakishomohopane-22R	**26.5**
Pentakishomohopane-22S	**46.1**
Pentakishomohopane-22R	**32.3**
13b(H),17a(H)-20S-Diacholestane	**37.3**
13b(H),17a(H)-20R-Diacholestane	**15.8**
13b,17a-20S-Methyldiacholestane	**17.2**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**60.4**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**73.9**
Unknown Sterane (S18)	**13.3**
13a,17b-20S-Ethyldiacholestane	**7.60**
14a,17a-20S-Methylcholestane	**29.7**
14a,17a-20R-Methylcholestane	**26.5**
14a(H),17a(H)-20S-Ethylcholestane	**65.4**
14a(H),17a(H)-20R-Ethylcholestane	**49.2**
14b(H),17b(H)-20R-Cholestane	**49.0**
14b(H),17b(H)-20S-Cholestane	**49.1**
14b,17b-20R-Methylcholestane	**38.4**
14b,17b-20S-Methylcholestane	**55.7**
14b(H),17b(H)-20R-Ethylcholestane	**71.2**
14b(H),17b(H)-20S-Ethylcholestane	**51.4**
C26,20R- +C27,20S- triaromatic steroid	**263**
C28,20S-triaromatic steroid	**220**
C27,20R-triaromatic steroid	**170**
C28,20R-triaromatic steroid	**182**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	112	50-130

N/A - Not Applicable

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812841.D
Acq On : 19 Nov 2012 1:08 pm
Operator : AC
Sample : SS112012CL01
Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

11/20/12

Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	57324	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	97505	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	232106	1021.698	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.17%			
42) Phenanthrene-d10	32.843	188	193443	1096.492	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.65%			
83) Benzo[b]fluoranthene-d12	47.335	264	206671	1112.150	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.22%			
88) Benzo[a]pyrene-d12	48.543	264	197878	1077.793	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.78%			
129) 5B(H)Cholane - Surr	44.045	217	39763	1115.252	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.53%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	32800	643.872	ng/mL	100
4) cis-Decalin	17.879	138	1988M3	53.270	ng/mL	
5) C1-Decalins	18.143	152	74445M5	1461.374	ng/mL	
6) C2-Decalins	19.567	166	102768M5	2017.361	ng/mL	
7) C3-Decalins	22.396	180	70807M5	1389.959	ng/mL	
8) C4-Decalins	25.781	194	66800M5	1311.301	ng/mL	
10) Naphthalene	20.078	128	94043	361.847	ng/mL#	100
11) C1-Naphthalenes	22.779	142	244321M5	940.067	ng/mL	
12) C2-Naphthalenes	25.617	156	504345M5	1940.554	ng/mL	
13) C3-Naphthalenes	28.300	170	586416M5	2256.337	ng/mL	
14) C4-Naphthalenes	31.046	184	463945M5	1785.108	ng/mL	
16) 2-Methylnaphthalene	22.779	142	146703	947.592	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	98620	680.279	ng/mL#	100
18) Benzothiophene	20.297	134	11006	52.391	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	54170M5	257.862	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	94749M5	451.028	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	152803M5	727.380	ng/mL	
22) C4-Benzo(b)thiophenes	29.896	190	154249M5	734.263	ng/mL	
23) Biphenyl	24.659	154	19907	101.066	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	124866	942.405	ng/mL#	100
25) Dibenzofuran	27.743	168	9141	43.990	ng/mL#	64
26) Acenaphthylene	26.365	152	3479M3	14.747	ng/mL	
27) Acenaphthene	27.104	153	10841M3	76.992	ng/mL	
28) 2,3,5-Trimethylnaphthalen	28.656	170	33501M3	293.571	ng/mL	
29) Fluorene	29.121	166	25883M3	163.892	ng/mL	
30) C1-Fluorenes	31.484	180	67262M5	425.905	ng/mL	
31) C2-Fluorenes	33.683	194	142699M5	903.574	ng/mL	
32) C3-Fluorenes	35.508	208	177157M5	1121.763	ng/mL	
33) Dibenzothiophene	32.442	184	76804	353.659	ng/mL#	71
34) 4-Methyldibenzothiophene(	34.212	198	101617	467.915	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.568	198	83008	382.227	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.988	198	54333	250.187	ng/mL#	100
37) OTP	34.623	198	11148M3	51.333	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	274258M5	1262.875	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	492762M5	2269.019	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	509028M5	2343.919	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
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Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	39.389	240	346927M5	1597.493	ng/mL	
43) Phenanthrene	32.935	178	92817M3	444.049	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.897	192	49157	235.174	ng/mL	95
45) 2-Methylphenanthrene(2MP)	35.015	192	56203	268.883	ng/mL	96
46) 2-Methylanthracene(2MA)	35.171	192	6576M3	31.460	ng/mL	
47) 9/4-Methylphenanthrene(9M	35.353	192	95525	457.005	ng/mL	99
48) 1-Methylphenanthrene(1MP)	35.444	192	53264M3	254.822	ng/mL	
49) C1-Phenanthrenes/Anthrace	35.353	192	267192M5	1278.283	ng/mL	
50) C2-Phenanthrenes/Anthrace	37.161	206	392849M5	1879.443	ng/mL	
52) C3-Phenanthrenes/Anthrace	40.265	220	326583M5	1562.418	ng/mL	
53) C4-Phenanthrenes/Anthrace	39.918	234	154251M5	737.958	ng/mL	
54) Retene	39.918	234	14543M3	300.011	ng/mL	
55) Anthracene	33.144	178	6140M3	31.530	ng/mL	
56) Carbazole	33.774	167	4009M3	19.730	ng/mL	
57) 1-Methylphenanthrene	35.444	192	53517M3	361.188	ng/mL	
58) Fluoranthene	37.708	202	6888M3	31.992	ng/mL	
60) Pyrene	38.594	202	23109M3	106.113	ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.982	216	85448M5	392.363	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.447	230	121078M5	555.969	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.798	244	129973M5	596.814	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.141	258	127459M5	585.270	ng/mL	
66) Naphthobenzothiophene	42.438	234	33329	164.862	ng/ml#	85
67) Naphthobenzothiophene-2,1	42.438	234	33329	164.862	ng/mL#	85
68) Naphthobenzothiophene-1,2	42.776	234	9019	44.613	ng/mL#	10
69) Naphthobenzothiophene-2,3	43.077	234	6147M3	30.406	ng/mL	
70) C1-Naphthobenzothiophenes	43.835	248	147993M5	732.049	ng/ml	
71) C2-Naphthobenzothiophenes	45.881	262	227658M5	1126.113	ng/ml	
72) C3-Naphthobenzothiophenes	47.445	276	199000M5	984.356	ng/ml	
73) C4-Naphthobenzothiophenes	48.534	290	155837M5	770.849	ng/mL	
75) Benz[a]anthracene	43.369	228	5065M3	23.696	ng/mL	
77) Chrysene/Triphenylene	43.506	228	23562M3	108.897	ng/mL	
78) C1-Chrysenes	44.995	242	62939M5	290.888	ng/mL	
79) C2-Chrysenes	47.070	256	105286M5	486.605	ng/mL	
80) BBF-D12 Surr BKGD	47.335	256	7096	32.796	ng/mL	100
81) C3-Chrysenes	48.460	270	122008M5	563.890	ng/mL	
82) C4-Chrysenes	49.832	284	74575M5	344.666	ng/mL	
84) Benzo[b]fluoranthene	47.418	252	6500	28.314	ng/mL	92
85) Benzo[j]+[k]fluoranthene	47.491	252	2127M3	8.492	ng/mL	
87) Benzo[e]pyrene	48.442	252	10708M3	45.269	ng/mL	
89) Benzo[a]pyrene	48.634	252	5486M3	25.072	ng/mL	
90) Perylene	48.954	252	12532	52.434	ng/mL#	70
91) Indeno[1,2,3-cd]pyrene	53.554	276	3284M3	14.129	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.591	278	1425M3	6.255	ng/mL	
93) Benzo[g,h,i]perylene	54.879	276	8245	31.258	ng/mL#	75
94) Hopane (T19)	52.640	191	102497	1399.704	ng/mL#	88
96) C23 Tricyclic Terpane (T4	41.078	191	39951M4	545.573	ng/ml	
97) C24 Tricyclic Terpane (T5	41.799	191	22453	306.619	ng/ml	100
98) C25 Tricyclic Terpane (T6	43.324	191	19954M3	272.493	ng/ml	
99) C24 Tetracyclic Terpane (	44.602	191	7594	103.704	ng/ml	100
100) C26 Tricyclic Terpane-22S	44.337	191	8100M3	110.614	ng/ml	
101) C26 Tricyclic Terpane-22R	44.428	191	7997M3	109.207	ng/ml	
102) C28 Tricyclic Terpane-22S	46.713	191	8461	115.544	ng/ml	100
103) C28 Tricyclic Terpane-22R	46.878	191	9137	124.775	ng/ml	100

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104)	C29 Tricyclic Terpane-22S	47.399	191	11008M4	150.326	ng/ml	
105)	C29 Tricyclic Terpane-22R	47.610	191	10585	144.549	ng/ml	100
106)	18a-22,29,30-Trisnorneoho	48.762	191	11043	150.804	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.854	191	8404M3	114.765	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.101	191	8096M3	110.559	ng/mL	
109)	17a(H)-22,29,30-Trisnorho	49.320	191	27230	371.854	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	50.546	191	16989M3	232.003	ng/ml	
111)	17a(H),21b(H)-25-Norhopan	50.326	191	4355	59.472	ng/ml	100
112)	30-Norhopane (T15)	51.232	191	72659M3	992.235	ng/ml	
113)	18a(H)-30-Norneohopane-C2	51.341	191	9817M3	134.061	ng/ml	
114)	17a(H)-Diahopane (X)	51.460	191	3127	42.702	ng/ml	100
115)	30-Normoretane (T17)	52.027	191	7223	98.638	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	52.430	191	1321M3	18.040	ng/ml	
117)	Moretane (T20)	53.344	191	7589M3	103.636	ng/ml	
118)	30-Homohopane-22S (T21)	54.477	191	43485	593.833	ng/ml	100
119)	30-Homohopane-22R (T22)	54.715	191	34951	477.292	ng/ml	100
120)	Gammacerane/C32-diahopane	55.272	191	14909M4	203.598	ng/mL	
121)	30,31-Bishomohopane-22S (	56.076	191	27478	375.241	ng/ml	100
122)	30,31-Bishomohopane-22R (	56.479	191	19957	272.534	ng/ml	100
123)	30,31-Trishomohopane-22S	58.288	191	20650	281.997	ng/ml	100
124)	30,31-Trishomohopane-22R	58.928	191	12922M3	176.463	ng/ml	
125)	Tetrakishomohopane-22S (T	61.011	191	14487	197.835	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.943	191	9817	134.061	ng/ml	100
127)	Pentakishomohopane-22S (T	64.255	191	17106	233.600	ng/ml	100
128)	Pentakishomohopane-22R (T	65.589	191	11990M3	163.736	ng/ml	
130)	13b(H),17a(H)-20S-Diachol	45.552	217	6741M3	189.068	ng/ml	
131)	13b(H),17a(H)-20R-Diachol	45.972	217	2860M3	80.216	ng/ml	
132)	13b,17a-20S-Methyldiachol	46.677	217	3110M3	87.228	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.546	217	10902M3	305.774	ng/ml	
134)	14a,17a-20R-Chol/13b,17a-	48.076	217	13342M3	374.209	ng/ml	
135)	Unknown Sterane (S18)	48.369	217	2398	67.258	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.625	217	1372	38.481	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.790	217	5366	150.503	ng/ml	100
138)	14a,17a-20R-Methylcholest	49.521	217	4784M4	134.179	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.887	217	11817M3	331.437	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.820	217	8881M3	249.090	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	47.637	218	8849M3	248.192	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.729	218	8864M3	248.613	ng/ml	
143)	14b,17b-20R-Methylcholest	48.973	218	6928M4	194.313	ng/ml	
144)	14b,17b-20S-Methylcholest	49.055	218	10054M3	281.989	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	50.143	218	12856	360.578	ng/ml	100
146)	14b(H),17b(H)-20S-Ethylch	50.180	218	9285M3	260.421	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.832	231	47454	1330.965	ng/mL	100
148)	C28,20S-triaromatic stero	50.719	231	39667M3	1112.559	ng/mL	
149)	C27,20R-triaromatic stero	51.186	231	30715M3	861.478	ng/mL	
150)	C28,20R-triaromatic stero	52.421	231	32930	923.603	ng/mL	100

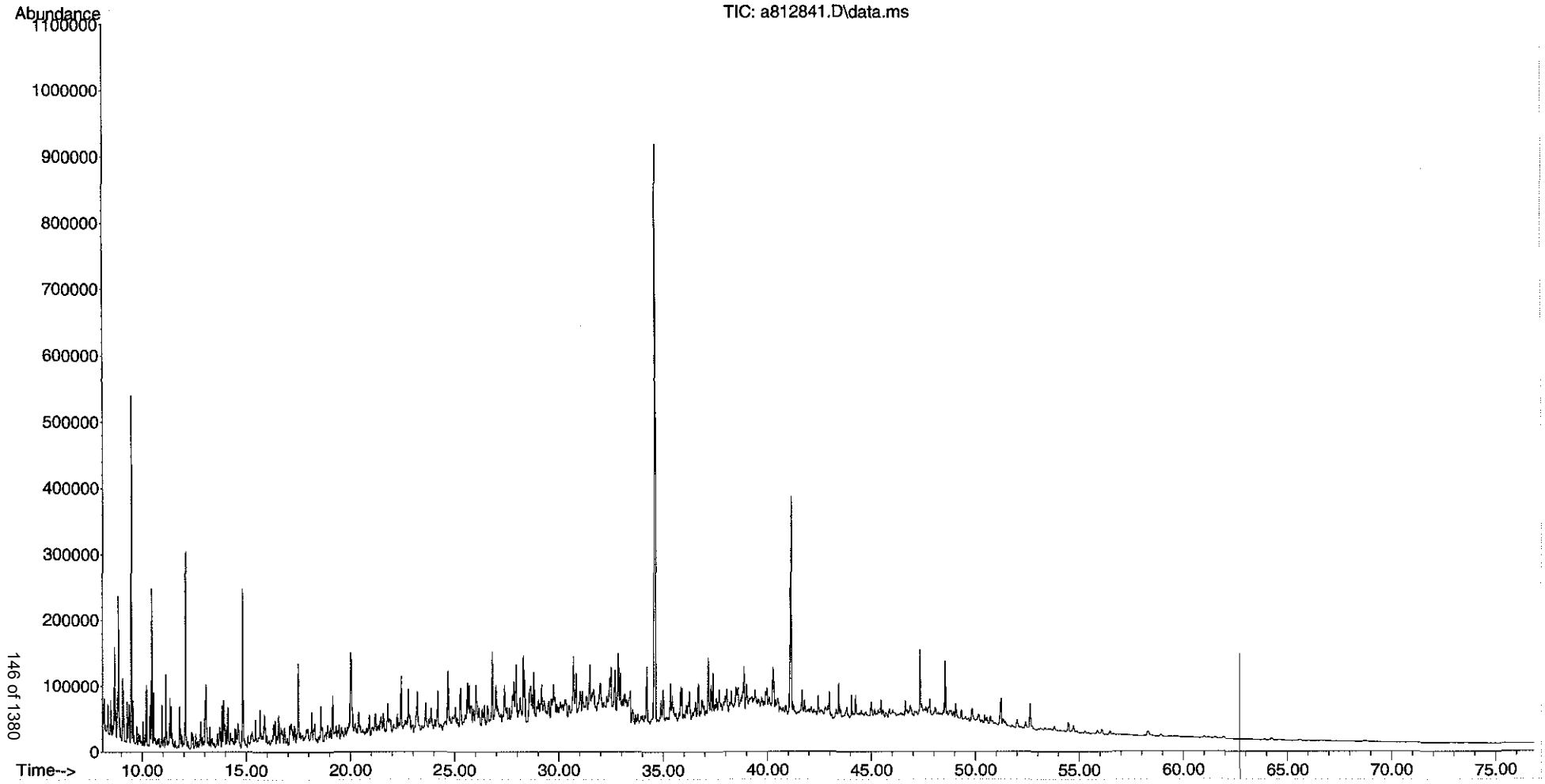
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812841.D
Acq On : 19 Nov 2012 1:08 pm
Operator : AC
Sample : SS112012CL01
Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Western Canadian Select
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05036	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	**164**		C3-Dibenzothiophenes	**401**	
C1-Decalins	**312**		C4-Dibenzothiophenes	**274**	
C2-Decalins	**400**		Benzo(b)fluorene	1.99	U
C3-Decalins	**286**		Fluoranthene	**7.46**	
C4-Decalins	**282**		Pyrene	**25.2**	
Benzothiophene	**7.14**		C1-Fluoranthenes/Pyrenes	**87.1**	
C1-Benzo(b)thiophenes	**38.2**		C2-Fluoranthenes/Pyrenes	**116**	
C2-Benzo(b)thiophenes	**63.2**		C3-Fluoranthenes/Pyrenes	**135**	
C3-Benzo(b)thiophenes	**118**		C4-Fluoranthenes/Pyrenes	**133**	
C4-Benzo(b)thiophenes	**117**		Naphthobenzothiophenes	**42.4**	
Naphthalene	**74.8**		C1-Naphthobenzothiophenes	**139**	
C1-Naphthalenes	**207**		C2-Naphthobenzothiophenes	**226**	
C2-Naphthalenes	**484**		C3-Naphthobenzothiophenes	**185**	
C3-Naphthalenes	**534**		C4-Naphthobenzothiophenes	**137**	
C4-Naphthalenes	**382**		Benz[a]anthracene	**4.55**	
Biphenyl	**20.4**		Chrysene/Triphenylene	**21.7**	
Dibenzofuran	**9.45**		C1-Chrysenes	**61.0**	
Acenaphthylene	**3.94**		C2-Chrysenes	**94.4**	
Acenaphthene	**15.7**		C3-Chrysenes	**107**	
Fluorene	**36.3**		C4-Chrysenes	**70.1**	
C1-Fluorenes	**91.3**		Benzo[b]fluoranthene	**6.47**	
C2-Fluorenes	**203**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**2.00**	
C3-Fluorenes	**228**		Benzo[a]fluoranthene	1.99	U
Anthracene	**5.78**		Benzo[e]pyrene	**10.4**	
Phenanthrene	**96.8**		Benzo[a]pyrene	**5.82**	
C1-Phenanthrenes/Anthracenes	**261**		Perylene	**10.1**	
C2-Phenanthrenes/Anthracenes	**366**		Indeno[1,2,3-cd]pyrene	**3.05**	
C3-Phenanthrenes/Anthracenes	**294**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**1.19**	J
C4-Phenanthrenes/Anthracenes	**144**		Benzo[g,h,i]perylene	**7.38**	
Retene	**95.4**				
Dibenzothiophene	**64.4**				
C1-Dibenzothiophenes	**222**				
C2-Dibenzothiophenes	**389**				

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	99	40-120
Phenanthrene-d10	115	40-120
Benzo[a]pyrene-d12	103	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Western Canadian Select
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05036	10	1	AC

Parameter	Result
Carbazole	**4.35**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	99	40-120
Phenanthrene-d10	115	40-120
Benzo[a]pyrene-d12	103	40-120

N/A - Not Applicable

Form I
Western Canadian Select
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05036	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**87.6**
2/3-Methyldibenzothiophene	**72.7**
1-Methyldibenzothiophene	**46.0**
3-Methylphenanthrene	**52.5**
2-Methylphenanthrene	**58.8**
2-Methylanthracene	**4.49**
9/4-Methylphenanthrene	**86.7**
1-Methylphenanthrene	**51.5**
2-Methylnaphthalene	**213**
1-Methylnaphthalene	**143**
2,6-Dimethylnaphthalene	**241**
2,3,5-Trimethylnaphthalene	**68.4**
Naphthobenzothiophene-2,1-D	**28.7**
Naphthobenzothiophene-1,2-D	**8.19**
Naphthobenzothiophene-2,3-D	**5.51**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	99	40-120
Phenanthrene-d10	115	40-120
Benzo[a]pyrene-d12	103	40-120

N/A - Not Applicable

Form I
Western Canadian Select
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/19/12	100	0.05036	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	**98.7**
C24 Tricyclic Terpane	**55.8**
C25 Tricyclic Terpane	**51.7**
C24 Tetracyclic Terpane	**20.4**
C26 Tricyclic Terpane-22S	**21.7**
C26 Tricyclic Terpane-22R	**19.8**
C28 Tricyclic Terpane-22S	**23.3**
C28 Tricyclic Terpane-22R	**24.8**
C29 Tricyclic Terpane-22S	**27.1**
C29 Tricyclic Terpane-22R	**27.9**
18a-22,29,30-Trisnorneohopane-TS	**29.0**
C30 Tricyclic Terpane-22S	**20.2**
C30 Tricyclic Terpane-22R	**18.8**
17a(H)-22,29,30-Trisnorhopane-TM	**67.6**
17a/b,21b/a 28,30-Bisnorhopane	**41.4**
17a(H),21b(H)-25-Norhopane	**10.8**
30-Norhopane	**175**
18a(H)-30-Norneohopane-C29Ts	**27.4**
17a(H)-Diahopane	**8.84**
30-Normoretane	**16.6**
18a(H)&18b(H)-Oleananes	**2.23**
Hopane	**249**
Moretane	**18.9**
30-Homohopane-22S	**105**
30-Homohopane-22R	**84.6**
T22a-Gammacerane/C32-diahopane	**38.8**
30,31-Bishomohopane-22S	**66.4**
30,31-Bishomohopane-22R	**49.4**

Parameter	Result
30,31-Trishomohopane-22S	**54.4**
30,31-Trishomohopane-22R	**37.0**
Tetrakishomohopane-22S	**34.8**
Tetrakishomohopane-22R	**25.4**
Pentakishomohopane-22S	**43.8**
Pentakishomohopane-22R	**29.1**
13b(H),17a(H)-20S-Diacholestane	**33.2**
13b(H),17a(H)-20R-Diacholestane	**16.3**
13b,17a-20S-Methyldiacholestane	**16.8**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**56.8**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**68.3**
Unknown Sterane (S18)	**14.0**
13a,17b-20S-Ethyldiacholestane	**4.76**
14a,17a-20S-Methylcholestane	**26.9**
14a,17a-20R-Methylcholestane	**24.5**
14a(H),17a(H)-20S-Ethylcholestane	**58.0**
14a(H),17a(H)-20R-Ethylcholestane	**45.4**
14b(H),17b(H)-20R-Cholestane	**42.5**
14b(H),17b(H)-20S-Cholestane	**43.7**
14b,17b-20R-Methylcholestane	**35.3**
14b,17b-20S-Methylcholestane	**49.8**
14b(H),17b(H)-20R-Ethylcholestane	**71.2**
14b(H),17b(H)-20S-Ethylcholestane	**40.1**
C26,20R- +C27,20S- triaromatic steroid	**248**
C28,20S-triaromatic steroid	**208**
C27,20R-triaromatic steroid	**164**
C28,20R-triaromatic steroid	**174**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	111	50-130

N/A - Not Applicable

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812840.D
Acq On : 19 Nov 2012 11:42 am
Operator : AC
Sample : SS112012WCS01
Misc : whaq73
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Nov 20 14:57:17 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	55055	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	99583	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	217089	994.978	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 99.50%			
42) Phenanthrene-d10	32.843	188	195606	1154.448	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 115.44%			
83) Benzo[b]fluoranthene-d12	47.326	264	199120	1049.156	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.92%			
88) Benzo[a]pyrene-d12	48.534	264	192813	1028.290	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.83%			
129) 5B(H)Cholane - Surr	44.045	217	40309	1106.974	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 110.70%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	37429	765.022	ng/mL	100
4) cis-Decalin	17.870	138	2199M3	61.353	ng/mL	
5) C1-Decalins	18.134	152	76766M5	1569.042	ng/mL	
6) C2-Decalins	19.558	166	98568M5	2014.659	ng/mL	
7) C3-Decalins	22.396	180	70399M5	1438.905	ng/mL	
8) C4-Decalins	25.781	194	69507M5	1420.673	ng/mL	
10) Naphthalene	20.078	128	93996	376.571	ng/mL#	100
11) C1-Naphthalenes	22.779	142	259790M5	1040.783	ng/mL	
12) C2-Naphthalenes	25.617	156	607891M5	2435.362	ng/mL	
13) C3-Naphthalenes	28.300	170	671164M5	2688.849	ng/mL	
14) C4-Naphthalenes	30.718	184	480034M5	1923.135	ng/mL	
16) 2-Methylnaphthalene	22.779	142	159529	1072.906	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	100417	721.222	ng/mL#	100
18) Benzothiophene	20.297	134	7256	35.964	ng/mL	100
19) C1-Benzo(b)thiophenes	22.341	148	38787M5	192.245	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	64250M5	318.451	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	119395M5	591.773	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	118788M5	588.764	ng/mL	
23) Biphenyl	24.659	154	19431	102.715	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	154186	1211.653	ng/mL#	100
25) Dibenzofuran	27.743	168	9501M3	47.607	ng/mL	
26) Acenaphthylene	26.356	152	4496	19.844	ng/mL#	100
27) Acenaphthene	27.105	153	10722M3	79.285	ng/mL	
28) 2,3,5-Trimethylnaphthalen	28.656	170	37762M3	344.548	ng/mL	
29) Fluorene	29.121	166	27697M3	182.606	ng/mL	
30) C1-Fluorenes	31.484	180	69751M5	459.868	ng/mL	
31) C2-Fluorenes	33.674	194	154839M5	1020.852	ng/mL	
32) C3-Fluorenes	35.509	208	173992M5	1147.128	ng/mL	
33) Dibenzothiophene	32.442	184	67600	324.106	ng/mL#	65
34) 4-Methyldibenzothiophene(	34.212	198	91998	441.082	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.559	198	76318	365.904	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.979	198	48281	231.482	ng/mL#	100
37) OTP	34.623	198	10287M3	49.321	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	243233M5	1166.174	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	408293M5	1957.549	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	421694M5	2021.800	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812840.D
Acq On : 19 Nov 2012 11:42 am
Operator : AC
Sample : SS112012WCS01
Misc : whaq73
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Nov 20 14:57:17 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41)	C4-Dibenzothiophenes	39.389	240	287725M5	1379.489	ng/mL	
43)	Phenanthrene	32.935	178	97849M3	487.416	ng/mL	
44)	3-Methylphenanthrene(3MP)	34.897	192	53106	264.537	ng/mL	96
45)	2-Methylphenanthrene(2MP)	35.007	192	59497	296.373	ng/mL	97
46)	2-Methylanthracene(2MA)	35.162	192	4537M3	22.600	ng/mL	
47)	9/4-Methylphenanthrene(9M	35.344	192	87612	436.422	ng/mL	99
48)	1-Methylphenanthrene(1MP)	35.445	192	52023M3	259.143	ng/mL	
49)	C1-Phenanthrenes/Anthrace	35.344	192	263426M5	1312.206	ng/mL	
50)	C2-Phenanthrenes/Anthrace	37.161	206	369802M5	1842.097	ng/mL	
52)	C3-Phenanthrenes/Anthrace	40.265	220	297183M5	1480.360	ng/mL	
53)	C4-Phenanthrenes/Anthrace	39.918	234	145700M5	725.776	ng/mL	
54)	Retene	39.918	234	22371	480.517	ng/mL#	60
55)	Anthracene	33.145	178	5443M3	29.103	ng/mL	
56)	Carbazole	33.774	167	4277M3	21.917	ng/mL	
57)	1-Methylphenanthrene	35.445	192	52517M3	369.047	ng/mL	
58)	Fluoranthene	37.709	202	7771M3	37.580	ng/mL	
60)	Pyrene	38.594	202	26544M3	126.909	ng/mL	
61)	C1-Fluoranthenes/Pyrenes	39.982	216	91764M5	438.730	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.438	230	122284M5	584.649	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.789	244	142387M5	680.763	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.141	258	140206M5	670.335	ng/mL	
66)	Naphthobenzothiophene	42.438	234	28058	144.509	ng/ml#	83
67)	Naphthobenzothiophene-2,1	42.438	234	28058	144.509	ng/mL#	83
68)	Naphthobenzothiophene-1,2	42.776	234	8008	41.244	ng/mL#	10
69)	Naphthobenzothiophene-2,3	43.068	234	5389M3	27.755	ng/mL	
70)	C1-Naphthobenzothiophenes	44.520	248	135970M5	700.296	ng/ml	
71)	C2-Naphthobenzothiophenes	45.872	262	220766M5	1137.027	ng/ml	
72)	C3-Naphthobenzothiophenes	47.445	276	180923M5	931.821	ng/ml	
73)	C4-Naphthobenzothiophenes	48.534	290	134012M5	690.212	ng/mL	
75)	Benz[a]anthracene	43.360	228	5006M3	22.931	ng/mL	
77)	Chrysene/Triphenylene	43.506	228	24187M3	109.453	ng/mL	
78)	C1-Chrysenes	44.995	242	67917M5	307.345	ng/mL	
79)	C2-Chrysenes	47.070	256	112002M5	506.843	ng/mL	
80)	BBF-D12 Surr BKGD	47.326	256	6943	31.419	ng/mL	100
81)	C3-Chrysenes	48.451	270	119061M5	538.787	ng/mL	
82)	C4-Chrysenes	49.823	284	77994M5	352.946	ng/mL	
84)	Benzo[b]fluoranthene	47.418	252	7635	32.564	ng/mL	98
85)	Benzo[j]+[k]fluoranthene	47.491	252	2573M3	10.058	ng/mL	
87)	Benzo[e]pyrene	48.433	252	12637M3	52.309	ng/mL	
89)	Benzo[a]pyrene	48.625	252	6551M3	29.315	ng/mL	
90)	Perylene	48.945	252	12394	50.775	ng/mL#	64
91)	Indeno[1,2,3-cd]pyrene	53.545	276	3644M3	15.351	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.600	278	1391M3	5.978	ng/mL	
93)	Benzo[g,h,i]perylene	54.880	276	10013	37.169	ng/mL#	84
94)	Hopane (T19)	52.631	191	93826	1254.555	ng/mL#	87
96)	C23 Tricyclic Terpane (T4	41.069	191	37187M4	497.231	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.799	191	21027	281.154	ng/ml	100
98)	C25 Tricyclic Terpane (T6	43.278	191	19457M3	260.161	ng/ml	
99)	C24 Tetracyclic Terpane (	44.602	191	7689M3	102.810	ng/ml	
100)	C26 Tricyclic Terpane-22S	44.337	191	8183M3	109.416	ng/ml	
101)	C26 Tricyclic Terpane-22R	44.429	191	7477M3	99.976	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.714	191	8787	117.492	ng/ml	100
103)	C28 Tricyclic Terpane-22R	46.869	191	9339	124.873	ng/ml	100

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812840.D
Acq On : 19 Nov 2012 11:42 am
Operator : AC
Sample : SS112012WCS01
Misc : whaq73
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Nov 20 14:57:17 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
104) C29 Tricyclic Terpane-22S	47.400	191	10215	136.586	ng/ml	100
105) C29 Tricyclic Terpane-22R	47.601	191	10512	140.557	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.762	191	10904M3	145.798	ng/ml	
107) C30 Tricyclic Terpane-22S	48.845	191	7615M3	101.821	ng/mL	
108) C30 Tricyclic Terpane-22R	49.092	191	7091M3	94.814	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	49.320	191	25442	340.187	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	50.537	191	15598M3	208.562	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	50.317	191	4074	54.474	ng/ml	100
112) 30-Norhopane (T15)	51.223	191	65811M3	879.965	ng/ml	
113) 18a(H)-30-Norneohopane-C2	51.332	191	10336M3	138.204	ng/ml	
114) 17a(H)-Diahopane (X)	51.451	191	3328M3	44.499	ng/ml	
115) 30-Normoretane (T17)	52.028	191	6269	83.823	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	52.421	191	841	11.245	ng/ml	100
117) Moretane (T20)	53.335	191	7121	95.216	ng/ml	100
118) 30-Homohopane-22S (T21)	54.468	191	39535	528.626	ng/ml	100
119) 30-Homohopane-22R (T22)	54.715	191	31852	425.896	ng/ml	100
120) Gammacerane/C32-diahopane	55.272	191	14630M4	195.619	ng/mL	
121) 30,31-Bishomohopane-22S (	56.077	191	25011	334.424	ng/ml	100
122) 30,31-Bishomohopane-22R (	56.470	191	18615	248.903	ng/ml	100
123) 30,31-Trishomohopane-22S	58.279	191	20474	273.760	ng/ml	100
124) 30,31-Trishomohopane-22R	58.909	191	13936	186.339	ng/ml	100
125) Tetrakishomohopane-22S (T	61.002	191	13113	175.335	ng/ml	100
126) Tetrakishomohopane-22R (T	61.925	191	9564	127.881	ng/ml	100
127) Pentakishomohopane-22S (T	64.237	191	16477	220.315	ng/ml	100
128) Pentakishomohopane-22R (T	65.580	191	10958	146.520	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	45.552	217	6084M3	167.080	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.973	217	2989	82.085	ng/ml	100
132) 13b,17a-20S-Methyldiachol	46.668	217	3090M3	84.858	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	47.537	217	10414	285.991	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	48.076	217	12520	343.827	ng/ml	100
135) Unknown Sterane (S18)	48.360	217	2563	70.386	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	48.625	217	873	23.975	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.781	217	4931	135.416	ng/ml	100
138) 14a,17a-20R-Methylcholest	49.522	217	4487	123.223	ng/ml	100
139) 14a(H),17a(H)-20S-Ethylch	49.878	217	10639M3	292.170	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.811	217	8319M3	228.458	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	47.637	218	7790M3	213.931	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.720	218	8013M3	220.055	ng/ml	
143) 14b,17b-20R-Methylcholest	48.964	218	6468	177.626	ng/ml	100
144) 14b,17b-20S-Methylcholest	49.046	218	9133M3	250.812	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	50.134	218	13066M3	358.821	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	50.171	218	7356M3	202.012	ng/ml	
147) C26,20R- +C27,20S- triaro	49.832	231	45542	1250.684	ng/mL	100
148) C28,20S-triaromatic stero	50.711	231	38155M3	1047.820	ng/mL	
149) C27,20R-triaromatic stero	51.177	231	30103M4	826.695	ng/mL	
150) C28,20R-triaromatic stero	52.412	231	31880	875.495	ng/mL	100

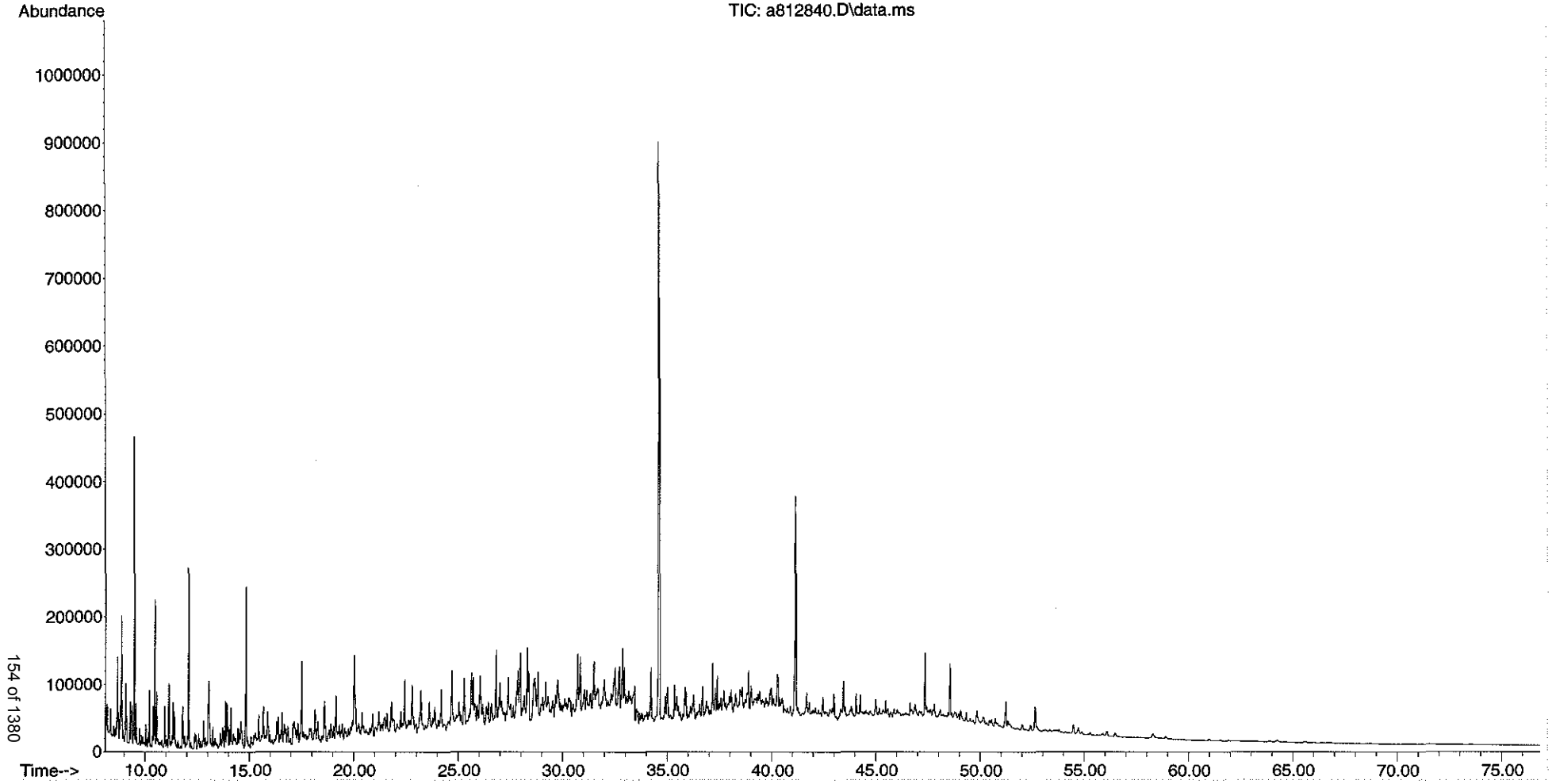
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812840.D
Acq On : 19 Nov 2012 11:42 am
Operator : AC
Sample : SS112012WCS01
Misc : whaq73
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Nov 20 14:57:17 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alaska North Slope Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/18/12	100	0.05076	10	1	AC

Parameter	Result	
cis/trans-Decalin	**418**	
C1-Decalins	**633**	
C2-Decalins	**556**	
C3-Decalins	**244**	
C4-Decalins	**276**	
Benzothiophene	**5.09**	
C1-Benzo(b)thiophenes	**26.7**	
C2-Benzo(b)thiophenes	**49.2**	
C3-Benzo(b)thiophenes	**94.8**	
C4-Benzo(b)thiophenes	**82.7**	
Naphthalene	**491**	
C1-Naphthalenes	**1040**	
C2-Naphthalenes	**1340**	
C3-Naphthalenes	**979**	
C4-Naphthalenes	**510**	
Biphenyl	**136**	
Dibenzofuran	**52.2**	
Acenaphthylene	**6.67**	
Acenaphthene	**18.5**	
Fluorene	**77.6**	
C1-Fluorenes	**167**	
C2-Fluorenes	**252**	
C3-Fluorenes	**249**	
Anthracene	1.97	U
Phenanthrene	**217**	
C1-Phenanthrenes/Anthracenes	**484**	
C2-Phenanthrenes/Anthracenes	**516**	
C3-Phenanthrenes/Anthracenes	**331**	
C4-Phenanthrenes/Anthracenes	**138**	
Retene	1.97	U
Dibenzothiophene	**140**	
C1-Dibenzothiophenes	**285**	
C2-Dibenzothiophenes	**414**	

Parameter	Result	
C3-Dibenzothiophenes	**357**	
C4-Dibenzothiophenes	**197**	
Benzo(b)fluorene	**7.10**	
Fluoranthene	**4.18**	
Pyrene	**12.6**	
C1-Fluoranthenes/Pyrenes	**70.9**	
C2-Fluoranthenes/Pyrenes	**111**	
C3-Fluoranthenes/Pyrenes	**128**	
C4-Fluoranthenes/Pyrenes	**102**	
Naphthobenzothiophenes	**47.9**	
C1-Naphthobenzothiophenes	**118**	
C2-Naphthobenzothiophenes	**176**	
C3-Naphthobenzothiophenes	**128**	
C4-Naphthobenzothiophenes	**86.6**	
Benz[a]anthracene	**2.34**	
Chrysene/Triphenylene	**38.3**	
C1-Chrysenes	**67.0**	
C2-Chrysenes	**88.2**	
C3-Chrysenes	**97.7**	
C4-Chrysenes	**60.0**	
Benzo[b]fluoranthene	**5.34**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**0.466**	J
Benzo[a]fluoranthene	1.97	U
Benzo[e]pyrene	**10.0**	
Benzo[a]pyrene	**2.06**	
Perylene	**2.77**	
Indeno[1,2,3-cd]pyrene	**0.771**	J
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**1.14**	J
Benzo[g,h,i]perylene	**3.13**	

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Alaska North Slope Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/18/12	100	0.05076	10	1	AC

Parameter	Result
Carbazole	**6.36**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/18/12	100	0.05076	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**129**
2/3-Methyldibenzothiophene	**102**
1-Methyldibenzothiophene	**48.1**
3-Methylphenanthrene	**100**
2-Methylphenanthrene	**106**
2-Methylanthracene	**3.43**
9/4-Methylphenanthrene	**162**
1-Methylphenanthrene	**103**
2-Methylnaphthalene	**1010**
1-Methylnaphthalene	**785**
2,6-Dimethylnaphthalene	**653**
2,3,5-Trimethylnaphthalene	**156**
Naphthobenzothiophene-2,1-D	**35.3**
Naphthobenzothiophene-1,2-D	**8.62**
Naphthobenzothiophene-2,3-D	**3.99**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS112012ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/18/12	100	0.05076	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	63.7
C24 Tricyclic Terpane	43.4
C25 Tricyclic Terpane	38.9
C24 Tetracyclic Terpane	12.9
C26 Tricyclic Terpane-22S	14.3
C26 Tricyclic Terpane-22R	13.2
C28 Tricyclic Terpane-22S	15.8
C28 Tricyclic Terpane-22R	16.2
C29 Tricyclic Terpane-22S	17.3
C29 Tricyclic Terpane-22R	18.4
18a-22,29,30-Trisnorneohopane-TS	26.8
C30 Tricyclic Terpane-22S	15.3
C30 Tricyclic Terpane-22R	13.8
17a(H)-22,29,30-Trisnorhopane-TM	34.1
17a/b,21b/a 28,30-Bisnorhopane	6.34
17a(H),21b(H)-25-Norhopane	7.44
30-Norhopane	91.0
18a(H)-30-Norneohopane-C29Ts	22.0
17a(H)-Diahopane	13.4
30-Normoretane	11.1
18a(H)&18b(H)-Oleananes	1.97 U
Hopane	162
Moretane	17.6
30-Homohopane-22S	66.8
30-Homohopane-22R	55.9
T22a-Gammacerane/C32-diahopane	12.0
30,31-Bishomohopane-22S	47.6
30,31-Bishomohopane-22R	34.6

Parameter	Result
30,31-Trishomohopane-22S	36.2
30,31-Trishomohopane-22R	24.8
Tetrakishomohopane-22S	27.4
Tetrakishomohopane-22R	17.6
Pentakishomohopane-22S	27.0
Pentakishomohopane-22R	22.0
13b(H),17a(H)-20S-Diacholestane	50.5
13b(H),17a(H)-20R-Diacholestane	25.3
13b,17a-20S-Methyldiacholestane	22.7
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	58.2
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	71.2
Unknown Sterane (S18)	18.8
13a,17b-20S-Ethyldiacholestane	3.54
14a,17a-20S-Methylcholestane	36.1
14a,17a-20R-Methylcholestane	31.9
14a(H),17a(H)-20S-Ethylcholestane	51.6
14a(H),17a(H)-20R-Ethylcholestane	39.1
14b(H),17b(H)-20R-Cholestane	38.3
14b(H),17b(H)-20S-Cholestane	38.5
14b,17b-20R-Methylcholestane	41.6
14b,17b-20S-Methylcholestane	53.3
14b(H),17b(H)-20R-Ethylcholestane	54.6
14b(H),17b(H)-20S-Ethylcholestane	40.2
C26,20R- +C27,20S- triaromatic steroid	266
C28,20S-triaromatic steroid	169
C27,20R-triaromatic steroid	167
C28,20R-triaromatic steroid	136

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	78991M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	124160	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	262683	839.125	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 83.91%			
42) Phenanthrene-d10	32.843	188	235516	968.795	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.88%			
83) Benzo[b]fluoranthene-d12	47.326	264	243327	1028.298	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.83%			
88) Benzo[a]pyrene-d12	48.534	264	238405	1019.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.98%			
129) 5B(H)Cholane - Surr	44.045	217	49287M3	1085.604	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.56%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	140424	2000.442	ng/mL	100
4) cis-Decalin	17.879	138	6223M3	121.012	ng/mL	
5) C1-Decalins	18.590	152	225633M5	3214.307	ng/mL	
6) C2-Decalins	19.923	166	197945M5	2819.871	ng/mL	
7) C3-Decalins	22.396	180	86941M5	1238.538	ng/mL	
8) C4-Decalins	25.781	194	98332M5	1400.811	ng/mL	
10) Naphthalene	20.078	128	893038	2493.601	ng/mL#	100
11) C1-Naphthalenes	22.779	142	1892183M5	5283.480	ng/mL	
12) C2-Naphthalenes	25.617	156	2429476M5	6783.746	ng/mL	
13) C3-Naphthalenes	27.953	170	1779439M5	4968.669	ng/mL	
14) C4-Naphthalenes	30.709	184	926139M5	2586.028	ng/mL	
16) 2-Methylnaphthalene	22.779	142	1098352	5148.524	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	795886	3984.112	ng/mL#	100
18) Benzothiophene	20.288	134	7480M3	25.840	ng/mL	
19) C1-Benzo(b)thiophenes	22.341	148	39206M5	135.438	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	72234M5	249.534	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	139278M5	481.139	ng/mL	
22) C4-Benzo(b)thiophenes	29.532	190	121540M5	419.863	ng/mL	
23) Biphenyl	24.650	154	186634	687.624	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	605392	3315.806	ng/mL#	100
25) Dibenzofuran	27.743	168	75894	265.048	ng/mL#	85
26) Acenaphthylene	26.356	152	11000	33.839	ng/mL#	100
27) Acenaphthene	27.105	153	18184M3	93.718	ng/mL	
28) 2,3,5-Trimethylnaphthalen	28.656	170	124200M3	789.833	ng/mL	
29) Fluorene	29.112	166	85680M3	393.714	ng/mL	
30) C1-Fluorenes	31.484	180	184625M5	848.383	ng/mL	
31) C2-Fluorenes	33.674	194	278786M5	1281.069	ng/mL	
32) C3-Fluorenes	35.499	208	275240M5	1264.775	ng/mL	
33) Dibenzothiophene	32.433	184	212077	708.685	ng/mL#	85
34) 4-Methyldibenzothiophene(	34.212	198	196394	656.278	ng/mL#	100
35) 2/3-Methyldibenzothiophen	34.559	198	155047	518.111	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.979	198	73034	244.053	ng/mL#	100
37) OTP	34.623	198	14139M3	47.247	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	446536M5	1492.163	ng/mL	
39) C2-Dibenzothiophenes	36.257	212	628709M5	2100.920	ng/mL	
40) C3-Dibenzothiophenes	37.690	226	542766M5	1813.729	ng/mL	

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41)	C4-Dibenzothiophenes	39.379	240	299645M5	1001.306	ng/mL	
43)	Phenanthrene	32.935	178	316886	1100.184	ng/mL	96
44)	3-Methylphenanthrene(3MP)	34.897	192	146687	509.277	ng/mL	99
45)	2-Methylphenanthrene(2MP)	35.006	192	155574	540.131	ng/mL	97
46)	2-Methylanthracene(2MA)	35.162	192	5018M3	17.422	ng/mL	
47)	9/4-Methylphenanthrene(9M	35.344	192	237440	824.359	ng/mL	99
48)	1-Methylphenanthrene(1MP)	35.435	192	150356M3	522.015	ng/mL	
49)	C1-Phenanthrenes/Anthrace	35.344	192	708112M5	2458.467	ng/mL	
50)	C2-Phenanthrenes/Anthrace	37.161	206	754557M5	2619.718	ng/mL	
52)	C3-Phenanthrenes/Anthrace	38.996	220	484184M5	1681.020	ng/mL	
53)	C4-Phenanthrenes/Anthrace	41.178	234	201655M5	700.118	ng/mL	
56)	Carbazole	33.774	167	9037M4	32.276	ng/mL	
57)	1-Methylphenanthrene	35.435	192	153338M3	751.019	ng/mL	
58)	Fluoranthene	37.699	202	6289M3	21.197	ng/mL	
59)	Benzo(b)fluorene	40.220	216	6189M3	36.061	ng/mL	
60)	Pyrene	38.585	202	19232M3	64.087	ng/mL	
61)	C1-Fluoranthenes/Pyrenes	39.973	216	107991M5	359.859	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.772	230	169671M5	565.395	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.789	244	195654M5	651.978	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.141	258	155110M5	516.874	ng/mL	
66)	Naphthobenzothiophene	42.429	234	49992M3	179.456	ng/ml	
67)	Naphthobenzothiophene-2,1	42.429	234	49921M3	179.201	ng/mL	
68)	Naphthobenzothiophene-1,2	42.776	234	12190	43.758	ng/mL#	10
69)	Naphthobenzothiophene-2,3	43.068	234	5647M3	20.271	ng/mL	
70)	C1-Naphthobenzothiophenes	43.826	248	166798M5	598.754	ng/ml	
71)	C2-Naphthobenzothiophenes	45.826	262	249402M5	895.278	ng/ml	
72)	C3-Naphthobenzothiophenes	47.436	276	181212M5	650.496	ng/ml	
73)	C4-Naphthobenzothiophenes	48.525	290	122522M5	439.817	ng/mL	
75)	Benz[a]anthracene	43.360	228	3229M3	11.863	ng/mL	
76)	Chrysene	43.488	228	53021M3	192.442	ng/mL	
77)	Chrysene/Triphenylene	43.488	228	53597M3	194.532	ng/mL	
78)	C1-Chrysenes	44.986	242	93757M5	340.294	ng/mL	
79)	C2-Chrysenes	47.061	256	131721M5	478.086	ng/mL	
80)	BBF-D12 Surr BKGD	47.326	256	8334	30.249	ng/mL	100
81)	C3-Chrysenes	49.814	270	136635M5	495.921	ng/mL	
82)	C4-Chrysenes	49.906	284	83967M5	304.761	ng/mL	
84)	Benzo[b]fluoranthene	47.409	252	7917M3	27.083	ng/mL	
85)	Benzo[j]+[k]fluoranthene	47.464	252	754M3	2.364	ng/mL	
87)	Benzo[e]pyrene	48.433	252	15308M3	50.823	ng/mL	
89)	Benzo[a]pyrene	48.625	252	2919M3	10.477	ng/mL	
90)	Perylene	48.936	252	4273	14.040	ng/mL#	29
91)	Indeno[1,2,3-cd]pyrene	53.518	276	1158M3	3.913	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.573	278	1684M3	5.805	ng/mL	
93)	Benzo[g,h,i]perylene	54.861	276	5336	15.887	ng/mL	91
94)	Hopane (T19)	52.622	191	76529	820.722	ng/mL#	88
95)	17a(H),21B(H)-hopane - C3	52.622	191	76529	820.722	ng/mL#	88
96)	C23 Tricyclic Terpane (T4	41.069	191	30142	323.253	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.799	191	20520	220.063	ng/ml	100
98)	C25 Tricyclic Terpane (T6	43.278	191	18397M3	197.296	ng/ml	
99)	C24 Tetracyclic Terpane (	44.602	191	6107M3	65.493	ng/ml	
100)	C26 Tricyclic Terpane-22S	44.337	191	6784M3	72.754	ng/ml	
101)	C26 Tricyclic Terpane-22R	44.429	191	6272	67.263	ng/ml	100
102)	C28 Tricyclic Terpane-22S	46.713	191	7467	80.079	ng/ml	100

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.869	191	7677M3	82.331	ng/ml	
104)	C29 Tricyclic Terpane-22S	47.399	191	8171	87.629	ng/ml	100
105)	C29 Tricyclic Terpane-22R	47.601	191	8732M3	93.645	ng/ml	
106)	18a-22,29,30-Trisnorneoho	48.753	191	12689	136.081	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.845	191	7247M3	77.719	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.092	191	6548M3	70.223	ng/mL	
109)	17a(H)-22,29,30-Trisnorho	49.311	191	16155	173.252	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	50.528	191	3002	32.194	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	50.317	191	3522	37.771	ng/ml	100
112)	30-Norhopane (T15)	51.223	191	43079M3	461.993	ng/ml	
113)	18a(H)-30-Norneohopane-C2	51.323	191	10404M3	111.576	ng/ml	
114)	17a(H)-Diahopane (X)	51.451	191	6338M3	67.971	ng/ml	
115)	30-Normoretane (T17)	52.018	191	5234	56.131	ng/ml	100
117)	Moretane (T20)	53.335	191	8314M3	89.162	ng/ml	
118)	30-Homohopane-22S (T21)	54.468	191	31628	339.189	ng/ml	100
119)	30-Homohopane-22R (T22)	54.706	191	26440	283.551	ng/ml	100
120)	Gammacerane/C32-diahopane	55.263	191	5656	60.657	ng/mL	100
121)	30,31-Bishomohopane-22S (	56.067	191	22510M3	241.405	ng/ml	
122)	30,31-Bishomohopane-22R (	56.460	191	16361	175.461	ng/ml	100
123)	30,31-Trishomohopane-22S	58.261	191	17135	183.761	ng/ml	100
124)	30,31-Trishomohopane-22R	58.909	191	11749	126.000	ng/ml	100
125)	Tetrakishomohopane-22S (T	60.984	191	12977	139.170	ng/ml	100
126)	Tetrakishomohopane-22R (T	61.916	191	8321	89.237	ng/ml	100
127)	Pentakishomohopane-22S (T	64.228	191	12785	137.111	ng/ml	100
128)	Pentakishomohopane-22R (T	65.571	191	10409	111.630	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	45.543	217	11631	256.186	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.973	217	5823M3	128.258	ng/ml	
132)	13b,17a-20S-Methyldiachol	46.668	217	5227M3	115.131	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	47.546	217	13402	295.195	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	48.067	217	16410M3	361.449	ng/ml	
135)	Unknown Sterane (S18)	48.351	217	4336	95.505	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	48.625	217	815	17.951	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.781	217	8320M3	183.258	ng/ml	
138)	14a,17a-20R-Methylcholest	49.521	217	7349M3	161.870	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.878	217	11898	262.067	ng/ml	100
140)	14a(H),17a(H)-20R-Ethylch	50.811	217	9006M3	198.368	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	47.637	218	8824M3	194.359	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.720	218	8873M3	195.438	ng/ml	
143)	14b,17b-20R-Methylcholest	48.964	218	9597	211.385	ng/ml	100
144)	14b,17b-20S-Methylcholest	49.046	218	12292M3	270.746	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	50.134	218	12571M3	276.891	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	50.171	218	9254M3	203.830	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.832	231	61216M3	1348.354	ng/mL	
148)	C28,20S-triaromatic stero	50.710	231	38935	857.589	ng/mL	100
149)	C27,20R-triaromatic stero	51.177	231	38396	845.717	ng/mL	100
150)	C28,20R-triaromatic stero	52.412	231	31233	687.943	ng/mL	100

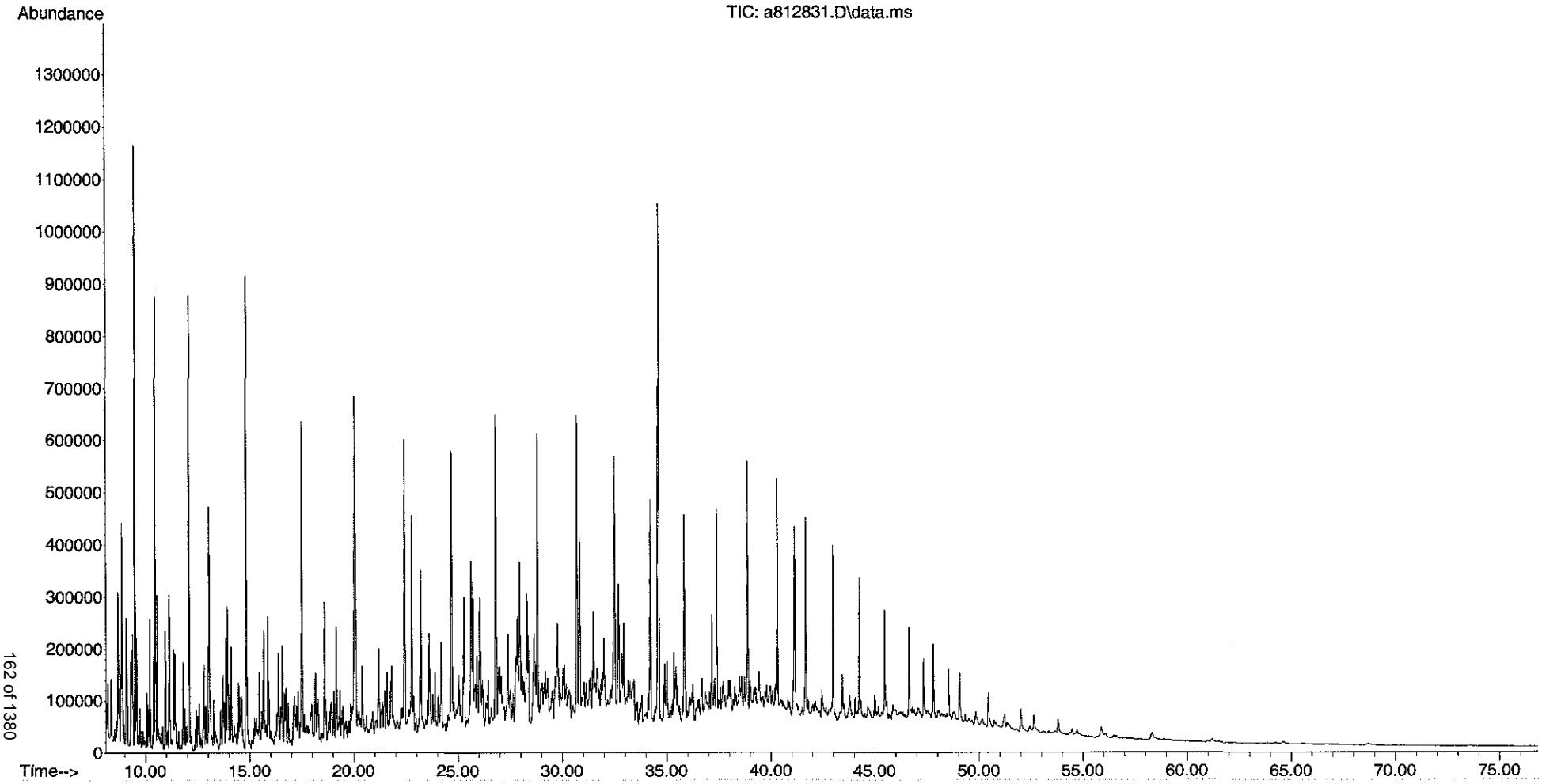
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH8\Nov12\nov18\
Data File : a812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed



Alpha Woods Hole Lab
Batch Prep Report

11/06/2012 1210082 - OP NEWFIE

Lab ID	QC Type	Prep Method	Analyst	Prep Start Date	Prep Completed Date	TCLP	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1210082-01	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-02	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-03	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-04	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.03	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-05	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.01	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-06	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-07	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612B08	B	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCS04	LCS	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCSD04	LCSD	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210082 - OP NEWFIE

Lab ID	Notes
1210082-01	1st Prep
1210082-02	1st Prep
1210082-03	1st Prep: Sample blown low on water bath during initial concentration. CTK 11-7-12
1210082-04	1st Prep
1210082-05	1st Prep
1210082-06	1st Prep
1210082-07	1st Prep
SS110612B08	1st Prep
SS110612LCS04	1st Prep
SS110612LCSD04	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210082 - OP NEWFIE Analyst: CTK Witness: AMK

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1210082-01	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-02	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-03	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-04	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-05	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-06	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-07	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612B08	B	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612LCS04	LCS	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl
SS110612LCSD04	LCSD	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ65	Biomarker Surrogate	5b(H) Cholane = 10 ug/mL	DCM	7787
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210082 - OP SHC Analyst: CTK Witness: AMK

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1210082-01	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-02	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-03	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-04	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-05	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-06	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-07	SAM	WHAQ79	100	µl				WHAQ72	50	µl
SS110612B08	B	WHAQ79	100	µl				WHAQ72	50	µl
SS110612LCS04	LCS	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl
SS110612LCSD04	LCSD	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ72	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene-d10, Chrysene-d12 = 5 ug/mL	DCM	L14S03
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

ETR 1210082

Analyst AMK

Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	0.280	56.00	N/A	N/A	N/A	104%
1210081	1		4000	50	0.201	16.08	2000	8.04	2.00	
	2		4000	50	0.222	17.76	2000	8.88	2.00	
	3		4000	50	0.219	17.52	2000	8.76	2.00	
	4		4000	50	0.208	16.64	2000	8.32	2.00	
	5		4000	50	0.201	16.08	2000	8.04	2.00	
	6		4000	50	0.190	15.20	2000	7.60	2.00	
	7		4000	50	0.217	17.36	2000	8.68	2.00	

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: BLS

Date: 11/12/12

ETR 1210082

Analyst AMK

Date 11/07/2012

Alpha Analytical

- [ ] Pre-Alumina
- [ ] Post-Alumina
- [x] Pre-Silica
- [ ] Oily Material Prep.
- [ ] Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	.280		N/A	N/A	N/A	0%
1210081	1		4000	50	.201					
	2		4000	50	~~.228~~ .222	AMK 11/7/12				
	3		4000	50	.219					
	4		4000	50	.208					
	5		4000	50	.201					
	6		4000	50	.190					
	7		4000	50	.217					

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: AMK

Date: 11/7/12

Alpha Woods Hole Lab
Batch Weight Report
11/06/2012

Lab ID	QC Type	1210082 - Sample
1210082-01	SAM	15
1210082-02	SAM	15.02
1210082-03	SAM	15
1210082-04	SAM	15.03
1210082-05	SAM	15.01
1210082-06	SAM	15.02
1210082-07	SAM	15
SS110612B08	B	15
SS110612LCS04LCS	OP NEWFIE	15
SS110612LCS04LCS	OP SHC	15
SS110612LCS04LCS	OP Steranes/Triterpanes	15
SS110612LCSD04LCSD	OP NEWFIE	15
SS110612LCSD04LCSD	OP SHC	15
SS110612LCSD04LCSD	OP Steranes/Triterpanes	15 KML 11/21/12

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210082 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210082-01	SAM	3660B	CTK	11/7/2012												True
1210082-02	SAM	3660B	CTK	11/7/2012												True
1210082-03	SAM	3660B	CTK	11/7/2012												True
1210082-04	SAM	3660B	CTK	11/7/2012												True
1210082-05	SAM	3660B	CTK	11/7/2012												True
1210082-06	SAM	3660B	CTK	11/7/2012												True
1210082-07	SAM	3660B	CTK	11/7/2012												True
SS110612B08	B	3660B	CTK	11/7/2012												True
SS110612LCS04	LCS	3660B	CTK	11/7/2012												True
SS110612LCSD04	LCSD	3660B	CTK	11/7/2012												True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210082 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210082-01	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-02	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-03	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-04	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-05	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-06	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-07	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612B08	B	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCS04	LCS	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCSD04	LCSD	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210082 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210082-01	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-02	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-03	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-04	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-05	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-06	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-07	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612B08	B	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCS04	LCS	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCSD04	LCSD	split	KJD	11/8/2012							0.9	0.45	2			True

Forensic Preparation Checklist

Batch ID: 1210082 **Client:** AECOM **Project:** Enbridge MDL

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil
Product • PUF • Sediment • Sheen
Soil • Solid • SPMD • Tissue
1L Water • 4L Water • Floc Water

Extraction HT:
9/12/11 13

	Date:	Initials:
COC/ETR Check:	11/6/12	CTK
1st Extraction:	11/6/12	CTK
2nd Extraction:	11/6/12	CTK
3rd Extraction:	11/7/12	WR/MH

Cleanup Methods:		Date/Initials:
No Cleanup Required		
Alumina Column (3610)		
Silica Column (3630)	X	11/7/12 AMK
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)	X	11/7/12 CTK
Water pH<2 verified		
Date/Initials:		**ID & Amount:**
RIS Spike Analyst:	11/8/12 KM	WHAQ 72
RIS Spike Witness:	11/8/12 BLS	50 mL

Prep Process Notes

Sample 3 blown low on water bath during initial concentration. CTK 11/7/12

Samples 1-7 spiked with 300 uL WHAQ62. CTK 11/7/12

REAGENT	LOT #
DCM	000015769
SODIUM SULFATE	000011407
SILICA GEL	BCBH9150V
ALUMINA	n/a

REAGENT	LOT #
COPPER	OWR110712B
GLASS WOOL	05112999

BATCH COMPLETE Analyst:	KM	Date:	11/8/12
BATCH REVIEWED Analyst:	BLS	Date:	11/12/12

Alpha Woods Hole Lab
Batch Weight Report
10/05/2012

Lab ID	QC Type	PS1210003 - Pan Weight	PS1210003 - Wet Weight	PS1210003 - Dry Weight	PS1210003 - Dry Weight #2	PS1210003 - Dry Weight #3	Percent Solid
1210003-01	SAM 1210082-01	1.31	7.73	5.4	5.39		63.55
1210003-02	SAM 1210082-02	1.31	7.73	5.4	5.39		63.55
1210003-03	SAM 1210082-03	1.31	7.73	5.4	5.39		63.55
1210003-04	SAM 1210082-04	1.31	7.73	5.4	5.39		63.55
1210003-05	SAM 1210082-05	1.31	7.73	5.4	5.39		63.55
1210003-06	SAM 1210082-06	1.31	7.73	5.4	5.39		63.55
1210003-07	SAM 1210082-07	1.31	7.73	5.4	5.39		63.55
PSS100512B05	B	1.32	1.32	1.32	1.32		100.00

KmL 11/16/12

Initial: 10/5/2012 12:30:30 PM wr
Weight #1: 10/9/2012 8:17:48 AM ctk
Weight #2: 10/10/2012 12:20:20 PM bls

1601

Analysis log File

Total Files Reported in Log : 34
Log Generated From Directory: O:\Forensics\Data\PAH8\Nov12\nov18\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	a812822.D	dcm	dcm	11/18/2012 8:20 am
2	a812823.D	i811181201 ✓	11 whaq83	11/18/2012 9:44 am
3	a812824.D	i811181202 ✓	12 whaq84	11/18/2012 11:08 am
4	a812825.D	i811181203 ✓	13 whaq85	11/18/2012 12:33 pm
5	a812826.D	i811181204 ✓	14 whaq86	11/18/2012 1:58 pm
6	a812827.D	i811181205 ✓	15 whaq87	11/18/2012 3:23 pm
7	a812828.D	i811181206 ✓	16 whaq88	11/18/2012 4:48 pm
8	a812829.D	i811181207 ✓	17 whaq89	11/18/2012 6:13 pm
9	a812830.D	dcm	dcm	11/18/2012 7:37 pm
10	a812831.D	✓ SS112012ANC01 ✓	whaq46 5.076	11/18/2012 9:02 pm
11	a812832.D	dcm	dcm	11/18/2012 10:26 pm
12	a812833.D	q811181201 ✓	icc whaq50	11/18/2012 11:50 pm
13	a812834.D	mc252811161201	whaq47 5.205	11/19/2012 1:14 am
14	a812835.D	srm1582811161201	whaq56 5.437	11/19/2012 2:39 am
15	a812836.D	corexit	rt only	11/19/2012 4:03 am
16	a812837.D	dcm	dcm	11/19/2012 5:27 am
17	a812838.D	c811181201	cc whaq86 500ng/ml	11/19/2012 6:52 am
18	a812839.D	✓ c811181202	cc whaq86 500ng/ml	11/19/2012 10:00 am
19	a812840.D	✓ SS112012WCS01	whaq73	11/19/2012 11:42 am
20	a812841.D	✓ SS112012CL01	whaq74	11/19/2012 1:08 pm
21	a812842.D	dcm	dcm	11/19/2012 2:34 pm
22	a812843.D	dcm	dcm	11/19/2012 3:59 pm
23	a812844.D	✓ ss110612b08	1x etr1210082	11/19/2012 5:23 pm
24	a812845.D	✓ ss110612lcs04	1x etr1210082	11/19/2012 6:48 pm
25	a812846.D	✓ ss110612lcsd04	1x etr1210082	11/19/2012 8:12 pm
26	a812847.D	✓ 1210082-01	1x	11/19/2012 9:36 pm
27	a812848.D	✓ 1210082-02	1x	11/19/2012 11:00 pm
28	a812849.D	✓ c811181203	cc whaq86 500ng/ml	11/20/2012 12:24 am
29	a812850.D	✓ 1210082-03	1x	11/20/2012 1:48 am
30	a812851.D	✓ 1210082-04	1x	11/20/2012 3:12 am
31	a812852.D	✓ 1210082-05	1x	11/20/2012 4:36 am
32	a812853.D	✓ 1210082-06	1x	11/20/2012 6:00 am
33	a812854.D	✓ 1210082-07	1x	11/20/2012 7:25 am
34	a812855.D	✓ c811181205	cc whaq86 500ng/ml	11/20/2012 8:49 am

PAH8 111812.M
CCV = WHAQ86 = 500 ng/ml
11/20/12

Printed: 11/20/12 Page: 1

Total Saturated Hydrocarbons By GC/FID

Form II
Surrogate Recovery
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210082**
Matrix: **Sediment**

Case: **N/A** SDG: **N/A**

Client ID	Lab ID	ortho-Terphenyl	d50-Tetracosane
Blank	SS110612B08	89	88
LCS	SS110612LCS04	89	89
LCSD	SS110612LCSD04	83	82
SEBC0000L012S092112D004_MDL1	1210082-01	85	88
SEBC0000L012S092112D004_MDL2	1210082-02	87	87
SEBC0000L012S092112D004_MDL3	1210082-03	86	86
SEBC0000L012S092112D004_MDL4	1210082-04	84	85
SEBC0000L012S092112D004_MDL5	1210082-05	84	88
SEBC0000L012S092112D004_MDL6	1210082-06	85	87
SEBC0000L012S092112D004_MDL7	1210082-07	87	87

N/A - Not Applicable

Surrogate	QC Limit
ortho-Terphenyl	40-125
d50-Tetracosane	40-125

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **See Below**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/06/12	100	AC

Lab ID:		SS110612B08	SS110612LCS04		SS110612LCSD04				
Parameter		**Blank Conc.**	**LCS Conc.**	**% Recovery**	**LCSD Conc.**	**% Recovery**	**% RPD**	**RPD Limit**	**% Recovery Limits**
n-Nonane (C9)		0.0181	U 0.974	73	0.859	64	13	30	50-125
n-Decane (C10)		0.00800	1.07	81	0.967	73	10	30	50-125
n-Dodecane (C12)		0.0188	U 1.13	84	1.02	77	10	30	50-125
n-Tetradecane (C14)		0.0139	U 1.16	87	1.06	80	9	30	50-125
n-Hexadecane (C16)		0.0128	U 1.24	93	1.14	86	8	30	50-125
n-Octadecane (C18)		0.0587	1.24	93	1.15	86	8	30	50-125
n-Nonadecane (C19)		0.0108	U 1.15	86	1.06	80	8	30	50-125
n-Eicosane (C20)		0.00741	U 1.18	89	1.09	82	8	30	50-125
n-Docosane (C22)		0.00133	1.20	90	1.10	83	8	30	50-125
n-Tetracosane (C24)		0.0124	U 1.25	94	1.14	86	9	30	50-125
n-Hexacosane (C26)		0.00213	1.23	92	1.14	85	8	30	50-125
n-Octacosane (C28)		0.00573	1.24	93	1.15	86	8	30	50-125
n-Triacontane (C30)		0.0133	U 1.26	94	1.16	87	8	30	50-125
n-Hexatriacontane (C36)		0.0221	U 1.21	91	1.12	84	8	30	50-125

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	89	83	40-125
d50-Tetracosane	89	82	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Nonane (C9)	6286	7340	117	65-135
n-Decane (C10)	5047	5900	117	65-135
n-Undecane (C11)	4703	5390	115	65-135
n-Dodecane (C12)	4155	5000	120	65-135
n-Tridecane (C13)	4058	4780	118	65-135
2,6,10 Trimethyldodecane (1380)	845	914	108	65-135
n-Tetradecane (C14)	3670	4170	114	65-135
2,6,10 Trimethyltridecane (1470)	1367	1580	115	65-135
n-Pentadecane (C15)	3660	4060	111	65-135
n-Hexadecane (C16)	3330	3940	118	65-135
Norpristane (1650)	1093	1240	113	65-135
n-Heptadecane (C17)	3012	3540	117	65-135
Pristane	2145	2370	110	65-135
n-Octadecane (C18)	2700	3060	114	65-135
Phytane	1215	1410	116	65-135
n-Nonadecane (C19)	2305	2680	116	65-135
n-Eicosane (C20)	2337	2570	110	65-135
n-Heneicosane (C21)	2044	2280	112	65-135
n-Docosane (C22)	1972	2220	112	65-135
n-Tricosane (C23)	1745	1940	111	65-135
n-Tetracosane (C24)	1641	1960	119	65-135
n-Pentacosane (C25)	1562	1730	110	65-135
n-Hexacosane (C26)	1378	1530	111	65-135
n-Heptacosane (C27)	1083	1190	110	65-135
n-Octacosane (C28)	776	881	114	65-135
n-Nonacosane (C29)	734	776	106	65-135
n-Triacontane (C30)	627	724	116	65-135
n-Hentriacontane (C31)	514	674	131	65-135
n-Dotriacontane (C32)	458	446	97	65-135
n-Tritriacontane (C33)	388	371	96	65-135
n-Tetratriacontane (C34)	347	366	105	65-135
n-Pentatriacontane (C35)	278	333	120	65-135
n-Hexatriacontane (C36)	186	219	118	65-135

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Heptatriacontane (C37)	152	169	111	65-135
n-Octatriacontane (C38)	131	154	118	65-135
n-Nonatriacontane (C39)	88.7	99.3	112	65-135
n-Tetracontane (C40)	92.3	99.3	108	65-135
Total Petroleum Hydrocarbons (C9-C44)	554993	627000	113	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Nonane (C9)	6204	6790	109	65-135
n-Decane (C10)	5060	5470	108	65-135
n-Undecane (C11)	4640	5000	108	65-135
n-Dodecane (C12)	4121	4300	104	65-135
n-Tridecane (C13)	3859	4300	111	65-135
2,6,10 Trimethyldodecane (1380)	914	914	100	65-135
n-Tetradecane (C14)	3500	3750	107	65-135
2,6,10 Trimethyltridecane (1470)	1316	1520	115	65-135
n-Pentadecane (C15)	3836	3830	100	65-135
n-Hexadecane (C16)	3174	3530	111	65-135
Norpristane (1650)	1030	1050	102	65-135
n-Heptadecane (C17)	2818	3210	114	65-135
Pristane	2093	2150	103	65-135
n-Octadecane (C18)	2460	2850	116	65-135
Phytane	1213	1260	104	65-135
n-Nonadecane (C19)	2354	2410	103	65-135
n-Eicosane (C20)	2305	2560	111	65-135
n-Heneicosane (C21)	2077	2120	102	65-135
n-Docosane (C22)	2010	2070	103	65-135
n-Tricosane (C23)	1735	1850	107	65-135
n-Tetracosane (C24)	1629	1710	105	65-135
n-Pentacosane (C25)	1607	1630	102	65-135
n-Hexacosane (C26)	1333	1470	110	65-135
n-Heptacosane (C27)	1085	1100	101	65-135
n-Octacosane (C28)	770	782	102	65-135
n-Nonacosane (C29)	774	770	100	65-135
n-Triacontane (C30)	595	655	110	65-135
n-Hentriacontane (C31)	534	493	92	65-135
n-Dotriacontane (C32)	501	441	88	65-135
n-Tritriacontane (C33)	322	403	125	65-135
n-Tetratriacontane (C34)	289	378	131	65-135
n-Pentatriacontane (C35)	271	283	104	65-135
n-Hexatriacontane (C36)	166	207	125	65-135

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Heptatriacontane (C37)	145	172	118	65-135
n-Octatriacontane (C38)	136	136	100	65-135
n-Nonatriacontane (C39)	94.3	104	110	65-135
n-Tetracontane (C40)	86.5	98.2	114	65-135
Total Petroleum Hydrocarbons (C9-C44)	544000	590000	109	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form IV
Method Blank Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Date Analyzed: **11/09/12 19:18**

Client ID	Lab ID	Date/Time Analyzed
LCS	SS110612LCS04	11/09/12 23:46
LCSD	SS110612LCSD04	11/10/12 04:13
SEBC0000L012S092112D004_MDL1	1210082-01	11/11/12 04:03
SEBC0000L012S092112D004_MDL2	1210082-02	11/11/12 05:33
SEBC0000L012S092112D004_MDL3	1210082-03	11/11/12 07:02
SEBC0000L012S092112D004_MDL4	1210082-04	11/11/12 08:32
SEBC0000L012S092112D004_MDL5	1210082-05	11/11/12 10:02
SEBC0000L012S092112D004_MDL6	1210082-06	11/11/12 11:31
SEBC0000L012S092112D004_MDL7	1210082-07	11/11/12 13:02

N/A - Not Applicable

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28814.D
Time Acquired : 09 Nov 2012 11:49 am

C211091201R 59338300

File	Sample	Internal Standard Responses
e28824.D	SS110612B08	70064942
e28830.D	SS110612LCS04	67284804
e28836.D	SS110612LCSD04	69081849
e28840.D	C211091202R	62613621

(fails) - fails 24hr time check * - fails criteria

Created: Sat Nov 17 12:11:57 2012 PAH2

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28860.D
Time Acquired : 10 Nov 2012 11:35 pm

C211091203R 61327900

File	Sample	Internal Standard Responses
e28866.D	1210082-01	70311065
e28868.D	1210082-02	70453666
e28870.D	1210082-03	68551992
e28872.D	1210082-04	75235021
e28874.D	1210082-05	73020720
e28876.D	1210082-06	72350951
e28878.D	1210082-07	70400715
e28880.D	C211091204R	61473588

(fails) - fails 24hr time check * - fails criteria

Created: Sat Nov 17 12:10:10 2012 PAH2

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-01**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0298**	J	n-Tricosane (C23)	**0.348**	
n-Decane (C10)	**0.0539**	JB	n-Tetracosane (C24)	**0.178**	J
n-Undecane (C11)	**0.0514**	J	n-Pentacosane (C25)	**1.54**	G
n-Dodecane (C12)	**0.0428**	J	n-Hexacosane (C26)	**0.275**	
n-Tridecane (C13)	**0.101**	J	n-Heptacosane (C27)	**1.58**	
2,6,10 Trimethyldodecane (1380)	**0.0558**	J	n-Octacosane (C28)	**0.258**	
n-Tetradecane (C14)	**0.165**	J	n-Nonacosane (C29)	**3.72**	
2,6,10 Trimethyltridecane (1470)	**0.198**	GJ	n-Triacontane (C30)	**0.266**	
n-Pentadecane (C15)	**0.241**		n-Hentriacontane (C31)	**1.65**	
n-Hexadecane (C16)	**0.326**		n-Dotriacontane (C32)	**0.162**	J
Norpristane (1650)	**0.154**	J	n-Tritriacontane (C33)	**0.423**	
n-Heptadecane (C17)	**0.348**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.278**		n-Pentatriacontane (C35)	**0.180**	J
n-Octadecane (C18)	**1.20**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.315**	G	n-Heptatriacontane (C37)	**0.0736**	J
n-Nonadecane (C19)	**0.211**		n-Octatriacontane (C38)	**0.174**	J
n-Eicosane (C20)	**0.230**		n-Nonatriacontane (C39)	0.0384	U
n-Heneicosane (C21)	**0.180**	J	n-Tetracontane (C40)	**0.0770**	J
n-Docosane (C22)	**0.191**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**15.3**
Total Petroleum Hydrocarbons (C9-C44)	**497**
Total Resolved Hydrocarbons	**74.5**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	85	40-125
d50-Tetracosane	88	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28866.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 4:03 am
Operator : AC
Sample : 1210082-01
Misc : 1X
ALS Vial : 78 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:49:10 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	70311065	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.638	31490660	21.206 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	42.41%#
24) s	d50-Tetracosane	35.362	26404218	21.947 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.89%#
	Target Compounds			
2) t	n-Octane (C8)	5.215	112454	0.099 ug/mL M4
3) t	n-Nonane (C9)	7.361	163869	0.142 ug/mL M4
4) t	n-Decane (C10)	9.812	309044	0.257 ug/mL M4
5) t	n-Undecane (C11)	12.306	297187	0.245 ug/mL M4
6) t	n-Dodecane (C12)	14.723	251741	0.204 ug/mL M4
7) t	n-Tridecane (C13)	17.027	595892	0.480 ug/mL M4
8) t	1380	18.702	333361	0.266 ug/mL M4
9) t	n-Tetradecane (C14)	19.203	984354	0.786 ug/mL M4
10) t	1470	20.491	1185092G	0.944 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1443285	1.149 ug/mL M4
12) t	n-Hexadecane (C16)	23.220	1965308	1.552 ug/mL M4
13) t	1650	24.124	925053	0.735 ug/mL M4
14) t	n-Heptadecane (C17)	25.071	2088641	1.660 ug/mL M4
15) t	Pristane	25.169	1701926	1.324 ug/mL M4
16) t	n-Octadecane (C18)	26.809	7332344G	5.697 ug/mL M4
17) t	Phytane	26.987	1910220G	1.501 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1295172	1.008 ug/mL M4
20) t	n-Eicosane (C20)	30.124	1420176	1.095 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	1115116	0.856 ug/mL M4
22) t	n-Docosane (C22)	33.126	1191024	0.912 ug/mL M4
23) t	n-Tricosane (C23)	34.536	2197081	1.657 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	1108629	0.850 ug/mL M4
26) t	n-Pentacosane (C25)	37.184	9742437G	7.333 ug/mL M4
27) t	n-Hexacosane (C26)	38.452	1730798	1.311 ug/mL M4
28) t	n-Heptacosane (C27)	39.666	9746142	7.528 ug/mL M4
29) t	n-Octacosane (C28)	40.831	1608061	1.230 ug/mL M4
30) t	n-Nonacosane (C29)	41.971	23159108	17.714 ug/mL M4
31) t	n-Triacontane (C30)	43.054	1641250	1.269 ug/mL M4
32) t	n-Hentriacontane (C31)	44.114	10243647	7.854 ug/mL M4
33) t	n-Dotriacontane (C32)	45.127	1002329	0.771 ug/mL M4
34) t	n-Tritriacontane (C33)	46.130	2505318	2.018 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.131	1117314	0.857 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28866.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 4:03 am
Operator : AC
Sample : 1210082-01
Misc : 1X
ALS Vial : 78 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:49:10 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

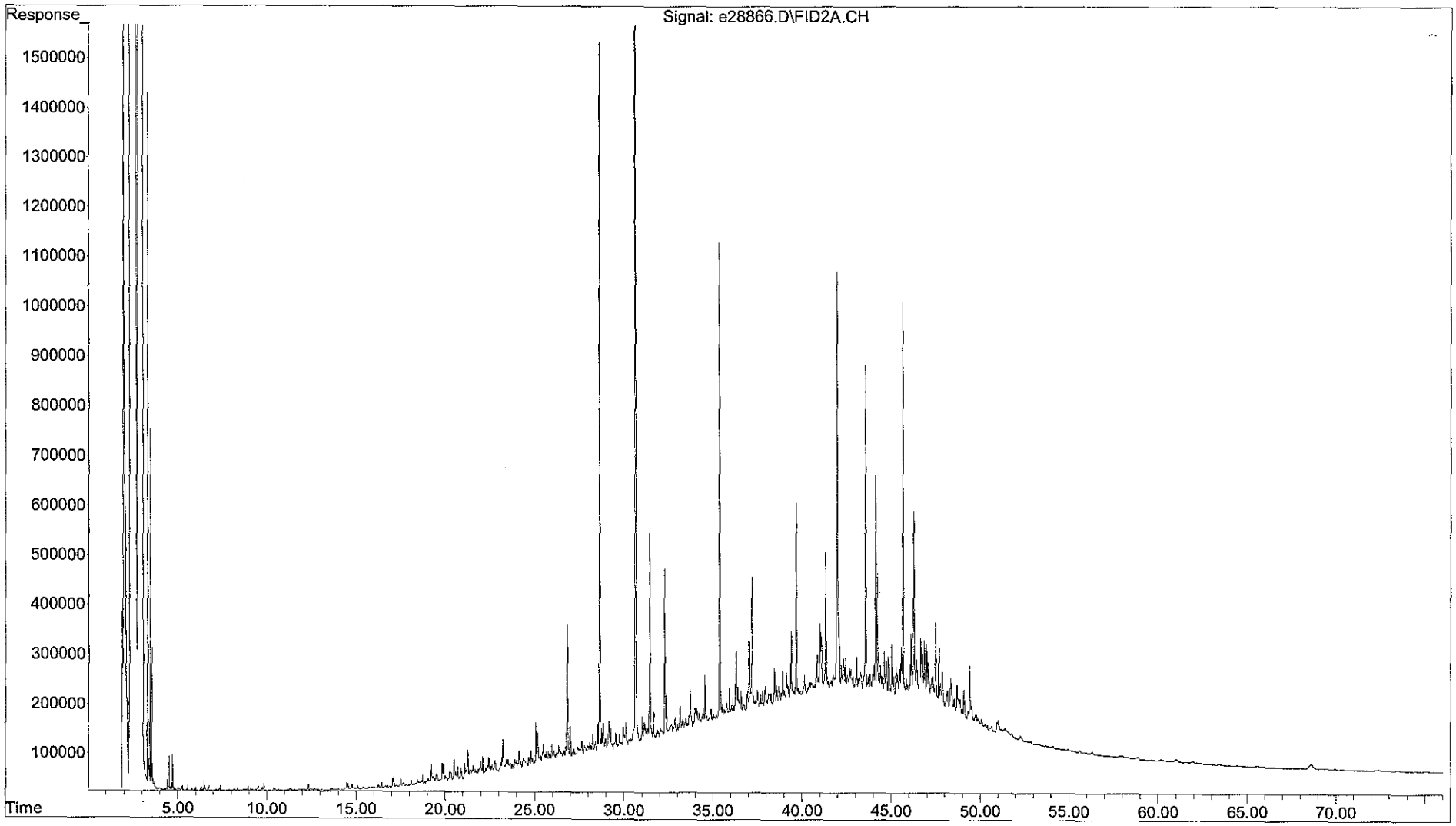
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.667	458051	0.351	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.247	1078663	0.831	ug/mL	M4
41) t	n-Tetracontane (C40)	56.263	451713	0.367	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	3911153010	3058.944	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3026620620	2367.144	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	453946605	355.035	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28866.D
Operator : AC
Acquired : 11 Nov 2012 4:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-01
Misc Info : 1X
ALS Vial : 78



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-02**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.02	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0249**	J	n-Tricosane (C23)	**0.356**	
n-Decane (C10)	**0.0513**	JB	n-Tetracosane (C24)	**0.193**	J
n-Undecane (C11)	**0.0536**	J	n-Pentacosane (C25)	**1.82**	G
n-Dodecane (C12)	**0.0423**	J	n-Hexacosane (C26)	**0.280**	
n-Tridecane (C13)	**0.101**	J	n-Heptacosane (C27)	**1.87**	
2,6,10 Trimethyldodecane (1380)	**0.0608**	J	n-Octacosane (C28)	**0.292**	
n-Tetradecane (C14)	**0.168**	J	n-Nonacosane (C29)	**3.59**	
2,6,10 Trimethyltridecane (1470)	**0.217**	G	n-Triacontane (C30)	**0.254**	
n-Pentadecane (C15)	**0.248**		n-Hentriacontane (C31)	**1.57**	
n-Hexadecane (C16)	**0.340**		n-Dotriacontane (C32)	**0.158**	J
Norpristane (1650)	**0.163**	J	n-Tritriacontane (C33)	**0.467**	
n-Heptadecane (C17)	**0.350**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.293**		n-Pentatriacontane (C35)	**0.208**	J
n-Octadecane (C18)	**1.42**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.351**	G	n-Heptatriacontane (C37)	**0.0769**	J
n-Nonadecane (C19)	**0.224**		n-Octatriacontane (C38)	**0.191**	J
n-Eicosane (C20)	**0.214**		n-Nonatriacontane (C39)	0.0383	U
n-Heneicosane (C21)	**0.193**	J	n-Tetracontane (C40)	**0.108**	J
n-Docosane (C22)	**0.194**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**16.1**
Total Petroleum Hydrocarbons (C9-C44)	**567**
Total Resolved Hydrocarbons	**86.7**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	87	40-125
d50-Tetracosane	87	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28868.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 5:33 am
Operator : AC
Sample : 1210082-02
Misc : 1X
ALS Vial : 79 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:46:07 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.666	70453666	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.640	32536831	21.866 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	43.73%#
24) s	d50-Tetracosane	35.363	26128165	21.673 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	43.35%#
	Target Compounds			
2) t	n-Octane (C8)	5.212	93751	0.083 ug/mL M4
3) t	n-Nonane (C9)	7.359	137531	0.119 ug/mL M4
4) t	n-Decane (C10)	9.809	295190	0.245 ug/mL M4
5) t	n-Undecane (C11)	12.304	311148	0.256 ug/mL M4
6) t	n-Dodecane (C12)	14.724	249582	0.202 ug/mL M4
7) t	n-Tridecane (C13)	17.026	599838	0.482 ug/mL M4
8) t	1380	18.702	363517	0.290 ug/mL M4
9) t	n-Tetradecane (C14)	19.203	1008181	0.803 ug/mL M4
10) t	1470	20.490	1301241G	1.034 ug/mL M4
11) t	n-Pentadecane (C15)	21.261	1491333	1.185 ug/mL M4
12) t	n-Hexadecane (C16)	23.219	2060129	1.624 ug/mL M4
13) t	1650	24.126	980655	0.778 ug/mL M4
14) t	n-Heptadecane (C17)	25.072	2104150	1.669 ug/mL M4
15) t	Pristane	25.168	1801593	1.399 ug/mL M4
16) t	n-Octadecane (C18)	26.808	8759184G	6.792 ug/mL M4
17) t	Phytane	26.988	2133321G	1.673 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1379097	1.071 ug/mL M4
20) t	n-Eicosane (C20)	30.120	1328034	1.022 ug/mL M4
21) t	n-Heneicosane (C21)	31.655	1204876	0.923 ug/mL M4
22) t	n-Docosane (C22)	33.124	1210208	0.925 ug/mL M4
23) t	n-Tricosane (C23)	34.537	2255159	1.697 ug/mL M4
25) t	n-Tetracosane (C24)	35.895	1200638	0.919 ug/mL M4
26) t	n-Pentacosane (C25)	37.182	11561174G	8.684 ug/mL M4
27) t	n-Hexacosane (C26)	38.452	1769263	1.338 ug/mL M4
28) t	n-Heptacosane (C27)	39.666	11554306	8.907 ug/mL M4
29) t	n-Octacosane (C28)	40.833	1826075	1.394 ug/mL M4
30) t	n-Nonacosane (C29)	41.976	22449019	17.136 ug/mL M4
31) t	n-Triacontane (C30)	43.051	1567904	1.210 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	9774287	7.479 ug/mL M4
33) t	n-Dotriacontane (C32)	45.136	979533	0.752 ug/mL M4
34) t	n-Tritriacontane (C33)	46.132	2771340	2.228 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.133	1298352	0.994 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.657	479637	0.367 ug/mL M4
39) t	n-Octatriacontane (C38)	52.240	1183325	0.910 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28868.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 5:33 am
Operator : AC
Sample : 1210082-02
Misc : 1X
ALS Vial : 79 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:46:07 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

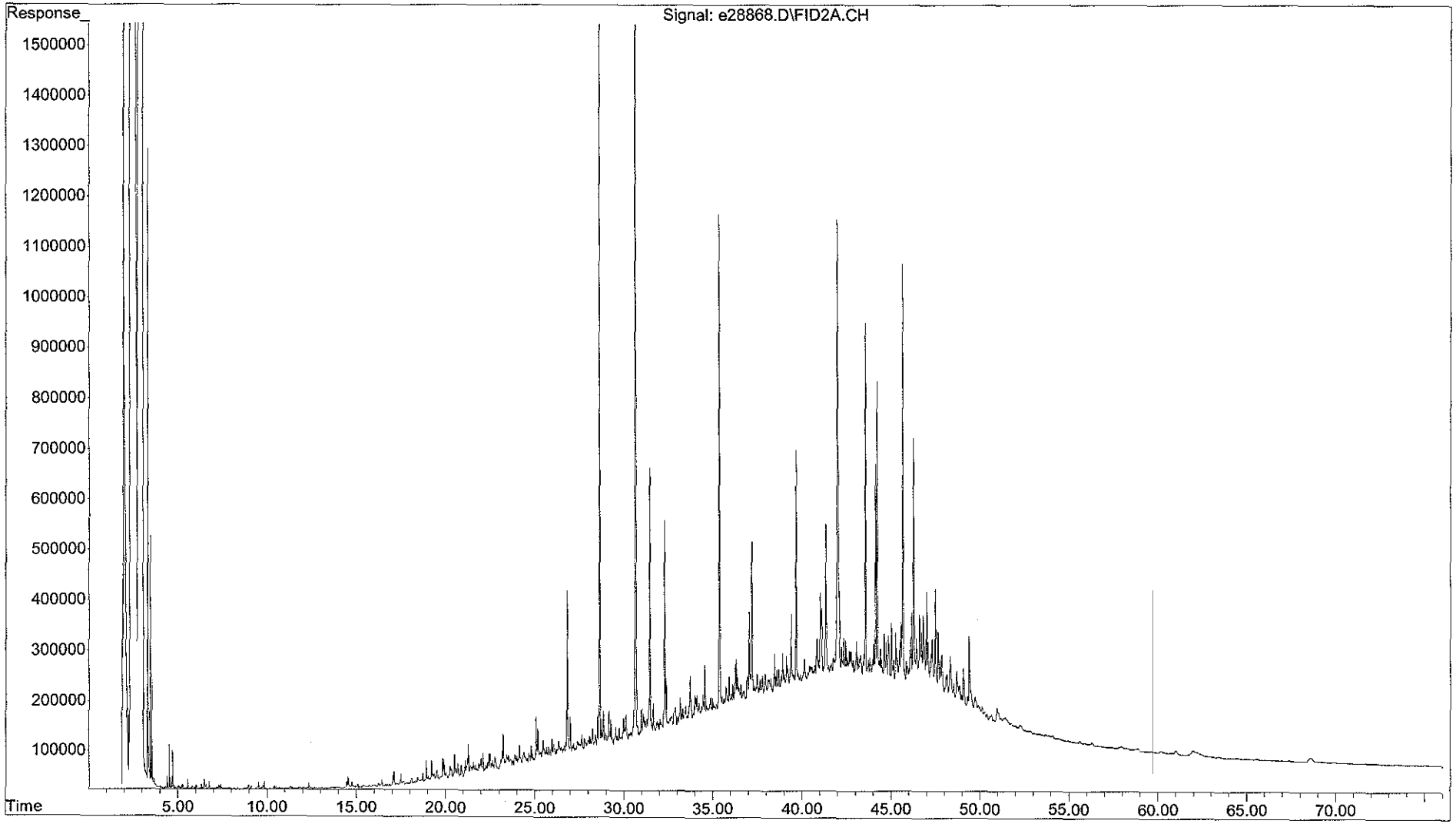
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
41) t	n-Tetracontane (C40)	56.281	636483	0.517	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	4351362622	3396.347	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3466830232	2705.948	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	530008392	413.685	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28868.D
Operator : AC
Acquired : 11 Nov 2012 5:33 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-02
Misc Info : 1X
ALS Vial : 79



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-03**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0224**	J	n-Tricosane (C23)	**0.315**	
n-Decane (C10)	**0.0514**	JB	n-Tetracosane (C24)	**0.163**	J
n-Undecane (C11)	**0.0508**	J	n-Pentacosane (C25)	**1.45**	G
n-Dodecane (C12)	**0.0447**	J	n-Hexacosane (C26)	**0.235**	
n-Tridecane (C13)	**0.0867**	J	n-Heptacosane (C27)	**1.46**	
2,6,10 Trimethyldodecane (1380)	**0.0615**	J	n-Octacosane (C28)	**0.230**	
n-Tetradecane (C14)	**0.175**	J	n-Nonacosane (C29)	**3.52**	
2,6,10 Trimethyltridecane (1470)	**0.218**	G	n-Triacontane (C30)	**0.262**	
n-Pentadecane (C15)	**0.229**		n-Hentriacontane (C31)	**1.53**	
n-Hexadecane (C16)	**0.324**		n-Dotriacontane (C32)	**0.186**	J
Norpristane (1650)	**0.148**	J	n-Tritriacontane (C33)	**0.450**	
n-Heptadecane (C17)	**0.352**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.292**		n-Pentatriacontane (C35)	**0.180**	J
n-Octadecane (C18)	**1.04**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.261**	G	n-Heptatriacontane (C37)	**0.0783**	J
n-Nonadecane (C19)	**0.206**	J	n-Octatriacontane (C38)	**0.166**	J
n-Eicosane (C20)	**0.272**		n-Nonatriacontane (C39)	0.0384	U
n-Heneicosane (C21)	**0.180**	J	n-Tetracontane (C40)	**0.0787**	J
n-Docosane (C22)	**0.185**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**14.5**
Total Petroleum Hydrocarbons (C9-C44)	**539**
Total Resolved Hydrocarbons	**75.0**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	86	40-125
d50-Tetracosane	86	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28870.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 7:02 am
Operator : AC
Sample : 1210082-03
Misc : 1X
ALS Vial : 80 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:49:57 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	68551992	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.639	31237346	21.575 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.15%#
24) s	d50-Tetracosane	35.363	25282705	21.554 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.11%#
	Target Compounds			
2) t	n-Octane (C8)	5.213	92509	0.084 ug/mL M4
3) t	n-Nonane (C9)	7.360	120608	0.107 ug/mL M4
4) t	n-Decane (C10)	9.811	286570	0.245 ug/mL M4
5) t	n-Undecane (C11)	12.306	286716	0.242 ug/mL M4
6) t	n-Dodecane (C12)	14.724	256468	0.213 ug/mL M4
7) t	n-Tridecane (C13)	17.026	499888	0.413 ug/mL M4
8) t	1380	18.704	358198	0.293 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	1015924	0.832 ug/mL M4
10) t	1470	20.490	1272942G	1.040 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1336352	1.091 ug/mL M4
12) t	n-Hexadecane (C16)	23.220	1906300	1.544 ug/mL M4
13) t	1650	24.127	867072	0.707 ug/mL M4
14) t	n-Heptadecane (C17)	25.071	2061502	1.680 ug/mL M4
15) t	Pristane	25.168	1744549	1.392 ug/mL M4
16) t	n-Octadecane (C18)	26.810	6247529G	4.979 ug/mL M4
17) t	Phytane	26.990	1541818G	1.242 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1232221	0.984 ug/mL M4
20) t	n-Eicosane (C20)	30.124	1638198	1.295 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	1087276	0.856 ug/mL M4
22) t	n-Docosane (C22)	33.125	1124335	0.883 ug/mL M4
23) t	n-Tricosane (C23)	34.537	1939671	1.500 ug/mL M4
25) t	n-Tetracosane (C24)	35.894	990849	0.779 ug/mL M4
26) t	n-Pentacosane (C25)	37.189	8939848G	6.901 ug/mL M4
27) t	n-Hexacosane (C26)	38.453	1439989	1.119 ug/mL M4
28) t	n-Heptacosane (C27)	39.665	8758828	6.939 ug/mL M4
29) t	n-Octacosane (C28)	40.834	1400045	1.098 ug/mL M4
30) t	n-Nonacosane (C29)	41.973	21374109	16.768 ug/mL M4
31) t	n-Triacontane (C30)	43.053	1574638	1.249 ug/mL M4
32) t	n-Hentriacontane (C31)	44.116	9273469	7.293 ug/mL M4
33) t	n-Dotriacontane (C32)	45.130	1122203	0.886 ug/mL M4
34) t	n-Tritriacontane (C33)	46.128	2597608	2.146 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.130	1093470	0.860 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28870.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 7:02 am
Operator : AC
Sample : 1210082-03
Misc : 1X
ALS Vial : 80 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:49:57 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

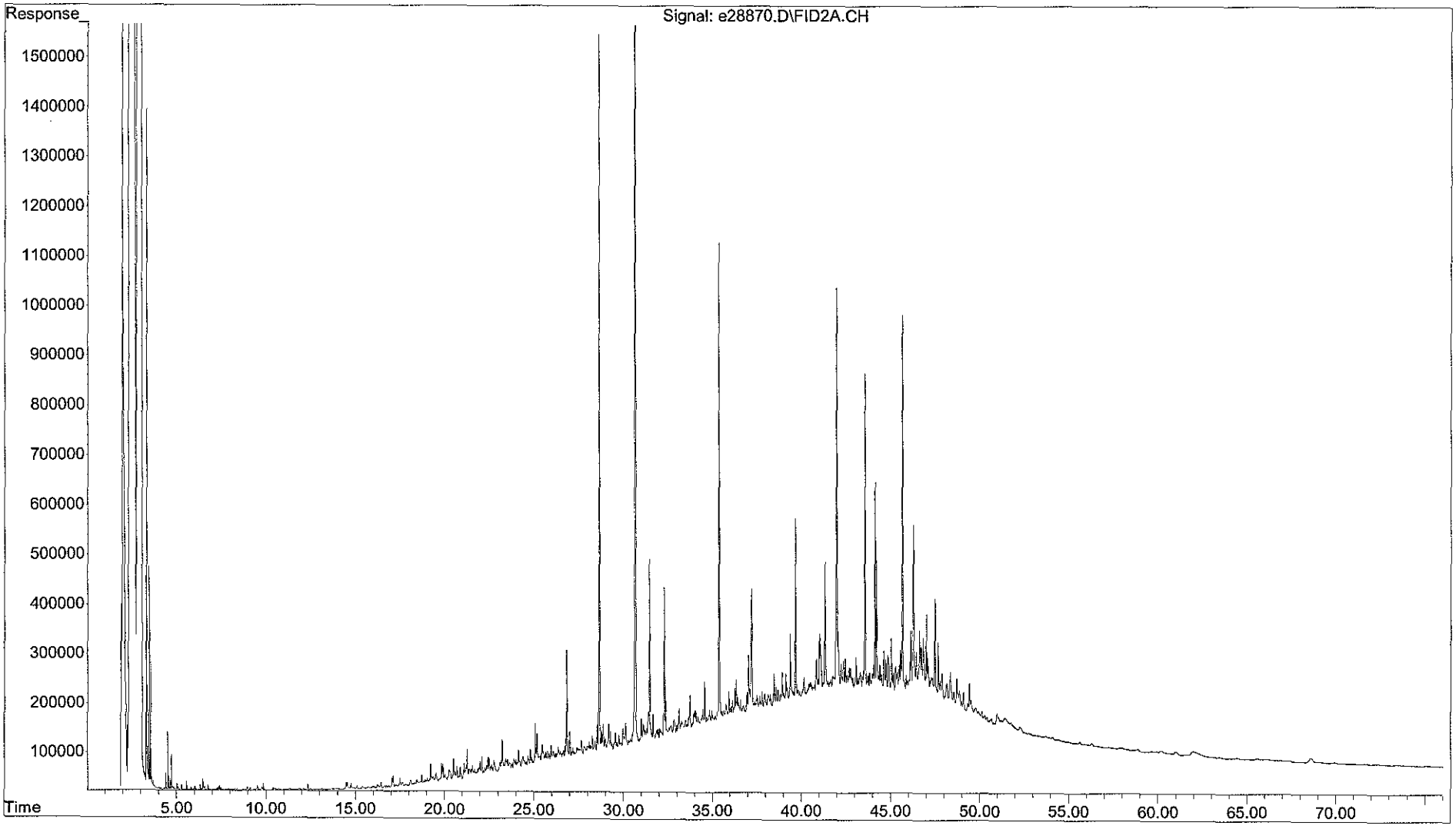
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.670	474565	0.373	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.269	1001828	0.792	ug/mL	M4
41) t	n-Tetracontane (C40)	56.266	449452	0.375	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	4085863573	3277.587	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3201331183	2568.035	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	445494747	357.366	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28870.D
Operator : AC
Acquired : 11 Nov 2012 7:02 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-03
Misc Info : 1X
ALS Vial : 80



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-04**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.03	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0230**	J	n-Tricosane (C23)	**0.355**	
n-Decane (C10)	**0.0496**	JB	n-Tetracosane (C24)	**0.203**	J
n-Undecane (C11)	**0.0547**	J	n-Pentacosane (C25)	**1.89**	G
n-Dodecane (C12)	**0.0494**	J	n-Hexacosane (C26)	**0.333**	
n-Tridecane (C13)	**0.0990**	J	n-Heptacosane (C27)	**1.82**	
2,6,10 Trimethyldodecane (1380)	**0.0586**	J	n-Octacosane (C28)	**0.295**	
n-Tetradecane (C14)	**0.170**	J	n-Nonacosane (C29)	**3.69**	
2,6,10 Trimethyltridecane (1470)	**0.203**	GJ	n-Triacontane (C30)	**0.271**	
n-Pentadecane (C15)	**0.245**		n-Hentriacontane (C31)	**1.66**	
n-Hexadecane (C16)	**0.322**		n-Dotriacontane (C32)	**0.203**	J
Norpristane (1650)	**0.166**	J	n-Tritriacontane (C33)	**0.581**	
n-Heptadecane (C17)	**0.337**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.311**		n-Pentatriacontane (C35)	**0.214**	
n-Octadecane (C18)	**1.53**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.334**	G	n-Heptatriacontane (C37)	**0.0858**	J
n-Nonadecane (C19)	**0.211**		n-Octatriacontane (C38)	**0.179**	J
n-Eicosane (C20)	**0.211**		n-Nonatriacontane (C39)	0.0383	U
n-Heneicosane (C21)	**0.182**	J	n-Tetracontane (C40)	**0.0783**	J
n-Docosane (C22)	**0.206**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**16.6**
Total Petroleum Hydrocarbons (C9-C44)	**544**
Total Resolved Hydrocarbons	**80.8**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	84	40-125
d50-Tetracosane	85	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28872.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 8:32 am
Operator : AC
Sample : 1210082-04
Misc : 1X
ALS Vial : 81 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 16:04:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.666	75235021	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.640	33299861	20.957 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	41.91%#
24) s	d50-Tetracosane	35.361	27446525	21.320 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.64%#
	Target Compounds			
2) t	n-Octane (C8)	5.215	108395	0.089 ug/mL M4
3) t	n-Nonane (C9)	7.360	136654	0.110 ug/mL M4
4) t	n-Decane (C10)	9.811	304566	0.237 ug/mL M4
5) t	n-Undecane (C11)	12.304	339334	0.261 ug/mL M4
6) t	n-Dodecane (C12)	14.723	311883	0.236 ug/mL M4
7) t	n-Tridecane (C13)	17.026	629026	0.473 ug/mL M4
8) t	1380	18.704	375114	0.280 ug/mL M4
9) t	n-Tetradecane (C14)	19.203	1086817	0.811 ug/mL M4
10) t	1470	20.492	1301384G	0.968 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1572412	1.170 ug/mL M4
12) t	n-Hexadecane (C16)	23.220	2085305	1.539 ug/mL M4
13) t	1650	24.126	1064584	0.791 ug/mL M4
14) t	n-Heptadecane (C17)	25.073	2167575	1.610 ug/mL M4
15) t	Pristane	25.172	2042974	1.486 ug/mL M4
16) t	n-Octadecane (C18)	26.810	10045621G	7.295 ug/mL M4
17) t	Phytane	26.985	2172944G	1.595 ug/mL M4
18) t	n-Nonadecane (C19)	28.522	1385605	1.008 ug/mL M4
20) t	n-Eicosane (C20)	30.125	1401797	1.010 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	1207932	0.867 ug/mL M4
22) t	n-Docosane (C22)	33.126	1373026	0.983 ug/mL M4
23) t	n-Tricosane (C23)	34.537	2403448	1.694 ug/mL M4
25) t	n-Tetracosane (C24)	35.895	1351730	0.969 ug/mL M4
26) t	n-Pentacosane (C25)	37.185	12851192G	9.040 ug/mL M4
27) t	n-Hexacosane (C26)	38.451	2244603	1.589 ug/mL M4
28) t	n-Heptacosane (C27)	39.666	12065274	8.710 ug/mL M4
29) t	n-Octacosane (C28)	40.835	1971255	1.409 ug/mL M4
30) t	n-Nonacosane (C29)	41.974	24667585	17.633 ug/mL M4
31) t	n-Triacontane (C30)	43.056	1789689	1.294 ug/mL M4
32) t	n-Hentriacontane (C31)	44.118	11055208	7.921 ug/mL M4
33) t	n-Dotriacontane (C32)	45.136	1348276	0.970 ug/mL M4
34) t	n-Tritriacontane (C33)	46.134	3688523	2.777 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.133	1424455	1.021 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.662	571339	0.410 ug/mL M4
39) t	n-Octatriacontane (C38)	52.266	1189982	0.857 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28872.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 8:32 am
Operator : AC
Sample : 1210082-04
Misc : 1X
ALS Vial : 81 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 16:04:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

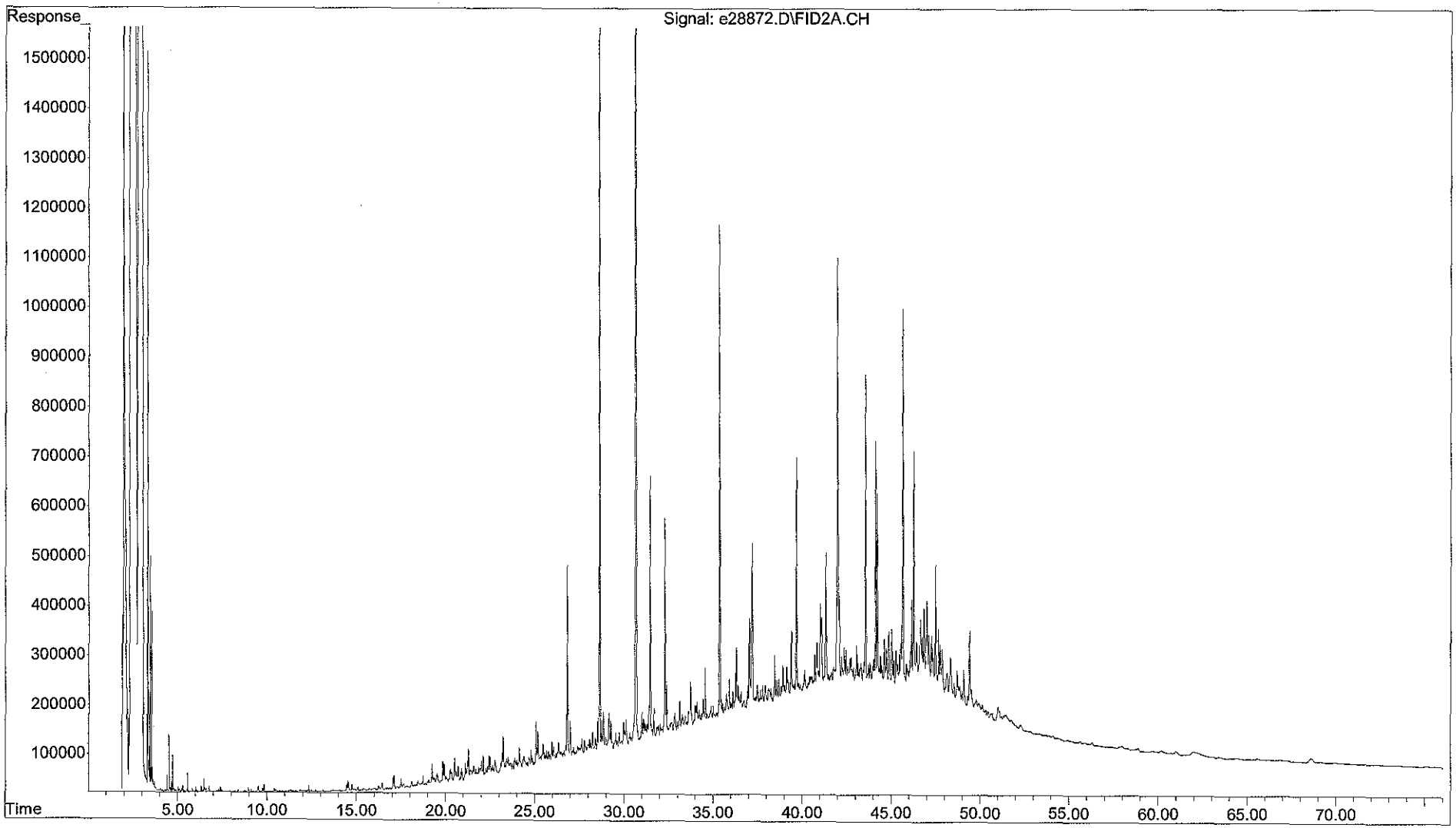
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
41) t	n-Tetracontane (C40)	56.280	491651	0.374	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	4435392036	3241.921	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3550859646	2595.398	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	527930274	385.875	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28872.D
Operator : AC
Acquired : 11 Nov 2012 8:32 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-04
Misc Info : 1X
ALS Vial : 81



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-05**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.01	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0216**	J	n-Tricosane (C23)	**0.359**	
n-Decane (C10)	**0.0478**	JB	n-Tetracosane (C24)	**0.204**	J
n-Undecane (C11)	**0.0478**	J	n-Pentacosane (C25)	**1.84**	G
n-Dodecane (C12)	**0.0421**	J	n-Hexacosane (C26)	**0.314**	
n-Tridecane (C13)	**0.0979**	J	n-Heptacosane (C27)	**1.63**	
2,6,10 Trimethyldodecane (1380)	**0.0600**	J	n-Octacosane (C28)	**0.350**	
n-Tetradecane (C14)	**0.173**	J	n-Nonacosane (C29)	**3.90**	
2,6,10 Trimethyltridecane (1470)	**0.213**	G	n-Triacontane (C30)	**0.387**	
n-Pentadecane (C15)	**0.257**		n-Hentriacontane (C31)	**1.72**	
n-Hexadecane (C16)	**0.325**		n-Dotriacontane (C32)	**0.199**	J
Norpristane (1650)	**0.163**	J	n-Tritriacontane (C33)	**0.469**	
n-Heptadecane (C17)	**0.361**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.298**		n-Pentatriacontane (C35)	**0.173**	J
n-Octadecane (C18)	**1.58**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.327**	G	n-Heptatriacontane (C37)	**0.0912**	J
n-Nonadecane (C19)	**0.232**		n-Octatriacontane (C38)	**0.177**	J
n-Eicosane (C20)	**0.226**		n-Nonatriacontane (C39)	0.0384	U
n-Heneicosane (C21)	**0.194**	J	n-Tetracontane (C40)	**0.0843**	J
n-Docosane (C22)	**0.185**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**16.7**
Total Petroleum Hydrocarbons (C9-C44)	**576**
Total Resolved Hydrocarbons	**83.5**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	84	40-125
d50-Tetracosane	88	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28874.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 10:02 am
Operator : AC
Sample : 1210082-05
Misc : 1X
ALS Vial : 82 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 16:06:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.668	73020720	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.641	32538844	21.099 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.20%#
24) s	d50-Tetracosane	35.366	27479545	21.993 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	43.99%#
	Target Compounds			
2) t	n-Octane (C8)	5.217	80928	0.069 ug/mL M4
3) t	n-Nonane (C9)	7.363	123224	0.103 ug/mL M4
4) t	n-Decane (C10)	9.814	283934	0.228 ug/mL M4
5) t	n-Undecane (C11)	12.309	287080	0.228 ug/mL M4
6) t	n-Dodecane (C12)	14.725	257523	0.201 ug/mL M4
7) t	n-Tridecane (C13)	17.027	602817	0.467 ug/mL M4
8) t	1380	18.705	372038	0.286 ug/mL M4
9) t	n-Tetradecane (C14)	19.205	1071178	0.823 ug/mL M4
10) t	1470	20.493	1327917G	1.018 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	1598532	1.226 ug/mL M4
12) t	n-Hexadecane (C16)	23.220	2039943	1.551 ug/mL M4
13) t	1650	24.126	1017825	0.779 ug/mL M4
14) t	n-Heptadecane (C17)	25.073	2247227	1.720 ug/mL M4
15) t	Pristane	25.170	1894772	1.420 ug/mL M4
16) t	n-Octadecane (C18)	26.812	10059016G	7.526 ug/mL M4
17) t	Phytane	26.987	2062231G	1.560 ug/mL M4
18) t	n-Nonadecane (C19)	28.522	1478668	1.108 ug/mL M4
20) t	n-Eicosane (C20)	30.124	1453166	1.079 ug/mL M4
21) t	n-Heneicosane (C21)	31.658	1250464	0.924 ug/mL M4
22) t	n-Docosane (C22)	33.126	1194844	0.881 ug/mL M4
23) t	n-Tricosane (C23)	34.538	2355932	1.710 ug/mL M4
25) t	n-Tetracosane (C24)	35.895	1315247	0.971 ug/mL M4
26) t	n-Pentacosane (C25)	37.188	12143159G	8.801 ug/mL M4
27) t	n-Hexacosane (C26)	38.454	2050674	1.496 ug/mL M4
28) t	n-Heptacosane (C27)	39.668	10446736	7.770 ug/mL M4
29) t	n-Octacosane (C28)	40.835	2269616	1.671 ug/mL M4
30) t	n-Nonacosane (C29)	41.975	25241821	18.591 ug/mL M4
31) t	n-Triacontane (C30)	43.054	2479158	1.846 ug/mL M4
32) t	n-Hentriacontane (C31)	44.121	11078968	8.179 ug/mL M4
33) t	n-Dotriacontane (C32)	45.136	1278419	0.947 ug/mL M4
34) t	n-Tritriacontane (C33)	46.133	2883314	2.236 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.135	1120100	0.827 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.671	588234	0.435 ug/mL M4
39) t	n-Octatriacontane (C38)	52.259	1137978	0.844 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28874.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 10:02 am
Operator : AC
Sample : 1210082-05
Misc : 1X
ALS Vial : 82 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 16:06:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

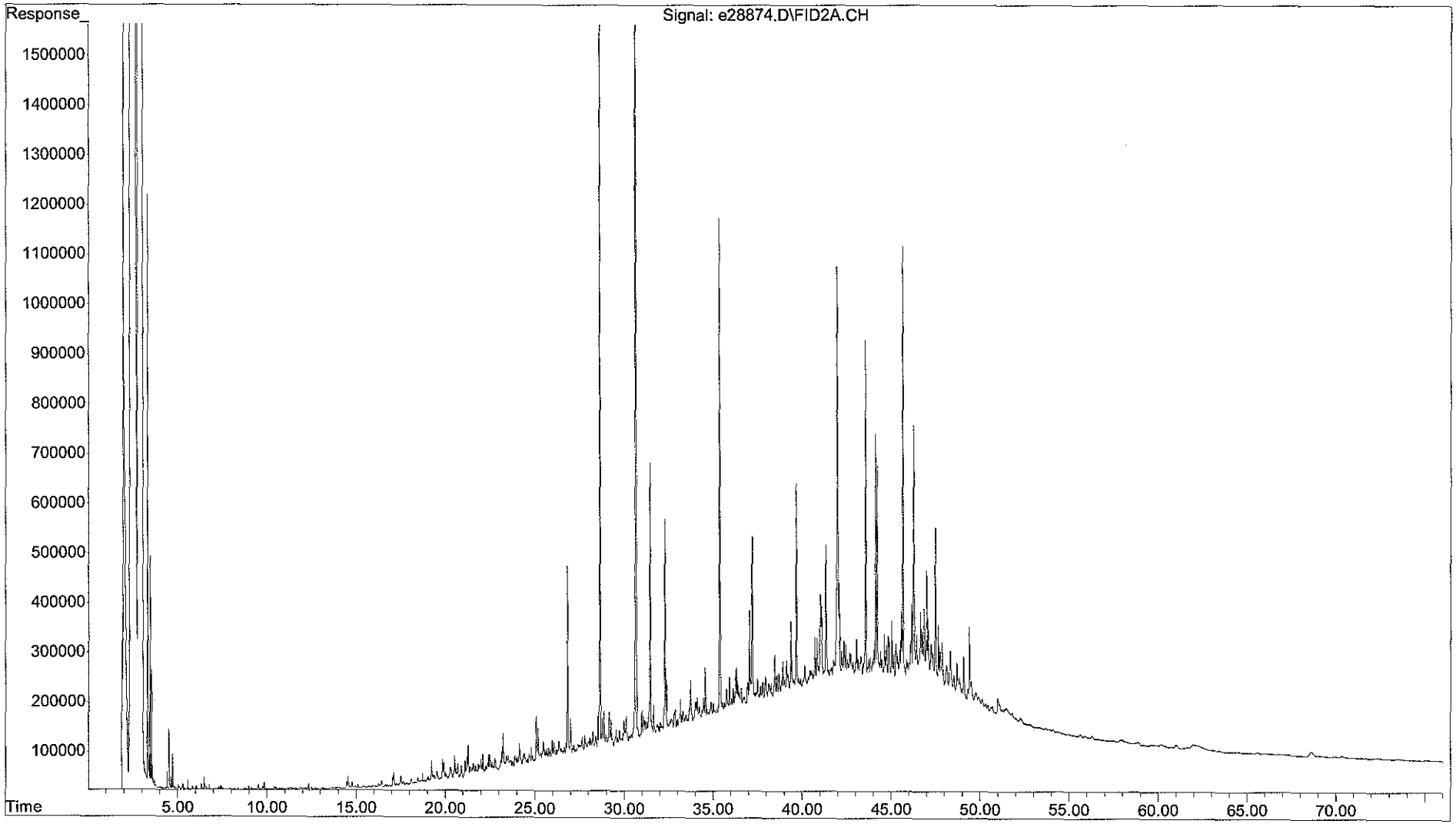
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
41)	t	n-Tetracontane (C40)	56.276	513586	0.402	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	4534116993	3414.578	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	3649584603	2748.449	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	528852469	398.271	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28874.D
Operator : AC
Acquired : 11 Nov 2012 10:02 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-05
Misc Info : 1X
ALS Vial : 82



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-06**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.02	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0212**	J	n-Tricosane (C23)	**0.332**	
n-Decane (C10)	**0.0488**	JB	n-Tetracosane (C24)	**0.172**	J
n-Undecane (C11)	**0.0476**	J	n-Pentacosane (C25)	**1.49**	G
n-Dodecane (C12)	**0.0411**	J	n-Hexacosane (C26)	**0.276**	
n-Tridecane (C13)	**0.0987**	J	n-Heptacosane (C27)	**1.48**	
2,6,10 Trimethyldodecane (1380)	**0.0679**	J	n-Octacosane (C28)	**0.272**	
n-Tetradecane (C14)	**0.191**	J	n-Nonacosane (C29)	**3.51**	
2,6,10 Trimethyltridecane (1470)	**0.215**	G	n-Triacontane (C30)	**0.247**	
n-Pentadecane (C15)	**0.265**		n-Hentriacontane (C31)	**1.49**	
n-Hexadecane (C16)	**0.311**		n-Dotriacontane (C32)	**0.165**	J
Norpristane (1650)	**0.157**	J	n-Tritriacontane (C33)	**0.459**	
n-Heptadecane (C17)	**0.343**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.289**		n-Pentatriacontane (C35)	**0.166**	J
n-Octadecane (C18)	**1.10**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.287**	G	n-Heptatriacontane (C37)	**0.0746**	J
n-Nonadecane (C19)	**0.214**		n-Octatriacontane (C38)	**0.164**	J
n-Eicosane (C20)	**0.236**		n-Nonatriacontane (C39)	0.0383	U
n-Heneicosane (C21)	**0.175**	J	n-Tetracontane (C40)	**0.0895**	J
n-Docosane (C22)	**0.176**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**14.7**
Total Petroleum Hydrocarbons (C9-C44)	**558**
Total Resolved Hydrocarbons	**74.0**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	85	40-125
d50-Tetracosane	87	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28876.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 11:31 am
Operator : AC
Sample : 1210082-06
Misc : 1X
ALS Vial : 83 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:50:57 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.667	72350951	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.642	32360704	21.177 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	42.35%#
24) s	d50-Tetracosane	35.366	26892835	21.723 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.45%#
	Target Compounds			
2) t	n-Octane (C8)	5.217	94367	0.081 ug/mL M4
3) t	n-Nonane (C9)	7.363	120389	0.101 ug/mL M4
4) t	n-Decane (C10)	9.814	287583	0.233 ug/mL M4
5) t	n-Undecane (C11)	12.308	284224	0.227 ug/mL M4
6) t	n-Dodecane (C12)	14.725	249106	0.196 ug/mL M4
7) t	n-Tridecane (C13)	17.028	601772	0.471 ug/mL M4
8) t	1380	18.705	417688	0.324 ug/mL M4
9) t	n-Tetradecane (C14)	19.205	1176949	0.913 ug/mL M4
10) t	1470	20.494	1323767G	1.024 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	1637309	1.267 ug/mL M4
12) t	n-Hexadecane (C16)	23.222	1930836	1.482 ug/mL M4
13) t	1650	24.128	972695	0.751 ug/mL M4
14) t	n-Heptadecane (C17)	25.073	2121955	1.639 ug/mL M4
15) t	Pristane	25.171	1822908	1.378 ug/mL M4
16) t	n-Octadecane (C18)	26.811	6947511G	5.246 ug/mL M4
17) t	Phytane	26.991	1794006G	1.370 ug/mL M4
18) t	n-Nonadecane (C19)	28.522	1350149	1.021 ug/mL M4
20) t	n-Eicosane (C20)	30.125	1501668	1.125 ug/mL M4
21) t	n-Heneicosane (C21)	31.658	1115924	0.833 ug/mL M4
22) t	n-Docosane (C22)	33.127	1130438	0.841 ug/mL M4
23) t	n-Tricosane (C23)	34.540	2160883	1.583 ug/mL M4
25) t	n-Tetracosane (C24)	35.896	1102803	0.822 ug/mL M4
26) t	n-Pentacosane (C25)	37.187	9697687G	7.093 ug/mL M4
27) t	n-Hexacosane (C26)	38.455	1790758	1.318 ug/mL M4
28) t	n-Heptacosane (C27)	39.669	9432386	7.081 ug/mL M4
29) t	n-Octacosane (C28)	40.836	1747057	1.298 ug/mL M4
30) t	n-Nonacosane (C29)	41.975	22522449	16.741 ug/mL M4
31) t	n-Triacontane (C30)	43.056	1570856	1.181 ug/mL M4
32) t	n-Hentriacontane (C31)	44.120	9551494	7.117 ug/mL M4
33) t	n-Dotriacontane (C32)	45.135	1052706	0.787 ug/mL M4
34) t	n-Tritriacontane (C33)	46.130	2796116	2.189 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.141	1059584	0.790 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28876.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 11:31 am
Operator : AC
Sample : 1210082-06
Misc : 1X
ALS Vial : 83 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:50:57 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

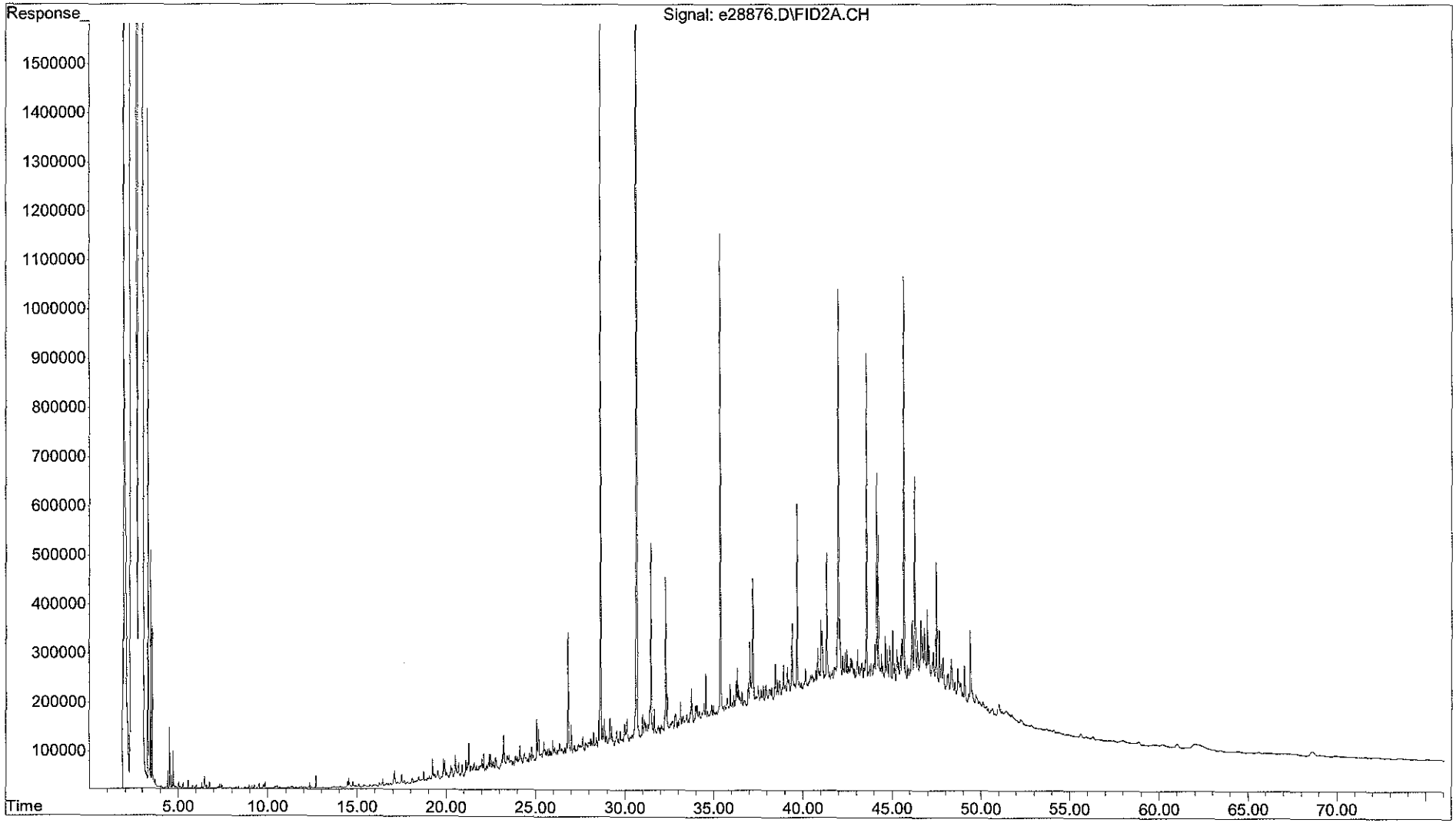
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.676	477444	0.356	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.246	1046029	0.783	ug/mL	M4
41) t	n-Tetracontane (C40)	56.275	540468	0.427	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	4387044114	3334.404	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3502511724	2662.109	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	464946311	353.386	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28876.D
Operator : AC
Acquired : 11 Nov 2012 11:31 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-06
Misc Info : 1X
ALS Vial : 83



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEBC0000L012S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **1210082-07**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/11/12	63.6	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0233**	J	n-Tricosane (C23)	**0.323**	
n-Decane (C10)	**0.0548**	JB	n-Tetracosane (C24)	**0.174**	J
n-Undecane (C11)	**0.0520**	J	n-Pentacosane (C25)	**1.44**	G
n-Dodecane (C12)	**0.0516**	J	n-Hexacosane (C26)	**0.282**	
n-Tridecane (C13)	**0.111**	J	n-Heptacosane (C27)	**1.41**	
2,6,10 Trimethyldodecane (1380)	**0.0602**	J	n-Octacosane (C28)	**0.282**	
n-Tetradecane (C14)	**0.180**	J	n-Nonacosane (C29)	**3.43**	
2,6,10 Trimethyltridecane (1470)	**0.215**	G	n-Triacontane (C30)	**0.312**	
n-Pentadecane (C15)	**0.258**		n-Hentriacontane (C31)	**1.52**	
n-Hexadecane (C16)	**0.312**		n-Dotriacontane (C32)	**0.168**	J
Norpristane (1650)	**0.147**	J	n-Tritriacontane (C33)	**0.418**	
n-Heptadecane (C17)	**0.337**		n-Tetratriacontane (C34)	0.0281	U
Pristane	**0.273**		n-Pentatriacontane (C35)	**0.197**	J
n-Octadecane (C18)	**1.15**	G	n-Hexatriacontane (C36)	0.0348	U
Phytane	**0.274**	G	n-Heptatriacontane (C37)	**0.0881**	J
n-Nonadecane (C19)	**0.205**	J	n-Octatriacontane (C38)	**0.210**	J
n-Eicosane (C20)	**0.224**		n-Nonatriacontane (C39)	0.0384	U
n-Heneicosane (C21)	**0.182**	J	n-Tetracontane (C40)	**0.0629**	J
n-Docosane (C22)	**0.190**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**14.6**
Total Petroleum Hydrocarbons (C9-C44)	**597**
Total Resolved Hydrocarbons	**73.5**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	87	40-125
d50-Tetracosane	87	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28878.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 1:02 pm
Operator : AC
Sample : 1210082-07
Misc : 1X
ALS Vial : 84 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:51:48 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.666	70400715	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.642	32229788	21.676 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.35%#
24) s	d50-Tetracosane	35.366	26194268	21.744 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.49%#
	Target Compounds			
2) t	n-Octane (C8)	5.222	90597	0.080 ug/mL M4
3) t	n-Nonane (C9)	7.365	128736	0.111 ug/mL M4
4) t	n-Decane (C10)	9.814	313696	0.261 ug/mL M4
5) t	n-Undecane (C11)	12.309	301561	0.248 ug/mL M4
6) t	n-Dodecane (C12)	14.727	304683	0.246 ug/mL M4
7) t	n-Tridecane (C13)	17.029	654967	0.527 ug/mL M4
8) t	1380	18.706	359588	0.287 ug/mL M4
9) t	n-Tetradecane (C14)	19.206	1074931	0.857 ug/mL M4
10) t	1470	20.493	1286744G	1.023 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	1547454	1.231 ug/mL M4
12) t	n-Hexadecane (C16)	23.222	1883707	1.486 ug/mL M4
13) t	1650	24.127	882499	0.700 ug/mL M4
14) t	n-Heptadecane (C17)	25.074	2022530	1.605 ug/mL M4
15) t	Pristane	25.172	1675702	1.302 ug/mL M4
16) t	n-Octadecane (C18)	26.813	7053407G	5.474 ug/mL M4
17) t	Phytane	26.993	1665366G	1.307 ug/mL M4
18) t	n-Nonadecane (C19)	28.524	1253832	0.975 ug/mL M4
20) t	n-Eicosane (C20)	30.126	1384441	1.066 ug/mL M4
21) t	n-Heneicosane (C21)	31.659	1129908	0.866 ug/mL M4
22) t	n-Docosane (C22)	33.126	1184412	0.906 ug/mL M4
23) t	n-Tricosane (C23)	34.540	2044955	1.540 ug/mL M4
25) t	n-Tetracosane (C24)	35.896	1083353	0.830 ug/mL M4
26) t	n-Pentacosane (C25)	37.189	9143196G	6.873 ug/mL M4
27) t	n-Hexacosane (C26)	38.459	1779431	1.346 ug/mL M4
28) t	n-Heptacosane (C27)	39.668	8716733	6.725 ug/mL M4
29) t	n-Octacosane (C28)	40.835	1759778	1.344 ug/mL M4
30) t	n-Nonacosane (C29)	41.976	21386763	16.337 ug/mL M4
31) t	n-Triacontane (C30)	43.055	1922563	1.485 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	9484138	7.262 ug/mL M4
33) t	n-Dotriacontane (C32)	45.136	1043720	0.802 ug/mL M4
34) t	n-Tritriacontane (C33)	46.136	2476365	1.992 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.142	1225198	0.938 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28878.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 1:02 pm
Operator : AC
Sample : 1210082-07
Misc : 1X
ALS Vial : 84 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:51:48 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091204R
Blank File : e28884.D

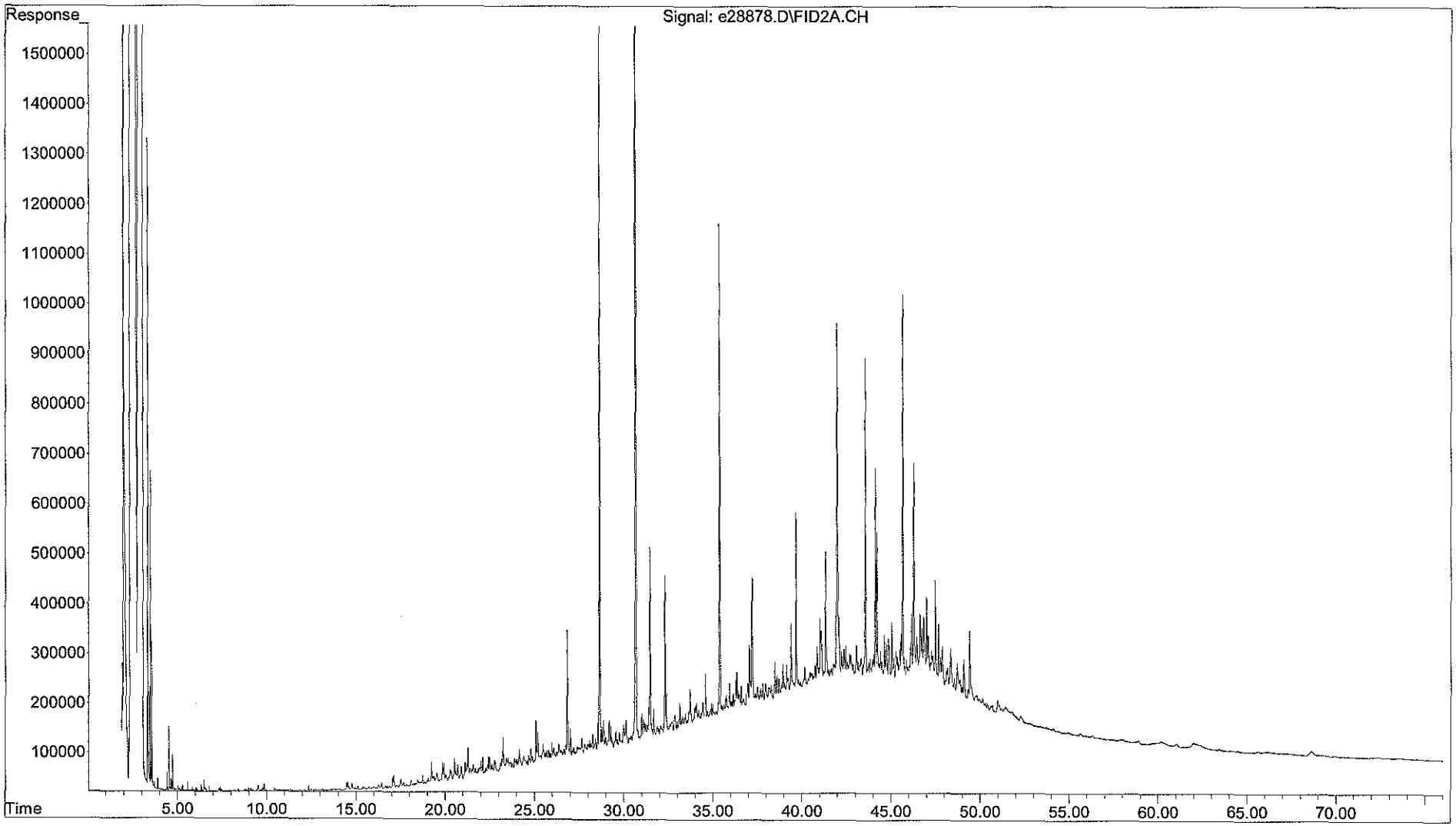
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.675	547713	0.420	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.278	1297851	0.999	ug/mL	M4
41) t	n-Tetracontane (C40)	56.300	368807	0.300	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	4527076175	3536.154	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3642543785	2845.235	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	448251189	350.134	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28878.D
Operator : AC
Acquired : 11 Nov 2012 1:02 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210082-07
Misc Info : 1X
ALS Vial : 84



Response Factor Report PAH2

Method Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Method File : HC2090412R.M
Title : FID Forensics
Last Update : Fri Sep 07 14:14:19 2012
Response Via : Initial Calibration

Calibration Files
1 =E27100.D 10 =E27102.D 50 =E27104.D 100 =E27106.D 200 =E27108.D 500 =E27110.D

		Compound	1	10	50	100	200	500	Avg	%RSD
1)	I	5-alpha-androstane	ISTD							
2)	t	n-Octane (C8)	0.811	0.826	0.805	0.799	0.784		0.805	1.89
3)	t	n-Nonane (C9)	0.827	0.841	0.820	0.824	0.802		0.823	1.70
4)	t	n-Decane (C10)	0.845	0.875	0.852	0.863	0.836		0.854	1.77
5)	t	n-Undecane (C11)	0.852	0.884	0.862	0.874	0.846		0.864	1.79
6)	t	n-Dodecane (C12)	0.860	0.900	0.878	0.891	0.861		0.878	2.06
7)	t	n-Tridecane (...	0.874	0.904	0.882	0.894	0.862		0.883	1.86
8)	t	1380	0.885	0.912	0.889	0.901	0.868		0.891	1.89
9)	t	n-Tetradecane...	0.885	0.912	0.889	0.901	0.868		0.891	1.89
10)	t	1470	0.900	0.912	0.889	0.899	0.865		0.893	1.98
11)	t	n-Pentadecane...	0.900	0.912	0.889	0.899	0.865		0.893	1.98
12)	t	n-Hexadecane ...	0.897	0.923	0.899	0.909	0.875		0.900	1.95
13)	t	1650	0.889	0.914	0.891	0.904	0.876		0.895	1.64
14)	t	n-Heptadecane...	0.889	0.914	0.891	0.904	0.876		0.895	1.64
15)	t	Pristane	0.917	0.943	0.915	0.921	0.874		0.914	2.72
16)	t	n-Octadecane ...	0.916	0.939	0.913	0.923	0.885		0.915	2.15
17)	t	Phytane	0.906	0.930	0.903	0.912	0.874		0.905	2.26
18)	t	n-Nonadecane ...	0.915	0.939	0.912	0.920	0.882		0.914	2.23
19)	s	ortho-terphenyl	1.059	1.146	0.999	1.018	0.983	1.131	1.056	6.50
20)	t	n-Eicosane (C20)	0.930	0.948	0.920	0.927	0.887		0.922	2.40
21)	t	n-Heneicosane...	0.952	0.950	0.919	0.925	0.885		0.926	2.96
22)	t	n-Docosane (C22)	0.939	0.957	0.927	0.931	0.890		0.929	2.64
23)	t	n-Tricosane (...	1.012	0.958	0.926	0.930	0.888		0.943	4.88
24)	s	d50-Tetracosane	0.856	0.953	0.833	0.811	0.780	0.901	0.856	7.35
25)	t	n-Tetracosane...	0.950	0.956	0.923	0.925	0.882		0.927	3.13
26)	t	n-Pentacosane...	0.962	0.977	0.943	0.943	0.900		0.945	3.07
27)	t	n-Hexacosane ...	0.959	0.972	0.936	0.935	0.891		0.939	3.27
28)	t	n-Heptacosane...	0.949	0.952	0.916	0.914	0.871		0.921	3.58
29)	t	n-Octacosane ...	0.961	0.963	0.924	0.922	0.879		0.930	3.68
30)	t	n-Nonacosane ...	0.954	0.965	0.925	0.923	0.881		0.930	3.51
31)	t	n-Triacontane...	0.953	0.952	0.911	0.910	0.870		0.919	3.77
32)	t	n-Hentriacont...	0.958	0.962	0.920	0.919	0.879		0.928	3.63
33)	t	n-Dotriaconta...	0.953	0.958	0.916	0.916	0.878		0.924	3.54
34)	t	n-Tritriacont...	0.910	0.915	0.874	0.876	0.839		0.883	3.48
35)	t	n-tetratriaco...	0.939	0.943	0.902	0.905	0.867		0.911	3.40
36)	t	n-Pentatriaco...	0.952	0.960	0.919	0.922	0.884		0.927	3.24
37)	t	n-Hexatriacon...	0.981	0.978	0.938	0.941	0.902		0.948	3.46
38)	t	n-Heptatriaco...	0.951	0.958	0.920	0.923	0.884		0.927	3.16
39)	t	n-Octatriacon...	0.952	0.951	0.915	0.918	0.879		0.923	3.26
40)	t	n-Nonatriacon...	0.899	0.901	0.867	0.870	0.834		0.874	3.15
41)	t	n-Tetracontan...	0.899	0.901	0.867	0.870	0.834		0.874	3.15
42)	h	C9-C44 Total ...	0.924	0.936	0.904	0.909	0.872		0.909	2.67
43)	h	C9-C40 Total ...	0.924	0.936	0.904	0.909	0.872		0.909	2.67
44)	h	C10-C28 DRO	0.924	0.936	0.904	0.909	0.872		0.909	2.67
45)	h	Total Resolve...	0.924	0.936	0.904	0.909	0.872		0.909	2.67

(#) = Out of Range

HC2090412R.M Fri Sep 07 14:43:18 2012

rfupdate

RSF Update Summary Report

Method Path.....: O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Method File.....: HC2090412R.M
Method Title.....: FID Forensics
Last Update.....: Fri Sep 07 13:35:53 2012

Generating Average Response Factor For: C9-C44 Total Petroleum Hydrocarbons

No	Compound	Level	Conc	Response
1	n-Nonane (C9)	1	1.00000	1058594.832
2	n-Decane (C10)	1	1.00000	1081680.094
3	n-Undecane (C11)	1	1.00000	1090605.419
4	n-Dodecane (C12)	1	1.00000	1100096.066
5	n-Tridecane (C13)	1	1.00000	1118594.131
6	n-Tetradecane (C14)	1	1.00000	1131811.217
7	n-Pentadecane (C15)	1	1.00000	1152025.742
8	n-Hexadecane (C16)	1	1.00000	1147414.030
9	n-Heptadecane (C17)	1	1.00000	1137165.347
10	Pristane	1	1.00000	1173645.774
11	n-Octadecane (C18)	1	1.00000	1172041.065
12	Phytane	1	1.00000	1159670.706
13	n-Nonadecane (C19)	1	1.00000	1170948.694
14	n-Eicosane (C20)	1	1.00000	1189205.460
15	n-Heneicosane (C21)	1	1.00000	1218462.382
16	n-Docosane (C22)	1	1.00000	1200777.971
17	n-Tricosane (C23)	1	1.00000	1295230.182
18	n-Tetracosane (C24)	1	1.00000	1215267.007
19	n-Pentacosane (C25)	1	1.00000	1230493.463
20	n-Hexacosane (C26)	1	1.00000	1227506.722
21	n-Heptacosane (C27)	1	1.00000	1214572.774
22	n-Octacosane (C28)	1	1.00000	1229079.729
23	n-Nonacosane (C29)	1	1.00000	1220303.287
24	n-Triacontane (C30)	1	1.00000	1219155.295
25	n-Hentriacontane (C31)	1	1.00000	1225588.003
26	n-Dotriacontane (C32)	1	1.00000	1219518.985
27	n-Tritriacontane (C33)	1	1.00000	1163577.647
28	n-tetratriacontane (C34)	1	1.00000	1201629.642
29	n-Pentatriacontane (C35)	1	1.00000	1217652.701
30	n-Hexatriacontane (C36)	1	1.00000	1255297.278
31	n-Heptatriacontane (C37)	1	1.00000	1216439.627
32	n-Octatriacontane (C38)	1	1.00000	1217319.017
33	n-Tetracontane (C40)	1	1.00000	1150188.078
Avg RSF For: C9-C44 Total Petroleum			1.00000	1182471.466
1	n-Nonane (C9)	2	10.00000	10984036.148
2	n-Decane (C10)	2	10.00000	11426913.435
3	n-Undecane (C11)	2	10.00000	11541092.695
4	n-Dodecane (C12)	2	10.00000	11759368.321
5	n-Tridecane (C13)	2	10.00000	11803720.967
6	n-Tetradecane (C14)	2	10.00000	11918135.542
7	n-Pentadecane (C15)	2	10.00000	11911917.164
8	n-Hexadecane (C16)	2	10.00000	12051235.427
9	n-Heptadecane (C17)	2	10.00000	11942187.715

		rfupdate		
10	Pristane	2	10.00000	12312714.192
11	n-Octadecane (C18)	2	10.00000	12267744.016
12	Phytane	2	10.00000	12154748.453
13	n-Nonadecane (C19)	2	10.00000	12262858.725
14	n-Eicosane (C20)	2	10.00000	12385892.855
15	n-Heneicosane (C21)	2	10.00000	12409357.102
16	n-Docosane (C22)	2	10.00000	12501279.532
17	n-Tricosane (C23)	2	10.00000	12518262.662
18	n-Tetracosane (C24)	2	10.00000	12486435.610
19	n-Pentacosane (C25)	2	10.00000	12760359.164
20	n-Hexacosane (C26)	2	10.00000	12692005.077
21	n-Heptacosane (C27)	2	10.00000	12441614.096
22	n-Octacosane (C28)	2	10.00000	12578571.784
23	n-Nonacosane (C29)	2	10.00000	12608505.444
24	n-Triacontane (C30)	2	10.00000	12441268.160
25	n-Hentriacontane (C31)	2	10.00000	12562193.326
26	n-Dotriacontane (C32)	2	10.00000	12516087.109
27	n-Tritriacontane (C33)	2	10.00000	11955175.333
28	n-tetratriacontane (C34)	2	10.00000	12319701.907
29	n-Pentatriacontane (C35)	2	10.00000	12536902.969
30	n-Hexatriacontane (C36)	2	10.00000	12781199.118
31	n-Heptatriacontane (C37)	2	10.00000	12507537.054
32	n-Octatriacontane (C38)	2	10.00000	12423624.790
33	n-Tetracontane (C40)	2	10.00000	11764410.929
Avg RSF For: C9-C44 Total Petroleum			10.00000	12228092.631

1	n-Nonane (C9)	3	50.00000	51431899.250
2	n-Decane (C10)	3	50.00000	53477708.452
3	n-Undecane (C11)	3	50.00000	54086162.221
4	n-Dodecane (C12)	3	50.00000	55112695.928
5	n-Tridecane (C13)	3	50.00000	55323499.897
6	n-Tetradecane (C14)	3	50.00000	55819898.370
7	n-Pentadecane (C15)	3	50.00000	55798198.582
8	n-Hexadecane (C16)	3	50.00000	56395639.587
9	n-Heptadecane (C17)	3	50.00000	55912409.212
10	Pristane	3	50.00000	57437430.240
11	n-Octadecane (C18)	3	50.00000	57286525.276
12	Phytane	3	50.00000	56698111.863
13	n-Nonadecane (C19)	3	50.00000	57214049.606
14	n-Eicosane (C20)	3	50.00000	57746295.867
15	n-Heneicosane (C21)	3	50.00000	57661836.730
16	n-Docosane (C22)	3	50.00000	58144372.499
17	n-Tricosane (C23)	3	50.00000	58140566.950
18	n-Tetracosane (C24)	3	50.00000	57910263.550
19	n-Pentacosane (C25)	3	50.00000	59153058.151
20	n-Hexacosane (C26)	3	50.00000	58717976.872
21	n-Heptacosane (C27)	3	50.00000	57481187.004
22	n-Octacosane (C28)	3	50.00000	58008772.195
23	n-Nonacosane (C29)	3	50.00000	58069091.972
24	n-Triacontane (C30)	3	50.00000	57200513.657
25	n-Hentriacontane (C31)	3	50.00000	57723927.186
26	n-Dotriacontane (C32)	3	50.00000	57470436.162
27	n-Tritriacontane (C33)	3	50.00000	54868096.236
28	n-tetratriacontane (C34)	3	50.00000	56607059.512
29	n-Pentatriacontane (C35)	3	50.00000	57676295.954
30	n-Hexatriacontane (C36)	3	50.00000	58855677.139
31	n-Heptatriacontane (C37)	3	50.00000	57717954.923
32	n-Octatriacontane (C38)	3	50.00000	57409255.550
33	n-Tetracontane (C40)	3	50.00000	54429678.824
Avg RSF For: C9-C44 Total Petroleum			50.00000	56757168.043

1	n-Nonane (C9)	4	100.00000	111752271.345
2	n-Decane (C10)	4	100.00000	116984897.373
3	n-Undecane (C11)	4	100.00000	118514867.736
4	n-Dodecane (C12)	4	100.00000	120843203.816
5	n-Tridecane (C13)	4	100.00000	121149783.816
6	n-Tetradecane (C14)	4	100.00000	122139240.252
7	n-Pentadecane (C15)	4	100.00000	121857533.730
8	n-Hexadecane (C16)	4	100.00000	123242271.456
9	n-Heptadecane (C17)	4	100.00000	122526770.850
10	Pristane	4	100.00000	124809058.330
11	n-Octadecane (C18)	4	100.00000	125112512.642
12	Phytane	4	100.00000	123586542.283
13	n-Nonadecane (C19)	4	100.00000	124732127.711
14	n-Eicosane (C20)	4	100.00000	125691042.797
15	n-Heneicosane (C21)	4	100.00000	125366878.886
16	n-Docosane (C22)	4	100.00000	126233873.550
17	n-Tricosane (C23)	4	100.00000	126131442.518
18	n-Tetracosane (C24)	4	100.00000	125399621.174
19	n-Pentacosane (C25)	4	100.00000	127879101.521
20	n-Hexacosane (C26)	4	100.00000	126799057.051
21	n-Heptacosane (C27)	4	100.00000	123932414.032
22	n-Octacosane (C28)	4	100.00000	125029911.858
23	n-Nonacosane (C29)	4	100.00000	125125083.556
24	n-Triacontane (C30)	4	100.00000	123385317.523
25	n-Hentriacontane (C31)	4	100.00000	124529688.560
26	n-Dotriacontane (C32)	4	100.00000	124184813.333
27	n-Tritriacontane (C33)	4	100.00000	118737875.555
28	n-tetratriacontane (C34)	4	100.00000	122711891.431
29	n-Pentatriacontane (C35)	4	100.00000	125058476.886
30	n-Hexatriacontane (C36)	4	100.00000	127622682.143
31	n-Heptatriacontane (C37)	4	100.00000	125075125.481
32	n-Octatriacontane (C38)	4	100.00000	124388237.286
33	n-Tetracontane (C40)	4	100.00000	117936987.855
Avg RSF For: C9-C44 Total Petroleum			100.00000	123286988.010

1	n-Nonane (C9)	5	200.00000	218945844.183
2	n-Decane (C10)	5	200.00000	228110991.458
3	n-Undecane (C11)	5	200.00000	230818796.408
4	n-Dodecane (C12)	5	200.00000	234831426.459
5	n-Tridecane (C13)	5	200.00000	235100149.350
6	n-Tetradecane (C14)	5	200.00000	236826645.070
7	n-Pentadecane (C15)	5	200.00000	236005456.586
8	n-Hexadecane (C16)	5	200.00000	238720267.241
9	n-Heptadecane (C17)	5	200.00000	239070404.726
10	Pristane	5	200.00000	238512894.131
11	n-Octadecane (C18)	5	200.00000	241489233.828
12	Phytane	5	200.00000	238431706.212
13	n-Nonadecane (C19)	5	200.00000	240747450.530
14	n-Eicosane (C20)	5	200.00000	242168551.102
15	n-Heneicosane (C21)	5	200.00000	241506941.187
16	n-Docosane (C22)	5	200.00000	242910758.874
17	n-Tricosane (C23)	5	200.00000	242370056.561
18	n-Tetracosane (C24)	5	200.00000	240808405.475
19	n-Pentacosane (C25)	5	200.00000	245473132.745
20	n-Hexacosane (C26)	5	200.00000	243267757.250
21	n-Heptacosane (C27)	5	200.00000	237743444.733
22	n-Octacosane (C28)	5	200.00000	239982573.735
23	n-Nonacosane (C29)	5	200.00000	240486580.739
24	n-Triacontane (C30)	5	200.00000	237389922.184

		rfupdate		
25	n-Hentriacontane (C31)	5	200.00000	239996685.433
26	n-Dotriacontane (C32)	5	200.00000	239559495.241
27	n-Tritriacontane (C33)	5	200.00000	229022990.546
28	n-tetratriacontane (C34)	5	200.00000	236682062.459
29	n-Pentatriacontane (C35)	5	200.00000	241226825.797
30	n-Hexatriacontane (C36)	5	200.00000	246080144.446
31	n-Heptatriacontane (C37)	5	200.00000	241177910.897
32	n-Octatriacontane (C38)	5	200.00000	239930610.526
33	n-Tetracontane (C40)	5	200.00000	227487481.370
Avg RSF For: C9-C44 Total Petroleum			200.00000	237966169.621

Generating Reference Response Factors

No	Compound	No	Refrence Compound
8	1380	9	n-Tetradecane (C14)
10	1470	11	n-Pentadecane (C15)
13	1650	14	n-Heptadecane (C17)
40	n-Nonatriacontane (C39)	41	n-Tetracontane (C40)
43	C9-C40 Total Petroleum Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons
44	C10-C28 DRO	42	C9-C44 Total Petroleum Hydrocarbons
45	Total Resolved Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons

Abacus Response Factor Update Macro Ver. 1.0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27100.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 4:46 pm
Operator : AC
Sample : I209041201R
Misc : WHAO93
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 11:46:48 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

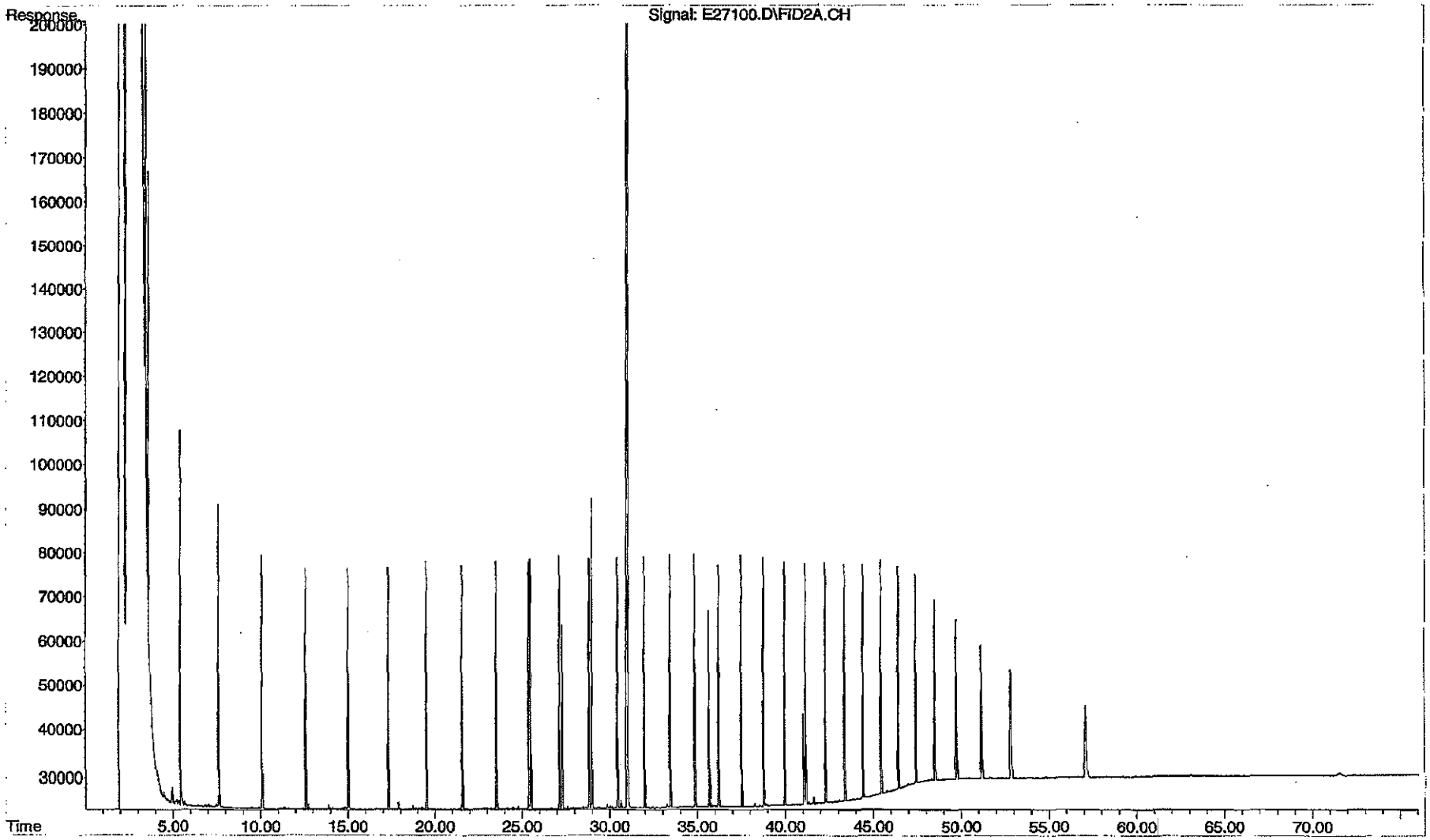
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.020	63967821	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.981	1355313	1.013 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	2.03%#
24) s	d50-Tetracosane	35.663	1095582	0.986 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	1.97%#
	Target Compounds			
2) t	n-Octane (C8)	5.423	1037454	0.997 ug/mL M4
3) t	n-Nonane (C9)	7.608	1058595	1.003 ug/mL M4
4) t	n-Decane (C10)	10.084	1081680	0.991 ug/mL M4
5) t	n-Undecane (C11)	12.592	1090605	0.994 ug/mL M4
6) t	n-Dodecane (C12)	15.017	1100096	0.983 ug/mL M4
7) t	n-Tridecane (C13)	17.323	1118594	0.991 ug/mL M4
9) t	n-Tetradecane (C14)	19.505	1131811	0.995 ug/mL M4
11) t	n-Pentadecane (C15)	21.569	1152026	1.010 ug/mL M4
12) t	n-Hexadecane (C16)	23.525	1147414	0.992 ug/mL M4
14) t	n-Heptadecane (C17)	25.381	1137165	0.999 ug/mL M4
15) t	Pristane	25.492	1173646	0.986 ug/mL M4
16) t	n-Octadecane (C18)	27.146	1172041	0.997 ug/mL M4
17) t	Phytane	27.310	1159671	0.990 ug/mL M4
18) t	n-Nonadecane (C19)	28.830	1170949	0.987 ug/mL M4
20) t	n-Eicosane (C20)	30.435	1189205	1.000 ug/mL M4
21) t	n-Heneicosane (C21)	31.968	1218462	1.024 ug/mL M4
22) t	n-Docosane (C22)	33.440	1200778	0.998 ug/mL M4
23) t	n-Tricosane (C23)	34.850	1295230	1.056 ug/mL M4
25) t	n-Tetracosane (C24)	36.206	1215267	1.004 ug/mL M4
26) t	n-Pentacosane (C25)	37.506	1230493	0.997 ug/mL M4
27) t	n-Hexacosane (C26)	38.761	1227507	1.000 ug/mL M4
28) t	n-Heptacosane (C27)	39.972	1214573	1.003 ug/mL M4
29) t	n-Octacosane (C28)	41.138	1229080	1.005 ug/mL M4
30) t	n-Nonacosane (C29)	42.269	1220303	0.992 ug/mL M4
31) t	n-Triacontane (C30)	43.358	1219155	1.000 ug/mL M4
32) t	n-Hentriacontane (C31)	44.415	1225588	0.990 ug/mL M4
33) t	n-Dotriacontane (C32)	45.439	1219519	0.986 ug/mL M4
34) t	n-Tritriacontane (C33)	46.431	1163578	0.980 ug/mL M4
35) t	n-tetratriacontane (C34)	47.414	1201630	0.977 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.499	1217653	0.970 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.738	1255297	0.980 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.167	1216440	0.966 ug/mL M4
39) t	n-Octatriacontane (C38)	52.830	1217319	0.969 ug/mL M4
41) t	n-Tetracontane (C40)	57.089	1150188	0.964 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27100.D
Operator : AC
Acquired : 04 Sep 2012 4:46 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041201R
Misc Info : WHA093
ALS Vial : 56



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27102.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 6:18 pm
Operator : AC
Sample : I209041202R
Misc : WHAP92
ALS Vial : 57 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 12:31:19 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

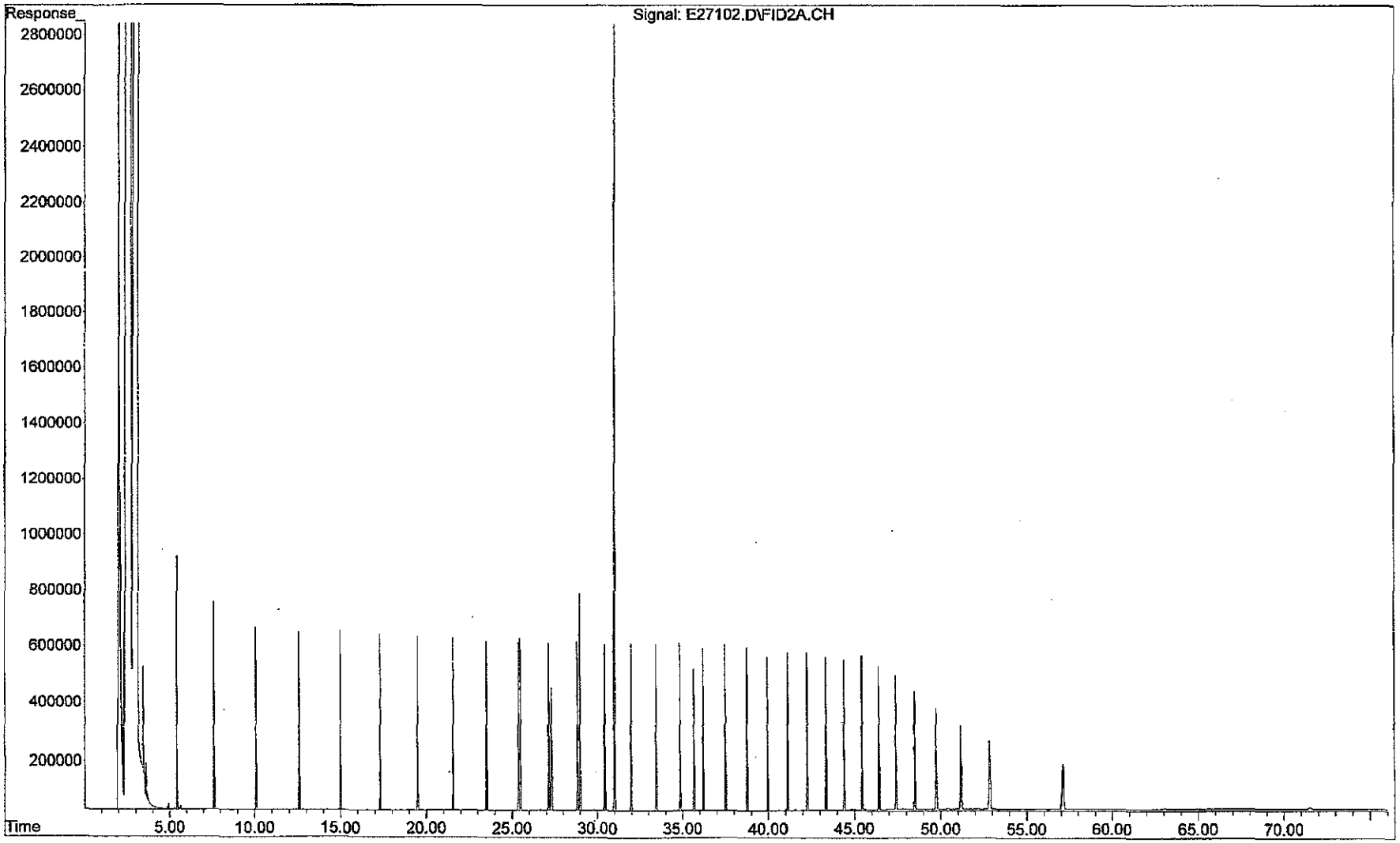
Sub List : CCAL - CCAL

9-7-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.021	65313442	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.987	14965081	10.953 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	21.91%#
24) s	d50-Tetracosane	35.669	12446669	10.975 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	21.95%#
	Target Compounds			
2) t	n-Octane (C8)	5.429	10787663	10.152 ug/mL M4
3) t	n-Nonane (C9)	7.611	10984036	10.192 ug/mL M4
4) t	n-Decane (C10)	10.088	11426913	10.253 ug/mL M4
5) t	n-Undecane (C11)	12.595	11541093	10.300 ug/mL M4
6) t	n-Dodecane (C12)	15.021	11759368	10.295 ug/mL M4
7) t	n-Tridecane (C13)	17.327	11803721	10.240 ug/mL M4
9) t	n-Tetradecane (C14)	19.509	11918136	10.260 ug/mL M4
11) t	n-Pentadecane (C15)	21.573	11911917	10.224 ug/mL M4
12) t	n-Hexadecane (C16)	23.529	12051235	10.202 ug/mL M4
14) t	n-Heptadecane (C17)	25.385	11942188	10.280 ug/mL M4
15) t	Pristane	25.496	12312714	10.129 ug/mL M4
16) t	n-Octadecane (C18)	27.151	12267744	10.217 ug/mL M4
17) t	Phytane	27.314	12154748	10.167 ug/mL M4
18) t	n-Nonadecane (C19)	28.836	12262859	10.121 ug/mL M4
20) t	n-Eicosane (C20)	30.440	12385893	10.206 ug/mL M4
21) t	n-Heneicosane (C21)	31.974	12409357	10.210 ug/mL M4
22) t	n-Docosane (C22)	33.445	12501280	10.177 ug/mL M4
23) t	n-Tricosane (C23)	34.856	12518263	9.998 ug/mL M4
25) t	n-Tetracosane (C24)	36.209	12486436	10.102 ug/mL M4
26) t	n-Pentacosane (C25)	37.514	12760359	10.128 ug/mL M4
27) t	n-Hexacosane (C26)	38.769	12692005	10.124 ug/mL M4
28) t	n-Heptacosane (C27)	39.978	12441614	10.067 ug/mL M4
29) t	n-Octacosane (C28)	41.145	12578572	10.074 ug/mL M4
30) t	n-Nonacosane (C29)	42.273	12608505	10.041 ug/mL M4
31) t	n-Triacontane (C30)	43.365	12441268	9.998 ug/mL M4
32) t	n-Hentriacontane (C31)	44.423	12562193	9.941 ug/mL M4
33) t	n-Dotriacontane (C32)	45.443	12516087	9.914 ug/mL M4
34) t	n-Tritriacontane (C33)	46.436	11955175	9.860 ug/mL M4
35) t	n-tetratriacontane (C34)	47.421	12319702	9.810 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.509	12536903	9.781 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.746	12781199	9.768 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.176	12507537	9.727 ug/mL M4
39) t	n-Octatriacontane (C38)	52.842	12423625	9.686 ug/mL M4
41) t	n-Tetracontane (C40)	57.111	11764411	9.660 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27102.D
Operator : AC
Acquired : 04 Sep 2012 6:18 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041202R
Misc Info : WHAP92
ALS Vial : 57



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27104.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 7:50 pm
Operator : AC
Sample : I209041203R
Misc : WHAQ26
ALS Vial : 58 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 12:44:59 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

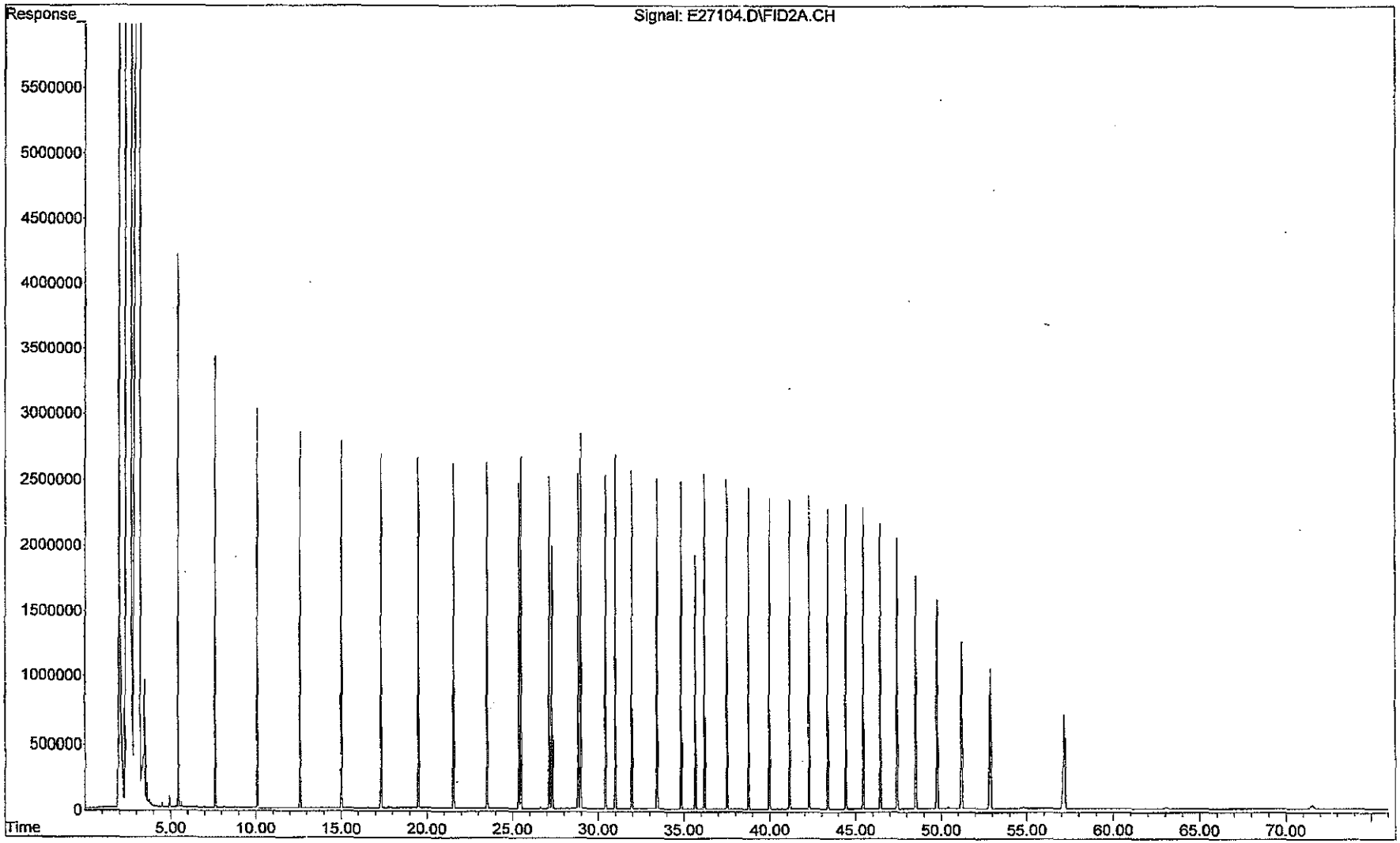
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.022	62756803	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.010	62693889	47.757 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	95.51%
24) s	d50-Tetracosane	35.687	52247168	47.945 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	95.89%
	Target Compounds			
2) t	n-Octane (C8)	5.453	50532455	49.490 ug/mL M4
3) t	n-Nonane (C9)	7.629	51431899	49.669 ug/mL M4
4) t	n-Decane (C10)	10.104	53477708	49.937 ug/mL M4
5) t	n-Undecane (C11)	12.610	54086162	50.236 ug/mL M4
6) t	n-Dodecane (C12)	15.035	55112696	50.215 ug/mL M4
7) t	n-Tridecane (C13)	17.343	55323500	49.950 ug/mL M4
9) t	n-Tetradecane (C14)	19.525	55819898	50.011 ug/mL M4
11) t	n-Pentadecane (C15)	21.590	55798199	49.844 ug/mL M4
12) t	n-Hexadecane (C16)	23.547	56395640	49.688 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	55912409	50.090 ug/mL M4
15) t	Pristane	25.517	57437430	49.177 ug/mL M4
16) t	n-Octadecane (C18)	27.170	57286525	49.653 ug/mL M4
17) t	Phytane	27.336	56698112	49.359 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	57214050	49.147 ug/mL M4
20) t	n-Eicosane (C20)	30.460	57746296	49.519 ug/mL M4
21) t	n-Heneicosane (C21)	31.995	57661837	49.376 ug/mL M4
22) t	n-Docosane (C22)	33.466	58144372	49.262 ug/mL M4
23) t	n-Tricosane (C23)	34.876	58140567	48.328 ug/mL M4
25) t	n-Tetracosane (C24)	36.233	57910264	48.762 ug/mL M4
26) t	n-Pentacosane (C25)	37.536	59153058	48.864 ug/mL M4
27) t	n-Hexacosane (C26)	38.791	58717977	48.747 ug/mL M4
28) t	n-Heptacosane (C27)	40.000	57481187	48.405 ug/mL M4
29) t	n-Octacosane (C28)	41.169	58008772	48.351 ug/mL M4
30) t	n-Nonacosane (C29)	42.297	58069092	48.126 ug/mL M4
31) t	n-Triacontane (C30)	43.386	57200514	47.840 ug/mL M4
32) t	n-Hentriacontane (C31)	44.446	57723927	47.541 ug/mL M4
33) t	n-Dotriacontane (C32)	45.469	57470436	47.378 ug/mL M4
34) t	n-Tritriacontane (C33)	46.459	54868096	47.094 ug/mL M4
35) t	n-tetratriacontane (C34)	47.446	56607060	46.909 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.539	57676296	46.830 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.783	58855677	46.815 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.219	57717955	46.716 ug/mL M4
39) t	n-Octatriacontane (C38)	52.895	57409256	46.580 ug/mL M4
41) t	n-Tetracontane (C40)	57.178	54429679	46.515 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27104.D
Operator : AC
Acquired : 04 Sep 2012 7:50 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041203R
Misc Info : WHAQ26
ALS Vial : 58



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27106.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 9:22 pm
Operator : AC
Sample : I209041204R
Misc : WHAO95
ALS Vial : 59 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:07:59 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

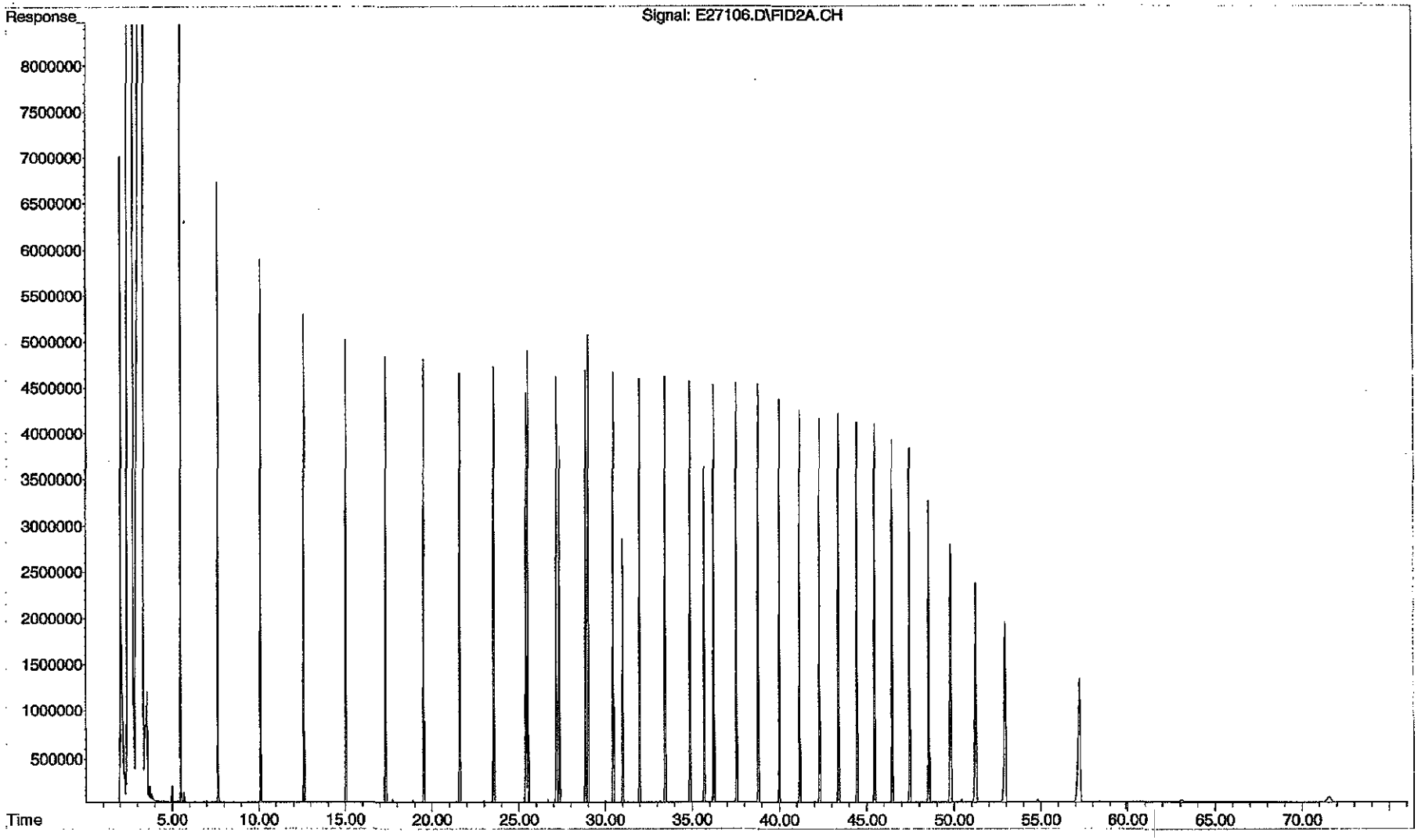
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.027	67785779	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.035	138056751	97.363 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	194.73%#
24) s	d50-Tetracosane	35.709	109892560	93.362 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	186.72%#
	Target Compounds			
2) t	n-Octane (C8)	5.486	108325396	98.220 ug/mL M4
3) t	n-Nonane (C9)	7.654	111752271	99.915 ug/mL M4
4) t	n-Decane (C10)	10.122	116984897	101.135 ug/mL M4
5) t	n-Undecane (C11)	12.626	118514868	101.911 ug/mL M4
6) t	n-Dodecane (C12)	15.051	120843204	101.935 ug/mL M4
7) t	n-Tridecane (C13)	17.357	121149784	101.267 ug/mL M4
9) t	n-Tetradecane (C14)	19.541	122139240	101.311 ug/mL M4
11) t	n-Pentadecane (C15)	21.608	121857534	100.779 ug/mL M4
12) t	n-Hexadecane (C16)	23.565	123242271	100.529 ug/mL M4
14) t	n-Heptadecane (C17)	25.424	122526771	101.625 ug/mL M4
15) t	Pristane	25.539	124809058	98.931 ug/mL M4
16) t	n-Octadecane (C18)	27.193	125112513	100.395 ug/mL M4
17) t	Phytane	27.360	123586542	99.608 ug/mL M4
18) t	n-Nonadecane (C19)	28.879	124732128	99.195 ug/mL M4
20) t	n-Eicosane (C20)	30.483	125691043	99.787 ug/mL M4
21) t	n-Heneicosane (C21)	32.018	125366879	99.387 ug/mL M4
22) t	n-Docosane (C22)	33.488	126233874	99.015 ug/mL M4
23) t	n-Tricosane (C23)	34.900	126131443	97.066 ug/mL M4
25) t	n-Tetracosane (C24)	36.258	125399621	97.756 ug/mL M4
26) t	n-Pentacosane (C25)	37.561	127879102	97.799 ug/mL M4
27) t	n-Hexacosane (C26)	38.816	126799057	97.457 ug/mL M4
28) t	n-Heptacosane (C27)	40.026	123932414	96.620 ug/mL M4
29) t	n-Octacosane (C28)	41.194	125029912	96.483 ug/mL M4
30) t	n-Nonacosane (C29)	42.322	125125084	96.008 ug/mL M4
31) t	n-Triacontane (C30)	43.414	123385318	95.538 ug/mL M4
32) t	n-Hentriacontane (C31)	44.471	124529689	94.952 ug/mL M4
33) t	n-Dotriacontane (C32)	45.494	124184813	94.781 ug/mL M4
34) t	n-Tritriacontane (C33)	46.486	118737876	94.353 ug/mL M4
35) t	n-tetratriacontane (C34)	47.475	122711891	94.145 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.572	125058477	94.007 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.826	127622682	93.982 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.271	125075125	93.722 ug/mL M4
39) t	n-Octatriacontane (C38)	52.951	124388237	93.437 ug/mL M4
41) t	n-Tetracontane (C40)	57.256	117936988	93.310 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27106.D
Operator : AC
Acquired : 04 Sep 2012 9:22 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041204R
Misc Info : WHAO95
ALS Vial : 59



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27108.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 10:53 pm
Operator : AC
Sample : I209041205R
Misc : WHAO96
ALS Vial : 60 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:35:38 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

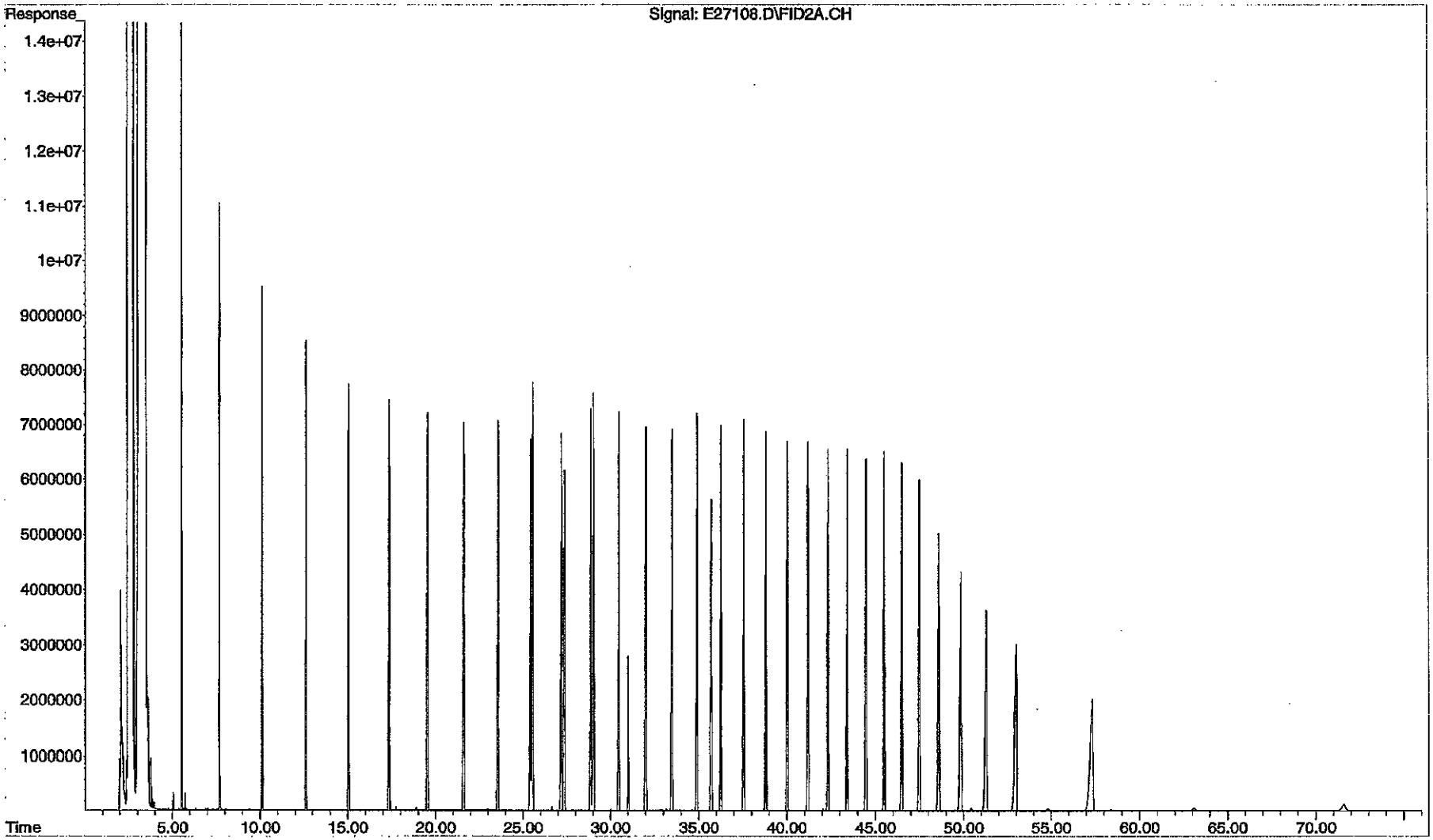
Sub List : CCAL - CCAL

9-7-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.033	68220607	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.064	268314389	188.019 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery	= 376.04%#
24) s	d50-Tetracosane	35.737	212880617	179.706 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery	= 359.41%#
	Target Compounds			
2) t	n-Octane (C8)	5.549	214066752	192.861 ug/mL M4
3) t	n-Nonane (C9)	7.699	218945844	194.507 ug/mL M4
4) t	n-Decane (C10)	10.149	228110991	195.947 ug/mL M4
5) t	n-Undecane (C11)	12.647	230818796	197.216 ug/mL M4
6) t	n-Dodecane (C12)	15.070	234831426	196.825 ug/mL M4
7) t	n-Tridecane (C13)	17.376	235100149	195.264 ug/mL M4
9) t	n-Tetradecane (C14)	19.561	236826645	195.189 ug/mL M4
11) t	n-Pentadecane (C15)	21.627	236005457	193.938 ug/mL M4
12) t	n-Hexadecane (C16)	23.586	238720267	193.483 ug/mL M4
14) t	n-Heptadecane (C17)	25.450	239070405	197.023 ug/mL M4
15) t	Pristane	25.566	238512894	187.854 ug/mL M4
16) t	n-Octadecane (C18)	27.219	241489234	192.546 ug/mL M4
17) t	Phytane	27.389	238431706	190.945 ug/mL M4
18) t	n-Nonadecane (C19)	28.905	240747451	190.238 ug/mL M4
20) t	n-Eicosane (C20)	30.509	242168551	191.035 ug/mL M4
21) t	n-Heneicosane (C21)	32.045	241506941	190.239 ug/mL M4
22) t	n-Docosane (C22)	33.517	242910759	189.320 ug/mL M4
23) t	n-Tricosane (C23)	34.928	242370057	185.330 ug/mL M4
25) t	n-Tetracosane (C24)	36.287	240808405	186.527 ug/mL M4
26) t	n-Pentacosane (C25)	37.590	245473133	186.536 ug/mL M4
27) t	n-Hexacosane (C26)	38.846	243267757	185.782 ug/mL M4
28) t	n-Heptacosane (C27)	40.056	237743445	184.168 ug/mL M4
29) t	n-Octacosane (C28)	41.225	239982574	184.009 ug/mL M4
30) t	n-Nonacosane (C29)	42.354	240486581	183.347 ug/mL M4
31) t	n-Triacontane (C30)	43.446	237389922	182.641 ug/mL M4
32) t	n-Hentriacontane (C31)	44.502	239996685	181.828 ug/mL M4
33) t	n-Dotriacontane (C32)	45.529	239559495	181.672 ug/mL M4
34) t	n-Tritriacontane (C33)	46.516	229022991	180.828 ug/mL M4
35) t	n-tetratriacontane (C34)	47.510	236682062	180.426 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.614	241226826	180.175 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.877	246080144	180.060 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.328	241177911	179.570 ug/mL M4
39) t	n-Octatriacontane (C38)	53.022	239930611	179.081 ug/mL M4
41) t	n-Tetracontane (C40)	57.347	227487481	178.837 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27108.D
Operator : AC
Acquired : 04 Sep 2012 10:53 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041205R
Misc Info : WHA096
ALS Vial : 60



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27110.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 12:26 am
Operator : AC
Sample : I209041206R
Misc : WHAP58
ALS Vial : 61 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:32:09 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

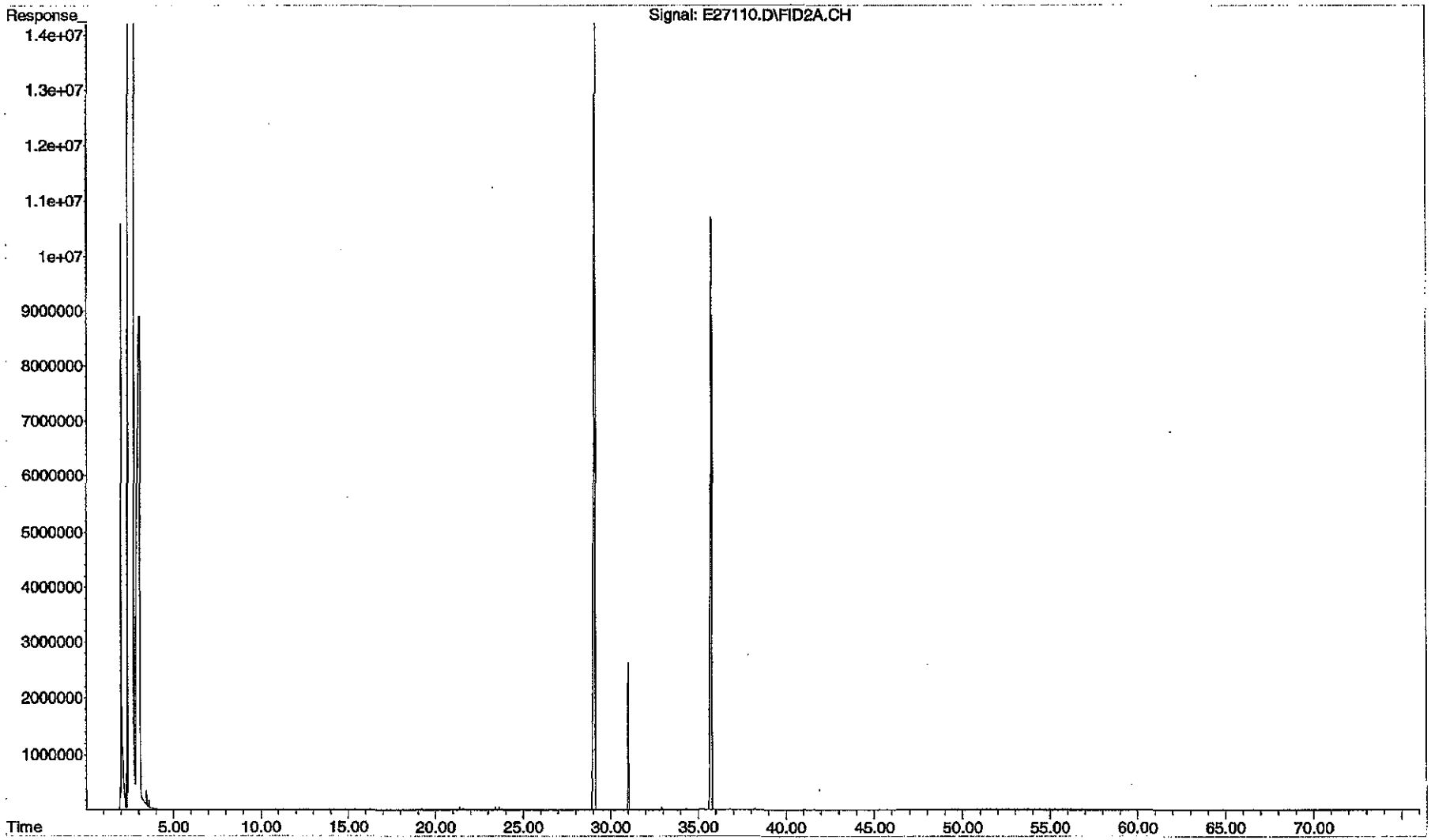
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.025	61806277	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.116f	698740911	540.453 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1080.91%#
24) s d50-Tetracosane	35.785	556842709	518.851 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1037.70%#
Target Compounds			
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27110.D
Operator : AC
Acquired : 05 Sep 2012 12:26 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041206R
Misc Info : WHAP58
ALS Vial : 61



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27114.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 3:31 am
Operator : AC
Sample : CQ209041201R
Misc : WHAQ27
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:25:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	104	0.00
2	t	n-Octane (C8)	50.000	47.063	5.9	98	0.00
3	t	n-Nonane (C9)	50.000	49.007	2.0	103	0.00
4	t	n-Decane (C10)	50.000	50.320	-0.6	105	0.00
5	t	n-Undecane (C11)	50.000	49.146	1.7	103	0.00
6	t	n-Dodecane (C12)	50.000	48.915	2.2	102	0.00
7	t	n-Tridecane (C13)	50.000	48.760	2.5	102	0.00
9	t	n-Tetradecane (C14)	50.000	50.157	-0.3	105	0.00
11	t	n-Pentadecane (C15)	50.000	49.481	1.0	104	0.00
12	t	n-Hexadecane (C16)	50.000	49.370	1.3	103	0.00
14	t	n-Heptadecane (C17)	50.000	50.050	-0.1	105	0.00
15	t	Pristane	50.000	48.998	2.0	102	0.00
16	t	n-Octadecane (C18)	50.000	48.584	2.8	102	0.00
17	t	Phytane	50.000	49.812	0.4	104	0.00
18	t	n-Nonadecane (C19)	50.000	48.354	3.3	101	0.00
19	s	ortho-terphenyl	50.000	46.094	7.8	102	0.00
20	t	n-Eicosane (C20)	50.000	48.032	3.9	101	0.00
21	t	n-Heneicosane (C21)	50.000	48.244	3.5	102	0.00
22	t	n-Docosane (C22)	50.000	48.375	3.3	101	0.00
23	t	n-Tricosane (C23)	50.000	47.726	4.5	102	0.00
24	s	d50-Tetracosane	50.000	47.325	5.3	102	0.00
25	t	n-Tetracosane (C24)	50.000	48.418	3.2	102	0.00
26	t	n-Pentacosane (C25)	50.000	47.522	5.0	100	0.00
27	t	n-Hexacosane (C26)	50.000	48.612	2.8	102	0.00
28	t	n-Heptacosane (C27)	50.000	48.885	2.2	103	0.00
29	t	n-Octacosane (C28)	50.000	48.281	3.4	102	0.00
30	t	n-Nonacosane (C29)	50.000	48.446	3.1	102	0.00
31	t	n-Triacontane (C30)	50.000	48.776	2.4	103	0.00
32	t	n-Hentriacontane (C31)	50.000	48.323	3.4	102	0.00
33	t	n-Dotriacontane (C32)	50.000	47.821	4.4	101	0.00
34	t	n-Tritriacontane (C33)	50.000	48.228	3.5	102	0.00
35	t	n-tetratriacontane (C34)	50.000	49.219	1.6	104	0.00
36	t	n-Pentatriacontane (C35)	50.000	48.298	3.4	102	0.00
37	t	n-Hexatriacontane (C36)	50.000	50.607	-1.2	107	0.00
38	t	n-Heptatriacontane (C37)	50.000	48.327	3.3	102	0.00
39	t	n-Octatriacontane (C38)	50.000	48.341	3.3	102	0.00
41	t	n-Tetracontane (C40)	50.000	48.568	2.9	102	-0.02

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.08	0.85 - 1.15

HC2090412R.M Fri Sep 07 14:40:59 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27114.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 3:31 am
Operator : AC
Sample : CQ209041201R
Misc : WHAQ27
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:25:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

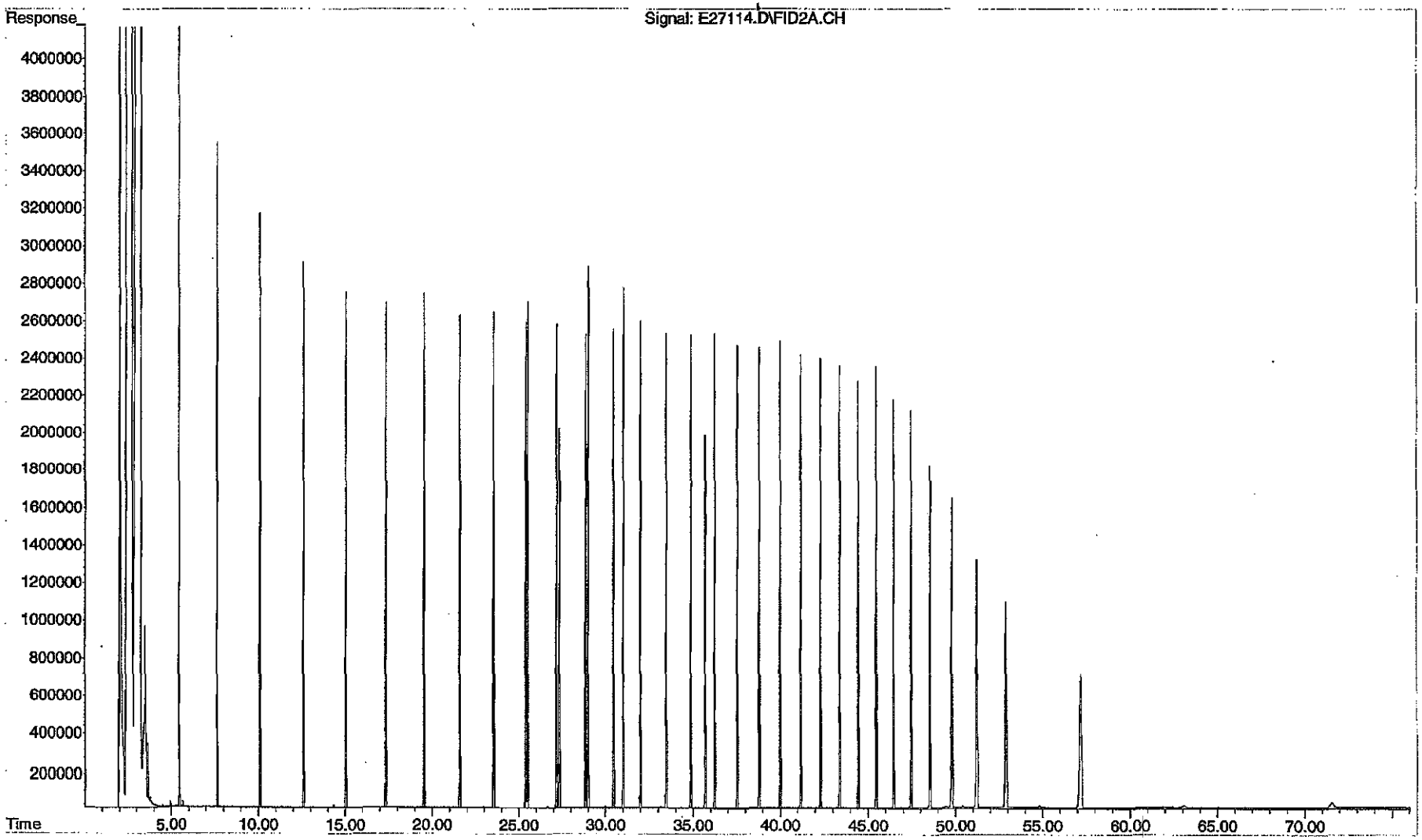
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.024	65571366	50.000 ug/mL
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.012	63835564	46.094 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	92.19%
24) s	d50-Tetracosane	35.689	53098557	47.325 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	94.65%
	Target Compounds			
2) t	n-Octane (C8)	5.453	49690127	47.063 ug/mL M4
3) t	n-Nonane (C9)	7.630	52887630	49.007 ug/mL M4
4) t	n-Decane (C10)	10.102	56372966	50.320 ug/mL M4
5) t	n-Undecane (C11)	12.609	55658323	49.146 ug/mL M4
6) t	n-Dodecane (C12)	15.035	56324963	48.915 ug/mL M4
7) t	n-Tridecane (C13)	17.342	56459788	48.760 ug/mL M4
9) t	n-Tetradecane (C14)	19.526	58612103	50.157 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	57949659	49.481 ug/mL M4
12) t	n-Hexadecane (C16)	23.547	58296284	49.370 ug/mL M4
14) t	n-Heptadecane (C17)	25.406	58730121	50.050 ug/mL M4
15) t	Pristane	25.519	58729630	48.998 ug/mL M4
16) t	n-Octadecane (C18)	27.172	58310676	48.584 ug/mL M4
17) t	Phytane	27.337	59128171	49.812 ug/mL M4
18) t	n-Nonadecane (C19)	28.857	57933404	48.354 ug/mL M4
20) t	n-Eicosane (C20)	30.460	58108037	48.032 ug/mL M4
21) t	n-Heneicosane (C21)	31.997	58598806	48.244 ug/mL M4
22) t	n-Docosane (C22)	33.468	58916110	48.375 ug/mL M4
23) t	n-Tricosane (C23)	34.880	59031115	47.726 ug/mL M4
25) t	n-Tetracosane (C24)	36.236	58874577	48.418 ug/mL M4
26) t	n-Pentacosane (C25)	37.538	58882462	47.522 ug/mL M4
27) t	n-Hexacosane (C26)	38.793	59842693	48.612 ug/mL M4
28) t	n-Heptacosane (C27)	40.004	59020259	48.885 ug/mL M4
29) t	n-Octacosane (C28)	41.170	58880667	48.281 ug/mL M4
30) t	n-Nonacosane (C29)	42.300	59068845	48.446 ug/mL M4
31) t	n-Triacontane (C30)	43.391	58809464	48.776 ug/mL M4
32) t	n-Hentriacontane (C31)	44.447	58777847	48.323 ug/mL M4
33) t	n-Dotriacontane (C32)	45.469	57961177	47.821 ug/mL M4
34) t	n-Tritriacontane (C33)	46.464	55836240	48.228 ug/mL M4
35) t	n-tetratriacontane (C34)	47.449	58826487	49.219 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.542	58740743	48.298 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.790	62924218	50.607 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.227	58743156	48.327 ug/mL M4
39) t	n-Octatriacontane (C38)	52.903	58503229	48.341 ug/mL M4
41) t	n-Tetracontane (C40)	57.180	55675313	48.568 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27114.D
Operator : AC
Acquired : 05 Sep 2012 3:31 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : CQ209041201R
Misc Info : WHAQ27
ALS Vial : 63



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.032	67666055	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.018	69566380	48.677 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	97.35%
24) s	d50-Tetracosane	35.697	57141267	49.351 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	98.70%
	Target Compounds			
2) t	n-Octane (C8)	5.422	102285134	93.879 ug/mL M4
3) t	n-Nonane (C9)	7.619	76013115	68.256 ug/mL M4
4) t	n-Decane (C10)	10.101	63613609	55.026 ug/mL M4
5) t	n-Undecane (C11)	12.611	58788004	50.302 ug/mL M4
6) t	n-Dodecane (C12)	15.036	51442150	43.291 ug/mL M4
7) t	n-Tridecane (C13)	17.344	51674013	43.246 ug/mL M4
8) t	1380	19.019	11081649	9.190 ug/mL M4
9) t	n-Tetradecane (C14)	19.527	45446037	37.687 ug/mL M4
10) t	1470	20.811	18437347	15.256 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	46510985	38.484 ug/mL M4
12) t	n-Hexadecane (C16)	23.546	43300293	35.535 ug/mL M4
13) t	1650	24.454	12821499	10.588 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	39092129	32.283 ug/mL M4
15) t	Pristane	25.504	26773773	21.646 ug/mL M4
16) t	n-Octadecane (C18)	27.170	35486858	28.652 ug/mL M4
17) t	Phytane	27.326	15485089	12.641 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	30026103	24.285 ug/mL M4
20) t	n-Eicosane (C20)	30.459	32191313	25.786 ug/mL M4
21) t	n-Heneicosane (C21)	31.993	26761484	21.351 ug/mL M4
22) t	n-Docosane (C22)	33.463	26156955	20.812 ug/mL M4
23) t	n-Tricosane (C23)	34.874	23790002	18.639 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

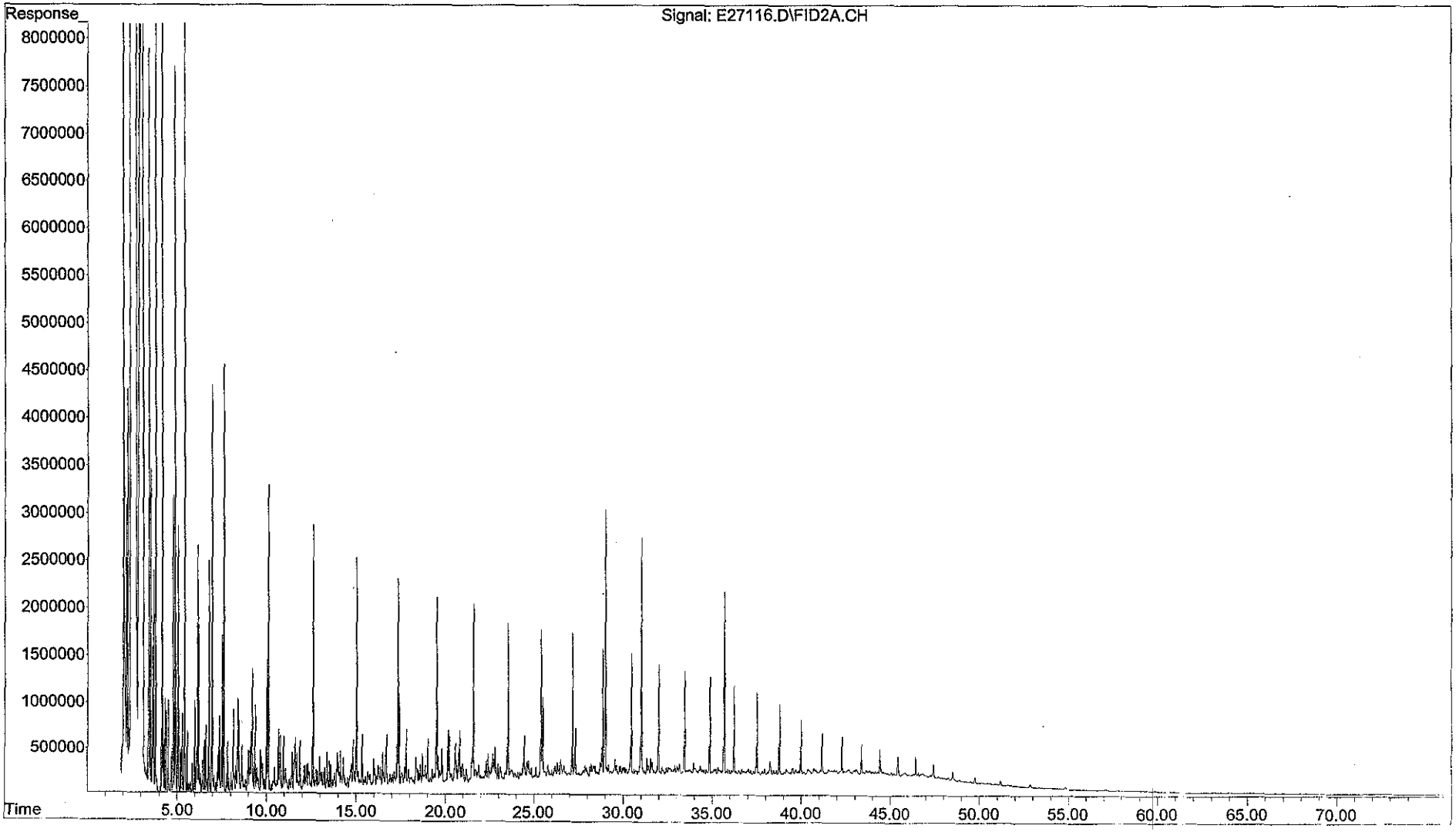
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units
25)	t	n-Tetracosane (C24)	36.229	21569823	17.190	ug/mL M4
26)	t	n-Pentacosane (C25)	37.530	21011766	16.433	ug/mL M4
27)	t	n-Hexacosane (C26)	38.784	18776288	14.780	ug/mL M4
28)	t	n-Heptacosane (C27)	39.993	13757353	11.042	ug/mL M4
29)	t	n-Octacosane (C28)	41.160	9894280	7.862	ug/mL M4
30)	t	n-Nonacosane (C29)	42.290	9748811	7.748	ug/mL M4
31)	t	n-Triacontane (C30)	43.376	8202260	6.592	ug/mL M4
32)	t	n-Hentriacontane (C31)	44.435	6227691	4.961	ug/mL M4
33)	t	n-Dotriacontane (C32)	45.452	5544934	4.433	ug/mL M4
34)	t	n-Tritriacontane (C33)	46.450	4844041	4.054	ug/mL M4
35)	t	n-tetratriacontane (C34)	47.431	4685802	3.799	ug/mL M4
36)	t	n-Pentatriacontane (C35)	48.521	3574400	2.848	ug/mL M4
37)	t	n-Hexatriacontane (C36)	49.764	2674892	2.085	ug/mL M4
38)	t	n-Heptatriacontane (C37)	51.193	2164492	1.726	ug/mL M4
39)	t	n-Octatriacontane (C38)	52.859	1707302	1.367	ug/mL M4
40)	t	n-Nonatriacontane (C39)	54.811	1232956	1.042	ug/mL M4
41)	t	n-Tetracontane (C40)	57.125	1168429	0.988	ug/mL M4
42)	h	C9-C44 Total Petroleu...	39.610	7428814548	6037.249	ug/mL M4
42)	h	C9-C44 Total Petroleu BS	39.610	7306360378	5937.733	ug/mLM4
45)	h	Total Resolved Hydroc...	39.151	2429958845	1974.779	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27116.D
Operator : AC
Acquired : 05 Sep 2012 5:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TW090712ANS01
Misc Info : WHAP13
ALS Vial : 64



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28814.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:49 am
Operator : AC
Sample : C211091201R
Misc : WHAQ67
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:34:46 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	95	0.02
2	t	n-Octane (C8)	50.000	52.684	-5.4	100	0.01
3	t	n-Nonane (C9)	50.000	52.703	-5.4	100	0.01
4	t	n-Decane (C10)	50.000	52.442	-4.9	99	0.01
5	t	n-Undecane (C11)	50.000	52.383	-4.8	99	0.01
6	t	n-Dodecane (C12)	50.000	52.518	-5.0	99	0.01
7	t	n-Tridecane (C13)	50.000	52.340	-4.7	99	0.01
9	t	n-Tetradecane (C14)	50.000	52.078	-4.2	99	0.01
11	t	n-Pentadecane (C15)	50.000	51.863	-3.7	99	0.02
12	t	n-Hexadecane (C16)	50.000	52.102	-4.2	99	0.01
14	t	n-Heptadecane (C17)	50.000	51.282	-2.6	97	0.02
15	t	Pristane	50.000	52.310	-4.6	99	0.02
16	t	n-Octadecane (C18)	50.000	51.646	-3.3	98	0.02
17	t	Phytane	50.000	51.732	-3.5	98	0.02
18	t	n-Nonadecane (C19)	50.000	51.545	-3.1	98	0.02
19	s	ortho-terphenyl	50.000	50.005	-0.0	100	0.02
20	t	n-Eicosane (C20)	50.000	51.665	-3.3	98	0.02
21	t	n-Heneicosane (C21)	50.000	51.345	-2.7	98	0.02
22	t	n-Docosane (C22)	50.000	51.572	-3.1	98	0.02
23	t	n-Tricosane (C23)	50.000	50.839	-1.7	98	0.02
24	s	d50-Tetracosane	50.000	51.404	-2.8	100	0.02
25	t	n-Tetracosane (C24)	50.000	54.645	-9.3	104	0.02
26	t	n-Pentacosane (C25)	50.000	51.600	-3.2	98	0.02
27	t	n-Hexacosane (C26)	50.000	51.587	-3.2	98	0.04
28	t	n-Heptacosane (C27)	50.000	51.557	-3.1	98	0.04
29	t	n-Octacosane (C28)	50.000	51.560	-3.1	98	0.04
30	t	n-Nonacosane (C29)	50.000	51.766	-3.5	98	0.04
31	t	n-Triacontane (C30)	50.000	51.676	-3.4	99	0.04
32	t	n-Hentriacontane (C31)	50.000	51.809	-3.6	99	0.05
33	t	n-Dotriacontane (C32)	50.000	51.869	-3.7	99	0.05
34	t	n-Tritriacontane (C33)	50.000	51.965	-3.9	99	0.05
35	t	n-tetratriacontane (C34)	50.000	52.016	-4.0	99	0.05
36	t	n-Pentatriacontane (C35)	50.000	52.017	-4.0	99	0.06
37	t	n-Hexatriacontane (C36)	50.000	51.862	-3.7	99	0.06
38	t	n-Heptatriacontane (C37)	50.000	51.978	-4.0	99	0.08
39	t	n-Octatriacontane (C38)	50.000	51.908	-3.8	99	0.08
41	t	n-Tetracontane (C40)	50.000	51.924	-3.8	99	0.11

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.03	0.85 - 1.15

HC2090412R.M Fri Nov 16 16:49:22 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28814.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:49 am
Operator : AC
Sample : C211091201R
Misc : WHAQ67
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:34:46 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

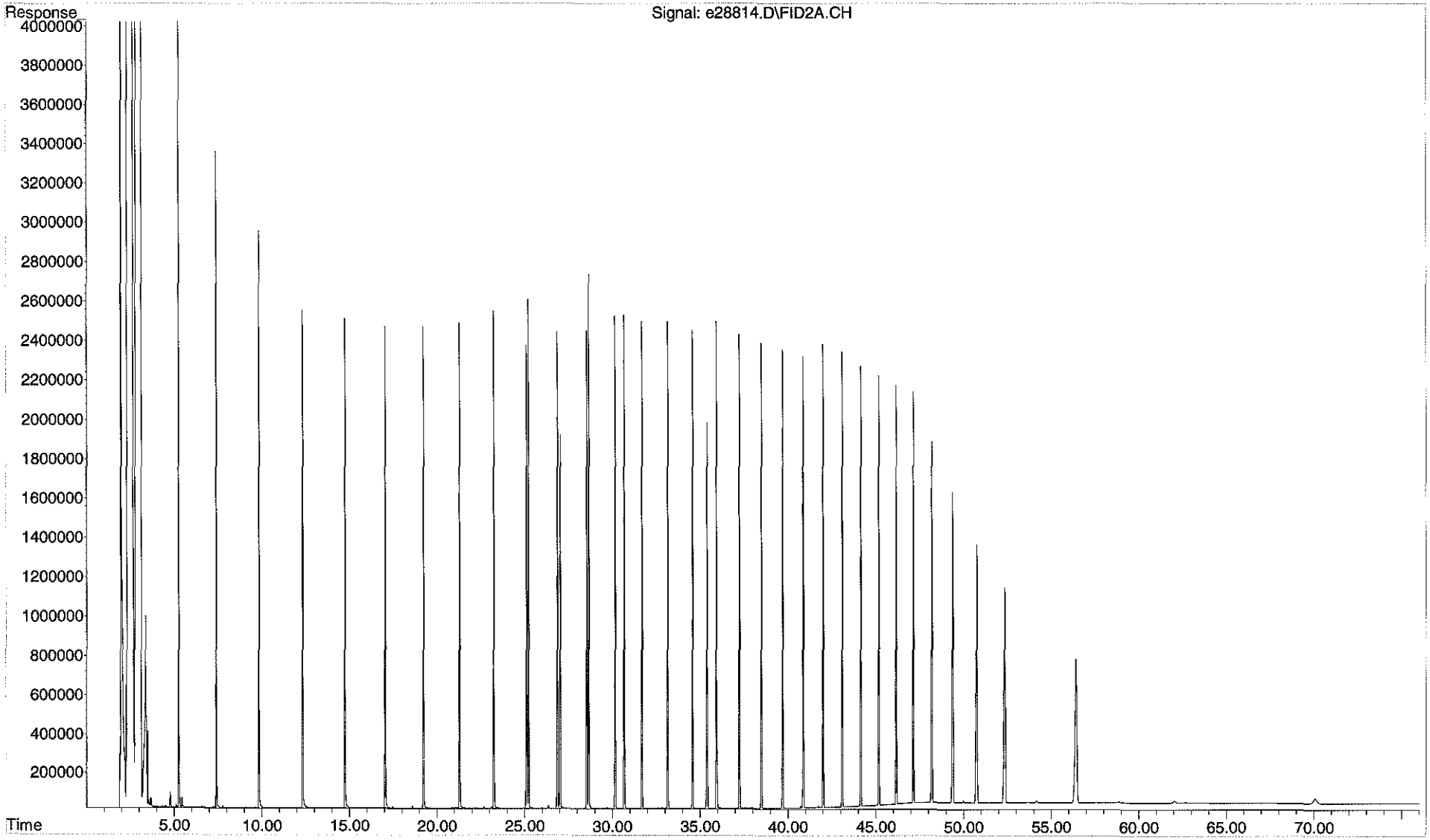
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.682	59338325	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.673	62668313	50.005 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery = 100.01%	
24) s	d50-Tetracosane	35.392	52193464	51.404 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery = 102.81%	
	Target Compounds			
2) t	n-Octane (C8)	5.255	50337544	52.684 ug/mL M4
3) t	n-Nonane (C9)	7.396	51469196	52.703 ug/mL M4
4) t	n-Decane (C10)	9.840	53164966	52.442 ug/mL M4
5) t	n-Undecane (C11)	12.334	53685449	52.383 ug/mL M4
6) t	n-Dodecane (C12)	14.754	54725925	52.518 ug/mL M4
7) t	n-Tridecane (C13)	17.057	54844079	52.340 ug/mL M4
9) t	n-Tetradecane (C14)	19.237	55071777	52.078 ug/mL M4
11) t	n-Pentadecane (C15)	21.300	54966349	51.863 ug/mL M4
12) t	n-Hexadecane (C16)	23.254	55673725	52.102 ug/mL M4
14) t	n-Heptadecane (C17)	25.111	54455883	51.282 ug/mL M4
15) t	Pristane	25.224	56739504	52.310 ug/mL M4
16) t	n-Octadecane (C18)	26.877	56092925	51.646 ug/mL M4
17) t	Phytane	27.040	55570435	51.732 ug/mL M4
18) t	n-Nonadecane (C19)	28.560	55886648	51.545 ug/mL M4
20) t	n-Eicosane (C20)	30.163	56562006	51.665 ug/mL M4
21) t	n-Heneicosane (C21)	31.698	56437101	51.345 ug/mL M4
22) t	n-Docosane (C22)	33.169	56838486	51.572 ug/mL M4
23) t	n-Tricosane (C23)	34.582	56904124	50.839 ug/mL M4
25) t	n-Tetracosane (C24)	35.939	60129103	54.645 ug/mL M4
26) t	n-Pentacosane (C25)	37.242	57857579	51.600 ug/mL M4
27) t	n-Hexacosane (C26)	38.496	57468791	51.587 ug/mL M4
28) t	n-Heptacosane (C27)	39.708	56329431	51.557 ug/mL M4
29) t	n-Octacosane (C28)	40.876	56901866	51.560 ug/mL M4
30) t	n-Nonacosane (C29)	42.007	57116400	51.766 ug/mL M4
31) t	n-Triacontane (C30)	43.099	56382835	51.676 ug/mL M4
32) t	n-Hentriacontane (C31)	44.157	57027946	51.809 ug/mL M4
33) t	n-Dotriacontane (C32)	45.184	56891160	51.869 ug/mL M4
34) t	n-Tritriacontane (C33)	46.178	54444135	51.965 ug/mL M4
35) t	n-tetratriacontane (C34)	47.150	56259465	52.016 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.201	57249960	52.017 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.392	58355104	51.862 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.765	57175973	51.978 ug/mL M4
39) t	n-Octatriacontane (C38)	52.357	56848642	51.908 ug/mL M4
41) t	n-Tetracontane (C40)	56.435	53864301	51.924 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28814.D
Operator : AC
Acquired : 09 Nov 2012 11:49 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091201R
Misc Info : WHAQ67
ALS Vial : 52



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28840.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:10 am
Operator : AC
Sample : C211091202R
Misc : WHAQ67
ALS Vial : 65 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:59:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	100	0.00
2	t	n-Octane (C8)	50.000	50.921	-1.8	102	0.00
3	t	n-Nonane (C9)	50.000	51.309	-2.6	103	0.00
4	t	n-Decane (C10)	50.000	51.582	-3.2	103	0.00
5	t	n-Undecane (C11)	50.000	50.532	-1.1	101	0.00
6	t	n-Dodecane (C12)	50.000	51.614	-3.2	103	0.00
7	t	n-Tridecane (C13)	50.000	51.734	-3.5	103	0.00
9	t	n-Tetradecane (C14)	50.000	51.534	-3.1	103	0.00
11	t	n-Pentadecane (C15)	50.000	51.344	-2.7	103	0.00
12	t	n-Hexadecane (C16)	50.000	51.669	-3.3	103	0.00
14	t	n-Heptadecane (C17)	50.000	50.856	-1.7	102	0.00
15	t	Pristane	50.000	52.019	-4.0	104	0.00
16	t	n-Octadecane (C18)	50.000	51.290	-2.6	103	0.00
17	t	Phytane	50.000	51.754	-3.5	103	0.00
18	t	n-Nonadecane (C19)	50.000	51.217	-2.4	102	0.00
19	s	ortho-terphenyl	50.000	49.941	0.1	105	0.00
20	t	n-Eicosane (C20)	50.000	51.292	-2.6	103	0.00
21	t	n-Heneicosane (C21)	50.000	51.010	-2.0	103	0.00
22	t	n-Docosane (C22)	50.000	51.223	-2.4	102	0.00
23	t	n-Tricosane (C23)	50.000	50.509	-1.0	103	0.00
24	s	d50-Tetracosane	50.000	51.064	-2.1	105	0.00
25	t	n-Tetracosane (C24)	50.000	51.186	-2.4	103	0.00
26	t	n-Pentacosane (C25)	50.000	51.228	-2.5	102	0.00
27	t	n-Hexacosane (C26)	50.000	51.194	-2.4	102	0.02
28	t	n-Heptacosane (C27)	50.000	51.118	-2.2	103	0.03
29	t	n-Octacosane (C28)	50.000	51.147	-2.3	103	0.03
30	t	n-Nonacosane (C29)	50.000	51.147	-2.3	103	0.03
31	t	n-Triacontane (C30)	50.000	50.916	-1.8	102	0.03
32	t	n-Hentriacontane (C31)	50.000	50.904	-1.8	102	0.03
33	t	n-Dotriacontane (C32)	50.000	50.870	-1.7	102	0.03
34	t	n-Tritriacontane (C33)	50.000	50.798	-1.6	102	0.03
35	t	n-tetratriacontane (C34)	50.000	50.713	-1.4	102	0.03
36	t	n-Pentatriacontane (C35)	50.000	50.602	-1.2	102	0.03
37	t	n-Hexatriacontane (C36)	50.000	50.342	-0.7	102	0.03
38	t	n-Heptatriacontane (C37)	50.000	50.296	-0.6	101	0.03
39	t	n-Octatriacontane (C38)	50.000	50.047	-0.1	101	0.03
41	t	n-Tetracontane (C40)	50.000	49.647	0.7	100	0.04

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.01	0.85 - 1.15

HC2090412R.M Fri Nov 16 16:49:37 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28840.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:10 am
Operator : AC
Sample : C211091202R
Misc : WHAQ67
ALS Vial : 65 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:59:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

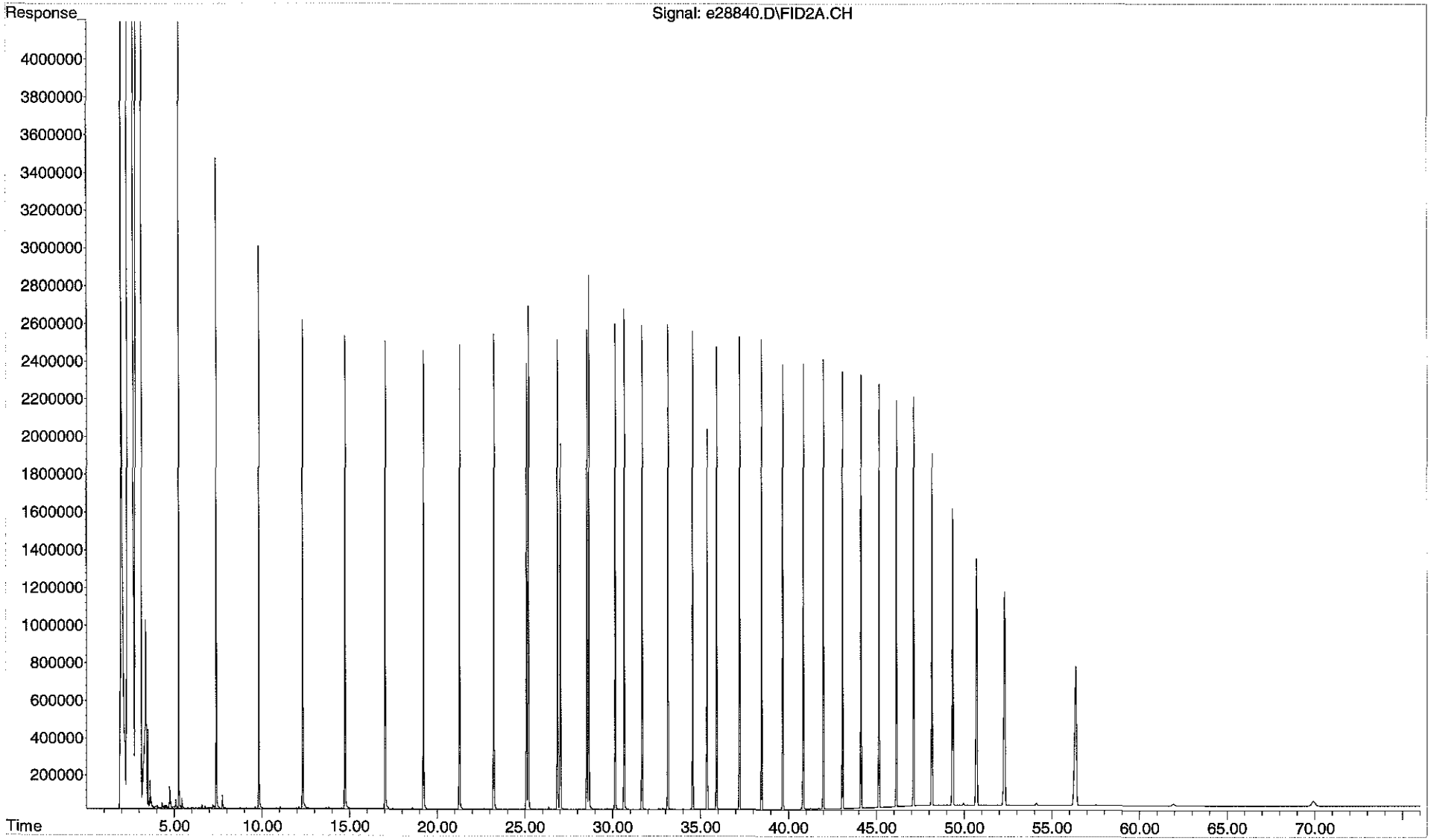
Sub List : CCAL - CCAL

11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.667	62613621	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.660	66042741	49.941 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	99.88%
24) s	d50-Tetracosane	35.378	54709612	51.064 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	102.13%
	Target Compounds			
2) t	n-Octane (C8)	5.250	51337889	50.921 ug/mL M4
3) t	n-Nonane (C9)	7.388	52873524	51.309 ug/mL M4
4) t	n-Decane (C10)	9.831	55179452	51.582 ug/mL M4
5) t	n-Undecane (C11)	12.324	54646866	50.532 ug/mL M4
6) t	n-Dodecane (C12)	14.744	56752330	51.614 ug/mL M4
7) t	n-Tridecane (C13)	17.047	57201404	51.734 ug/mL M4
9) t	n-Tetradecane (C14)	19.226	57504724	51.534 ug/mL M4
11) t	n-Pentadecane (C15)	21.289	57419940	51.344 ug/mL M4
12) t	n-Hexadecane (C16)	23.243	58258144	51.669 ug/mL M4
14) t	n-Heptadecane (C17)	25.099	56984355	50.856 ug/mL M4
15) t	Pristane	25.211	59537775	52.019 ug/mL M4
16) t	n-Octadecane (C18)	26.864	58781589	51.290 ug/mL M4
17) t	Phytane	27.029	58662983	51.754 ug/mL M4
18) t	n-Nonadecane (C19)	28.547	58595574	51.217 ug/mL M4
20) t	n-Eicosane (C20)	30.150	59252937	51.292 ug/mL M4
21) t	n-Heneicosane (C21)	31.685	59163614	51.010 ug/mL M4
22) t	n-Docosane (C22)	33.154	59570222	51.223 ug/mL M4
23) t	n-Tricosane (C23)	34.566	59654582	50.509 ug/mL M4
25) t	n-Tetracosane (C24)	35.921	59432710	51.186 ug/mL M4
26) t	n-Pentacosane (C25)	37.226	60611235	51.228 ug/mL M4
27) t	n-Hexacosane (C26)	38.480	60179189	51.194 ug/mL M4
28) t	n-Heptacosane (C27)	39.691	58932628	51.118 ug/mL M4
29) t	n-Octacosane (C28)	40.861	59562569	51.147 ug/mL M4
30) t	n-Nonacosane (C29)	41.988	59548759	51.147 ug/mL M4
31) t	n-Triacontane (C30)	43.081	58620633	50.916 ug/mL M4
32) t	n-Hentriacontane (C31)	44.140	59124345	50.904 ug/mL M4
33) t	n-Dotriacontane (C32)	45.165	58874892	50.870 ug/mL M4
34) t	n-Tritriacontane (C33)	46.157	56159221	50.798 ug/mL M4
35) t	n-tetratriacontane (C34)	47.127	57877859	50.713 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.172	58766768	50.602 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.362	59772034	50.342 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.724	58379594	50.296 ug/mL M4
39) t	n-Octatriacontane (C38)	52.313	57835381	50.047 ug/mL M4
41) t	n-Tetracontane (C40)	56.370	54344567	49.647 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28840.D
Operator : AC
Acquired : 10 Nov 2012 7:10 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091202R
Misc Info : WHAQ67
ALS Vial : 65



Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28860.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 11:35 pm
Operator : AC
Sample : C211091203R
Misc : WHAQ67
ALS Vial : 75 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:07:05 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

GH 11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	98	0.00
2	t	n-Octane (C8)	50.000	50.579	-1.2	99	0.00
3	t	n-Nonane (C9)	50.000	50.349	-0.7	99	0.00
4	t	n-Decane (C10)	50.000	50.845	-1.7	100	0.00
5	t	n-Undecane (C11)	50.000	50.502	-1.0	99	0.00
6	t	n-Dodecane (C12)	50.000	51.315	-2.6	100	0.00
7	t	n-Tridecane (C13)	50.000	51.255	-2.5	100	0.00
9	t	n-Tetradecane (C14)	50.000	51.149	-2.3	100	0.00
11	t	n-Pentadecane (C15)	50.000	51.110	-2.2	100	0.00
12	t	n-Hexadecane (C16)	50.000	51.473	-2.9	101	0.00
14	t	n-Heptadecane (C17)	50.000	50.661	-1.3	99	0.00
15	t	Pristane	50.000	51.973	-3.9	101	0.00
16	t	n-Octadecane (C18)	50.000	51.300	-2.6	101	0.00
17	t	Phytane	50.000	51.647	-3.3	101	0.00
18	t	n-Nonadecane (C19)	50.000	51.145	-2.3	100	0.00
19	s	ortho-terphenyl	50.000	49.718	0.6	103	0.00
20	t	n-Eicosane (C20)	50.000	51.206	-2.4	100	0.00
21	t	n-Heneicosane (C21)	50.000	50.946	-1.9	100	0.00
22	t	n-Docosane (C22)	50.000	51.110	-2.2	100	0.00
23	t	n-Tricosane (C23)	50.000	50.412	-0.8	100	0.00
24	s	d50-Tetracosane	50.000	50.984	-2.0	102	0.00
25	t	n-Tetracosane (C24)	50.000	51.065	-2.1	100	0.00
26	t	n-Pentacosane (C25)	50.000	51.201	-2.4	100	0.00
27	t	n-Hexacosane (C26)	50.000	51.199	-2.4	100	0.02
28	t	n-Heptacosane (C27)	50.000	51.065	-2.1	100	0.02
29	t	n-Octacosane (C28)	50.000	51.068	-2.1	100	0.02
30	t	n-Nonacosane (C29)	50.000	51.102	-2.2	100	0.02
31	t	n-Triacontane (C30)	50.000	51.146	-2.3	101	0.02
32	t	n-Hentriacontane (C31)	50.000	51.099	-2.2	101	0.02
33	t	n-Dotriacontane (C32)	50.000	51.121	-2.2	101	0.02
34	t	n-Tritriacontane (C33)	50.000	51.212	-2.4	101	0.02
35	t	n-tetratriacontane (C34)	50.000	51.175	-2.3	101	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.183	-2.4	101	0.02
37	t	n-Hexatriacontane (C36)	50.000	50.936	-1.9	101	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.908	-1.8	100	0.02
39	t	n-Octatriacontane (C38)	50.000	50.624	-1.2	100	0.03
41	t	n-Tetracontane (C40)	50.000	50.147	-0.3	99	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Fri Nov 16 16:49:59 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28860.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 11:35 pm
Operator : AC
Sample : C211091203R
Misc : WHAQ67
ALS Vial : 75 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:07:05 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

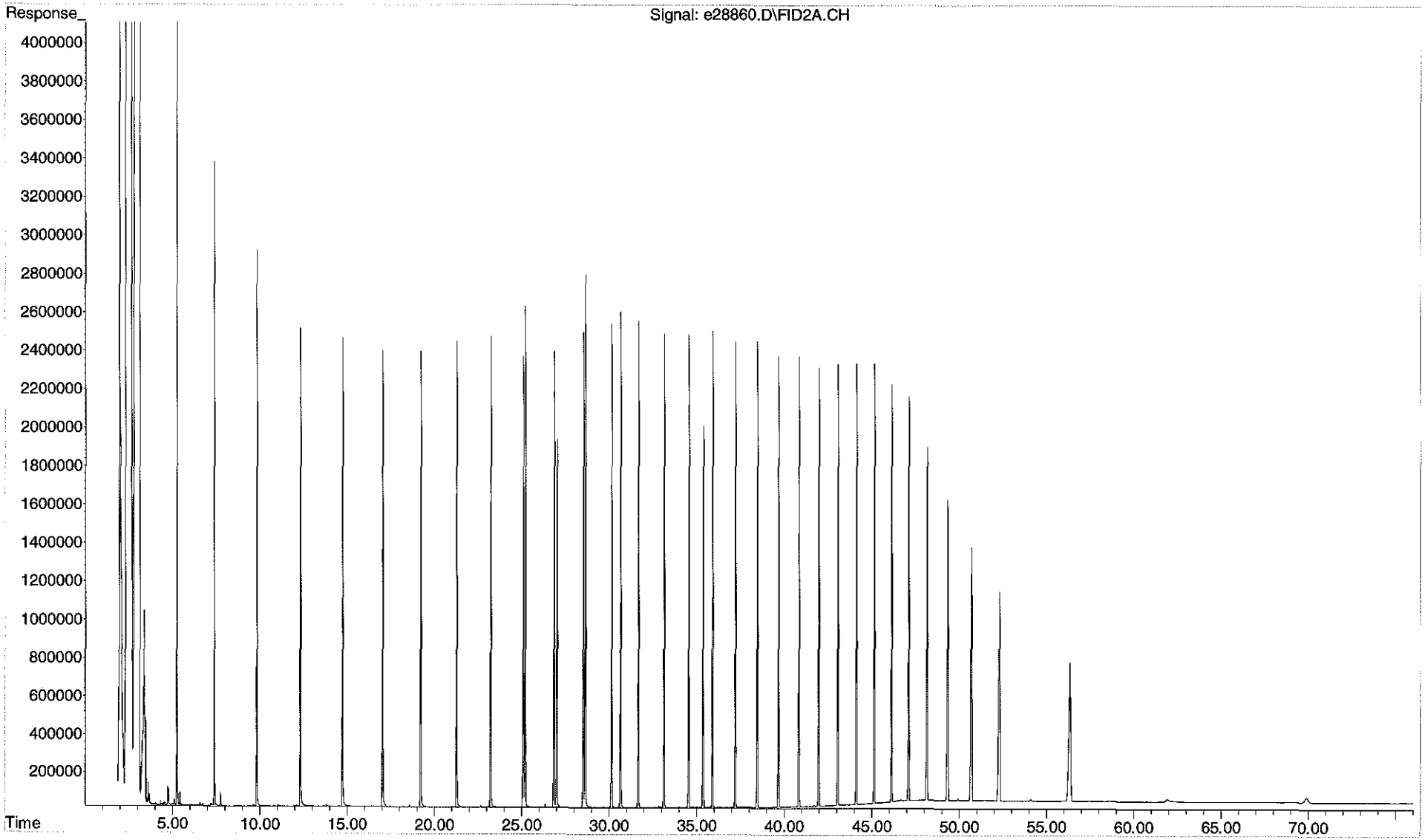
Sub List : CCAL - CCAL

11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.661	61327887	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	64397780	49.718 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	99.44%
24) s	d50-Tetracosane	35.372	53502611	50.984 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	101.97%
	Target Compounds			
2) t	n-Octane (C8)	5.247	49946704	50.579 ug/mL M4
3) t	n-Nonane (C9)	7.385	50819161	50.349 ug/mL M4
4) t	n-Decane (C10)	9.829	53275010	50.845 ug/mL M4
5) t	n-Undecane (C11)	12.322	53492953	50.502 ug/mL M4
6) t	n-Dodecane (C12)	14.742	55264831	51.315 ug/mL M4
7) t	n-Tridecane (C13)	17.044	55507971	51.255 ug/mL M4
9) t	n-Tetradecane (C14)	19.222	55902978	51.149 ug/mL M4
11) t	n-Pentadecane (C15)	21.284	55983962	51.110 ug/mL M4
12) t	n-Hexadecane (C16)	23.237	56845586	51.473 ug/mL M4
14) t	n-Heptadecane (C17)	25.094	55599818	50.661 ug/mL M4
15) t	Pristane	25.206	58263702	51.973 ug/mL M4
16) t	n-Octadecane (C18)	26.858	57585881	51.300 ug/mL M4
17) t	Phytane	27.021	57339653	51.647 ug/mL M4
18) t	n-Nonadecane (C19)	28.541	57312231	51.145 ug/mL M4
20) t	n-Eicosane (C20)	30.145	57938519	51.206 ug/mL M4
21) t	n-Heneicosane (C21)	31.680	57875539	50.946 ug/mL M4
22) t	n-Docosane (C22)	33.150	58218259	51.110 ug/mL M4
23) t	n-Tricosane (C23)	34.562	58317540	50.412 ug/mL M4
25) t	n-Tetracosane (C24)	35.916	58074872	51.065 ug/mL M4
26) t	n-Pentacosane (C25)	37.219	59334818	51.201 ug/mL M4
27) t	n-Hexacosane (C26)	38.473	58949602	51.199 ug/mL M4
28) t	n-Heptacosane (C27)	39.683	57662111	51.065 ug/mL M4
29) t	n-Octacosane (C28)	40.852	58249175	51.068 ug/mL M4
30) t	n-Nonacosane (C29)	41.979	58274243	51.102 ug/mL M4
31) t	n-Triacontane (C30)	43.073	57675507	51.146 ug/mL M4
32) t	n-Hentriacontane (C31)	44.131	58131849	51.099 ug/mL M4
33) t	n-Dotriacontane (C32)	45.157	57950565	51.121 ug/mL M4
34) t	n-Tritriacontane (C33)	46.148	55454596	51.212 ug/mL M4
35) t	n-tetratriacontane (C34)	47.120	57205500	51.175 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.162	58220895	51.183 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.350	59235077	50.936 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.714	57875883	50.908 ug/mL M4
39) t	n-Octatriacontane (C38)	52.306	57301775	50.624 ug/mL M4
41) t	n-Tetracontane (C40)	56.353	53764908	50.147 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28860.D
Operator : AC
Acquired : 10 Nov 2012 11:35 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091203R
Misc Info : WHAQ67
ALS Vial : 75



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28880.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 2:32 pm
Operator : AC
Sample : C211091204R
Misc : WHAQ67
ALS Vial : 85 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:17:02 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	98	0.00
2	t	n-Octane (C8)	50.000	50.137	-0.3	98	0.00
3	t	n-Nonane (C9)	50.000	49.841	0.3	98	0.00
4	t	n-Decane (C10)	50.000	50.402	-0.8	99	0.00
5	t	n-Undecane (C11)	50.000	49.604	0.8	97	0.00
6	t	n-Dodecane (C12)	50.000	51.217	-2.4	100	0.00
7	t	n-Tridecane (C13)	50.000	51.384	-2.8	101	0.00
9	t	n-Tetradecane (C14)	50.000	51.282	-2.6	101	0.00
11	t	n-Pentadecane (C15)	50.000	51.258	-2.5	101	0.00
12	t	n-Hexadecane (C16)	50.000	51.642	-3.3	101	0.00
14	t	n-Heptadecane (C17)	50.000	50.737	-1.5	100	0.00
15	t	Pristane	50.000	52.242	-4.5	102	0.00
16	t	n-Octadecane (C18)	50.000	51.395	-2.8	101	0.00
17	t	Phytane	50.000	51.824	-3.6	102	0.00
18	t	n-Nonadecane (C19)	50.000	51.327	-2.7	101	0.00
19	s	ortho-terphenyl	50.000	49.687	0.6	103	0.00
20	t	n-Eicosane (C20)	50.000	51.321	-2.6	101	0.00
21	t	n-Heneicosane (C21)	50.000	51.026	-2.1	101	0.00
22	t	n-Docosane (C22)	50.000	51.159	-2.3	100	0.00
23	t	n-Tricosane (C23)	50.000	50.466	-0.9	101	0.00
24	s	d50-Tetracosane	50.000	51.001	-2.0	103	0.00
25	t	n-Tetracosane (C24)	50.000	51.092	-2.2	101	0.00
26	t	n-Pentacosane (C25)	50.000	51.171	-2.3	100	0.00
27	t	n-Hexacosane (C26)	50.000	51.119	-2.2	100	0.02
28	t	n-Heptacosane (C27)	50.000	51.080	-2.2	101	0.02
29	t	n-Octacosane (C28)	50.000	51.100	-2.2	101	0.02
30	t	n-Nonacosane (C29)	50.000	51.187	-2.4	101	0.02
31	t	n-Triacontane (C30)	50.000	51.277	-2.6	101	0.02
32	t	n-Hentriacontane (C31)	50.000	51.439	-2.9	102	0.02
33	t	n-Dotriacontane (C32)	50.000	51.510	-3.0	102	0.02
34	t	n-Tritriacontane (C33)	50.000	51.577	-3.2	102	0.02
35	t	n-tetratriacontane (C34)	50.000	51.457	-2.9	102	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.321	-2.6	101	0.02
37	t	n-Hexatriacontane (C36)	50.000	50.943	-1.9	101	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.975	-2.0	101	0.03
39	t	n-Octatriacontane (C38)	50.000	50.554	-1.1	100	0.02
41	t	n-Tetracontane (C40)	50.000	49.892	0.2	99	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Fri Nov 16 16:50:20 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28880.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 2:32 pm
Operator : AC
Sample : C211091204R
Misc : WHAQ67
ALS Vial : 85 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:17:02 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

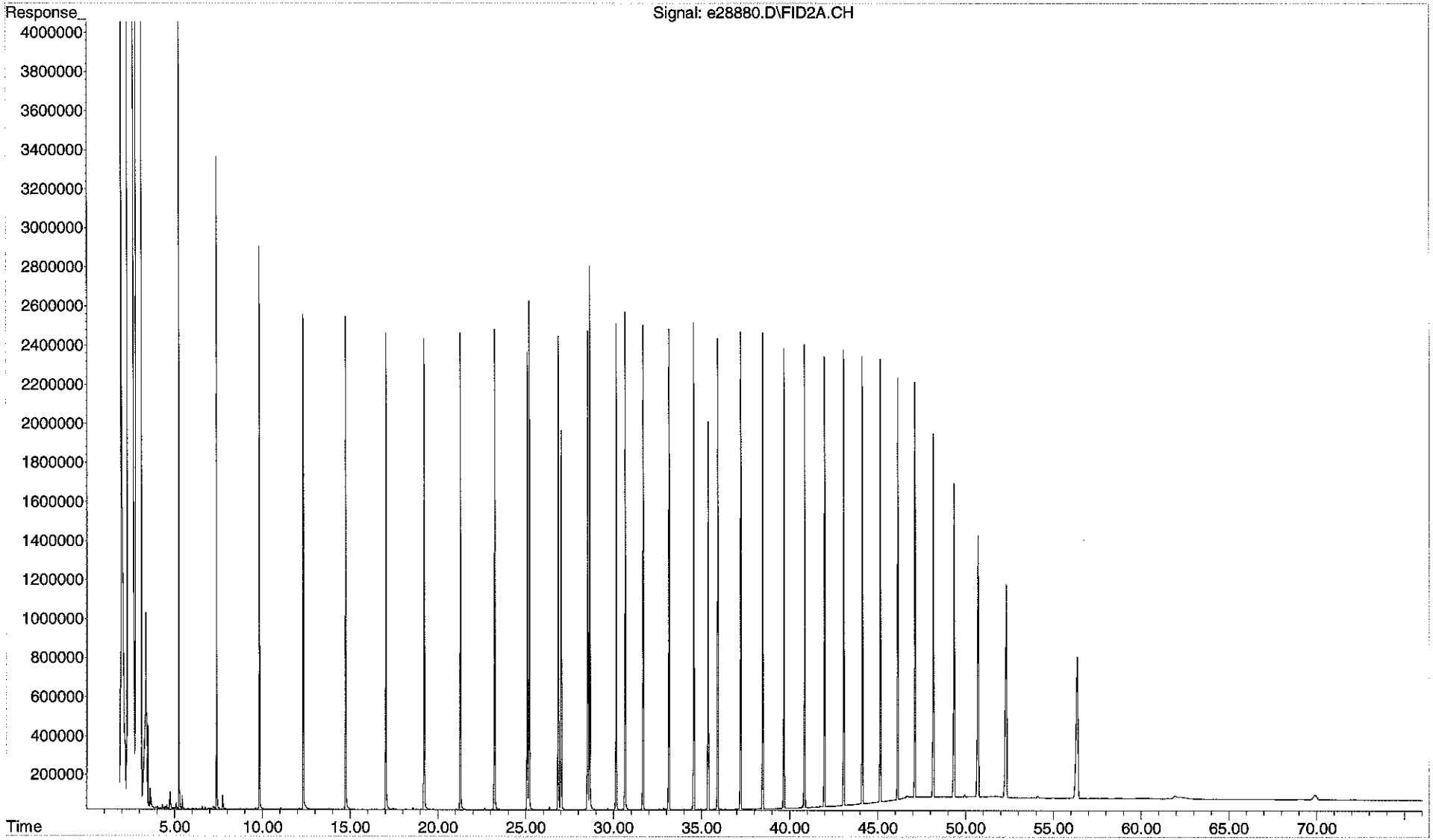
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	61473588	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.655	64511644	49.687 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	99.37%
24) s	d50-Tetracosane	35.372	53647584	51.001 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	102.00%
	Target Compounds			
2) t	n-Octane (C8)	5.245	49627633	50.137 ug/mL M4
3) t	n-Nonane (C9)	7.384	50426020	49.841 ug/mL M4
4) t	n-Decane (C10)	9.830	52935798	50.402 ug/mL M4
5) t	n-Undecane (C11)	12.323	52666087	49.604 ug/mL M4
6) t	n-Dodecane (C12)	14.743	55290636	51.217 ug/mL M4
7) t	n-Tridecane (C13)	17.045	55779756	51.384 ug/mL M4
9) t	n-Tetradecane (C14)	19.225	56181156	51.282 ug/mL M4
11) t	n-Pentadecane (C15)	21.286	56280028	51.258 ug/mL M4
12) t	n-Hexadecane (C16)	23.240	57168308	51.642 ug/mL M4
14) t	n-Heptadecane (C17)	25.096	55815477	50.737 ug/mL M4
15) t	Pristane	25.208	58704110	52.242 ug/mL M4
16) t	n-Octadecane (C18)	26.862	57829061	51.395 ug/mL M4
17) t	Phytane	27.025	57672264	51.824 ug/mL M4
18) t	n-Nonadecane (C19)	28.544	57652279	51.327 ug/mL M4
20) t	n-Eicosane (C20)	30.148	58206536	51.321 ug/mL M4
21) t	n-Heneicosane (C21)	31.681	58105105	51.026 ug/mL M4
22) t	n-Docosane (C22)	33.152	58412102	51.159 ug/mL M4
23) t	n-Tricosane (C23)	34.562	58519204	50.466 ug/mL M4
25) t	n-Tetracosane (C24)	35.917	58243566	51.092 ug/mL M4
26) t	n-Pentacosane (C25)	37.221	59441590	51.171 ug/mL M4
27) t	n-Hexacosane (C26)	38.476	58996456	51.119 ug/mL M4
28) t	n-Heptacosane (C27)	39.685	57817173	51.080 ug/mL M4
29) t	n-Octacosane (C28)	40.854	58423884	51.100 ug/mL M4
30) t	n-Nonacosane (C29)	41.983	58510359	51.187 ug/mL M4
31) t	n-Triacontane (C30)	43.076	57961319	51.277 ug/mL M4
32) t	n-Hentriacontane (C31)	44.133	58657300	51.439 ug/mL M4
33) t	n-Dotriacontane (C32)	45.159	58530655	51.510 ug/mL M4
34) t	n-Tritriacontane (C33)	46.152	55981757	51.577 ug/mL M4
35) t	n-tetratriacontane (C34)	47.120	57657556	51.457 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.165	58516558	51.321 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.352	59383519	50.943 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.719	58090351	50.975 ug/mL M4
39) t	n-Octatriacontane (C38)	52.305	57357763	50.554 ug/mL M4
41) t	n-Tetracontane (C40)	56.353	53618524	49.892 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28880.D
Operator : AC
Acquired : 11 Nov 2012 2:32 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091204R
Misc Info : WHAQ67
ALS Vial : 85



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28906.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:47 pm
Operator : AC
Sample : C211091206R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:44:13 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	93	0.00
2	t	n-Octane (C8)	50.000	53.214	-6.4	99	0.00
3	t	n-Nonane (C9)	50.000	52.183	-4.4	97	0.00
4	t	n-Decane (C10)	50.000	51.076	-2.2	95	0.00
5	t	n-Undecane (C11)	50.000	50.552	-1.1	94	0.00
6	t	n-Dodecane (C12)	50.000	52.293	-4.6	97	0.00
7	t	n-Tridecane (C13)	50.000	52.312	-4.6	97	0.00
9	t	n-Tetradecane (C14)	50.000	52.096	-4.2	97	0.00
11	t	n-Pentadecane (C15)	50.000	51.870	-3.7	97	0.00
12	t	n-Hexadecane (C16)	50.000	52.263	-4.5	97	0.00
14	t	n-Heptadecane (C17)	50.000	51.228	-2.5	95	0.00
15	t	Pristane	50.000	53.135	-6.3	98	0.00
16	t	n-Octadecane (C18)	50.000	51.908	-3.8	96	0.00
17	t	Phytane	50.000	52.389	-4.8	97	0.00
18	t	n-Nonadecane (C19)	50.000	51.825	-3.7	96	0.00
19	s	ortho-terphenyl	50.000	50.302	-0.6	99	0.00
20	t	n-Eicosane (C20)	50.000	52.013	-4.0	97	0.00
21	t	n-Heneicosane (C21)	50.000	51.851	-3.7	97	0.00
22	t	n-Docosane (C22)	50.000	51.905	-3.8	96	0.00
23	t	n-Tricosane (C23)	50.000	51.240	-2.5	97	0.00
24	s	d50-Tetracosane	50.000	51.902	-3.8	99	0.00
25	t	n-Tetracosane (C24)	50.000	52.000	-4.0	97	0.00
26	t	n-Pentacosane (C25)	50.000	52.206	-4.4	97	0.00
27	t	n-Hexacosane (C26)	50.000	52.323	-4.6	97	0.02
28	t	n-Heptacosane (C27)	50.000	52.445	-4.9	98	0.02
29	t	n-Octacosane (C28)	50.000	52.742	-5.5	98	0.02
30	t	n-Nonacosane (C29)	50.000	52.990	-6.0	99	0.02
31	t	n-Triacontane (C30)	50.000	53.030	-6.1	99	0.02
32	t	n-Hentriacontane (C31)	50.000	53.196	-6.4	99	0.02
33	t	n-Dotriacontane (C32)	50.000	53.319	-6.6	100	0.02
34	t	n-Tritriacontane (C33)	50.000	53.357	-6.7	100	0.02
35	t	n-tetratriacontane (C34)	50.000	53.057	-6.1	99	0.02
36	t	n-Pentatriacontane (C35)	50.000	52.981	-6.0	99	0.02
37	t	n-Hexatriacontane (C36)	50.000	52.653	-5.3	99	0.02
38	t	n-Heptatriacontane (C37)	50.000	52.605	-5.2	98	0.02
39	t	n-Octatriacontane (C38)	50.000	52.261	-4.5	98	0.01
41	t	n-Tetracontane (C40)	50.000	51.515	-3.0	96	0.02

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.04	0.85 - 1.15

HC2090412R.M Fri Nov 16 16:50:39 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28906.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:47 pm
Operator : AC
Sample : C211091206R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:44:13 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

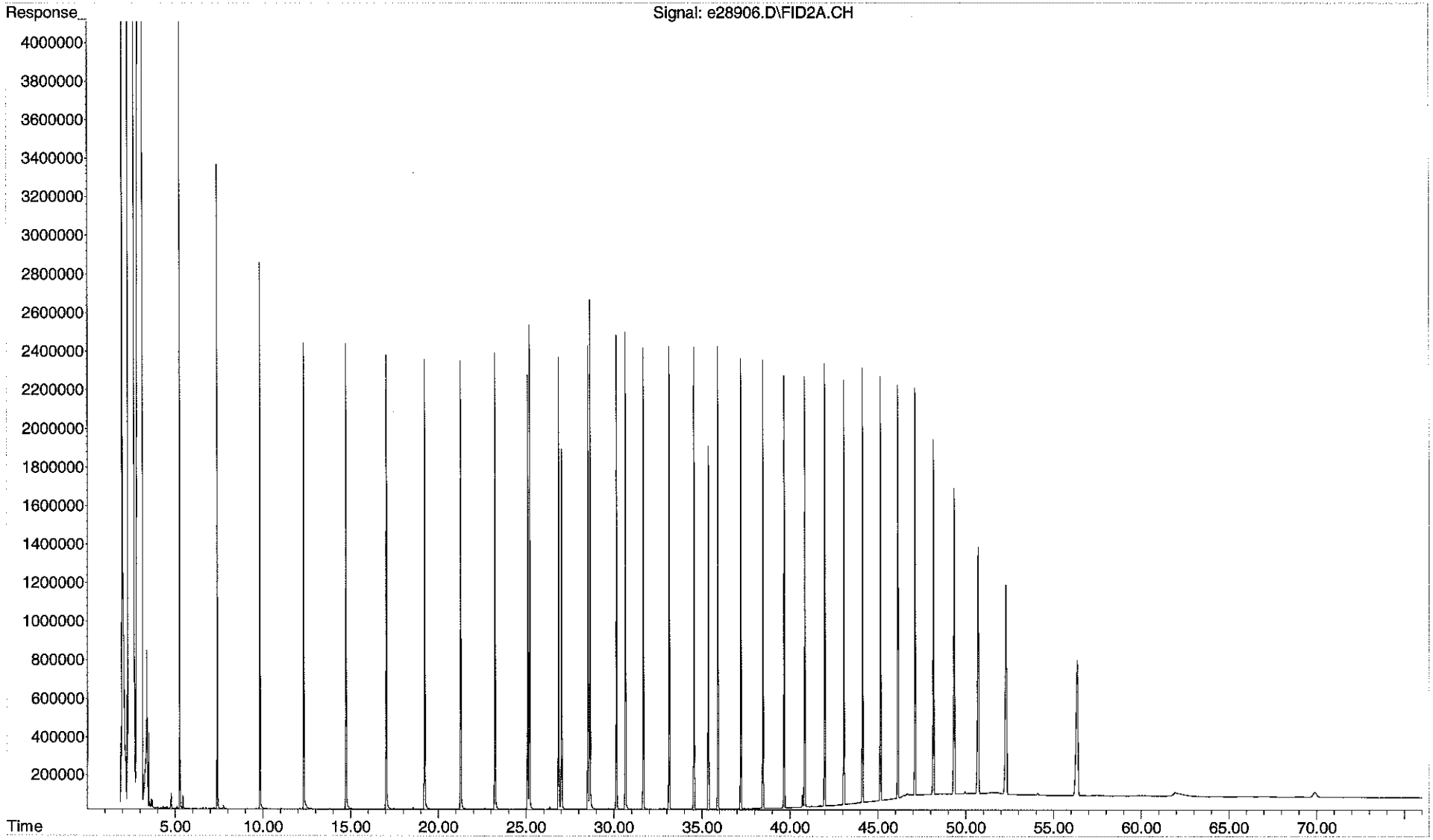
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.658	58151868	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.650	61780706	50.302 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	100.60%
24) s	d50-Tetracosane	35.369	51644987	51.902 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	103.80%
	Target Compounds			
2) t	n-Octane (C8)	5.253	49826989	53.214 ug/mL M4
3) t	n-Nonane (C9)	7.389	49942317	52.183 ug/mL M4
4) t	n-Decane (C10)	9.829	50744703	51.076 ug/mL M4
5) t	n-Undecane (C11)	12.320	50772546	50.552 ug/mL M4
6) t	n-Dodecane (C12)	14.739	53401489	52.293 ug/mL M4
7) t	n-Tridecane (C13)	17.041	53718453	52.312 ug/mL M4
9) t	n-Tetradecane (C14)	19.220	53988970	52.096 ug/mL M4
11) t	n-Pentadecane (C15)	21.282	53873916	51.870 ug/mL M4
12) t	n-Hexadecane (C16)	23.235	54728697	52.263 ug/mL M4
14) t	n-Heptadecane (C17)	25.092	53310847	51.228 ug/mL M4
15) t	Pristane	25.203	56481520	53.135 ug/mL M4
16) t	n-Octadecane (C18)	26.856	55250547	51.908 ug/mL M4
17) t	Phytane	27.021	55151283	52.389 ug/mL M4
18) t	n-Nonadecane (C19)	28.538	55066508	51.825 ug/mL M4
20) t	n-Eicosane (C20)	30.143	55803773	52.013 ug/mL M4
21) t	n-Heneicosane (C21)	31.676	55853174	51.851 ug/mL M4
22) t	n-Docosane (C22)	33.146	56062300	51.905 ug/mL M4
23) t	n-Tricosane (C23)	34.558	56205678	51.240 ug/mL M4
25) t	n-Tetracosane (C24)	35.913	56074926	52.000 ug/mL M4
26) t	n-Pentacosane (C25)	37.217	57367000	52.206 ug/mL M4
27) t	n-Hexacosane (C26)	38.472	57123451	52.323 ug/mL M4
28) t	n-Heptacosane (C27)	39.680	56154306	52.445 ug/mL M4
29) t	n-Octacosane (C28)	40.849	57042504	52.742 ug/mL M4
30) t	n-Nonacosane (C29)	41.979	57298458	52.990 ug/mL M4
31) t	n-Triacontane (C30)	43.072	56703611	53.030 ug/mL M4
32) t	n-Hentriacontane (C31)	44.129	57383852	53.196 ug/mL M4
33) t	n-Dotriacontane (C32)	45.154	57311932	53.319 ug/mL M4
34) t	n-Tritriacontane (C33)	46.146	54784413	53.357 ug/mL M4
35) t	n-tetratriacontane (C34)	47.119	56238234	53.057 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.160	57145086	52.981 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.343	58060296	52.653 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.708	56708434	52.605 ug/mL M4
39) t	n-Octatriacontane (C38)	52.293	56090620	52.261 ug/mL M4
41) t	n-Tetracontane (C40)	56.344	52371393	51.515 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28906.D
Operator : AC
Acquired : 12 Nov 2012 5:47 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091206R
Misc Info : WHAQ67
ALS Vial : 95



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28918.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 2:43 am
Operator : AC
Sample : C211091207R
Misc : WHAQ67
ALS Vial : 51 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:33:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M -
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

11-16-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	108	0.00
2	t	n-Octane (C8)	50.000	47.561	4.9	103	0.00
3	t	n-Nonane (C9)	50.000	49.337	1.3	107	0.00
4	t	n-Decane (C10)	50.000	50.284	-0.6	109	0.00
5	t	n-Undecane (C11)	50.000	49.835	0.3	108	0.00
6	t	n-Dodecane (C12)	50.000	51.373	-2.7	111	0.00
7	t	n-Tridecane (C13)	50.000	51.578	-3.2	112	0.00
9	t	n-Tetradecane (C14)	50.000	51.411	-2.8	112	0.00
11	t	n-Pentadecane (C15)	50.000	51.536	-3.1	112	0.00
12	t	n-Hexadecane (C16)	50.000	51.849	-3.7	113	0.00
14	t	n-Heptadecane (C17)	50.000	50.794	-1.6	111	0.00
15	t	Pristane	50.000	52.771	-5.5	114	0.00
16	t	n-Octadecane (C18)	50.000	51.576	-3.2	112	0.00
17	t	Phytane	50.000	51.570	-3.1	112	0.00
18	t	n-Nonadecane (C19)	50.000	51.450	-2.9	112	0.00
19	s	ortho-terphenyl	50.000	50.301	-0.6	115	0.00
20	t	n-Eicosane (C20)	50.000	51.643	-3.3	112	0.00
21	t	n-Heneicosane (C21)	50.000	51.435	-2.9	112	0.00
22	t	n-Docosane (C22)	50.000	51.508	-3.0	112	0.00
23	t	n-Tricosane (C23)	50.000	50.776	-1.6	112	0.00
24	s	d50-Tetracosane	50.000	51.356	-2.7	114	0.00
25	t	n-Tetracosane (C24)	50.000	51.360	-2.7	112	0.00
26	t	n-Pentacosane (C25)	50.000	51.483	-3.0	112	0.00
27	t	n-Hexacosane (C26)	50.000	51.494	-3.0	112	0.02
28	t	n-Heptacosane (C27)	50.000	51.491	-3.0	112	0.02
29	t	n-Octacosane (C28)	50.000	51.648	-3.3	113	0.02
30	t	n-Nonacosane (C29)	50.000	51.822	-3.6	113	0.02
31	t	n-Triacontane (C30)	50.000	51.778	-3.6	113	0.02
32	t	n-Hentriacontane (C31)	50.000	51.906	-3.8	113	0.02
33	t	n-Dotriacontane (C32)	50.000	51.937	-3.9	114	0.02
34	t	n-Tritriacontane (C33)	50.000	51.942	-3.9	114	0.02
35	t	n-tetratriacontane (C34)	50.000	51.812	-3.6	113	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.485	-3.0	113	0.02
37	t	n-Hexatriacontane (C36)	50.000	51.129	-2.3	112	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.834	-1.7	111	0.02
39	t	n-Octatriacontane (C38)	50.000	50.409	-0.8	110	0.02
41	t	n-Tetracontane (C40)	50.000	49.602	0.8	108	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Fri Nov 16 16:50:58 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28918.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 2:43 am
Operator : AC
Sample : C211091207R
Misc : WHAQ67
ALS Vial : 51 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:33:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

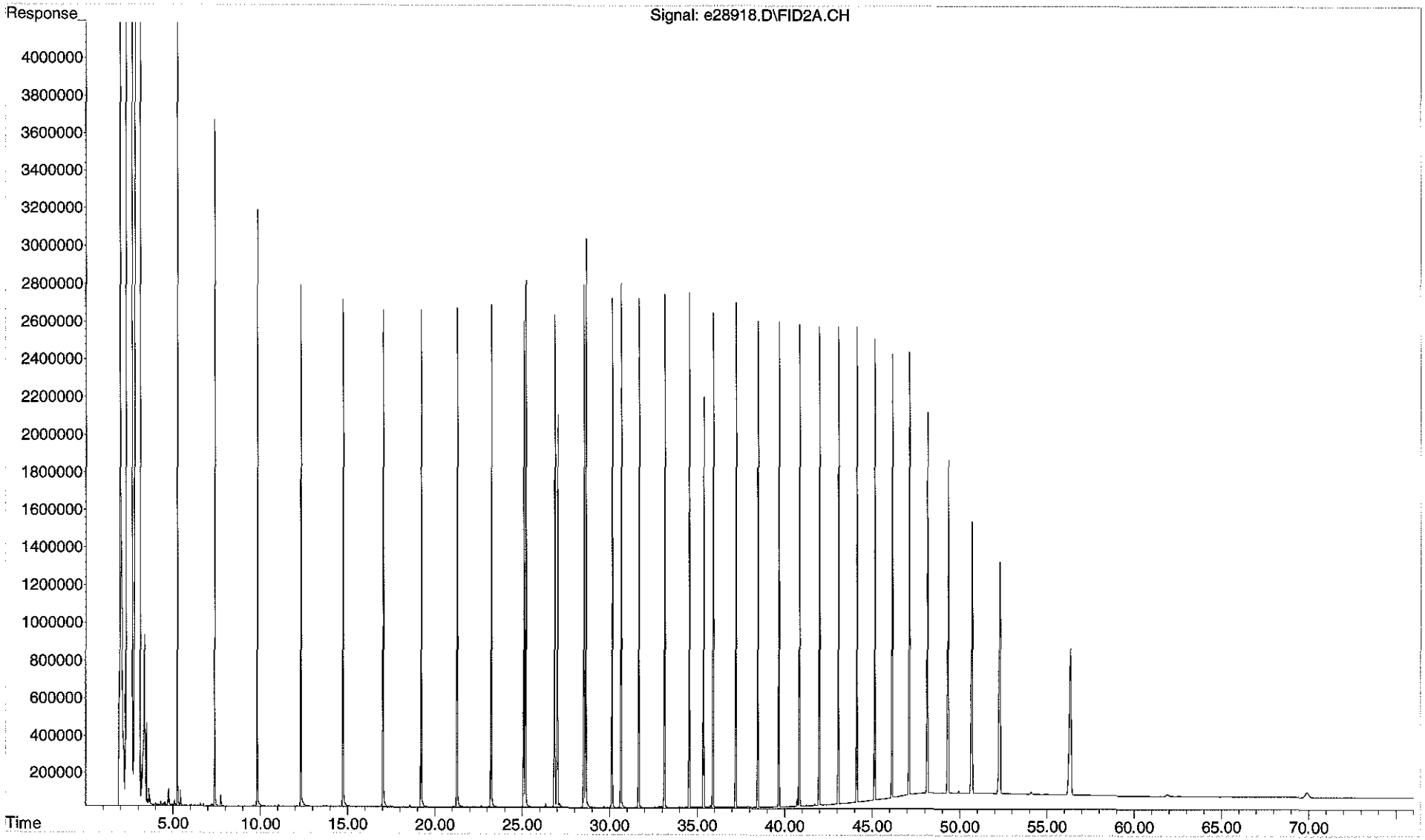
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.659	67988757	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.652	72230407	50.301 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	100.60%
24) s	d50-Tetracosane	35.369	59745833	51.356 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	102.71%
	Target Compounds			
2) t	n-Octane (C8)	5.241	52067502	47.561 ug/mL M4
3) t	n-Nonane (C9)	7.382	55206171	49.337 ug/mL M4
4) t	n-Decane (C10)	9.824	58408886	50.284 ug/mL M4
5) t	n-Undecane (C11)	12.317	58519851	49.835 ug/mL M4
6) t	n-Dodecane (C12)	14.737	61336288	51.373 ug/mL M4
7) t	n-Tridecane (C13)	17.040	61924069	51.578 ug/mL M4
9) t	n-Tetradecane (C14)	19.220	62292362	51.411 ug/mL M4
11) t	n-Pentadecane (C15)	21.281	62581928	51.536 ug/mL M4
12) t	n-Hexadecane (C16)	23.235	63480076	51.849 ug/mL M4
14) t	n-Heptadecane (C17)	25.093	61800397	50.794 ug/mL M4
15) t	Pristane	25.205	65583341	52.771 ug/mL M4
16) t	n-Octadecane (C18)	26.856	64183124	51.576 ug/mL M4
17) t	Phytane	27.022	63472368	51.570 ug/mL M4
18) t	n-Nonadecane (C19)	28.540	63915448	51.450 ug/mL M4
20) t	n-Eicosane (C20)	30.145	64779741	51.643 ug/mL M4
21) t	n-Heneicosane (C21)	31.679	64778126	51.435 ug/mL M4
22) t	n-Docosane (C22)	33.150	65043518	51.508 ug/mL M4
23) t	n-Tricosane (C23)	34.560	65118989	50.776 ug/mL M4
25) t	n-Tetracosane (C24)	35.916	64753702	51.360 ug/mL M4
26) t	n-Pentacosane (C25)	37.219	66141640	51.483 ug/mL M4
27) t	n-Hexacosane (C26)	38.476	65728239	51.494 ug/mL M4
28) t	n-Heptacosane (C27)	39.683	64459250	51.491 ug/mL M4
29) t	n-Octacosane (C28)	40.853	65308380	51.648 ug/mL M4
30) t	n-Nonacosane (C29)	41.982	65514519	51.822 ug/mL M4
31) t	n-Triacontane (C30)	43.075	64730471	51.778 ug/mL M4
32) t	n-Hentriacontane (C31)	44.132	65463535	51.906 ug/mL M4
33) t	n-Dotriacontane (C32)	45.157	65270107	51.937 ug/mL M4
34) t	n-Tritriacontane (C33)	46.149	62353361	51.942 ug/mL M4
35) t	n-tetratriacontane (C34)	47.121	64208419	51.812 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.163	64925963	51.485 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.350	65917470	51.129 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.714	64068968	50.834 ug/mL M4
39) t	n-Octatriacontane (C38)	52.302	63254438	50.409 ug/mL M4
41) t	n-Tetracontane (C40)	56.354	58956520	49.602 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28918.D
Operator : AC
Acquired : 13 Nov 2012 2:43 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091207R
Misc Info : WHAQ67
ALS Vial : 51



Instrument Blank
Raw Data

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27112.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 1:58 am
Operator : AC
Sample : IB209041203R
Misc : DCM
ALS Vial : 62 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:35:50 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

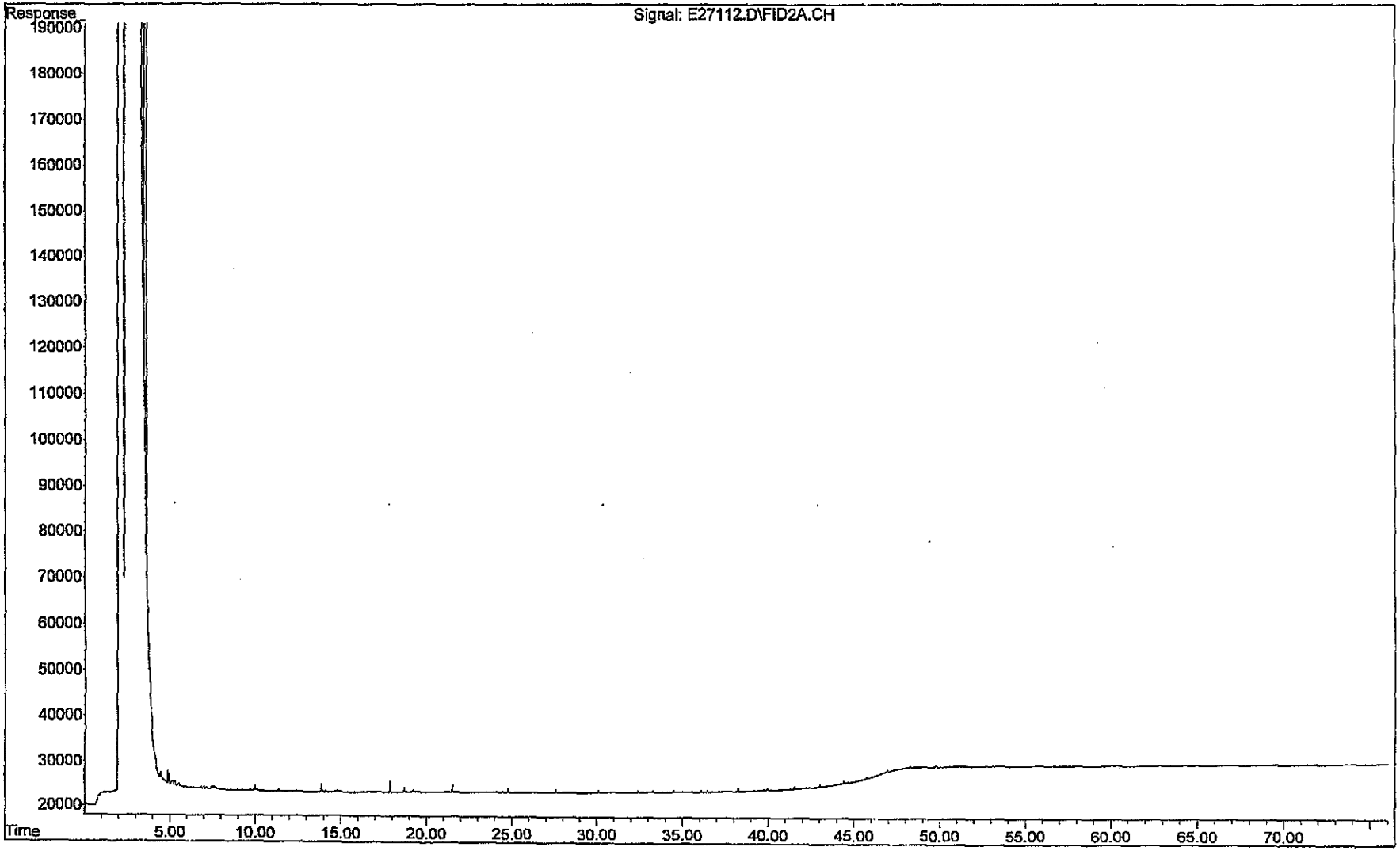
Sub List : TPH - TPH

9-7-12

	Compound	R.T.	Response	Conc Units
Internal Standards				
1) I	5-alpha-androstane	31.016	1184	50.000 ug/mL M4
System Monitoring Compounds				
Target Compounds				
42) h	C9-C44 Total Petroleu...	39.610	122454170	5687693.907 ug/mL M5
45) h	Total Resolved Hydroc...	39.151	1666475	77403.663 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument				

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27112.D
Operator : AC
Acquired : 05 Sep 2012 1:58 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB209041203R
Misc Info : DCM
ALS Vial : 62



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28820.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 4:19 pm
Operator : AC
Sample : IB211091201R
Misc : DCM
ALS Vial : 55 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:42:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

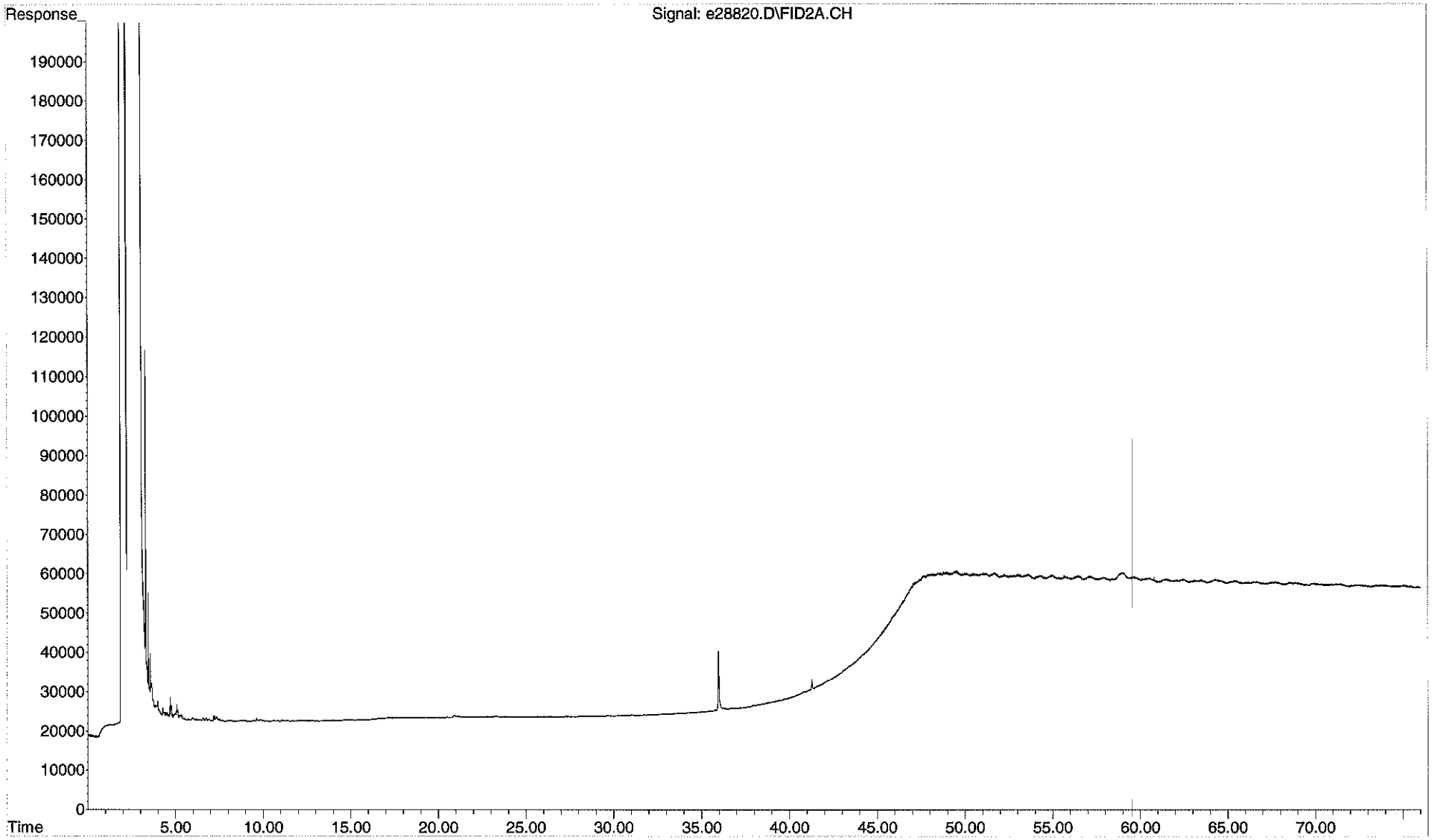
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.710	3120	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	660485366	11640050.890 ug/mL M5
45) h	Total Resolved Hydroc...	38.728	5850614	103108.185 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28820.D
Operator : AC
Acquired : 09 Nov 2012 4:19 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091201R
Misc Info : DCM
ALS Vial : 55



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28884.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 5:32 pm
Operator : AC
Sample : IB211091204R
Misc : DCM
ALS Vial : 87 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:45:39 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

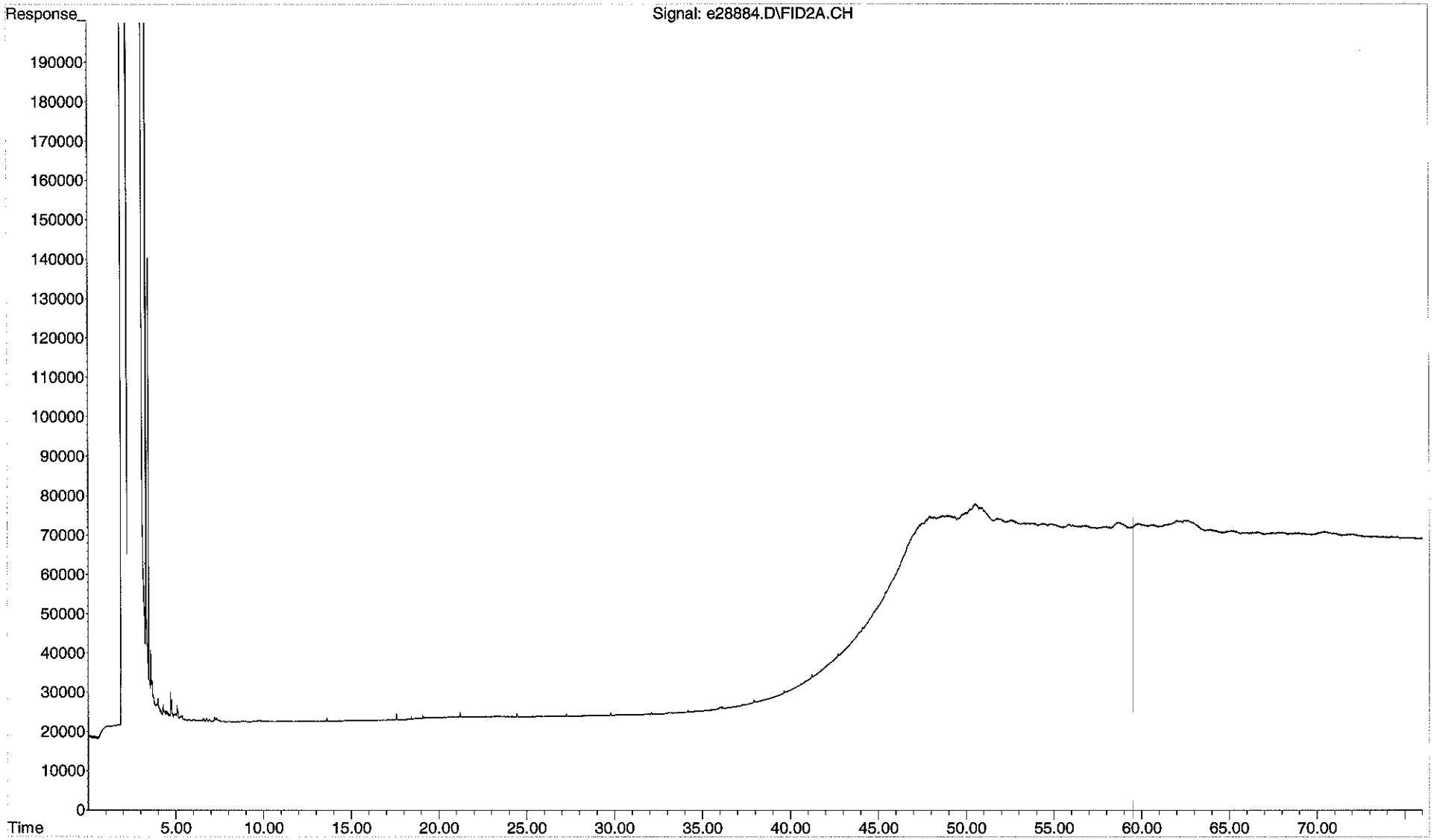
Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.665	2376	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	884532390	20469812.537 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	5689284	131661.184 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

11-16-12

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28884.D
Operator : AC
Acquired : 11 Nov 2012 5:32 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091204R
Misc Info : DCM
ALS Vial : 87



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28922.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 5:41 am
Operator : AC
Sample : IB211091206R
Misc : DCM
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:28 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

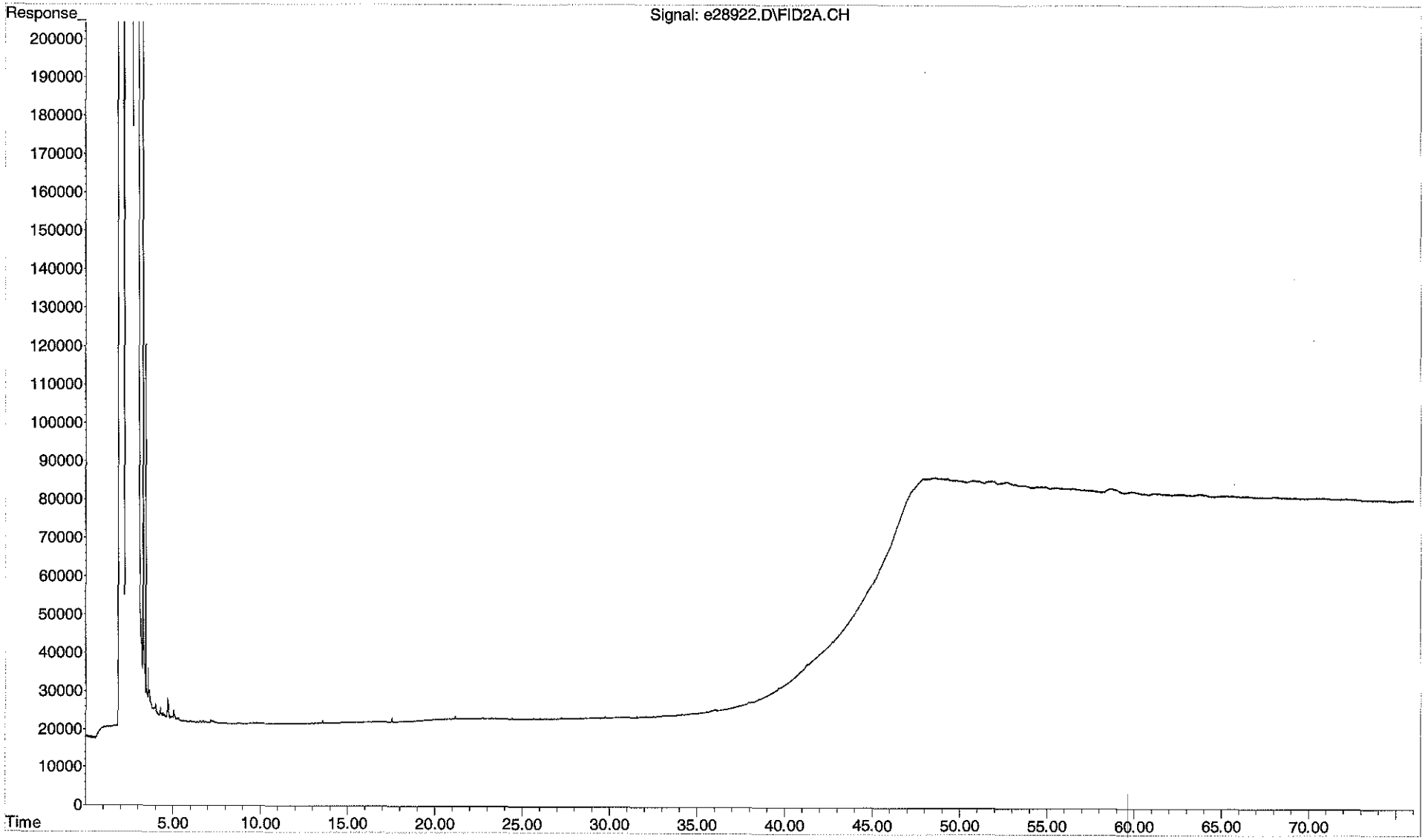
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.696	5463	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	1041692890	10485840.730 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	4731261	47625.603 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28922.D
Operator : AC
Acquired : 13 Nov 2012 5:41 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091206R
Misc Info : DCM
ALS Vial : 53



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612B08**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/09/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0181	U	n-Tricosane (C23)	**0.00453**	J
n-Decane (C10)	**0.00800**	J	n-Tetracosane (C24)	0.0124	U
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	**0.0725**	CJ
n-Dodecane (C12)	0.0188	U	n-Hexacosane (C26)	**0.00213**	J
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	**0.00427**	J
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**0.00573**	J
n-Tetradecane (C14)	0.0139	U	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	0.0133	U
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	**0.00293**	J
n-Hexadecane (C16)	0.0128	U	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	**0.00160**	J	n-Tetratriacontane (C34)	0.0179	U
Pristane	**0.00120**	J	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**0.0587**	CJ	n-Hexatriacontane (C36)	0.0221	U
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	0.0108	U	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	0.00741	U	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	**0.00133**	J	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**0.00133**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**0.164**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	89	40-125
d50-Tetracosane	88	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
C - Co-elution

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28824.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 7:18 pm
Operator : AC
Sample : SS110612B08
Misc : 1X
ALS Vial : 57 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:48:34 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

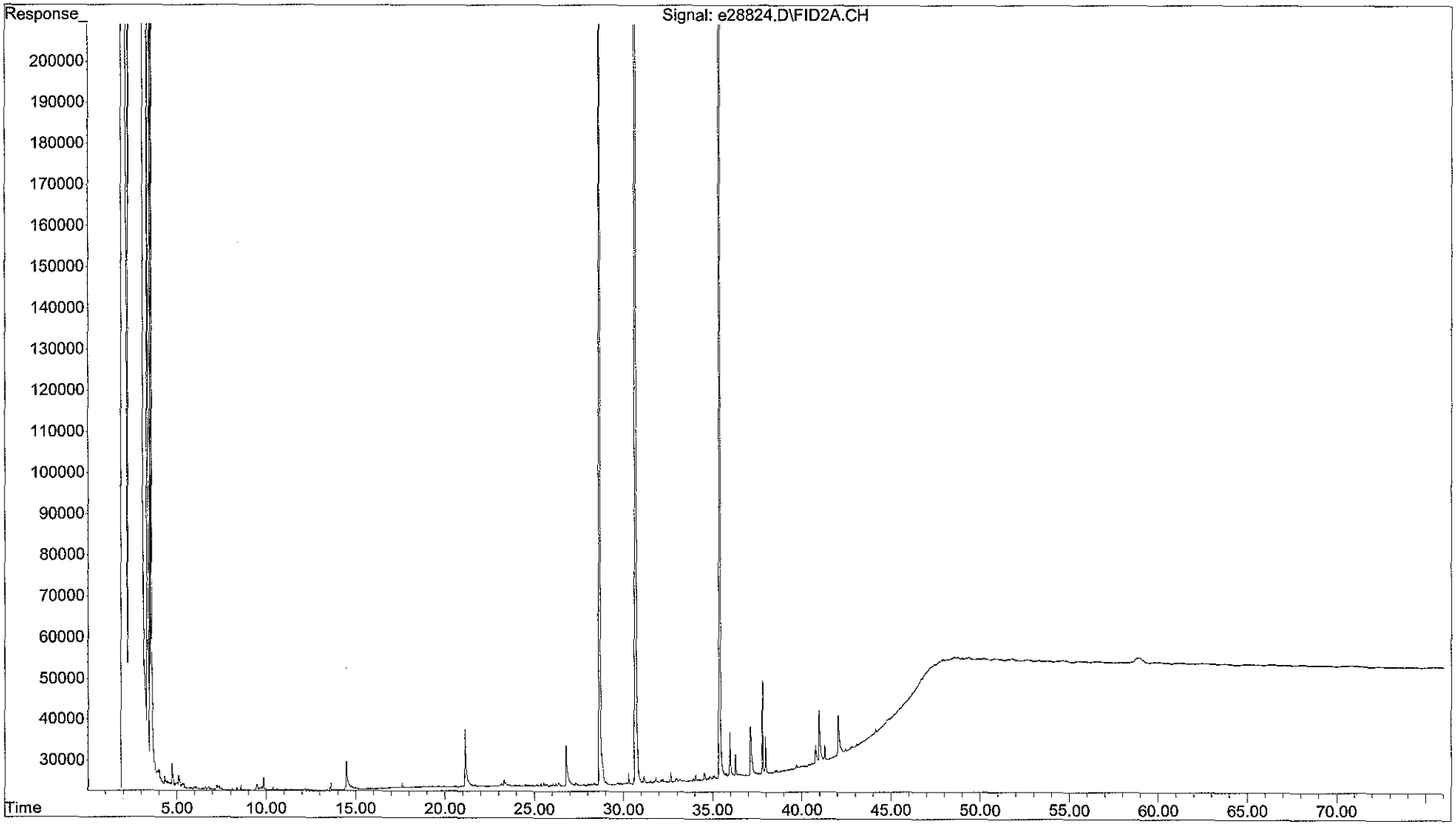
Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units	
	Internal Standards				
1) I	5-alpha-androstane	30.676	70064942	50.000 ug/mL M4	
	System Monitoring Compounds				
19) s	ortho-terphenyl	28.653	33092560	22.363 ug/mL M4	
Spiked Amount	50.000 Range	50 - 130	Recovery =	44.73%#	
24) s	d50-Tetracosane	35.374	26405940	22.025 ug/mL M4	
Spiked Amount	50.000 Range	50 - 130	Recovery =	44.05%#	
	Target Compounds				
2) t	n-Octane (C8)	5.230	11111	0.010 ug/mL M4	
4) t	n-Decane (C10)	9.820	71610	0.060 ug/mL M4	
14) t	n-Heptadecane (C17)	25.099	15237	0.012 ug/mL M4	
15) t	Pristane	25.184	12050	0.009 ug/mL M4	
16) t	n-Octadecane (C18)	26.765	564468C	0.440 ug/mL M4	B
21) t	n-Heneicosane (C21)	31.678	12766	0.010 ug/mL M4	
22) t	n-Docosane (C22)	33.144	12589	0.010 ug/mL M4	
23) t	n-Tricosane (C23)	34.506	44627	0.034 ug/mL M4	
26) t	n-Pentacosane (C25)	37.114f	720270C	0.544 ug/mL M4	
27) t	n-Hexacosane (C26)	38.471	20464	0.016 ug/mL M4	
28) t	n-Heptacosane (C27)	39.678	40902	0.032 ug/mL M4	
29) t	n-Octacosane (C28)	40.844	56349	0.043 ug/mL M4	
32) t	n-Hentriacontane (C31)	44.129	28927	0.022 ug/mL M4	
42) h	C9-C44 Total Petroleu...	38.728	606485162	476.003 ug/mL M4	
42) h	C9-C44 Total Petroleu BS	38.728	-54000204	N.D. ug/mL M4	
45) h	Total Resolved Hydroc...	38.728	10620255	8.335 ug/mL m	
	SemiQuant Compounds - Not Calibrated on this Instrument				

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28824.D
Operator : AC
Acquired : 09 Nov 2012 7:18 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612B08
Misc Info : 1X
ALS Vial : 57



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCS04**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/09/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.974**	S	n-Tricosane (C23)	0.00793	U
n-Decane (C10)	**1.07**	S	n-Tetracosane (C24)	**1.25**	S
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	0.0781	U
n-Dodecane (C12)	**1.13**	S	n-Hexacosane (C26)	**1.23**	S
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	0.0104	U
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**1.24**	S
n-Tetradecane (C14)	**1.16**	S	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**1.26**	S
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	0.0143	U
n-Hexadecane (C16)	**1.24**	S	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	0.0161	U	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**1.24**	S	n-Hexatriacontane (C36)	**1.21**	S
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	**1.15**	S	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	**1.18**	S	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**1.20**	S			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**16.5**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	89	40-125
d50-Tetracosane	89	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28830.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:46 pm
Operator : AC
Sample : SS110612LCS04
Misc : 1X
ALS Vial : 60 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:42:52 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

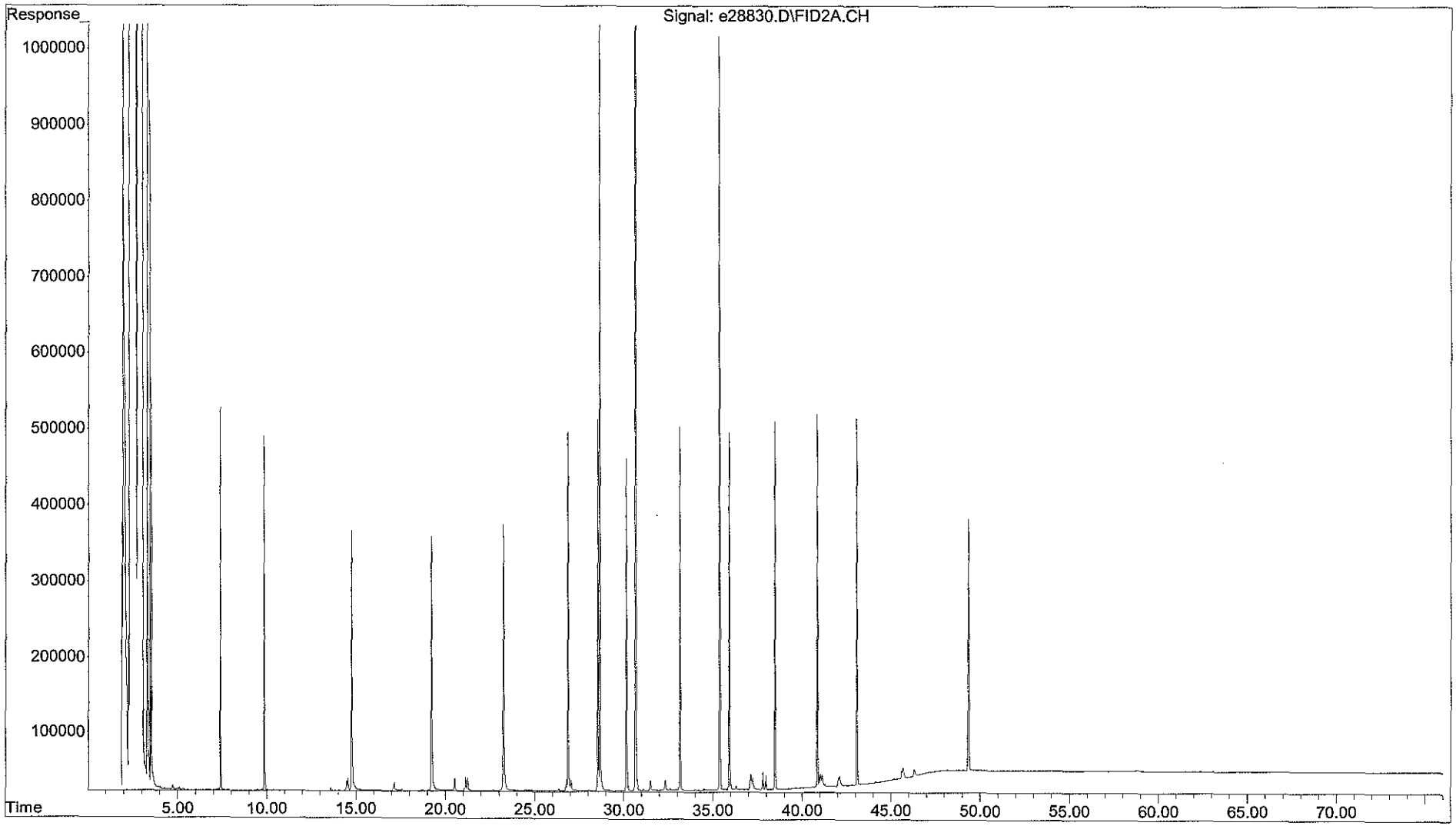
Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.670	67284804	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.648	31727035	22.326 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.65%#
24) s	d50-Tetracosane	35.368	25553447	22.195 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.39%#
	Target Compounds			
3) t	n-Nonane (C9)	7.362	8090919	7.306 ug/mL M4
4) t	n-Decane (C10)	9.816	9259586	8.055 ug/mL M4
6) t	n-Dodecane (C12)	14.733	9976446	8.443 ug/mL M4
9) t	n-Tetradecane (C14)	19.214	10399667	8.673 ug/mL M4
12) t	n-Hexadecane (C16)	23.230	11244411	9.280 ug/mL M4
16) t	n-Octadecane (C18)	26.847	11479574	9.321 ug/mL M4
18) t	n-Nonadecane (C19)	28.530	10628641	8.645 ug/mL M4
20) t	n-Eicosane (C20)	30.135	10991292	8.854 ug/mL M4
22) t	n-Docosane (C22)	33.140	11209797	8.970 ug/mL M4
25) t	n-Tetracosane (C24)	35.905	11668189	9.352 ug/mL M4
27) t	n-Hexacosane (C26)	38.463	11657184	9.228 ug/mL M4
29) t	n-Octacosane (C28)	40.841	11645044	9.306 ug/mL M4
31) t	n-Triacontane (C30)	43.063	11654864	9.420 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.329	11610438	9.100 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.728	726049356	593.389 ug/mL M4
42) h	C9-C44 Total Petroleu BS	38.728	65563990	53.584 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	168188061	137.458 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28830.D
Operator : AC
Acquired : 09 Nov 2012 11:46 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612LCS04
Misc Info : 1X
ALS Vial : 60



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **SS110612LCSD04**
Associated Blank: **SS110612B08**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/10/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.859**	S	n-Tricosane (C23)	0.00793	U
n-Decane (C10)	**0.967**	S	n-Tetracosane (C24)	**1.14**	S
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	0.0781	U
n-Dodecane (C12)	**1.02**	S	n-Hexacosane (C26)	**1.14**	S
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	0.0104	U
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**1.15**	S
n-Tetradecane (C14)	**1.06**	S	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**1.16**	S
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	0.0143	U
n-Hexadecane (C16)	**1.14**	S	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	0.0161	U	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**1.15**	S	n-Hexatriacontane (C36)	**1.12**	S
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	**1.06**	S	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	**1.09**	S	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**1.10**	S			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**15.2**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	83	40-125
d50-Tetracosane	82	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28836.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 4:13 am
Operator : AC
Sample : SS110612LCSD04
Misc : 1X
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:42:58 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

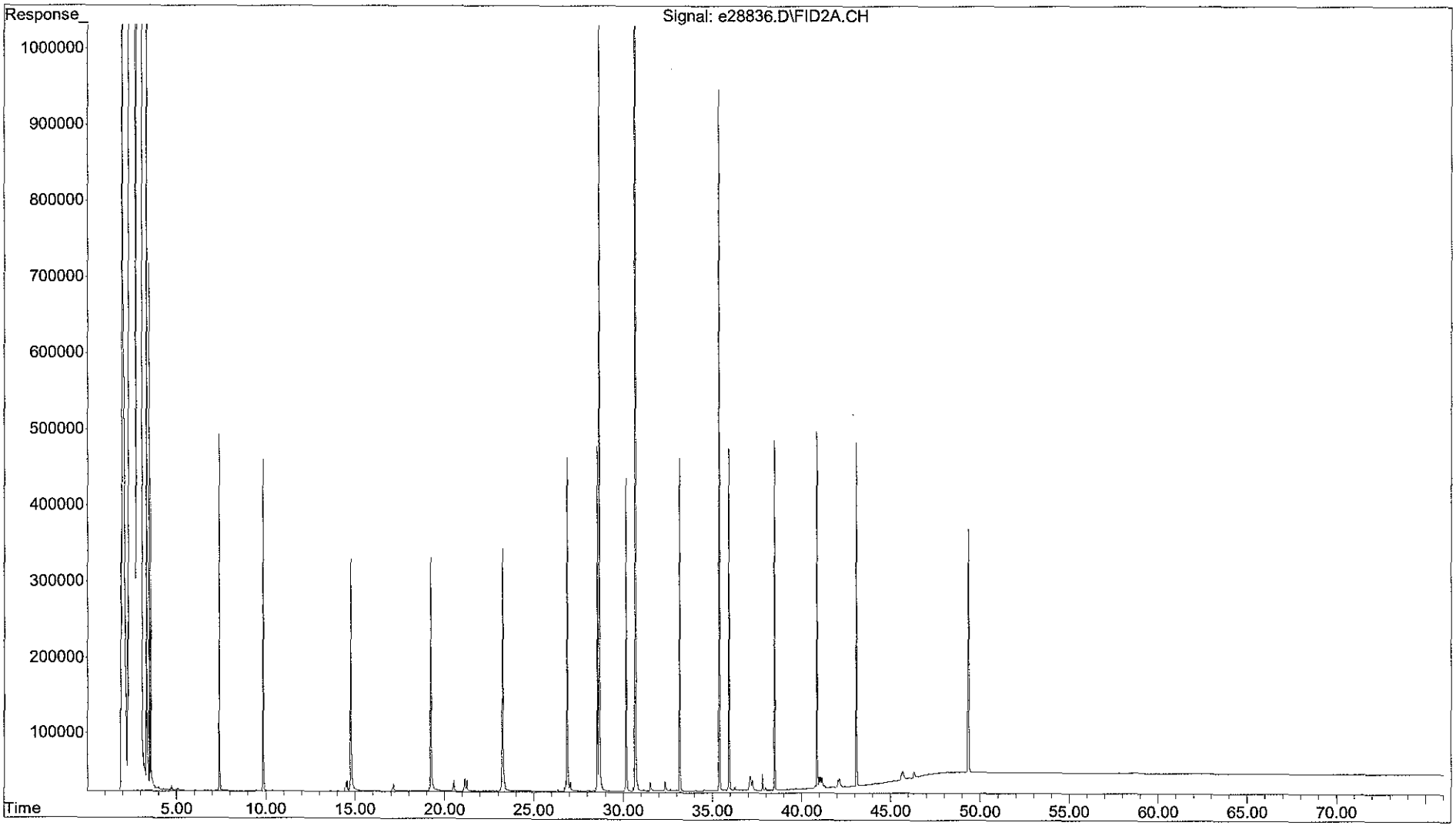
Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.668	69081849	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.646	30238749	20.725 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 41.45%#	
24) s d50-Tetracosane	35.366	24093703	20.382 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 40.76%#	
Target Compounds			
3) t n-Nonane (C9)	7.365	7326532	6.444 ug/mL M4
4) t n-Decane (C10)	9.816	8563613	7.256 ug/mL M4
6) t n-Dodecane (C12)	14.732	9307727	7.672 ug/mL M4
9) t n-Tetradecane (C14)	19.214	9806339	7.965 ug/mL M4
12) t n-Hexadecane (C16)	23.232	10676615	8.582 ug/mL M4
16) t n-Octadecane (C18)	26.846	10927913	8.642 ug/mL M4
18) t n-Nonadecane (C19)	28.529	10049751	7.962 ug/mL M4
20) t n-Eicosane (C20)	30.135	10434290	8.187 ug/mL M4
22) t n-Docosane (C22)	33.139	10634045	8.288 ug/mL M4
25) t n-Tetracosane (C24)	35.903	10993024	8.581 ug/mL M4
27) t n-Hexacosane (C26)	38.459	11036249	8.509 ug/mL M4
29) t n-Octacosane (C28)	40.839	11050913	8.601 ug/mL M4
31) t n-Triacontane (C30)	43.059	11020227	8.676 ug/mL M4
37) t n-Hexatriacontane (C36)	49.327	10995452	8.394 ug/mL M4
42) h C9-C44 Total Petroleu...	38.728	695750673	553.835 ug/mL M4
42) h C9-C44 Total Petroleu BS	38.728	35265307	28.072 ug/mL M4
45) h Total Resolved Hydroc...	38.728	159158512	126.694 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28836.D
Operator : AC
Acquired : 10 Nov 2012 4:13 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612LCSD04
Misc Info : 1X
ALS Vial : 63



Form I
Cold Lake Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TS111312CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/12/12	100	0.10018	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**1900**		n-Tricosane (C23)	**213**	
n-Decane (C10)	**1000**		n-Tetracosane (C24)	**191**	
n-Undecane (C11)	**841**		n-Pentacosane (C25)	**250**	
n-Dodecane (C12)	**590**		n-Hexacosane (C26)	**154**	
n-Tridecane (C13)	**633**		n-Heptacosane (C27)	**143**	
2,6,10 Trimethyldodecane (1380)	**305**		n-Octacosane (C28)	**114**	
n-Tetradecane (C14)	**704**		n-Nonacosane (C29)	**120**	
2,6,10 Trimethyltridecane (1470)	**461**		n-Triacontane (C30)	**133**	
n-Pentadecane (C15)	**571**		n-Hentriacontane (C31)	**341**	
n-Hexadecane (C16)	**612**		n-Dotriacontane (C32)	**117**	
Norpristane (1650)	**226**		n-Tritriacontane (C33)	**76.3**	J
n-Heptadecane (C17)	**463**		n-Tetratriacontane (C34)	**196**	
Pristane	**443**		n-Pentatriacontane (C35)	**122**	
n-Octadecane (C18)	**401**		n-Hexatriacontane (C36)	**112**	
Phytane	**330**		n-Heptatriacontane (C37)	**71.9**	J
n-Nonadecane (C19)	**303**		n-Octatriacontane (C38)	**68.5**	J
n-Eicosane (C20)	**322**		n-Nonatriacontane (C39)	**35.5**	J
n-Heneicosane (C21)	**229**		n-Tetracontane (C40)	**42.2**	J
n-Docosane (C22)	**218**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**13000**
Total Petroleum Hydrocarbons (C9-C44)	**467000**
Total Resolved Hydrocarbons	**64600**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	40-125
d50-Tetracosane	94	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28914.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:44 pm
Operator : AC
Sample : TS111312CL01
Misc : WHAP16
ALS Vial : 99 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

Sub List : SHC - SHC

11-16-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	65826060	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	71118073	51.154 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	102.31%
24) s	d50-Tetracosane	35.375	53029960	47.080 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	94.16%
	Target Compounds			
2) t	n-Octane (C8)	5.211	32587805	30.746 ug/mL M4
3) t	n-Nonane (C9)	7.359	20587631	19.003 ug/mL M4
4) t	n-Decane (C10)	9.808	11262429	10.014 ug/mL M4
5) t	n-Undecane (C11)	12.304	9576562	8.423 ug/mL M4
6) t	n-Dodecane (C12)	14.724	6828149	5.907 ug/mL M4
7) t	n-Tridecane (C13)	17.026	7366389	6.337 ug/mL M4
8) t	1380	18.704	3580328	3.052 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	8275895	7.055 ug/mL M4
10) t	1470	20.494	5428434	4.617 ug/mL M4
11) t	n-Pentadecane (C15)	21.264	6725409	5.720 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	7271259	6.134 ug/mL M4
13) t	1650	24.127	2669829	2.266 ug/mL M4
14) t	n-Heptadecane (C17)	25.075	5466206	4.640 ug/mL M4
15) t	Pristane	25.173	5337565	4.436 ug/mL M4
16) t	n-Octadecane (C18)	26.837	4834604	4.013 ug/mL M4
17) t	Phytane	27.000	3938903	3.305 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	3646196	3.031 ug/mL M4
20) t	n-Eicosane (C20)	30.126	3924339	3.231 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	2797500	2.294 ug/mL M4
22) t	n-Docosane (C22)	33.128	2665808	2.180 ug/mL M4
23) t	n-Tricosane (C23)	34.539	2647949	2.133 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	2334559	1.913 ug/mL M4
26) t	n-Pentacosane (C25)	37.195	3110581	2.501 ug/mL M4
27) t	n-Hexacosane (C26)	38.451	1903410	1.540 ug/mL M4
28) t	n-Heptacosane (C27)	39.659	1733325	1.430 ug/mL M4
29) t	n-Octacosane (C28)	40.828	1397060	1.141 ug/mL M4
30) t	n-Nonacosane (C29)	41.958	1466178	1.198 ug/mL M4
31) t	n-Triacontane (C30)	43.051	1610237	1.330 ug/mL M4
32) t	n-Hentriacontane (C31)	44.121	4170703	3.416 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	1429256	1.175 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	888465	0.764 ug/mL M4
35) t	n-tetratriacontane (C34)	47.050	2358831	1.966 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.137	1496801	1.226 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.288	1406017	1.126 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28914.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:44 pm
Operator : AC
Sample : TS111312CL01
Misc : WHAP16
ALS Vial : 99 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

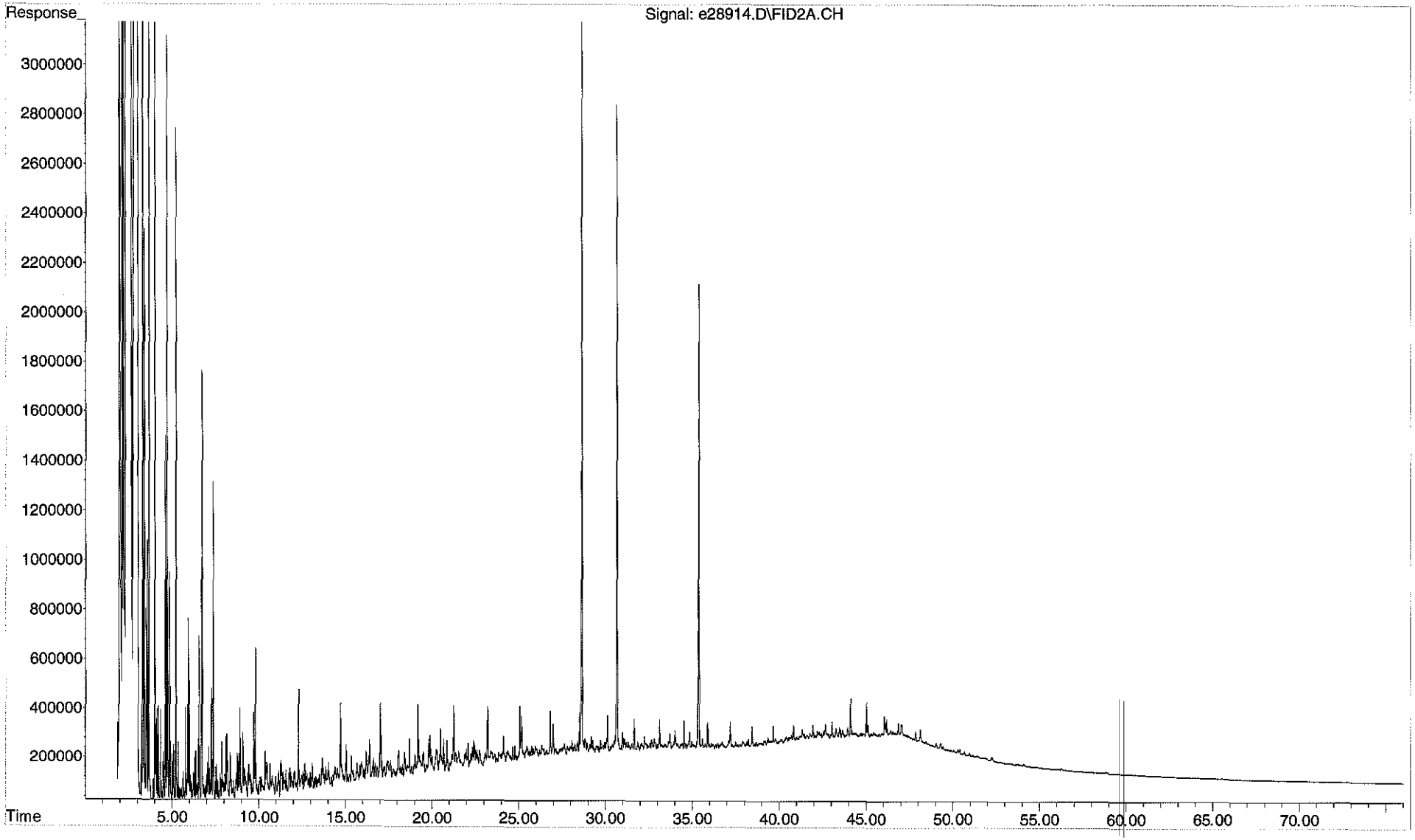
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.671	878384	0.720	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.270	832971	0.686	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.095	409877	0.356	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.286	486821	0.423	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	6637208111	5544.699	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	5595515221	4674.473	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	774204769	646.768	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28914.D
Operator : AC
Acquired : 12 Nov 2012 11:44 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312CL01
Misc Info : WHAP16
ALS Vial : 99



Form I
Western Canadian Select
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TS111312WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/12/12	100	0.10119	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**1600**		n-Tricosane (C23)	**207**	
n-Decane (C10)	**1000**		n-Tetracosane (C24)	**196**	
n-Undecane (C11)	**874**		n-Pentacosane (C25)	**224**	
n-Dodecane (C12)	**574**		n-Hexacosane (C26)	**155**	
n-Tridecane (C13)	**689**		n-Heptacosane (C27)	**127**	
2,6,10 Trimethyldodecane (1380)	**299**		n-Octacosane (C28)	**89.7**	J
n-Tetradecane (C14)	**688**		n-Nonacosane (C29)	**89.9**	J
2,6,10 Trimethyltridecane (1470)	**534**		n-Triacontane (C30)	**113**	
n-Pentadecane (C15)	**610**		n-Hentriacontane (C31)	**298**	
n-Hexadecane (C16)	**658**		n-Dotriacontane (C32)	**67.9**	J
Norpristane (1650)	**244**		n-Tritriacontane (C33)	**44.3**	J
n-Heptadecane (C17)	**455**		n-Tetratriacontane (C34)	**192**	
Pristane	**613**		n-Pentatriacontane (C35)	**93.8**	J
n-Octadecane (C18)	**397**		n-Hexatriacontane (C36)	**85.7**	J
Phytane	**355**		n-Heptatriacontane (C37)	**38.4**	J
n-Nonadecane (C19)	**306**		n-Octatriacontane (C38)	**82.8**	J
n-Eicosane (C20)	**310**		n-Nonatriacontane (C39)	98.8	U
n-Heneicosane (C21)	**225**		n-Tetracontane (C40)	98.8	U
n-Docosane (C22)	**208**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**12700**
Total Petroleum Hydrocarbons (C9-C44)	**464000**
Total Resolved Hydrocarbons	**67400**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	97	40-125
d50-Tetracosane	95	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28912.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:15 pm
Operator : AC
Sample : TS111312WCS01
Misc : WHAP15
ALS Vial : 98 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:53 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.666	69883728	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	71871575	48.694 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	97.39%
24) s	d50-Tetracosane	35.375	56901718	47.585 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	95.17%
	Target Compounds			
2) t	n-Octane (C8)	5.206	27301688	24.263 ug/mL M4
3) t	n-Nonane (C9)	7.356	18673033	16.235 ug/mL M4
4) t	n-Decane (C10)	9.807	12082767	10.120 ug/mL M4
5) t	n-Undecane (C11)	12.304	10672327	8.842 ug/mL M4
6) t	n-Dodecane (C12)	14.722	7122246	5.804 ug/mL M4
7) t	n-Tridecane (C13)	17.025	8600410	6.969 ug/mL M4
8) t	1380	18.704	3767421	3.025 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	8669720	6.961 ug/mL M4
10) t	1470	20.492	6744645	5.404 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	7707900	6.175 ug/mL M4
12) t	n-Hexadecane (C16)	23.221	8378975	6.658 ug/mL M4
13) t	1650	24.130	3087847	2.469 ug/mL M4
14) t	n-Heptadecane (C17)	25.076	5760489	4.606 ug/mL M4
15) t	Pristane	25.174	7920762	6.201 ug/mL M4
16) t	n-Octadecane (C18)	26.839	5138781	4.017 ug/mL M4
17) t	Phytane	27.001	4539345	3.588 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	3948450	3.092 ug/mL M4
20) t	n-Eicosane (C20)	30.126	4047588	3.139 ug/mL M4
21) t	n-Heneicosane (C21)	31.658	2947227	2.277 ug/mL M4
22) t	n-Docosane (C22)	33.129	2736106	2.108 ug/mL M4
23) t	n-Tricosane (C23)	34.538	2756718	2.091 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	2570359	1.983 ug/mL M4
26) t	n-Pentacosane (C25)	37.195	2989618	2.264 ug/mL M4
27) t	n-Hexacosane (C26)	38.452	2057263	1.568 ug/mL M4
28) t	n-Heptacosane (C27)	39.661	1656881	1.288 ug/mL M4
29) t	n-Octacosane (C28)	40.832	1179728	0.908 ug/mL M4
30) t	n-Nonacosane (C29)	41.961	1183107	0.910 ug/mL M4
31) t	n-Triacontane (C30)	43.058	1475563	1.148 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	3910023	3.016 ug/mL M4
33) t	n-Dotriacontane (C32)	45.132	887245	0.687 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	552842	0.448 ug/mL M4
35) t	n-tetratriacontane (C34)	47.049	2469637	1.939 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.136	1229457	0.949 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.268	1148441	0.867 ug/mL M4

11-16-12

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28912.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:15 pm
Operator : AC
Sample : TS111312WCS01
Misc : WHAP15
ALS Vial : 98 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:53 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

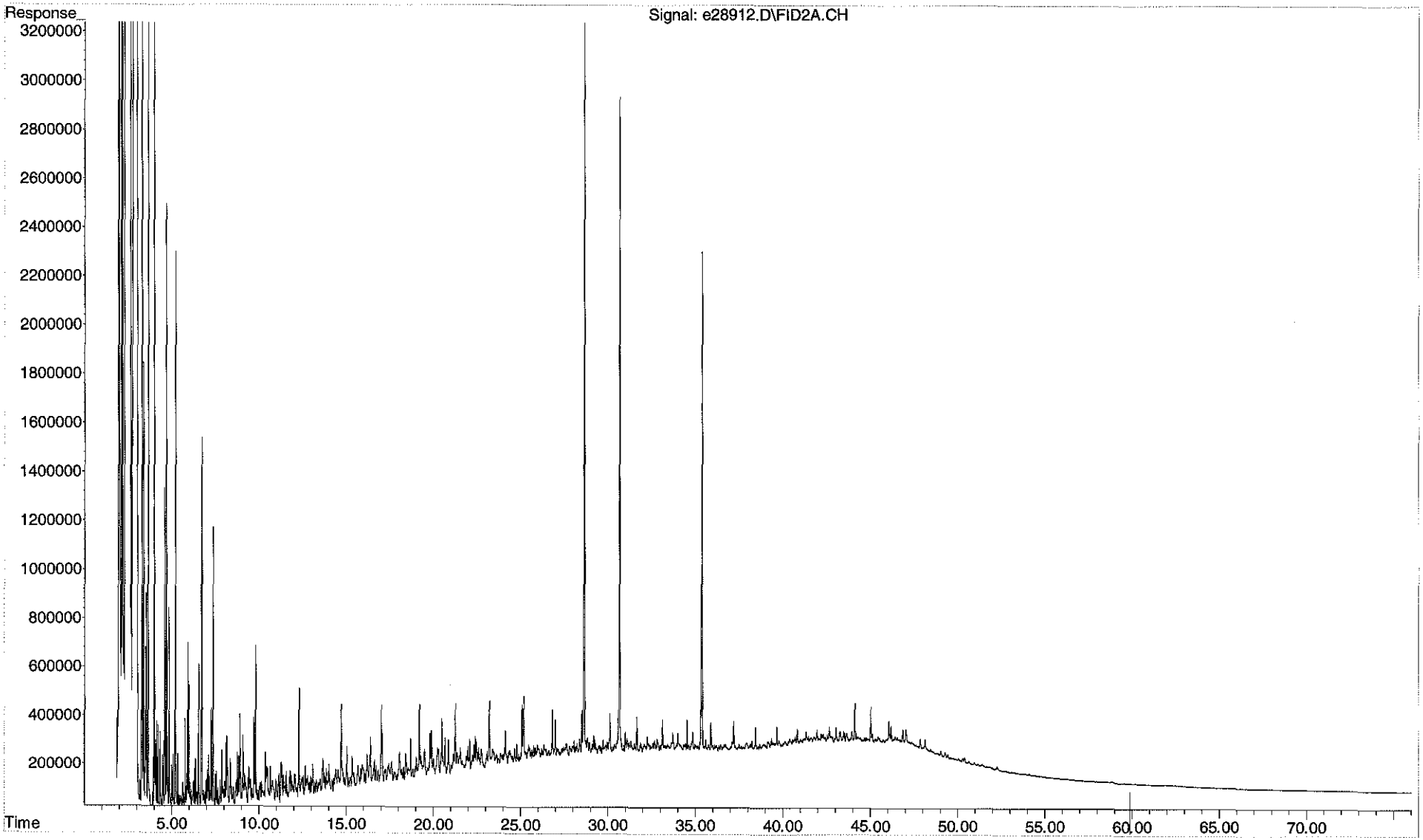
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.657	504384	0.389	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.279	1080989	0.838	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	7008489108	5514.914	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	5966796218	4695.216	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	866480449	681.825	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28912.D
Operator : AC
Acquired : 12 Nov 2012 10:15 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312WCS01
Misc Info : WHAP15
ALS Vial : 98



Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/09/12	100	0.10058	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**7340**		n-Tricosane (C23)	**1940**	
n-Decane (C10)	**5900**		n-Tetracosane (C24)	**1960**	
n-Undecane (C11)	**5390**		n-Pentacosane (C25)	**1730**	
n-Dodecane (C12)	**5000**		n-Hexacosane (C26)	**1530**	
n-Tridecane (C13)	**4780**		n-Heptacosane (C27)	**1190**	
2,6,10 Trimethyldodecane (1380)	**914**		n-Octacosane (C28)	**881**	
n-Tetradecane (C14)	**4170**		n-Nonacosane (C29)	**776**	
2,6,10 Trimethyltridecane (1470)	**1580**		n-Triacontane (C30)	**724**	
n-Pentadecane (C15)	**4060**		n-Hentriacontane (C31)	**674**	
n-Hexadecane (C16)	**3940**		n-Dotriacontane (C32)	**446**	
Norpristane (1650)	**1240**		n-Tritriacontane (C33)	**371**	
n-Heptadecane (C17)	**3540**		n-Tetratriacontane (C34)	**366**	
Pristane	**2370**		n-Pentatriacontane (C35)	**333**	
n-Octadecane (C18)	**3060**		n-Hexatriacontane (C36)	**219**	
Phytane	**1410**		n-Heptatriacontane (C37)	**169**	
n-Nonadecane (C19)	**2680**		n-Octatriacontane (C38)	**154**	
n-Eicosane (C20)	**2570**		n-Nonatriacontane (C39)	**99.3**	J
n-Heneicosane (C21)	**2280**		n-Tetracontane (C40)	**99.3**	J
n-Docosane (C22)	**2220**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**78100**
Total Petroleum Hydrocarbons (C9-C44)	**627000**
Total Resolved Hydrocarbons	**197000**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28816.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 1:19 pm
Operator : AC
Sample : TS111312ANC01
Misc : 1X WHAP13
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:11:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

6/16/16

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.690	64252423	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.680	70802069	52.174 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	104.35%
24) s	d50-Tetracosane	35.400	58230087	52.963 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	105.93%
	Target Compounds			
2) t	n-Octane (C8)	5.231	105612147	102.082 ug/mL M4
3) t	n-Nonane (C9)	7.386	78036226	73.795 ug/mL M4
4) t	n-Decane (C10)	9.837	65194237	59.389 ug/mL M4
5) t	n-Undecane (C11)	12.336	60154601	54.206 ug/mL M4
6) t	n-Dodecane (C12)	14.756	56684456	50.237 ug/mL M4
7) t	n-Tridecane (C13)	17.059	54610876	48.132 ug/mL M4
8) t	1380	18.728	10528329	9.195 ug/mL M4
9) t	n-Tetradecane (C14)	19.239	48049969	41.963 ug/mL M4
10) t	1470	20.519	18178259	15.840 ug/mL M4
11) t	n-Pentadecane (C15)	21.301	46854027	40.828 ug/mL M4
12) t	n-Hexadecane (C16)	23.252	45801337	39.585 ug/mL M4
13) t	1650	24.154	14329063	12.462 ug/mL M4
14) t	n-Heptadecane (C17)	25.109	40902782	35.573 ug/mL M4
15) t	Pristane	25.206	27939411	23.788 ug/mL M4
16) t	n-Octadecane (C18)	26.873	36257328	30.830 ug/mL M4
17) t	Phytane	27.030	16542980	14.222 ug/mL M4
18) t	n-Nonadecane (C19)	28.556	31604938	26.920 ug/mL M4
20) t	n-Eicosane (C20)	30.159	30589125	25.804 ug/mL M4
21) t	n-Heneicosane (C21)	31.692	27320748	22.955 ug/mL M4
22) t	n-Docosane (C22)	33.163	26612353	22.300 ug/mL M4
23) t	n-Tricosane (C23)	34.574	23643581	19.508 ug/mL M4
25) t	n-Tetracosane (C24)	35.931	23473852	19.701 ug/mL M4
26) t	n-Pentacosane (C25)	37.231	21072792	17.356 ug/mL M4
27) t	n-Hexacosane (C26)	38.487	18557529	15.384 ug/mL M4
28) t	n-Heptacosane (C27)	39.697	14192088	11.996 ug/mL M4
29) t	n-Octacosane (C28)	40.862	10589890	8.862 ug/mL M4
30) t	n-Nonacosane (C29)	41.994	9318520	7.800 ug/mL M4
31) t	n-Triacontane (C30)	43.085	8607714	7.286 ug/mL M4
32) t	n-Hentriacontane (C31)	44.144	8081325	6.780 ug/mL M4
33) t	n-Dotriacontane (C32)	45.168	5333538	4.491 ug/mL M4
34) t	n-Tritriacontane (C33)	46.162	4228293	3.727 ug/mL M4
35) t	n-tetratriacontane (C34)	47.128	4306436	3.677 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.178	3990307	3.348 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.360	2678828	2.199 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28816.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 1:19 pm
Operator : AC
Sample : TS111312ANC01
Misc : 1X WHAP13
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:11:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

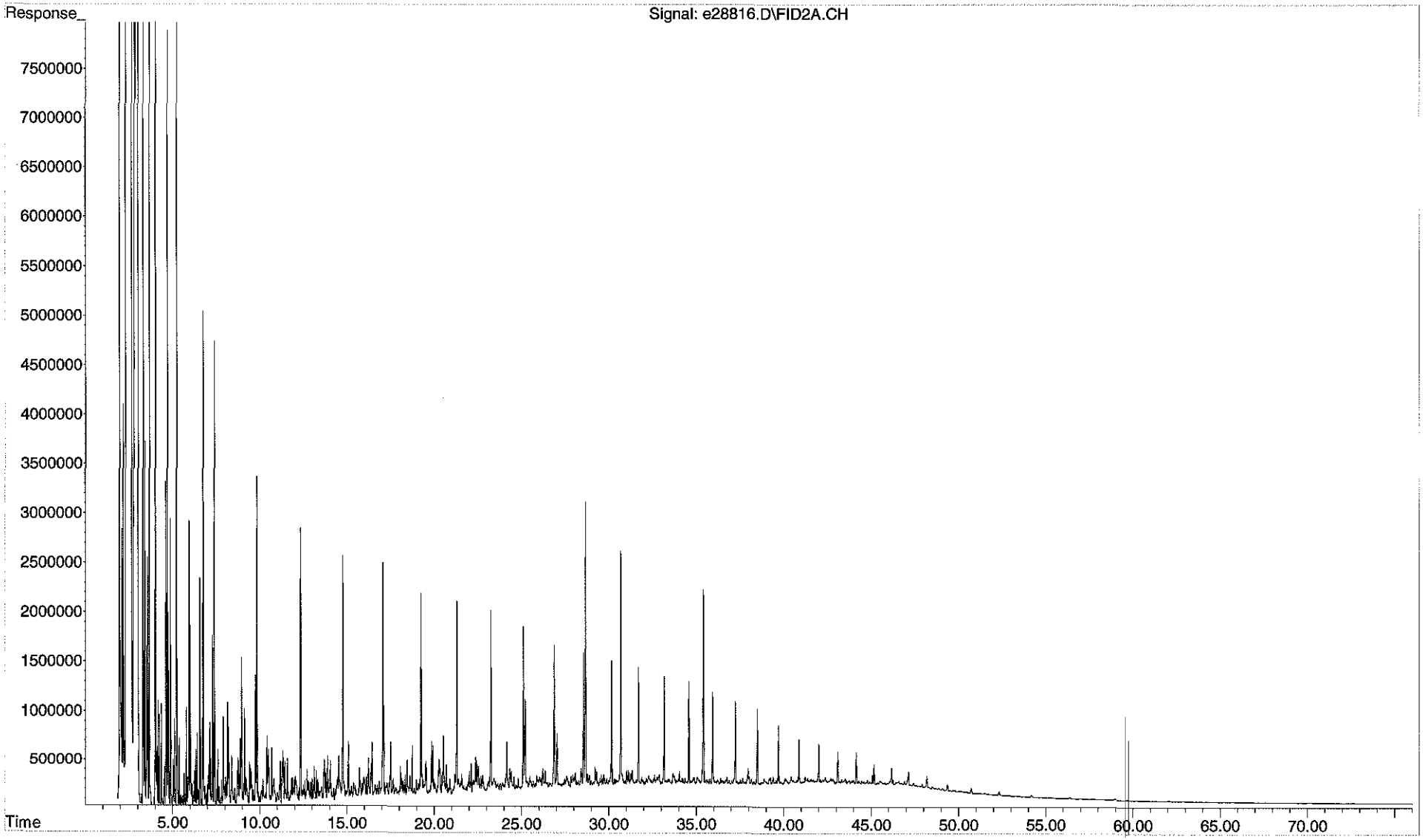
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.732	2028207	1.703	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.323	1836612	1.549	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.178	1121630	0.999	ug/mL	m
41)	t	n-Tetracontane (C40)	56.381	1122632	0.999	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	8023993224	6867.386	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	7363507858	6302.106	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	2316966904	1982.991	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28816.D
Operator : AC
Acquired : 09 Nov 2012 1:19 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312ANC01
Misc Info : 1X WHAP13
ALS Vial : 53



Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210082**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	09/05/12	100	0.10058	10	1	AC

Parameter	Result	Parameter	Result
n-Nonane (C9)	**6790**	n-Tricosane (C23)	**1850**
n-Decane (C10)	**5470**	n-Tetracosane (C24)	**1710**
n-Undecane (C11)	**5000**	n-Pentacosane (C25)	**1630**
n-Dodecane (C12)	**4300**	n-Hexacosane (C26)	**1470**
n-Tridecane (C13)	**4300**	n-Heptacosane (C27)	**1100**
2,6,10 Trimethyldodecane (1380)	**914**	n-Octacosane (C28)	**782**
n-Tetradecane (C14)	**3750**	n-Nonacosane (C29)	**770**
2,6,10 Trimethyltridecane (1470)	**1520**	n-Triacontane (C30)	**655**
n-Pentadecane (C15)	**3830**	n-Hentriacontane (C31)	**493**
n-Hexadecane (C16)	**3530**	n-Dotriacontane (C32)	**441**
Norpristane (1650)	**1050**	n-Tritriacontane (C33)	**403**
n-Heptadecane (C17)	**3210**	n-Tetratriacontane (C34)	**378**
Pristane	**2150**	n-Pentatriacontane (C35)	**283**
n-Octadecane (C18)	**2850**	n-Hexatriacontane (C36)	**207**
Phytane	**1260**	n-Heptatriacontane (C37)	**172**
n-Nonadecane (C19)	**2410**	n-Octatriacontane (C38)	**136**
n-Eicosane (C20)	**2560**	n-Nonatriacontane (C39)	**104**
n-Heneicosane (C21)	**2120**	n-Tetracontane (C40)	**98.2** J
n-Docosane (C22)	**2070**		

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**71800**
Total Petroleum Hydrocarbons (C9-C44)	**590000**
Total Resolved Hydrocarbons	**196000**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

Sub List : SHC - SHC

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.032	67666055	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.018	69566380	48.677 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 97.35%	
24) s d50-Tetracosane	35.697	57141267	49.351 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 98.70%	
Target Compounds			
2) t n-Octane (C8)	5.422	102285134	93.879 ug/mL M4
3) t n-Nonane (C9)	7.619	76013115	68.256 ug/mL M4
4) t n-Decane (C10)	10.101	63613609	55.026 ug/mL M4
5) t n-Undecane (C11)	12.611	58788004	50.302 ug/mL M4
6) t n-Dodecane (C12)	15.036	51442150	43.291 ug/mL M4
7) t n-Tridecane (C13)	17.344	51674013	43.246 ug/mL M4
8) t 1380	19.019	11081649	9.190 ug/mL M4
9) t n-Tetradecane (C14)	19.527	45446037	37.687 ug/mL M4
10) t 1470	20.811	18437347	15.256 ug/mL M4
11) t n-Pentadecane (C15)	21.591	46510985	38.484 ug/mL M4
12) t n-Hexadecane (C16)	23.546	43300293	35.535 ug/mL M4
13) t 1650	24.454	12821499	10.588 ug/mL M4
14) t n-Heptadecane (C17)	25.404	39092129	32.283 ug/mL M4
15) t Pristane	25.504	26773773	21.646 ug/mL M4
16) t n-Octadecane (C18)	27.170	35486858	28.652 ug/mL M4
17) t Phytane	27.326	15485089	12.641 ug/mL M4
18) t n-Nonadecane (C19)	28.855	30026103	24.285 ug/mL M4
20) t n-Eicosane (C20)	30.459	32191313	25.786 ug/mL M4
21) t n-Heneicosane (C21)	31.993	26761484	21.351 ug/mL M4
22) t n-Docosane (C22)	33.463	26156955	20.812 ug/mL M4
23) t n-Tricosane (C23)	34.874	23790002	18.639 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

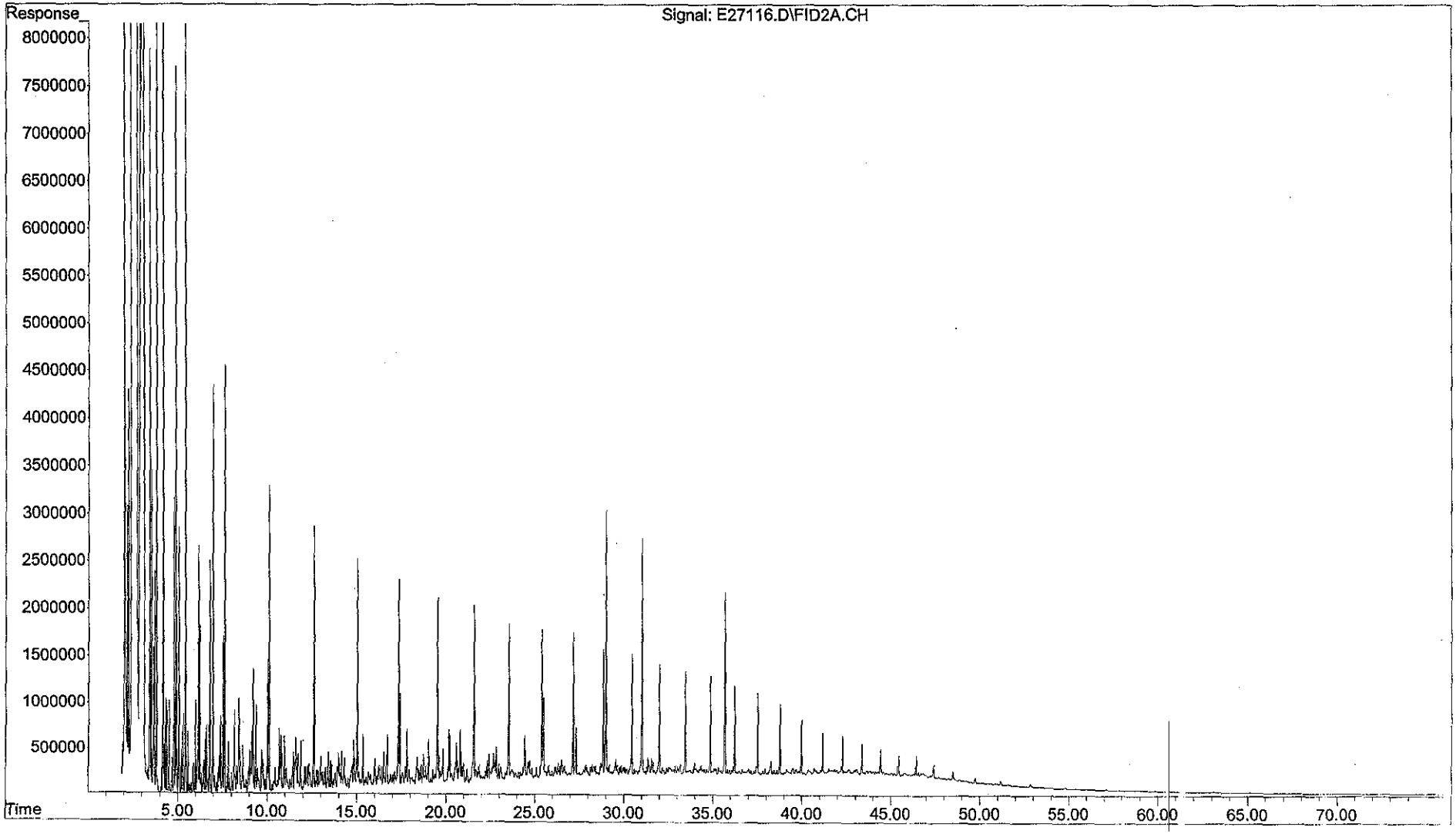
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
25)	t	n-Tetracosane (C24)	36.229	21569823	17.190	ug/mL	M4
26)	t	n-Pentacosane (C25)	37.530	21011766	16.433	ug/mL	M4
27)	t	n-Hexacosane (C26)	38.784	18776288	14.780	ug/mL	M4
28)	t	n-Heptacosane (C27)	39.993	13757353	11.042	ug/mL	M4
29)	t	n-Octacosane (C28)	41.160	9894280	7.862	ug/mL	M4
30)	t	n-Nonacosane (C29)	42.290	9748811	7.748	ug/mL	M4
31)	t	n-Triacontane (C30)	43.376	8202260	6.592	ug/mL	M4
32)	t	n-Hentriacontane (C31)	44.435	6227691	4.961	ug/mL	M4
33)	t	n-Dotriacontane (C32)	45.452	5544934	4.433	ug/mL	M4
34)	t	n-Tritriacontane (C33)	46.450	4844041	4.054	ug/mL	M4
35)	t	n-tetratriacontane (C34)	47.431	4685802	3.799	ug/mL	M4
36)	t	n-Pentatriacontane (C35)	48.521	3574400	2.848	ug/mL	M4
37)	t	n-Hexatriacontane (C36)	49.764	2674892	2.085	ug/mL	M4
38)	t	n-Heptatriacontane (C37)	51.193	2164492	1.726	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.859	1707302	1.367	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.811	1232956	1.042	ug/mL	M4
41)	t	n-Tetracontane (C40)	57.125	1168429	0.988	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	39.610	7428814548	6037.249	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	39.610	7306360378	5937.733	ug/mL	M4
45)	h	Total Resolved Hydroc...	39.151	2429958845	1974.779	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27116.D
Operator : AC
Acquired : 05 Sep 2012 5:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TW090712ANS01
Misc Info : WHAP13
ALS Vial : 64



Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210082 - OP SHC

Lab ID	QC Type	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1210082-01	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-02	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-03	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-04	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.03	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-05	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.01	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-06	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.02	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210082-07	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612B08	B	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCS04	LCS	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCSD04	LCSD	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210082 - OP SHC

Lab ID	Notes
1210082-01	1st Prep
1210082-02	1st Prep
1210082-03	1st Prep: Sample blown low on water bath during initial concentration. CTK 11-7-12
1210082-04	1st Prep
1210082-05	1st Prep
1210082-06	1st Prep
1210082-07	1st Prep
SS110612B08	1st Prep
SS110612LCS04	1st Prep
SS110612LCSD04	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210082 - OP NEWFIE Analyst: CTK Witness: AMK

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1210082-01	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-02	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-03	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-04	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-05	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-06	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210082-07	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612B08	B	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612LCS04	LCS	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl
SS110612LCSD04	LCSD	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ65	Biomarker Surrogate	5b(H) Cholane = 10 ug/mL	DCM	7787
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210082 - OP SHC Analyst: CTK Witness: AMK

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1210082-01	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-02	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-03	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-04	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-05	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-06	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210082-07	SAM	WHAQ79	100	µl				WHAQ72	50	µl
SS110612B08	B	WHAQ79	100	µl				WHAQ72	50	µl
SS110612LCS04	LCS	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl
SS110612LCSD04	LCSD	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ72	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene-d10, Chrysene-d12 = 5 ug/mL	DCM	L14S03
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

ETR 1210082

Alpha Analytical

Analyst AMK
Date 11/07/2012

- [ ] Pre-Alumina
- [ ] Post-Alumina
- [x] Pre-Silica
- [ ] Oily Material Prep.
- [ ] Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	0.280	56.00	N/A	N/A	N/A	104%
1210081	1		4000	50	0.201	16.08	2000	8.04	2.00	
	2		4000	50	0.222	17.76	2000	8.88	2.00	
	3		4000	50	0.219	17.52	2000	8.76	2.00	
	4		4000	50	0.208	16.64	2000	8.32	2.00	
	5		4000	50	0.201	16.08	2000	8.04	2.00	
	6		4000	50	0.190	15.20	2000	7.60	2.00	
	7		4000	50	0.217	17.36	2000	8.68	2.00	

Note:
Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)
Gravimetric Standard = 5 mg/mL
LCS Acceptance Criteria: 95% - 105%

Verified by: BLS
Date: 11/12/12

ETR 1210082

Analyst

Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	.280		N/A	N/A	N/A	0%
1210081	1		4000	50	.201					
	2		4000	50	~~.228~~ .222	AMK 11/7/12				
	3		4000	50	.219					
	4		4000	50	.208					
	5		4000	50	.201					
	6		4000	50	.190					
	7		4000	50	.217					

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: AMK

Date: 11/7/12

Alpha Woods Hole Lab
Batch Weight Report
11/06/2012

Lab ID	QC Type	1210082 - Sample
1210082-01	SAM	15
1210082-02	SAM	15.02
1210082-03	SAM	15
1210082-04	SAM	15.03
1210082-05	SAM	15.01
1210082-06	SAM	15.02
1210082-07	SAM	15
SS110612B08	B	15
SS110612LCS04LCS	OP NEWFIE	15
SS110612LCS04LCS	OP SHC	15
SS110612LCS04LCS	OP Steranes/Triterpanes	
SS110612LCSD04LCSD	OP NEWFIE	15
SS110612LCSD04LCSD	OP SHC	15
SS110612LCSD04LCSD	OP Steranes/Triterpanes	

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210082 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210082-01	SAM	3660B	CTK	11/7/2012												True
1210082-02	SAM	3660B	CTK	11/7/2012												True
1210082-03	SAM	3660B	CTK	11/7/2012												True
1210082-04	SAM	3660B	CTK	11/7/2012												True
1210082-05	SAM	3660B	CTK	11/7/2012												True
1210082-06	SAM	3660B	CTK	11/7/2012												True
1210082-07	SAM	3660B	CTK	11/7/2012												True
SS110612B08	B	3660B	CTK	11/7/2012												True
SS110612LCS04	LCS	3660B	CTK	11/7/2012												True
SS110612LCSD04	LCSD	3660B	CTK	11/7/2012												True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210082 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210082-01	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-02	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-03	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-04	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-05	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-06	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
1210082-07	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612B08	B	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCS04	LCS	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True
SS110612LCSD04	LCSD	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210082 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210082-01	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-02	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-03	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-04	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-05	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-06	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210082-07	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612B08	B	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCS04	LCS	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCSD04	LCSD	split	KJD	11/8/2012							0.9	0.45	2			True

Forensic Preparation Checklist

Batch ID: 1210082 **Client:** AECOM **Project:** Enbridge MDL

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil
Product • PUF • Sediment • Sheen
Soil • Solid • SPMD • Tissue
1L Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:	11/6/12	CTK
1st Extraction:	11/6/12	CTK
2nd Extraction:	11/6/12	CTK
3rd Extraction:	11/7/12	WR/MH

Extraction HT:
9/21/13

Cleanup Methods:		Date/Initials:
No Cleanup Required		
Alumina Column (3610)		
Silica Column (3630)	X	11/7/12 AMK
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)	X	11/7/12 CTK
Water pH<2 verified		
Date/Initials:		**ID & Amount:**
RIS Spike Analyst:	11/8/12 KM	WHAQ 72 50 uL
RIS Spike Witness:	11/8/12 BLS	

Prep Process Notes

Sample 3 blown low on water bath during initial concentration. CTK 11/7/12

Samples 1-7 spiked with 300 uL WHAQ62. CTK 11/7/12

REAGENT	LOT #
DCM	000015769
SODIUM SULFATE	000011407
SILICA GEL	BCBH9150V
ALUMINA	n/a

REAGENT	LOT #
COPPER	OWR110712B
GLASS WOOL	05112999

BATCH COMPLETE Analyst:	KM	Date:	11/8/12
BATCH REVIEWED Analyst:	BLS	Date:	11/12/12

Alpha Woods Hole Lab
Batch Weight Report
10/05/2012

Lab ID	QC Type	PS1210003 - Pan Weight	PS1210003 - Wet Weight	PS1210003 - Dry Weight	PS1210003 - Dry Weight #2	PS1210003 - Dry Weight #3	Percent Solid
1210003-01	SAM 1210082-01	1.31	7.73	5.4	5.39		63.55
1210003-02	SAM 1210082-02	1.31	7.73	5.4	5.39		63.55
1210003-03	SAM 1210082-03	1.31	7.73	5.4	5.39		63.55
1210003-04	SAM 1210082-04	1.31	7.73	5.4	5.39		63.55
1210003-05	SAM 1210082-05	1.31	7.73	5.4	5.39		63.55
1210003-06	SAM 1210082-06	1.31	7.73	5.4	5.39		63.55
1210003-07	SAM 1210082-07	1.31	7.73	5.4	5.39		63.55
PSS100512B05	B	1.32	1.32	1.32	1.32		100.00

KML 11/16/12

Initial: 10/5/2012 12:30:30 PM wr
Weight #1: 10/9/2012 8:17:48 AM ctk
Weight #2: 10/10/2012 12:20:20 PM bls

1734

Analysis log File

Total Files Reported in Log : 30
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\

9.7.12

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E27092.D	DCM	DCM	9/4/2012 9:08 am
2	E27094.D	IB209041201R	DCM	9/4/2012 10:36 am
3	E27095A.D	DCM	DCM	9/4/2012 12:13 pm
4	E27096.D	C209041201R	WHAQ26	9/4/2012 1:43 pm
5	E27098.D	IB209041202R	DCM	9/4/2012 3:14 pm
6	E27100.D	I209041201R	WHAO93	9/4/2012 4:46 pm
7	E27102.D	I209041202R	WHAP92	9/4/2012 6:18 pm
8	E27104.D	I209041203R	WHAQ26	9/4/2012 7:50 pm
9	E27106.D	I209041204R	WHAO95	9/4/2012 9:22 pm
10	E27108.D	I209041205R	WHAO96	9/4/2012 10:53 pm
11	E27110.D	I209041206R	WHAP58	9/5/2012 12:26 am
12	E27112.D	IB209041203R	DCM	9/5/2012 1:58 am
13	E27114.D	CQ209041201R	WHAQ27	9/5/2012 3:31 am
14	E27116.D	TW090712ANS01	WHAP13	9/5/2012 5:03 am
15	E27118.D	TW090712MC206	WHAP35	9/5/2012 6:36 am
16	E27120.D	DCM	DCM	9/5/2012 8:19 am
17	E27122.D		DCM	9/5/2012 9:48 am
18	E27124.D		DCM	9/5/2012 11:17 am
19	E27126.D		DCM	9/5/2012 12:46 pm
20	E27128.D		DCM	9/5/2012 2:16 pm
21	E27130.D		DCM	9/5/2012 3:45 pm
22	E27132.D		DCM	9/5/2012 5:15 pm
23	E27134.D		DCM	9/5/2012 6:44 pm
24	E27136.D			9/5/2012 8:13 pm
25	E27138.D			9/5/2012 9:41 pm
26	E27140.D			9/5/2012 11:09 pm
27	E27142.D			9/6/2012 12:36 am
28	E27144.D			9/6/2012 2:04 am
29	E27146.D			9/6/2012 3:31 am
30	E27148.D			9/6/2012 4:58 am

Data files for method HC2904I2R.m

- IB for ANS+MC252
- ICV ✓ pass
- ANS ✓ pass
- MC252 ✓ pass

Printed: 09/07/12 Page: 1

SeqLog 1.0.0.1 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 58
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E28812.D	SPIKE CGECK	1X	11/9/2012 10:12 am
2	e28814.D	C211091201R	WHAQ67	11/9/2012 11:49 am
3	e28816.D	TS111312ANC01	1X WHAP13	11/9/2012 1:19 pm
4	e28818.D	DCM	DCM	11/9/2012 2:49 pm
5	e28820.D	IB211091201R	DCM	11/9/2012 4:19 pm
6	e28822.D	SS110612B07	1X	11/9/2012 5:49 pm
7	e28824.D	SS110612B08	1X	11/9/2012 7:18 pm
8	e28826.D	SS110612B09	1X	11/9/2012 8:48 pm
9	e28828.D	SS110612LCS03	1X	11/9/2012 10:17 pm
10	e28830.D	SS110612LCS04	1X	11/9/2012 11:46 pm
11	e28832.D	SS110612LCS05	1X	11/10/2012 1:15 am
12	e28834.D	SS110612LCSD03	1X	11/10/2012 2:44 am
13	e28836.D	SS110612LCSD04	1X	11/10/2012 4:13 am
14	e28838.D	SS110612LCSD05	1X	11/10/2012 5:41 am
15	e28840.D	C211091202R	WHAQ67	11/10/2012 7:10 am
16	e28842.D	DCM	DCM	11/10/2012 8:38 am
17	e28844.D	IB211091202R	DCM	11/10/2012 10:08 am
18	e28845a.D	dcm		11/10/2012 11:39 am
19	e28846.D	1210081-01	1X	11/10/2012 1:08 pm
20	e28848.D	1210081-02	1X	11/10/2012 2:38 pm
21	e28850.D	1210081-03	1X	11/10/2012 4:08 pm
22	e28852.D	1210081-04	1X	11/10/2012 5:38 pm
23	e28854.D	1210081-05	1X	11/10/2012 7:08 pm
24	e28856.D	1210081-06	1X	11/10/2012 8:37 pm
25	e28858.D	1210081-07	1X	11/10/2012 10:06 pm
26	e28860.D	C211091203R	WHAQ67	11/10/2012 11:35 pm
27	e28862.D	DCM	DCM	11/11/2012 1:04 am
28	e28864.D	IB211091203R	DCM	11/11/2012 2:34 am
29	e28866.D	1210082-01	1X	11/11/2012 4:03 am
30	e28868.D	1210082-02	1X	11/11/2012 5:33 am
31	e28870.D	1210082-03	1X	11/11/2012 7:02 am
32	e28872.D	1210082-04	1X	11/11/2012 8:32 am
33	e28874.D	1210082-05	1X	11/11/2012 10:02 am
34	e28876.D	1210082-06	1X	11/11/2012 11:31 am
35	e28878.D	1210082-07	1X	11/11/2012 1:02 pm
36	e28880.D	C211091204R	WHAQ67	11/11/2012 2:32 pm
37	e28882.D	DCM	DCM	11/11/2012 4:02 pm
38	e28884.D	IB211091204R	DCM	11/11/2012 5:32 pm
39	e28886.D	1210083-01	RA, INST STOPPED	11/11/2012 7:02 pm
40	e28888.D	1210083-02	RA, INST STOPPED	11/11/2012 8:39 pm
41	e28890.D	1210083-03	RA, FAILED IS	11/12/2012 4:22 am
42	e28892.D	1210083-04	1X	11/12/2012 5:50 am
43	e28893a.D	C211091205R	WHAQ67	11/12/2012 7:20 am
44	e28894.D	1210083-05	1X	11/12/2012 8:49 am
45	e28896.D	1210083-06	1X	11/12/2012 10:18 am
46	e28898.D	1210083-07	1X	11/12/2012 11:48 am
47	e28900.D	1210083-01	1X	11/12/2012 1:18 pm
48	e28902.D	1210083-02	1X	11/12/2012 2:48 pm
49	e28904.D	1210083-03	1X	11/12/2012 4:17 pm
50	e28906.D	C211091206R	WHAQ67	11/12/2012 5:47 pm
51	e28908.D	DCM	DCM	11/12/2012 7:16 pm
52	e28910.D	IB211091205R	DCM	11/12/2012 8:46 pm
53	e28912.D	TS111312WCS01	WHAP15	11/12/2012 10:15 pm
54	e28914.D	TS111312CL01	WHAP16	11/12/2012 11:44 pm

Printed: 11/16/12

METHOD: HCL090412R.m
CCV = 50 ug/ml WHAQ67

SeqLog 1.0.0.1 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 58
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
55	e28916.D	DCM	DCM	11/13/2012 1:14 am
56	e28918.D	C211091207R	WHAQ67	11/13/2012 2:43 am
57	e28920.D	DCM	DCM	11/13/2012 4:12 am
58	e28922.D	IB211091206R	DCM	11/13/2012 5:41 am

Chain of Custody Records

MANSFIELD CHAIN OF CUSTODY

PAGE 1 OF 1

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #: 1209034

Project Information

Project Name: MDLSed

Project Location: MARSHALL, MI

Project #: 60246209

Project Manager: DAVE BAREHAM

ALPHA Quote #:

Client Information

Client: ENBRIDGE

Address: 333 KALAMAZOO AVE

MARSHALL , MI 49068

Phone: 616.970.9700

Fax:

Email: JOHN.BOHRMAN@ENBRIDGE.COM

☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information Data Deliverables

☐ FAX ☐ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #: TASK# 9.04

Regulatory Requirements/Report Limits

State/Fed Program Criteria

Other Project Specific Requirements/Comments/Detection Limits:

Oil Topping-Range Finding-MDL Study'

☐ MS/MSD (at unit cost) will be omitted unless you check here

ANALYSIS

SAMPLE HANDLING

Filtration

☐ Done

☐ Not Needed

☐ Lab to do

Preservation

☐ Lab to do

(Please specify below)

MDL Study

Sample Specific Comments 10.30.12

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials												TOTAL # BOTTLES
1209034-01	SEKR0000R024S092112D004	09/21/12	1630	SE	ADM	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	1210081	8
-02	SEBC0000L012S092112D004	09/21/12	1455	SE	ADM	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	1210082	8
-03	SEKR3510R018S092112D004	09/21/12	1031	SE	ADM	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	1210083	8
-04	SEKR0000R024AS092112D004	09/21/12	1630	CORE	ADM	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		1
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
Container Type		G	G	G	G	G	G	G	-	-	-	-	-				
Preservative		A	A	A	A	A	A	A	-	-	-	-	-				

Relinquished By:	Date/Time	Received By:	Date/Time
	9.24.12/0850		9.24.12/0850
	9.24.12 0900	FedEx	
FEDEX	9/25/12 1025		9/25/12 1025

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 101-09(I-NJ) (rev. 8-JAN-12)

Sample Delivery Group Form

Laboratory Job No: 1209034 **Client:** AECOM

Receipt Date/Time: 9/25/12 1025 **SDG Reviewer:** MS

1210081, 1210082, 1210083

Samples Delivered By:

[ ] Alpha Courier [ ] Client [ ] UPS [X] FedEx [ ] Other _____

Bill of Laden: [X] Yes [ ] Unavailable Tracking #: Attached

Chain of Custody: [ ] Present [ ] Absent: _____

Custody Seals: [ ] Absent [X] Present/Intact [ ] Present/Broken

Cooler/Sample Temperature:

Is Ice/Blue Ice present? [X] Yes [ ] No [ ] N/A _____

A = Cores
B = Jars

Temp taken from: Temp Blank: (a) 2° (b) NR (c) _____ (d) _____ (e) _____

IR Gun: (a) 2.3° (b) 2.7° (c) _____ (d) _____ (e) _____

IR Gun SN (circle one): (90512810) 100311463

Was Temp: [X] 2-6 Celsius

[ ] <2 Celsius ... were samples frozen upon receipt? [ ] Yes [ ] No

[ ] >6 Celsius ... were samples delivered direct from site? [ ] Yes [ ] No

Containers Received: [X] Intact

[ ] Broken/Leaking Sample IDs: _____

Sample IDs: _____

All Containers Accounted For? [X] Yes

[ ] No: rec'd 2 cores - A1, A2 Not 1 as on COC

Extra Samples Received? [X] No

[ ] Yes: _____

Do Sample Labels and COC agree? [X] Yes

[ ] No: _____

Are Samples in Appropriate Containers? [X] Yes

[ ] No: _____

Are samples rec'd within holding time? [X] Yes

[ ] No: _____

* Please note: the analysis of pH will always be performed beyond the regulatory-required holding time of 15 min. from the time of collection.

pH of samples upon receipt: [X] N/A [ ] <2 [ ] >12 and/or [ ] _____

Are samples properly preserved? [ ] Yes [ ] No If No then.....

Initial pH= _____ preserved In-House with [ ] HCL [ ] H_2SO_4 [ ] HNO_3 [ ] NAOH <<Final pH = _____>>

Other Issues: _____

Chlorine Check: [ ] N/A [ ] Present [ ] Absent

VOA/VPH vials: [ ] Yes [X] No Preserved? [ ] Yes [ ] No If yes: [ ] HCL, [ ] _____

Aqueous: vials contain head space? [ ] No [ ] Yes: _____

Soils: MeOH covering soil? [ ] Yes [ ] No: _____

Reagent H_2O Preserved vials Frozen @ date/time: _____

Frozen by Client? [ ] No [ ] Yes @ date/time: _____

Was Client notified of any discrepancies listed above? [X] Yes [ ] No [ ] N/A

If Yes: Call Tracker # _____

FedEx Express® **NEW Package US Airbill**

FedEx Tracking Number: 8762 5989 8873

Form ID No.: 0200

FedEx Retrieval Copy

1 From

Date: 9.24.12 Sender's FedEx Account Number: 2138-5929-3

Sender's Name: APRIL MODERT Phone: 517 227 4710

Company: SUPERIOR ENVIRONMENTAL CORP

Address: 1680 Marquette Street

Dept/Floor/Suite/Room:

City: Bay City State: MI ZIP: 48706-4178

2 Your Internal Billing Reference: BC3279. TASK 9.045

3 To

Recipient's Name: SUE O'NEIL Phone: 508 544 4117

Company: ALPHA WOODS HOLE LABS

Address: 320 FORBES BLVD

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept/Floor/Suite/Room:

Address: Use this line for the HOLD location address or for continuation of your shipping address.

City: MANSFIELD State: MA ZIP: 02048

HOLD Weekday 01 ☐ FedEx location address REQUIRED. NOT available for FedEx First Overnight.

HOLD Saturday 31 ☐ FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

2082

8762 5989 8873

4 Express Package Service • To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

06 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01 ☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

49 ☐ NEW FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.

03 ☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging • Declared value limit $500.

06 ☐ FedEx Envelope* 02 ☐ FedEx Pak* 03 ☐ FedEx Box 04 ☐ FedEx Tube 01 ☒ Other

6 Special Handling and Delivery Signature Options

03 ☐ **SATURDAY DELIVERY**

No Signature Required ☐ Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. *Fee applies.*

34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. *Fee applies.*

Does this shipment contain dangerous goods? One box must be checked.

☒ No 04 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 06 ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

1 ☒ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

[redacted]

Total Packages: 1 Total Weight: ____ lbs. Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

612

Rev. Date 11/10 • Part #163136 • ©1994–2010 FedEx • PRINTED IN U.S.A. SRY

FedEx Express® **NEW Package US Airbill**

FedEx Tracking Number: 8762 5989 8884

Form ID No.: 0200

FedEx Retrieval Copy

1 From

Date: 9.24.12 Sender's FedEx Account Number: 2138-5929-3

Sender's Name: APRIL MODERT Phone: 517 227 4710

Company: SUPERIOR ENVIRONMENTAL CORP

Address: 1680 MARQUETTE STREET

Dept/Floor/Suite/Room:

City: BAY CITY State: MI ZIP: 48706-4178

2 Your Internal Billing Reference: BC3279 TASK 9.045

3 To

Recipient's Name: SUE O'NEIL Phone: 508 544 4117

Company: ALPHA WOODS HOLE LABS

Address: 320 FORBES BLVD

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept/Floor/Suite/Room:

Address: Use this line for the HOLD location address or for continuation of your shipping address.

City: MANSFIELD State: MA ZIP: 02048

HOLD Weekday 01 ☐ FedEx location address REQUIRED. NOT available for FedEx First Overnight.

HOLD Saturday 31 ☐ FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8762 5989 8884

4 Express Package Service • To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

06 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01 ☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

49 ☐ NEW FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.

03 ☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging • Declared value limit $500.

06 ☐ FedEx Envelope* 02 ☐ FedEx Pak* 03 ☐ FedEx Box 04 ☐ FedEx Tube 01 ☒ Other

6 Special Handling and Delivery Signature Options

03 ☐ **SATURDAY DELIVERY**

No Signature Required ☒ Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. *Fee applies.*

34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. *Fee applies.*

Does this shipment contain dangerous goods? One box must be checked.

☒ No 04 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 06 ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

1 ☒ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

[redacted]

Total Packages: 1 Total Weight: ____ lbs. Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

612

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ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 9.24.12 Time: 0900
Name: [signature]
Company: TEC

Seal Broken By:

Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

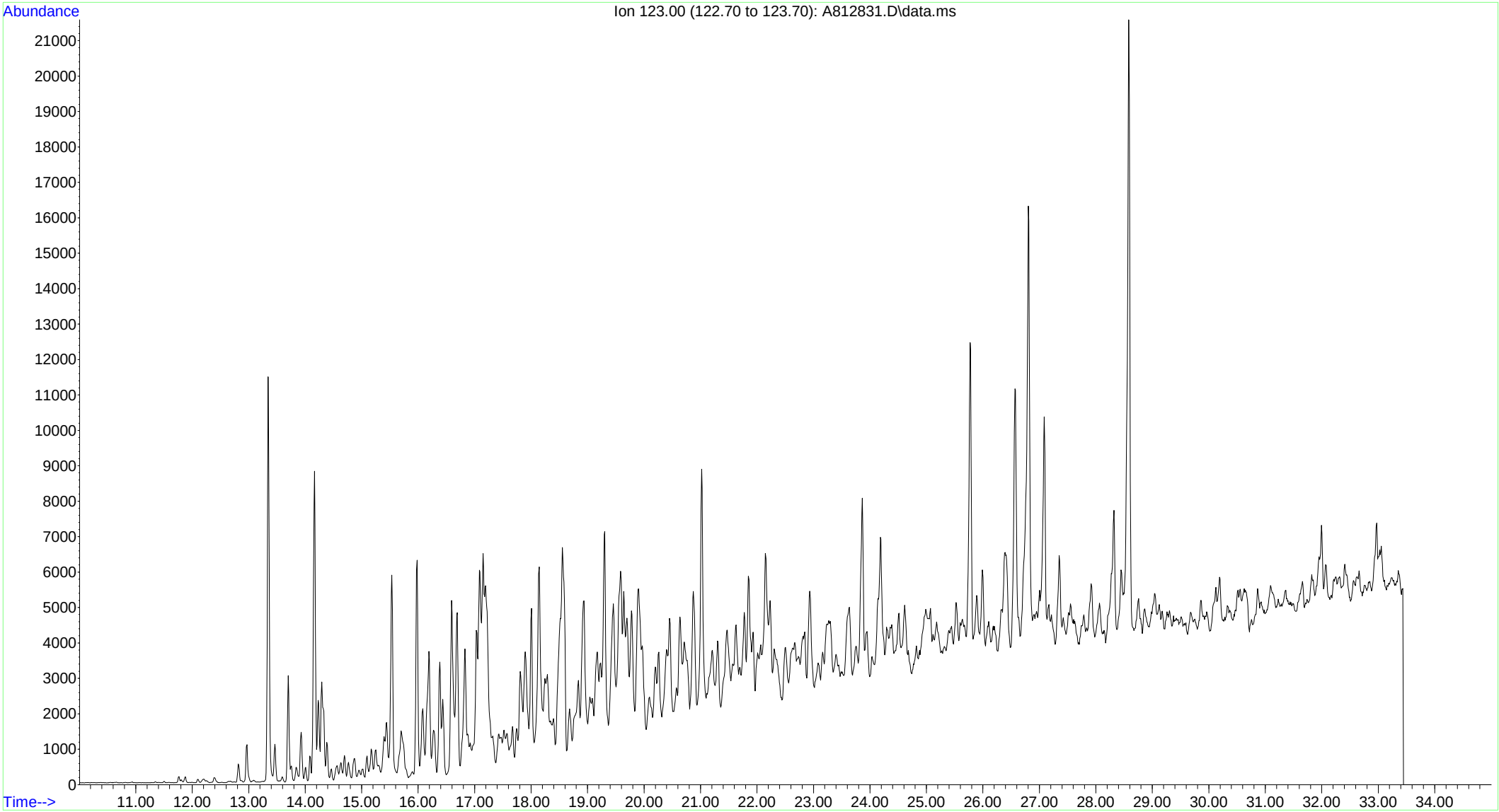
CUSTODY SEAL

Date: 9.24.12 Time: 0900
Name: [signature]
Company: TEC

Seal Broken By:

Date:

File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\A812831.D
Operator : AC
Acquired : 18 Nov 2012 9:02 pm using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: SS112012ANC01
Misc Info : whaq46 5.076
Vial Number: 12



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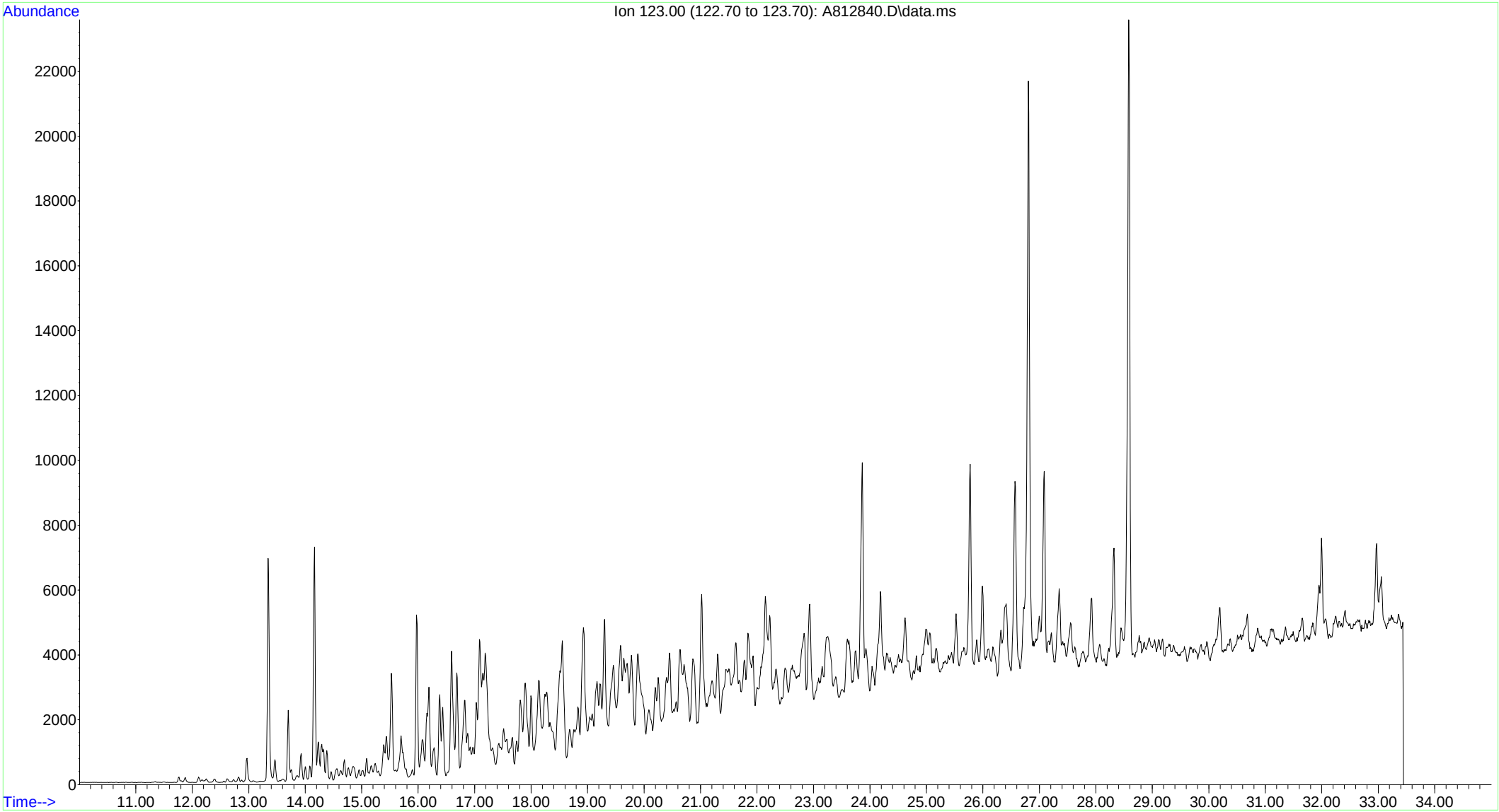
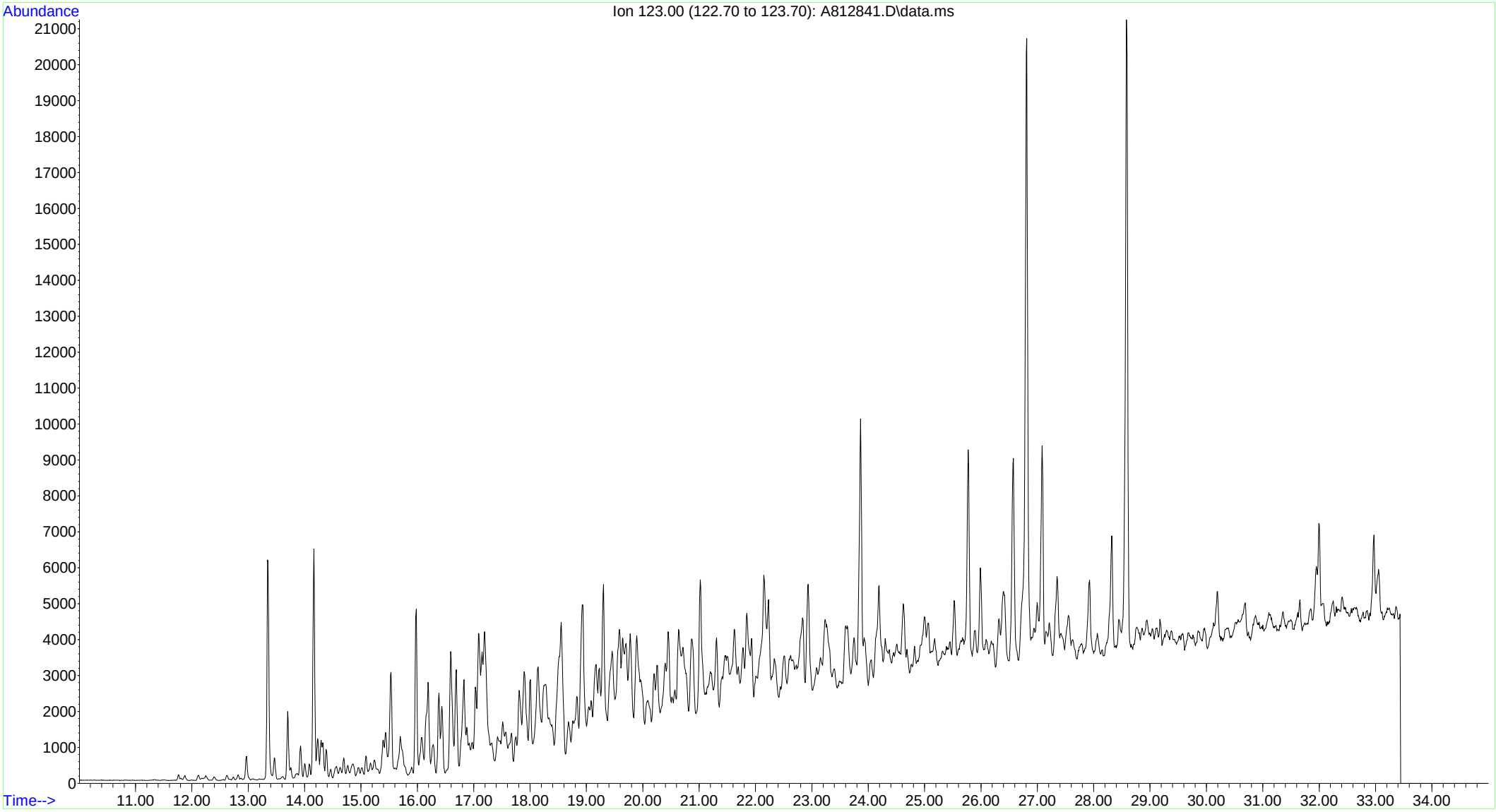
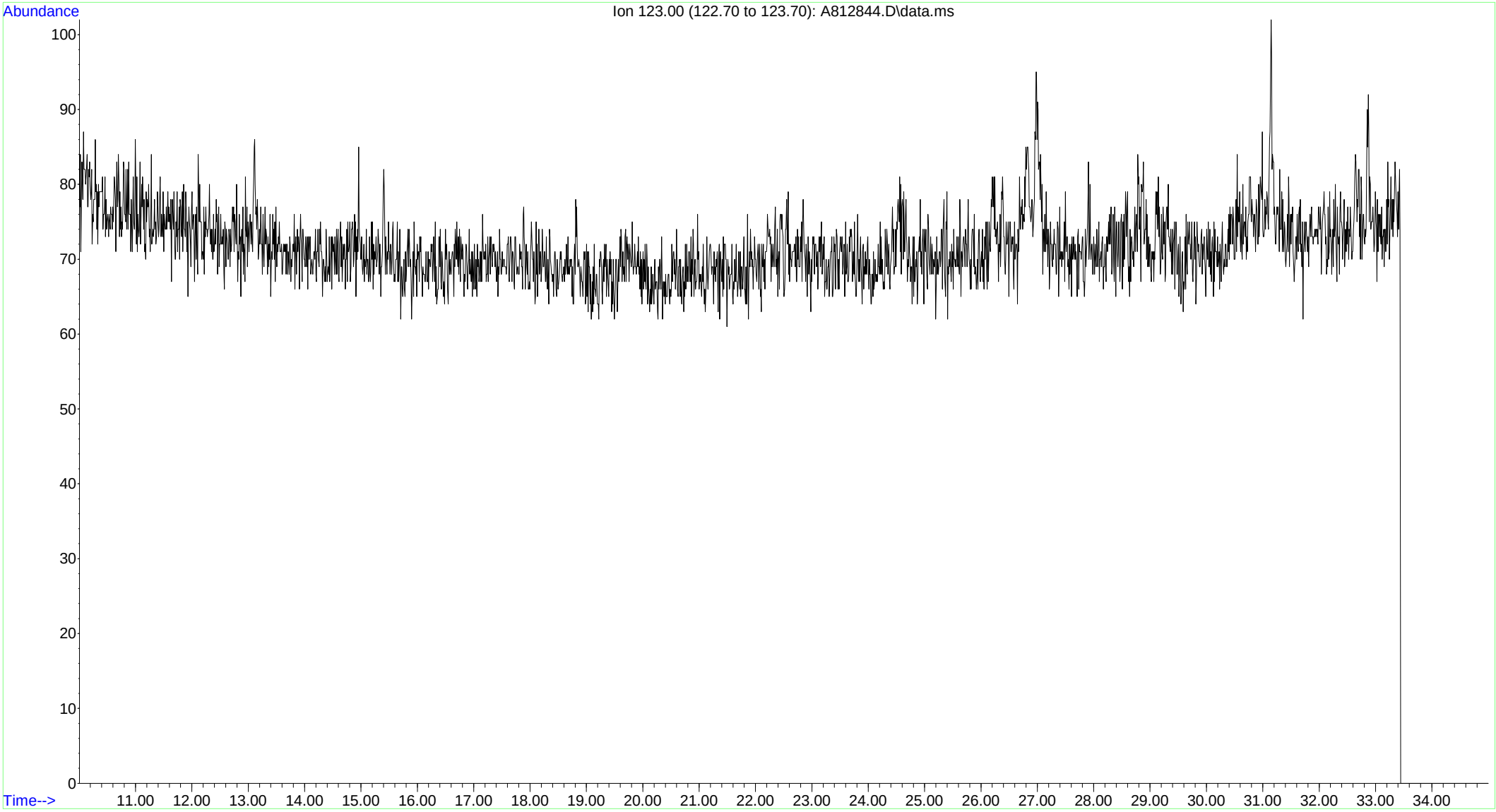
Acquired : 19 Nov 2012 11:42 am using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: SS112012WCS01
Misc Info : whaq73
Vial Number: 21



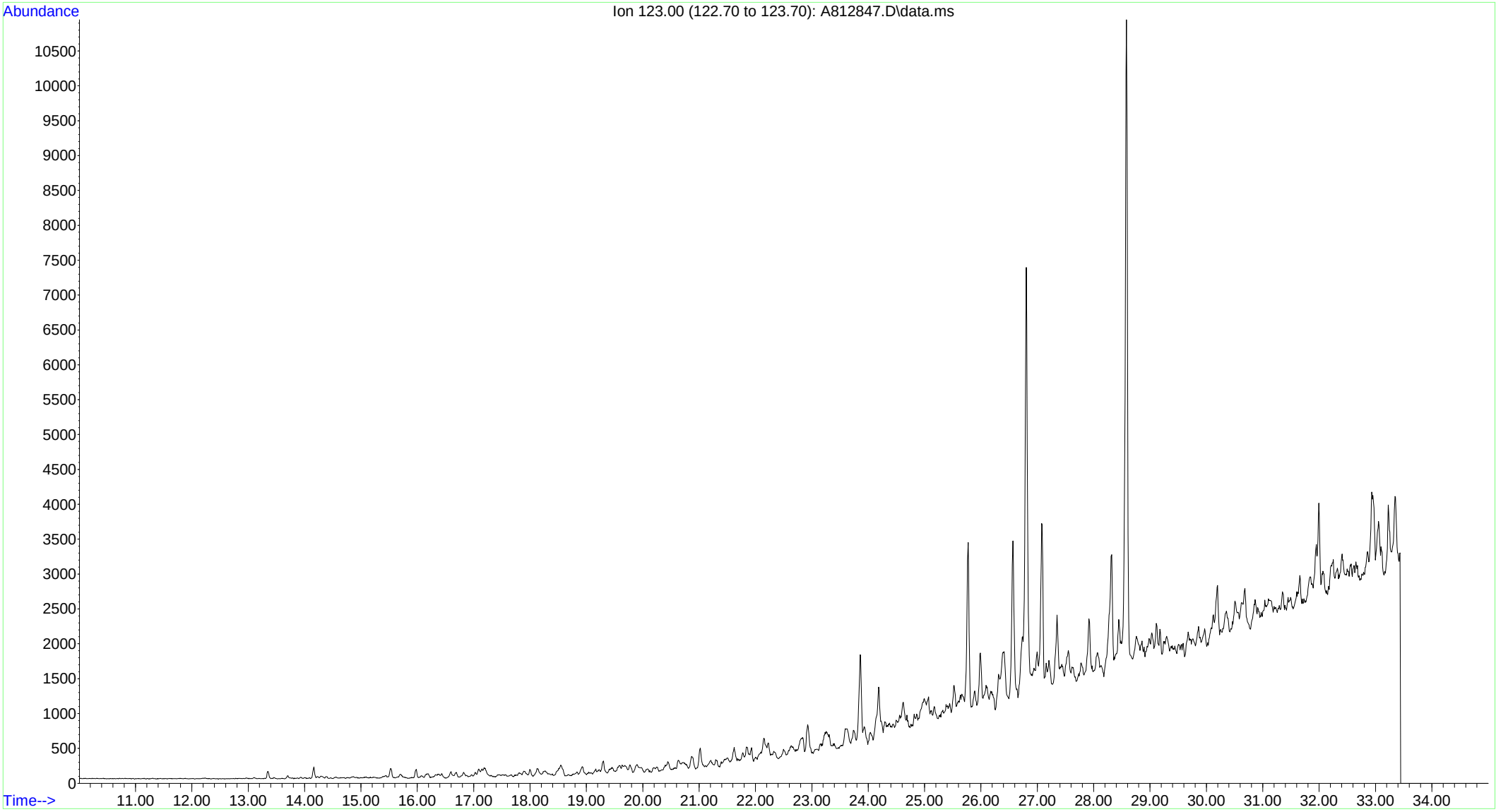
File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\A812841.D
Operator : AC
Acquired : 19 Nov 2012 1:08 pm using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: SS112012CL01
Misc Info : whaq74
Vial Number: 22



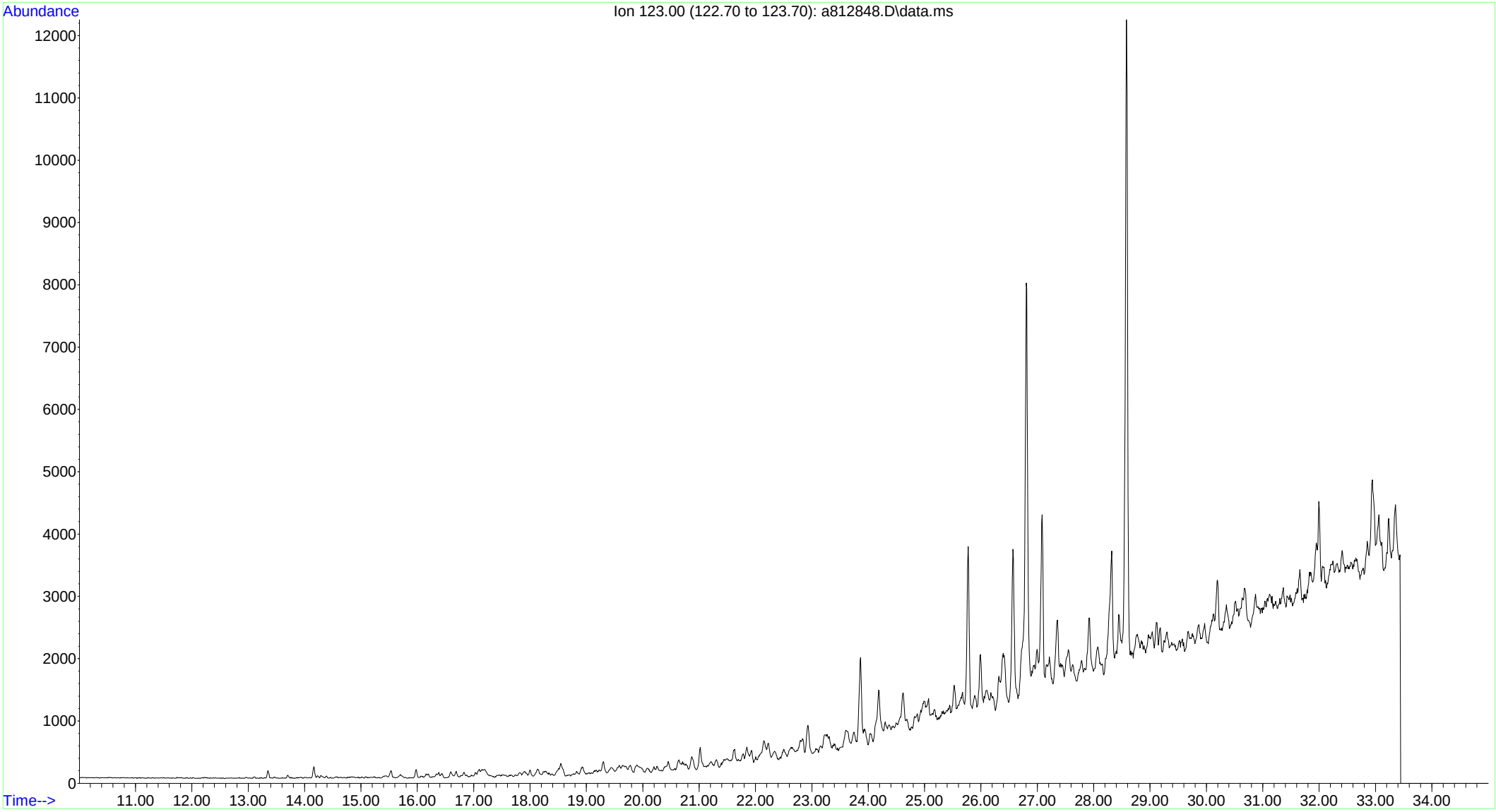
File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\A812844.D
Operator : AC
Acquired : 19 Nov 2012 5:23 pm using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: ss110612b08
Misc Info : 1x etr1210082
Vial Number: 25



File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\A812847.D
Operator : AC
Acquired : 19 Nov 2012 9:36 pm using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-01
Misc Info : 1x
Vial Number: 28



File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\a812848.D
Operator : AC
Acquired : 19 Nov 2012 11:00 pm using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-02
Misc Info : 1x
Vial Number: 29



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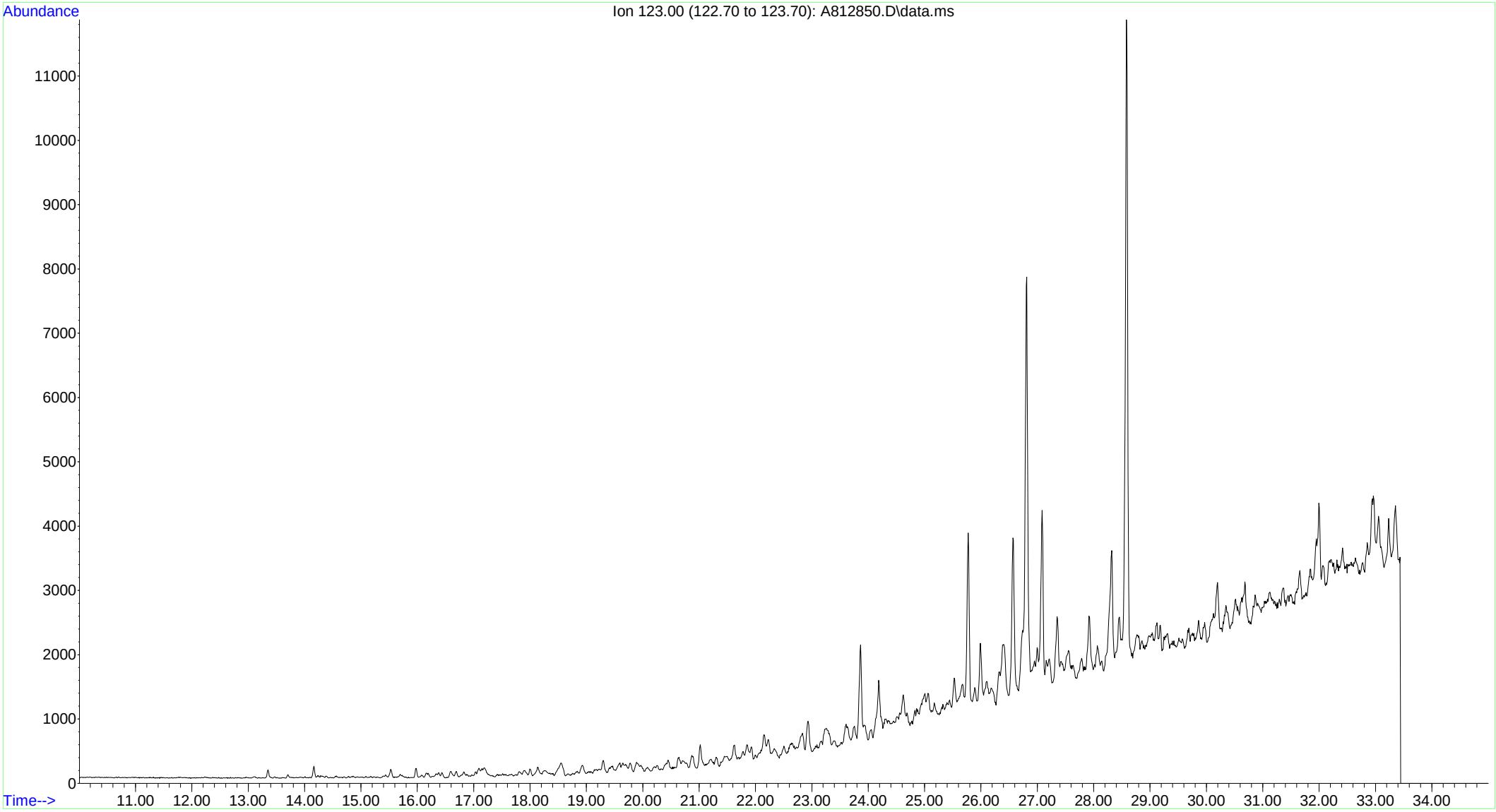
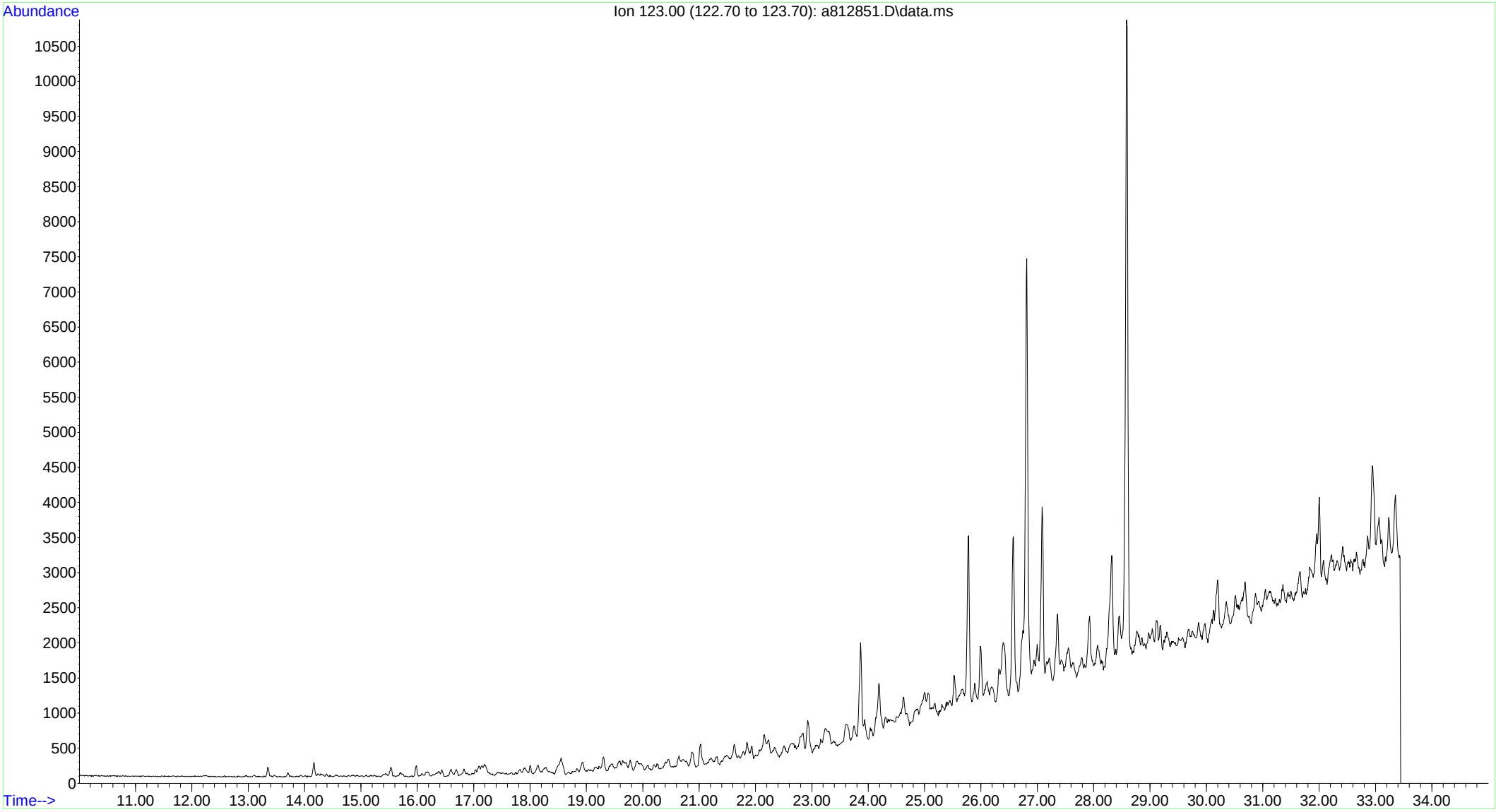
Operator : AC
Acquired : 20 Nov 2012 1:48 am using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-03
Misc Info : 1x
Vial Number: 31

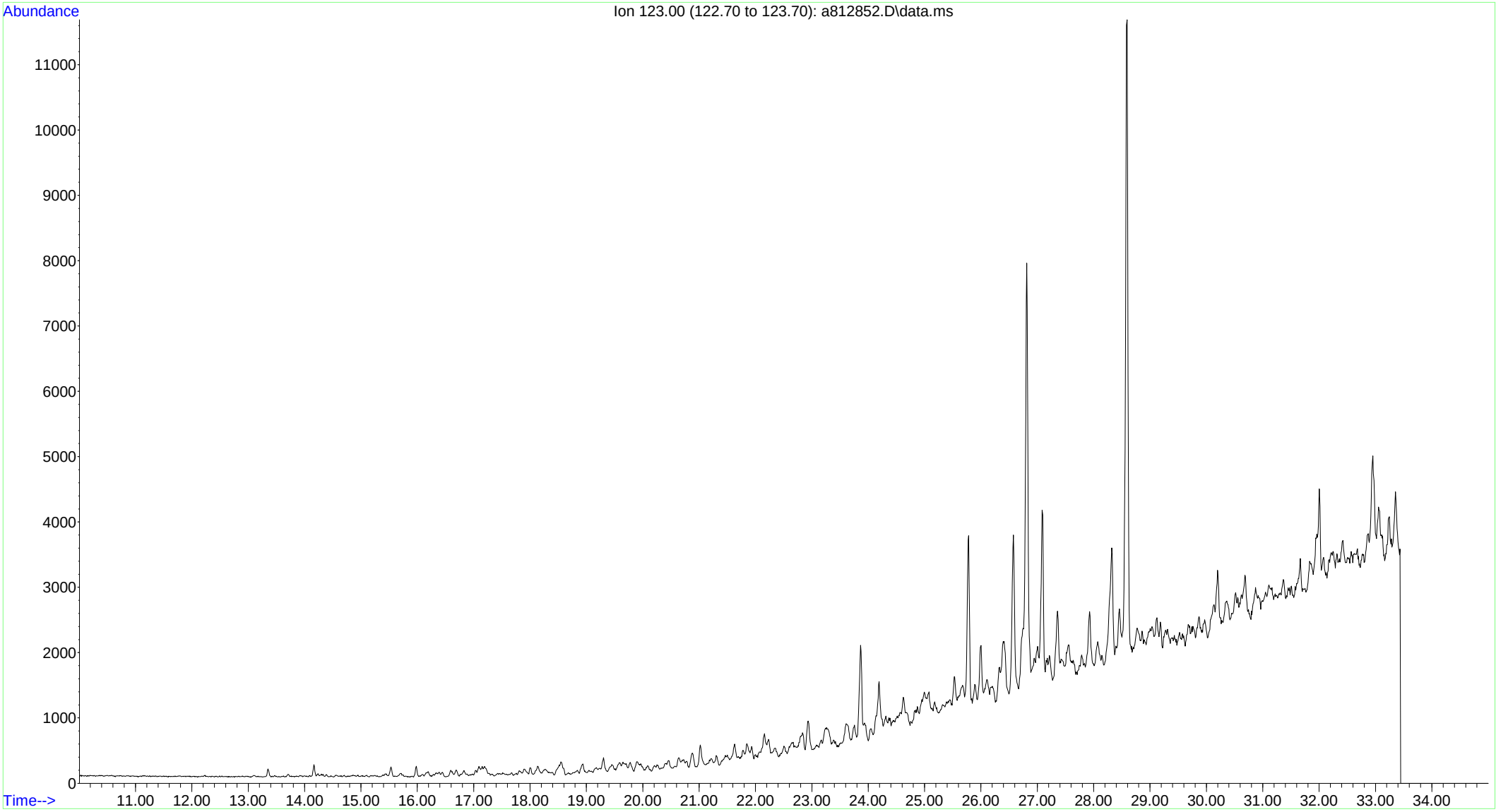


File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\a812851.D
Operator : AC
Acquired : 20 Nov 2012 3:12 am using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-04
Misc Info : 1x
Vial Number: 32

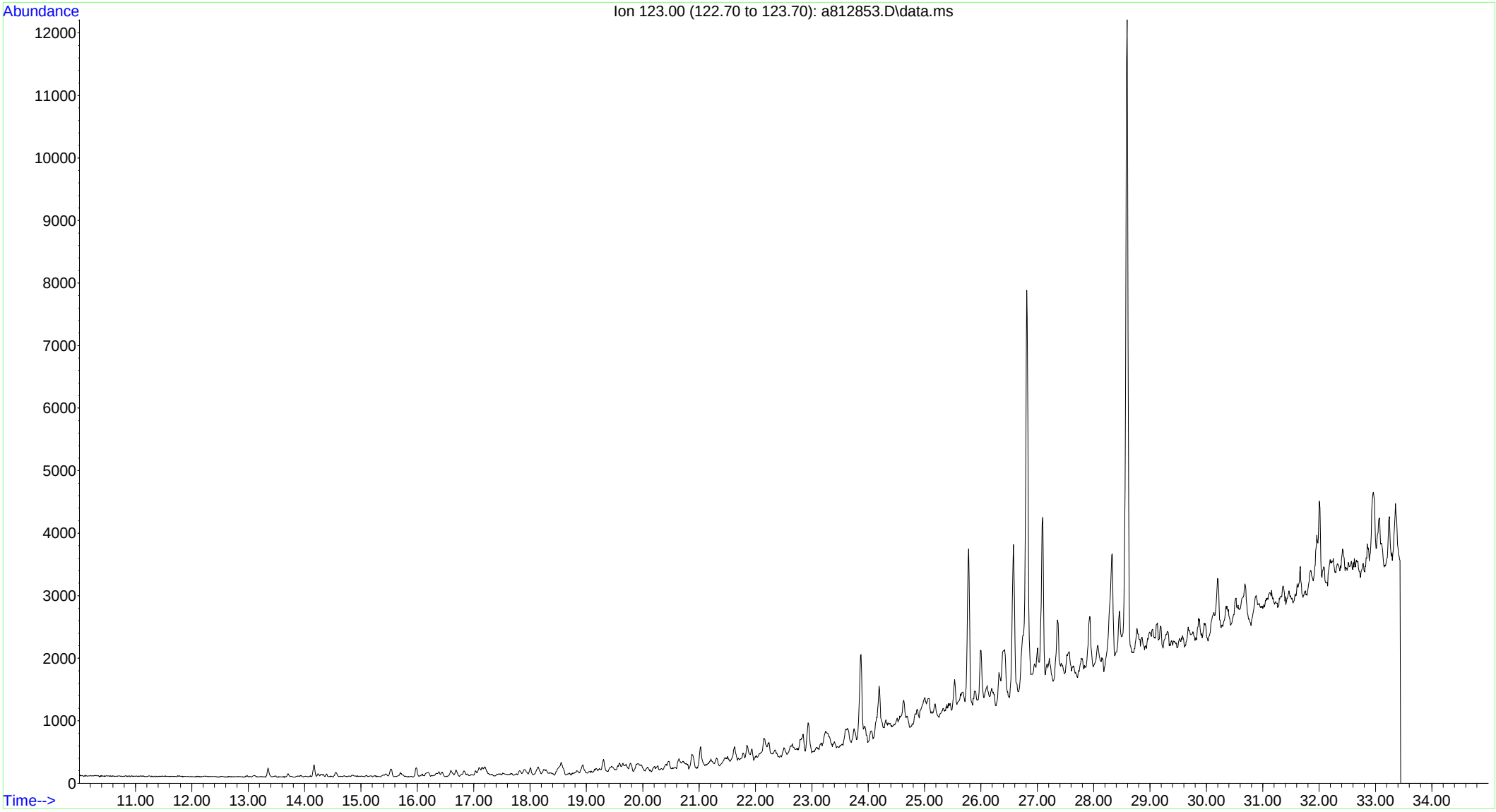


1750

File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\a812852.D
Operator : AC
Acquired : 20 Nov 2012 4:36 am using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-05
Misc Info : 1x
Vial Number: 33



File :O:\FORENSICS\DATA\PAH8\NOV12\NOV18\a812853.D
Operator : AC
Acquired : 20 Nov 2012 6:00 am using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-06
Misc Info : 1x
Vial Number: 34



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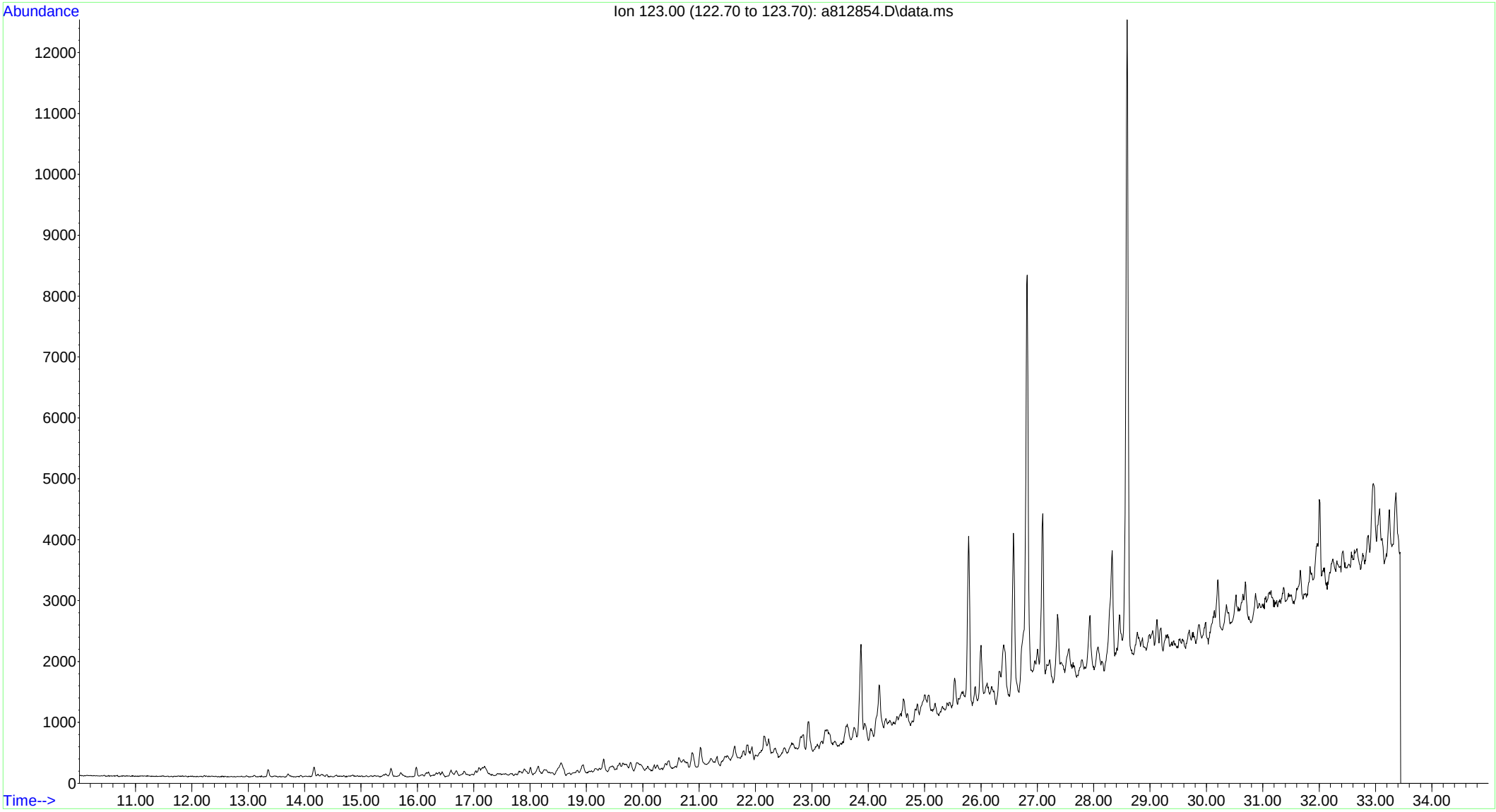
Operator : AC
Acquired : 20 Nov 2012 7:25 am using AcqMethod FRNC8A.M
Instrument : PAH8
Sample Name: 1210082-07
Misc Info : 1x
Vial Number: 35



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	78991M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	124160	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	262683	839.125	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 83.91%			
42) Phenanthrene-d10	32.843	188	235516	968.795	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.88%			
83) Benzo[b]fluoranthene-d12	47.326	264	243327	1028.298	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.83%			
88) Benzo[a]pyrene-d12	48.534	264	238405	1019.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.98%			
129) 5B(H)Cholane - Surr	44.045	217	49287M3	1085.604	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.56%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	140424	2000.442	ng/mL	100
4) cis-Decalin	17.879	138	6223M3	121.012	ng/mL	
5) C1-Decalins	18.590	152	225633M5	3214.307	ng/mL	
6) C2-Decalins	19.923	166	197945M5	2819.871	ng/mL	
7) C3-Decalins	22.396	180	86941M5	1238.538	ng/mL	
8) C4-Decalins	25.781	194	98332M5	1400.811	ng/mL	
10) Naphthalene	20.078	128	893038	2493.601	ng/mL#	100
11) C1-Naphthalenes	22.779	142	1892183M5	5283.480	ng/mL	
12) C2-Naphthalenes	25.617	156	2429476M5	6783.746	ng/mL	
13) C3-Naphthalenes	27.953	170	1779439M5	4968.669	ng/mL	
14) C4-Naphthalenes	30.709	184	926139M5	2586.028	ng/mL	
16) 2-Methylnaphthalene	22.779	142	1098352	5148.524	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	795886	3984.112	ng/mL#	100
18) Benzothiophene	20.288	134	7480M3	25.840	ng/mL	
19) C1-Benzo(b)thiophenes	22.341	148	39206M5	135.438	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	72234M5	249.534	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	139278M5	481.139	ng/mL	
22) C4-Benzo(b)thiophenes	29.532	190	121540M5	419.863	ng/mL	
23) Biphenyl	24.650	154	186634	687.624	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	605392	3315.806	ng/mL#	100
25) Dibenzofuran	27.743	168	75894	265.048	ng/mL#	85
26) Acenaphthylene	26.356	152	11000	33.839	ng/mL#	100
27) Acenaphthene	27.105	153	18184M3	93.718	ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.656	170	124200M3	789.833	ng/mL	
29) Fluorene	29.112	166	85680M3	393.714	ng/mL	
30) C1-Fluorenes	31.484	180	184625M5	848.383	ng/mL	
31) C2-Fluorenes	33.674	194	278786M5	1281.069	ng/mL	
32) C3-Fluorenes	35.499	208	275240M5	1264.775	ng/mL	
33) Dibenzothiophene	32.433	184	212077	708.685	ng/mL#	85
34) 4-Methyldibenzothiophe...	34.212	198	196394	656.278	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.559	198	155047	518.111	ng/mL#	100
36) 1-Methyldibenzothiophe...	34.979	198	73034	244.053	ng/mL#	100
37) OTP	34.623	198	14139M3	47.247	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	446536M5	1492.163	ng/mL	
39) C2-Dibenzothiophenes	36.257	212	628709M5	2100.920	ng/mL	
40) C3-Dibenzothiophenes	37.690	226	542766M5	1813.729	ng/mL	
41) C4-Dibenzothiophenes	39.379	240	299645M5	1001.306	ng/mL	
43) Phenanthrene	32.935	178	316886	1100.184	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.897	192	146687	509.277	ng/mL	99
45) 2-Methylphenanthrene(2MP)	35.006	192	155574	540.131	ng/mL	97
46) 2-Methylanthracene(2MA)	35.162	192	5018M3	17.422	ng/mL	
47) 9/4-Methylphenanthrene...	35.344	192	237440	824.359	ng/mL	99
48) 1-Methylphenanthrene(1MP)	35.435	192	150356M3	522.015	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.344	192	708112M5	2458.467	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.161	206	754557M5	2619.718	ng/mL	
52) C3-Phenanthrenes/Anthr...	38.996	220	484184M5	1681.020	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.178	234	201655M5	700.118	ng/mL	
56) Carbazole	33.774	167	9037M4	32.276	ng/mL	
57) 1-Methylphenanthrene	35.435	192	153338M3	751.019	ng/mL	
58) Fluoranthene	37.699	202	6289M3	21.197	ng/mL	
59) Benzo(b)fluorene	40.220	216	6189M3	36.061	ng/mL	
60) Pyrene	38.585	202	19232M3	64.087	ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.973	216	107991M5	359.859	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.772	230	169671M5	565.395	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.789	244	195654M5	651.978	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.141	258	155110M5	516.874	ng/mL	
66) Naphthobenzothiophene	42.429	234	49992M3	179.456	ng/ml	
67) Naphthobenzothiophene-...	42.429	234	49921M3	179.201	ng/mL	
68) Naphthobenzothiophene-...	42.776	234	12190	43.758	ng/mL#	10
69) Naphthobenzothiophene-...	43.068	234	5647M3	20.271	ng/mL	
70) C1-Naphthobenzothiophenes	43.826	248	166798M5	598.754	ng/ml	
71) C2-Naphthobenzothiophenes	45.826	262	249402M5	895.278	ng/ml	
72) C3-Naphthobenzothiophenes	47.436	276	181212M5	650.496	ng/ml	
73) C4-Naphthobenzothiophenes	48.525	290	122522M5	439.817	ng/mL	
75) Benz[a]anthracene	43.360	228	3229M3	11.863	ng/mL	
76) Chrysene	43.488	228	53021M3	192.442	ng/mL	
77) Chrysene/Triphenylene	43.488	228	53597M3	194.532	ng/mL	
78) C1-Chrysenes	44.986	242	93757M5	340.294	ng/mL	
79) C2-Chrysenes	47.061	256	131721M5	478.086	ng/mL	
80) BBF-D12 Surr BKGD	47.326	256	8334	30.249	ng/mL	100
81) C3-Chrysenes	49.814	270	136635M5	495.921	ng/mL	
82) C4-Chrysenes	49.906	284	83967M5	304.761	ng/mL	
84) Benzo[b]fluoranthene	47.409	252	7917M3	27.083	ng/mL	
85) Benzo[j]+[k]fluoranthene	47.464	252	754M3	2.364	ng/mL	
87) Benzo[e]pyrene	48.433	252	15308M3	50.823	ng/mL	
89) Benzo[a]pyrene	48.625	252	2919M3	10.477	ng/mL	
90) Perylene	48.936	252	4273	14.040	ng/mL#	29
91) Indeno[1,2,3-cd]pyrene	53.518	276	1158M3	3.913	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.573	278	1684M3	5.805	ng/mL	
93) Benzo[g,h,i]perylene	54.861	276	5336	15.887	ng/mL	91
94) Hopane (T19)	52.622	191	76529	820.722	ng/mL#	88
95) 17a(H),21B(H)-hopane -...	52.622	191	76529	820.722	ng/mL#	88
96) C23 Tricyclic Terpane ...	41.069	191	30142	323.253	ng/ml	100
97) C24 Tricyclic Terpane ...	41.799	191	20520	220.063	ng/ml	100
98) C25 Tricyclic Terpane ...	43.278	191	18397M3	197.296	ng/ml	
99) C24 Tetracyclic Terpan...	44.602	191	6107M3	65.493	ng/ml	
100) C26 Tricyclic Terpane-...	44.337	191	6784M3	72.754	ng/ml	
101) C26 Tricyclic Terpane-...	44.429	191	6272	67.263	ng/ml	100
102) C28 Tricyclic Terpane-...	46.713	191	7467	80.079	ng/ml	100
103) C28 Tricyclic Terpane-...	46.869	191	7677M3	82.331	ng/ml	
104) C29 Tricyclic Terpane-...	47.399	191	8171	87.629	ng/ml	100
105) C29 Tricyclic Terpane-...	47.601	191	8732M3	93.645	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.753	191	12689	136.081	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.845	191	7247M3	77.719	ng/mL	
108) C30 Tricyclic Terpane-22R	49.092	191	6548M3	70.223	ng/mL	
109) 17a(H)-22,29,30-Trisno...	49.311	191	16155	173.252	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.528	191	3002	32.194	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.317	191	3522	37.771	ng/ml	100
112) 30-Norhopane (T15)	51.223	191	43079M3	461.993	ng/ml	
113) 18a(H)-30-Norneohopane...	51.323	191	10404M3	111.576	ng/ml	
114) 17a(H)-Diahopane (X)	51.451	191	6338M3	67.971	ng/ml	
115) 30-Normoretane (T17)	52.018	191	5234	56.131	ng/ml	100
117) Moretane (T20)	53.335	191	8314M3	89.162	ng/ml	
118) 30-Homohopane-22S (T21)	54.468	191	31628	339.189	ng/ml	100
119) 30-Homohopane-22R (T22)	54.706	191	26440	283.551	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

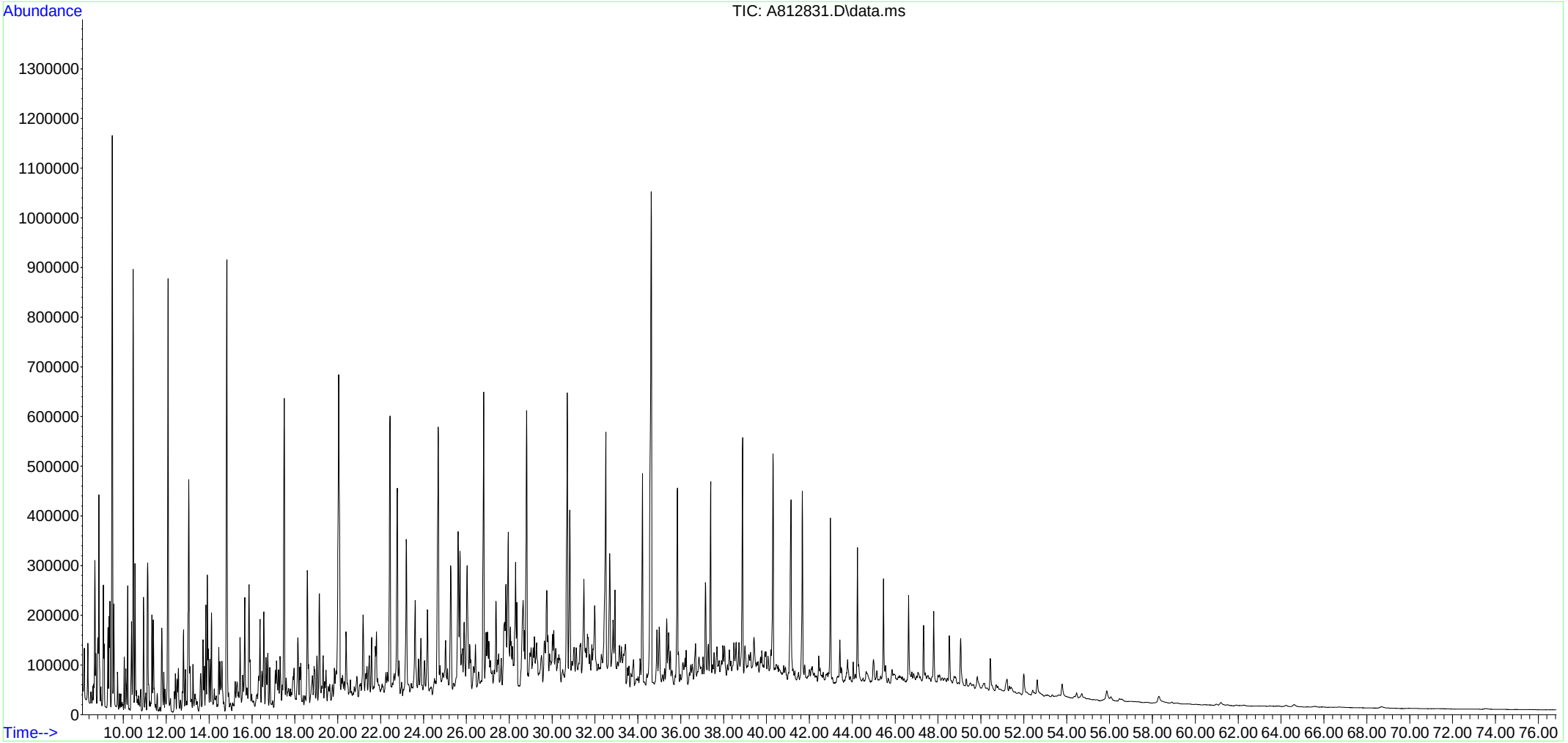
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120)	Gammacerane/C32-diahopane	55.263	191	5656	60.657	ng/mL	100
121)	30,31-Bishomohopane-22...	56.067	191	22510M3	241.405	ng/ml	
122)	30,31-Bishomohopane-22...	56.460	191	16361	175.461	ng/ml	100
123)	30,31-Trishomohopane-2...	58.261	191	17135	183.761	ng/ml	100
124)	30,31-Trishomohopane-2...	58.909	191	11749	126.000	ng/ml	100
125)	Tetrakishomohopane-22S...	60.984	191	12977	139.170	ng/ml	100
126)	Tetrakishomohopane-22R...	61.916	191	8321	89.237	ng/ml	100
127)	Pentakishomohopane-22S...	64.228	191	12785	137.111	ng/ml	100
128)	Pentakishomohopane-22R...	65.571	191	10409	111.630	ng/ml	100
130)	13b(H),17a(H)-20S-Diac...	45.543	217	11631	256.186	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.973	217	5823M3	128.258	ng/ml	
132)	13b,17a-20S-Methyldiac...	46.668	217	5227M3	115.131	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.546	217	13402	295.195	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.067	217	16410M3	361.449	ng/ml	
135)	Unknown Sterane (S18)	48.351	217	4336	95.505	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.625	217	815	17.951	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.781	217	8320M3	183.258	ng/ml	
138)	14a,17a-20R-Methylchol...	49.521	217	7349M3	161.870	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.878	217	11898	262.067	ng/ml	100
140)	14a(H),17a(H)-20R-Ethy...	50.811	217	9006M3	198.368	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.637	218	8824M3	194.359	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.720	218	8873M3	195.438	ng/ml	
143)	14b,17b-20R-Methylchol...	48.964	218	9597	211.385	ng/ml	100
144)	14b,17b-20S-Methylchol...	49.046	218	12292M3	270.746	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.134	218	12571M3	276.891	ng/ml	
146)	14b(H),17b(H)-20S-Ethy...	50.171	218	9254M3	203.830	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.832	231	61216M3	1348.354	ng/mL	
148)	C28,20S-triaromatic st...	50.710	231	38935	857.589	ng/mL	100
149)	C27,20R-triaromatic st...	51.177	231	38396	845.717	ng/mL	100
150)	C28,20R-triaromatic st...	52.412	231	31233	687.943	ng/mL	100

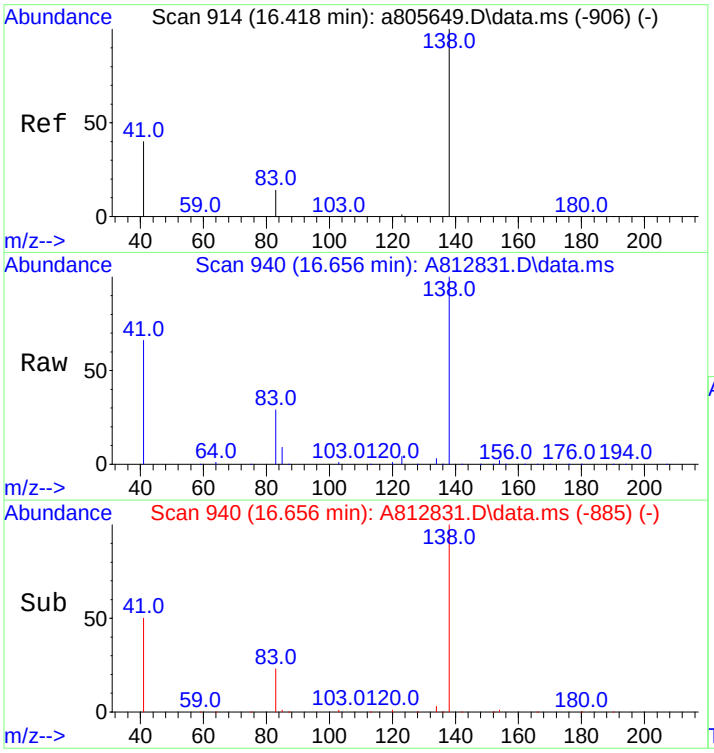
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : Default - All compounds listedort (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

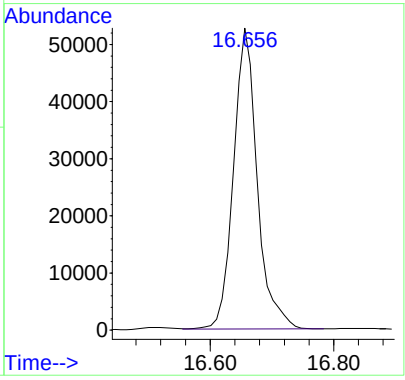
Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

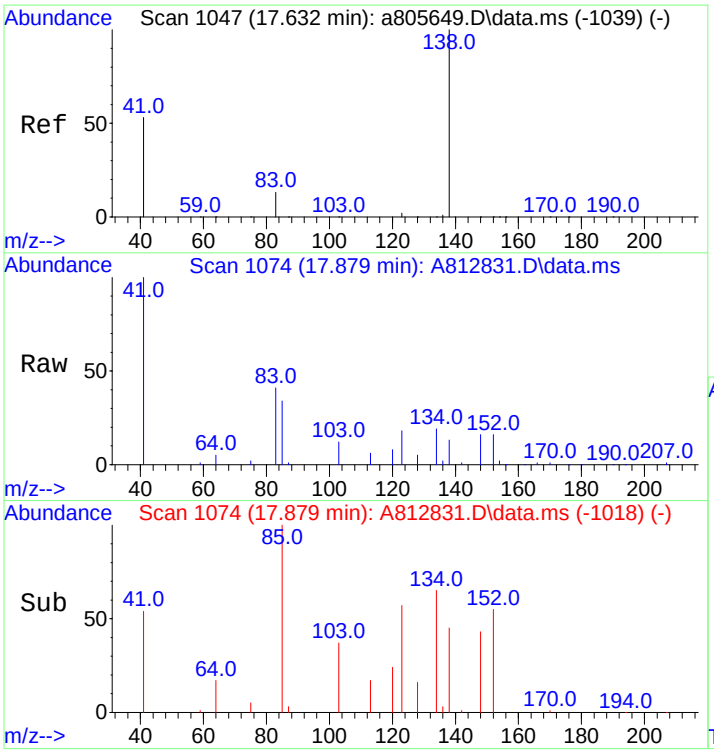




#3
trans-Decalin
Concen: 2000.44 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

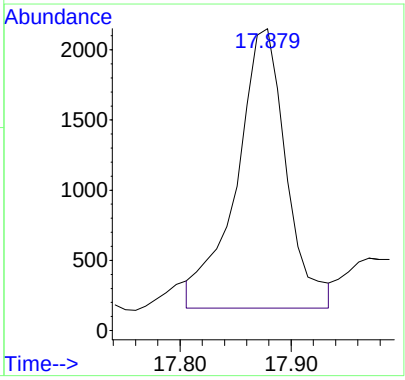
Tgt Ion:138 Resp: 140424

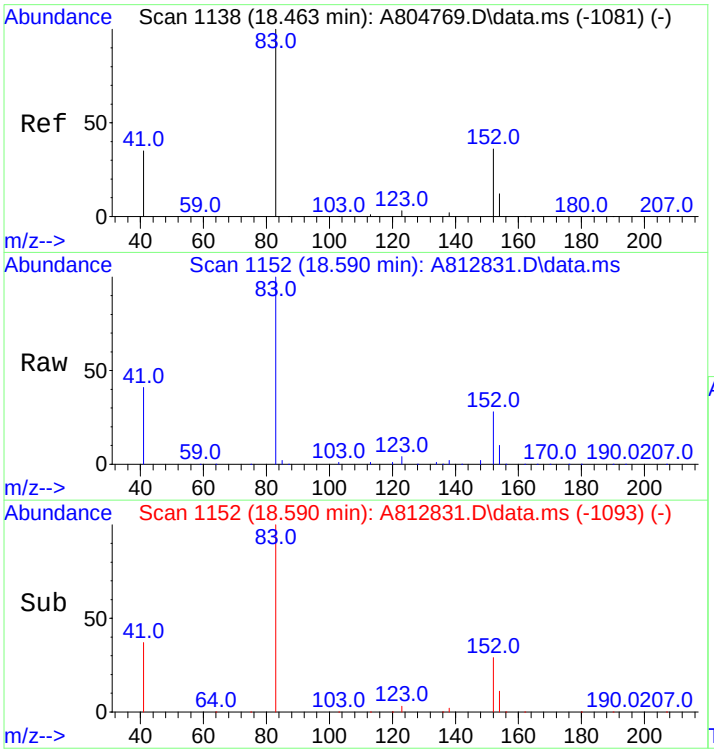




#4
cis-Decalin
Concen: 121.01 ng/mL m
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

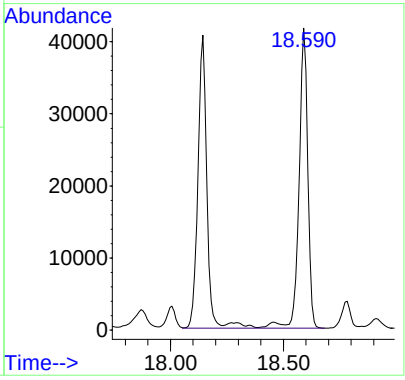
Tgt Ion:138 Resp: 6223

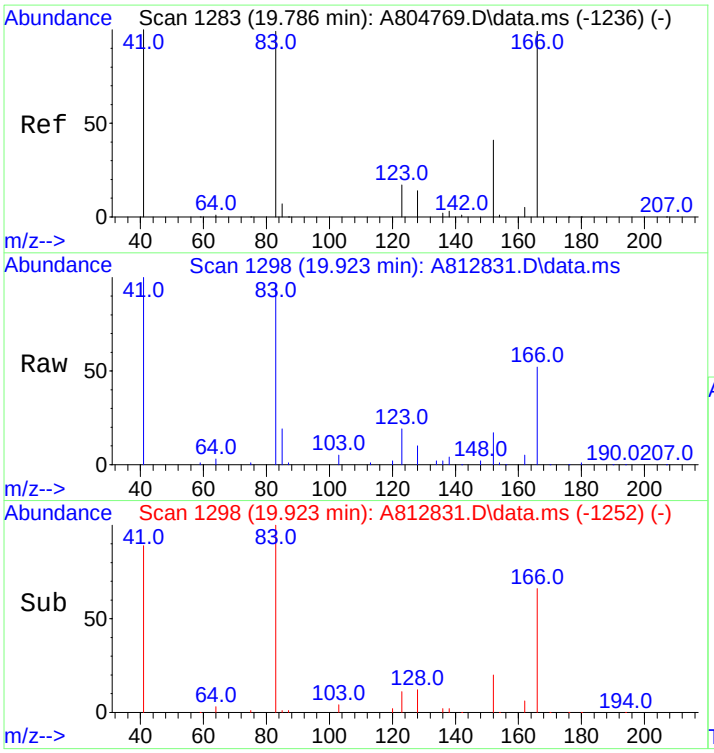




#5
C1-Decalins
Concen: 3214.31 ng/mL m
RT: 18.590 min Scan# 1152
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

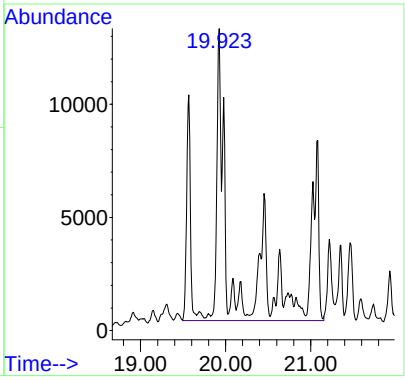
Tgt Ion:152 Resp: 225633

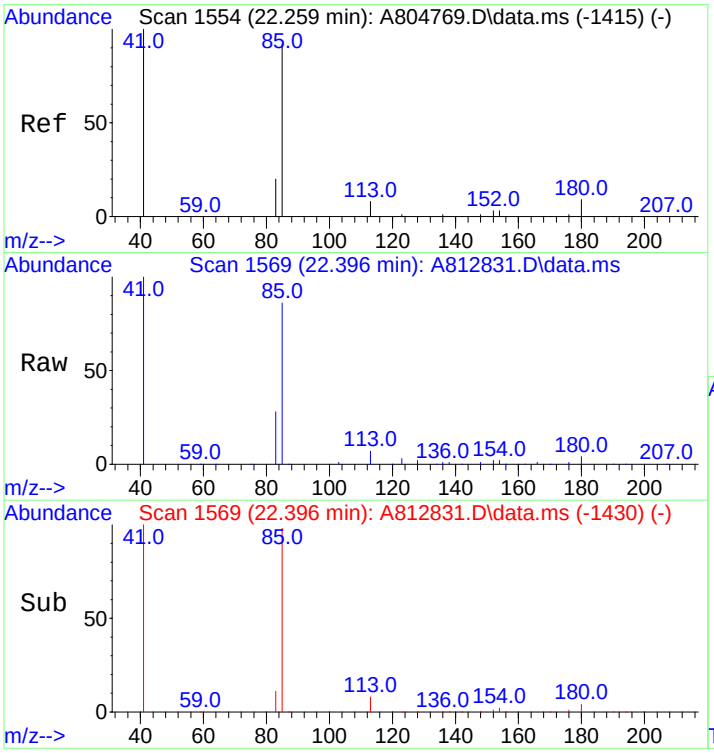




#6
C2-Decalins
Concen: 2819.87 ng/mL m
RT: 19.923 min Scan# 1298
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

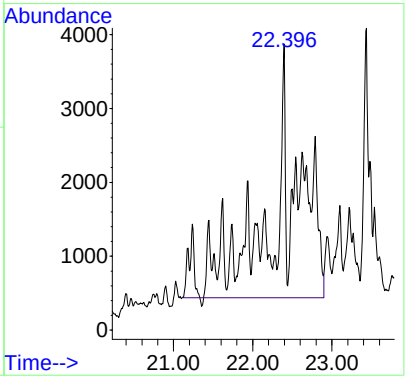
Tgt Ion:166 Resp: 197945

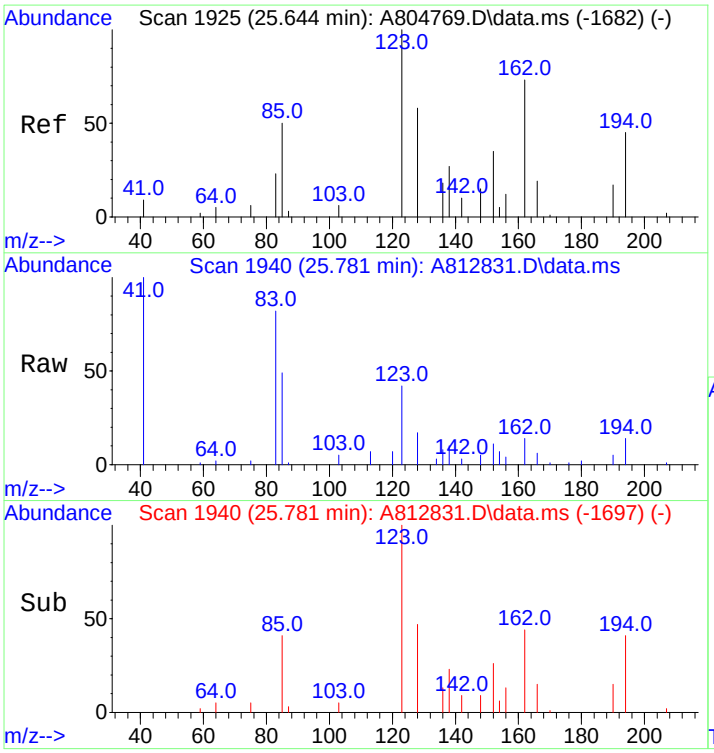




#7
C3-Decalins
Concen: 1238.54 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

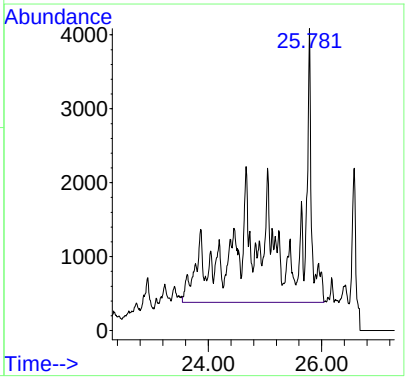
Tgt Ion:180 Resp: 86941

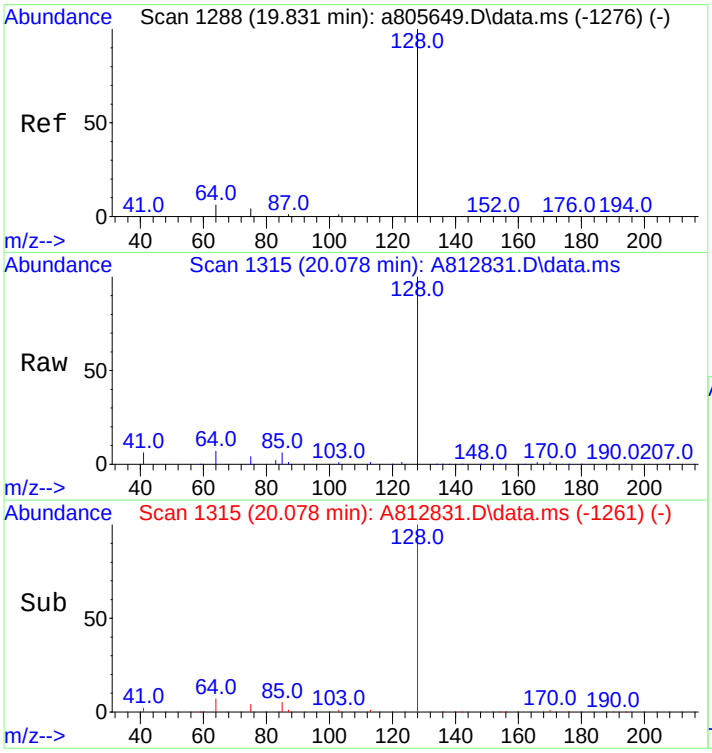




#8
C4-Decalins
Concen: 1400.81 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:194 Resp: 98332

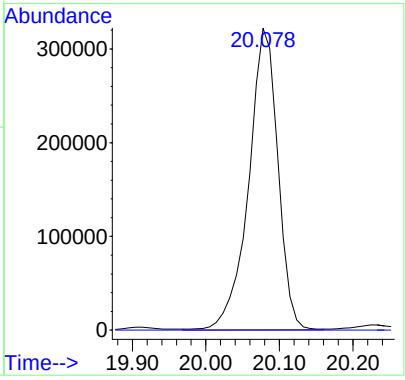


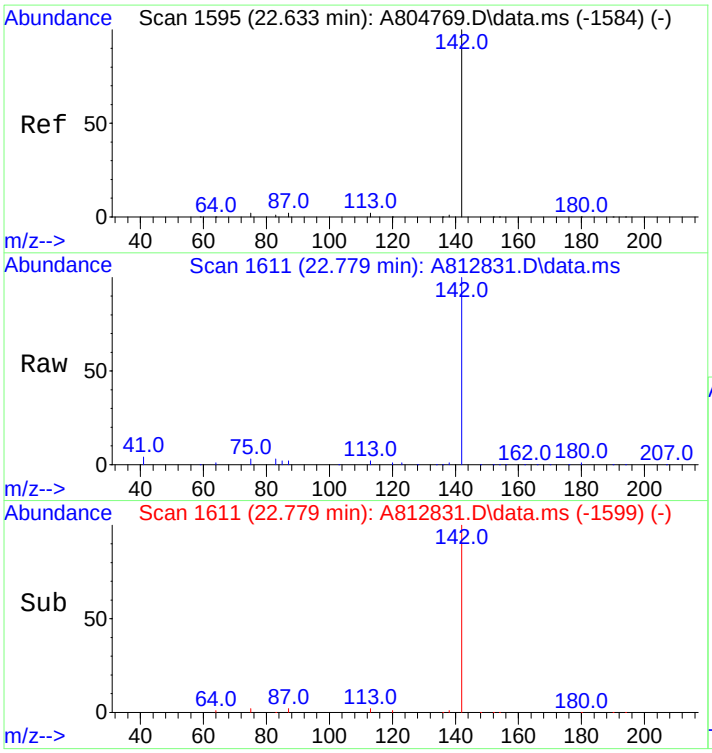


#10
Naphthalene
Concen: 2493.60 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:128 Resp: 893038

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

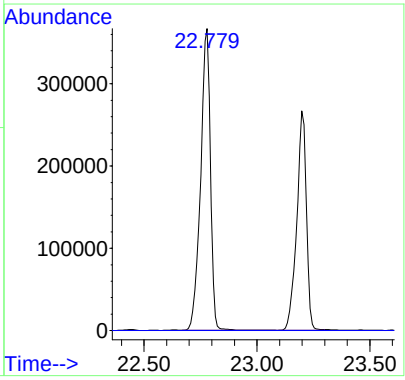


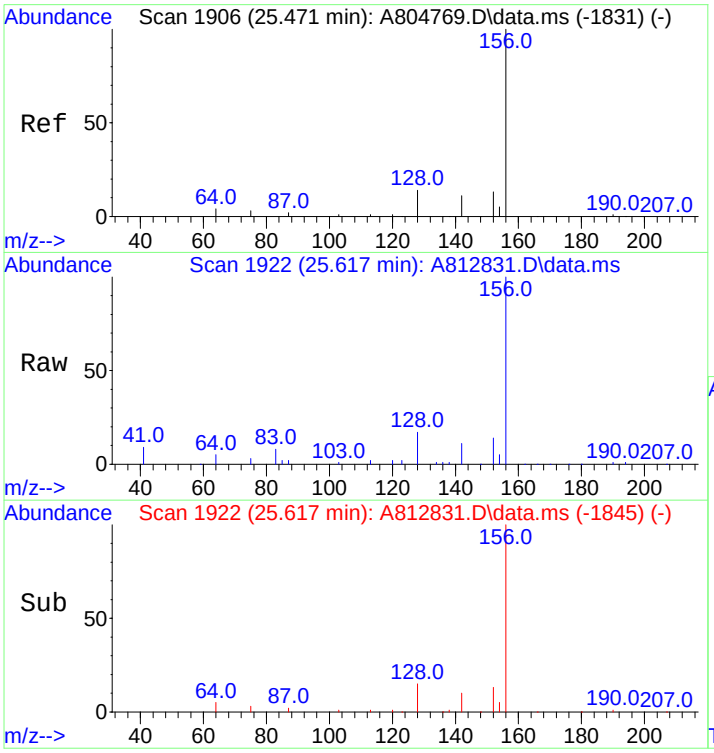


#11
C1-Naphthalenes
Concen: 5283.48 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:142 Resp: 1892183

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

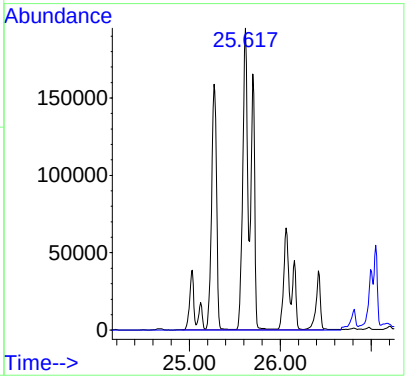


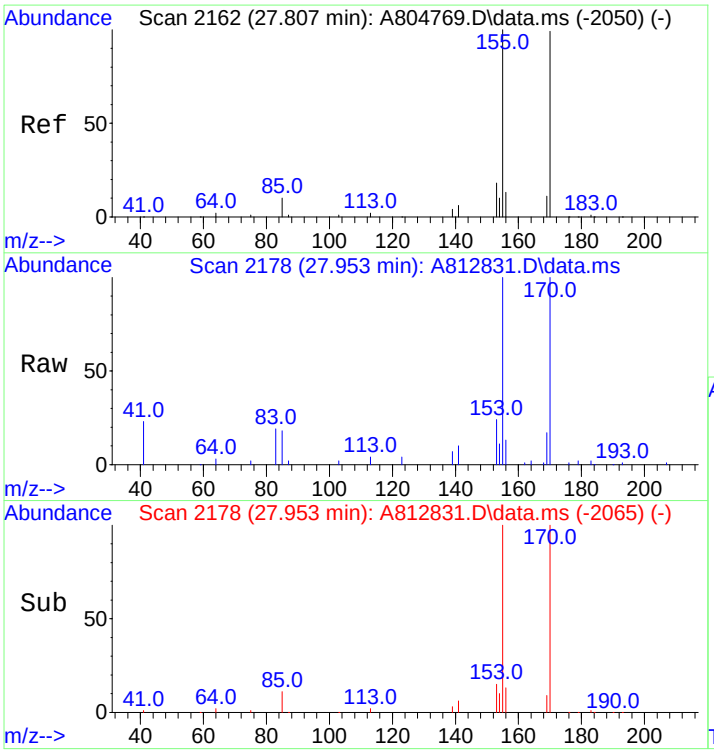


#12
C2-Naphthalenes
Concen: 6783.75 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:156 Resp: 2429476

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

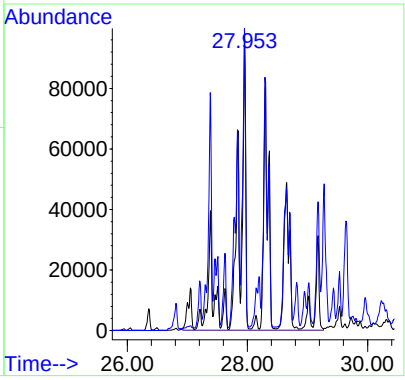


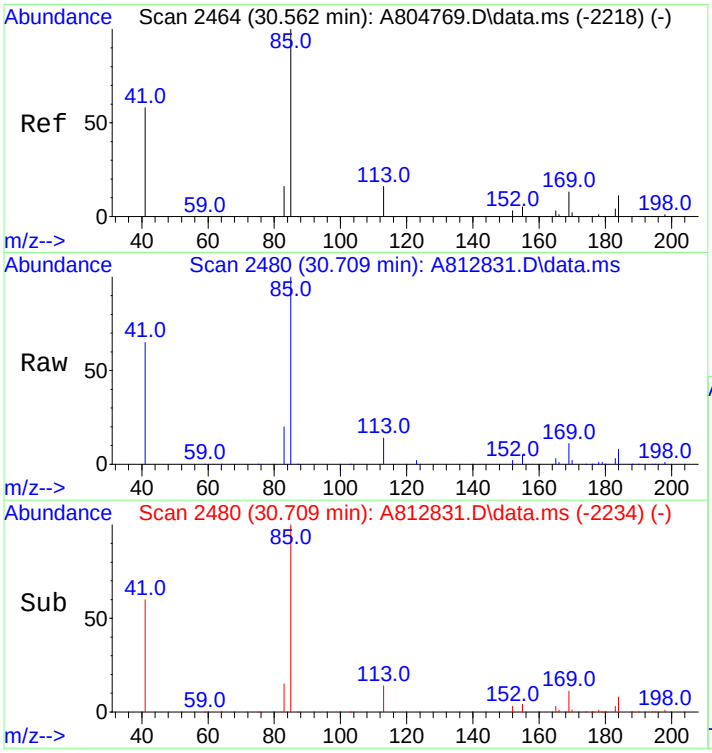


#13
C3-Naphthalenes
Concen: 4968.67 ng/mL m
RT: 27.953 min Scan# 2178
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:170 Resp: 1779439

Ion	Ratio	Lower	Upper
170	100		
155	18.5	80.2	120.4#

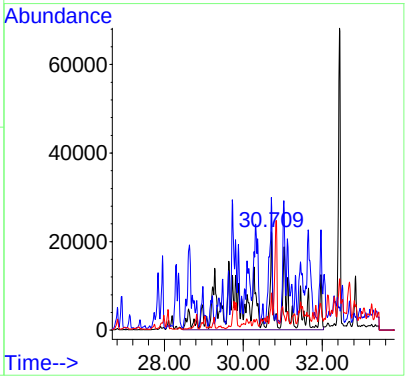


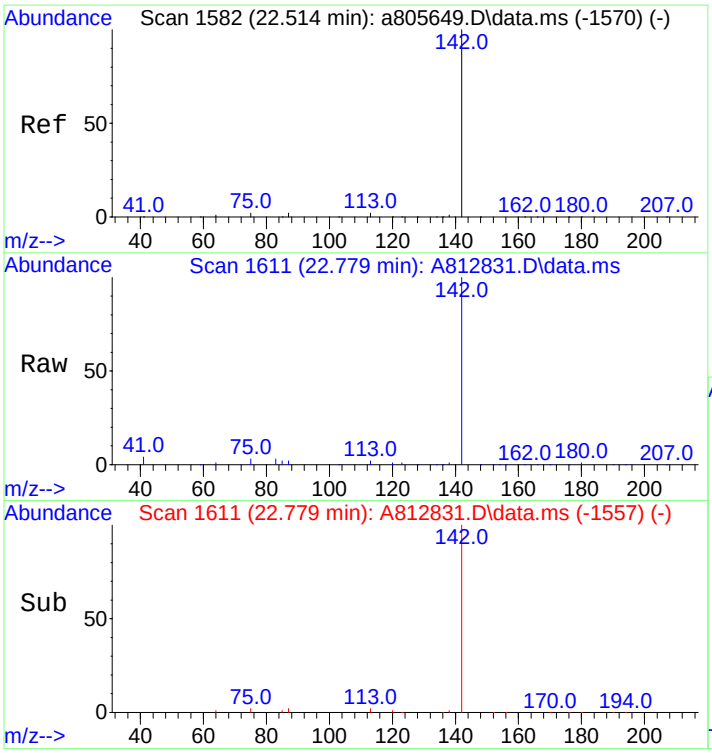


#14
C4-Naphthalenes
Concen: 2586.03 ng/mL m
RT: 30.709 min Scan# 2480
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:184 Resp: 926139

Ion	Ratio	Lower	Upper
184	100		
169	16.4	108.2	162.2#
183	2.3	29.7	44.5#

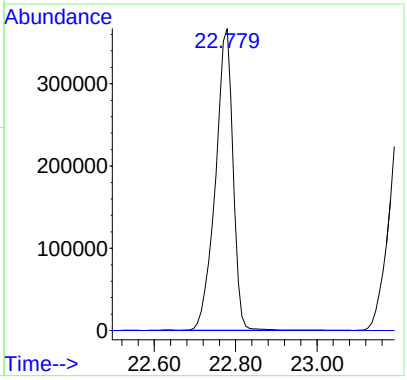


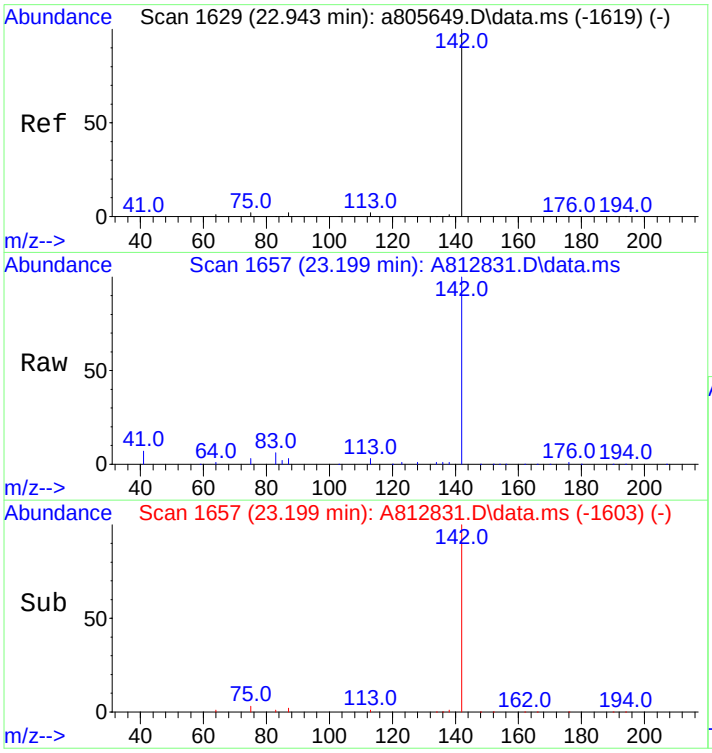


#16
2-Methylnaphthalene
Concen: 5148.52 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:142 Resp: 1098352

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

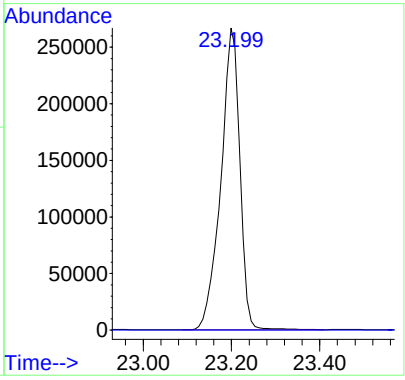


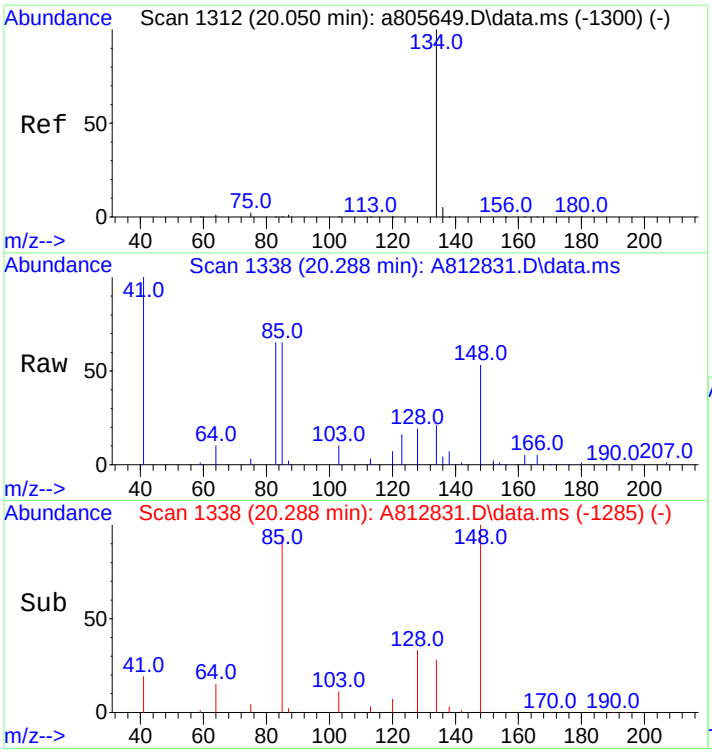


#17
1-Methylnaphthalene
Concen: 3984.11 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:142 Resp: 795886

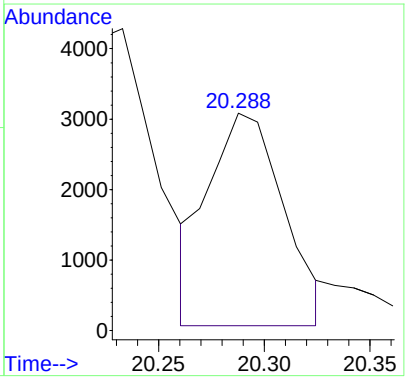
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

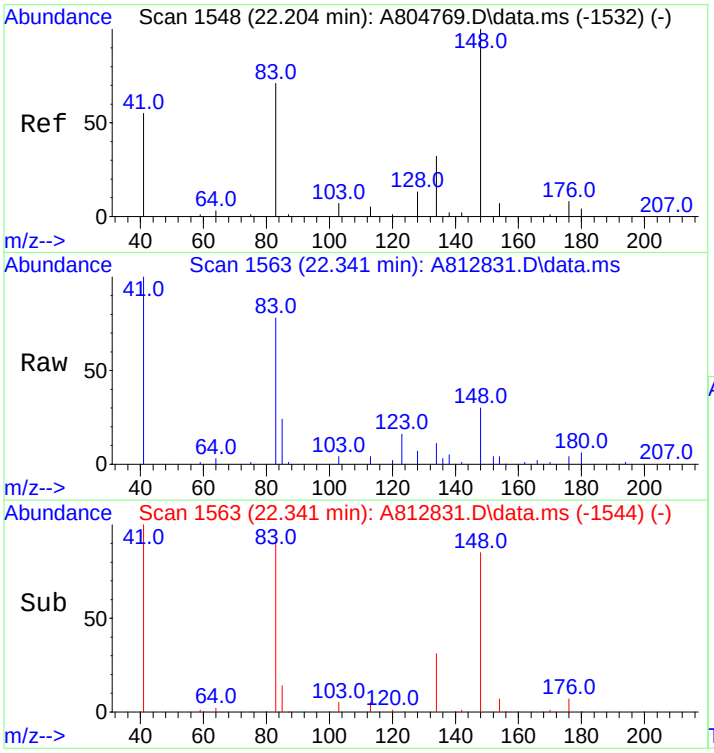




#18
Benzothiophene
Concen: 25.84 ng/mL m
RT: 20.288 min Scan# 1338
Delta R.T. -0.018 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

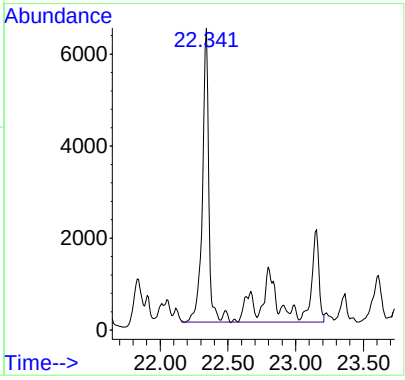
Tgt Ion:134 Resp: 7480

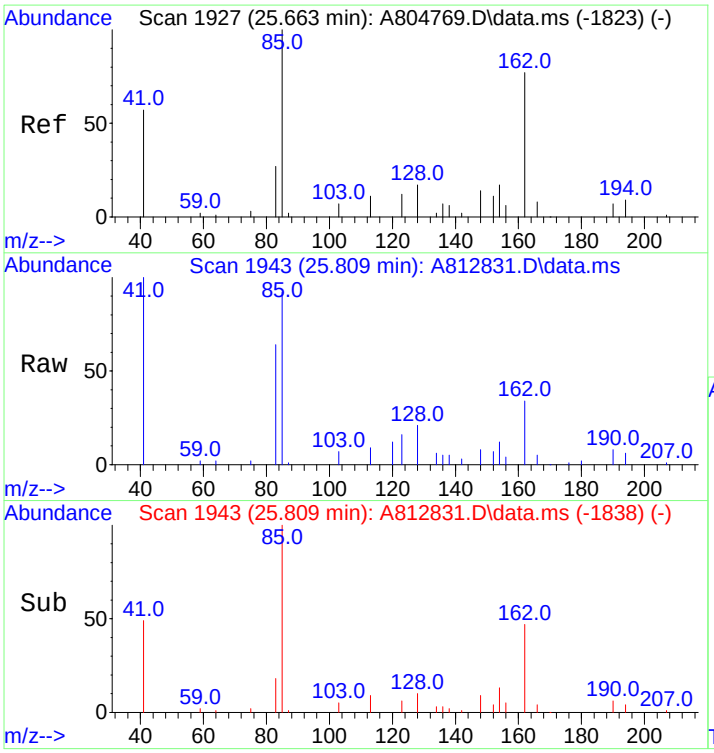




#19
C1-Benzo(b)thiophenes
Concen: 135.44 ng/mL m
RT: 22.341 min Scan# 1563
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

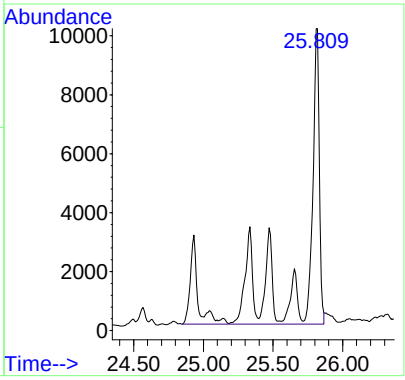
Tgt Ion:148 Resp: 39206

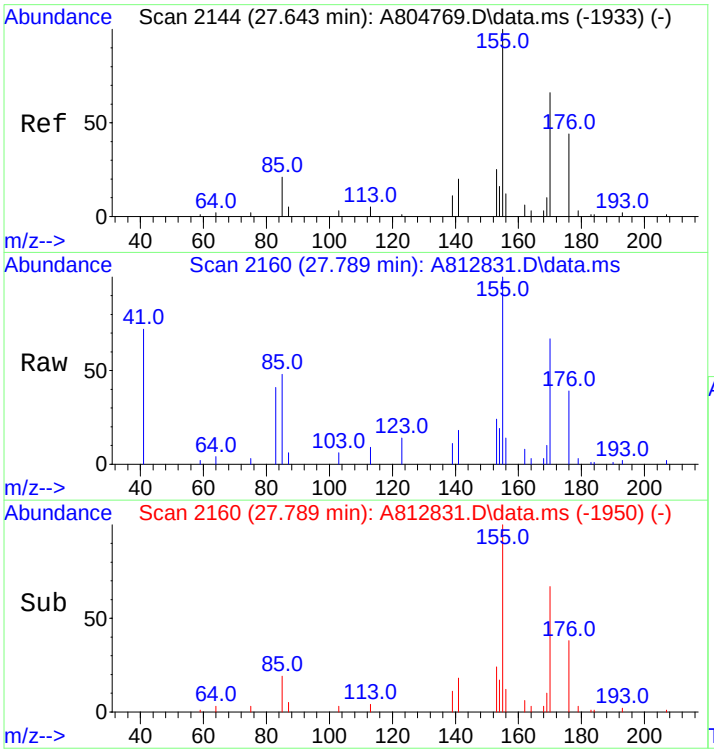




#20
C2-Benzo(b)thiophenes
Concen: 249.53 ng/mL m
RT: 25.809 min Scan# 1943
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

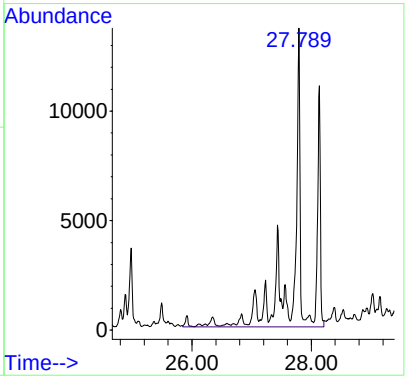
Tgt Ion:162 Resp: 72234

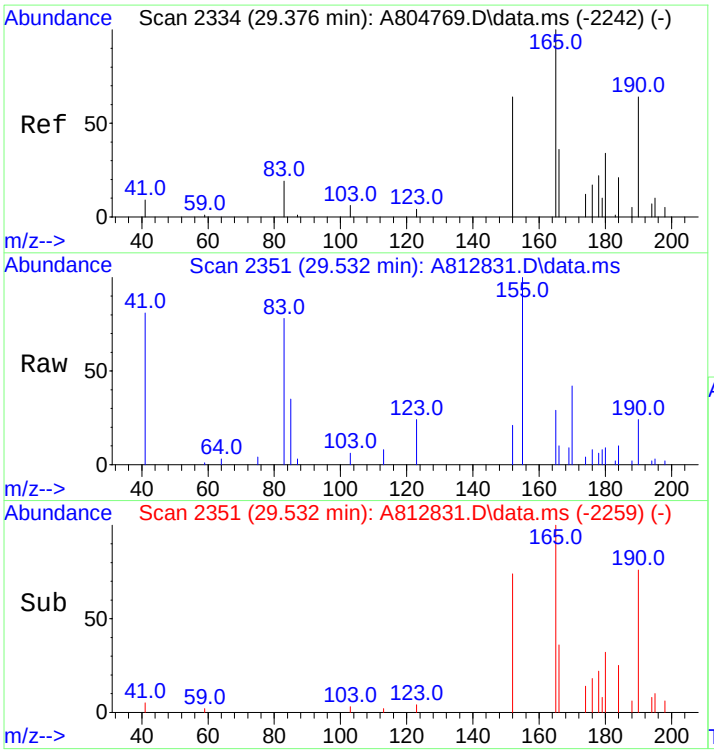




#21
C3-Benzo(b)thiophenes
Concen: 481.14 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

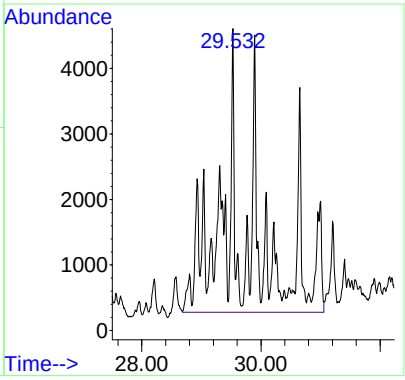
Tgt Ion:176 Resp: 139278

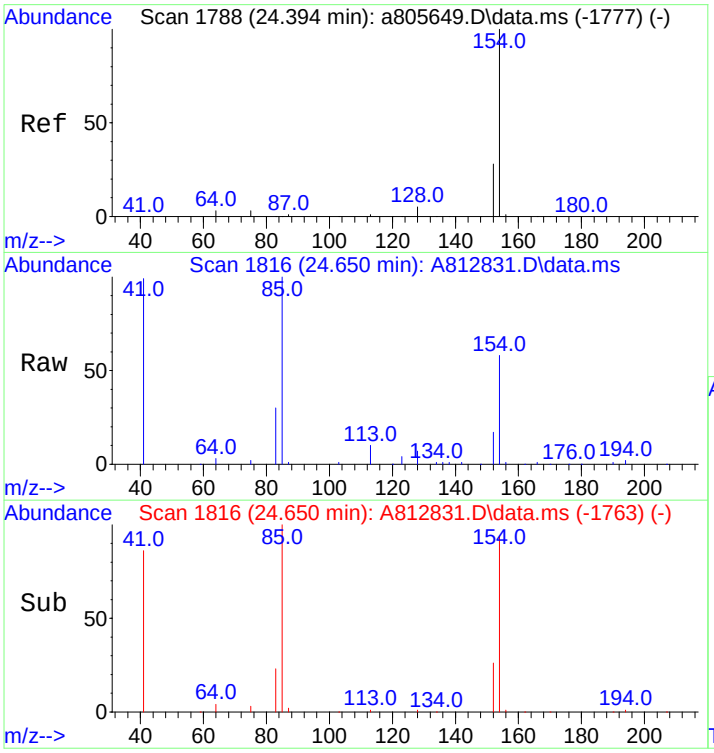




#22
C4-Benzo(b)thiophenes
Concen: 419.86 ng/mL m
RT: 29.532 min Scan# 2351
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:190 Resp: 121540

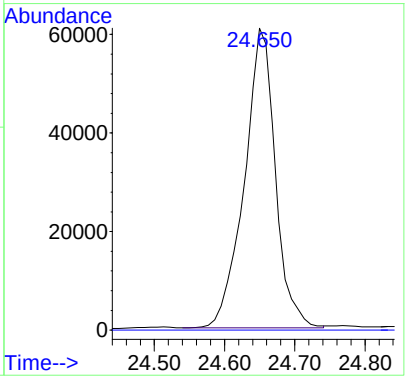


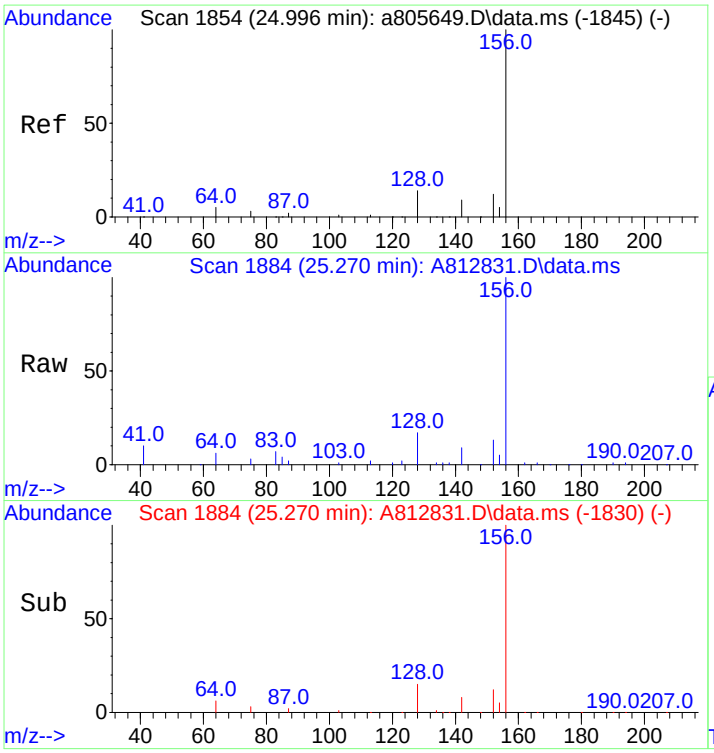


#23
Biphenyl
Concen: 687.62 ng/mL
RT: 24.650 min Scan# 1816
Delta R.T. -0.018 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:154 Resp: 186634

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

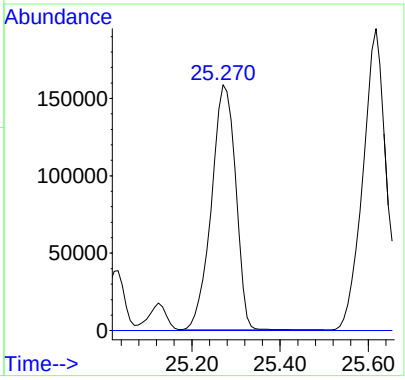


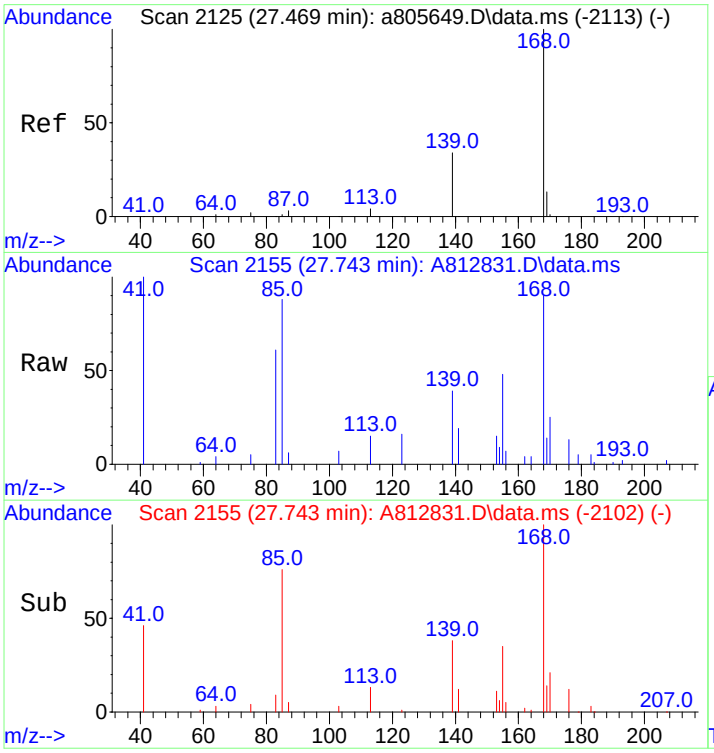


#24
2,6-Dimethylnaphthalene
Concen: 3315.81 ng/mL
RT: 25.270 min Scan# 1884
Delta R.T. -0.010 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:156 Resp: 605392

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

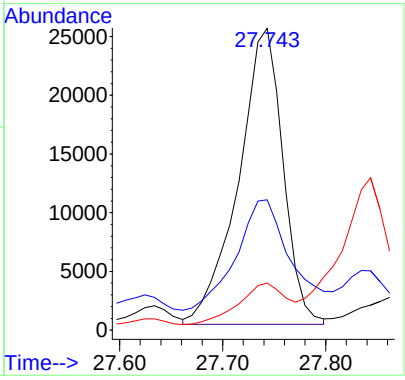


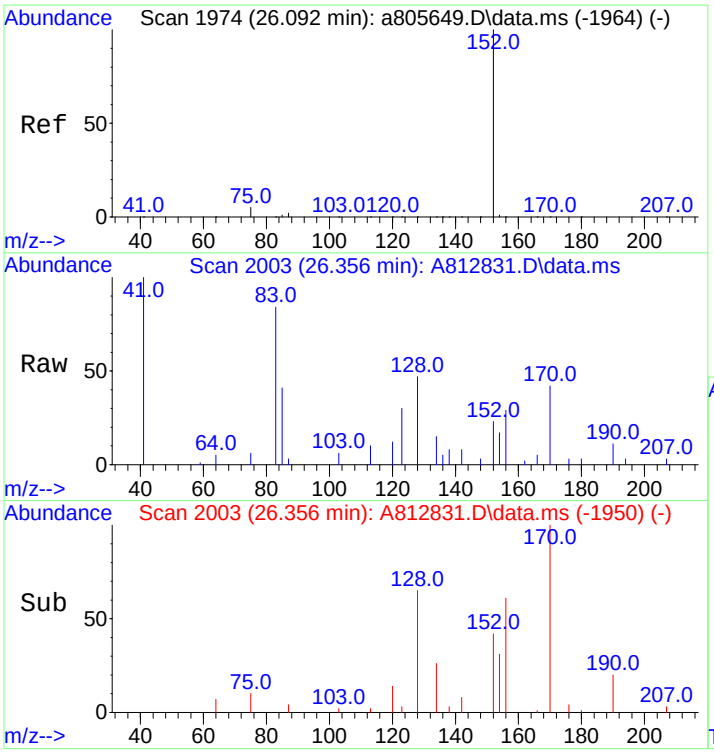


#25
Dibenzofuran
Concen: 265.05 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:168 Resp: 75894

Ion	Ratio	Lower	Upper
168	100		
139	45.7	28.0	42.0#
169	15.4	10.6	15.8

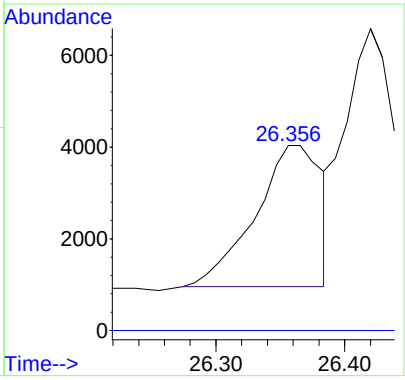


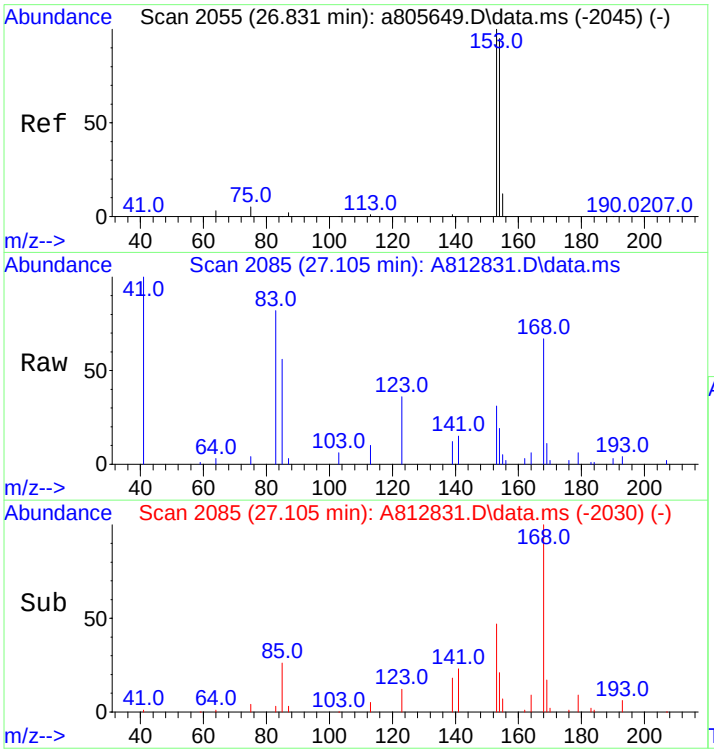


#26
Acenaphthylene
Concen: 33.84 ng/mL
RT: 26.356 min Scan# 2003
Delta R.T. -0.019 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:152 Resp: 11000

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

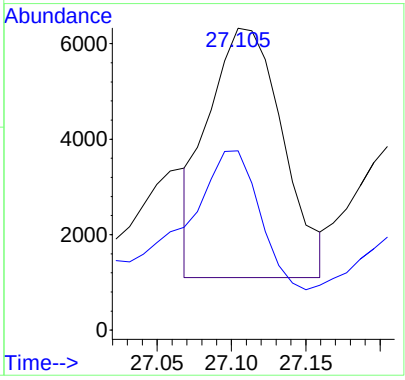


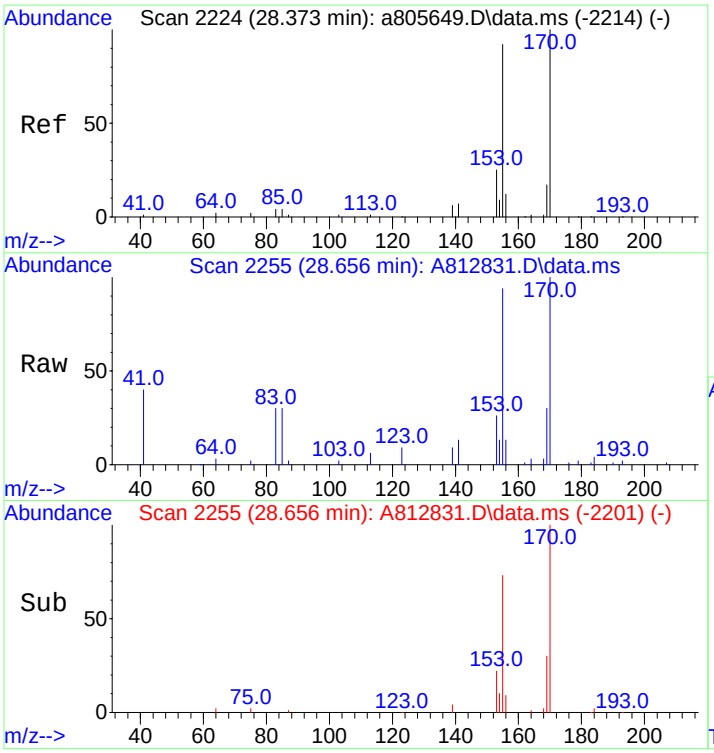


#27
Acenaphthene
Concen: 93.72 ng/mL m
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:153 Resp: 18184

Ion	Ratio	Lower	Upper
153	100		
154	74.7	75.4	113.2#

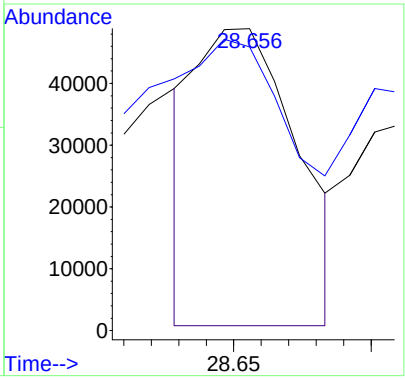


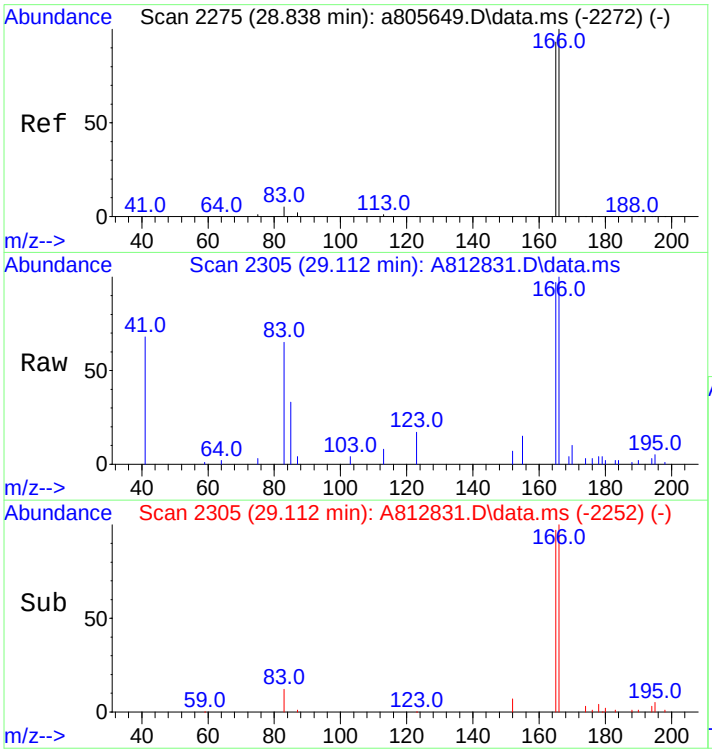


#28
2,3,5-Trimethylnaphthalene
Concen: 789.83 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:170 Resp: 124200

Ion	Ratio	Lower	Upper
170	100		
155	177.9	71.7	107.5#

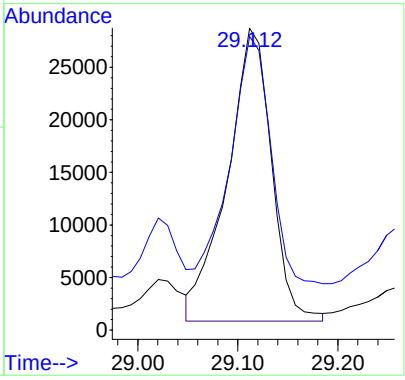


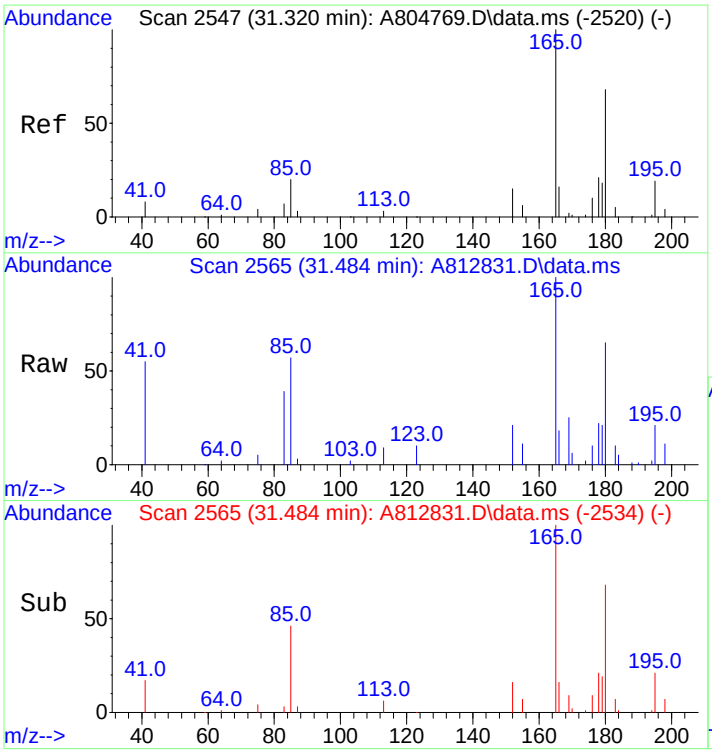


#29
Fluorene
Concen: 393.71 ng/mL m
RT: 29.112 min Scan# 2305
Delta R.T. -0.018 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:166 Resp: 85680

Ion	Ratio	Lower	Upper
166	100		
165	105.9	74.2	111.2

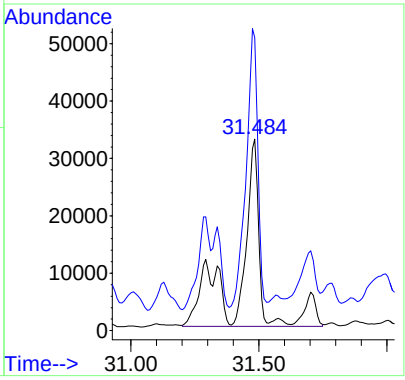


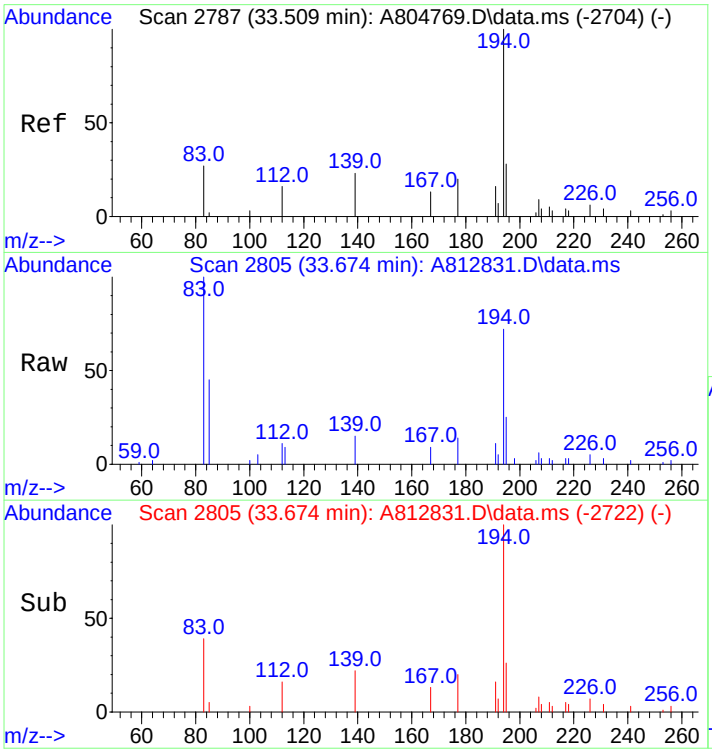


#30
C1-Fluorenes
Concen: 848.38 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:180 Resp: 184625

Ion	Ratio	Lower	Upper
180	100		
165	82.7	122.4	183.6#

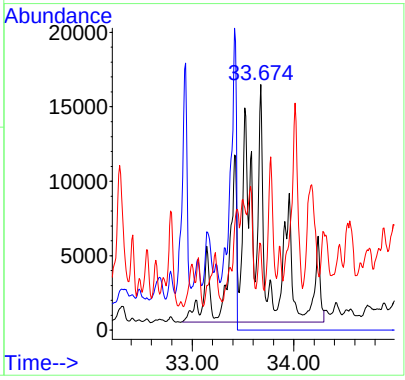


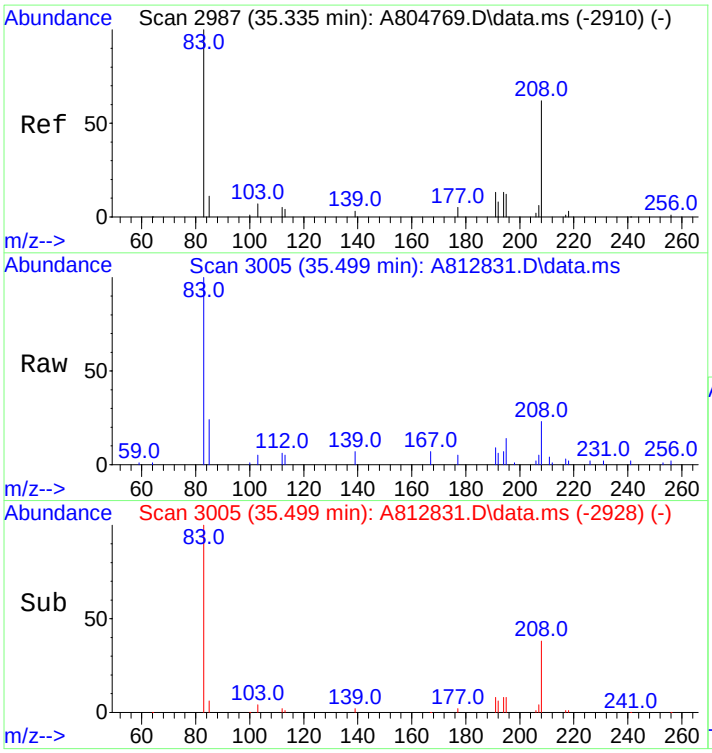


#31
C2-Fluorenes
Concen: 1281.07 ng/mL m
RT: 33.674 min Scan# 2805
Delta R.T. 0.068 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:194 Resp: 278786

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.4	41.0#

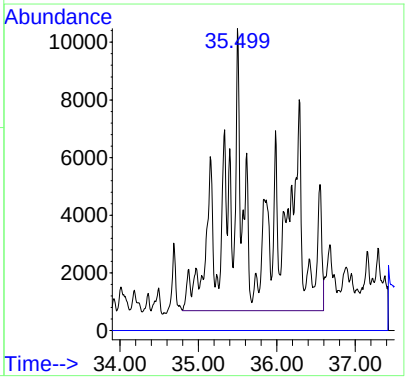


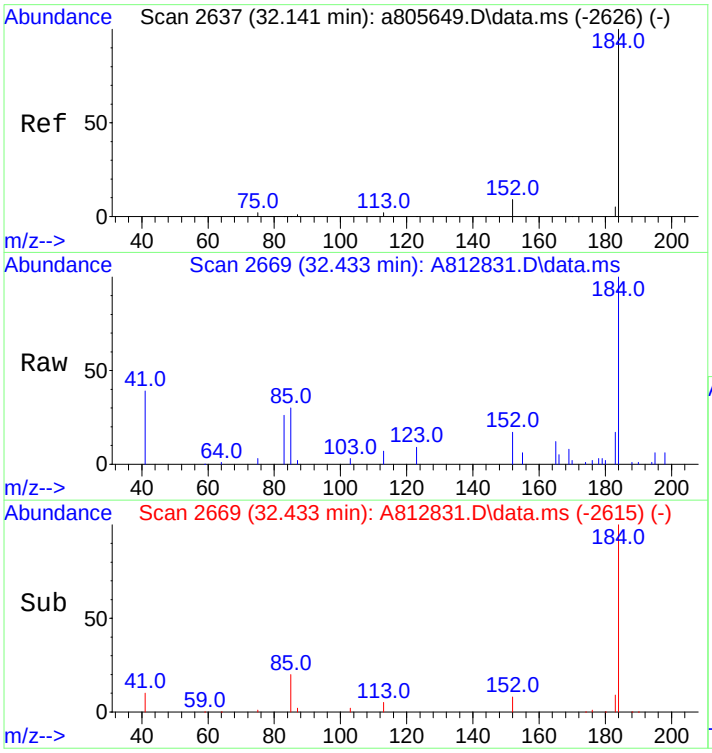


#32
C3-Fluorenes
Concen: 1264.77 ng/mL m
RT: 35.499 min Scan# 3005
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:208 Resp: 275240

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

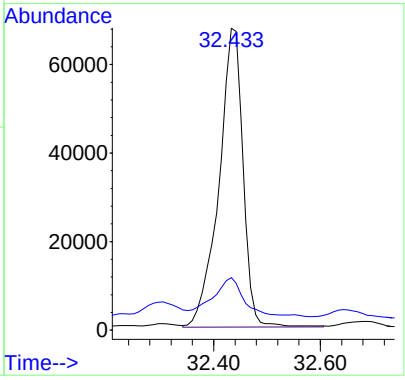


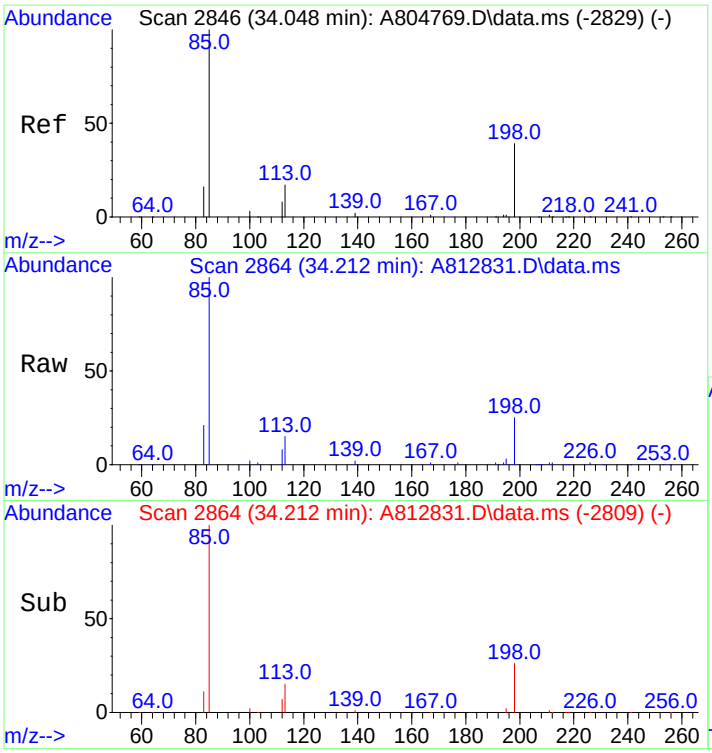


#33
Dibenzothiophene
Concen: 708.69 ng/mL
RT: 32.433 min Scan# 2669
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:184 Resp: 212077

Ion	Ratio	Lower	Upper
184	100		
152	15.4	7.8	11.8#

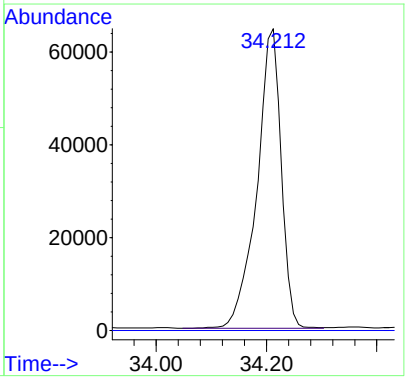


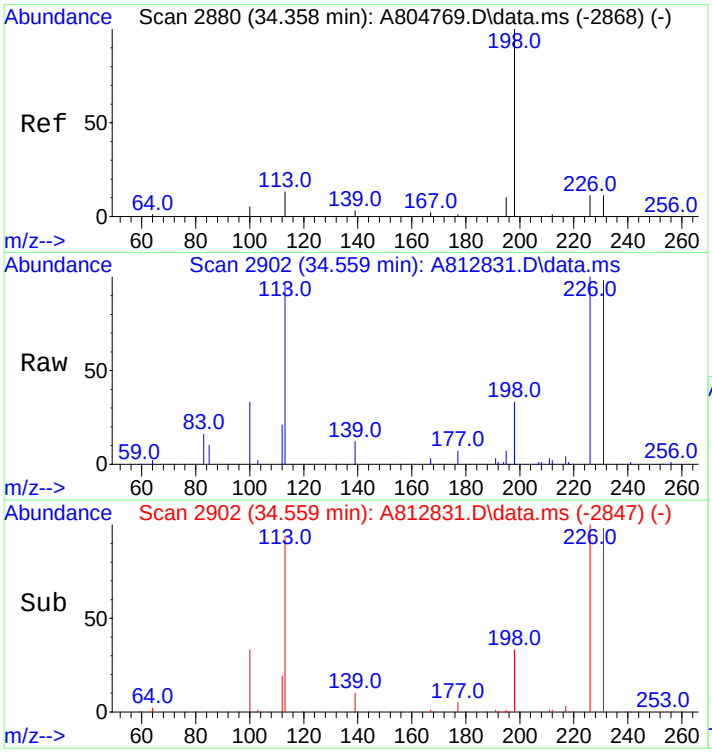


#34
4-Methyldibenzothiophene(4MDT)
Concen: 656.28 ng/mL
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 196394

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

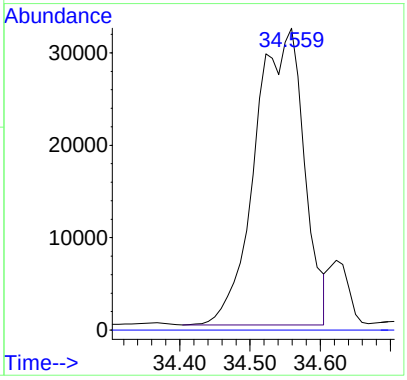


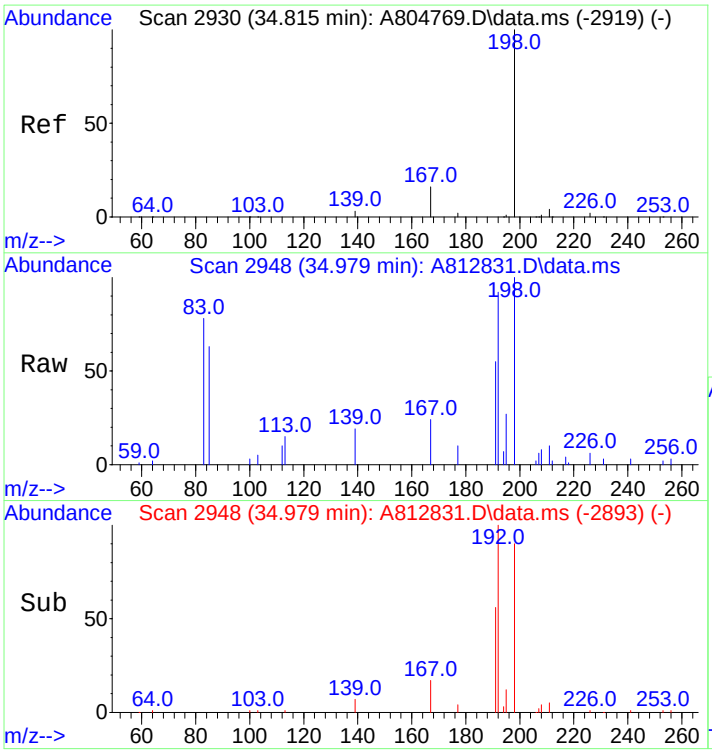


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 518.11 ng/mL
RT: 34.559 min Scan# 2902
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 155047

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

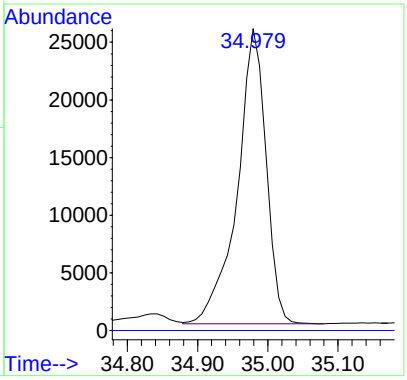


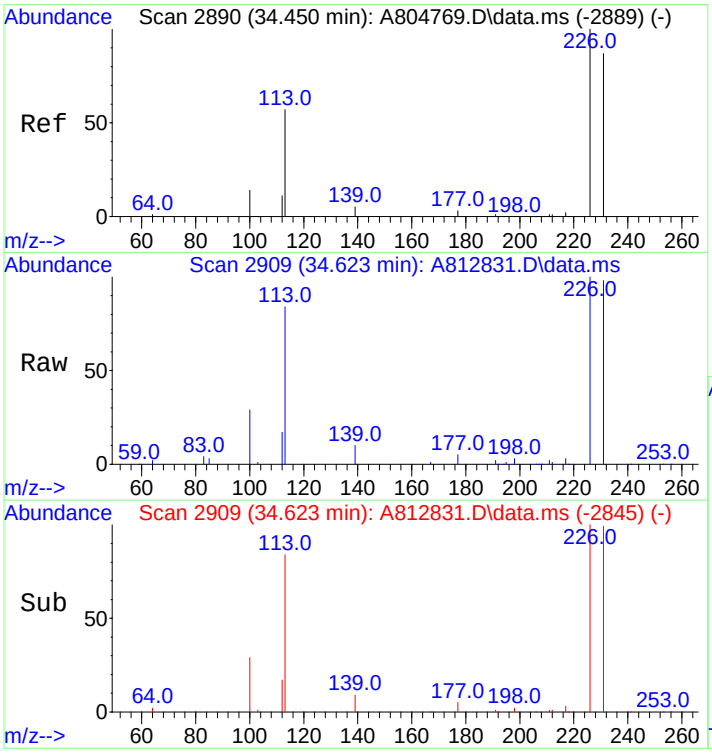


#36
1-Methyldibenzothiophene(1MDT)
Concen: 244.05 ng/mL
RT: 34.979 min Scan# 2948
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 73034

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

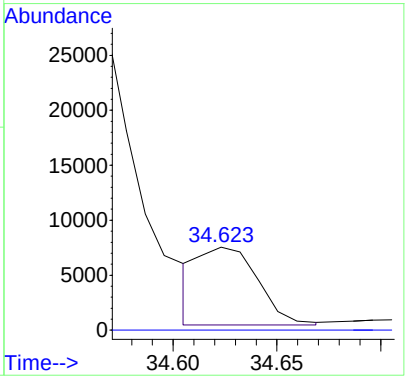


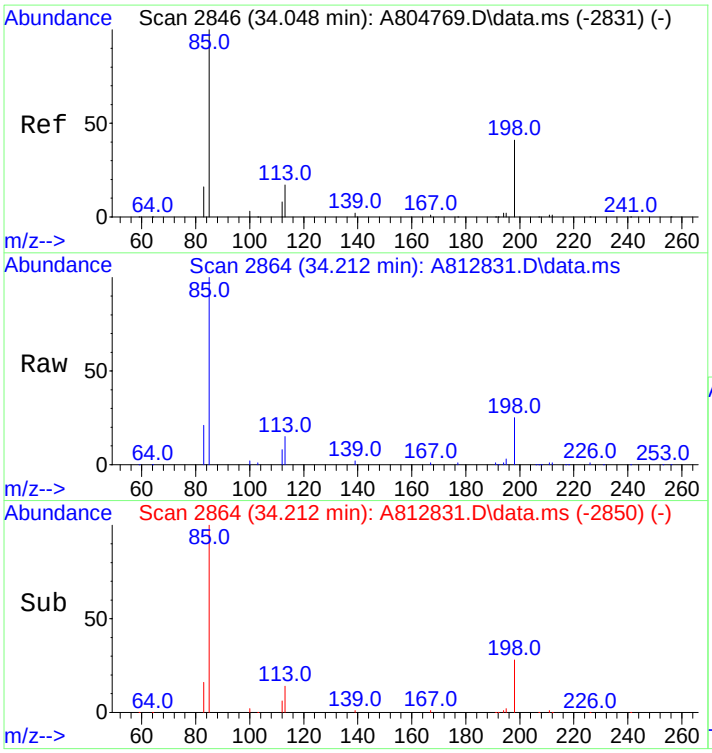


#37
OTP
Concen: 47.25 ng/mL m
RT: 34.623 min Scan# 2909
Delta R.T. 0.037 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 14139

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

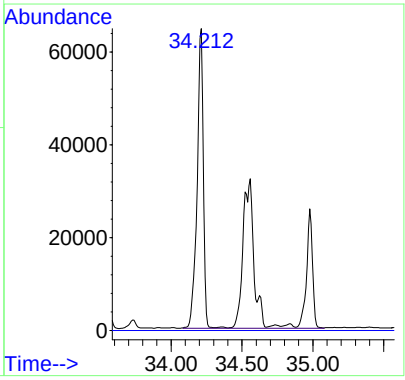


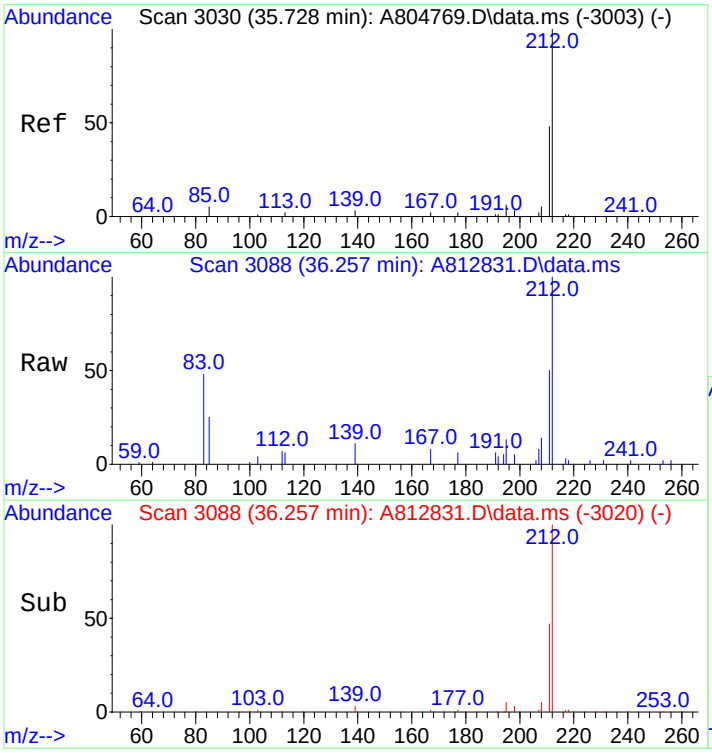


#38
C1-Dibenzothiophenes
Concen: 1492.16 ng/mL m
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 446536

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

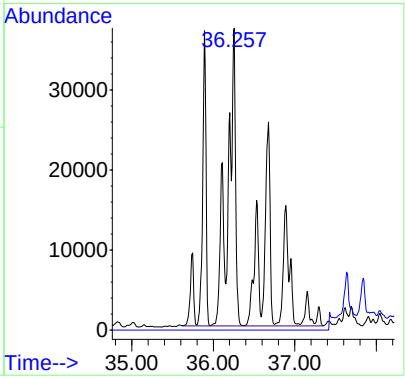


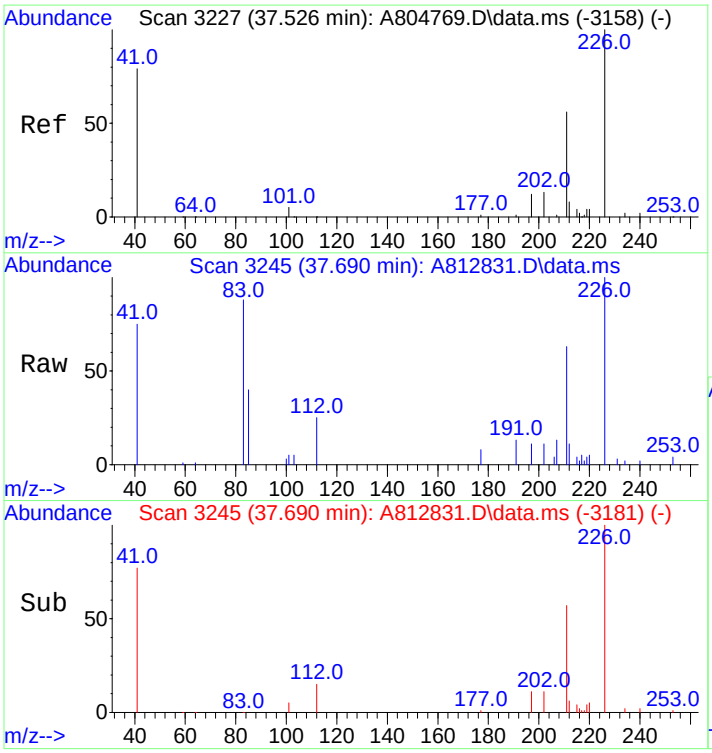


#39
C2-Dibenzothiophenes
Concen: 2100.92 ng/mL m
RT: 36.257 min Scan# 3088
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:212 Resp: 628709

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

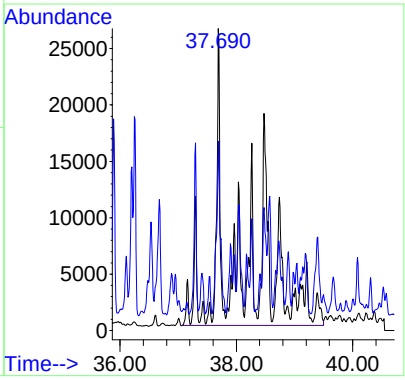


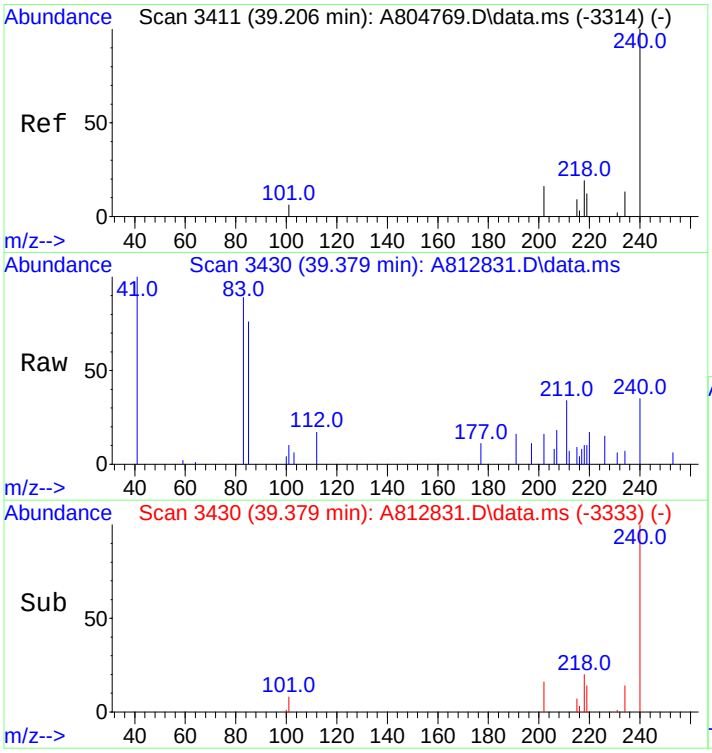


#40
C3-Dibenzothiophenes
Concen: 1813.73 ng/mL m
RT: 37.690 min Scan# 3245
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:226 Resp: 542766

Ion	Ratio	Lower	Upper
226	100		
211	2.4	50.2	75.2#

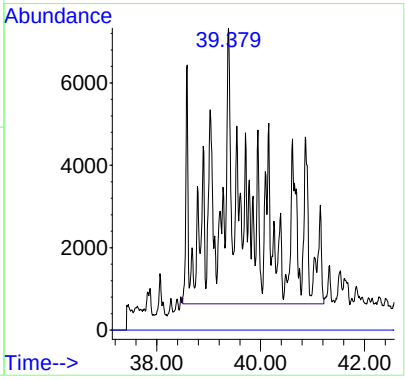


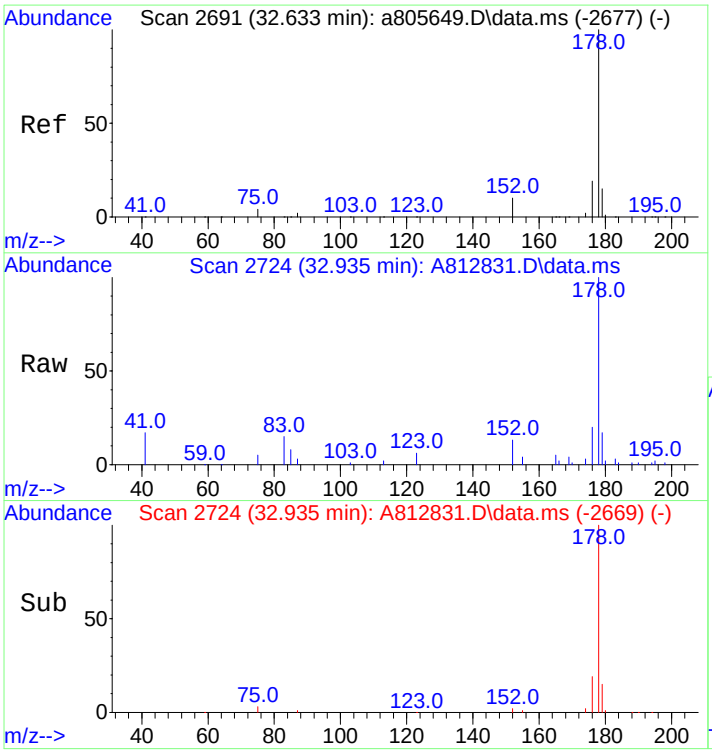


#41
C4-Dibenzothiophenes
Concen: 1001.31 ng/mL m
RT: 39.379 min Scan# 3430
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:240 Resp: 299645

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

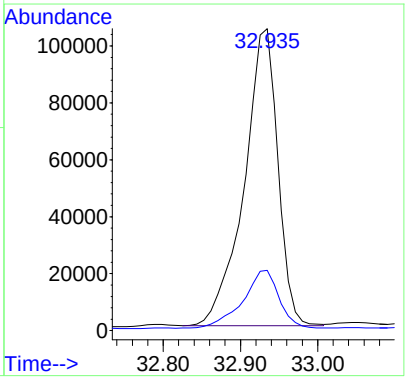


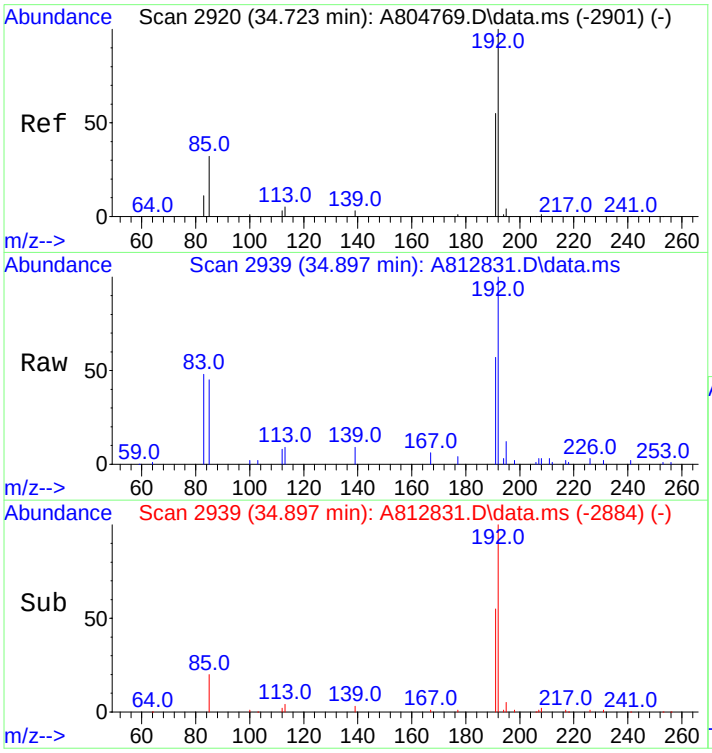


#43
Phenanthrene
Concen: 1100.18 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:178 Resp: 316886

Ion	Ratio	Lower	Upper
178	100		
176	21.0	15.2	22.8

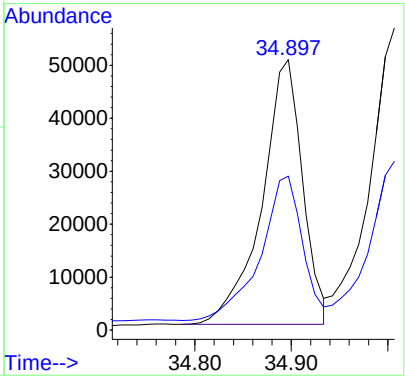


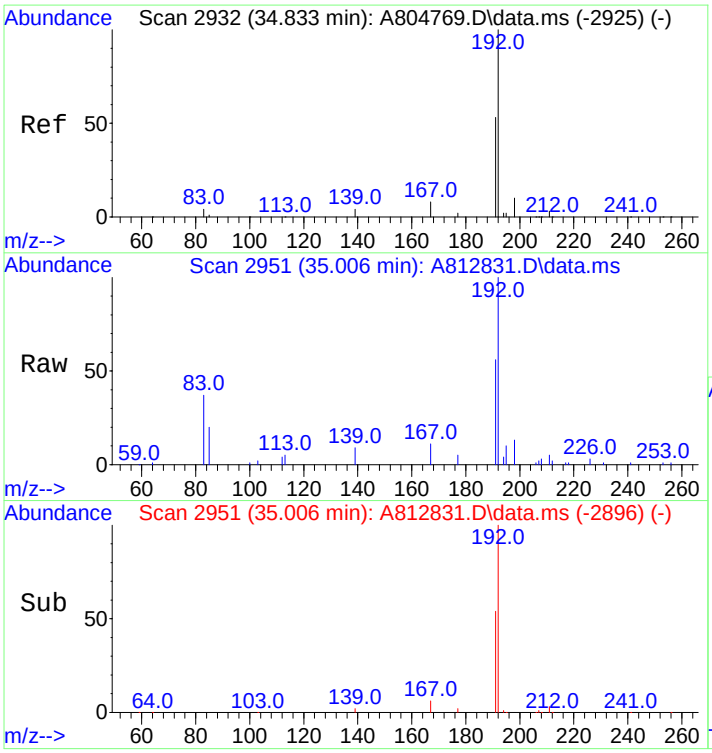


#44
3-Methylphenanthrene(3MP)
Concen: 509.28 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 146687

Ion	Ratio	Lower	Upper
192	100		
191	56.1	45.5	68.3

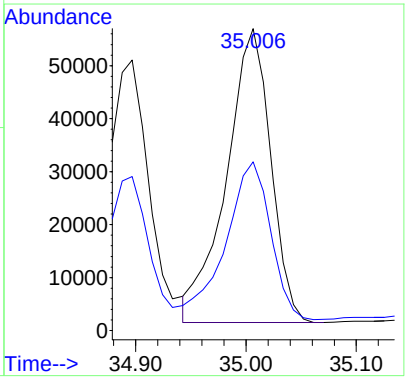


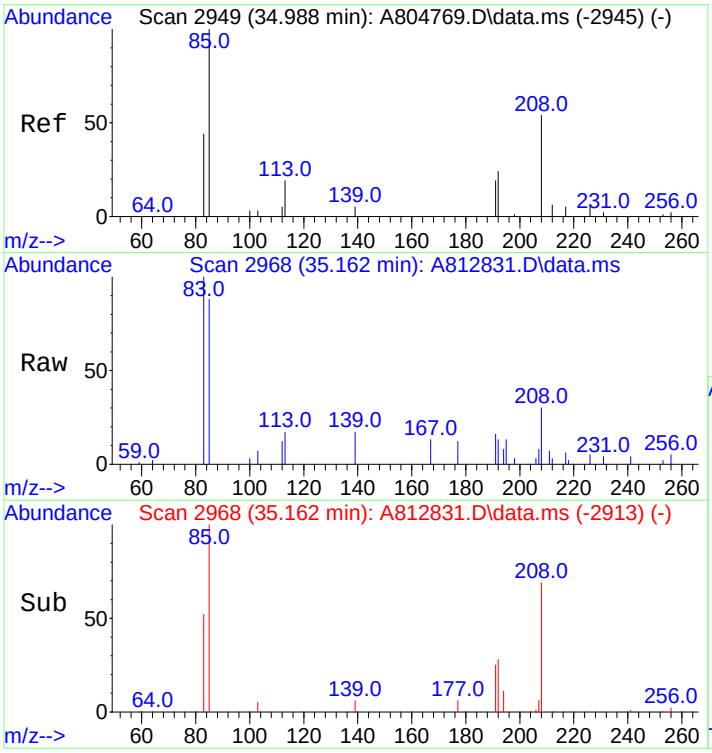


#45
2-Methylphenanthrene(2MP)
Concen: 540.13 ng/mL
RT: 35.006 min Scan# 2951
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 155574

Ion	Ratio	Lower	Upper
192	100		
191	53.5	44.6	67.0

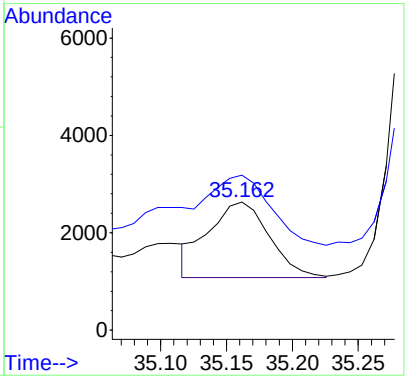


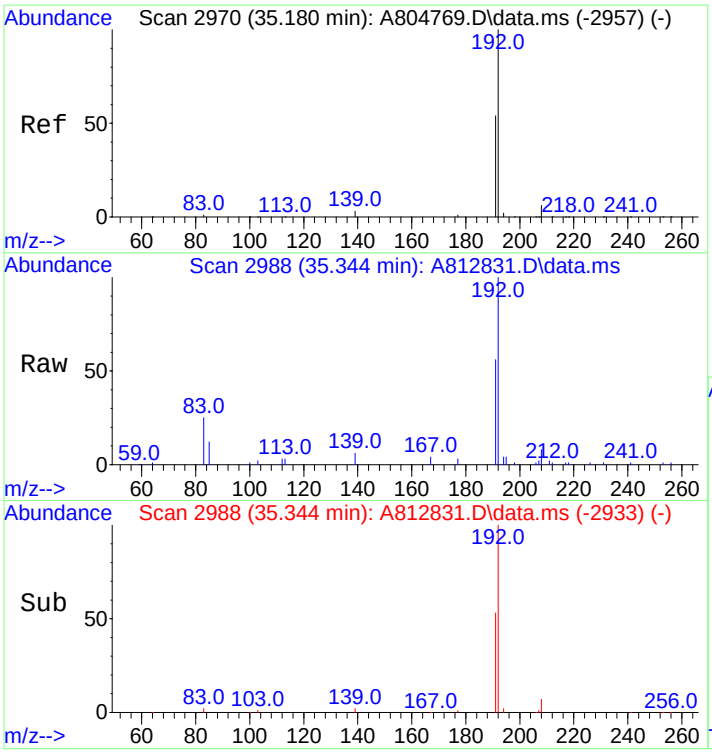


#46
2-Methylanthracene(2MA)
Concen: 17.42 ng/mL m
RT: 35.162 min Scan# 2968
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 5018

Ion	Ratio	Lower	Upper
192	100		
191	135.5	96.9	145.3

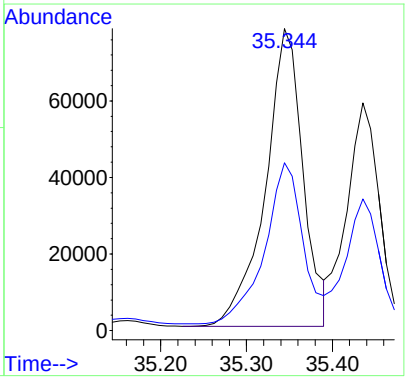


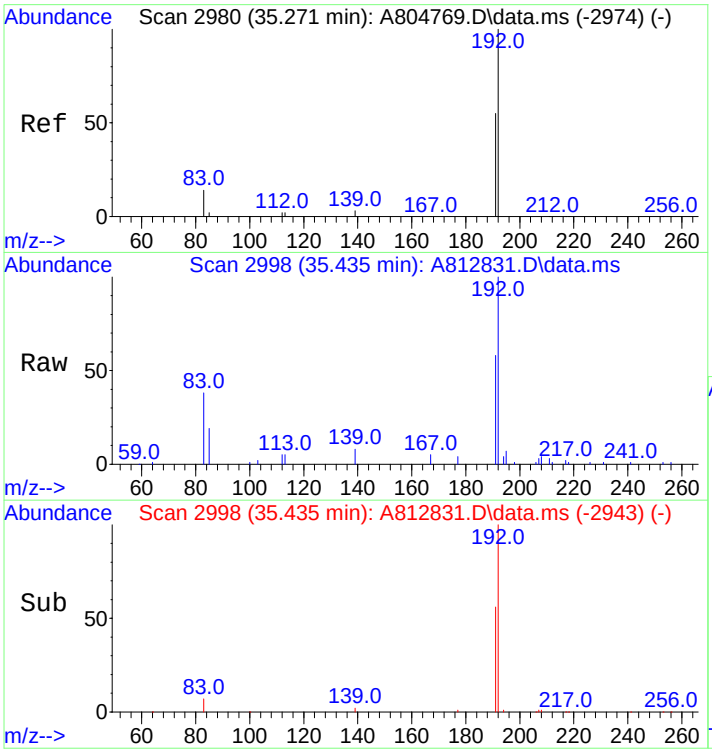


#47
9/4-Methylphenanthrene(9MP)
Concen: 824.36 ng/mL
RT: 35.344 min Scan# 2988
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 237440

Ion	Ratio	Lower	Upper
192	100		
191	55.0	44.5	66.7

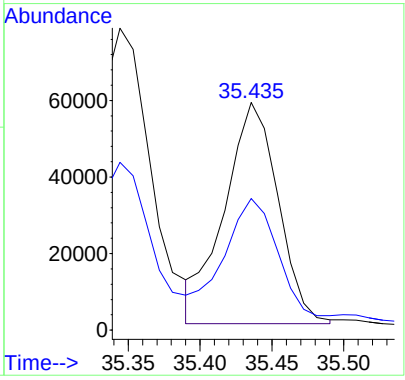


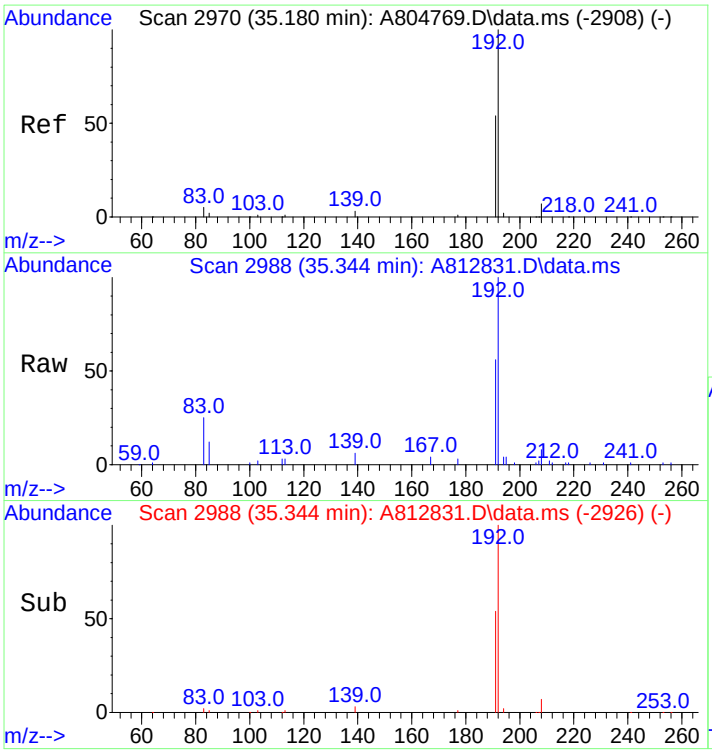


#48
1-Methylphenanthrene(1MP)
Concen: 522.02 ng/mL m
RT: 35.435 min Scan# 2998
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 150356

Ion	Ratio	Lower	Upper
192	100		
191	51.6	46.2	69.4

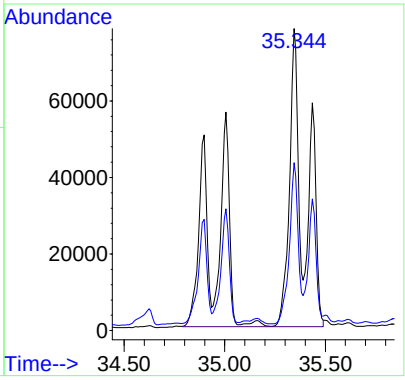


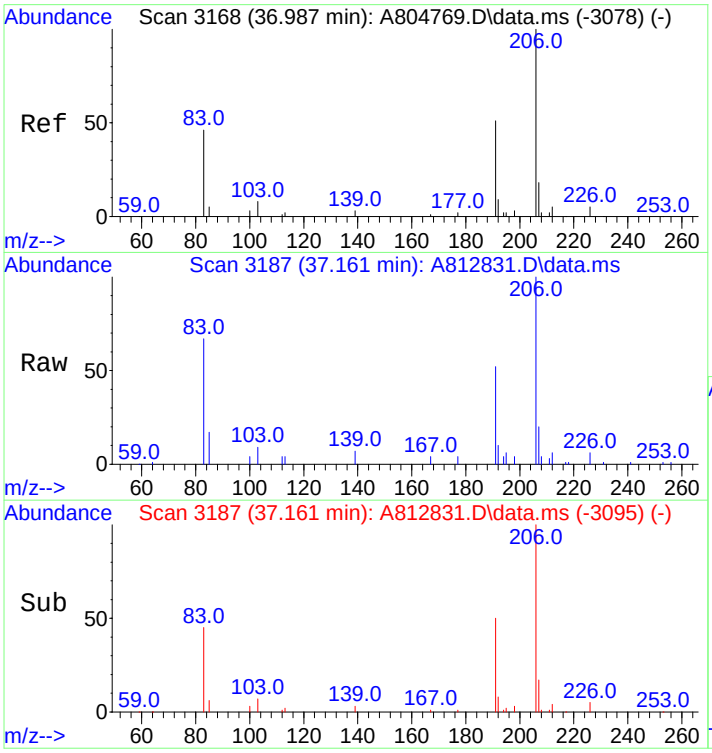


#49
C1-Phenanthrenes/Anthracenes
Concen: 2458.47 ng/mL m
RT: 35.344 min Scan# 2988
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 708112

Ion	Ratio	Lower	Upper
192	100		
191	18.4	44.5	66.7#

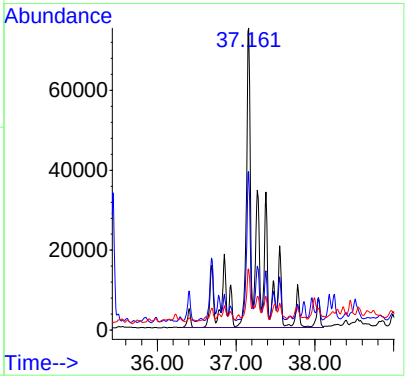


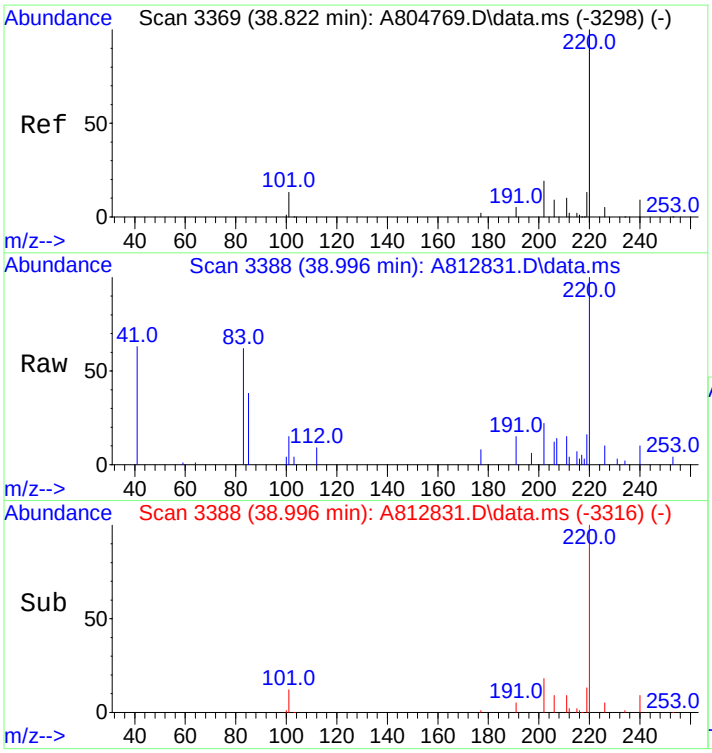


#50
C2-Phenanthrenes/Anthracenes
Concen: 2619.72 ng/mL m
RT: 37.161 min Scan# 3187
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:206 Resp: 754557

Ion	Ratio	Lower	Upper
206	100		
191	16.4	42.0	63.0#
207	5.7	16.2	24.4#

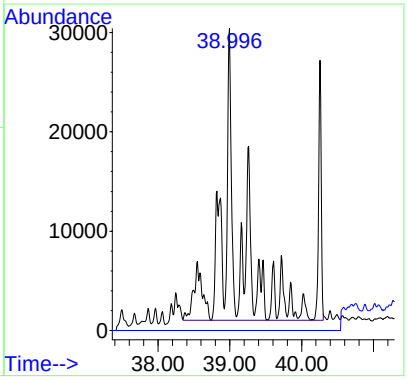


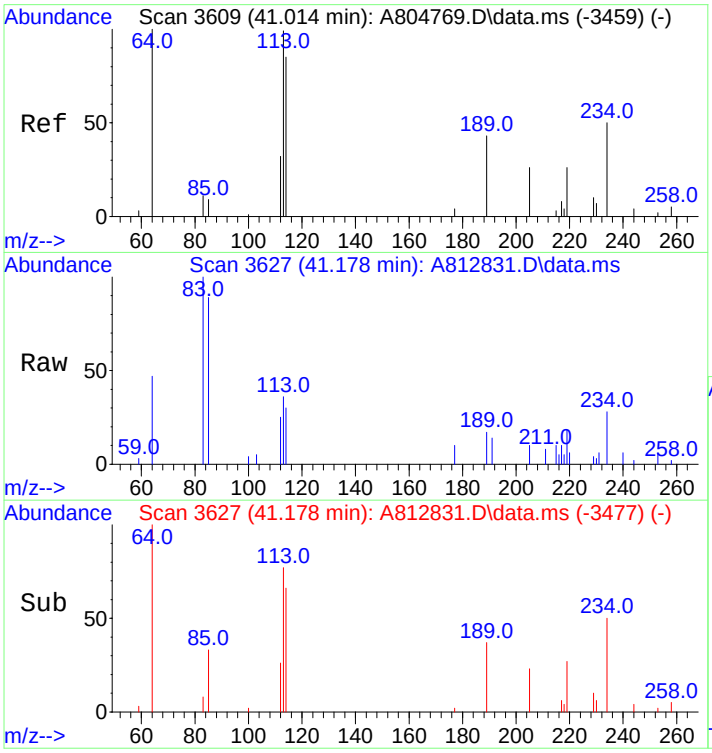


#52
C3-Phenanthrenes/Anthracenes
Concen: 1681.02 ng/mL m
RT: 38.996 min Scan# 3388
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:220 Resp: 484184

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

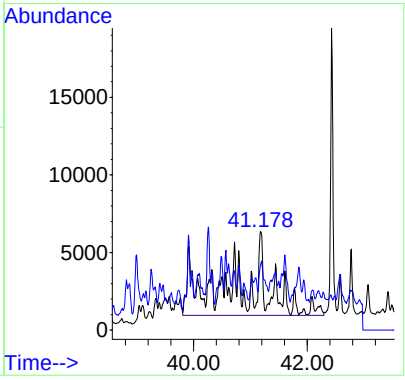


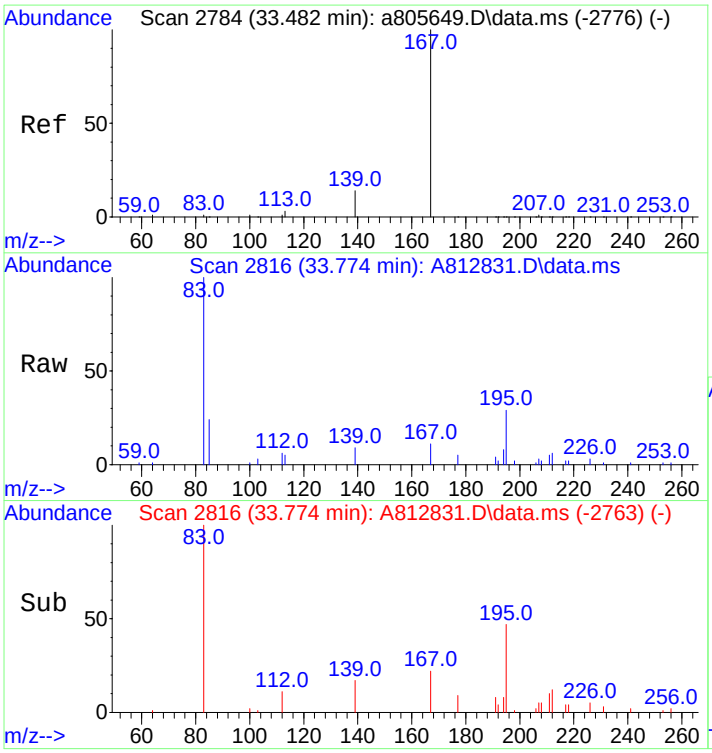


#53
C4-Phenanthrenes/Anthracenes
Concen: 700.12 ng/mL m
RT: 41.178 min Scan# 3627
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 201655

Ion	Ratio	Lower	Upper
234	100		
219	2.6	52.3	78.5#

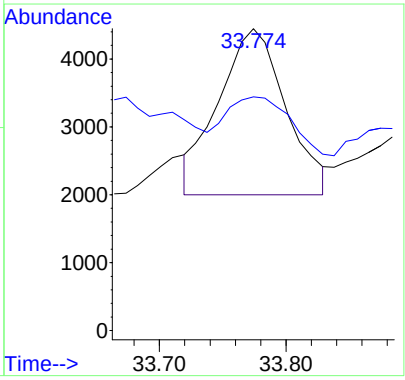


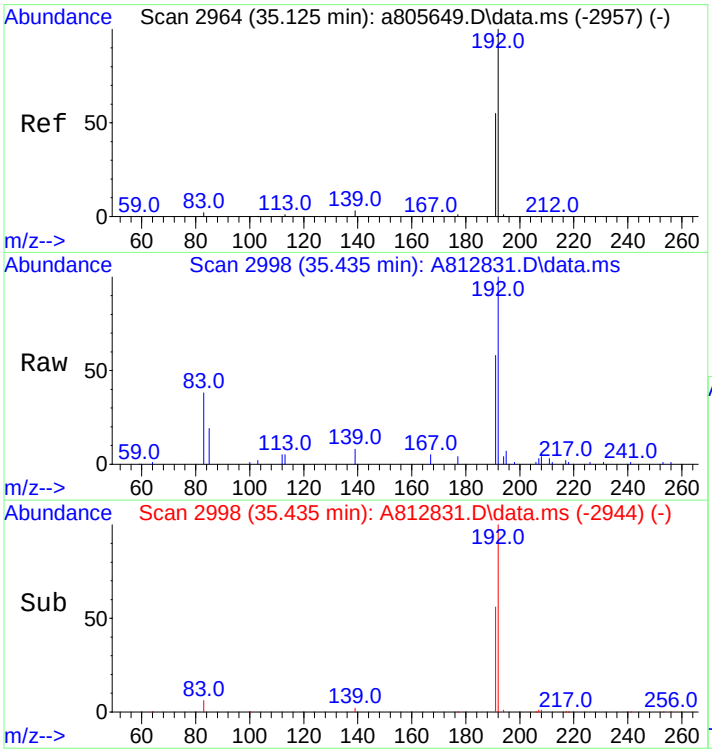


#56
Carbazole
Concen: 32.28 ng/mL m
RT: 33.774 min Scan# 2816
Delta R.T. -0.019 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:167 Resp: 9037

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.6	16.0#

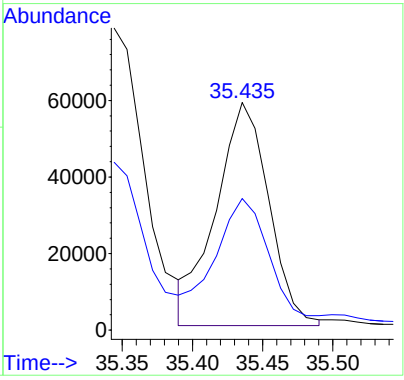


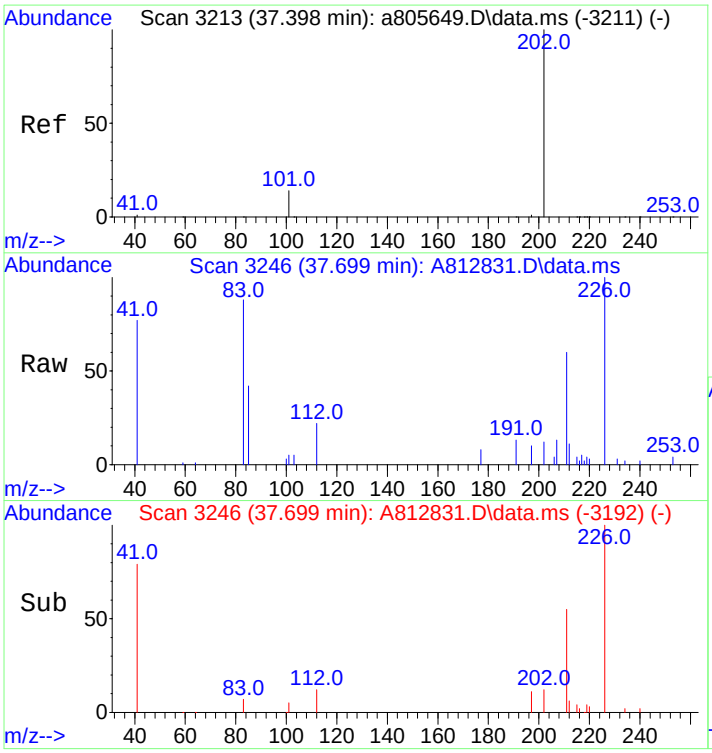


#57
1-Methylphenanthrene
Concen: 751.02 ng/mL m
RT: 35.435 min Scan# 2998
Delta R.T. -0.010 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 153338

Ion	Ratio	Lower	Upper
192	100		
191	50.6	44.2	66.4

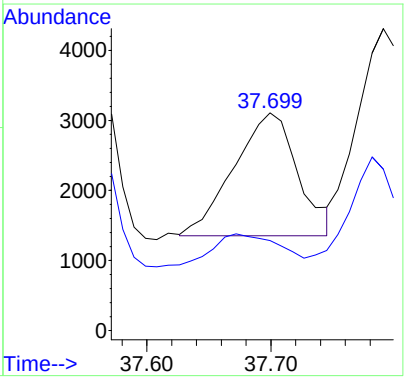


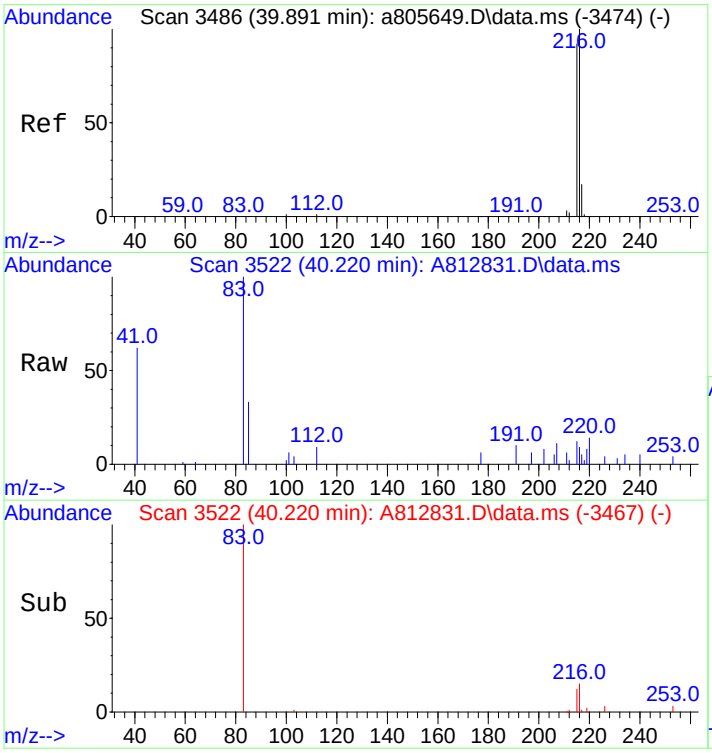


#58
Fluoranthene
Concen: 21.20 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. -0.010 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:202 Resp: 6289

Ion	Ratio	Lower	Upper
202	100		
101	0.0	13.6	20.4#

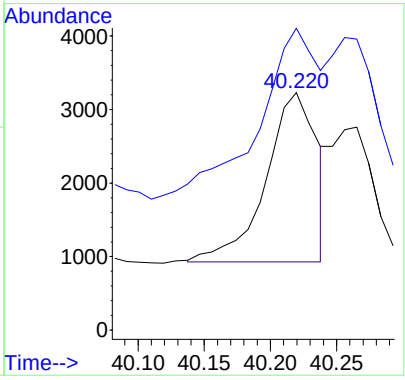


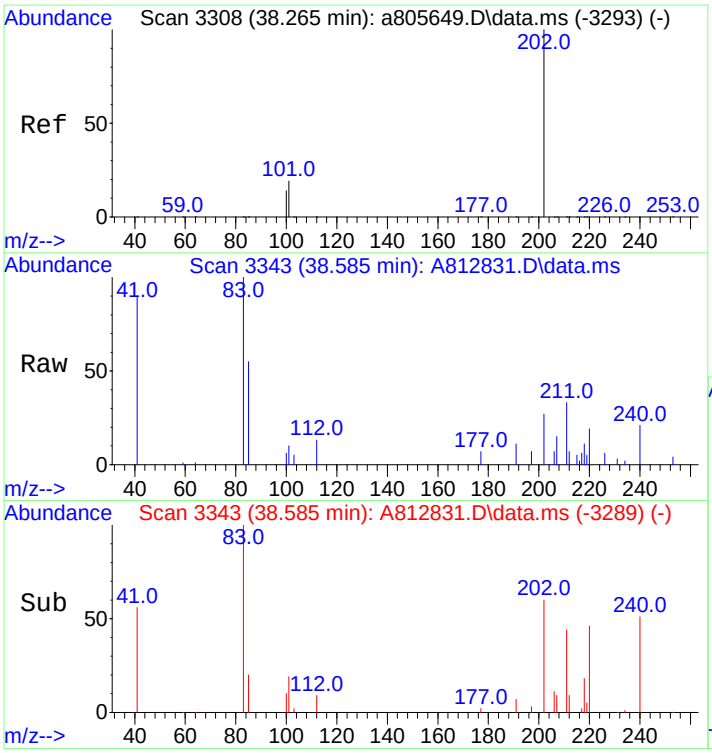


#59
Benzo(b)fluorene
Concen: 36.06 ng/mL m
RT: 40.220 min Scan# 3522
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:216 Resp: 6189

Ion	Ratio	Lower	Upper
216	100		
215	504.7	74.2	111.2#

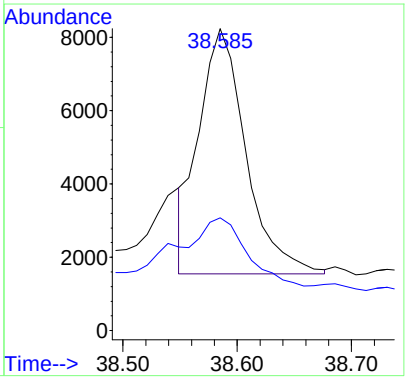


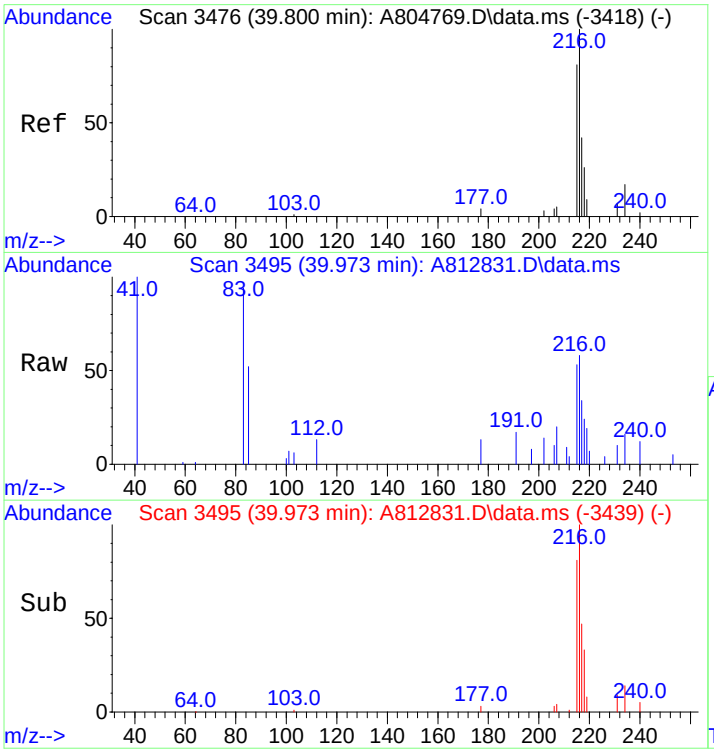


#60
Pyrene
Concen: 64.09 ng/mL m
RT: 38.585 min Scan# 3343
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:202 Resp: 19232

Ion	Ratio	Lower	Upper
202	100		
101	56.1	15.4	23.2#

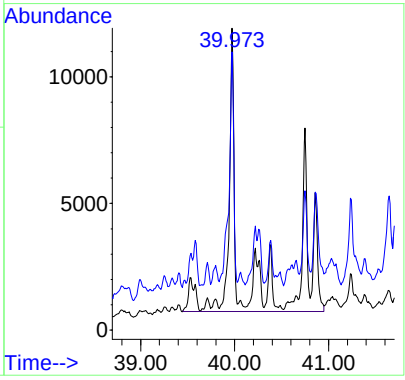


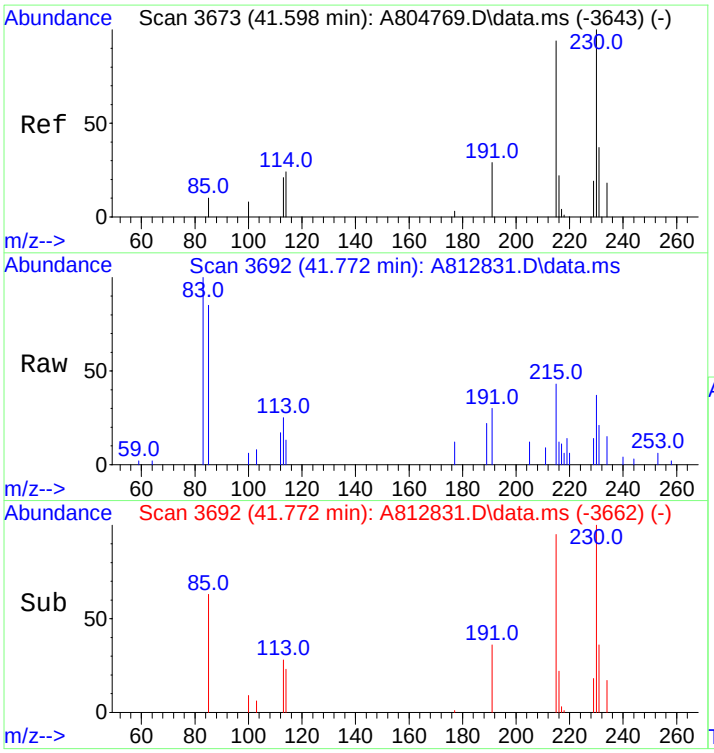


#61
C1-Fluoranthenes/Pyrenes
Concen: 359.86 ng/mL m
RT: 39.973 min Scan# 3495
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:216 Resp: 107991

Ion	Ratio	Lower	Upper
216	100		
215	28.9	73.8	110.6#

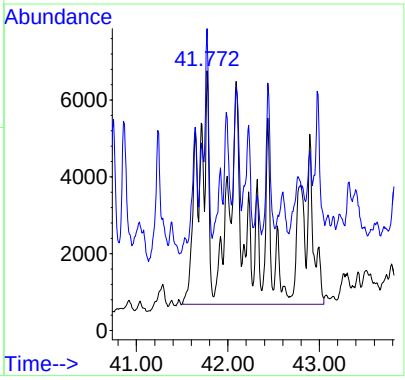


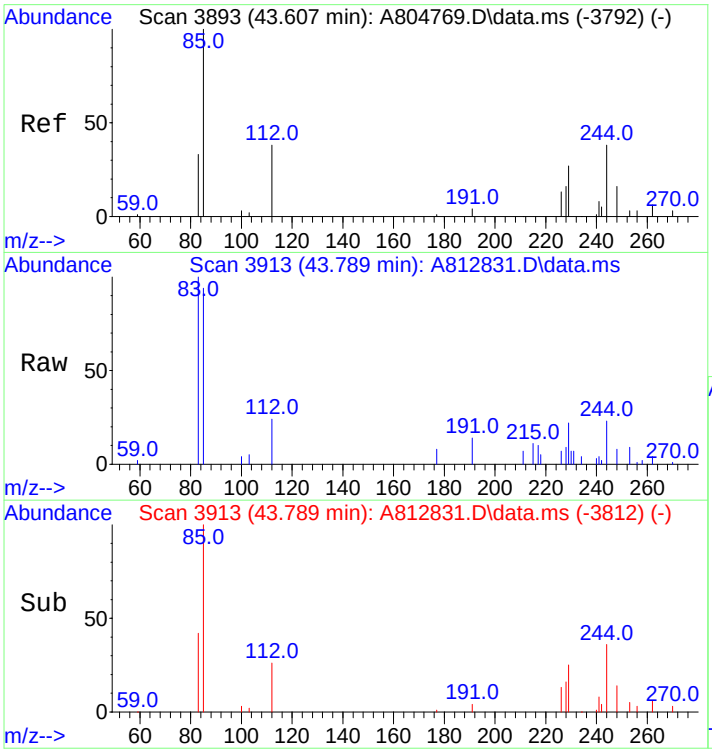


#62
C2-Fluoranthenes/Pyrenes
Concen: 565.40 ng/mL m
RT: 41.772 min Scan# 3692
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:230 Resp: 169671

Ion	Ratio	Lower	Upper
230	100		
215	8.1	93.1	139.7#

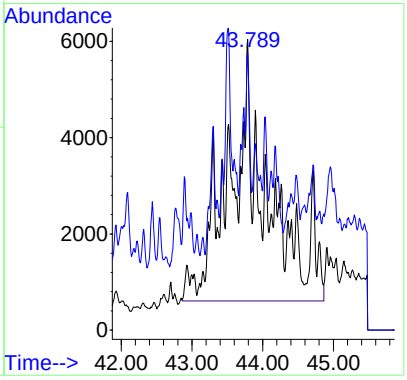


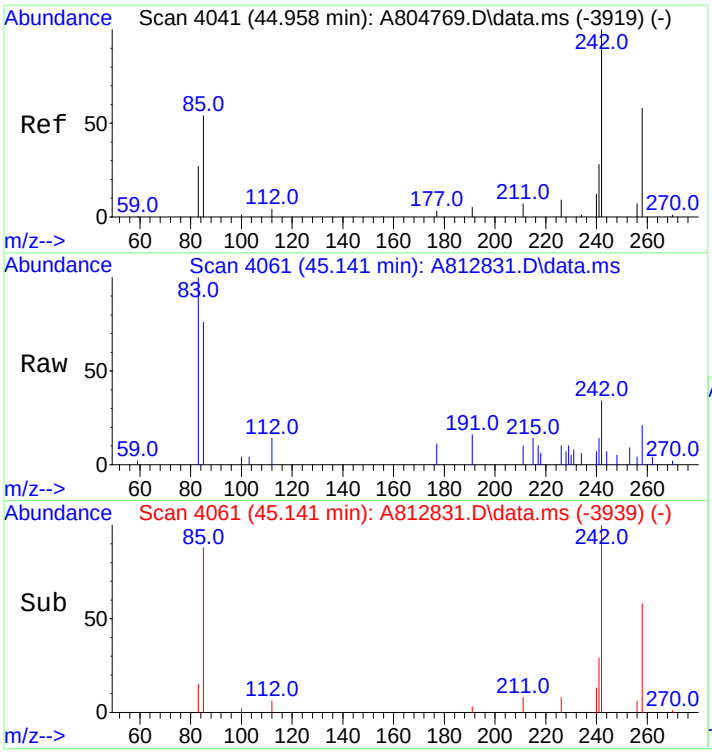


#63
C3-Fluoranthenes/Pyrenes
Concen: 651.98 ng/mL m
RT: 43.789 min Scan# 3913
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:244 Resp: 195654

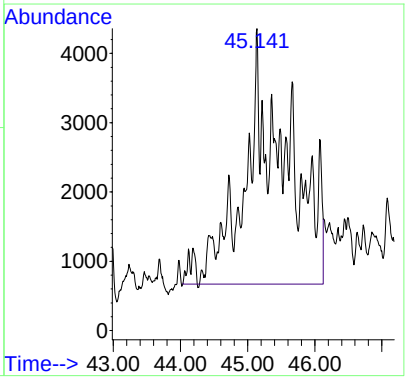
Ion	Ratio	Lower	Upper
244	100		
229	2.6	76.2	114.2#

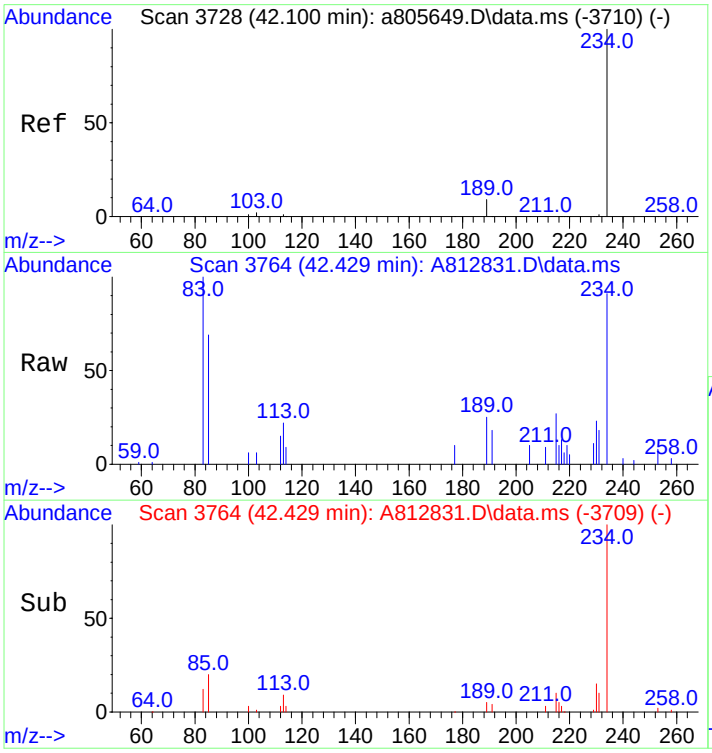




#64
C4-Fluoranthenes/Pyrenes
Concen: 516.87 ng/mL m
RT: 45.141 min Scan# 4061
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:258 Resp: 155110

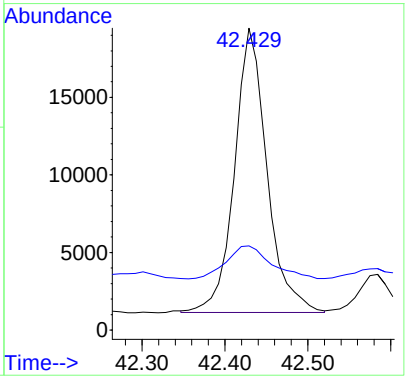


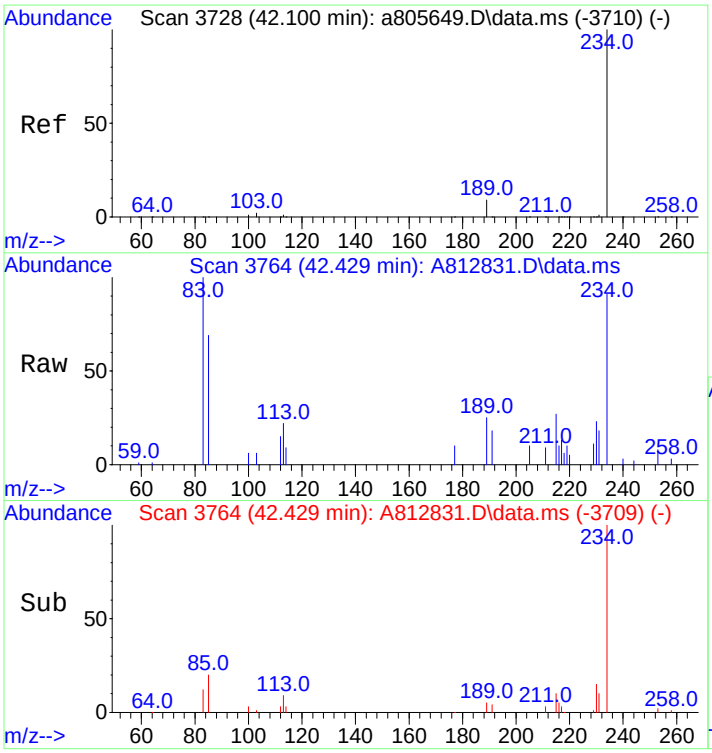


#66
Naphthobenzothiophene
Concen: 179.46 ng/ml m
RT: 42.429 min Scan# 3764
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 49992

Ion	Ratio	Lower	Upper
234	100		
189	4.1	22.3	33.5#

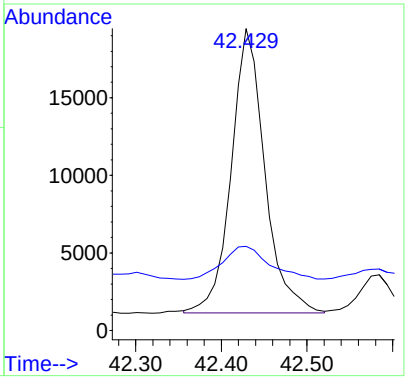


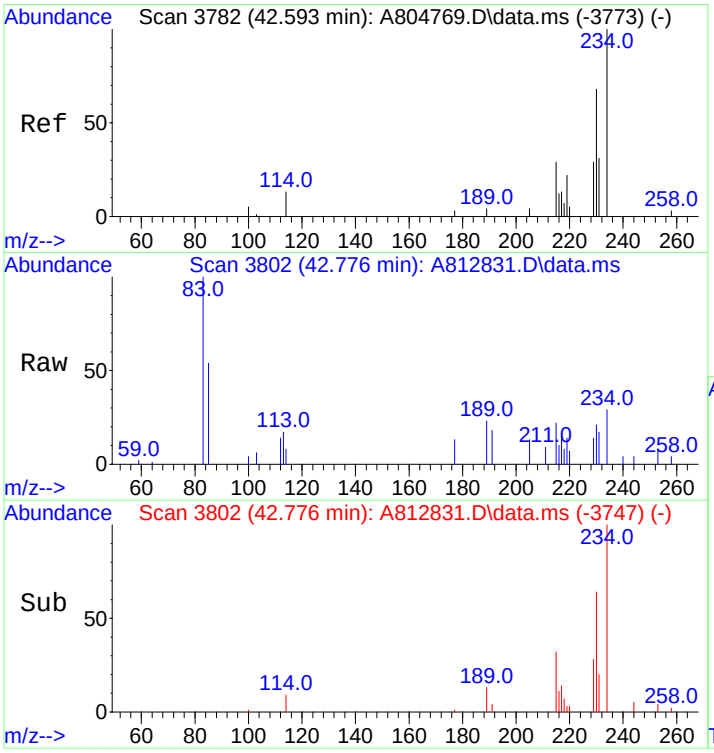


#67
Naphthobenzothiophene-2,1-D
Concen: 179.20 ng/mL m
RT: 42.429 min Scan# 3764
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 49921

Ion	Ratio	Lower	Upper
234	100		
189	4.1	22.3	33.5#

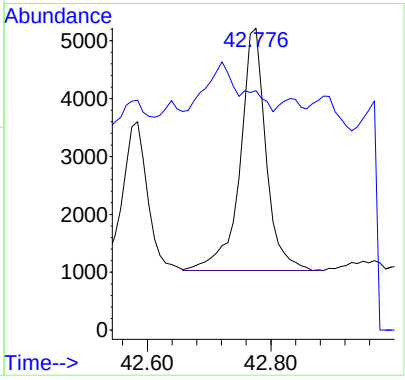


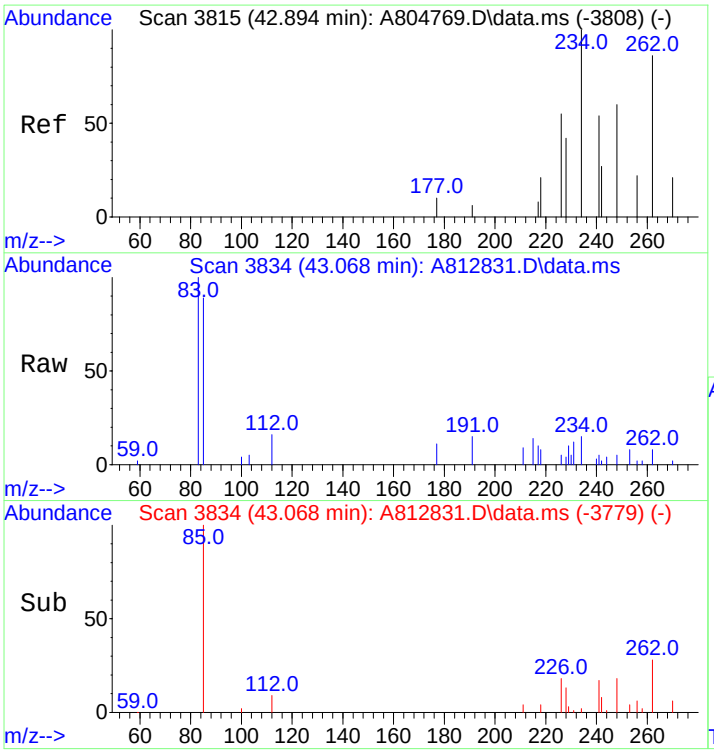


#68
Naphthobenzothiophene-1,2-D
Concen: 43.76 ng/mL
RT: 42.776 min Scan# 3802
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 12190

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

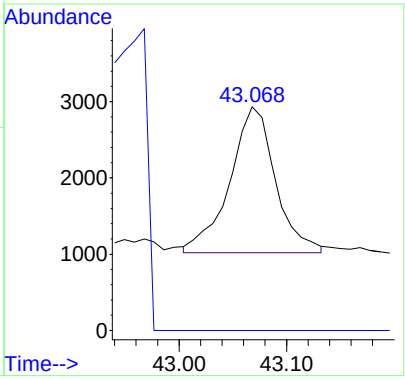


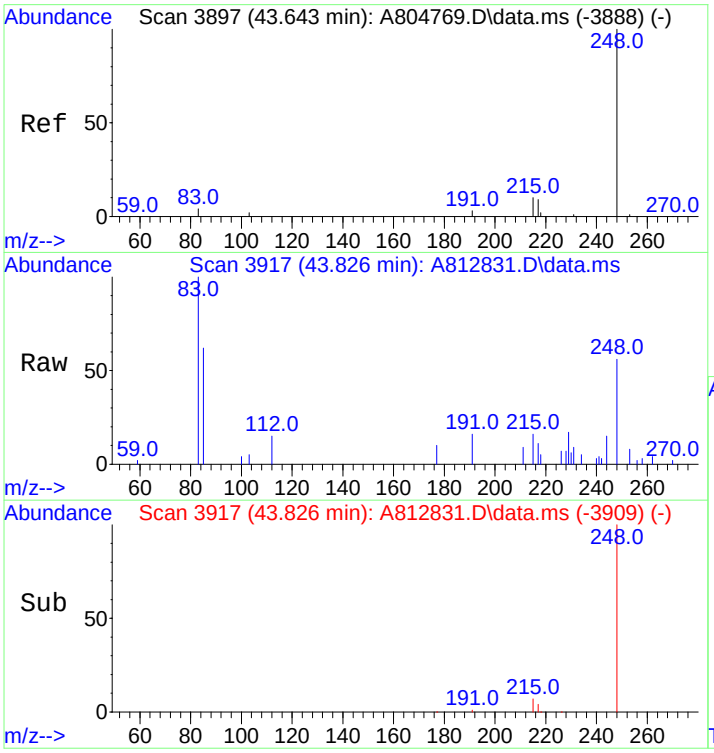


#69
Naphthobenzothiophene-2,3-D
Concen: 20.27 ng/mL m
RT: 43.068 min Scan# 3834
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 5647

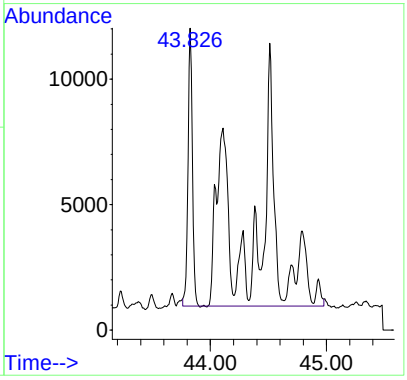
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

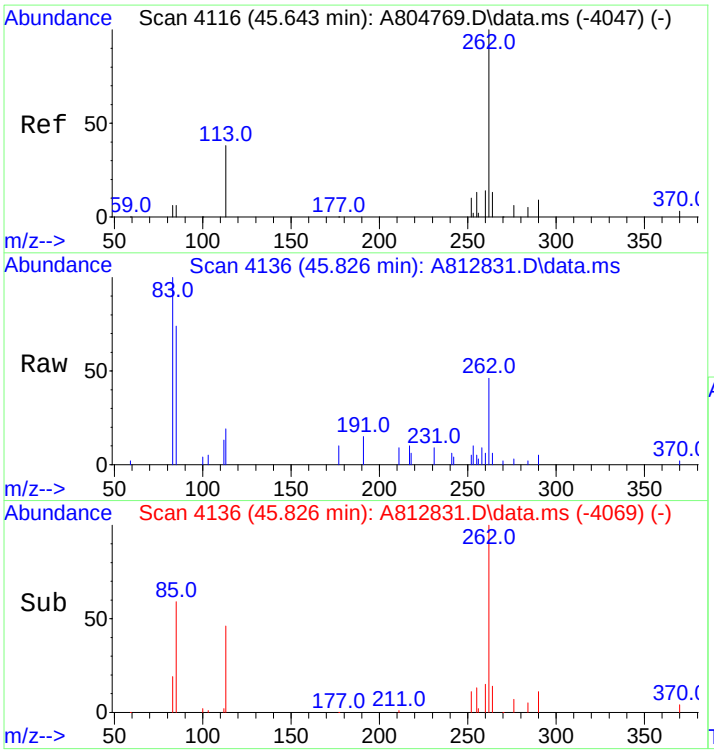




#70
C1-Naphthobenzothiophenes
Concen: 598.75 ng/ml m
RT: 43.826 min Scan# 3917
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

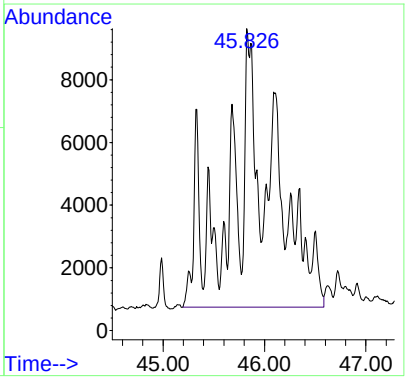
Tgt Ion:248 Resp: 166798

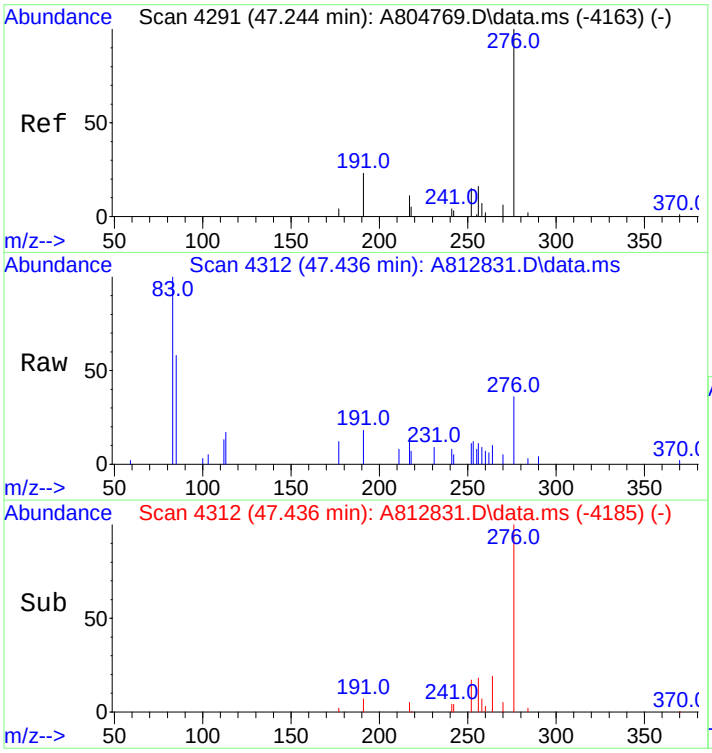




#71
C2-Naphthobenzothiophenes
Concen: 895.28 ng/ml m
RT: 45.826 min Scan# 4136
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

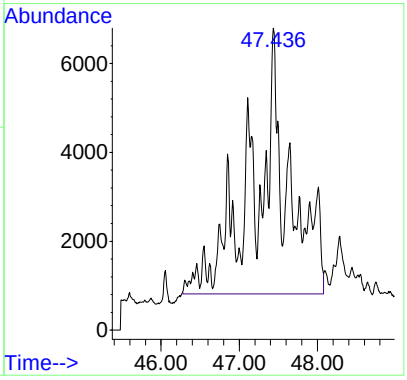
Tgt Ion:262 Resp: 249402

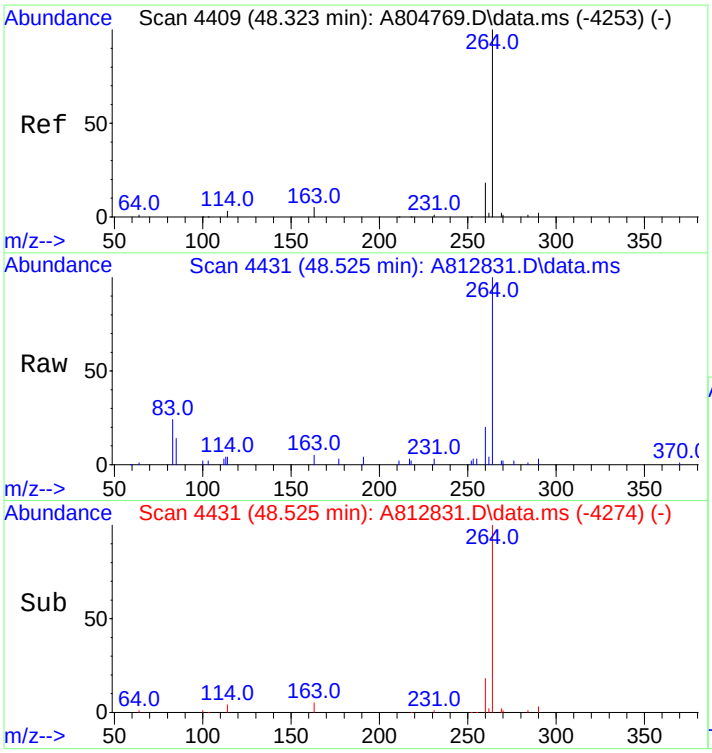




#72
C3-Naphthobenzothiophenes
Concen: 650.50 ng/ml m
RT: 47.436 min Scan# 4312
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

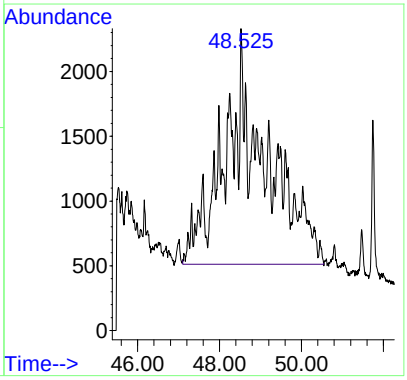
Tgt Ion:276 Resp: 181212

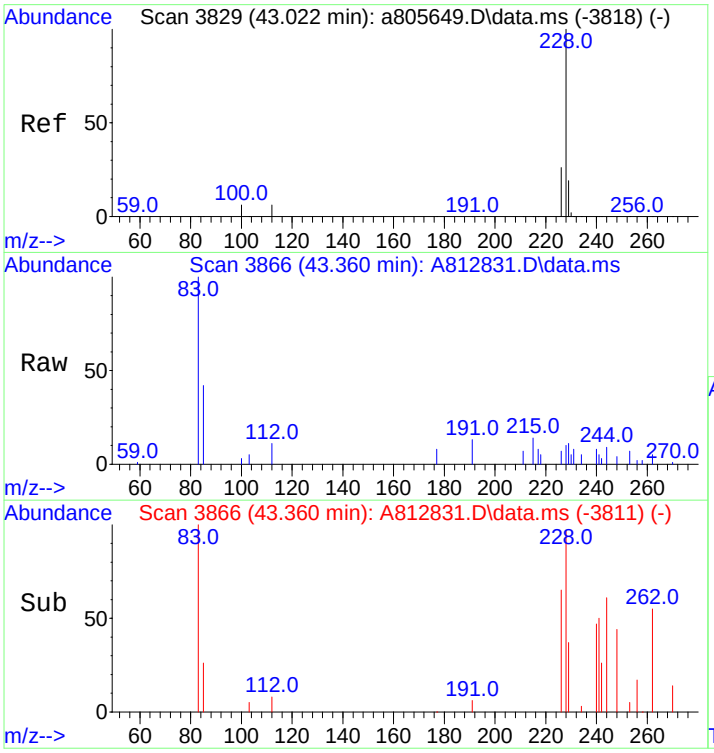




#73
C4-Naphthobenzothiophenes
Concen: 439.82 ng/mL m
RT: 48.525 min Scan# 4431
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:290 Resp: 122522

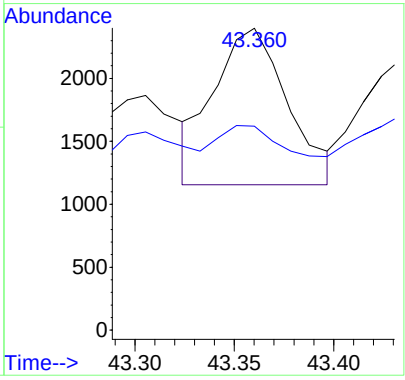


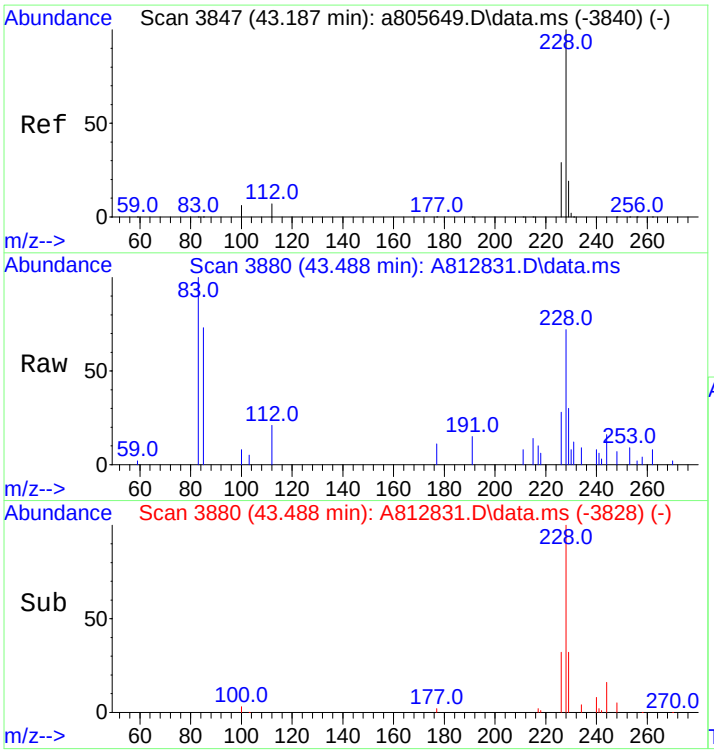


#75
Benz[a]anthracene
Concen: 11.86 ng/mL m
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:228 Resp: 3229

Ion	Ratio	Lower	Upper
228	100		
226	467.3	21.3	31.9#

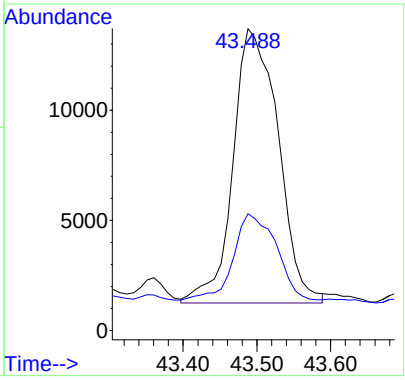


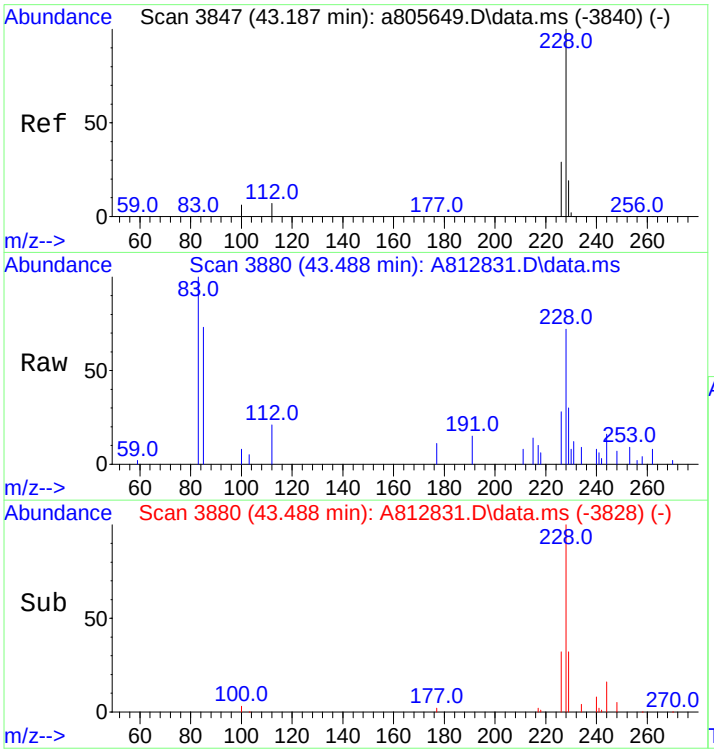


#76
Chrysene
Concen: 192.44 ng/mL m
RT: 43.488 min Scan# 3880
Delta R.T. -0.028 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:228 Resp: 53021

Ion	Ratio	Lower	Upper
228	100		
226	31.2	23.6	35.4

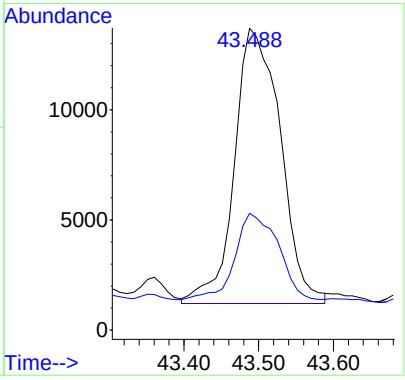


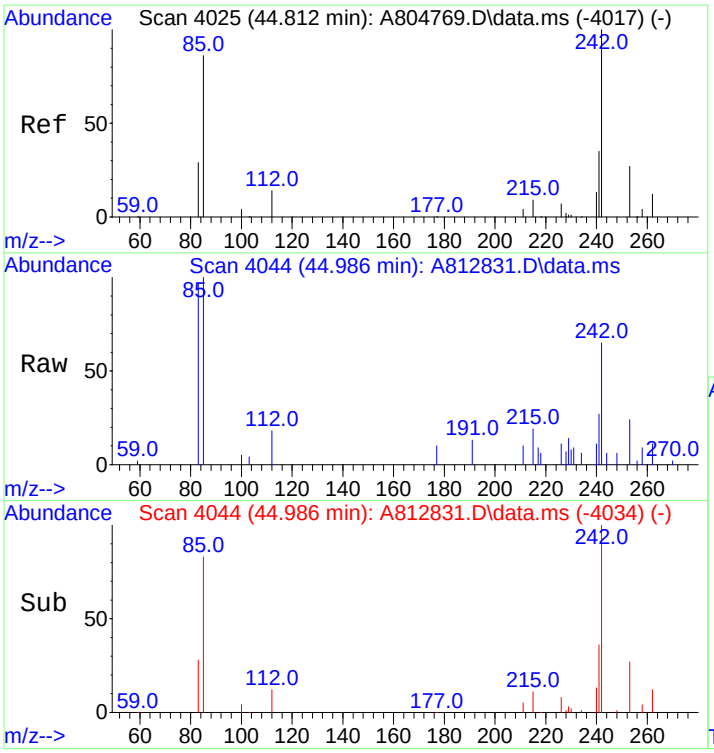


#77
Chrysene/Triphenylene
Concen: 194.53 ng/mL m
RT: 43.488 min Scan# 3880
Delta R.T. -0.028 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:228 Resp: 53597

Ion	Ratio	Lower	Upper
228	100		
226	30.9	23.6	35.4

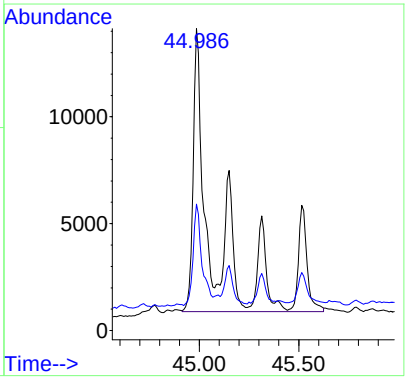


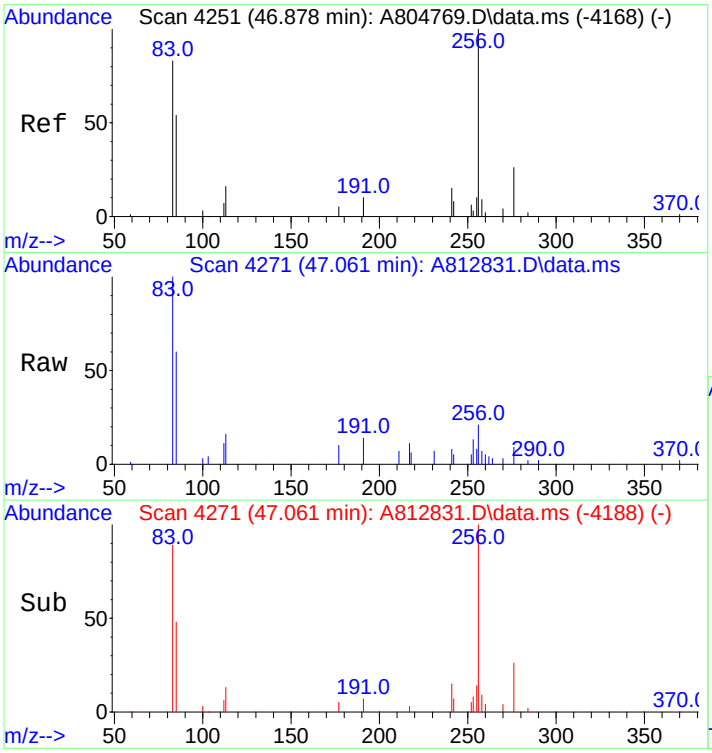


#78
C1-Chrysenes
Concen: 340.29 ng/mL m
RT: 44.986 min Scan# 4044
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:242 Resp: 93757

Ion	Ratio	Lower	Upper
242	100		
241	14.9	33.5	50.3#

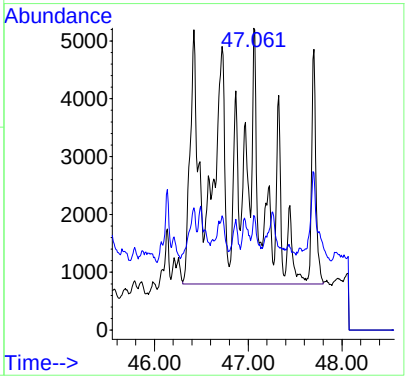


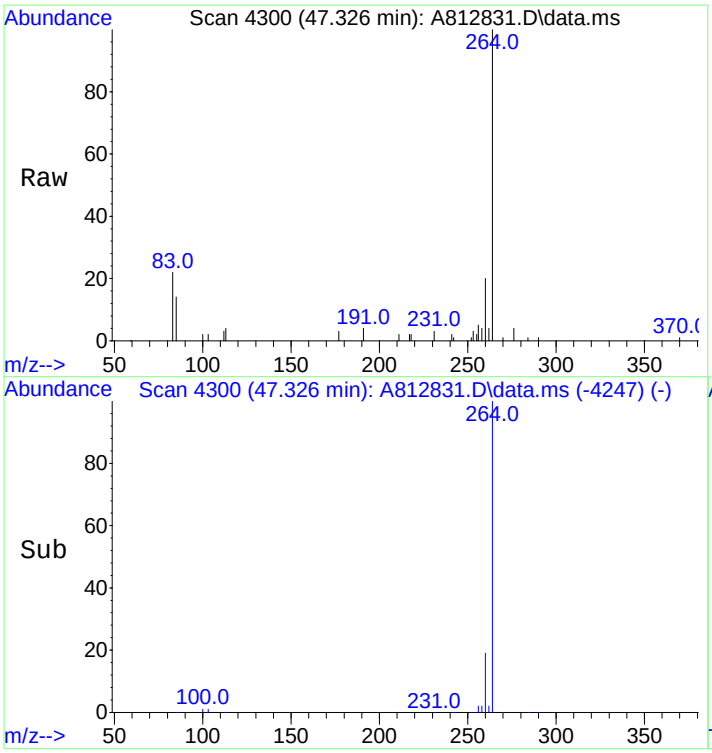


#79
C2-Chrysenes
Concen: 478.09 ng/mL m
RT: 47.061 min Scan# 4271
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:256 Resp: 131721

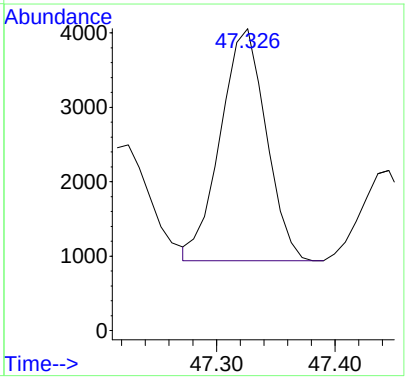
Ion	Ratio	Lower	Upper
256	100		
241	4.0	30.4	45.6#

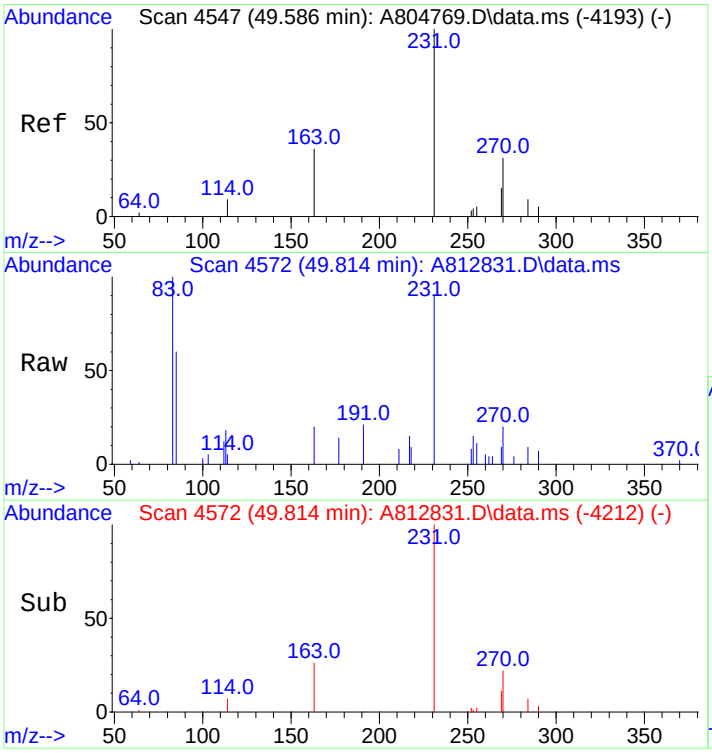




#80
BBF-D12 Surr BKGD
Concen: 30.25 ng/mL
RT: 47.326 min Scan# 4300
Delta R.T. -0.017 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:256 Resp: 8334

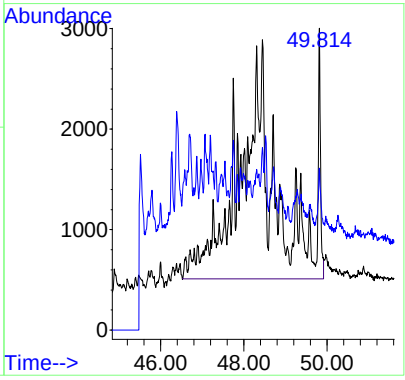


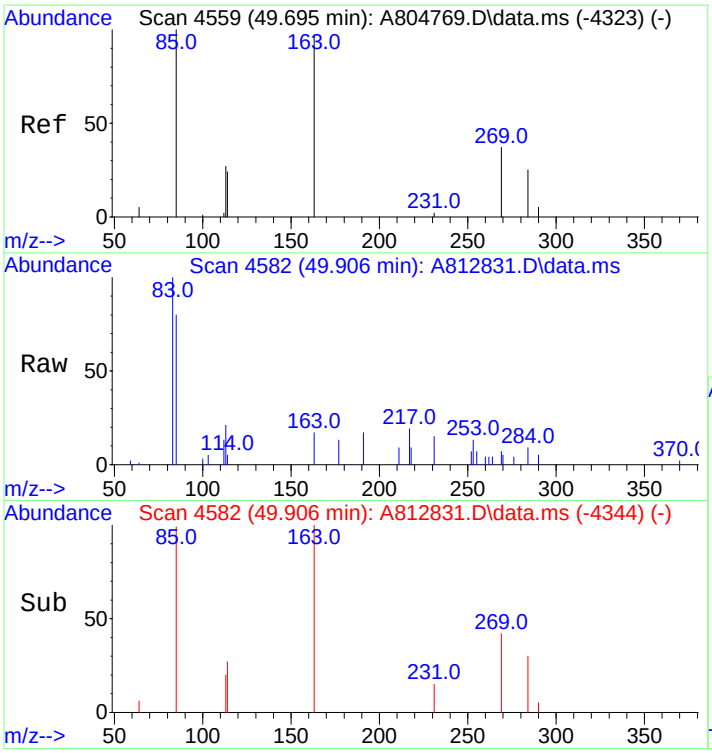


#81
C3-Chrysenes
Concen: 495.92 ng/mL m
RT: 49.814 min Scan# 4572
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:270 Resp: 136635

Ion	Ratio	Lower	Upper
270	100		
255	1.8	42.9	64.3#

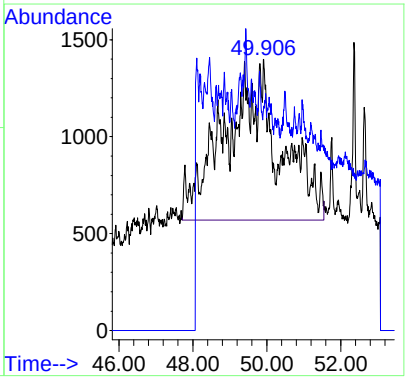


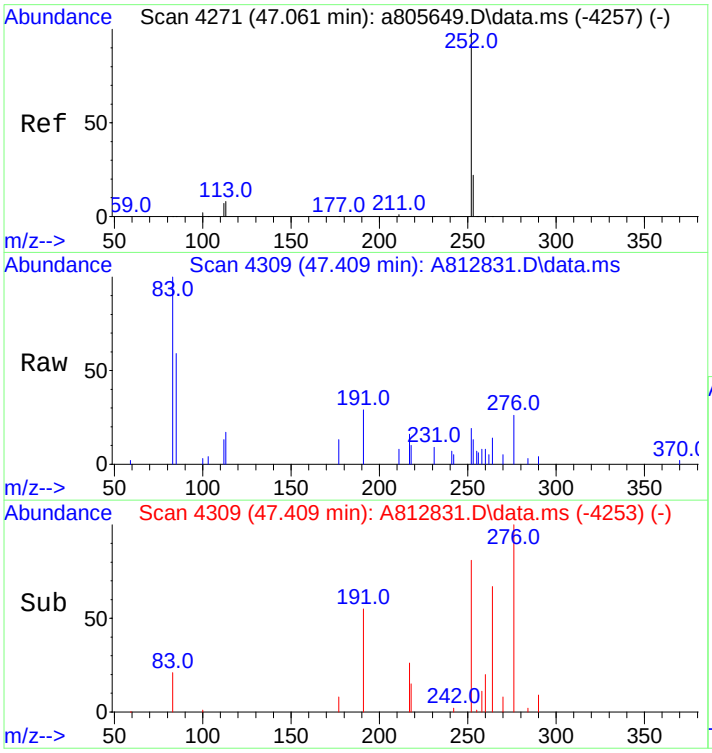


#82
C4-Chrysenes
Concen: 304.76 ng/mL m
RT: 49.906 min Scan# 4582
Delta R.T. 0.081 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:284 Resp: 83967

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

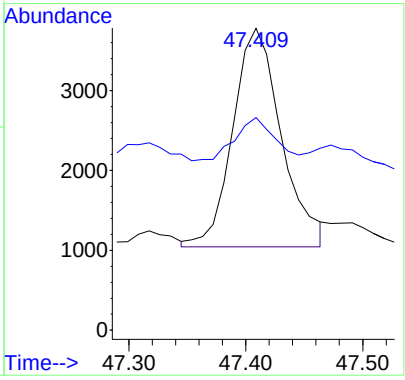


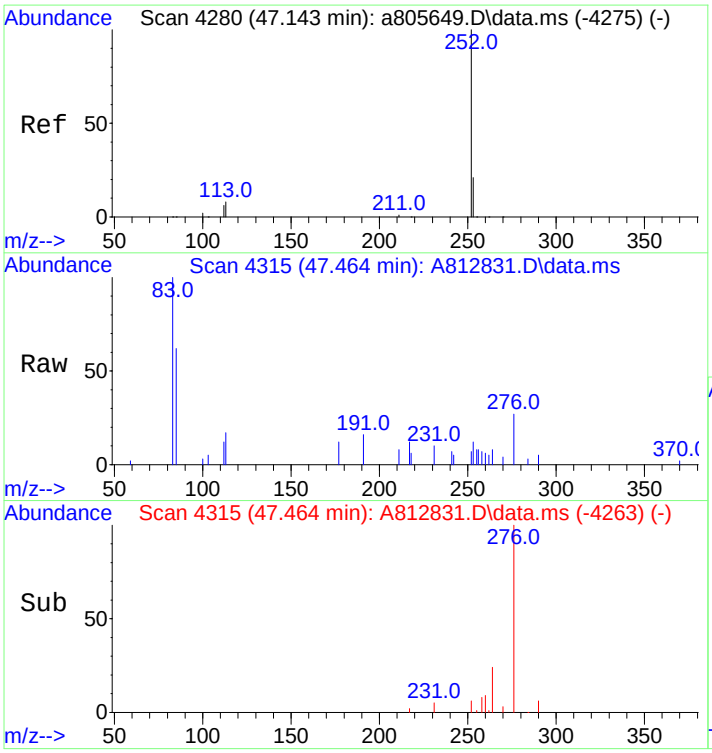


#84
Benzo[b]fluoranthene
Concen: 27.08 ng/mL m
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 7917

Ion	Ratio	Lower	Upper
252	100		
253	14.7	18.5	27.7#

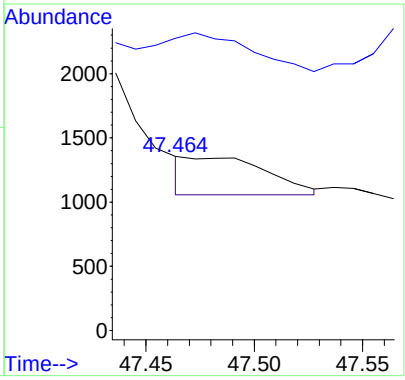


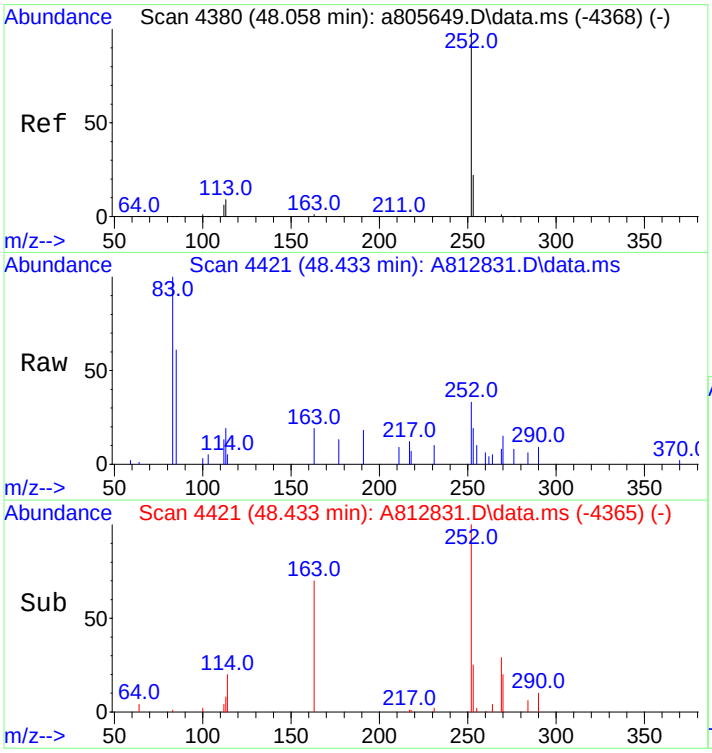


#85
Benzo[j]+[k]fluoranthene
Concen: 2.36 ng/mL m
RT: 47.464 min Scan# 4315
Delta R.T. -0.027 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 754

Ion	Ratio	Lower	Upper
252	100		
253	154.0	18.8	28.2#

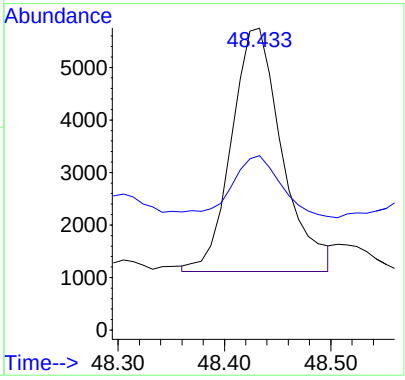


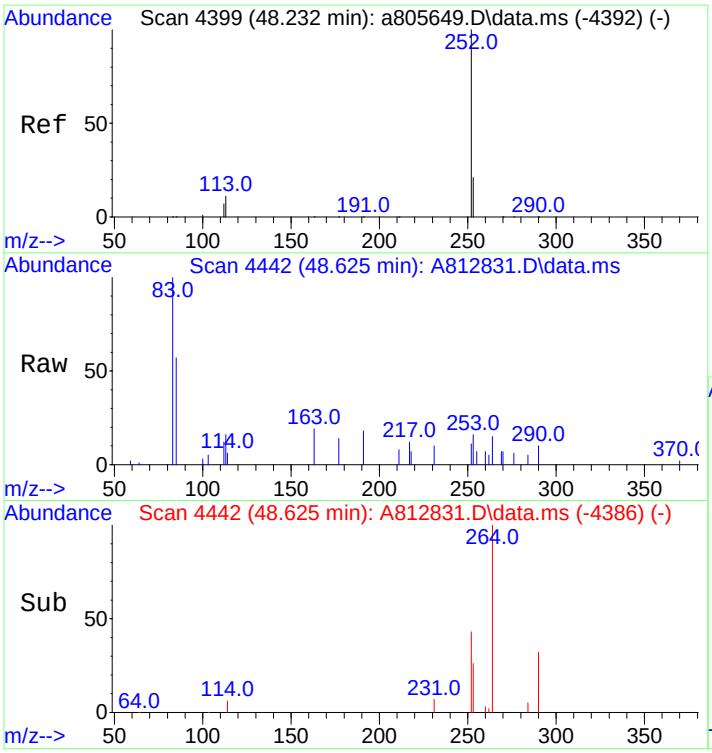


#87
Benzo[e]pyrene
Concen: 50.82 ng/mL m
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 15308

Ion	Ratio	Lower	Upper
252	100		
253	24.2	18.9	28.3

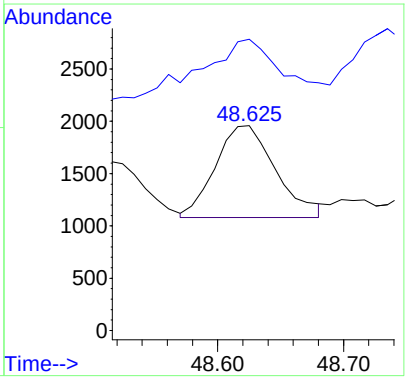


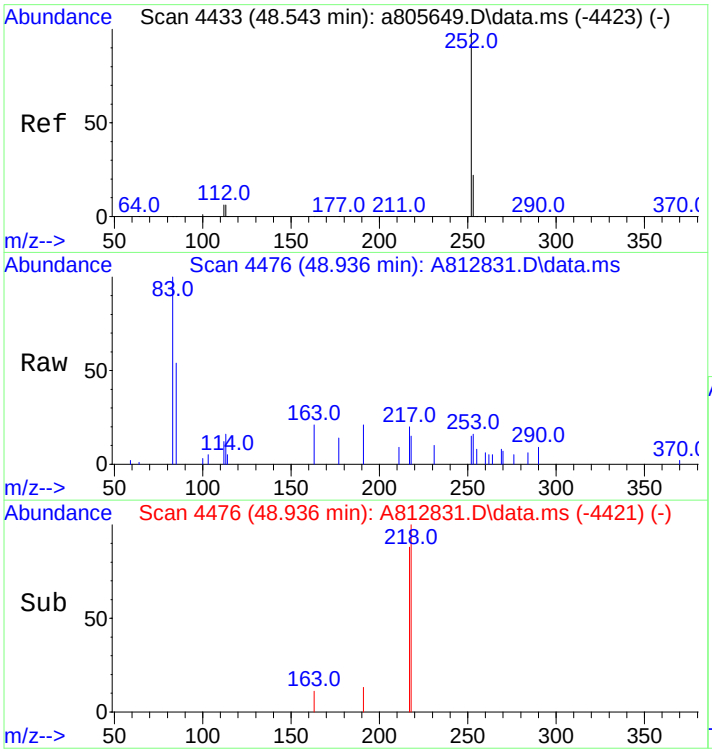


#89
Benzo[a]pyrene
Concen: 10.48 ng/mL m
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 2919

Ion	Ratio	Lower	Upper
252	100		
253	126.0	19.4	29.0#

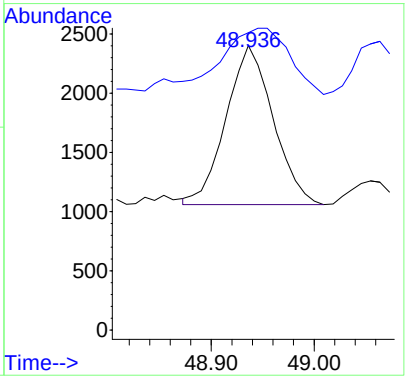


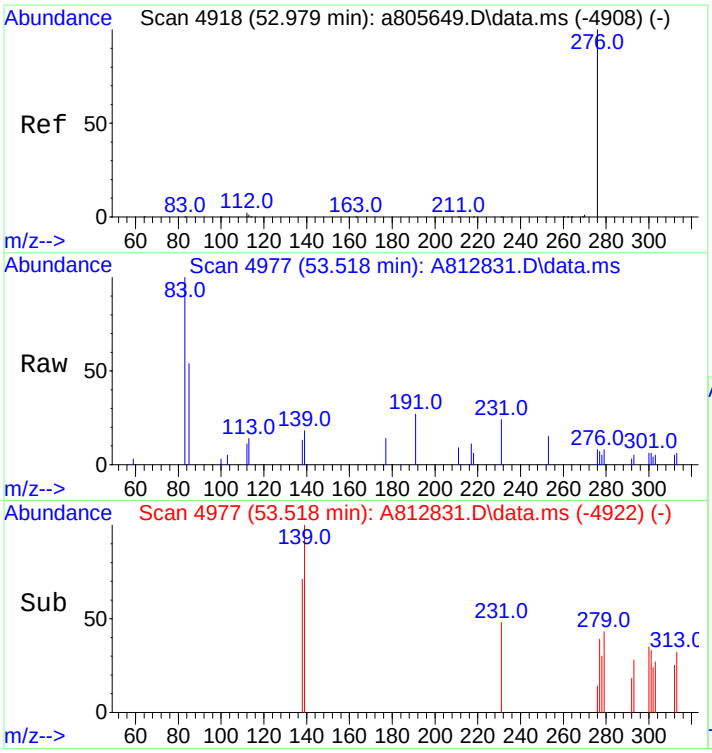


#90
Perylene
Concen: 14.04 ng/mL
RT: 48.936 min Scan# 4476
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 4273

Ion	Ratio	Lower	Upper
252	100		
253	59.2	19.3	28.9#

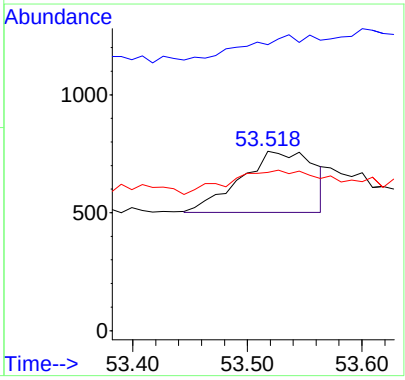


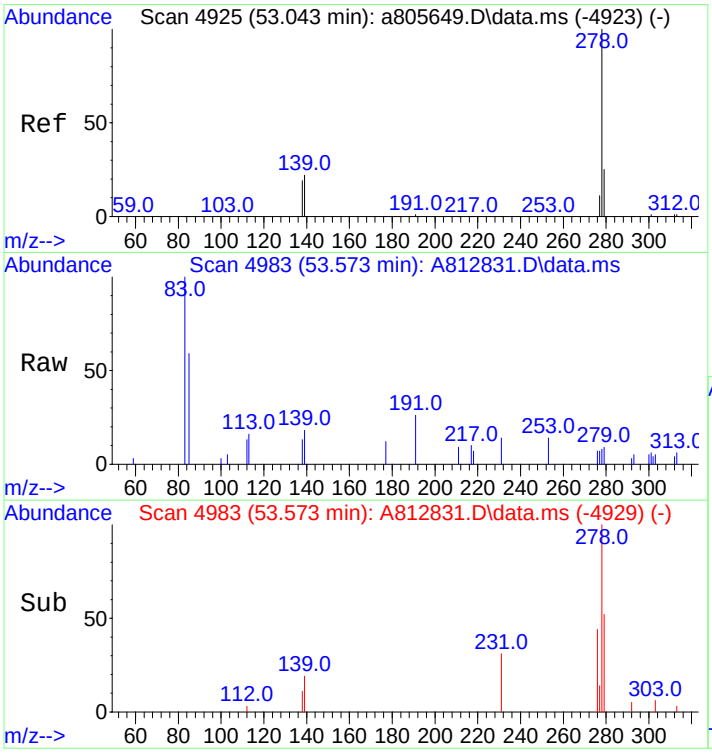


#91
Indeno[1,2,3-cd]pyrene
Concen: 3.91 ng/mL m
RT: 53.518 min Scan# 4977
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:276 Resp: 1158

Ion	Ratio	Lower	Upper
276	100		
138	0.0	19.9	29.9#
277	0.0	19.0	28.6#

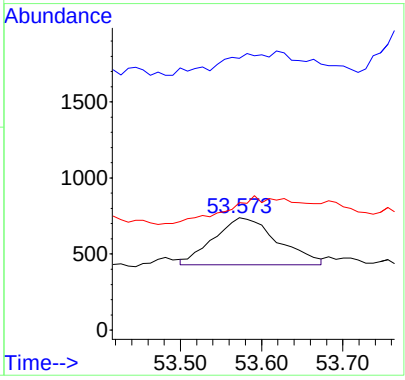


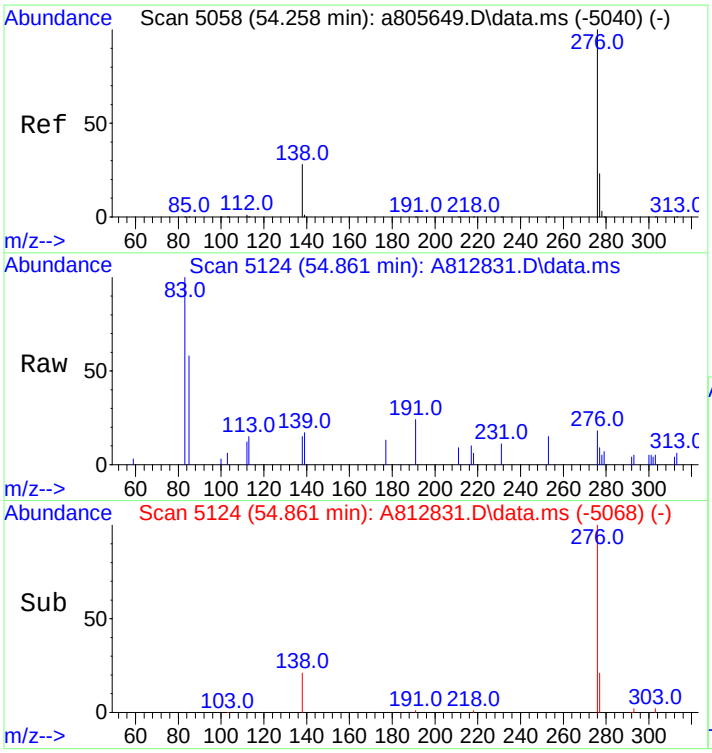


#92
Dibenz[ah]+[ac]anthracene
Concen: 5.80 ng/mL m
RT: 53.573 min Scan# 4983
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:278 Resp: 1684

Ion	Ratio	Lower	Upper
278	100		
139	28.6	16.6	25.0#
279	32.8	19.1	28.7#

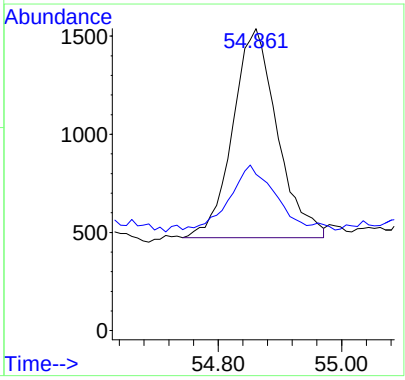


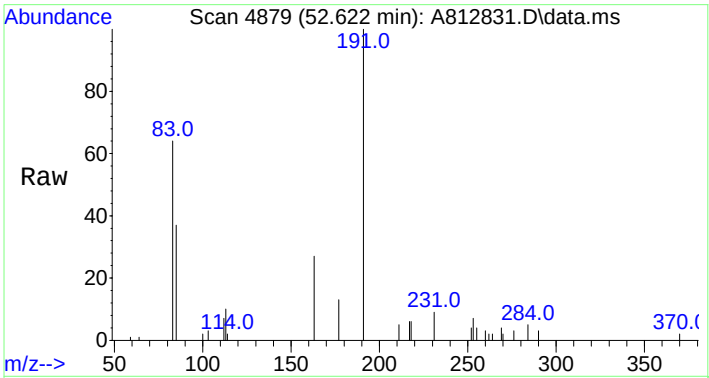


#93
Benzo[g,h,i]perylene
Concen: 15.89 ng/mL
RT: 54.861 min Scan# 5124
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:276 Resp: 5336

Ion	Ratio	Lower	Upper
276	100		
277	28.1	18.9	28.3

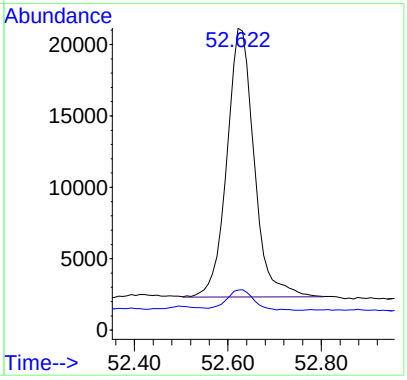


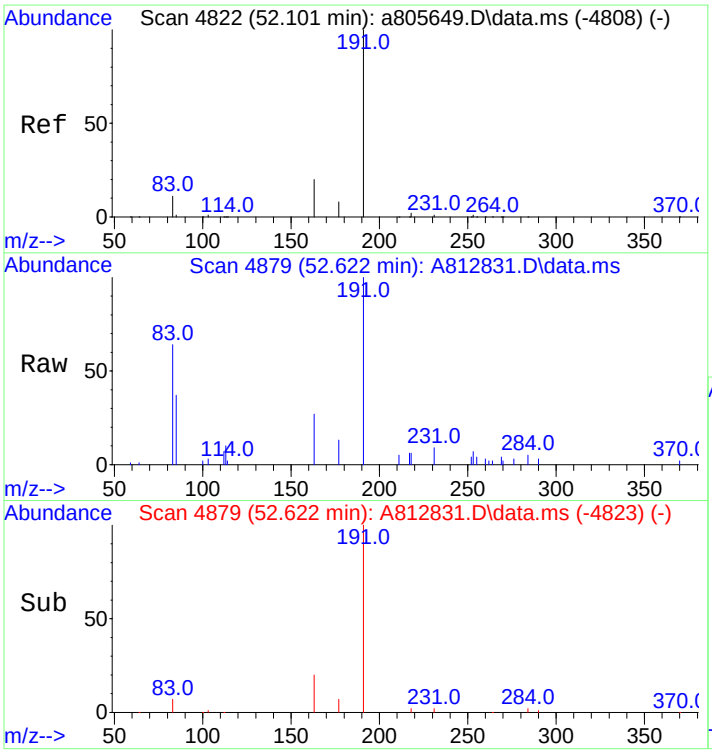


#94
Hopane (T19)
Concen: 820.72 ng/mL
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:191 Resp: 76529

Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#

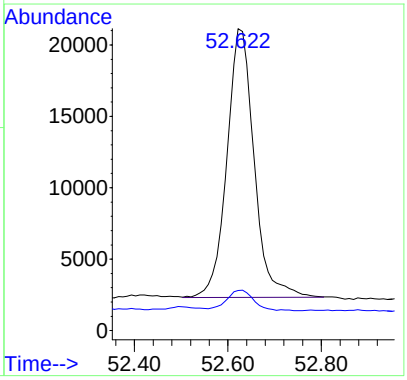


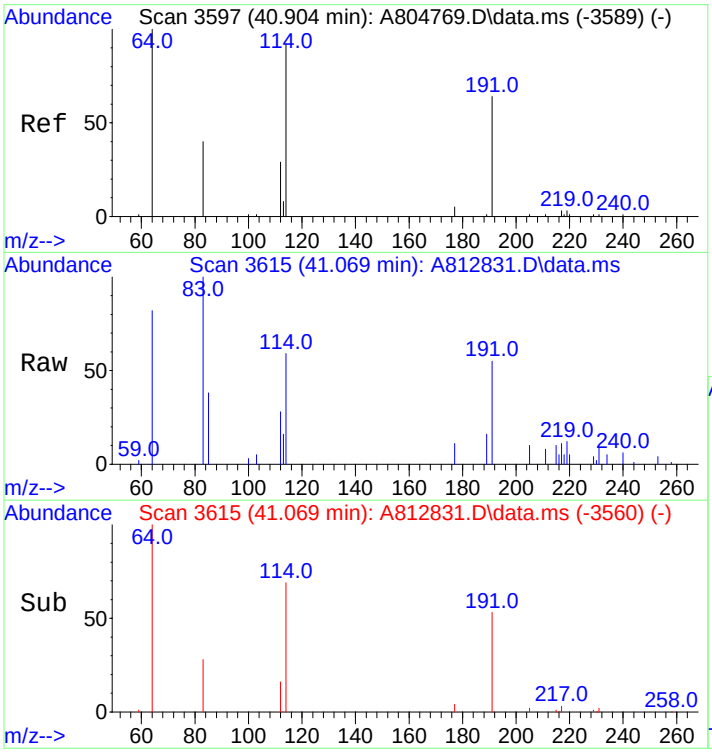


#95
17a(H),21B(H)-hopane - C30H52
Concen: 820.72 ng/mL
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:191 Resp: 76529

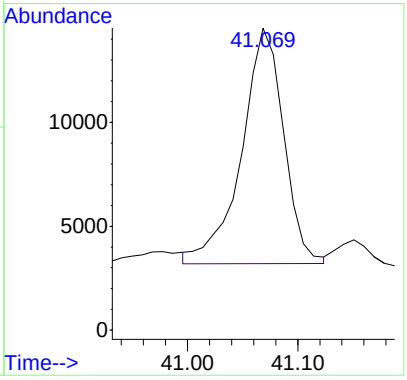
Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#

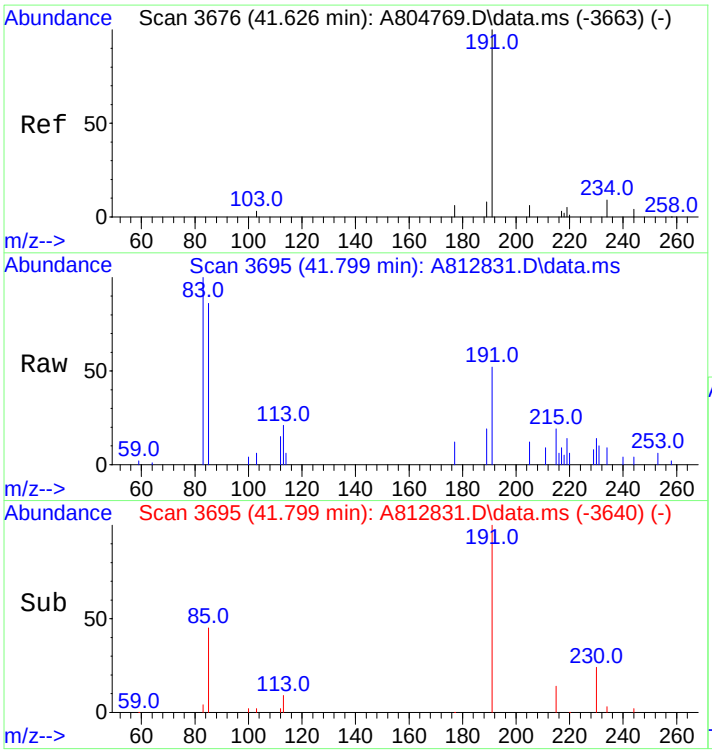




#96
C23 Tricyclic Terpane (T4)
Concen: 323.25 ng/ml
RT: 41.069 min Scan# 3615
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

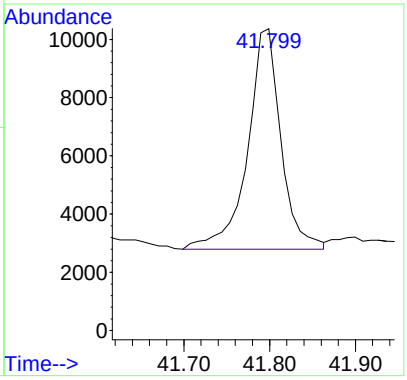
Tgt Ion:191 Resp: 30142

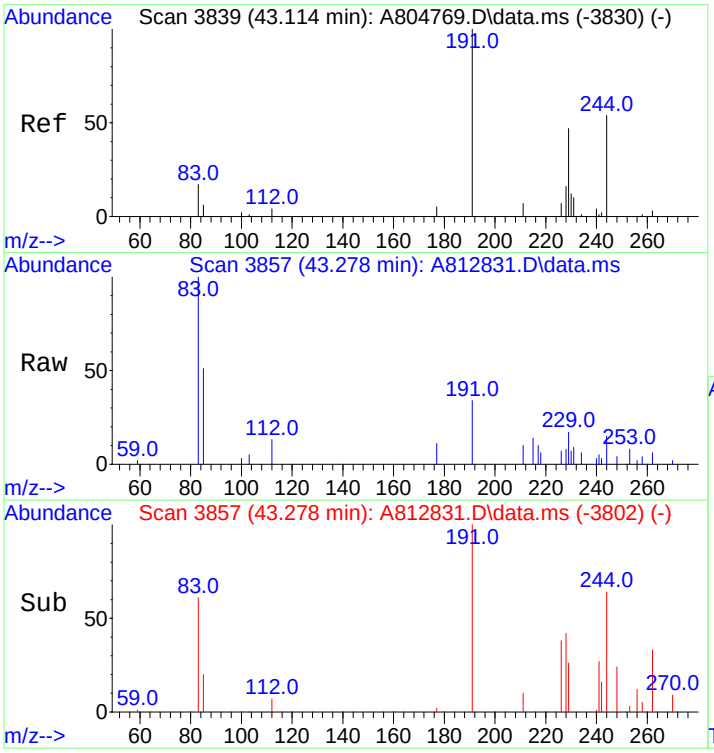




#97
C24 Tricyclic Terpane (T5)
Concen: 220.06 ng/ml
RT: 41.799 min Scan# 3695
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

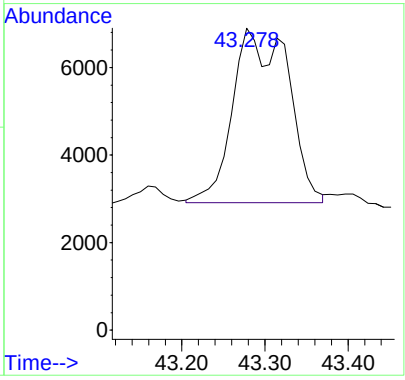
Tgt Ion:191 Resp: 20520

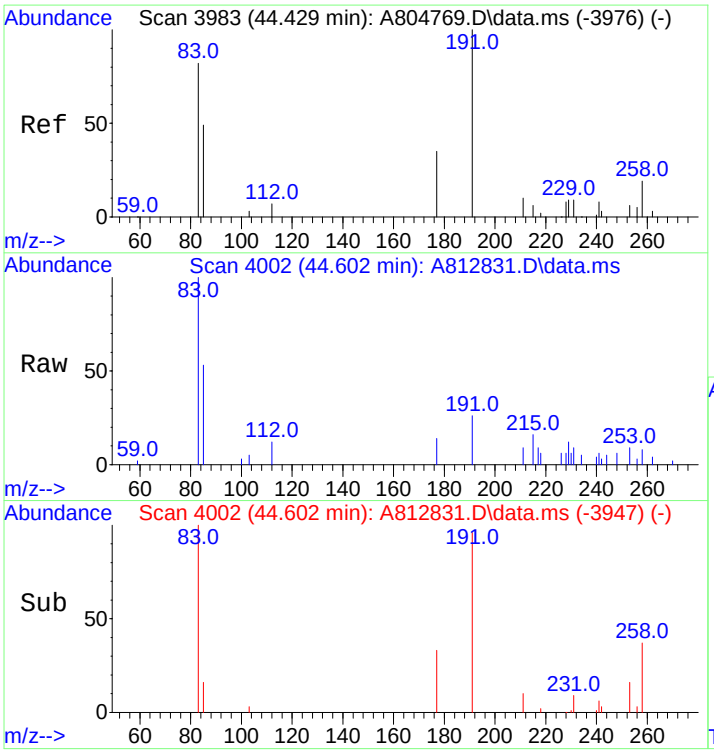




#98
C25 Tricyclic Terpane (T6)
Concen: 197.30 ng/ml m
RT: 43.278 min Scan# 3857
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

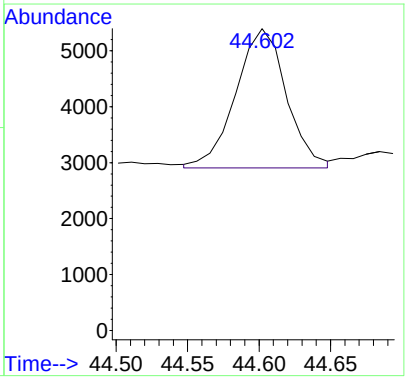
Tgt Ion:191 Resp: 18397

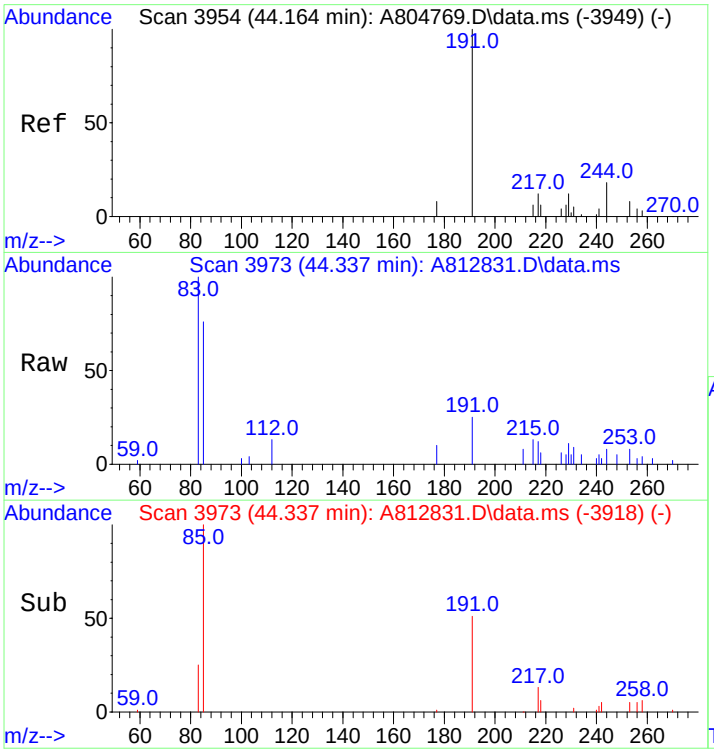




#99
C24 Tetracyclic Terpane (T6a)
Concen: 65.49 ng/ml m
RT: 44.602 min Scan# 4002
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

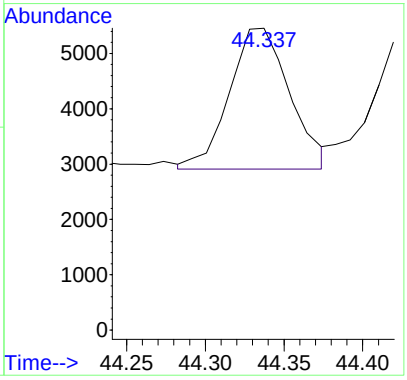
Tgt Ion:191 Resp: 6107

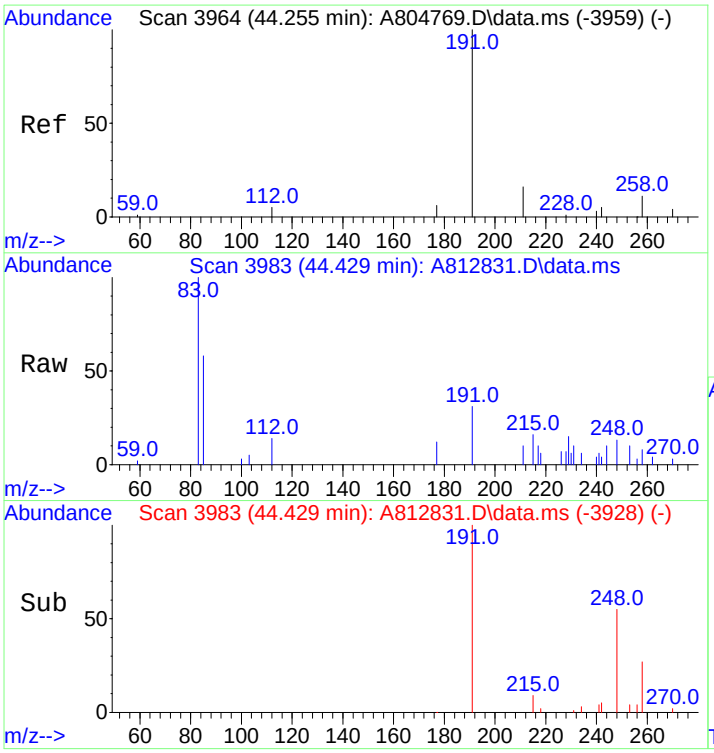




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 72.75 ng/ml m
RT: 44.337 min Scan# 3973
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

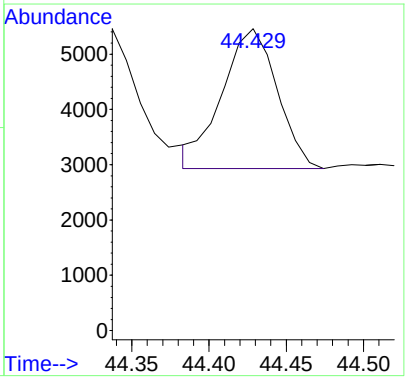
Tgt Ion:191 Resp: 6784

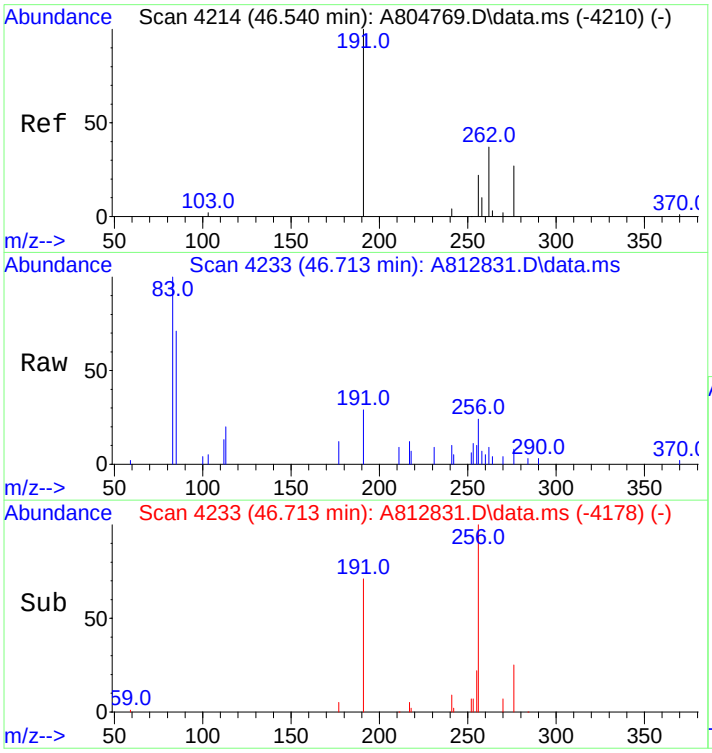




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 67.26 ng/ml
RT: 44.429 min Scan# 3983
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

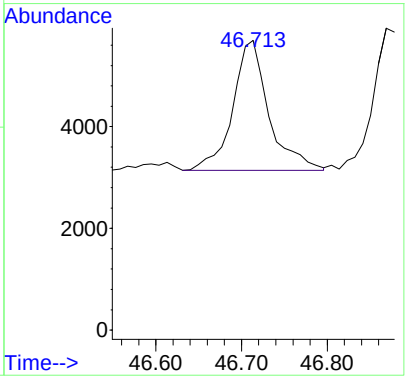
Tgt Ion:191 Resp: 6272

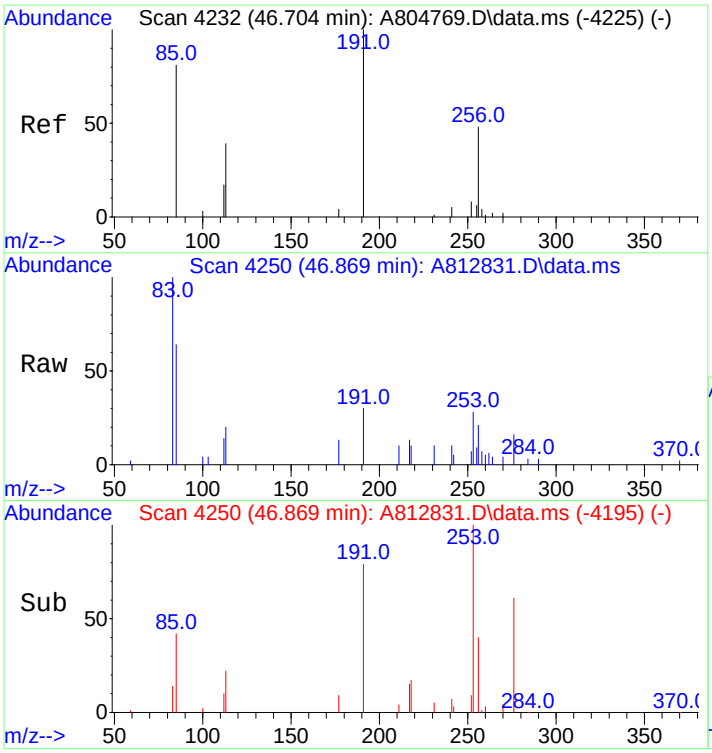




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 80.08 ng/ml
RT: 46.713 min Scan# 4233
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

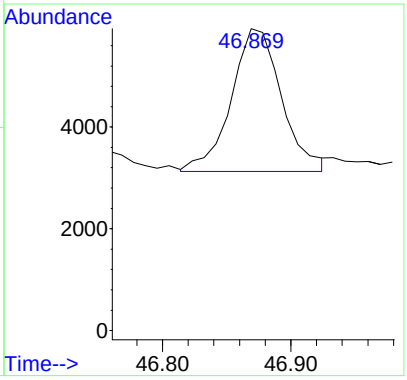
Tgt Ion:191 Resp: 7467

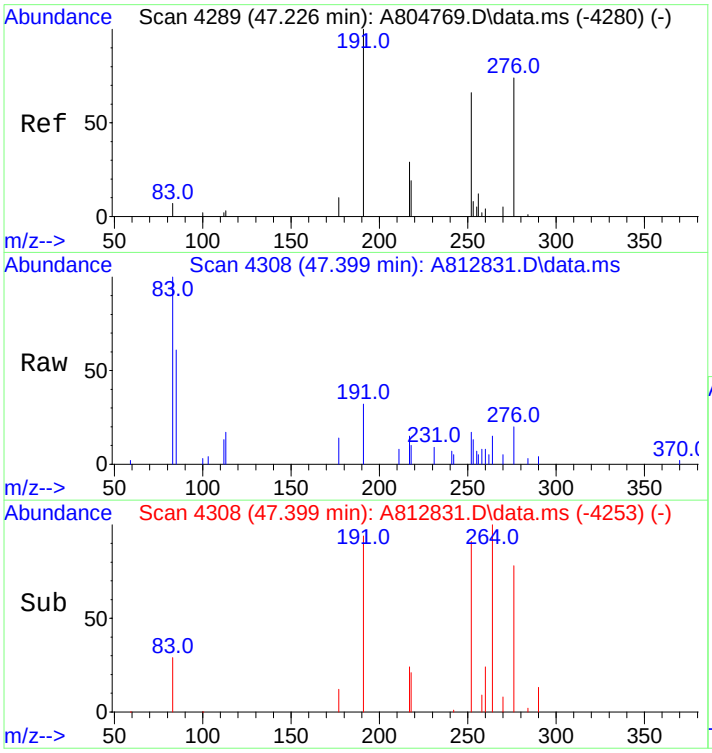




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 82.33 ng/ml m
RT: 46.869 min Scan# 4250
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

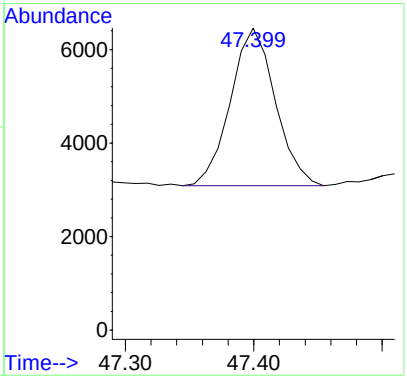
Tgt Ion:191 Resp: 7677

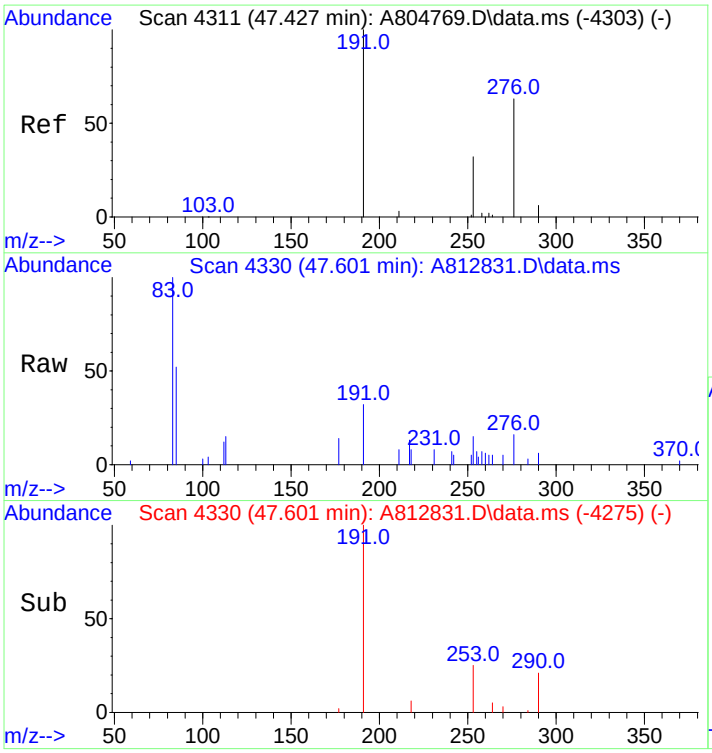




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 87.63 ng/ml
RT: 47.399 min Scan# 4308
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

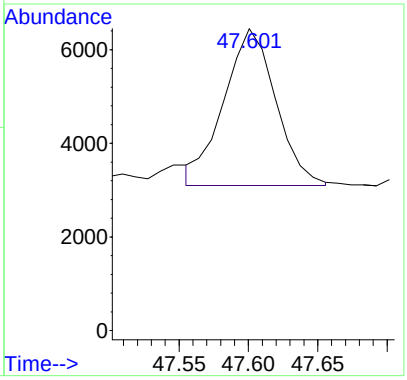
Tgt Ion:191 Resp: 8171

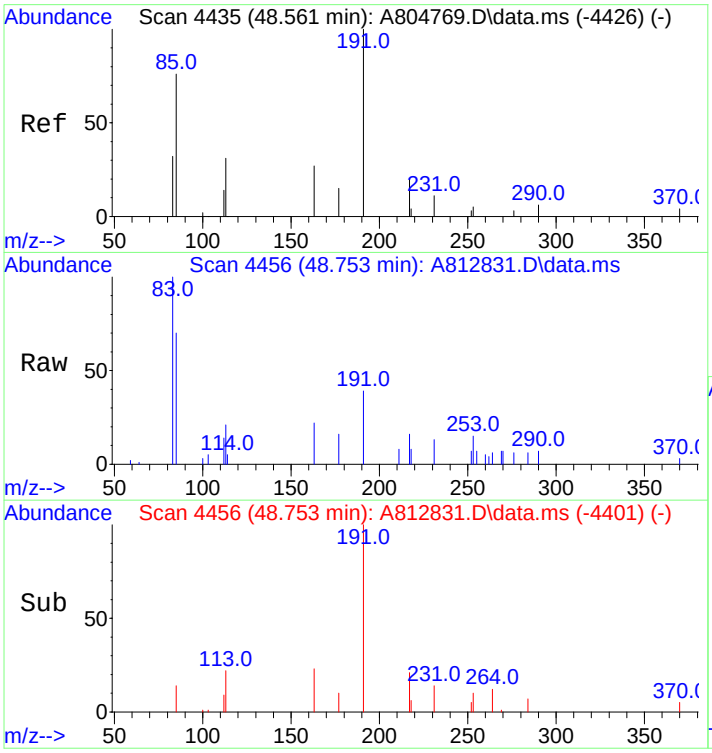




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 93.64 ng/ml m
RT: 47.601 min Scan# 4330
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

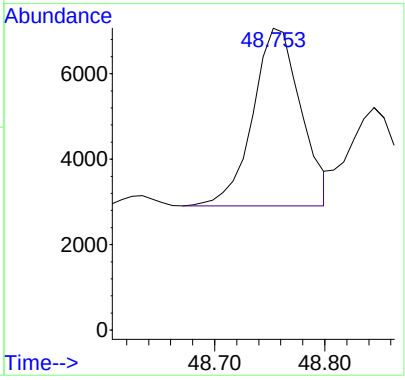
Tgt Ion:191 Resp: 8732

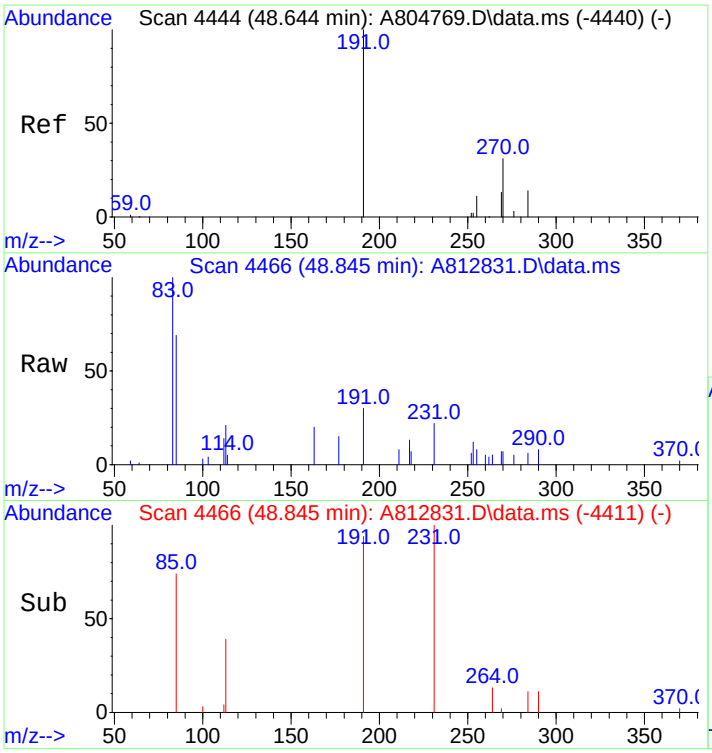




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 136.08 ng/ml
RT: 48.753 min Scan# 4456
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

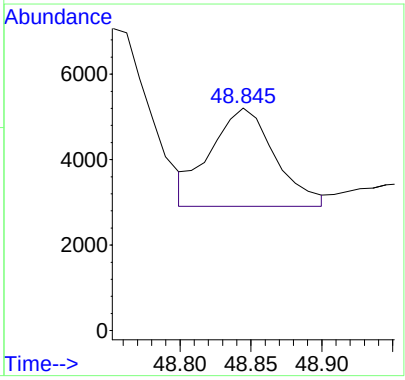
Tgt Ion:191 Resp: 12689

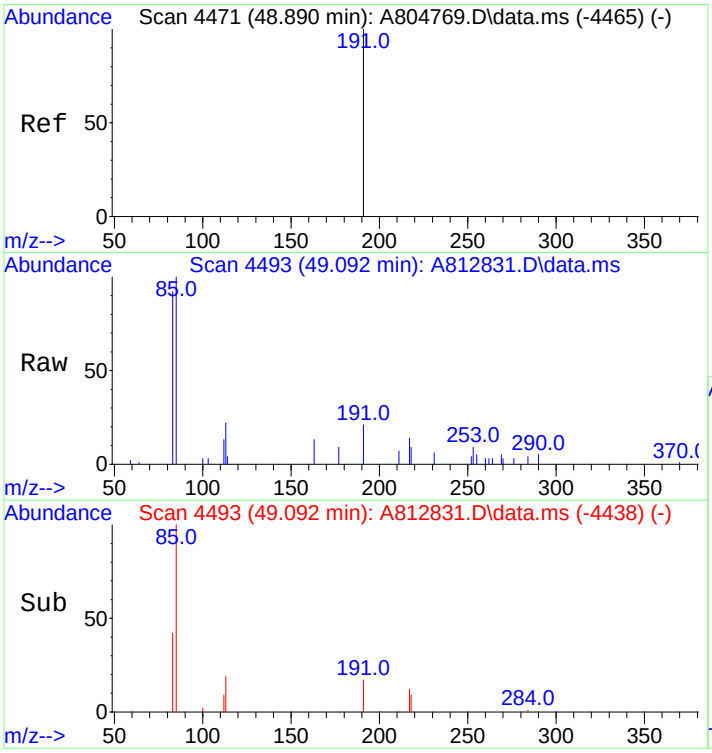




#107
C30 Tricyclic Terpane-22S
Concen: 77.72 ng/mL m
RT: 48.845 min Scan# 4466
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

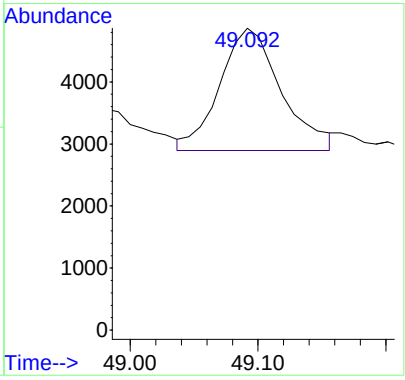
Tgt Ion:191 Resp: 7247

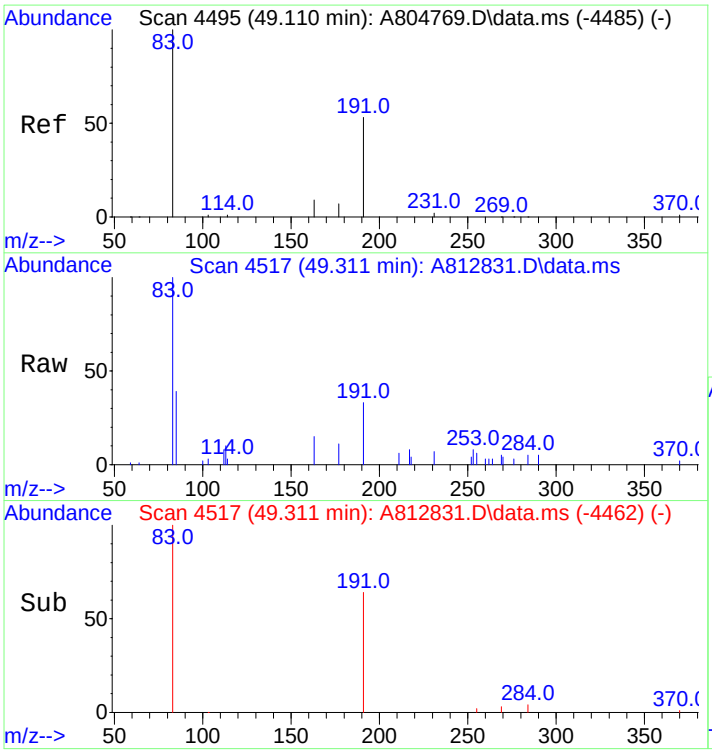




#108
C30 Tricyclic Terpane-22R
Concen: 70.22 ng/mL m
RT: 49.092 min Scan# 4493
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

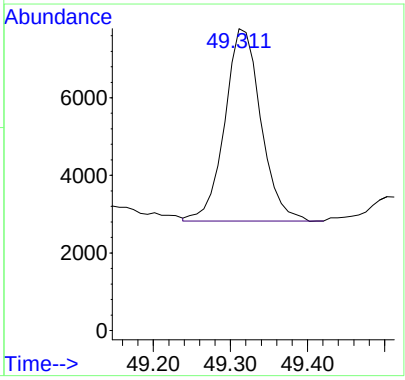
Tgt Ion:191 Resp: 6548

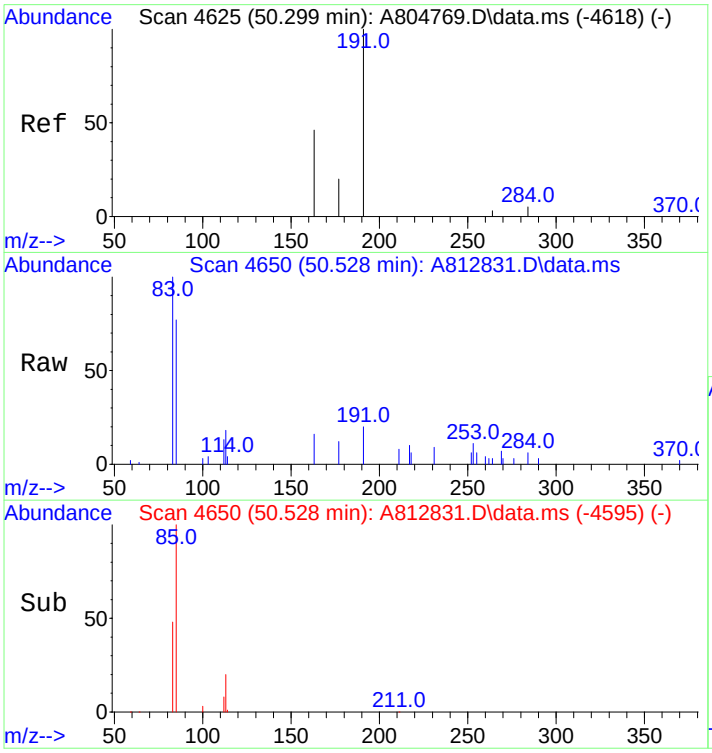




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 173.25 ng/ml
RT: 49.311 min Scan# 4517
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

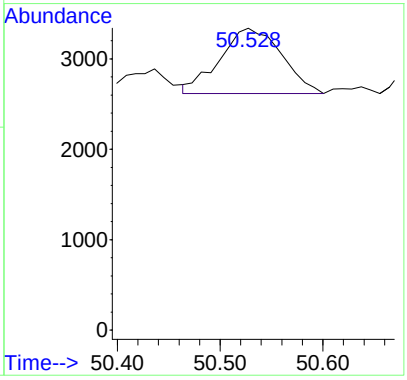
Tgt Ion:191 Resp: 16155

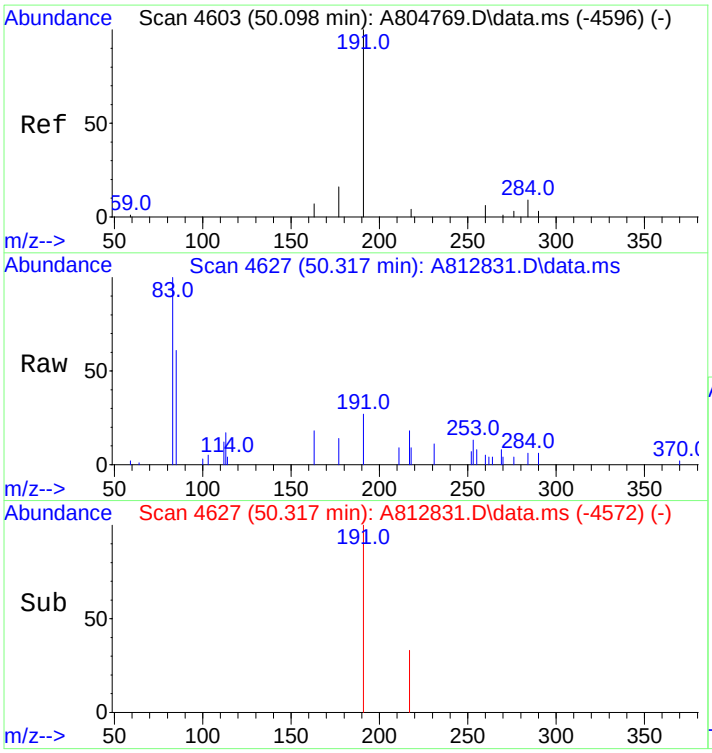




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 32.19 ng/ml
RT: 50.528 min Scan# 4650
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

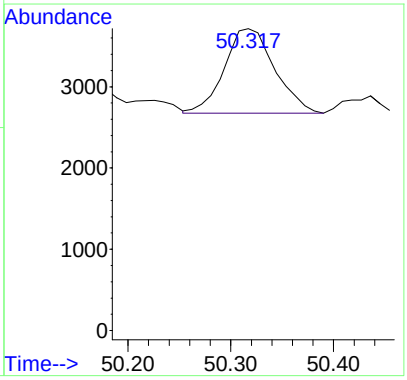
Tgt Ion:191 Resp: 3002

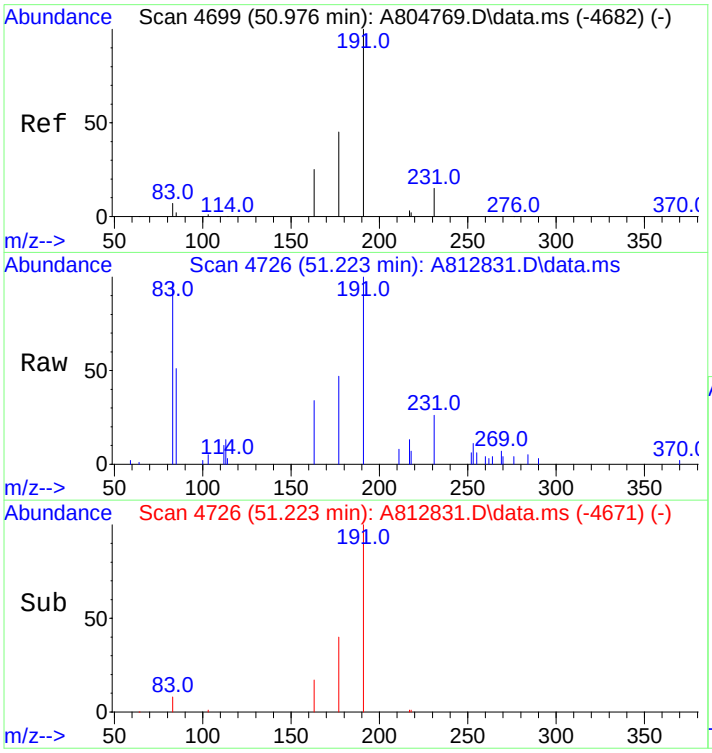




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 37.77 ng/ml
RT: 50.317 min Scan# 4627
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

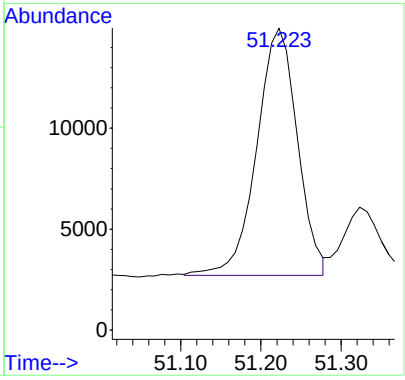
Tgt Ion:191 Resp: 3522

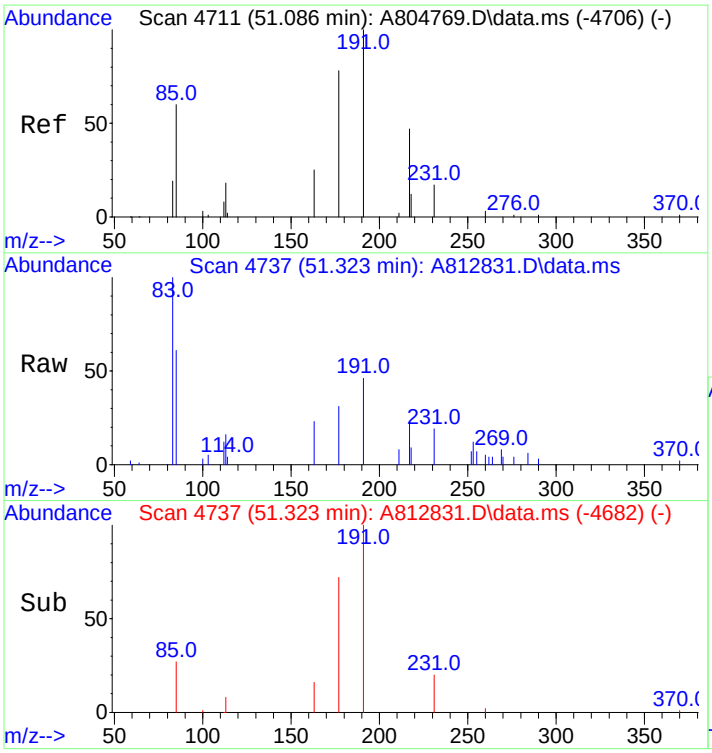




#112
30-Norhopane (T15)
Concen: 461.99 ng/ml m
RT: 51.223 min Scan# 4726
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

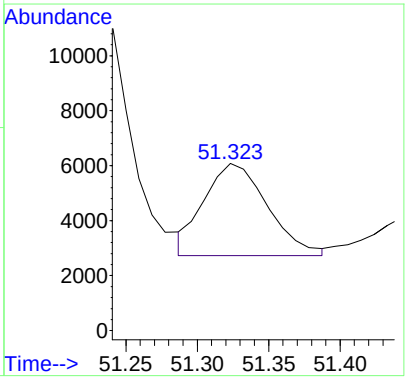
Tgt Ion:191 Resp: 43079

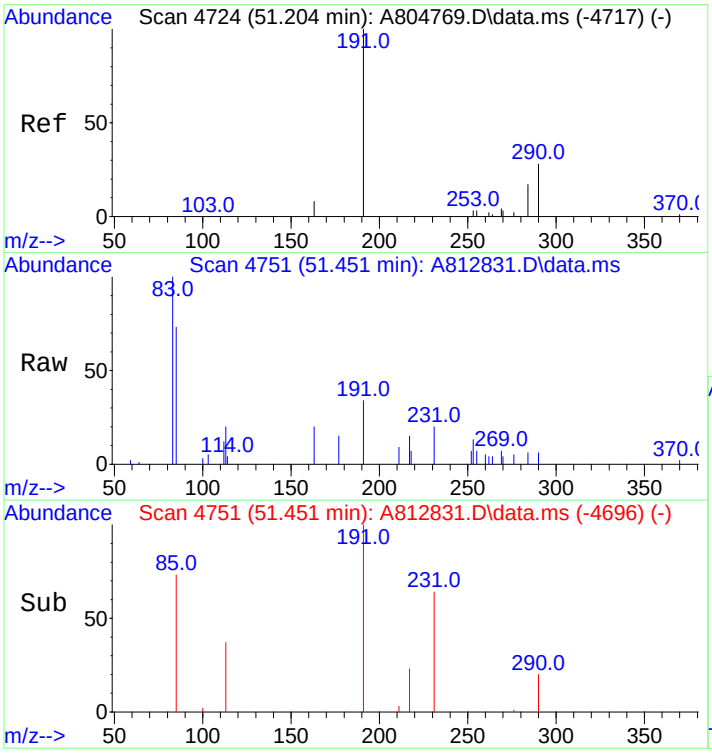




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 111.58 ng/ml m
RT: 51.323 min Scan# 4737
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

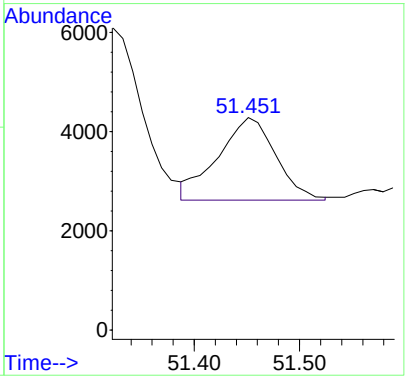
Tgt Ion:191 Resp: 10404

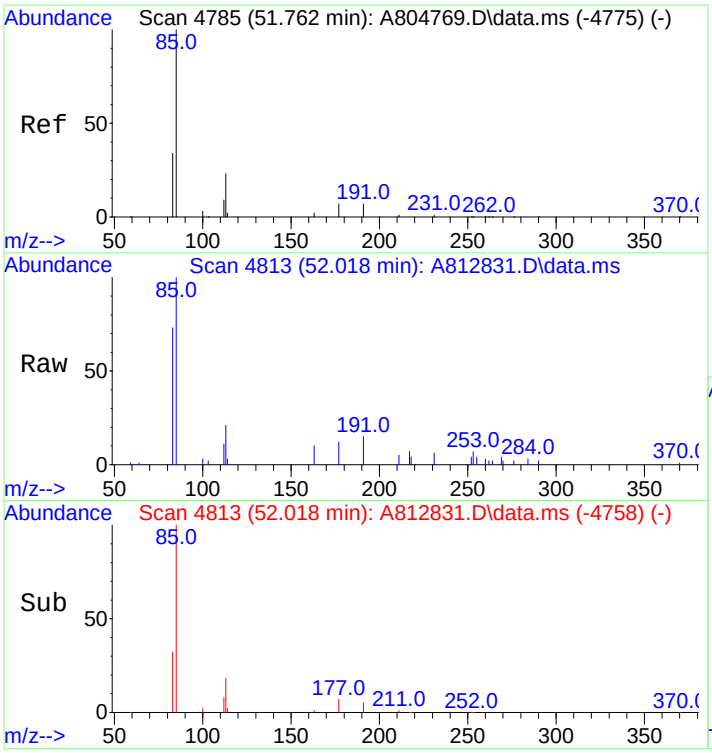




#114
17a(H)-Diahopane (X)
Concen: 67.97 ng/ml m
RT: 51.451 min Scan# 4751
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

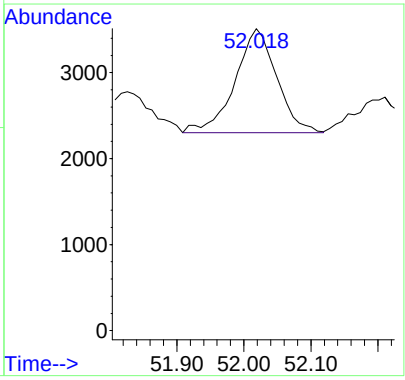
Tgt Ion:191 Resp: 6338

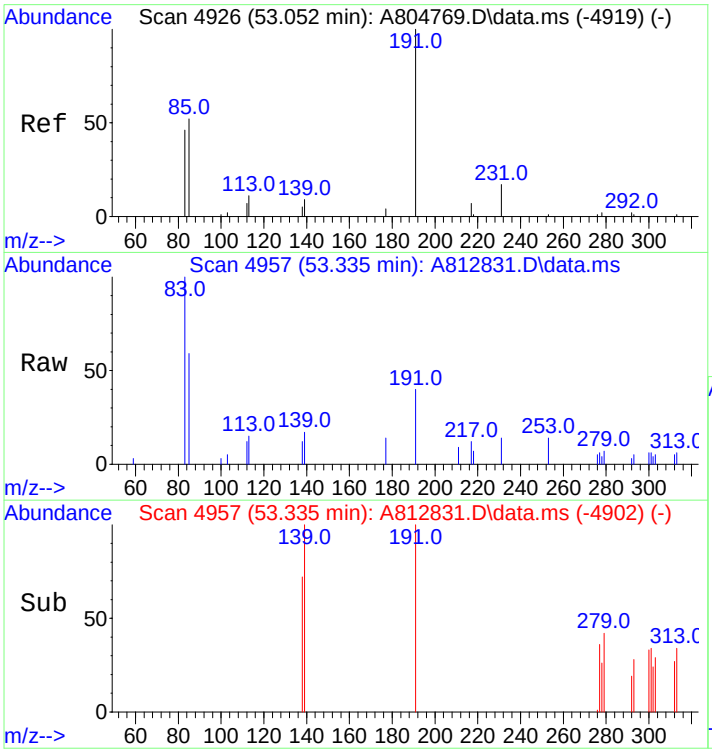




#115
30-Normoretane (T17)
Concen: 56.13 ng/ml
RT: 52.018 min Scan# 4813
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

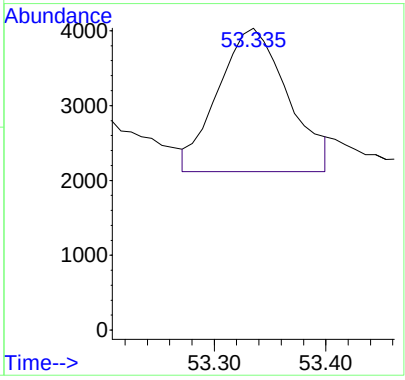
Tgt Ion:191 Resp: 5234

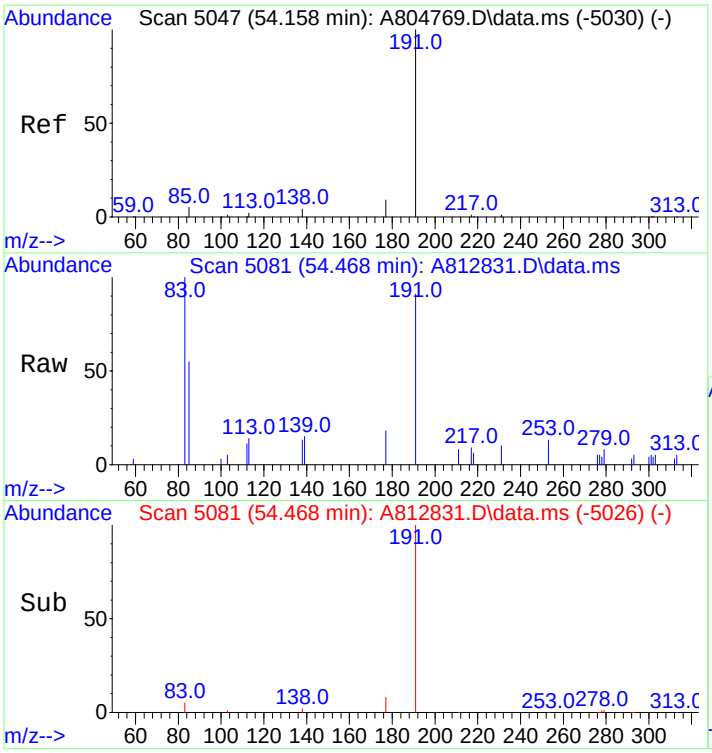




#117
Moretane (T20)
Concen: 89.16 ng/ml m
RT: 53.335 min Scan# 4957
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

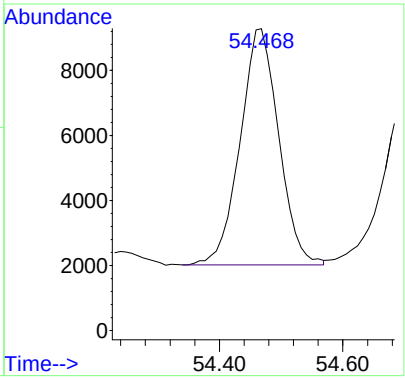
Tgt Ion:191 Resp: 8314

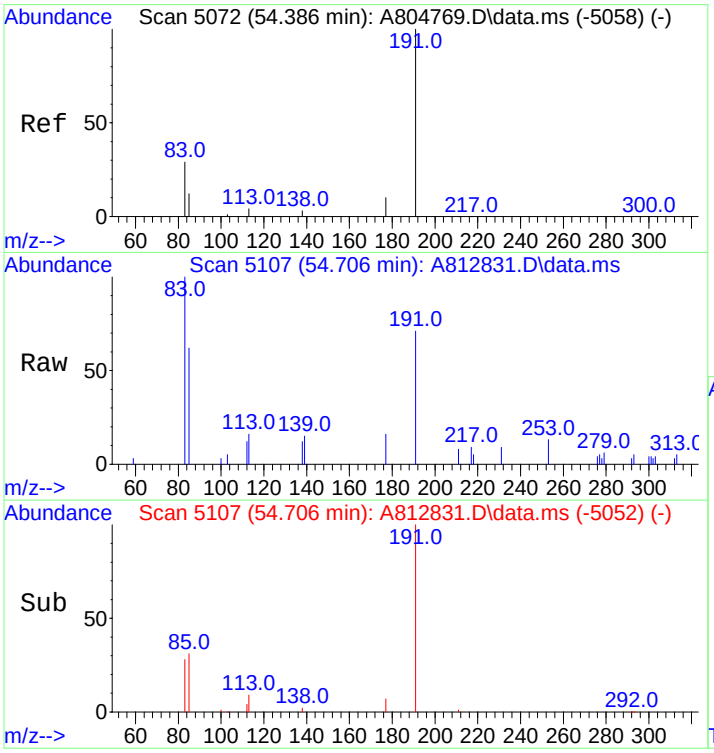




#118
30-Homohopane-22S (T21)
Concen: 339.19 ng/ml
RT: 54.468 min Scan# 5081
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

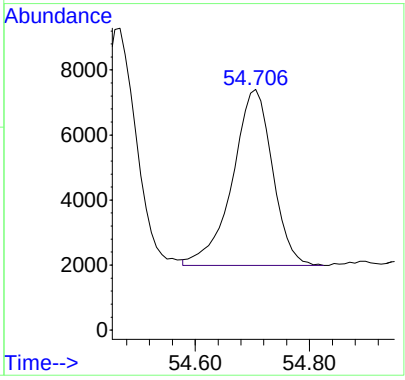
Tgt Ion:191 Resp: 31628

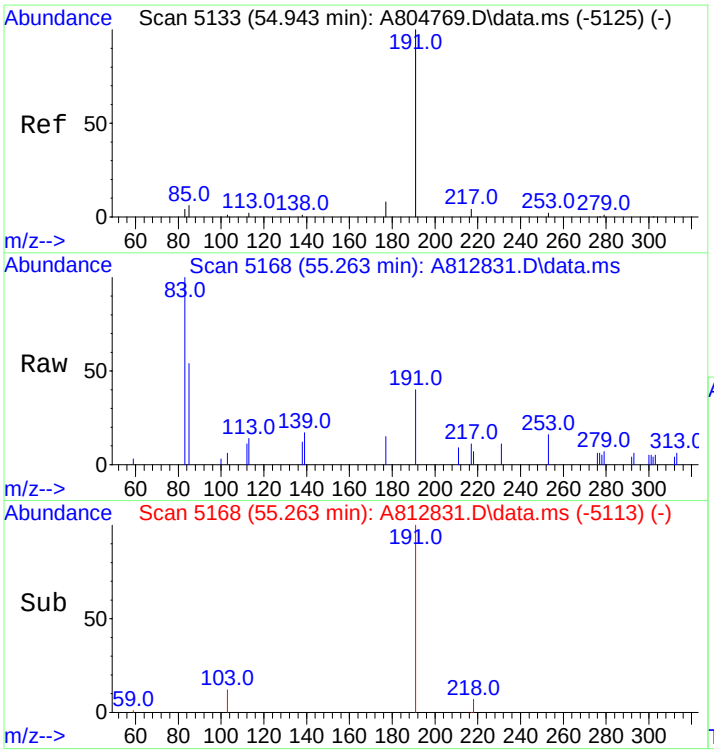




#119
30-Homohopane-22R (T22)
Concen: 283.55 ng/ml
RT: 54.706 min Scan# 5107
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

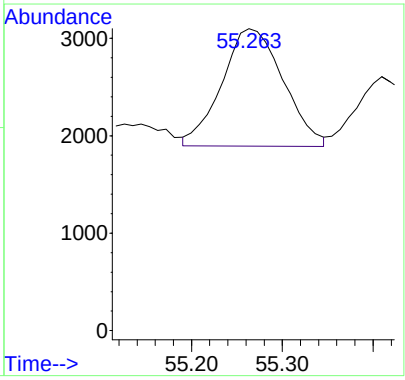
Tgt Ion:191 Resp: 26440

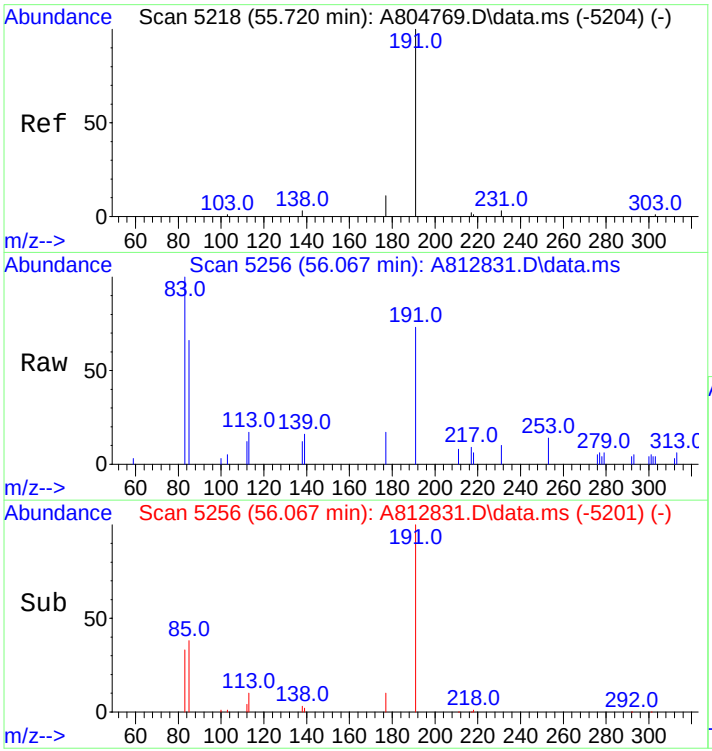




#120
Gammacerane/C32-diahopane
Concen: 60.66 ng/mL
RT: 55.263 min Scan# 5168
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

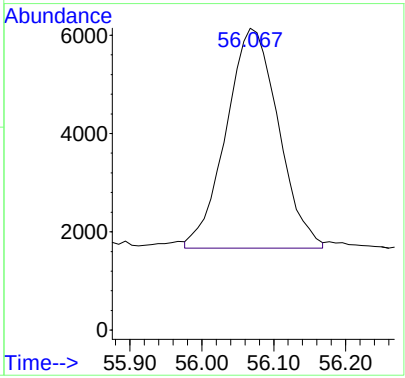
Tgt Ion:191 Resp: 5656

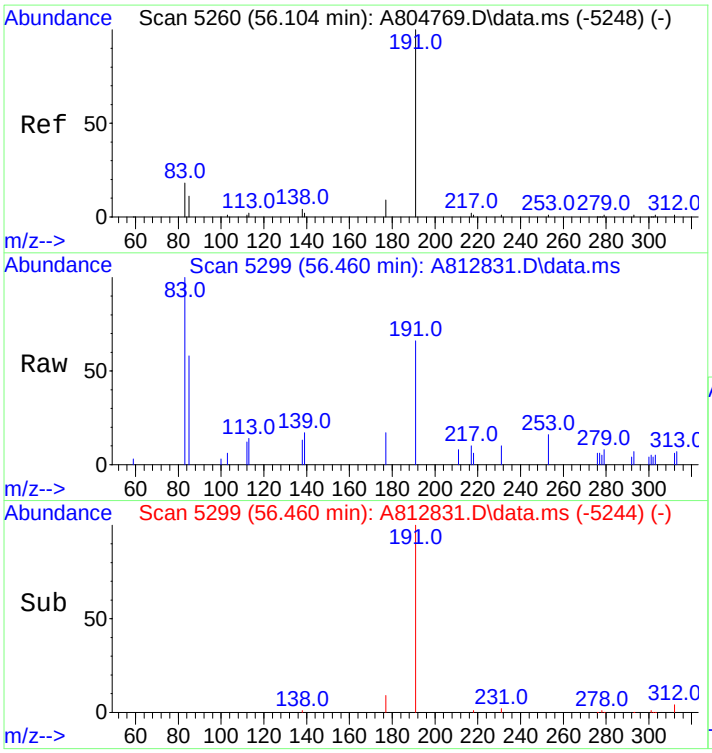




#121
30,31-Bishomohopane-22S (T26)
Concen: 241.40 ng/ml m
RT: 56.067 min Scan# 5256
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

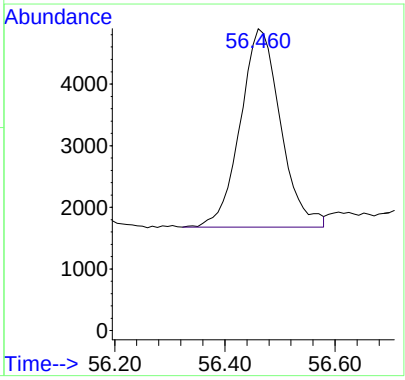
Tgt Ion:191 Resp: 22510

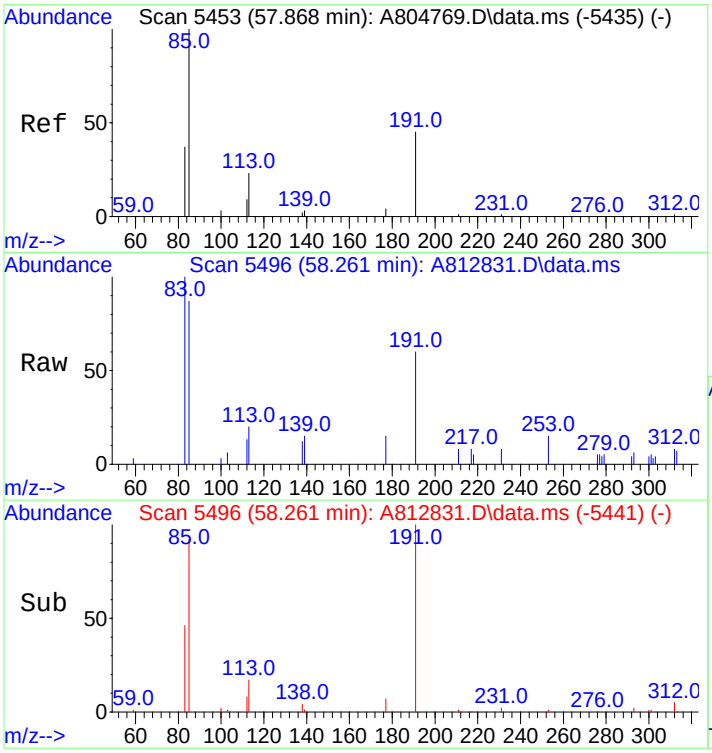




#122
30,31-Bishomohopane-22R (T27)
Concen: 175.46 ng/ml
RT: 56.460 min Scan# 5299
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

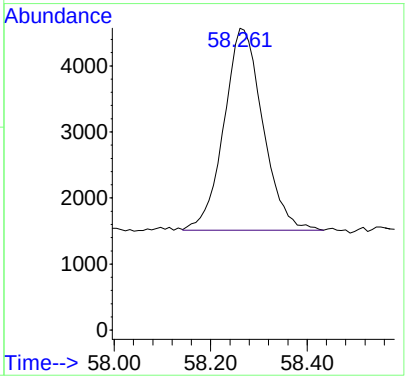
Tgt Ion:191 Resp: 16361

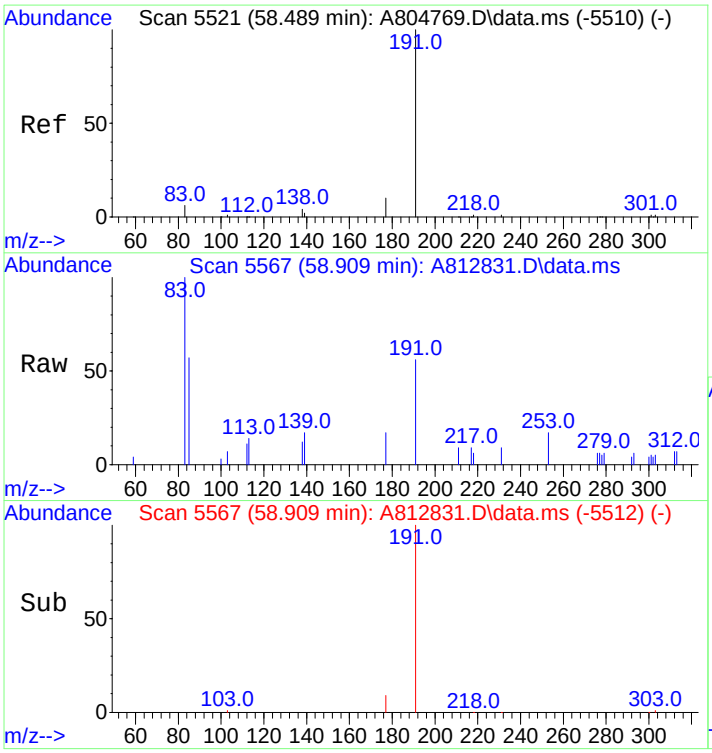




#123
30,31-Trishomohopane-22S (T30)
Concen: 183.76 ng/ml
RT: 58.261 min Scan# 5496
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

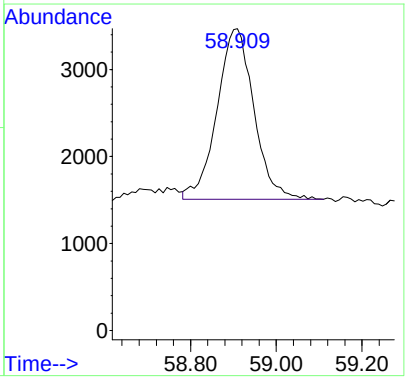
Tgt Ion:191 Resp: 17135

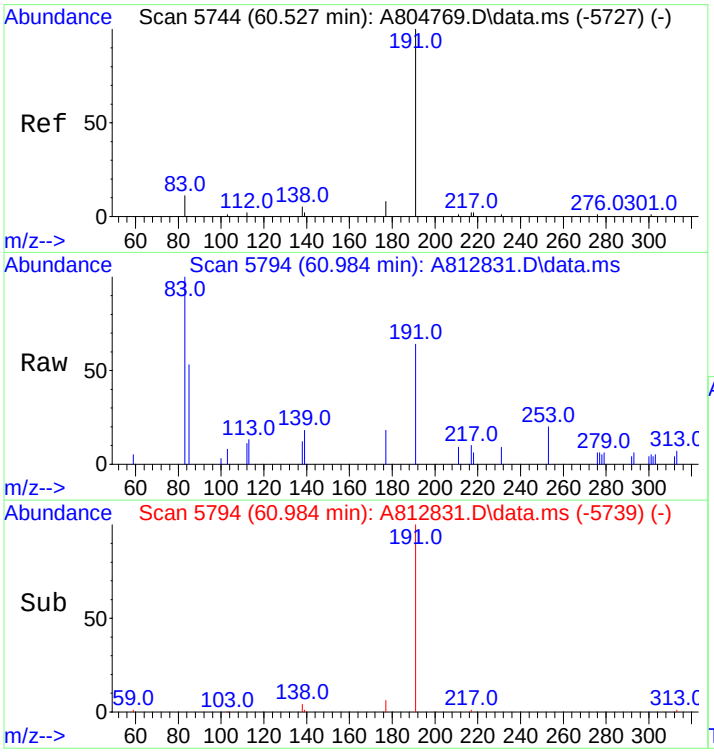




#124
30,31-Trishomohopane-22R (T31)
Concen: 126.00 ng/ml
RT: 58.909 min Scan# 5567
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

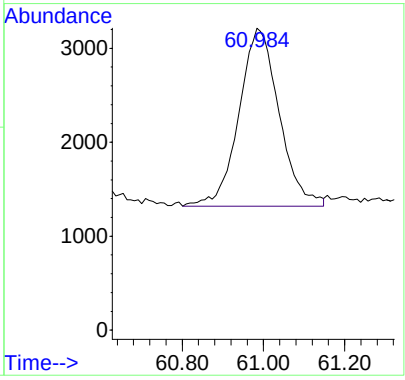
Tgt Ion:191 Resp: 11749

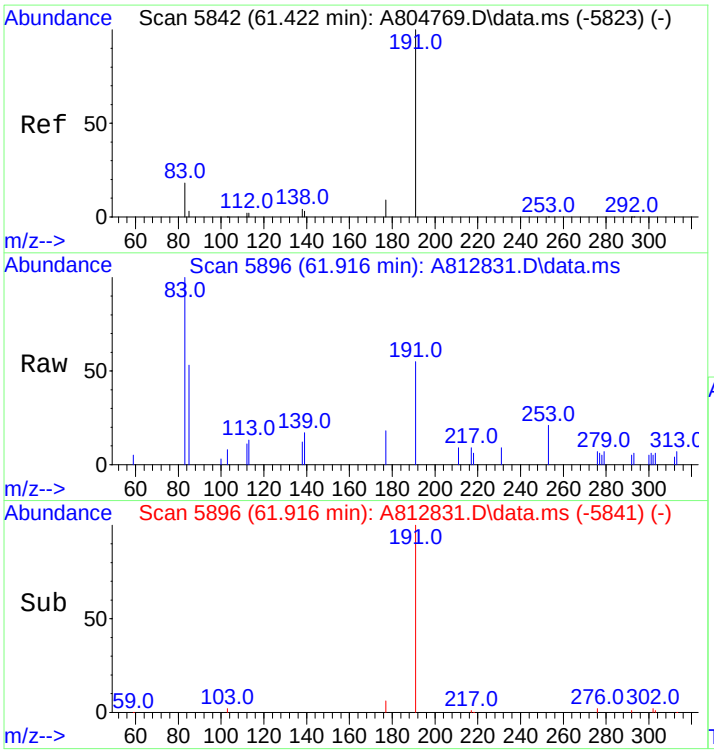




#125
Tetrakishomohopane-22S (T32)
Concen: 139.17 ng/ml
RT: 60.984 min Scan# 5794
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

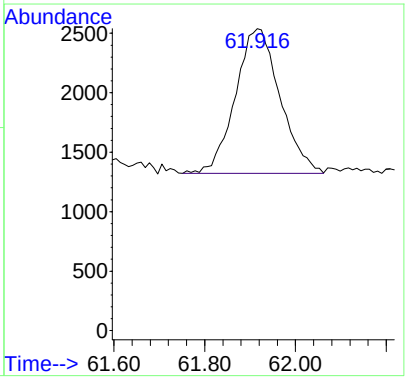
Tgt Ion:191 Resp: 12977

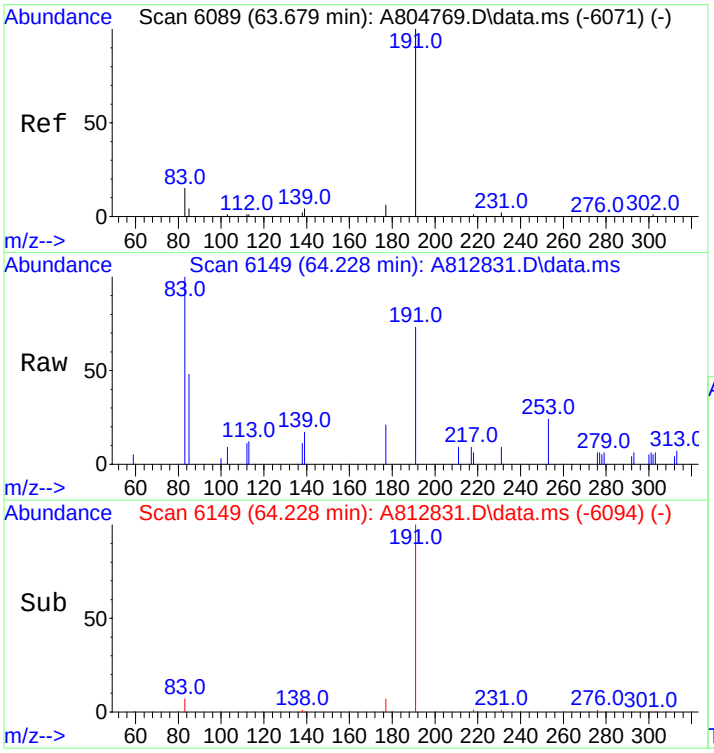




#126
Tetrakishomohopane-22R (T33)
Concen: 89.24 ng/ml
RT: 61.916 min Scan# 5896
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

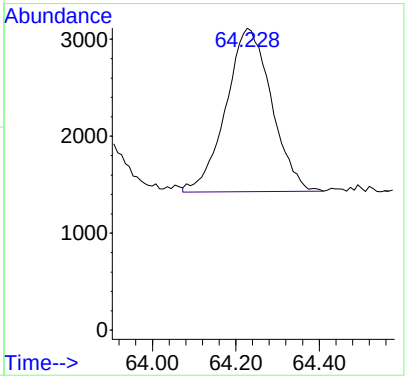
Tgt Ion:191 Resp: 8321

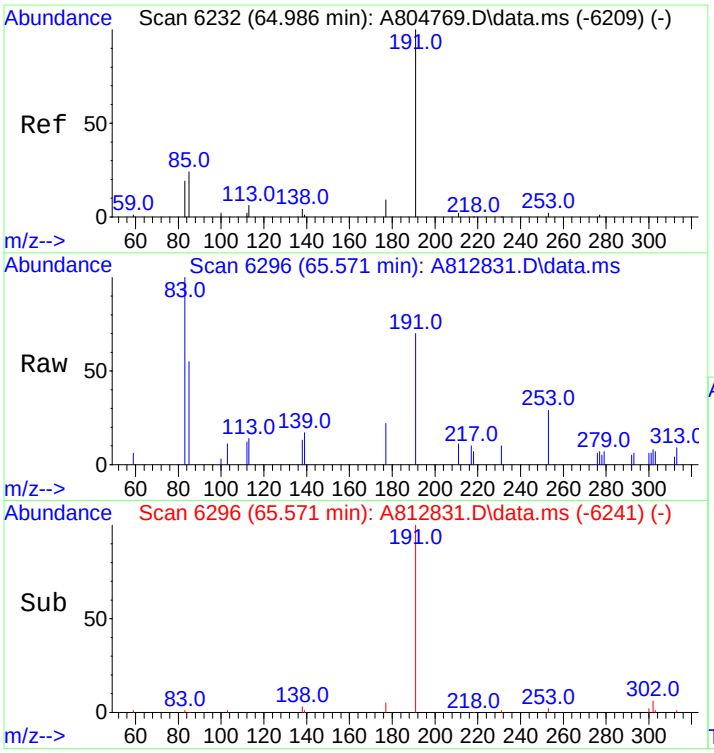




#127
Pentakishomohopane-22S (T34)
Concen: 137.11 ng/ml
RT: 64.228 min Scan# 6149
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

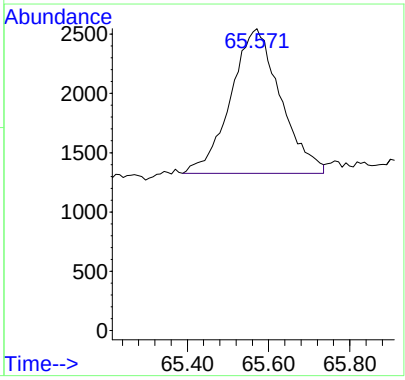
Tgt Ion:191 Resp: 12785

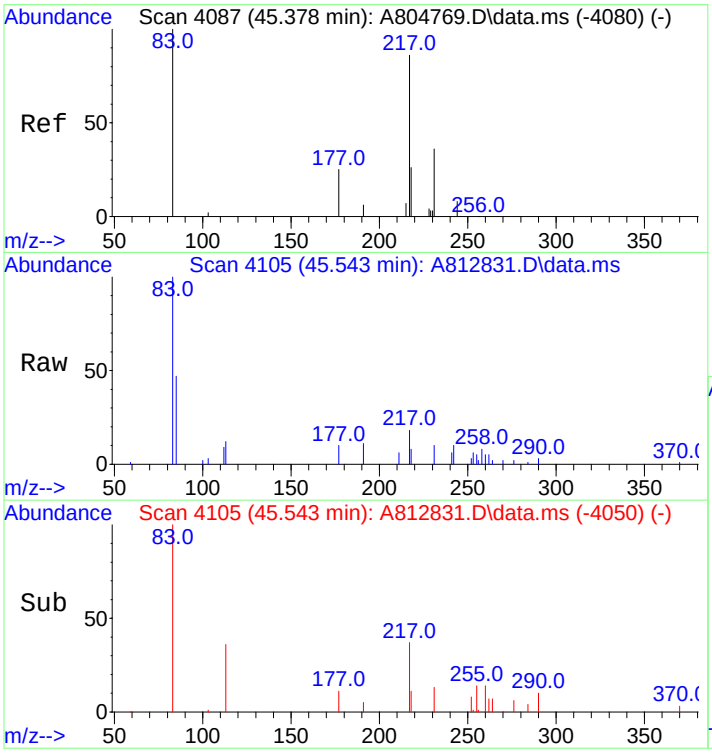




#128
Pentakishomohopane-22R (T35)
Concen: 111.63 ng/ml
RT: 65.571 min Scan# 6296
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

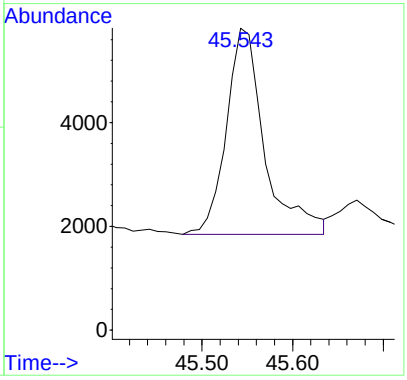
Tgt Ion:191 Resp: 10409

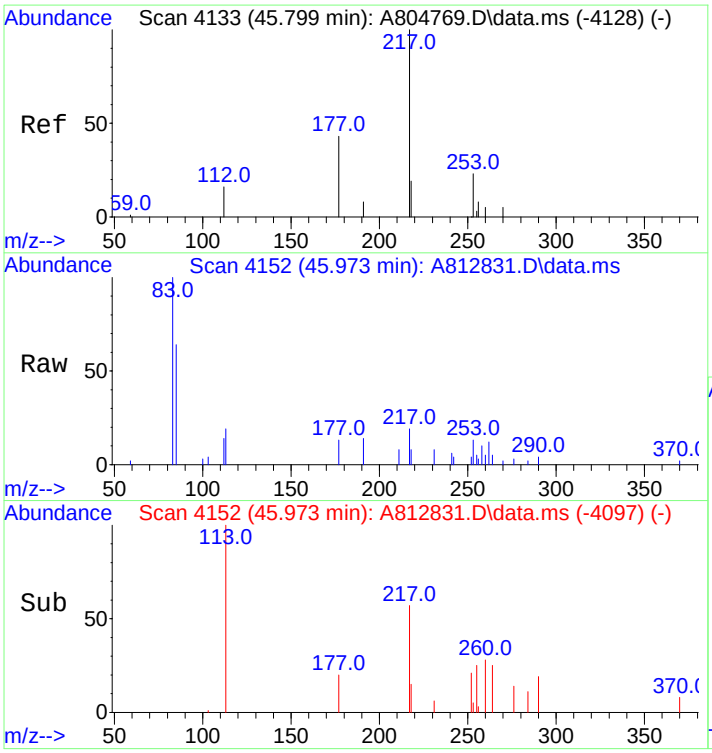




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 256.19 ng/ml
RT: 45.543 min Scan# 4105
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

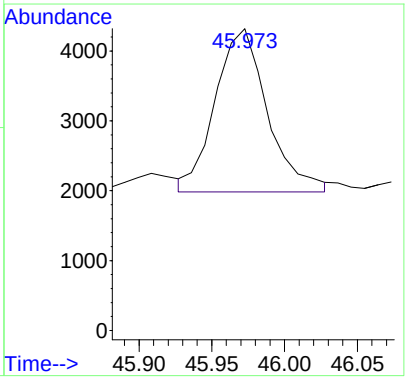
Tgt Ion:217 Resp: 11631

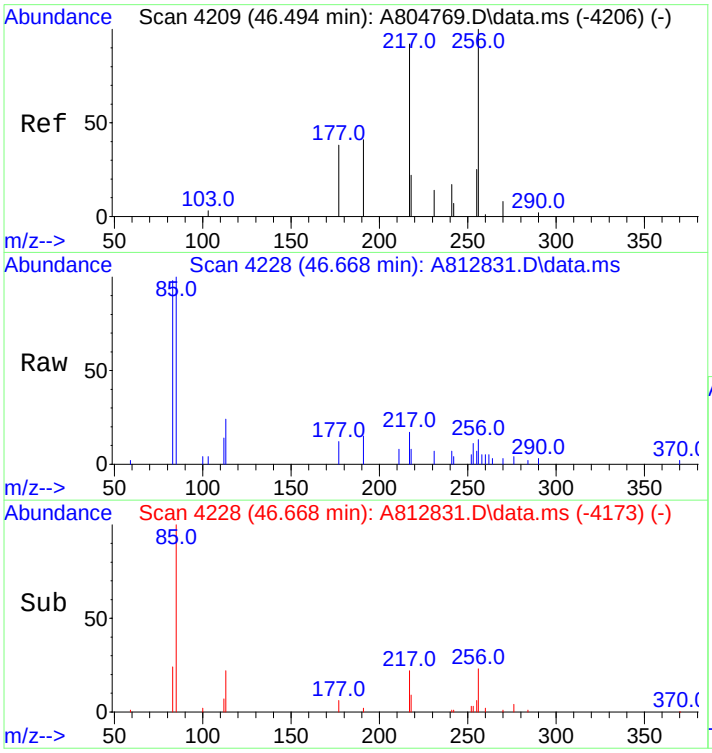




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 128.26 ng/ml m
RT: 45.973 min Scan# 4152
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

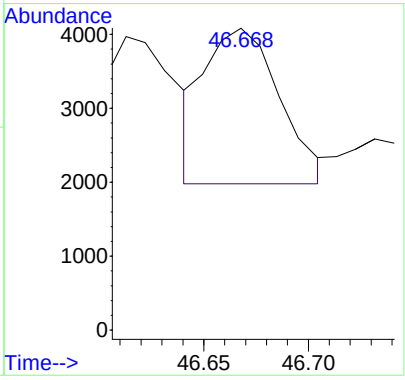
Tgt Ion:217 Resp: 5823

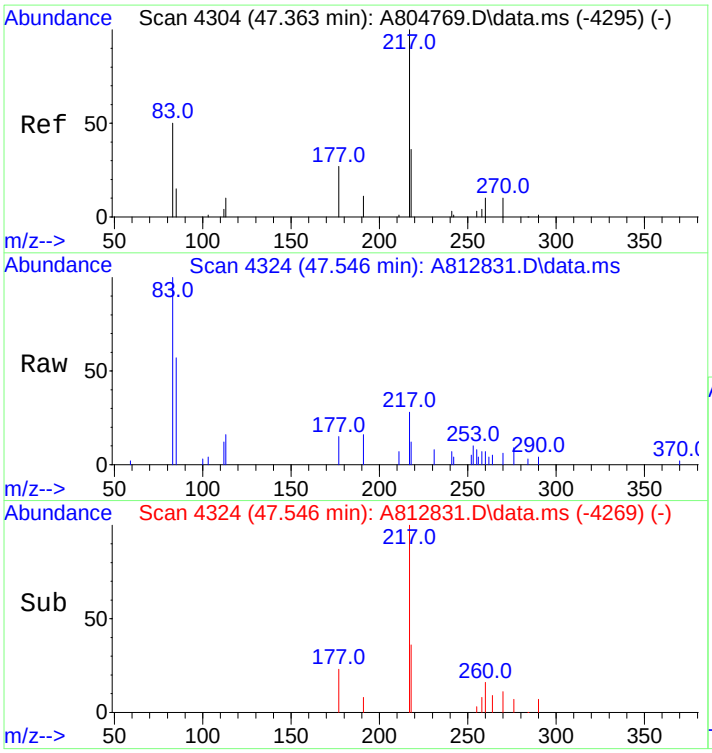




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 115.13 ng/ml m
RT: 46.668 min Scan# 4228
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

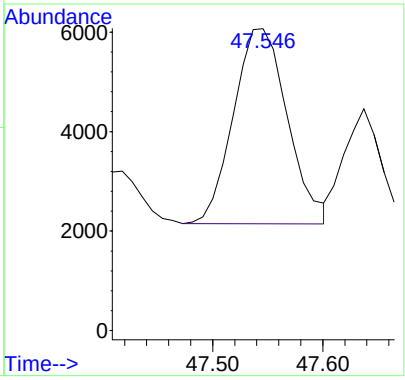
Tgt Ion:217 Resp: 5227

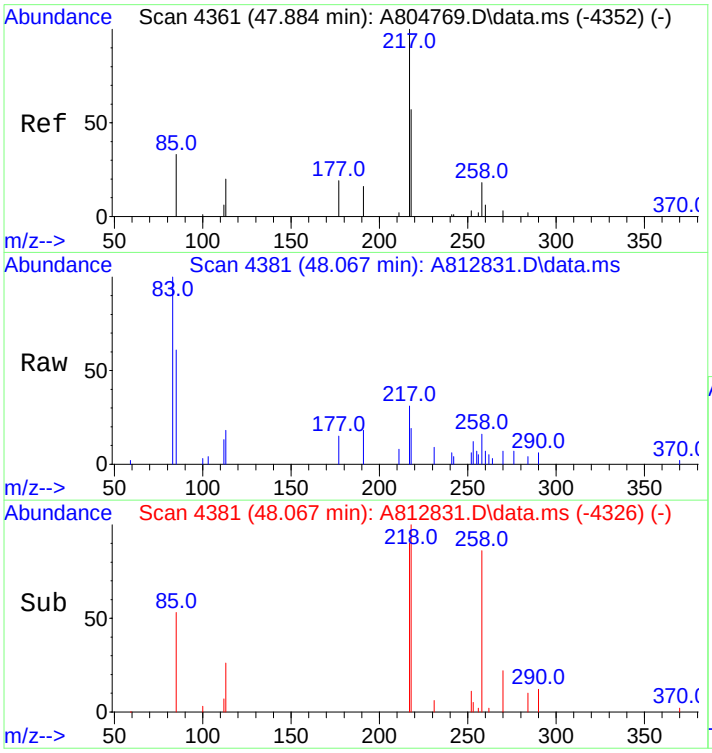




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 295.19 ng/ml
RT: 47.546 min Scan# 4324
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

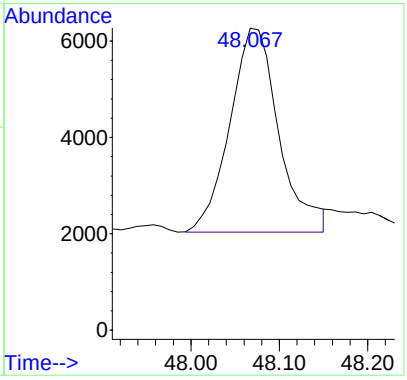
Tgt Ion:217 Resp: 13402

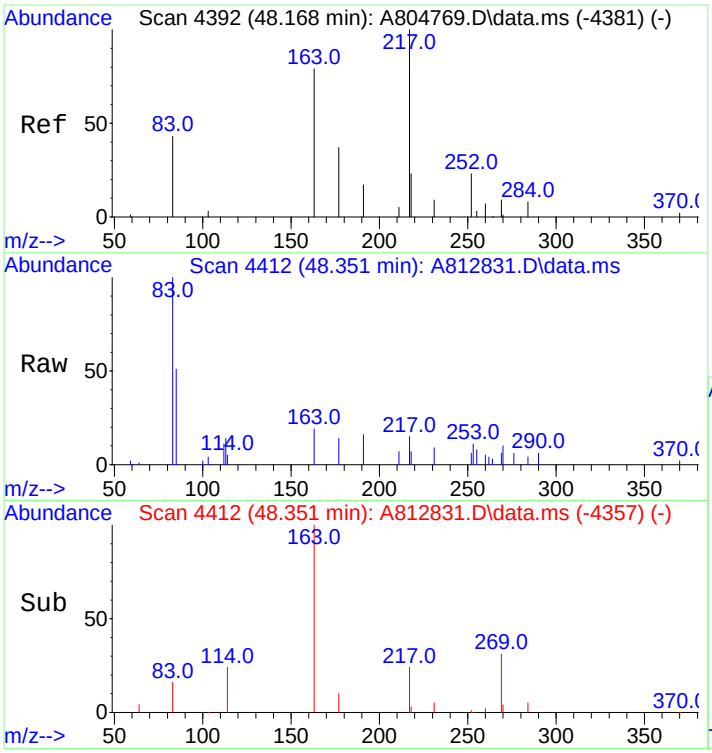




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 361.45 ng/ml m
RT: 48.067 min Scan# 4381
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

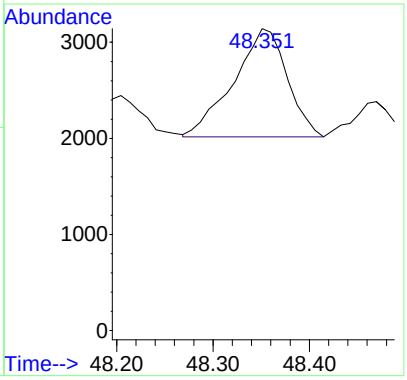
Tgt Ion:217 Resp: 16410

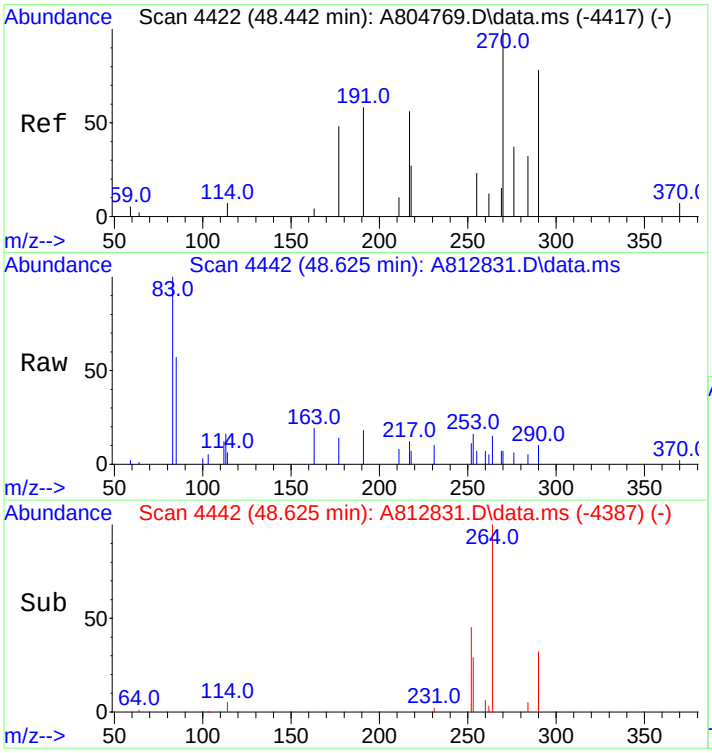




#135
Unknown Sterane (S18)
Concen: 95.51 ng/ml
RT: 48.351 min Scan# 4412
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

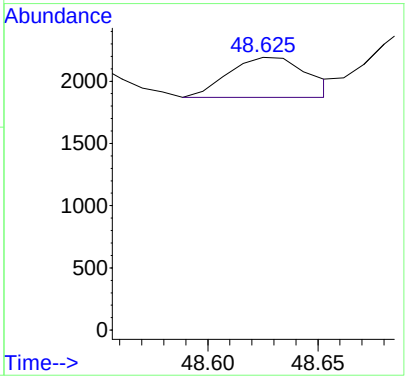
Tgt Ion:217 Resp: 4336

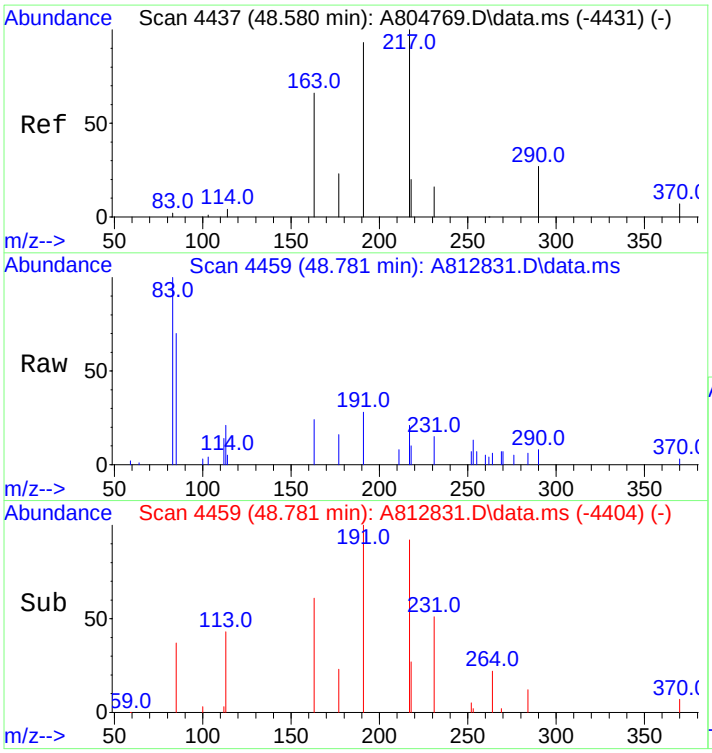




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 17.95 ng/ml
RT: 48.625 min Scan# 4442
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

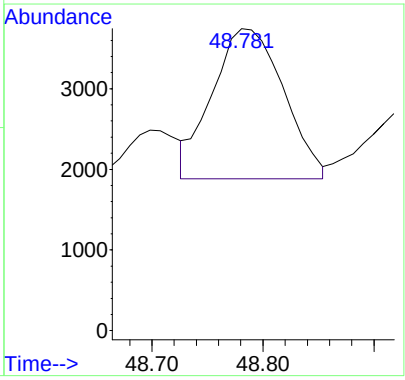
Tgt Ion:217 Resp: 815

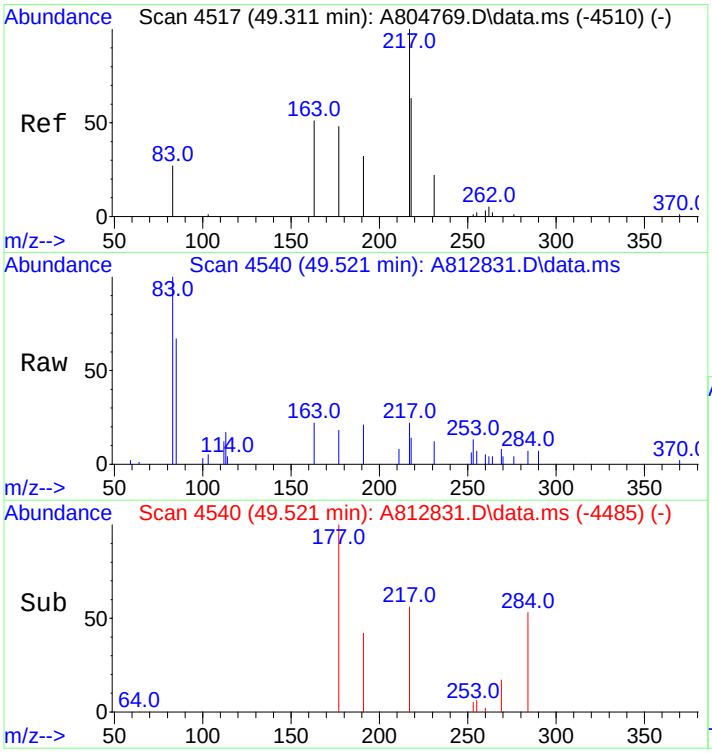




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 183.26 ng/ml m
RT: 48.781 min Scan# 4459
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

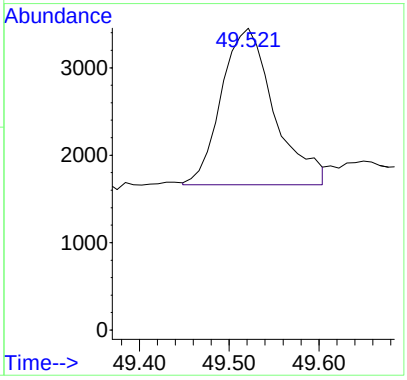
Tgt Ion:217 Resp: 8320

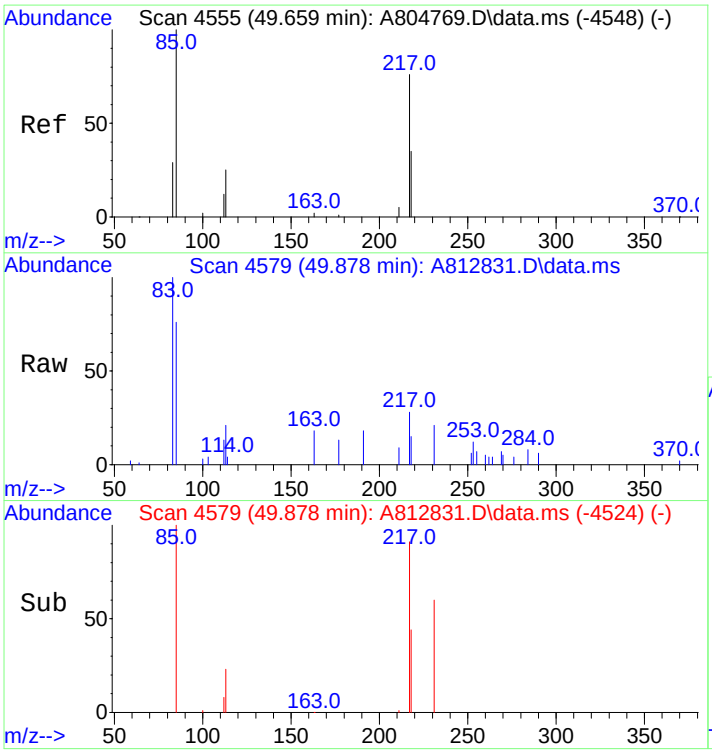




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 161.87 ng/ml m
RT: 49.521 min Scan# 4540
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

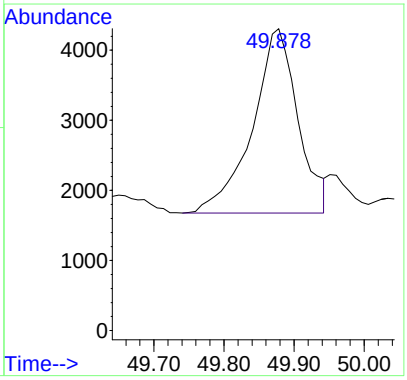
Tgt Ion:217 Resp: 7349

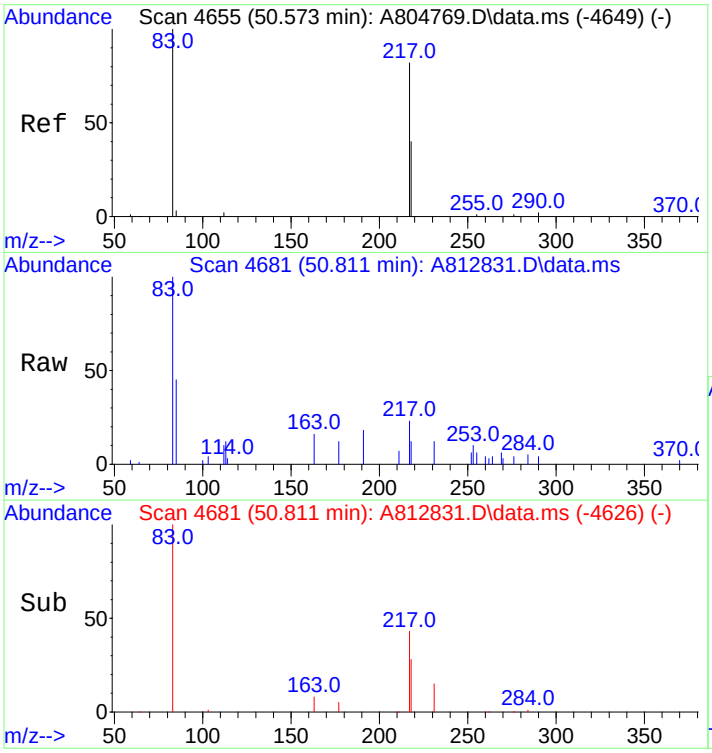




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 262.07 ng/ml
RT: 49.878 min Scan# 4579
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

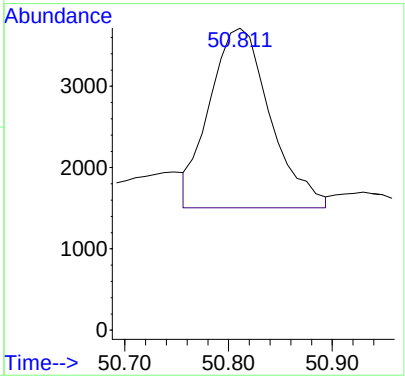
Tgt Ion:217 Resp: 11898

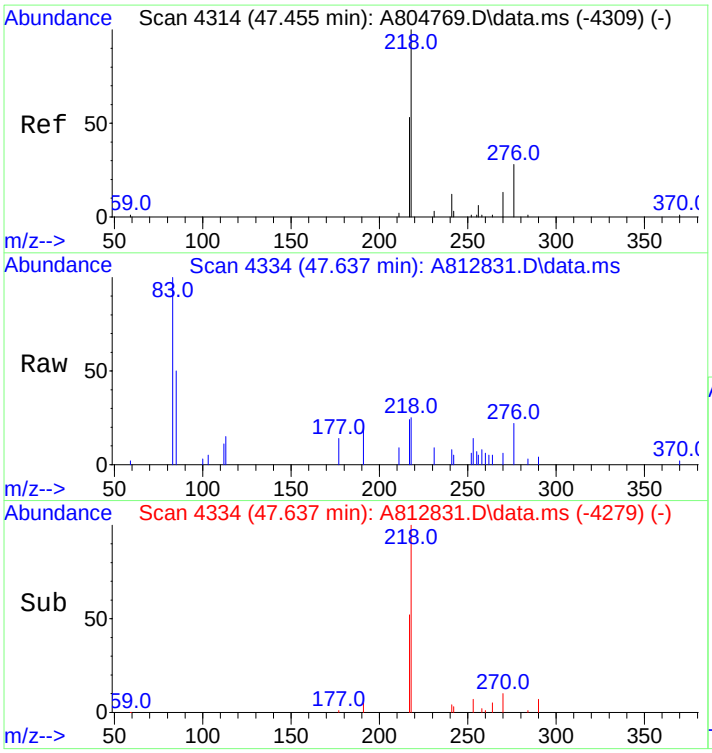




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 198.37 ng/ml m
RT: 50.811 min Scan# 4681
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

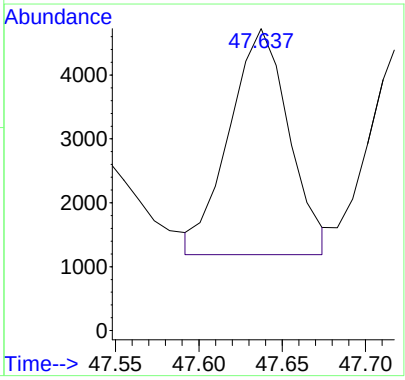
Tgt Ion:217 Resp: 9006

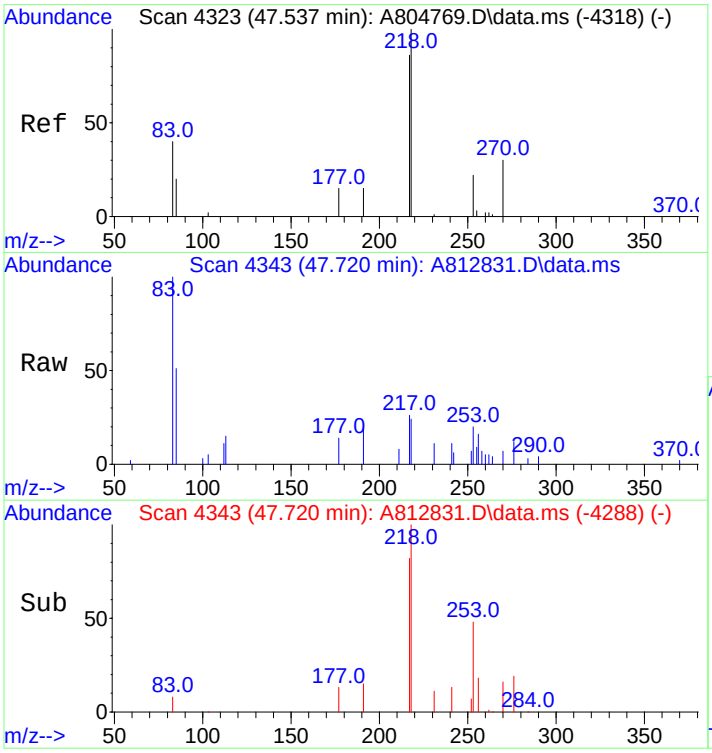




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 194.36 ng/ml m
RT: 47.637 min Scan# 4334
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

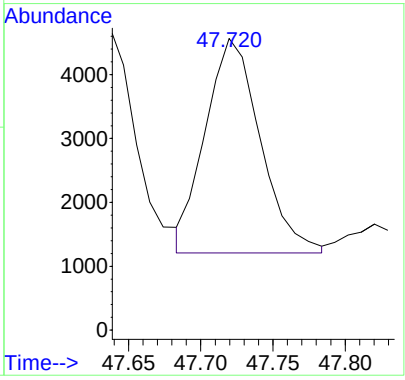
Tgt Ion:218 Resp: 8824

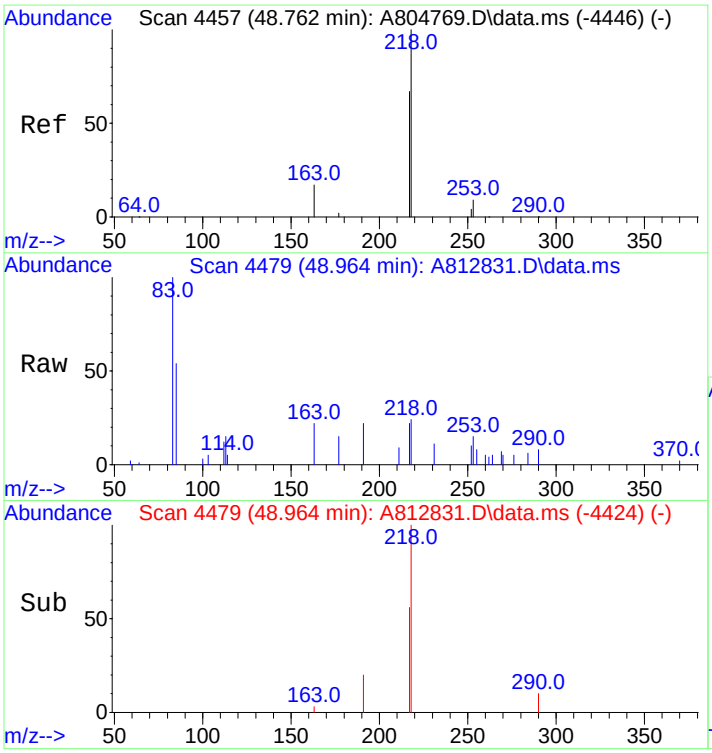




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 195.44 ng/ml m
RT: 47.720 min Scan# 4343
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

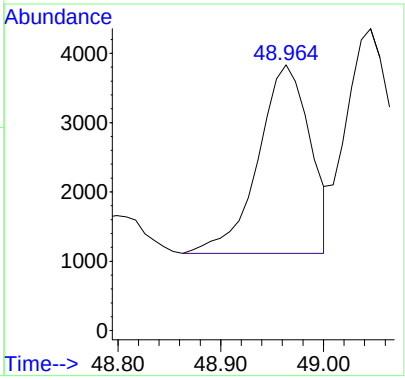
Tgt Ion:218 Resp: 8873

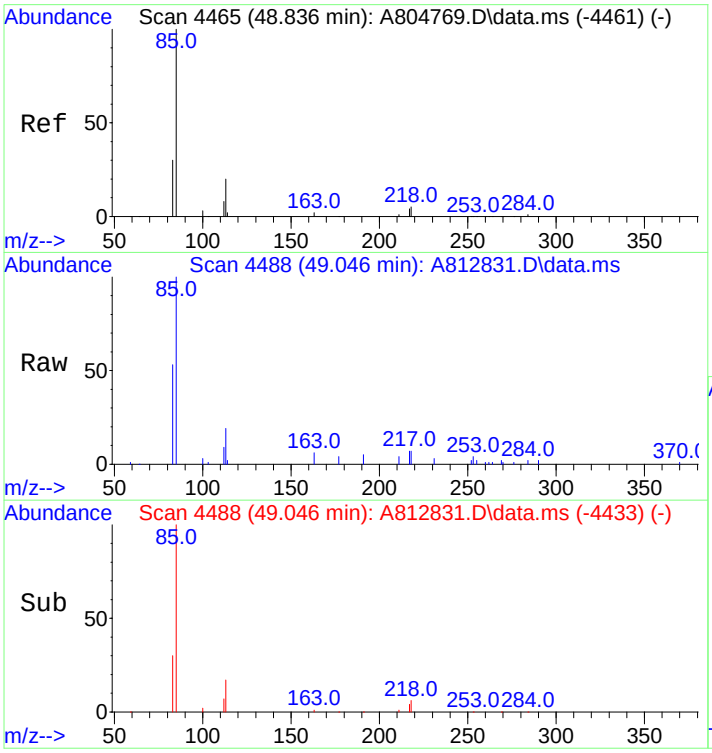




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 211.39 ng/ml
RT: 48.964 min Scan# 4479
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

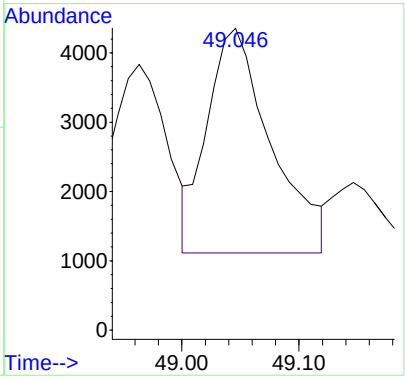
Tgt Ion:218 Resp: 9597

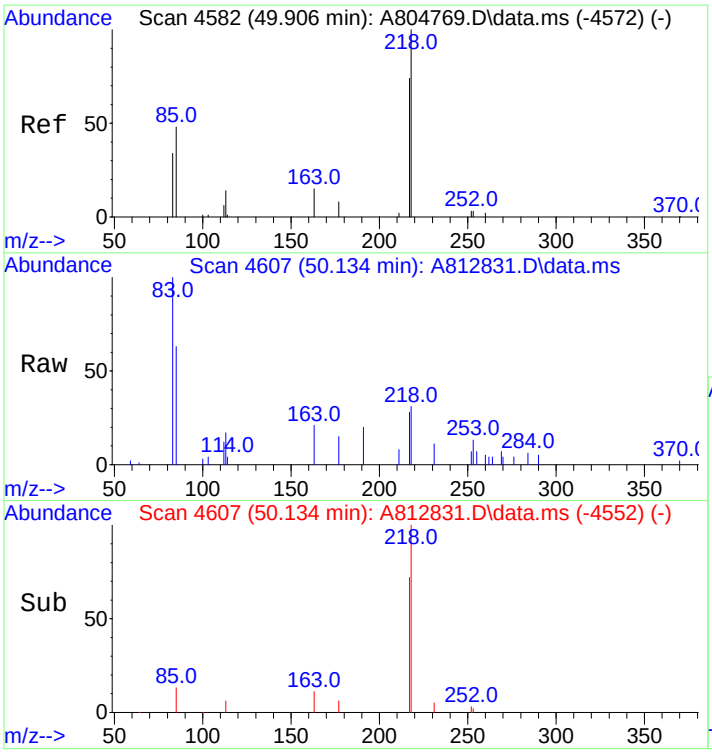




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 270.75 ng/ml m
RT: 49.046 min Scan# 4488
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

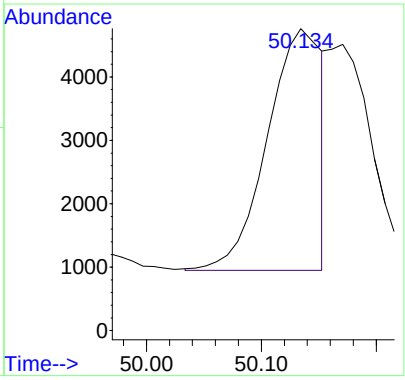
Tgt Ion:218 Resp: 12292

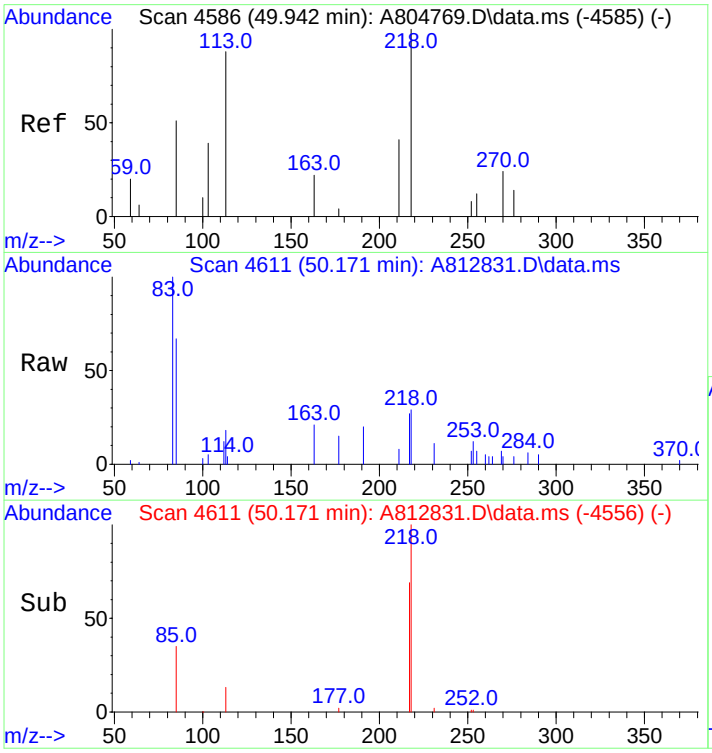




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 276.89 ng/ml m
RT: 50.134 min Scan# 4607
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

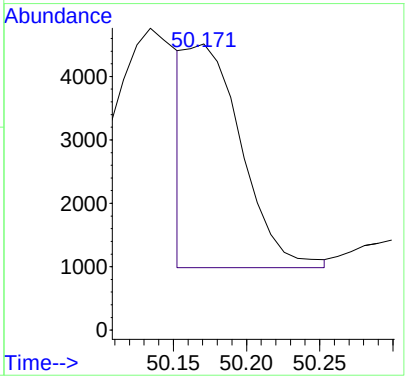
Tgt Ion:218 Resp: 12571

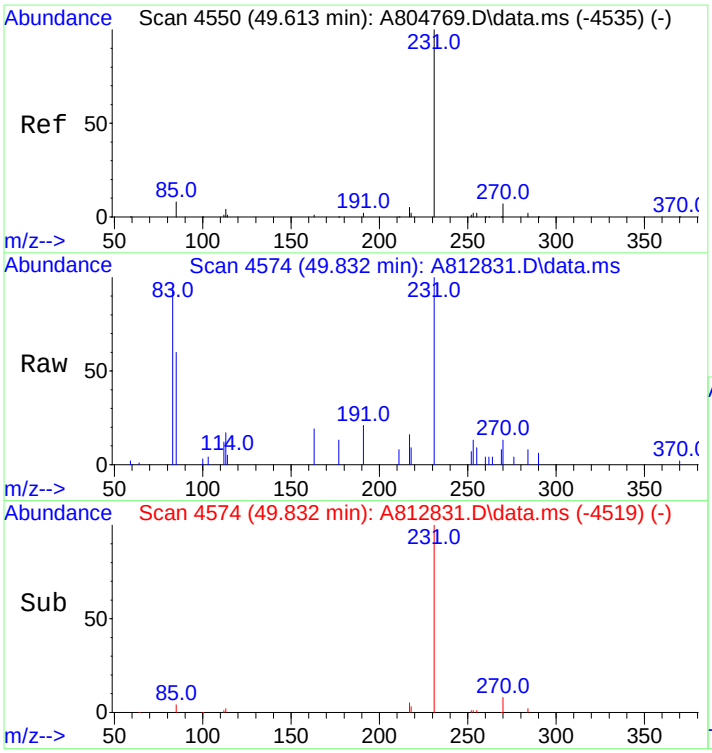




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 203.83 ng/ml m
RT: 50.171 min Scan# 4611
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

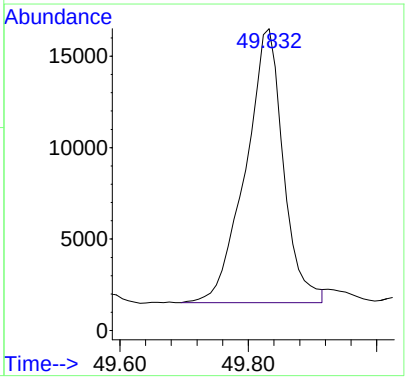
Tgt Ion:218 Resp: 9254

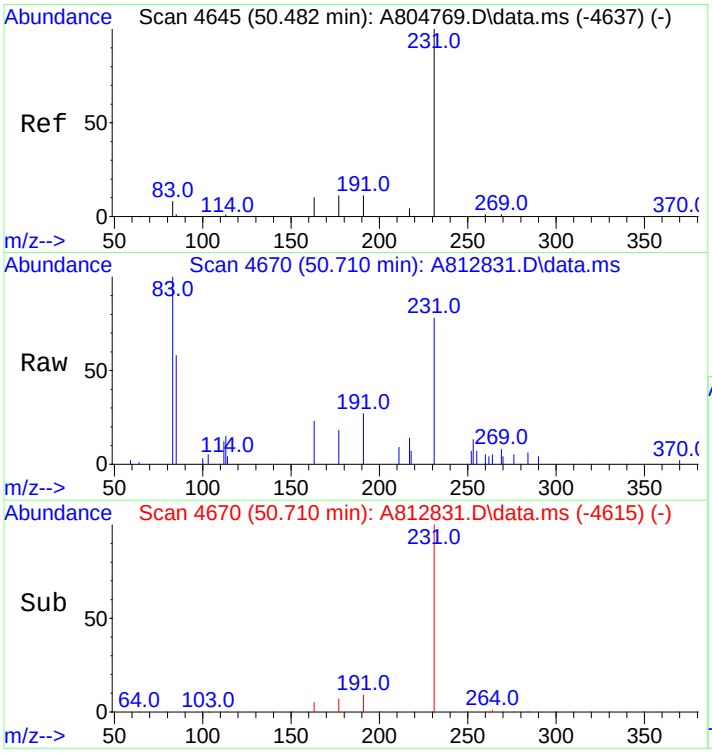




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1348.35 ng/mL m
RT: 49.832 min Scan# 4574
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

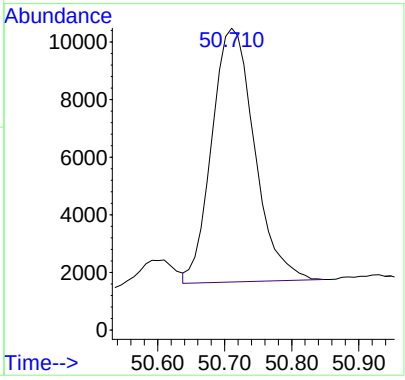
Tgt Ion:231 Resp: 61216

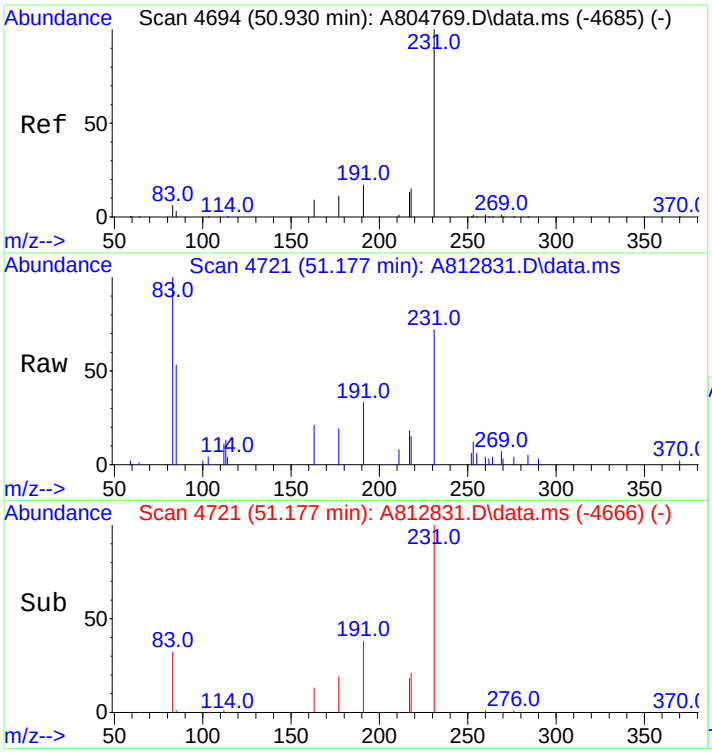




#148
C28,20S-triaromatic steroid
Concen: 857.59 ng/mL
RT: 50.710 min Scan# 4670
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

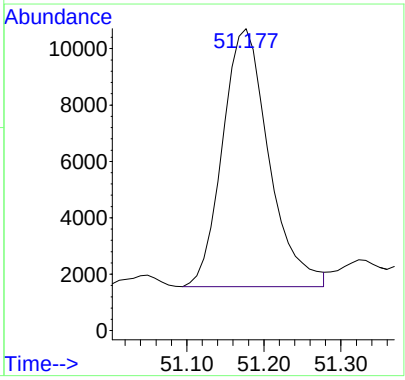
Tgt Ion:231 Resp: 38935

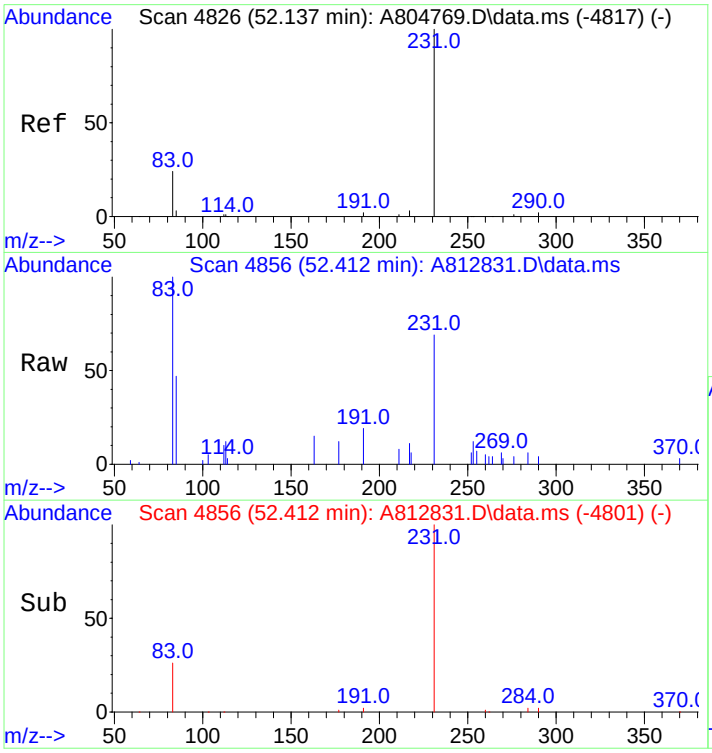




#149
C27,20R-triaromatic steroid
Concen: 845.72 ng/mL
RT: 51.177 min Scan# 4721
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

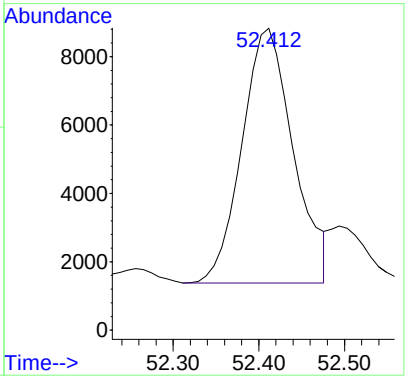
Tgt Ion:231 Resp: 38396





#150
C28,20R-triaromatic steroid
Concen: 687.94 ng/mL
RT: 52.412 min Scan# 4856
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:231 Resp: 31233



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812840.D
Acq On : 19 Nov 2012 11:42 am
Operator : AC
Sample : SS112012WCS01
Misc : whaq73
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Nov 20 14:57:17 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	55055	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	99583	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	217089	994.978	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 99.50%			
42) Phenanthrene-d10	32.843	188	195606	1154.448	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 115.44%			
83) Benzo[b]fluoranthene-d12	47.326	264	199120	1049.156	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.92%			
88) Benzo[a]pyrene-d12	48.534	264	192813	1028.290	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.83%			
129) 5B(H)Cholane - Surr	44.045	217	40309	1106.974	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 110.70%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	37429	765.022	ng/mL	100
4) cis-Decalin	17.870	138	2199M3	61.353	ng/mL	
5) C1-Decalins	18.134	152	76766M5	1569.042	ng/mL	
6) C2-Decalins	19.558	166	98568M5	2014.659	ng/mL	
7) C3-Decalins	22.396	180	70399M5	1438.905	ng/mL	
8) C4-Decalins	25.781	194	69507M5	1420.673	ng/mL	
10) Naphthalene	20.078	128	93996	376.571	ng/mL#	100
11) C1-Naphthalenes	22.779	142	259790M5	1040.783	ng/mL	
12) C2-Naphthalenes	25.617	156	607891M5	2435.362	ng/mL	
13) C3-Naphthalenes	28.300	170	671164M5	2688.849	ng/mL	
14) C4-Naphthalenes	30.718	184	480034M5	1923.135	ng/mL	
16) 2-Methylnaphthalene	22.779	142	159529	1072.906	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	100417	721.222	ng/mL#	100
18) Benzothiophene	20.297	134	7256	35.964	ng/mL	100
19) C1-Benzo(b)thiophenes	22.341	148	38787M5	192.245	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	64250M5	318.451	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	119395M5	591.773	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	118788M5	588.764	ng/mL	
23) Biphenyl	24.659	154	19431	102.715	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	154186	1211.653	ng/mL#	100
25) Dibenzofuran	27.743	168	9501M3	47.607	ng/mL	
26) Acenaphthylene	26.356	152	4496	19.844	ng/mL#	100
27) Acenaphthene	27.105	153	10722M3	79.285	ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.656	170	37762M3	344.548	ng/mL	
29) Fluorene	29.121	166	27697M3	182.606	ng/mL	
30) C1-Fluorenes	31.484	180	69751M5	459.868	ng/mL	
31) C2-Fluorenes	33.674	194	154839M5	1020.852	ng/mL	
32) C3-Fluorenes	35.509	208	173992M5	1147.128	ng/mL	
33) Dibenzothiophene	32.442	184	67600	324.106	ng/mL#	65
34) 4-Methyldibenzothiophe...	34.212	198	91998	441.082	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.559	198	76318	365.904	ng/mL#	100
36) 1-Methyldibenzothiophe...	34.979	198	48281	231.482	ng/mL#	100
37) OTP	34.623	198	10287M3	49.321	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	243233M5	1166.174	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	408293M5	1957.549	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	421694M5	2021.800	ng/mL	
41) C4-Dibenzothiophenes	39.389	240	287725M5	1379.489	ng/mL	
43) Phenanthrene	32.935	178	97849M3	487.416	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.897	192	53106	264.537	ng/mL	96
45) 2-Methylphenanthrene(2MP)	35.007	192	59497	296.373	ng/mL	97
46) 2-Methylanthracene(2MA)	35.162	192	4537M3	22.600	ng/mL	
47) 9/4-Methylphenanthrene...	35.344	192	87612	436.422	ng/mL	99
48) 1-Methylphenanthrene(1MP)	35.445	192	52023M3	259.143	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.344	192	263426M5	1312.206	ng/mL	

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.161	206	369802M5	1842.097	ng/mL	
52) C3-Phenanthrenes/Anthr...	40.265	220	297183M5	1480.360	ng/mL	
53) C4-Phenanthrenes/Anthr...	39.918	234	145700M5	725.776	ng/mL	
54) Retene	39.918	234	22371	480.517	ng/mL#	60
55) Anthracene	33.145	178	5443M3	29.103	ng/mL	
56) Carbazole	33.774	167	4277M3	21.917	ng/mL	
57) 1-Methylphenanthrene	35.445	192	52517M3	369.047	ng/mL	
58) Fluoranthene	37.709	202	7771M3	37.580	ng/mL	
60) Pyrene	38.594	202	26544M3	126.909	ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.982	216	91764M5	438.730	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.438	230	122284M5	584.649	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.789	244	142387M5	680.763	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.141	258	140206M5	670.335	ng/mL	
66) Naphthobenzothiophene	42.438	234	28058	144.509	ng/ml#	83
67) Naphthobenzothiophene-...	42.438	234	28058	144.509	ng/mL#	83
68) Naphthobenzothiophene-...	42.776	234	8008	41.244	ng/mL#	10
69) Naphthobenzothiophene-...	43.068	234	5389M3	27.755	ng/mL	
70) C1-Naphthobenzothiophenes	44.520	248	135970M5	700.296	ng/ml	
71) C2-Naphthobenzothiophenes	45.872	262	220766M5	1137.027	ng/ml	
72) C3-Naphthobenzothiophenes	47.445	276	180923M5	931.821	ng/ml	
73) C4-Naphthobenzothiophenes	48.534	290	134012M5	690.212	ng/mL	
75) Benz[a]anthracene	43.360	228	5006M3	22.931	ng/mL	
77) Chrysene/Triphenylene	43.506	228	24187M3	109.453	ng/mL	
78) C1-Chrysenes	44.995	242	67917M5	307.345	ng/mL	
79) C2-Chrysenes	47.070	256	112002M5	506.843	ng/mL	
80) BBF-D12 Surr BKGD	47.326	256	6943	31.419	ng/mL	100
81) C3-Chrysenes	48.451	270	119061M5	538.787	ng/mL	
82) C4-Chrysenes	49.823	284	77994M5	352.946	ng/mL	
84) Benzo[b]fluoranthene	47.418	252	7635	32.564	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.491	252	2573M3	10.058	ng/mL	
87) Benzo[e]pyrene	48.433	252	12637M3	52.309	ng/mL	
89) Benzo[a]pyrene	48.625	252	6551M3	29.315	ng/mL	
90) Perylene	48.945	252	12394	50.775	ng/mL#	64
91) Indeno[1,2,3-cd]pyrene	53.545	276	3644M3	15.351	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	1391M3	5.978	ng/mL	
93) Benzo[g,h,i]perylene	54.880	276	10013	37.169	ng/mL#	84
94) Hopane (T19)	52.631	191	93826	1254.555	ng/mL#	87
96) C23 Tricyclic Terpane ...	41.069	191	37187M4	497.231	ng/ml	
97) C24 Tricyclic Terpane ...	41.799	191	21027	281.154	ng/ml	100
98) C25 Tricyclic Terpane ...	43.278	191	19457M3	260.161	ng/ml	
99) C24 Tetracyclic Terpan...	44.602	191	7689M3	102.810	ng/ml	
100) C26 Tricyclic Terpane-...	44.337	191	8183M3	109.416	ng/ml	
101) C26 Tricyclic Terpane-...	44.429	191	7477M3	99.976	ng/ml	
102) C28 Tricyclic Terpane-...	46.714	191	8787	117.492	ng/ml	100
103) C28 Tricyclic Terpane-...	46.869	191	9339	124.873	ng/ml	100
104) C29 Tricyclic Terpane-...	47.400	191	10215	136.586	ng/ml	100
105) C29 Tricyclic Terpane-...	47.601	191	10512	140.557	ng/ml	100
106) 18a-22,29,30-Trisnorne...	48.762	191	10904M3	145.798	ng/ml	
107) C30 Tricyclic Terpane-22S	48.845	191	7615M3	101.821	ng/mL	
108) C30 Tricyclic Terpane-22R	49.092	191	7091M3	94.814	ng/mL	
109) 17a(H)-22,29,30-Trisno...	49.320	191	25442	340.187	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.537	191	15598M3	208.562	ng/ml	
111) 17a(H),21b(H)-25-Norho...	50.317	191	4074	54.474	ng/ml	100
112) 30-Norhopane (T15)	51.223	191	65811M3	879.965	ng/ml	
113) 18a(H)-30-Norneohopane...	51.332	191	10336M3	138.204	ng/ml	
114) 17a(H)-Diahopane (X)	51.451	191	3328M3	44.499	ng/ml	
115) 30-Normoretane (T17)	52.028	191	6269	83.823	ng/ml	100
116) 18a(H)&18b(H)-Oleanane...	52.421	191	841	11.245	ng/ml	100
117) Moretane (T20)	53.335	191	7121	95.216	ng/ml	100
118) 30-Homohopane-22S (T21)	54.468	191	39535	528.626	ng/ml	100
119) 30-Homohopane-22R (T22)	54.715	191	31852	425.896	ng/ml	100

Quantitation Report (QT Reviewed)

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120)	Gammacerane/C32-diahopane	55.272	191	14630M4	195.619	ng/mL	
121)	30,31-Bishomohopane-22...	56.077	191	25011	334.424	ng/ml	100
122)	30,31-Bishomohopane-22...	56.470	191	18615	248.903	ng/ml	100
123)	30,31-Trishomohopane-2...	58.279	191	20474	273.760	ng/ml	100
124)	30,31-Trishomohopane-2...	58.909	191	13936	186.339	ng/ml	100
125)	Tetrakishomohopane-22S...	61.002	191	13113	175.335	ng/ml	100
126)	Tetrakishomohopane-22R...	61.925	191	9564	127.881	ng/ml	100
127)	Pentakishomohopane-22S...	64.237	191	16477	220.315	ng/ml	100
128)	Pentakishomohopane-22R...	65.580	191	10958	146.520	ng/ml	100
130)	13b(H),17a(H)-20S-Diac...	45.552	217	6084M3	167.080	ng/ml	
131)	13b(H),17a(H)-20R-Diac...	45.973	217	2989	82.085	ng/ml	100
132)	13b,17a-20S-Methyldiac...	46.668	217	3090M3	84.858	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.537	217	10414	285.991	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.076	217	12520	343.827	ng/ml	100
135)	Unknown Sterane (S18)	48.360	217	2563	70.386	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.625	217	873	23.975	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.781	217	4931	135.416	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.522	217	4487	123.223	ng/ml	100
139)	14a(H),17a(H)-20S-Ethy...	49.878	217	10639M3	292.170	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.811	217	8319M3	228.458	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.637	218	7790M3	213.931	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.720	218	8013M3	220.055	ng/ml	
143)	14b,17b-20R-Methylchol...	48.964	218	6468	177.626	ng/ml	100
144)	14b,17b-20S-Methylchol...	49.046	218	9133M3	250.812	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.134	218	13066M3	358.821	ng/ml	
146)	14b(H),17b(H)-20S-Ethy...	50.171	218	7356M3	202.012	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.832	231	45542	1250.684	ng/mL	100
148)	C28,20S-triaromatic st...	50.711	231	38155M3	1047.820	ng/mL	
149)	C27,20R-triaromatic st...	51.177	231	30103M4	826.695	ng/mL	
150)	C28,20R-triaromatic st...	52.412	231	31880	875.495	ng/mL	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

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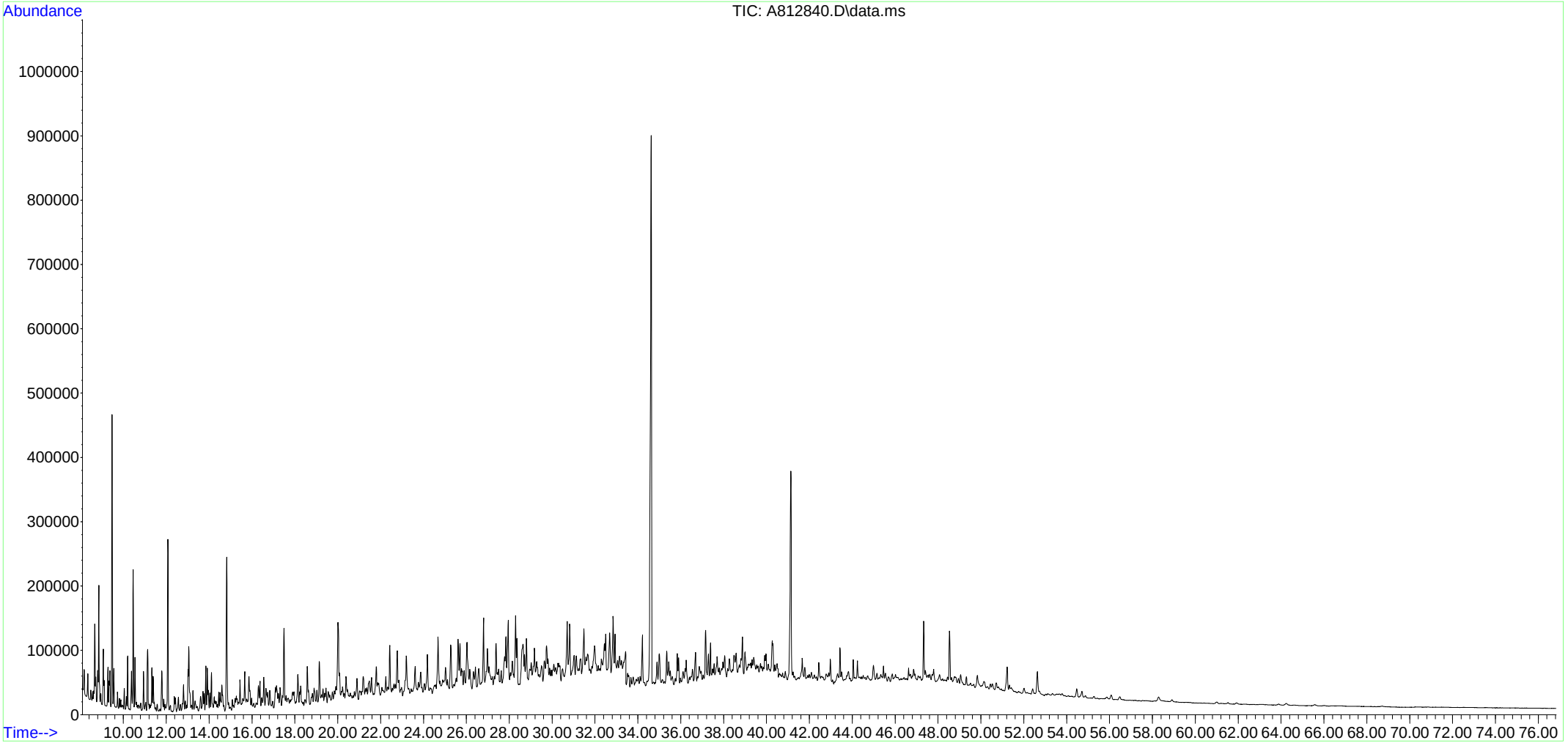
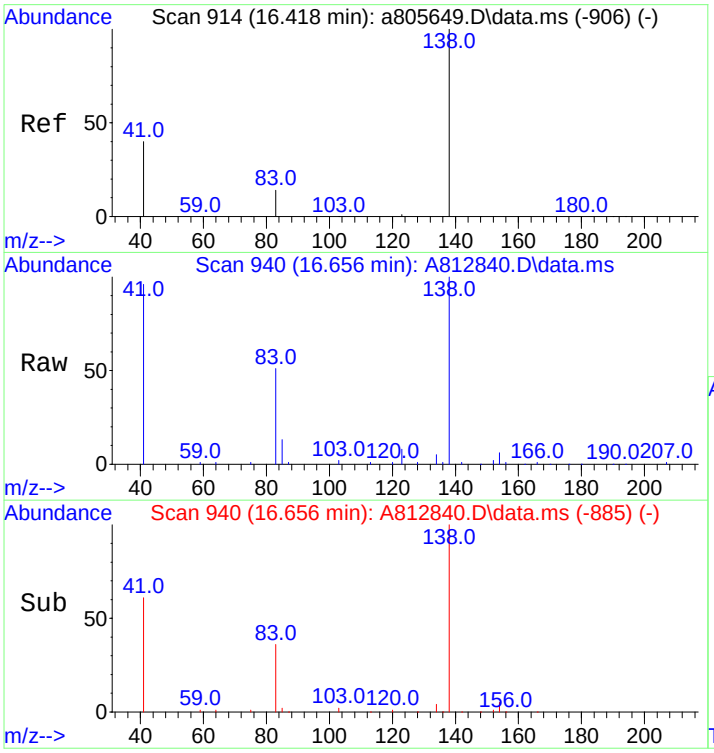
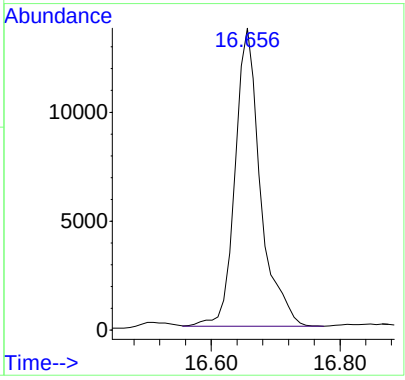
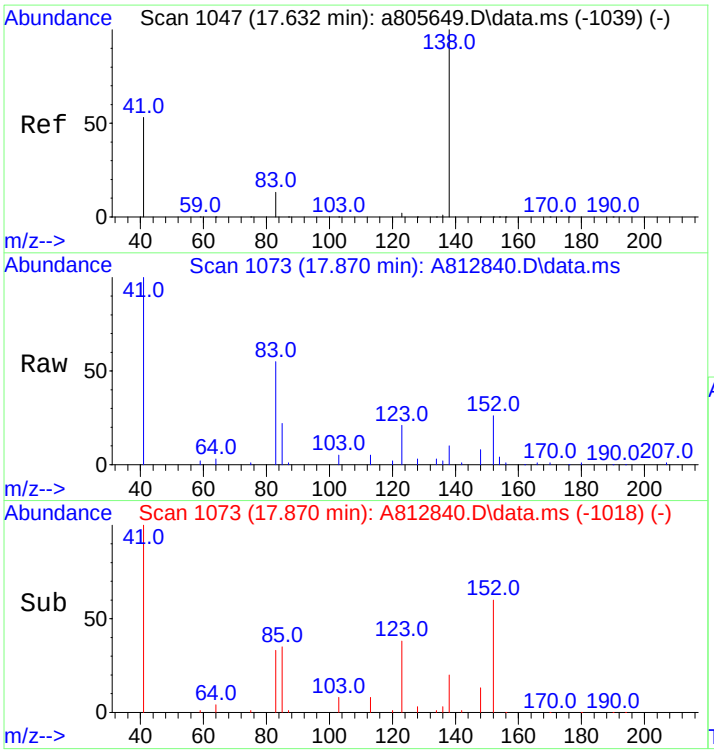




#3
trans-Decalin
Concen: 765.02 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

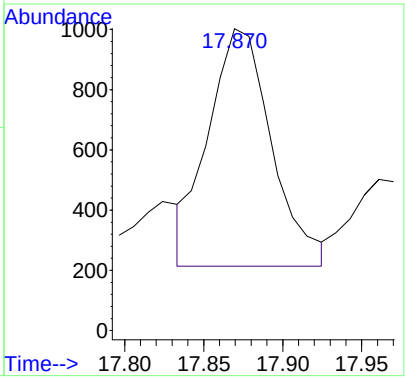
Tgt Ion:138 Resp: 37429

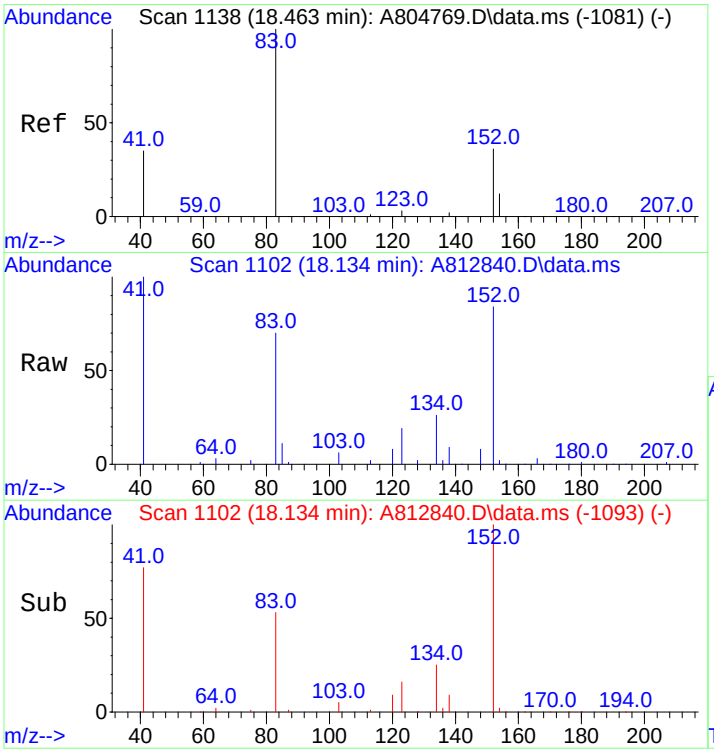




#4
cis-Decalin
Concen: 61.35 ng/mL m
RT: 17.870 min Scan# 1073
Delta R.T. -0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

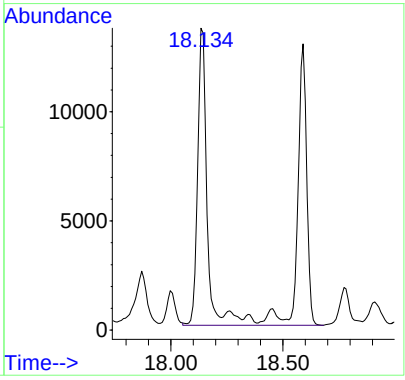
Tgt Ion:138 Resp: 2199

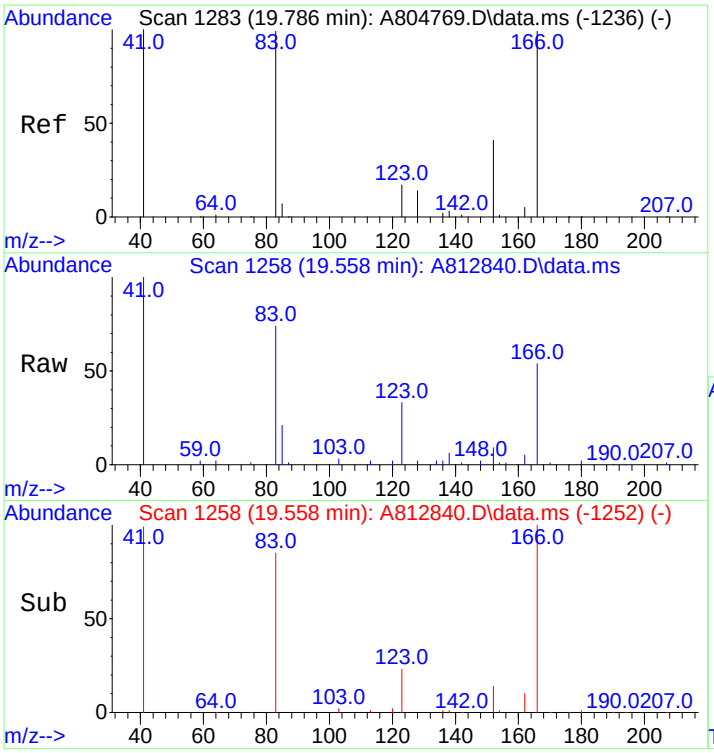




#5
C1-Decalins
Concen: 1569.04 ng/mL m
RT: 18.134 min Scan# 1102
Delta R.T. -0.456 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

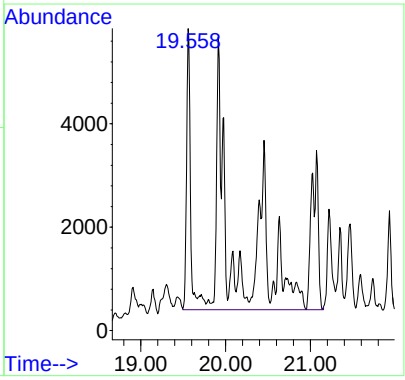
Tgt Ion:152 Resp: 76766

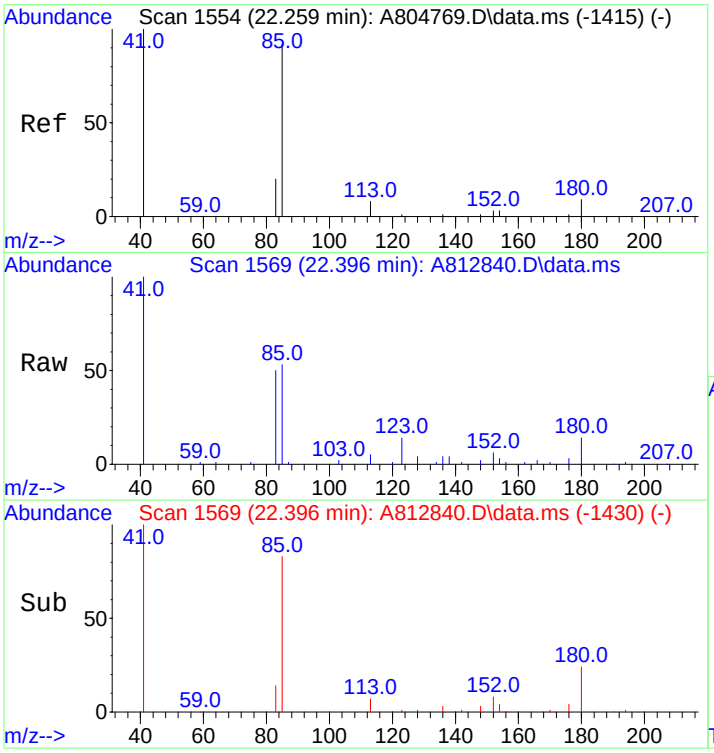




#6
C2-Decalins
Concen: 2014.66 ng/mL m
RT: 19.558 min Scan# 1258
Delta R.T. -0.365 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

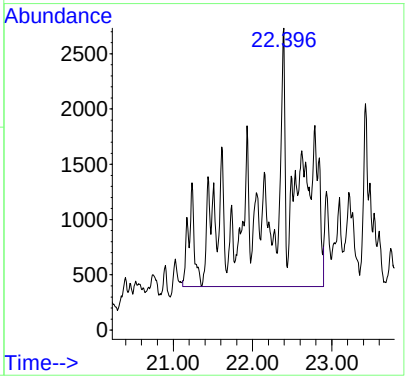
Tgt Ion:166 Resp: 98568

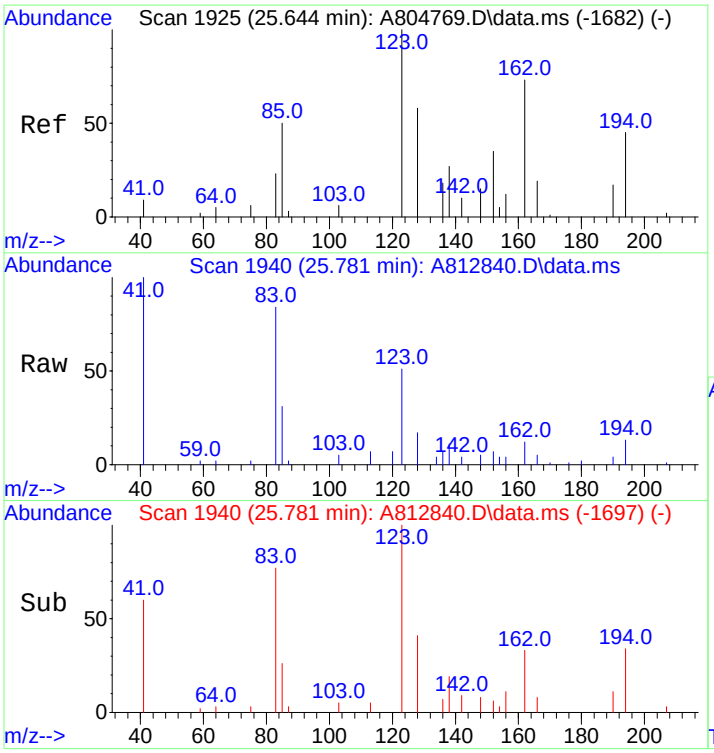




#7
C3-Decalins
Concen: 1438.90 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

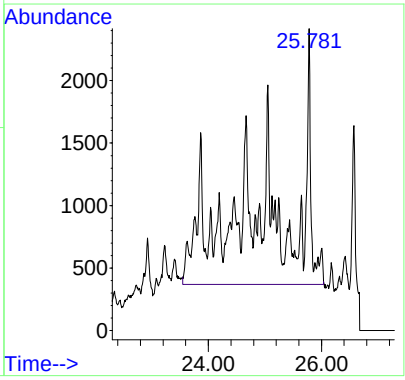
Tgt Ion:180 Resp: 70399

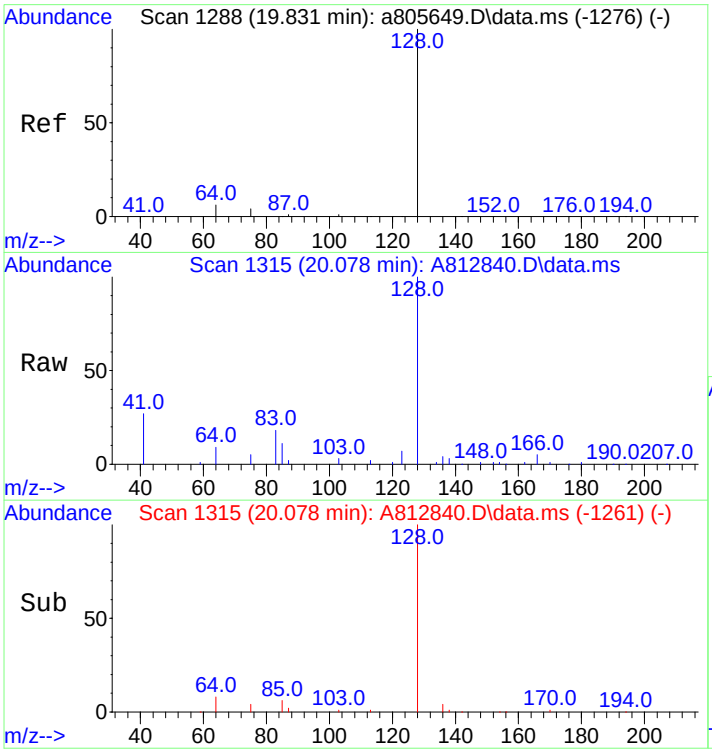




#8
C4-Decalins
Concen: 1420.67 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:194 Resp: 69507

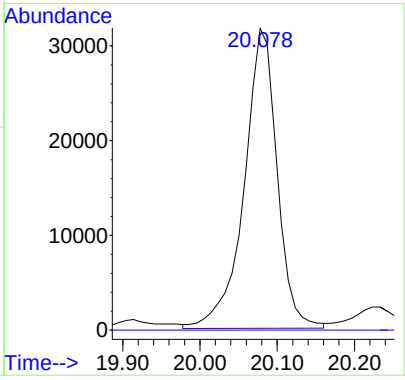


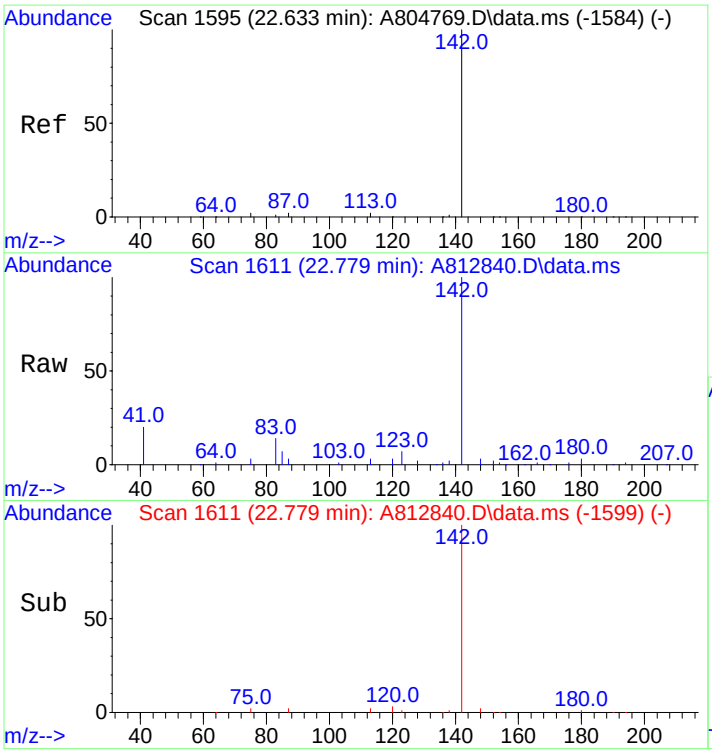


#10
Naphthalene
Concen: 376.57 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:128 Resp: 93996

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

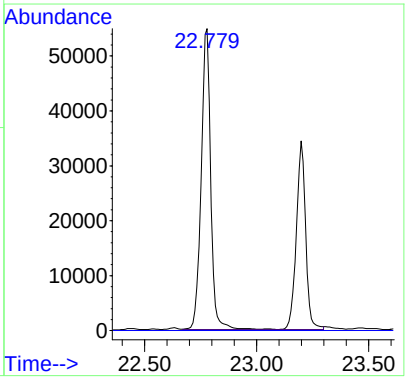


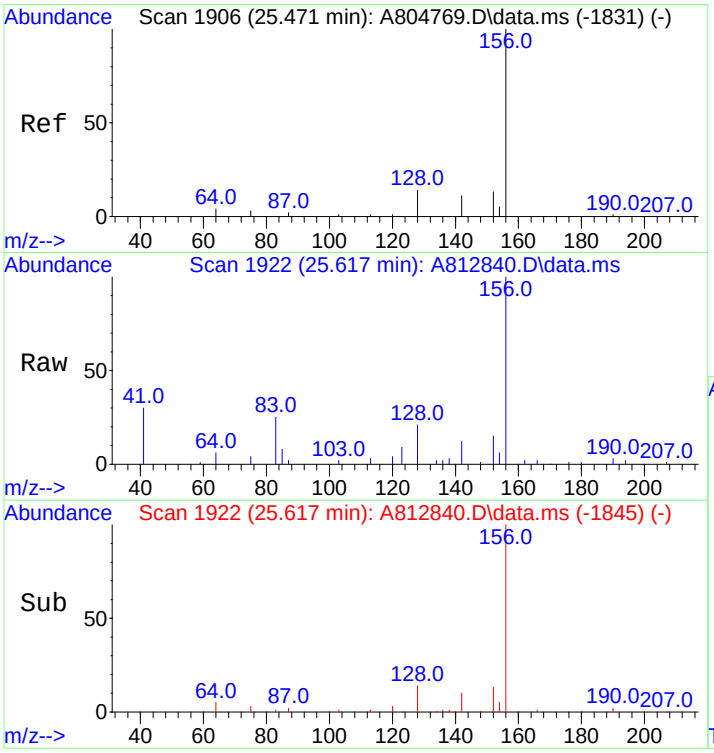


#11
C1-Naphthalenes
Concen: 1040.78 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:142 Resp: 259790

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

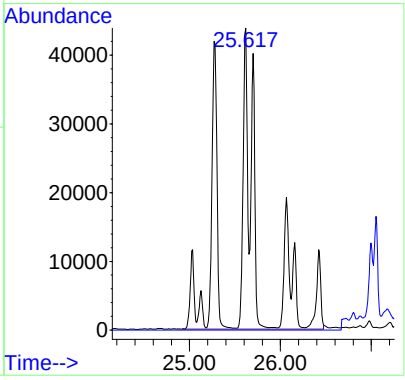


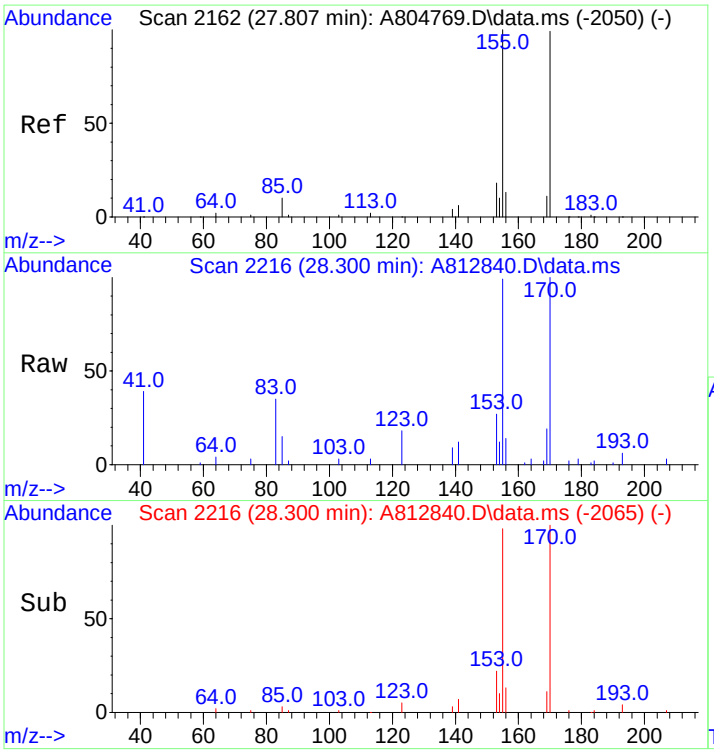


#12
C2-Naphthalenes
Concen: 2435.36 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:156 Resp: 607891

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

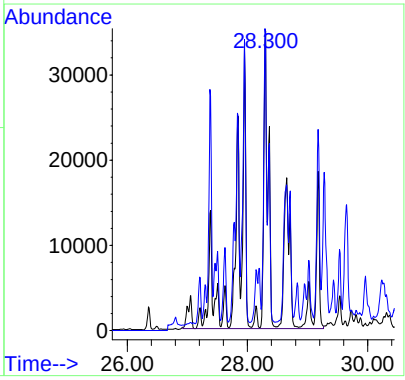


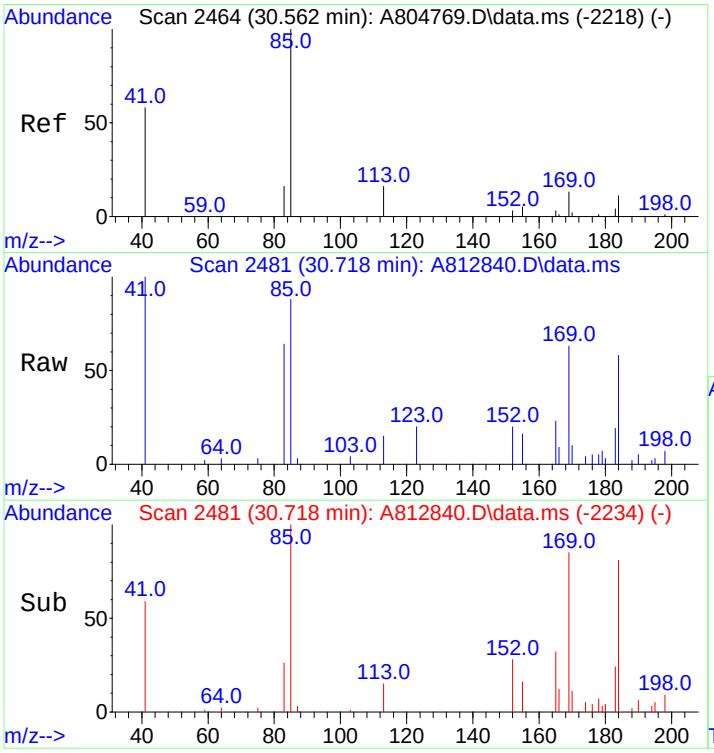


#13
C3-Naphthalenes
Concen: 2688.85 ng/mL m
RT: 28.300 min Scan# 2216
Delta R.T. 0.347 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:170 Resp: 671164

Ion	Ratio	Lower	Upper
170	100		
155	16.1	80.2	120.4#

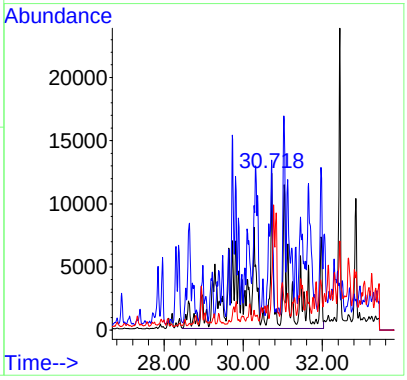


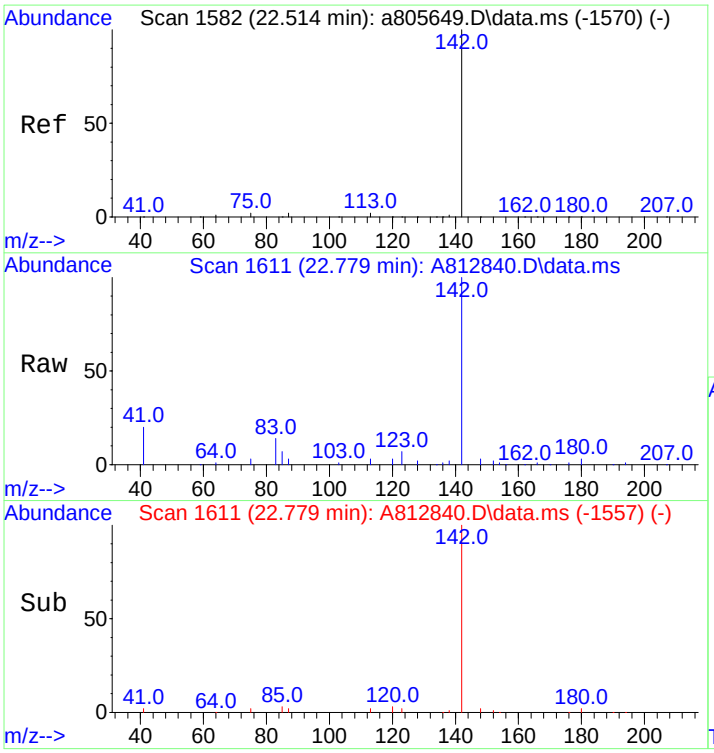


#14
C4-Naphthalenes
Concen: 1923.14 ng/mL m
RT: 30.718 min Scan# 2481
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:184 Resp: 480034

Ion	Ratio	Lower	Upper
184	100		
169	4.6	108.2	162.2#
183	1.3	29.7	44.5#

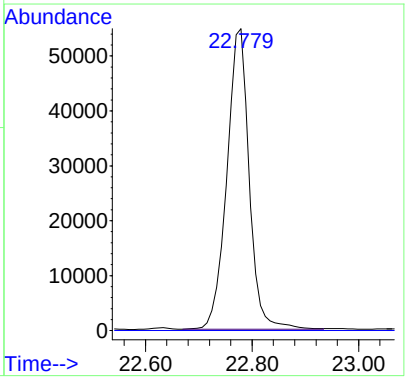


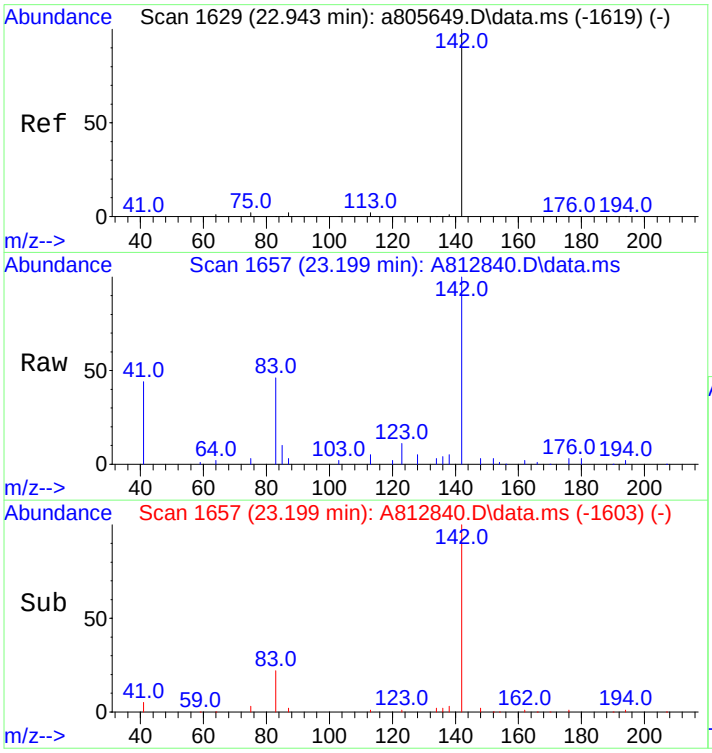


#16
2-Methylnaphthalene
Concen: 1072.91 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:142 Resp: 159529

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

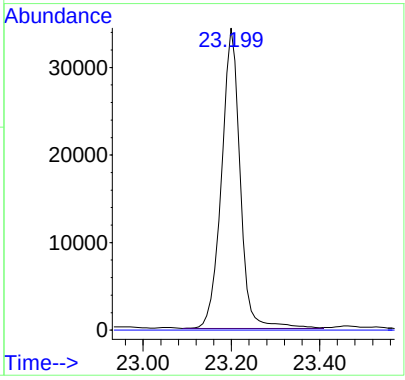


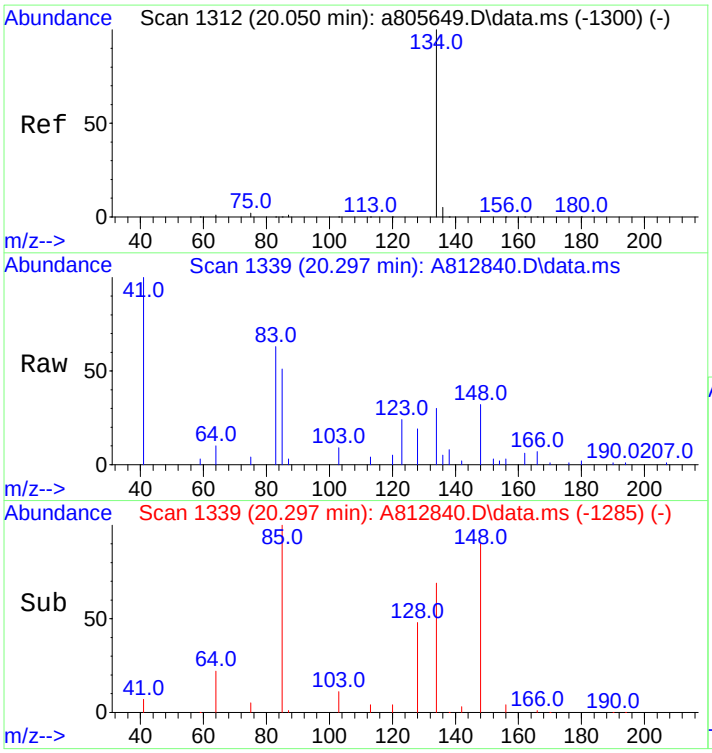


#17
1-Methylnaphthalene
Concen: 721.22 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:142 Resp: 100417

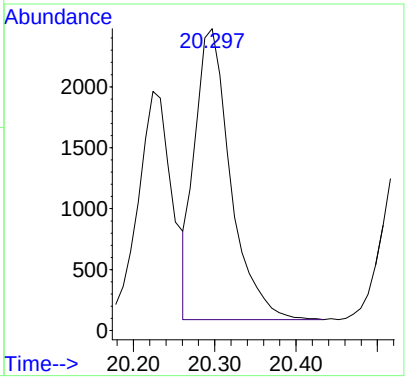
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

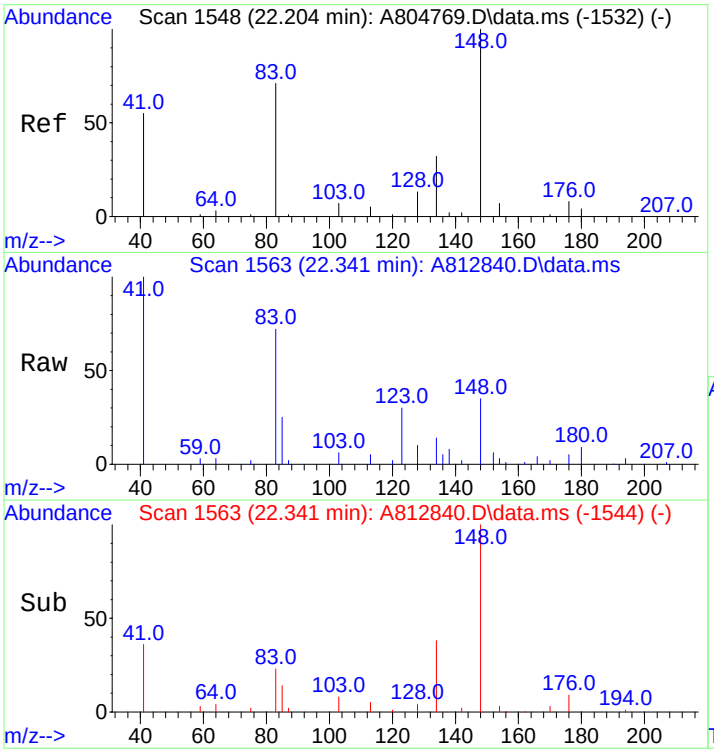




#18
Benzothiophene
Concen: 35.96 ng/mL
RT: 20.297 min Scan# 1339
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

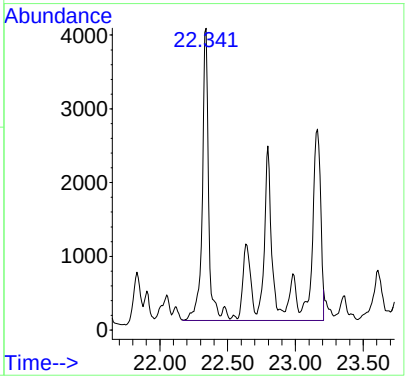
Tgt Ion:134 Resp: 7256

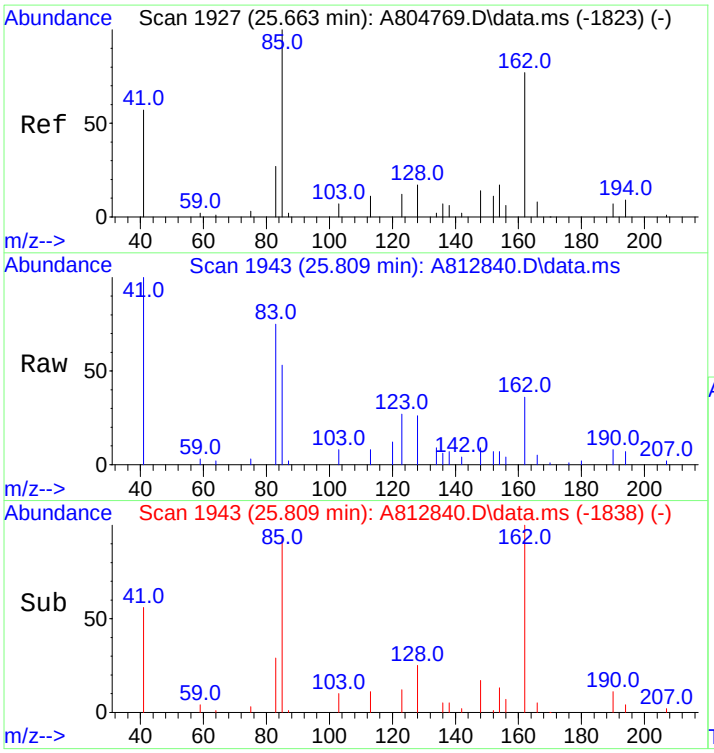




#19
C1-Benzo(b)thiophenes
Concen: 192.25 ng/mL m
RT: 22.341 min Scan# 1563
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

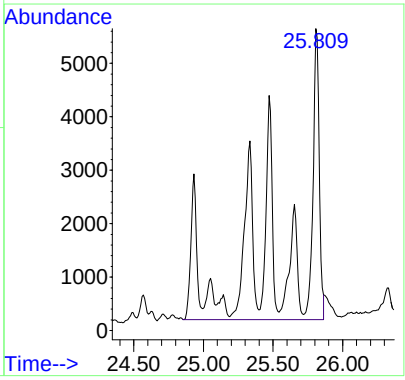
Tgt Ion:148 Resp: 38787

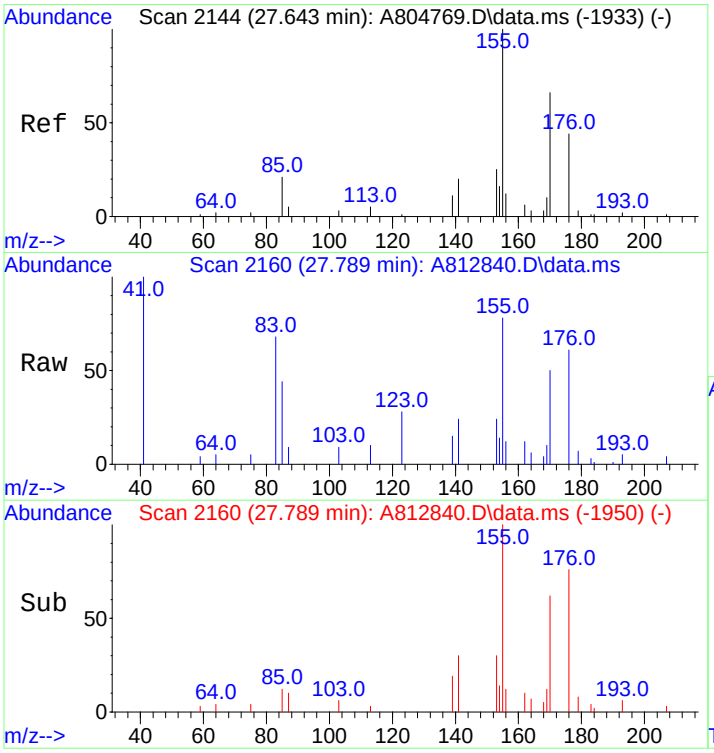




#20
C2-Benzo(b)thiophenes
Concen: 318.45 ng/mL m
RT: 25.809 min Scan# 1943
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

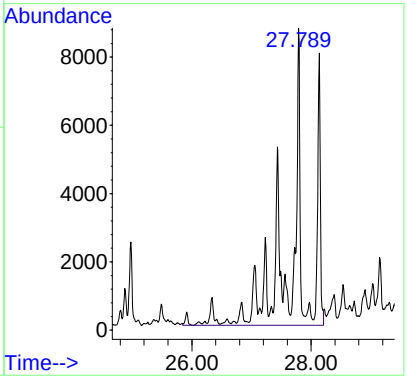
Tgt Ion:162 Resp: 64250

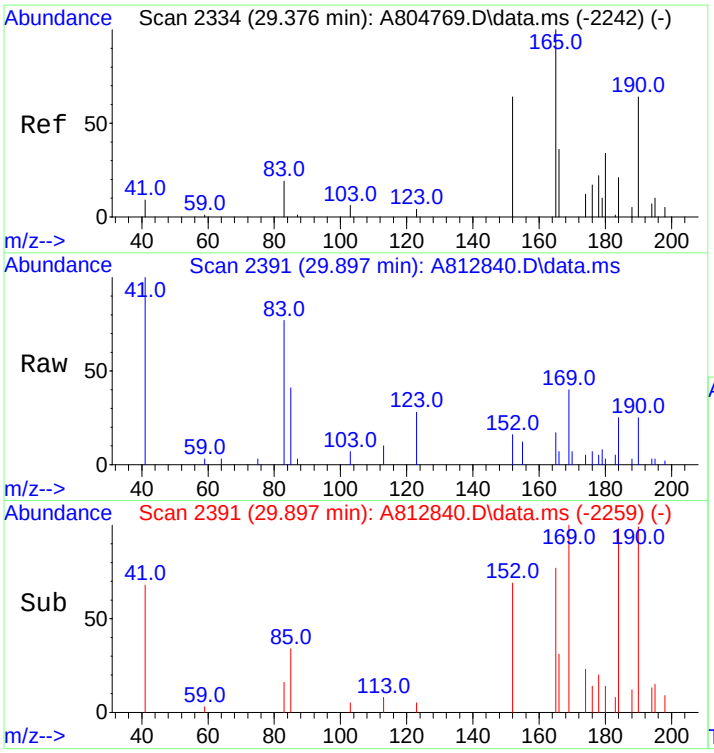




#21
C3-Benzo(b)thiophenes
Concen: 591.77 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

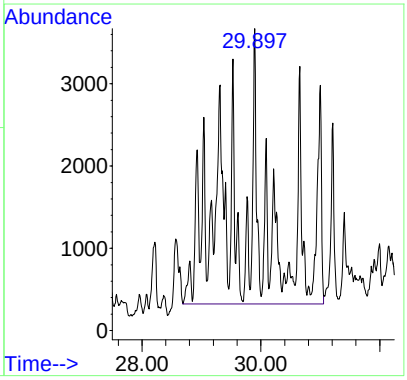
Tgt Ion:176 Resp: 119395

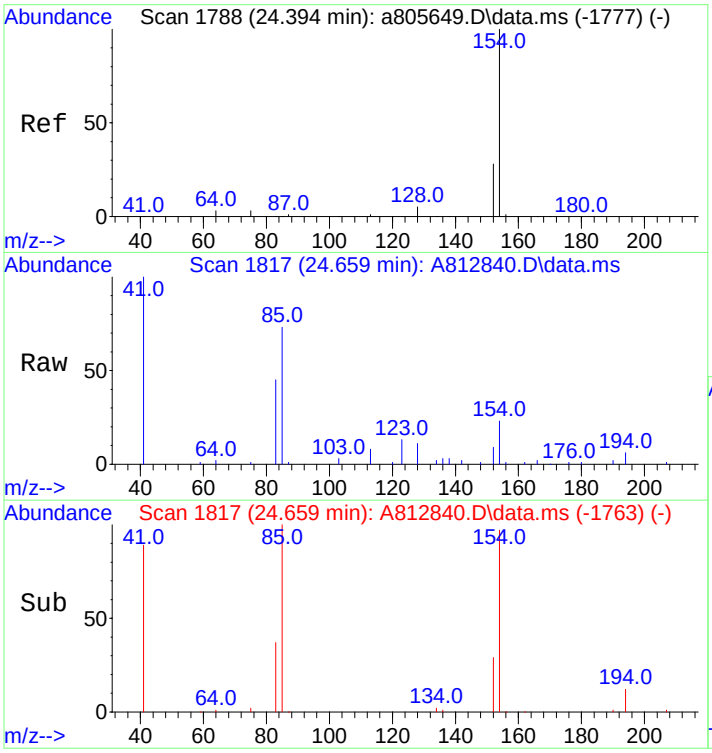




#22
C4-Benzo(b)thiophenes
Concen: 588.76 ng/mL m
RT: 29.897 min Scan# 2391
Delta R.T. 0.365 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:190 Resp: 118788

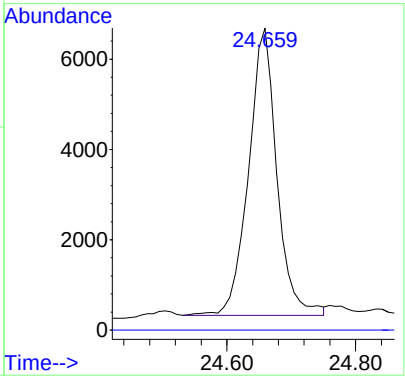


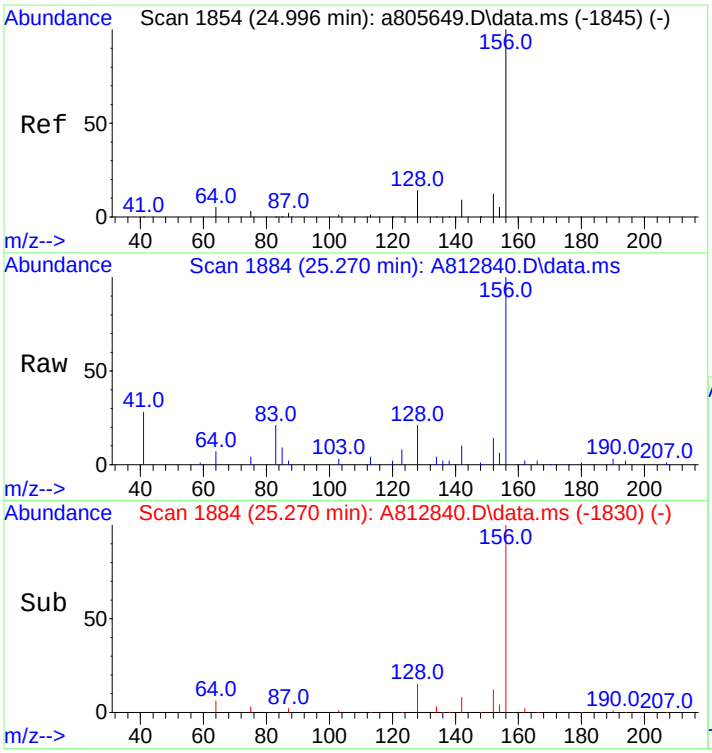


#23
Biphenyl
Concen: 102.72 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:154 Resp: 19431

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

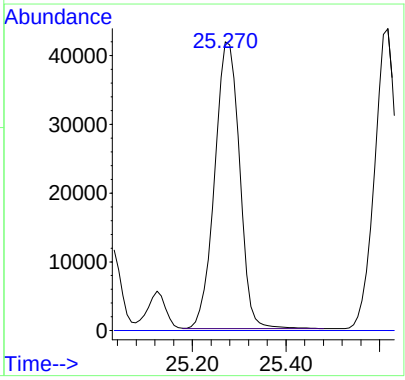


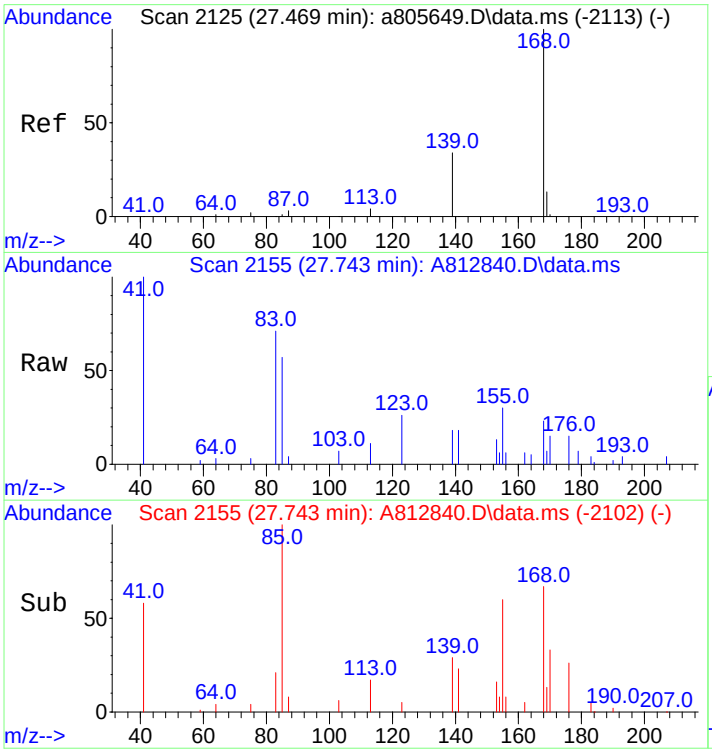


#24
2,6-Dimethylnaphthalene
Concen: 1211.65 ng/mL
RT: 25.270 min Scan# 1884
Delta R.T. -0.010 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:156 Resp: 154186

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

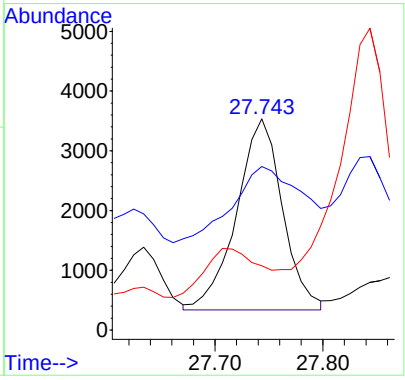


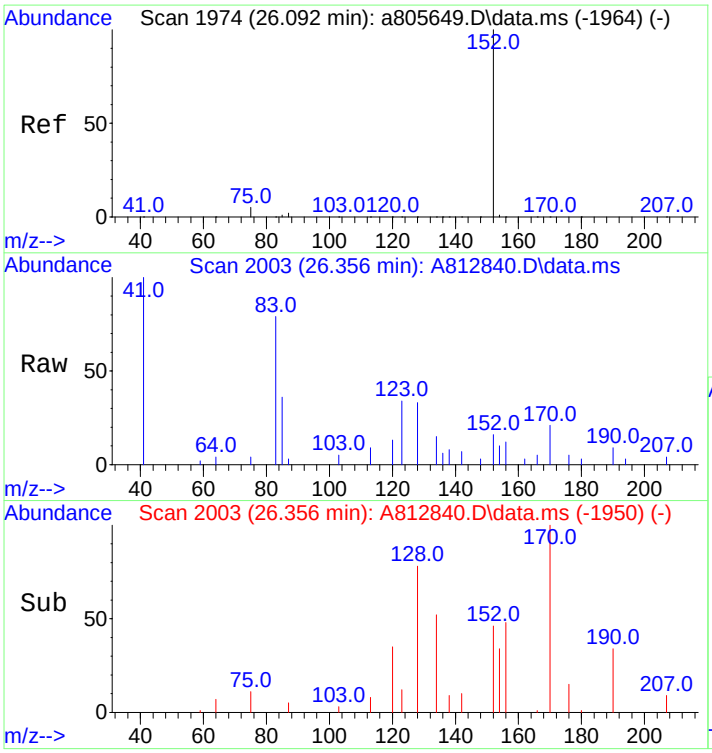


#25
Dibenzofuran
Concen: 47.61 ng/mL m
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:168 Resp: 9501

Ion	Ratio	Lower	Upper
168	100		
139	59.7	28.0	42.0#
169	0.0	10.6	15.8#

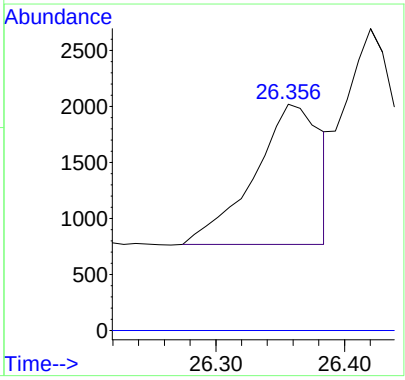


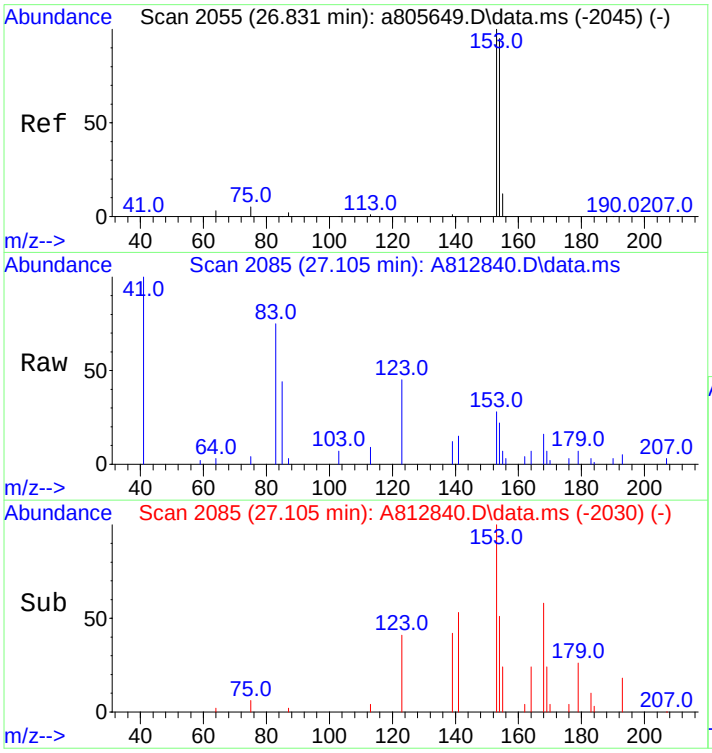


#26
Acenaphthylene
Concen: 19.84 ng/mL
RT: 26.356 min Scan# 2003
Delta R.T. -0.019 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:152 Resp: 4496

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

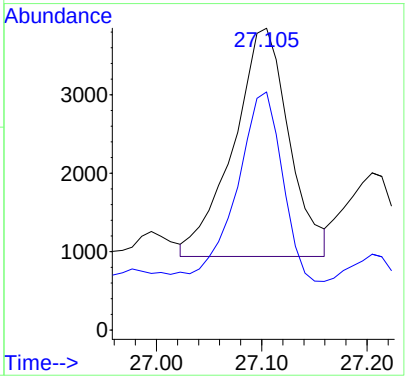


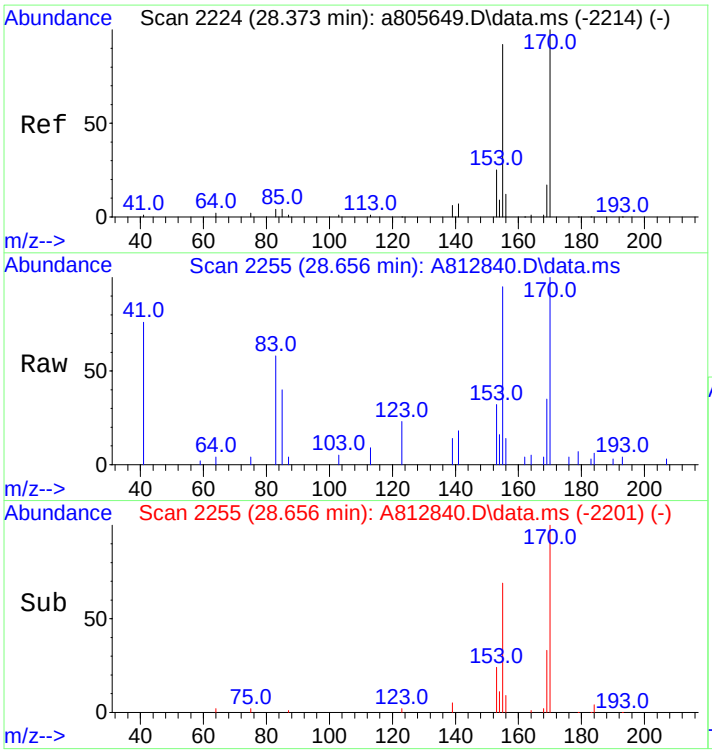


#27
Acenaphthene
Concen: 79.29 ng/mL m
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:153 Resp: 10722

Ion	Ratio	Lower	Upper
153	100		
154	73.2	75.4	113.2#

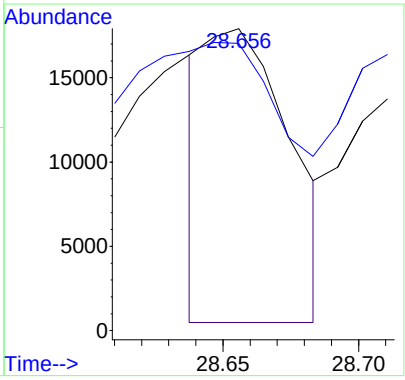


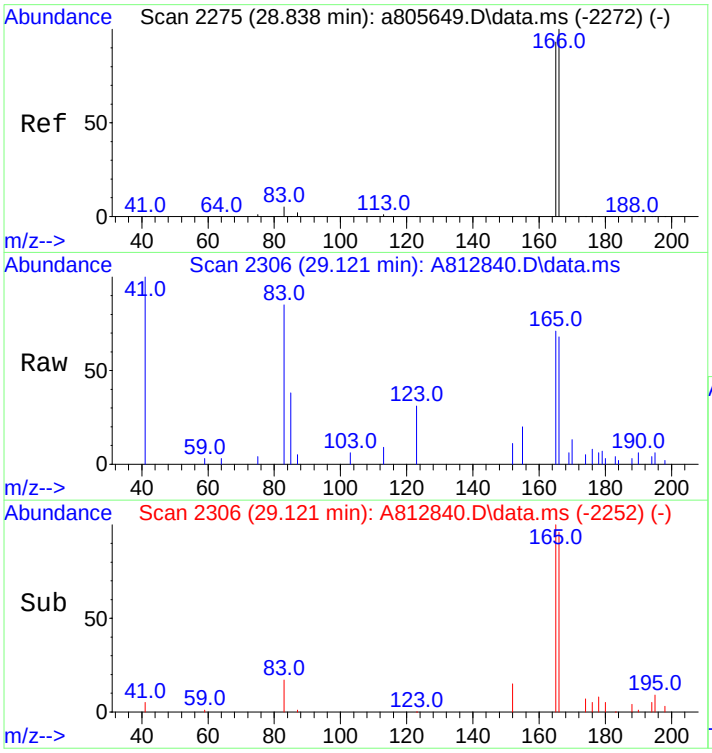


#28
2,3,5-Trimethylnaphthalene
Concen: 344.55 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:170 Resp: 37762

Ion	Ratio	Lower	Upper
170	100		
155	211.8	71.7	107.5#

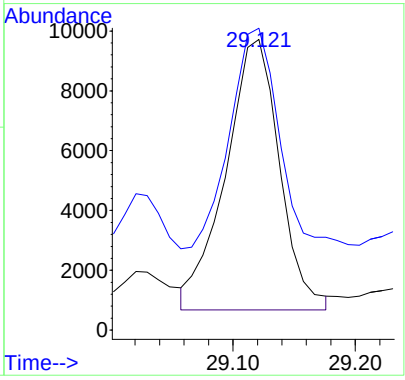


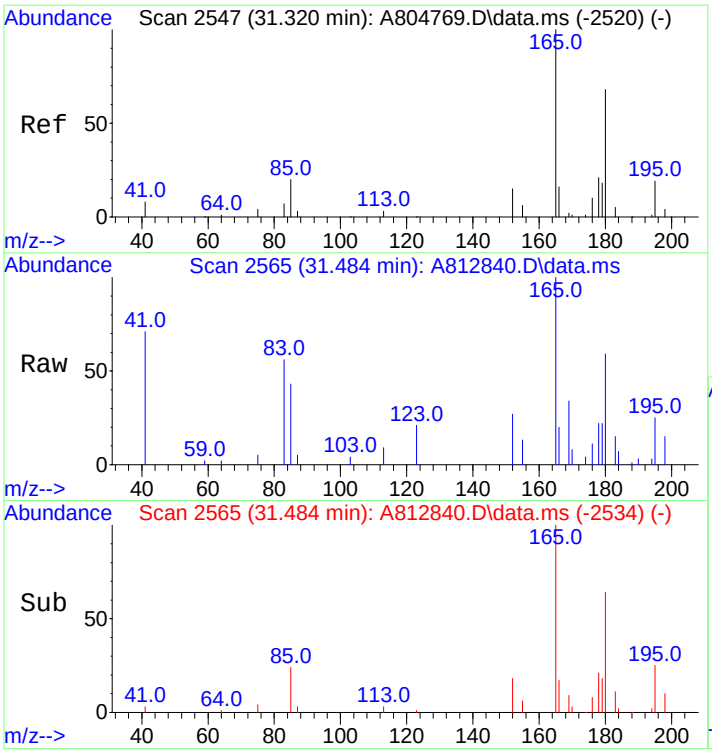


#29
Fluorene
Concen: 182.61 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:166 Resp: 27697

Ion	Ratio	Lower	Upper
166	100		
165	89.5	74.2	111.2

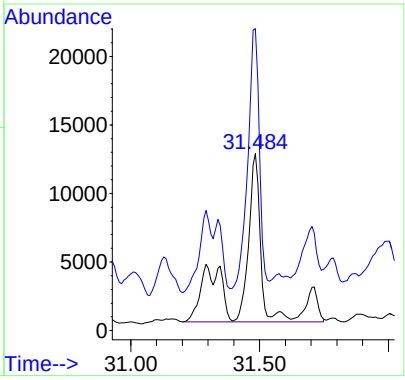


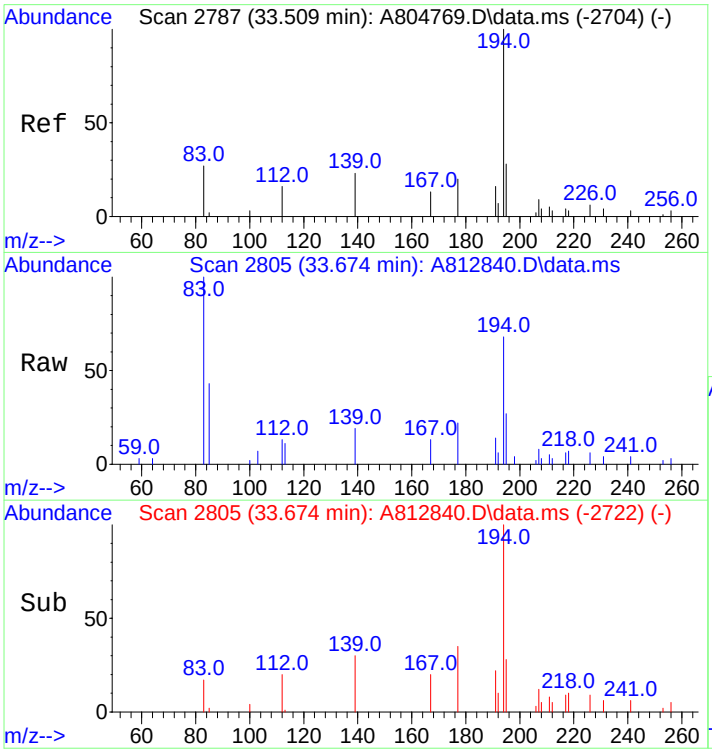


#30
C1-Fluorenes
Concen: 459.87 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:180 Resp: 69751

Ion	Ratio	Lower	Upper
180	100		
165	84.9	122.4	183.6#

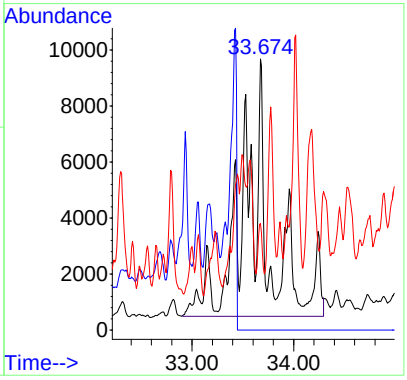


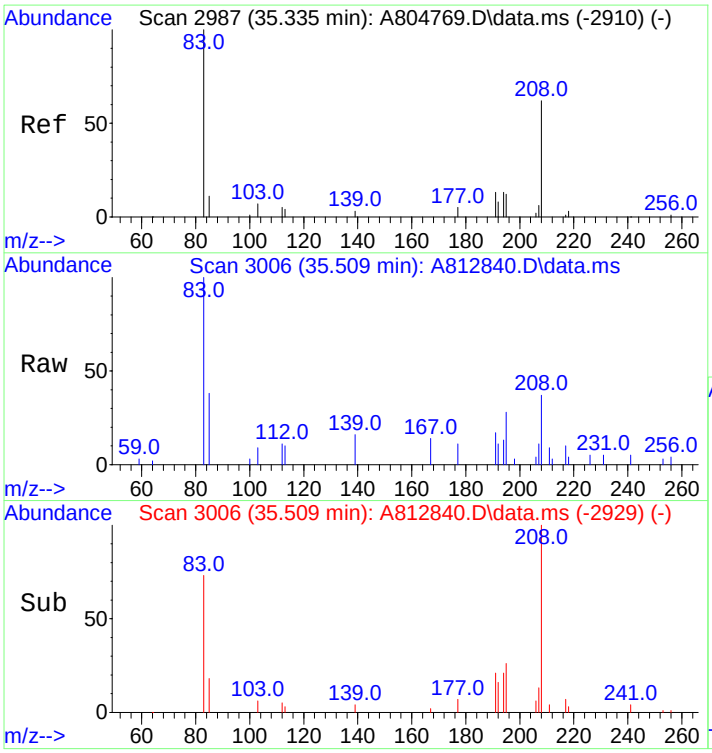


#31
C2-Fluorenes
Concen: 1020.85 ng/mL m
RT: 33.674 min Scan# 2805
Delta R.T. 0.068 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:194 Resp: 154839

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.4	41.0#

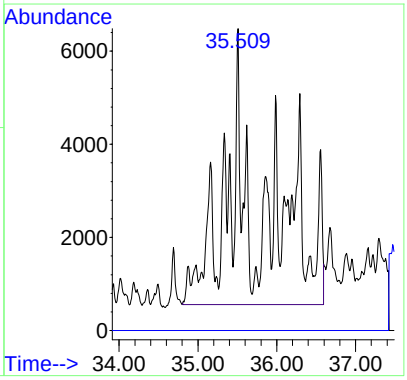


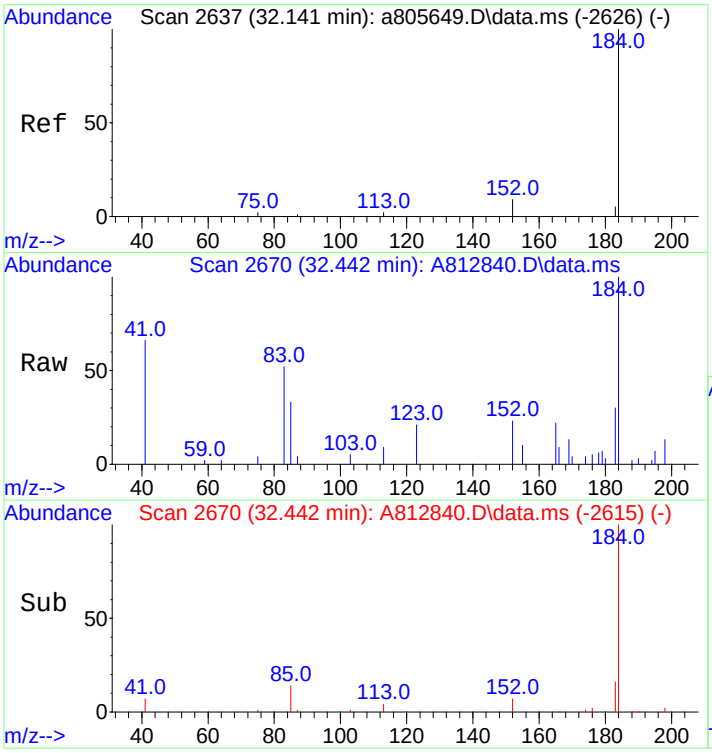


#32
C3-Fluorenes
Concen: 1147.13 ng/mL m
RT: 35.509 min Scan# 3006
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:208 Resp: 173992

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

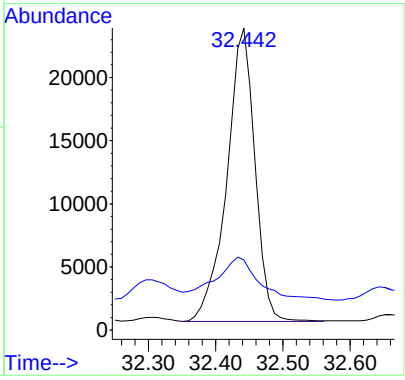


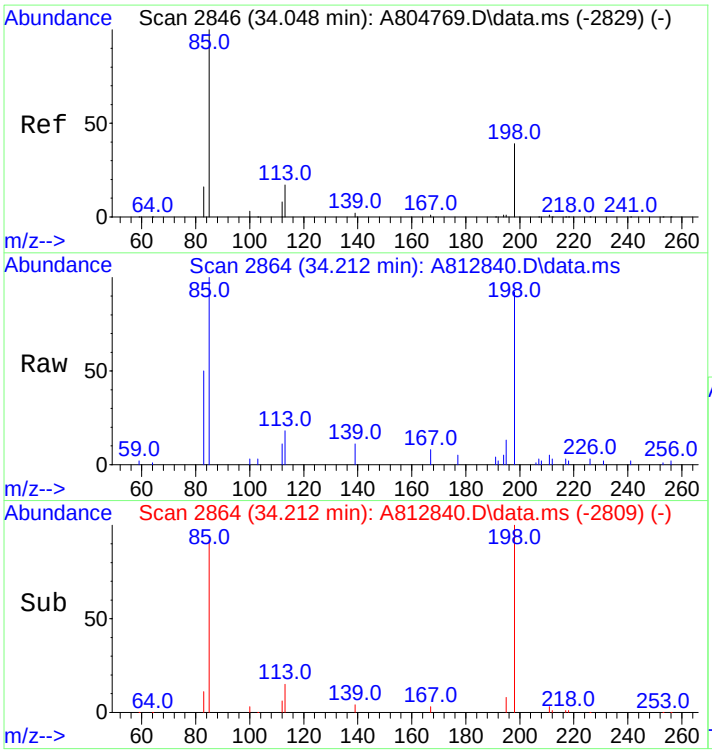


#33
Dibenzothiophene
Concen: 324.11 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:184 Resp: 67600

Ion	Ratio	Lower	Upper
184	100		
152	22.6	7.8	11.8#

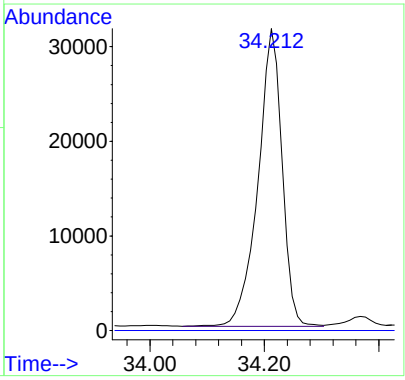


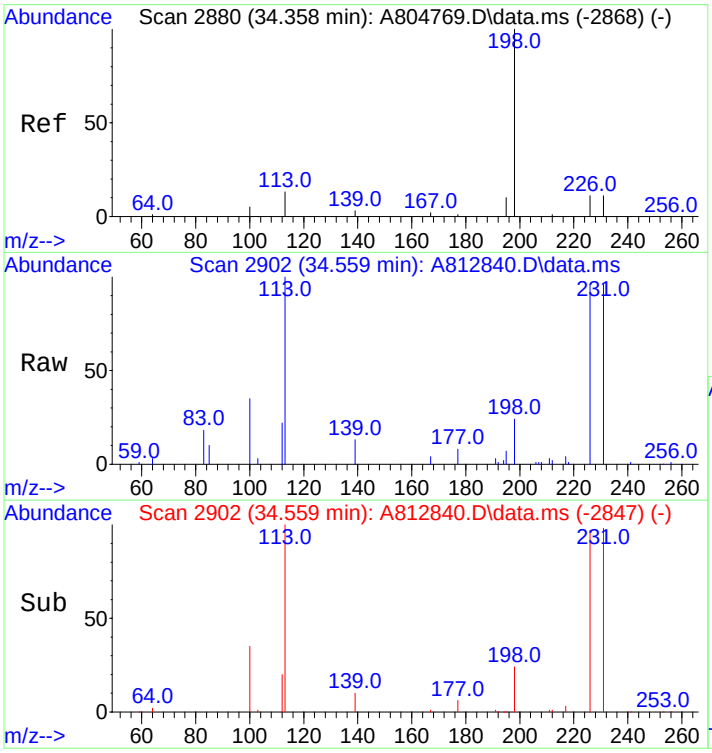


#34
4-Methyldibenzothiophene(4MDT)
Concen: 441.08 ng/mL
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:198 Resp: 91998

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

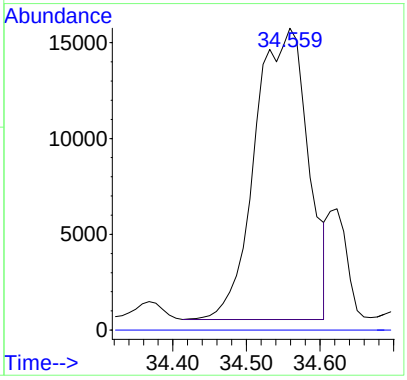


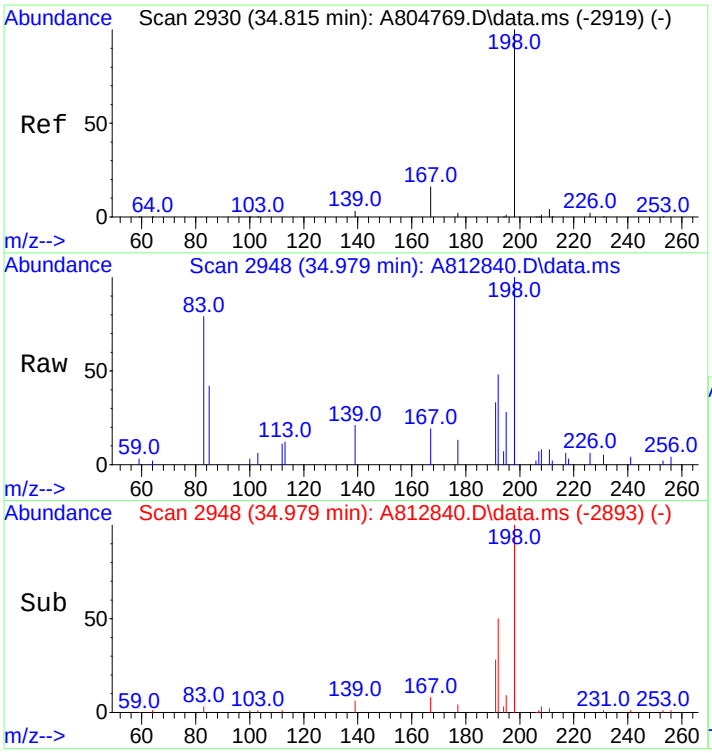


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 365.90 ng/mL
RT: 34.559 min Scan# 2902
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:198 Resp: 76318

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

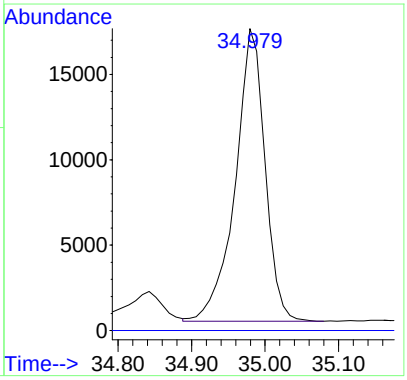


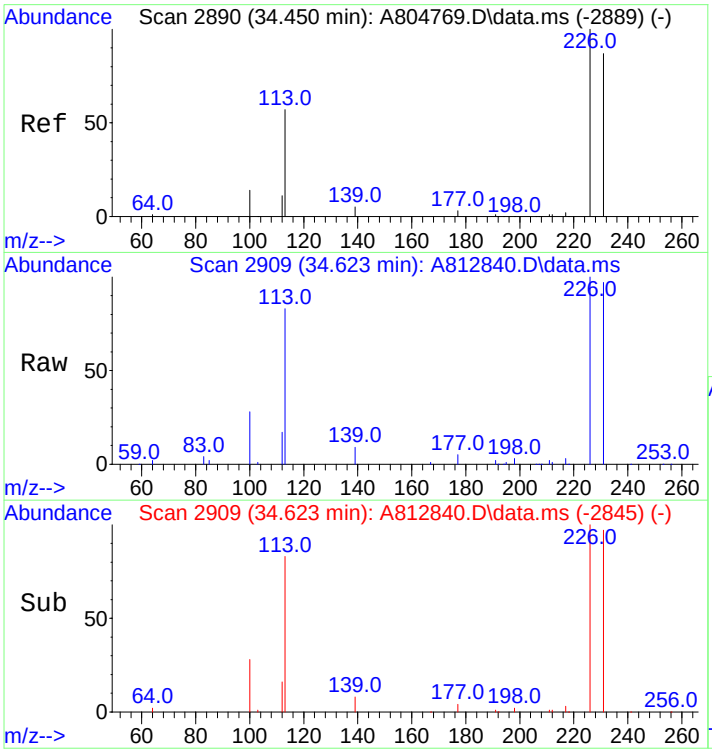


#36
1-Methyldibenzothiophene(1MDT)
Concen: 231.48 ng/mL
RT: 34.979 min Scan# 2948
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:198 Resp: 48281

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

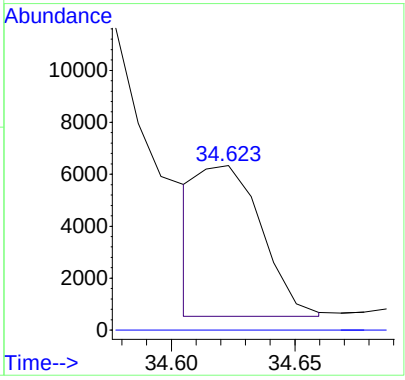


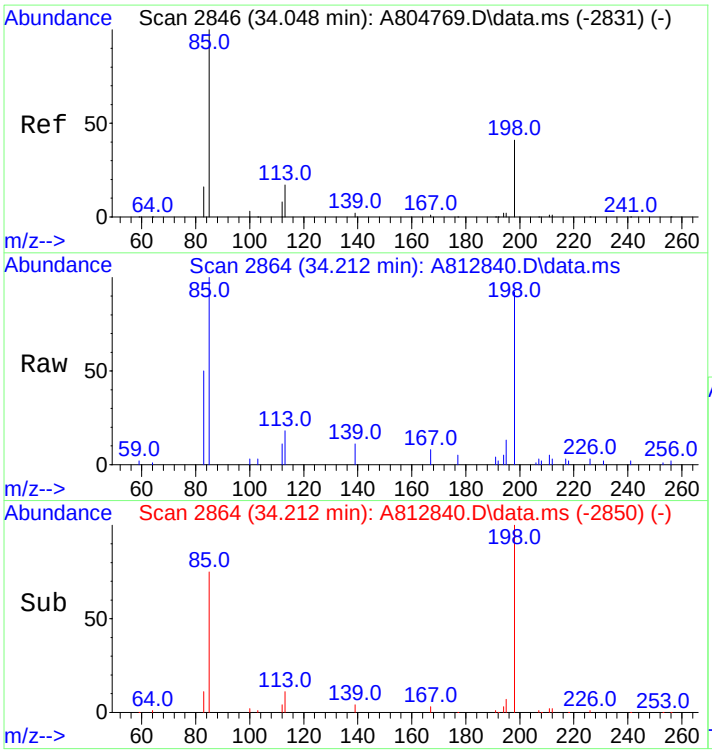


#37
OTP
Concen: 49.32 ng/mL m
RT: 34.623 min Scan# 2909
Delta R.T. 0.037 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:198 Resp: 10287

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

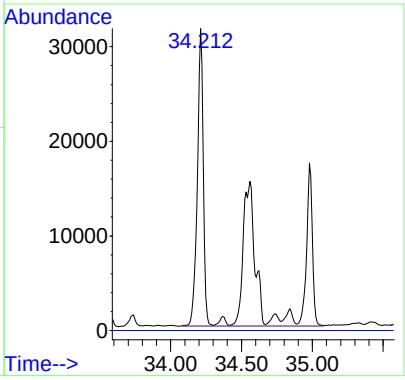


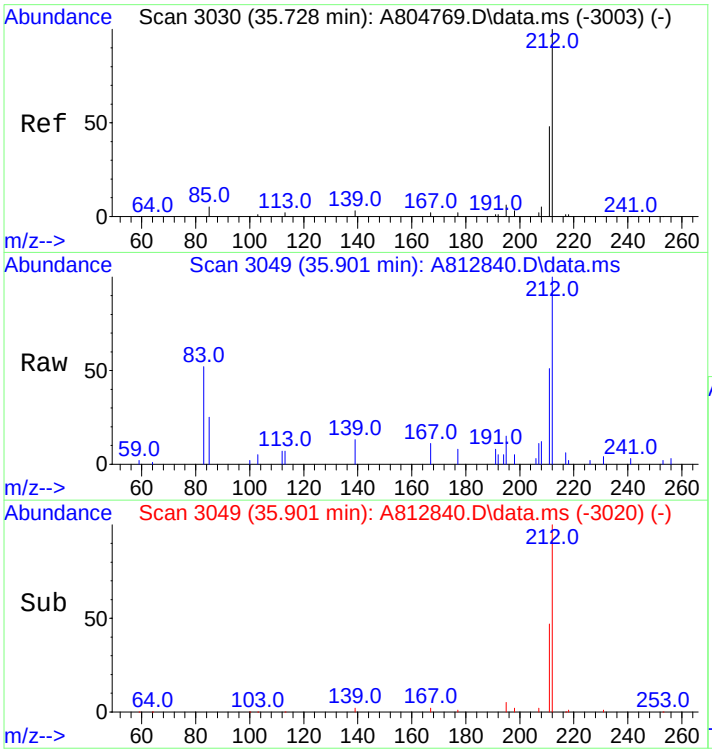


#38
C1-Dibenzothiophenes
Concen: 1166.17 ng/mL m
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:198 Resp: 243233

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

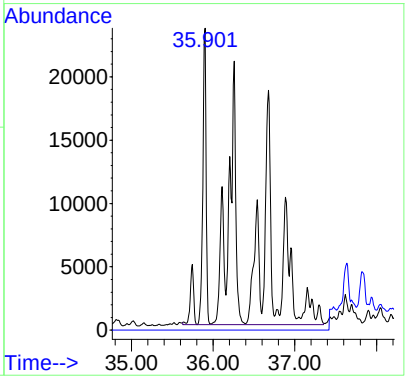


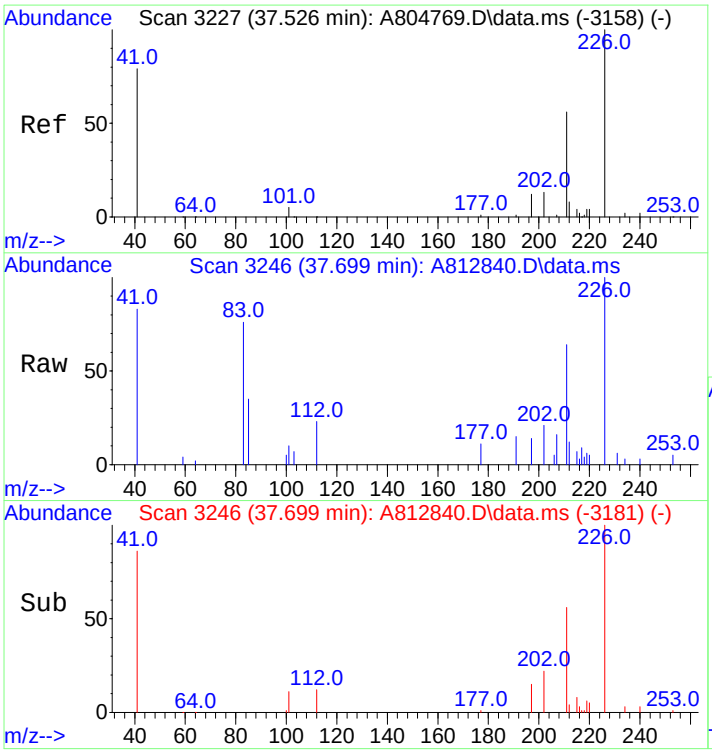


#39
C2-Dibenzothiophenes
Concen: 1957.55 ng/mL m
RT: 35.901 min Scan# 3049
Delta R.T. -0.356 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:212 Resp: 408293

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

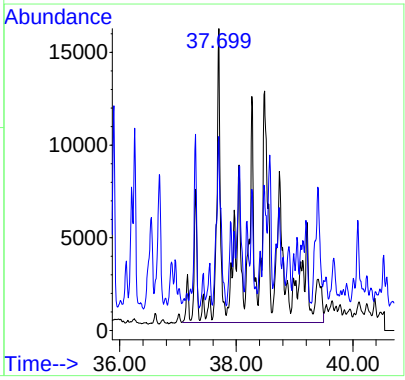


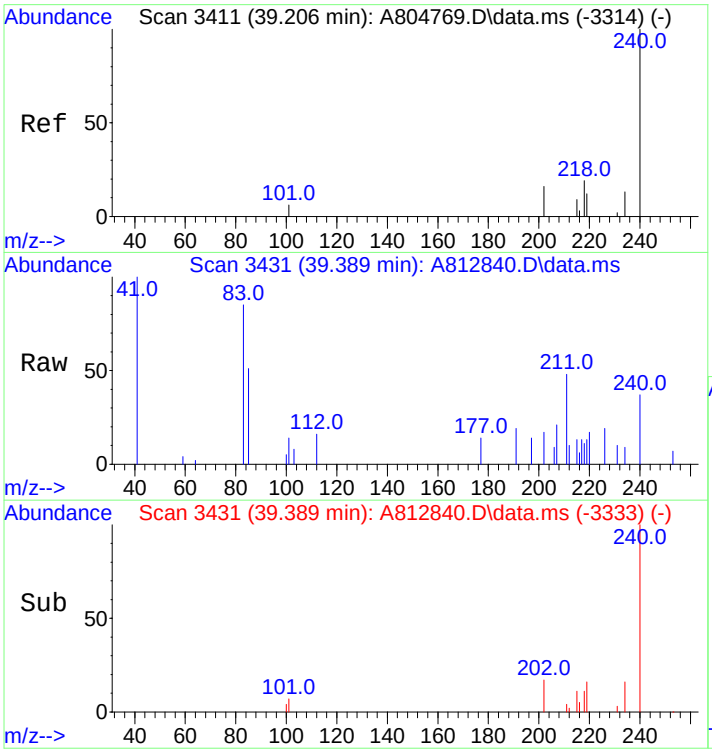


#40
C3-Dibenzothiophenes
Concen: 2021.80 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:226 Resp: 421694

Ion	Ratio	Lower	Upper
226	100		
211	1.5	50.2	75.2#

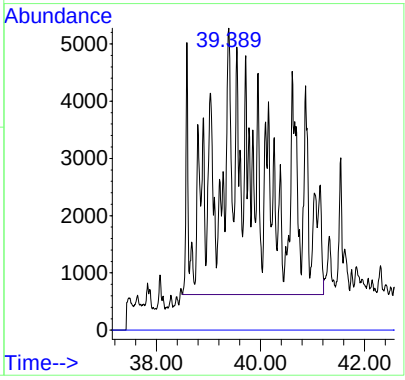


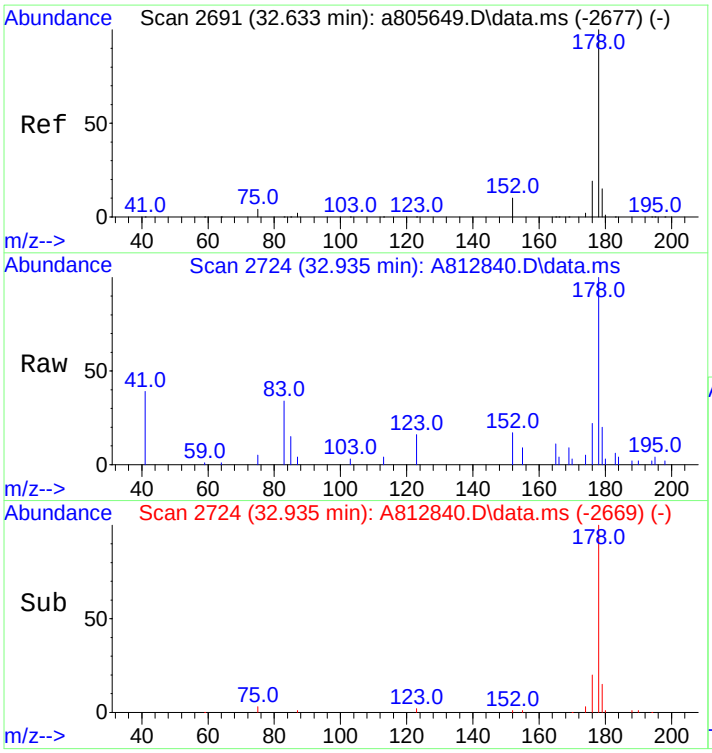


#41
C4-Dibenzothiophenes
Concen: 1379.49 ng/mL m
RT: 39.389 min Scan# 3431
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:240 Resp: 287725

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

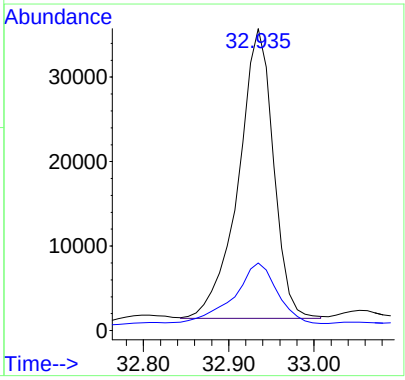


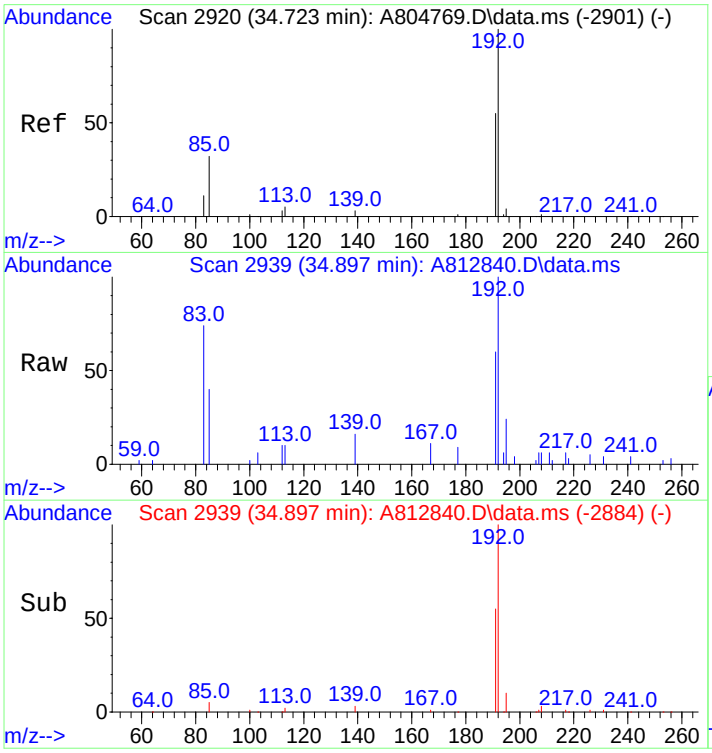


#43
Phenanthrene
Concen: 487.42 ng/mL m
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:178 Resp: 97849

Ion	Ratio	Lower	Upper
178	100		
176	0.4	15.2	22.8#

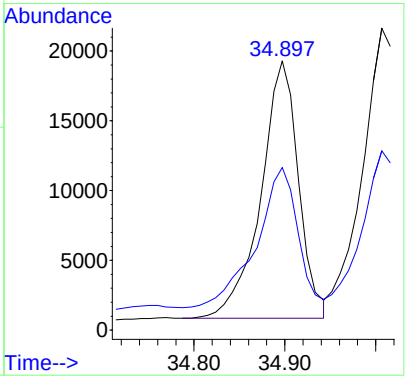


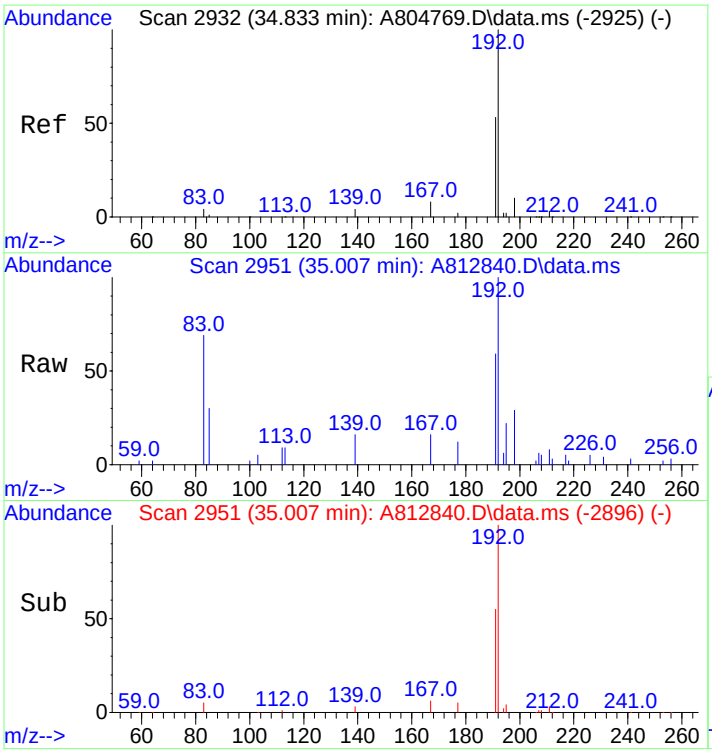


#44
3-Methylphenanthrene(3MP)
Concen: 264.54 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 53106

Ion	Ratio	Lower	Upper
192	100		
191	59.7	45.5	68.3

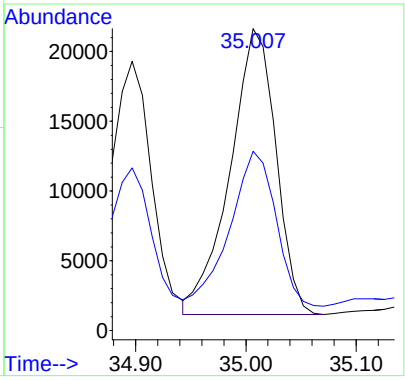


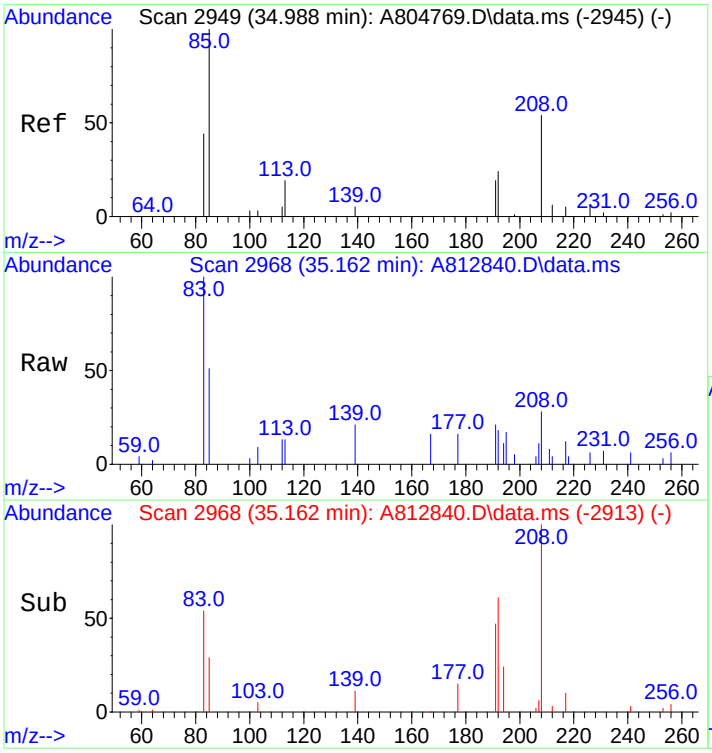


#45
2-Methylphenanthrene(2MP)
Concen: 296.37 ng/mL
RT: 35.007 min Scan# 2951
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 59497

Ion	Ratio	Lower	Upper
192	100		
191	53.8	44.6	67.0

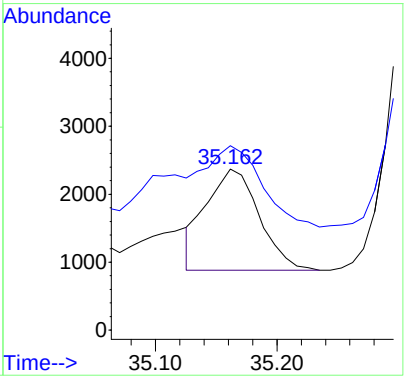


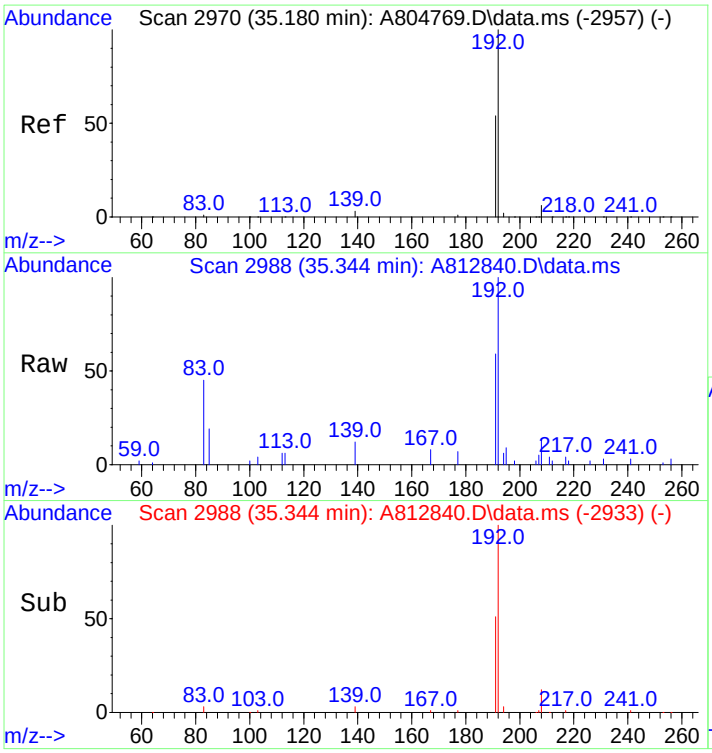


#46
2-Methylanthracene(2MA)
Concen: 22.60 ng/mL m
RT: 35.162 min Scan# 2968
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 4537

Ion	Ratio	Lower	Upper
192	100		
191	130.8	96.9	145.3

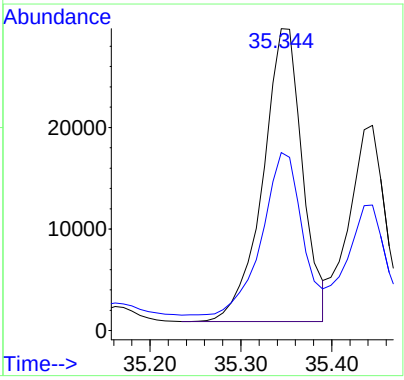


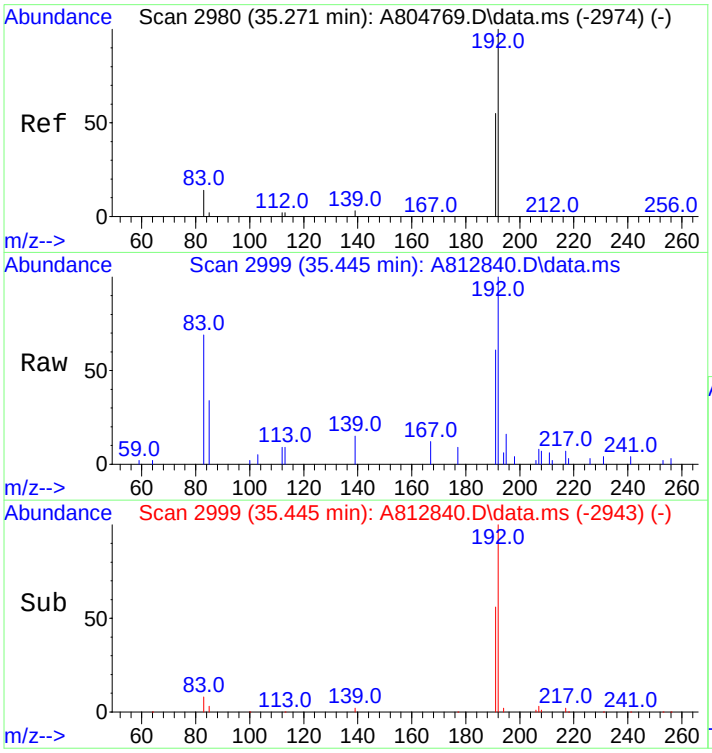


#47
9/4-Methylphenanthrene(9MP)
Concen: 436.42 ng/mL
RT: 35.344 min Scan# 2988
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 87612

Ion	Ratio	Lower	Upper
192	100		
191	56.1	44.5	66.7

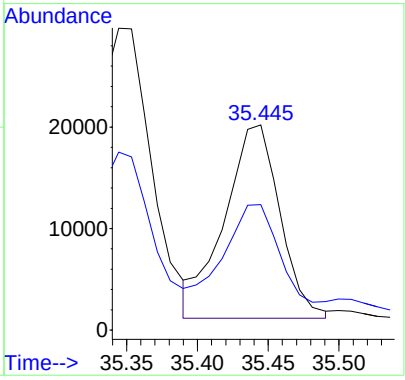


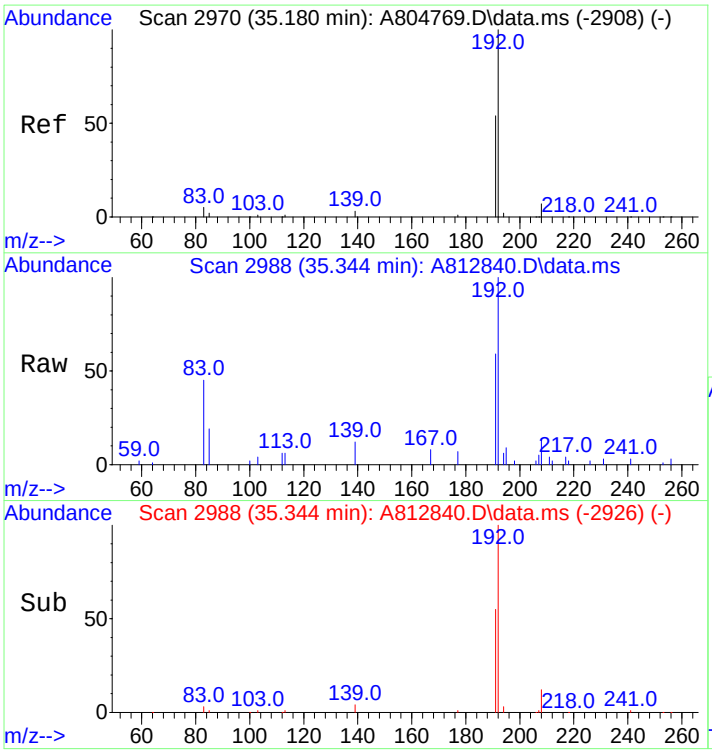


#48
1-Methylphenanthrene(1MP)
Concen: 259.14 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 52023

Ion	Ratio	Lower	Upper
192	100		
191	47.8	46.2	69.4

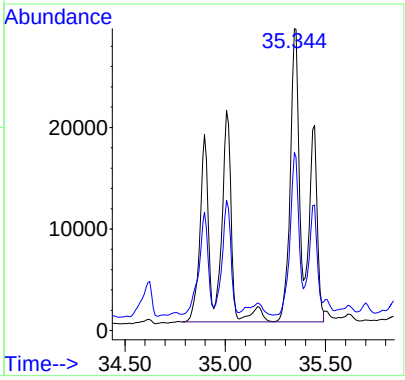


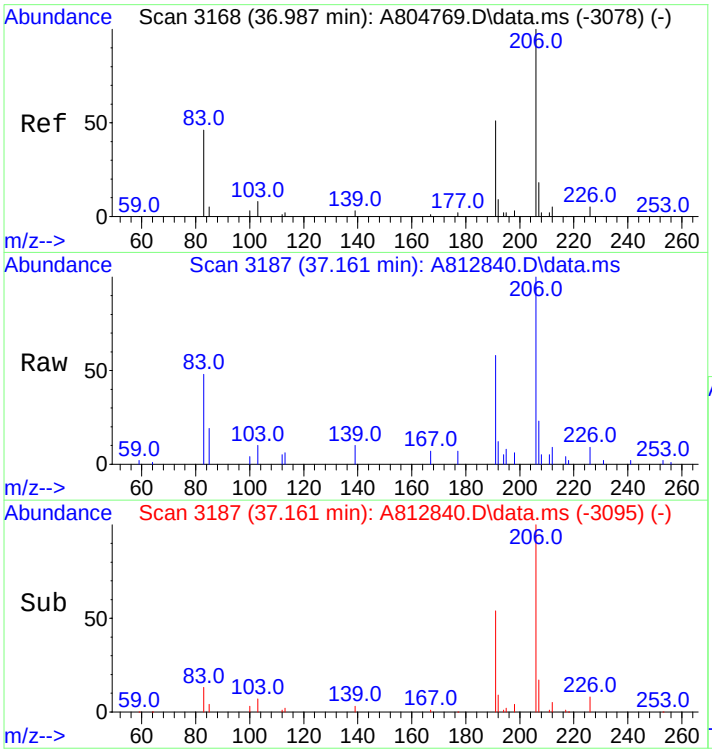


#49
C1-Phenanthrenes/Anthracenes
Concen: 1312.21 ng/mL m
RT: 35.344 min Scan# 2988
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 263426

Ion	Ratio	Lower	Upper
192	100		
191	18.7	44.5	66.7#

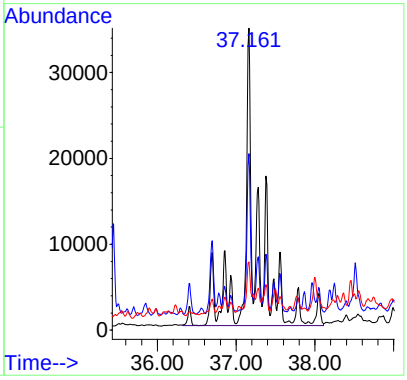


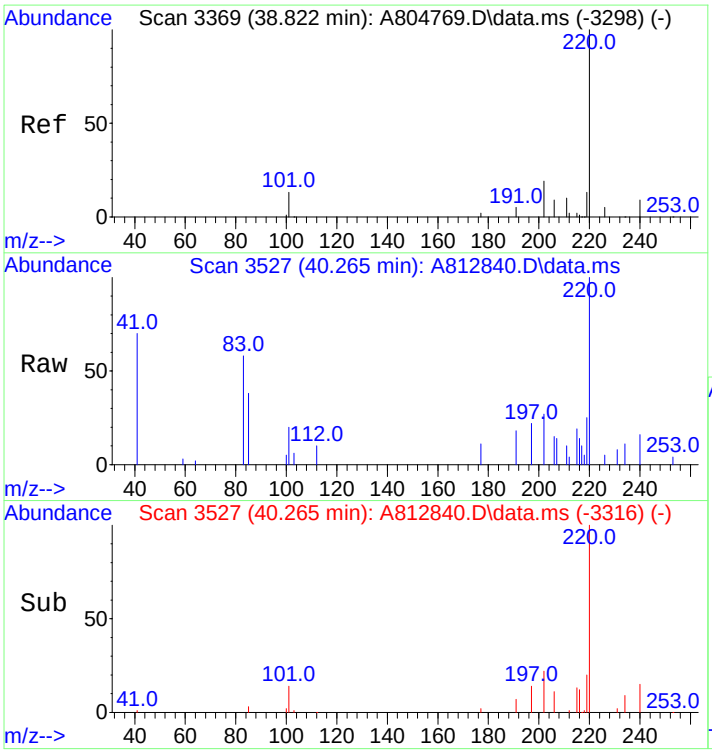


#50
C2-Phenanthrenes/Anthracenes
Concen: 1842.10 ng/mL m
RT: 37.161 min Scan# 3187
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:206 Resp: 369802

Ion	Ratio	Lower	Upper
206	100		
191	1.7	42.0	63.0#
207	0.8	16.2	24.4#

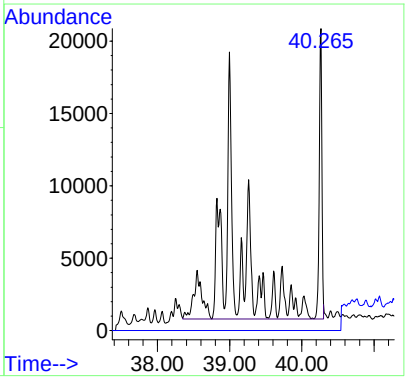


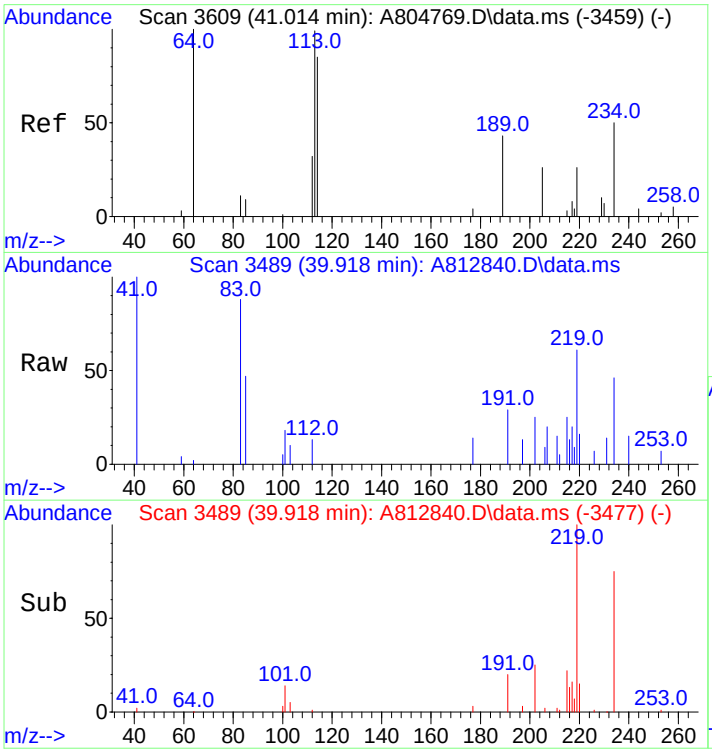


#52
C3-Phenanthrenes/Anthracenes
Concen: 1480.36 ng/mL m
RT: 40.265 min Scan# 3527
Delta R.T. 1.269 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:220 Resp: 297183

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

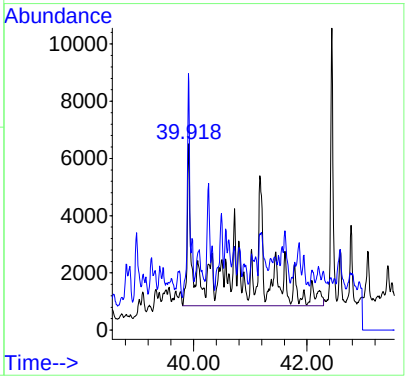


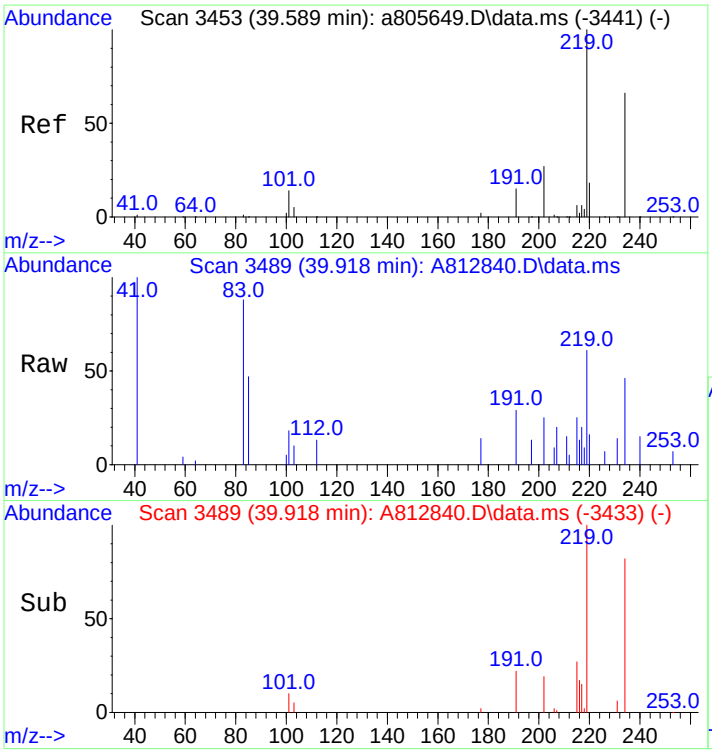


#53
C4-Phenanthrenes/Anthracenes
Concen: 725.78 ng/mL m
RT: 39.918 min Scan# 3489
Delta R.T. -1.260 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:234 Resp: 145700

Ion	Ratio	Lower	Upper
234	100		
219	2.2	52.3	78.5#

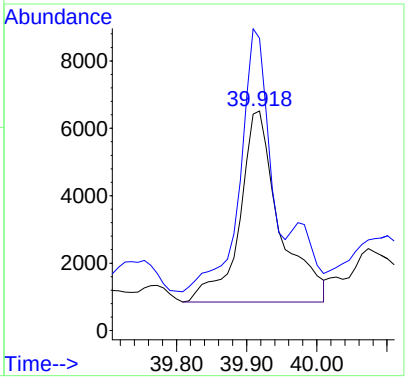


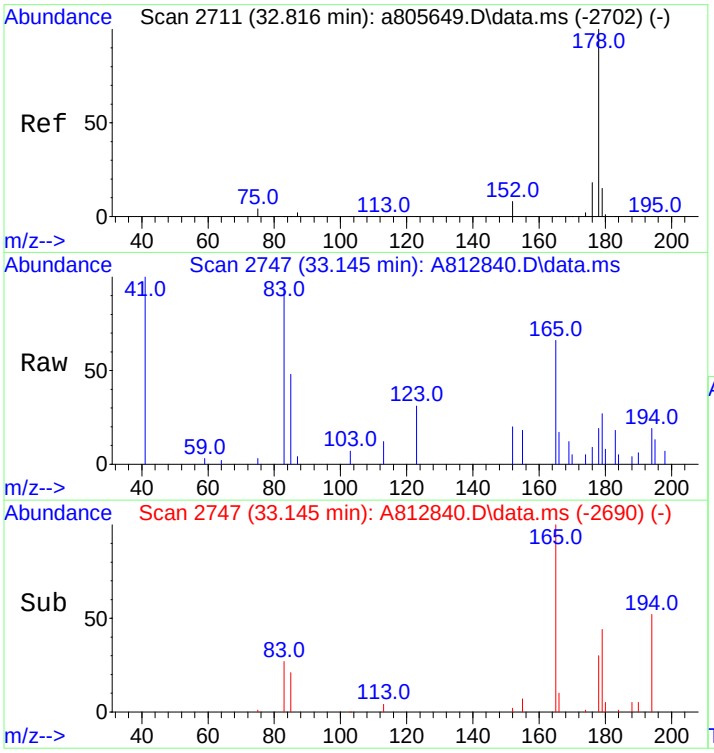


#54
Retene
Concen: 480.52 ng/mL
RT: 39.918 min Scan# 3489
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:234 Resp: 22371

Ion	Ratio	Lower	Upper
234	100		
219	102.9	124.0	186.0#

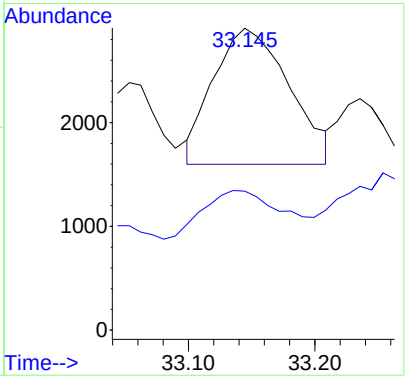


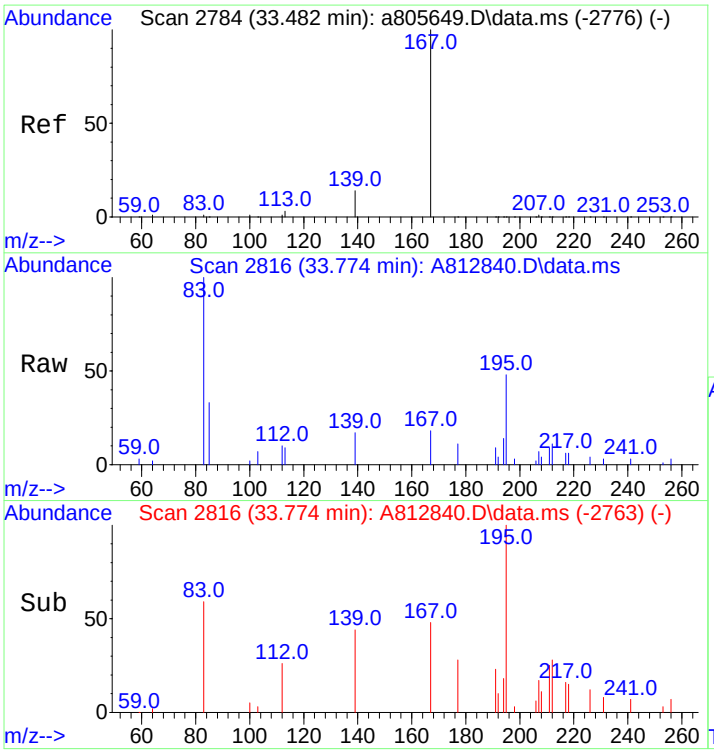


#55
Anthracene
Concen: 29.10 ng/mL m
RT: 33.145 min Scan# 2747
Delta R.T. 0.019 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:178 Resp: 5443

Ion	Ratio	Lower	Upper
178	100		
176	34.4	14.3	21.5#

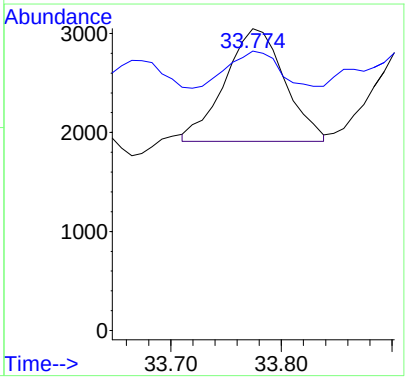


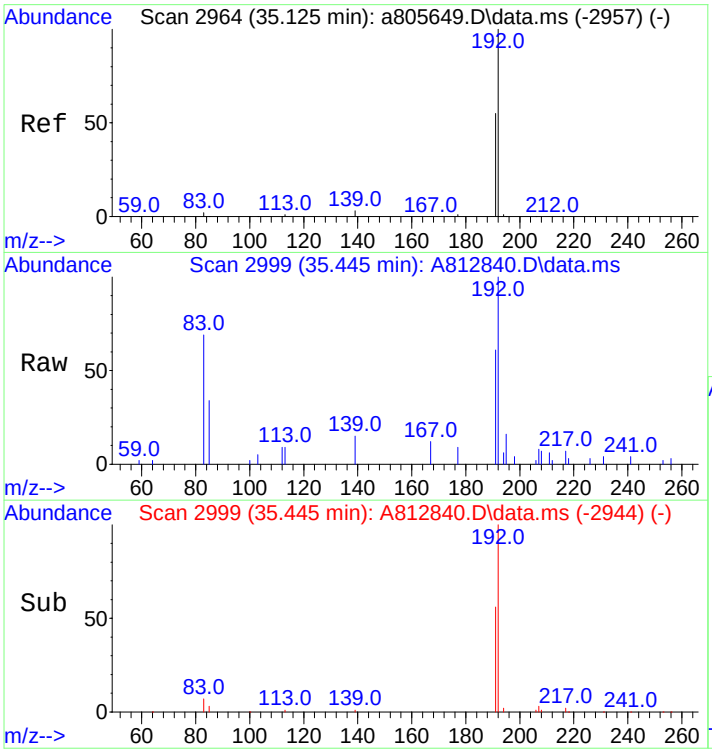


#56
Carbazole
Concen: 21.92 ng/mL m
RT: 33.774 min Scan# 2816
Delta R.T. -0.019 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:167 Resp: 4277

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.6	16.0#

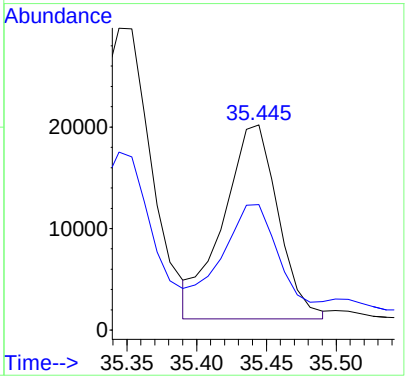


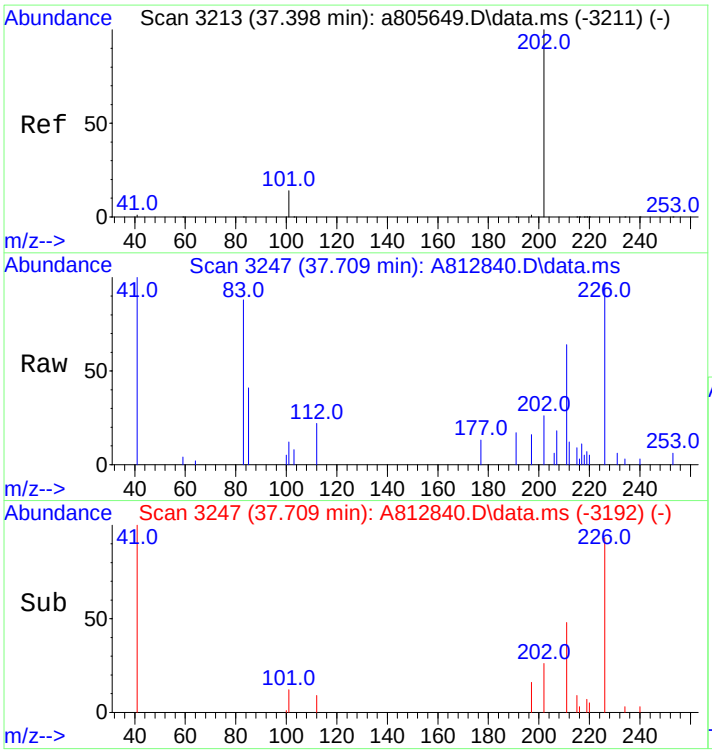


#57
1-Methylphenanthrene
Concen: 369.05 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. -0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:192 Resp: 52517

Ion	Ratio	Lower	Upper
192	100		
191	47.4	44.2	66.4

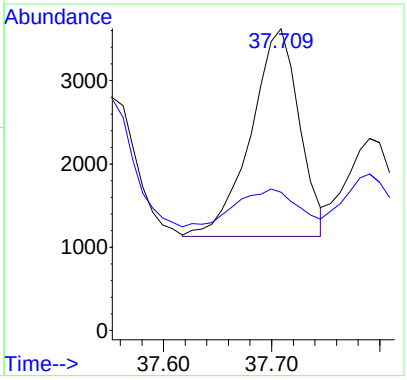


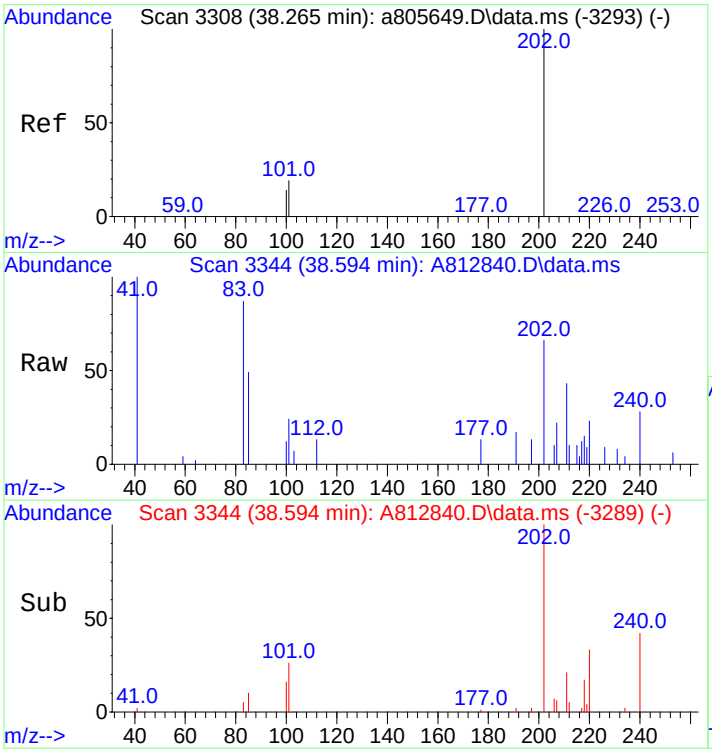


#58
Fluoranthene
Concen: 37.58 ng/mL m
RT: 37.709 min Scan# 3247
Delta R.T. -0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:202 Resp: 7771

Ion	Ratio	Lower	Upper
202	100		
101	0.0	13.6	20.4#

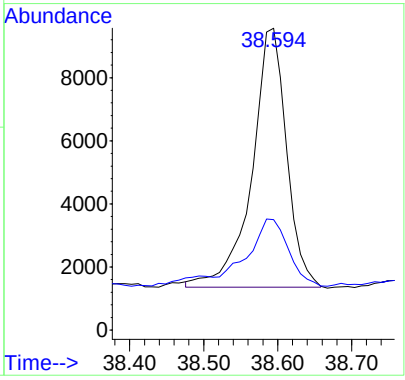


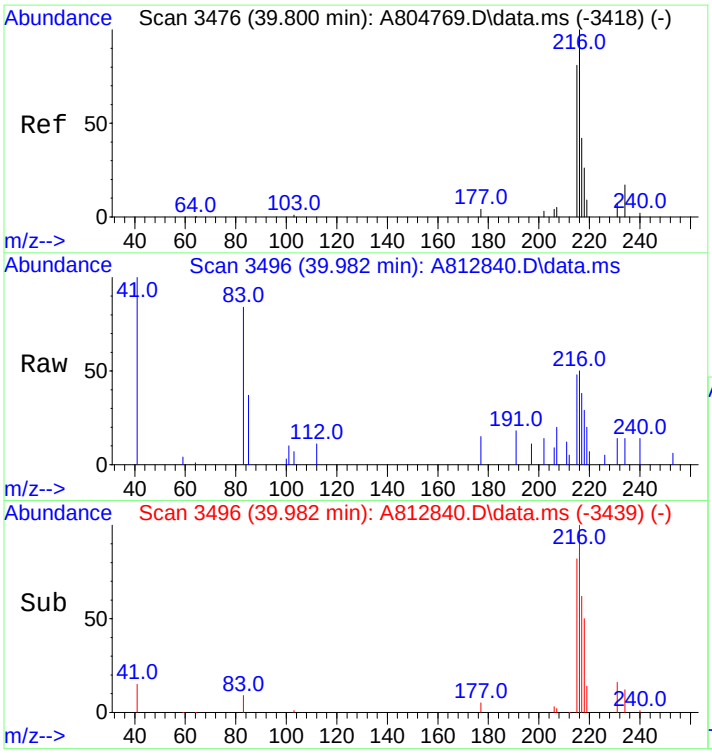


#60
Pyrene
Concen: 126.91 ng/mL m
RT: 38.594 min Scan# 3344
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:202 Resp: 26544

Ion	Ratio	Lower	Upper
202	100		
101	30.4	15.4	23.2#

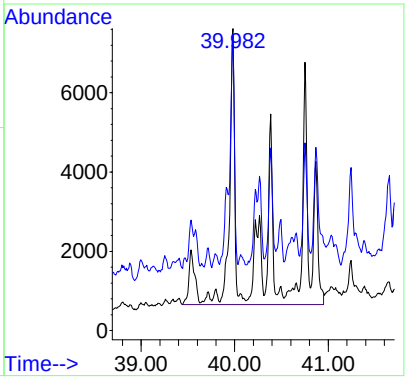


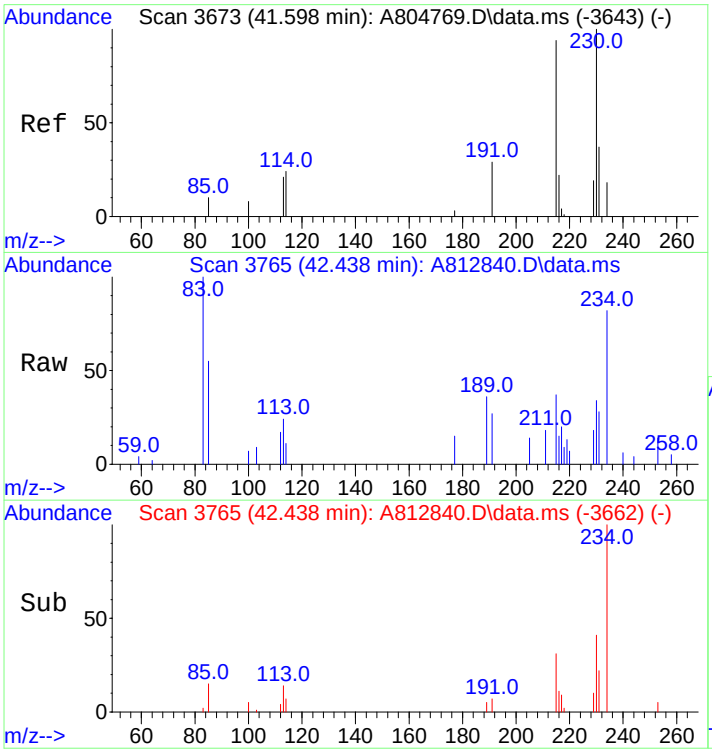


#61
C1-Fluoranthenes/Pyrenes
Concen: 438.73 ng/mL m
RT: 39.982 min Scan# 3496
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:216 Resp: 91764

Ion	Ratio	Lower	Upper
216	100		
215	5.5	73.8	110.6#

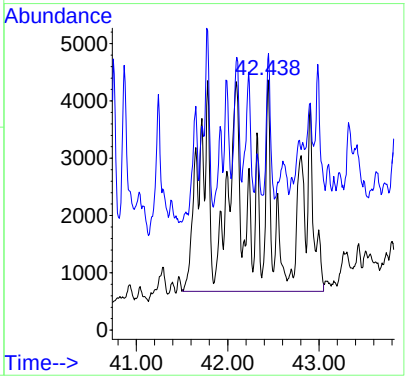


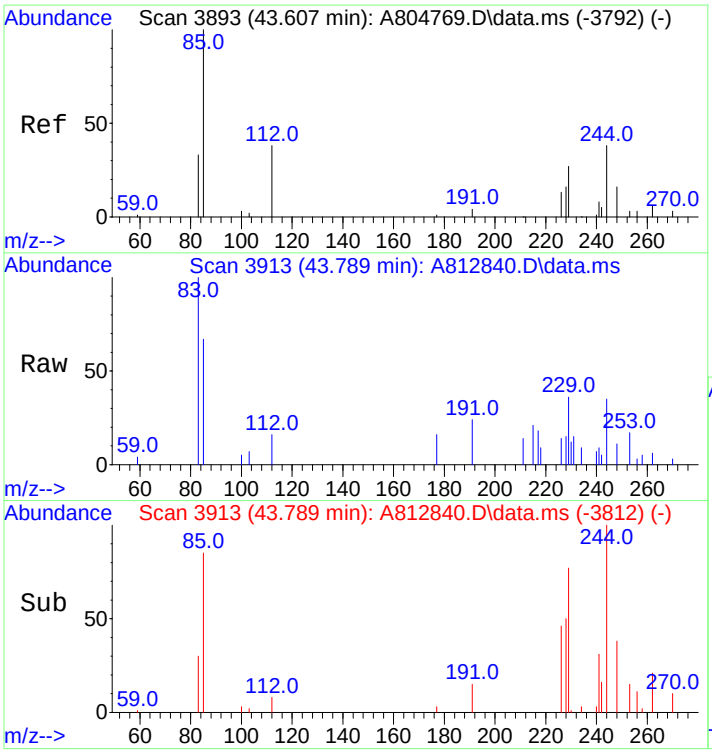


#62
C2-Fluoranthenes/Pyrenes
Concen: 584.65 ng/mL m
RT: 42.438 min Scan# 3765
Delta R.T. 0.666 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:230 Resp: 122284

Ion	Ratio	Lower	Upper
230	100		
215	7.6	93.1	139.7#

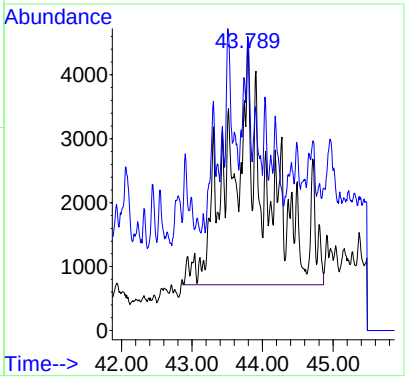


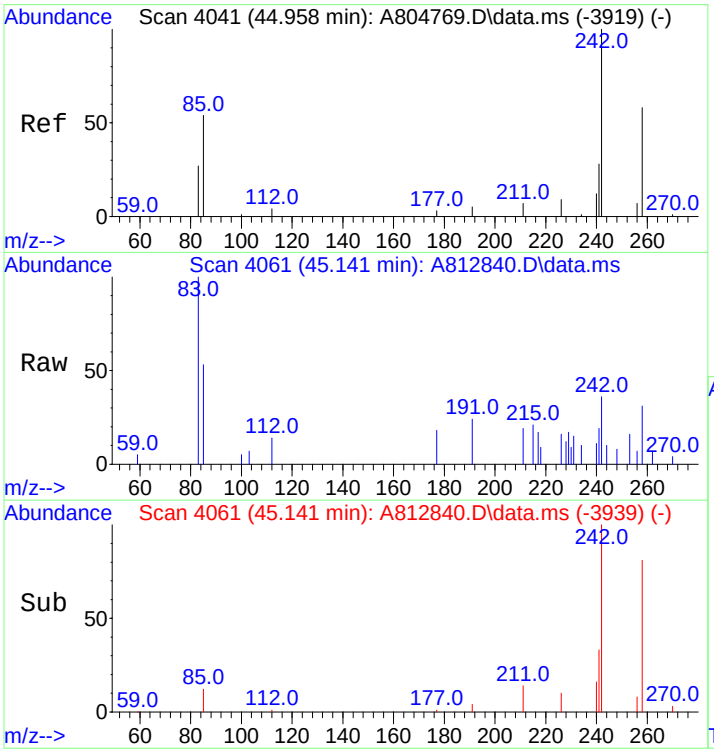


#63
C3-Fluoranthenes/Pyrenes
Concen: 680.76 ng/mL m
RT: 43.789 min Scan# 3913
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:244 Resp: 142387

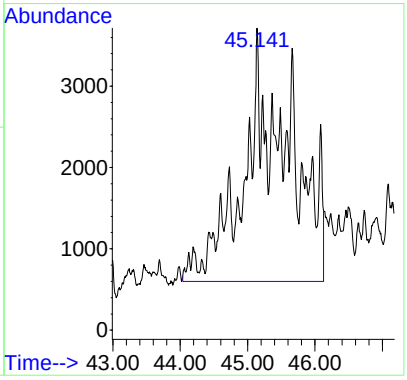
Ion	Ratio	Lower	Upper
244	100		
229	4.7	76.2	114.2#

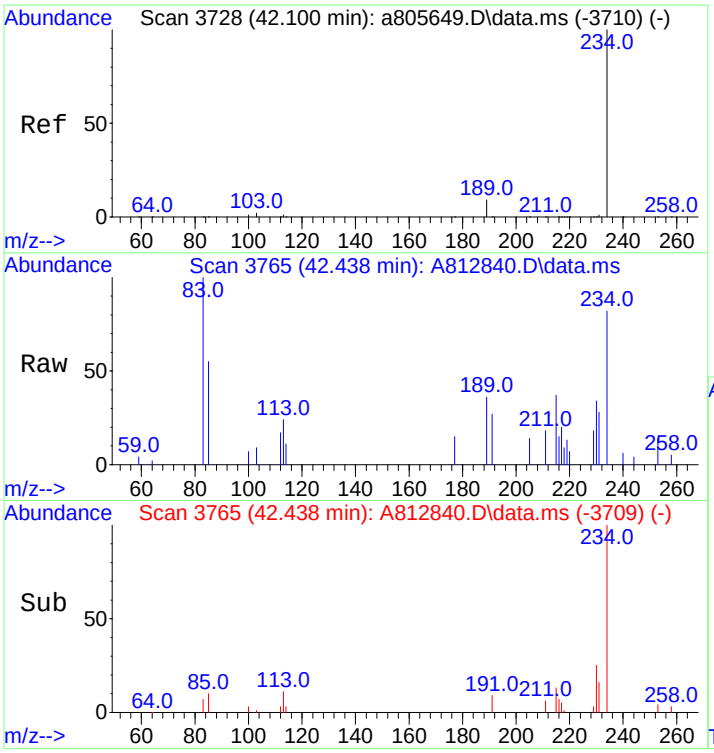




#64
C4-Fluoranthenes/Pyrenes
Concen: 670.34 ng/mL m
RT: 45.141 min Scan# 4061
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:258 Resp: 140206

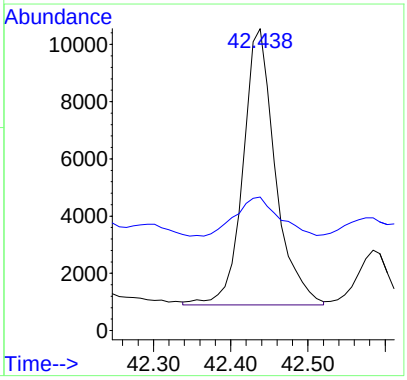


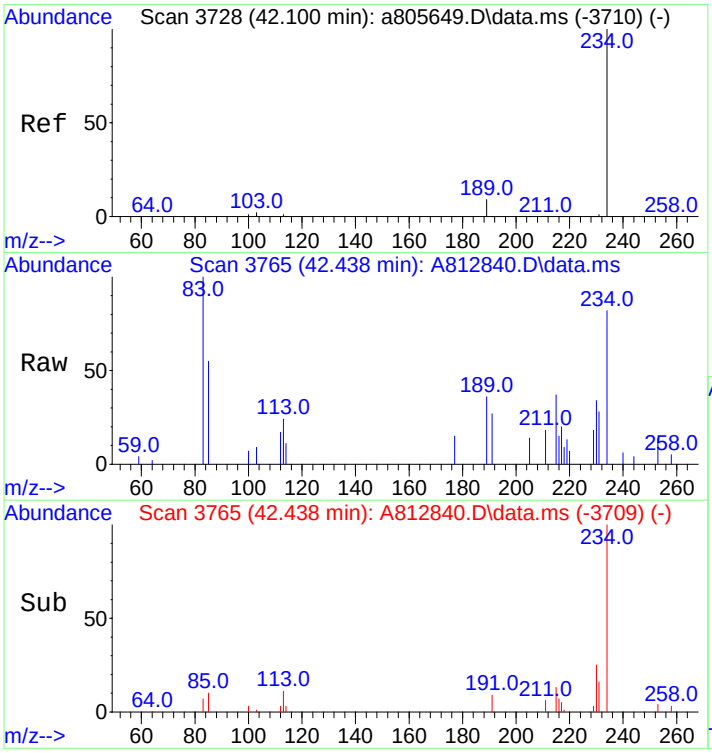


#66
Naphthobenzothiophene
Concen: 144.51 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:234 Resp: 28058

Ion	Ratio	Lower	Upper
234	100		
189	18.9	22.3	33.5#

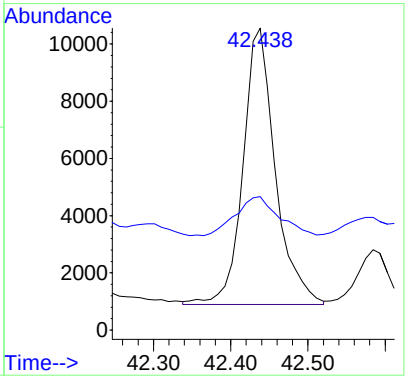


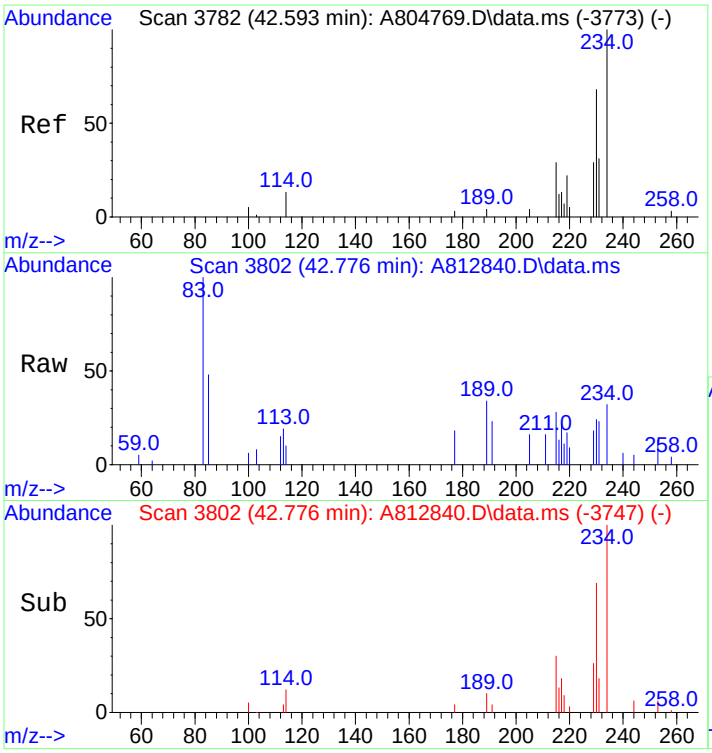


#67
Naphthobenzothiophene-2,1-D
Concen: 144.51 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:234 Resp: 28058

Ion	Ratio	Lower	Upper
234	100		
189	18.9	22.3	33.5#

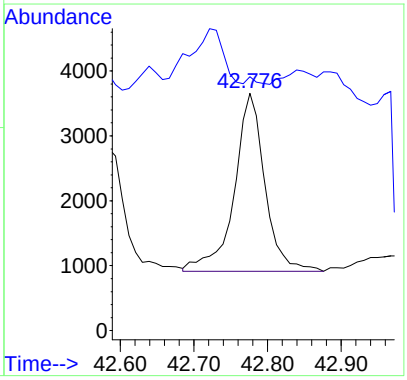


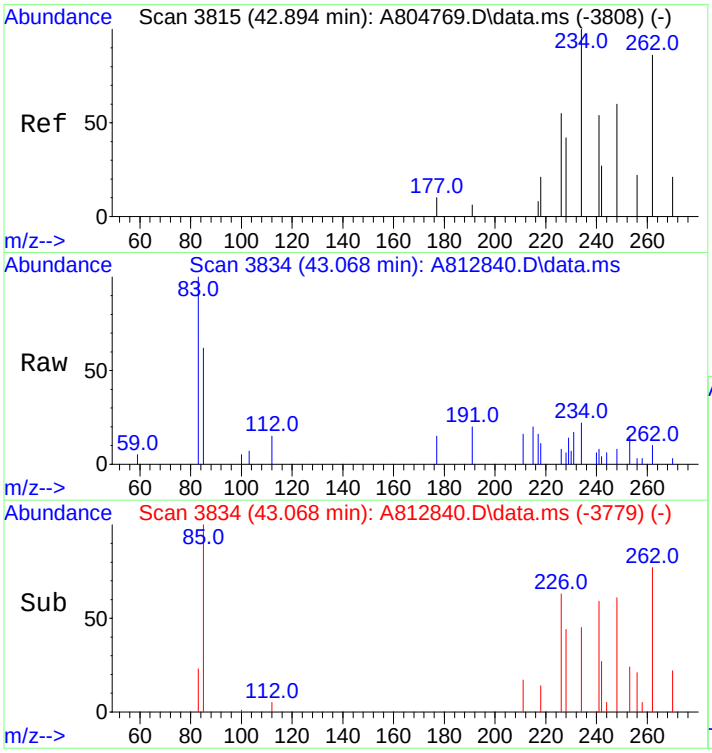


#68
Naphthobenzothiophene-1,2-D
Concen: 41.24 ng/mL
RT: 42.776 min Scan# 3802
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:234 Resp: 8008

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

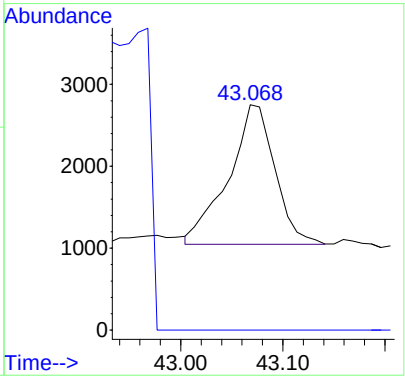


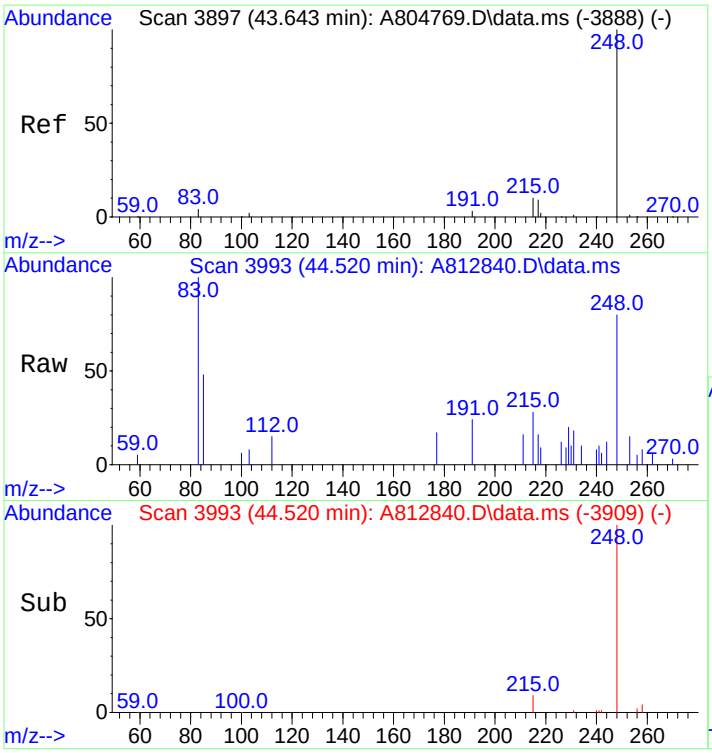


#69
Naphthobenzothiophene-2,3-D
Concen: 27.76 ng/mL m
RT: 43.068 min Scan# 3834
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:234 Resp: 5389

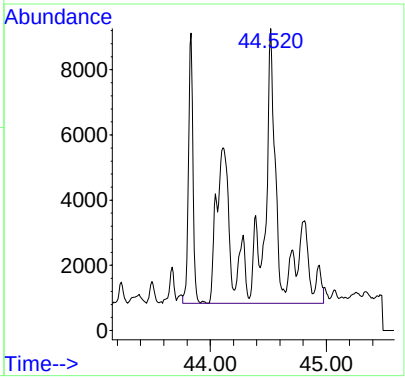
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

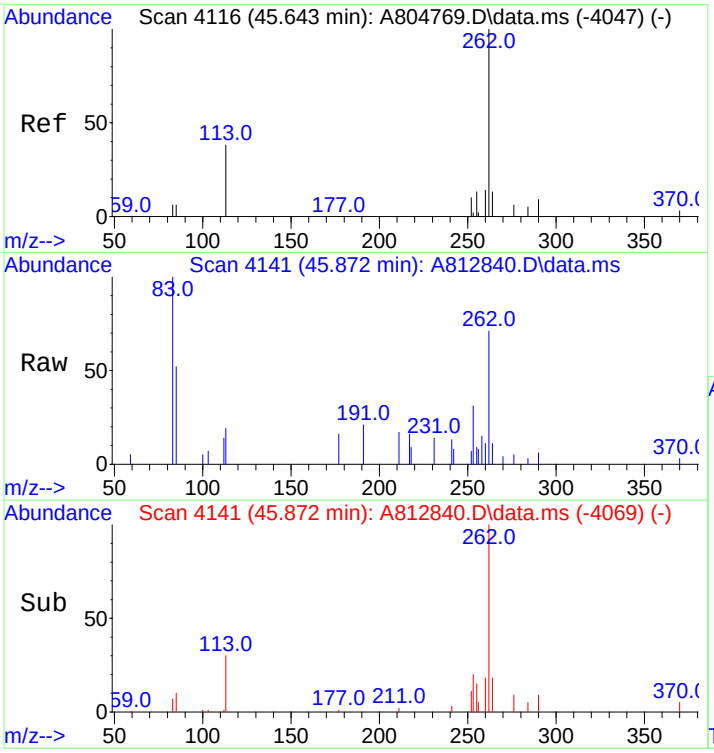




#70
C1-Naphthobenzothiophenes
Concen: 700.30 ng/ml m
RT: 44.520 min Scan# 3993
Delta R.T. 0.694 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

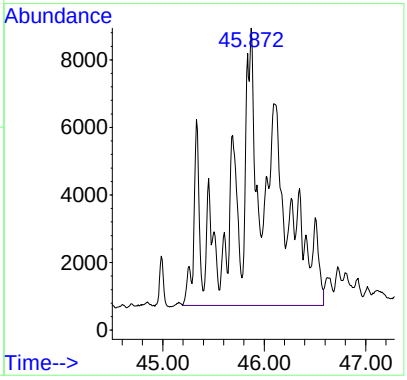
Tgt Ion:248 Resp: 135970

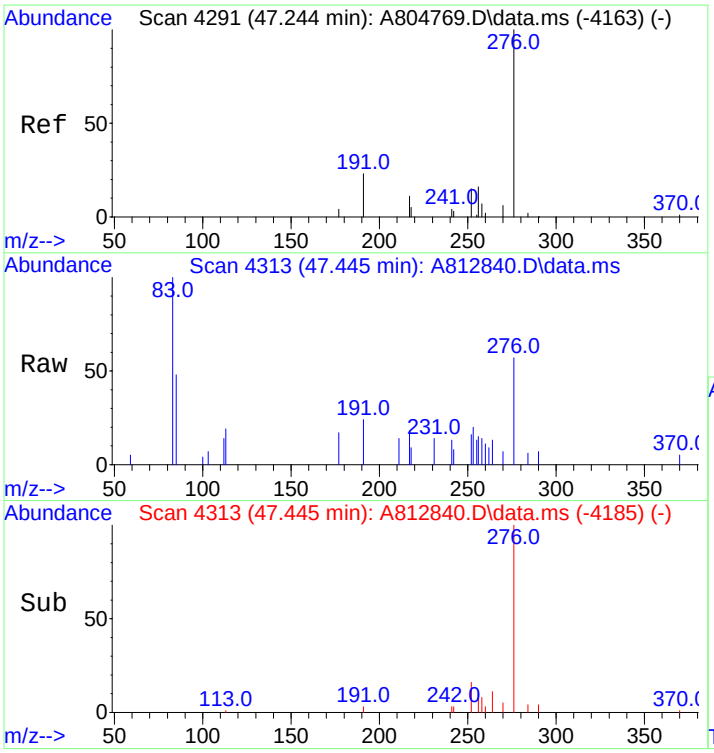




#71
C2-Naphthobenzothiophenes
Concen: 1137.03 ng/ml m
RT: 45.872 min Scan# 4141
Delta R.T. 0.046 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

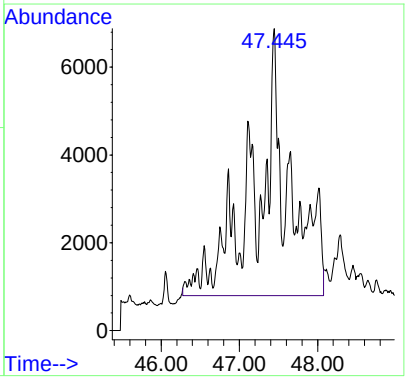
Tgt Ion:262 Resp: 220766

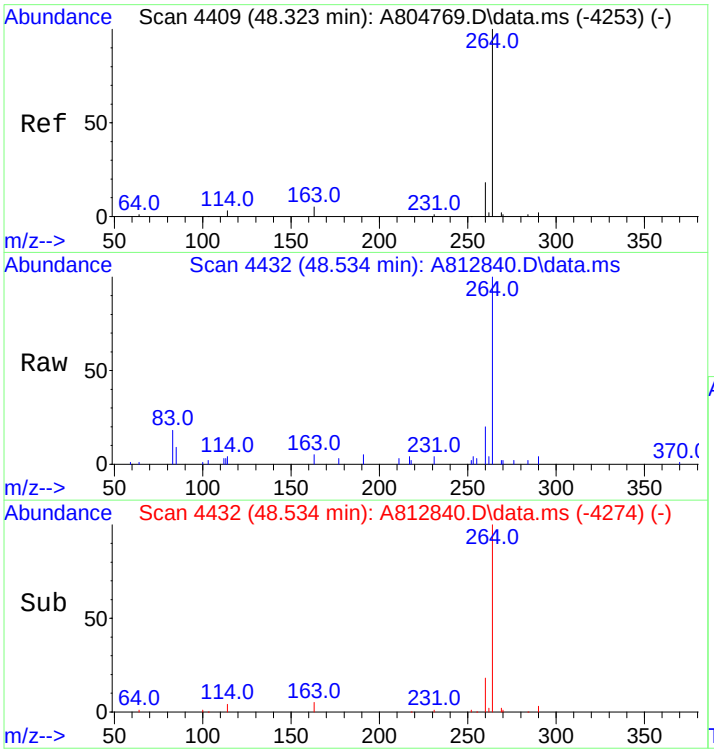




#72
C3-Naphthobenzothiophenes
Concen: 931.82 ng/ml m
RT: 47.445 min Scan# 4313
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

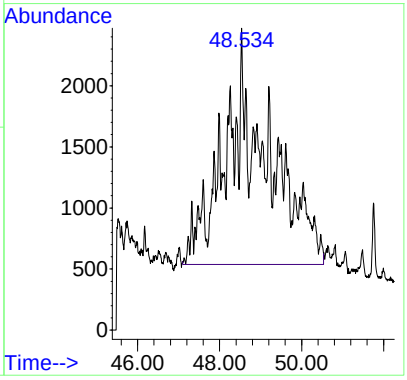
Tgt Ion:276 Resp: 180923

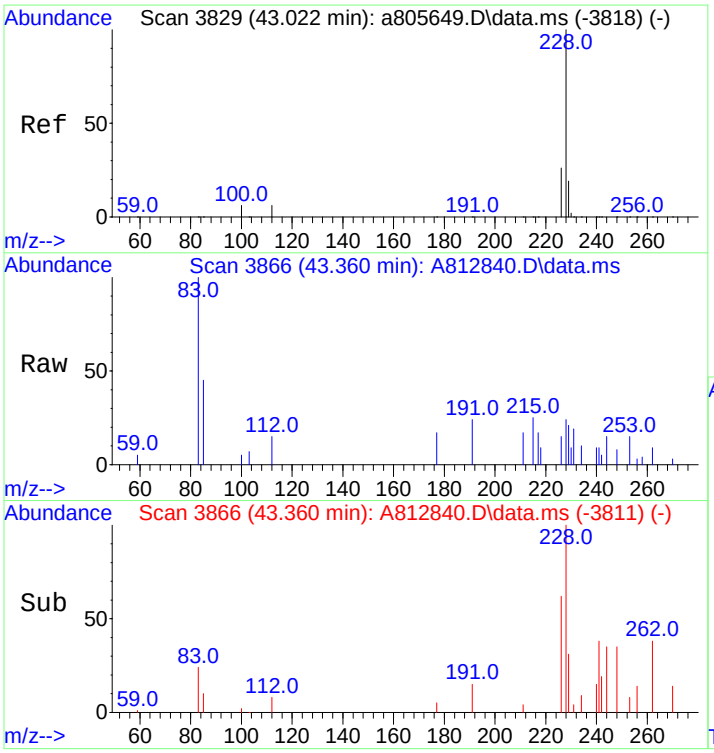




#73
C4-Naphthobenzothiophenes
Concen: 690.21 ng/mL m
RT: 48.534 min Scan# 4432
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:290 Resp: 134012

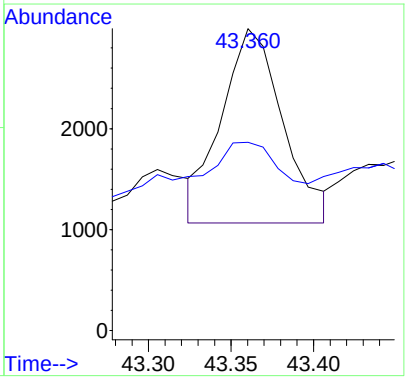


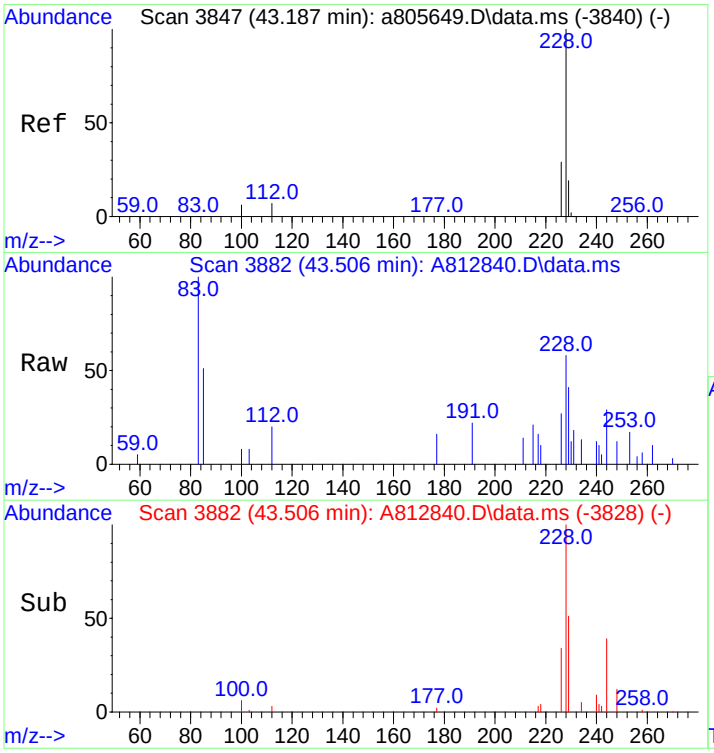


#75
Benz[a]anthracene
Concen: 22.93 ng/mL m
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:228 Resp: 5006

Ion	Ratio	Lower	Upper
228	100		
226	144.2	21.3	31.9#

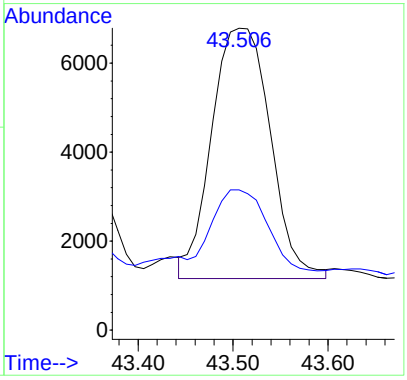


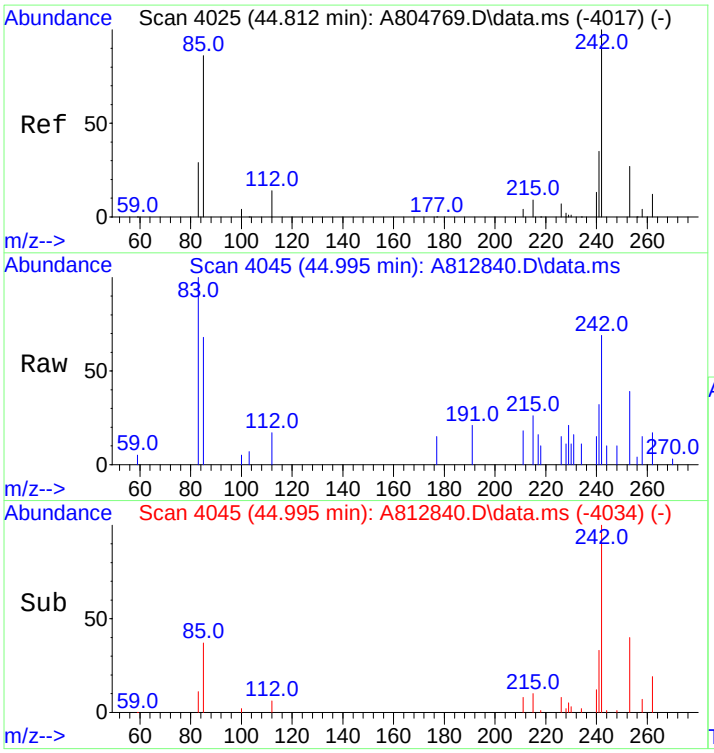


#77
Chrysene/Triphenylene
Concen: 109.45 ng/mL m
RT: 43.506 min Scan# 3882
Delta R.T. -0.010 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:228 Resp: 24187

Ion	Ratio	Lower	Upper
228	100		
226	36.3	23.6	35.4#

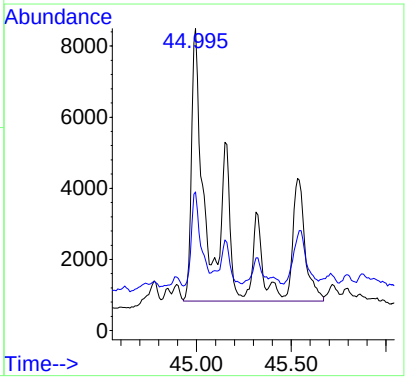


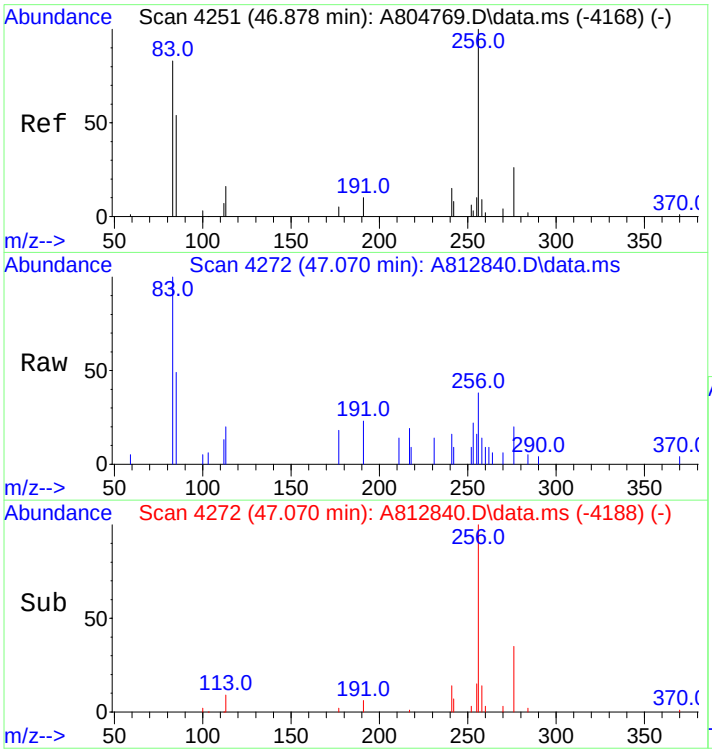


#78
C1-Chrysenes
Concen: 307.34 ng/mL m
RT: 44.995 min Scan# 4045
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:242 Resp: 67917

Ion	Ratio	Lower	Upper
242	100		
241	13.7	33.5	50.3#

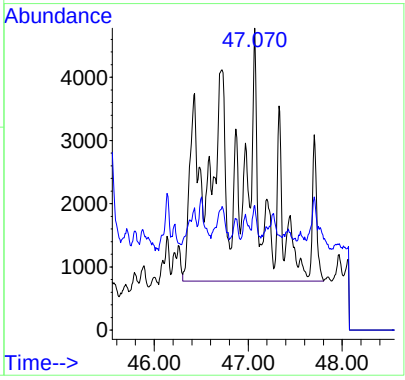


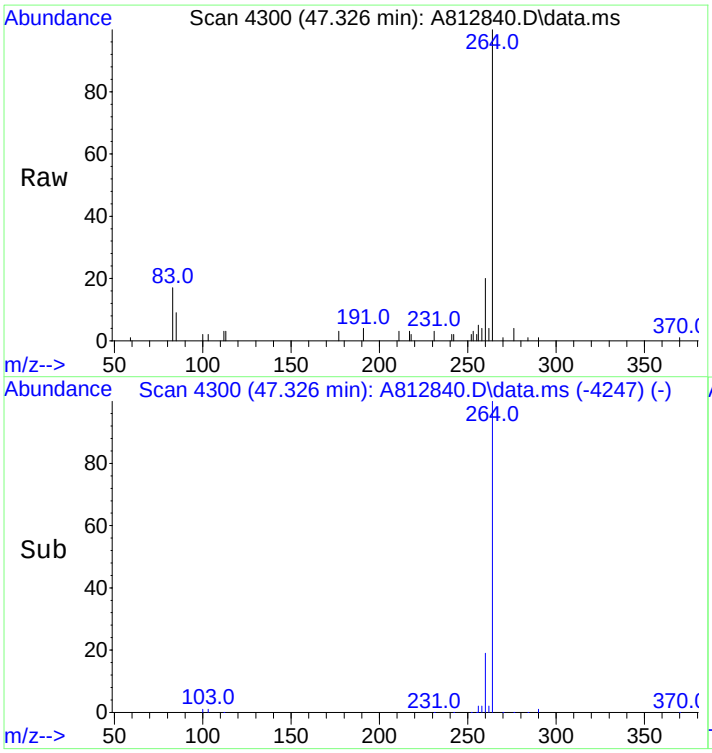


#79
C2-Chrysenes
Concen: 506.84 ng/mL m
RT: 47.070 min Scan# 4272
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:256 Resp: 112002

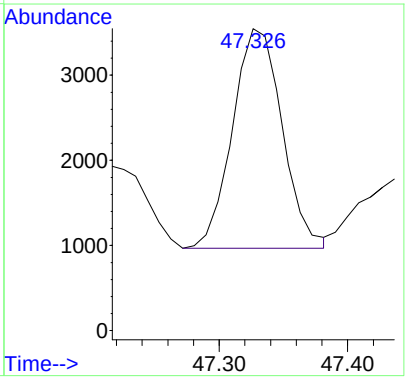
Ion	Ratio	Lower	Upper
256	100		
241	0.3	30.4	45.6#

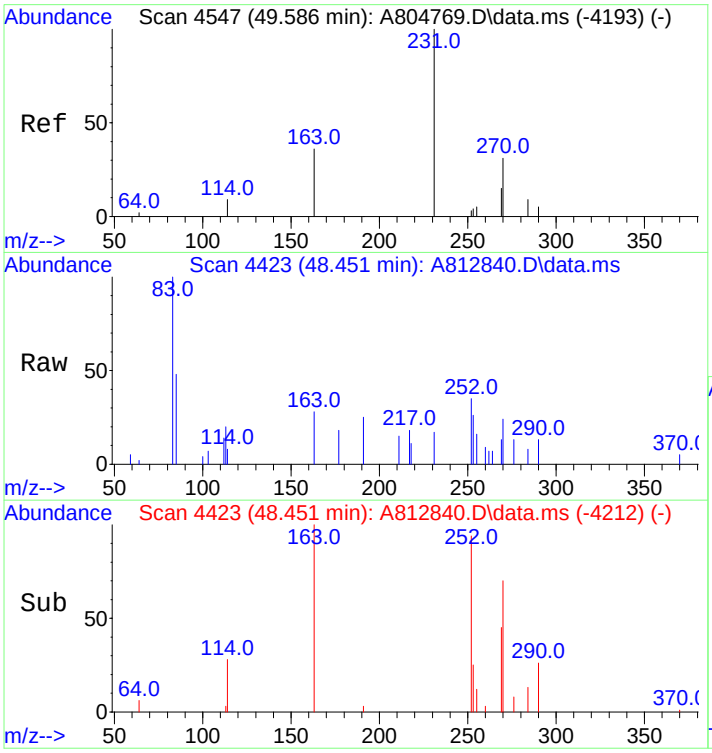




#80
BBF-D12 Surr BKGD
Concen: 31.42 ng/mL
RT: 47.326 min Scan# 4300
Delta R.T. -0.017 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:256 Resp: 6943

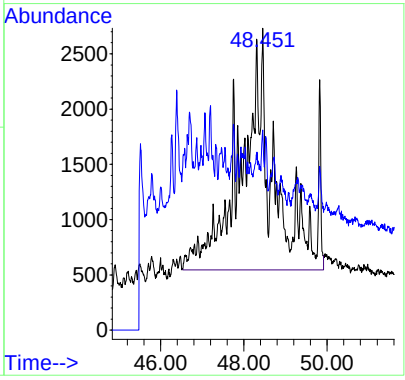


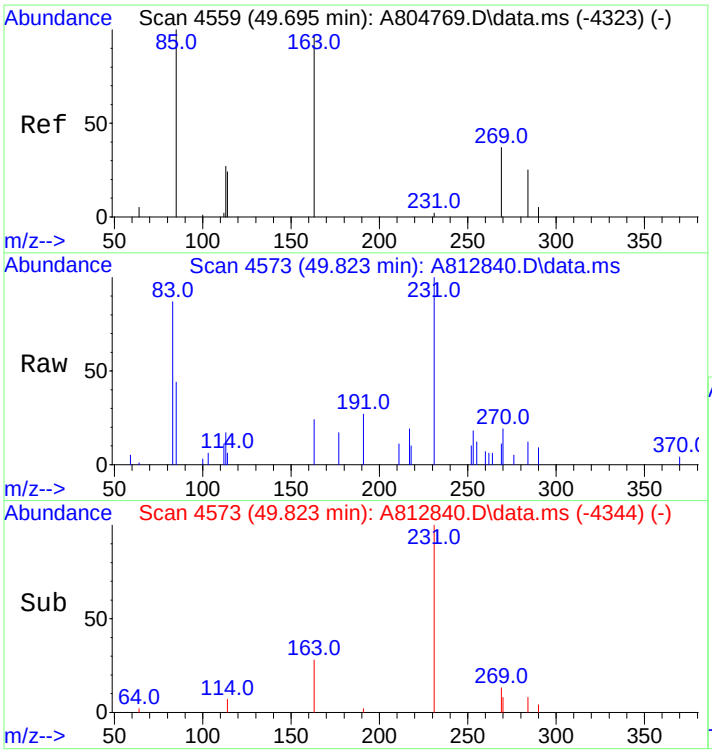


#81
C3-Chrysenes
Concen: 538.79 ng/mL m
RT: 48.451 min Scan# 4423
Delta R.T. -1.363 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:270 Resp: 119061

Ion	Ratio	Lower	Upper
270	100		
255	2.0	42.9	64.3#

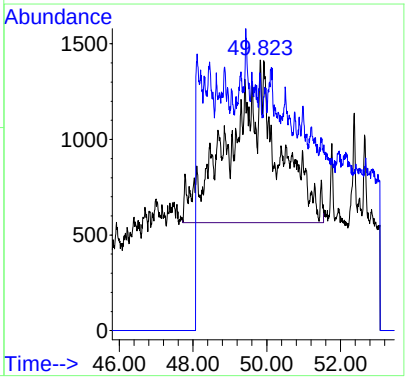


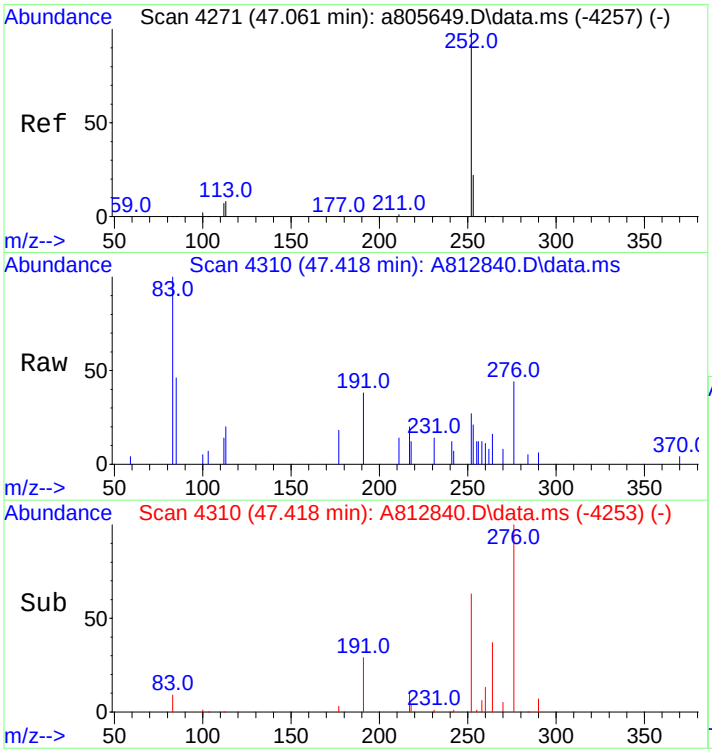


#82
C4-Chrysenes
Concen: 352.95 ng/mL m
RT: 49.823 min Scan# 4573
Delta R.T. -0.002 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:284 Resp: 77994

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

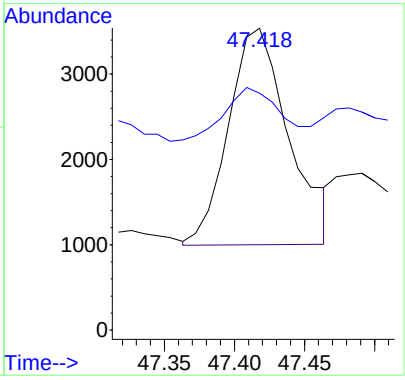


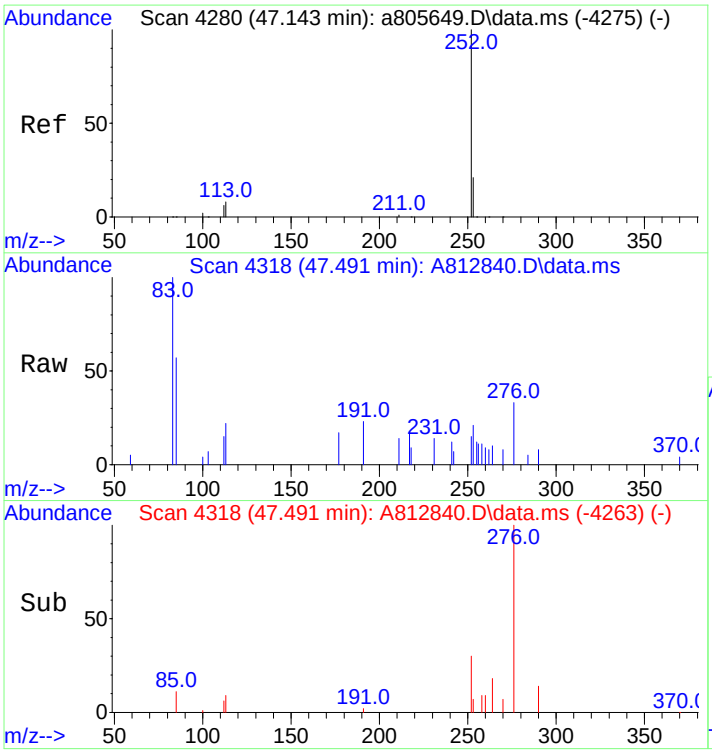


#84
Benzo[b]fluoranthene
Concen: 32.56 ng/mL
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:252 Resp: 7635

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.5	27.7

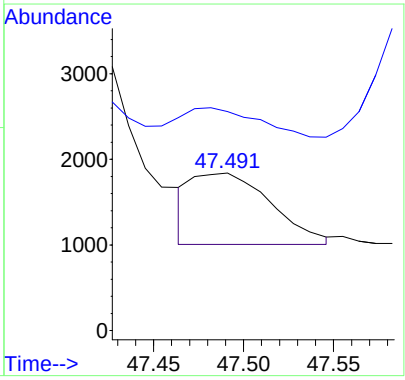


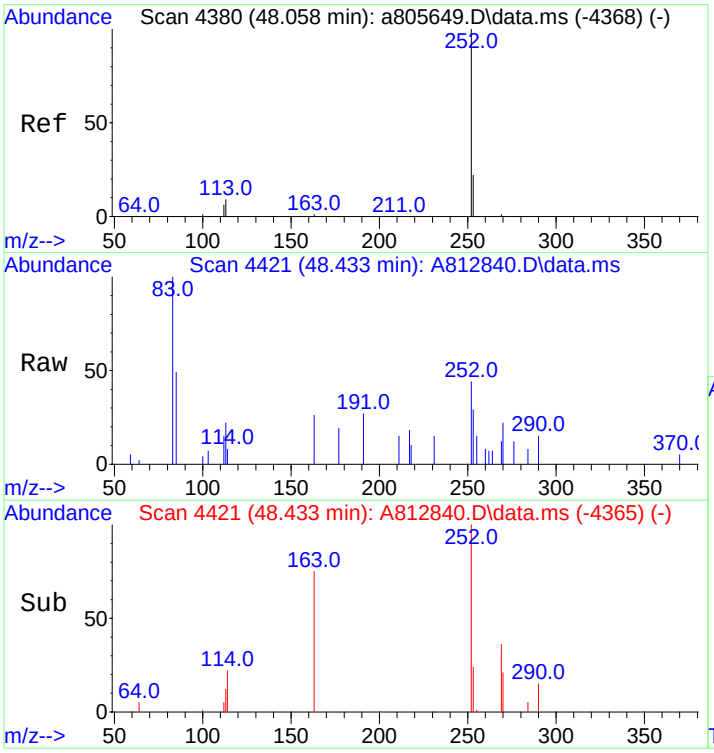


#85
Benzo[j]+[k]fluoranthene
Concen: 10.06 ng/mL m
RT: 47.491 min Scan# 4318
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:252 Resp: 2573

Ion	Ratio	Lower	Upper
252	100		
253	65.2	18.8	28.2#

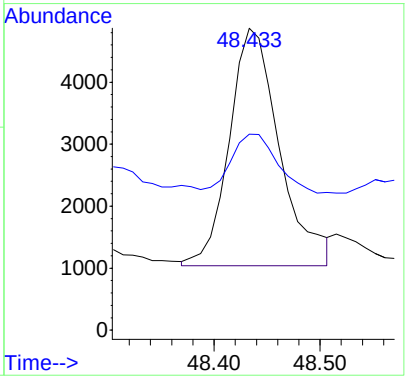


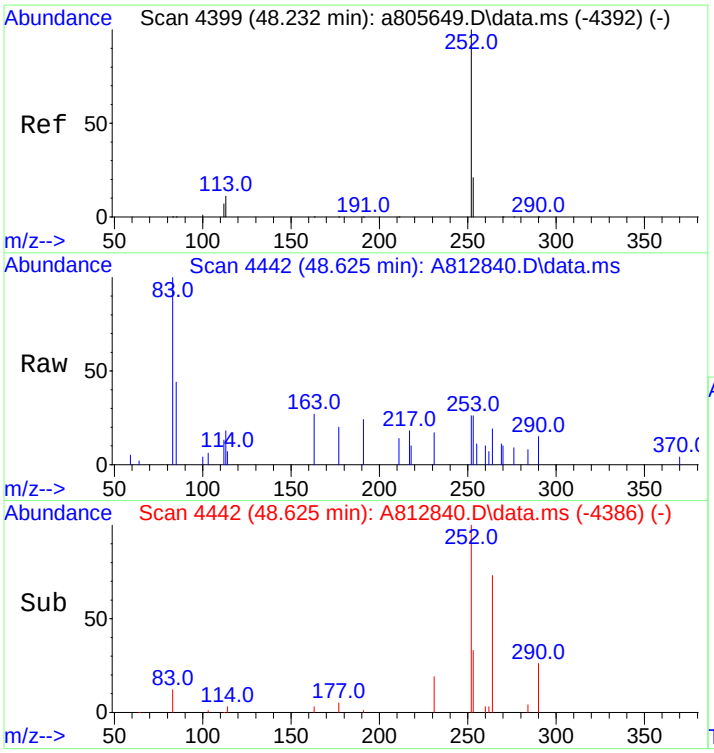


#87
Benzo[e]pyrene
Concen: 52.31 ng/mL m
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:252 Resp: 12637

Ion	Ratio	Lower	Upper
252	100		
253	27.1	18.9	28.3

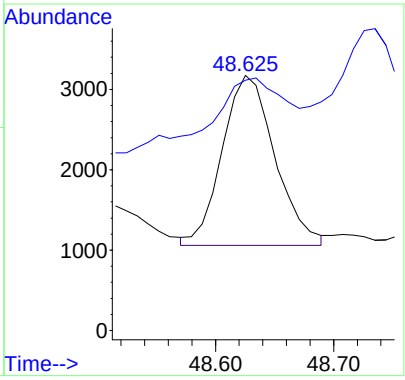


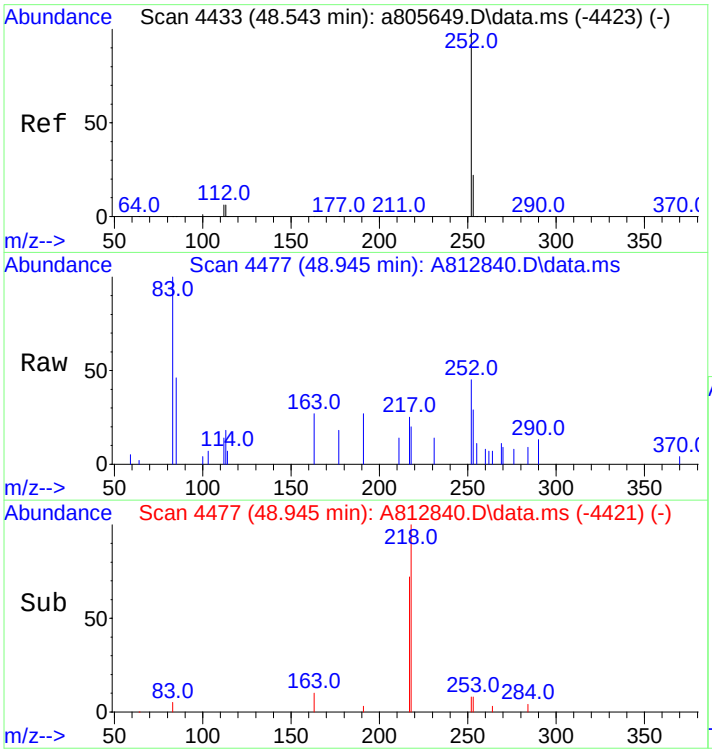


#89
Benzo[a]pyrene
Concen: 29.31 ng/mL m
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:252 Resp: 6551

Ion	Ratio	Lower	Upper
252	100		
253	47.1	19.4	29.0#

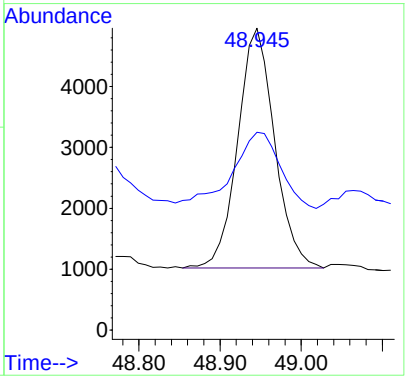


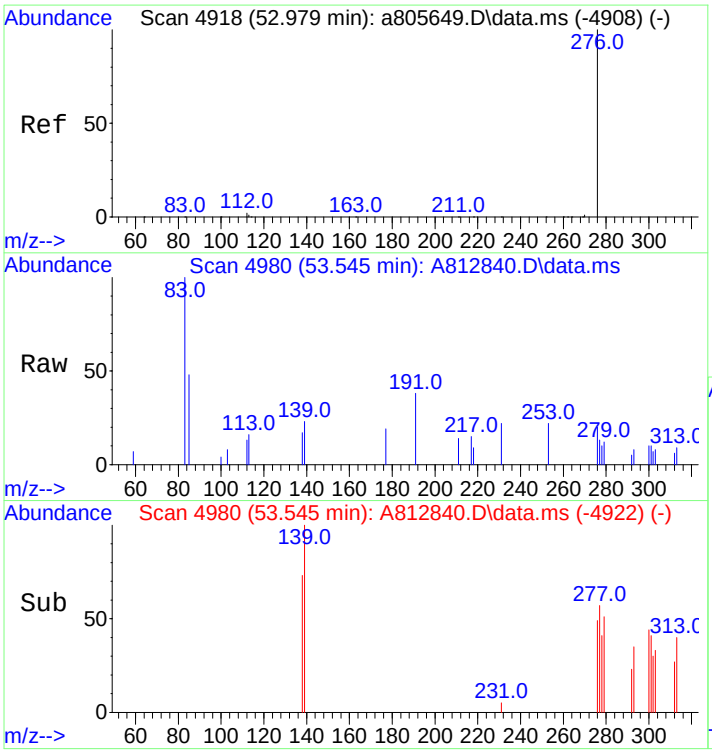


#90
Perylene
Concen: 50.77 ng/mL
RT: 48.945 min Scan# 4477
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:252 Resp: 12394

Ion	Ratio	Lower	Upper
252	100		
253	42.0	19.3	28.9#

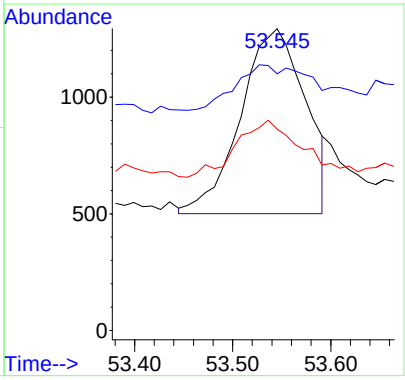


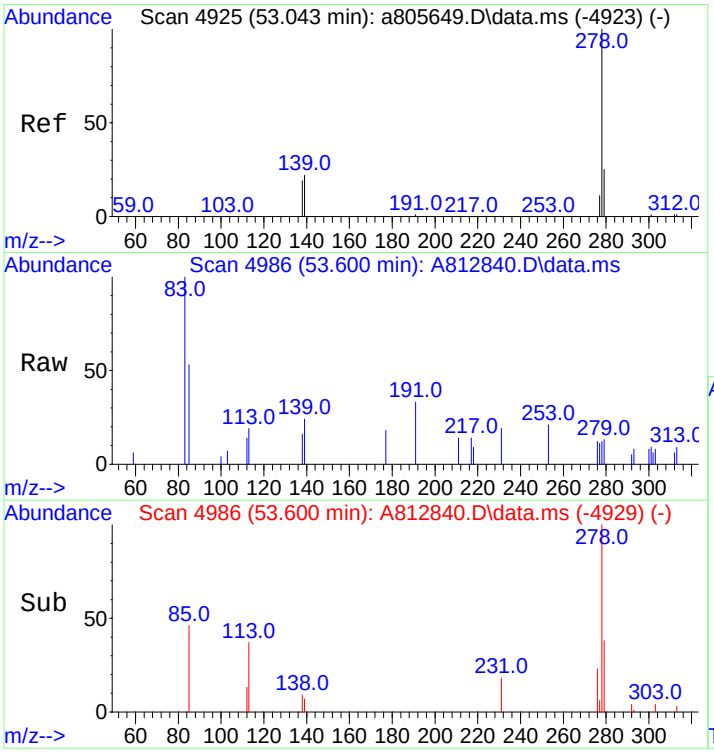


#91
Indeno[1,2,3-cd]pyrene
Concen: 15.35 ng/mL m
RT: 53.545 min Scan# 4980
Delta R.T. 0.027 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:276 Resp: 3644

Ion	Ratio	Lower	Upper
276	100		
138	0.0	19.9	29.9#
277	0.0	19.0	28.6#

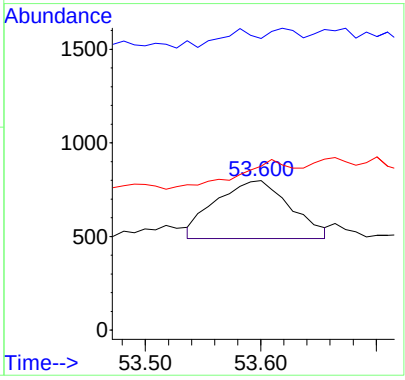


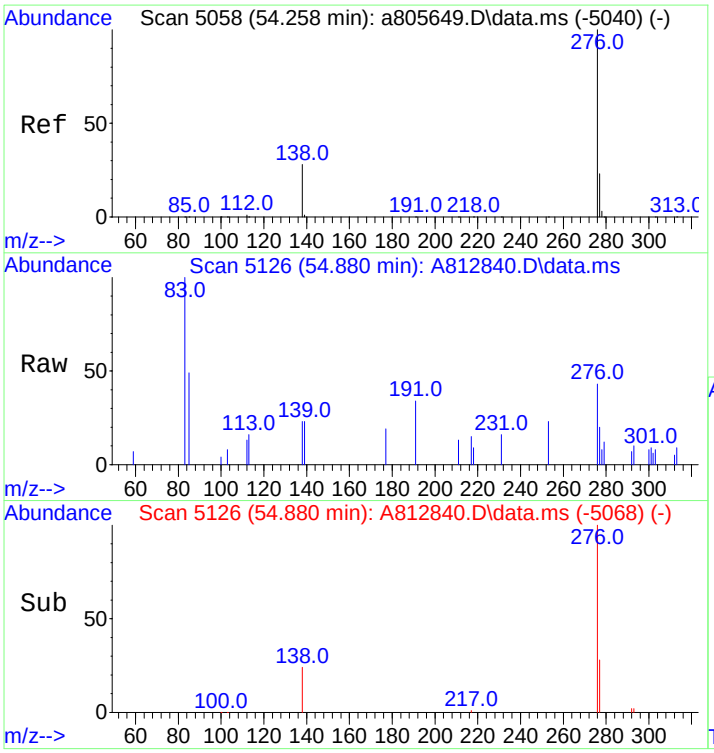


#92
Dibenz[ah]+[ac]anthracene
Concen: 5.98 ng/mL m
RT: 53.600 min Scan# 4986
Delta R.T. 0.018 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:278 Resp: 1391

Ion	Ratio	Lower	Upper
278	100		
139	0.0	16.6	25.0#
279	35.7	19.1	28.7#

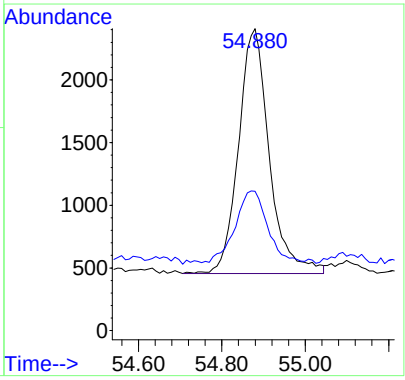


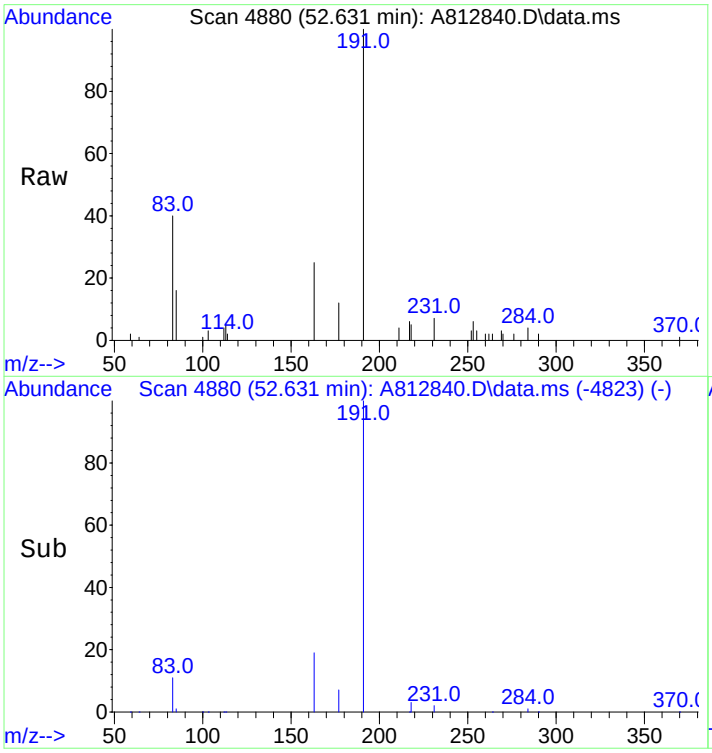


#93
Benzo[g,h,i]perylene
Concen: 37.17 ng/mL
RT: 54.880 min Scan# 5126
Delta R.T. 0.028 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:276 Resp: 10013

Ion	Ratio	Lower	Upper
276	100		
277	31.6	18.9	28.3#

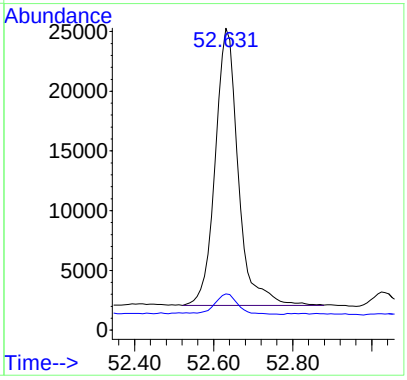


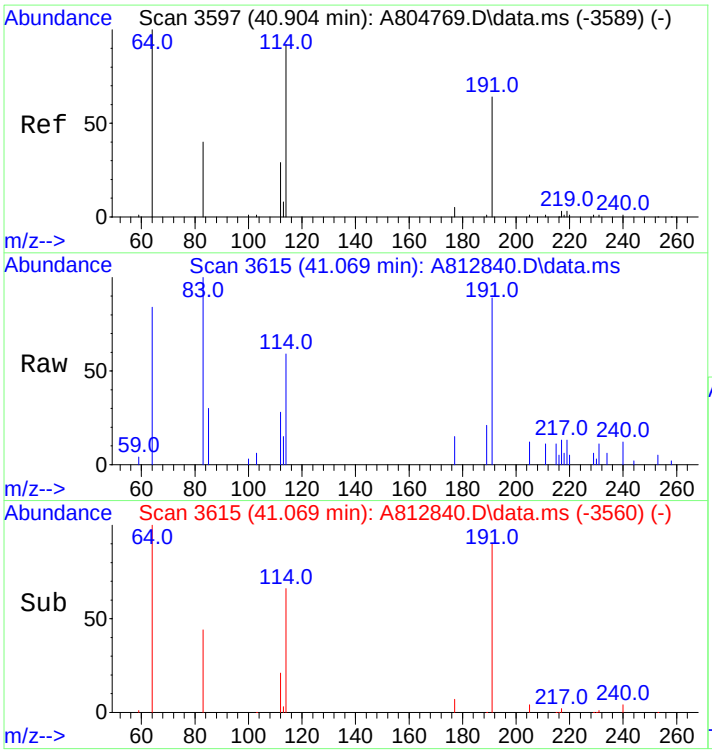


#94
Hopane (T19)
Concen: 1254.56 ng/mL
RT: 52.631 min Scan# 4880
Delta R.T. 0.018 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:191 Resp: 93826

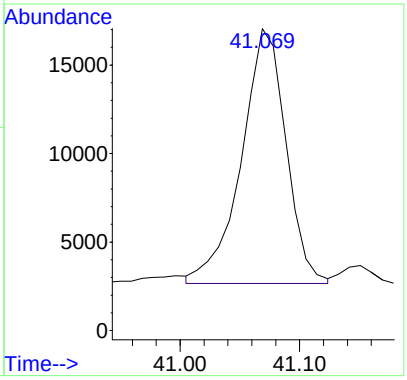
Ion	Ratio	Lower	Upper
191	100		
177	7.2	9.8	14.8#

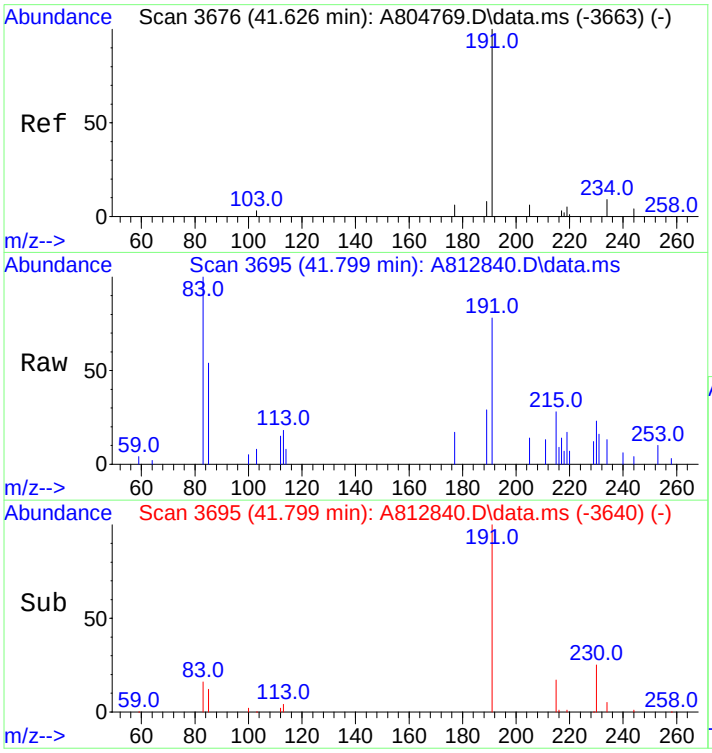




#96
C23 Tricyclic Terpane (T4)
Concen: 497.23 ng/ml m
RT: 41.069 min Scan# 3615
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

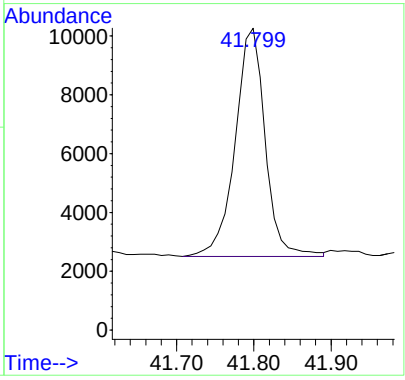
Tgt Ion:191 Resp: 37187

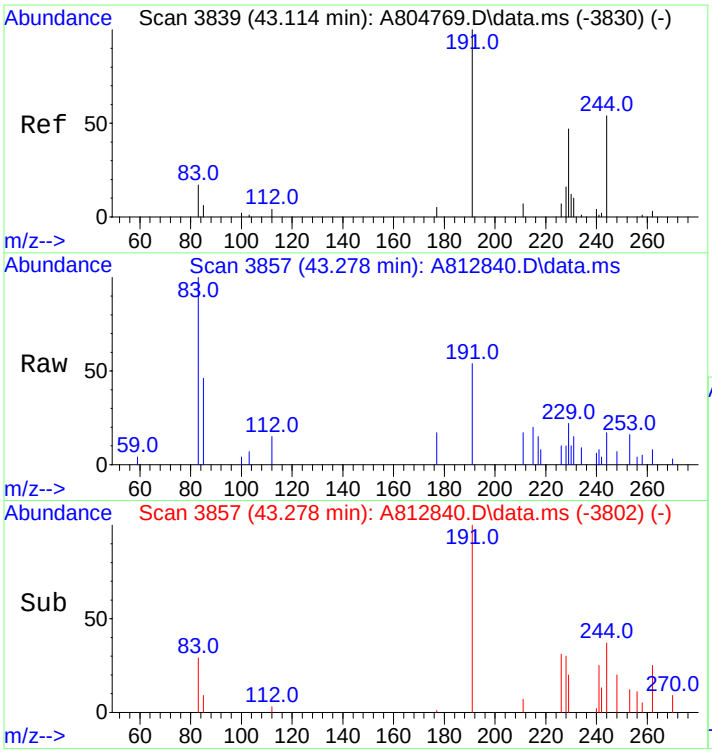




#97
C24 Tricyclic Terpane (T5)
Concen: 281.15 ng/ml
RT: 41.799 min Scan# 3695
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

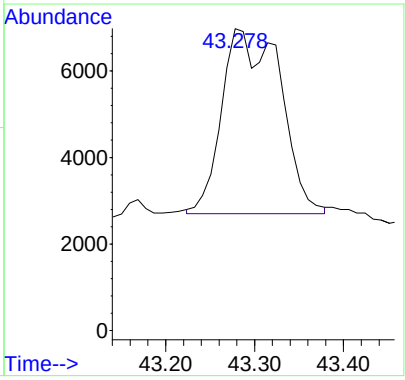
Tgt Ion:191 Resp: 21027

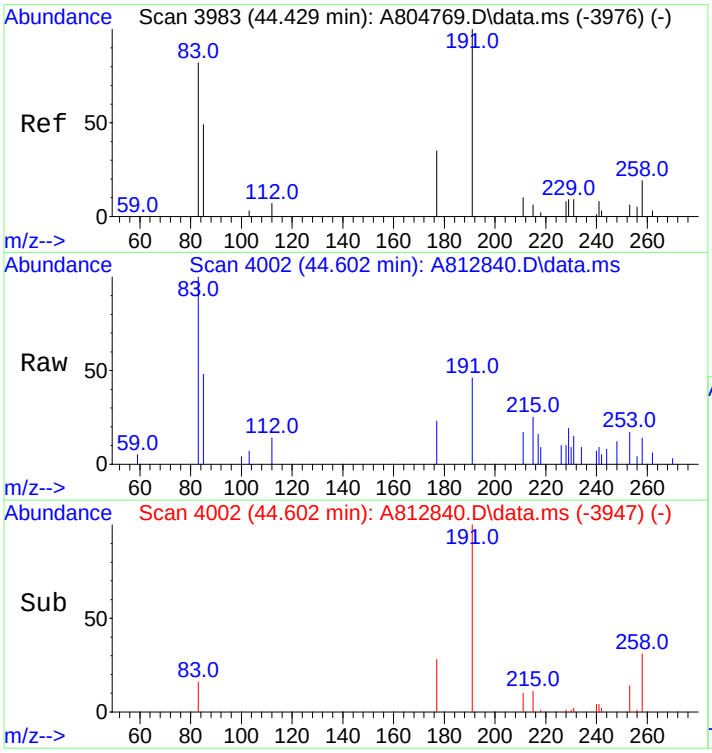




#98
C25 Tricyclic Terpane (T6)
Concen: 260.16 ng/ml m
RT: 43.278 min Scan# 3857
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

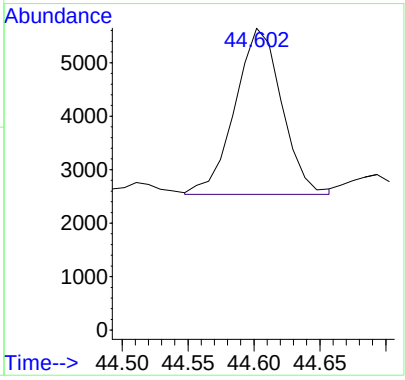
Tgt Ion:191 Resp: 19457

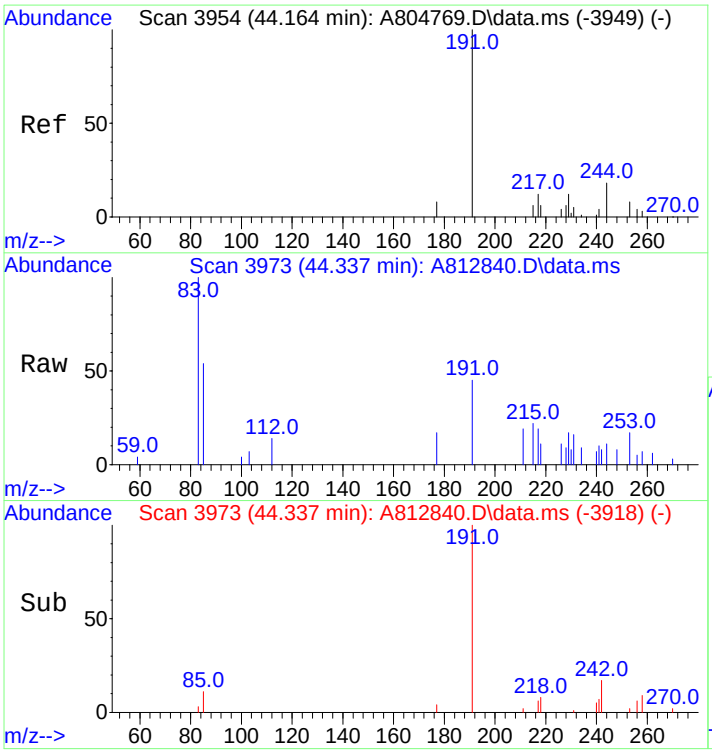




#99
C24 Tetracyclic Terpane (T6a)
Concen: 102.81 ng/ml m
RT: 44.602 min Scan# 4002
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

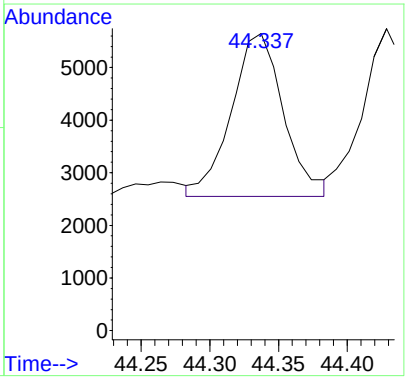
Tgt Ion:191 Resp: 7689

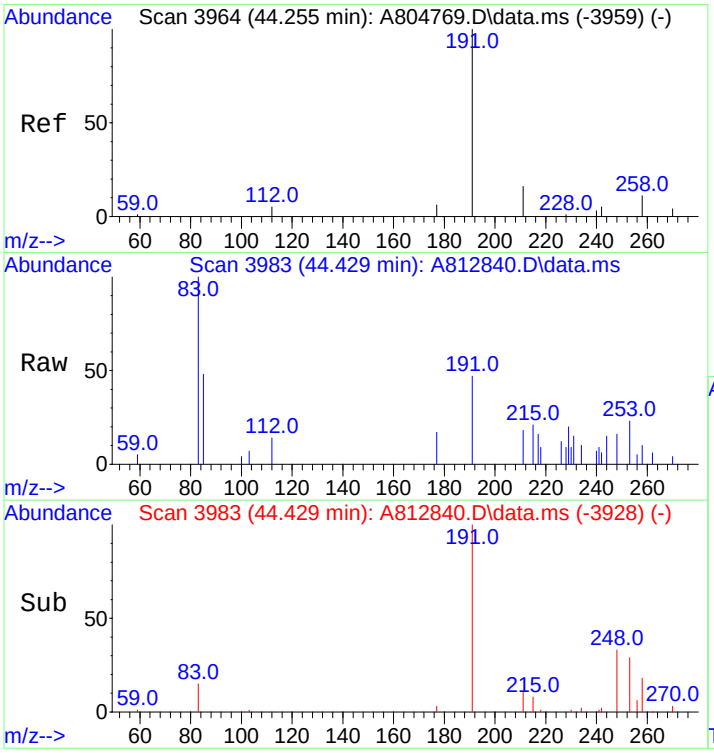




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 109.42 ng/ml m
RT: 44.337 min Scan# 3973
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

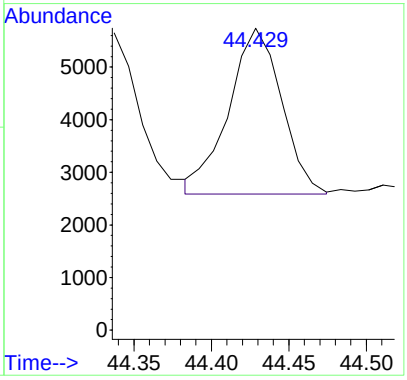
Tgt Ion:191 Resp: 8183

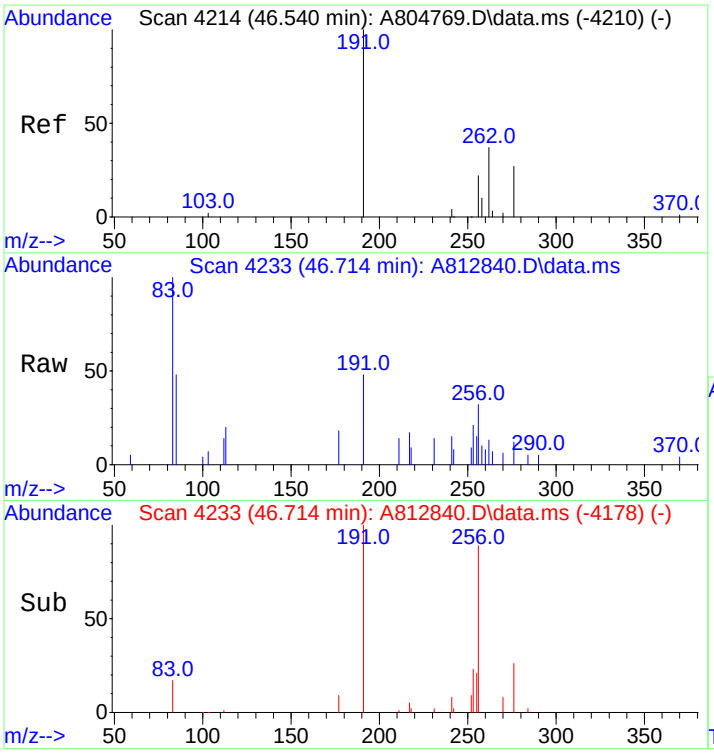




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 99.98 ng/ml m
RT: 44.429 min Scan# 3983
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

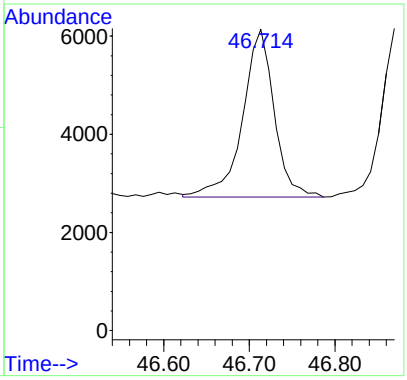
Tgt Ion:191 Resp: 7477

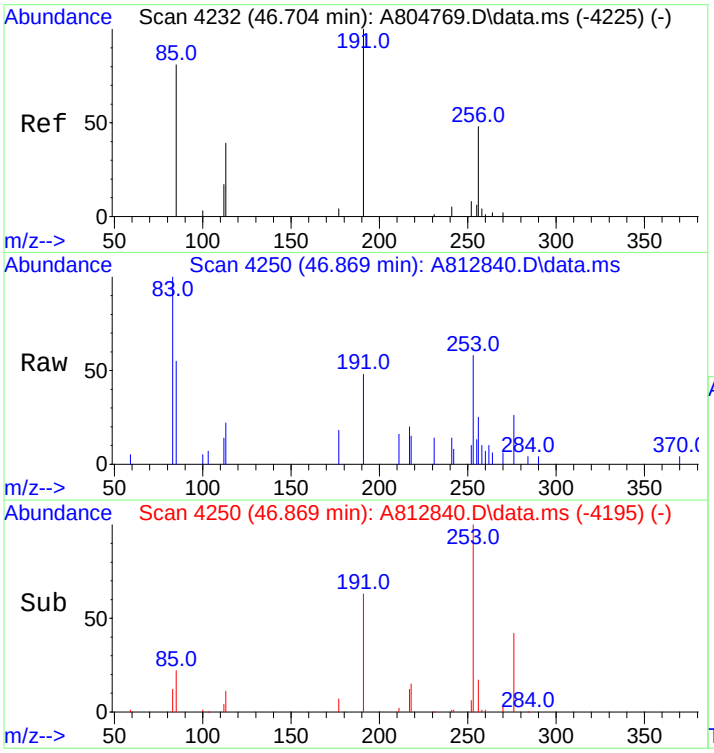




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 117.49 ng/ml
RT: 46.714 min Scan# 4233
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

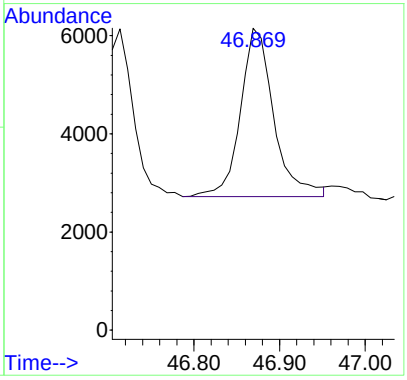
Tgt Ion:191 Resp: 8787

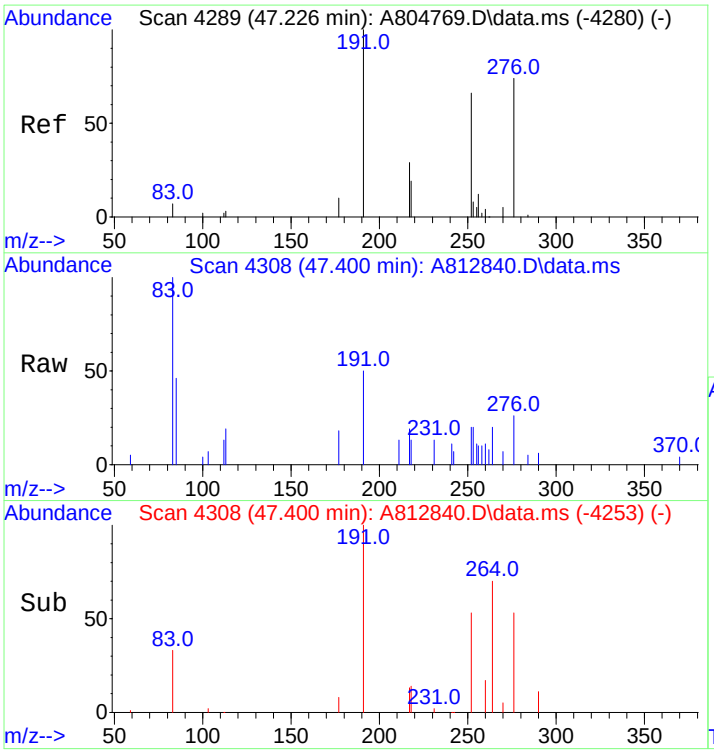




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 124.87 ng/ml
RT: 46.869 min Scan# 4250
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

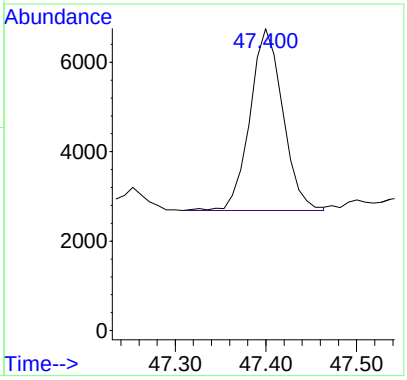
Tgt Ion:191 Resp: 9339

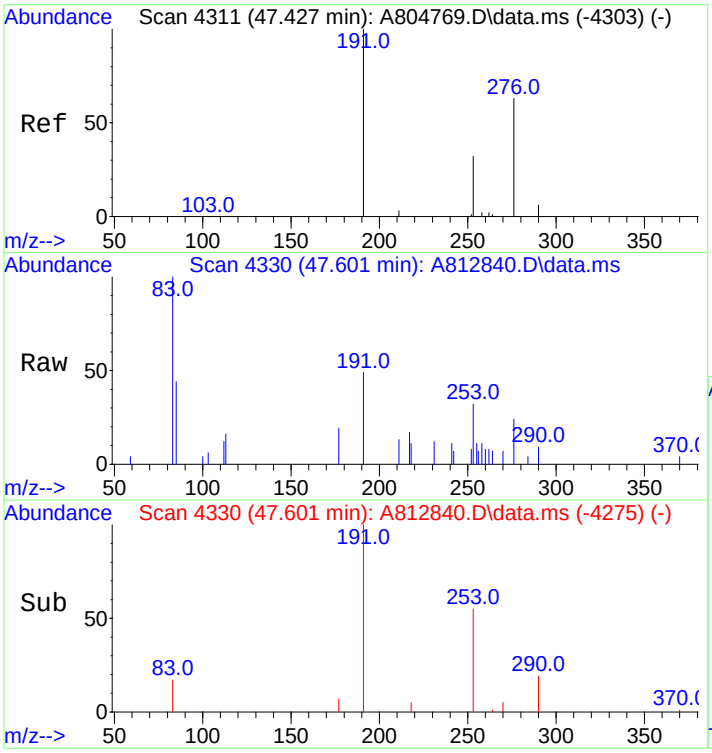




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 136.59 ng/ml
RT: 47.400 min Scan# 4308
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

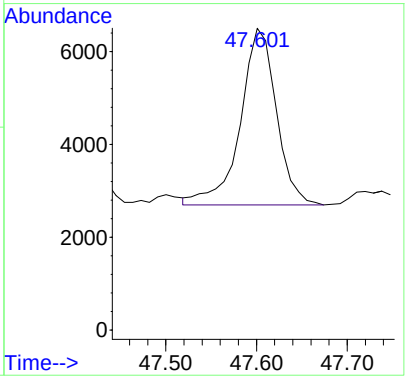
Tgt Ion:191 Resp: 10215

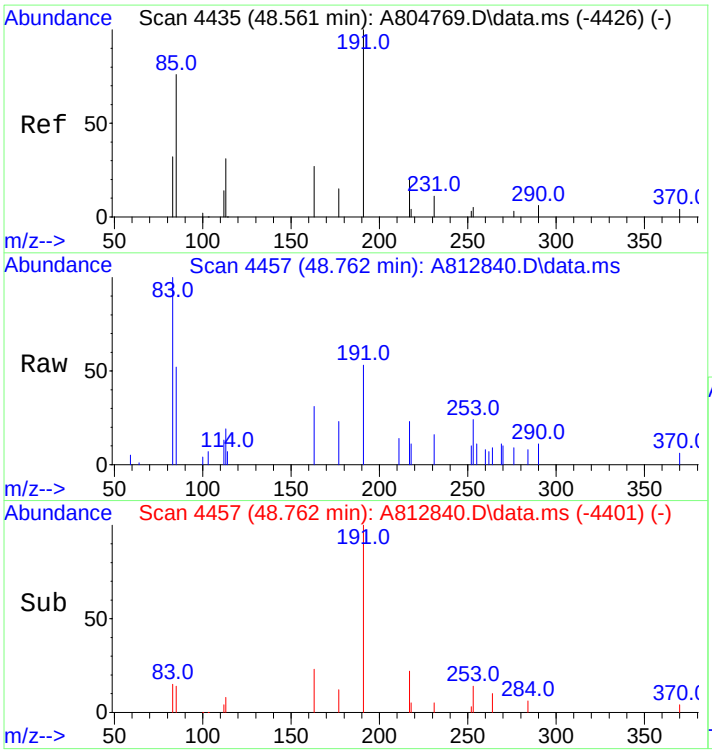




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 140.56 ng/ml
RT: 47.601 min Scan# 4330
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

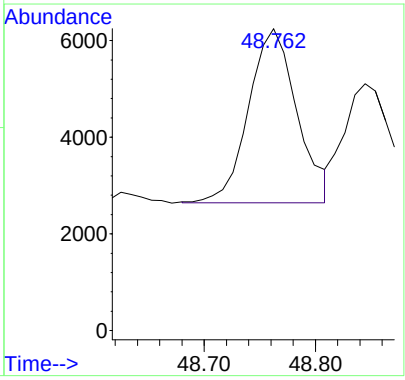
Tgt Ion:191 Resp: 10512

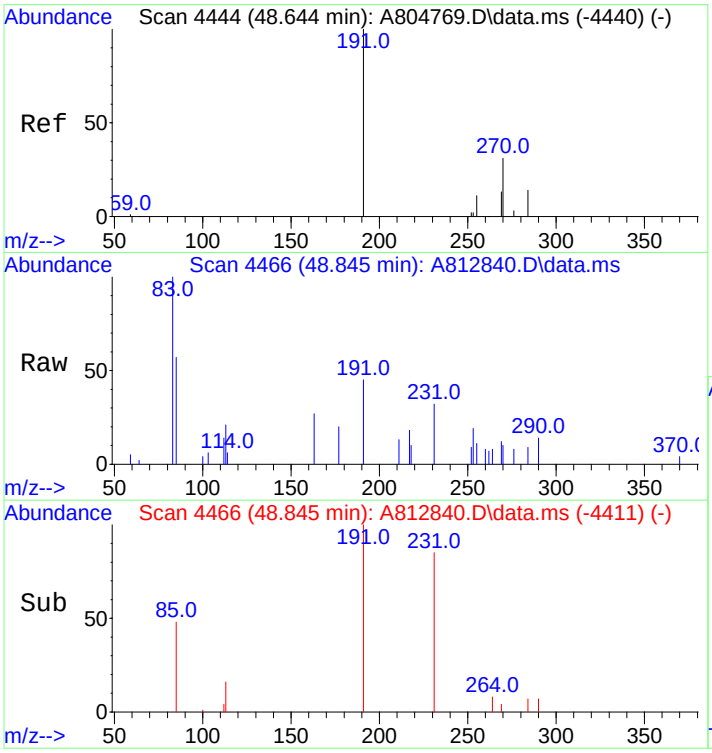




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 145.80 ng/ml m
RT: 48.762 min Scan# 4457
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

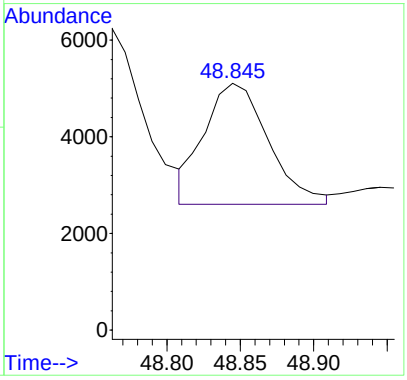
Tgt Ion:191 Resp: 10904

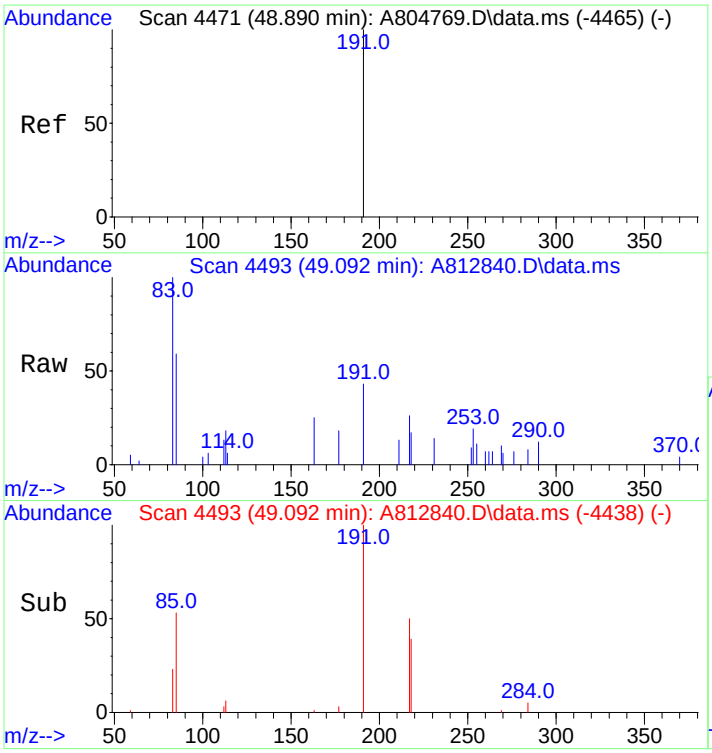




#107
C30 Tricyclic Terpane-22S
Concen: 101.82 ng/mL m
RT: 48.845 min Scan# 4466
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

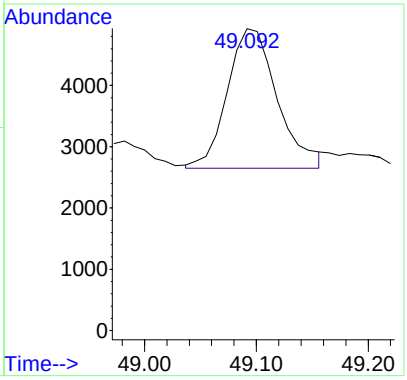
Tgt Ion:191 Resp: 7615

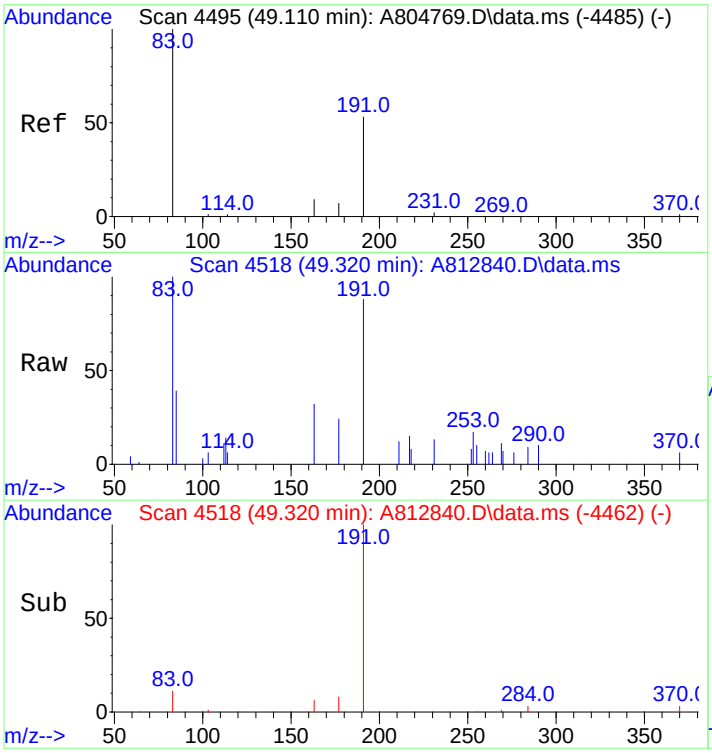




#108
C30 Tricyclic Terpane-22R
Concen: 94.81 ng/mL m
RT: 49.092 min Scan# 4493
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

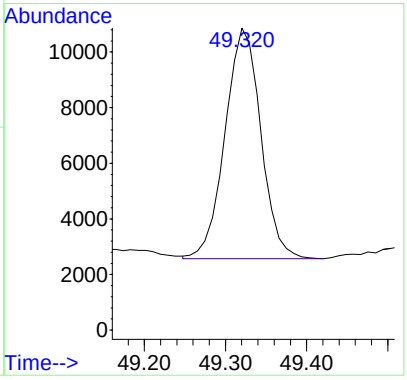
Tgt Ion:191 Resp: 7091

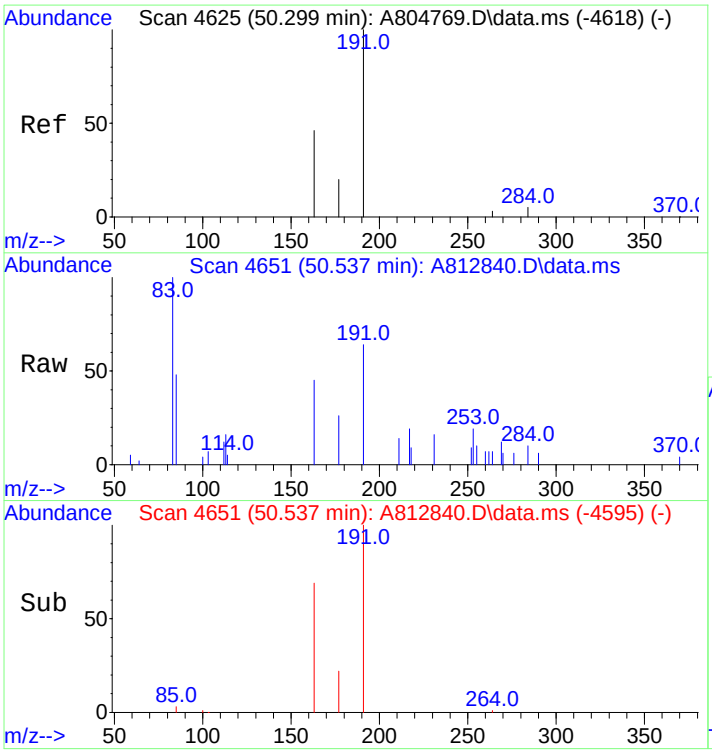




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 340.19 ng/ml
RT: 49.320 min Scan# 4518
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

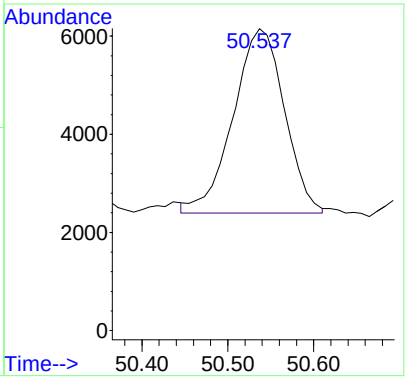
Tgt Ion:191 Resp: 25442

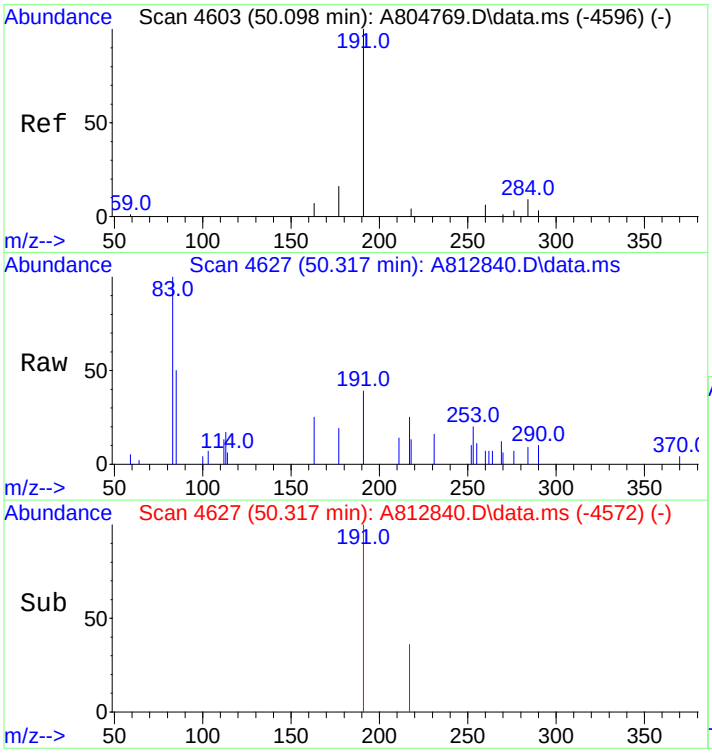




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 208.56 ng/ml m
RT: 50.537 min Scan# 4651
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

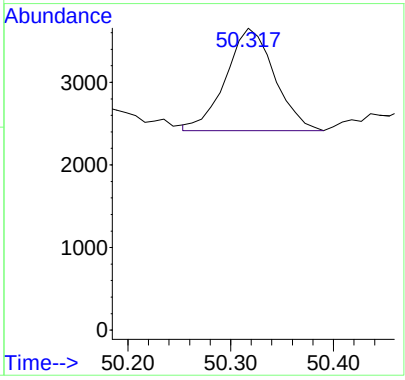
Tgt Ion:191 Resp: 15598

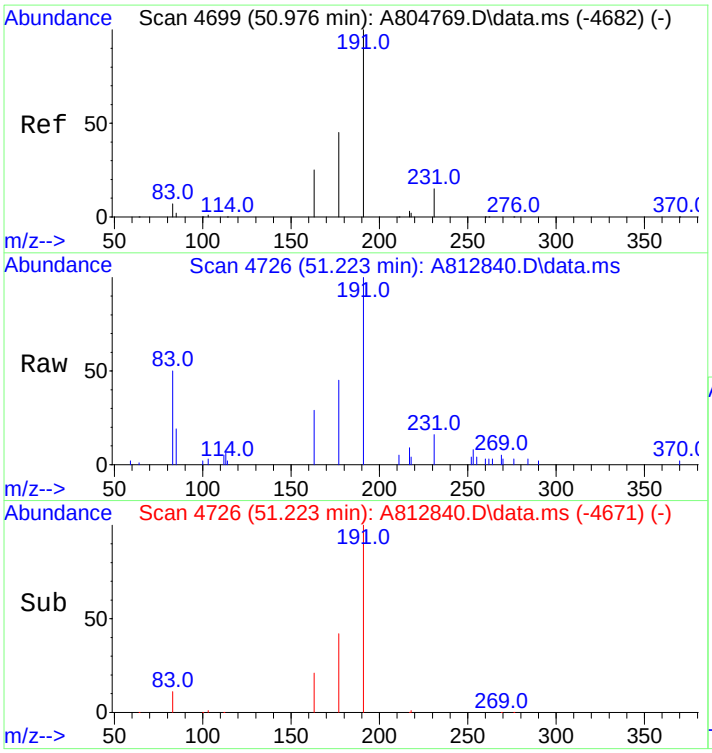




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 54.47 ng/ml
RT: 50.317 min Scan# 4627
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

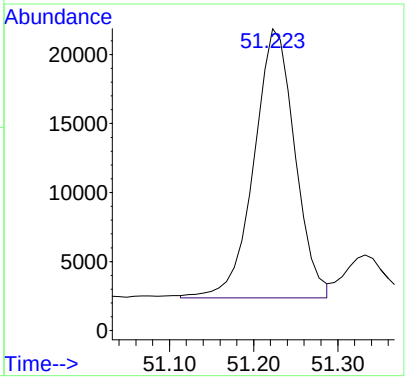
Tgt Ion:191 Resp: 4074

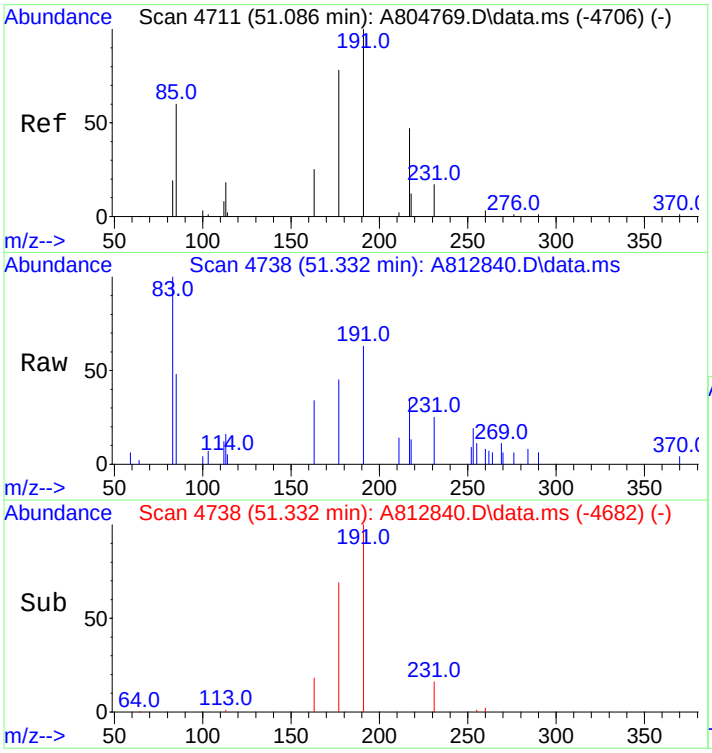




#112
30-Norhopane (T15)
Concen: 879.96 ng/ml m
RT: 51.223 min Scan# 4726
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

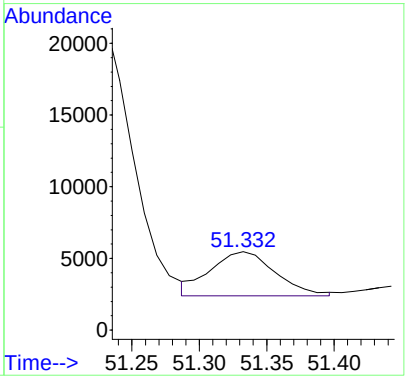
Tgt Ion:191 Resp: 65811

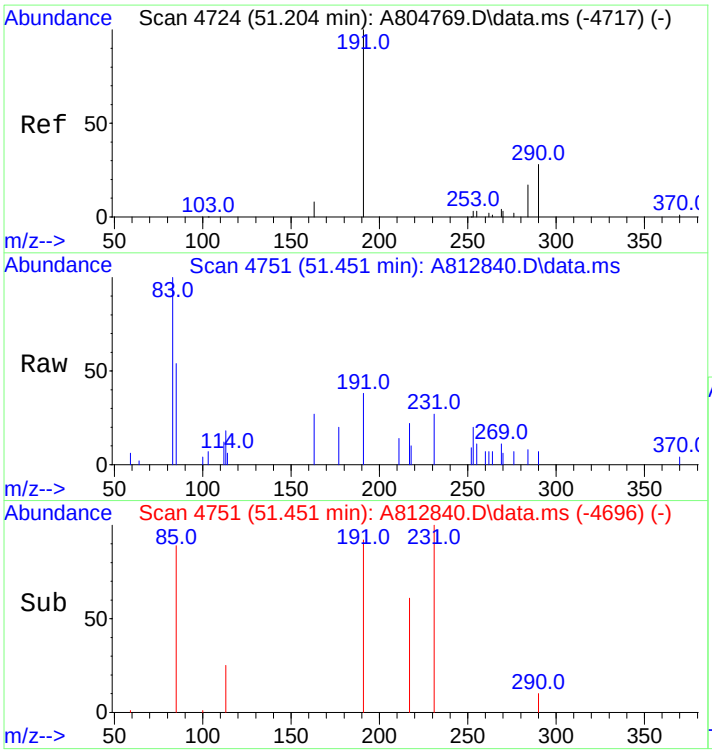




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 138.20 ng/ml m
RT: 51.332 min Scan# 4738
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

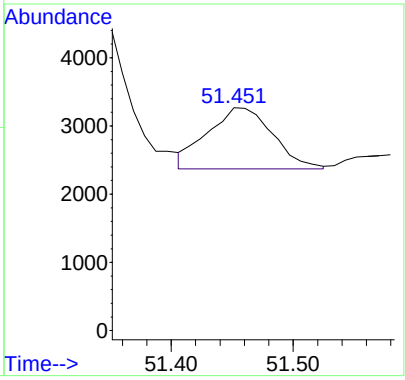
Tgt Ion:191 Resp: 10336

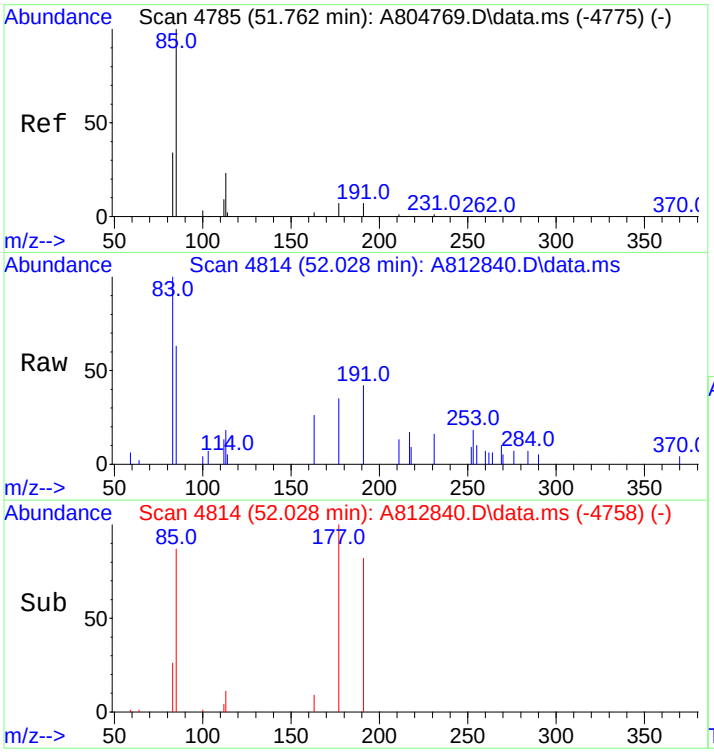




#114
17a(H)-Diahopane (X)
Concen: 44.50 ng/ml m
RT: 51.451 min Scan# 4751
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

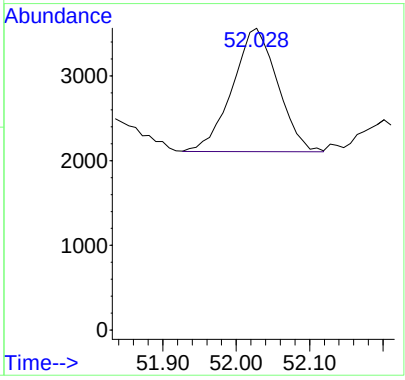
Tgt Ion:191 Resp: 3328

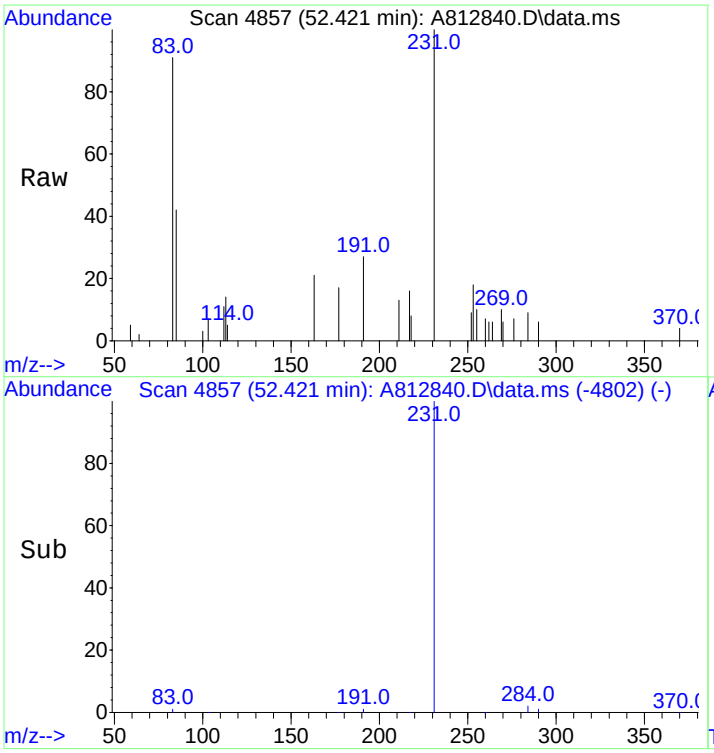




#115
30-Normoretane (T17)
Concen: 83.82 ng/ml
RT: 52.028 min Scan# 4814
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

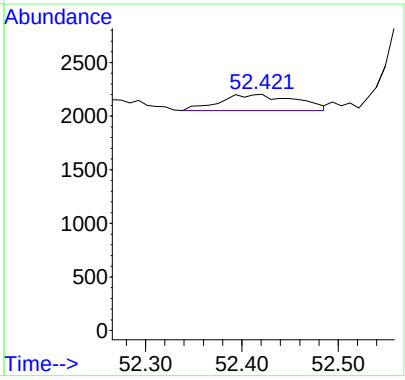
Tgt Ion:191 Resp: 6269

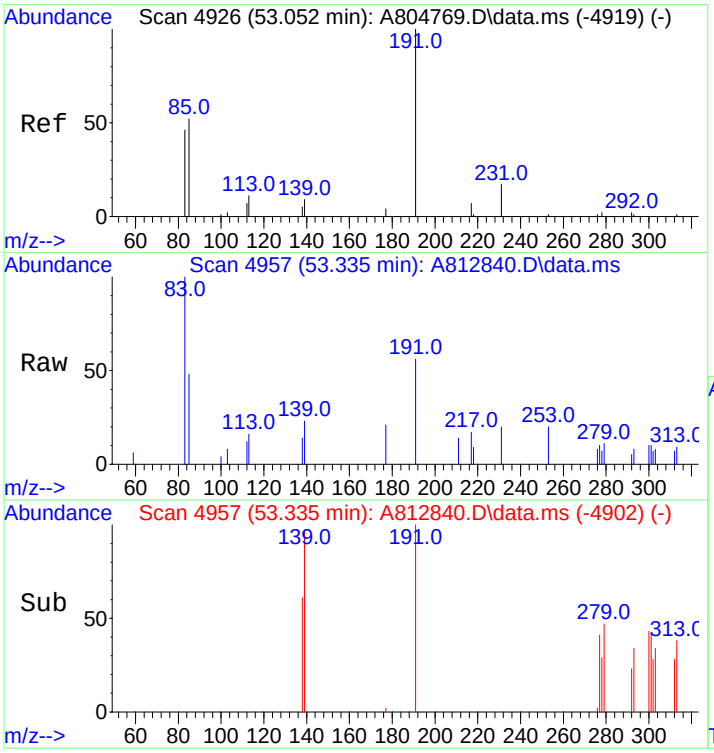




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 11.25 ng/ml
RT: 52.421 min Scan# 4857
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

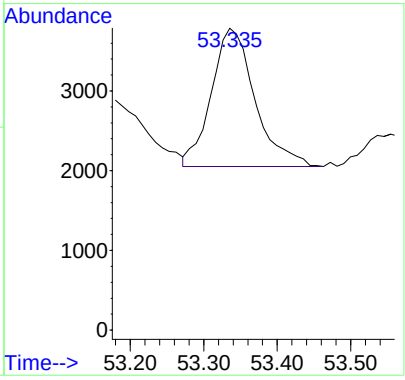
Tgt Ion:191 Resp: 841

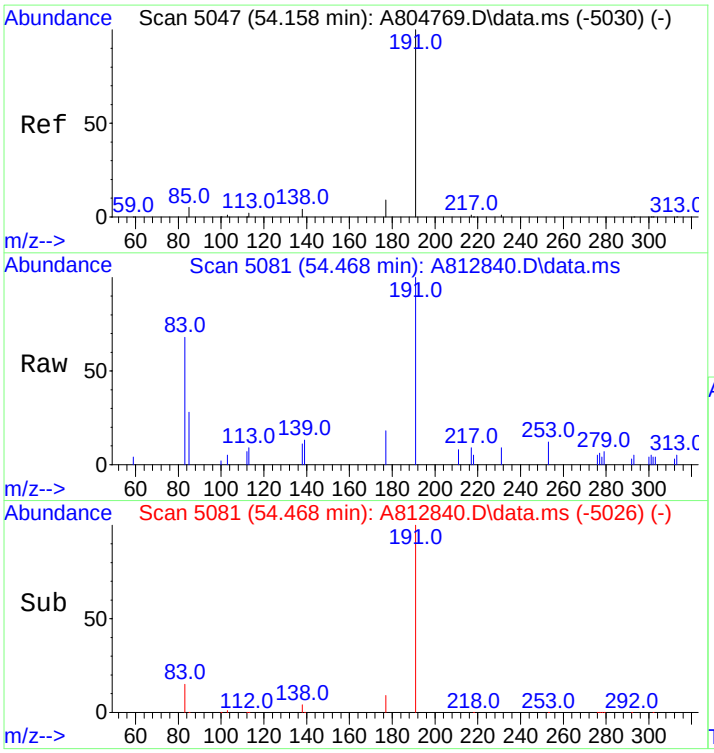




#117
Moretane (T20)
Concen: 95.22 ng/ml
RT: 53.335 min Scan# 4957
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

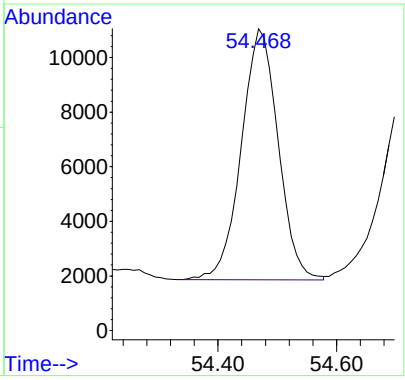
Tgt Ion:191 Resp: 7121

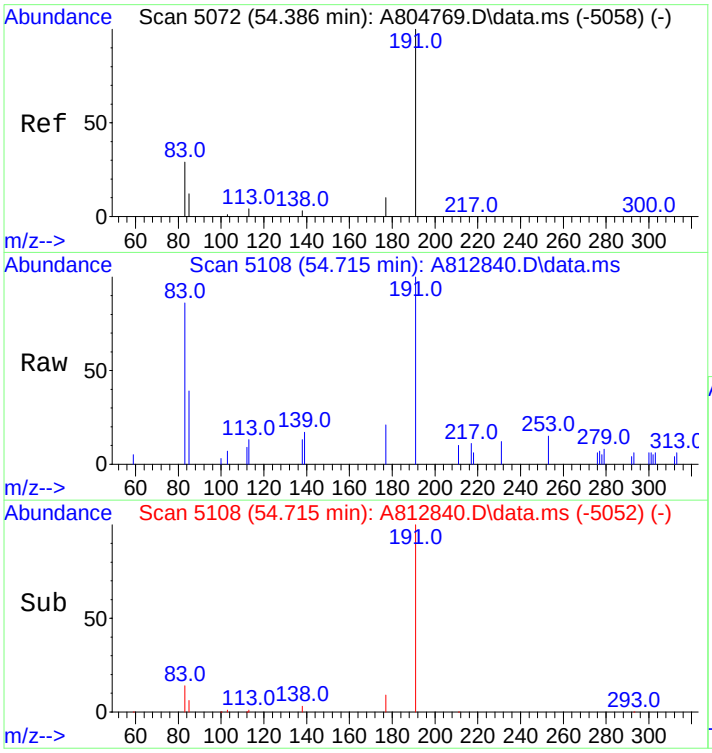




#118
30-Homohopane-22S (T21)
Concen: 528.63 ng/ml
RT: 54.468 min Scan# 5081
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

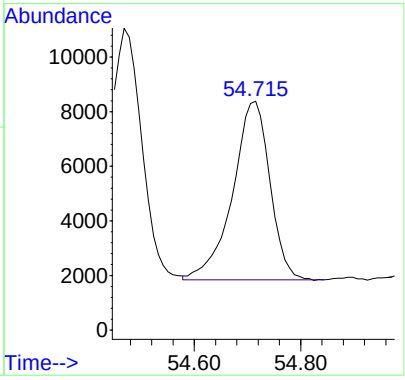
Tgt Ion:191 Resp: 39535

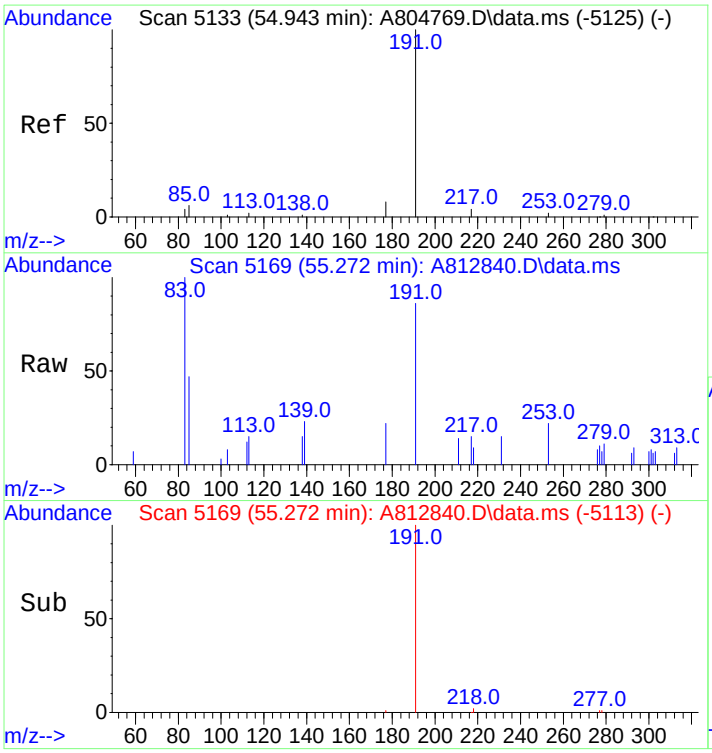




#119
30-Homohopane-22R (T22)
Concen: 425.90 ng/ml
RT: 54.715 min Scan# 5108
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

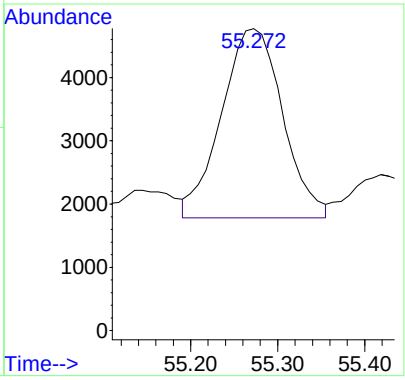
Tgt Ion:191 Resp: 31852

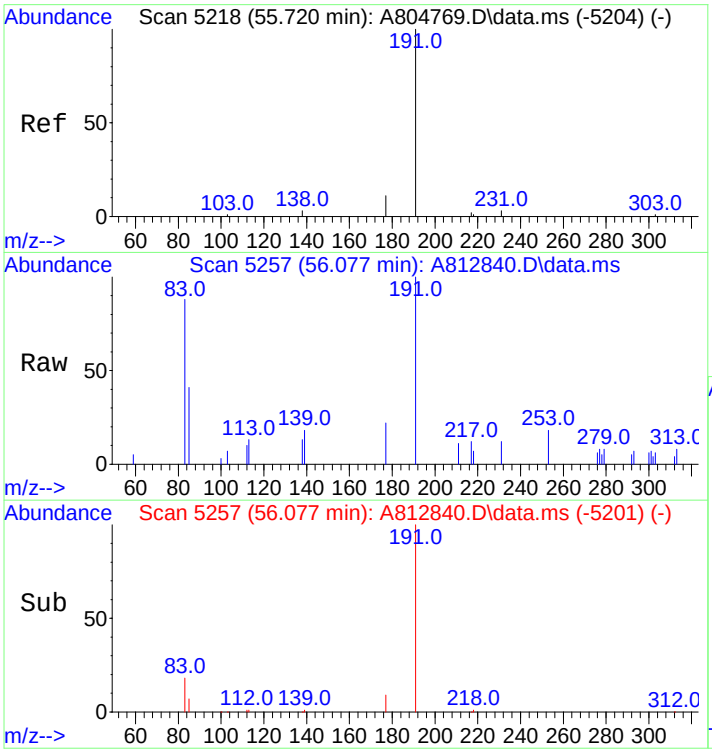




#120
Gammacerane/C32-diahopane
Concen: 195.62 ng/mL m
RT: 55.272 min Scan# 5169
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

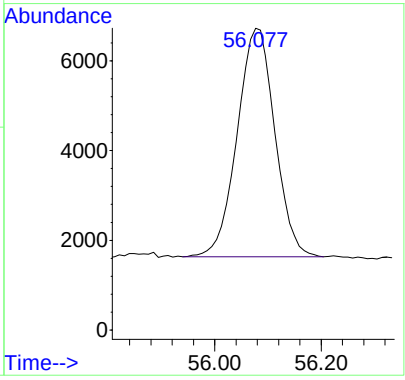
Tgt Ion:191 Resp: 14630

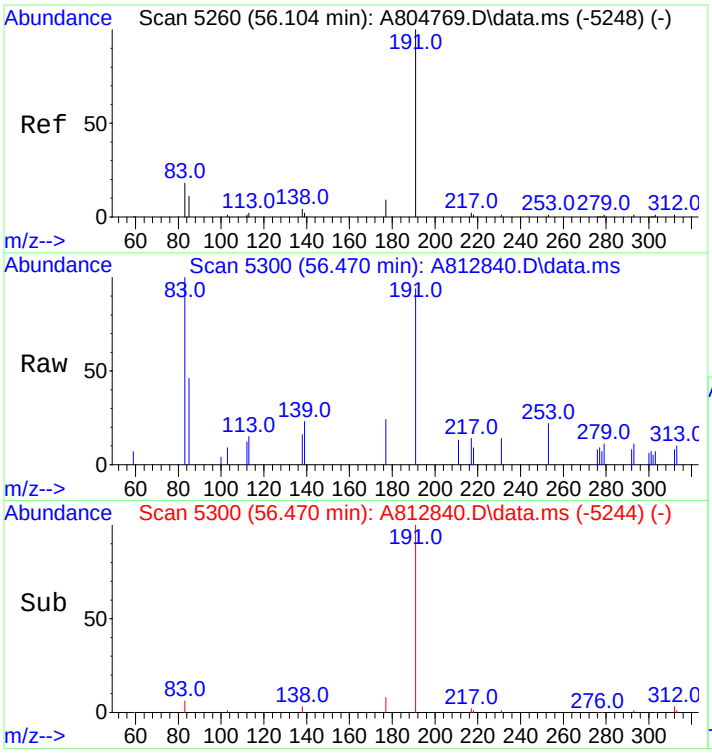




#121
30,31-Bishomohopane-22S (T26)
Concen: 334.42 ng/ml
RT: 56.077 min Scan# 5257
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

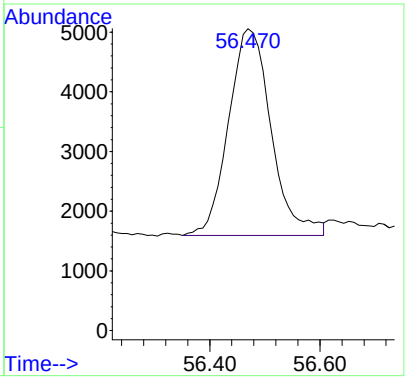
Tgt Ion:191 Resp: 25011

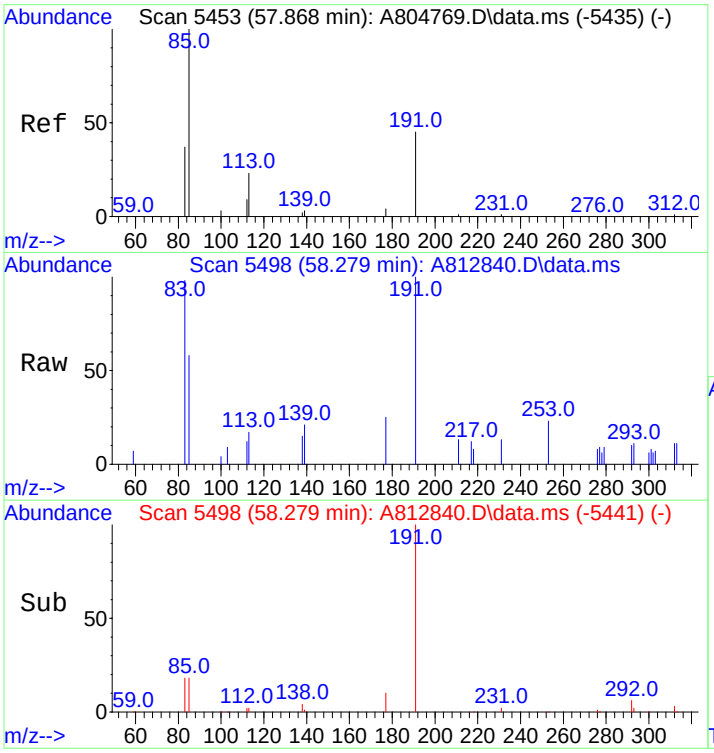




#122
30,31-Bishomohopane-22R (T27)
Concen: 248.90 ng/ml
RT: 56.470 min Scan# 5300
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

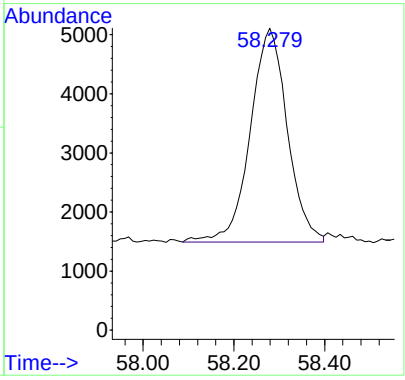
Tgt Ion:191 Resp: 18615

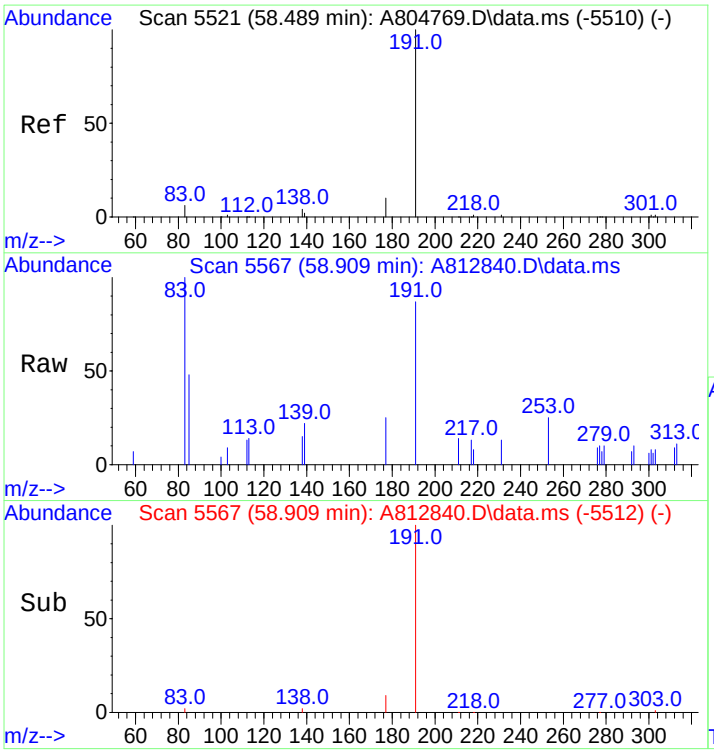




#123
30,31-Trishomohopane-22S (T30)
Concen: 273.76 ng/ml
RT: 58.279 min Scan# 5498
Delta R.T. 0.018 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

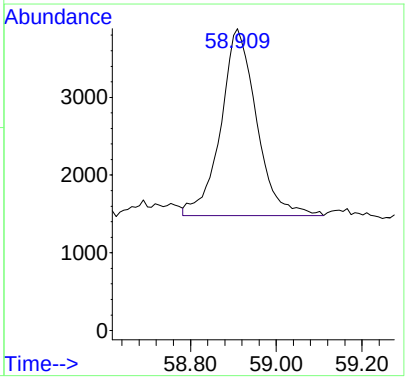
Tgt Ion:191 Resp: 20474

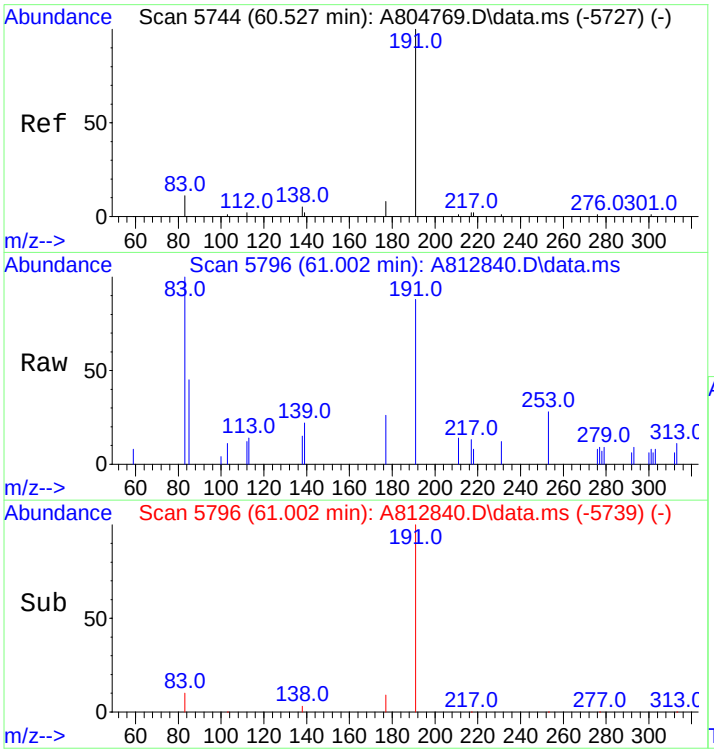




#124
30,31-Trishomohopane-22R (T31)
Concen: 186.34 ng/ml
RT: 58.909 min Scan# 5567
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

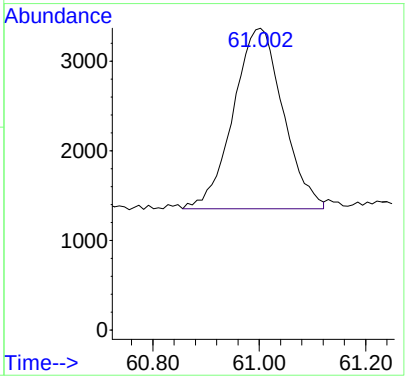
Tgt Ion:191 Resp: 13936

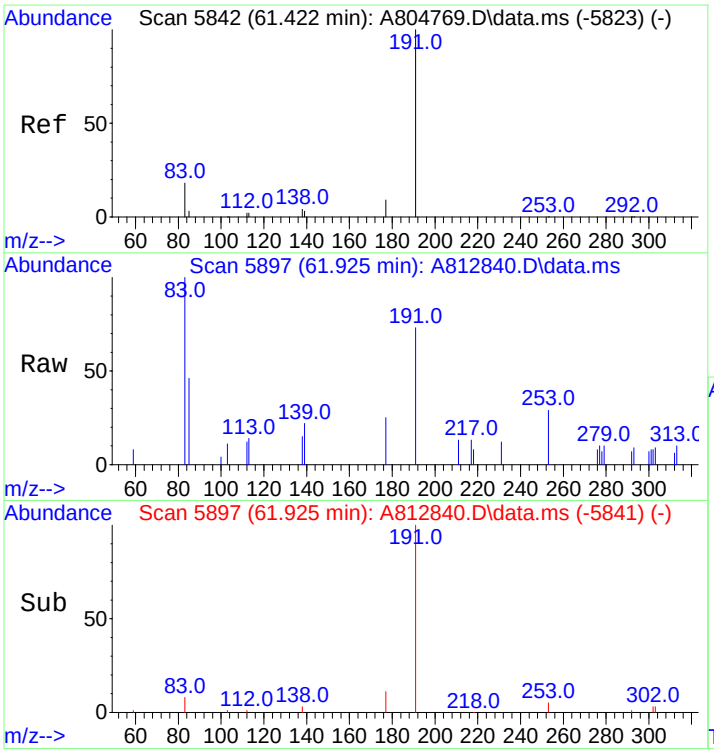




#125
Tetrakishomohopane-22S (T32)
Concen: 175.34 ng/ml
RT: 61.002 min Scan# 5796
Delta R.T. 0.018 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

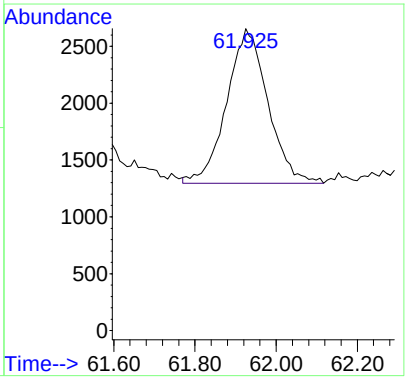
Tgt Ion:191 Resp: 13113

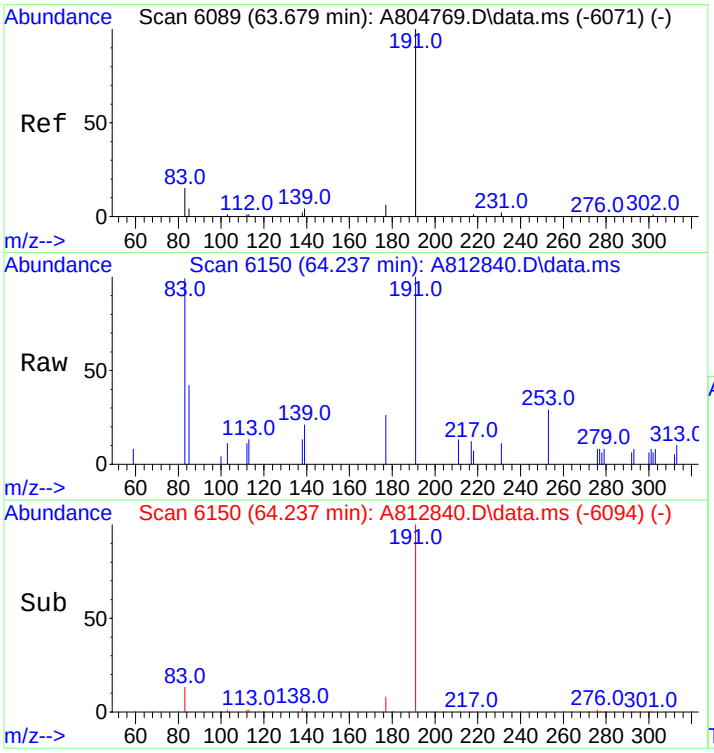




#126
Tetrakishomohopane-22R (T33)
Concen: 127.88 ng/ml
RT: 61.925 min Scan# 5897
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

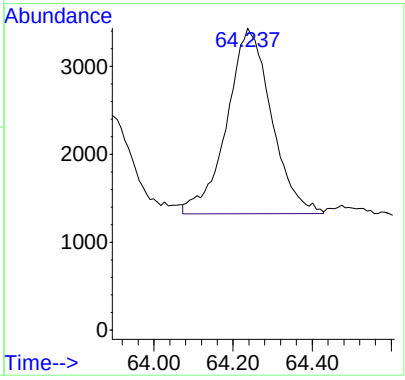
Tgt Ion:191 Resp: 9564

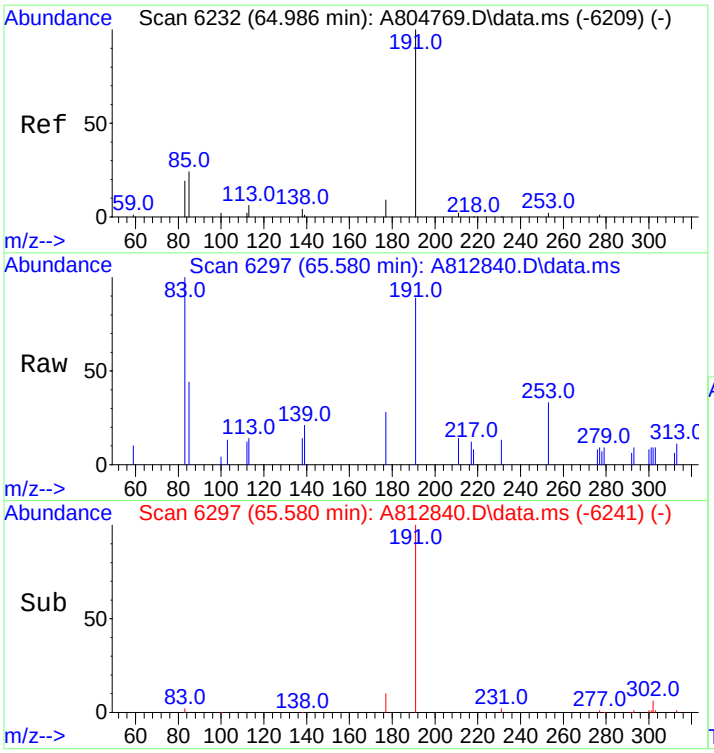




#127
Pentakishomohopane-22S (T34)
Concen: 220.32 ng/ml
RT: 64.237 min Scan# 6150
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

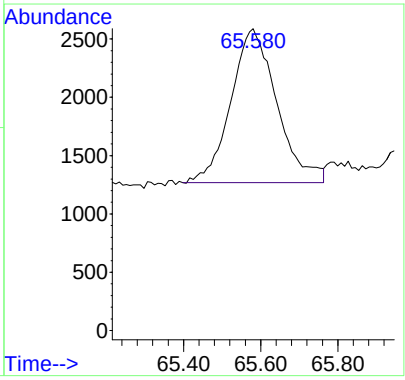
Tgt Ion:191 Resp: 16477

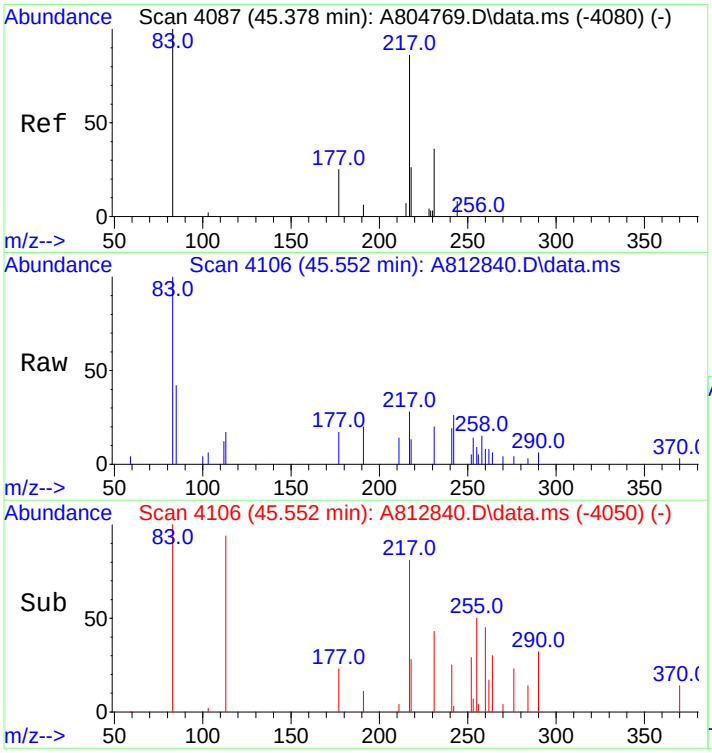




#128
Pentakishomohopane-22R (T35)
Concen: 146.52 ng/ml
RT: 65.580 min Scan# 6297
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

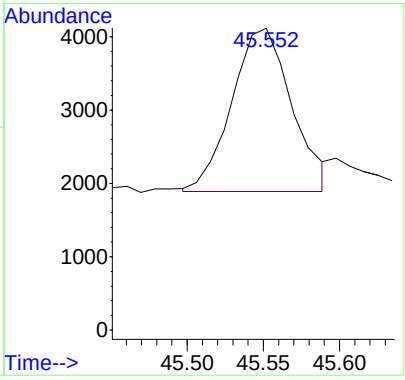
Tgt Ion:191 Resp: 10958

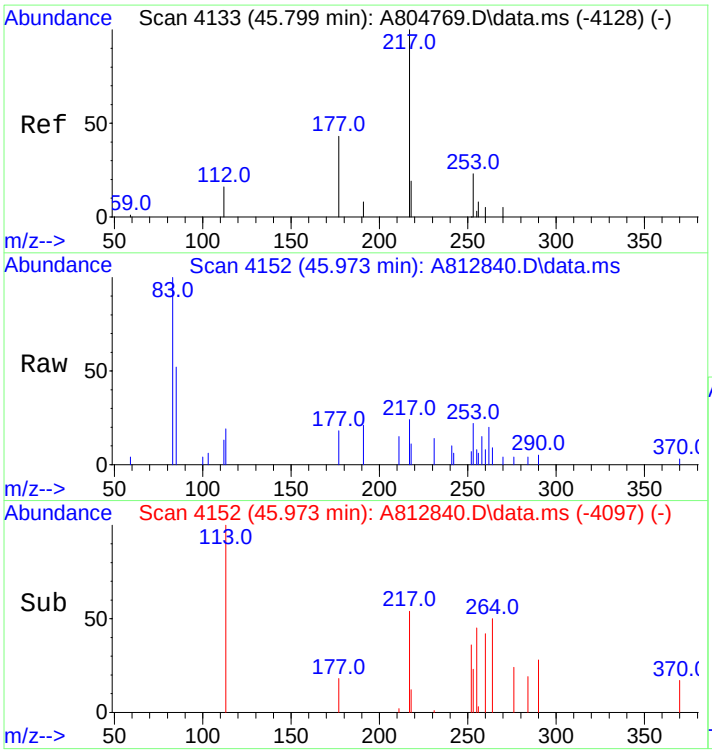




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 167.08 ng/ml m
RT: 45.552 min Scan# 4106
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

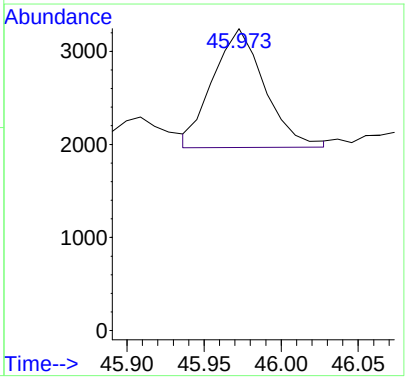
Tgt Ion:217 Resp: 6084

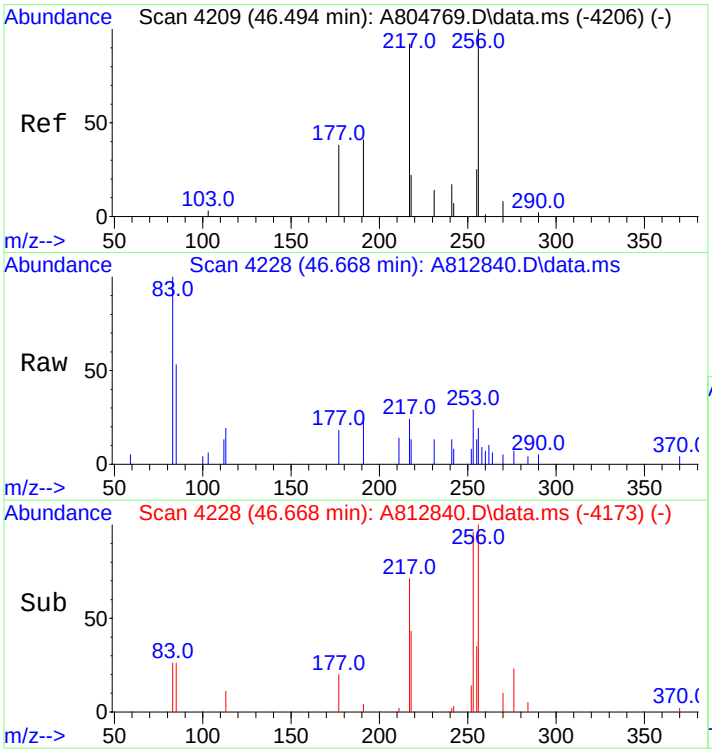




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 82.08 ng/ml
RT: 45.973 min Scan# 4152
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

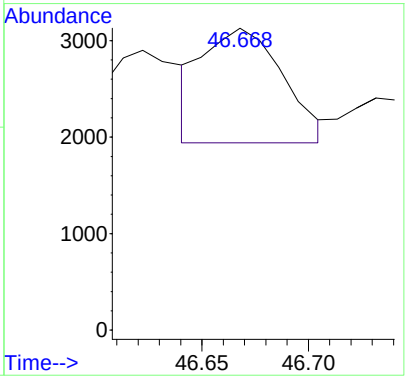
Tgt Ion:217 Resp: 2989

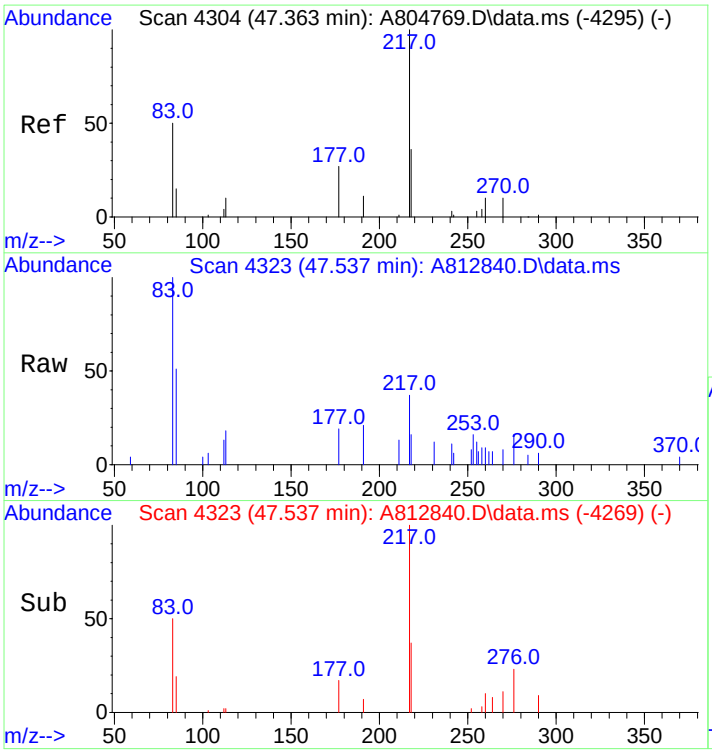




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 84.86 ng/ml m
RT: 46.668 min Scan# 4228
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

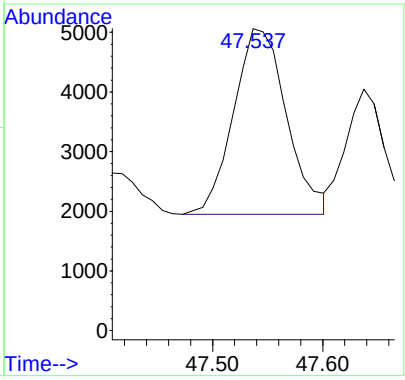
Tgt Ion:217 Resp: 3090

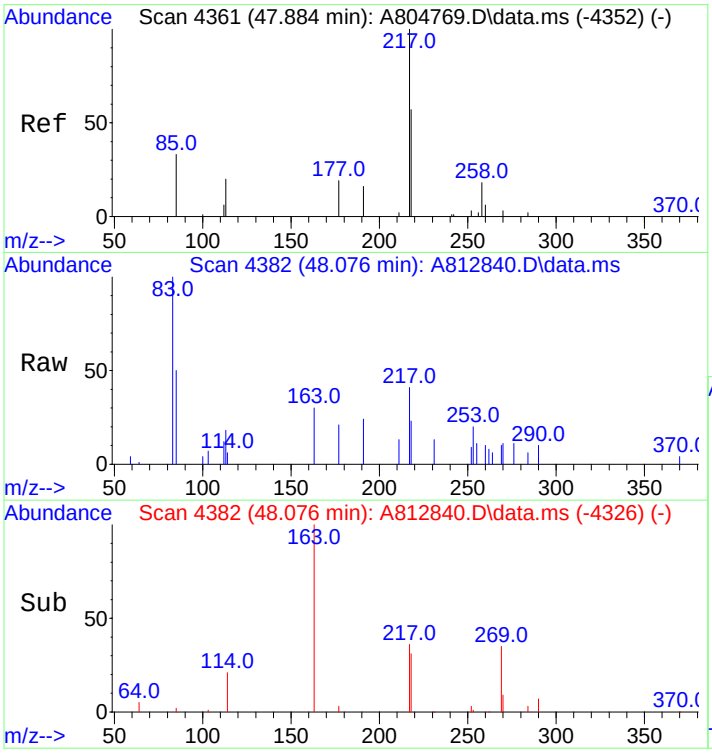




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 285.99 ng/ml
RT: 47.537 min Scan# 4323
Delta R.T. -0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

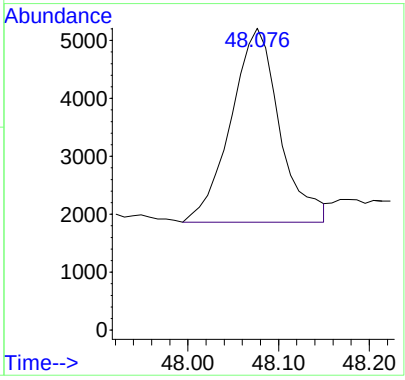
Tgt Ion:217 Resp: 10414

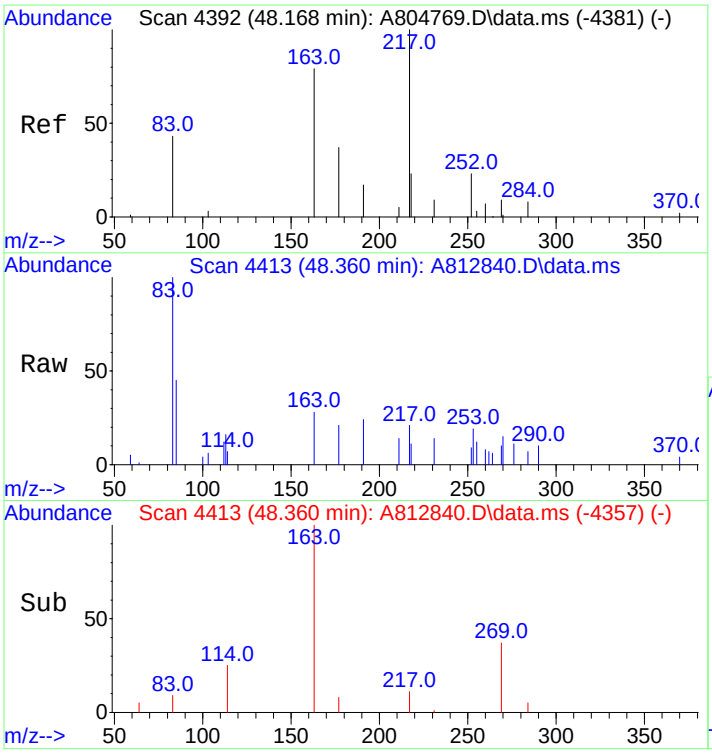




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 343.83 ng/ml
RT: 48.076 min Scan# 4382
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

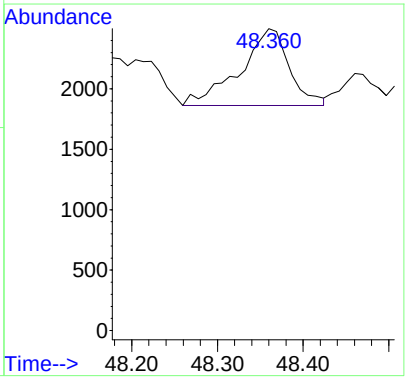
Tgt Ion:217 Resp: 12520

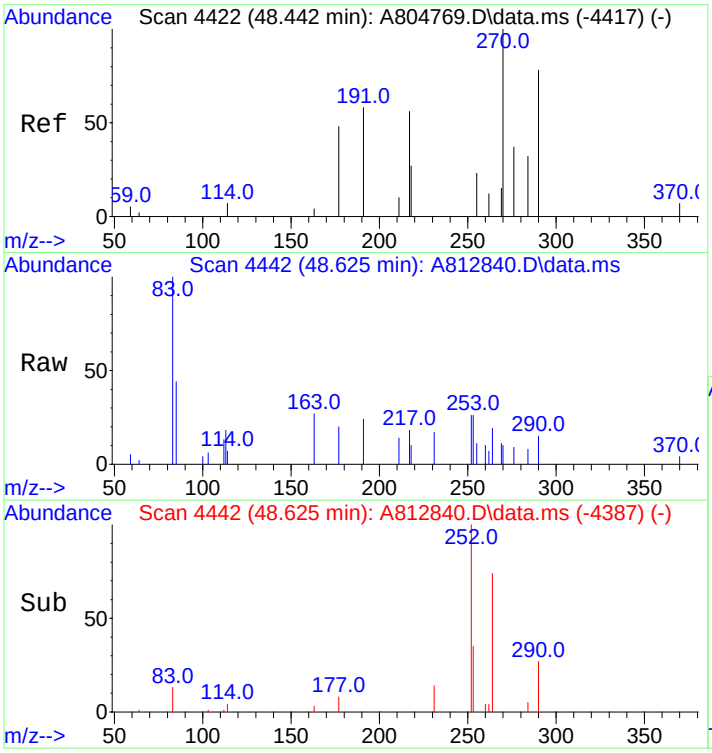




#135
Unknown Sterane (S18)
Concen: 70.39 ng/ml
RT: 48.360 min Scan# 4413
Delta R.T. 0.009 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

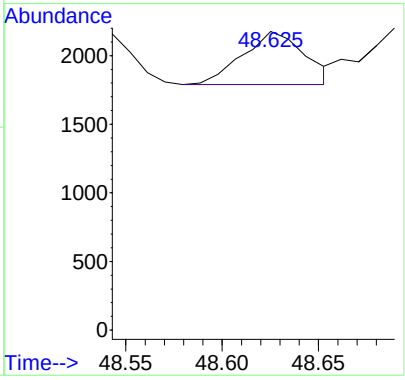
Tgt Ion:217 Resp: 2563

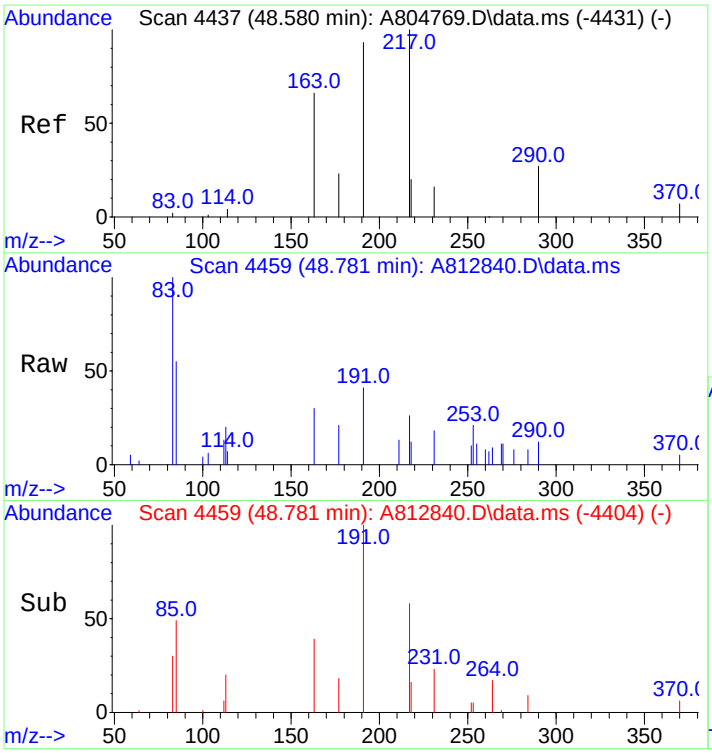




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 23.97 ng/ml
RT: 48.625 min Scan# 4442
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

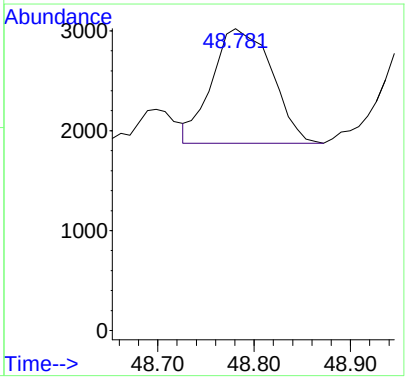
Tgt Ion:217 Resp: 873

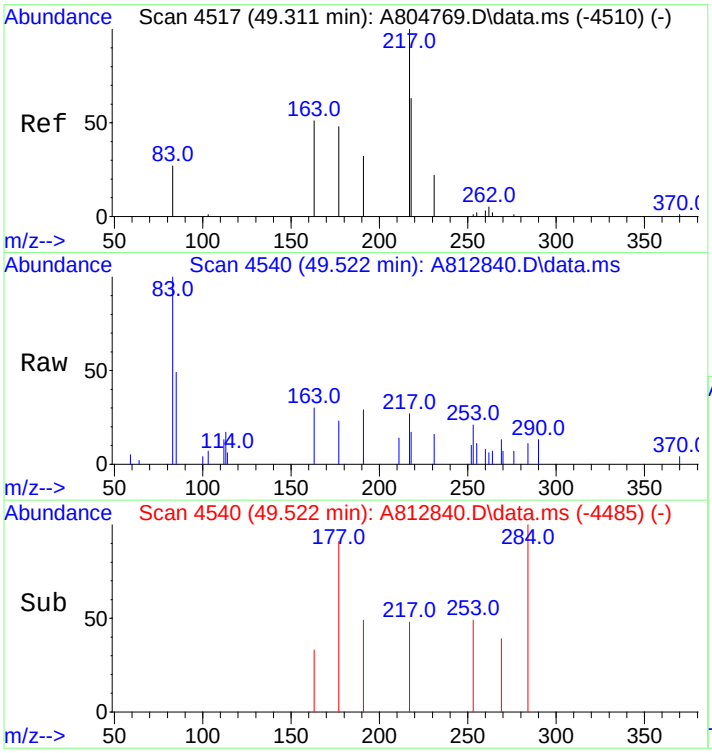




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 135.42 ng/ml
RT: 48.781 min Scan# 4459
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

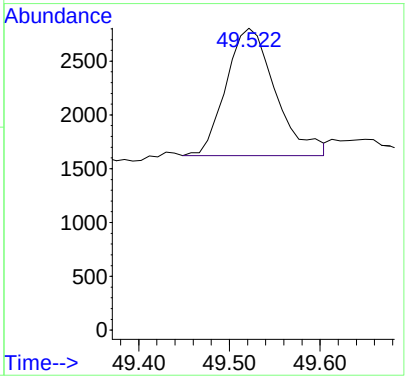
Tgt Ion:217 Resp: 4931

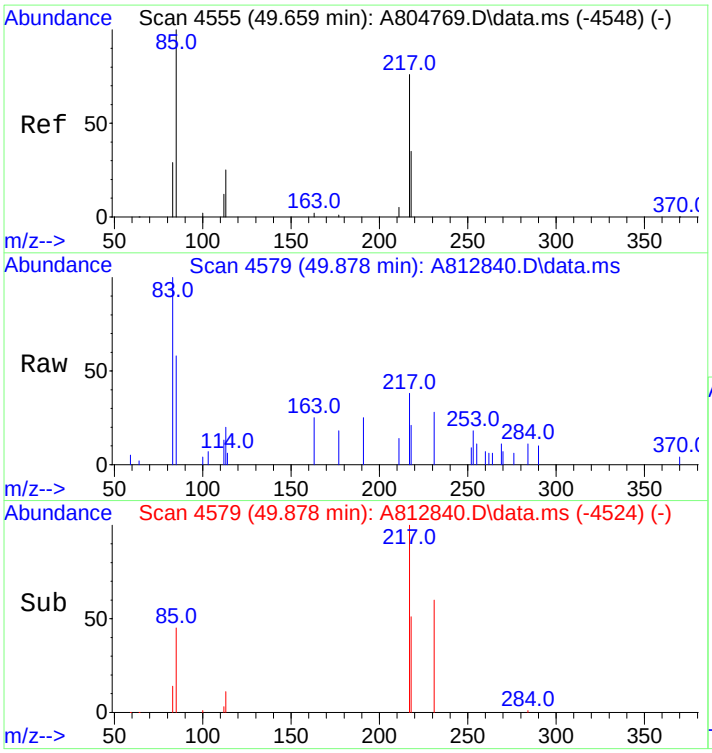




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 123.22 ng/ml
RT: 49.522 min Scan# 4540
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

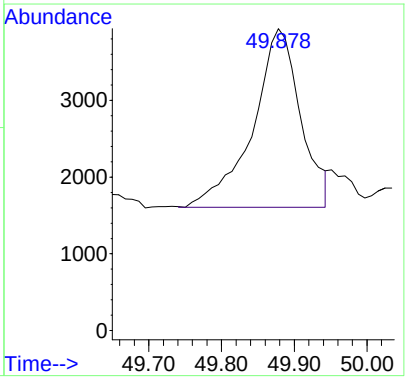
Tgt Ion:217 Resp: 4487

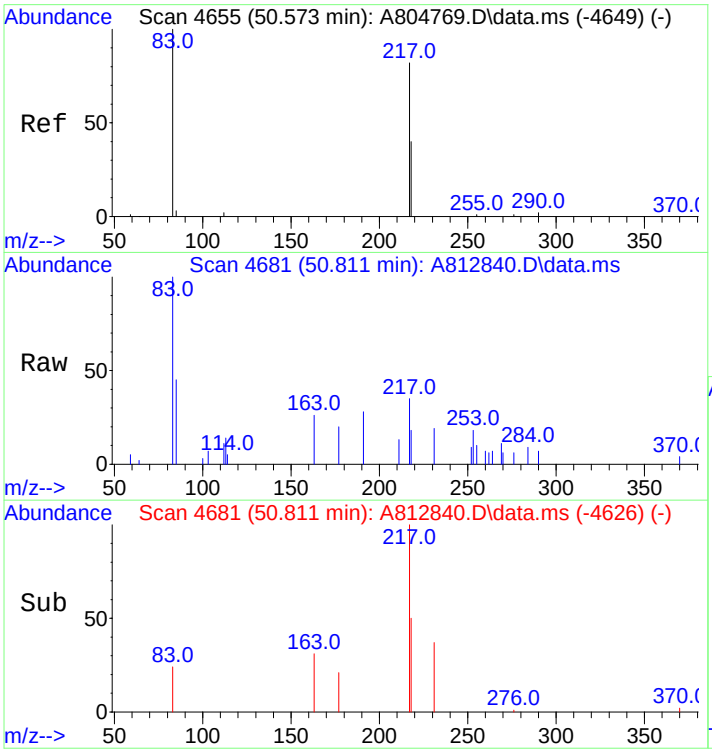




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 292.17 ng/ml m
RT: 49.878 min Scan# 4579
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

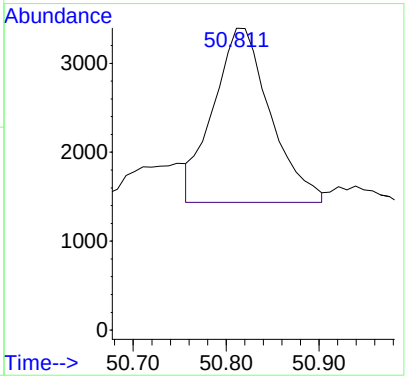
Tgt Ion:217 Resp: 10639

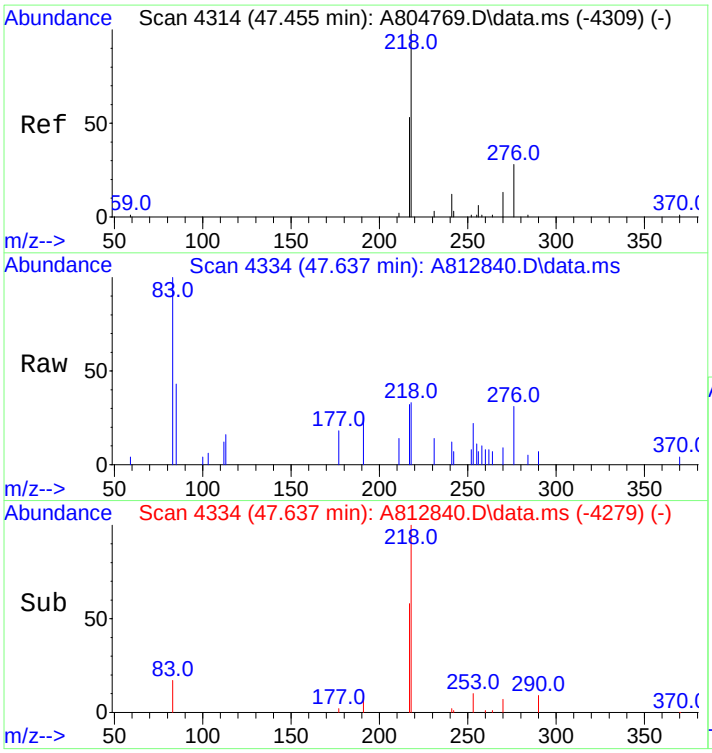




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 228.46 ng/ml m
RT: 50.811 min Scan# 4681
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

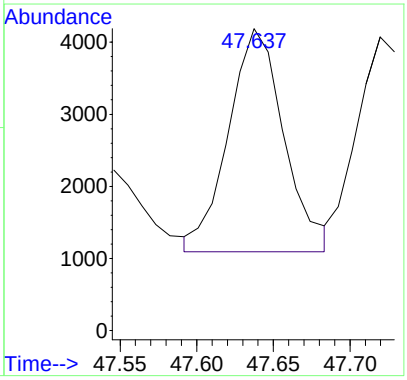
Tgt Ion:217 Resp: 8319

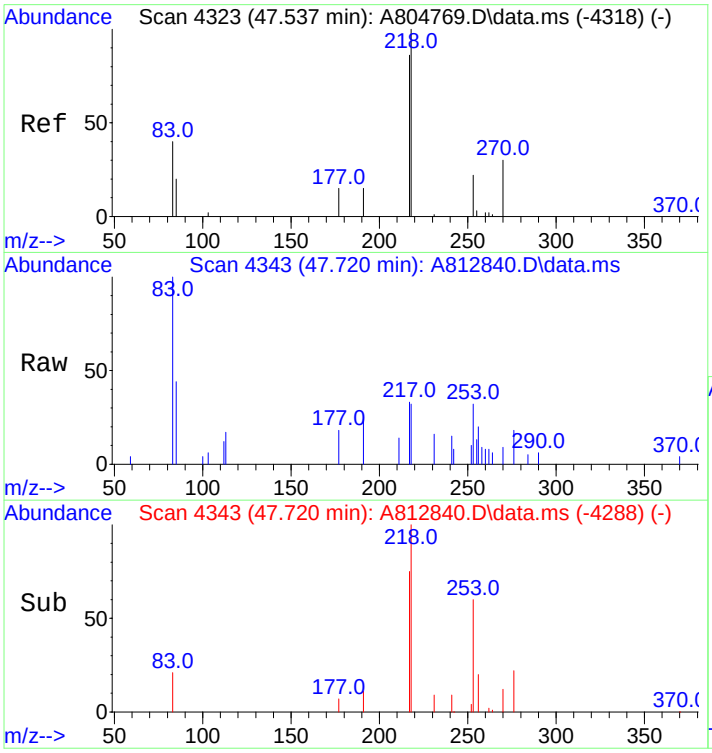




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 213.93 ng/ml m
RT: 47.637 min Scan# 4334
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

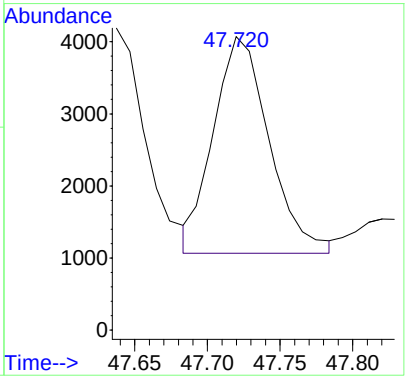
Tgt Ion:218 Resp: 7790

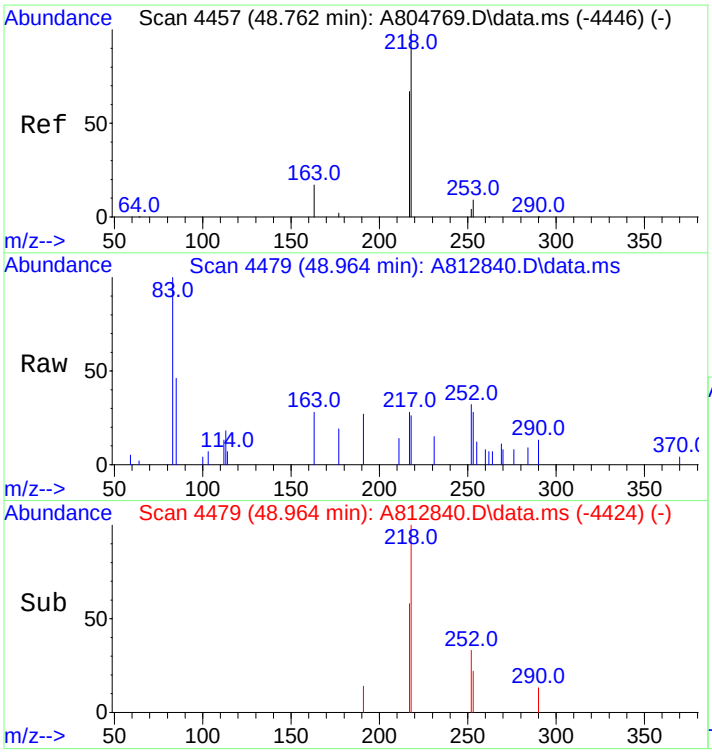




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 220.05 ng/ml m
RT: 47.720 min Scan# 4343
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

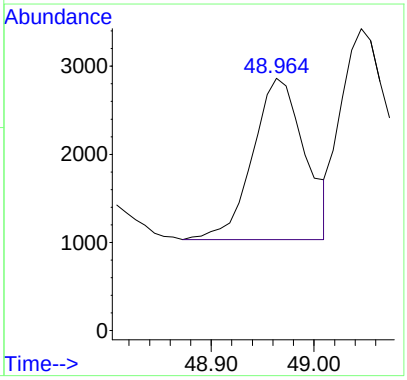
Tgt Ion:218 Resp: 8013

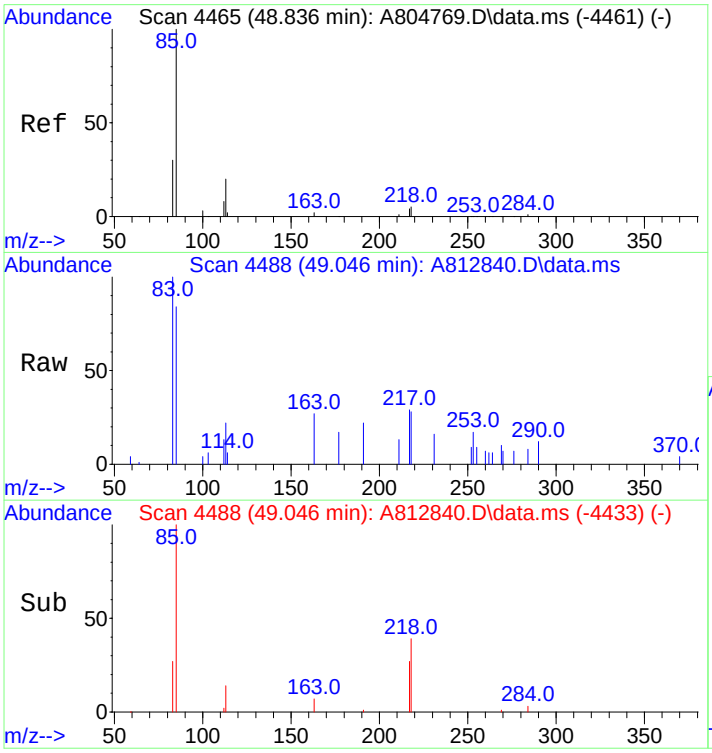




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 177.63 ng/ml
RT: 48.964 min Scan# 4479
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

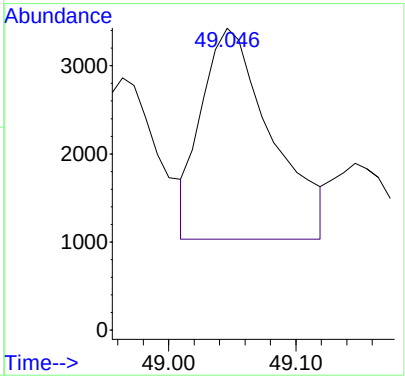
Tgt Ion:218 Resp: 6468

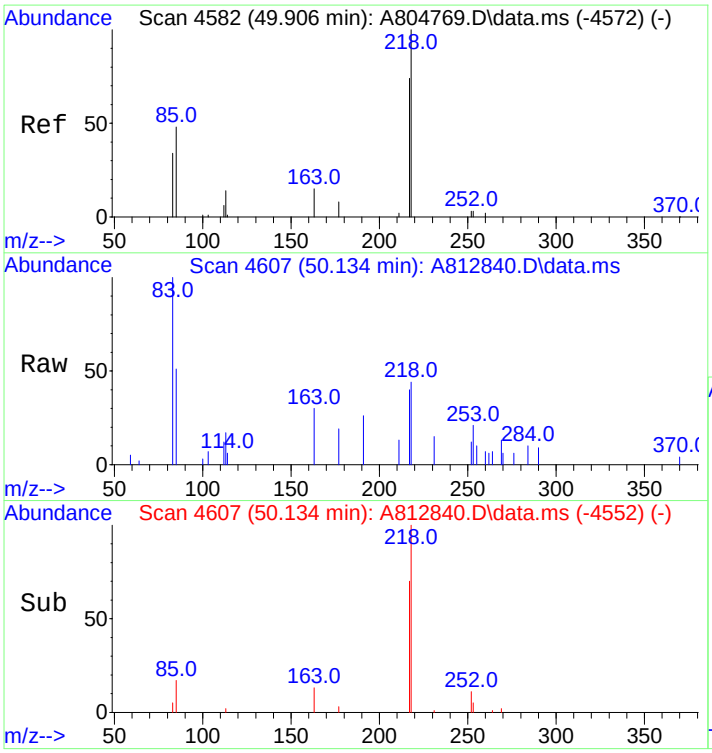




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 250.81 ng/ml m
RT: 49.046 min Scan# 4488
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

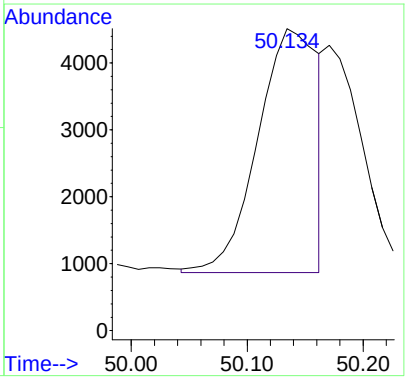
Tgt Ion:218 Resp: 9133

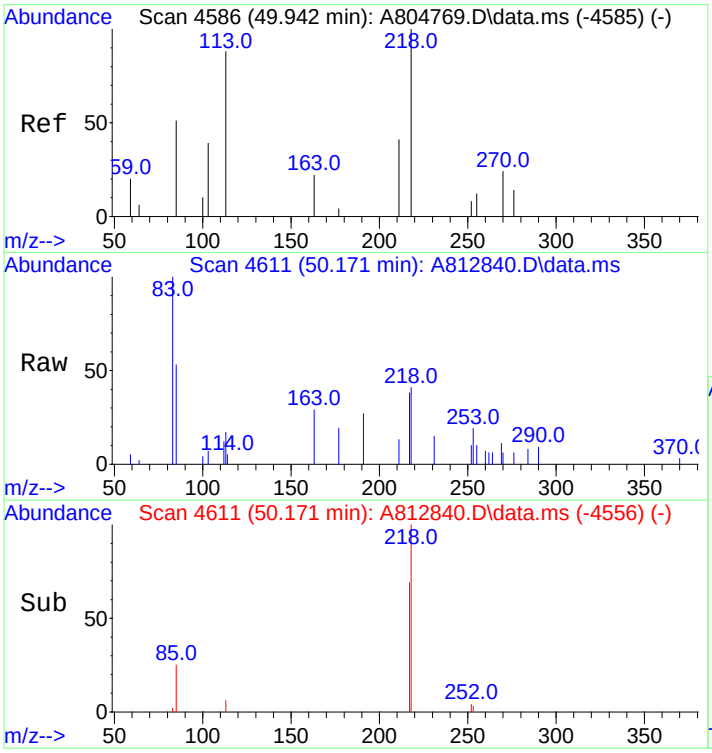




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 358.82 ng/ml m
RT: 50.134 min Scan# 4607
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

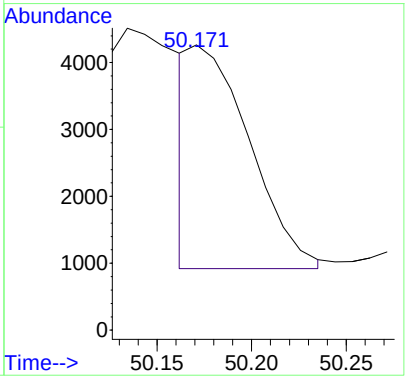
Tgt Ion:218 Resp: 13066

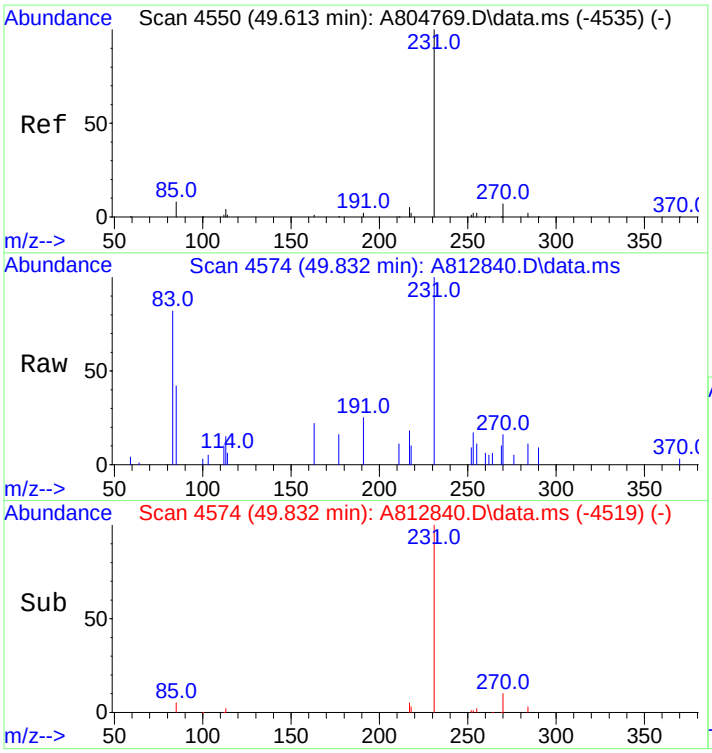




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 202.01 ng/ml m
RT: 50.171 min Scan# 4611
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

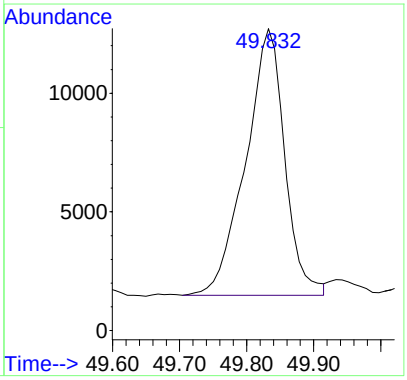
Tgt Ion:218 Resp: 7356

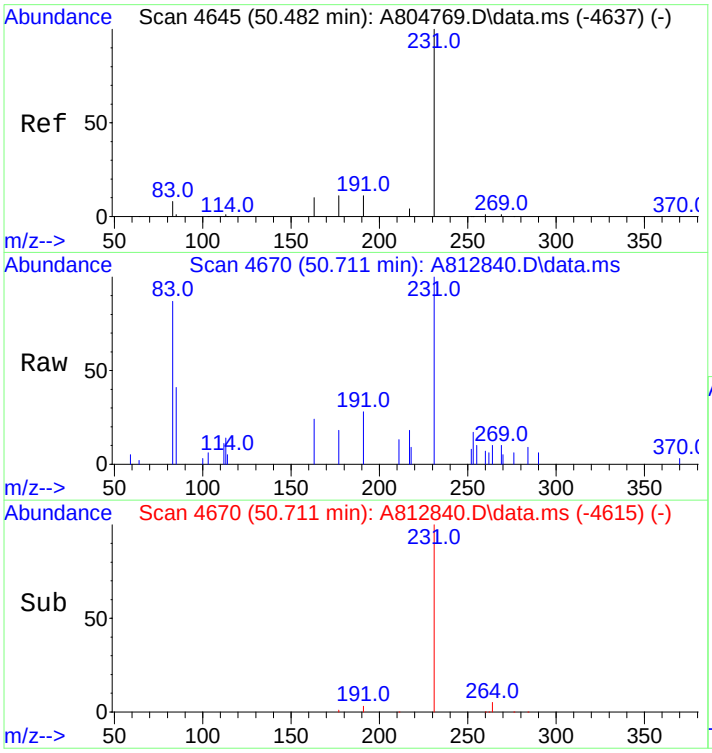




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1250.68 ng/mL
RT: 49.832 min Scan# 4574
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

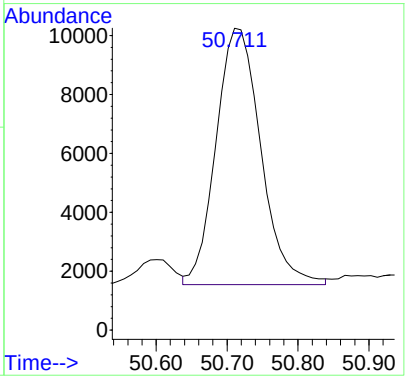
Tgt Ion:231 Resp: 45542

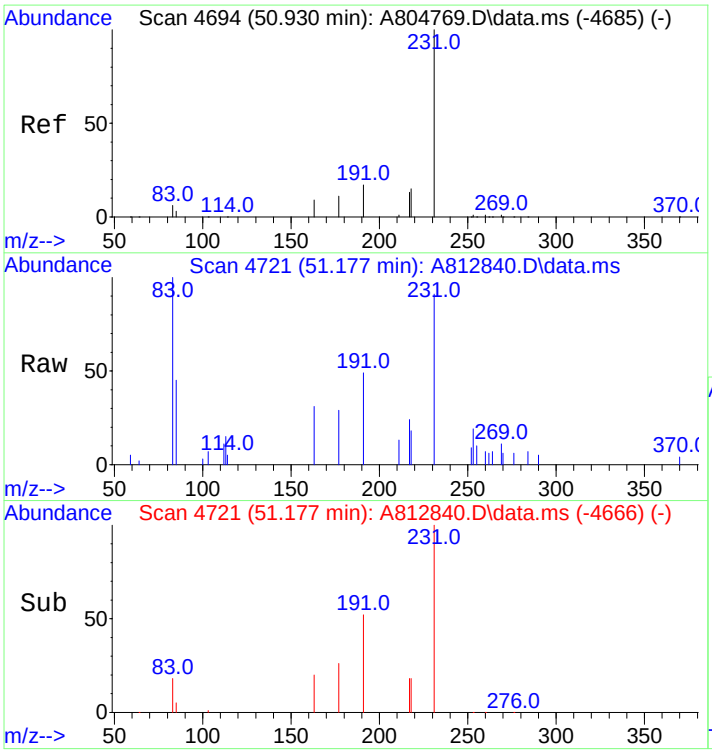




#148
C28,20S-triaromatic steroid
Concen: 1047.82 ng/mL m
RT: 50.711 min Scan# 4670
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

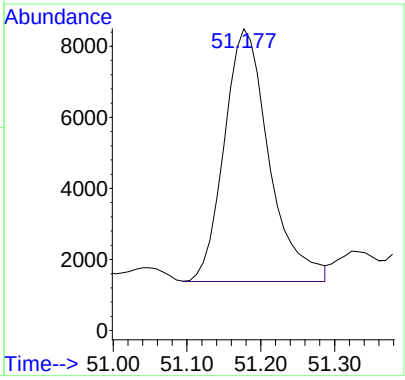
Tgt Ion:231 Resp: 38155

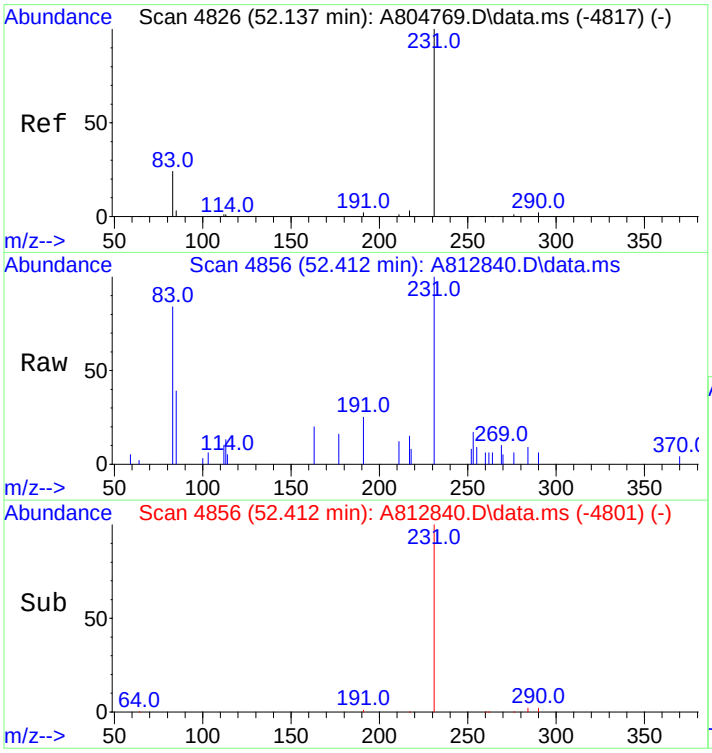




#149
C27,20R-triaromatic steroid
Concen: 826.69 ng/mL m
RT: 51.177 min Scan# 4721
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

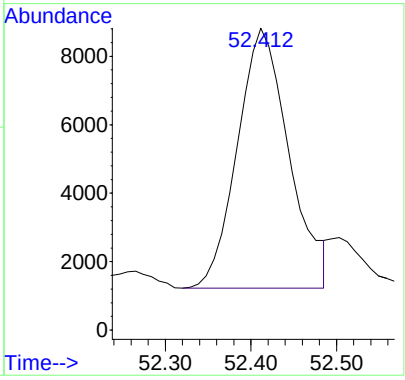
Tgt Ion:231 Resp: 30103





#150
C28,20R-triaromatic steroid
Concen: 875.50 ng/mL
RT: 52.412 min Scan# 4856
Delta R.T. 0.000 min
Lab File: A812840.D
Acq: 19 Nov 2012 11:42 am

Tgt Ion:231 Resp: 31880



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812841.D
Acq On : 19 Nov 2012 1:08 pm
Operator : AC
Sample : SS112012CL01
Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	57324	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	97505	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	232106	1021.698	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.17%			
42) Phenanthrene-d10	32.843	188	193443	1096.492	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.65%			
83) Benzo[b]fluoranthene-d12	47.335	264	206671	1112.150	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.22%			
88) Benzo[a]pyrene-d12	48.543	264	197878	1077.793	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.78%			
129) 5B(H)Cholane - Surr	44.045	217	39763	1115.252	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.53%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	32800	643.872	ng/mL	100
4) cis-Decalin	17.879	138	1988M3	53.270	ng/mL	
5) C1-Decalins	18.143	152	74445M5	1461.374	ng/mL	
6) C2-Decalins	19.567	166	102768M5	2017.361	ng/mL	
7) C3-Decalins	22.396	180	70807M5	1389.959	ng/mL	
8) C4-Decalins	25.781	194	66800M5	1311.301	ng/mL	
10) Naphthalene	20.078	128	94043	361.847	ng/mL#	100
11) C1-Naphthalenes	22.779	142	244321M5	940.067	ng/mL	
12) C2-Naphthalenes	25.617	156	504345M5	1940.554	ng/mL	
13) C3-Naphthalenes	28.300	170	586416M5	2256.337	ng/mL	
14) C4-Naphthalenes	31.046	184	463945M5	1785.108	ng/mL	
16) 2-Methylnaphthalene	22.779	142	146703	947.592	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	98620	680.279	ng/mL#	100
18) Benzothiophene	20.297	134	11006	52.391	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	54170M5	257.862	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	94749M5	451.028	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	152803M5	727.380	ng/mL	
22) C4-Benzo(b)thiophenes	29.896	190	154249M5	734.263	ng/mL	
23) Biphenyl	24.659	154	19907	101.066	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	124866	942.405	ng/mL#	100
25) Dibenzofuran	27.743	168	9141	43.990	ng/mL#	64
26) Acenaphthylene	26.365	152	3479M3	14.747	ng/mL	
27) Acenaphthene	27.104	153	10841M3	76.992	ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.656	170	33501M3	293.571	ng/mL	
29) Fluorene	29.121	166	25883M3	163.892	ng/mL	
30) C1-Fluorenes	31.484	180	67262M5	425.905	ng/mL	
31) C2-Fluorenes	33.683	194	142699M5	903.574	ng/mL	
32) C3-Fluorenes	35.508	208	177157M5	1121.763	ng/mL	
33) Dibenzothiophene	32.442	184	76804	353.659	ng/mL#	71
34) 4-Methyldibenzothiophe...	34.212	198	101617	467.915	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.568	198	83008	382.227	ng/mL#	100
36) 1-Methyldibenzothiophe...	34.988	198	54333	250.187	ng/mL#	100
37) OTP	34.623	198	11148M3	51.333	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	274258M5	1262.875	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	492762M5	2269.019	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	509028M5	2343.919	ng/mL	
41) C4-Dibenzothiophenes	39.389	240	346927M5	1597.493	ng/mL	
43) Phenanthrene	32.935	178	92817M3	444.049	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.897	192	49157	235.174	ng/mL	95
45) 2-Methylphenanthrene(2MP)	35.015	192	56203	268.883	ng/mL	96
46) 2-Methylanthracene(2MA)	35.171	192	6576M3	31.460	ng/mL	
47) 9/4-Methylphenanthrene...	35.353	192	95525	457.005	ng/mL	99
48) 1-Methylphenanthrene(1MP)	35.444	192	53264M3	254.822	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.353	192	267192M5	1278.283	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812841.D
Acq On : 19 Nov 2012 1:08 pm
Operator : AC
Sample : SS112012CL01
Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50)	C2-Phenanthrenes/Anthr...	37.161	206	392849M5	1879.443	ng/mL	
52)	C3-Phenanthrenes/Anthr...	40.265	220	326583M5	1562.418	ng/mL	
53)	C4-Phenanthrenes/Anthr...	39.918	234	154251M5	737.958	ng/mL	
54)	Retene	39.918	234	14543M3	300.011	ng/mL	
55)	Anthracene	33.144	178	6140M3	31.530	ng/mL	
56)	Carbazole	33.774	167	4009M3	19.730	ng/mL	
57)	1-Methylphenanthrene	35.444	192	53517M3	361.188	ng/mL	
58)	Fluoranthene	37.708	202	6888M3	31.992	ng/mL	
60)	Pyrene	38.594	202	23109M3	106.113	ng/mL	
61)	C1-Fluoranthenes/Pyrenes	39.982	216	85448M5	392.363	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.447	230	121078M5	555.969	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.798	244	129973M5	596.814	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.141	258	127459M5	585.270	ng/mL	
66)	Naphthobenzothiophene	42.438	234	33329	164.862	ng/ml#	85
67)	Naphthobenzothiophene-...	42.438	234	33329	164.862	ng/mL#	85
68)	Naphthobenzothiophene-...	42.776	234	9019	44.613	ng/mL#	10
69)	Naphthobenzothiophene-...	43.077	234	6147M3	30.406	ng/mL	
70)	C1-Naphthobenzothiophenes	43.835	248	147993M5	732.049	ng/ml	
71)	C2-Naphthobenzothiophenes	45.881	262	227658M5	1126.113	ng/ml	
72)	C3-Naphthobenzothiophenes	47.445	276	199000M5	984.356	ng/ml	
73)	C4-Naphthobenzothiophenes	48.534	290	155837M5	770.849	ng/mL	
75)	Benz[a]anthracene	43.369	228	5065M3	23.696	ng/mL	
77)	Chrysene/Triphenylene	43.506	228	23562M3	108.897	ng/mL	
78)	C1-Chrysenes	44.995	242	62939M5	290.888	ng/mL	
79)	C2-Chrysenes	47.070	256	105286M5	486.605	ng/mL	
80)	BBF-D12 Surr BKGD	47.335	256	7096	32.796	ng/mL	100
81)	C3-Chrysenes	48.460	270	122008M5	563.890	ng/mL	
82)	C4-Chrysenes	49.832	284	74575M5	344.666	ng/mL	
84)	Benzo[b]fluoranthene	47.418	252	6500	28.314	ng/mL	92
85)	Benzo[j]+[k]fluoranthene	47.491	252	2127M3	8.492	ng/mL	
87)	Benzo[e]pyrene	48.442	252	10708M3	45.269	ng/mL	
89)	Benzo[a]pyrene	48.634	252	5486M3	25.072	ng/mL	
90)	Perylene	48.954	252	12532	52.434	ng/mL#	70
91)	Indeno[1,2,3-cd]pyrene	53.554	276	3284M3	14.129	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.591	278	1425M3	6.255	ng/mL	
93)	Benzo[g,h,i]perylene	54.879	276	8245	31.258	ng/mL#	75
94)	Hopane (T19)	52.640	191	102497	1399.704	ng/mL#	88
96)	C23 Tricyclic Terpane ...	41.078	191	39951M4	545.573	ng/ml	
97)	C24 Tricyclic Terpane ...	41.799	191	22453	306.619	ng/ml	100
98)	C25 Tricyclic Terpane ...	43.324	191	19954M3	272.493	ng/ml	
99)	C24 Tetracyclic Terpan...	44.602	191	7594	103.704	ng/ml	100
100)	C26 Tricyclic Terpane-...	44.337	191	8100M3	110.614	ng/ml	
101)	C26 Tricyclic Terpane-...	44.428	191	7997M3	109.207	ng/ml	
102)	C28 Tricyclic Terpane-...	46.713	191	8461	115.544	ng/ml	100
103)	C28 Tricyclic Terpane-...	46.878	191	9137	124.775	ng/ml	100
104)	C29 Tricyclic Terpane-...	47.399	191	11008M4	150.326	ng/ml	
105)	C29 Tricyclic Terpane-...	47.610	191	10585	144.549	ng/ml	100
106)	18a-22,29,30-Trisnorne...	48.762	191	11043	150.804	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.854	191	8404M3	114.765	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.101	191	8096M3	110.559	ng/mL	
109)	17a(H)-22,29,30-Trisno...	49.320	191	27230	371.854	ng/ml	100
110)	17a/b,21b/a 28,30-Bisn...	50.546	191	16989M3	232.003	ng/ml	
111)	17a(H),21b(H)-25-Norho...	50.326	191	4355	59.472	ng/ml	100
112)	30-Norhopane (T15)	51.232	191	72659M3	992.235	ng/ml	
113)	18a(H)-30-Norneohopane...	51.341	191	9817M3	134.061	ng/ml	
114)	17a(H)-Diahopane (X)	51.460	191	3127	42.702	ng/ml	100
115)	30-Normoretane (T17)	52.027	191	7223	98.638	ng/ml	100
116)	18a(H)&18b(H)-Oleanane...	52.430	191	1321M3	18.040	ng/ml	
117)	Moretane (T20)	53.344	191	7589M3	103.636	ng/ml	
118)	30-Homohopane-22S (T21)	54.477	191	43485	593.833	ng/ml	100
119)	30-Homohopane-22R (T22)	54.715	191	34951	477.292	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812841.D
Acq On : 19 Nov 2012 1:08 pm
Operator : AC
Sample : SS112012CL01
Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

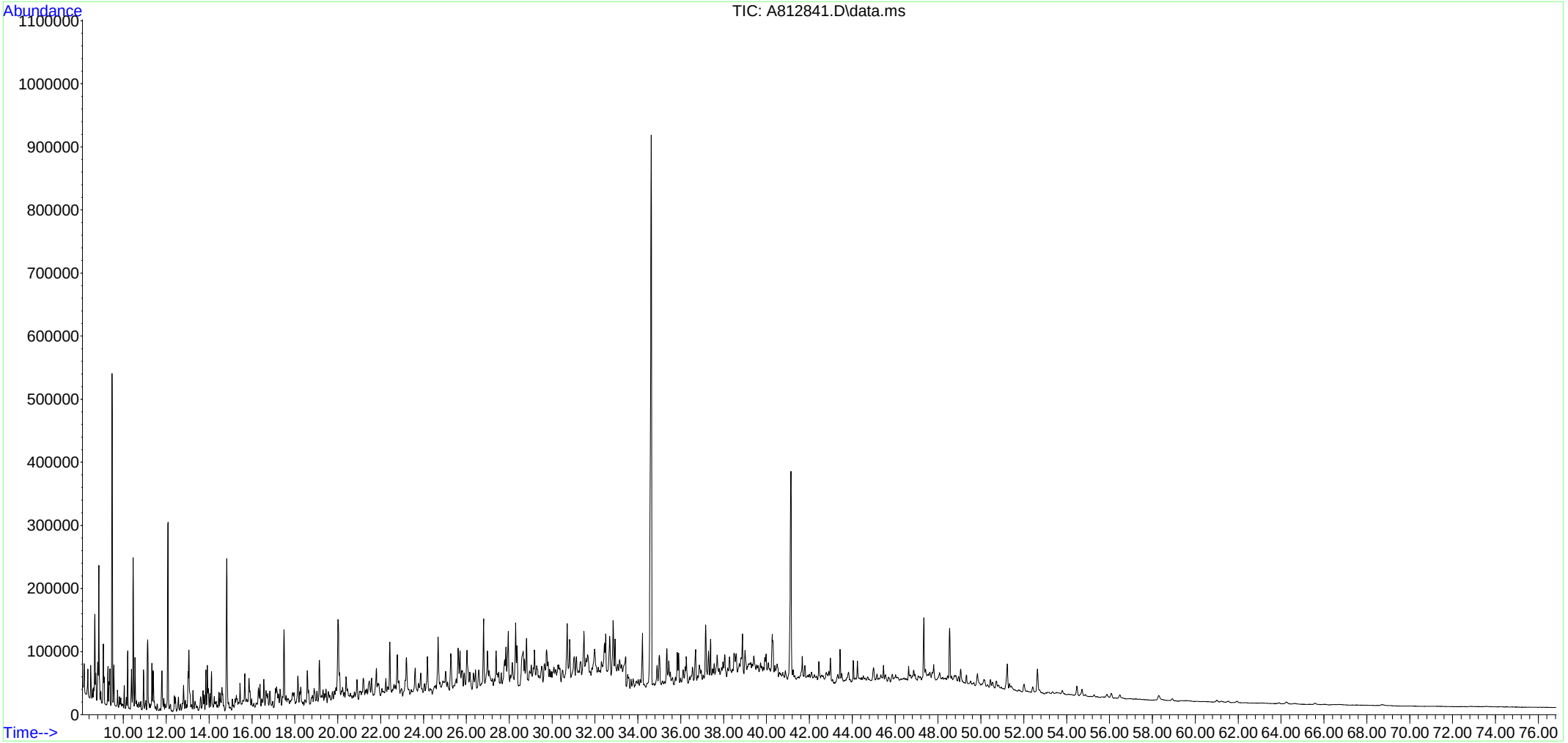
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120)	Gammacerane/C32-diahopane	55.272	191	14909M4	203.598	ng/mL	
121)	30,31-Bishomohopane-22...	56.076	191	27478	375.241	ng/ml	100
122)	30,31-Bishomohopane-22...	56.479	191	19957	272.534	ng/ml	100
123)	30,31-Trishomohopane-2...	58.288	191	20650	281.997	ng/ml	100
124)	30,31-Trishomohopane-2...	58.928	191	12922M3	176.463	ng/ml	
125)	Tetrakishomohopane-22S...	61.011	191	14487	197.835	ng/ml	100
126)	Tetrakishomohopane-22R...	61.943	191	9817	134.061	ng/ml	100
127)	Pentakishomohopane-22S...	64.255	191	17106	233.600	ng/ml	100
128)	Pentakishomohopane-22R...	65.589	191	11990M3	163.736	ng/ml	
130)	13b(H),17a(H)-20S-Diac...	45.552	217	6741M3	189.068	ng/ml	
131)	13b(H),17a(H)-20R-Diac...	45.972	217	2860M3	80.216	ng/ml	
132)	13b,17a-20S-Methyldiac...	46.677	217	3110M3	87.228	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.546	217	10902M3	305.774	ng/ml	
134)	14a,17a-20R-Chol/13b,1...	48.076	217	13342M3	374.209	ng/ml	
135)	Unknown Sterane (S18)	48.369	217	2398	67.258	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.625	217	1372	38.481	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.790	217	5366	150.503	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.521	217	4784M4	134.179	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.887	217	11817M3	331.437	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.820	217	8881M3	249.090	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.637	218	8849M3	248.192	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.729	218	8864M3	248.613	ng/ml	
143)	14b,17b-20R-Methylchol...	48.973	218	6928M4	194.313	ng/ml	
144)	14b,17b-20S-Methylchol...	49.055	218	10054M3	281.989	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.143	218	12856	360.578	ng/ml	100
146)	14b(H),17b(H)-20S-Ethy...	50.180	218	9285M3	260.421	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.832	231	47454	1330.965	ng/mL	100
148)	C28,20S-triaromatic st...	50.719	231	39667M3	1112.559	ng/mL	
149)	C27,20R-triaromatic st...	51.186	231	30715M3	861.478	ng/mL	
150)	C28,20R-triaromatic st...	52.421	231	32930	923.603	ng/mL	100

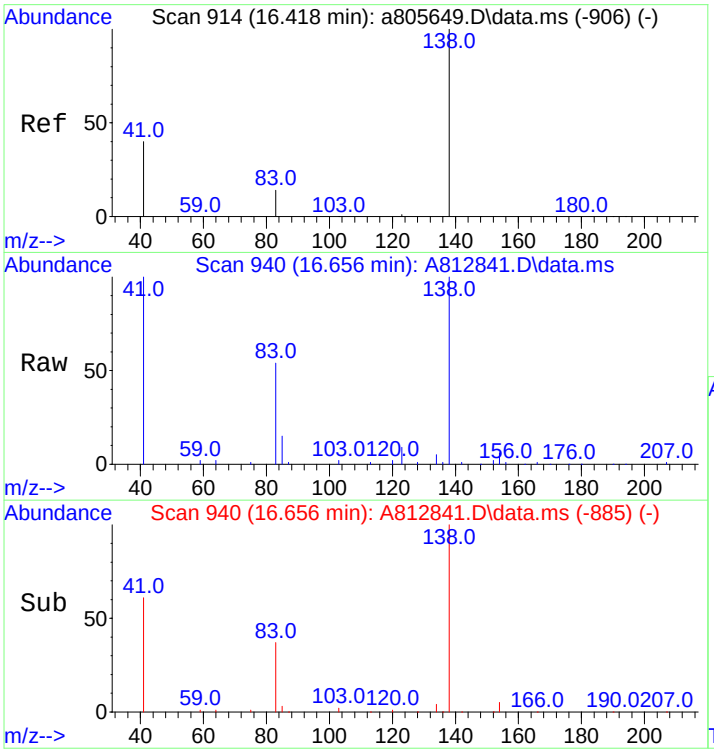
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812841.D
Acq On : 19 Nov 2012 1:08 pm
Operator : AC
Sample : SS112012CL01
Misc : whaq74
ALS Vial : 22 Sample Multiplier: 1

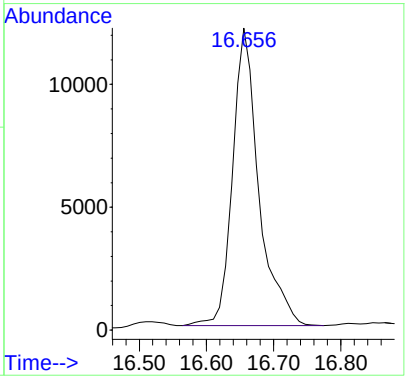
Quant Time: Nov 20 14:59:30 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

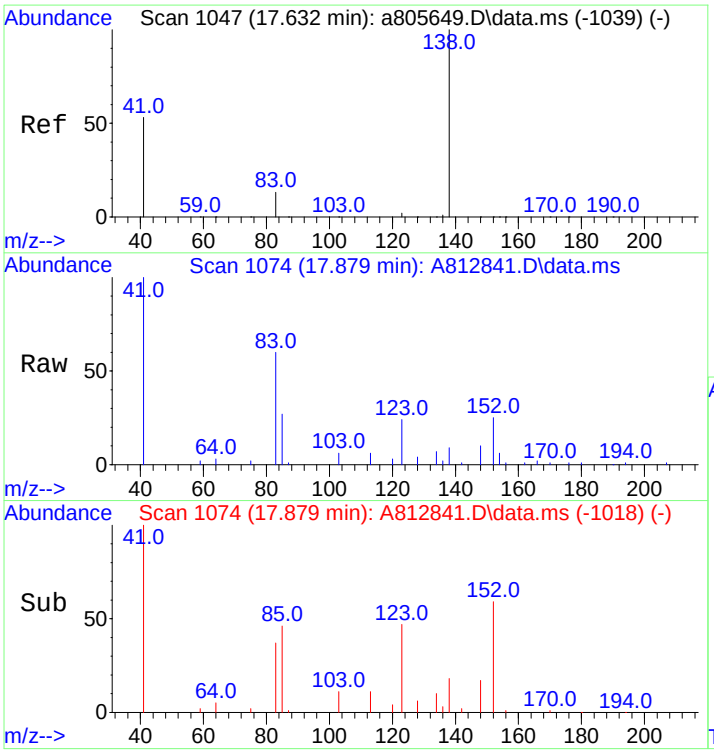




#3
trans-Decalin
Concen: 643.87 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

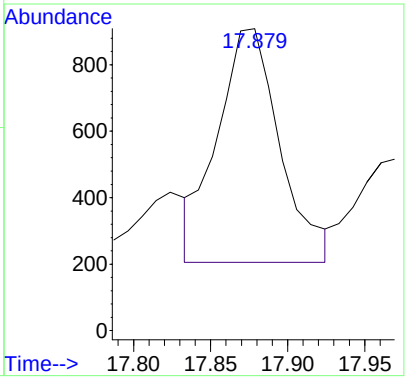
Tgt Ion:138 Resp: 32800

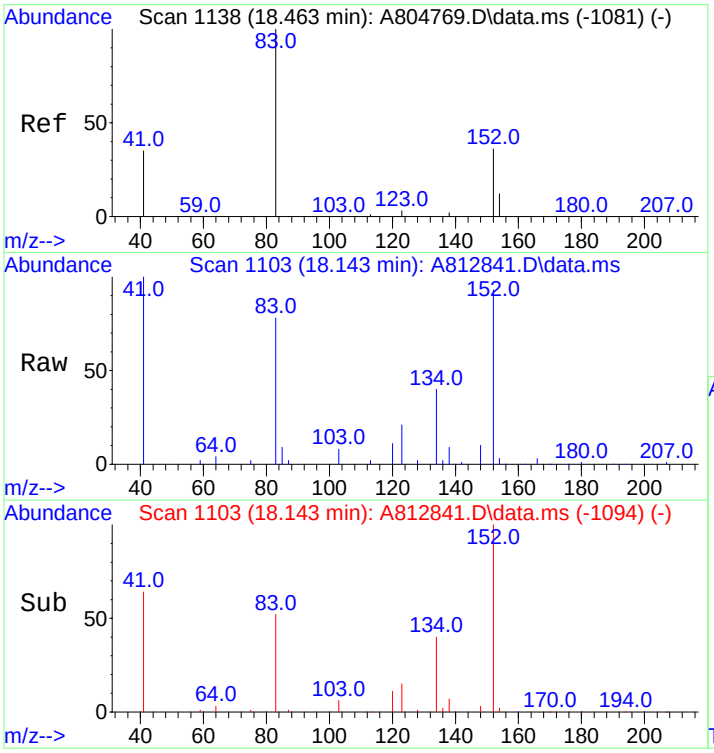




#4
cis-Decalin
Concen: 53.27 ng/mL m
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

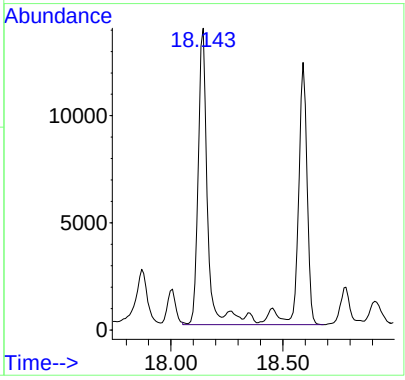
Tgt Ion:138 Resp: 1988

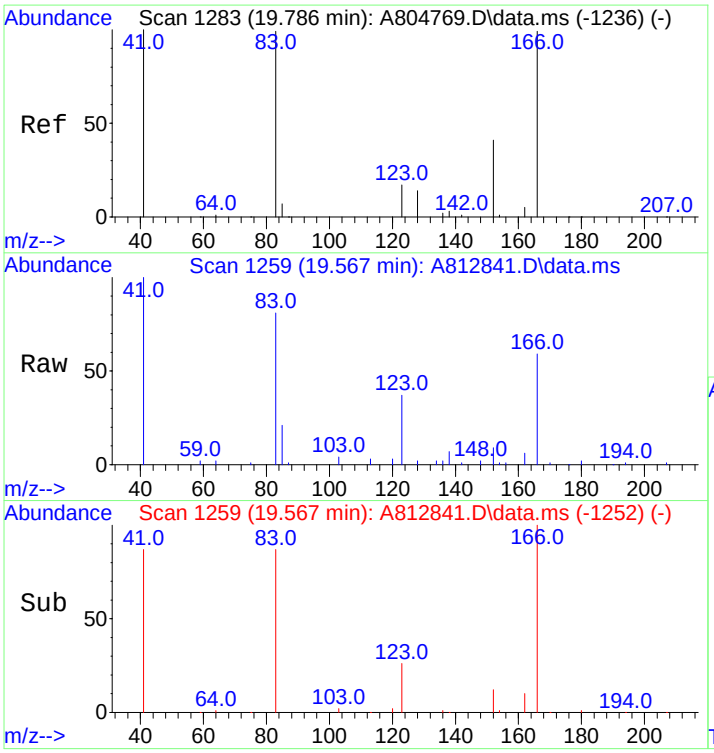




#5
C1-Decalins
Concen: 1461.37 ng/mL m
RT: 18.143 min Scan# 1103
Delta R.T. -0.447 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

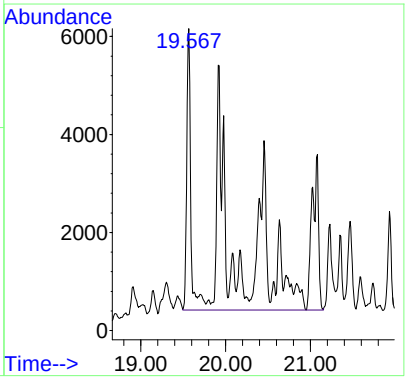
Tgt Ion:152 Resp: 74445

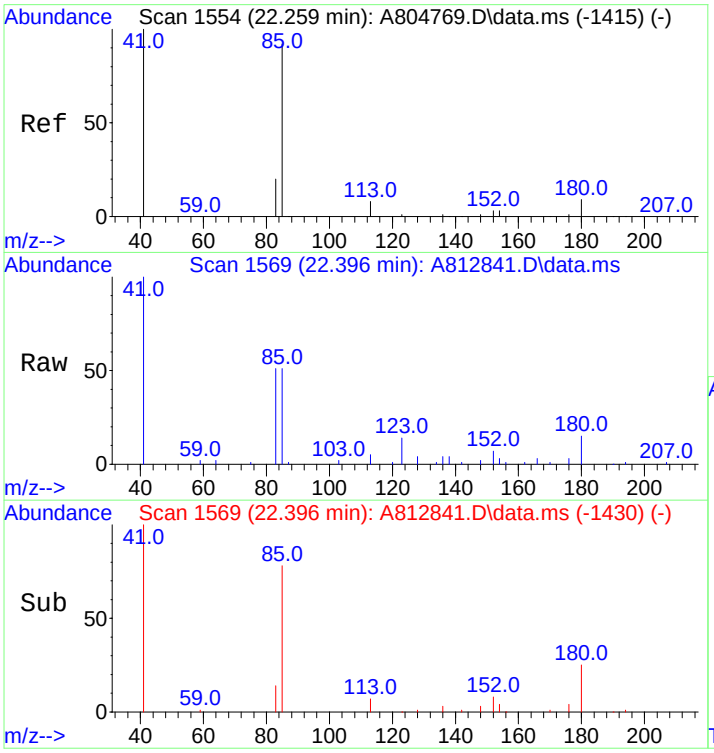




#6
C2-Decalins
Concen: 2017.36 ng/mL m
RT: 19.567 min Scan# 1259
Delta R.T. -0.356 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

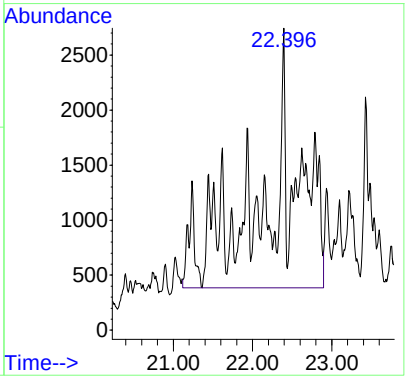
Tgt Ion:166 Resp: 102768

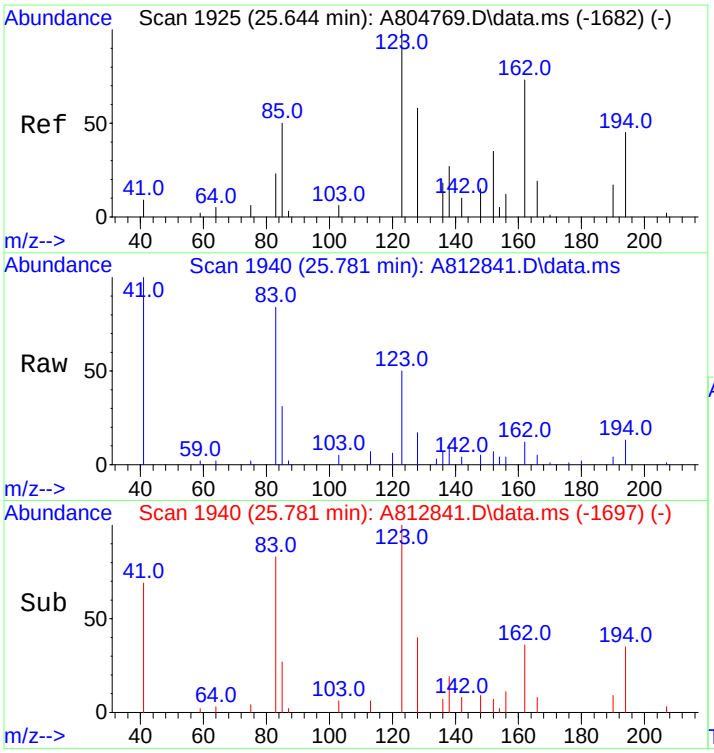




#7
C3-Decalins
Concen: 1389.96 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

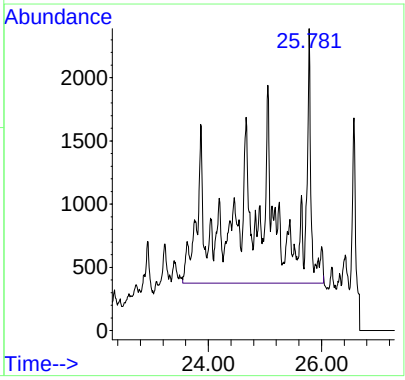
Tgt Ion:180 Resp: 70807

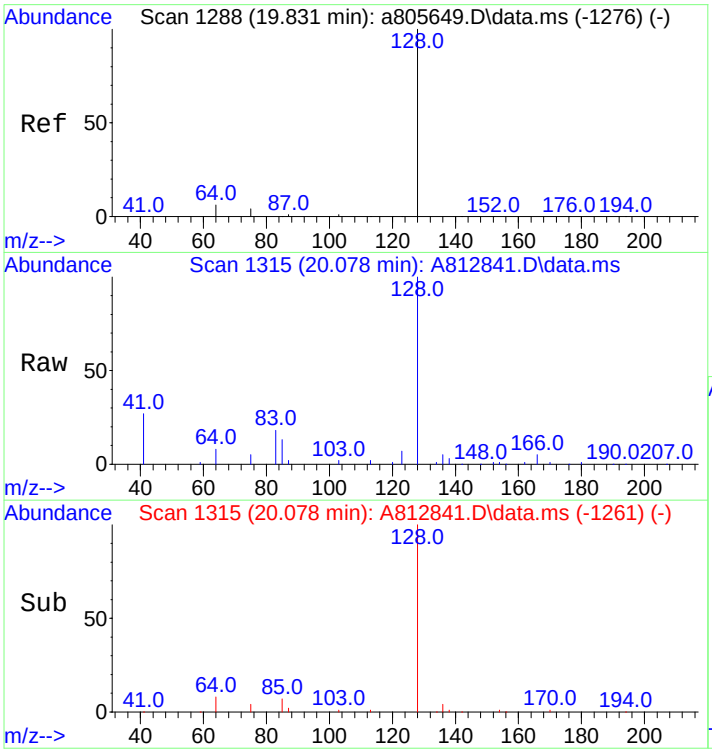




#8
C4-Decalins
Concen: 1311.30 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:194 Resp: 66800

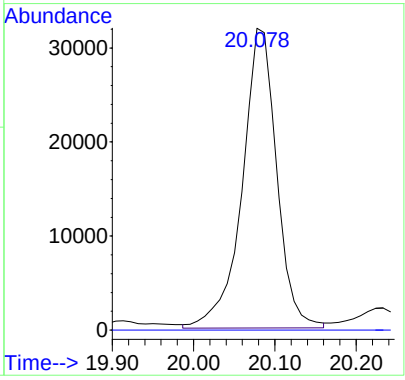


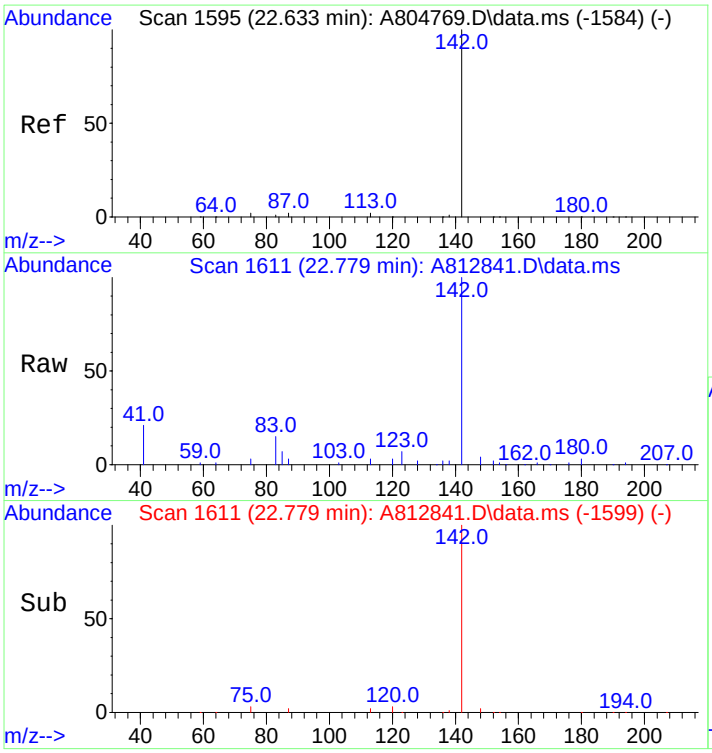


#10
Naphthalene
Concen: 361.85 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:128 Resp: 94043

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

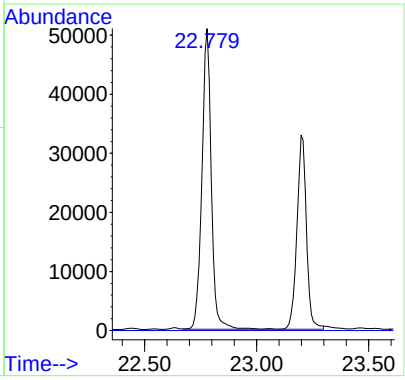


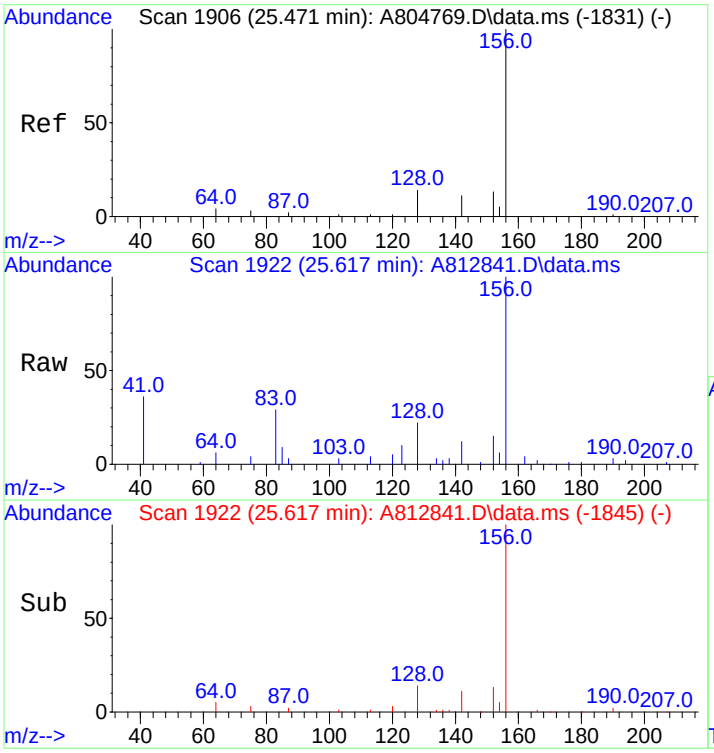


#11
C1-Naphthalenes
Concen: 940.07 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:142 Resp: 244321

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

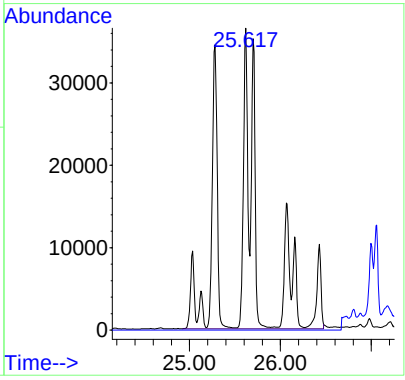


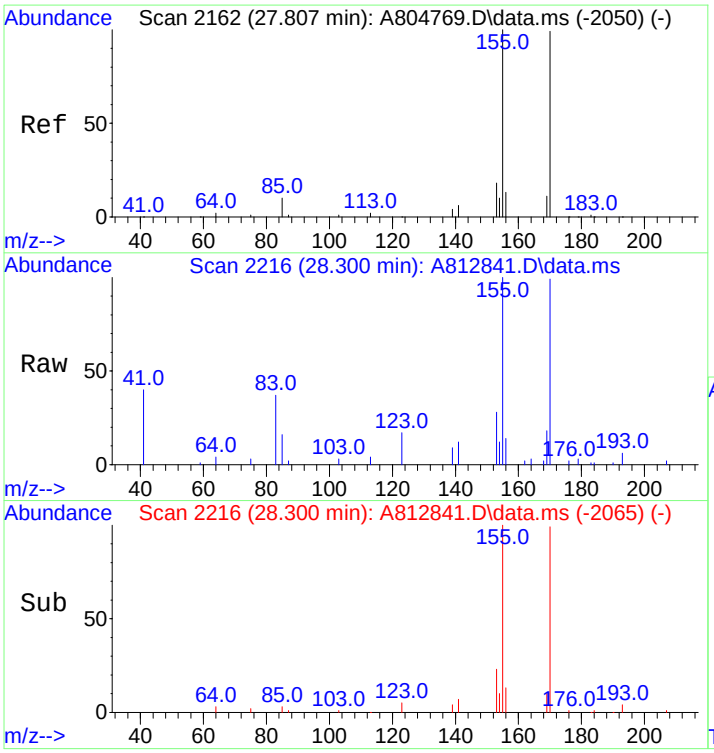


#12
C2-Naphthalenes
Concen: 1940.55 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:156 Resp: 504345

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

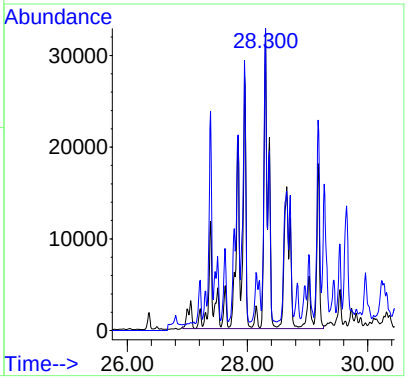


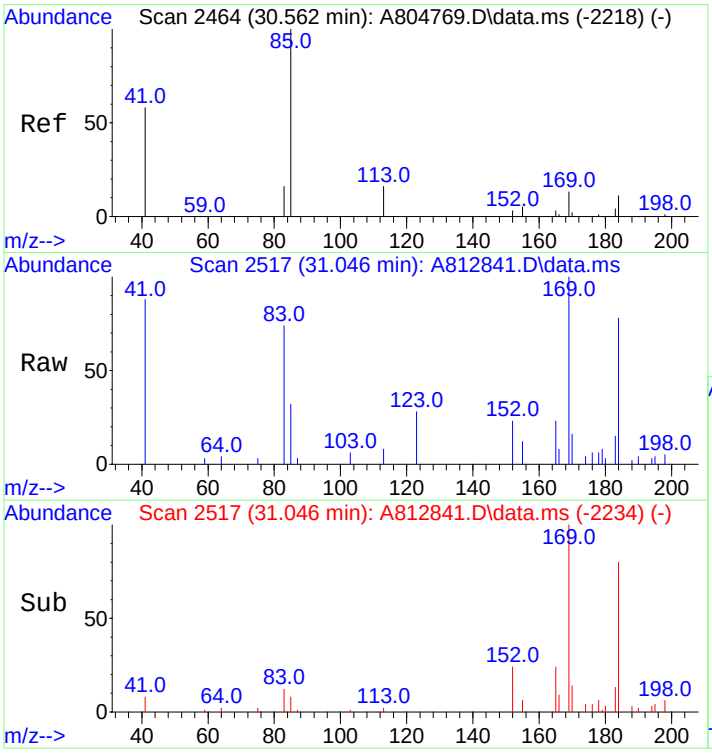


#13
C3-Naphthalenes
Concen: 2256.34 ng/mL m
RT: 28.300 min Scan# 2216
Delta R.T. 0.347 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:170 Resp: 586416

Ion	Ratio	Lower	Upper
170	100		
155	15.9	80.2	120.4#

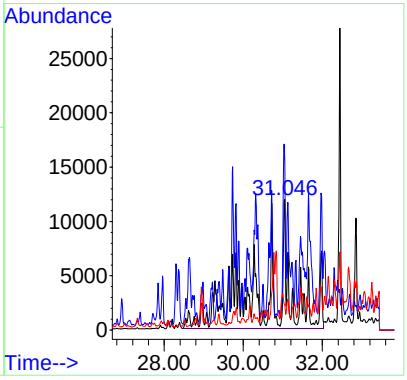


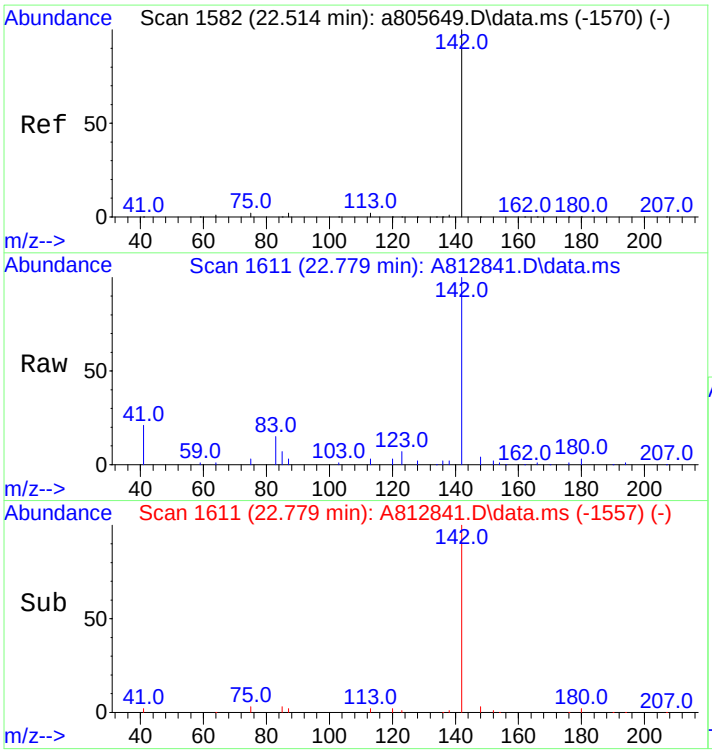


#14
C4-Naphthalenes
Concen: 1785.11 ng/mL m
RT: 31.046 min Scan# 2517
Delta R.T. 0.337 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:184 Resp: 463945

Ion	Ratio	Lower	Upper
184	100		
169	5.2	108.2	162.2#
183	1.3	29.7	44.5#

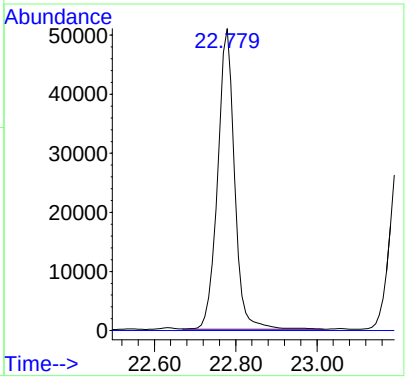


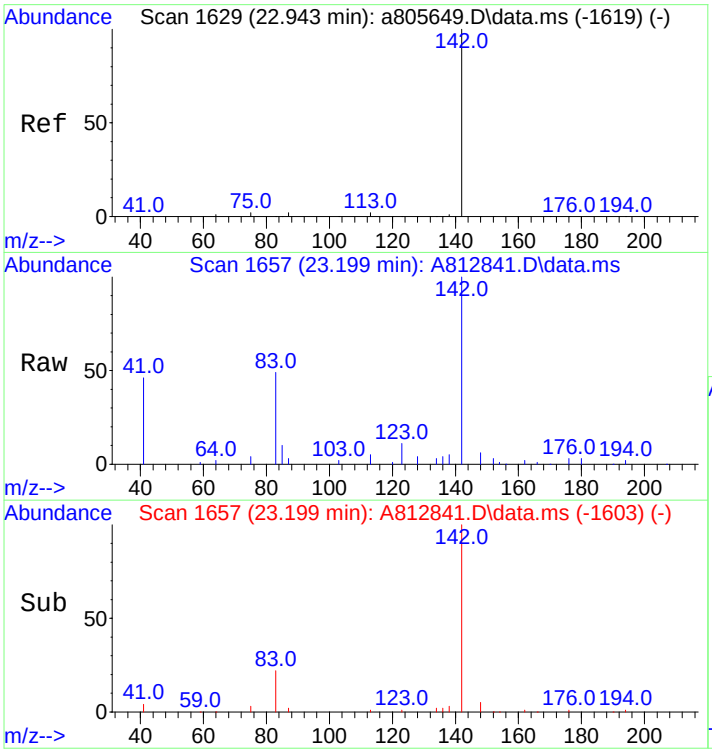


#16
2-Methylnaphthalene
Concen: 947.59 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:142 Resp: 146703

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

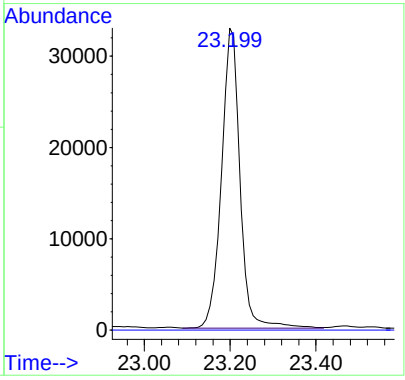


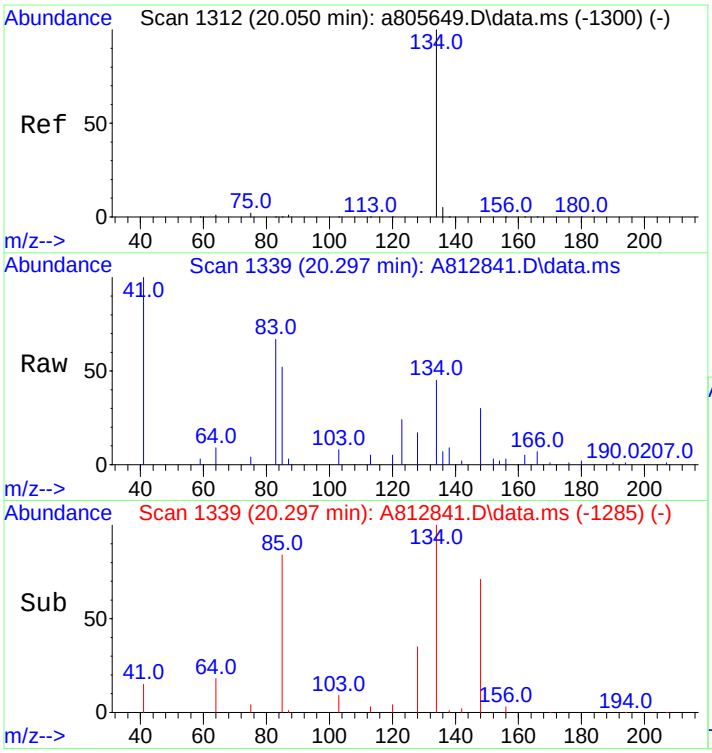


#17
1-Methylnaphthalene
Concen: 680.28 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:142 Resp: 98620

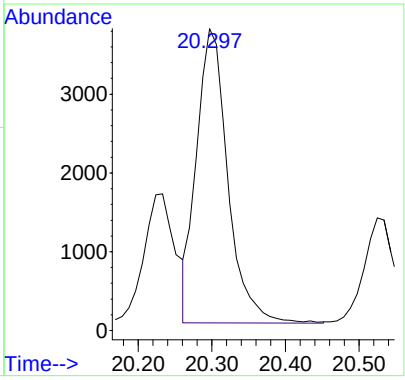
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

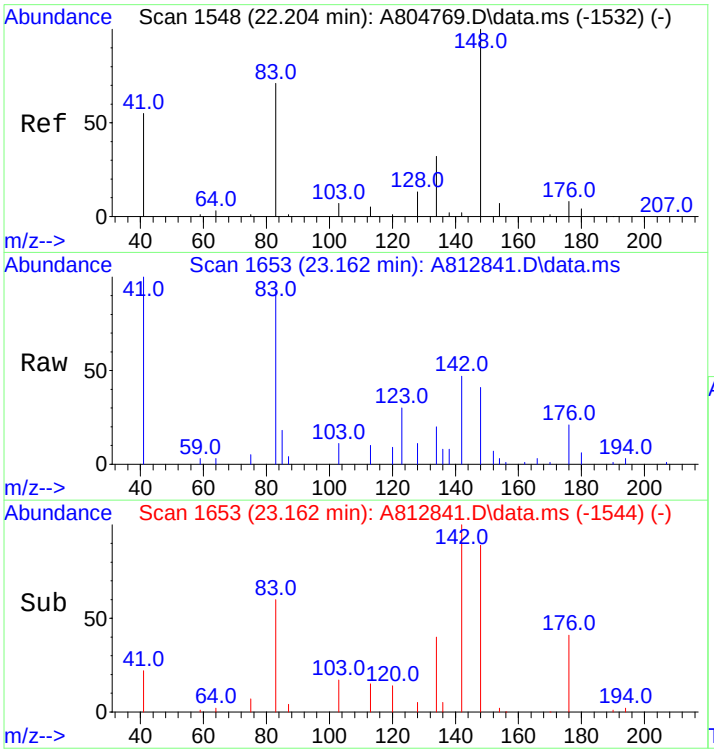




#18
Benzothiophene
Concen: 52.39 ng/mL
RT: 20.297 min Scan# 1339
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

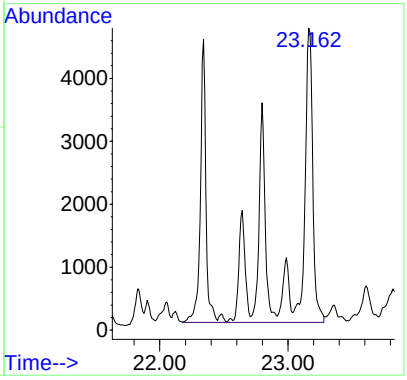
Tgt Ion:134 Resp: 11006

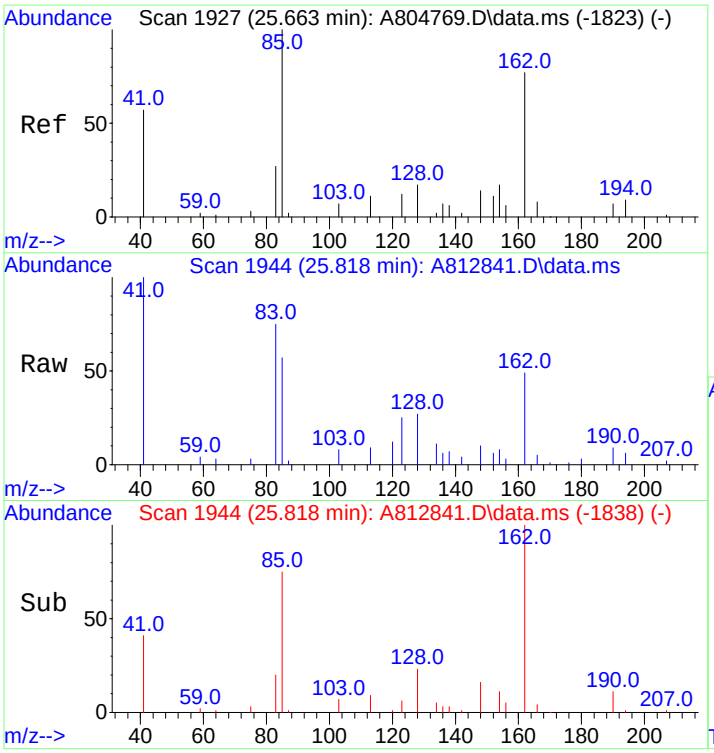




#19
C1-Benzo(b)thiophenes
Concen: 257.86 ng/mL m
RT: 23.162 min Scan# 1653
Delta R.T. 0.821 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

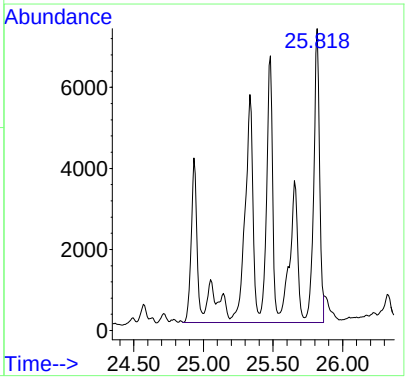
Tgt Ion:148 Resp: 54170

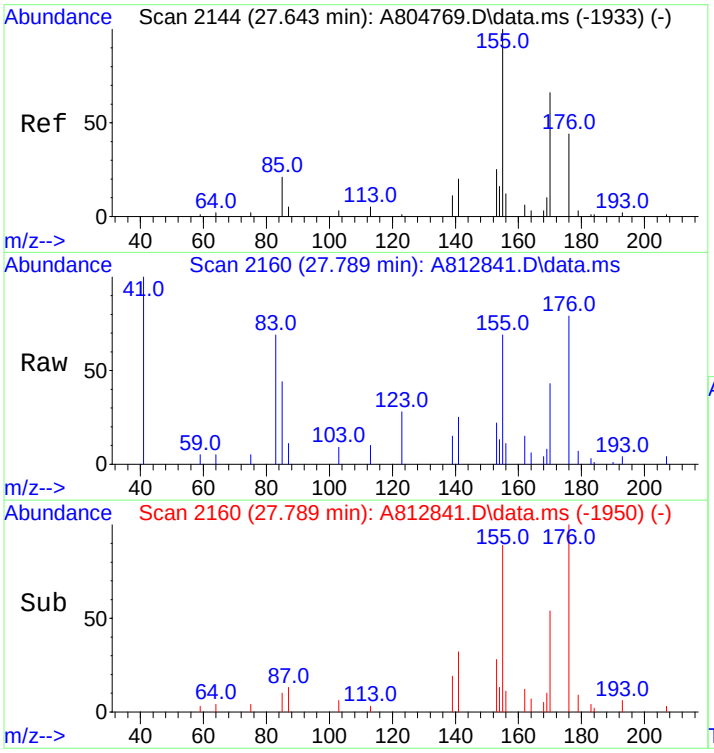




#20
C2-Benzo(b)thiophenes
Concen: 451.03 ng/mL m
RT: 25.818 min Scan# 1944
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

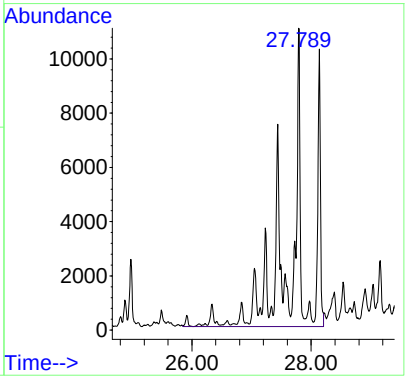
Tgt Ion:162 Resp: 94749

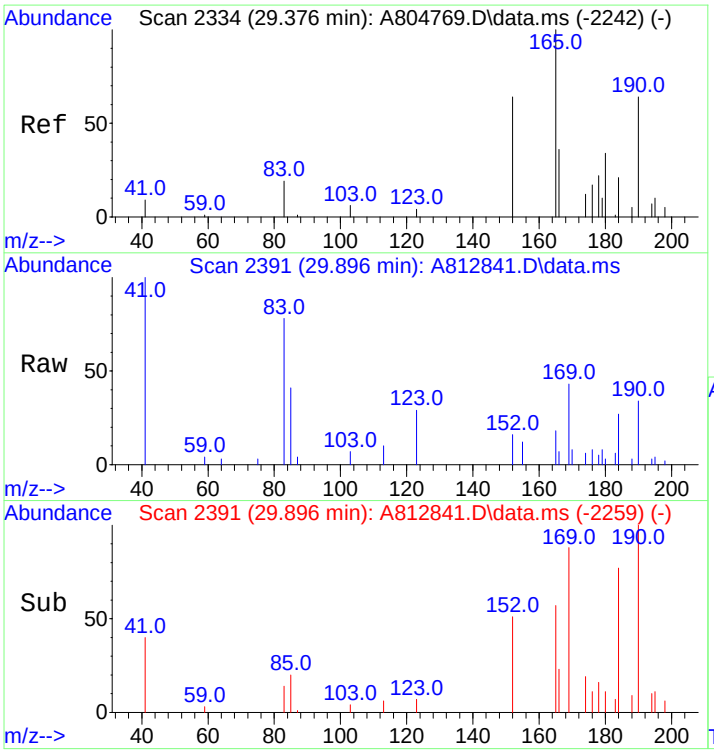




#21
C3-Benzo(b)thiophenes
Concen: 727.38 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

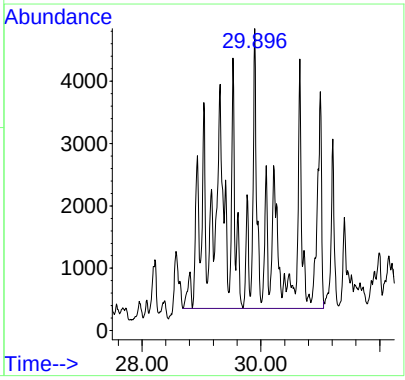
Tgt Ion:176 Resp: 152803

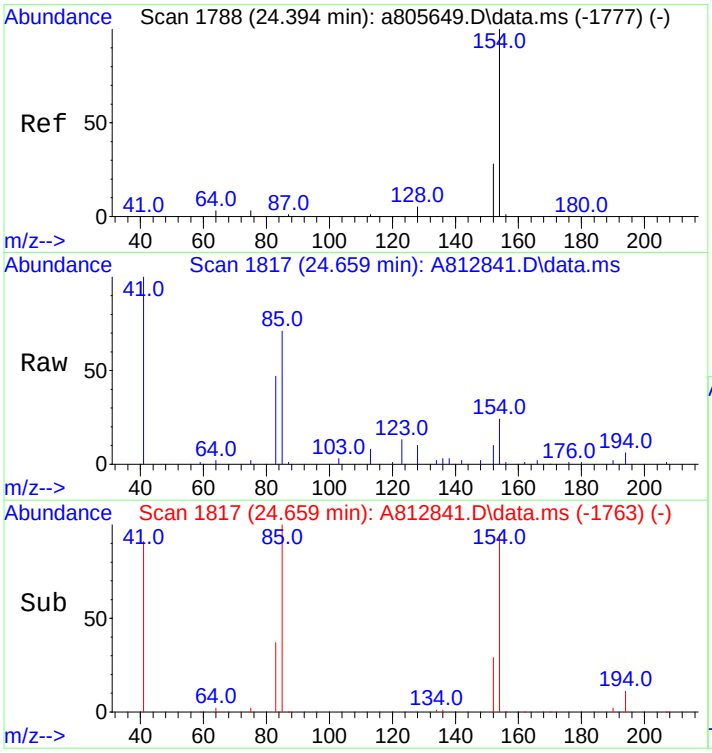




#22
C4-Benzo(b)thiophenes
Concen: 734.26 ng/mL m
RT: 29.896 min Scan# 2391
Delta R.T. 0.365 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:190 Resp: 154249

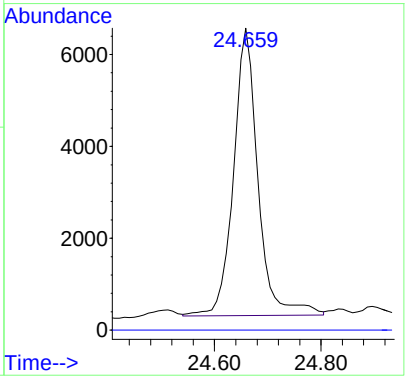


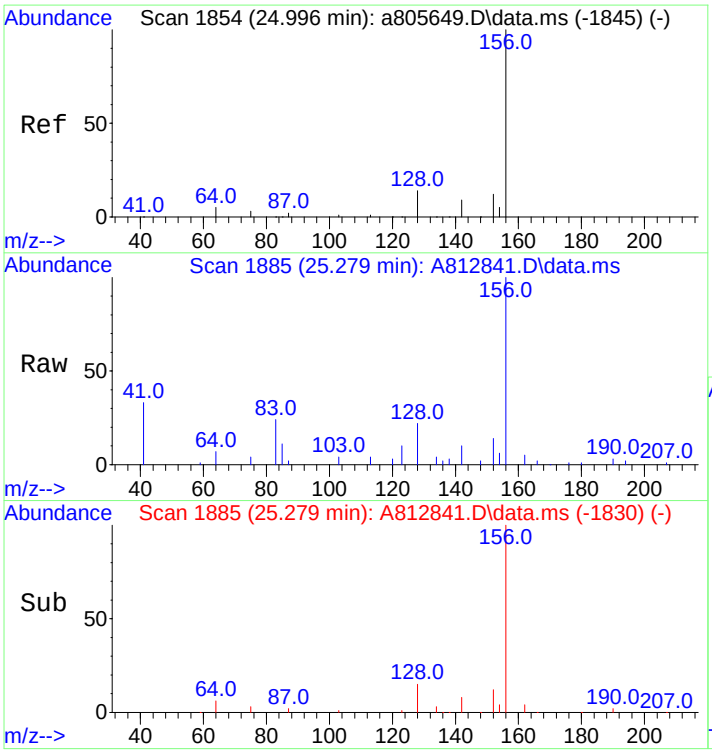


#23
Biphenyl
Concen: 101.07 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:154 Resp: 19907

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

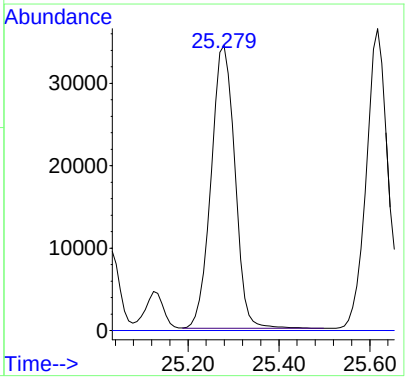


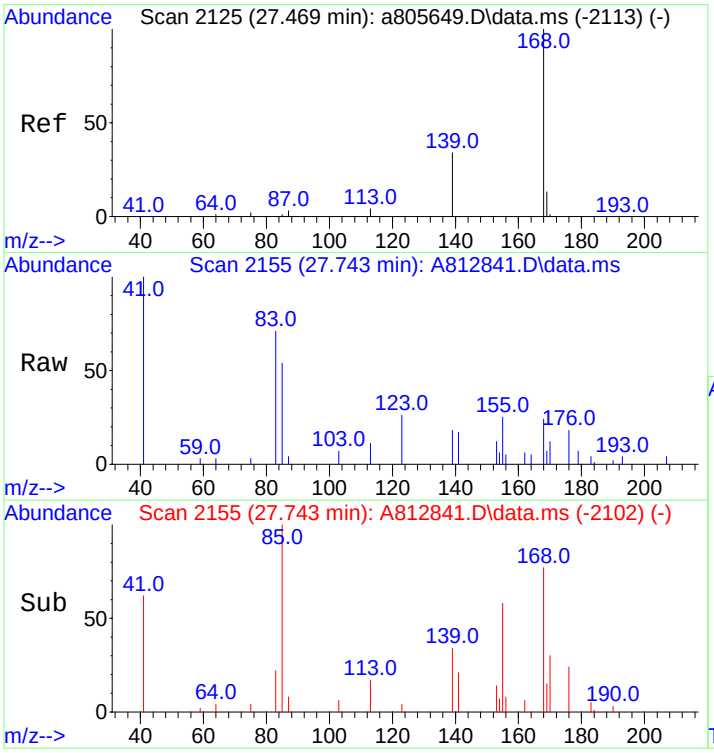


#24
2,6-Dimethylnaphthalene
Concen: 942.41 ng/mL
RT: 25.279 min Scan# 1885
Delta R.T. -0.001 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:156 Resp: 124866

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

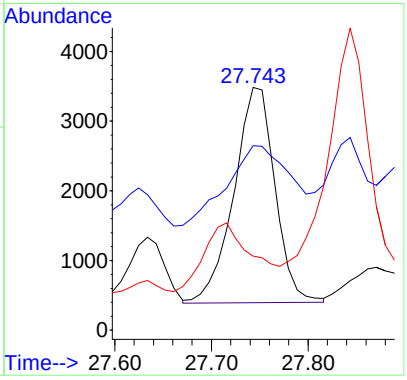


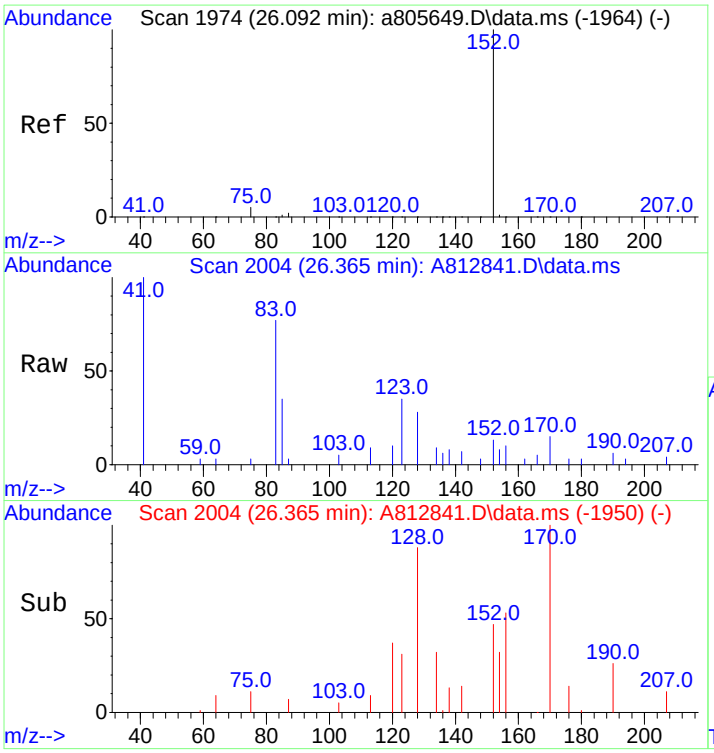


#25
Dibenzofuran
Concen: 43.99 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:168 Resp: 9141

Ion	Ratio	Lower	Upper
168	100		
139	56.5	28.0	42.0#
169	0.0	10.6	15.8#

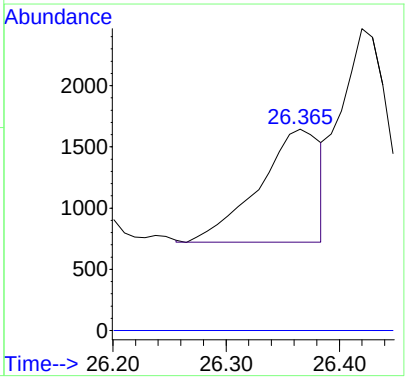


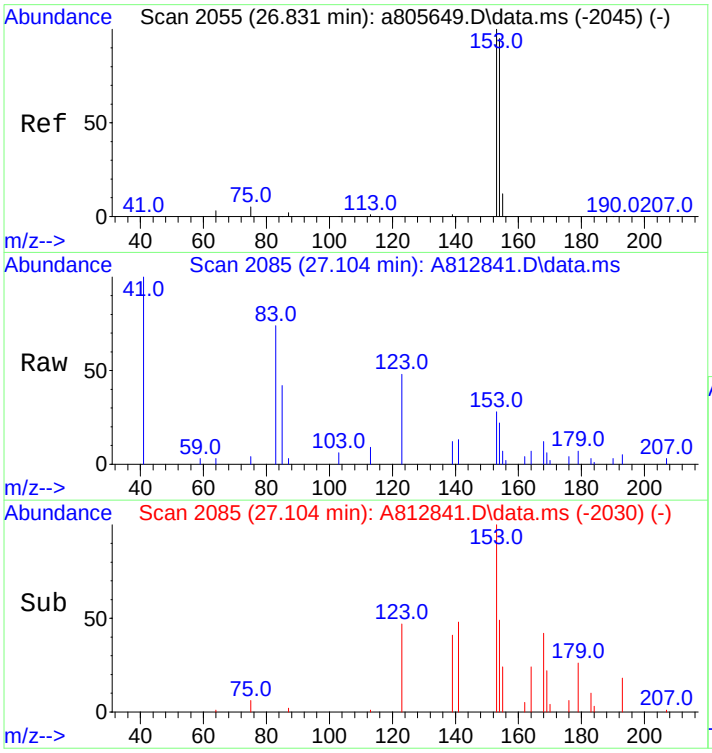


#26
Acenaphthylene
Concen: 14.75 ng/mL m
RT: 26.365 min Scan# 2004
Delta R.T. -0.010 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:152 Resp: 3479

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

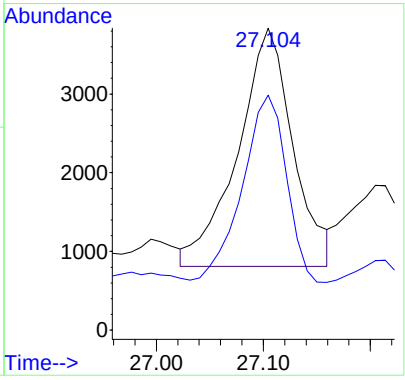


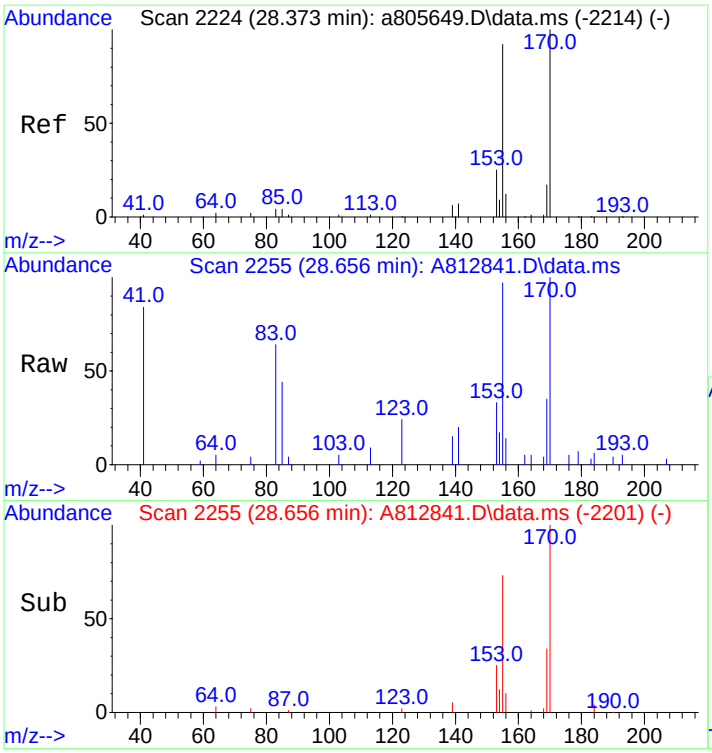


#27
Acenaphthene
Concen: 76.99 ng/mL m
RT: 27.104 min Scan# 2085
Delta R.T. -0.001 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:153 Resp: 10841

Ion	Ratio	Lower	Upper
153	100		
154	68.3	75.4	113.2#

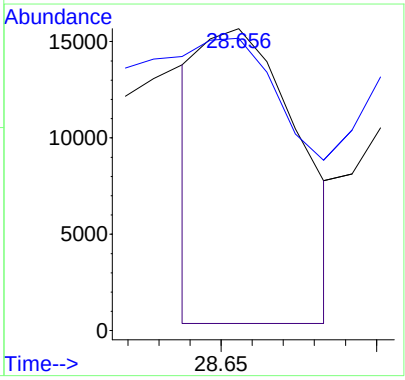


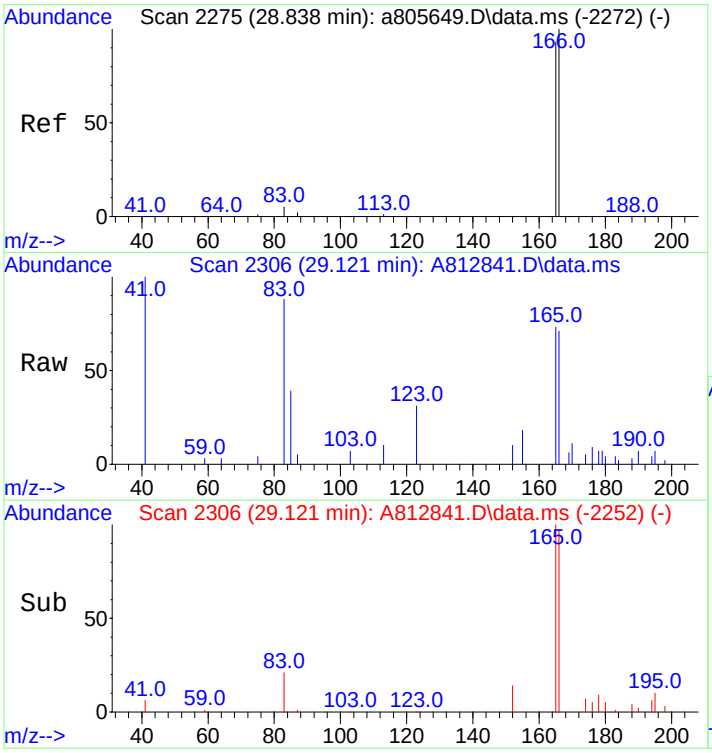


#28
2,3,5-Trimethylnaphthalene
Concen: 293.57 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:170 Resp: 33501

Ion	Ratio	Lower	Upper
170	100		
155	203.4	71.7	107.5#

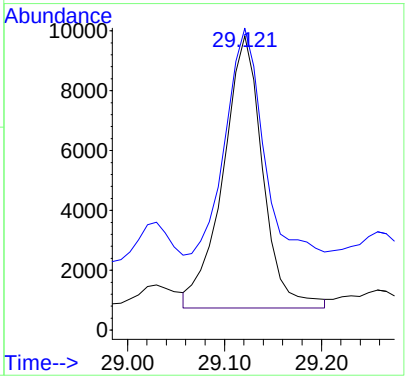


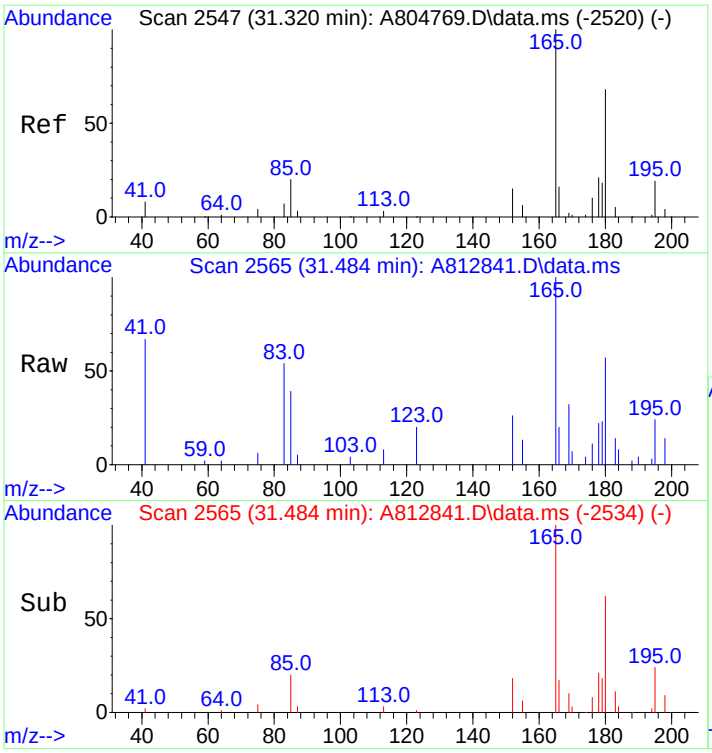


#29
Fluorene
Concen: 163.89 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:166 Resp: 25883

Ion	Ratio	Lower	Upper
166	100		
165	89.7	74.2	111.2

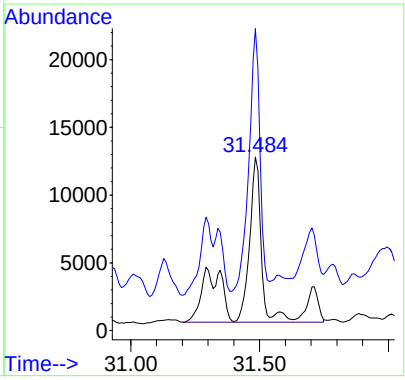


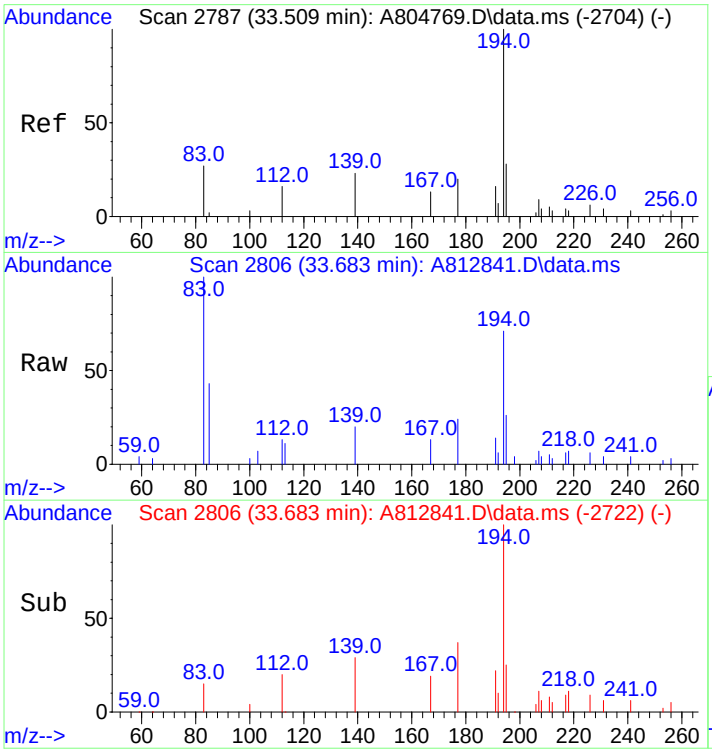


#30
C1-Fluorenes
Concen: 425.90 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:180 Resp: 67262

Ion	Ratio	Lower	Upper
180	100		
165	86.0	122.4	183.6#

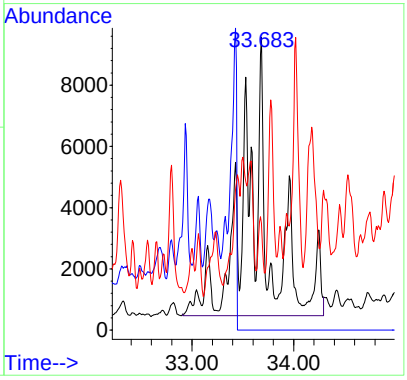


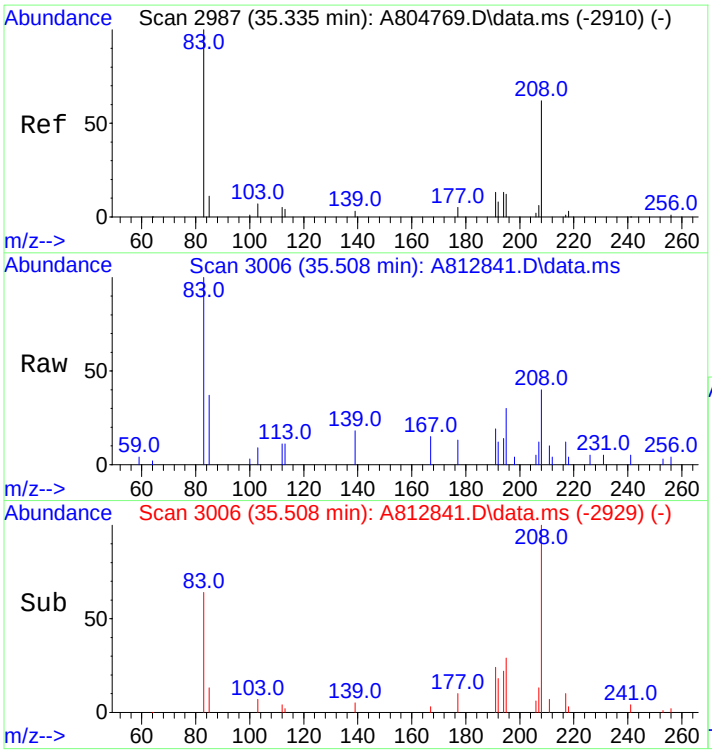


#31
C2-Fluorenes
Concen: 903.57 ng/mL m
RT: 33.683 min Scan# 2806
Delta R.T. 0.077 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:194 Resp: 142699

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.4	41.0#

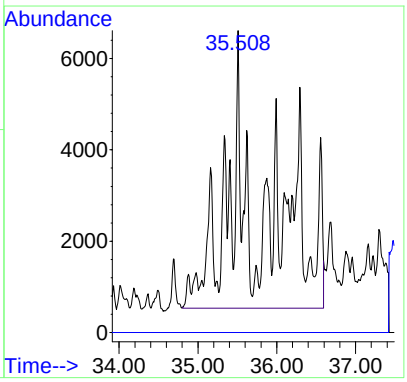


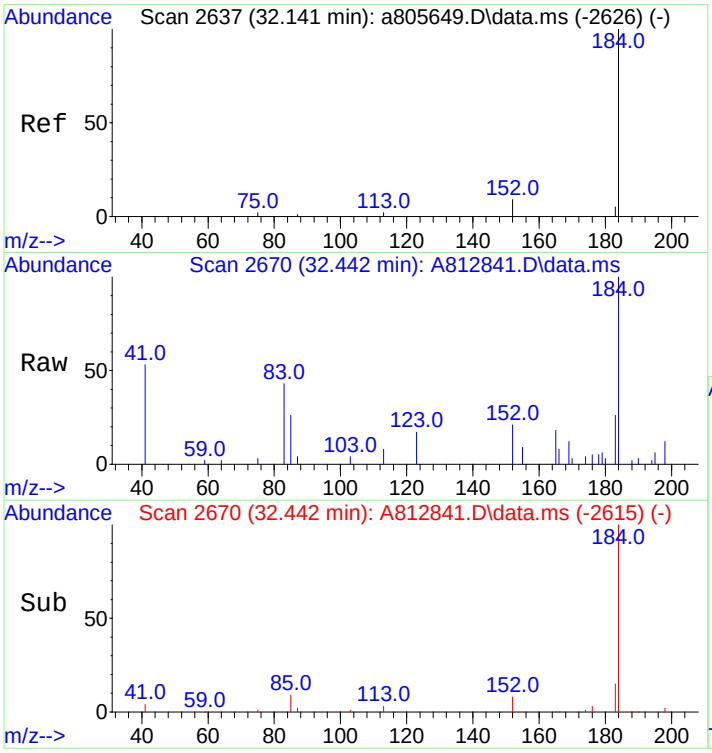


#32
C3-Fluorenes
Concen: 1121.76 ng/mL m
RT: 35.508 min Scan# 3006
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:208 Resp: 177157

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

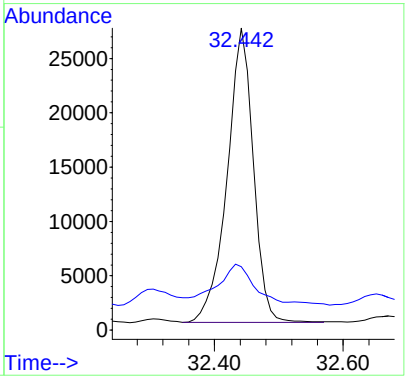


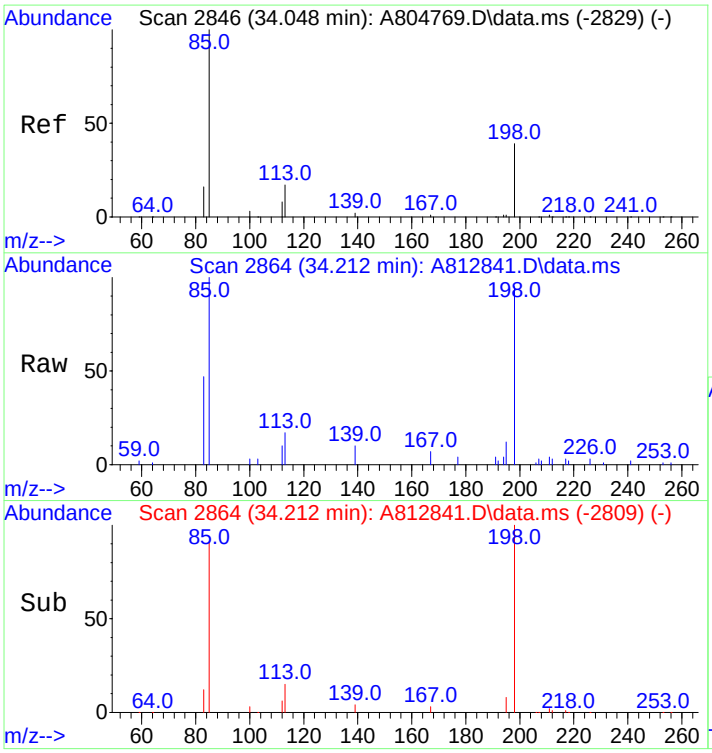


#33
Dibenzothiophene
Concen: 353.66 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:184 Resp: 76804

Ion	Ratio	Lower	Upper
184	100		
152	20.4	7.8	11.8#

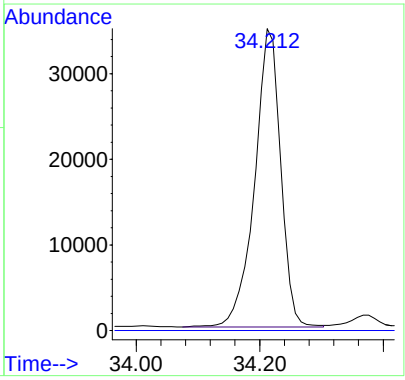


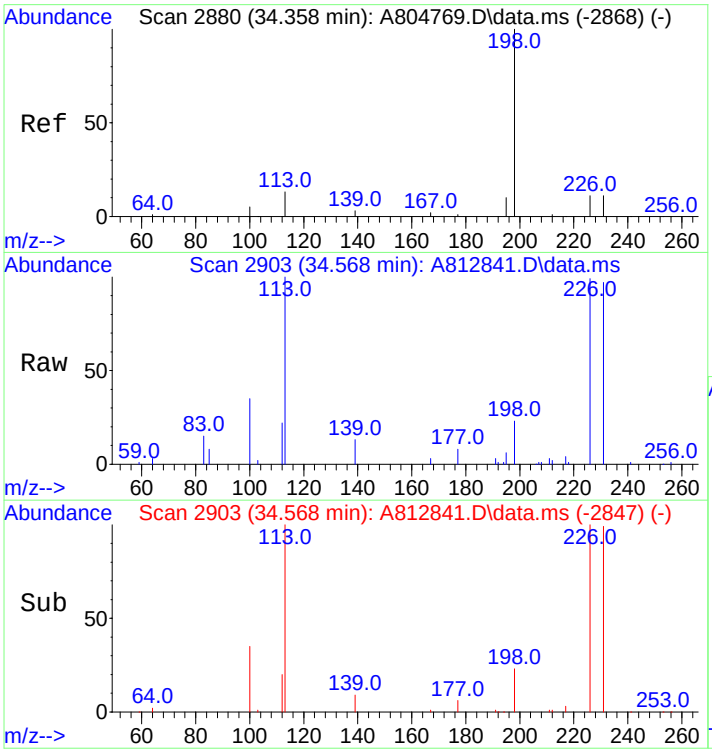


#34
4-Methyldibenzothiophene(4MDT)
Concen: 467.92 ng/mL
RT: 34.212 min Scan# 2864
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:198 Resp: 101617

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

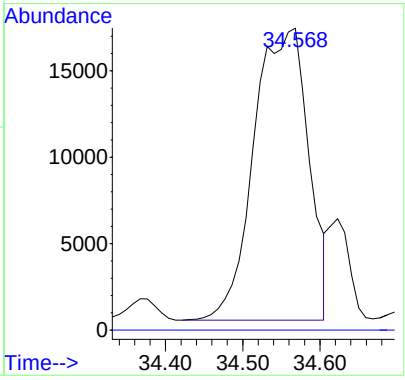


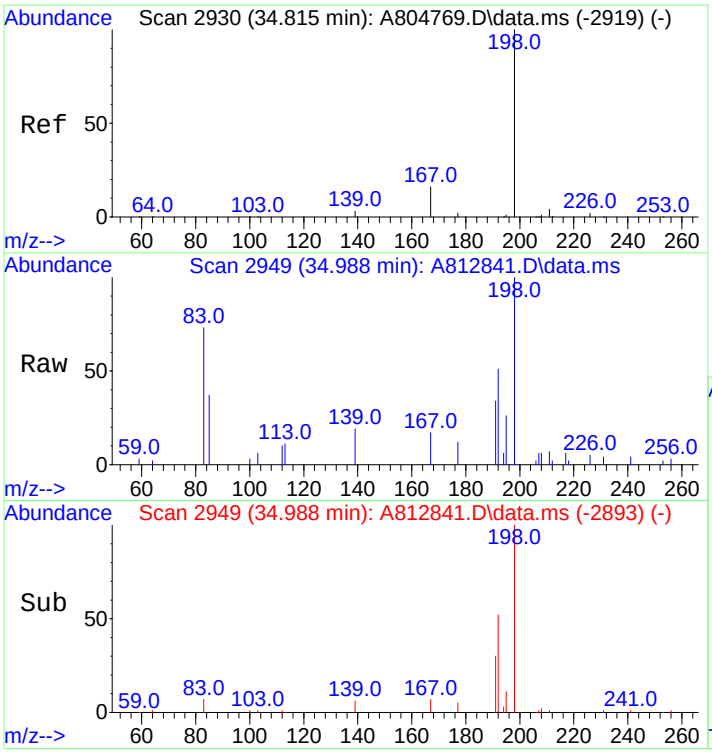


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 382.23 ng/mL
RT: 34.568 min Scan# 2903
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:198 Resp: 83008

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

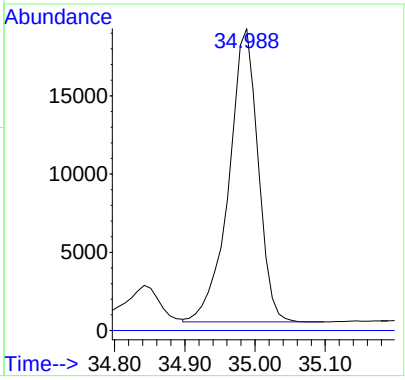


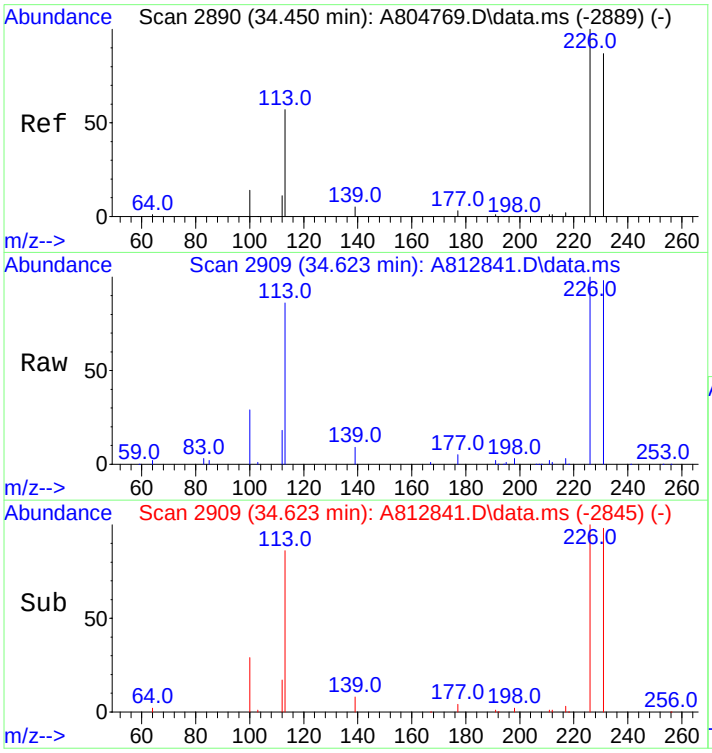


#36
1-Methyldibenzothiophene(1MDT)
Concen: 250.19 ng/mL
RT: 34.988 min Scan# 2949
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:198 Resp: 54333

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

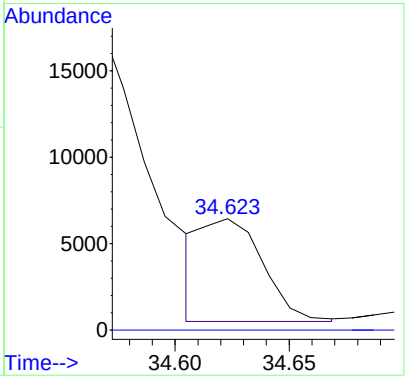


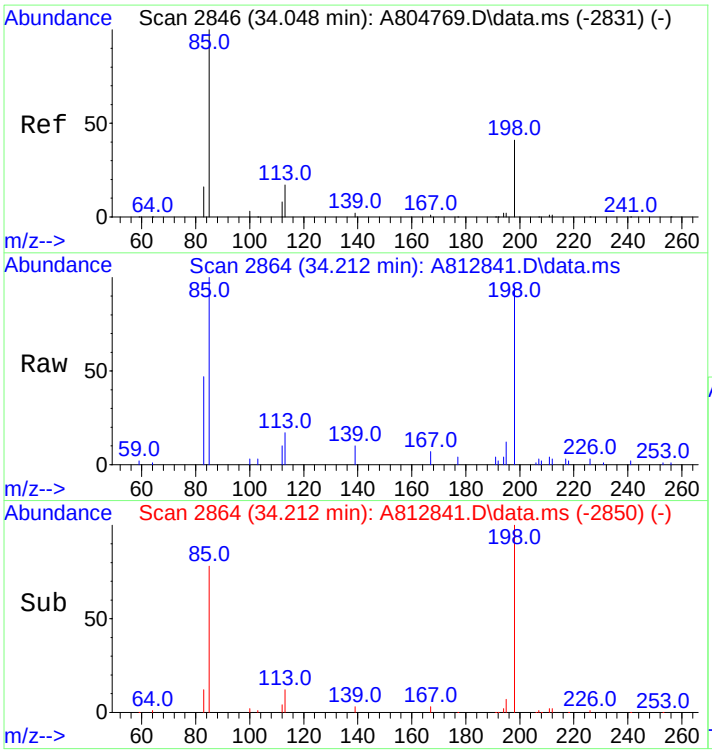


#37
OTP
Concen: 51.33 ng/mL m
RT: 34.623 min Scan# 2909
Delta R.T. 0.036 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:198 Resp: 11148

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

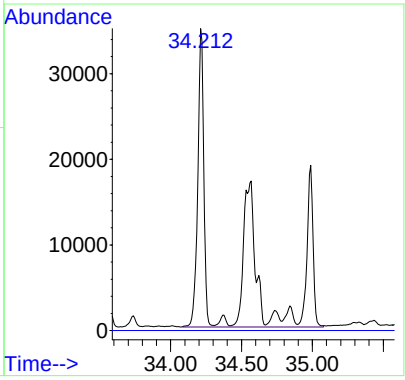


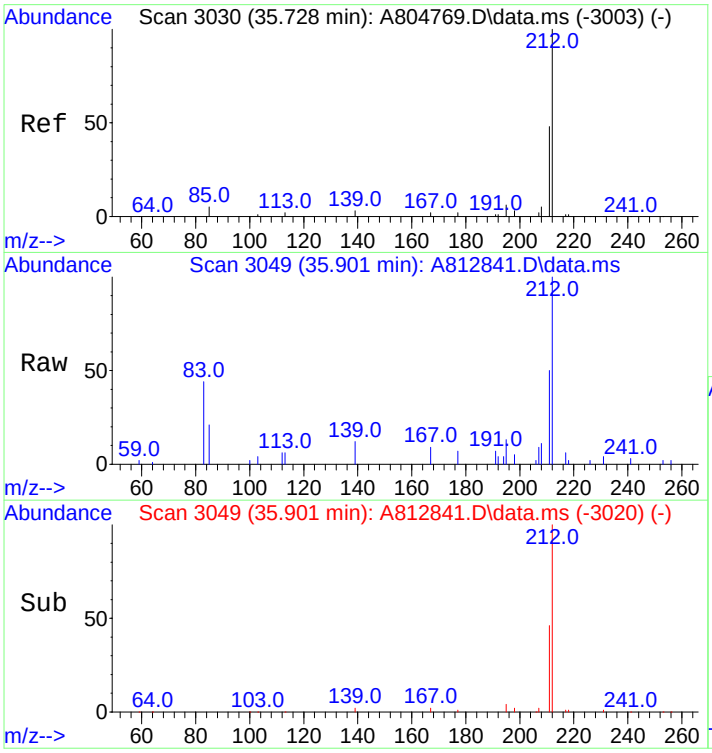


#38
C1-Dibenzothiophenes
Concen: 1262.87 ng/mL m
RT: 34.212 min Scan# 2864
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:198 Resp: 274258

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

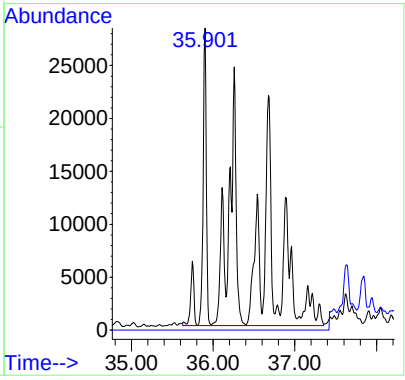


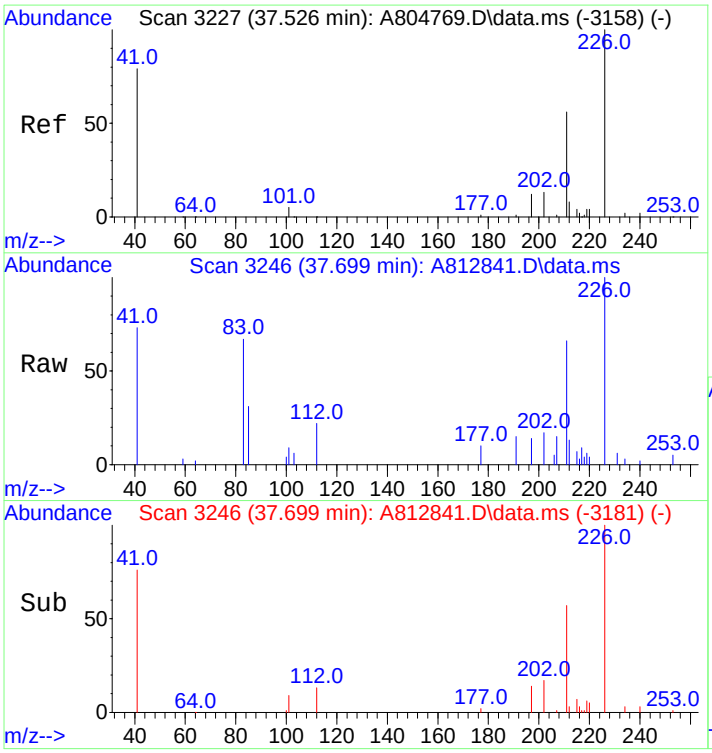


#39
C2-Dibenzothiophenes
Concen: 2269.02 ng/mL m
RT: 35.901 min Scan# 3049
Delta R.T. -0.356 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:212 Resp: 492762

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

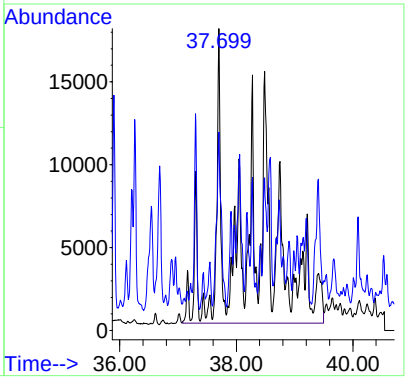


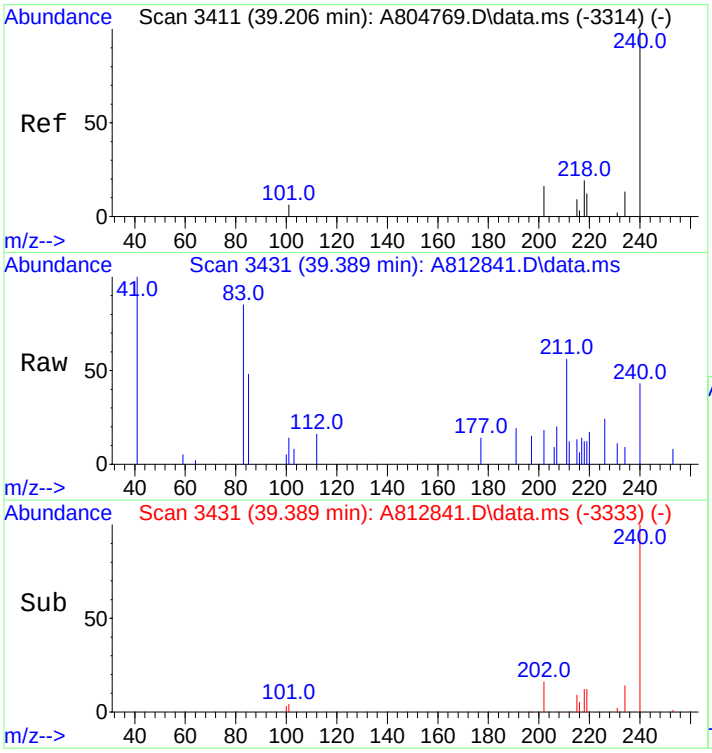


#40
C3-Dibenzothiophenes
Concen: 2343.92 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:226 Resp: 509028

Ion	Ratio	Lower	Upper
226	100		
211	3.2	50.2	75.2#

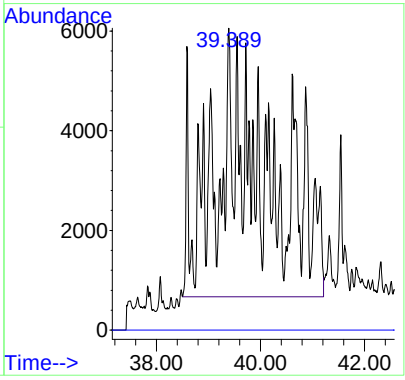


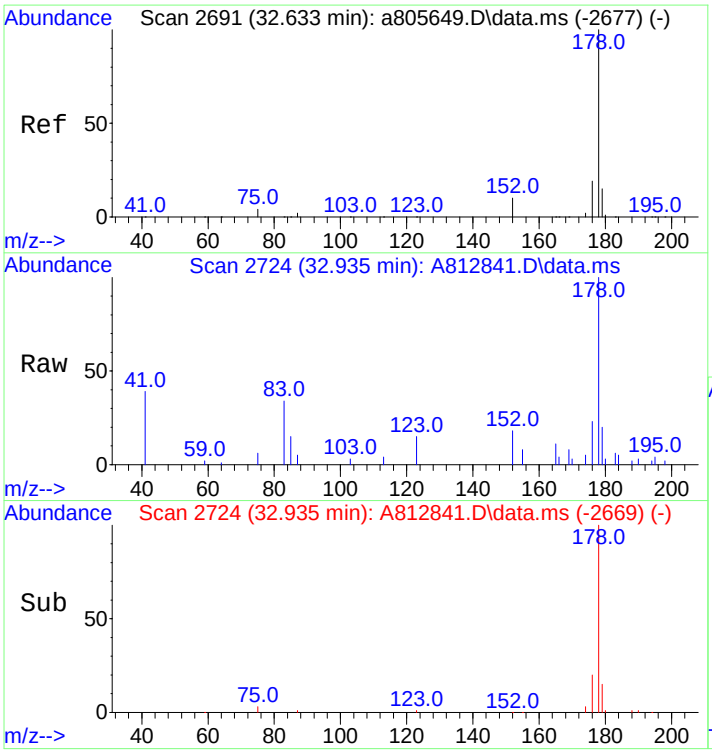


#41
C4-Dibenzothiophenes
Concen: 1597.49 ng/mL m
RT: 39.389 min Scan# 3431
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:240 Resp: 346927

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

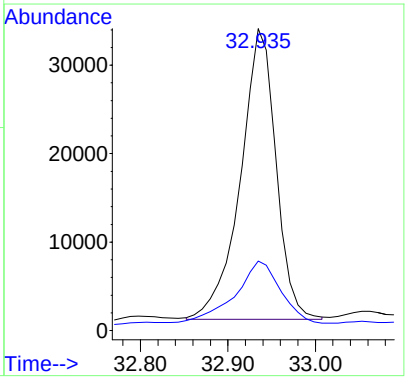


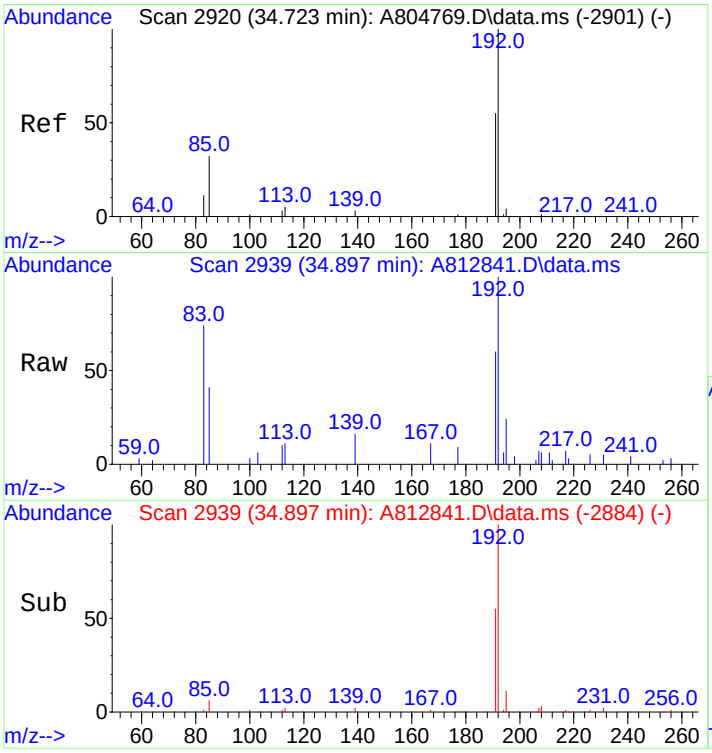


#43
Phenanthrene
Concen: 444.05 ng/mL m
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:178 Resp: 92817

Ion	Ratio	Lower	Upper
178	100		
176	0.4	15.2	22.8#

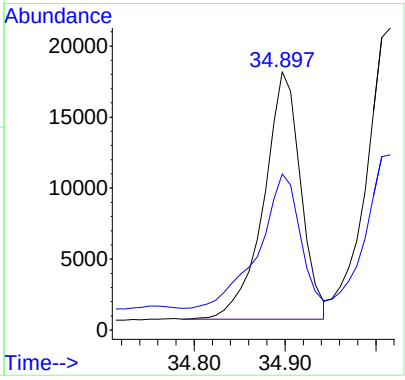


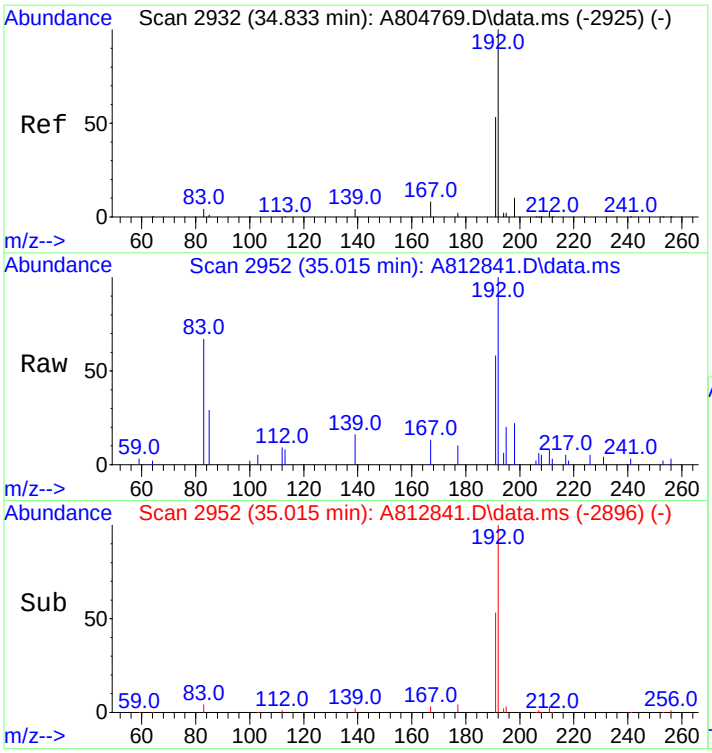


#44
3-Methylphenanthrene(3MP)
Concen: 235.17 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 49157

Ion	Ratio	Lower	Upper
192	100		
191	60.3	45.5	68.3

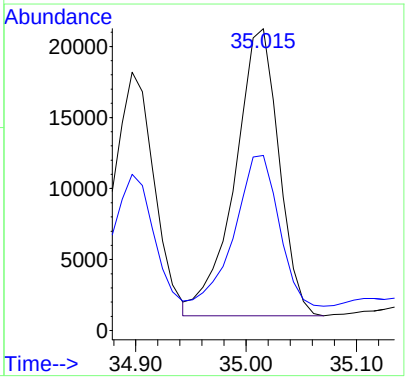


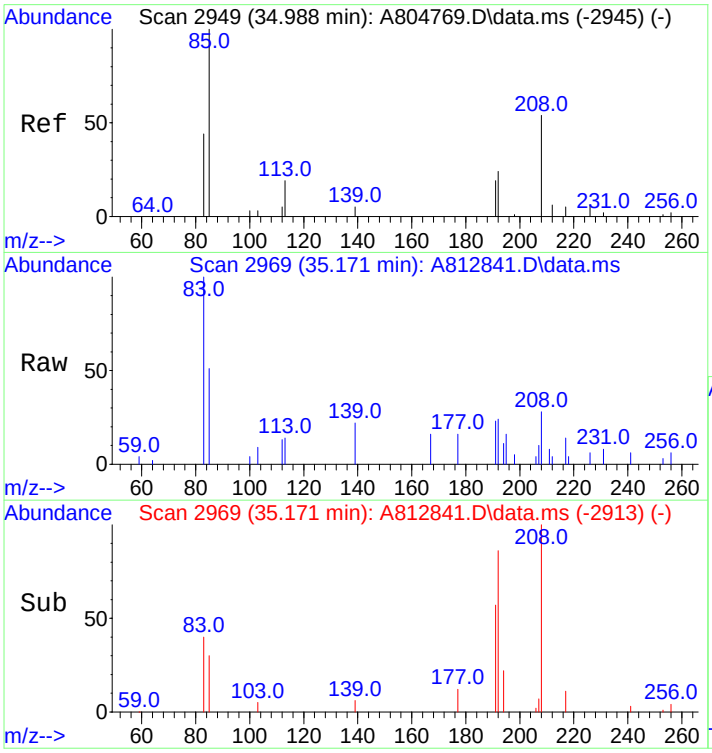


#45
2-Methylphenanthrene(2MP)
Concen: 268.88 ng/mL
RT: 35.015 min Scan# 2952
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 56203

Ion	Ratio	Lower	Upper
192	100		
191	52.7	44.6	67.0

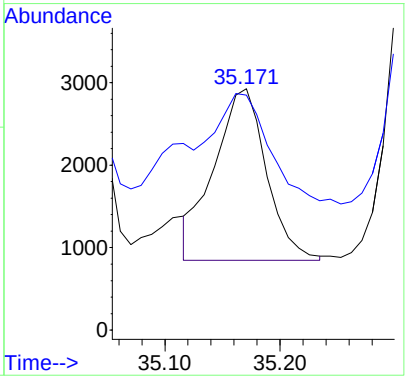


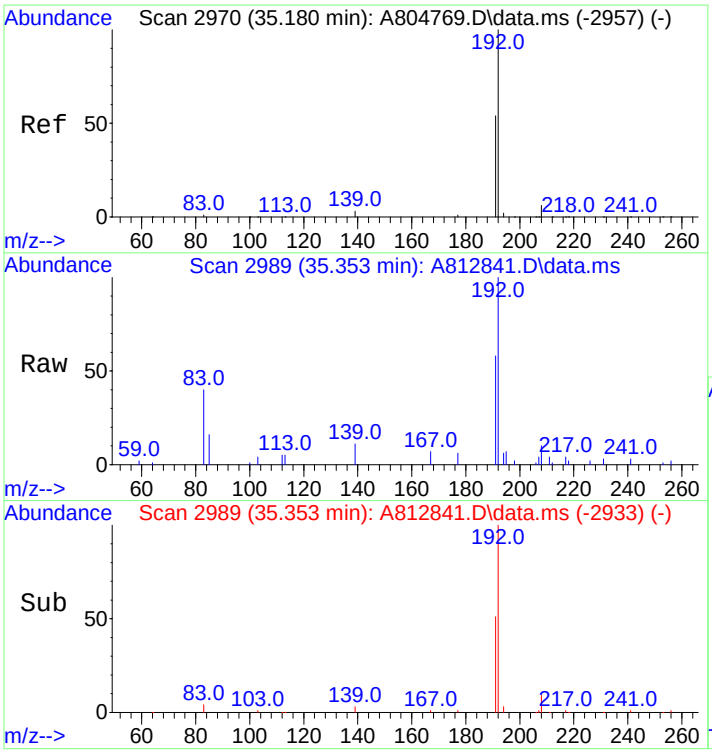


#46
2-Methylanthracene(2MA)
Concen: 31.46 ng/mL m
RT: 35.171 min Scan# 2969
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 6576

Ion	Ratio	Lower	Upper
192	100		
191	97.0	96.9	145.3

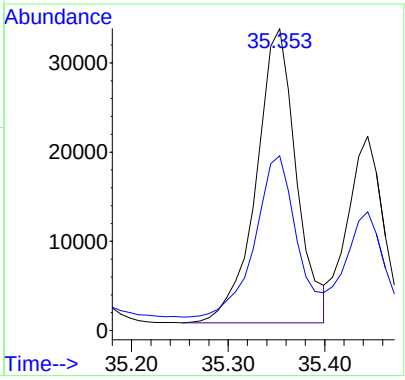


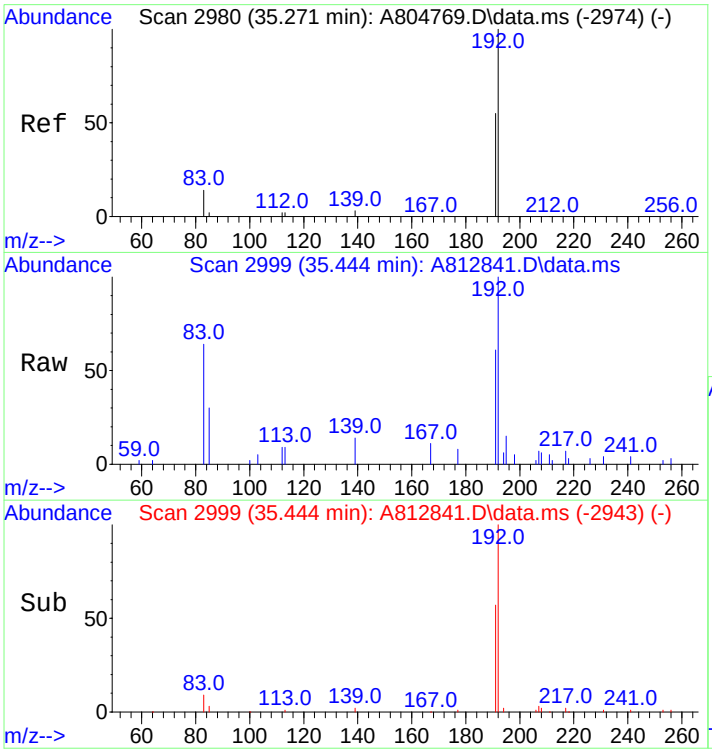


#47
9/4-Methylphenanthrene(9MP)
Concen: 457.00 ng/mL
RT: 35.353 min Scan# 2989
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 95525

Ion	Ratio	Lower	Upper
192	100		
191	56.4	44.5	66.7

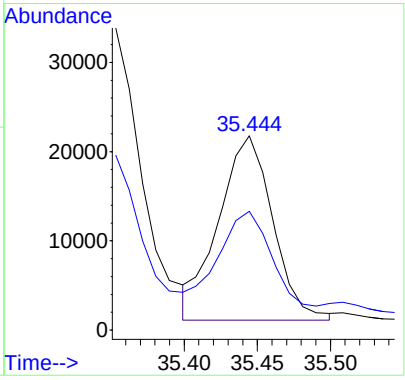


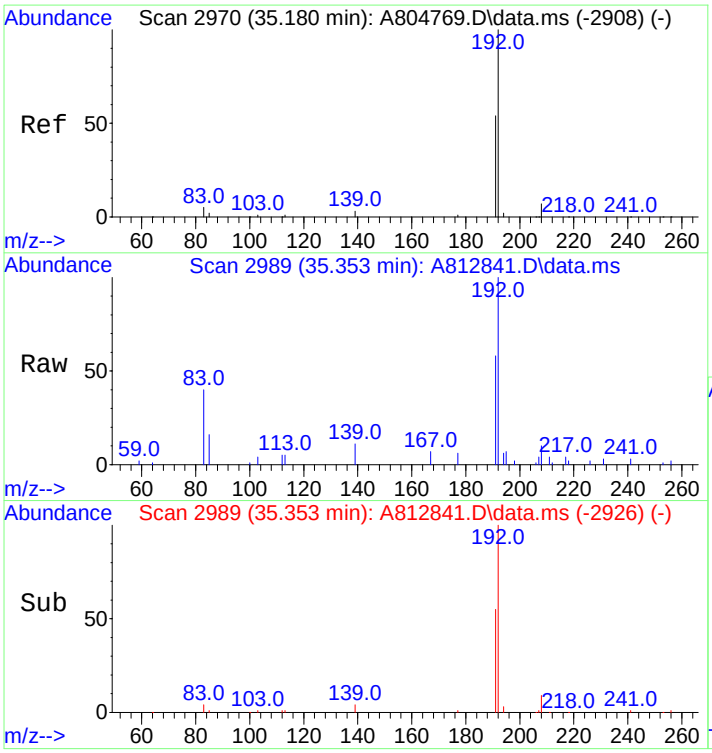


#48
1-Methylphenanthrene(1MP)
Concen: 254.82 ng/mL m
RT: 35.444 min Scan# 2999
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 53264

Ion	Ratio	Lower	Upper
192	100		
191	48.7	46.2	69.4

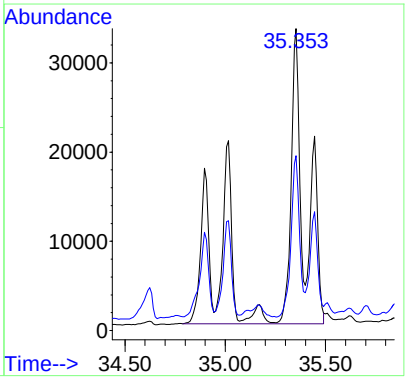


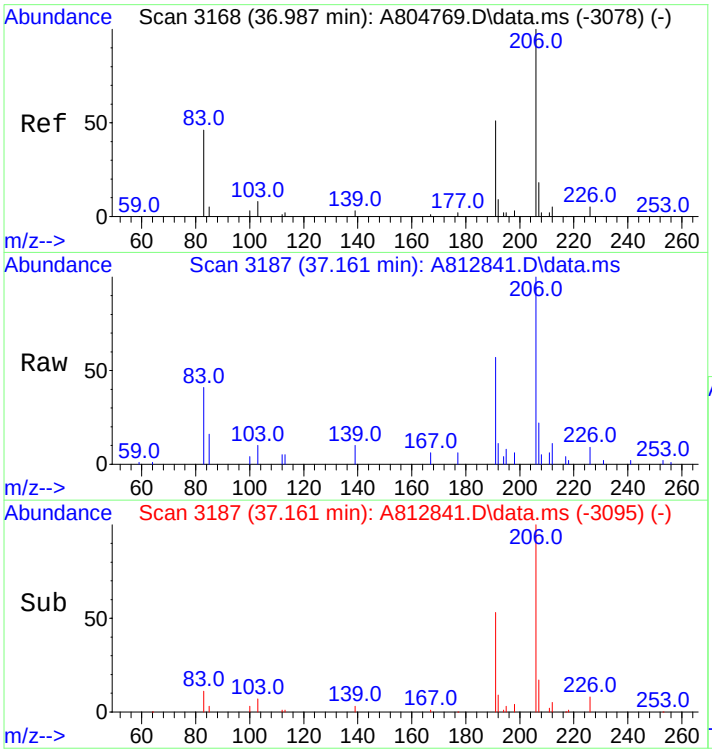


#49
C1-Phenanthrenes/Anthracenes
Concen: 1278.28 ng/mL m
RT: 35.353 min Scan# 2989
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 267192

Ion	Ratio	Lower	Upper
192	100		
191	20.2	44.5	66.7#

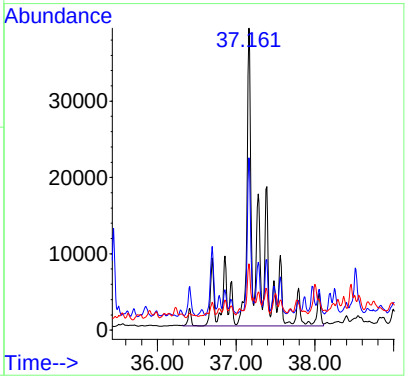


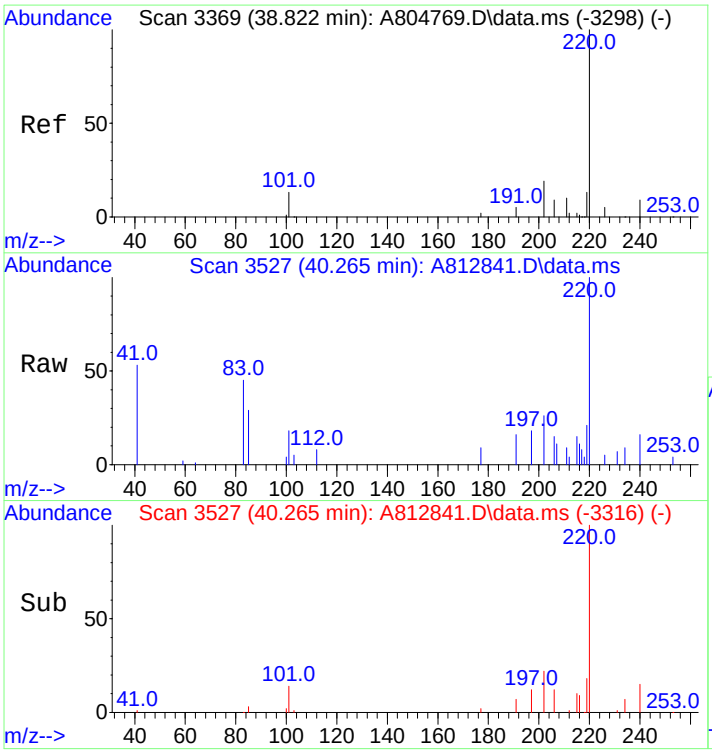


#50
C2-Phenanthrenes/Anthracenes
Concen: 1879.44 ng/mL m
RT: 37.161 min Scan# 3187
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:206 Resp: 392849

Ion	Ratio	Lower	Upper
206	100		
191	3.3	42.0	63.0#
207	1.3	16.2	24.4#

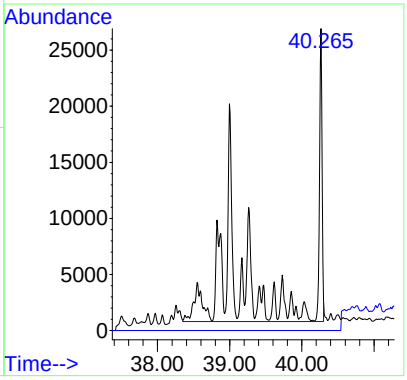


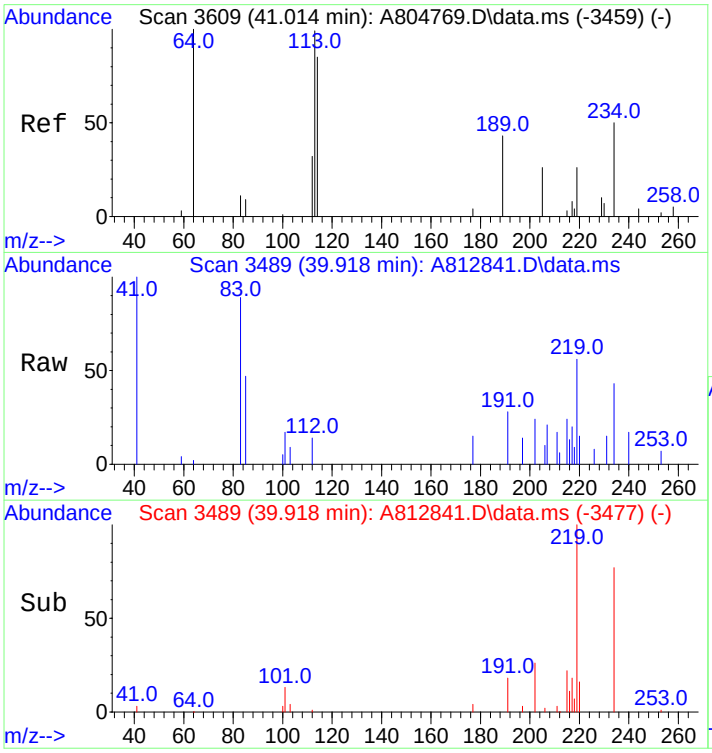


#52
C3-Phenanthrenes/Anthracenes
Concen: 1562.42 ng/mL m
RT: 40.265 min Scan# 3527
Delta R.T. 1.269 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:220 Resp: 326583

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

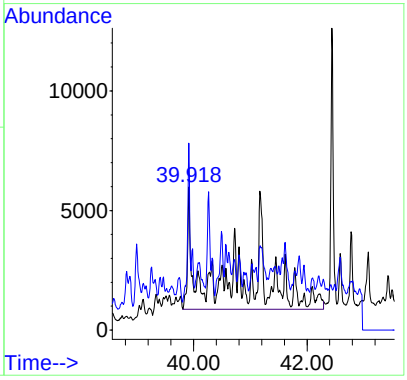


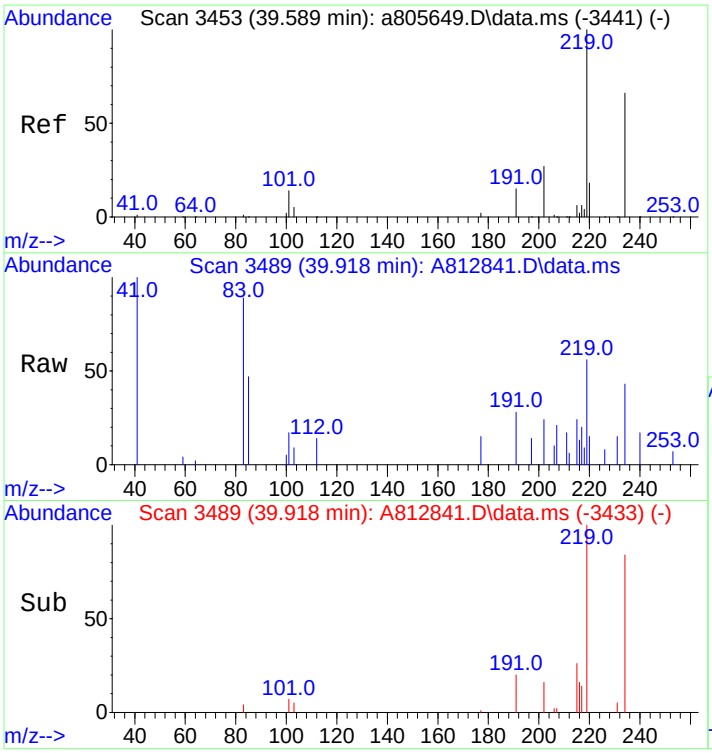


#53
C4-Phenanthrenes/Anthracenes
Concen: 737.96 ng/mL m
RT: 39.918 min Scan# 3489
Delta R.T. -1.260 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:234 Resp: 154251

Ion	Ratio	Lower	Upper
234	100		
219	2.4	52.3	78.5#

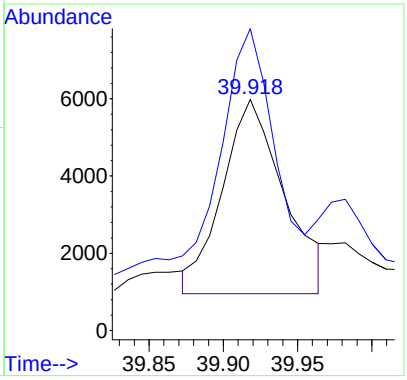


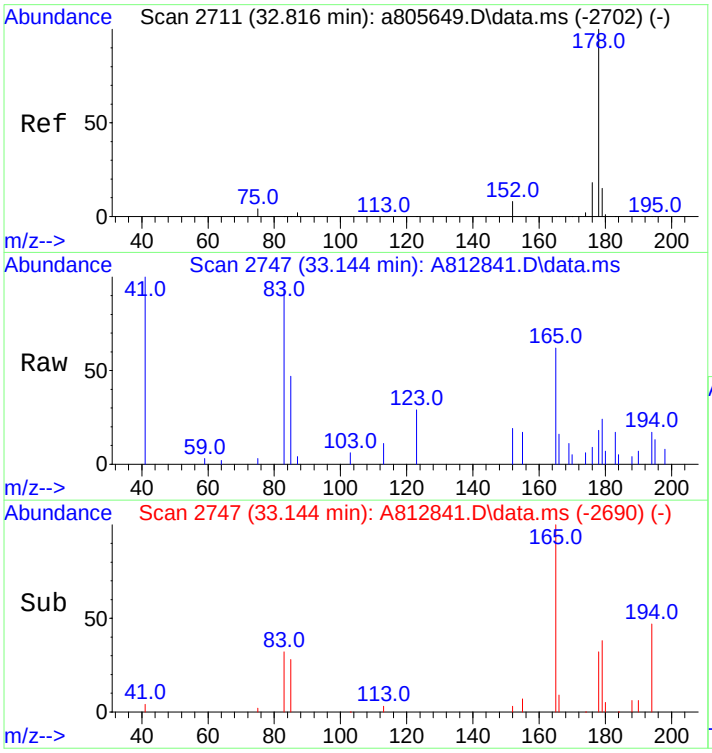


#54
Retene
Concen: 300.01 ng/mL m
RT: 39.918 min Scan# 3489
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:234 Resp: 14543

Ion	Ratio	Lower	Upper
234	100		
219	7.4	124.0	186.0#

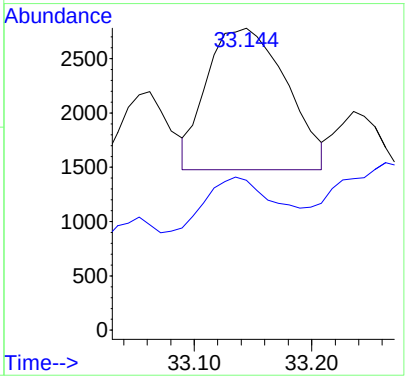


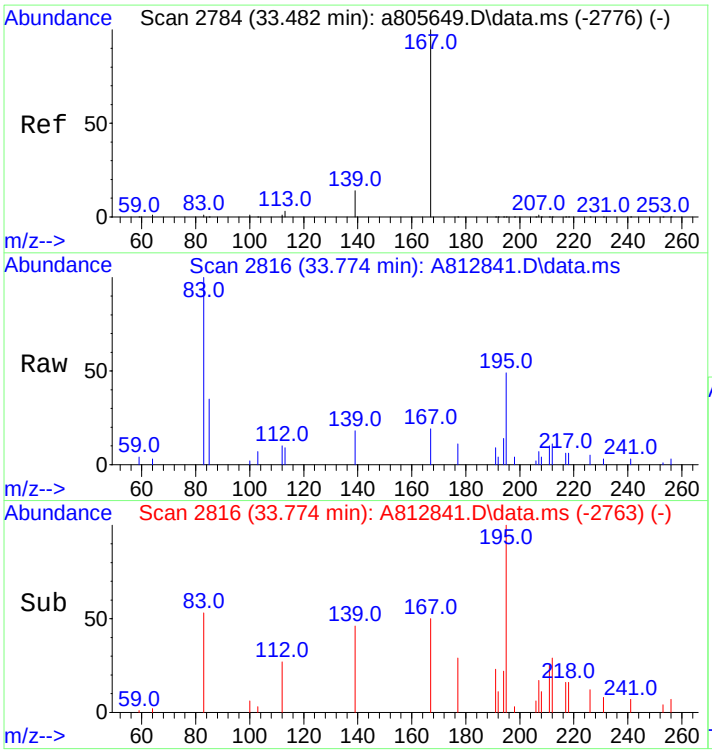


#55
Anthracene
Concen: 31.53 ng/mL m
RT: 33.144 min Scan# 2747
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:178 Resp: 6140

Ion	Ratio	Lower	Upper
178	100		
176	29.0	14.3	21.5#

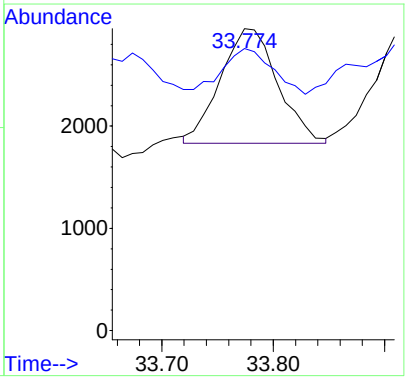


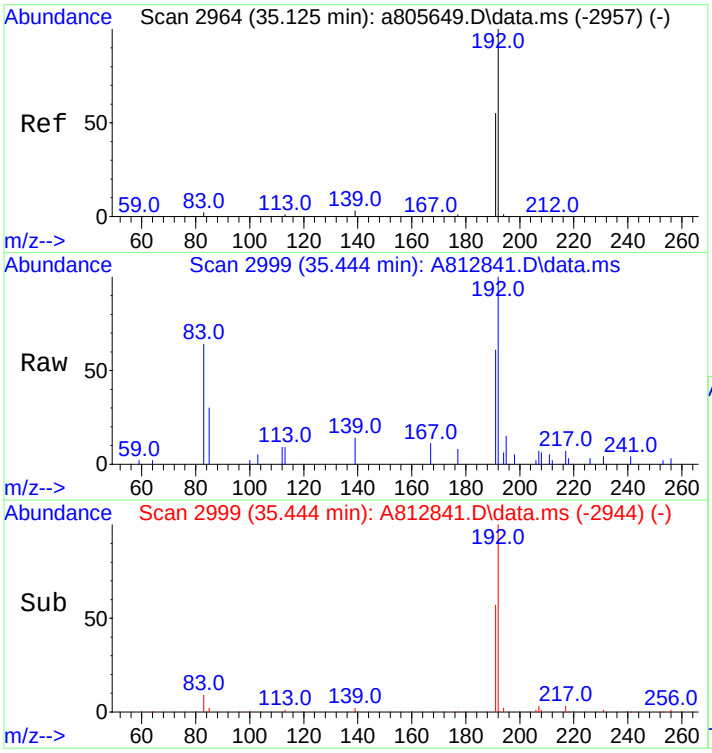


#56
Carbazole
Concen: 19.73 ng/mL m
RT: 33.774 min Scan# 2816
Delta R.T. -0.019 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:167 Resp: 4009

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.6	16.0#

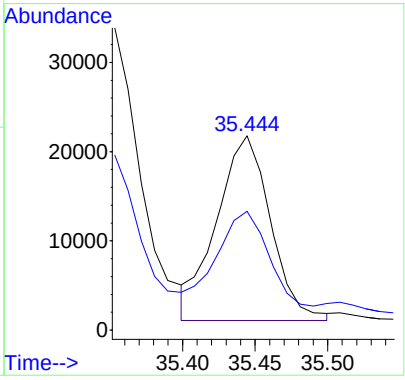


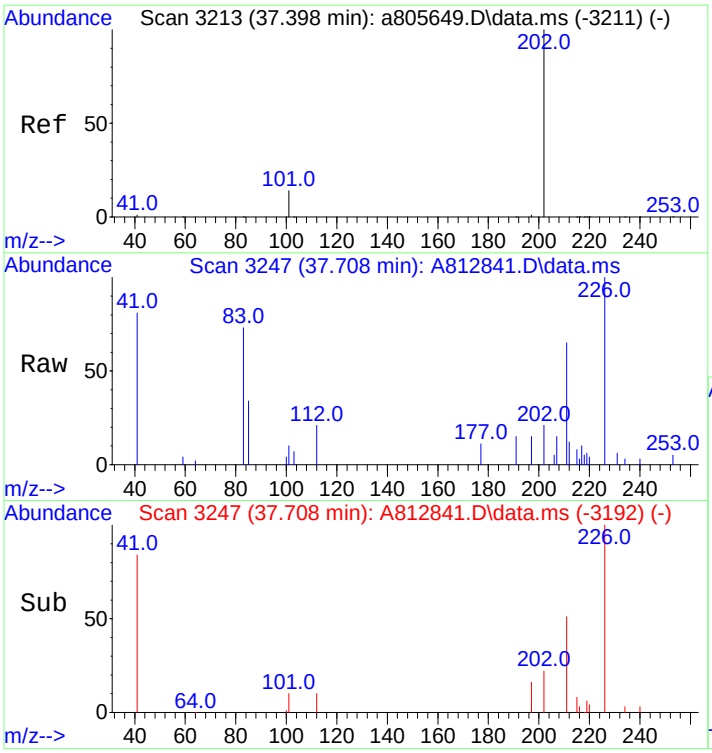


#57
1-Methylphenanthrene
Concen: 361.19 ng/mL m
RT: 35.444 min Scan# 2999
Delta R.T. -0.001 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:192 Resp: 53517

Ion	Ratio	Lower	Upper
192	100		
191	48.5	44.2	66.4

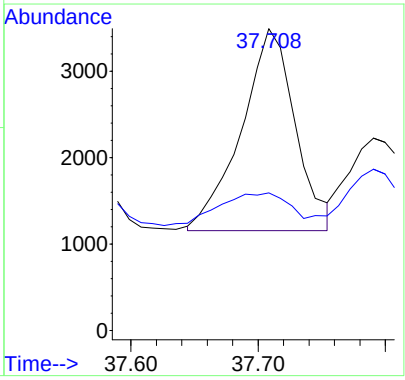


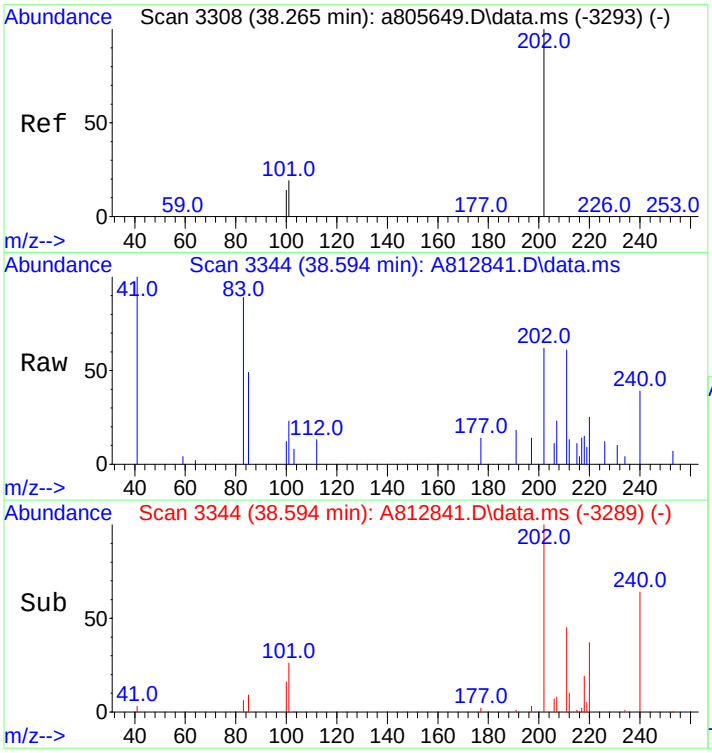


#58
Fluoranthene
Concen: 31.99 ng/mL m
RT: 37.708 min Scan# 3247
Delta R.T. -0.001 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:202 Resp: 6888

Ion	Ratio	Lower	Upper
202	100		
101	0.0	13.6	20.4#

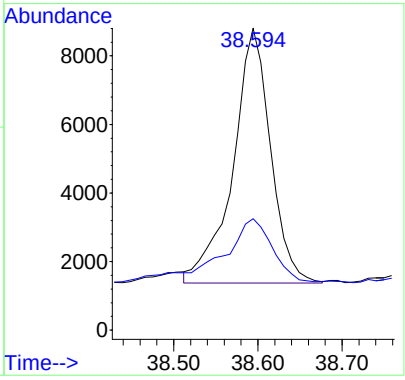


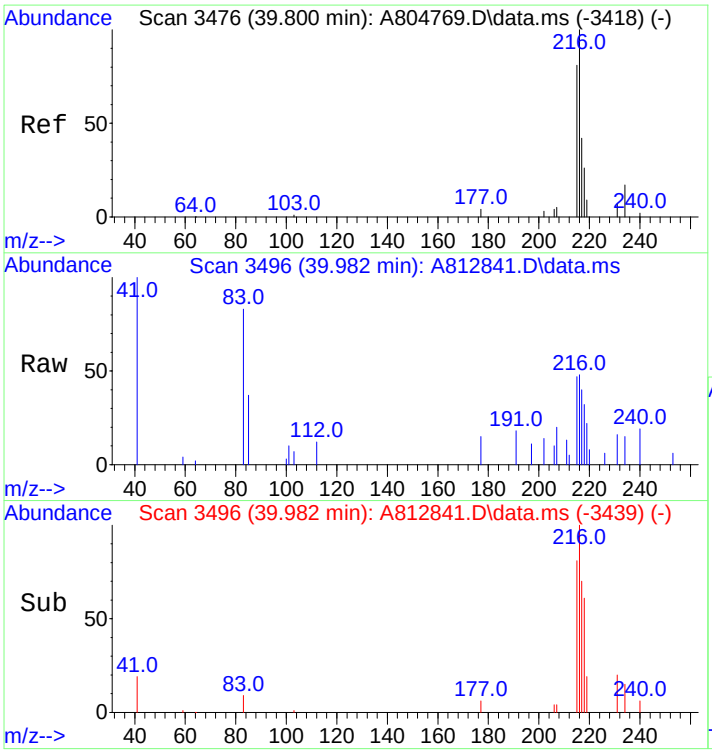


#60
Pyrene
Concen: 106.11 ng/mL m
RT: 38.594 min Scan# 3344
Delta R.T. 0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:202 Resp: 23109

Ion	Ratio	Lower	Upper
202	100		
101	38.4	15.4	23.2#

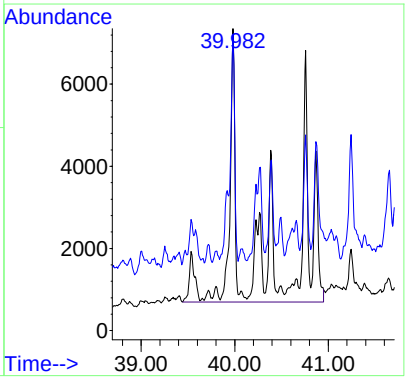


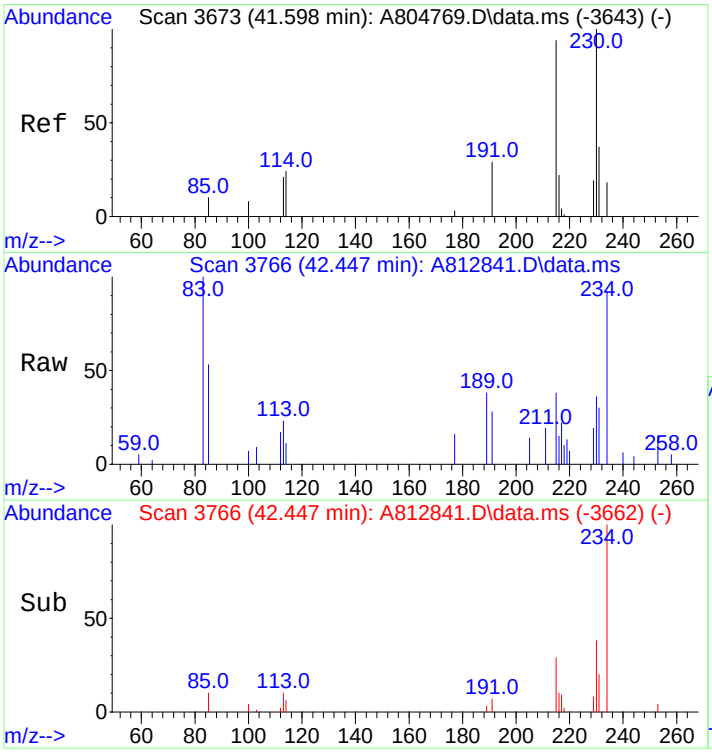


#61
C1-Fluoranthenes/Pyrenes
Concen: 392.36 ng/mL m
RT: 39.982 min Scan# 3496
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:216 Resp: 85448

Ion	Ratio	Lower	Upper
216	100		
215	0.9	73.8	110.6#

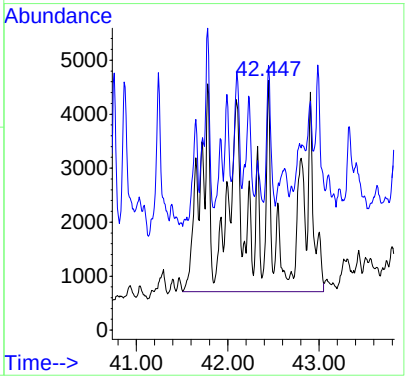


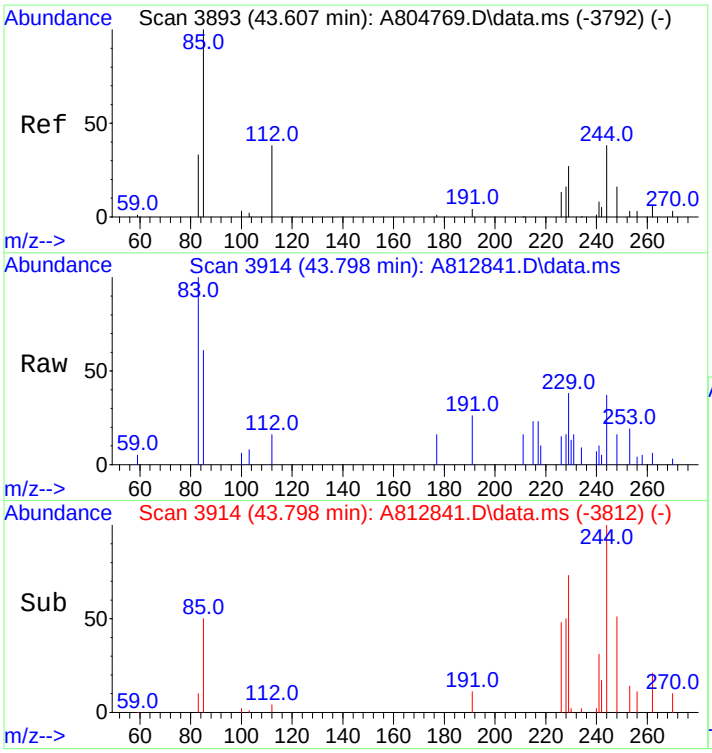


#62
C2-Fluoranthenes/Pyrenes
Concen: 555.97 ng/mL m
RT: 42.447 min Scan# 3766
Delta R.T. 0.675 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:230 Resp: 121078

Ion	Ratio	Lower	Upper
230	100		
215	7.5	93.1	139.7#

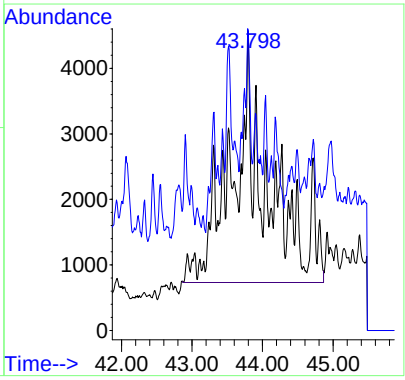


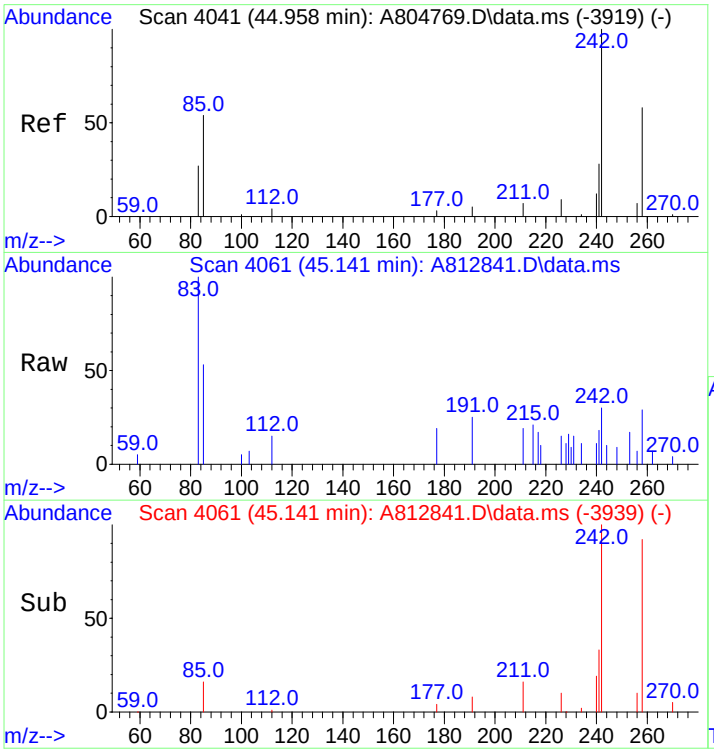


#63
C3-Fluoranthenes/Pyrenes
Concen: 596.81 ng/mL m
RT: 43.798 min Scan# 3914
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:244 Resp: 129973

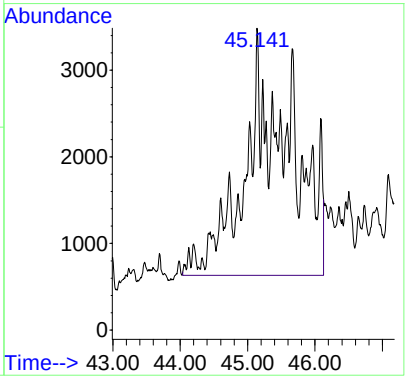
Ion	Ratio	Lower	Upper
244	100		
229	2.5	76.2	114.2#

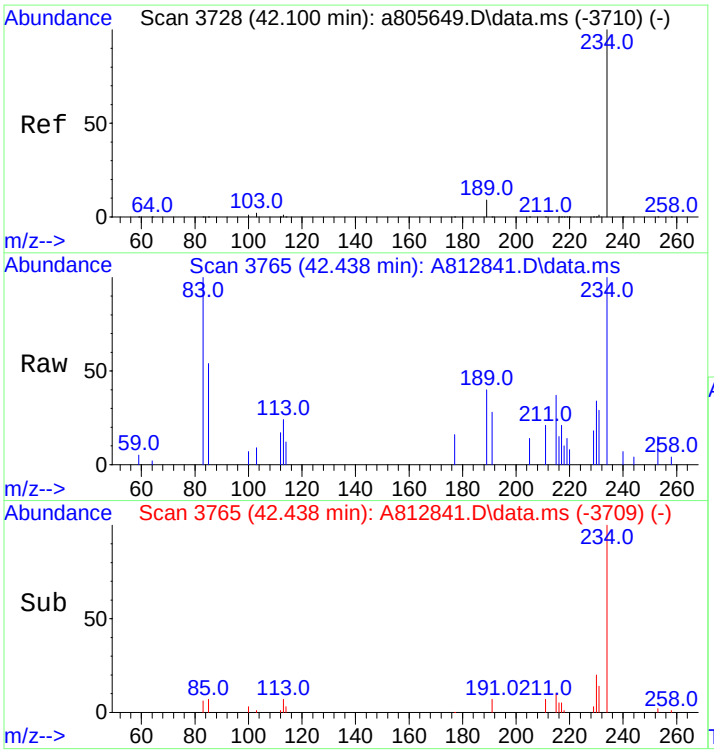




#64
C4-Fluoranthenes/Pyrenes
Concen: 585.27 ng/mL m
RT: 45.141 min Scan# 4061
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:258 Resp: 127459

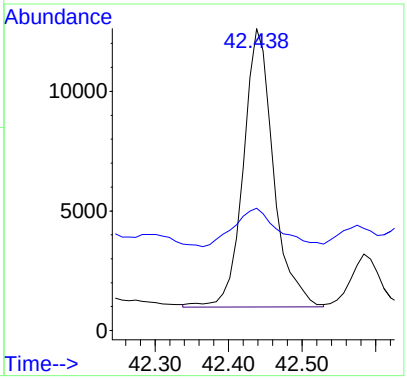


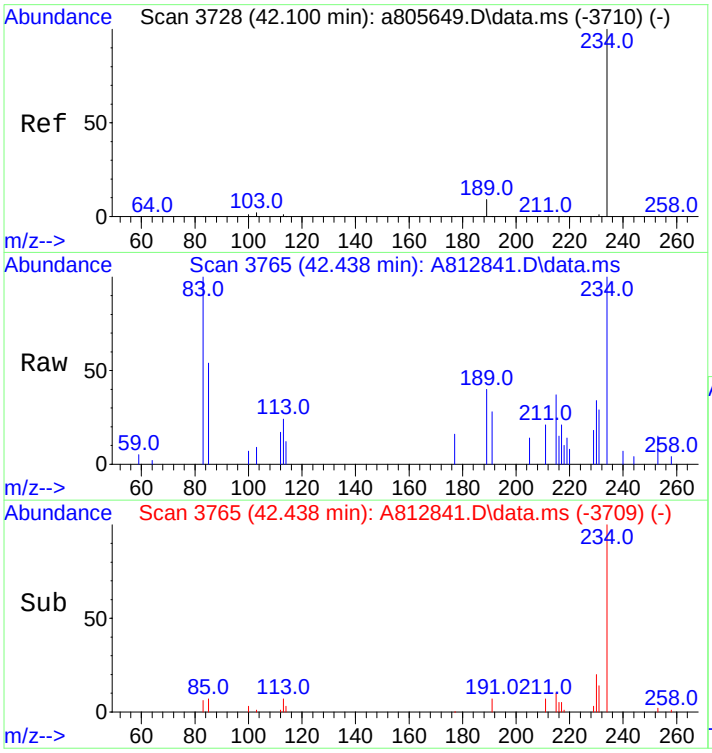


#66
Naphthobenzothiophene
Concen: 164.86 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:234 Resp: 33329

Ion	Ratio	Lower	Upper
234	100		
189	19.9	22.3	33.5#

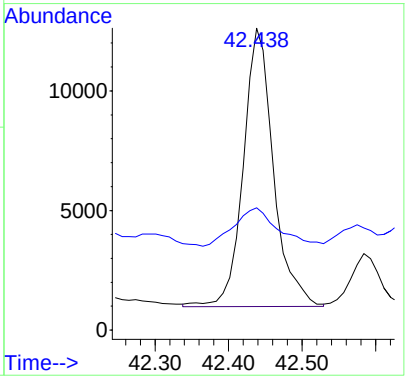


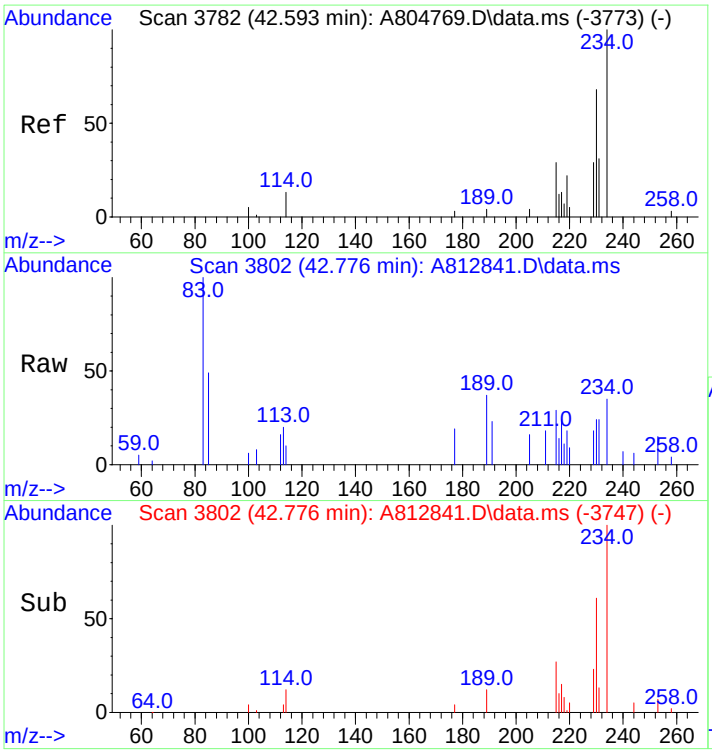


#67
Naphthobenzothiophene-2,1-D
Concen: 164.86 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:234 Resp: 33329

Ion	Ratio	Lower	Upper
234	100		
189	19.9	22.3	33.5#

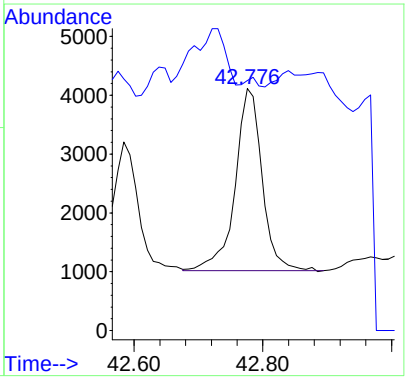


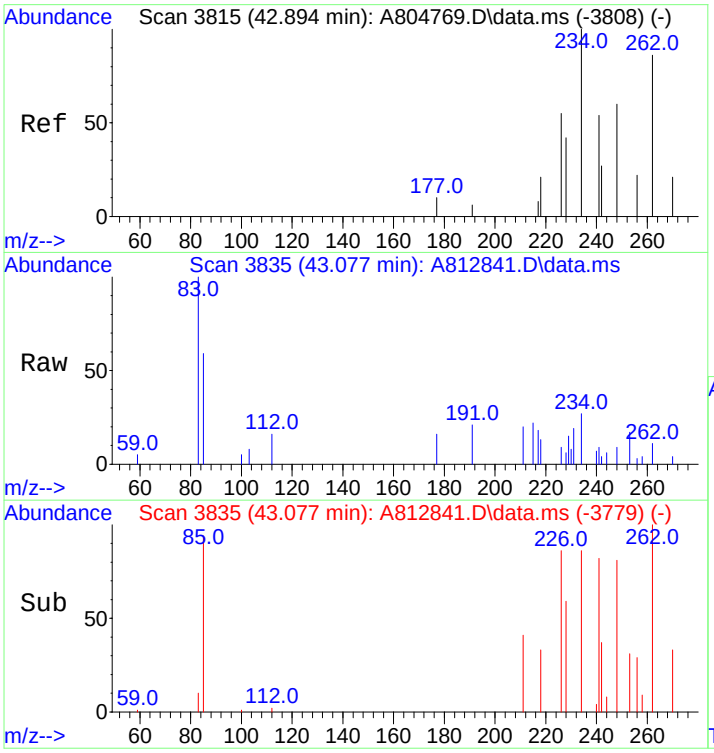


#68
Naphthobenzothiophene-1,2-D
Concen: 44.61 ng/mL
RT: 42.776 min Scan# 3802
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:234 Resp: 9019

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

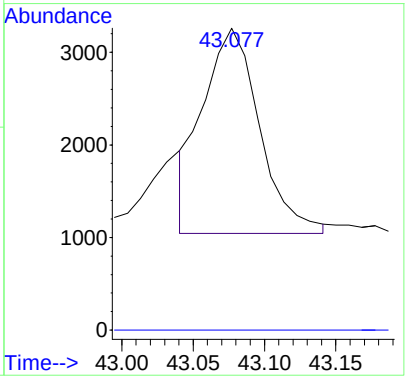


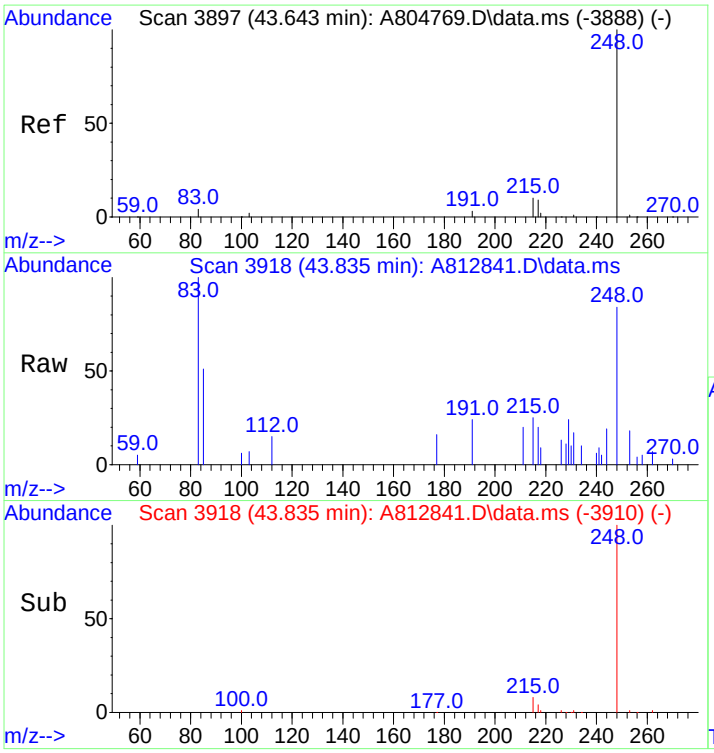


#69
Naphthobenzothiophene-2,3-D
Concen: 30.41 ng/mL m
RT: 43.077 min Scan# 3835
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:234 Resp: 6147

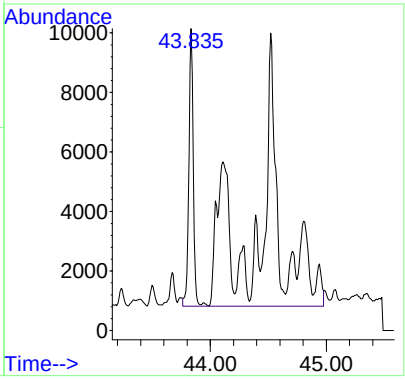
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

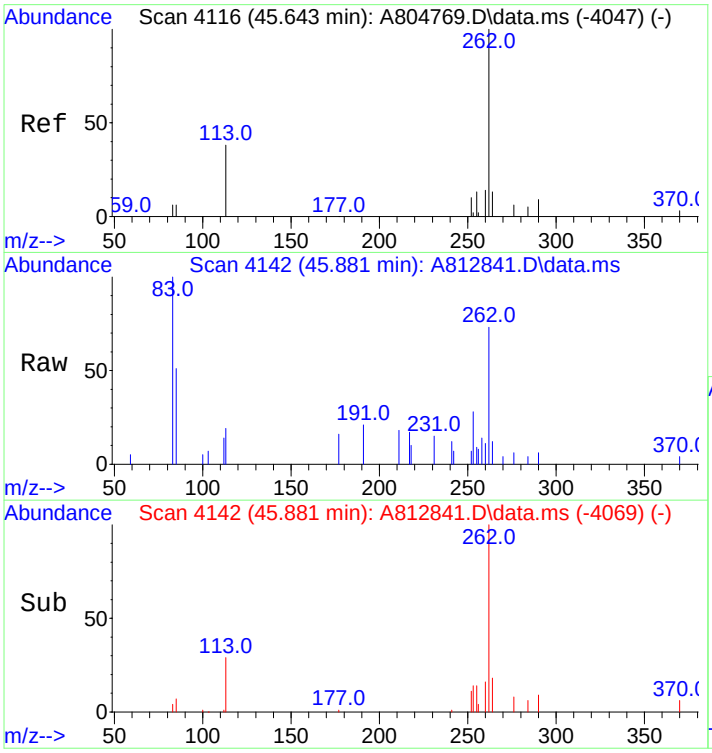




#70
C1-Naphthobenzothiophenes
Concen: 732.05 ng/ml m
RT: 43.835 min Scan# 3918
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

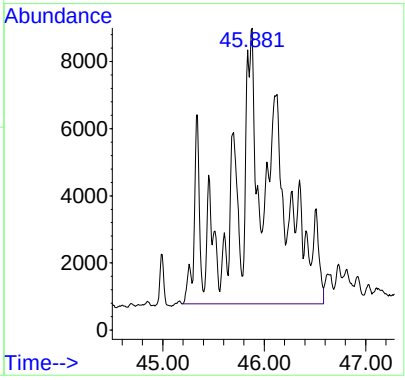
Tgt Ion:248 Resp: 147993

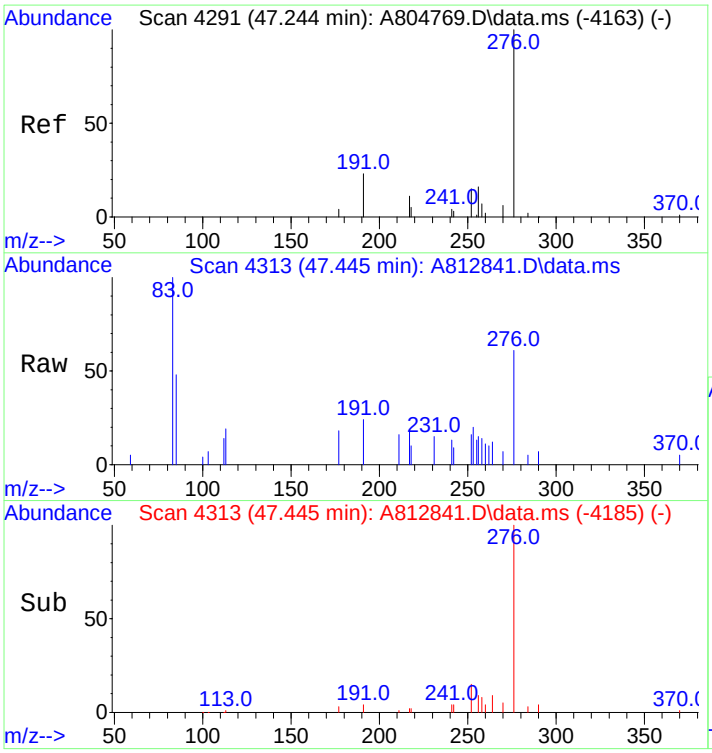




#71
C2-Naphthobenzothiophenes
Concen: 1126.11 ng/ml m
RT: 45.881 min Scan# 4142
Delta R.T. 0.055 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

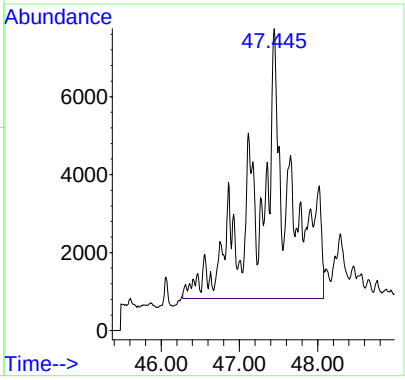
Tgt Ion:262 Resp: 227658

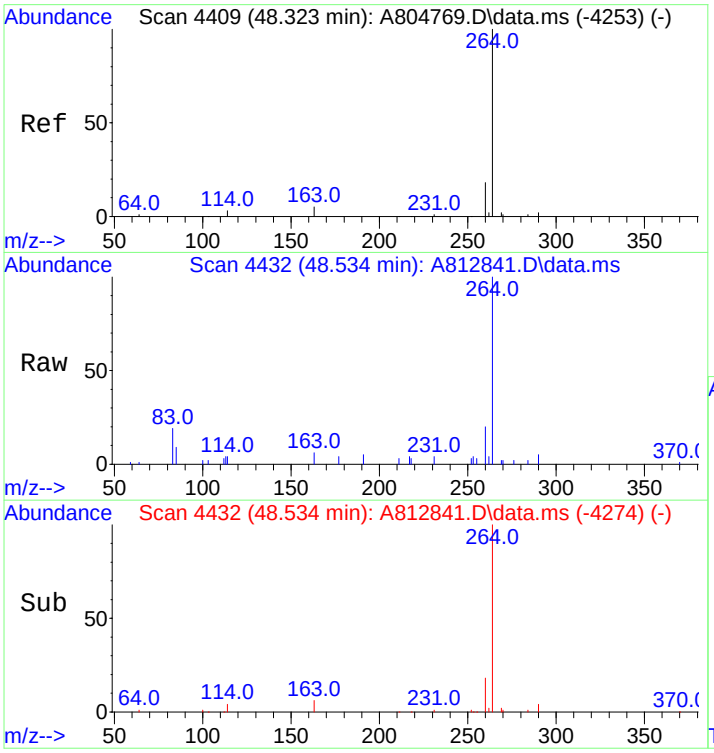




#72
C3-Naphthobenzothiophenes
Concen: 984.36 ng/ml m
RT: 47.445 min Scan# 4313
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

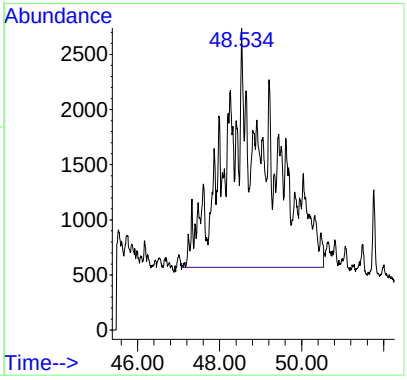
Tgt Ion:276 Resp: 199000

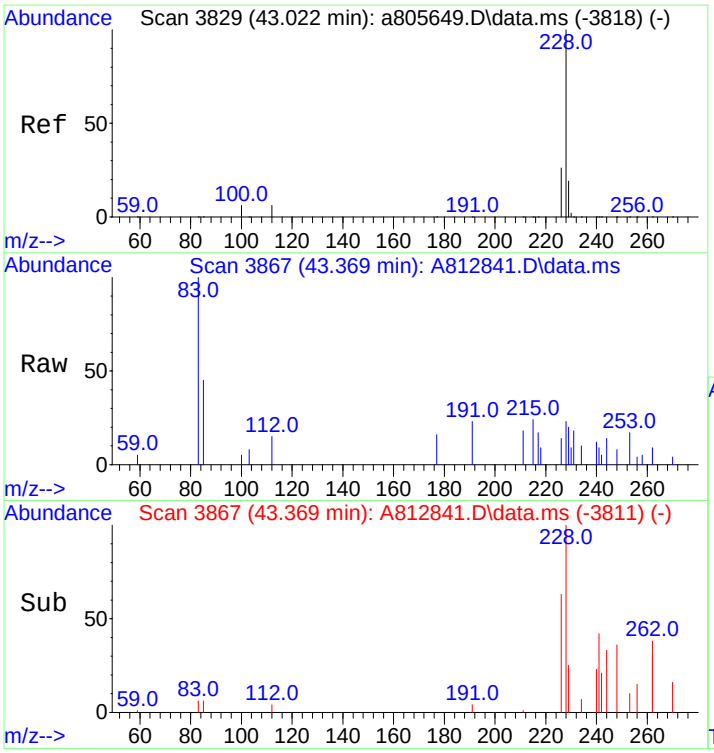




#73
C4-Naphthobenzothiophenes
Concen: 770.85 ng/mL m
RT: 48.534 min Scan# 4432
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:290 Resp: 155837

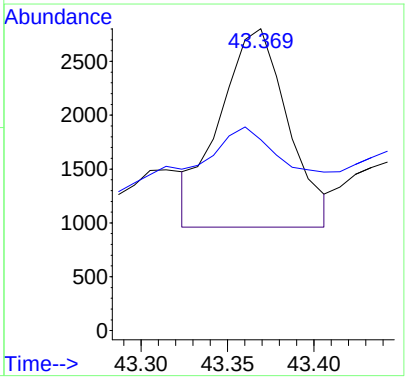


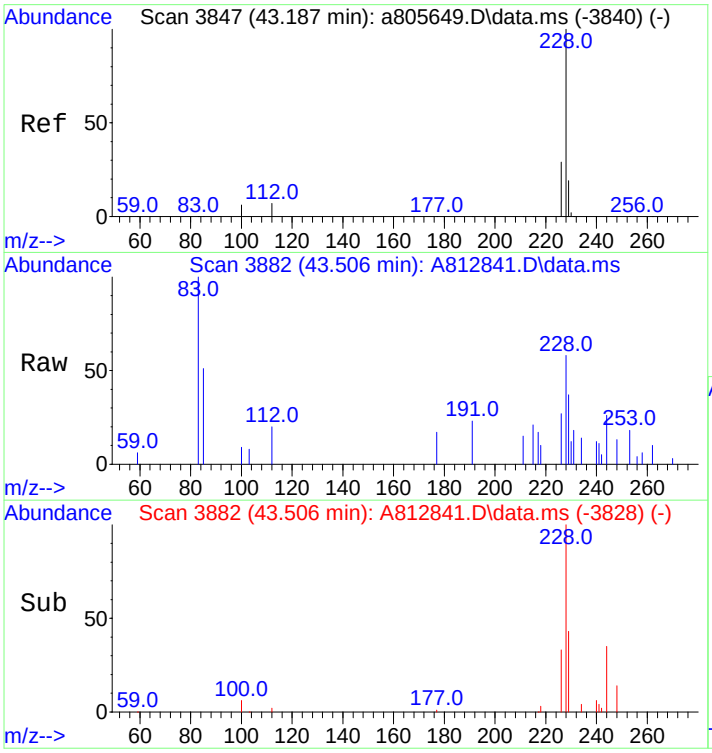


#75
Benz[a]anthracene
Concen: 23.70 ng/mL m
RT: 43.369 min Scan# 3867
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:228 Resp: 5065

Ion	Ratio	Lower	Upper
228	100		
226	135.3	21.3	31.9#

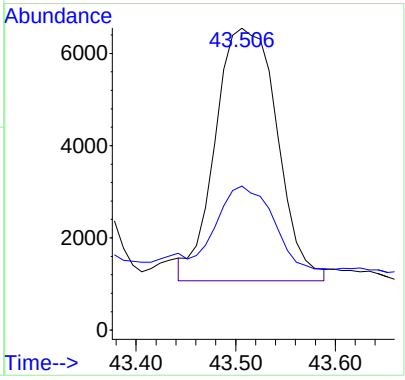


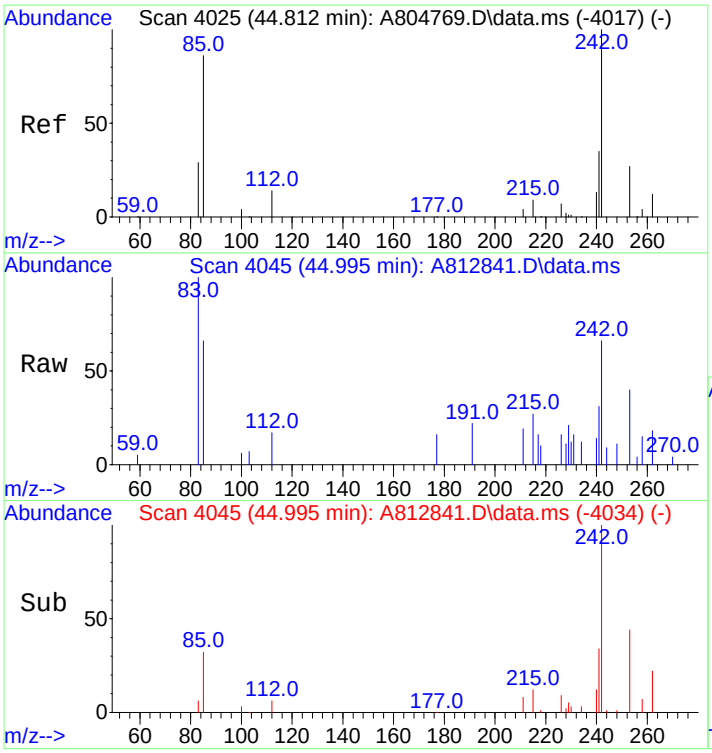


#77
Chrysene/Triphenylene
Concen: 108.90 ng/mL m
RT: 43.506 min Scan# 3882
Delta R.T. -0.010 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:228 Resp: 23562

Ion	Ratio	Lower	Upper
228	100		
226	35.3	23.6	35.4

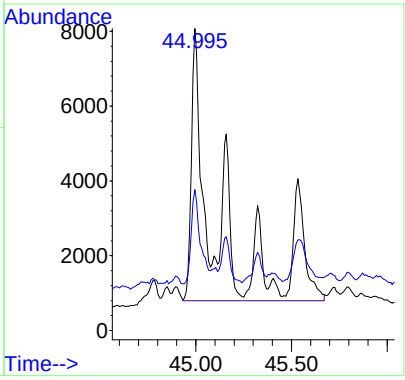


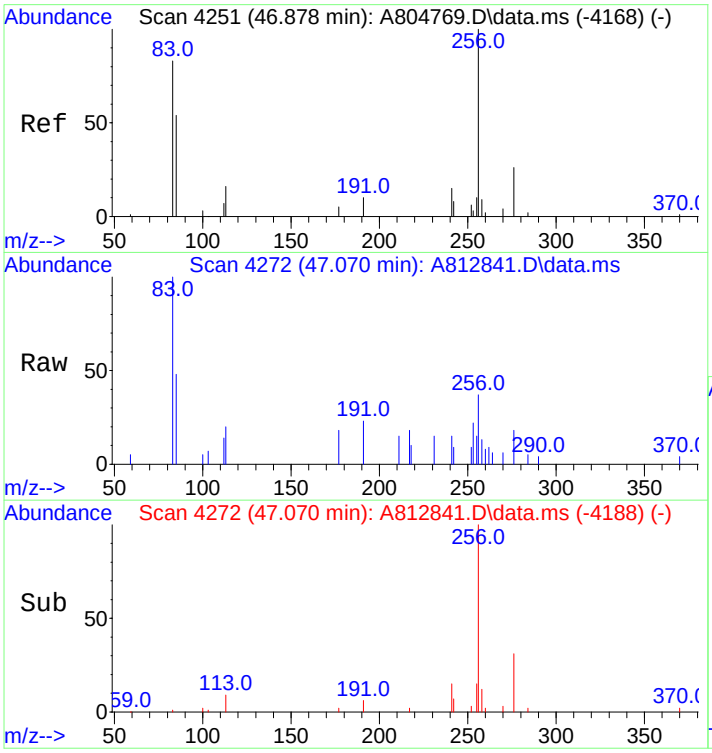


#78
C1-Chrysenes
Concen: 290.89 ng/mL m
RT: 44.995 min Scan# 4045
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:242 Resp: 62939

Ion	Ratio	Lower	Upper
242	100		
241	13.5	33.5	50.3#

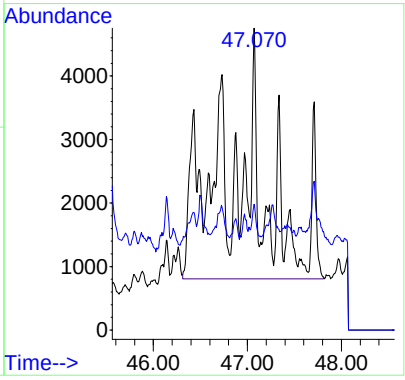


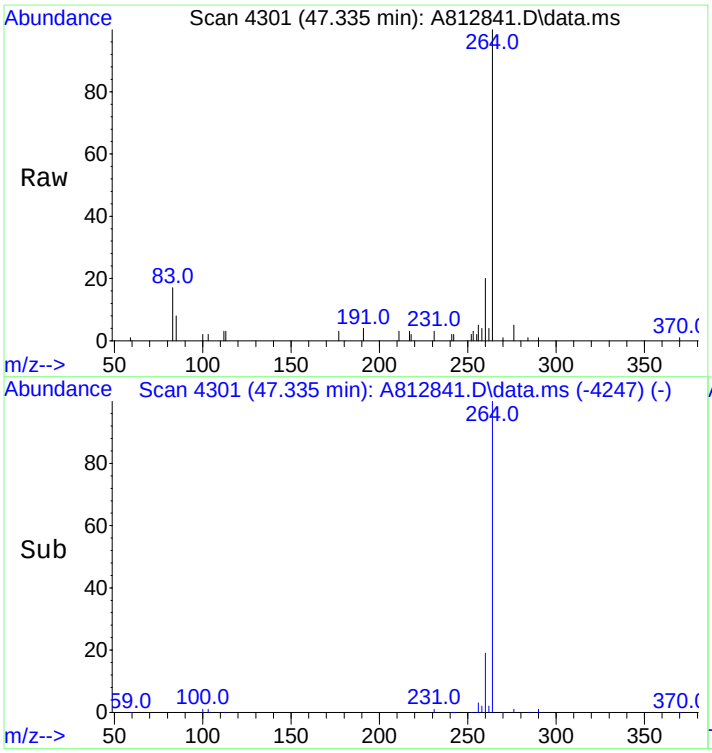


#79
C2-Chrysenes
Concen: 486.60 ng/mL m
RT: 47.070 min Scan# 4272
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:256 Resp: 105286

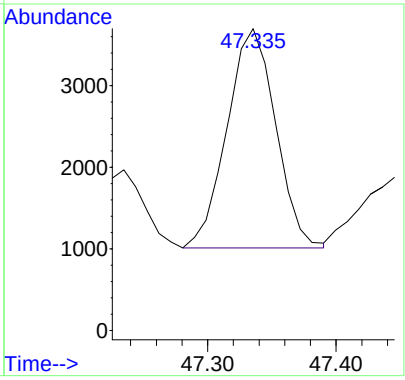
Ion	Ratio	Lower	Upper
256	100		
241	2.7	30.4	45.6#

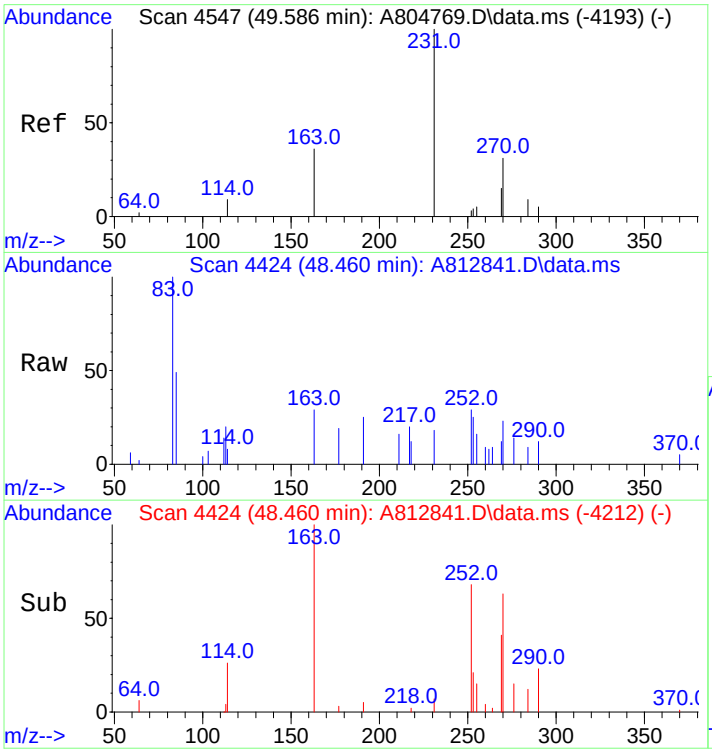




#80
BBF-D12 Surr BKGD
Concen: 32.80 ng/mL
RT: 47.335 min Scan# 4301
Delta R.T. -0.008 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:256 Resp: 7096

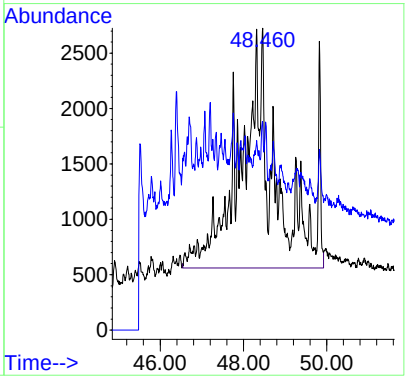


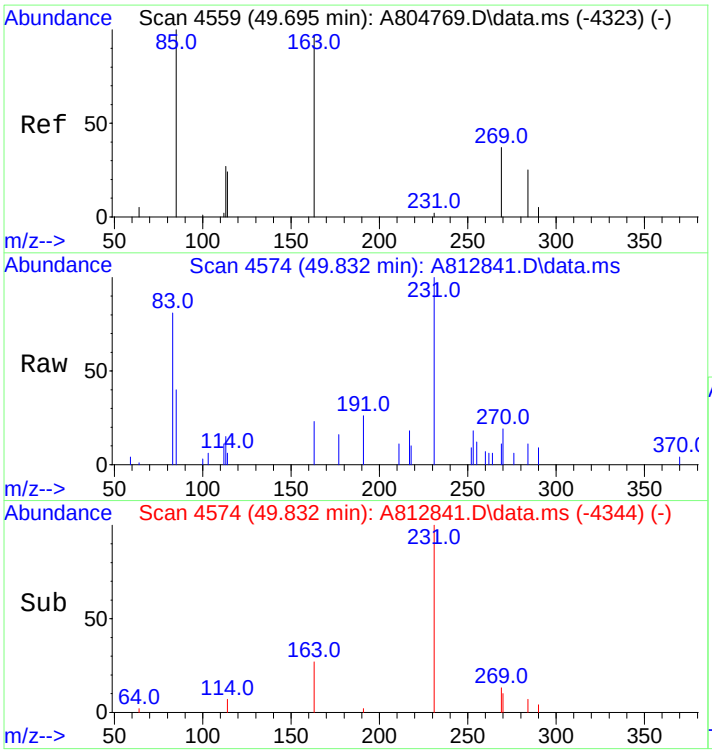


#81
C3-Chrysenes
Concen: 563.89 ng/mL m
RT: 48.460 min Scan# 4424
Delta R.T. -1.354 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:270 Resp: 122008

Ion	Ratio	Lower	Upper
270	100		
255	0.2	42.9	64.3#

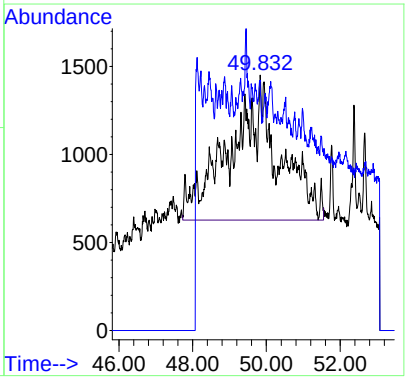


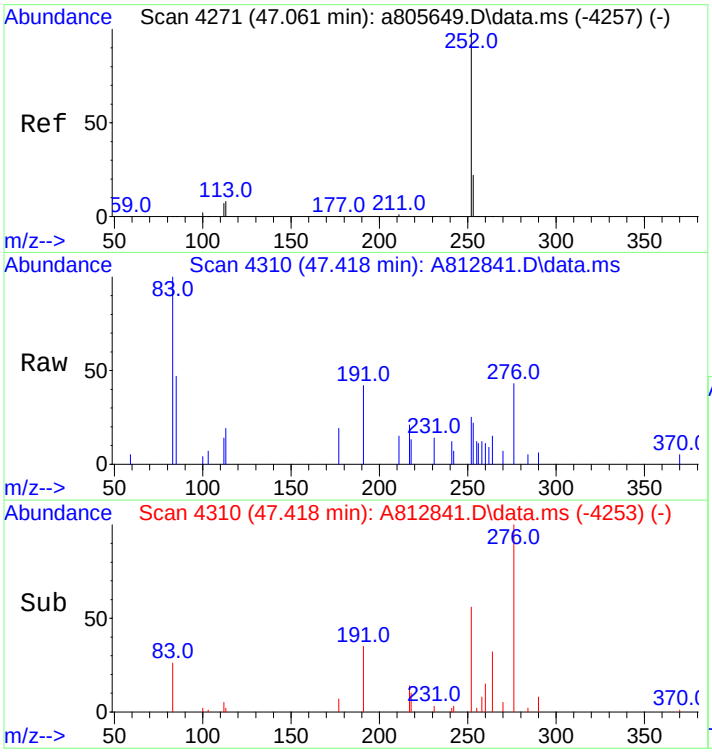


#82
C4-Chrysenes
Concen: 344.67 ng/mL m
RT: 49.832 min Scan# 4574
Delta R.T. 0.007 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:284 Resp: 74575

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

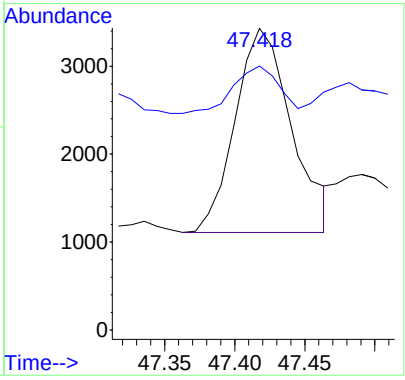


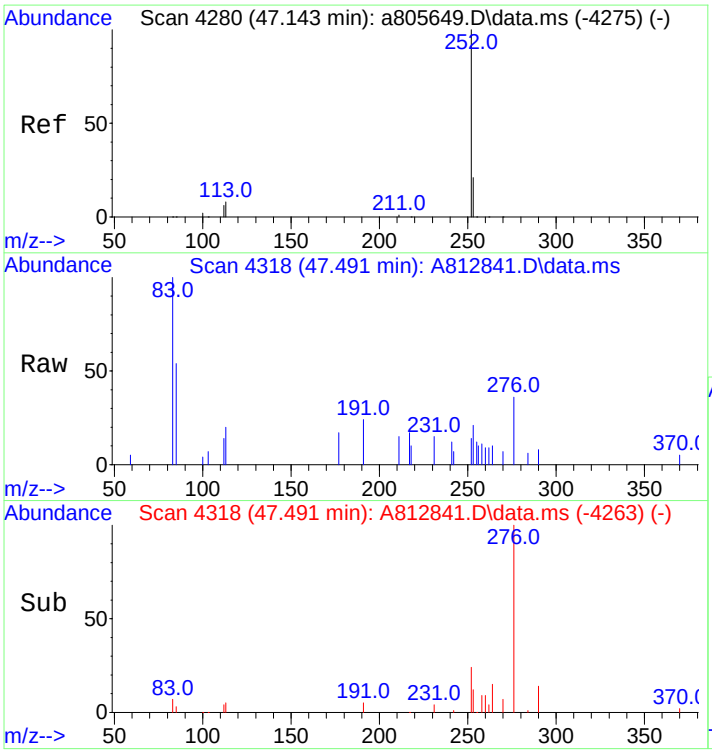


#84
Benzo[b]fluoranthene
Concen: 28.31 ng/mL
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:252 Resp: 6500

Ion	Ratio	Lower	Upper
252	100		
253	19.3	18.5	27.7

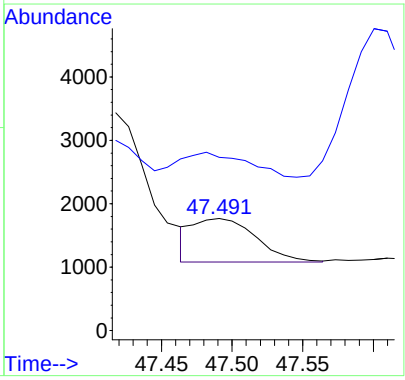


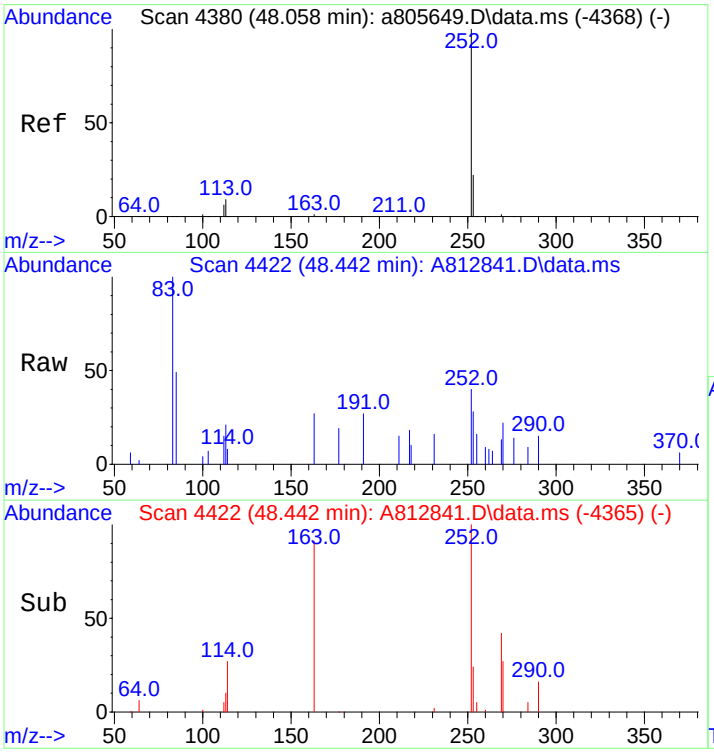


#85
Benzo[j]+[k]fluoranthene
Concen: 8.49 ng/mL m
RT: 47.491 min Scan# 4318
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:252 Resp: 2127

Ion	Ratio	Lower	Upper
252	100		
253	91.4	18.8	28.2#

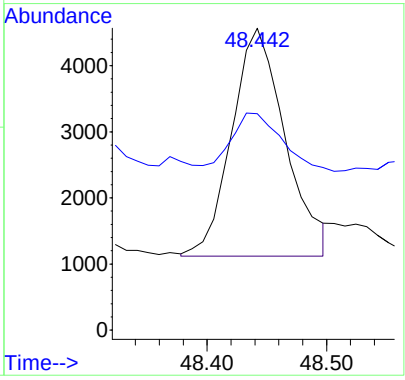


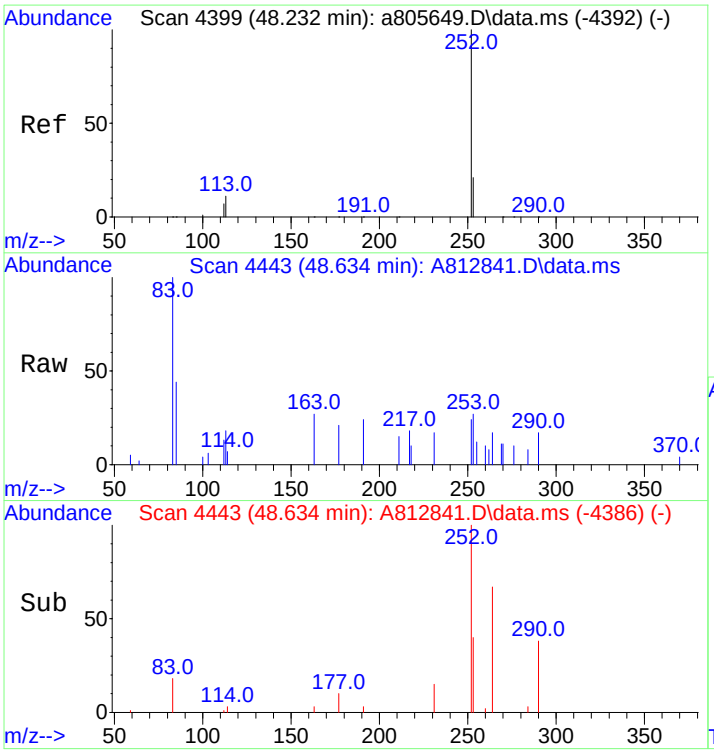


#87
Benzo[e]pyrene
Concen: 45.27 ng/mL m
RT: 48.442 min Scan# 4422
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:252 Resp: 10708

Ion	Ratio	Lower	Upper
252	100		
253	29.1	18.9	28.3#

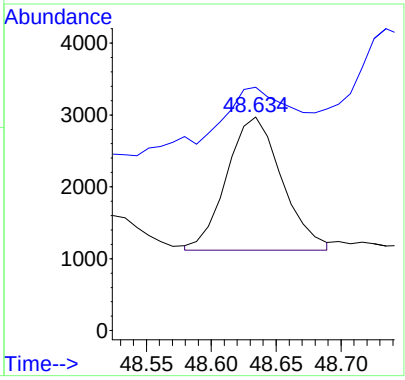


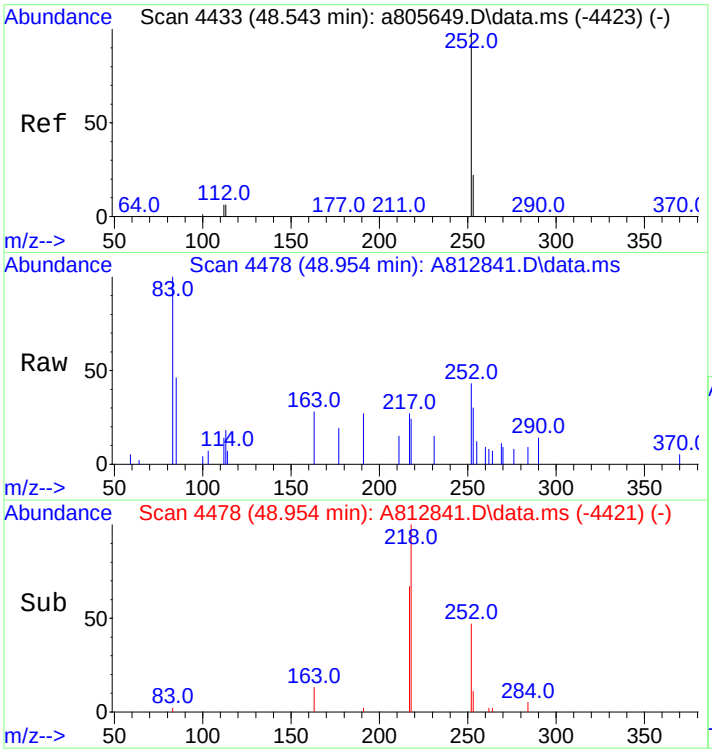


#89
Benzo[a]pyrene
Concen: 25.07 ng/mL m
RT: 48.634 min Scan# 4443
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:252 Resp: 5486

Ion	Ratio	Lower	Upper
252	100		
253	49.1	19.4	29.0#

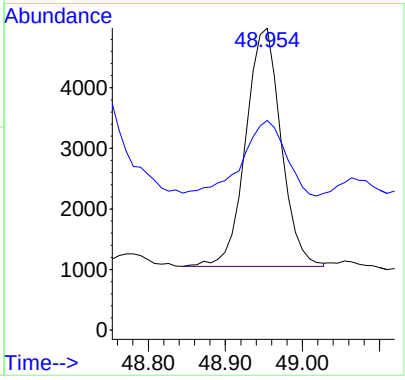


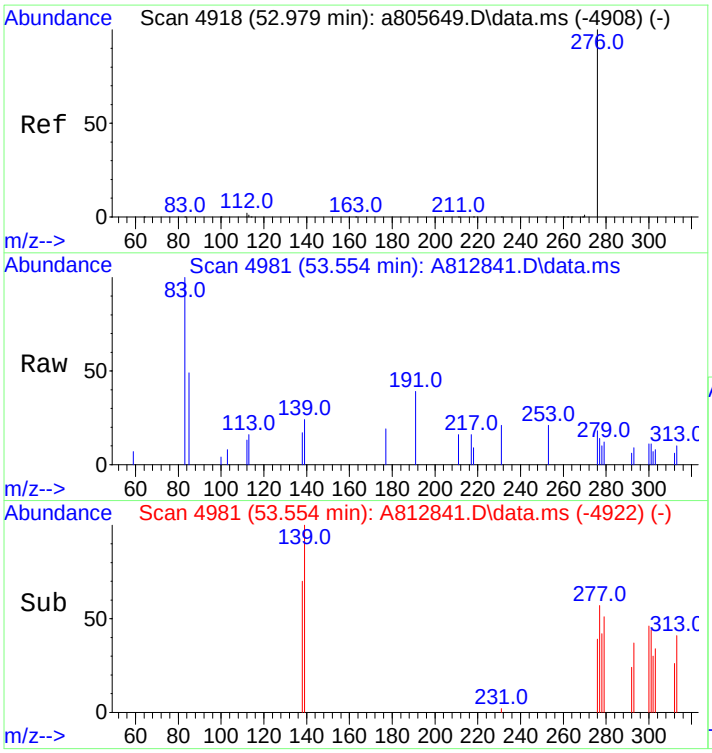


#90
Perylene
Concen: 52.43 ng/mL
RT: 48.954 min Scan# 4478
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:252 Resp: 12532

Ion	Ratio	Lower	Upper
252	100		
253	39.1	19.3	28.9#

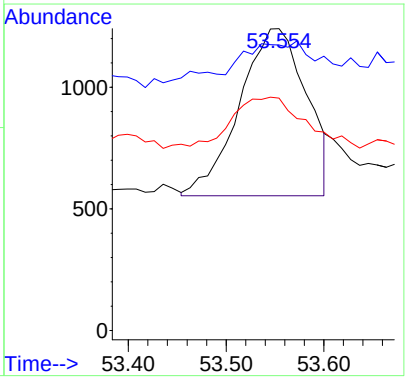


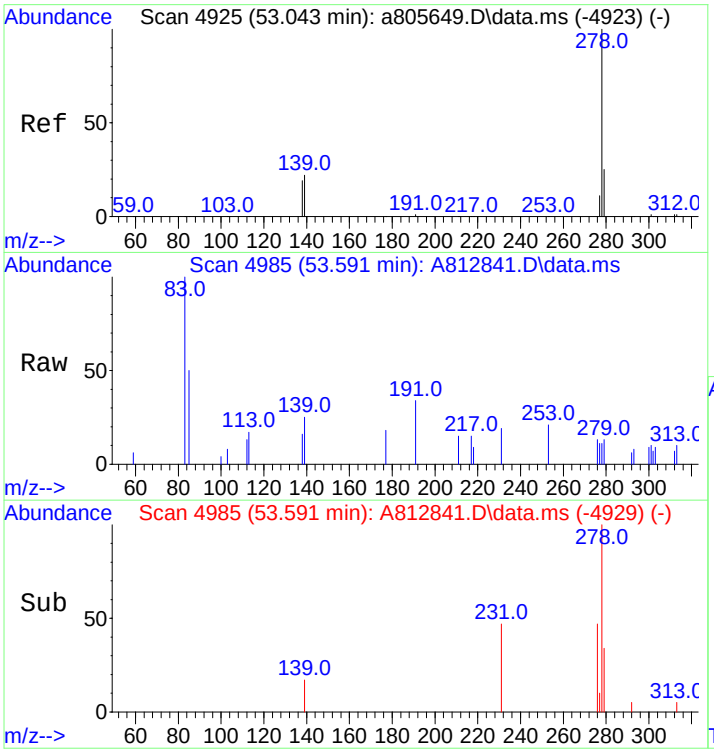


#91
Indeno[1,2,3-cd]pyrene
Concen: 14.13 ng/mL m
RT: 53.554 min Scan# 4981
Delta R.T. 0.036 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:276 Resp: 3284

Ion	Ratio	Lower	Upper
276	100		
138	0.0	19.9	29.9#
277	0.0	19.0	28.6#

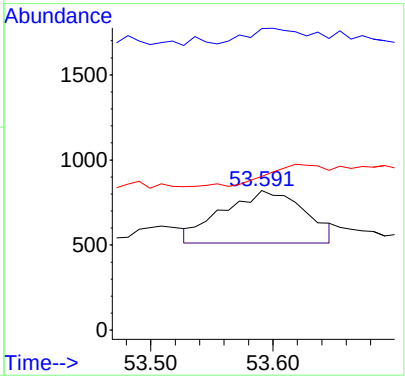


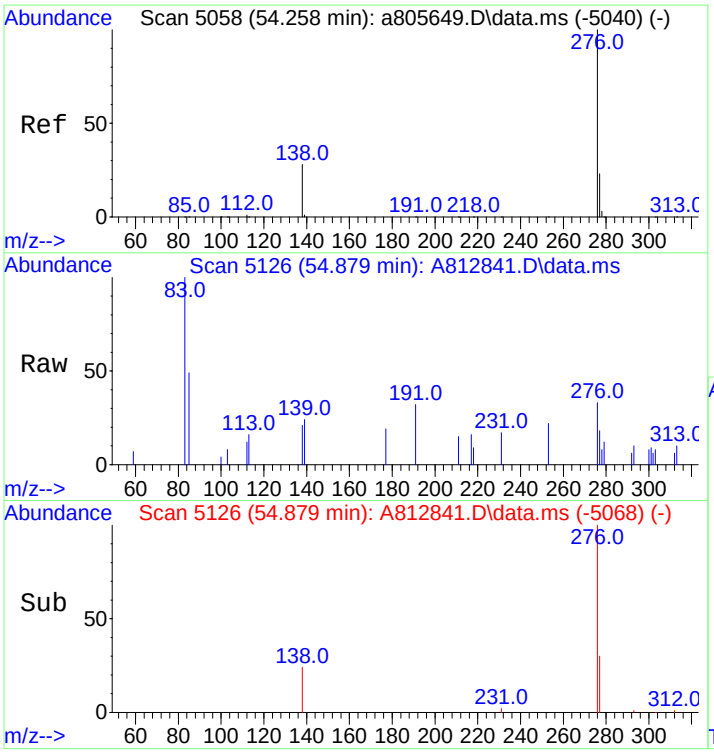


#92
Dibenz[ah]+[ac]anthracene
Concen: 6.25 ng/mL m
RT: 53.591 min Scan# 4985
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:278 Resp: 1425

Ion	Ratio	Lower	Upper
278	100		
139	22.7	16.6	25.0
279	0.0	19.1	28.7#

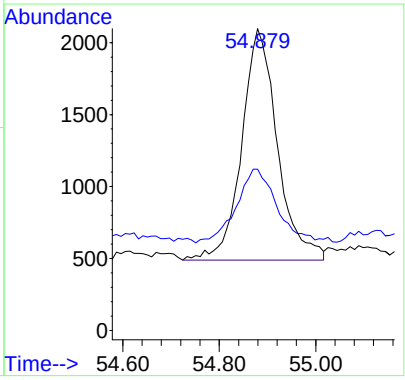


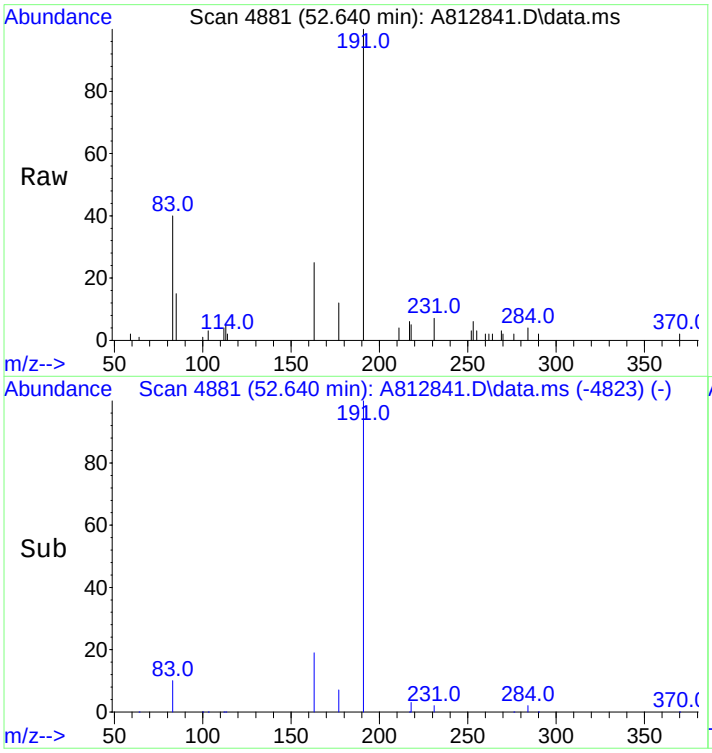


#93
Benzo[g,h,i]perylene
Concen: 31.26 ng/mL
RT: 54.879 min Scan# 5126
Delta R.T. 0.027 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:276 Resp: 8245

Ion	Ratio	Lower	Upper
276	100		
277	36.1	18.9	28.3#

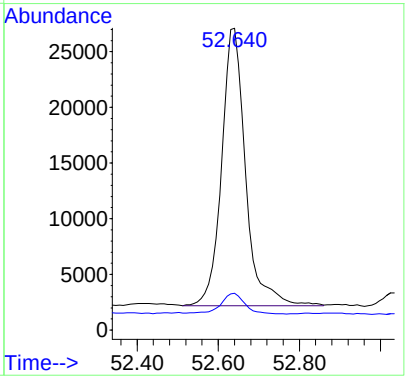


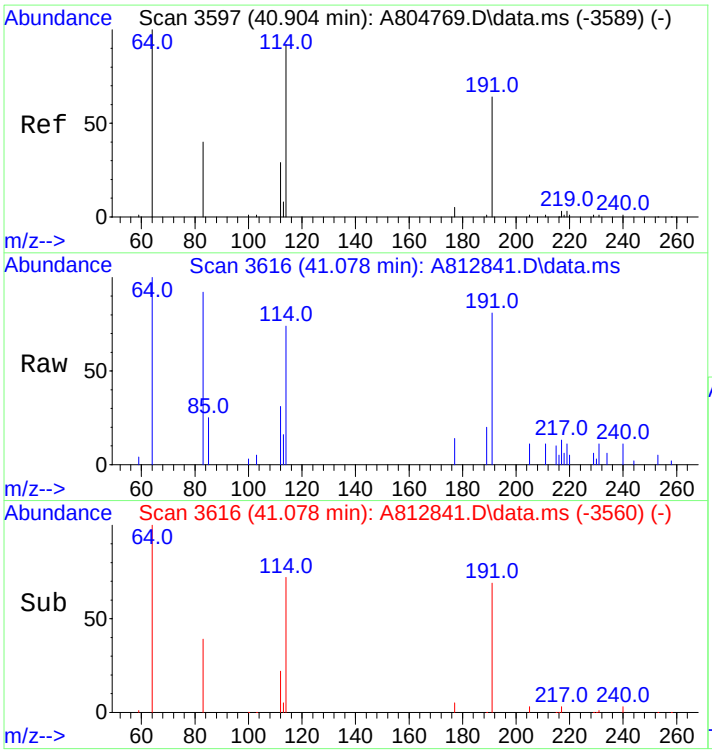


#94
Hopane (T19)
Concen: 1399.70 ng/mL
RT: 52.640 min Scan# 4881
Delta R.T. 0.027 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:191 Resp: 102497

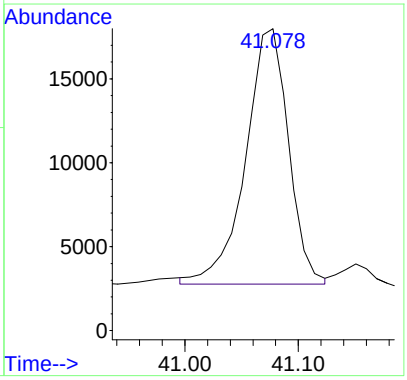
Ion	Ratio	Lower	Upper
191	100		
177	7.4	9.8	14.8#

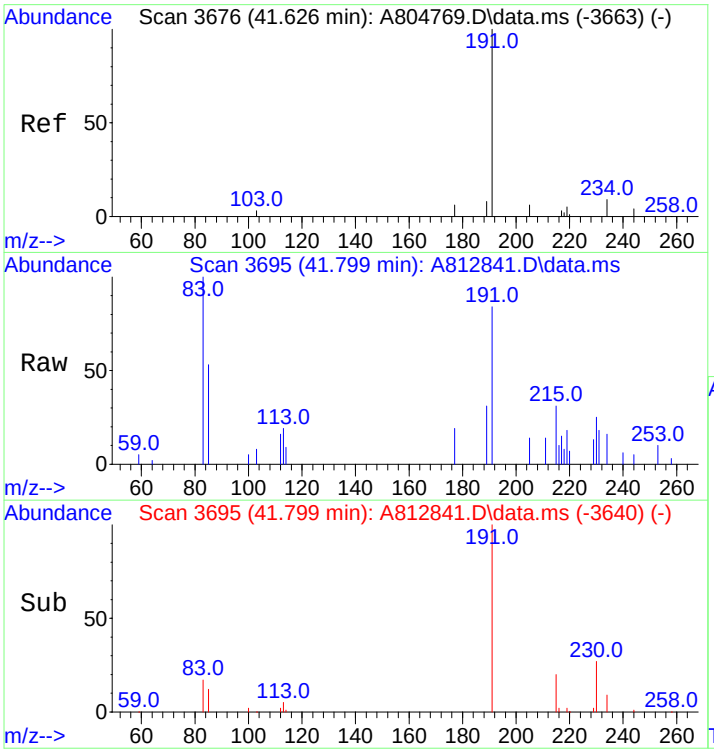




#96
C23 Tricyclic Terpane (T4)
Concen: 545.57 ng/ml m
RT: 41.078 min Scan# 3616
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

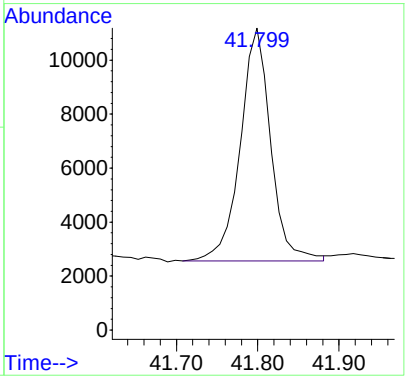
Tgt Ion:191 Resp: 39951

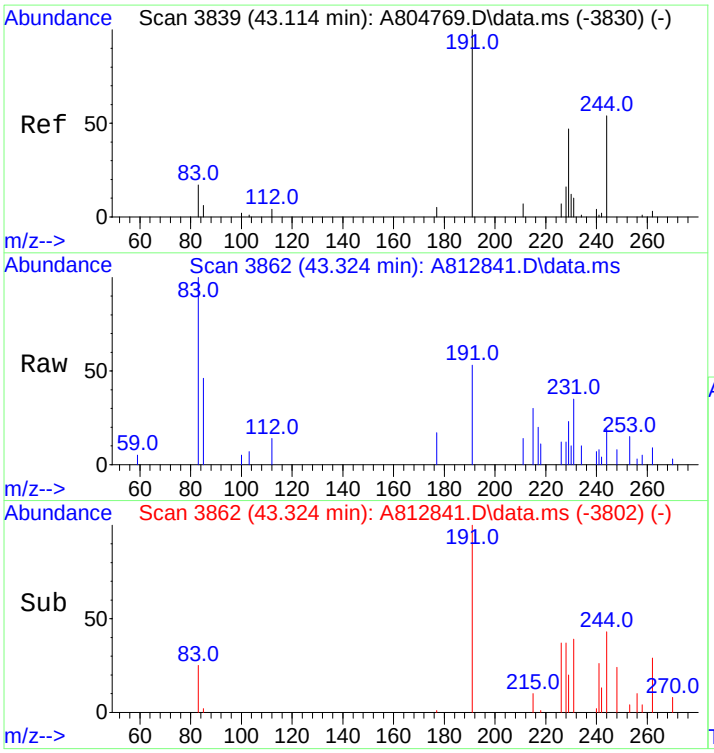




#97
C24 Tricyclic Terpane (T5)
Concen: 306.62 ng/ml
RT: 41.799 min Scan# 3695
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

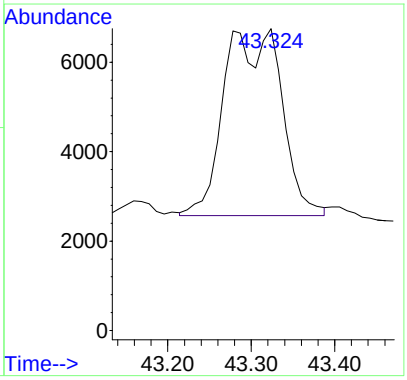
Tgt Ion:191 Resp: 22453

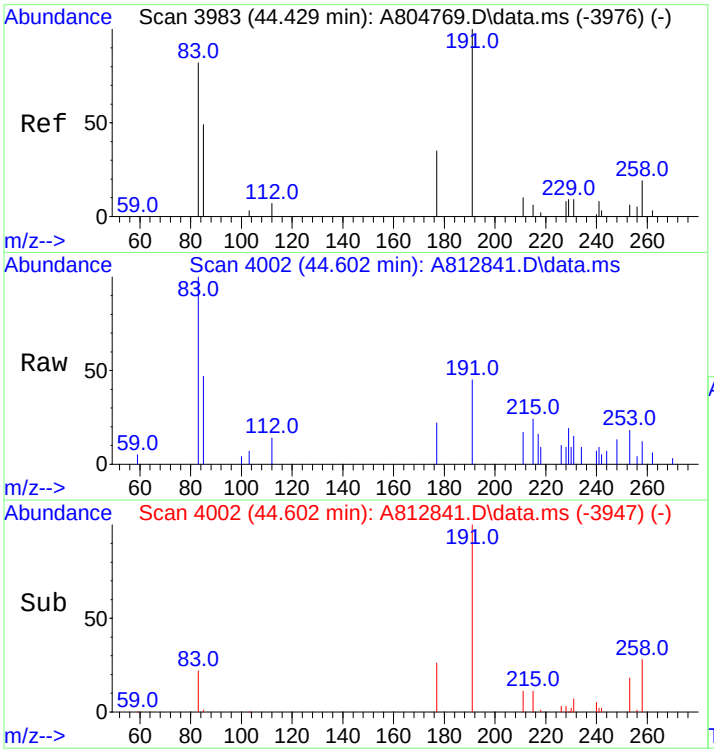




#98
C25 Tricyclic Terpane (T6)
Concen: 272.49 ng/ml m
RT: 43.324 min Scan# 3862
Delta R.T. 0.046 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

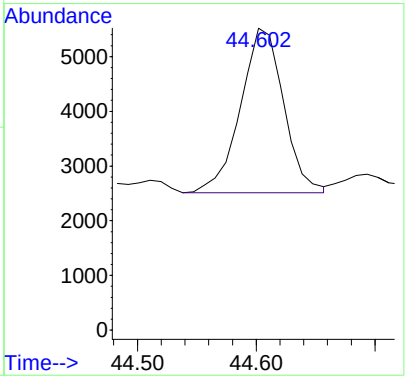
Tgt Ion:191 Resp: 19954

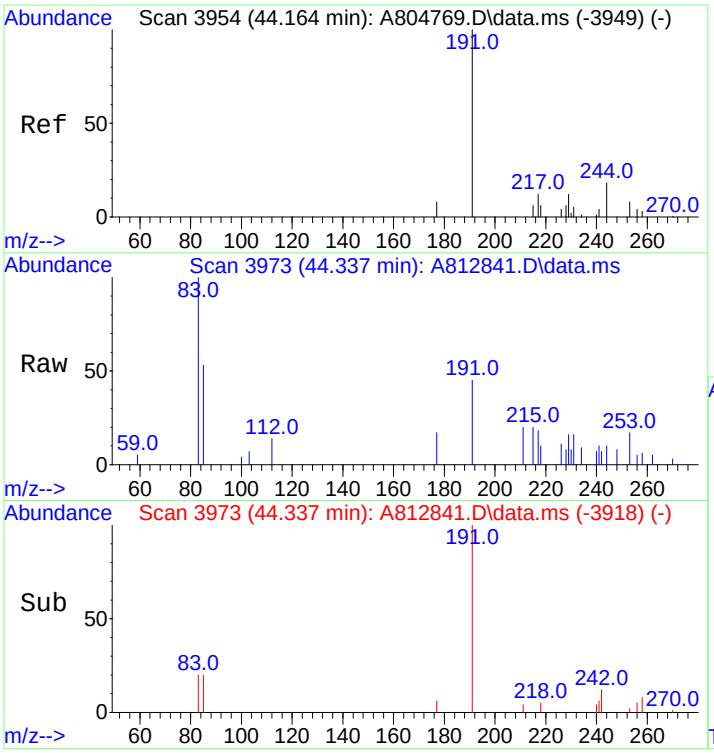




#99
C24 Tetracyclic Terpane (T6a)
Concen: 103.70 ng/ml
RT: 44.602 min Scan# 4002
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

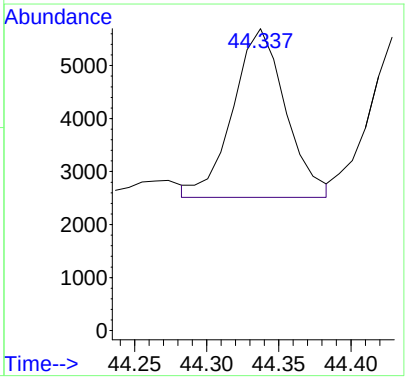
Tgt Ion:191 Resp: 7594

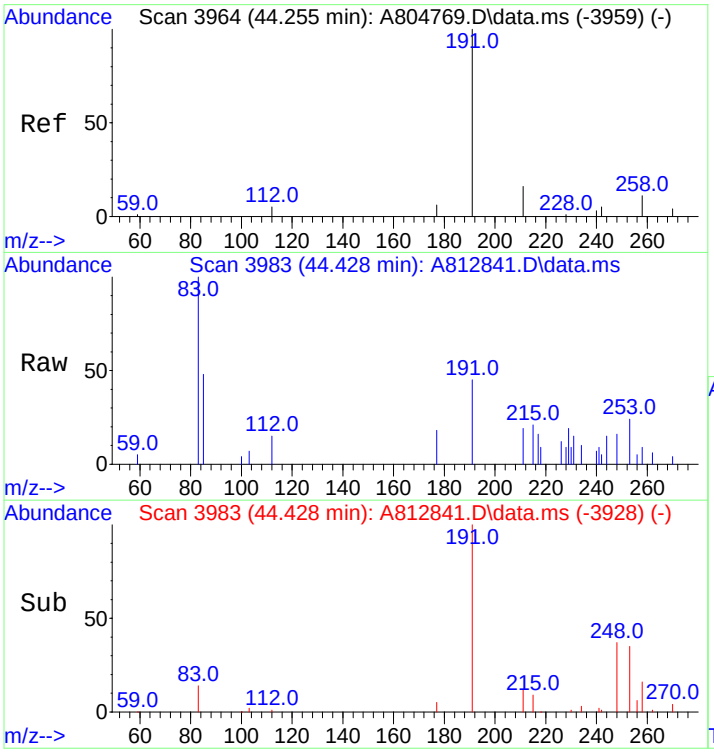




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 110.61 ng/ml m
RT: 44.337 min Scan# 3973
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

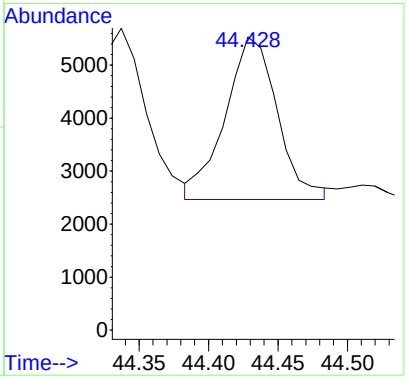
Tgt Ion:191 Resp: 8100

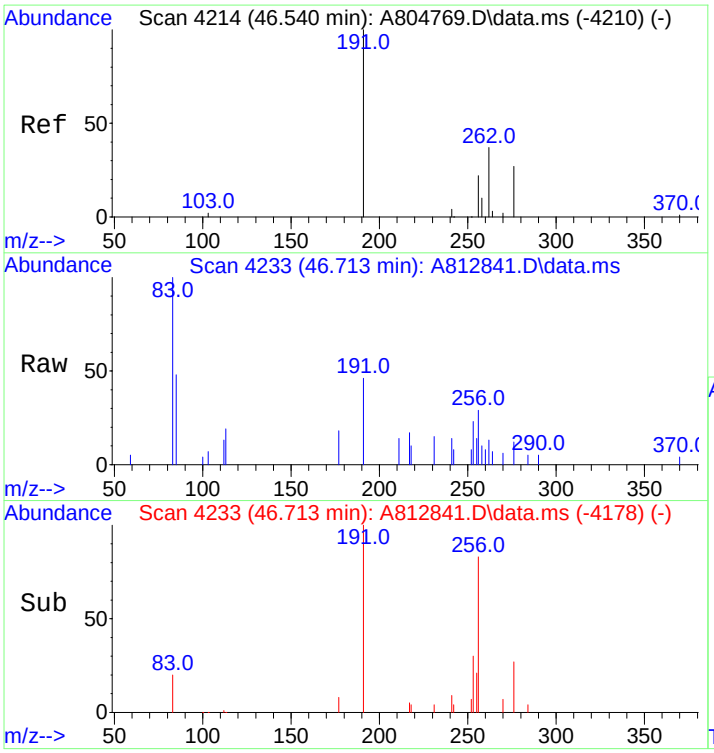




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 109.21 ng/ml m
RT: 44.428 min Scan# 3983
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

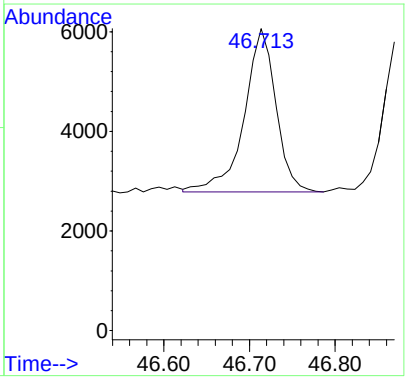
Tgt Ion:191 Resp: 7997

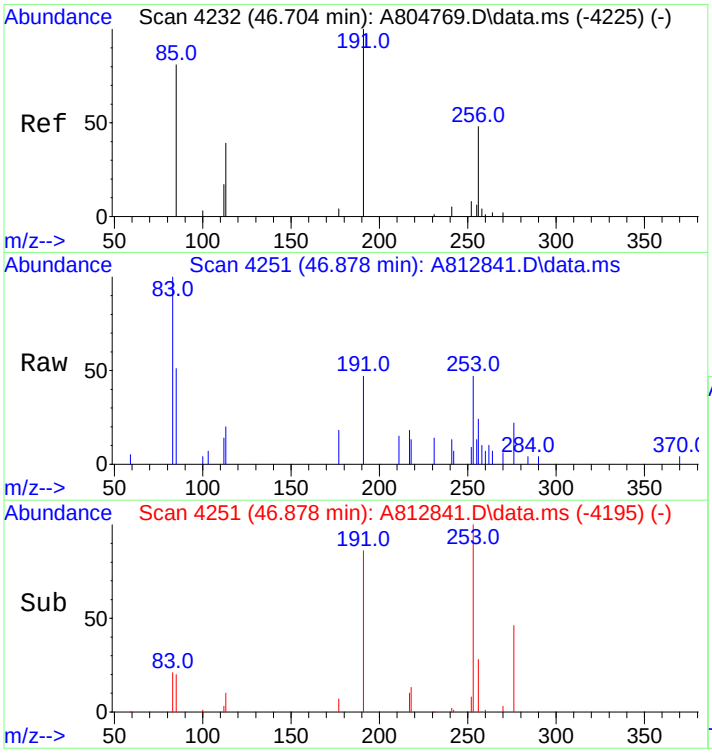




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 115.54 ng/ml
RT: 46.713 min Scan# 4233
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

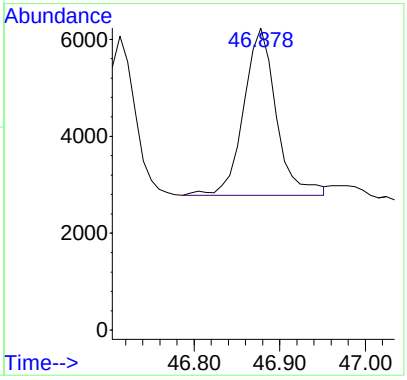
Tgt Ion:191 Resp: 8461

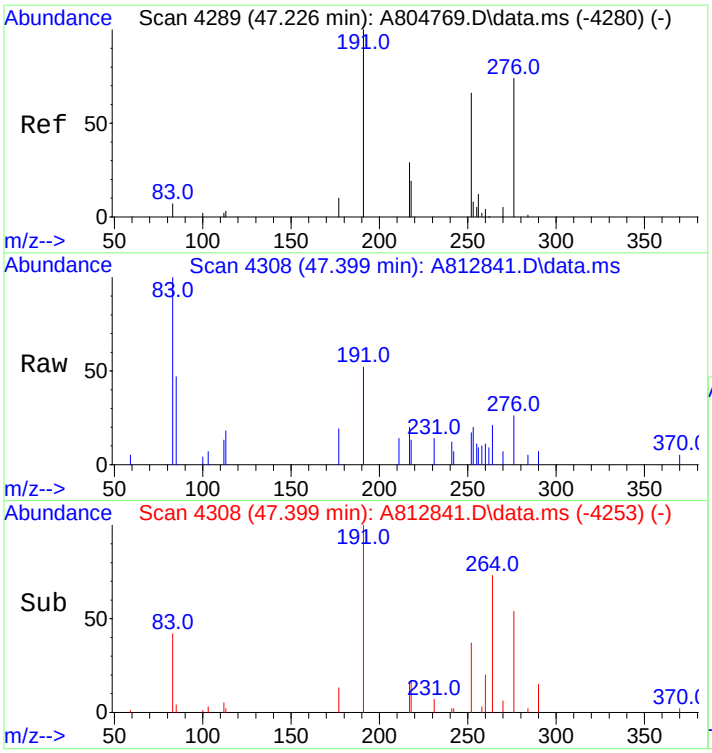




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 124.78 ng/ml
RT: 46.878 min Scan# 4251
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

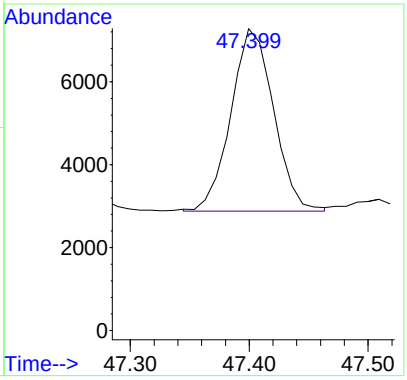
Tgt Ion:191 Resp: 9137

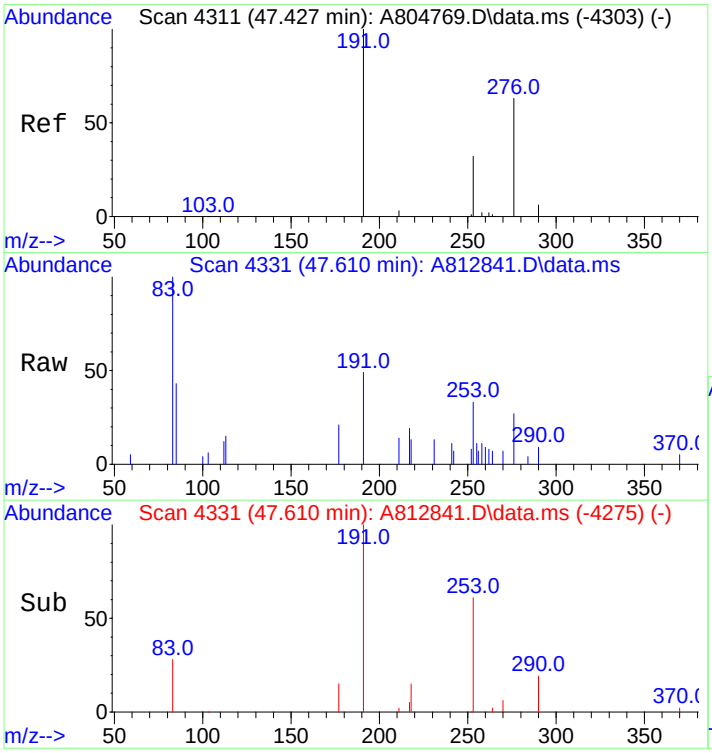




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 150.33 ng/ml m
RT: 47.399 min Scan# 4308
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

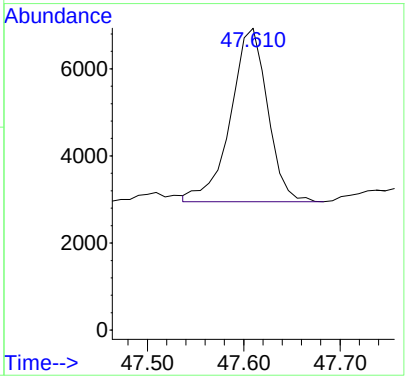
Tgt Ion:191 Resp: 11008

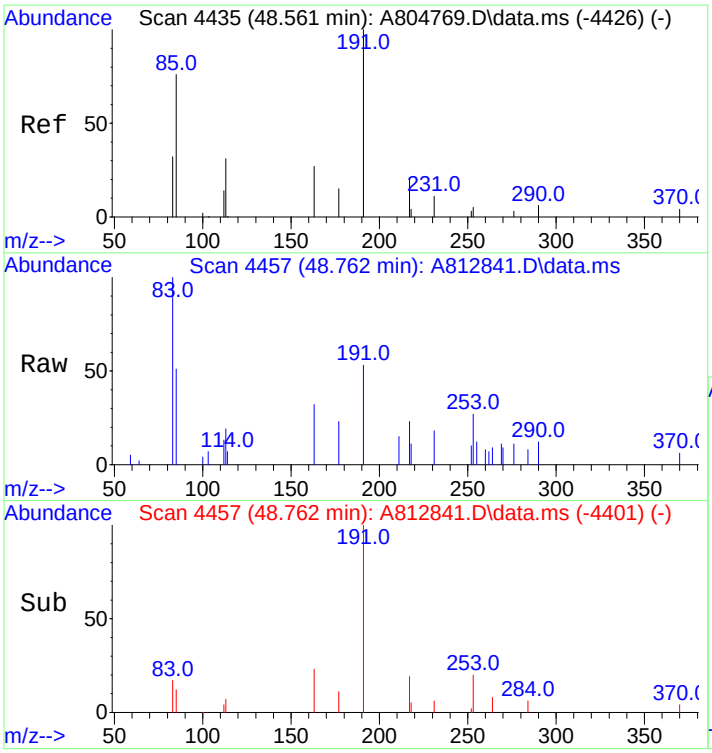




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 144.55 ng/ml
RT: 47.610 min Scan# 4331
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

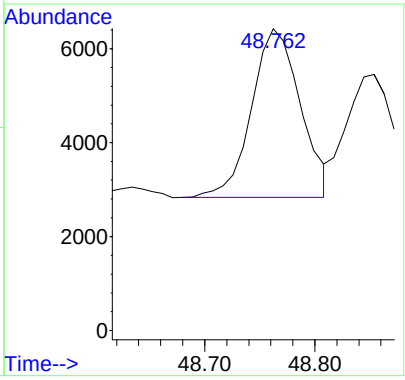
Tgt Ion:191 Resp: 10585

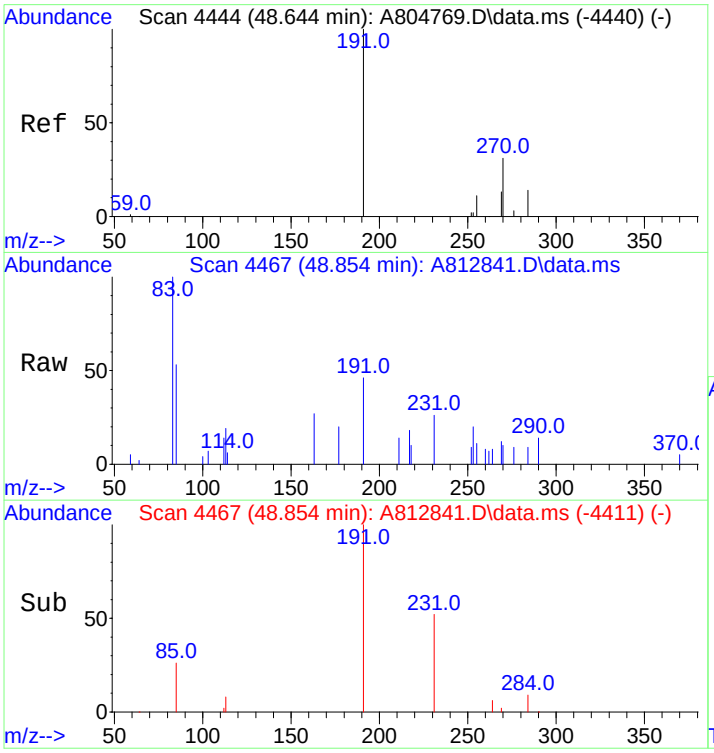




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 150.80 ng/ml
RT: 48.762 min Scan# 4457
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

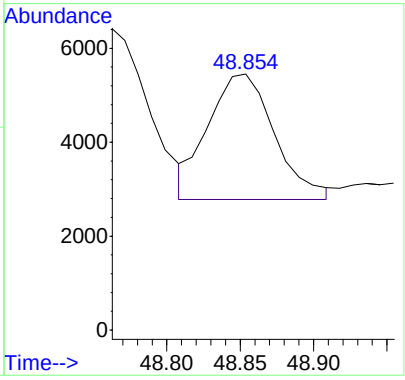
Tgt Ion:191 Resp: 11043

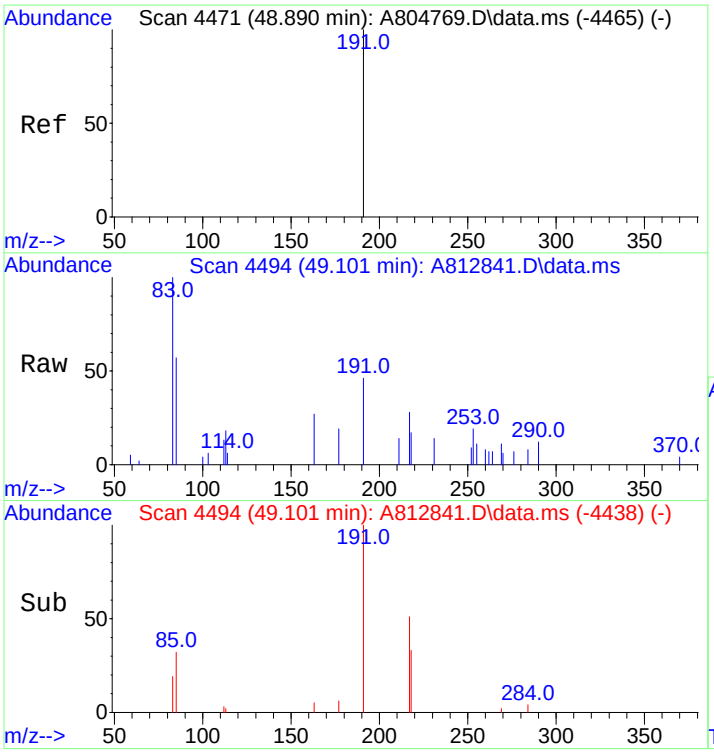




#107
C30 Tricyclic Terpane-22S
Concen: 114.77 ng/mL m
RT: 48.854 min Scan# 4467
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

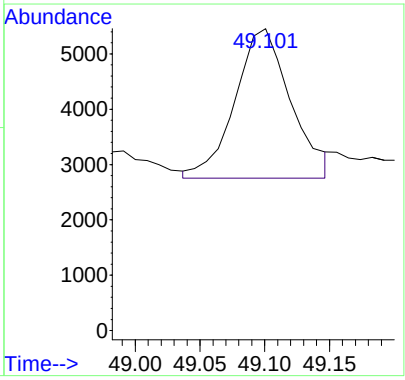
Tgt Ion:191 Resp: 8404

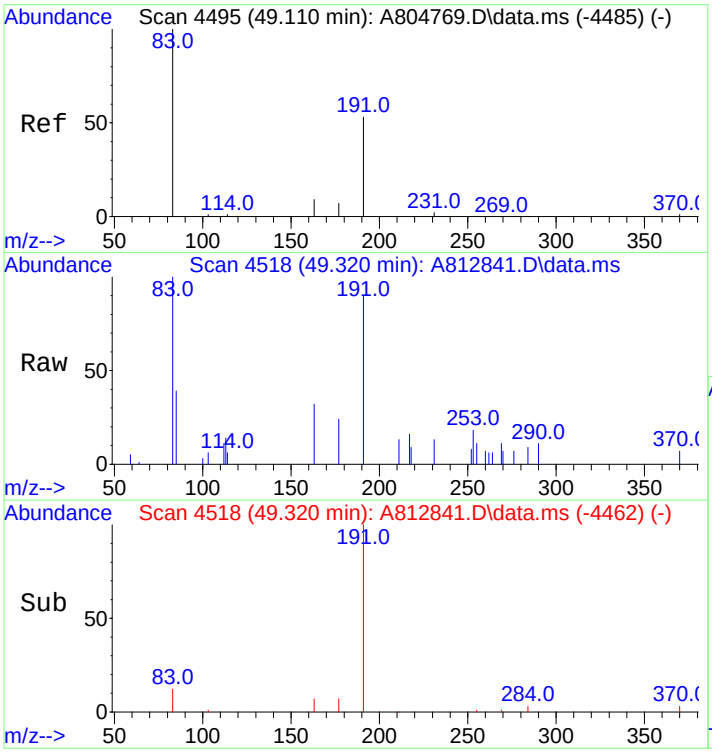




#108
C30 Tricyclic Terpane-22R
Concen: 110.56 ng/mL m
RT: 49.101 min Scan# 4494
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

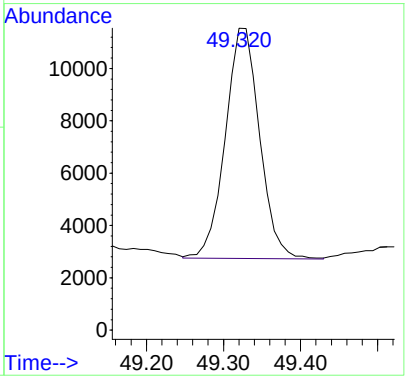
Tgt Ion:191 Resp: 8096

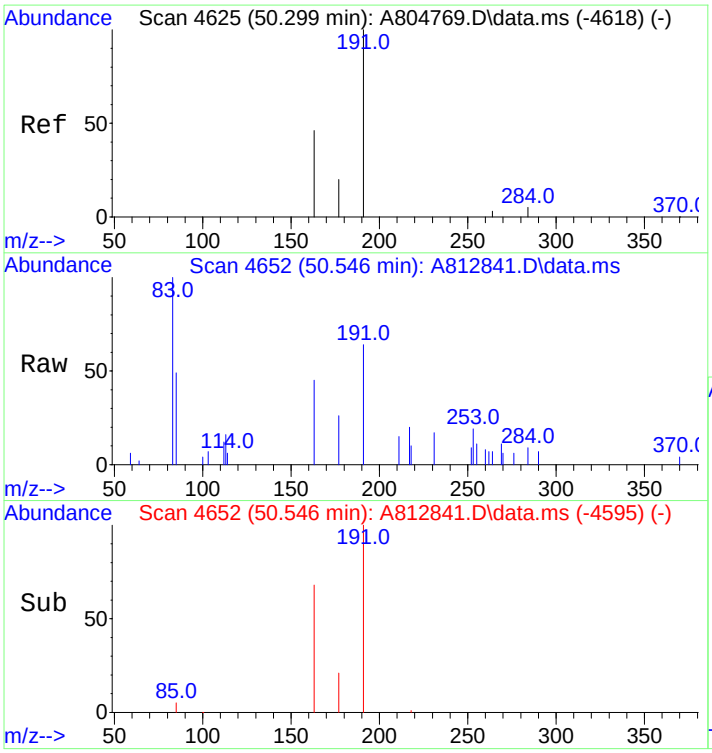




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 371.85 ng/ml
RT: 49.320 min Scan# 4518
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

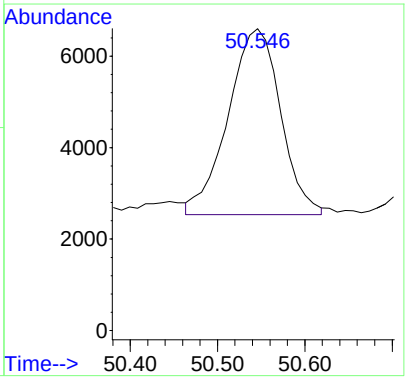
Tgt Ion:191 Resp: 27230

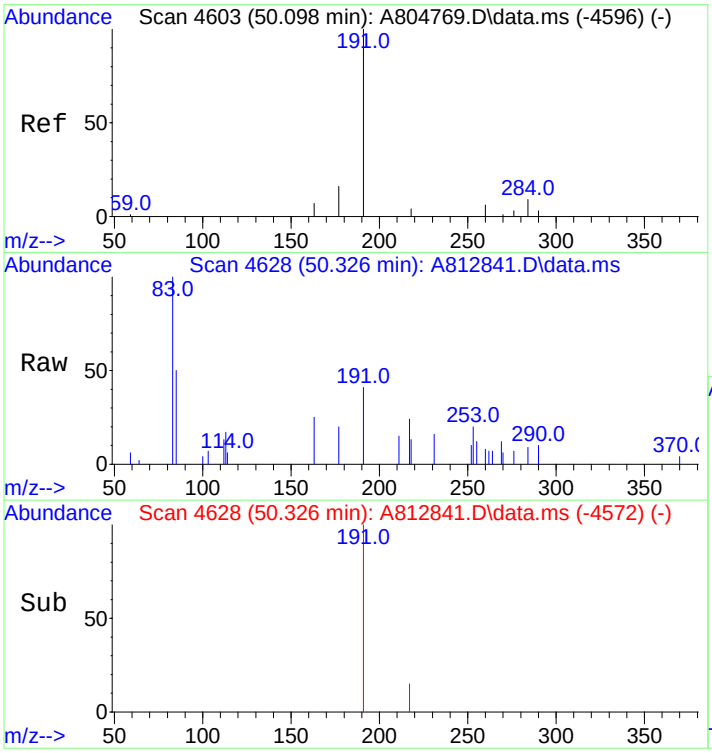




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 232.00 ng/ml m
RT: 50.546 min Scan# 4652
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

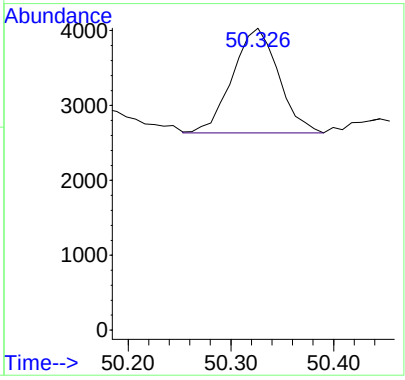
Tgt Ion:191 Resp: 16989

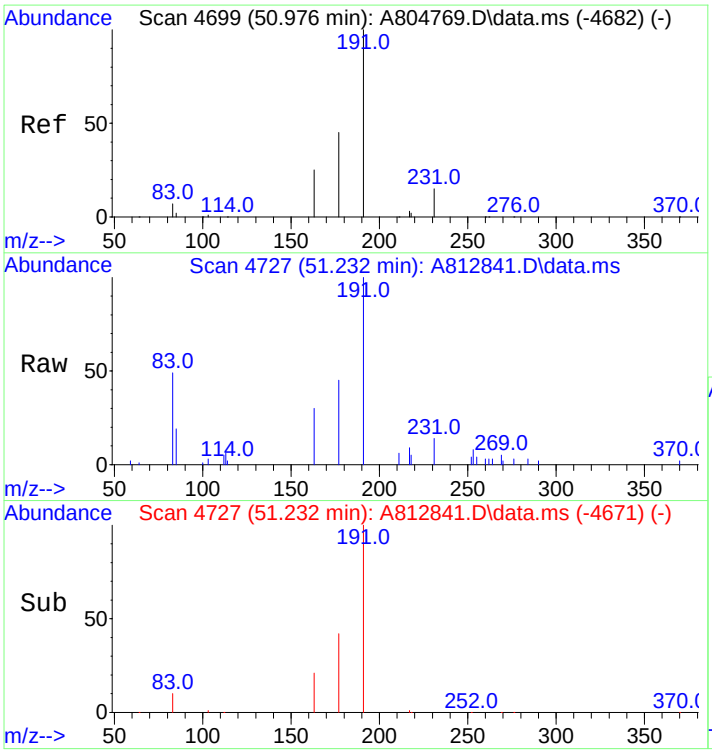




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 59.47 ng/ml
RT: 50.326 min Scan# 4628
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

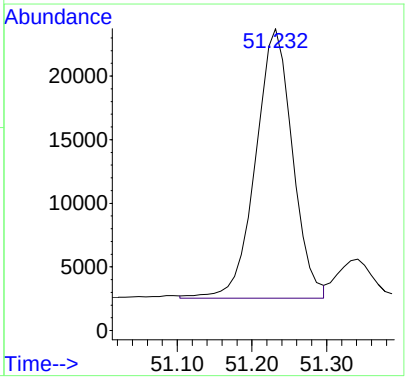
Tgt Ion:191 Resp: 4355

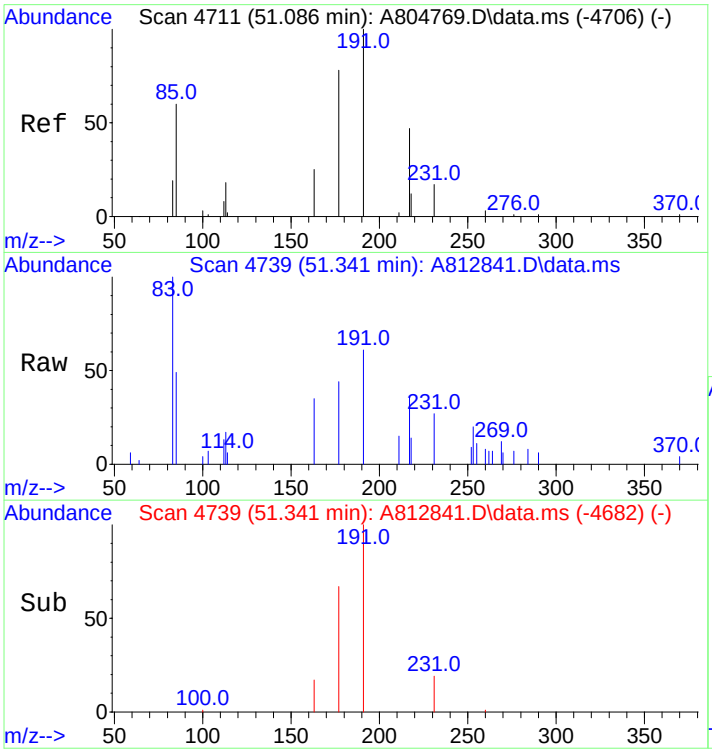




#112
30-Norhopane (T15)
Concen: 992.23 ng/ml m
RT: 51.232 min Scan# 4727
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

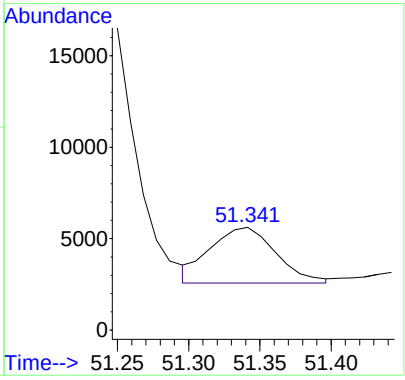
Tgt Ion:191 Resp: 72659

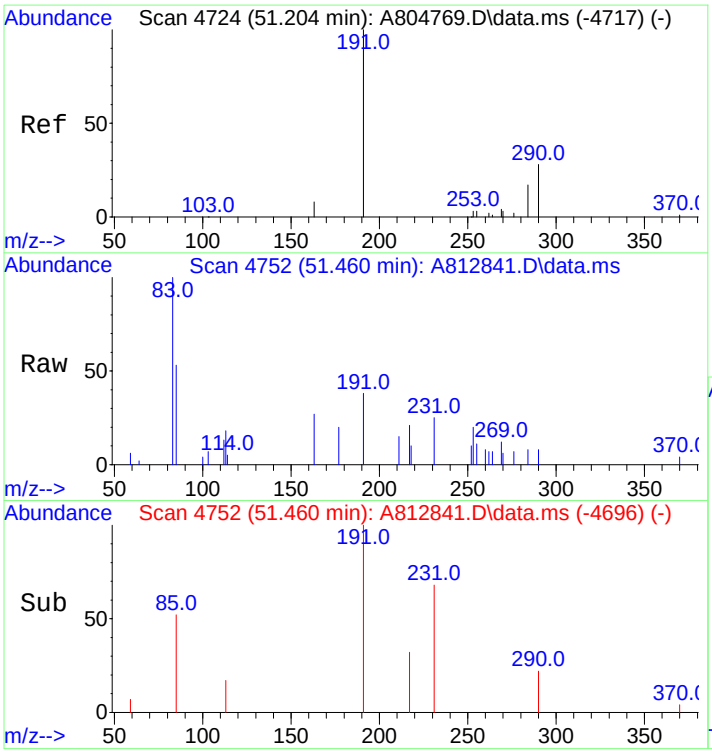




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 134.06 ng/ml m
RT: 51.341 min Scan# 4739
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

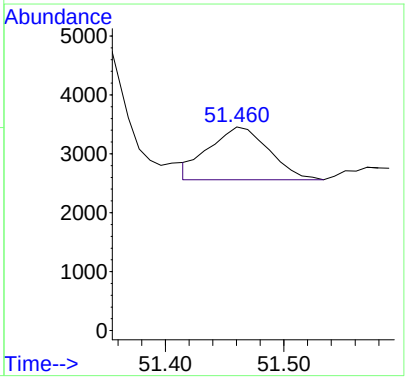
Tgt Ion:191 Resp: 9817

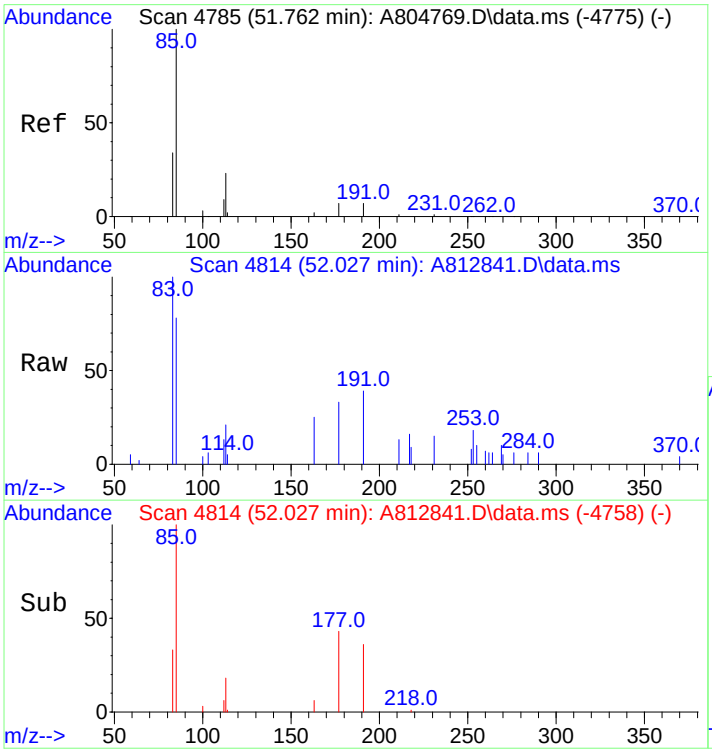




#114
17a(H)-Diahopane (X)
Concen: 42.70 ng/ml
RT: 51.460 min Scan# 4752
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

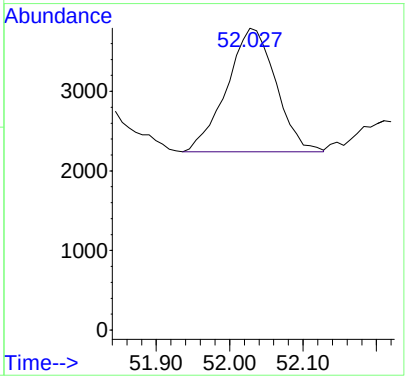
Tgt Ion:191 Resp: 3127

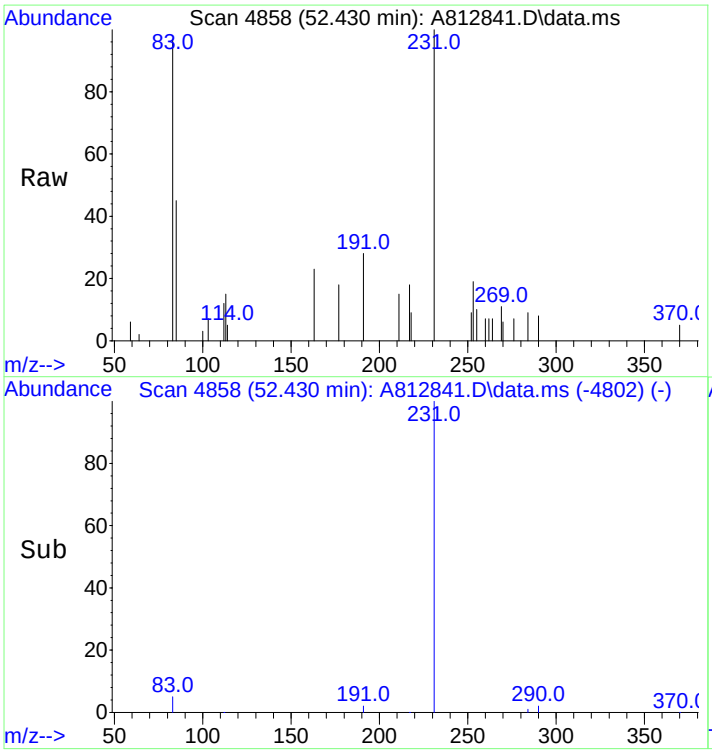




#115
30-Normoretane (T17)
Concen: 98.64 ng/ml
RT: 52.027 min Scan# 4814
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

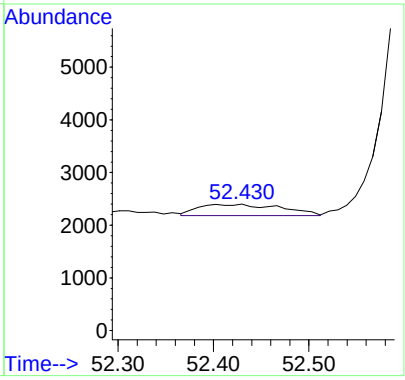
Tgt Ion:191 Resp: 7223

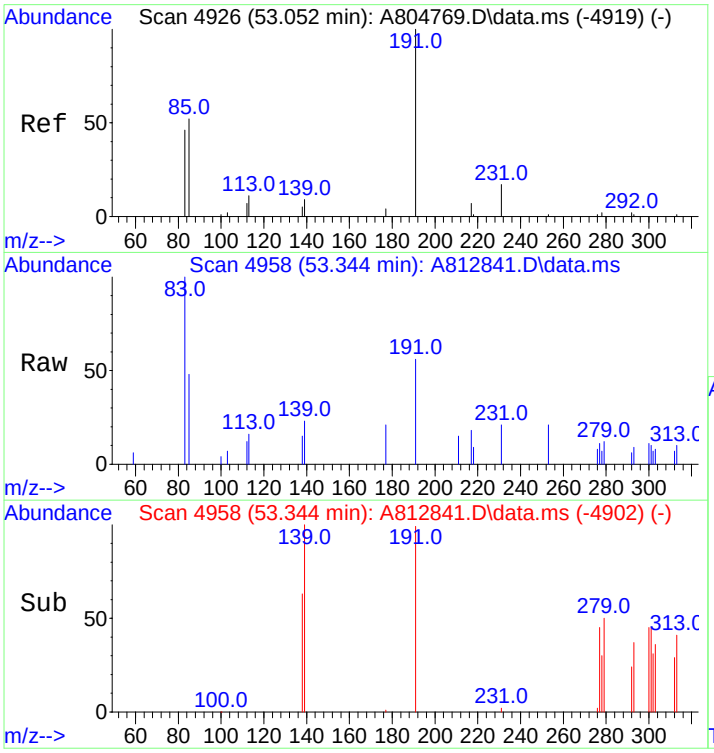




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 18.04 ng/ml m
RT: 52.430 min Scan# 4858
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

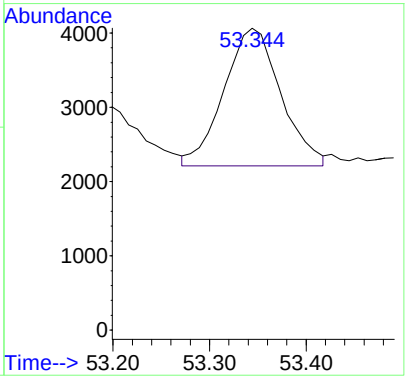
Tgt Ion:191 Resp: 1321

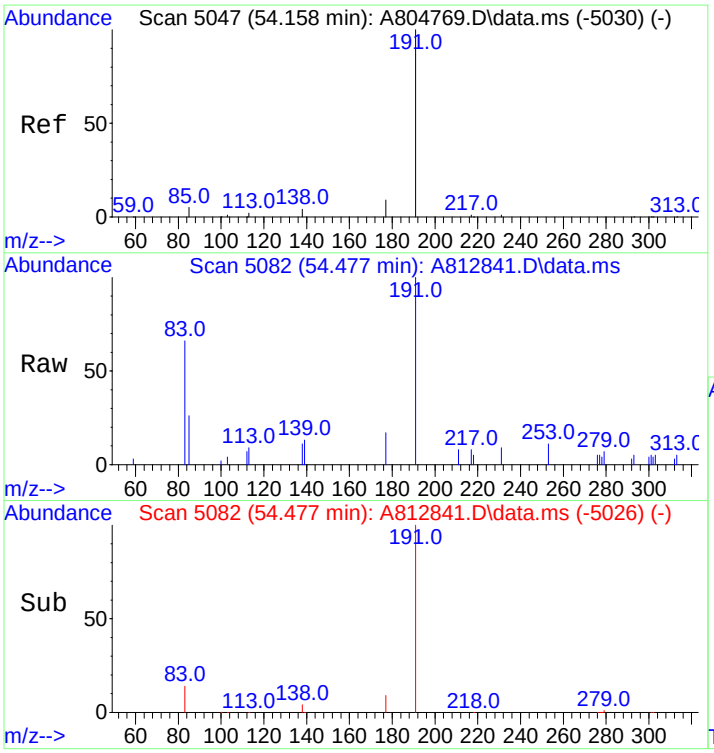




#117
Moretane (T20)
Concen: 103.64 ng/ml m
RT: 53.344 min Scan# 4958
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

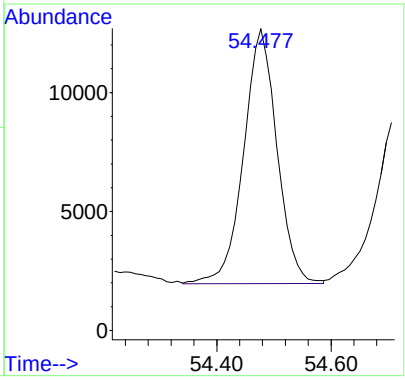
Tgt Ion:191 Resp: 7589

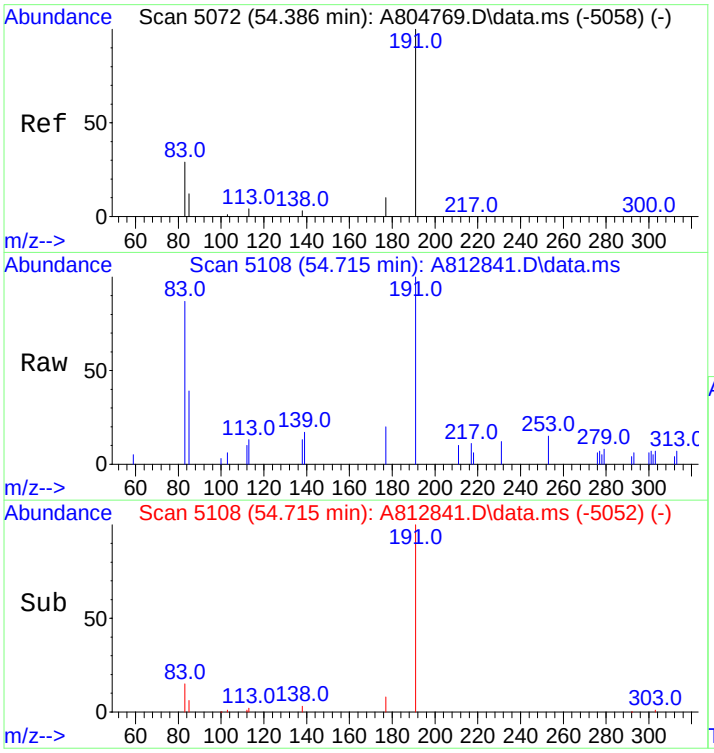




#118
30-Homohopane-22S (T21)
Concen: 593.83 ng/ml
RT: 54.477 min Scan# 5082
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

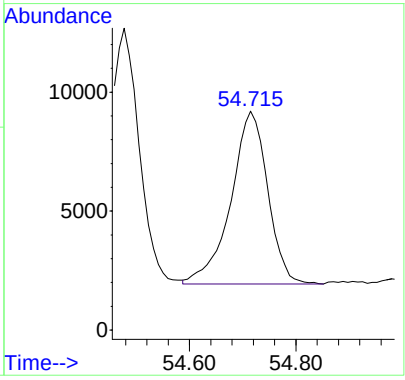
Tgt Ion:191 Resp: 43485

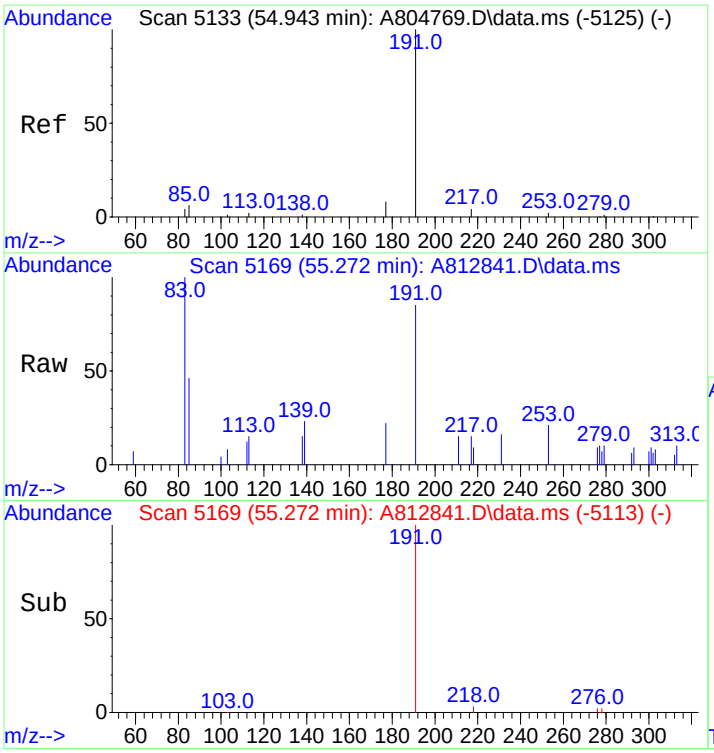




#119
30-Homohopane-22R (T22)
Concen: 477.29 ng/ml
RT: 54.715 min Scan# 5108
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

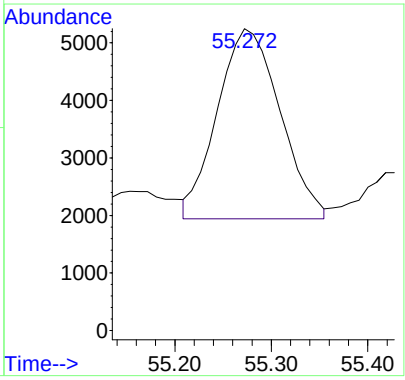
Tgt Ion:191 Resp: 34951

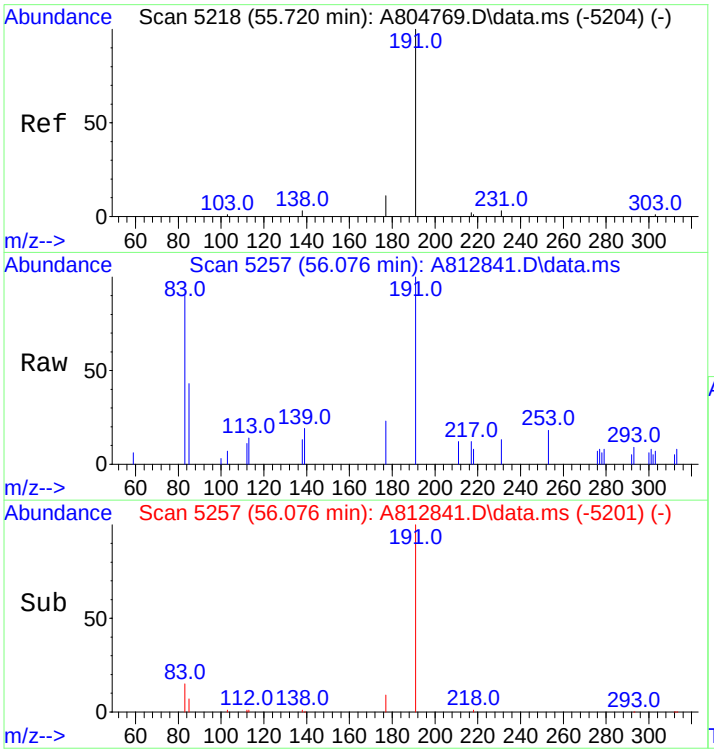




#120
Gammacerane/C32-diahopane
Concen: 203.60 ng/mL m
RT: 55.272 min Scan# 5169
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

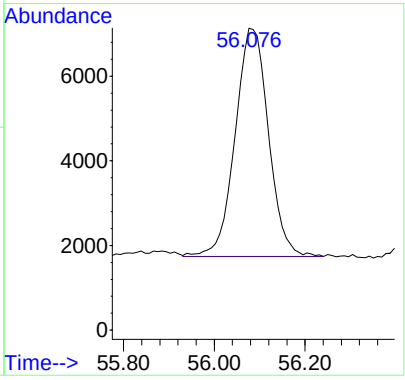
Tgt Ion:191 Resp: 14909

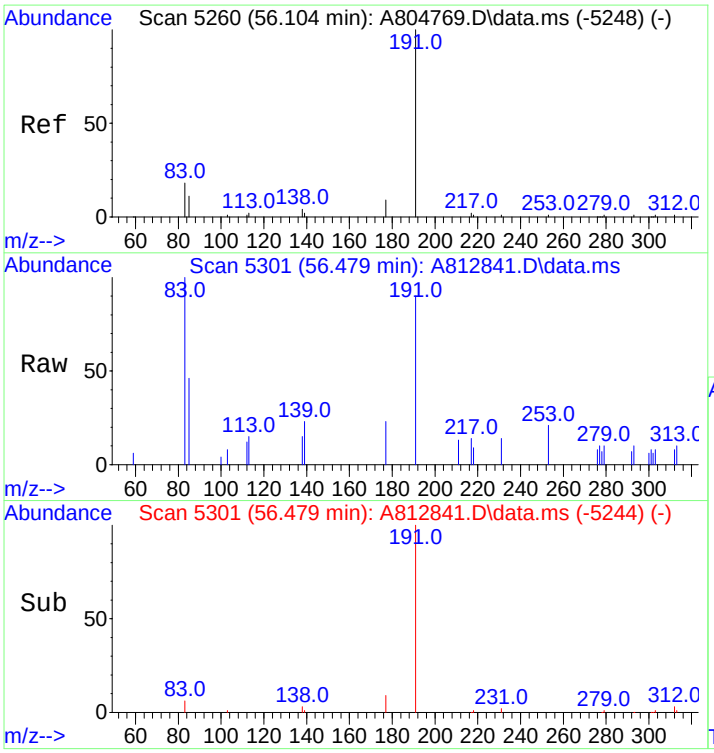




#121
30,31-Bishomohopane-22S (T26)
Concen: 375.24 ng/ml
RT: 56.076 min Scan# 5257
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

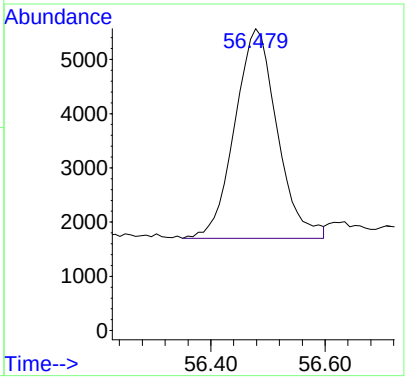
Tgt Ion:191 Resp: 27478

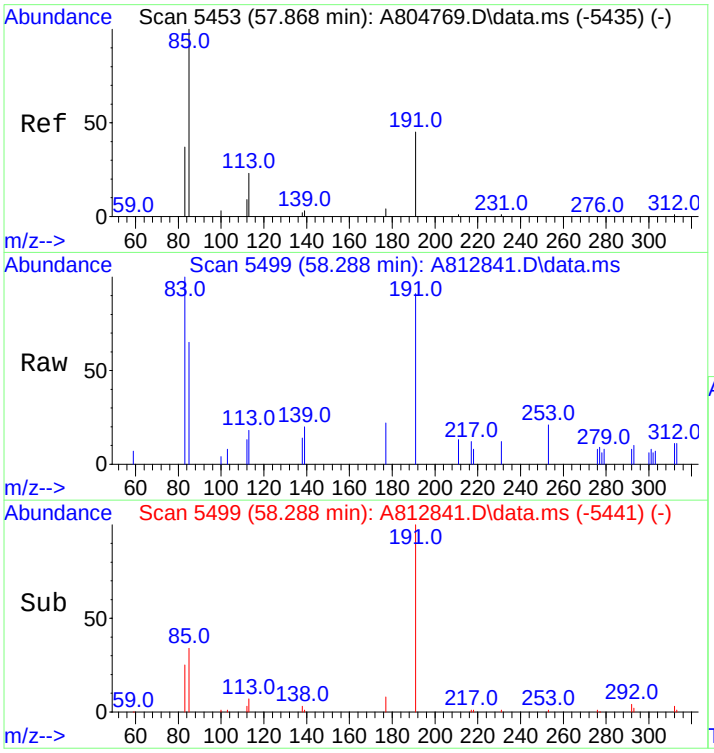




#122
30,31-Bishomohopane-22R (T27)
Concen: 272.53 ng/ml
RT: 56.479 min Scan# 5301
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

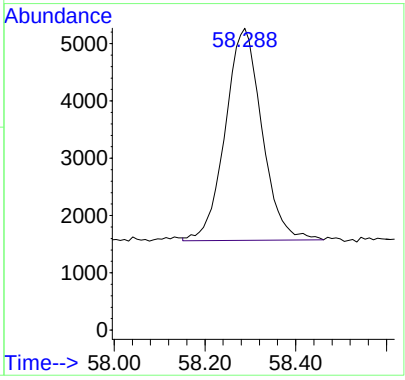
Tgt Ion:191 Resp: 19957

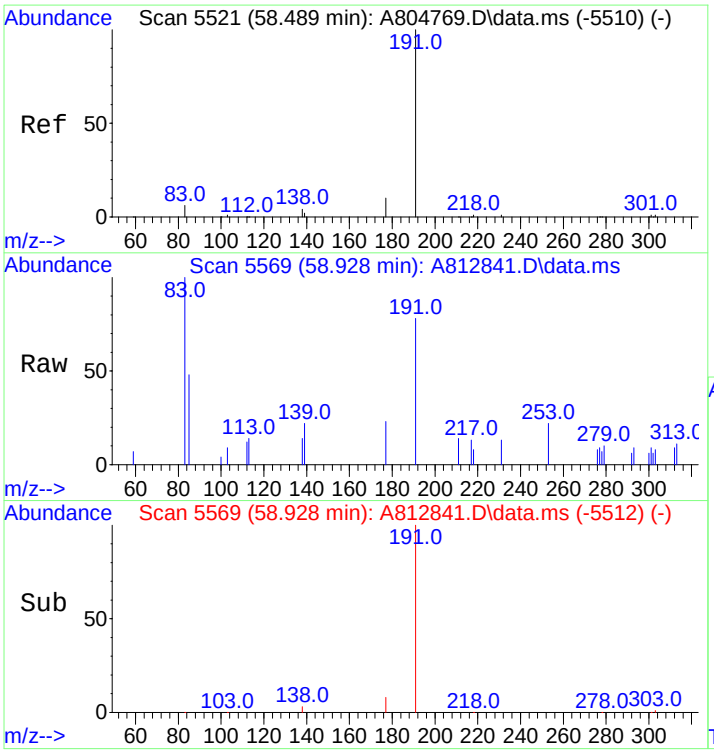




#123
30,31-Trishomohopane-22S (T30)
Concen: 282.00 ng/ml
RT: 58.288 min Scan# 5499
Delta R.T. 0.027 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

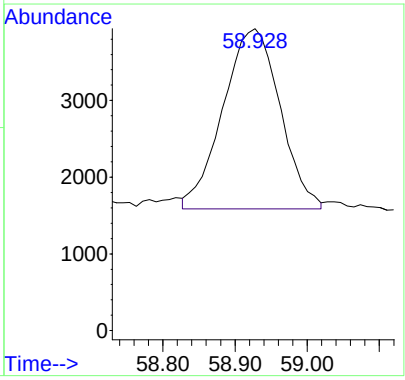
Tgt Ion:191 Resp: 20650

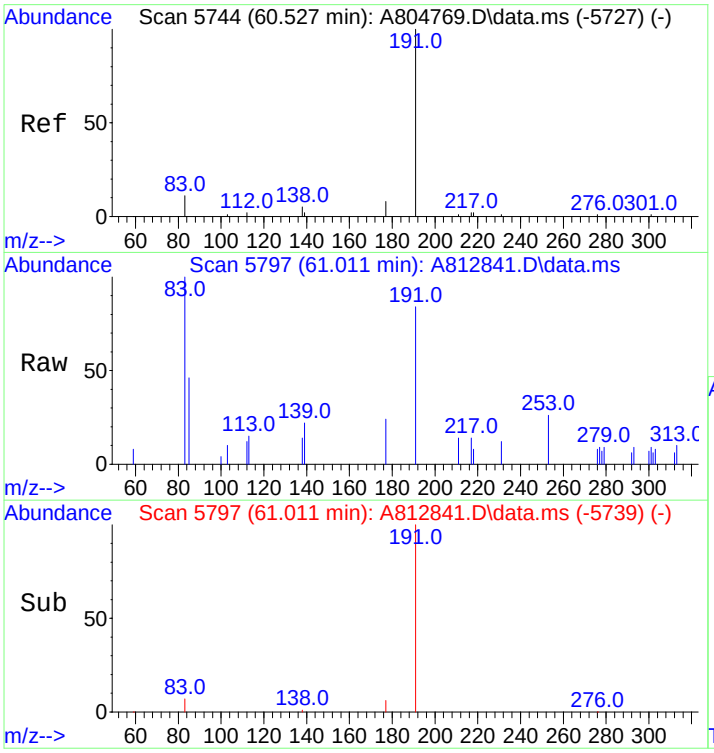




#124
30,31-Trishomohopane-22R (T31)
Concen: 176.46 ng/ml m
RT: 58.928 min Scan# 5569
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

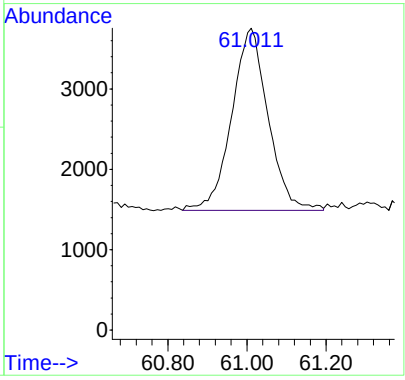
Tgt Ion:191 Resp: 12922

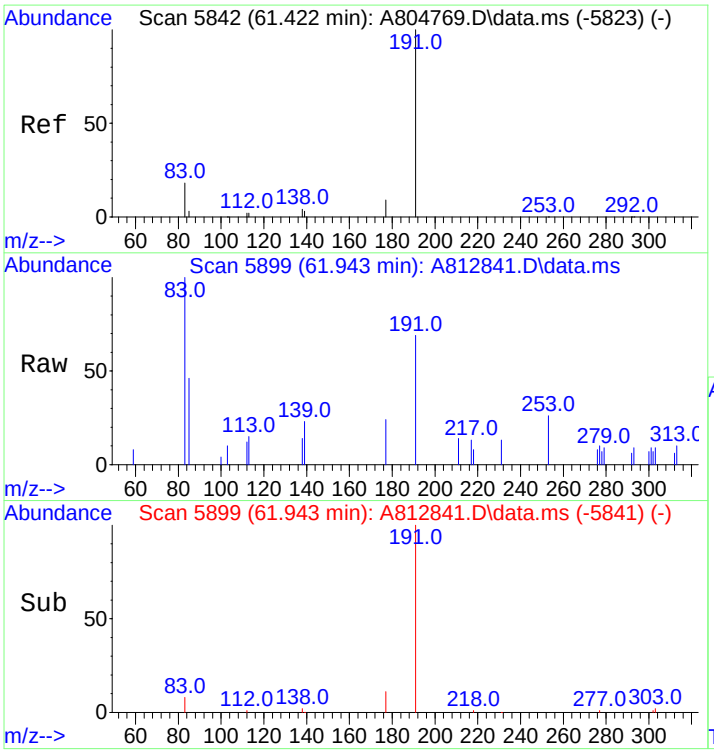




#125
Tetrakishomohopane-22S (T32)
Concen: 197.84 ng/ml
RT: 61.011 min Scan# 5797
Delta R.T. 0.027 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

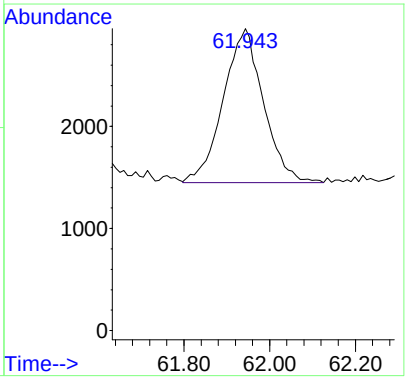
Tgt Ion:191 Resp: 14487

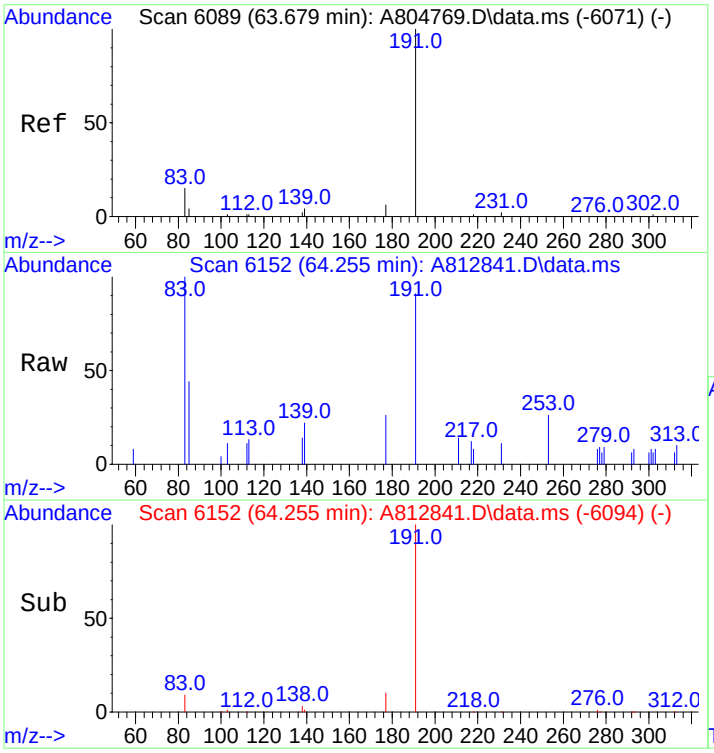




#126
Tetrakishomohopane-22R (T33)
Concen: 134.06 ng/ml
RT: 61.943 min Scan# 5899
Delta R.T. 0.027 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

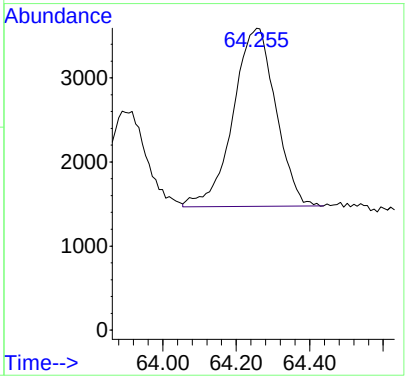
Tgt Ion:191 Resp: 9817

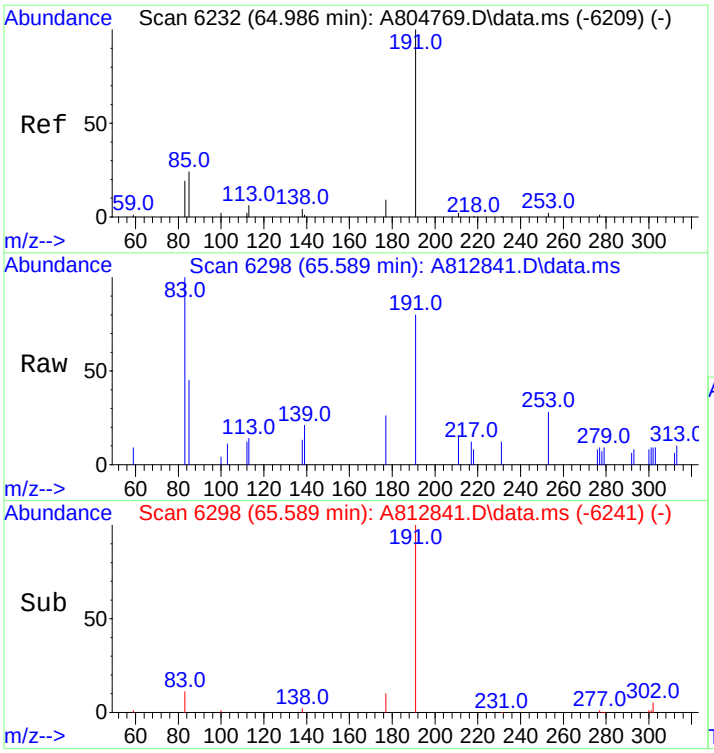




#127
Pentakishomohopane-22S (T34)
Concen: 233.60 ng/ml
RT: 64.255 min Scan# 6152
Delta R.T. 0.027 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

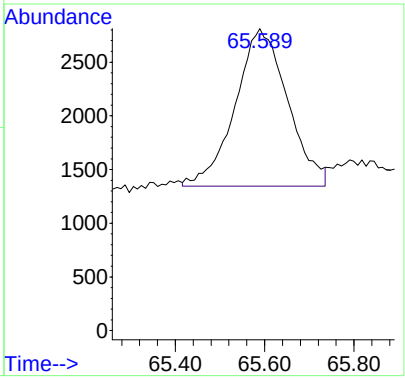
Tgt Ion:191 Resp: 17106

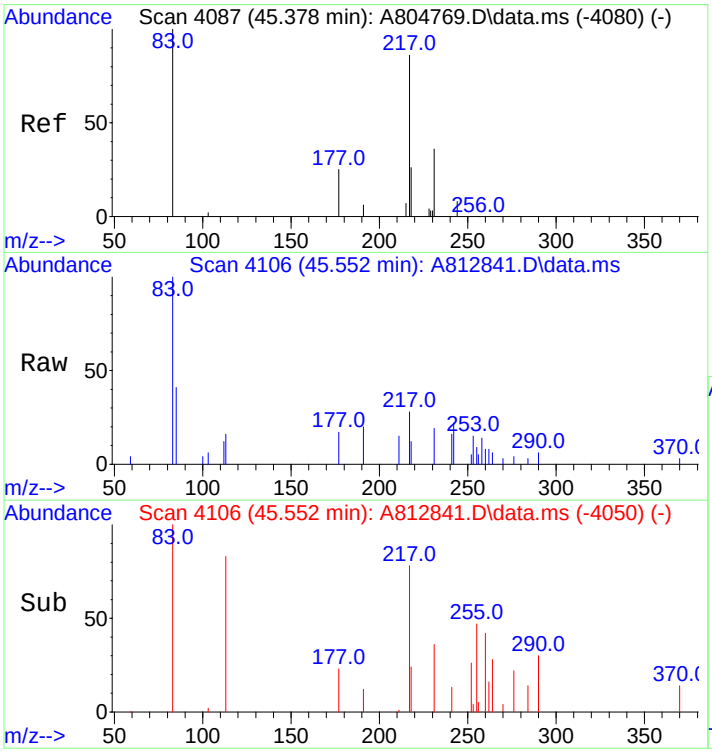




#128
Pentakishomohopane-22R (T35)
Concen: 163.74 ng/ml m
RT: 65.589 min Scan# 6298
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

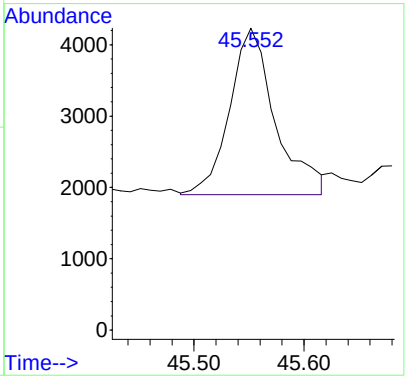
Tgt Ion:191 Resp: 11990

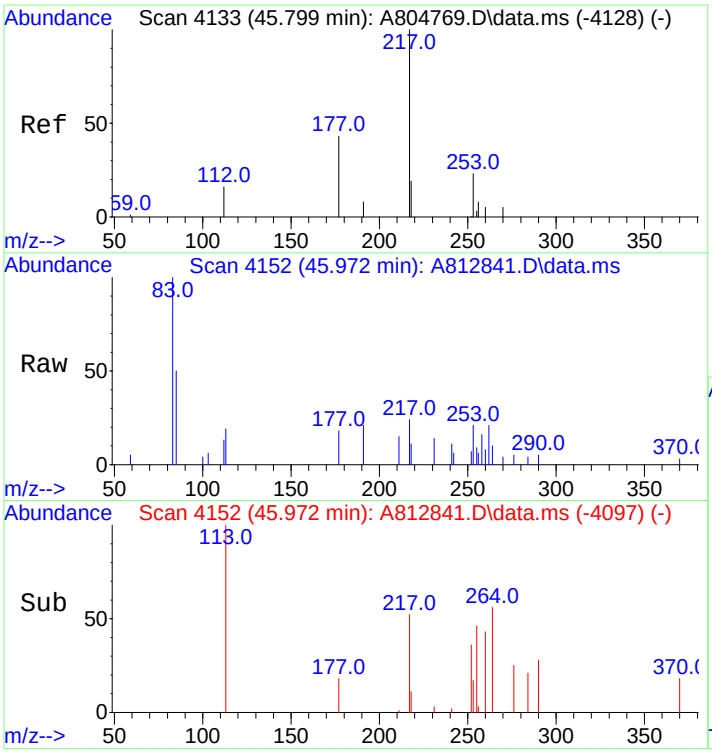




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 189.07 ng/ml m
RT: 45.552 min Scan# 4106
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

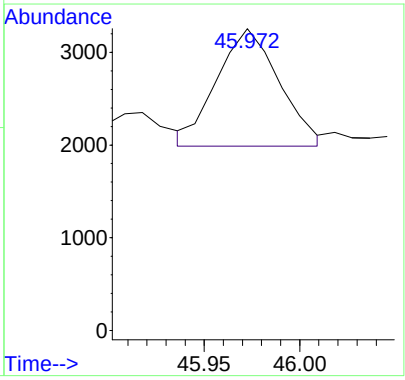
Tgt Ion:217 Resp: 6741

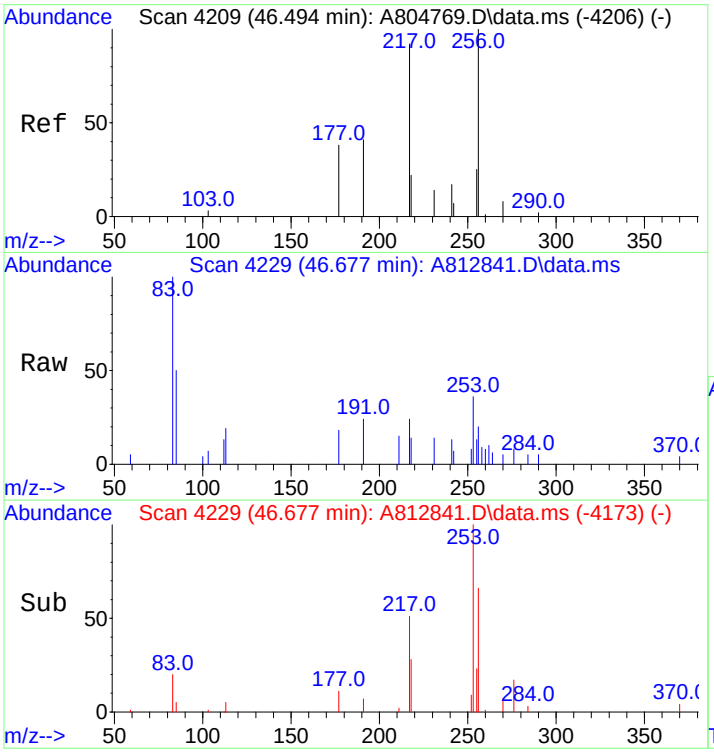




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 80.22 ng/ml m
RT: 45.972 min Scan# 4152
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

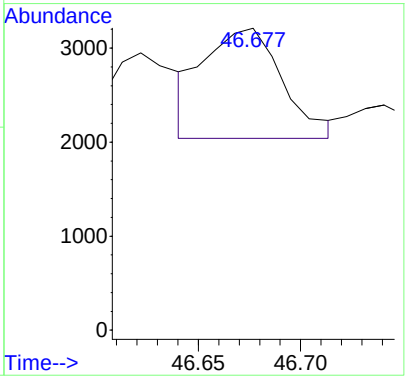
Tgt Ion:217 Resp: 2860

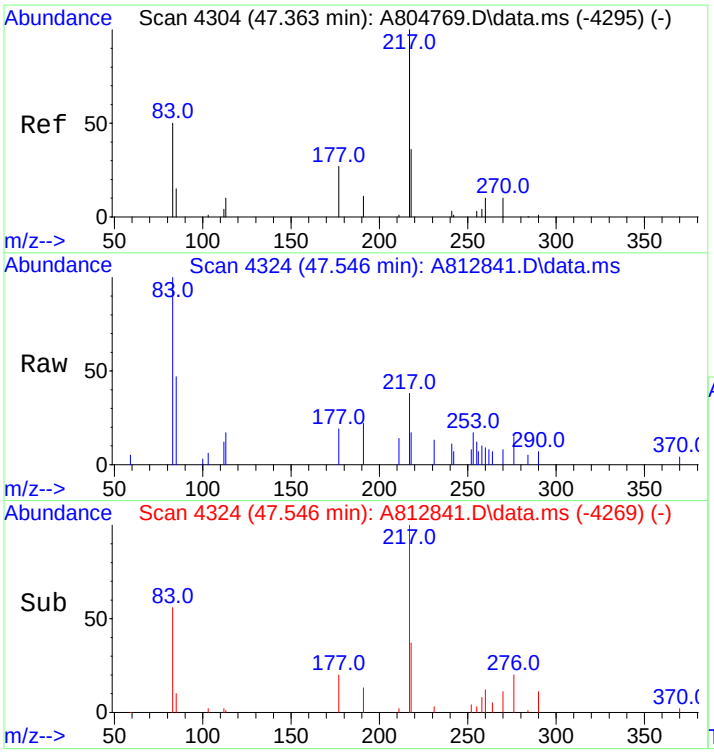




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 87.23 ng/ml m
RT: 46.677 min Scan# 4229
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

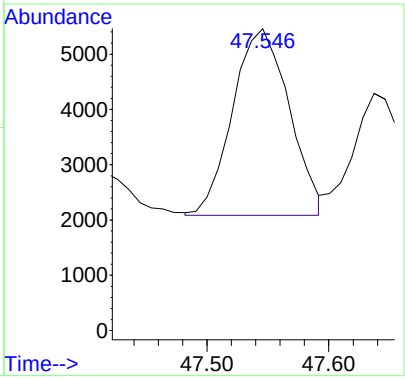
Tgt Ion:217 Resp: 3110

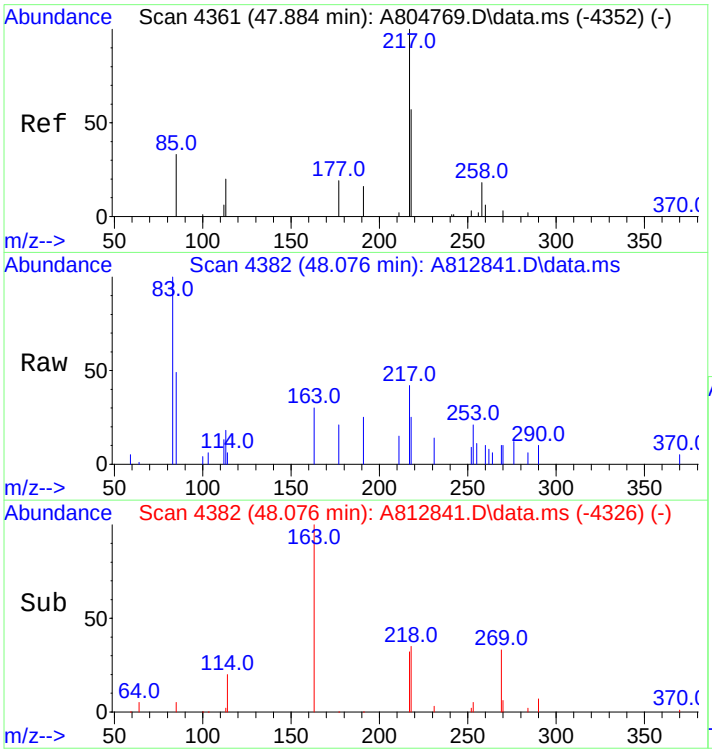




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 305.77 ng/ml m
RT: 47.546 min Scan# 4324
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

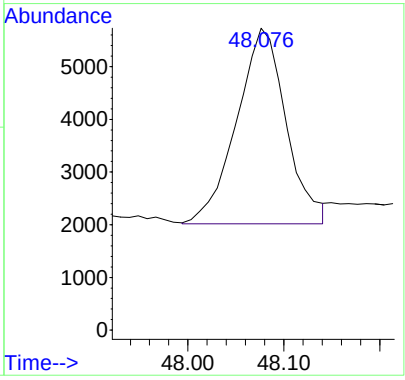
Tgt Ion:217 Resp: 10902

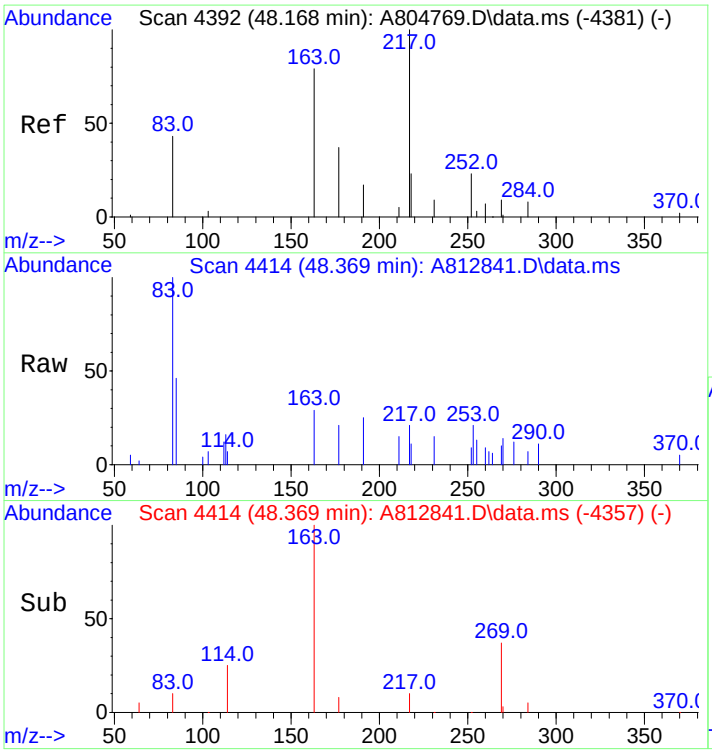




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 374.21 ng/ml m
RT: 48.076 min Scan# 4382
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

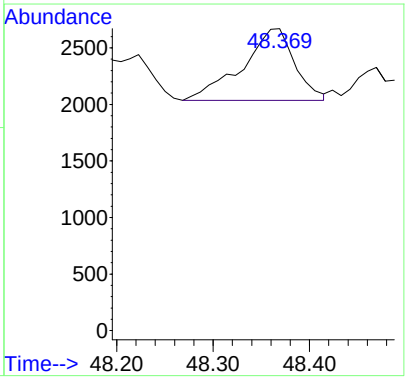
Tgt Ion:217 Resp: 13342

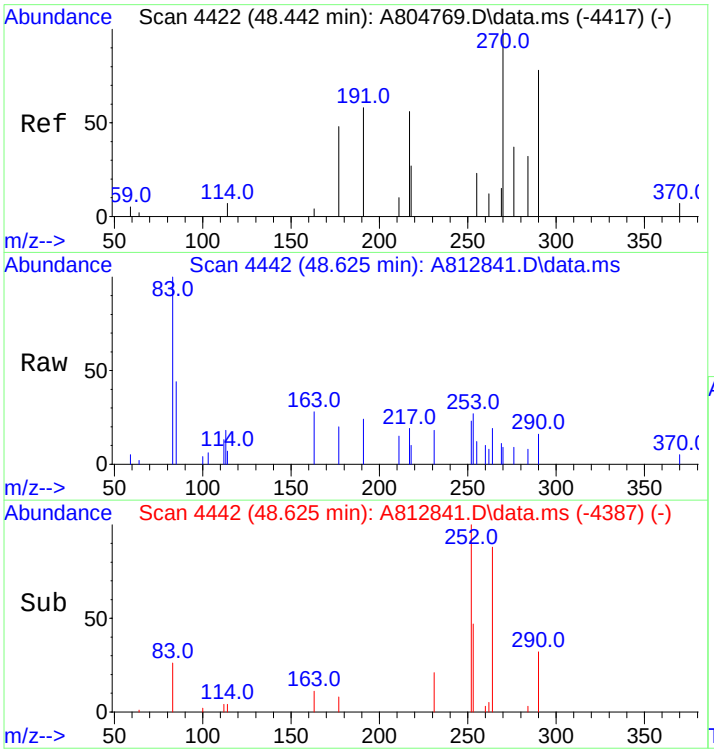




#135
Unknown Sterane (S18)
Concen: 67.26 ng/ml
RT: 48.369 min Scan# 4414
Delta R.T. 0.018 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

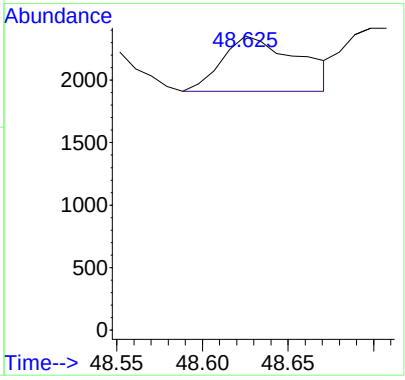
Tgt Ion:217 Resp: 2398

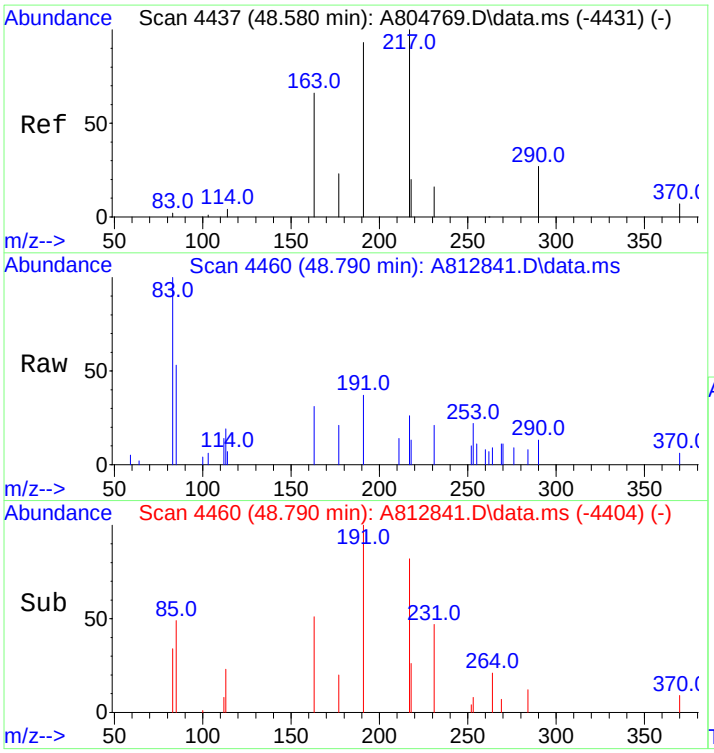




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 38.48 ng/ml
RT: 48.625 min Scan# 4442
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

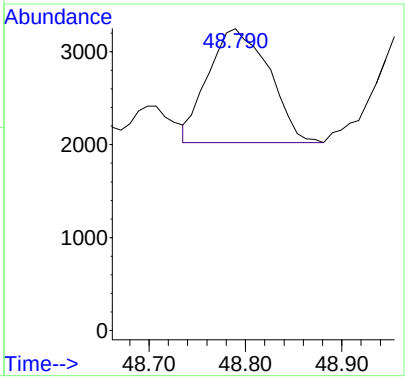
Tgt Ion:217 Resp: 1372

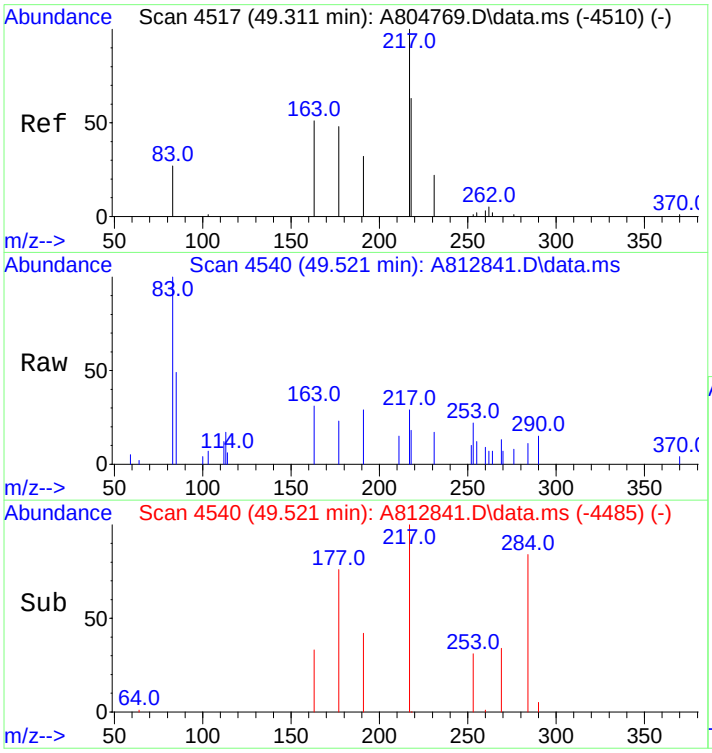




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 150.50 ng/ml
RT: 48.790 min Scan# 4460
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

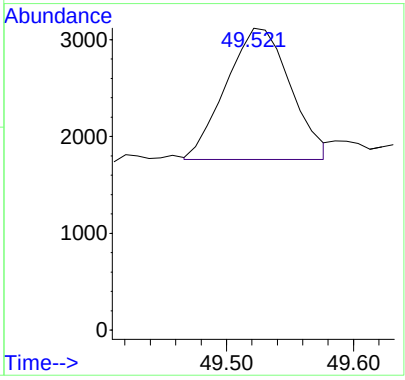
Tgt Ion:217 Resp: 5366

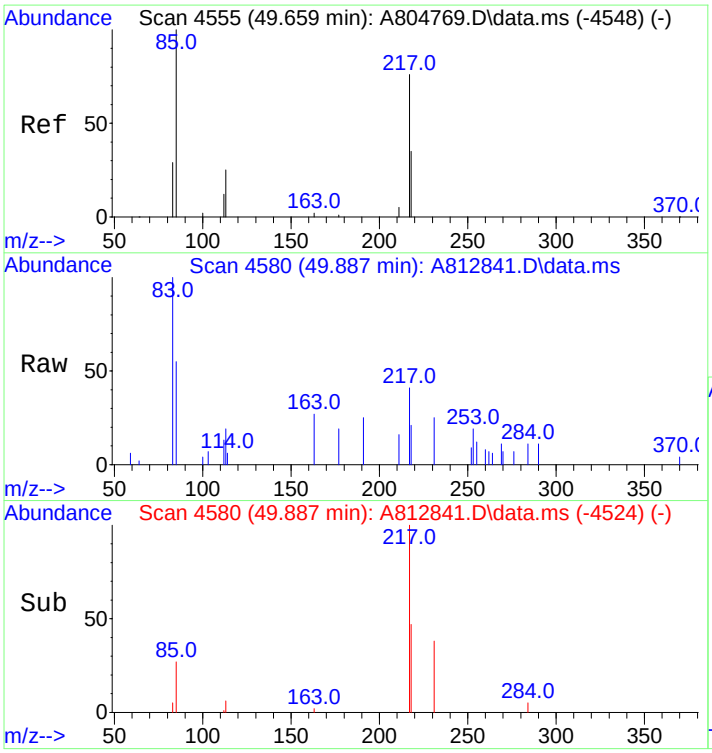




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 134.18 ng/ml m
RT: 49.521 min Scan# 4540
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

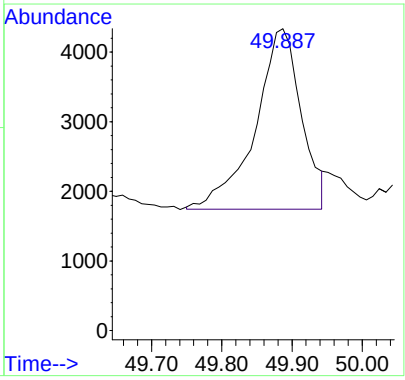
Tgt Ion:217 Resp: 4784

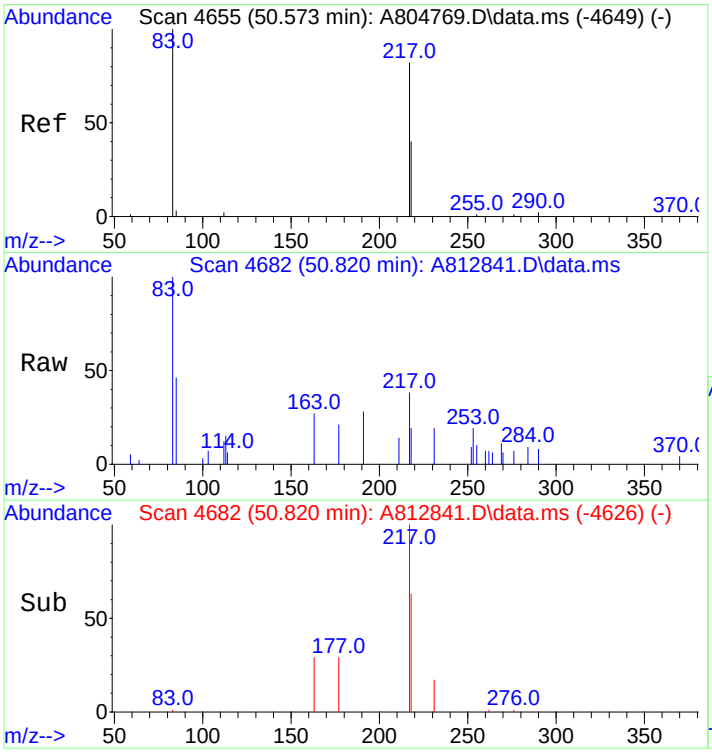




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 331.44 ng/ml m
RT: 49.887 min Scan# 4580
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

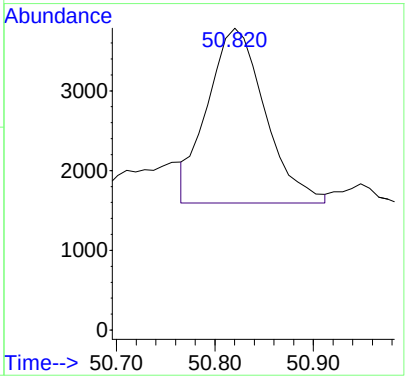
Tgt Ion:217 Resp: 11817

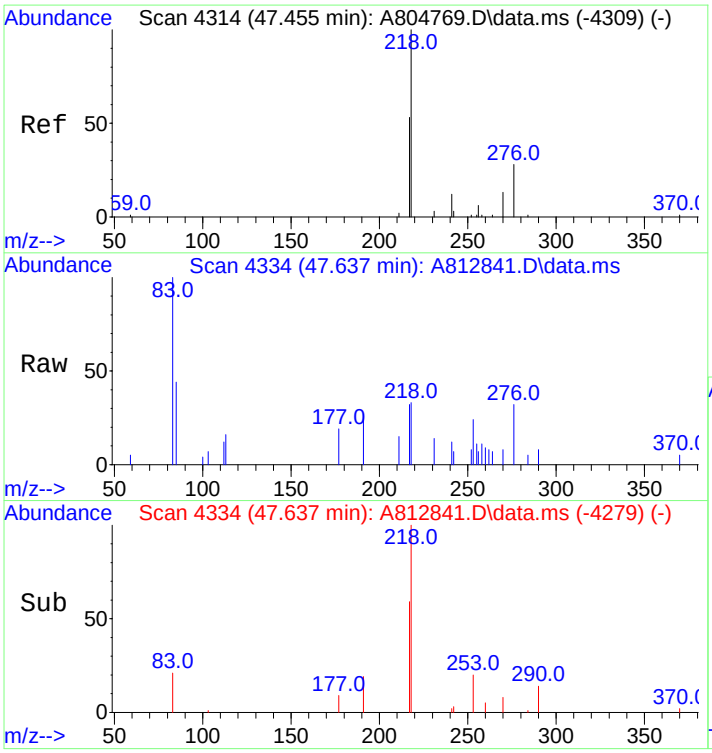




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 249.09 ng/ml m
RT: 50.820 min Scan# 4682
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

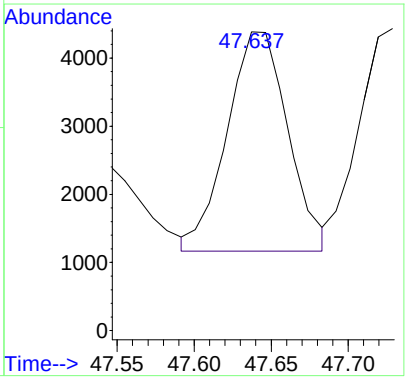
Tgt Ion:217 Resp: 8881

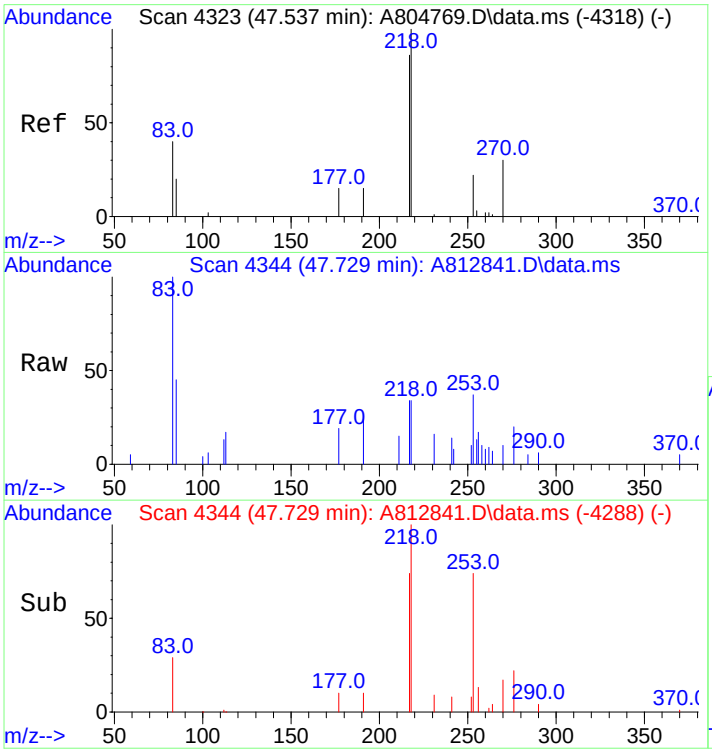




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 248.19 ng/ml m
RT: 47.637 min Scan# 4334
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

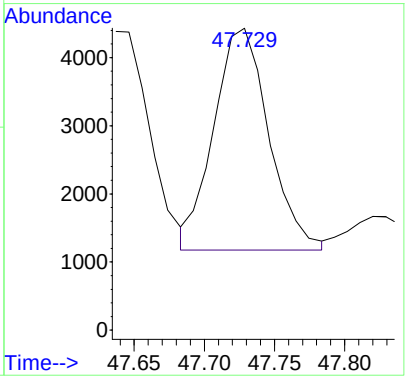
Tgt Ion:218 Resp: 8849

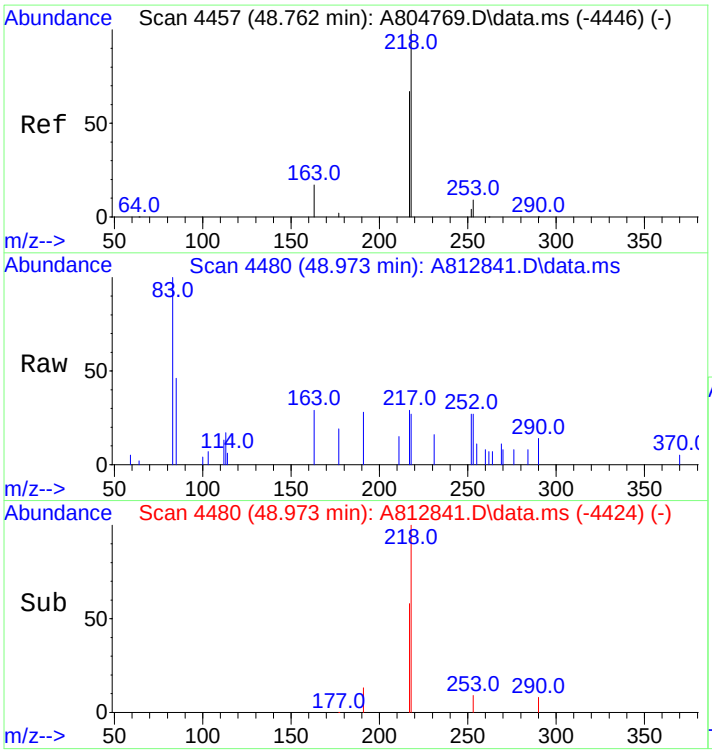




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 248.61 ng/ml m
RT: 47.729 min Scan# 4344
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

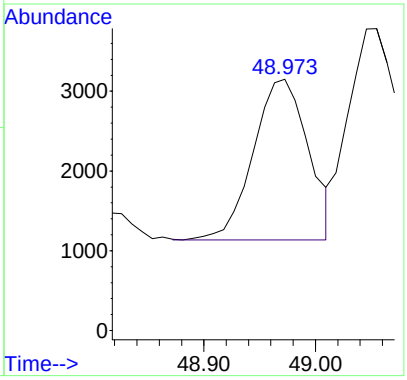
Tgt Ion:218 Resp: 8864

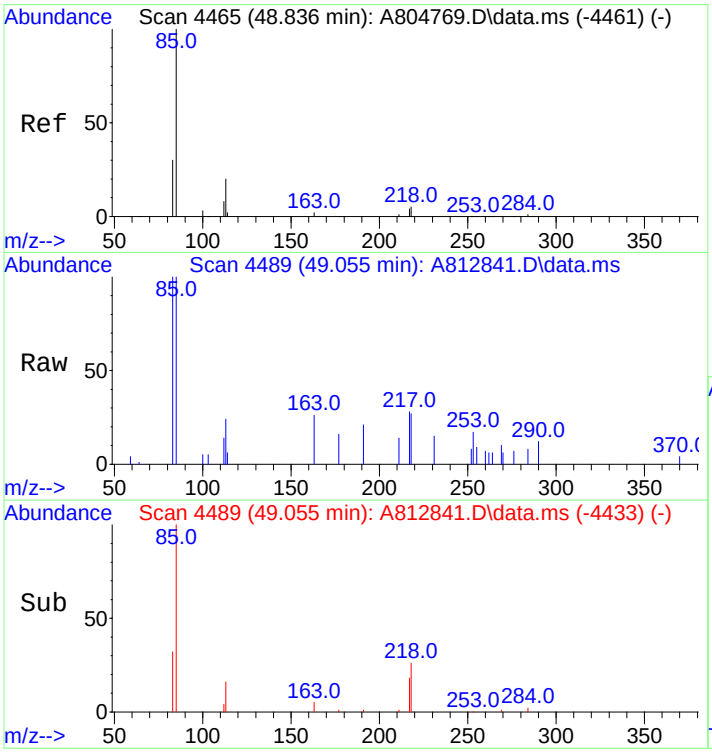




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 194.31 ng/ml m
RT: 48.973 min Scan# 4480
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

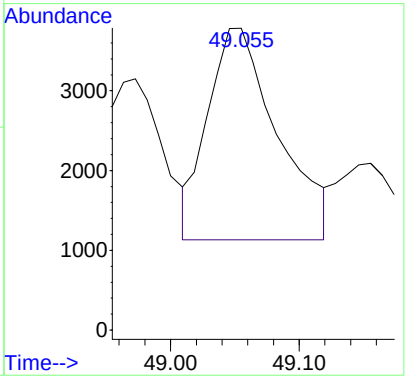
Tgt Ion:218 Resp: 6928

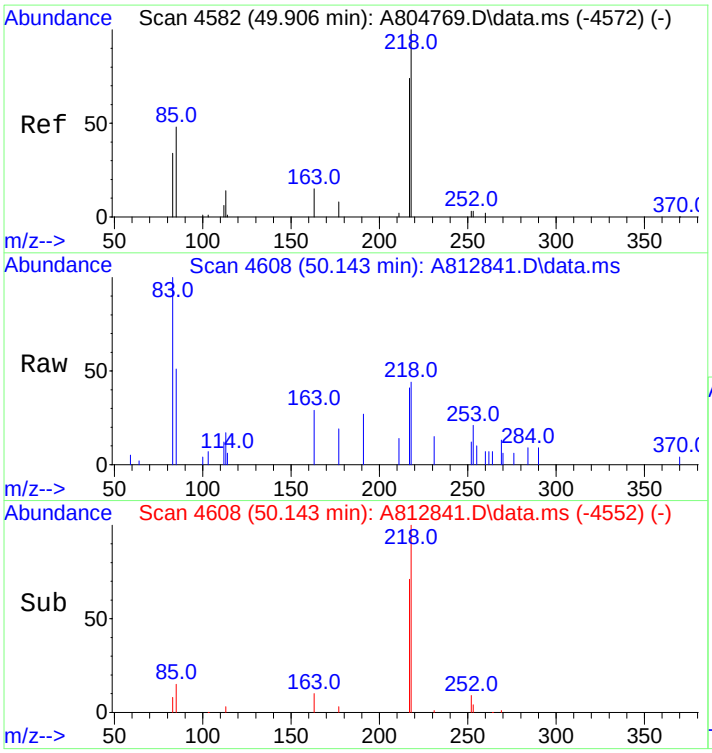




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 281.99 ng/ml m
RT: 49.055 min Scan# 4489
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

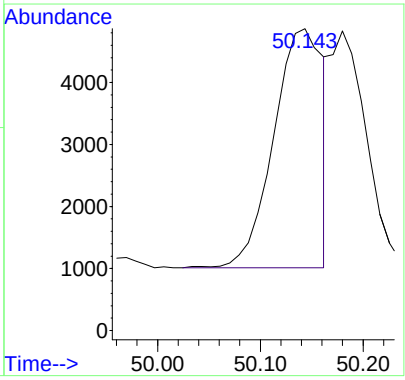
Tgt Ion:218 Resp: 10054

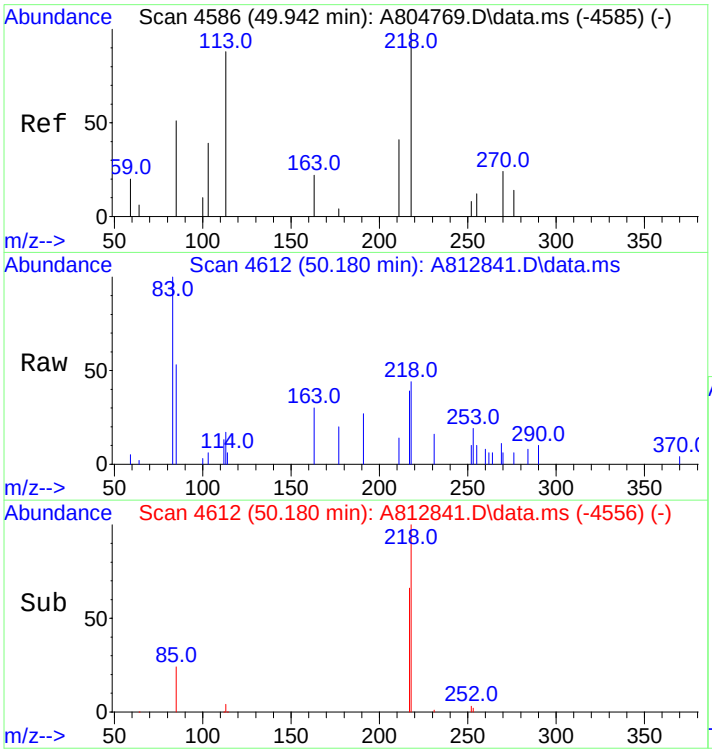




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 360.58 ng/ml
RT: 50.143 min Scan# 4608
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

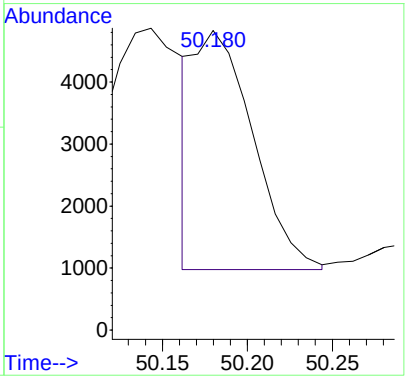
Tgt Ion:218 Resp: 12856

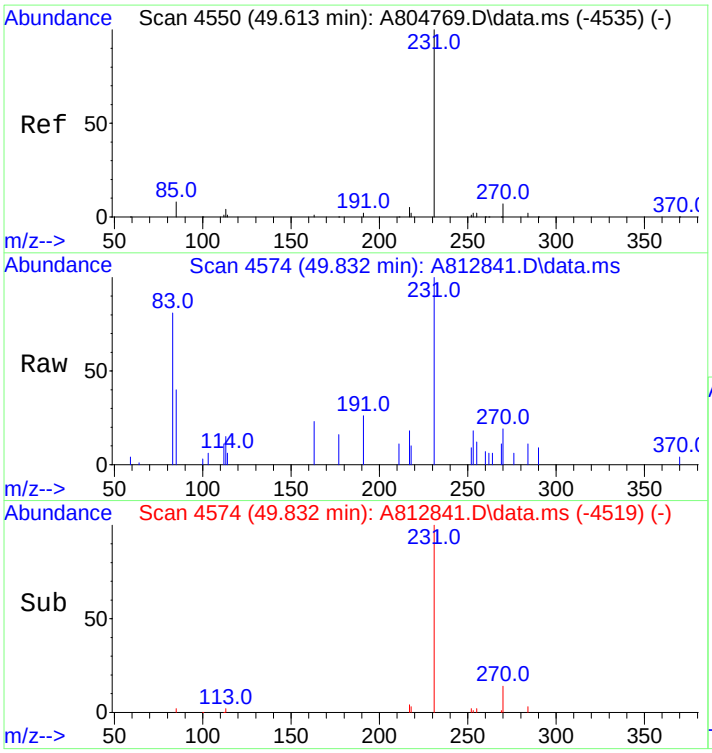




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 260.42 ng/ml m
RT: 50.180 min Scan# 4612
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

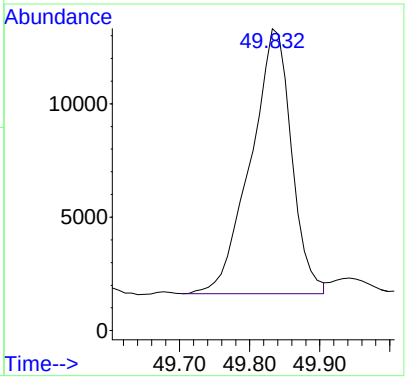
Tgt Ion:218 Resp: 9285

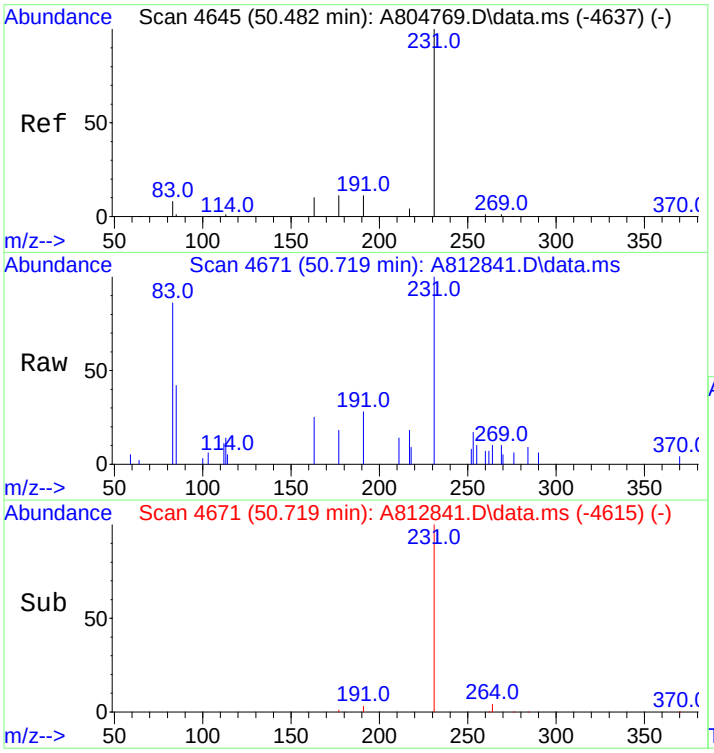




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1330.96 ng/mL
RT: 49.832 min Scan# 4574
Delta R.T. -0.000 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

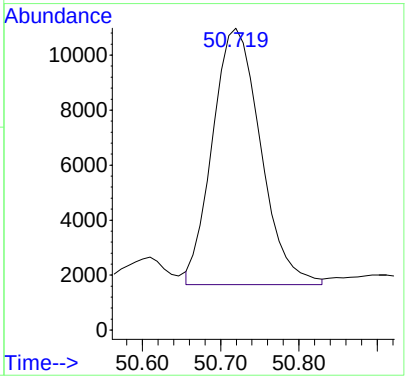
Tgt Ion:231 Resp: 47454

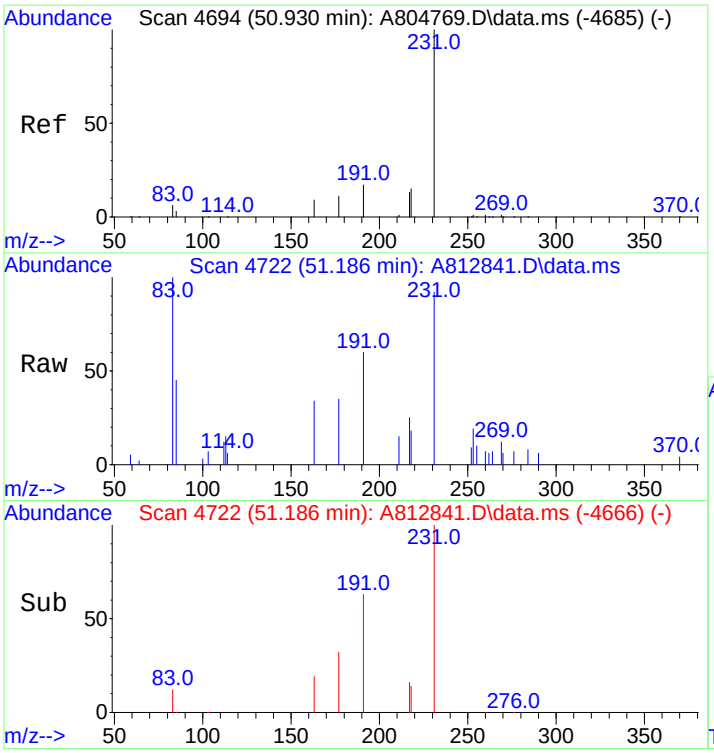




#148
C28,20S-triaromatic steroid
Concen: 1112.56 ng/mL m
RT: 50.719 min Scan# 4671
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

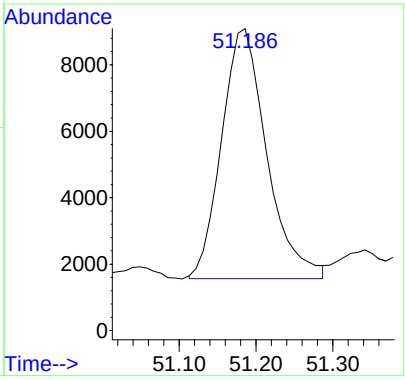
Tgt Ion:231 Resp: 39667

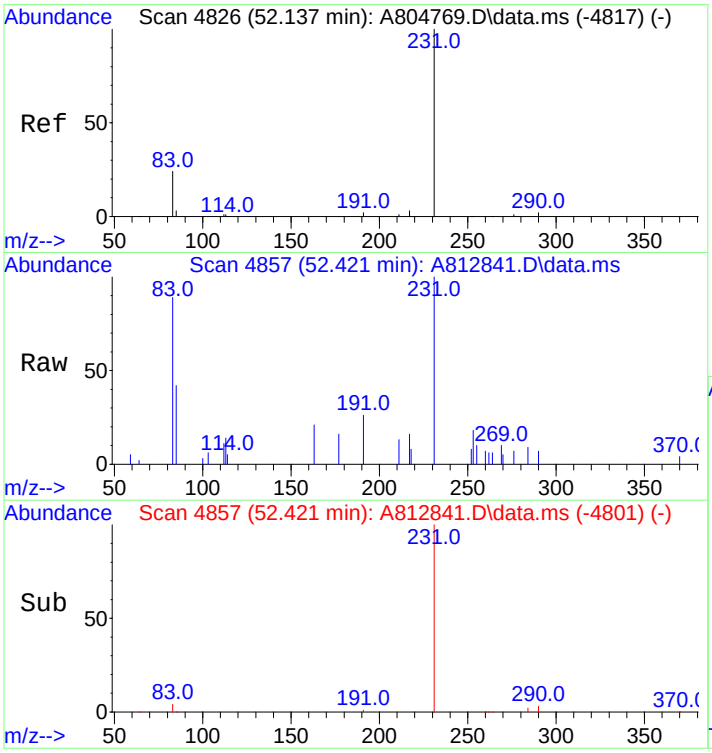




#149
C27,20R-triaromatic steroid
Concen: 861.48 ng/mL m
RT: 51.186 min Scan# 4722
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

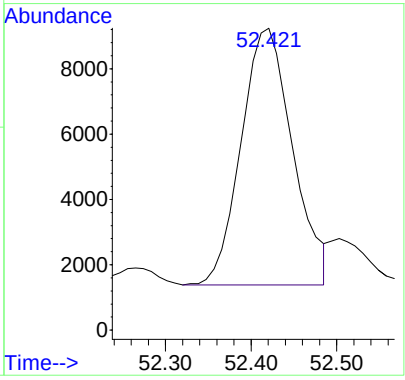
Tgt Ion:231 Resp: 30715





#150
C28,20R-triaromatic steroid
Concen: 923.60 ng/mL
RT: 52.421 min Scan# 4857
Delta R.T. 0.009 min
Lab File: A812841.D
Acq: 19 Nov 2012 1:08 pm

Tgt Ion:231 Resp: 32930



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812844.D
Acq On : 19 Nov 2012 5:23 pm
Operator : AC
Sample : ss110612b08
Misc : 1x etr1210082
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 20 14:18:00 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

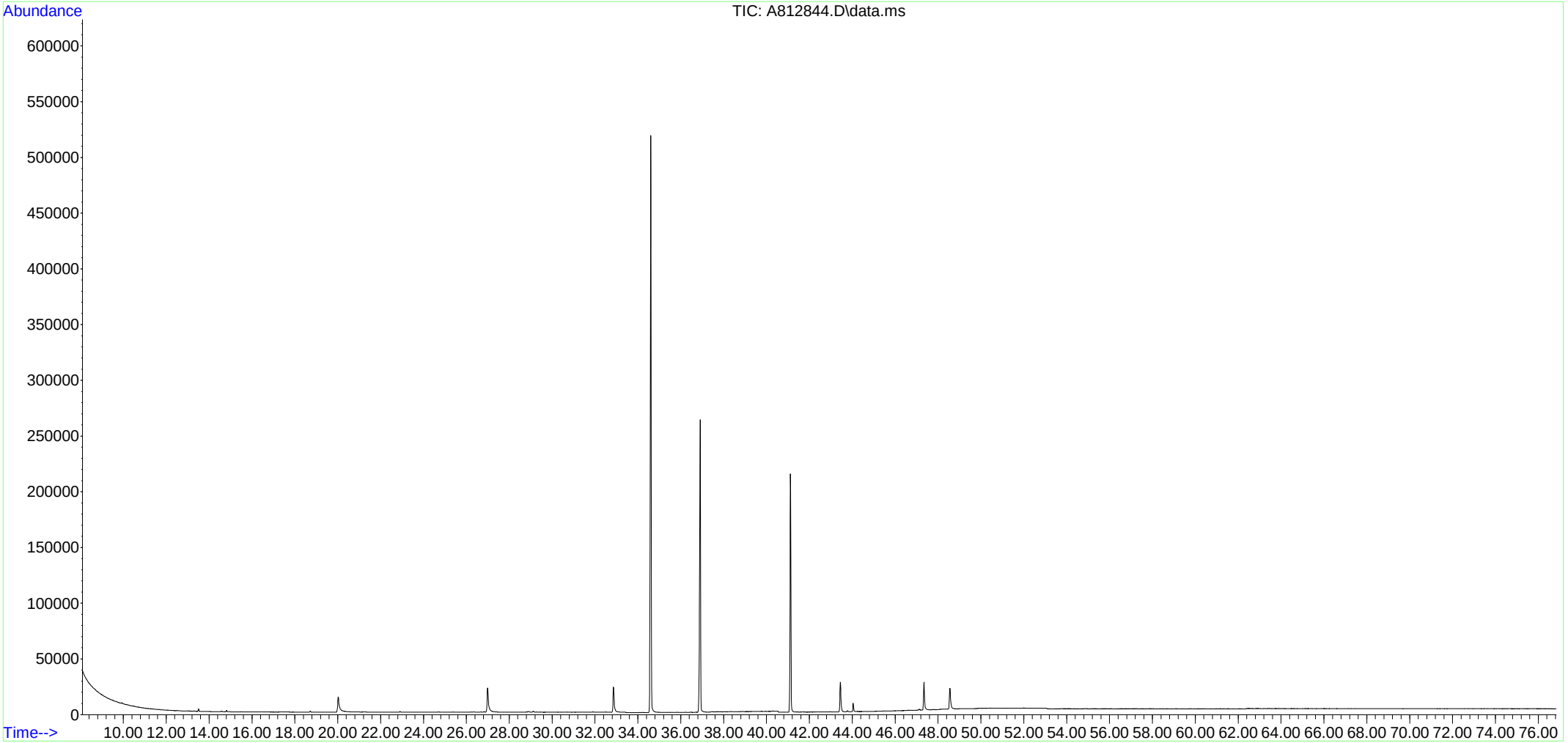
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	52112M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.442	240	76269	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.023	136	81595M2	395.092	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.51%#			
42) Phenanthrene-d10	32.862	188	72757	453.655	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.37%#			
83) Benzo[b]fluoranthene-d12	47.345	264	65111	447.937	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.79%#			
88) Benzo[a]pyrene-d12	48.552	264	59277	412.765	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.28%#			
129) 5B(H)Cholane - Surr	44.045	217	12317	441.649	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.16%#			
Target Compounds						Qvalue
3) trans-Decalin	16.647	138	39M3	0.842	ng/mL	
29) Fluorene	29.121	166	111M3	0.773	ng/mL	
33) Dibenzothiophene	32.469	184	272	1.378	ng/mL#	73
34) 4-Methyldibenzothiophe...	34.230	198	134M3	0.679	ng/mL	
36) 1-Methyldibenzothiophe...	34.988	198	269	1.363	ng/mL#	100
37) OTP	34.605	198	9261	46.909	ng/mL#	100
38) C1-Dibenzothiophenes	34.605	198	9943M5	50.364	ng/mL	
39) C2-Dibenzothiophenes	36.704	212	1216M5	6.159	ng/mL	
43) Phenanthrene	32.953	178	111M3	0.584	ng/mL	
58) Fluoranthene	37.736	202	100M3	0.511	ng/mL	
60) Pyrene	38.631	202	104	0.525	ng/mL#	57
66) Naphthobenzothiophene	42.456	234	55M2	0.299	ng/ml	
67) Naphthobenzothiophene-...	42.456	234	64M2	0.348	ng/mL	
75) Benz[a]anthracene	43.378	228	38M3	0.227	ng/mL	
77) Chrysene/Triphenylene	43.543	228	89M3	0.526	ng/mL	
91) Indeno[1,2,3-cd]pyrene	53.609	276	100	0.550	ng/mL#	51
92) Dibenz[ah]+[ac]anthracene	53.646	278	111M3	0.623	ng/mL	
93) Benzo[g,h,i]perylene	54.925	276	161M3	0.780	ng/mL	

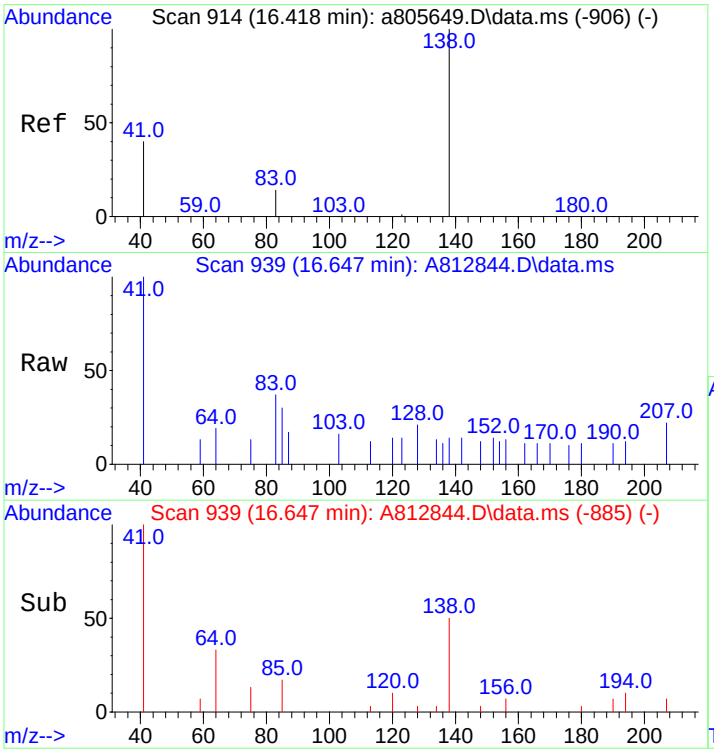
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812844.D
Acq On : 19 Nov 2012 5:23 pm
Operator : AC
Sample : ss110612b08
Misc : 1x etr1210082
ALS Vial : 25 Sample Multiplier: 1

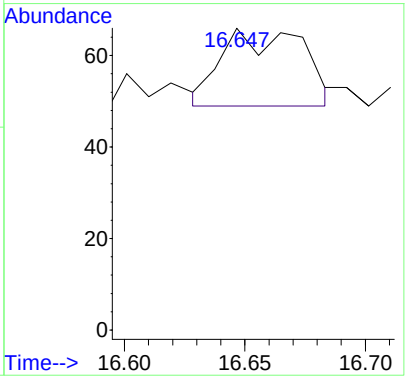
Quant Time: Nov 20 14:18:00 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

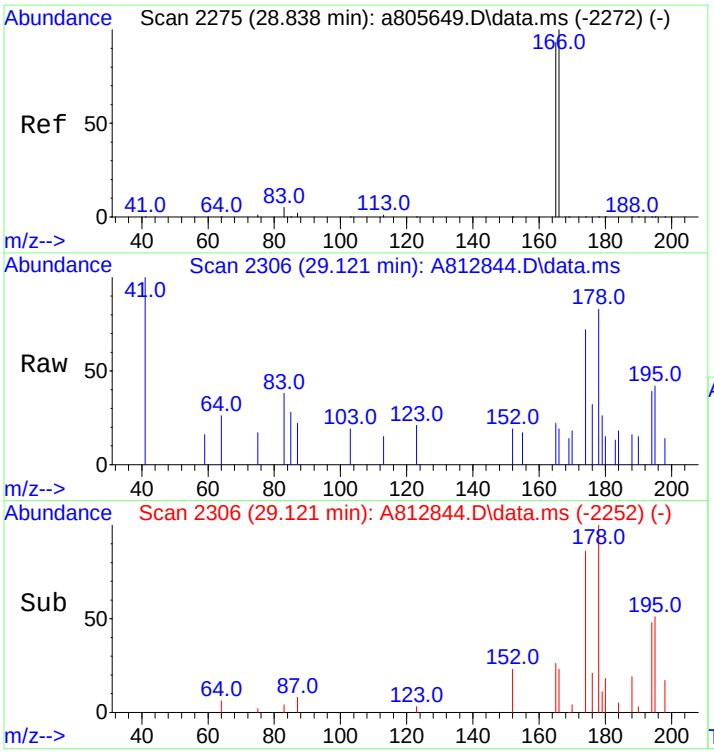




#3
trans-Decalin
Concen: 0.84 ng/mL m
RT: 16.647 min Scan# 939
Delta R.T. -0.009 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:138 Resp: 39

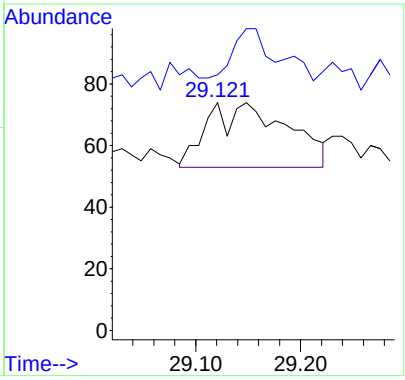


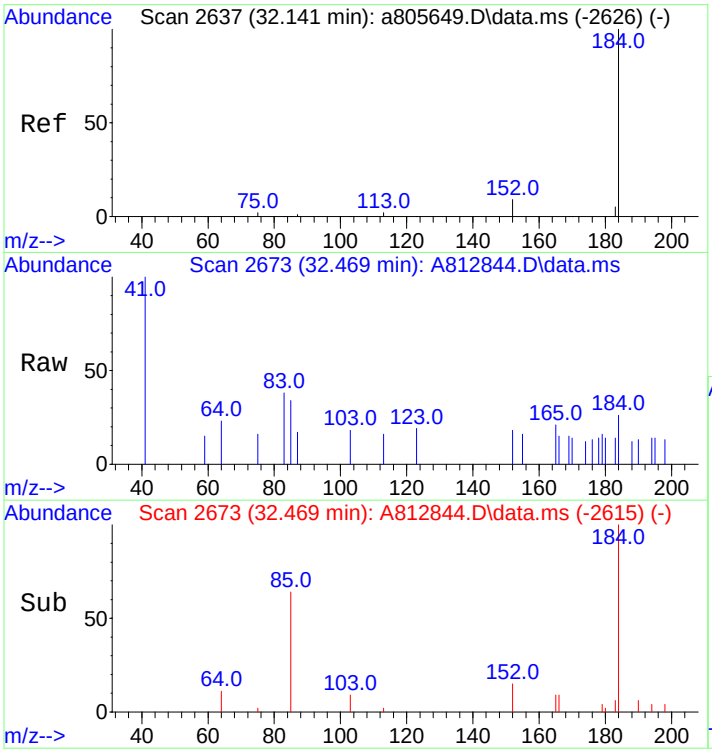


#29
Fluorene
Concen: 0.77 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:166 Resp: 111

Ion	Ratio	Lower	Upper
166	100		
165	234.2	74.2	111.2#

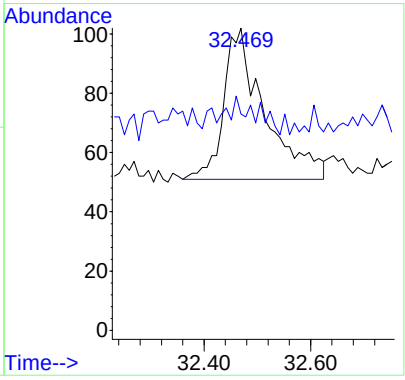


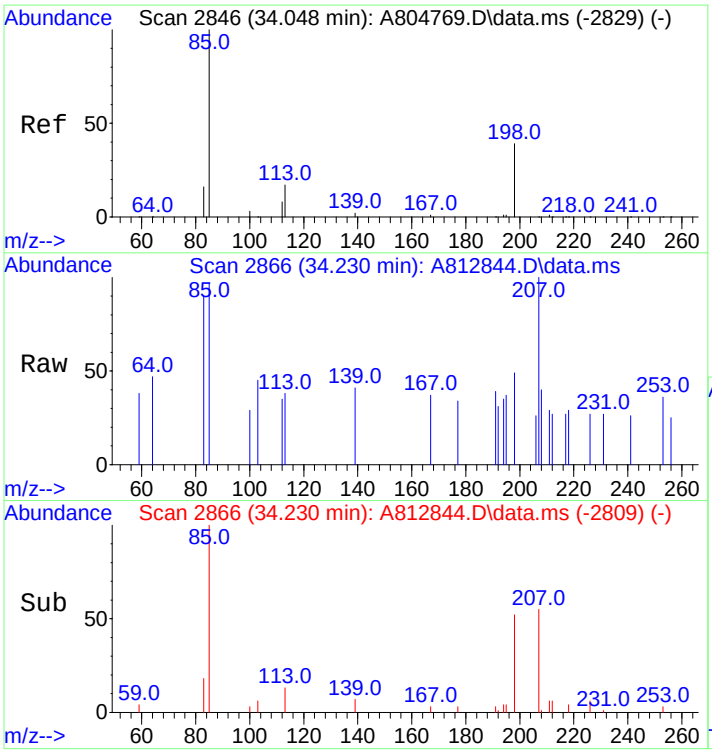


#33
Dibenzothiophene
Concen: 1.38 ng/mL
RT: 32.469 min Scan# 2673
Delta R.T. 0.027 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:184 Resp: 272

Ion	Ratio	Lower	Upper
184	100		
152	0.0	7.8	11.8#

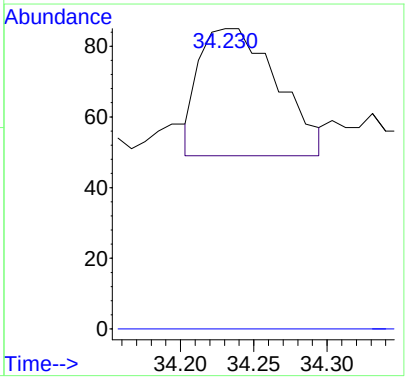


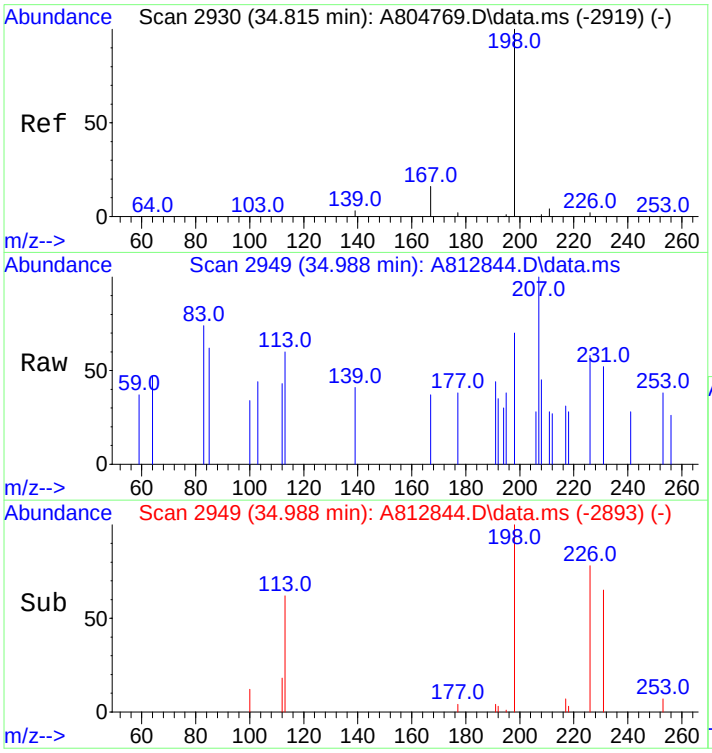


#34
4-Methyldibenzothiophene(4MDT)
Concen: 0.68 ng/mL m
RT: 34.230 min Scan# 2866
Delta R.T. 0.018 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:198 Resp: 134

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

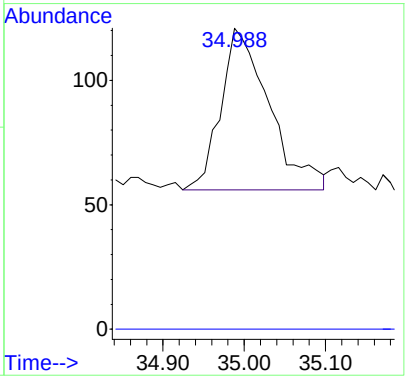


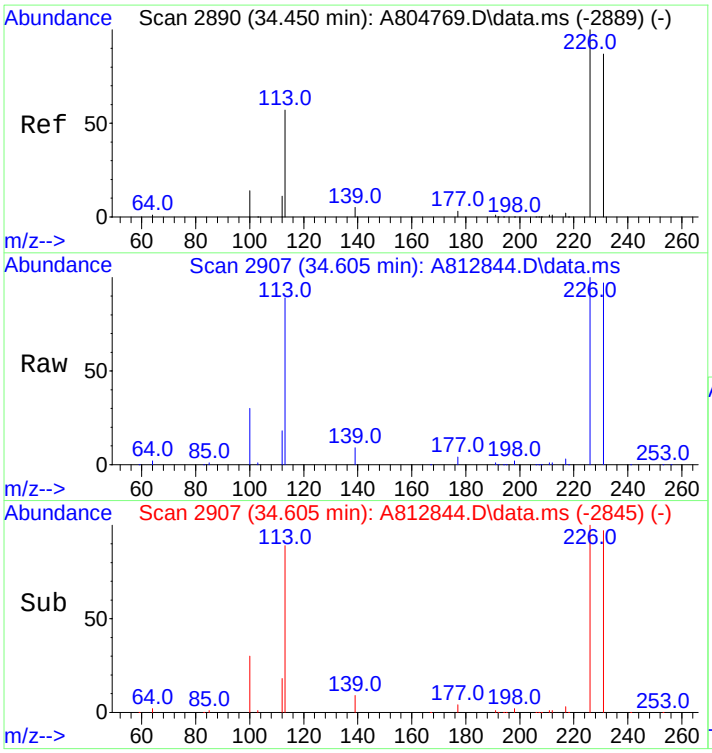


#36
1-Methyldibenzothiophene(1MDT)
Concen: 1.36 ng/mL
RT: 34.988 min Scan# 2949
Delta R.T. 0.009 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:198 Resp: 269

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

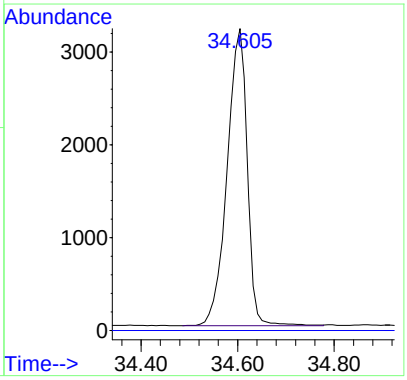


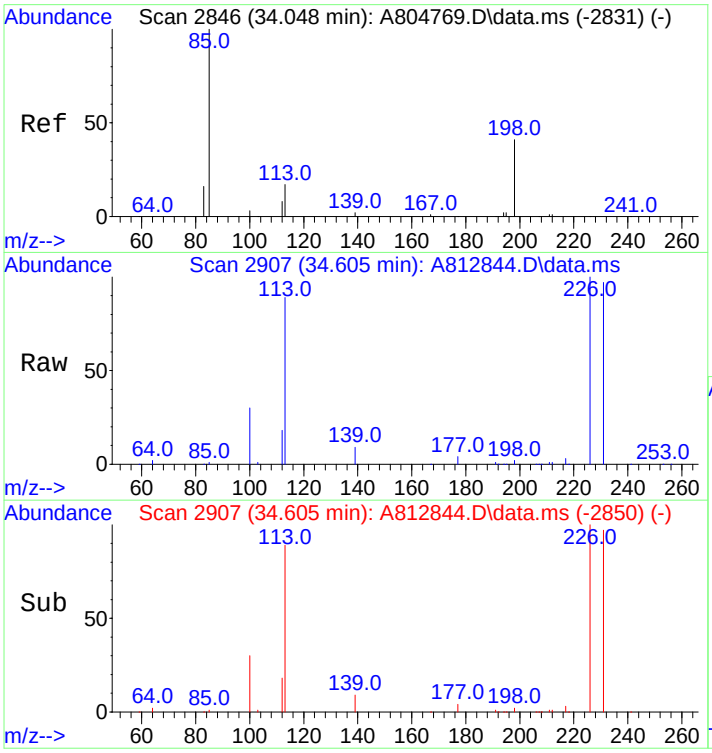


#37
OTP
Concen: 46.91 ng/mL
RT: 34.605 min Scan# 2907
Delta R.T. 0.018 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:198 Resp: 9261

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

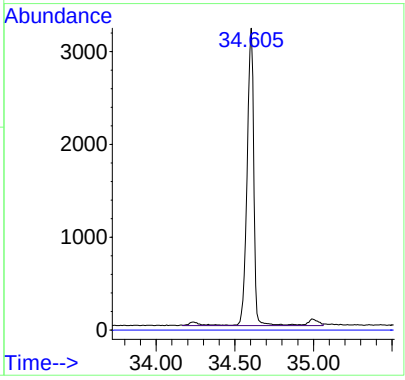


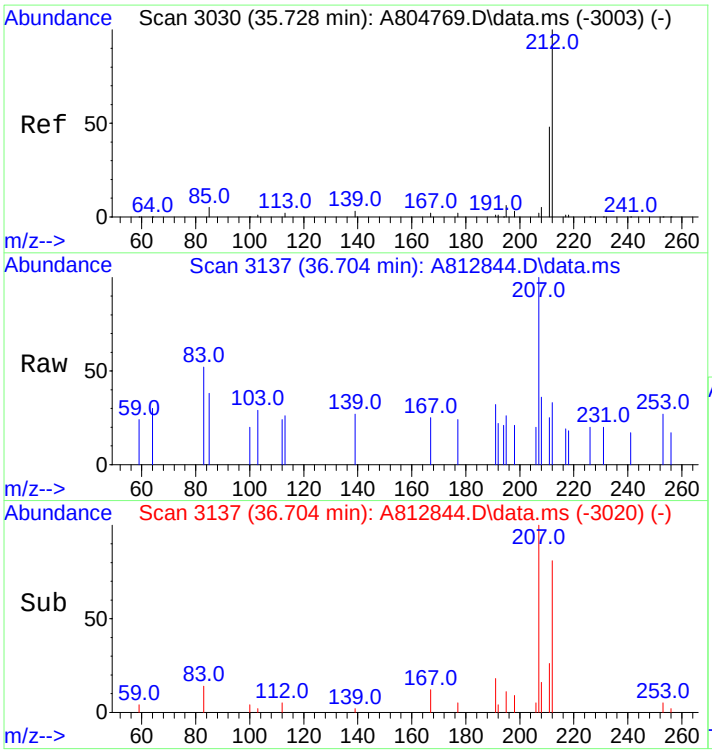


#38
C1-Dibenzothiophenes
Concen: 50.36 ng/mL m
RT: 34.605 min Scan# 2907
Delta R.T. 0.392 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:198 Resp: 9943

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

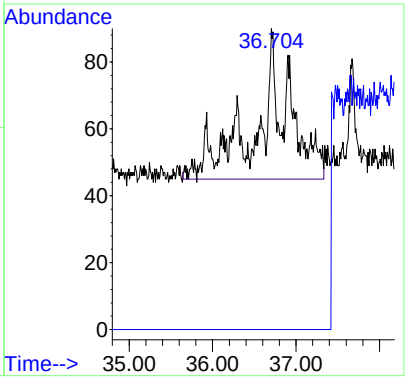


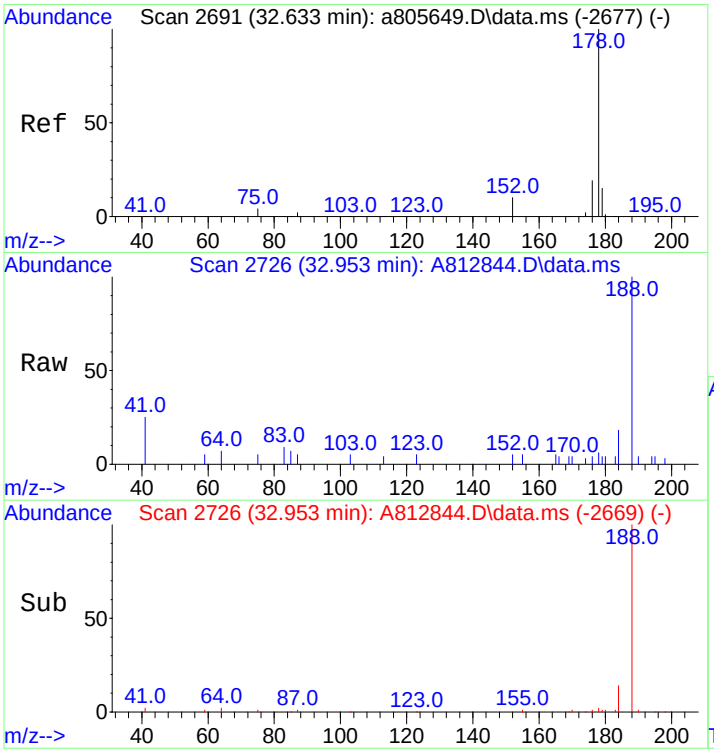


#39
C2-Dibenzothiophenes
Concen: 6.16 ng/mL m
RT: 36.704 min Scan# 3137
Delta R.T. 0.447 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:212 Resp: 1216

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

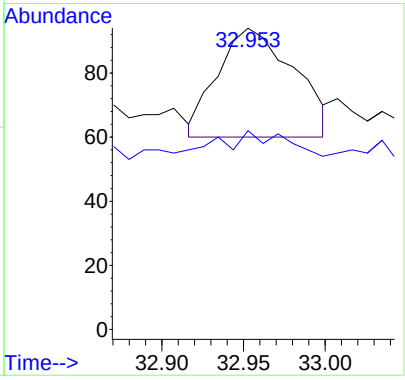


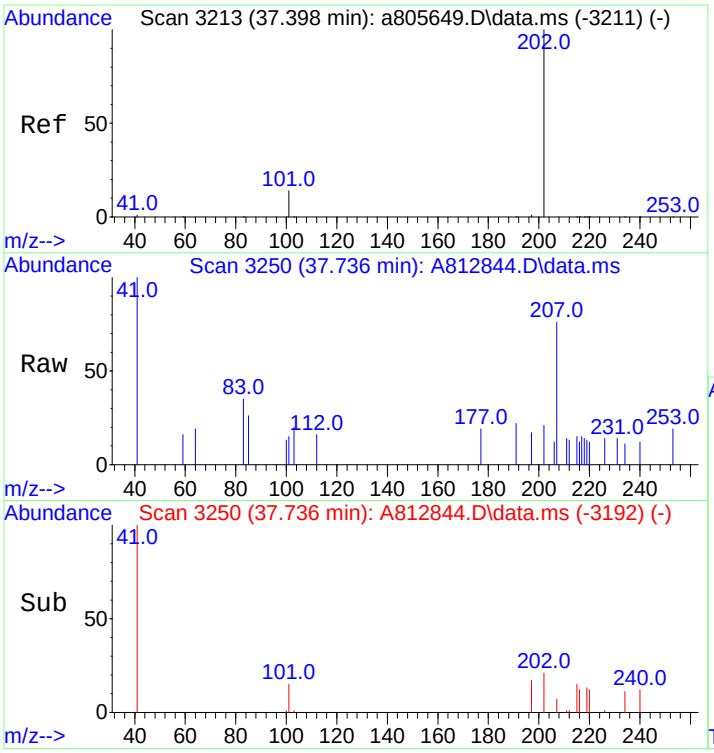


#43
Phenanthrene
Concen: 0.58 ng/mL m
RT: 32.953 min Scan# 2726
Delta R.T. 0.018 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:178 Resp: 111

Ion	Ratio	Lower	Upper
178	100		
176	0.0	15.2	22.8#

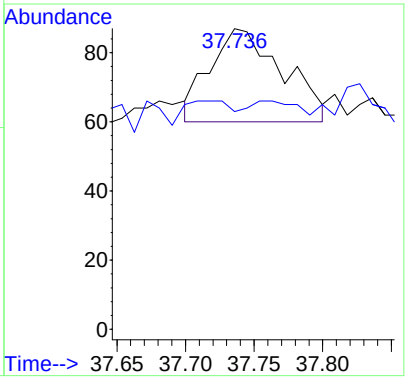


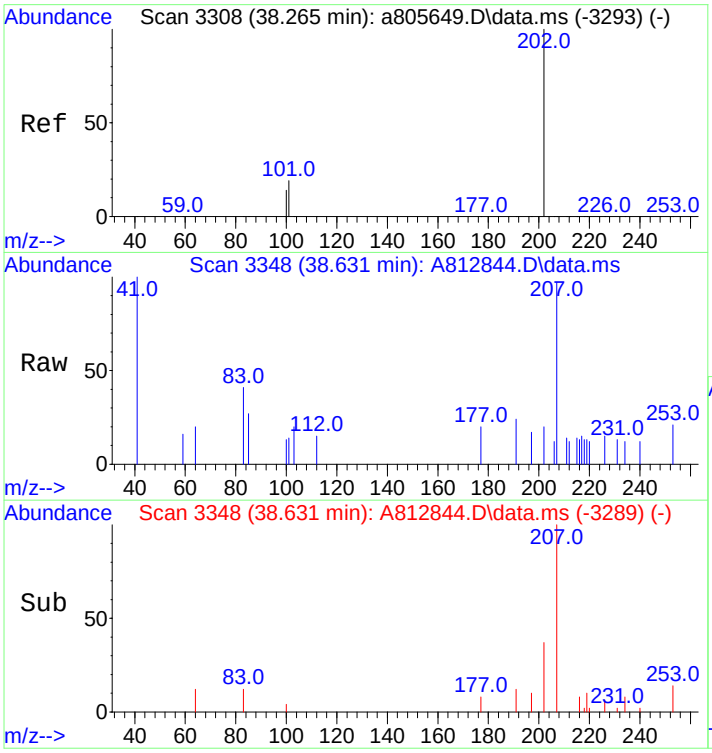


#58
Fluoranthene
Concen: 0.51 ng/mL m
RT: 37.736 min Scan# 3250
Delta R.T. 0.027 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:202 Resp: 100

Ion	Ratio	Lower	Upper
202	100		
101	139.0	13.6	20.4#

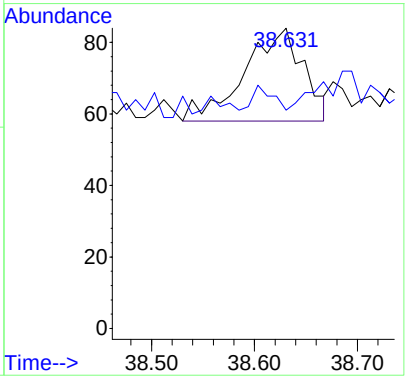


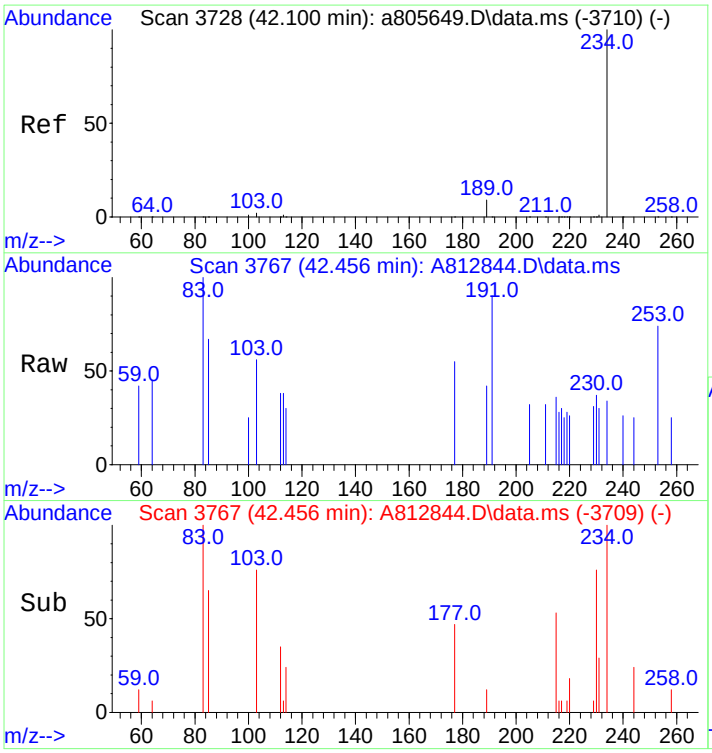


#60
Pyrene
Concen: 0.53 ng/mL
RT: 38.631 min Scan# 3348
Delta R.T. 0.037 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:202 Resp: 104

Ion	Ratio	Lower	Upper
202	100		
101	0.0	15.4	23.2#

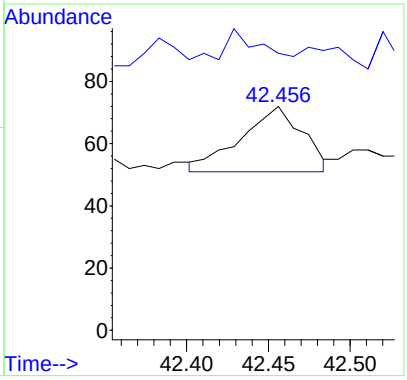


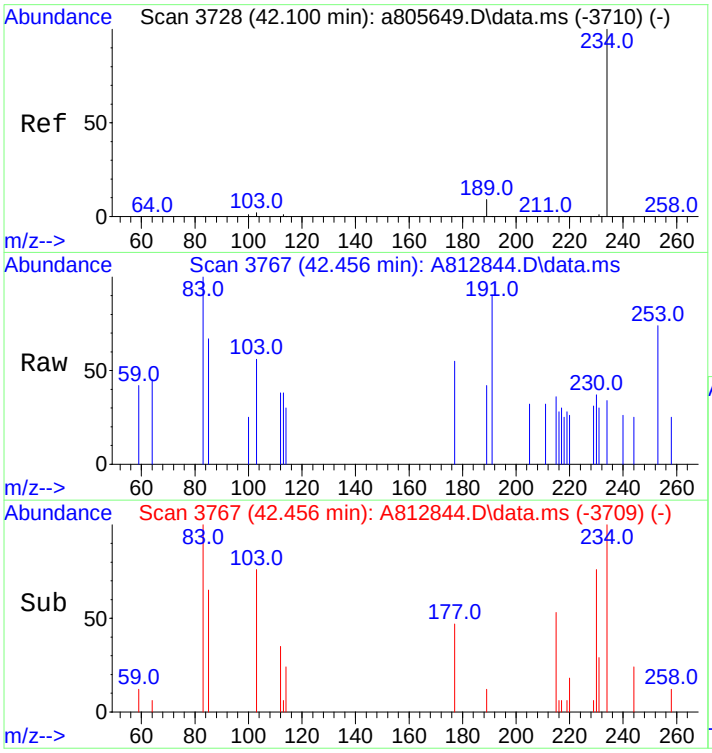


#66
Naphthobenzothiophene
Concen: 0.30 ng/ml m
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:234 Resp: 55

Ion	Ratio	Lower	Upper
234	100		
189	0.0	22.3	33.5#

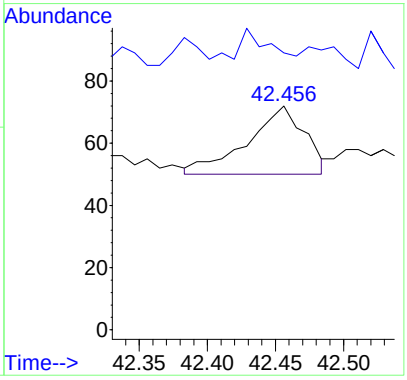


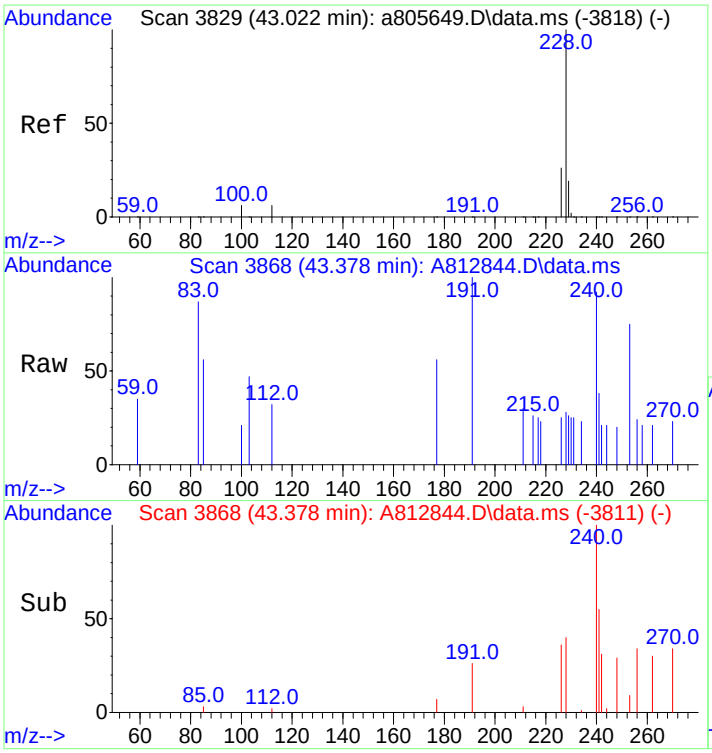


#67
Naphthobenzothiophene-2,1-D
Concen: 0.35 ng/mL m
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:234 Resp: 64

Ion	Ratio	Lower	Upper
234	100		
189	0.0	22.3	33.5#

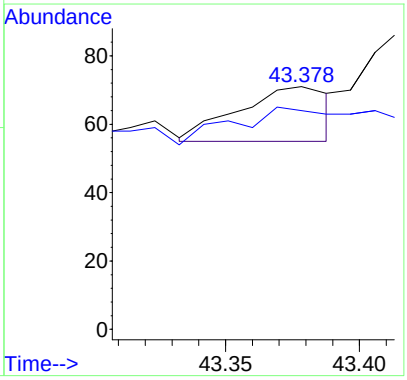


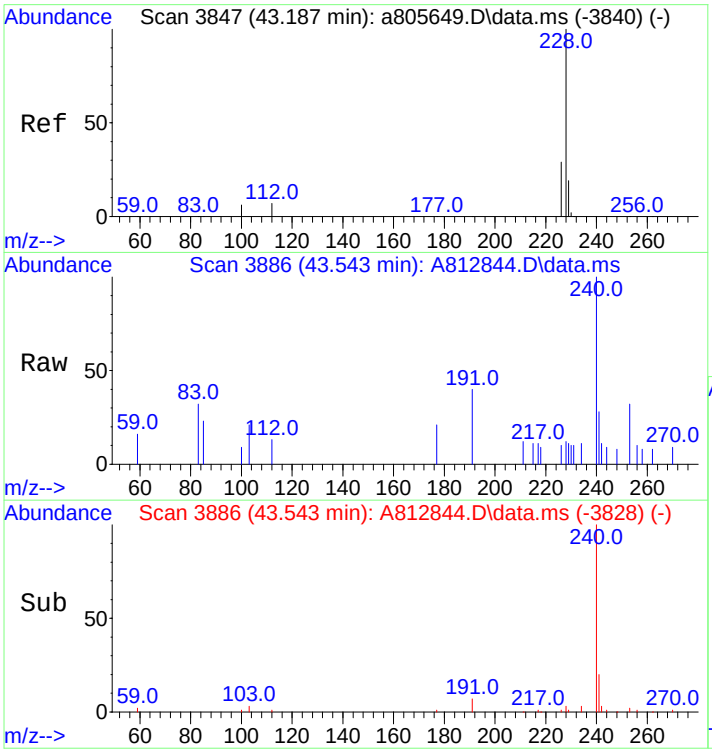


#75
Benz[a]anthracene
Concen: 0.23 ng/mL m
RT: 43.378 min Scan# 3868
Delta R.T. 0.018 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:228 Resp: 38

Ion	Ratio	Lower	Upper
228	100		
226	0.0	21.3	31.9#

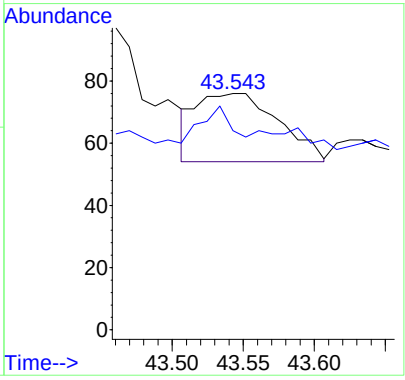


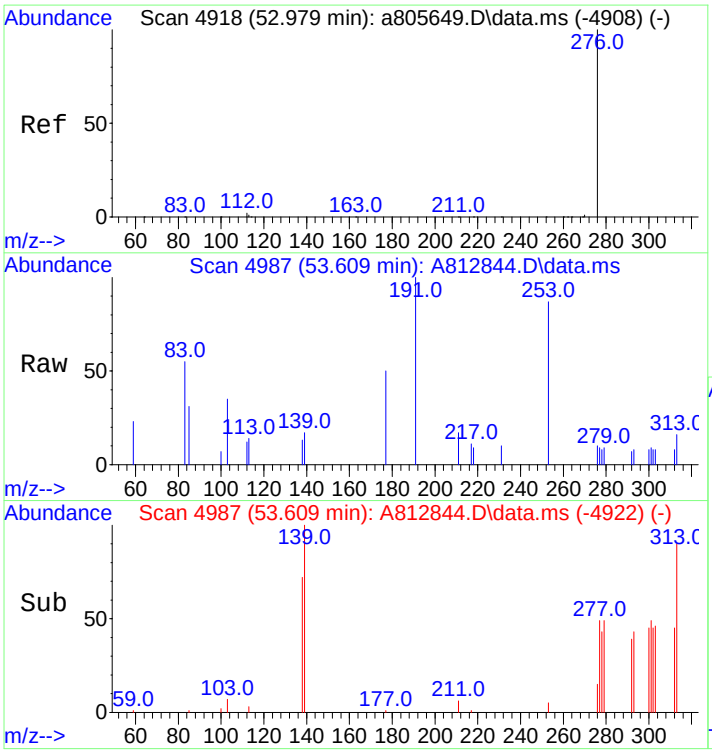


#77
Chrysene/Triphenylene
Concen: 0.53 ng/mL m
RT: 43.543 min Scan# 3886
Delta R.T. 0.027 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:228 Resp: 89

Ion	Ratio	Lower	Upper
228	100		
226	0.0	23.6	35.4#

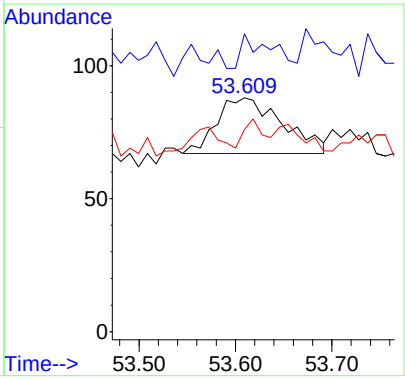


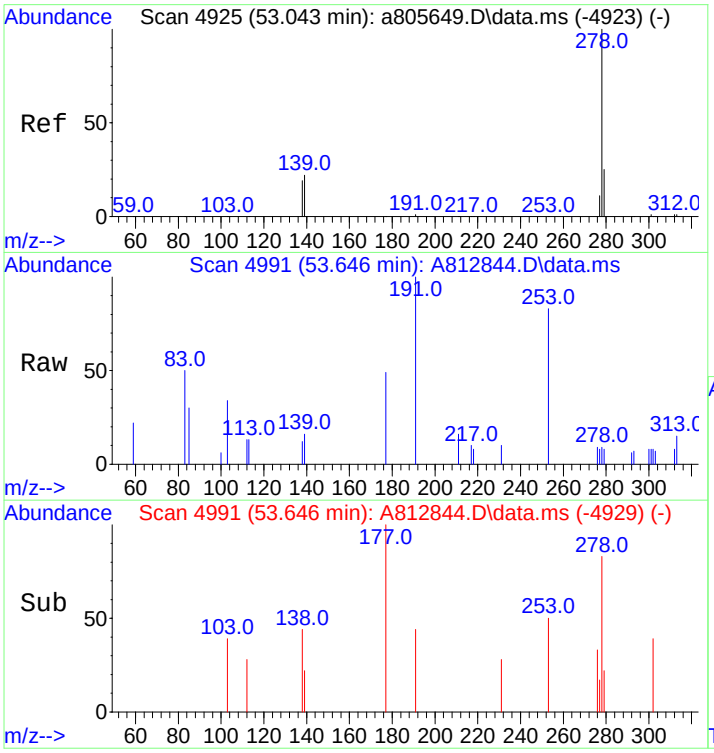


#91
Indeno[1,2,3-cd]pyrene
Concen: 0.55 ng/mL
RT: 53.609 min Scan# 4987
Delta R.T. 0.091 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:276 Resp: 100

Ion	Ratio	Lower	Upper
276	100		
138	0.0	19.9	29.9#
277	0.0	19.0	28.6#

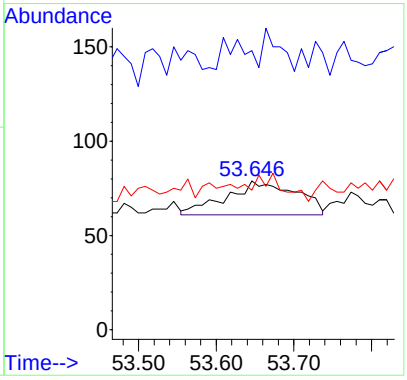


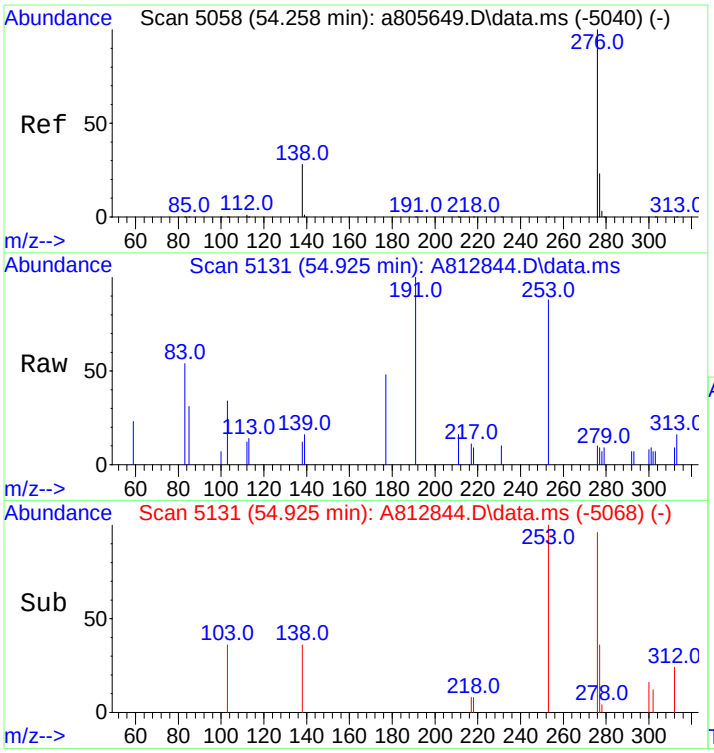


#92
Dibenz[ah]+[ac]anthracene
Concen: 0.62 ng/mL m
RT: 53.646 min Scan# 4991
Delta R.T. 0.064 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:278 Resp: 111

Ion	Ratio	Lower	Upper
278	100		
139	0.0	16.6	25.0#
279	0.0	19.1	28.7#

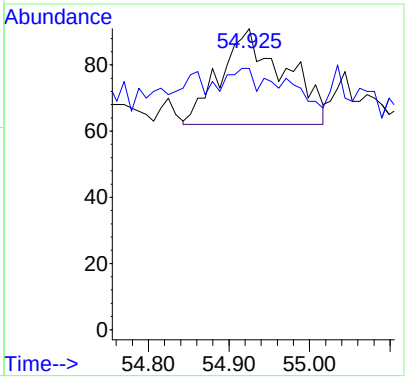




#93
Benzo[g,h,i]perylene
Concen: 0.78 ng/mL m
RT: 54.925 min Scan# 5131
Delta R.T. 0.073 min
Lab File: A812844.D
Acq: 19 Nov 2012 5:23 pm

Tgt Ion:276 Resp: 161

Ion	Ratio	Lower	Upper
276	100		
277	0.0	18.9	28.3#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812845.D
Acq On : 19 Nov 2012 6:48 pm
Operator : AC
Sample : ss110612lcs04
Misc : 1x etr1210082
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Nov 20 14:18:07 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

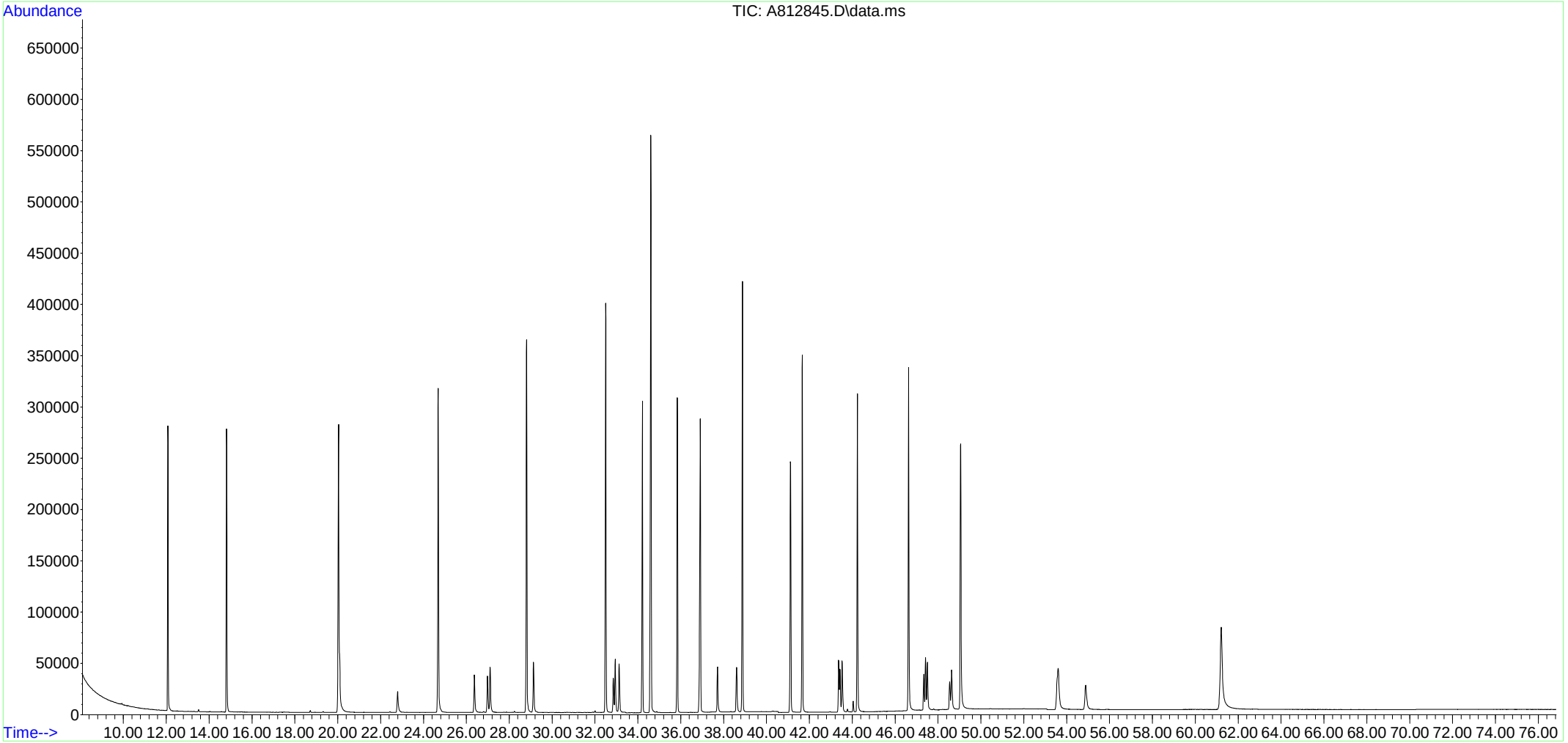
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	56119	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	87473	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	103357	464.732	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.47%#			
42) Phenanthrene-d10	32.853	188	82998	480.559	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.06%#			
83) Benzo[b]fluoranthene-d12	47.336	264	80535	483.082	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.31%#			
88) Benzo[a]pyrene-d12	48.543	264	73524	446.396	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.64%#			
129) 5B(H)Cholane - Surr	44.045	217	14678	458.895	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.89%#			
Target Compounds						Qvalue
10) Naphthalene	20.087	128	117136	460.379	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	74848	493.843	ng/mL#	100
26) Acenaphthylene	26.375	152	107734M3	466.489	ng/mL	
27) Acenaphthene	27.105	153	65599	475.883	ng/mL	100
29) Fluorene	29.130	166	71055	459.583	ng/mL	99
43) Phenanthrene	32.944	178	96721	472.662	ng/mL	100
55) Anthracene	33.126	178	92696M3	486.237	ng/mL	
58) Fluoranthene	37.718	202	101912	483.498	ng/mL	100
60) Pyrene	38.603	202	106088	497.598	ng/mL	98
75) Benz[a]anthracene	43.360	228	93110	485.552	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	91450	471.132	ng/mL	100
84) Benzo[b]fluoranthene	47.418	252	99529	483.269	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.509	252	108671	483.600	ng/mL	95
89) Benzo[a]pyrene	48.634	252	96492	491.569	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.554	276	101746M3	487.953	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.609	278	92880	454.424	ng/mL	99
93) Benzo[g,h,i]perylene	54.889	276	99694	421.301	ng/mL	99

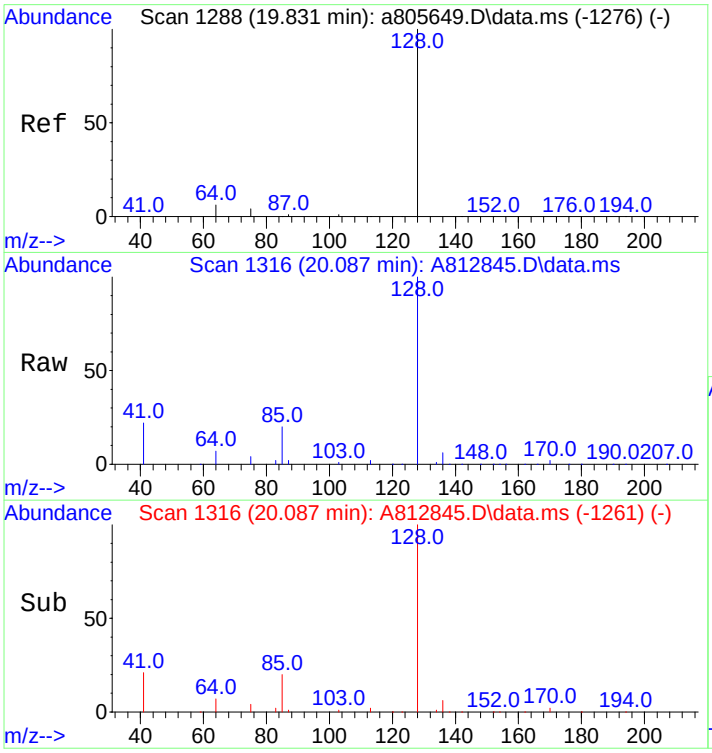
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812845.D
Acq On : 19 Nov 2012 6:48 pm
Operator : AC
Sample : ss110612lcs04
Misc : 1x etr1210082
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Nov 20 14:18:07 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

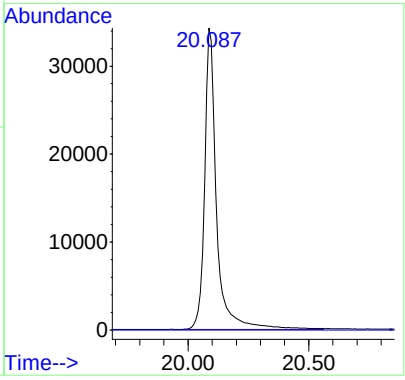


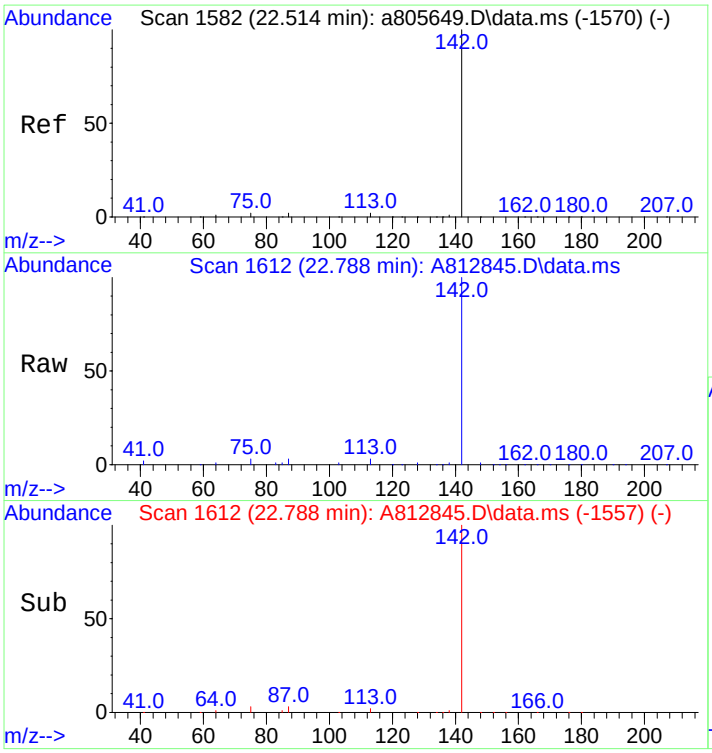


#10
Naphthalene
Concen: 460.38 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:128 Resp: 117136

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

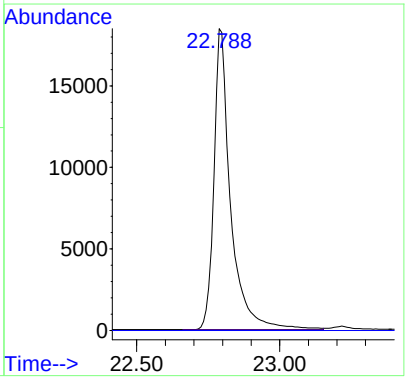


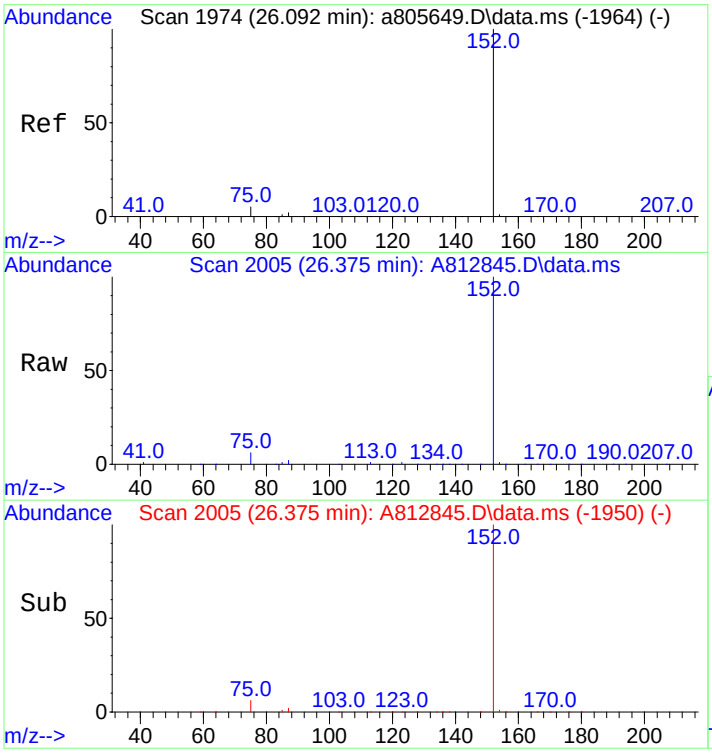


#16
2-Methylnaphthalene
Concen: 493.84 ng/mL
RT: 22.788 min Scan# 1612
Delta R.T. 0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:142 Resp: 74848

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

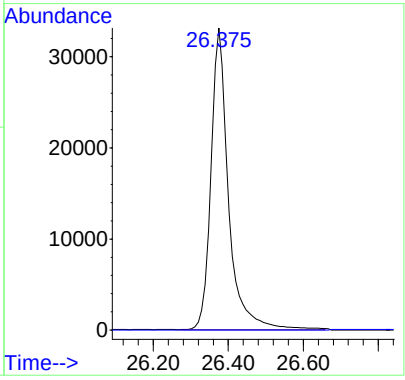


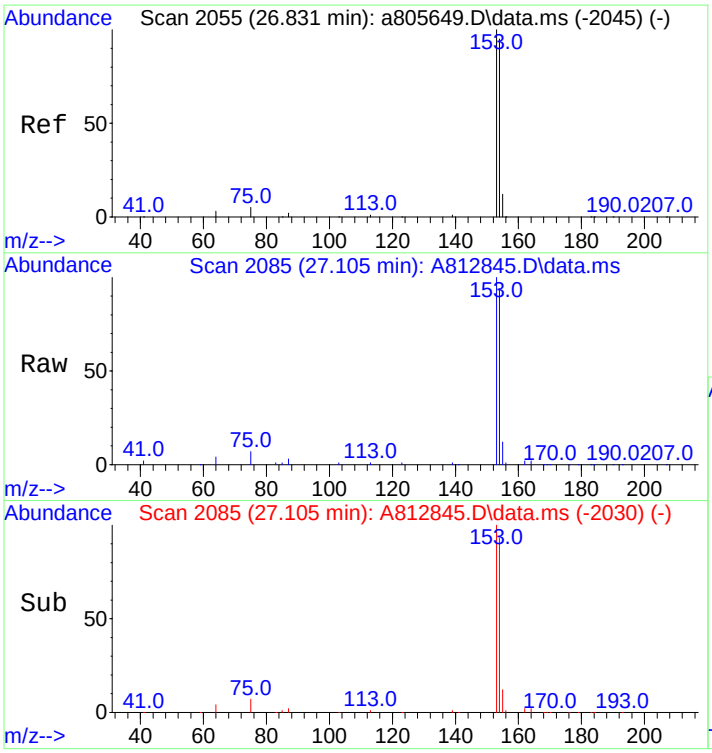


#26
Acenaphthylene
Concen: 466.49 ng/mL m
RT: 26.375 min Scan# 2005
Delta R.T. -0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:152 Resp: 107734

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

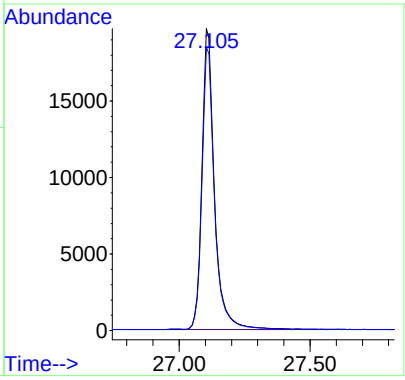


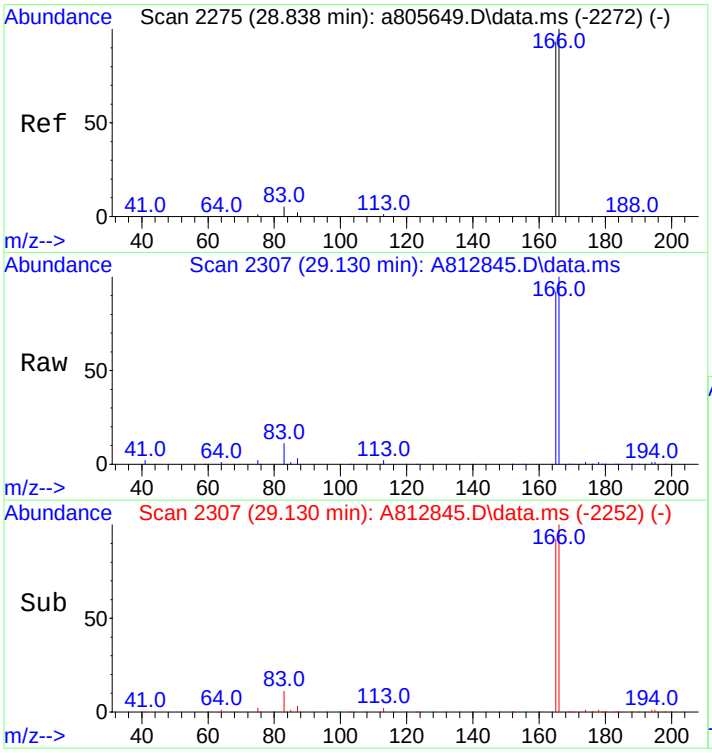


#27
Acenaphthene
Concen: 475.88 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:153 Resp: 65599

Ion	Ratio	Lower	Upper
153	100		
154	94.1	75.4	113.2

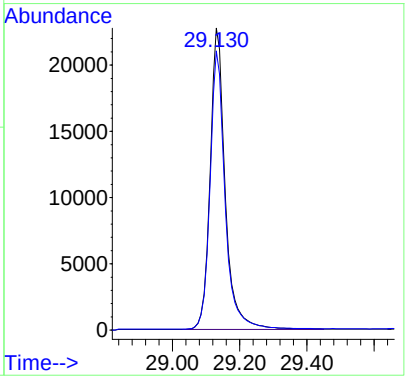


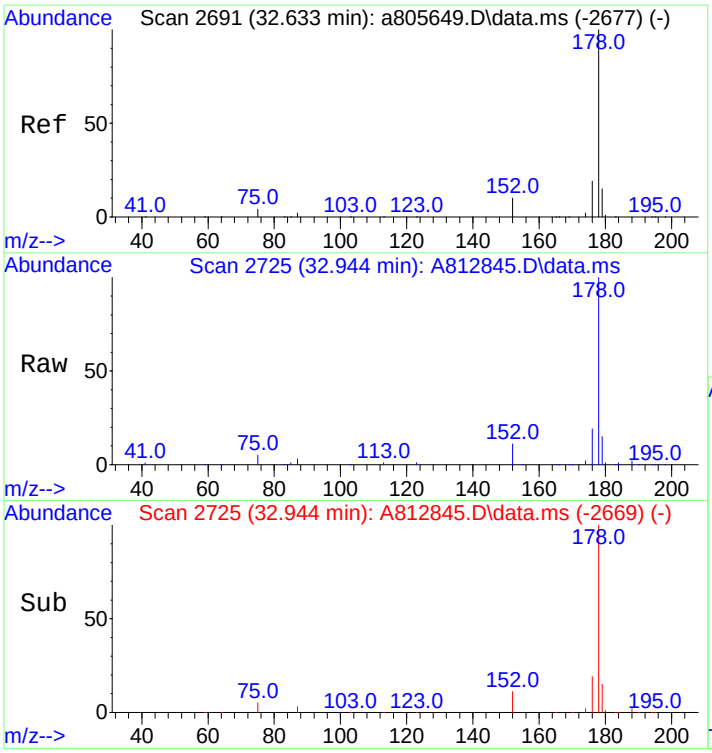


#29
Fluorene
Concen: 459.58 ng/mL
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:166 Resp: 71055

Ion	Ratio	Lower	Upper
166	100		
165	92.1	74.2	111.2

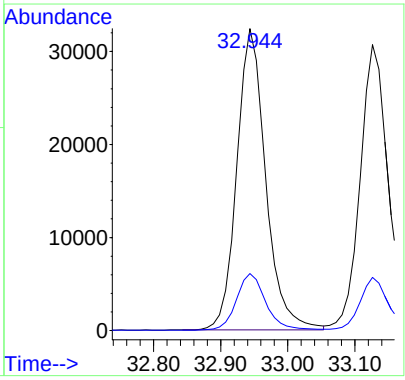


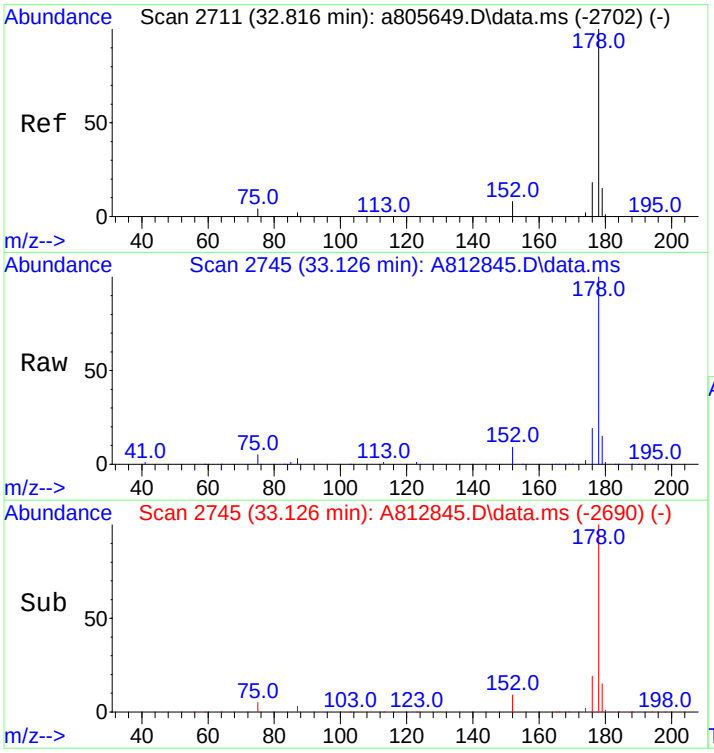


#43
Phenanthrene
Concen: 472.66 ng/mL
RT: 32.944 min Scan# 2725
Delta R.T. 0.009 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:178 Resp: 96721

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

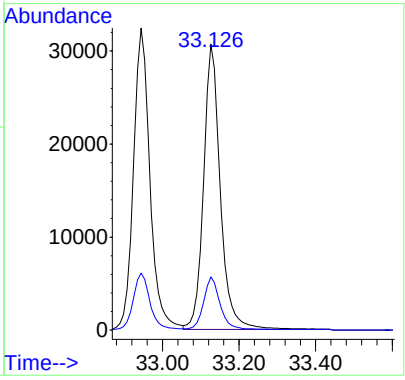


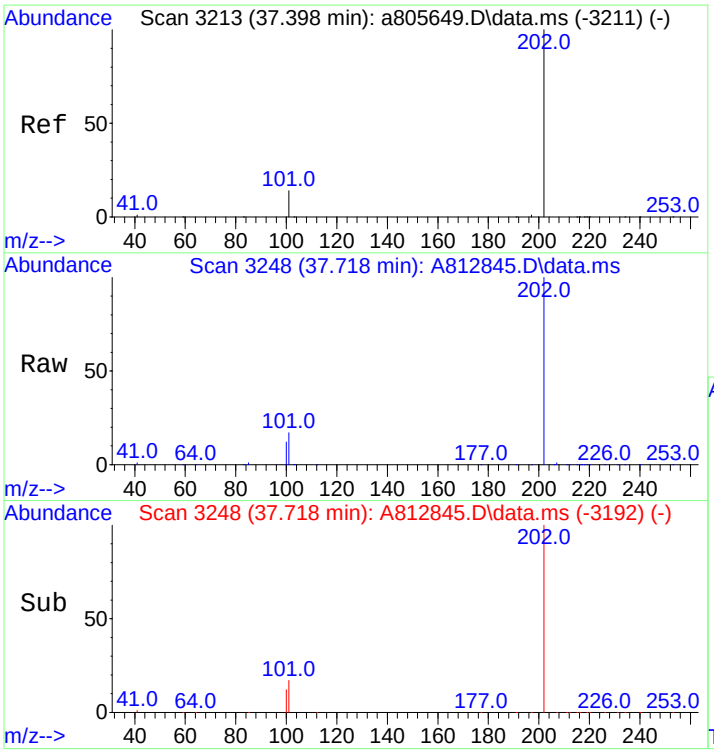


#55
Anthracene
Concen: 486.24 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:178 Resp: 92696

Ion	Ratio	Lower	Upper
178	100		
176	18.1	14.3	21.5

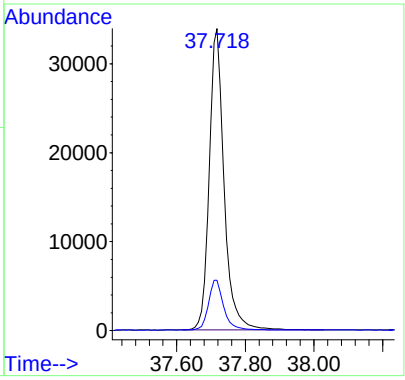


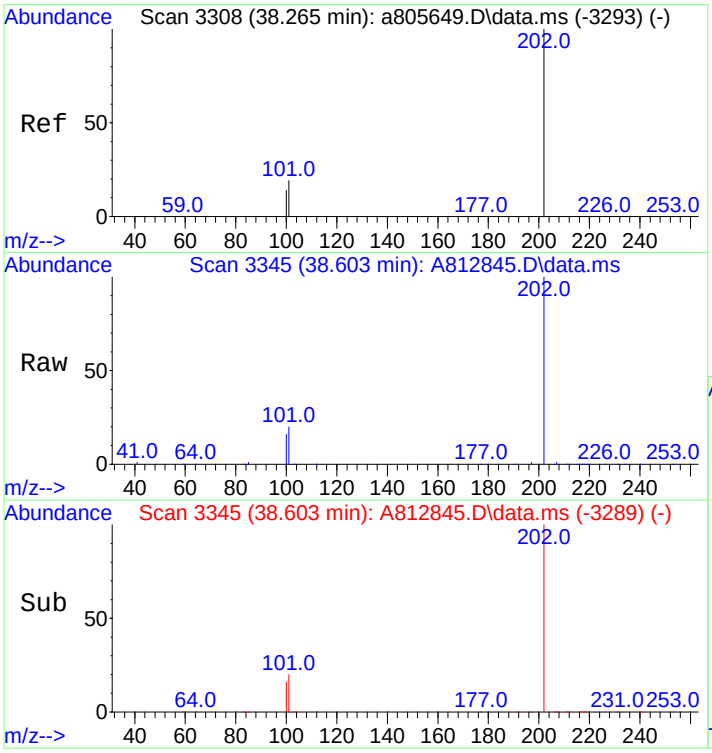


#58
Fluoranthene
Concen: 483.50 ng/mL
RT: 37.718 min Scan# 3248
Delta R.T. 0.009 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:202 Resp: 101912

Ion	Ratio	Lower	Upper
202	100		
101	16.9	13.6	20.4

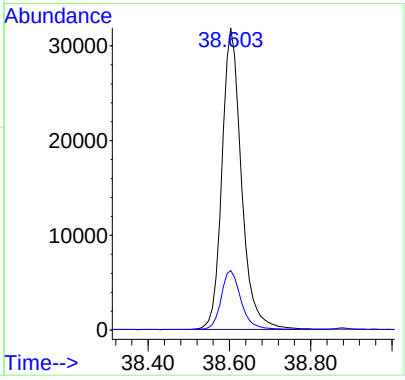


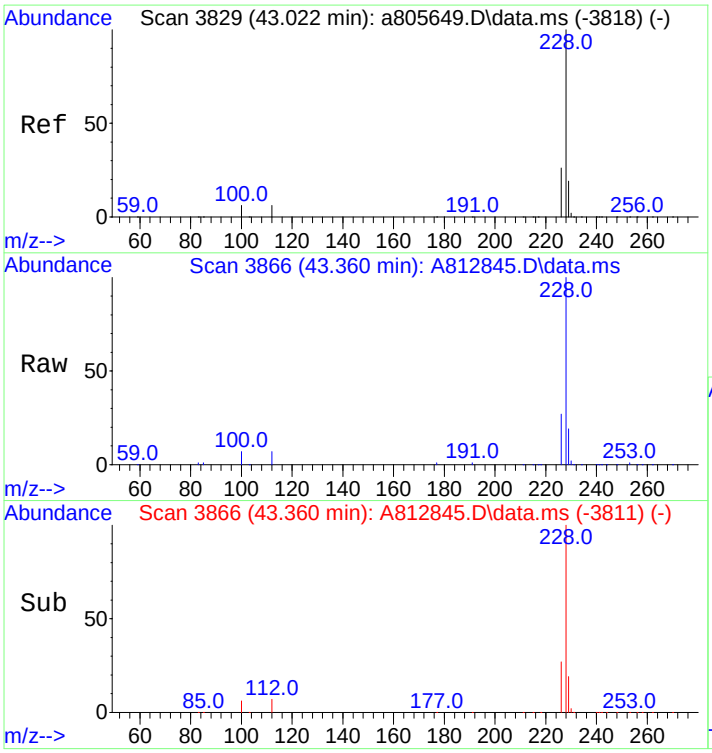


#60
Pyrene
Concen: 497.60 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:202 Resp: 106088

Ion	Ratio	Lower	Upper
202	100		
101	20.1	15.4	23.2

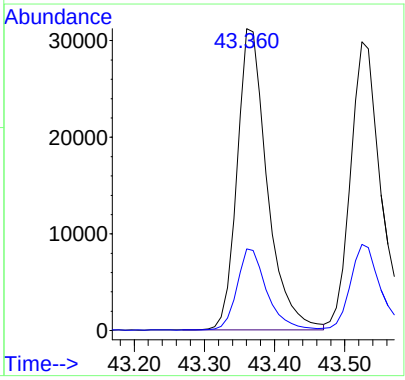


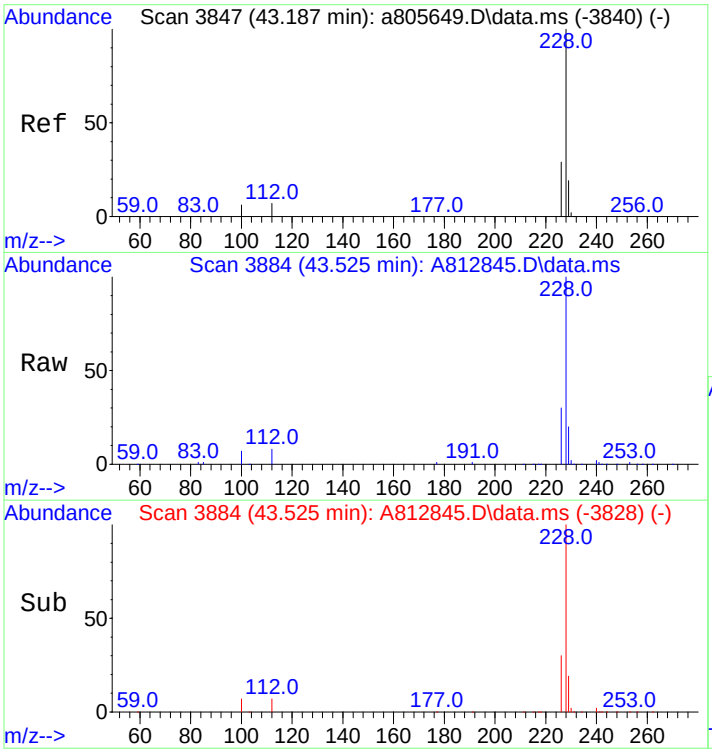


#75
Benz[a]anthracene
Concen: 485.55 ng/mL
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:228 Resp: 93110

Ion	Ratio	Lower	Upper
228	100		
226	26.5	21.3	31.9

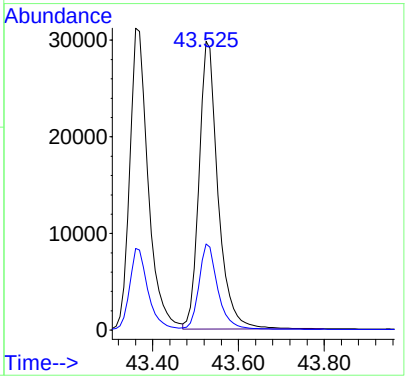


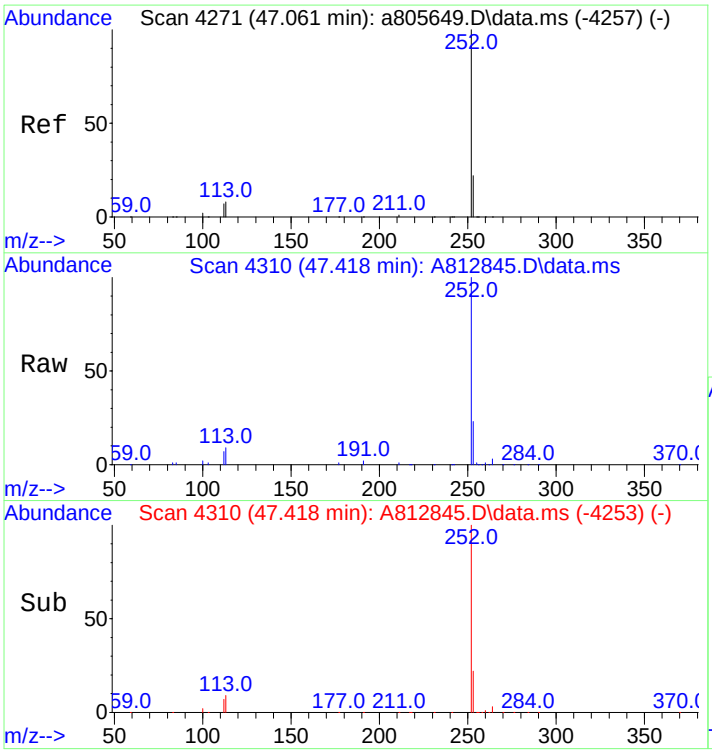


#77
Chrysene/Triphenylene
Concen: 471.13 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:228 Resp: 91450

Ion	Ratio	Lower	Upper
228	100		
226	29.6	23.6	35.4

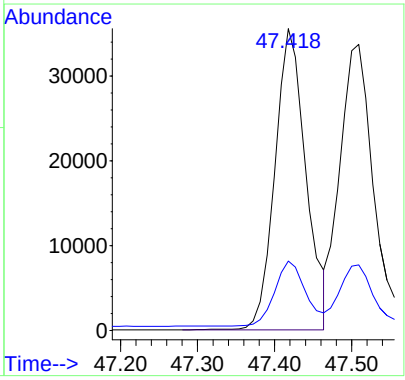


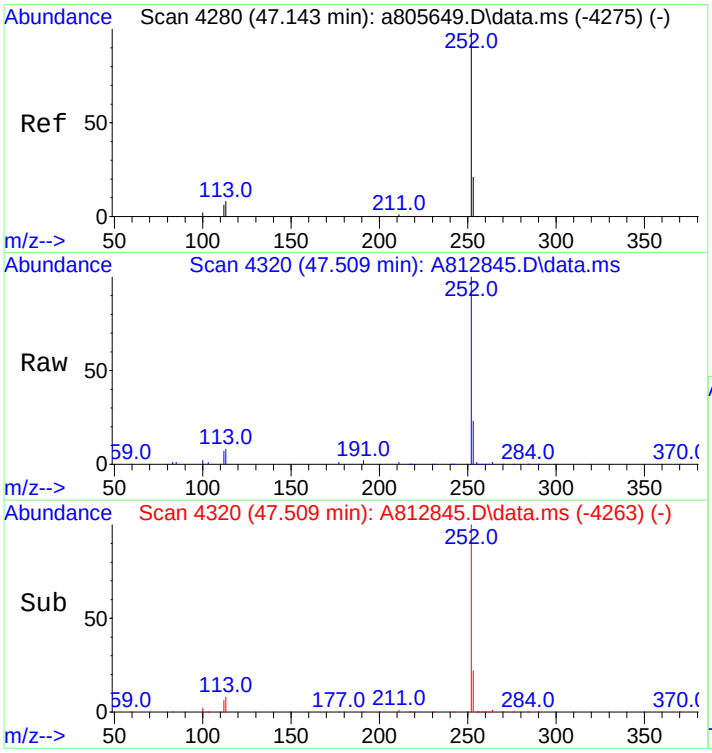


#84
Benzo[b]fluoranthene
Concen: 483.27 ng/mL
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:252 Resp: 99529

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.5	27.7

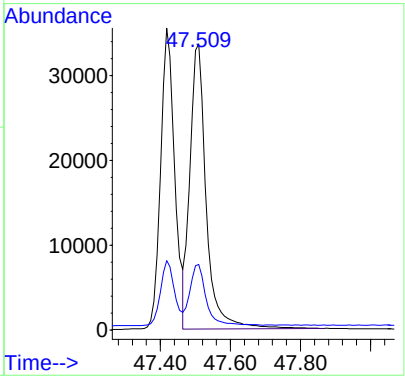


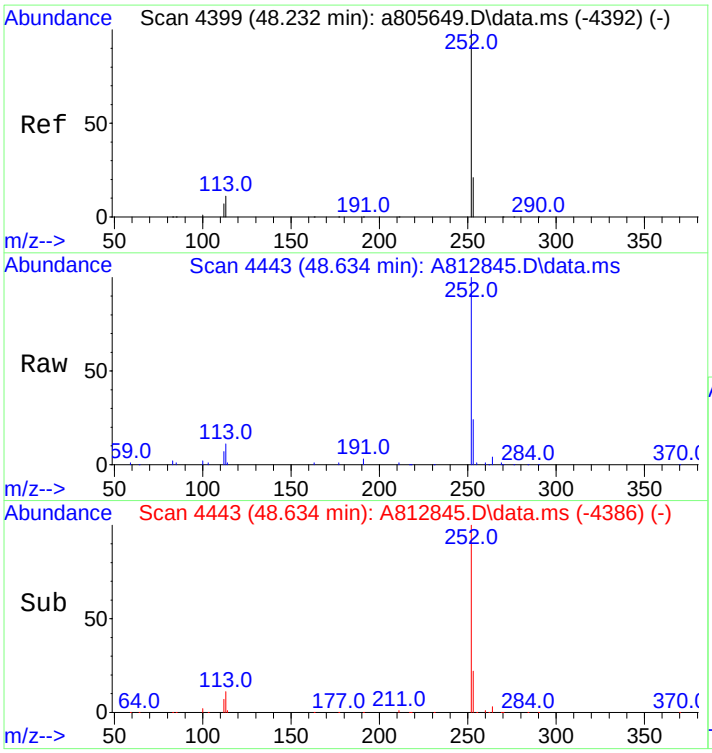


#85
Benzo[j]+[k]fluoranthene
Concen: 483.60 ng/mL
RT: 47.509 min Scan# 4320
Delta R.T. 0.018 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:252 Resp: 108671

Ion	Ratio	Lower	Upper
252	100		
253	21.0	18.8	28.2

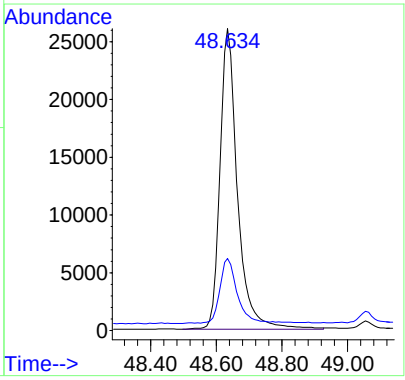


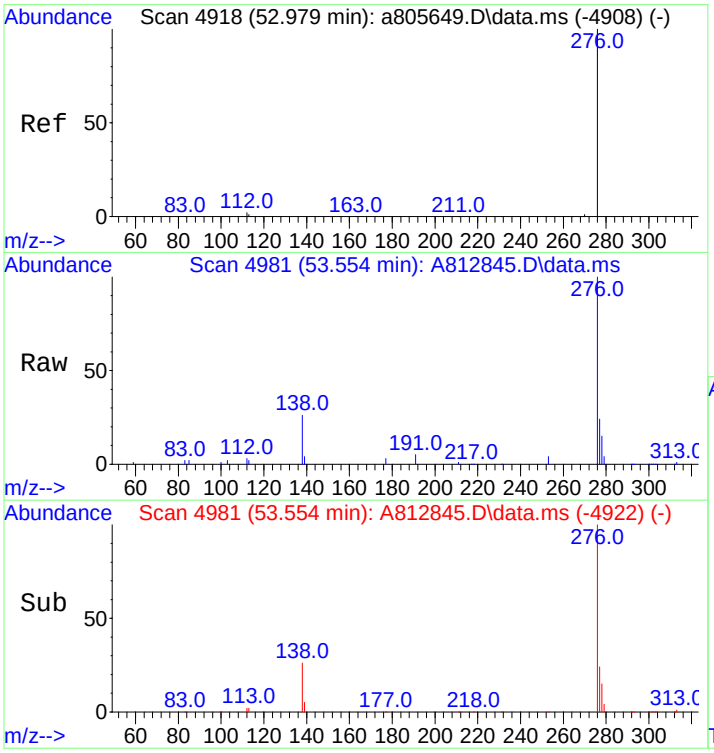


#89
Benzo[a]pyrene
Concen: 491.57 ng/mL
RT: 48.634 min Scan# 4443
Delta R.T. 0.018 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:252 Resp: 96492

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.4	29.0

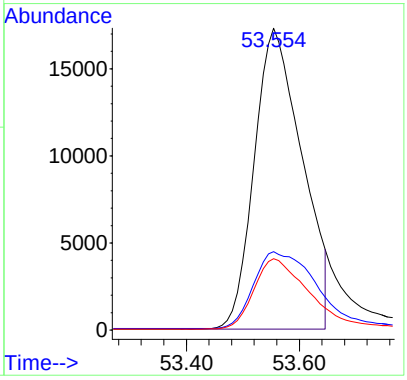


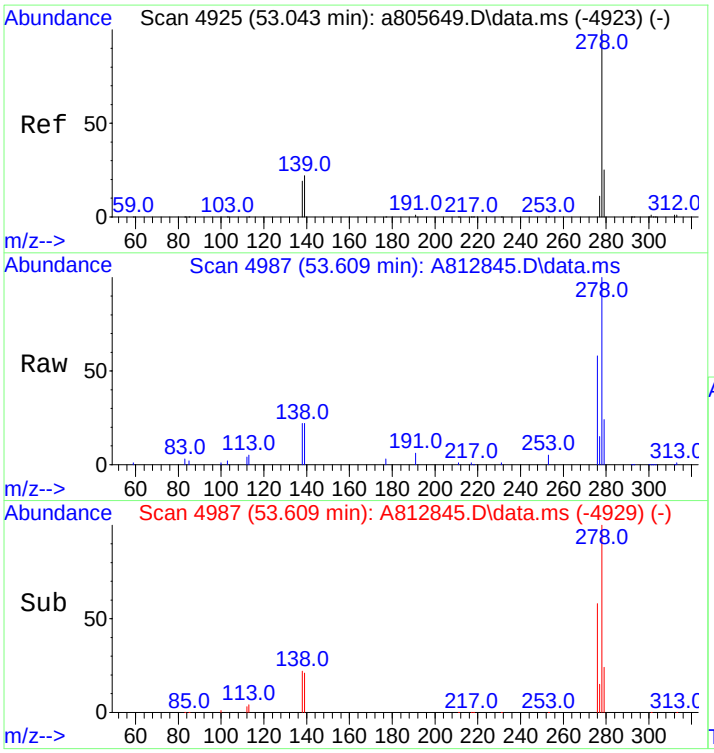


#91
Indeno[1,2,3-cd]pyrene
Concen: 487.95 ng/mL m
RT: 53.554 min Scan# 4981
Delta R.T. 0.036 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:276 Resp: 101746

Ion	Ratio	Lower	Upper
276	100		
138	35.2	19.9	29.9#
277	28.0	19.0	28.6

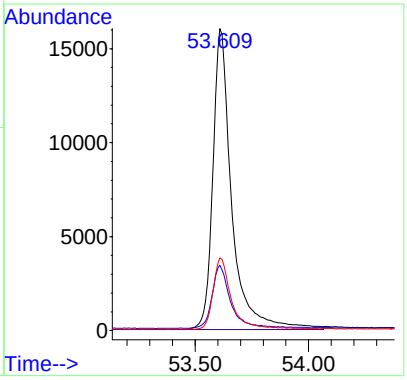


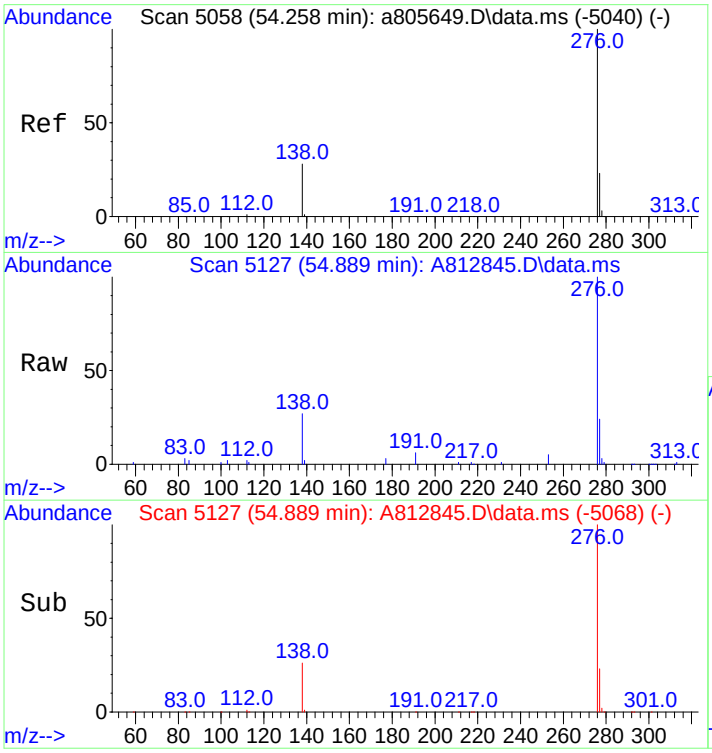


#92
Dibenz[ah]+[ac]anthracene
Concen: 454.42 ng/mL
RT: 53.609 min Scan# 4987
Delta R.T. 0.027 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:278 Resp: 92880

Ion	Ratio	Lower	Upper
278	100		
139	20.7	16.6	25.0
279	23.2	19.1	28.7

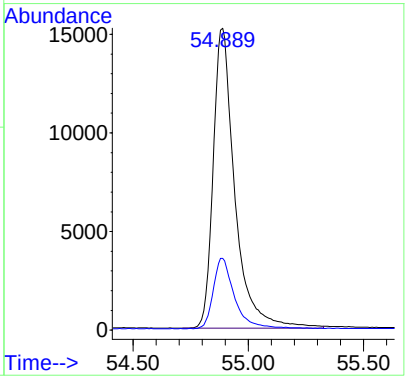




#93
Benzo[g,h,i]perylene
Concen: 421.30 ng/mL
RT: 54.889 min Scan# 5127
Delta R.T. 0.037 min
Lab File: A812845.D
Acq: 19 Nov 2012 6:48 pm

Tgt Ion:276 Resp: 99694

Ion	Ratio	Lower	Upper
276	100		
277	23.2	18.9	28.3



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812846.D
Acq On : 19 Nov 2012 8:12 pm
Operator : AC
Sample : ss110612lcsd04
Misc : 1x etr1210082
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Nov 20 14:18:16 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

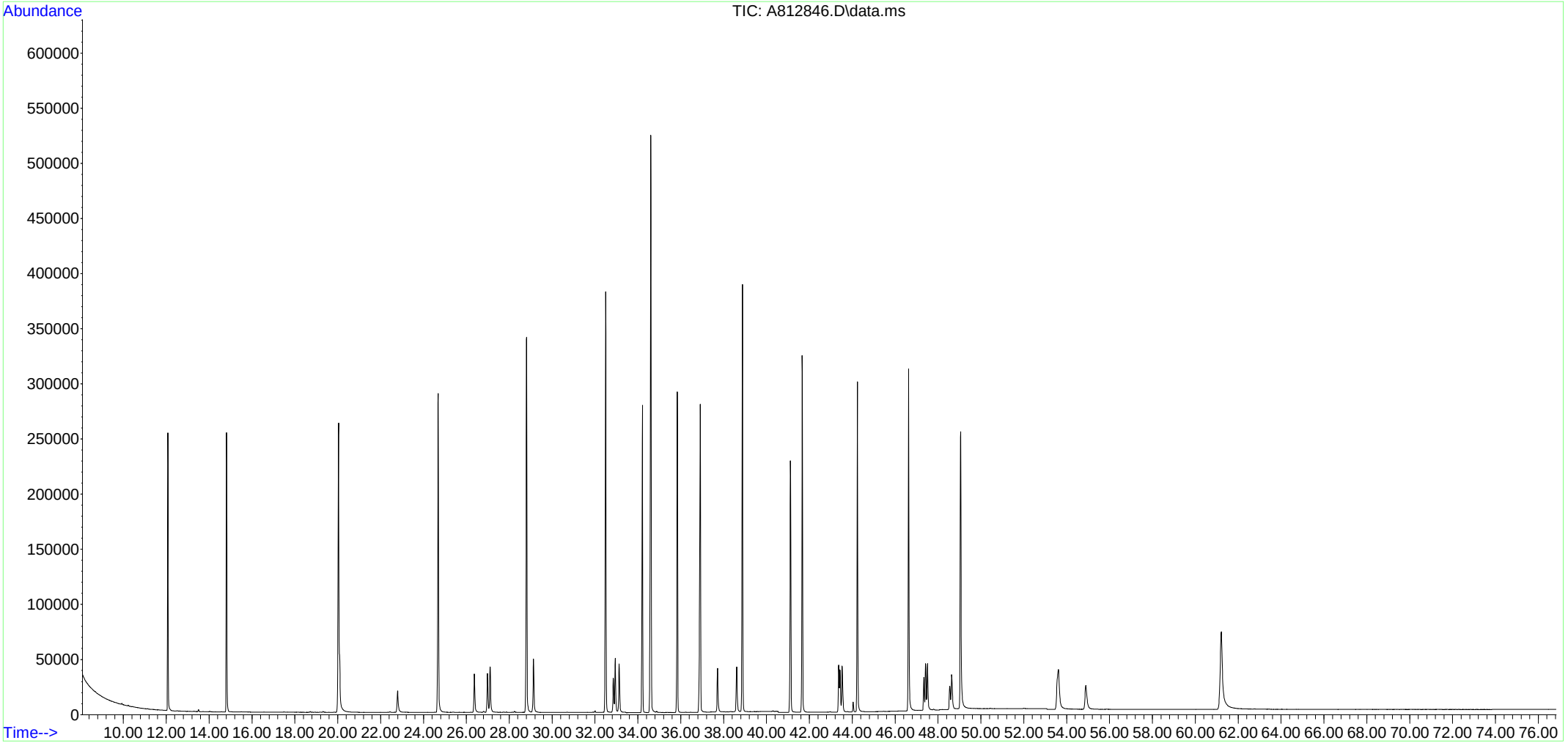
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	56192	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	82484	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	98961	444.388	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.44%#			
42) Phenanthrene-d10	32.853	188	77401	447.570	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.76%#			
83) Benzo[b]fluoranthene-d12	47.336	264	71181	452.798	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.28%#			
88) Benzo[a]pyrene-d12	48.543	264	64454	414.997	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.50%#			
129) 5B(H)Cholane - Surr	44.045	217	13003	431.116	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.11%#			
Target Compounds						Qvalue
10) Naphthalene	20.087	128	109552	430.012	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	70336	463.470	ng/mL#	100
26) Acenaphthylene	26.375	152	103671M3	448.313	ng/mL	
27) Acenaphthene	27.114	153	62448	452.435	ng/mL	99
29) Fluorene	29.130	166	68665	443.548	ng/mL	100
43) Phenanthrene	32.944	178	90235	440.393	ng/mL	100
55) Anthracene	33.126	178	85424M3	447.510	ng/mL	
58) Fluoranthene	37.718	202	98247	465.504	ng/mL	99
60) Pyrene	38.613	202	102715	481.151	ng/mL	99
75) Benz[a]anthracene	43.369	228	83128	459.718	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	82431	450.353	ng/mL	100
84) Benzo[b]fluoranthene	47.427	252	86662	446.244	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.509	252	99738	470.693	ng/mL	95
89) Benzo[a]pyrene	48.634	252	86267	466.061	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	53.555	276	91550M3	465.611	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.628	278	90274	468.388	ng/mL	98
93) Benzo[g,h,i]perylene	54.889	276	96412	432.075	ng/mL	99

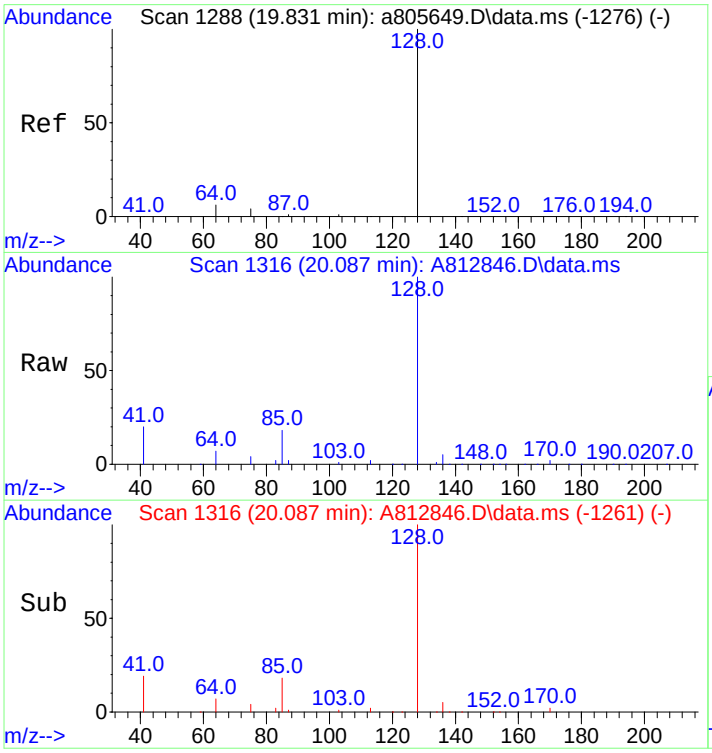
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812846.D
Acq On : 19 Nov 2012 8:12 pm
Operator : AC
Sample : ss110612lcsd04
Misc : 1x etr1210082
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Nov 20 14:18:16 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

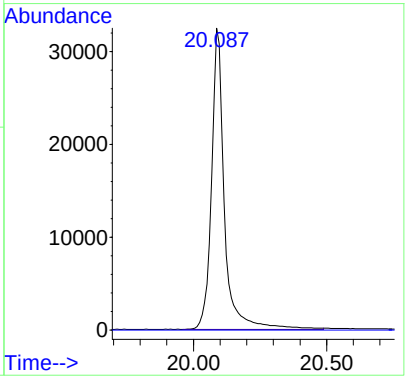


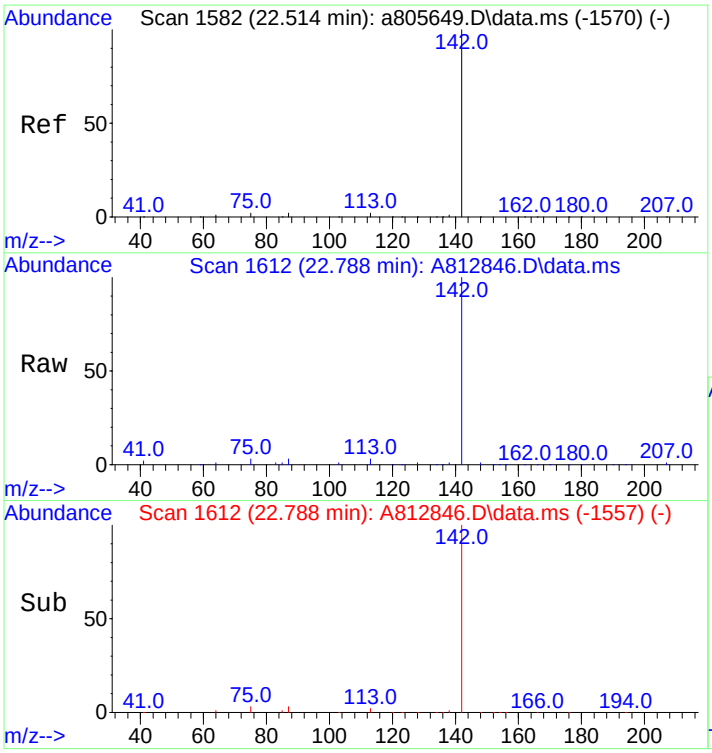


#10
Naphthalene
Concen: 430.01 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:128 Resp: 109552

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

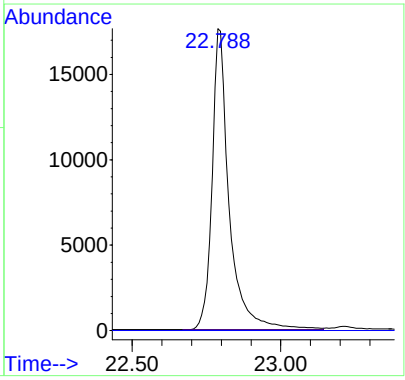


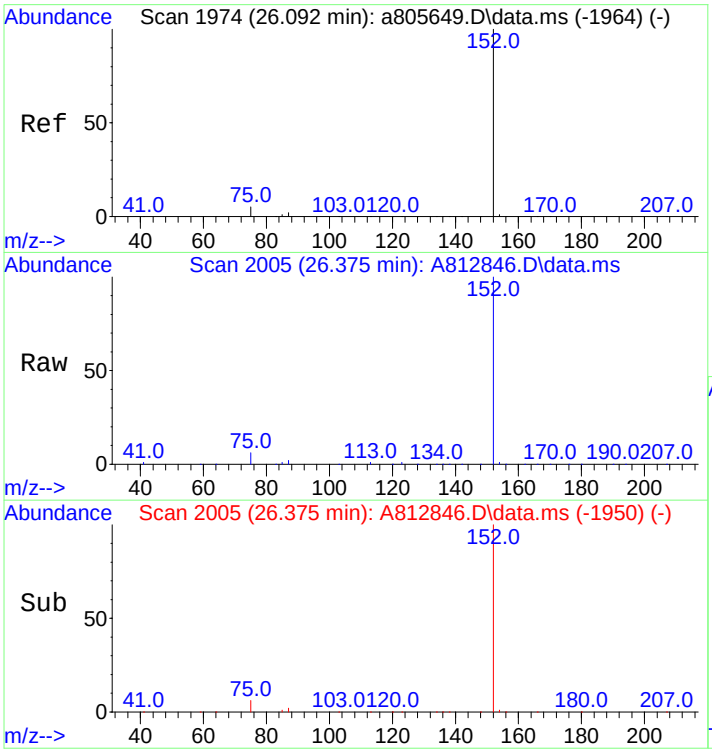


#16
2-Methylnaphthalene
Concen: 463.47 ng/mL
RT: 22.788 min Scan# 1612
Delta R.T. 0.000 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:142 Resp: 70336

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

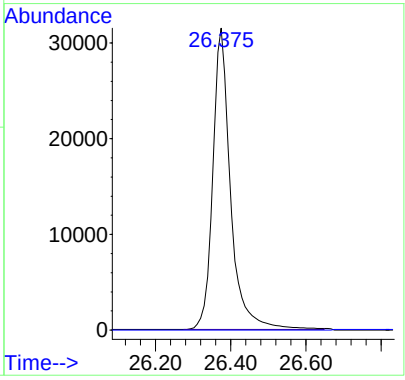


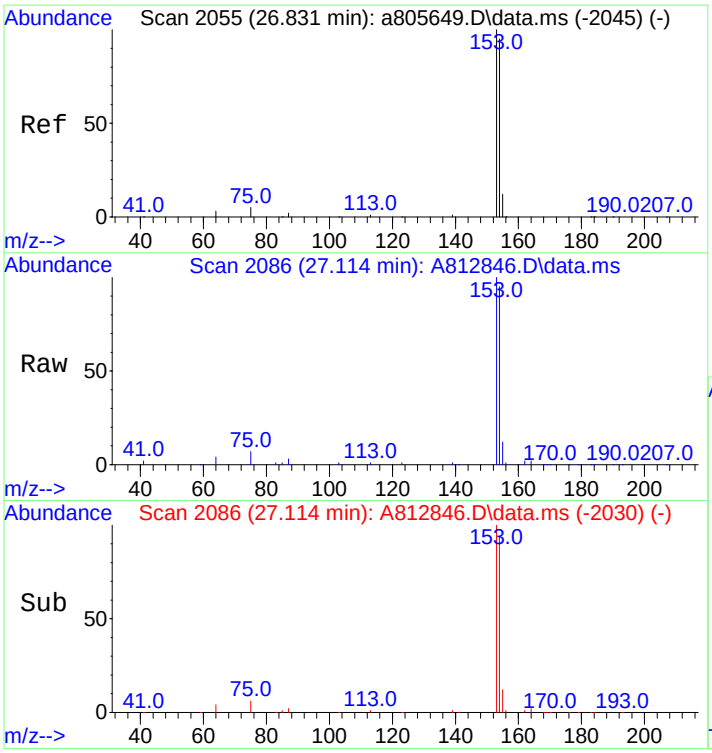


#26
Acenaphthylene
Concen: 448.31 ng/mL m
RT: 26.375 min Scan# 2005
Delta R.T. -0.000 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:152 Resp: 103671

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

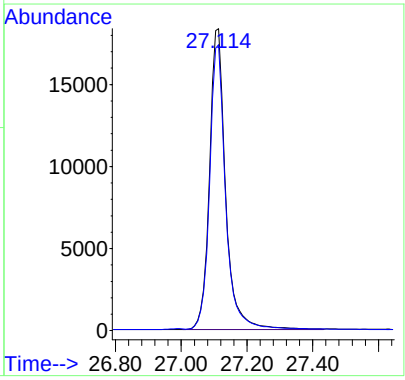


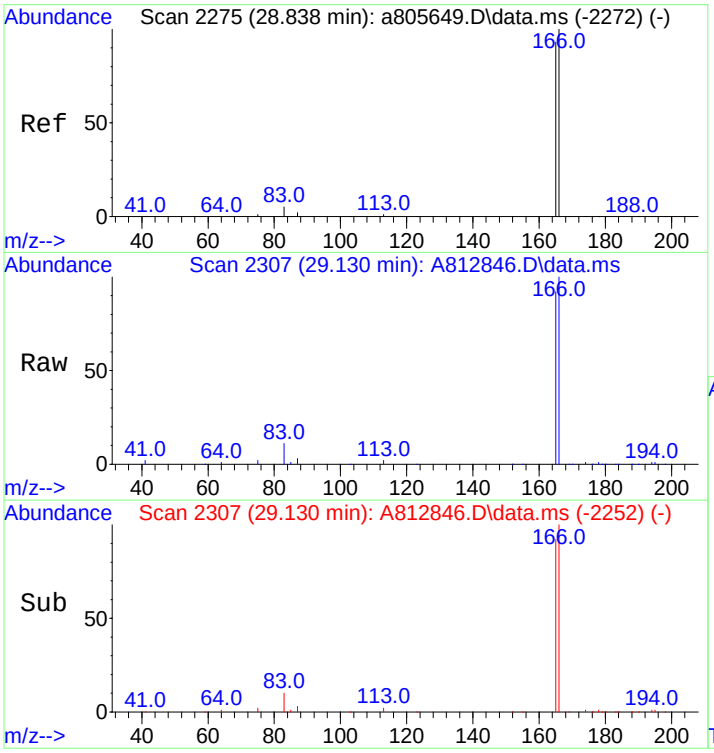


#27
Acenaphthene
Concen: 452.44 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:153 Resp: 62448

Ion	Ratio	Lower	Upper
153	100		
154	93.7	75.4	113.2

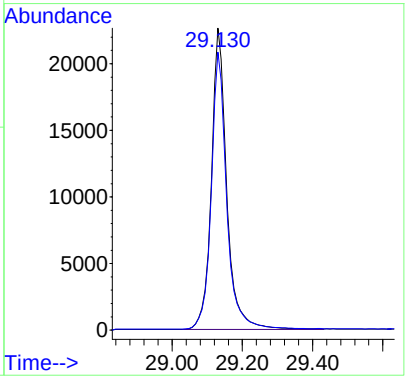


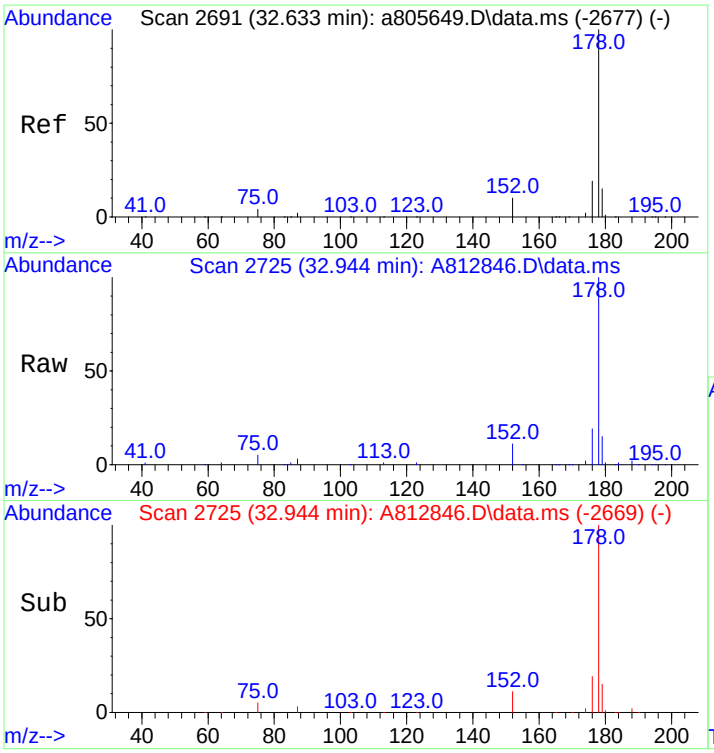


#29
Fluorene
Concen: 443.55 ng/mL
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:166 Resp: 68665

Ion	Ratio	Lower	Upper
166	100		
165	92.7	74.2	111.2

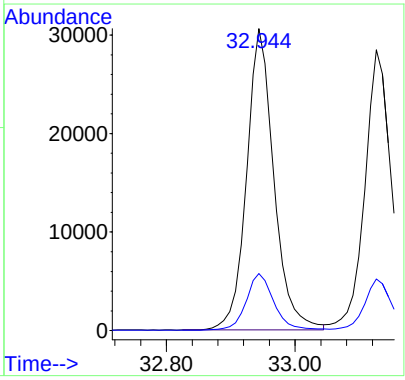


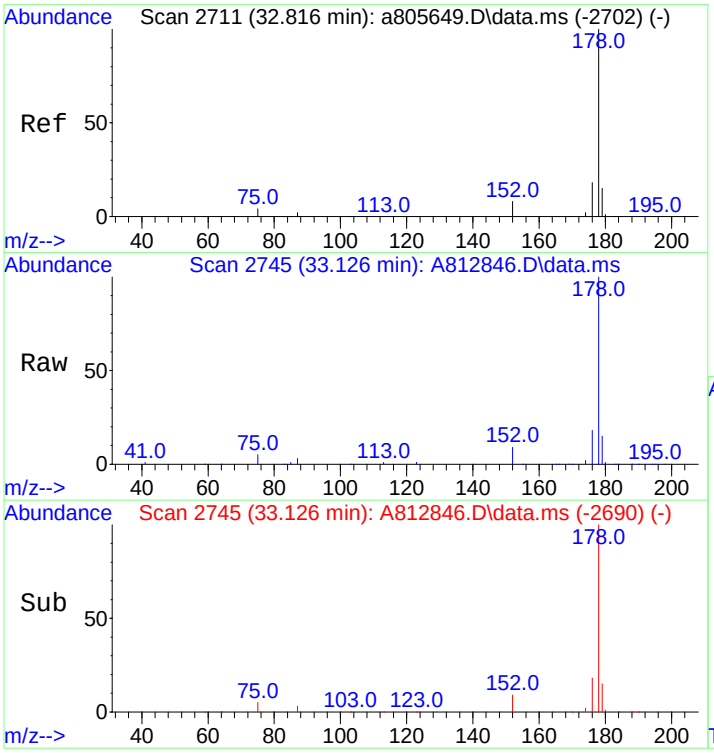


#43
Phenanthrene
Concen: 440.39 ng/mL
RT: 32.944 min Scan# 2725
Delta R.T. 0.009 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:178 Resp: 90235

Ion	Ratio	Lower	Upper
178	100		
176	18.9	15.2	22.8

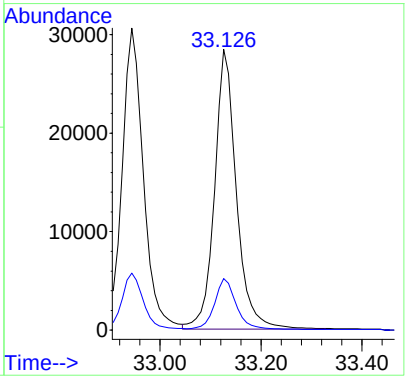


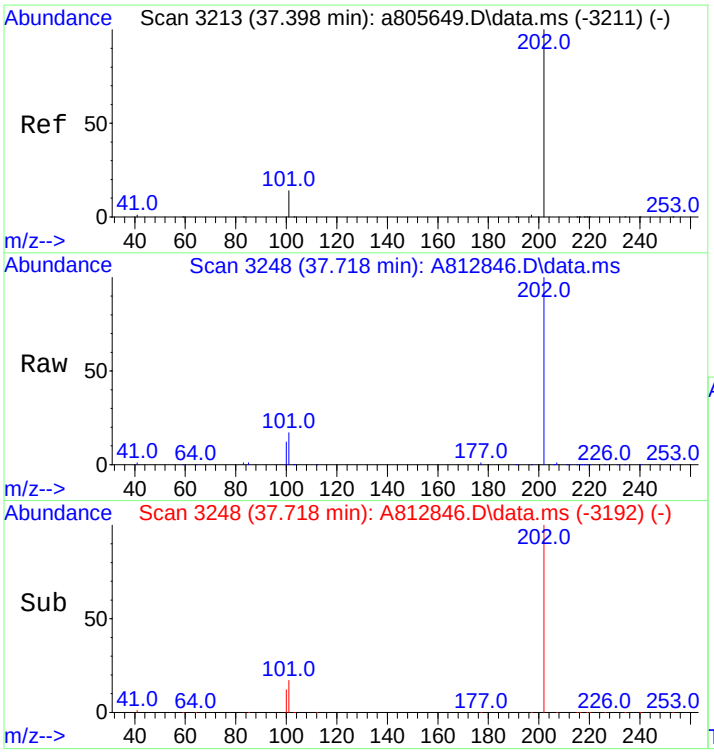


#55
Anthracene
Concen: 447.51 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:178 Resp: 85424

Ion	Ratio	Lower	Upper
178	100		
176	18.3	14.3	21.5

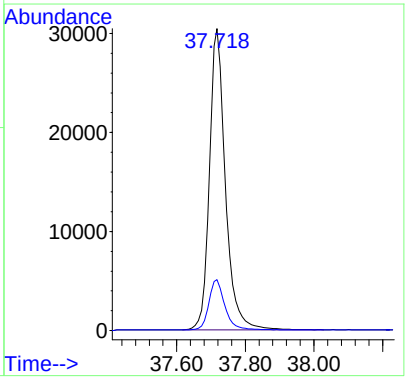


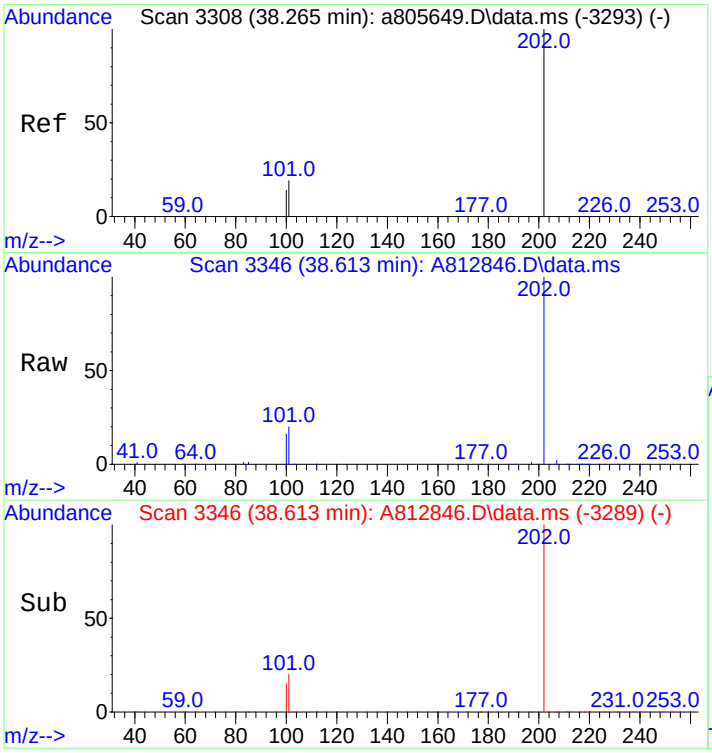


#58
Fluoranthene
Concen: 465.50 ng/mL
RT: 37.718 min Scan# 3248
Delta R.T. 0.009 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:202 Resp: 98247

Ion	Ratio	Lower	Upper
202	100		
101	16.8	13.6	20.4

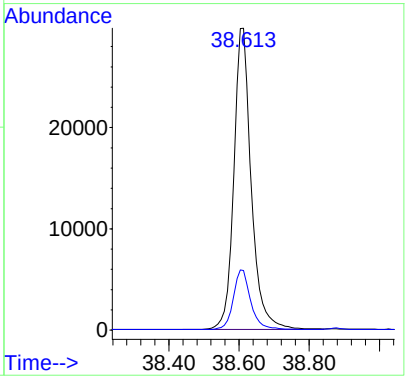


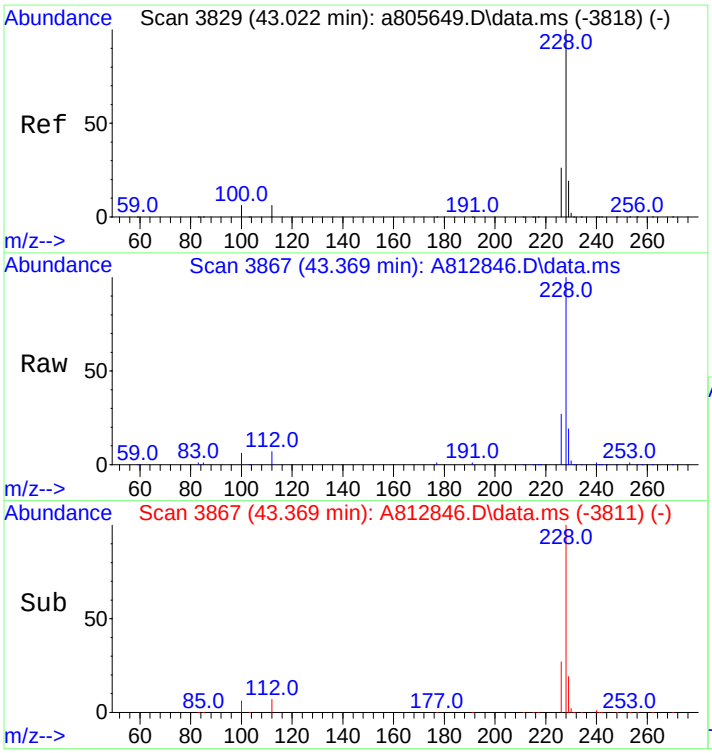


#60
Pyrene
Concen: 481.15 ng/mL
RT: 38.613 min Scan# 3346
Delta R.T. 0.019 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:202 Resp: 102715

Ion	Ratio	Lower	Upper
202	100		
101	19.8	15.4	23.2

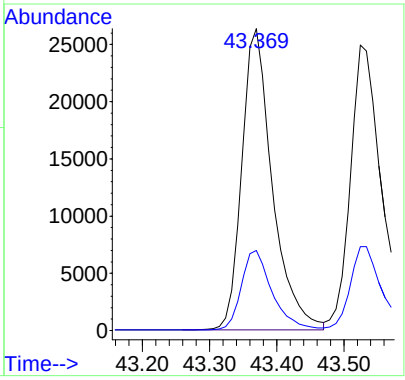


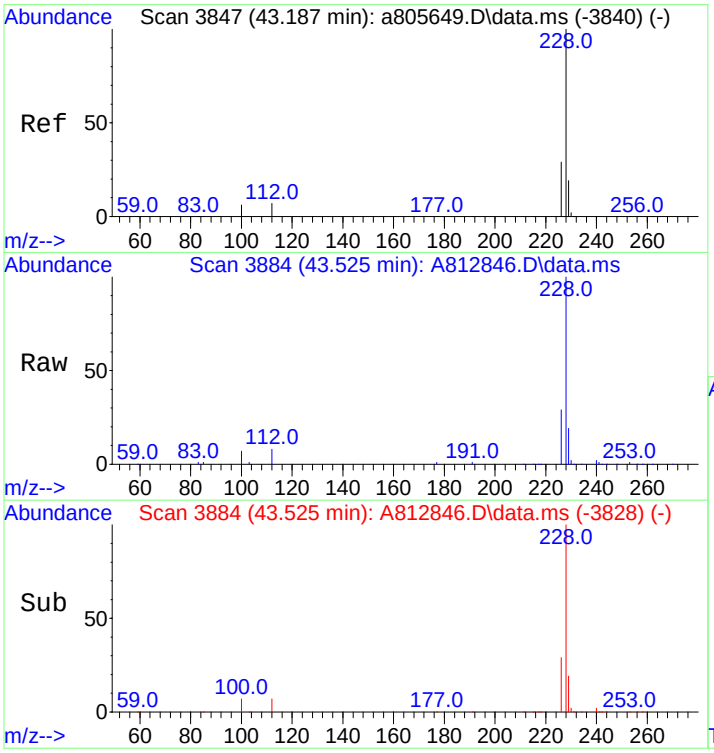


#75
Benz[a]anthracene
Concen: 459.72 ng/mL
RT: 43.369 min Scan# 3867
Delta R.T. 0.009 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:228 Resp: 83128

Ion	Ratio	Lower	Upper
228	100		
226	26.6	21.3	31.9

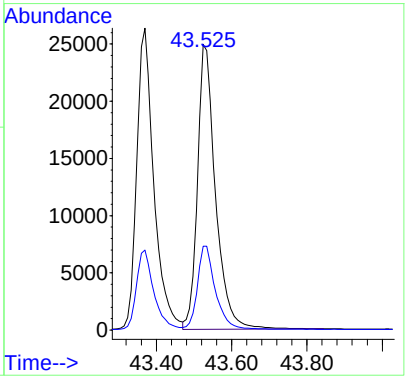


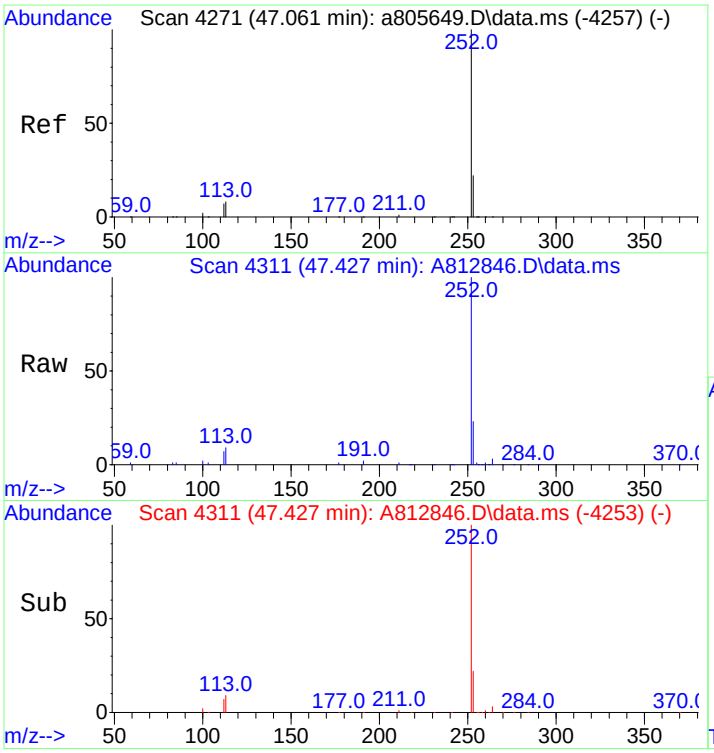


#77
Chrysene/Triphenylene
Concen: 450.35 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:228 Resp: 82431

Ion	Ratio	Lower	Upper
228	100		
226	29.4	23.6	35.4

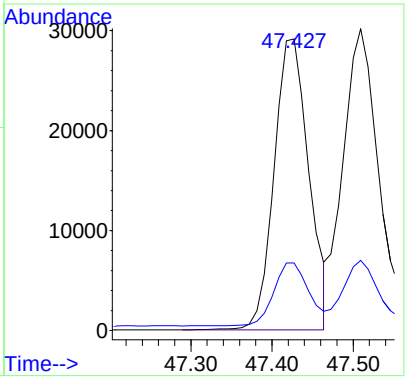


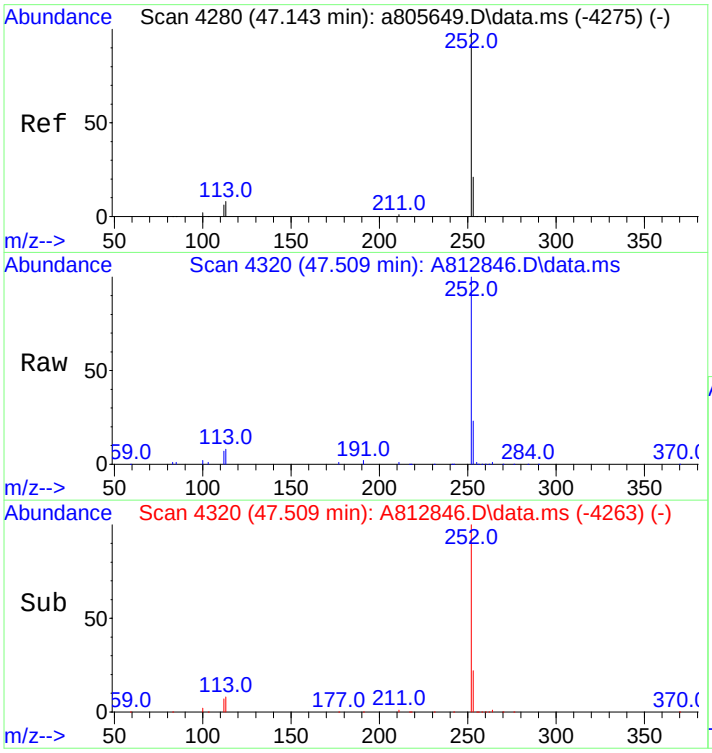


#84
Benzo[b]fluoranthene
Concen: 446.24 ng/mL
RT: 47.427 min Scan# 4311
Delta R.T. 0.027 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:252 Resp: 86662

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.5	27.7

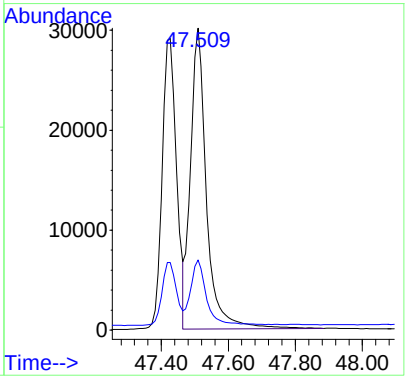


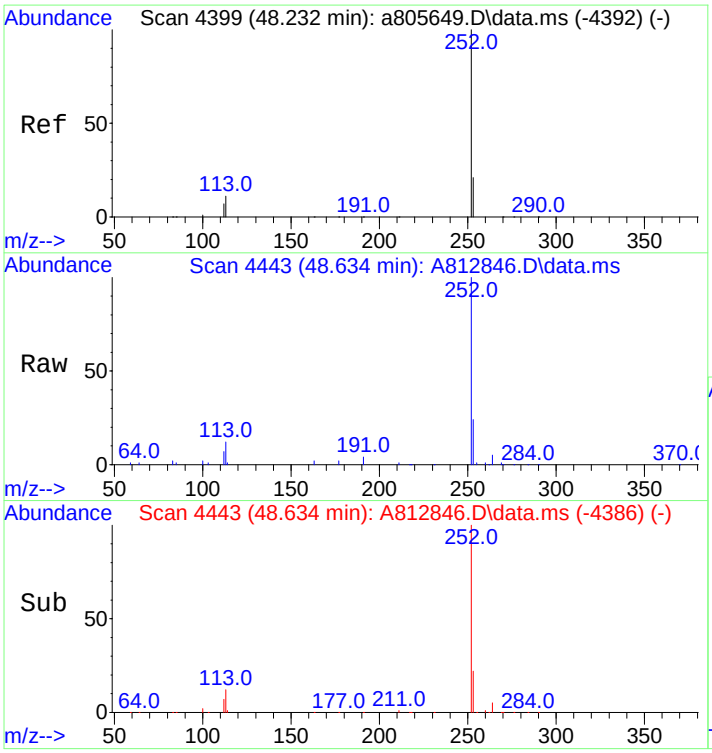


#85
Benzo[j]+[k]fluoranthene
Concen: 470.69 ng/mL
RT: 47.509 min Scan# 4320
Delta R.T. 0.018 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:252 Resp: 99738

Ion	Ratio	Lower	Upper
252	100		
253	21.0	18.8	28.2

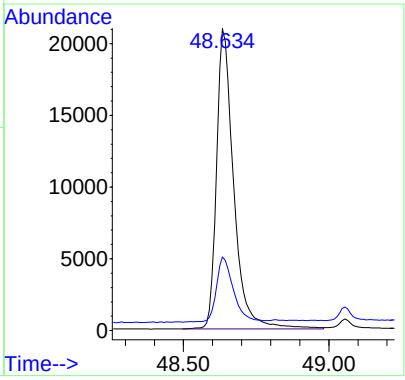


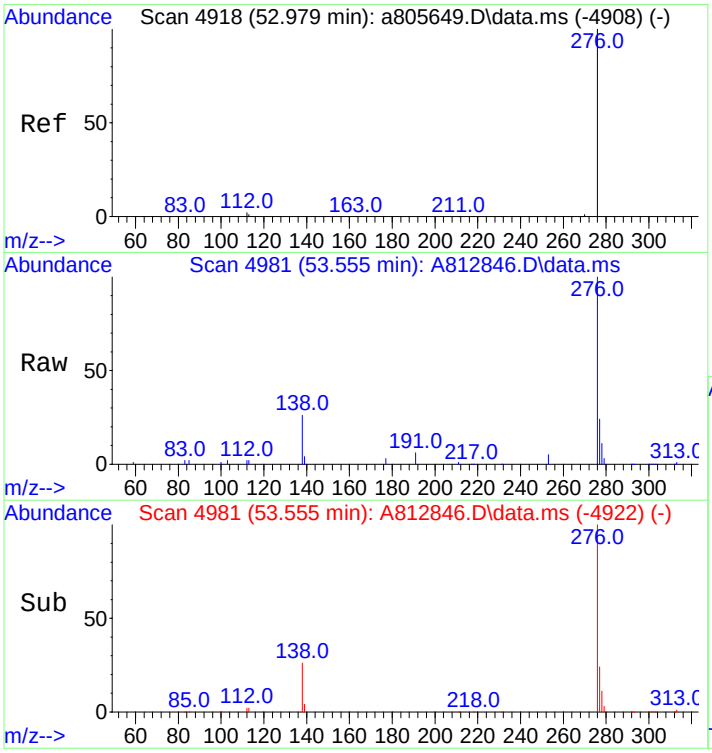


#89
Benzo[a]pyrene
Concen: 466.06 ng/mL
RT: 48.634 min Scan# 4443
Delta R.T. 0.018 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:252 Resp: 86267

Ion	Ratio	Lower	Upper
252	100		
253	20.8	19.4	29.0

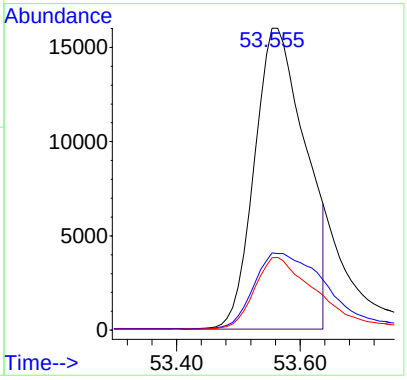


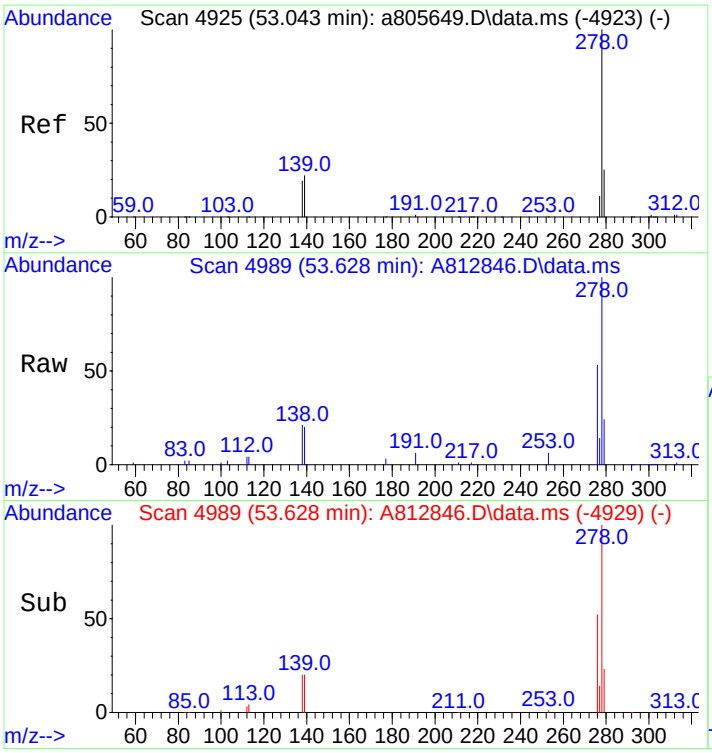


#91
Indeno[1,2,3-cd]pyrene
Concen: 465.61 ng/mL m
RT: 53.555 min Scan# 4981
Delta R.T. 0.037 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:276 Resp: 91550

Ion	Ratio	Lower	Upper
276	100		
138	37.0	19.9	29.9#
277	30.3	19.0	28.6#

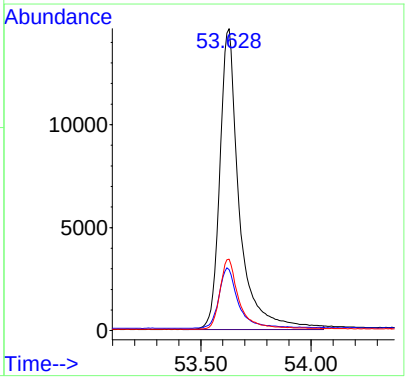


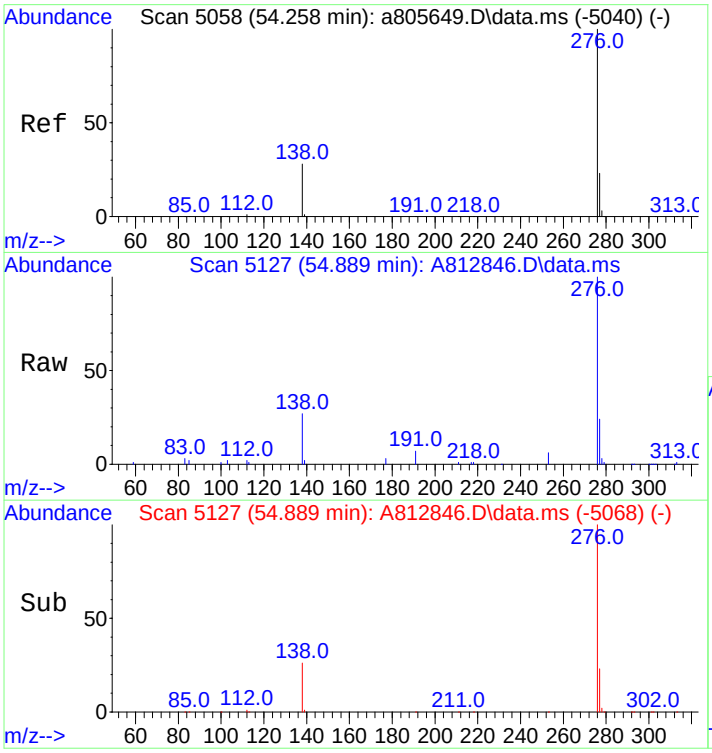


#92
Dibenz[ah]+[ac]anthracene
Concen: 468.39 ng/mL
RT: 53.628 min Scan# 4989
Delta R.T. 0.046 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:278 Resp: 90274

Ion	Ratio	Lower	Upper
278	100		
139	20.2	16.6	25.0
279	22.9	19.1	28.7

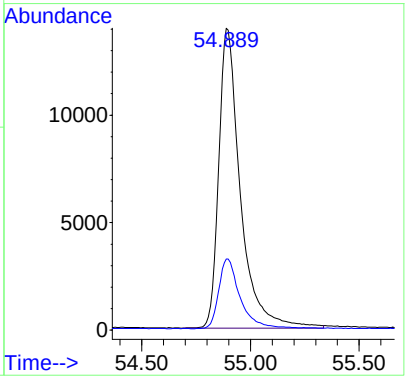




#93
Benzo[g,h,i]perylene
Concen: 432.07 ng/mL
RT: 54.889 min Scan# 5127
Delta R.T. 0.037 min
Lab File: A812846.D
Acq: 19 Nov 2012 8:12 pm

Tgt Ion:276 Resp: 96412

Ion	Ratio	Lower	Upper
276	100		
277	23.1	18.9	28.3



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	54031	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	84247	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	78847	368.226	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.82%#			
42) Phenanthrene-d10	32.843	188	75344	453.101	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.31%#			
83) Benzo[b]fluoranthene-d12	47.335	264	75507	470.266	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.03%#			
88) Benzo[a]pyrene-d12	48.543	264	67676	426.624	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.66%#			
129) 5B(H)Cholane - Surr	44.045	217	16957	550.447	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.04%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2025	42.174	ng/mL	100
4) cis-Decalin	17.879	138	104M3	2.957	ng/mL	
5) C1-Decalins	18.134	152	4191M5	87.284	ng/mL	
6) C2-Decalins	19.914	166	7118M5	148.244	ng/mL	
7) C3-Decalins	22.387	180	9084M5	189.189	ng/mL	
8) C4-Decalins	25.781	194	18118M5	377.337	ng/mL	
10) Naphthalene	20.078	128	88401	360.868	ng/mL#	100
11) C1-Naphthalenes	22.779	142	123793M5	505.345	ng/mL	
12) C2-Naphthalenes	25.617	156	271156M5	1106.906	ng/mL	
13) C3-Naphthalenes	27.953	170	417427M5	1704.010	ng/mL	
14) C4-Naphthalenes	30.718	184	390026M5	1592.154	ng/mL	
16) 2-Methylnaphthalene	22.779	142	70018	479.828	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	52843	386.725	ng/mL#	100
18) Benzothiophene	20.297	134	3362	16.979	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	10158M5	51.302	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	26980M5	136.259	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	59855M5	302.290	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	70102M5	354.041	ng/mL	
23) Biphenyl	24.659	154	15802	85.115	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	60146	481.608	ng/mL#	100
25) Dibenzofuran	27.743	168	57740	294.800	ng/mL	95
26) Acenaphthylene	26.365	152	29803	134.034	ng/mL#	100
27) Acenaphthene	27.105	153	53383	402.228	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.656	170	26384M3	245.295	ng/mL	
29) Fluorene	29.121	166	79915M3	536.864	ng/mL	
30) C1-Fluorenes	31.484	180	68760M5	461.926	ng/mL	
31) C2-Fluorenes	33.674	194	159235M5	1069.732	ng/mL	
32) C3-Fluorenes	35.508	208	194582M5	1307.191	ng/mL	
33) Dibenzothiophene	32.442	184	87997	429.895	ng/mL#	70
34) 4-Methyldibenzothiophe...	34.212	198	79630	389.019	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.559	198	67589M3	330.195	ng/mL	
36) 1-Methyldibenzothiophe...	34.979	198	32319	157.889	ng/mL#	100
37) OTP	34.596	198	5876M3	28.706	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	206054M5	1006.643	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	359643M5	1756.977	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	384448M5	1878.158	ng/mL	
41) C4-Dibenzothiophenes	39.379	240	248407M5	1213.552	ng/mL	
43) Phenanthrene	32.935	178	932602	4733.620	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.897	192	127767	648.509	ng/mL	98
45) 2-Methylphenanthrene(2MP)	35.006	192	147620	749.277	ng/mL	97
46) 2-Methylanthracene(2MA)	35.162	192	44558M3	226.164	ng/mL	
47) 9/4-Methylphenanthrene...	35.344	192	151182	767.356	ng/mL	86
48) 1-Methylphenanthrene(1MP)	35.445	192	97573M3	495.253	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.006	192	578644M5	2937.031	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.161	206	570296M5	2894.659	ng/mL	
52) C3-Phenanthrenes/Anthr...	38.996	220	397250M5	2016.327	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.169	234	206207M5	1046.647	ng/mL	
55) Anthracene	33.117	178	183731M3	1001.006	ng/mL	
56) Carbazole	33.783	167	110743M3	578.235	ng/mL	
57) 1-Methylphenanthrene	35.445	192	98708M3	706.786	ng/mL	
58) Fluoranthene	37.708	202	1579837M3	7784.813	ng/mL	
59) Benzo(b)fluorene	40.229	216	97101M3	827.139	ng/mL	
60) Pyrene	38.594	202	1368079	6664.848	ng/mL	95
61) C1-Fluoranthenes/Pyrenes	39.982	216	683432M5	3329.464	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.027	230	431352M5	2101.410	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.908	244	259839M5	1265.853	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.196	258	239600M5	1167.255	ng/mL	
66) Naphthobenzothiophene	42.438	234	132983	697.893	ng/ml#	68
67) Naphthobenzothiophene-...	42.438	234	132983	697.893	ng/mL#	68
68) Naphthobenzothiophene-...	42.776	234	29401	154.296	ng/mL#	10
69) Naphthobenzothiophene-...	43.077	234	35107M3	184.241	ng/mL	
70) C1-Naphthobenzothiophenes	43.835	248	165809M5	870.163	ng/ml	
71) C2-Naphthobenzothiophenes	45.845	262	219383M5	1151.318	ng/ml	
72) C3-Naphthobenzothiophenes	47.445	276	166485M5	873.710	ng/ml	
73) C4-Naphthobenzothiophenes	48.543	290	114108M5	598.837	ng/mL	
75) Benz[a]anthracene	43.369	228	539844	2922.990	ng/mL	98
77) Chrysene/Triphenylene	43.534	228	681750	3646.728	ng/mL	99
78) C1-Chrysenes	45.004	242	313517M5	1677.024	ng/mL	
79) C2-Chrysenes	46.704	256	242950M5	1299.556	ng/mL	
80) BBF-D12 Surr BKGD	47.335	256	3438	18.390	ng/mL	100
81) C3-Chrysenes	47.765	270	204663M5	1094.757	ng/mL	
82) C4-Chrysenes	49.933	284	110164M5	589.275	ng/mL	
84) Benzo[b]fluoranthene	47.427	252	702973	3544.033	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.500	252	631554	2918.119	ng/mL	95
86) Benzo[a]fluoranthene	47.811	252	114450	528.820	ng/mL#	1
87) Benzo[e]pyrene	48.451	252	525502	2571.234	ng/mL	97
89) Benzo[a]pyrene	48.643	252	625926	3310.823	ng/mL	97
90) Perylene	48.954	252	200539	971.105	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.564	276	439902M3	2190.463	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	102803M6	522.233	ng/mL	
93) Benzo[g,h,i]perylene	54.898	276	542201	2379.050	ng/mL	100
94) Hopane (T19)	52.640	191	120994	1912.323	ng/mL#	89
96) C23 Tricyclic Terpane ...	41.078	191	23792M3	376.035	ng/ml	
97) C24 Tricyclic Terpane ...	41.799	191	14739M3	232.951	ng/ml	
98) C25 Tricyclic Terpane ...	43.324	191	18925M3	299.112	ng/ml	
99) C24 Tetracyclic Terpan...	44.602	191	8549	135.118	ng/ml	100
100) C26 Tricyclic Terpane-...	44.337	191	7884M3	124.607	ng/ml	
101) C26 Tricyclic Terpane-...	44.438	191	6444M3	101.848	ng/ml	
102) C28 Tricyclic Terpane-...	46.713	191	7991M3	126.299	ng/ml	
103) C28 Tricyclic Terpane-...	46.878	191	8380	132.447	ng/ml	100
104) C29 Tricyclic Terpane-...	47.409	191	7857	124.181	ng/ml	100
105) C29 Tricyclic Terpane-...	47.610	191	8348M3	131.941	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.771	191	20767	328.225	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.854	191	7867M3	124.339	ng/mL	
108) C30 Tricyclic Terpane-22R	49.101	191	6582	104.029	ng/mL	100
109) 17a(H)-22,29,30-Trisno...	49.329	191	28930	457.242	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.546	191	8459	133.695	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.326	191	4749M3	75.058	ng/ml	
112) 30-Norhopane (T15)	51.232	191	79876	1262.449	ng/ml	100
113) 18a(H)-30-Norneohopane...	51.342	191	22540M3	356.247	ng/ml	
114) 17a(H)-Diahopane (X)	51.470	191	6357M3	100.473	ng/ml	
115) 30-Normoretane (T17)	52.037	191	12424	196.363	ng/ml	100
116) 18a(H)&18b(H)-Oleanane...	52.457	191	8160	128.970	ng/ml	100
117) Moretane (T20)	53.353	191	21315M3	336.886	ng/ml	
118) 30-Homohopane-22S (T21)	54.487	191	40933	646.950	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

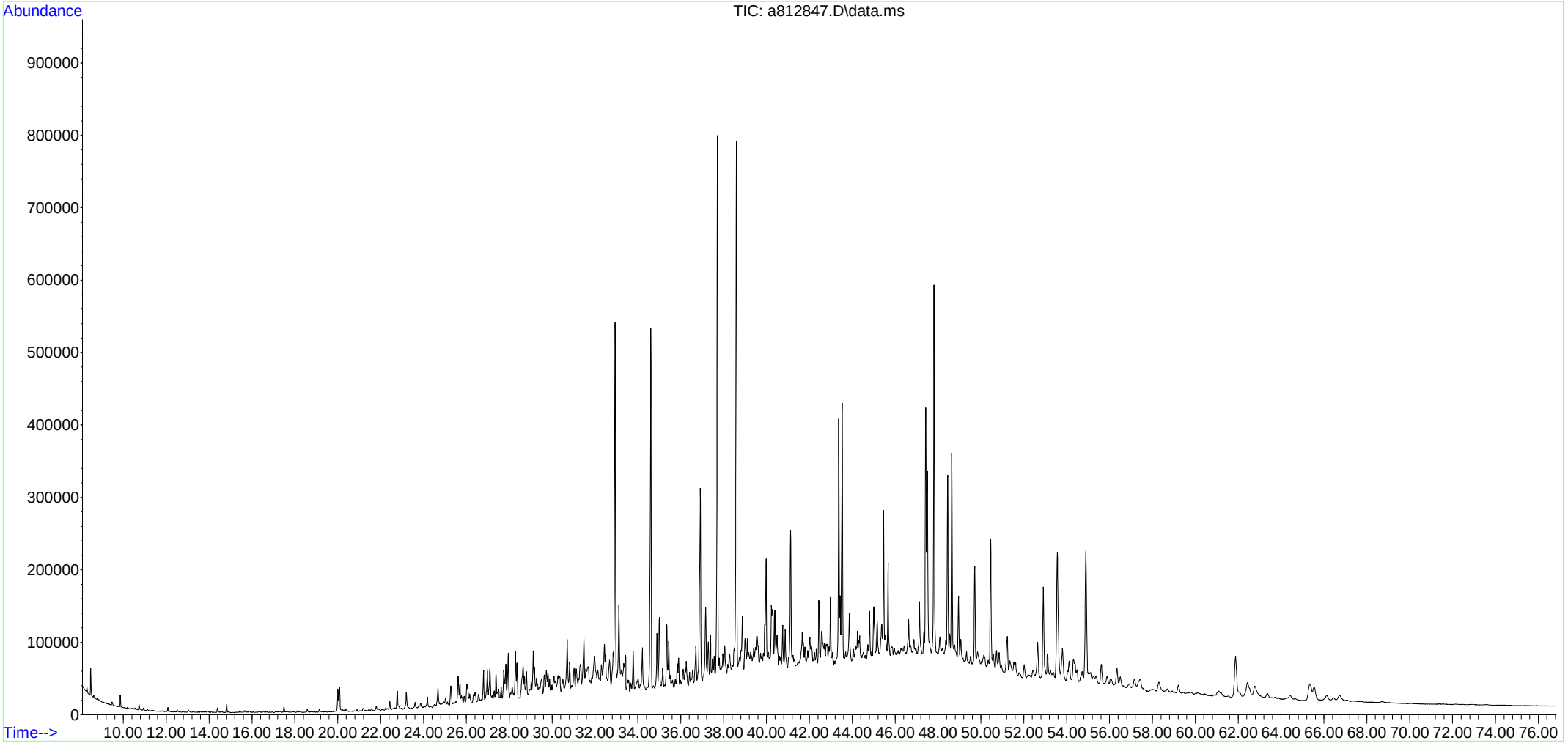
	Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119)	30-Homohopane-22R (T22)	54.724	191		39778	628.696	ng/ml	100
120)	Gammacerane/C32-diahopane	55.291	191		14057M4	222.172	ng/mL	
121)	30,31-Bishomohopane-22...	56.077	191	G	50501	798.174	ng/ml	100
122)	30,31-Bishomohopane-22...	56.488	191		21888	345.942	ng/ml	100
123)	30,31-Trishomohopane-2...	58.297	191		25286M3	399.648	ng/ml	
124)	30,31-Trishomohopane-2...	58.928	191		13058	206.383	ng/ml	100
125)	Tetrakishomohopane-22S...	61.029	191		19874	314.111	ng/ml	100
126)	Tetrakishomohopane-22R...	61.870	191	G	23513	371.625	ng/ml	100
127)	Pentakishomohopane-22S...	64.264	191		13519	213.669	ng/ml	100
128)	Pentakishomohopane-22R...	65.589	191		10818	170.980	ng/ml	100
130)	13b(H),17a(H)-20S-Diac...	45.552	217		9098	295.333	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.973	217		5146	167.046	ng/ml	100
132)	13b,17a-20S-Methyldiac...	46.677	217		5204M3	168.929	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.555	217		17302	561.646	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.086	217		18555	602.320	ng/ml	100
135)	Unknown Sterane (S18)	48.369	217		4651	150.978	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.634	217		518	16.815	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.799	217		9026M3	292.996	ng/ml	
138)	14a,17a-20R-Methylchol...	49.531	217		6342	205.870	ng/ml	100
139)	14a(H),17a(H)-20S-Ethy...	49.887	217		12305M3	399.437	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.829	217		10642M3	345.453	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.646	218		8965M3	291.016	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.729	218		9770M3	317.147	ng/ml	
143)	14b,17b-20R-Methylchol...	48.973	218		8362M3	271.442	ng/ml	
144)	14b,17b-20S-Methylchol...	49.055	218		13584M3	440.955	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.143	218		19891	645.688	ng/ml	100
146)	14b(H),17b(H)-20S-Ethy...	50.180	218		11835M3	384.180	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.842	231		29794	967.153	ng/mL	100
148)	C28,20S-triaromatic st...	50.729	231		32156	1043.826	ng/mL	100
149)	C27,20R-triaromatic st...	51.186	231		19217M3	623.809	ng/mL	
150)	C28,20R-triaromatic st...	52.421	231		25034M3	812.637	ng/mL	

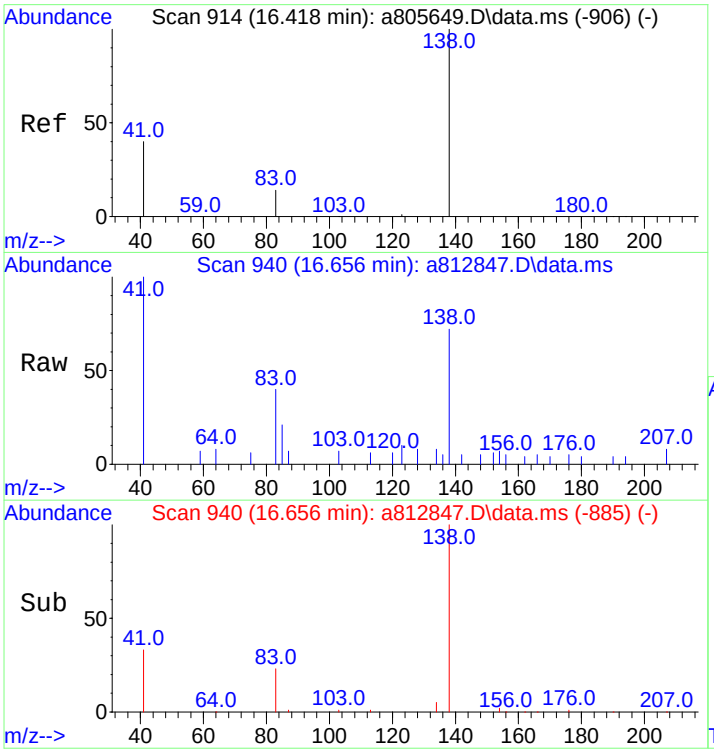
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812847.D
Acq On : 19 Nov 2012 9:36 pm
Operator : AC
Sample : 1210082-01
Misc : 1x
ALS Vial : 28 Sample Multiplier: 1

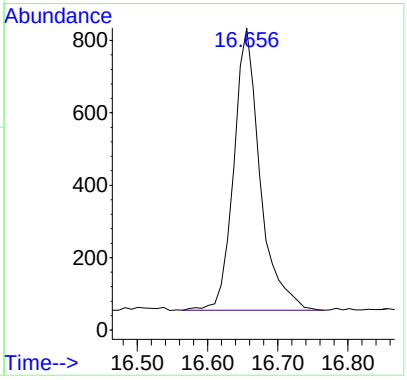
Quant Time: Nov 20 15:06:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

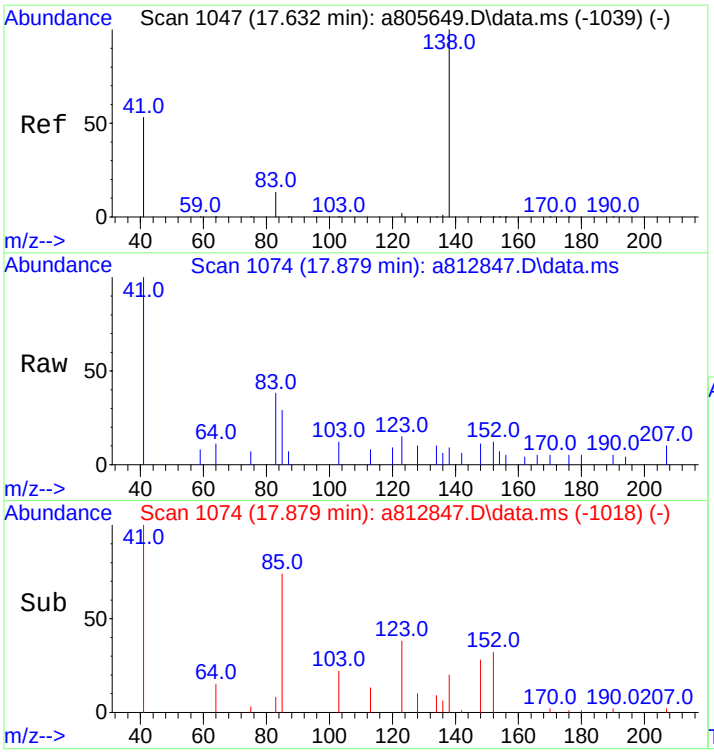




#3
trans-Decalin
Concen: 42.17 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

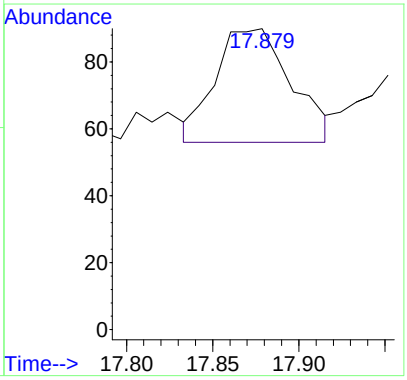
Tgt Ion:138 Resp: 2025

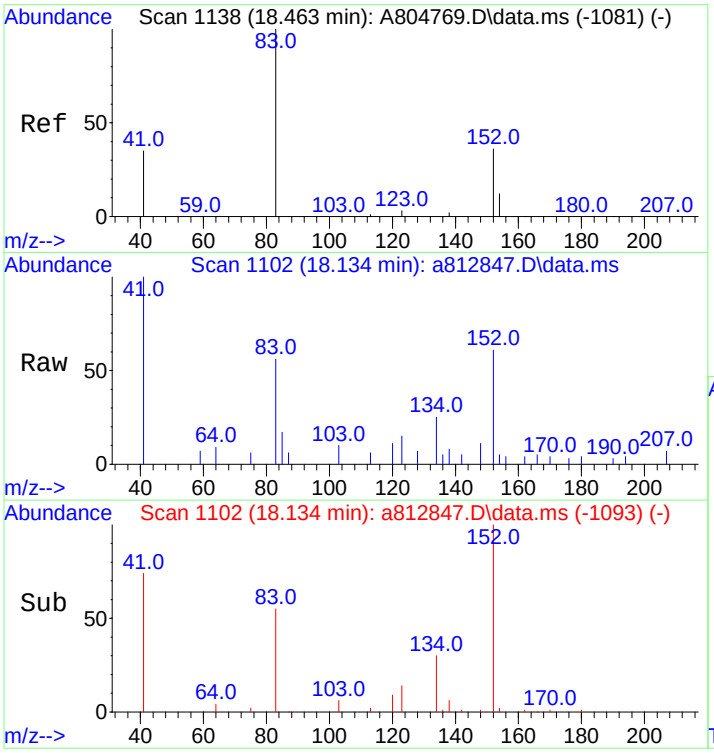




#4
cis-Decalin
Concen: 2.96 ng/mL m
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

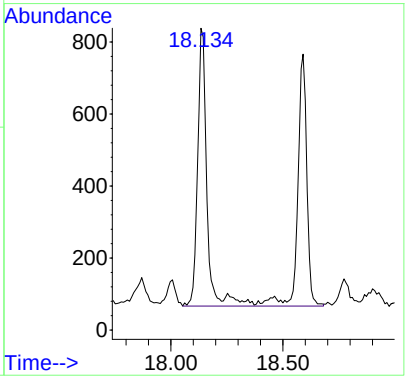
Tgt Ion:138 Resp: 104

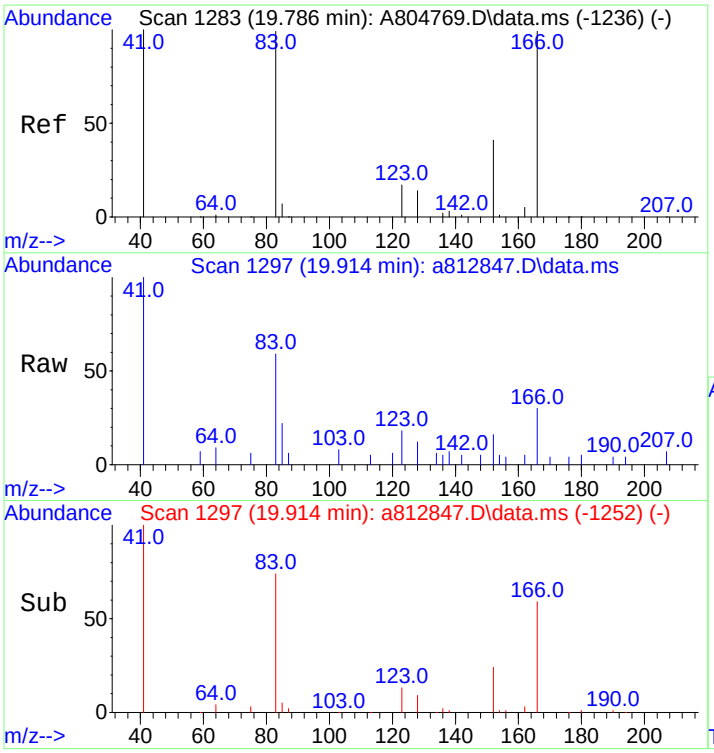




#5
C1-Decalins
Concen: 87.28 ng/mL m
RT: 18.134 min Scan# 1102
Delta R.T. -0.456 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

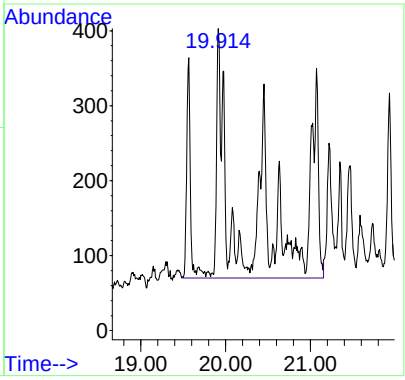
Tgt Ion:152 Resp: 4191

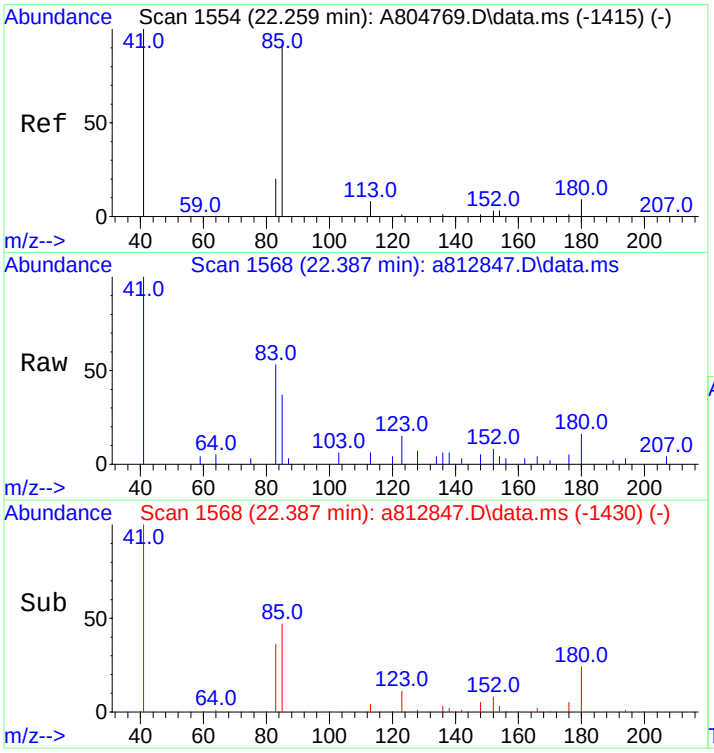




#6
C2-Decalins
Concen: 148.24 ng/mL m
RT: 19.914 min Scan# 1297
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

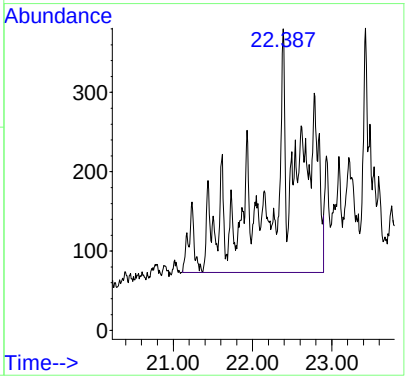
Tgt Ion:166 Resp: 7118

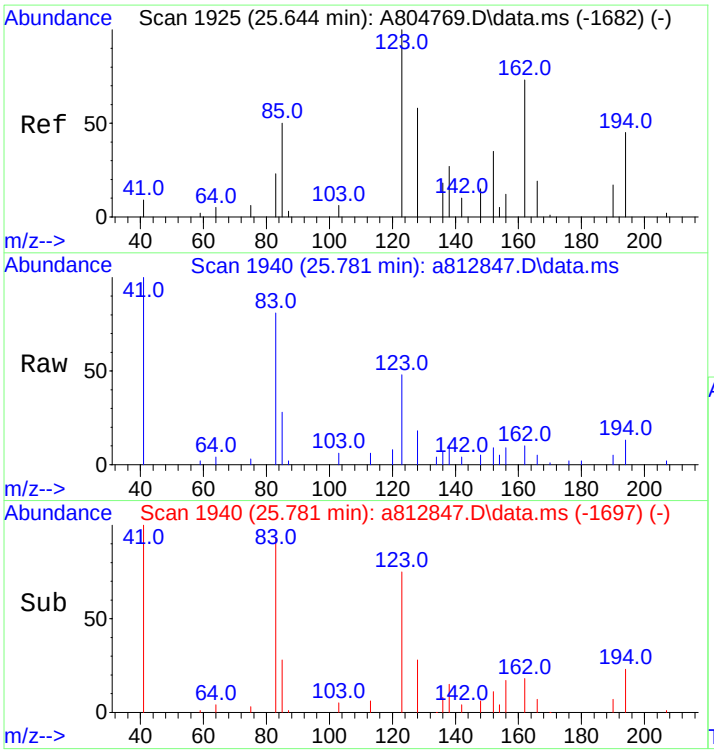




#7
C3-Decalins
Concen: 189.19 ng/mL m
RT: 22.387 min Scan# 1568
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

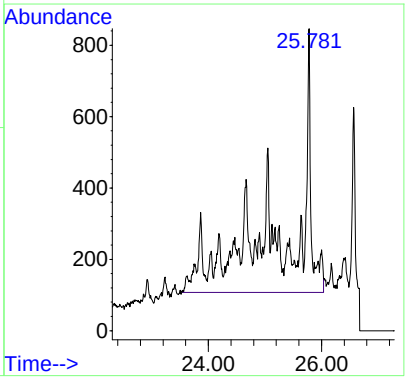
Tgt Ion:180 Resp: 9084

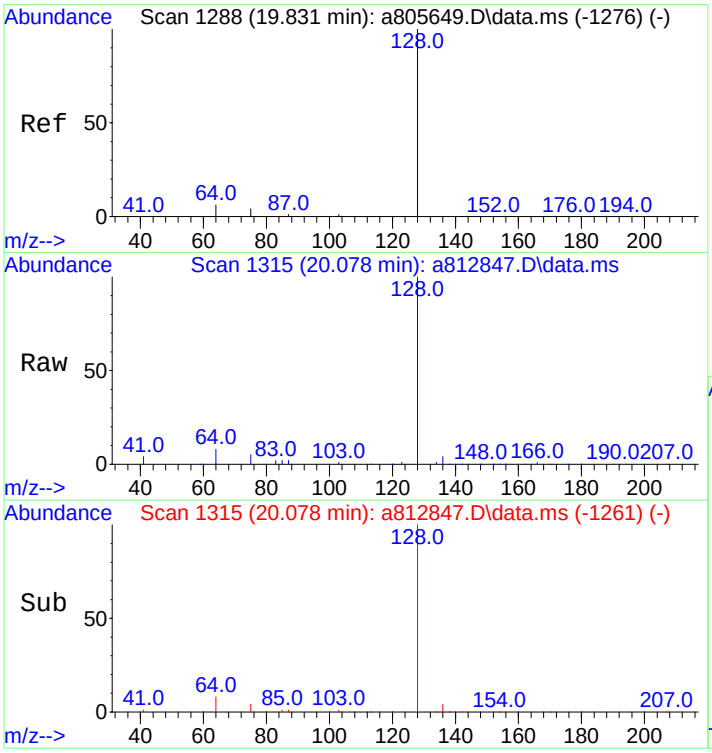




#8
C4-Decalins
Concen: 377.34 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:194 Resp: 18118

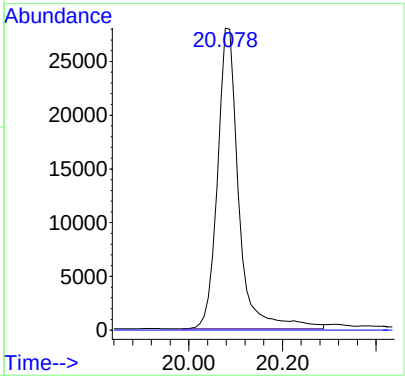


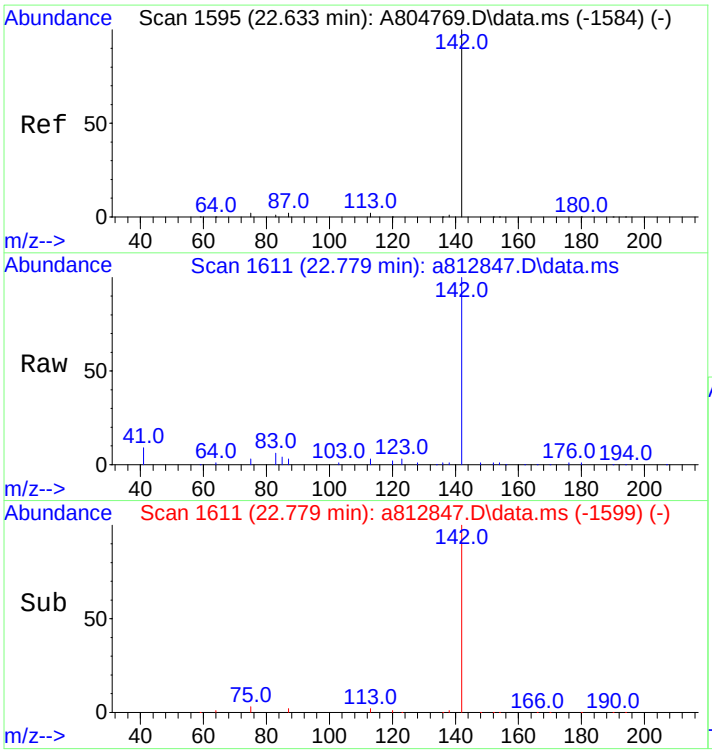


#10
Naphthalene
Concen: 360.87 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:128 Resp: 88401

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

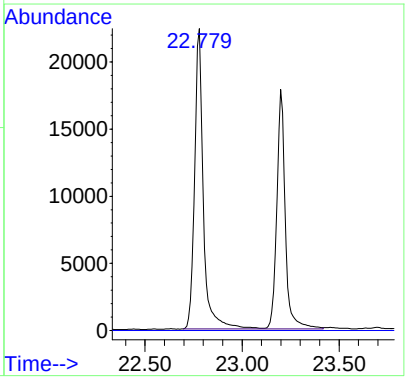


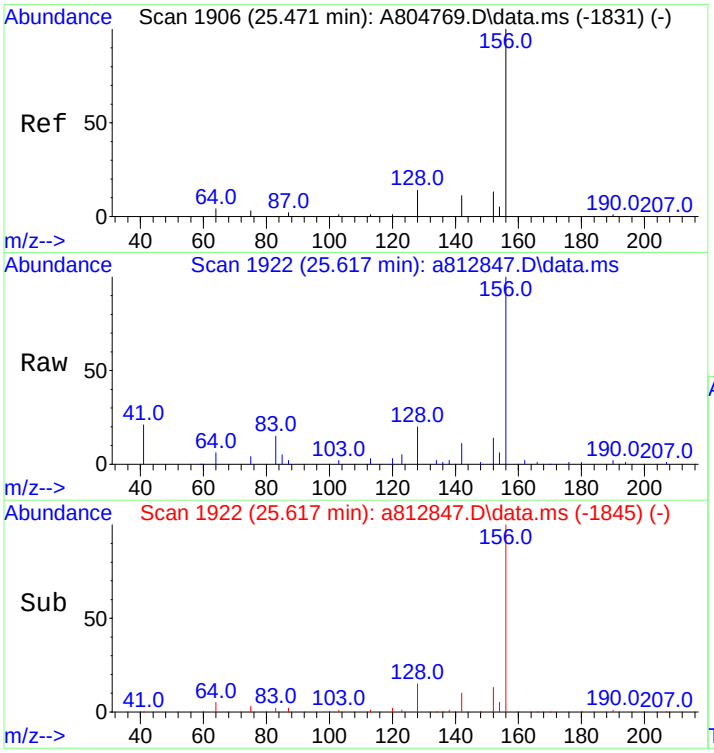


#11
C1-Naphthalenes
Concen: 505.34 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:142 Resp: 123793

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

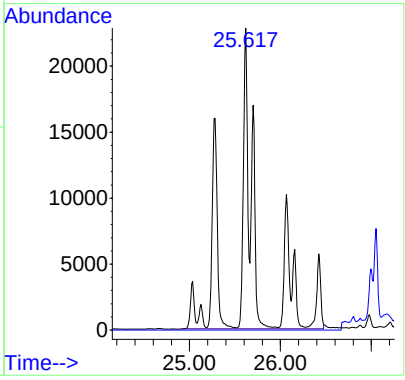


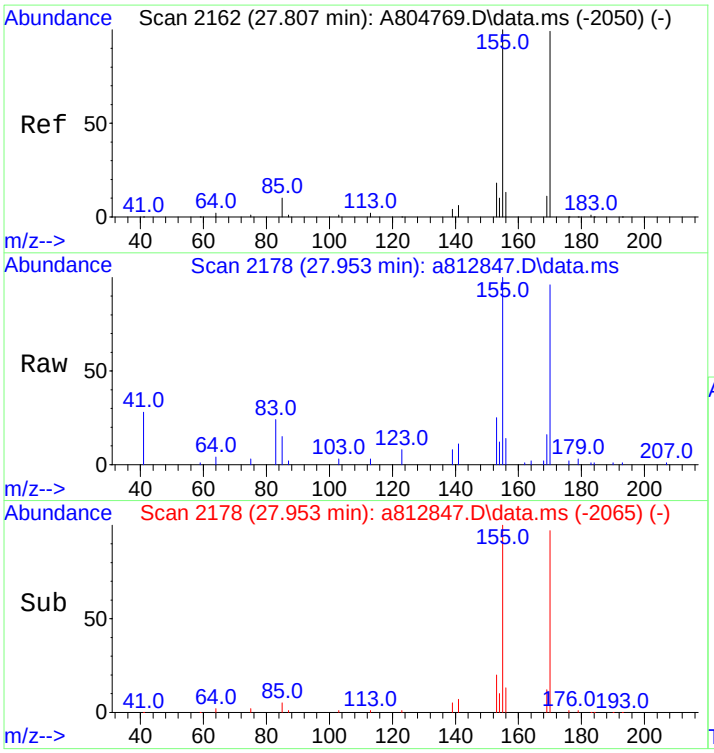


#12
C2-Naphthalenes
Concen: 1106.91 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:156 Resp: 271156

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

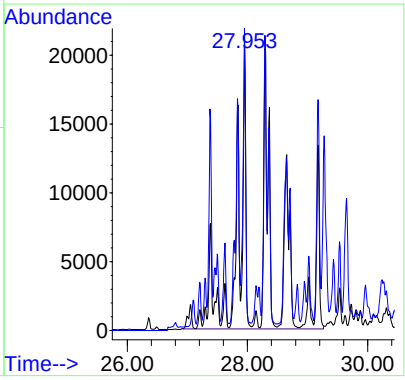


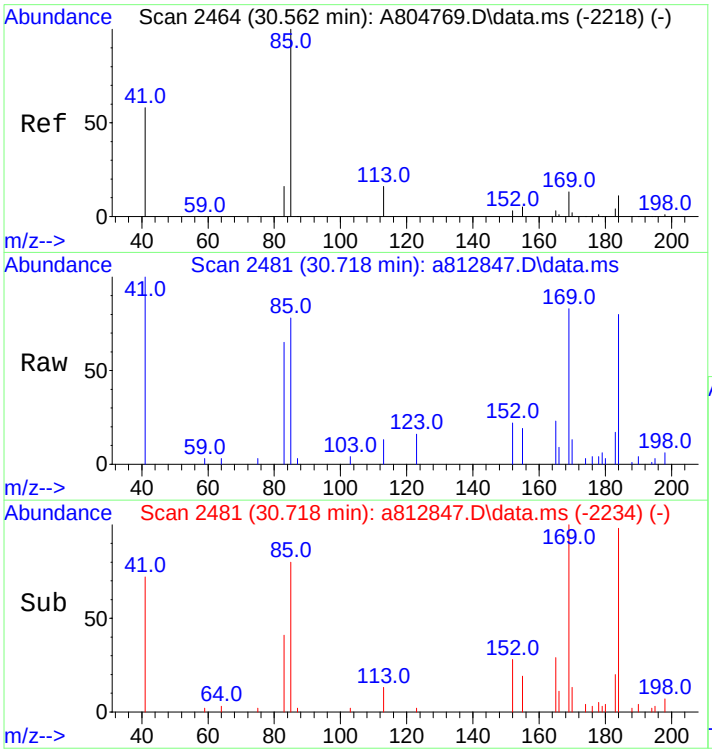


#13
C3-Naphthalenes
Concen: 1704.01 ng/mL m
RT: 27.953 min Scan# 2178
Delta R.T. 0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:170 Resp: 417427

Ion	Ratio	Lower	Upper
170	100		
155	15.7	80.2	120.4#

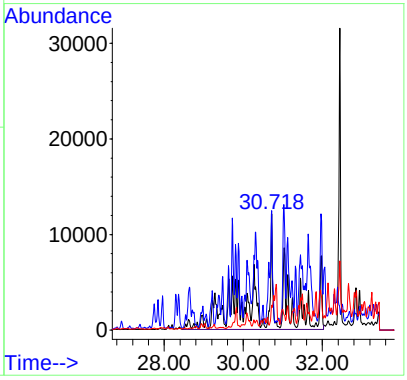


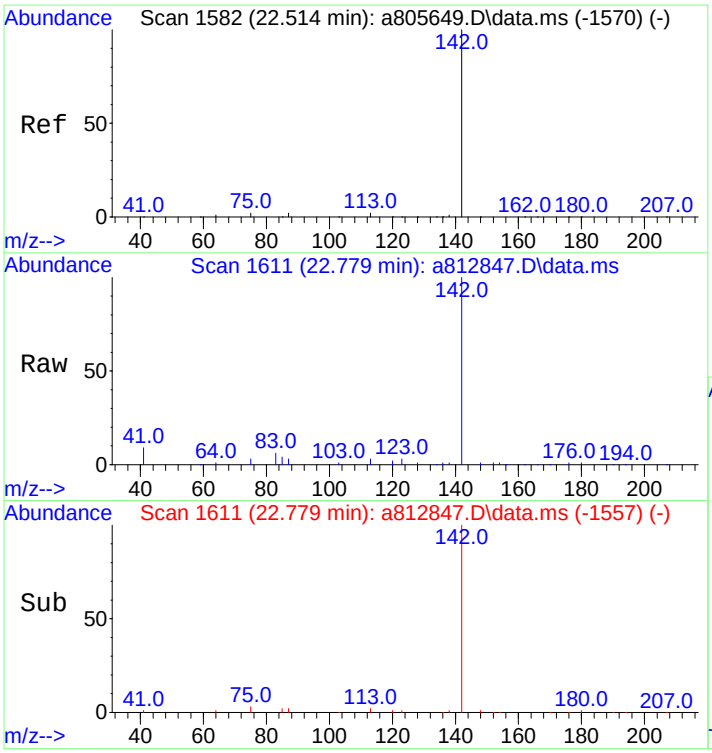


#14
C4-Naphthalenes
Concen: 1592.15 ng/mL m
RT: 30.718 min Scan# 2481
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:184 Resp: 390026

Ion	Ratio	Lower	Upper
184	100		
169	5.0	108.2	162.2#
183	1.4	29.7	44.5#

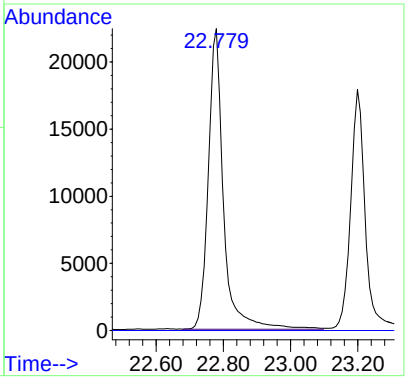


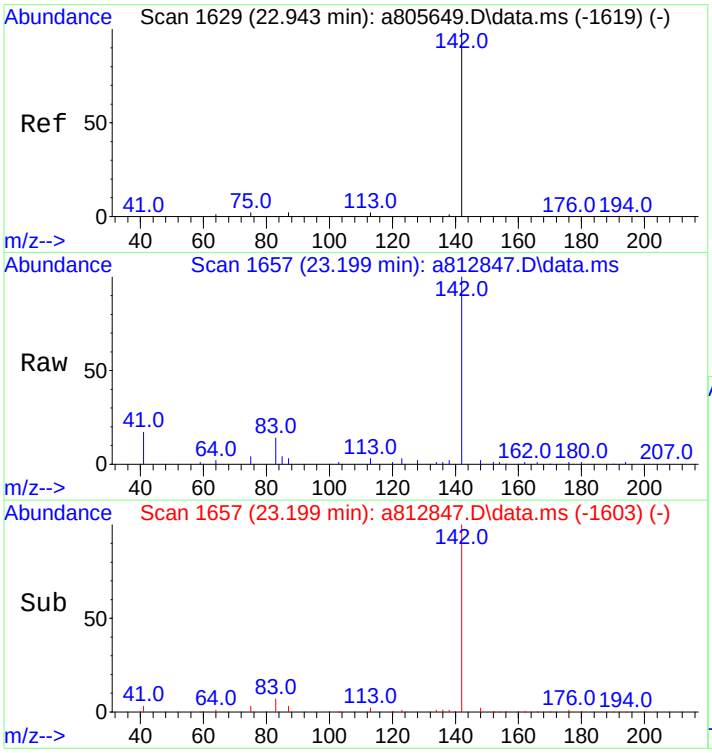


#16
2-Methylnaphthalene
Concen: 479.83 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:142 Resp: 70018

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

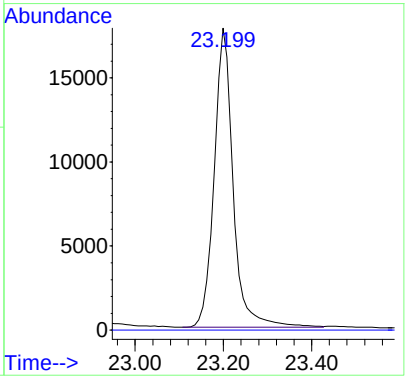


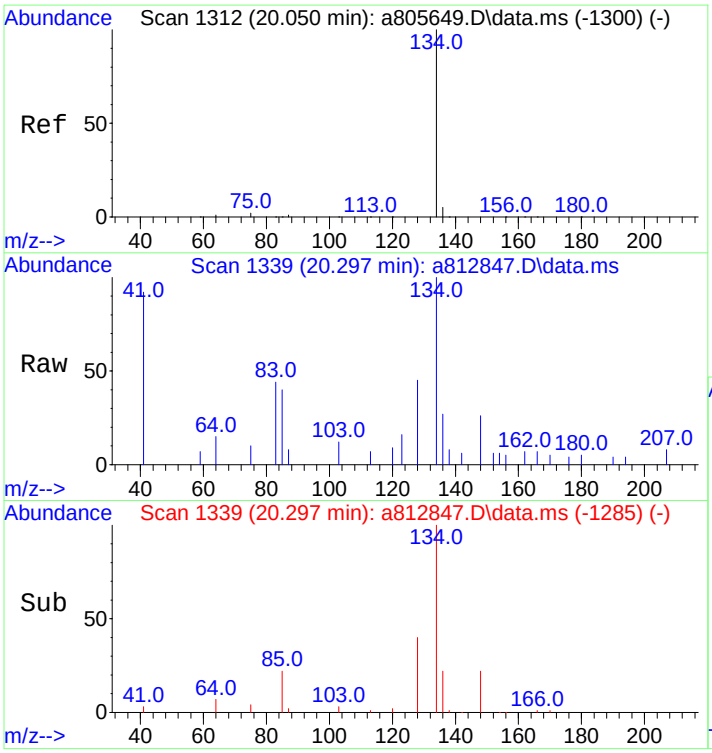


#17
1-Methylnaphthalene
Concen: 386.73 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:142 Resp: 52843

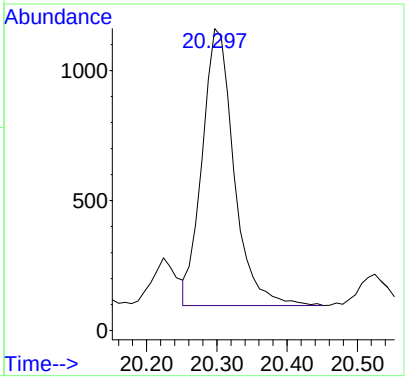
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

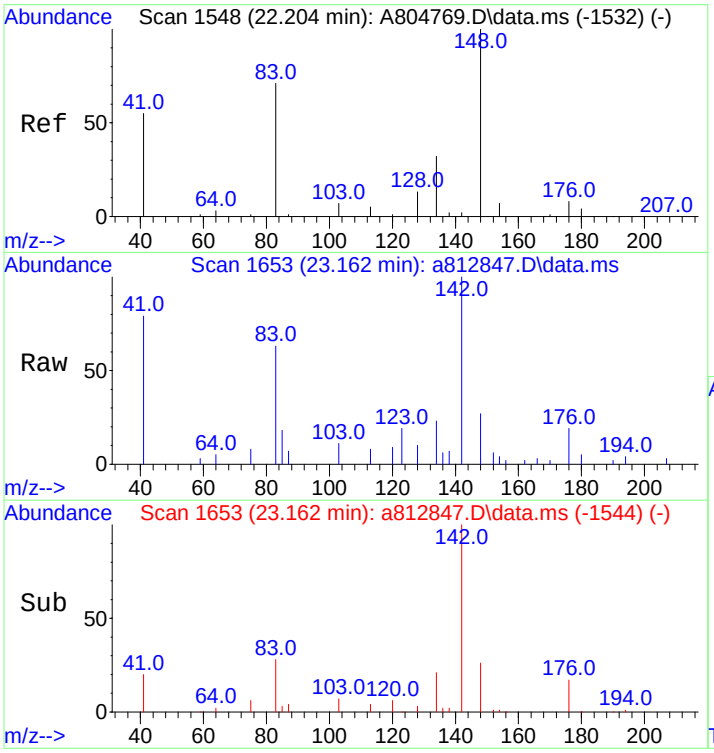




#18
Benzothiophene
Concen: 16.98 ng/mL
RT: 20.297 min Scan# 1339
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

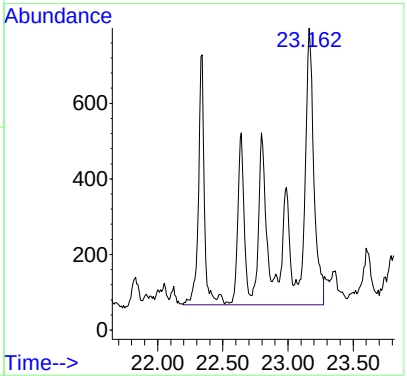
Tgt Ion:134 Resp: 3362

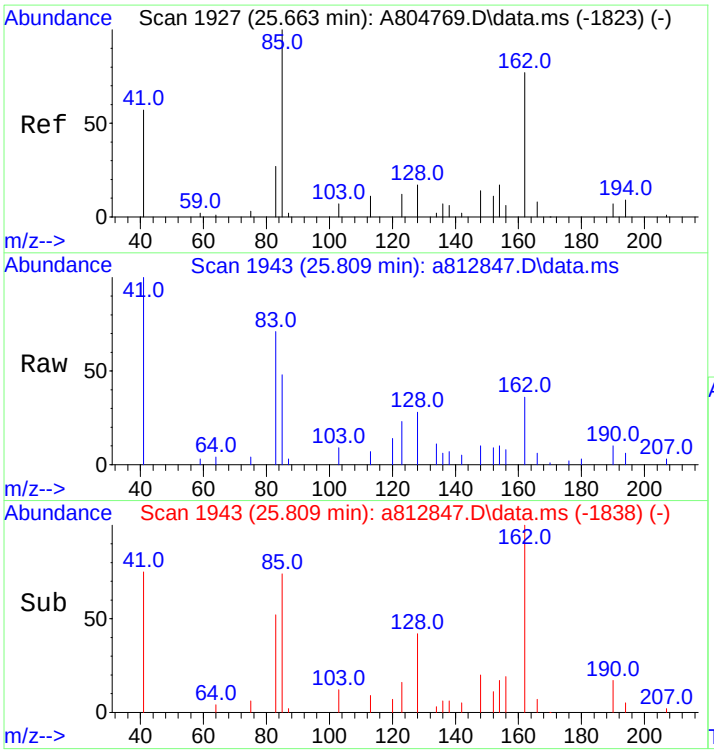




#19
C1-Benzo(b)thiophenes
Concen: 51.30 ng/mL m
RT: 23.162 min Scan# 1653
Delta R.T. 0.821 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

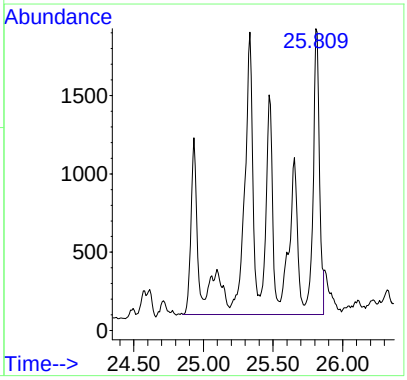
Tgt Ion:148 Resp: 10158

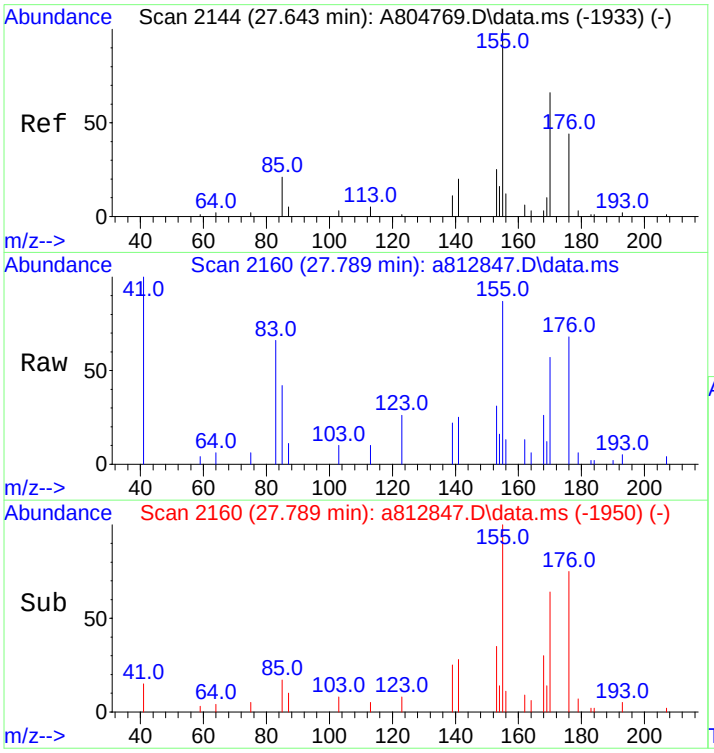




#20
C2-Benzo(b)thiophenes
Concen: 136.26 ng/mL m
RT: 25.809 min Scan# 1943
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

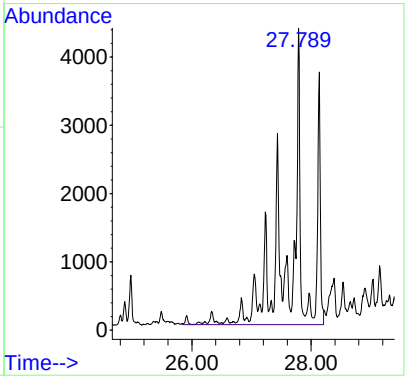
Tgt Ion:162 Resp: 26980

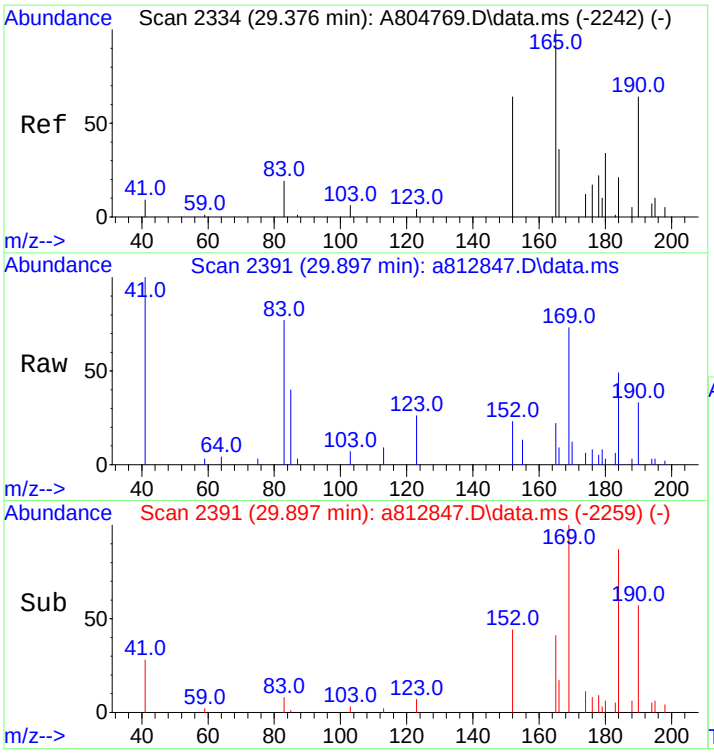




#21
C3-Benzo(b)thiophenes
Concen: 302.29 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

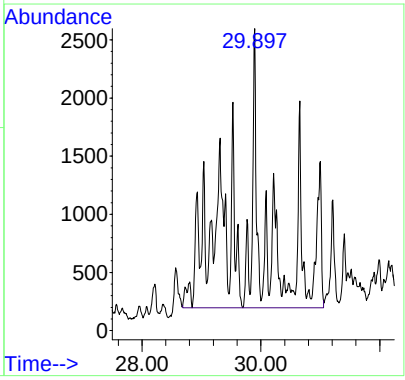
Tgt Ion:176 Resp: 59855

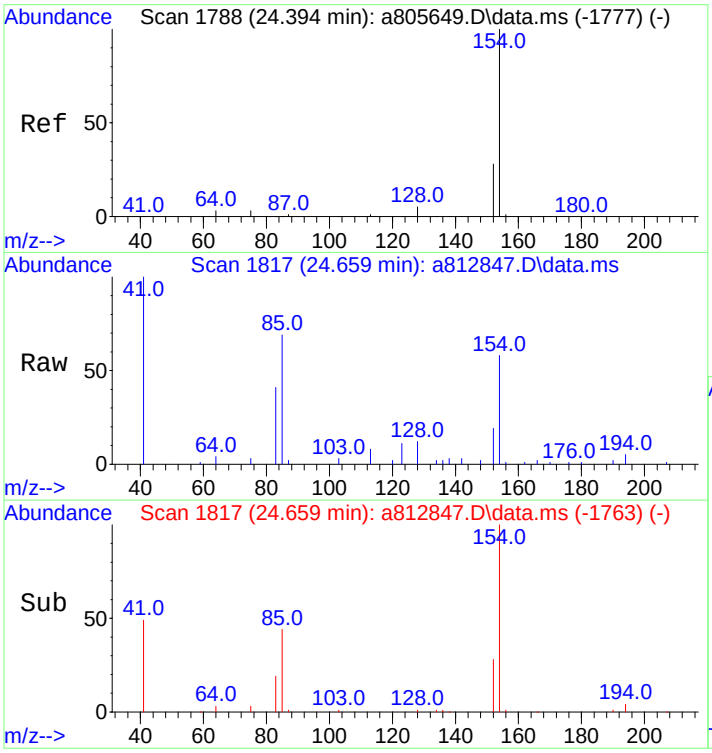




#22
C4-Benzo(b)thiophenes
Concen: 354.04 ng/mL m
RT: 29.897 min Scan# 2391
Delta R.T. 0.365 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:190 Resp: 70102

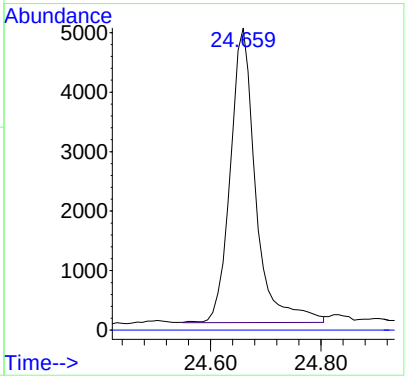


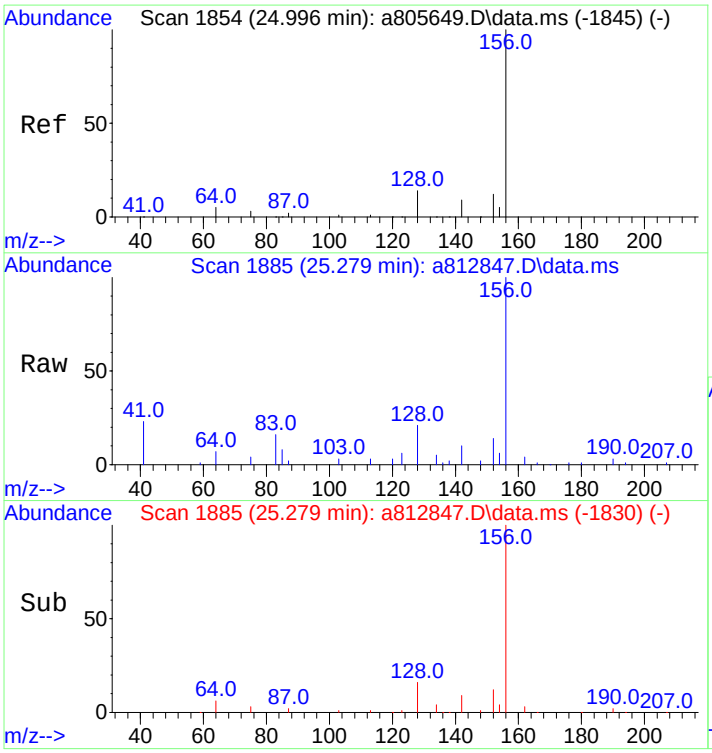


#23
Biphenyl
Concen: 85.12 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:154 Resp: 15802

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

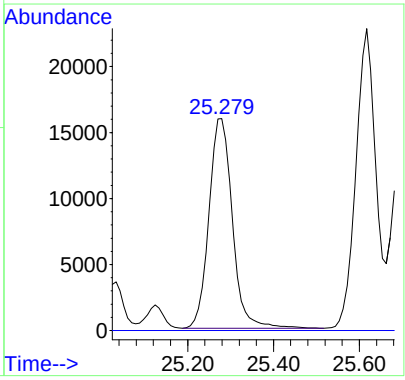


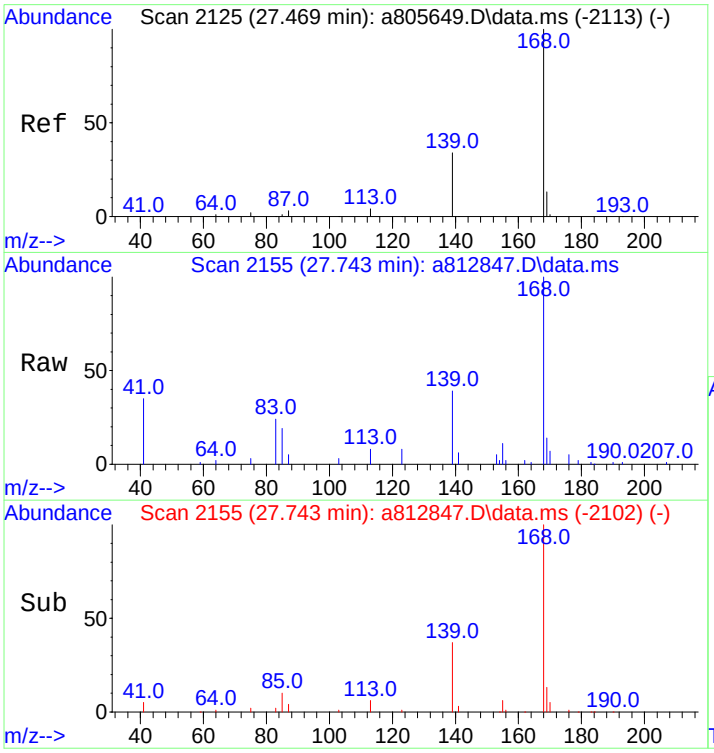


#24
2,6-Dimethylnaphthalene
Concen: 481.61 ng/mL
RT: 25.279 min Scan# 1885
Delta R.T. -0.001 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:156 Resp: 60146

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

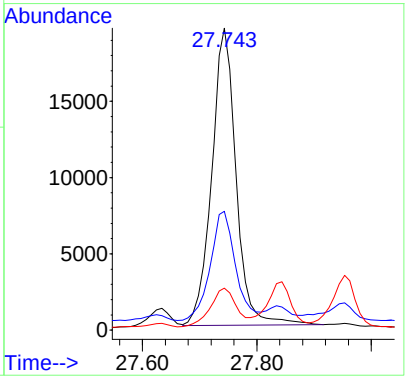


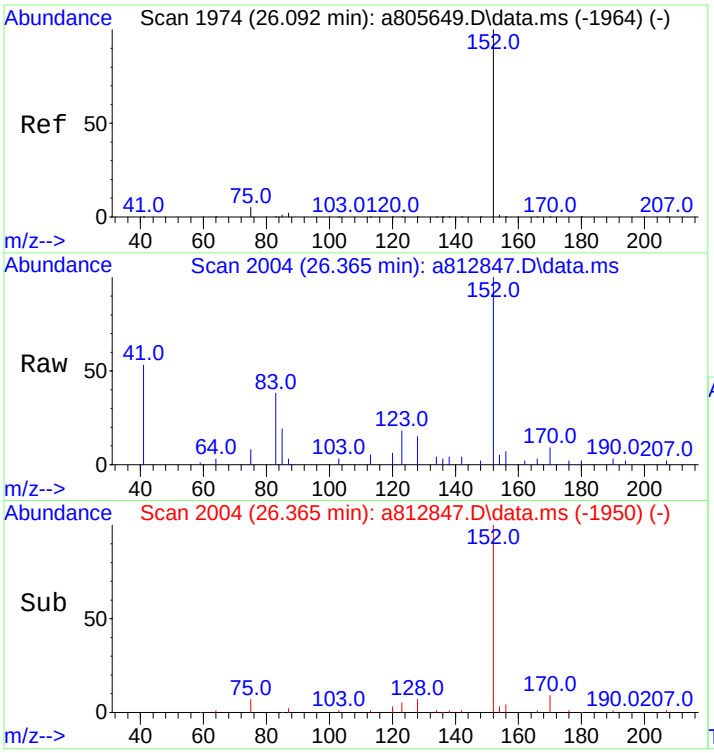


#25
Dibenzofuran
Concen: 294.80 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:168 Resp: 57740

Ion	Ratio	Lower	Upper
168	100		
139	38.1	28.0	42.0
169	14.2	10.6	15.8

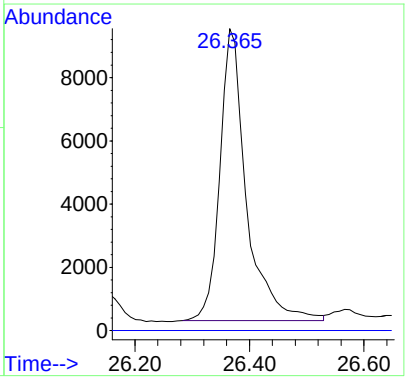


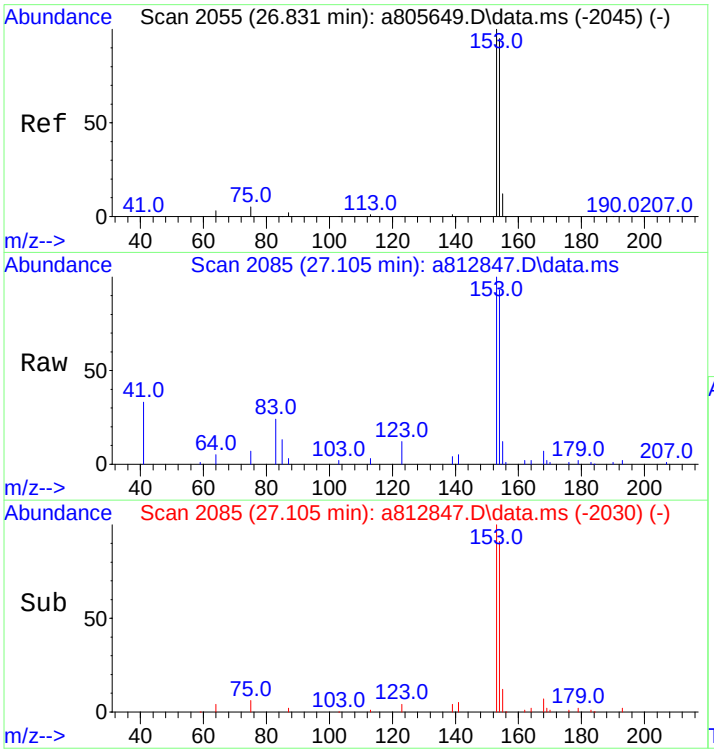


#26
Acenaphthylene
Concen: 134.03 ng/mL
RT: 26.365 min Scan# 2004
Delta R.T. -0.010 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:152 Resp: 29803

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

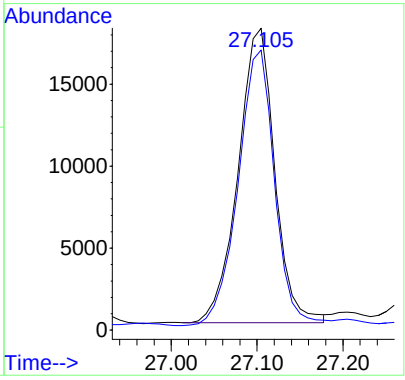


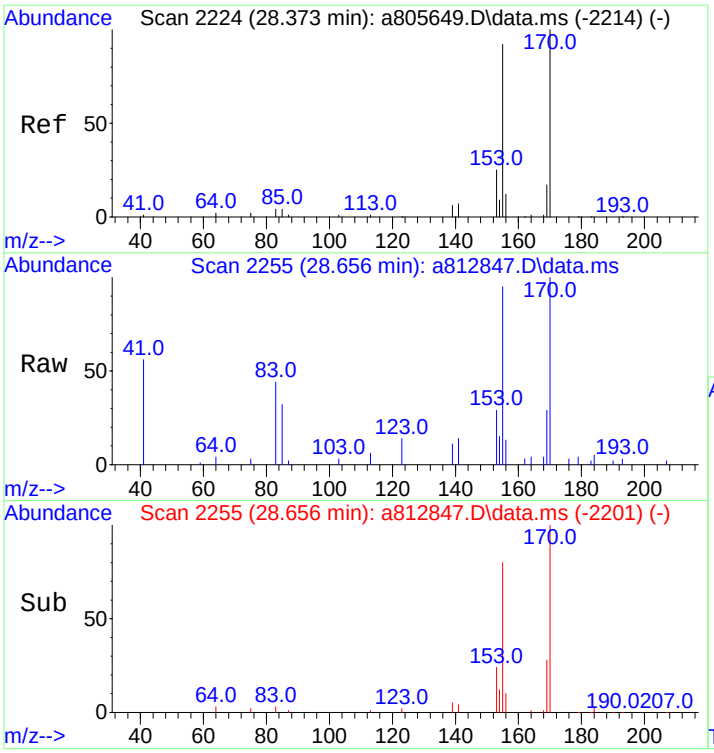


#27
Acenaphthene
Concen: 402.23 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:153 Resp: 53383

Ion	Ratio	Lower	Upper
153	100		
154	93.2	75.4	113.2

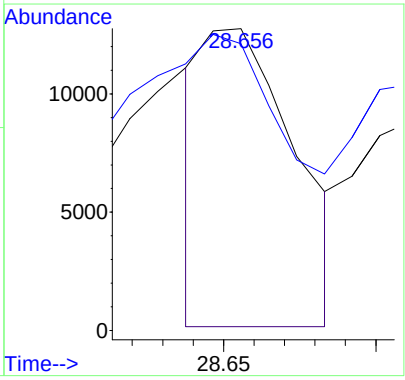


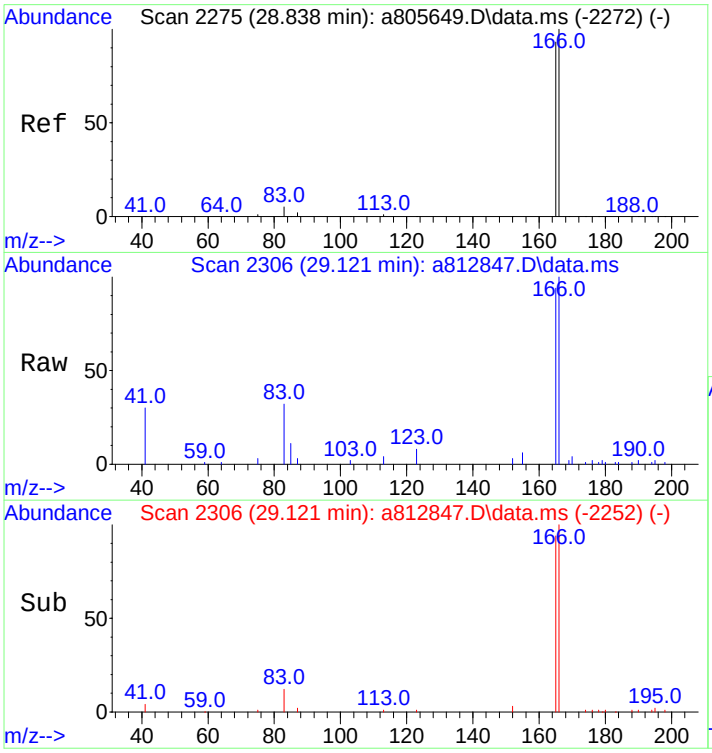


#28
2,3,5-Trimethylnaphthalene
Concen: 245.30 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:170 Resp: 26384

Ion	Ratio	Lower	Upper
170	100		
155	201.0	71.7	107.5#

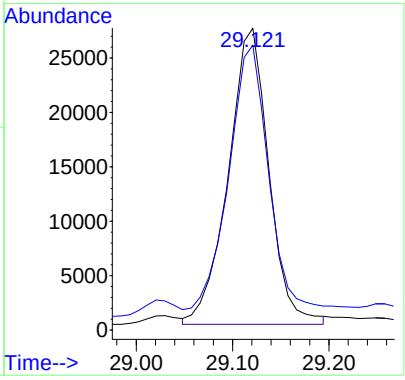


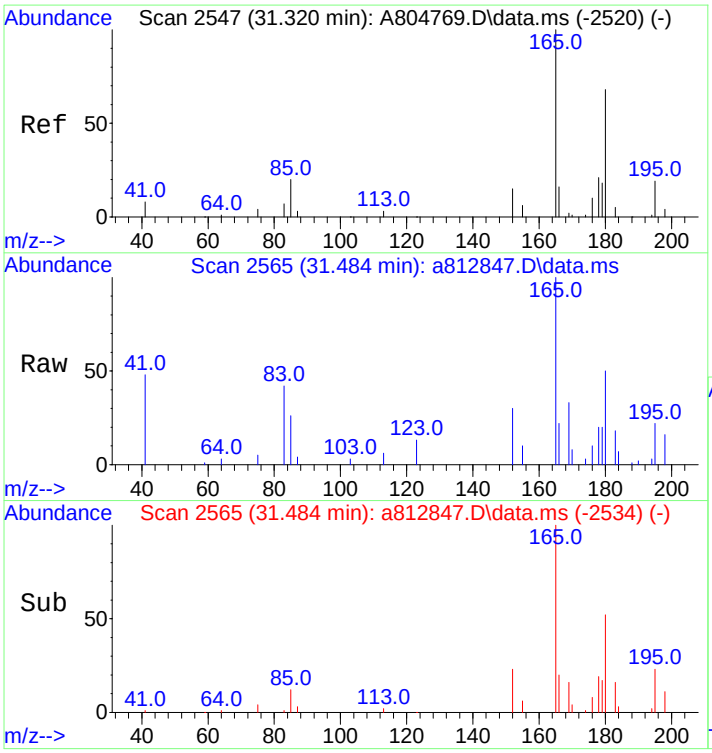


#29
Fluorene
Concen: 536.86 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:166 Resp: 79915

Ion	Ratio	Lower	Upper
166	100		
165	91.1	74.2	111.2

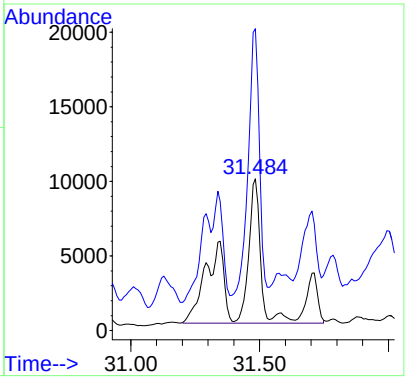


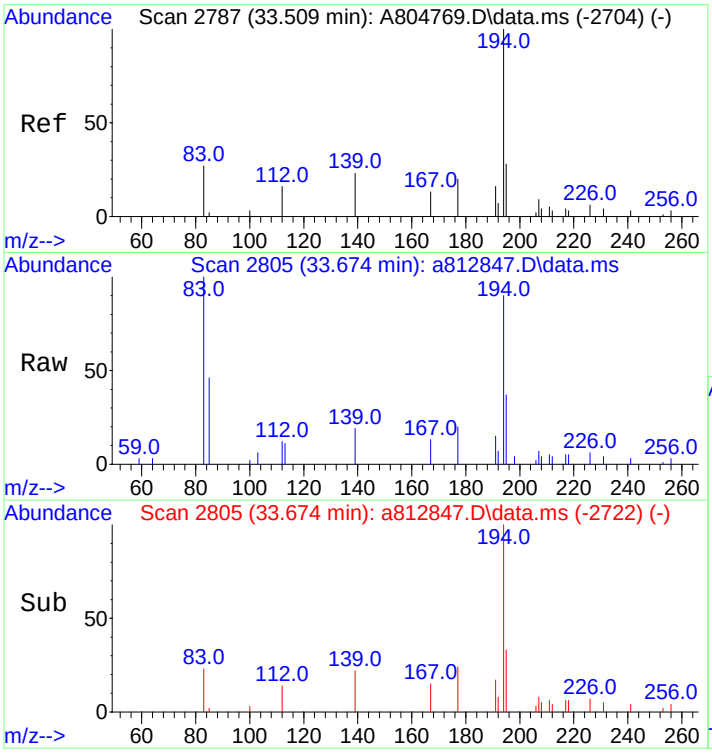


#30
C1-Fluorenes
Concen: 461.93 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:180 Resp: 68760

Ion	Ratio	Lower	Upper
180	100		
165	22.7	122.4	183.6#

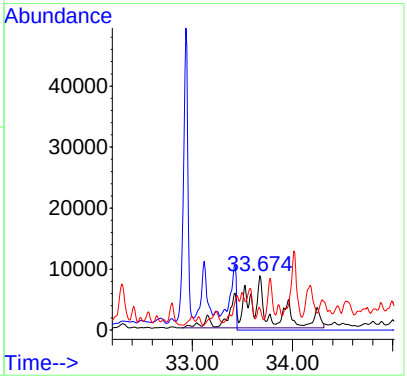


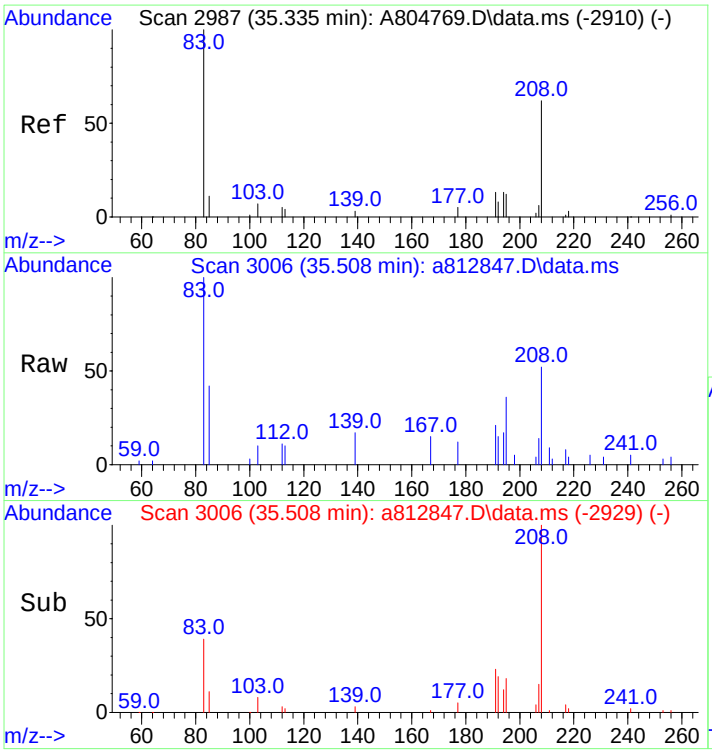


#31
C2-Fluorenes
Concen: 1069.73 ng/mL m
RT: 33.674 min Scan# 2805
Delta R.T. 0.068 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:194 Resp: 159235

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	10.0	27.4	41.0#

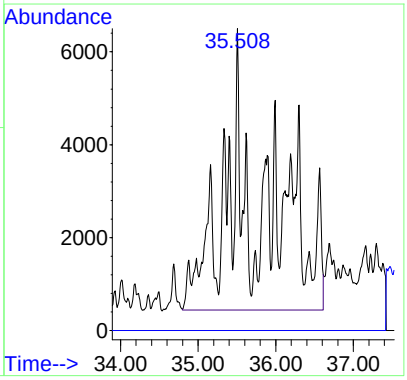


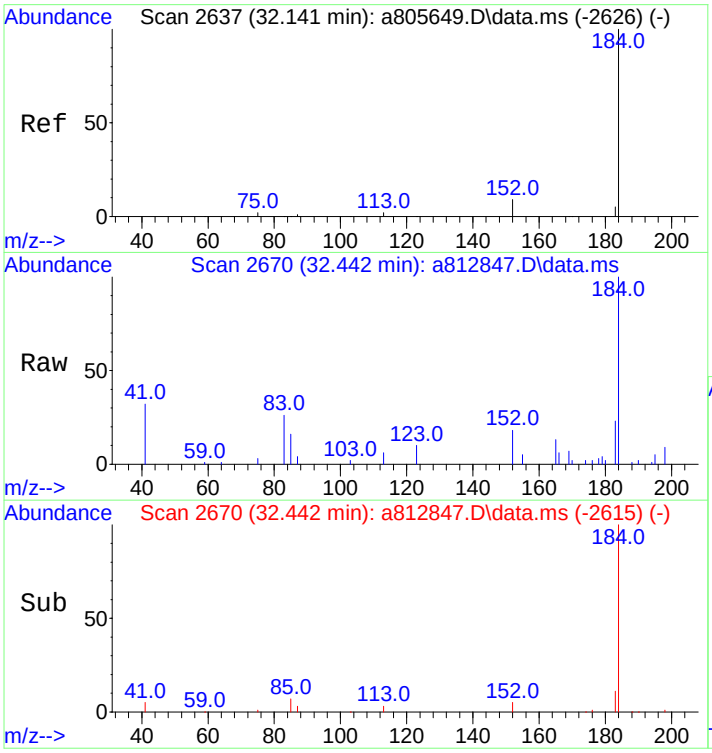


#32
C3-Fluorenes
Concen: 1307.19 ng/mL m
RT: 35.508 min Scan# 3006
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:208 Resp: 194582

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

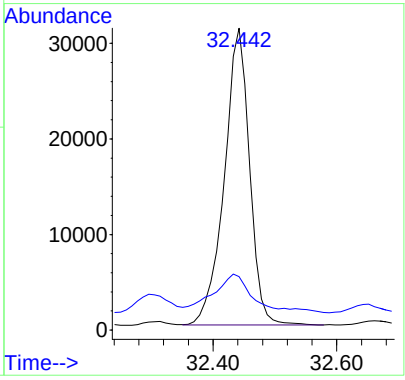


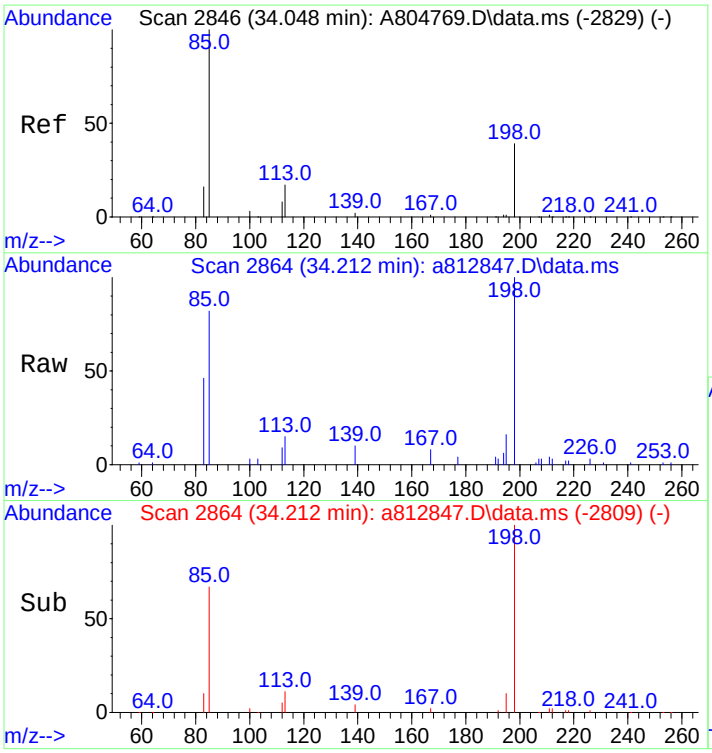


#33
Dibenzothiophene
Concen: 429.89 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:184 Resp: 87997

Ion	Ratio	Lower	Upper
184	100		
152	20.8	7.8	11.8#

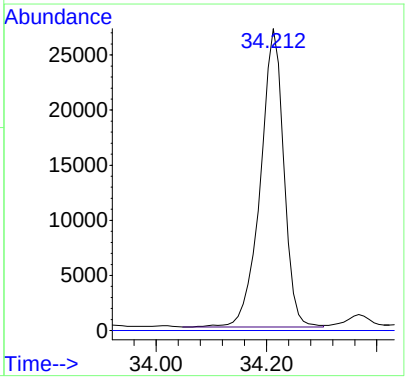


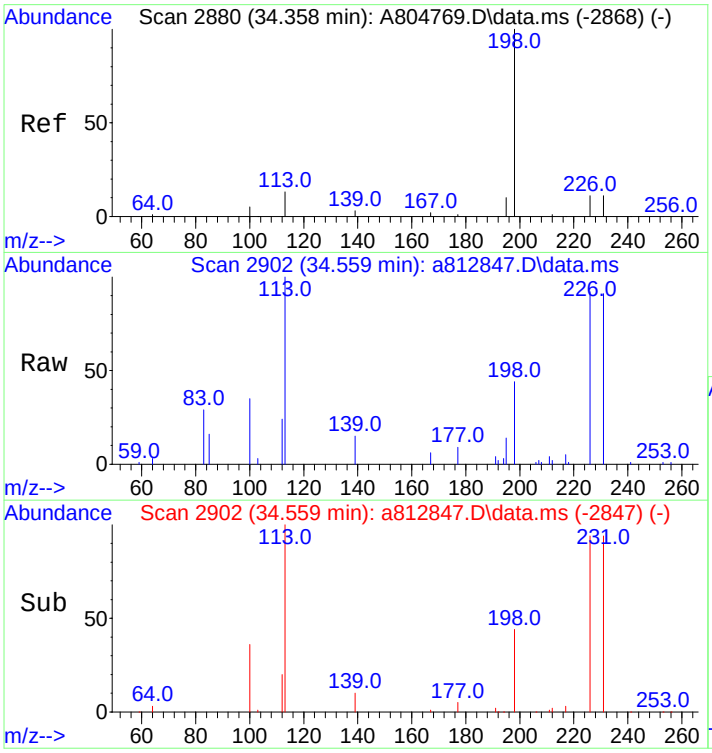


#34
4-Methyldibenzothiophene(4MDT)
Concen: 389.02 ng/mL
RT: 34.212 min Scan# 2864
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:198 Resp: 79630

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

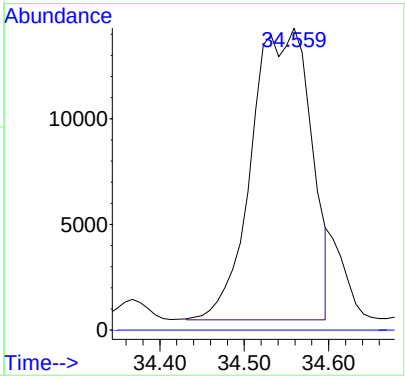


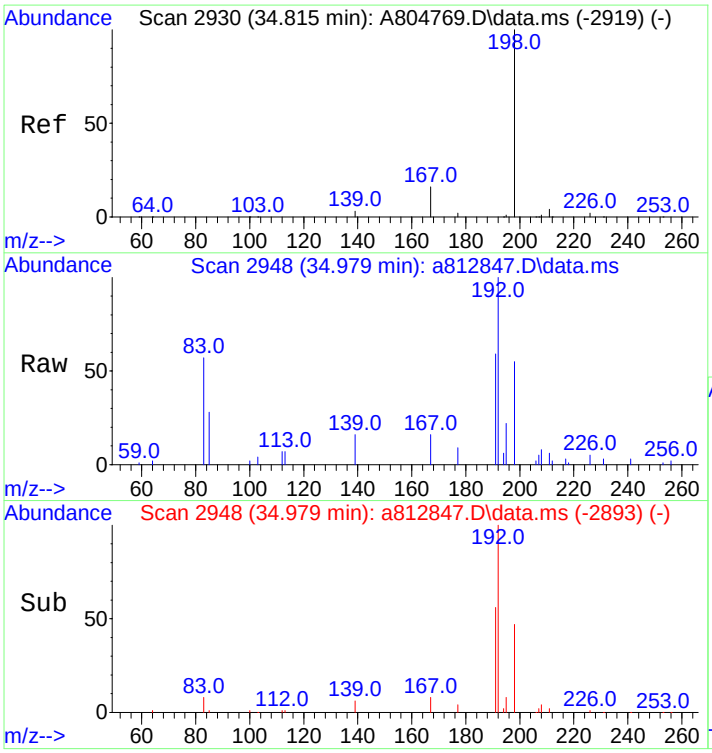


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 330.19 ng/mL m
RT: 34.559 min Scan# 2902
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:198 Resp: 67589

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

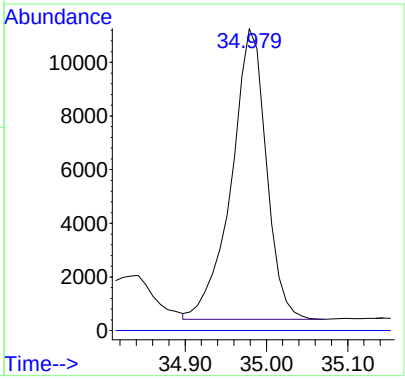


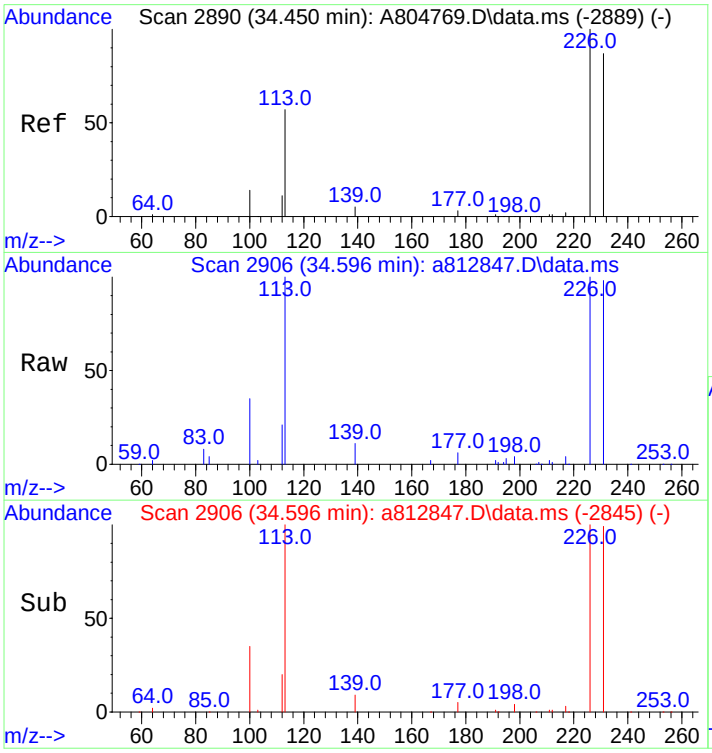


#36
1-Methyldibenzothiophene(1MDT)
Concen: 157.89 ng/mL
RT: 34.979 min Scan# 2948
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:198 Resp: 32319

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

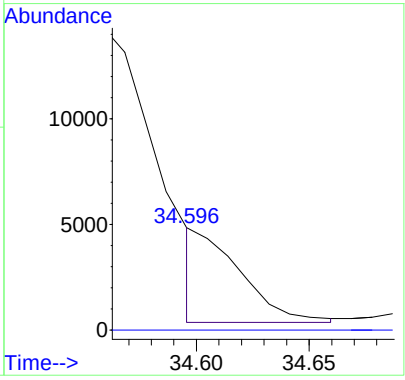


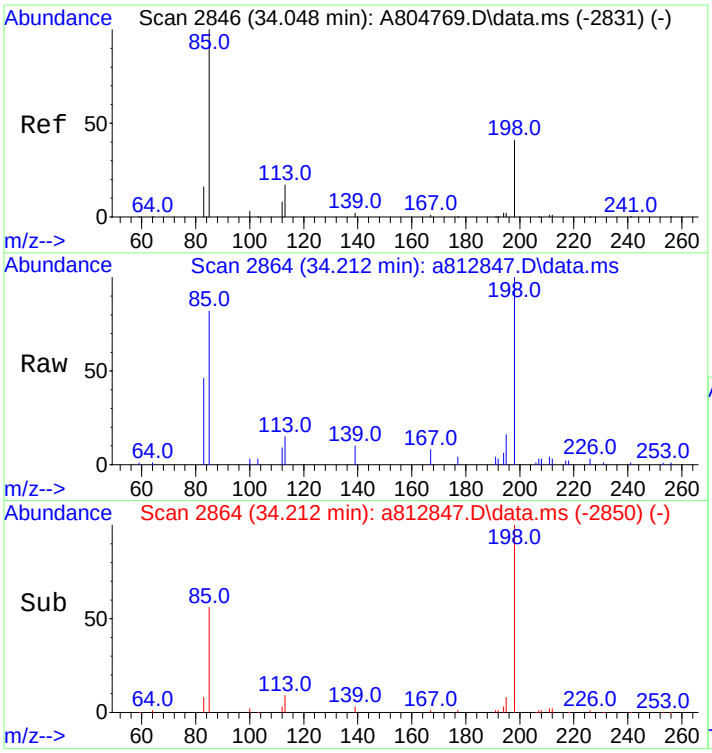


#37
OTP
Concen: 28.71 ng/mL m
RT: 34.596 min Scan# 2906
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:198 Resp: 5876

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

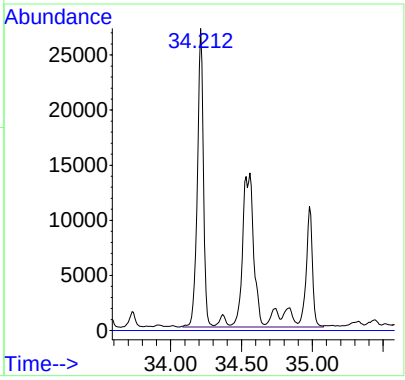


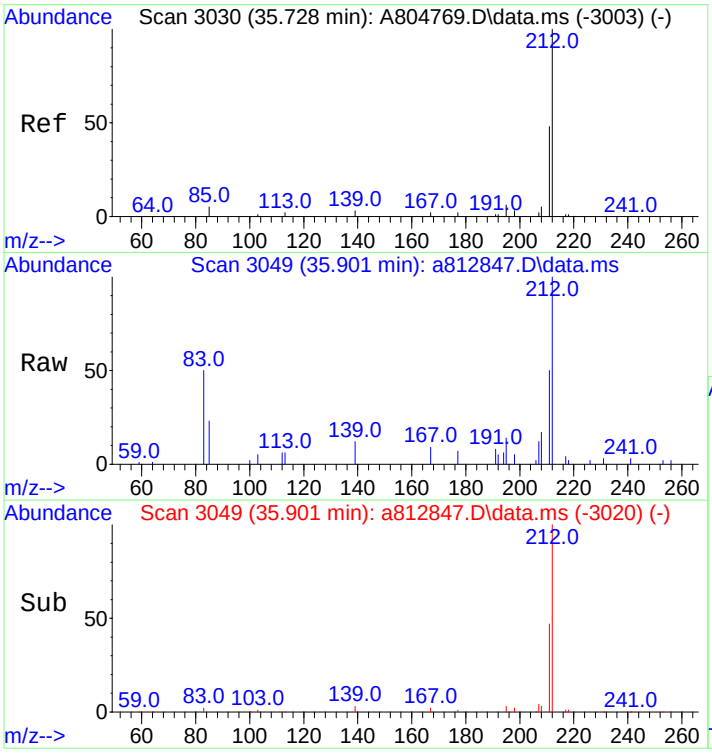


#38
C1-Dibenzothiophenes
Concen: 1006.64 ng/mL m
RT: 34.212 min Scan# 2864
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:198 Resp: 206054

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

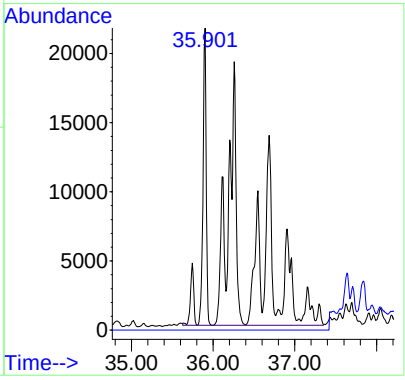


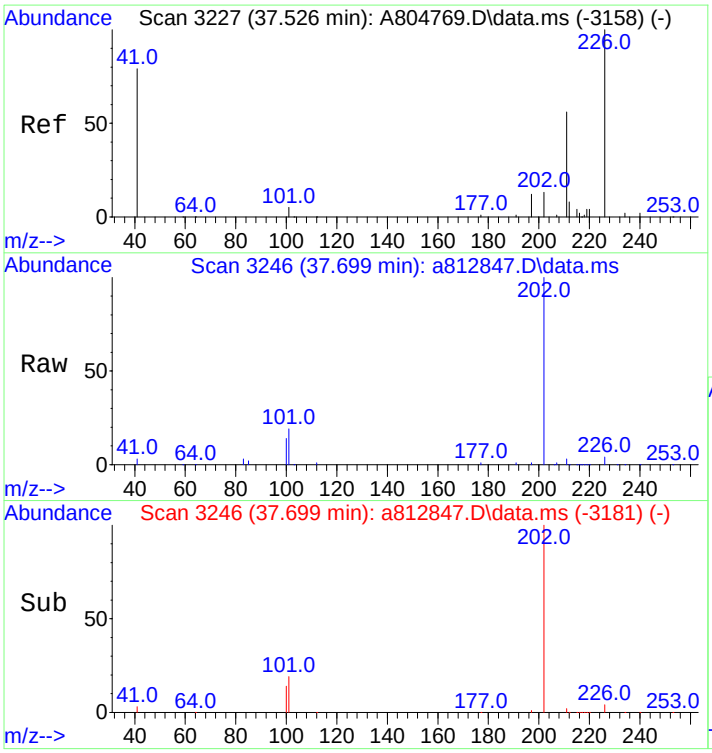


#39
C2-Dibenzothiophenes
Concen: 1756.98 ng/mL m
RT: 35.901 min Scan# 3049
Delta R.T. -0.356 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:212 Resp: 359643

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

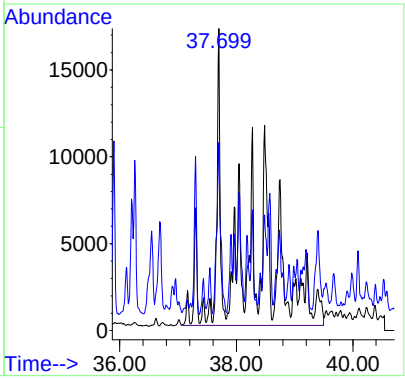


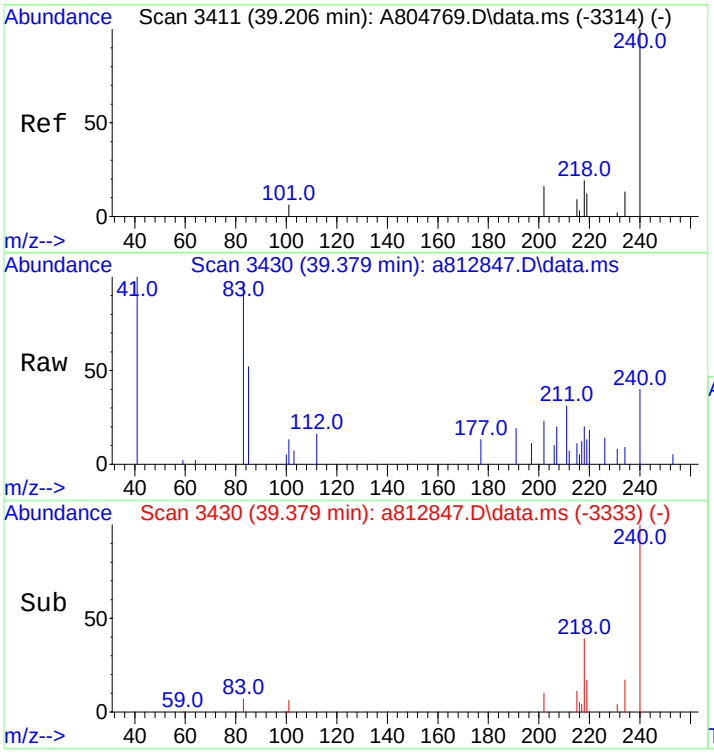


#40
C3-Dibenzothiophenes
Concen: 1878.16 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:226 Resp: 384448

Ion	Ratio	Lower	Upper
226	100		
211	1.8	50.2	75.2#

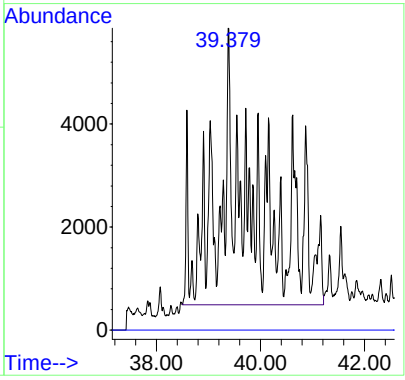


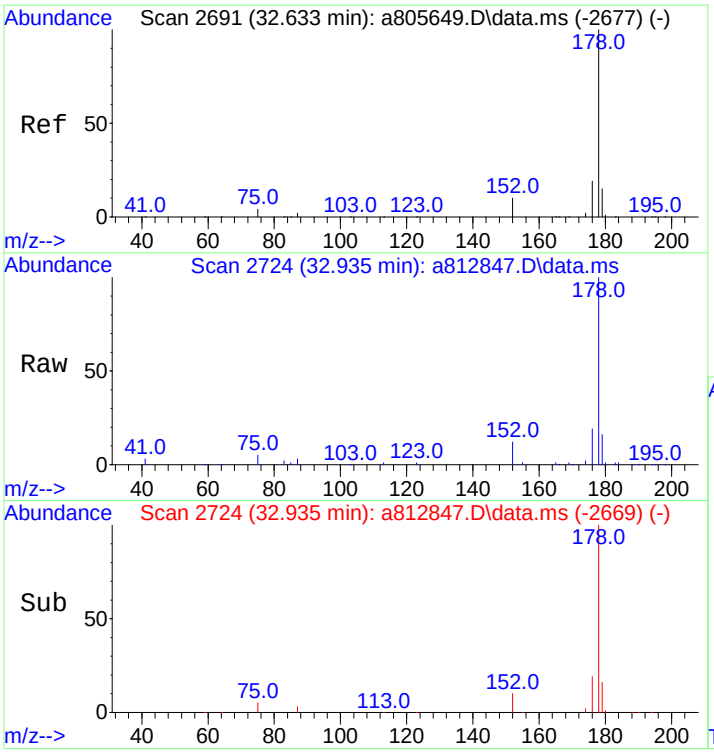


#41
C4-Dibenzothiophenes
Concen: 1213.55 ng/mL m
RT: 39.379 min Scan# 3430
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:240 Resp: 248407

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

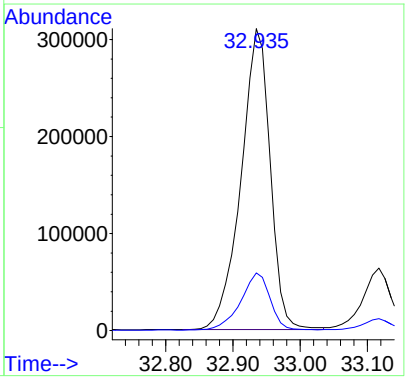


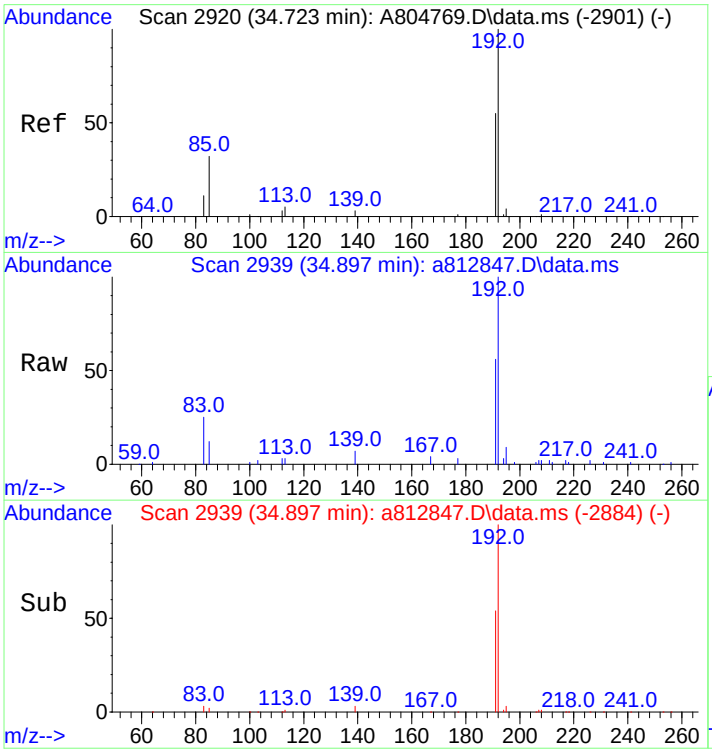


#43
Phenanthrene
Concen: 4733.62 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:178 Resp: 932602

Ion	Ratio	Lower	Upper
178	100		
176	19.1	15.2	22.8

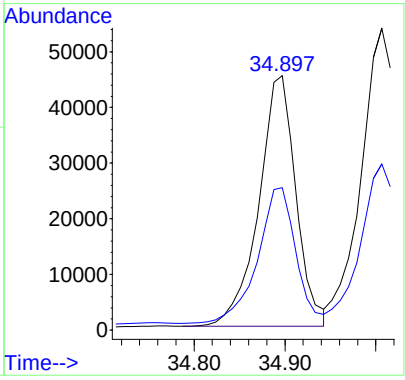


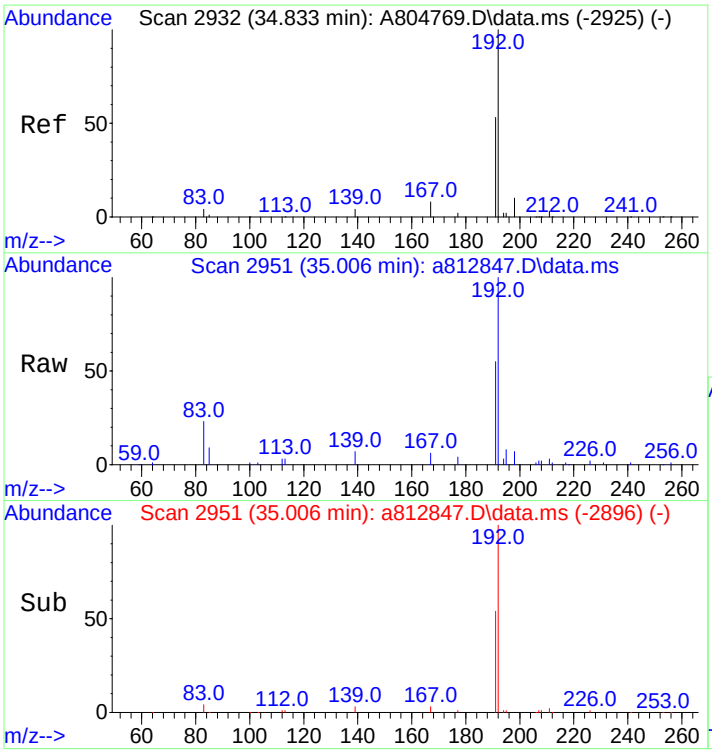


#44
3-Methylphenanthrene(3MP)
Concen: 648.51 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 127767

Ion	Ratio	Lower	Upper
192	100		
191	55.7	45.5	68.3

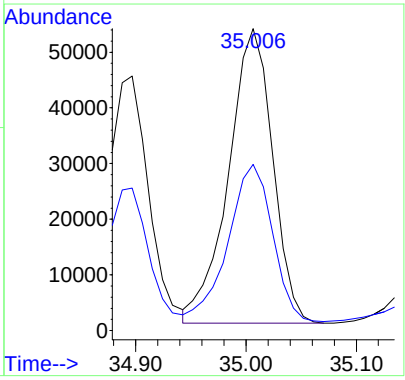


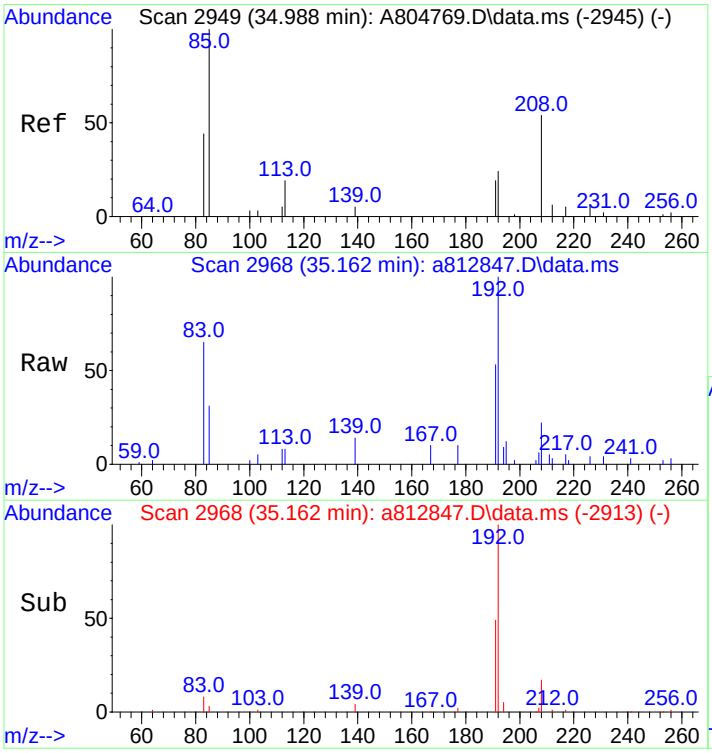


#45
2-Methylphenanthrene(2MP)
Concen: 749.28 ng/mL
RT: 35.006 min Scan# 2951
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 147620

Ion	Ratio	Lower	Upper
192	100		
191	53.5	44.6	67.0

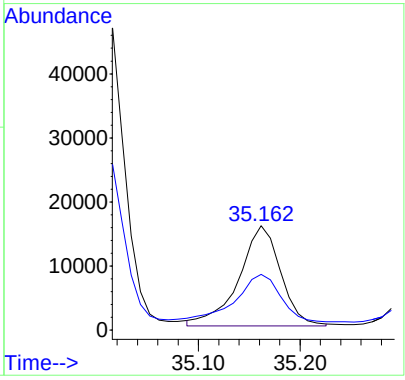


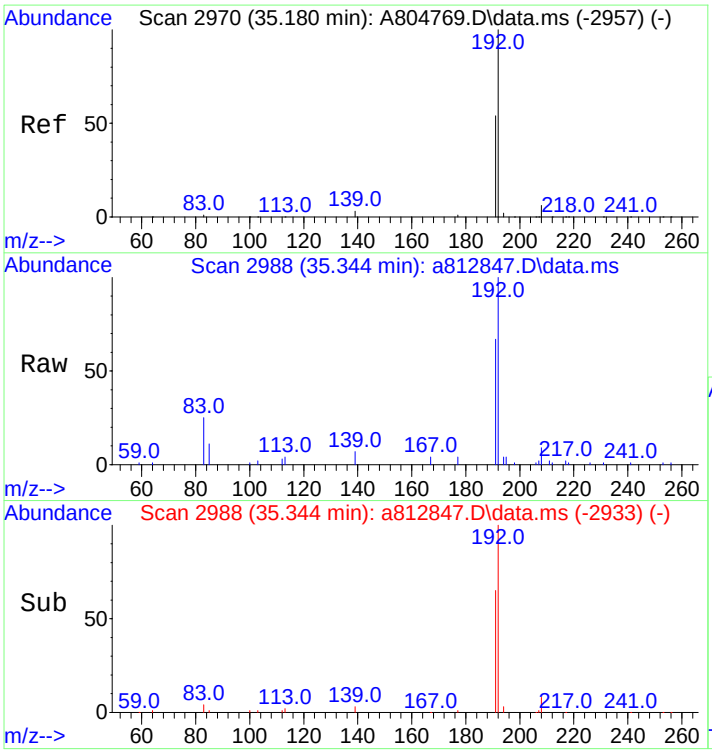


#46
2-Methylanthracene(2MA)
Concen: 226.16 ng/mL m
RT: 35.162 min Scan# 2968
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 44558

Ion	Ratio	Lower	Upper
192	100		
191	1.4	96.9	145.3#

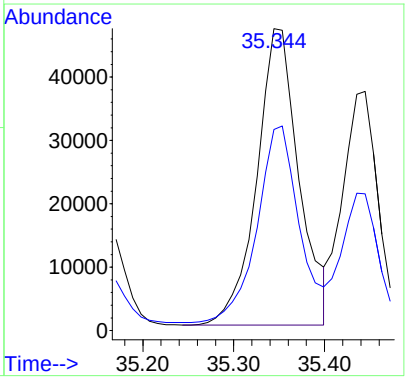


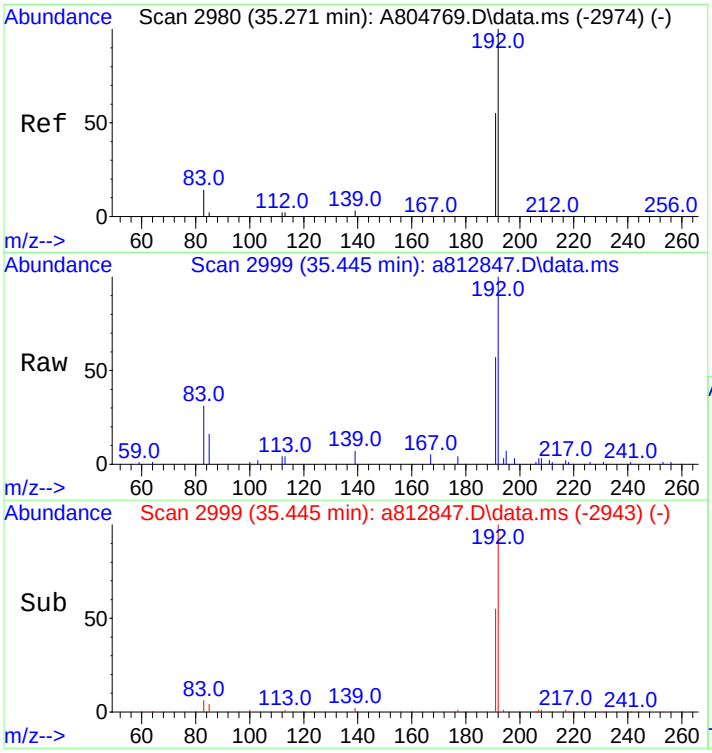


#47
9/4-Methylphenanthrene(9MP)
Concen: 767.36 ng/mL
RT: 35.344 min Scan# 2988
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 151182

Ion	Ratio	Lower	Upper
192	100		
191	65.7	44.5	66.7

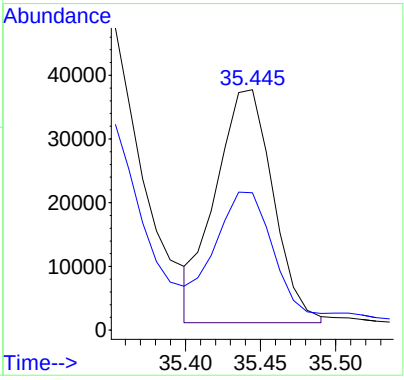


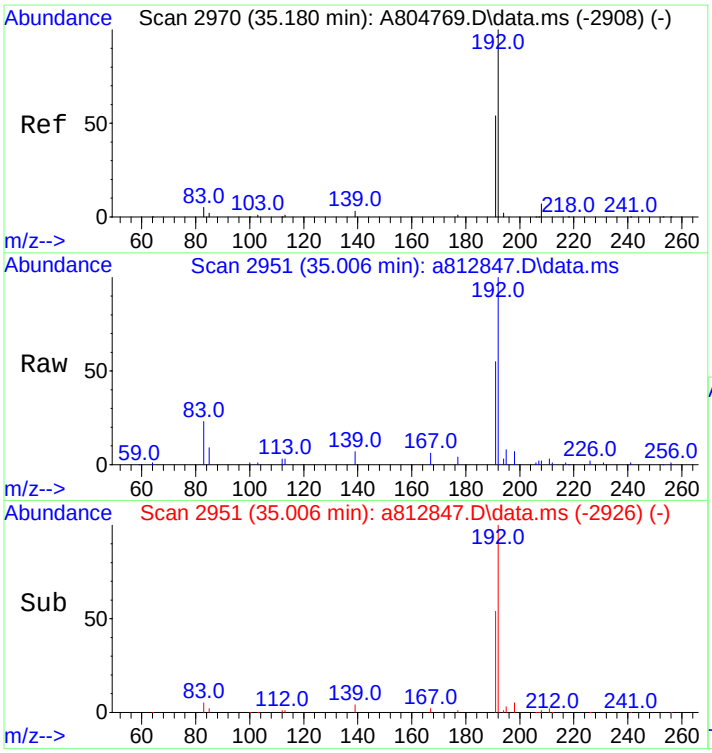


#48
1-Methylphenanthrene(1MP)
Concen: 495.25 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 97573

Ion	Ratio	Lower	Upper
192	100		
191	57.5	46.2	69.4

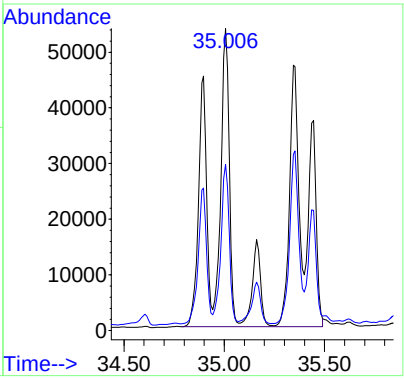


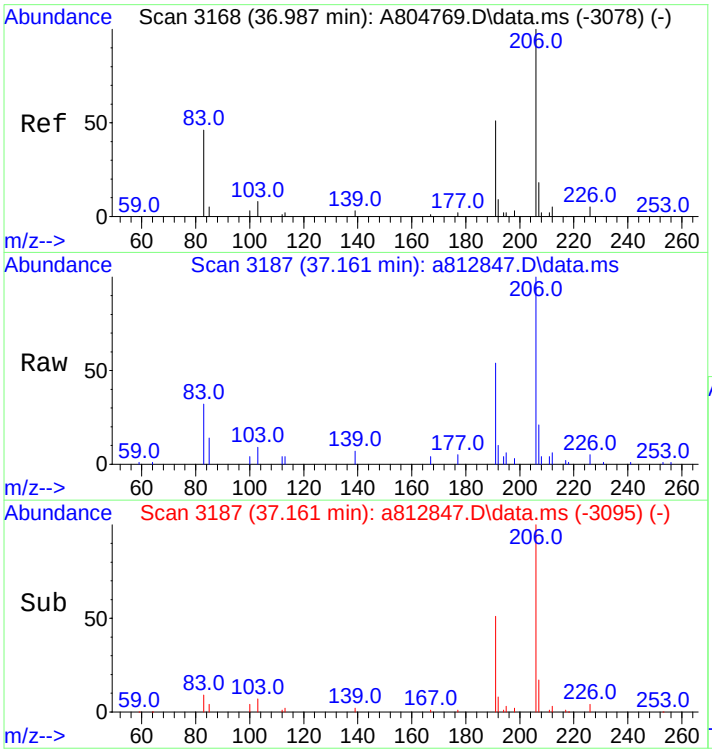


#49
C1-Phenanthrenes/Anthracenes
Concen: 2937.03 ng/mL m
RT: 35.006 min Scan# 2951
Delta R.T. -0.338 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 578644

Ion	Ratio	Lower	Upper
192	100		
191	17.2	44.5	66.7#

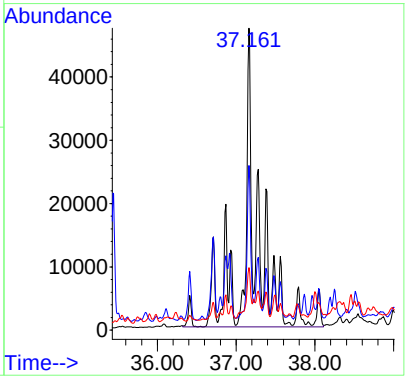


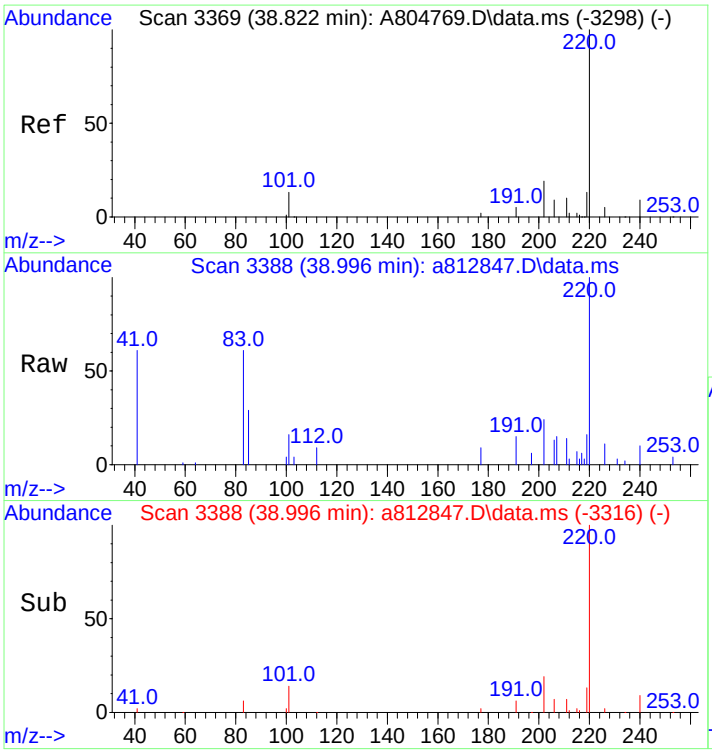


#50
C2-Phenanthrenes/Anthracenes
Concen: 2894.66 ng/mL m
RT: 37.161 min Scan# 3187
Delta R.T. 0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:206 Resp: 570296

Ion	Ratio	Lower	Upper
206	100		
191	14.4	42.0	63.0#
207	5.0	16.2	24.4#

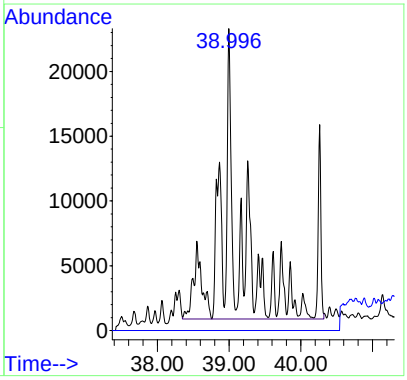


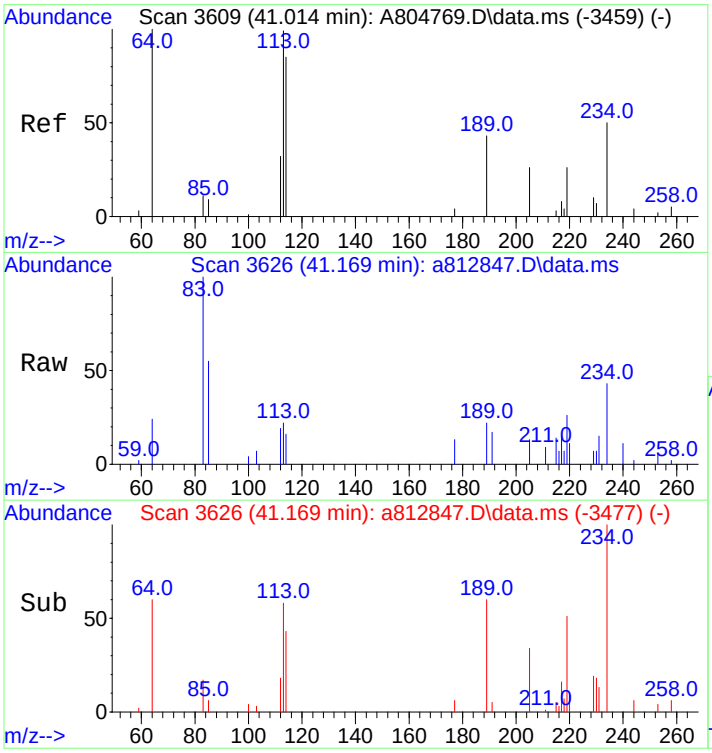


#52
C3-Phenanthrenes/Anthracenes
Concen: 2016.33 ng/mL m
RT: 38.996 min Scan# 3388
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:220 Resp: 397250

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

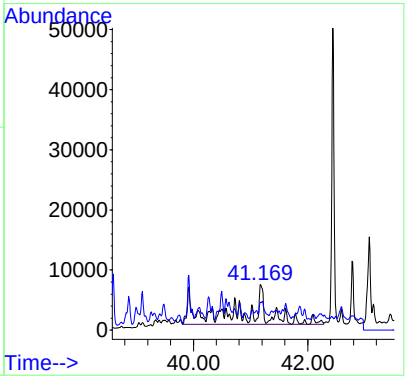


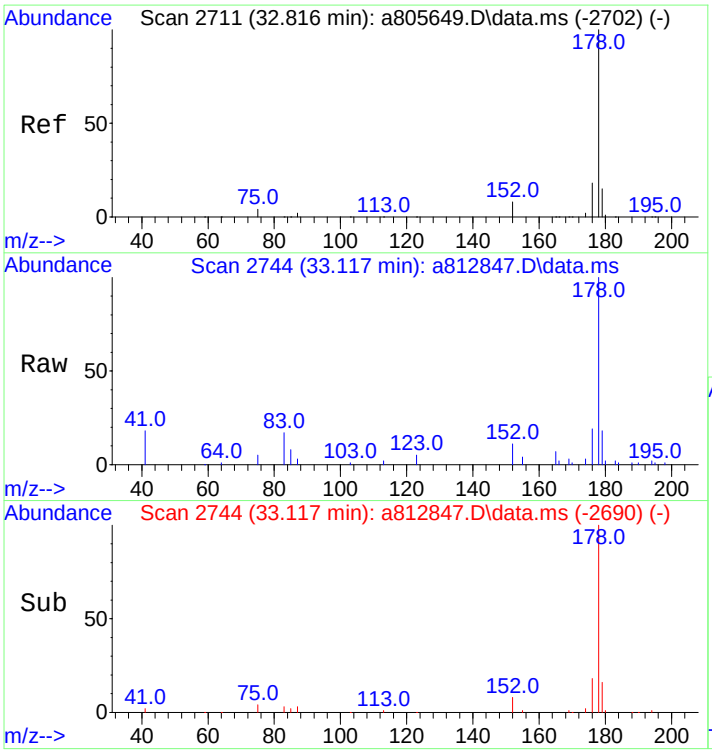


#53
C4-Phenanthrenes/Anthracenes
Concen: 1046.65 ng/mL m
RT: 41.169 min Scan# 3626
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:234 Resp: 206207

Ion	Ratio	Lower	Upper
234	100		
219	0.0	52.3	78.5#

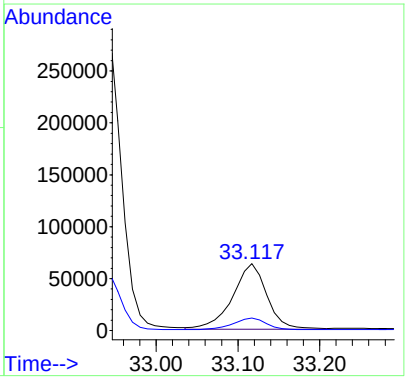


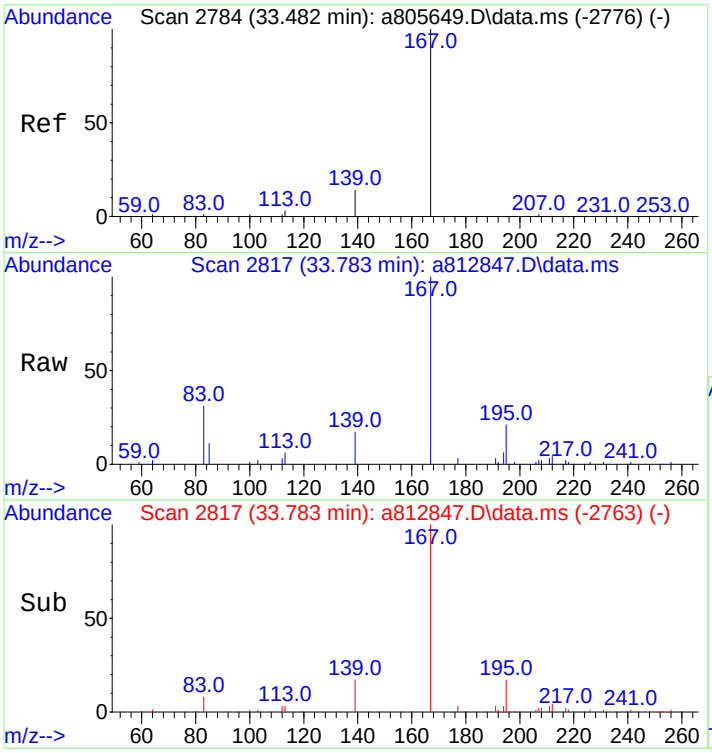


#55
Anthracene
Concen: 1001.01 ng/mL m
RT: 33.117 min Scan# 2744
Delta R.T. -0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:178 Resp: 183731

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

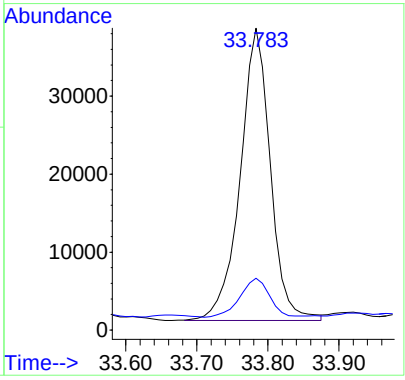


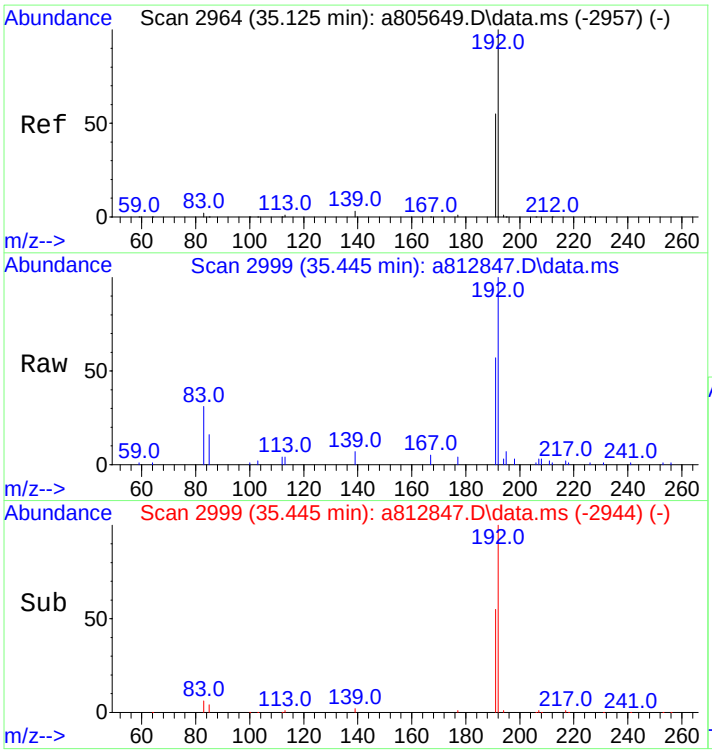


#56
Carbazole
Concen: 578.24 ng/mL m
RT: 33.783 min Scan# 2817
Delta R.T. -0.010 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:167 Resp: 110743

Ion	Ratio	Lower	Upper
167	100		
139	12.4	10.6	16.0

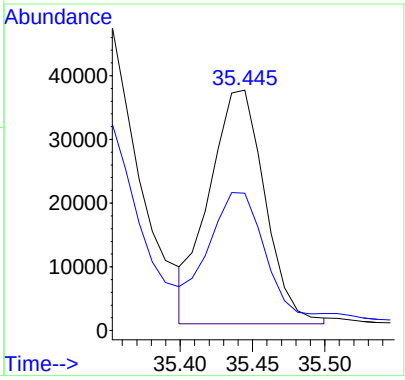


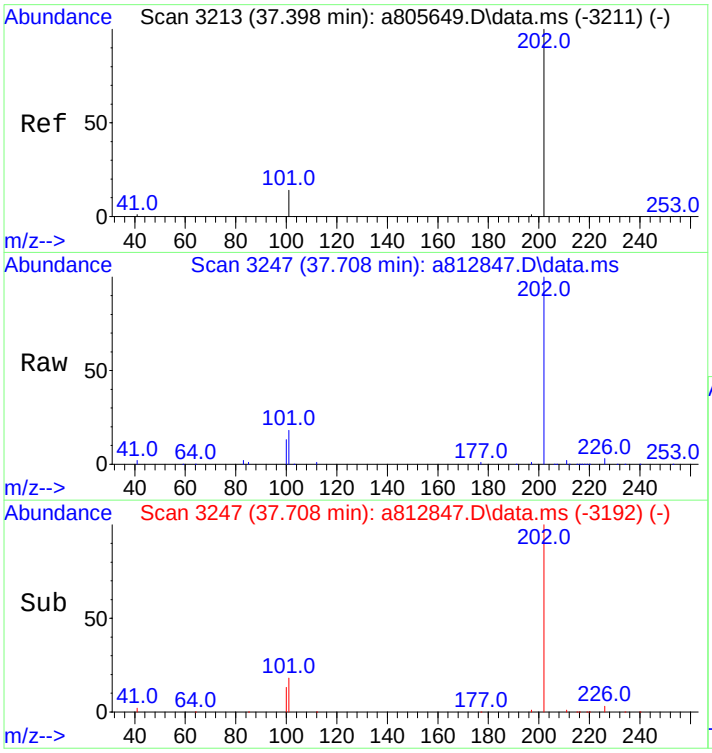


#57
1-Methylphenanthrene
Concen: 706.79 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:192 Resp: 98708

Ion	Ratio	Lower	Upper
192	100		
191	56.9	44.2	66.4

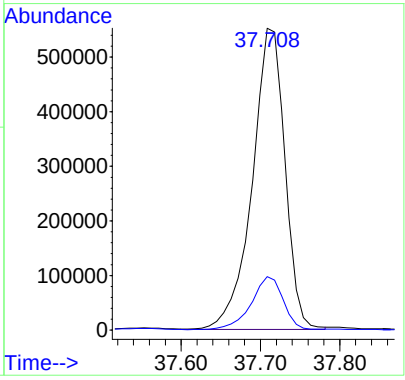


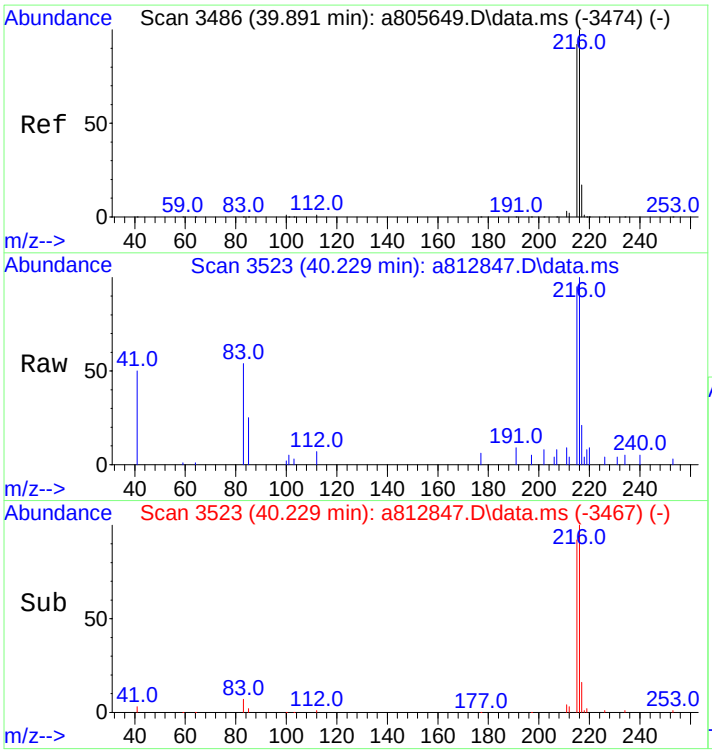


#58
Fluoranthene
Concen: 7784.81 ng/mL m
RT: 37.708 min Scan# 3247
Delta R.T. -0.001 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:202 Resp: 1579837

Ion	Ratio	Lower	Upper
202	100		
101	17.1	13.6	20.4

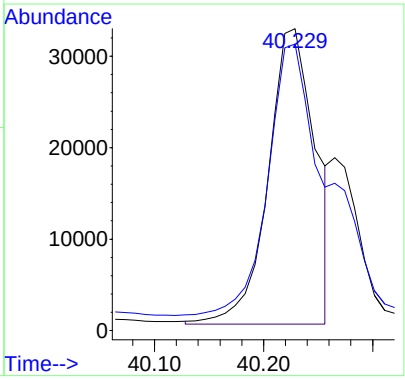


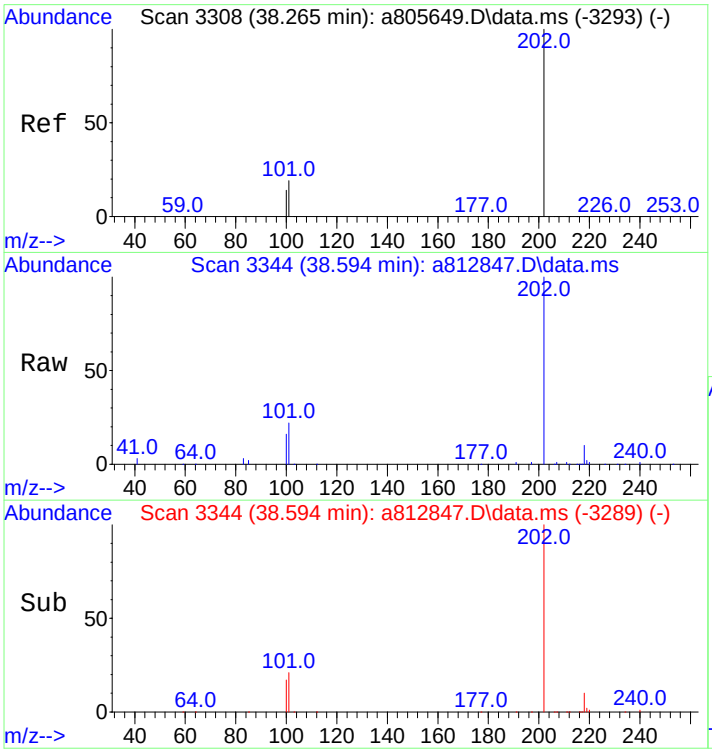


#59
Benzo(b)fluorene
Concen: 827.14 ng/mL m
RT: 40.229 min Scan# 3523
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:216 Resp: 97101

Ion	Ratio	Lower	Upper
216	100		
215	117.7	74.2	111.2#

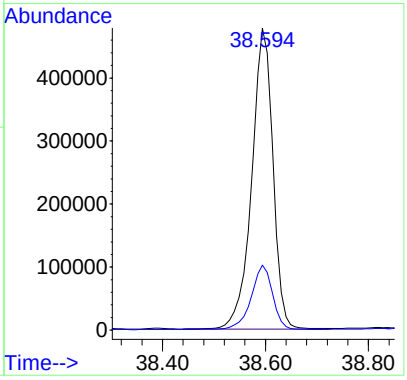


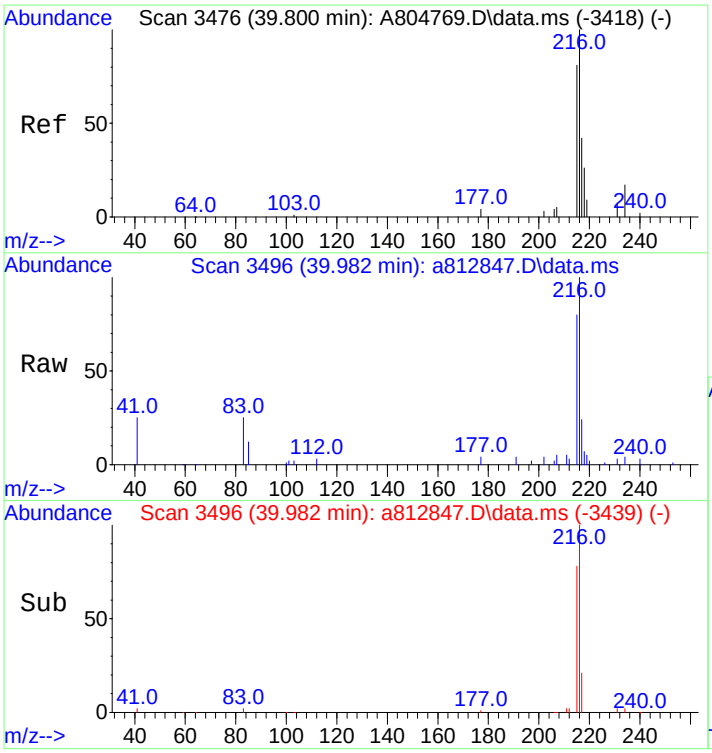


#60
Pyrene
Concen: 6664.85 ng/mL
RT: 38.594 min Scan# 3344
Delta R.T. 0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:202 Resp: 1368079

Ion	Ratio	Lower	Upper
202	100		
101	21.8	15.4	23.2

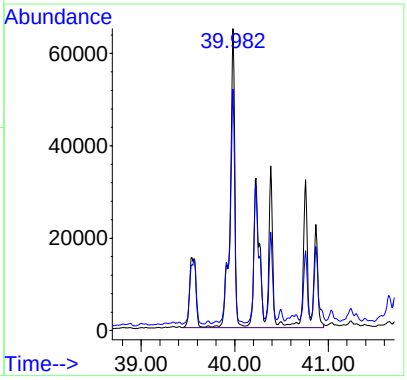


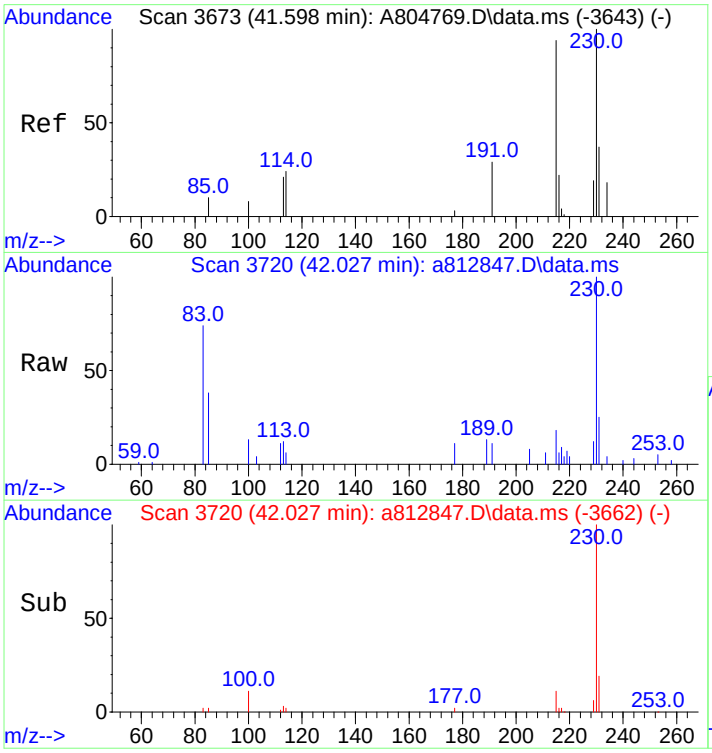


#61
C1-Fluoranthenes/Pyrenes
Concen: 3329.46 ng/mL m
RT: 39.982 min Scan# 3496
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:216 Resp: 683432

Ion	Ratio	Lower	Upper
216	100		
215	26.6	73.8	110.6#

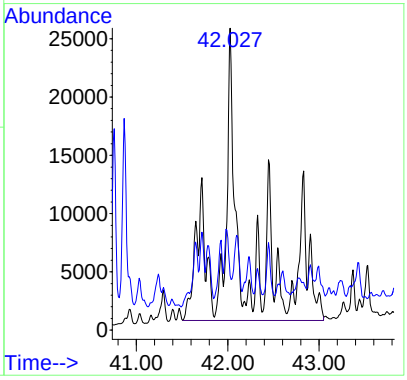


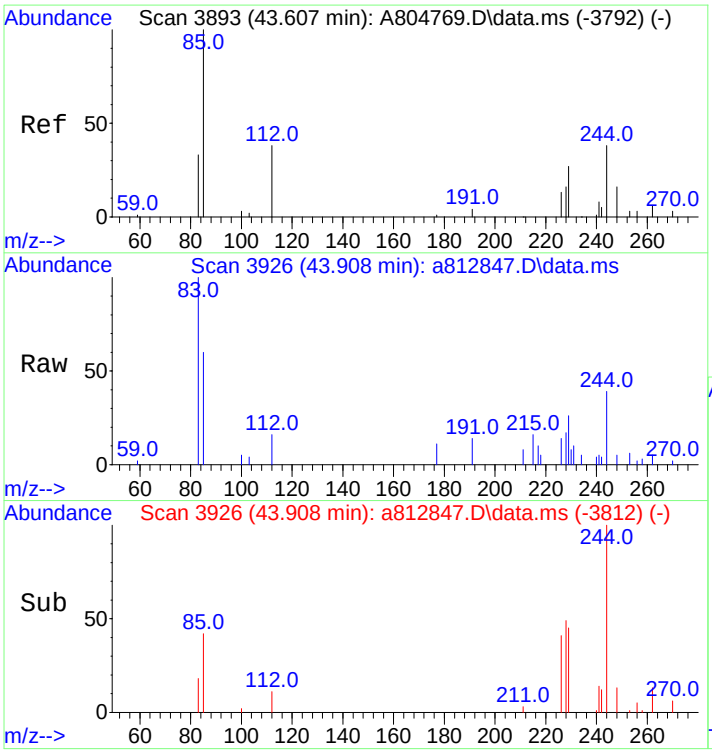


#62
C2-Fluoranthenes/Pyrenes
Concen: 2101.41 ng/mL m
RT: 42.027 min Scan# 3720
Delta R.T. 0.256 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:230 Resp: 431352

Ion	Ratio	Lower	Upper
230	100		
215	3.4	93.1	139.7#

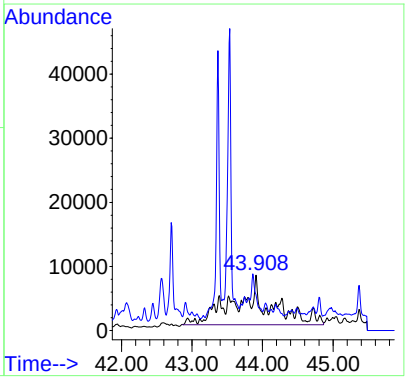


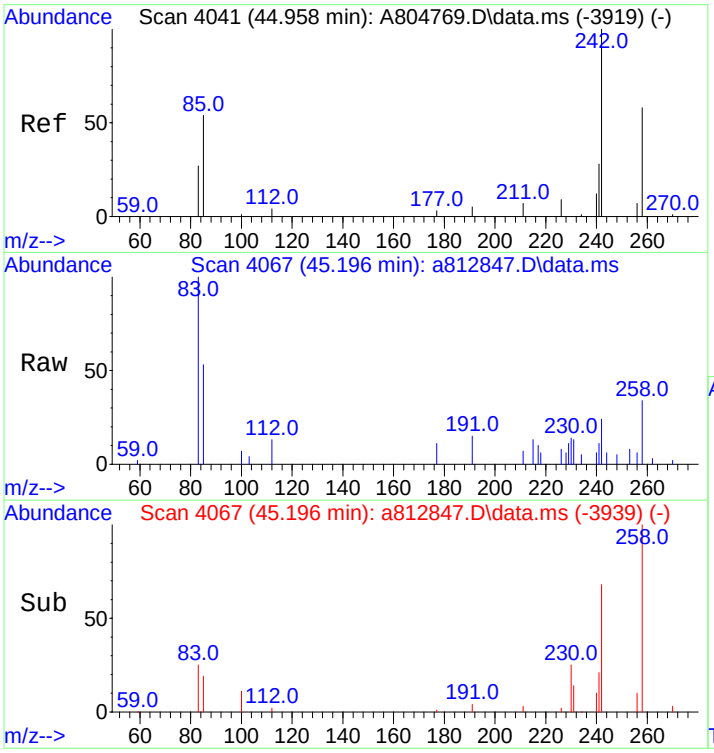


#63
C3-Fluoranthenes/Pyrenes
Concen: 1265.85 ng/mL m
RT: 43.908 min Scan# 3926
Delta R.T. 0.119 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:244 Resp: 259839

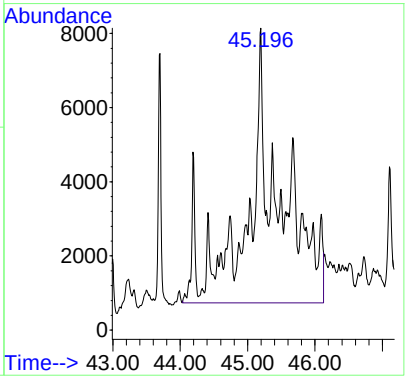
Ion	Ratio	Lower	Upper
244	100		
229	1.4	76.2	114.2#

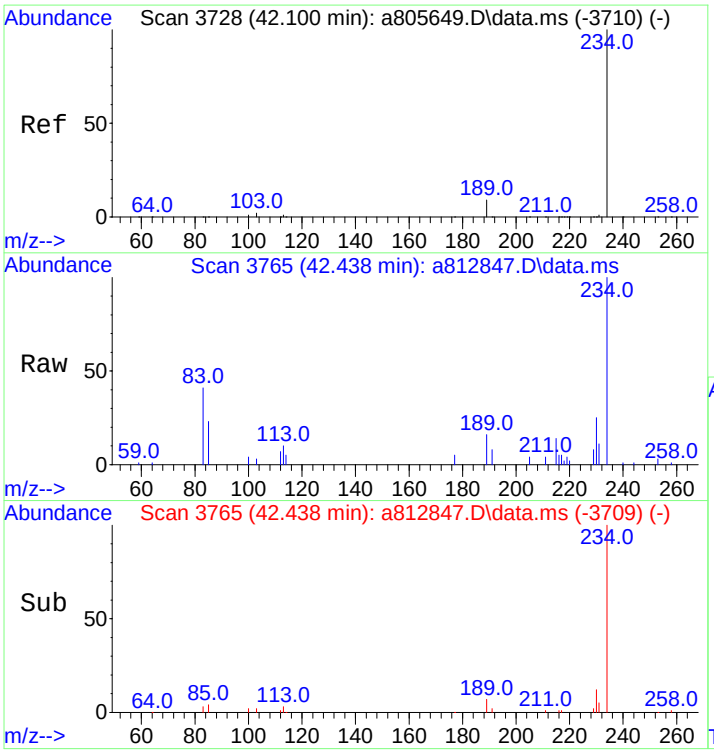




#64
C4-Fluoranthenes/Pyrenes
Concen: 1167.26 ng/mL m
RT: 45.196 min Scan# 4067
Delta R.T. 0.055 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:258 Resp: 239600

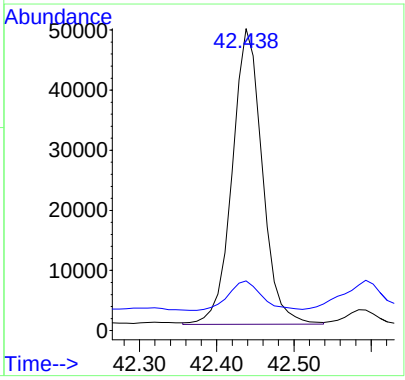


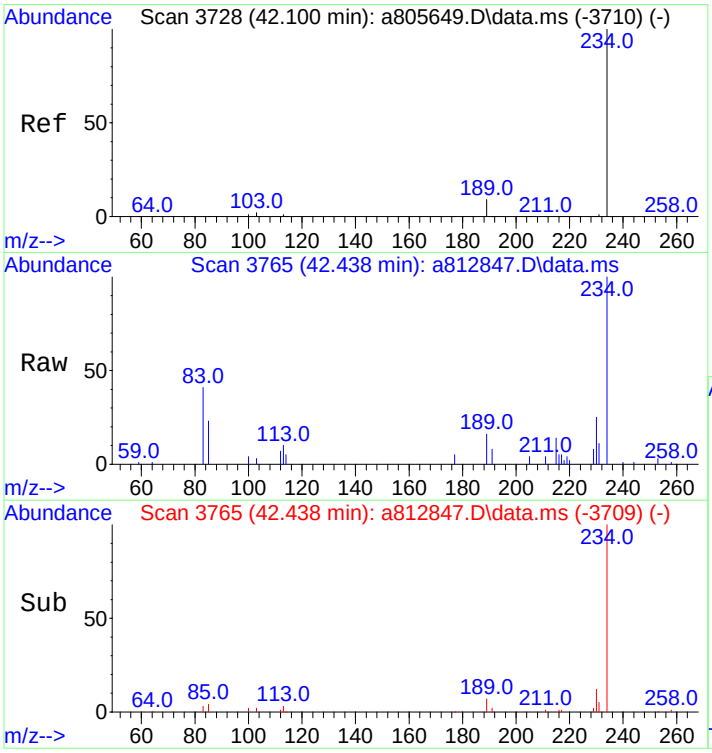


#66
Naphthobenzothiophene
Concen: 697.89 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:234 Resp: 132983

Ion	Ratio	Lower	Upper
234	100		
189	11.1	22.3	33.5#

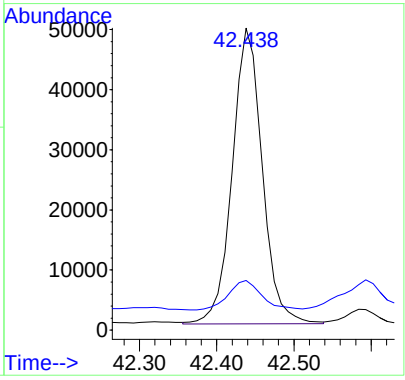


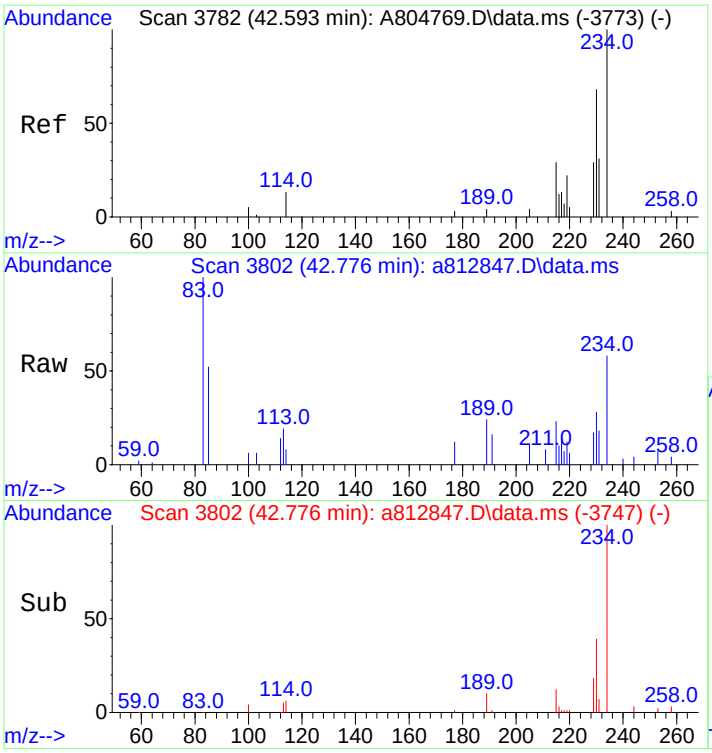


#67
Naphthobenzothiophene-2,1-D
Concen: 697.89 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:234 Resp: 132983

Ion	Ratio	Lower	Upper
234	100		
189	11.1	22.3	33.5#

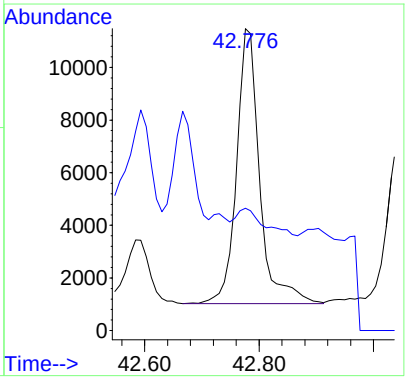


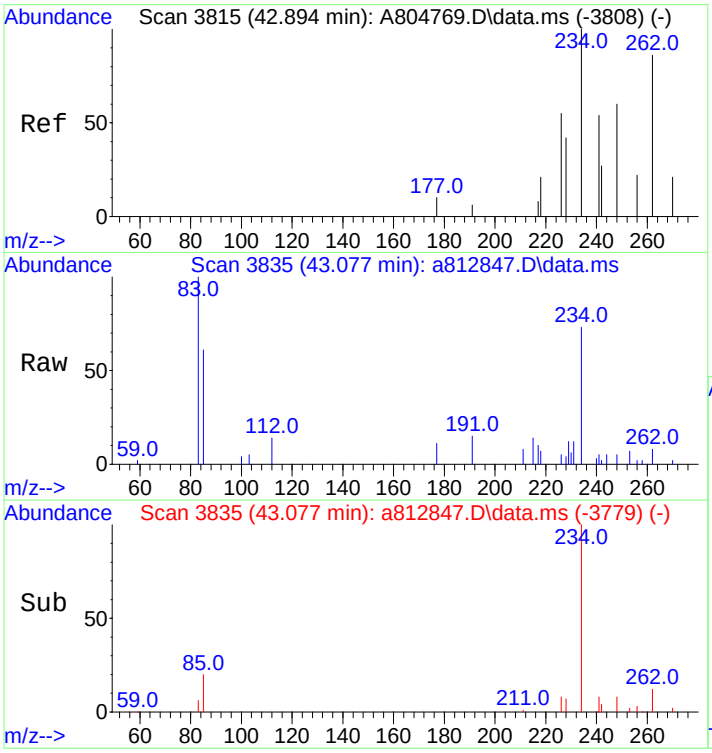


#68
Naphthobenzothiophene-1,2-D
Concen: 154.30 ng/mL
RT: 42.776 min Scan# 3802
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:234 Resp: 29401

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

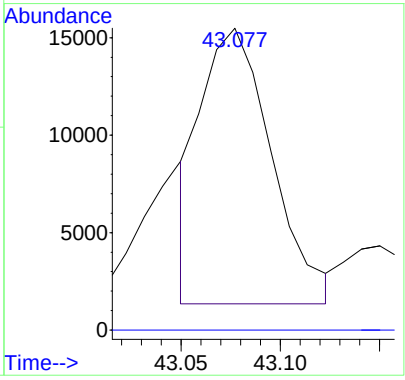


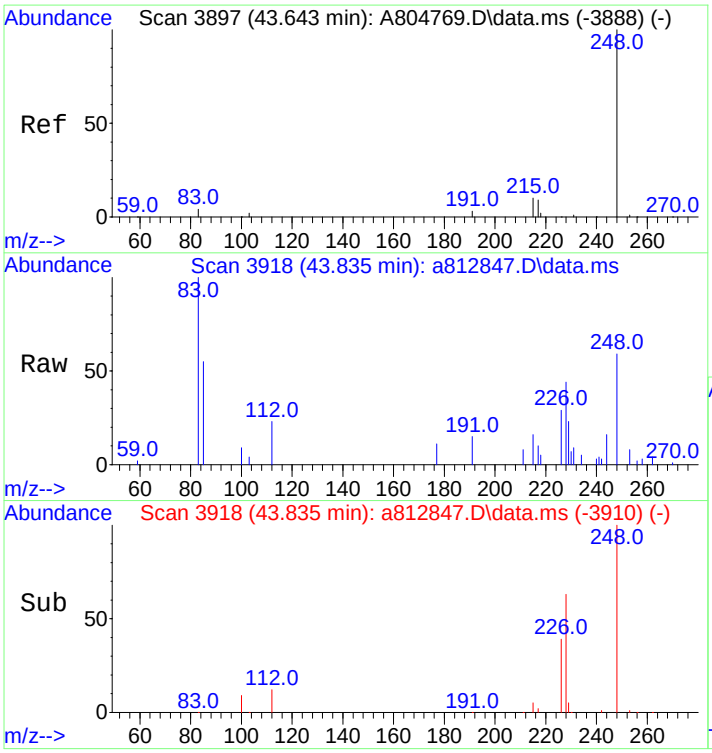


#69
Naphthobenzothiophene-2,3-D
Concen: 184.24 ng/mL m
RT: 43.077 min Scan# 3835
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:234 Resp: 35107

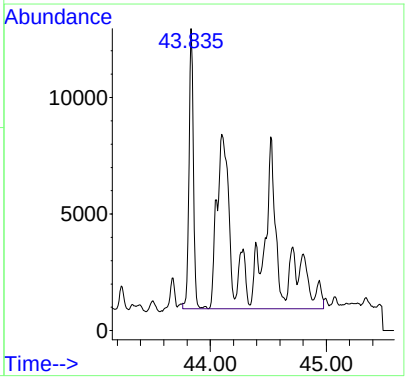
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

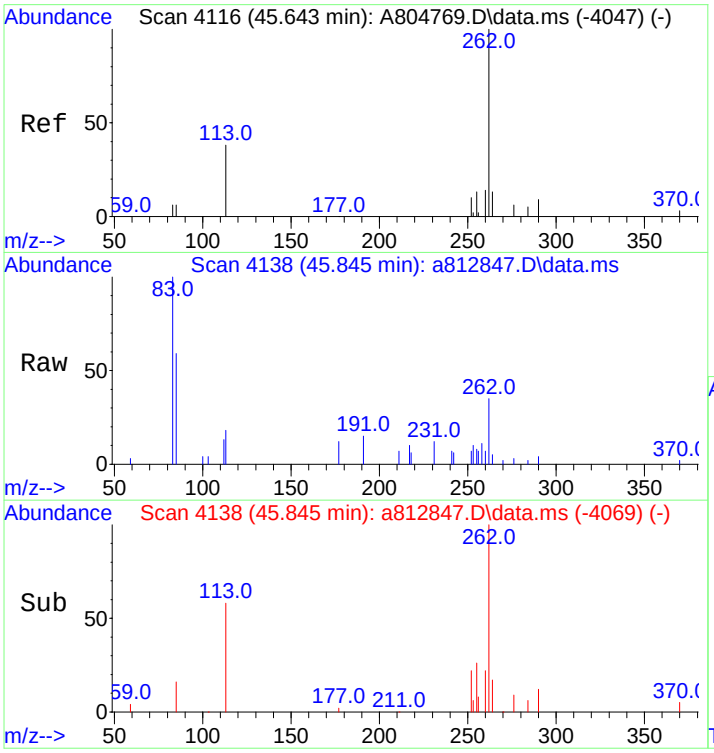




#70
C1-Naphthobenzothiophenes
Concen: 870.16 ng/ml m
RT: 43.835 min Scan# 3918
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

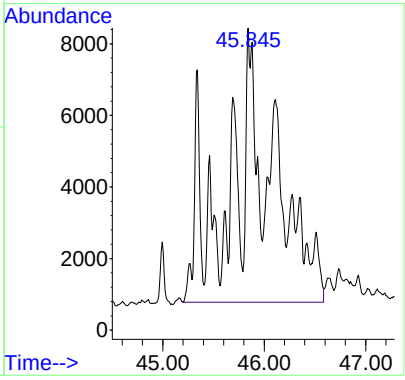
Tgt Ion:248 Resp: 165809

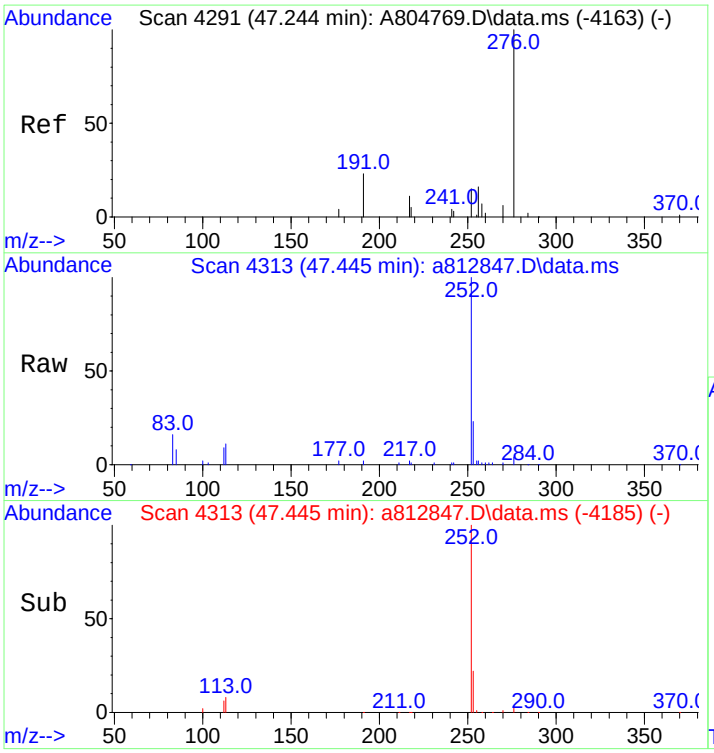




#71
C2-Naphthobenzothiophenes
Concen: 1151.32 ng/ml m
RT: 45.845 min Scan# 4138
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

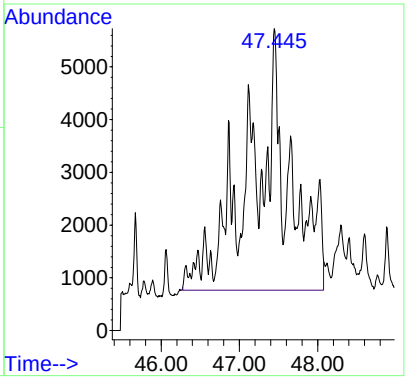
Tgt Ion:262 Resp: 219383

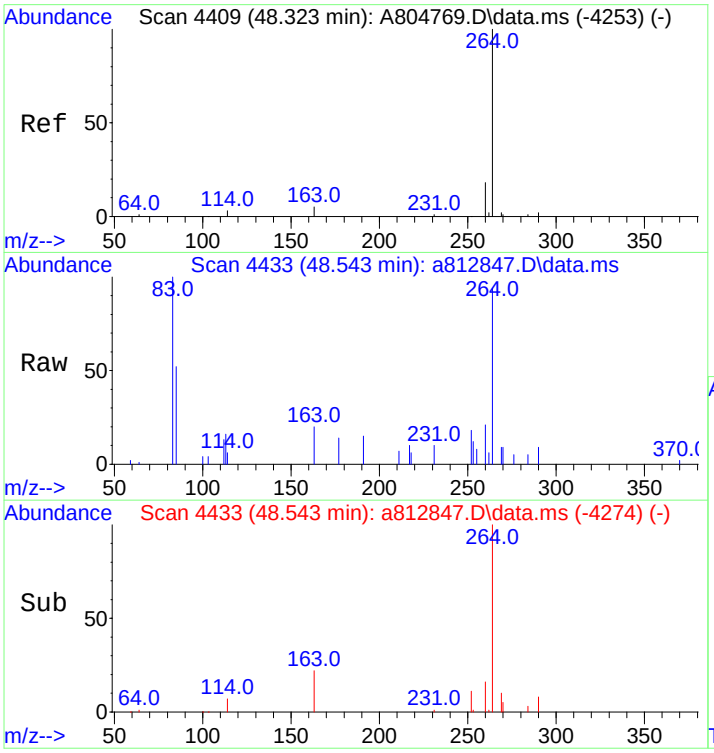




#72
C3-Naphthobenzothiophenes
Concen: 873.71 ng/ml m
RT: 47.445 min Scan# 4313
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

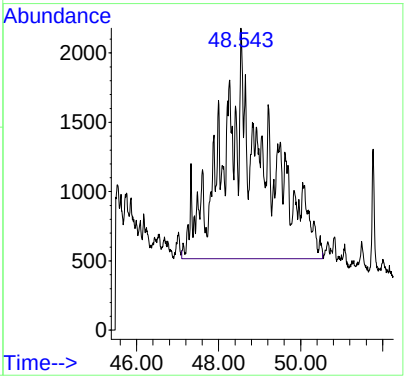
Tgt Ion:276 Resp: 166485

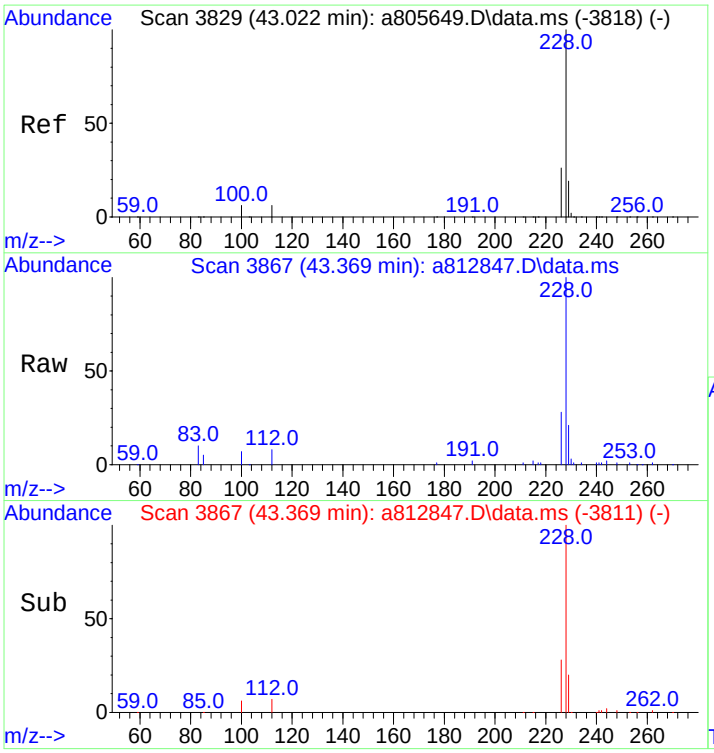




#73
C4-Naphthobenzothiophenes
Concen: 598.84 ng/mL m
RT: 48.543 min Scan# 4433
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:290 Resp: 114108

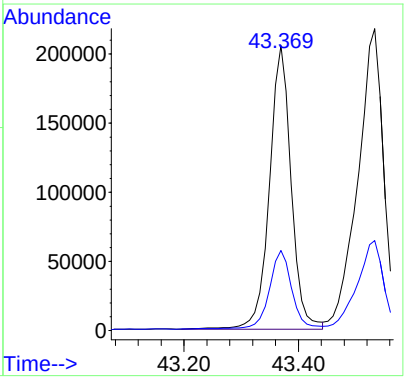


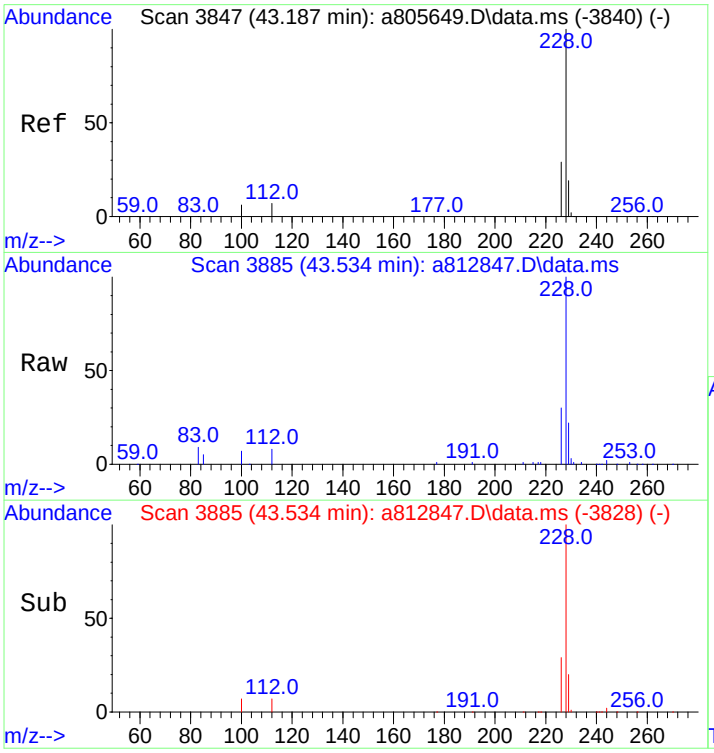


#75
Benz[a]anthracene
Concen: 2922.99 ng/mL
RT: 43.369 min Scan# 3867
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:228 Resp: 539844

Ion	Ratio	Lower	Upper
228	100		
226	27.5	21.3	31.9

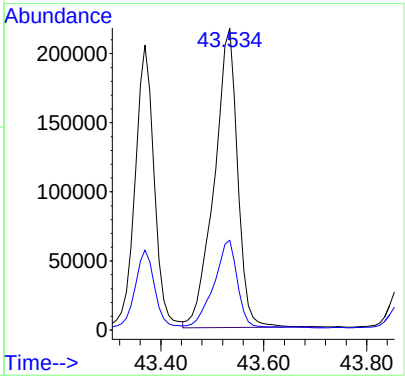


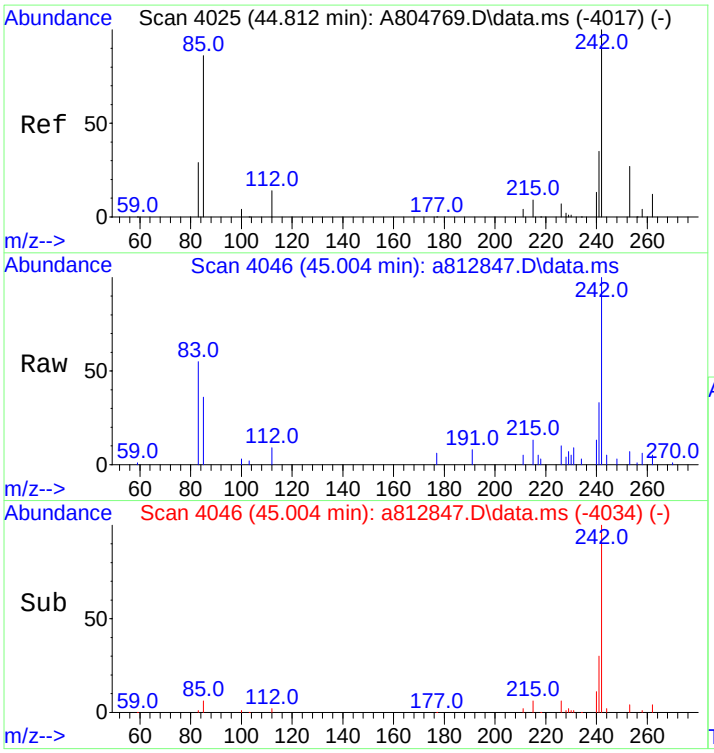


#77
Chrysene/Triphenylene
Concen: 3646.73 ng/mL
RT: 43.534 min Scan# 3885
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:228 Resp: 681750

Ion	Ratio	Lower	Upper
228	100		
226	29.0	23.6	35.4

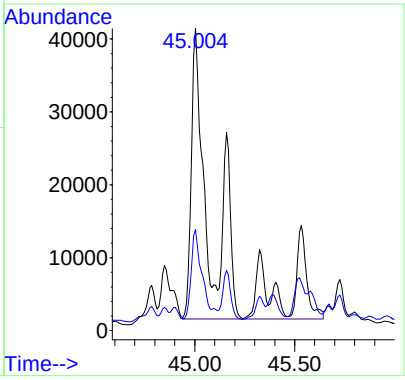


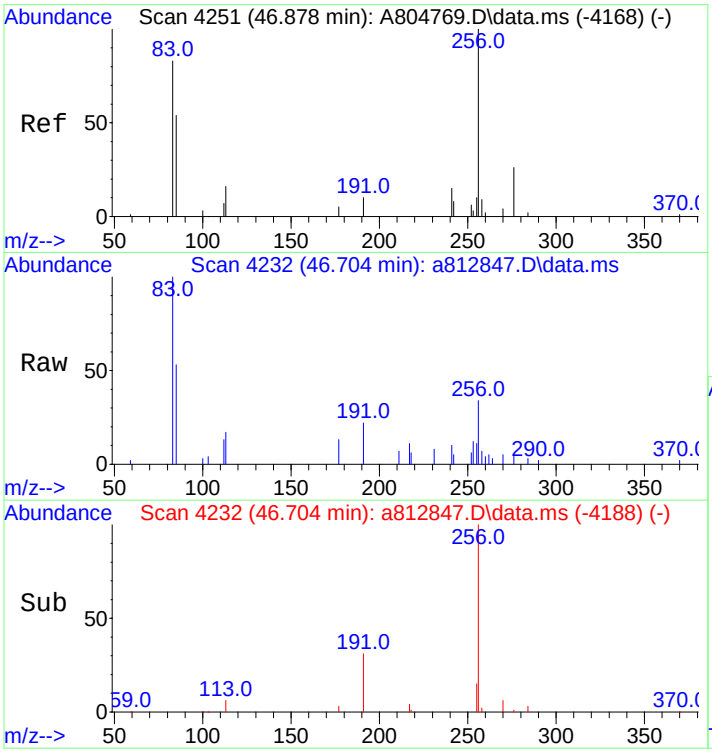


#78
C1-Chrysenes
Concen: 1677.02 ng/mL m
RT: 45.004 min Scan# 4046
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:242 Resp: 313517

Ion	Ratio	Lower	Upper
242	100		
241	2.9	33.5	50.3#

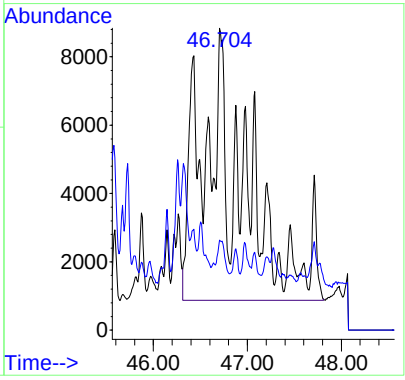


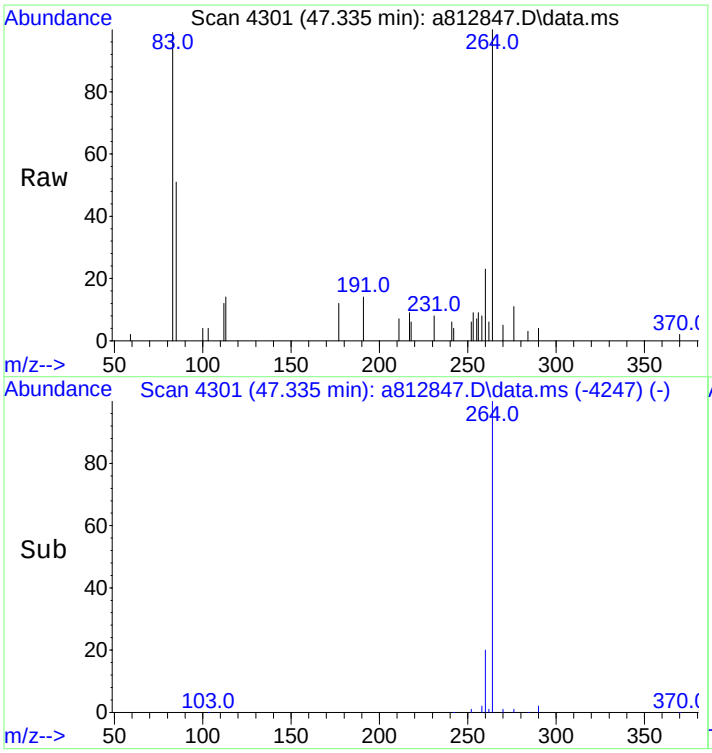


#79
C2-Chrysenes
Concen: 1299.56 ng/mL m
RT: 46.704 min Scan# 4232
Delta R.T. -0.357 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:256 Resp: 242950

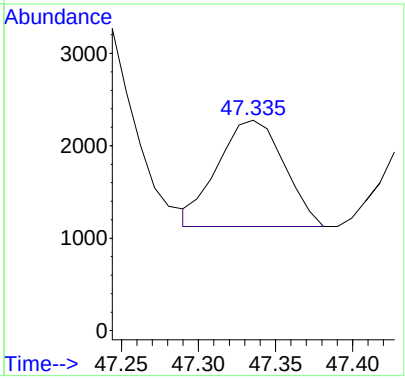
Ion	Ratio	Lower	Upper
256	100		
241	1.4	30.4	45.6#

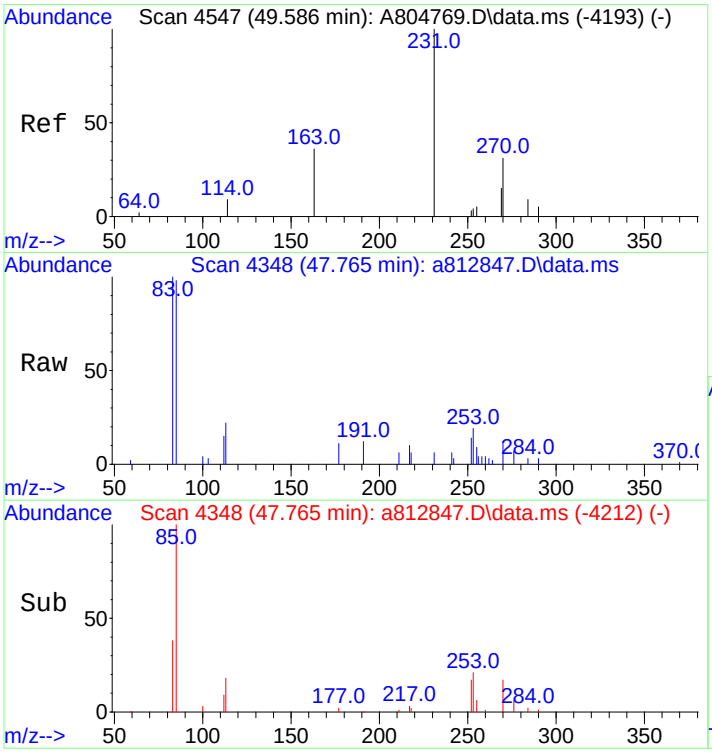




#80
BBF-D12 Surr BKGD
Concen: 18.39 ng/mL
RT: 47.335 min Scan# 4301
Delta R.T. -0.008 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:256 Resp: 3438

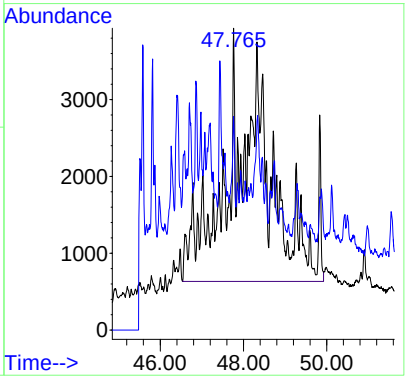


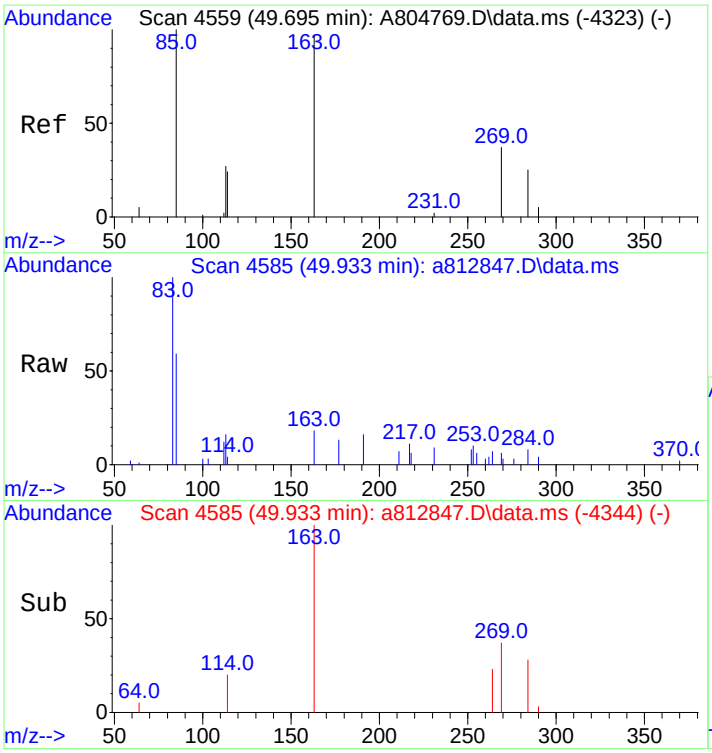


#81
C3-Chrysenes
Concen: 1094.76 ng/mL m
RT: 47.765 min Scan# 4348
Delta R.T. -2.049 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:270 Resp: 204663

Ion	Ratio	Lower	Upper
270	100		
255	0.8	42.9	64.3#

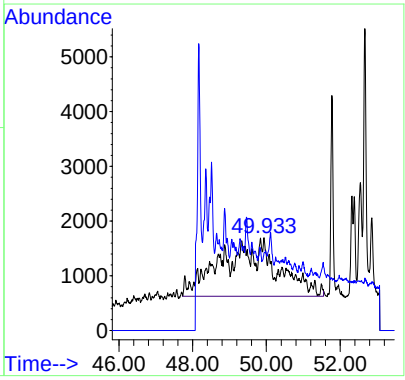


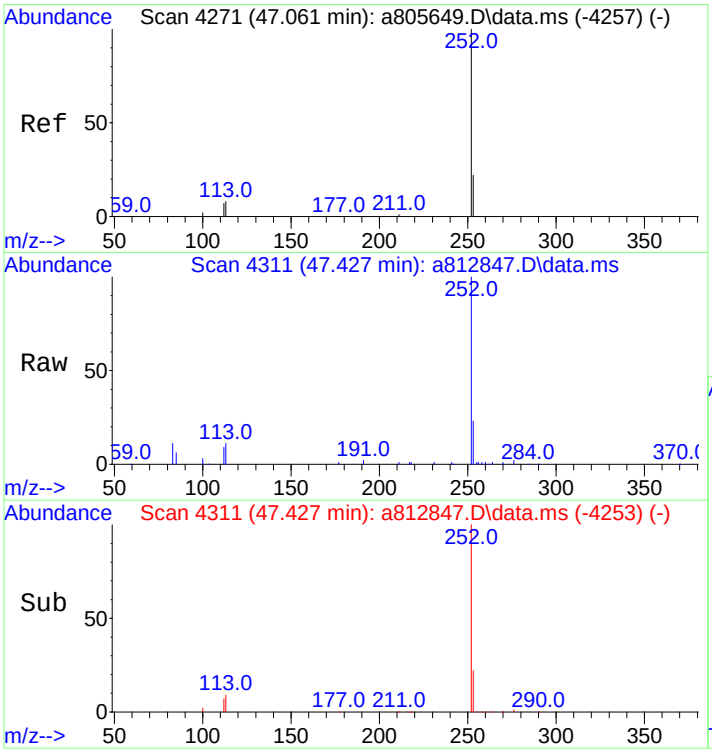


#82
C4-Chrysenes
Concen: 589.27 ng/mL m
RT: 49.933 min Scan# 4585
Delta R.T. 0.108 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:284 Resp: 110164

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

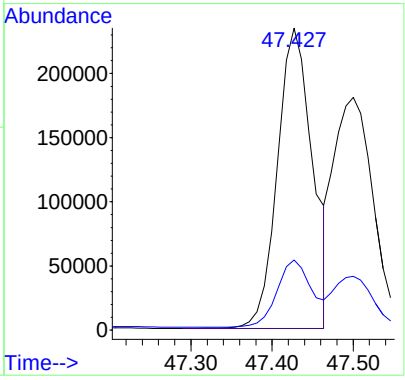


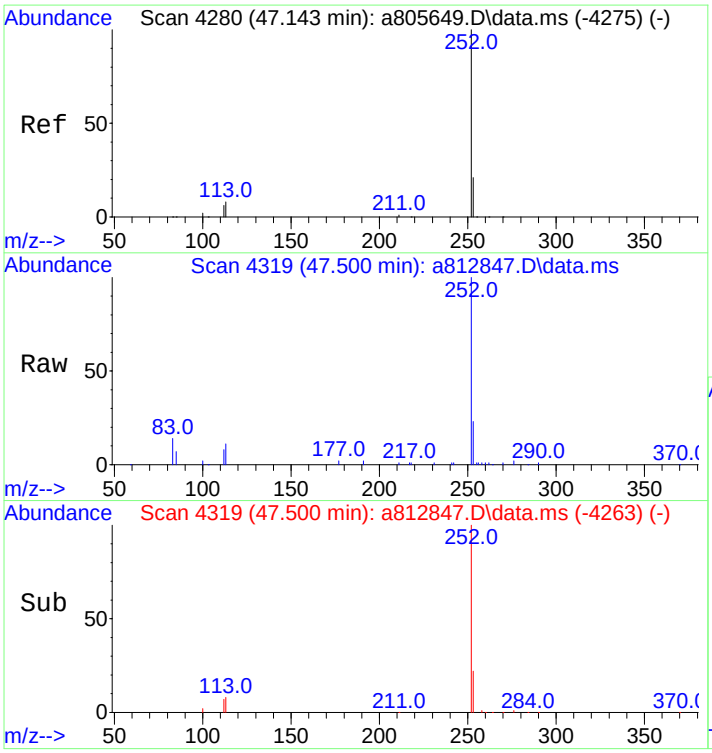


#84
Benzo[b]fluoranthene
Concen: 3544.03 ng/mL
RT: 47.427 min Scan# 4311
Delta R.T. 0.027 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:252 Resp: 702973

Ion	Ratio	Lower	Upper
252	100		
253	22.4	18.5	27.7

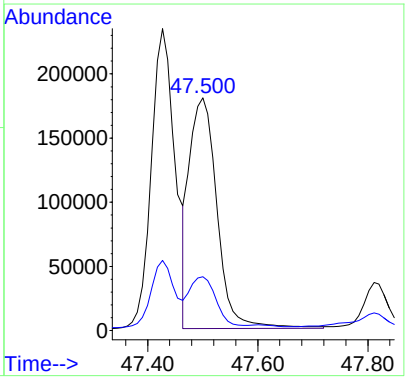


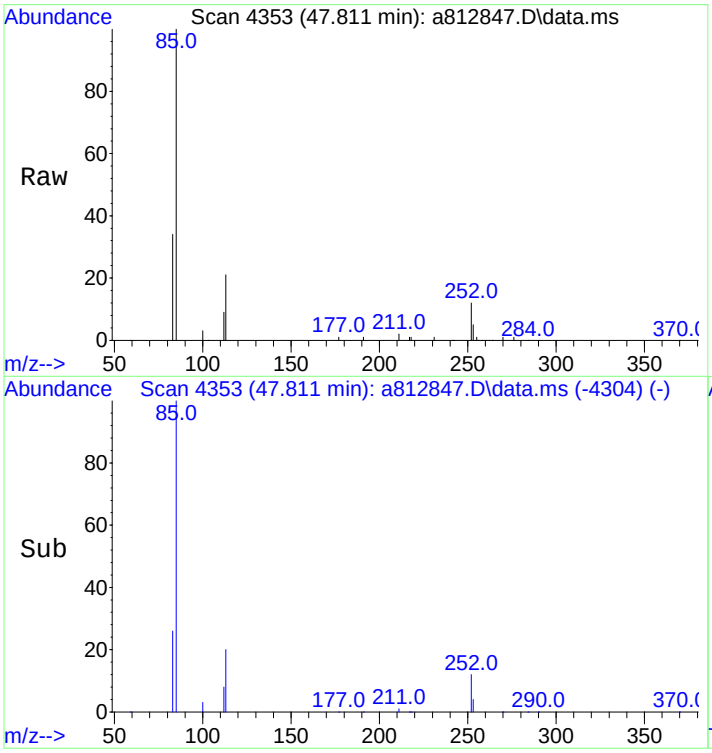


#85
Benzo[j]+[k]fluoranthene
Concen: 2918.12 ng/mL
RT: 47.500 min Scan# 4319
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:252 Resp: 631554

Ion	Ratio	Lower	Upper
252	100		
253	21.1	18.8	28.2

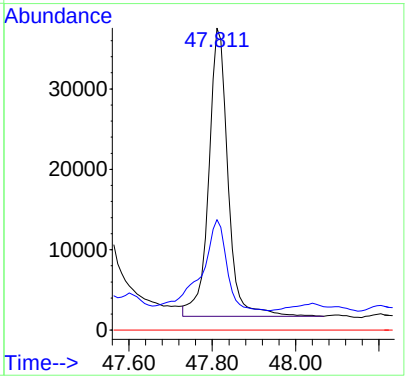


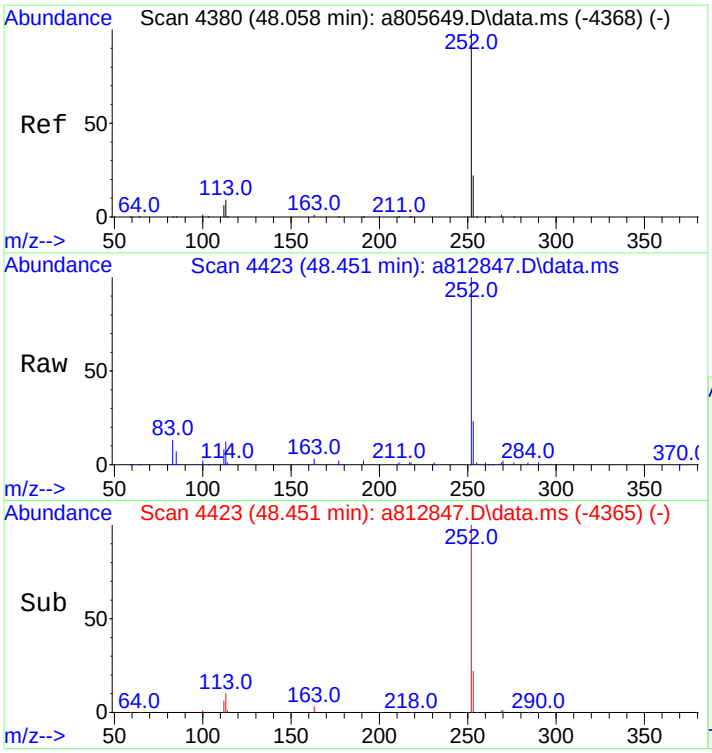


#86
Benzo[a]fluoranthene
Concen: 528.82 ng/mL
RT: 47.811 min Scan# 4353
Delta R.T. -0.055 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:252 Resp: 114450

Ion	Ratio	Lower	Upper
252	100		
253	42.6	372.3	558.5#
125	0.0	0.0	0.0

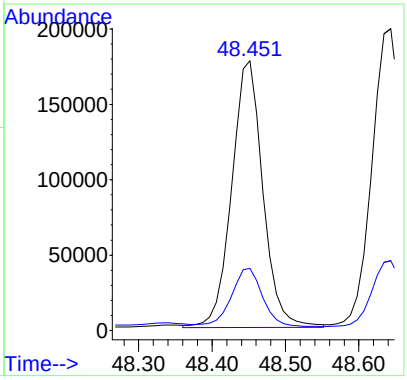


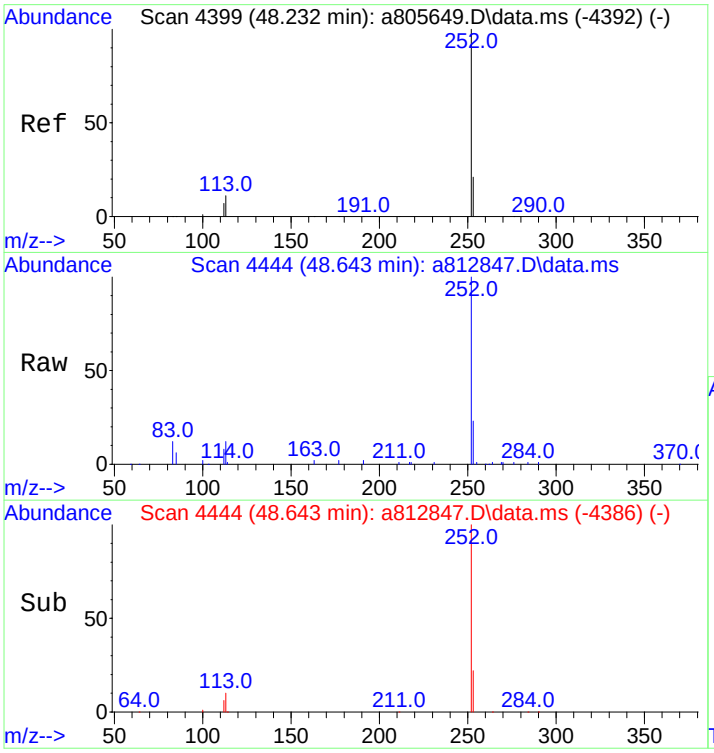


#87
Benzo[e]pyrene
Concen: 2571.23 ng/mL
RT: 48.451 min Scan# 4423
Delta R.T. 0.027 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:252 Resp: 525502

Ion	Ratio	Lower	Upper
252	100		
253	22.2	18.9	28.3

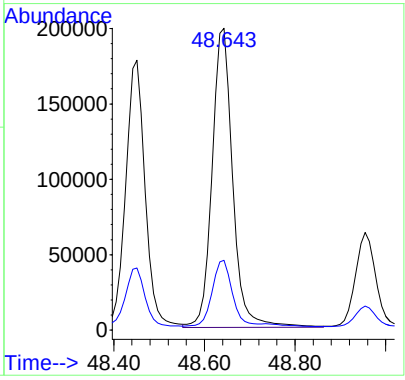


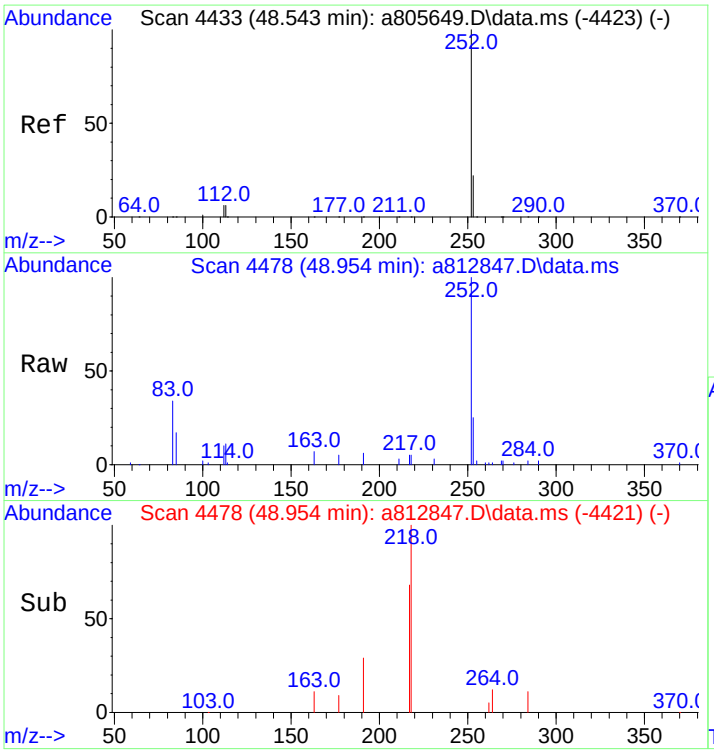


#89
Benzo[a]pyrene
Concen: 3310.82 ng/mL
RT: 48.643 min Scan# 4444
Delta R.T. 0.027 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:252 Resp: 625926

Ion	Ratio	Lower	Upper
252	100		
253	22.7	19.4	29.0

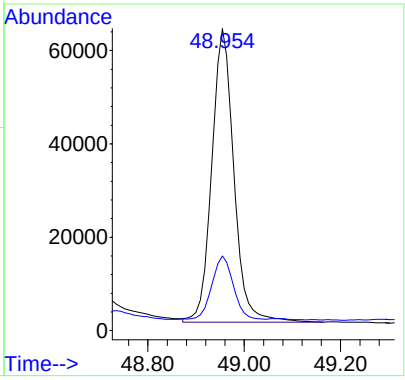


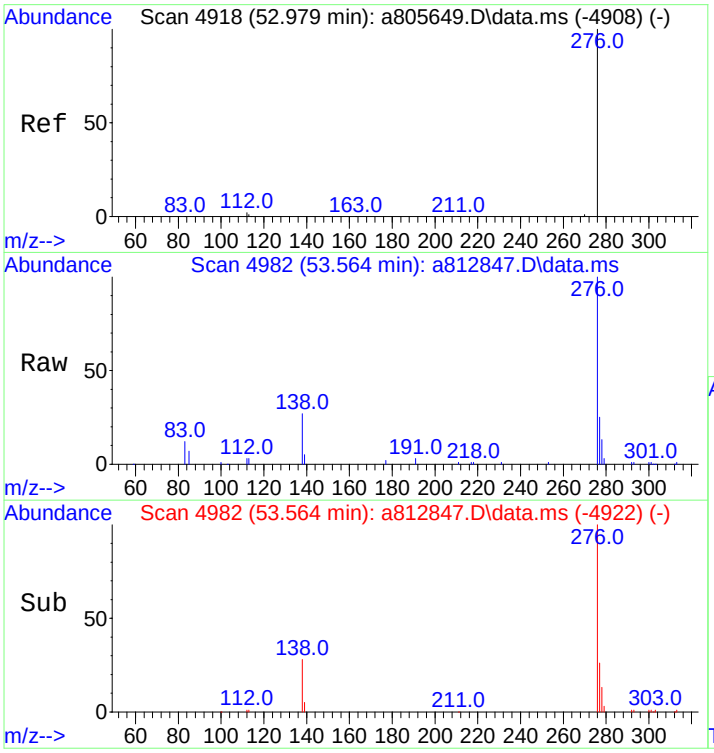


#90
Perylene
Concen: 971.11 ng/mL
RT: 48.954 min Scan# 4478
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:252 Resp: 200539

Ion	Ratio	Lower	Upper
252	100		
253	21.2	19.3	28.9

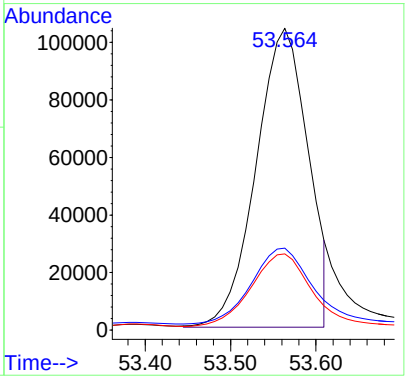


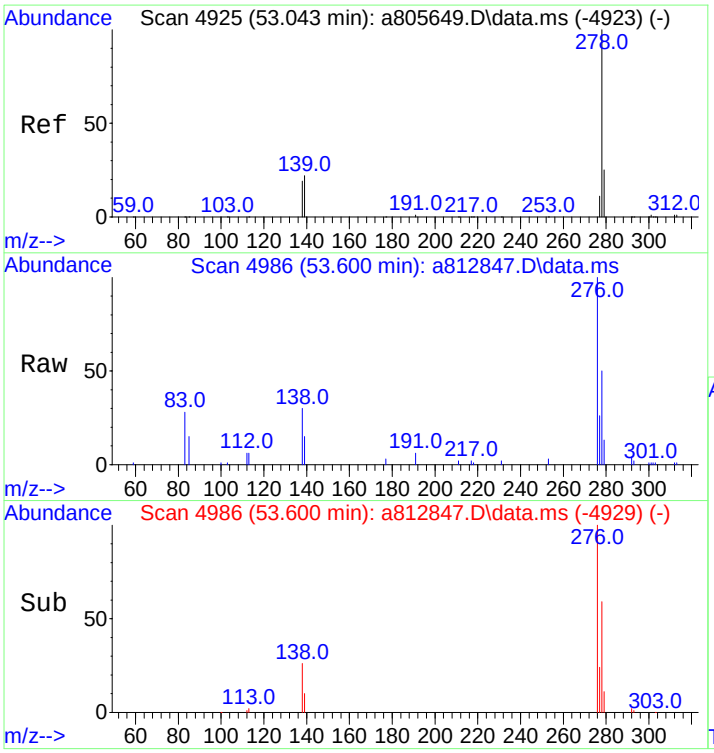


#91
Indeno[1,2,3-cd]pyrene
Concen: 2190.46 ng/mL m
RT: 53.564 min Scan# 4982
Delta R.T. 0.046 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:276 Resp: 439902

Ion	Ratio	Lower	Upper
276	100		
138	29.9	19.9	29.9#
277	29.1	19.0	28.6#

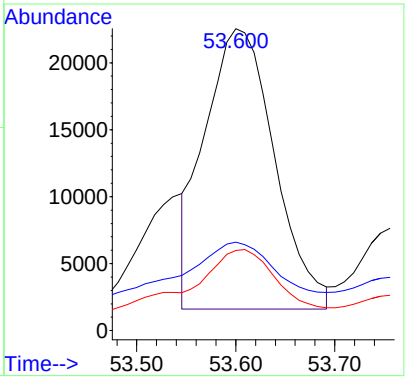


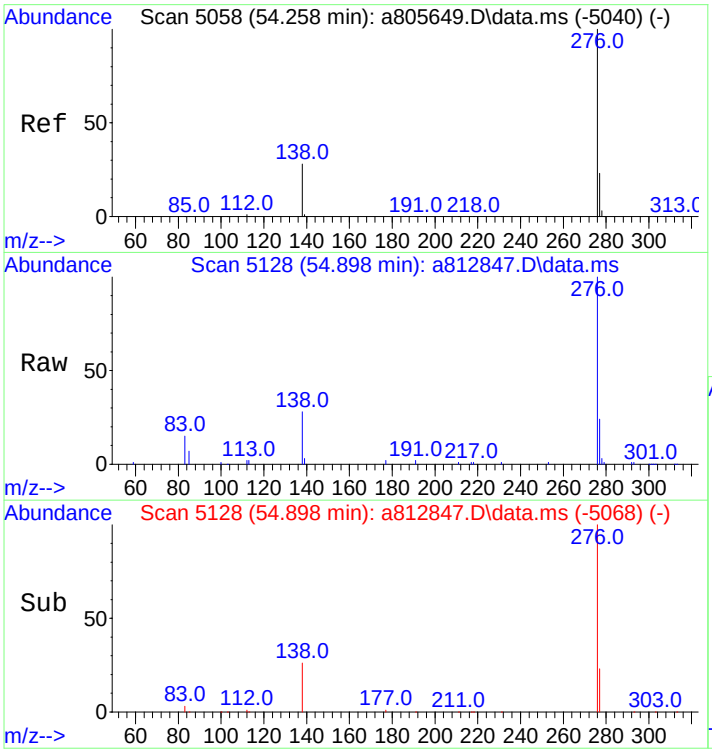


#92
Dibenz[ah]+[ac]anthracene
Concen: 522.23 ng/mL m
RT: 53.600 min Scan# 4986
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:278 Resp: 102803

Ion	Ratio	Lower	Upper
278	100		
139	24.7	16.6	25.0
279	27.1	19.1	28.7

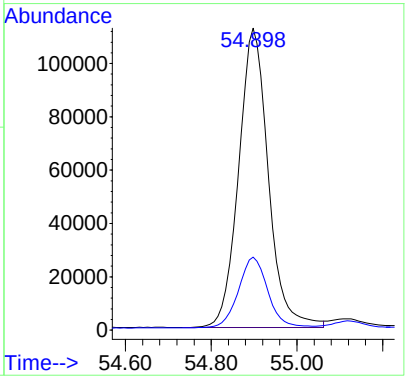


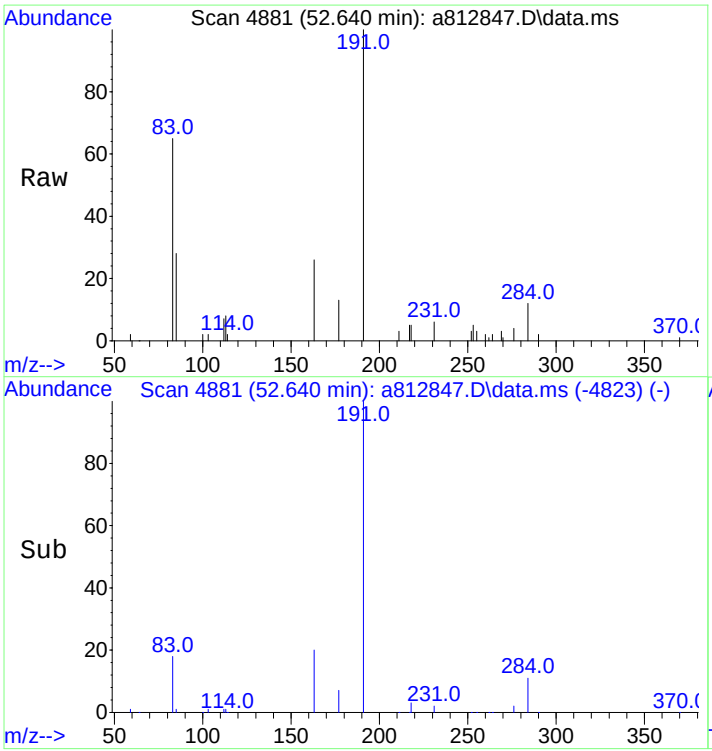


#93
Benzo[g,h,i]perylene
Concen: 2379.05 ng/mL
RT: 54.898 min Scan# 5128
Delta R.T. 0.046 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:276 Resp: 542201

Ion	Ratio	Lower	Upper
276	100		
277	23.6	18.9	28.3

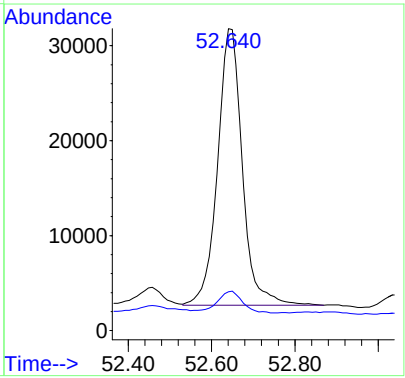


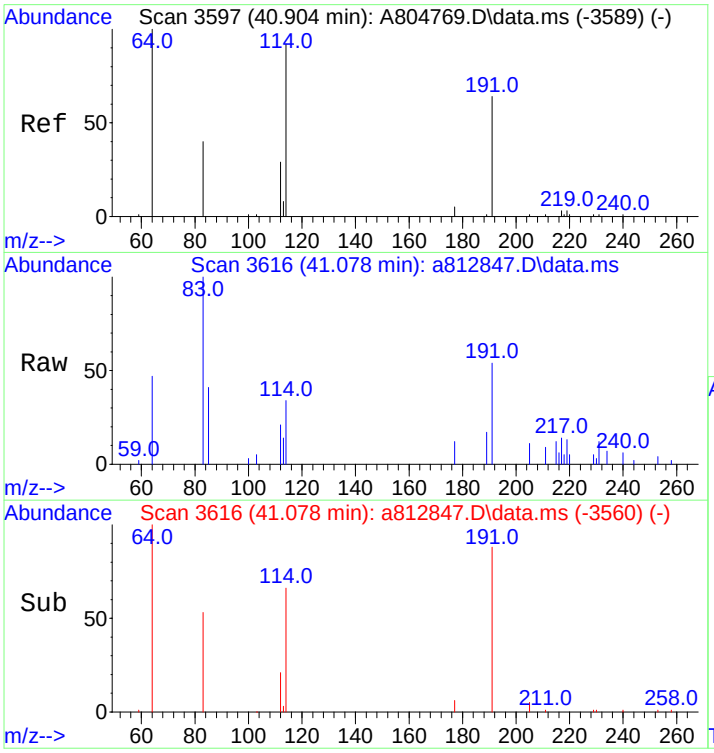


#94
Hopane (T19)
Concen: 1912.32 ng/mL
RT: 52.640 min Scan# 4881
Delta R.T. 0.027 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:191 Resp: 120994

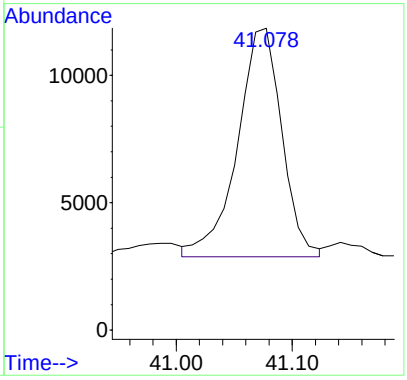
Ion	Ratio	Lower	Upper
191	100		
177	7.9	9.8	14.8#

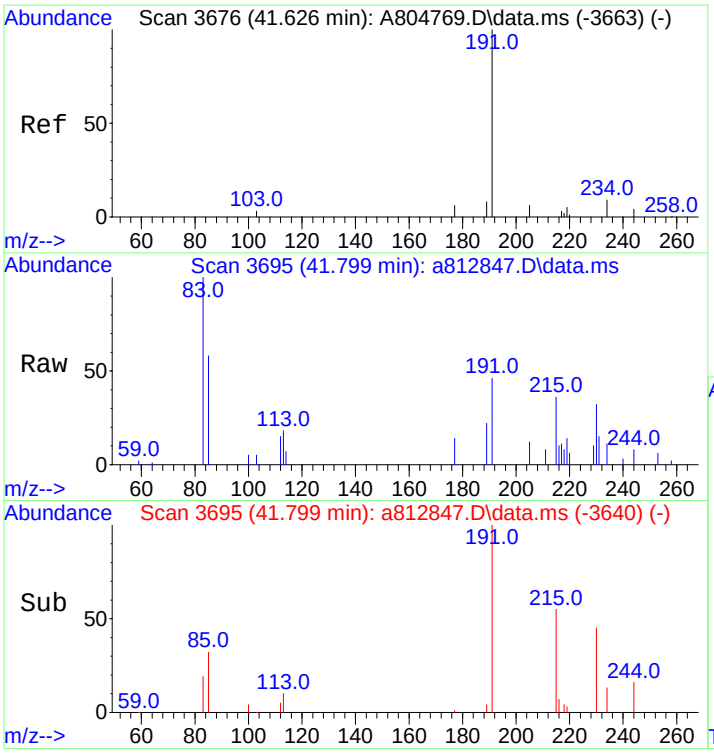




#96
C23 Tricyclic Terpane (T4)
Concen: 376.04 ng/ml m
RT: 41.078 min Scan# 3616
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

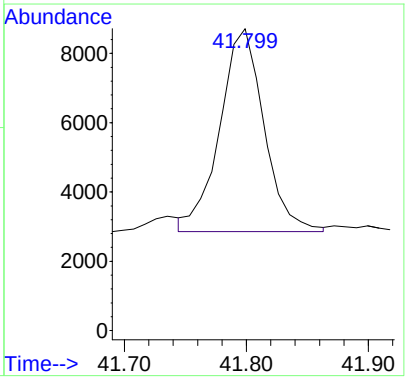
Tgt Ion:191 Resp: 23792

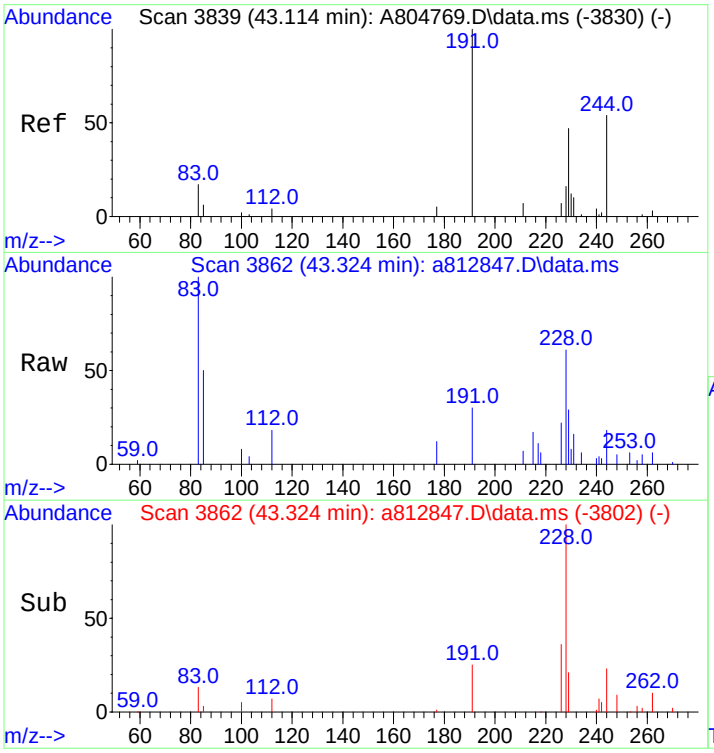




#97
C24 Tricyclic Terpane (T5)
Concen: 232.95 ng/ml m
RT: 41.799 min Scan# 3695
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

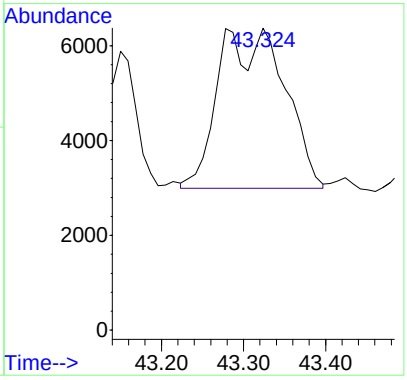
Tgt Ion:191 Resp: 14739

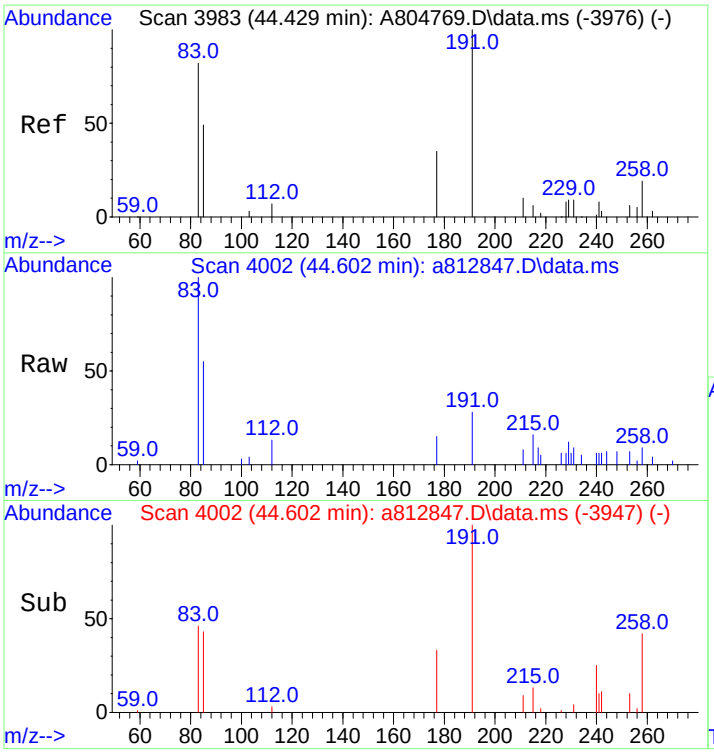




#98
C25 Tricyclic Terpane (T6)
Concen: 299.11 ng/ml m
RT: 43.324 min Scan# 3862
Delta R.T. 0.046 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

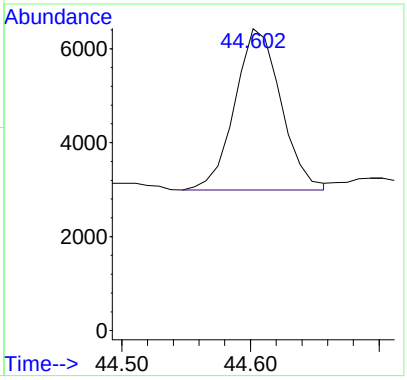
Tgt Ion:191 Resp: 18925

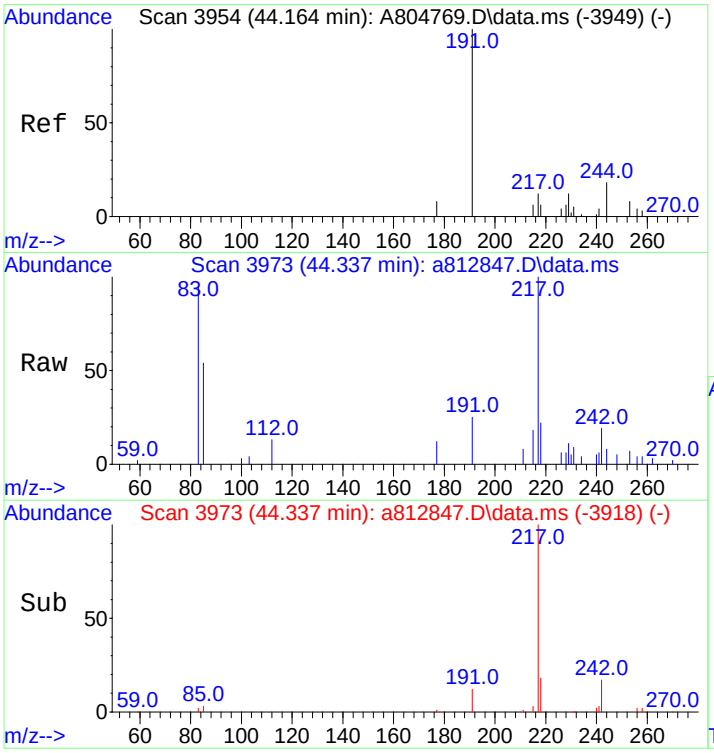




#99
C24 Tetracyclic Terpane (T6a)
Concen: 135.12 ng/ml
RT: 44.602 min Scan# 4002
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

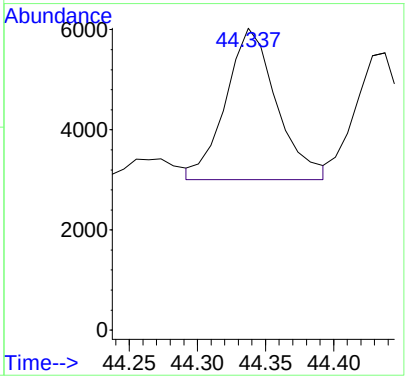
Tgt Ion:191 Resp: 8549

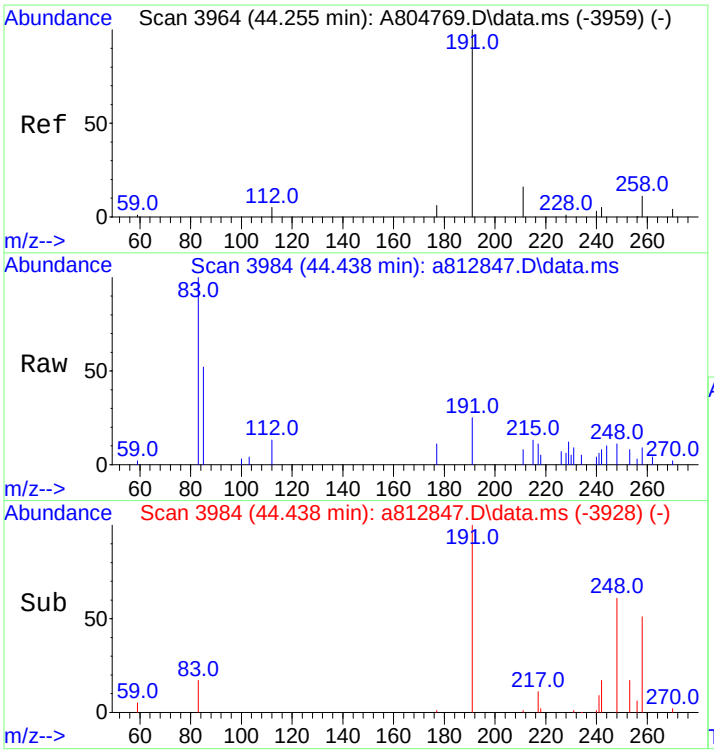




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 124.61 ng/ml m
RT: 44.337 min Scan# 3973
Delta R.T. 0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

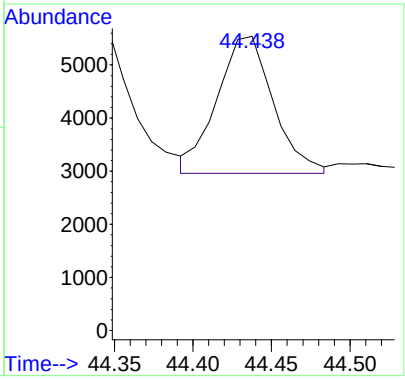
Tgt Ion:191 Resp: 7884

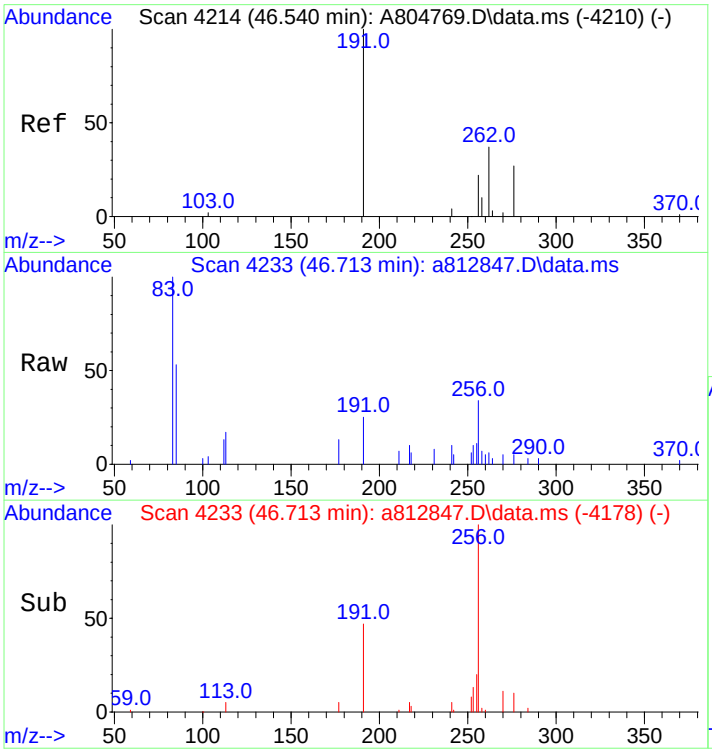




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 101.85 ng/ml m
RT: 44.438 min Scan# 3984
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

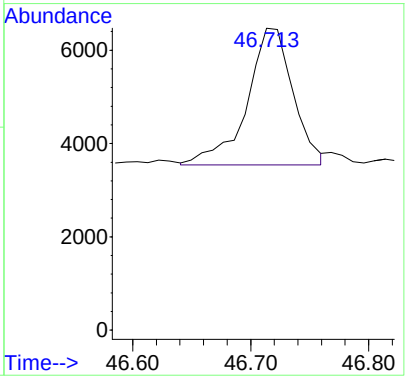
Tgt Ion:191 Resp: 6444

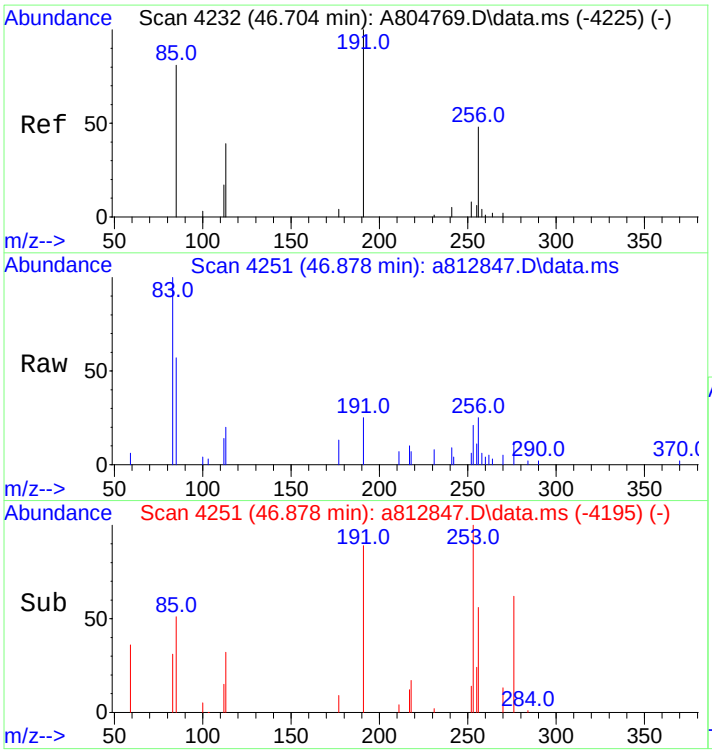




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 126.30 ng/ml m
RT: 46.713 min Scan# 4233
Delta R.T. 0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

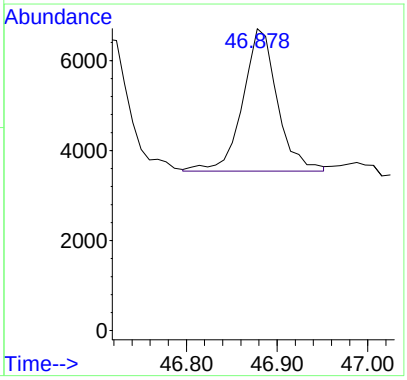
Tgt Ion:191 Resp: 7991

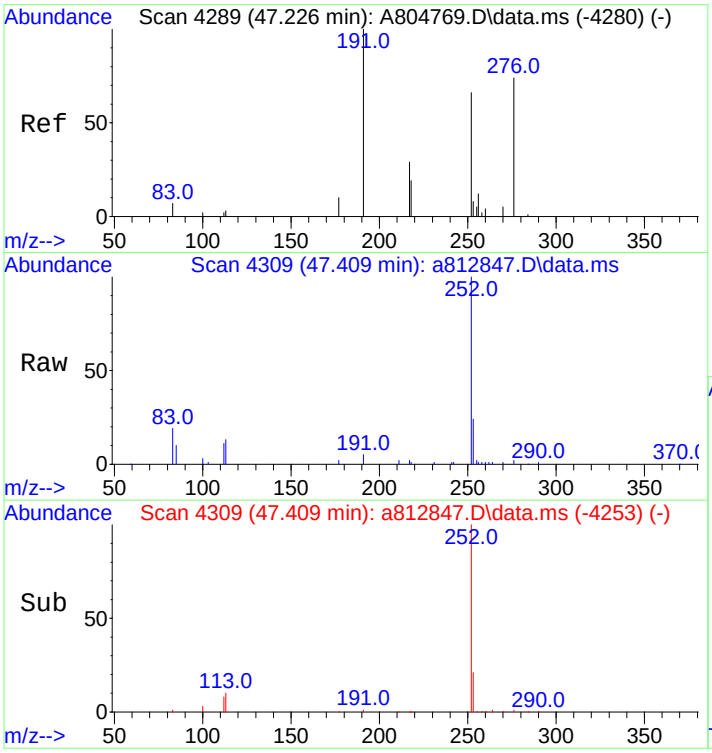




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 132.45 ng/ml
RT: 46.878 min Scan# 4251
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

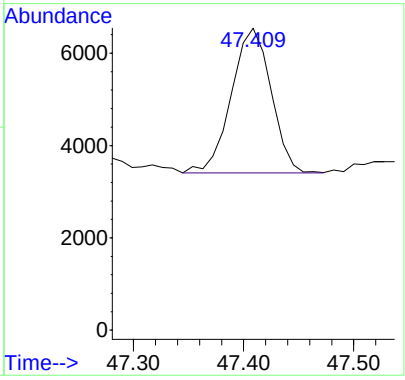
Tgt Ion:191 Resp: 8380

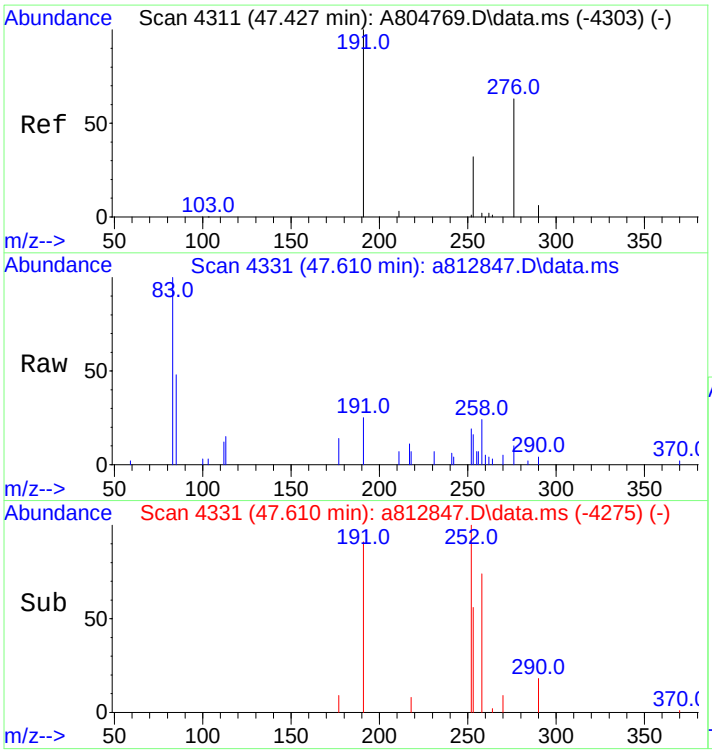




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 124.18 ng/ml
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

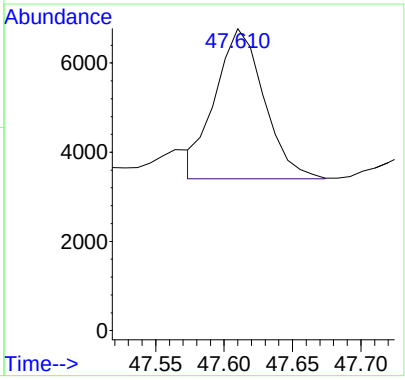
Tgt Ion:191 Resp: 7857

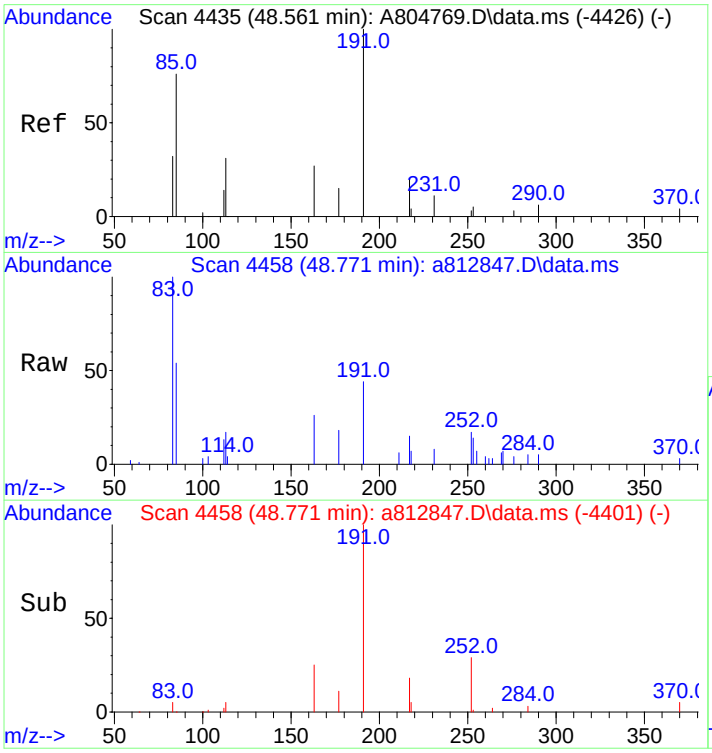




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 131.94 ng/ml m
RT: 47.610 min Scan# 4331
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

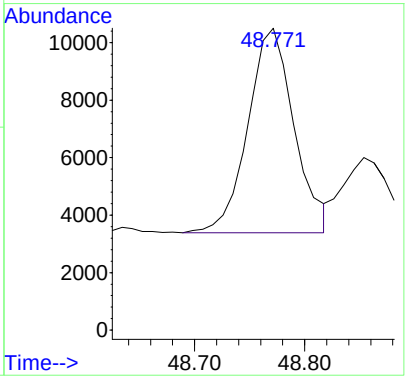
Tgt Ion:191 Resp: 8348

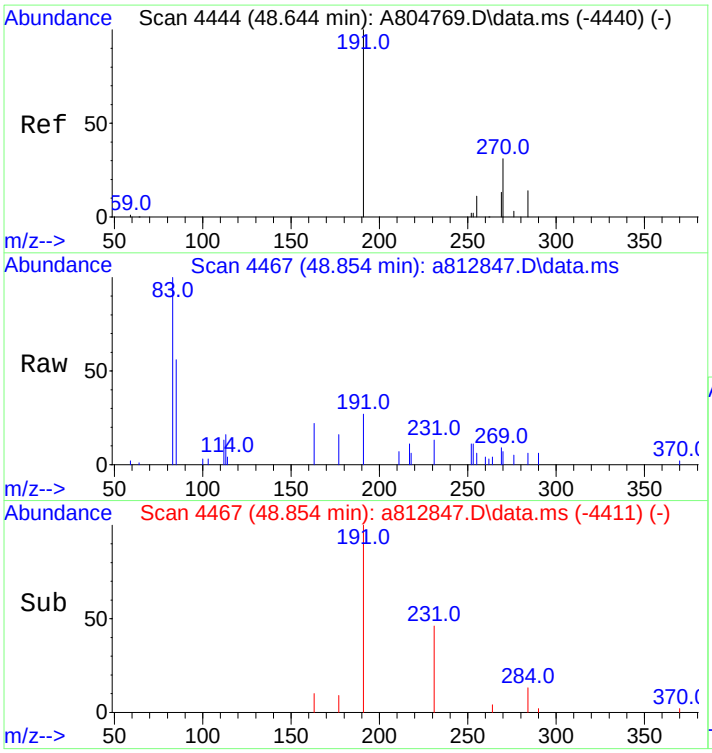




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 328.22 ng/ml
RT: 48.771 min Scan# 4458
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

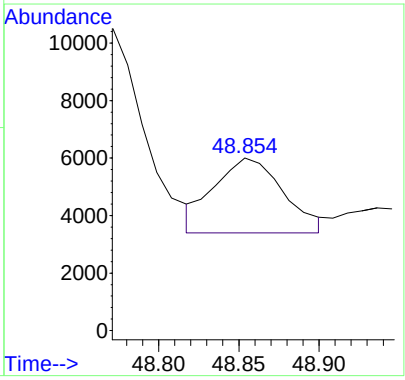
Tgt Ion:191 Resp: 20767

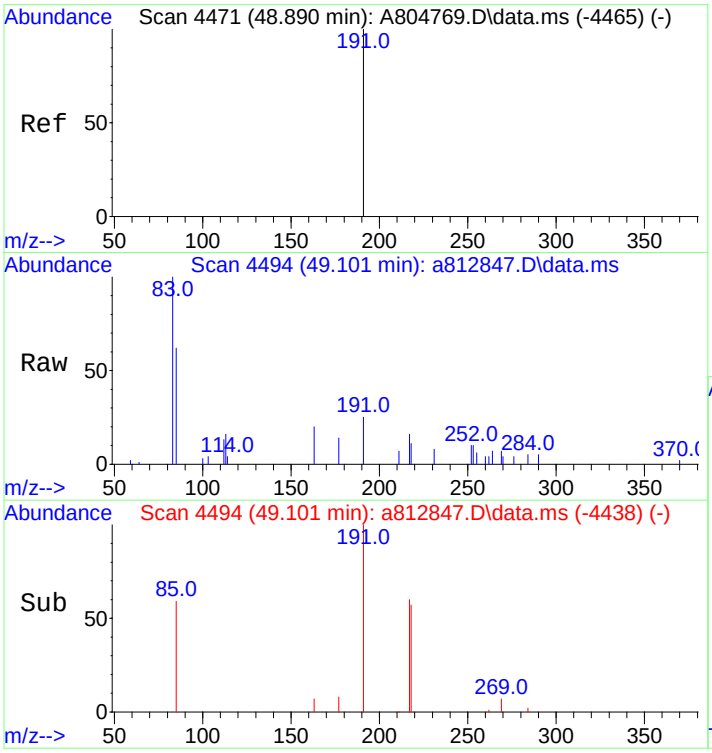




#107
C30 Tricyclic Terpane-22S
Concen: 124.34 ng/mL m
RT: 48.854 min Scan# 4467
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

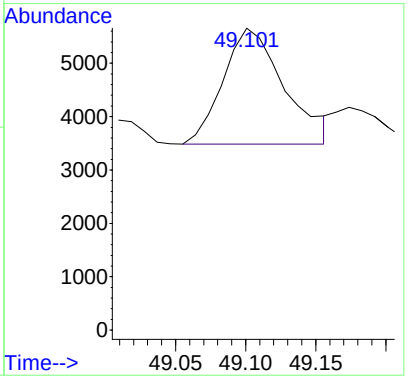
Tgt Ion:191 Resp: 7867

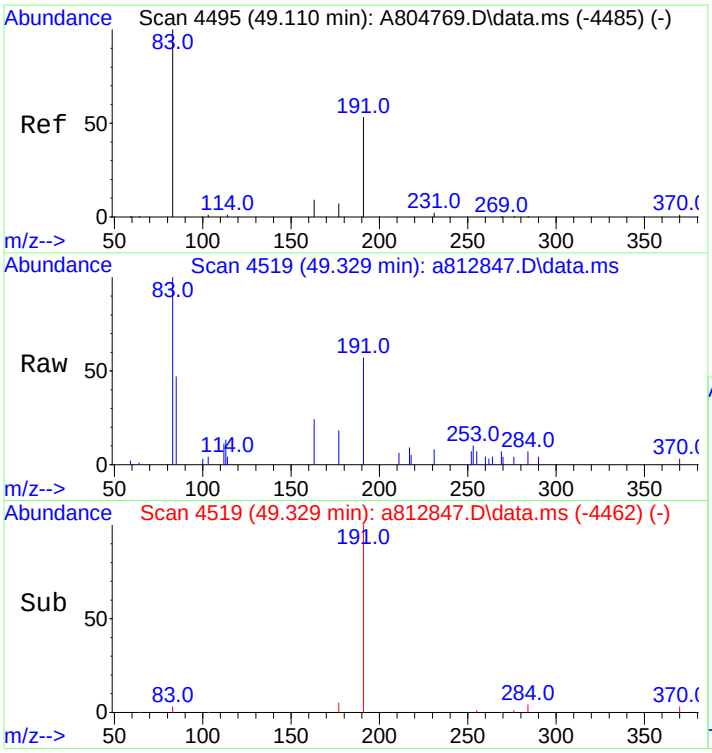




#108
C30 Tricyclic Terpane-22R
Concen: 104.03 ng/mL
RT: 49.101 min Scan# 4494
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

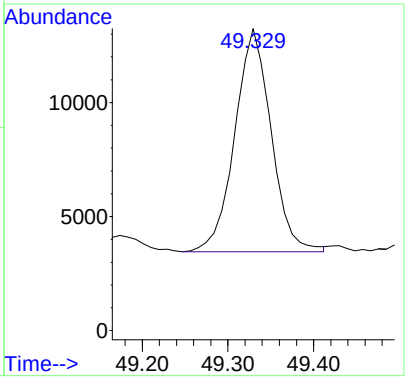
Tgt Ion:191 Resp: 6582

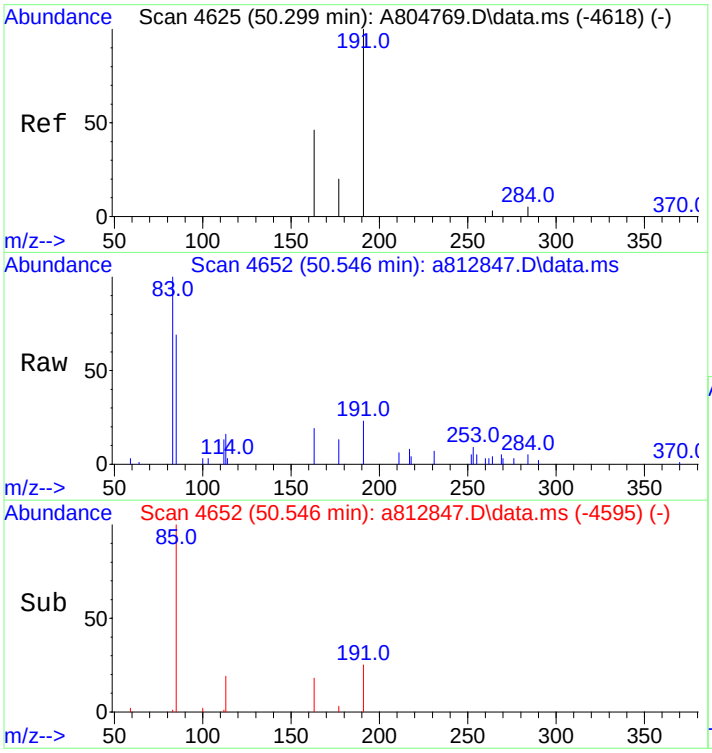




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 457.24 ng/ml
RT: 49.329 min Scan# 4519
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

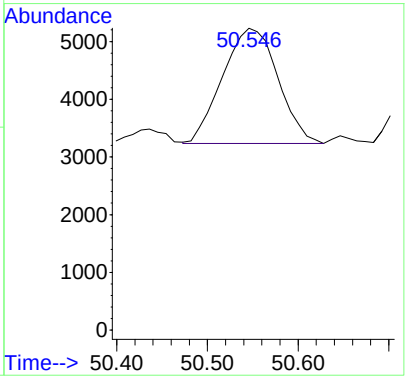
Tgt Ion:191 Resp: 28930

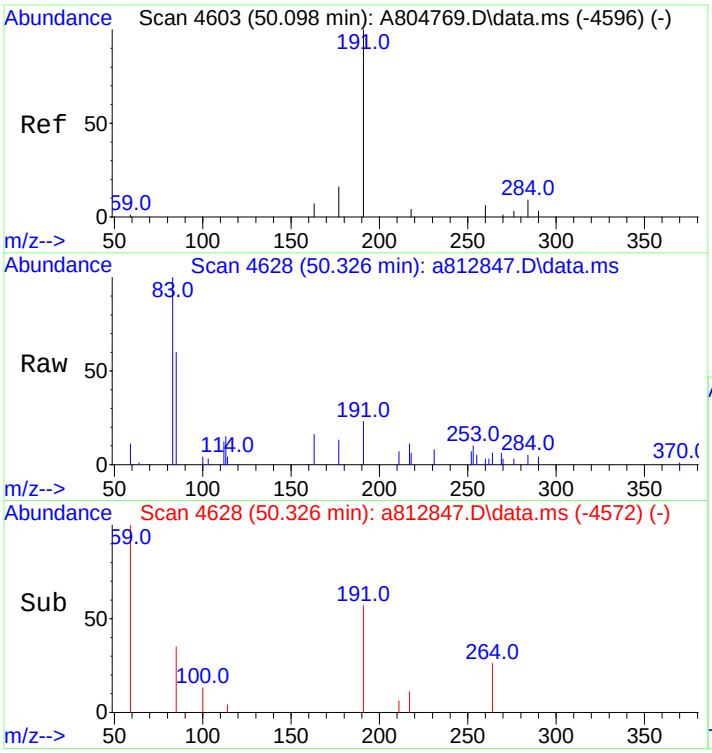




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 133.70 ng/ml
RT: 50.546 min Scan# 4652
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

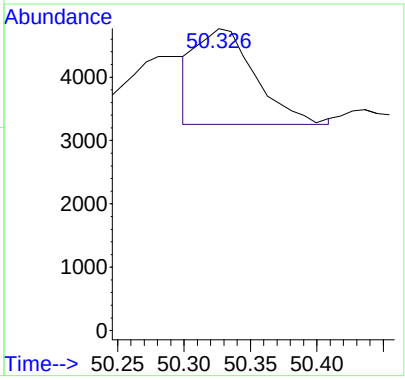
Tgt Ion:191 Resp: 8459

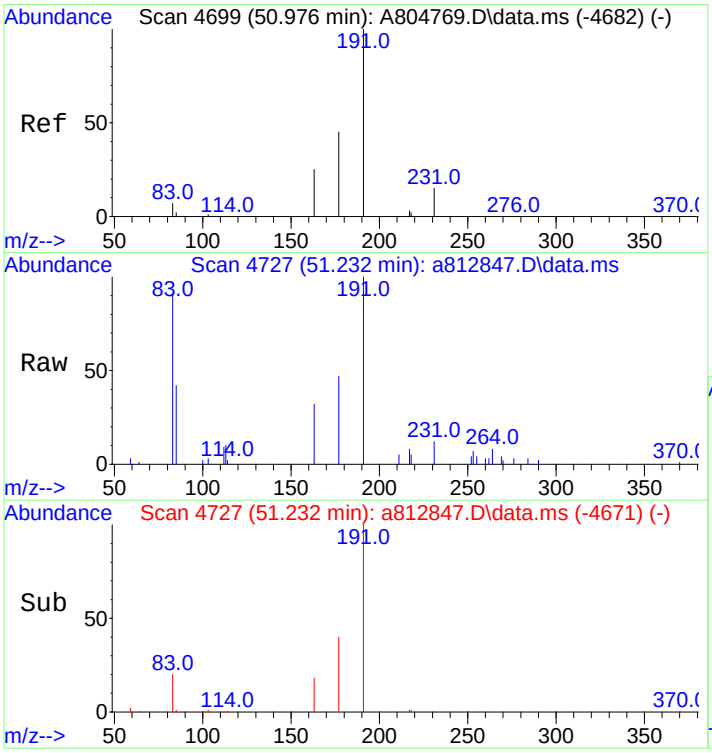




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 75.06 ng/ml m
RT: 50.326 min Scan# 4628
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

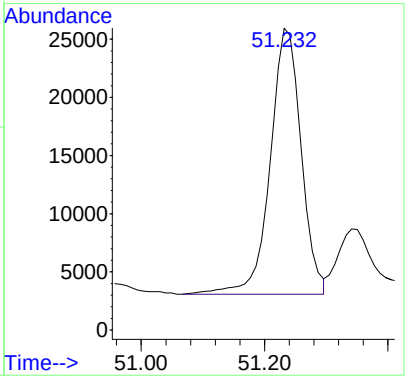
Tgt Ion:191 Resp: 4749

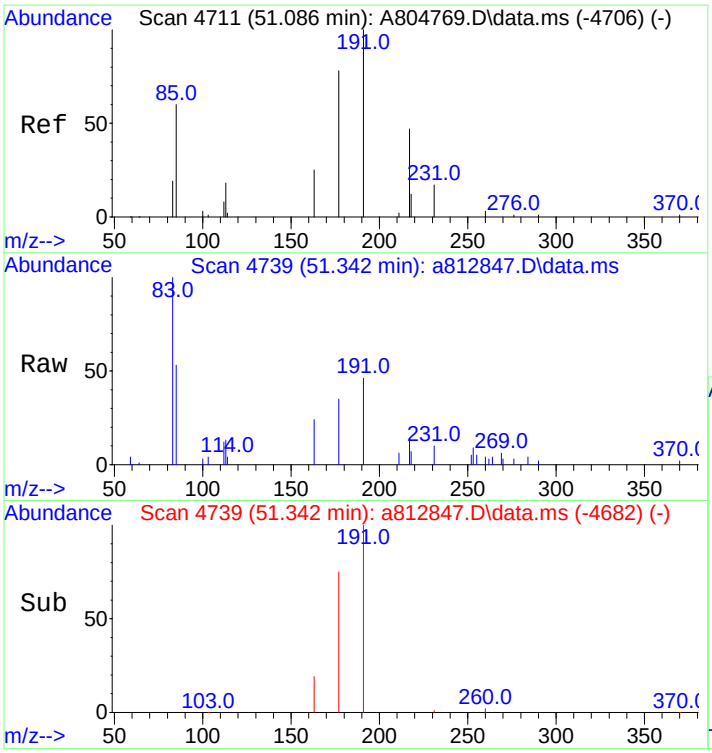




#112
30-Norhopane (T15)
Concen: 1262.45 ng/ml
RT: 51.232 min Scan# 4727
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

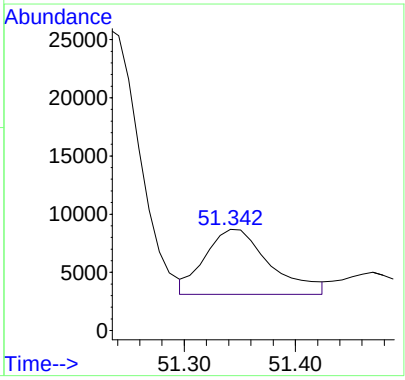
Tgt Ion:191 Resp: 79876

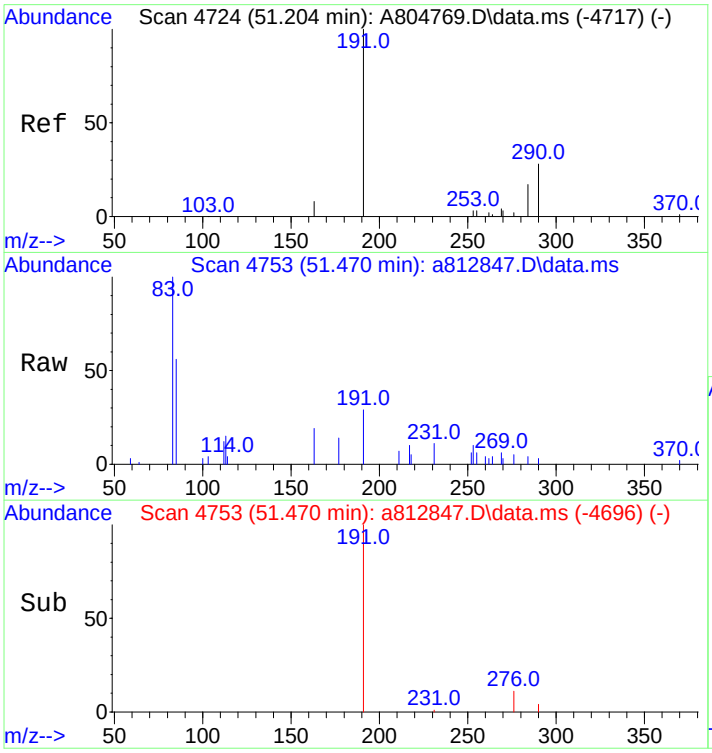




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 356.25 ng/ml m
RT: 51.342 min Scan# 4739
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

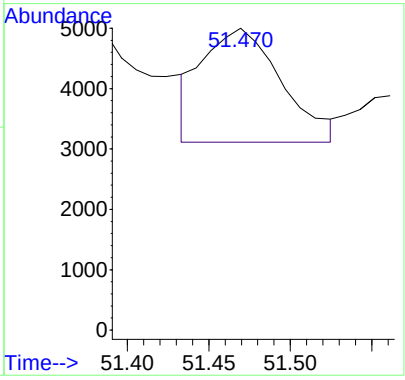
Tgt Ion:191 Resp: 22540

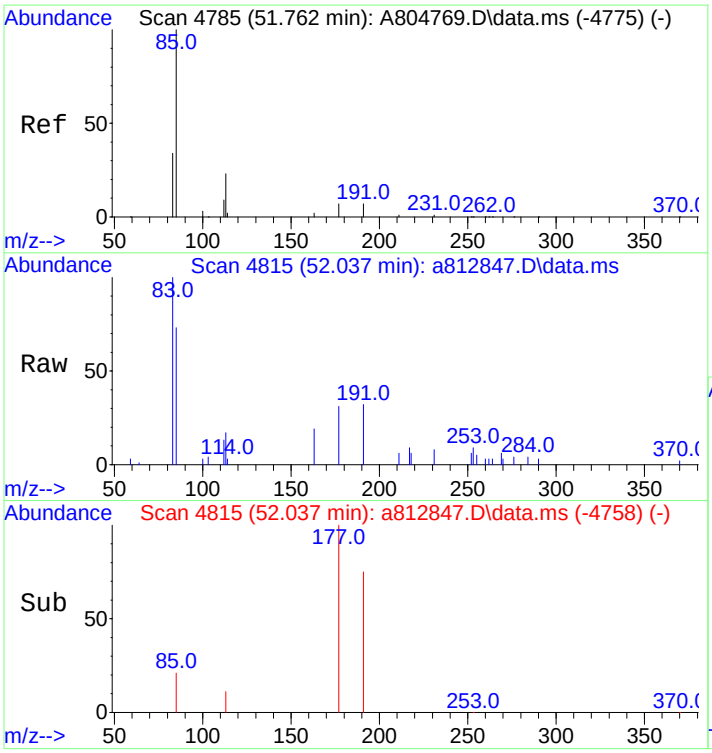




#114
17a(H)-Diahopane (X)
Concen: 100.47 ng/ml m
RT: 51.470 min Scan# 4753
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

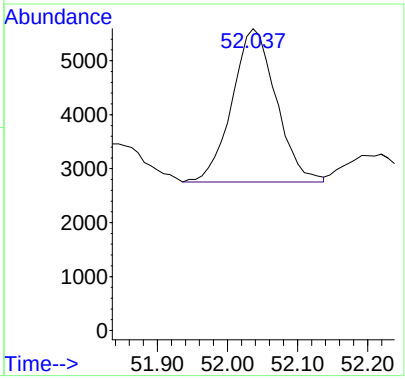
Tgt Ion:191 Resp: 6357

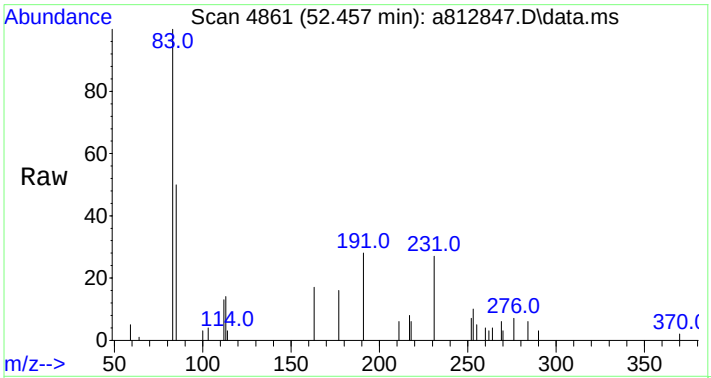




#115
30-Normoretane (T17)
Concen: 196.36 ng/ml
RT: 52.037 min Scan# 4815
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

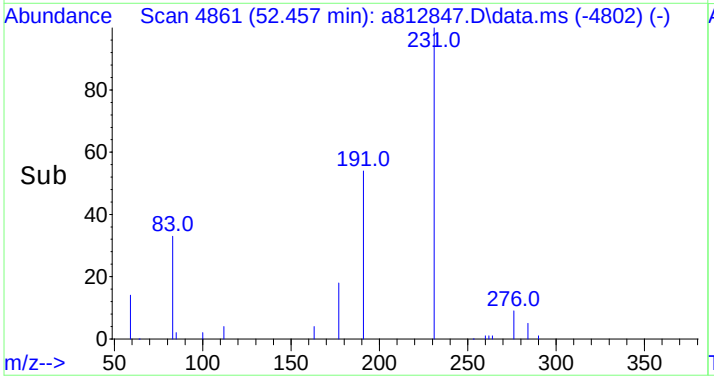
Tgt Ion:191 Resp: 12424

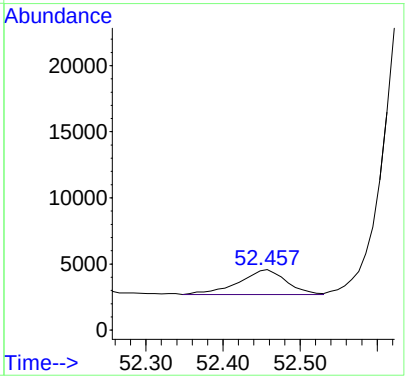


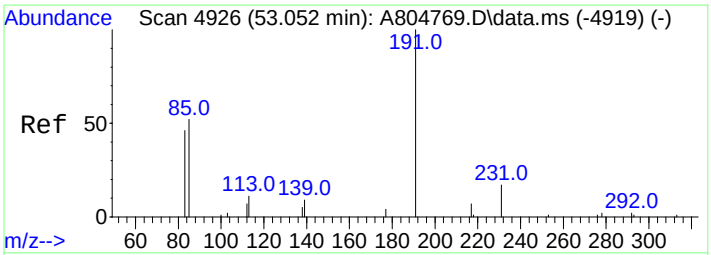


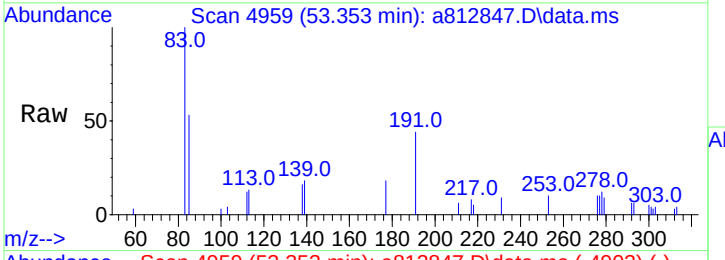
#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 128.97 ng/ml
RT: 52.457 min Scan# 4861
Delta R.T. 0.037 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:191 Resp: 8160



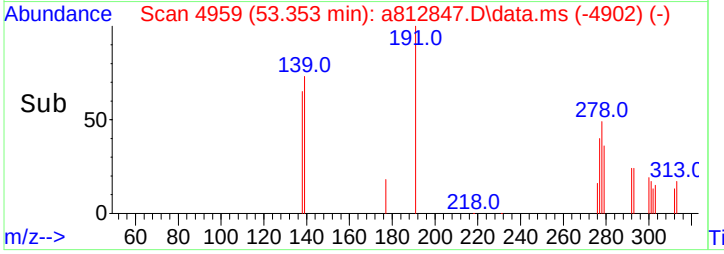


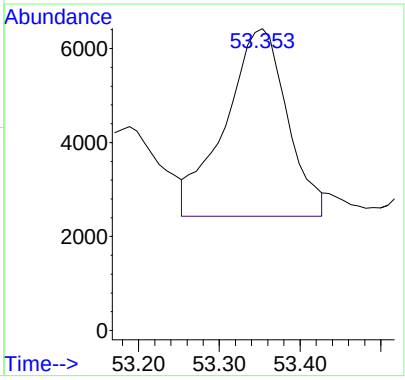


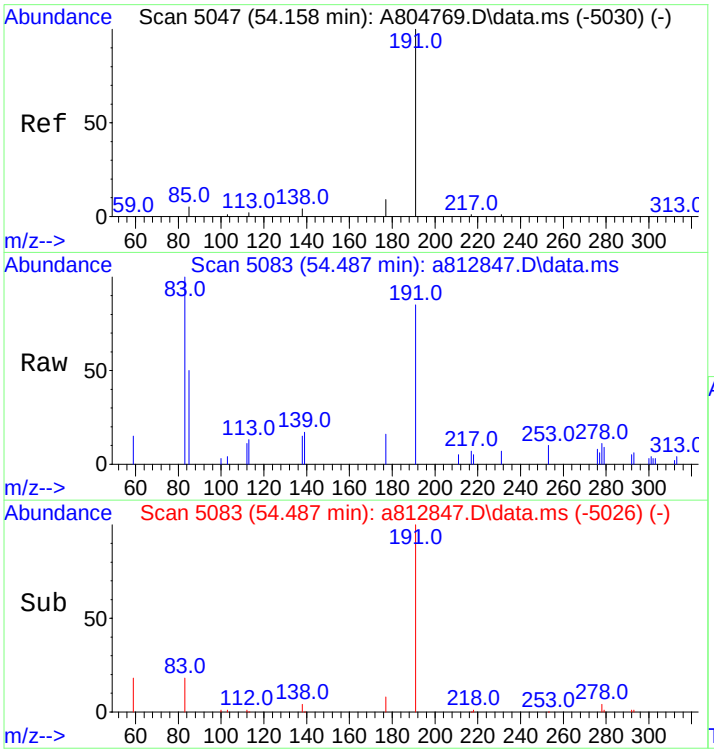


#117
Moretane (T20)
Concen: 336.89 ng/ml m
RT: 53.353 min Scan# 4959
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:191 Resp: 21315

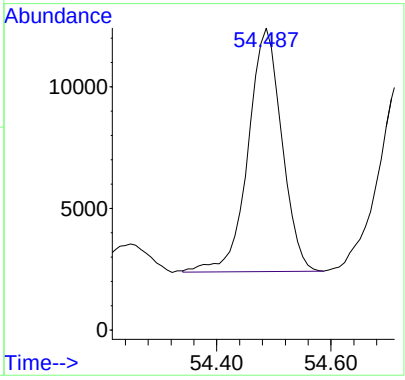


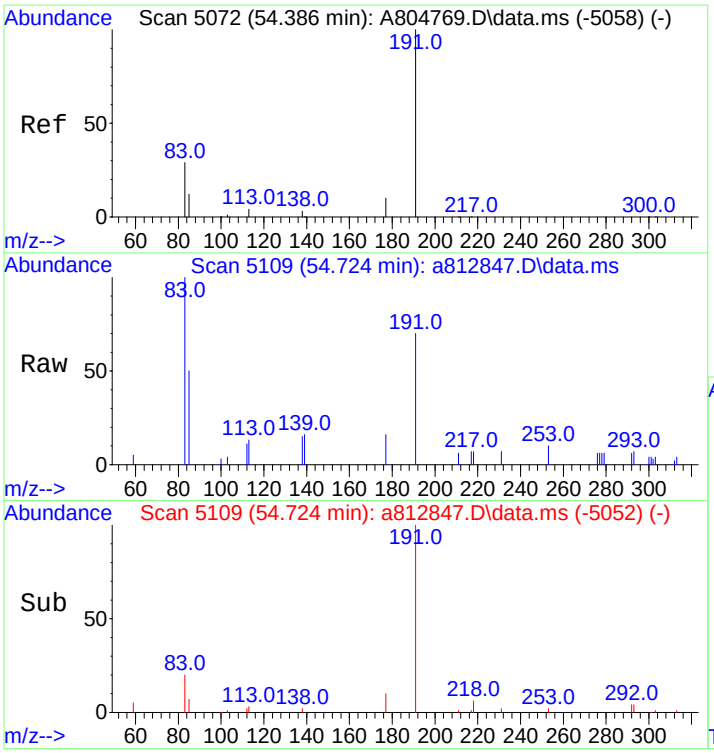




#118
30-Homohopane-22S (T21)
Concen: 646.95 ng/ml
RT: 54.487 min Scan# 5083
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

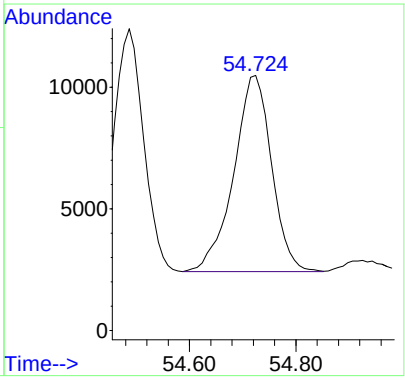
Tgt Ion:191 Resp: 40933

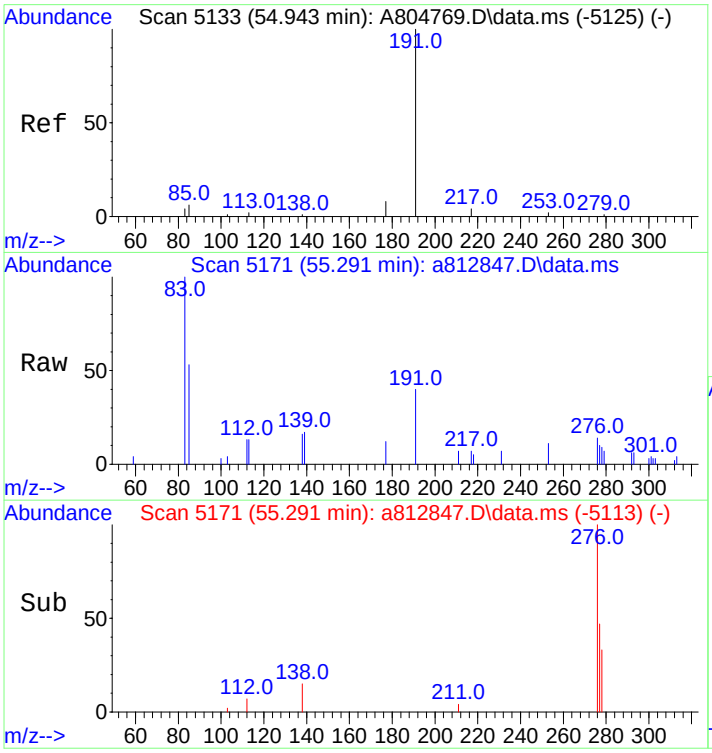




#119
30-Homohopane-22R (T22)
Concen: 628.70 ng/ml
RT: 54.724 min Scan# 5109
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

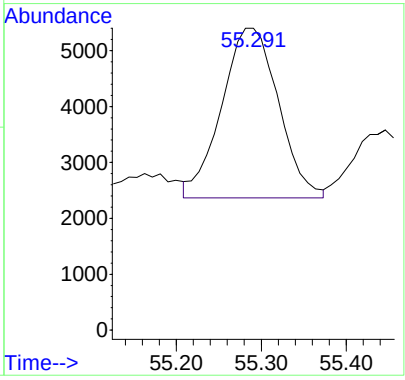
Tgt Ion:191 Resp: 39778

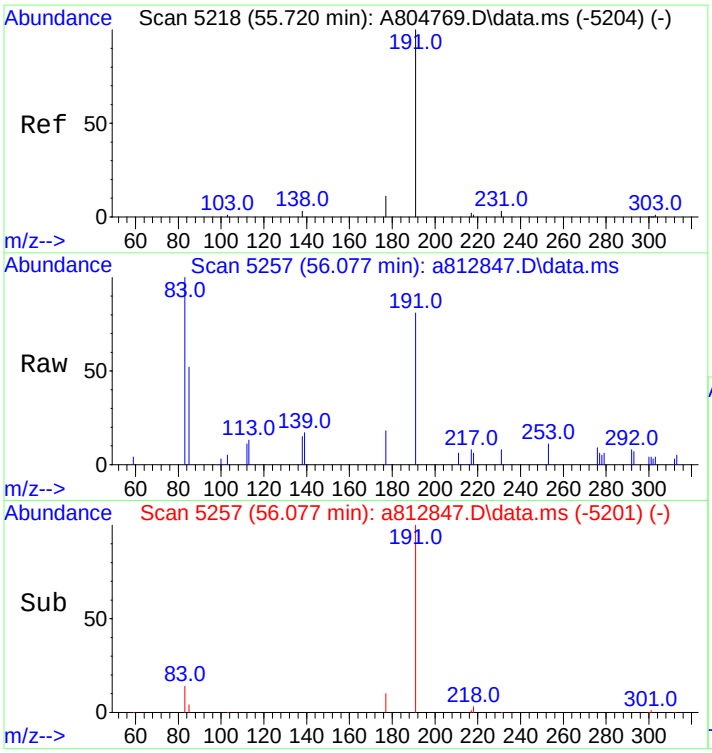




#120
Gammacerane/C32-diahopane
Concen: 222.17 ng/mL m
RT: 55.291 min Scan# 5171
Delta R.T. 0.027 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

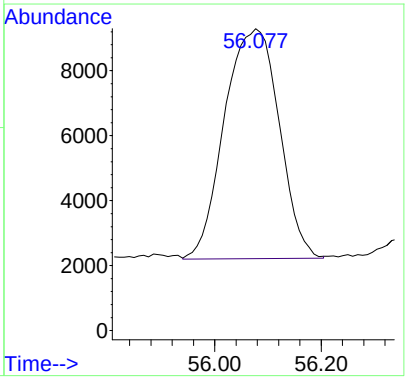
Tgt Ion:191 Resp: 14057

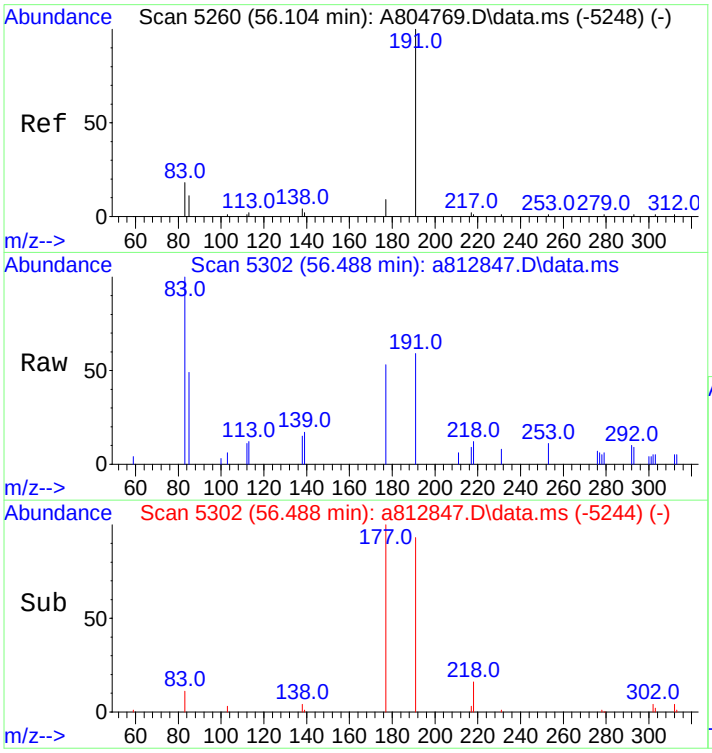




#121
30,31-Bishomohopane-22S (T26)
Concen: 798.17 ng/ml
RT: 56.077 min Scan# 5257
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

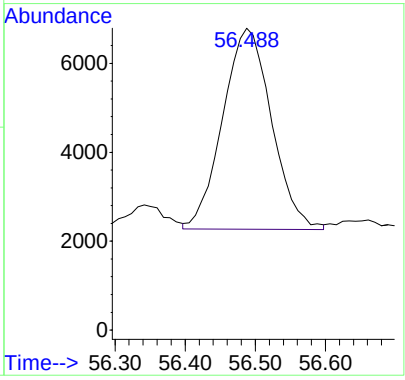
Tgt Ion:191 Resp: 50501

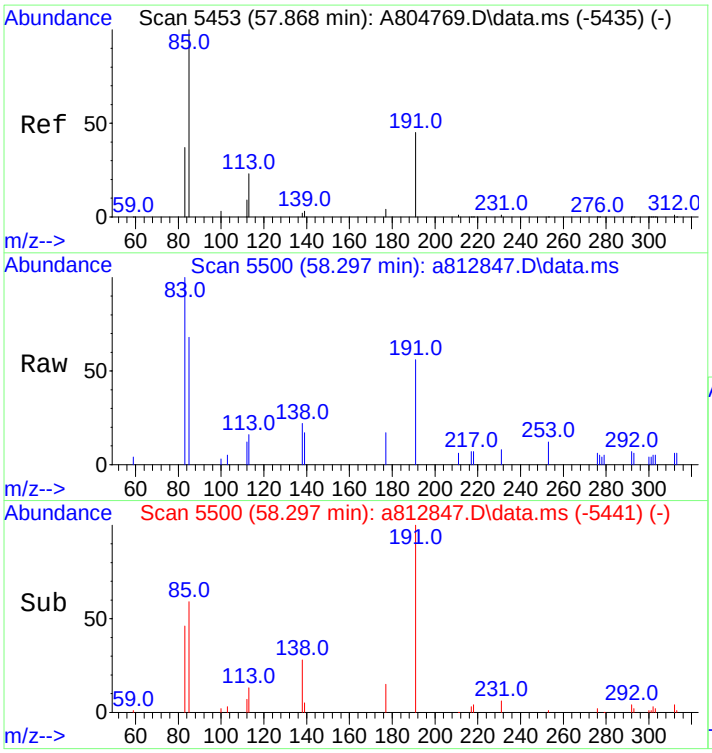




#122
30,31-Bishomohopane-22R (T27)
Concen: 345.94 ng/ml
RT: 56.488 min Scan# 5302
Delta R.T. 0.027 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

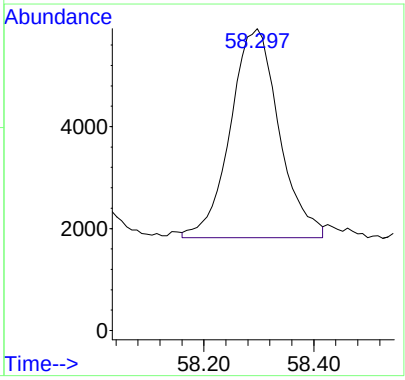
Tgt Ion:191 Resp: 21888

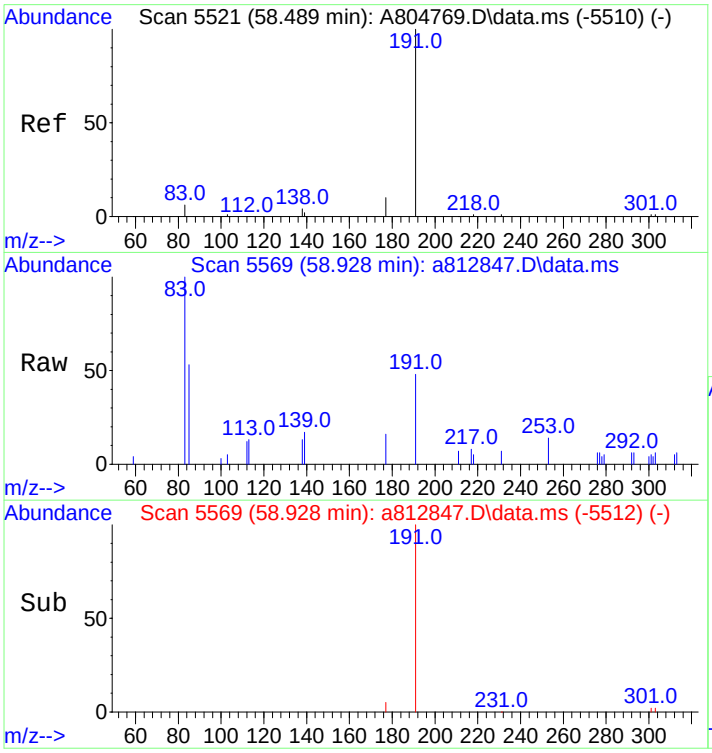




#123
30,31-Trishomohopane-22S (T30)
Concen: 399.65 ng/ml m
RT: 58.297 min Scan# 5500
Delta R.T. 0.037 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

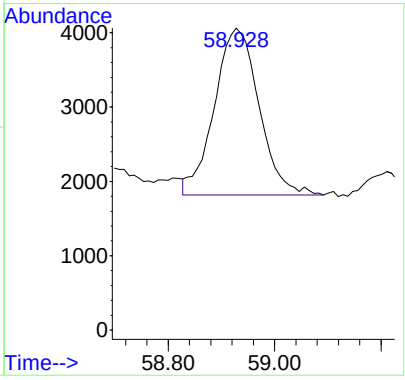
Tgt Ion:191 Resp: 25286

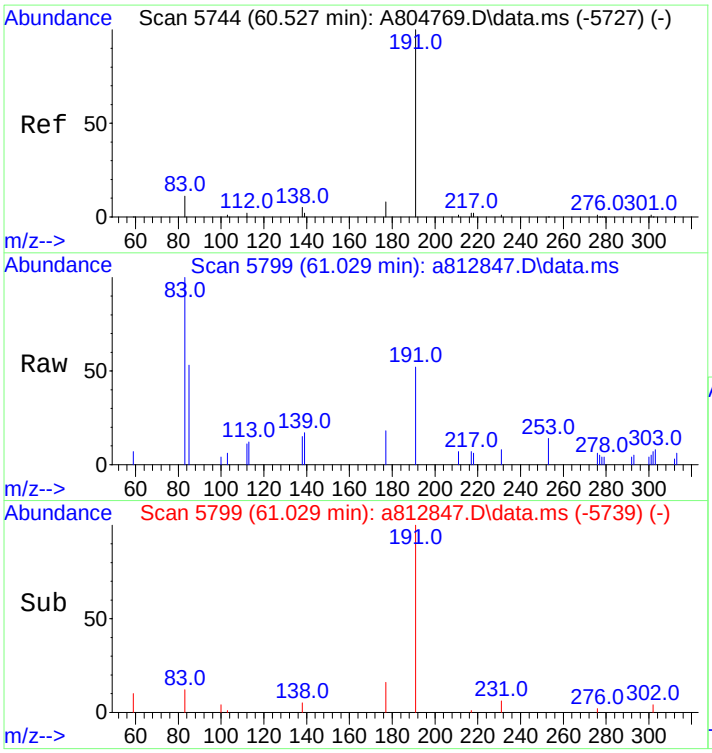




#124
30,31-Trishomohopane-22R (T31)
Concen: 206.38 ng/ml
RT: 58.928 min Scan# 5569
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

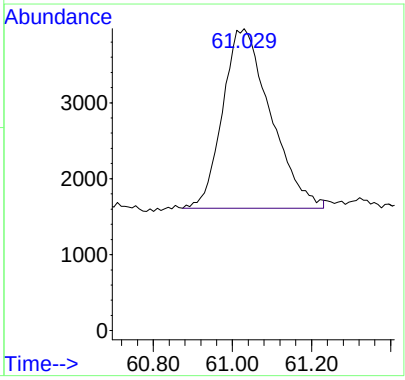
Tgt Ion:191 Resp: 13058

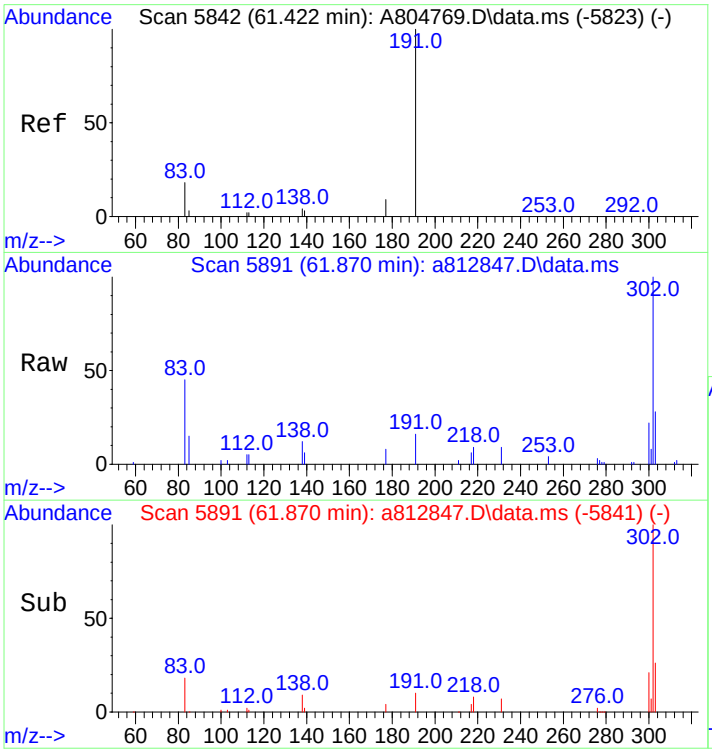




#125
Tetrakishomohopane-22S (T32)
Concen: 314.11 ng/ml
RT: 61.029 min Scan# 5799
Delta R.T. 0.046 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

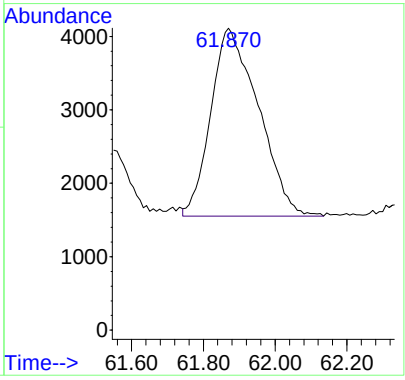
Tgt Ion:191 Resp: 19874

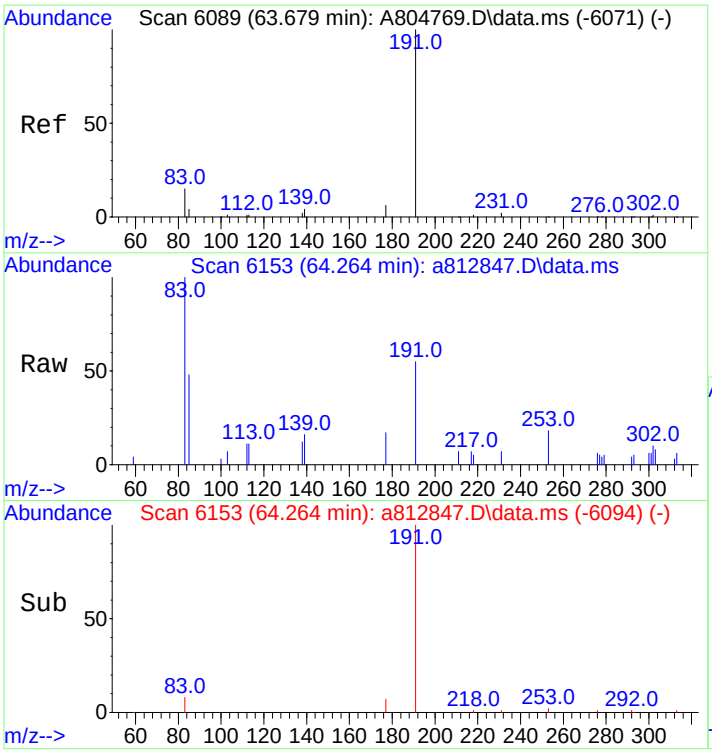




#126
Tetrakishomohopane-22R (T33)
Concen: 371.63 ng/ml
RT: 61.870 min Scan# 5891
Delta R.T. -0.046 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

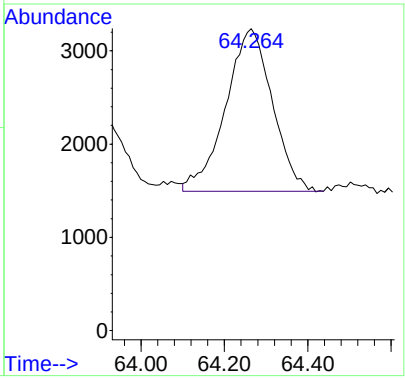
Tgt Ion:191 Resp: 23513

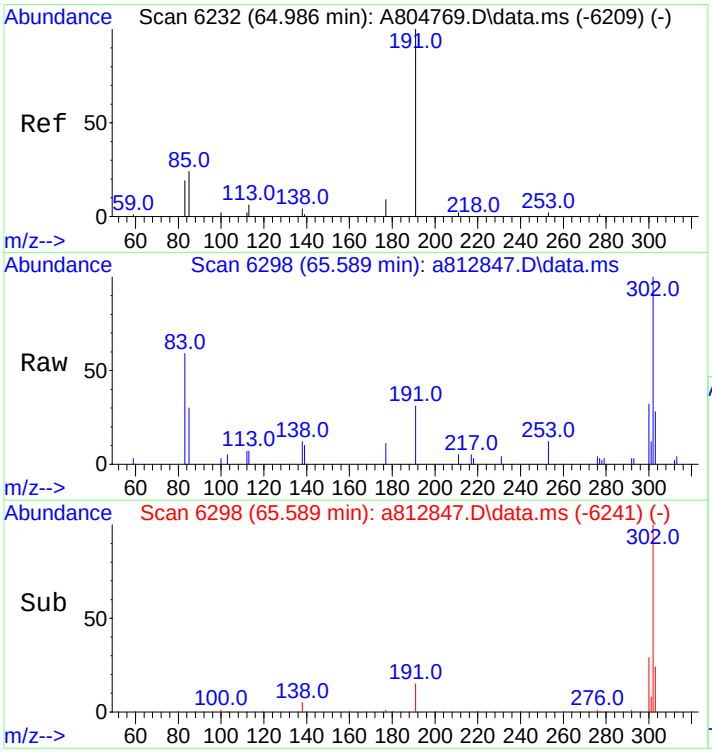




#127
Pentakishomohopane-22S (T34)
Concen: 213.67 ng/ml
RT: 64.264 min Scan# 6153
Delta R.T. 0.037 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

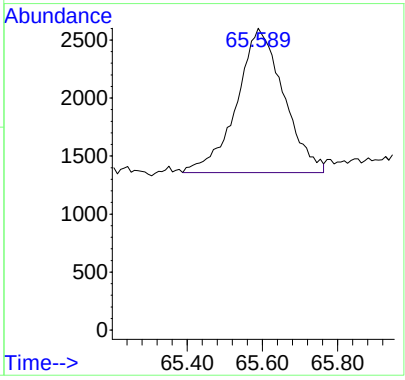
Tgt Ion:191 Resp: 13519

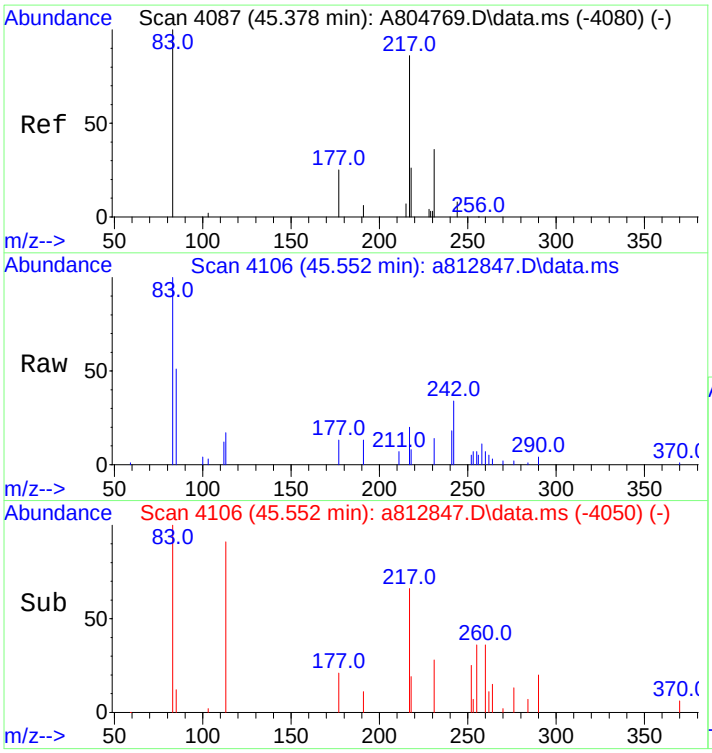




#128
Pentakishomohopane-22R (T35)
Concen: 170.98 ng/ml
RT: 65.589 min Scan# 6298
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

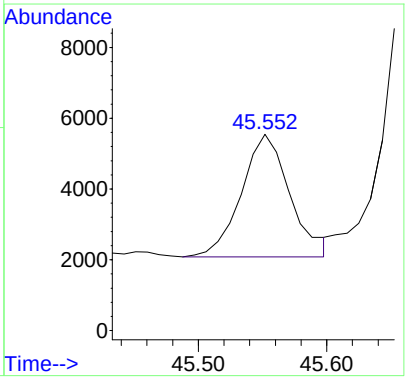
Tgt Ion:191 Resp: 10818

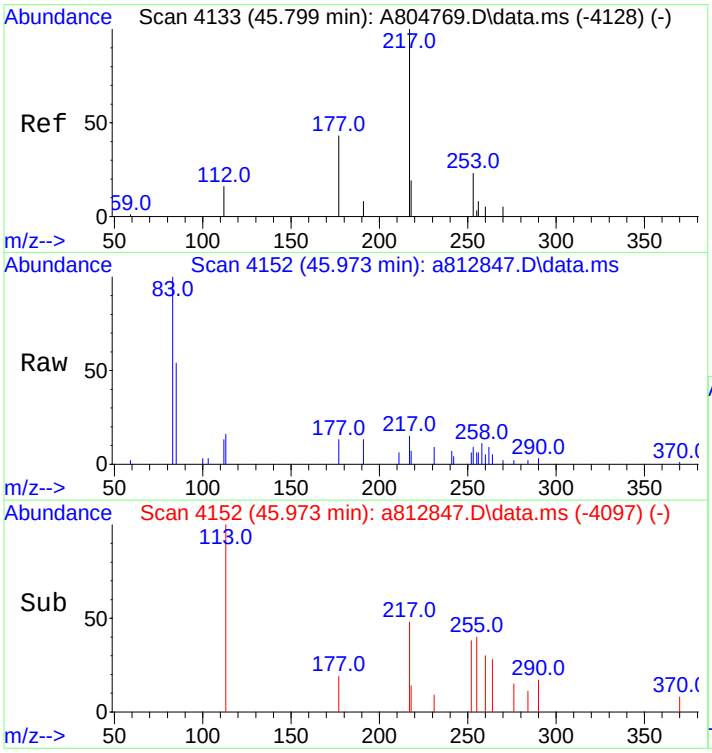




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 295.33 ng/ml
RT: 45.552 min Scan# 4106
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

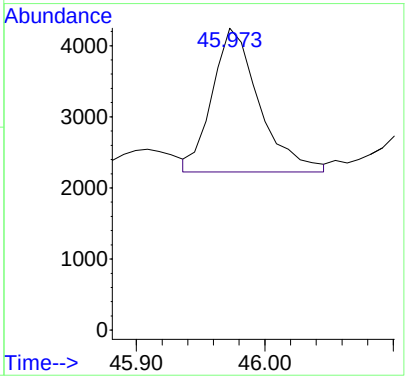
Tgt Ion:217 Resp: 9098

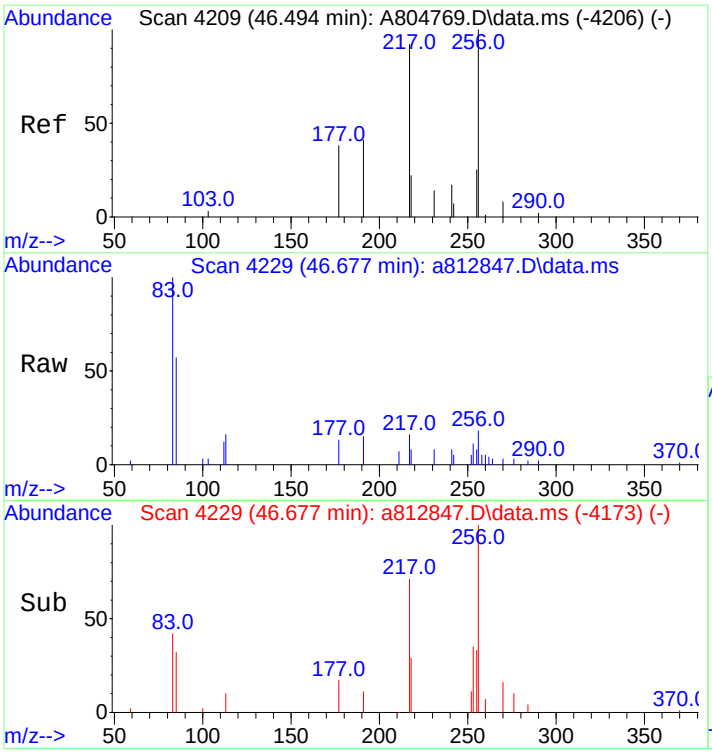




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 167.05 ng/ml
RT: 45.973 min Scan# 4152
Delta R.T. -0.000 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

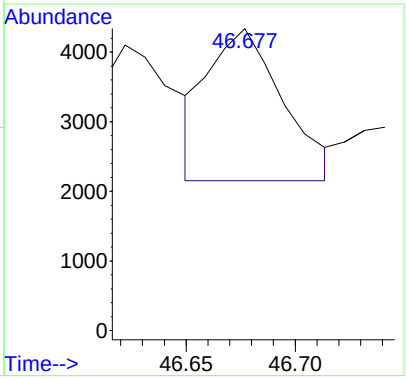
Tgt Ion:217 Resp: 5146

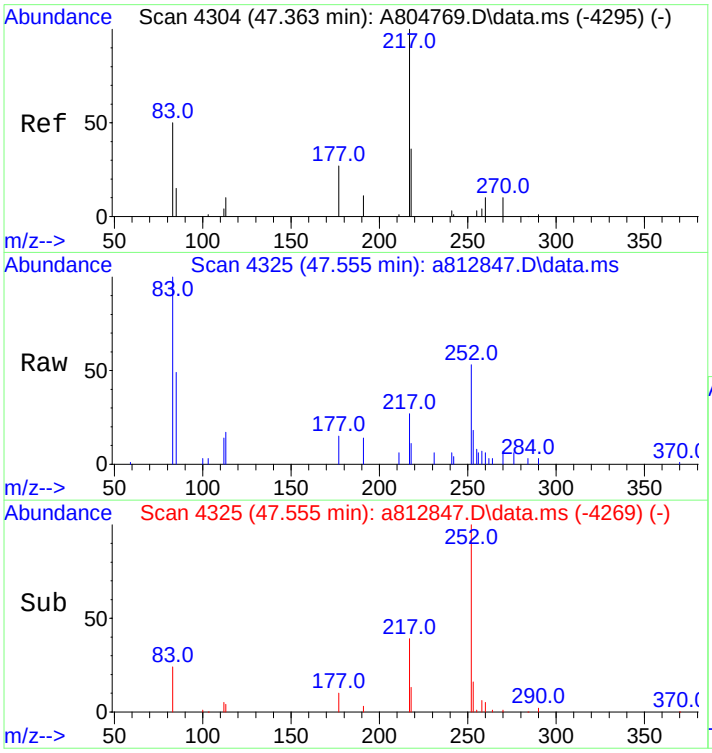




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 168.93 ng/ml m
RT: 46.677 min Scan# 4229
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

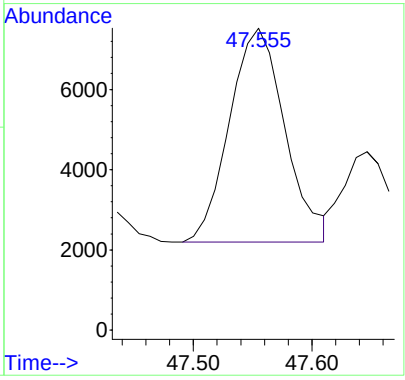
Tgt Ion:217 Resp: 5204

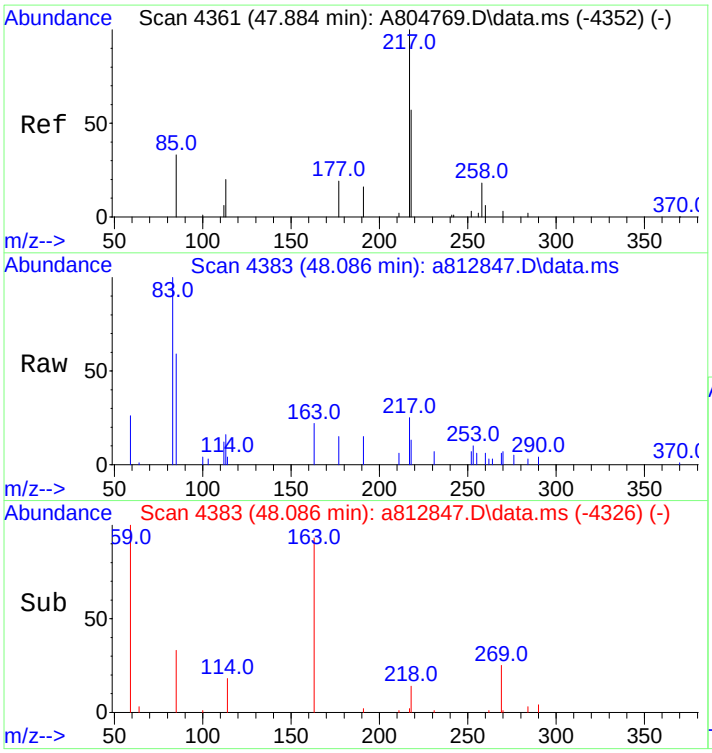




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 561.65 ng/ml
RT: 47.555 min Scan# 4325
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

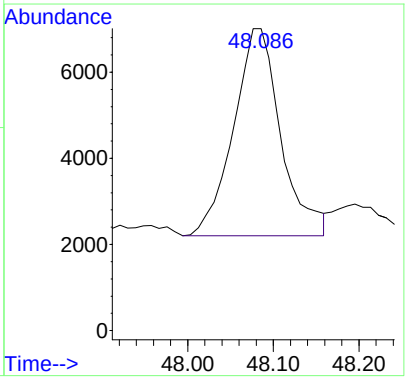
Tgt Ion:217 Resp: 17302

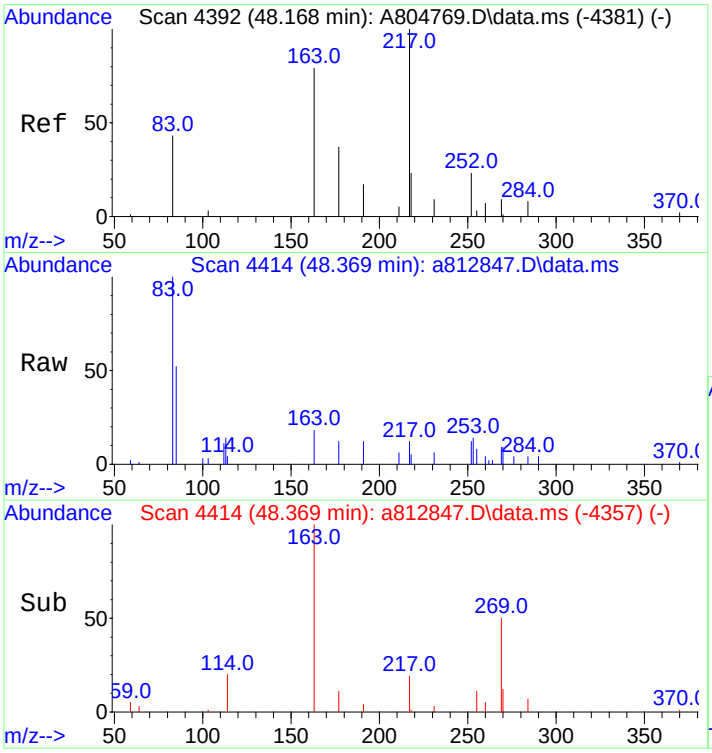




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 602.32 ng/ml
RT: 48.086 min Scan# 4383
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

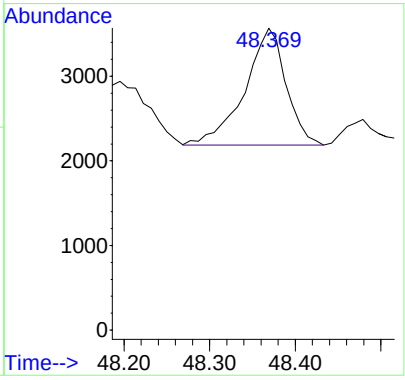
Tgt Ion:217 Resp: 18555

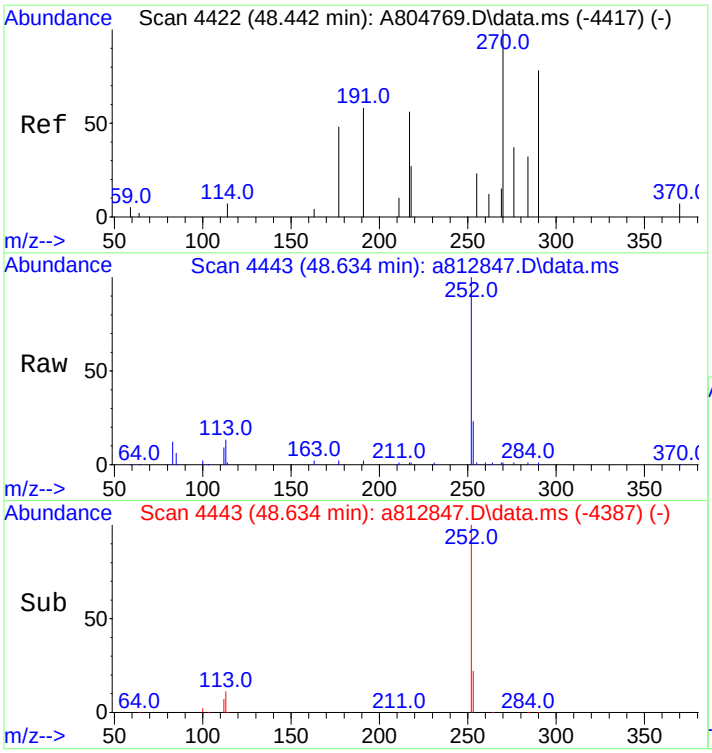




#135
Unknown Sterane (S18)
Concen: 150.98 ng/ml
RT: 48.369 min Scan# 4414
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

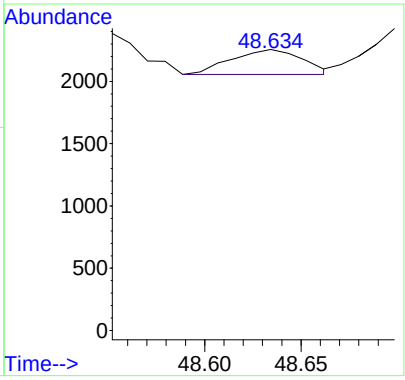
Tgt Ion:217 Resp: 4651

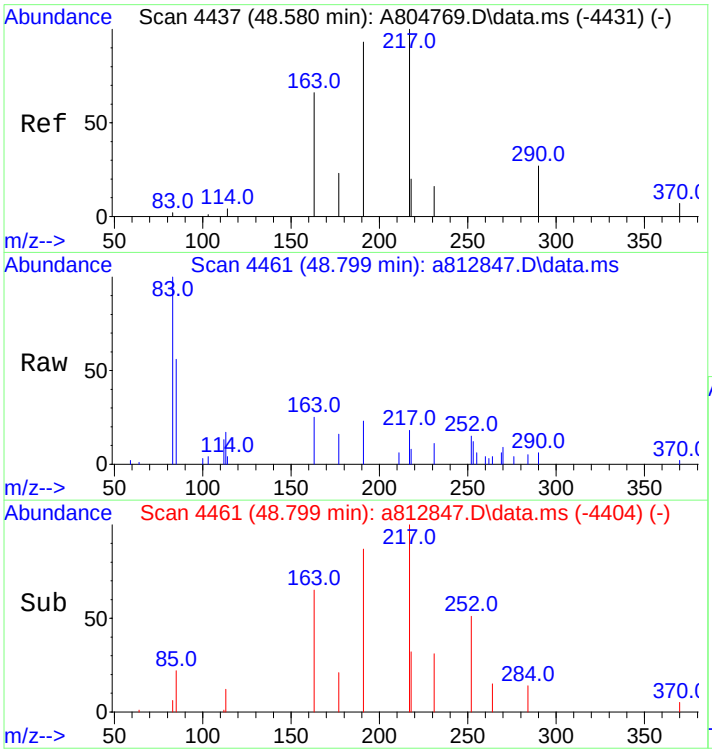




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 16.81 ng/ml
RT: 48.634 min Scan# 4443
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

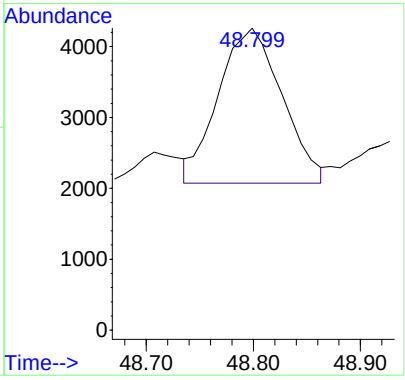
Tgt Ion:217 Resp: 518

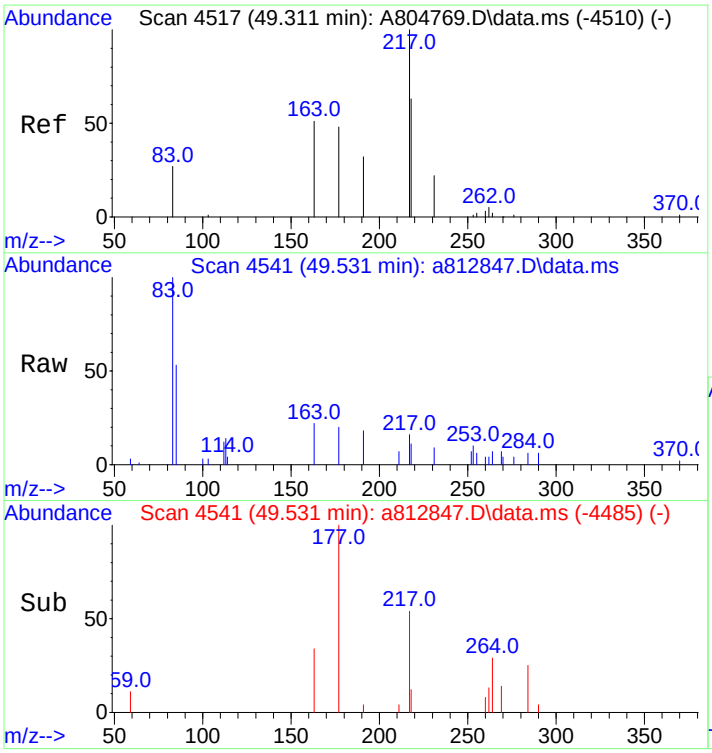




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 293.00 ng/ml m
RT: 48.799 min Scan# 4461
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

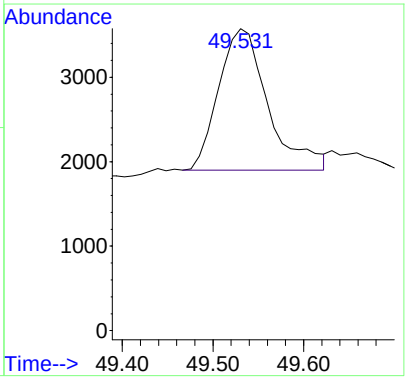
Tgt Ion:217 Resp: 9026

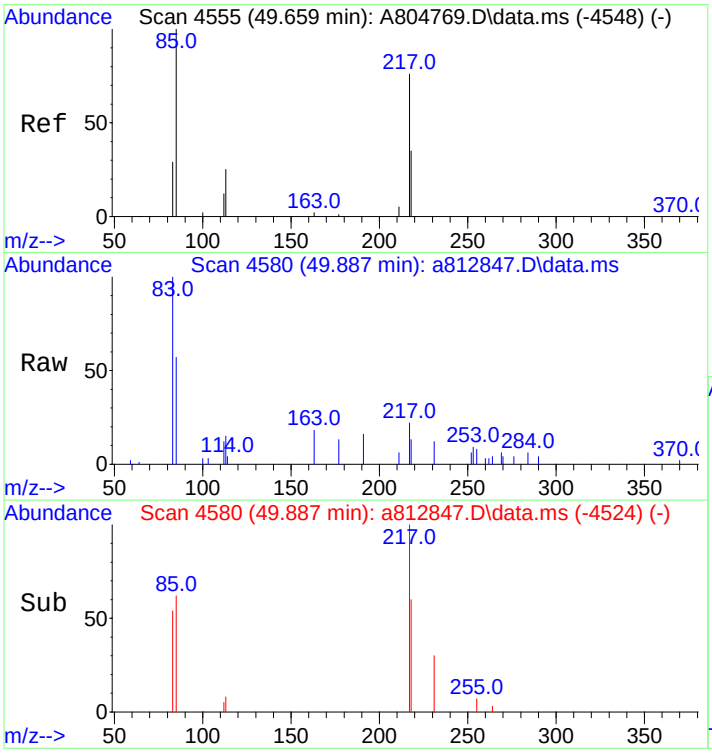




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 205.87 ng/ml
RT: 49.531 min Scan# 4541
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

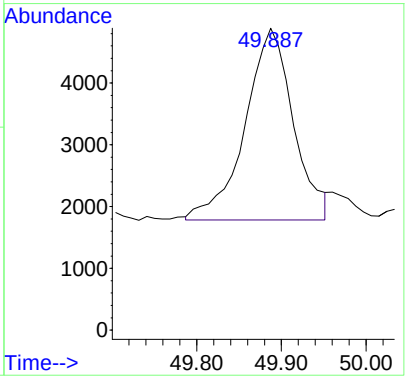
Tgt Ion:217 Resp: 6342

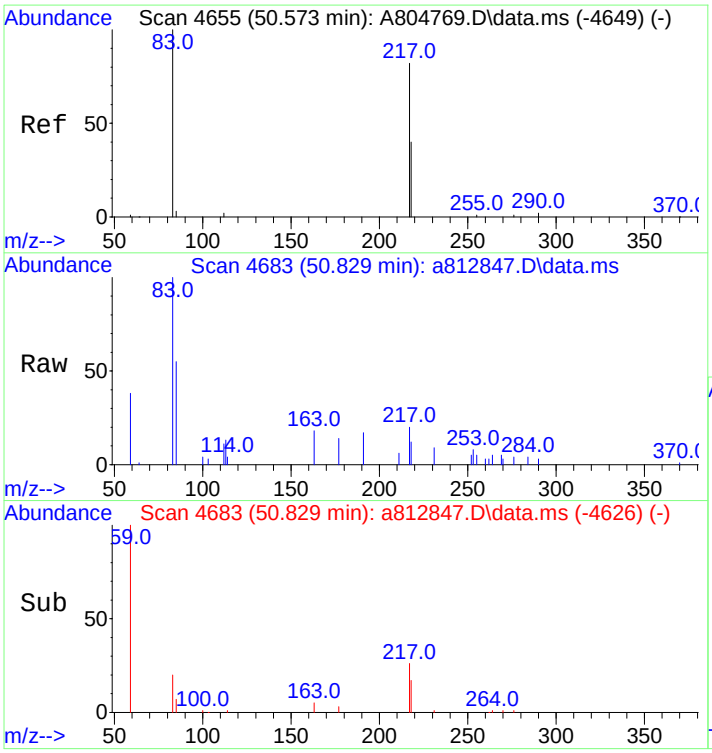




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 399.44 ng/ml m
RT: 49.887 min Scan# 4580
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

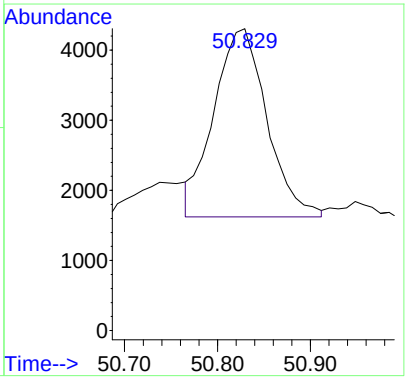
Tgt Ion:217 Resp: 12305

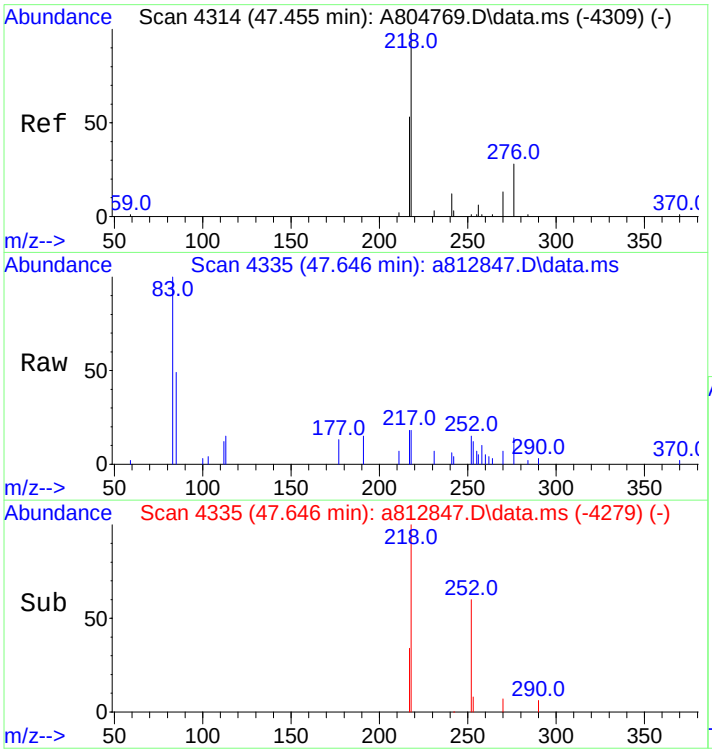




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 345.45 ng/ml m
RT: 50.829 min Scan# 4683
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

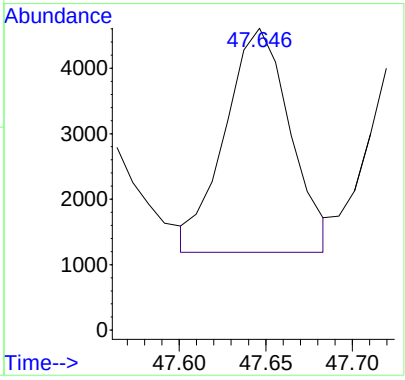
Tgt Ion:217 Resp: 10642

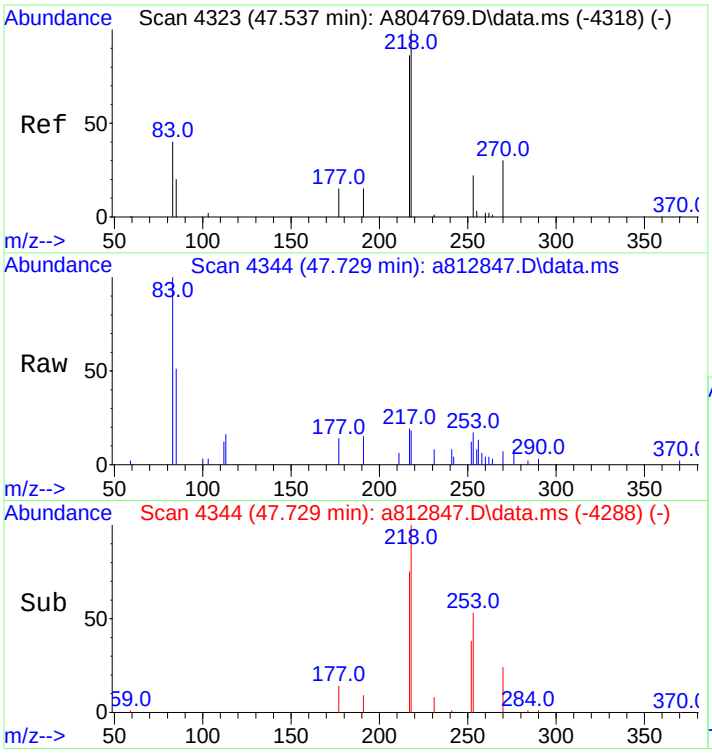




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 291.02 ng/ml m
RT: 47.646 min Scan# 4335
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

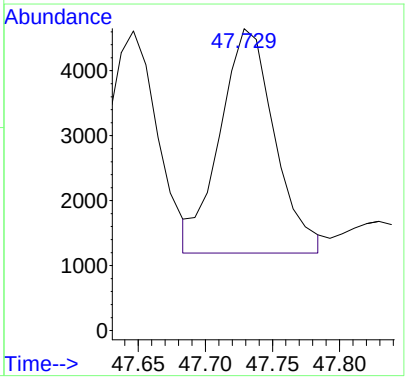
Tgt Ion:218 Resp: 8965

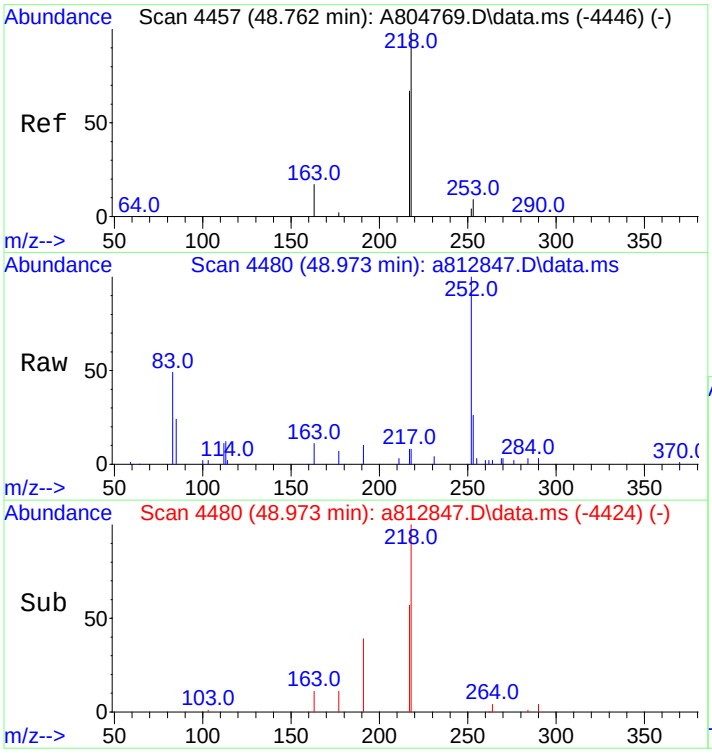




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 317.15 ng/ml m
RT: 47.729 min Scan# 4344
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

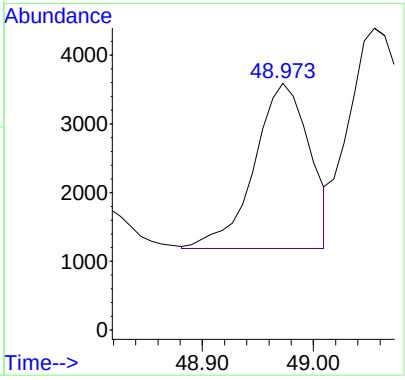
Tgt Ion:218 Resp: 9770

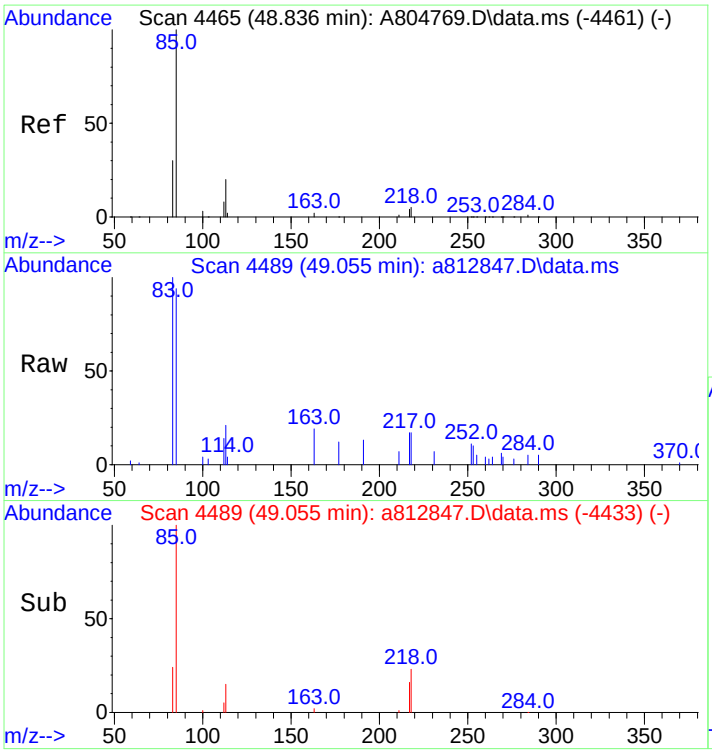




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 271.44 ng/ml m
RT: 48.973 min Scan# 4480
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

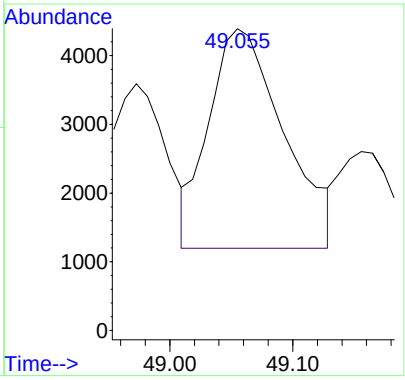
Tgt Ion:218 Resp: 8362

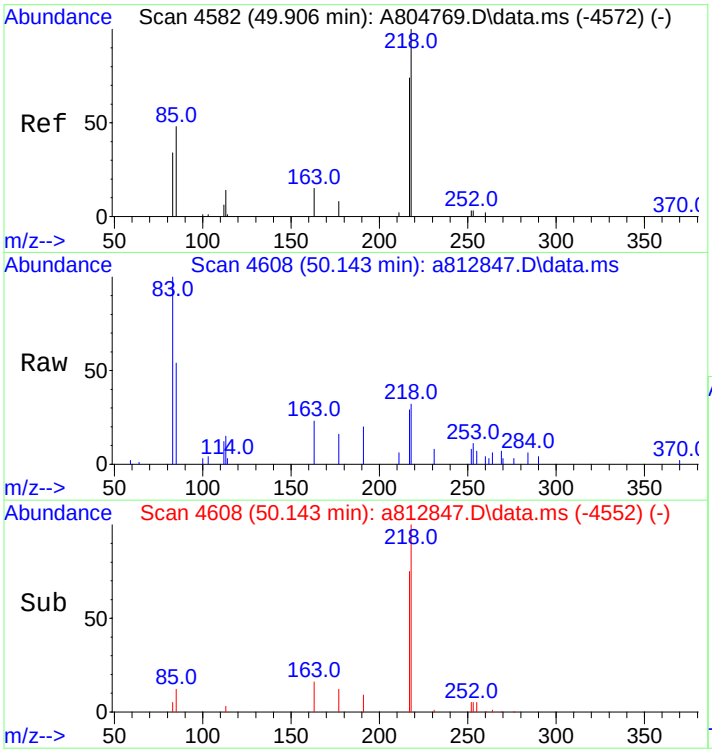




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 440.95 ng/ml m
RT: 49.055 min Scan# 4489
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

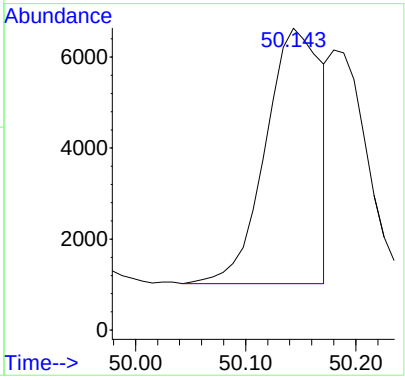
Tgt Ion:218 Resp: 13584

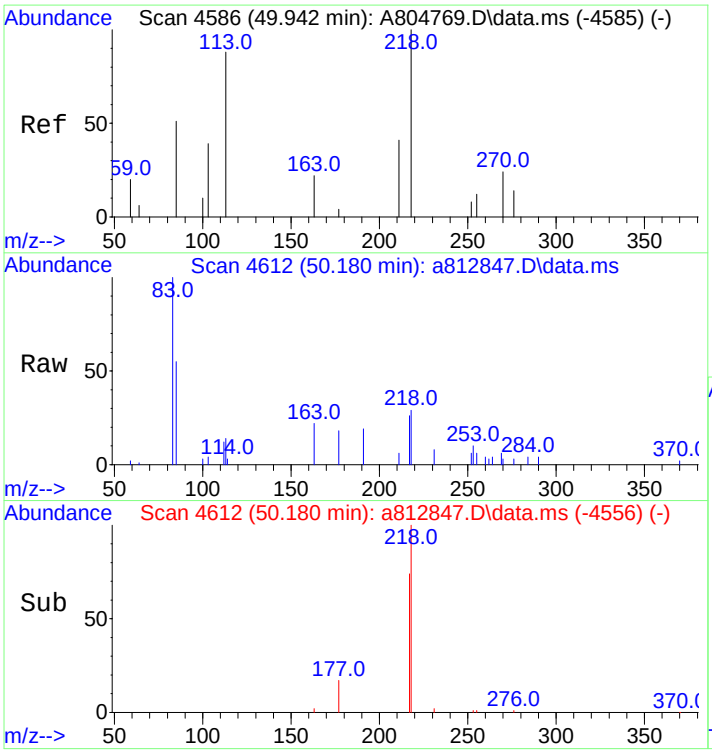




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 645.69 ng/ml
RT: 50.143 min Scan# 4608
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

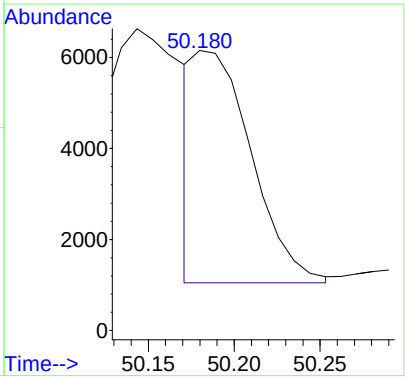
Tgt Ion:218 Resp: 19891

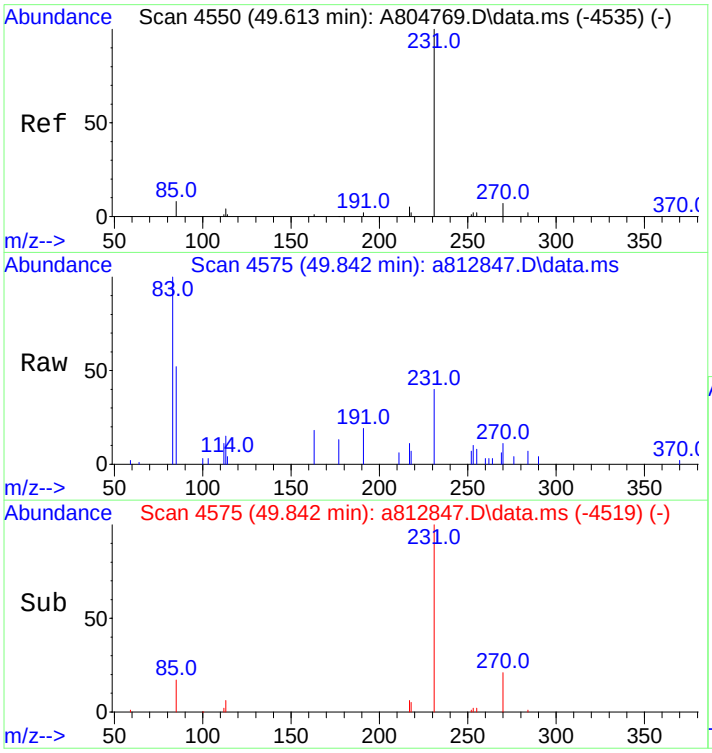




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 384.18 ng/ml m
RT: 50.180 min Scan# 4612
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

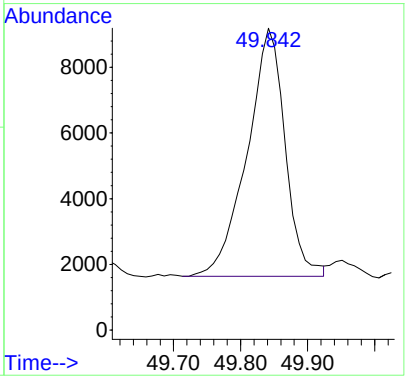
Tgt Ion:218 Resp: 11835

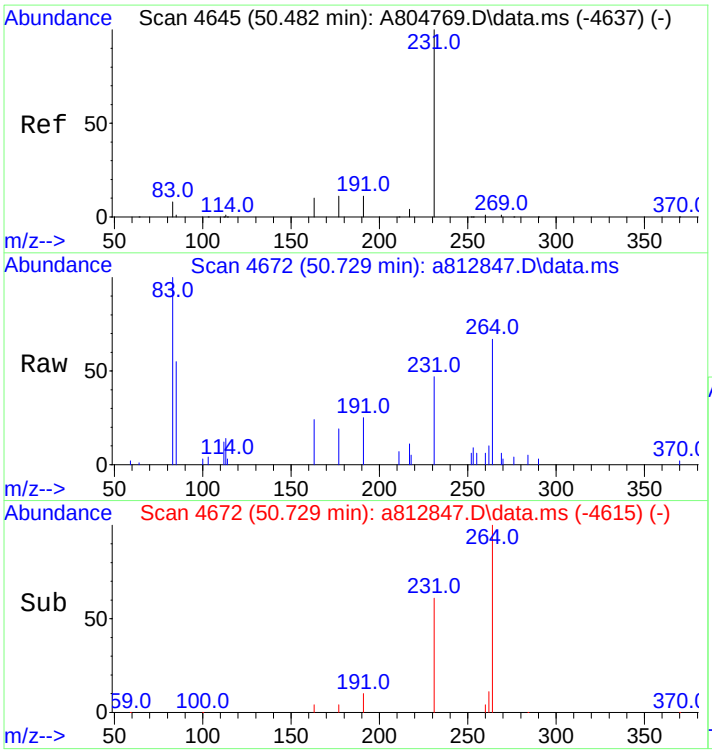




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 967.15 ng/mL
RT: 49.842 min Scan# 4575
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

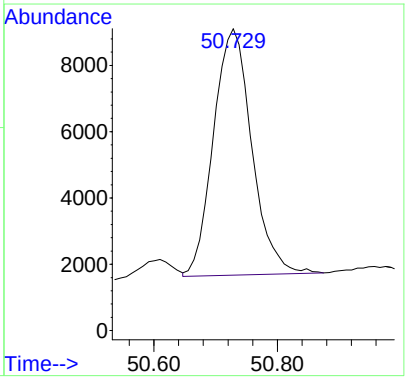
Tgt Ion:231 Resp: 29794

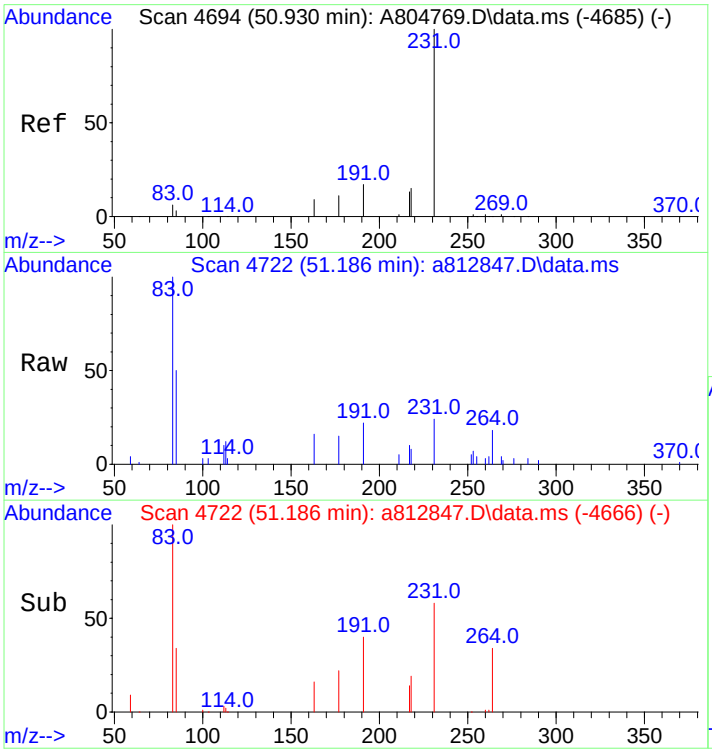




#148
C28,20S-triaromatic steroid
Concen: 1043.83 ng/mL
RT: 50.729 min Scan# 4672
Delta R.T. 0.018 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

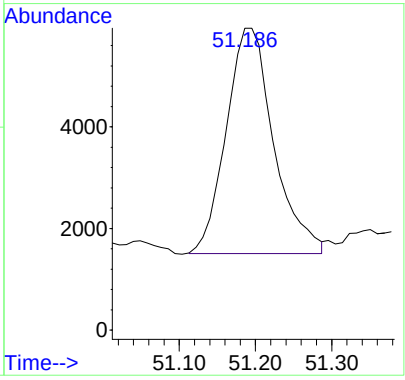
Tgt Ion:231 Resp: 32156

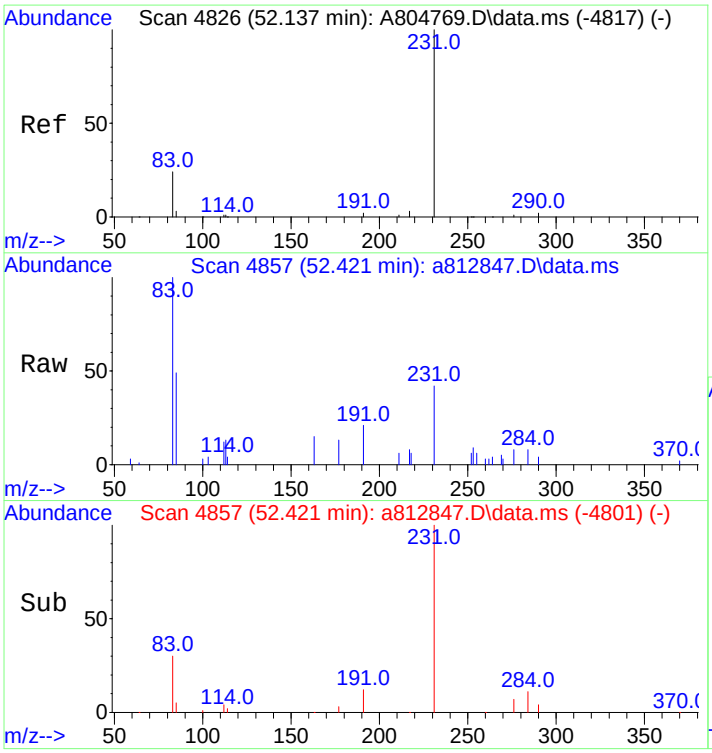




#149
C27,20R-triaromatic steroid
Concen: 623.81 ng/mL m
RT: 51.186 min Scan# 4722
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

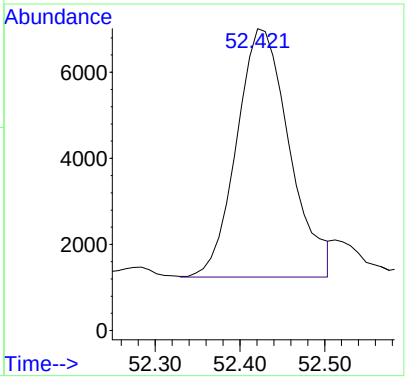
Tgt Ion:231 Resp: 19217





#150
C28,20R-triaromatic steroid
Concen: 812.64 ng/mL m
RT: 52.421 min Scan# 4857
Delta R.T. 0.009 min
Lab File: a812847.D
Acq: 19 Nov 2012 9:36 pm

Tgt Ion:231 Resp: 25034



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	59571	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	91232	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	87289	369.741	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.97%#			
42) Phenanthrene-d10	32.843	188	85663	467.248	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.72%#			
83) Benzo[b]fluoranthene-d12	47.345	264	81068	466.244	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.62%#			
88) Benzo[a]pyrene-d12	48.552	264	79119	460.573	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.06%#			
129) 5B(H)Cholane - Surr	44.054	217	18910	566.846	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 56.68%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	1980	37.402	ng/mL	100
4) cis-Decalin	17.879	138	123	3.172	ng/mL	100
5) C1-Decalins	18.143	152	4287M5	80.981	ng/mL	
6) C2-Decalins	19.914	166	7997M5	151.062	ng/mL	
7) C3-Decalins	22.387	180	10428M5	196.983	ng/mL	
8) C4-Decalins	25.781	194	20269M5	382.877	ng/mL	
10) Naphthalene	20.087	128	158079	585.294	ng/mL#	100
11) C1-Naphthalenes	22.779	142	168165M5	622.638	ng/mL	
12) C2-Naphthalenes	25.617	156	309035M5	1144.214	ng/mL	
13) C3-Naphthalenes	27.953	170	469007M5	1736.517	ng/mL	
14) C4-Naphthalenes	30.718	184	438564M5	1623.800	ng/mL	
16) 2-Methylnaphthalene	22.779	142	95630	594.399	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	71031	471.489	ng/mL#	100
18) Benzothiophene	20.306	134	4725	21.644	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	11449M5	52.444	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	29188M5	133.701	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	66878M5	306.347	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	79573M5	364.499	ng/mL	
23) Biphenyl	24.659	154	20910	102.154	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	68466	497.245	ng/mL#	100
25) Dibenzofuran	27.743	168	87040	403.068	ng/mL	98
26) Acenaphthylene	26.375	152	38544	157.224	ng/mL#	100
27) Acenaphthene	27.105	153	67956	464.414	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.656	170	30267M3	255.226	ng/mL	
29) Fluorene	29.121	166	105724M3	644.196	ng/mL	
30) C1-Fluorenes	31.484	180	77848M5	474.342	ng/mL	
31) C2-Fluorenes	33.683	194	175360M5	1068.501	ng/mL	
32) C3-Fluorenes	35.509	208	212164M5	1292.755	ng/mL	
33) Dibenzothiophene	32.442	184	103685	459.429	ng/mL#	71
34) 4-Methyldibenzothiophe...	34.212	198	85095	377.057	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.559	198	72202M3	319.928	ng/mL	
36) 1-Methyldibenzothiophe...	34.988	198	34204	151.558	ng/mL#	100
37) OTP	34.596	198	6410M3	28.403	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	220219M5	975.792	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	382199M5	1693.527	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	406551M5	1801.431	ng/mL	
41) C4-Dibenzothiophenes	39.389	240	284199M5	1259.288	ng/mL	
43) Phenanthrene	32.935	178	1215736	5596.860	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.897	192	153433	706.356	ng/mL	98
45) 2-Methylphenanthrene(2MP)	35.007	192	182718	841.175	ng/mL	96
46) 2-Methylanthracene(2MA)	35.171	192	46598M3	214.522	ng/mL	
47) 9/4-Methylphenanthrene...	35.353	192	169839	781.884	ng/mL	85
48) 1-Methylphenanthrene(1MP)	35.445	192	118854M3	547.166	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.007	192	683283M5	3145.616	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.170	206	632113M5	2910.046	ng/mL	
52) C3-Phenanthrenes/Anthr...	39.005	220	440464M5	2027.755	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.178	234	245269M5	1129.140	ng/mL	
55) Anthracene	33.117	178	223168M3	1102.793	ng/mL	
56) Carbazole	33.783	167	136607M3	646.948	ng/mL	
57) 1-Methylphenanthrene	35.445	192	117777M3	764.899	ng/mL	
58) Fluoranthene	37.718	202	1954912M3	8737.179	ng/mL	
59) Benzo(b)fluorene	40.229	216	118461M3	915.246	ng/mL	
60) Pyrene	38.603	202	1674940	7400.933	ng/mL	94
61) C1-Fluoranthenes/Pyrenes	39.982	216	880142M5	3889.018	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.027	230	580334M5	2564.279	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.908	244	338280M5	1494.733	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.196	258	298750M5	1320.064	ng/mL	
66) Naphthobenzothiophene	42.447	234	168490M3	802.001	ng/ml	
67) Naphthobenzothiophene-...	42.447	234	167570M3	797.621	ng/mL	
68) Naphthobenzothiophene-...	42.785	234	35472M3	168.844	ng/mL	
69) Naphthobenzothiophene-...	43.077	234	41242M3	196.309	ng/mL	
70) C1-Naphthobenzothiophenes	43.844	248	200489M5	954.314	ng/ml	
71) C2-Naphthobenzothiophenes	45.845	262	245867M5	1170.310	ng/ml	
72) C3-Naphthobenzothiophenes	47.454	276	187862M5	894.210	ng/ml	
73) C4-Naphthobenzothiophenes	48.552	290	139022M5	661.735	ng/mL	
75) Benz[a]anthracene	43.379	228	710979	3554.865	ng/mL	98
77) Chrysene/Triphenylene	43.534	228	882328	4358.284	ng/mL	99
78) C1-Chrysenes	45.004	242	390070M5	1926.762	ng/mL	
79) C2-Chrysenes	46.714	256	294910M5	1456.716	ng/mL	
80) BBF-D12 Surr BKGD	47.336	256	4103	20.267	ng/mL	100
81) C3-Chrysenes	48.333	270	273690M5	1351.899	ng/mL	
82) C4-Chrysenes	49.320	284	155412M5	767.662	ng/mL	
84) Benzo[b]fluoranthene	47.436	252	825421	3842.748	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.509	252	759761	3241.729	ng/mL	96
86) Benzo[a]fluoranthene	47.820	252	136674	583.157	ng/mL#	1
87) Benzo[e]pyrene	48.451	252	691472	3124.274	ng/mL	96
89) Benzo[a]pyrene	48.653	252	832163	4064.701	ng/mL	94
90) Perylene	48.964	252	257226	1150.243	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.573	276	614814M3	2827.034	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.618	278	144807M6	679.290	ng/mL	
93) Benzo[g,h,i]perylene	54.916	276	637790	2584.212	ng/mL	100
94) Hopane (T19)	52.649	191	142436	2078.856	ng/mL#	88
96) C23 Tricyclic Terpane ...	41.078	191	27542	401.976	ng/ml	100
97) C24 Tricyclic Terpane ...	41.799	191	18478	269.687	ng/ml	100
98) C25 Tricyclic Terpane ...	43.287	191	21037M3	307.035	ng/ml	
99) C24 Tetracyclic Terpan...	44.611	191	10692M3	156.050	ng/ml	
100) C26 Tricyclic Terpane-...	44.346	191	9276M3	135.383	ng/ml	
101) C26 Tricyclic Terpane-...	44.438	191	7582M3	110.659	ng/ml	
102) C28 Tricyclic Terpane-...	46.723	191	8885M4	129.677	ng/ml	
103) C28 Tricyclic Terpane-...	46.887	191	9918	144.753	ng/ml	100
104) C29 Tricyclic Terpane-...	47.409	191	8511	124.218	ng/ml	100
105) C29 Tricyclic Terpane-...	47.619	191	9527M3	139.047	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.781	191	26301	383.864	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.863	191	10197M3	148.825	ng/mL	
108) C30 Tricyclic Terpane-22R	49.110	191	7592	110.805	ng/mL	100
109) 17a(H)-22,29,30-Trisno...	49.339	191	34486M3	503.324	ng/ml	
110) 17a/b,21b/a 28,30-Bisn...	50.555	191	9582	139.849	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.336	191	6272M3	91.540	ng/ml	
112) 30-Norhopane (T15)	51.241	191	93810	1369.159	ng/ml	100
113) 18a(H)-30-Norneohopane...	51.351	191	27095M3	395.452	ng/ml	
114) 17a(H)-Diahopane (X)	51.479	191	8431M3	123.051	ng/ml	
115) 30-Normoretane (T17)	52.046	191	14154	206.578	ng/ml	100
116) 18a(H)&18b(H)-Oleanane...	52.457	191	9511	138.813	ng/ml	100
117) Moretane (T20)	53.363	191	26857M3	391.978	ng/ml	
118) 30-Homohopane-22S (T21)	54.496	191	48832	712.704	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

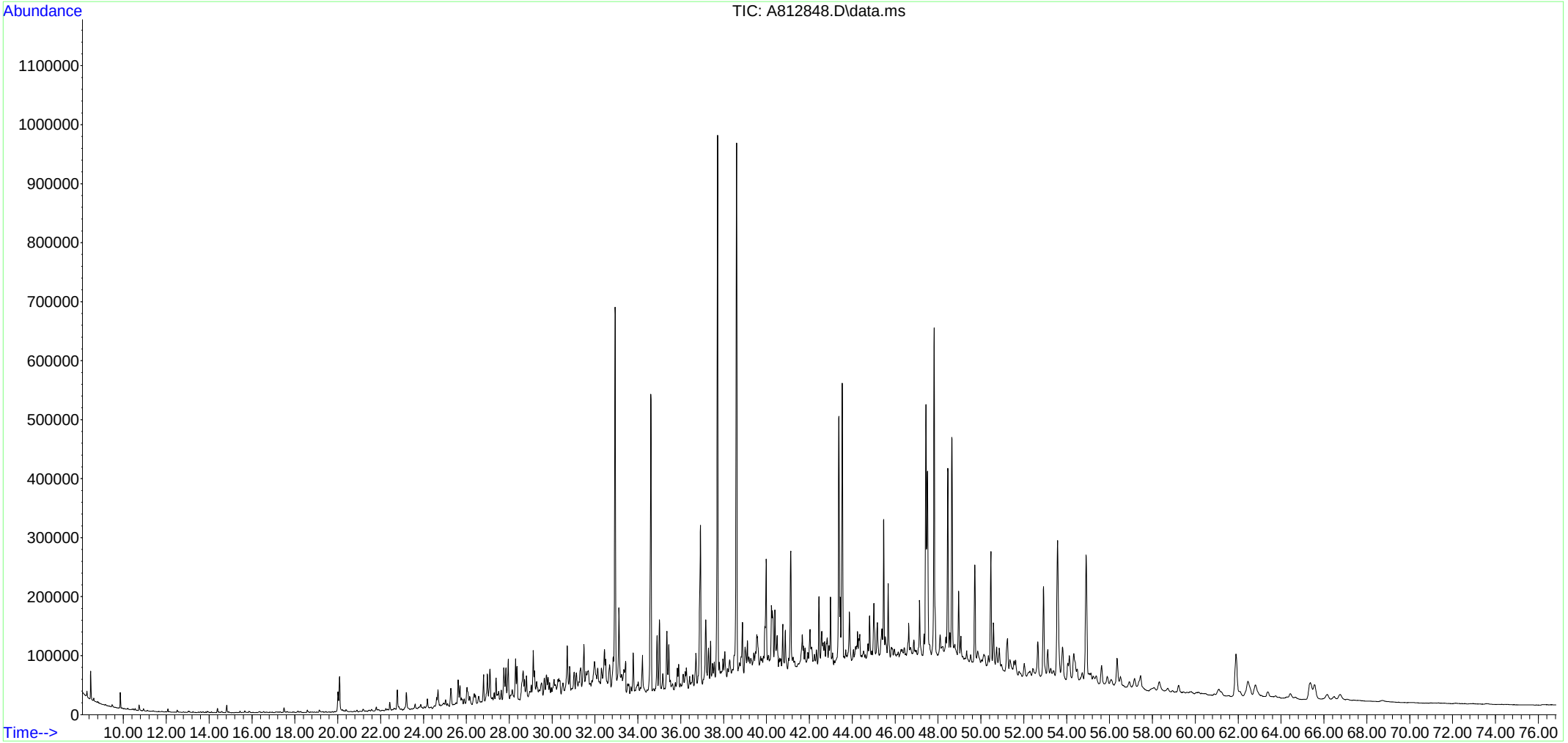
Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119) 30-Homohopane-22R (T22)	54.733	191		43621	636.649	ng/ml	100
120) Gammacerane/C32-diahopane	55.300	191		14855M4	216.809	ng/mL	
121) 30,31-Bishomohopane-22...	56.077	191	G	54641	797.486	ng/ml	100
122) 30,31-Bishomohopane-22...	56.497	191		24254	353.988	ng/ml	100
123) 30,31-Trishomohopane-2...	58.297	191		28148	410.821	ng/ml	100
124) 30,31-Trishomohopane-2...	58.937	191		14500	211.628	ng/ml	100
125) Tetrakishomohopane-22S...	61.048	191		25813	376.741	ng/ml	100
126) Tetrakishomohopane-22R...	61.888	191	G	28754	419.665	ng/ml	100
127) Pentakishomohopane-22S...	64.273	191		16708M3	243.854	ng/ml	
128) Pentakishomohopane-22R...	65.608	191		12910M4	188.422	ng/ml	
130) 13b(H),17a(H)-20S-Diac...	45.552	217		9794	293.585	ng/ml	100
131) 13b(H),17a(H)-20R-Diac...	45.982	217		5059M3	151.648	ng/ml	
132) 13b,17a-20S-Methyldiac...	46.677	217		5976M3	179.136	ng/ml	
133) 14a,17a-20S-Chol/13b,1...	47.555	217		19257	577.247	ng/ml	100
134) 14a,17a-20R-Chol/13b,1...	48.086	217		20885	626.048	ng/ml	100
135) Unknown Sterane (S18)	48.369	217		5727	171.672	ng/ml	100
136) 13a,17b-20S-Ethyldiach...	48.644	217		447	13.399	ng/ml	100
137) 14a,17a-20S-Methylchol...	48.799	217		9494	284.592	ng/ml	100
138) 14a,17a-20R-Methylchol...	49.540	217		7545M3	226.169	ng/ml	
139) 14a(H),17a(H)-20S-Ethy...	49.887	217		14465M3	433.603	ng/ml	
140) 14a(H),17a(H)-20R-Ethy...	50.829	217		13148M3	394.124	ng/ml	
141) 14b(H),17b(H)-20R-Chol...	47.647	218		10256M3	307.434	ng/ml	
142) 14b(H),17b(H)-20S-Chol...	47.738	218		10601M3	317.775	ng/ml	
143) 14b,17b-20R-Methylchol...	48.982	218		10533M3	315.737	ng/ml	
144) 14b,17b-20S-Methylchol...	49.064	218		15547M3	466.037	ng/ml	
145) 14b(H),17b(H)-20R-Ethy...	50.153	218		21128	633.333	ng/ml	100
146) 14b(H),17b(H)-20S-Ethy...	50.189	218		16131M3	483.543	ng/ml	
147) C26,20R- +C27,20S- tri...	49.851	231		35191	1054.885	ng/mL	100
148) C28,20S-triaromatic st...	50.729	231		39346M4	1179.435	ng/mL	
149) C27,20R-triaromatic st...	51.195	231		22986M4	689.028	ng/mL	
150) C28,20R-triaromatic st...	52.430	231		29445M3	882.643	ng/mL	

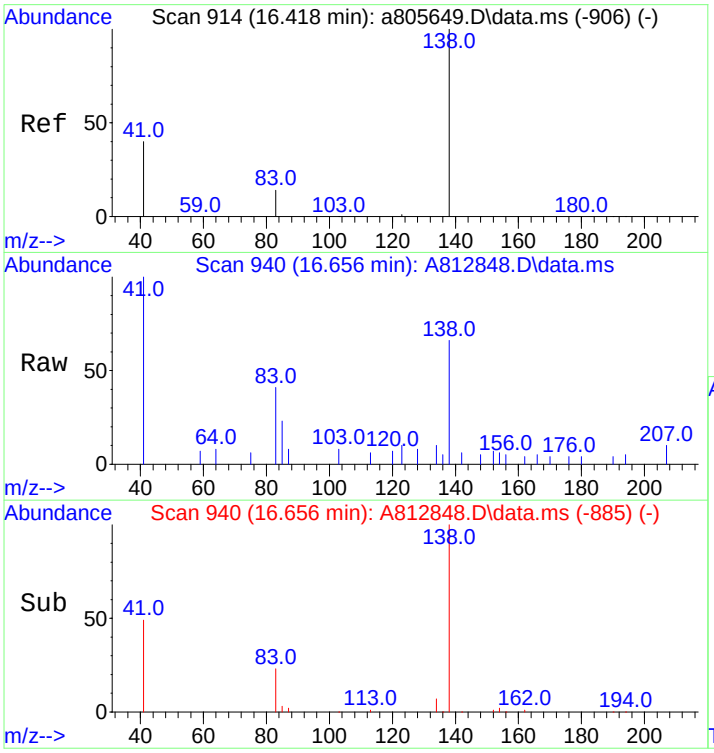
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812848.D
Acq On : 19 Nov 2012 11:00 pm
Operator : AC
Sample : 1210082-02
Misc : 1x
ALS Vial : 29 Sample Multiplier: 1

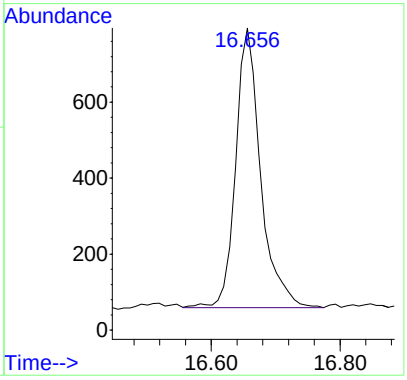
Quant Time: Nov 20 15:10:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

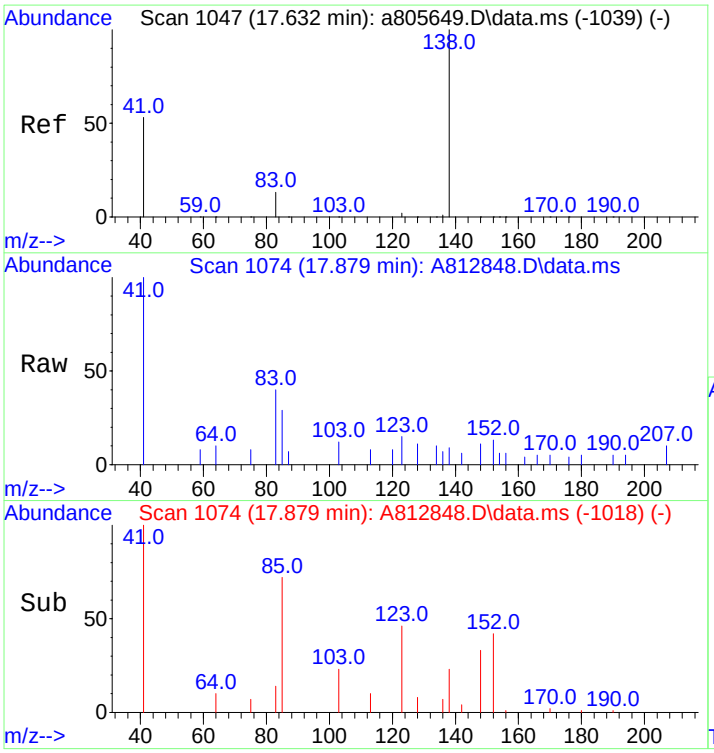




#3
trans-Decalin
Concen: 37.40 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

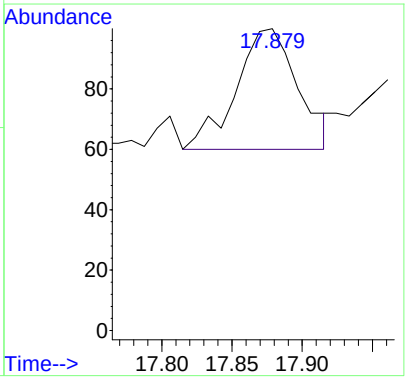
Tgt Ion:138 Resp: 1980

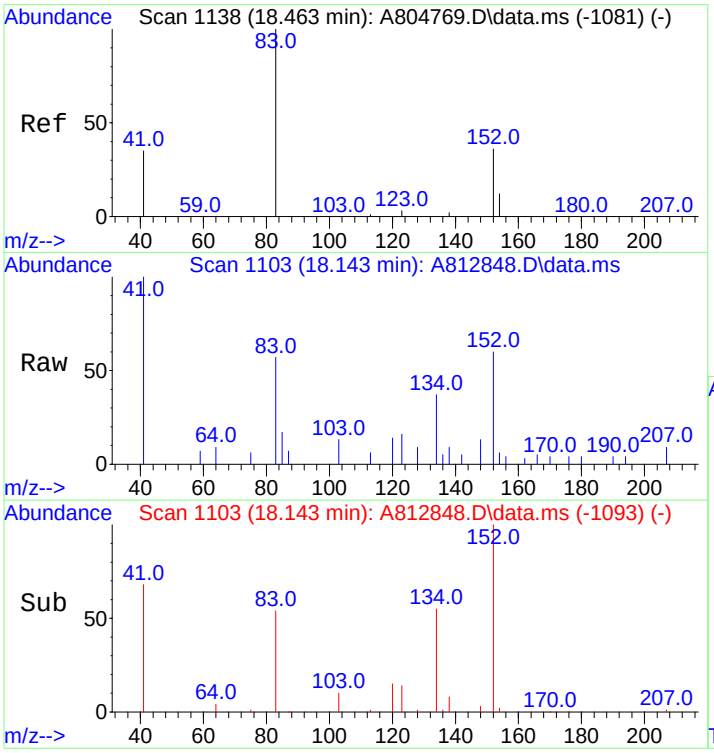




#4
cis-Decalin
Concen: 3.17 ng/mL
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

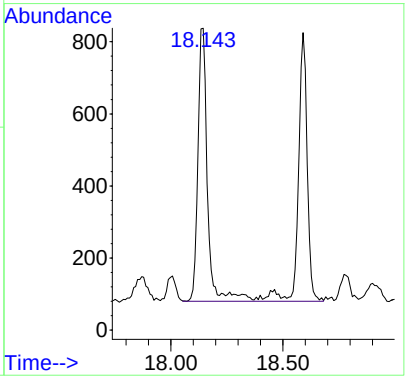
Tgt Ion:138 Resp: 123

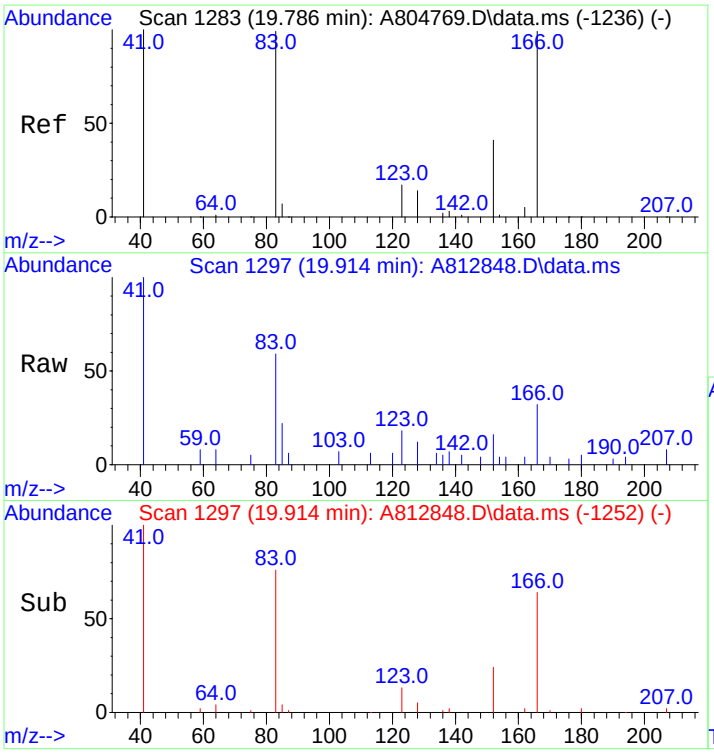




#5
C1-Decalins
Concen: 80.98 ng/mL m
RT: 18.143 min Scan# 1103
Delta R.T. -0.447 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

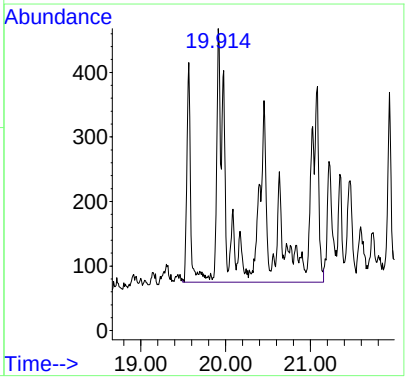
Tgt Ion:152 Resp: 4287

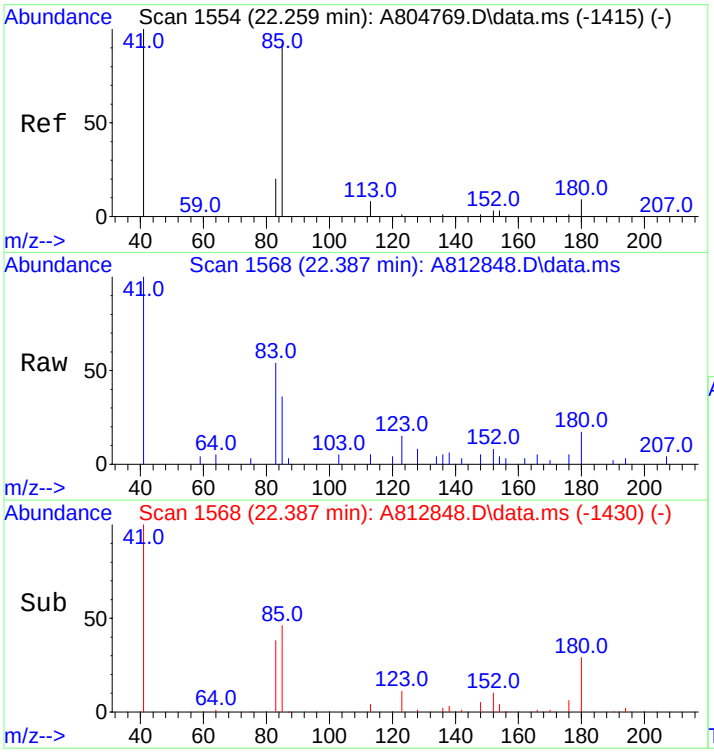




#6
C2-Decalins
Concen: 151.06 ng/mL m
RT: 19.914 min Scan# 1297
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

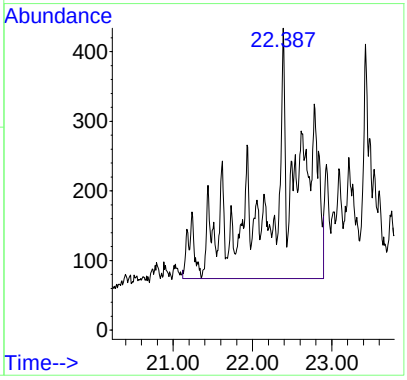
Tgt Ion:166 Resp: 7997

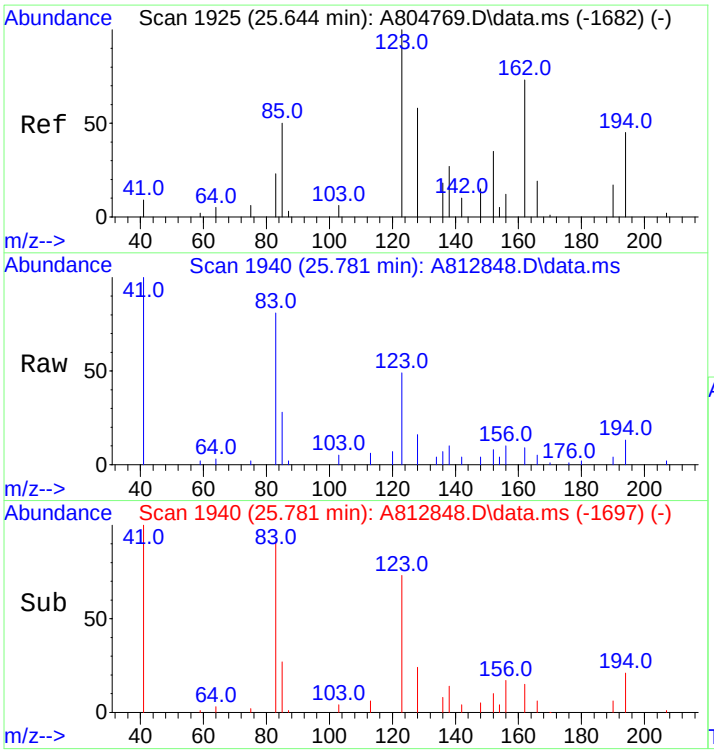




#7
C3-Decalins
Concen: 196.98 ng/mL m
RT: 22.387 min Scan# 1568
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

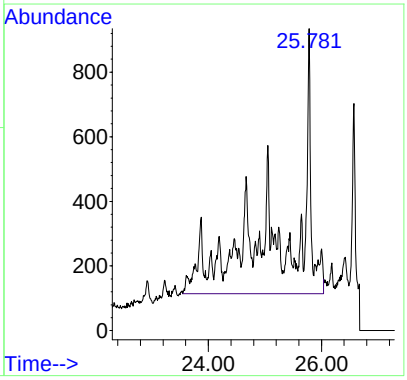
Tgt Ion:180 Resp: 10428

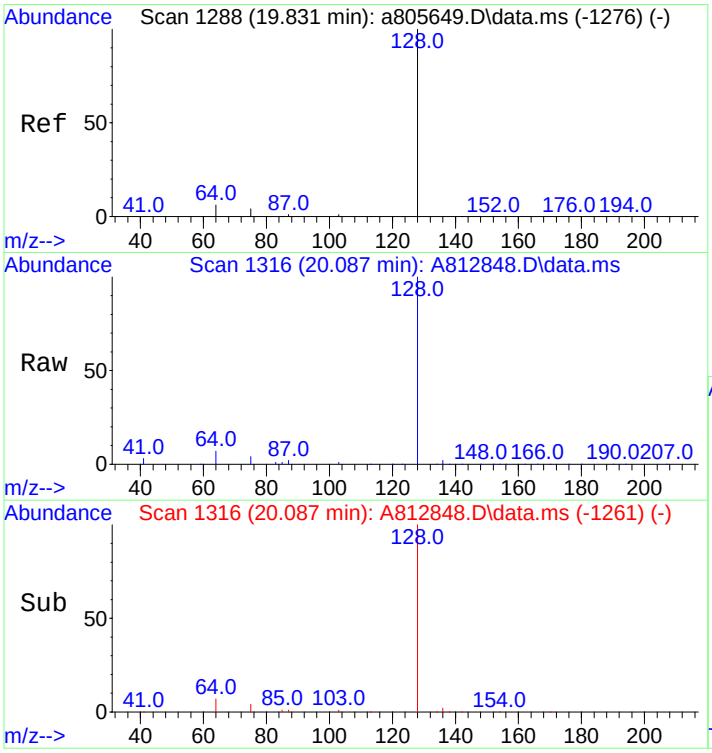




#8
C4-Decalins
Concen: 382.88 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:194 Resp: 20269

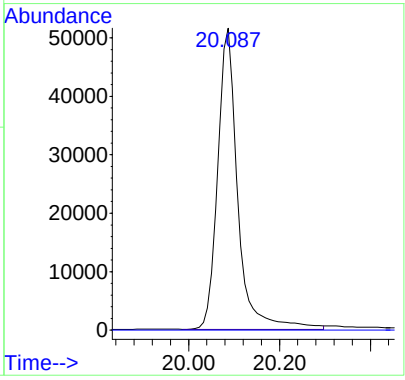


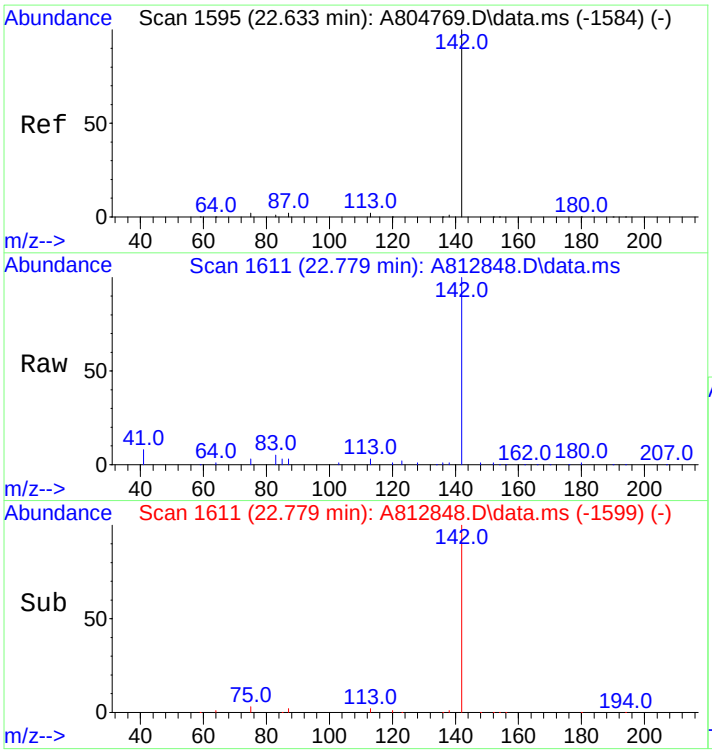


#10
Naphthalene
Concen: 585.29 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:128 Resp: 158079

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

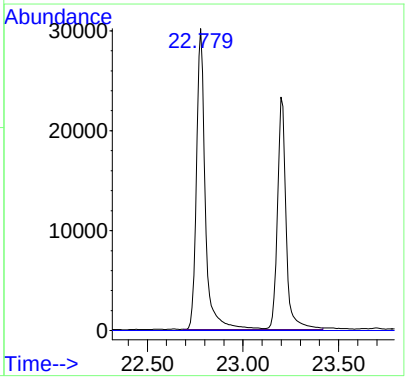


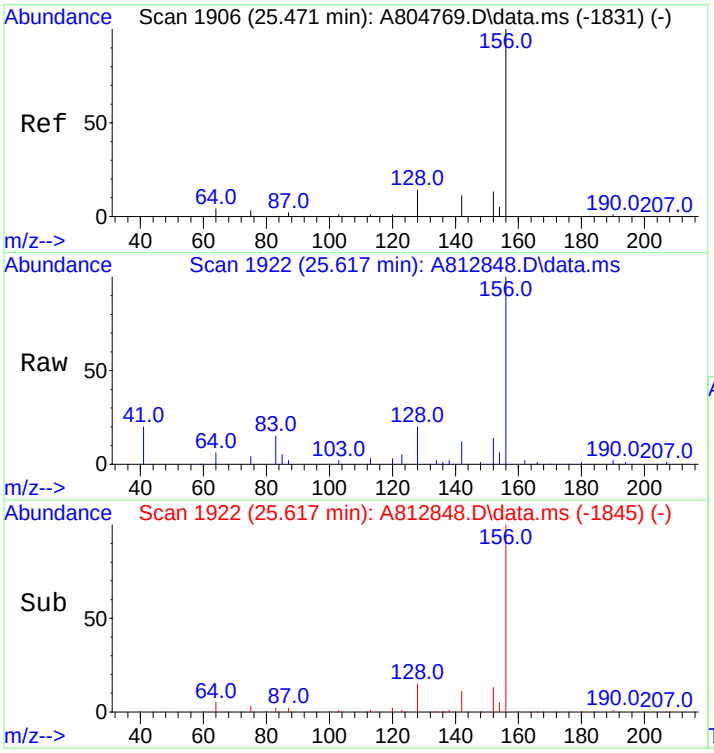


#11
C1-Naphthalenes
Concen: 622.64 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:142 Resp: 168165

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

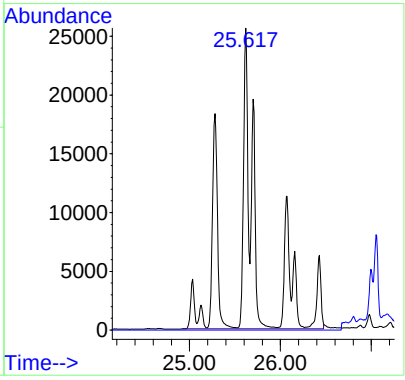


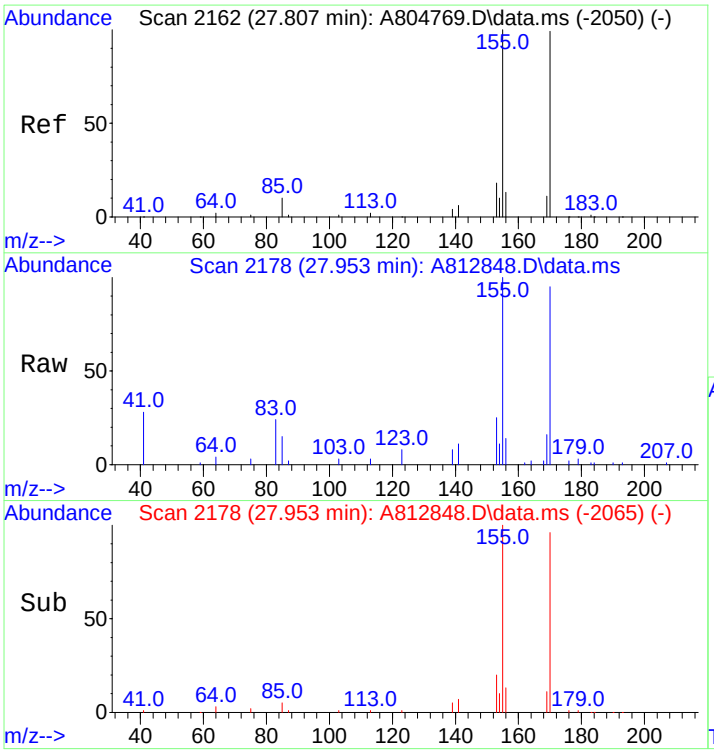


#12
C2-Naphthalenes
Concen: 1144.21 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:156 Resp: 309035

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

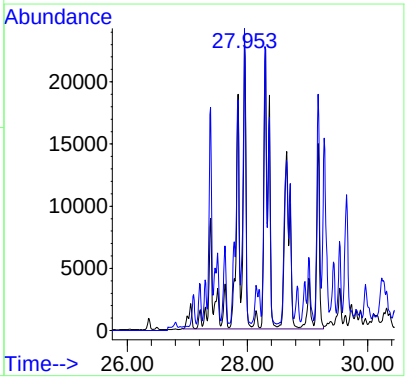


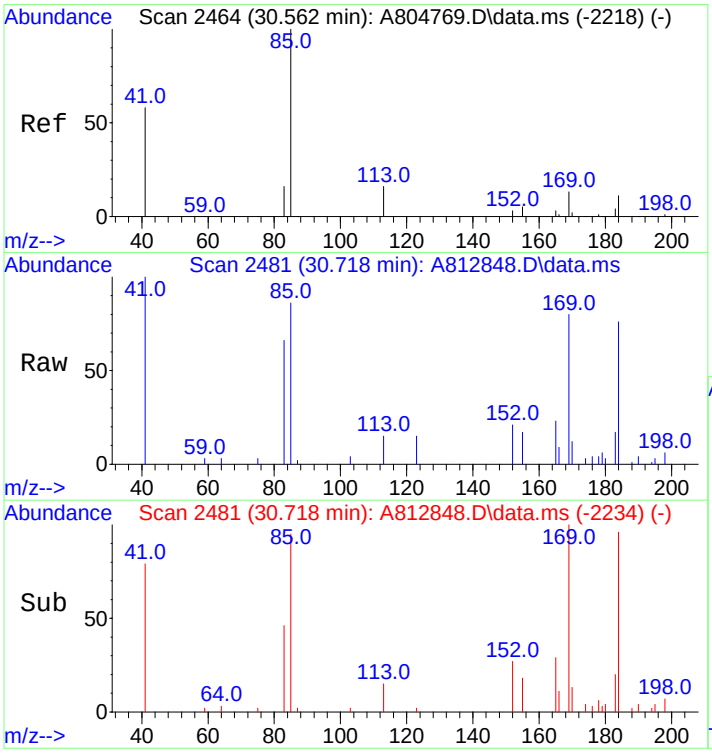


#13
C3-Naphthalenes
Concen: 1736.52 ng/mL m
RT: 27.953 min Scan# 2178
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:170 Resp: 469007

Ion	Ratio	Lower	Upper
170	100		
155	15.5	80.2	120.4#

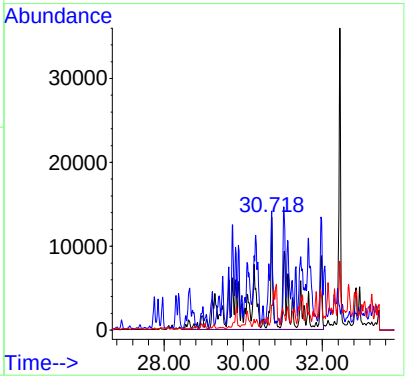


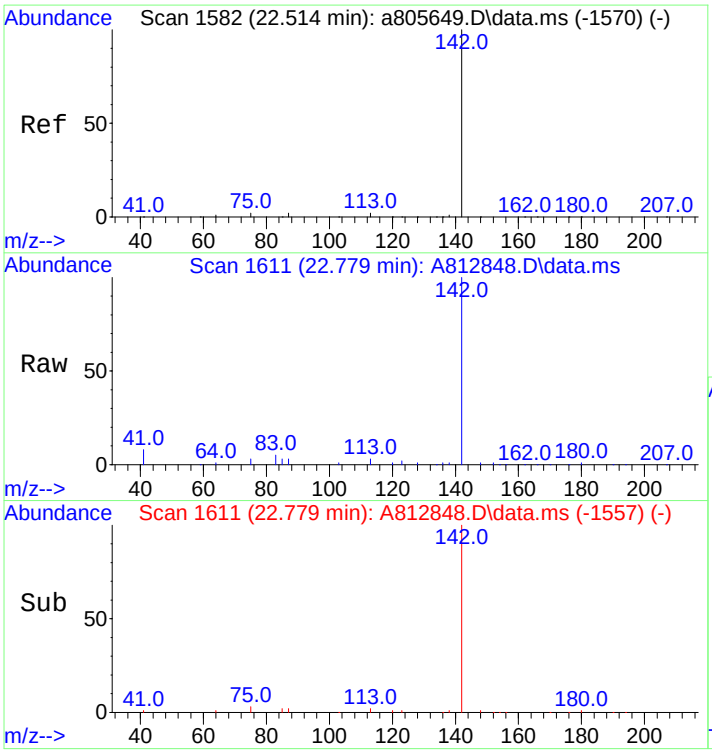


#14
C4-Naphthalenes
Concen: 1623.80 ng/mL m
RT: 30.718 min Scan# 2481
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:184 Resp: 438564

Ion	Ratio	Lower	Upper
184	100		
169	10.3	108.2	162.2#
183	0.0	29.7	44.5#

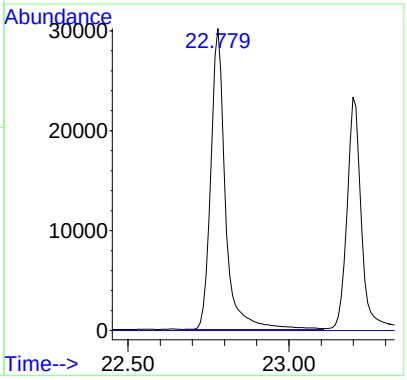


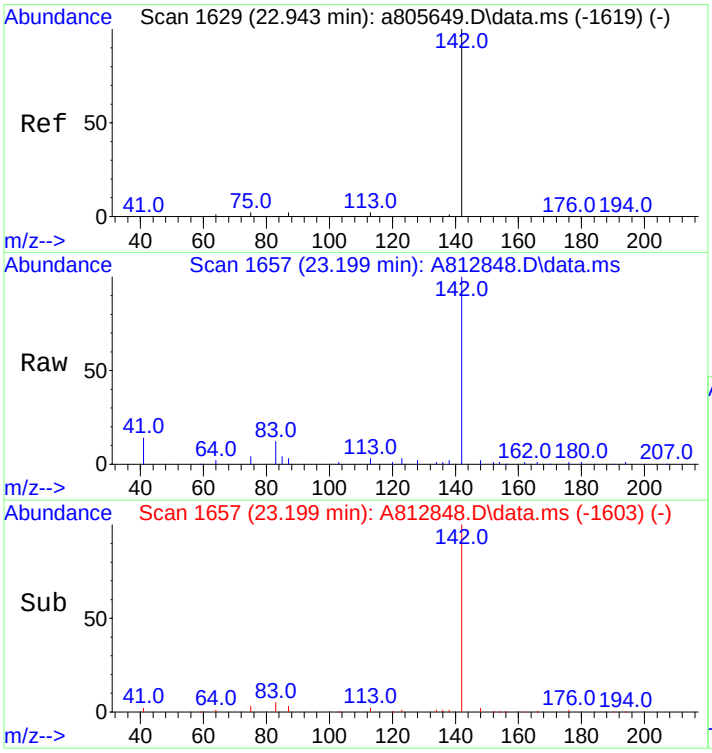


#16
2-Methylnaphthalene
Concen: 594.40 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:142 Resp: 95630

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

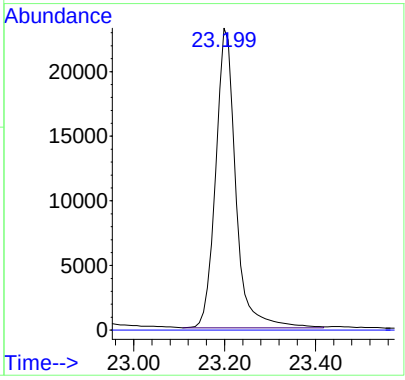


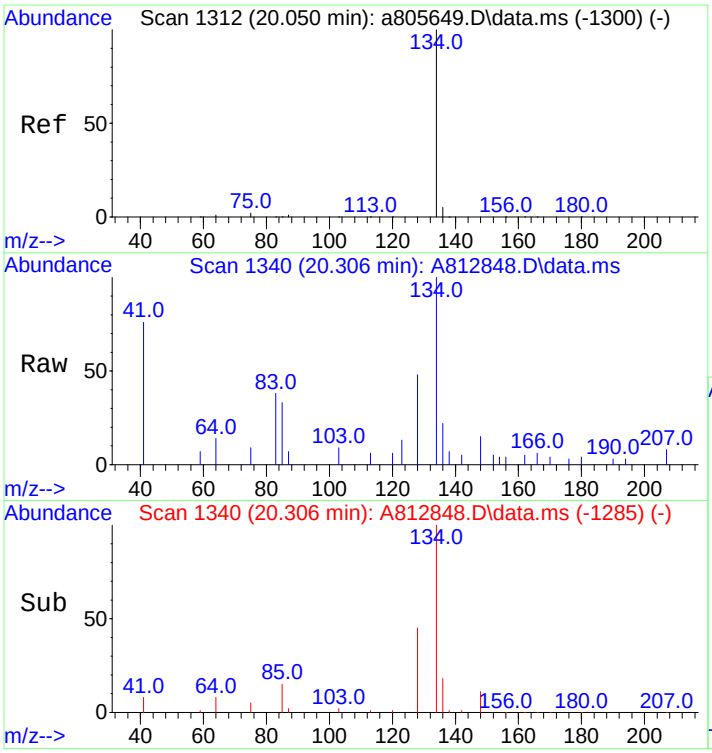


#17
1-Methylnaphthalene
Concen: 471.49 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:142 Resp: 71031

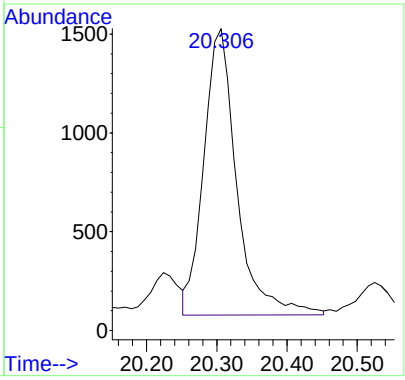
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

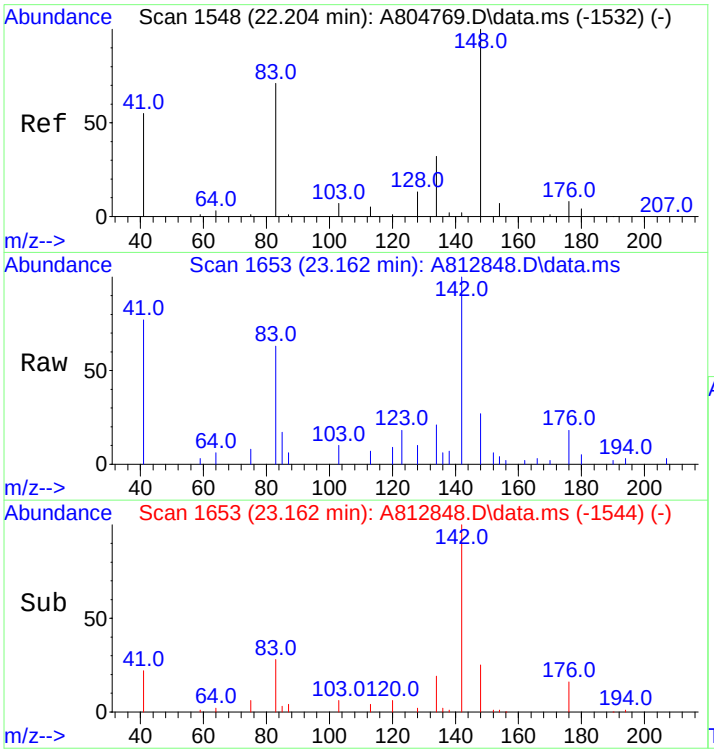




#18
Benzothiophene
Concen: 21.64 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

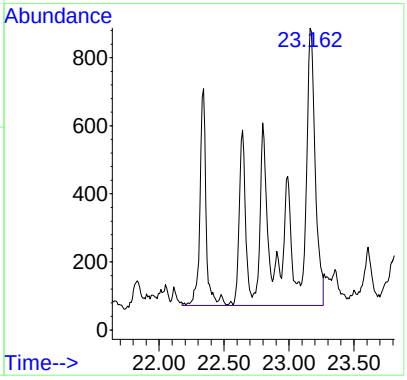
Tgt Ion:134 Resp: 4725

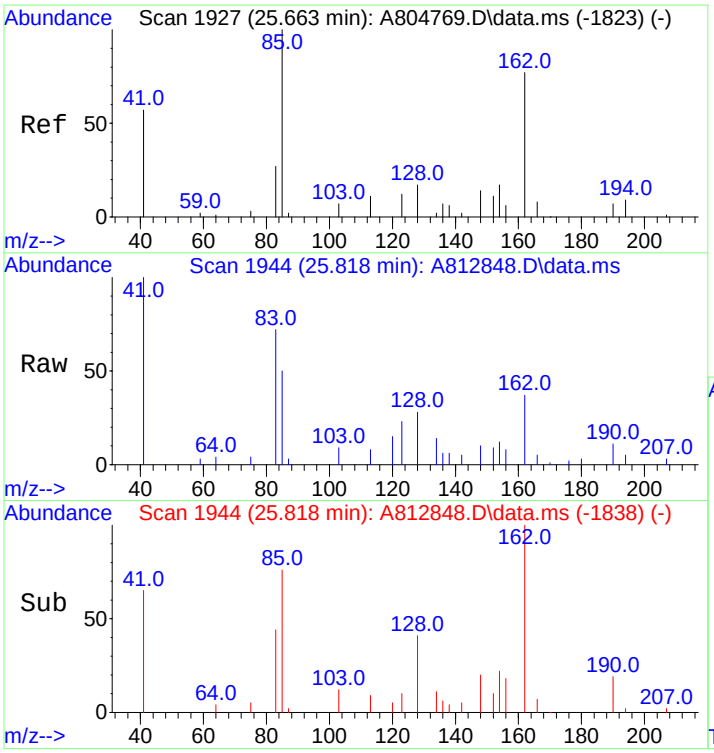




#19
C1-Benzo(b)thiophenes
Concen: 52.44 ng/mL m
RT: 23.162 min Scan# 1653
Delta R.T. 0.821 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

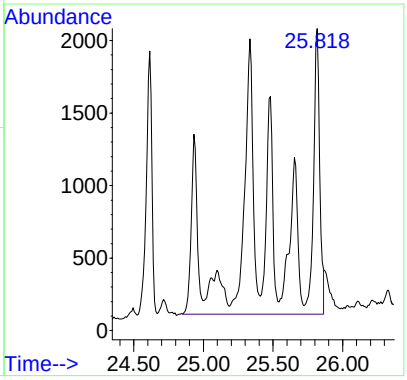
Tgt Ion:148 Resp: 11449

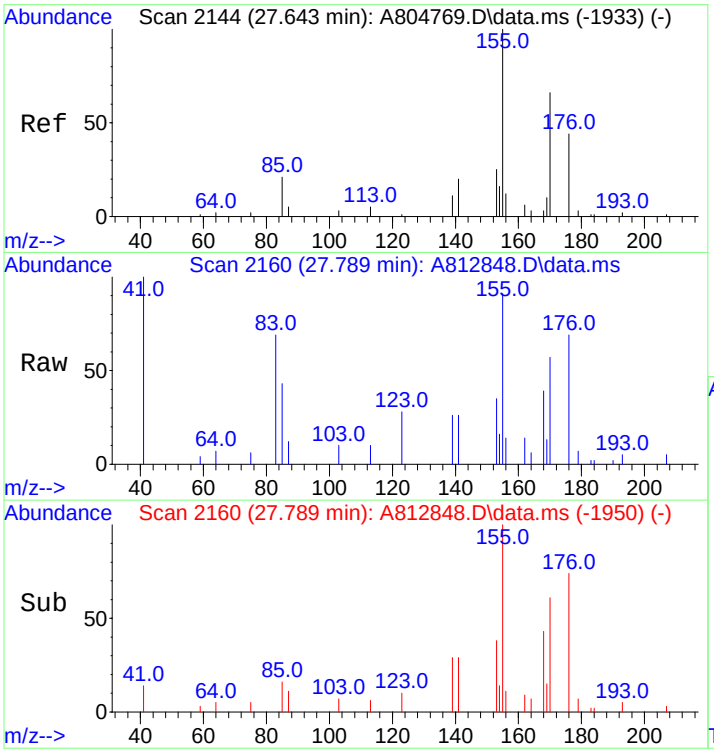




#20
C2-Benzo(b)thiophenes
Concen: 133.70 ng/mL m
RT: 25.818 min Scan# 1944
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

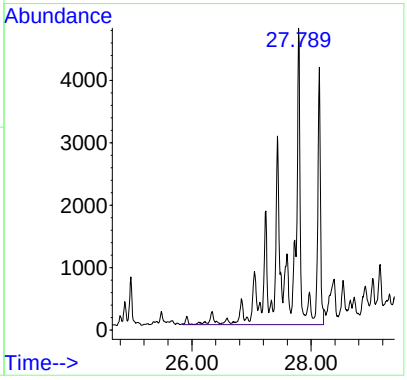
Tgt Ion:162 Resp: 29188

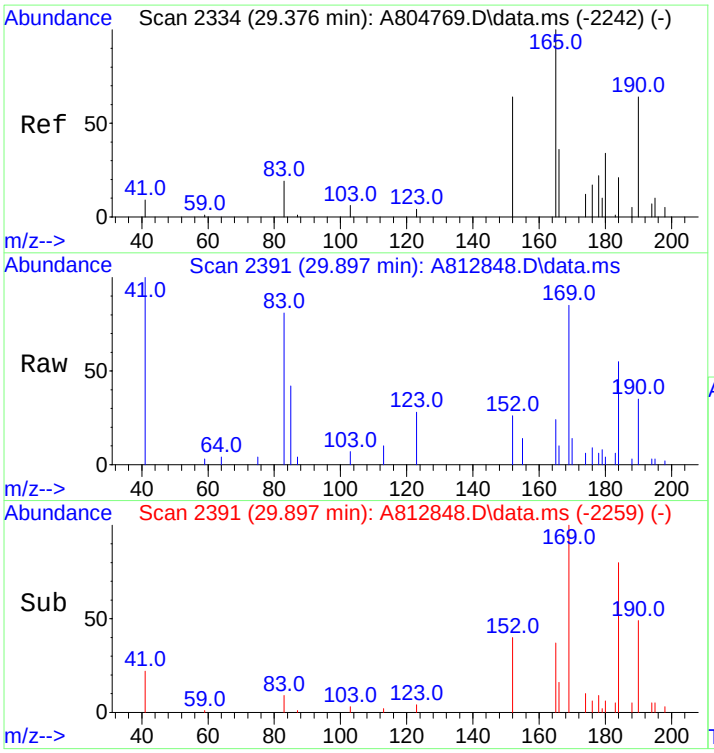




#21
C3-Benzo(b)thiophenes
Concen: 306.35 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

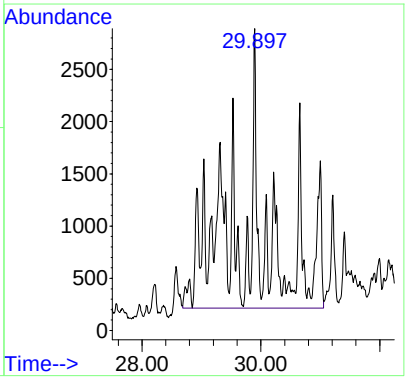
Tgt Ion:176 Resp: 66878

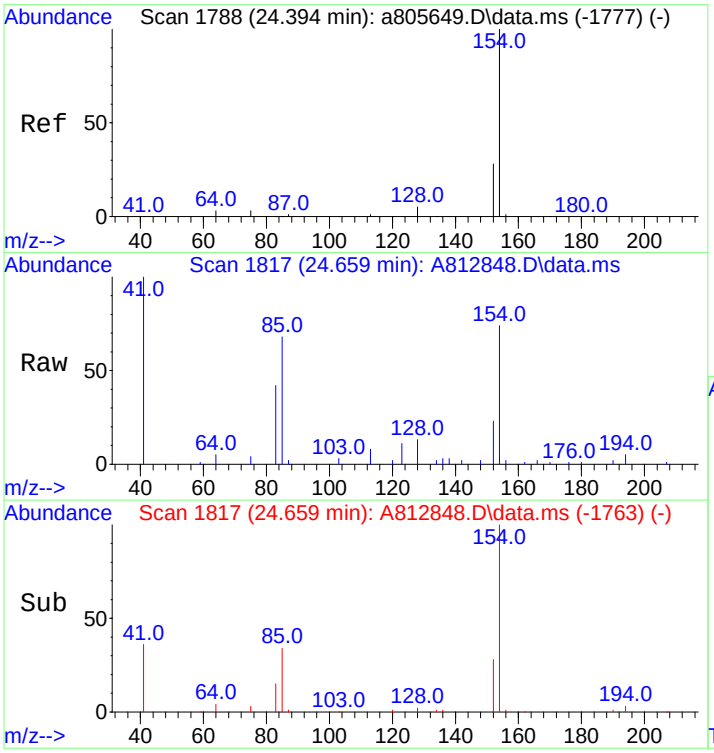




#22
C4-Benzo(b)thiophenes
Concen: 364.50 ng/mL m
RT: 29.897 min Scan# 2391
Delta R.T. 0.365 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:190 Resp: 79573

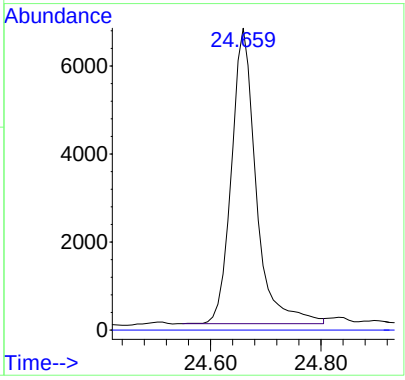


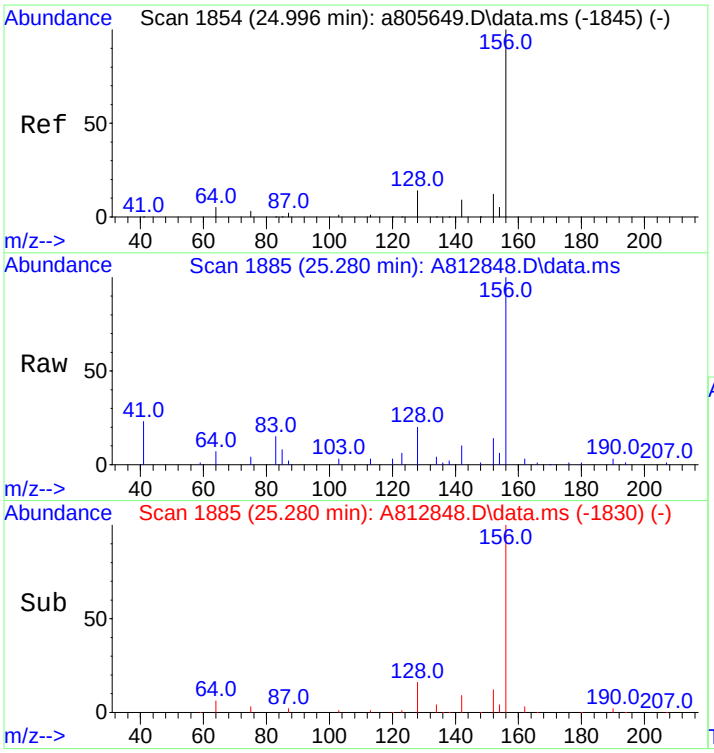


#23
Biphenyl
Concen: 102.15 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:154 Resp: 20910

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

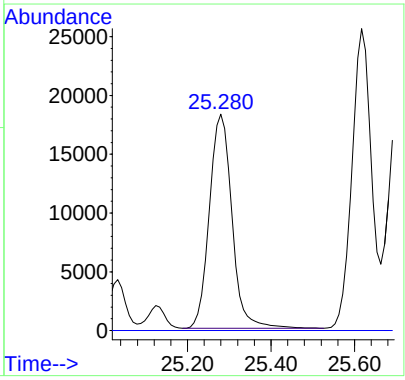


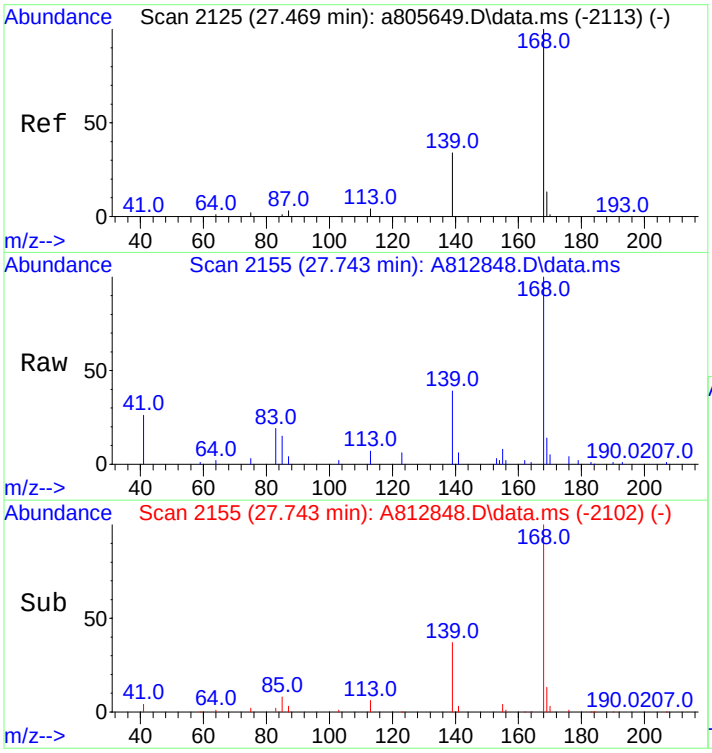


#24
2,6-Dimethylnaphthalene
Concen: 497.24 ng/mL
RT: 25.280 min Scan# 1885
Delta R.T. -0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:156 Resp: 68466

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

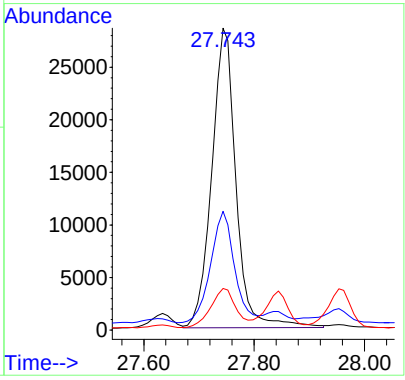


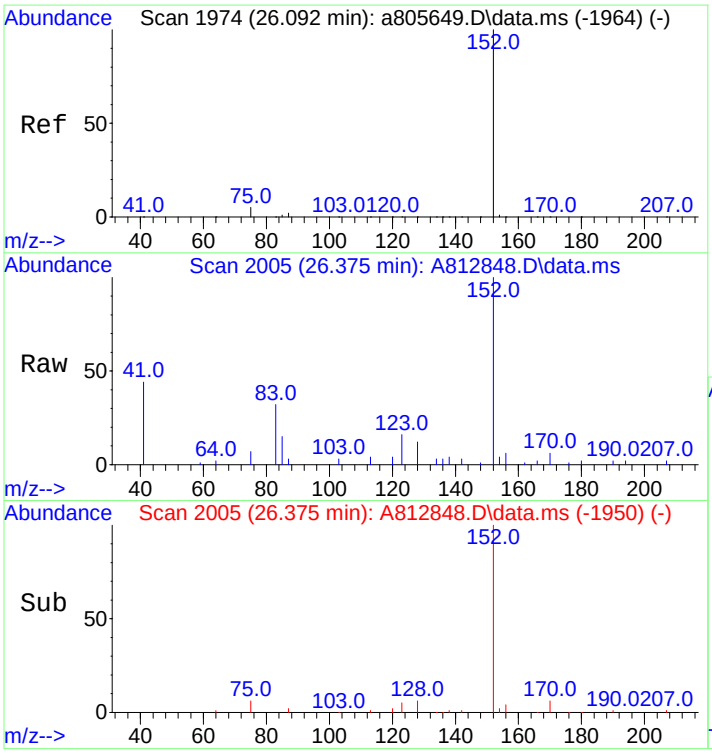


#25
Dibenzofuran
Concen: 403.07 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:168 Resp: 87040

Ion	Ratio	Lower	Upper
168	100		
139	36.5	28.0	42.0
169	13.5	10.6	15.8

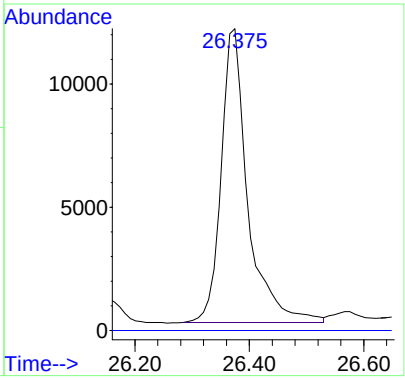


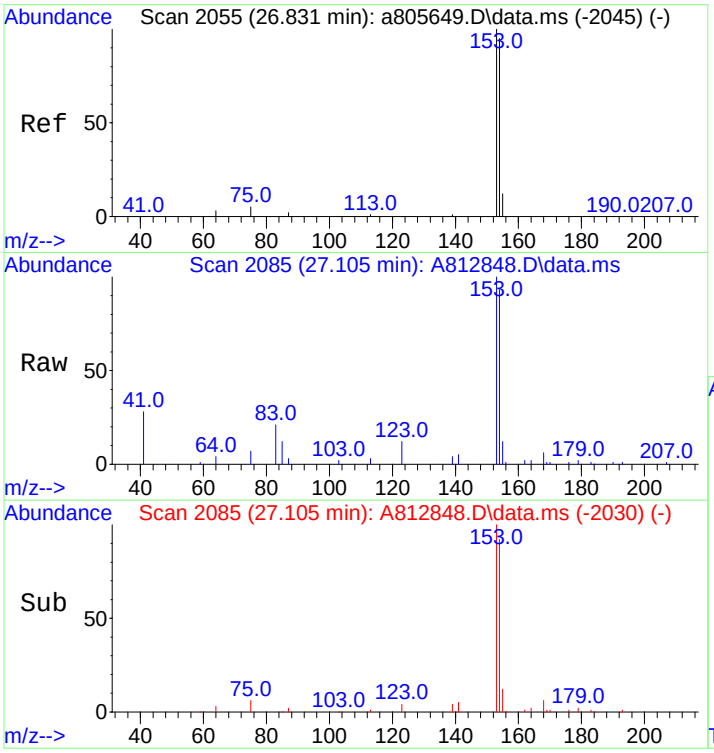


#26
Acenaphthylene
Concen: 157.22 ng/mL
RT: 26.375 min Scan# 2005
Delta R.T. -0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:152 Resp: 38544

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

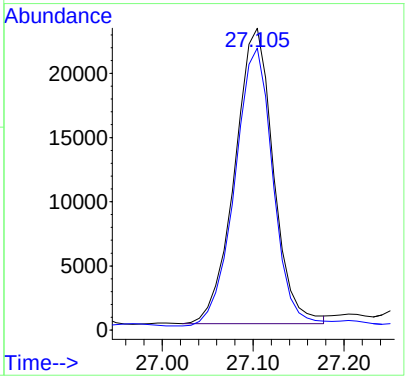


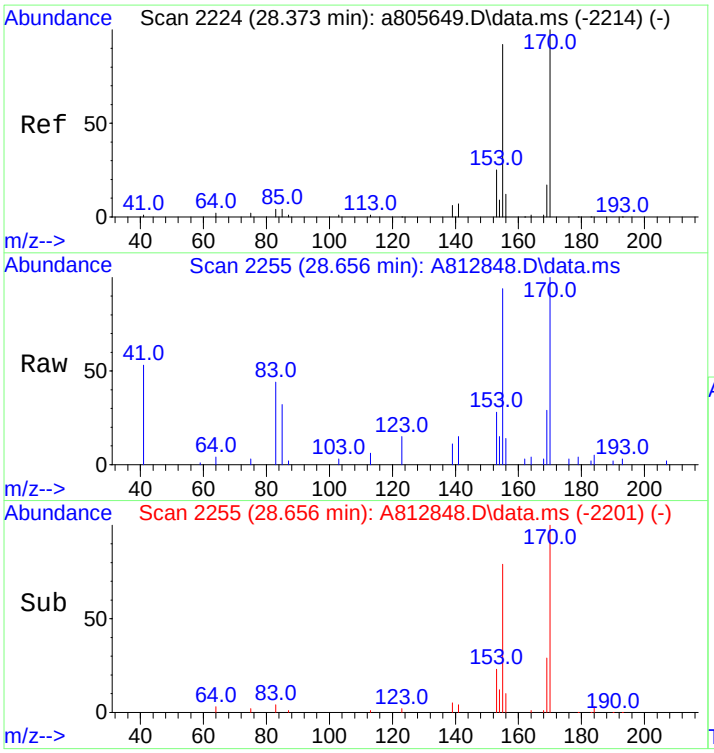


#27
Acenaphthene
Concen: 464.41 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:153 Resp: 67956

Ion	Ratio	Lower	Upper
153	100		
154	93.0	75.4	113.2

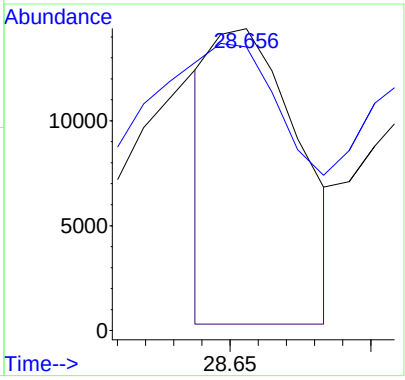


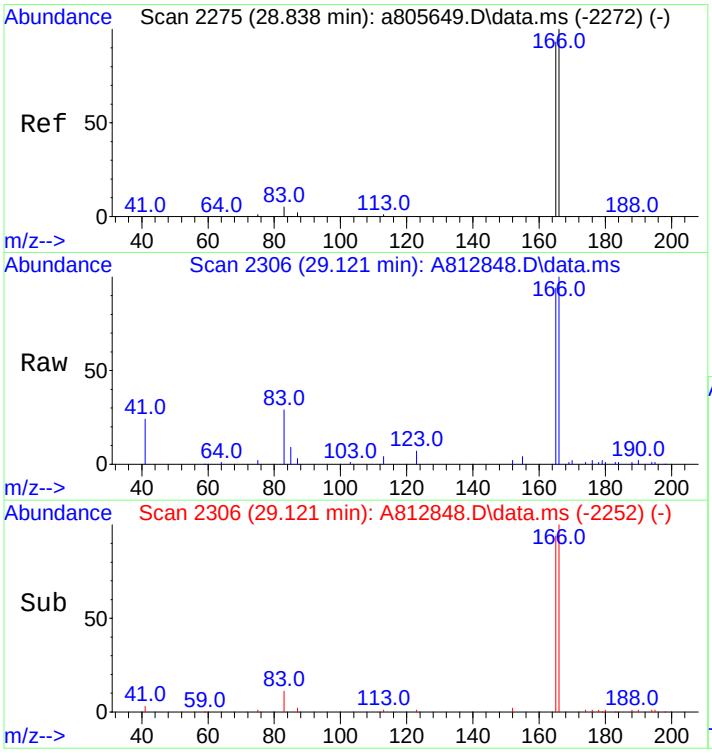


#28
2,3,5-Trimethylnaphthalene
Concen: 255.23 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:170 Resp: 30267

Ion	Ratio	Lower	Upper
170	100		
155	191.6	71.7	107.5#

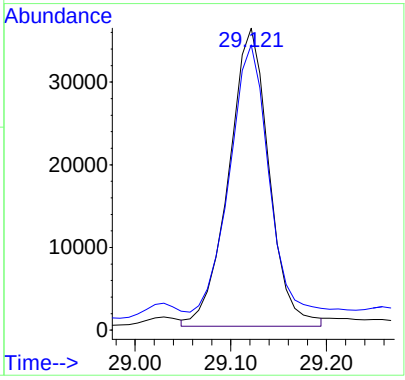


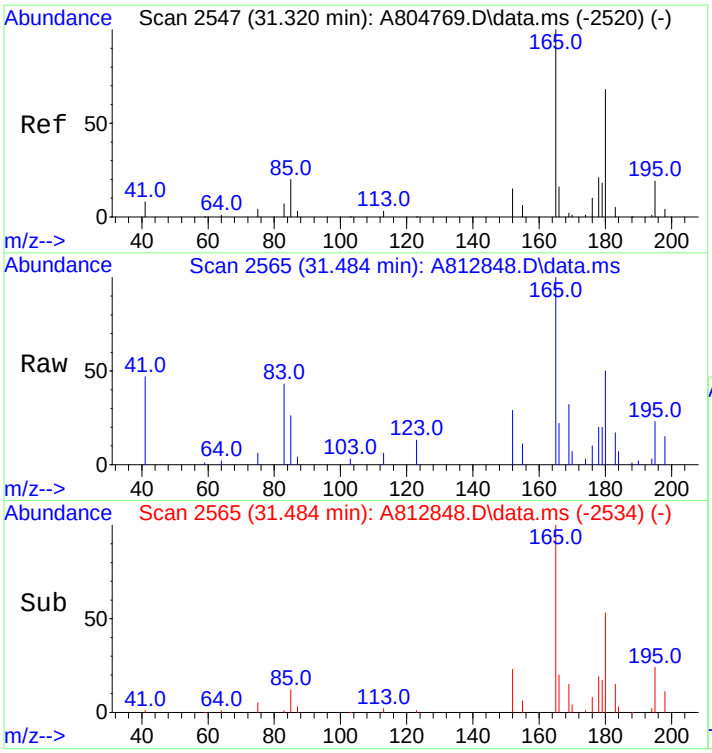


#29
Fluorene
Concen: 644.20 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:166 Resp: 105724

Ion	Ratio	Lower	Upper
166	100		
165	89.6	74.2	111.2

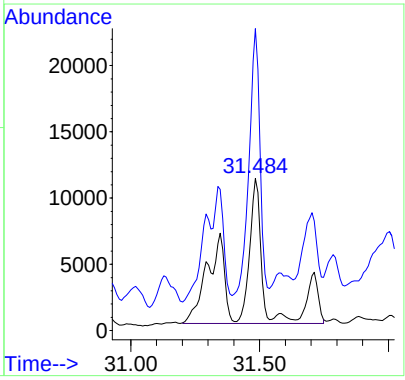


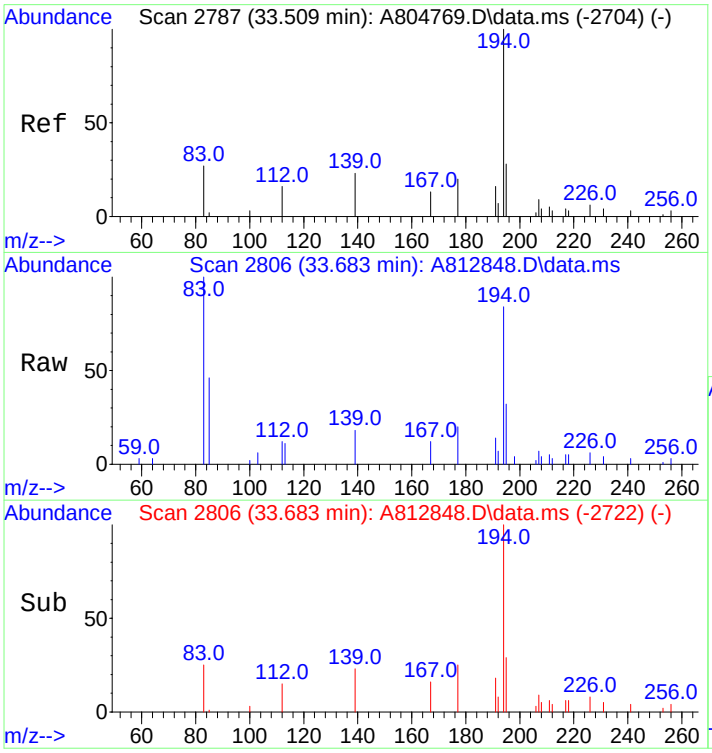


#30
C1-Fluorenes
Concen: 474.34 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:180 Resp: 77848

Ion	Ratio	Lower	Upper
180	100		
165	26.6	122.4	183.6#

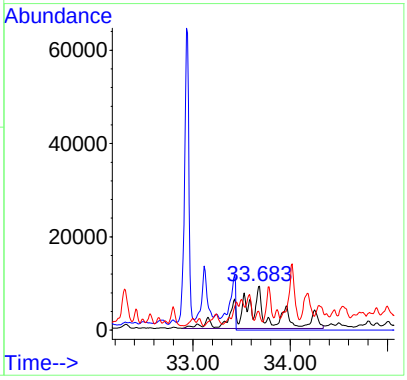


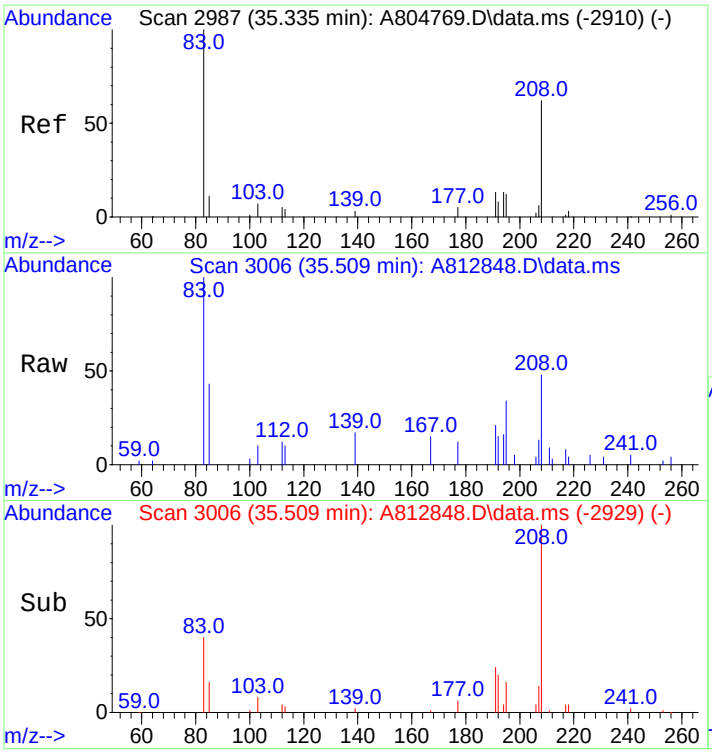


#31
C2-Fluorenes
Concen: 1068.50 ng/mL m
RT: 33.683 min Scan# 2806
Delta R.T. 0.077 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:194 Resp: 175360

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	10.1	27.4	41.0#

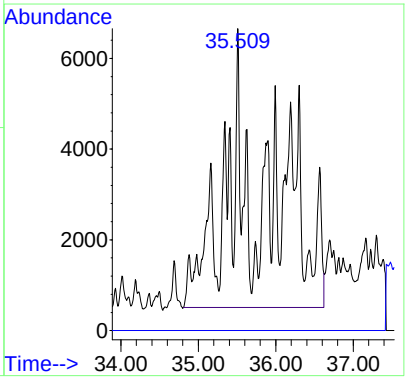


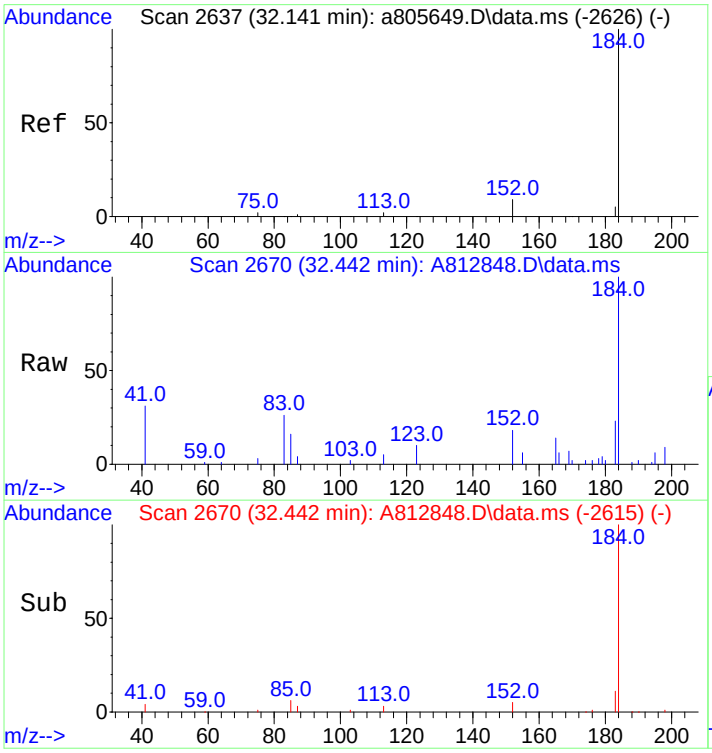


#32
C3-Fluorenes
Concen: 1292.75 ng/mL m
RT: 35.509 min Scan# 3006
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:208 Resp: 212164

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

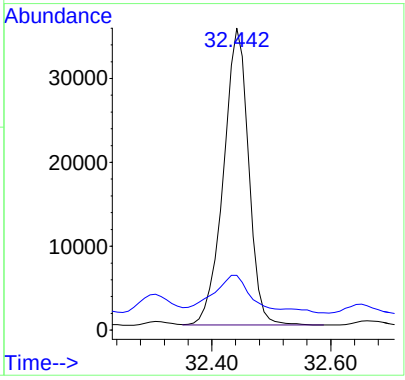


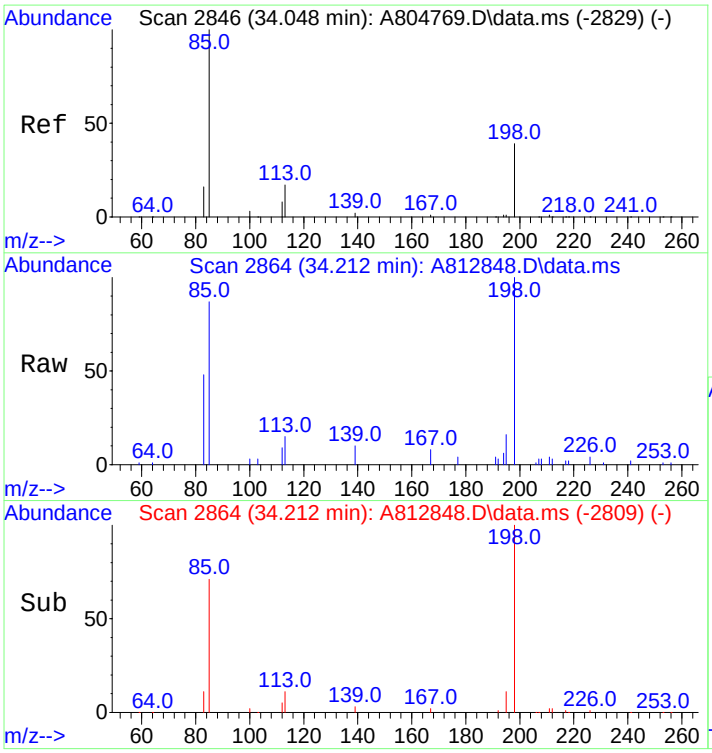


#33
Dibenzothiophene
Concen: 459.43 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:184 Resp: 103685

Ion	Ratio	Lower	Upper
184	100		
152	20.3	7.8	11.8#

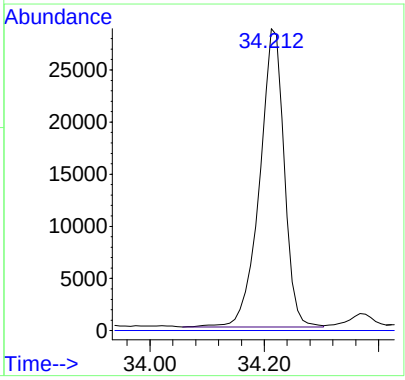


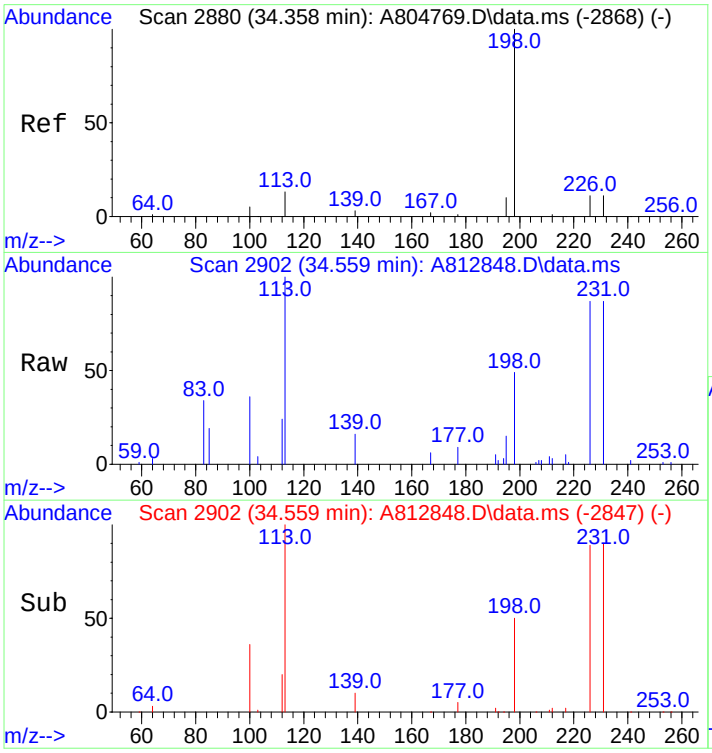


#34
4-Methyldibenzothiophene(4MDT)
Concen: 377.06 ng/mL
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:198 Resp: 85095

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

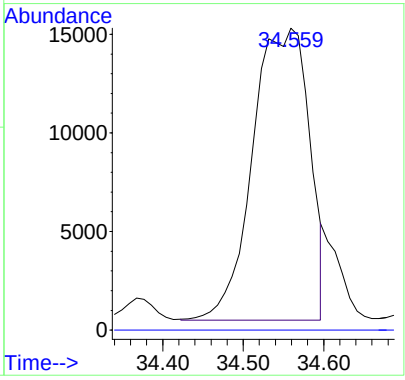


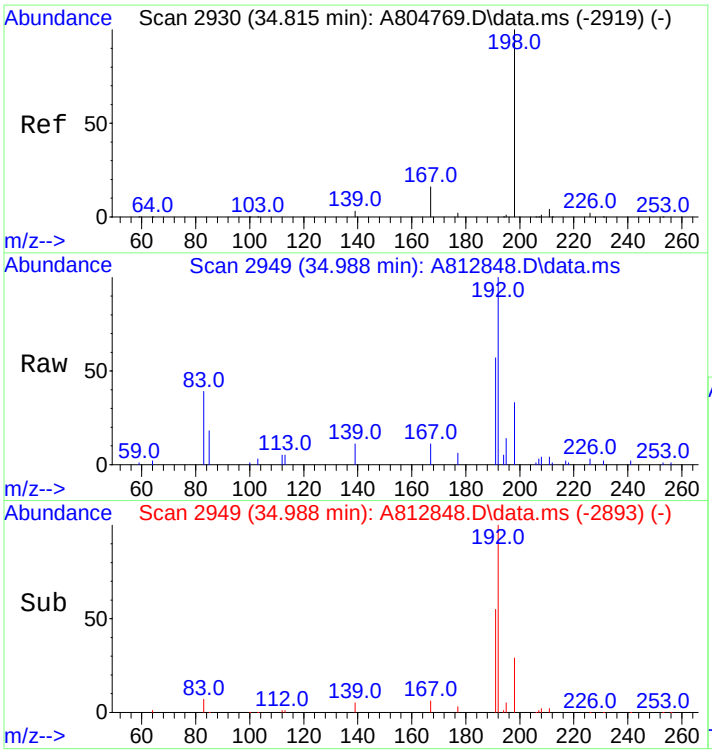


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 319.93 ng/mL m
RT: 34.559 min Scan# 2902
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:198 Resp: 72202

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

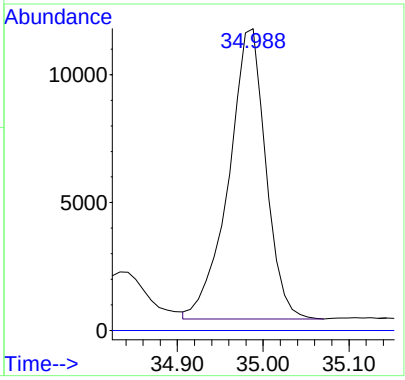


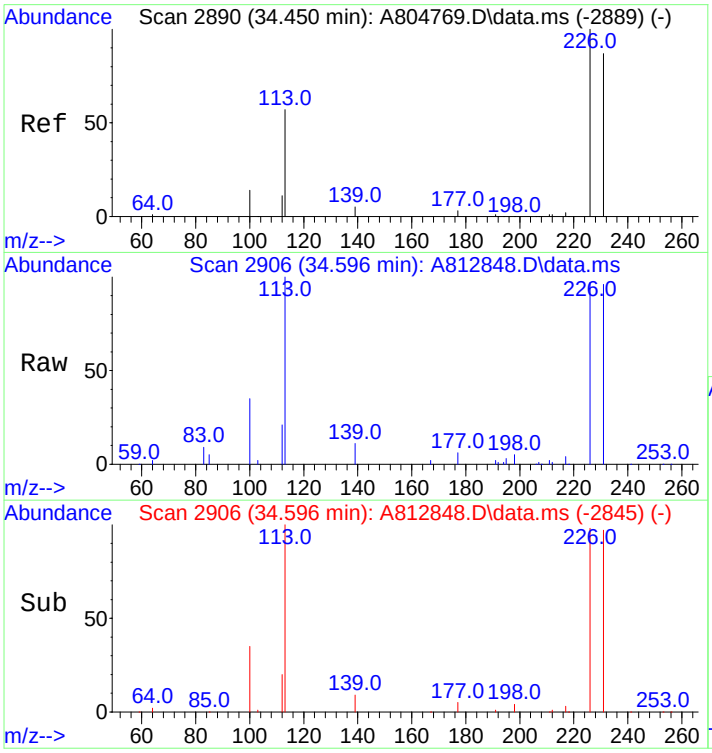


#36
1-Methyldibenzothiophene(1MDT)
Concen: 151.56 ng/mL
RT: 34.988 min Scan# 2949
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:198 Resp: 34204

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

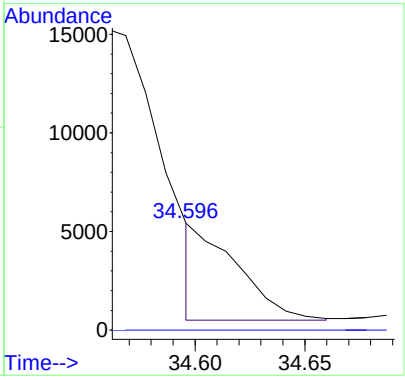


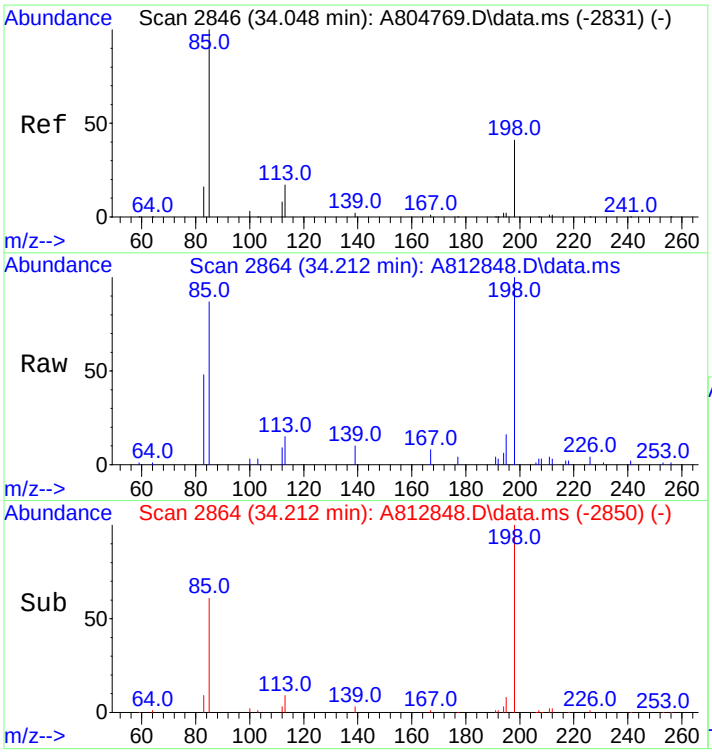


#37
OTP
Concen: 28.40 ng/mL m
RT: 34.596 min Scan# 2906
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:198 Resp: 6410

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

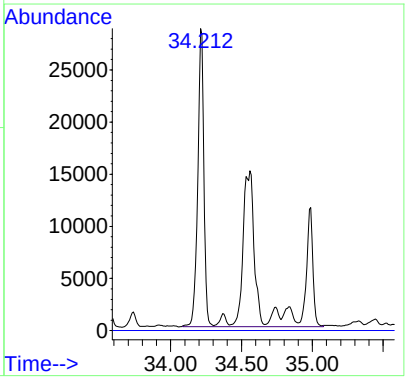


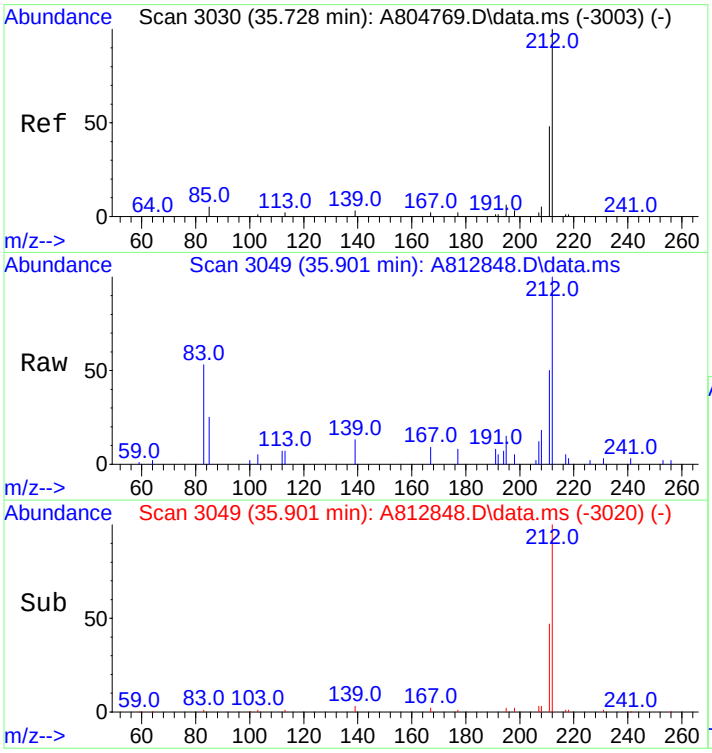


#38
C1-Dibenzothiophenes
Concen: 975.79 ng/mL m
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:198 Resp: 220219

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

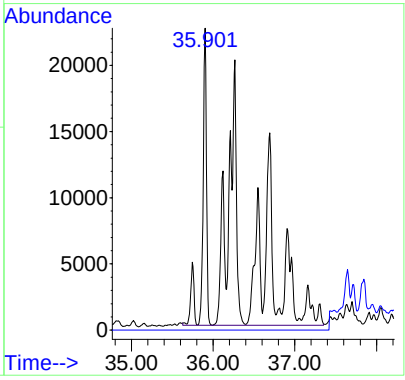


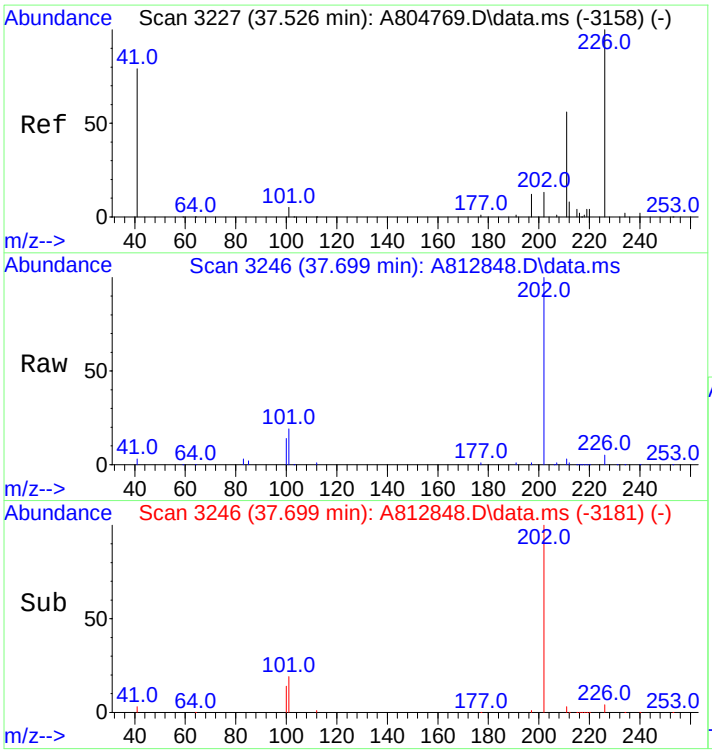


#39
C2-Dibenzothiophenes
Concen: 1693.53 ng/mL m
RT: 35.901 min Scan# 3049
Delta R.T. -0.356 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:212 Resp: 382199

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

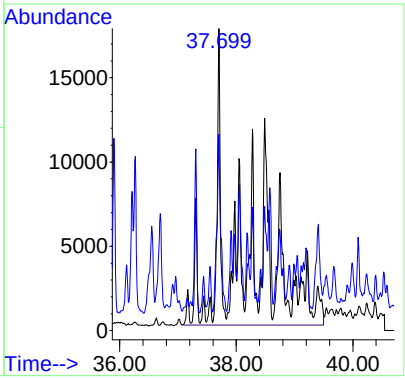


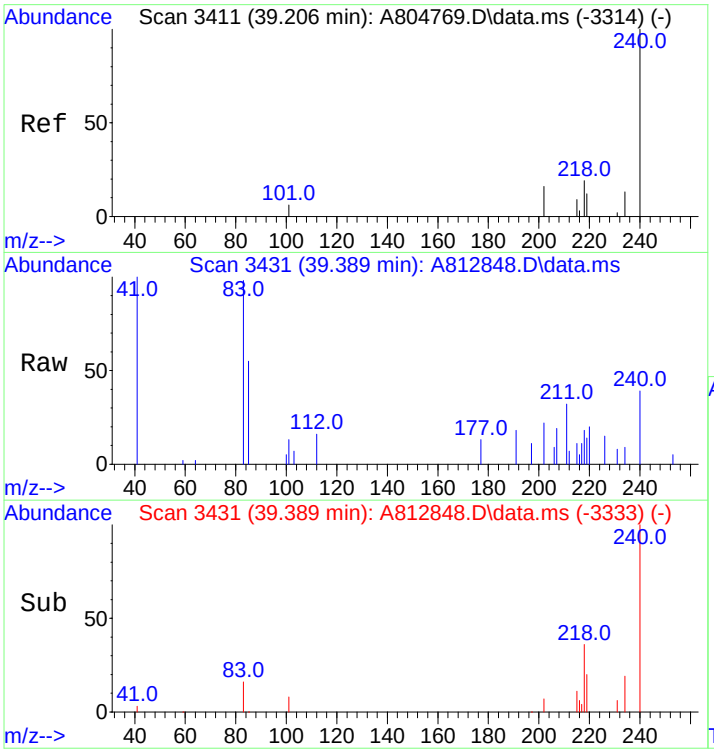


#40
C3-Dibenzothiophenes
Concen: 1801.43 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:226 Resp: 406551

Ion	Ratio	Lower	Upper
226	100		
211	1.9	50.2	75.2#

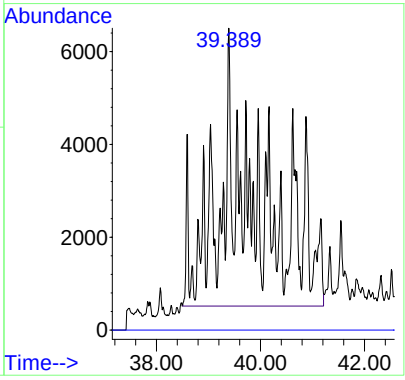


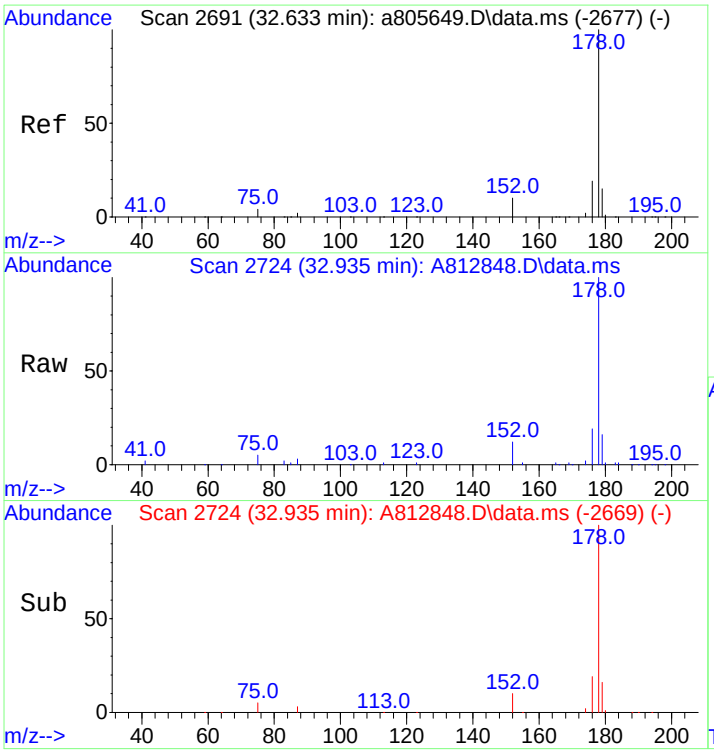


#41
C4-Dibenzothiophenes
Concen: 1259.29 ng/mL m
RT: 39.389 min Scan# 3431
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:240 Resp: 284199

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

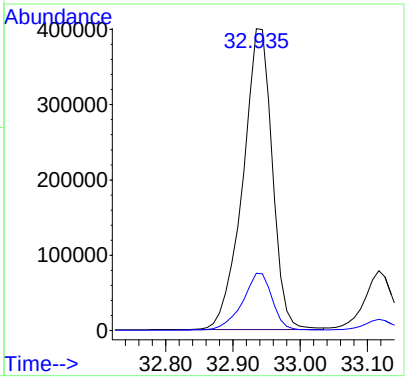


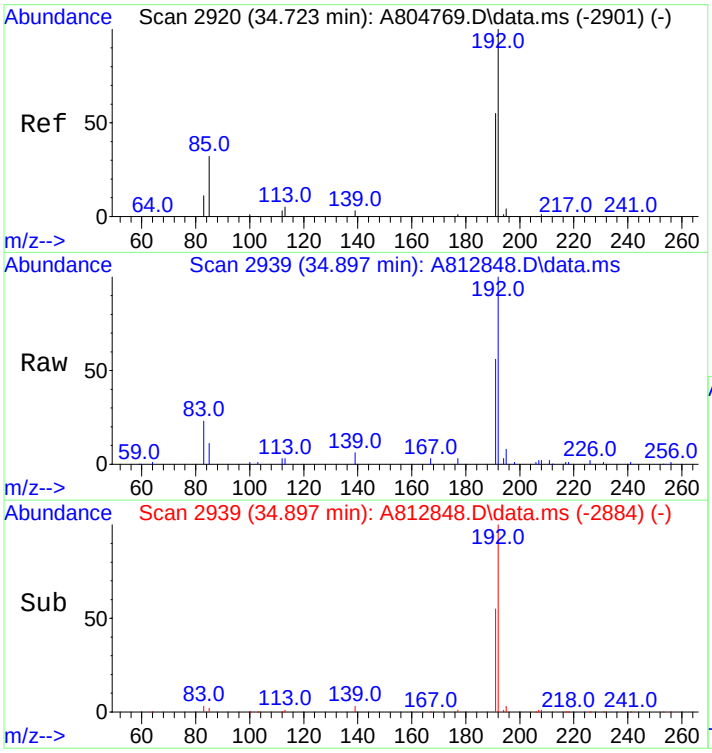


#43
Phenanthrene
Concen: 5596.86 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:178 Resp: 1215736

Ion	Ratio	Lower	Upper
178	100		
176	19.0	15.2	22.8

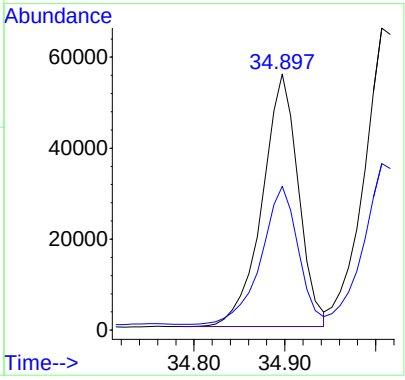


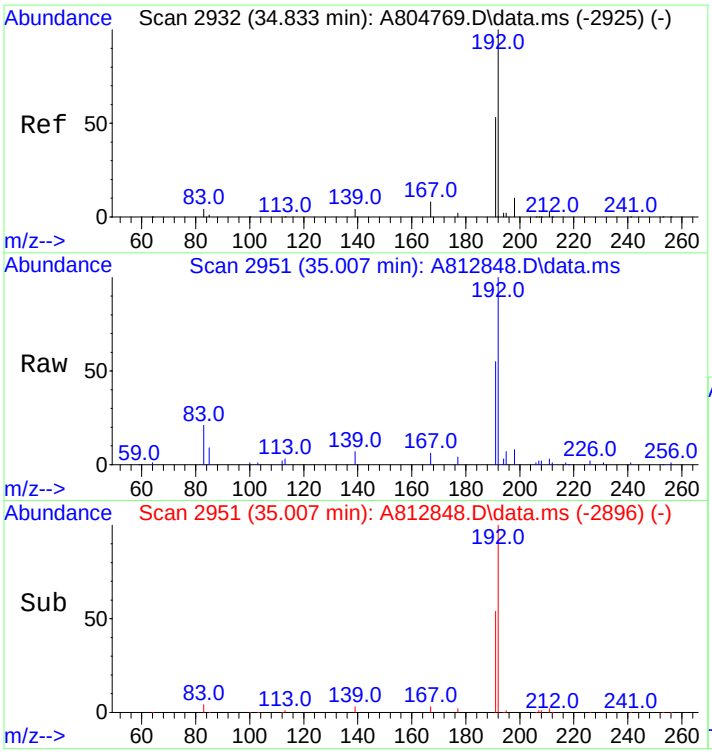


#44
3-Methylphenanthrene(3MP)
Concen: 706.36 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 153433

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.5	68.3

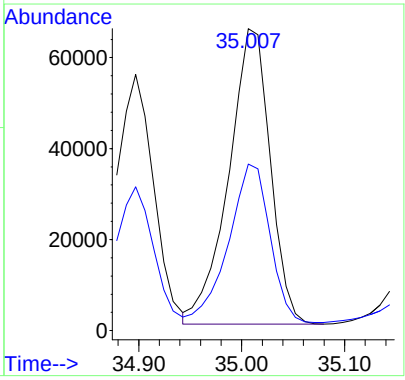


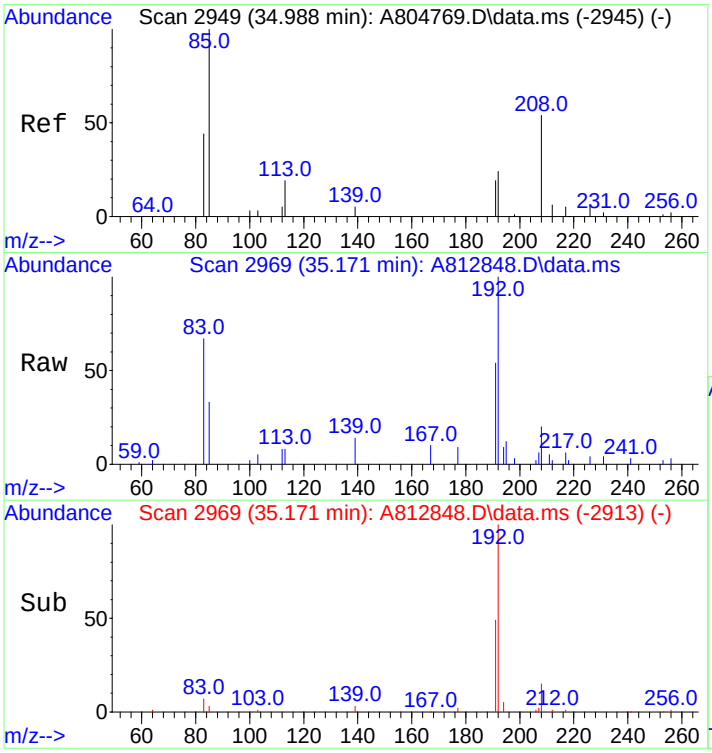


#45
2-Methylphenanthrene(2MP)
Concen: 841.18 ng/mL
RT: 35.007 min Scan# 2951
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 182718

Ion	Ratio	Lower	Upper
192	100		
191	53.2	44.6	67.0

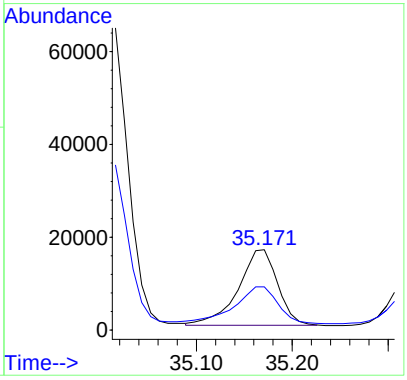


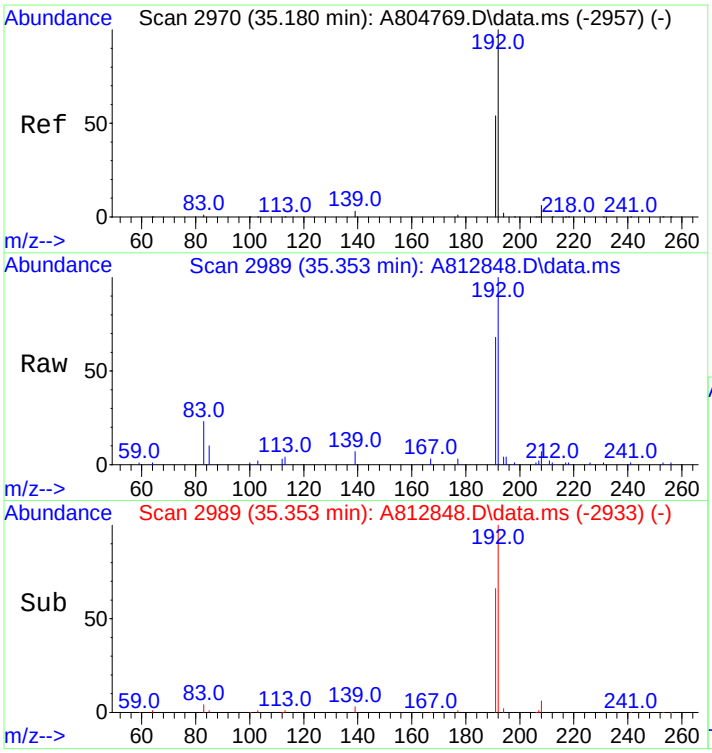


#46
2-Methylanthracene(2MA)
Concen: 214.52 ng/mL m
RT: 35.171 min Scan# 2969
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 46598

Ion	Ratio	Lower	Upper
192	100		
191	1.6	96.9	145.3#

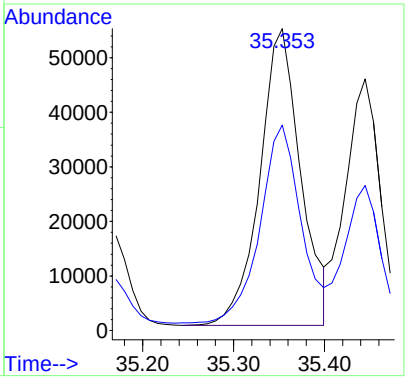


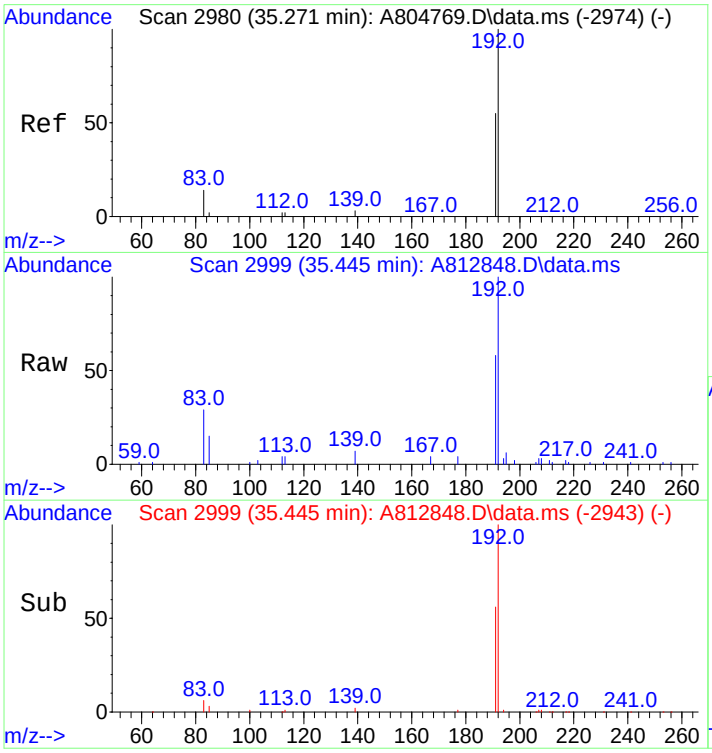


#47
9/4-Methylphenanthrene(9MP)
Concen: 781.88 ng/mL
RT: 35.353 min Scan# 2989
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 169839

Ion	Ratio	Lower	Upper
192	100		
191	66.5	44.5	66.7

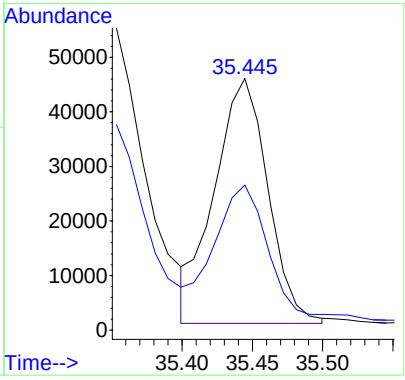


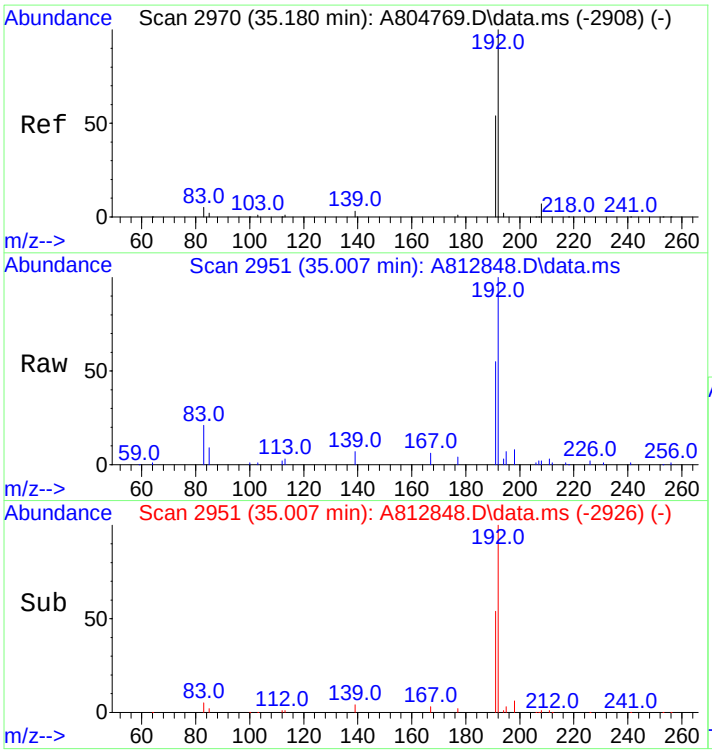


#48
1-Methylphenanthrene(1MP)
Concen: 547.17 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 118854

Ion	Ratio	Lower	Upper
192	100		
191	57.1	46.2	69.4

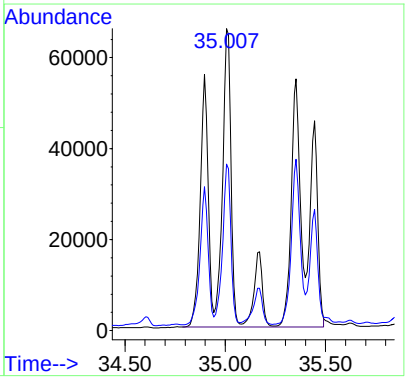


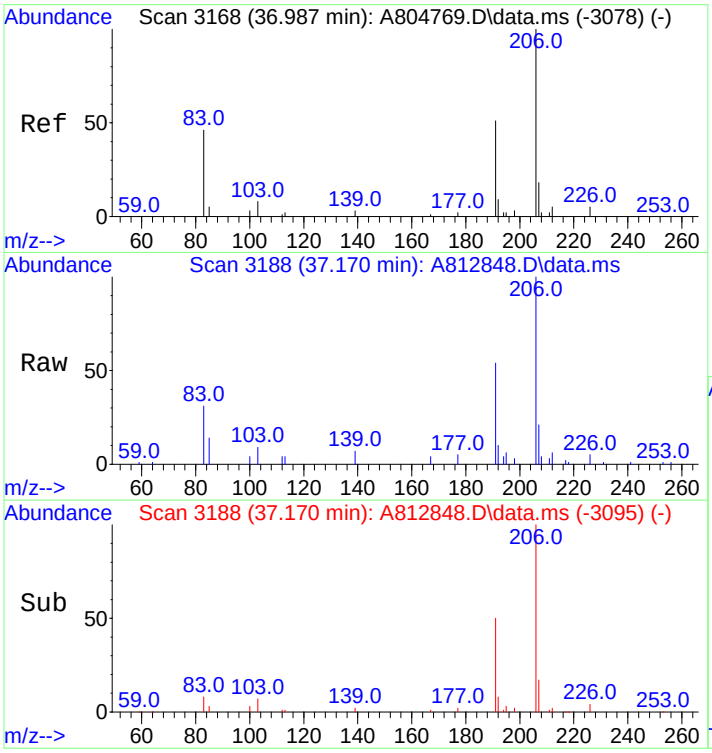


#49
C1-Phenanthrenes/Anthracenes
Concen: 3145.62 ng/mL m
RT: 35.007 min Scan# 2951
Delta R.T. -0.338 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 683283

Ion	Ratio	Lower	Upper
192	100		
191	16.5	44.5	66.7#

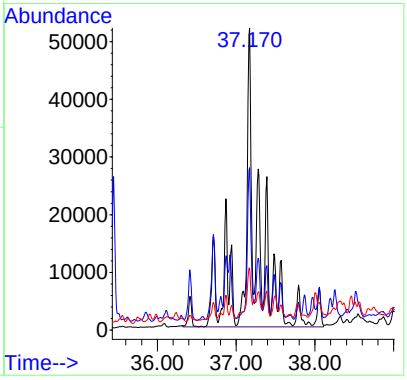


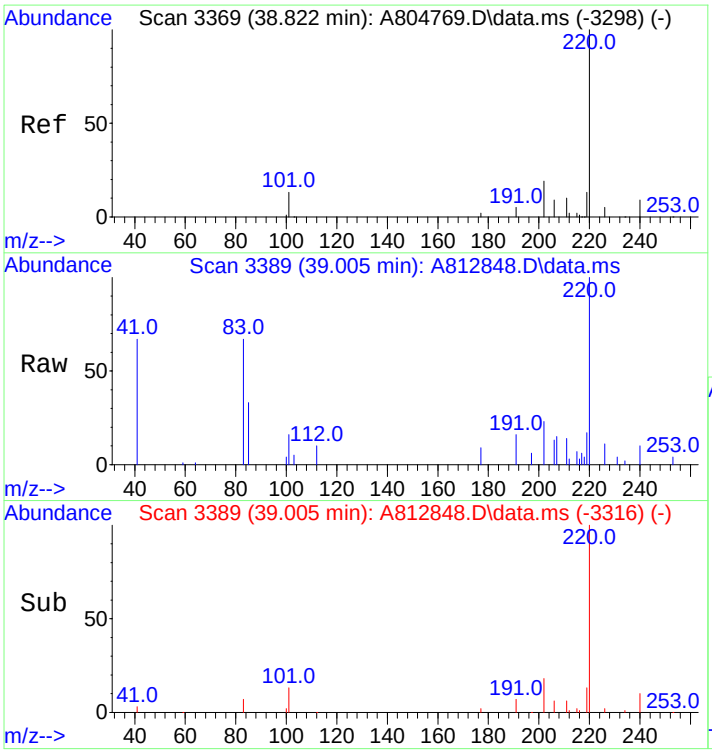


#50
C2-Phenanthrenes/Anthracenes
Concen: 2910.05 ng/mL m
RT: 37.170 min Scan# 3188
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:206 Resp: 632113

Ion	Ratio	Lower	Upper
206	100		
191	2.6	42.0	63.0#
207	0.8	16.2	24.4#

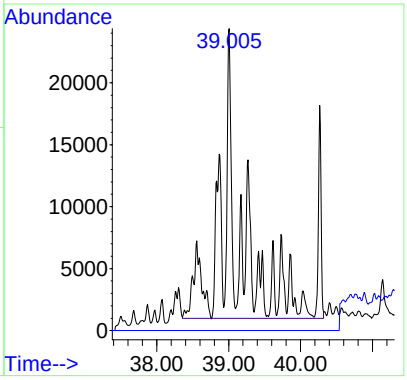


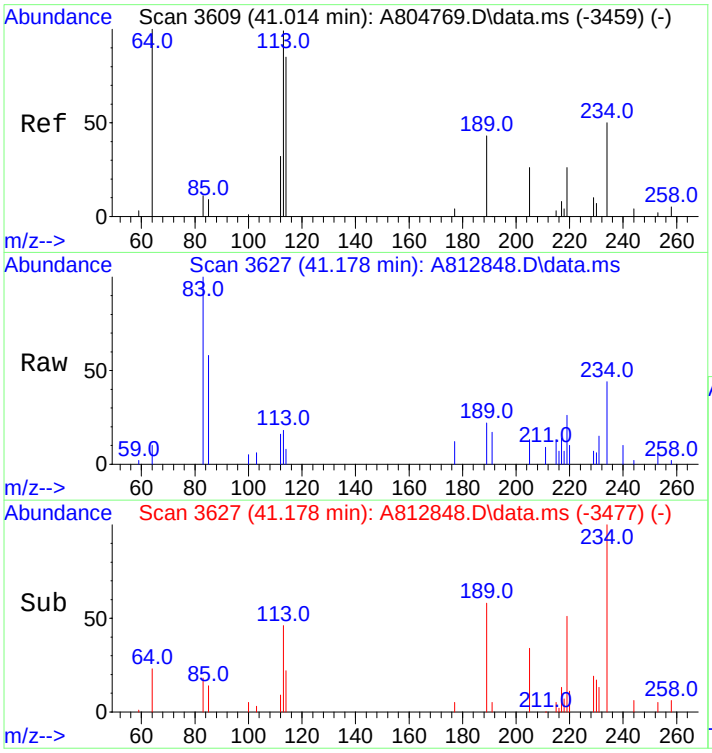


#52
C3-Phenanthrenes/Anthracenes
Concen: 2027.76 ng/mL m
RT: 39.005 min Scan# 3389
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:220 Resp: 440464

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

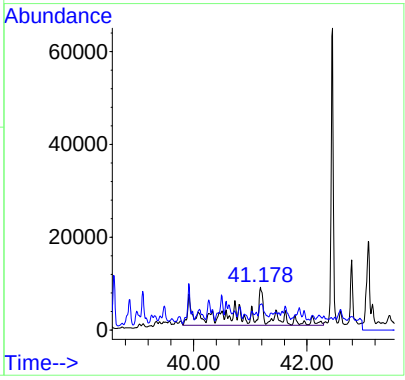


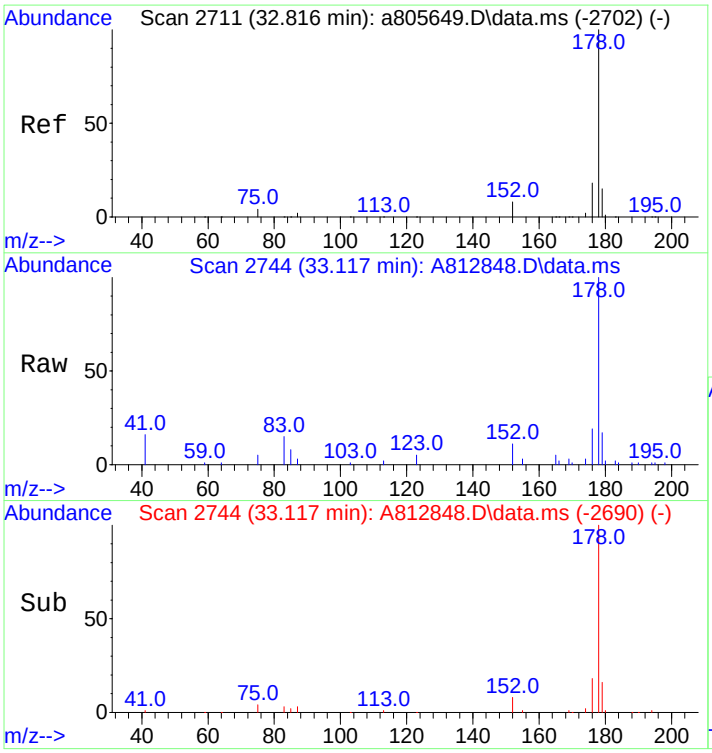


#53
C4-Phenanthrenes/Anthracenes
Concen: 1129.14 ng/mL m
RT: 41.178 min Scan# 3627
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:234 Resp: 245269

Ion	Ratio	Lower	Upper
234	100		
219	2.5	52.3	78.5#

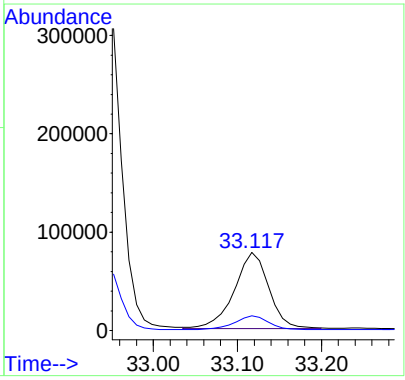


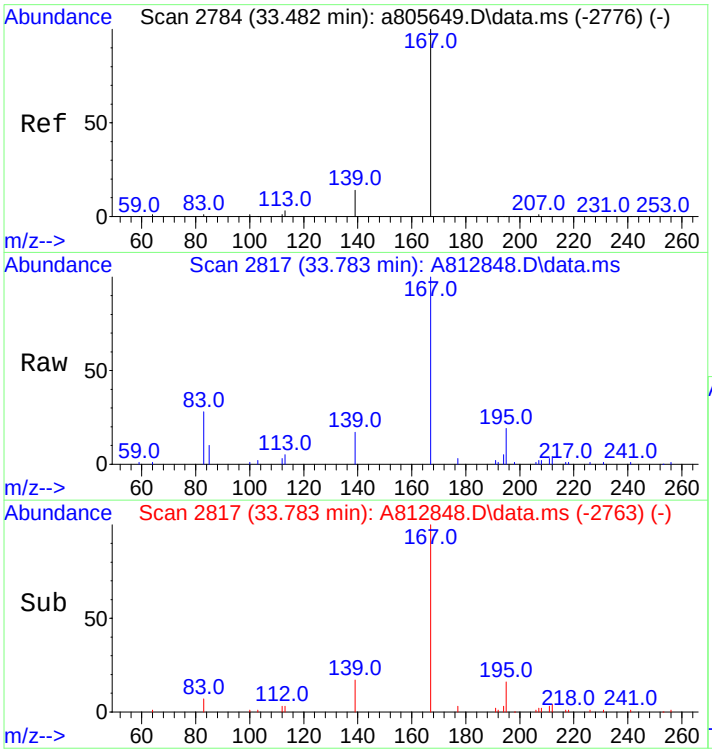


#55
Anthracene
Concen: 1102.79 ng/mL m
RT: 33.117 min Scan# 2744
Delta R.T. -0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:178 Resp: 223168

Ion	Ratio	Lower	Upper
178	100		
176	17.7	14.3	21.5

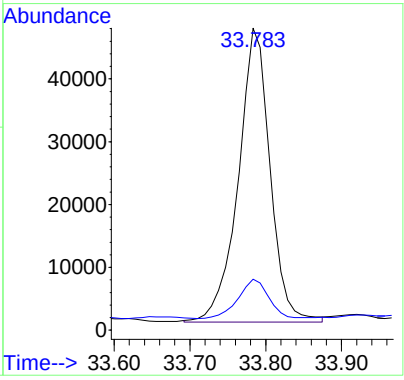


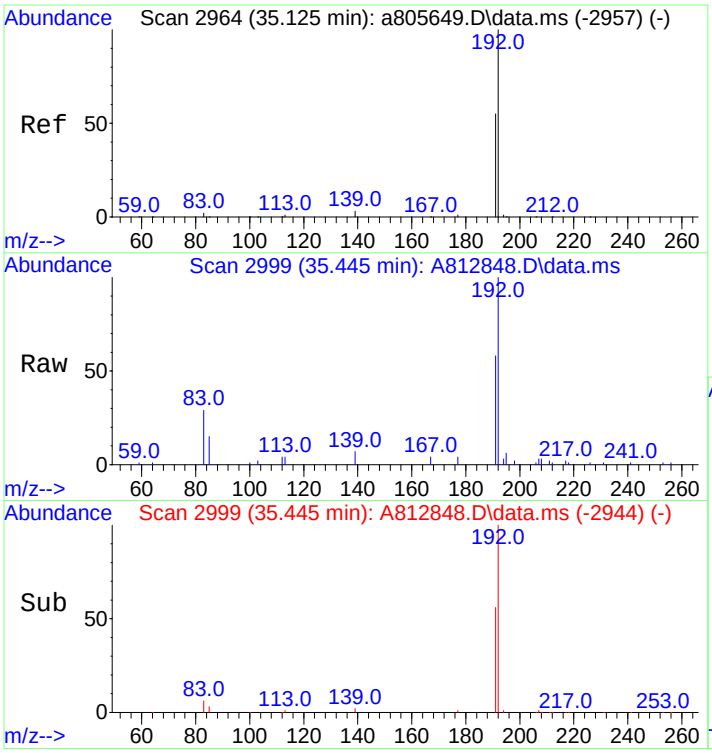


#56
Carbazole
Concen: 646.95 ng/mL m
RT: 33.783 min Scan# 2817
Delta R.T. -0.010 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:167 Resp: 136607

Ion	Ratio	Lower	Upper
167	100		
139	12.7	10.6	16.0

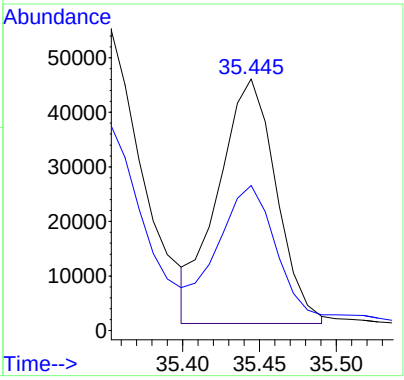


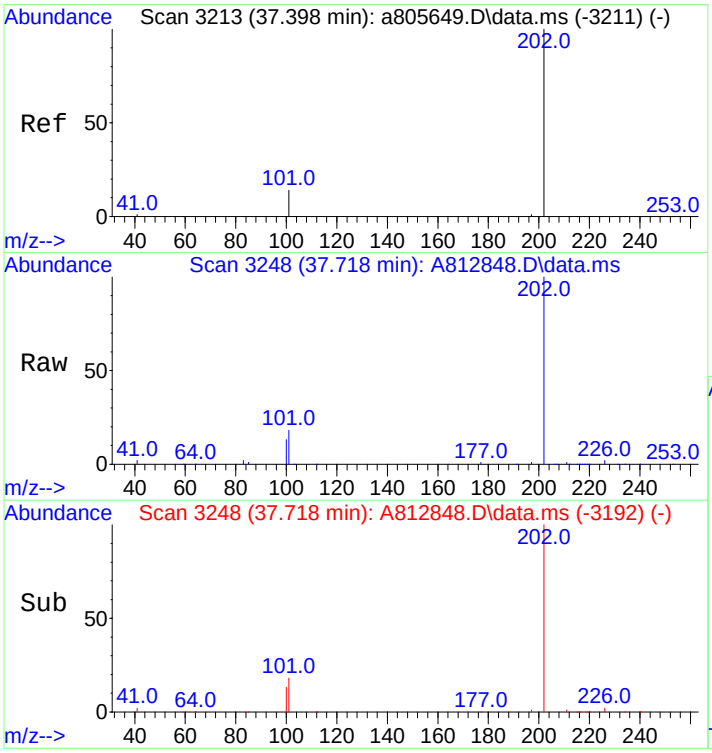


#57
1-Methylphenanthrene
Concen: 764.90 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. -0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:192 Resp: 117777

Ion	Ratio	Lower	Upper
192	100		
191	57.6	44.2	66.4

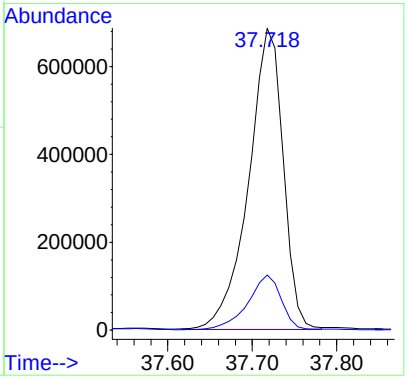


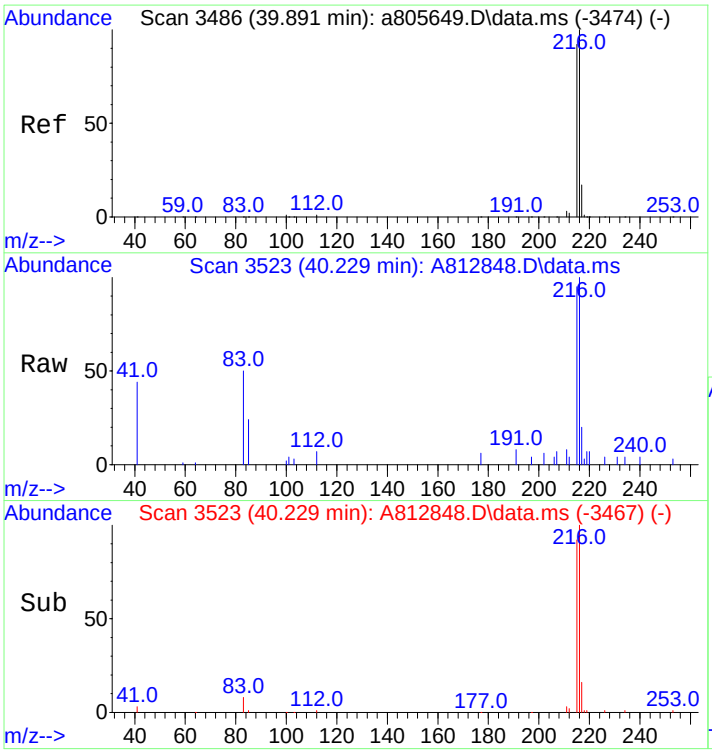


#58
Fluoranthene
Concen: 8737.18 ng/mL m
RT: 37.718 min Scan# 3248
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:202 Resp: 1954912

Ion	Ratio	Lower	Upper
202	100		
101	17.4	13.6	20.4

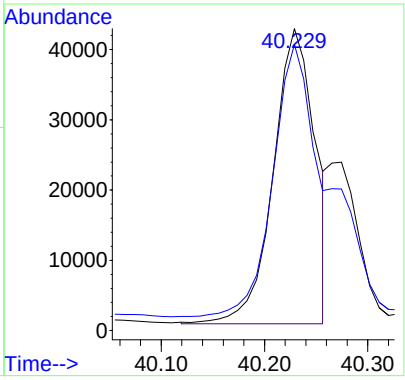


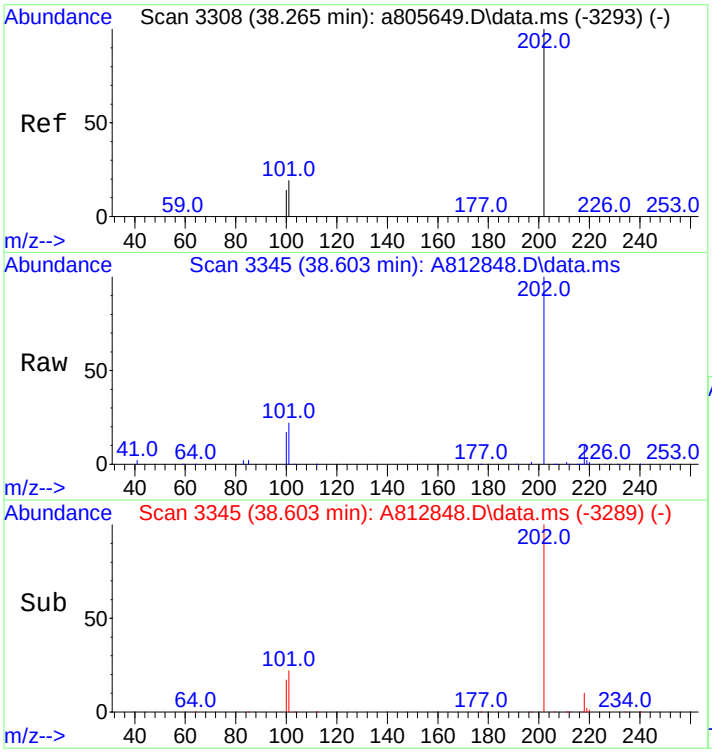


#59
Benzo(b)fluorene
Concen: 915.25 ng/mL m
RT: 40.229 min Scan# 3523
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:216 Resp: 118461

Ion	Ratio	Lower	Upper
216	100		
215	122.8	74.2	111.2#

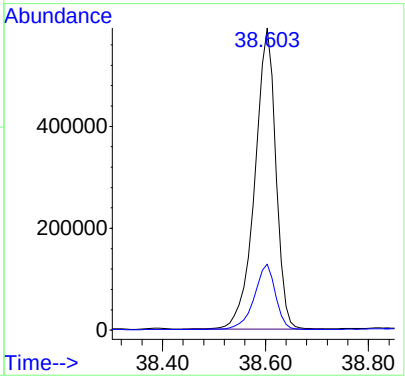


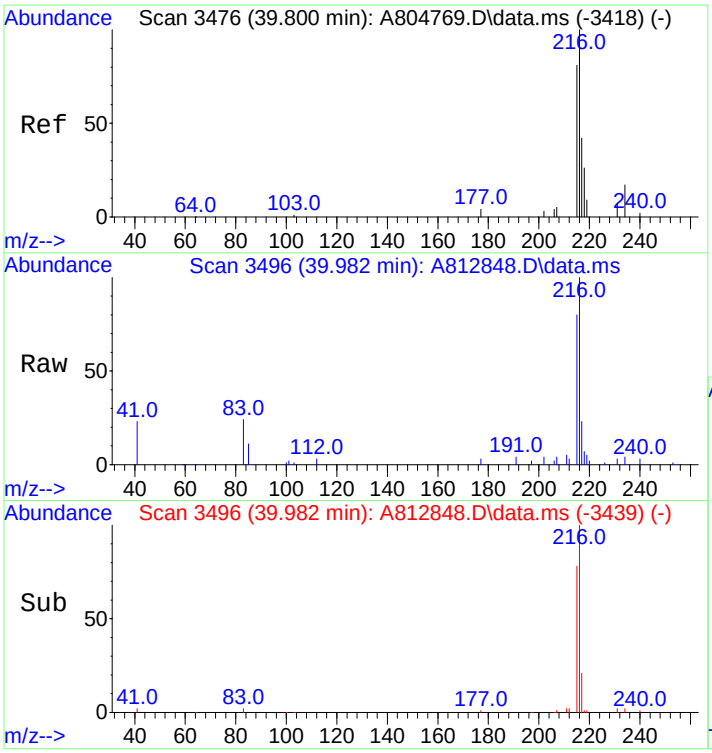


#60
Pyrene
Concen: 7400.93 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:202 Resp: 1674940

Ion	Ratio	Lower	Upper
202	100		
101	22.2	15.4	23.2

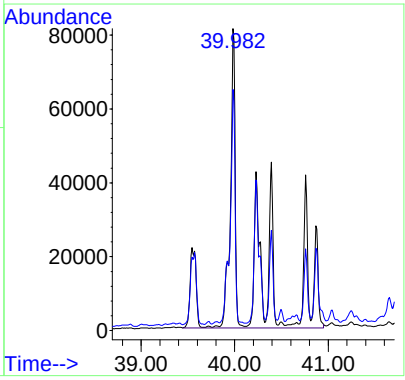


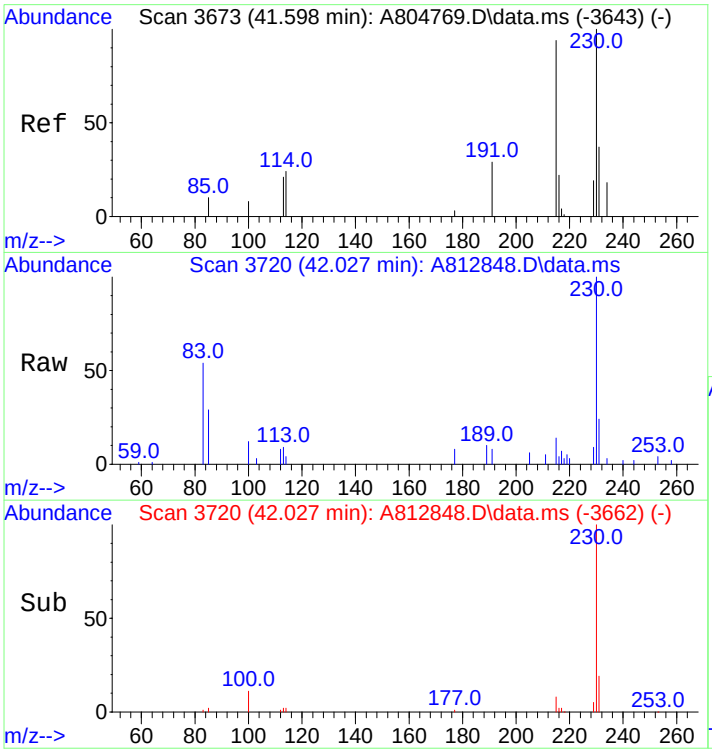


#61
C1-Fluoranthenes/Pyrenes
Concen: 3889.02 ng/mL m
RT: 39.982 min Scan# 3496
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:216 Resp: 880142

Ion	Ratio	Lower	Upper
216	100		
215	26.5	73.8	110.6#

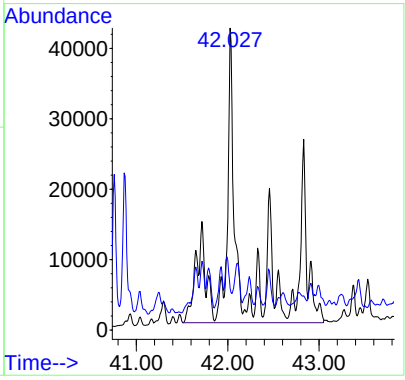


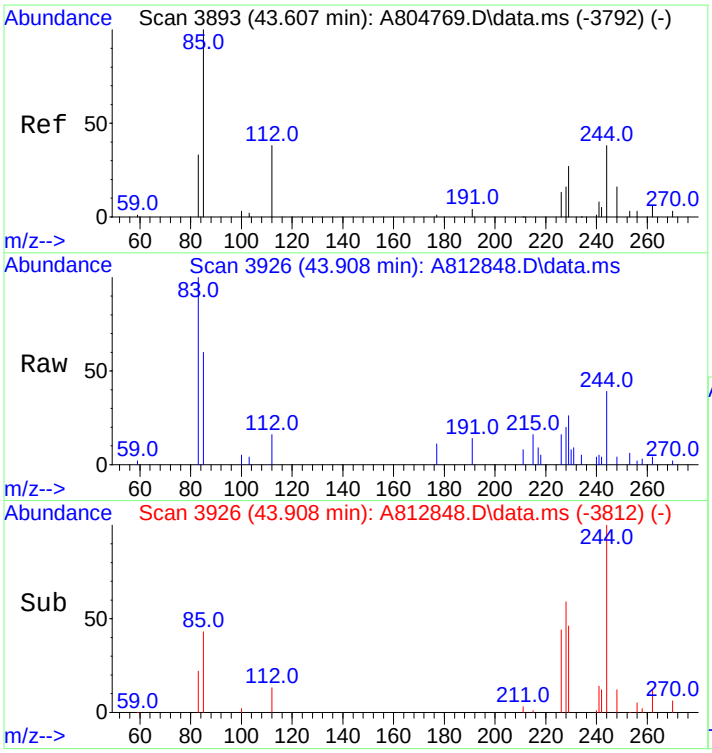


#62
C2-Fluoranthenes/Pyrenes
Concen: 2564.28 ng/mL m
RT: 42.027 min Scan# 3720
Delta R.T. 0.256 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:230 Resp: 580334

Ion	Ratio	Lower	Upper
230	100		
215	3.4	93.1	139.7#

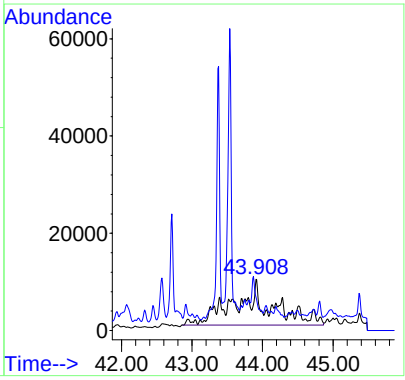


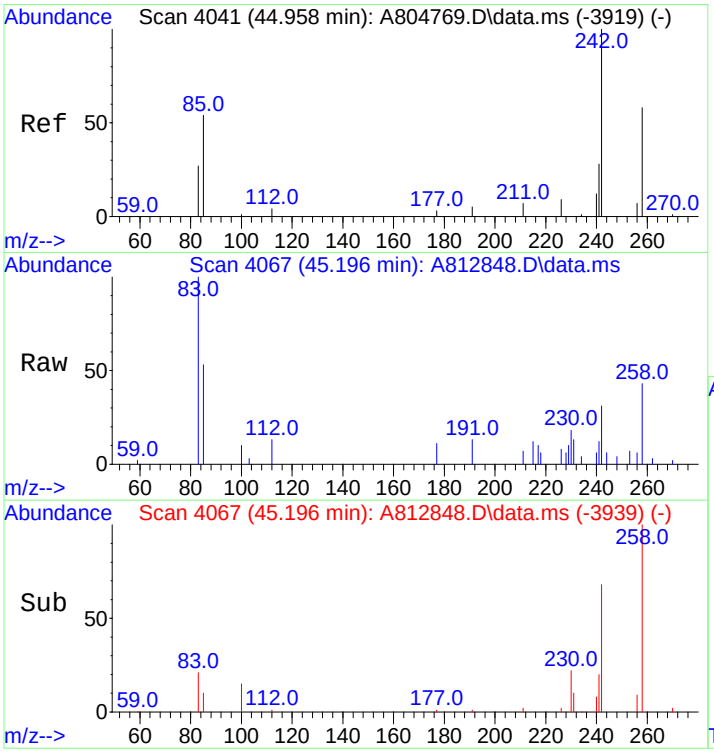


#63
C3-Fluoranthenes/Pyrenes
Concen: 1494.73 ng/mL m
RT: 43.908 min Scan# 3926
Delta R.T. 0.119 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:244 Resp: 338280

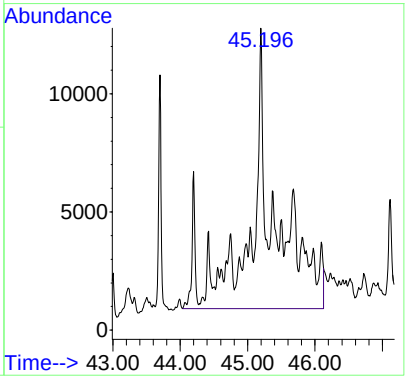
Ion	Ratio	Lower	Upper
244	100		
229	1.1	76.2	114.2#

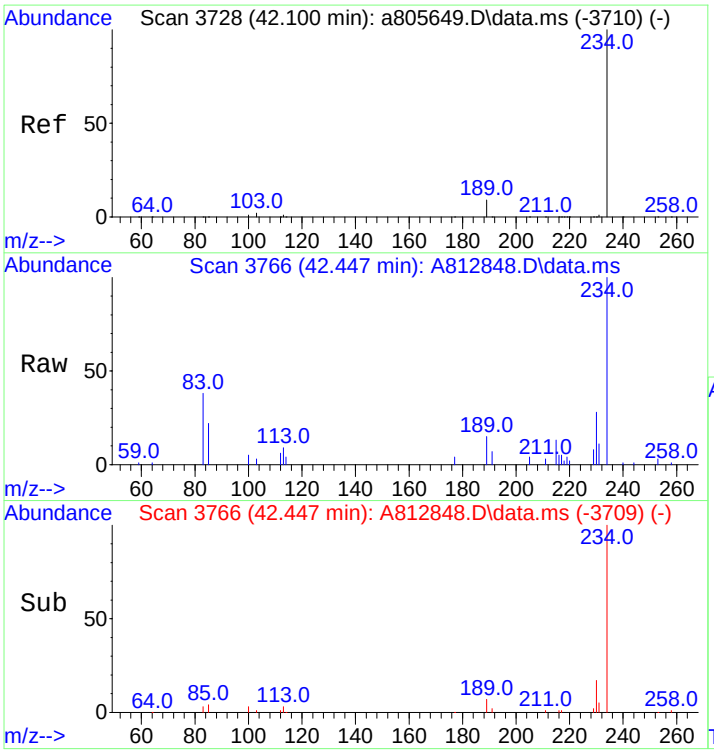




#64
C4-Fluoranthenes/Pyrenes
Concen: 1320.06 ng/mL m
RT: 45.196 min Scan# 4067
Delta R.T. 0.055 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:258 Resp: 298750

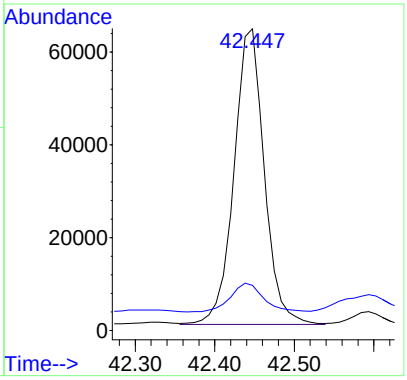


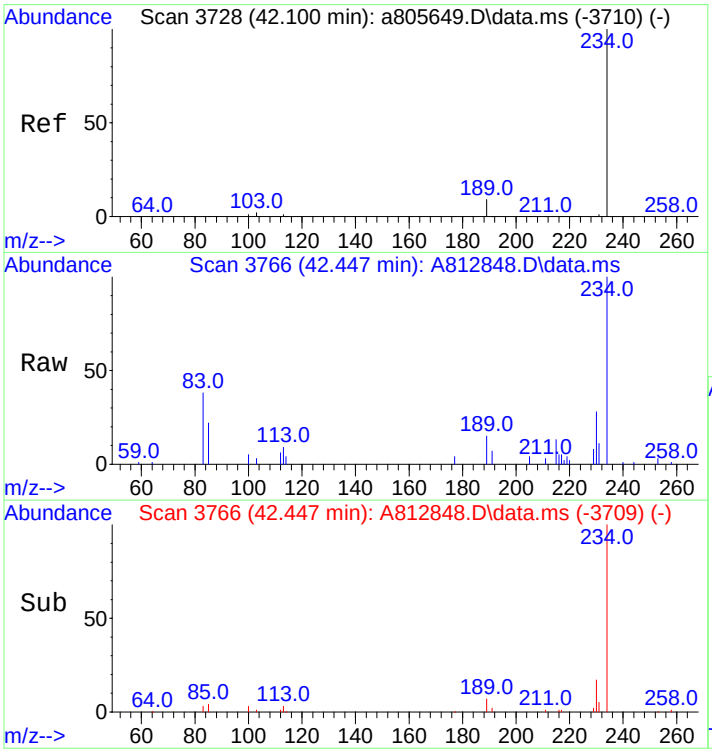


#66
Naphthobenzothiophene
Concen: 802.00 ng/ml m
RT: 42.447 min Scan# 3766
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:234 Resp: 168490

Ion	Ratio	Lower	Upper
234	100		
189	1.1	22.3	33.5#

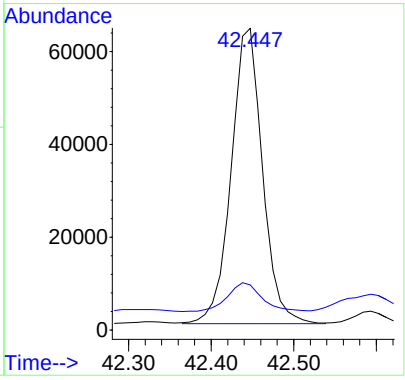


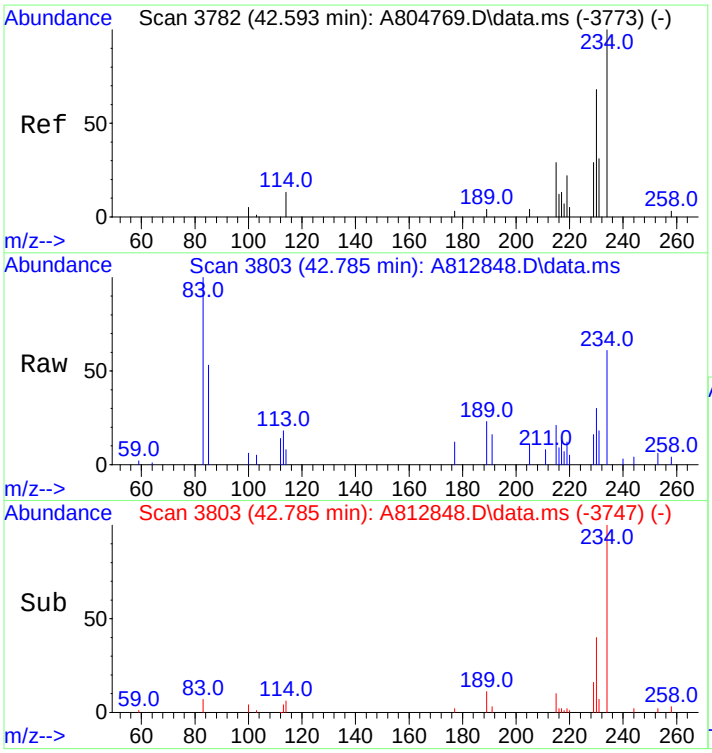


#67
Naphthobenzothiophene-2,1-D
Concen: 797.62 ng/mL m
RT: 42.447 min Scan# 3766
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:234 Resp: 167570

Ion	Ratio	Lower	Upper
234	100		
189	1.1	22.3	33.5#

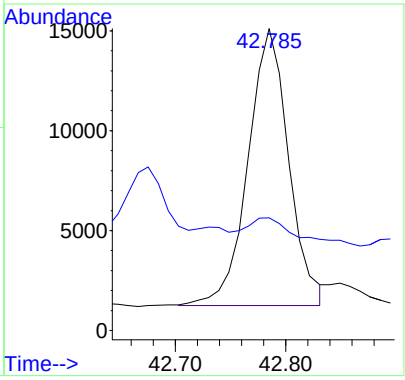


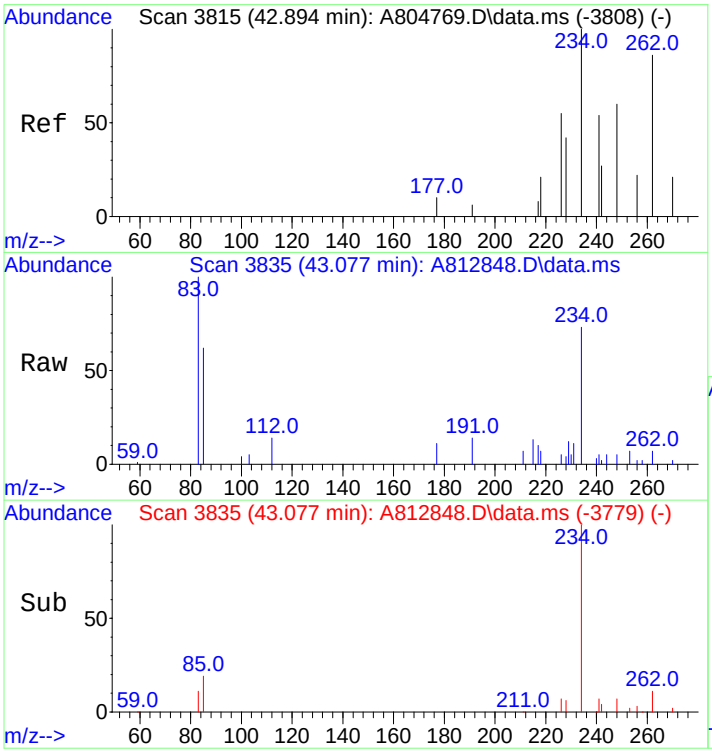


#68
Naphthobenzothiophene-1,2-D
Concen: 168.84 ng/mL m
RT: 42.785 min Scan# 3803
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:234 Resp: 35472

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

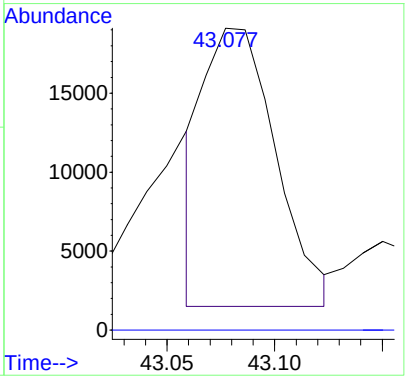


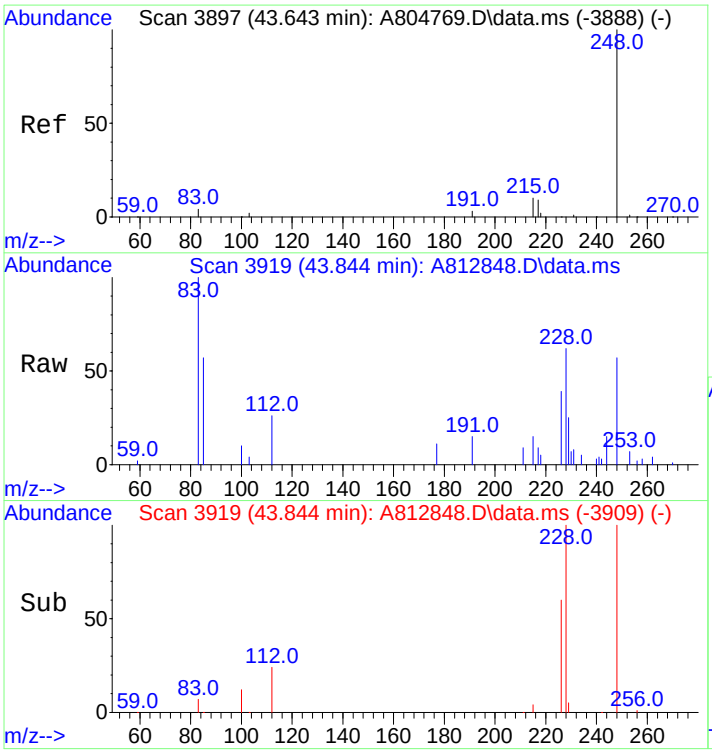


#69
Naphthobenzothiophene-2,3-D
Concen: 196.31 ng/mL m
RT: 43.077 min Scan# 3835
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:234 Resp: 41242

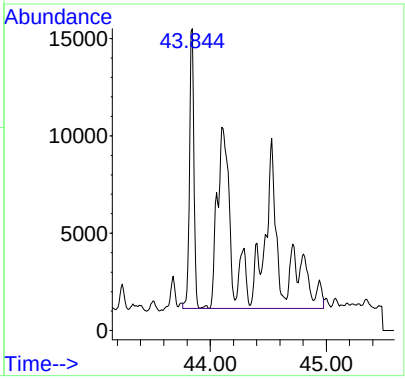
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

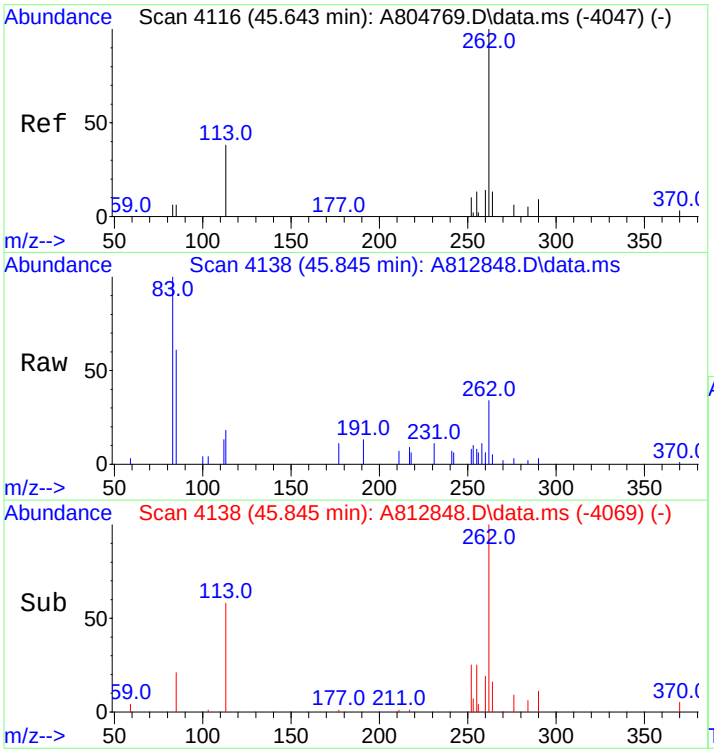




#70
C1-Naphthobenzothiophenes
Concen: 954.31 ng/ml m
RT: 43.844 min Scan# 3919
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

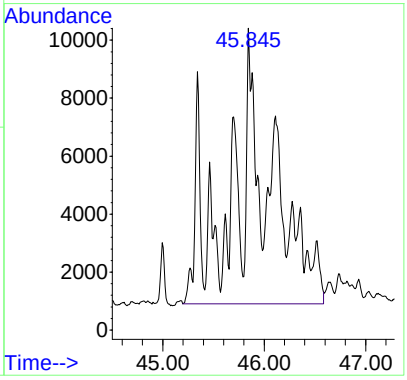
Tgt Ion:248 Resp: 200489

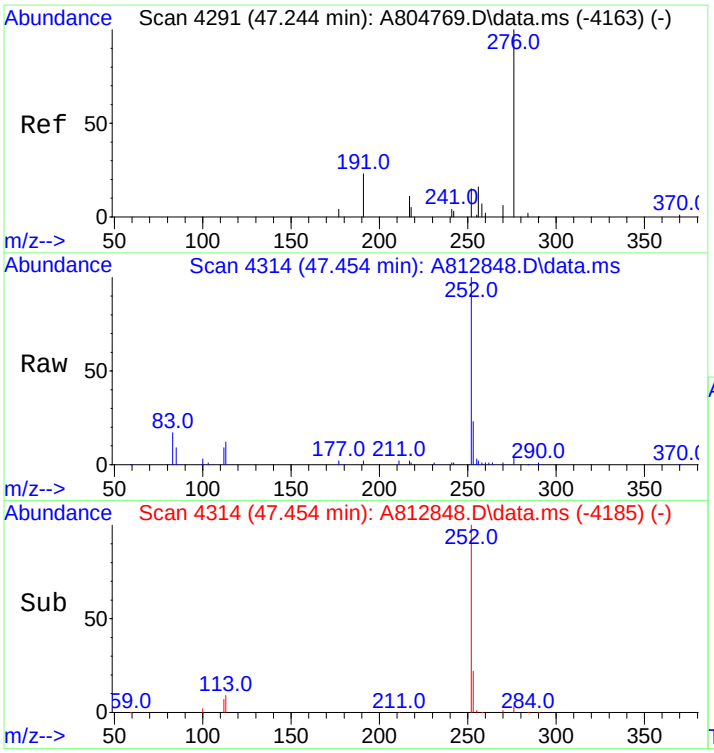




#71
C2-Naphthobenzothiophenes
Concen: 1170.31 ng/ml m
RT: 45.845 min Scan# 4138
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

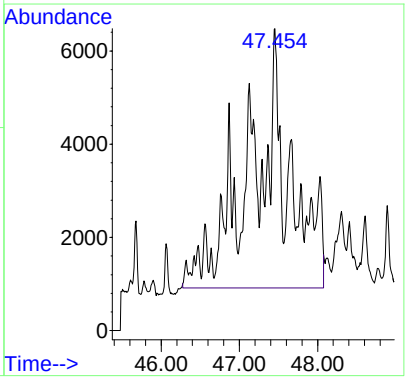
Tgt Ion:262 Resp: 245867

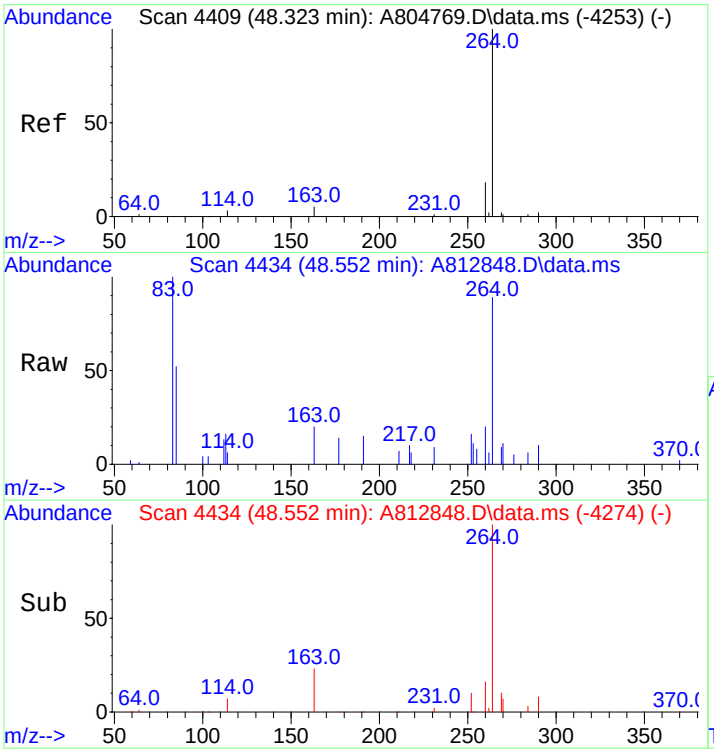




#72
C3-Naphthobenzothiophenes
Concen: 894.21 ng/ml m
RT: 47.454 min Scan# 4314
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

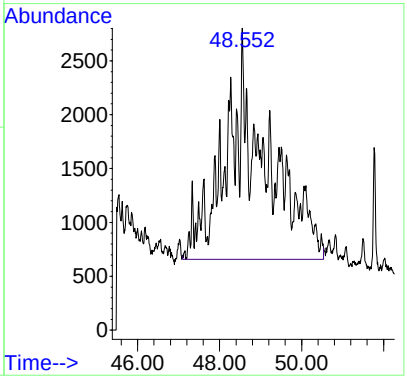
Tgt Ion:276 Resp: 187862

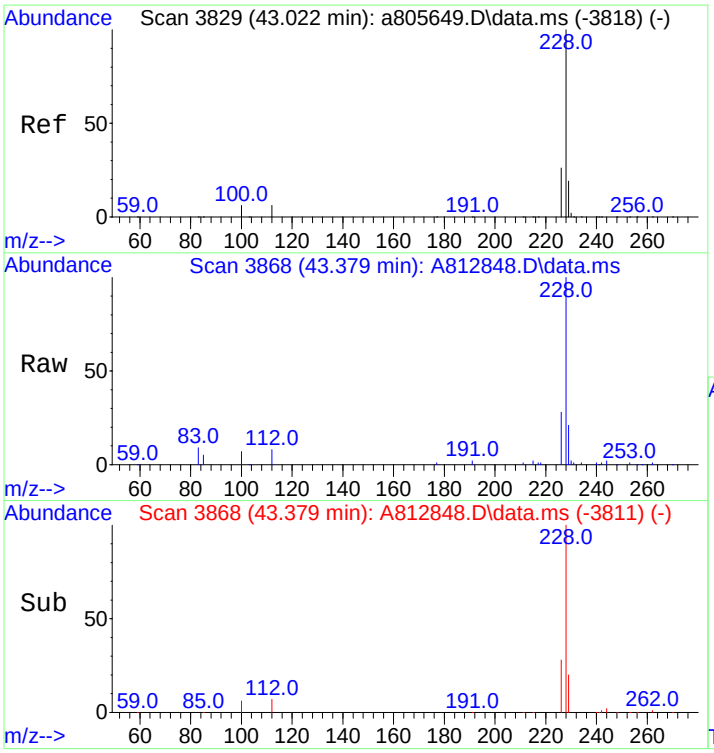




#73
C4-Naphthobenzothiophenes
Concen: 661.73 ng/mL m
RT: 48.552 min Scan# 4434
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:290 Resp: 139022

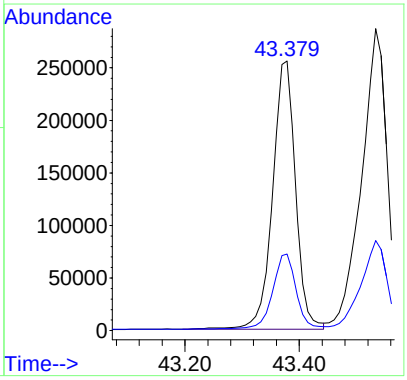


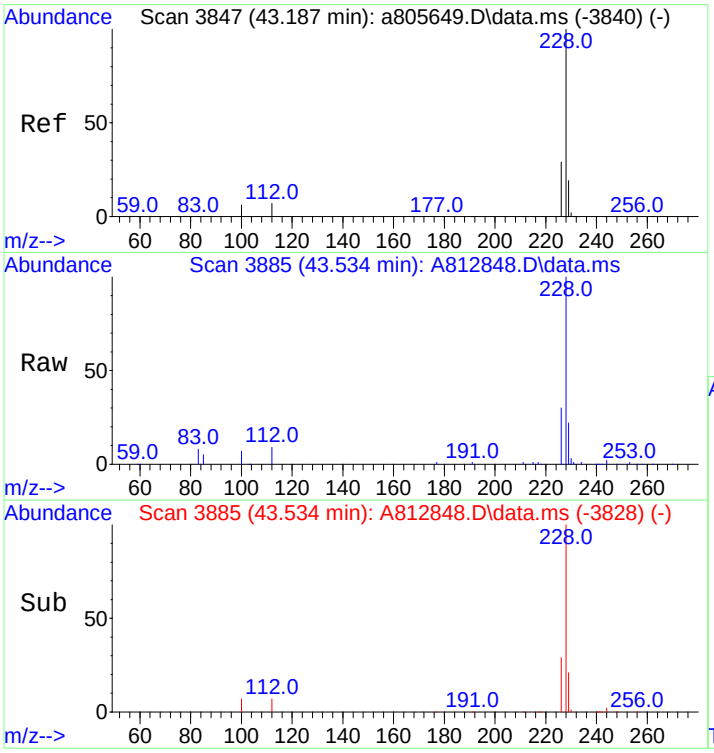


#75
Benz[a]anthracene
Concen: 3554.86 ng/mL
RT: 43.379 min Scan# 3868
Delta R.T. 0.019 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:228 Resp: 710979

Ion	Ratio	Lower	Upper
228	100		
226	27.6	21.3	31.9

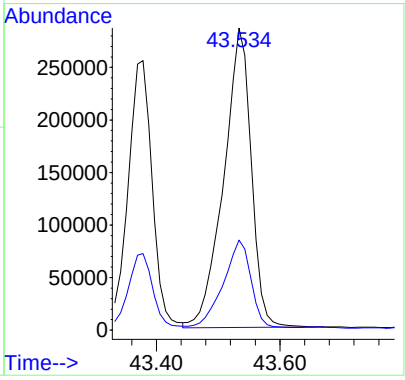


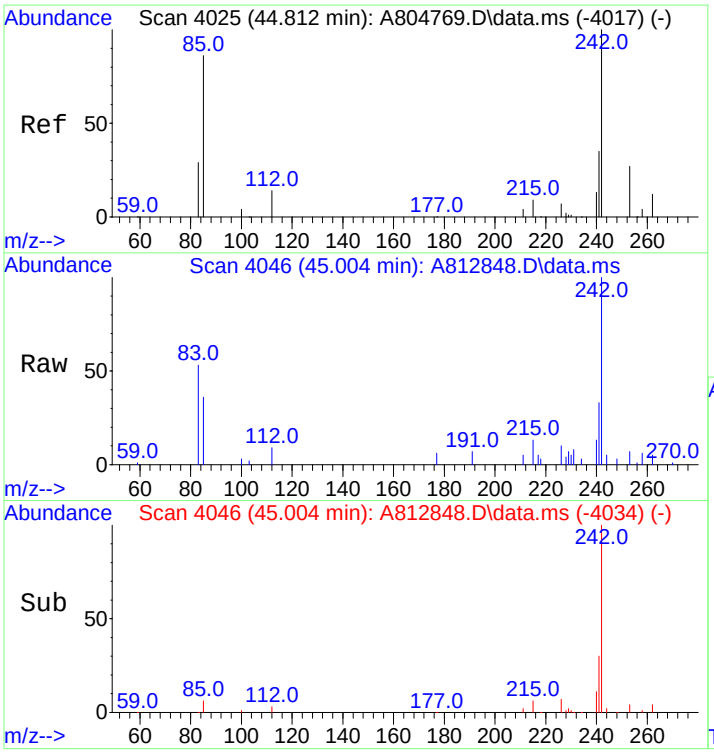


#77
Chrysene/Triphenylene
Concen: 4358.28 ng/mL
RT: 43.534 min Scan# 3885
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:228 Resp: 882328

Ion	Ratio	Lower	Upper
228	100		
226	30.1	23.6	35.4

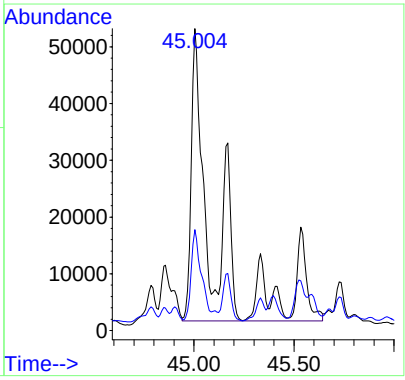


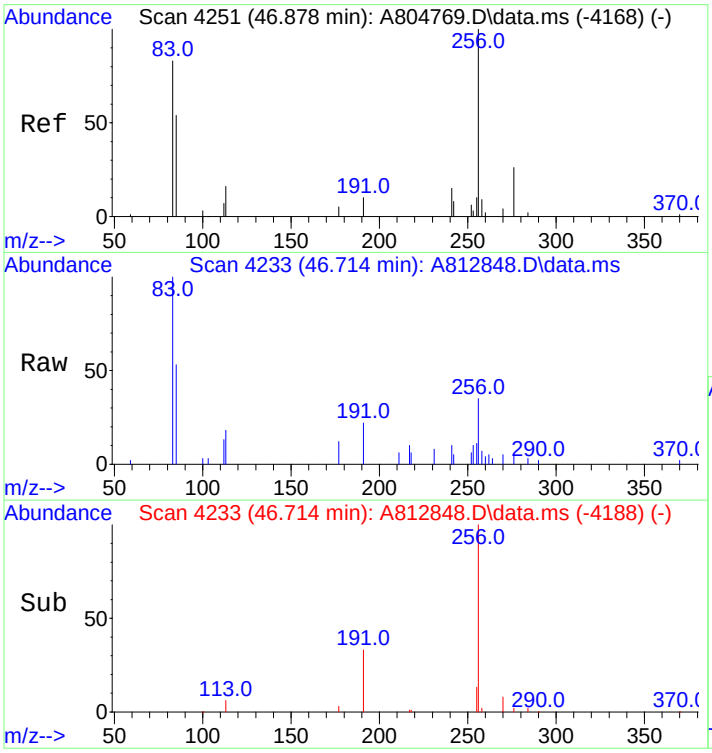


#78
C1-Chrysenes
Concen: 1926.76 ng/mL m
RT: 45.004 min Scan# 4046
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:242 Resp: 390070

Ion	Ratio	Lower	Upper
242	100		
241	3.0	33.5	50.3#

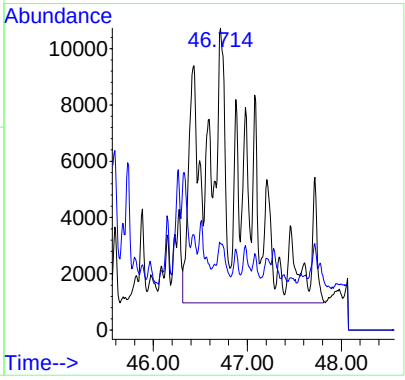


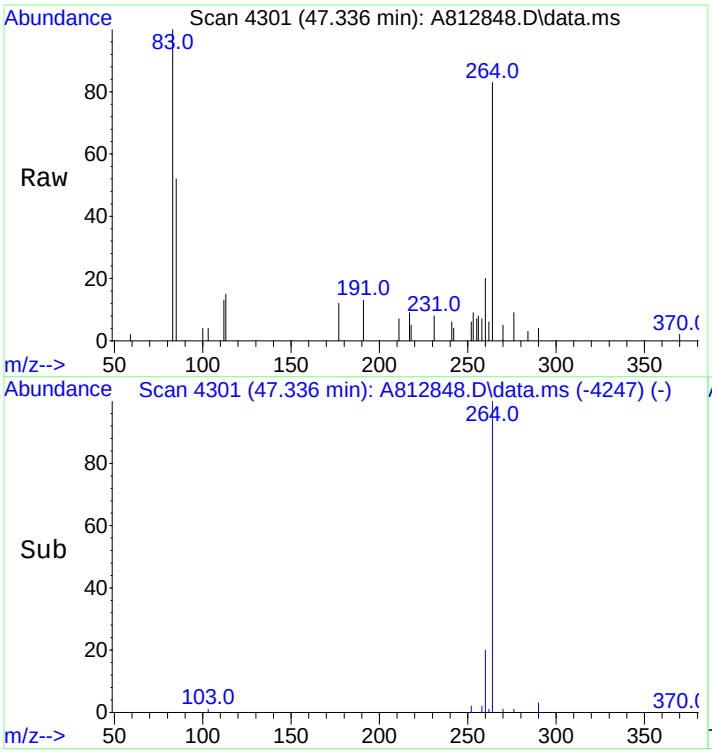


#79
C2-Chrysenes
Concen: 1456.72 ng/mL m
RT: 46.714 min Scan# 4233
Delta R.T. -0.347 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:256 Resp: 294910

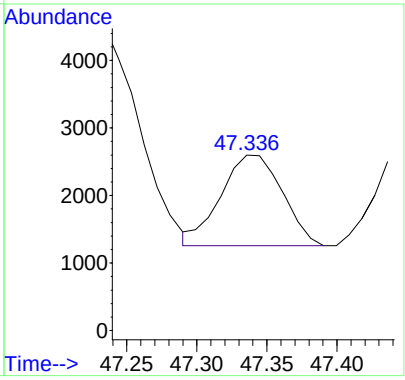
Ion	Ratio	Lower	Upper
256	100		
241	1.3	30.4	45.6#

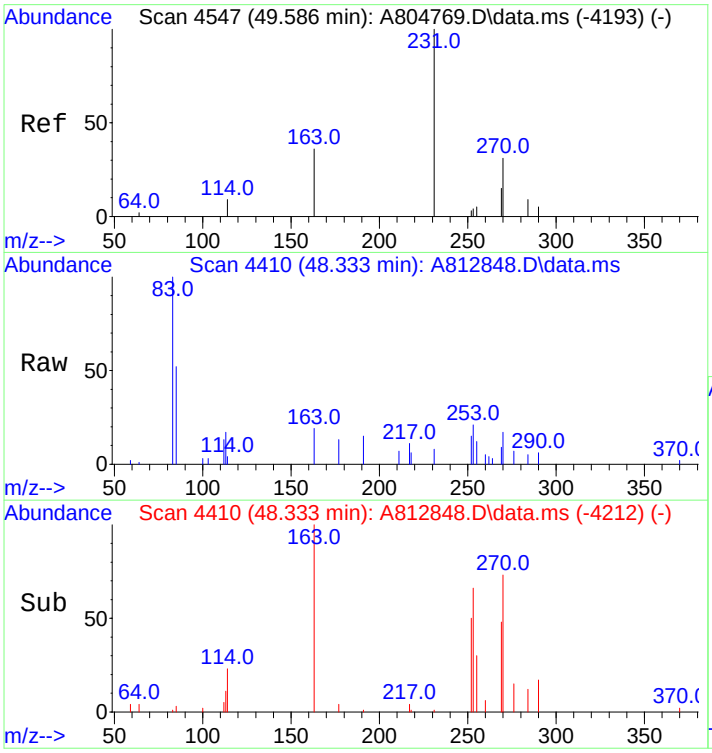




#80
BBF-D12 Surr BKGD
Concen: 20.27 ng/mL
RT: 47.336 min Scan# 4301
Delta R.T. -0.007 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:256 Resp: 4103

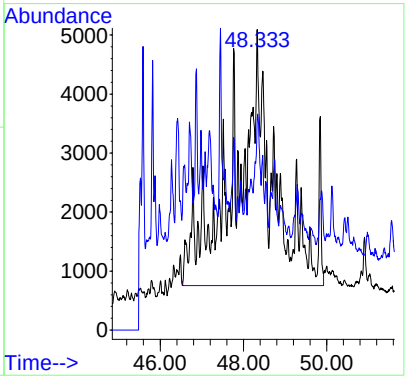


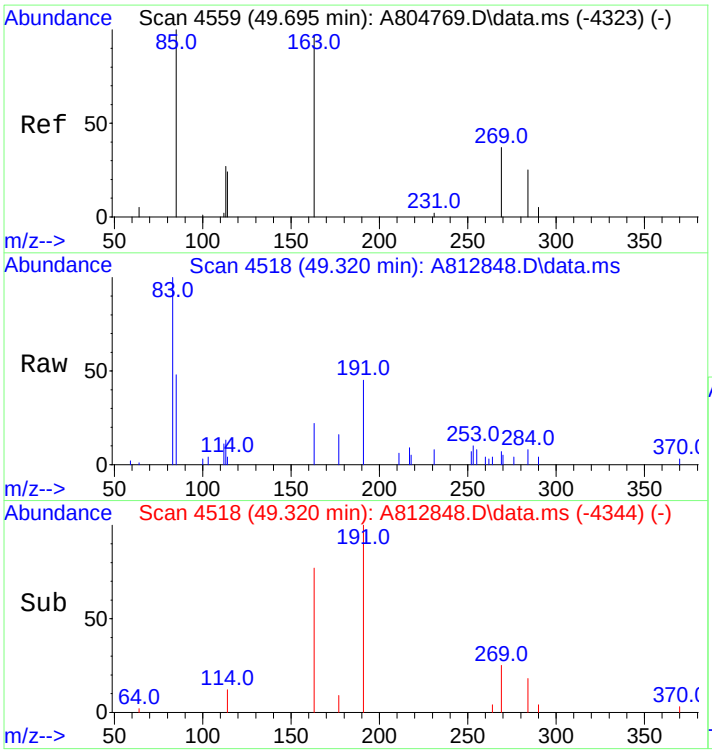


#81
C3-Chrysenes
Concen: 1351.90 ng/mL m
RT: 48.333 min Scan# 4410
Delta R.T. -1.482 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:270 Resp: 273690

Ion	Ratio	Lower	Upper
270	100		
255	0.5	42.9	64.3#

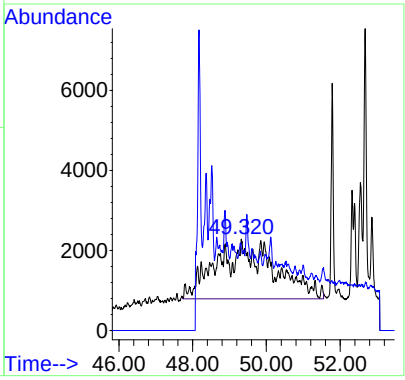


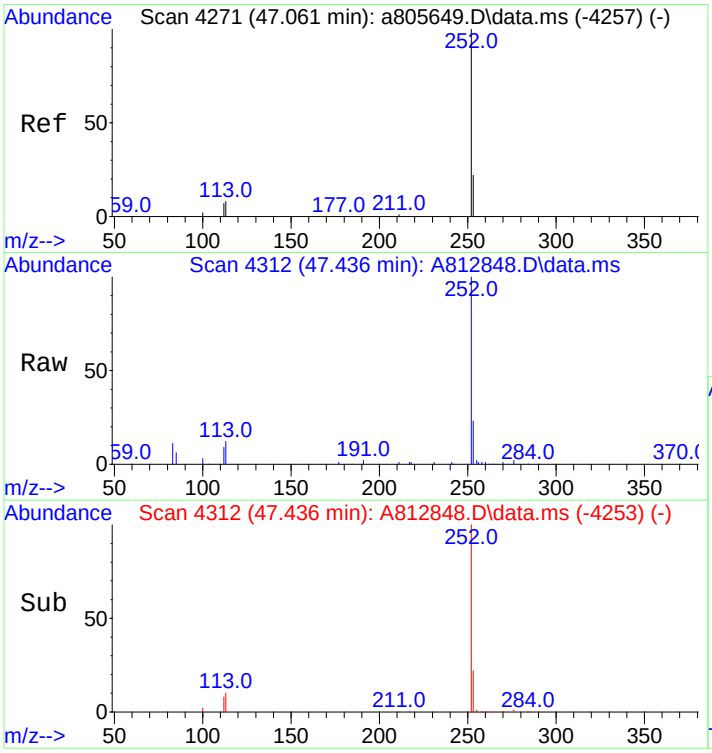


#82
C4-Chrysenes
Concen: 767.66 ng/mL m
RT: 49.320 min Scan# 4518
Delta R.T. -0.505 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:284 Resp: 155412

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

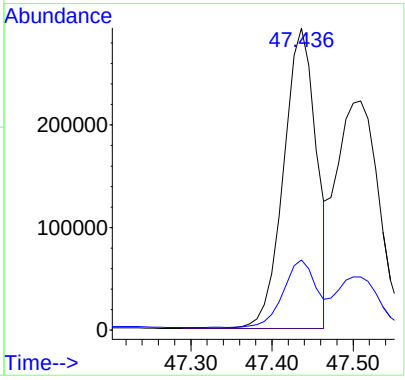


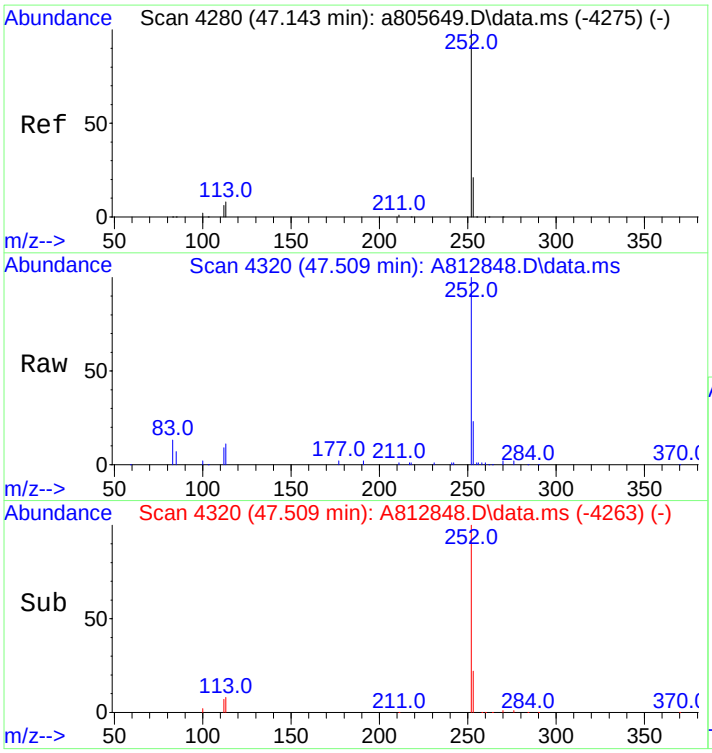


#84
Benzo[b]fluoranthene
Concen: 3842.75 ng/mL
RT: 47.436 min Scan# 4312
Delta R.T. 0.036 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:252 Resp: 825421

Ion	Ratio	Lower	Upper
252	100		
253	22.6	18.5	27.7

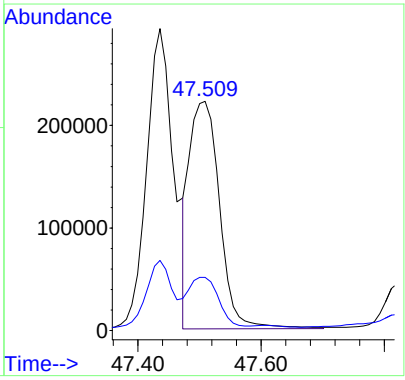


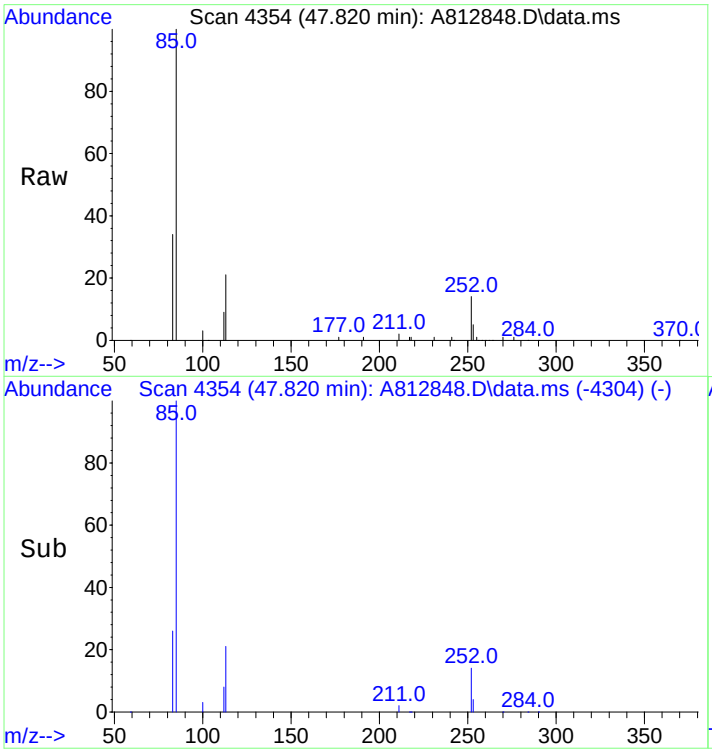


#85
Benzo[j]+[k]fluoranthene
Concen: 3241.73 ng/mL
RT: 47.509 min Scan# 4320
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:252 Resp: 759761

Ion	Ratio	Lower	Upper
252	100		
253	21.5	18.8	28.2

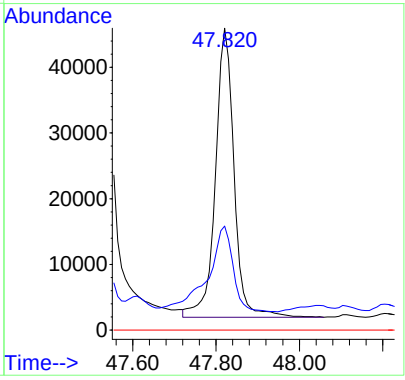


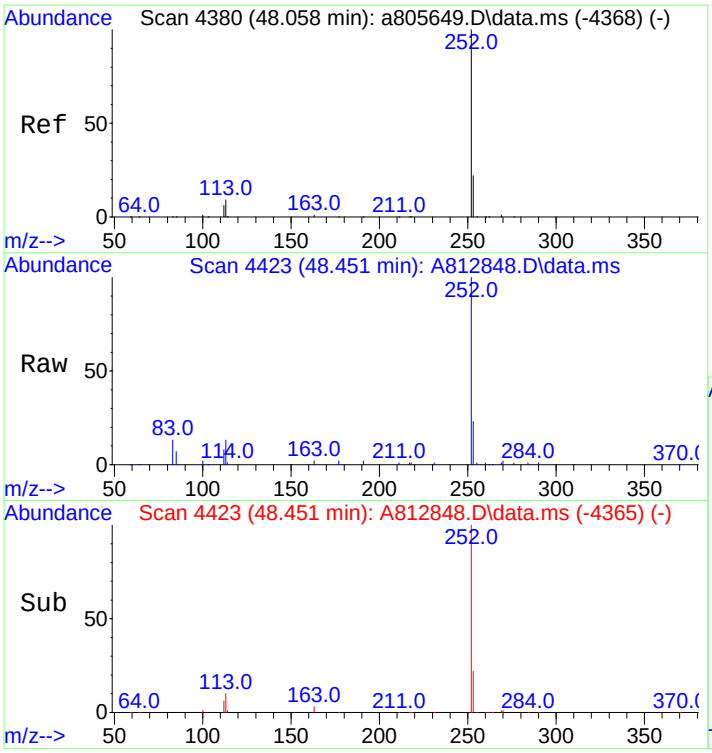


#86
Benzo[a]fluoranthene
Concen: 583.16 ng/mL
RT: 47.820 min Scan# 4354
Delta R.T. -0.046 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:252 Resp: 136674

Ion	Ratio	Lower	Upper
252	100		
253	40.9	372.3	558.5#
125	0.0	0.0	0.0

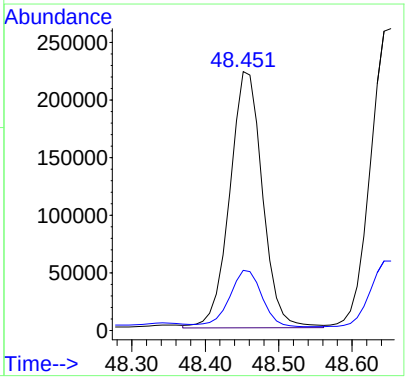


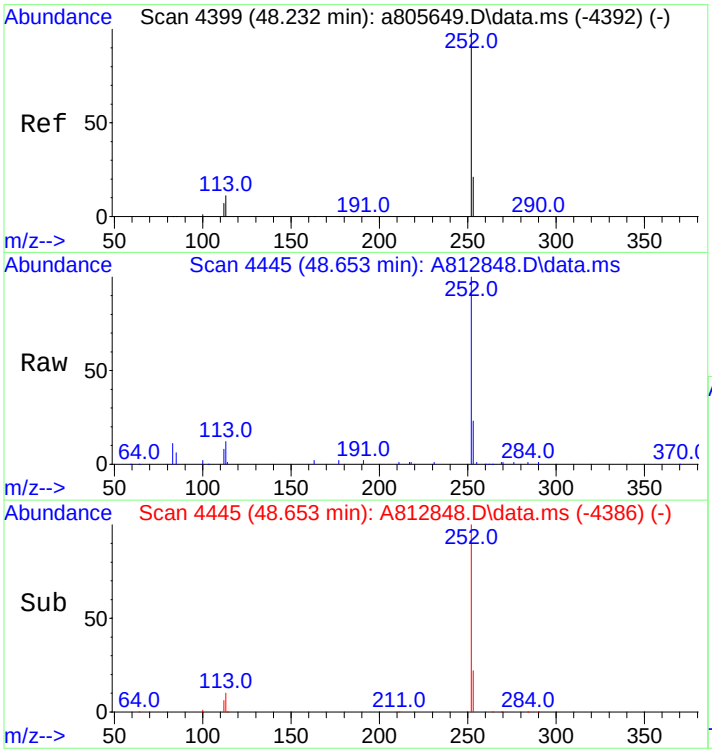


#87
Benzo[e]pyrene
Concen: 3124.27 ng/mL
RT: 48.451 min Scan# 4423
Delta R.T. 0.027 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:252 Resp: 691472

Ion	Ratio	Lower	Upper
252	100		
253	21.6	18.9	28.3

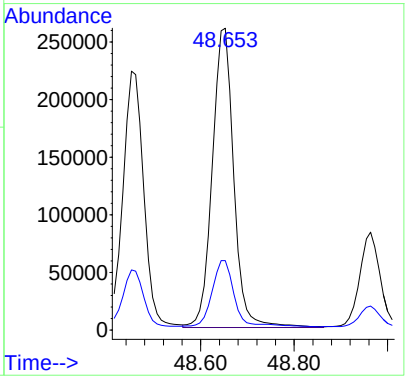


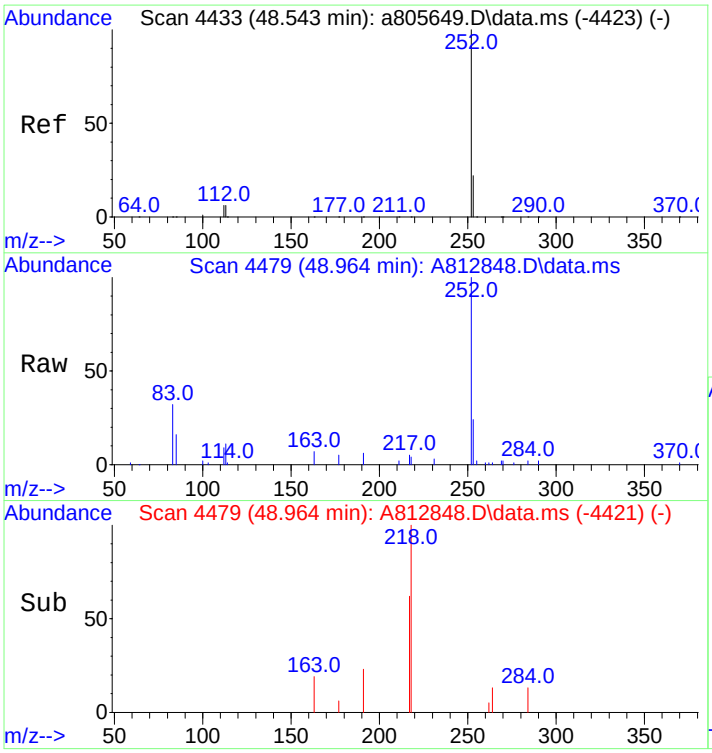


#89
Benzo[a]pyrene
Concen: 4064.70 ng/mL
RT: 48.653 min Scan# 4445
Delta R.T. 0.037 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:252 Resp: 832163

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.4	29.0

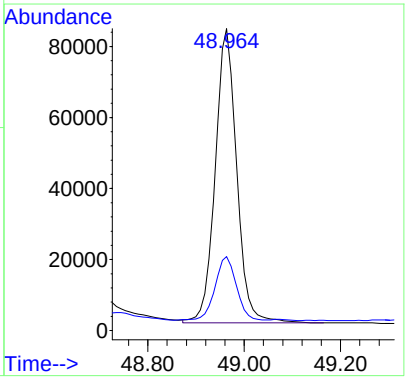


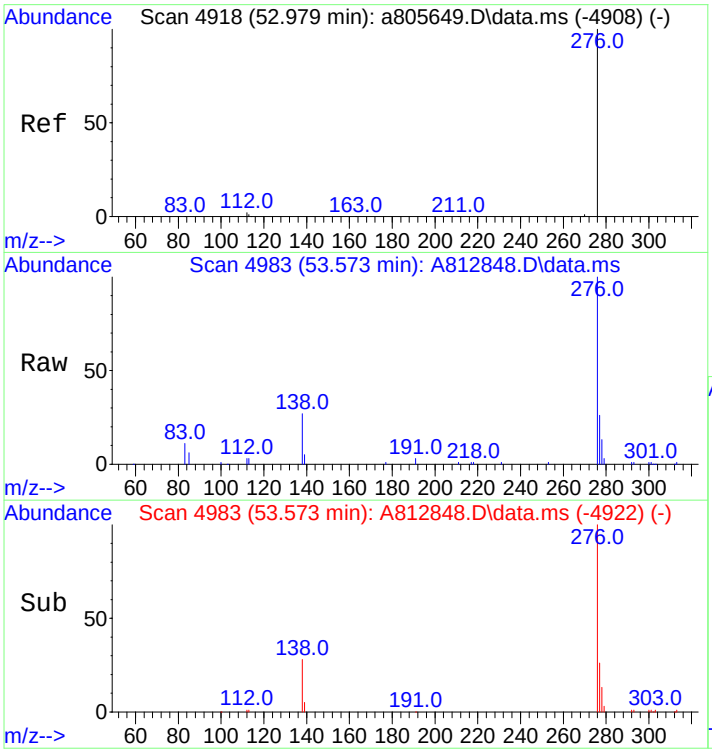


#90
Perylene
Concen: 1150.24 ng/mL
RT: 48.964 min Scan# 4479
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:252 Resp: 257226

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.3	28.9

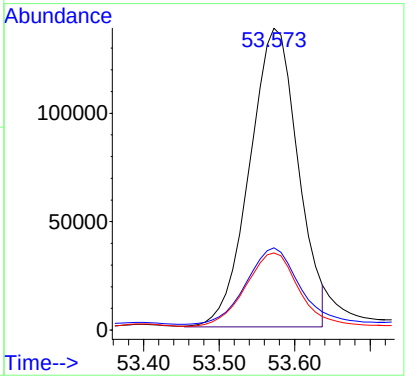


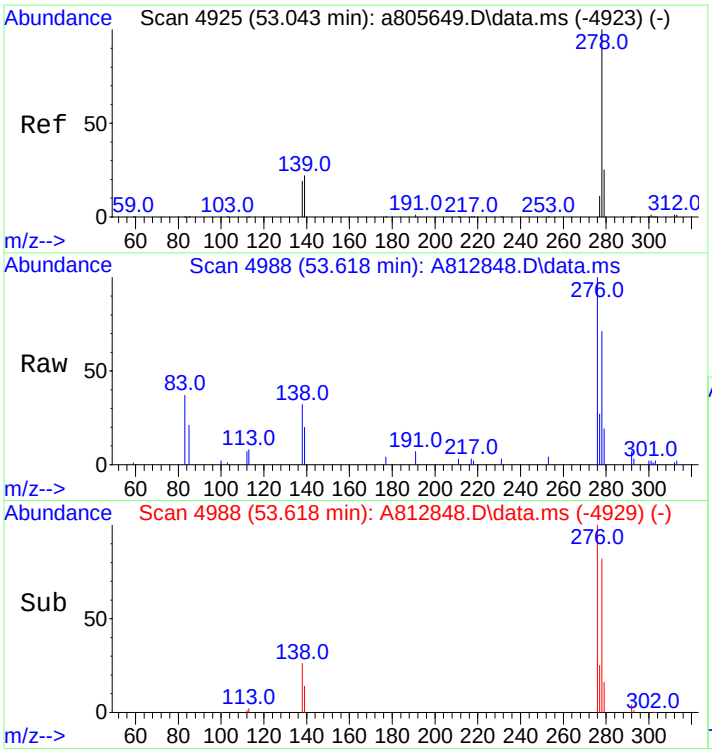


#91
Indeno[1,2,3-cd]pyrene
Concen: 2827.03 ng/mL m
RT: 53.573 min Scan# 4983
Delta R.T. 0.055 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:276 Resp: 614814

Ion	Ratio	Lower	Upper
276	100		
138	28.2	19.9	29.9
277	27.7	19.0	28.6

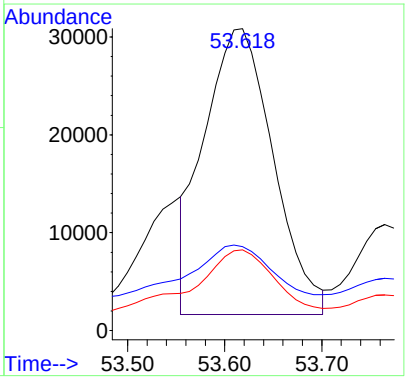


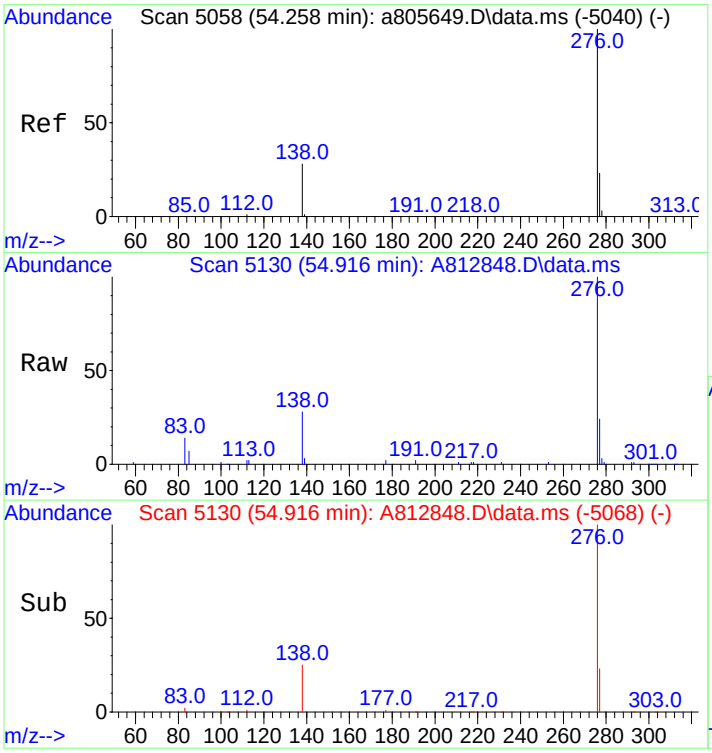


#92
Dibenz[ah]+[ac]anthracene
Concen: 679.29 ng/mL m
RT: 53.618 min Scan# 4988
Delta R.T. 0.036 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:278 Resp: 144807

Ion	Ratio	Lower	Upper
278	100		
139	23.6	16.6	25.0
279	28.5	19.1	28.7

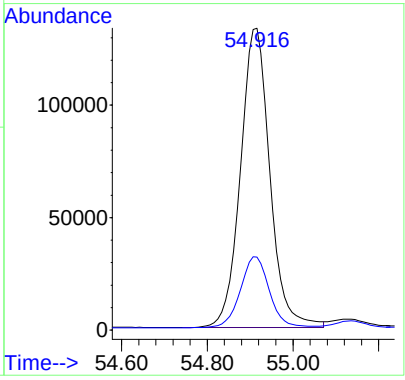


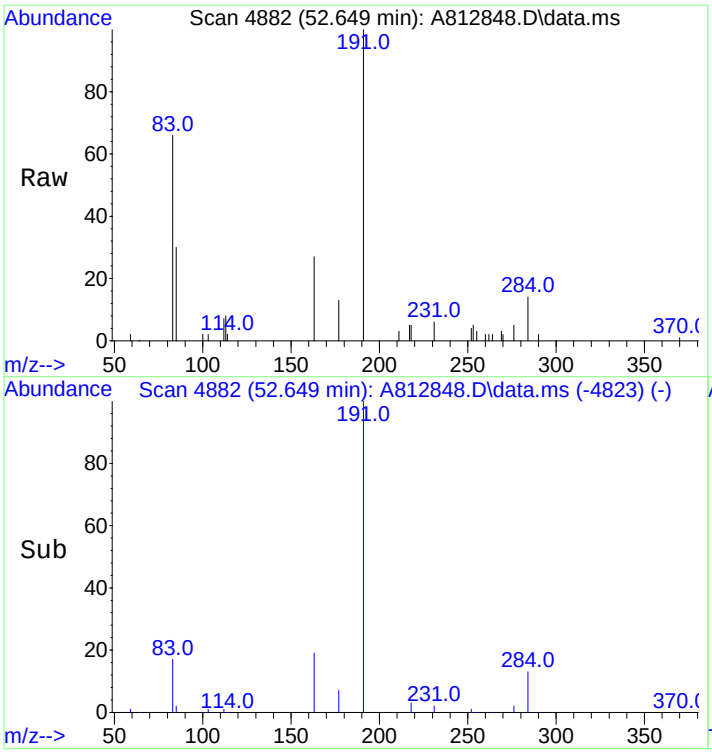


#93
Benzo[g,h,i]perylene
Concen: 2584.21 ng/mL
RT: 54.916 min Scan# 5130
Delta R.T. 0.064 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:276 Resp: 637790

Ion	Ratio	Lower	Upper
276	100		
277	23.7	18.9	28.3

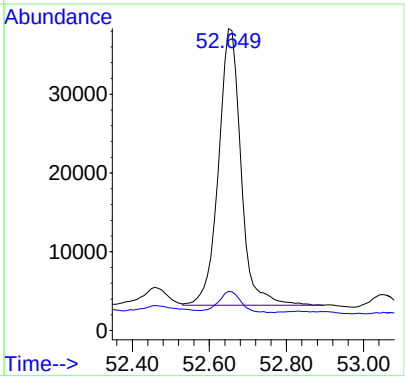


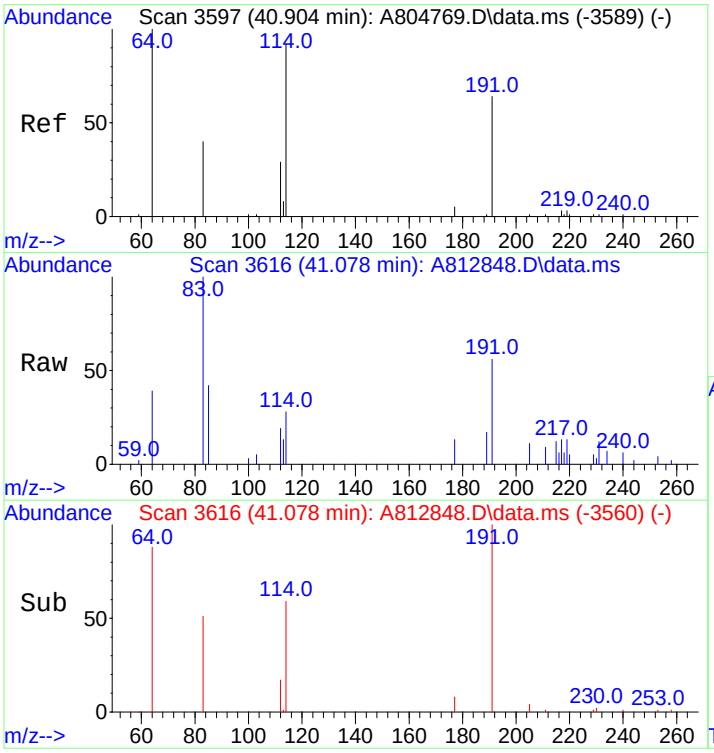


#94
Hopane (T19)
Concen: 2078.86 ng/mL
RT: 52.649 min Scan# 4882
Delta R.T. 0.036 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:191 Resp: 142436

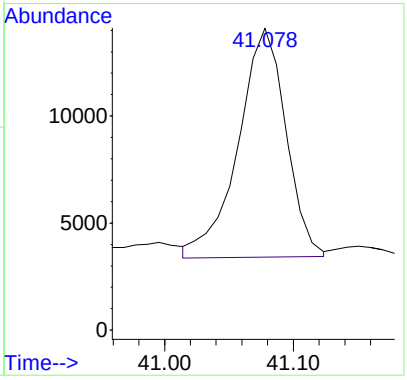
Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#

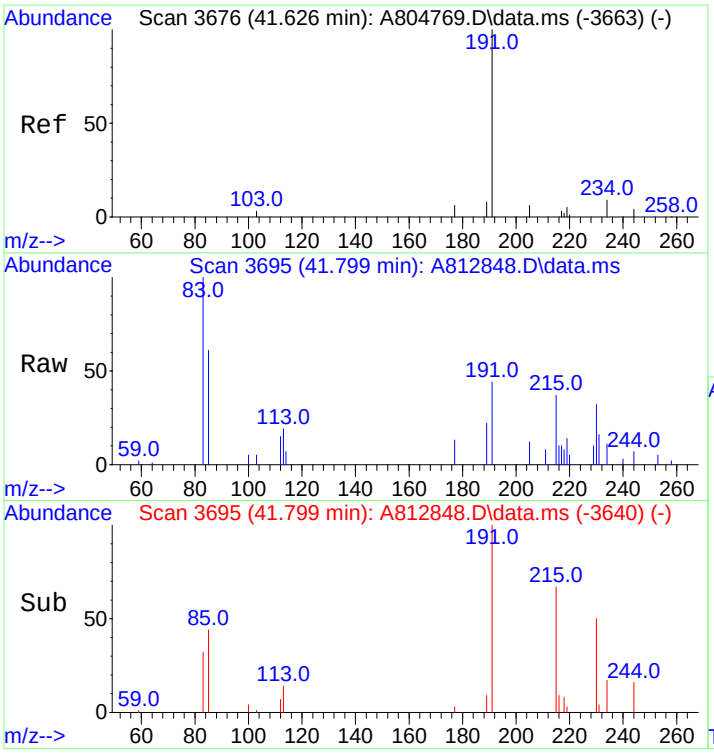




#96
C23 Tricyclic Terpane (T4)
Concen: 401.98 ng/ml
RT: 41.078 min Scan# 3616
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

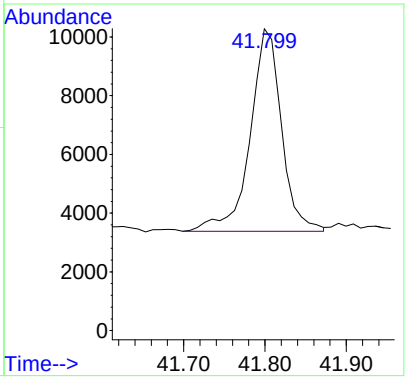
Tgt Ion:191 Resp: 27542

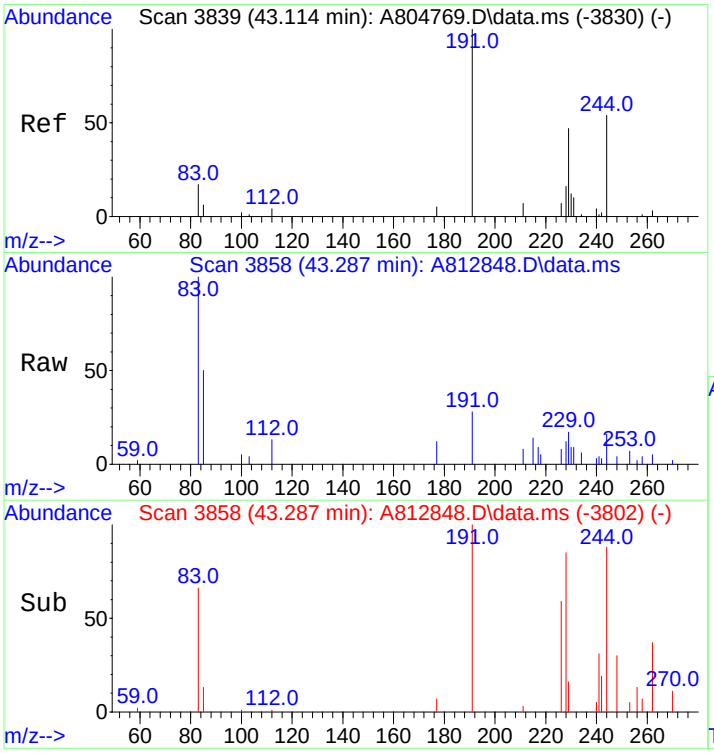




#97
C24 Tricyclic Terpane (T5)
Concen: 269.69 ng/ml
RT: 41.799 min Scan# 3695
Delta R.T. 0.000 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

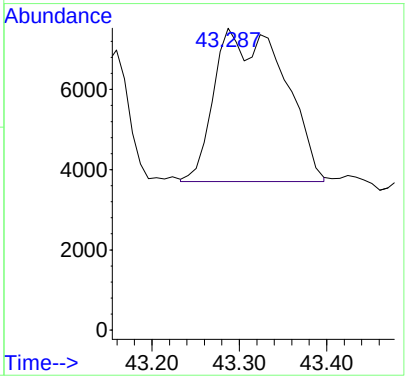
Tgt Ion:191 Resp: 18478

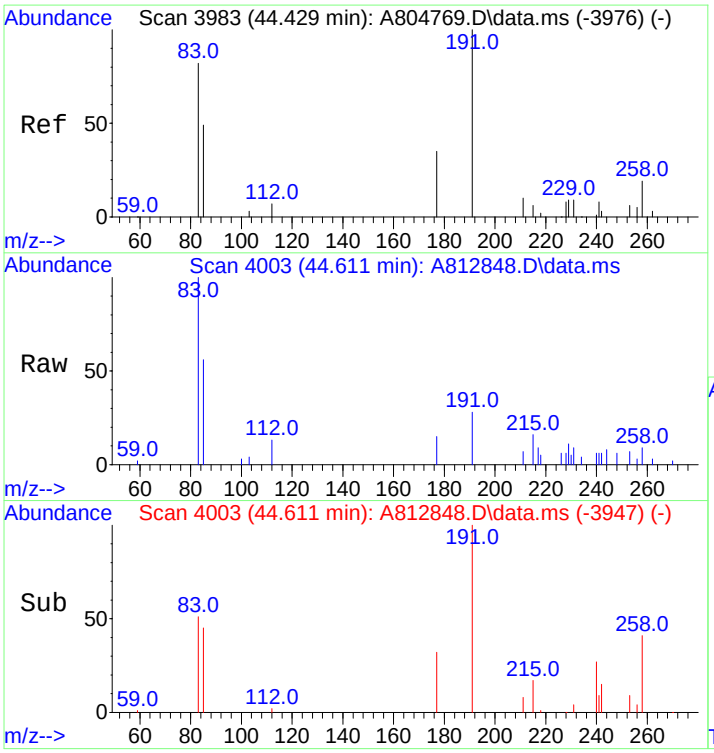




#98
C25 Tricyclic Terpane (T6)
Concen: 307.04 ng/ml m
RT: 43.287 min Scan# 3858
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

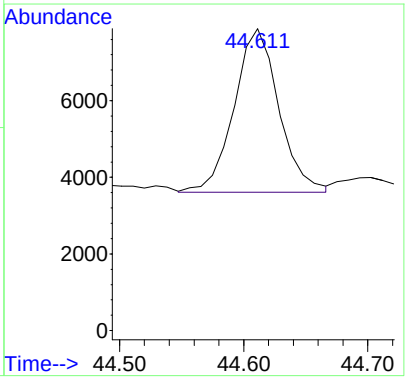
Tgt Ion:191 Resp: 21037

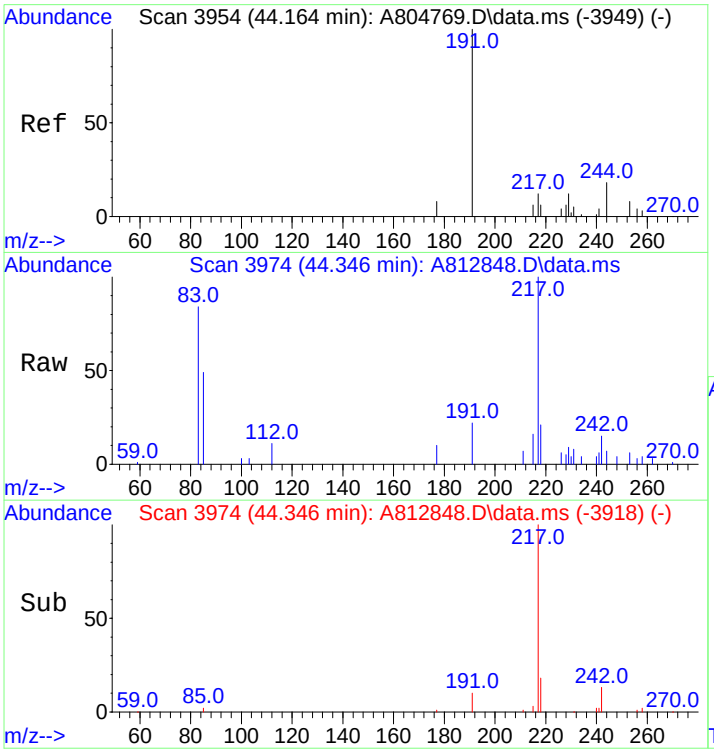




#99
C24 Tetracyclic Terpane (T6a)
Concen: 156.05 ng/ml m
RT: 44.611 min Scan# 4003
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

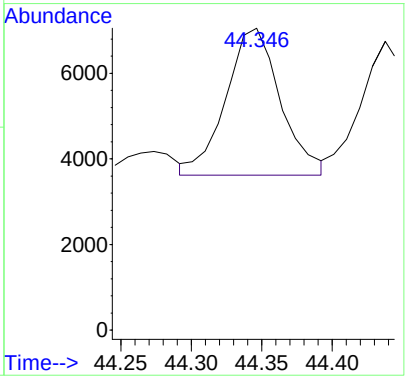
Tgt Ion:191 Resp: 10692

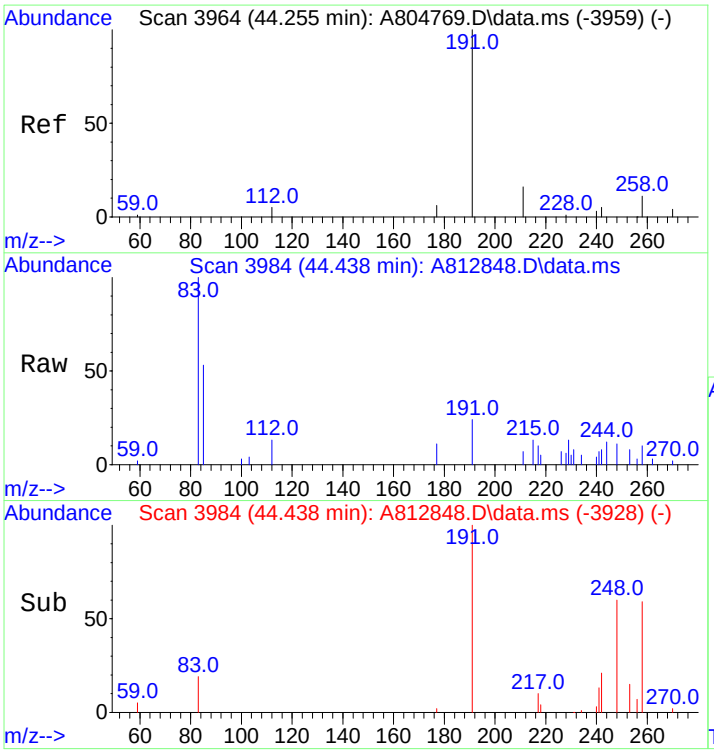




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 135.38 ng/ml m
RT: 44.346 min Scan# 3974
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

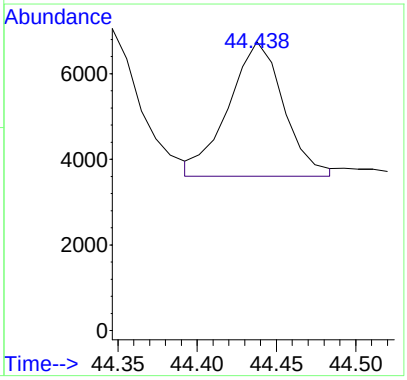
Tgt Ion:191 Resp: 9276

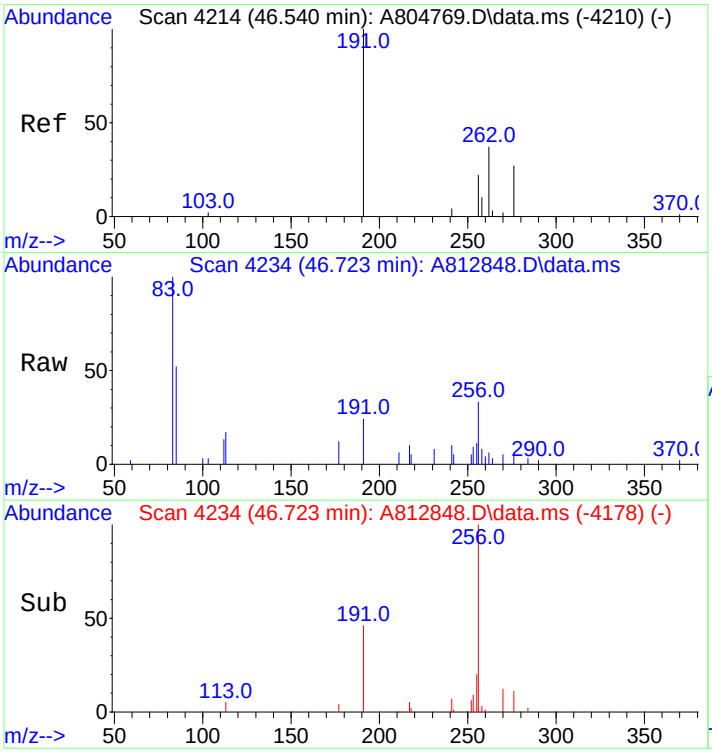




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 110.66 ng/ml m
RT: 44.438 min Scan# 3984
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

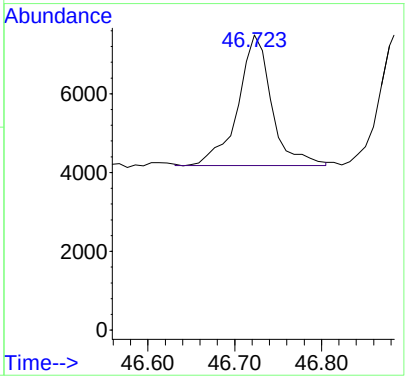
Tgt Ion:191 Resp: 7582

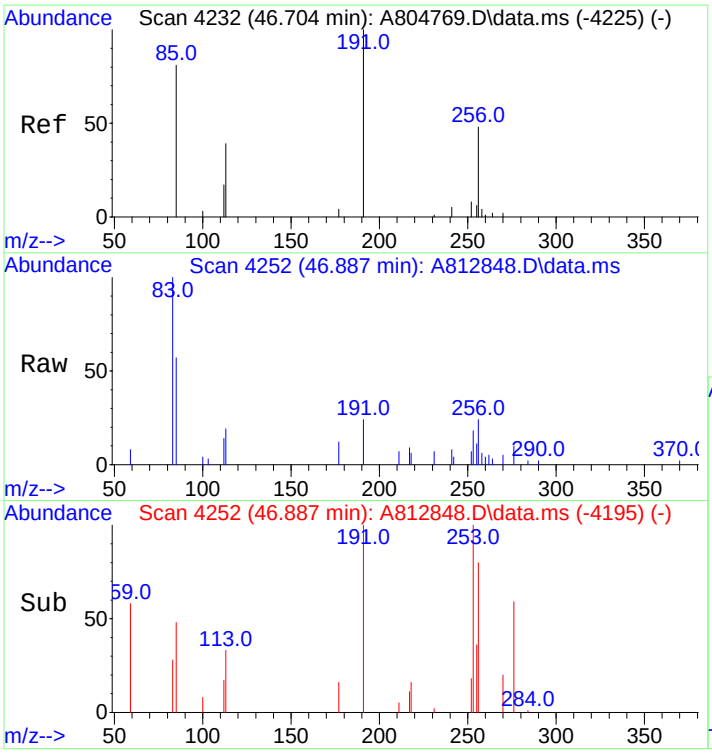




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 129.68 ng/ml m
RT: 46.723 min Scan# 4234
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

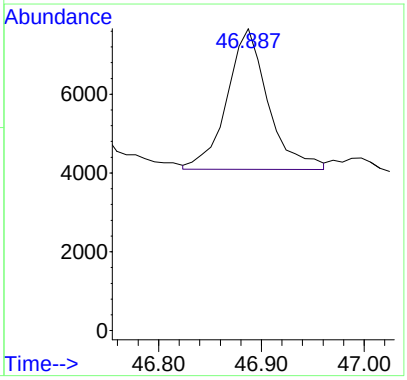
Tgt Ion:191 Resp: 8885

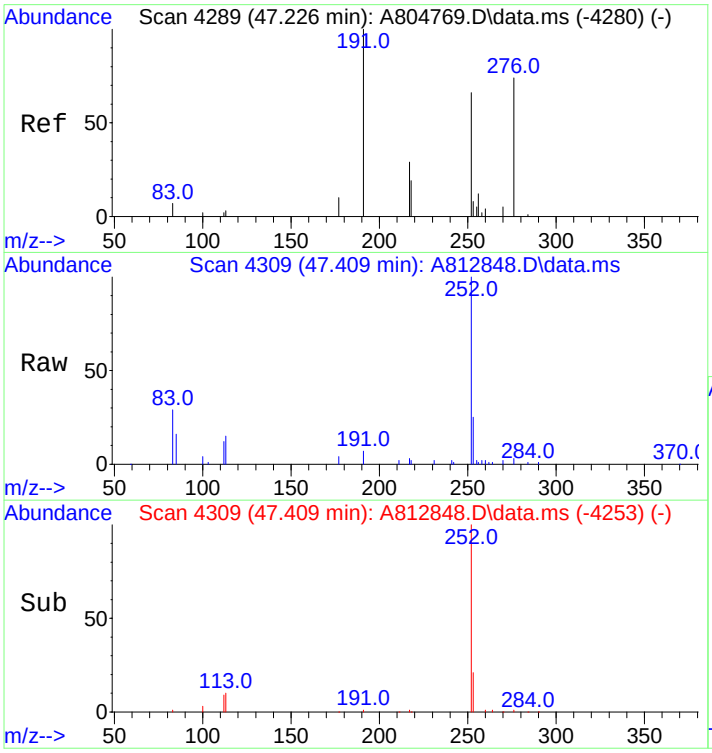




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 144.75 ng/ml
RT: 46.887 min Scan# 4252
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

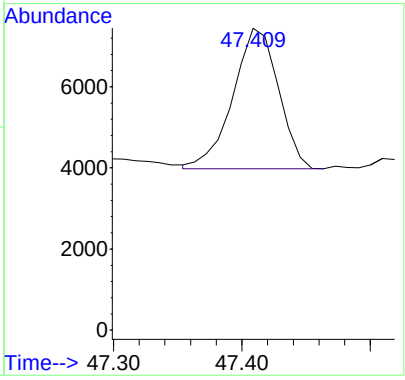
Tgt Ion:191 Resp: 9918

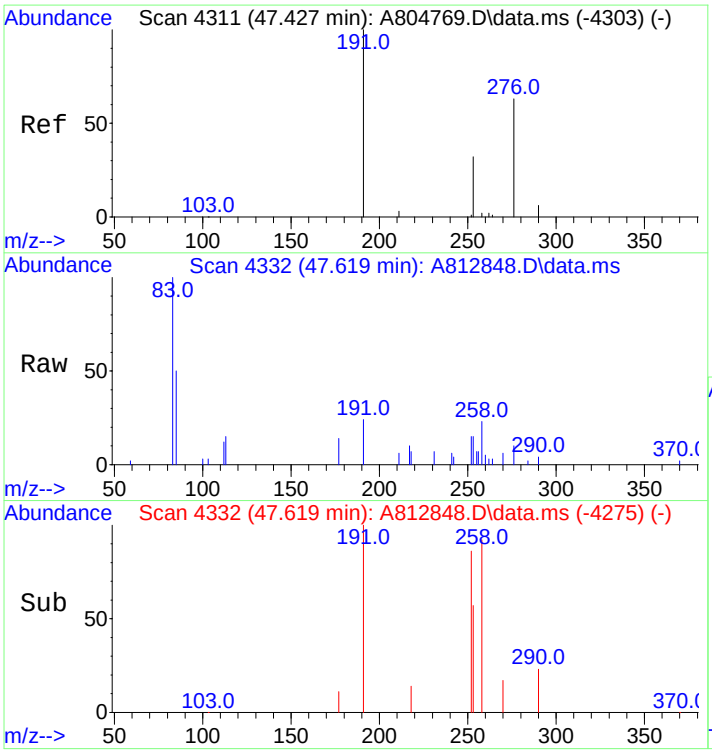




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 124.22 ng/ml
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

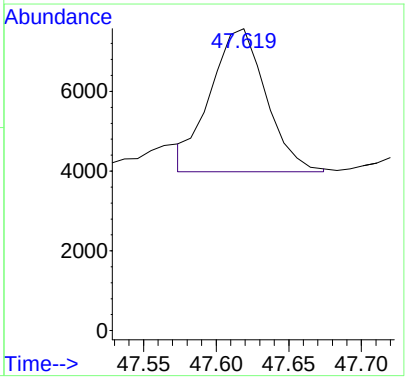
Tgt Ion:191 Resp: 8511

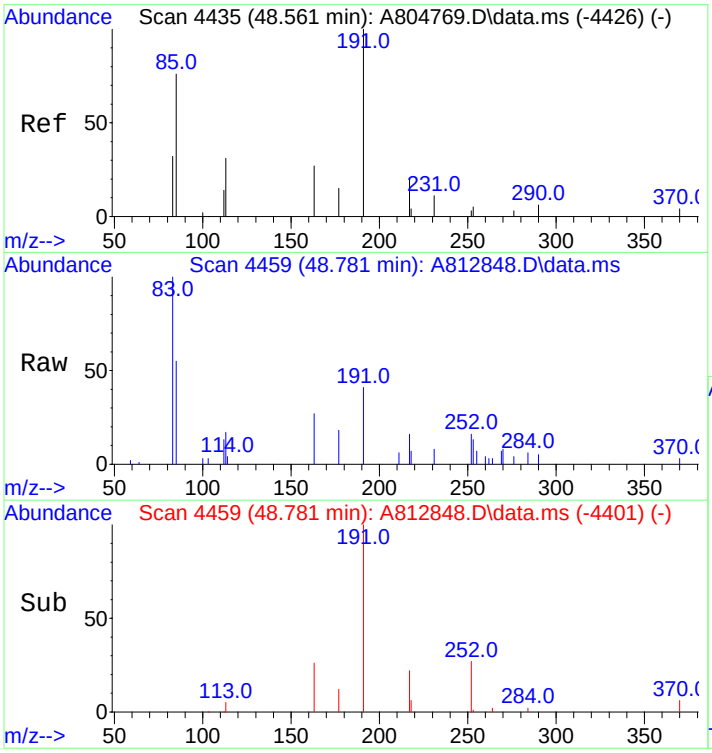




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 139.05 ng/ml m
RT: 47.619 min Scan# 4332
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

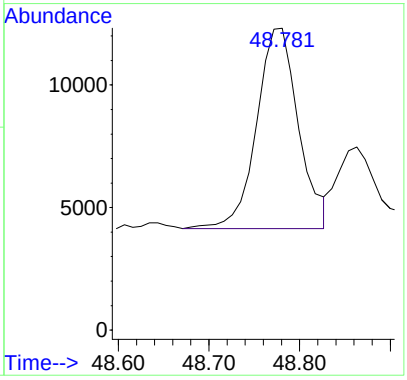
Tgt Ion:191 Resp: 9527

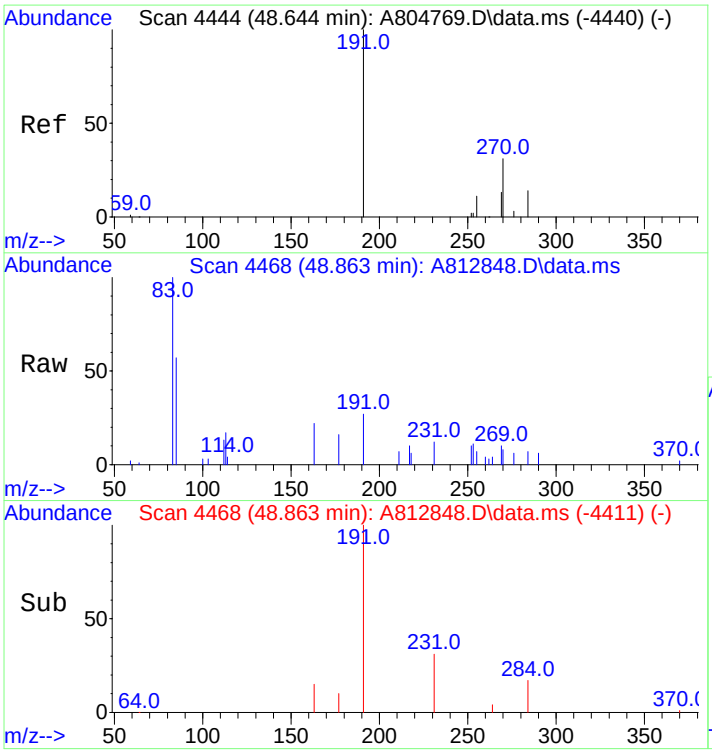




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 383.86 ng/ml
RT: 48.781 min Scan# 4459
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

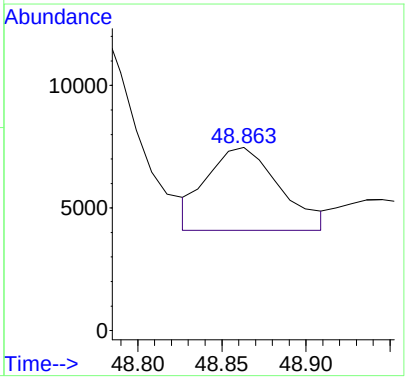
Tgt Ion:191 Resp: 26301

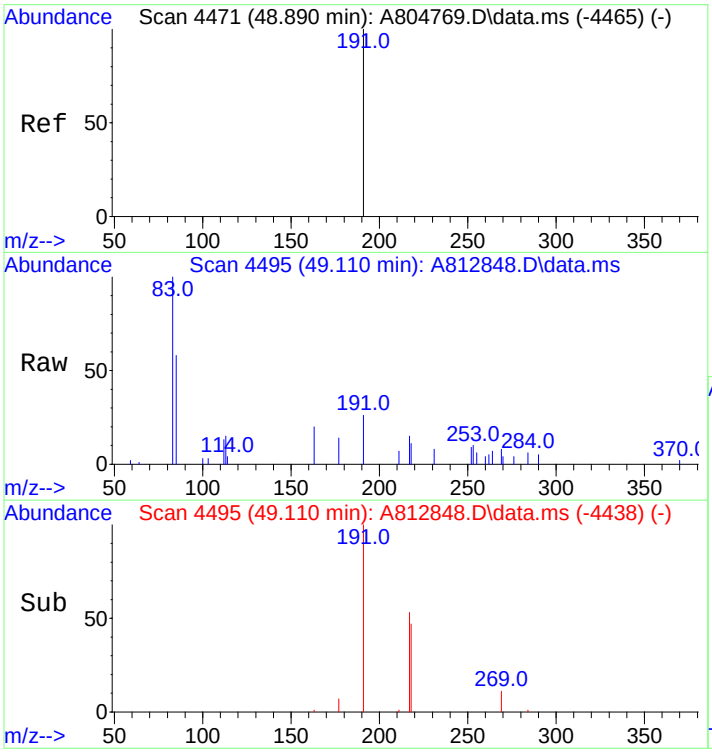




#107
C30 Tricyclic Terpane-22S
Concen: 148.83 ng/mL m
RT: 48.863 min Scan# 4468
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

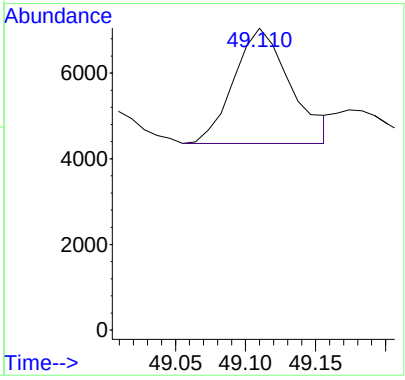
Tgt Ion:191 Resp: 10197

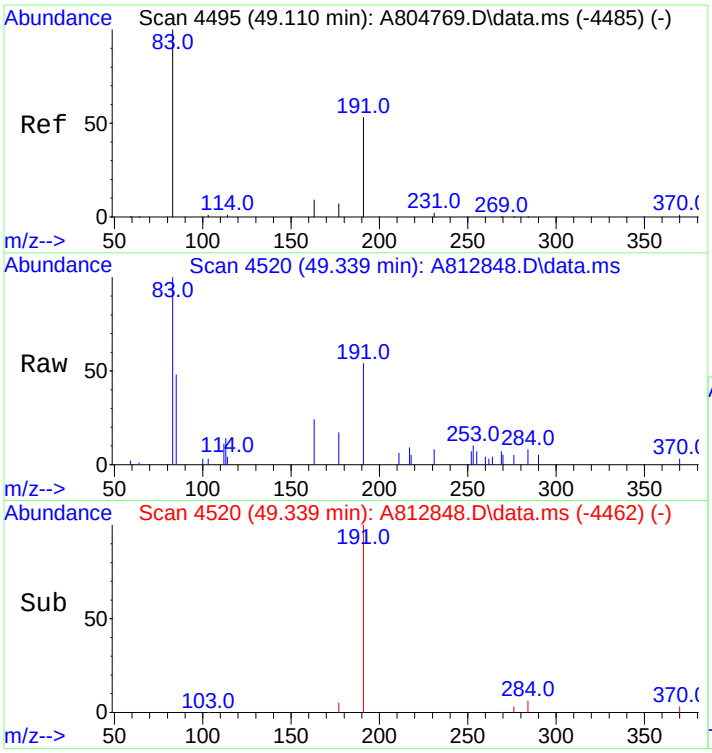




#108
C30 Tricyclic Terpane-22R
Concen: 110.81 ng/mL
RT: 49.110 min Scan# 4495
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

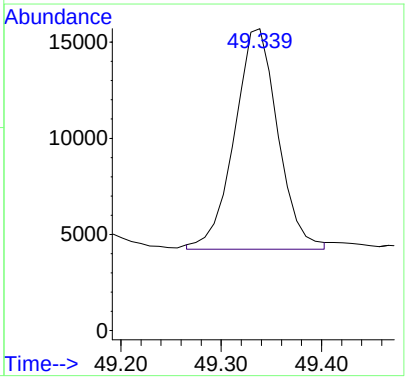
Tgt Ion:191 Resp: 7592

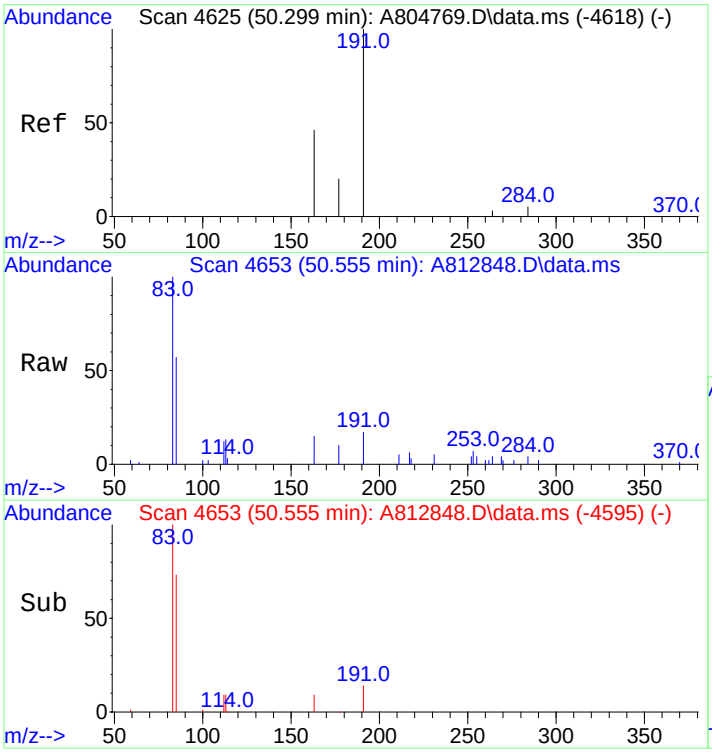




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 503.32 ng/ml m
RT: 49.339 min Scan# 4520
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

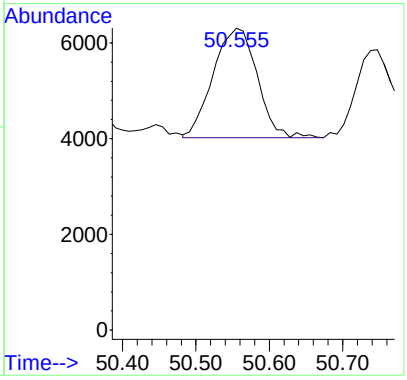
Tgt Ion:191 Resp: 34486

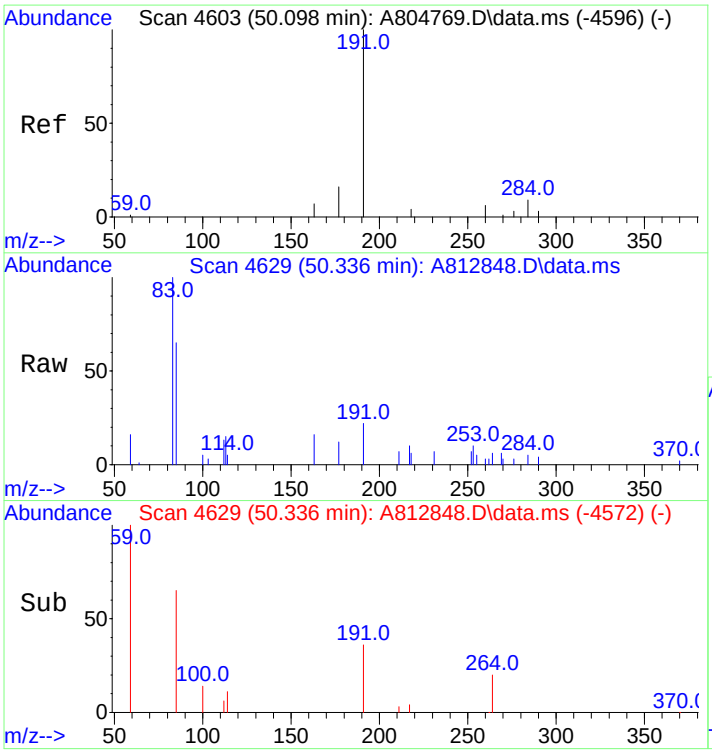




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 139.85 ng/ml
RT: 50.555 min Scan# 4653
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

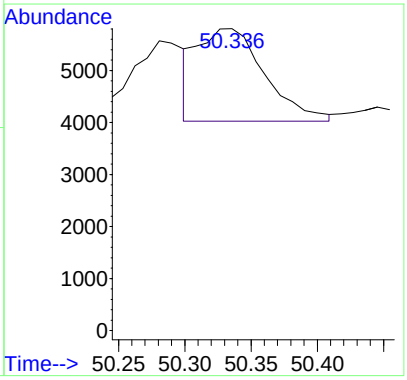
Tgt Ion:191 Resp: 9582

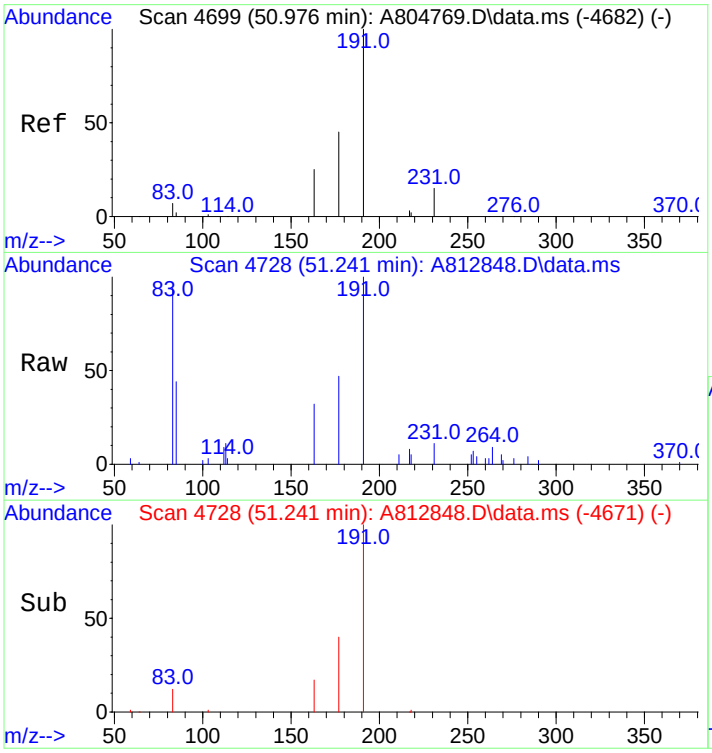




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 91.54 ng/ml m
RT: 50.336 min Scan# 4629
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

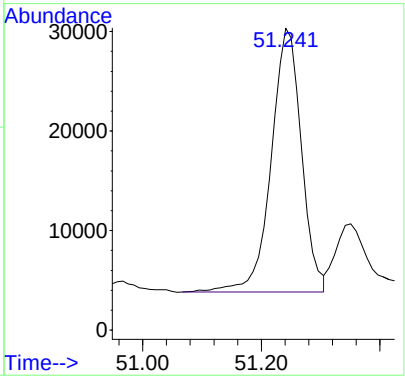
Tgt Ion:191 Resp: 6272

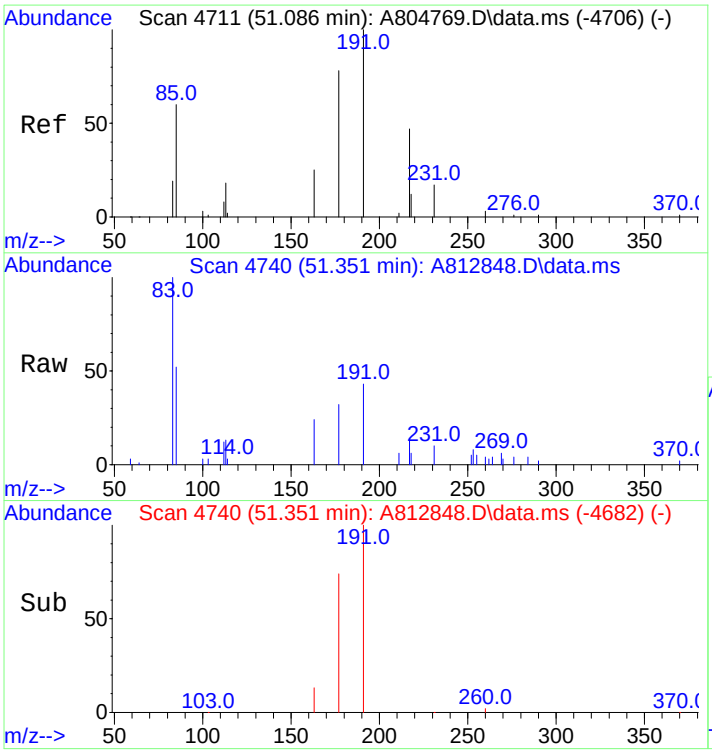




#112
30-Norhopane (T15)
Concen: 1369.16 ng/ml
RT: 51.241 min Scan# 4728
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

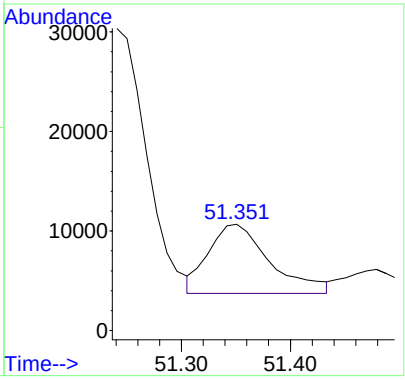
Tgt Ion:191 Resp: 93810

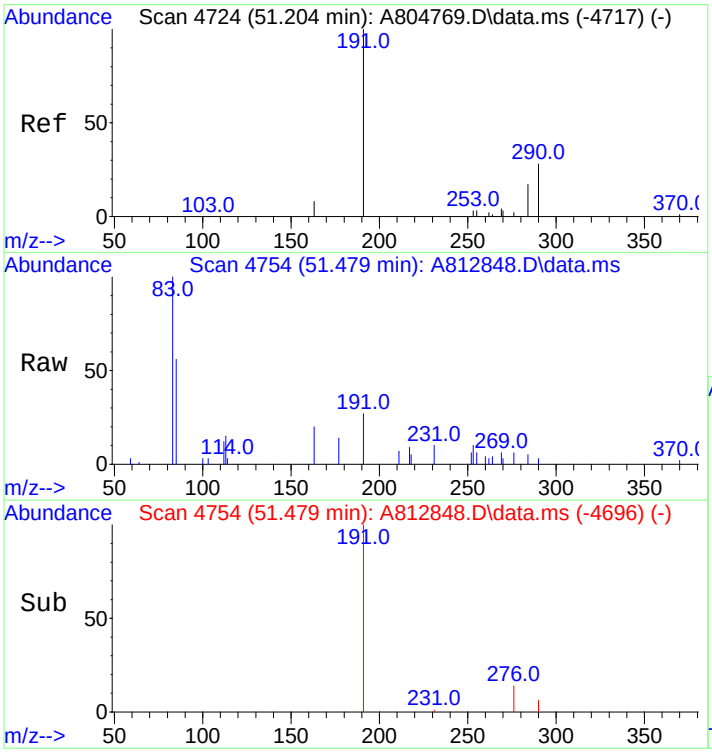




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 395.45 ng/ml m
RT: 51.351 min Scan# 4740
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

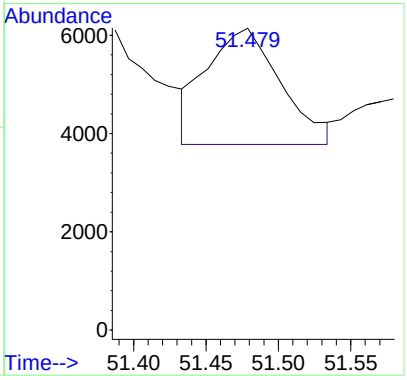
Tgt Ion:191 Resp: 27095

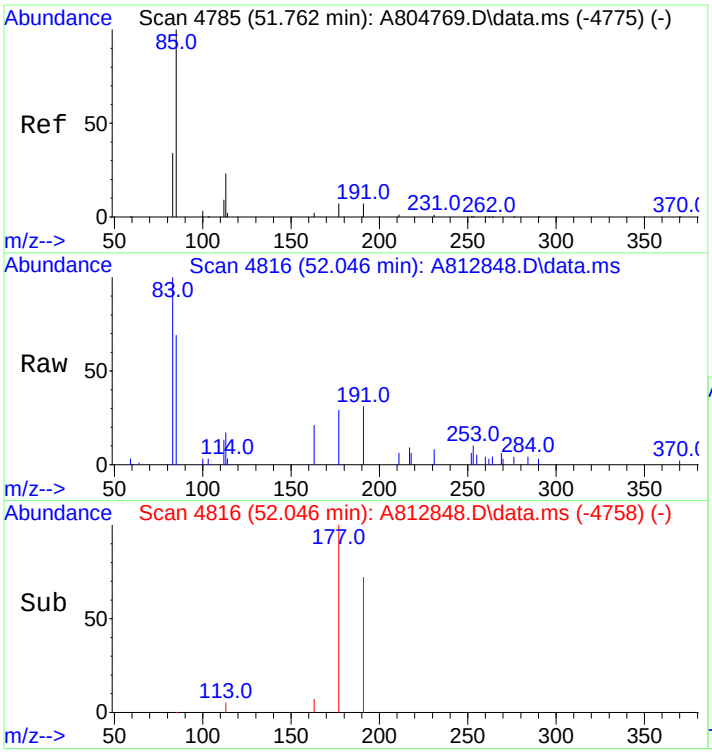




#114
17a(H)-Diahopane (X)
Concen: 123.05 ng/ml m
RT: 51.479 min Scan# 4754
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

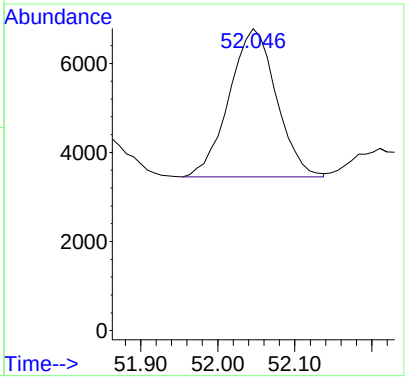
Tgt Ion:191 Resp: 8431

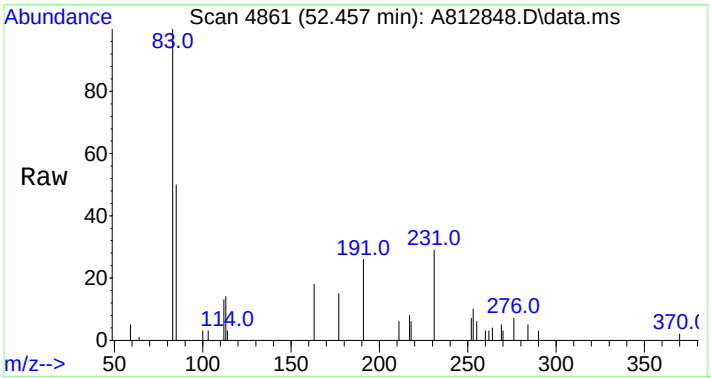




#115
30-Normoretane (T17)
Concen: 206.58 ng/ml
RT: 52.046 min Scan# 4816
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

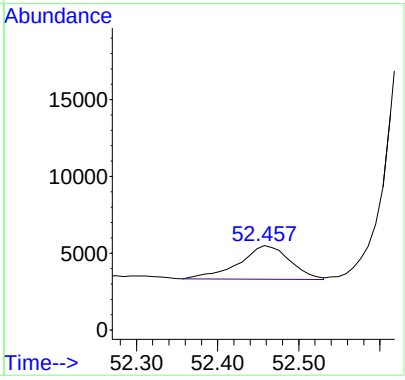
Tgt Ion:191 Resp: 14154

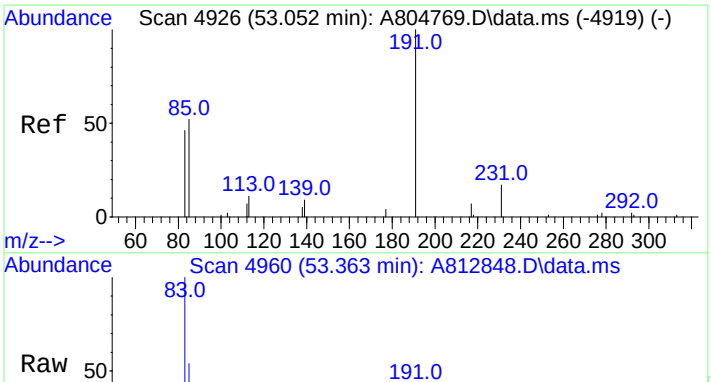




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 138.81 ng/ml
RT: 52.457 min Scan# 4861
Delta R.T. 0.037 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

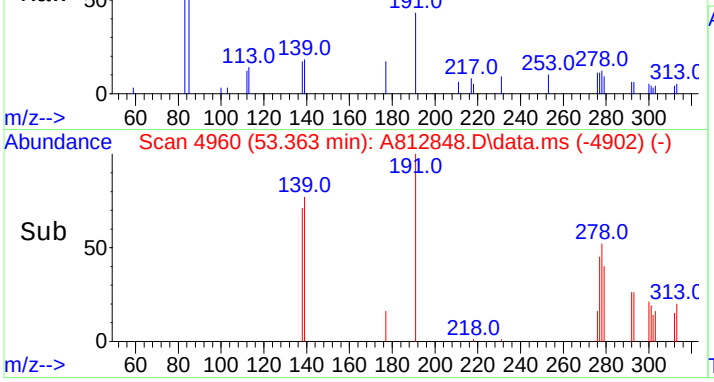
Tgt Ion:191 Resp: 9511

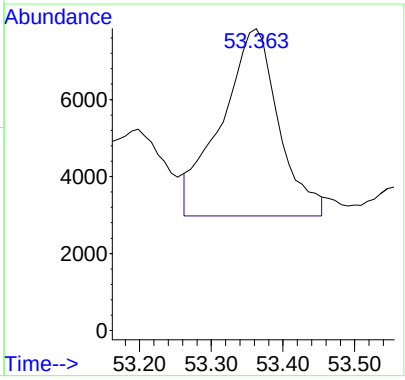


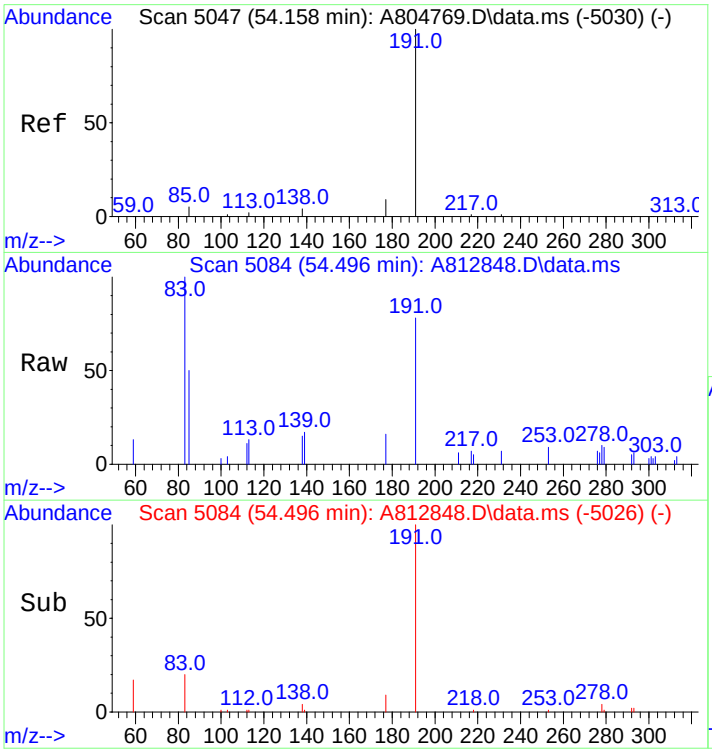


#117
Moretane (T20)
Concen: 391.98 ng/ml m
RT: 53.363 min Scan# 4960
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:191 Resp: 26857

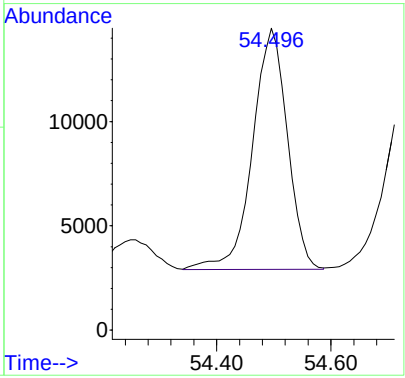


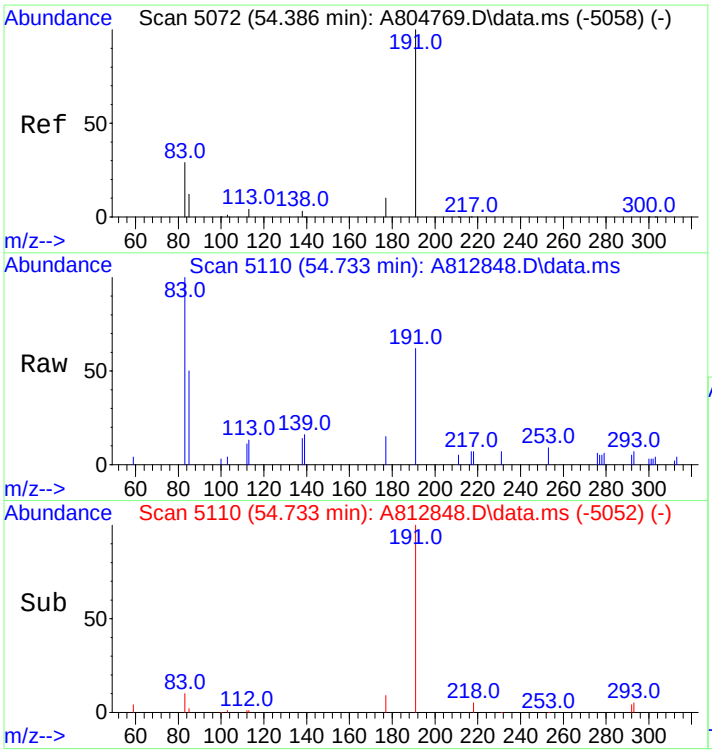




#118
30-Homohopane-22S (T21)
Concen: 712.70 ng/ml
RT: 54.496 min Scan# 5084
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

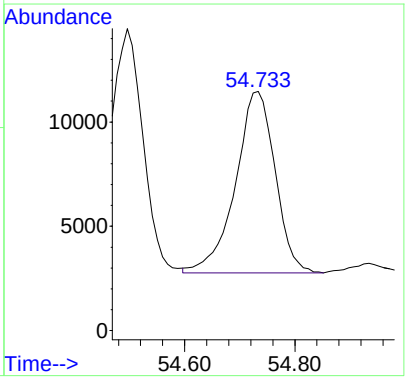
Tgt Ion:191 Resp: 48832

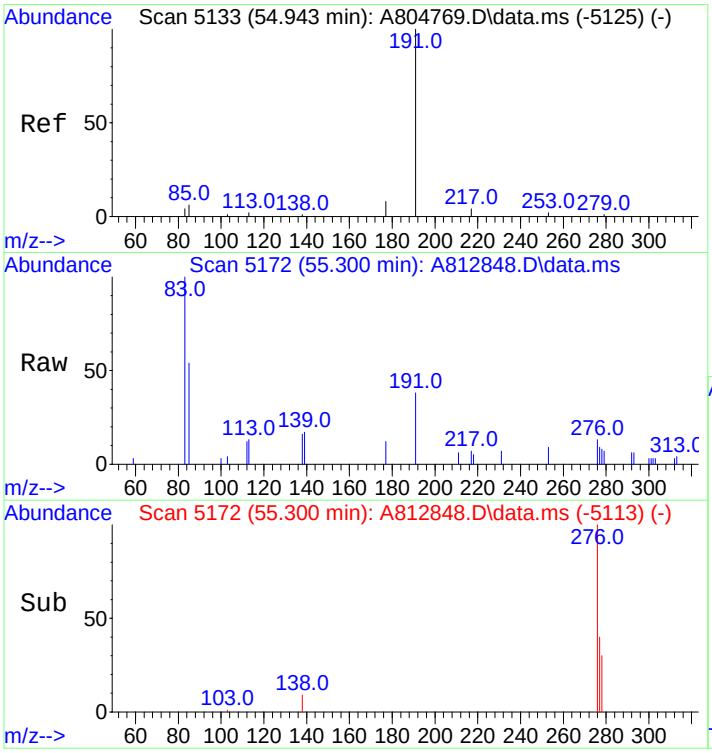




#119
30-Homohopane-22R (T22)
Concen: 636.65 ng/ml
RT: 54.733 min Scan# 5110
Delta R.T. 0.028 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

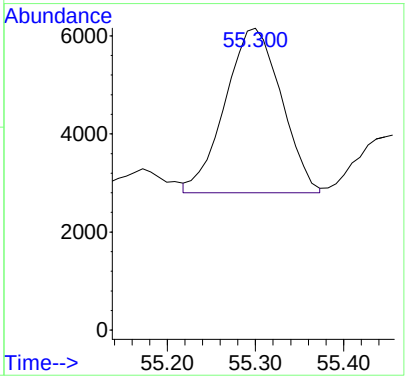
Tgt Ion:191 Resp: 43621

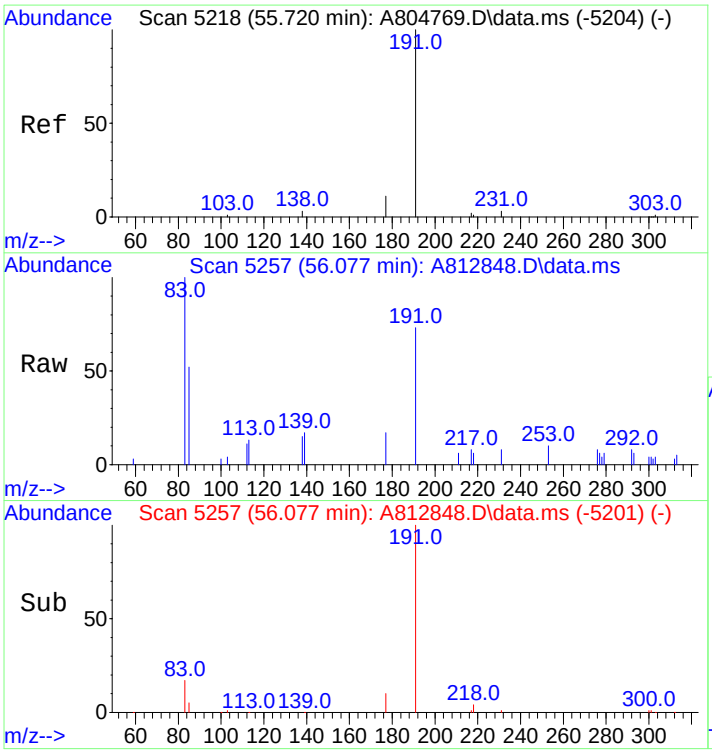




#120
Gammacerane/C32-diahopane
Concen: 216.81 ng/mL m
RT: 55.300 min Scan# 5172
Delta R.T. 0.037 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

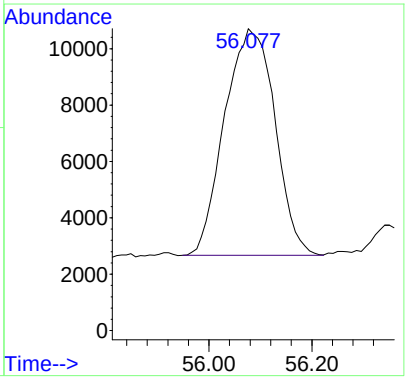
Tgt Ion:191 Resp: 14855

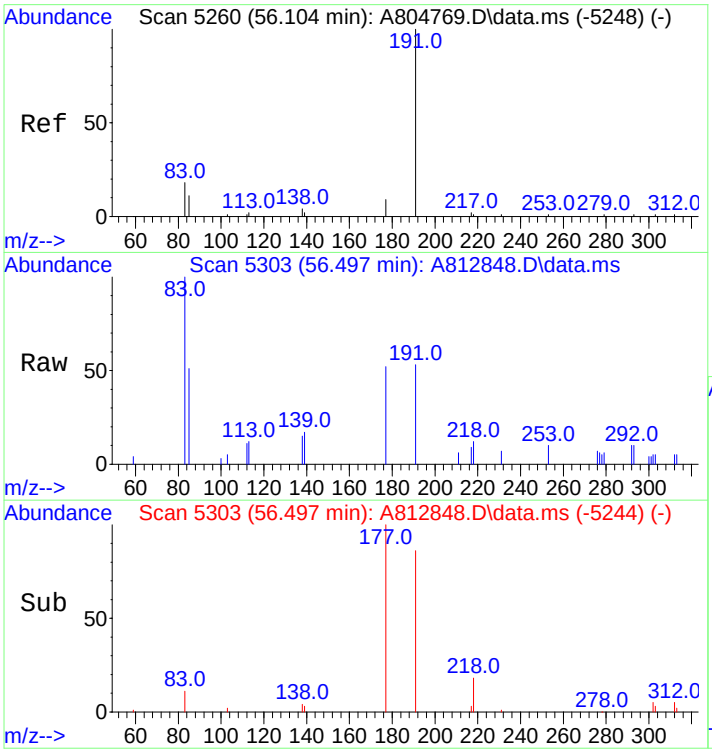




#121
30,31-Bishomohopane-22S (T26)
Concen: 797.49 ng/ml
RT: 56.077 min Scan# 5257
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

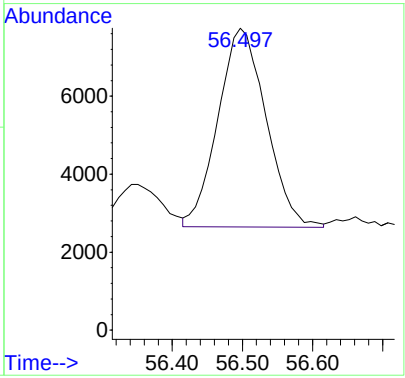
Tgt Ion:191 Resp: 54641

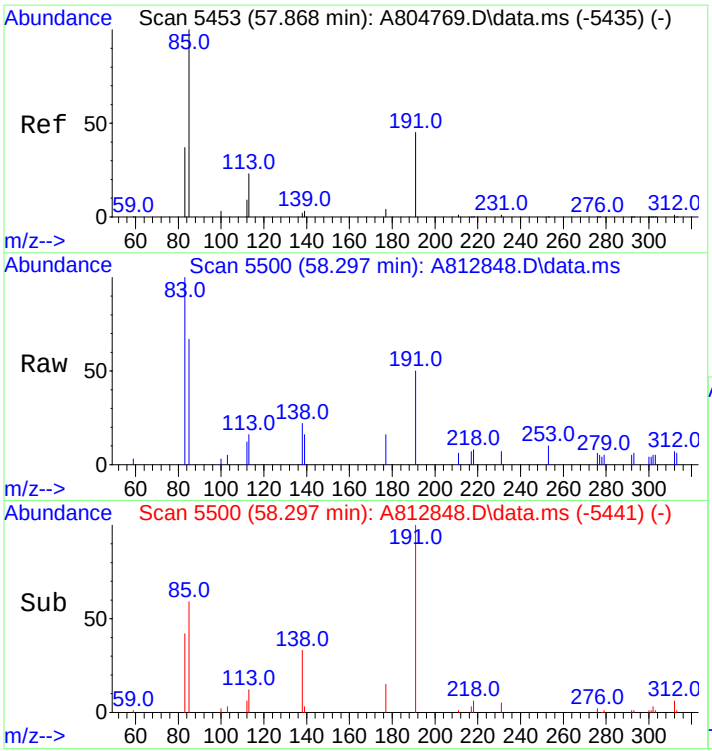




#122
30,31-Bishomohopane-22R (T27)
Concen: 353.99 ng/ml
RT: 56.497 min Scan# 5303
Delta R.T. 0.037 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

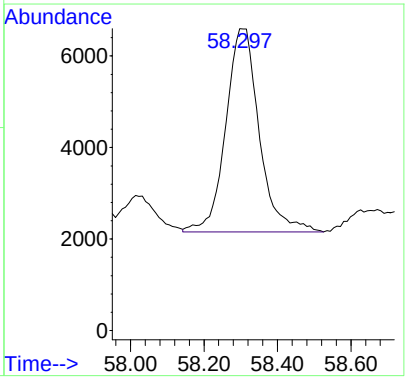
Tgt Ion:191 Resp: 24254

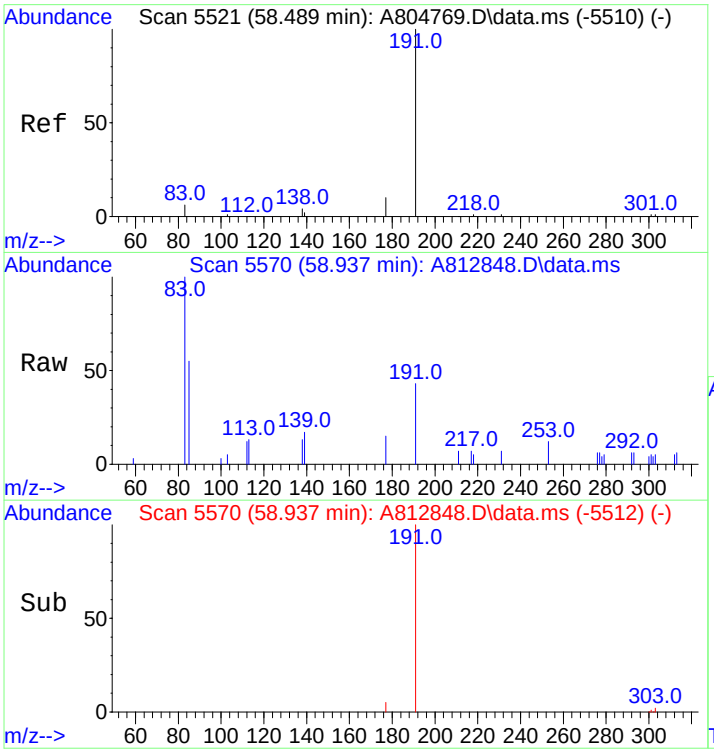




#123
30,31-Trishomohopane-22S (T30)
Concen: 410.82 ng/ml
RT: 58.297 min Scan# 5500
Delta R.T. 0.037 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

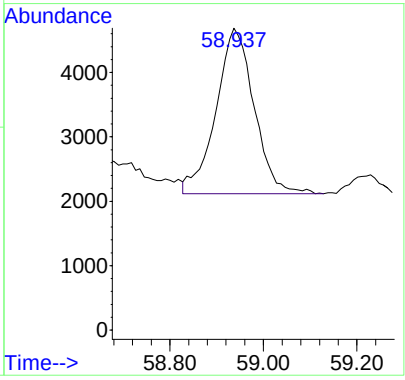
Tgt Ion:191 Resp: 28148

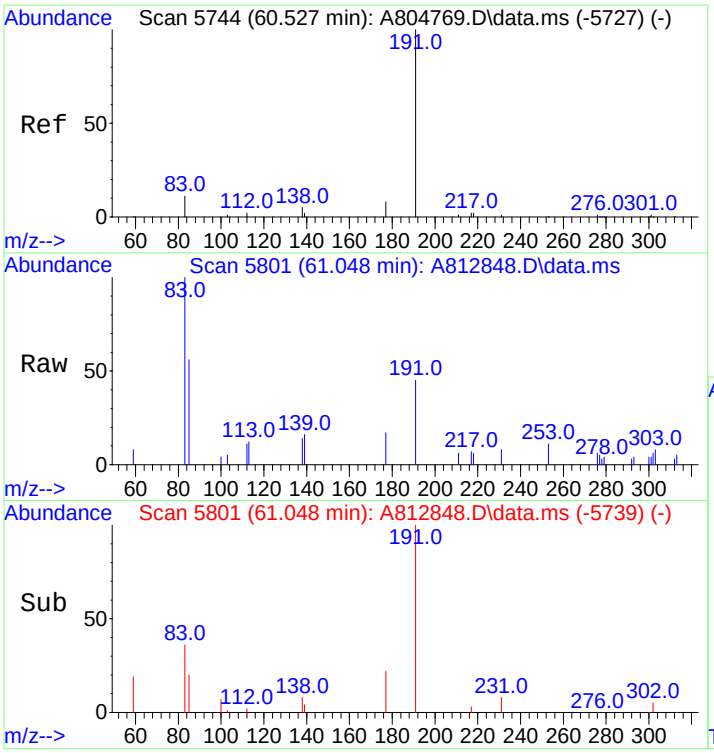




#124
30,31-Trishomohopane-22R (T31)
Concen: 211.63 ng/ml
RT: 58.937 min Scan# 5570
Delta R.T. 0.027 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

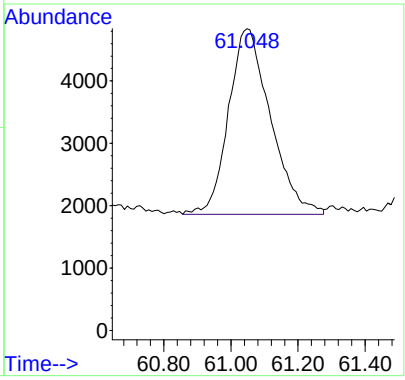
Tgt Ion:191 Resp: 14500

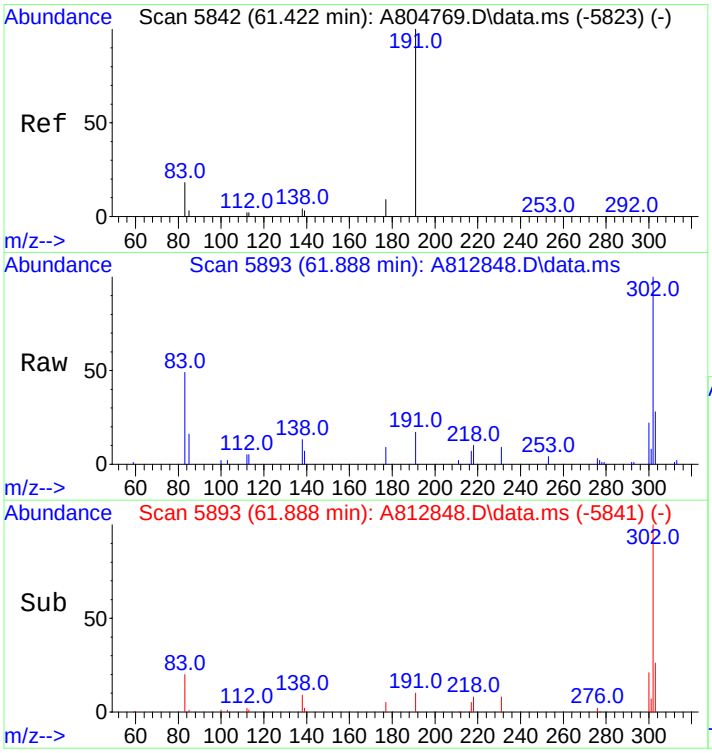




#125
Tetrakishomohopane-22S (T32)
Concen: 376.74 ng/ml
RT: 61.048 min Scan# 5801
Delta R.T. 0.064 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

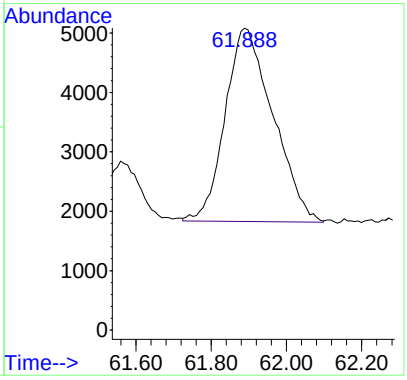
Tgt Ion:191 Resp: 25813

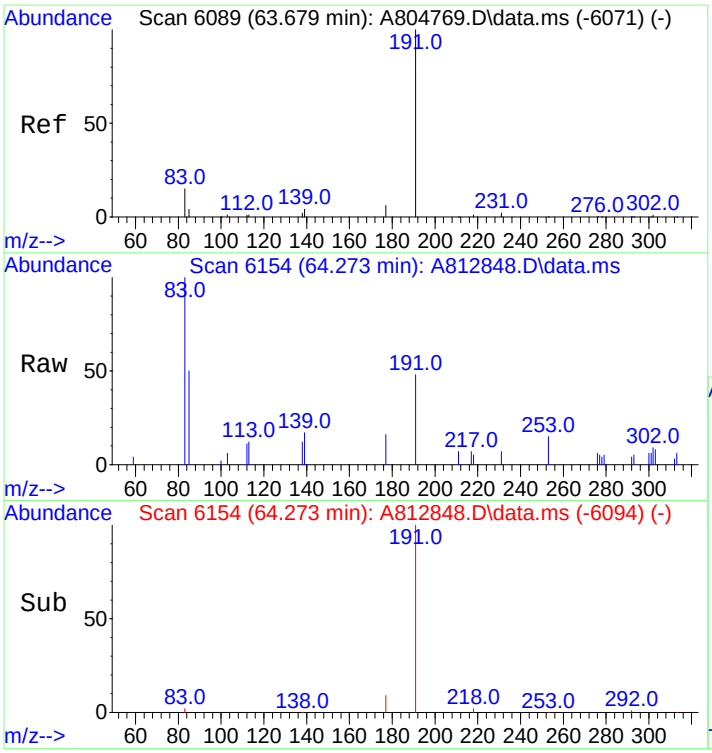




#126
Tetrakishomohopane-22R (T33)
Concen: 419.67 ng/ml
RT: 61.888 min Scan# 5893
Delta R.T. -0.027 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

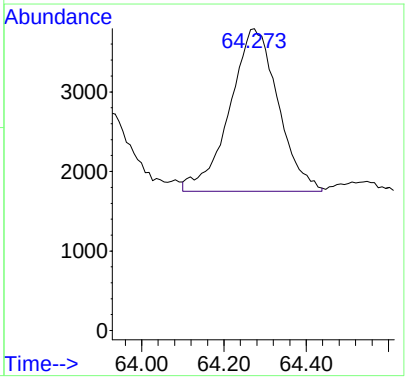
Tgt Ion:191 Resp: 28754

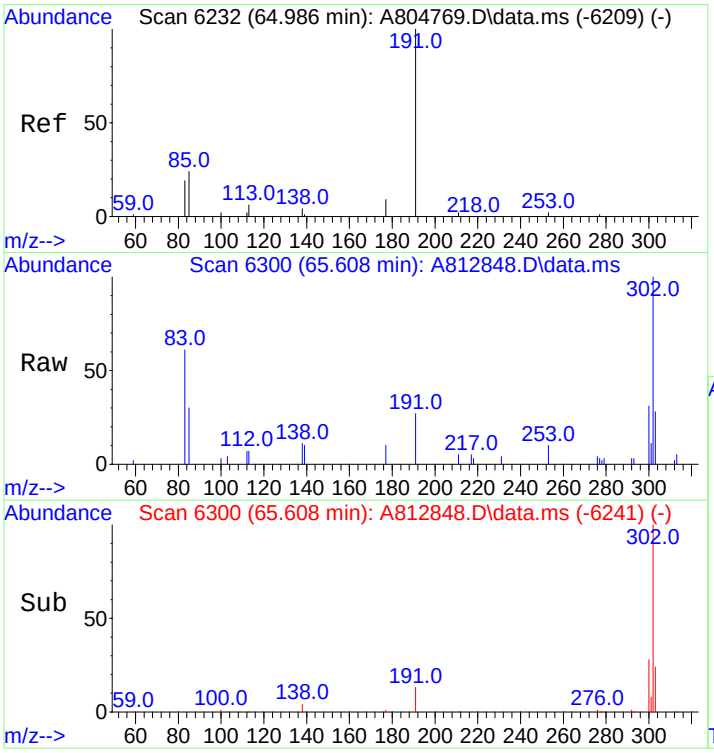




#127
Pentakishomohopane-22S (T34)
Concen: 243.85 ng/ml m
RT: 64.273 min Scan# 6154
Delta R.T. 0.046 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

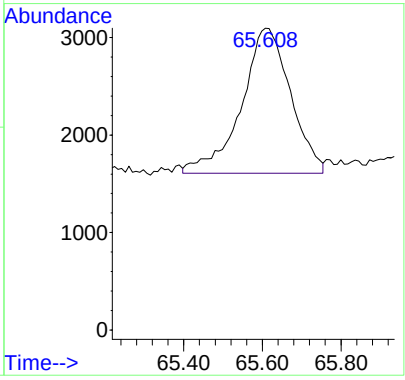
Tgt Ion:191 Resp: 16708

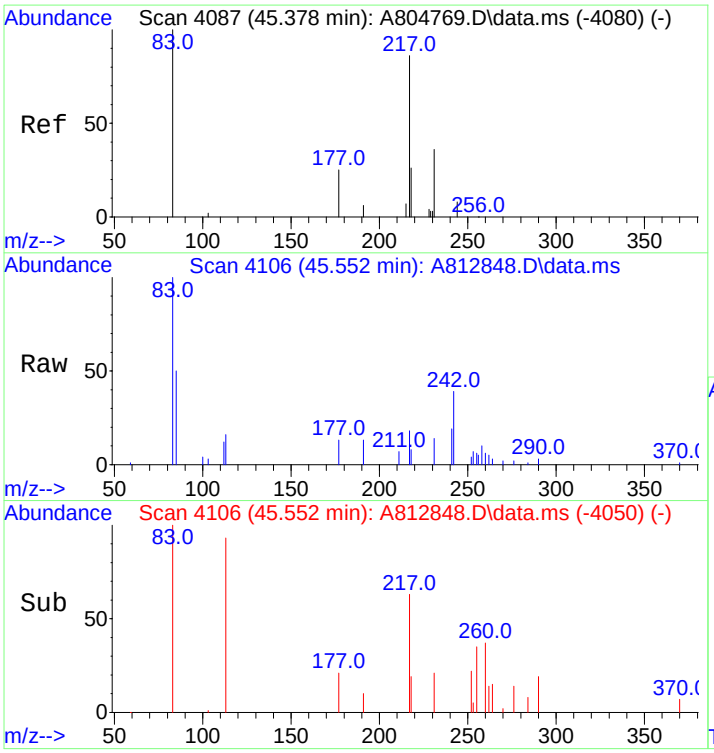




#128
Pentakishomohopane-22R (T35)
Concen: 188.42 ng/ml m
RT: 65.608 min Scan# 6300
Delta R.T. 0.037 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

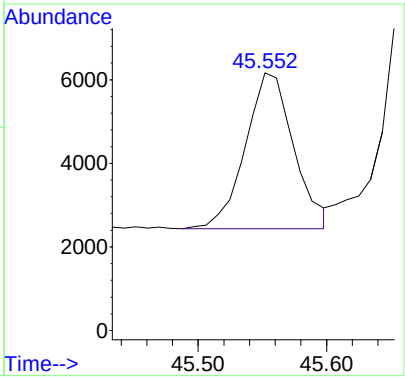
Tgt Ion:191 Resp: 12910

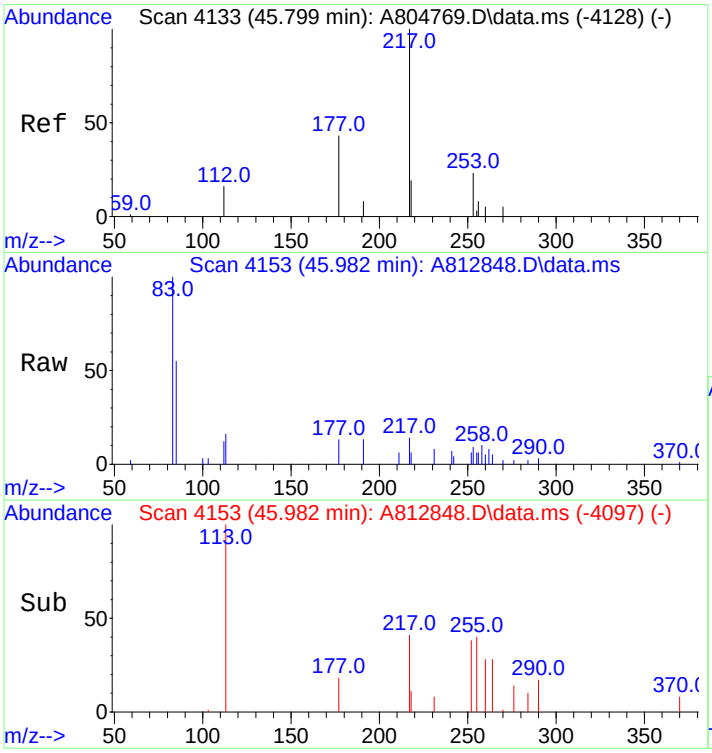




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 293.58 ng/ml
RT: 45.552 min Scan# 4106
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

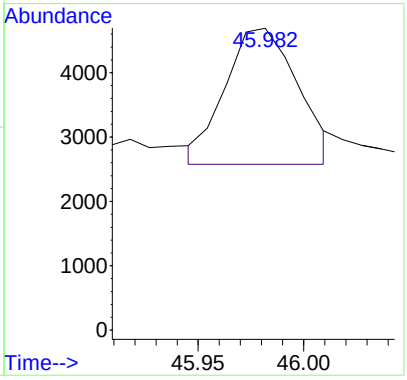
Tgt Ion:217 Resp: 9794

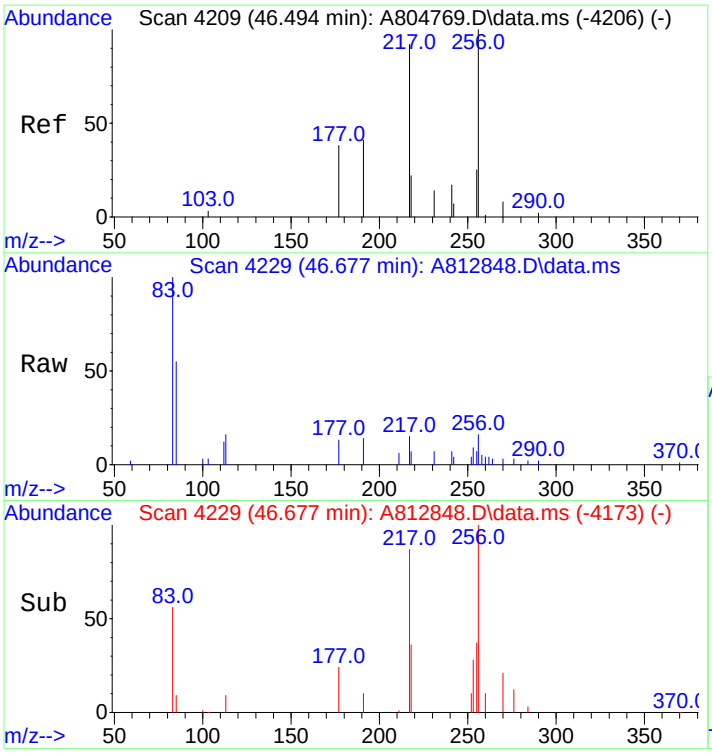




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 151.65 ng/ml m
RT: 45.982 min Scan# 4153
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

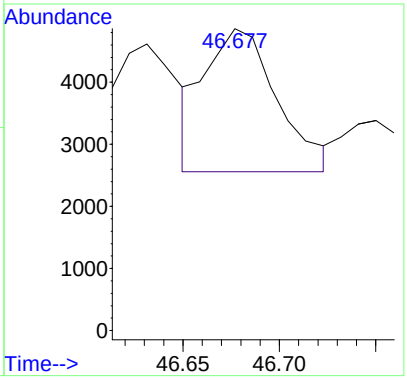
Tgt Ion:217 Resp: 5059

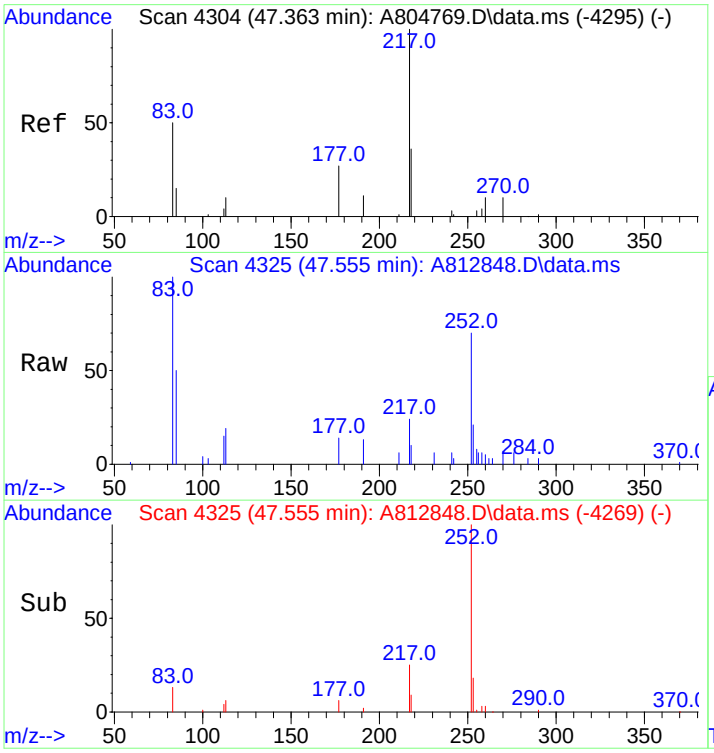




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 179.14 ng/ml m
RT: 46.677 min Scan# 4229
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

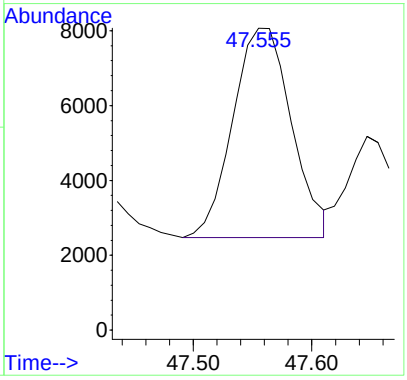
Tgt Ion:217 Resp: 5976

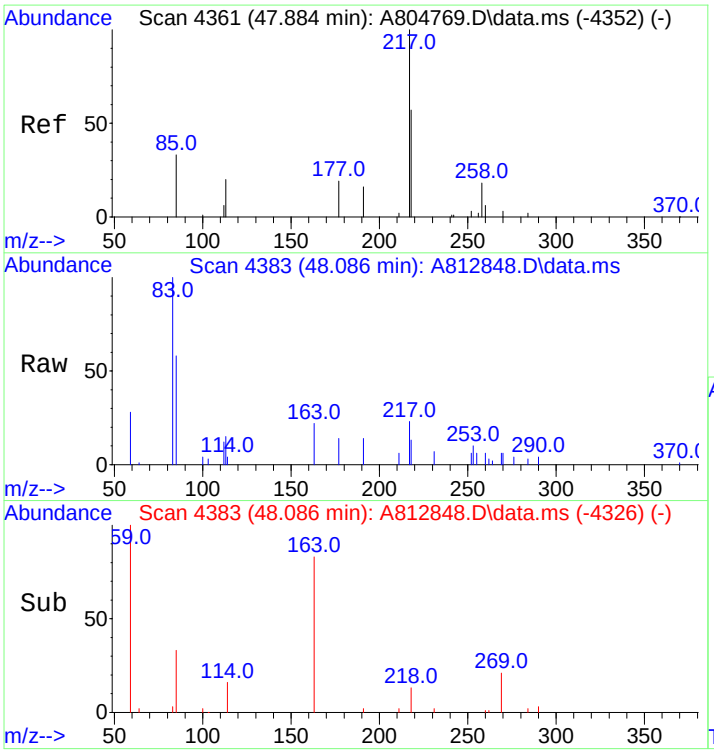




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 577.25 ng/ml
RT: 47.555 min Scan# 4325
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

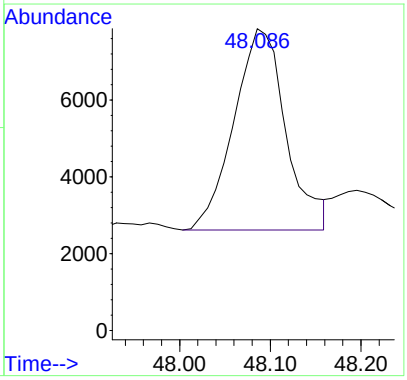
Tgt Ion:217 Resp: 19257

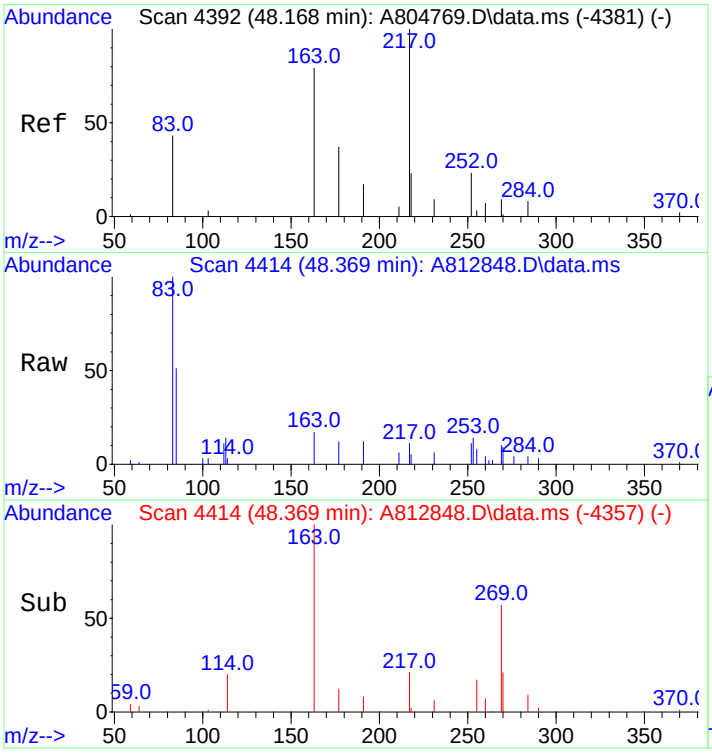




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 626.05 ng/ml
RT: 48.086 min Scan# 4383
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

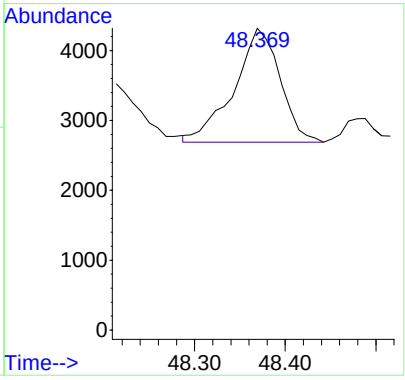
Tgt Ion:217 Resp: 20885

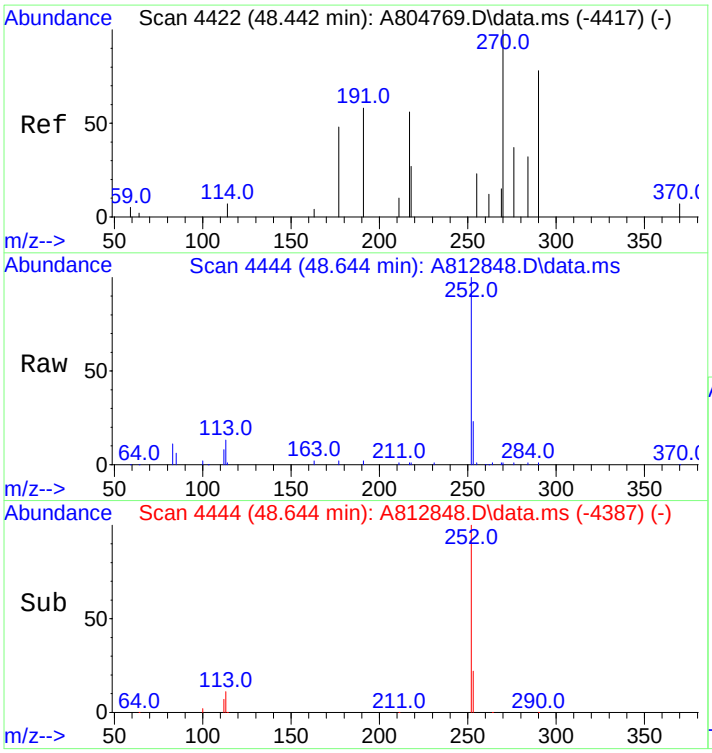




#135
Unknown Sterane (S18)
Concen: 171.67 ng/ml
RT: 48.369 min Scan# 4414
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

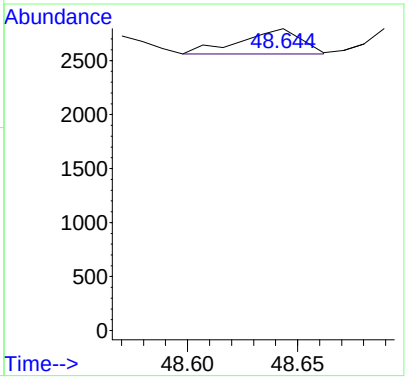
Tgt Ion:217 Resp: 5727

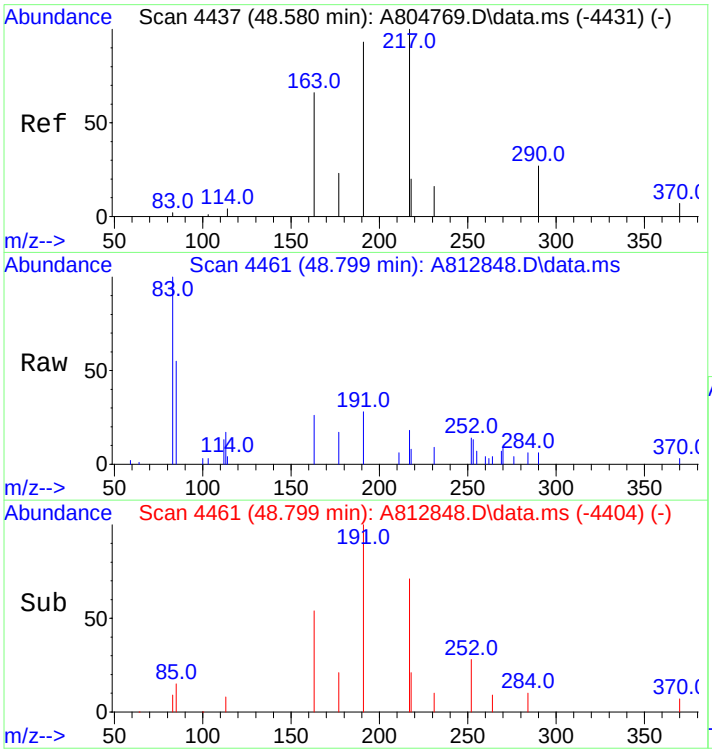




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 13.40 ng/ml
RT: 48.644 min Scan# 4444
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

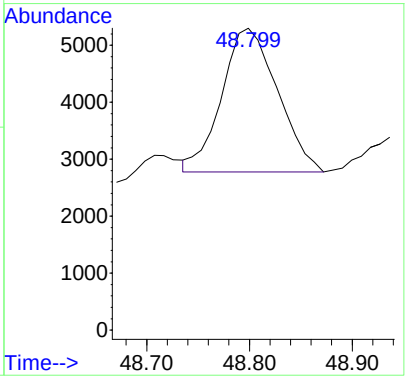
Tgt Ion:217 Resp: 447

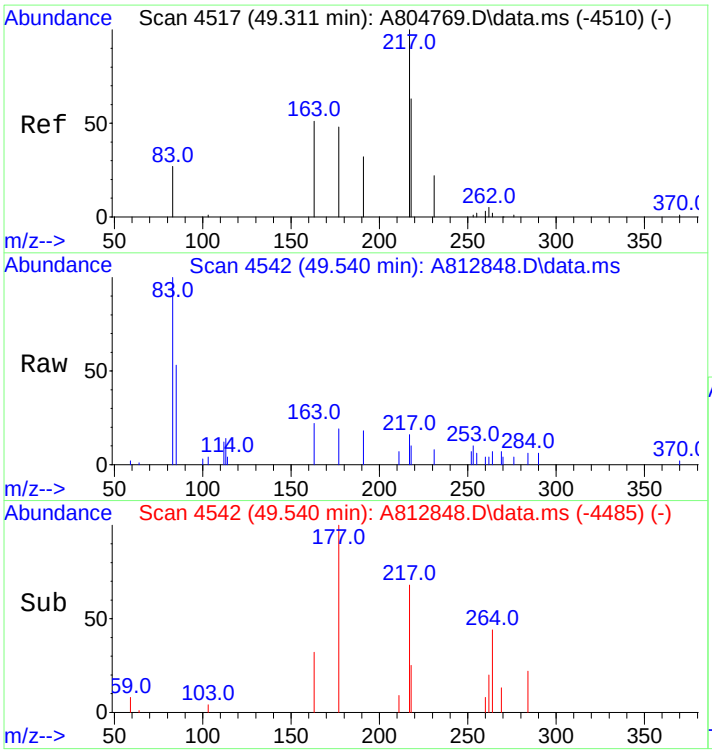




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 284.59 ng/ml
RT: 48.799 min Scan# 4461
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

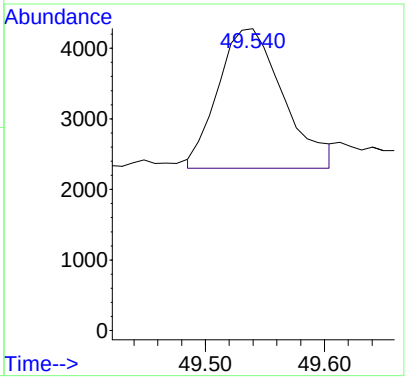
Tgt Ion:217 Resp: 9494

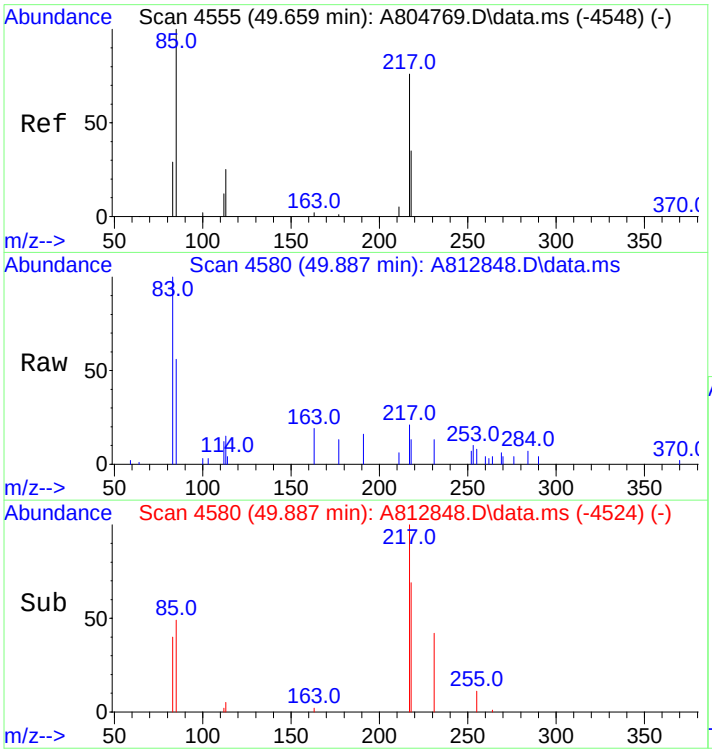




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 226.17 ng/ml m
RT: 49.540 min Scan# 4542
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

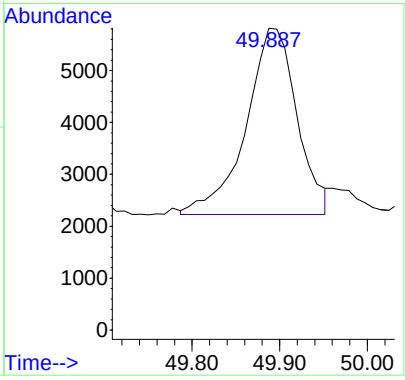
Tgt Ion:217 Resp: 7545

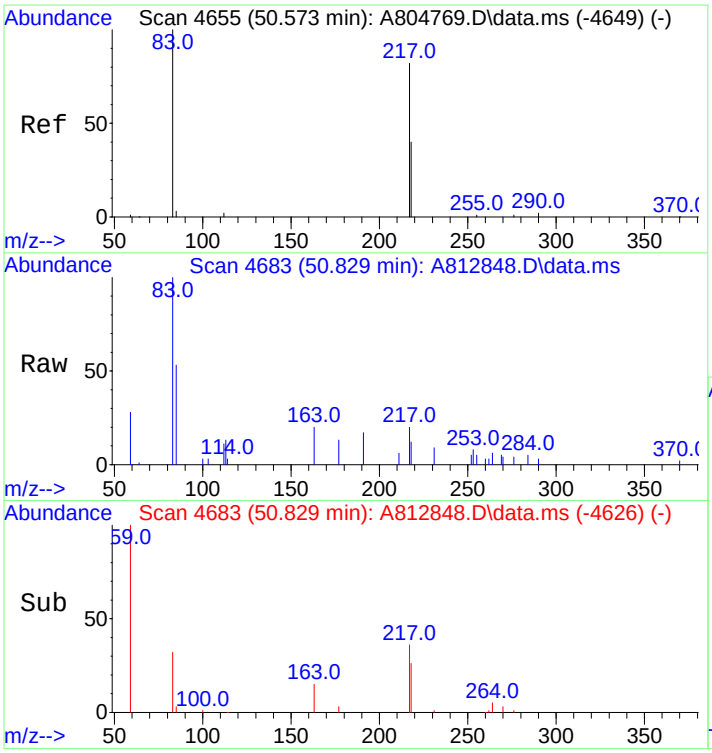




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 433.60 ng/ml m
RT: 49.887 min Scan# 4580
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

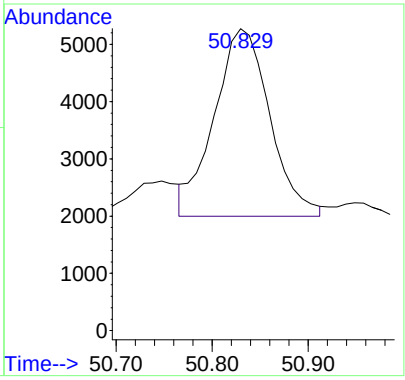
Tgt Ion:217 Resp: 14465

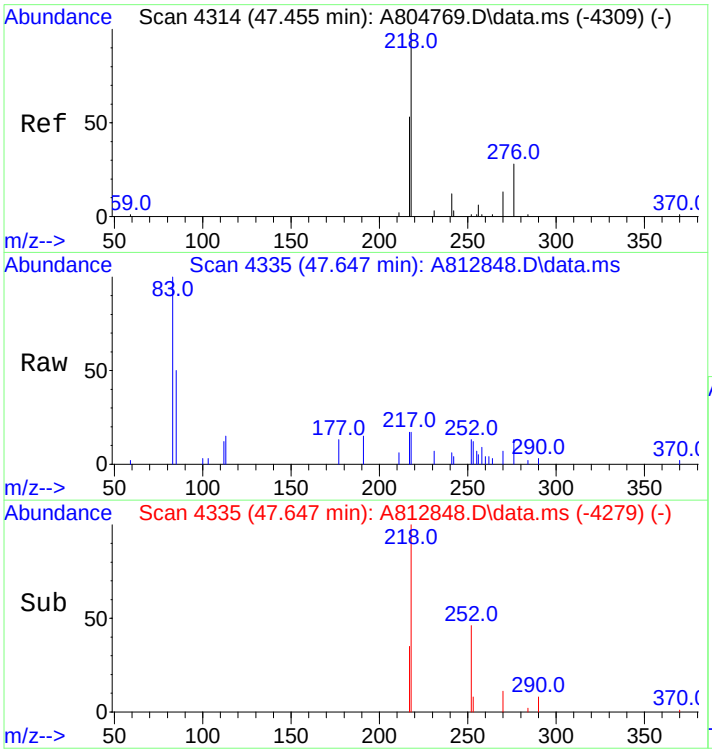




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 394.12 ng/ml m
RT: 50.829 min Scan# 4683
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

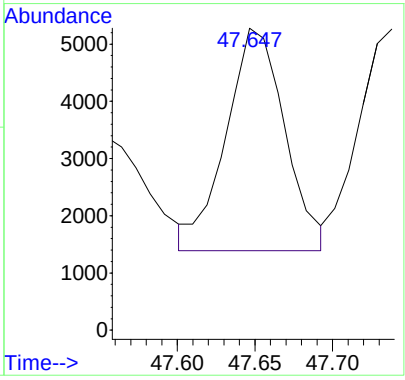
Tgt Ion:217 Resp: 13148

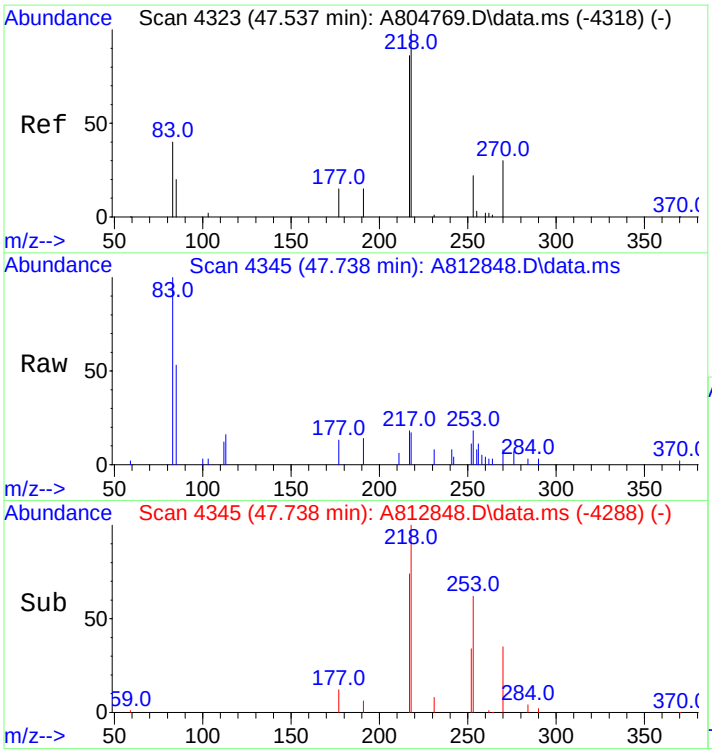




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 307.43 ng/ml m
RT: 47.647 min Scan# 4335
Delta R.T. 0.009 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

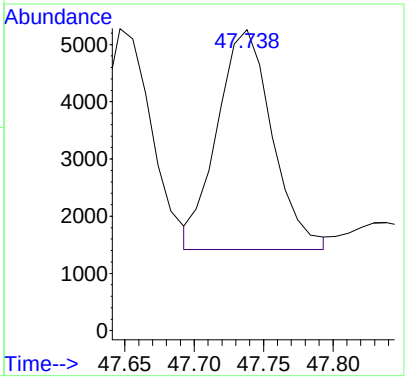
Tgt Ion:218 Resp: 10256

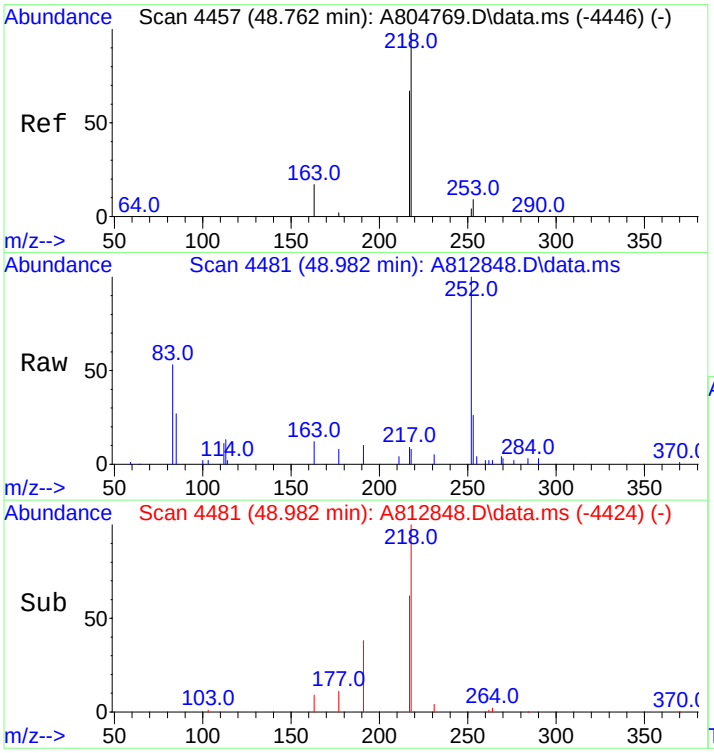




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 317.78 ng/ml m
RT: 47.738 min Scan# 4345
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

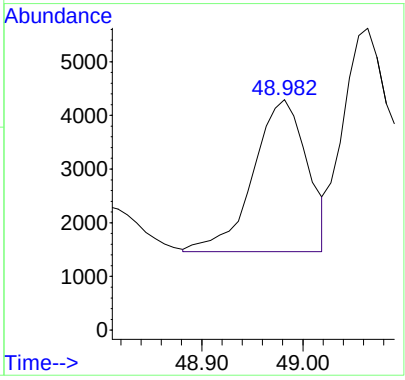
Tgt Ion:218 Resp: 10601

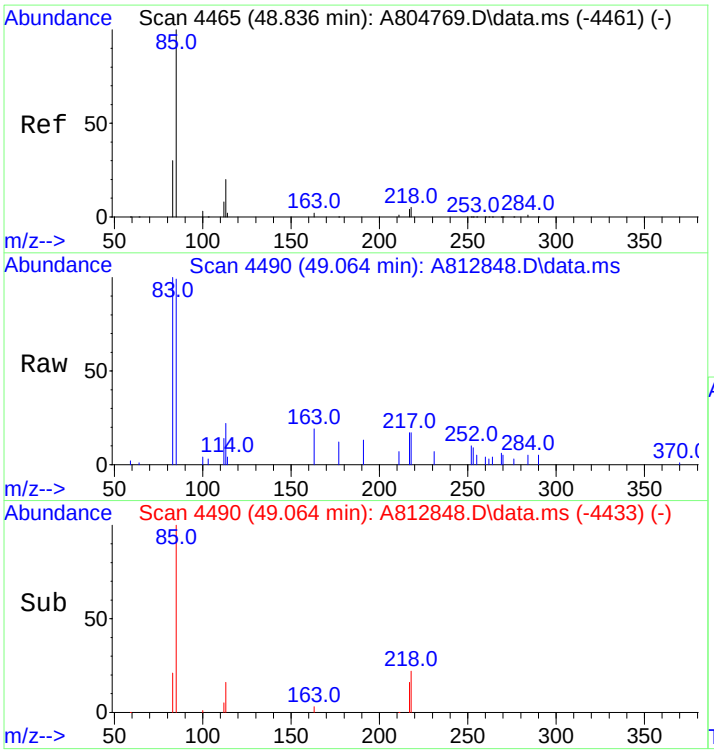




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 315.74 ng/ml m
RT: 48.982 min Scan# 4481
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

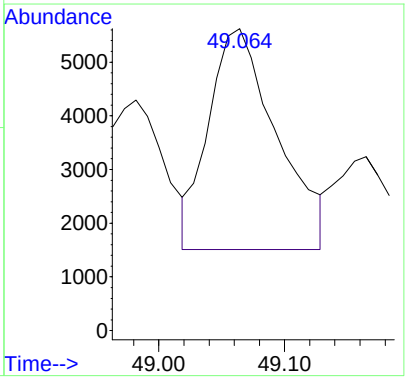
Tgt Ion:218 Resp: 10533

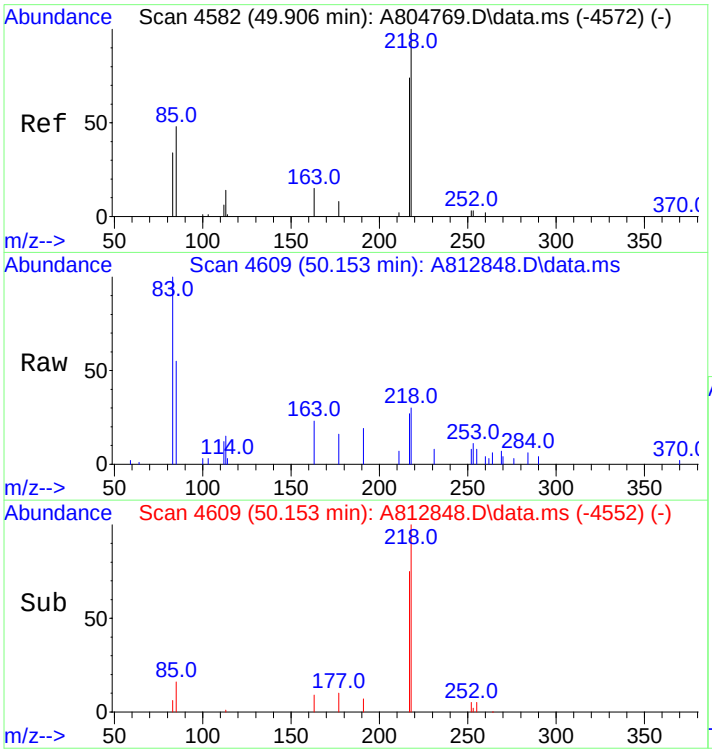




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 466.04 ng/ml m
RT: 49.064 min Scan# 4490
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

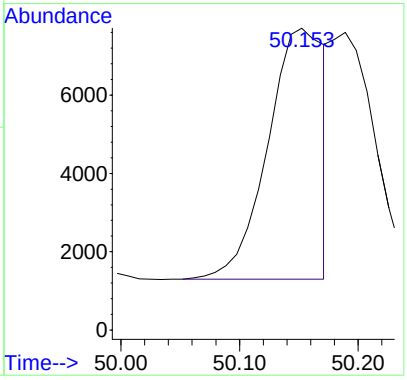
Tgt Ion:218 Resp: 15547

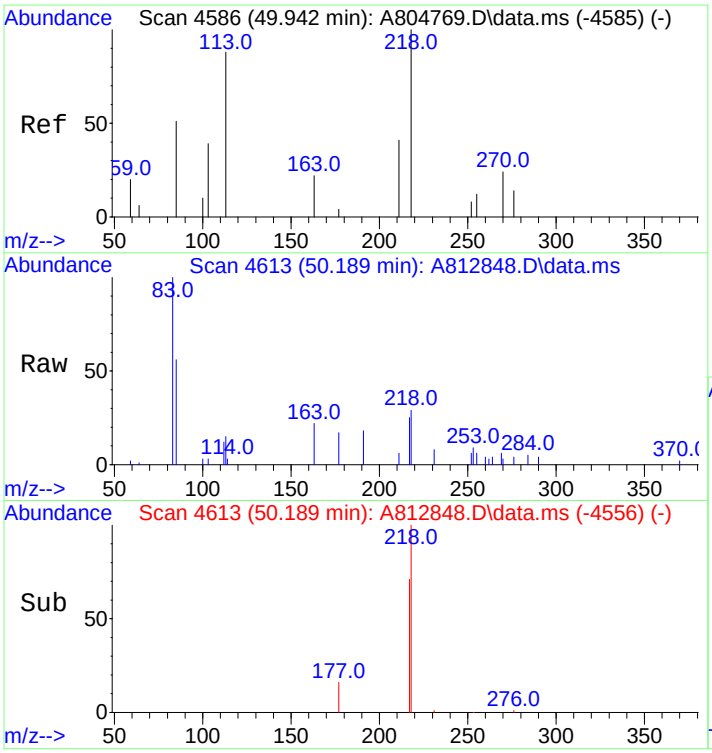




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 633.33 ng/ml
RT: 50.153 min Scan# 4609
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

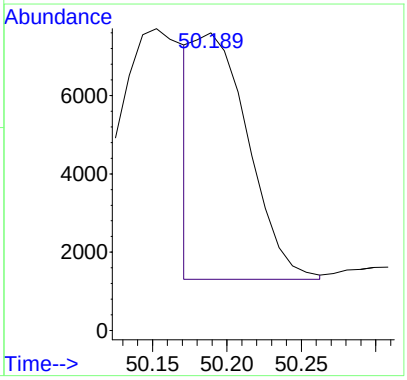
Tgt Ion:218 Resp: 21128

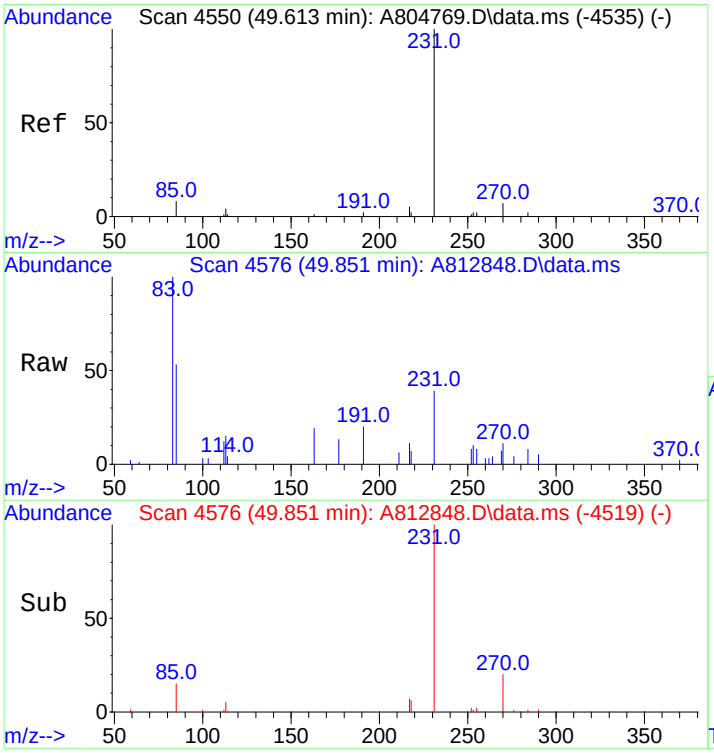




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 483.54 ng/ml m
RT: 50.189 min Scan# 4613
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

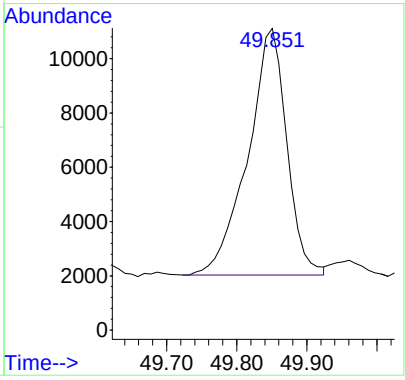
Tgt Ion:218 Resp: 16131

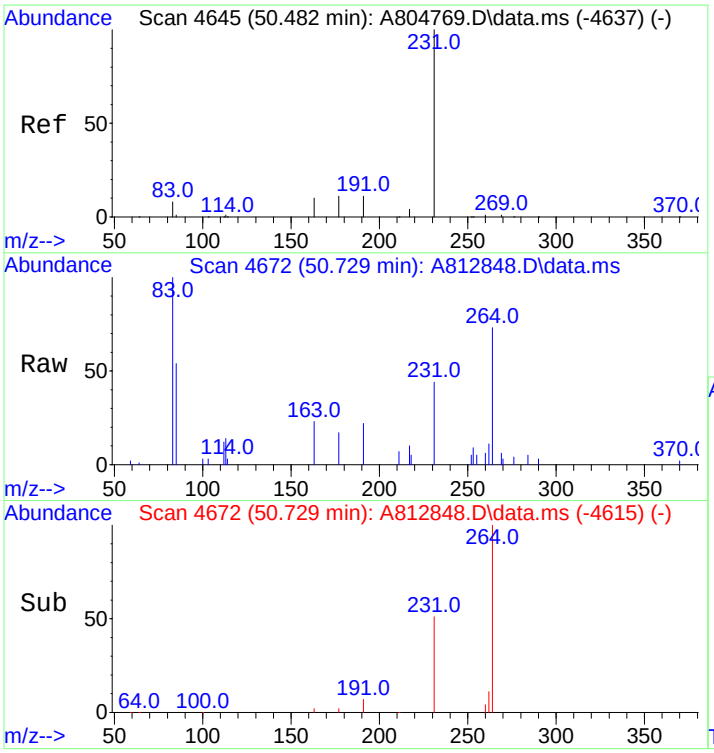




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1054.88 ng/mL
RT: 49.851 min Scan# 4576
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

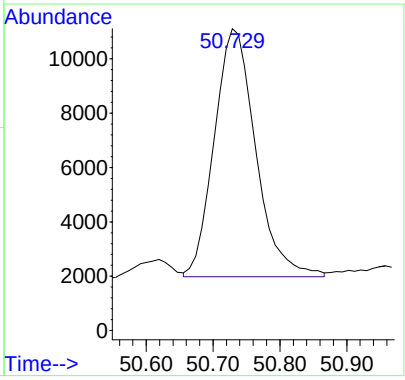
Tgt Ion:231 Resp: 35191

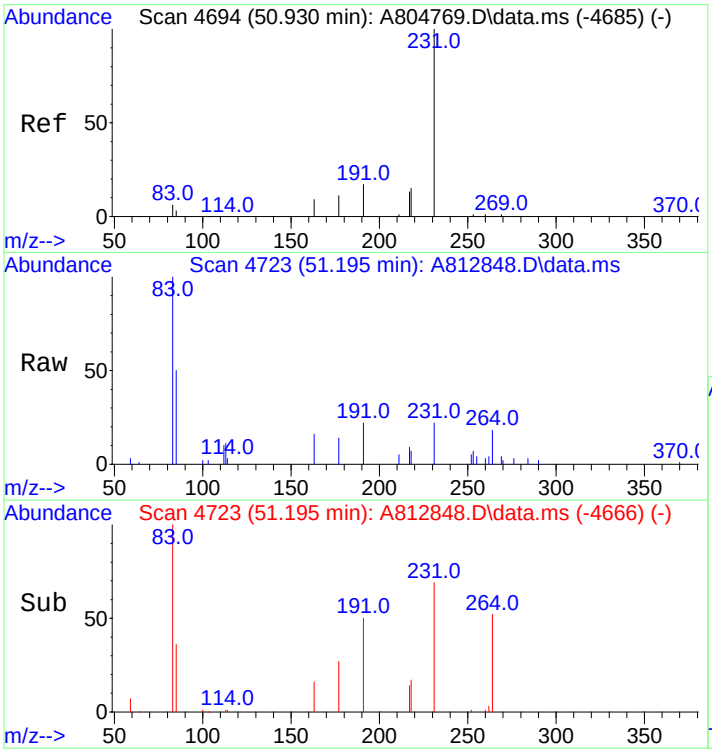




#148
C28,20S-triaromatic steroid
Concen: 1179.43 ng/mL m
RT: 50.729 min Scan# 4672
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

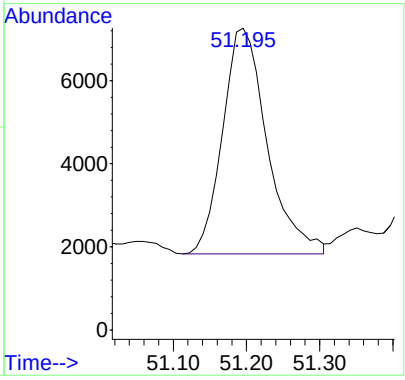
Tgt Ion:231 Resp: 39346

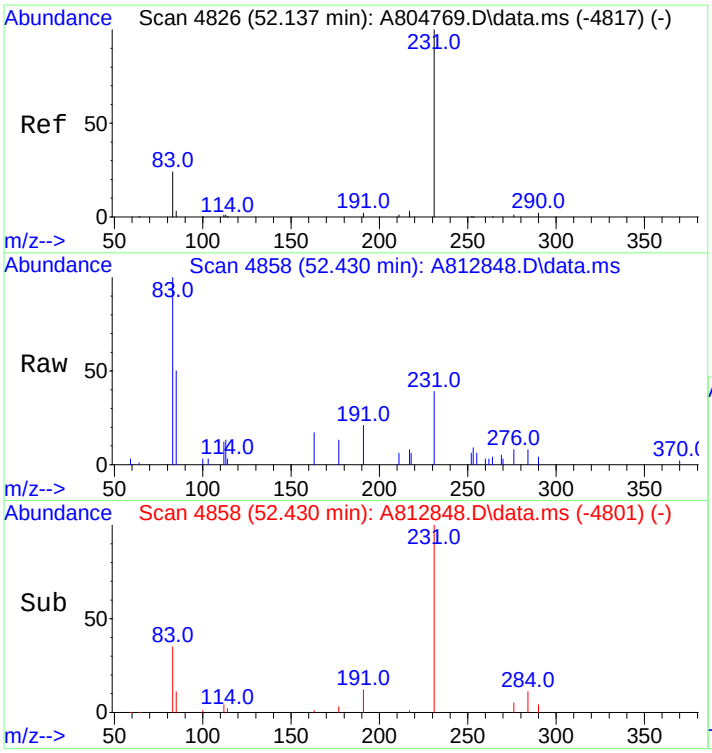




#149
C27,20R-triaromatic steroid
Concen: 689.03 ng/mL m
RT: 51.195 min Scan# 4723
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

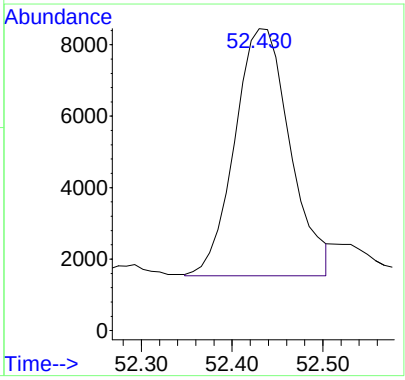
Tgt Ion:231 Resp: 22986





#150
C28,20R-triaromatic steroid
Concen: 882.64 ng/mL m
RT: 52.430 min Scan# 4858
Delta R.T. 0.018 min
Lab File: A812848.D
Acq: 19 Nov 2012 11:00 pm

Tgt Ion:231 Resp: 29445



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	59391	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	96579	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	94205	400.245	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 40.02%#			
42) Phenanthrene-d10	32.853	188	85569	468.150	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.81%#			
83) Benzo[b]fluoranthene-d12	47.345	264	82949	450.650	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.06%#			
88) Benzo[a]pyrene-d12	48.552	264	74278	408.453	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 40.85%#			
129) 5B(H)Cholane - Surr	44.054	217	19720	558.399	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.84%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2035	38.557	ng/mL	100
4) cis-Decalin	17.879	138	96M3	2.483	ng/mL	
5) C1-Decalins	18.591	152	4752M5	90.036	ng/mL	
6) C2-Decalins	19.914	166	9287M5	175.961	ng/mL	
7) C3-Decalins	22.396	180	11242M5	213.003	ng/mL	
8) C4-Decalins	25.781	194	21349M5	404.501	ng/mL	
10) Naphthalene	20.087	128	108372	402.468	ng/mL#	100
11) C1-Naphthalenes	22.779	142	142083M5	527.662	ng/mL	
12) C2-Naphthalenes	25.617	156	293591M5	1090.327	ng/mL	
13) C3-Naphthalenes	28.300	170	454967M5	1689.639	ng/mL	
14) C4-Naphthalenes	30.718	184	426803M5	1585.044	ng/mL	
16) 2-Methylnaphthalene	22.779	142	80492	501.823	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	59738	397.730	ng/mL#	100
18) Benzothiophene	20.306	134	3998	18.369	ng/mL	100
19) C1-Benzo(b)thiophenes	23.172	148	11690M5	53.711	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	29953M5	137.621	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	68039M5	312.610	ng/mL	
22) C4-Benzo(b)thiophenes	29.897	190	78055M5	358.629	ng/mL	
23) Biphenyl	24.659	154	17277	84.661	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	65987	480.693	ng/mL#	100
25) Dibenzofuran	27.743	168	59306	275.468	ng/mL	98
26) Acenaphthylene	26.375	152	35237	144.171	ng/mL#	100
27) Acenaphthene	27.105	153	42971	294.556	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.656	170	28916M3	244.573	ng/mL	
29) Fluorene	29.121	166	70947M3	433.603	ng/mL	
30) C1-Fluorenes	31.484	180	67916M5	415.079	ng/mL	
31) C2-Fluorenes	33.683	194	159581M5	975.304	ng/mL	
32) C3-Fluorenes	35.509	208	200153M5	1223.266	ng/mL	
33) Dibenzothiophene	32.442	184	90715	403.177	ng/mL#	70
34) 4-Methyldibenzothiophe...	34.222	198	81014	360.062	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.568	198	70502M3	313.342	ng/mL	
36) 1-Methyldibenzothiophe...	34.988	198	32794	145.751	ng/mL#	100
37) OTP	34.605	198	4560M3	20.267	ng/mL	
38) C1-Dibenzothiophenes	34.222	198	208341M5	925.959	ng/mL	
39) C2-Dibenzothiophenes	35.901	212	367992M5	1635.517	ng/mL	
40) C3-Dibenzothiophenes	37.699	226	409653M5	1820.677	ng/mL	
41) C4-Dibenzothiophenes	39.389	240	269283M5	1196.811	ng/mL	
43) Phenanthrene	32.944	178	871349	4023.570	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.897	192	124131	573.191	ng/mL	97
45) 2-Methylphenanthrene(2MP)	35.016	192	141899	655.237	ng/mL	96
46) 2-Methylanthracene(2MA)	35.171	192	34402	158.856	ng/mL#	41
47) 9/4-Methylphenanthrene...	35.353	192	140602	649.248	ng/mL	86
48) 1-Methylphenanthrene(1MP)	35.445	192	95242	439.793	ng/mL	99
49) C1-Phenanthrenes/Anthr...	35.016	192	542896M5	2506.894	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.170	206	570889M5	2636.156	ng/mL	
52) C3-Phenanthrenes/Anthr...	39.005	220	413067M5	1907.392	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.178	234	228194M5	1053.716	ng/mL	
55) Anthracene	33.117	178	138721M3	687.573	ng/mL	
56) Carbazole	33.783	167	102645M3	487.583	ng/mL	
57) 1-Methylphenanthrene	35.445	192	94321M3	614.421	ng/mL	
58) Fluoranthene	37.718	202	1560148	6993.975	ng/mL	100
59) Benzo(b)fluorene	40.229	216	76294M3	591.245	ng/mL	
60) Pyrene	38.603	202	1334690	5915.369	ng/mL	94
61) C1-Fluoranthenes/Pyrenes	39.991	216	641883M5	2844.837	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.036	230	463748M5	2055.339	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.917	244	288700M5	1279.523	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.196	258	263048M5	1165.833	ng/mL	
66) Naphthobenzothiophene	42.447	234	138533M3	661.406	ng/ml	
67) Naphthobenzothiophene-...	42.447	234	138148M3	659.568	ng/mL	
68) Naphthobenzothiophene-...	42.785	234	29689M3	141.746	ng/mL	
69) Naphthobenzothiophene-...	43.086	234	39507M3	188.620	ng/mL	
70) C1-Naphthobenzothiophenes	43.844	248	186621M5	890.995	ng/ml	
71) C2-Naphthobenzothiophenes	45.845	262	235697M5	1125.301	ng/ml	
72) C3-Naphthobenzothiophenes	47.455	276	183746M5	877.269	ng/ml	
73) C4-Naphthobenzothiophenes	48.543	290	119761M5	571.782	ng/mL	
75) Benz[a]anthracene	43.379	228	523821	2474.080	ng/mL	97
77) Chrysene/Triphenylene	43.534	228	704782	3288.552	ng/mL	100
78) C1-Chrysenes	45.004	242	312469M5	1457.998	ng/mL	
79) C2-Chrysenes	46.714	256	254244M5	1186.317	ng/mL	
80) BBF-D12 Surr BKGD	47.345	256	3755	17.521	ng/mL	100
81) C3-Chrysenes	47.766	270	211282M5	985.854	ng/mL	
82) C4-Chrysenes	49.942	284	118309M5	552.036	ng/mL	
84) Benzo[b]fluoranthene	47.436	252	653196	2872.595	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.509	252	592918	2389.785	ng/mL	96
86) Benzo[a]fluoranthene	47.820	252	99101	399.431	ng/mL#	1
87) Benzo[e]pyrene	48.461	252	515182	2198.871	ng/mL	96
89) Benzo[a]pyrene	48.653	252	586596	2706.598	ng/mL	94
90) Perylene	48.964	252	191311	808.126	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.573	276	425842M3	1849.695	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.619	278	107415M6	475.987	ng/mL	
93) Benzo[g,h,i]perylene	54.916	276	517268	1979.842	ng/mL	100
94) Hopane (T19)	52.650	191	134946M3	1860.498	ng/mL	
96) C23 Tricyclic Terpane ...	41.078	191	25318M3	349.059	ng/ml	
97) C24 Tricyclic Terpane ...	41.799	191	17950	247.476	ng/ml	100
98) C25 Tricyclic Terpane ...	43.287	191	21526M3	296.779	ng/ml	
99) C24 Tetracyclic Terpan...	44.611	191	10489M3	144.612	ng/ml	
100) C26 Tricyclic Terpane-...	44.337	191	9414M3	129.791	ng/ml	
101) C26 Tricyclic Terpane-...	44.438	191	7898M3	108.890	ng/ml	
102) C28 Tricyclic Terpane-...	46.723	191	9282	127.971	ng/ml	100
103) C28 Tricyclic Terpane-...	46.887	191	9257	127.626	ng/ml	100
104) C29 Tricyclic Terpane-...	47.409	191	8568	118.127	ng/ml	100
105) C29 Tricyclic Terpane-...	47.619	191	10352M3	142.723	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.781	191	23962	330.364	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.863	191	8597M3	118.527	ng/mL	
108) C30 Tricyclic Terpane-22R	49.110	191	7094	97.805	ng/mL	100
109) 17a(H)-22,29,30-Trisno...	49.339	191	33433	460.940	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.555	191	9432	130.039	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.336	191	6204M3	85.534	ng/ml	
112) 30-Norhopane (T15)	51.250	191	89859	1238.884	ng/ml	100
113) 18a(H)-30-Norneohopane...	51.351	191	25308M3	348.921	ng/ml	
114) 17a(H)-Diahopane (X)	51.479	191	7970M3	109.882	ng/ml	
115) 30-Normoretane (T17)	52.046	191	14602	201.317	ng/ml	100
116) 18a(H)&18b(H)-Oleanane...	52.467	191	9184M4	126.620	ng/ml	
117) Moretane (T20)	53.363	191	23589	325.221	ng/ml	100
118) 30-Homohopane-22S (T21)	54.496	191	49690M3	685.075	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

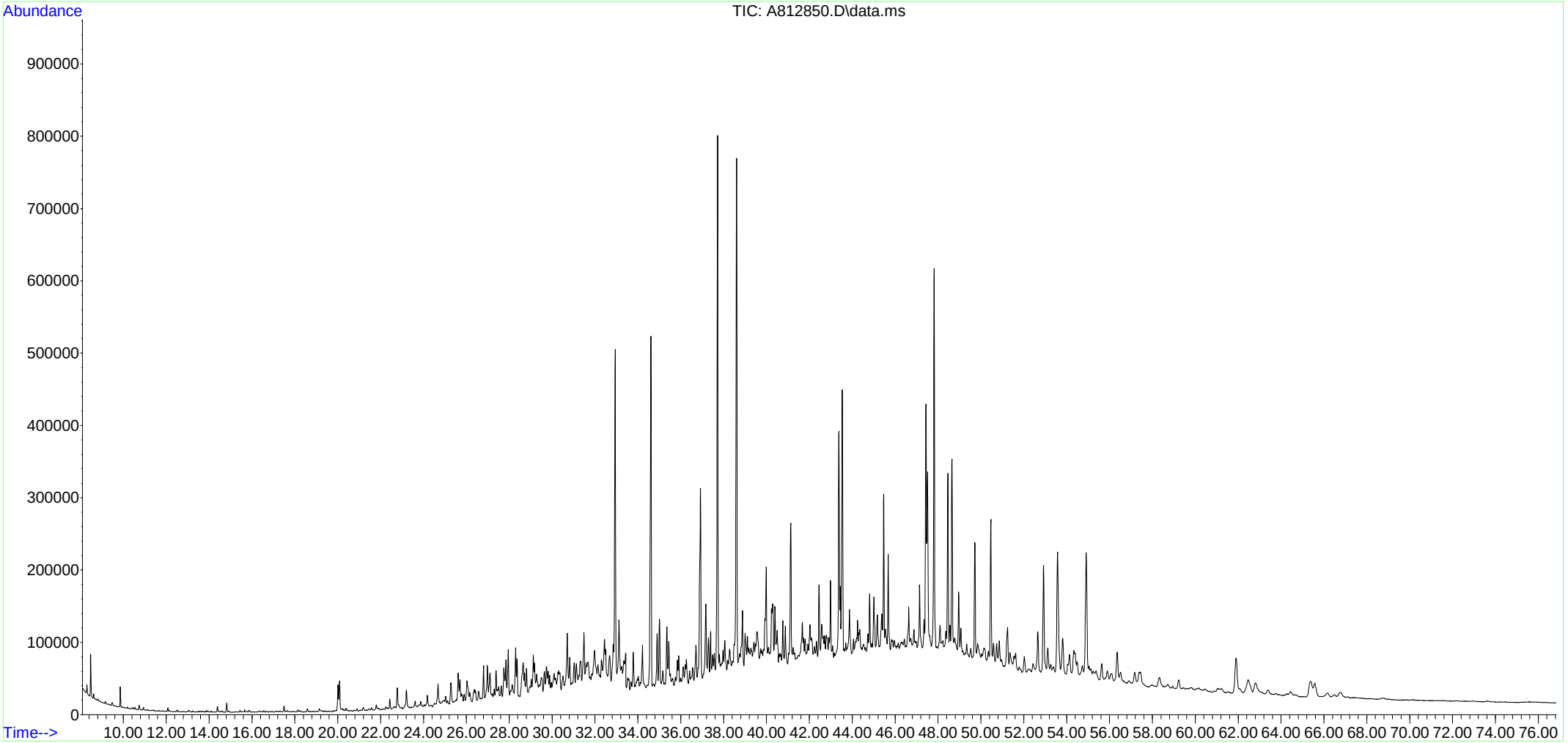
	Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119)	30-Homohopane-22R (T22)	54.733	191		43348	597.638	ng/ml	100
120)	Gammacerane/C32-diahopane	55.309	191		15926M4	219.571	ng/mL	
121)	30,31-Bishomohopane-22...	56.095	191	G	54592	752.659	ng/ml	100
122)	30,31-Bishomohopane-22...	56.497	191		23437	323.125	ng/ml	100
123)	30,31-Trishomohopane-2...	58.306	191		27664	381.403	ng/ml	100
124)	30,31-Trishomohopane-2...	58.946	191		14775	203.703	ng/ml	100
125)	Tetrakishomohopane-22S...	61.030	191		18879	260.284	ng/ml	100
126)	Tetrakishomohopane-22R...	61.925	191	G	18908M3	260.684	ng/ml	
127)	Pentakishomohopane-22S...	64.274	191		16042M4	221.171	ng/ml	
128)	Pentakishomohopane-22R...	65.635	191		11931M3	164.492	ng/ml	
130)	13b(H),17a(H)-20S-Diac...	45.561	217		9906	280.502	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.982	217		5023M4	142.233	ng/ml	
132)	13b,17a-20S-Methyldiac...	46.677	217		4874M3	138.014	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.555	217		19130	541.693	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.086	217		20026	567.064	ng/ml	100
135)	Unknown Sterane (S18)	48.378	217		5005	141.724	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.634	217		605	17.131	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.799	217		8949	253.403	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.531	217		7898M3	223.643	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.897	217		14058M3	398.072	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.829	217		12555M3	355.512	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.647	218		10005M3	283.305	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.738	218		10708M3	303.212	ng/ml	
143)	14b,17b-20R-Methylchol...	48.982	218		9715M3	275.094	ng/ml	
144)	14b,17b-20S-Methylchol...	49.064	218		14539M3	411.692	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.153	218		19763	559.617	ng/ml	100
146)	14b(H),17b(H)-20S-Ethy...	50.189	218		15607M3	441.934	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.851	231		34445	975.358	ng/mL	100
148)	C28,20S-triaromatic st...	50.729	231		38108M4	1079.081	ng/mL	
149)	C27,20R-triaromatic st...	51.195	231		21678M3	613.843	ng/mL	
150)	C28,20R-triaromatic st...	52.439	231		29062	822.931	ng/mL	100

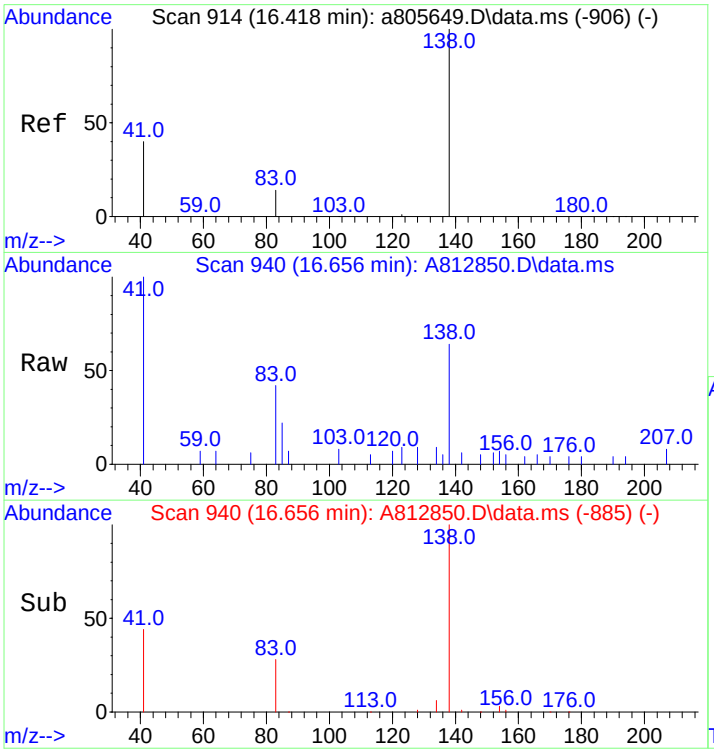
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812850.D
Acq On : 20 Nov 2012 1:48 am
Operator : AC
Sample : 1210082-03
Misc : 1x
ALS Vial : 31 Sample Multiplier: 1

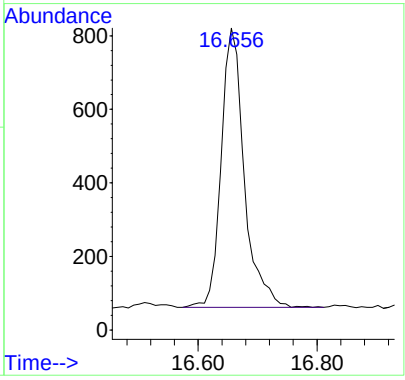
Quant Time: Nov 20 15:12:44 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

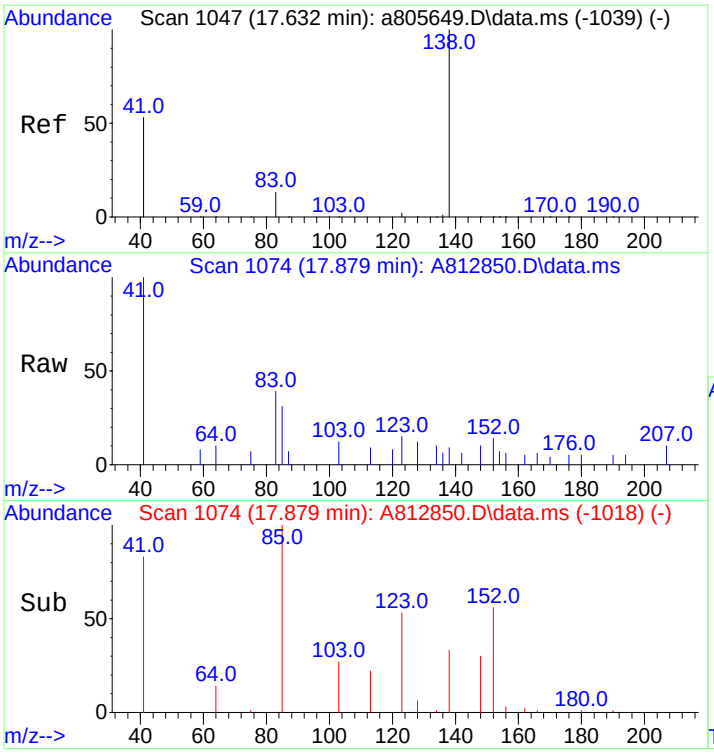




#3
trans-Decalin
Concen: 38.56 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

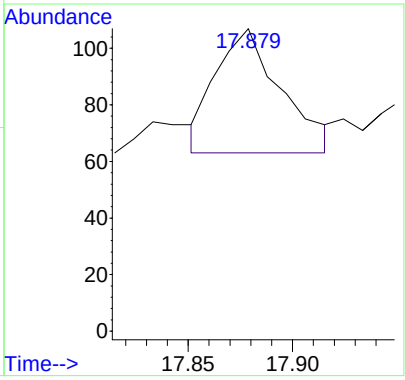
Tgt Ion:138 Resp: 2035

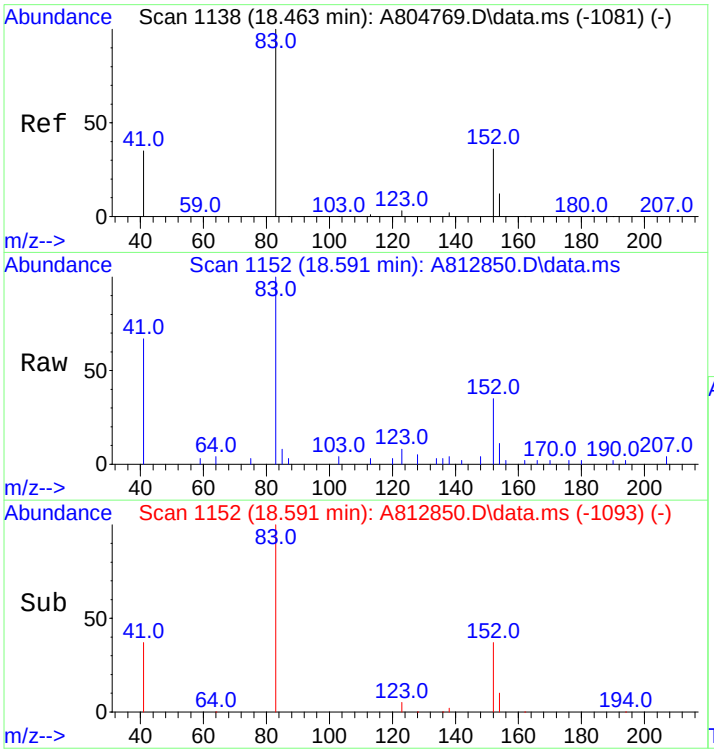




#4
cis-Decalin
Concen: 2.48 ng/mL m
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

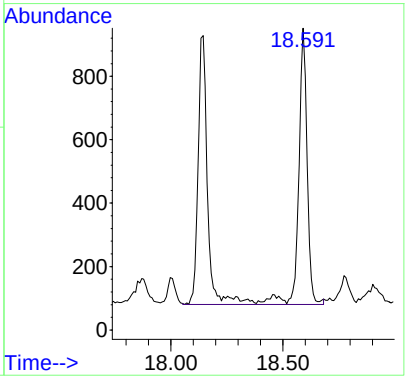
Tgt Ion:138 Resp: 96

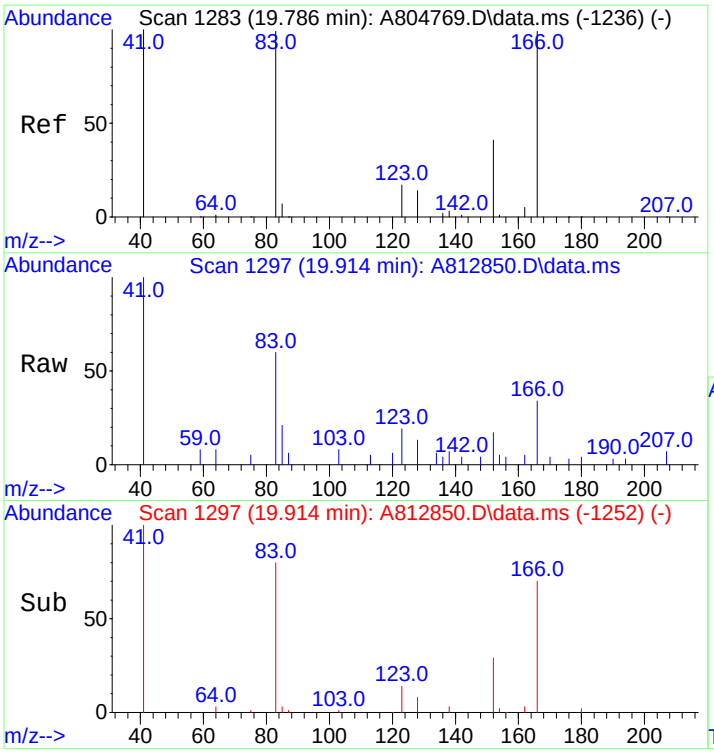




#5
C1-Decalins
Concen: 90.04 ng/mL m
RT: 18.591 min Scan# 1152
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

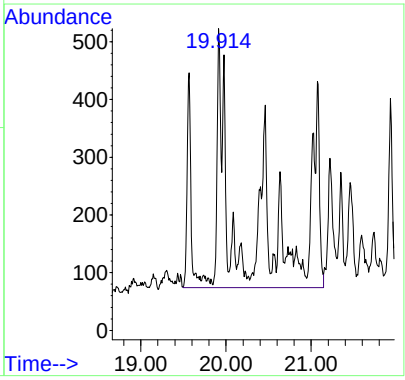
Tgt Ion:152 Resp: 4752

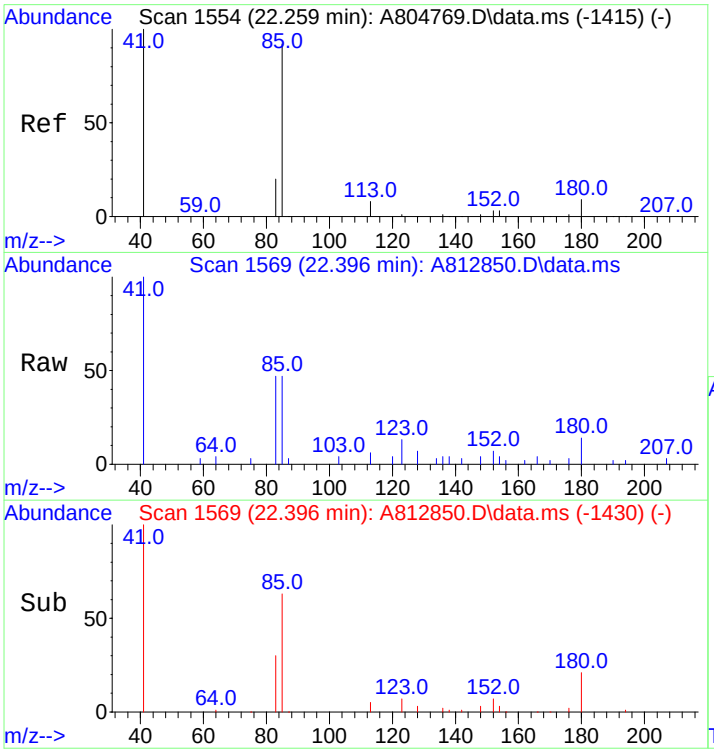




#6
C2-Decalins
Concen: 175.96 ng/mL m
RT: 19.914 min Scan# 1297
Delta R.T. -0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

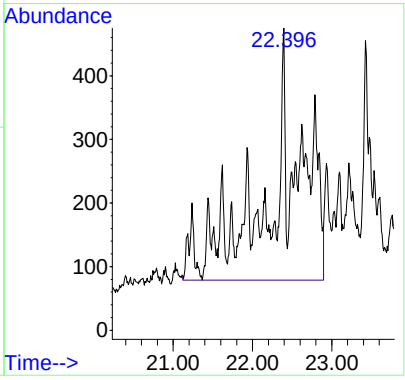
Tgt Ion:166 Resp: 9287

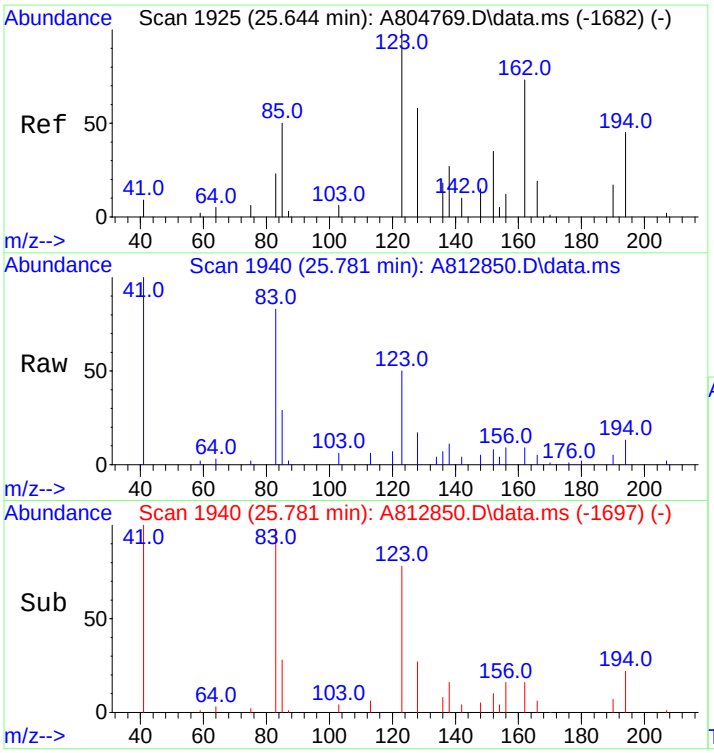




#7
C3-Decalins
Concen: 213.00 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

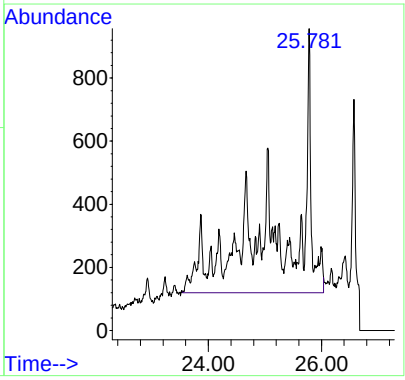
Tgt Ion:180 Resp: 11242

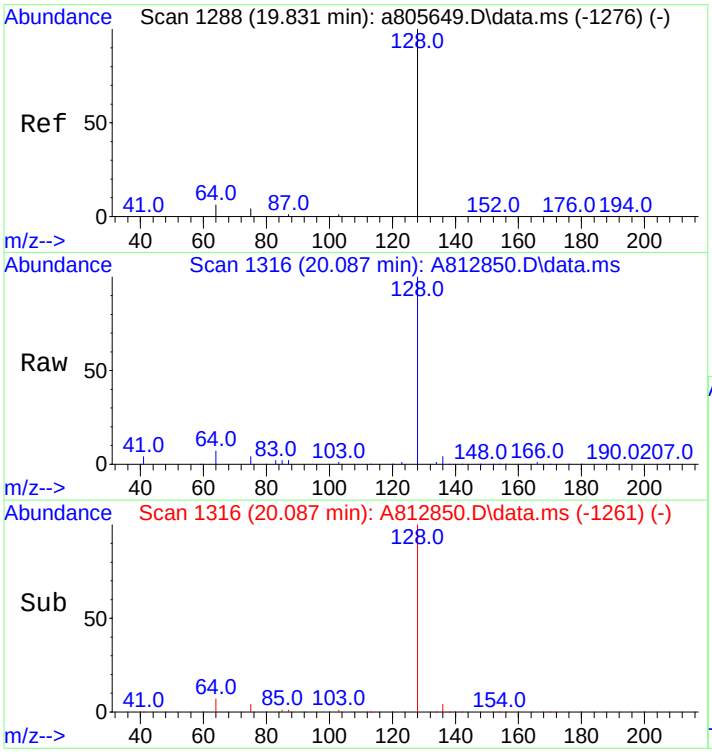




#8
C4-Decalins
Concen: 404.50 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:194 Resp: 21349

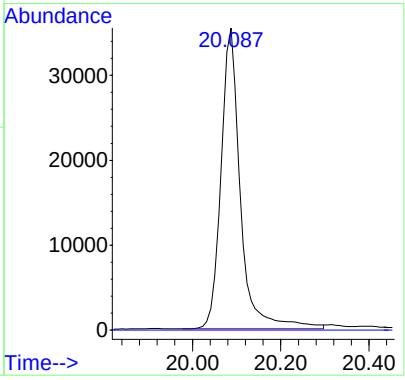


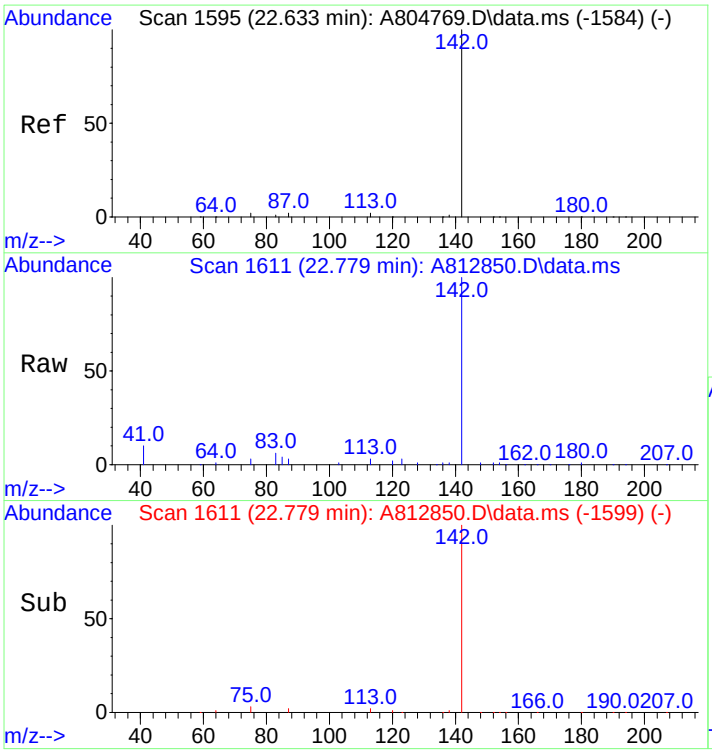


#10
Naphthalene
Concen: 402.47 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:128 Resp: 108372

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

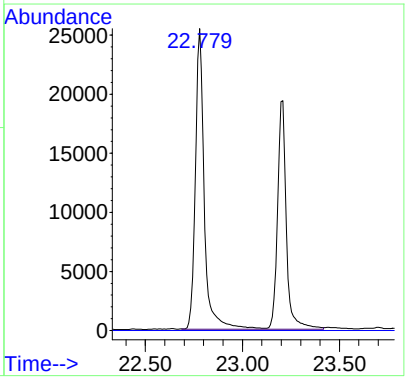


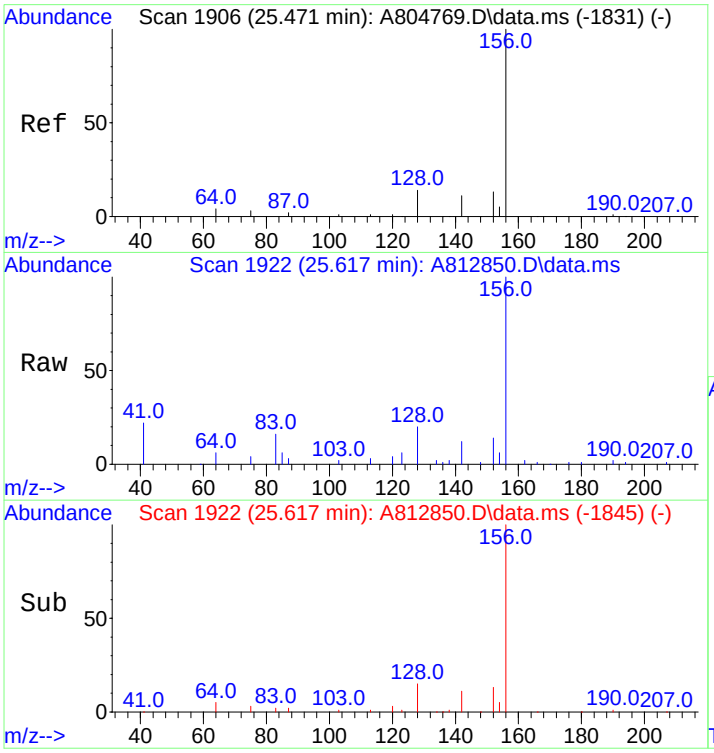


#11
C1-Naphthalenes
Concen: 527.66 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:142 Resp: 142083

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

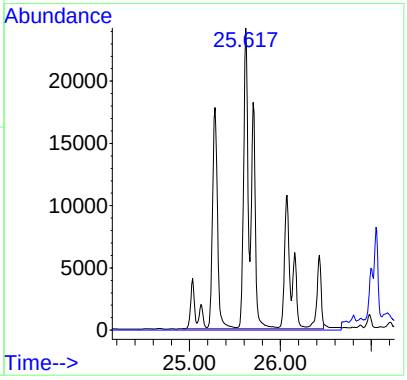


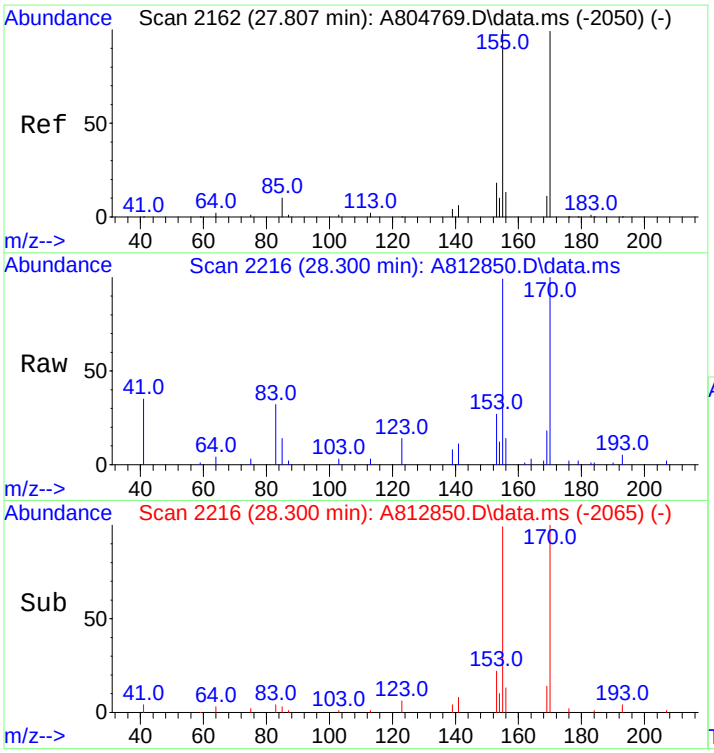


#12
C2-Naphthalenes
Concen: 1090.33 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:156 Resp: 293591

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

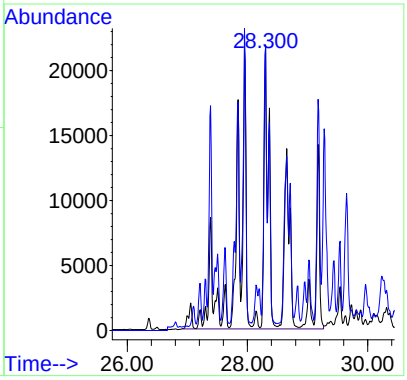


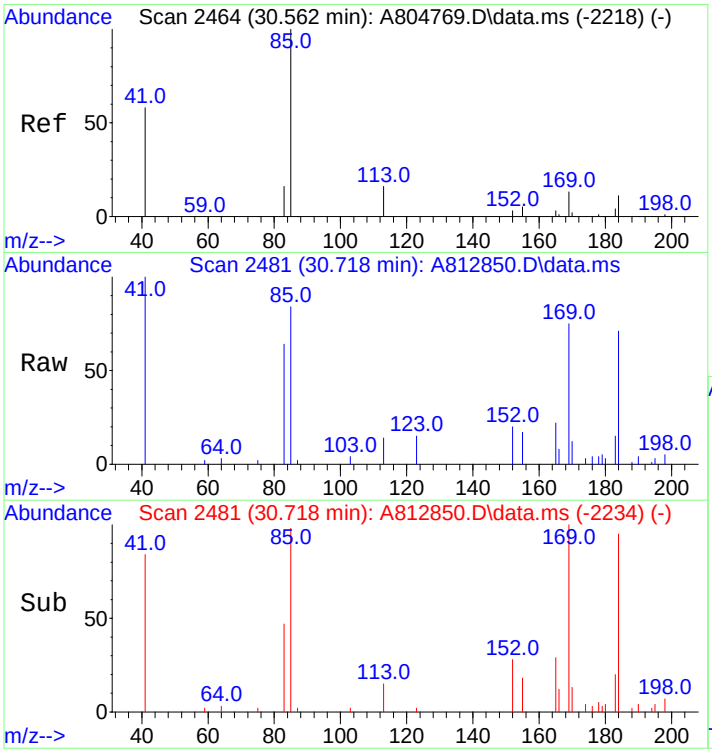


#13
C3-Naphthalenes
Concen: 1689.64 ng/mL m
RT: 28.300 min Scan# 2216
Delta R.T. 0.347 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:170 Resp: 454967

Ion	Ratio	Lower	Upper
170	100		
155	15.3	80.2	120.4#

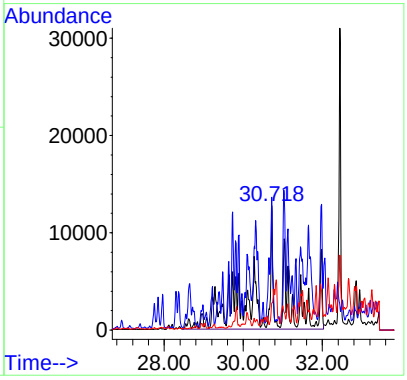


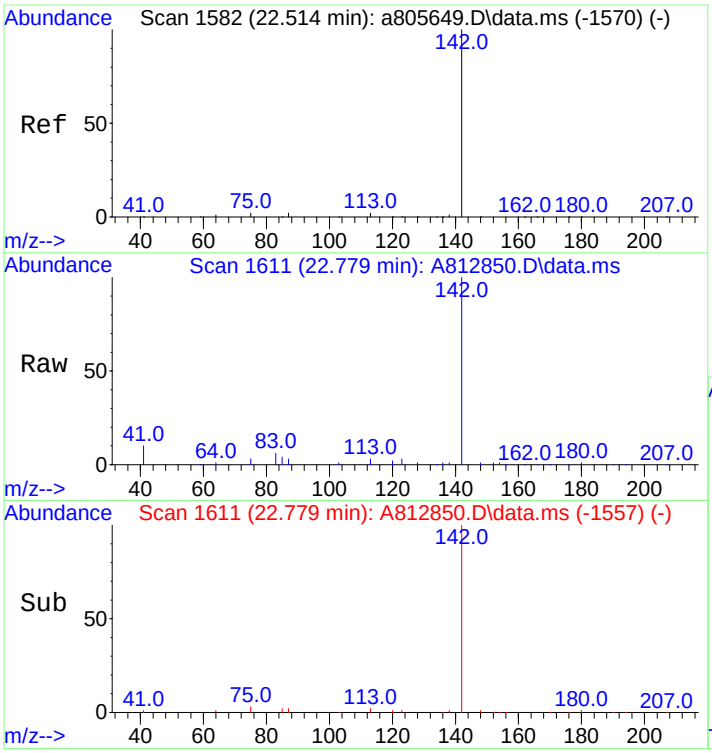


#14
C4-Naphthalenes
Concen: 1585.04 ng/mL m
RT: 30.718 min Scan# 2481
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:184 Resp: 426803

Ion	Ratio	Lower	Upper
184	100		
169	10.2	108.2	162.2#
183	0.0	29.7	44.5#

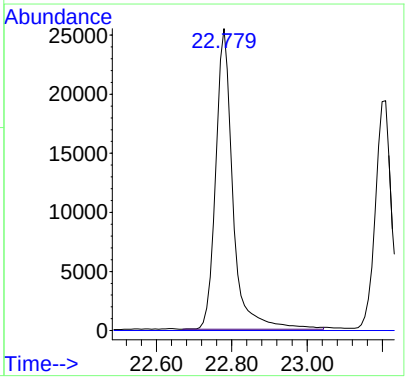


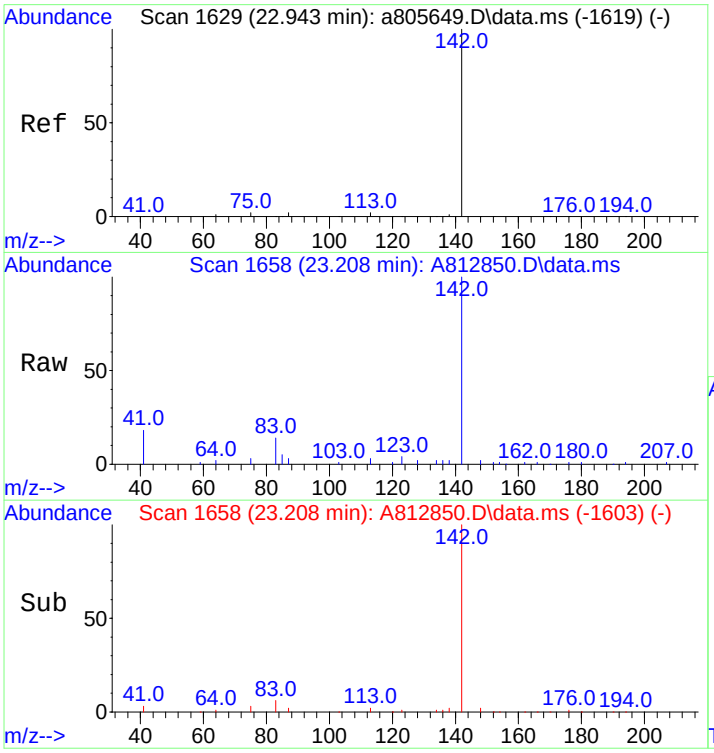


#16
2-Methylnaphthalene
Concen: 501.82 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:142 Resp: 80492

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

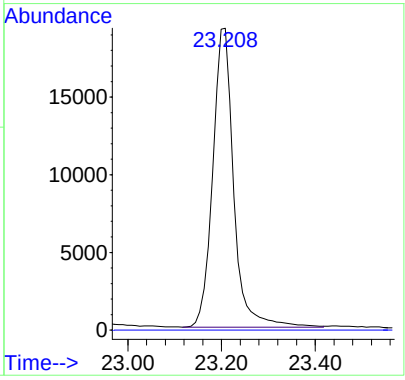


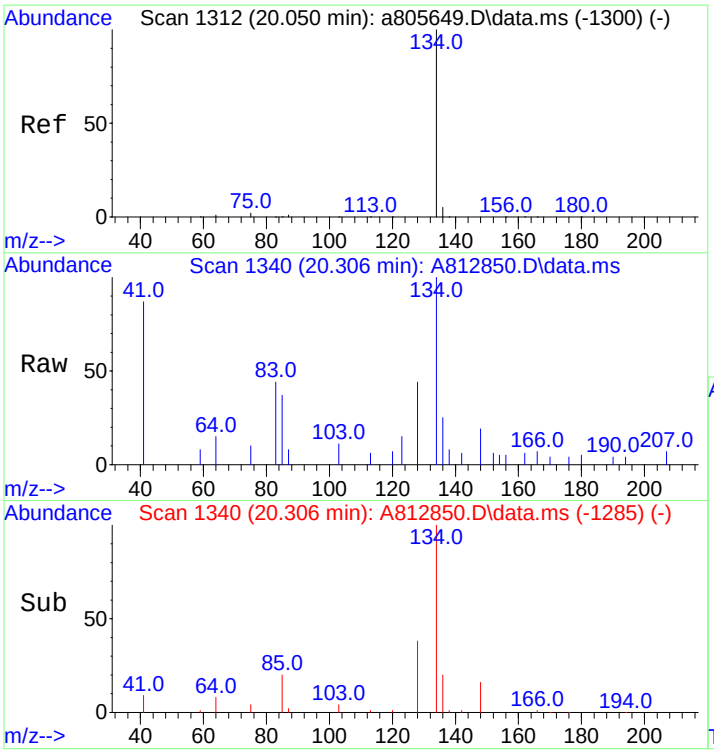


#17
1-Methylnaphthalene
Concen: 397.73 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:142 Resp: 59738

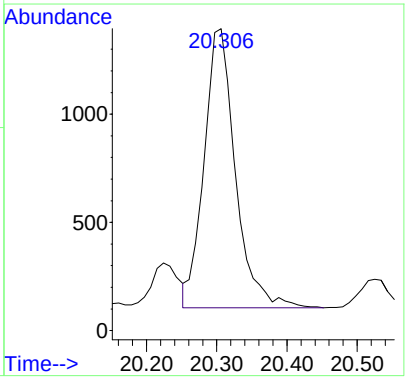
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

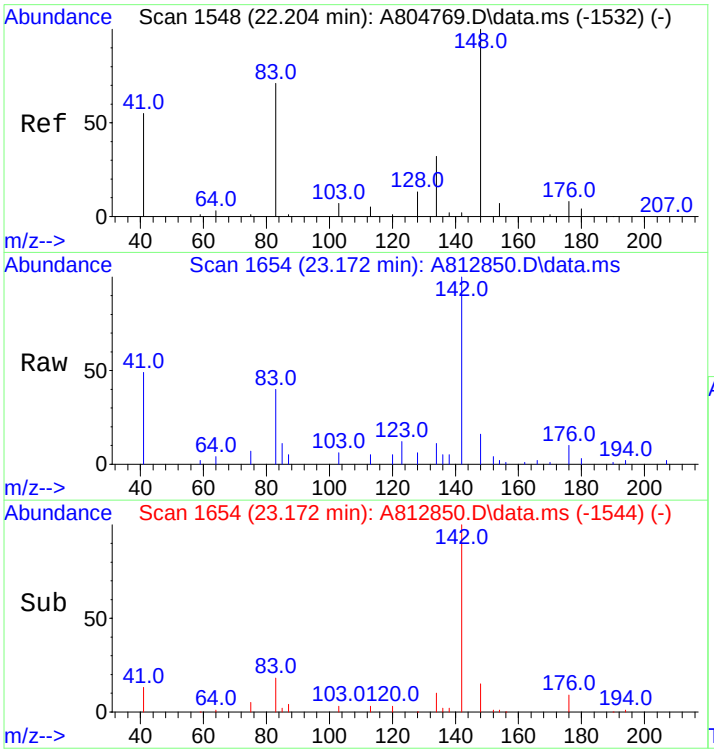




#18
Benzothiophene
Concen: 18.37 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

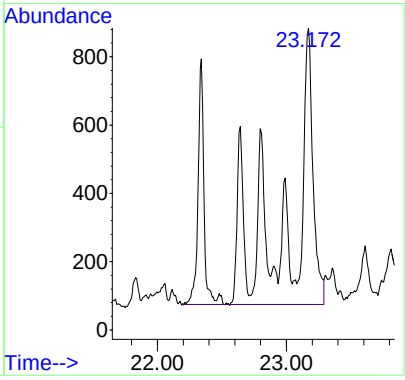
Tgt Ion:134 Resp: 3998

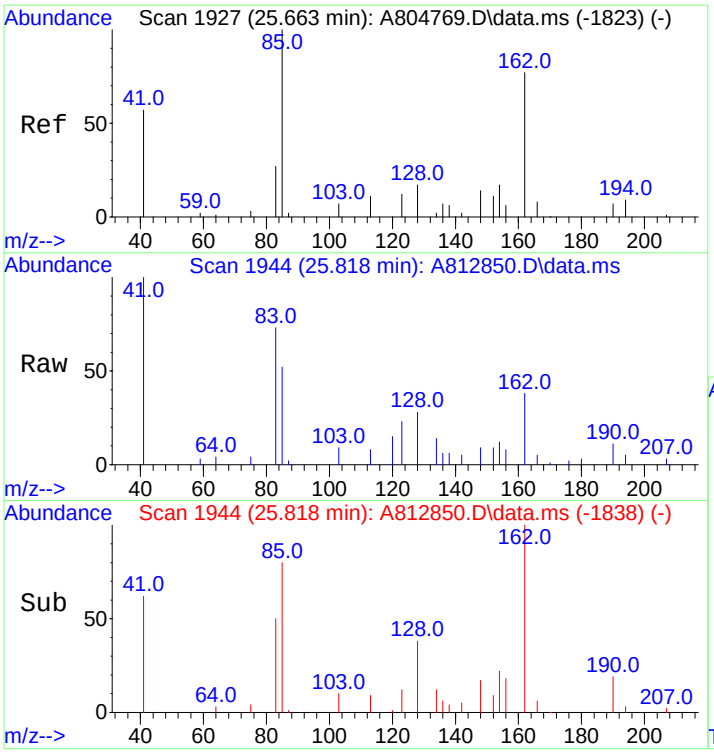




#19
C1-Benzo(b)thiophenes
Concen: 53.71 ng/mL m
RT: 23.172 min Scan# 1654
Delta R.T. 0.831 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

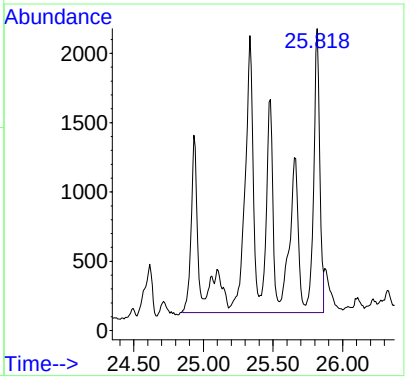
Tgt Ion:148 Resp: 11690

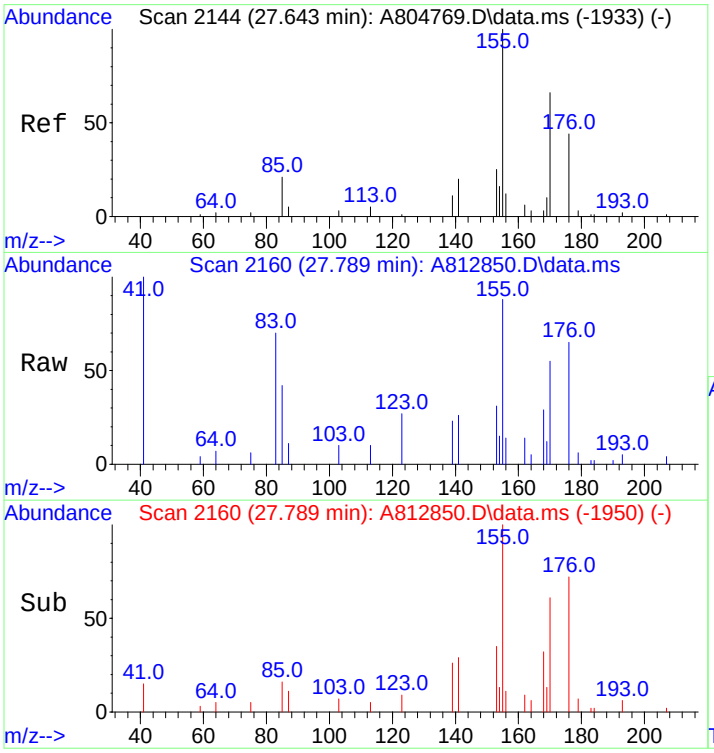




#20
C2-Benzo(b)thiophenes
Concen: 137.62 ng/mL m
RT: 25.818 min Scan# 1944
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

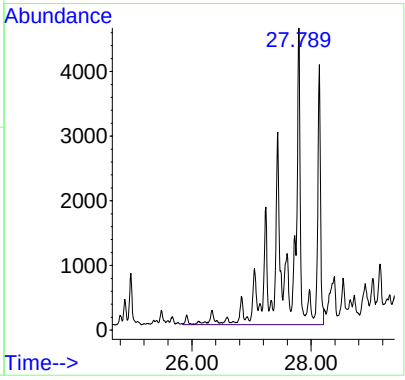
Tgt Ion:162 Resp: 29953

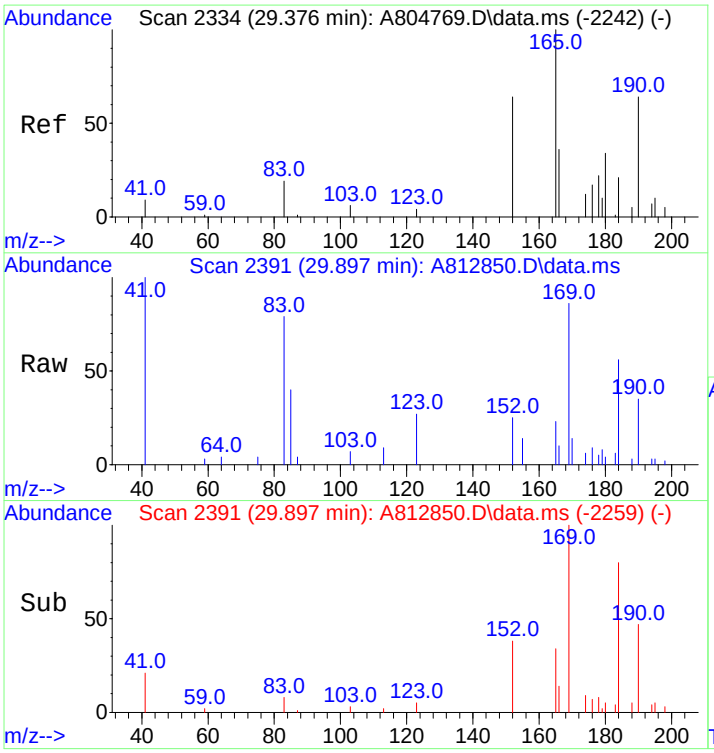




#21
C3-Benzo(b)thiophenes
Concen: 312.61 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

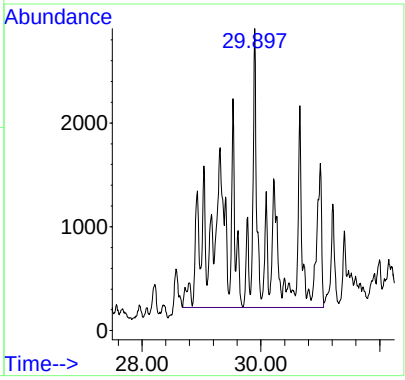
Tgt Ion:176 Resp: 68039

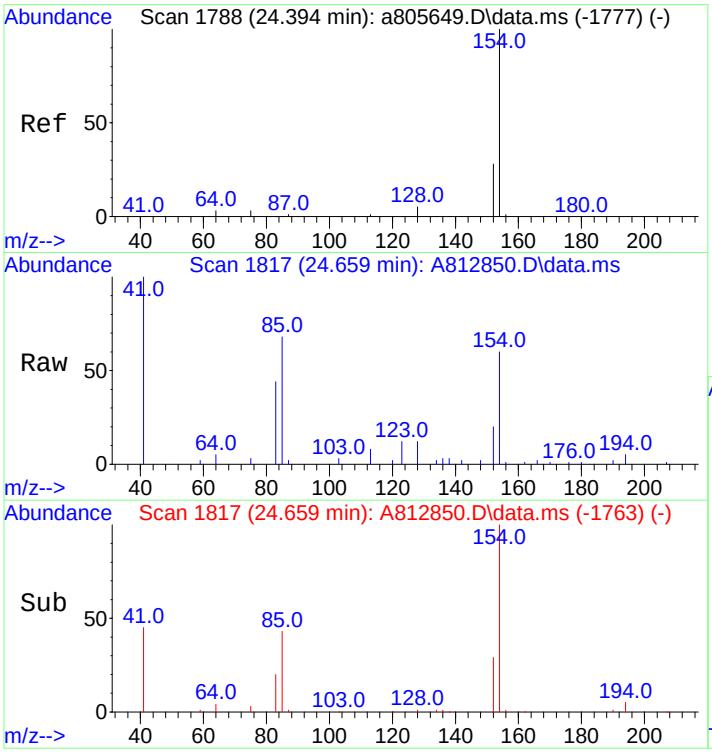




#22
C4-Benzo(b)thiophenes
Concen: 358.63 ng/mL m
RT: 29.897 min Scan# 2391
Delta R.T. 0.365 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:190 Resp: 78055

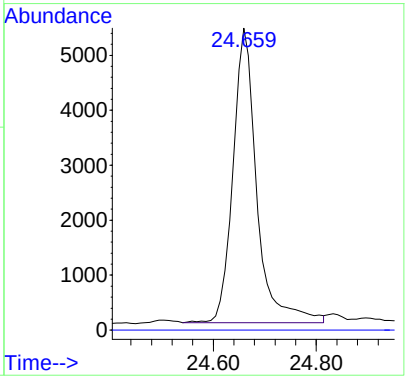


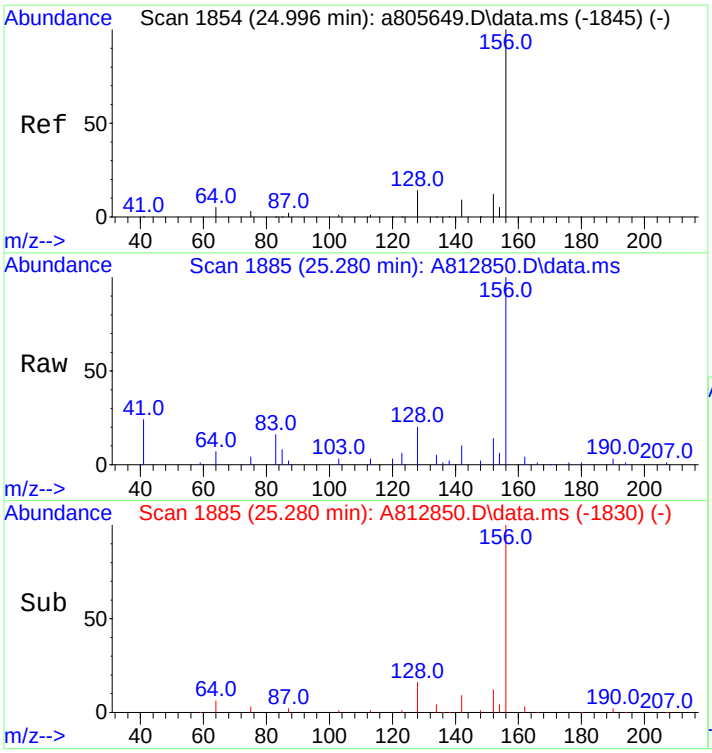


#23
Biphenyl
Concen: 84.66 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:154 Resp: 17277

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

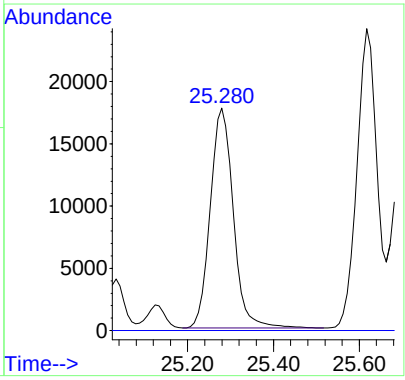


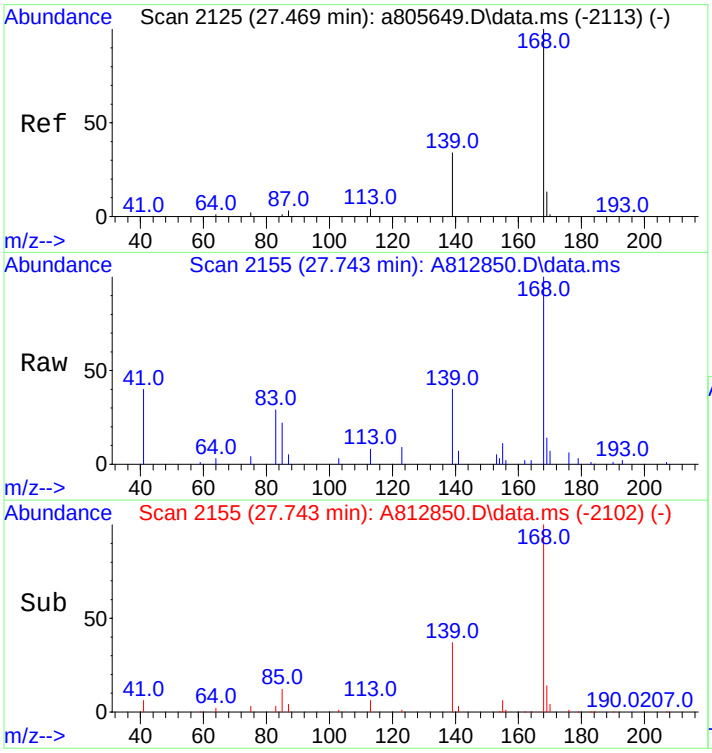


#24
2,6-Dimethylnaphthalene
Concen: 480.69 ng/mL
RT: 25.280 min Scan# 1885
Delta R.T. -0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:156 Resp: 65987

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

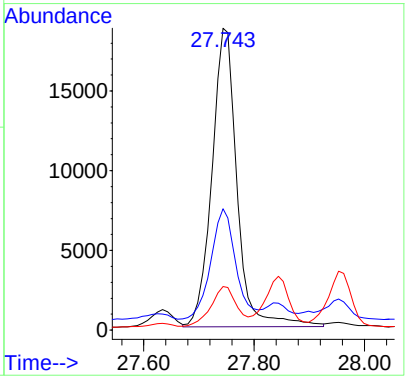


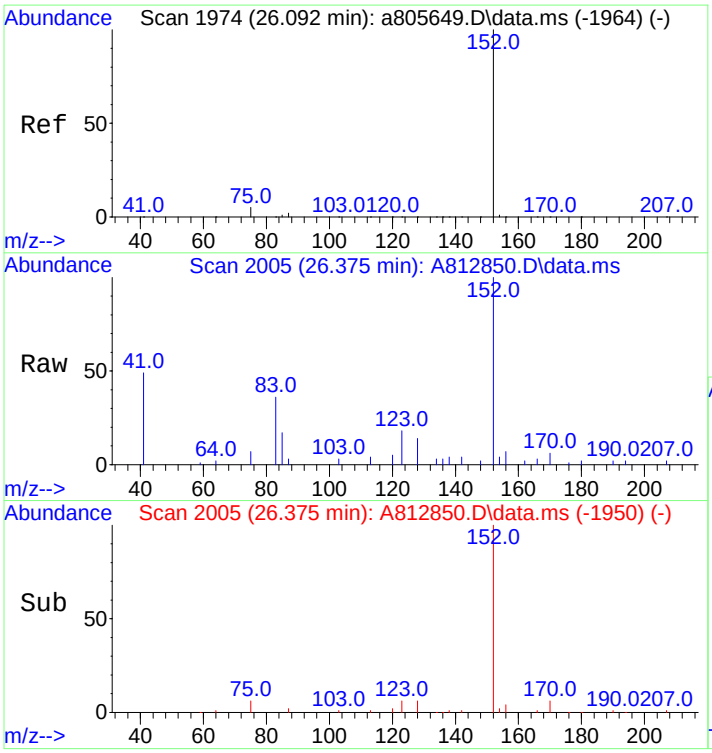


#25
Dibenzofuran
Concen: 275.47 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:168 Resp: 59306

Ion	Ratio	Lower	Upper
168	100		
139	36.6	28.0	42.0
169	13.7	10.6	15.8

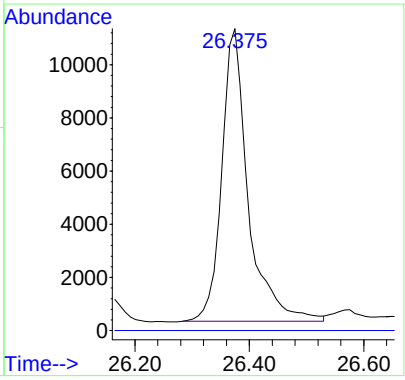


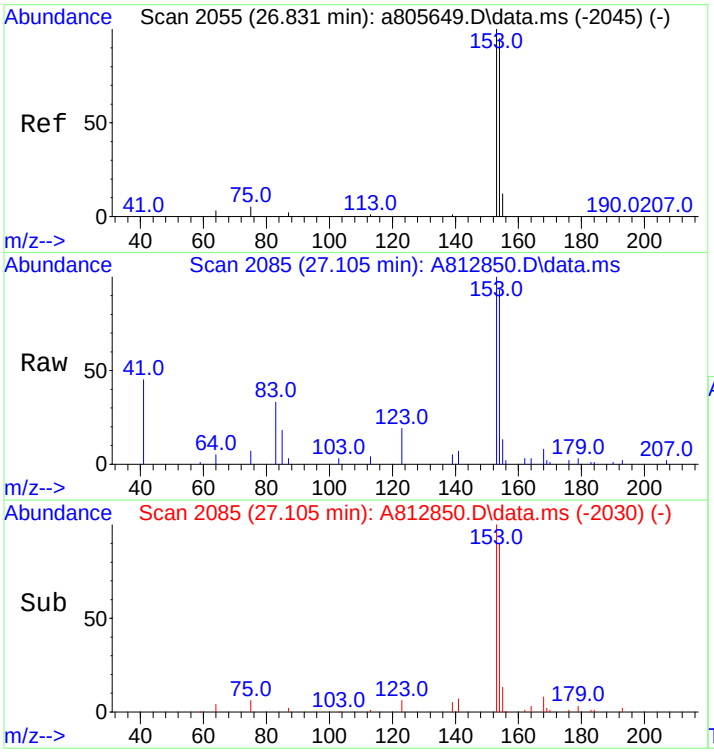


#26
Acenaphthylene
Concen: 144.17 ng/mL
RT: 26.375 min Scan# 2005
Delta R.T. -0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:152 Resp: 35237

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

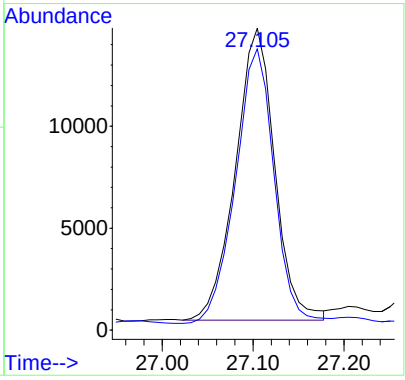


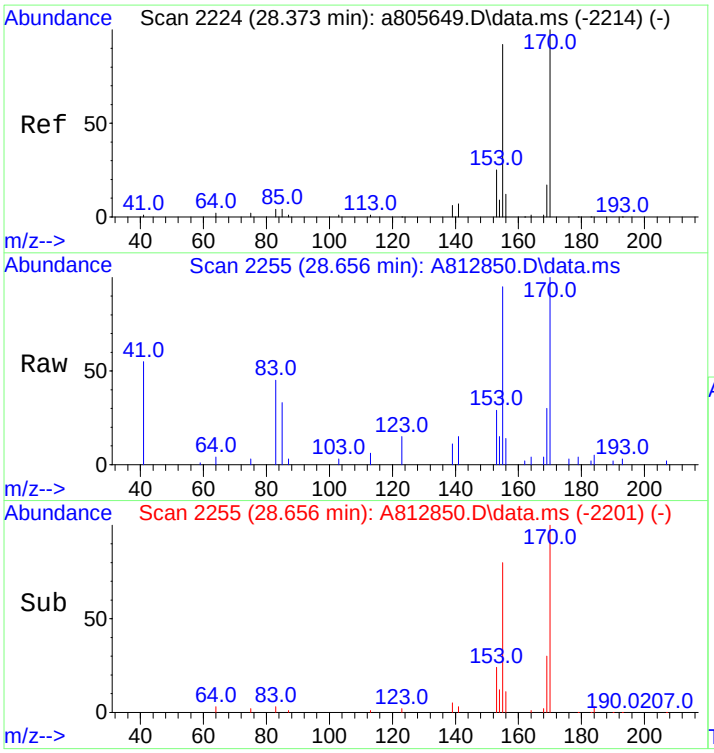


#27
Acenaphthene
Concen: 294.56 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:153 Resp: 42971

Ion	Ratio	Lower	Upper
153	100		
154	92.5	75.4	113.2

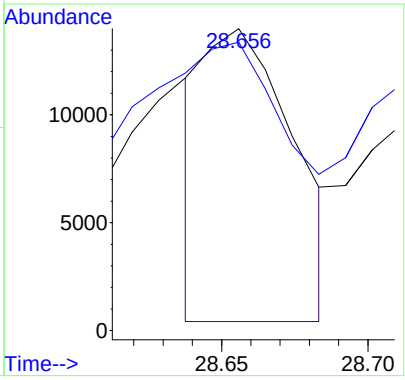


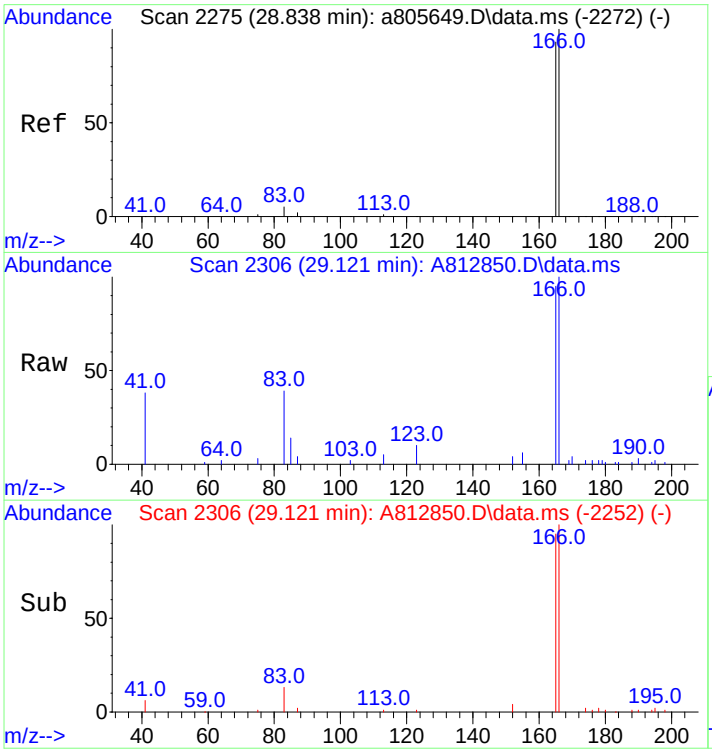


#28
2,3,5-Trimethylnaphthalene
Concen: 244.57 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:170 Resp: 28916

Ion	Ratio	Lower	Upper
170	100		
155	193.1	71.7	107.5#

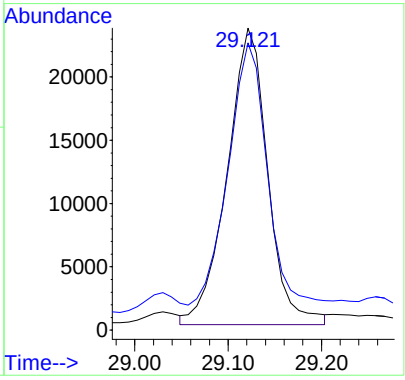


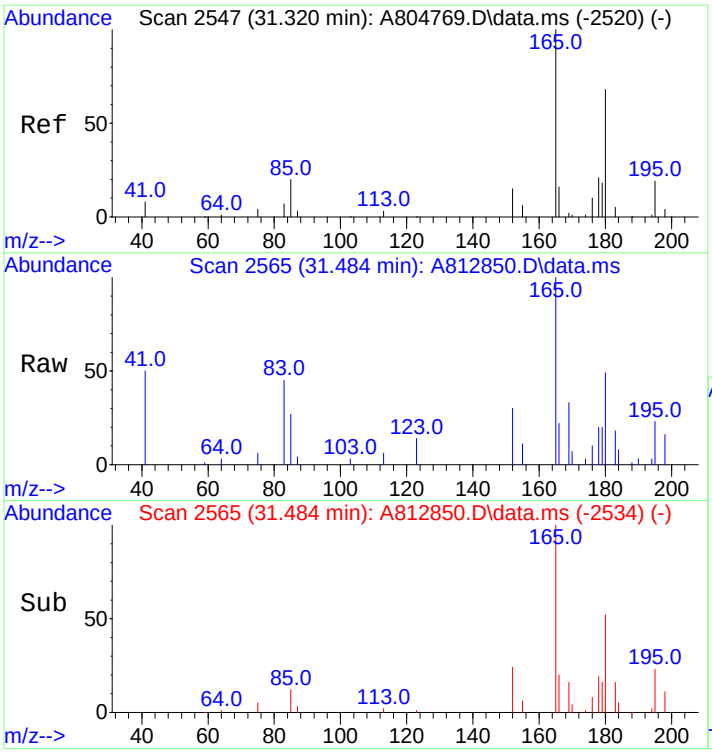


#29
Fluorene
Concen: 433.60 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:166 Resp: 70947

Ion	Ratio	Lower	Upper
166	100		
165	89.3	74.2	111.2

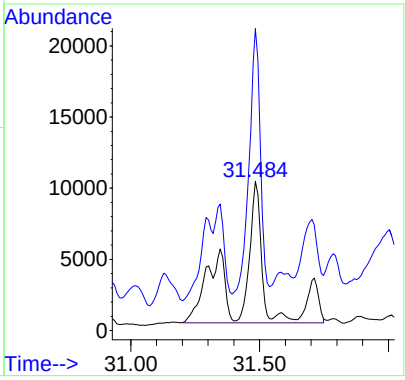


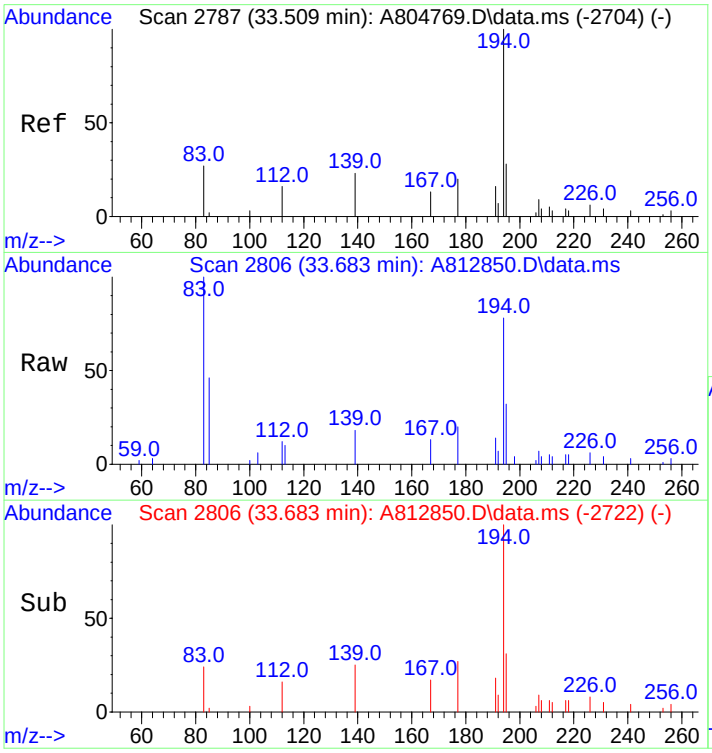


#30
C1-Fluorenes
Concen: 415.08 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:180 Resp: 67916

Ion	Ratio	Lower	Upper
180	100		
165	25.8	122.4	183.6#

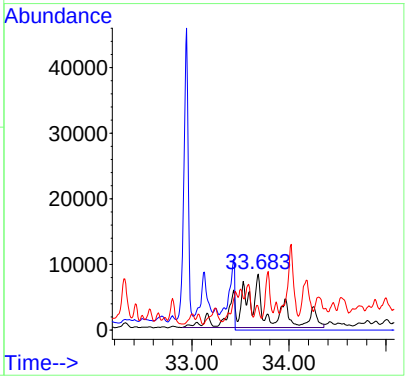


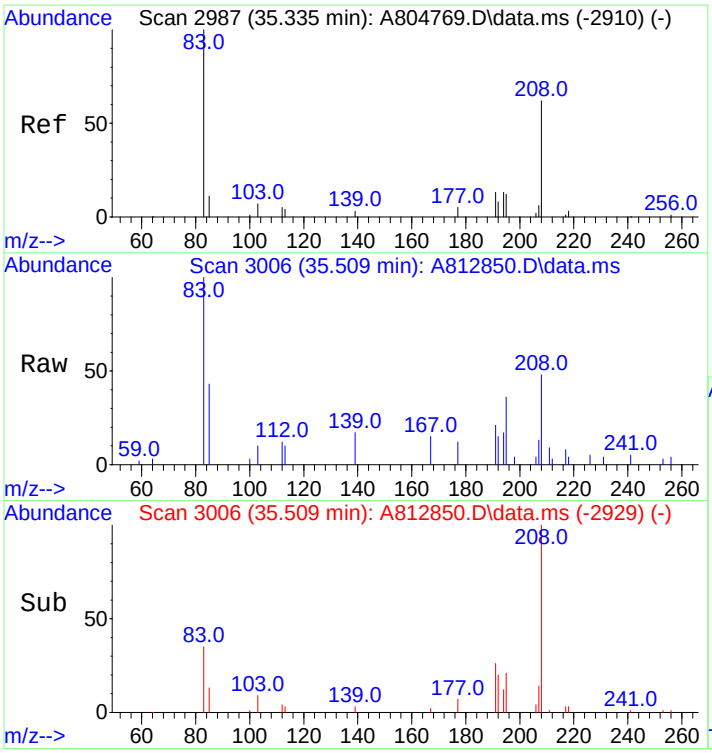


#31
C2-Fluorenes
Concen: 975.30 ng/mL m
RT: 33.683 min Scan# 2806
Delta R.T. 0.077 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:194 Resp: 159581

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	10.5	27.4	41.0#

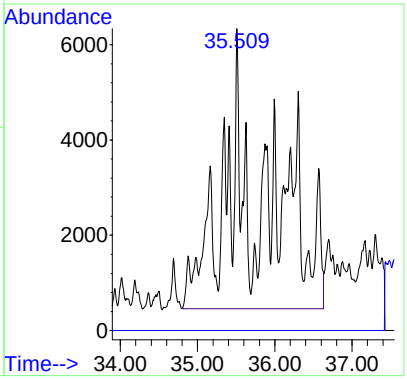


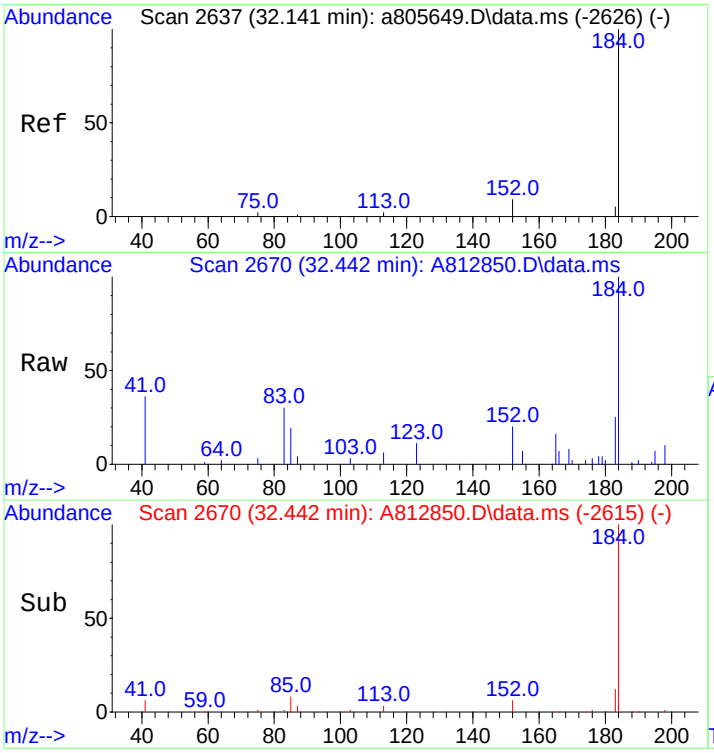


#32
C3-Fluorenes
Concen: 1223.27 ng/mL m
RT: 35.509 min Scan# 3006
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:208 Resp: 200153

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

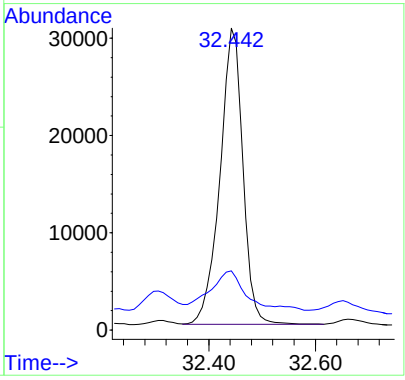


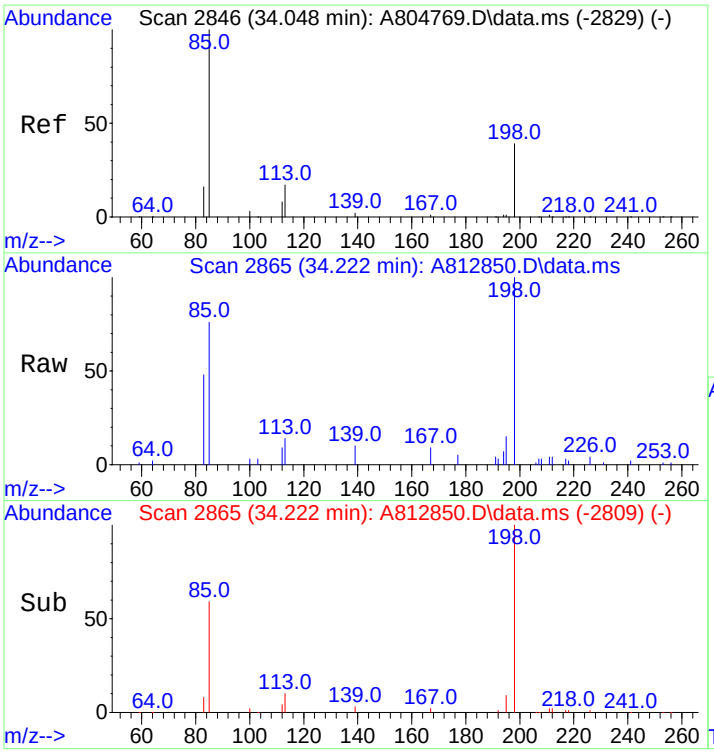


#33
Dibenzothiophene
Concen: 403.18 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:184 Resp: 90715

Ion	Ratio	Lower	Upper
184	100		
152	20.9	7.8	11.8#

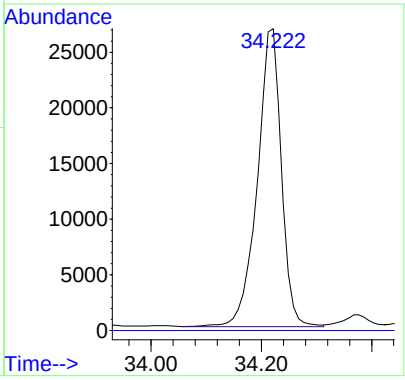


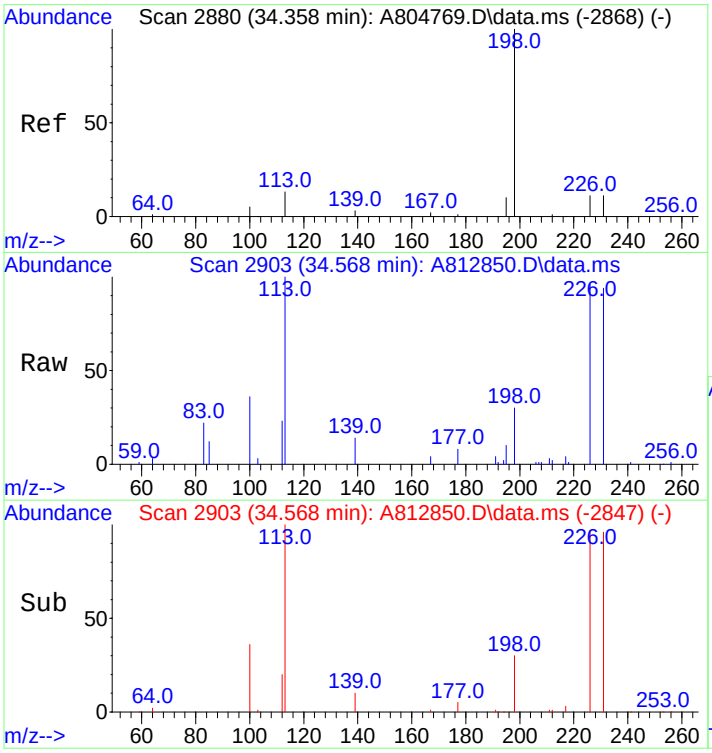


#34
4-Methyldibenzothiophene(4MDT)
Concen: 360.06 ng/mL
RT: 34.222 min Scan# 2865
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:198 Resp: 81014

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

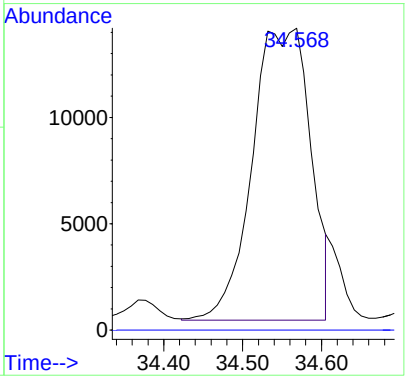


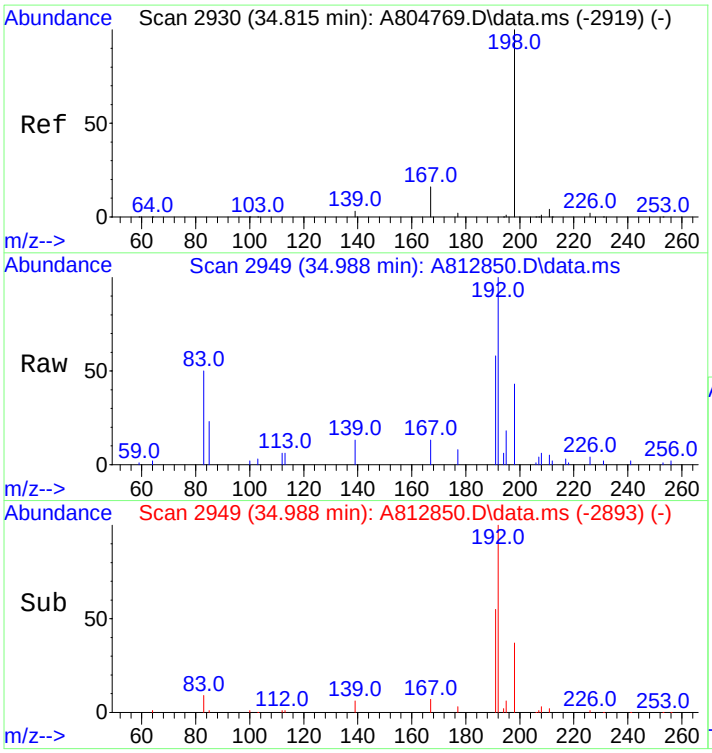


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 313.34 ng/mL m
RT: 34.568 min Scan# 2903
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:198 Resp: 70502

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

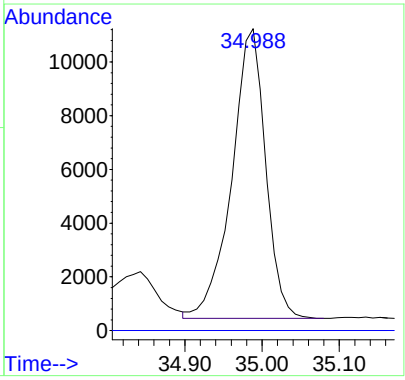


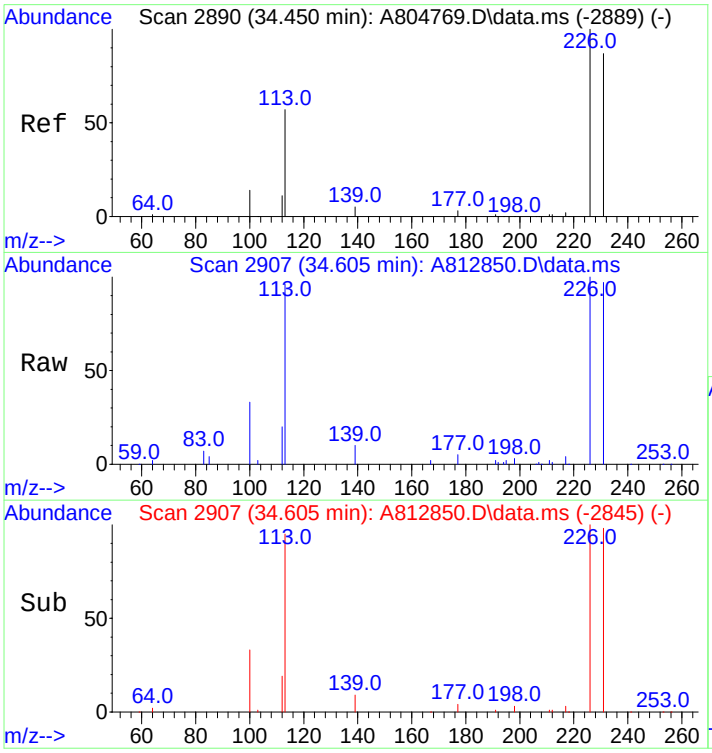


#36
1-Methyldibenzothiophene(1MDT)
Concen: 145.75 ng/mL
RT: 34.988 min Scan# 2949
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:198 Resp: 32794

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

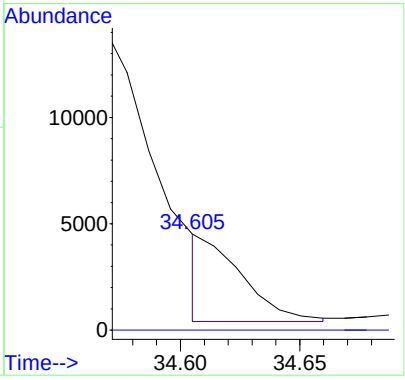


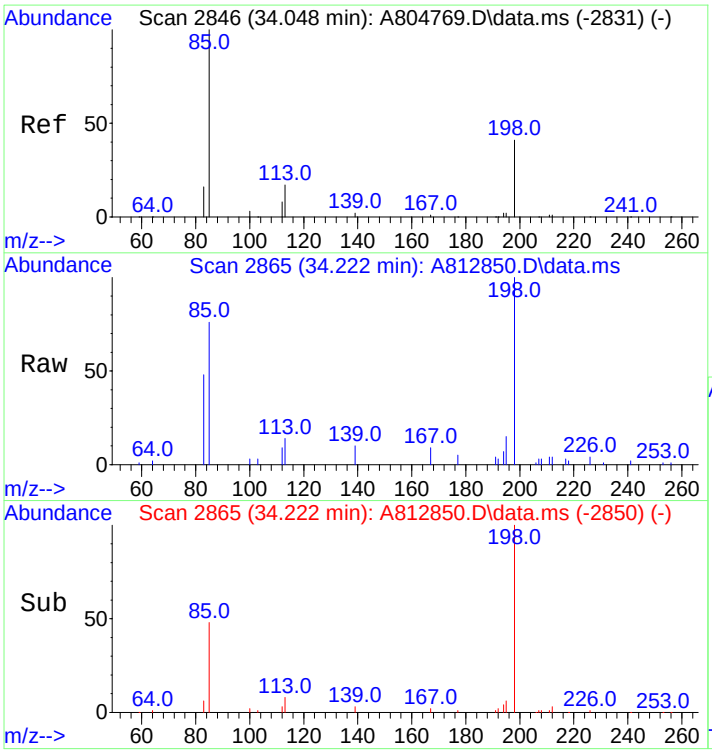


#37
OTP
Concen: 20.27 ng/mL m
RT: 34.605 min Scan# 2907
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:198 Resp: 4560

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

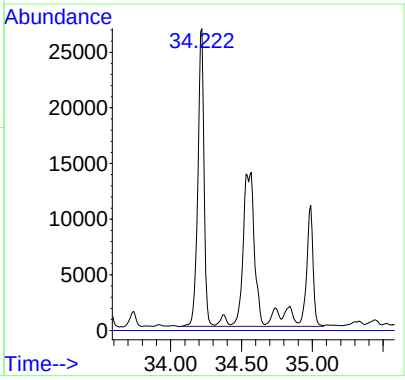


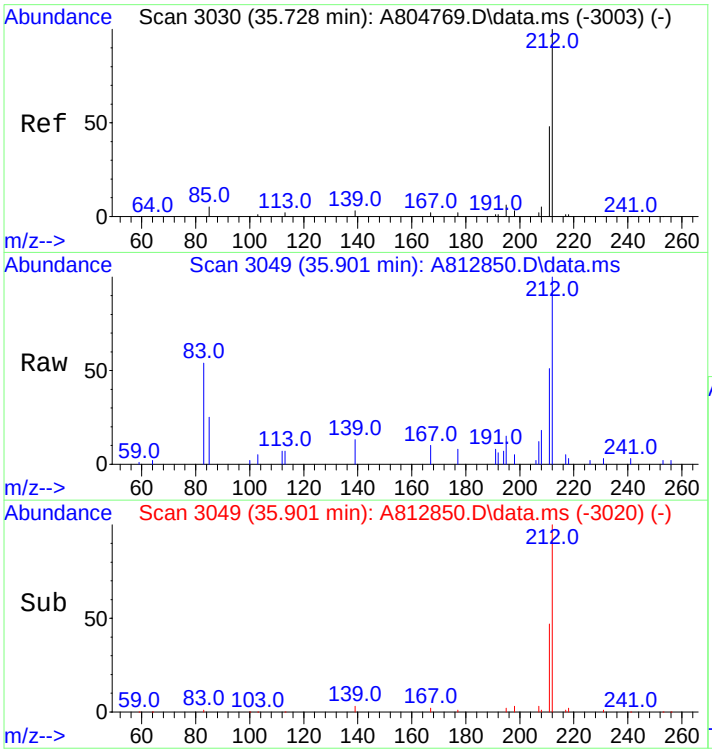


#38
C1-Dibenzothiophenes
Concen: 925.96 ng/mL m
RT: 34.222 min Scan# 2865
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:198 Resp: 208341

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

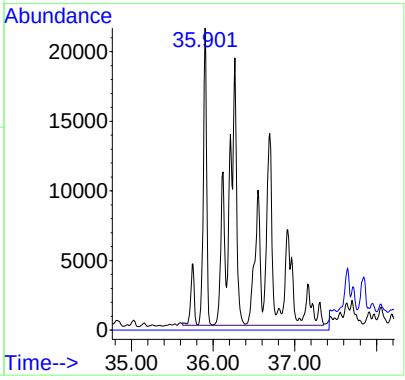


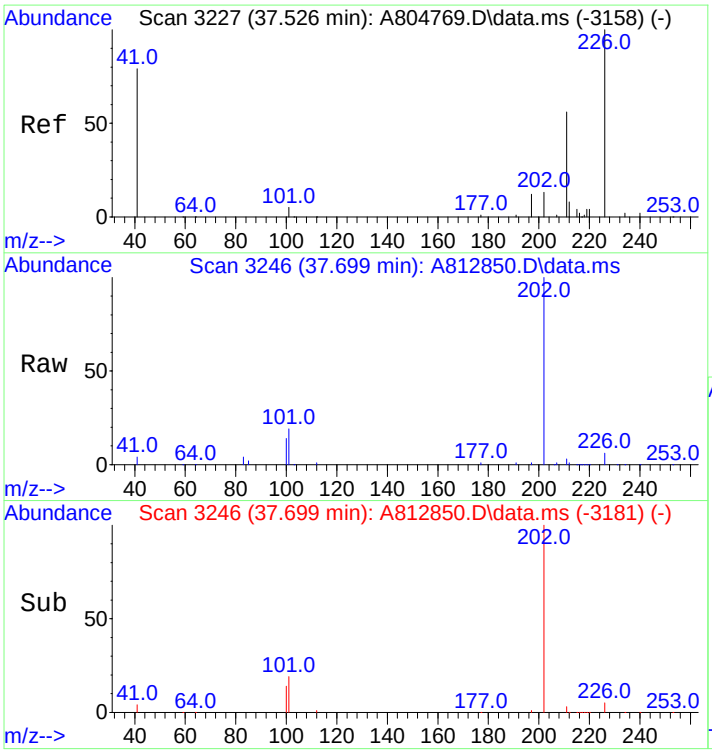


#39
C2-Dibenzothiophenes
Concen: 1635.52 ng/mL m
RT: 35.901 min Scan# 3049
Delta R.T. -0.356 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:212 Resp: 367992

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

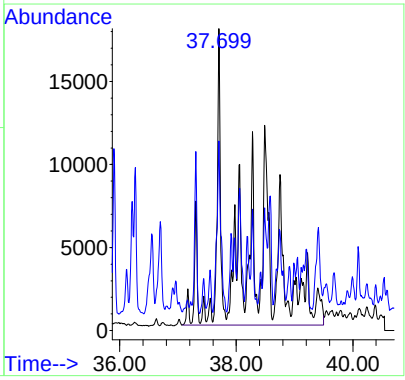


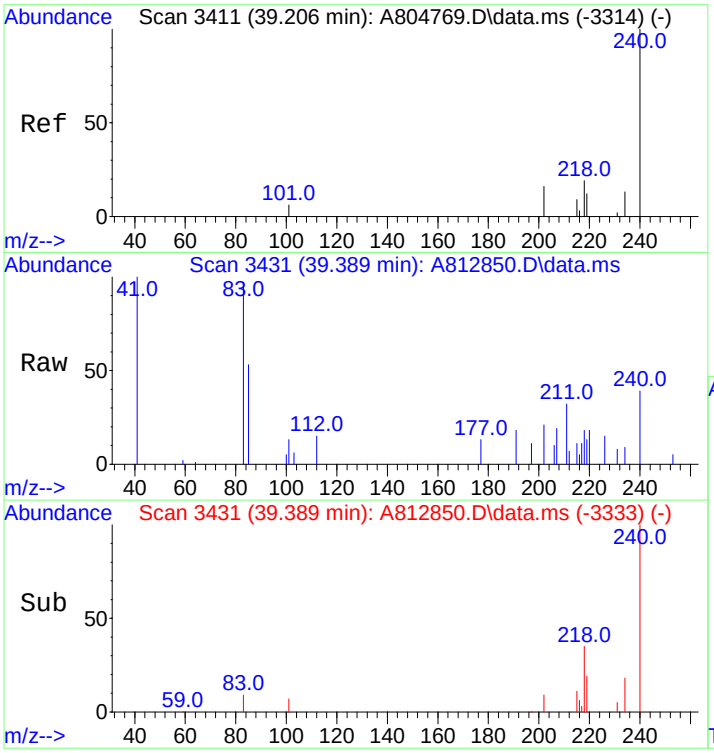


#40
C3-Dibenzothiophenes
Concen: 1820.68 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:226 Resp: 409653

Ion	Ratio	Lower	Upper
226	100		
211	11.9	50.2	75.2#

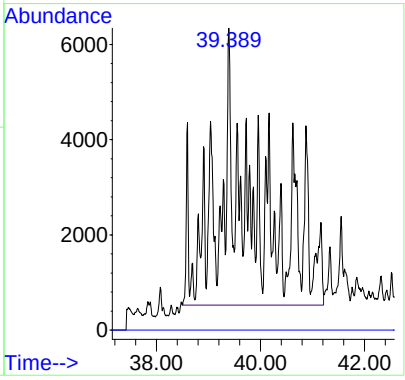


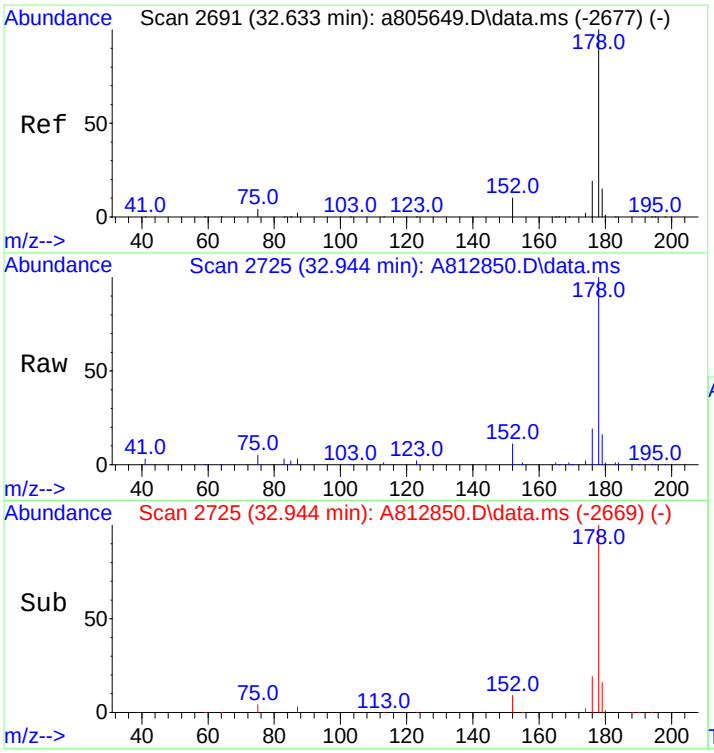


#41
C4-Dibenzothiophenes
Concen: 1196.81 ng/mL m
RT: 39.389 min Scan# 3431
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:240 Resp: 269283

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

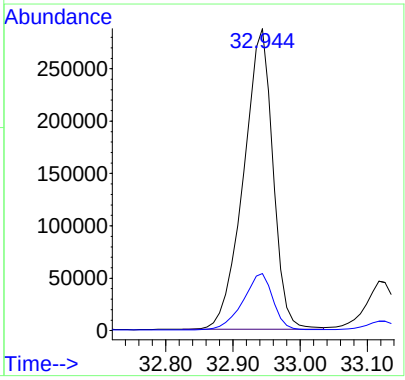


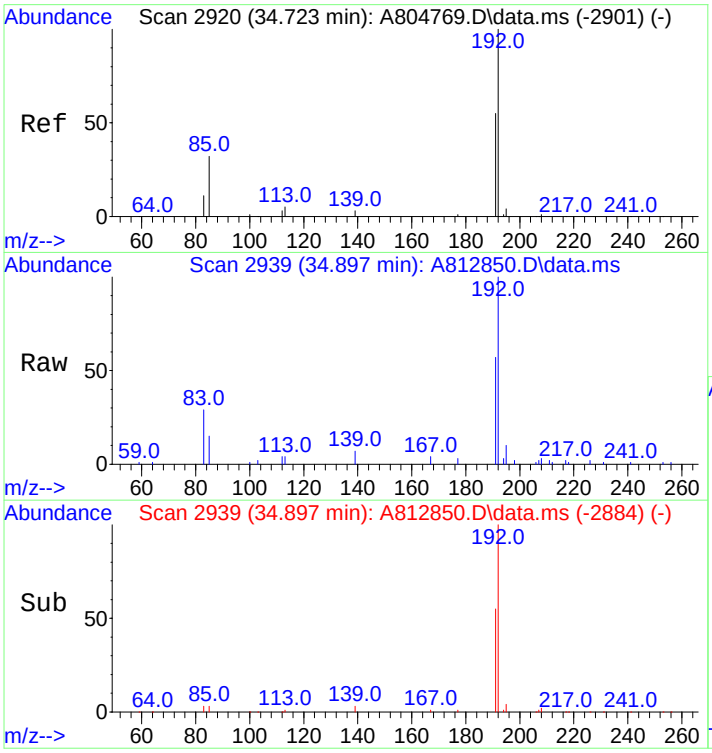


#43
Phenanthrene
Concen: 4023.57 ng/mL
RT: 32.944 min Scan# 2725
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:178 Resp: 871349

Ion	Ratio	Lower	Upper
178	100		
176	19.2	15.2	22.8

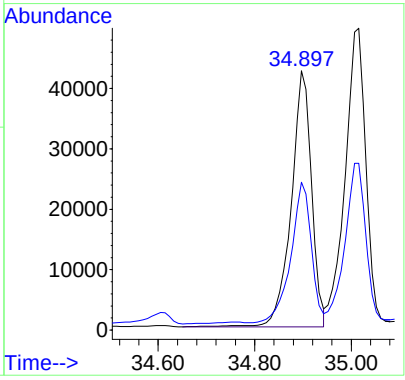


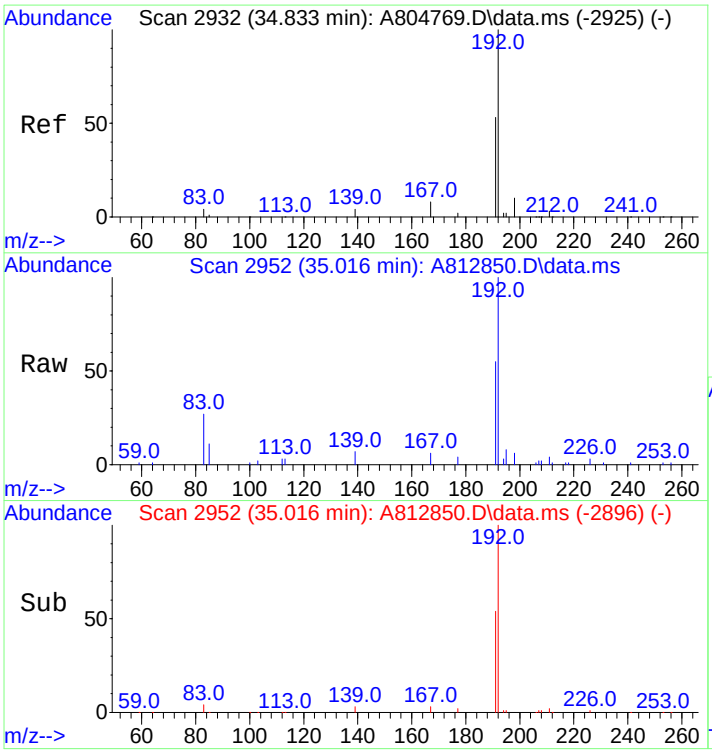


#44
3-Methylphenanthrene(3MP)
Concen: 573.19 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 124131

Ion	Ratio	Lower	Upper
192	100		
191	54.6	45.5	68.3

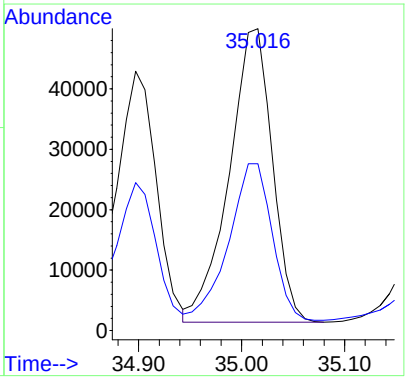


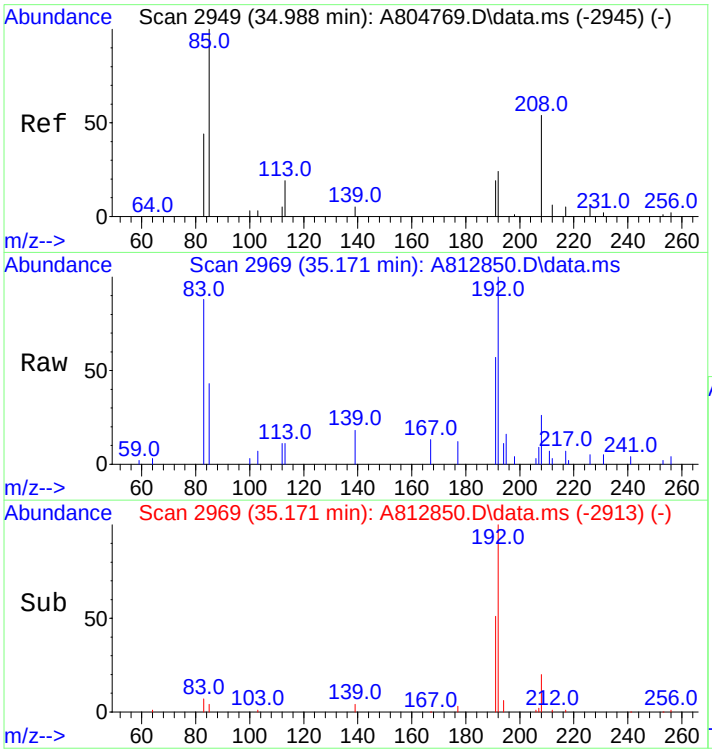


#45
2-Methylphenanthrene(2MP)
Concen: 655.24 ng/mL
RT: 35.016 min Scan# 2952
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 141899

Ion	Ratio	Lower	Upper
192	100		
191	53.2	44.6	67.0

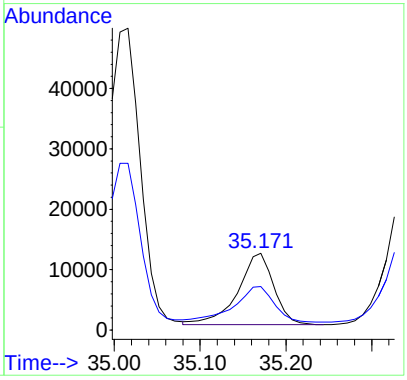


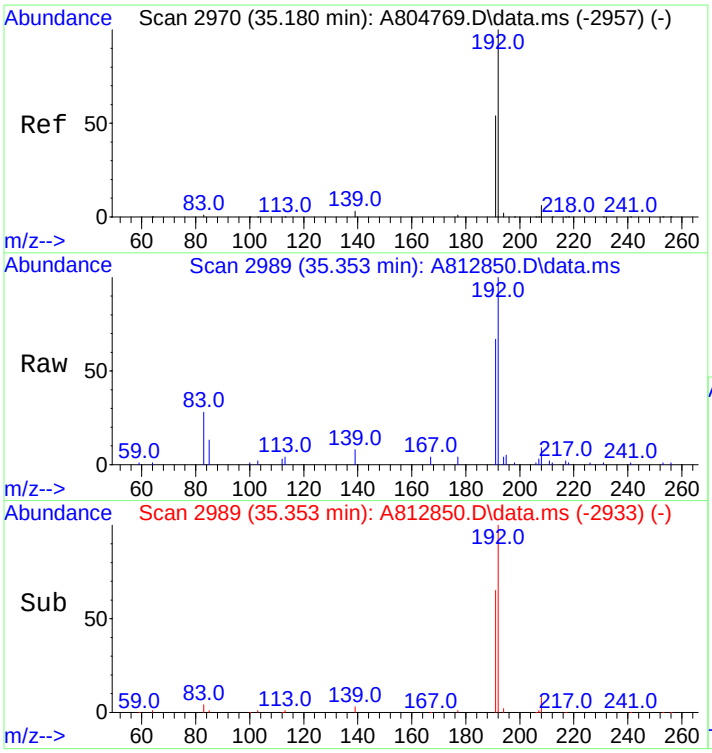


#46
2-Methylanthracene(2MA)
Concen: 158.86 ng/mL
RT: 35.171 min Scan# 2969
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 34402

Ion	Ratio	Lower	Upper
192	100		
191	55.7	96.9	145.3#

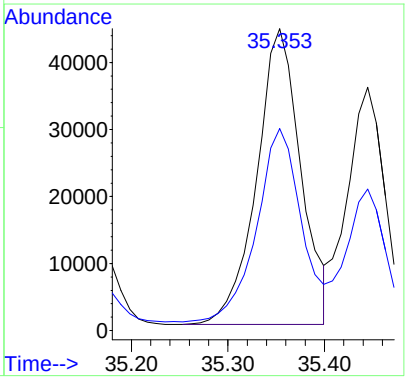


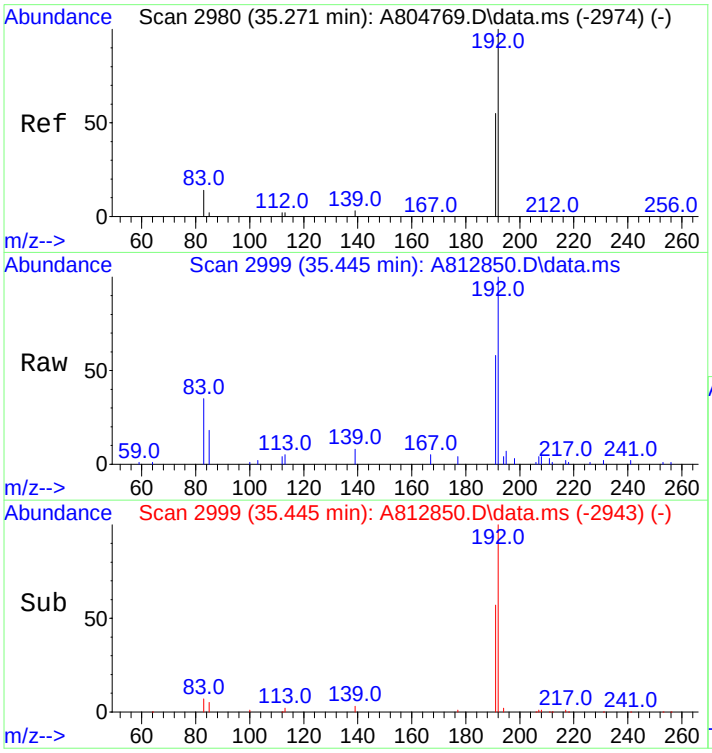


#47
9/4-Methylphenanthrene(9MP)
Concen: 649.25 ng/mL
RT: 35.353 min Scan# 2989
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 140602

Ion	Ratio	Lower	Upper
192	100		
191	65.4	44.5	66.7

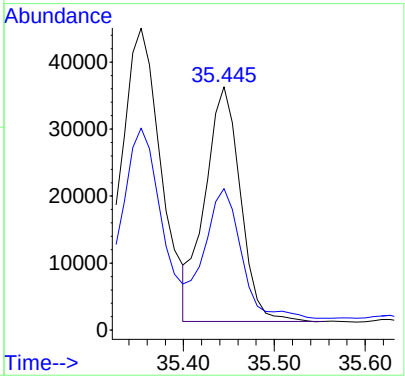


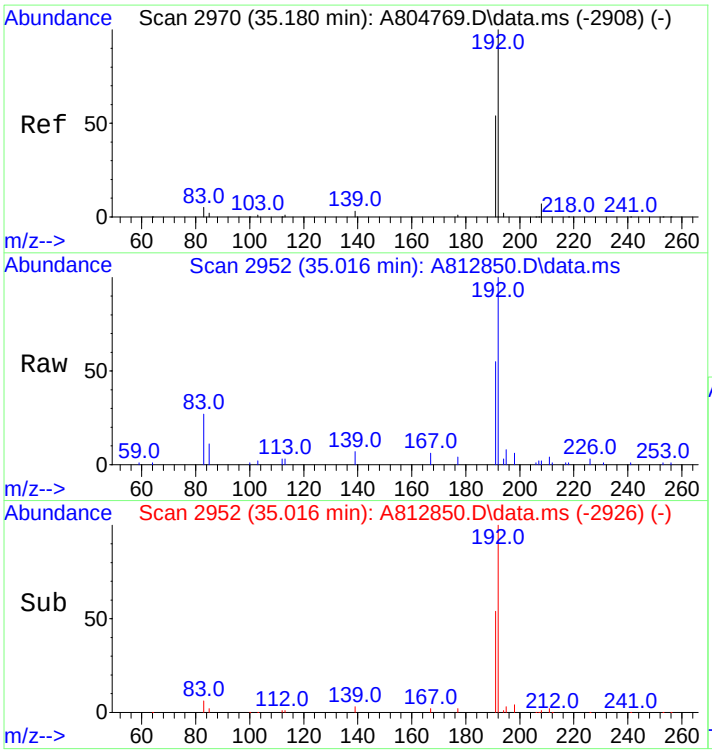


#48
1-Methylphenanthrene(1MP)
Concen: 439.79 ng/mL
RT: 35.445 min Scan# 2999
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 95242

Ion	Ratio	Lower	Upper
192	100		
191	57.3	46.2	69.4

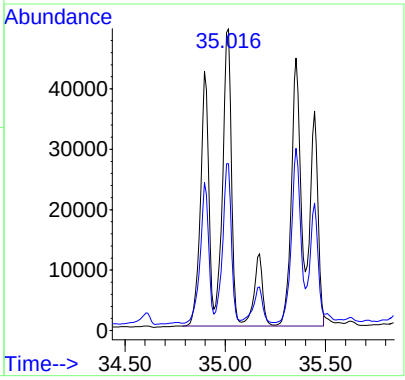


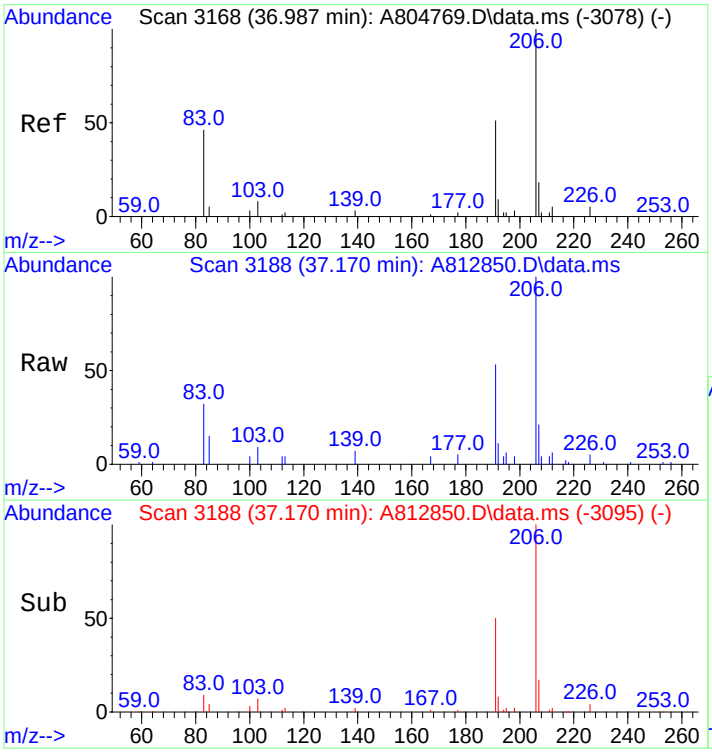


#49
C1-Phenanthrenes/Anthracenes
Concen: 2506.89 ng/mL m
RT: 35.016 min Scan# 2952
Delta R.T. -0.328 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 542896

Ion	Ratio	Lower	Upper
192	100		
191	16.9	44.5	66.7#

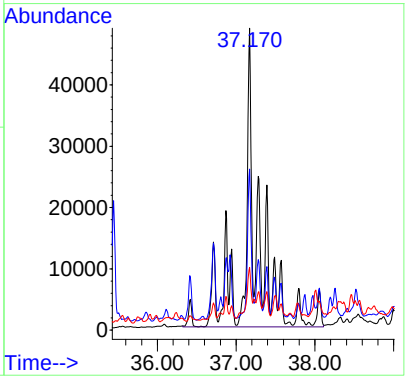


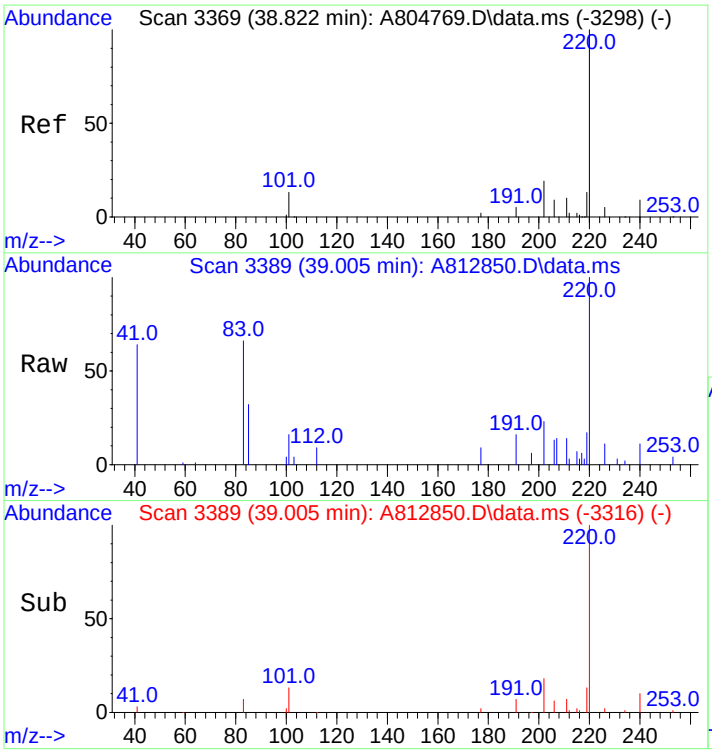


#50
C2-Phenanthrenes/Anthracenes
Concen: 2636.16 ng/mL m
RT: 37.170 min Scan# 3188
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:206 Resp: 570889

Ion	Ratio	Lower	Upper
206	100		
191	2.7	42.0	63.0#
207	0.9	16.2	24.4#

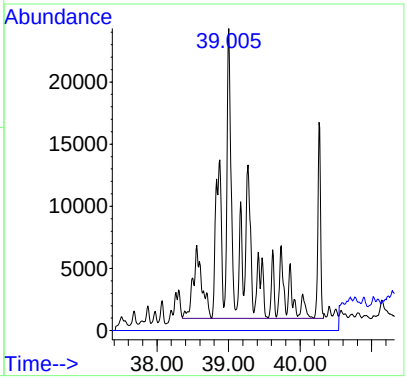


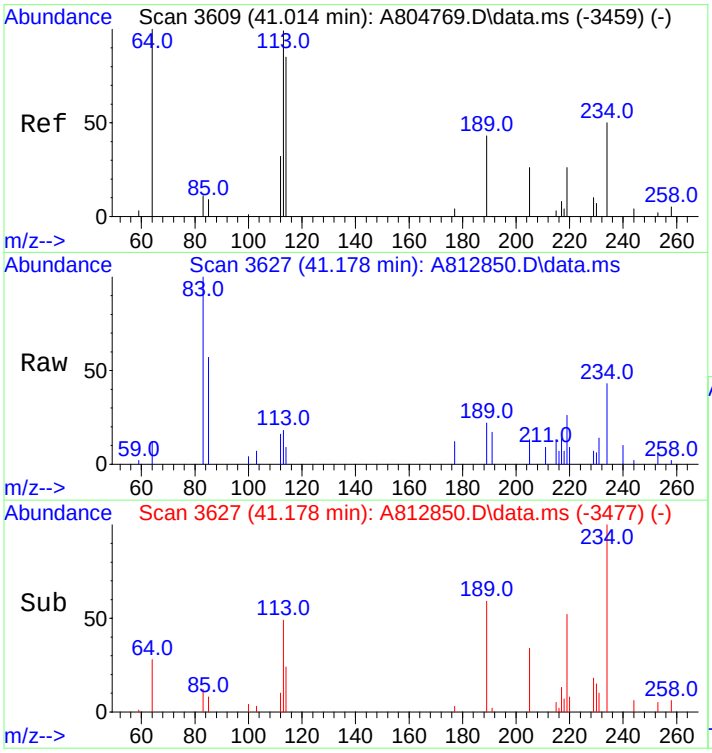


#52
C3-Phenanthrenes/Anthracenes
Concen: 1907.39 ng/mL m
RT: 39.005 min Scan# 3389
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:220 Resp: 413067

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

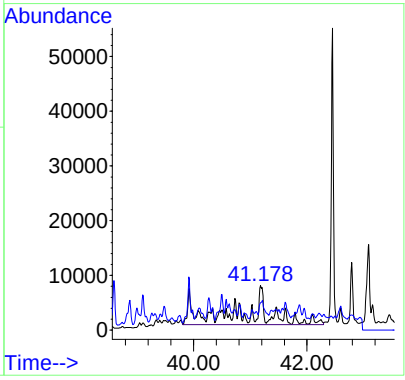


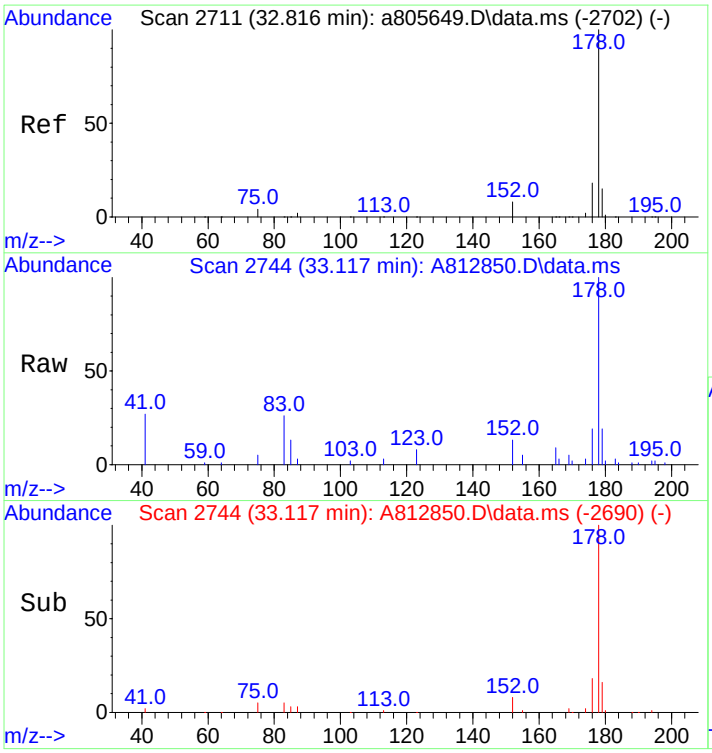


#53
C4-Phenanthrenes/Anthracenes
Concen: 1053.72 ng/mL m
RT: 41.178 min Scan# 3627
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:234 Resp: 228194

Ion	Ratio	Lower	Upper
234	100		
219	2.2	52.3	78.5#

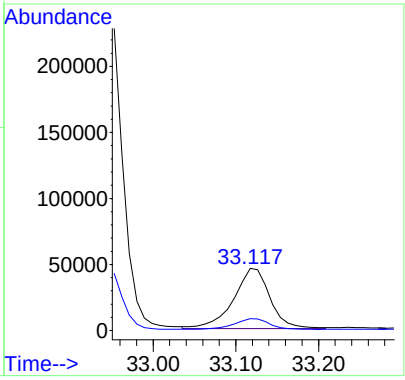


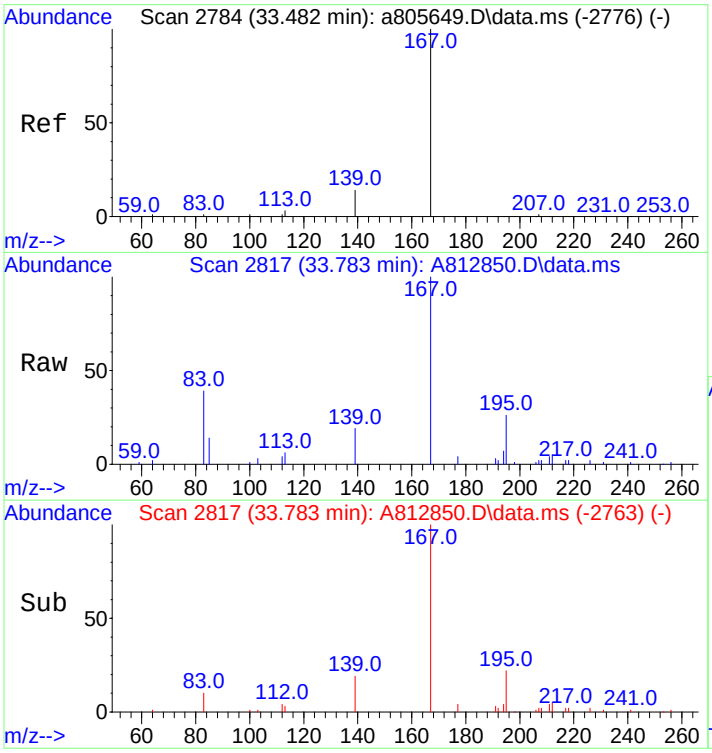


#55
Anthracene
Concen: 687.57 ng/mL m
RT: 33.117 min Scan# 2744
Delta R.T. -0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:178 Resp: 138721

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

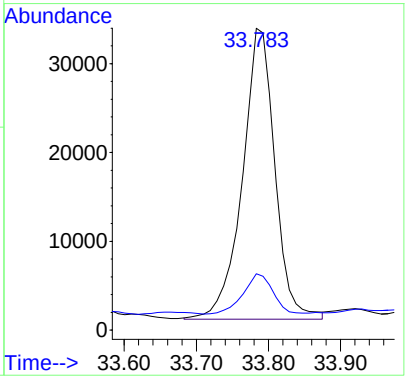


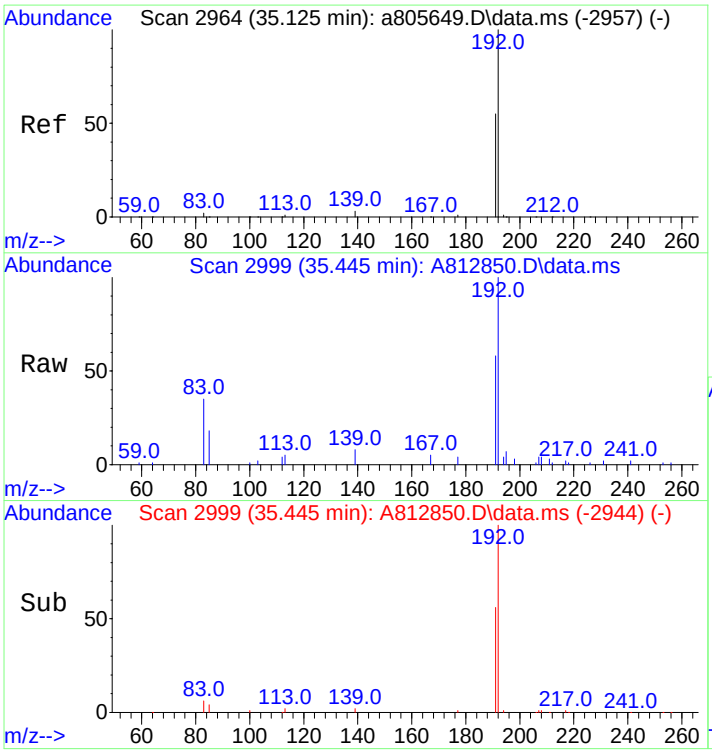


#56
Carbazole
Concen: 487.58 ng/mL m
RT: 33.783 min Scan# 2817
Delta R.T. -0.010 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:167 Resp: 102645

Ion	Ratio	Lower	Upper
167	100		
139	12.4	10.6	16.0

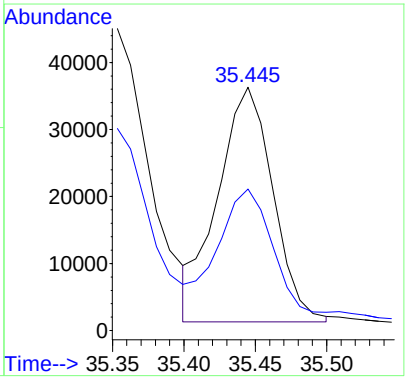


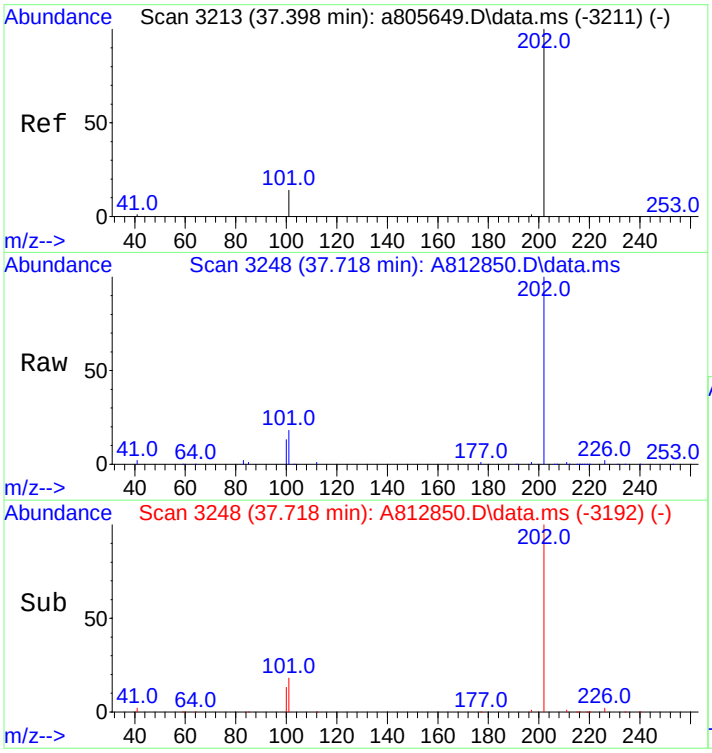


#57
1-Methylphenanthrene
Concen: 614.42 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. -0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:192 Resp: 94321

Ion	Ratio	Lower	Upper
192	100		
191	58.4	44.2	66.4

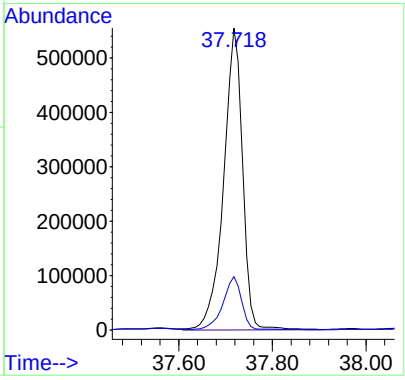


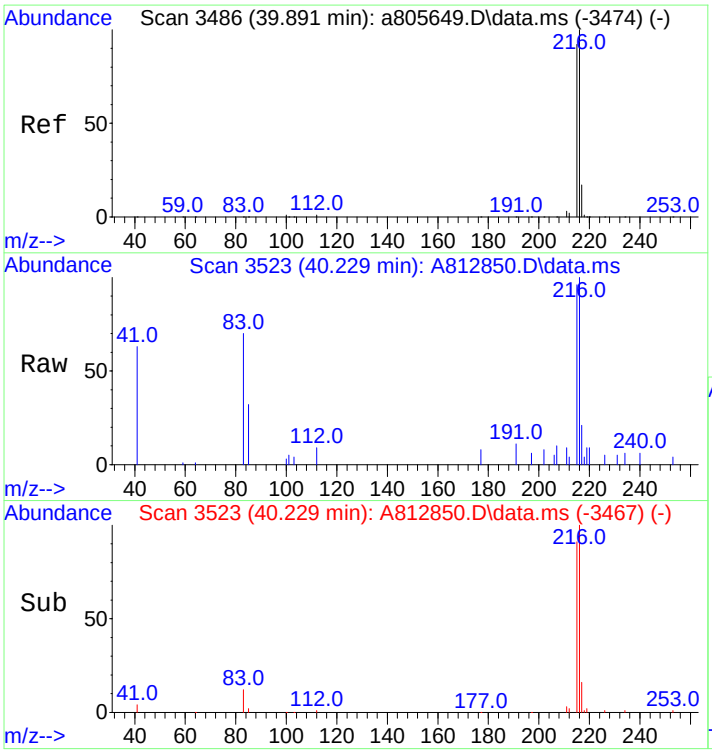


#58
Fluoranthene
Concen: 6993.97 ng/mL
RT: 37.718 min Scan# 3248
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:202 Resp: 1560148

Ion	Ratio	Lower	Upper
202	100		
101	17.0	13.6	20.4

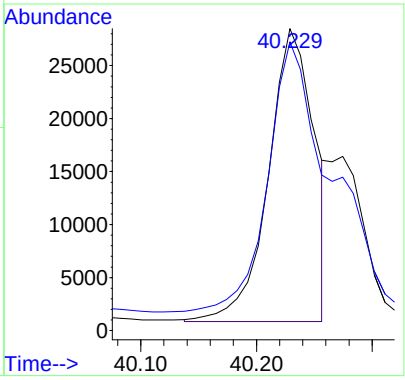


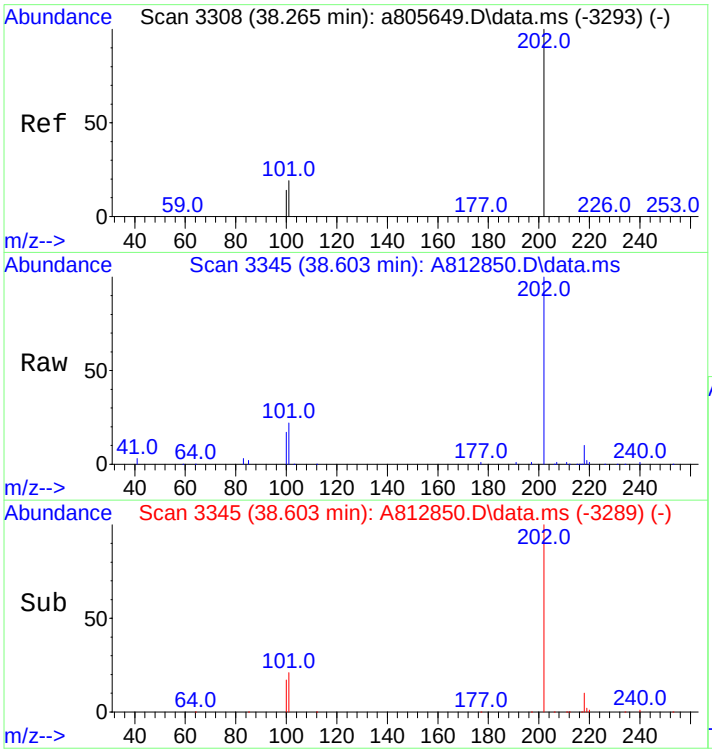


#59
Benzo(b)fluorene
Concen: 591.24 ng/mL m
RT: 40.229 min Scan# 3523
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:216 Resp: 76294

Ion	Ratio	Lower	Upper
216	100		
215	128.0	74.2	111.2#

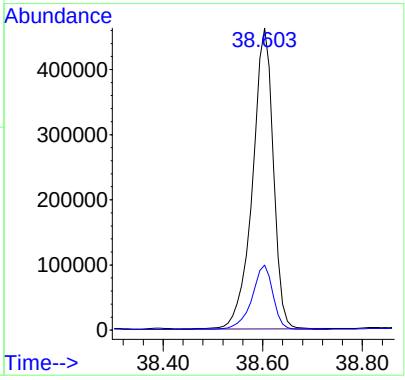


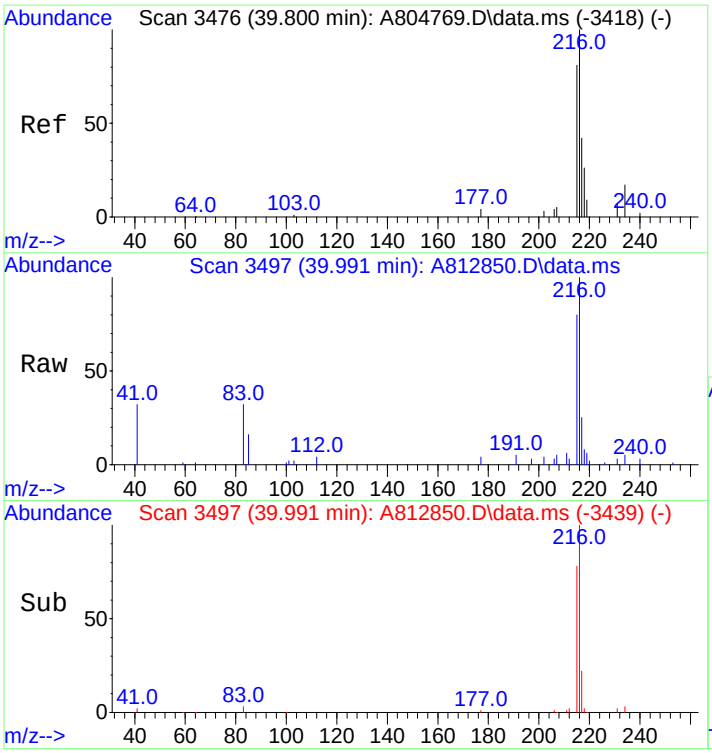


#60
Pyrene
Concen: 5915.37 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:202 Resp: 1334690

Ion	Ratio	Lower	Upper
202	100		
101	21.9	15.4	23.2

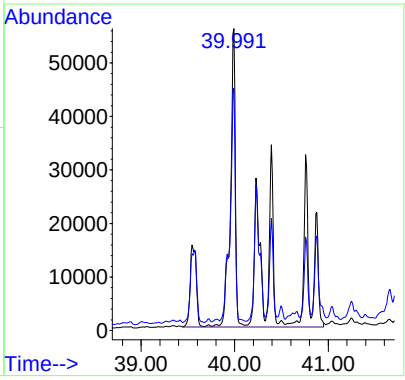


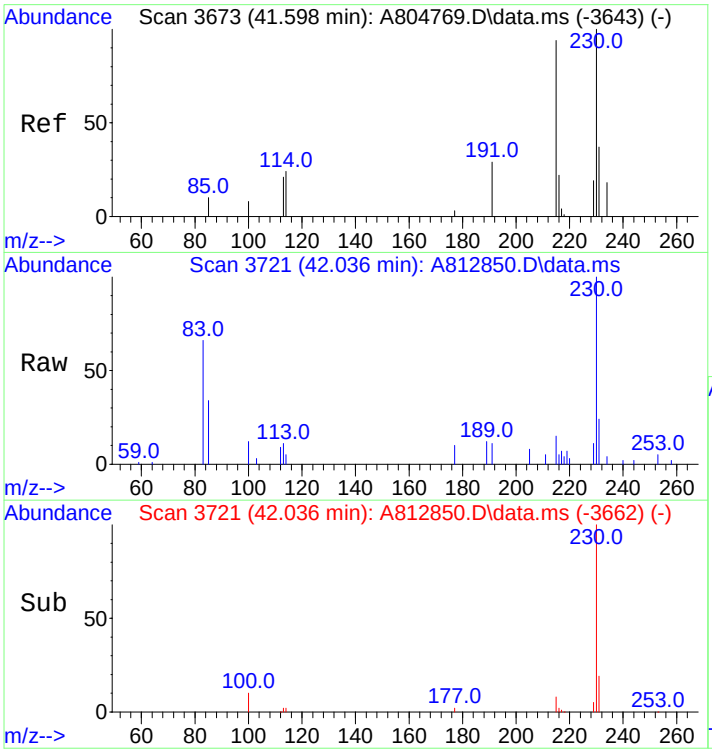


#61
C1-Fluoranthenes/Pyrenes
Concen: 2844.84 ng/mL m
RT: 39.991 min Scan# 3497
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:216 Resp: 641883

Ion	Ratio	Lower	Upper
216	100		
215	26.2	73.8	110.6#

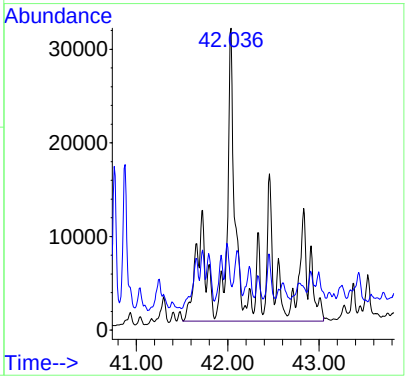


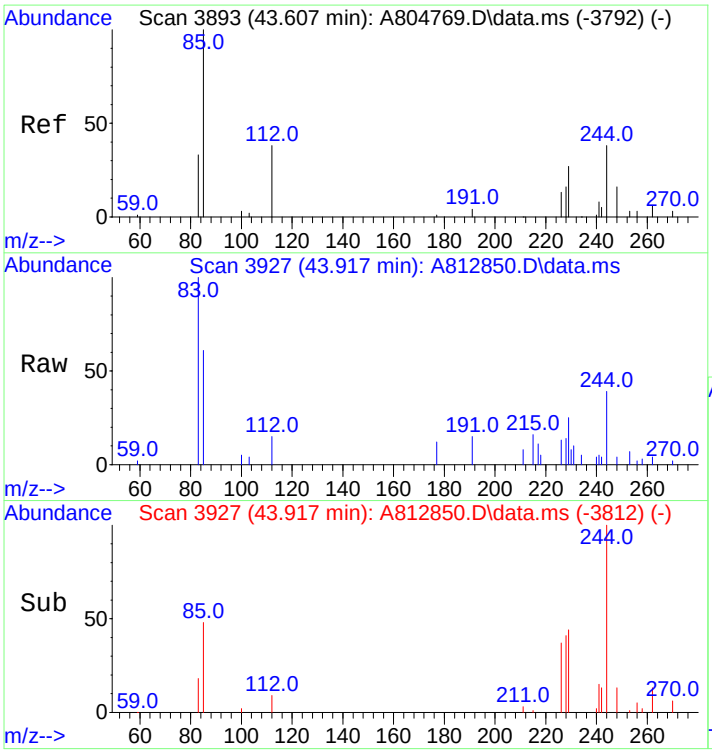


#62
C2-Fluoranthenes/Pyrenes
Concen: 2055.34 ng/mL m
RT: 42.036 min Scan# 3721
Delta R.T. 0.265 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:230 Resp: 463748

Ion	Ratio	Lower	Upper
230	100		
215	3.3	93.1	139.7#

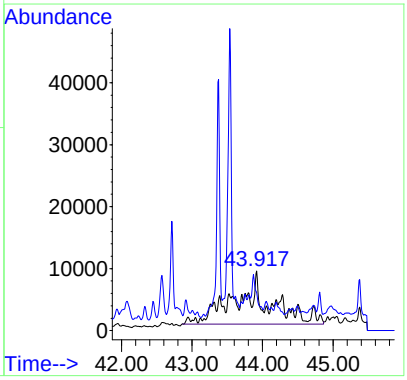


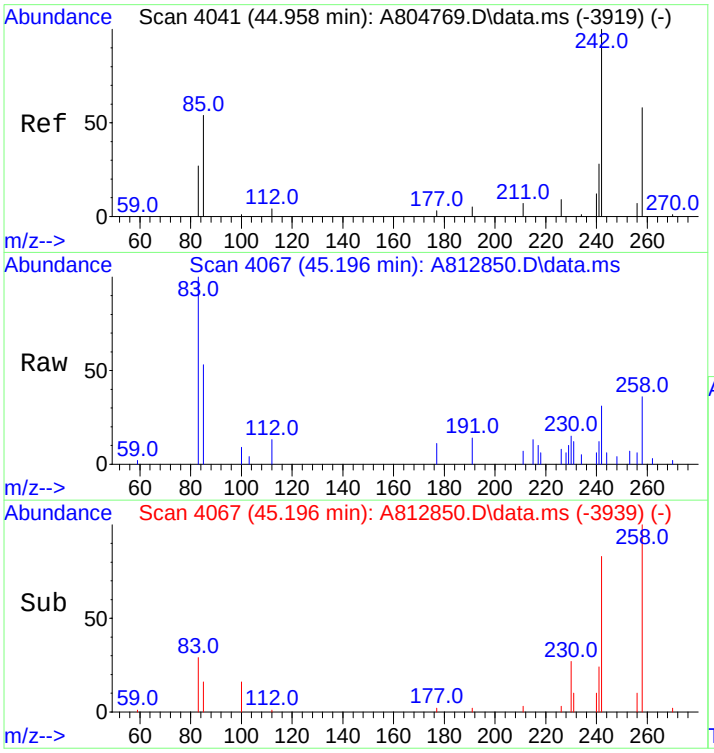


#63
C3-Fluoranthenes/Pyrenes
Concen: 1279.52 ng/mL m
RT: 43.917 min Scan# 3927
Delta R.T. 0.128 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:244 Resp: 288700

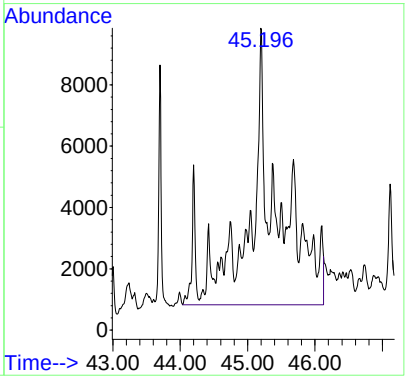
Ion	Ratio	Lower	Upper
244	100		
229	1.2	76.2	114.2#

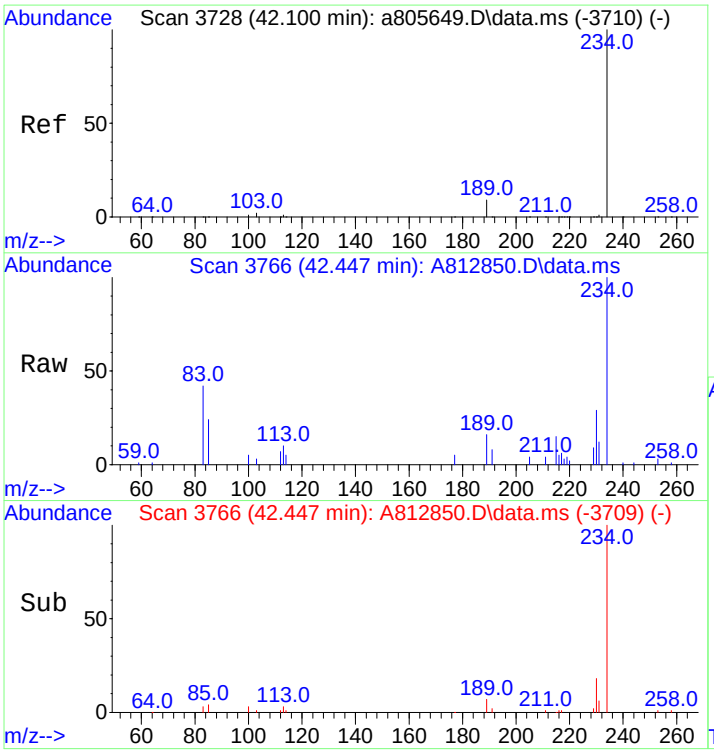




#64
C4-Fluoranthenes/Pyrenes
Concen: 1165.83 ng/mL m
RT: 45.196 min Scan# 4067
Delta R.T. 0.055 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:258 Resp: 263048

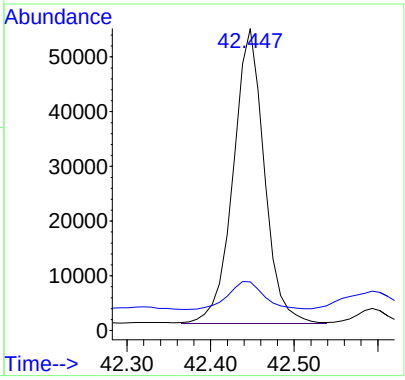


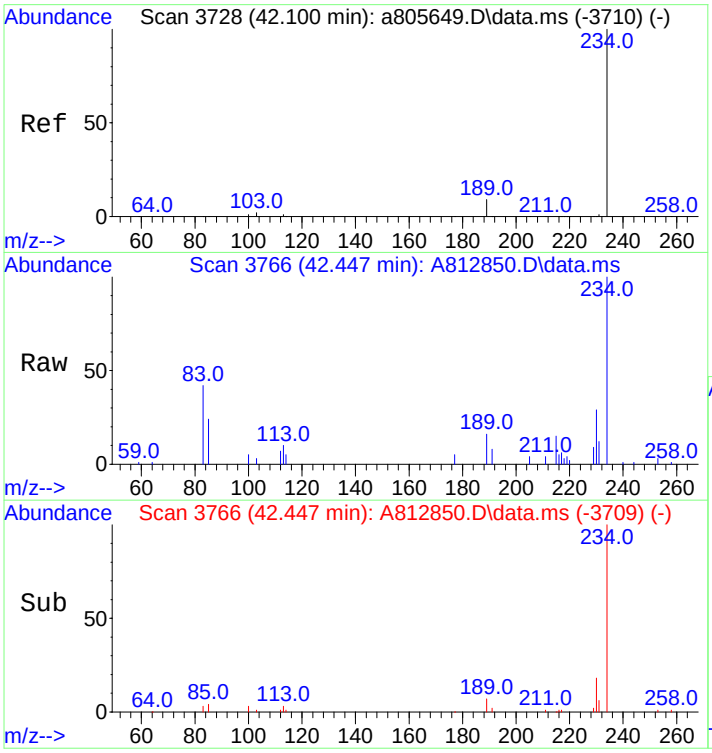


#66
Naphthobenzothiophene
Concen: 661.41 ng/ml m
RT: 42.447 min Scan# 3766
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:234 Resp: 138533

Ion	Ratio	Lower	Upper
234	100		
189	0.8	22.3	33.5#

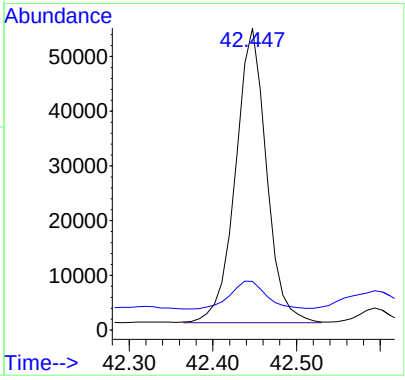


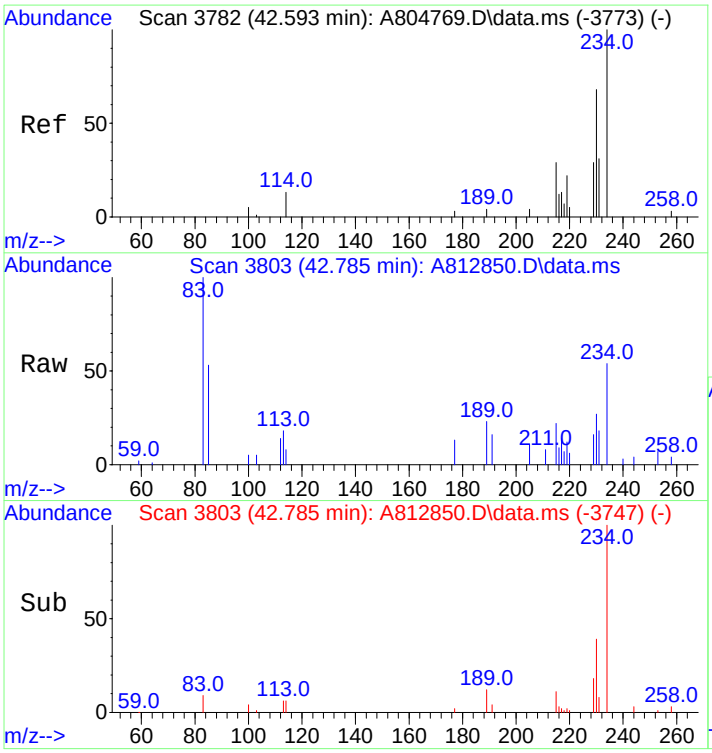


#67
Naphthobenzothiophene-2,1-D
Concen: 659.57 ng/mL m
RT: 42.447 min Scan# 3766
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:234 Resp: 138148

Ion	Ratio	Lower	Upper
234	100		
189	0.8	22.3	33.5#

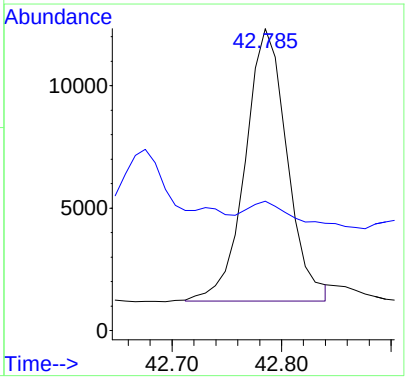


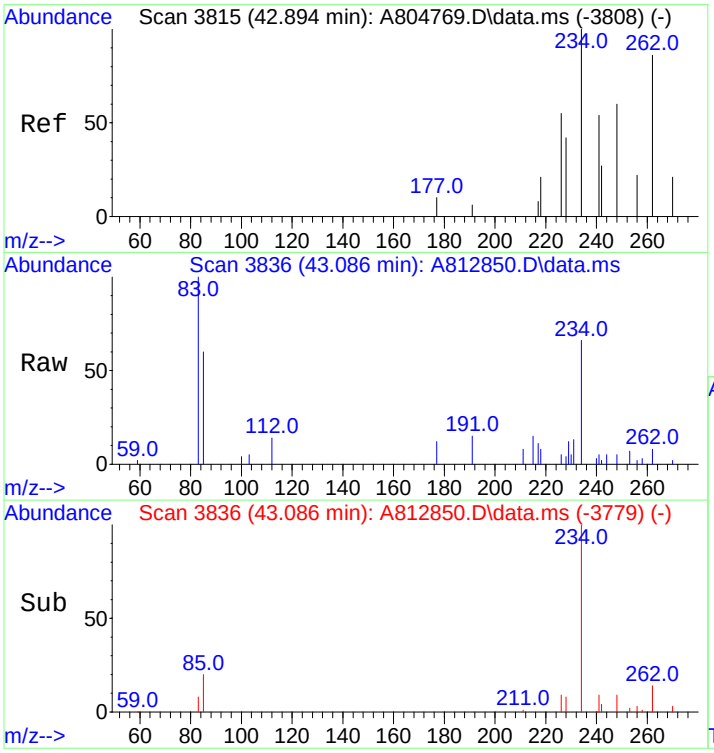


#68
Naphthobenzothiophene-1,2-D
Concen: 141.75 ng/mL m
RT: 42.785 min Scan# 3803
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:234 Resp: 29689

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

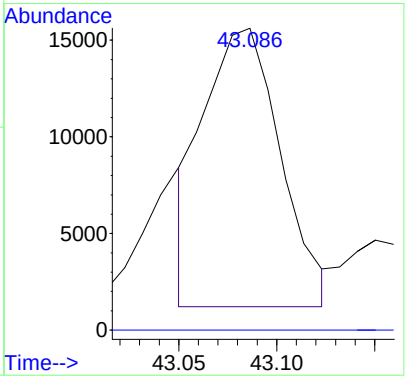


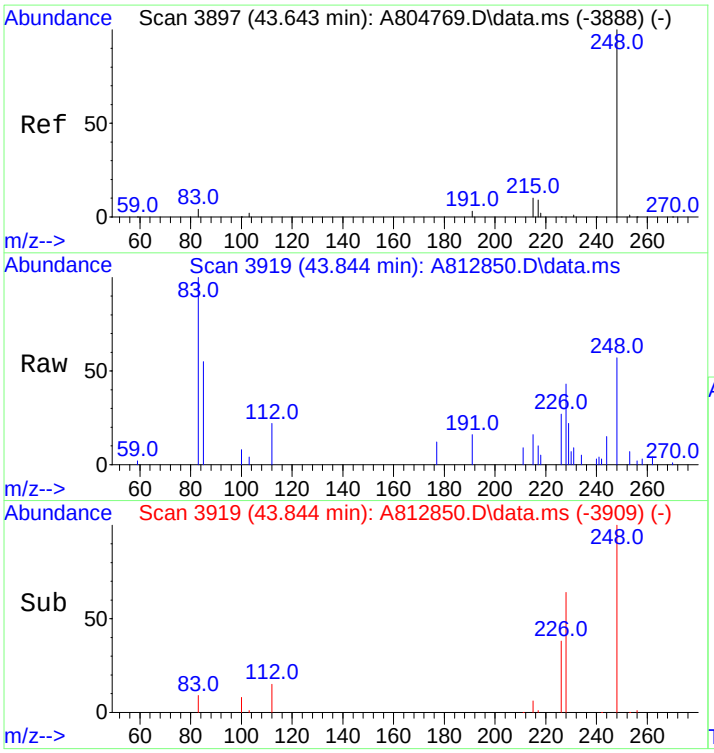


#69
Naphthobenzothiophene-2,3-D
Concen: 188.62 ng/mL m
RT: 43.086 min Scan# 3836
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:234 Resp: 39507

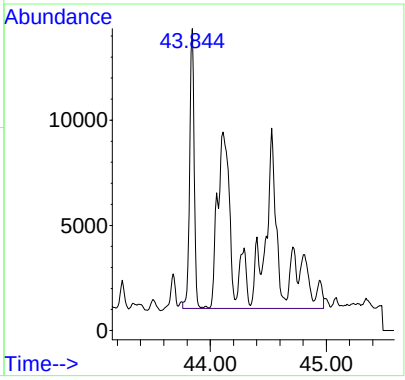
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

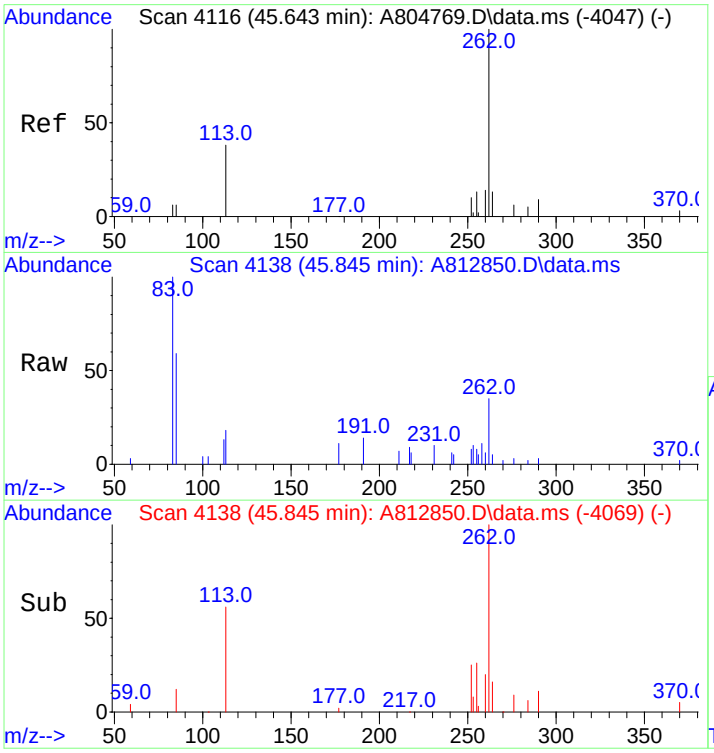




#70
C1-Naphthobenzothiophenes
Concen: 891.00 ng/ml m
RT: 43.844 min Scan# 3919
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

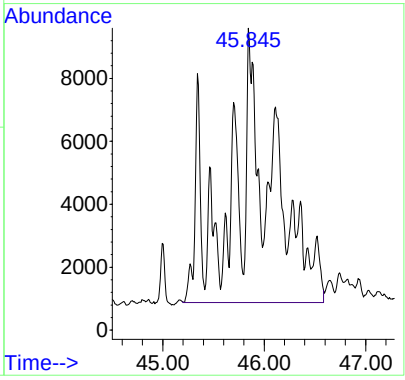
Tgt Ion:248 Resp: 186621

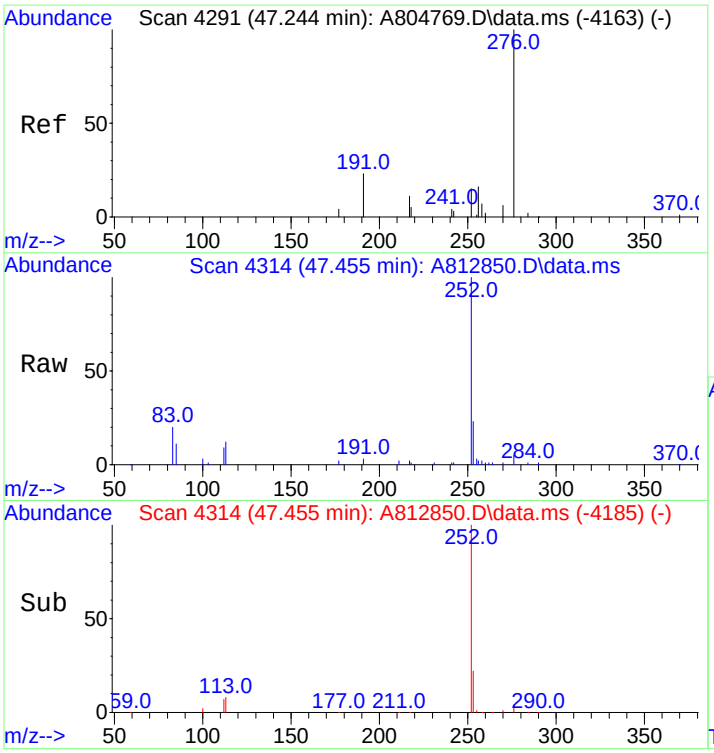




#71
C2-Naphthobenzothiophenes
Concen: 1125.30 ng/ml m
RT: 45.845 min Scan# 4138
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

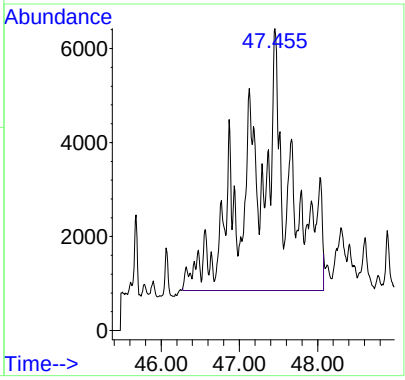
Tgt Ion:262 Resp: 235697

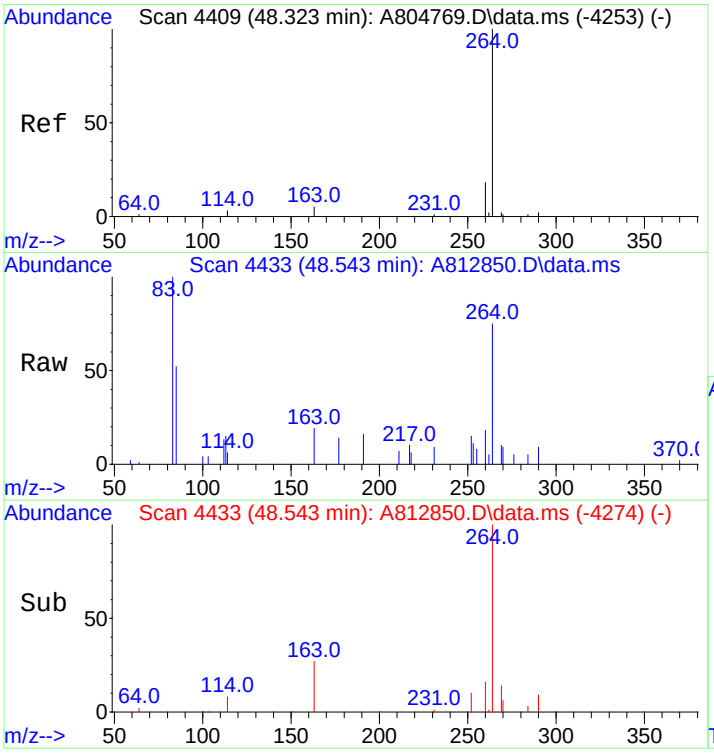




#72
C3-Naphthobenzothiophenes
Concen: 877.27 ng/ml m
RT: 47.455 min Scan# 4314
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

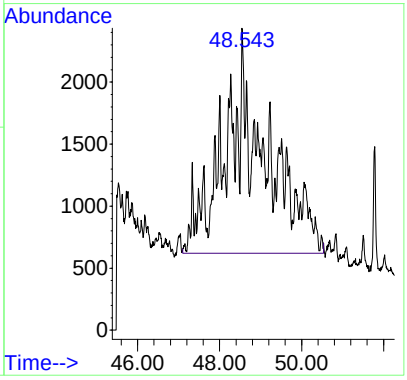
Tgt Ion:276 Resp: 183746

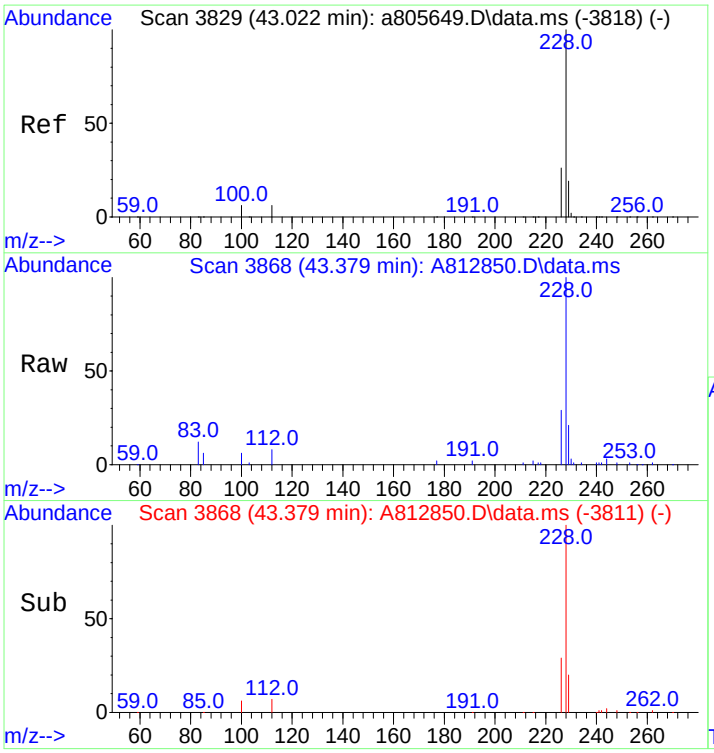




#73
C4-Naphthobenzothiophenes
Concen: 571.78 ng/mL m
RT: 48.543 min Scan# 4433
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:290 Resp: 119761

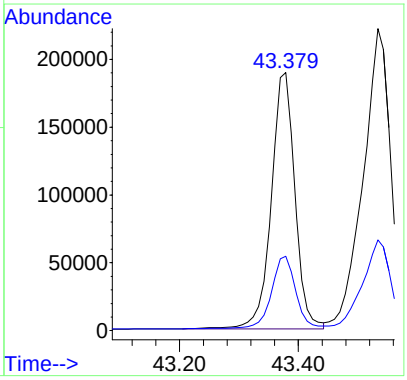


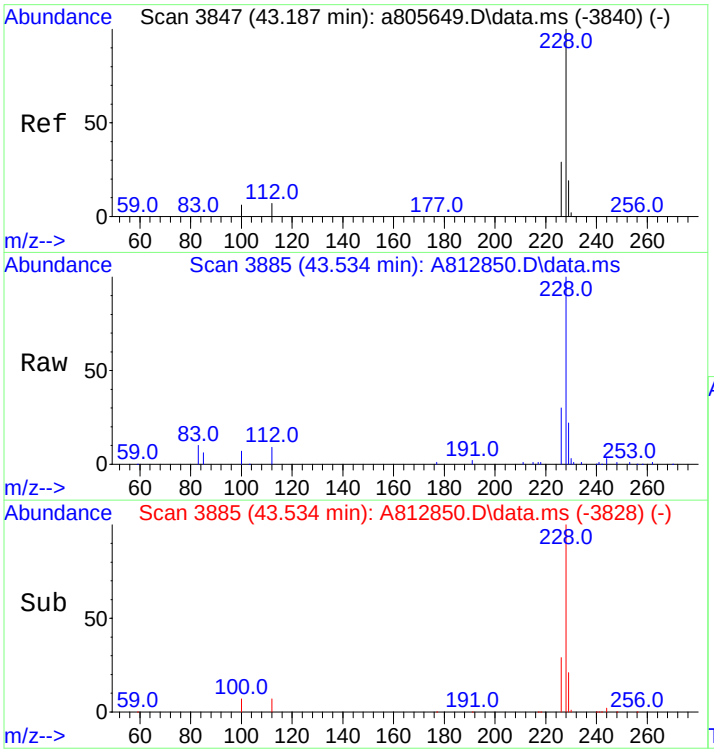


#75
Benz[a]anthracene
Concen: 2474.08 ng/mL
RT: 43.379 min Scan# 3868
Delta R.T. 0.019 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:228 Resp: 523821

Ion	Ratio	Lower	Upper
228	100		
226	28.1	21.3	31.9

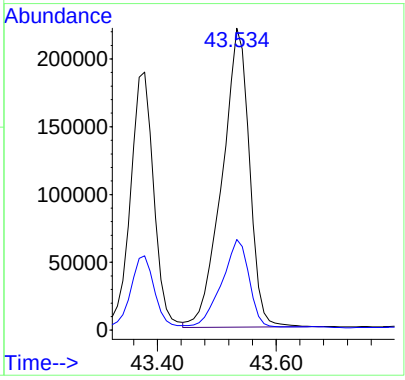


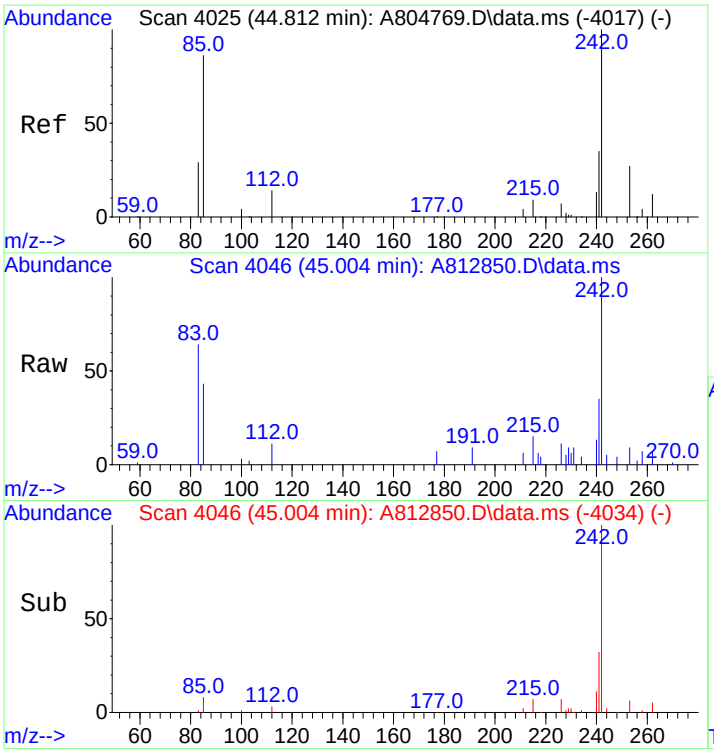


#77
Chrysene/Triphenylene
Concen: 3288.55 ng/mL
RT: 43.534 min Scan# 3885
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:228 Resp: 704782

Ion	Ratio	Lower	Upper
228	100		
226	29.3	23.6	35.4

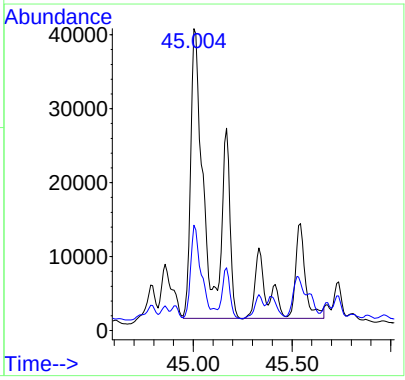


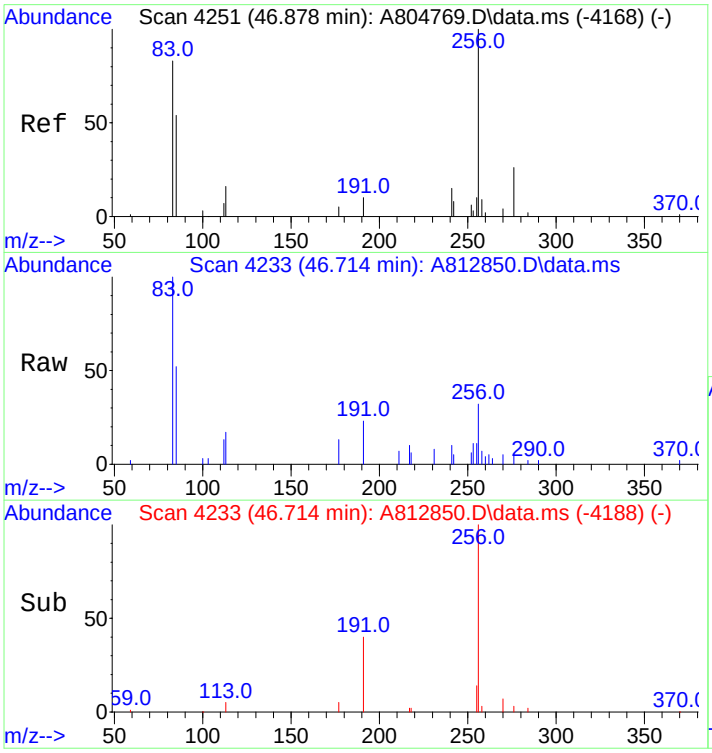


#78
C1-Chrysenes
Concen: 1458.00 ng/mL m
RT: 45.004 min Scan# 4046
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:242 Resp: 312469

Ion	Ratio	Lower	Upper
242	100		
241	3.1	33.5	50.3#

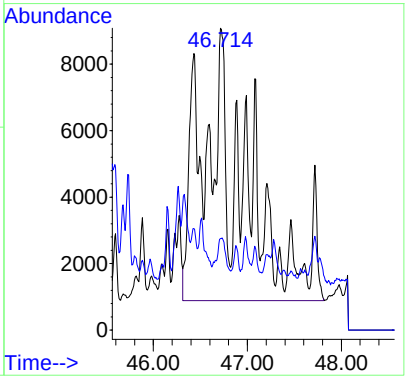


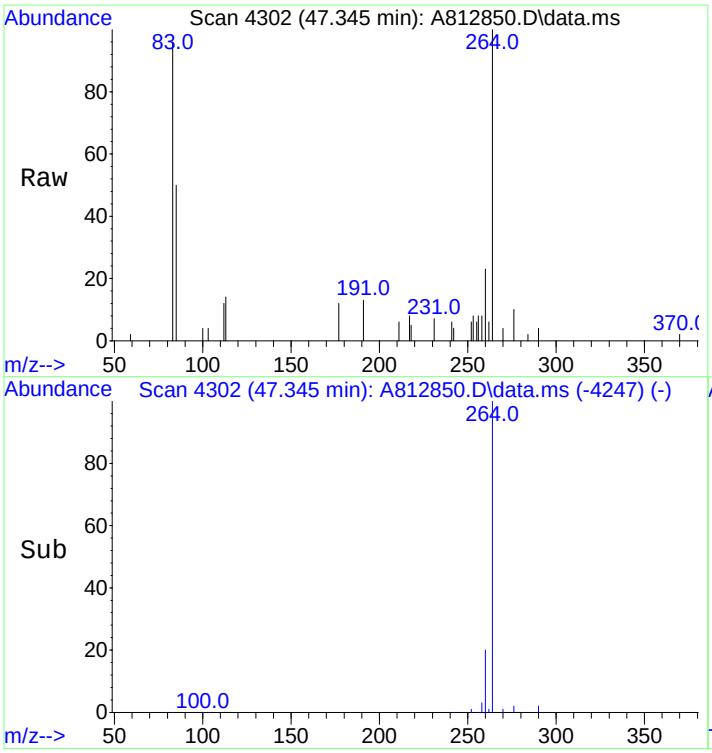


#79
C2-Chrysenes
Concen: 1186.32 ng/mL m
RT: 46.714 min Scan# 4233
Delta R.T. -0.347 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:256 Resp: 254244

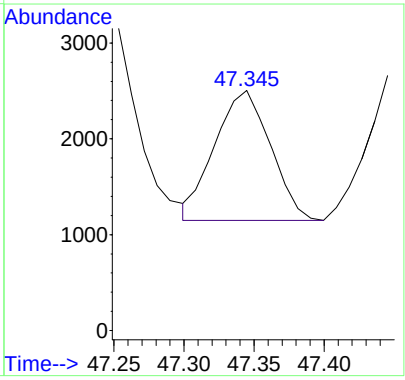
Ion	Ratio	Lower	Upper
256	100		
241	1.6	30.4	45.6#

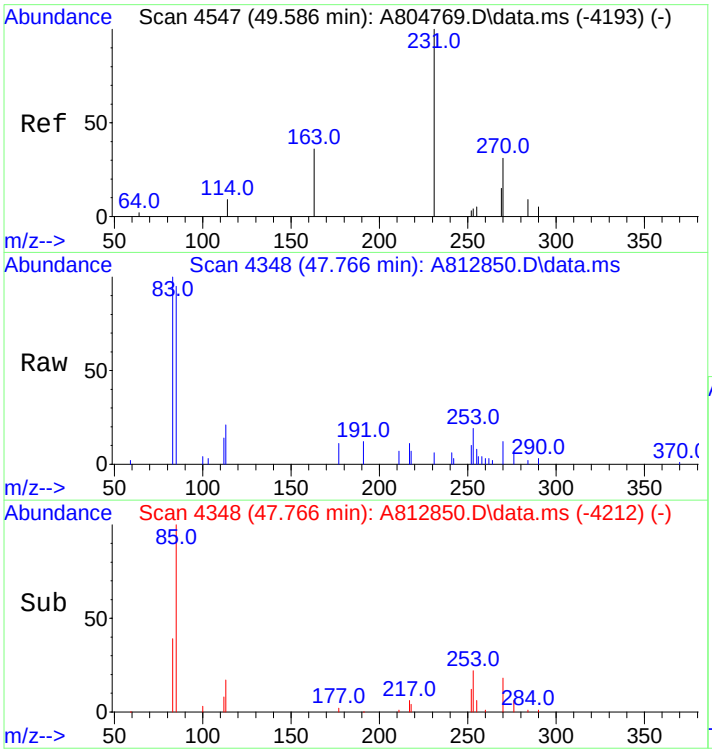




#80
BBF-D12 Surr BKGD
Concen: 17.52 ng/mL
RT: 47.345 min Scan# 4302
Delta R.T. 0.002 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:256 Resp: 3755

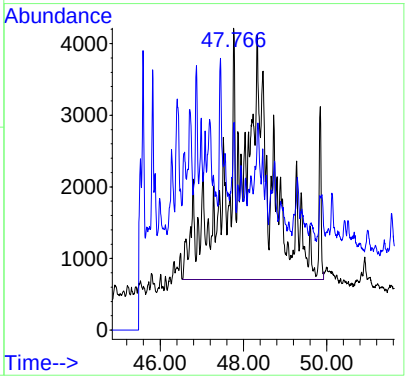


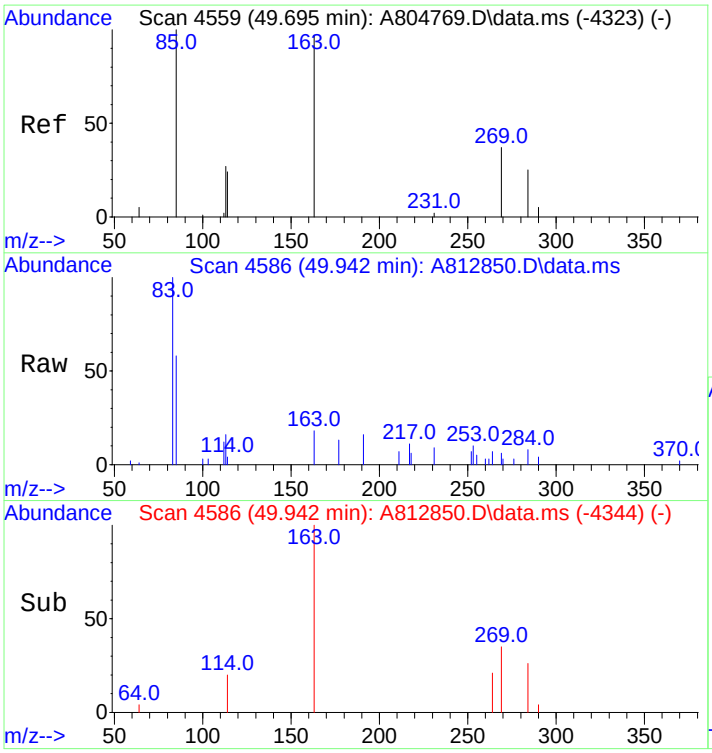


#81
C3-Chrysenes
Concen: 985.85 ng/mL m
RT: 47.766 min Scan# 4348
Delta R.T. -2.049 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:270 Resp: 211282

Ion	Ratio	Lower	Upper
270	100		
255	0.5	42.9	64.3#

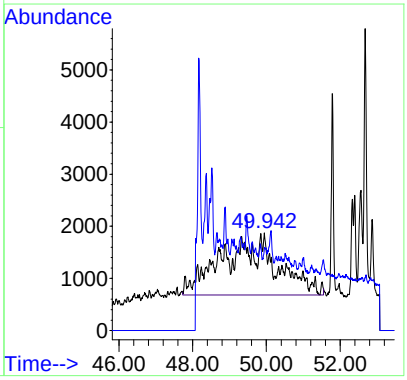


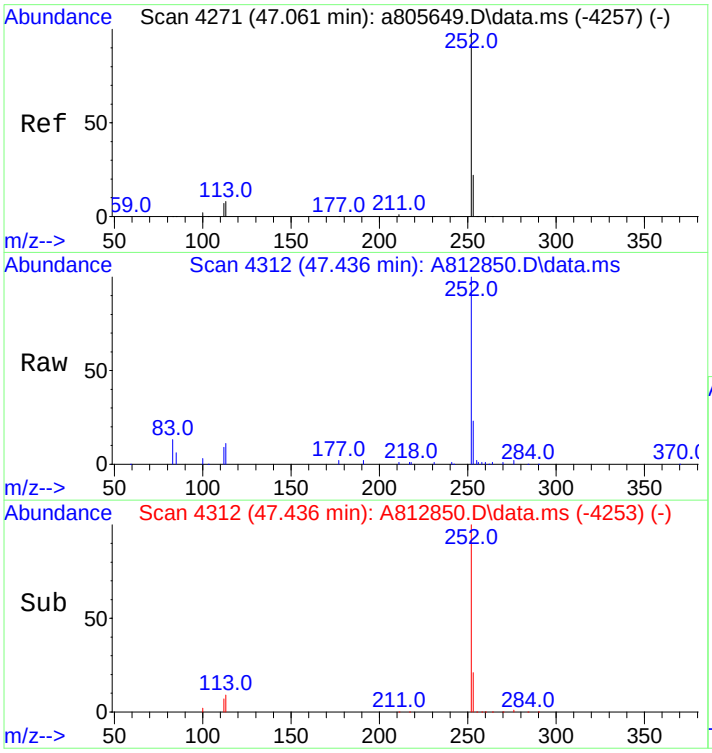


#82
C4-Chrysenes
Concen: 552.04 ng/mL m
RT: 49.942 min Scan# 4586
Delta R.T. 0.117 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:284 Resp: 118309

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

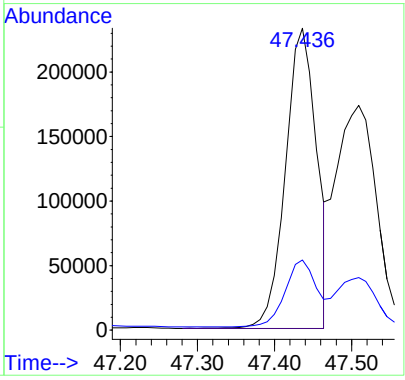


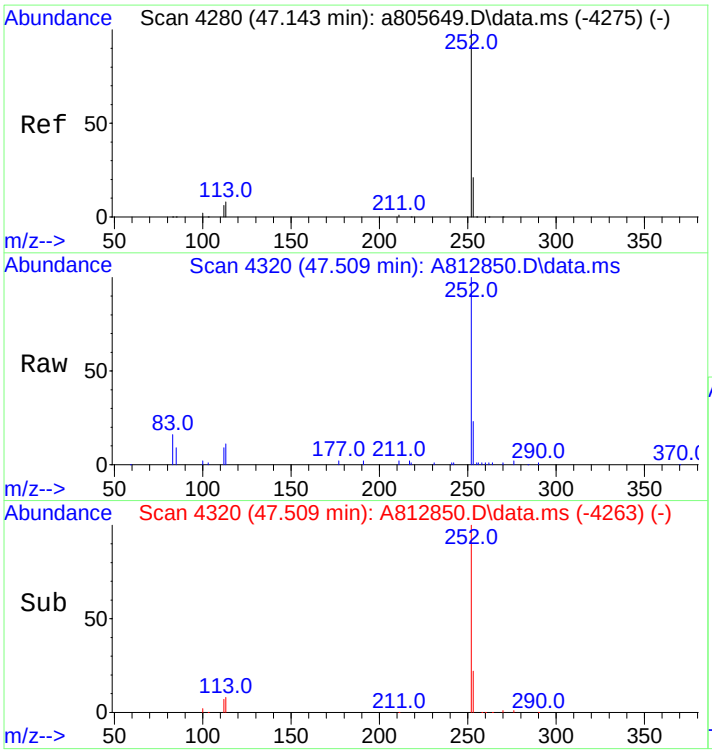


#84
Benzo[b]fluoranthene
Concen: 2872.60 ng/mL
RT: 47.436 min Scan# 4312
Delta R.T. 0.036 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:252 Resp: 653196

Ion	Ratio	Lower	Upper
252	100		
253	22.6	18.5	27.7

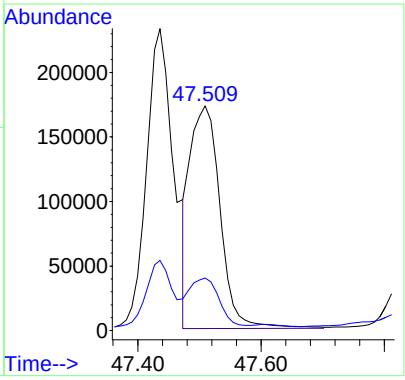


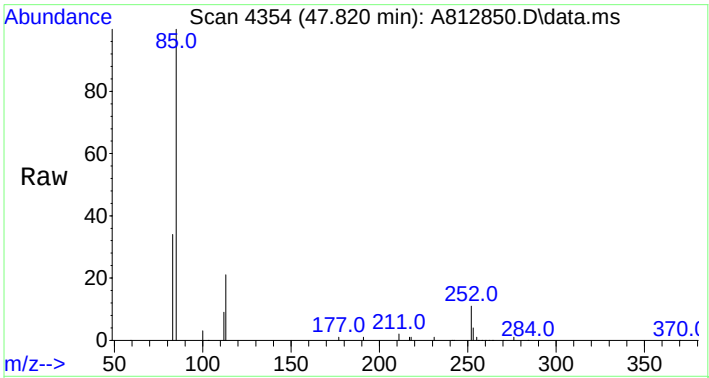


#85
Benzo[j]+[k]fluoranthene
Concen: 2389.79 ng/mL
RT: 47.509 min Scan# 4320
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:252 Resp: 592918

Ion	Ratio	Lower	Upper
252	100		
253	21.4	18.8	28.2

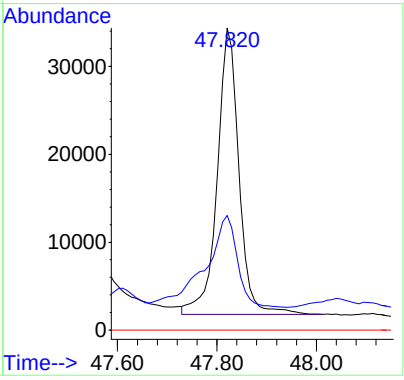


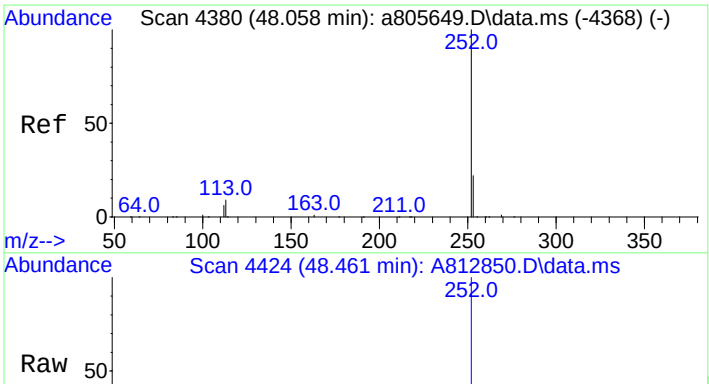


#86
Benzo[a]fluoranthene
Concen: 399.43 ng/mL
RT: 47.820 min Scan# 4354
Delta R.T. -0.046 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:252 Resp: 99101

Ion	Ratio	Lower	Upper
252	100		
253	48.2	372.3	558.5#
125	0.0	0.0	0.0

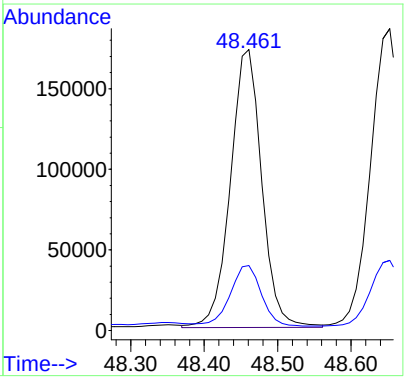


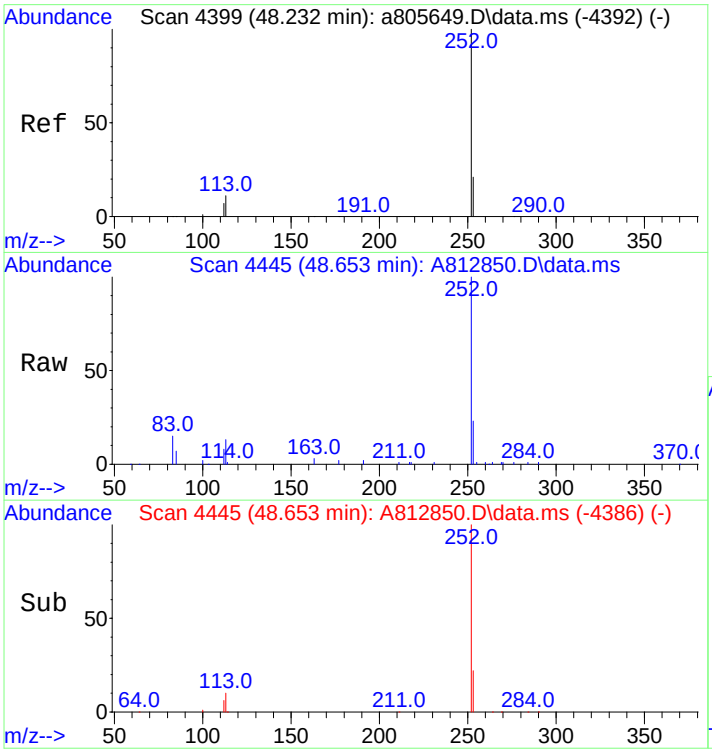


#87
Benzo[e]pyrene
Concen: 2198.87 ng/mL
RT: 48.461 min Scan# 4424
Delta R.T. 0.037 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:252 Resp: 515182

Ion	Ratio	Lower	Upper
252	100		
253	21.4	18.9	28.3

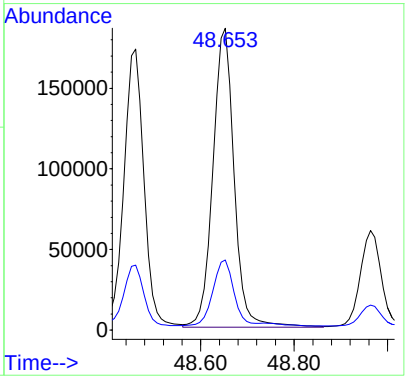


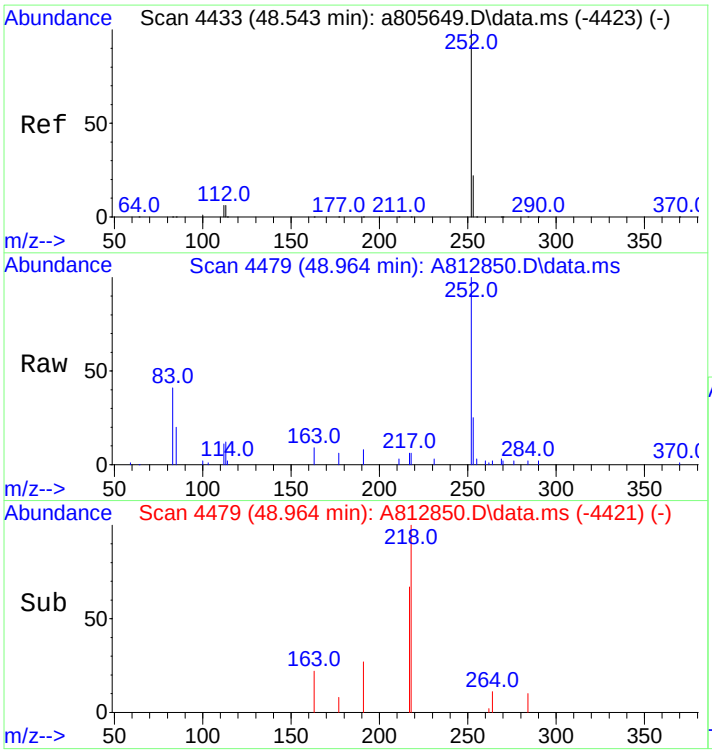


#89
Benzo[a]pyrene
Concen: 2706.60 ng/mL
RT: 48.653 min Scan# 4445
Delta R.T. 0.037 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:252 Resp: 586596

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.4	29.0

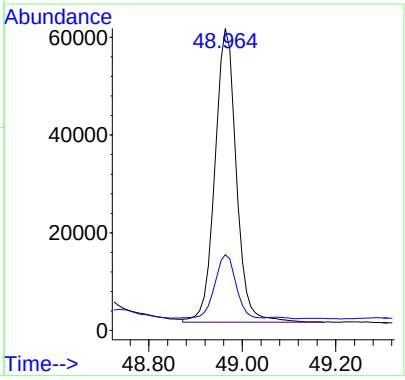


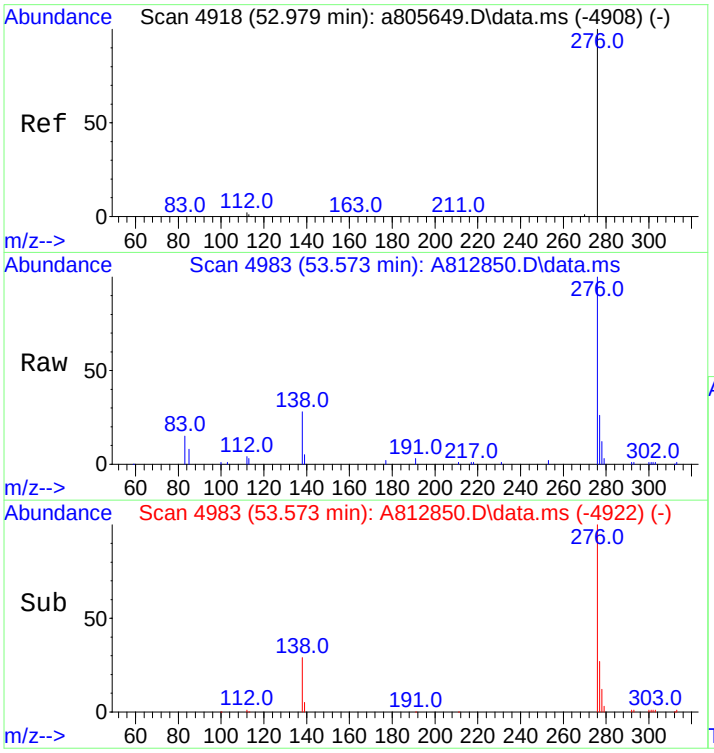


#90
Perylene
Concen: 808.13 ng/mL
RT: 48.964 min Scan# 4479
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:252 Resp: 191311

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.3	28.9

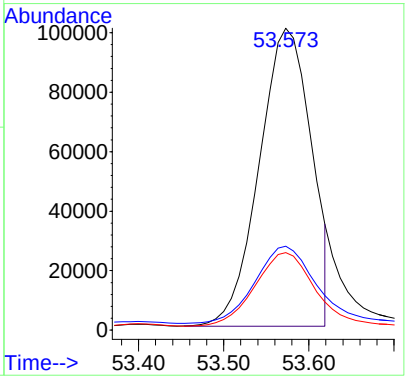


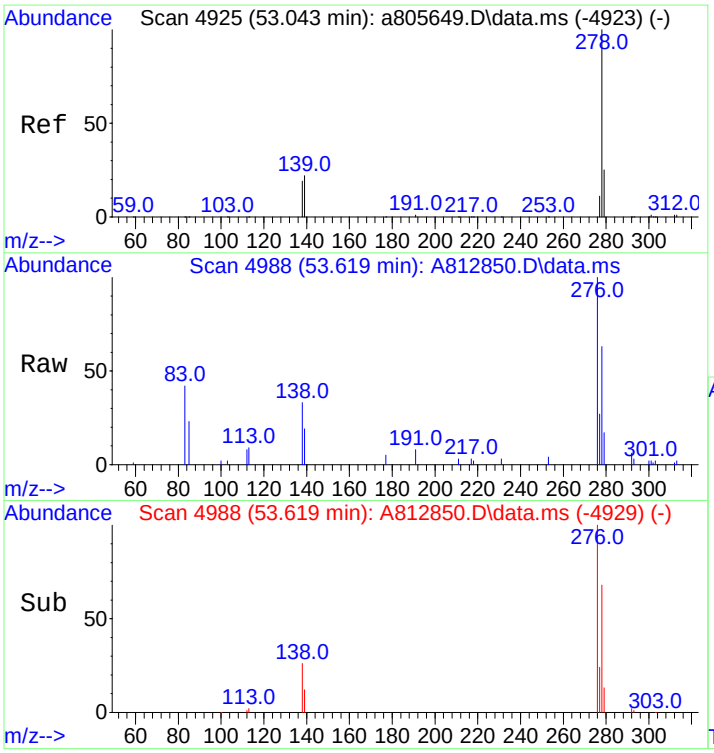


#91
Indeno[1,2,3-cd]pyrene
Concen: 1849.70 ng/mL m
RT: 53.573 min Scan# 4983
Delta R.T. 0.055 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:276 Resp: 425842

Ion	Ratio	Lower	Upper
276	100		
138	30.5	19.9	29.9#
277	29.3	19.0	28.6#

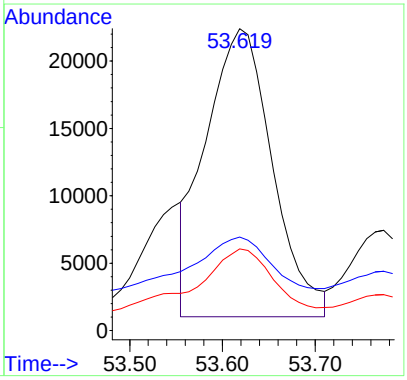


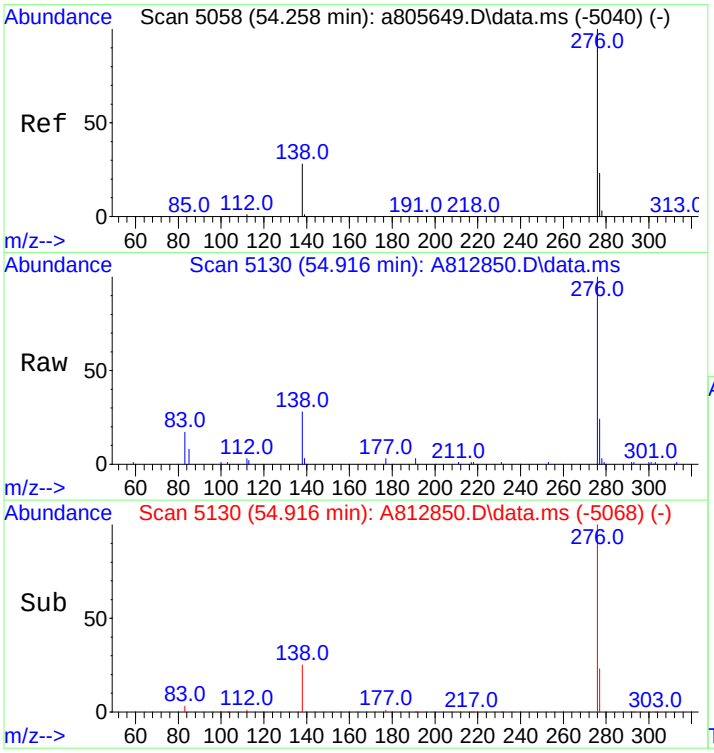


#92
Dibenz[ah]+[ac]anthracene
Concen: 475.99 ng/mL m
RT: 53.619 min Scan# 4988
Delta R.T. 0.037 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:278 Resp: 107415

Ion	Ratio	Lower	Upper
278	100		
139	22.4	16.6	25.0
279	25.3	19.1	28.7

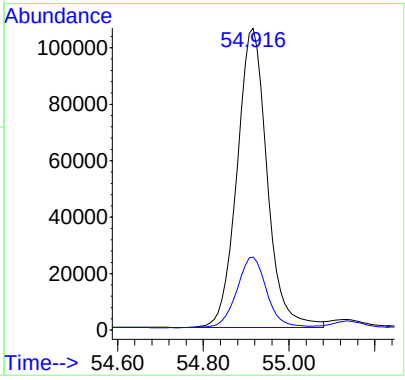


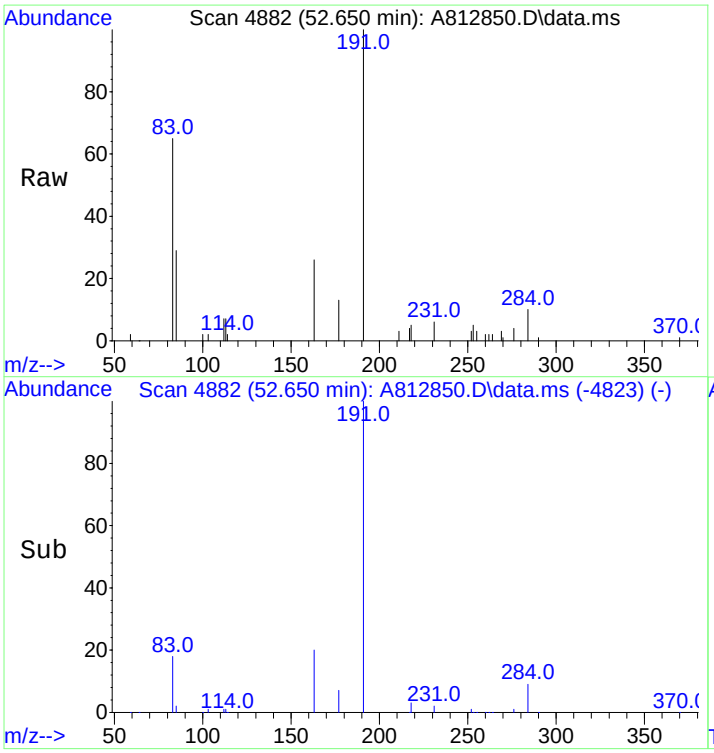


#93
Benzo[g,h,i]perylene
Concen: 1979.84 ng/mL
RT: 54.916 min Scan# 5130
Delta R.T. 0.064 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:276 Resp: 517268

Ion	Ratio	Lower	Upper
276	100		
277	23.7	18.9	28.3

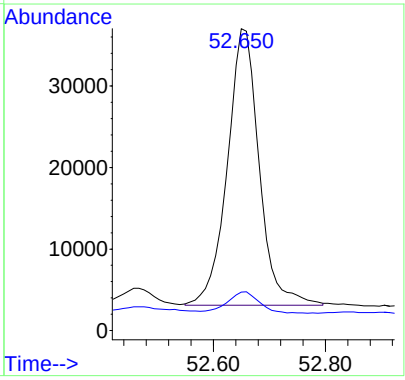


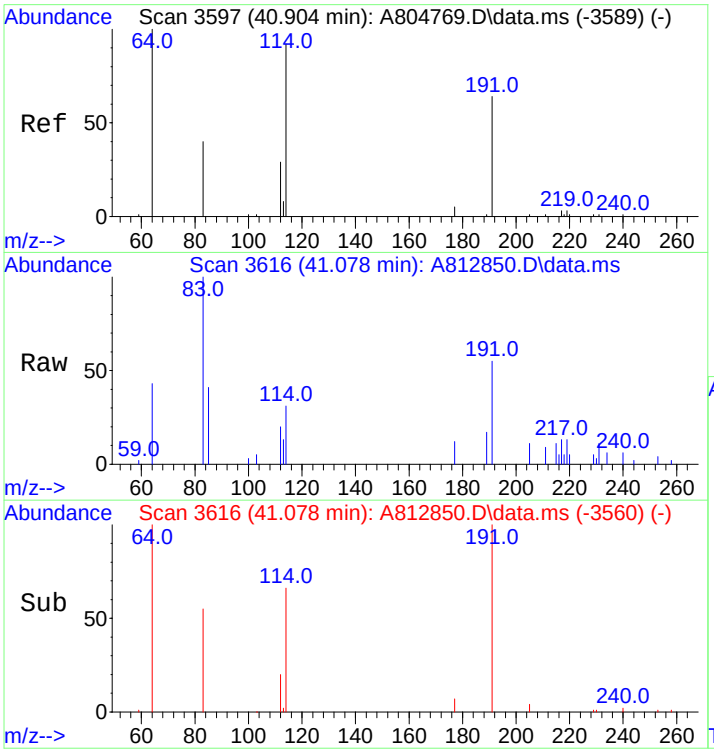


#94
Hopane (T19)
Concen: 1860.50 ng/mL m
RT: 52.650 min Scan# 4882
Delta R.T. 0.037 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:191 Resp: 134946

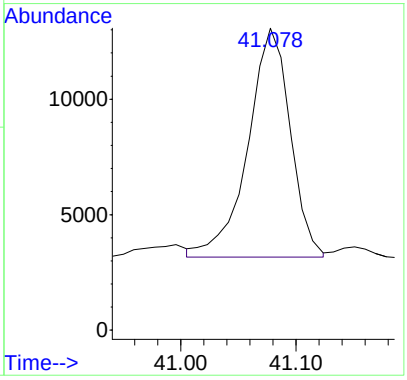
Ion	Ratio	Lower	Upper
191	100		
177	0.5	9.8	14.8#

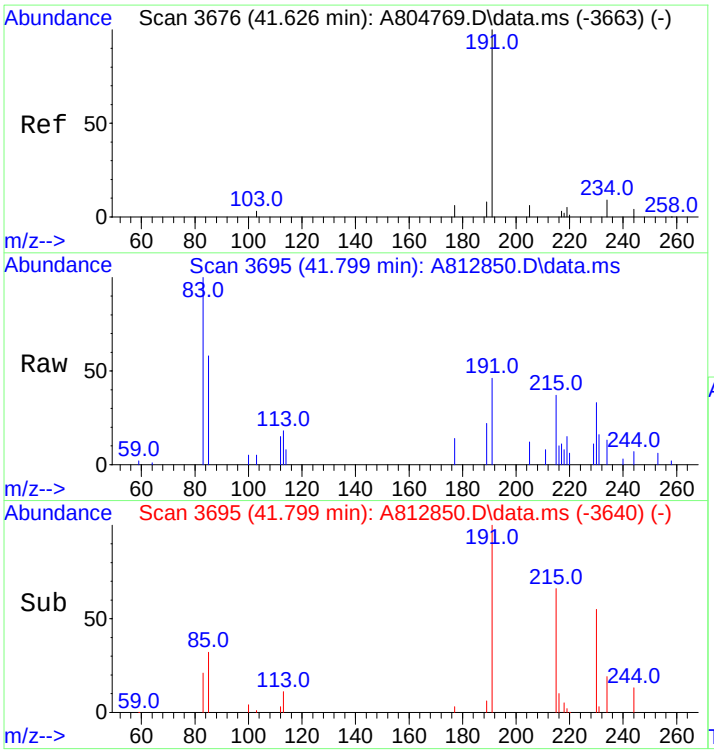




#96
C23 Tricyclic Terpane (T4)
Concen: 349.06 ng/ml m
RT: 41.078 min Scan# 3616
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

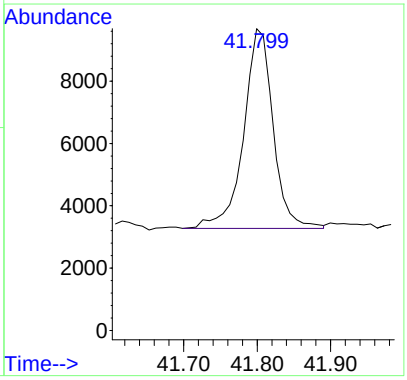
Tgt Ion:191 Resp: 25318

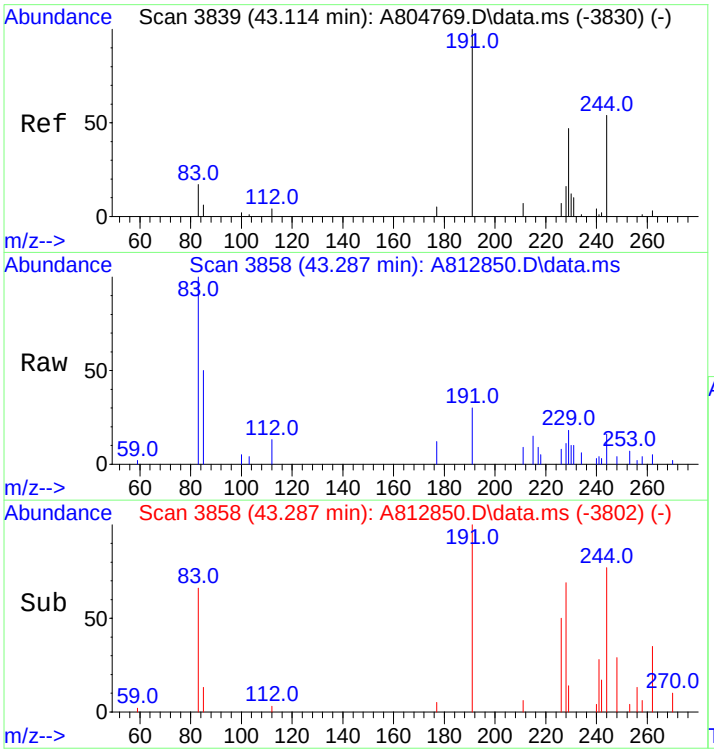




#97
C24 Tricyclic Terpane (T5)
Concen: 247.48 ng/ml
RT: 41.799 min Scan# 3695
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

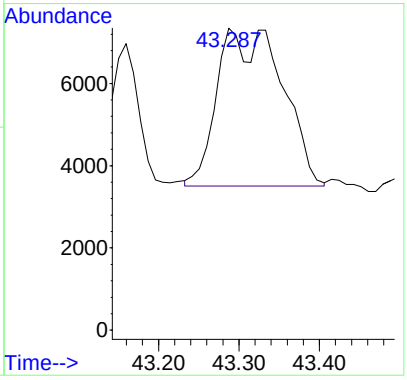
Tgt Ion:191 Resp: 17950

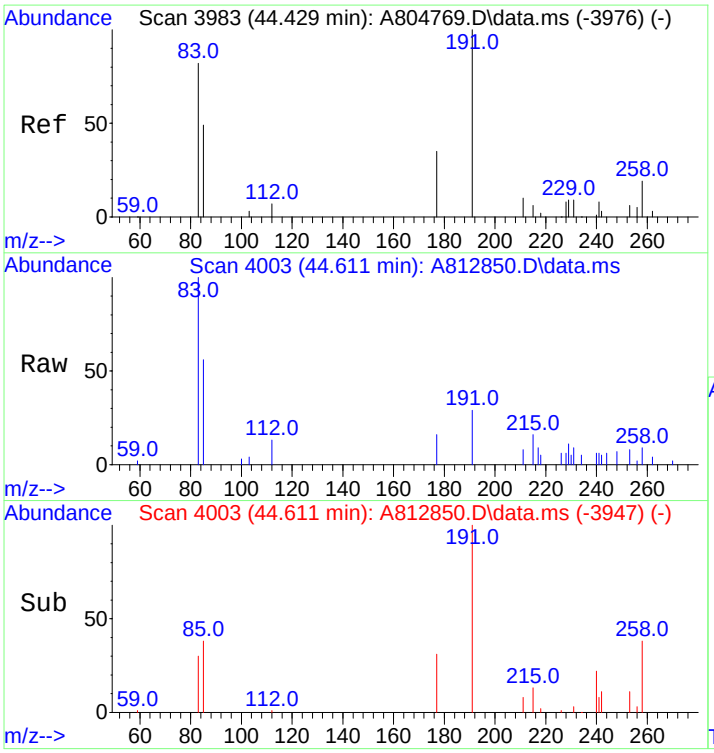




#98
C25 Tricyclic Terpane (T6)
Concen: 296.78 ng/ml m
RT: 43.287 min Scan# 3858
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

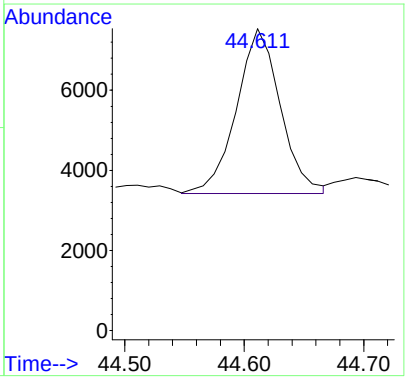
Tgt Ion:191 Resp: 21526

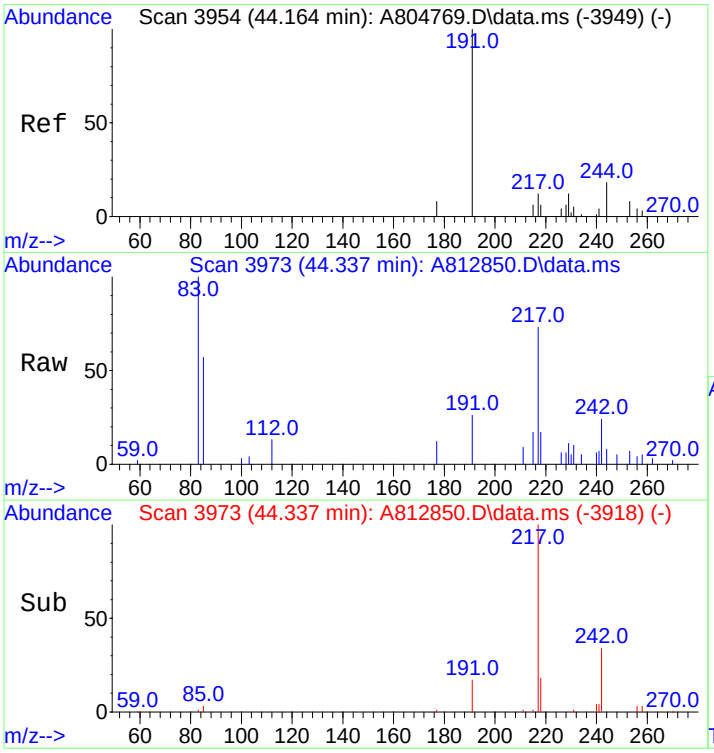




#99
C24 Tetracyclic Terpane (T6a)
Concen: 144.61 ng/ml m
RT: 44.611 min Scan# 4003
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

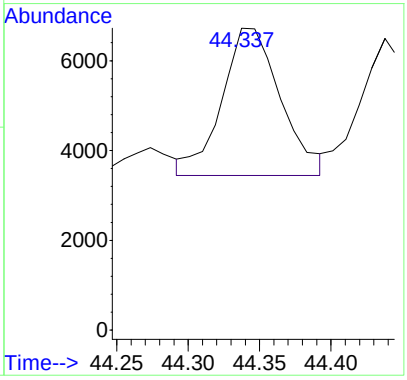
Tgt Ion:191 Resp: 10489

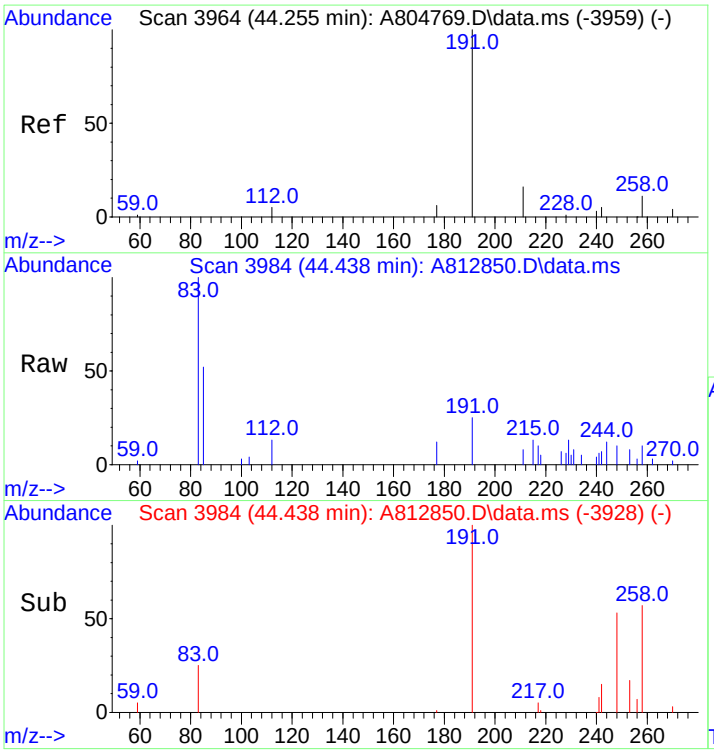




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 129.79 ng/ml m
RT: 44.337 min Scan# 3973
Delta R.T. 0.000 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

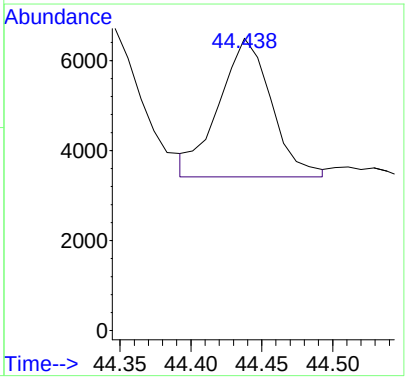
Tgt Ion:191 Resp: 9414

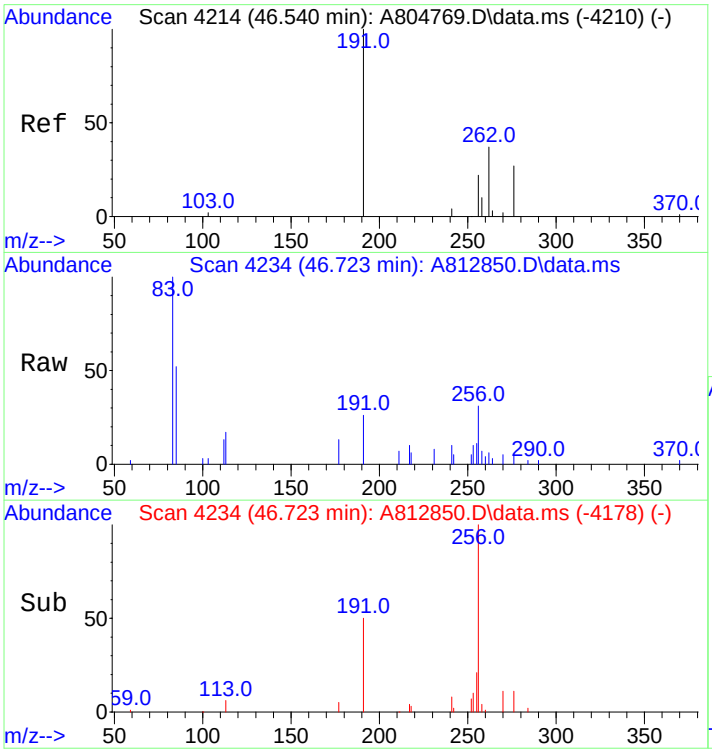




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 108.89 ng/ml m
RT: 44.438 min Scan# 3984
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

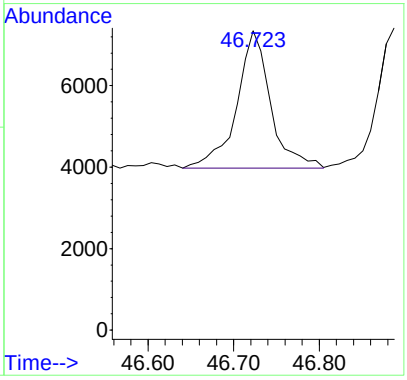
Tgt Ion:191 Resp: 7898

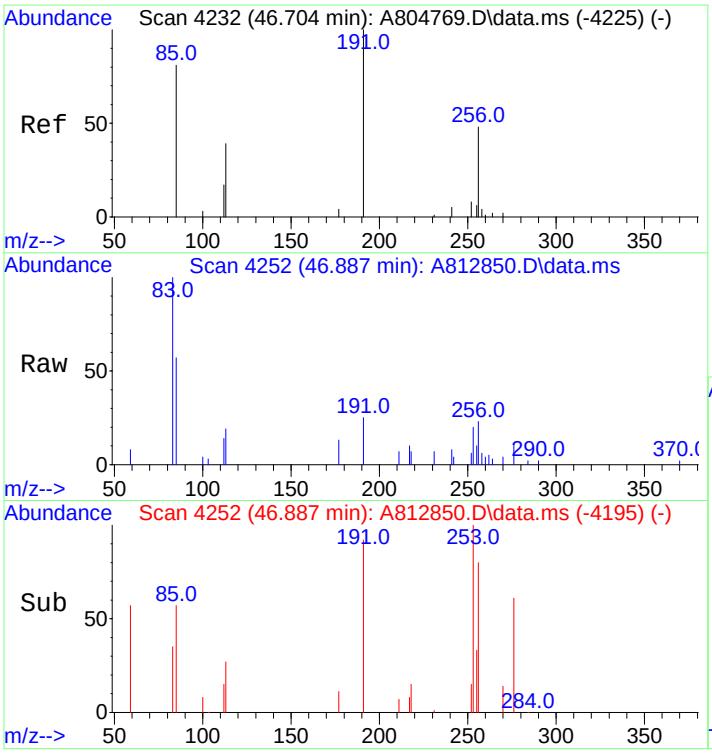




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 127.97 ng/ml
RT: 46.723 min Scan# 4234
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

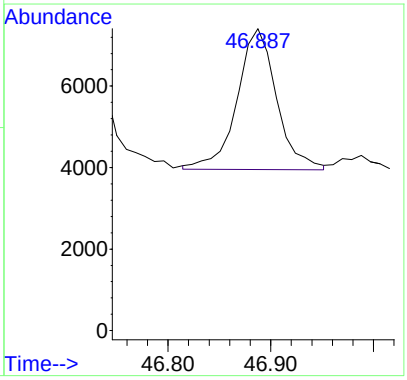
Tgt Ion:191 Resp: 9282

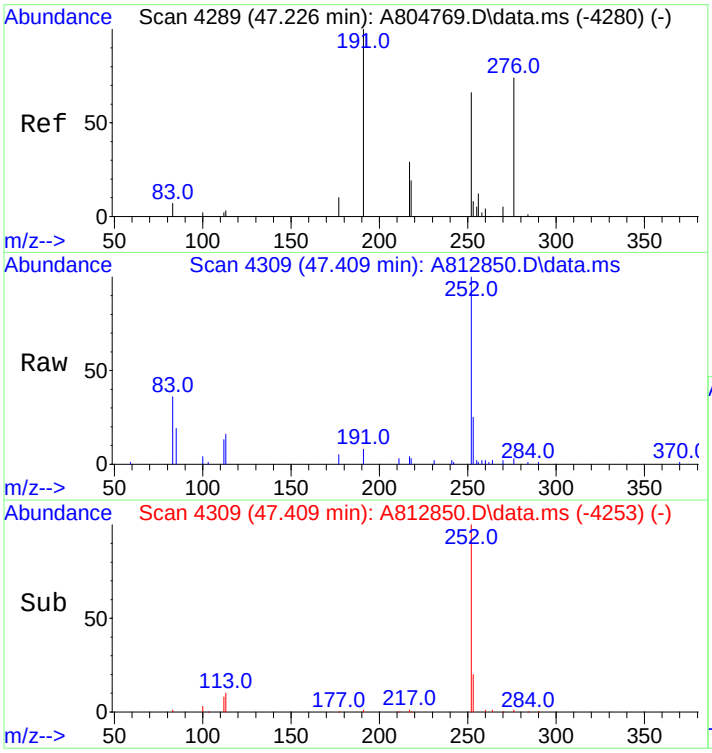




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 127.63 ng/ml
RT: 46.887 min Scan# 4252
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

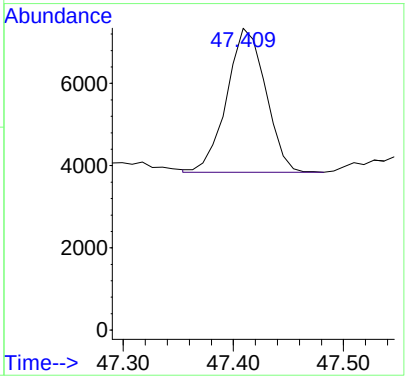
Tgt Ion:191 Resp: 9257

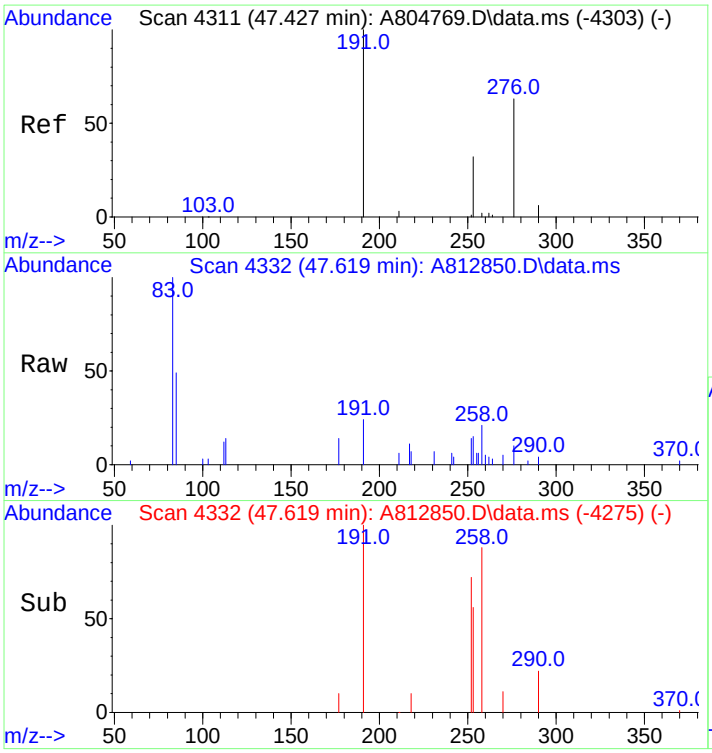




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 118.13 ng/ml
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

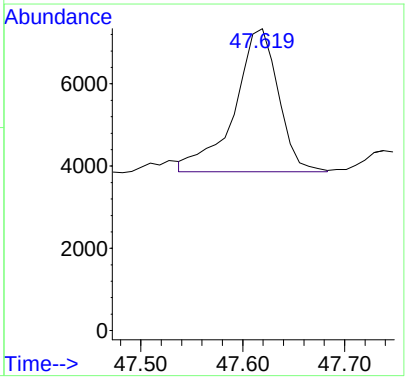
Tgt Ion:191 Resp: 8568

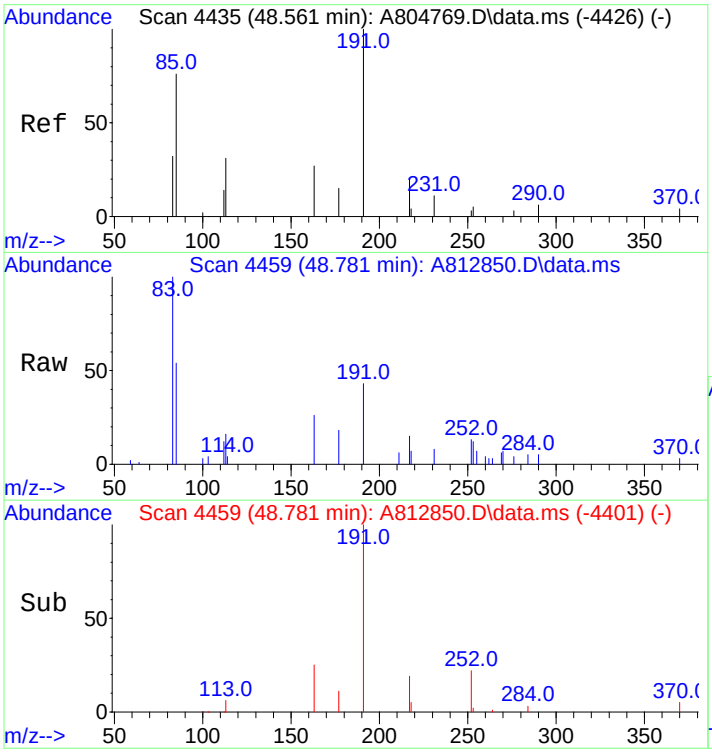




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 142.72 ng/ml m
RT: 47.619 min Scan# 4332
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

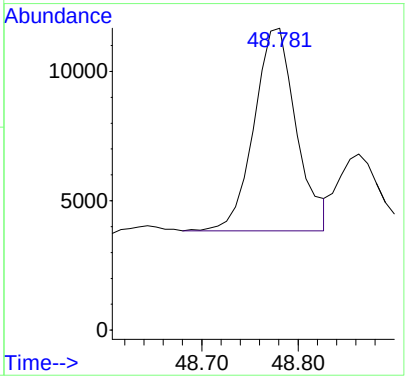
Tgt Ion:191 Resp: 10352

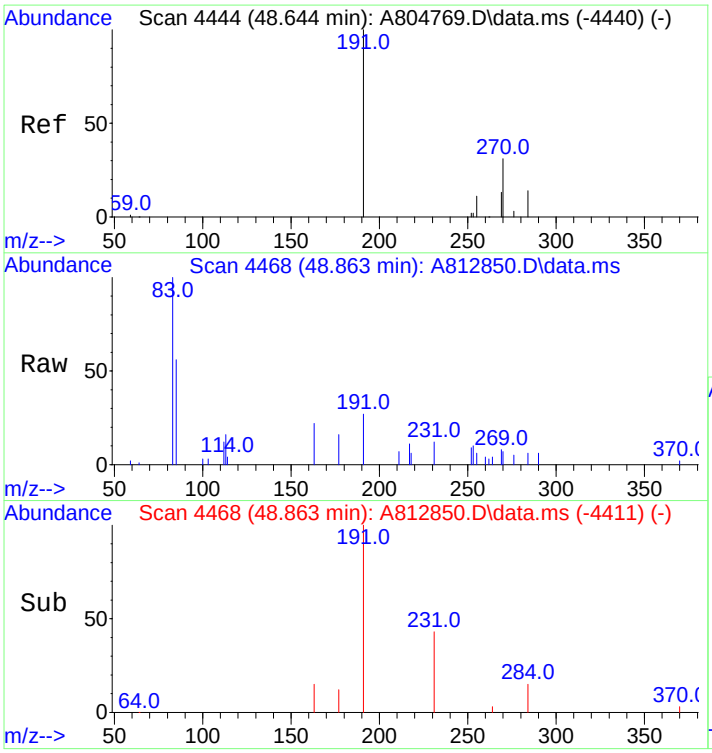




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 330.36 ng/ml
RT: 48.781 min Scan# 4459
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

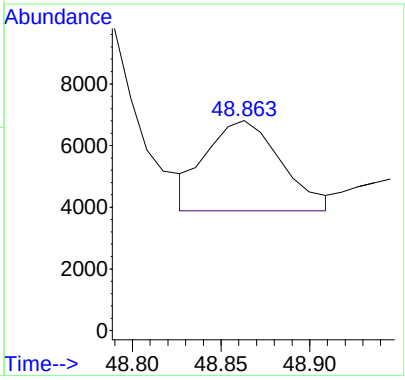
Tgt Ion:191 Resp: 23962

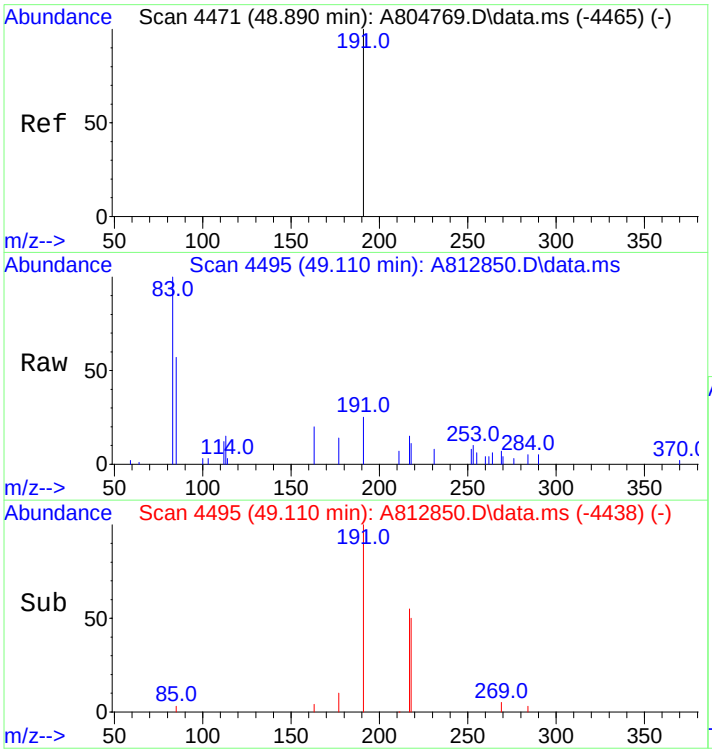




#107
C30 Tricyclic Terpane-22S
Concen: 118.53 ng/mL m
RT: 48.863 min Scan# 4468
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

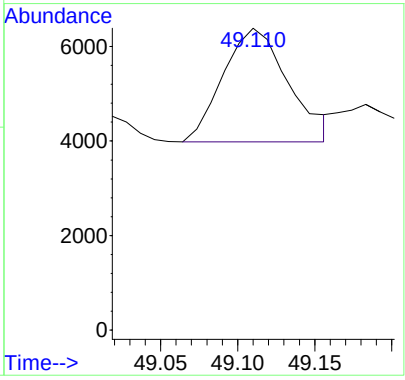
Tgt Ion:191 Resp: 8597

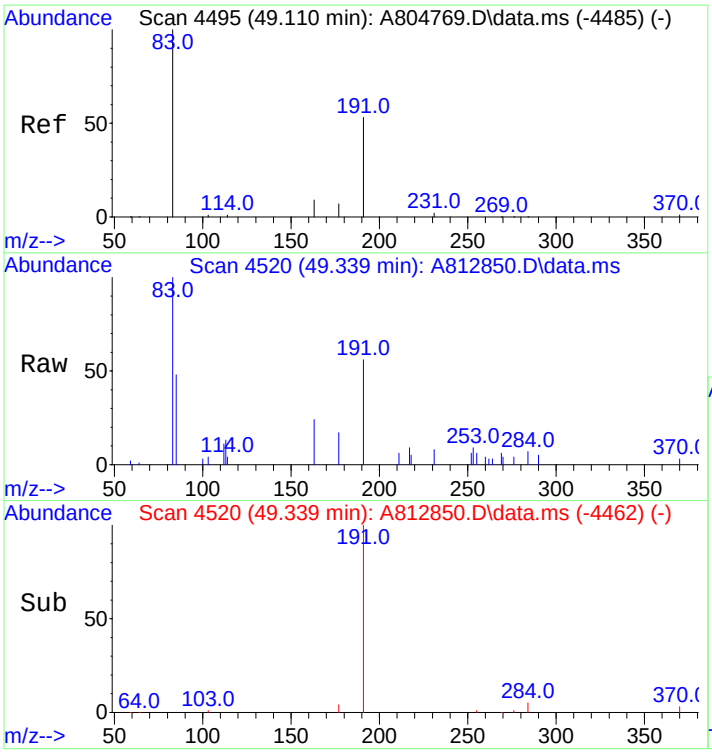




#108
C30 Tricyclic Terpane-22R
Concen: 97.80 ng/mL
RT: 49.110 min Scan# 4495
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

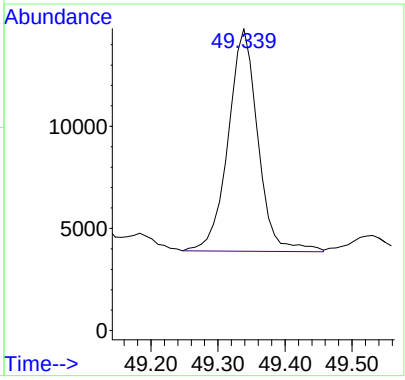
Tgt Ion:191 Resp: 7094

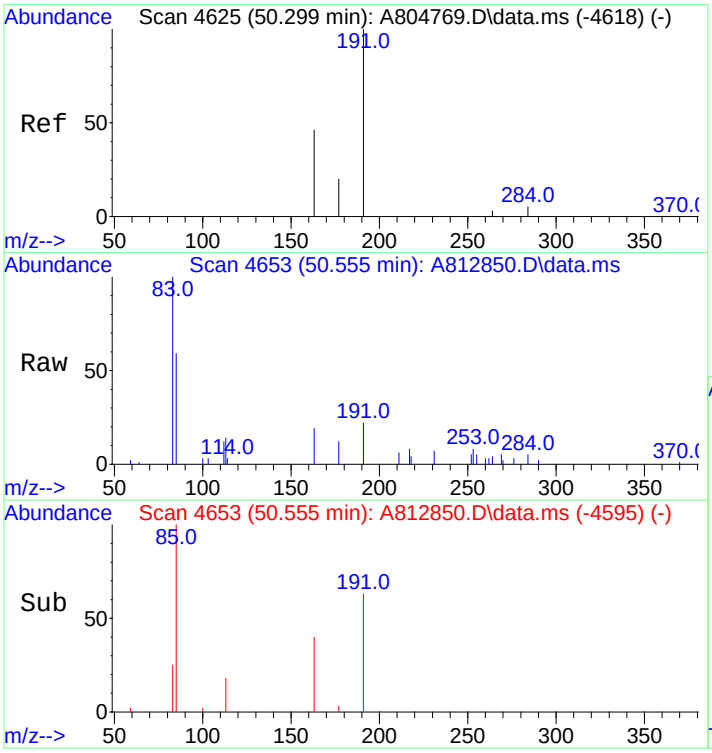




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 460.94 ng/ml
RT: 49.339 min Scan# 4520
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

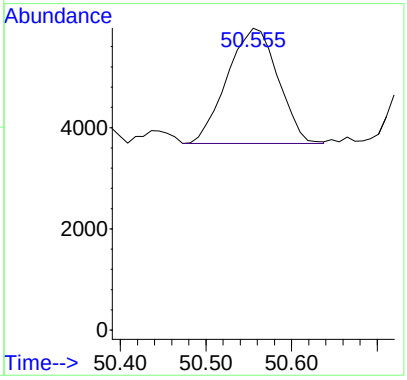
Tgt Ion:191 Resp: 33433

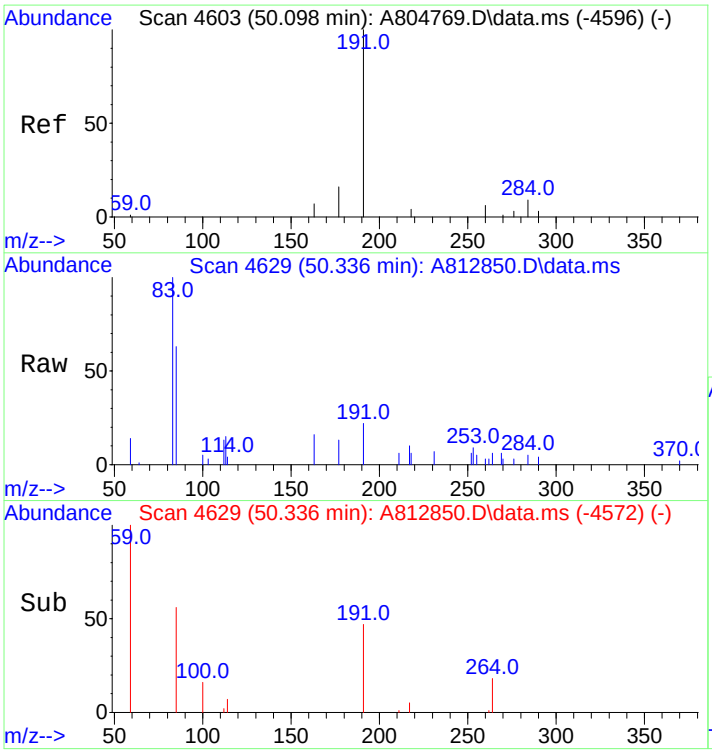




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 130.04 ng/ml
RT: 50.555 min Scan# 4653
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

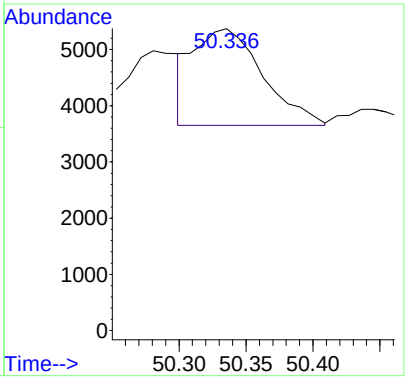
Tgt Ion:191 Resp: 9432

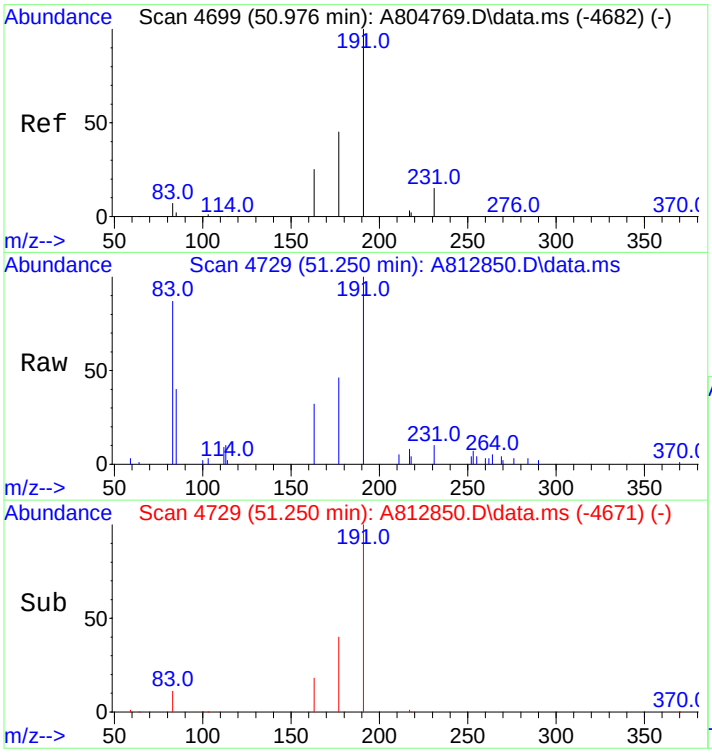




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 85.53 ng/ml m
RT: 50.336 min Scan# 4629
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

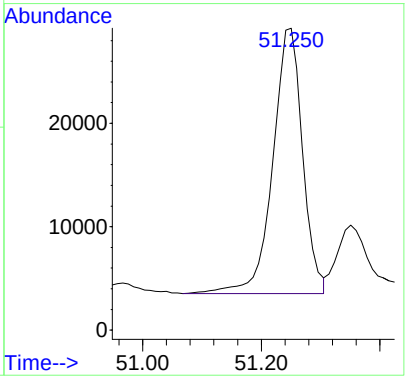
Tgt Ion:191 Resp: 6204

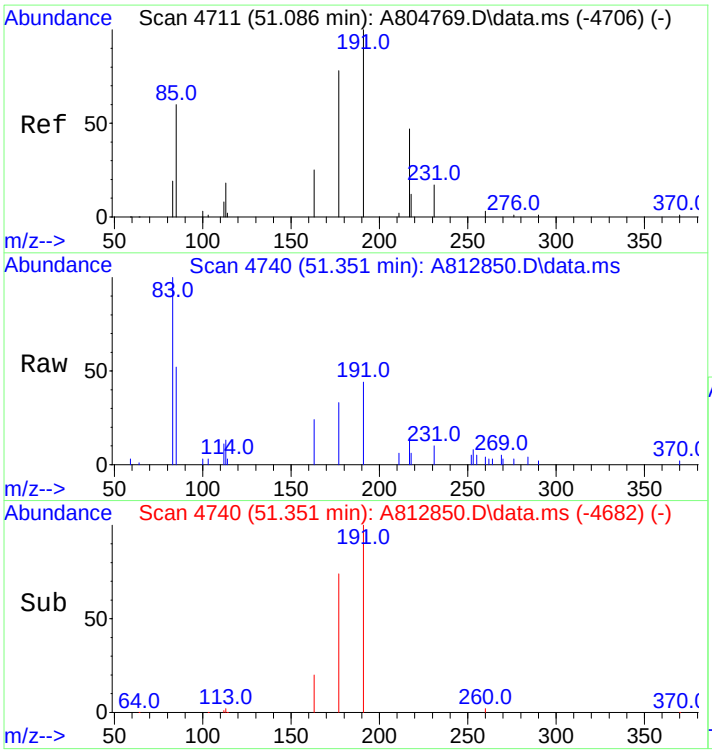




#112
30-Norhopane (T15)
Concen: 1238.88 ng/ml
RT: 51.250 min Scan# 4729
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

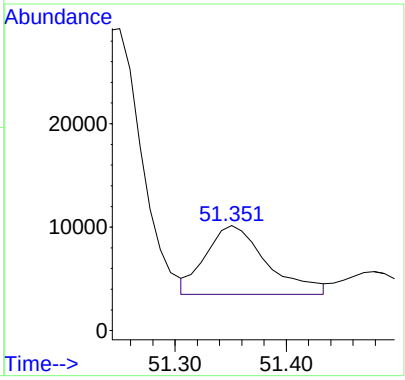
Tgt Ion:191 Resp: 89859

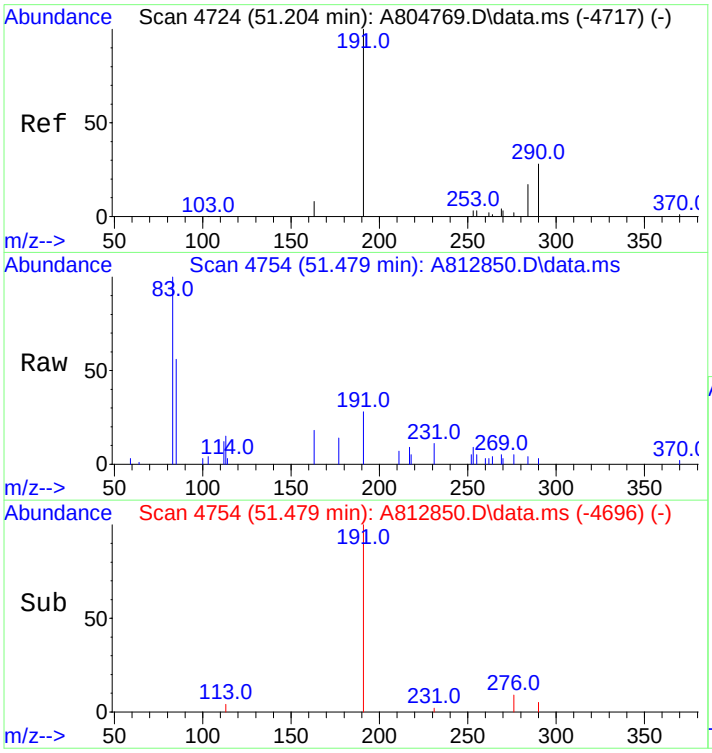




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 348.92 ng/ml m
RT: 51.351 min Scan# 4740
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

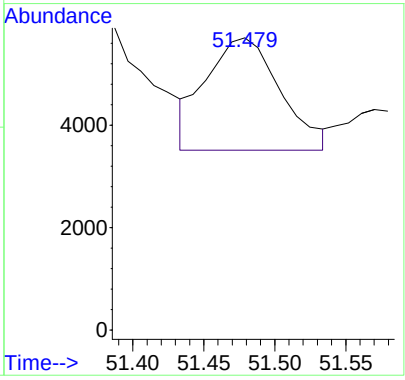
Tgt Ion:191 Resp: 25308

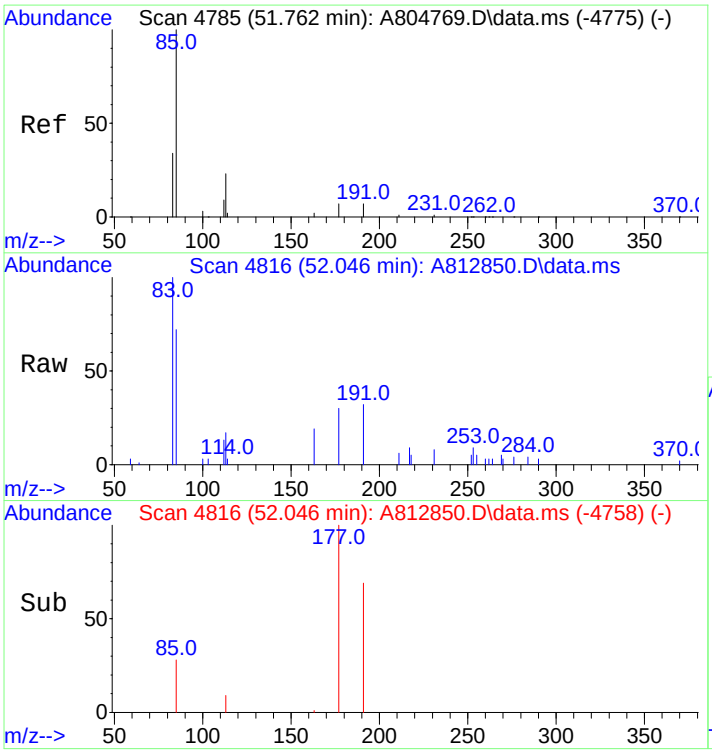




#114
17a(H)-Diahopane (X)
Concen: 109.88 ng/ml m
RT: 51.479 min Scan# 4754
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

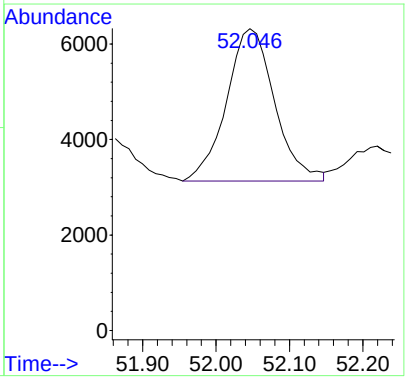
Tgt Ion:191 Resp: 7970

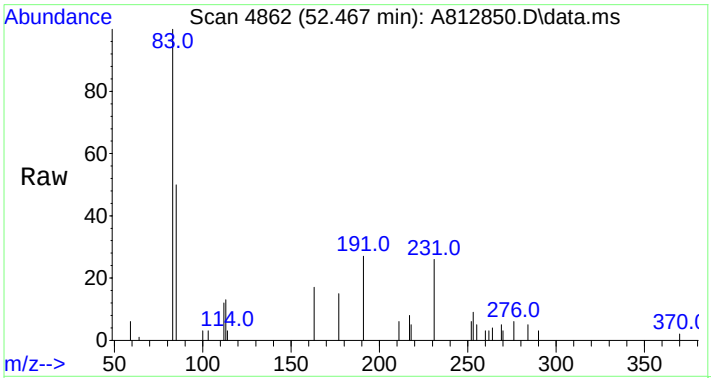




#115
30-Normoretane (T17)
Concen: 201.32 ng/ml
RT: 52.046 min Scan# 4816
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

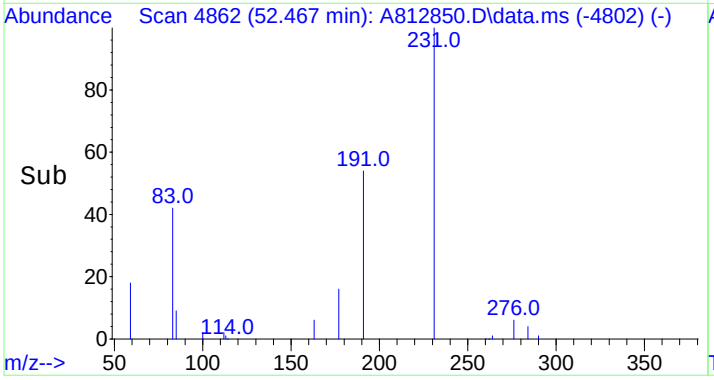
Tgt Ion:191 Resp: 14602

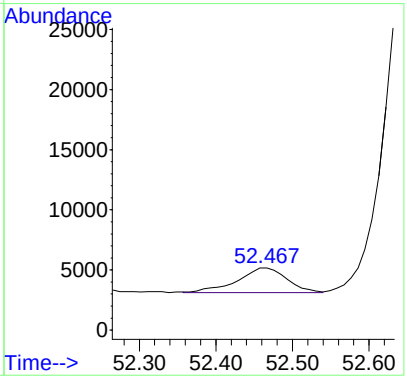


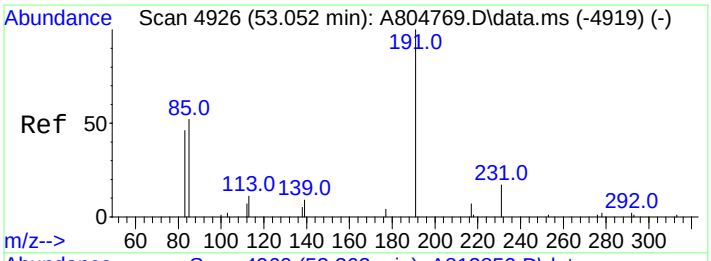


#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 126.62 ng/ml m
RT: 52.467 min Scan# 4862
Delta R.T. 0.046 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:191 Resp: 9184

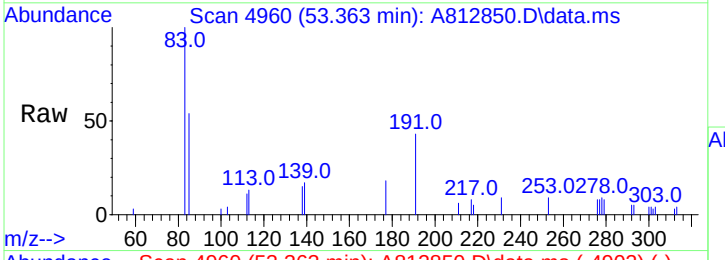


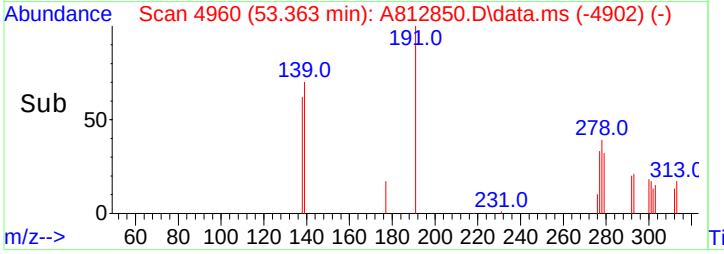


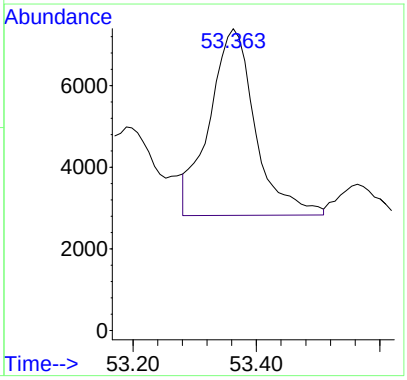


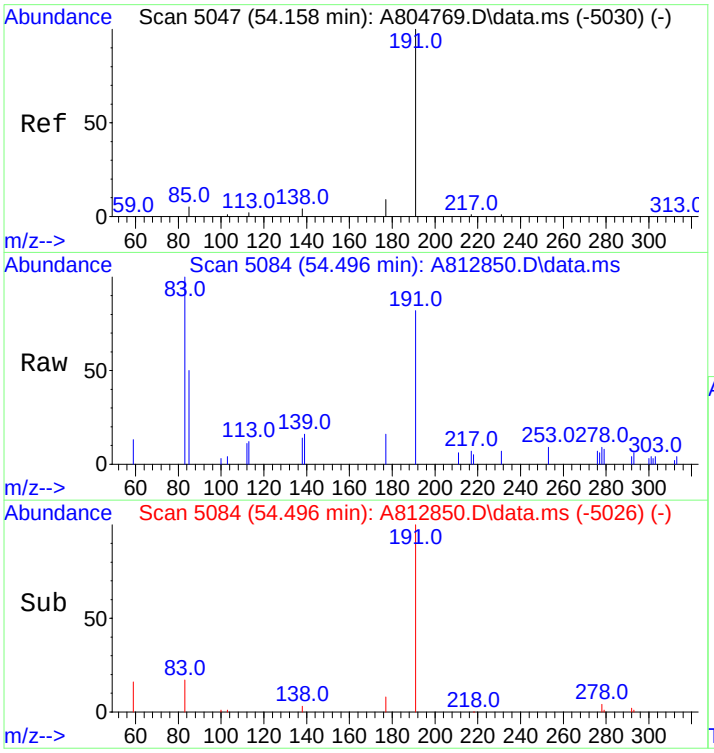
#117
Moretane (T20)
Concen: 325.22 ng/ml
RT: 53.363 min Scan# 4960
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:191 Resp: 23589



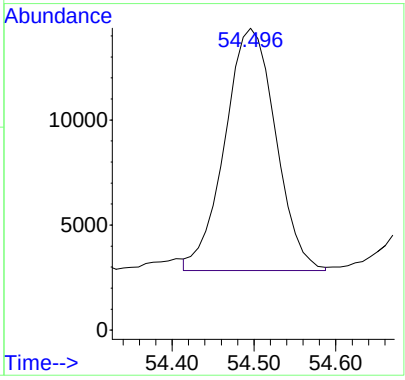


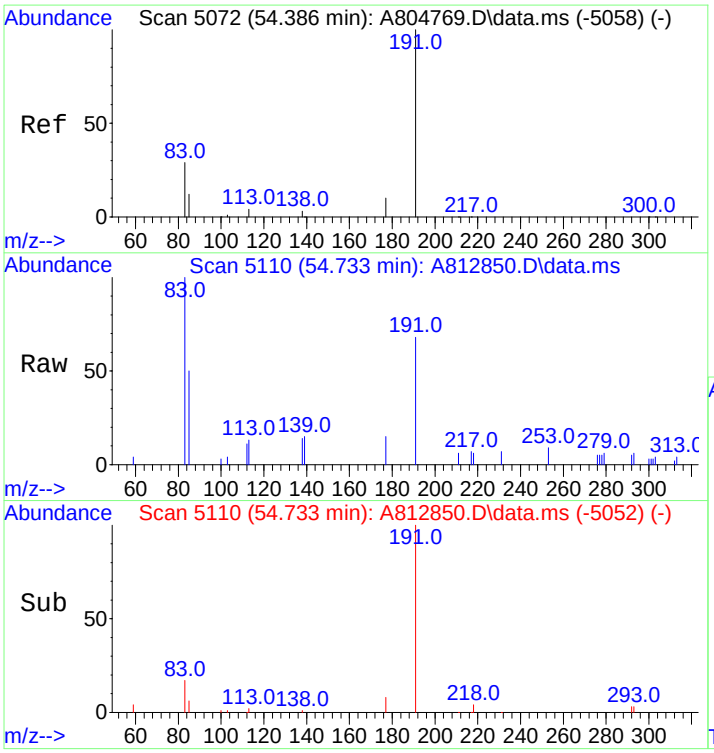




#118
30-Homohopane-22S (T21)
Concen: 685.08 ng/ml m
RT: 54.496 min Scan# 5084
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

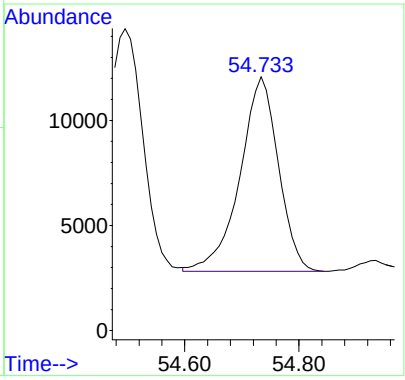
Tgt Ion:191 Resp: 49690

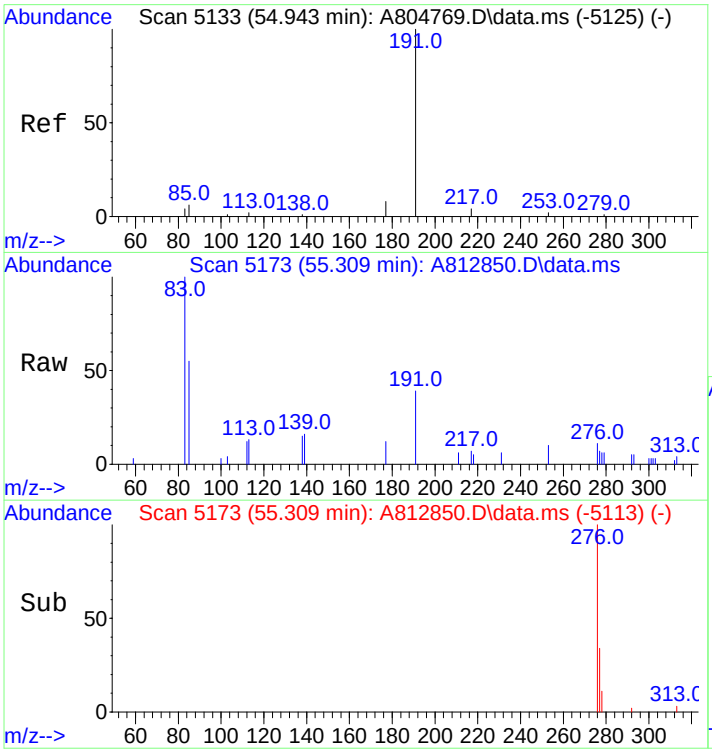




#119
30-Homohopane-22R (T22)
Concen: 597.64 ng/ml
RT: 54.733 min Scan# 5110
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

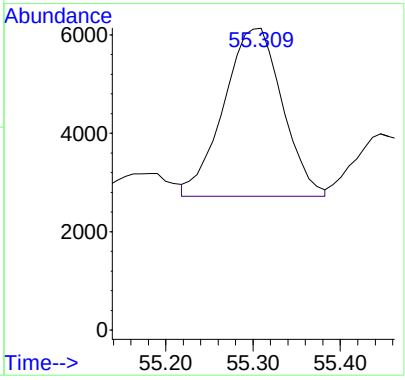
Tgt Ion:191 Resp: 43348

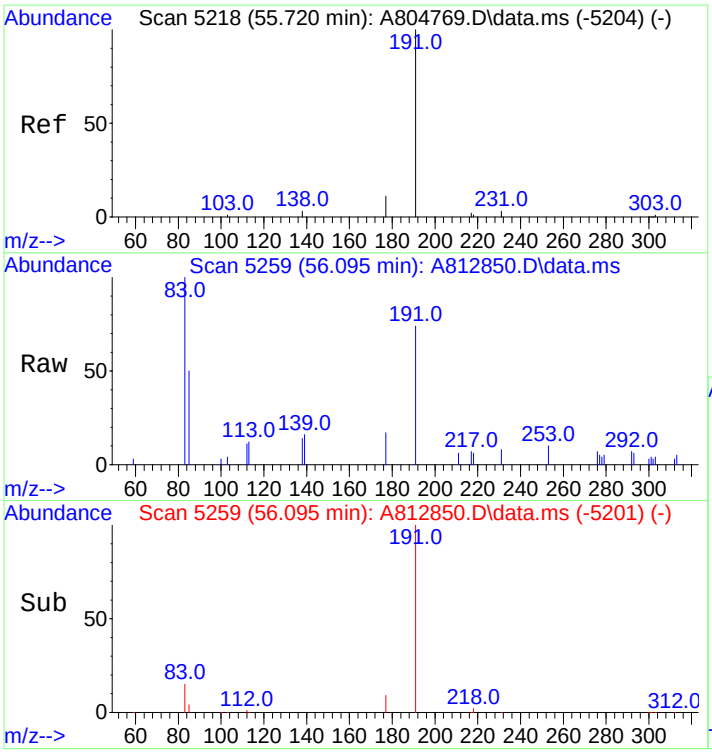




#120
Gammacerane/C32-diahopane
Concen: 219.57 ng/mL m
RT: 55.309 min Scan# 5173
Delta R.T. 0.046 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

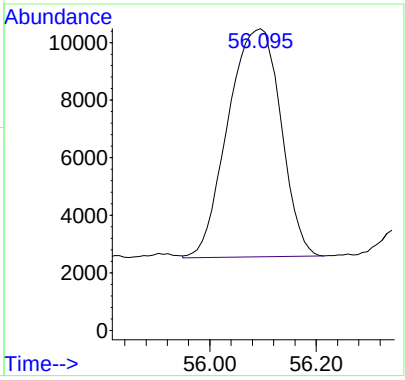
Tgt Ion:191 Resp: 15926

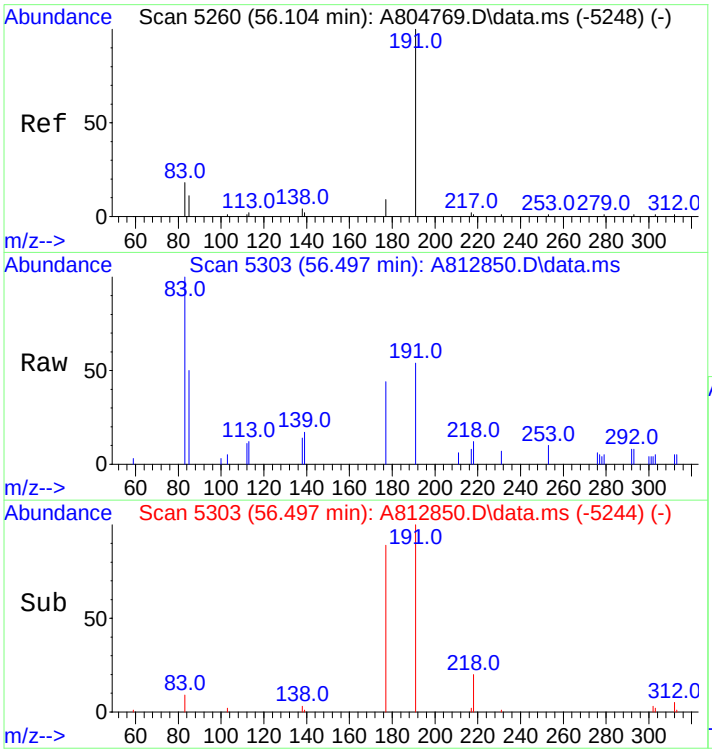




#121
30,31-Bishomohopane-22S (T26)
Concen: 752.66 ng/ml
RT: 56.095 min Scan# 5259
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

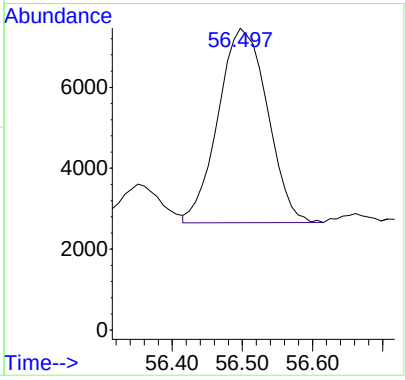
Tgt Ion:191 Resp: 54592

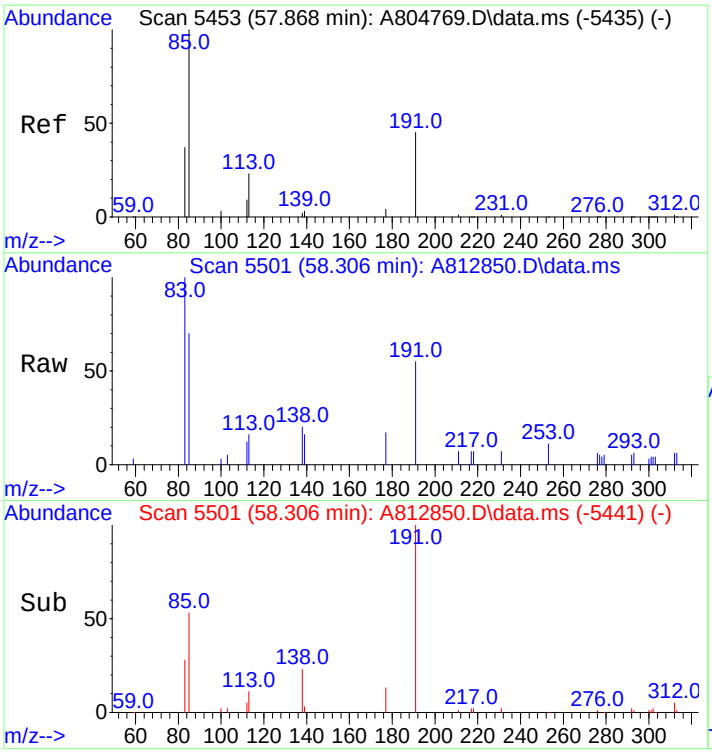




#122
30,31-Bishomohopane-22R (T27)
Concen: 323.13 ng/ml
RT: 56.497 min Scan# 5303
Delta R.T. 0.037 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

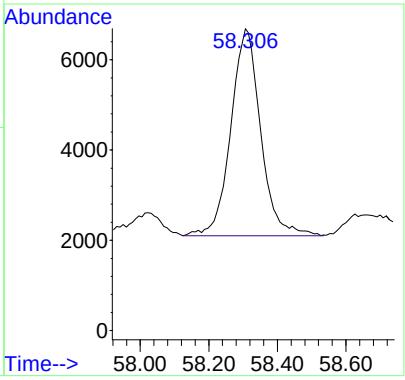
Tgt Ion:191 Resp: 23437

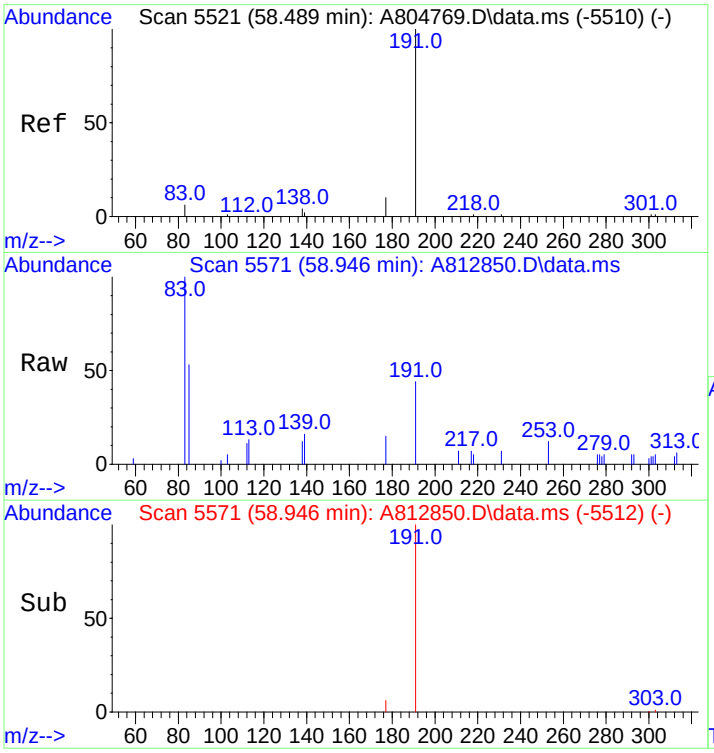




#123
30,31-Trishomohopane-22S (T30)
Concen: 381.40 ng/ml
RT: 58.306 min Scan# 5501
Delta R.T. 0.046 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

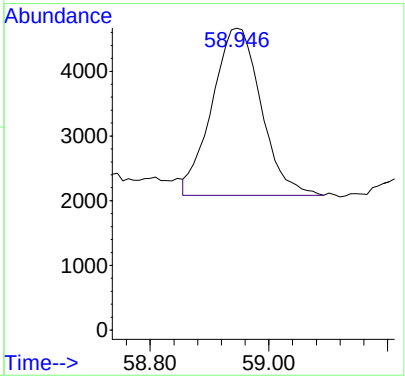
Tgt Ion:191 Resp: 27664

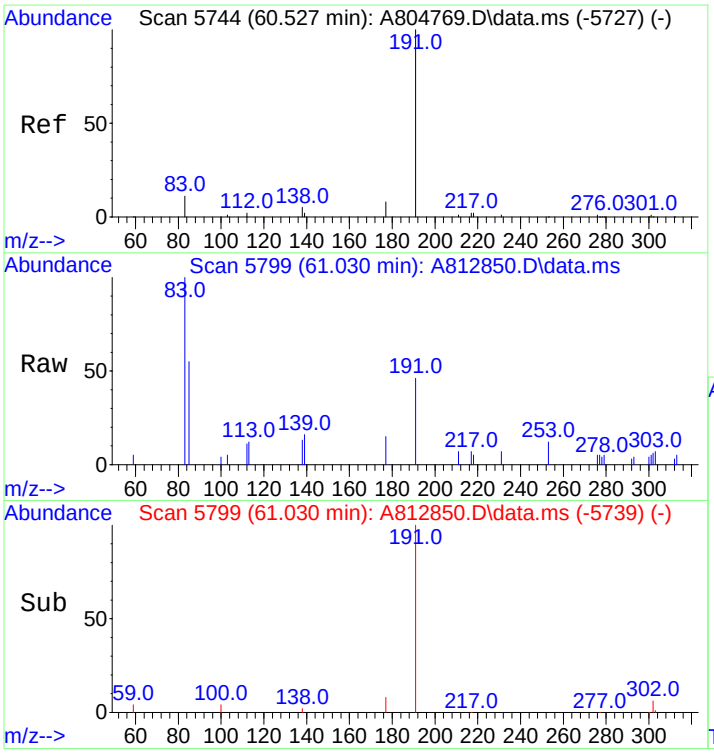




#124
30,31-Trishomohopane-22R (T31)
Concen: 203.70 ng/ml
RT: 58.946 min Scan# 5571
Delta R.T. 0.037 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

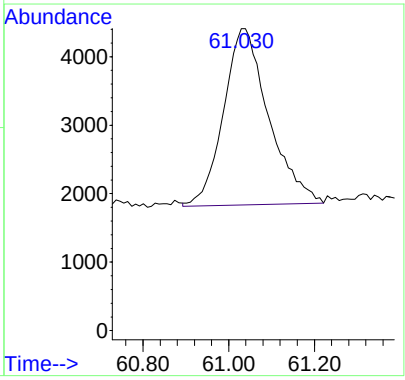
Tgt Ion:191 Resp: 14775

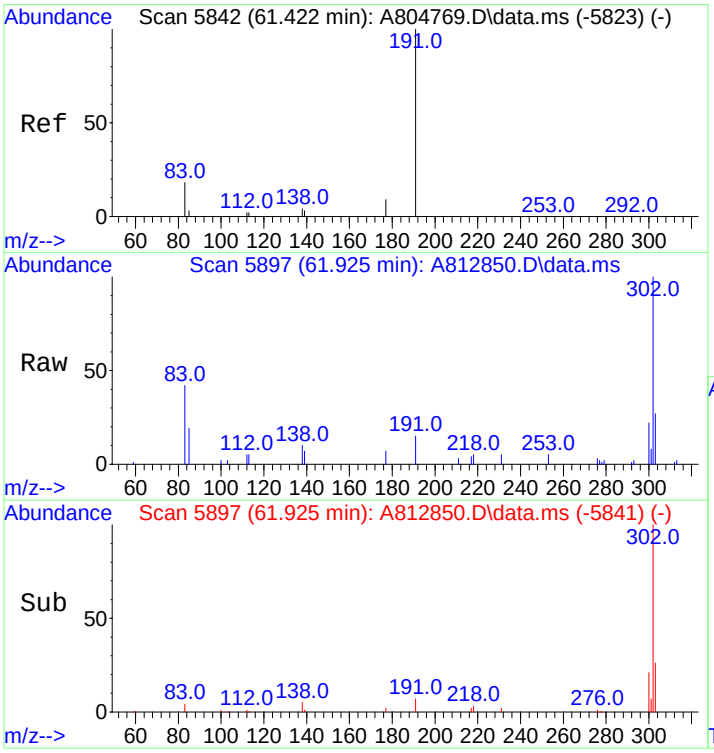




#125
Tetrakishomohopane-22S (T32)
Concen: 260.28 ng/ml
RT: 61.030 min Scan# 5799
Delta R.T. 0.046 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

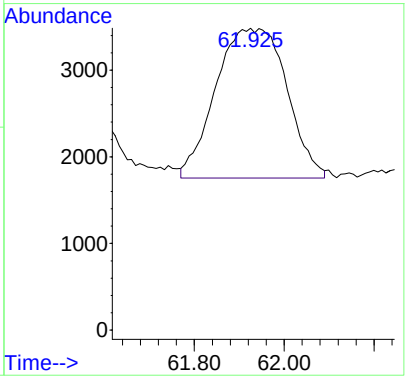
Tgt Ion:191 Resp: 18879

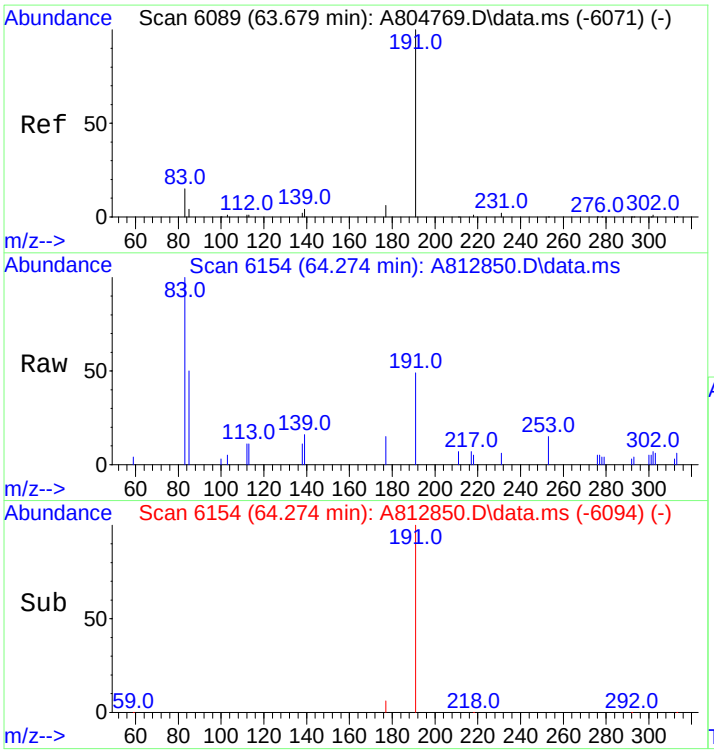




#126
Tetrakishomohopane-22R (T33)
Concen: 260.68 ng/ml m
RT: 61.925 min Scan# 5897
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

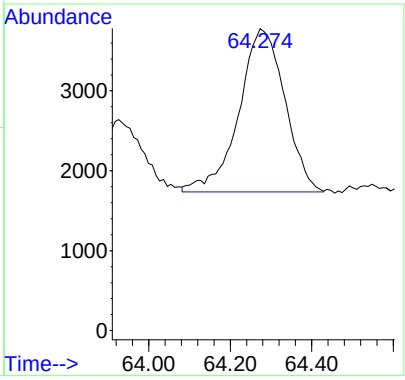
Tgt Ion:191 Resp: 18908

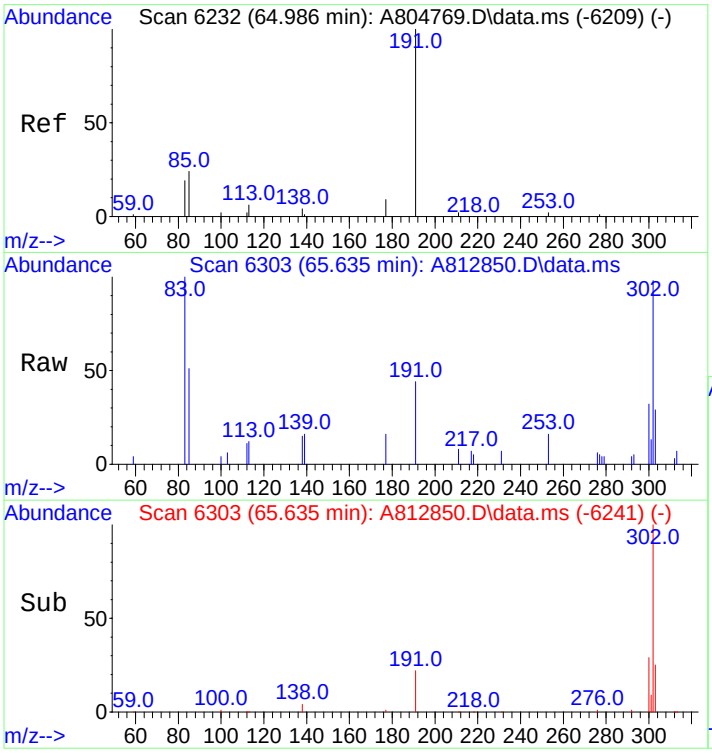




#127
Pentakishomohopane-22S (T34)
Concen: 221.17 ng/ml m
RT: 64.274 min Scan# 6154
Delta R.T. 0.046 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

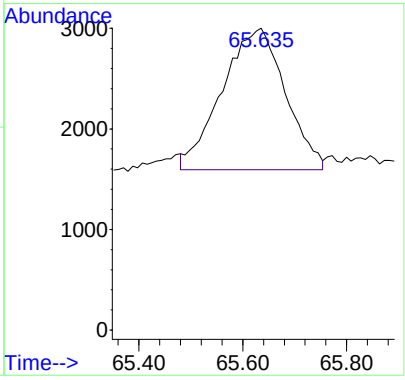
Tgt Ion:191 Resp: 16042

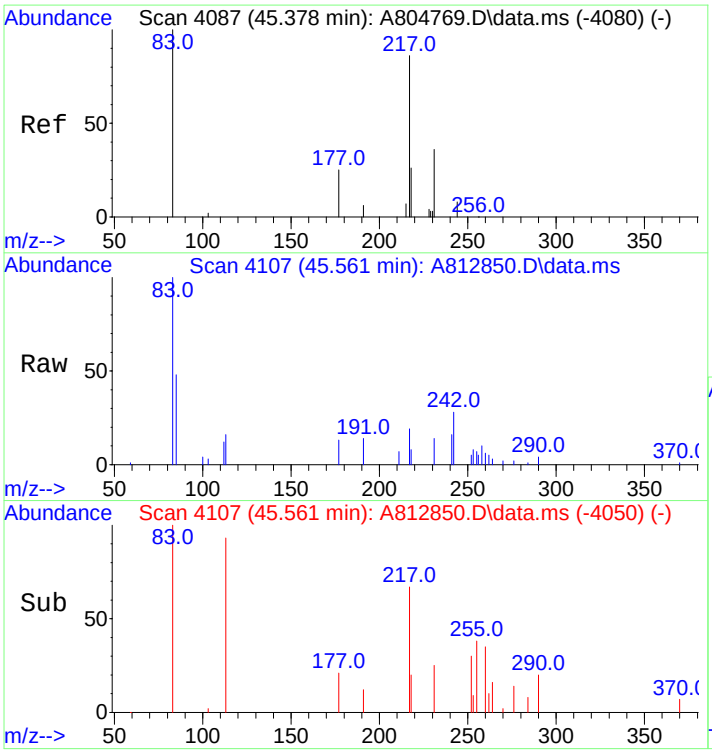




#128
Pentakishomohopane-22R (T35)
Concen: 164.49 ng/ml m
RT: 65.635 min Scan# 6303
Delta R.T. 0.064 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

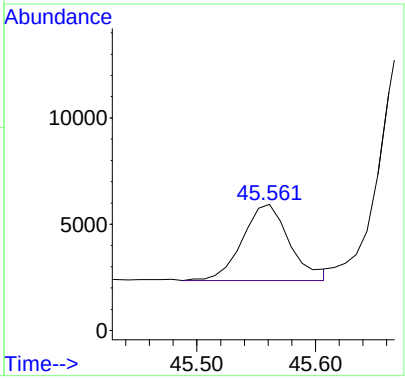
Tgt Ion:191 Resp: 11931

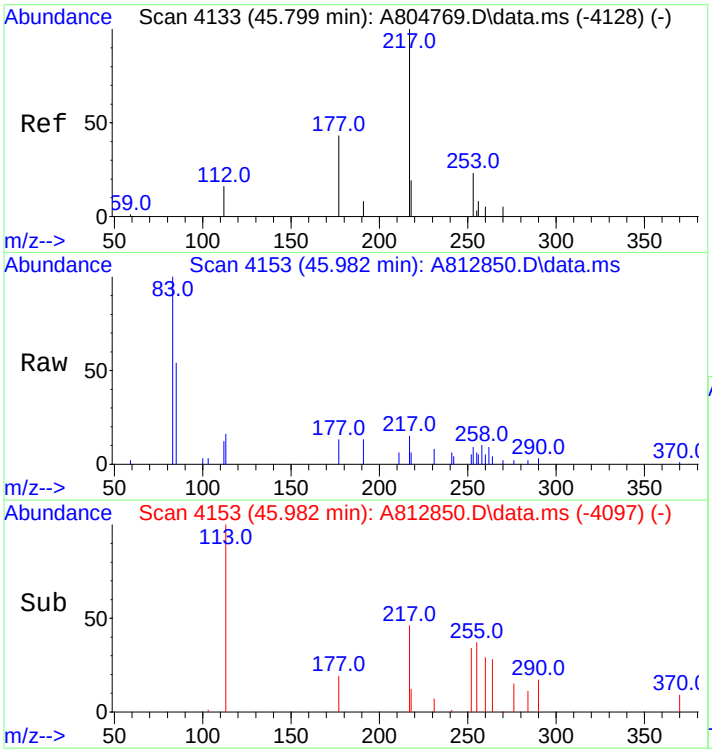




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 280.50 ng/ml
RT: 45.561 min Scan# 4107
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

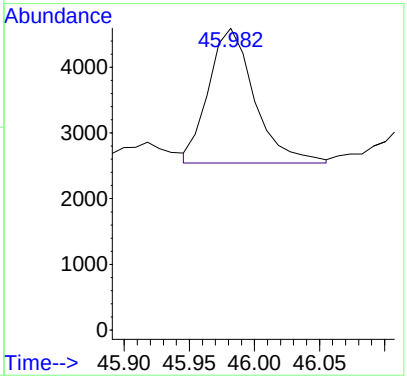
Tgt Ion:217 Resp: 9906

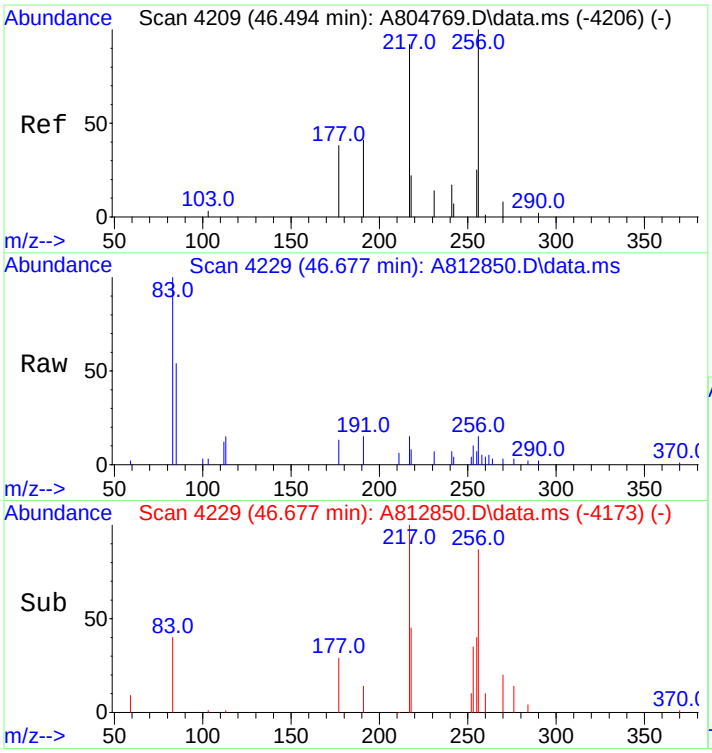




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 142.23 ng/ml m
RT: 45.982 min Scan# 4153
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

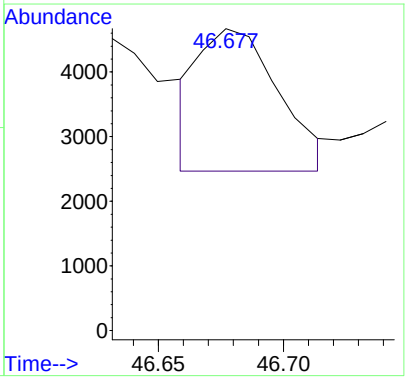
Tgt Ion:217 Resp: 5023

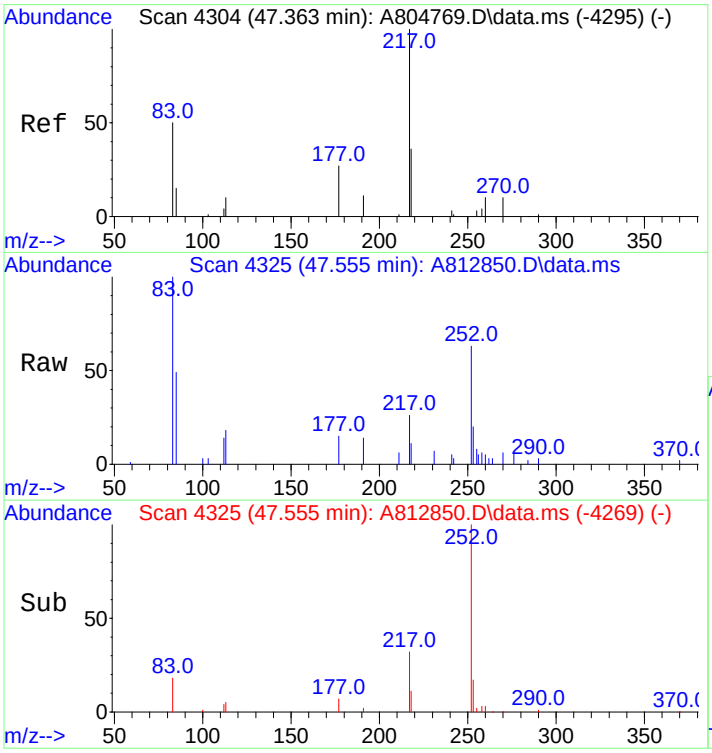




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 138.01 ng/ml m
RT: 46.677 min Scan# 4229
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

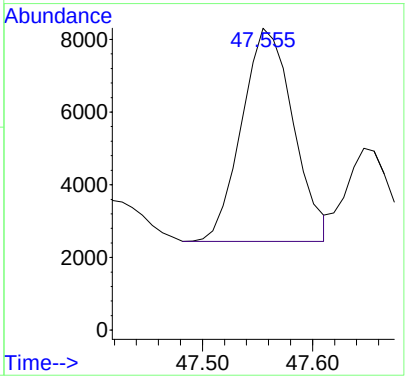
Tgt Ion:217 Resp: 4874

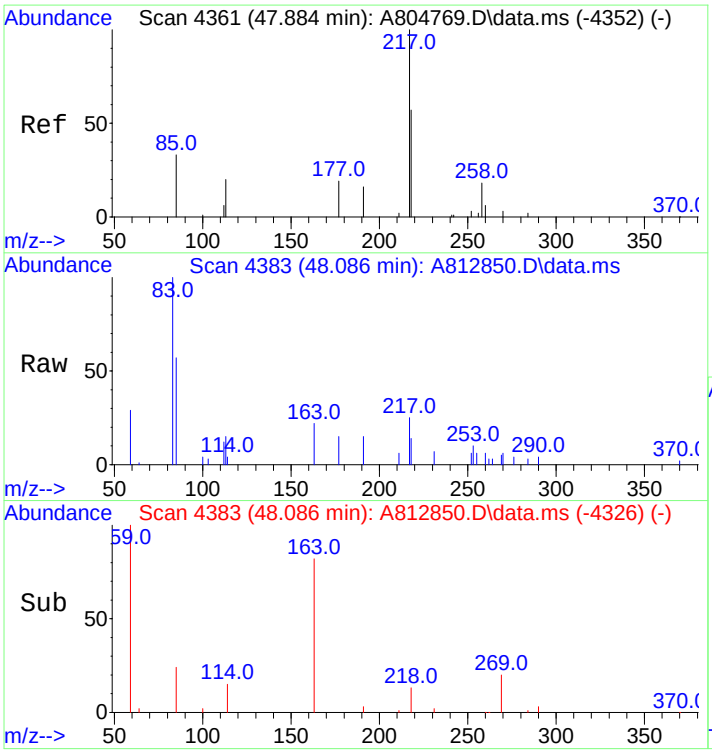




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 541.69 ng/ml
RT: 47.555 min Scan# 4325
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

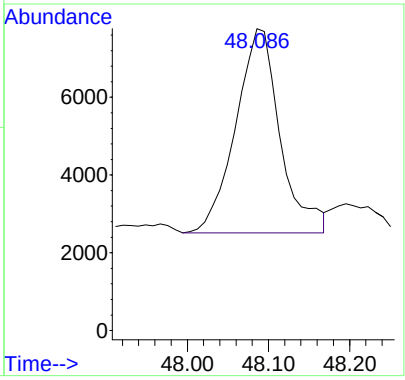
Tgt Ion:217 Resp: 19130

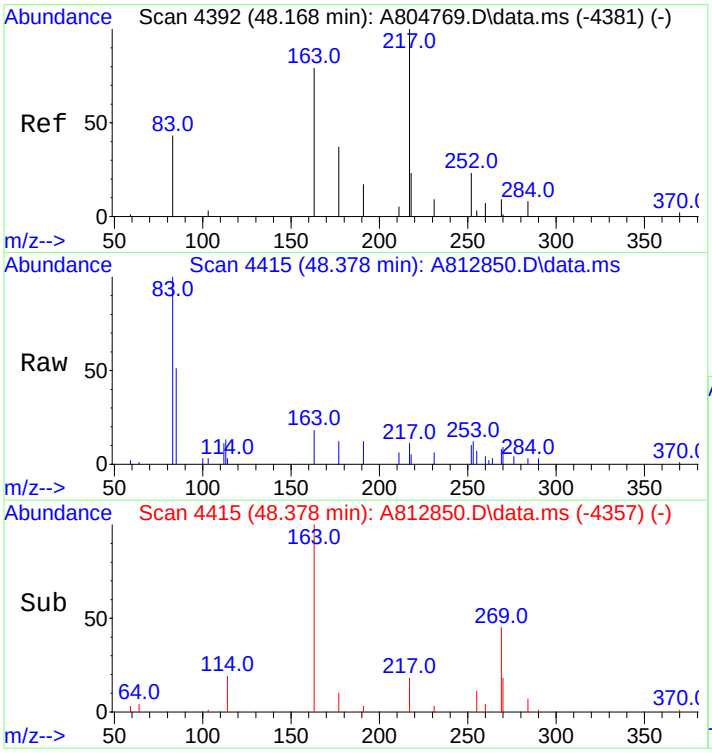




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 567.06 ng/ml
RT: 48.086 min Scan# 4383
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

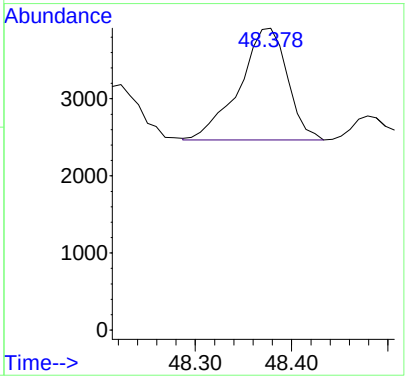
Tgt Ion:217 Resp: 20026

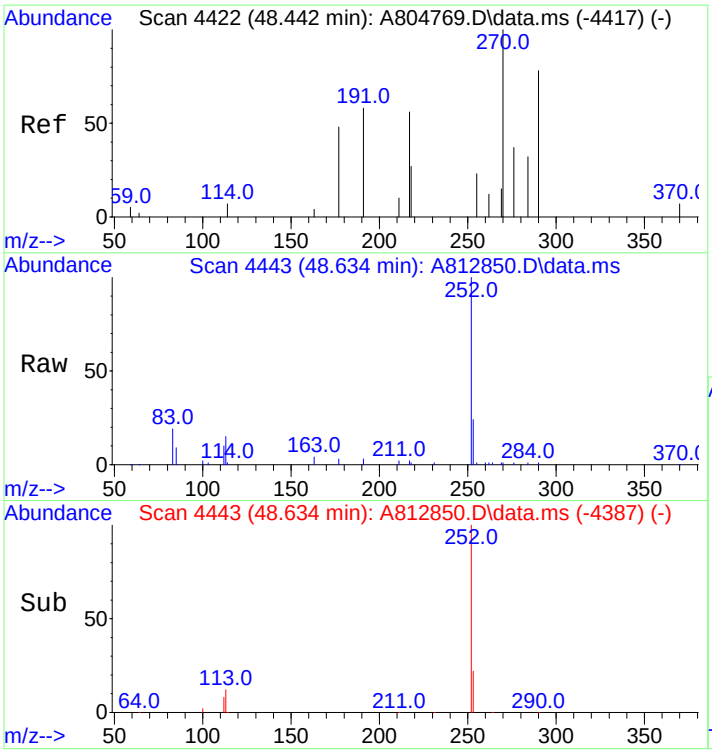




#135
Unknown Sterane (S18)
Concen: 141.72 ng/ml
RT: 48.378 min Scan# 4415
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

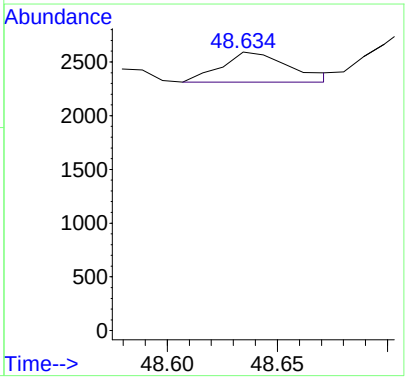
Tgt Ion:217 Resp: 5005

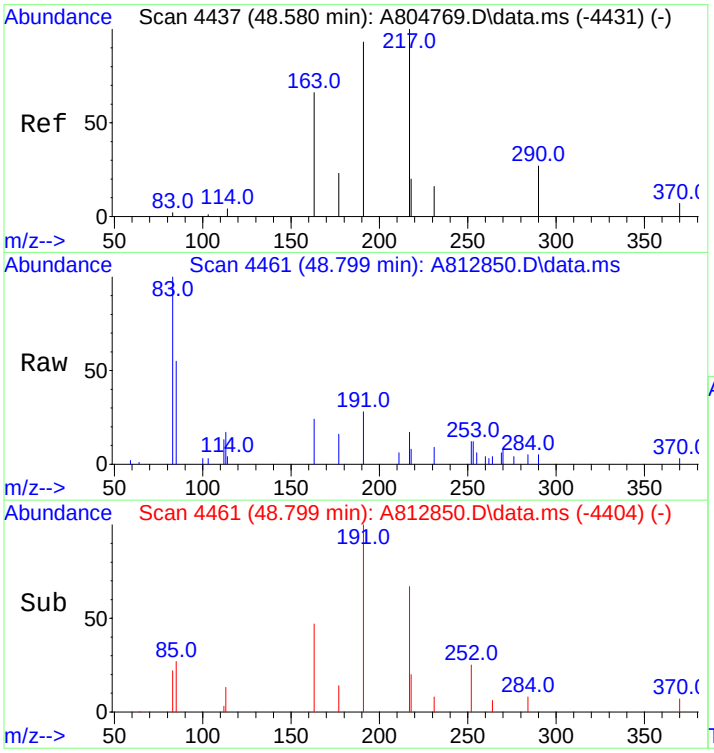




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 17.13 ng/ml
RT: 48.634 min Scan# 4443
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

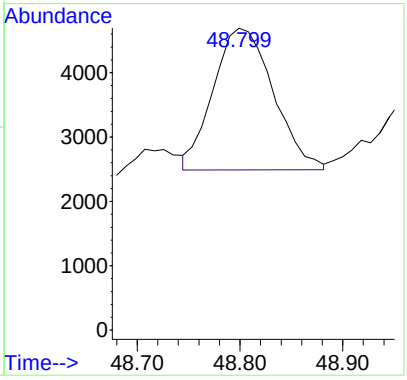
Tgt Ion:217 Resp: 605

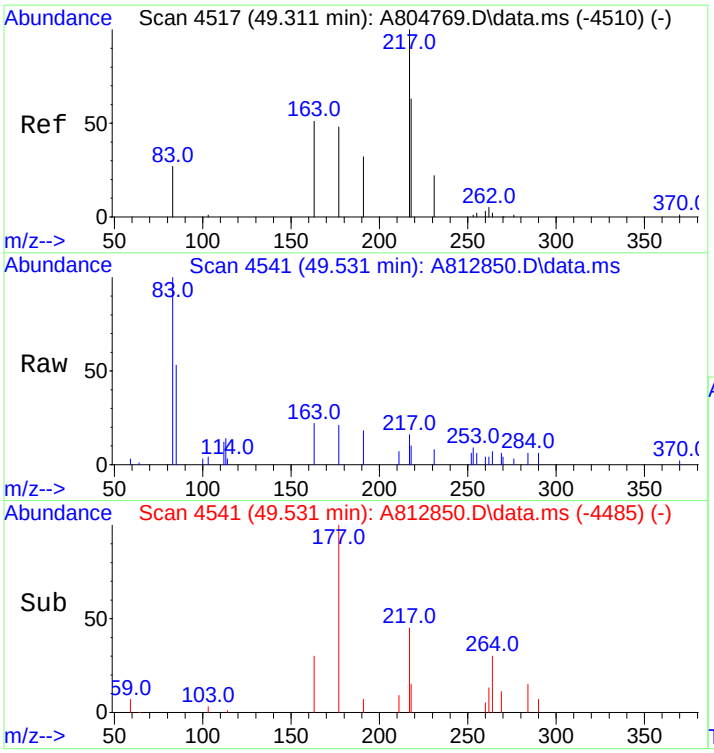




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 253.40 ng/ml
RT: 48.799 min Scan# 4461
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

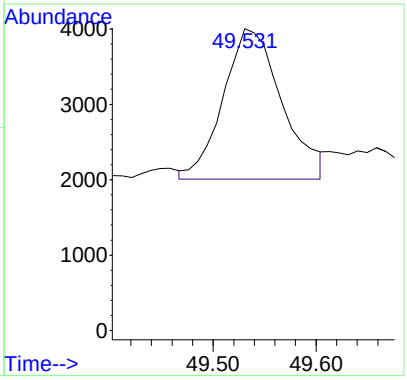
Tgt Ion:217 Resp: 8949

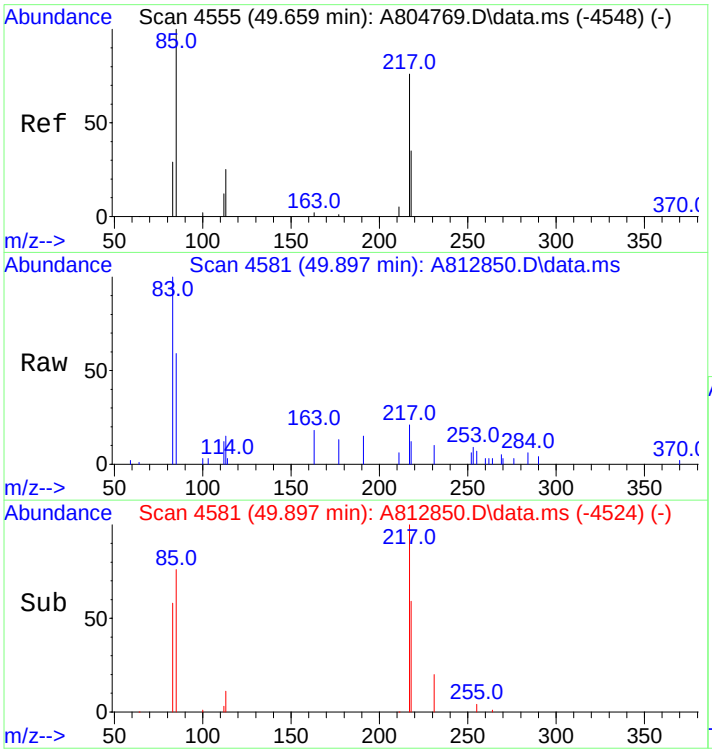




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 223.64 ng/ml m
RT: 49.531 min Scan# 4541
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

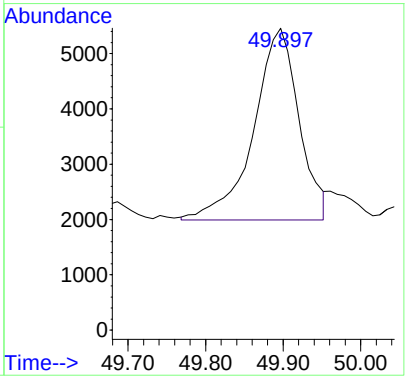
Tgt Ion:217 Resp: 7898

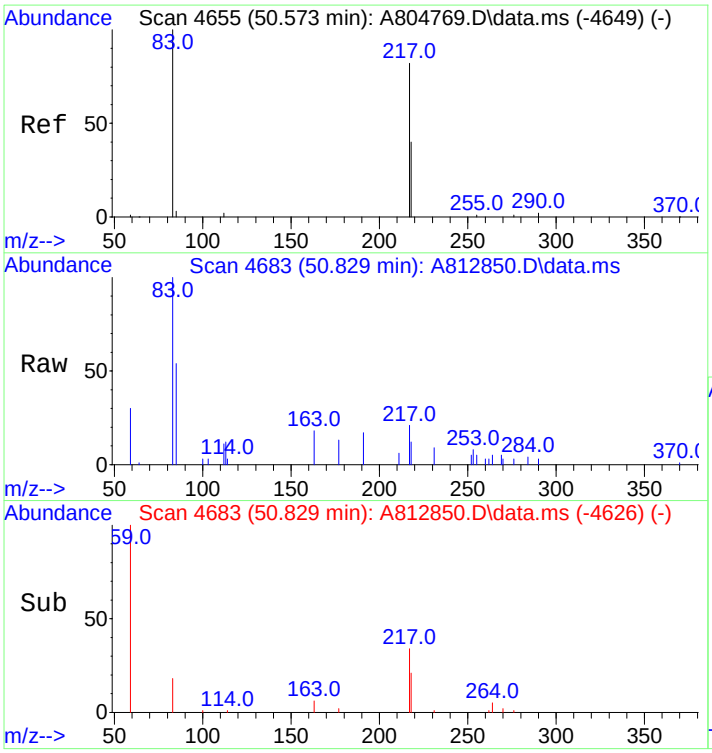




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 398.07 ng/ml m
RT: 49.897 min Scan# 4581
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

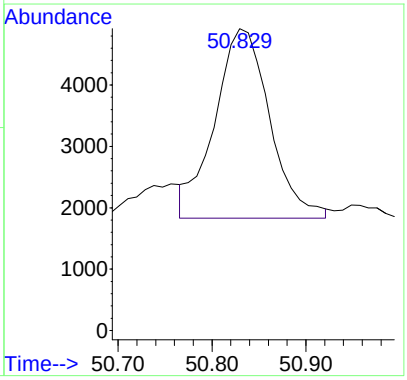
Tgt Ion:217 Resp: 14058

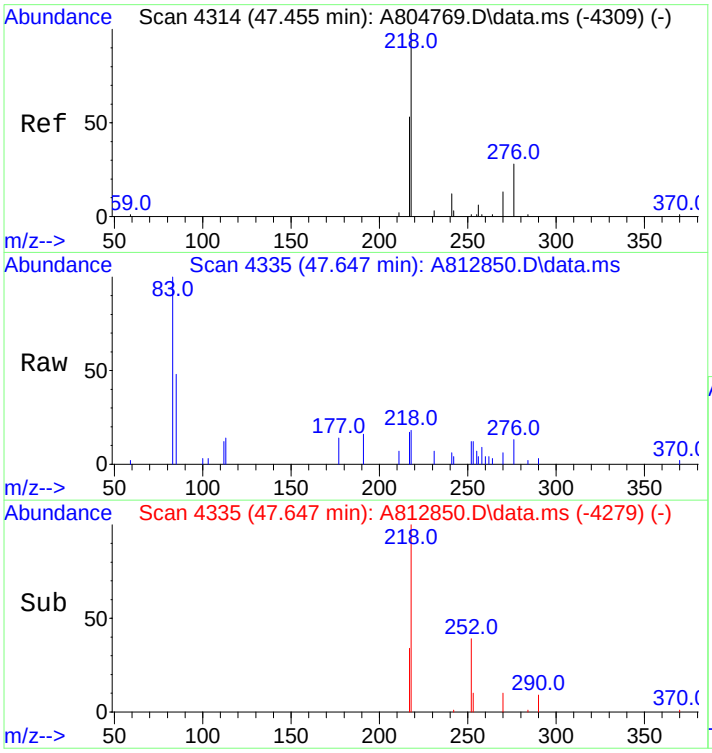




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 355.51 ng/ml m
RT: 50.829 min Scan# 4683
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

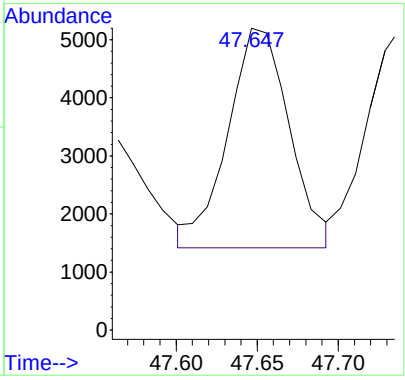
Tgt Ion:217 Resp: 12555

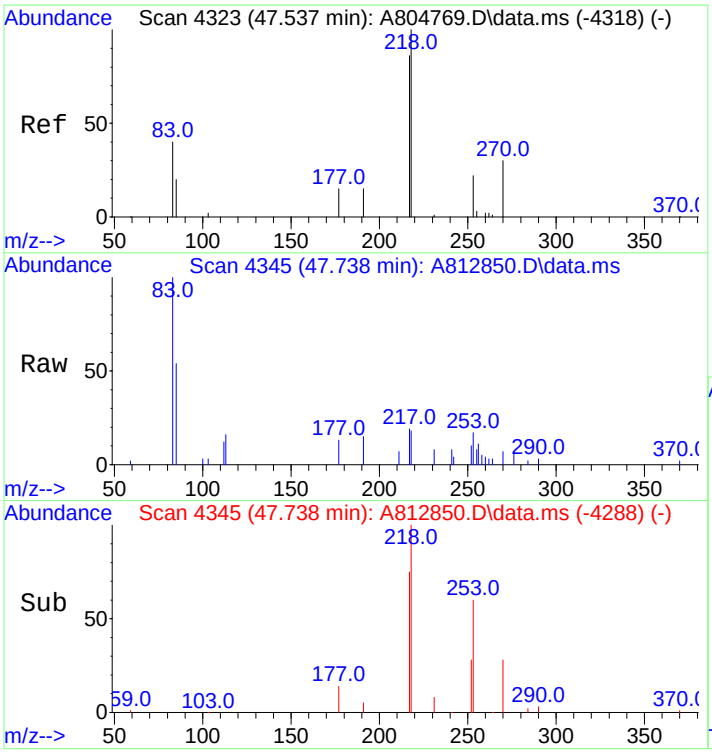




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 283.31 ng/ml m
RT: 47.647 min Scan# 4335
Delta R.T. 0.009 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

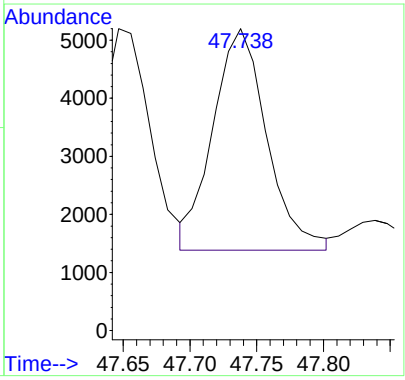
Tgt Ion:218 Resp: 10005

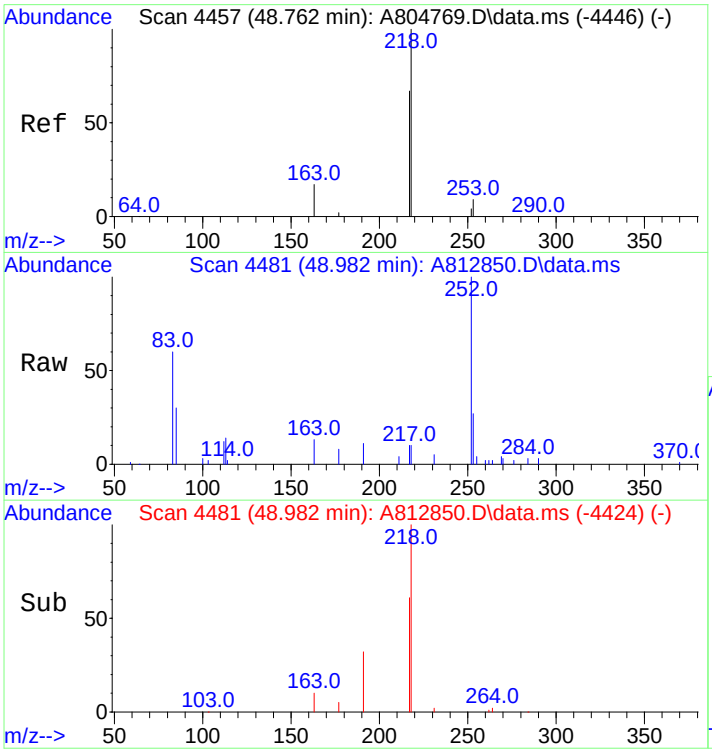




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 303.21 ng/ml m
RT: 47.738 min Scan# 4345
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

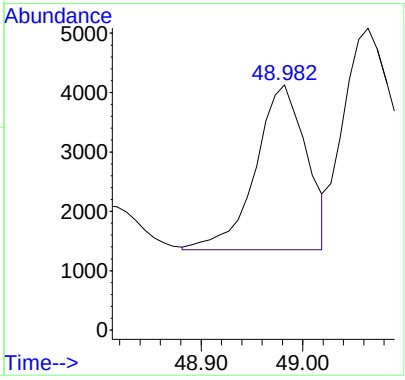
Tgt Ion:218 Resp: 10708

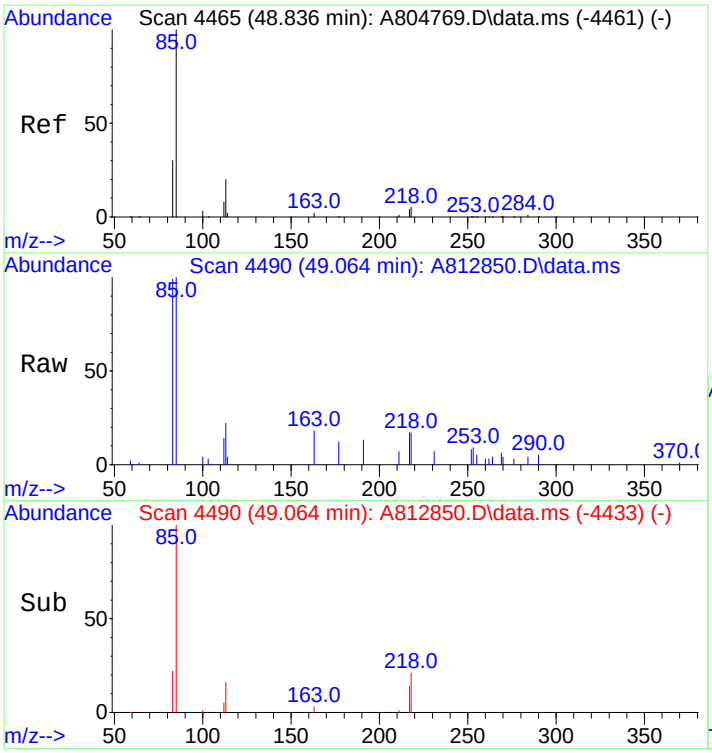




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 275.09 ng/ml m
RT: 48.982 min Scan# 4481
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

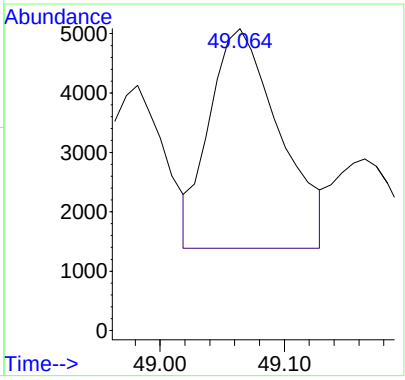
Tgt Ion:218 Resp: 9715

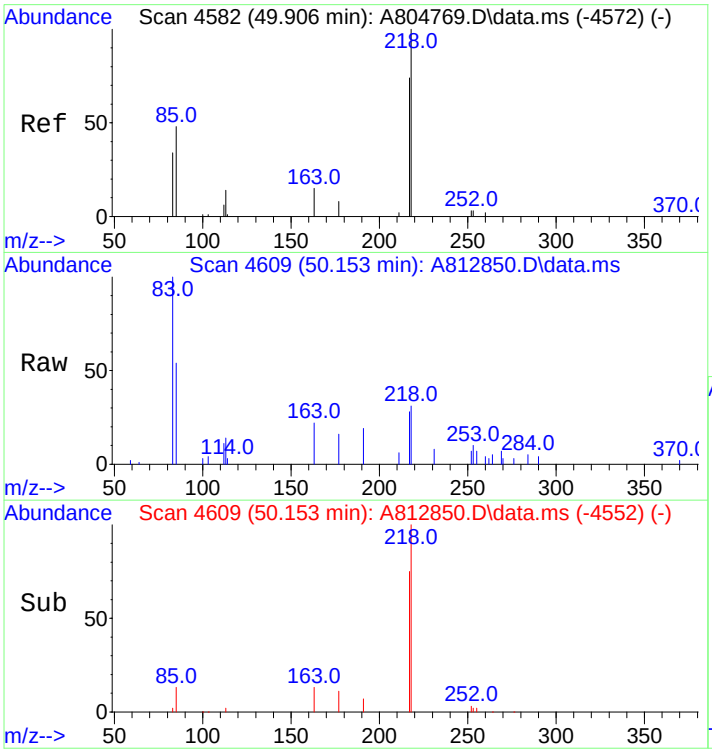




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 411.69 ng/ml m
RT: 49.064 min Scan# 4490
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

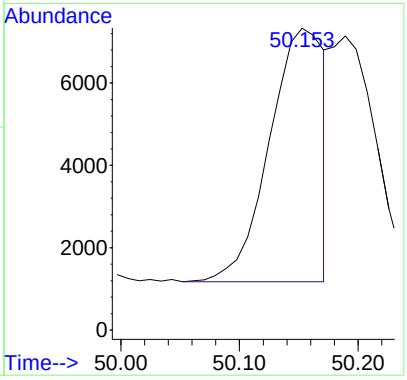
Tgt Ion:218 Resp: 14539

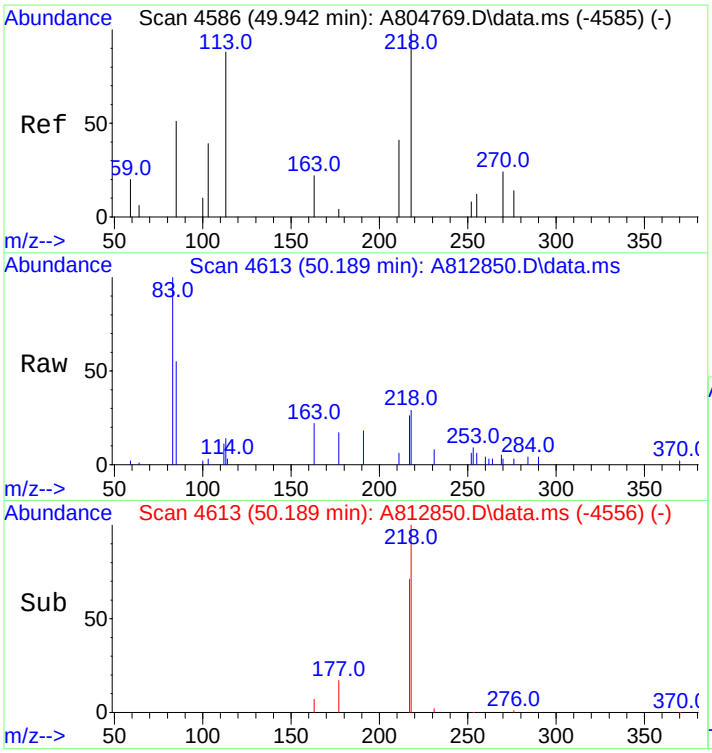




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 559.62 ng/ml
RT: 50.153 min Scan# 4609
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

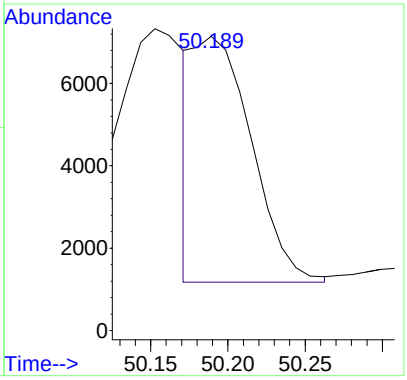
Tgt Ion:218 Resp: 19763

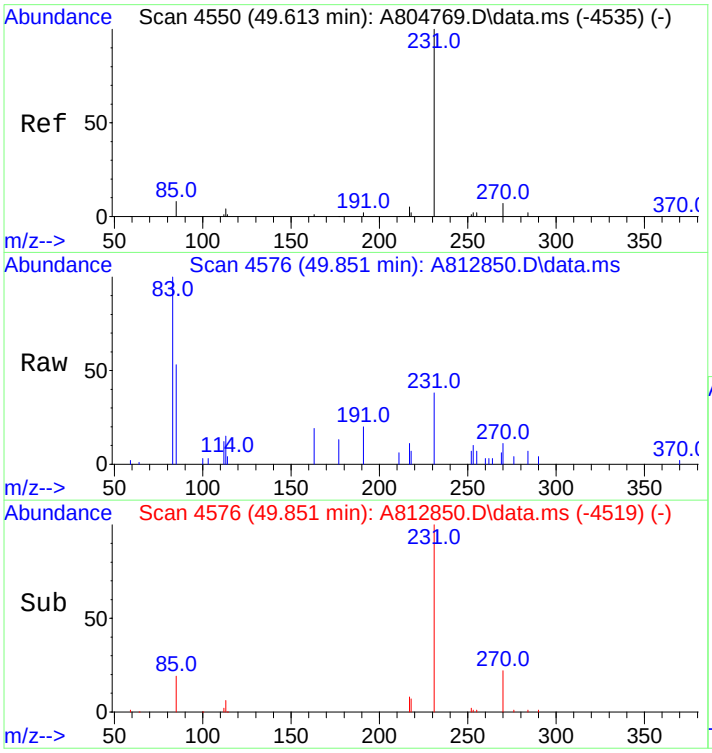




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 441.93 ng/ml m
RT: 50.189 min Scan# 4613
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

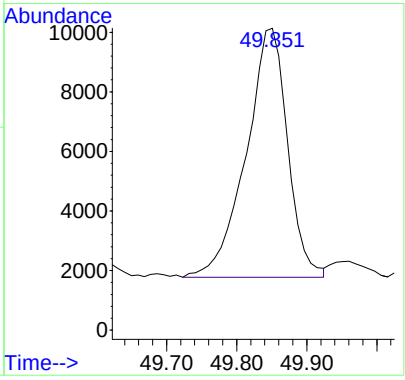
Tgt Ion:218 Resp: 15607

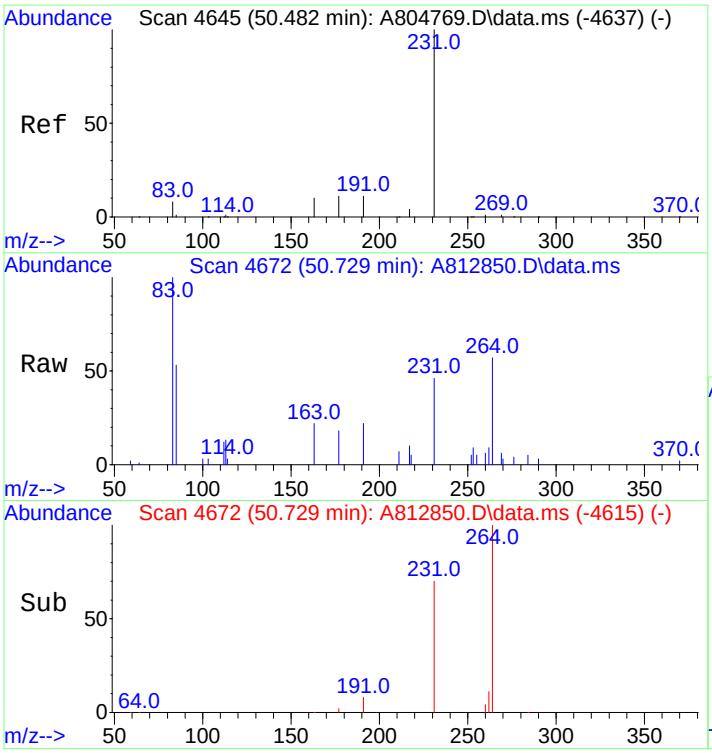




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 975.36 ng/mL
RT: 49.851 min Scan# 4576
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

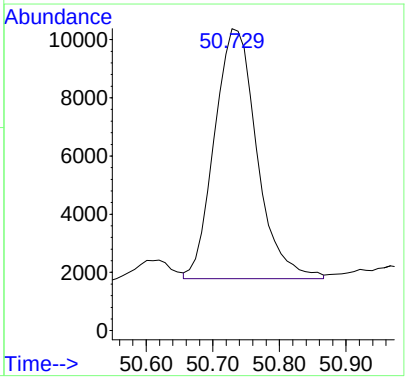
Tgt Ion:231 Resp: 34445

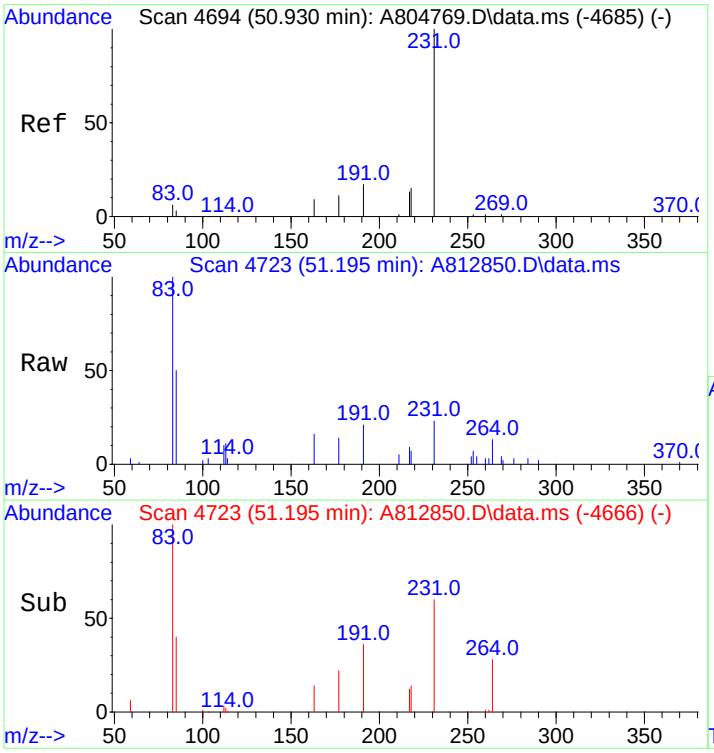




#148
C28,20S-triaromatic steroid
Concen: 1079.08 ng/mL m
RT: 50.729 min Scan# 4672
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

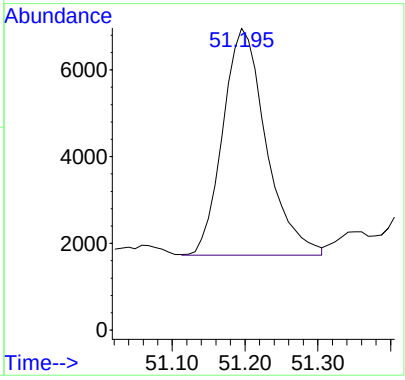
Tgt Ion:231 Resp: 38108

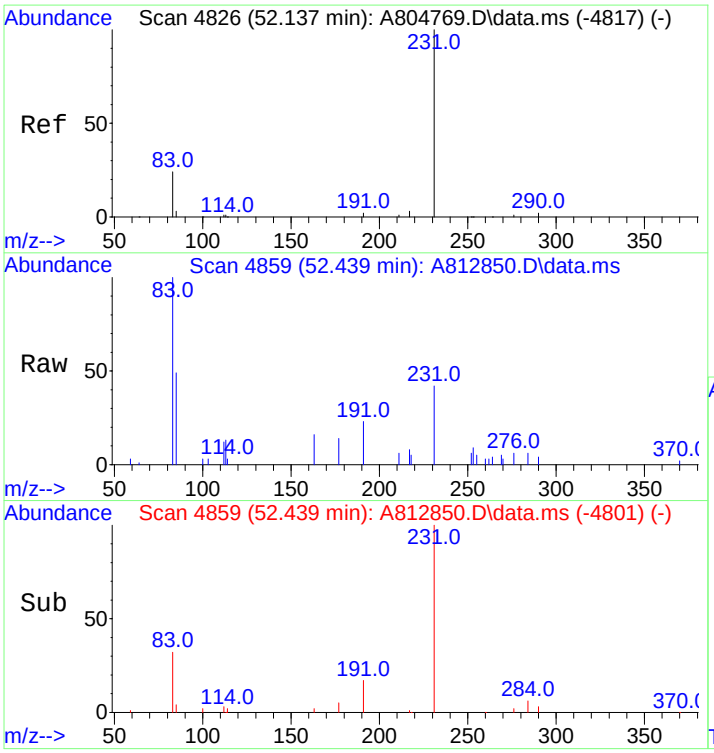




#149
C27,20R-triaromatic steroid
Concen: 613.84 ng/mL m
RT: 51.195 min Scan# 4723
Delta R.T. 0.018 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

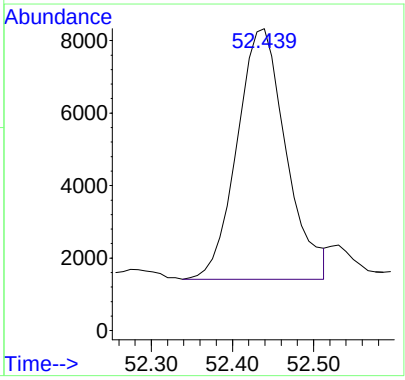
Tgt Ion:231 Resp: 21678





#150
C28,20R-triaromatic steroid
Concen: 822.93 ng/mL
RT: 52.439 min Scan# 4859
Delta R.T. 0.028 min
Lab File: A812850.D
Acq: 20 Nov 2012 1:48 am

Tgt Ion:231 Resp: 29062



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	57093	500.000	ng/mL	0.00
74) Chrysene-d12	43.442	240	91681	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	89067	393.647	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.36%#			
42) Phenanthrene-d10	32.852	188	80311	457.068	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.71%#			
83) Benzo[b]fluoranthene-d12	47.354	264	79694	456.097	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.61%#			
88) Benzo[a]pyrene-d12	48.561	264	70448	408.088	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 40.81%#			
129) 5B(H)Cholane - Surr	44.054	217	18529	552.705	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.27%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2154	42.455	ng/mL	100
4) cis-Decalin	17.869	138	67M3	1.803	ng/mL	
5) C1-Decalins	18.143	152	5079M5	100.105	ng/mL	
6) C2-Decalins	19.923	166	8188M5	161.383	ng/mL	
7) C3-Decalins	22.396	180	10130M5	199.659	ng/mL	
8) C4-Decalins	25.781	194	20124M5	396.637	ng/mL	
10) Naphthalene	20.087	128	131772	509.067	ng/mL#	100
11) C1-Naphthalenes	22.779	142	151698M5	586.046	ng/mL	
12) C2-Naphthalenes	25.617	156	310927M5	1201.186	ng/mL	
13) C3-Naphthalenes	27.962	170	464061M5	1792.779	ng/mL	
14) C4-Naphthalenes	30.727	184	417023M5	1611.060	ng/mL	
16) 2-Methylnaphthalene	22.779	142	84818	550.078	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	65547	453.971	ng/mL#	100
18) Benzothiophene	20.306	134	4675	22.344	ng/mL	100
19) C1-Benzo(b)thiophenes	23.162	148	11523M5	55.074	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	29180M5	139.466	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	63471M5	303.360	ng/mL	
22) C4-Benzo(b)thiophenes	29.896	190	75136M5	359.113	ng/mL	
23) Biphenyl	24.659	154	18388	93.732	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	66139	501.193	ng/mL#	100
25) Dibenzofuran	27.752	168	80914	390.962	ng/mL	98
26) Acenaphthylene	26.374	152	38714	164.772	ng/mL#	100
27) Acenaphthene	27.104	153	70704	504.166	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.656	170	34586M3	304.305	ng/mL	
29) Fluorene	29.121	166	105213M3	668.907	ng/mL	
30) C1-Fluorenes	31.493	180	77739M5	494.237	ng/mL	
31) C2-Fluorenes	33.683	194	162934M5	1035.877	ng/mL	
32) C3-Fluorenes	36.193	208	216524M5	1376.583	ng/mL	
33) Dibenzothiophene	32.451	184	113605	525.233	ng/mL#	76
34) 4-Methyldibenzothiophe...	34.221	198	86820	401.397	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.541	198	74942M3	346.481	ng/mL	
36) 1-Methyldibenzothiophe...	34.988	198	35208	162.778	ng/mL#	100
37) OTP	34.605	198	4635M3	21.429	ng/mL	
38) C1-Dibenzothiophenes	34.221	198	225040M5	1040.433	ng/mL	
39) C2-Dibenzothiophenes	35.910	212	377059M5	1743.267	ng/mL	
40) C3-Dibenzothiophenes	37.708	226	387952M5	1793.629	ng/mL	
41) C4-Dibenzothiophenes	39.398	240	259861M5	1201.422	ng/mL	
43) Phenanthrene	32.944	178	1282353	6159.774	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.906	192	170578	819.370	ng/mL	99
45) 2-Methylphenanthrene(2MP)	35.016	192	195308	938.161	ng/mL	97
46) 2-Methylanthracene(2MA)	35.171	192	49974	240.050	ng/mL#	39
47) 9/4-Methylphenanthrene...	35.353	192	184679M3	887.104	ng/mL	
48) 1-Methylphenanthrene(1MP)	35.445	192	135091	648.909	ng/mL	95
49) C1-Phenanthrenes/Anthr...	35.016	192	746436M5	3585.500	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50)	C2-Phenanthrenes/Anthr...	37.170	206	644459M5	3095.654	ng/mL	
52)	C3-Phenanthrenes/Anthr...	39.005	220	430406M5	2067.452	ng/mL	
53)	C4-Phenanthrenes/Anthr...	41.178	234	228424M5	1097.233	ng/mL	
55)	Anthracene	33.126	178	210944M3	1087.631	ng/mL	
56)	Carbazole	33.792	167	151417	748.209	ng/mL	98
57)	1-Methylphenanthrene	35.445	192	134600M3	912.096	ng/mL	
58)	Fluoranthene	37.727	202	1960043	9140.325	ng/mL	100
59)	Benzo(b)fluorene	40.238	216	94499M3	761.802	ng/mL	
60)	Pyrene	38.612	202	1703369	7853.224	ng/mL	94
61)	C1-Fluoranthenes/Pyrenes	39.991	216	811996M5	3743.632	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.036	230	634686M5	2926.160	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.917	244	340743M5	1570.964	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.205	258	284885M5	1313.436	ng/mL	
66)	Naphthobenzothiophene	42.447	234	167336M3	831.078	ng/ml	
67)	Naphthobenzothiophene-...	42.447	234	166645M3	827.646	ng/mL	
68)	Naphthobenzothiophene-...	42.794	234	36732	182.430	ng/mL#	10
69)	Naphthobenzothiophene-...	43.086	234	38805M3	192.726	ng/mL	
70)	C1-Naphthobenzothiophenes	43.844	248	201979M5	1003.134	ng/ml	
71)	C2-Naphthobenzothiophenes	45.844	262	239548M5	1189.721	ng/ml	
72)	C3-Naphthobenzothiophenes	47.463	276	180714M5	897.521	ng/ml	
73)	C4-Naphthobenzothiophenes	48.561	290	116138M5	576.802	ng/mL	
75)	Benz[a]anthracene	43.378	228	715905	3561.964	ng/mL	98
77)	Chrysene/Triphenylene	43.543	228	890775	4378.459	ng/mL	99
78)	C1-Chrysenes	45.013	242	402164M5	1976.772	ng/mL	
79)	C2-Chrysenes	46.723	256	293824M5	1444.244	ng/mL	
80)	BBF-D12 Surr BKGD	47.345	256	4070	20.005	ng/mL	100
81)	C3-Chrysenes	47.774	270	238985M5	1174.692	ng/mL	
82)	C4-Chrysenes	49.338	284	126279M5	620.704	ng/mL	
84)	Benzo[b]fluoranthene	47.445	252	843665	3908.448	ng/mL	99
85)	Benzo[j]+[k]fluoranthene	47.518	252	728040	3091.170	ng/mL	99
86)	Benzo[a]fluoranthene	47.829	252	128404	545.188	ng/mL#	1
87)	Benzo[e]pyrene	48.460	252	654434	2942.444	ng/mL	97
89)	Benzo[a]pyrene	48.653	252	764069	3713.818	ng/mL	97
90)	Perylene	48.973	252	234923	1045.366	ng/mL	94
91)	Indeno[1,2,3-cd]pyrene	53.582	276	556061M3	2544.354	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.627	278	132520M6	618.607	ng/mL	
93)	Benzo[g,h,i]perylene	54.925	276	599895	2418.764	ng/mL	100
94)	Hopane (T19)	52.658	191	129083M3	1874.742	ng/mL	
96)	C23 Tricyclic Terpane ...	41.087	191	24854	360.968	ng/ml	100
97)	C24 Tricyclic Terpane ...	41.808	191	17429	253.131	ng/ml	100
98)	C25 Tricyclic Terpane ...	43.296	191	20823M3	302.424	ng/ml	
99)	C24 Tetracyclic Terpan...	44.620	191	9740M3	141.459	ng/ml	
100)	C26 Tricyclic Terpane-...	44.346	191	8609M3	125.033	ng/ml	
101)	C26 Tricyclic Terpane-...	44.438	191	6940M3	100.793	ng/ml	
102)	C28 Tricyclic Terpane-...	46.732	191	8973	130.320	ng/ml	100
103)	C28 Tricyclic Terpane-...	46.887	191	10034	145.729	ng/ml	100
104)	C29 Tricyclic Terpane-...	47.418	191	8951	130.000	ng/ml	100
105)	C29 Tricyclic Terpane-...	47.619	191	10971M3	159.338	ng/ml	
106)	18a-22,29,30-Trisnorne...	48.781	191	23329	338.820	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.863	191	8457M3	122.826	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.110	191	6798	98.731	ng/mL	100
109)	17a(H)-22,29,30-Trisno...	49.338	191	31040M3	450.811	ng/ml	
110)	17a/b,21b/a 28,30-Bisn...	50.564	191	8975	130.349	ng/ml	100
111)	17a(H),21b(H)-25-Norho...	50.335	191	4209	61.130	ng/ml	100
112)	30-Norhopane (T15)	51.250	191	85663	1244.130	ng/ml	100
113)	18a(H)-30-Norneohopane...	51.360	191	23754M3	344.992	ng/ml	
114)	17a(H)-Diahopane (X)	51.488	191	7249M3	105.281	ng/ml	
115)	30-Normoretane (T17)	52.046	191	13407	194.717	ng/ml	100
116)	18a(H)&18b(H)-Oleanane...	52.466	191	7752M4	112.586	ng/ml	
117)	Moretane (T20)	53.372	191	25870M4	375.724	ng/ml	
118)	30-Homohopane-22S (T21)	54.505	191	45422M3	659.688	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

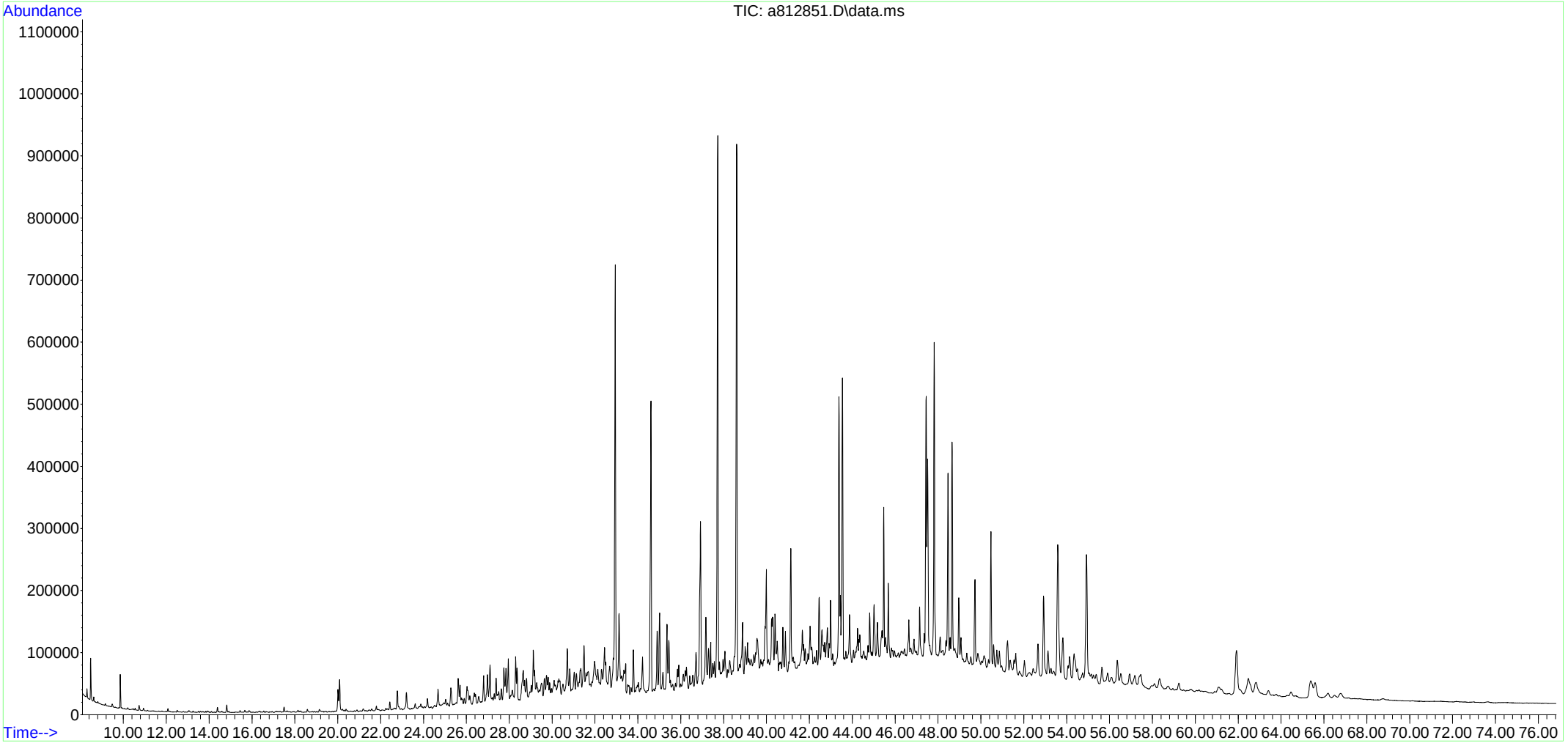
	Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119)	30-Homohopane-22R (T22)	54.742	191		39390	572.082	ng/ml	100
120)	Gammacerane/C32-diahopane	55.309	191		14136M4	205.305	ng/mL	
121)	30,31-Bishomohopane-22...	56.104	191	G	54586	792.782	ng/ml	100
122)	30,31-Bishomohopane-22...	56.515	191		23936	347.635	ng/ml	100
123)	30,31-Trishomohopane-2...	58.315	191		27052	392.891	ng/ml	100
124)	30,31-Trishomohopane-2...	58.955	191		13818	200.686	ng/ml	100
125)	Tetrakishomohopane-22S...	61.057	191		25342	368.056	ng/ml	100
126)	Tetrakishomohopane-22R...	61.897	191	G	30020	435.997	ng/ml	100
127)	Pentakishomohopane-22S...	64.292	191		15698	227.991	ng/ml	100
128)	Pentakishomohopane-22R...	65.644	191		10393M3	150.943	ng/ml	
130)	13b(H),17a(H)-20S-Diac...	45.561	217		9289	277.083	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.982	217		5126	152.904	ng/ml	100
132)	13b,17a-20S-Methyldiac...	46.686	217		5362M3	159.944	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.564	217		18028	537.760	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.095	217		18591	554.554	ng/ml	100
135)	Unknown Sterane (S18)	48.378	217		4568	136.260	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.643	217		641	19.121	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.799	217		8604	256.650	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.540	217		6766M3	201.824	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.896	217		13741M3	409.883	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.838	217		12173M3	363.111	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.656	218		10136M3	302.349	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.738	218		10322M3	307.897	ng/ml	
143)	14b,17b-20R-Methylchol...	48.991	218		9393M3	280.185	ng/ml	
144)	14b,17b-20S-Methylchol...	49.073	218		13938M3	415.759	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.162	218		20245M3	603.892	ng/ml	
146)	14b(H),17b(H)-20S-Ethy...	50.198	218		13330M3	397.623	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.851	231		32749	976.876	ng/mL	100
148)	C28,20S-triaromatic st...	50.738	231		36647	1093.150	ng/mL	100
149)	C27,20R-triaromatic st...	51.204	231		21493M4	641.118	ng/mL	
150)	C28,20R-triaromatic st...	52.439	231		26897M3	802.315	ng/mL	

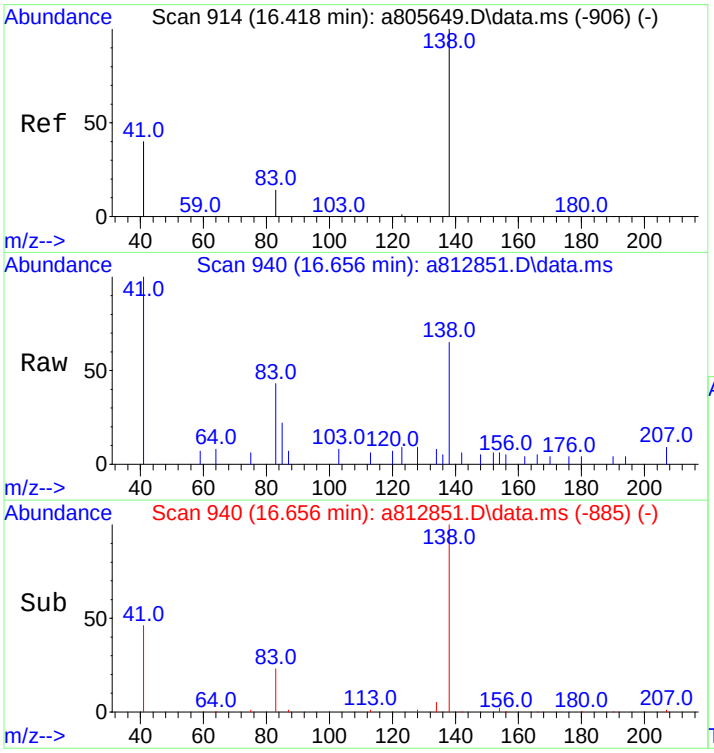
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812851.D
Acq On : 20 Nov 2012 3:12 am
Operator : AC
Sample : 1210082-04
Misc : 1x
ALS Vial : 32 Sample Multiplier: 1

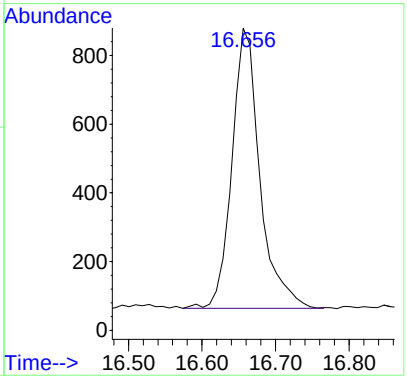
Quant Time: Nov 20 15:14:11 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

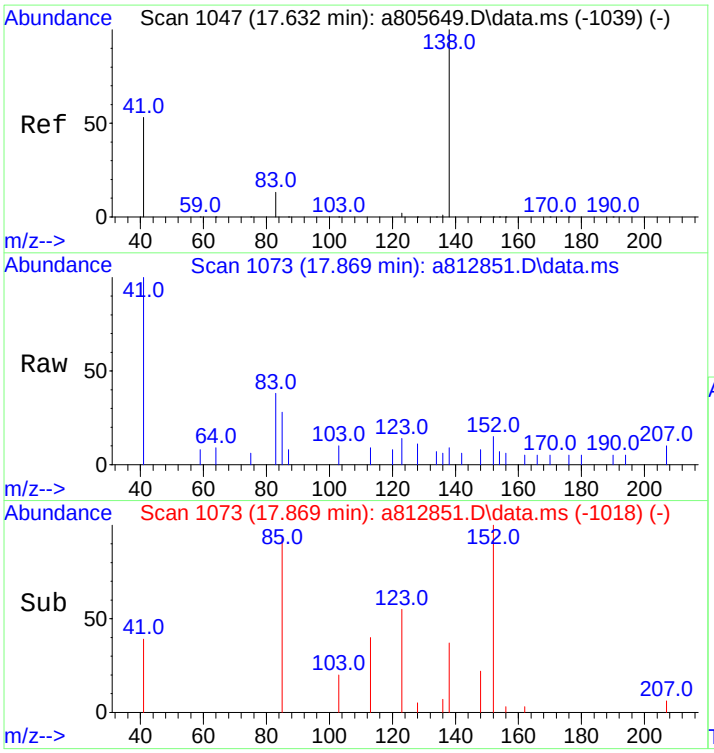




#3
trans-Decalin
Concen: 42.45 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

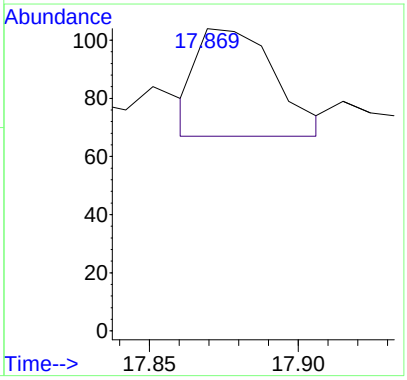
Tgt Ion:138 Resp: 2154

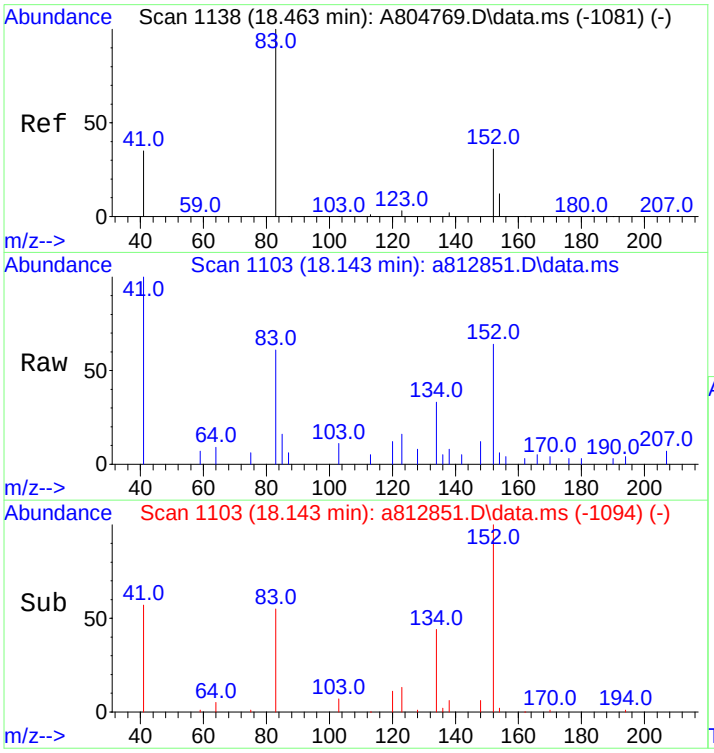




#4
cis-Decalin
Concen: 1.80 ng/mL m
RT: 17.869 min Scan# 1073
Delta R.T. -0.001 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

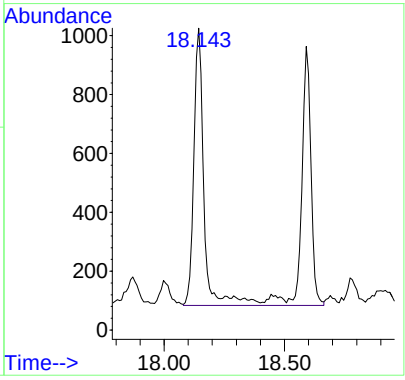
Tgt Ion:138 Resp: 67

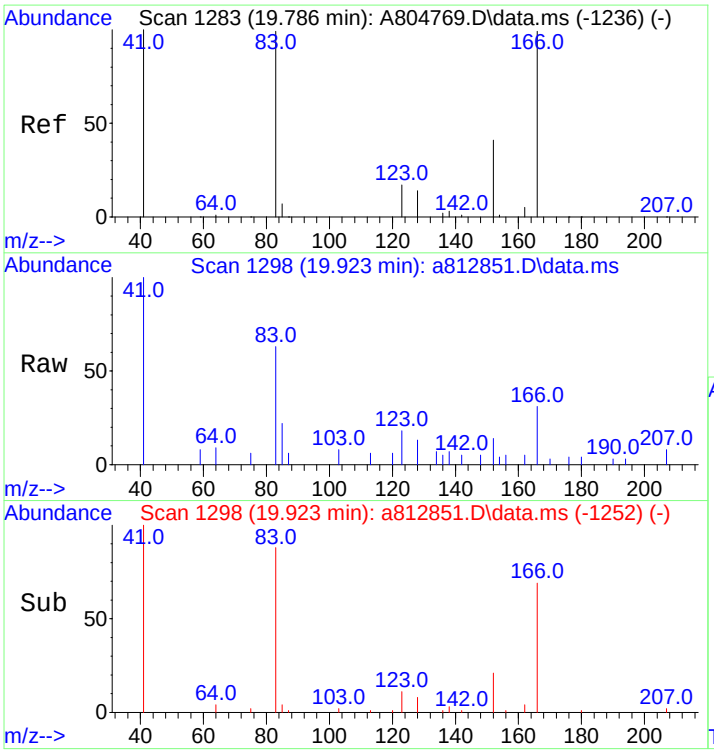




#5
C1-Decalins
Concen: 100.11 ng/mL m
RT: 18.143 min Scan# 1103
Delta R.T. -0.447 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

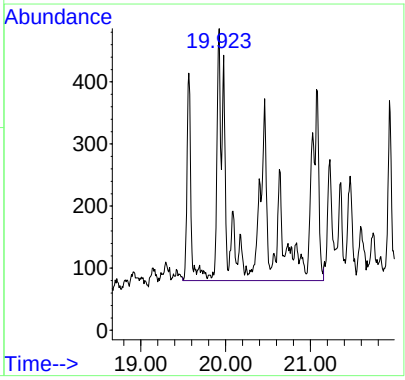
Tgt Ion:152 Resp: 5079

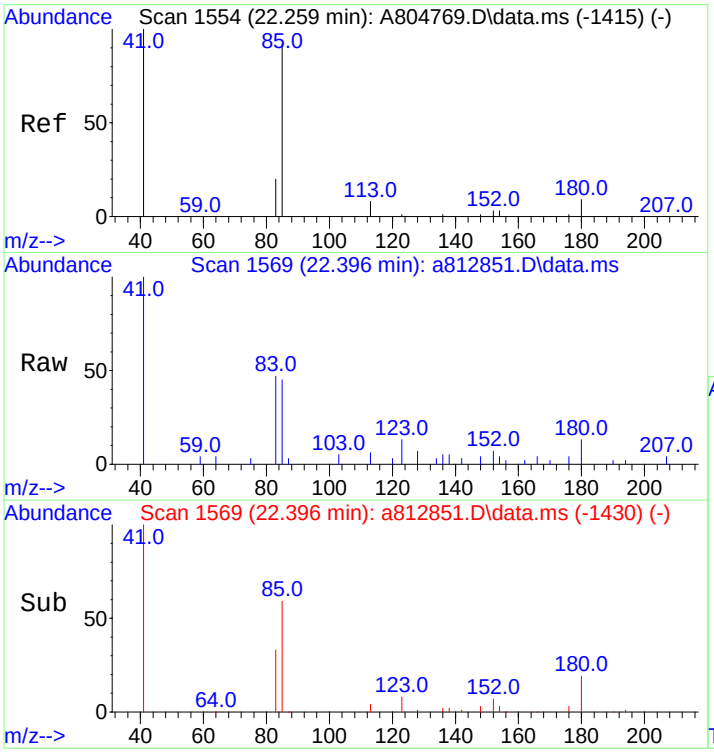




#6
C2-Decalins
Concen: 161.38 ng/mL m
RT: 19.923 min Scan# 1298
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

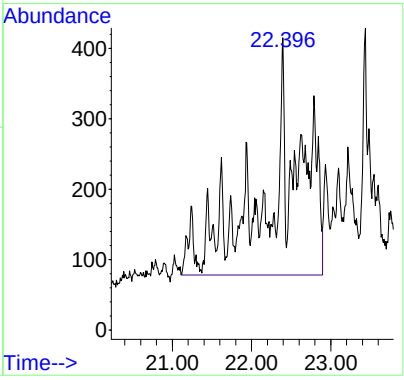
Tgt Ion:166 Resp: 8188

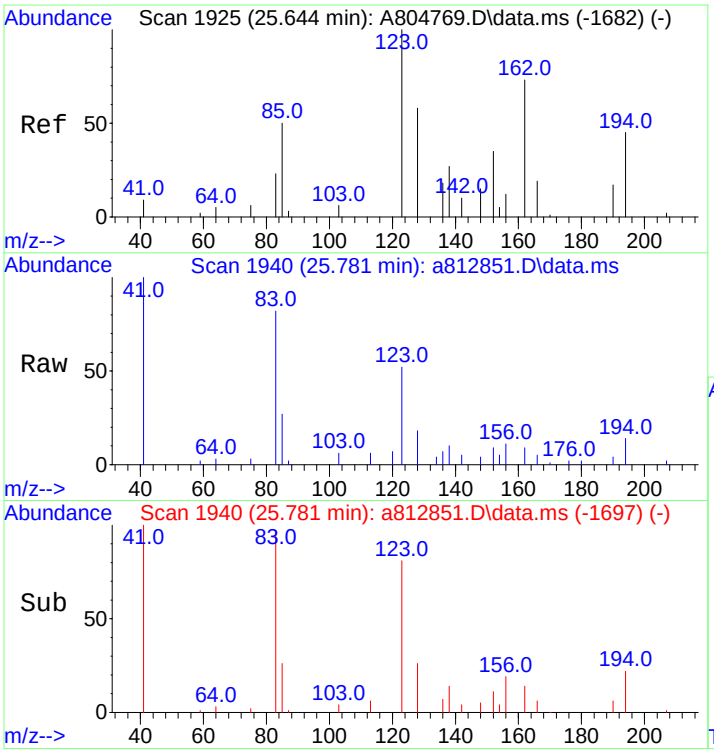




#7
C3-Decalins
Concen: 199.66 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

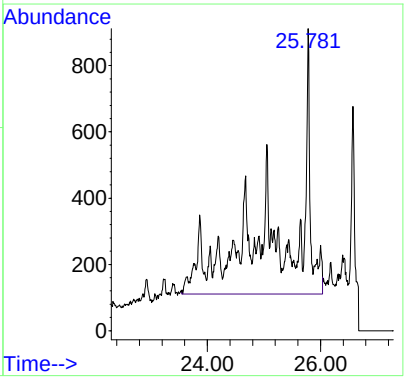
Tgt Ion:180 Resp: 10130

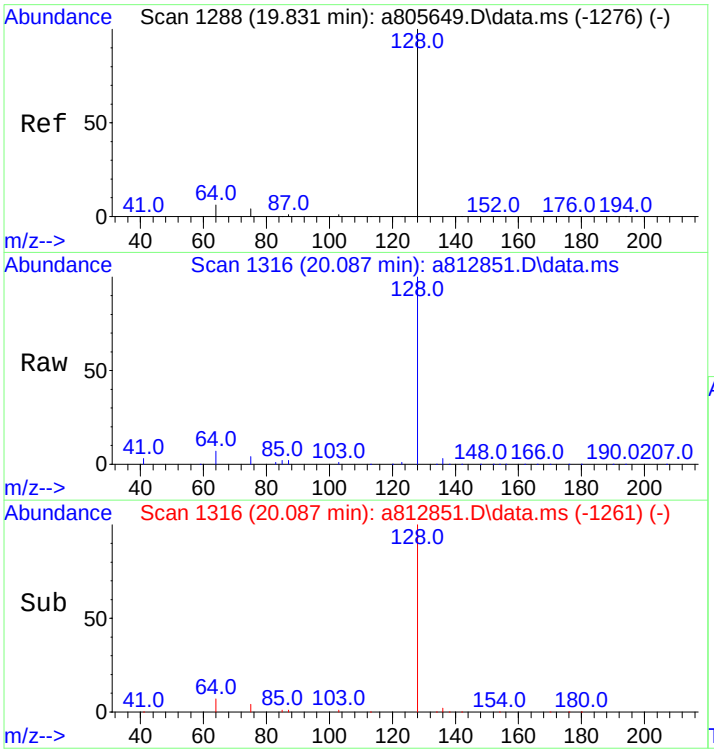




#8
C4-Decalins
Concen: 396.64 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:194 Resp: 20124

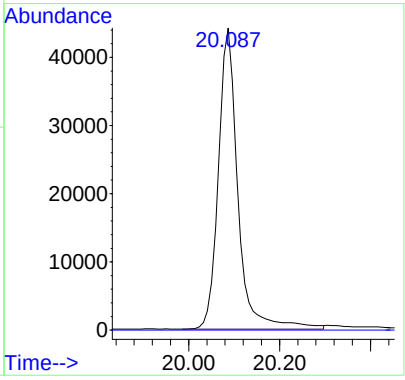


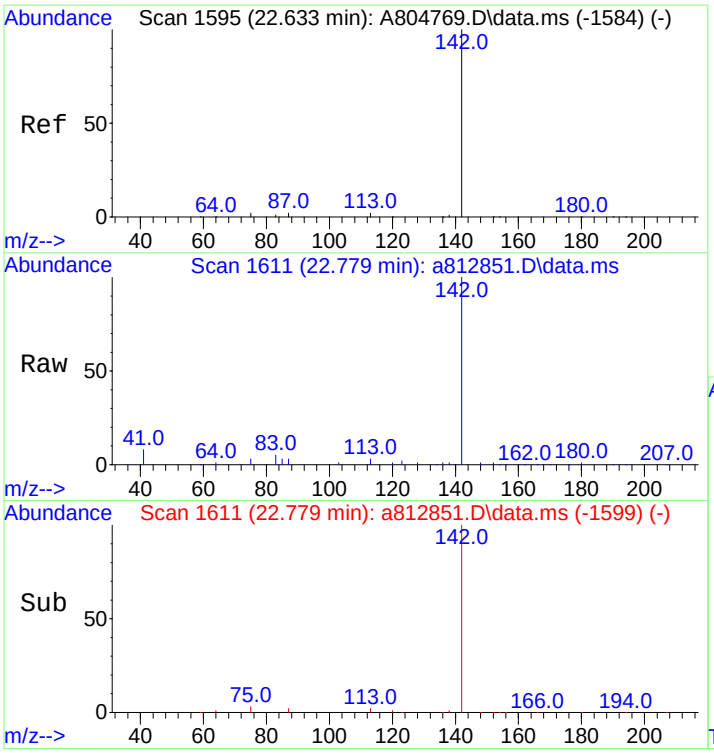


#10
Naphthalene
Concen: 509.07 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:128 Resp: 131772

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

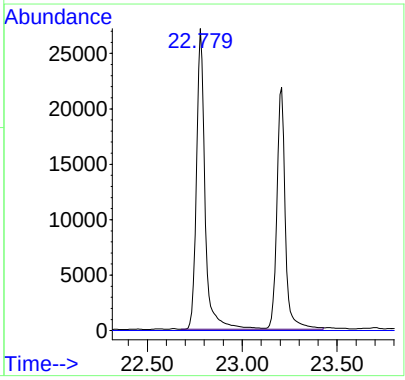


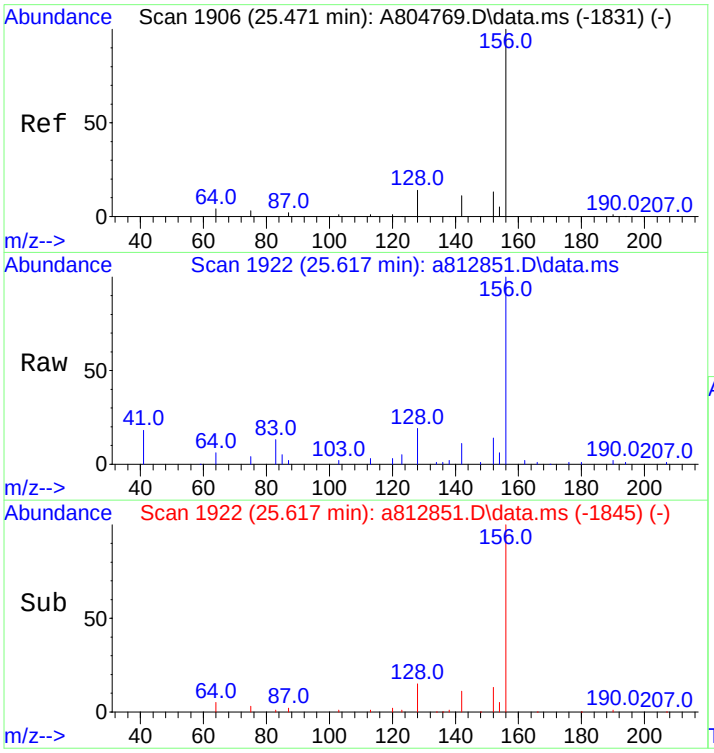


#11
C1-Naphthalenes
Concen: 586.05 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:142 Resp: 151698

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

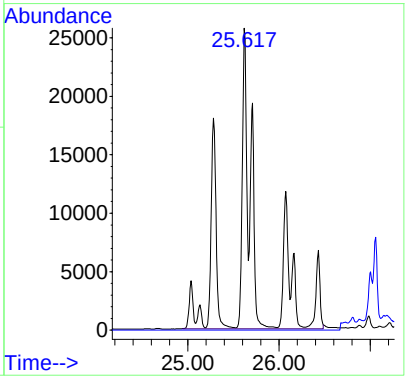


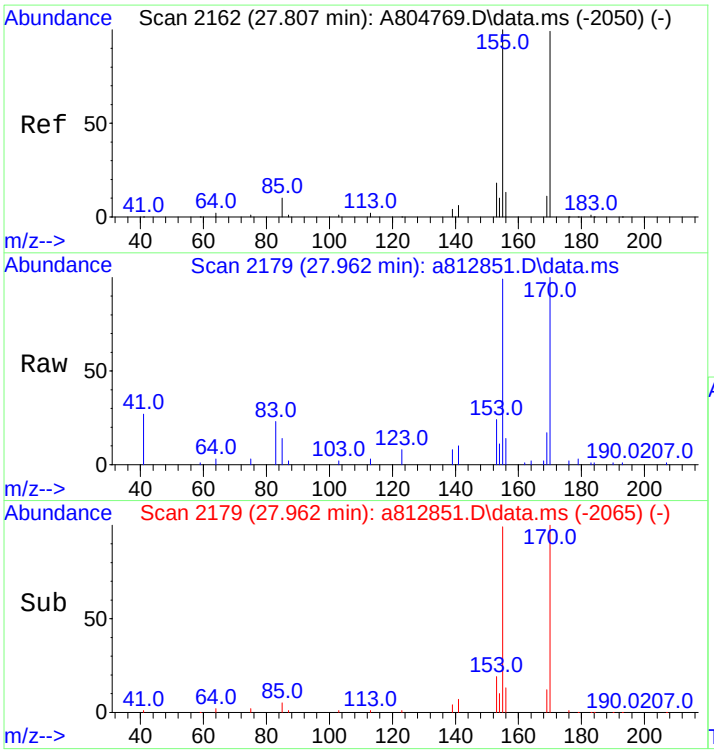


#12
C2-Naphthalenes
Concen: 1201.19 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:156 Resp: 310927

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

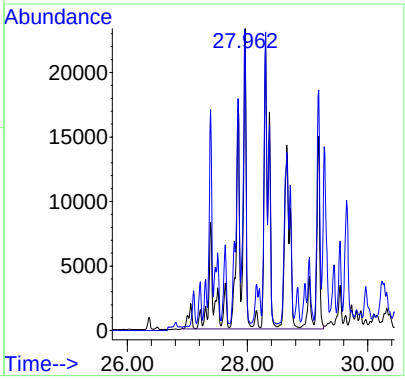


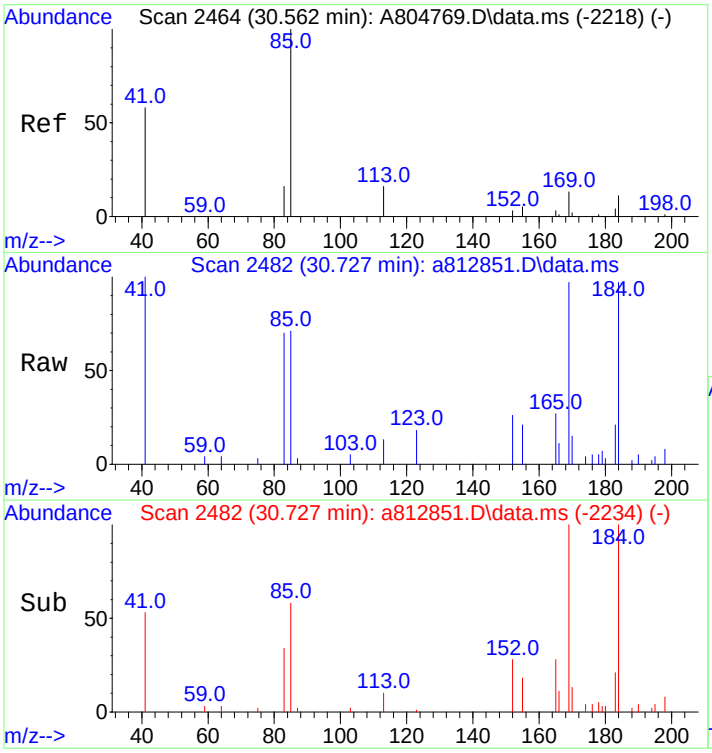


#13
C3-Naphthalenes
Concen: 1792.78 ng/mL m
RT: 27.962 min Scan# 2179
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:170 Resp: 464061

Ion	Ratio	Lower	Upper
170	100		
155	15.4	80.2	120.4#

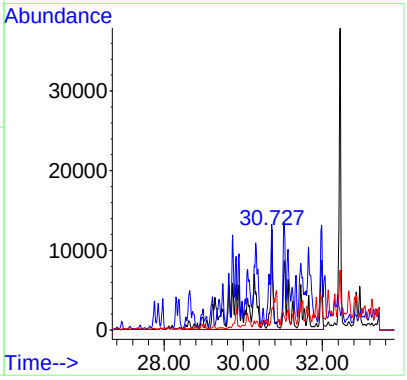


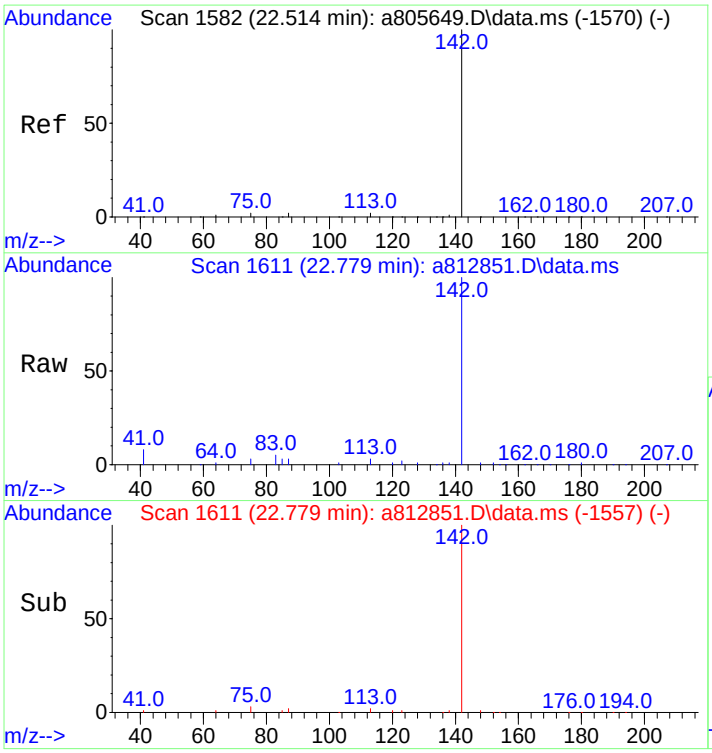


#14
C4-Naphthalenes
Concen: 1611.06 ng/mL m
RT: 30.727 min Scan# 2482
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:184 Resp: 417023

Ion	Ratio	Lower	Upper
184	100		
169	10.4	108.2	162.2#
183	0.0	29.7	44.5#

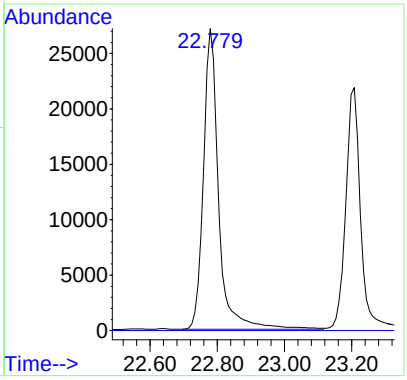


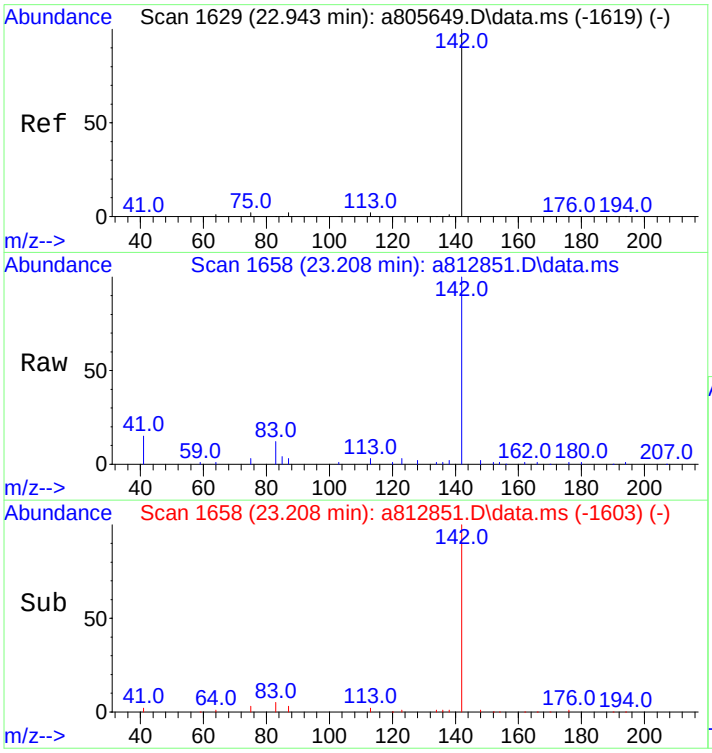


#16
2-Methylnaphthalene
Concen: 550.08 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:142 Resp: 84818

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

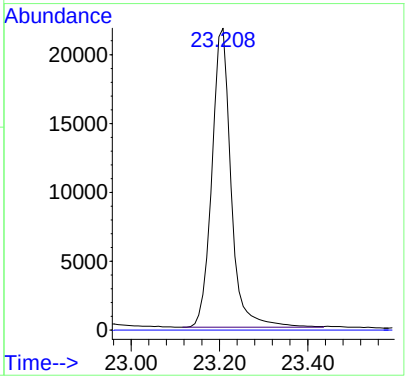


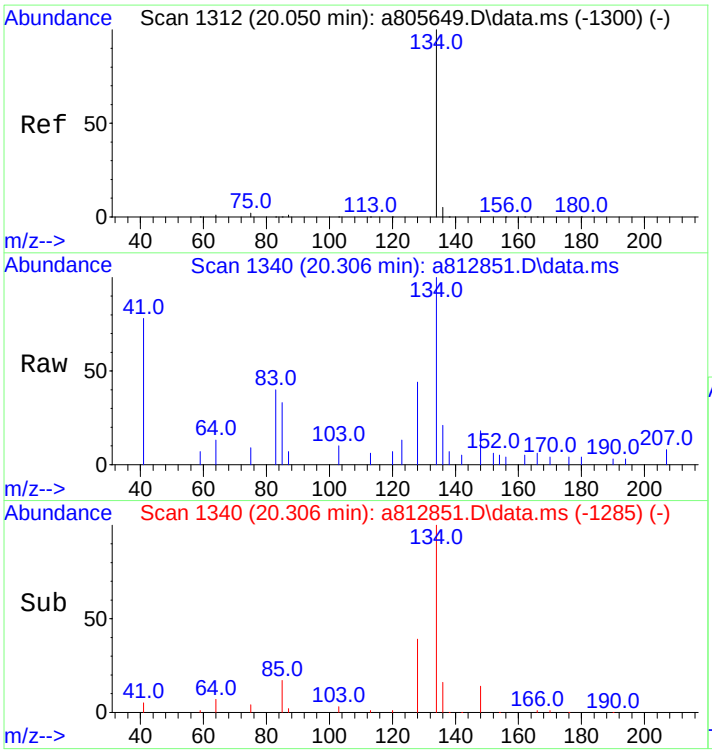


#17
1-Methylnaphthalene
Concen: 453.97 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:142 Resp: 65547

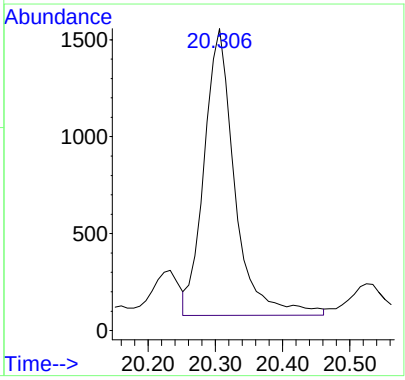
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

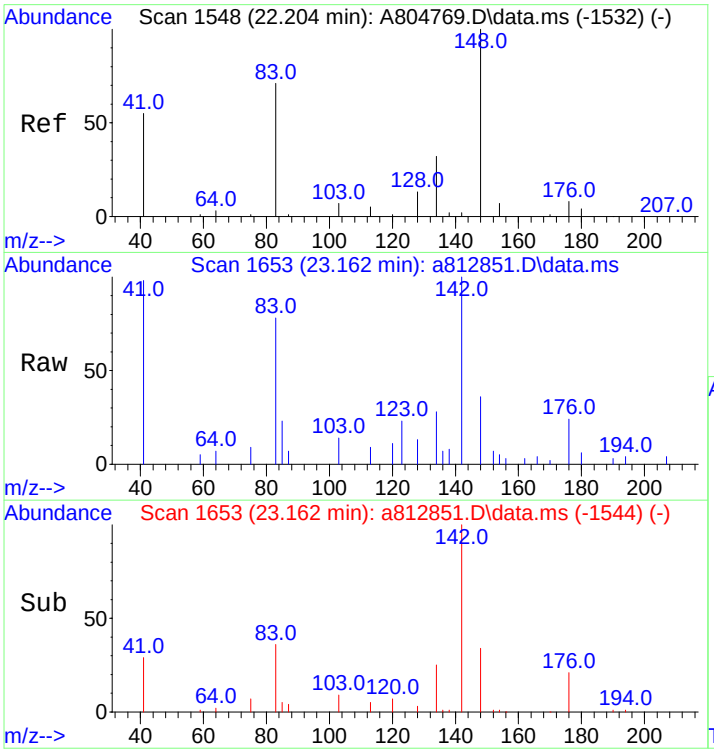




#18
Benzothiophene
Concen: 22.34 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

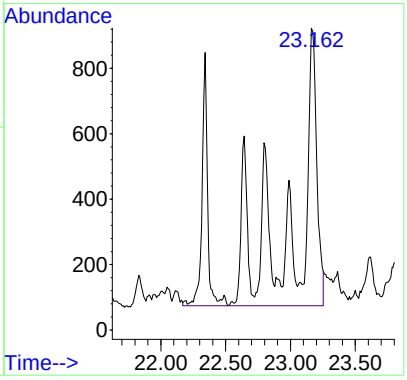
Tgt Ion:134 Resp: 4675

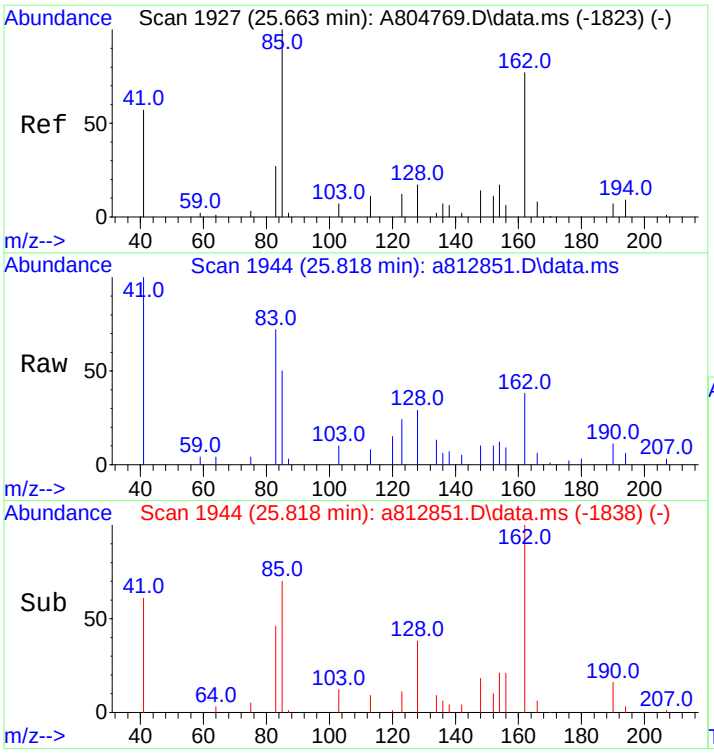




#19
C1-Benzo(b)thiophenes
Concen: 55.07 ng/mL m
RT: 23.162 min Scan# 1653
Delta R.T. 0.821 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

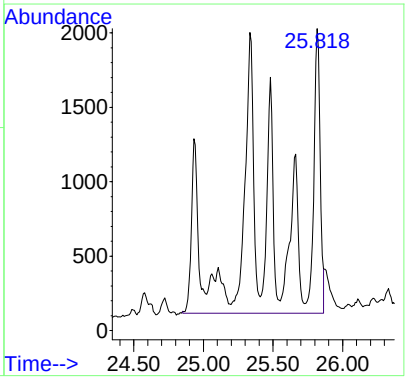
Tgt Ion:148 Resp: 11523

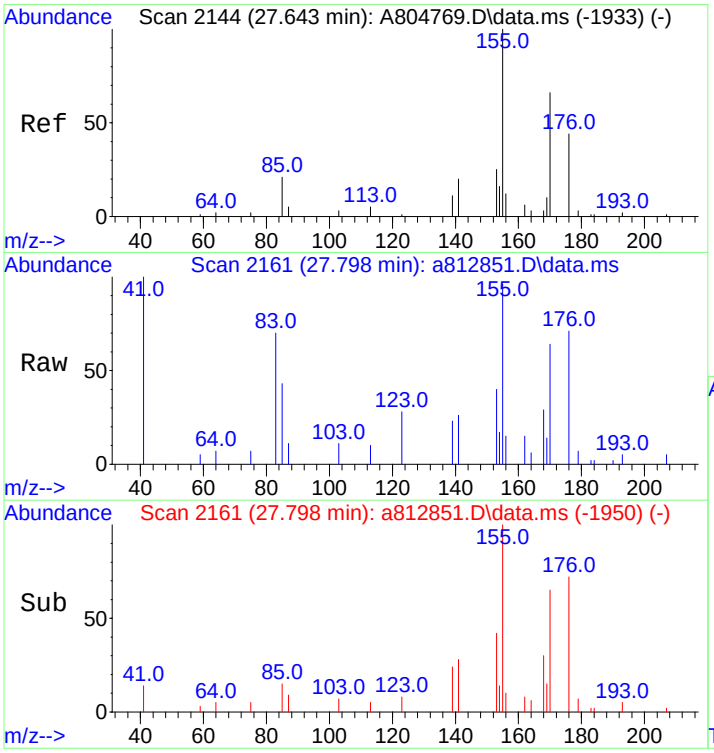




#20
C2-Benzo(b)thiophenes
Concen: 139.47 ng/mL m
RT: 25.818 min Scan# 1944
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

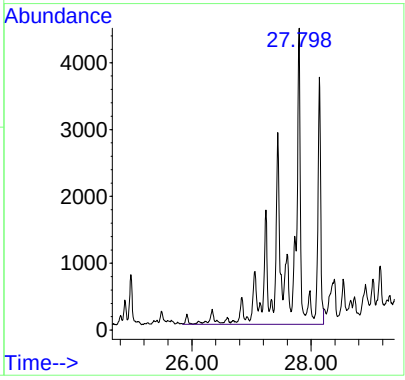
Tgt Ion:162 Resp: 29180

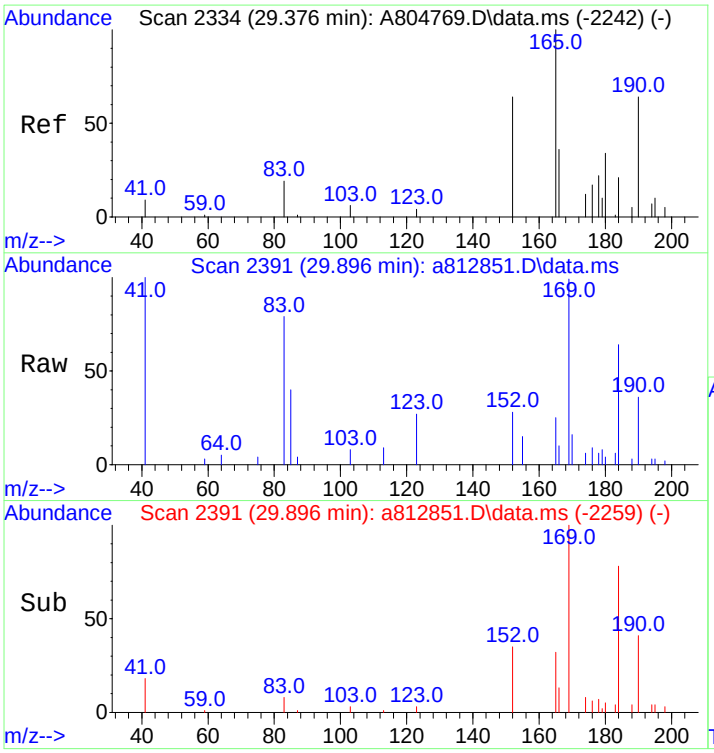




#21
C3-Benzo(b)thiophenes
Concen: 303.36 ng/mL m
RT: 27.798 min Scan# 2161
Delta R.T. 0.016 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

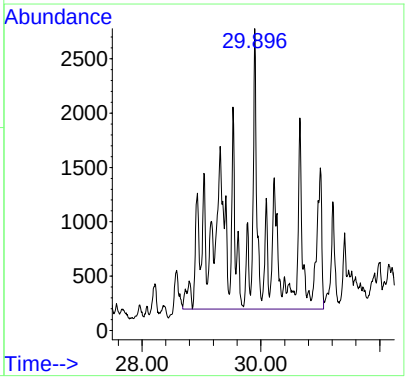
Tgt Ion:176 Resp: 63471

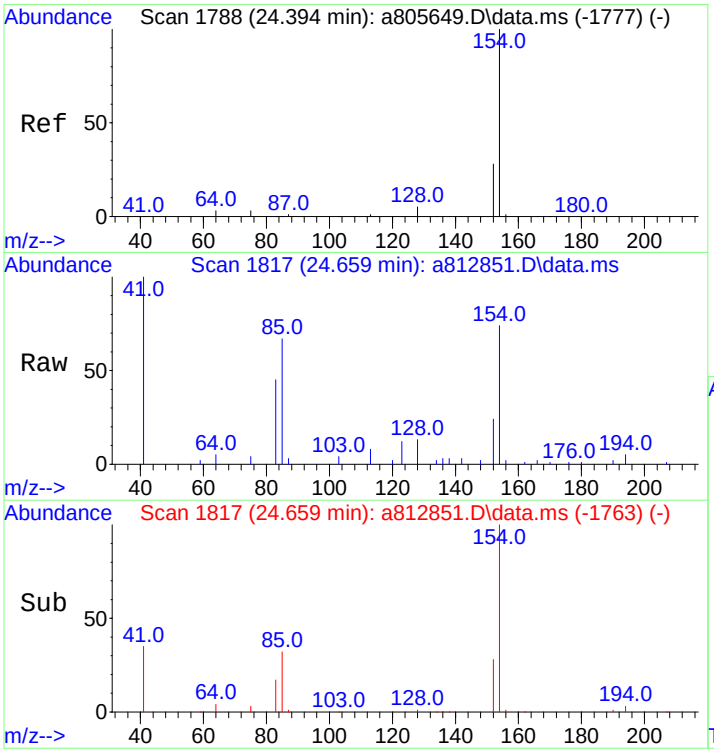




#22
C4-Benzo(b)thiophenes
Concen: 359.11 ng/mL m
RT: 29.896 min Scan# 2391
Delta R.T. 0.365 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:190 Resp: 75136

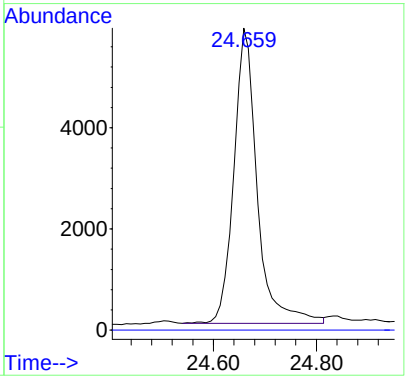


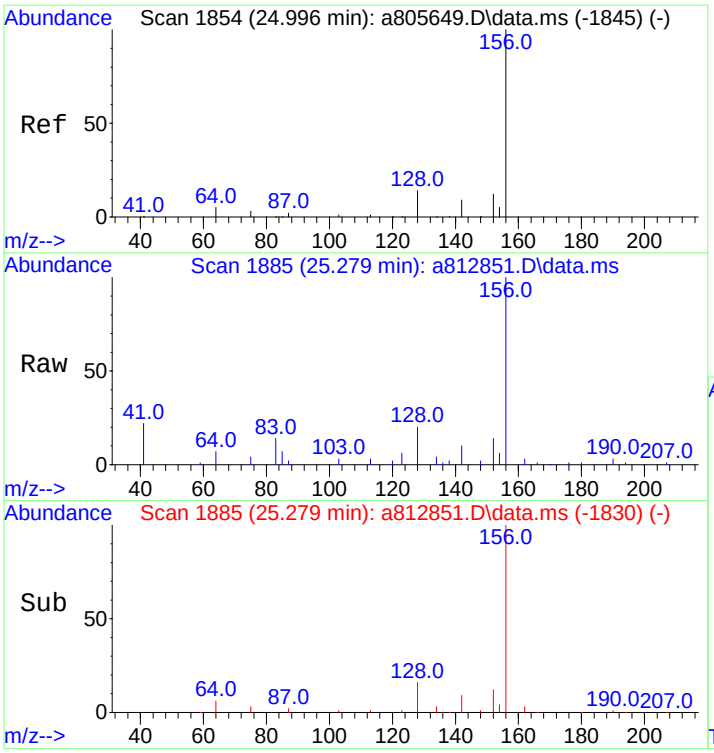


#23
Biphenyl
Concen: 93.73 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:154 Resp: 18388

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

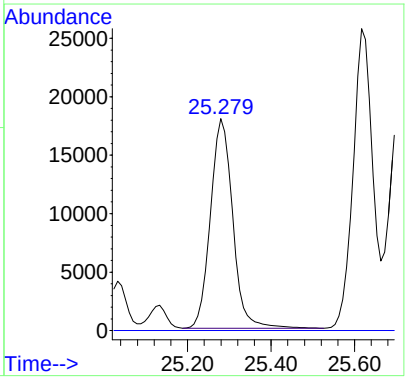


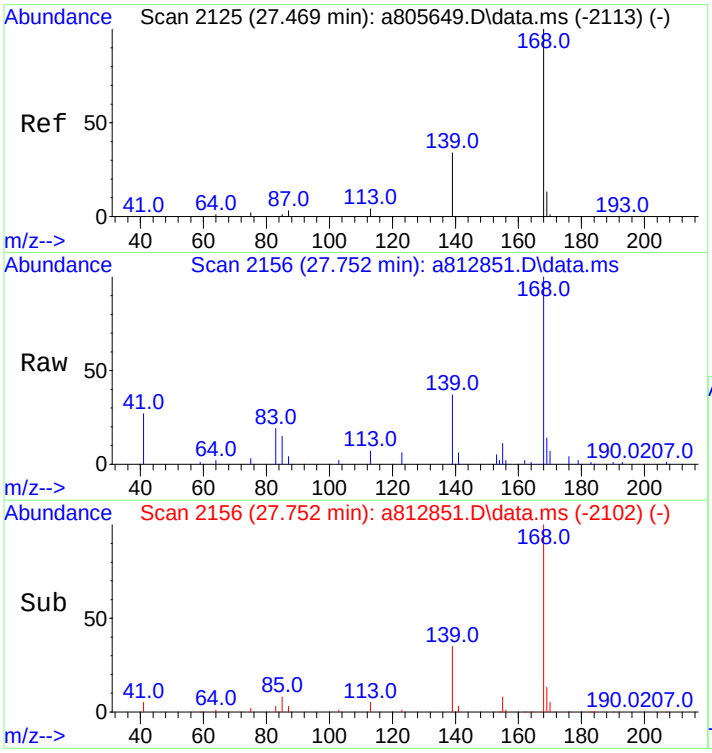


#24
2,6-Dimethylnaphthalene
Concen: 501.19 ng/mL
RT: 25.279 min Scan# 1885
Delta R.T. -0.001 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:156 Resp: 66139

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

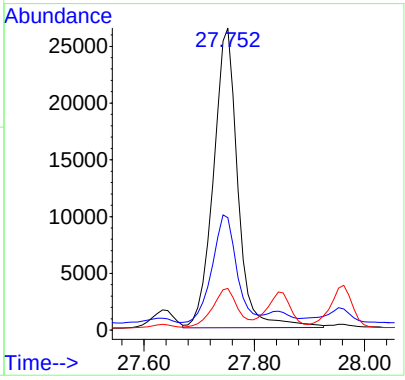


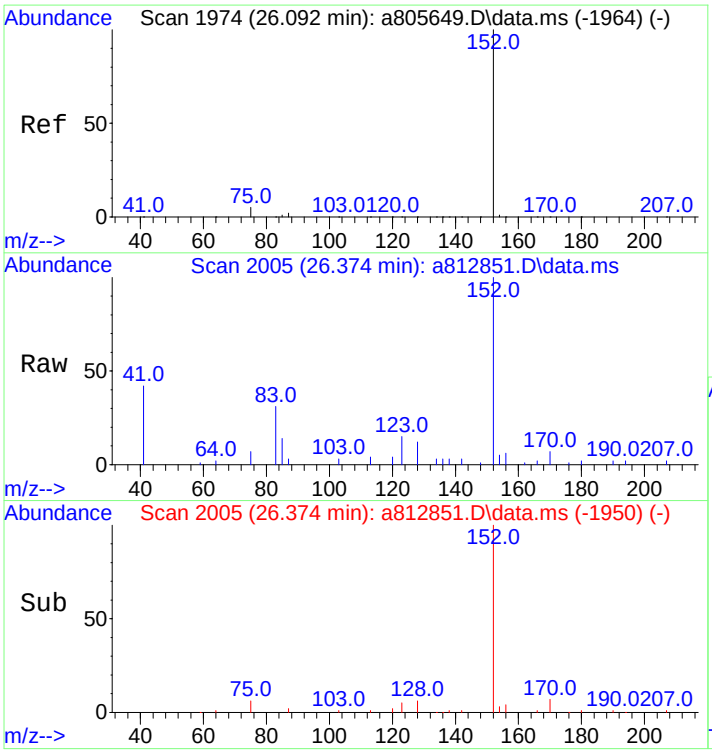


#25
Dibenzofuran
Concen: 390.96 ng/mL
RT: 27.752 min Scan# 2156
Delta R.T. -0.010 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:168 Resp: 80914

Ion	Ratio	Lower	Upper
168	100		
139	36.4	28.0	42.0
169	13.8	10.6	15.8

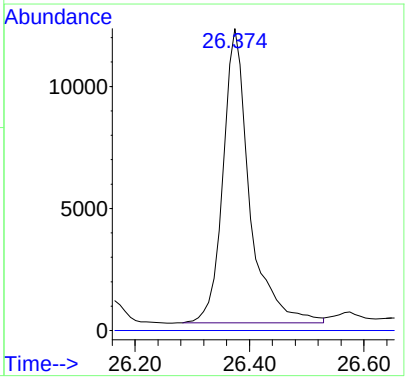


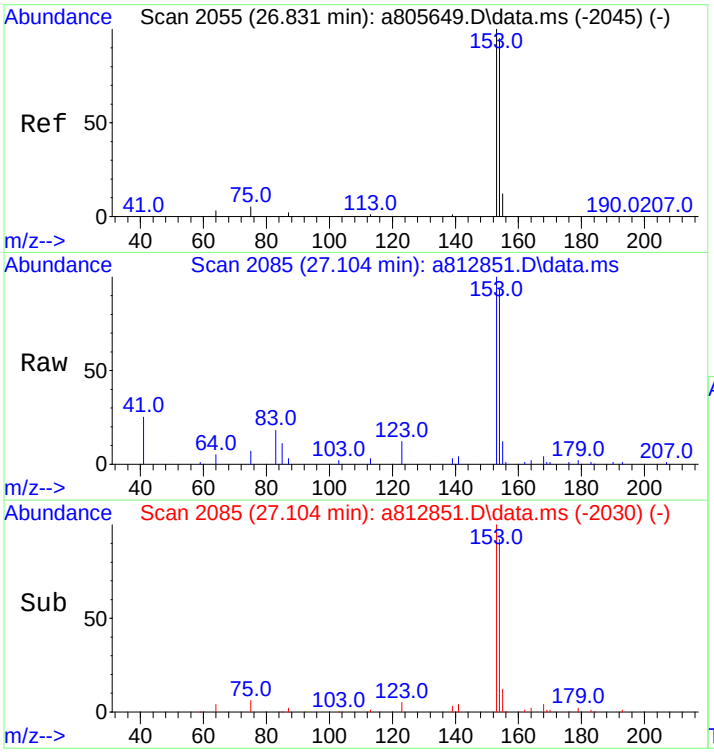


#26
Acenaphthylene
Concen: 164.77 ng/mL
RT: 26.374 min Scan# 2005
Delta R.T. -0.001 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:152 Resp: 38714

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

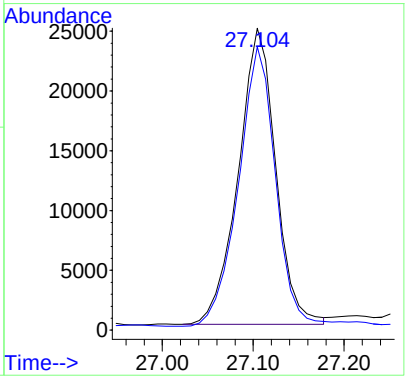


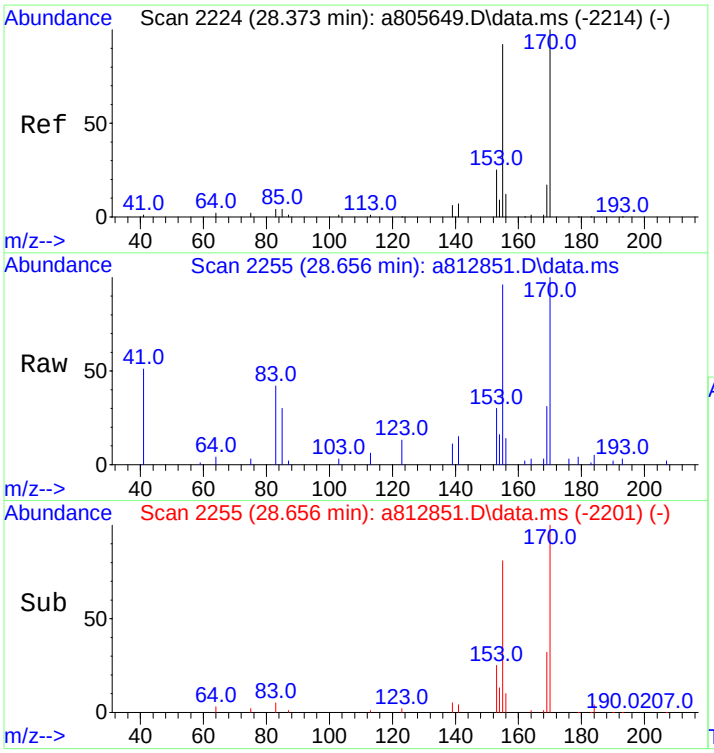


#27
Acenaphthene
Concen: 504.17 ng/mL
RT: 27.104 min Scan# 2085
Delta R.T. -0.001 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:153 Resp: 70704

Ion	Ratio	Lower	Upper
153	100		
154	95.3	75.4	113.2

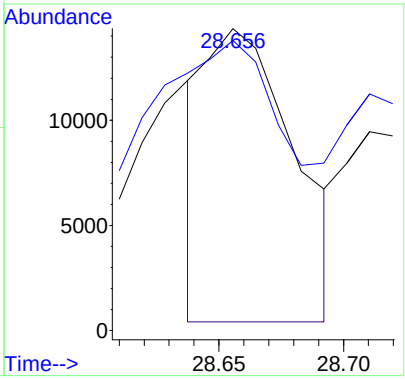


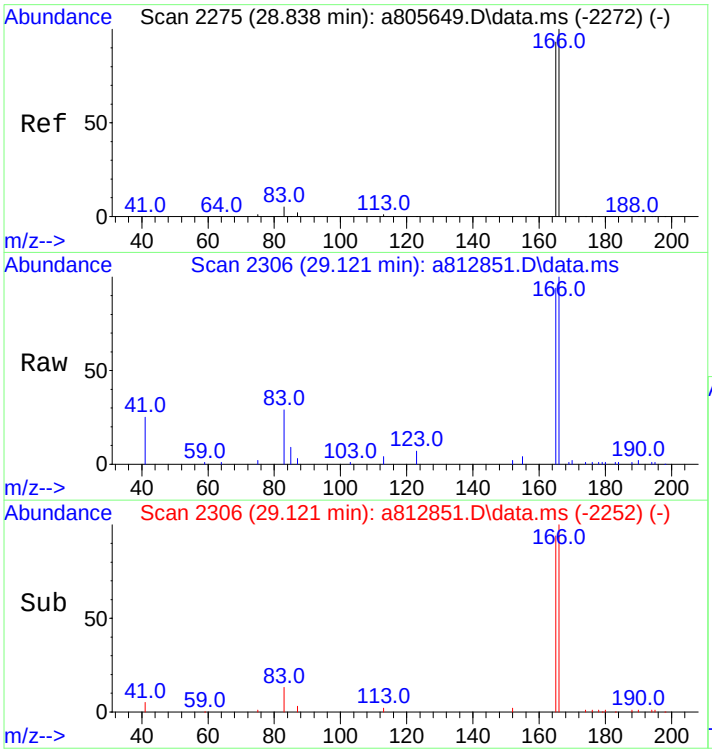


#28
2,3,5-Trimethylnaphthalene
Concen: 304.30 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:170 Resp: 34586

Ion	Ratio	Lower	Upper
170	100		
155	164.8	71.7	107.5#

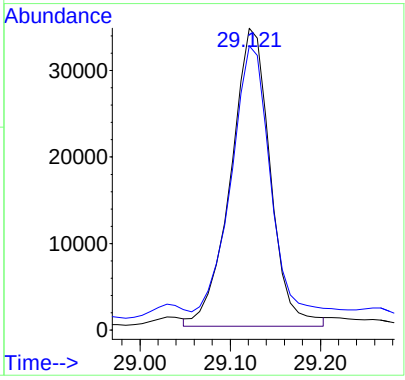


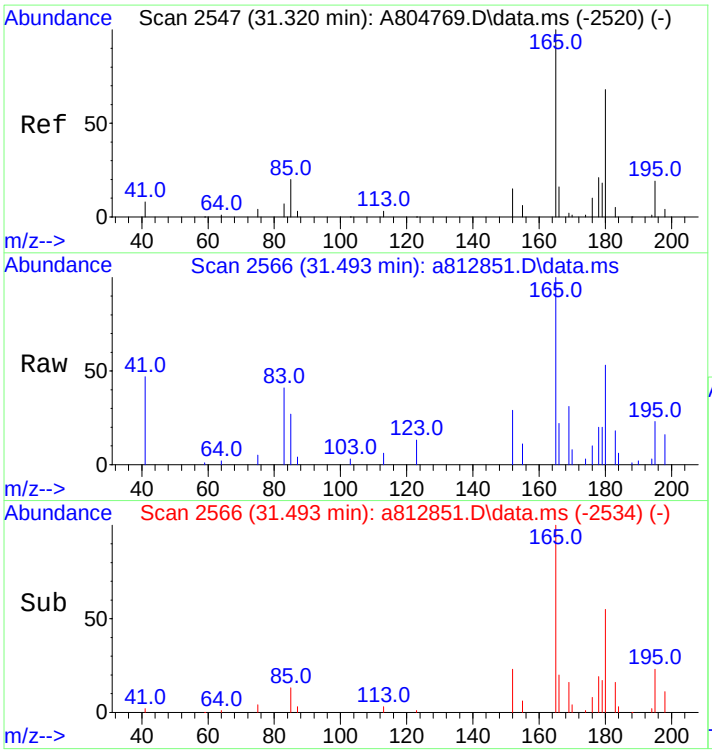


#29
Fluorene
Concen: 668.91 ng/mL m
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:166 Resp: 105213

Ion	Ratio	Lower	Upper
166	100		
165	88.9	74.2	111.2

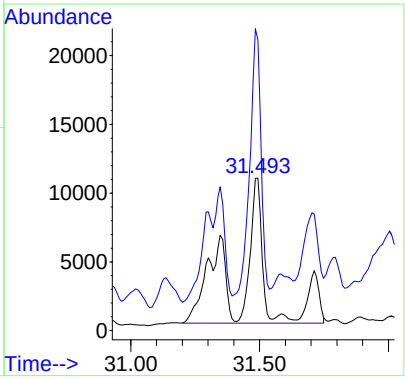


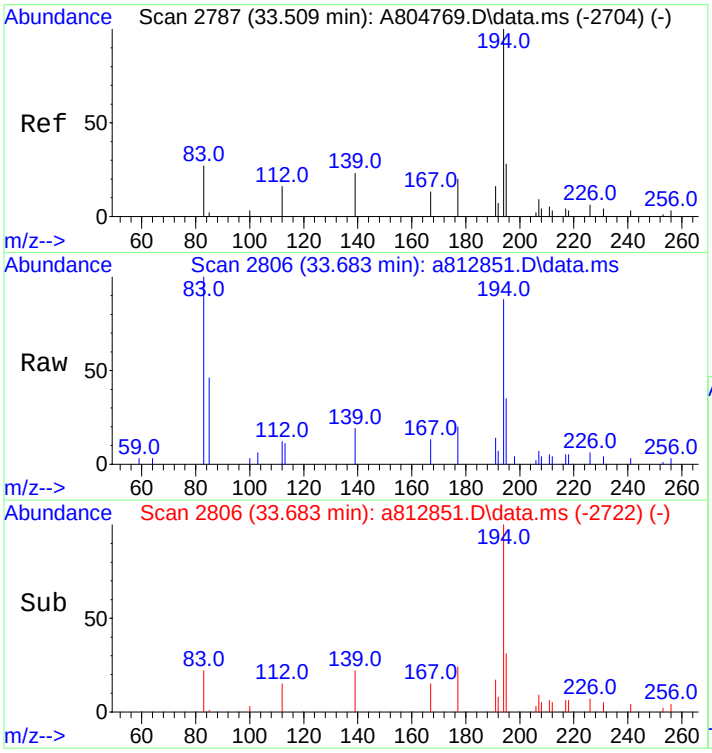


#30
C1-Fluorenes
Concen: 494.24 ng/mL m
RT: 31.493 min Scan# 2566
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:180 Resp: 77739

Ion	Ratio	Lower	Upper
180	100		
165	25.5	122.4	183.6#

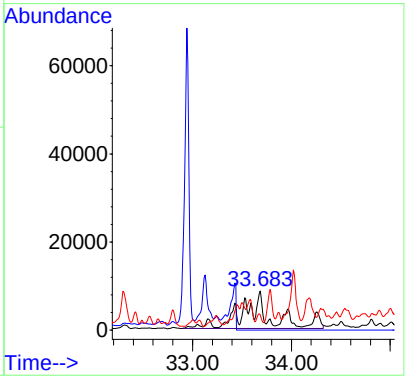


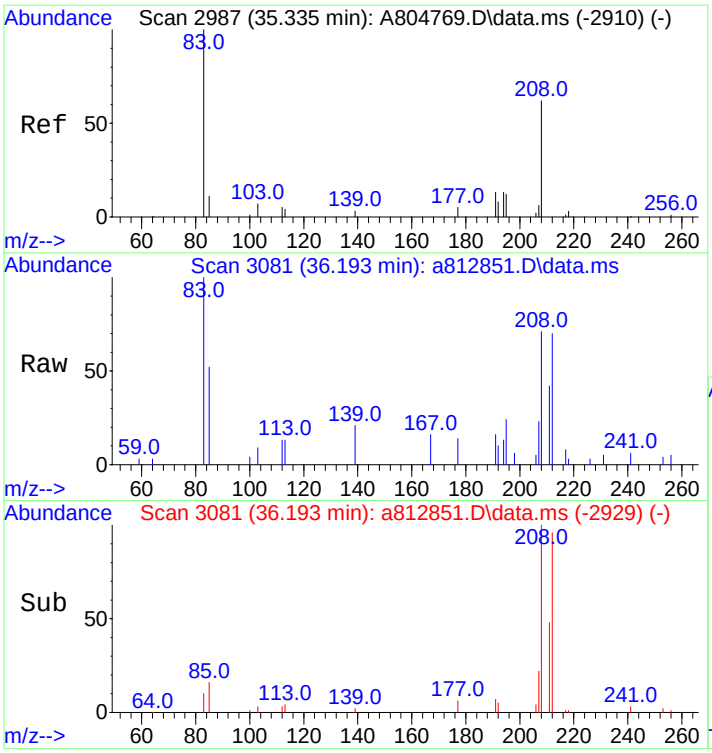


#31
C2-Fluorenes
Concen: 1035.88 ng/mL m
RT: 33.683 min Scan# 2806
Delta R.T. 0.077 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:194 Resp: 162934

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	9.6	27.4	41.0#

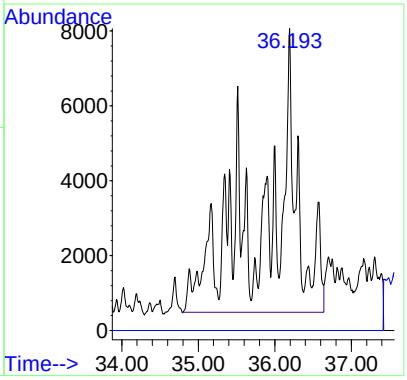


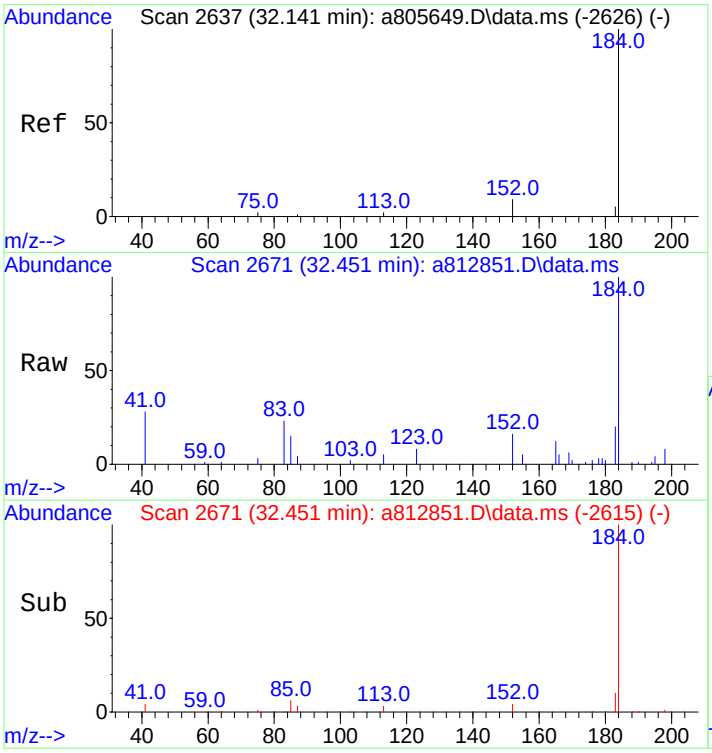


#32
C3-Fluorenes
Concen: 1376.58 ng/mL m
RT: 36.193 min Scan# 3081
Delta R.T. 0.694 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:208 Resp: 216524

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

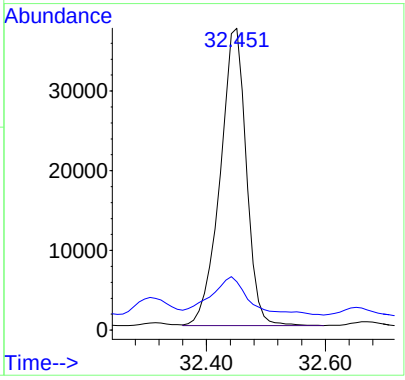


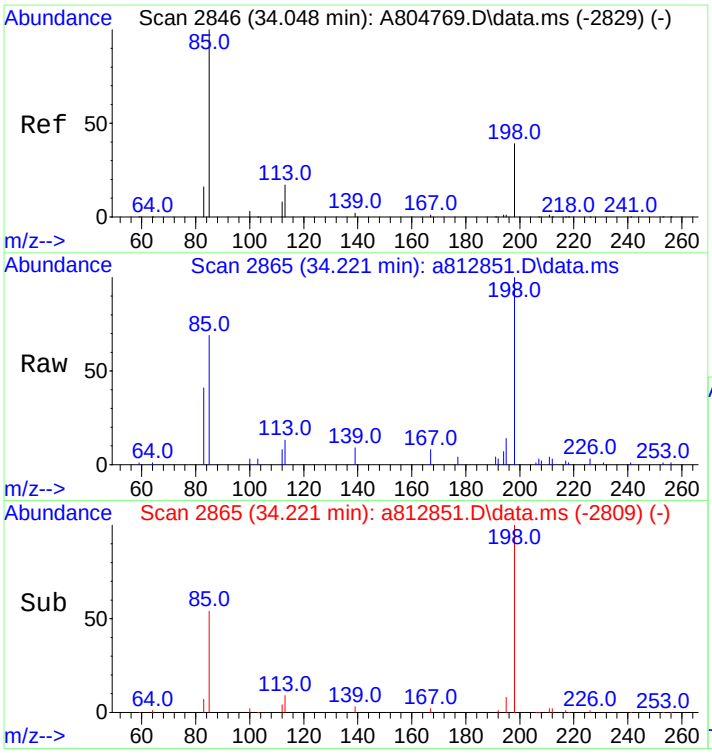


#33
Dibenzothiophene
Concen: 525.23 ng/mL
RT: 32.451 min Scan# 2671
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:184 Resp: 113605

Ion	Ratio	Lower	Upper
184	100		
152	18.6	7.8	11.8#

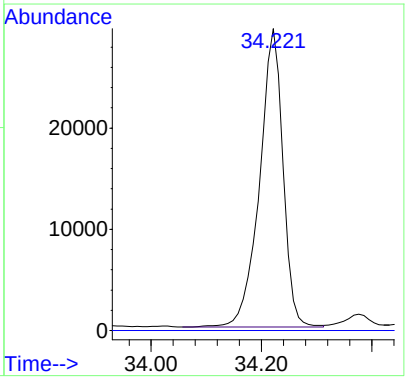


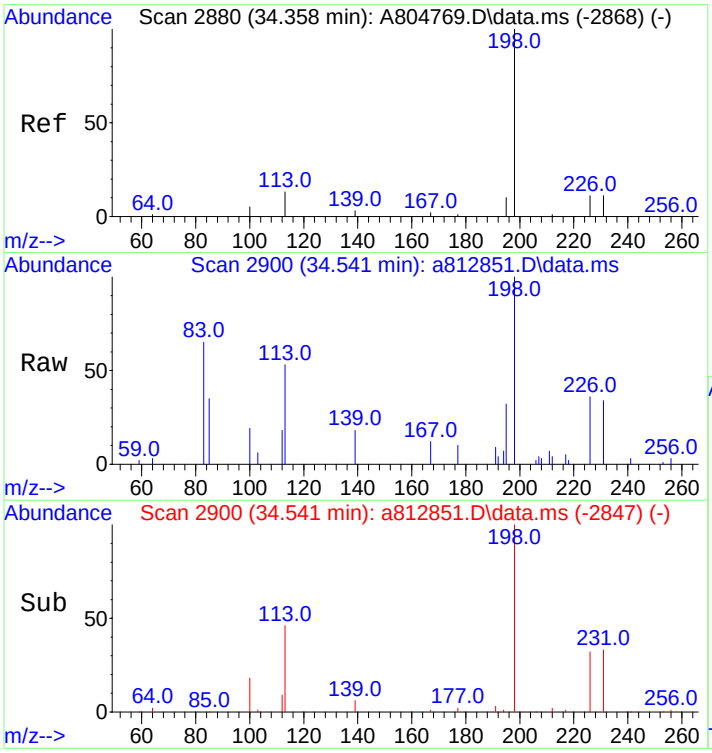


#34
4-Methyldibenzothiophene(4MDT)
Concen: 401.40 ng/mL
RT: 34.221 min Scan# 2865
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:198 Resp: 86820

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

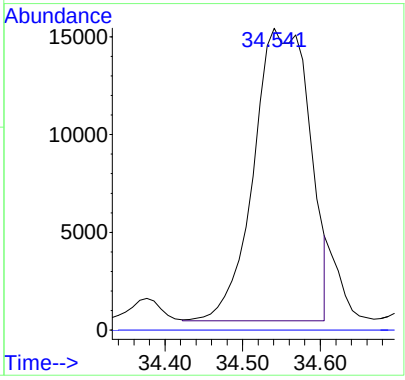


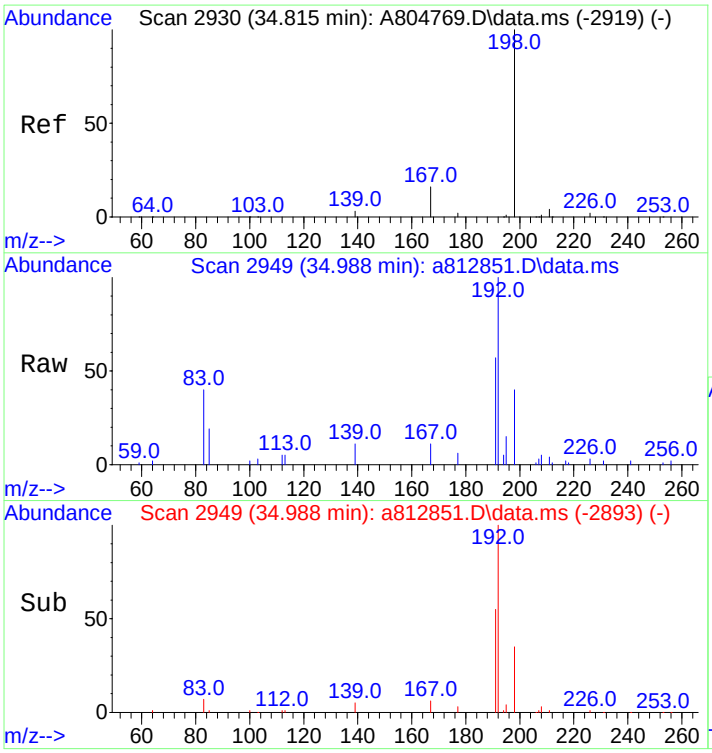


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 346.48 ng/mL m
RT: 34.541 min Scan# 2900
Delta R.T. -0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:198 Resp: 74942

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

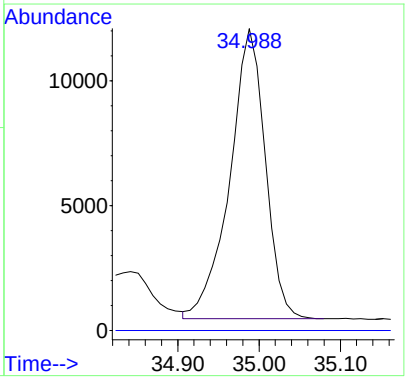


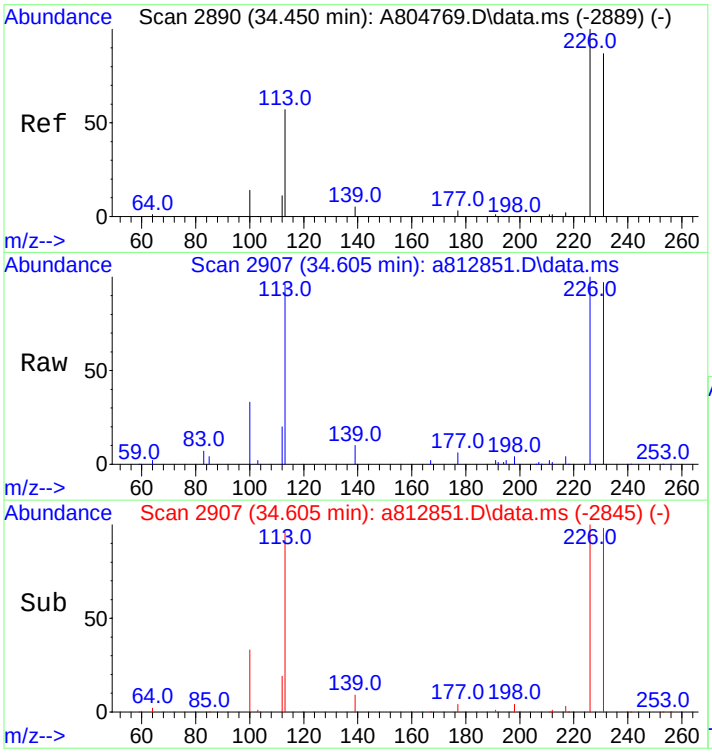


#36
1-Methyldibenzothiophene(1MDT)
Concen: 162.78 ng/mL
RT: 34.988 min Scan# 2949
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:198 Resp: 35208

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

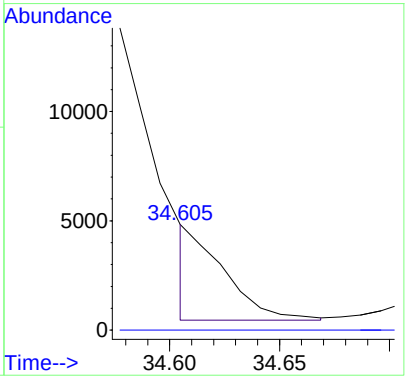


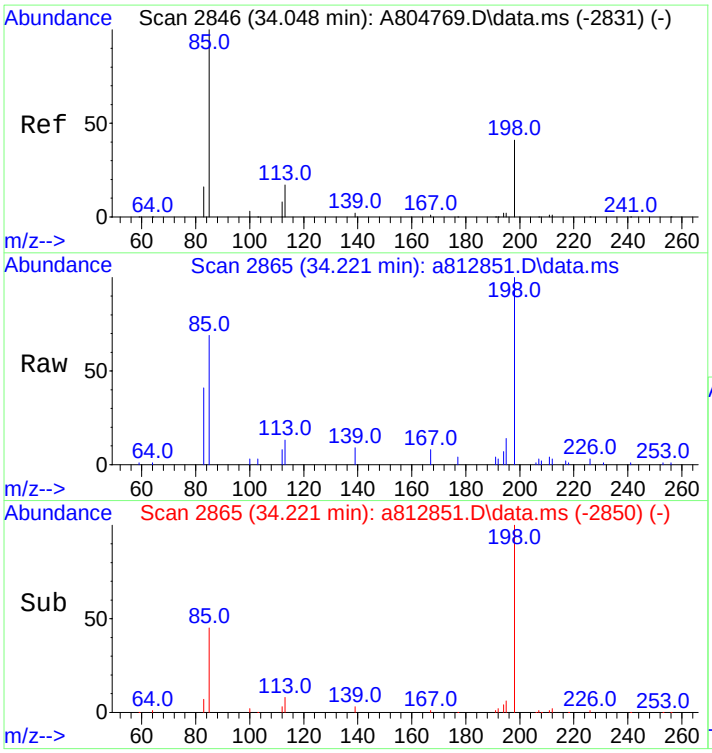


#37
OTP
Concen: 21.43 ng/mL m
RT: 34.605 min Scan# 2907
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:198 Resp: 4635

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

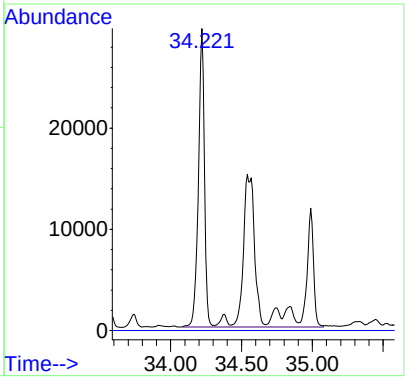


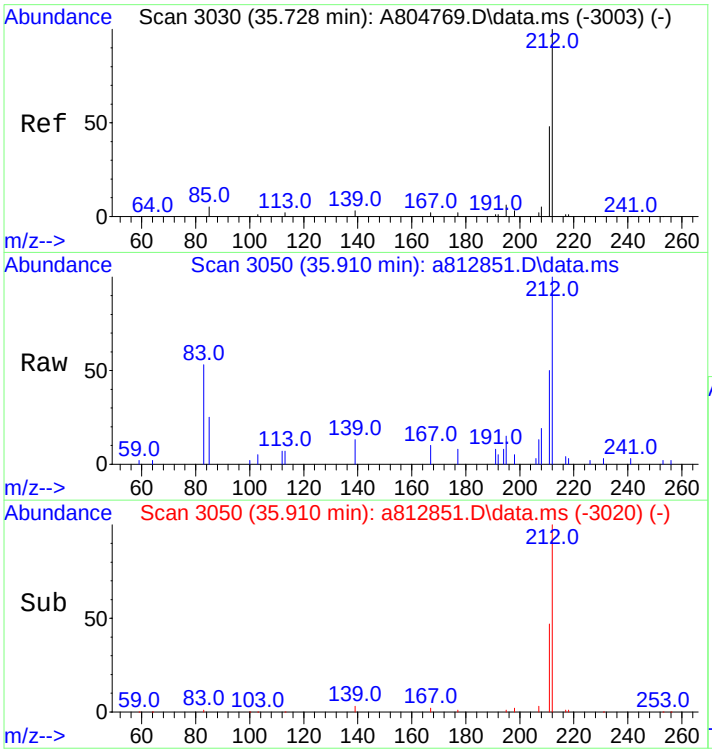


#38
C1-Dibenzothiophenes
Concen: 1040.43 ng/mL m
RT: 34.221 min Scan# 2865
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:198 Resp: 225040

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

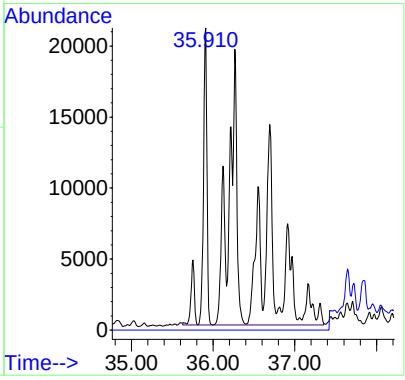


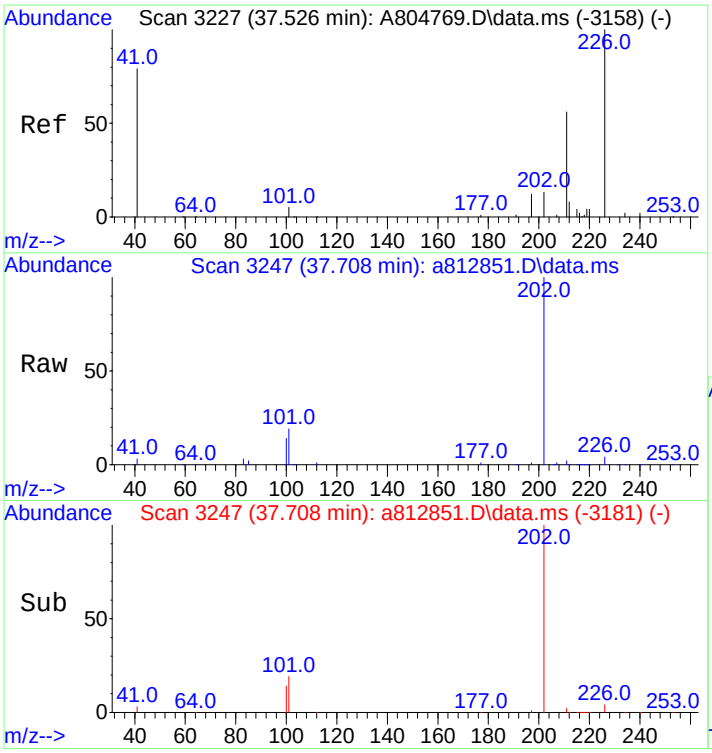


#39
C2-Dibenzothiophenes
Concen: 1743.27 ng/mL m
RT: 35.910 min Scan# 3050
Delta R.T. -0.347 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:212 Resp: 377059

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

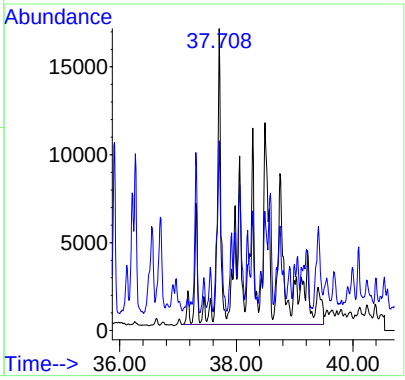


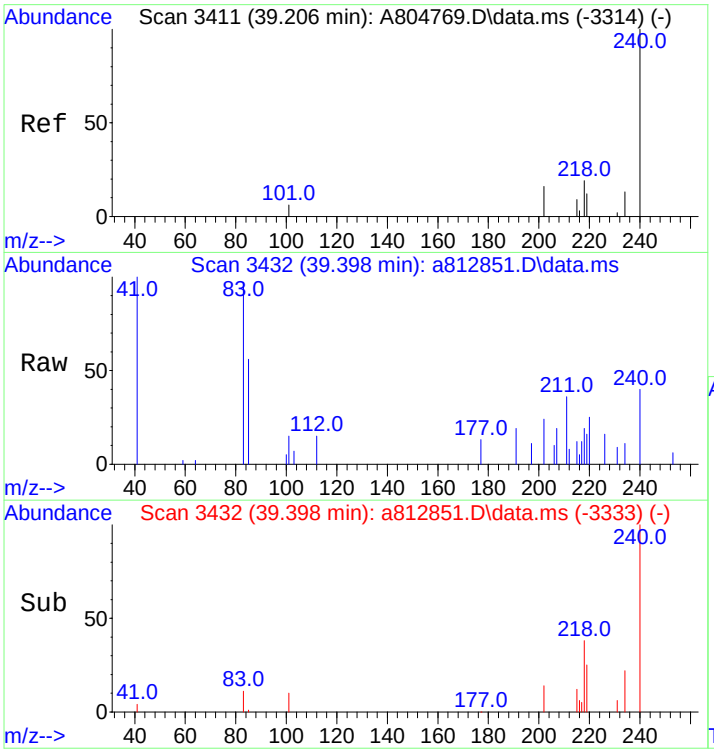


#40
C3-Dibenzothiophenes
Concen: 1793.63 ng/mL m
RT: 37.708 min Scan# 3247
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:226 Resp: 387952

Ion	Ratio	Lower	Upper
226	100		
211	11.8	50.2	75.2#

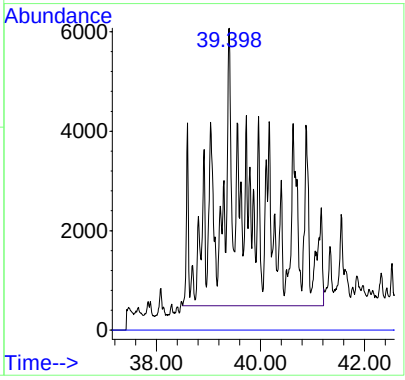


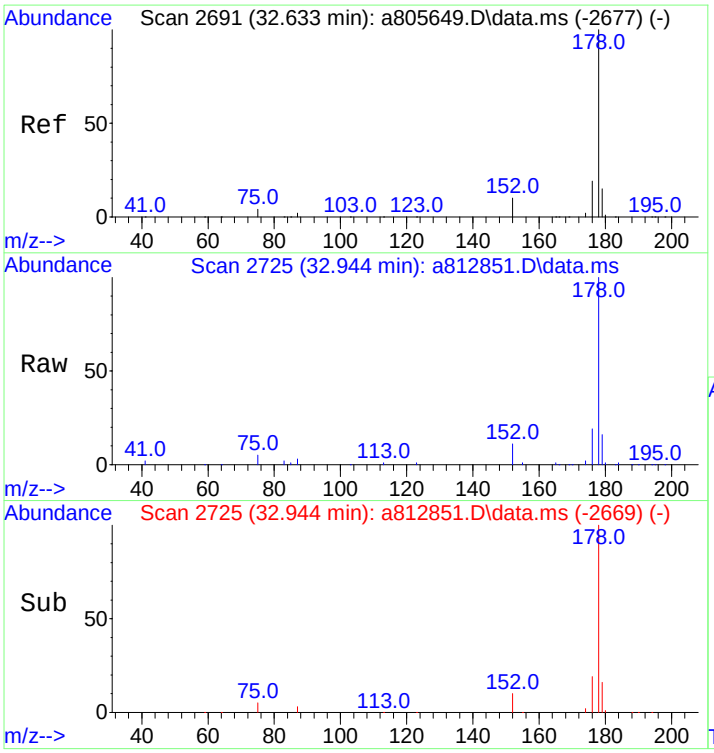


#41
C4-Dibenzothiophenes
Concen: 1201.42 ng/mL m
RT: 39.398 min Scan# 3432
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:240 Resp: 259861

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

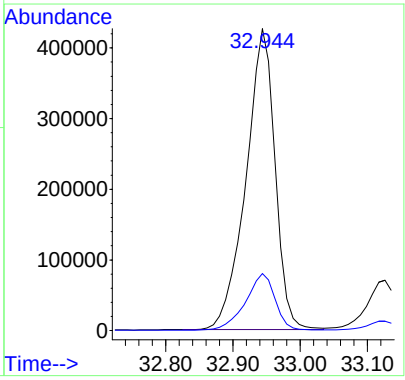


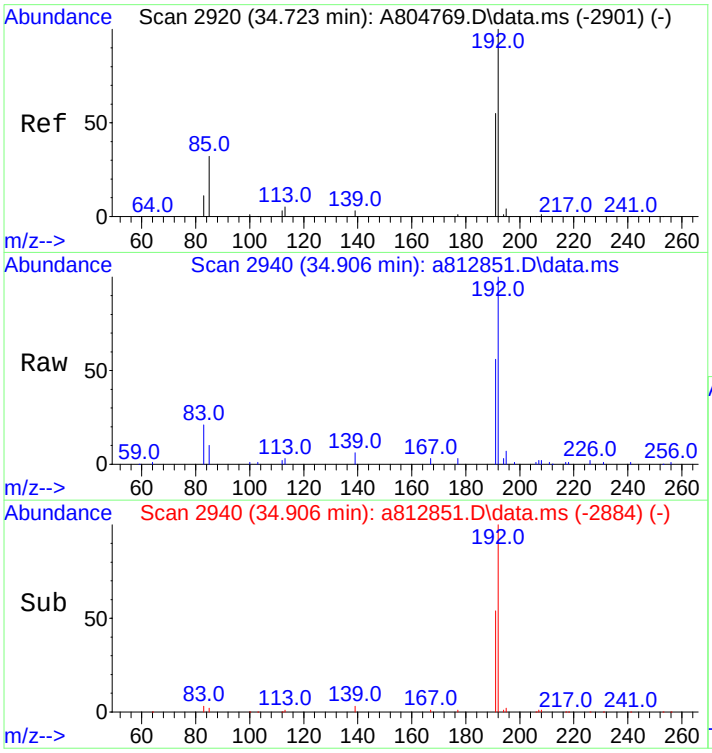


#43
Phenanthrene
Concen: 6159.77 ng/mL
RT: 32.944 min Scan# 2725
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:178 Resp: 1282353

Ion	Ratio	Lower	Upper
178	100		
176	19.0	15.2	22.8

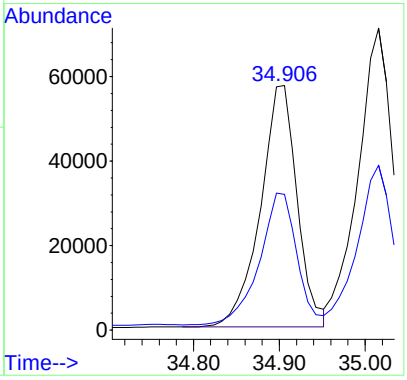


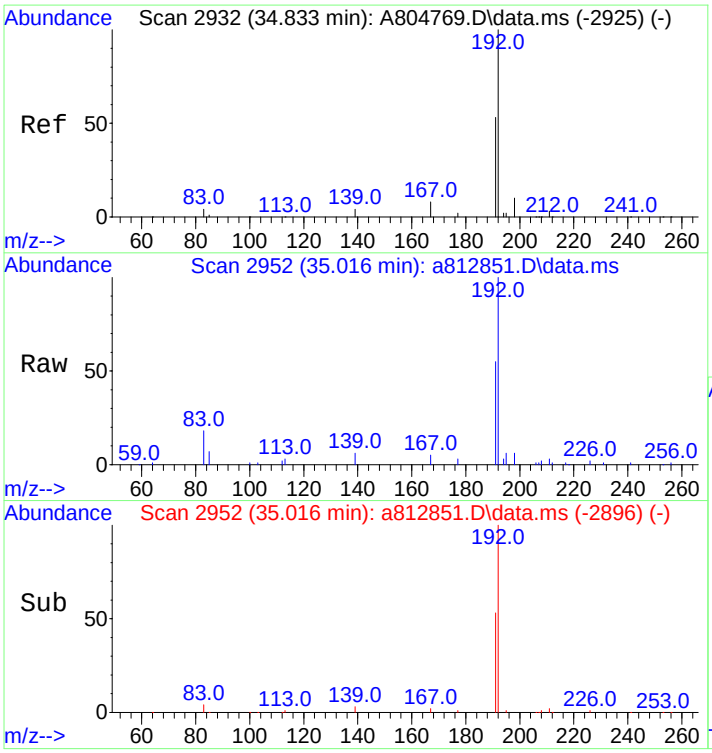


#44
3-Methylphenanthrene(3MP)
Concen: 819.37 ng/mL
RT: 34.906 min Scan# 2940
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 170578

Ion	Ratio	Lower	Upper
192	100		
191	55.9	45.5	68.3

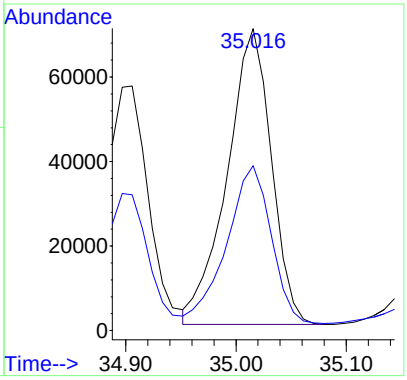


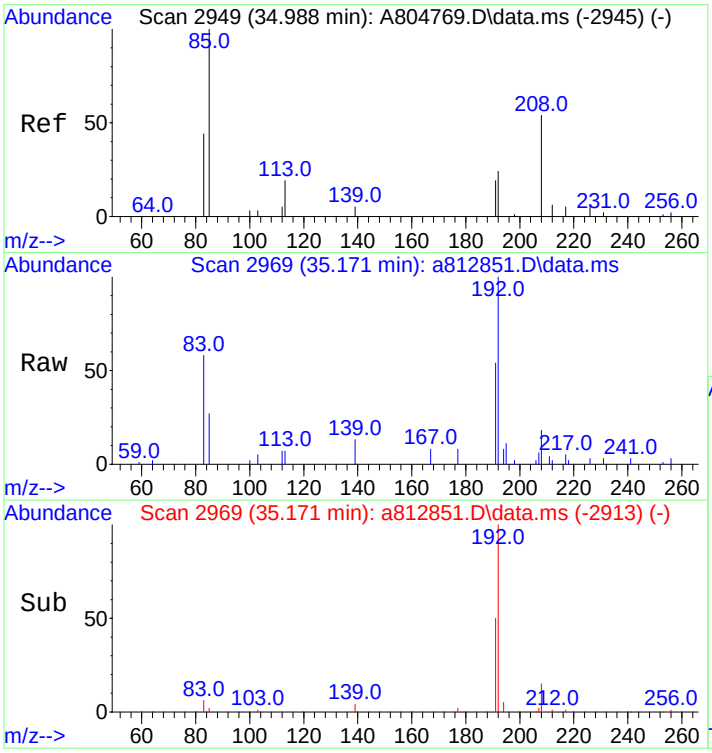


#45
2-Methylphenanthrene(2MP)
Concen: 938.16 ng/mL
RT: 35.016 min Scan# 2952
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 195308

Ion	Ratio	Lower	Upper
192	100		
191	53.3	44.6	67.0

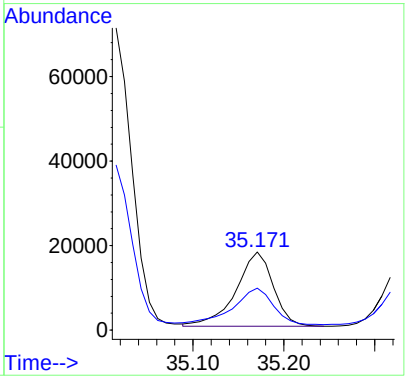


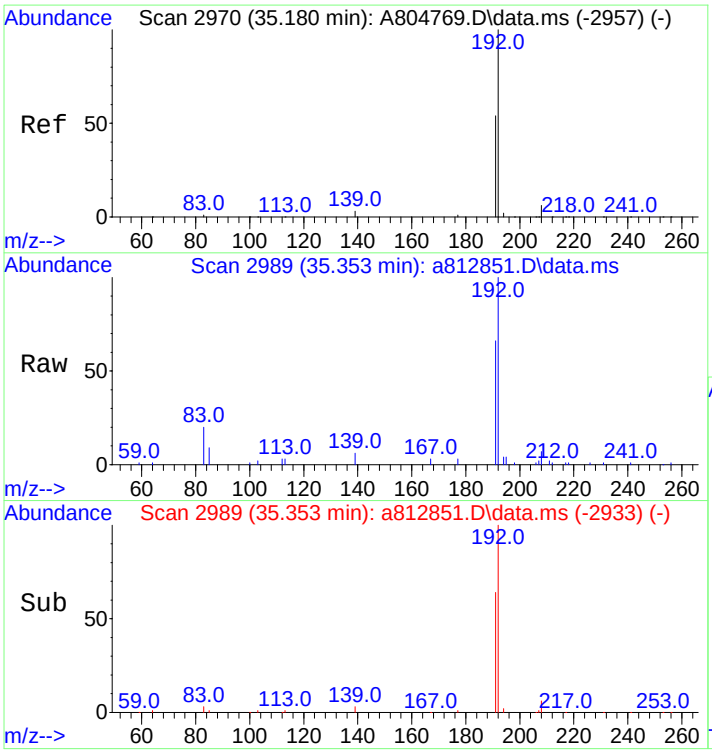


#46
2-Methylanthracene(2MA)
Concen: 240.05 ng/mL
RT: 35.171 min Scan# 2969
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 49974

Ion	Ratio	Lower	Upper
192	100		
191	52.7	96.9	145.3#

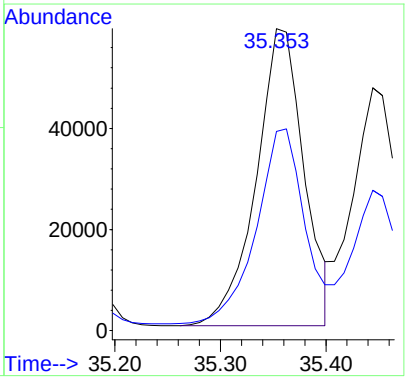


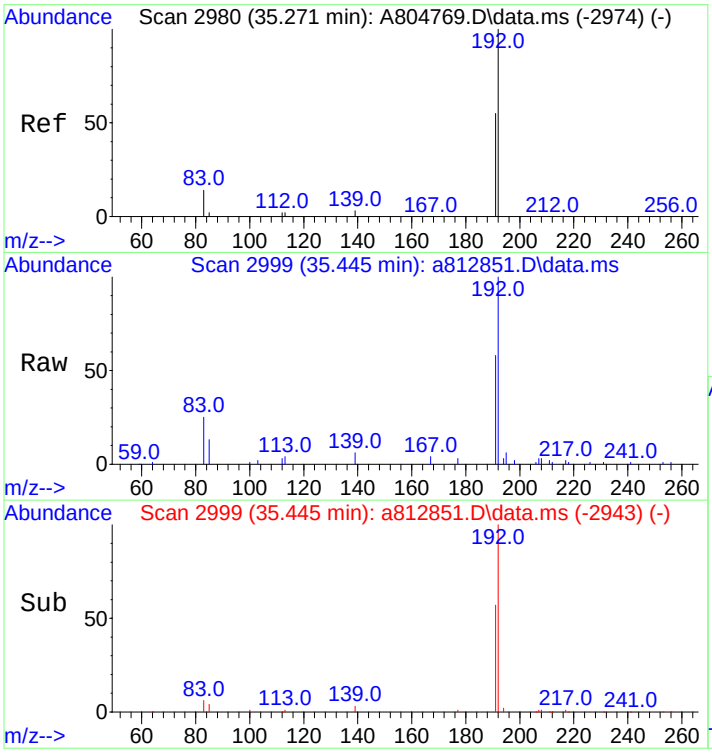


#47
9/4-Methylphenanthrene(9MP)
Concen: 887.10 ng/mL m
RT: 35.353 min Scan# 2989
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 184679

Ion	Ratio	Lower	Upper
192	100		
191	39.5	44.5	66.7#

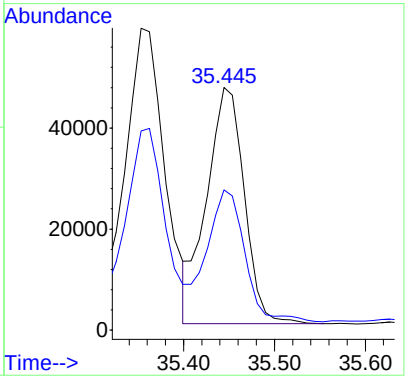


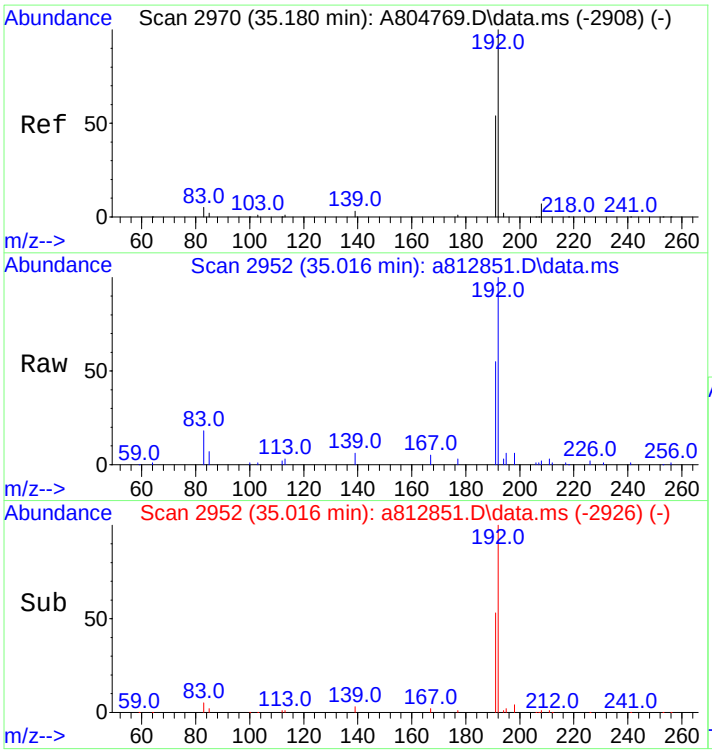


#48
1-Methylphenanthrene(1MP)
Concen: 648.91 ng/mL
RT: 35.445 min Scan# 2999
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 135091

Ion	Ratio	Lower	Upper
192	100		
191	54.1	46.2	69.4

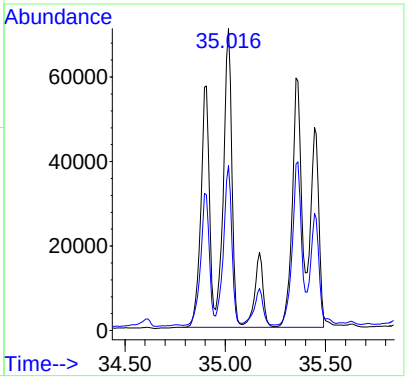


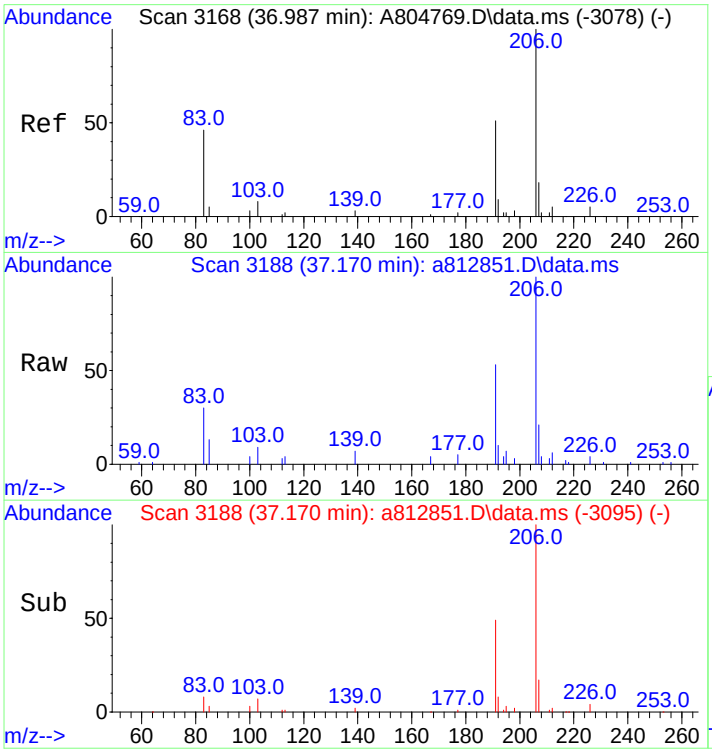


#49
C1-Phenanthrenes/Anthracenes
Concen: 3585.50 ng/mL m
RT: 35.016 min Scan# 2952
Delta R.T. -0.329 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 746436

Ion	Ratio	Lower	Upper
192	100		
191	5.1	44.5	66.7#

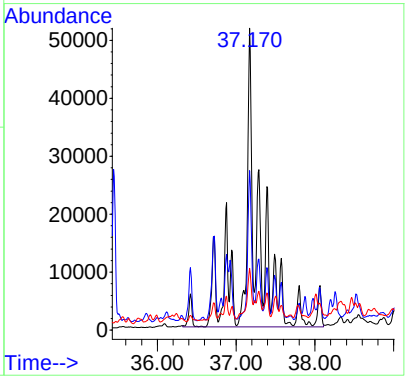


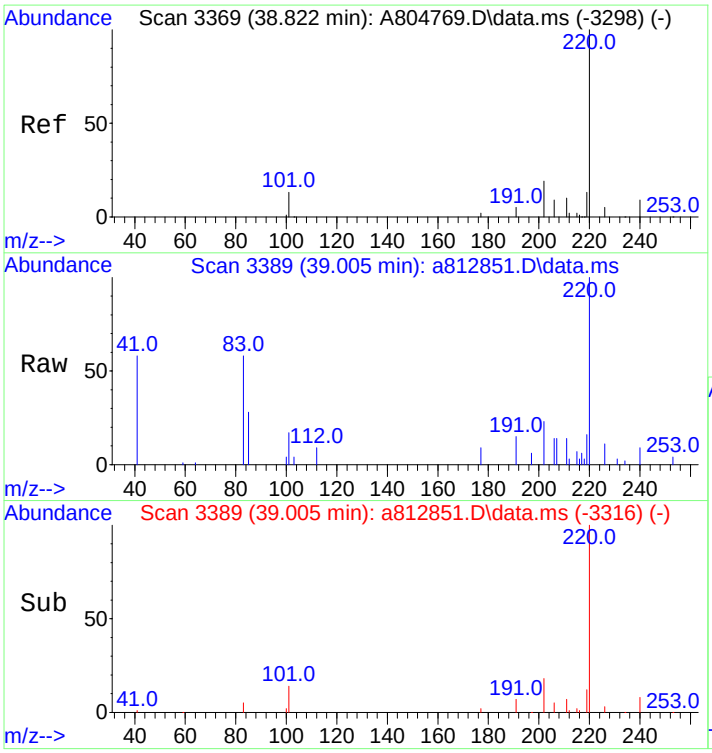


#50
C2-Phenanthrenes/Anthracenes
Concen: 3095.65 ng/mL m
RT: 37.170 min Scan# 3188
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:206 Resp: 644459

Ion	Ratio	Lower	Upper
206	100		
191	13.8	42.0	63.0#
207	5.0	16.2	24.4#

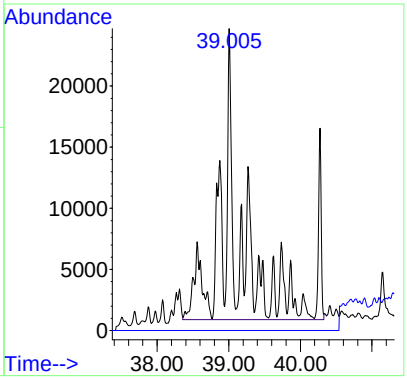


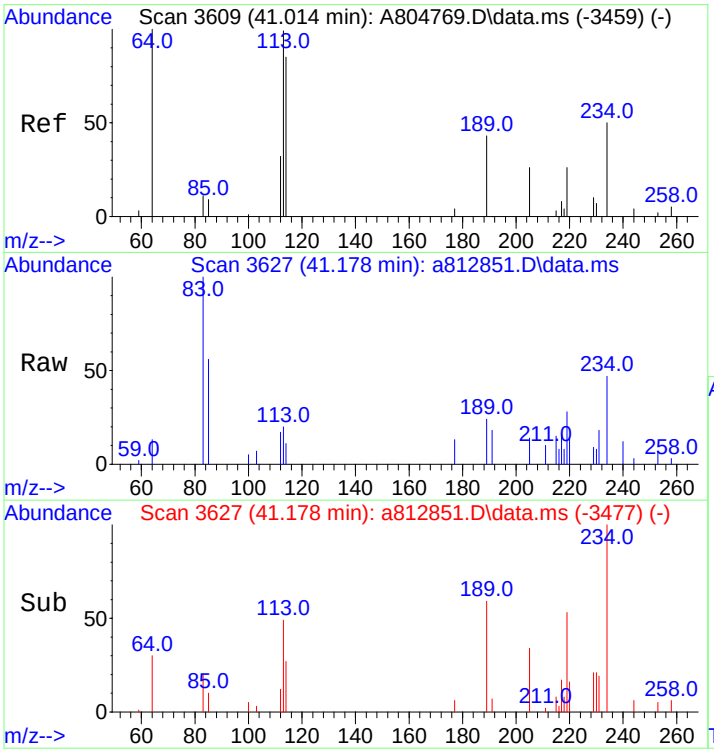


#52
C3-Phenanthrenes/Anthracenes
Concen: 2067.45 ng/mL m
RT: 39.005 min Scan# 3389
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:220 Resp: 430406

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

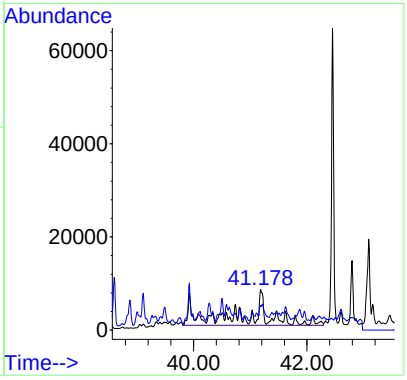


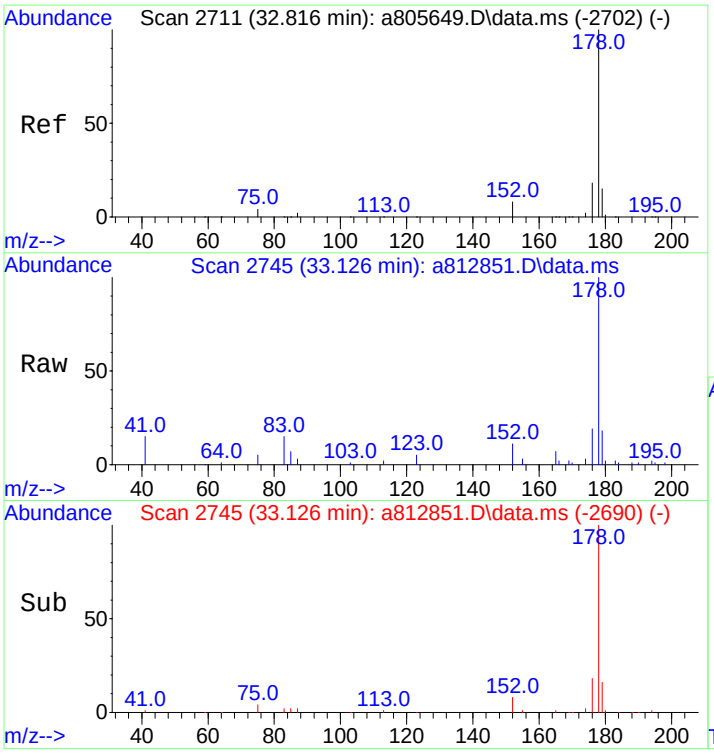


#53
C4-Phenanthrenes/Anthracenes
Concen: 1097.23 ng/mL m
RT: 41.178 min Scan# 3627
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:234 Resp: 228424

Ion	Ratio	Lower	Upper
234	100		
219	2.4	52.3	78.5#

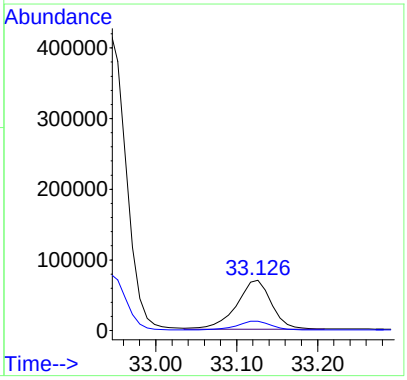


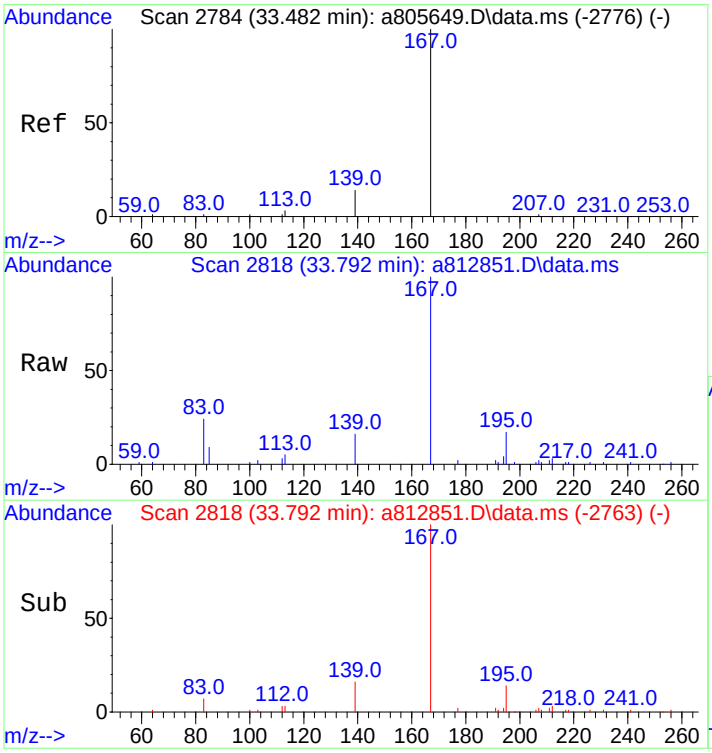


#55
Anthracene
Concen: 1087.63 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:178 Resp: 210944

Ion	Ratio	Lower	Upper
178	100		
176	17.6	14.3	21.5

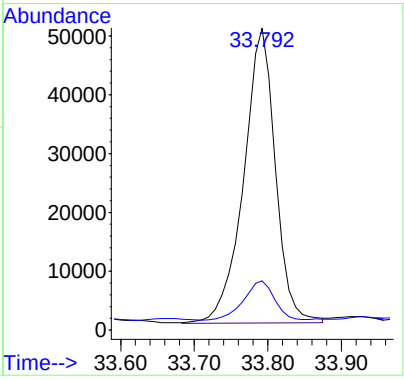


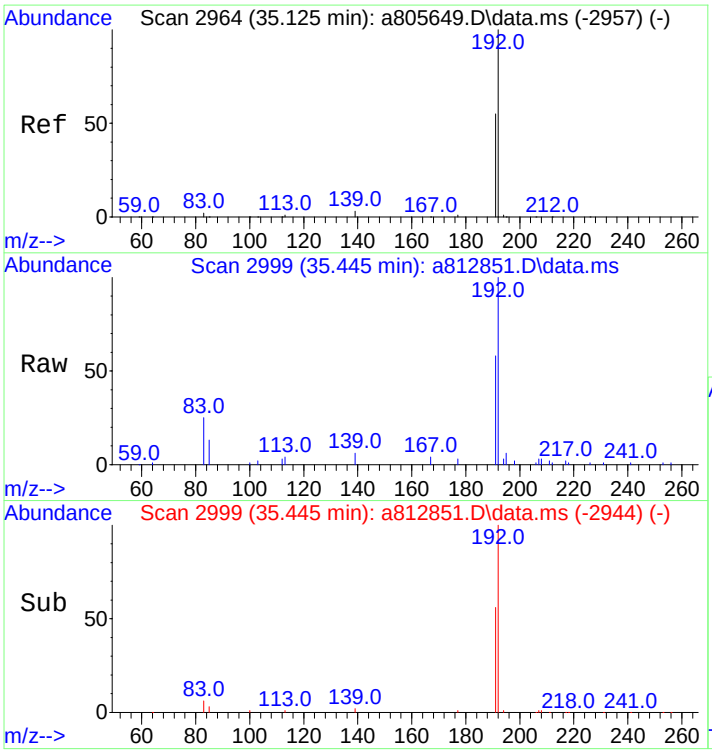


#56
Carbazole
Concen: 748.21 ng/mL
RT: 33.792 min Scan# 2818
Delta R.T. -0.001 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:167 Resp: 151417

Ion	Ratio	Lower	Upper
167	100		
139	12.5	10.6	16.0

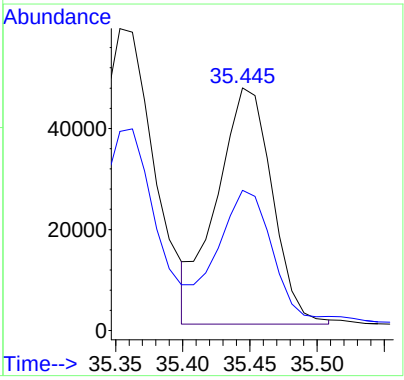


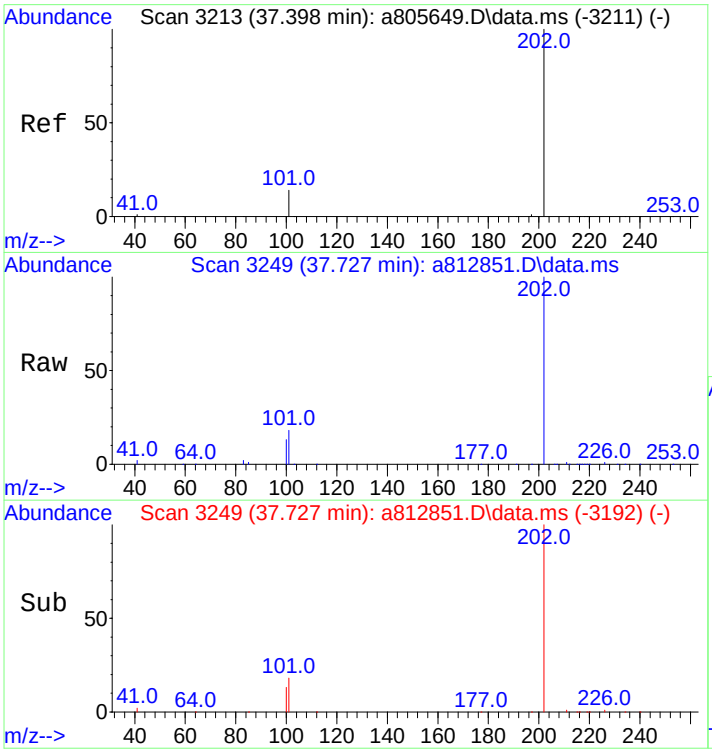


#57
1-Methylphenanthrene
Concen: 912.10 ng/mL m
RT: 35.445 min Scan# 2999
Delta R.T. -0.000 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:192 Resp: 134600

Ion	Ratio	Lower	Upper
192	100		
191	54.3	44.2	66.4

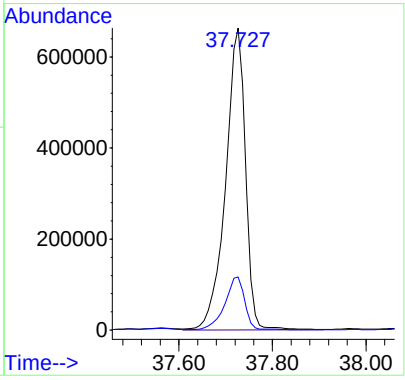


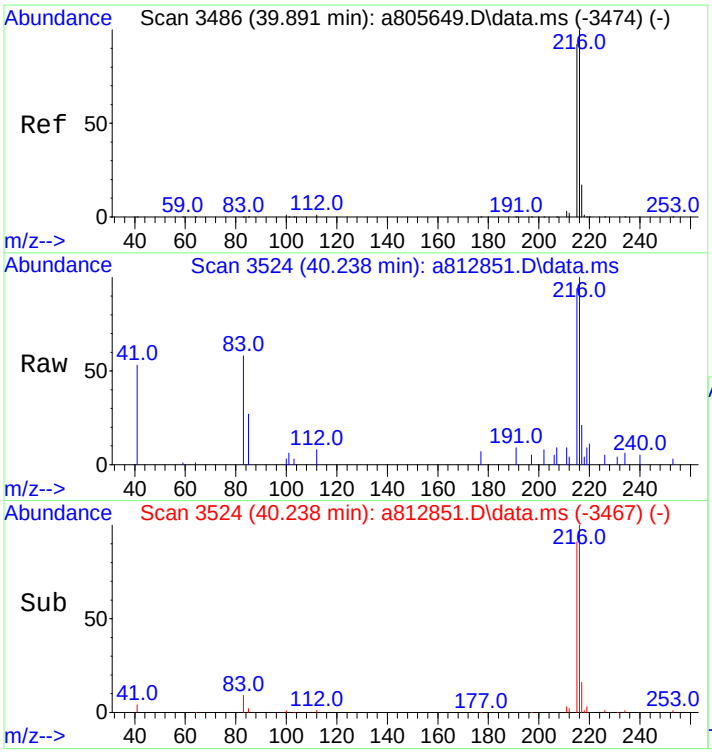


#58
Fluoranthene
Concen: 9140.33 ng/mL
RT: 37.727 min Scan# 3249
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:202 Resp: 1960043

Ion	Ratio	Lower	Upper
202	100		
101	17.1	13.6	20.4

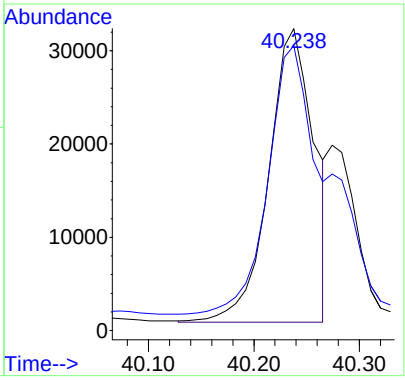


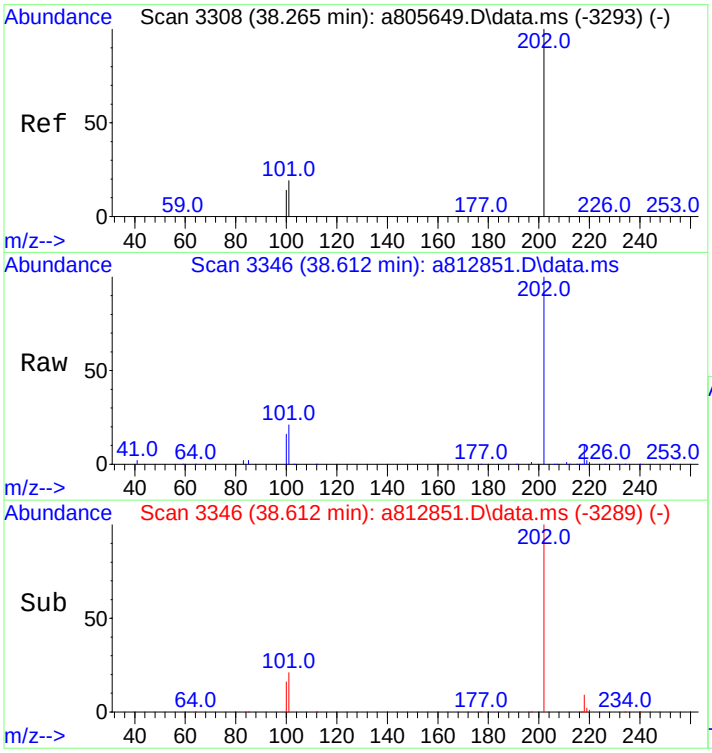


#59
Benzo(b)fluorene
Concen: 761.80 ng/mL m
RT: 40.238 min Scan# 3524
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:216 Resp: 94499

Ion	Ratio	Lower	Upper
216	100		
215	120.9	74.2	111.2#

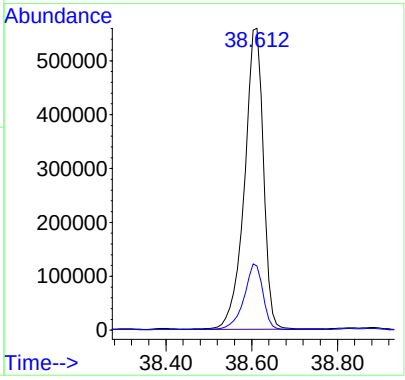


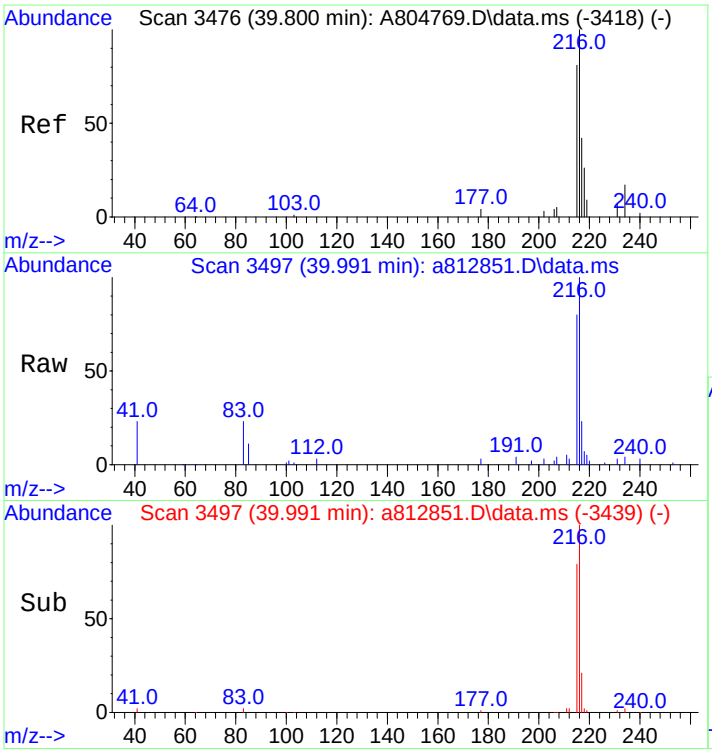


#60
Pyrene
Concen: 7853.22 ng/mL
RT: 38.612 min Scan# 3346
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:202 Resp: 1703369

Ion	Ratio	Lower	Upper
202	100		
101	21.9	15.4	23.2

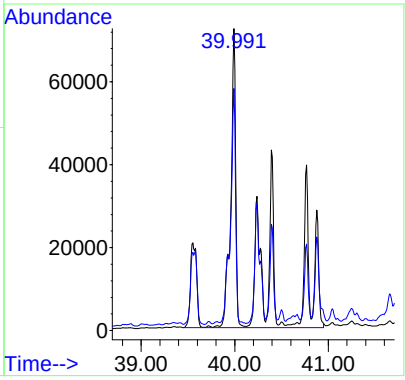


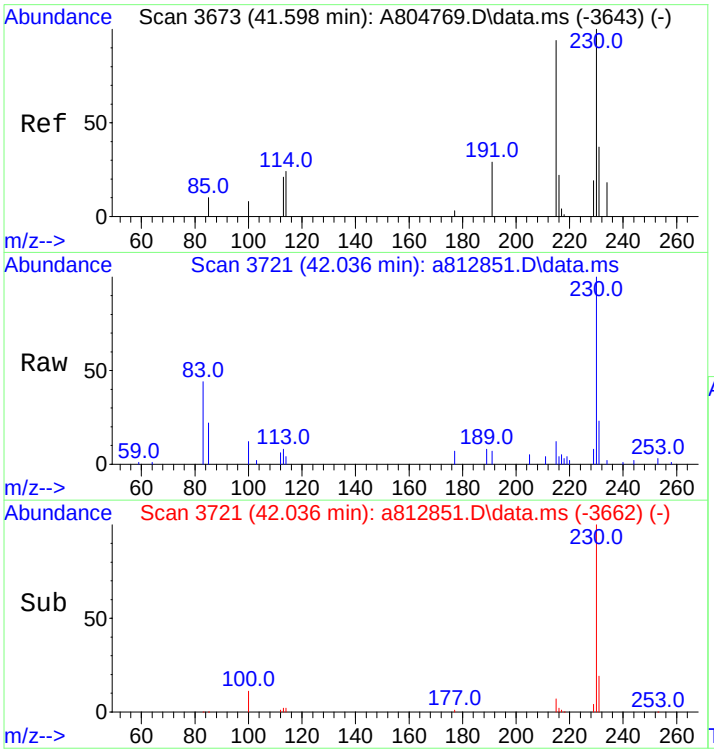


#61
C1-Fluoranthenes/Pyrenes
Concen: 3743.63 ng/mL m
RT: 39.991 min Scan# 3497
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:216 Resp: 811996

Ion	Ratio	Lower	Upper
216	100		
215	26.7	73.8	110.6#

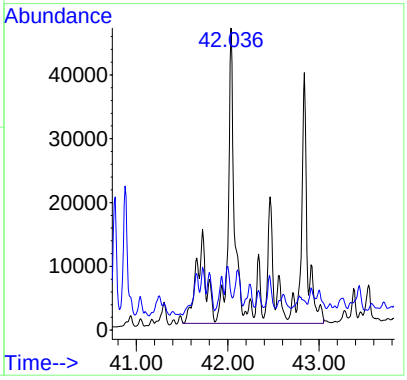


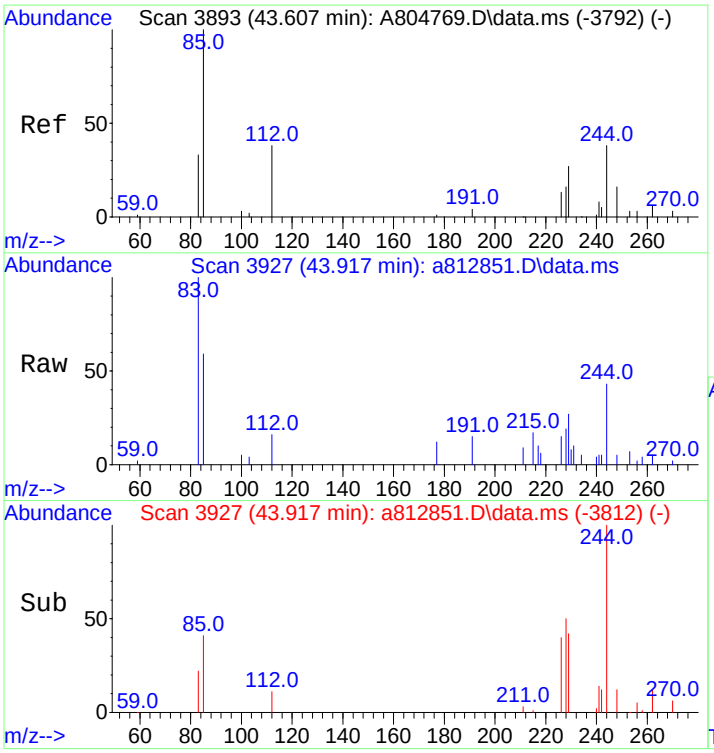


#62
C2-Fluoranthenes/Pyrenes
Concen: 2926.16 ng/mL m
RT: 42.036 min Scan# 3721
Delta R.T. 0.265 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:230 Resp: 634686

Ion	Ratio	Lower	Upper
230	100		
215	2.9	93.1	139.7#

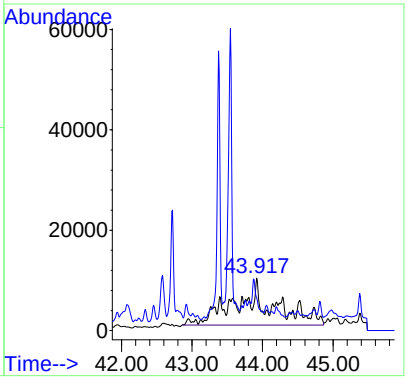


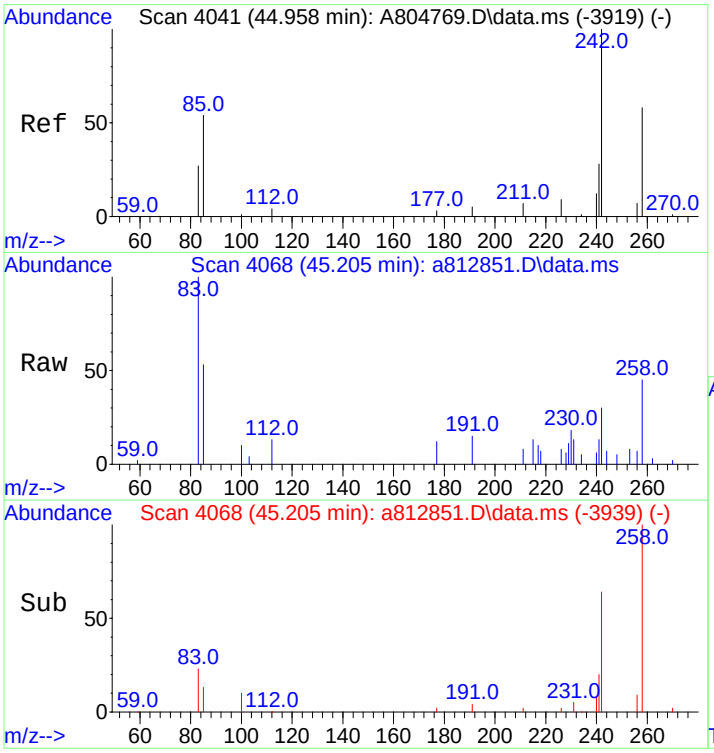


#63
C3-Fluoranthenes/Pyrenes
Concen: 1570.96 ng/mL m
RT: 43.917 min Scan# 3927
Delta R.T. 0.128 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:244 Resp: 340743

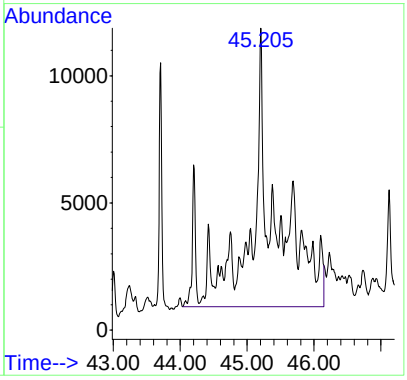
Ion	Ratio	Lower	Upper
244	100		
229	1.1	76.2	114.2#

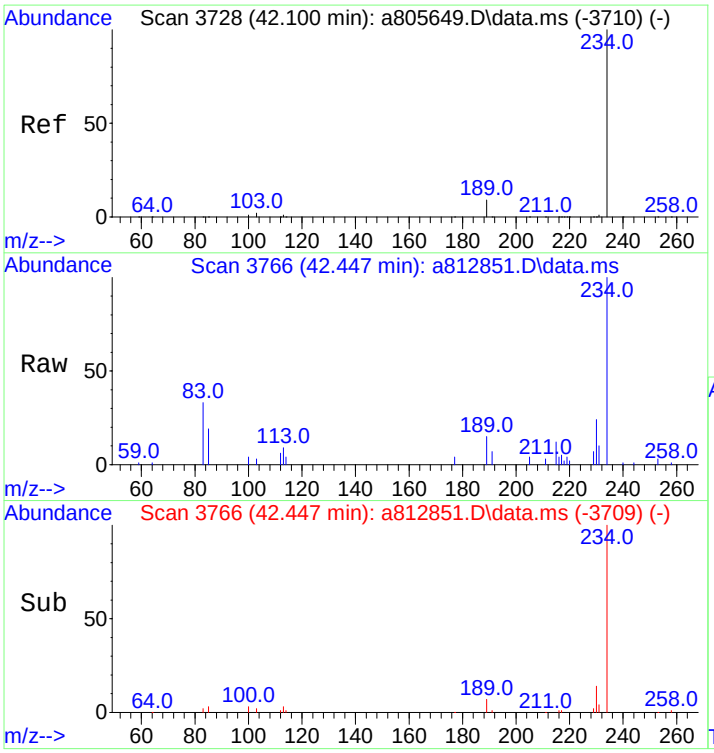




#64
C4-Fluoranthenes/Pyrenes
Concen: 1313.44 ng/mL m
RT: 45.205 min Scan# 4068
Delta R.T. 0.064 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:258 Resp: 284885

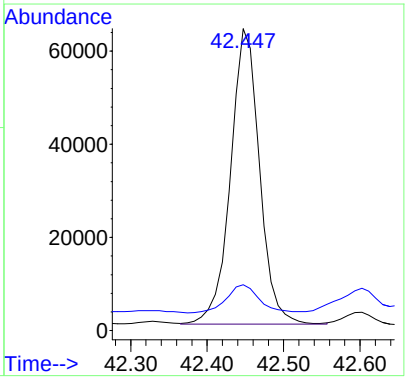


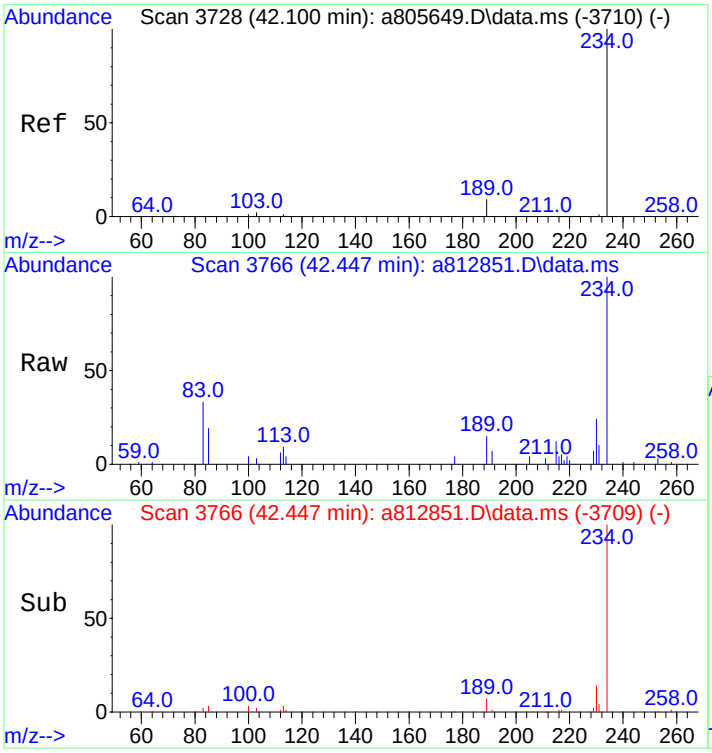


#66
Naphthobenzothiophene
Concen: 831.08 ng/ml m
RT: 42.447 min Scan# 3766
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:234 Resp: 167336

Ion	Ratio	Lower	Upper
234	100		
189	1.1	22.3	33.5#

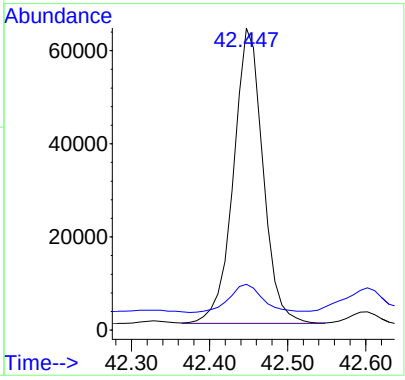


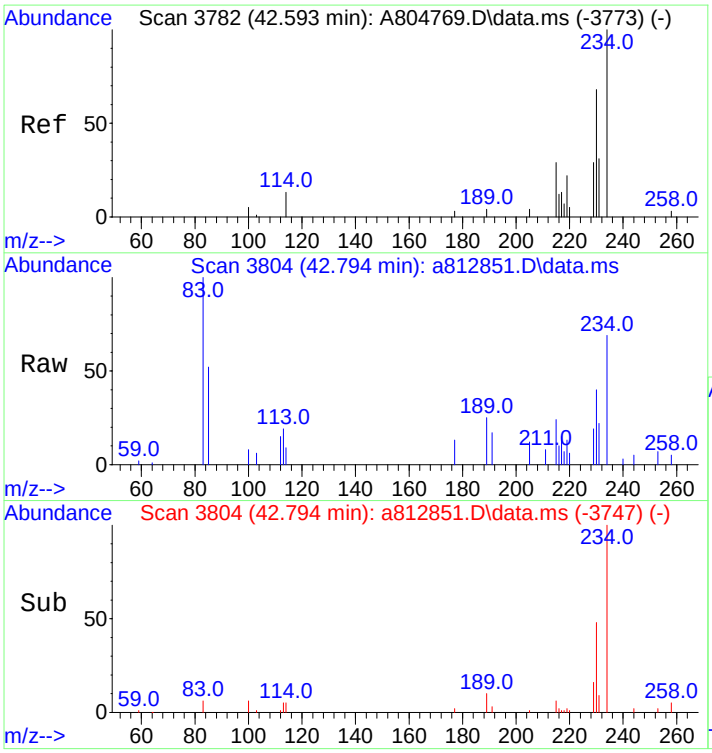


#67
Naphthobenzothiophene-2,1-D
Concen: 827.65 ng/mL m
RT: 42.447 min Scan# 3766
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:234 Resp: 166645

Ion	Ratio	Lower	Upper
234	100		
189	1.1	22.3	33.5#

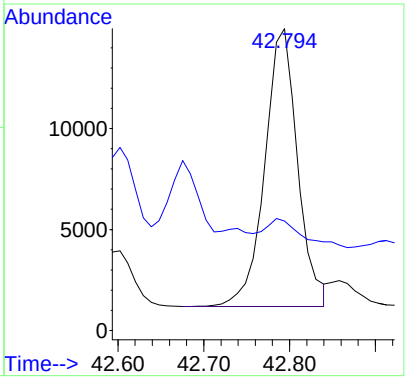


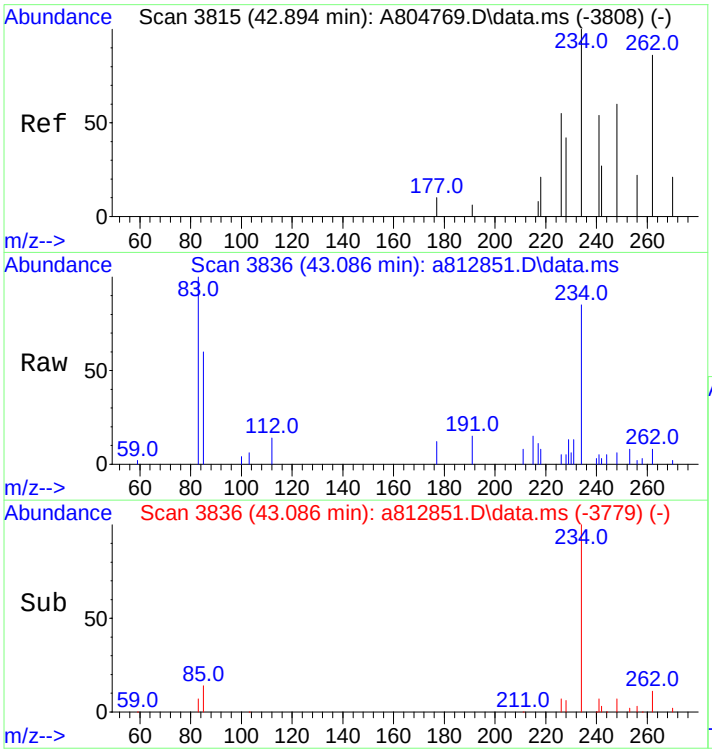


#68
Naphthobenzothiophene-1,2-D
Concen: 182.43 ng/mL
RT: 42.794 min Scan# 3804
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:234 Resp: 36732

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

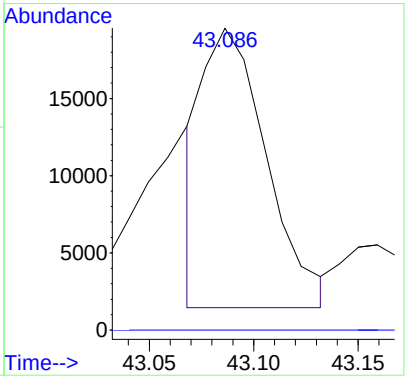


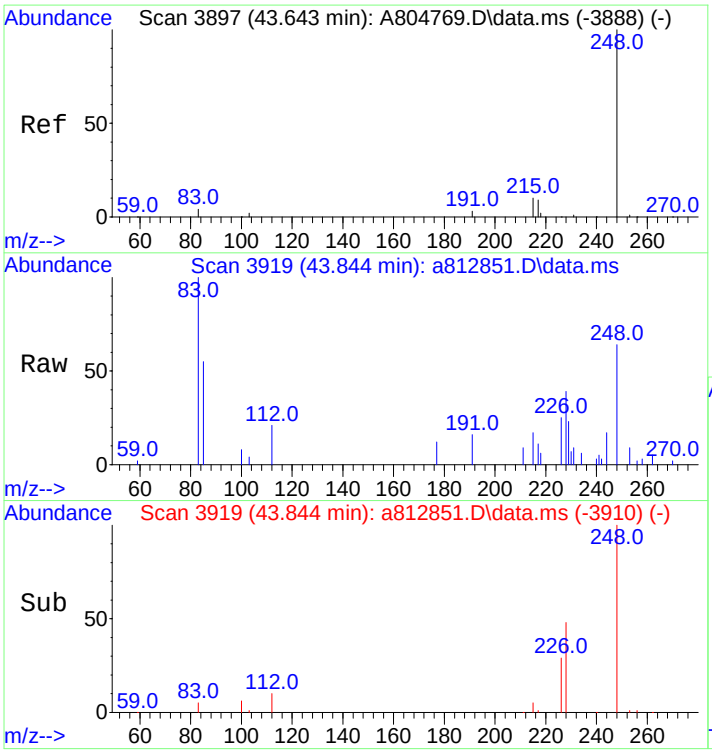


#69
Naphthobenzothiophene-2,3-D
Concen: 192.73 ng/mL m
RT: 43.086 min Scan# 3836
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:234 Resp: 38805

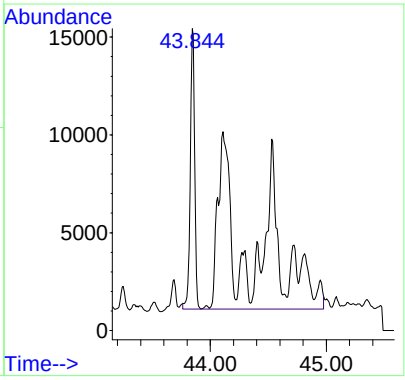
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

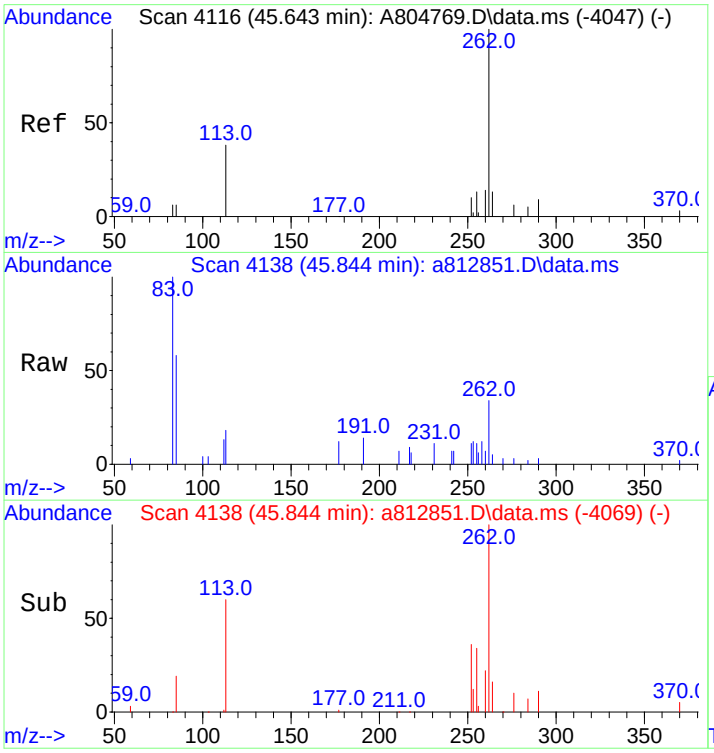




#70
C1-Naphthobenzothiophenes
Concen: 1003.13 ng/ml m
RT: 43.844 min Scan# 3919
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

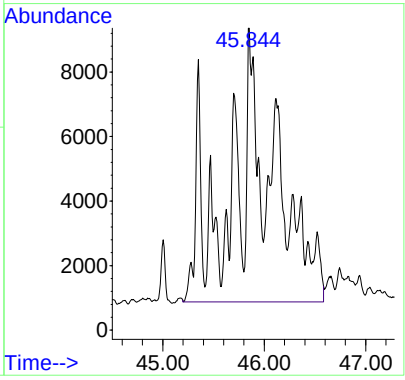
Tgt Ion:248 Resp: 201979

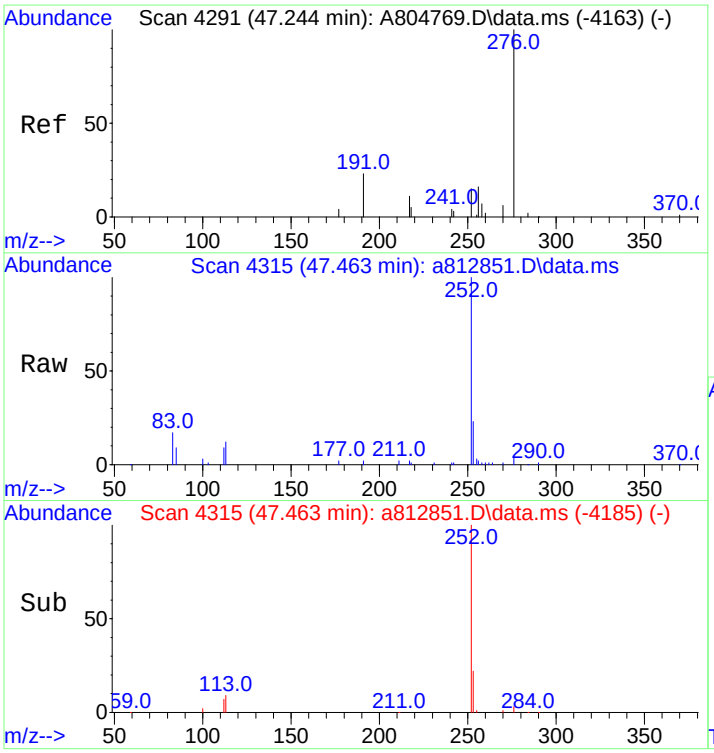




#71
C2-Naphthobenzothiophenes
Concen: 1189.72 ng/ml m
RT: 45.844 min Scan# 4138
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

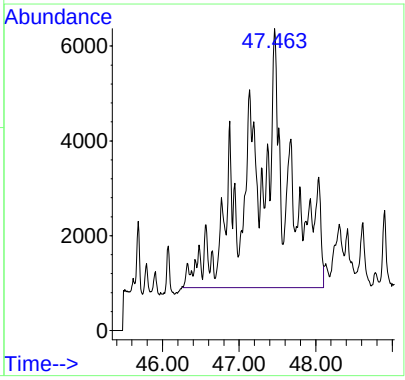
Tgt Ion:262 Resp: 239548

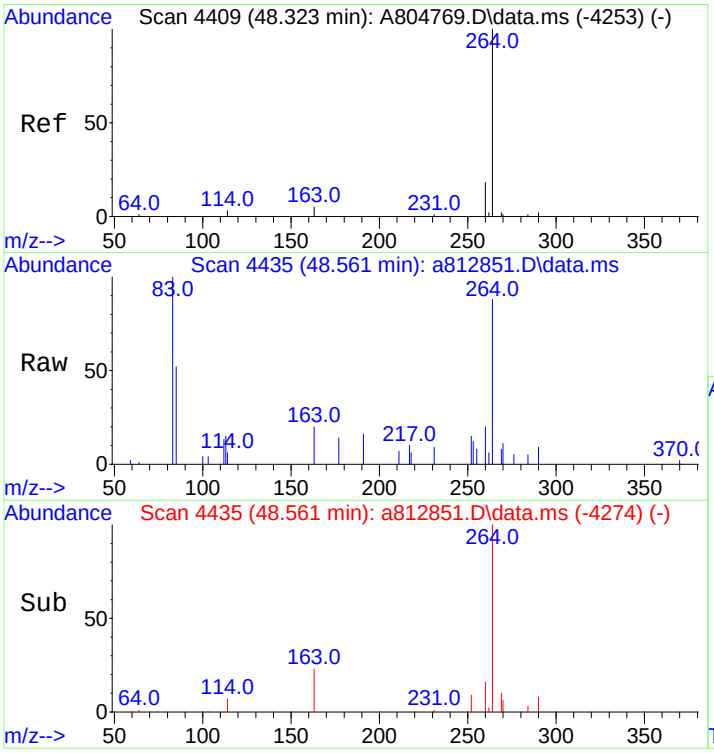




#72
C3-Naphthobenzothiophenes
Concen: 897.52 ng/ml m
RT: 47.463 min Scan# 4315
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

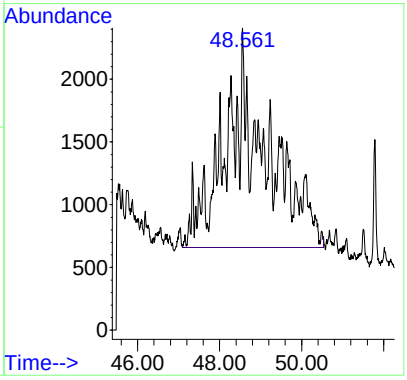
Tgt Ion:276 Resp: 180714

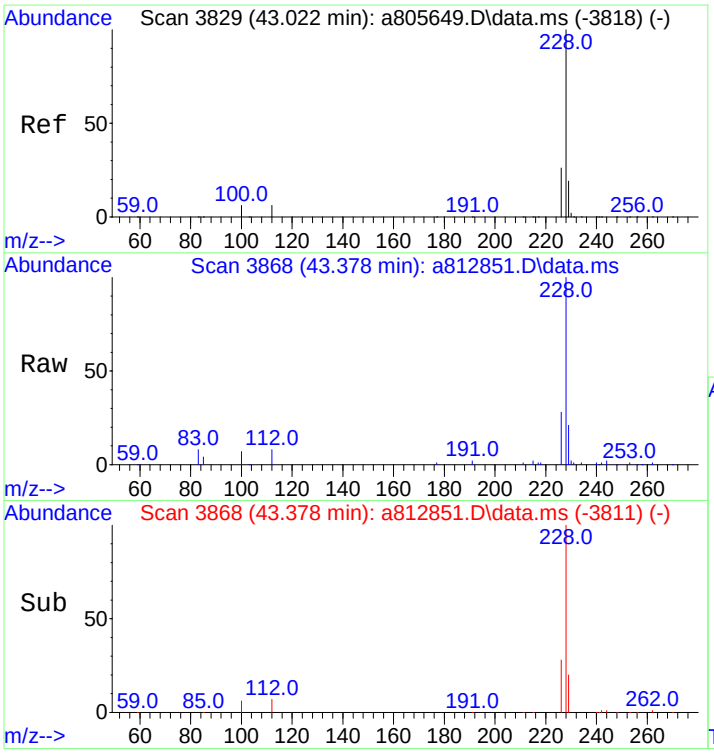




#73
C4-Naphthobenzothiophenes
Concen: 576.80 ng/mL m
RT: 48.561 min Scan# 4435
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:290 Resp: 116138

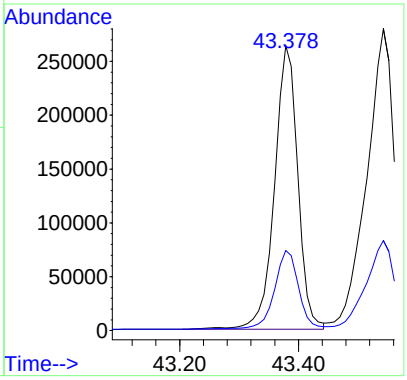


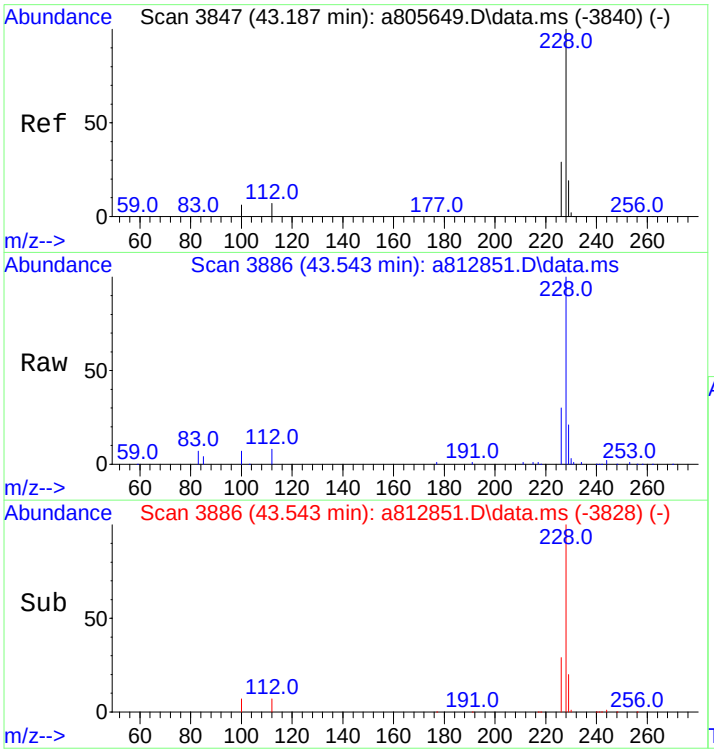


#75
Benz[a]anthracene
Concen: 3561.96 ng/mL
RT: 43.378 min Scan# 3868
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:228 Resp: 715905

Ion	Ratio	Lower	Upper
228	100		
226	27.8	21.3	31.9

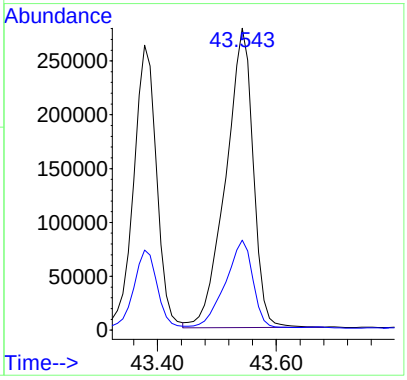


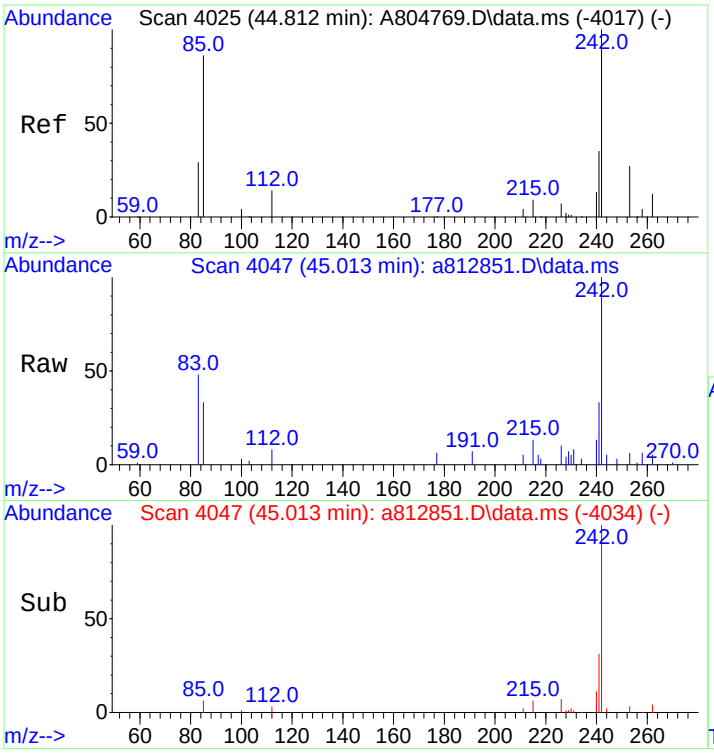


#77
Chrysene/Triphenylene
Concen: 4378.46 ng/mL
RT: 43.543 min Scan# 3886
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:228 Resp: 890775

Ion	Ratio	Lower	Upper
228	100		
226	30.1	23.6	35.4

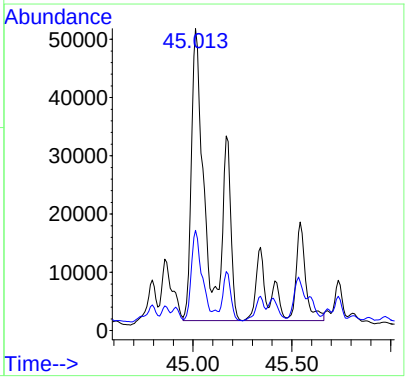


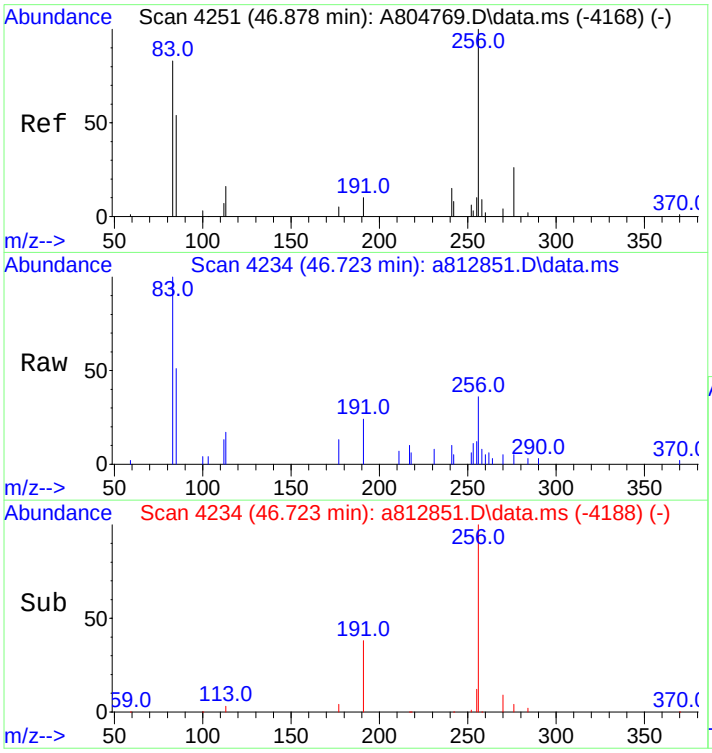


#78
C1-Chrysenes
Concen: 1976.77 ng/mL m
RT: 45.013 min Scan# 4047
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:242 Resp: 402164

Ion	Ratio	Lower	Upper
242	100		
241	3.2	33.5	50.3#

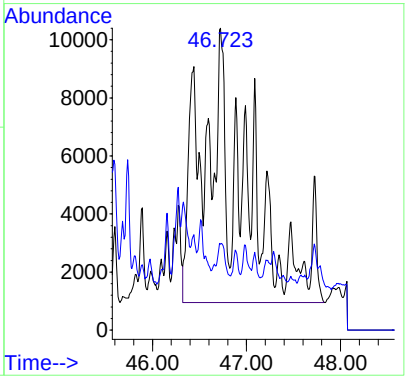


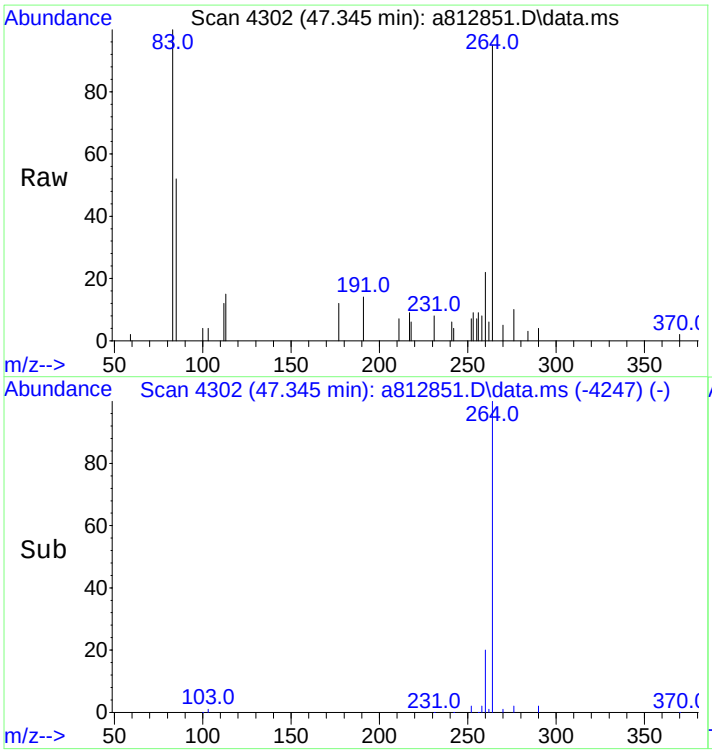


#79
C2-Chrysenes
Concen: 1444.24 ng/mL m
RT: 46.723 min Scan# 4234
Delta R.T. -0.338 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:256 Resp: 293824

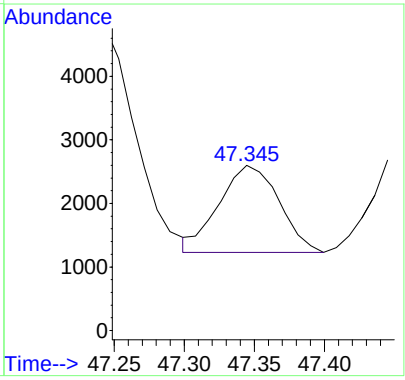
Ion	Ratio	Lower	Upper
256	100		
241	1.4	30.4	45.6#

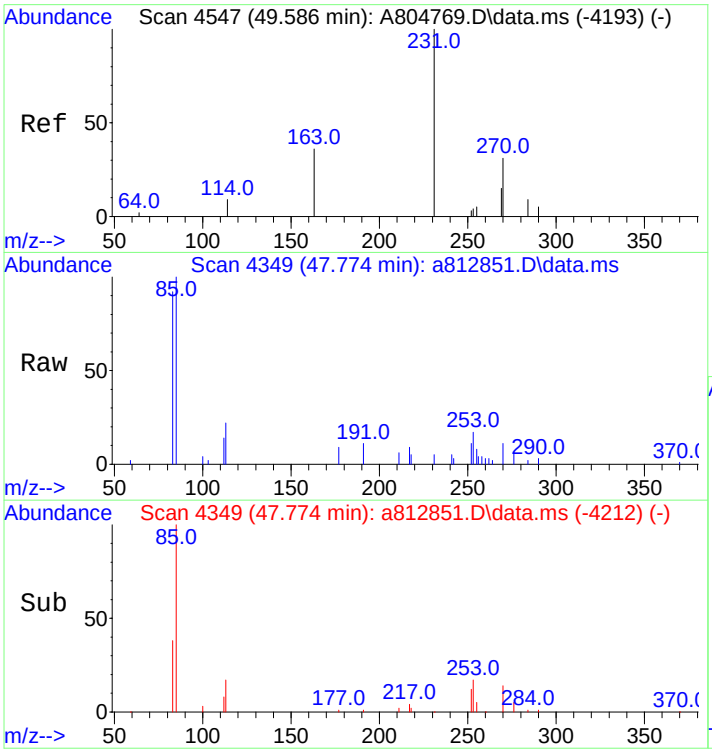




#80
BBF-D12 Surr BKGD
Concen: 20.01 ng/mL
RT: 47.345 min Scan# 4302
Delta R.T. 0.002 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:256 Resp: 4070

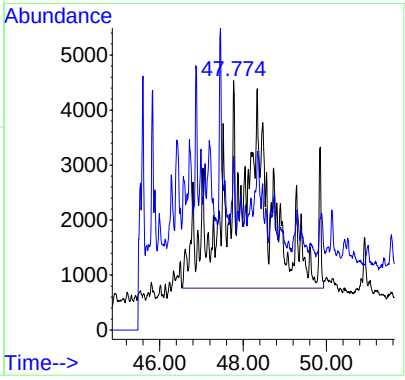


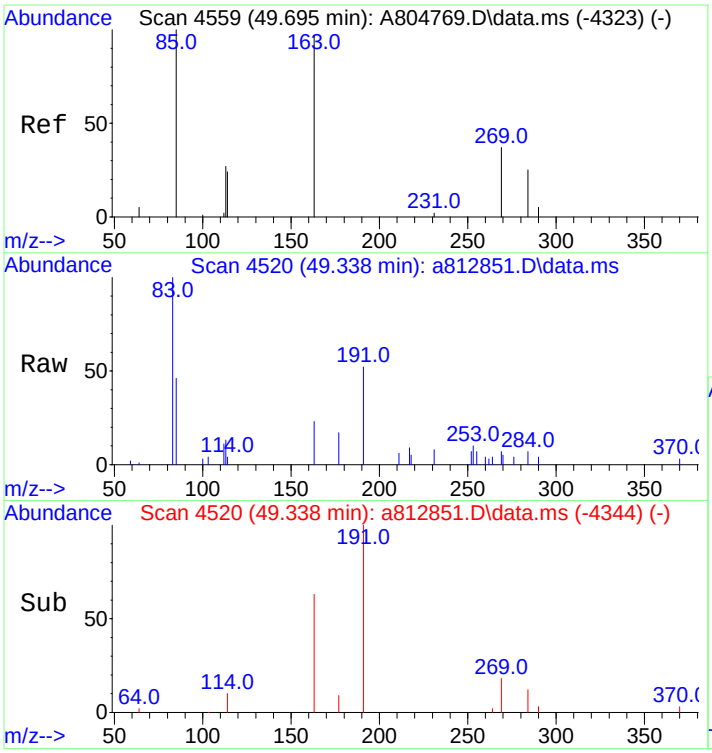


#81
C3-Chrysenes
Concen: 1174.69 ng/mL m
RT: 47.774 min Scan# 4349
Delta R.T. -2.040 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:270 Resp: 238985

Ion	Ratio	Lower	Upper
270	100		
255	0.5	42.9	64.3#

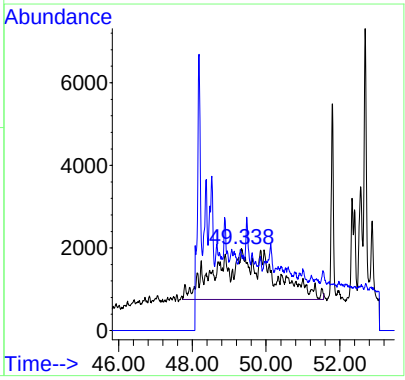


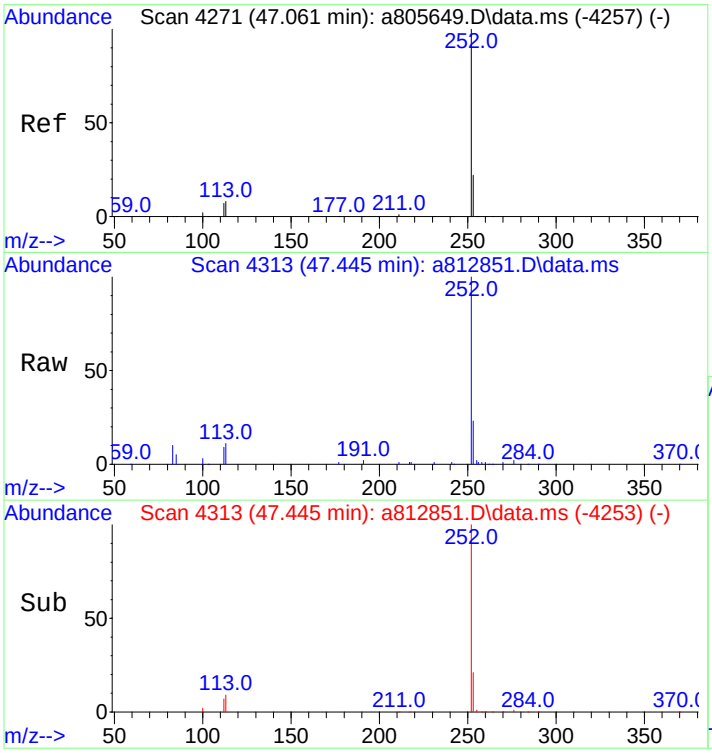


#82
C4-Chrysenes
Concen: 620.70 ng/mL m
RT: 49.338 min Scan# 4520
Delta R.T. -0.487 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:284 Resp: 126279

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

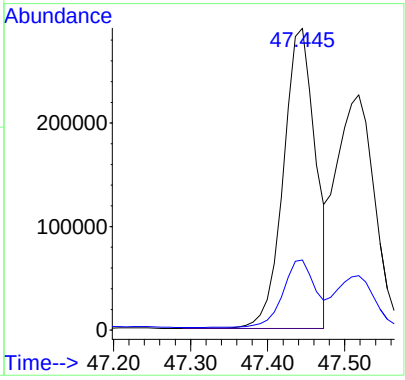


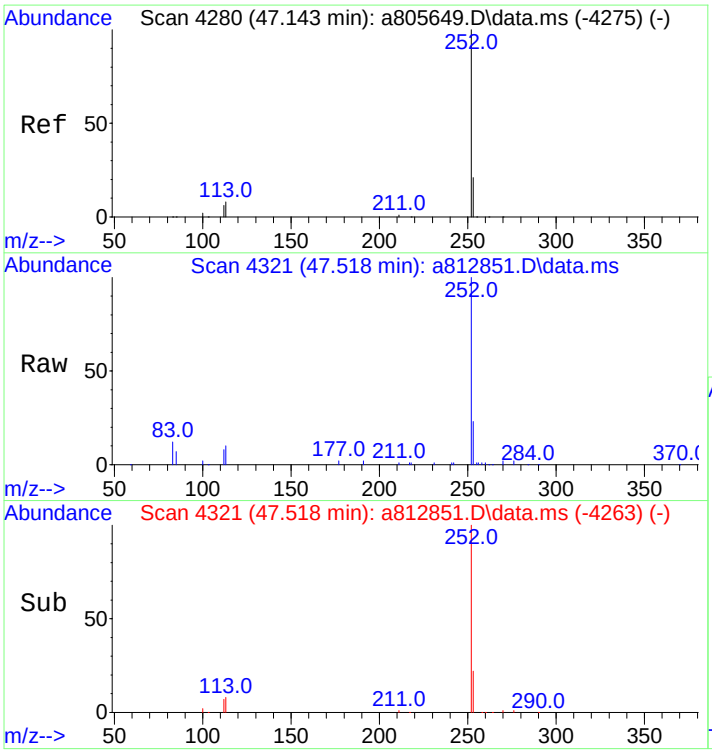


#84
Benzo[b]fluoranthene
Concen: 3908.45 ng/mL
RT: 47.445 min Scan# 4313
Delta R.T. 0.045 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:252 Resp: 843665

Ion	Ratio	Lower	Upper
252	100		
253	22.6	18.5	27.7

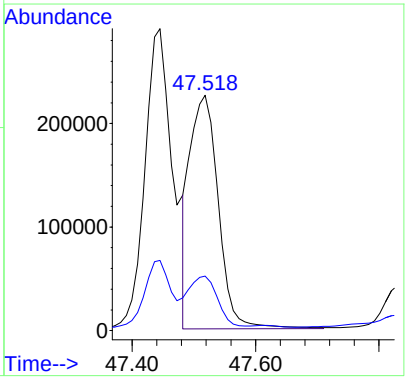


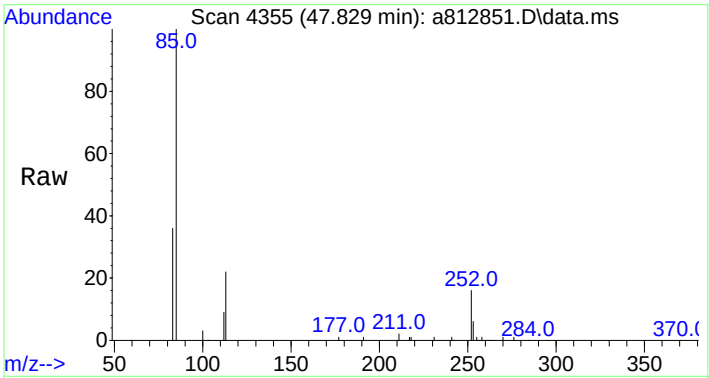


#85
Benzo[j]+[k]fluoranthene
Concen: 3091.17 ng/mL
RT: 47.518 min Scan# 4321
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:252 Resp: 728040

Ion	Ratio	Lower	Upper
252	100		
253	23.8	18.8	28.2

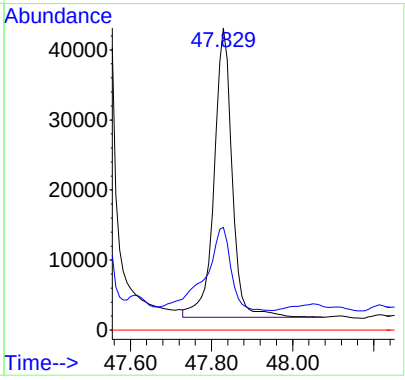


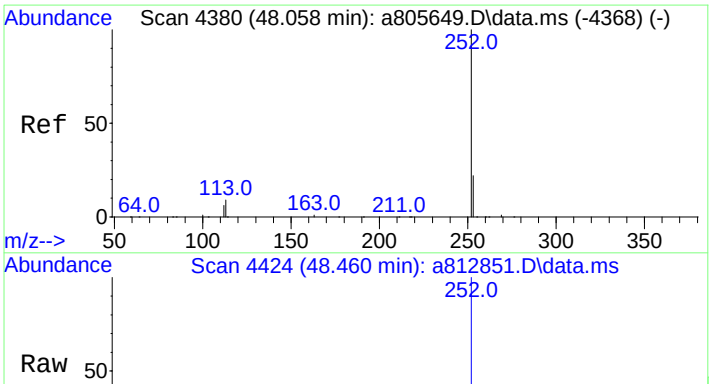


#86
Benzo[a]fluoranthene
Concen: 545.19 ng/mL
RT: 47.829 min Scan# 4355
Delta R.T. -0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:252 Resp: 128404

Ion	Ratio	Lower	Upper
252	100		
253	41.7	372.3	558.5#
125	0.0	0.0	0.0

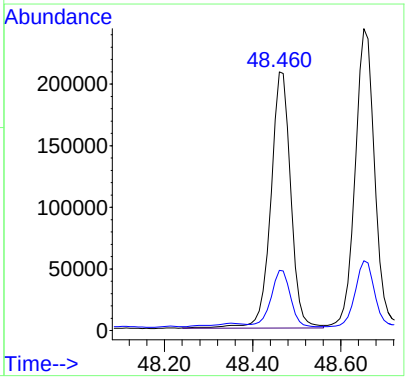


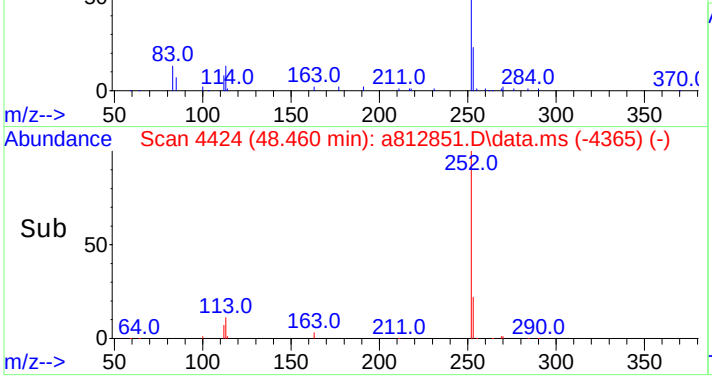


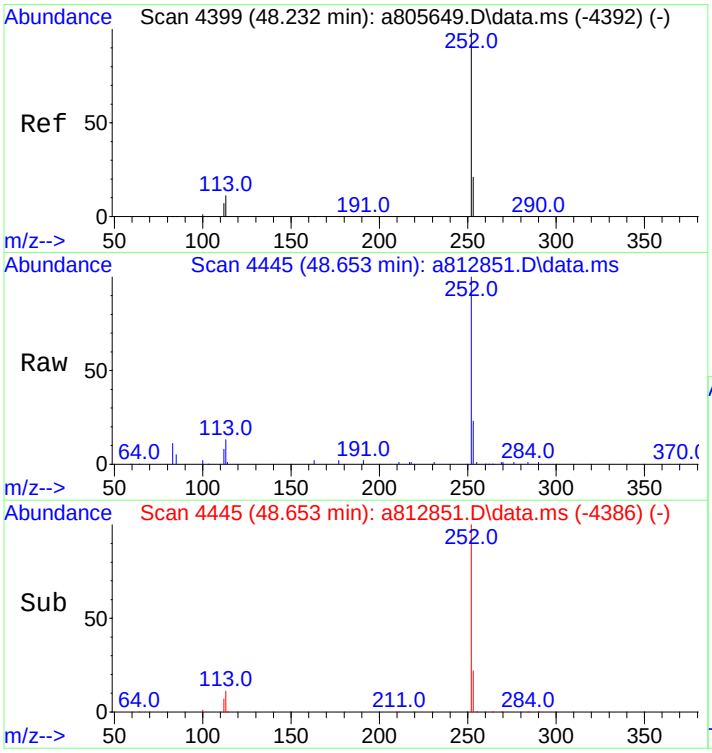
#87
Benzo[e]pyrene
Concen: 2942.44 ng/mL
RT: 48.460 min Scan# 4424
Delta R.T. 0.036 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:252 Resp: 654434

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.9	28.3



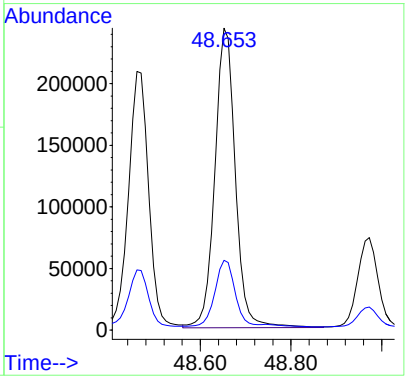


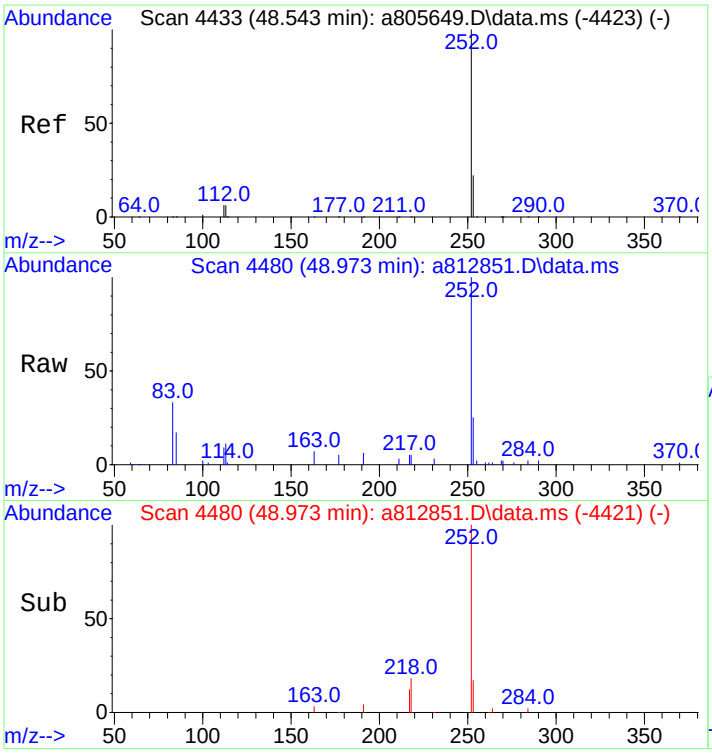


#89
Benzo[a]pyrene
Concen: 3713.82 ng/mL
RT: 48.653 min Scan# 4445
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:252 Resp: 764069

Ion	Ratio	Lower	Upper
252	100		
253	22.7	19.4	29.0

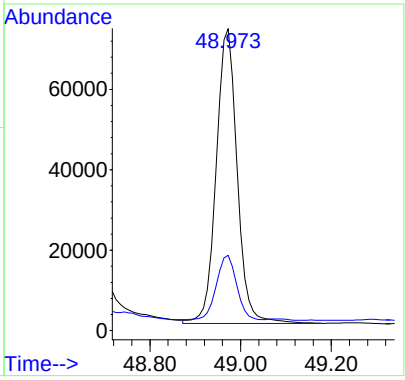


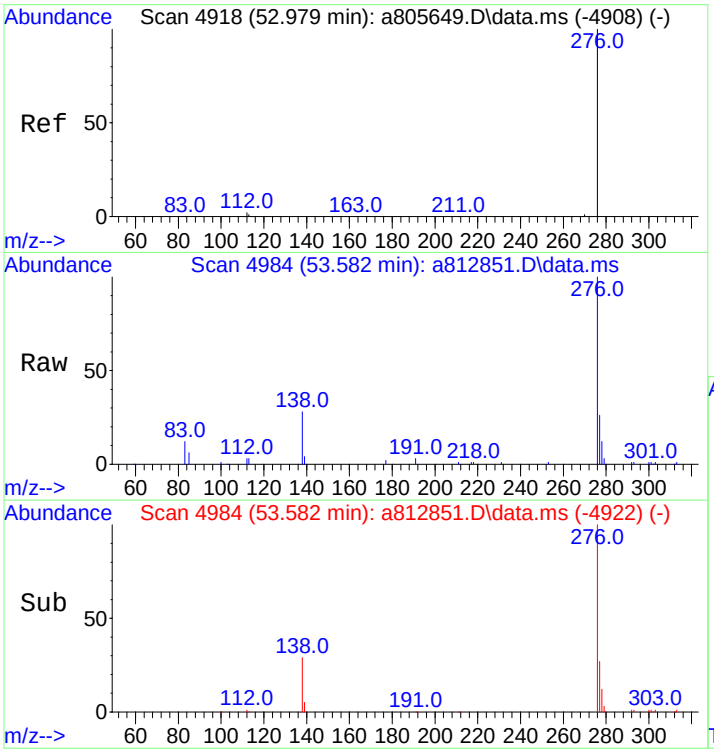


#90
Perylene
Concen: 1045.37 ng/mL
RT: 48.973 min Scan# 4480
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:252 Resp: 234923

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.3	28.9

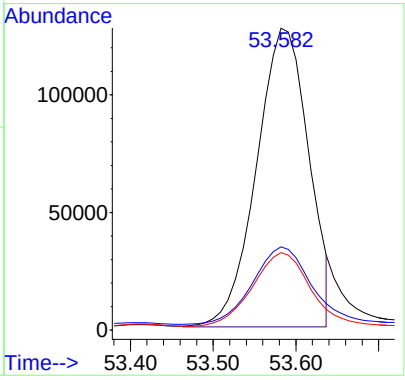


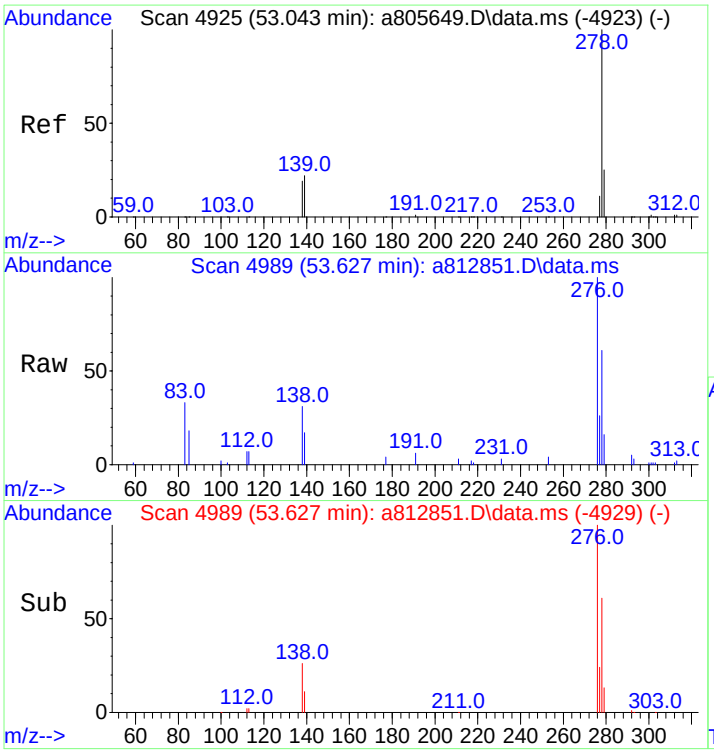


#91
Indeno[1,2,3-cd]pyrene
Concen: 2544.35 ng/mL m
RT: 53.582 min Scan# 4984
Delta R.T. 0.064 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:276 Resp: 556061

Ion	Ratio	Lower	Upper
276	100		
138	29.3	19.9	29.9
277	28.2	19.0	28.6

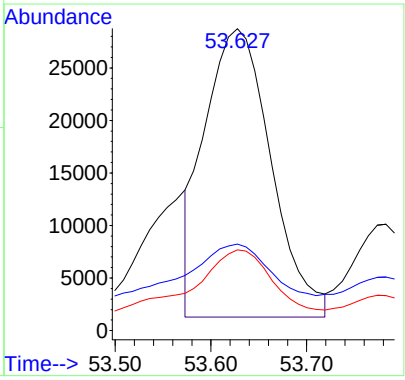


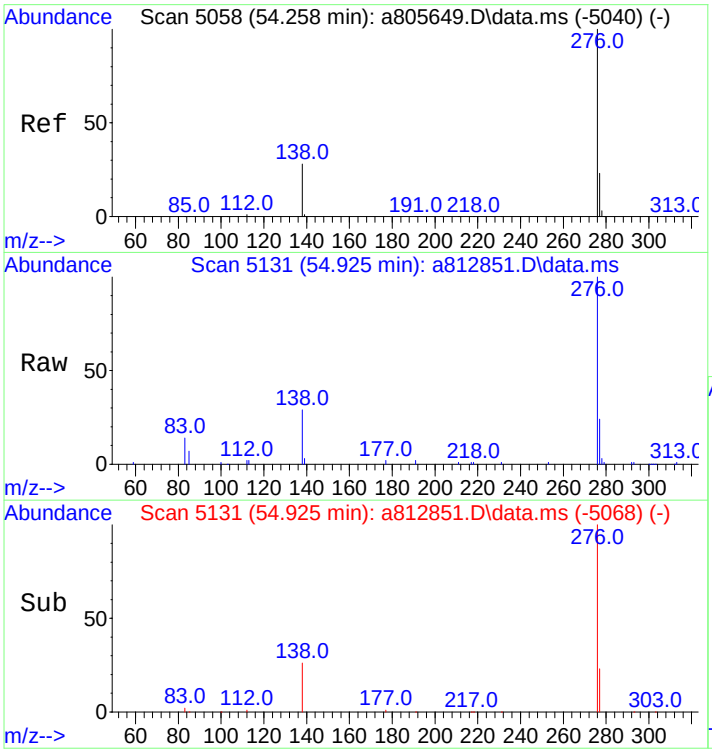


#92
Dibenz[ah]+[ac]anthracene
Concen: 618.61 ng/mL m
RT: 53.627 min Scan# 4989
Delta R.T. 0.045 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:278 Resp: 132520

Ion	Ratio	Lower	Upper
278	100		
139	24.6	16.6	25.0
279	29.0	19.1	28.7#

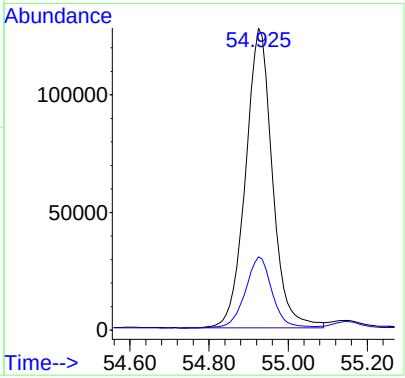


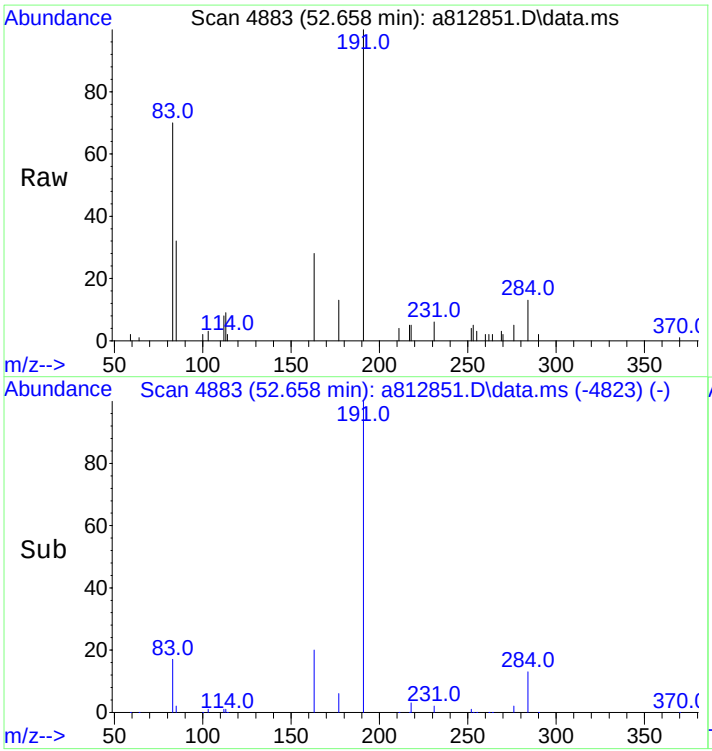


#93
Benzo[g,h,i]perylene
Concen: 2418.76 ng/mL
RT: 54.925 min Scan# 5131
Delta R.T. 0.073 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:276 Resp: 599895

Ion	Ratio	Lower	Upper
276	100		
277	23.7	18.9	28.3

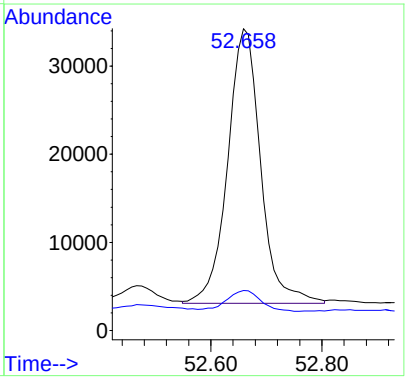


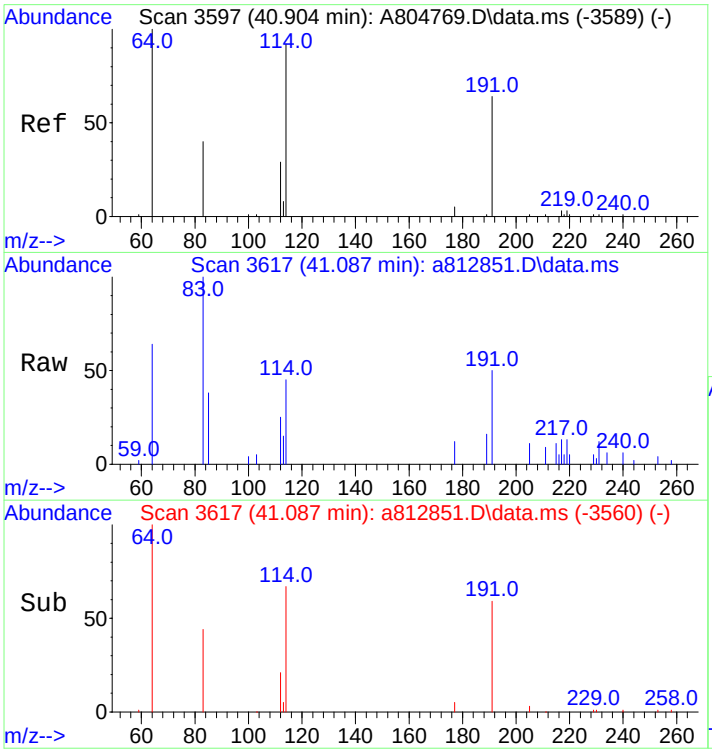


#94
Hopane (T19)
Concen: 1874.74 ng/mL m
RT: 52.658 min Scan# 4883
Delta R.T. 0.045 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:191 Resp: 129083

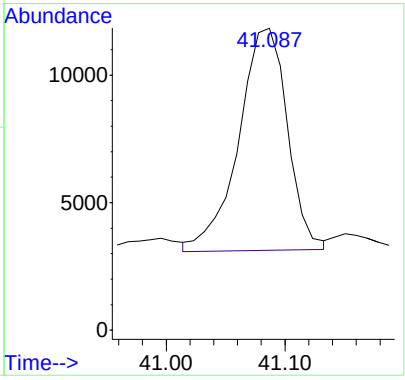
Ion	Ratio	Lower	Upper
191	100		
177	0.5	9.8	14.8#

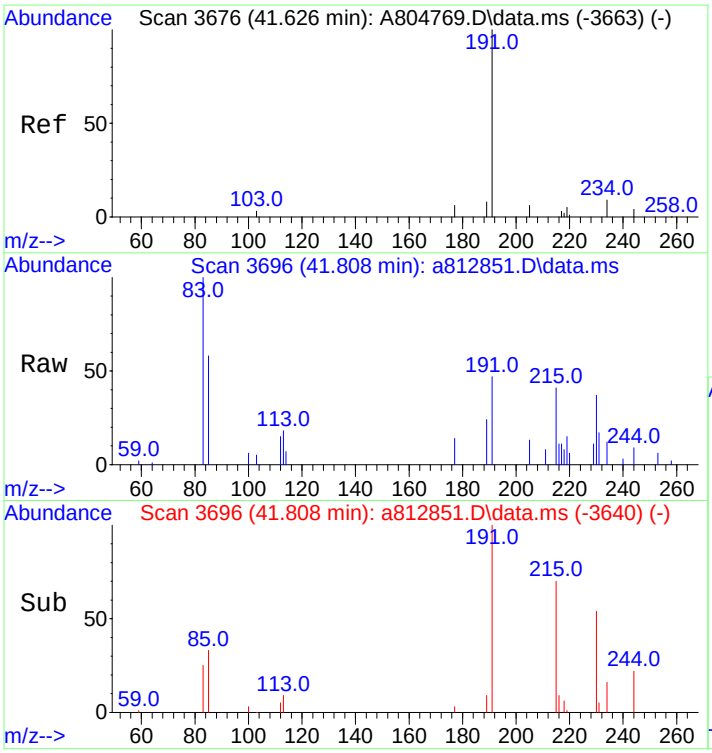




#96
C23 Tricyclic Terpane (T4)
Concen: 360.97 ng/ml
RT: 41.087 min Scan# 3617
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

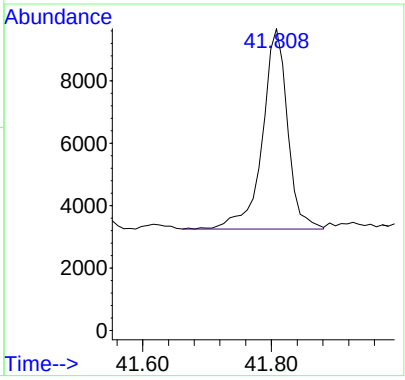
Tgt Ion:191 Resp: 24854

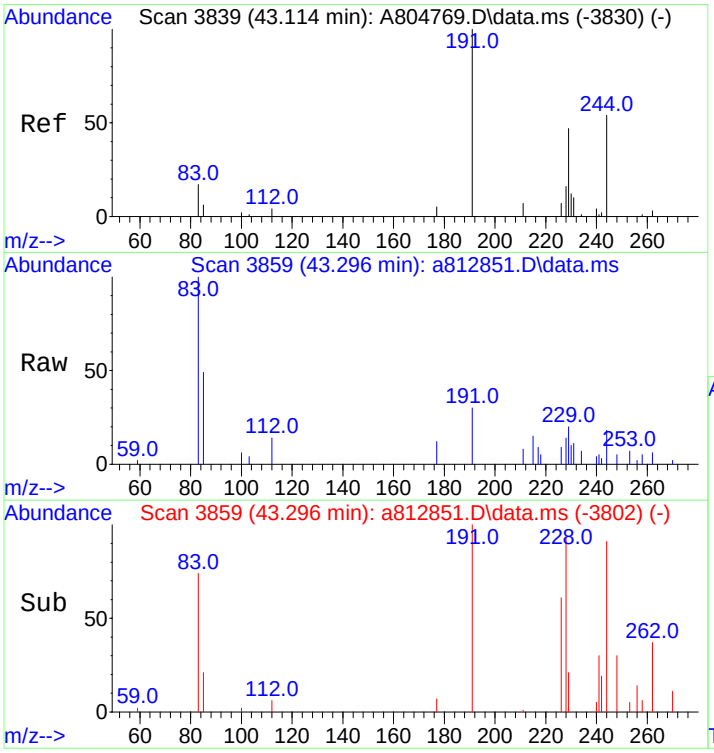




#97
C24 Tricyclic Terpane (T5)
Concen: 253.13 ng/ml
RT: 41.808 min Scan# 3696
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

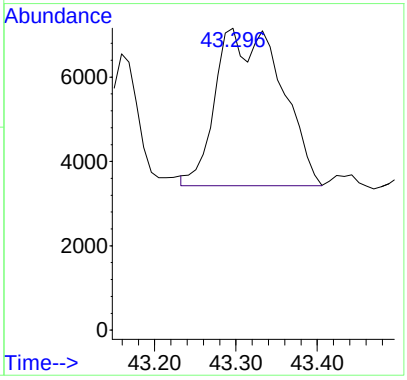
Tgt Ion:191 Resp: 17429

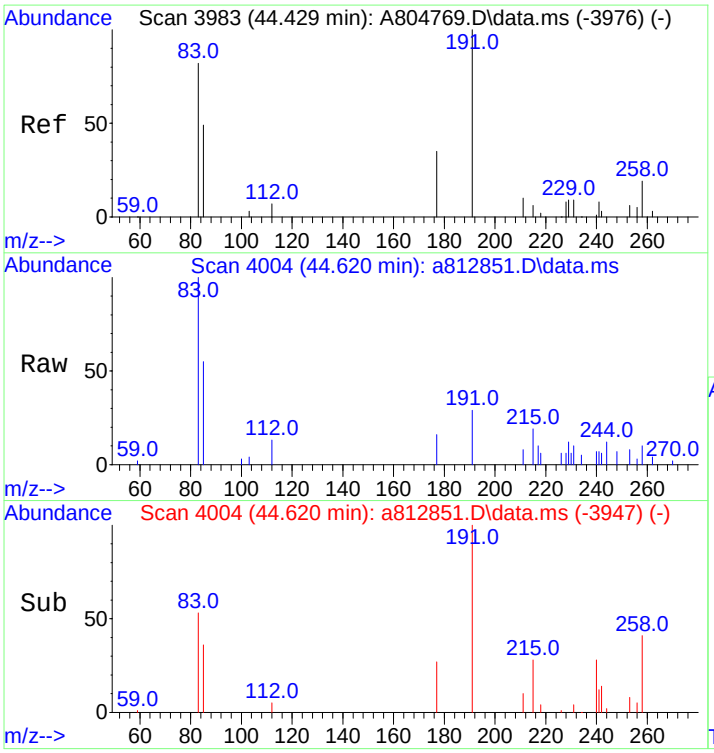




#98
C25 Tricyclic Terpane (T6)
Concen: 302.42 ng/ml m
RT: 43.296 min Scan# 3859
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

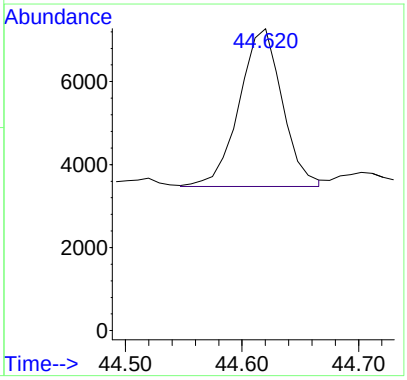
Tgt Ion:191 Resp: 20823

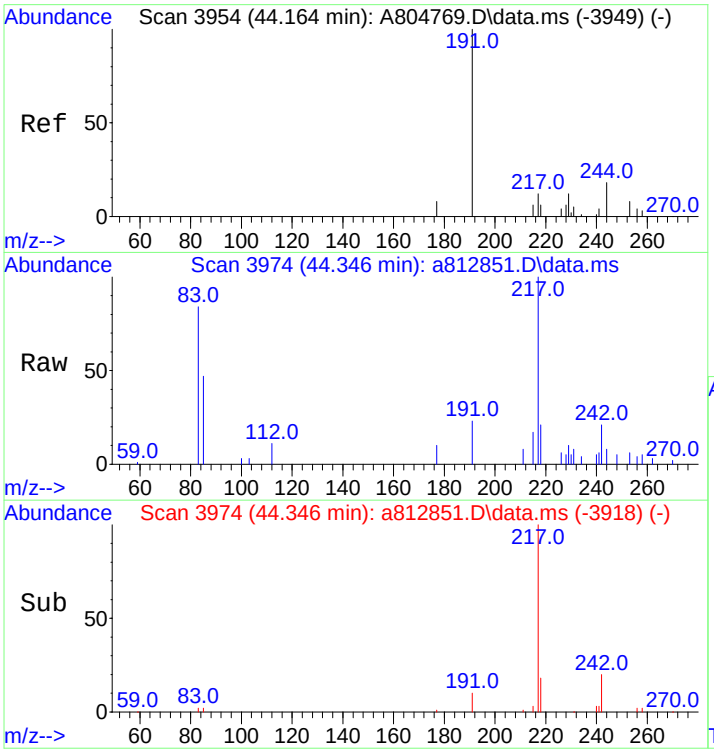




#99
C24 Tetracyclic Terpane (T6a)
Concen: 141.46 ng/ml m
RT: 44.620 min Scan# 4004
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

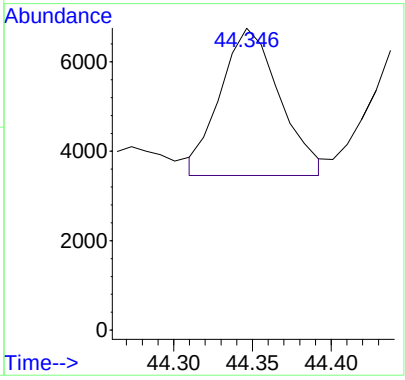
Tgt Ion:191 Resp: 9740

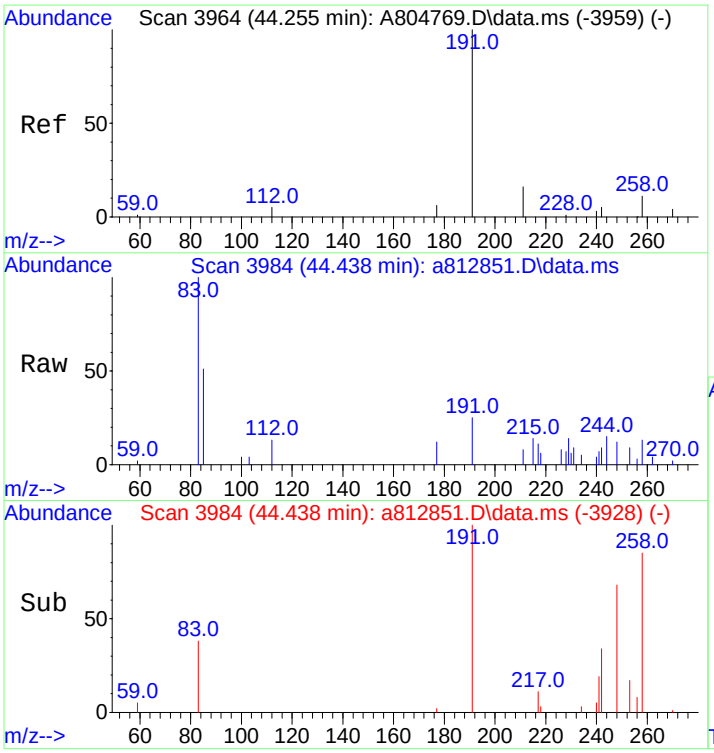




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 125.03 ng/ml m
RT: 44.346 min Scan# 3974
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

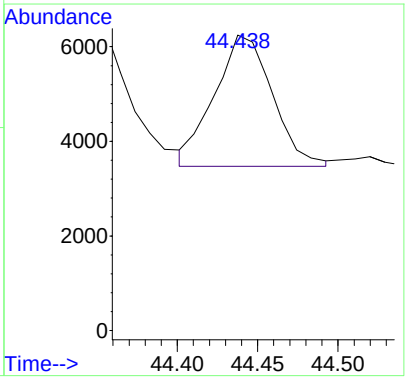
Tgt Ion:191 Resp: 8609

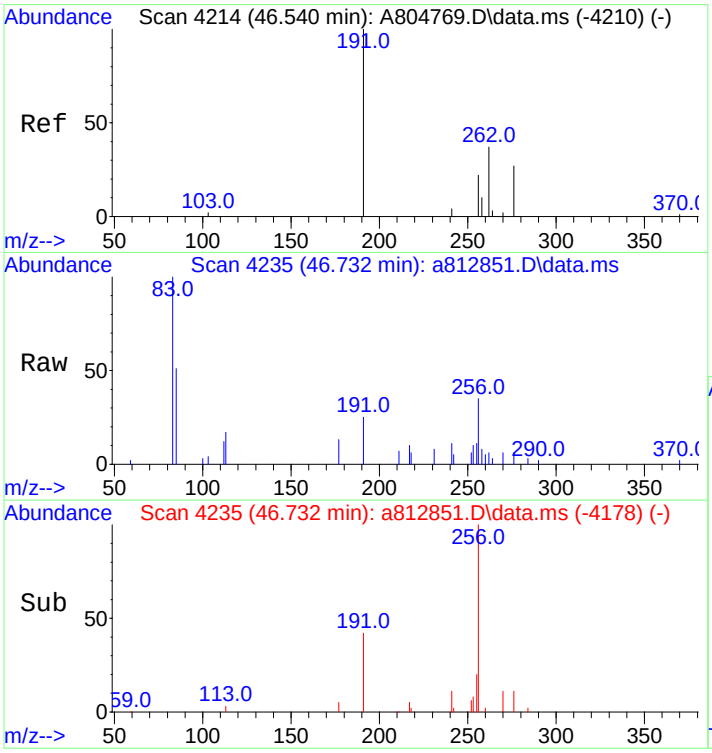




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 100.79 ng/ml m
RT: 44.438 min Scan# 3984
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

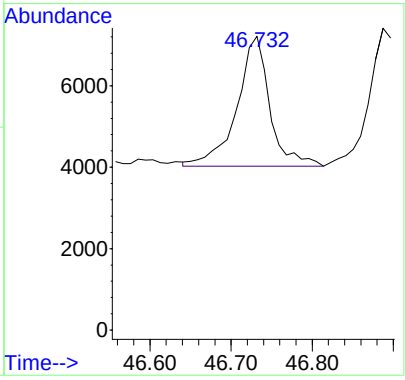
Tgt Ion:191 Resp: 6940

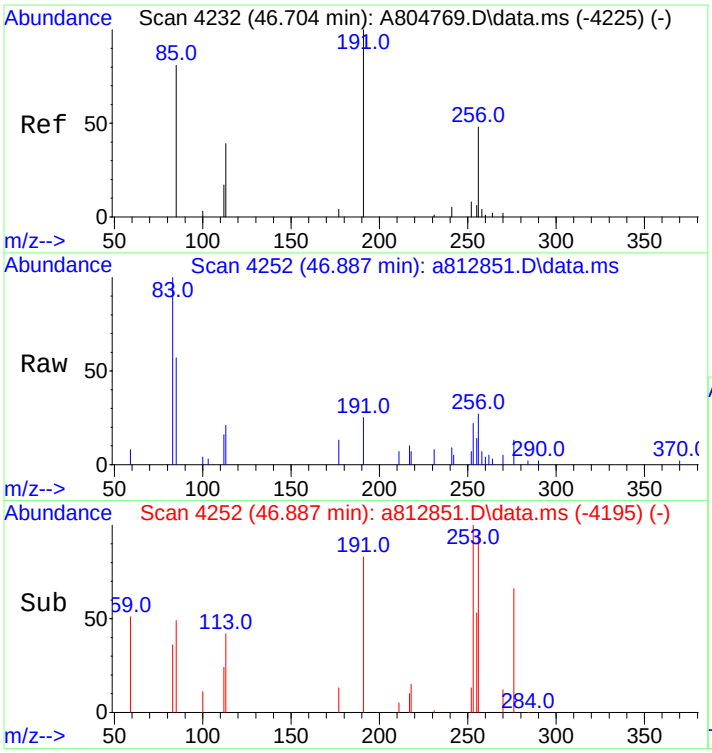




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 130.32 ng/ml
RT: 46.732 min Scan# 4235
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

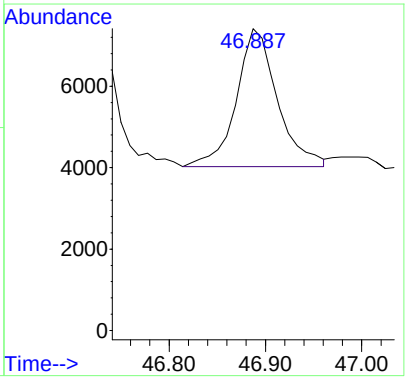
Tgt Ion:191 Resp: 8973

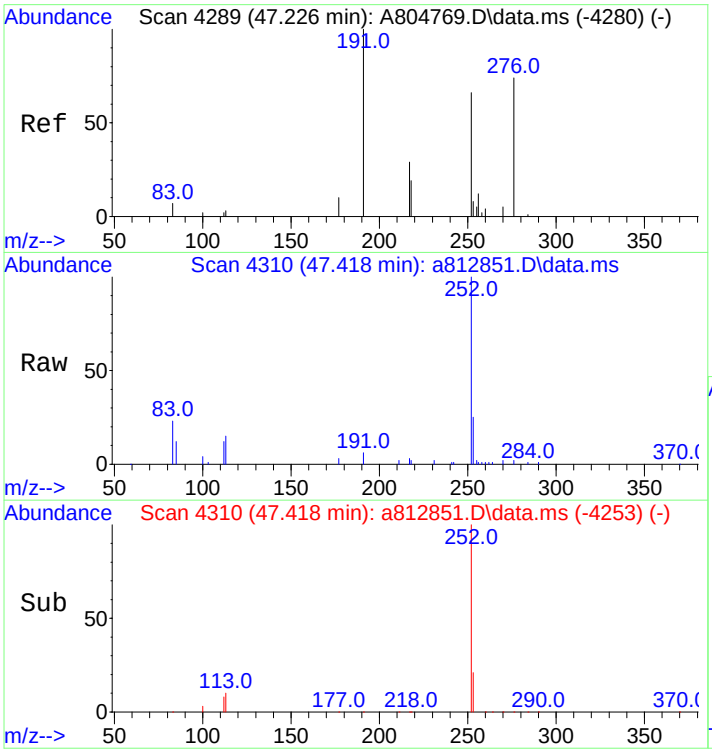




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 145.73 ng/ml
RT: 46.887 min Scan# 4252
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

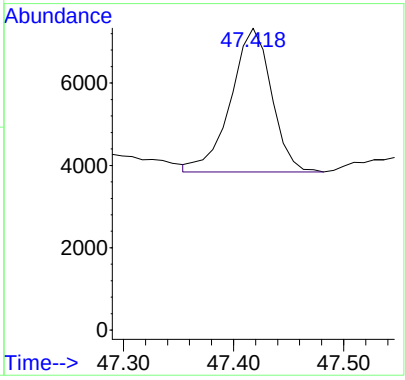
Tgt Ion:191 Resp: 10034

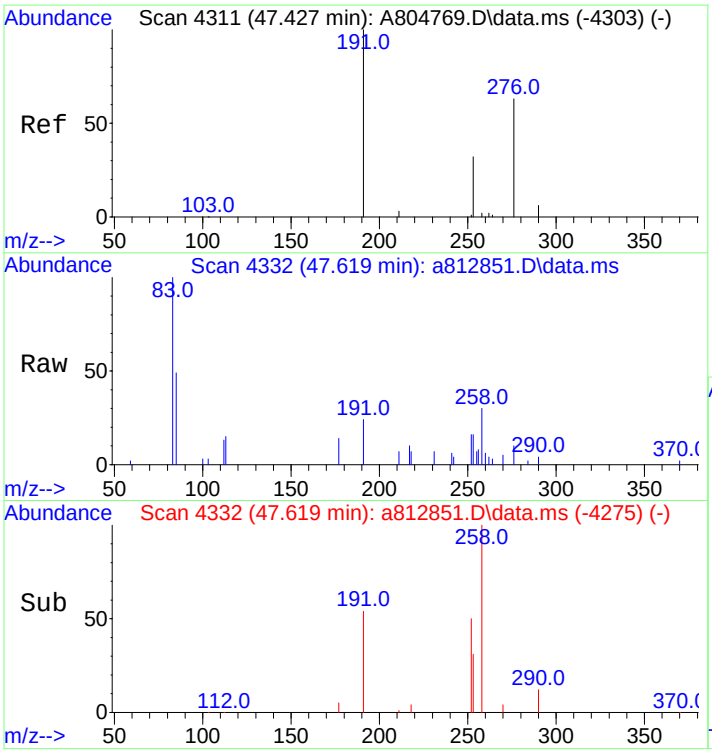




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 130.00 ng/ml
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

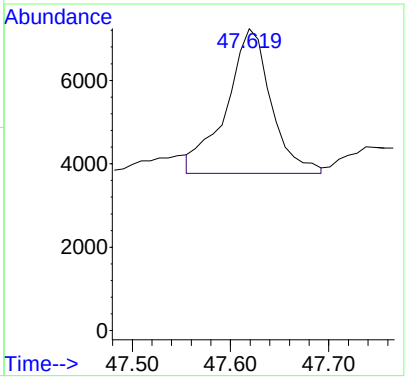
Tgt Ion:191 Resp: 8951

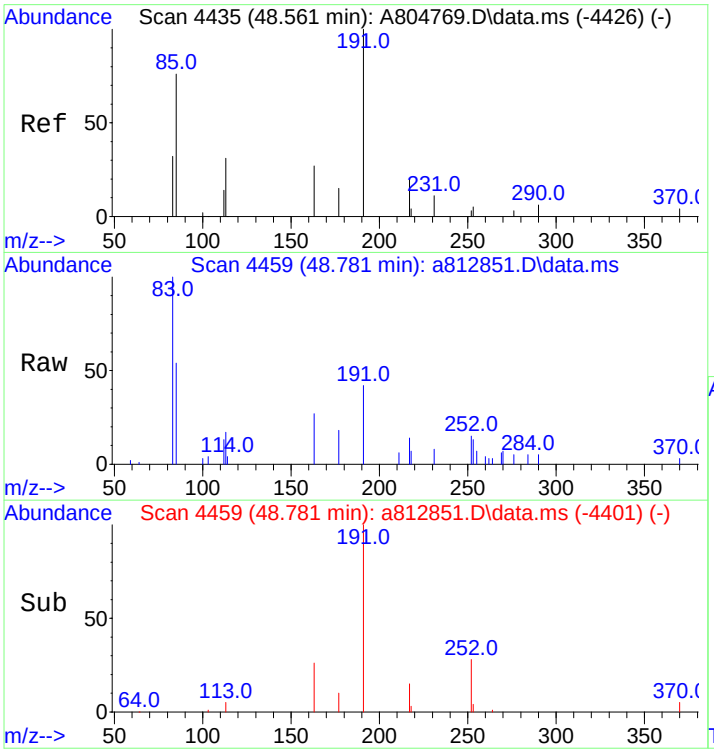




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 159.34 ng/ml m
RT: 47.619 min Scan# 4332
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

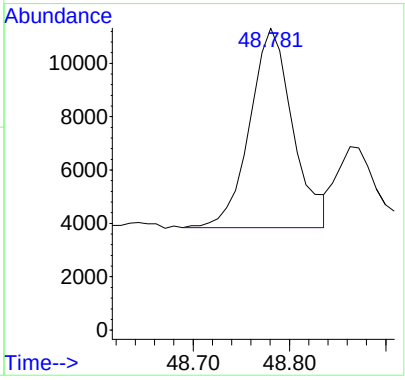
Tgt Ion:191 Resp: 10971

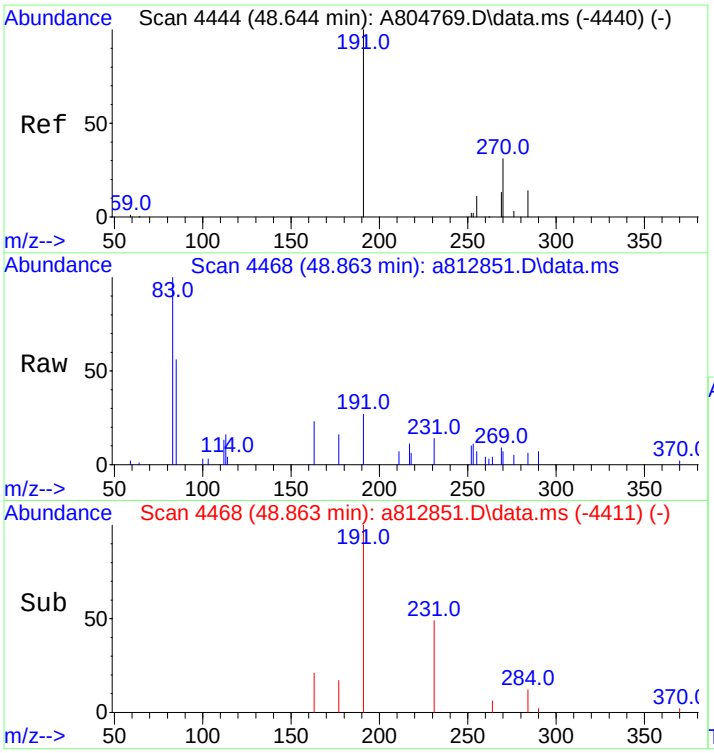




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 338.82 ng/ml
RT: 48.781 min Scan# 4459
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

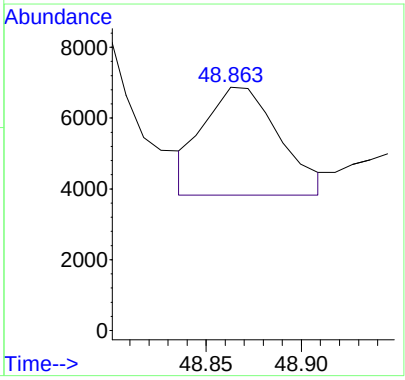
Tgt Ion:191 Resp: 23329

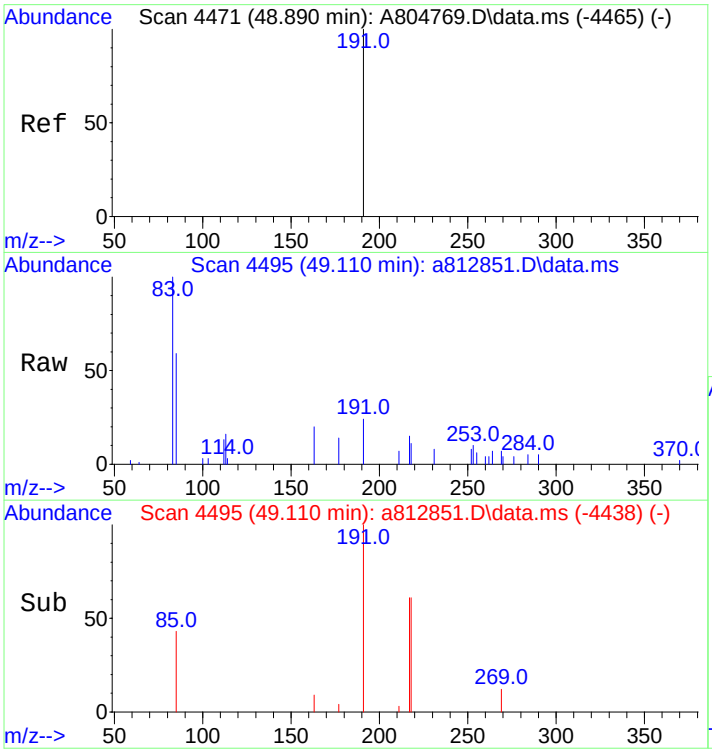




#107
C30 Tricyclic Terpane-22S
Concen: 122.83 ng/mL m
RT: 48.863 min Scan# 4468
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

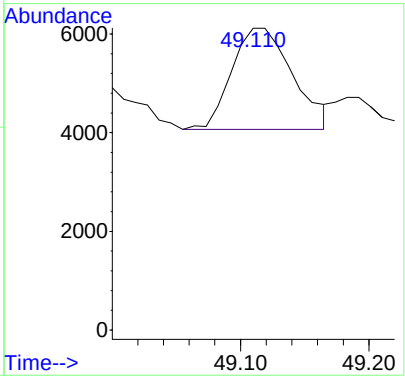
Tgt Ion:191 Resp: 8457

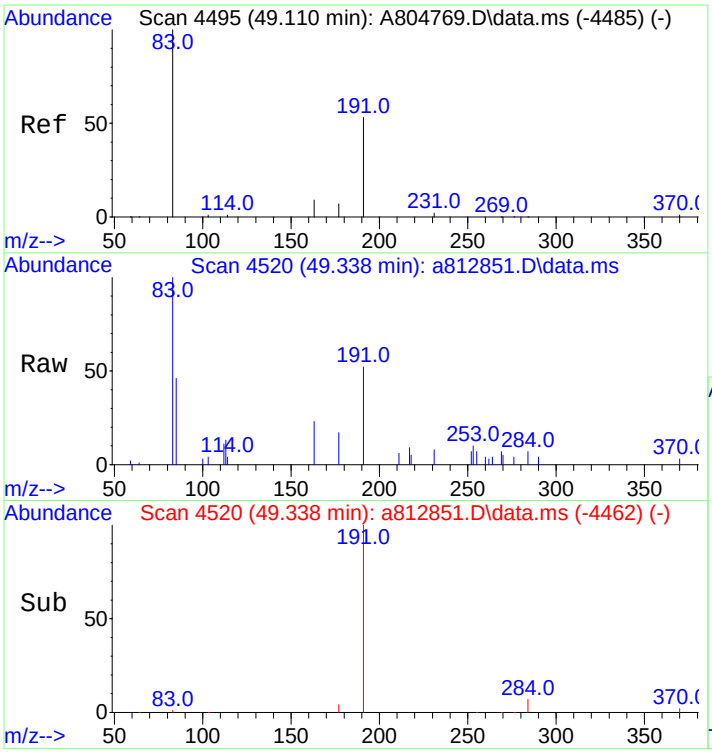




#108
C30 Tricyclic Terpane-22R
Concen: 98.73 ng/mL
RT: 49.110 min Scan# 4495
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

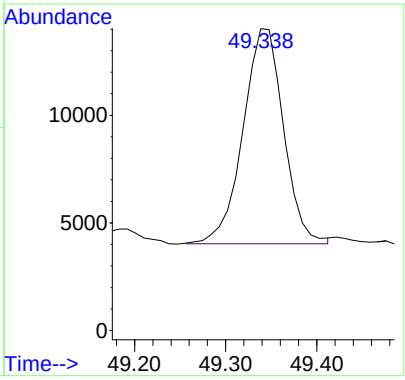
Tgt Ion:191 Resp: 6798

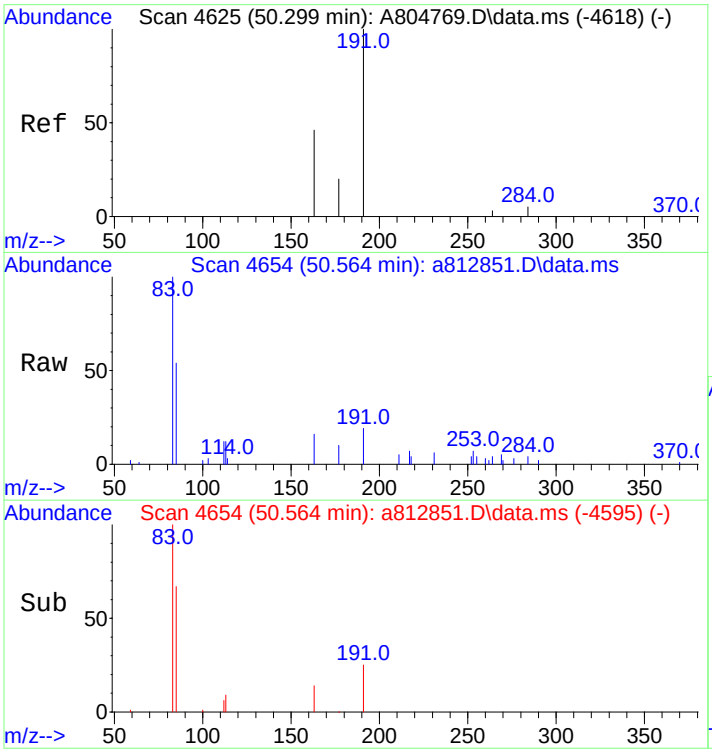




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 450.81 ng/ml m
RT: 49.338 min Scan# 4520
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

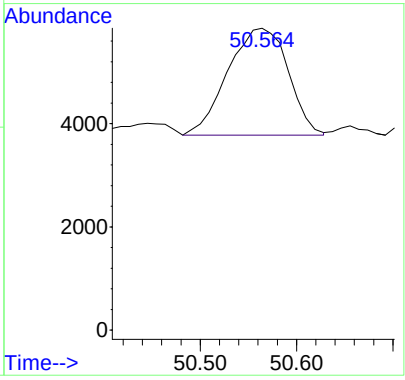
Tgt Ion:191 Resp: 31040

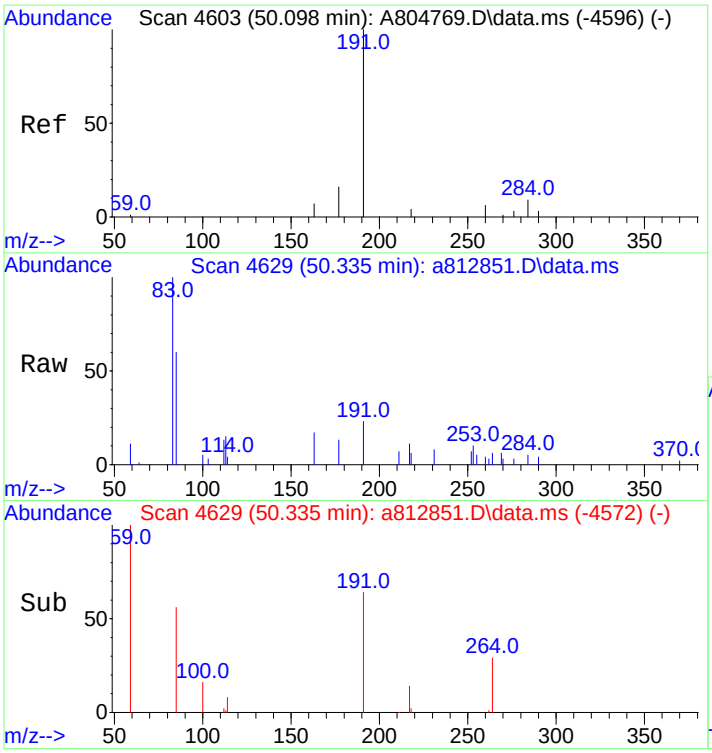




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 130.35 ng/ml
RT: 50.564 min Scan# 4654
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

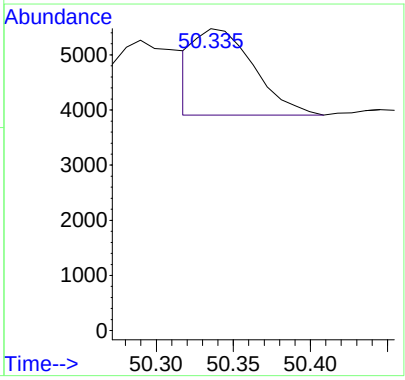
Tgt Ion:191 Resp: 8975

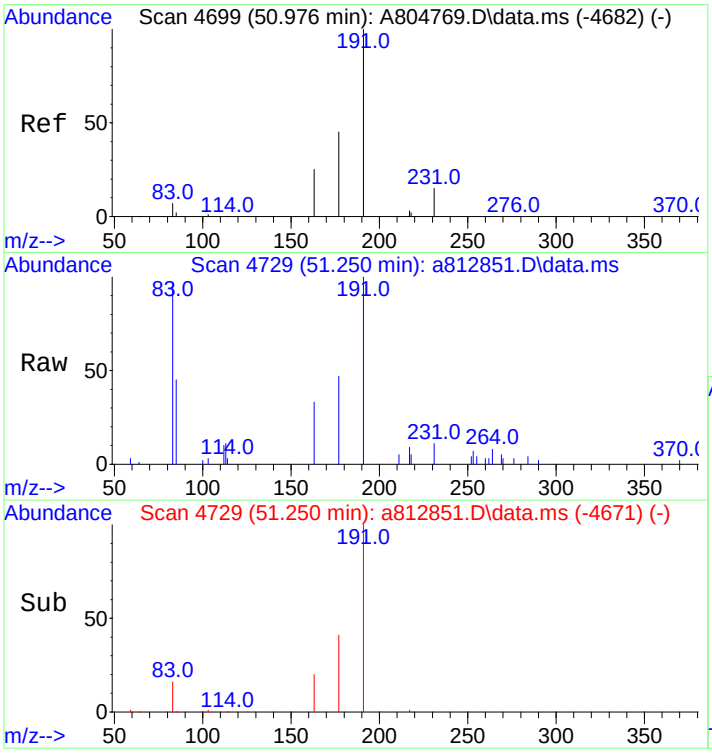




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 61.13 ng/ml
RT: 50.335 min Scan# 4629
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

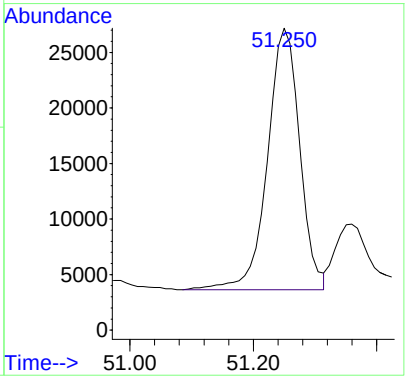
Tgt Ion:191 Resp: 4209

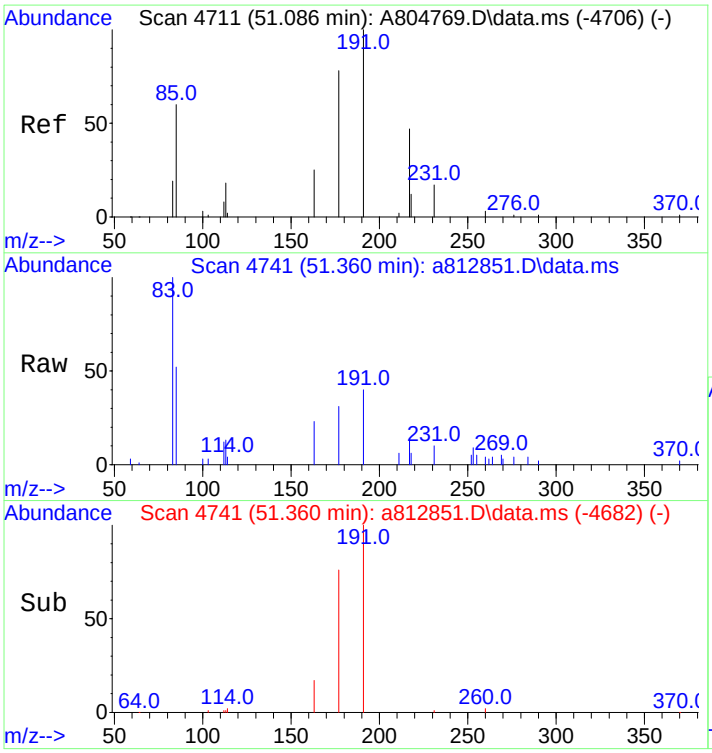




#112
30-Norhopane (T15)
Concen: 1244.13 ng/ml
RT: 51.250 min Scan# 4729
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

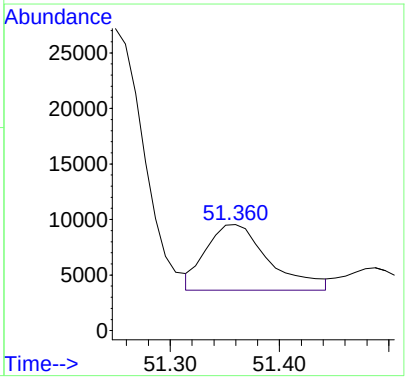
Tgt Ion:191 Resp: 85663

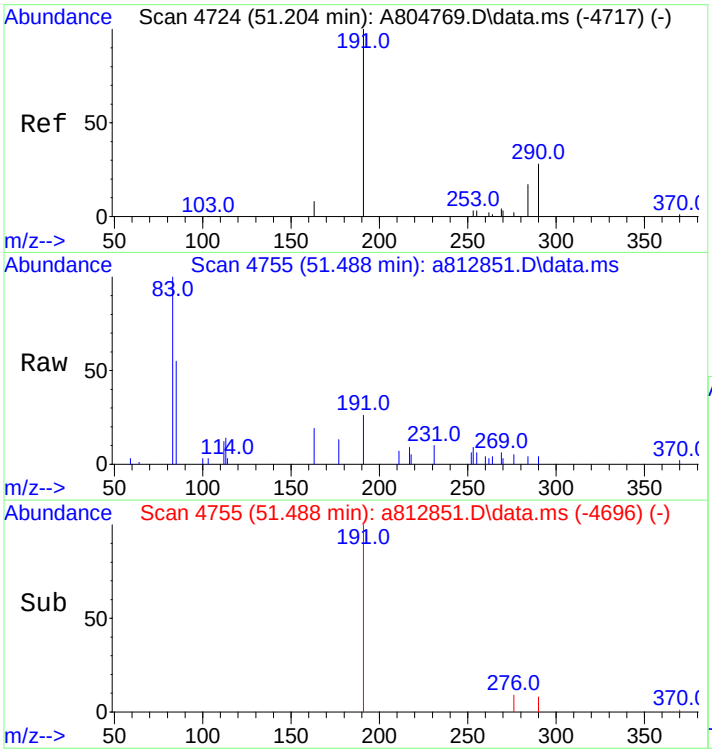




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 344.99 ng/ml m
RT: 51.360 min Scan# 4741
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

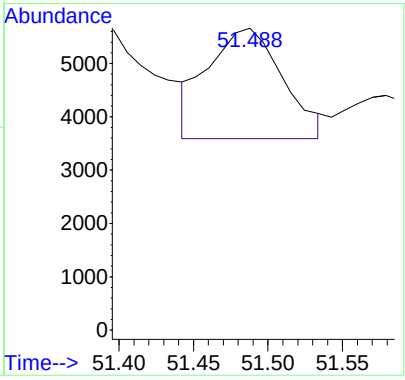
Tgt Ion:191 Resp: 23754

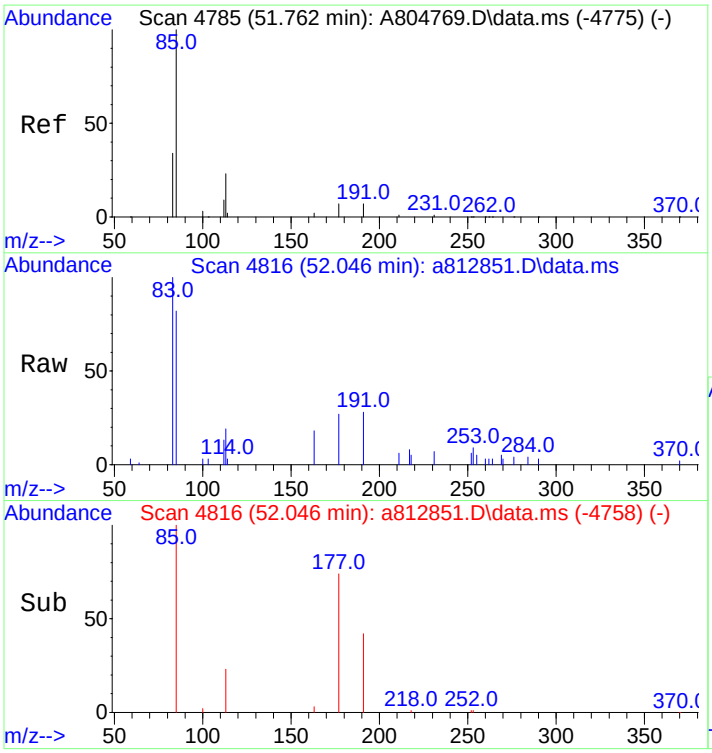




#114
17a(H)-Diahopane (X)
Concen: 105.28 ng/ml m
RT: 51.488 min Scan# 4755
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

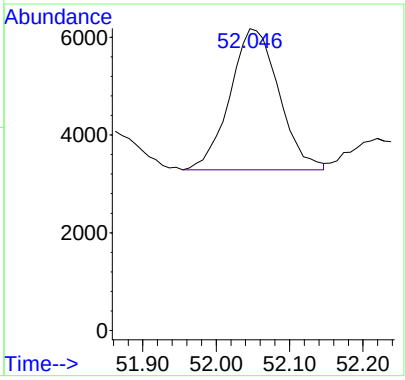
Tgt Ion:191 Resp: 7249

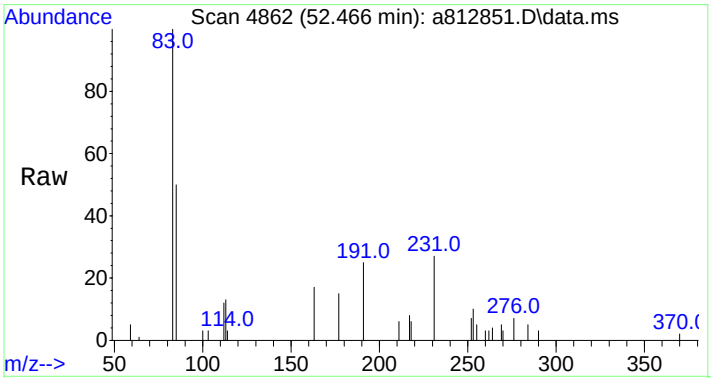




#115
30-Normoretane (T17)
Concen: 194.72 ng/ml
RT: 52.046 min Scan# 4816
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

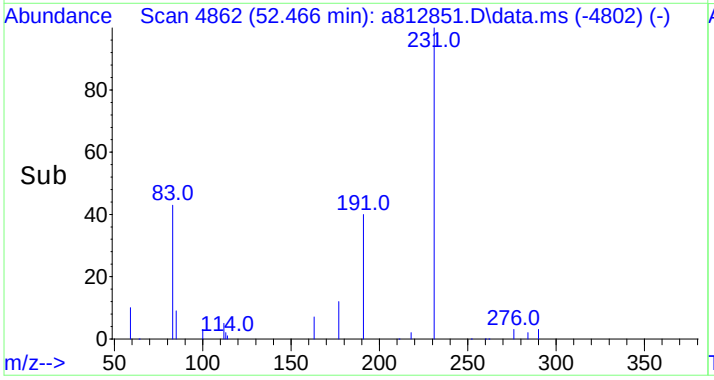
Tgt Ion:191 Resp: 13407

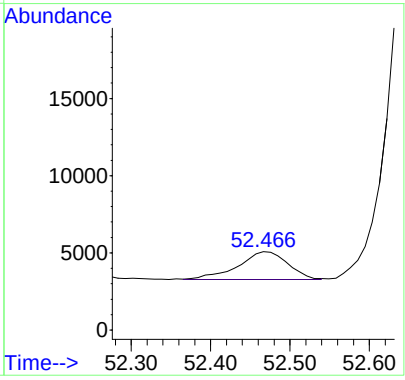


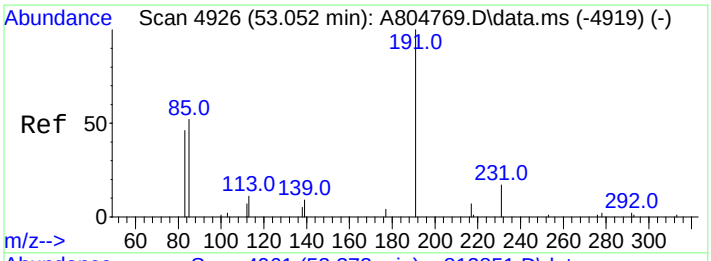


#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 112.59 ng/ml m
RT: 52.466 min Scan# 4862
Delta R.T. 0.046 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:191 Resp: 7752

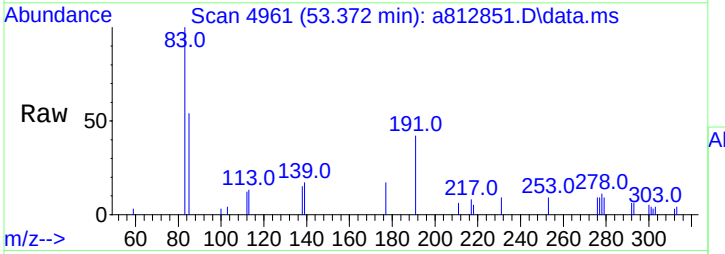


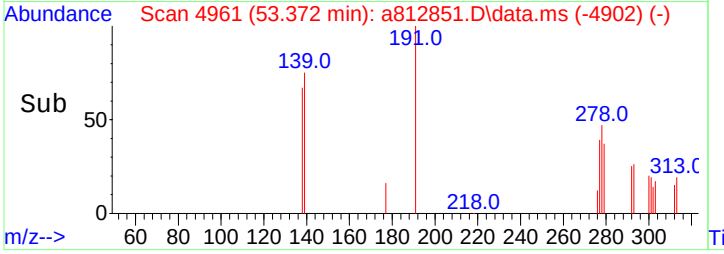


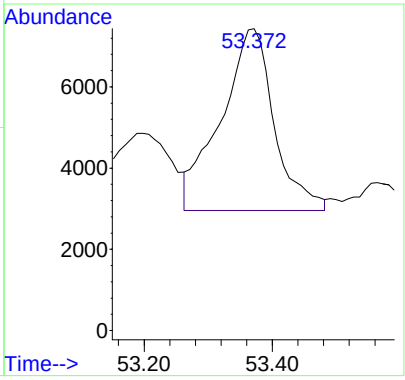


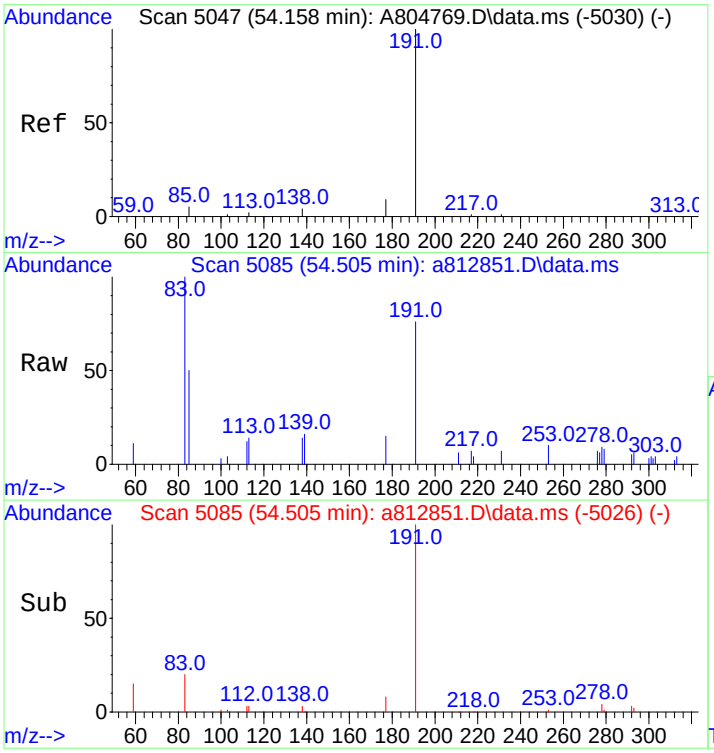
#117
Moretane (T20)
Concen: 375.72 ng/ml m
RT: 53.372 min Scan# 4961
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:191 Resp: 25870



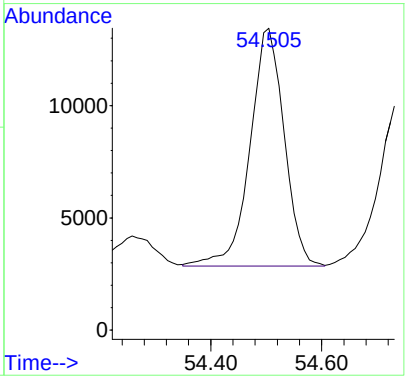


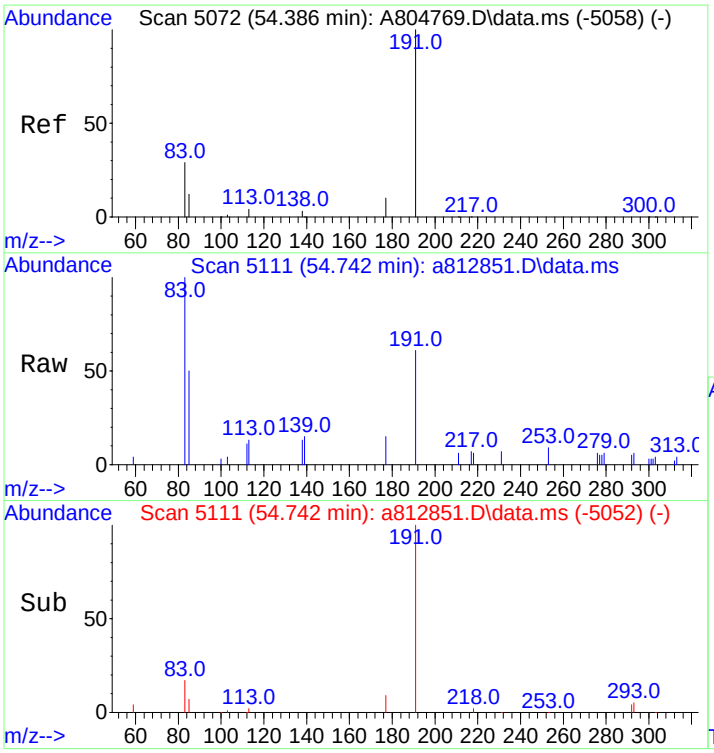




#118
30-Homohopane-22S (T21)
Concen: 659.69 ng/ml m
RT: 54.505 min Scan# 5085
Delta R.T. 0.036 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

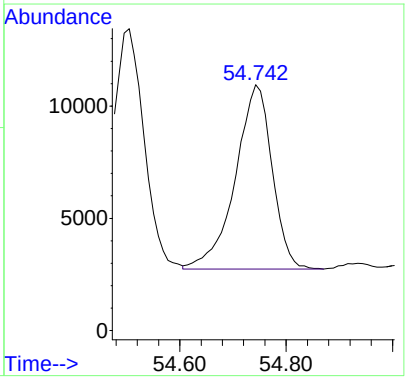
Tgt Ion:191 Resp: 45422

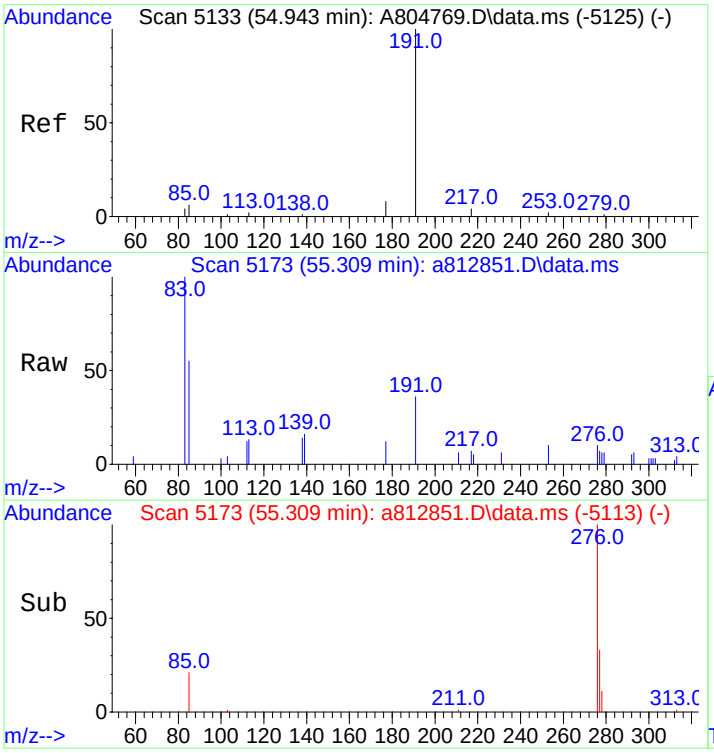




#119
30-Homohopane-22R (T22)
Concen: 572.08 ng/ml
RT: 54.742 min Scan# 5111
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

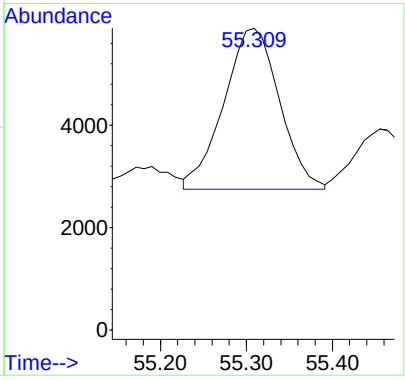
Tgt Ion:191 Resp: 39390

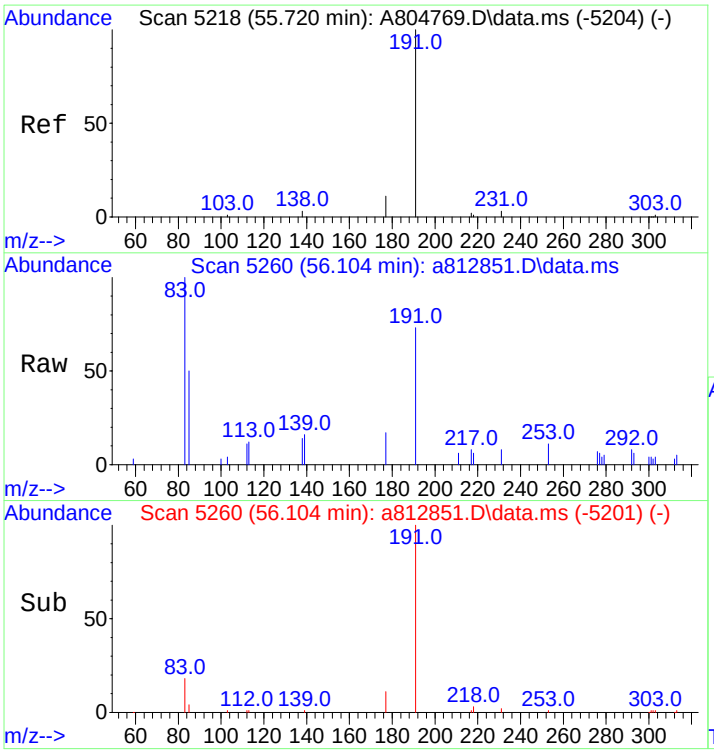




#120
Gammacerane/C32-diahopane
Concen: 205.30 ng/mL m
RT: 55.309 min Scan# 5173
Delta R.T. 0.046 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

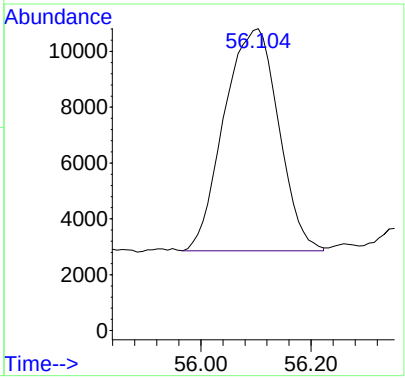
Tgt Ion:191 Resp: 14136

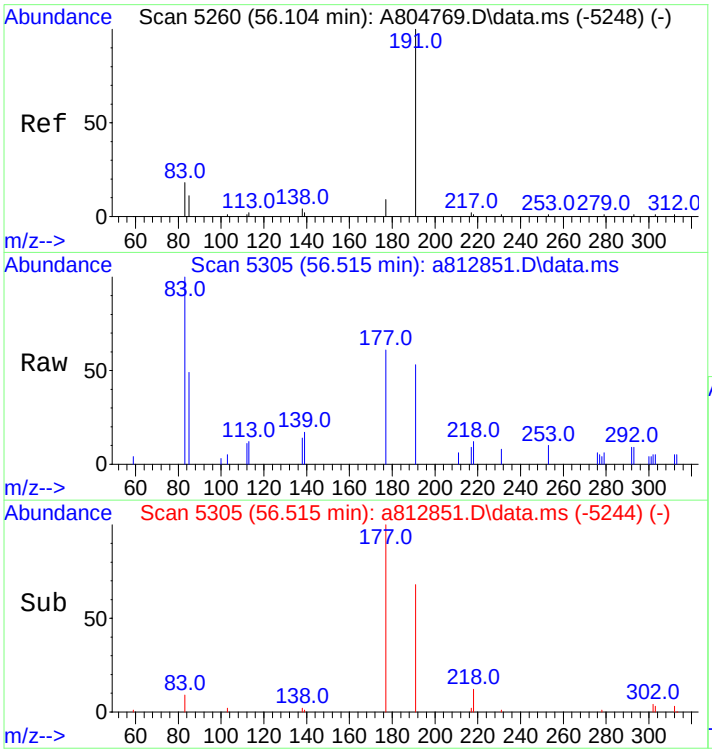




#121
30,31-Bishomohopane-22S (T26)
Concen: 792.78 ng/ml
RT: 56.104 min Scan# 5260
Delta R.T. 0.037 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

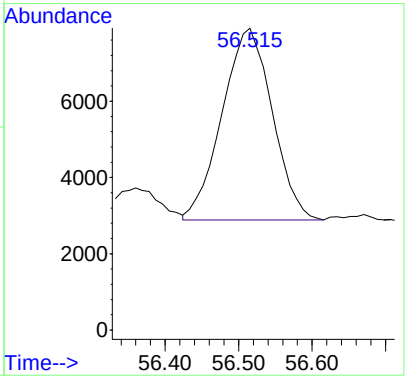
Tgt Ion:191 Resp: 54586

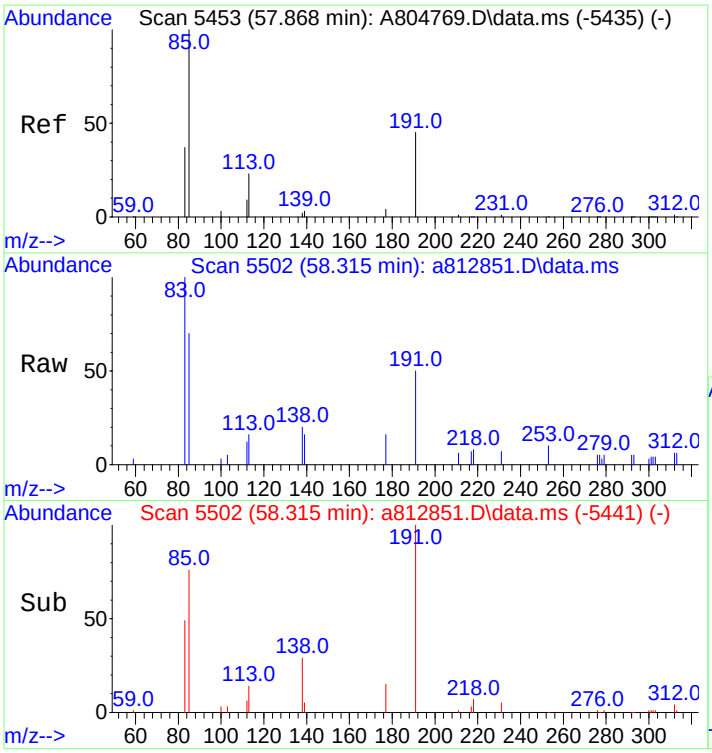




#122
30,31-Bishomohopane-22R (T27)
Concen: 347.64 ng/ml
RT: 56.515 min Scan# 5305
Delta R.T. 0.055 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

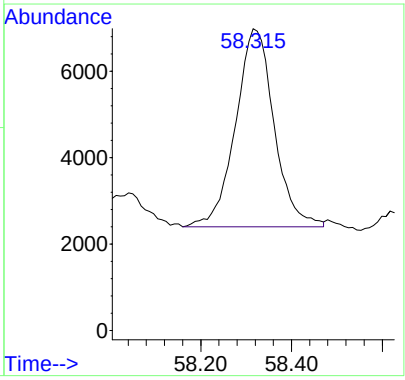
Tgt Ion:191 Resp: 23936

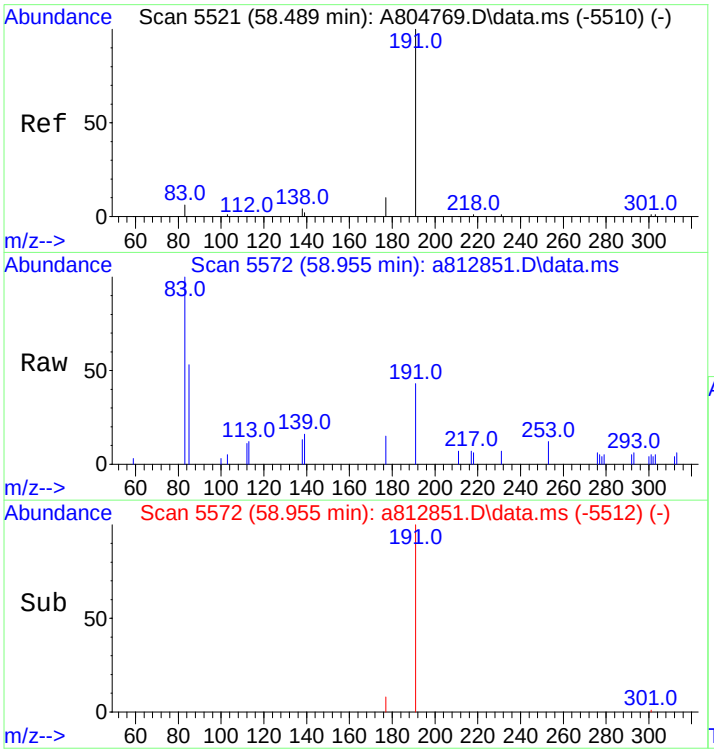




#123
30,31-Trishomohopane-22S (T30)
Concen: 392.89 ng/ml
RT: 58.315 min Scan# 5502
Delta R.T. 0.055 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

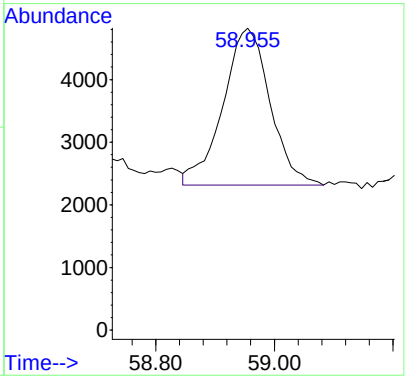
Tgt Ion:191 Resp: 27052

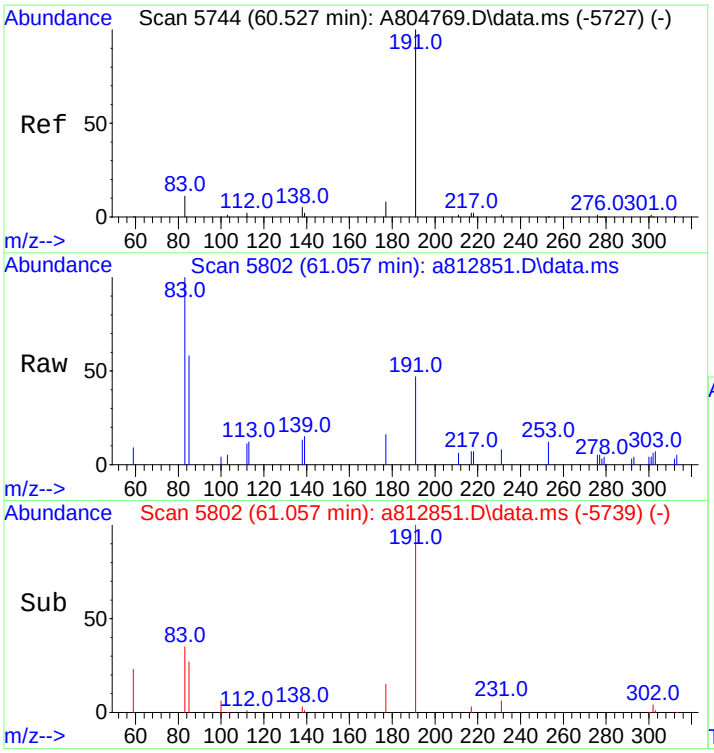




#124
30,31-Trishomohopane-22R (T31)
Concen: 200.69 ng/ml
RT: 58.955 min Scan# 5572
Delta R.T. 0.046 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

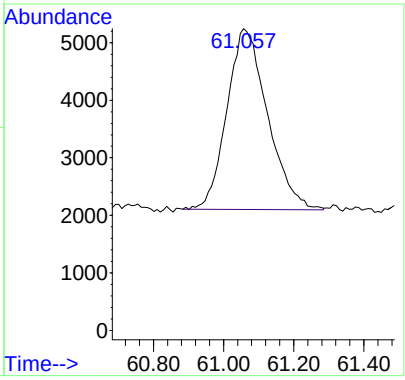
Tgt Ion:191 Resp: 13818

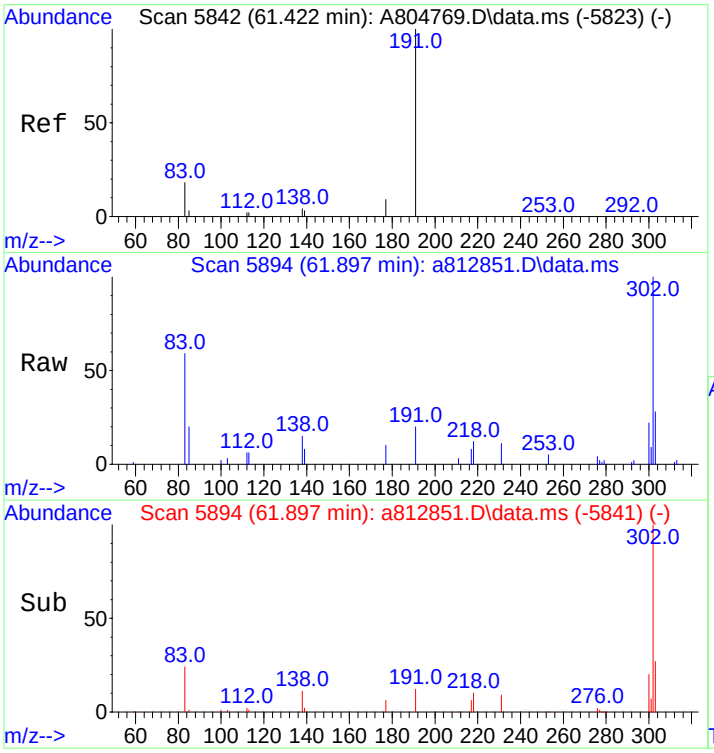




#125
Tetrakishomohopane-22S (T32)
Concen: 368.06 ng/ml
RT: 61.057 min Scan# 5802
Delta R.T. 0.073 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

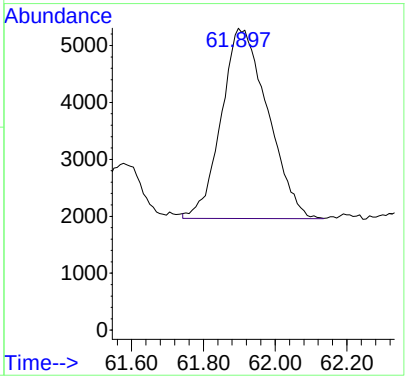
Tgt Ion:191 Resp: 25342

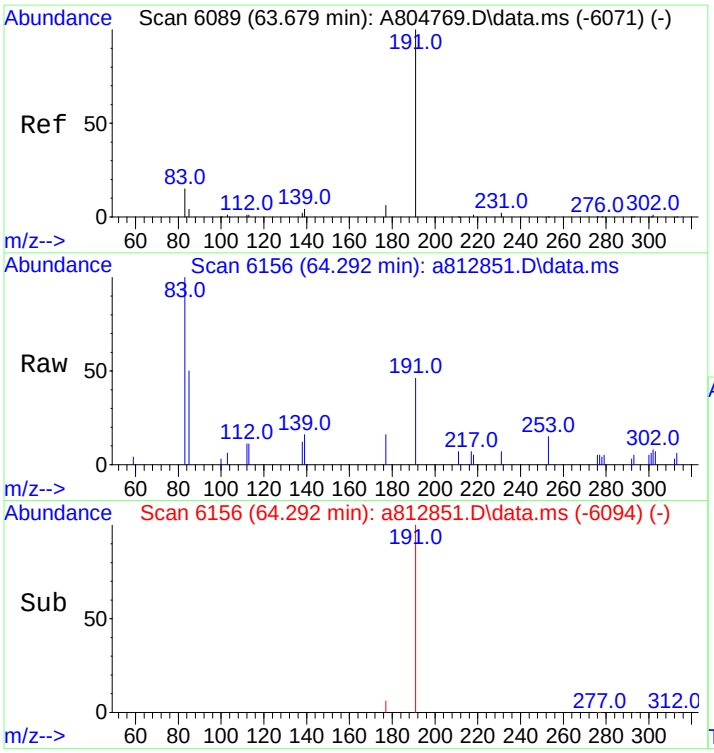




#126
Tetrakishomohopane-22R (T33)
Concen: 436.00 ng/ml
RT: 61.897 min Scan# 5894
Delta R.T. -0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

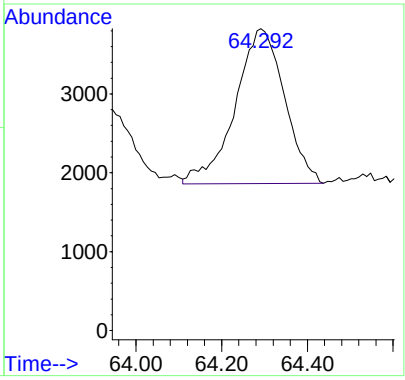
Tgt Ion:191 Resp: 30020

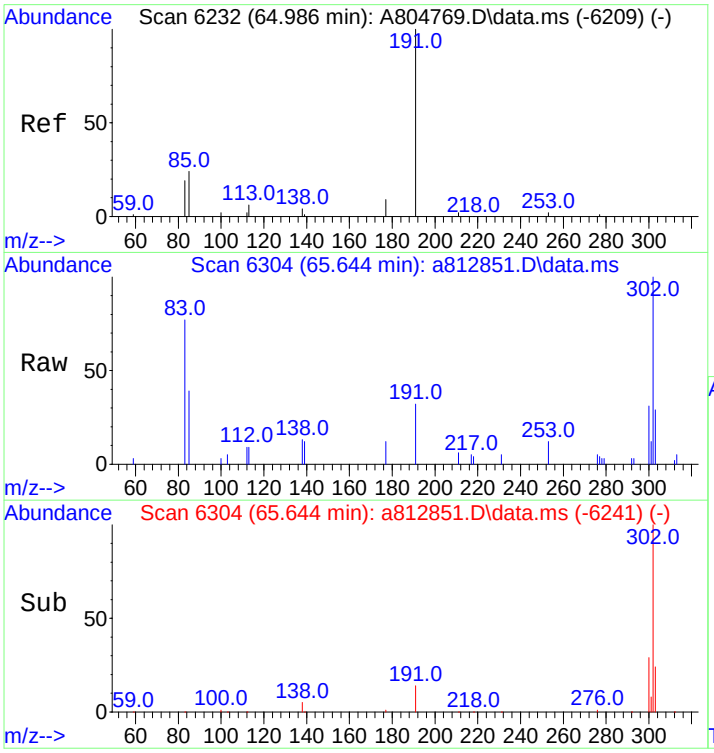




#127
Pentakishomohopane-22S (T34)
Concen: 227.99 ng/ml
RT: 64.292 min Scan# 6156
Delta R.T. 0.064 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

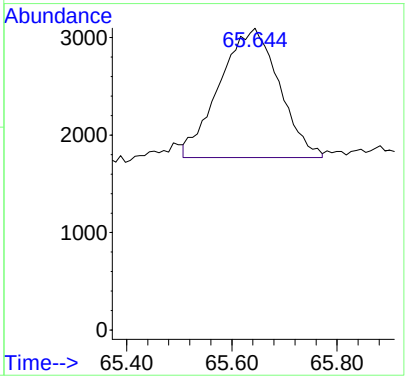
Tgt Ion:191 Resp: 15698

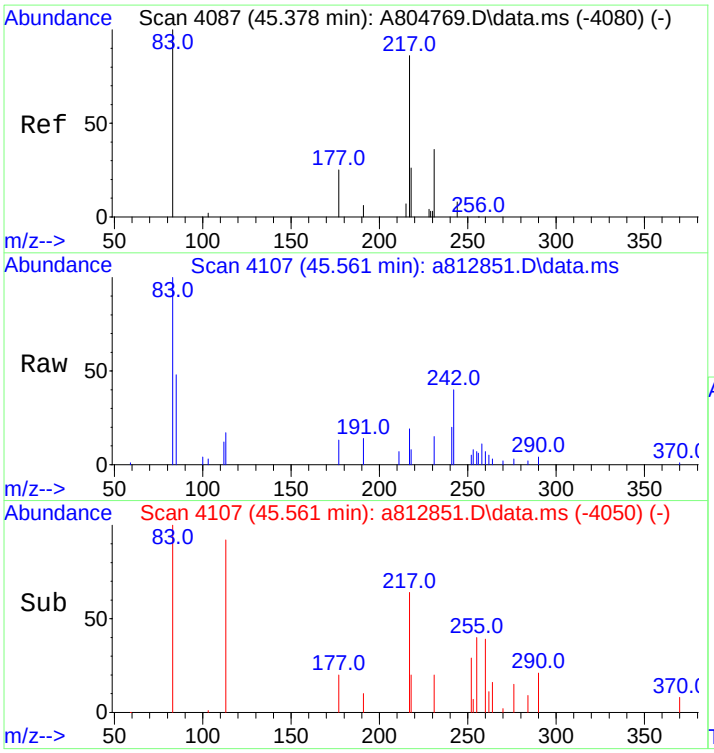




#128
Pentakishomohopane-22R (T35)
Concen: 150.94 ng/ml m
RT: 65.644 min Scan# 6304
Delta R.T. 0.073 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

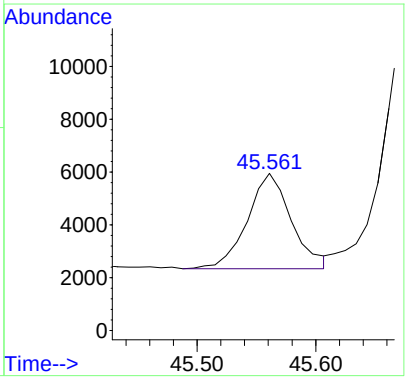
Tgt Ion:191 Resp: 10393

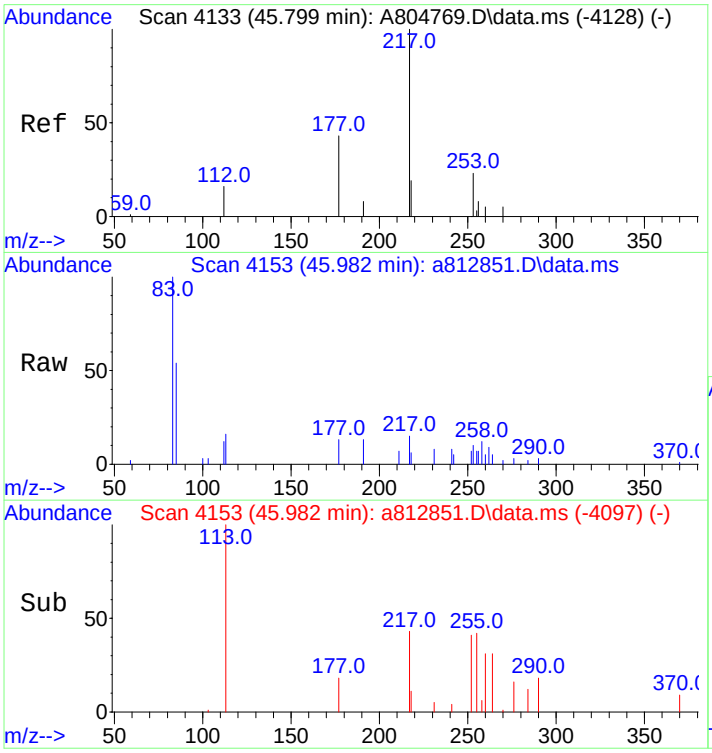




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 277.08 ng/ml
RT: 45.561 min Scan# 4107
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

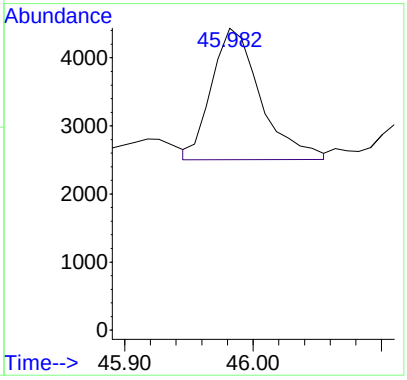
Tgt Ion:217 Resp: 9289

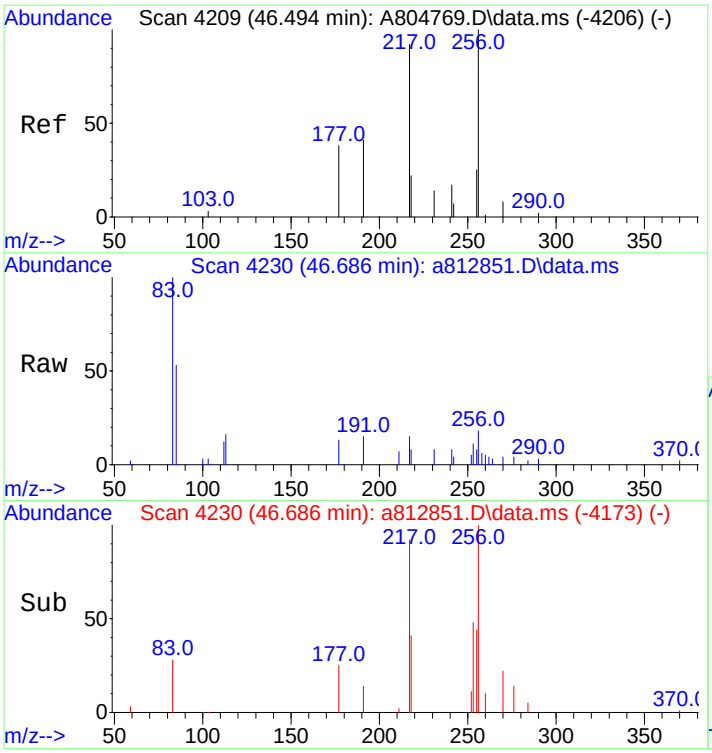




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 152.90 ng/ml
RT: 45.982 min Scan# 4153
Delta R.T. 0.009 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

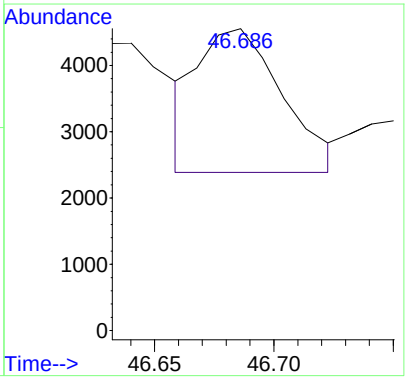
Tgt Ion:217 Resp: 5126

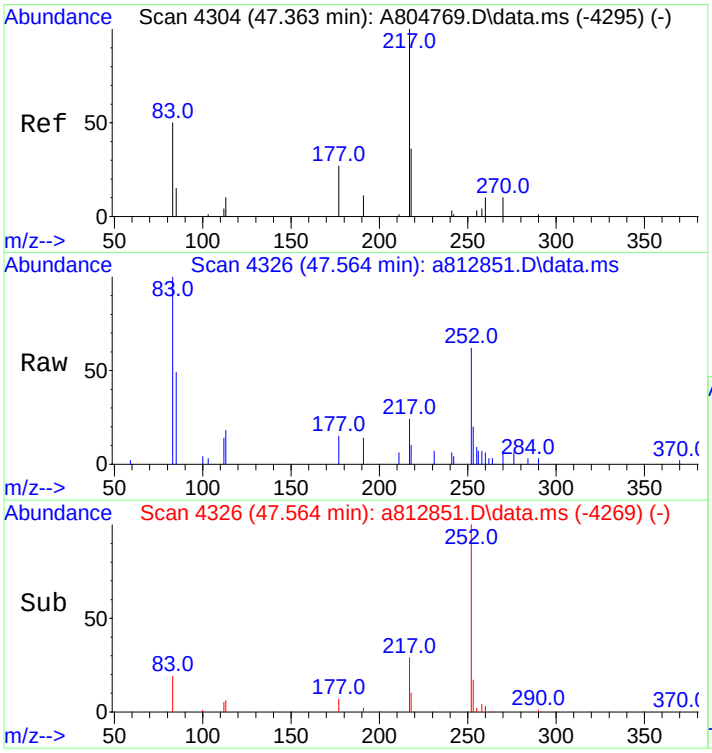




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 159.94 ng/ml m
RT: 46.686 min Scan# 4230
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

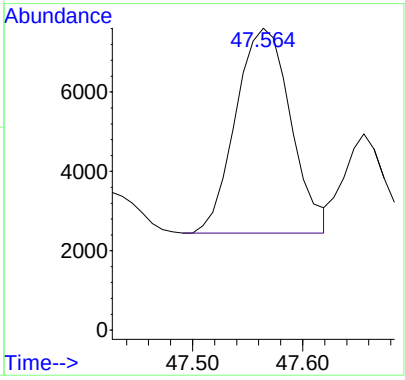
Tgt Ion:217 Resp: 5362

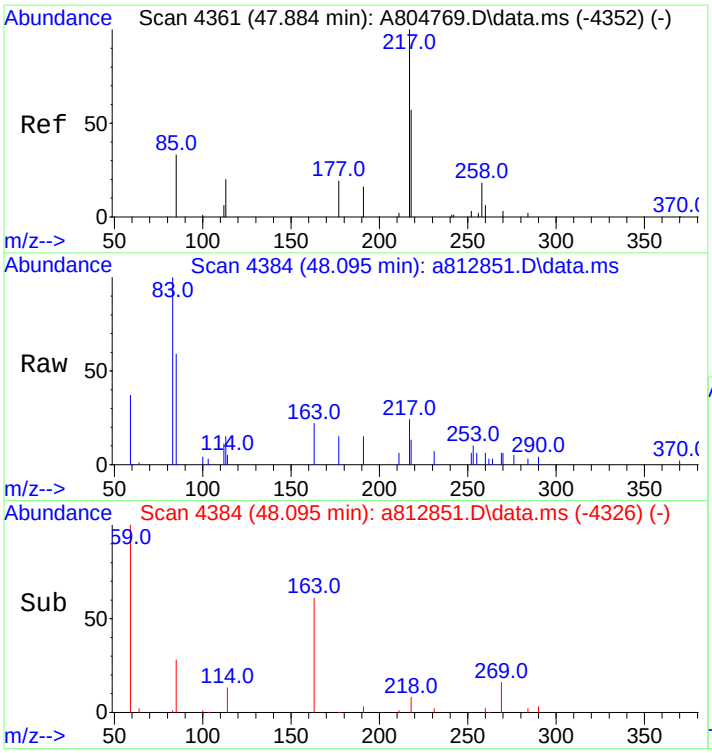




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 537.76 ng/ml
RT: 47.564 min Scan# 4326
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

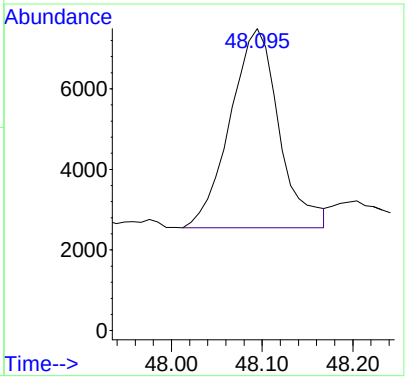
Tgt Ion:217 Resp: 18028

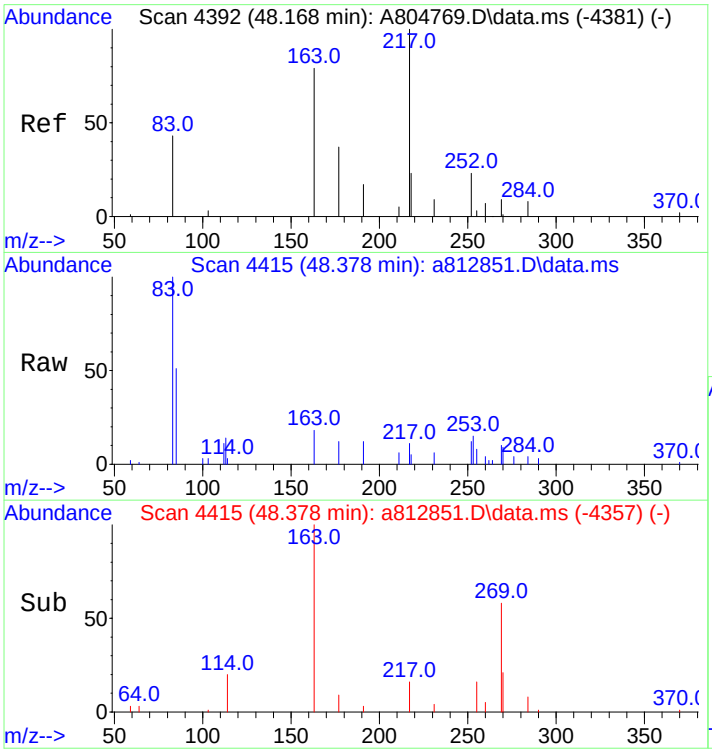




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 554.55 ng/ml
RT: 48.095 min Scan# 4384
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

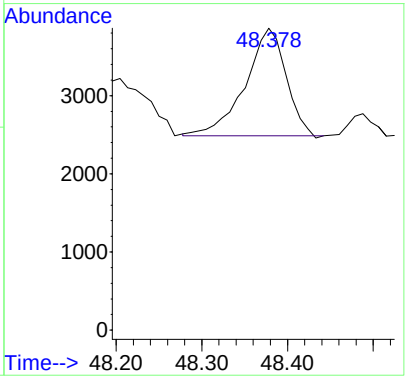
Tgt Ion:217 Resp: 18591

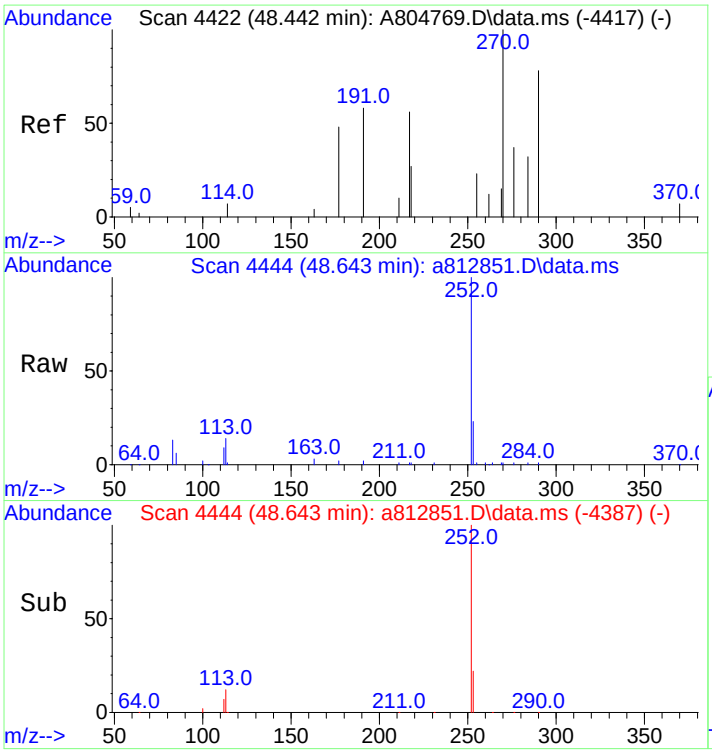




#135
Unknown Sterane (S18)
Concen: 136.26 ng/ml
RT: 48.378 min Scan# 4415
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

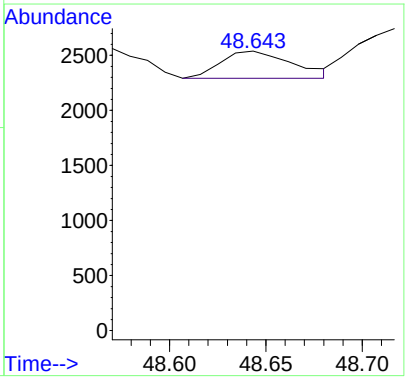
Tgt Ion:217 Resp: 4568

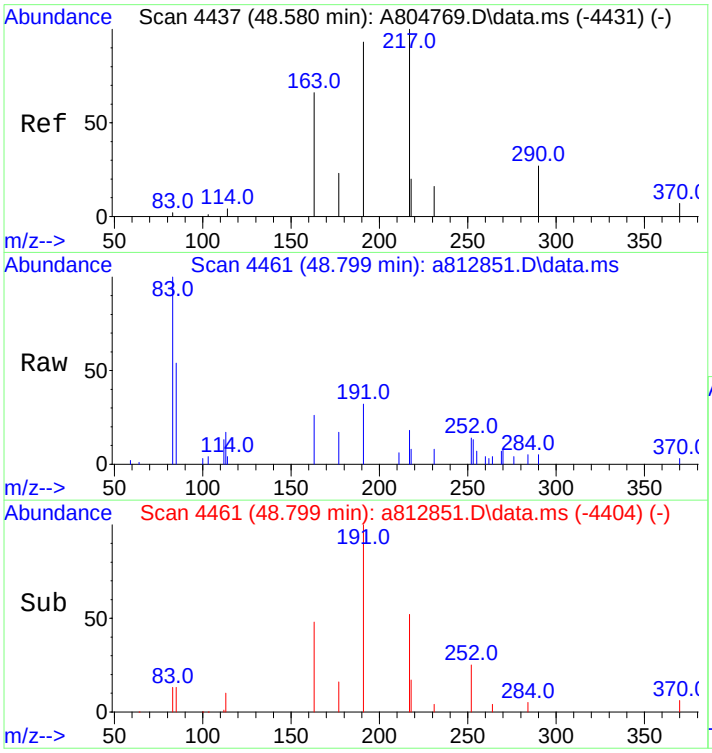




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 19.12 ng/ml
RT: 48.643 min Scan# 4444
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

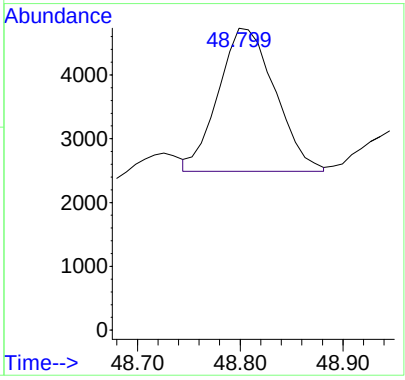
Tgt Ion:217 Resp: 641

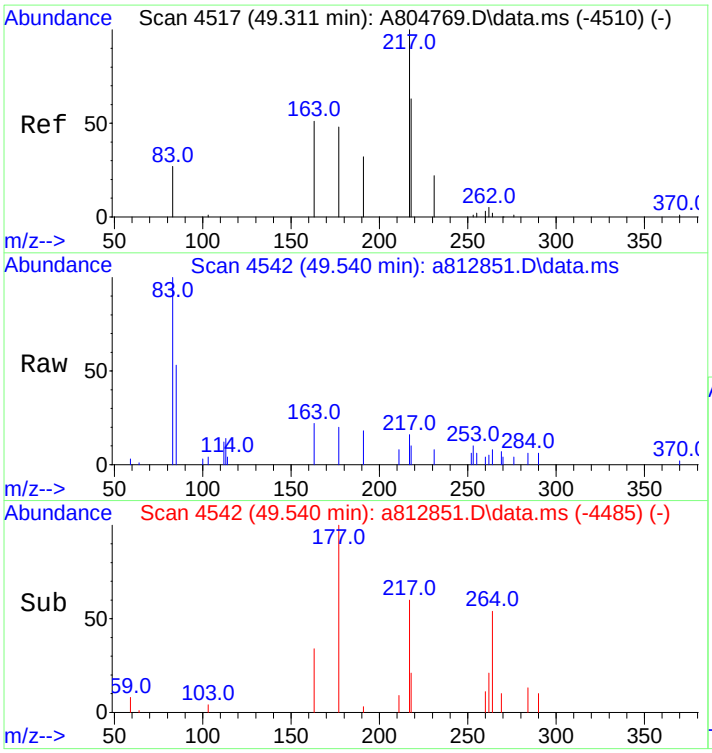




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 256.65 ng/ml
RT: 48.799 min Scan# 4461
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

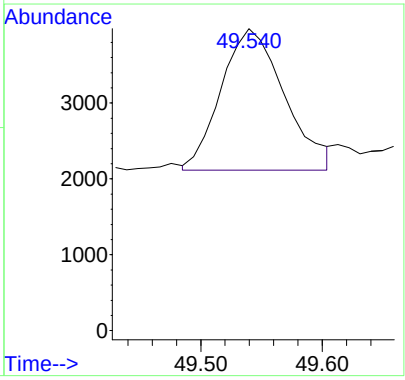
Tgt Ion:217 Resp: 8604

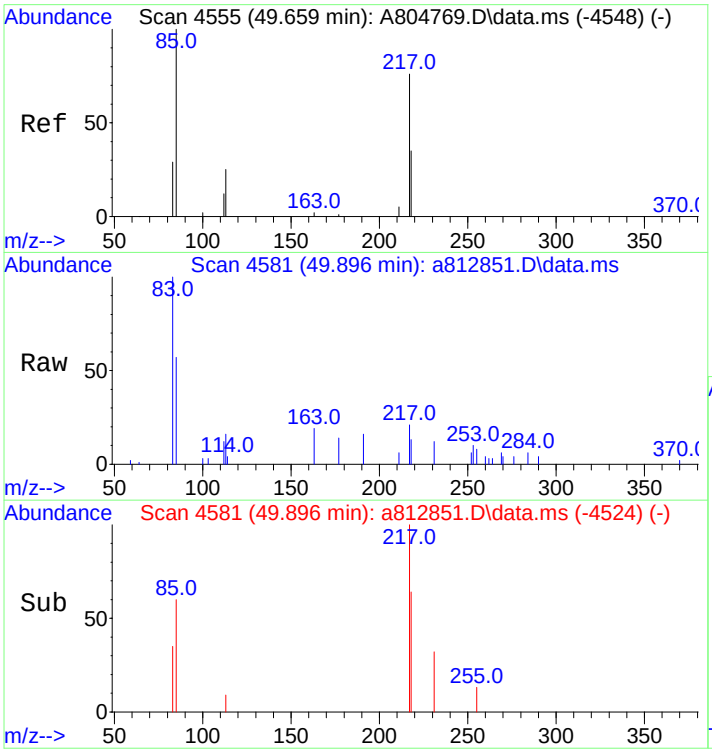




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 201.82 ng/ml m
RT: 49.540 min Scan# 4542
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

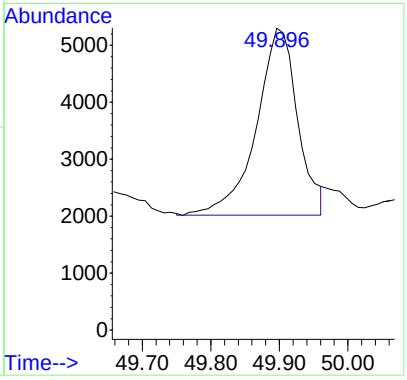
Tgt Ion:217 Resp: 6766

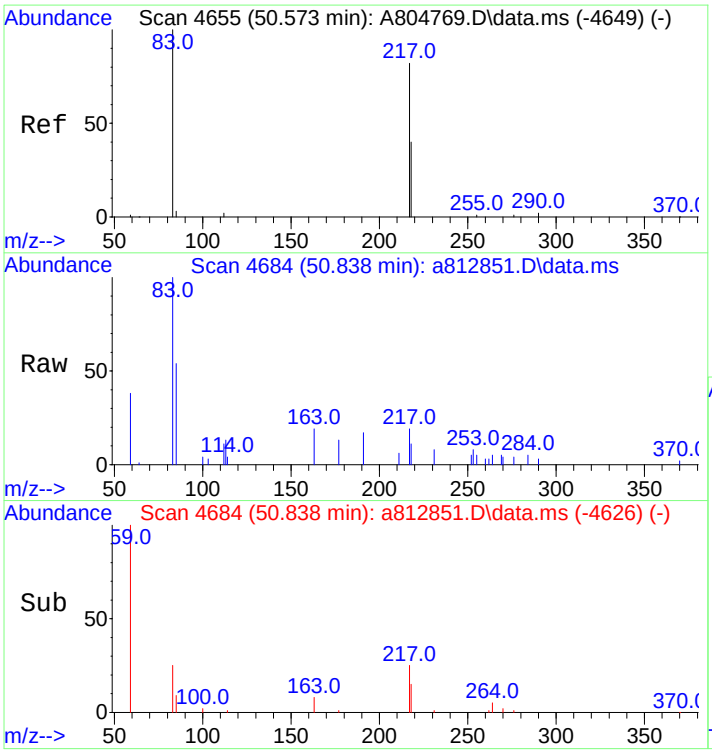




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 409.88 ng/ml m
RT: 49.896 min Scan# 4581
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

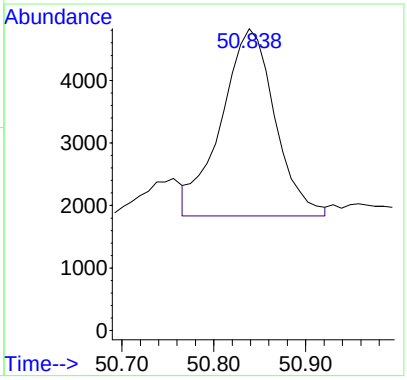
Tgt Ion:217 Resp: 13741

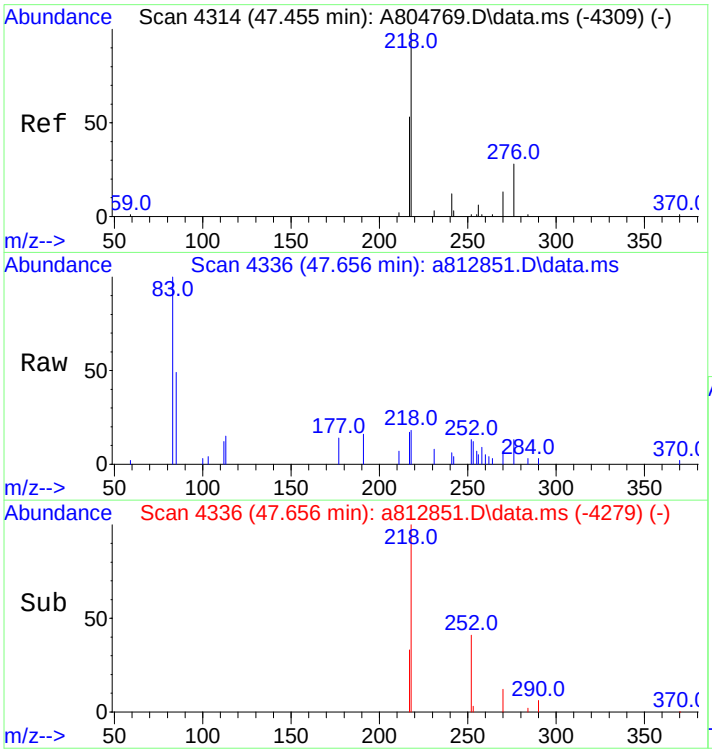




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 363.11 ng/ml m
RT: 50.838 min Scan# 4684
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

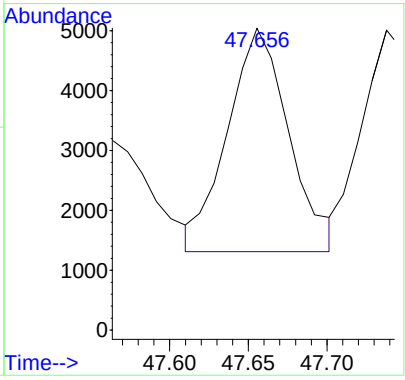
Tgt Ion:217 Resp: 12173

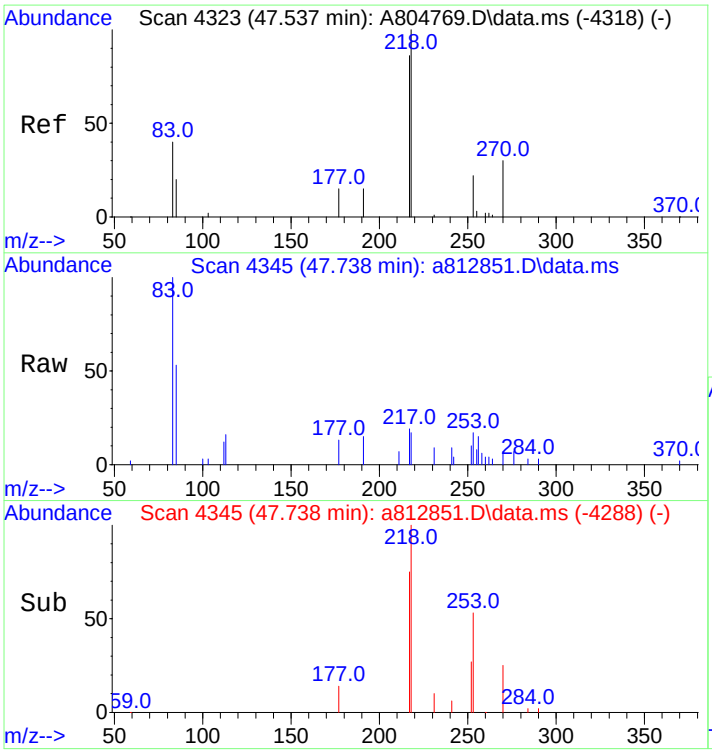




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 302.35 ng/ml m
RT: 47.656 min Scan# 4336
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

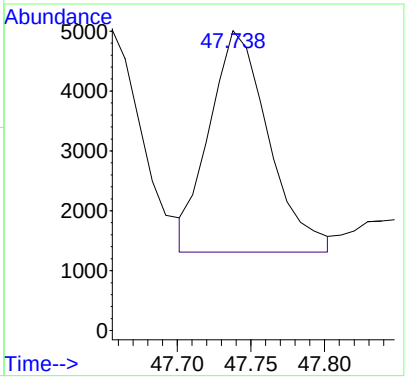
Tgt Ion:218 Resp: 10136

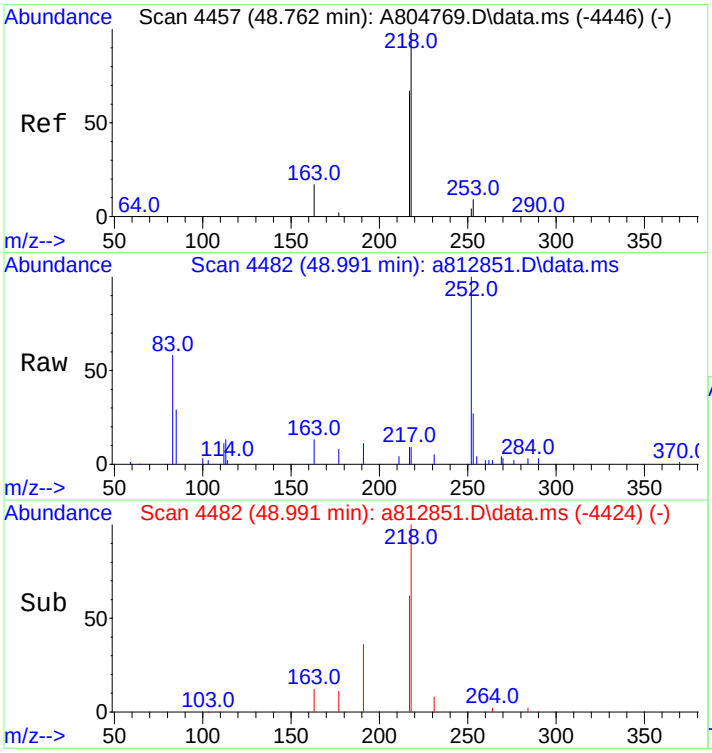




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 307.90 ng/ml m
RT: 47.738 min Scan# 4345
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

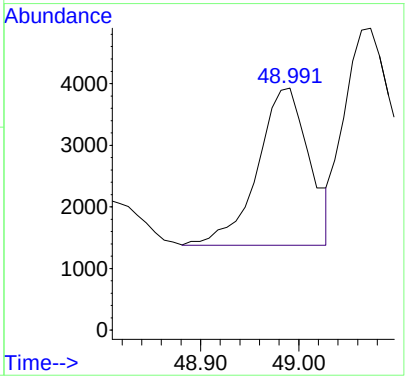
Tgt Ion:218 Resp: 10322

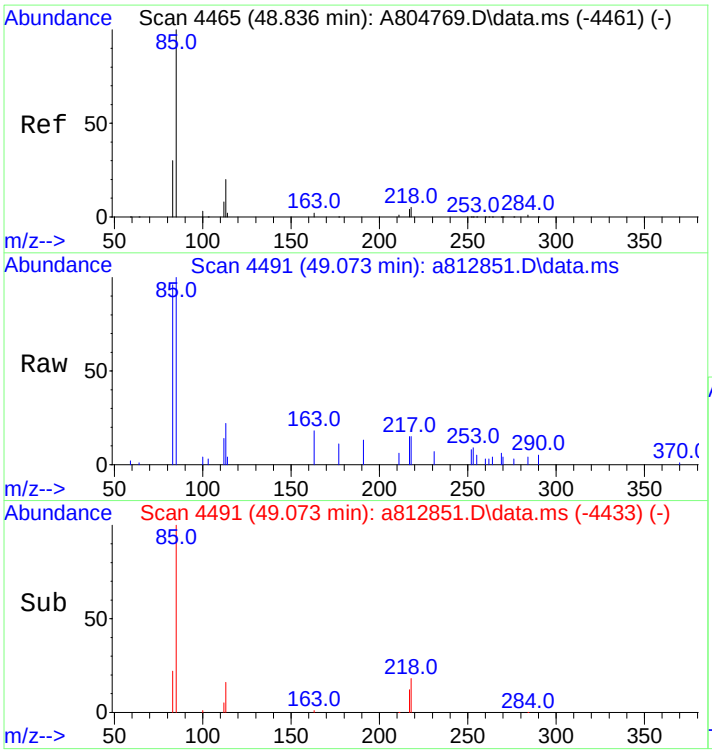




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 280.19 ng/ml m
RT: 48.991 min Scan# 4482
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

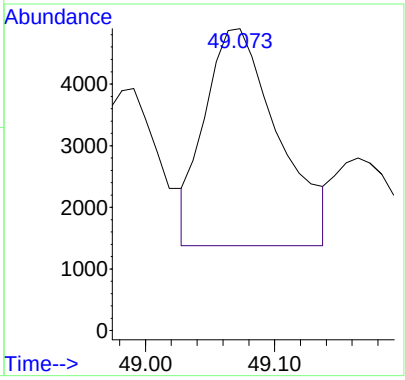
Tgt Ion:218 Resp: 9393

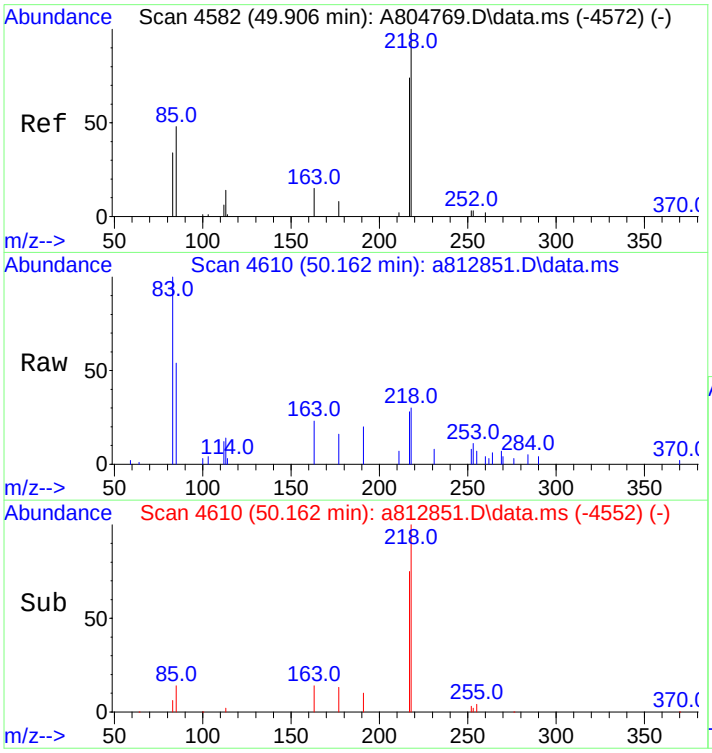




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 415.76 ng/ml m
RT: 49.073 min Scan# 4491
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

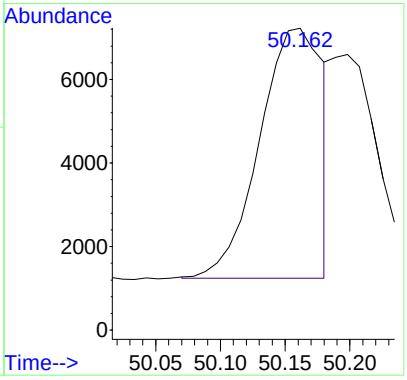
Tgt Ion:218 Resp: 13938

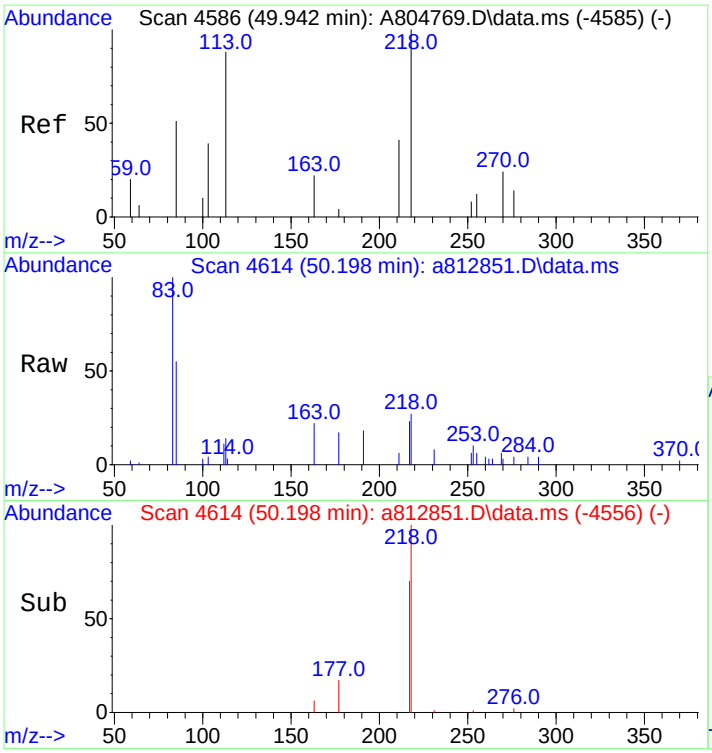




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 603.89 ng/ml m
RT: 50.162 min Scan# 4610
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

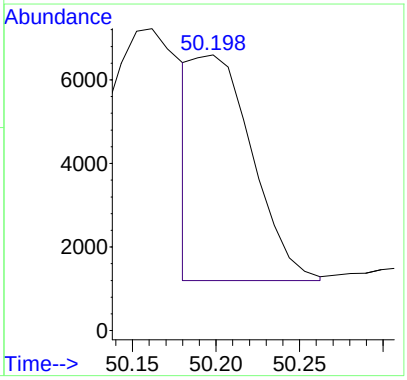
Tgt Ion:218 Resp: 20245

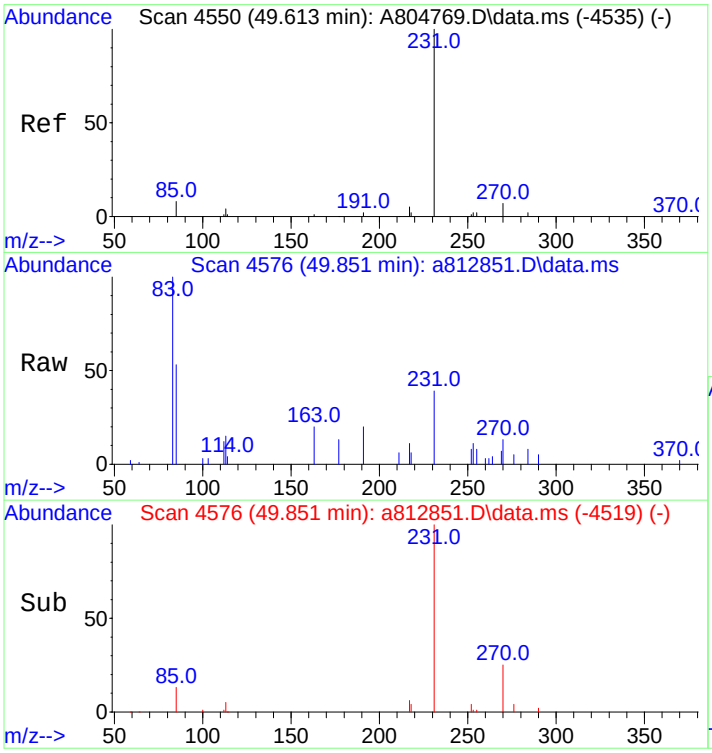




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 397.62 ng/ml m
RT: 50.198 min Scan# 4614
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

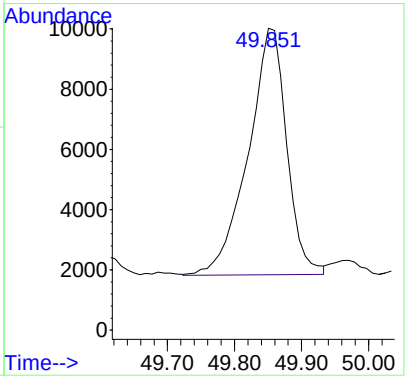
Tgt Ion:218 Resp: 13330

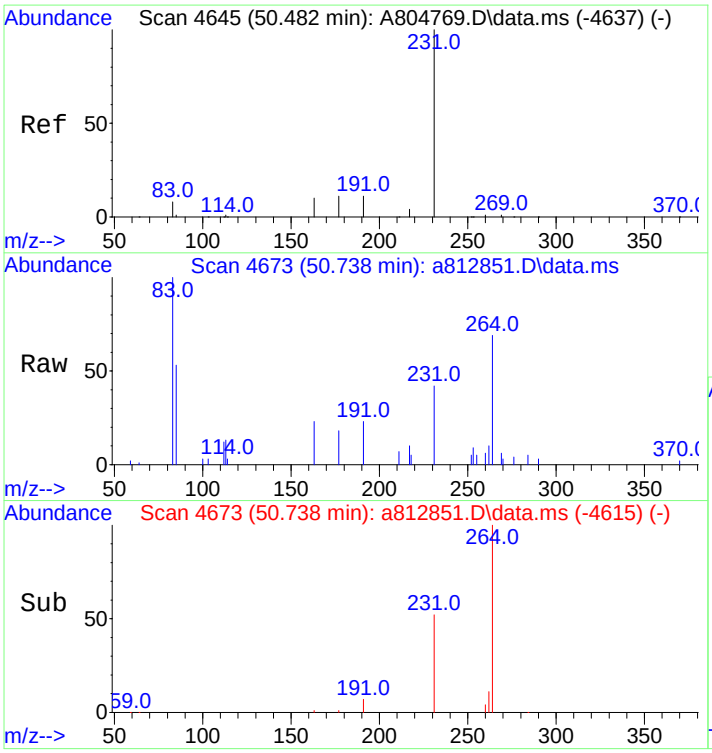




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 976.88 ng/mL
RT: 49.851 min Scan# 4576
Delta R.T. 0.018 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

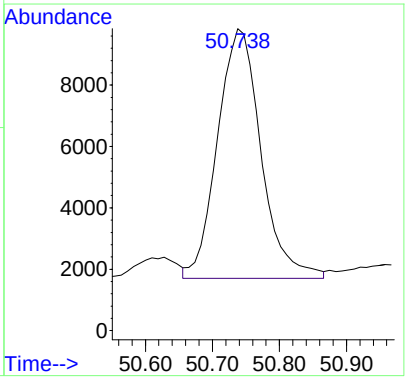
Tgt Ion:231 Resp: 32749

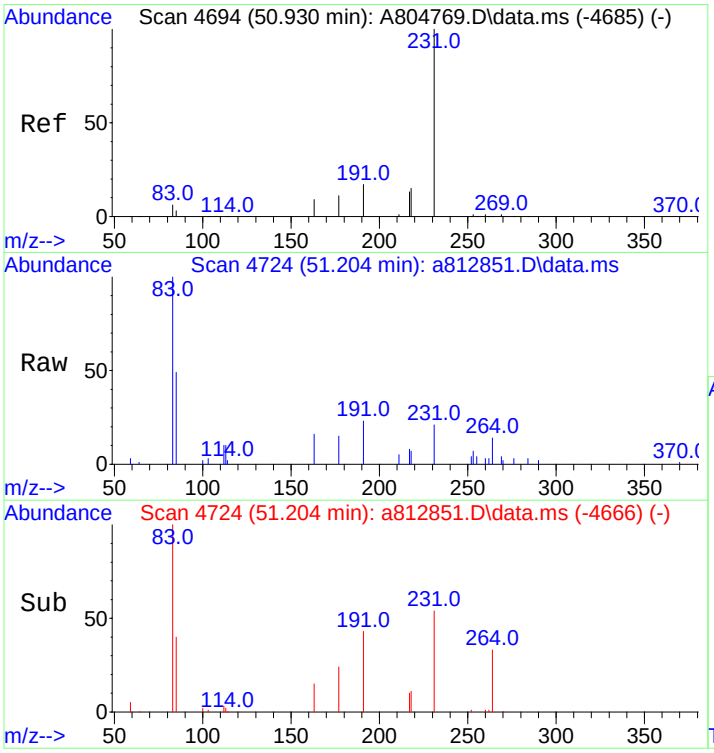




#148
C28,20S-triaromatic steroid
Concen: 1093.15 ng/mL
RT: 50.738 min Scan# 4673
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

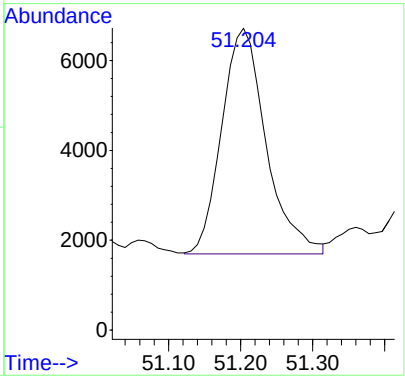
Tgt Ion:231 Resp: 36647

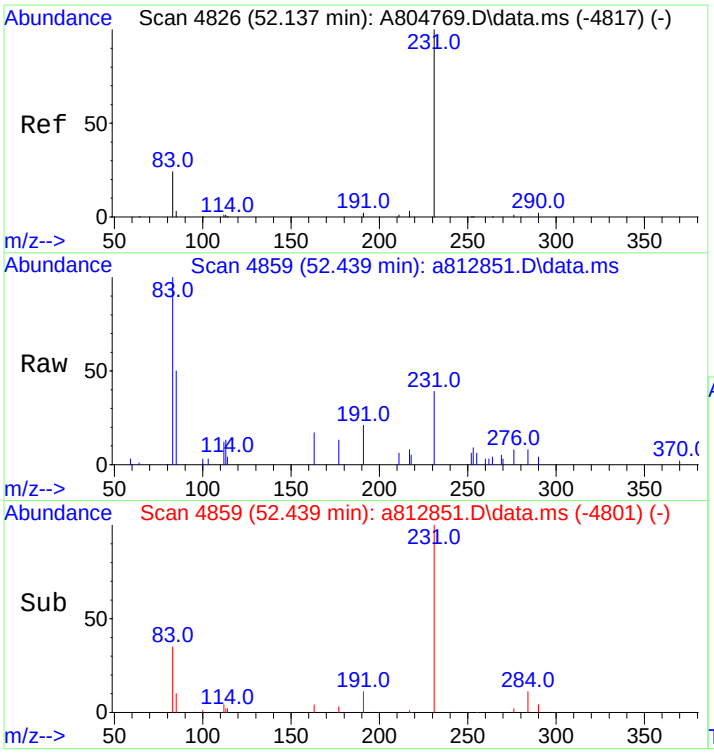




#149
C27,20R-triaromatic steroid
Concen: 641.12 ng/mL m
RT: 51.204 min Scan# 4724
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

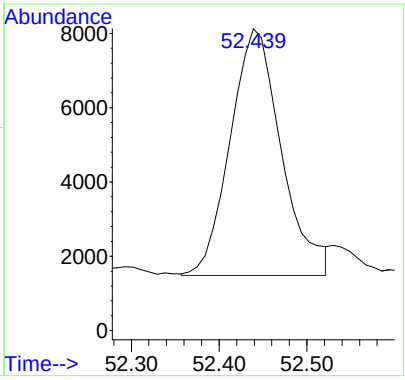
Tgt Ion:231 Resp: 21493





#150
C28,20R-triaromatic steroid
Concen: 802.32 ng/mL m
RT: 52.439 min Scan# 4859
Delta R.T. 0.027 min
Lab File: a812851.D
Acq: 20 Nov 2012 3:12 am

Tgt Ion:231 Resp: 26897



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	61412	500.000	ng/mL	0.00
74) Chrysene-d12	43.443	240	91275	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	91344	375.318	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 37.53%#			
42) Phenanthrene-d10	32.853	188	88671	469.156	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.92%#			
83) Benzo[b]fluoranthene-d12	47.354	264	89253	513.076	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.31%			
88) Benzo[a]pyrene-d12	48.561	264	79492	462.526	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.25%#			
129) 5B(H)Cholane - Surr	44.063	217	19333	579.253	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.93%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2184	40.019	ng/mL	100
4) cis-Decalin	17.879	138	100	2.501	ng/mL	100
5) C1-Decalins	18.143	152	4831M5	88.521	ng/mL	
6) C2-Decalins	19.923	166	8609M5	157.747	ng/mL	
7) C3-Decalins	22.396	180	10213M5	187.138	ng/mL	
8) C4-Decalins	25.781	194	21439M5	392.838	ng/mL	
10) Naphthalene	20.087	128	169619	609.194	ng/mL#	100
11) C1-Naphthalenes	22.779	142	170144M5	611.080	ng/mL	
12) C2-Naphthalenes	25.626	156	328482M5	1179.758	ng/mL	
13) C3-Naphthalenes	27.962	170	481324M5	1728.697	ng/mL	
14) C4-Naphthalenes	30.727	184	453086M5	1627.279	ng/mL	
16) 2-Methylnaphthalene	22.779	142	96102	579.426	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	72860	469.131	ng/mL#	100
18) Benzothiophene	20.306	134	5144	22.857	ng/mL	100
19) C1-Benzo(b)thiophenes	23.172	148	12327M5	54.773	ng/mL	
20) C2-Benzo(b)thiophenes	25.818	162	31837M5	141.464	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	69661M5	309.530	ng/mL	
22) C4-Benzo(b)thiophenes	29.906	190	81443M5	361.881	ng/mL	
23) Biphenyl	24.659	154	21823	103.419	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	72793	512.822	ng/mL#	100
25) Dibenzofuran	27.753	168	97743	439.062	ng/mL	98
26) Acenaphthylene	26.375	152	45062	178.302	ng/mL#	100
27) Acenaphthene	27.105	153	85566	567.232	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.656	170	29179M3	238.676	ng/mL	
29) Fluorene	29.130	166	119308M3	705.173	ng/mL	
30) C1-Fluorenes	31.493	180	82616M5	488.304	ng/mL	
31) C2-Fluorenes	33.683	194	182886M5	1080.952	ng/mL	
32) C3-Fluorenes	35.518	208	228316M5	1349.467	ng/mL	
33) Dibenzothiophene	32.451	184	119014	511.543	ng/mL#	75
34) 4-Methyldibenzothiophe...	34.222	198	88787	381.622	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.541	198	77387M3	332.623	ng/mL	
36) 1-Methyldibenzothiophe...	34.988	198	36465	156.733	ng/mL#	100
37) OTP	34.605	198	5198M3	22.342	ng/mL	
38) C1-Dibenzothiophenes	34.222	198	231914M5	996.807	ng/mL	
39) C2-Dibenzothiophenes	35.910	212	396632M5	1704.794	ng/mL	
40) C3-Dibenzothiophenes	37.709	226	421712M5	1812.592	ng/mL	
41) C4-Dibenzothiophenes	39.398	240	281906M5	1211.682	ng/mL	
43) Phenanthrene	32.944	178	1431255	6391.515	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.906	192	174606	779.733	ng/mL	98
45) 2-Methylphenanthrene(2MP)	35.016	192	202970	906.397	ng/mL	97
46) 2-Methylanthracene(2MA)	35.171	192	51972M3	232.090	ng/mL	
47) 9/4-Methylphenanthrene...	35.363	192	190501M3	850.715	ng/mL	
48) 1-Methylphenanthrene(1MP)	35.454	192	130101	580.988	ng/mL	98
49) C1-Phenanthrenes/Anthr...	35.016	192	759808M5	3393.053	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.170	206	673467M5	3007.482	ng/mL	
52) C3-Phenanthrenes/Anthr...	39.005	220	459330M5	2051.217	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.187	234	243079M5	1085.511	ng/mL	
55) Anthracene	33.126	178	232271M3	1113.368	ng/mL	
56) Carbazole	33.793	167	196625M3	903.268	ng/mL	
57) 1-Methylphenanthrene	35.454	192	129654M3	816.791	ng/mL	
58) Fluoranthene	37.727	202	2157368	9352.978	ng/mL	100
59) Benzo(b)fluorene	40.238	216	104367M3	782.181	ng/mL	
60) Pyrene	38.613	202	1845099	7908.398	ng/mL	94
61) C1-Fluoranthenes/Pyrenes	39.991	216	902654M5	3868.924	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.036	230	661822M5	2836.678	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.926	244	353475M5	1515.052	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.205	258	318084M5	1363.360	ng/mL	
66) Naphthobenzothiophene	42.456	234	174199M3	804.318	ng/ml	
67) Naphthobenzothiophene-...	42.456	234	173996M3	803.381	ng/mL	
68) Naphthobenzothiophene-...	42.794	234	38147	176.134	ng/mL#	10
69) Naphthobenzothiophene-...	43.086	234	48532M3	224.084	ng/mL	
70) C1-Naphthobenzothiophenes	43.853	248	211561M5	976.827	ng/ml	
71) C2-Naphthobenzothiophenes	45.854	262	260860M5	1204.453	ng/ml	
72) C3-Naphthobenzothiophenes	47.464	276	201302M5	929.459	ng/ml	
73) C4-Naphthobenzothiophenes	48.561	290	132712M5	612.763	ng/mL	
75) Benz[a]anthracene	43.388	228	781393	3905.091	ng/mL	97
77) Chrysene/Triphenylene	43.543	228	953686	4708.539	ng/mL	99
78) C1-Chrysenes	45.013	242	428355M5	2114.875	ng/mL	
79) C2-Chrysenes	46.723	256	336283M5	1660.297	ng/mL	
80) BBF-D12 Surr BKGD	47.354	256	4099	20.238	ng/mL	100
81) C3-Chrysenes	47.775	270	266603M5	1316.273	ng/mL	
82) C4-Chrysenes	49.339	284	140905M5	695.676	ng/mL	
84) Benzo[b]fluoranthene	47.445	252	1025553	4772.214	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.519	252	914583	3900.481	ng/mL	97
86) Benzo[a]fluoranthene	47.830	252	163418	696.939	ng/mL#	1
87) Benzo[e]pyrene	48.470	252	760086	3432.674	ng/mL	97
89) Benzo[a]pyrene	48.662	252	931671	4548.604	ng/mL	97
90) Perylene	48.973	252	281179	1256.762	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.591	276	656666M3	3018.055	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.637	278	167681M6	786.221	ng/mL	
93) Benzo[g,h,i]perylene	54.934	276	715222	2896.588	ng/mL	99
94) Hopane (T19)	52.668	191	147396	2150.234	ng/mL#	89
96) C23 Tricyclic Terpane ...	41.087	191	27143	395.966	ng/ml	100
97) C24 Tricyclic Terpane ...	41.808	191	17628	257.160	ng/ml	100
98) C25 Tricyclic Terpane ...	43.296	191	20092M3	293.105	ng/ml	
99) C24 Tetracyclic Terpan...	44.620	191	10664	155.568	ng/ml	100
100) C26 Tricyclic Terpane-...	44.347	191	9017M3	131.541	ng/ml	
101) C26 Tricyclic Terpane-...	44.447	191	7097M3	103.532	ng/ml	
102) C28 Tricyclic Terpane-...	46.732	191	9493M3	138.485	ng/ml	
103) C28 Tricyclic Terpane-...	46.897	191	9588	139.871	ng/ml	100
104) C29 Tricyclic Terpane-...	47.418	191	9480	138.296	ng/ml	100
105) C29 Tricyclic Terpane-...	47.619	191	10829M4	157.975	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.781	191	26565	387.534	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.872	191	9949M3	145.137	ng/mL	
108) C30 Tricyclic Terpane-22R	49.119	191	7978M3	116.384	ng/mL	
109) 17a(H)-22,29,30-Trisno...	49.348	191	35079	511.738	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.564	191	10122	147.661	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.336	191	6845M3	99.856	ng/ml	
112) 30-Norhopane (T15)	51.250	191	96910	1413.737	ng/ml	100
113) 18a(H)-30-Norneohopane...	51.360	191	26782M3	390.700	ng/ml	
114) 17a(H)-Diahopane (X)	51.488	191	7979M3	116.399	ng/ml	
115) 30-Normoretane (T17)	52.055	191	14875	216.999	ng/ml	100
116) 18a(H)&18b(H)-Oleanane...	52.476	191	9672	141.097	ng/ml	100
117) Moretane (T20)	53.372	191	27546	401.845	ng/ml	100
118) 30-Homohopane-22S (T21)	54.505	191	52633	767.818	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

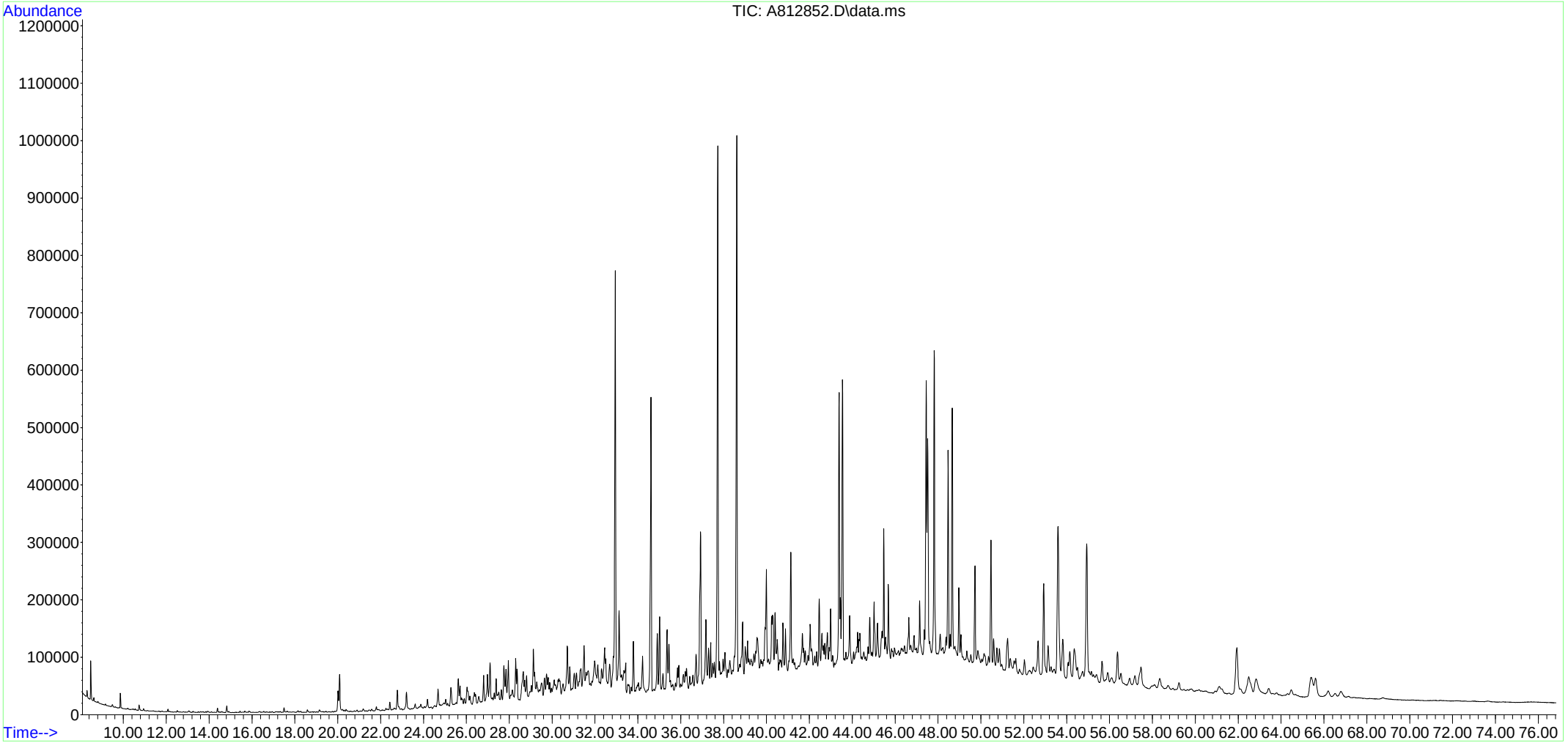
	Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119)	30-Homohopane-22R (T22)	54.743	191		45303	660.887	ng/ml	100
120)	Gammacerane/C32-diahopane	55.309	191		18141	264.644	ng/mL	100
121)	30,31-Bishomohopane-22...	56.104	191	G	56664	826.623	ng/ml	100
122)	30,31-Bishomohopane-22...	56.515	191		25479	371.691	ng/ml	100
123)	30,31-Trishomohopane-2...	58.325	191		30840	449.898	ng/ml	100
124)	30,31-Trishomohopane-2...	58.955	191		15740	229.617	ng/ml	100
125)	Tetrakishomohopane-22S...	61.066	191		26724	389.854	ng/ml	100
126)	Tetrakishomohopane-22R...	61.907	191	G	32427	473.050	ng/ml	100
127)	Pentakishomohopane-22S...	64.310	191		19706	287.474	ng/ml	100
128)	Pentakishomohopane-22R...	65.626	191		14980	218.530	ng/ml	100
130)	13b(H),17a(H)-20S-Diac...	45.561	217		9770	292.727	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.982	217		6400	191.756	ng/ml	100
132)	13b,17a-20S-Methyldiac...	46.686	217		5643M3	169.075	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.564	217		20063	601.125	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.095	217		20416M3	611.701	ng/ml	
135)	Unknown Sterane (S18)	48.387	217		5331	159.727	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.644	217		401	12.015	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.808	217		9021	270.286	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.549	217		8306M3	248.863	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.906	217		15105M3	452.574	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.839	217		12850M3	385.010	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.656	218		11061M3	331.408	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.747	218		11662M3	349.415	ng/ml	
143)	14b,17b-20R-Methylchol...	48.991	218		10993	329.371	ng/ml	100
144)	14b,17b-20S-Methylchol...	49.073	218		15834M3	474.416	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.162	218		22163	664.045	ng/ml	100
146)	14b(H),17b(H)-20S-Ethy...	50.198	218		16824M3	504.078	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.860	231		36172	1083.780	ng/mL	100
148)	C28,20S-triaromatic st...	50.738	231		40915	1225.889	ng/mL	100
149)	C27,20R-triaromatic st...	51.204	231		23580	706.501	ng/mL	100
150)	C28,20R-triaromatic st...	52.448	231		30154	903.470	ng/mL	100

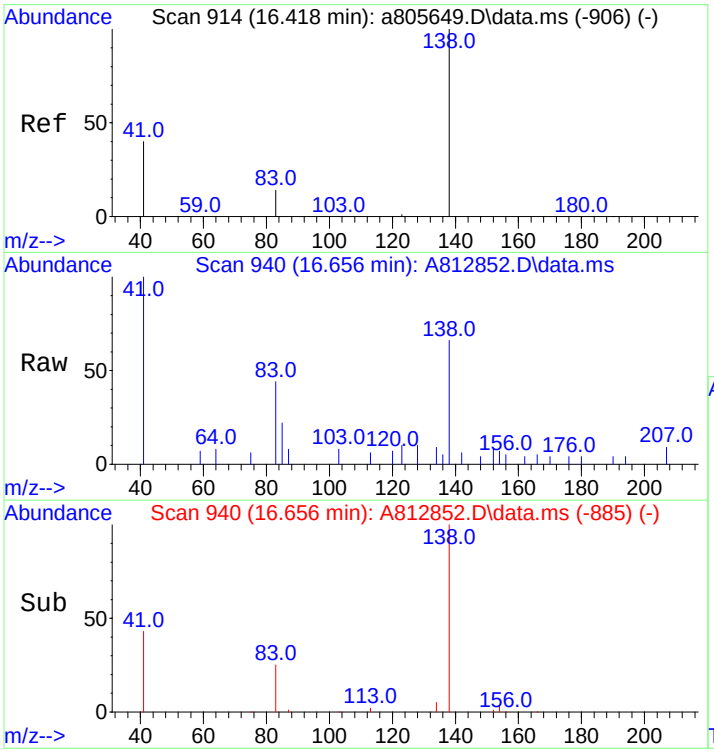
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812852.D
Acq On : 20 Nov 2012 4:36 am
Operator : AC
Sample : 1210082-05
Misc : 1x
ALS Vial : 33 Sample Multiplier: 1

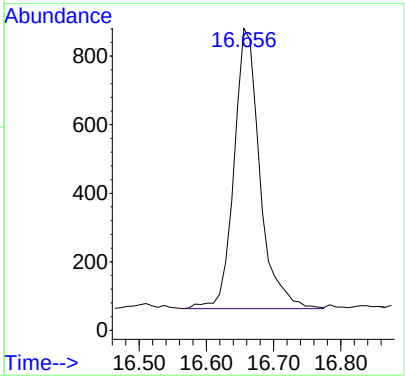
Quant Time: Nov 20 15:15:59 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

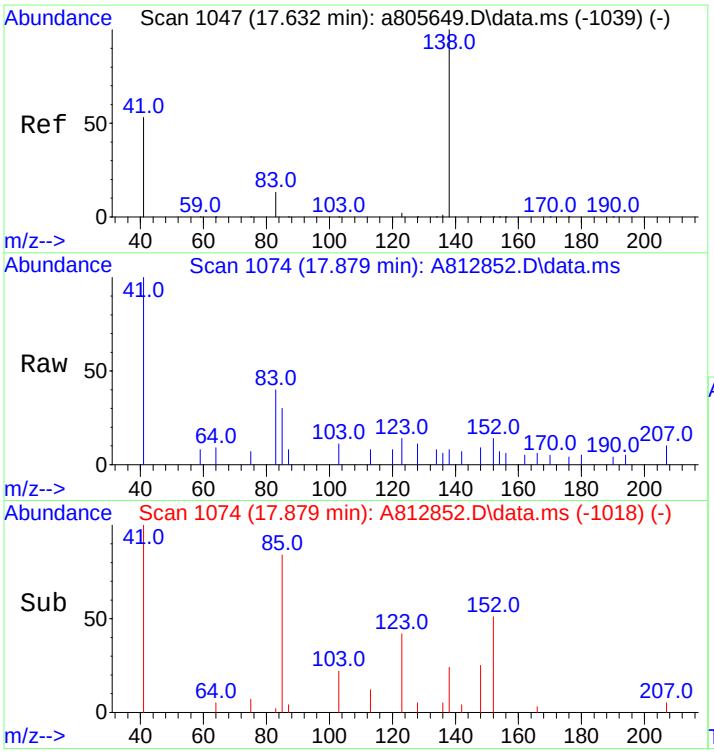




#3
trans-Decalin
Concen: 40.02 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

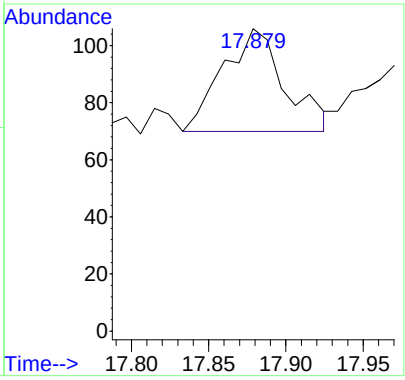
Tgt Ion:138 Resp: 2184

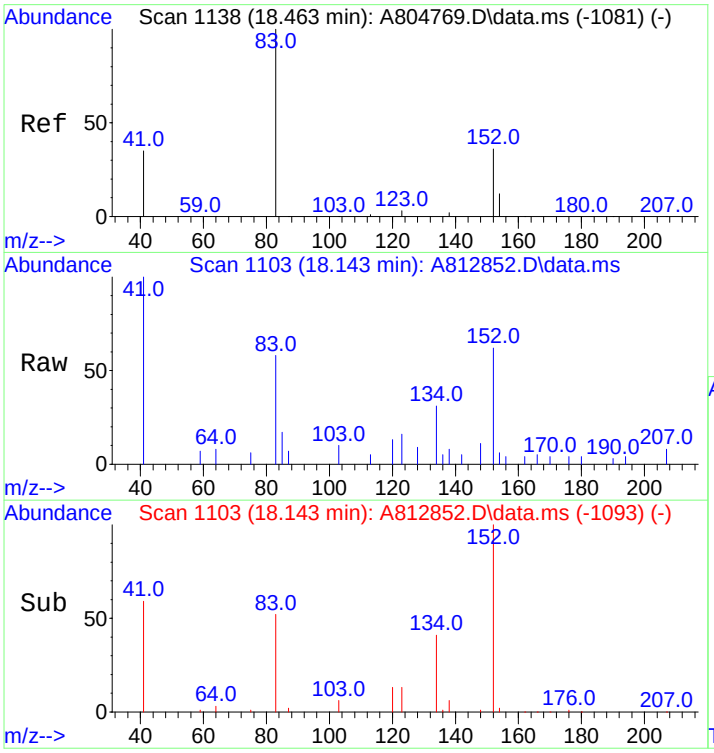




#4
cis-Decalin
Concen: 2.50 ng/mL
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

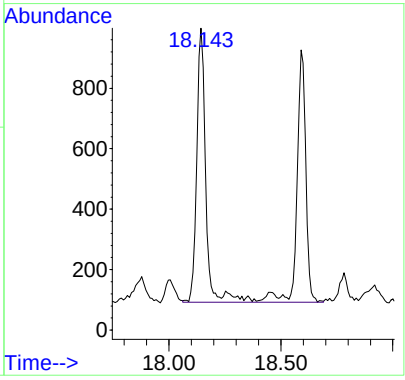
Tgt Ion:138 Resp: 100

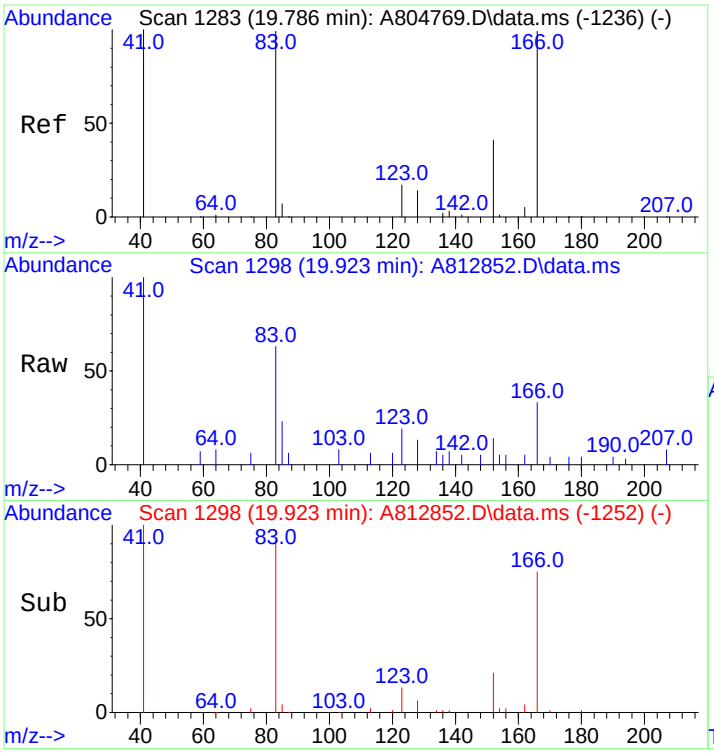




#5
C1-Decalins
Concen: 88.52 ng/mL m
RT: 18.143 min Scan# 1103
Delta R.T. -0.447 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

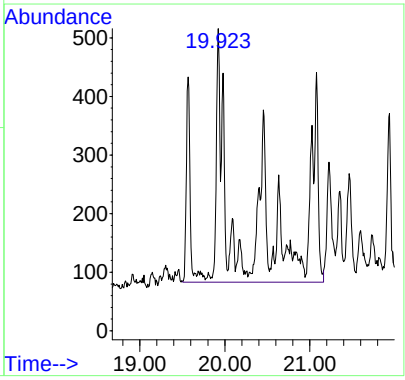
Tgt Ion:152 Resp: 4831

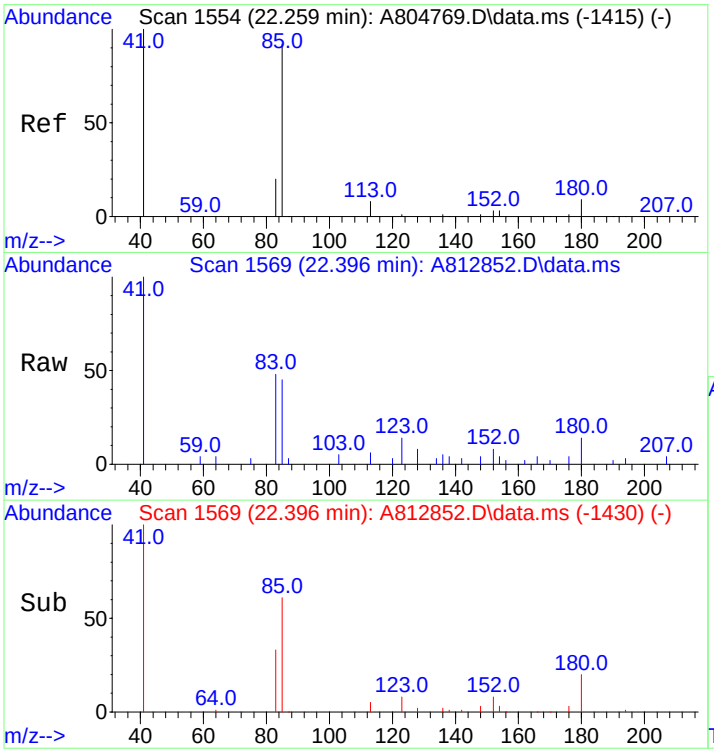




#6
C2-Decalins
Concen: 157.75 ng/mL m
RT: 19.923 min Scan# 1298
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

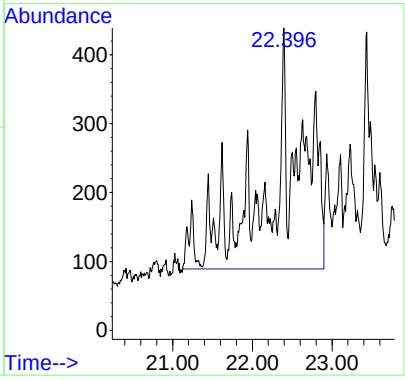
Tgt Ion:166 Resp: 8609

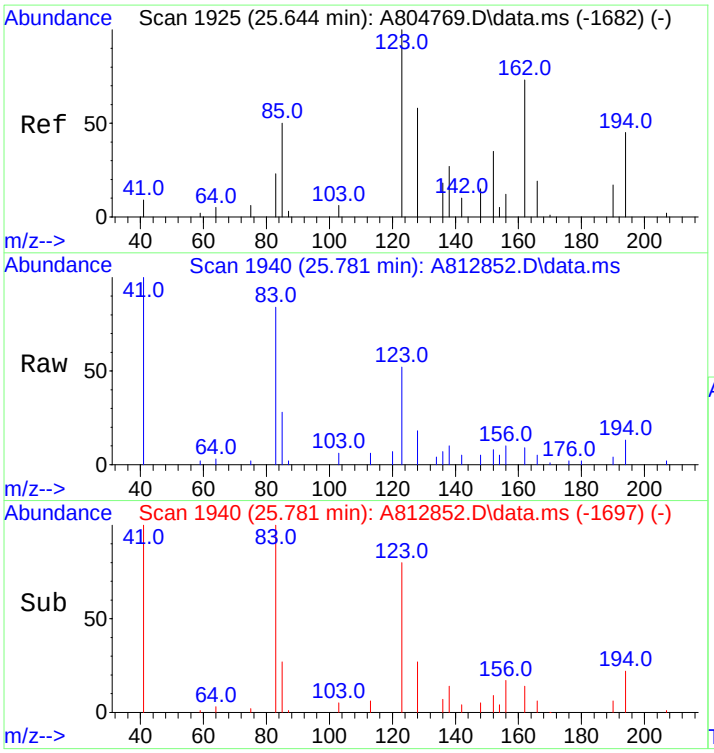




#7
C3-Decalins
Concen: 187.14 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

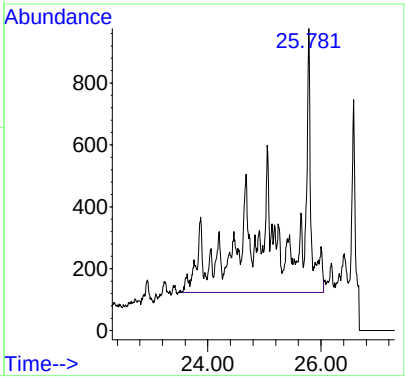
Tgt Ion:180 Resp: 10213

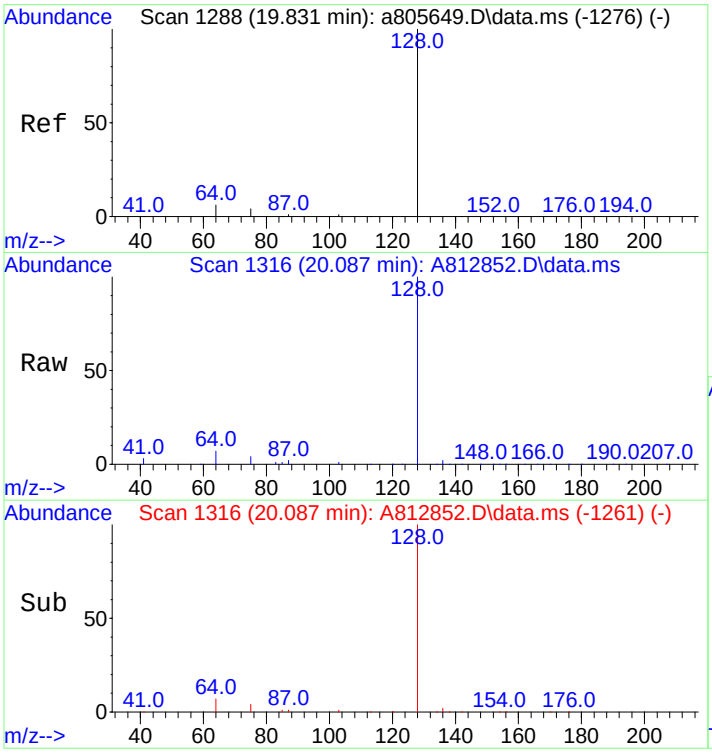




#8
C4-Decalins
Concen: 392.84 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:194 Resp: 21439

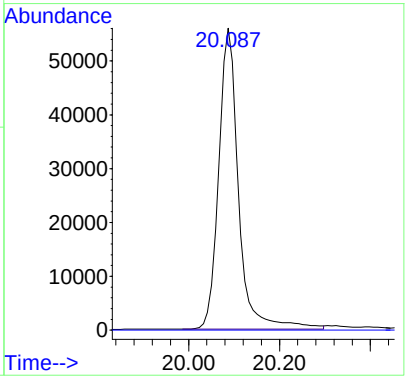


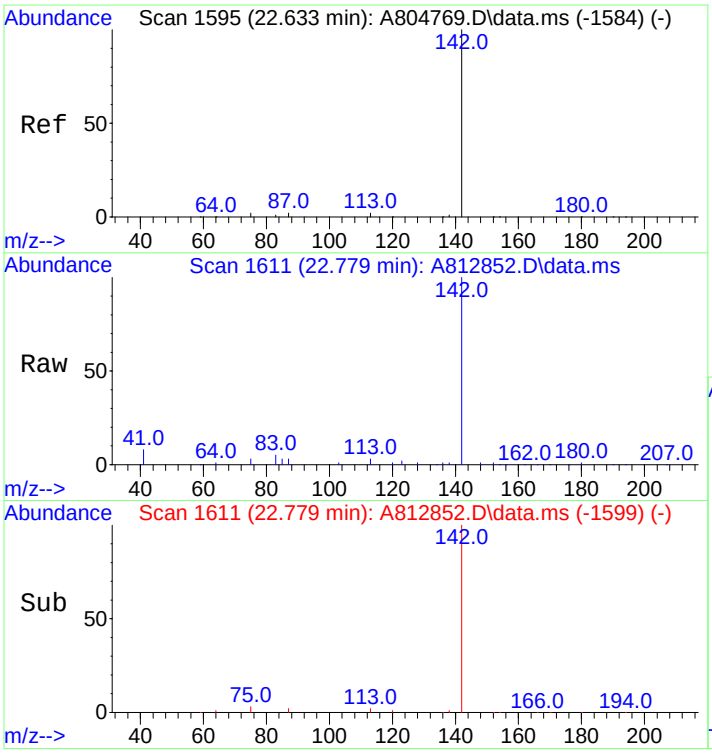


#10
Naphthalene
Concen: 609.19 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:128 Resp: 169619

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

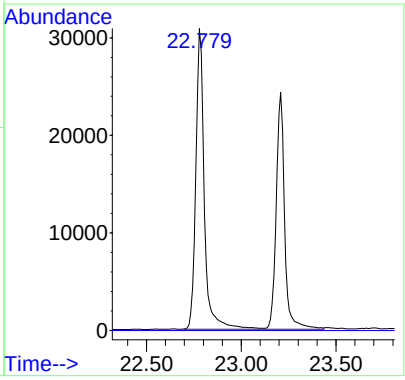


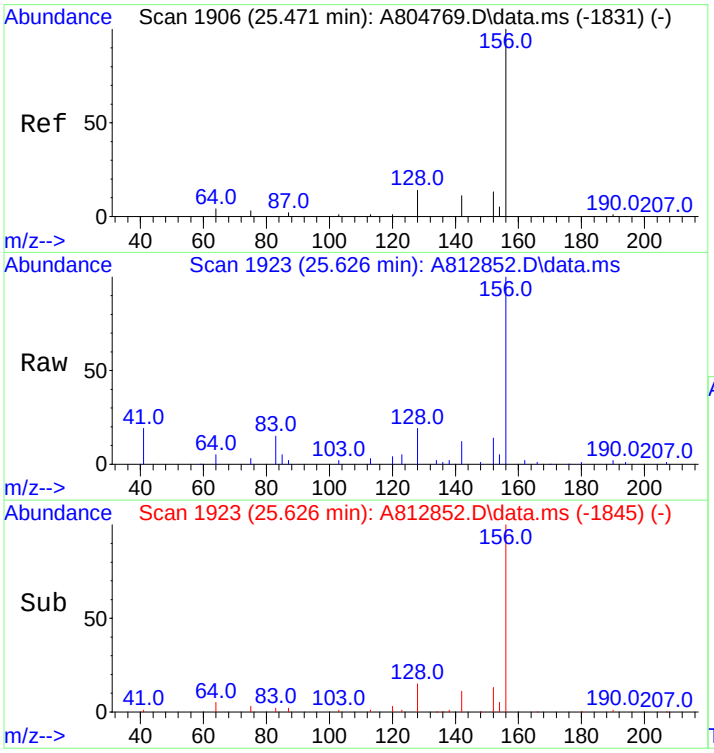


#11
C1-Naphthalenes
Concen: 611.08 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:142 Resp: 170144

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

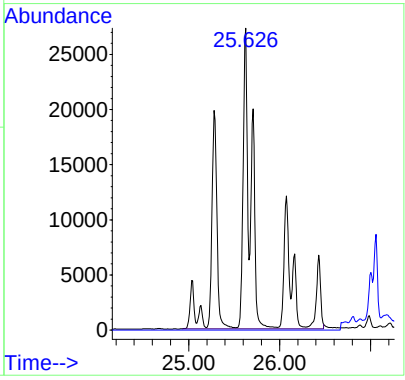


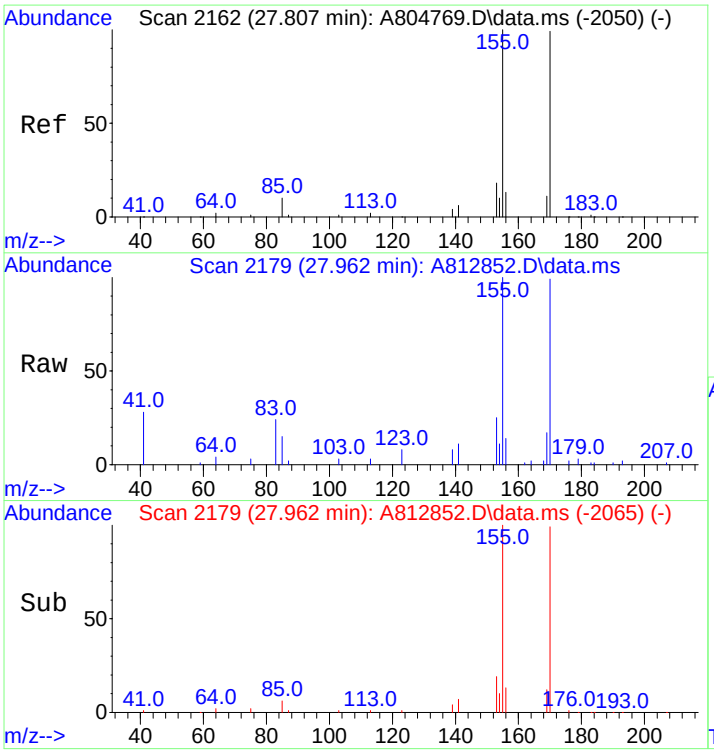


#12
C2-Naphthalenes
Concen: 1179.76 ng/mL m
RT: 25.626 min Scan# 1923
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:156 Resp: 328482

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

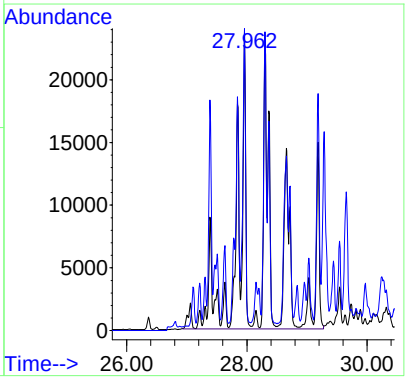


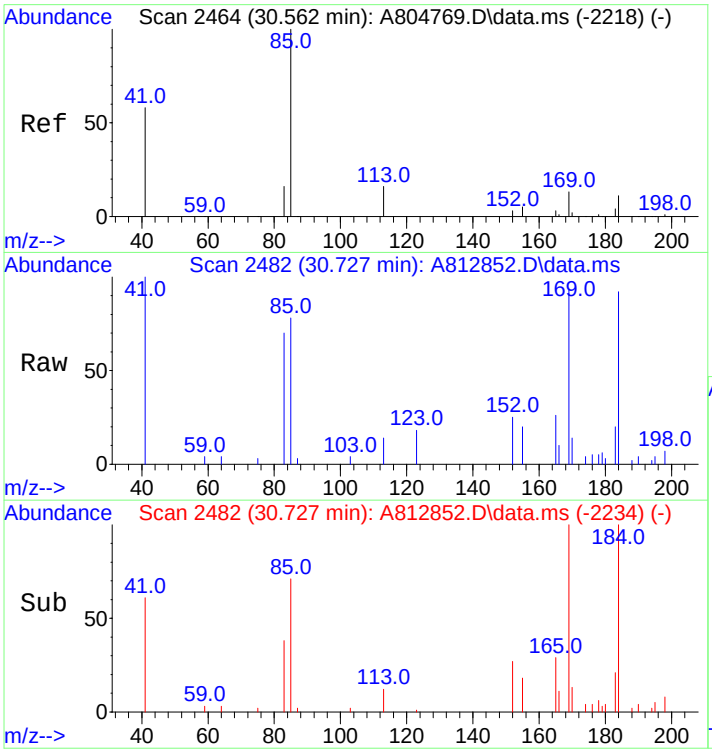


#13
C3-Naphthalenes
Concen: 1728.70 ng/mL m
RT: 27.962 min Scan# 2179
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:170 Resp: 481324

Ion	Ratio	Lower	Upper
170	100		
155	15.6	80.2	120.4#

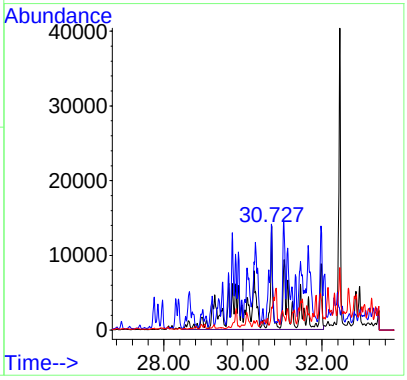


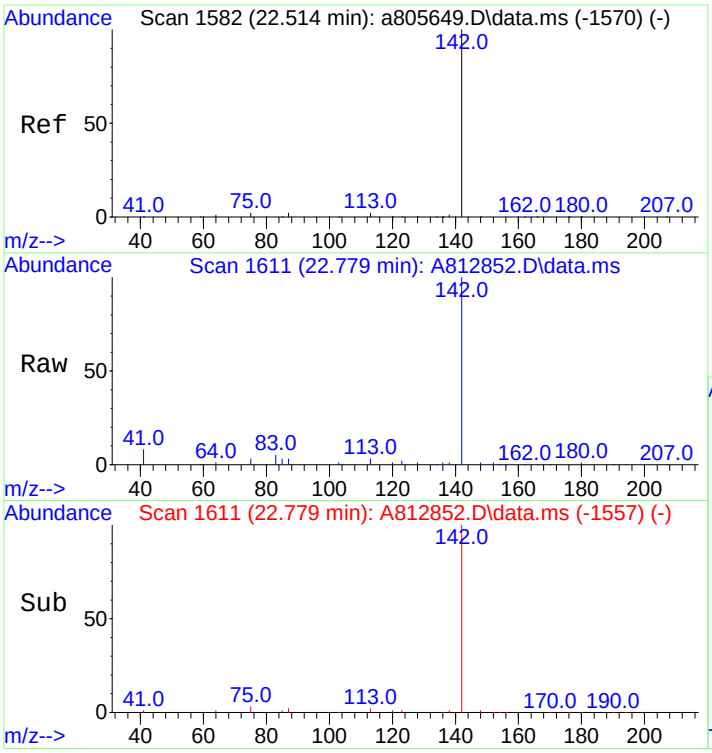


#14
C4-Naphthalenes
Concen: 1627.28 ng/mL m
RT: 30.727 min Scan# 2482
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:184 Resp: 453086

Ion	Ratio	Lower	Upper
184	100		
169	9.8	108.2	162.2#
183	0.0	29.7	44.5#

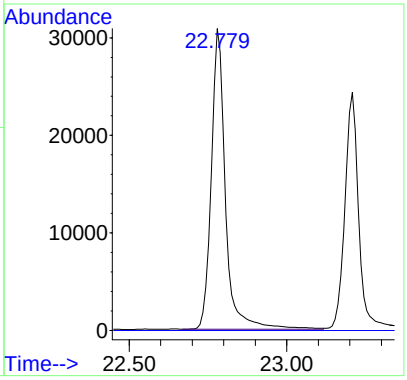


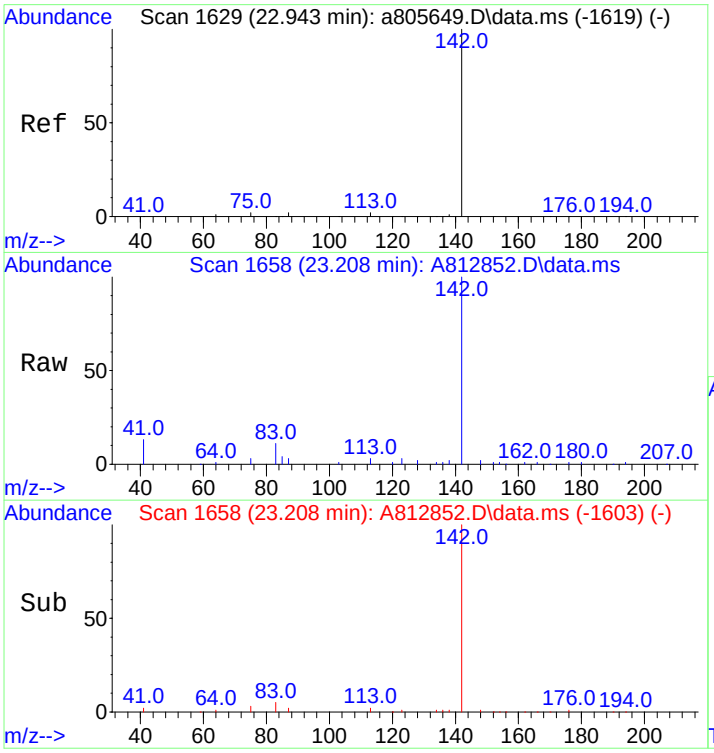


#16
2-Methylnaphthalene
Concen: 579.43 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:142 Resp: 96102

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

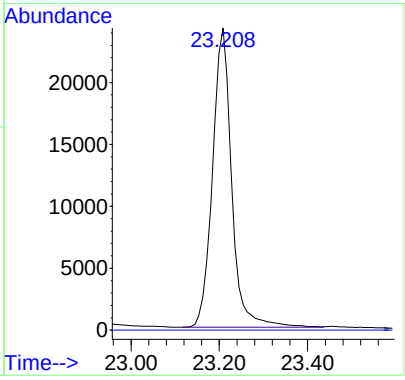


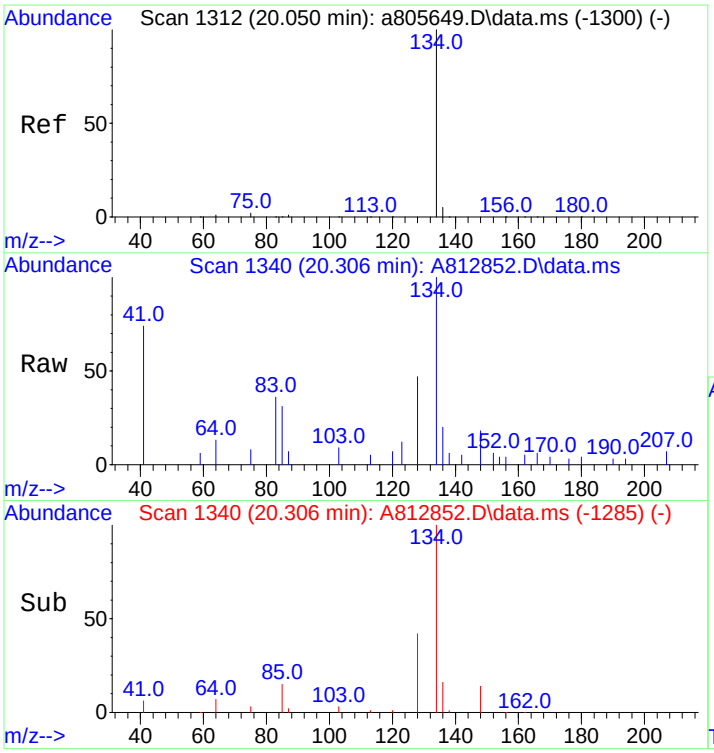


#17
1-Methylnaphthalene
Concen: 469.13 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:142 Resp: 72860

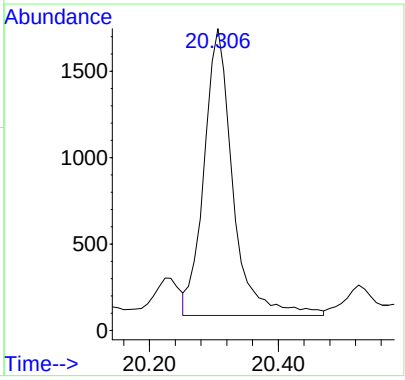
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

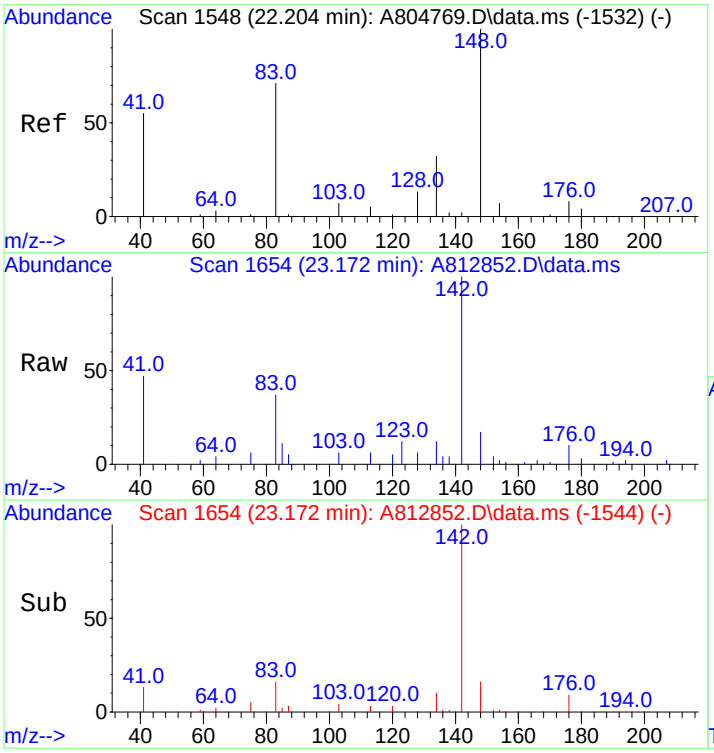




#18
Benzothiophene
Concen: 22.86 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

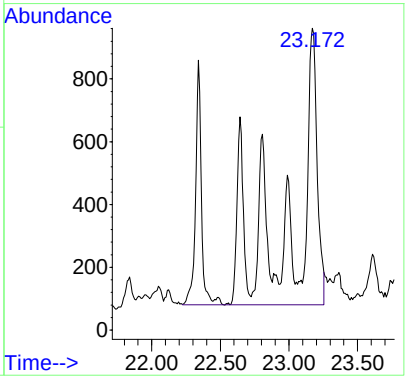
Tgt Ion:134 Resp: 5144

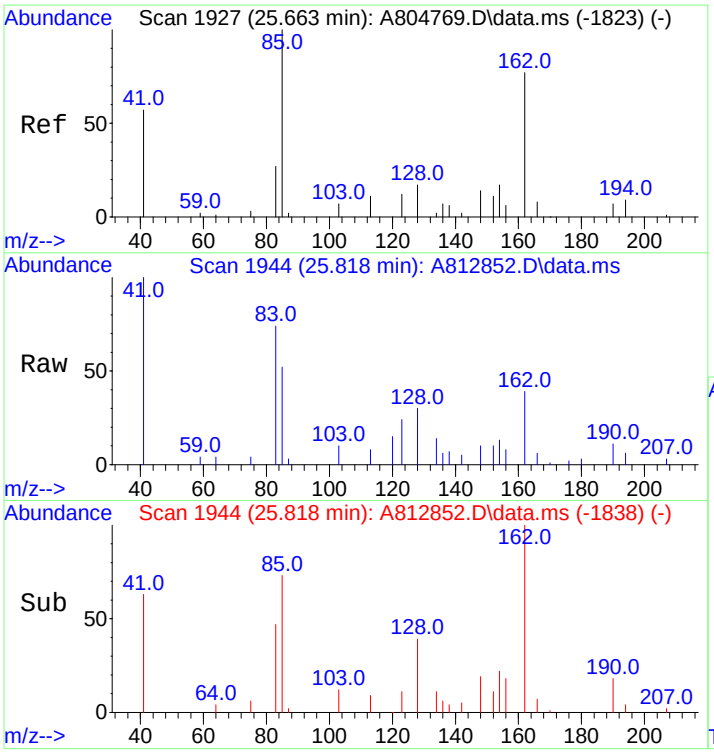




#19
C1-Benzo(b)thiophenes
Concen: 54.77 ng/mL m
RT: 23.172 min Scan# 1654
Delta R.T. 0.831 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

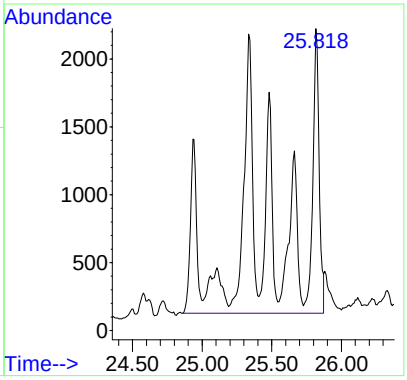
Tgt Ion:148 Resp: 12327

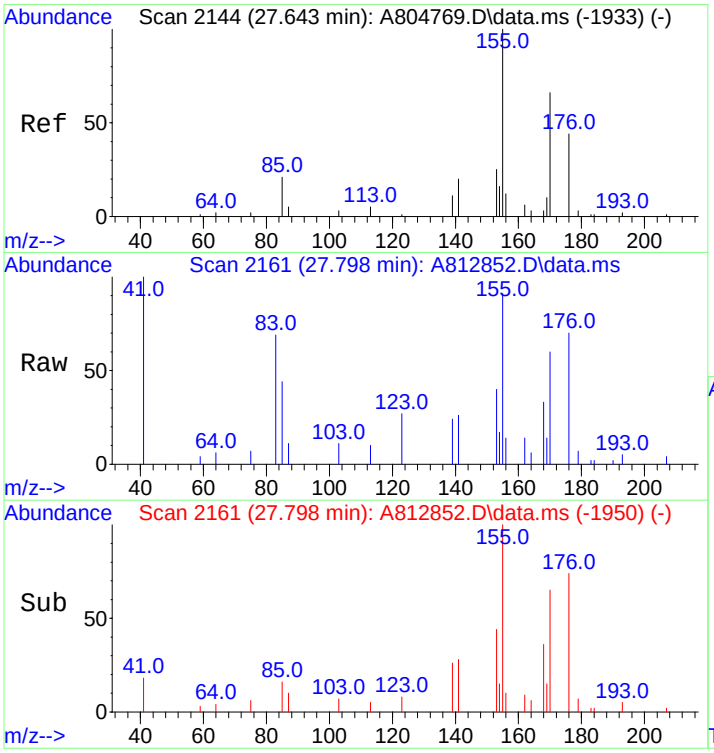




#20
C2-Benzo(b)thiophenes
Concen: 141.46 ng/mL m
RT: 25.818 min Scan# 1944
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

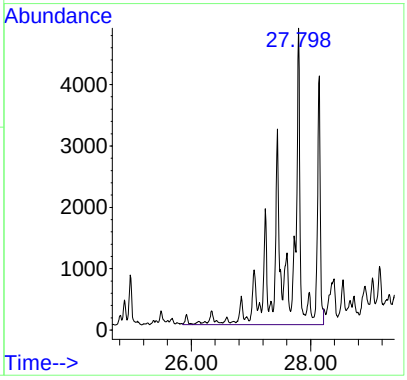
Tgt Ion:162 Resp: 31837

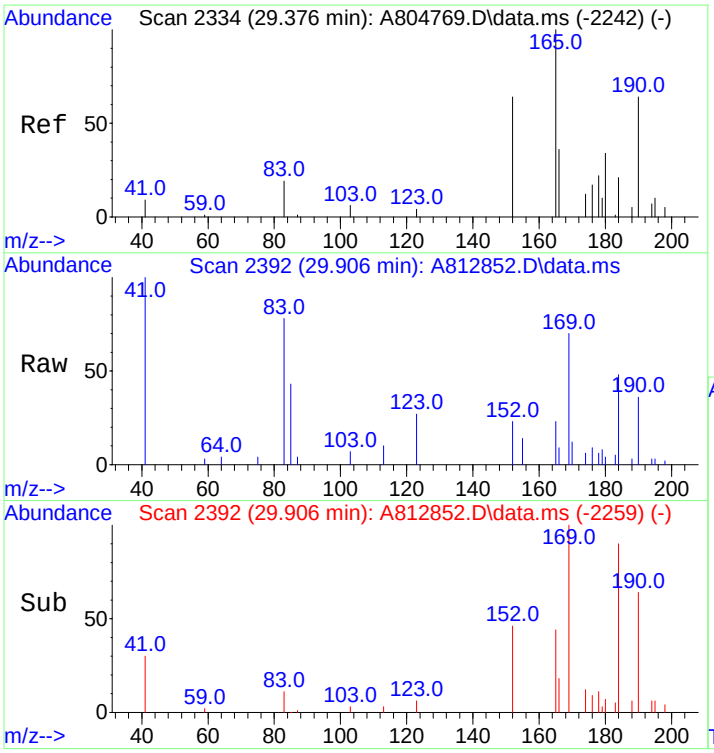




#21
C3-Benzo(b)thiophenes
Concen: 309.53 ng/mL m
RT: 27.798 min Scan# 2161
Delta R.T. 0.016 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

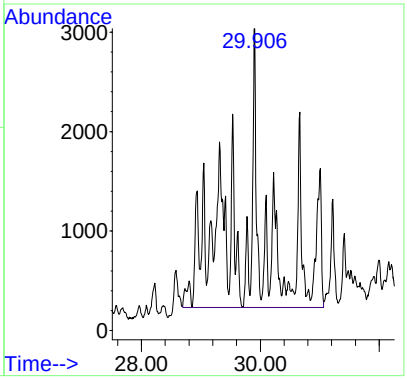
Tgt Ion:176 Resp: 69661

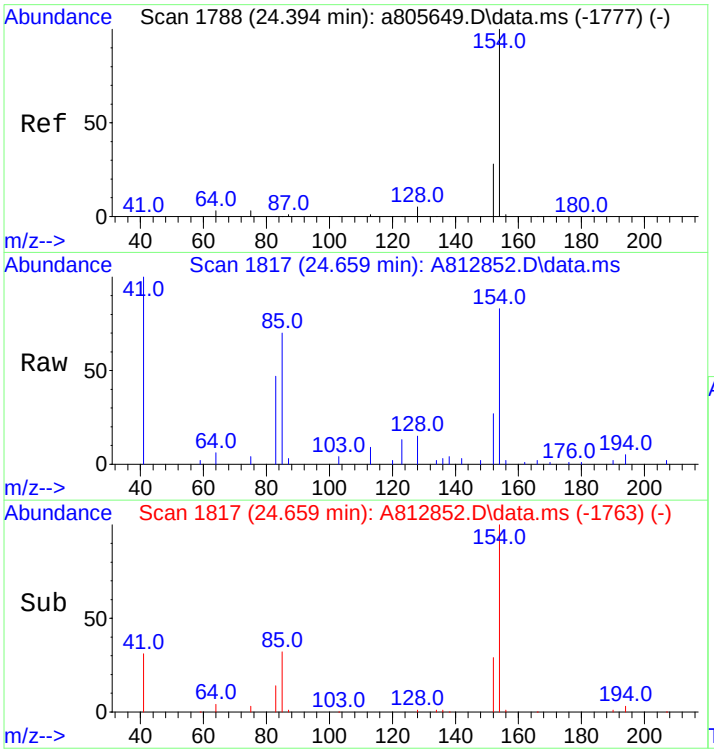




#22
C4-Benzo(b)thiophenes
Concen: 361.88 ng/mL m
RT: 29.906 min Scan# 2392
Delta R.T. 0.374 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:190 Resp: 81443

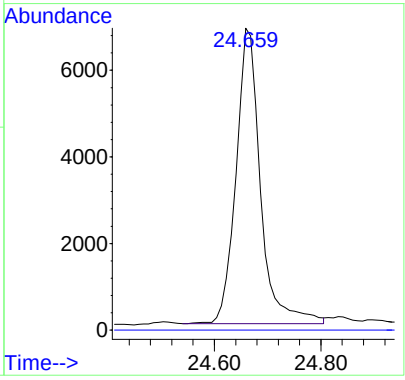


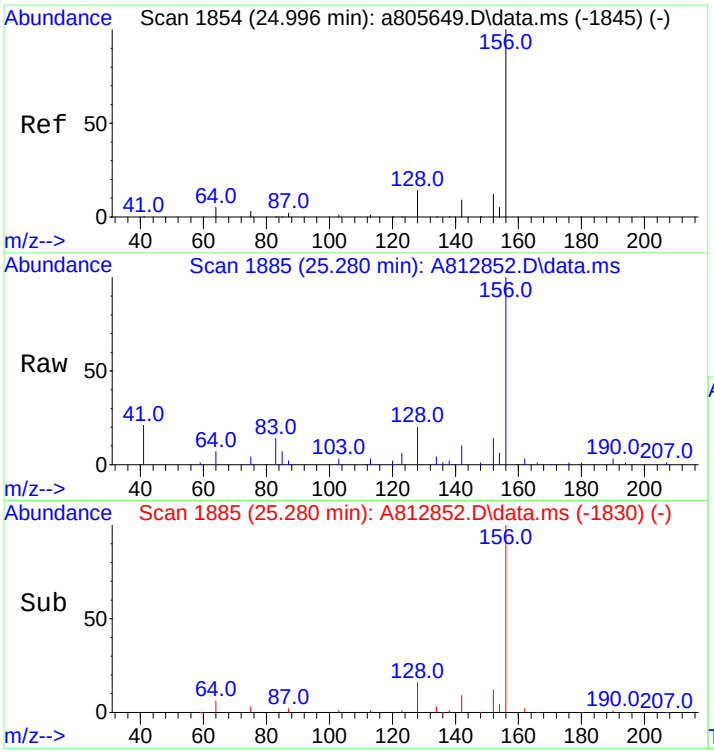


#23
Biphenyl
Concen: 103.42 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:154 Resp: 21823

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

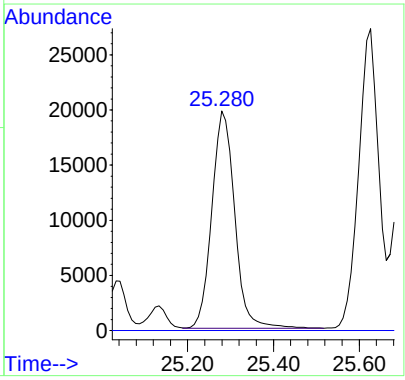


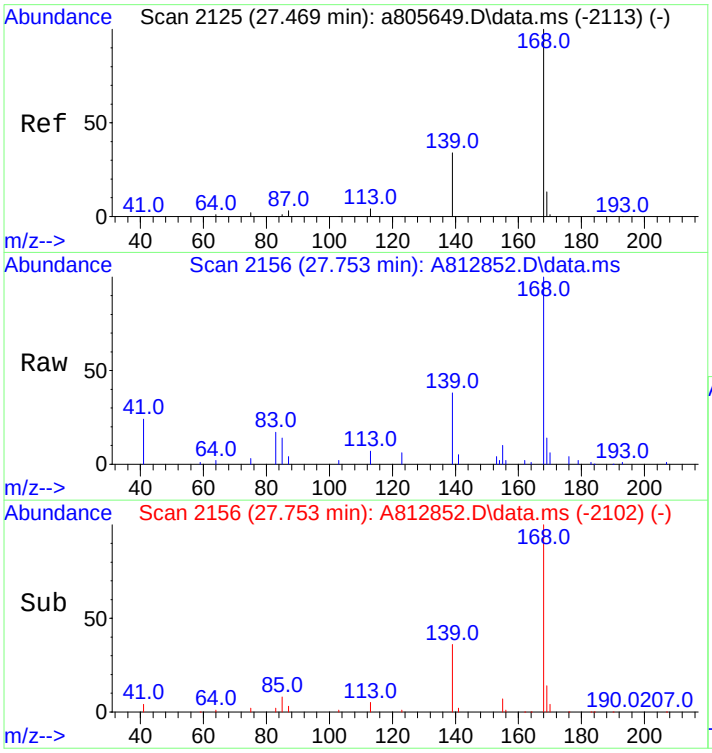


#24
2,6-Dimethylnaphthalene
Concen: 512.82 ng/mL
RT: 25.280 min Scan# 1885
Delta R.T. -0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:156 Resp: 72793

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

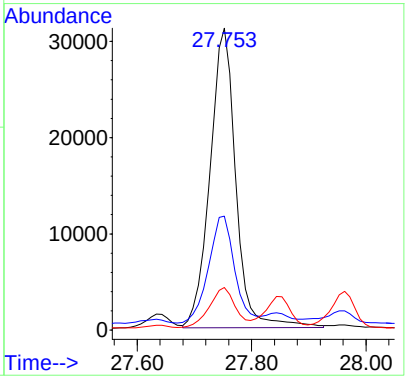


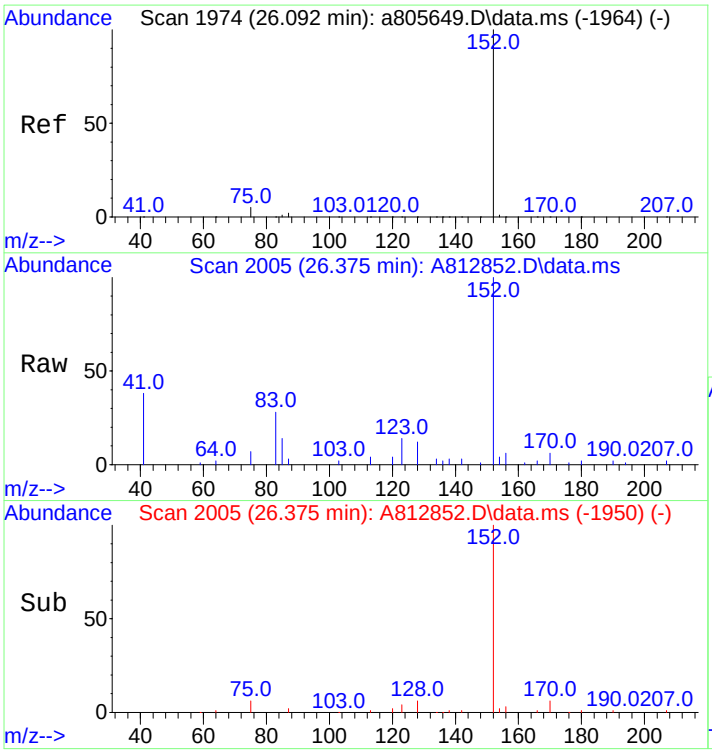


#25
Dibenzofuran
Concen: 439.06 ng/mL
RT: 27.753 min Scan# 2156
Delta R.T. -0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:168 Resp: 97743

Ion	Ratio	Lower	Upper
168	100		
139	36.1	28.0	42.0
169	13.7	10.6	15.8

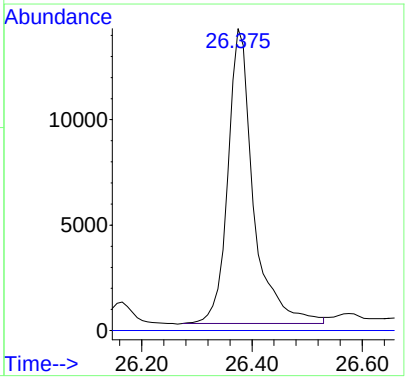


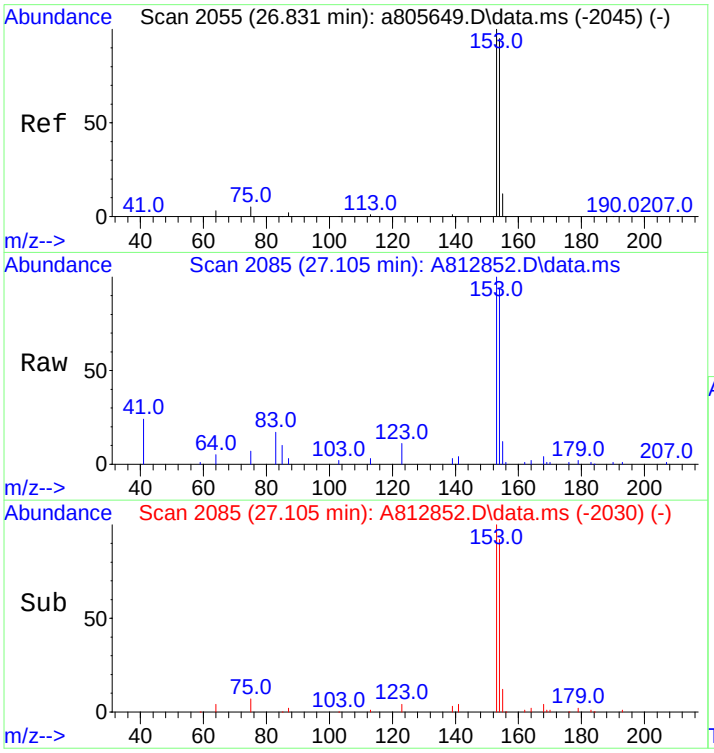


#26
Acenaphthylene
Concen: 178.30 ng/mL
RT: 26.375 min Scan# 2005
Delta R.T. -0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:152 Resp: 45062

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

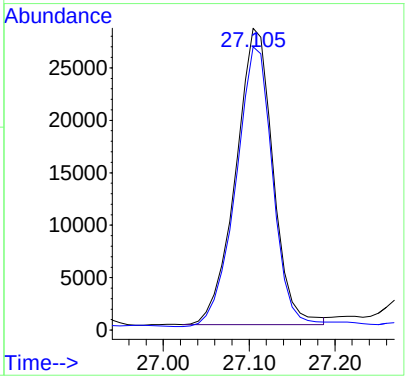


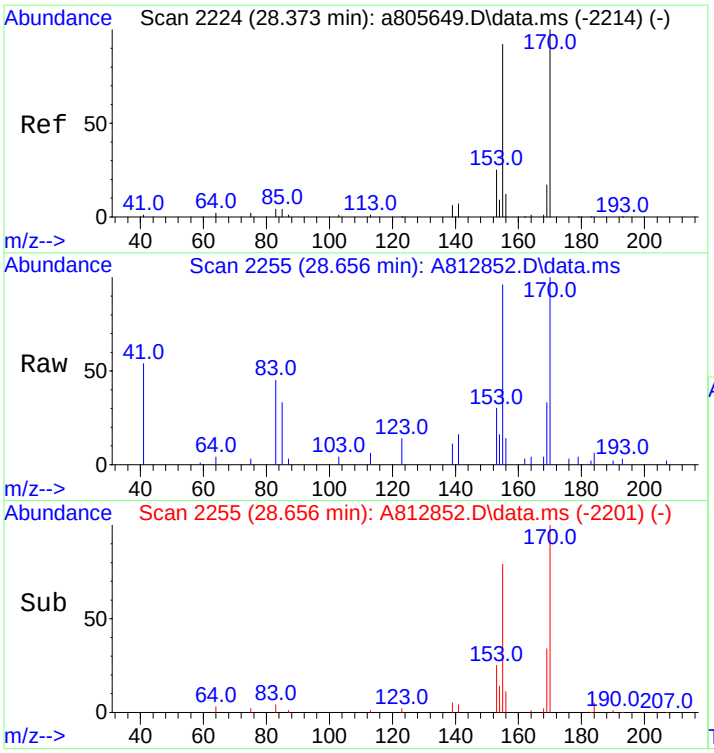


#27
Acenaphthene
Concen: 567.23 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:153 Resp: 85566

Ion	Ratio	Lower	Upper
153	100		
154	95.4	75.4	113.2

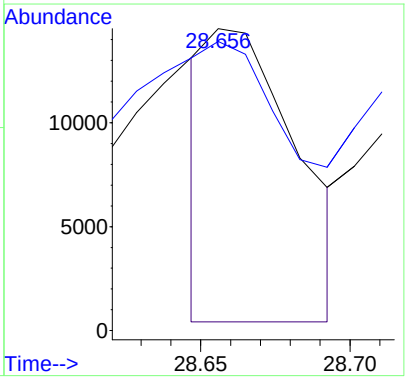


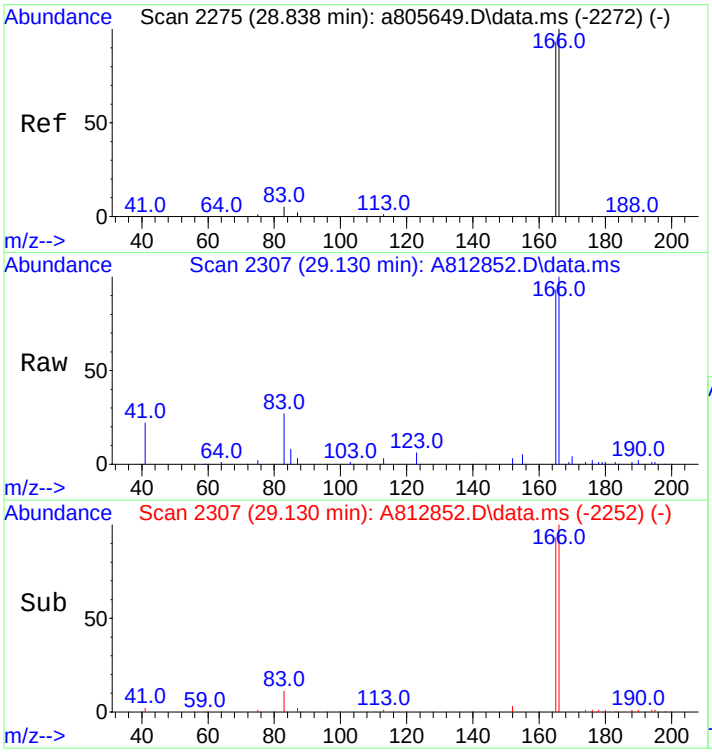


#28
2,3,5-Trimethylnaphthalene
Concen: 238.68 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:170 Resp: 29179

Ion	Ratio	Lower	Upper
170	100		
155	211.4	71.7	107.5#

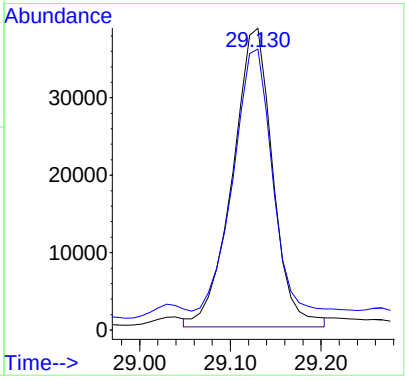


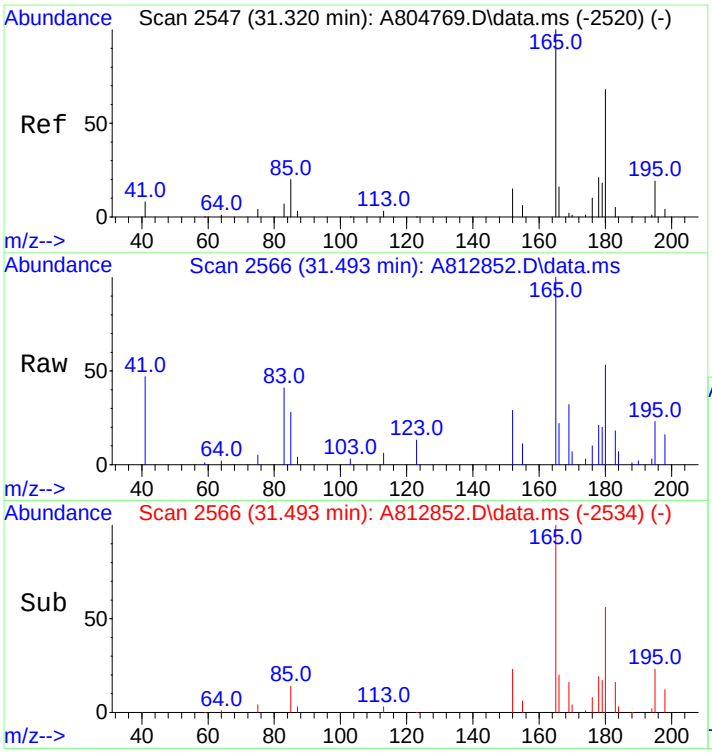


#29
Fluorene
Concen: 705.17 ng/mL m
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:166 Resp: 119308

Ion	Ratio	Lower	Upper
166	100		
165	88.1	74.2	111.2

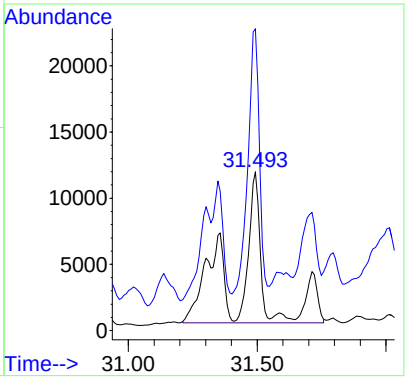


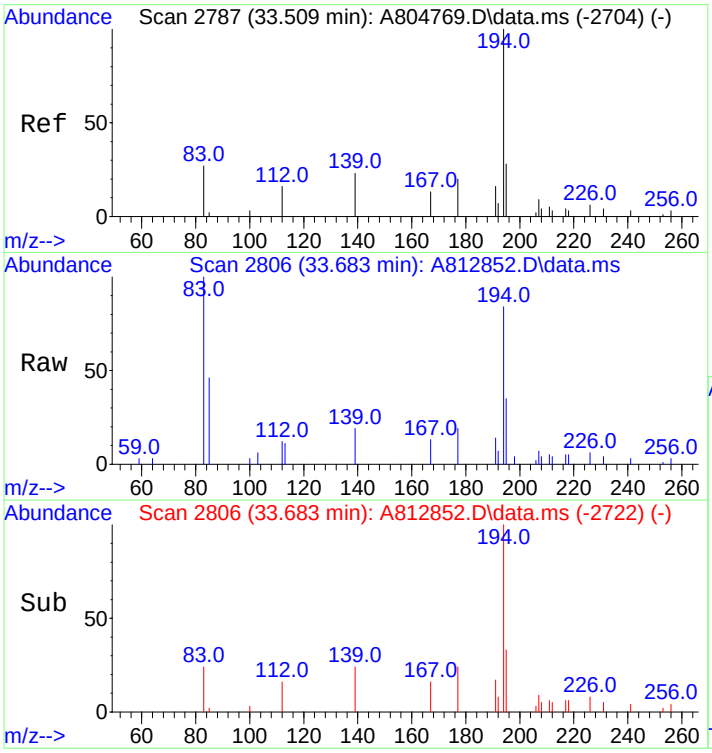


#30
C1-Fluorenes
Concen: 488.30 ng/mL m
RT: 31.493 min Scan# 2566
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:180 Resp: 82616

Ion	Ratio	Lower	Upper
180	100		
165	22.5	122.4	183.6#

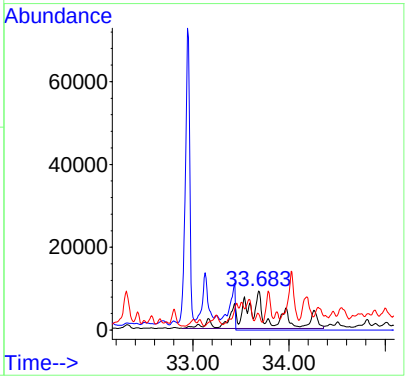


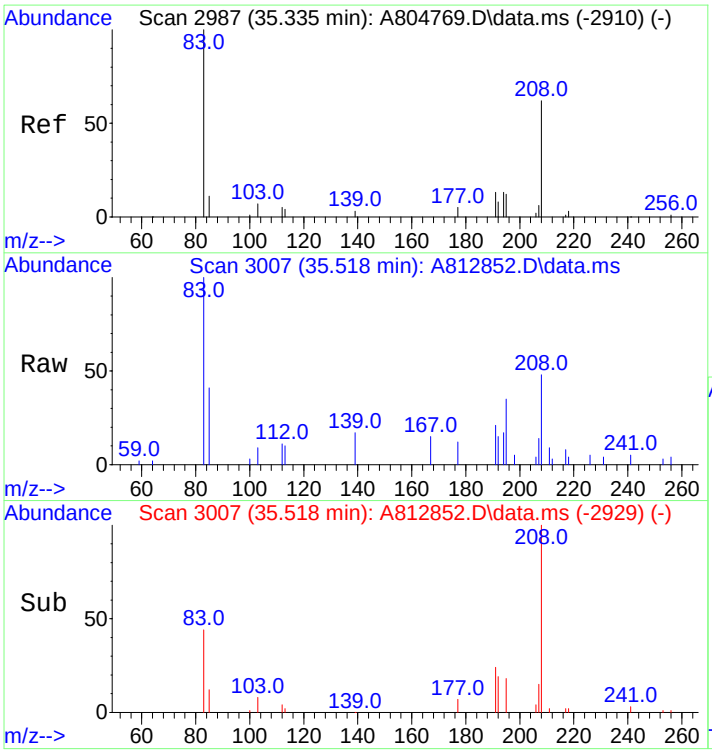


#31
C2-Fluorenes
Concen: 1080.95 ng/mL m
RT: 33.683 min Scan# 2806
Delta R.T. 0.077 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:194 Resp: 182886

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	9.2	27.4	41.0#

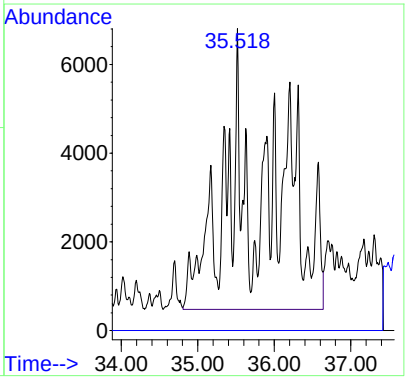


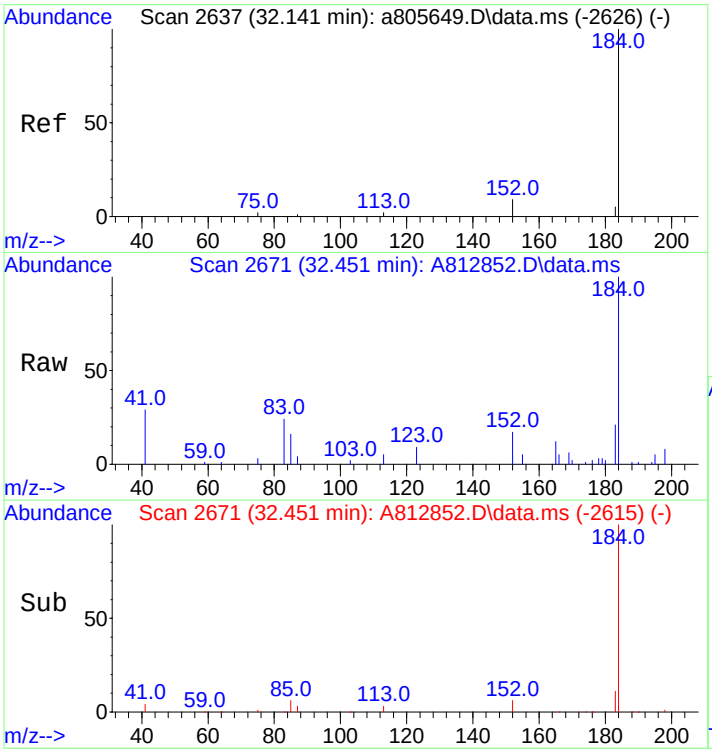


#32
C3-Fluorenes
Concen: 1349.47 ng/mL m
RT: 35.518 min Scan# 3007
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:208 Resp: 228316

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

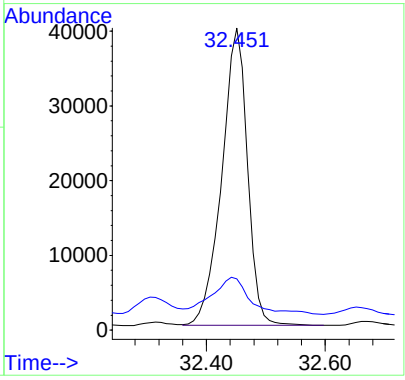


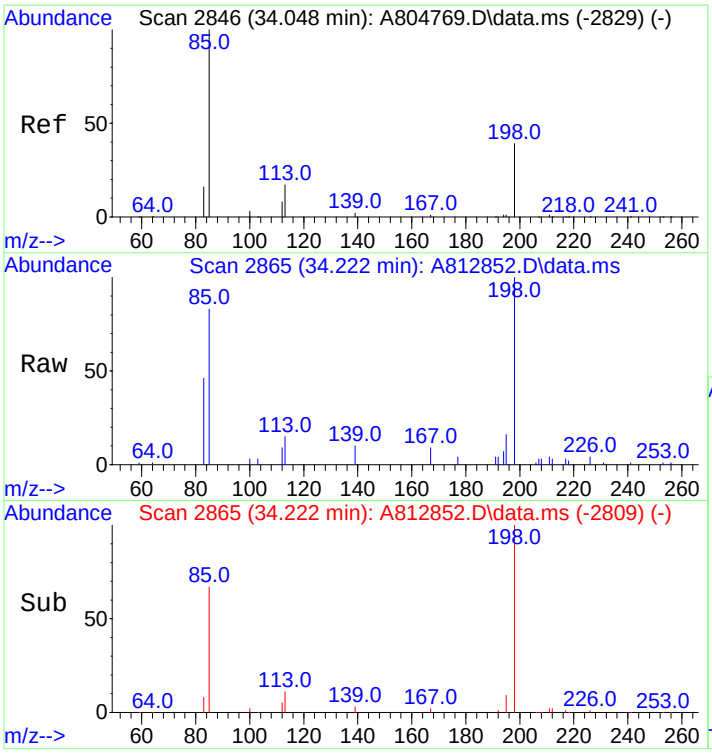


#33
Dibenzothiophene
Concen: 511.54 ng/mL
RT: 32.451 min Scan# 2671
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:184 Resp: 119014

Ion	Ratio	Lower	Upper
184	100		
152	18.9	7.8	11.8#

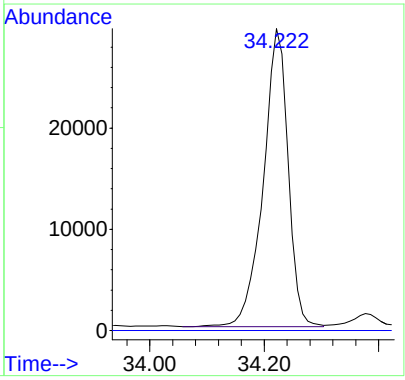


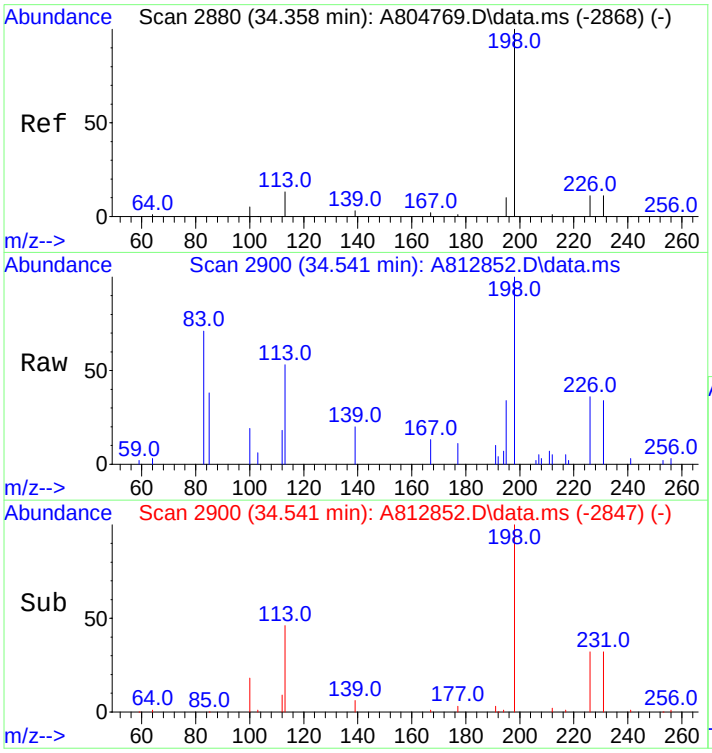


#34
4-Methyldibenzothiophene(4MDT)
Concen: 381.62 ng/mL
RT: 34.222 min Scan# 2865
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:198 Resp: 88787

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

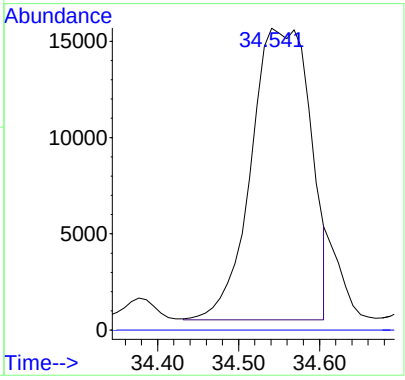


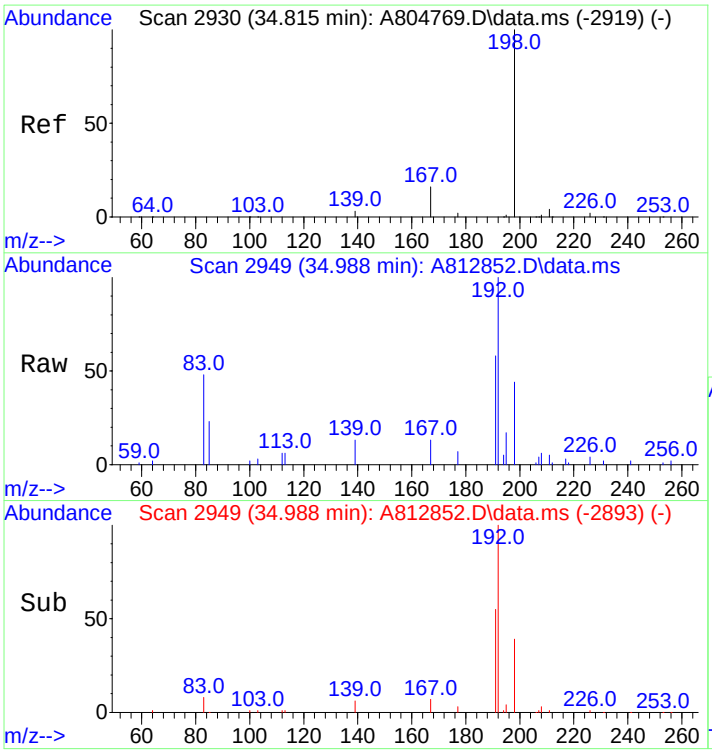


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 332.62 ng/mL m
RT: 34.541 min Scan# 2900
Delta R.T. -0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:198 Resp: 77387

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

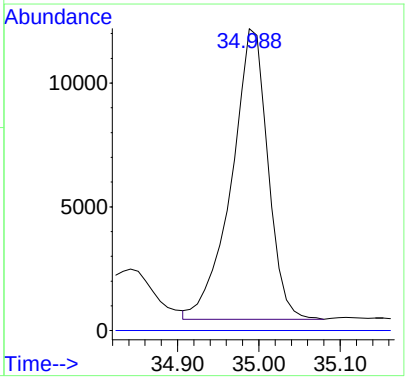


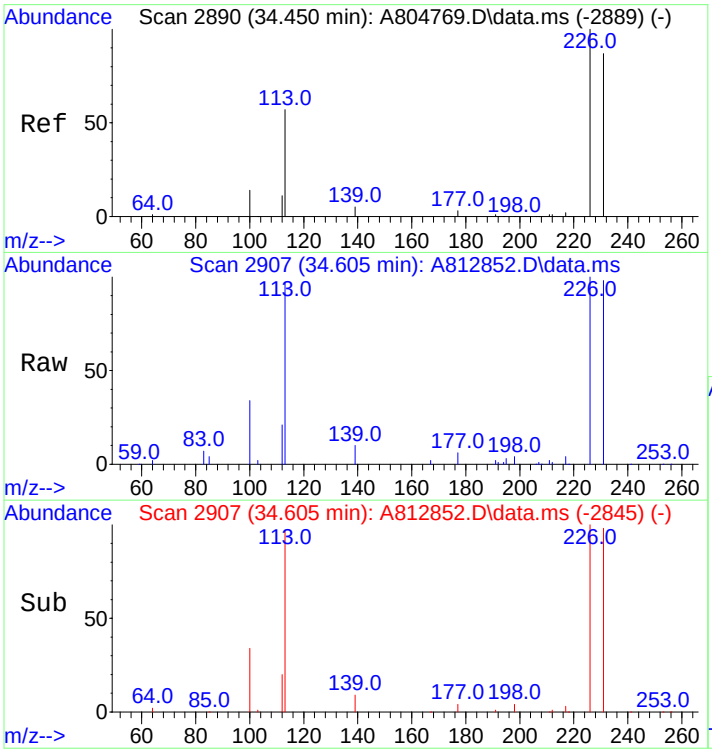


#36
1-Methyldibenzothiophene(1MDT)
Concen: 156.73 ng/mL
RT: 34.988 min Scan# 2949
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:198 Resp: 36465

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

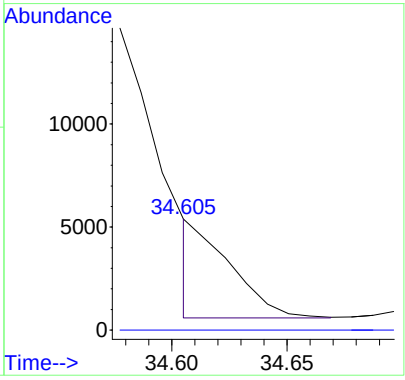


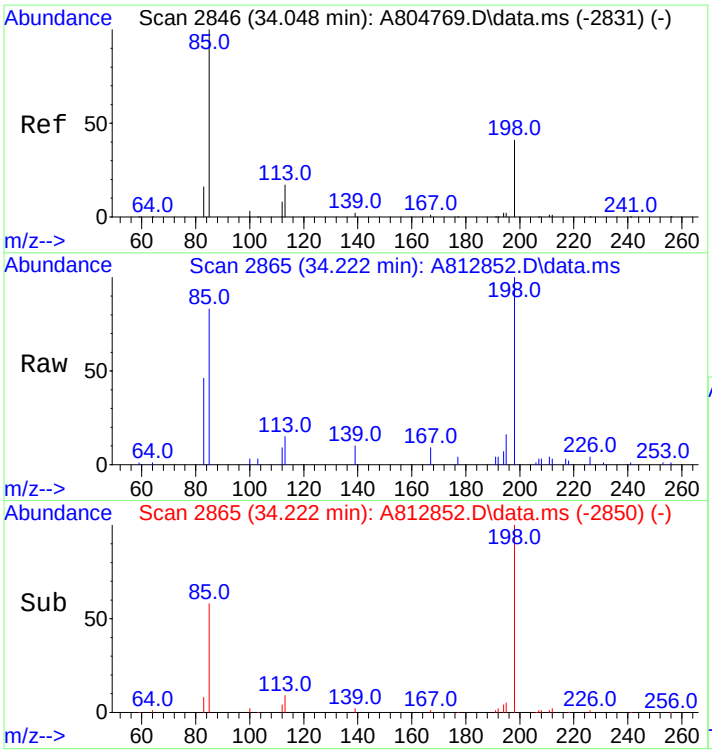


#37
OTP
Concen: 22.34 ng/mL m
RT: 34.605 min Scan# 2907
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:198 Resp: 5198

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

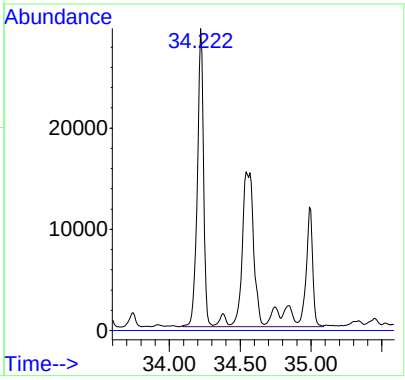


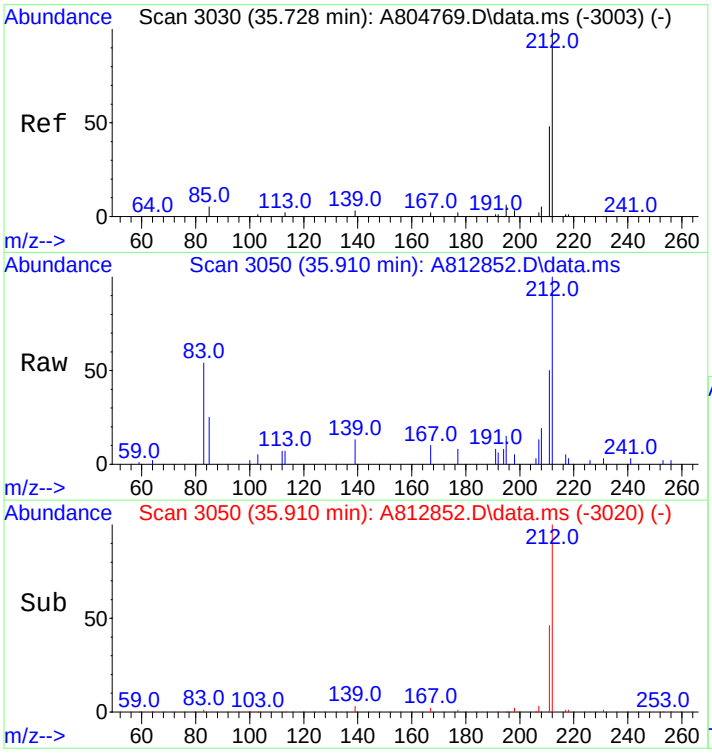


#38
C1-Dibenzothiophenes
Concen: 996.81 ng/mL m
RT: 34.222 min Scan# 2865
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:198 Resp: 231914

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

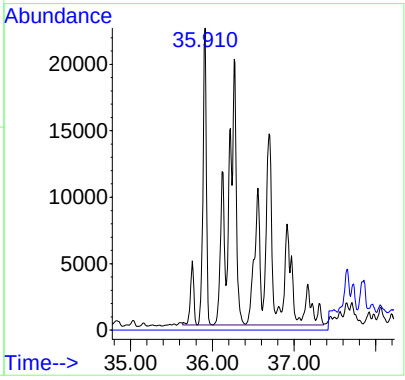


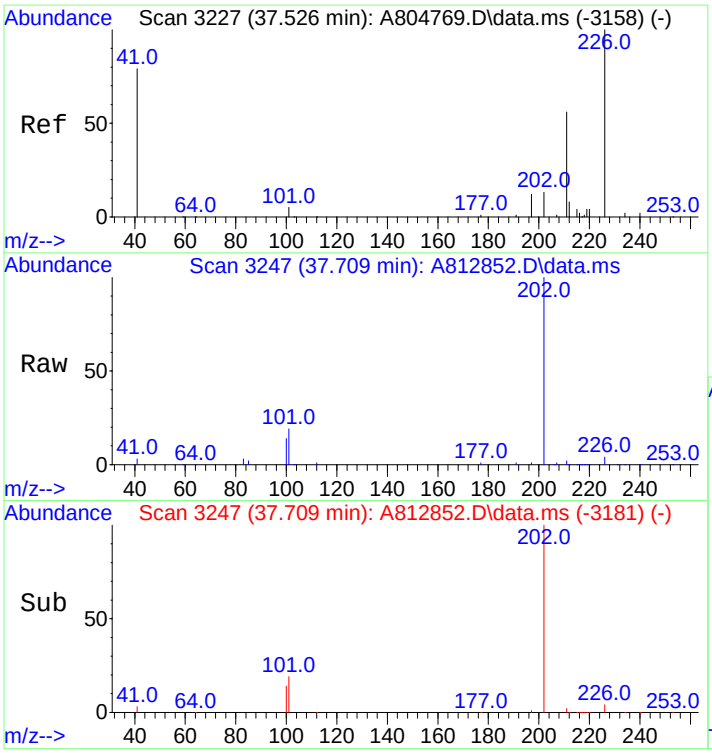


#39
C2-Dibenzothiophenes
Concen: 1704.79 ng/mL m
RT: 35.910 min Scan# 3050
Delta R.T. -0.347 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:212 Resp: 396632

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

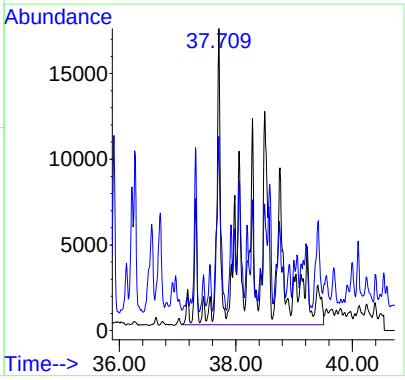


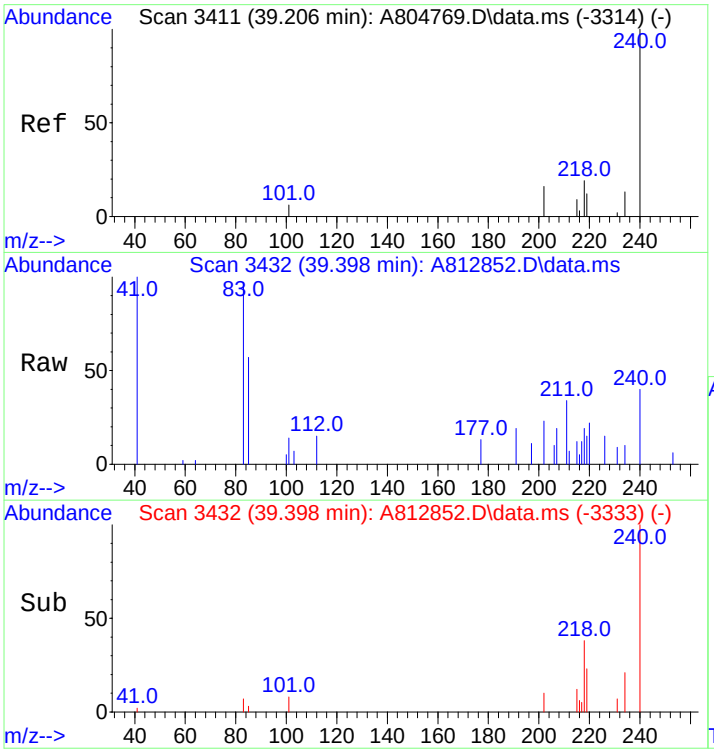


#40
C3-Dibenzothiophenes
Concen: 1812.59 ng/mL m
RT: 37.709 min Scan# 3247
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:226 Resp: 421712

Ion	Ratio	Lower	Upper
226	100		
211	1.9	50.2	75.2#

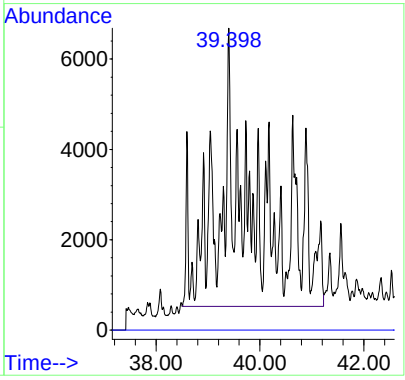


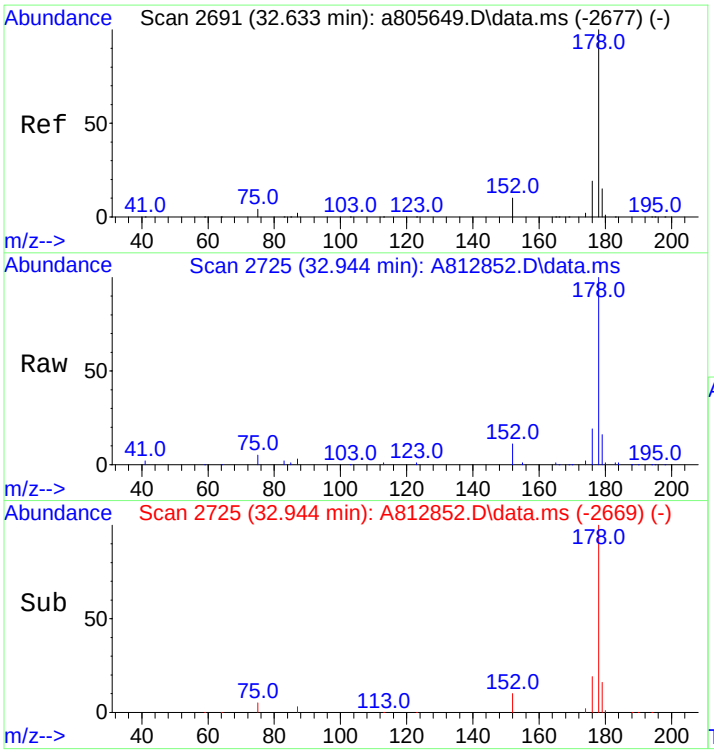


#41
C4-Dibenzothiophenes
Concen: 1211.68 ng/mL m
RT: 39.398 min Scan# 3432
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:240 Resp: 281906

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

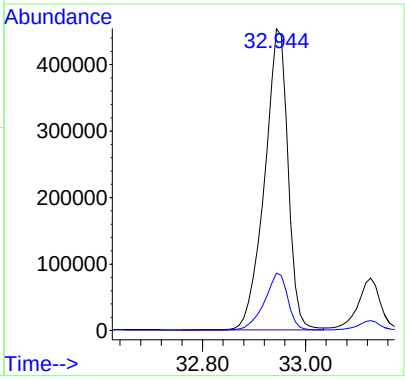


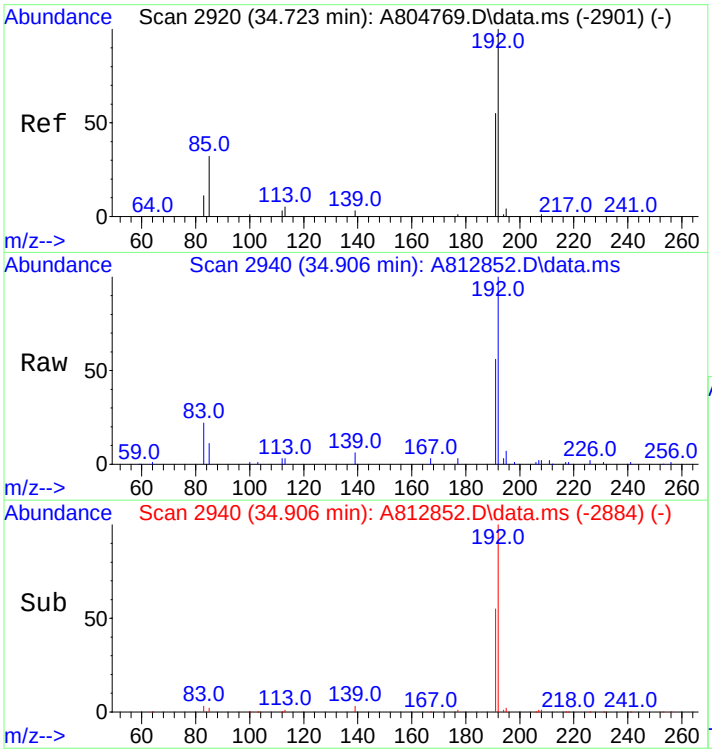


#43
Phenanthrene
Concen: 6391.51 ng/mL
RT: 32.944 min Scan# 2725
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:178 Resp: 1431255

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

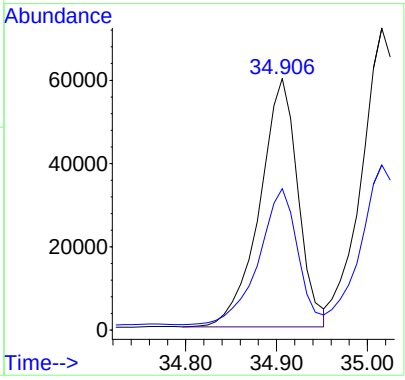


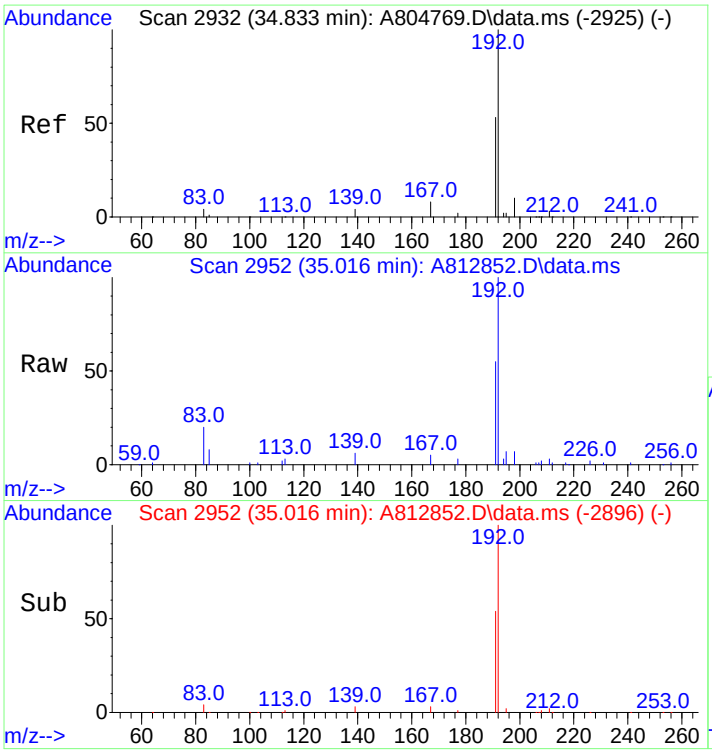


#44
3-Methylphenanthrene(3MP)
Concen: 779.73 ng/mL
RT: 34.906 min Scan# 2940
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 174606

Ion	Ratio	Lower	Upper
192	100		
191	55.5	45.5	68.3

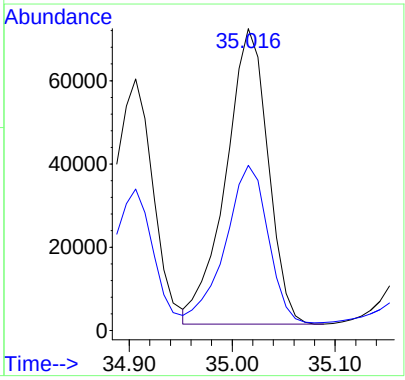


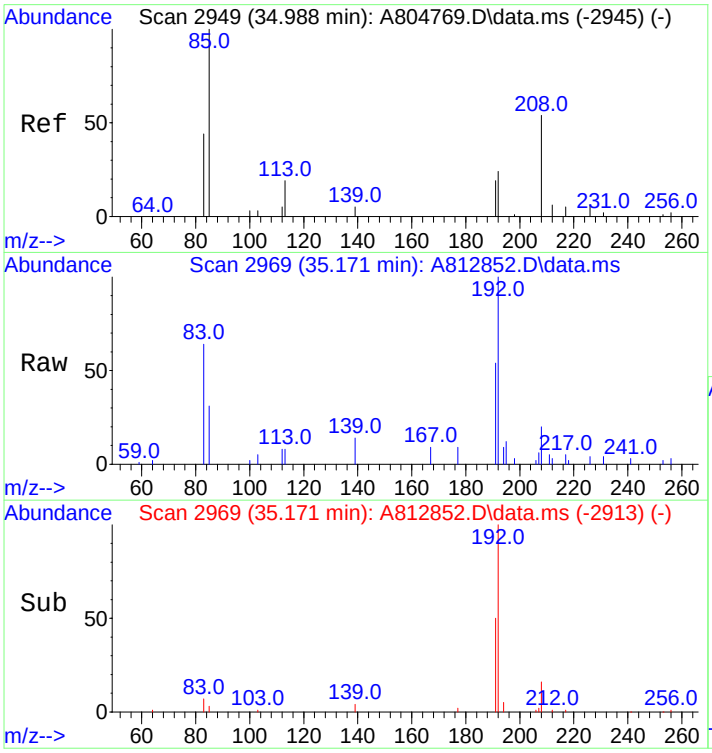


#45
2-Methylphenanthrene(2MP)
Concen: 906.40 ng/mL
RT: 35.016 min Scan# 2952
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 202970

Ion	Ratio	Lower	Upper
192	100		
191	53.5	44.6	67.0

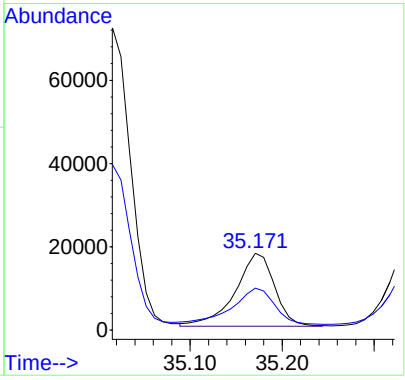


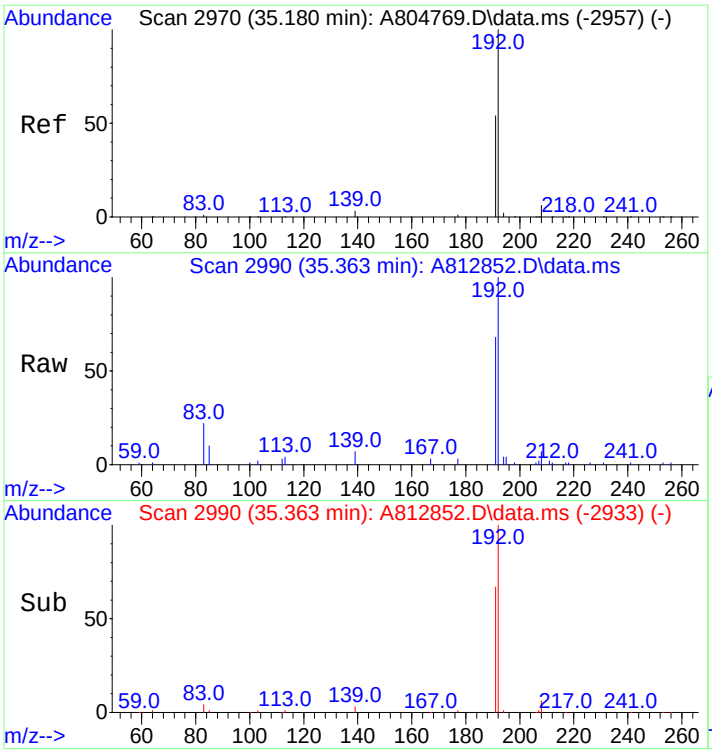


#46
2-Methylanthracene(2MA)
Concen: 232.09 ng/mL m
RT: 35.171 min Scan# 2969
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 51972

Ion	Ratio	Lower	Upper
192	100		
191	1.4	96.9	145.3#

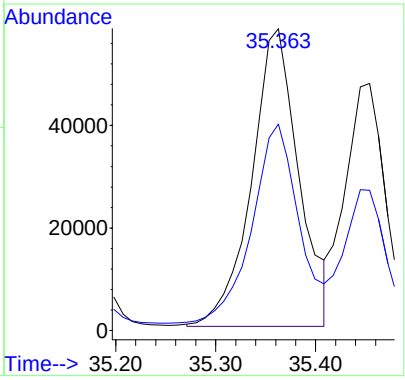


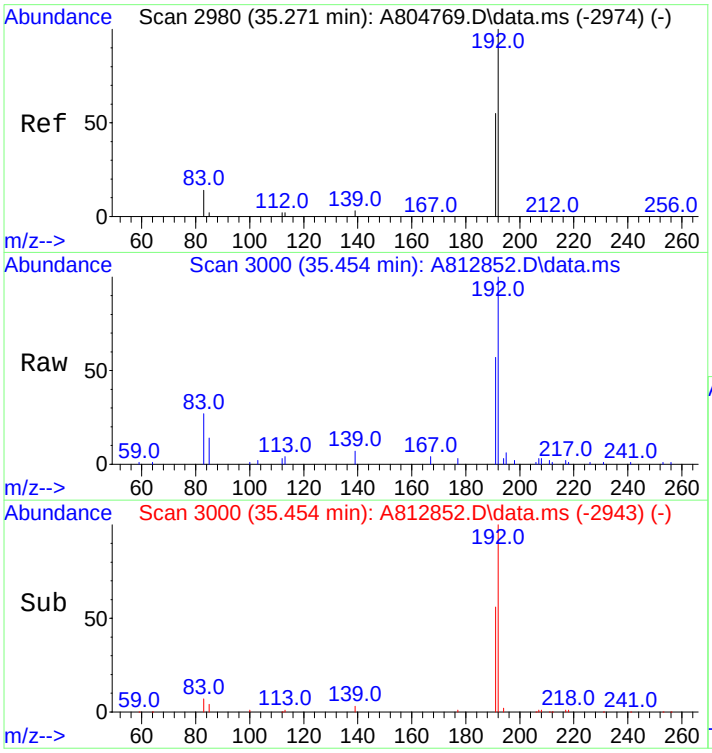


#47
9/4-Methylphenanthrene(9MP)
Concen: 850.71 ng/mL m
RT: 35.363 min Scan# 2990
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 190501

Ion	Ratio	Lower	Upper
192	100		
191	38.7	44.5	66.7#

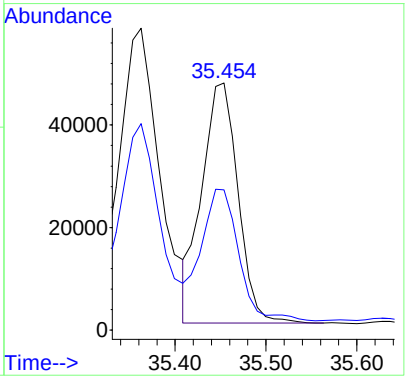


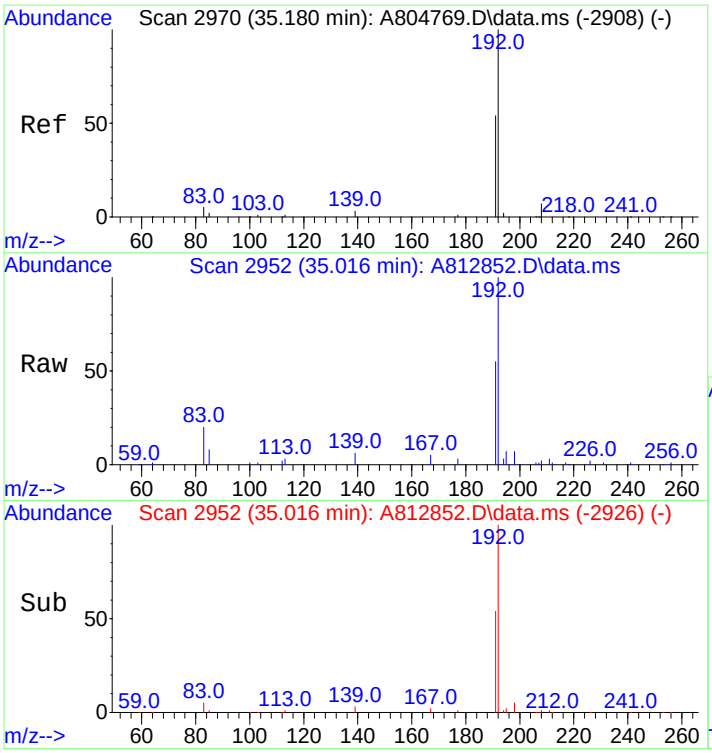


#48
1-Methylphenanthrene(1MP)
Concen: 580.99 ng/mL
RT: 35.454 min Scan# 3000
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 130101

Ion	Ratio	Lower	Upper
192	100		
191	56.6	46.2	69.4

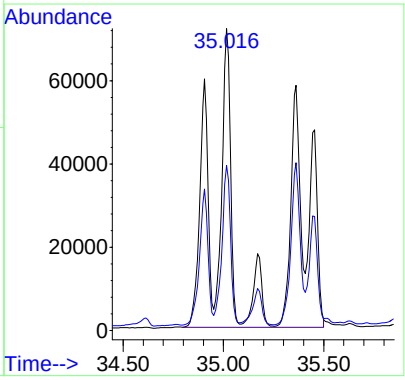


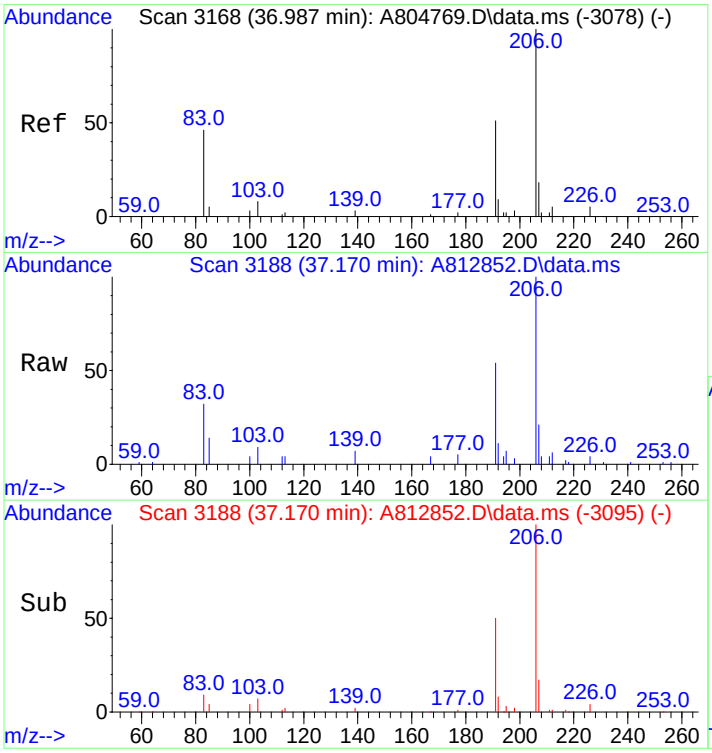


#49
C1-Phenanthrenes/Anthracenes
Concen: 3393.05 ng/mL m
RT: 35.016 min Scan# 2952
Delta R.T. -0.328 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 759808

Ion	Ratio	Lower	Upper
192	100		
191	5.2	44.5	66.7#

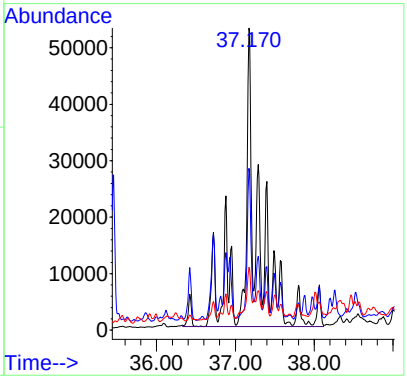


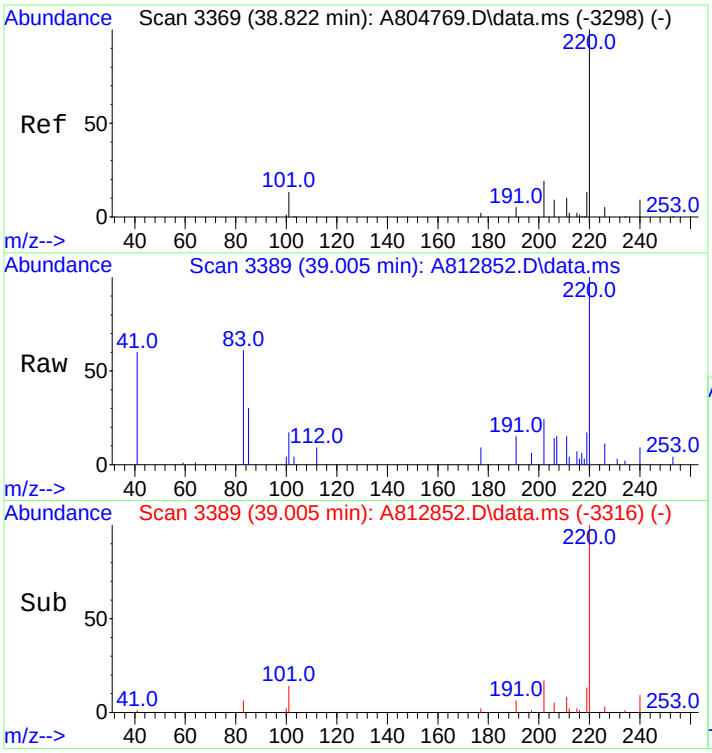


#50
C2-Phenanthrenes/Anthracenes
Concen: 3007.48 ng/mL m
RT: 37.170 min Scan# 3188
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:206 Resp: 673467

Ion	Ratio	Lower	Upper
206	100		
191	2.5	42.0	63.0#
207	0.8	16.2	24.4#

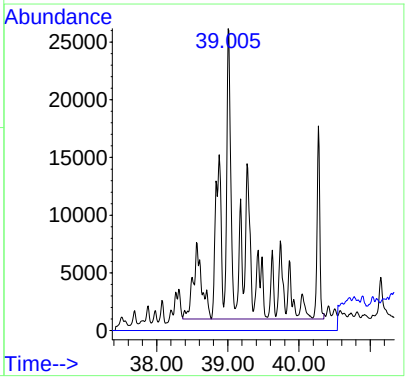


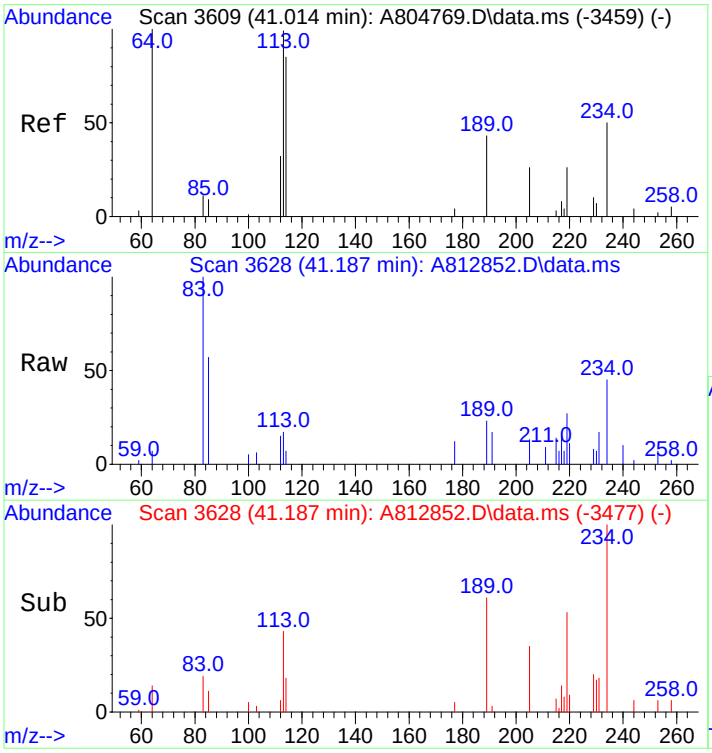


#52
C3-Phenanthrenes/Anthracenes
Concen: 2051.22 ng/mL m
RT: 39.005 min Scan# 3389
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:220 Resp: 459330

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

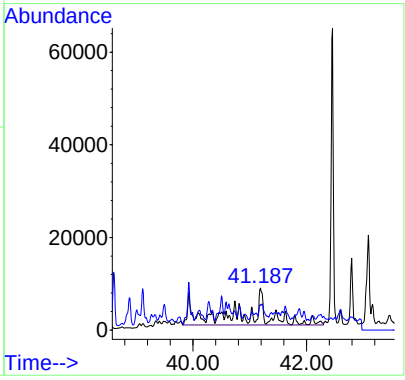


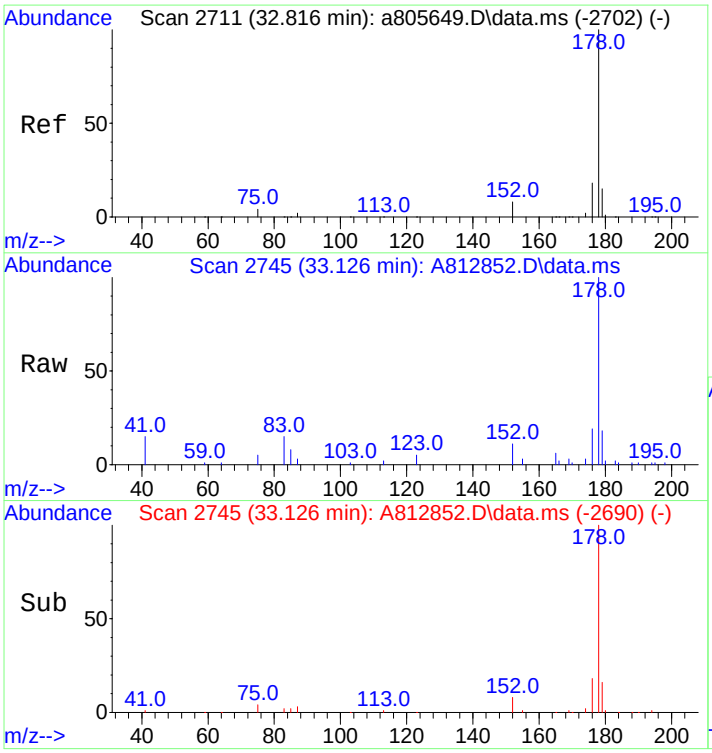


#53
C4-Phenanthrenes/Anthracenes
Concen: 1085.51 ng/mL m
RT: 41.187 min Scan# 3628
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:234 Resp: 243079

Ion	Ratio	Lower	Upper
234	100		
219	2.4	52.3	78.5#

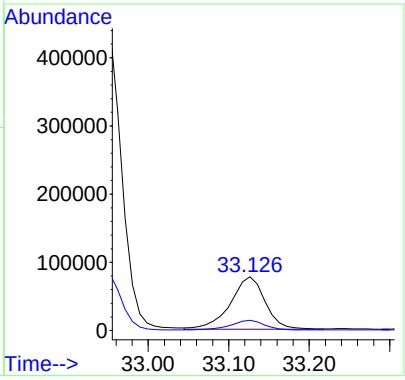


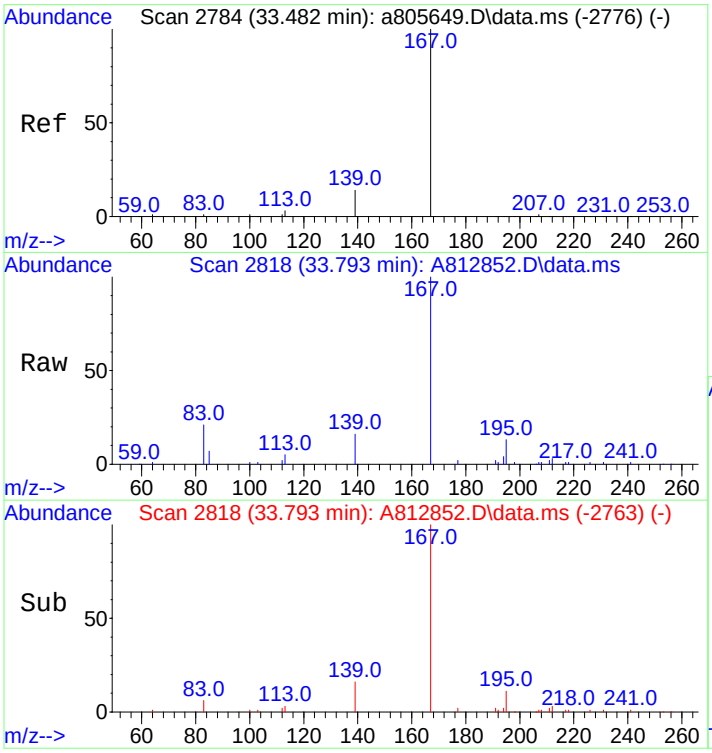


#55
Anthracene
Concen: 1113.37 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:178 Resp: 232271

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

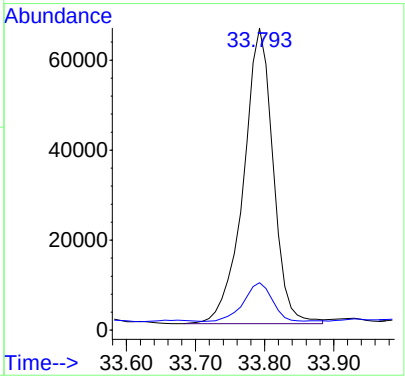


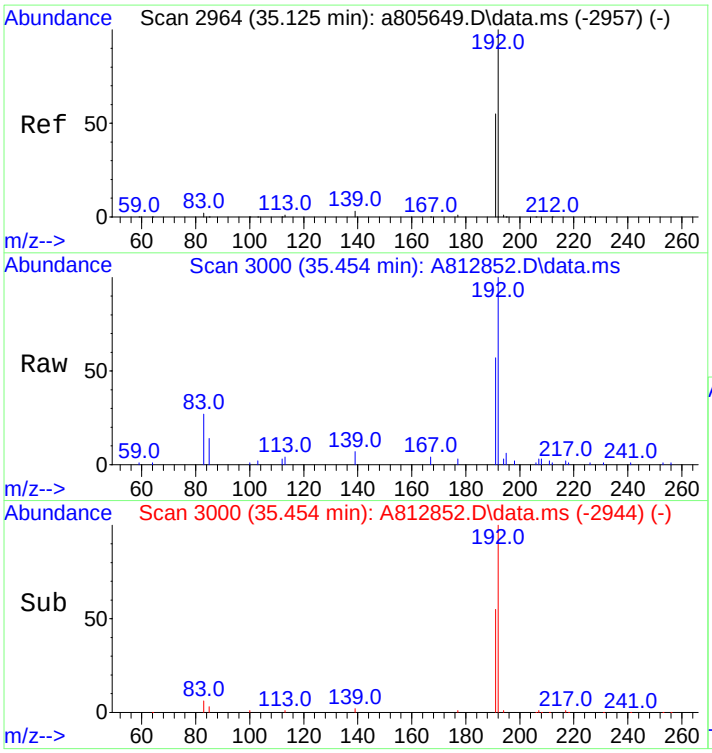


#56
Carbazole
Concen: 903.27 ng/mL m
RT: 33.793 min Scan# 2818
Delta R.T. -0.000 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:167 Resp: 196625

Ion	Ratio	Lower	Upper
167	100		
139	12.3	10.6	16.0

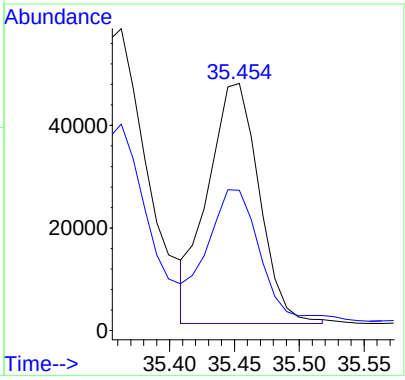


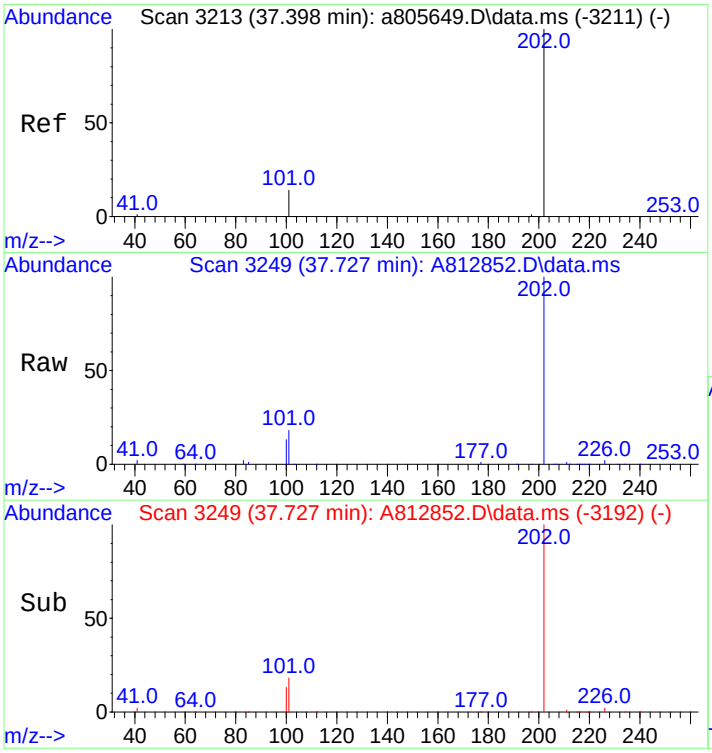


#57
1-Methylphenanthrene
Concen: 816.79 ng/mL m
RT: 35.454 min Scan# 3000
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:192 Resp: 129654

Ion	Ratio	Lower	Upper
192	100		
191	56.8	44.2	66.4

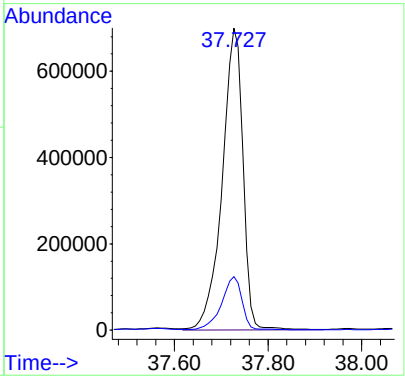


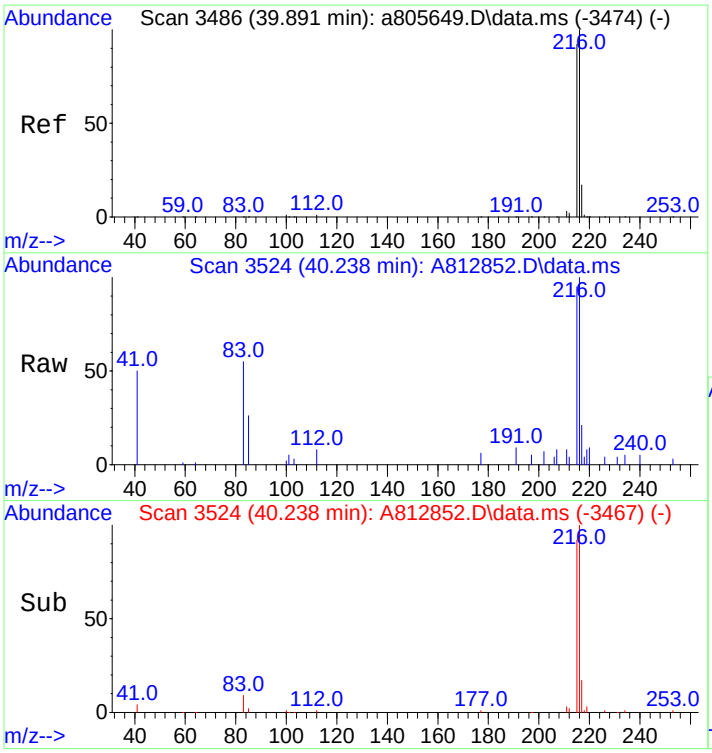


#58
Fluoranthene
Concen: 9352.98 ng/mL
RT: 37.727 min Scan# 3249
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:202 Resp: 2157368

Ion	Ratio	Lower	Upper
202	100		
101	17.0	13.6	20.4

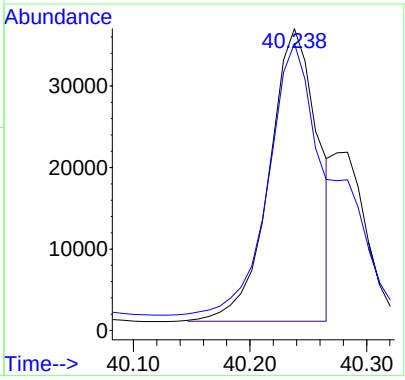


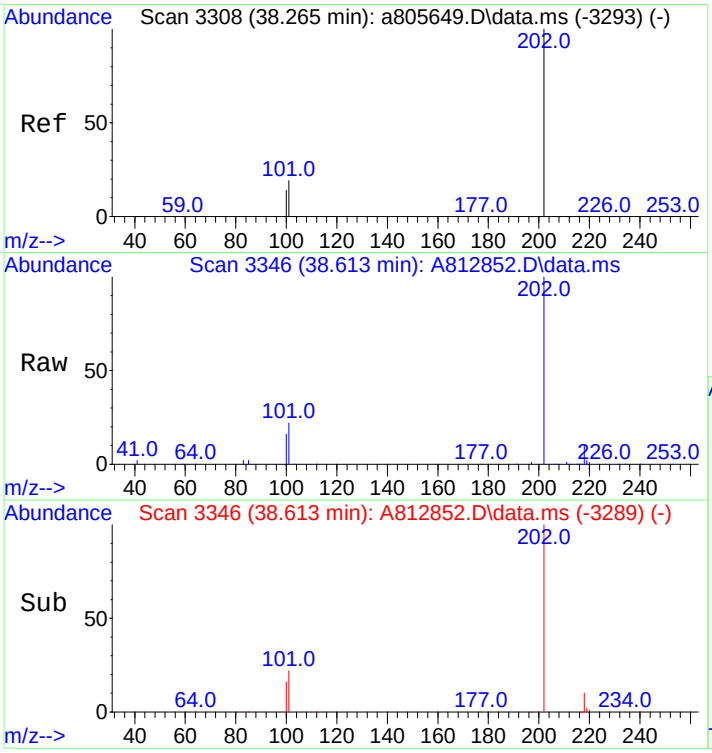


#59
Benzo(b)fluorene
Concen: 782.18 ng/mL m
RT: 40.238 min Scan# 3524
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:216 Resp: 104367

Ion	Ratio	Lower	Upper
216	100		
215	124.2	74.2	111.2#

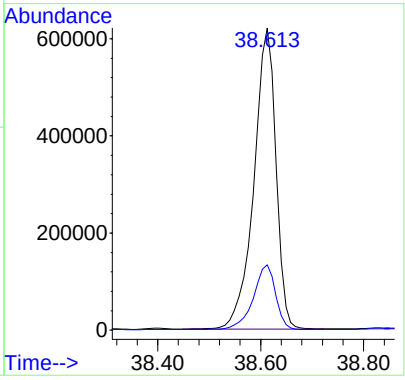


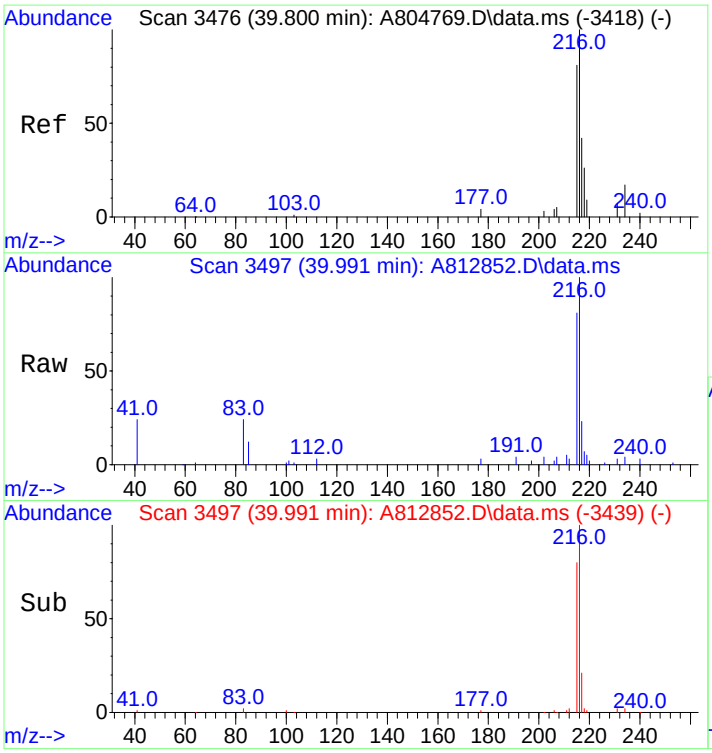


#60
Pyrene
Concen: 7908.40 ng/mL
RT: 38.613 min Scan# 3346
Delta R.T. 0.019 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:202 Resp: 1845099

Ion	Ratio	Lower	Upper
202	100		
101	21.9	15.4	23.2

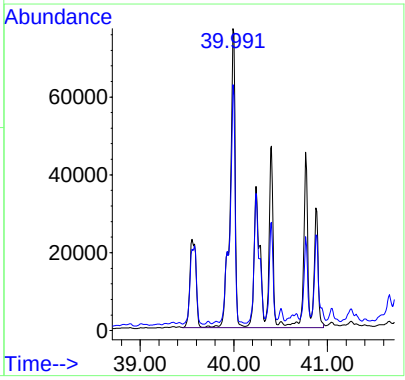


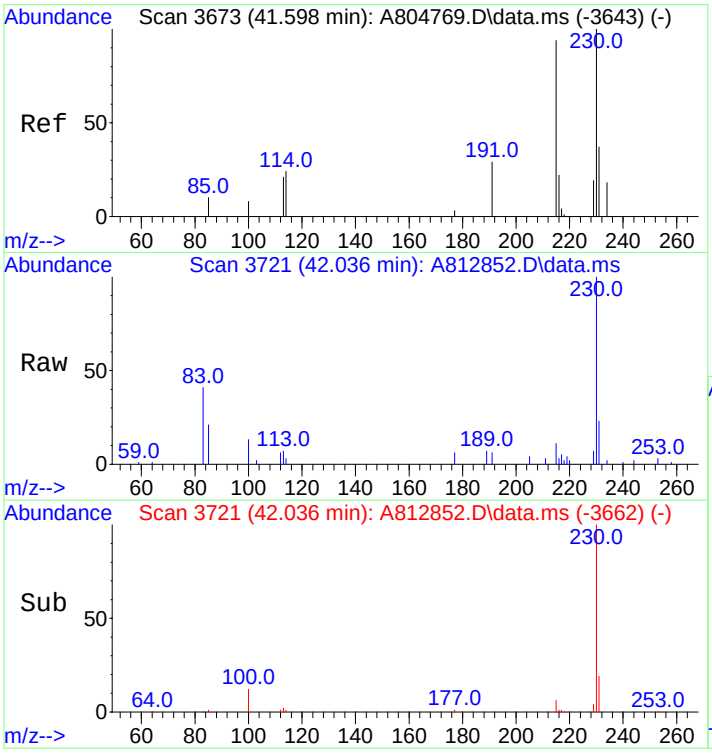


#61
C1-Fluoranthenes/Pyrenes
Concen: 3868.92 ng/mL m
RT: 39.991 min Scan# 3497
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:216 Resp: 902654

Ion	Ratio	Lower	Upper
216	100		
215	26.4	73.8	110.6#

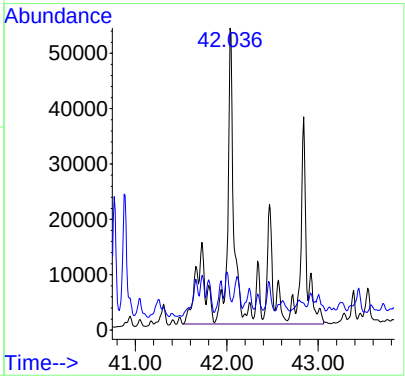


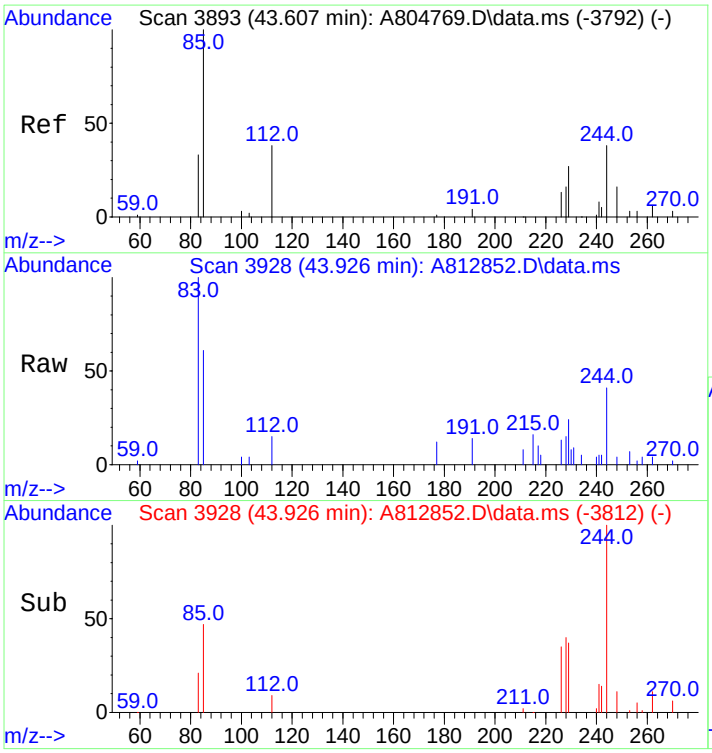


#62
C2-Fluoranthenes/Pyrenes
Concen: 2836.68 ng/mL m
RT: 42.036 min Scan# 3721
Delta R.T. 0.265 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:230 Resp: 661822

Ion	Ratio	Lower	Upper
230	100		
215	2.9	93.1	139.7#

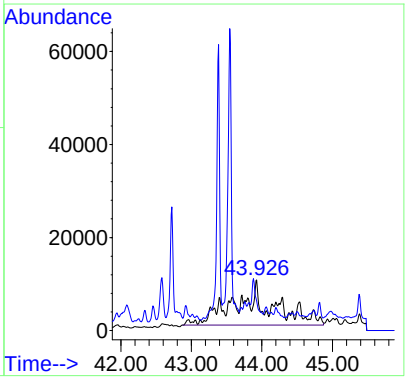


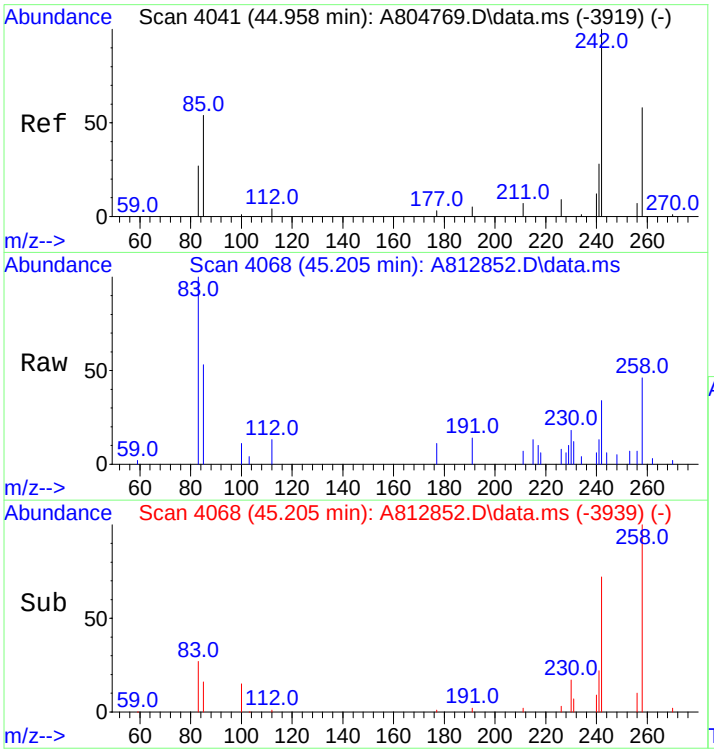


#63
C3-Fluoranthenes/Pyrenes
Concen: 1515.05 ng/mL m
RT: 43.926 min Scan# 3928
Delta R.T. 0.137 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:244 Resp: 353475

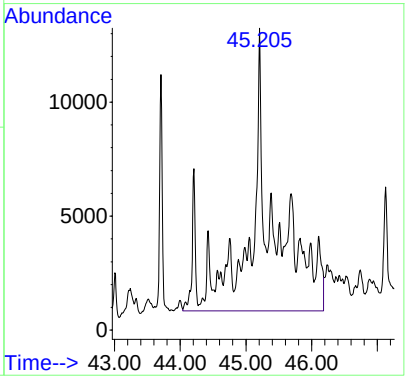
Ion	Ratio	Lower	Upper
244	100		
229	0.6	76.2	114.2#

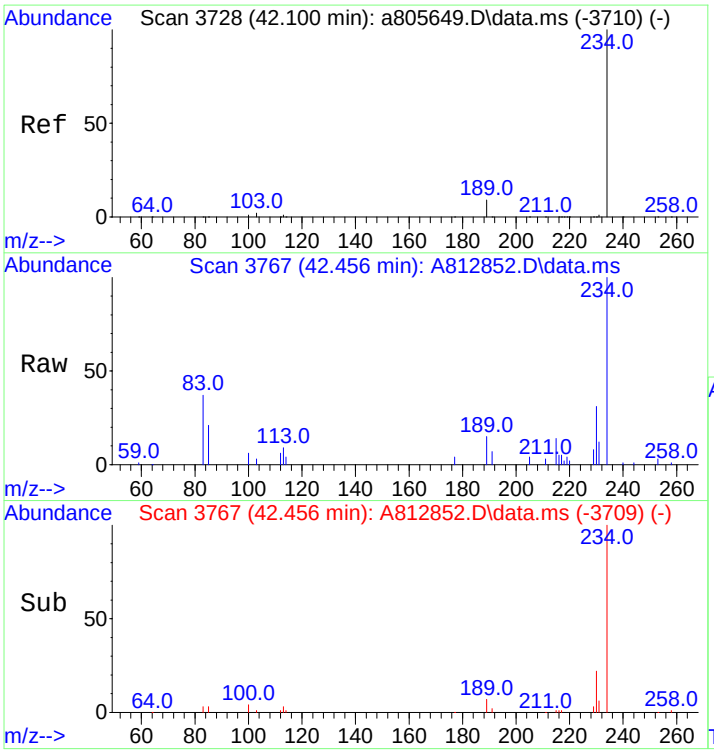




#64
C4-Fluoranthenes/Pyrenes
Concen: 1363.36 ng/mL m
RT: 45.205 min Scan# 4068
Delta R.T. 0.064 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:258 Resp: 318084

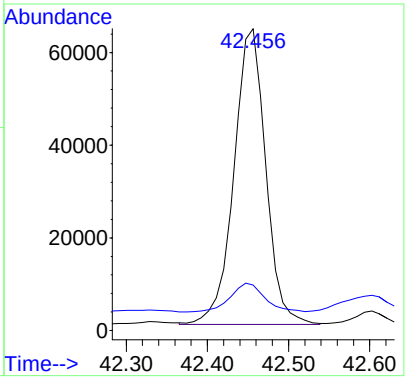


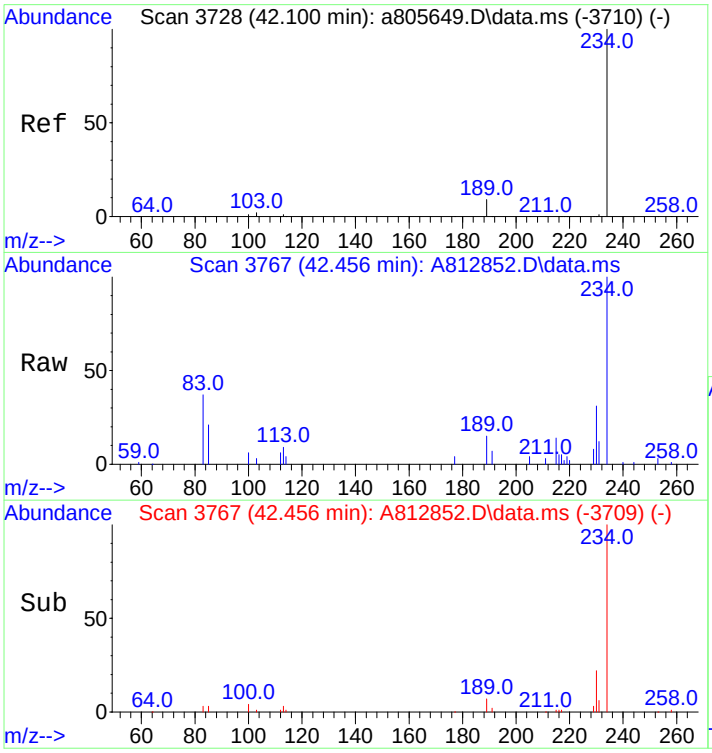


#66
Naphthobenzothiophene
Concen: 804.32 ng/ml m
RT: 42.456 min Scan# 3767
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:234 Resp: 174199

Ion	Ratio	Lower	Upper
234	100		
189	1.0	22.3	33.5#

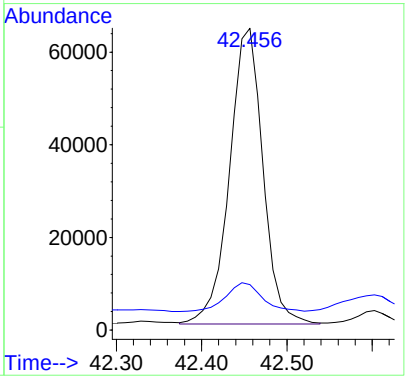


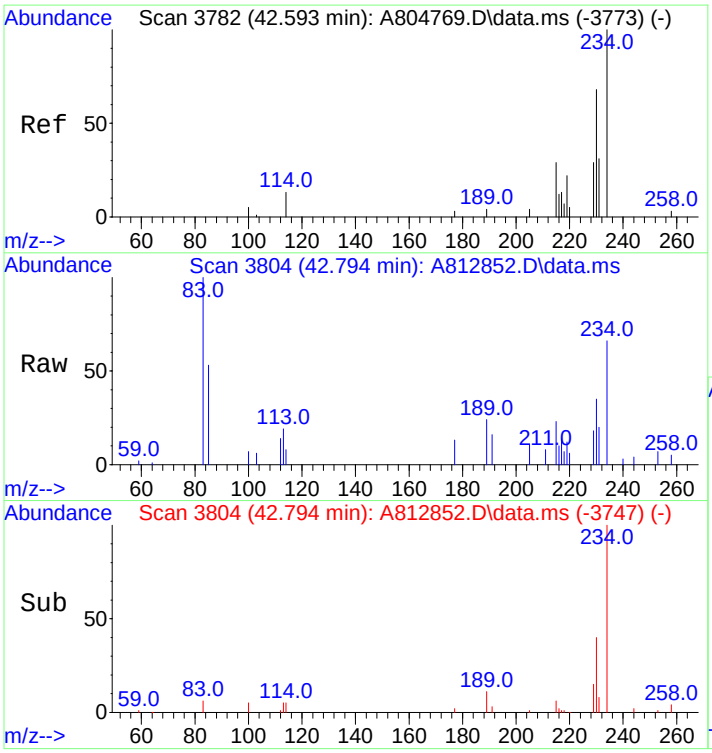


#67
Naphthobenzothiophene-2,1-D
Concen: 803.38 ng/mL m
RT: 42.456 min Scan# 3767
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:234 Resp: 173996

Ion	Ratio	Lower	Upper
234	100		
189	1.0	22.3	33.5#

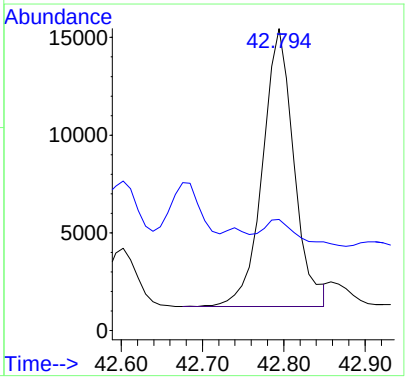


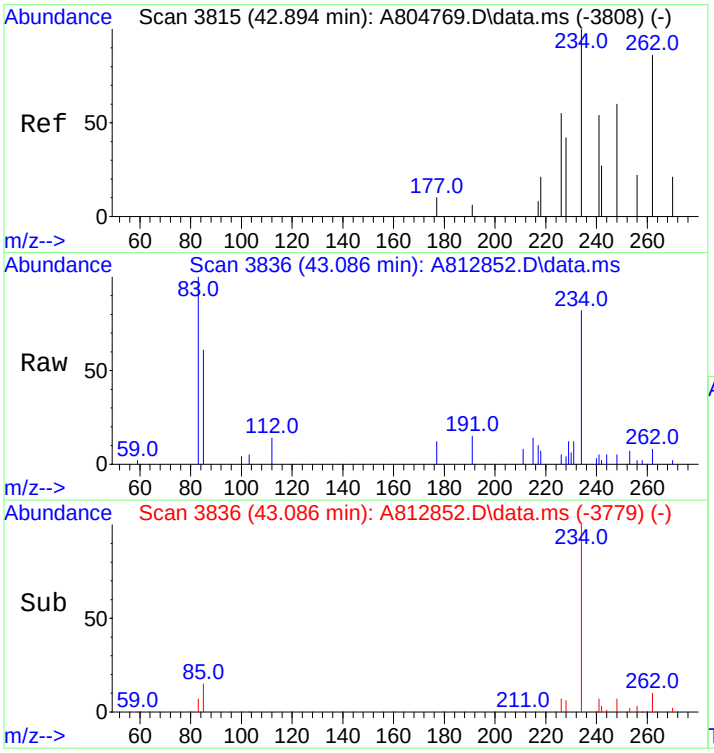


#68
Naphthobenzothiophene-1,2-D
Concen: 176.13 ng/mL
RT: 42.794 min Scan# 3804
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:234 Resp: 38147

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

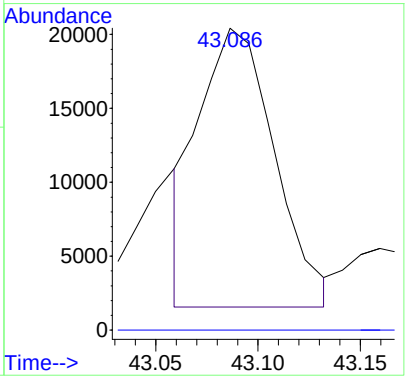


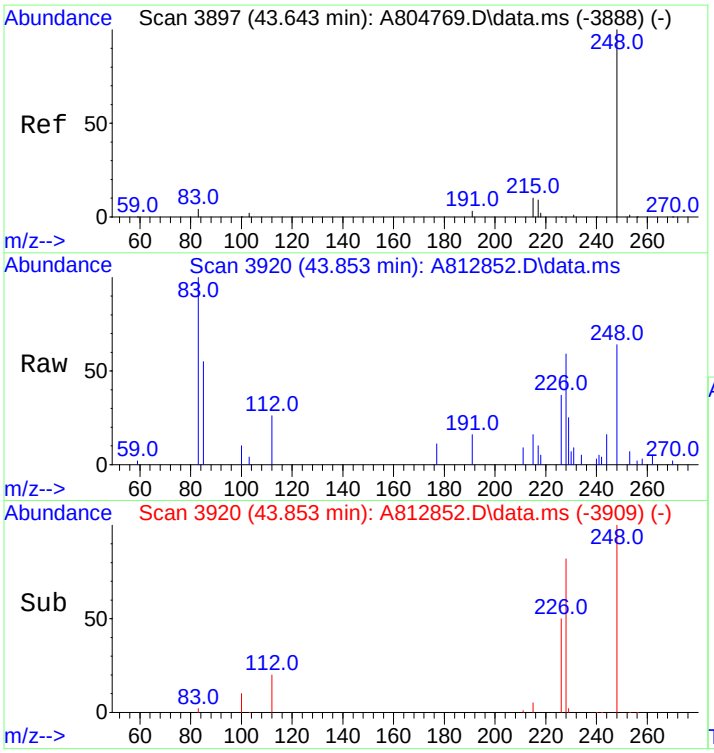


#69
Naphthobenzothiophene-2,3-D
Concen: 224.08 ng/mL m
RT: 43.086 min Scan# 3836
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:234 Resp: 48532

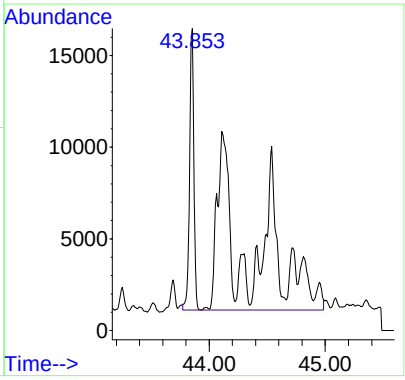
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

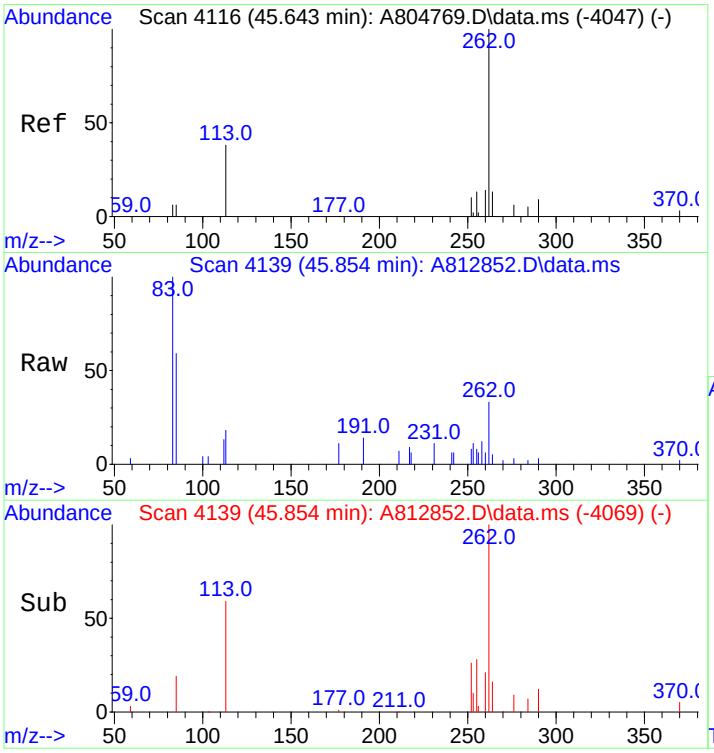




#70
C1-Naphthobenzothiophenes
Concen: 976.83 ng/ml m
RT: 43.853 min Scan# 3920
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

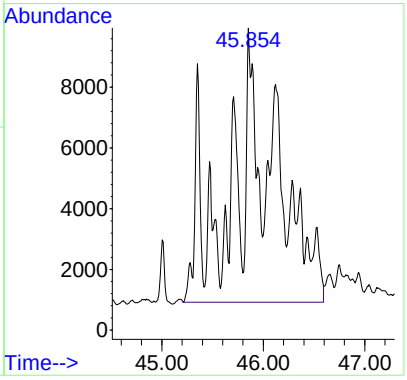
Tgt Ion:248 Resp: 211561

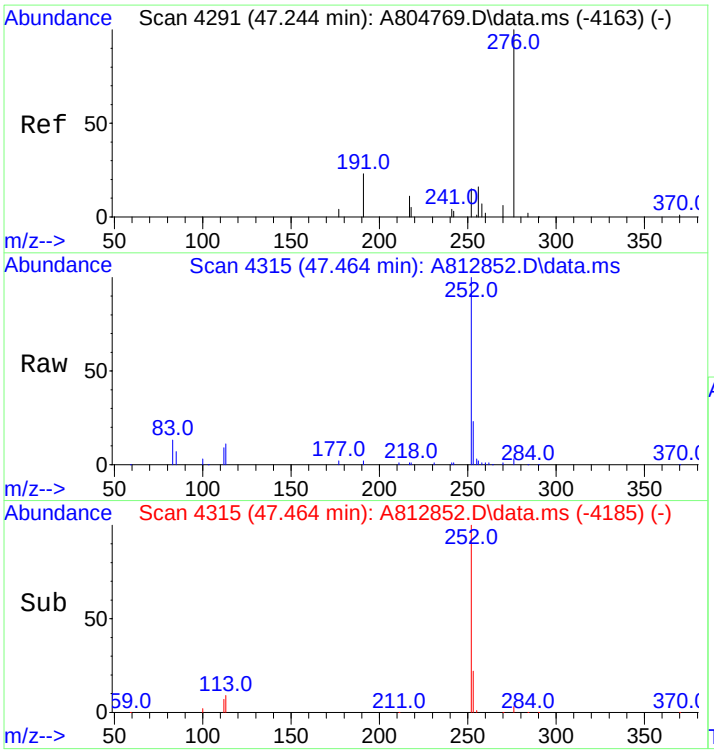




#71
C2-Naphthobenzothiophenes
Concen: 1204.45 ng/ml m
RT: 45.854 min Scan# 4139
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

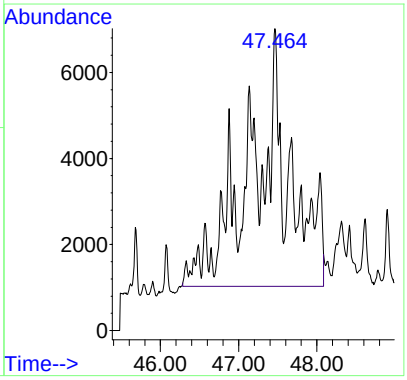
Tgt Ion:262 Resp: 260860

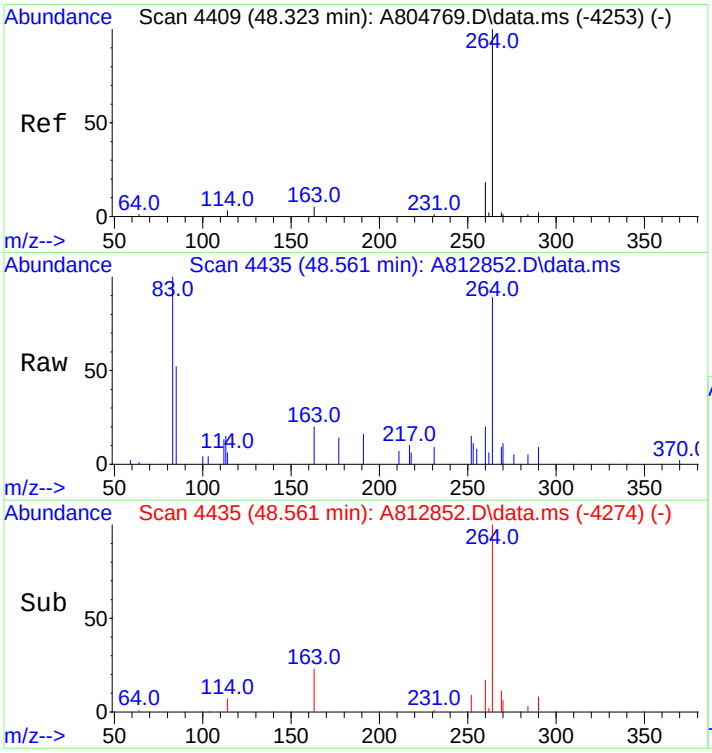




#72
C3-Naphthobenzothiophenes
Concen: 929.46 ng/ml m
RT: 47.464 min Scan# 4315
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

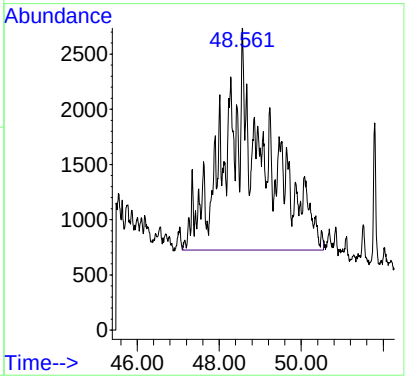
Tgt Ion:276 Resp: 201302

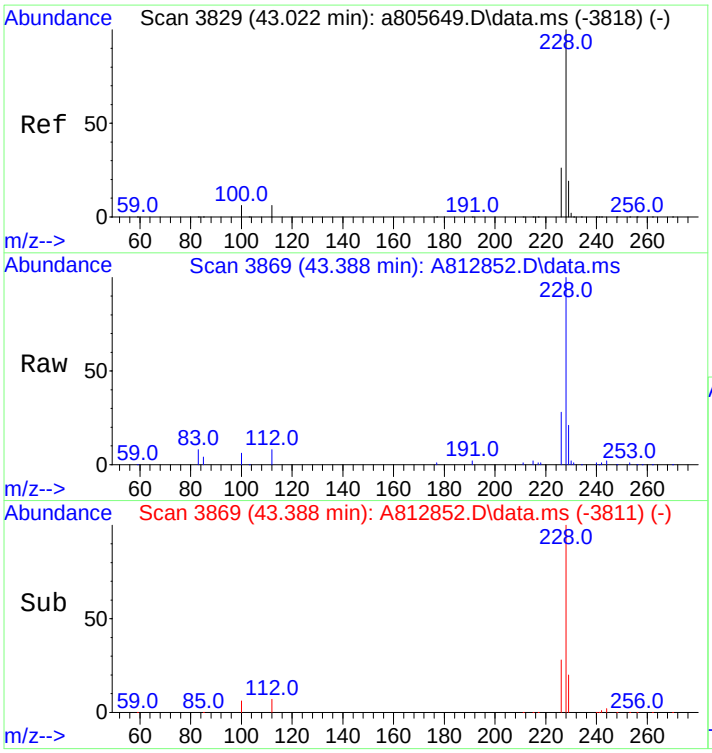




#73
C4-Naphthobenzothiophenes
Concen: 612.76 ng/mL m
RT: 48.561 min Scan# 4435
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:290 Resp: 132712

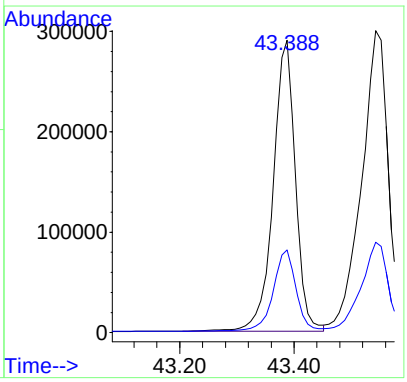


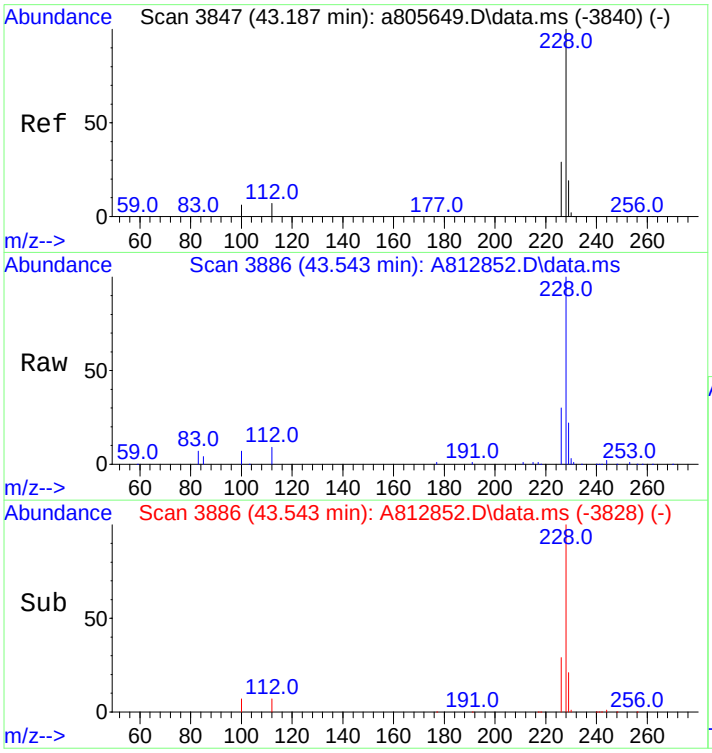


#75
Benz[a]anthracene
Concen: 3905.09 ng/mL
RT: 43.388 min Scan# 3869
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:228 Resp: 781393

Ion	Ratio	Lower	Upper
228	100		
226	28.0	21.3	31.9

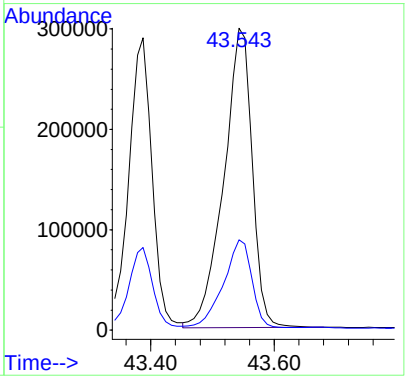


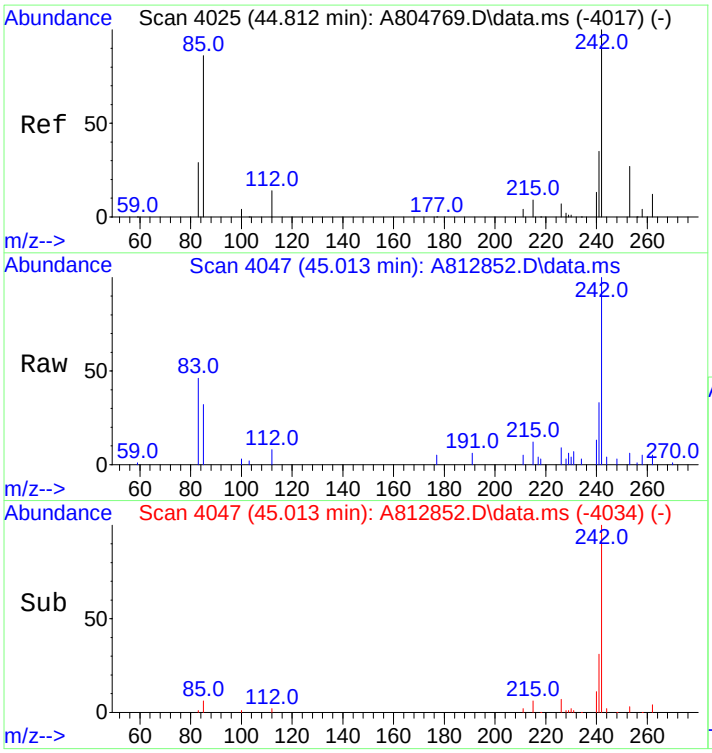


#77
Chrysene/Triphenylene
Concen: 4708.54 ng/mL
RT: 43.543 min Scan# 3886
Delta R.T. 0.027 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:228 Resp: 953686

Ion	Ratio	Lower	Upper
228	100		
226	30.0	23.6	35.4

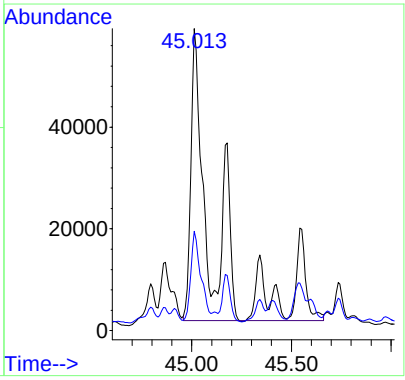


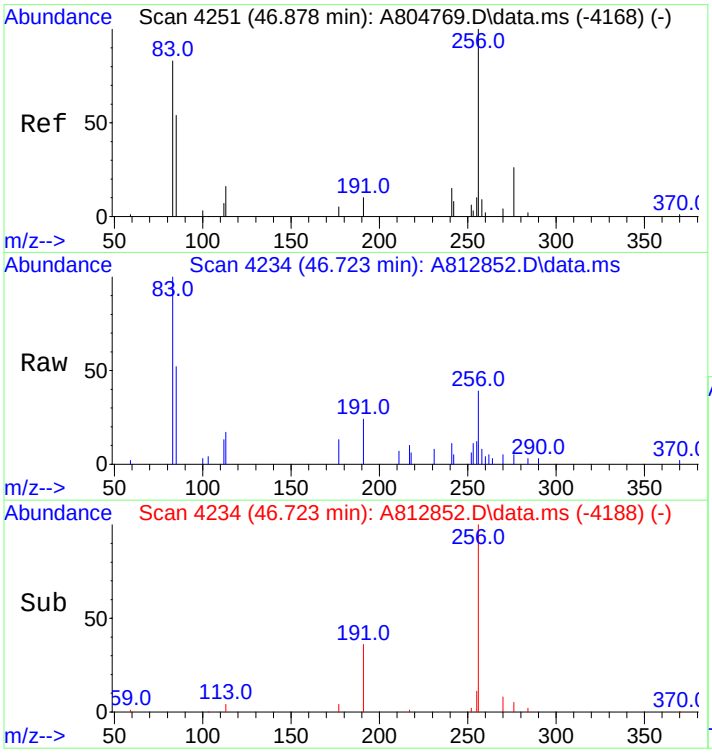


#78
C1-Chrysenes
Concen: 2114.87 ng/mL m
RT: 45.013 min Scan# 4047
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:242 Resp: 428355

Ion	Ratio	Lower	Upper
242	100		
241	3.1	33.5	50.3#

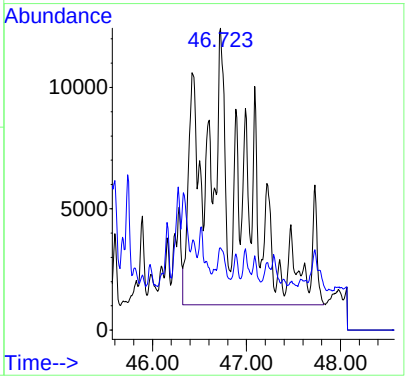


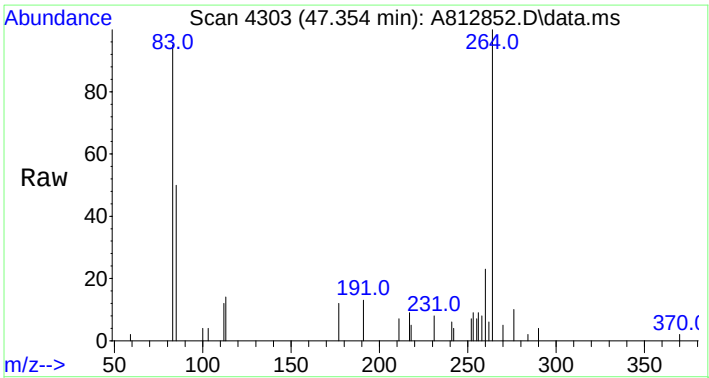


#79
C2-Chrysenes
Concen: 1660.30 ng/mL m
RT: 46.723 min Scan# 4234
Delta R.T. -0.338 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:256 Resp: 336283

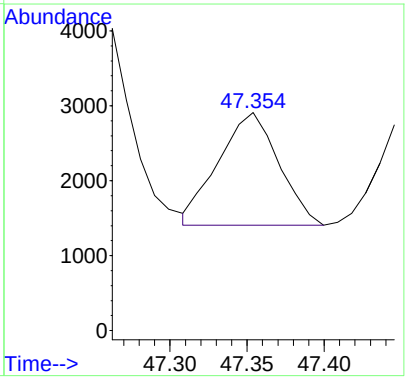
Ion	Ratio	Lower	Upper
256	100		
241	1.6	30.4	45.6#

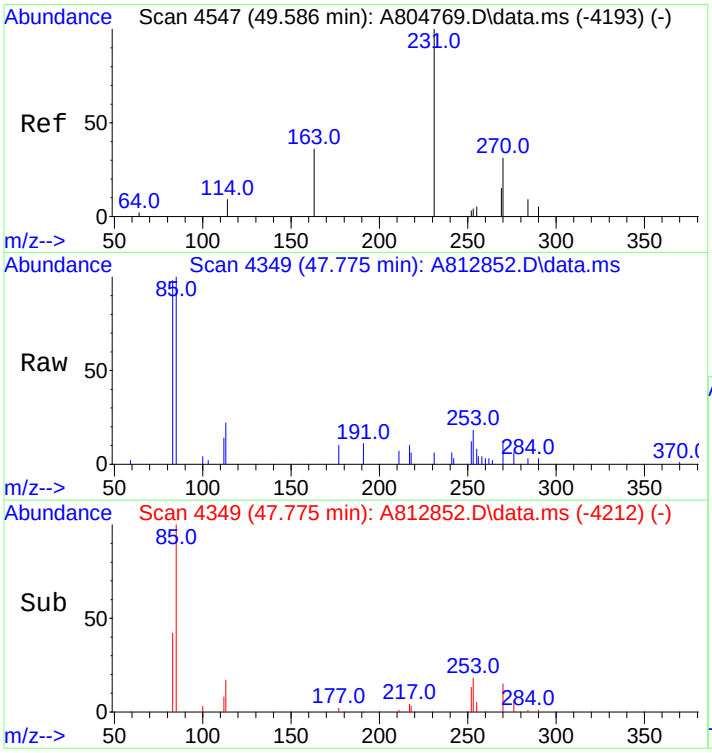




#80
BBF-D12 Surr BKGD
Concen: 20.24 ng/mL
RT: 47.354 min Scan# 4303
Delta R.T. 0.011 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:256 Resp: 4099

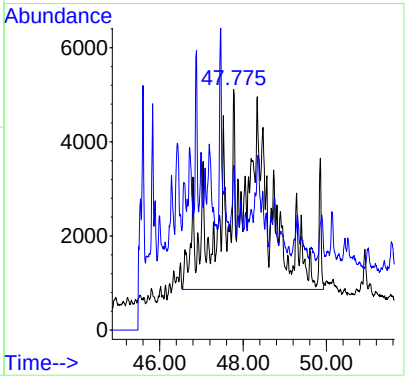


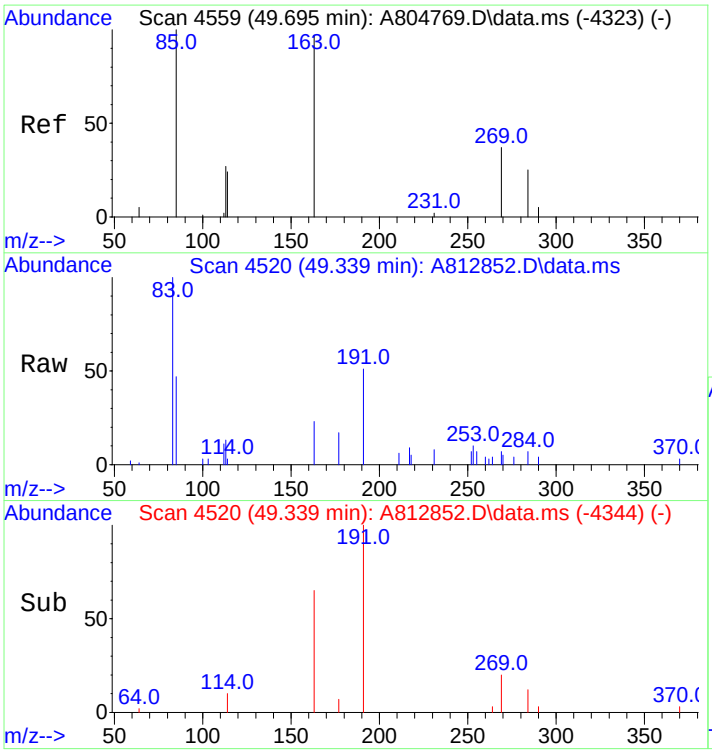


#81
C3-Chrysenes
Concen: 1316.27 ng/mL m
RT: 47.775 min Scan# 4349
Delta R.T. -2.039 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:270 Resp: 266603

Ion	Ratio	Lower	Upper
270	100		
255	1.2	42.9	64.3#

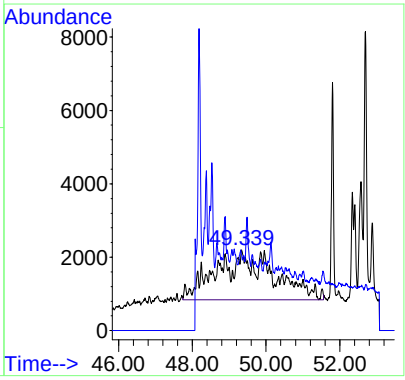


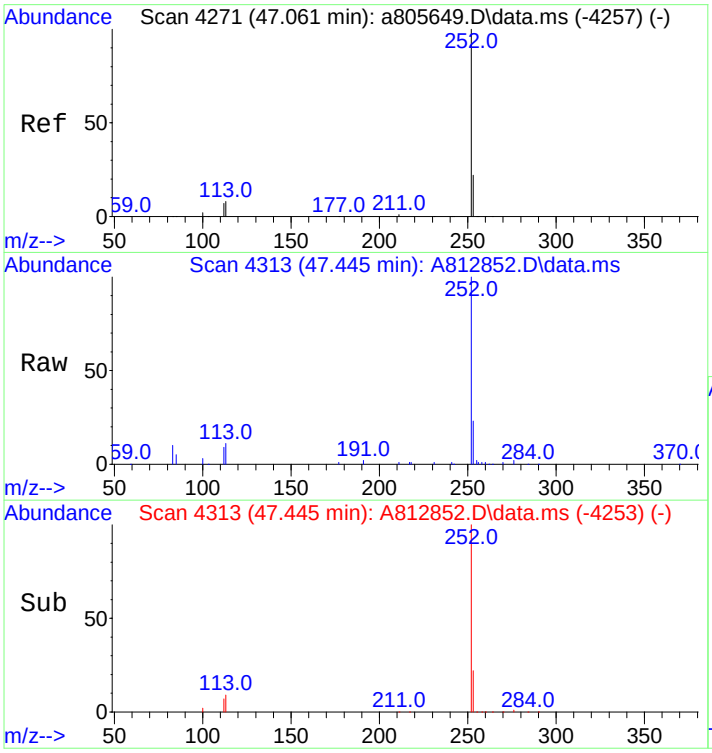


#82
C4-Chrysenes
Concen: 695.68 ng/mL m
RT: 49.339 min Scan# 4520
Delta R.T. -0.486 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:284 Resp: 140905

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

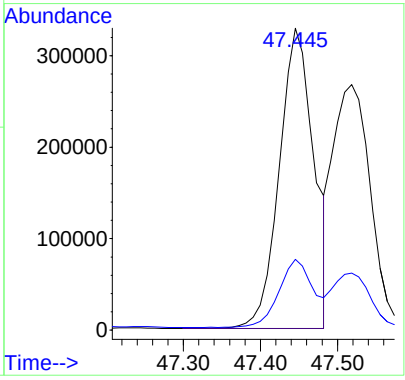


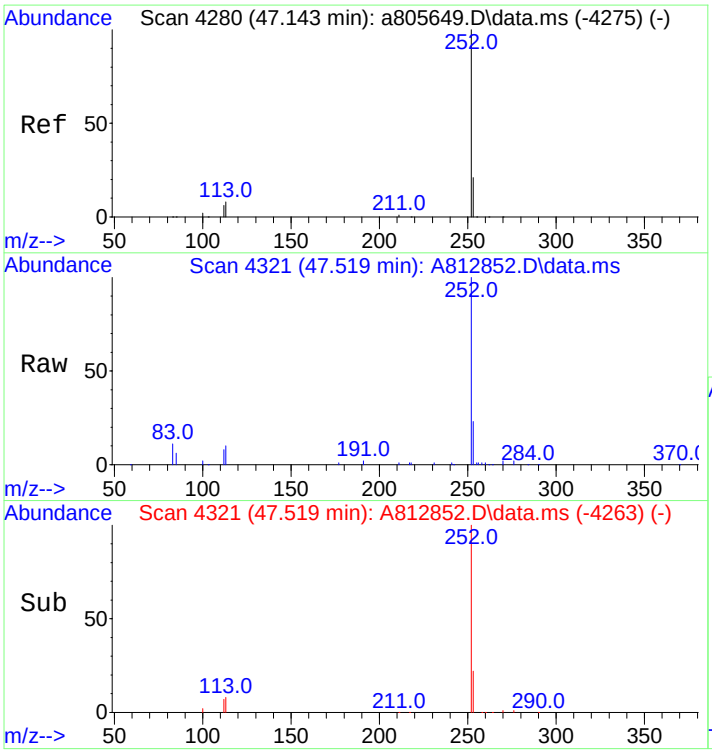


#84
Benzo[b]fluoranthene
Concen: 4772.21 ng/mL
RT: 47.445 min Scan# 4313
Delta R.T. 0.045 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:252 Resp: 1025553

Ion	Ratio	Lower	Upper
252	100		
253	22.8	18.5	27.7

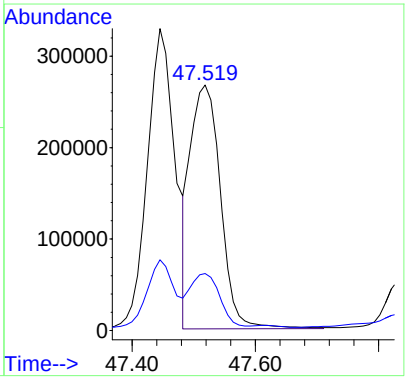


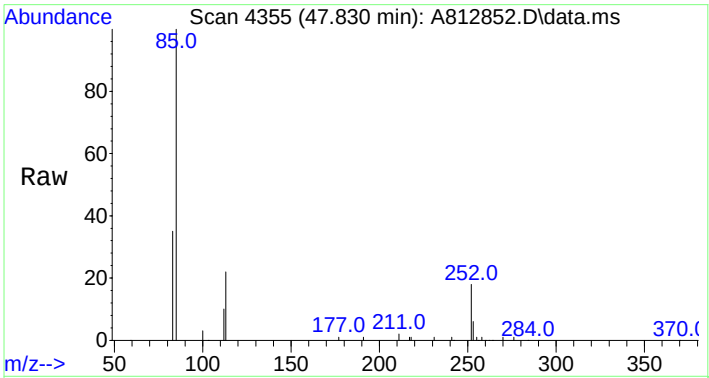


#85
Benzo[j]+[k]fluoranthene
Concen: 3900.48 ng/mL
RT: 47.519 min Scan# 4321
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:252 Resp: 914583

Ion	Ratio	Lower	Upper
252	100		
253	21.8	18.8	28.2

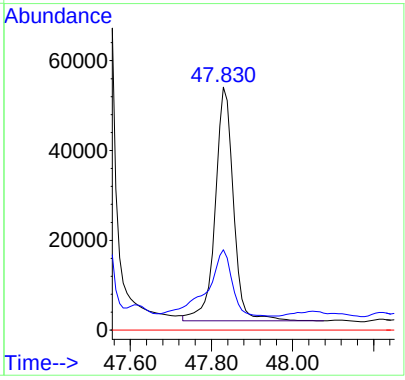


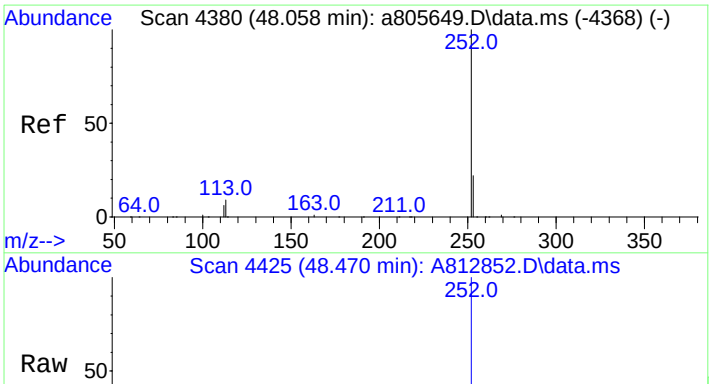


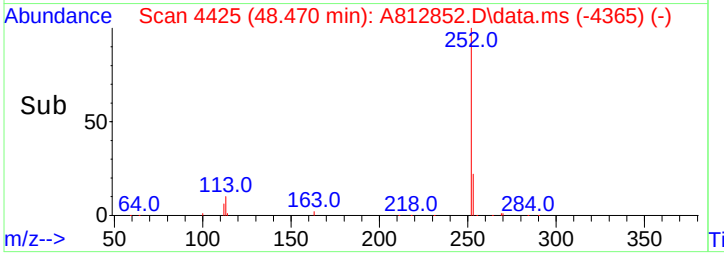
#86
Benzo[a]fluoranthene
Concen: 696.94 ng/mL
RT: 47.830 min Scan# 4355
Delta R.T. -0.036 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:252 Resp: 163418

Ion	Ratio	Lower	Upper
252	100		
253	39.2	372.3	558.5#
125	0.0	0.0	0.0



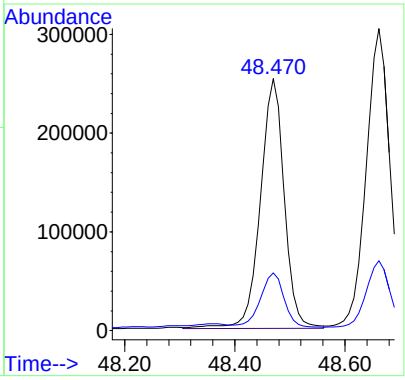


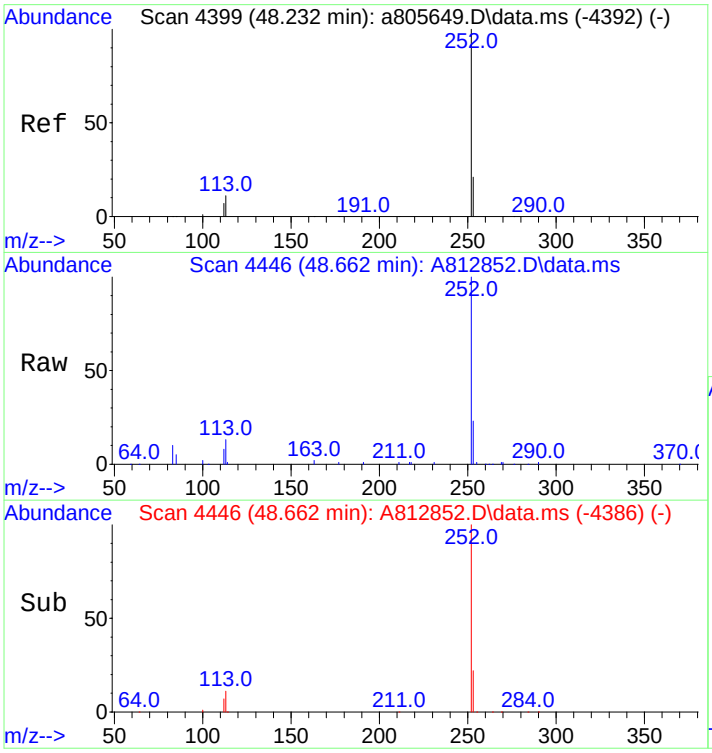


#87
Benzo[e]pyrene
Concen: 3432.67 ng/mL
RT: 48.470 min Scan# 4425
Delta R.T. 0.046 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:252 Resp: 760086

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.9	28.3

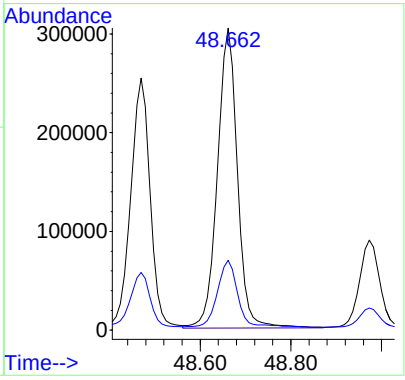


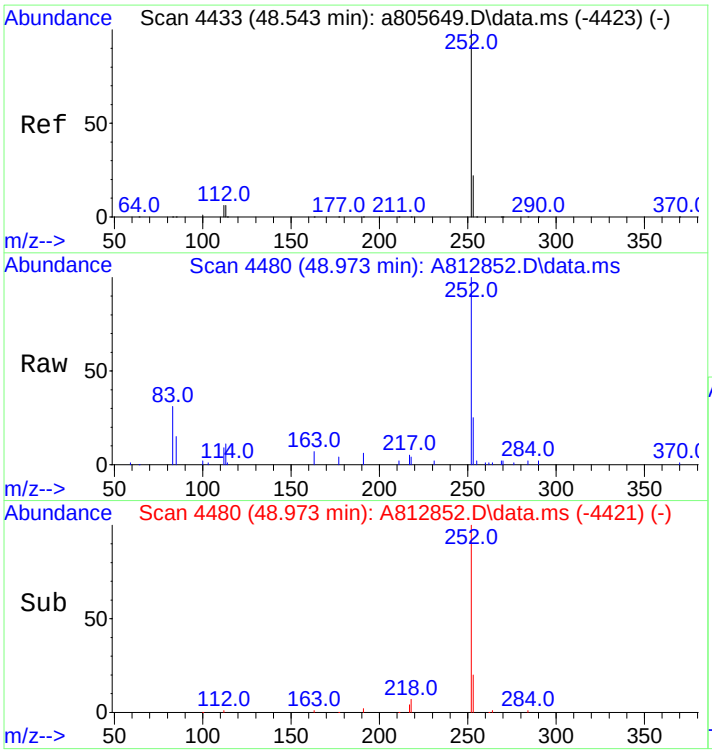


#89
Benzo[a]pyrene
Concen: 4548.60 ng/mL
RT: 48.662 min Scan# 4446
Delta R.T. 0.046 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:252 Resp: 931671

Ion	Ratio	Lower	Upper
252	100		
253	22.8	19.4	29.0

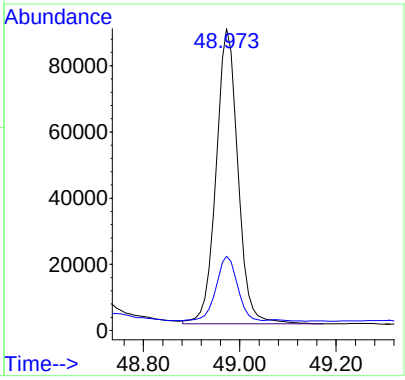


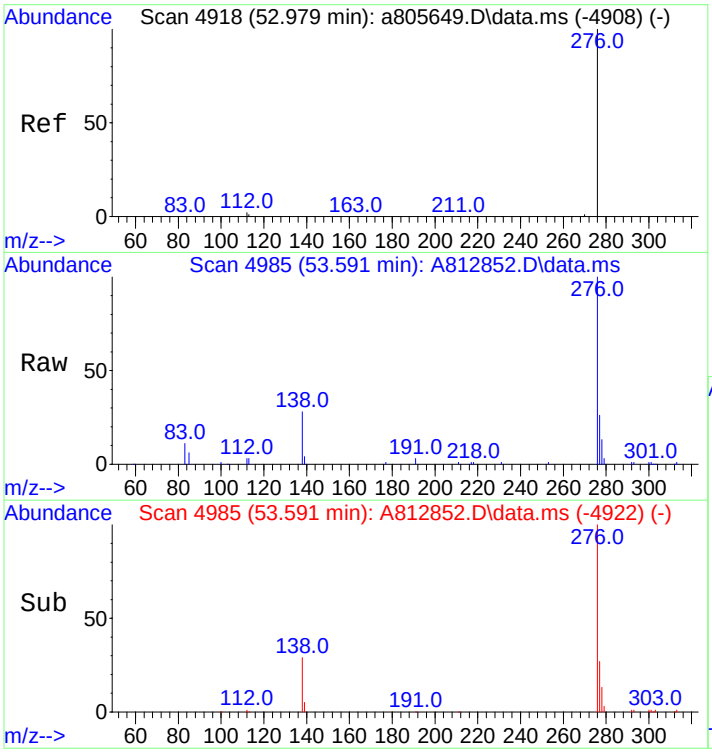


#90
Perylene
Concen: 1256.76 ng/mL
RT: 48.973 min Scan# 4480
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:252 Resp: 281179

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.3	28.9

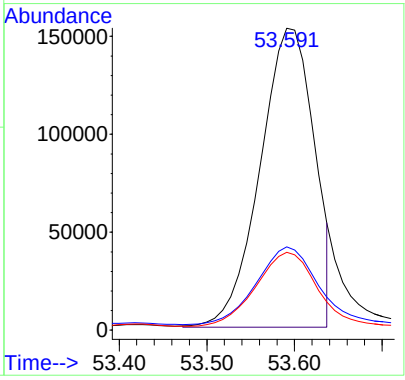


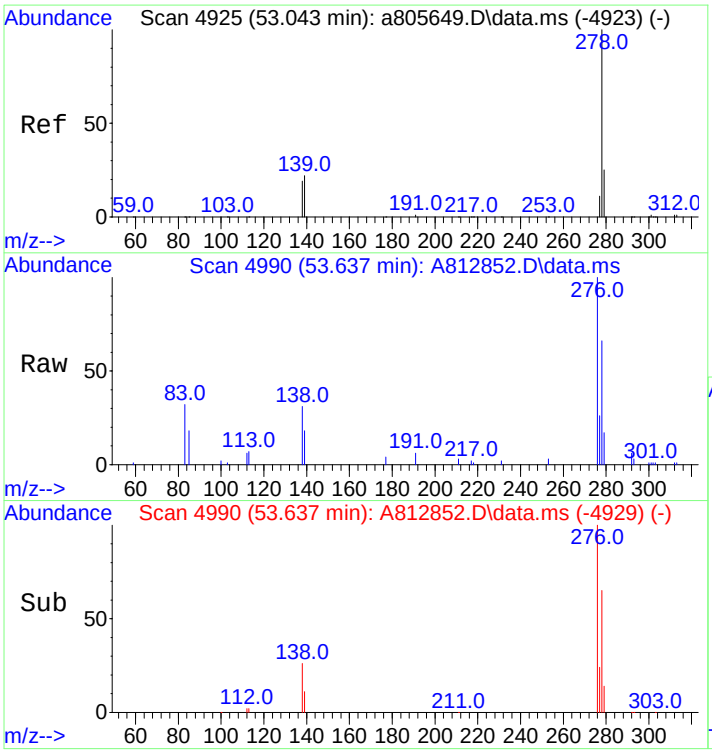


#91
Indeno[1,2,3-cd]pyrene
Concen: 3018.05 ng/mL m
RT: 53.591 min Scan# 4985
Delta R.T. 0.073 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:276 Resp: 656666

Ion	Ratio	Lower	Upper
276	100		
138	29.5	19.9	29.9
277	28.7	19.0	28.6#

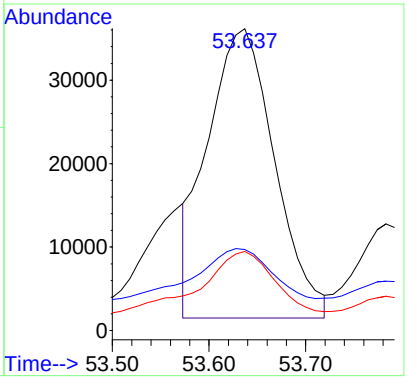


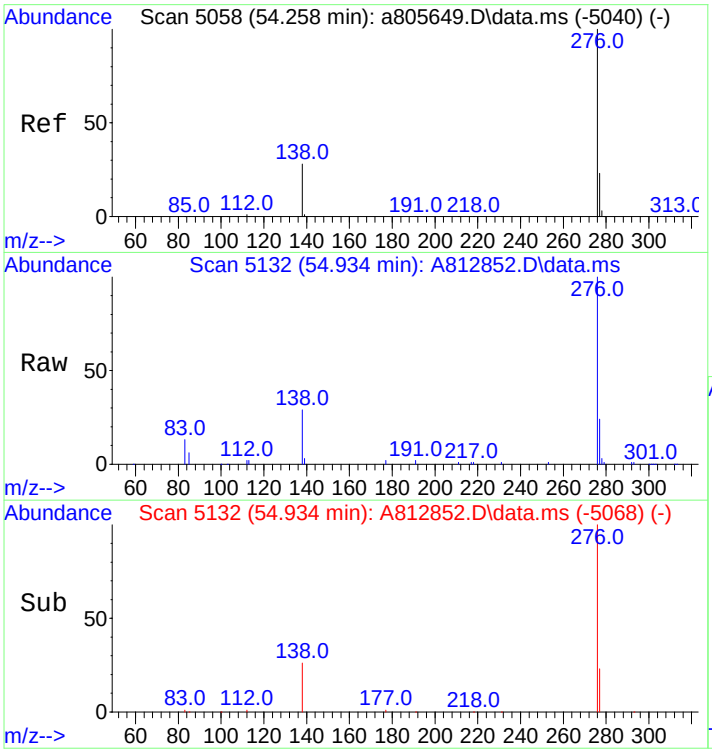


#92
Dibenz[ah]+[ac]anthracene
Concen: 786.22 ng/mL m
RT: 53.637 min Scan# 4990
Delta R.T. 0.055 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:278 Resp: 167681

Ion	Ratio	Lower	Upper
278	100		
139	22.9	16.6	25.0
279	27.8	19.1	28.7

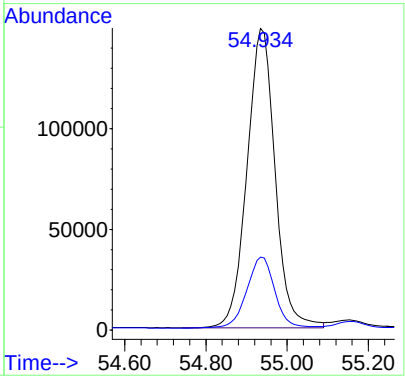


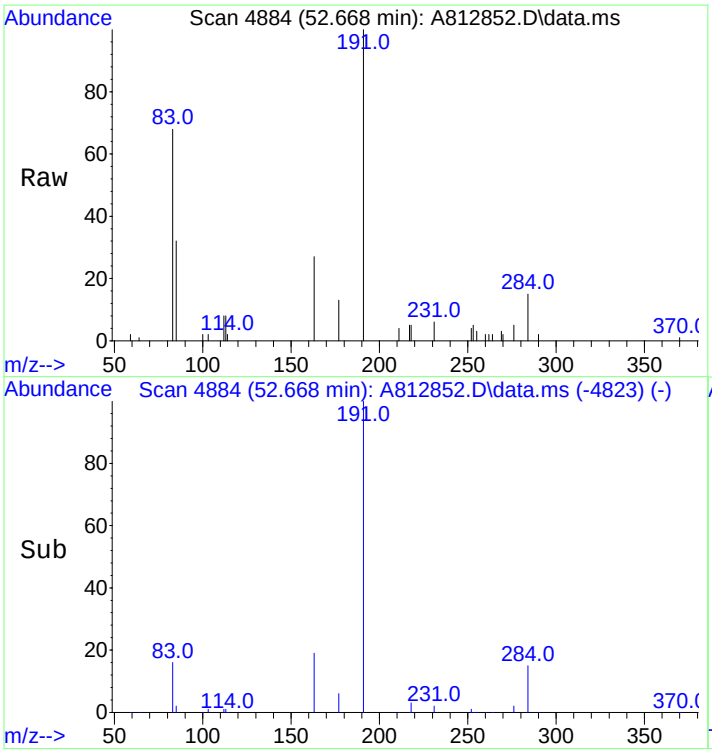


#93
Benzo[g,h,i]perylene
Concen: 2896.59 ng/mL
RT: 54.934 min Scan# 5132
Delta R.T. 0.082 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:276 Resp: 715222

Ion	Ratio	Lower	Upper
276	100		
277	23.9	18.9	28.3

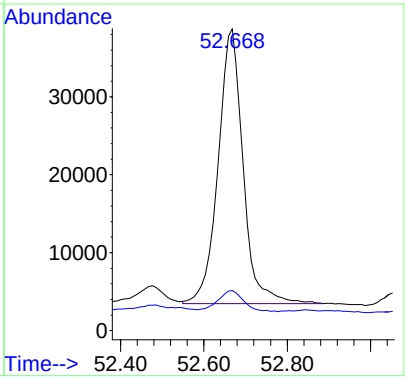


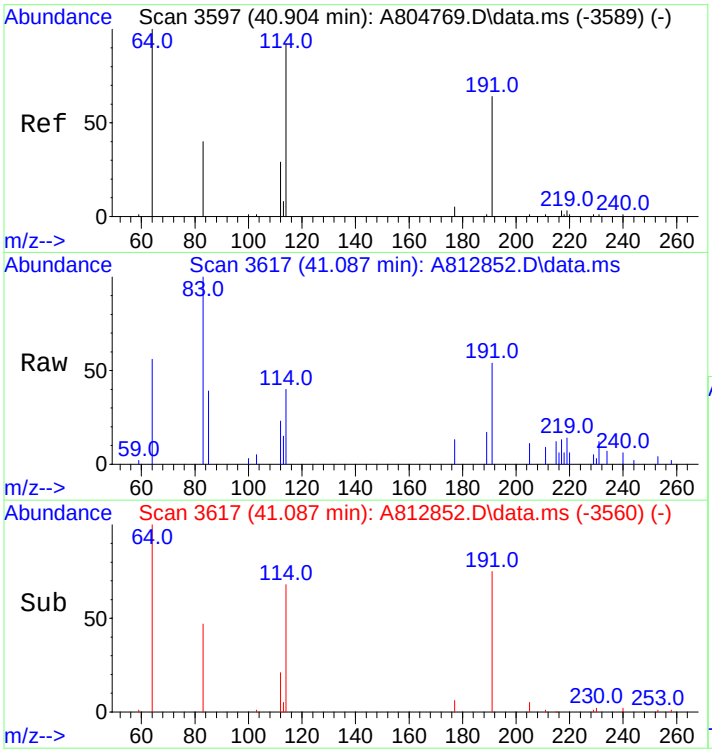


#94
Hopane (T19)
Concen: 2150.23 ng/mL
RT: 52.668 min Scan# 4884
Delta R.T. 0.055 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:191 Resp: 147396

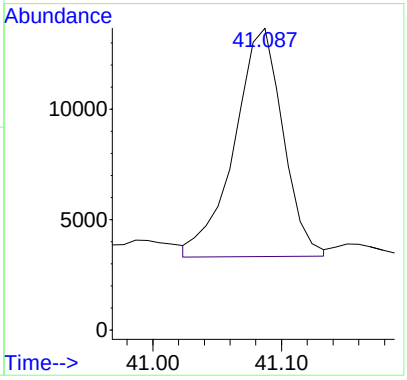
Ion	Ratio	Lower	Upper
191	100		
177	7.9	9.8	14.8#

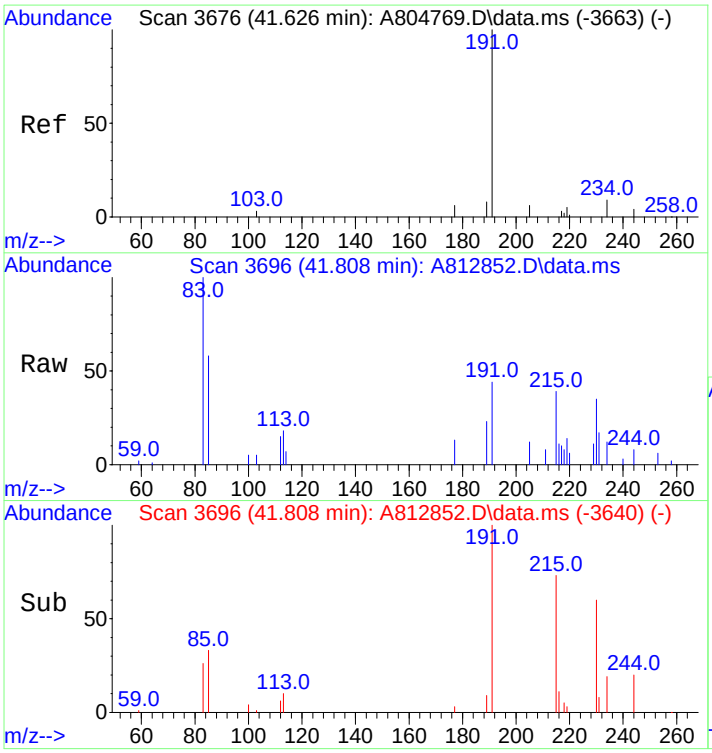




#96
C23 Tricyclic Terpane (T4)
Concen: 395.97 ng/ml
RT: 41.087 min Scan# 3617
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

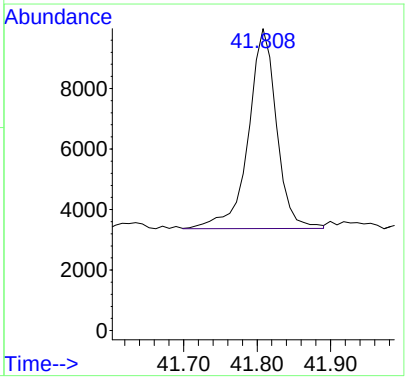
Tgt Ion:191 Resp: 27143

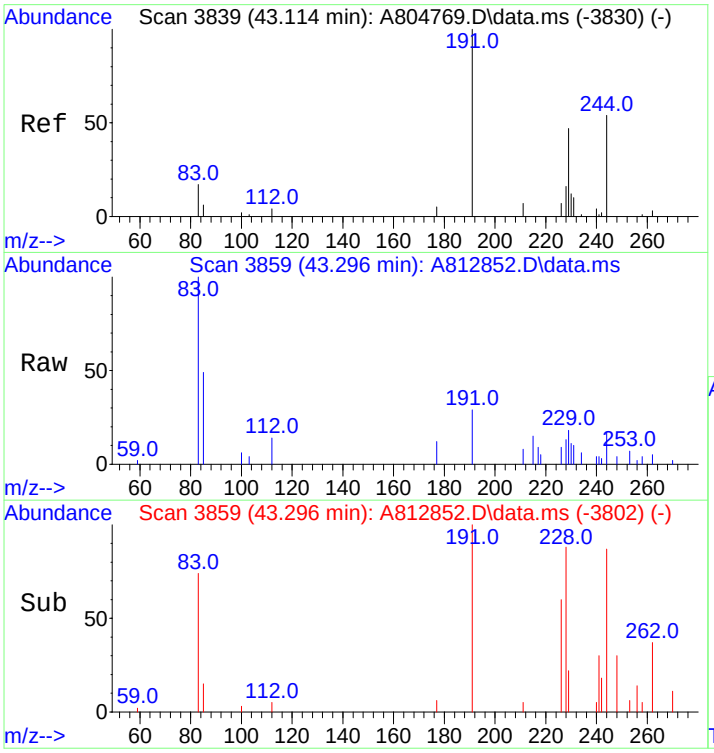




#97
C24 Tricyclic Terpane (T5)
Concen: 257.16 ng/ml
RT: 41.808 min Scan# 3696
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

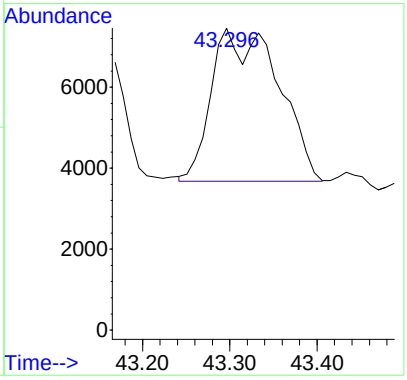
Tgt Ion:191 Resp: 17628

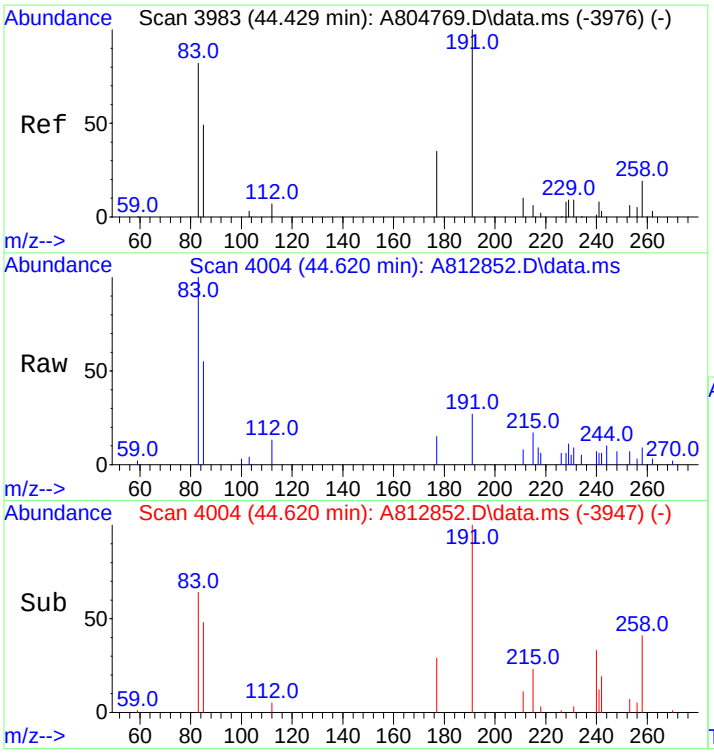




#98
C25 Tricyclic Terpane (T6)
Concen: 293.10 ng/ml m
RT: 43.296 min Scan# 3859
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

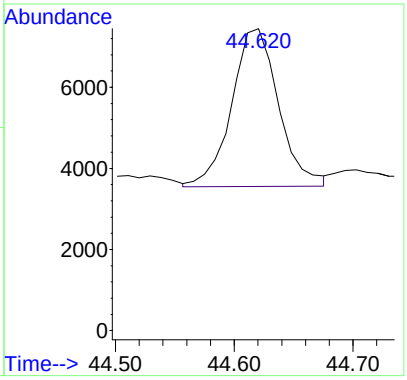
Tgt Ion:191 Resp: 20092

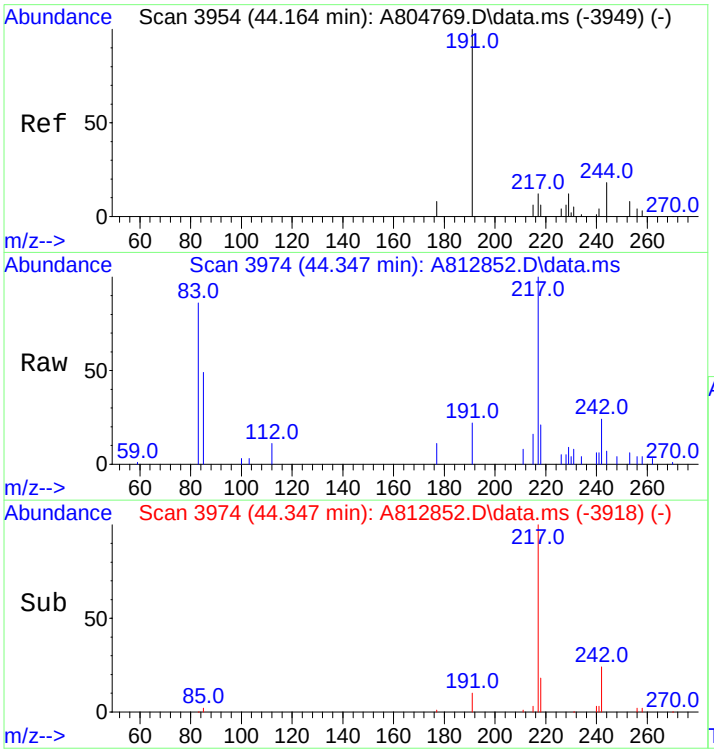




#99
C24 Tetracyclic Terpane (T6a)
Concen: 155.57 ng/ml
RT: 44.620 min Scan# 4004
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

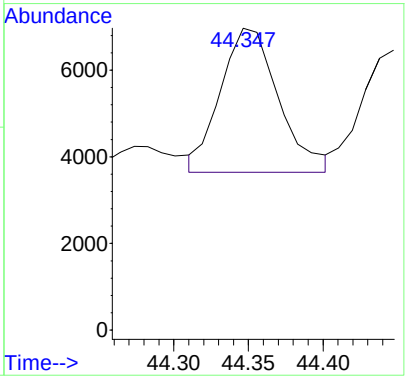
Tgt Ion:191 Resp: 10664

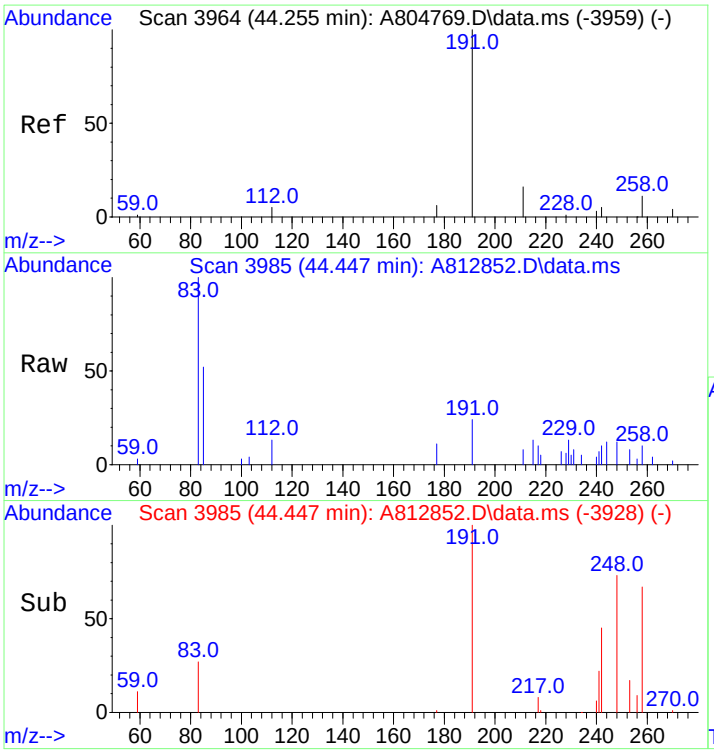




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 131.54 ng/ml m
RT: 44.347 min Scan# 3974
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

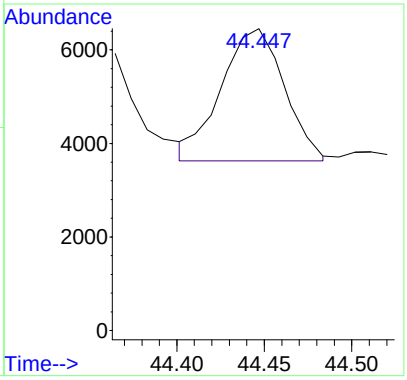
Tgt Ion:191 Resp: 9017

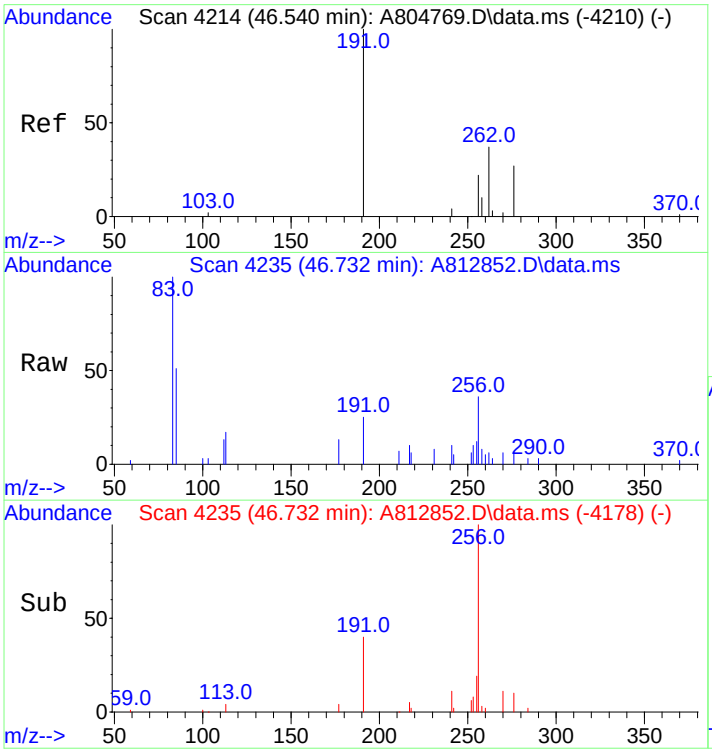




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 103.53 ng/ml m
RT: 44.447 min Scan# 3985
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

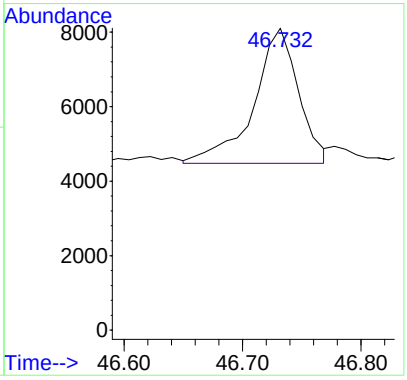
Tgt Ion:191 Resp: 7097

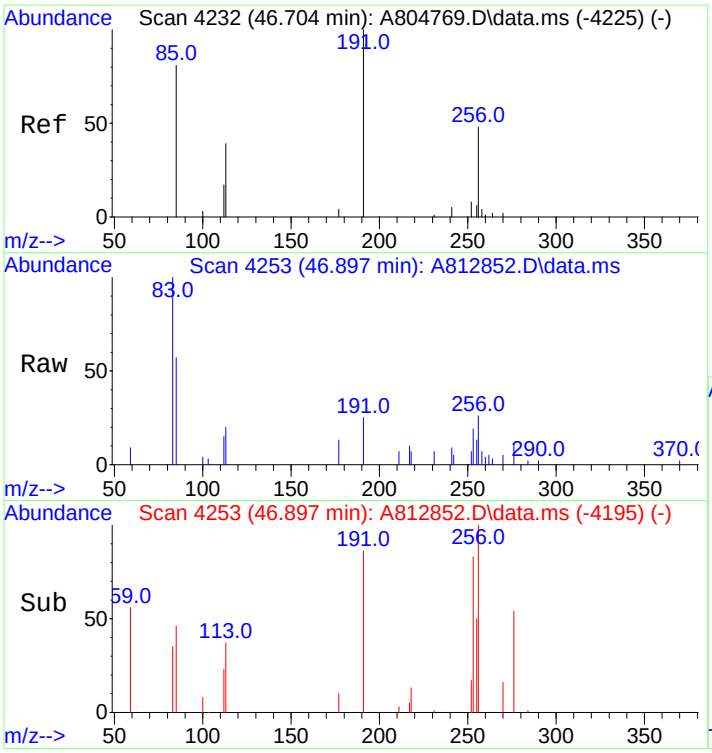




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 138.49 ng/ml m
RT: 46.732 min Scan# 4235
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

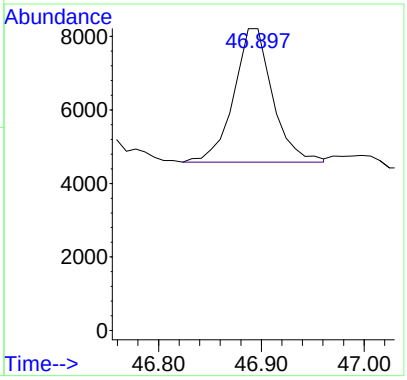
Tgt Ion:191 Resp: 9493

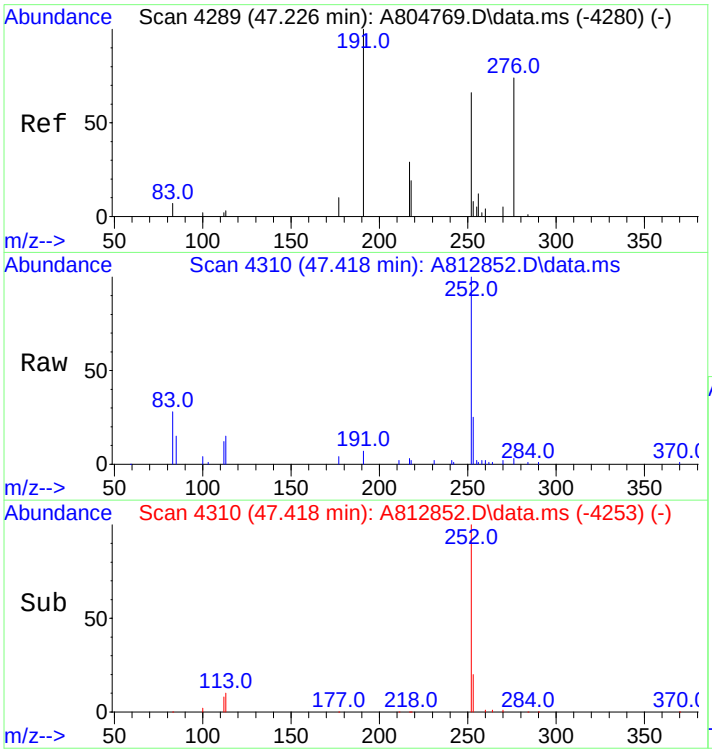




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 139.87 ng/ml
RT: 46.897 min Scan# 4253
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

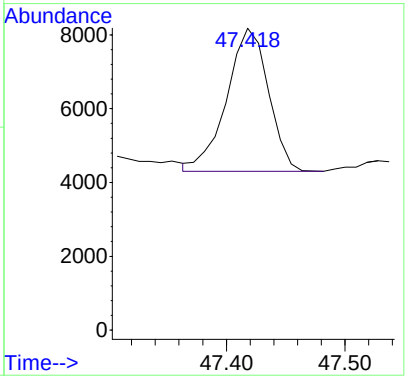
Tgt Ion:191 Resp: 9588

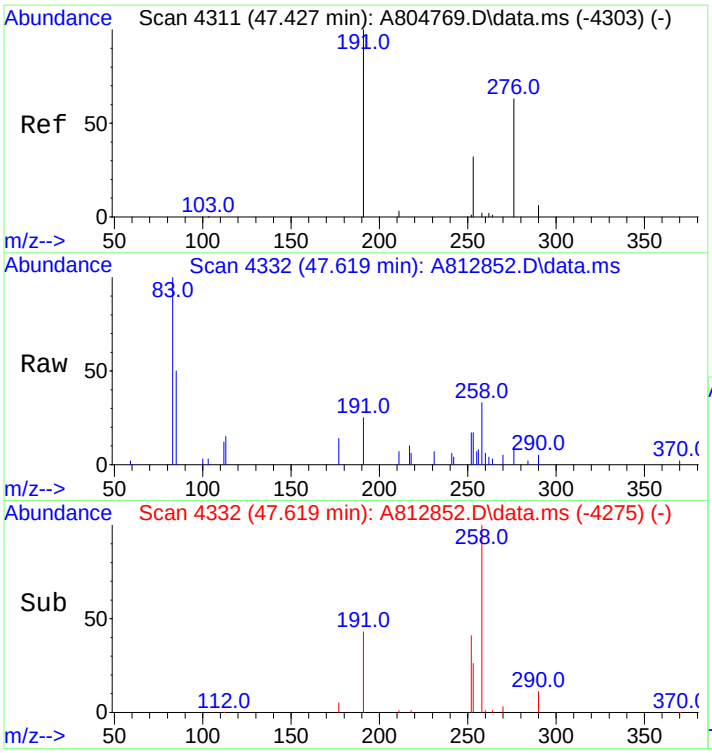




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 138.30 ng/ml
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

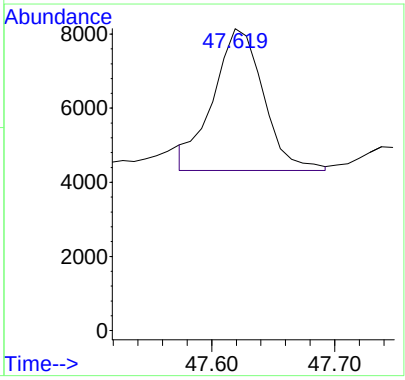
Tgt Ion:191 Resp: 9480

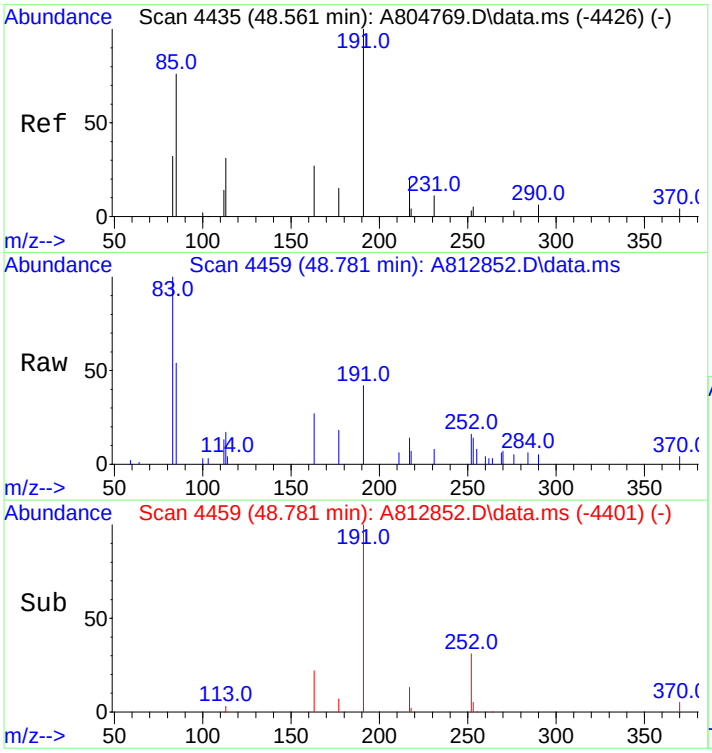




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 157.98 ng/ml m
RT: 47.619 min Scan# 4332
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

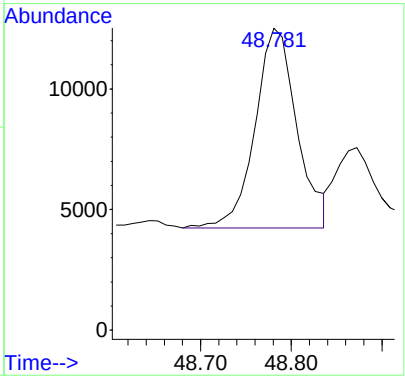
Tgt Ion:191 Resp: 10829

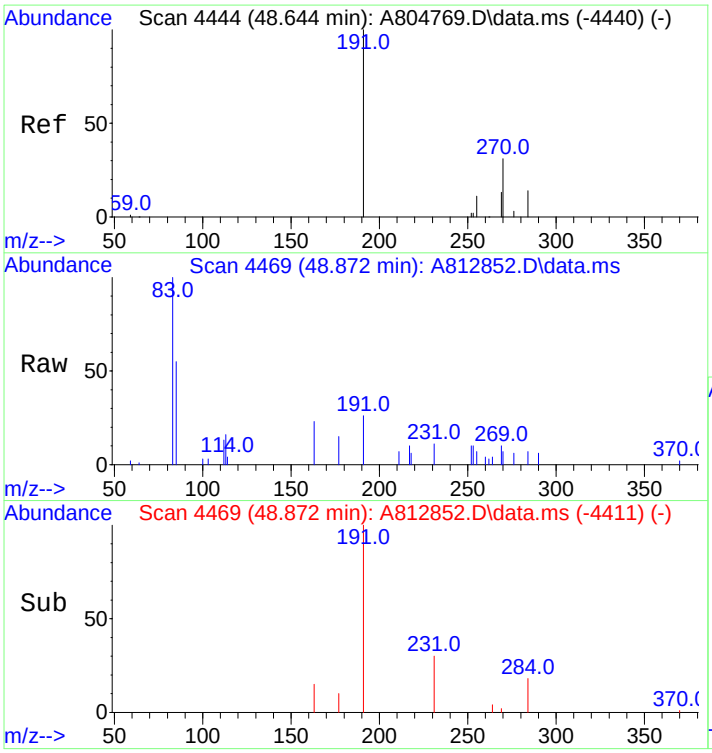




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 387.53 ng/ml
RT: 48.781 min Scan# 4459
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

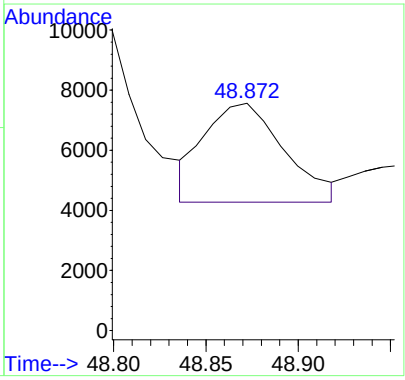
Tgt Ion:191 Resp: 26565

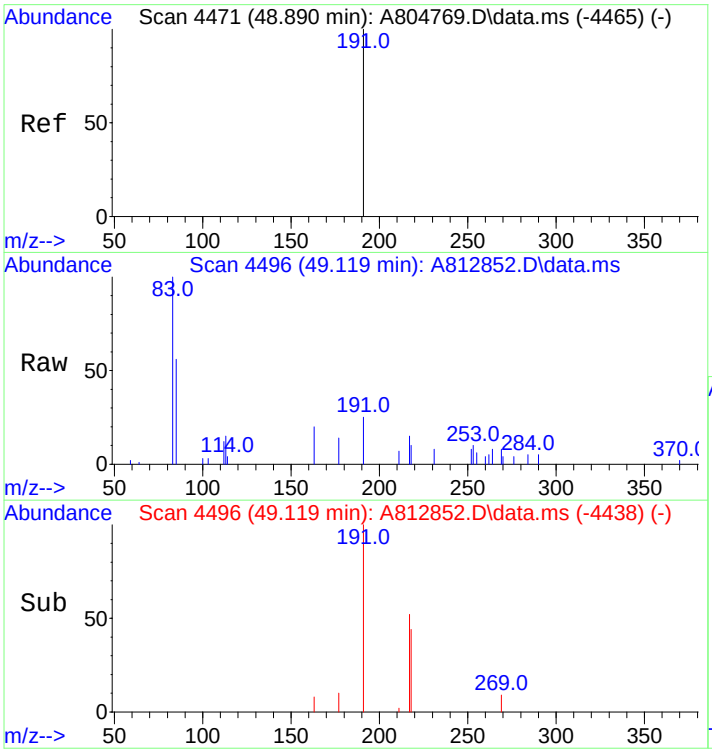




#107
C30 Tricyclic Terpane-22S
Concen: 145.14 ng/mL m
RT: 48.872 min Scan# 4469
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

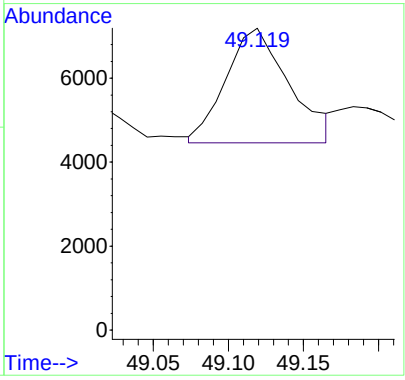
Tgt Ion:191 Resp: 9949

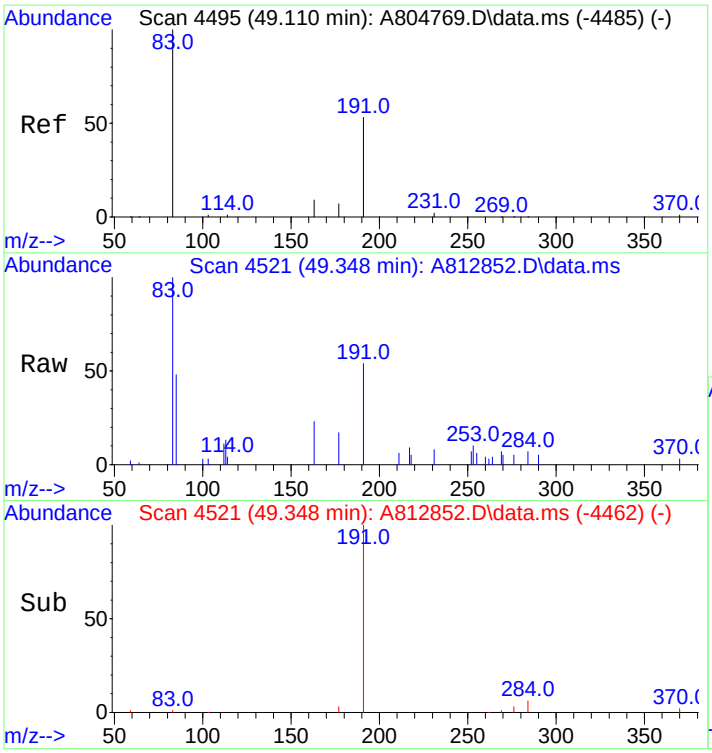




#108
C30 Tricyclic Terpane-22R
Concen: 116.38 ng/mL m
RT: 49.119 min Scan# 4496
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

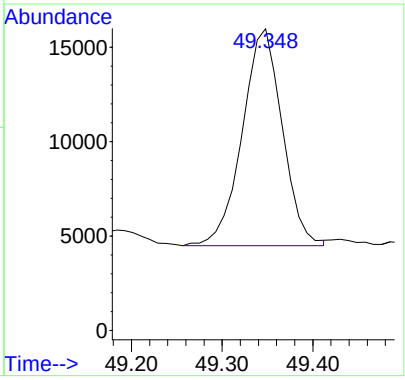
Tgt Ion:191 Resp: 7978

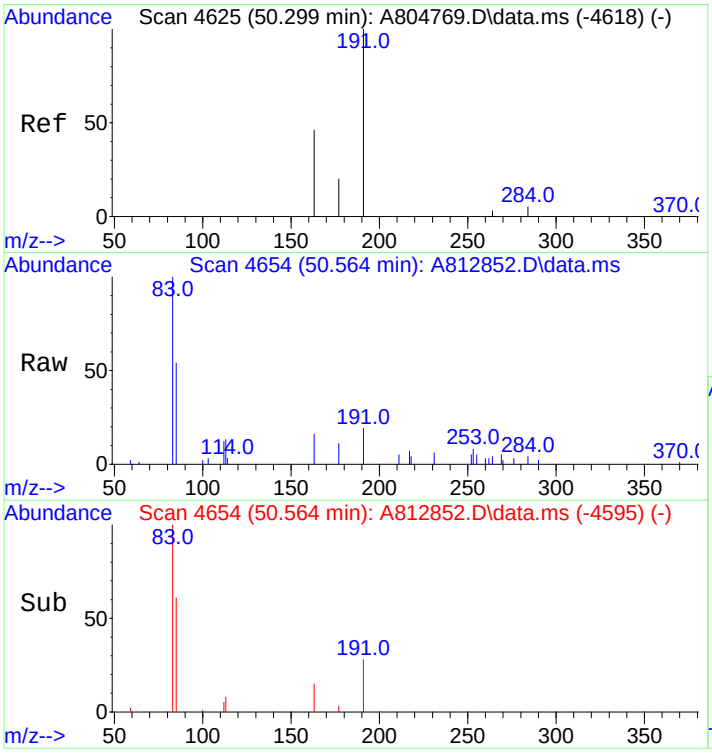




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 511.74 ng/ml
RT: 49.348 min Scan# 4521
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

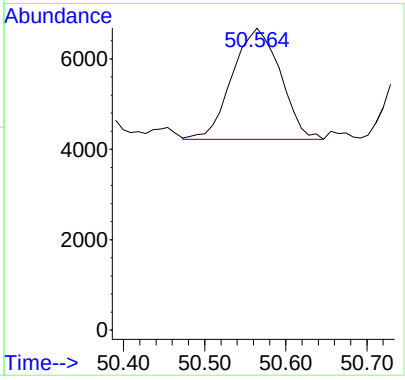
Tgt Ion:191 Resp: 35079

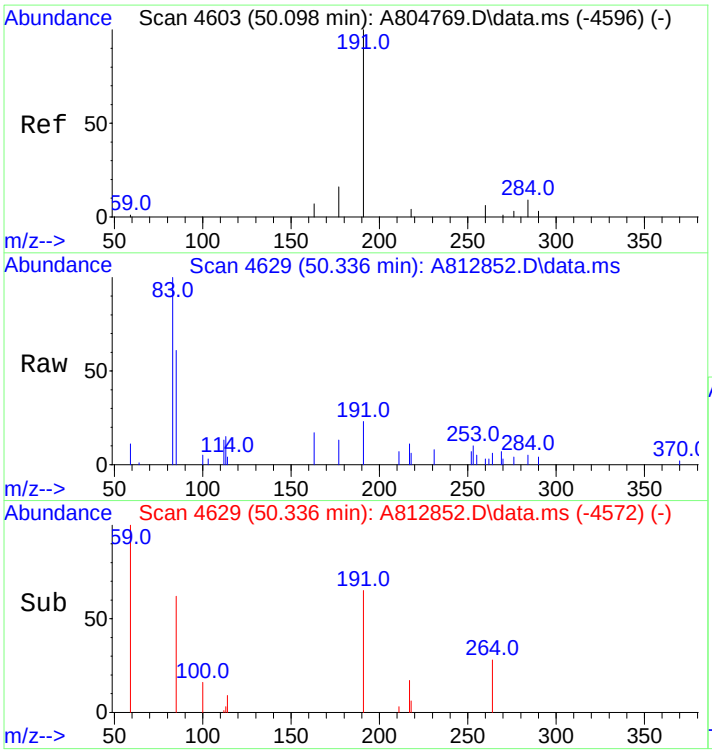




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 147.66 ng/ml
RT: 50.564 min Scan# 4654
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

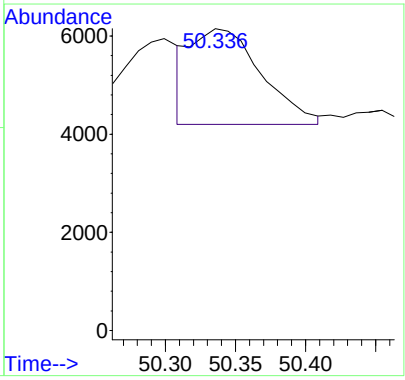
Tgt Ion:191 Resp: 10122

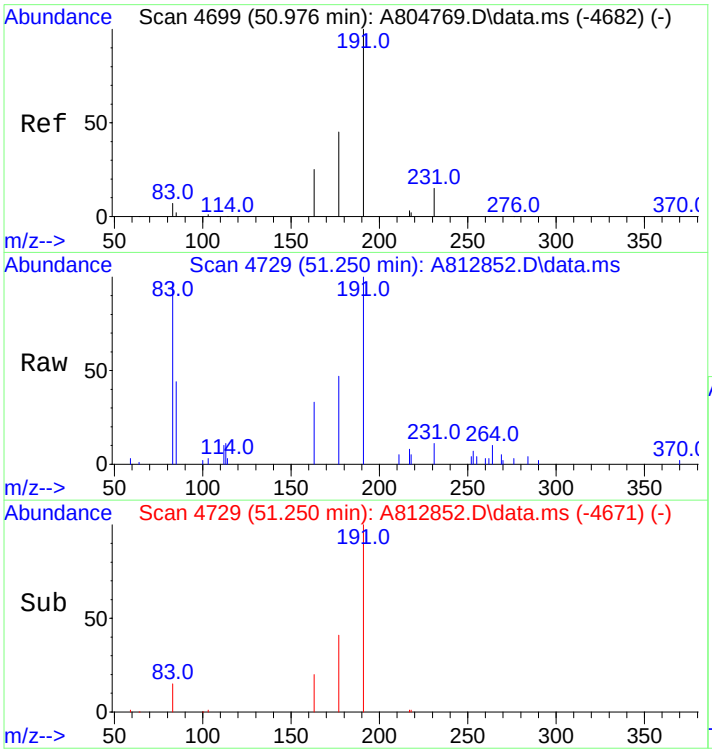




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 99.86 ng/ml m
RT: 50.336 min Scan# 4629
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

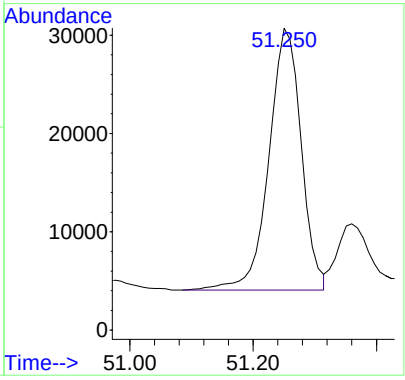
Tgt Ion:191 Resp: 6845

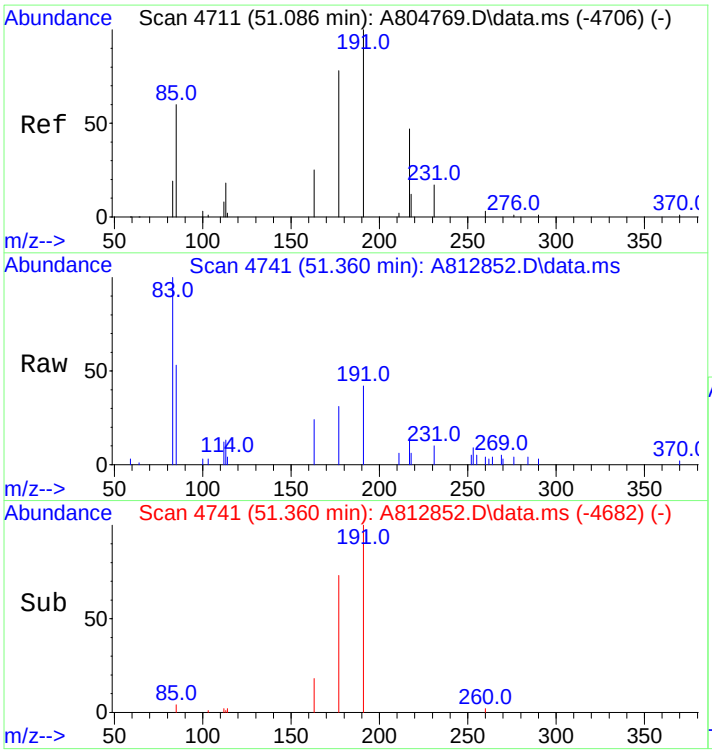




#112
30-Norhopane (T15)
Concen: 1413.74 ng/ml
RT: 51.250 min Scan# 4729
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

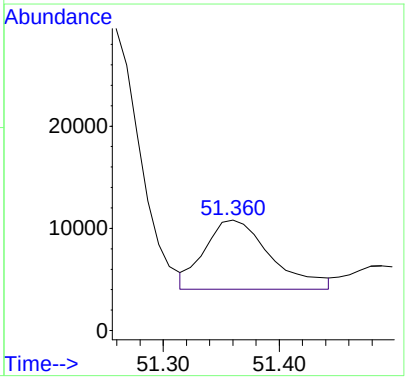
Tgt Ion:191 Resp: 96910

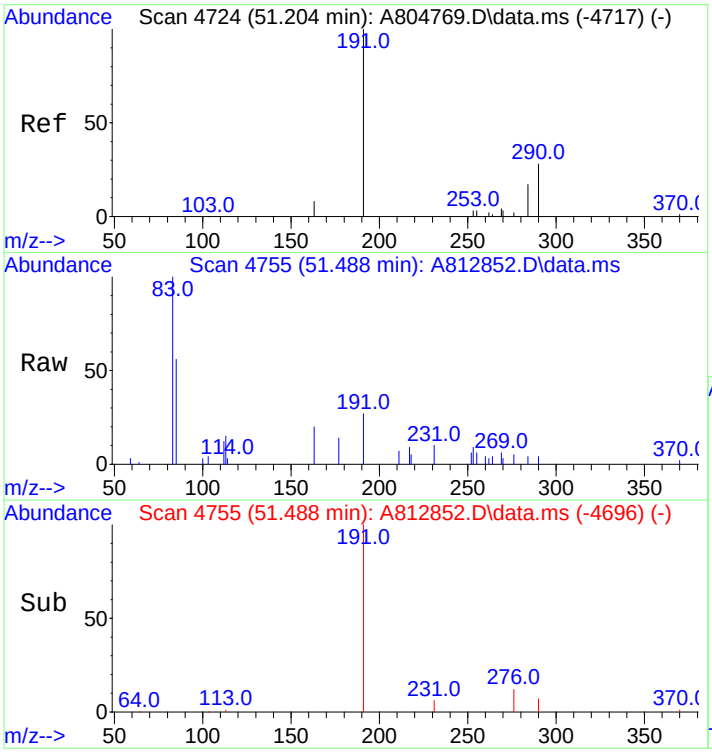




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 390.70 ng/ml m
RT: 51.360 min Scan# 4741
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

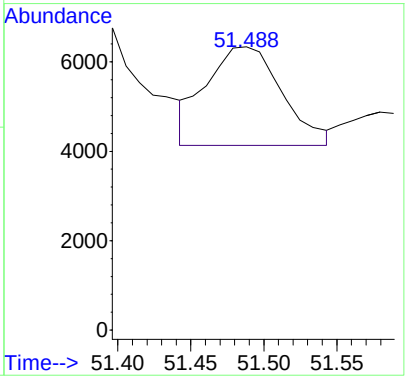
Tgt Ion:191 Resp: 26782

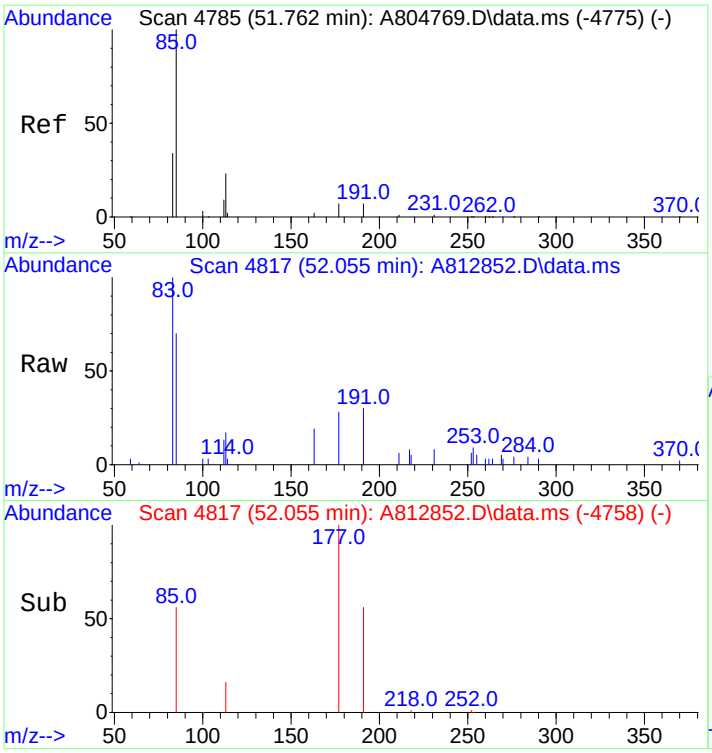




#114
17a(H)-Diahopane (X)
Concen: 116.40 ng/ml m
RT: 51.488 min Scan# 4755
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

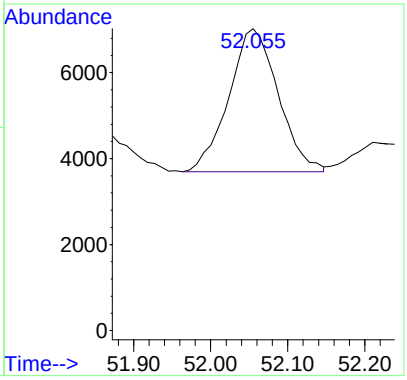
Tgt Ion:191 Resp: 7979

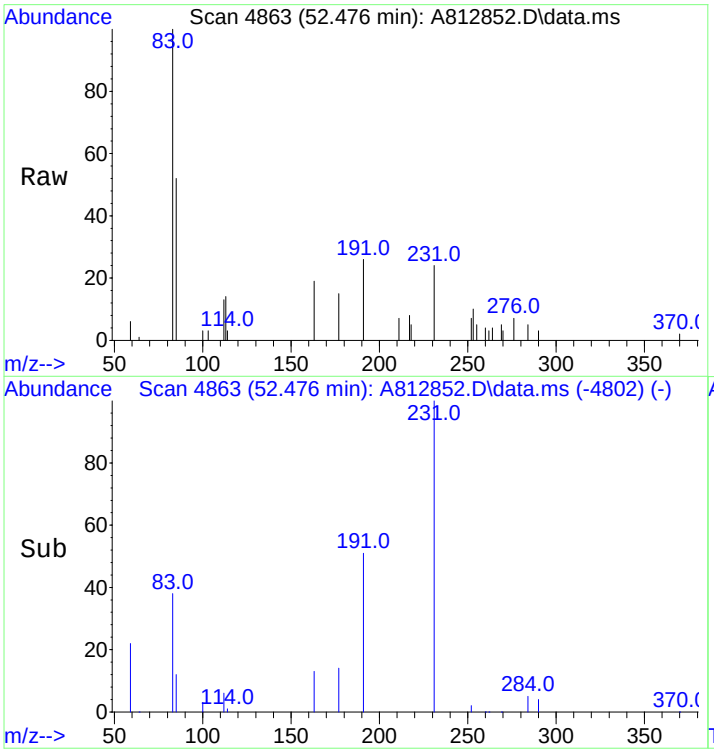




#115
30-Normoretane (T17)
Concen: 217.00 ng/ml
RT: 52.055 min Scan# 4817
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

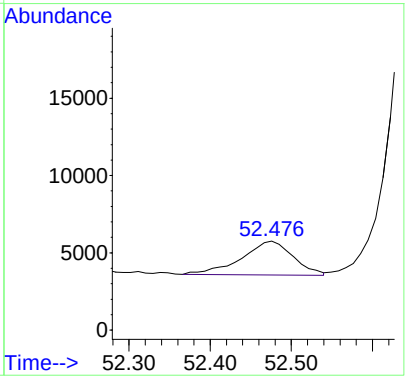
Tgt Ion:191 Resp: 14875

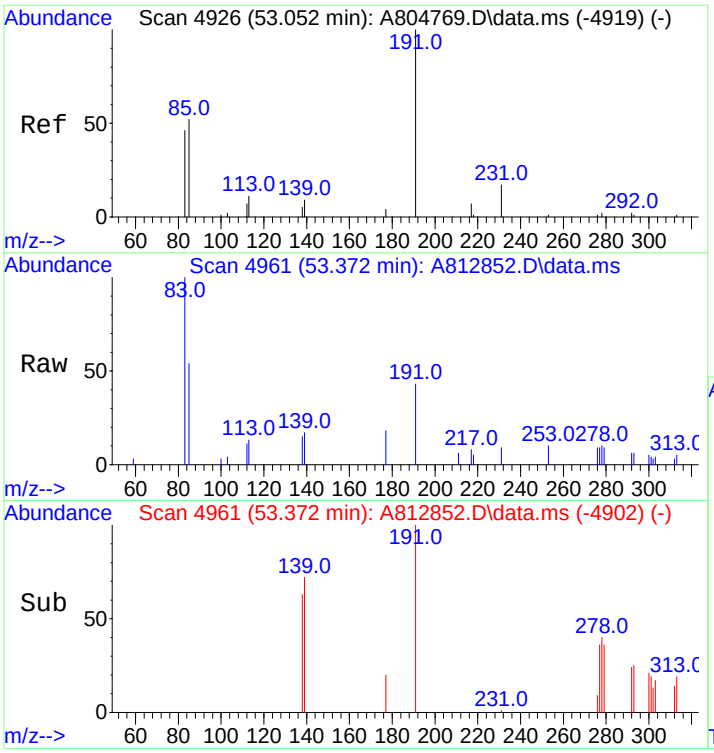




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 141.10 ng/ml
RT: 52.476 min Scan# 4863
Delta R.T. 0.055 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

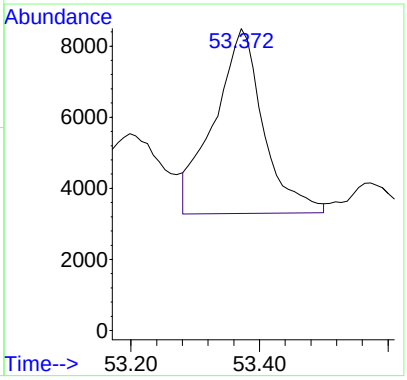
Tgt Ion:191 Resp: 9672

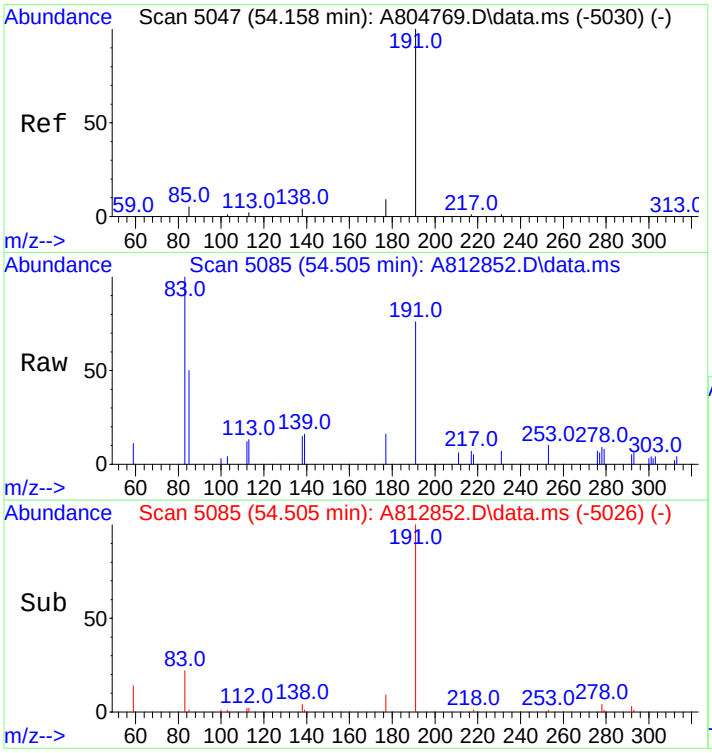




#117
Moretane (T20)
Concen: 401.85 ng/ml
RT: 53.372 min Scan# 4961
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

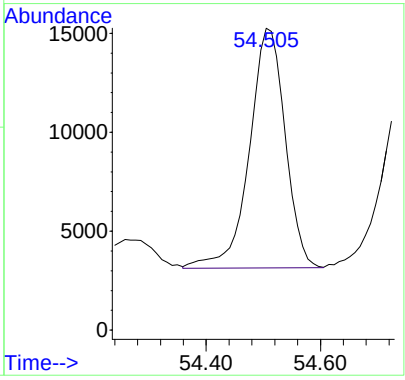
Tgt Ion:191 Resp: 27546

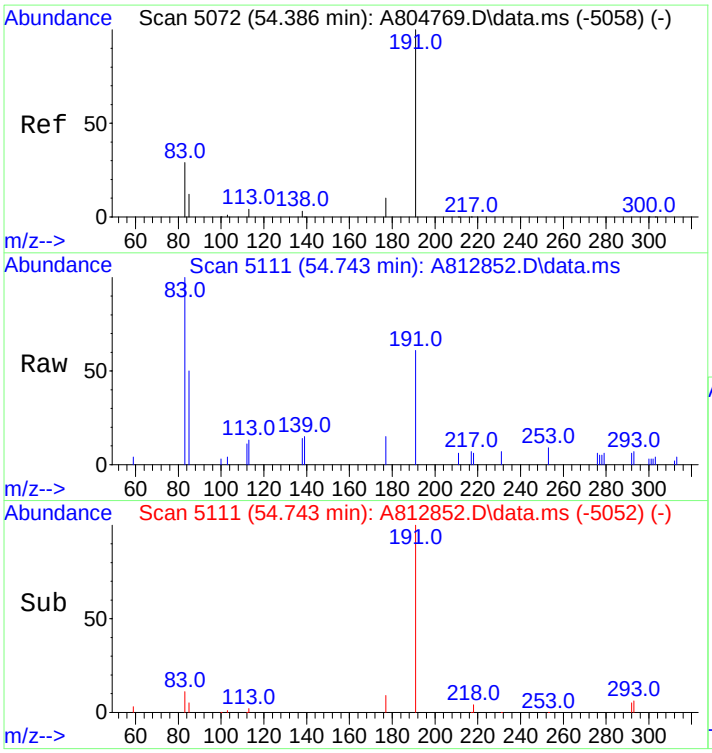




#118
30-Homohopane-22S (T21)
Concen: 767.82 ng/ml
RT: 54.505 min Scan# 5085
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

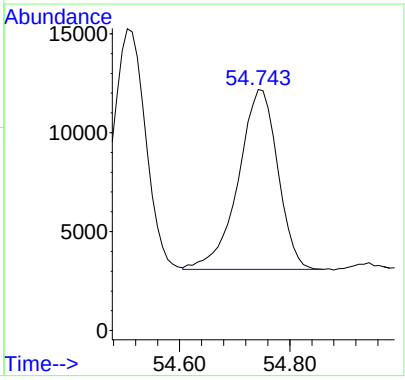
Tgt Ion:191 Resp: 52633

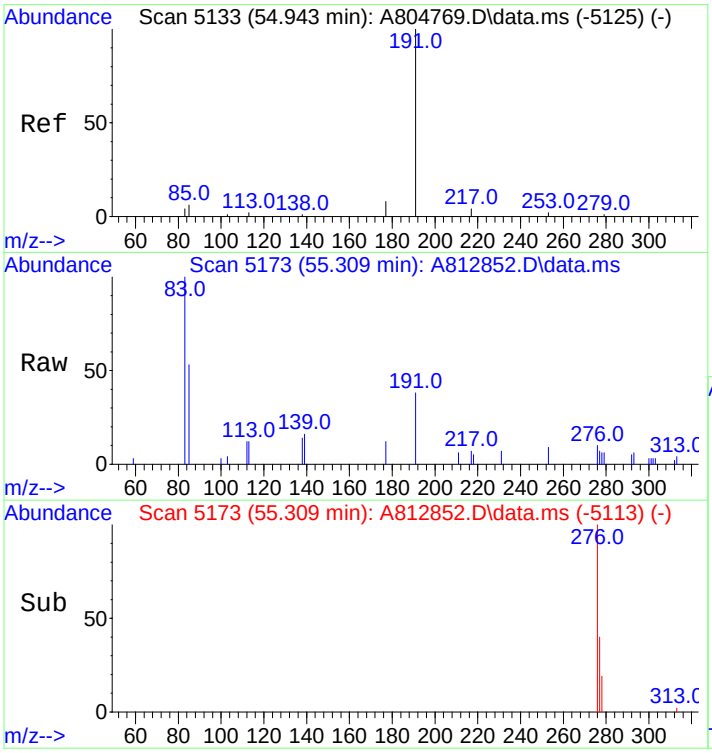




#119
30-Homohopane-22R (T22)
Concen: 660.89 ng/ml
RT: 54.743 min Scan# 5111
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

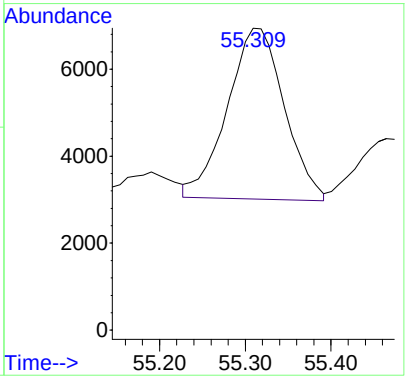
Tgt Ion:191 Resp: 45303

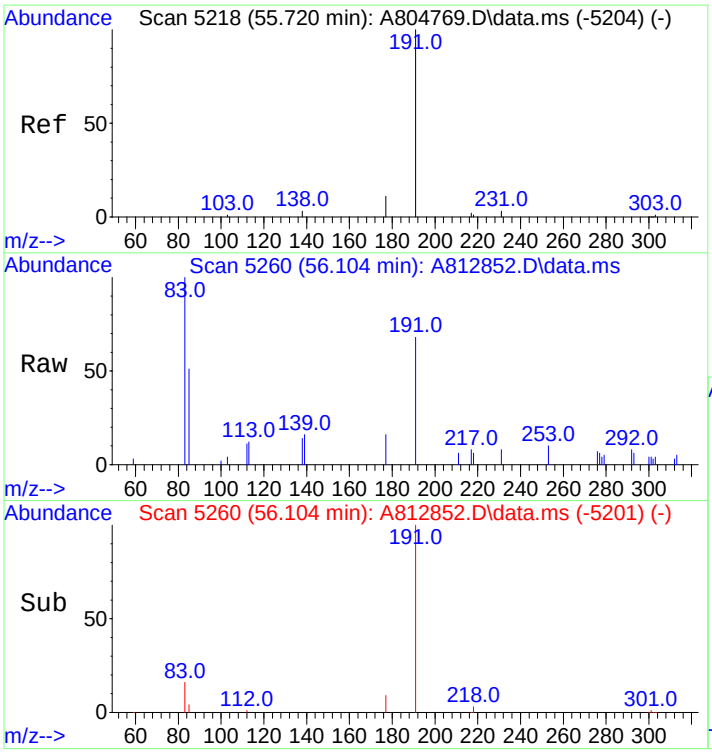




#120
Gammacerane/C32-diahopane
Concen: 264.64 ng/mL
RT: 55.309 min Scan# 5173
Delta R.T. 0.046 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

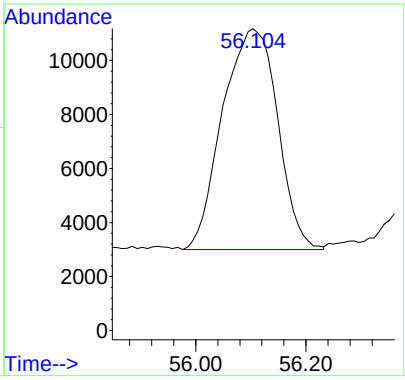
Tgt Ion:191 Resp: 18141

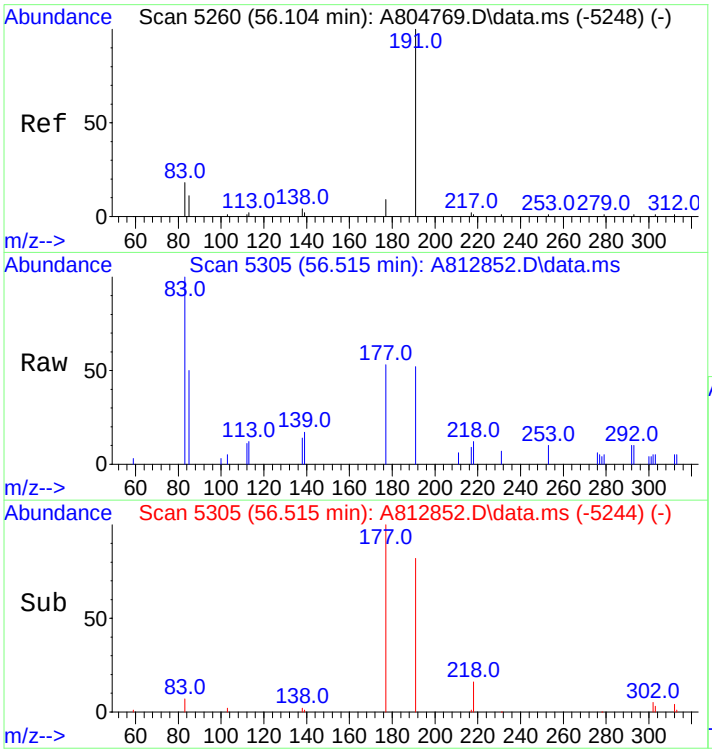




#121
30,31-Bishomohopane-22S (T26)
Concen: 826.62 ng/ml
RT: 56.104 min Scan# 5260
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

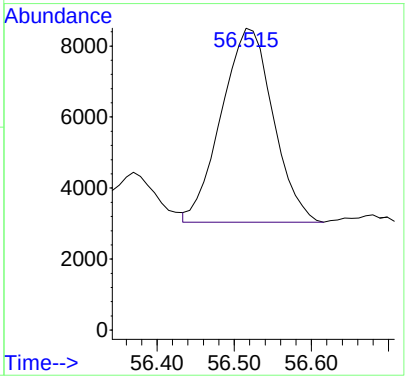
Tgt Ion:191 Resp: 56664

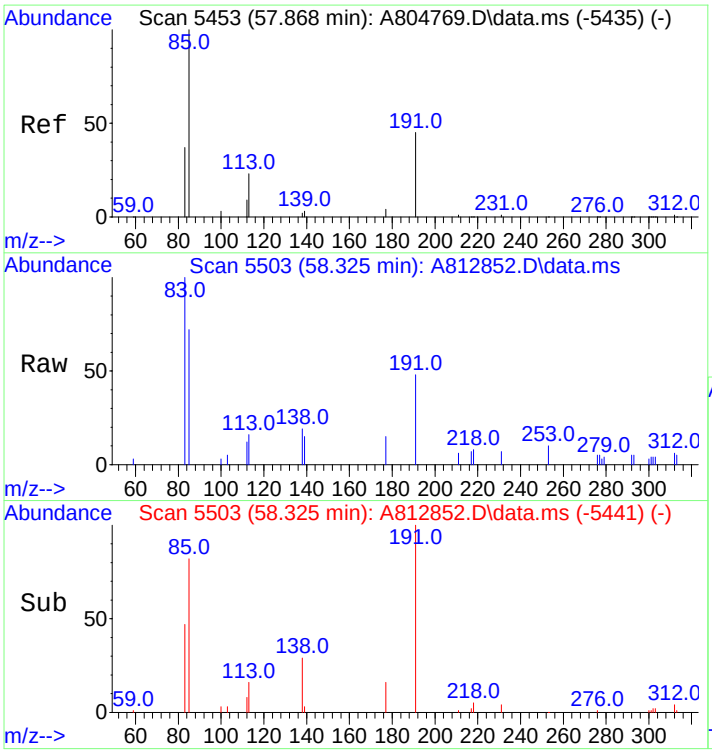




#122
30,31-Bishomohopane-22R (T27)
Concen: 371.69 ng/ml
RT: 56.515 min Scan# 5305
Delta R.T. 0.055 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

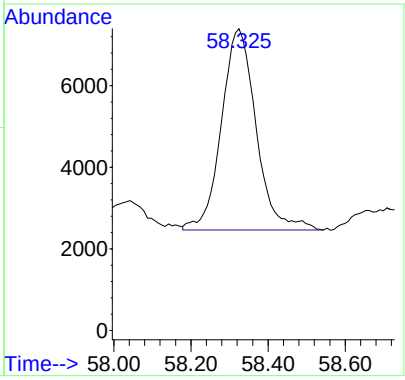
Tgt Ion:191 Resp: 25479

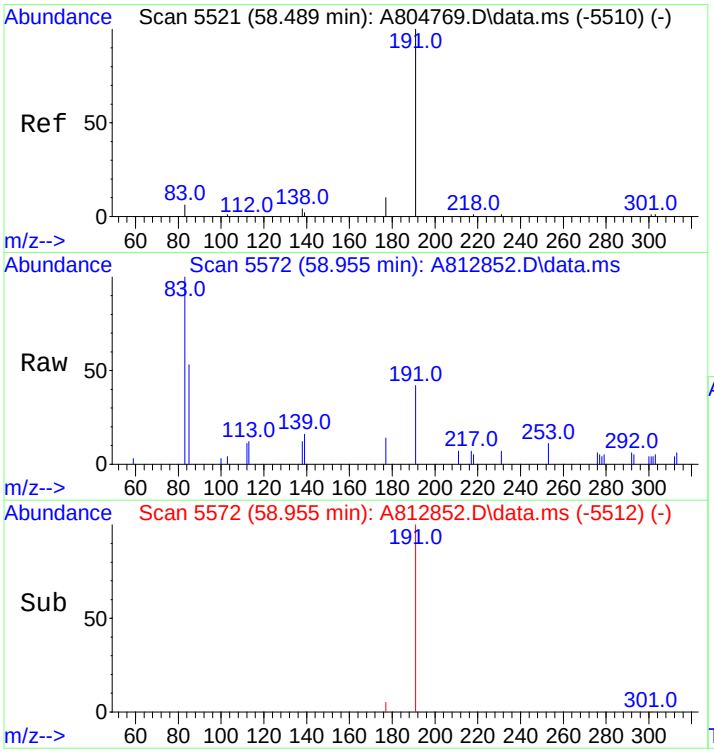




#123
30,31-Trishomohopane-22S (T30)
Concen: 449.90 ng/ml
RT: 58.325 min Scan# 5503
Delta R.T. 0.064 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

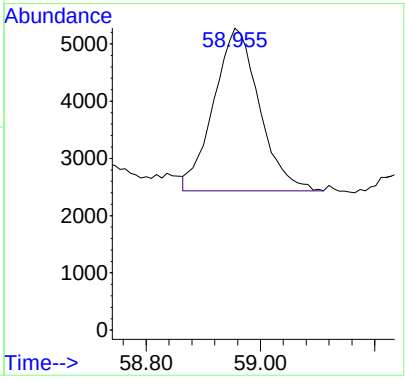
Tgt Ion:191 Resp: 30840

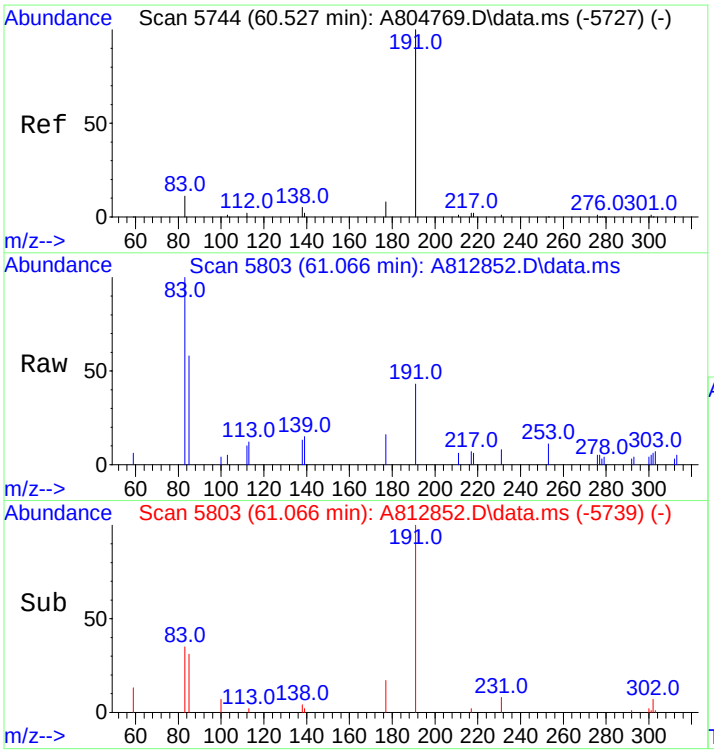




#124
30,31-Trishomohopane-22R (T31)
Concen: 229.62 ng/ml
RT: 58.955 min Scan# 5572
Delta R.T. 0.046 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

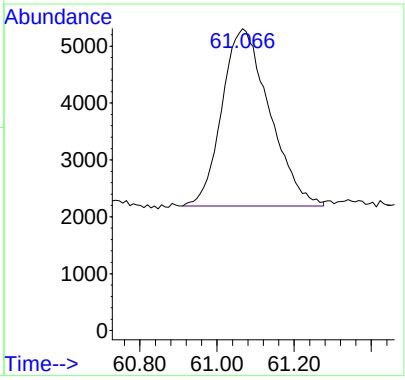
Tgt Ion:191 Resp: 15740

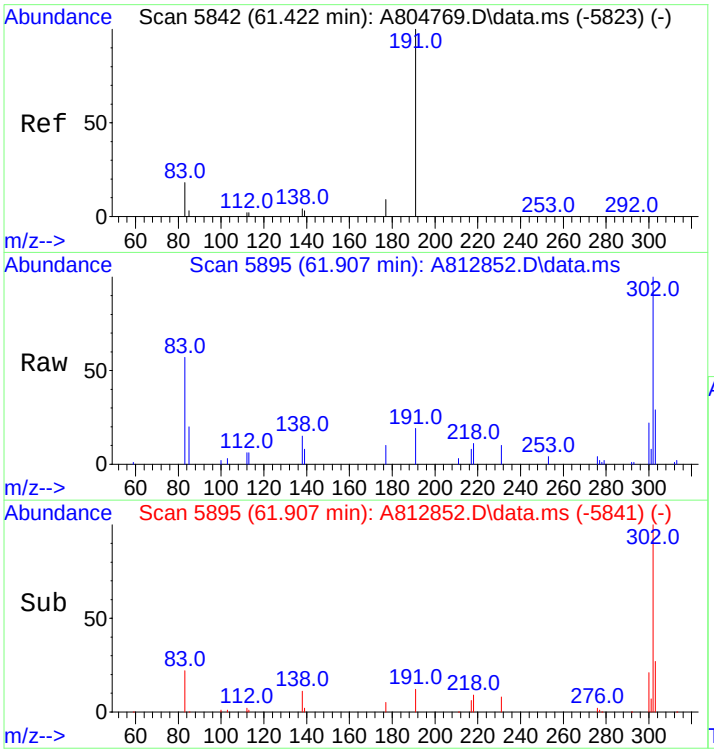




#125
Tetrakishomohopane-22S (T32)
Concen: 389.85 ng/ml
RT: 61.066 min Scan# 5803
Delta R.T. 0.082 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

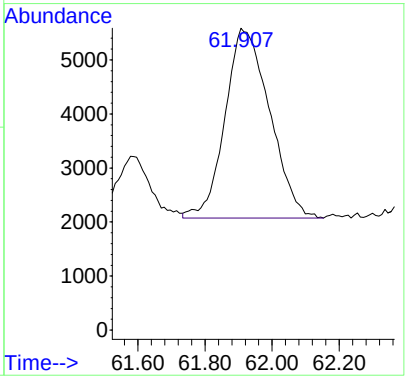
Tgt Ion:191 Resp: 26724

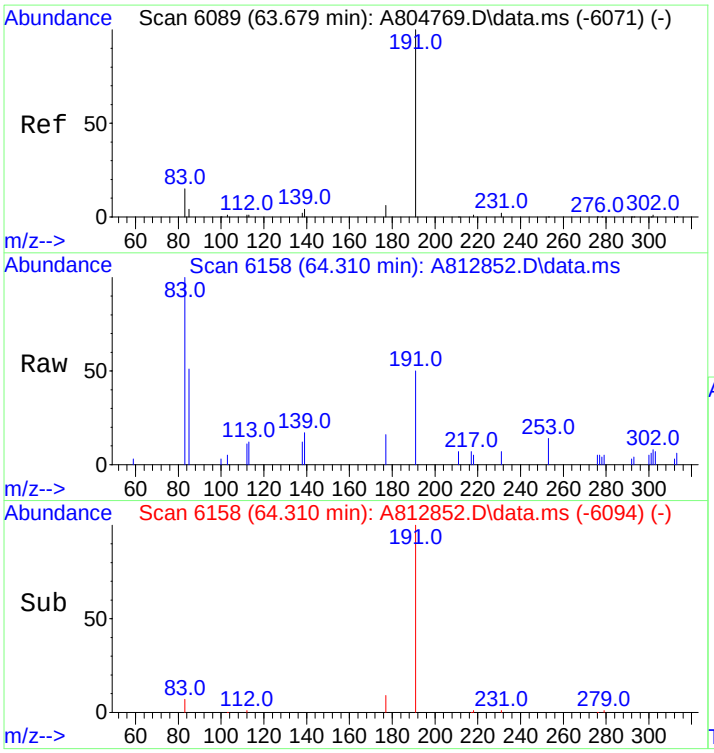




#126
Tetrakishomohopane-22R (T33)
Concen: 473.05 ng/ml
RT: 61.907 min Scan# 5895
Delta R.T. -0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

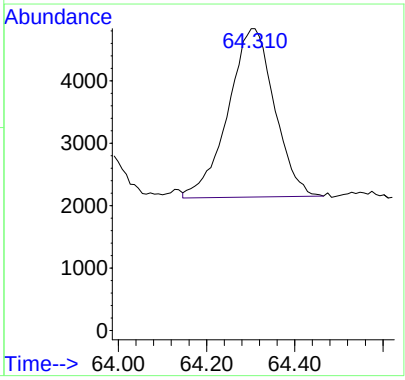
Tgt Ion:191 Resp: 32427

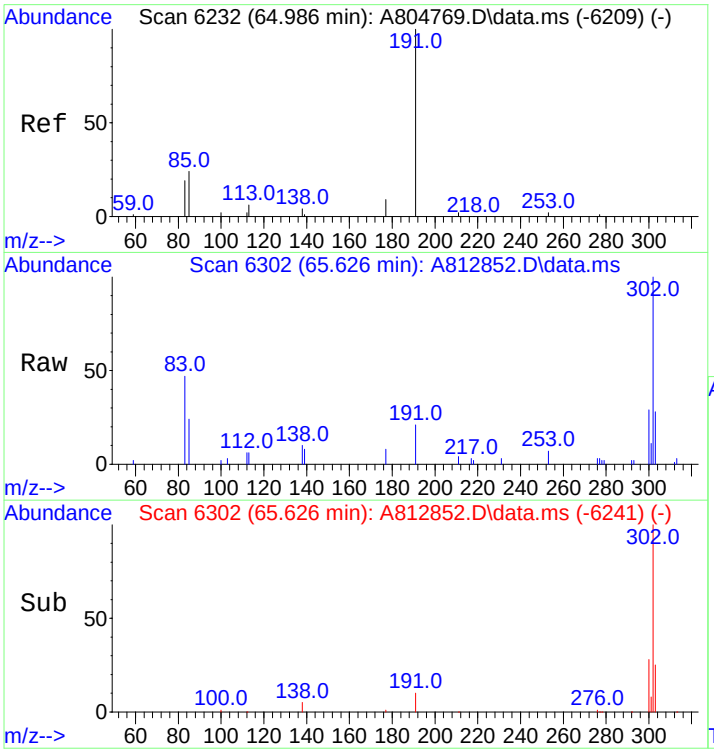




#127
Pentakishomohopane-22S (T34)
Concen: 287.47 ng/ml
RT: 64.310 min Scan# 6158
Delta R.T. 0.082 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

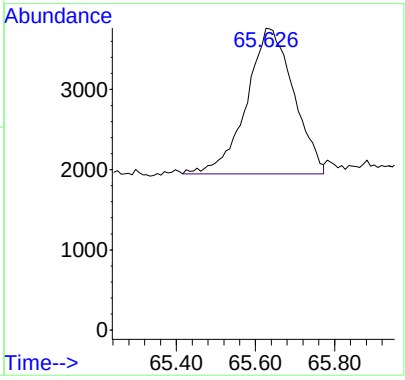
Tgt Ion:191 Resp: 19706

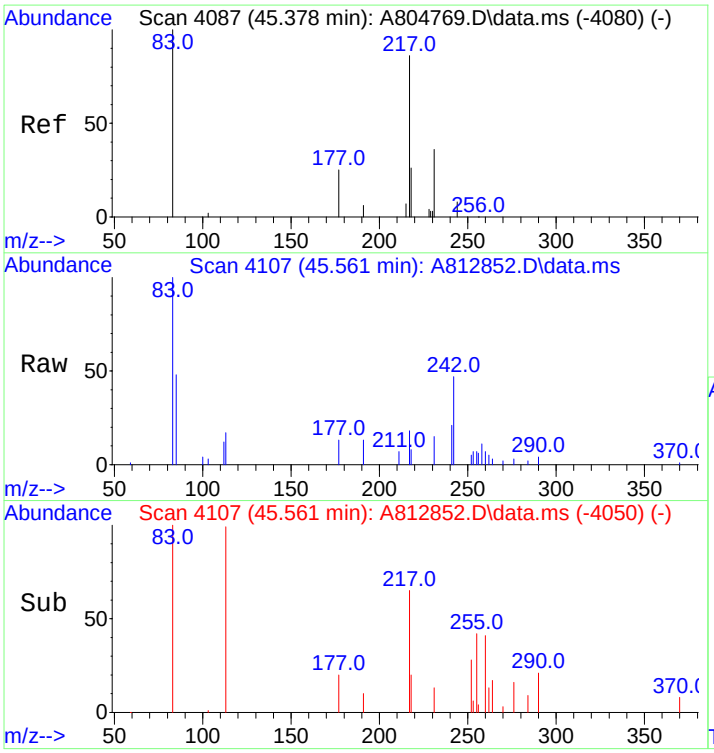




#128
Pentakishomohopane-22R (T35)
Concen: 218.53 ng/ml
RT: 65.626 min Scan# 6302
Delta R.T. 0.055 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

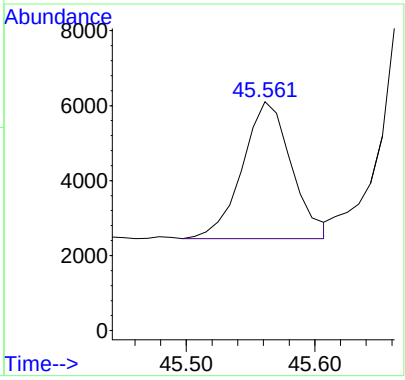
Tgt Ion:191 Resp: 14980

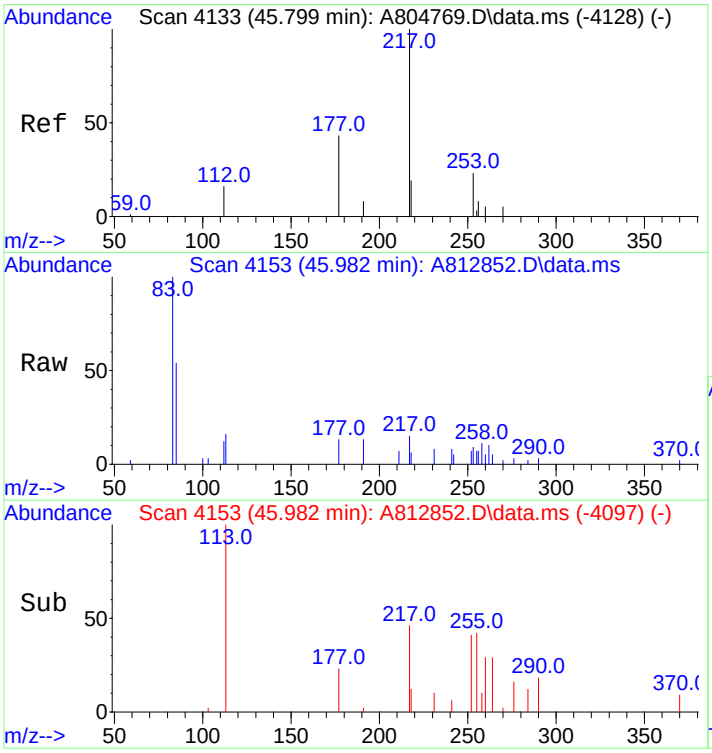




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 292.73 ng/ml
RT: 45.561 min Scan# 4107
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

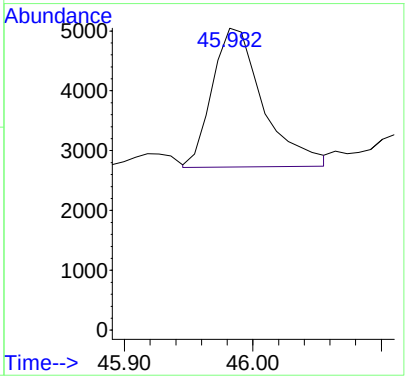
Tgt Ion:217 Resp: 9770

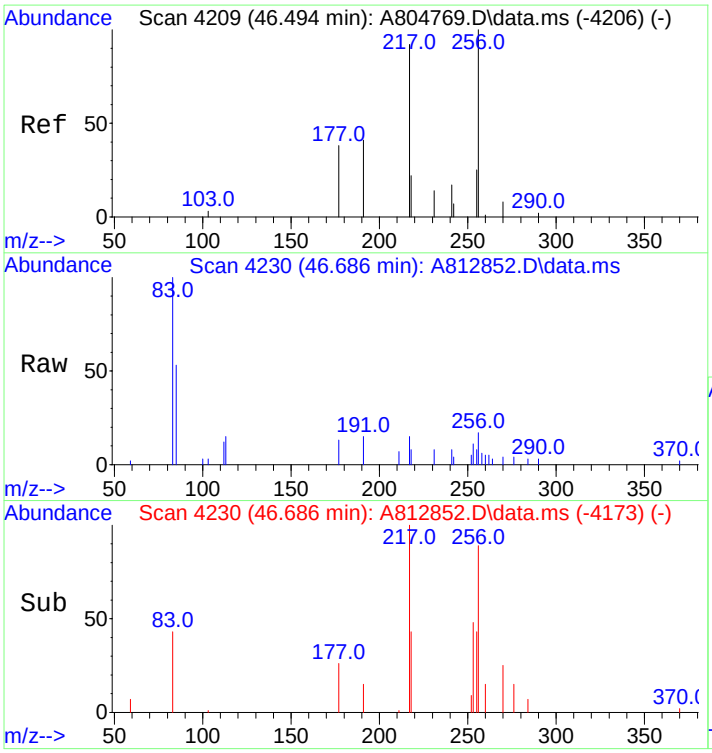




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 191.76 ng/ml
RT: 45.982 min Scan# 4153
Delta R.T. 0.009 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

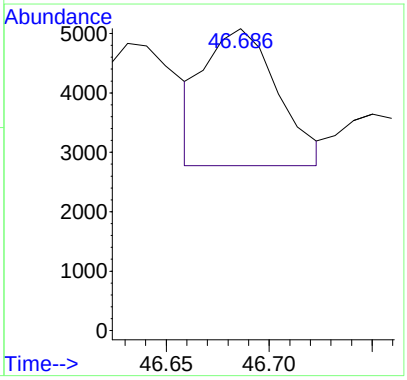
Tgt Ion:217 Resp: 6400

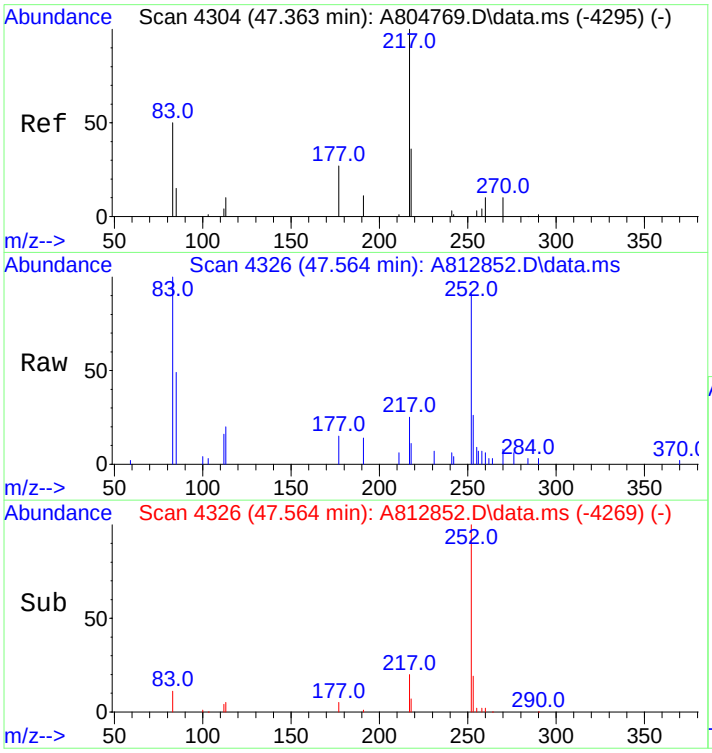




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 169.07 ng/ml m
RT: 46.686 min Scan# 4230
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

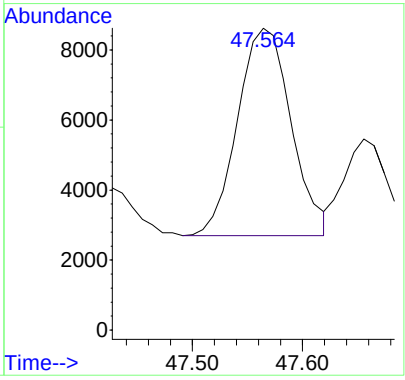
Tgt Ion:217 Resp: 5643

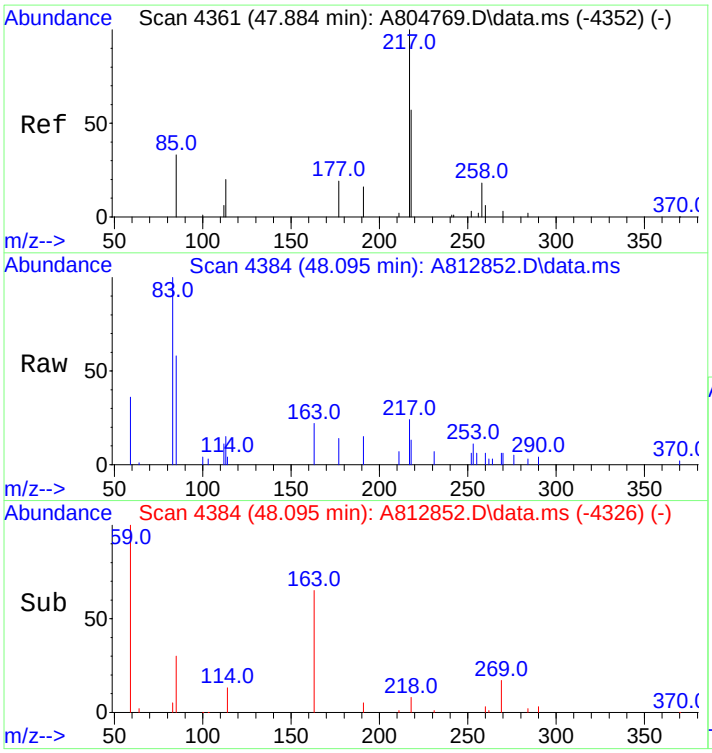




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 601.12 ng/ml
RT: 47.564 min Scan# 4326
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

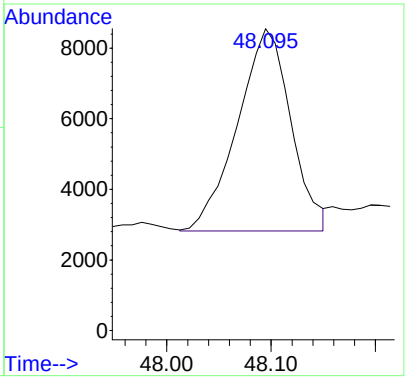
Tgt Ion:217 Resp: 20063

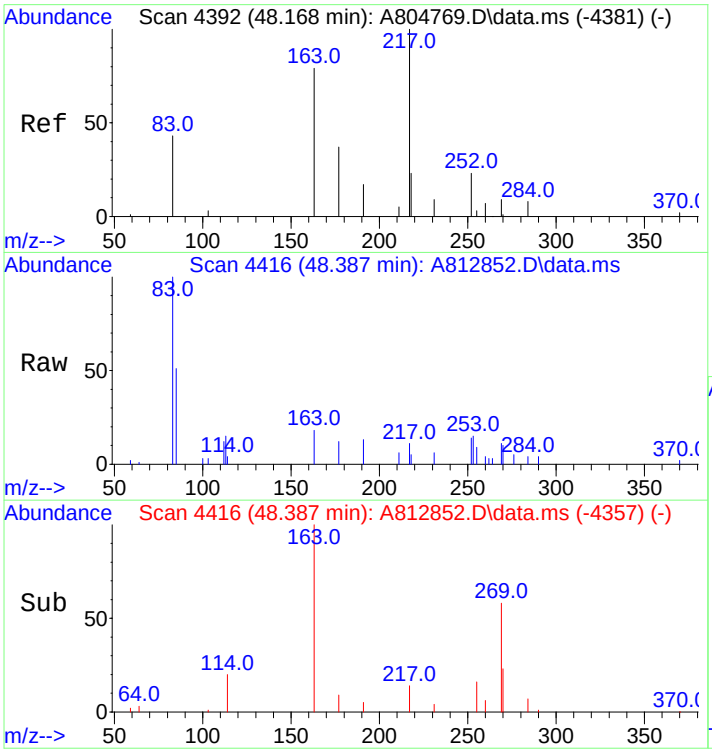




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 611.70 ng/ml m
RT: 48.095 min Scan# 4384
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

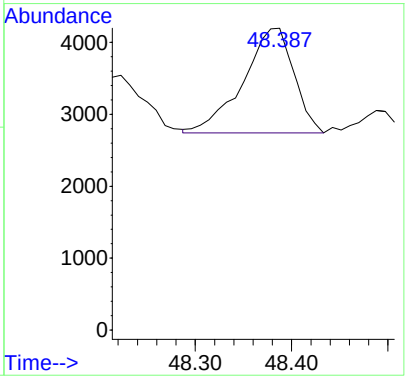
Tgt Ion:217 Resp: 20416

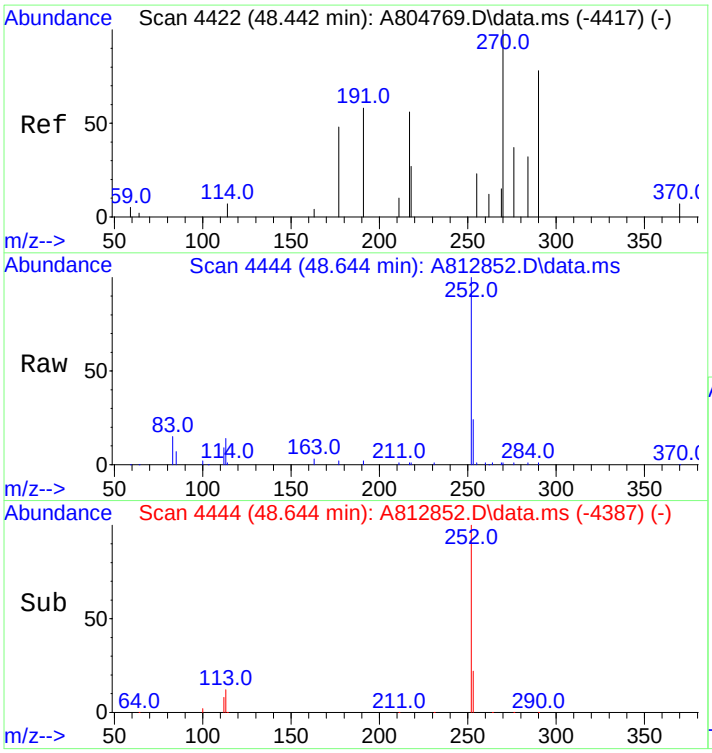




#135
Unknown Sterane (S18)
Concen: 159.73 ng/ml
RT: 48.387 min Scan# 4416
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

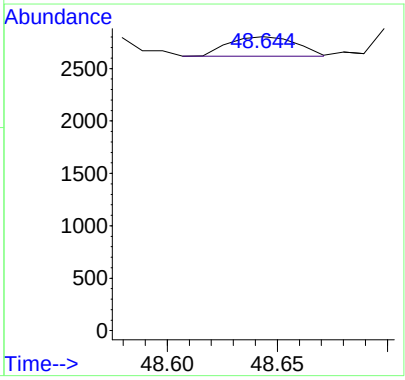
Tgt Ion:217 Resp: 5331

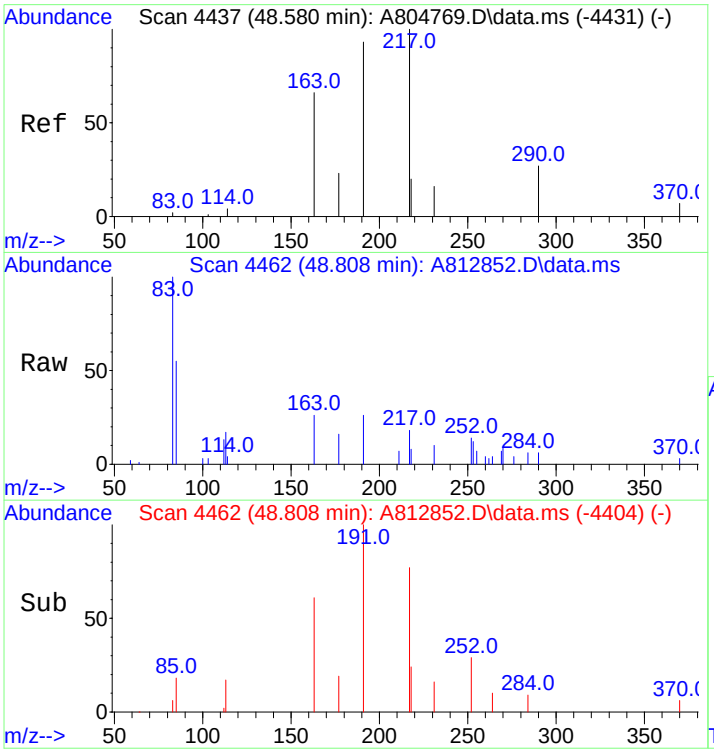




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 12.01 ng/ml
RT: 48.644 min Scan# 4444
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

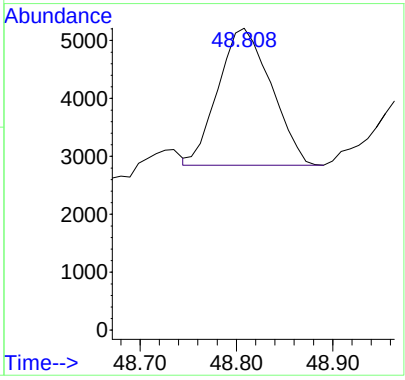
Tgt Ion:217 Resp: 401

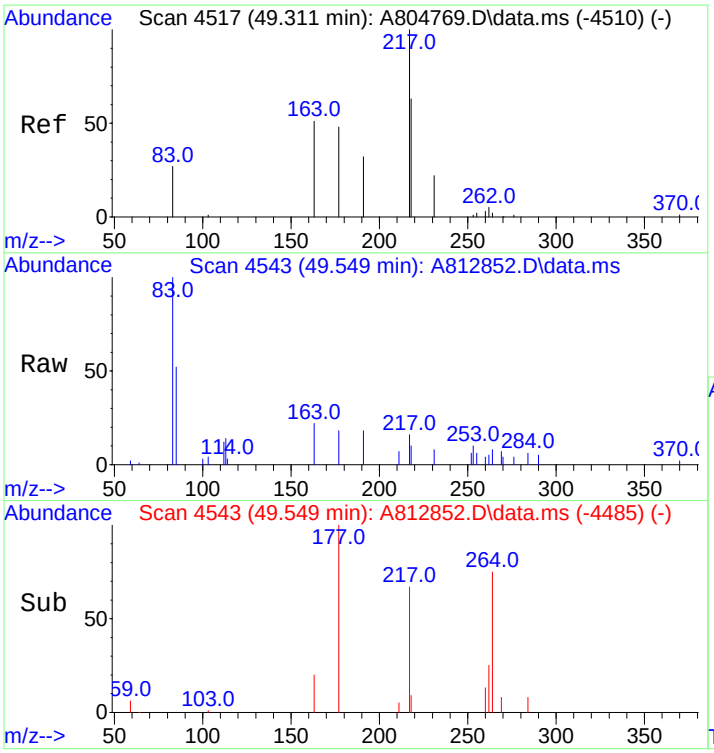




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 270.29 ng/ml
RT: 48.808 min Scan# 4462
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

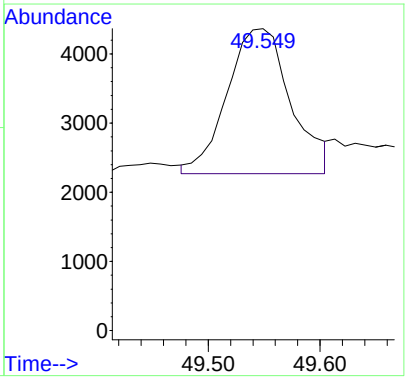
Tgt Ion:217 Resp: 9021

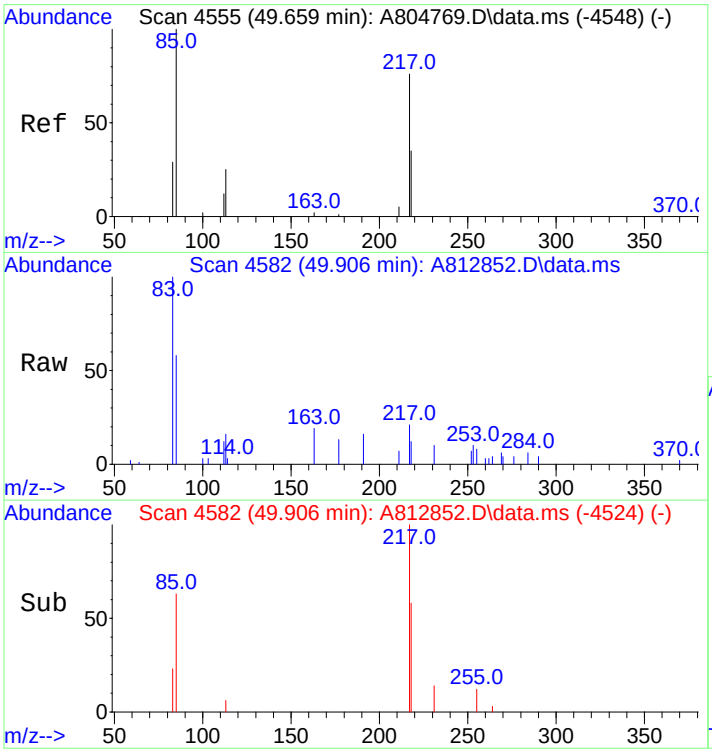




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 248.86 ng/ml m
RT: 49.549 min Scan# 4543
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

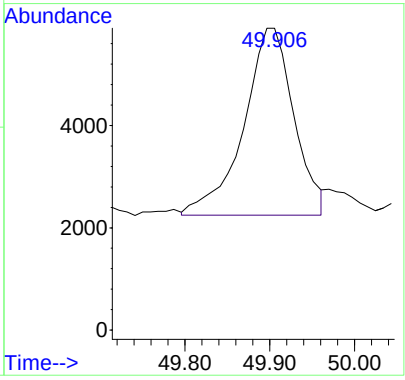
Tgt Ion:217 Resp: 8306

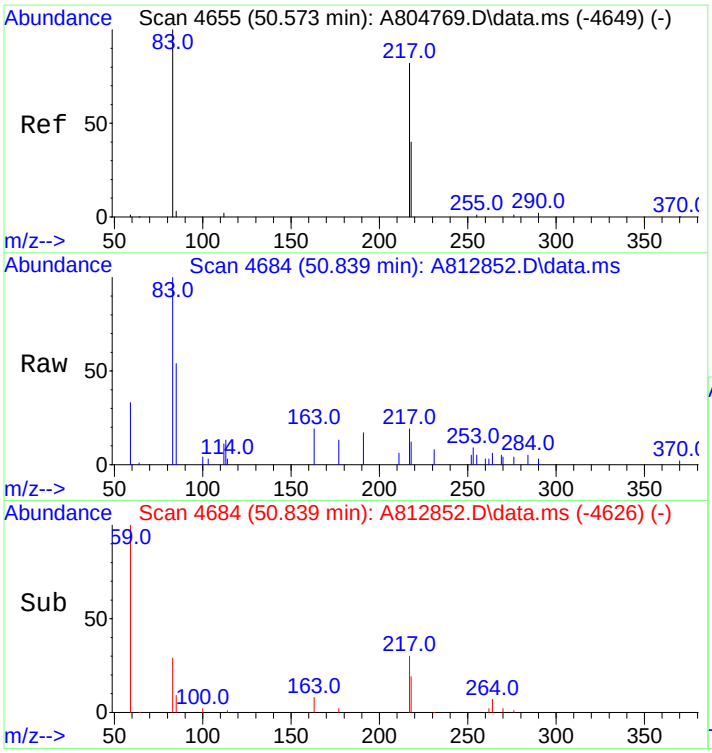




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 452.57 ng/ml m
RT: 49.906 min Scan# 4582
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

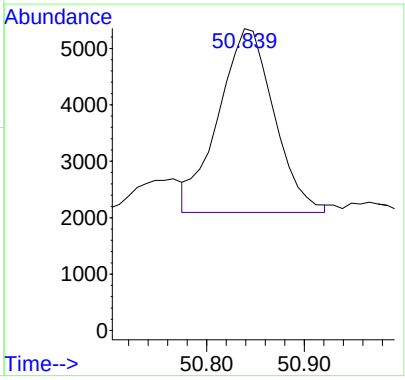
Tgt Ion:217 Resp: 15105

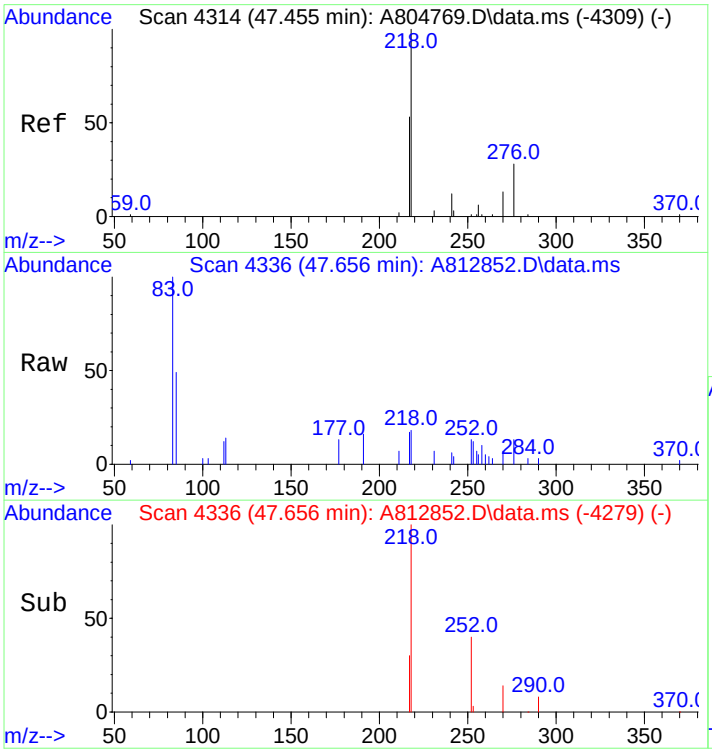




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 385.01 ng/ml m
RT: 50.839 min Scan# 4684
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

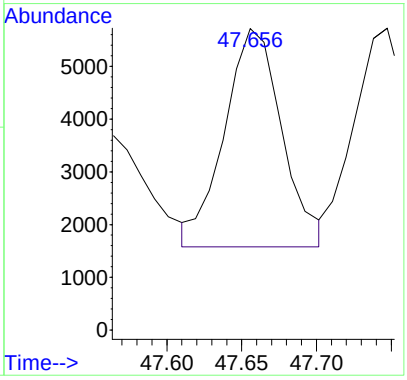
Tgt Ion:217 Resp: 12850

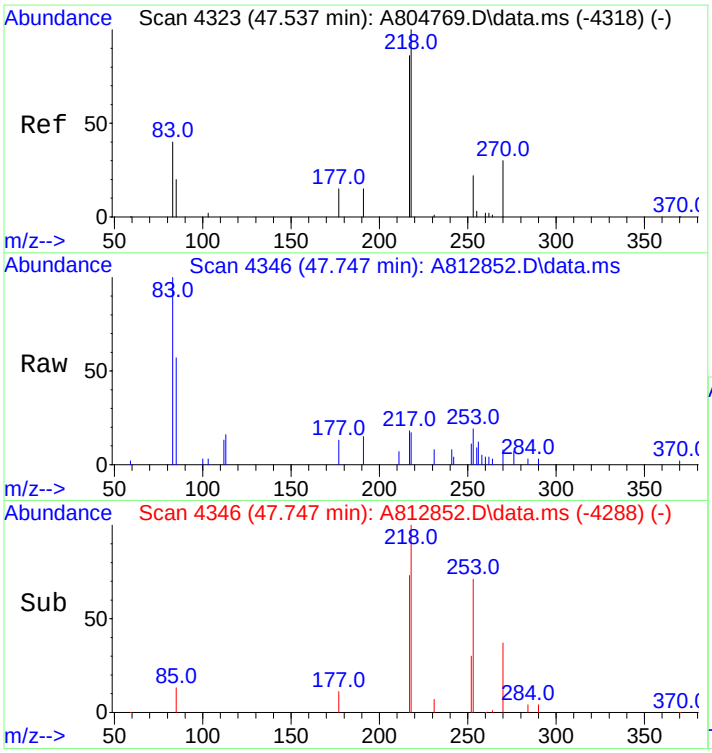




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 331.41 ng/ml m
RT: 47.656 min Scan# 4336
Delta R.T. 0.018 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

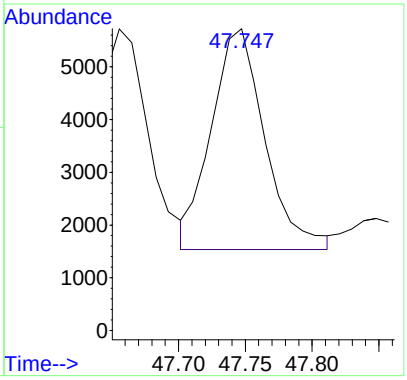
Tgt Ion:218 Resp: 11061

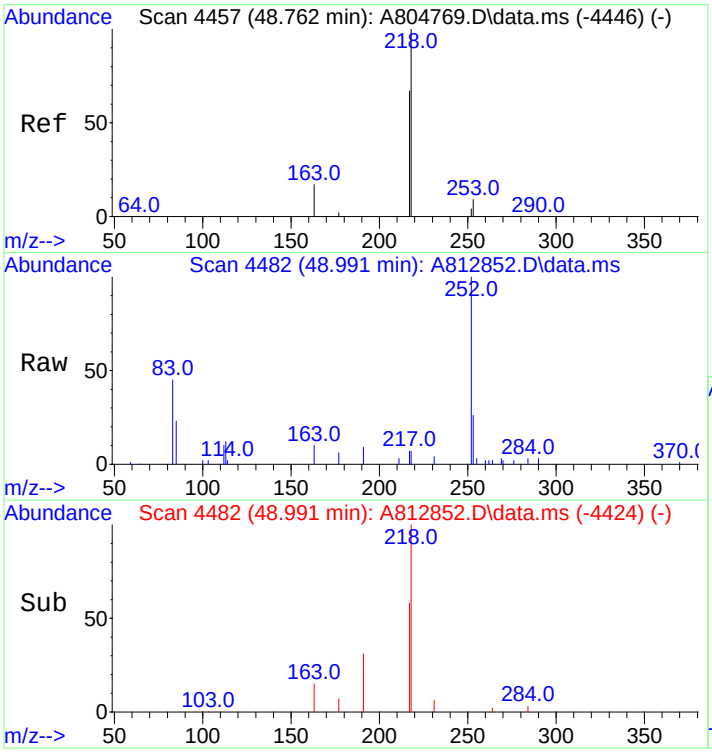




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 349.42 ng/ml m
RT: 47.747 min Scan# 4346
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

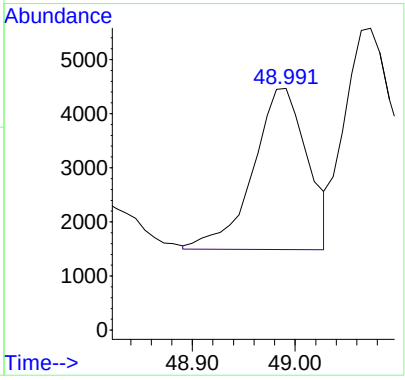
Tgt Ion:218 Resp: 11662

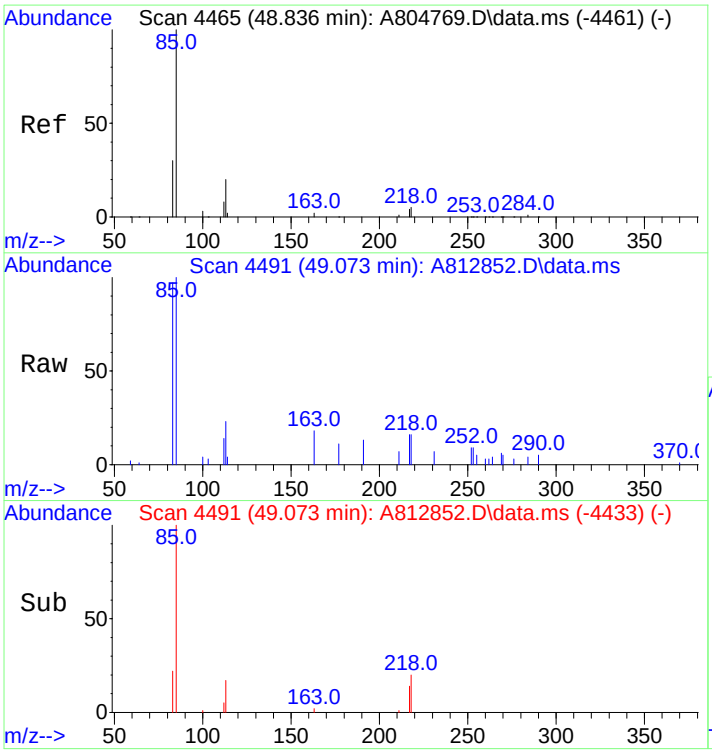




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 329.37 ng/ml
RT: 48.991 min Scan# 4482
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

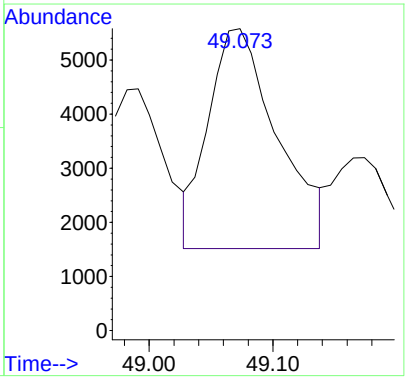
Tgt Ion:218 Resp: 10993

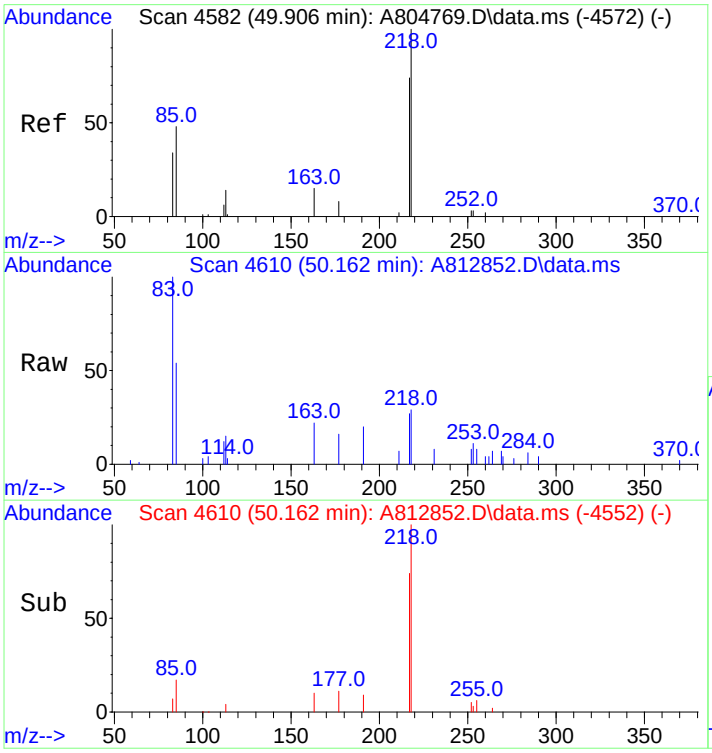




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 474.42 ng/ml m
RT: 49.073 min Scan# 4491
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

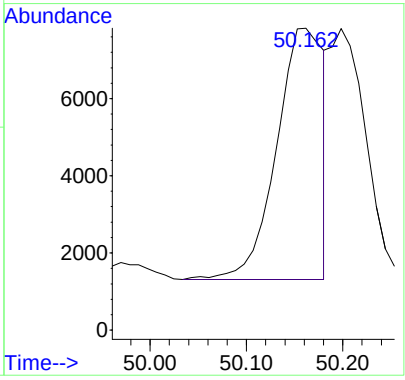
Tgt Ion:218 Resp: 15834

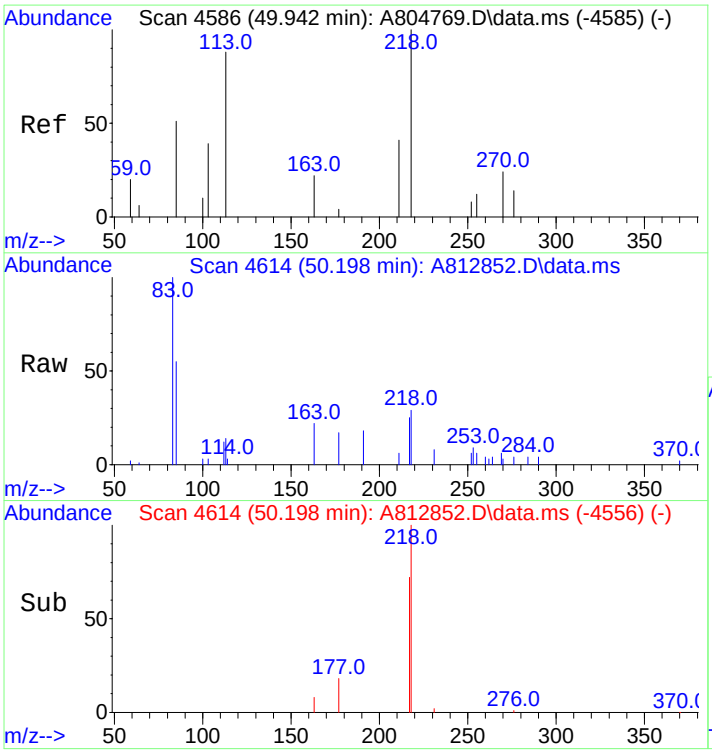




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 664.04 ng/ml
RT: 50.162 min Scan# 4610
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

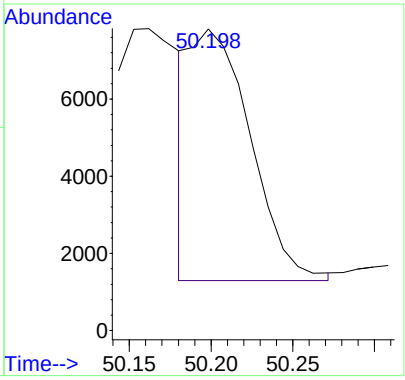
Tgt Ion:218 Resp: 22163

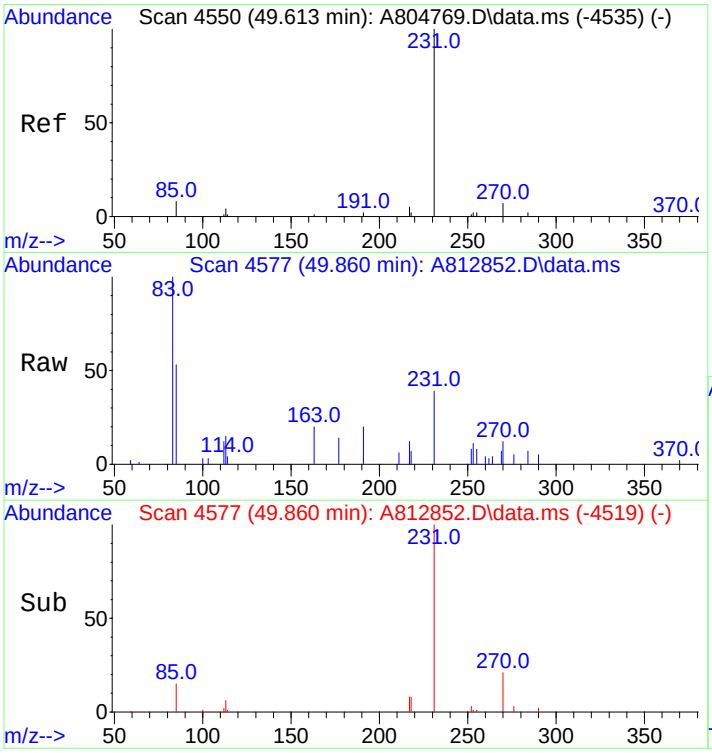




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 504.08 ng/ml m
RT: 50.198 min Scan# 4614
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

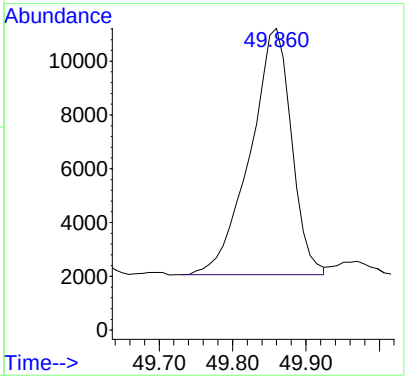
Tgt Ion:218 Resp: 16824

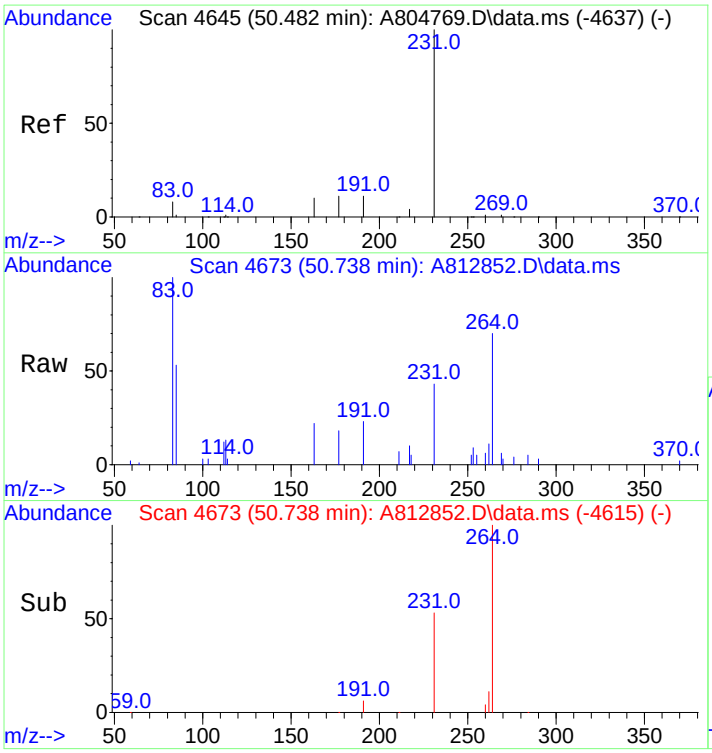




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1083.78 ng/mL
RT: 49.860 min Scan# 4577
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

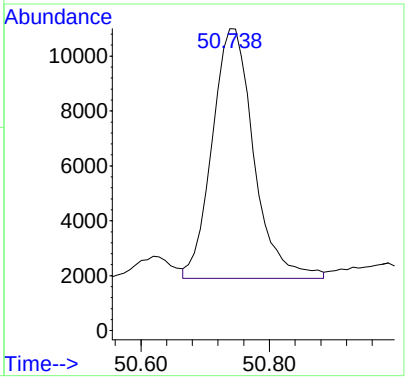
Tgt Ion:231 Resp: 36172

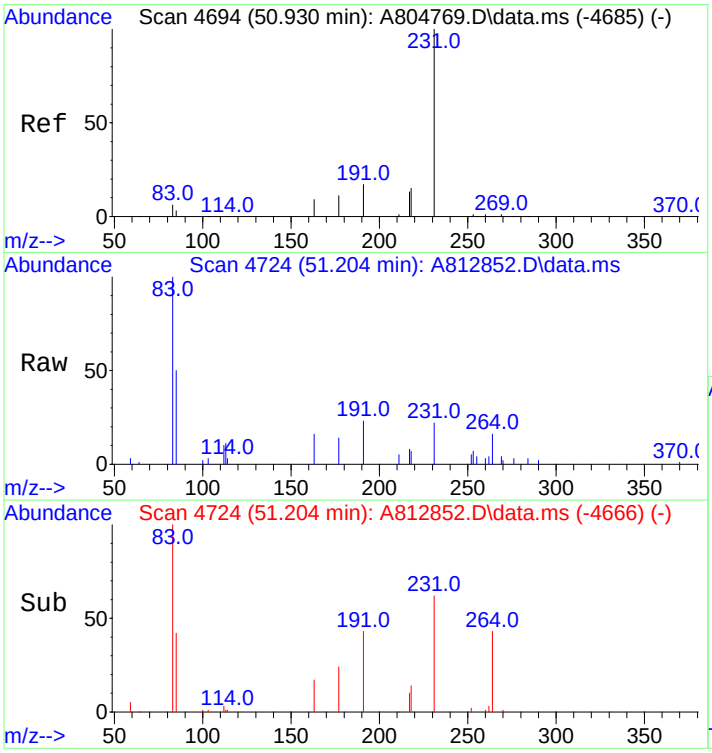




#148
C28,20S-triaromatic steroid
Concen: 1225.89 ng/mL
RT: 50.738 min Scan# 4673
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

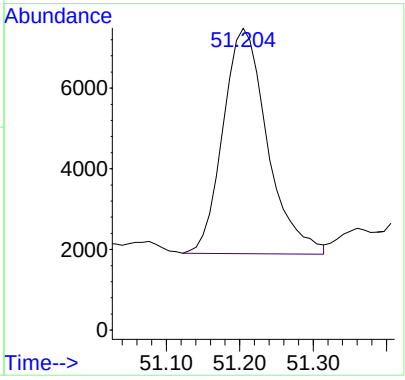
Tgt Ion:231 Resp: 40915

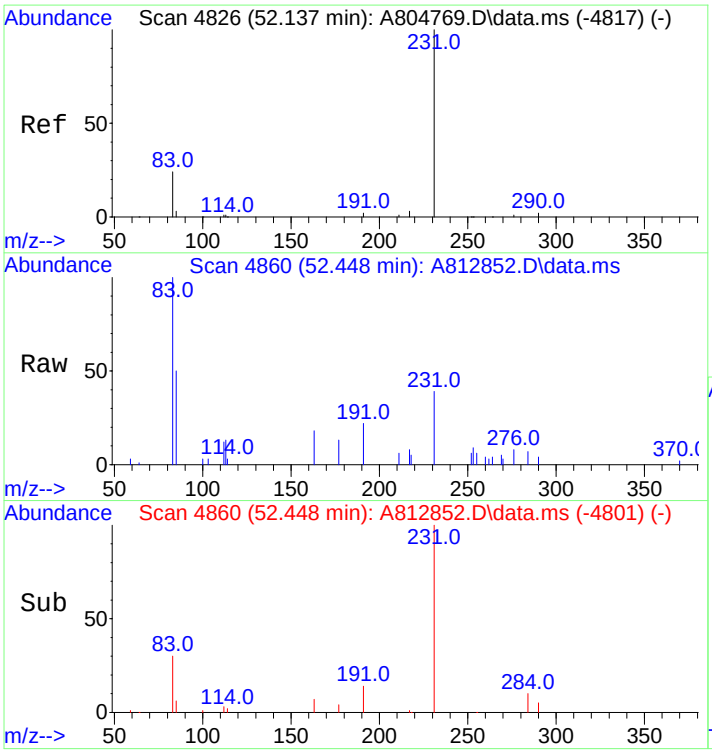




#149
C27,20R-triaromatic steroid
Concen: 706.50 ng/mL
RT: 51.204 min Scan# 4724
Delta R.T. 0.028 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

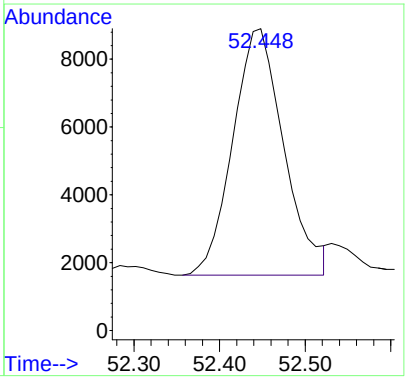
Tgt Ion:231 Resp: 23580





#150
C28,20R-triaromatic steroid
Concen: 903.47 ng/mL
RT: 52.448 min Scan# 4860
Delta R.T. 0.037 min
Lab File: A812852.D
Acq: 20 Nov 2012 4:36 am

Tgt Ion:231 Resp: 30154



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	59013	500.000	ng/mL	0.00
74) Chrysene-d12	43.452	240	95617	500.000	ng/mL	0.04
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	89944	384.589	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 38.46%#			
42) Phenanthrene-d10	32.862	188	88019	484.638	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.46%#			
83) Benzo[b]fluoranthene-d12	47.363	264	84666	464.606	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.46%#			
88) Benzo[a]pyrene-d12	48.570	264	75021	416.689	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.67%#			
129) 5B(H)Cholane - Surr	44.063	217	19995	571.883	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.19%			
Target Compounds						Qvalue
3) trans-Decalin	16.665	138	2213	42.198	ng/mL	100
4) cis-Decalin	17.888	138	116M3	3.019	ng/mL	
5) C1-Decalins	18.143	152	4624M5	88.172	ng/mL	
6) C2-Decalins	19.923	166	8261M5	157.524	ng/mL	
7) C3-Decalins	22.405	180	9824M5	187.328	ng/mL	
8) C4-Decalins	25.791	194	22337M5	425.931	ng/mL	
10) Naphthalene	20.087	128	131796	492.594	ng/mL#	100
11) C1-Naphthalenes	22.779	142	172079M5	643.154	ng/mL	
12) C2-Naphthalenes	25.626	156	325325M5	1215.918	ng/mL	
13) C3-Naphthalenes	28.309	170	475535M5	1777.335	ng/mL	
14) C4-Naphthalenes	30.727	184	442646M5	1654.411	ng/mL	
16) 2-Methylnaphthalene	22.779	142	97033	608.822	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	73090	489.743	ng/mL#	100
18) Benzothiophene	20.306	134	3807M3	17.604	ng/mL	
19) C1-Benzo(b)thiophenes	23.172	148	11930M5	55.164	ng/mL	
20) C2-Benzo(b)thiophenes	25.343	162	30789M5	142.368	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	69096M5	319.500	ng/mL	
22) C4-Benzo(b)thiophenes	29.906	190	81019M5	374.632	ng/mL	
23) Biphenyl	24.668	154	19219	94.781	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.289	156	70815	519.168	ng/mL#	100
25) Dibenzofuran	27.752	168	71092	332.328	ng/mL	98
26) Acenaphthylene	26.384	152	29978	123.439	ng/mL#	100
27) Acenaphthene	27.114	153	53055	366.008	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.665	170	30152M3	256.661	ng/mL	
29) Fluorene	29.130	166	90655M3	557.601	ng/mL	
30) C1-Fluorenes	31.493	180	75408M5	463.820	ng/mL	
31) C2-Fluorenes	33.692	194	170265M5	1047.266	ng/mL	
32) C3-Fluorenes	35.518	208	210438M5	1294.362	ng/mL	
33) Dibenzothiophene	32.451	184	97297	435.200	ng/mL#	71
34) 4-Methyldibenzothiophe...	34.231	198	85448	382.201	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.541	198	75130M3	336.049	ng/mL	
36) 1-Methyldibenzothiophe...	34.997	198	34355	153.667	ng/mL#	100
37) OTP	34.605	198	6300M3	28.179	ng/mL	
38) C1-Dibenzothiophenes	34.231	198	220702M5	987.179	ng/mL	
39) C2-Dibenzothiophenes	35.910	212	393967M5	1762.177	ng/mL	
40) C3-Dibenzothiophenes	37.718	226	446236M5	1995.972	ng/mL	
41) C4-Dibenzothiophenes	39.398	240	297796M5	1332.013	ng/mL	
43) Phenanthrene	32.953	178	970874	4511.856	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.906	192	135121	627.936	ng/mL	99
45) 2-Methylphenanthrene(2MP)	35.025	192	159004	738.925	ng/mL	96
46) 2-Methylanthracene(2MA)	35.180	192	41629M3	193.459	ng/mL	
47) 9/4-Methylphenanthrene...	35.363	192	155676	723.459	ng/mL	86
48) 1-Methylphenanthrene(1MP)	35.454	192	106881M3	496.698	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.025	192	609937M5	2834.506	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50)	C2-Phenanthrenes/Anthr...	37.179	206	648533M5	3013.869	ng/mL	
52)	C3-Phenanthrenes/Anthr...	39.014	220	458067M5	2128.734	ng/mL	
53)	C4-Phenanthrenes/Anthr...	41.187	234	248698M5	1155.752	ng/mL	
55)	Anthracene	33.126	178	173659M3	866.257	ng/mL	
56)	Carbazole	33.792	167	109214	522.110	ng/mL	98
57)	1-Methylphenanthrene	35.454	192	107424M3	704.259	ng/mL	
58)	Fluoranthene	37.727	202	1701619	7677.035	ng/mL	99
59)	Benzo(b)fluorene	40.238	216	97118M3	757.442	ng/mL	
60)	Pyrene	38.613	202	1446146	6450.398	ng/mL	95
61)	C1-Fluoranthenes/Pyrenes	40.000	216	761545M5	3396.800	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	42.046	230	512338M5	2285.235	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.926	244	311328M5	1388.649	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	45.214	258	275703M5	1229.747	ng/mL	
66)	Naphthobenzothiophene	42.456	234	140821M3	676.636	ng/ml	
67)	Naphthobenzothiophene-...	42.456	234	141707M3	680.893	ng/mL	
68)	Naphthobenzothiophene-...	42.794	234	31063M3	149.256	ng/mL	
69)	Naphthobenzothiophene-...	43.095	234	37487M3	180.123	ng/mL	
70)	C1-Naphthobenzothiophenes	43.853	248	194966M5	936.799	ng/ml	
71)	C2-Naphthobenzothiophenes	45.863	262	243371M5	1169.382	ng/ml	
72)	C3-Naphthobenzothiophenes	47.473	276	189424M5	910.171	ng/ml	
73)	C4-Naphthobenzothiophenes	48.561	290	118906M5	571.336	ng/mL	
75)	Benz[a]anthracene	43.388	228	582167	2777.320	ng/mL	98
77)	Chrysene/Triphenylene	43.552	228	739462	3485.085	ng/mL	99
78)	C1-Chrysenes	45.022	242	354082M5	1668.789	ng/mL	
79)	C2-Chrysenes	46.723	256	276309M5	1302.245	ng/mL	
80)	BBF-D12 Surr BKGD	47.354	256	3785	17.839	ng/mL	100
81)	C3-Chrysenes	47.784	270	224423M5	1057.706	ng/mL	
82)	C4-Chrysenes	49.860	284	125419M5	591.100	ng/mL	
84)	Benzo[b]fluoranthene	47.454	252	707669	3143.465	ng/mL	99
85)	Benzo[j]+[k]fluoranthene	47.518	252	663886	2702.747	ng/mL	96
86)	Benzo[a]fluoranthene	47.839	252	111086	452.242	ng/mL#	1
87)	Benzo[e]pyrene	48.470	252	538631	2322.084	ng/mL	96
89)	Benzo[a]pyrene	48.662	252	627456	2924.257	ng/mL	94
90)	Perylene	48.982	252	202628	864.542	ng/mL	95
91)	Indeno[1,2,3-cd]pyrene	53.600	276	473828M3	2078.835	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.646	278	118358M6	529.755	ng/mL	
93)	Benzo[g,h,i]perylene	54.944	276	520763	2013.273	ng/mL	100
94)	Hopane (T19)	52.677	191	135884	1892.279	ng/mL#	88
96)	C23 Tricyclic Terpane ...	41.087	191	27730	386.159	ng/ml	100
97)	C24 Tricyclic Terpane ...	41.808	191	18248	254.116	ng/ml	100
98)	C25 Tricyclic Terpane ...	43.296	191	22689M3	315.960	ng/ml	
99)	C24 Tetracyclic Terpan...	44.620	191	10311M3	143.588	ng/ml	
100)	C26 Tricyclic Terpane-...	44.356	191	9012M3	125.498	ng/ml	
101)	C26 Tricyclic Terpane-...	44.447	191	7265M3	101.170	ng/ml	
102)	C28 Tricyclic Terpane-...	46.732	191	9606	133.770	ng/ml	100
103)	C28 Tricyclic Terpane-...	46.897	191	8694	121.070	ng/ml	100
104)	C29 Tricyclic Terpane-...	47.427	191	9603	133.728	ng/ml	100
105)	C29 Tricyclic Terpane-...	47.628	191	9997M3	139.215	ng/ml	
106)	18a-22,29,30-Trisnorne...	48.790	191	23728	330.429	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.872	191	9406M3	130.985	ng/mL	
108)	C30 Tricyclic Terpane-22R	49.119	191	7441M3	103.621	ng/mL	
109)	17a(H)-22,29,30-Trisno...	49.348	191	32127M3	447.391	ng/ml	
110)	17a/b,21b/a 28,30-Bisn...	50.573	191	10052	139.981	ng/ml	100
111)	17a(H),21b(H)-25-Norho...	50.354	191	5588M3	77.817	ng/ml	
112)	30-Norhopane (T15)	51.259	191	91294	1271.332	ng/ml	100
113)	18a(H)-30-Norneohopane...	51.369	191	24645M3	343.199	ng/ml	
114)	17a(H)-Diahopane (X)	51.497	191	7688M3	107.061	ng/ml	
115)	30-Normoretane (T17)	52.064	191	14021	195.252	ng/ml	100
116)	18a(H)&18b(H)-Oleanane...	52.485	191	8901	123.953	ng/ml	100
117)	Moretane (T20)	53.381	191	24485M3	340.971	ng/ml	
118)	30-Homohopane-22S (T21)	54.514	191	49018	682.610	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812853.D
Acq On : 20 Nov 2012 6:00 am
Operator : AC
Sample : 1210082-06
Misc : 1x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Nov 20 15:16:24 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119)	30-Homohopane-22R (T22)	54.752	191		42513	592.023	ng/ml	100
120)	Gammacerane/C32-diahopane	55.318	191		17140	238.686	ng/mL	100
121)	30,31-Bishomohopane-22...	56.104	191	G	53216	741.070	ng/ml	100
122)	30,31-Bishomohopane-22...	56.524	191		22715	316.322	ng/ml	100
123)	30,31-Trishomohopane-2...	58.334	191		28945	403.079	ng/ml	100
124)	30,31-Trishomohopane-2...	58.973	191		15686	218.438	ng/ml	100
125)	Tetrakishomohopane-22S...	61.075	191		24904	346.805	ng/ml	100
126)	Tetrakishomohopane-22R...	61.925	191	G	33418	465.369	ng/ml	100
127)	Pentakishomohopane-22S...	64.328	191		16922	235.651	ng/ml	100
128)	Pentakishomohopane-22R...	65.653	191		13420	186.883	ng/ml	100
130)	13b(H),17a(H)-20S-Diac...	45.570	217		9991	285.755	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.991	217		4694M3	134.254	ng/ml	
132)	13b,17a-20S-Methyldiac...	46.686	217		6045M3	172.895	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.564	217		19112	546.628	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.104	217		19552	559.212	ng/ml	100
135)	Unknown Sterane (S18)	48.387	217		4924	140.833	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.653	217		573	16.389	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.817	217		9051	258.870	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.549	217		7296M3	208.675	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.915	217		14450M3	413.289	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.848	217		12744M3	364.495	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.665	218		10145M3	290.160	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.747	218		10898M3	311.697	ng/ml	
143)	14b,17b-20R-Methylchol...	48.991	218		9916	283.610	ng/ml	100
144)	14b,17b-20S-Methylchol...	49.073	218		15421	441.060	ng/ml	100
145)	14b(H),17b(H)-20R-Ethy...	50.162	218		21973M3	628.456	ng/ml	
146)	14b(H),17b(H)-20S-Ethy...	50.198	218		13727M3	392.610	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.860	231		34685	992.035	ng/mL	100
148)	C28,20S-triaromatic st...	50.747	231		41293	1181.033	ng/mL	100
149)	C27,20R-triaromatic st...	51.214	231		23375M3	668.555	ng/mL	
150)	C28,20R-triaromatic st...	52.448	231		29065M3	831.296	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

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QLast Update : Mon Nov 19 13:47:27 2012
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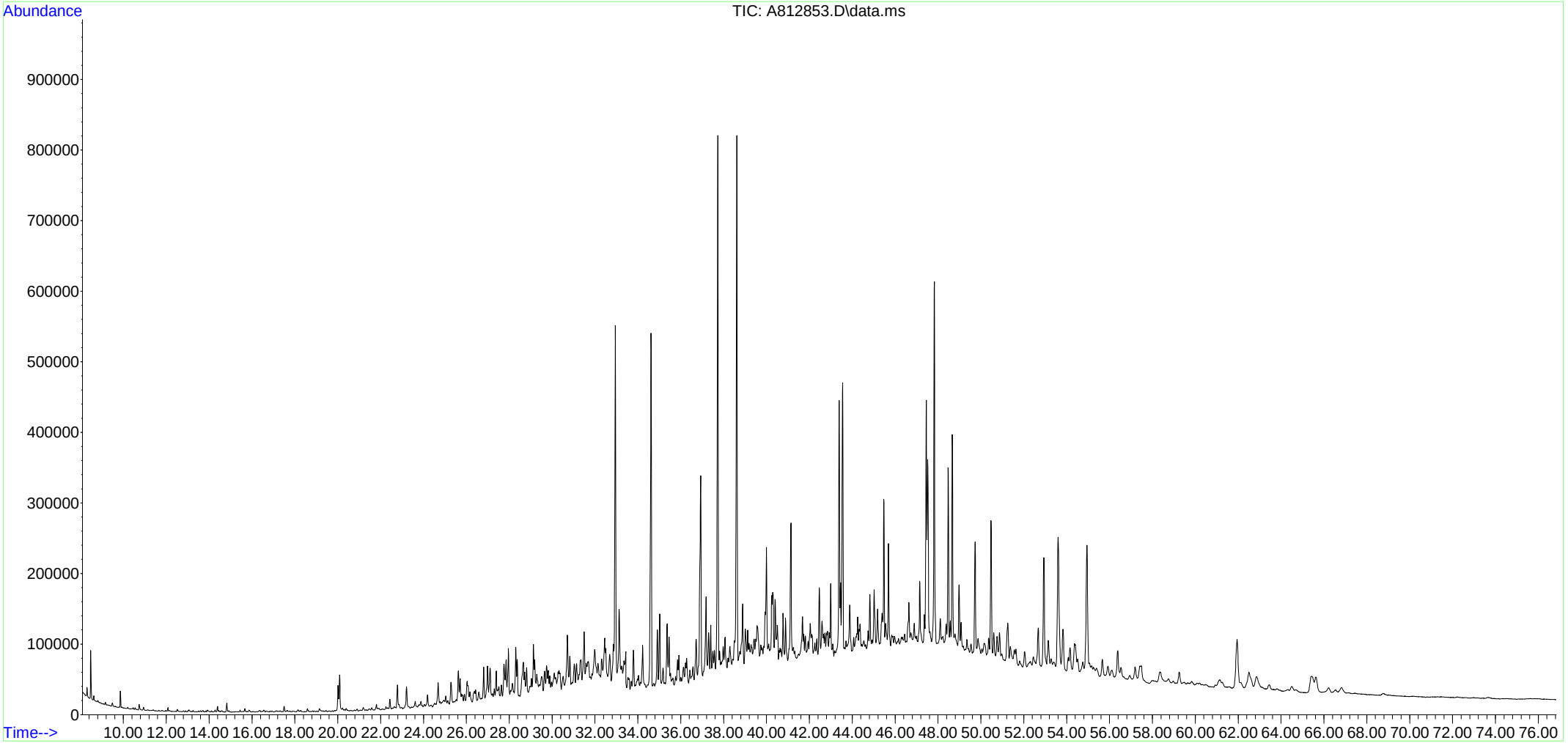
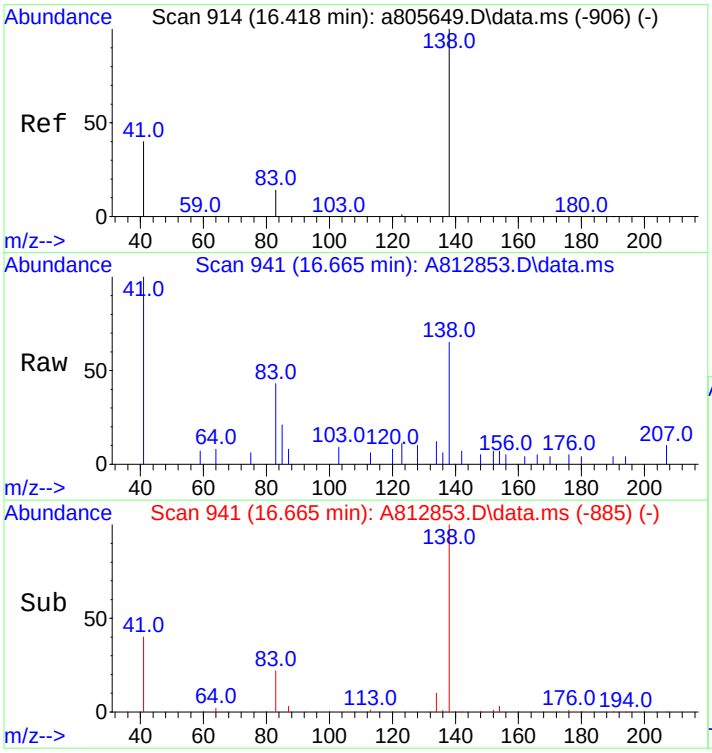
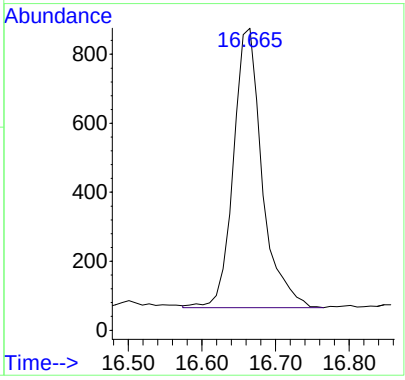
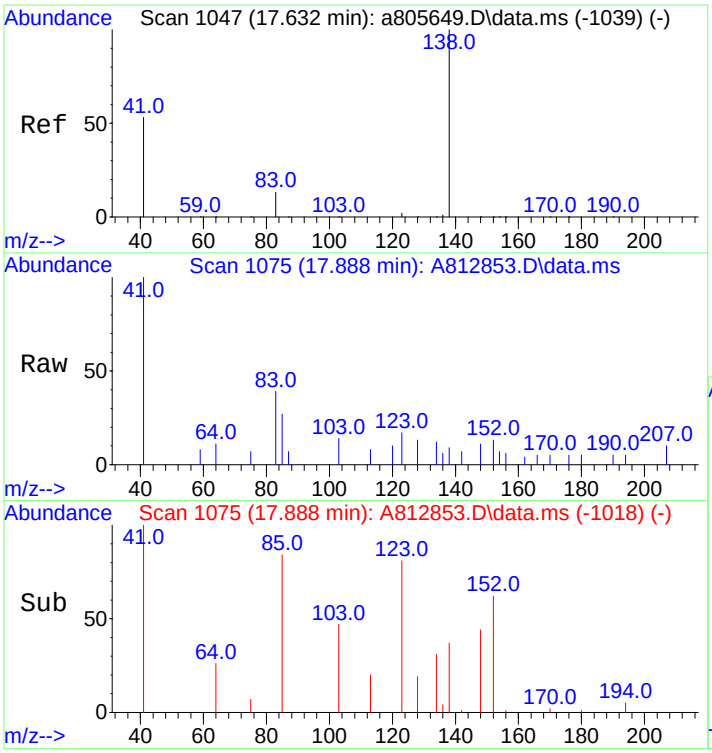




#3
trans-Decalin
Concen: 42.20 ng/mL
RT: 16.665 min Scan# 941
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

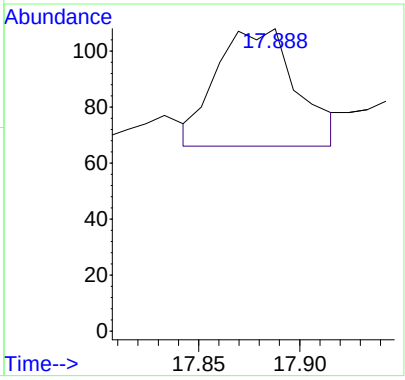
Tgt Ion:138 Resp: 2213

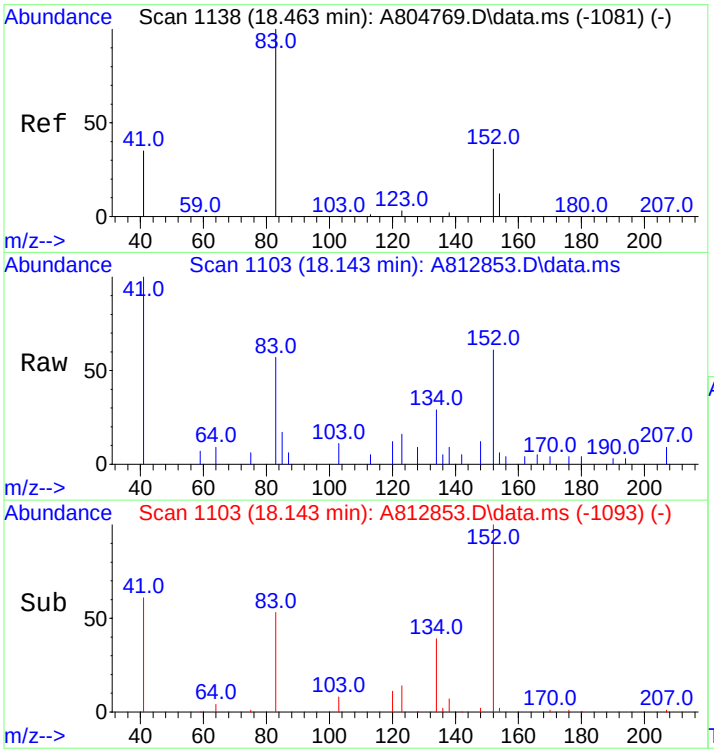




#4
cis-Decalin
Concen: 3.02 ng/mL m
RT: 17.888 min Scan# 1075
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

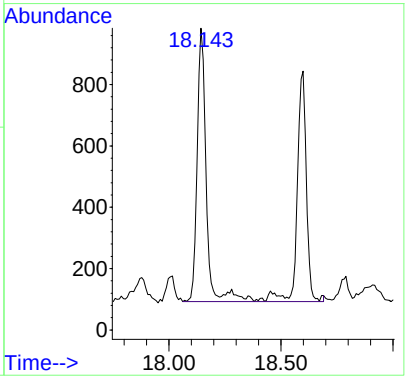
Tgt Ion:138 Resp: 116

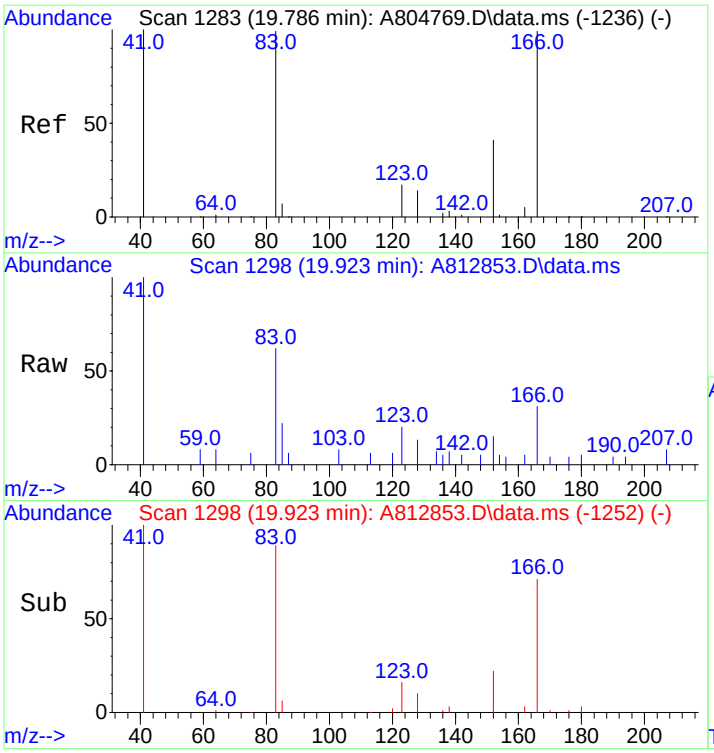




#5
C1-Decalins
Concen: 88.17 ng/mL m
RT: 18.143 min Scan# 1103
Delta R.T. -0.447 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

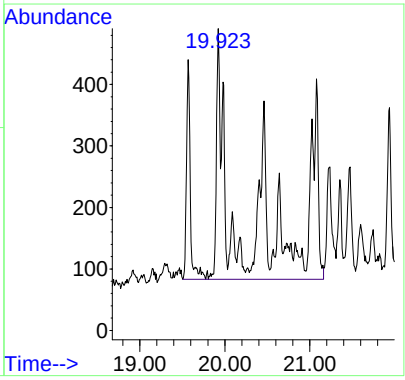
Tgt Ion:152 Resp: 4624

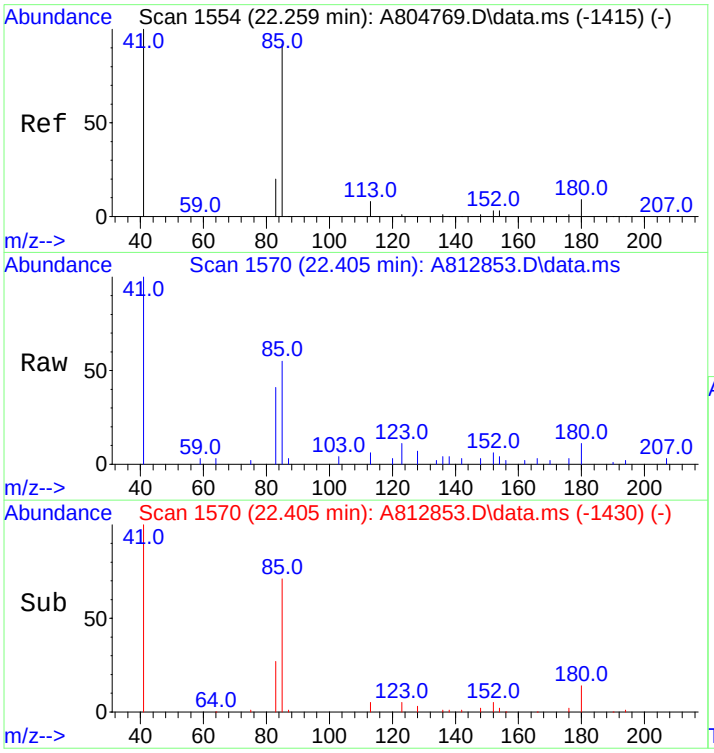




#6
C2-Decalins
Concen: 157.52 ng/mL m
RT: 19.923 min Scan# 1298
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

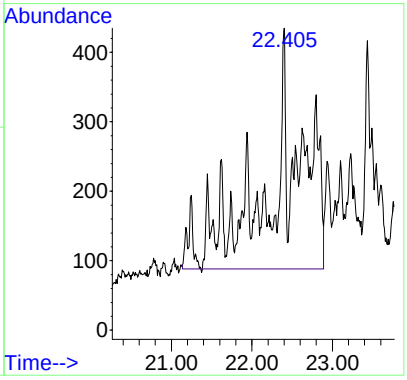
Tgt Ion:166 Resp: 8261

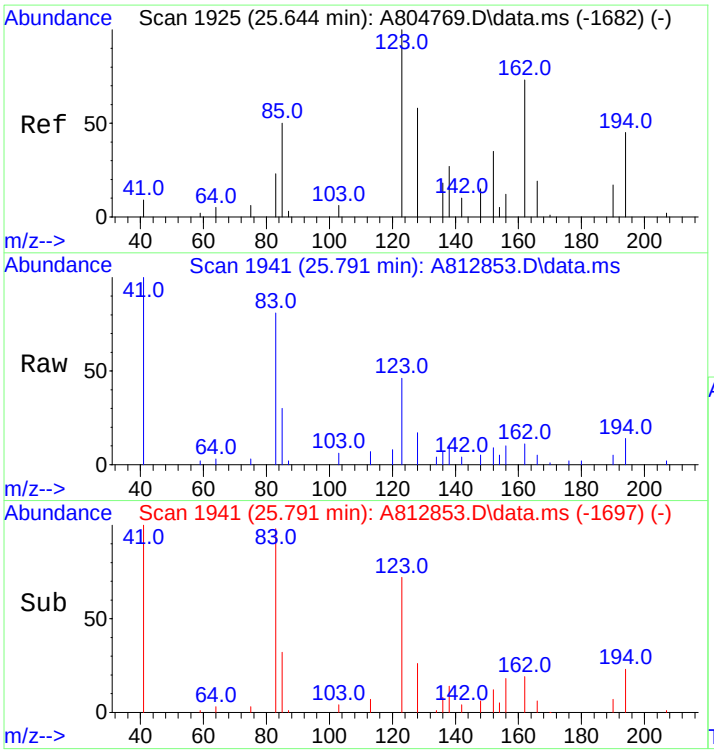




#7
C3-Decalins
Concen: 187.33 ng/mL m
RT: 22.405 min Scan# 1570
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

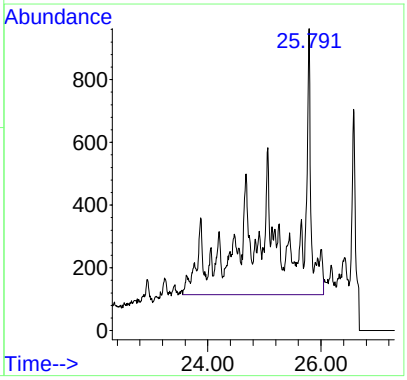
Tgt Ion:180 Resp: 9824

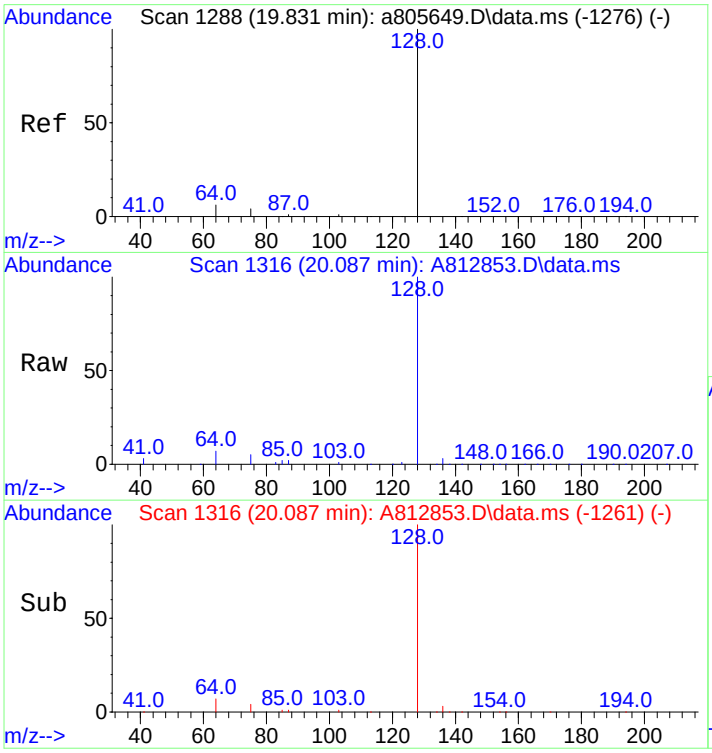




#8
C4-Decalins
Concen: 425.93 ng/mL m
RT: 25.791 min Scan# 1941
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:194 Resp: 22337

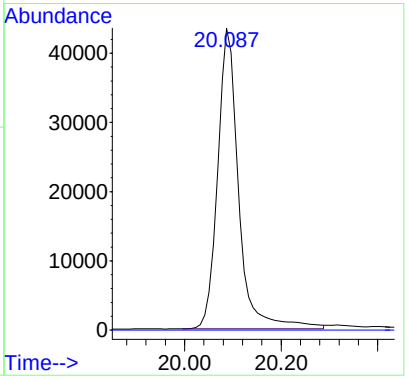


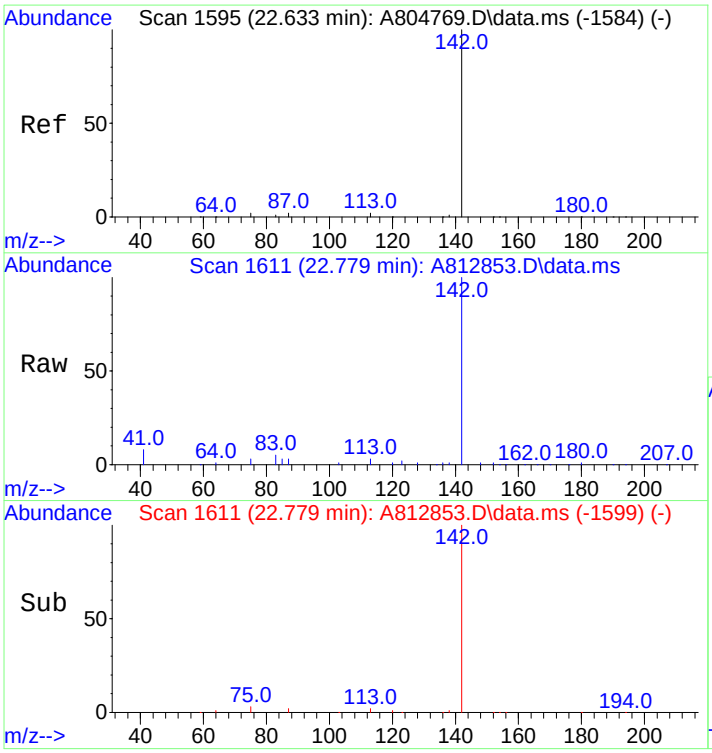


#10
Naphthalene
Concen: 492.59 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:128 Resp: 131796

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

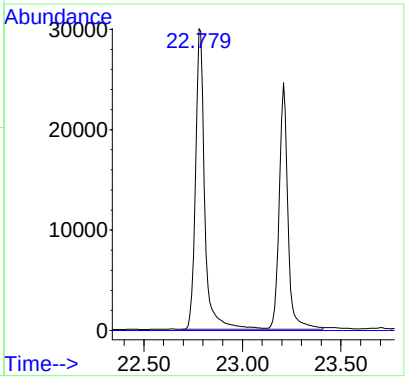


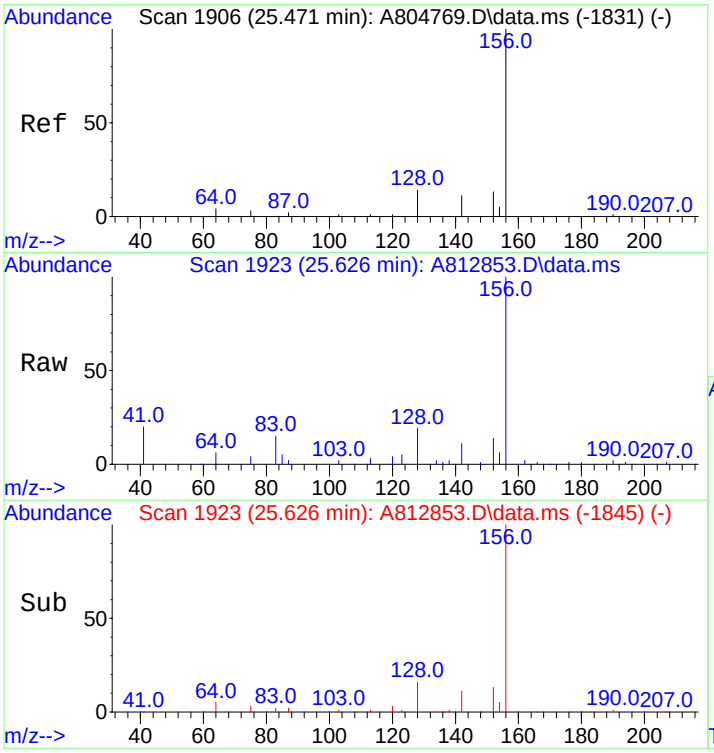


#11
C1-Naphthalenes
Concen: 643.15 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:142 Resp: 172079

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

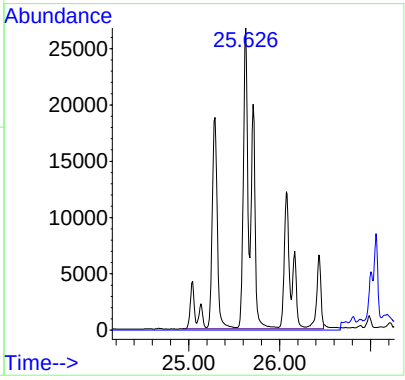


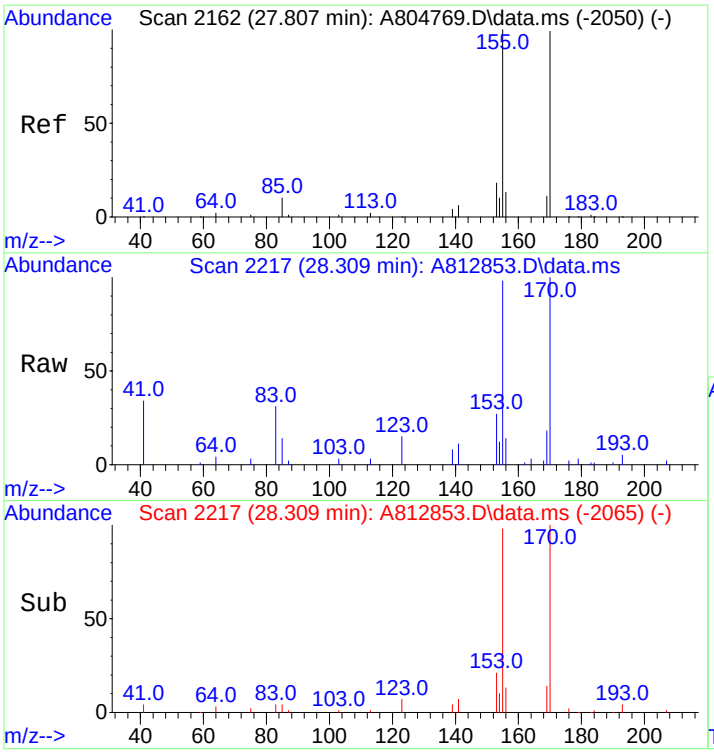


#12
C2-Naphthalenes
Concen: 1215.92 ng/mL m
RT: 25.626 min Scan# 1923
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:156 Resp: 325325

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

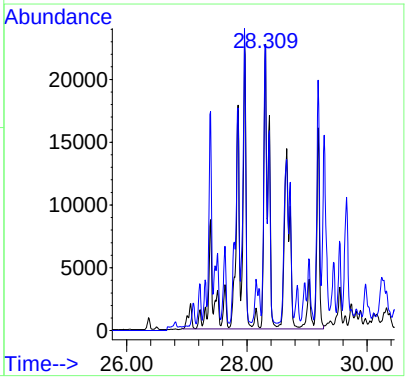


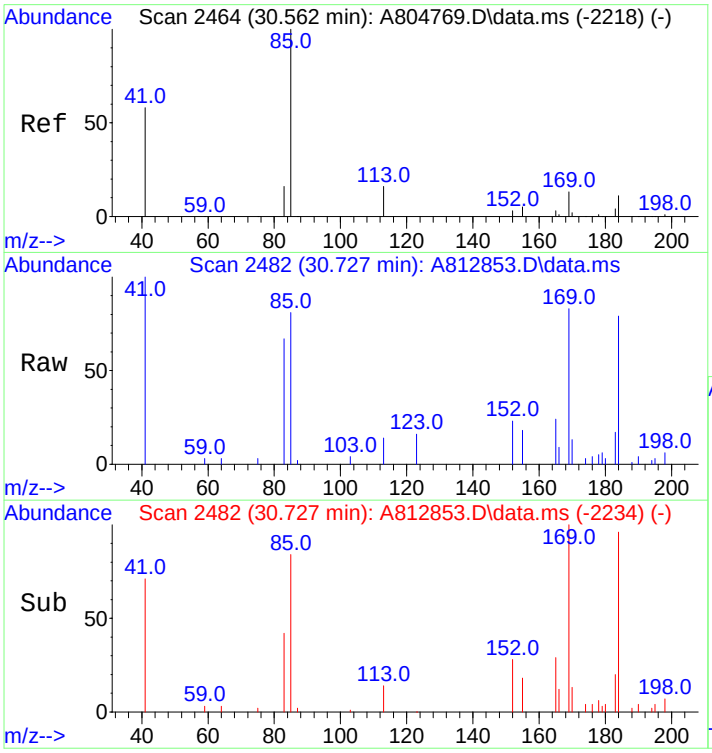


#13
C3-Naphthalenes
Concen: 1777.34 ng/mL m
RT: 28.309 min Scan# 2217
Delta R.T. 0.356 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:170 Resp: 475535

Ion	Ratio	Lower	Upper
170	100		
155	15.7	80.2	120.4#

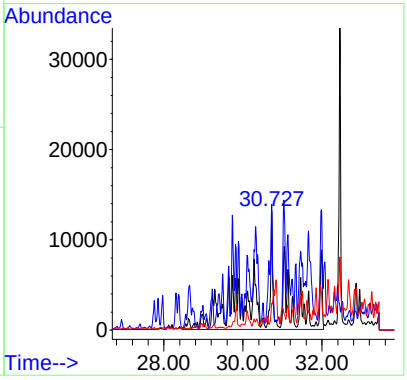


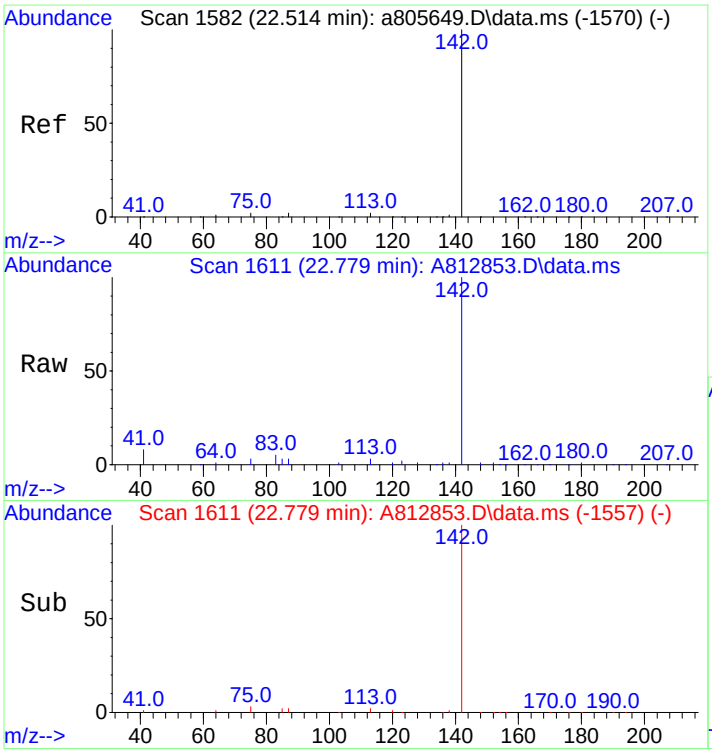


#14
C4-Naphthalenes
Concen: 1654.41 ng/mL m
RT: 30.727 min Scan# 2482
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:184 Resp: 442646

Ion	Ratio	Lower	Upper
184	100		
169	10.0	108.2	162.2#
183	0.0	29.7	44.5#

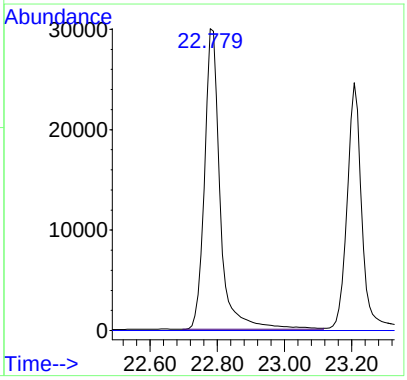


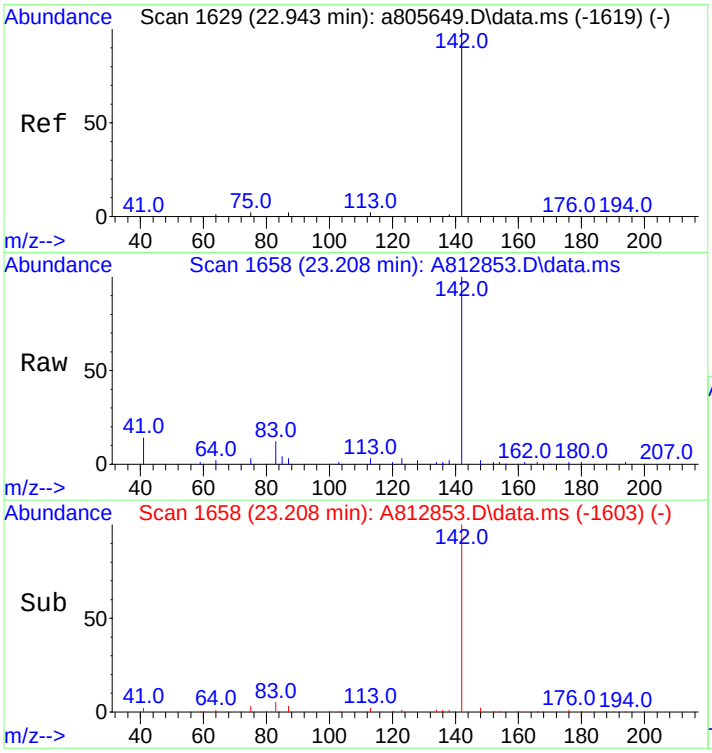


#16
2-Methylnaphthalene
Concen: 608.82 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:142 Resp: 97033

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

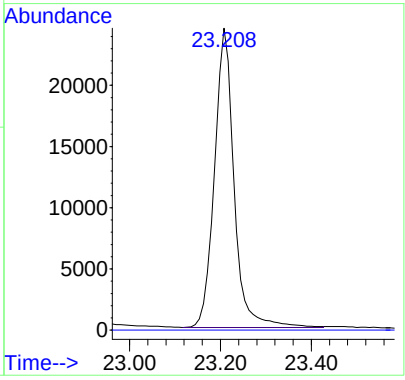


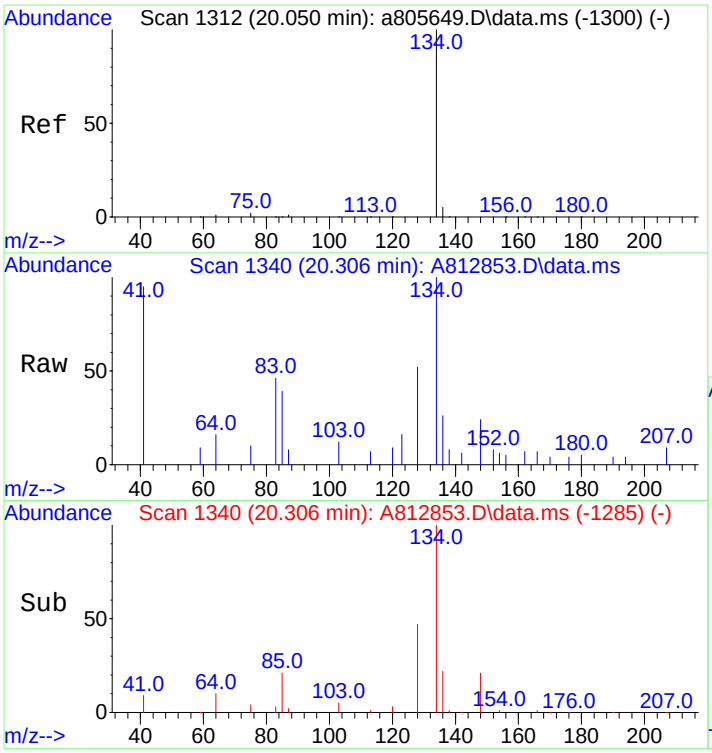


#17
1-Methylnaphthalene
Concen: 489.74 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:142 Resp: 73090

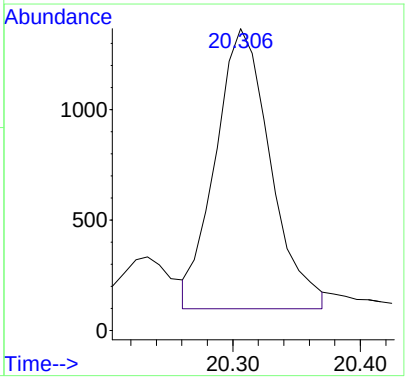
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

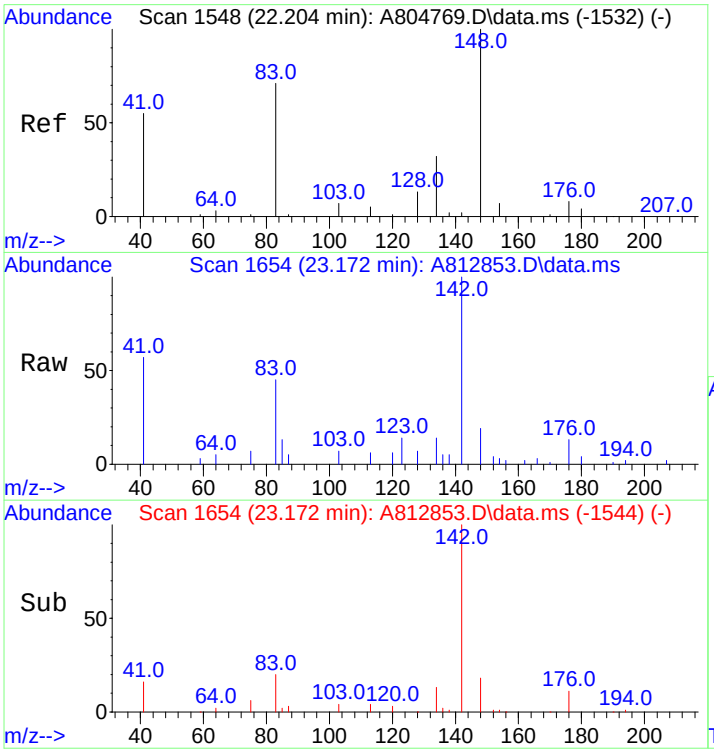




#18
Benzothiophene
Concen: 17.60 ng/mL m
RT: 20.306 min Scan# 1340
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

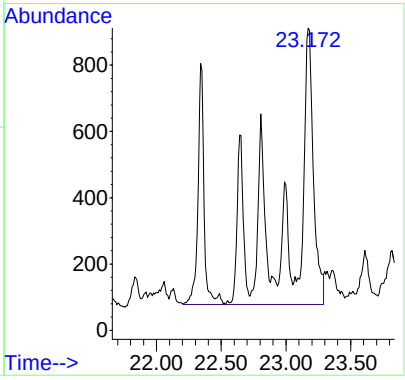
Tgt Ion:134 Resp: 3807

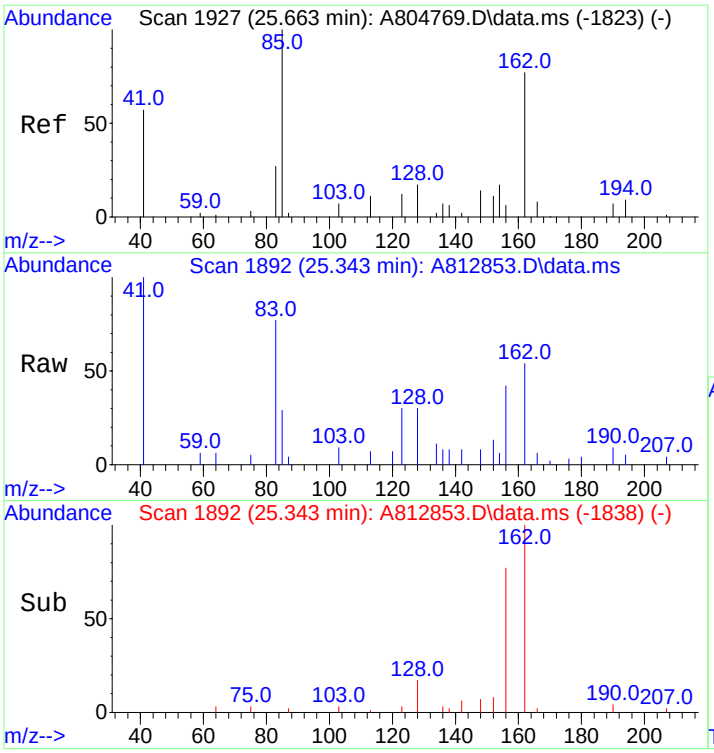




#19
C1-Benzo(b)thiophenes
Concen: 55.16 ng/mL m
RT: 23.172 min Scan# 1654
Delta R.T. 0.830 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

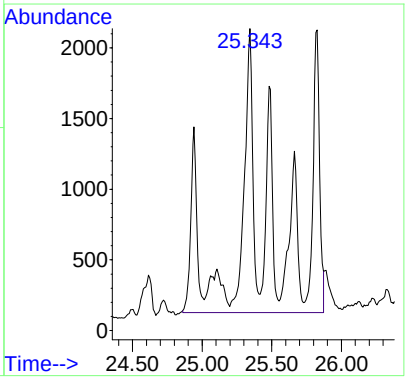
Tgt Ion:148 Resp: 11930

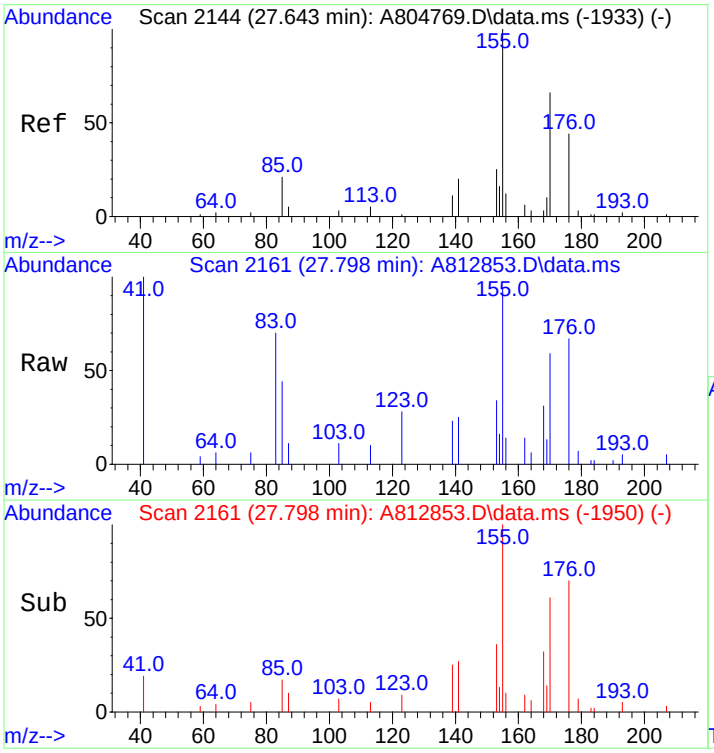




#20
C2-Benzo(b)thiophenes
Concen: 142.37 ng/mL m
RT: 25.343 min Scan# 1892
Delta R.T. -0.465 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

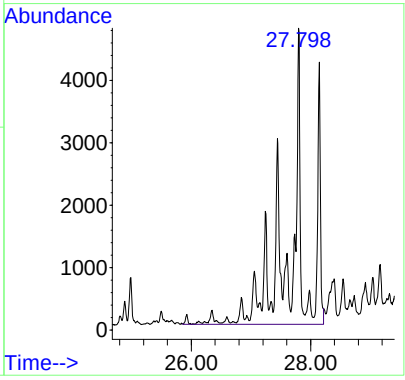
Tgt Ion:162 Resp: 30789

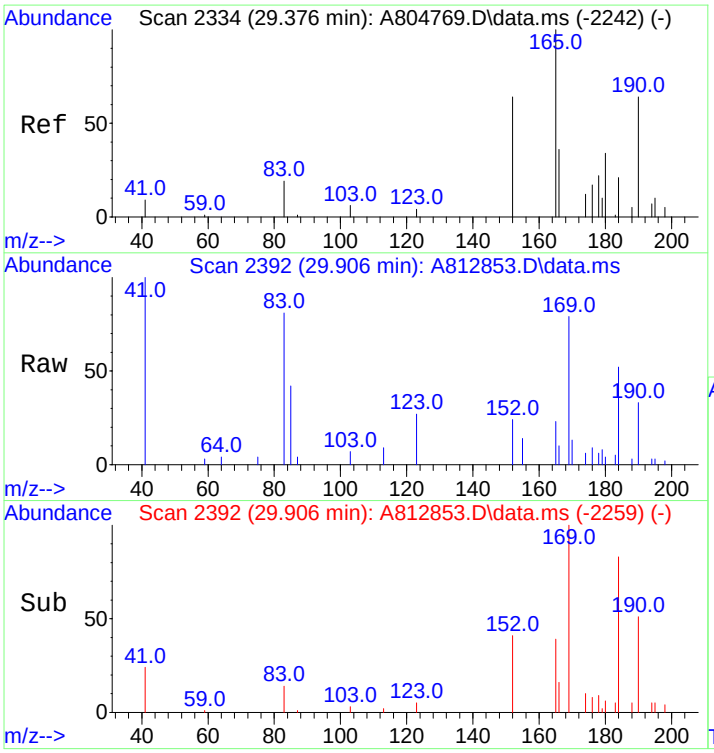




#21
C3-Benzo(b)thiophenes
Concen: 319.50 ng/mL m
RT: 27.798 min Scan# 2161
Delta R.T. 0.016 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

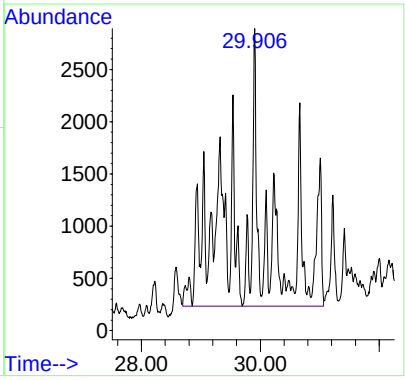
Tgt Ion:176 Resp: 69096

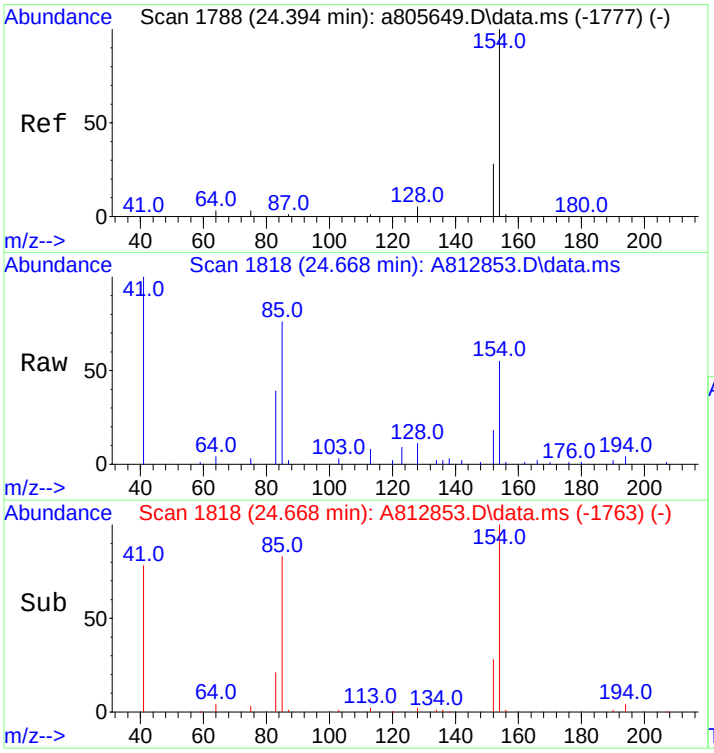




#22
C4-Benzo(b)thiophenes
Concen: 374.63 ng/mL m
RT: 29.906 min Scan# 2392
Delta R.T. 0.374 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:190 Resp: 81019

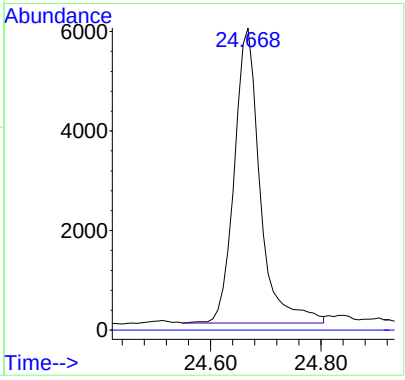


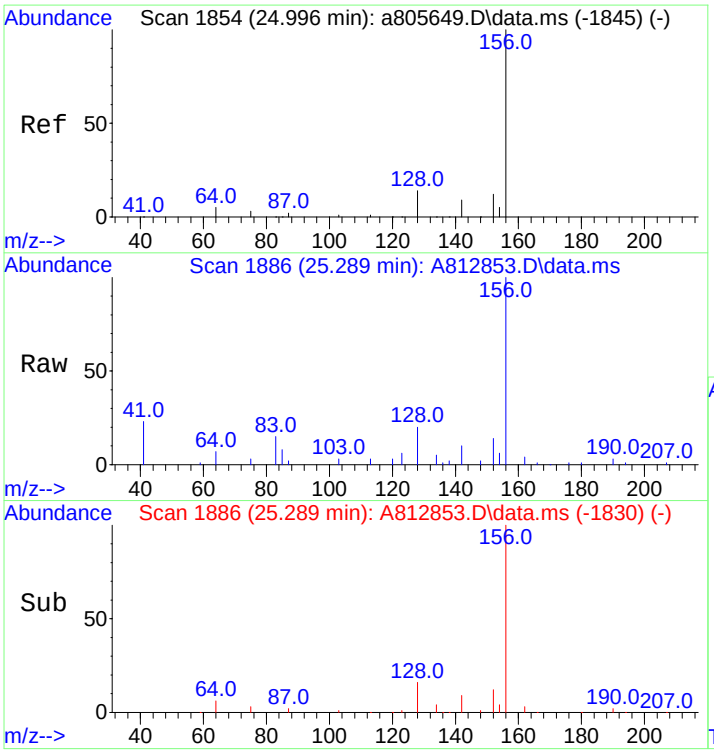


#23
Biphenyl
Concen: 94.78 ng/mL
RT: 24.668 min Scan# 1818
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:154 Resp: 19219

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

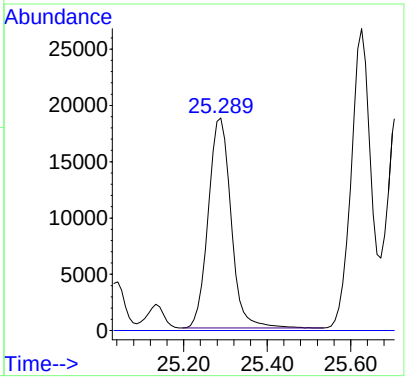


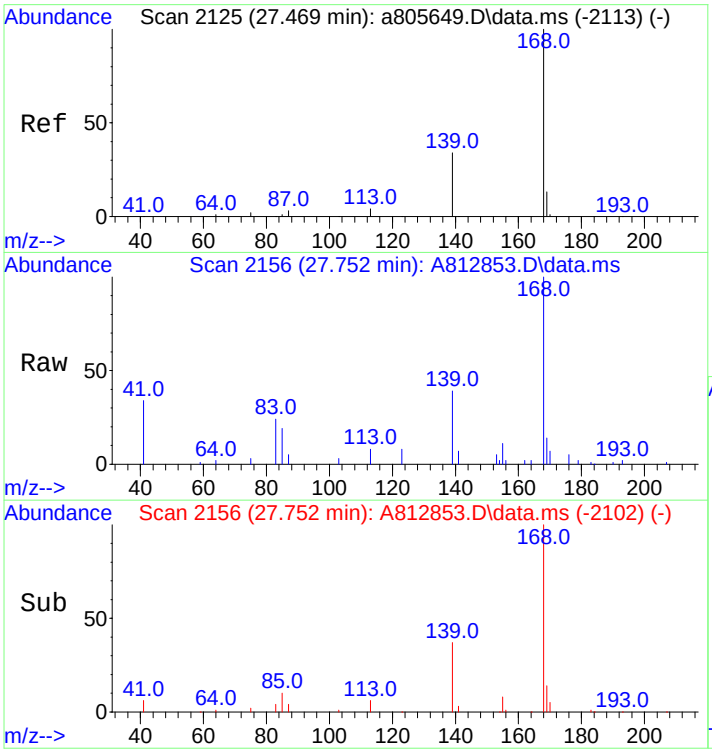


#24
2,6-Dimethylnaphthalene
Concen: 519.17 ng/mL
RT: 25.289 min Scan# 1886
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:156 Resp: 70815

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

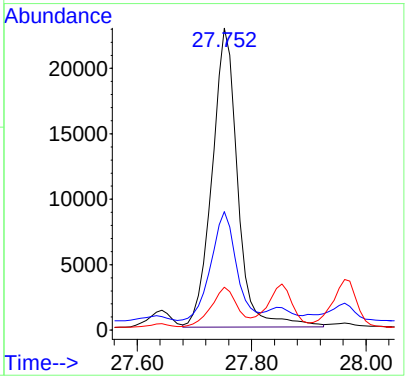


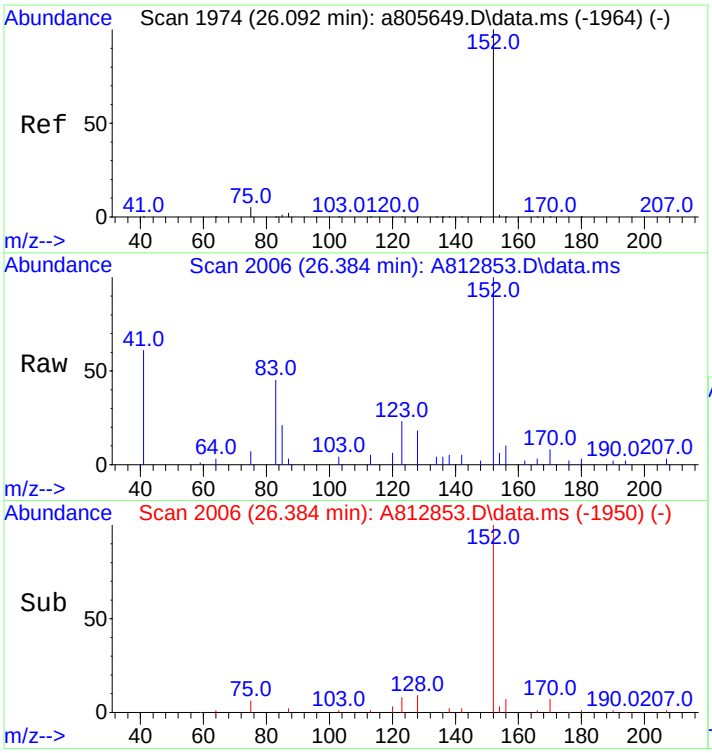


#25
Dibenzofuran
Concen: 332.33 ng/mL
RT: 27.752 min Scan# 2156
Delta R.T. -0.010 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:168 Resp: 71092

Ion	Ratio	Lower	Upper
168	100		
139	36.3	28.0	42.0
169	13.7	10.6	15.8

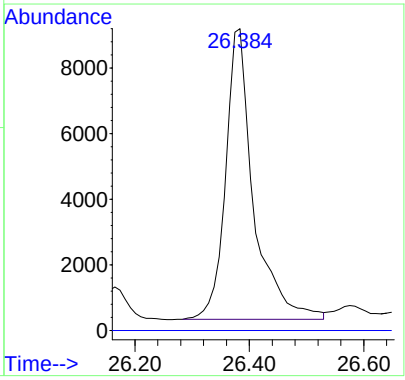


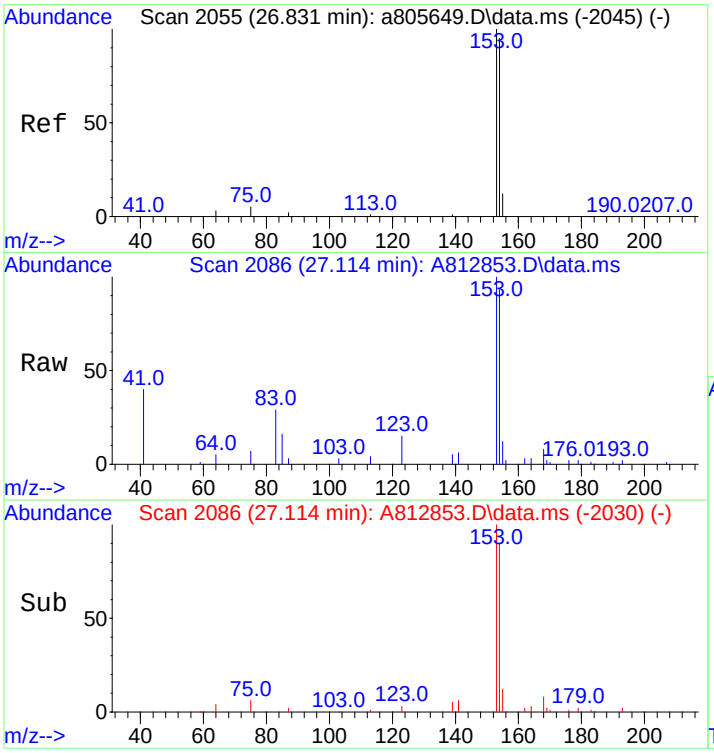


#26
Acenaphthylene
Concen: 123.44 ng/mL
RT: 26.384 min Scan# 2006
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:152 Resp: 29978

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

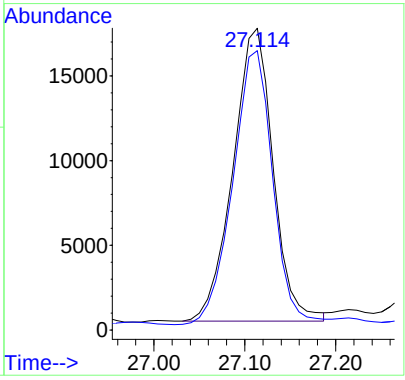


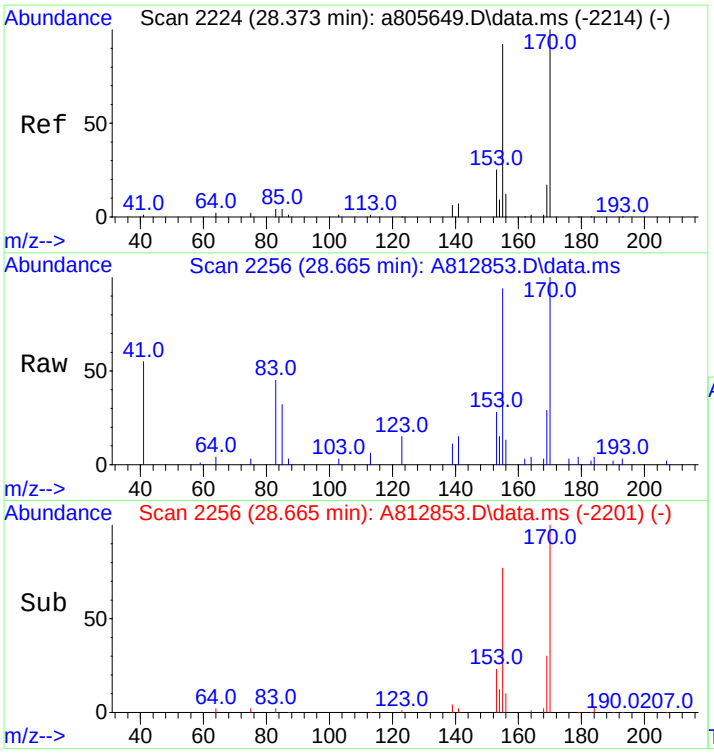


#27
Acenaphthene
Concen: 366.01 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:153 Resp: 53055

Ion	Ratio	Lower	Upper
153	100		
154	92.8	75.4	113.2

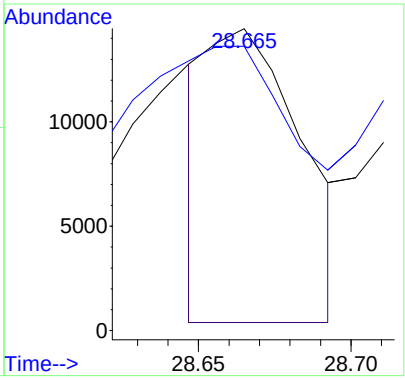


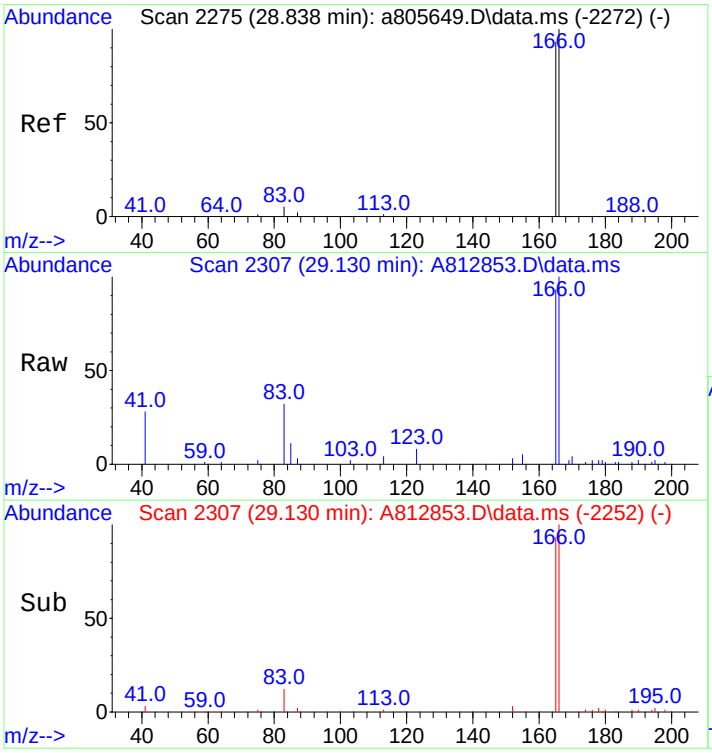


#28
2,3,5-Trimethylnaphthalene
Concen: 256.66 ng/mL m
RT: 28.665 min Scan# 2256
Delta R.T. -0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:170 Resp: 30152

Ion	Ratio	Lower	Upper
170	100		
155	196.3	71.7	107.5#

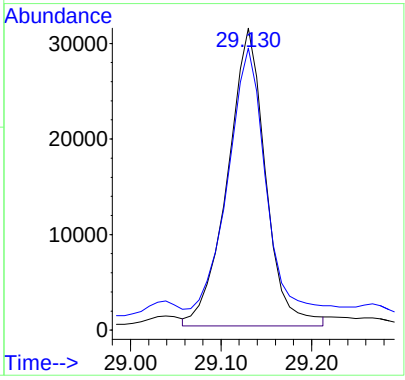


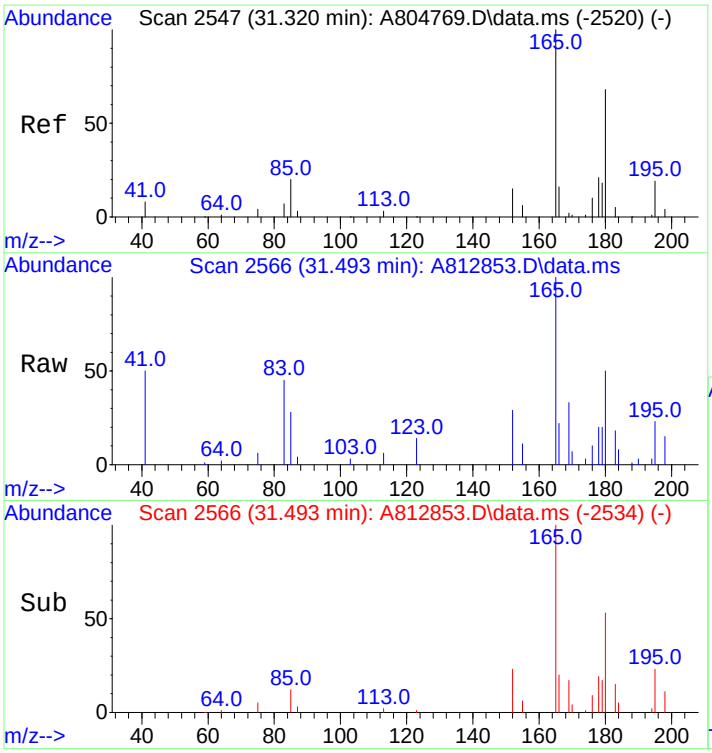


#29
Fluorene
Concen: 557.60 ng/mL m
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:166 Resp: 90655

Ion	Ratio	Lower	Upper
166	100		
165	89.2	74.2	111.2

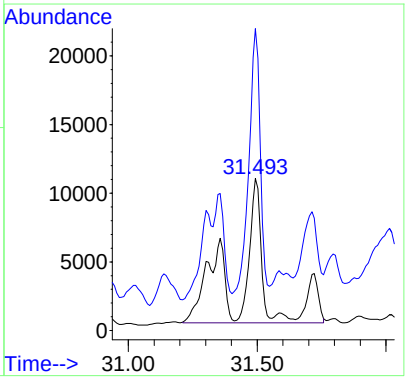


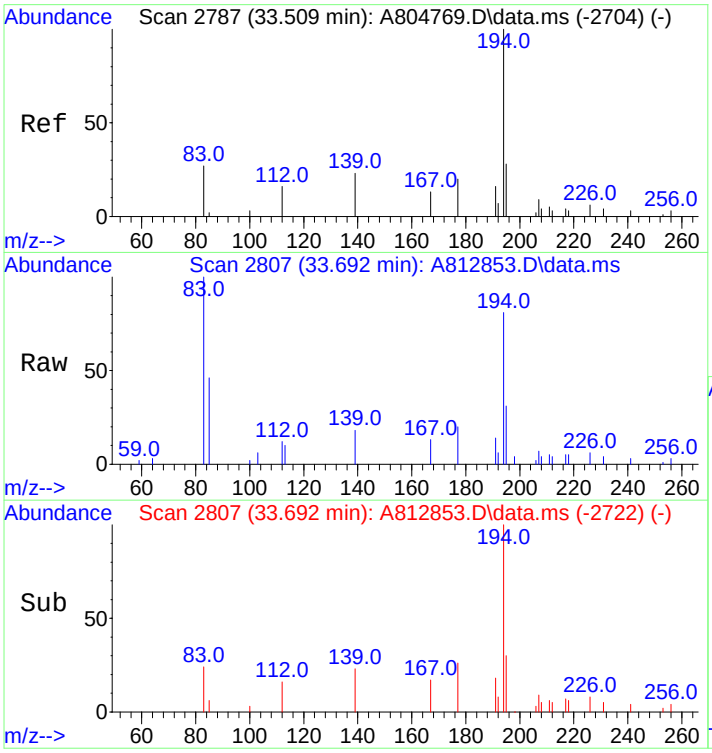


#30
C1-Fluorenes
Concen: 463.82 ng/mL m
RT: 31.493 min Scan# 2566
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:180 Resp: 75408

Ion	Ratio	Lower	Upper
180	100		
165	26.0	122.4	183.6#

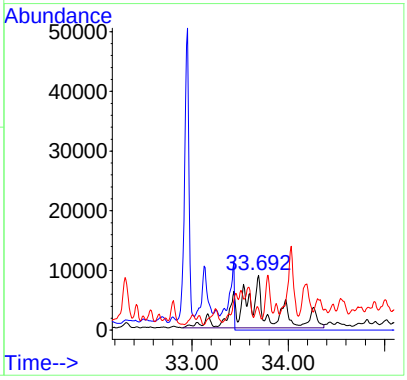


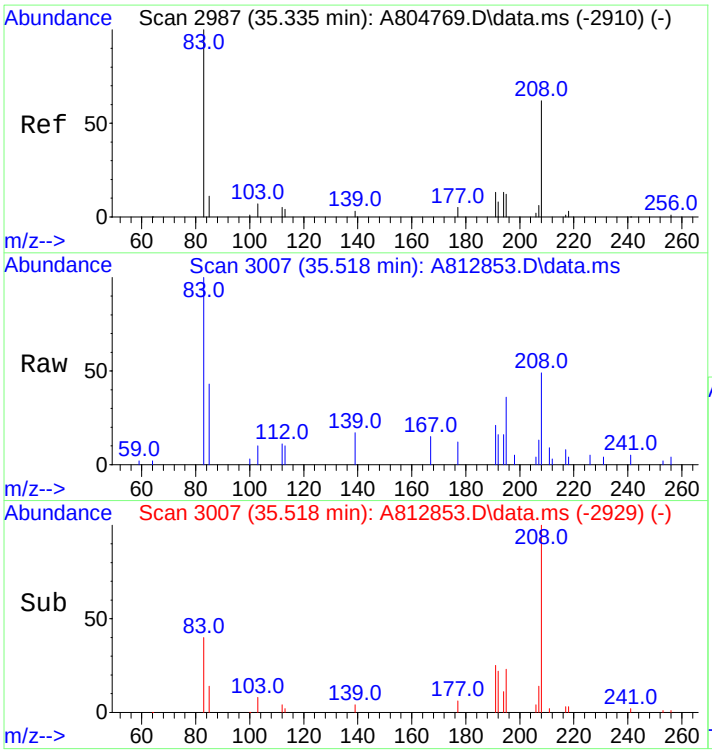


#31
C2-Fluorenes
Concen: 1047.27 ng/mL m
RT: 33.692 min Scan# 2807
Delta R.T. 0.086 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:194 Resp: 170265

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	10.3	27.4	41.0#

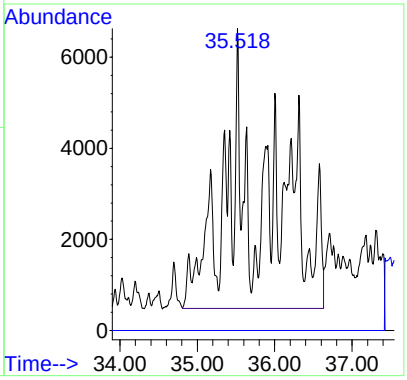


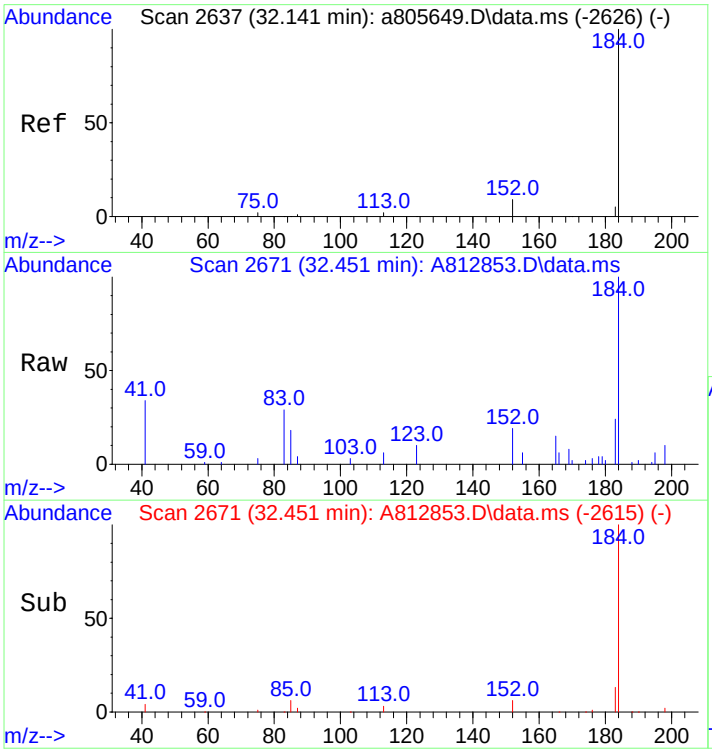


#32
C3-Fluorenes
Concen: 1294.36 ng/mL m
RT: 35.518 min Scan# 3007
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:208 Resp: 210438

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

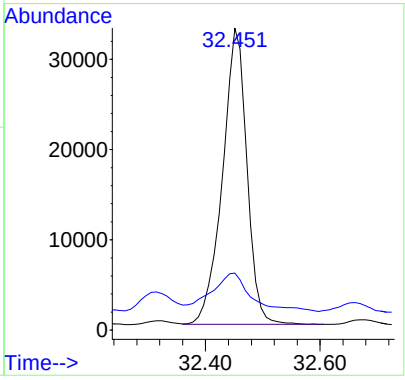


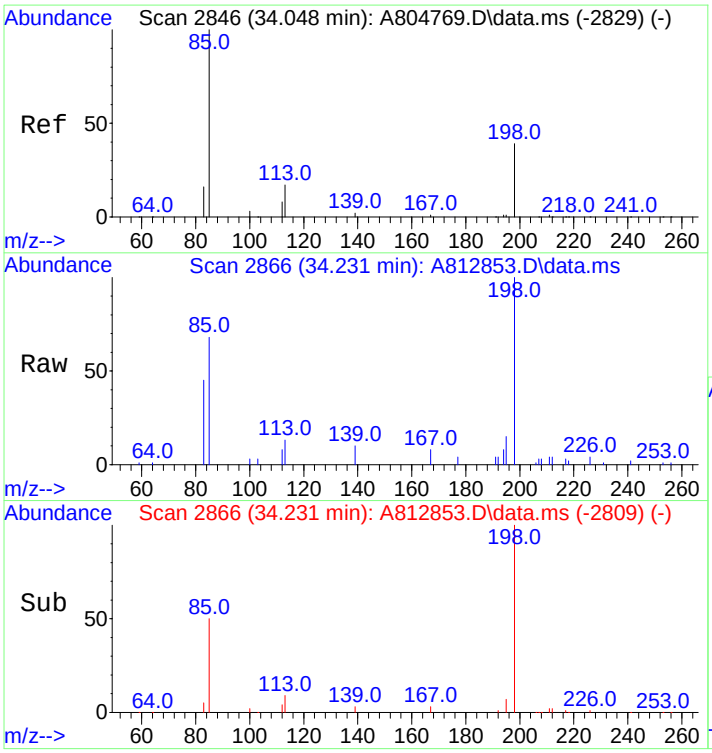


#33
Dibenzothiophene
Concen: 435.20 ng/mL
RT: 32.451 min Scan# 2671
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:184 Resp: 97297

Ion	Ratio	Lower	Upper
184	100		
152	20.6	7.8	11.8#

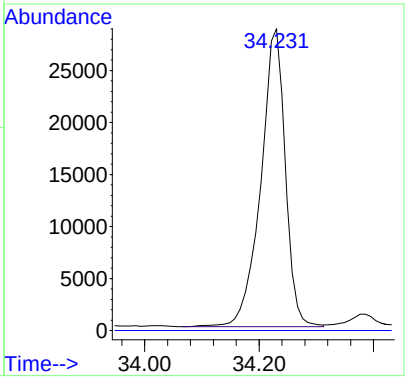


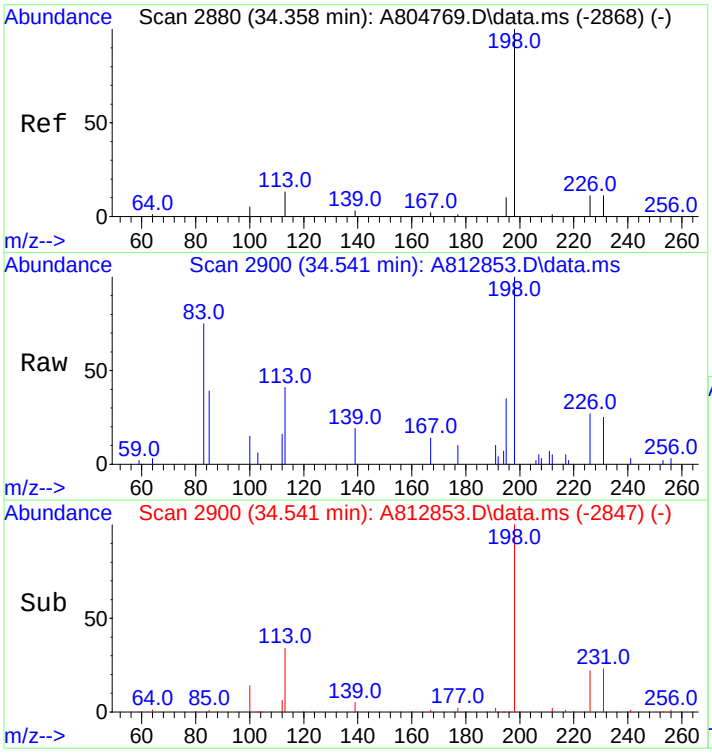


#34
4-Methyldibenzothiophene(4MDT)
Concen: 382.20 ng/mL
RT: 34.231 min Scan# 2866
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:198 Resp: 85448

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

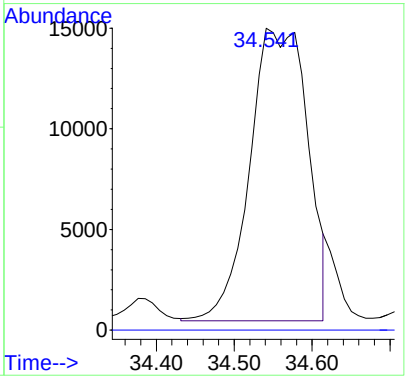


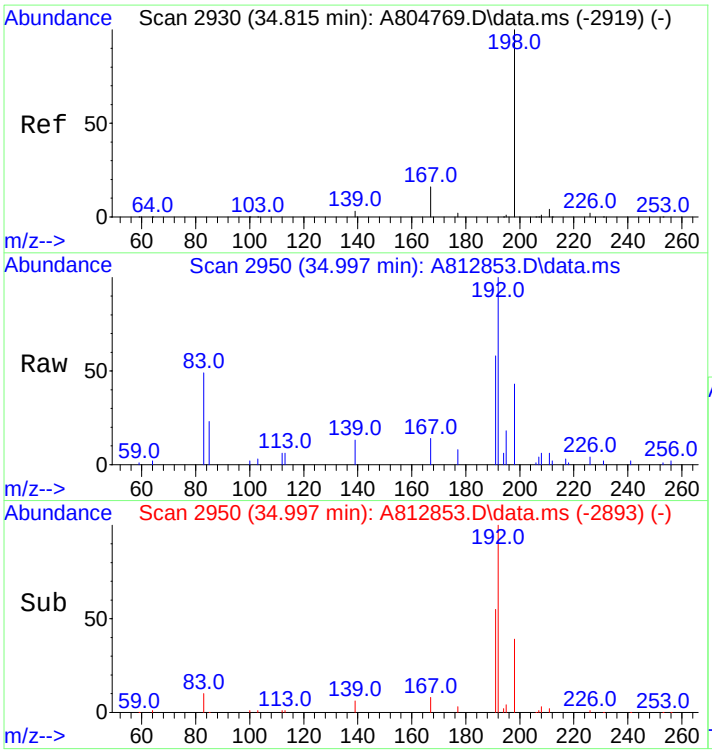


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 336.05 ng/mL m
RT: 34.541 min Scan# 2900
Delta R.T. -0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:198 Resp: 75130

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

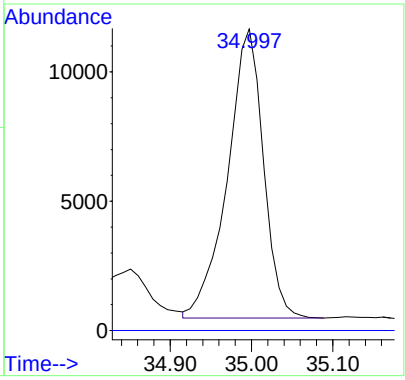


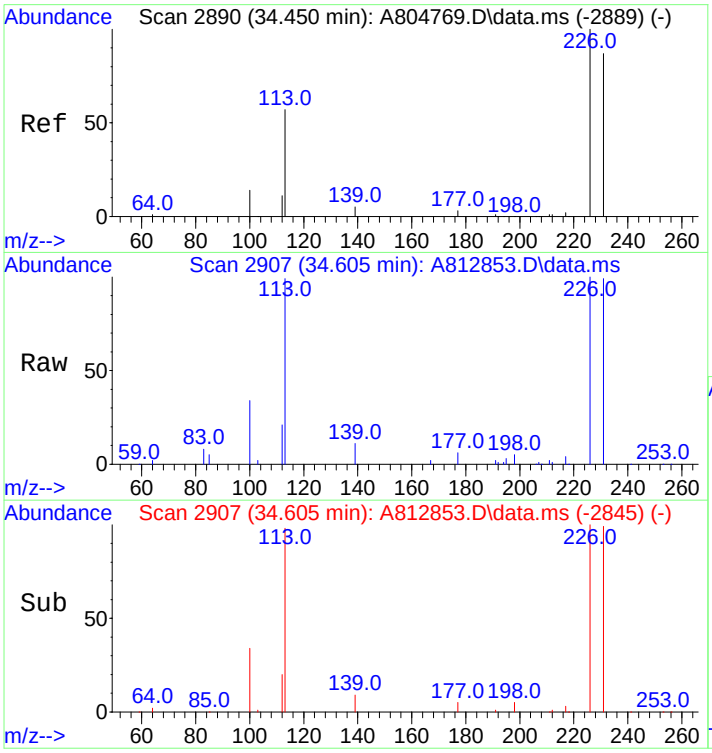


#36
1-Methyldibenzothiophene(1MDT)
Concen: 153.67 ng/mL
RT: 34.997 min Scan# 2950
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:198 Resp: 34355

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

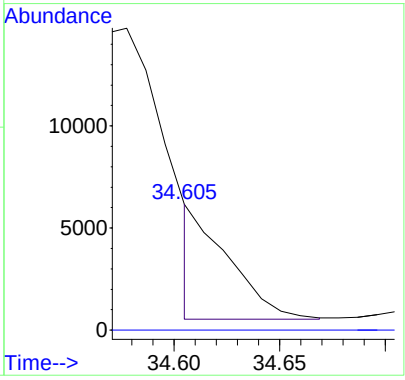


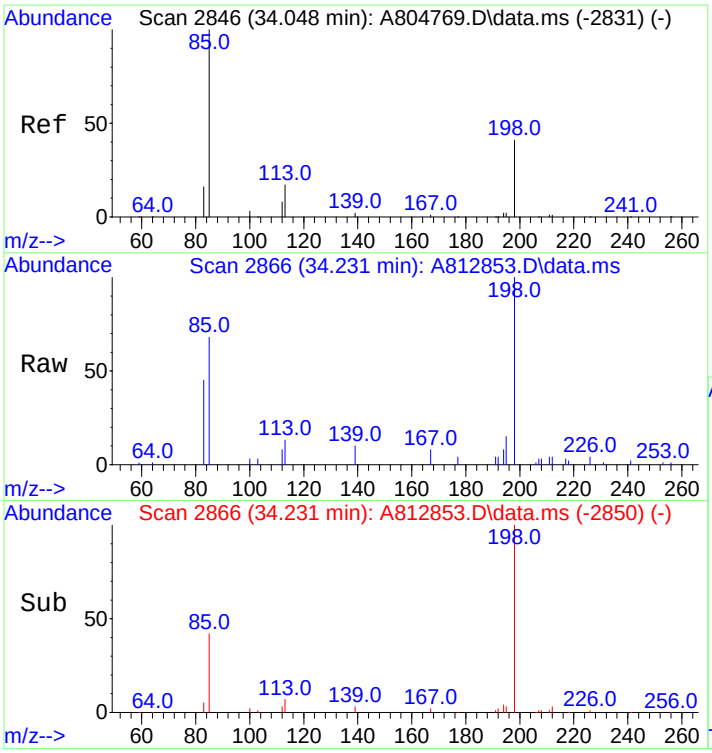


#37
OTP
Concen: 28.18 ng/mL m
RT: 34.605 min Scan# 2907
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:198 Resp: 6300

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

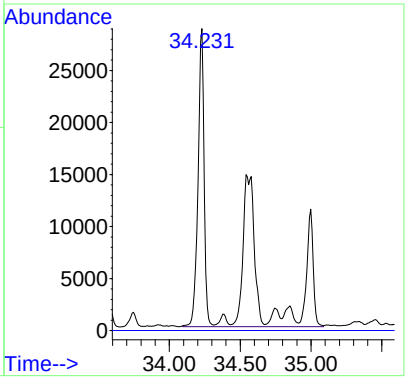


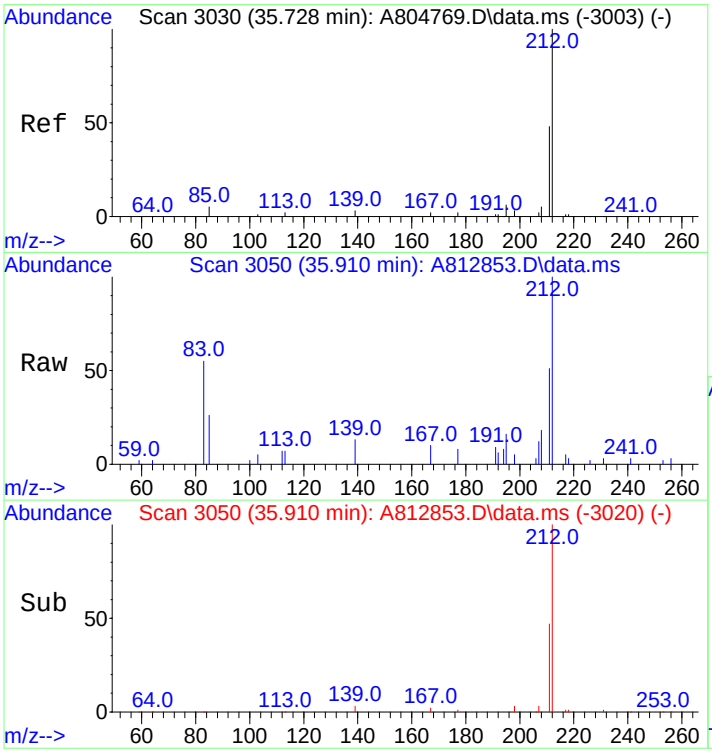


#38
C1-Dibenzothiophenes
Concen: 987.18 ng/mL m
RT: 34.231 min Scan# 2866
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:198 Resp: 220702

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

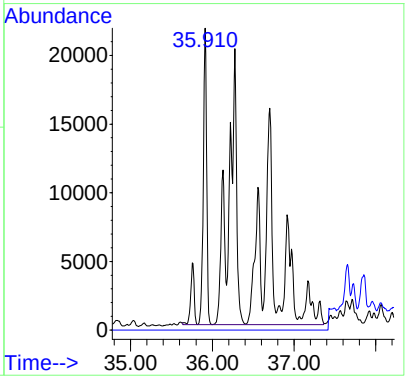


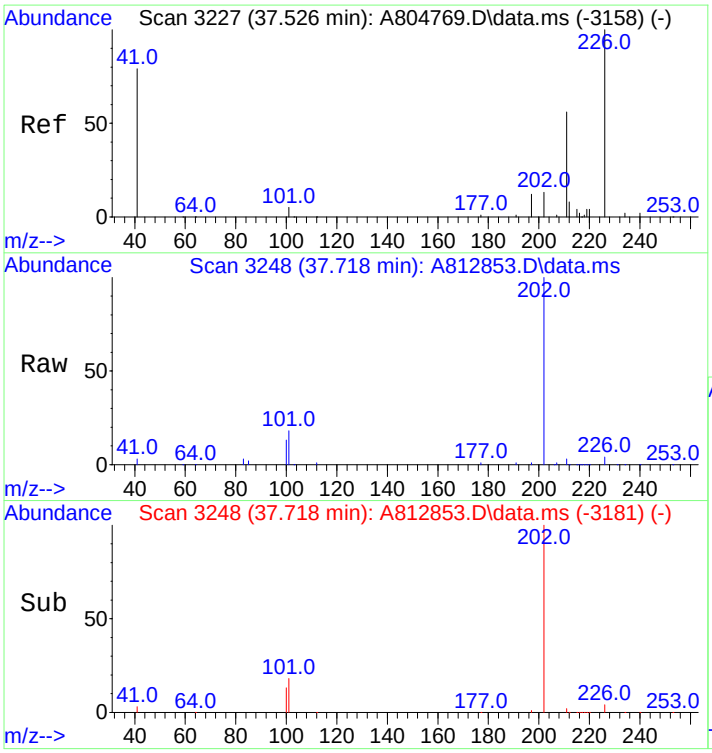


#39
C2-Dibenzothiophenes
Concen: 1762.18 ng/mL m
RT: 35.910 min Scan# 3050
Delta R.T. -0.347 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:212 Resp: 393967

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

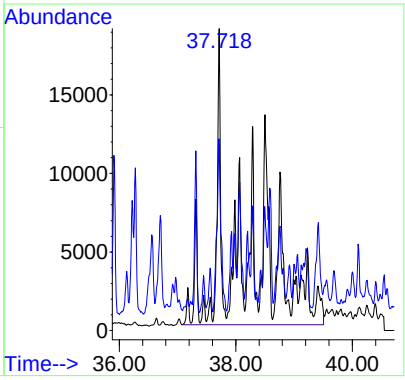


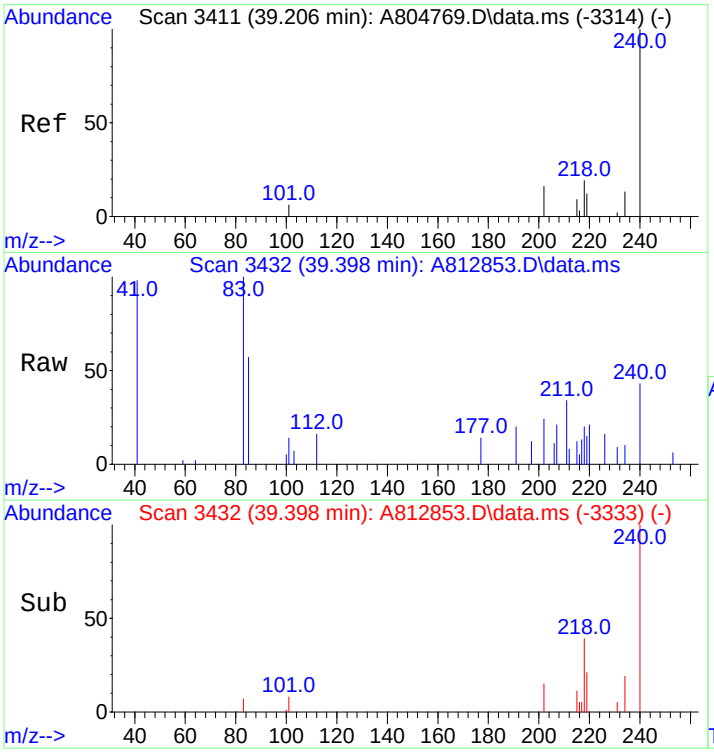


#40
C3-Dibenzothiophenes
Concen: 1995.97 ng/mL m
RT: 37.718 min Scan# 3248
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:226 Resp: 446236

Ion	Ratio	Lower	Upper
226	100		
211	2.3	50.2	75.2#

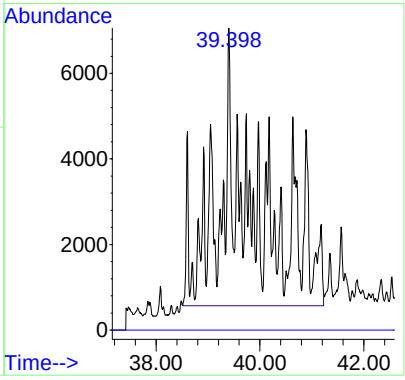


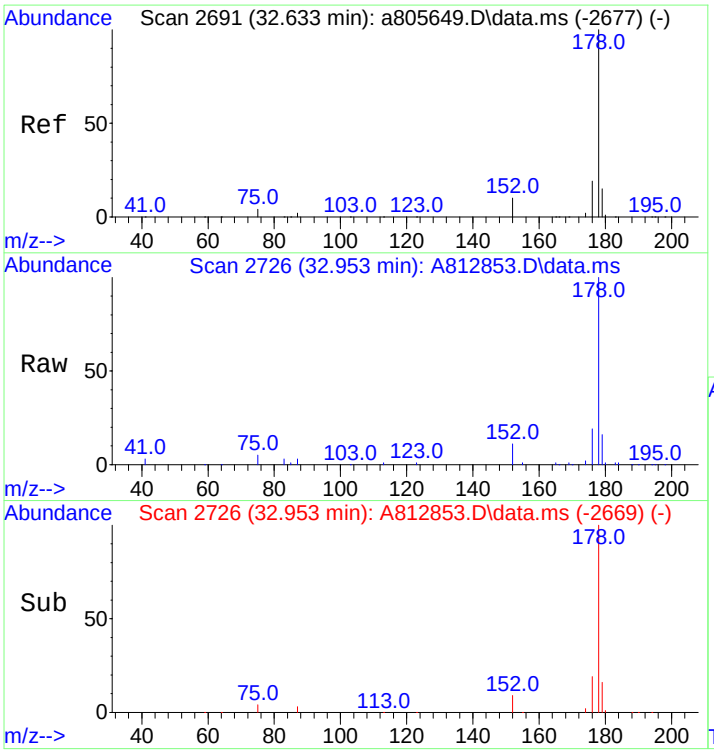


#41
C4-Dibenzothiophenes
Concen: 1332.01 ng/mL m
RT: 39.398 min Scan# 3432
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:240 Resp: 297796

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

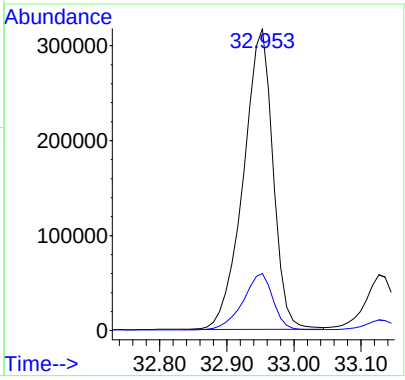


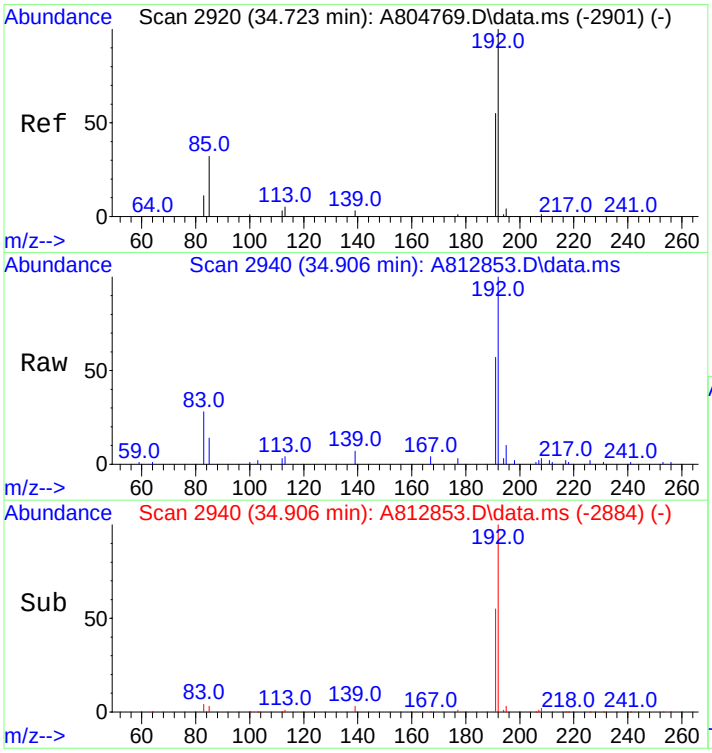


#43
Phenanthrene
Concen: 4511.86 ng/mL
RT: 32.953 min Scan# 2726
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:178 Resp: 970874

Ion	Ratio	Lower	Upper
178	100		
176	19.0	15.2	22.8

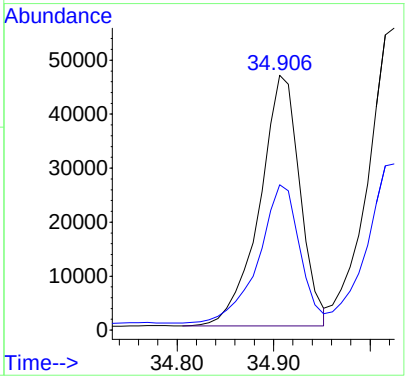


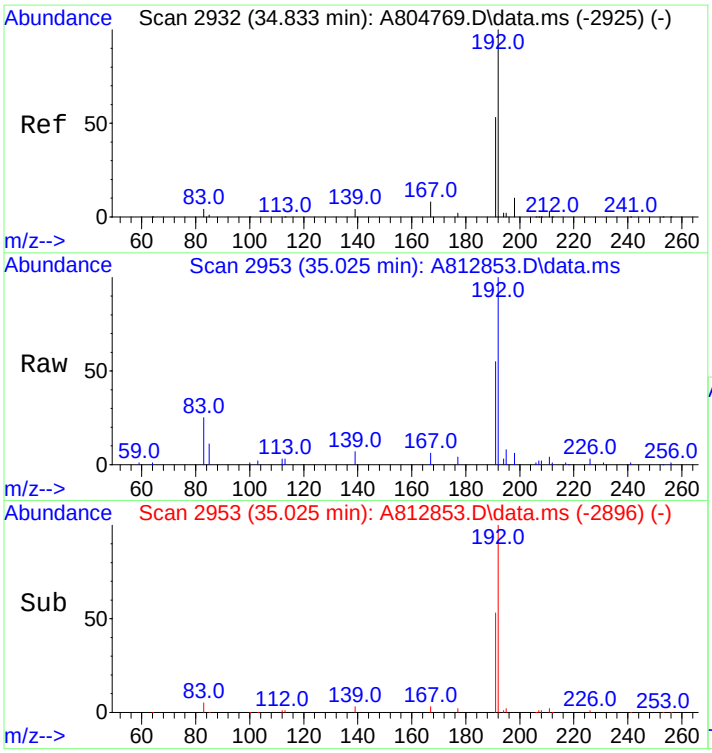


#44
3-Methylphenanthrene(3MP)
Concen: 627.94 ng/mL
RT: 34.906 min Scan# 2940
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 135121

Ion	Ratio	Lower	Upper
192	100		
191	56.0	45.5	68.3

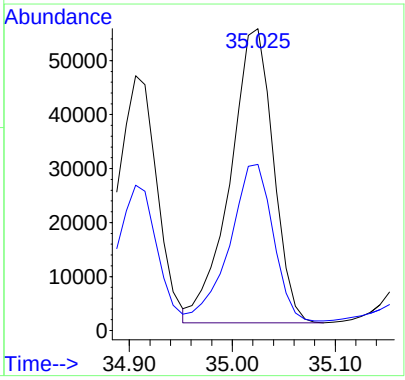


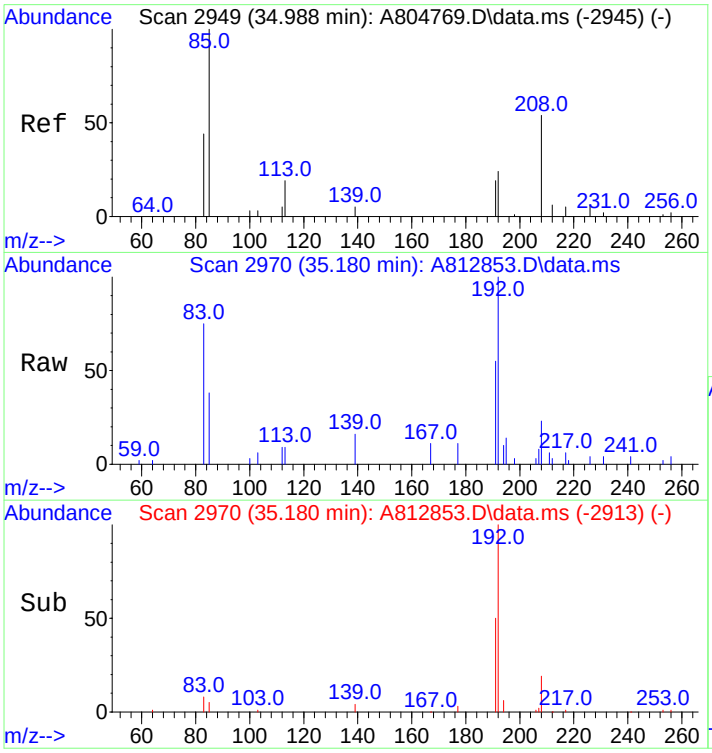


#45
2-Methylphenanthrene(2MP)
Concen: 738.93 ng/mL
RT: 35.025 min Scan# 2953
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 159004

Ion	Ratio	Lower	Upper
192	100		
191	53.1	44.6	67.0

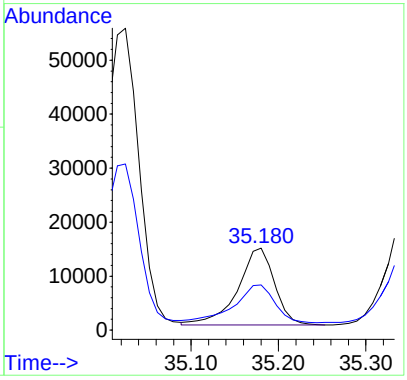


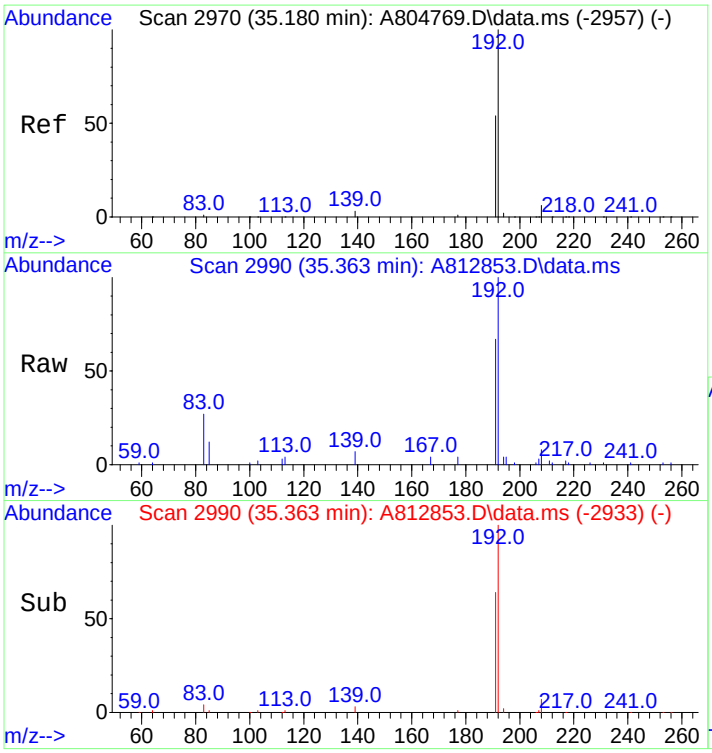


#46
2-Methylanthracene(2MA)
Concen: 193.46 ng/mL m
RT: 35.180 min Scan# 2970
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 41629

Ion	Ratio	Lower	Upper
192	100		
191	1.8	96.9	145.3#

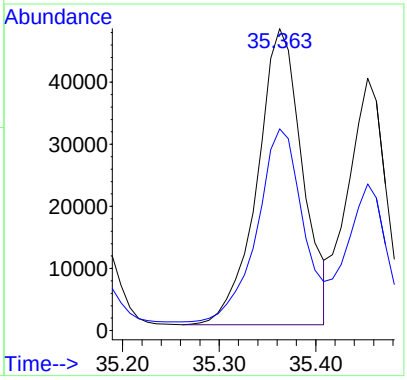


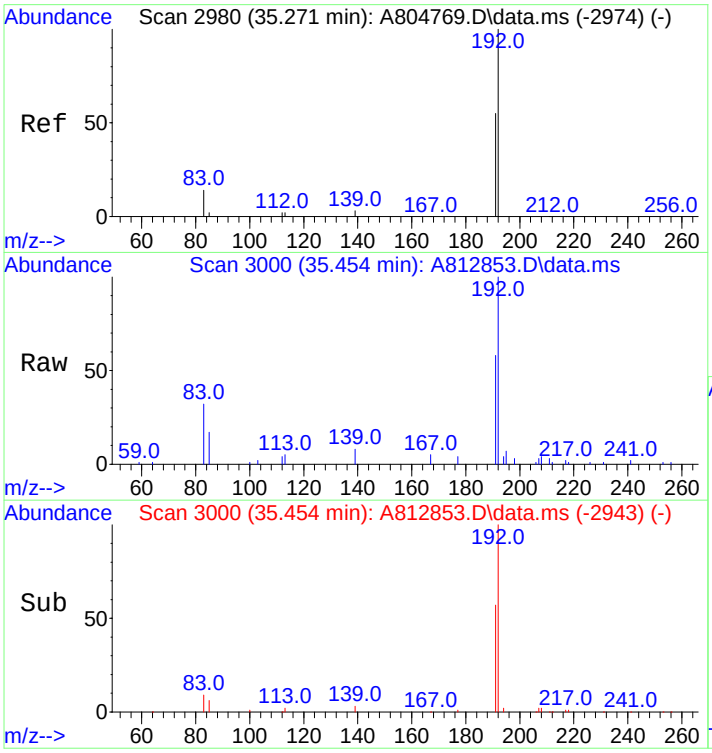


#47
9/4-Methylphenanthrene(9MP)
Concen: 723.46 ng/mL
RT: 35.363 min Scan# 2990
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 155676

Ion	Ratio	Lower	Upper
192	100		
191	65.5	44.5	66.7

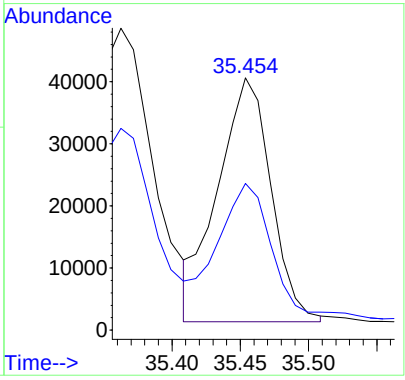


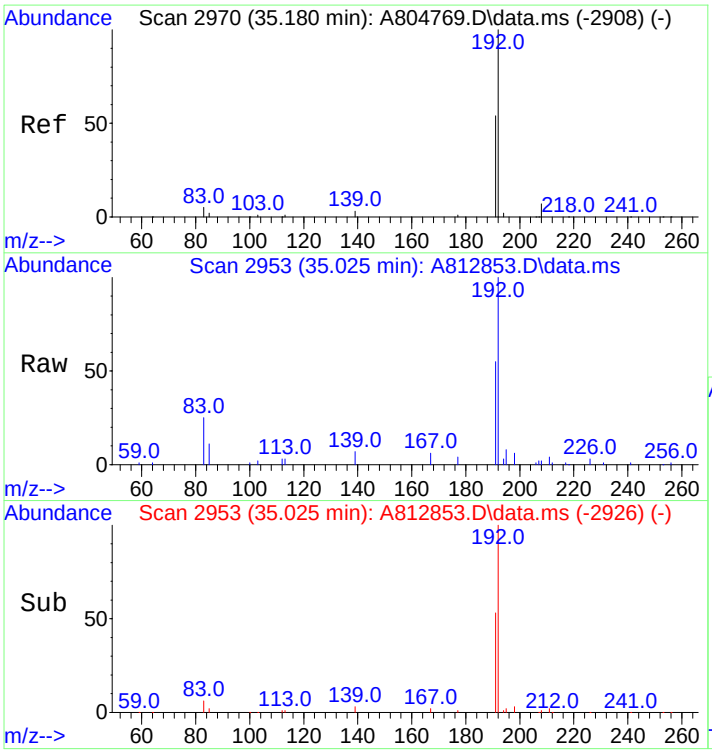


#48
1-Methylphenanthrene(1MP)
Concen: 496.70 ng/mL m
RT: 35.454 min Scan# 3000
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 106881

Ion	Ratio	Lower	Upper
192	100		
191	57.6	46.2	69.4

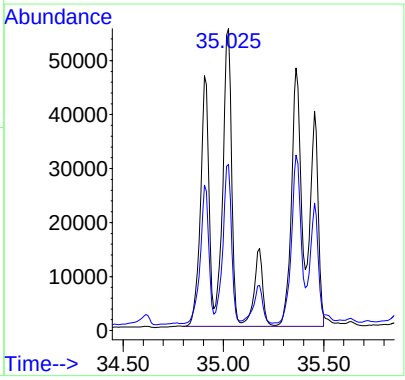


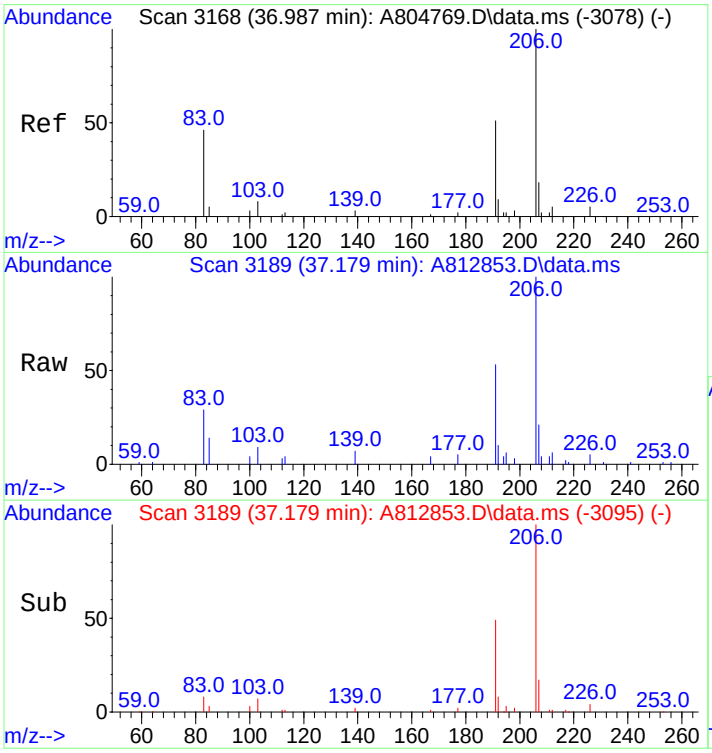


#49
C1-Phenanthrenes/Anthracenes
Concen: 2834.51 ng/mL m
RT: 35.025 min Scan# 2953
Delta R.T. -0.319 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 609937

Ion	Ratio	Lower	Upper
192	100		
191	16.7	44.5	66.7#

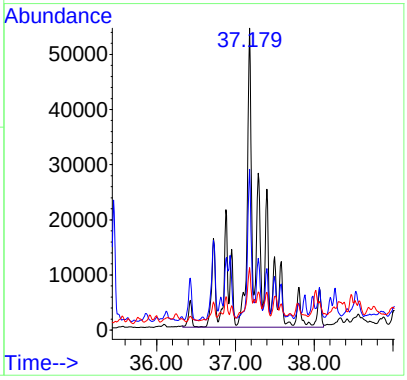


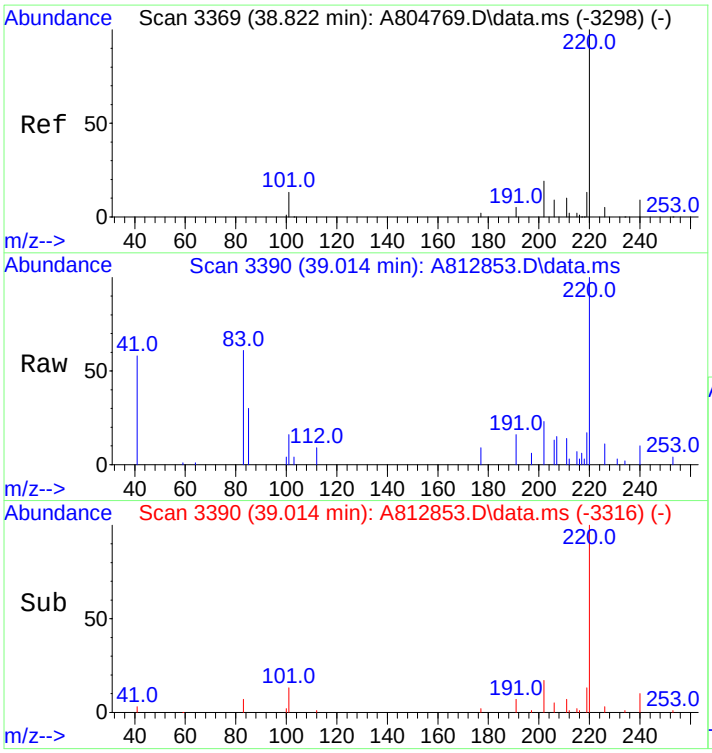


#50
C2-Phenanthrenes/Anthracenes
Concen: 3013.87 ng/mL m
RT: 37.179 min Scan# 3189
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:206 Resp: 648533

Ion	Ratio	Lower	Upper
206	100		
191	2.7	42.0	63.0#
207	0.9	16.2	24.4#

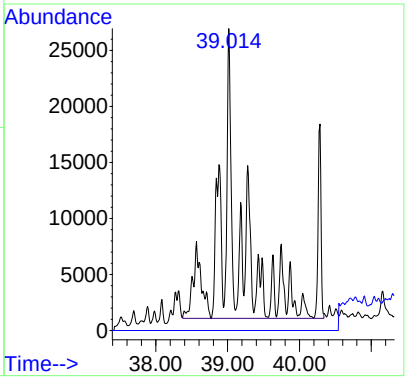


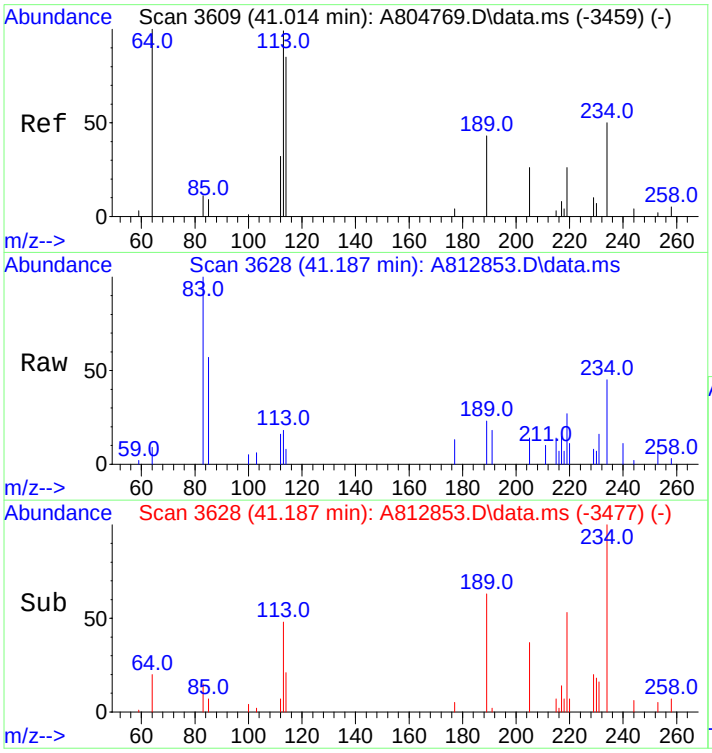


#52
C3-Phenanthrenes/Anthracenes
Concen: 2128.73 ng/mL m
RT: 39.014 min Scan# 3390
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:220 Resp: 458067

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

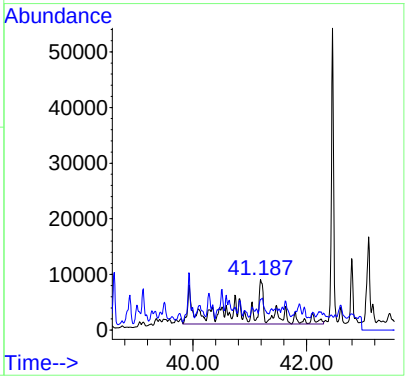


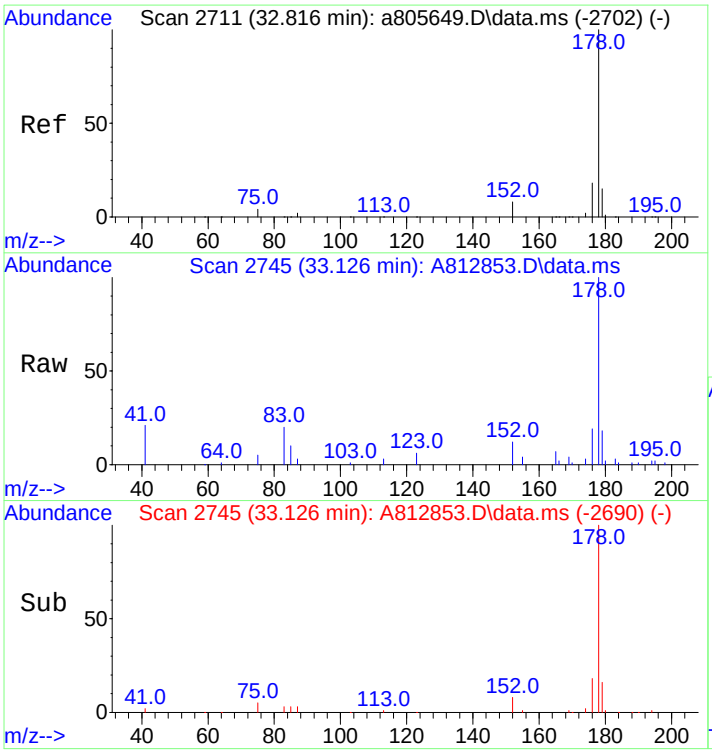


#53
C4-Phenanthrenes/Anthracenes
Concen: 1155.75 ng/mL m
RT: 41.187 min Scan# 3628
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:234 Resp: 248698

Ion	Ratio	Lower	Upper
234	100		
219	2.6	52.3	78.5#

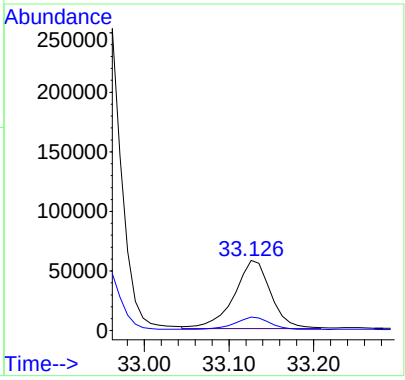


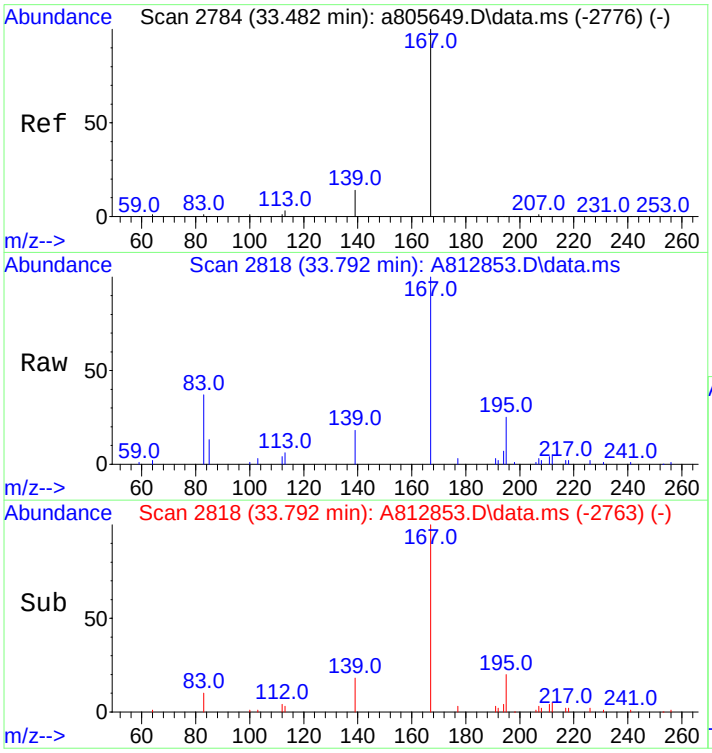


#55
Anthracene
Concen: 866.26 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:178 Resp: 173659

Ion	Ratio	Lower	Upper
178	100		
176	17.4	14.3	21.5

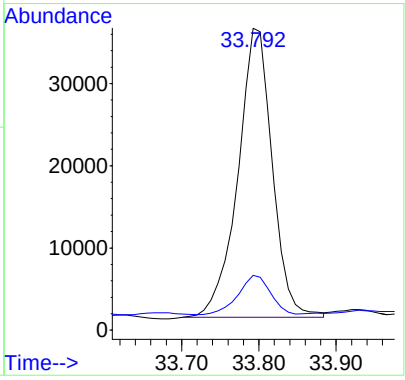


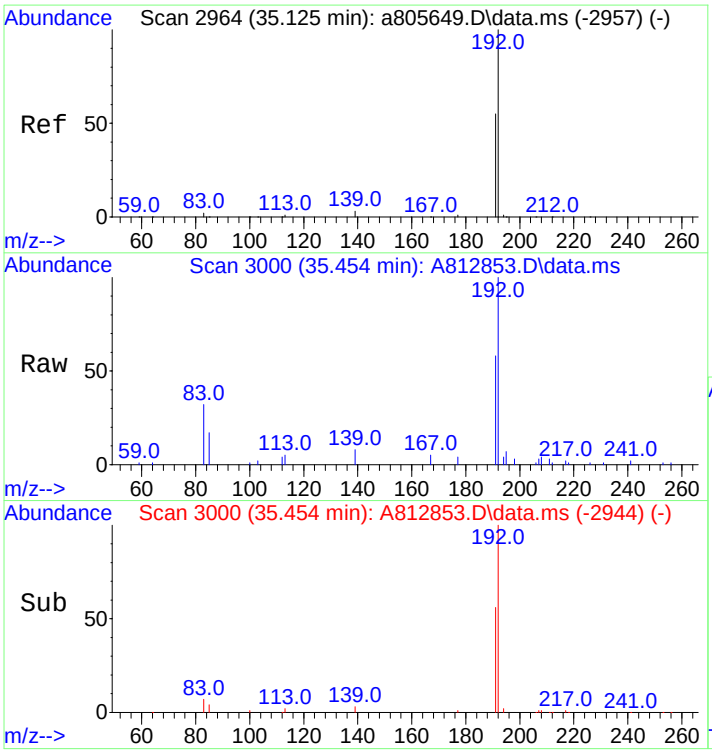


#56
Carbazole
Concen: 522.11 ng/mL
RT: 33.792 min Scan# 2818
Delta R.T. -0.001 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:167 Resp: 109214

Ion	Ratio	Lower	Upper
167	100		
139	12.4	10.6	16.0

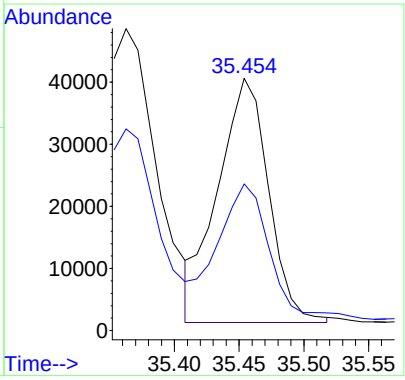


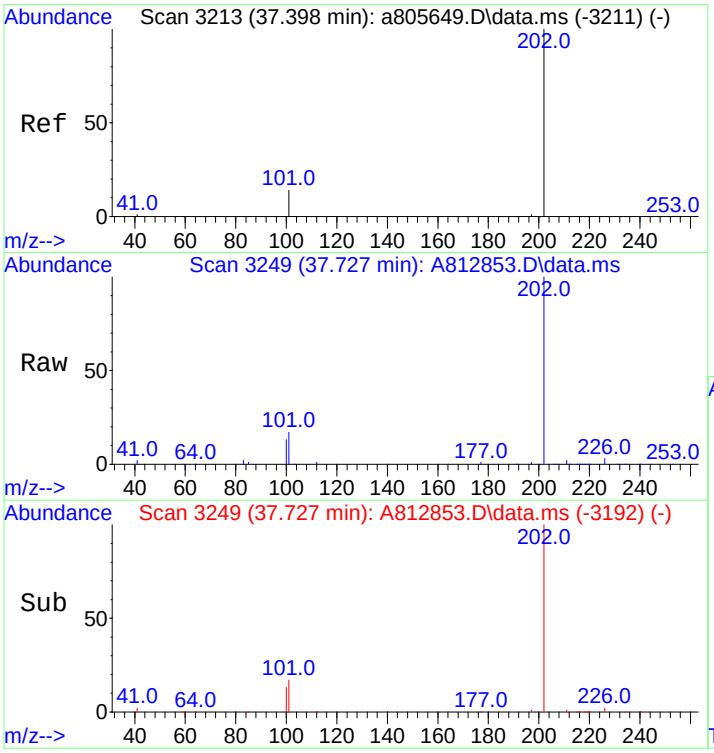


#57
1-Methylphenanthrene
Concen: 704.26 ng/mL m
RT: 35.454 min Scan# 3000
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:192 Resp: 107424

Ion	Ratio	Lower	Upper
192	100		
191	57.4	44.2	66.4

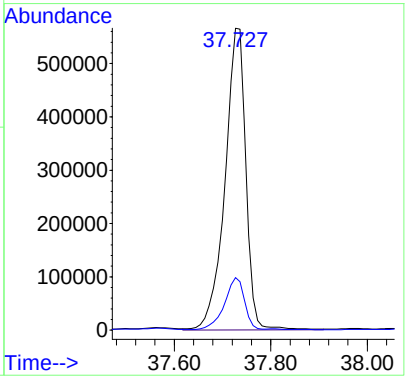


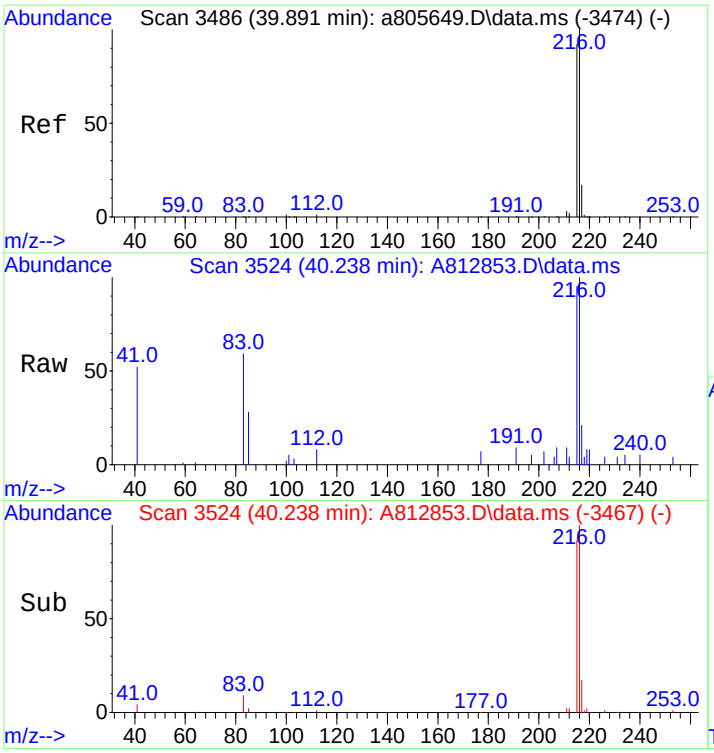


#58
Fluoranthene
Concen: 7677.04 ng/mL
RT: 37.727 min Scan# 3249
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:202 Resp: 1701619

Ion	Ratio	Lower	Upper
202	100		
101	16.4	13.6	20.4

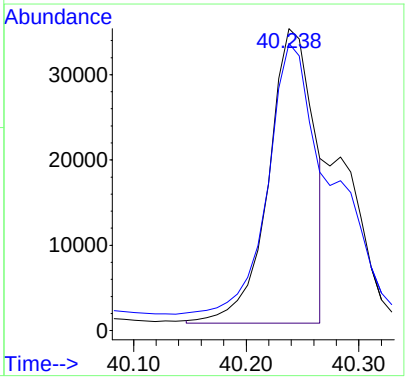


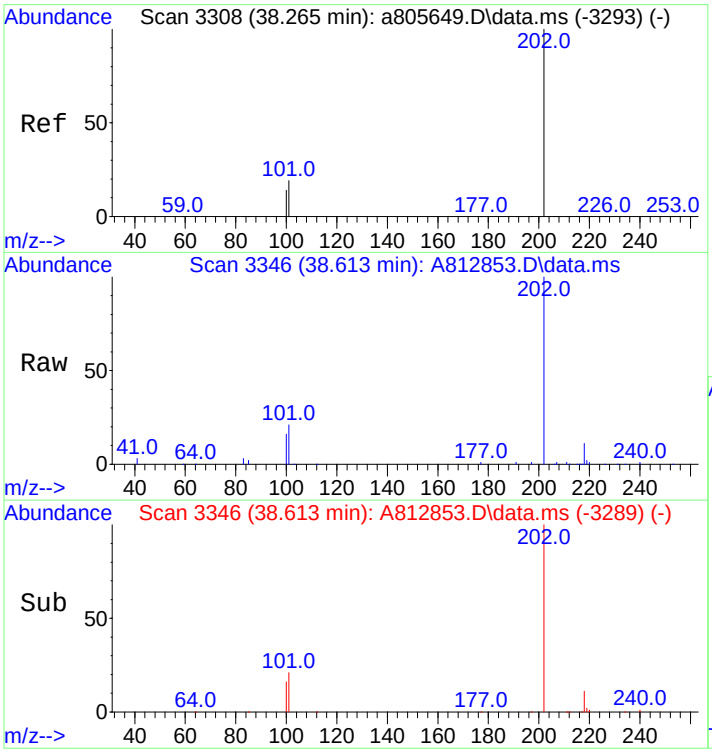


#59
Benzo(b)fluorene
Concen: 757.44 ng/mL m
RT: 40.238 min Scan# 3524
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:216 Resp: 97118

Ion	Ratio	Lower	Upper
216	100		
215	127.2	74.2	111.2#

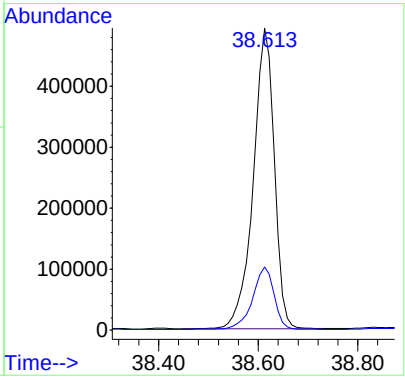


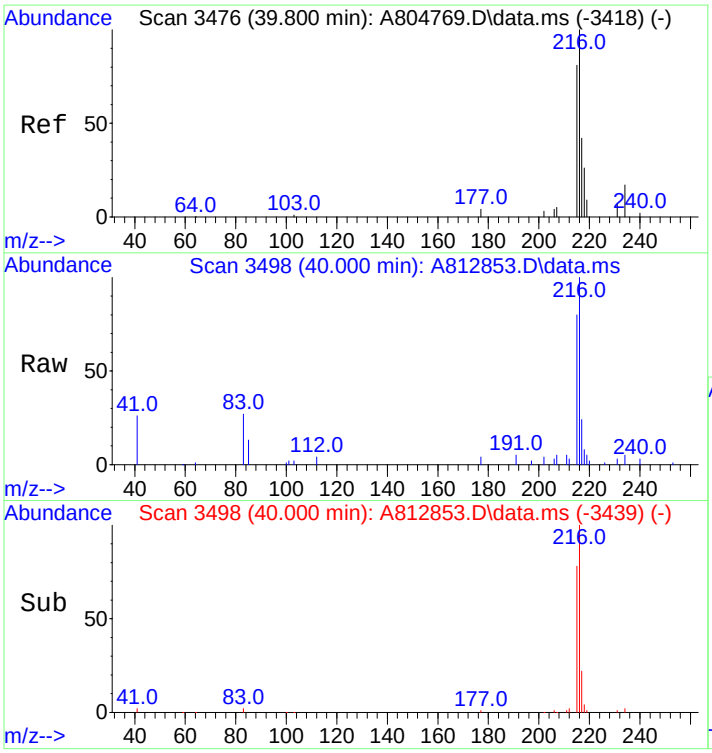


#60
Pyrene
Concen: 6450.40 ng/mL
RT: 38.613 min Scan# 3346
Delta R.T. 0.019 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:202 Resp: 1446146

Ion	Ratio	Lower	Upper
202	100		
101	21.4	15.4	23.2

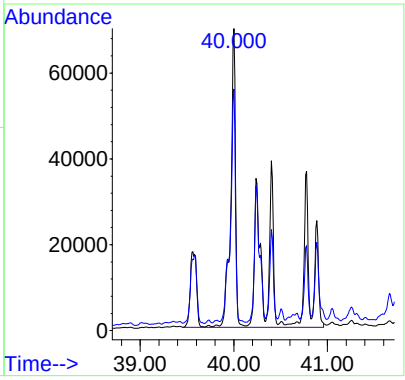


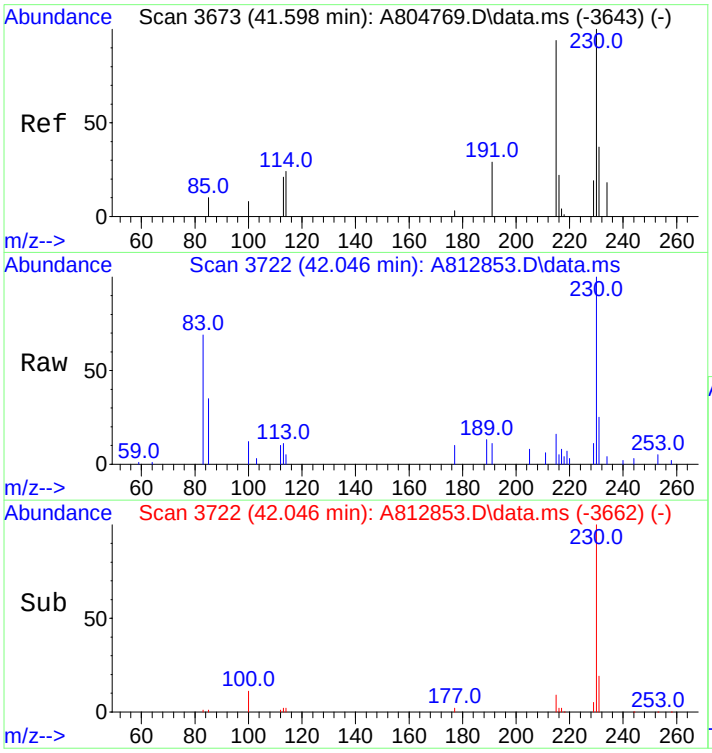


#61
C1-Fluoranthenes/Pyrenes
Concen: 3396.80 ng/mL m
RT: 40.000 min Scan# 3498
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:216 Resp: 761545

Ion	Ratio	Lower	Upper
216	100		
215	26.6	73.8	110.6#

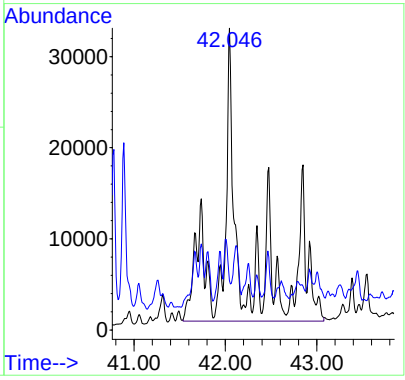


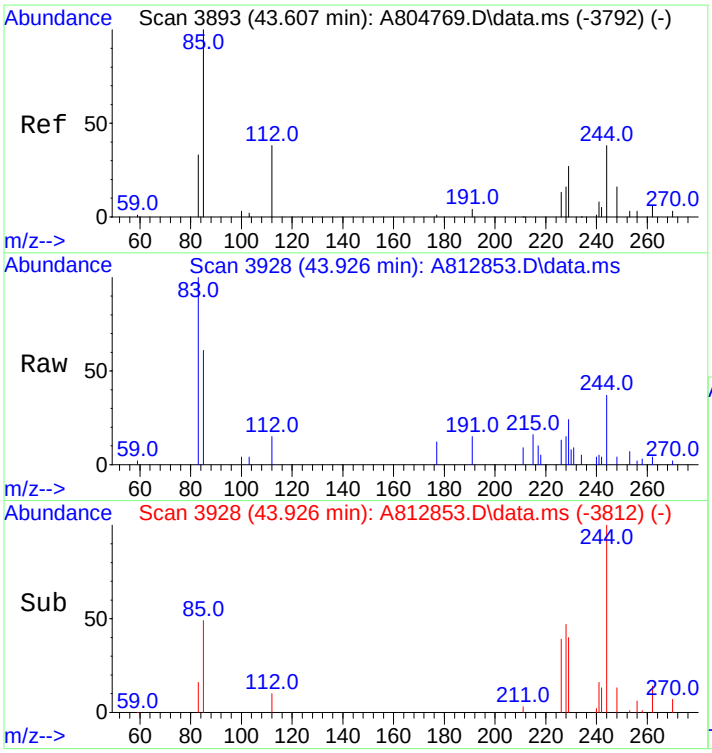


#62
C2-Fluoranthenes/Pyrenes
Concen: 2285.24 ng/mL m
RT: 42.046 min Scan# 3722
Delta R.T. 0.274 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:230 Resp: 512338

Ion	Ratio	Lower	Upper
230	100		
215	3.4	93.1	139.7#

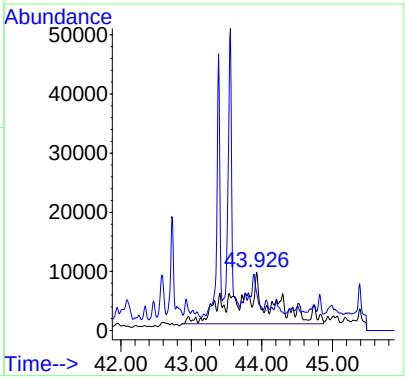


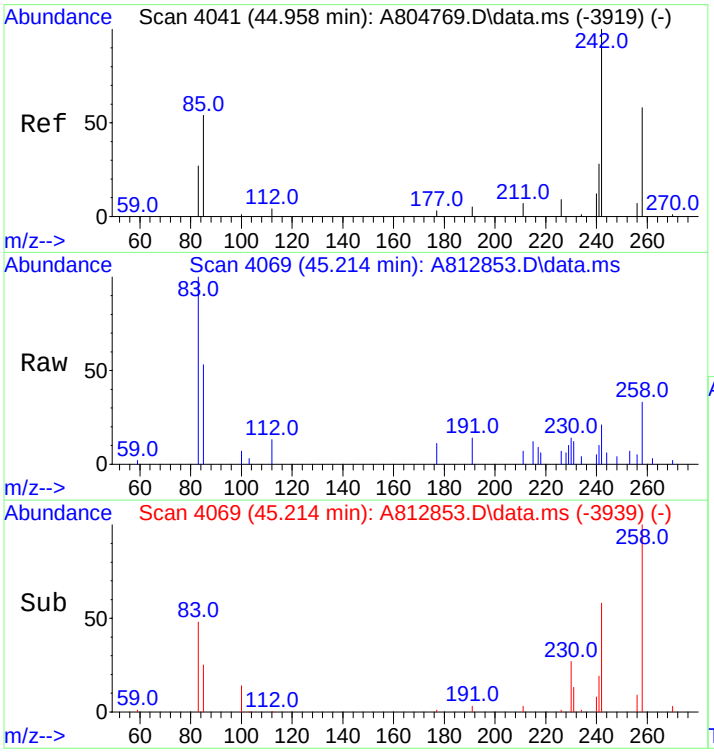


#63
C3-Fluoranthenes/Pyrenes
Concen: 1388.65 ng/mL m
RT: 43.926 min Scan# 3928
Delta R.T. 0.137 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:244 Resp: 311328

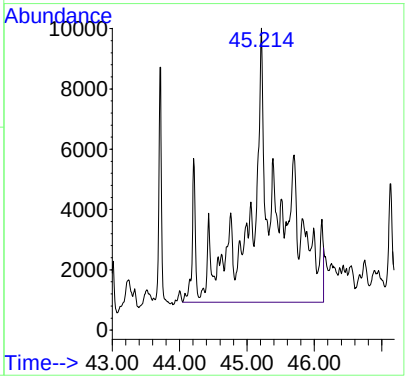
Ion	Ratio	Lower	Upper
244	100		
229	2.6	76.2	114.2#

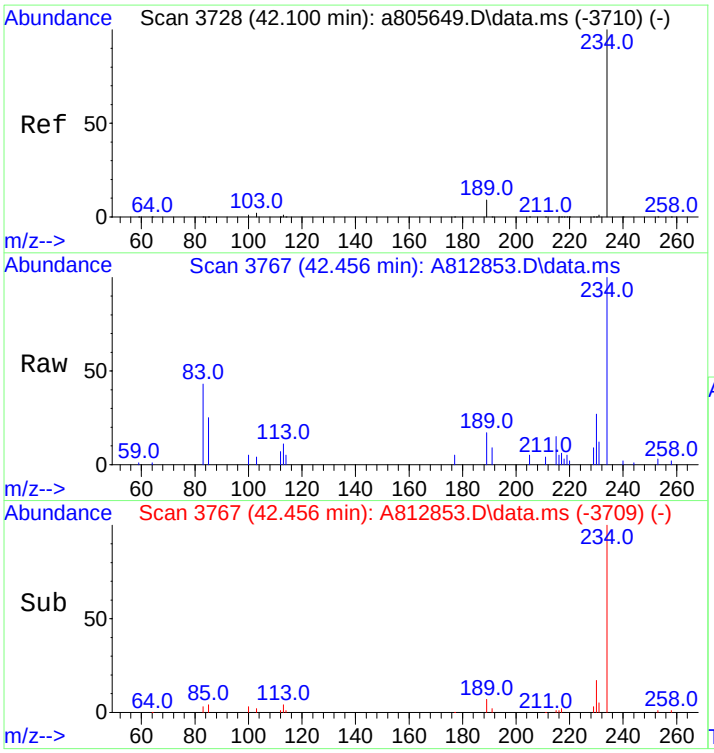




#64
C4-Fluoranthenes/Pyrenes
Concen: 1229.75 ng/mL m
RT: 45.214 min Scan# 4069
Delta R.T. 0.073 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:258 Resp: 275703

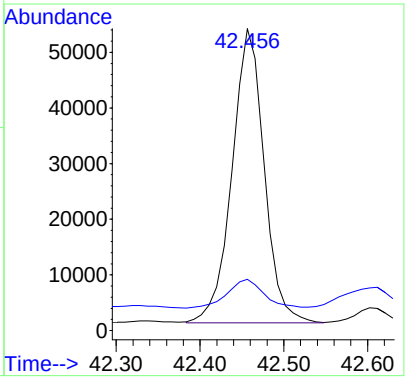


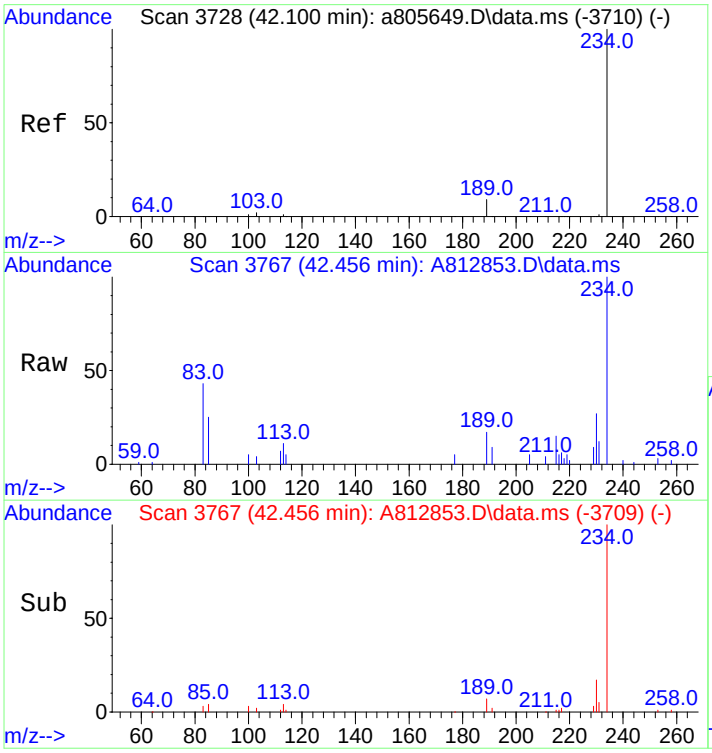


#66
Naphthobenzothiophene
Concen: 676.64 ng/ml m
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:234 Resp: 140821

Ion	Ratio	Lower	Upper
234	100		
189	0.8	22.3	33.5#

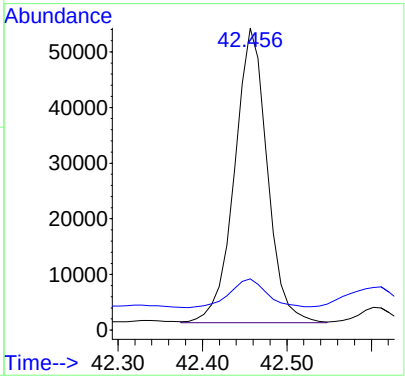


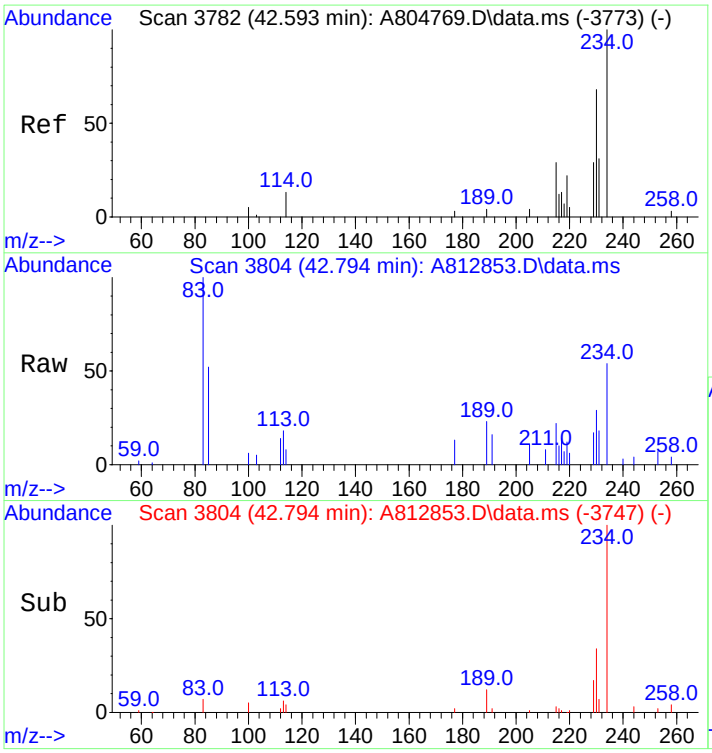


#67
Naphthobenzothiophene-2,1-D
Concen: 680.89 ng/mL m
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:234 Resp: 141707

Ion	Ratio	Lower	Upper
234	100		
189	0.8	22.3	33.5#

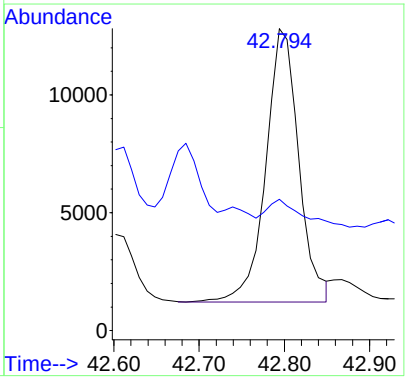


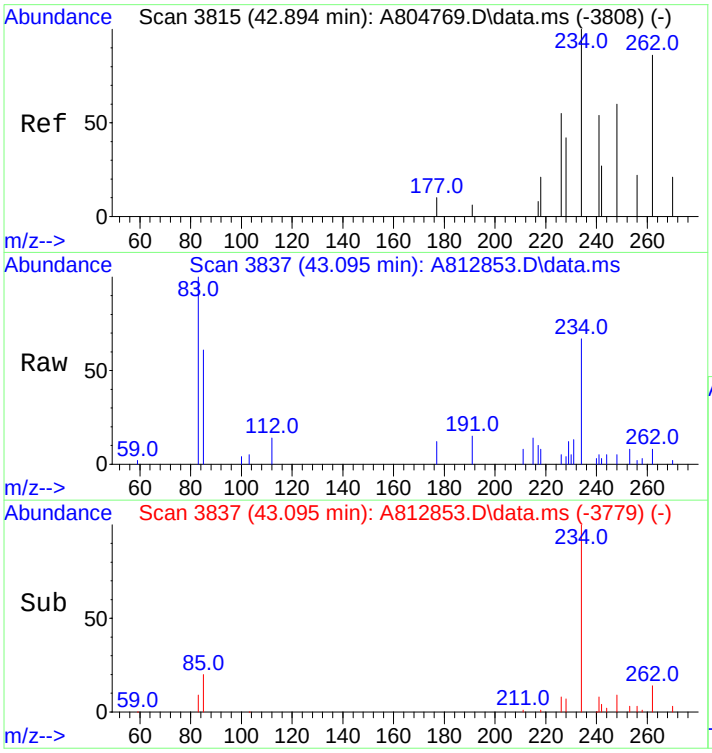


#68
Naphthobenzothiophene-1,2-D
Concen: 149.26 ng/mL m
RT: 42.794 min Scan# 3804
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:234 Resp: 31063

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

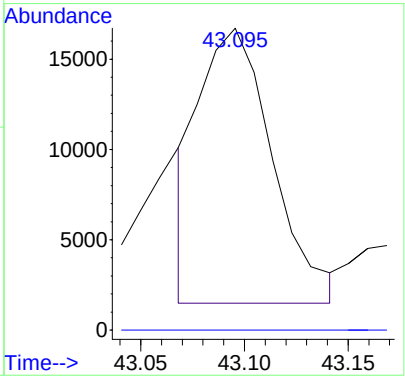


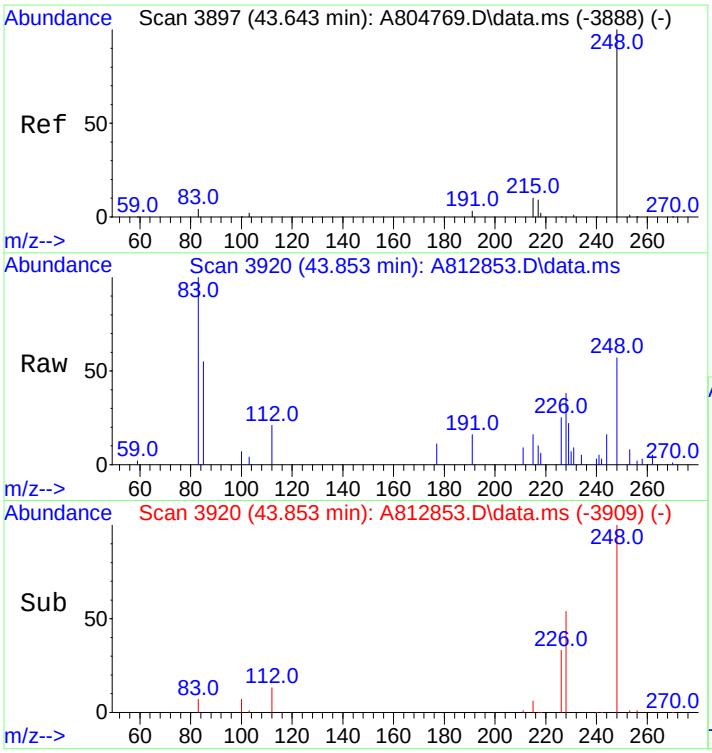


#69
Naphthobenzothiophene-2,3-D
Concen: 180.12 ng/mL m
RT: 43.095 min Scan# 3837
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:234 Resp: 37487

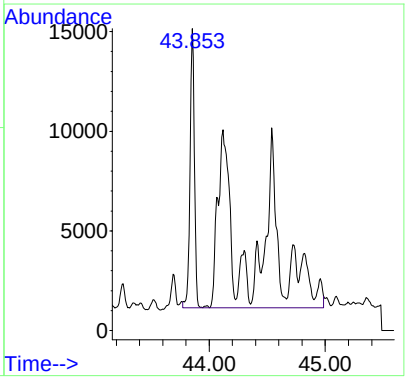
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

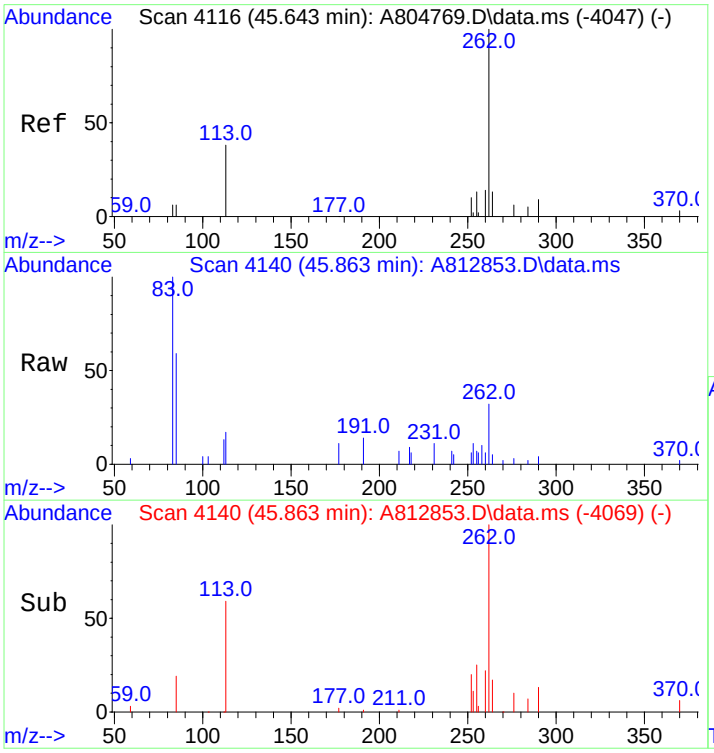




#70
C1-Naphthobenzothiophenes
Concen: 936.80 ng/ml m
RT: 43.853 min Scan# 3920
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

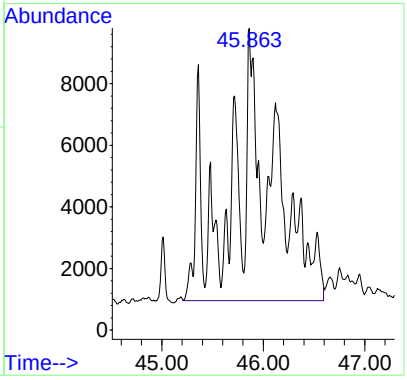
Tgt Ion:248 Resp: 194966

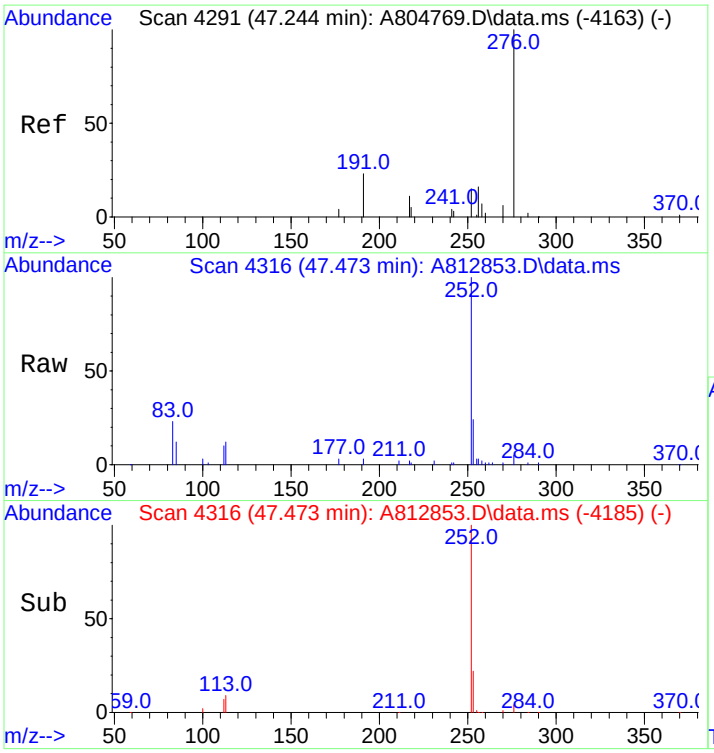




#71
C2-Naphthobenzothiophenes
Concen: 1169.38 ng/ml m
RT: 45.863 min Scan# 4140
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

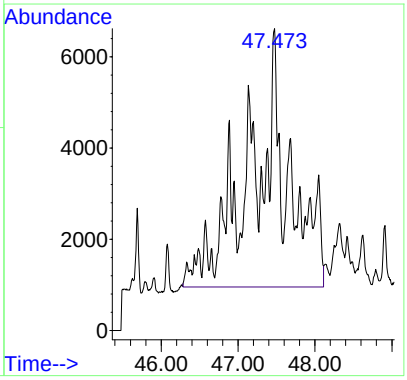
Tgt Ion:262 Resp: 243371

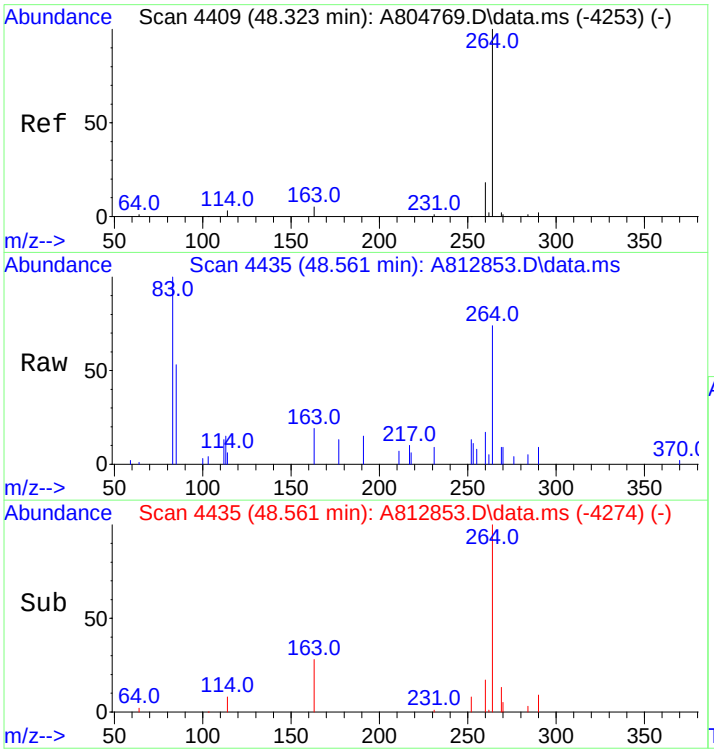




#72
C3-Naphthobenzothiophenes
Concen: 910.17 ng/ml m
RT: 47.473 min Scan# 4316
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

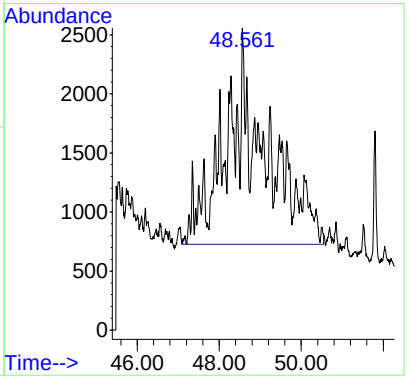
Tgt Ion:276 Resp: 189424

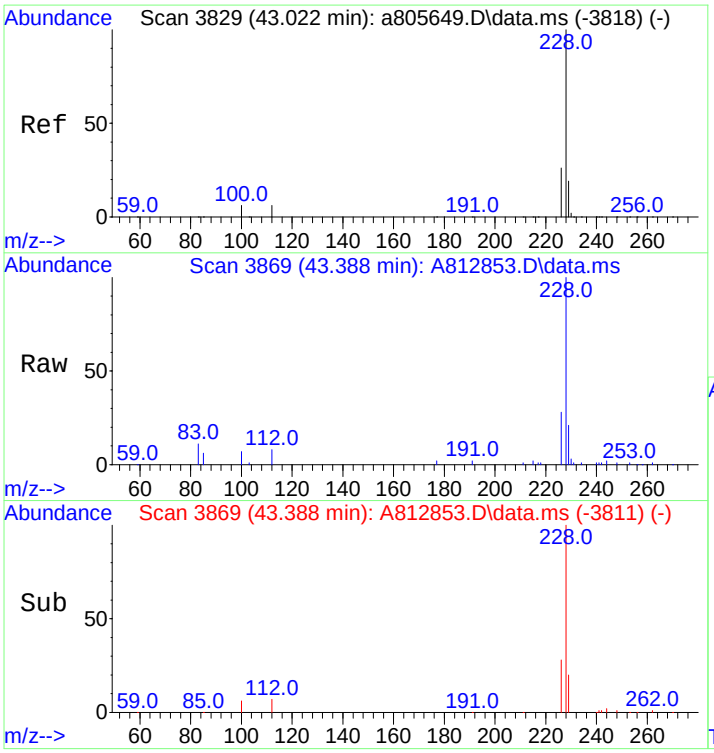




#73
C4-Naphthobenzothiophenes
Concen: 571.34 ng/mL m
RT: 48.561 min Scan# 4435
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:290 Resp: 118906

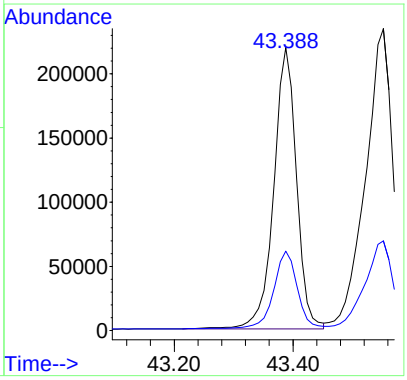


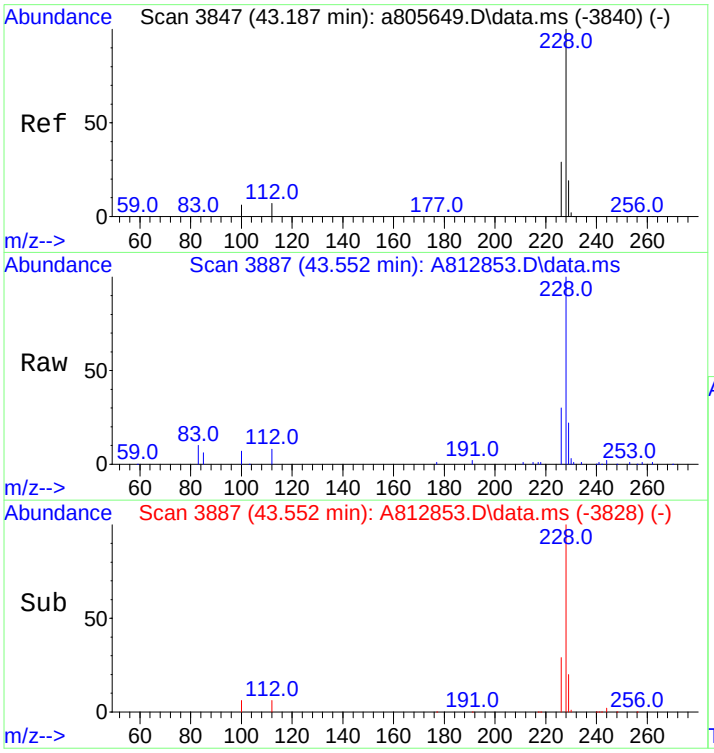


#75
Benz[a]anthracene
Concen: 2777.32 ng/mL
RT: 43.388 min Scan# 3869
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:228 Resp: 582167

Ion	Ratio	Lower	Upper
228	100		
226	27.7	21.3	31.9

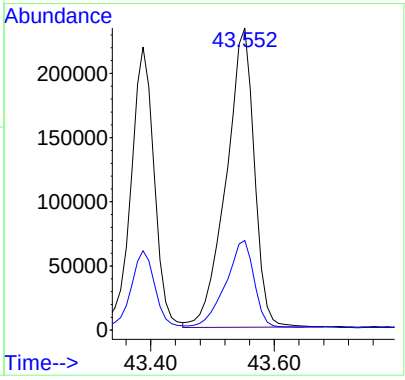


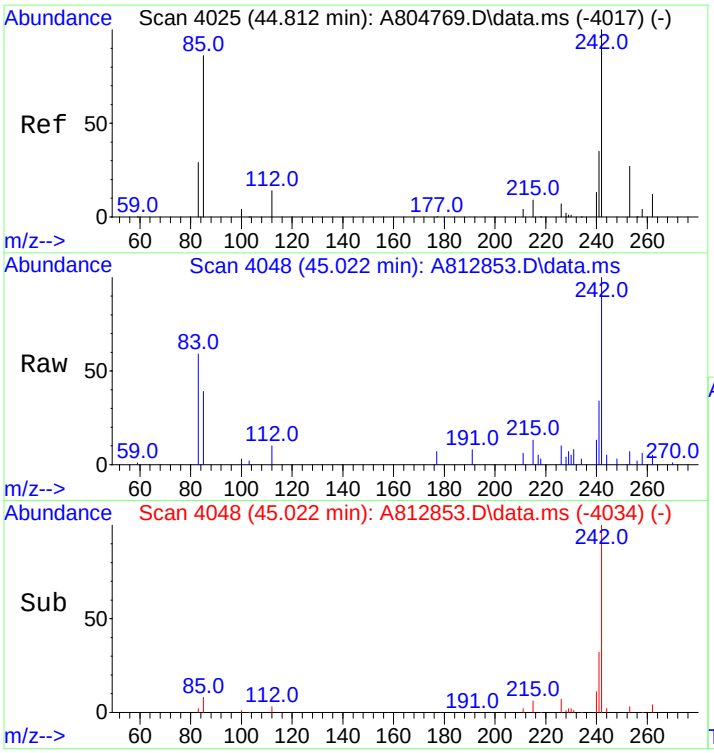


#77
Chrysene/Triphenylene
Concen: 3485.09 ng/mL
RT: 43.552 min Scan# 3887
Delta R.T. 0.036 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:228 Resp: 739462

Ion	Ratio	Lower	Upper
228	100		
226	30.1	23.6	35.4

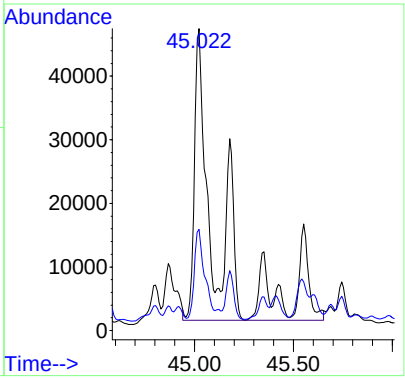


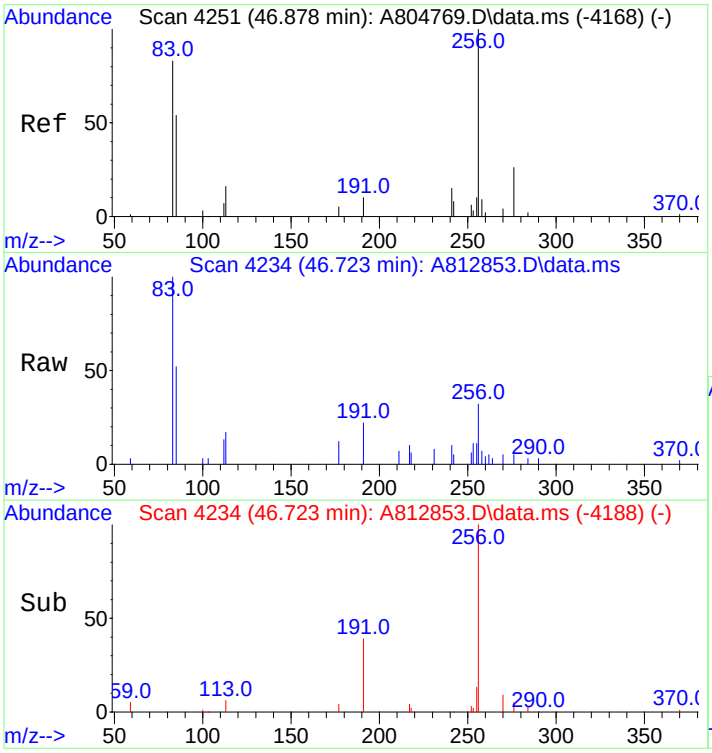


#78
C1-Chrysenes
Concen: 1668.79 ng/mL m
RT: 45.022 min Scan# 4048
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:242 Resp: 354082

Ion	Ratio	Lower	Upper
242	100		
241	3.2	33.5	50.3#

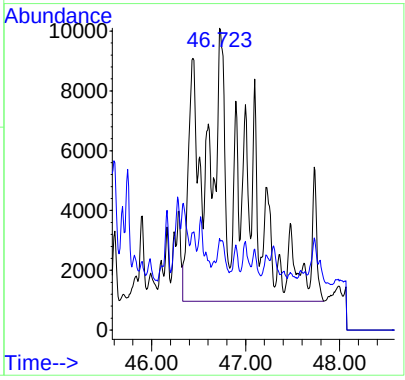


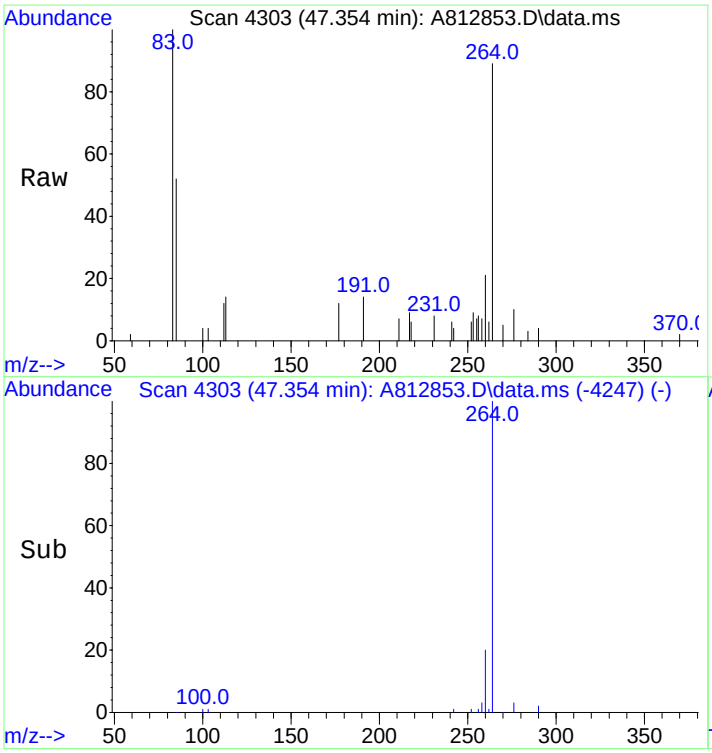


#79
C2-Chrysenes
Concen: 1302.24 ng/mL m
RT: 46.723 min Scan# 4234
Delta R.T. -0.338 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:256 Resp: 276309

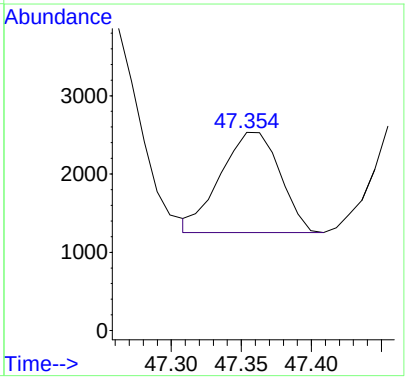
Ion	Ratio	Lower	Upper
256	100		
241	1.5	30.4	45.6#

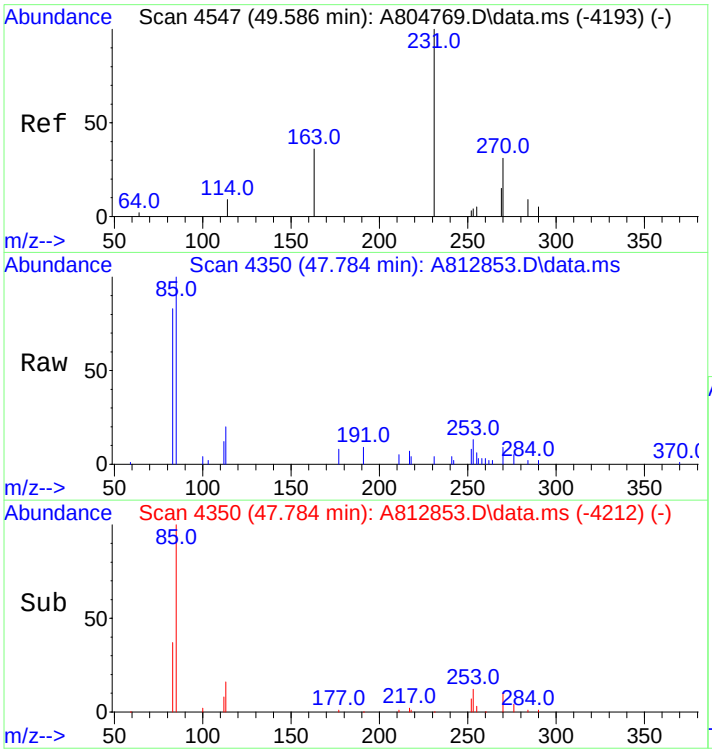




#80
BBF-D12 Surr BKGD
Concen: 17.84 ng/mL
RT: 47.354 min Scan# 4303
Delta R.T. 0.011 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:256 Resp: 3785

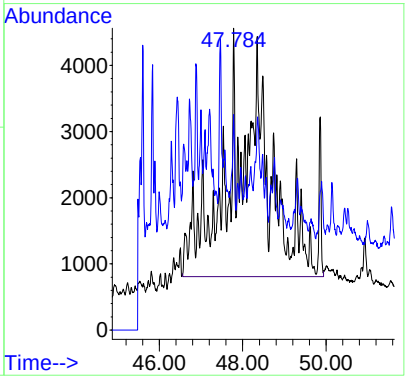


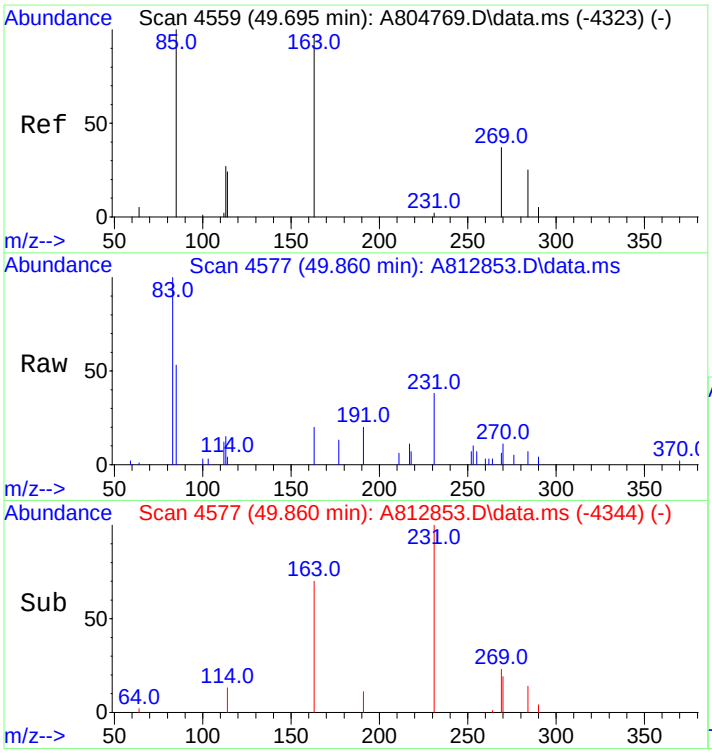


#81
C3-Chrysenes
Concen: 1057.71 ng/mL m
RT: 47.784 min Scan# 4350
Delta R.T. -2.030 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:270 Resp: 224423

Ion	Ratio	Lower	Upper
270	100		
255	0.2	42.9	64.3#

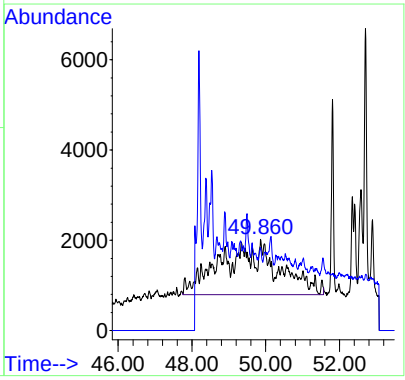


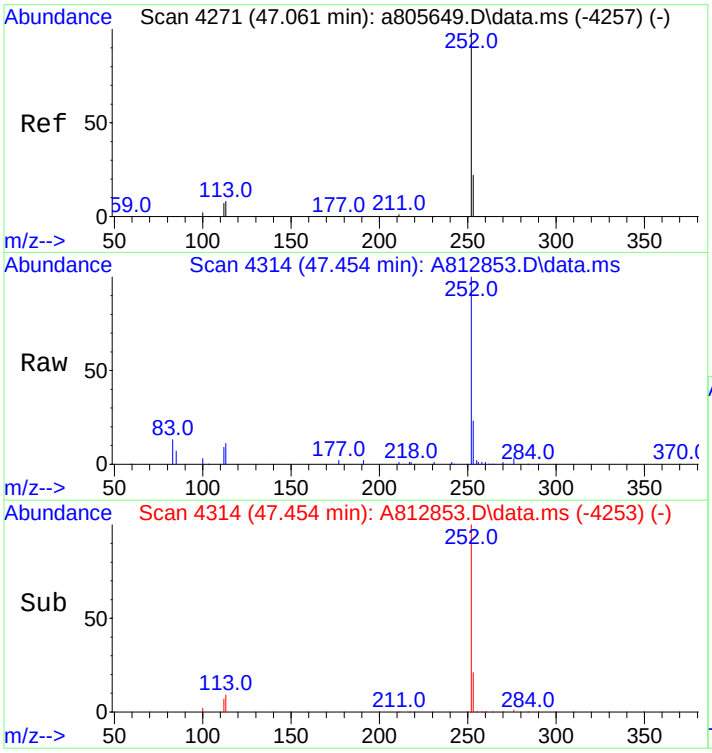


#82
C4-Chrysenes
Concen: 591.10 ng/mL m
RT: 49.860 min Scan# 4577
Delta R.T. 0.035 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:284 Resp: 125419

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

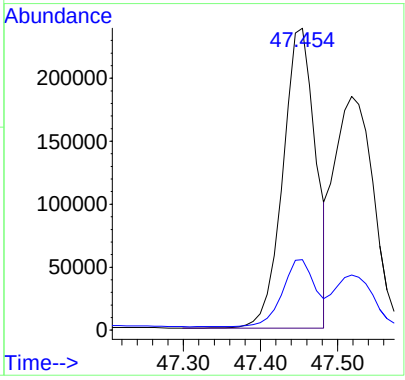


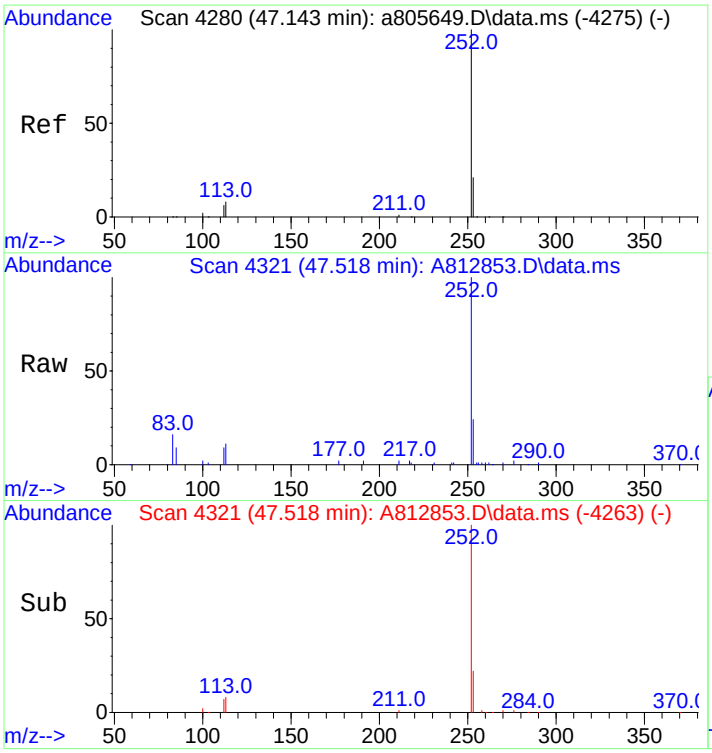


#84
Benzo[b]fluoranthene
Concen: 3143.47 ng/mL
RT: 47.454 min Scan# 4314
Delta R.T. 0.054 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:252 Resp: 707669

Ion	Ratio	Lower	Upper
252	100		
253	22.5	18.5	27.7

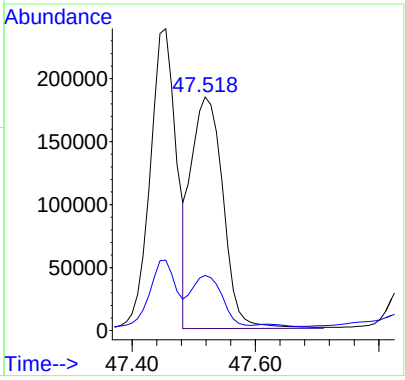


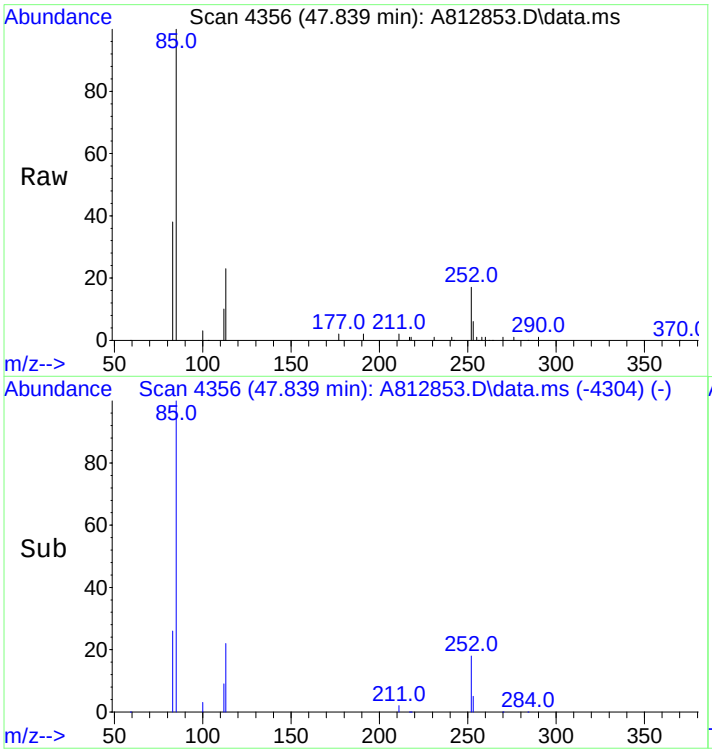


#85
Benzo[j]+[k]fluoranthene
Concen: 2702.75 ng/mL
RT: 47.518 min Scan# 4321
Delta R.T. 0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:252 Resp: 663886

Ion	Ratio	Lower	Upper
252	100		
253	21.5	18.8	28.2

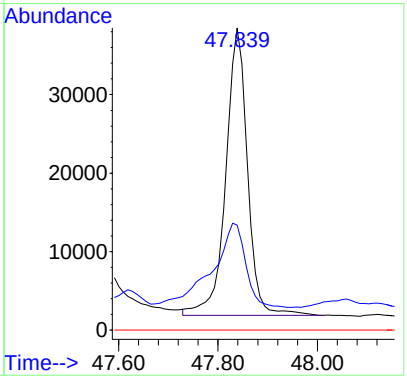


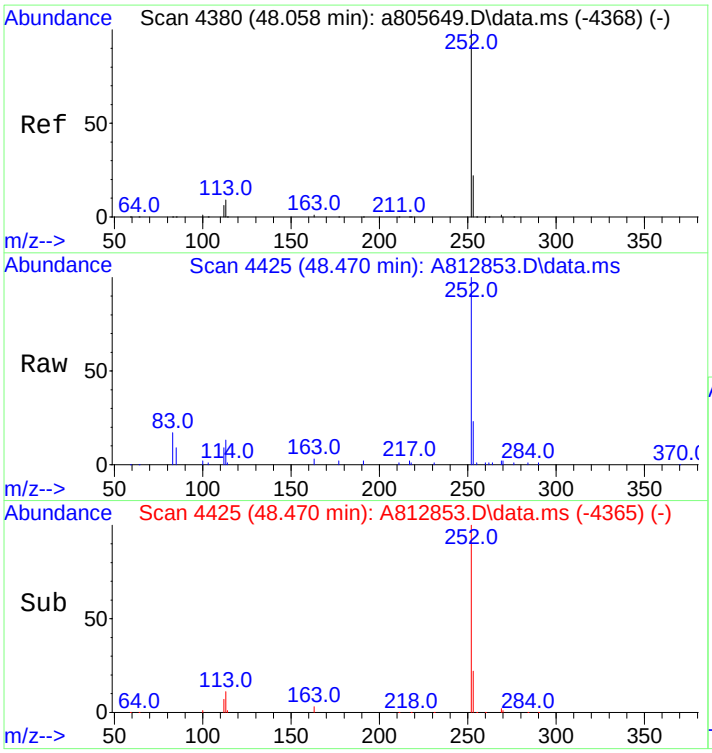


#86
Benzo[a]fluoranthene
Concen: 452.24 ng/mL
RT: 47.839 min Scan# 4356
Delta R.T. -0.027 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:252 Resp: 111086

Ion	Ratio	Lower	Upper
252	100		
253	45.9	372.3	558.5#
125	0.0	0.0	0.0

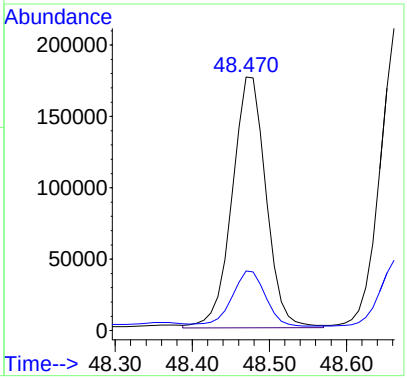


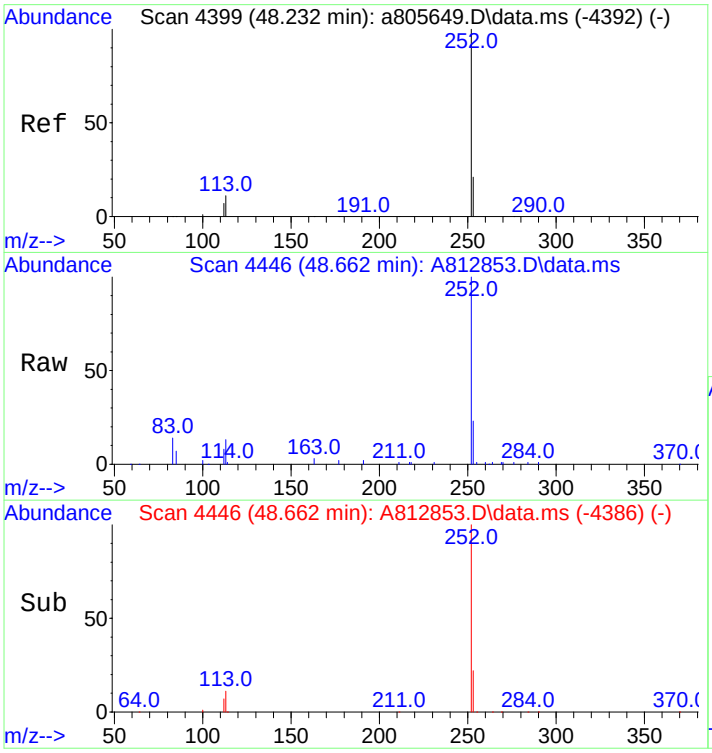


#87
Benzo[e]pyrene
Concen: 2322.08 ng/mL
RT: 48.470 min Scan# 4425
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:252 Resp: 538631

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.9	28.3

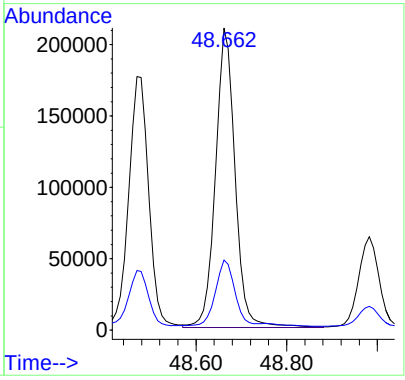


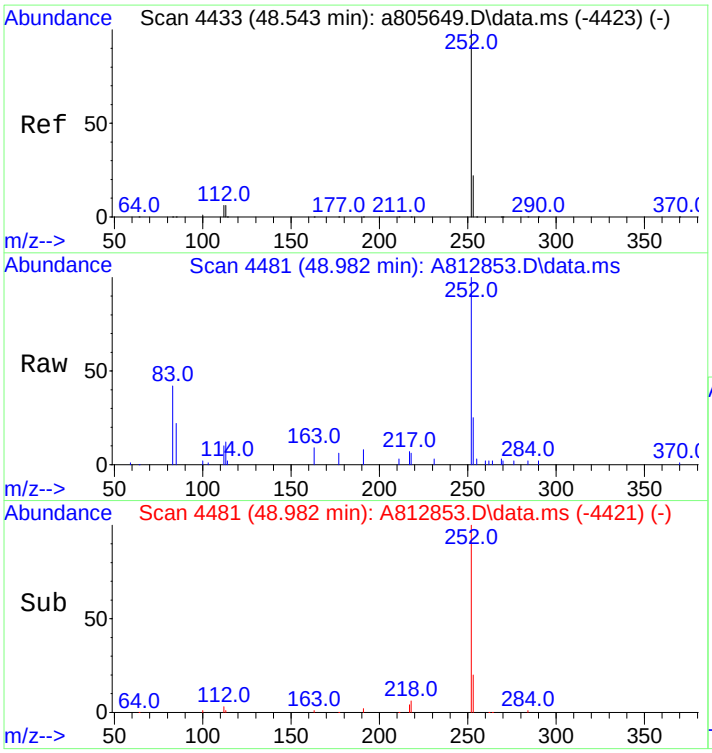


#89
Benzo[a]pyrene
Concen: 2924.26 ng/mL
RT: 48.662 min Scan# 4446
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:252 Resp: 627456

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.4	29.0

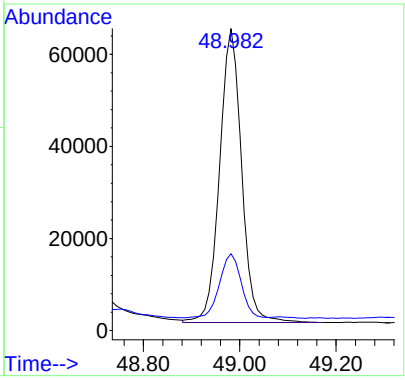


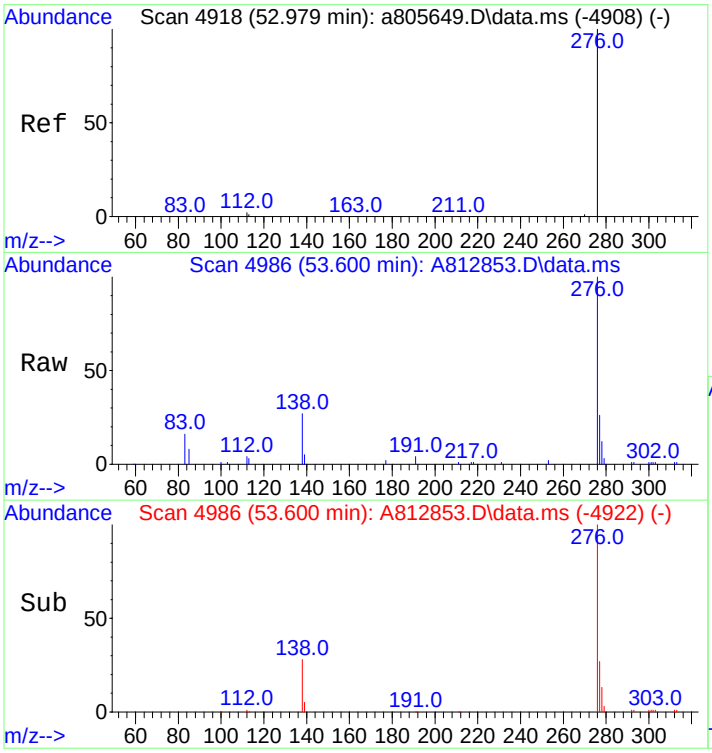


#90
Perylene
Concen: 864.54 ng/mL
RT: 48.982 min Scan# 4481
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:252 Resp: 202628

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.3	28.9

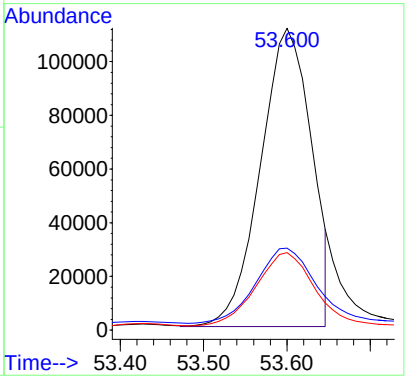


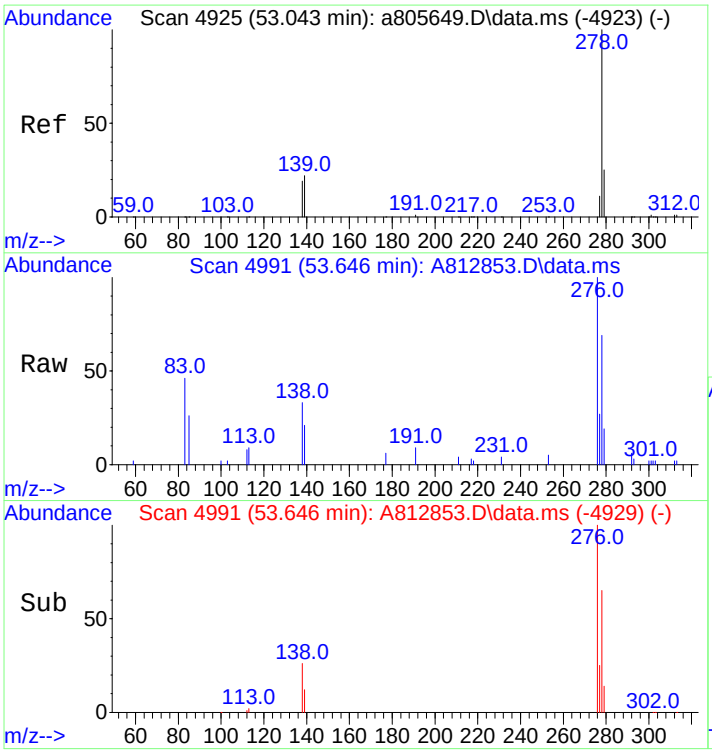


#91
Indeno[1,2,3-cd]pyrene
Concen: 2078.84 ng/mL m
RT: 53.600 min Scan# 4986
Delta R.T. 0.082 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:276 Resp: 473828

Ion	Ratio	Lower	Upper
276	100		
138	29.8	19.9	29.9
277	28.1	19.0	28.6

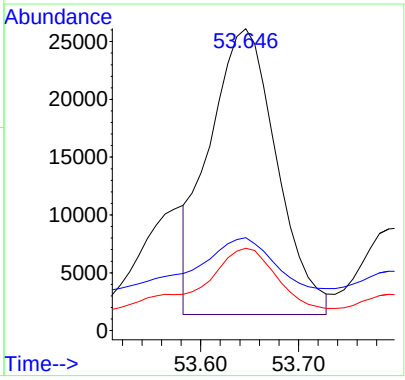


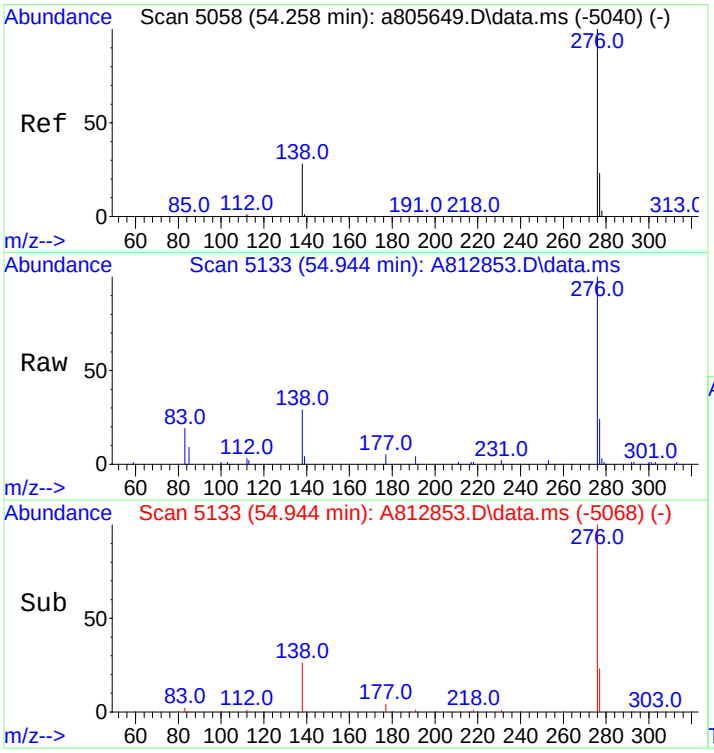


#92
Dibenz[ah]+[ac]anthracene
Concen: 529.76 ng/mL m
RT: 53.646 min Scan# 4991
Delta R.T. 0.064 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:278 Resp: 118358

Ion	Ratio	Lower	Upper
278	100		
139	23.5	16.6	25.0
279	28.9	19.1	28.7#

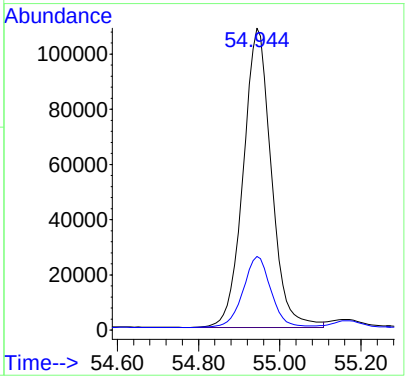


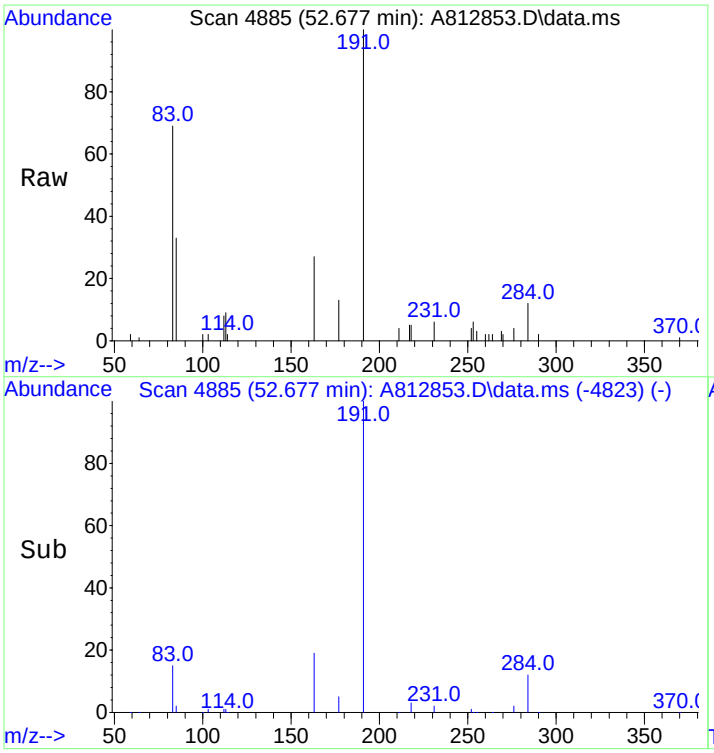


#93
Benzo[g,h,i]perylene
Concen: 2013.27 ng/mL
RT: 54.944 min Scan# 5133
Delta R.T. 0.092 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:276 Resp: 520763

Ion	Ratio	Lower	Upper
276	100		
277	23.7	18.9	28.3

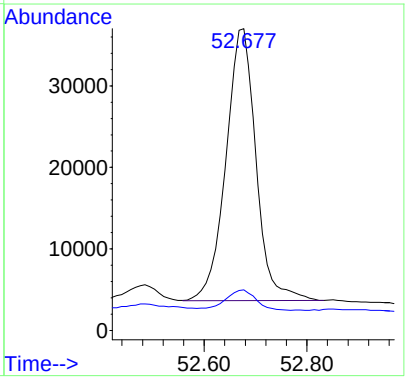


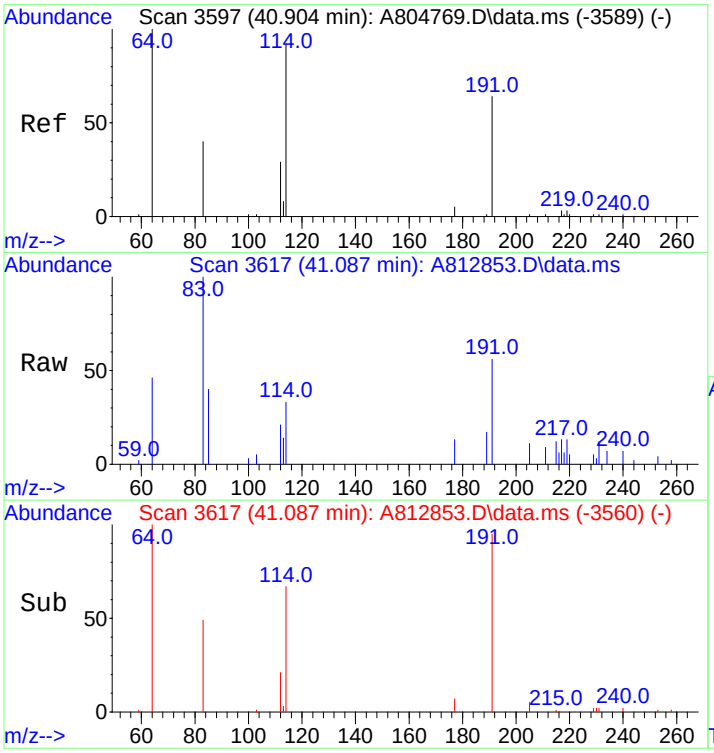


#94
Hopane (T19)
Concen: 1892.28 ng/mL
RT: 52.677 min Scan# 4885
Delta R.T. 0.064 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:191 Resp: 135884

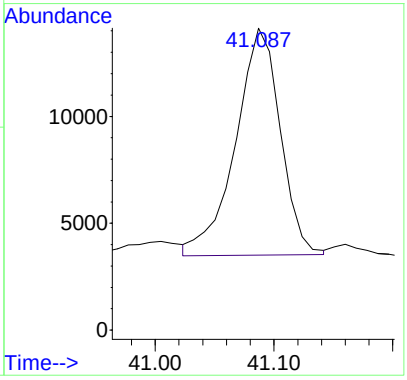
Ion	Ratio	Lower	Upper
191	100		
177	7.5	9.8	14.8#

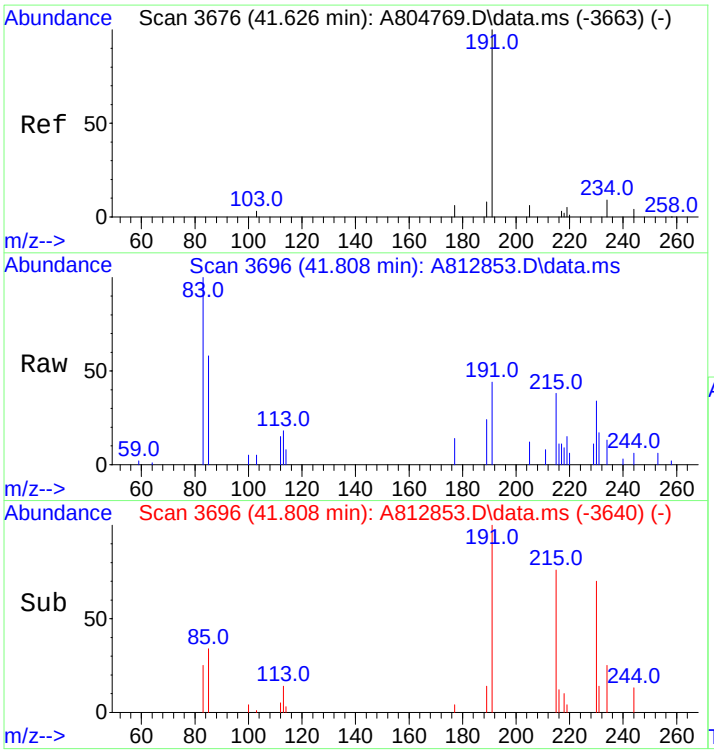




#96
C23 Tricyclic Terpane (T4)
Concen: 386.16 ng/ml
RT: 41.087 min Scan# 3617
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

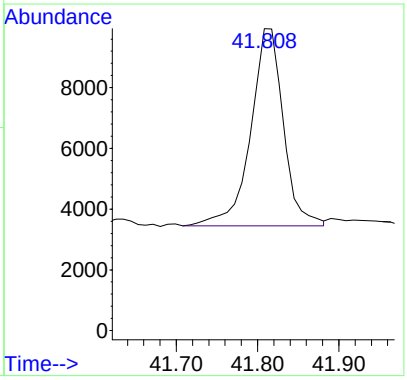
Tgt Ion:191 Resp: 27730

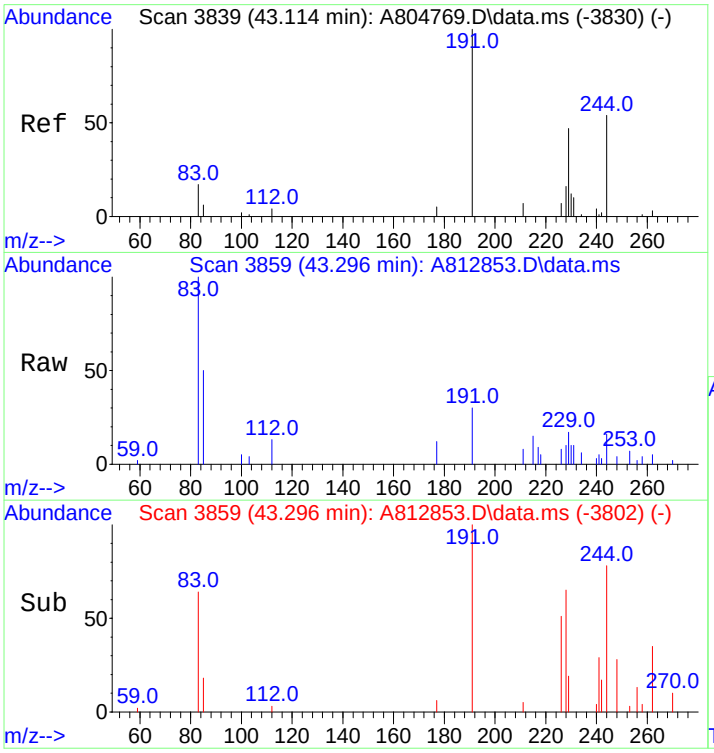




#97
C24 Tricyclic Terpane (T5)
Concen: 254.12 ng/ml
RT: 41.808 min Scan# 3696
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

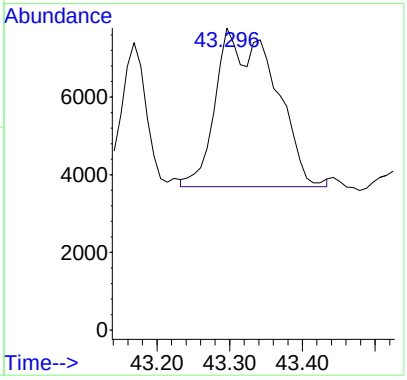
Tgt Ion:191 Resp: 18248

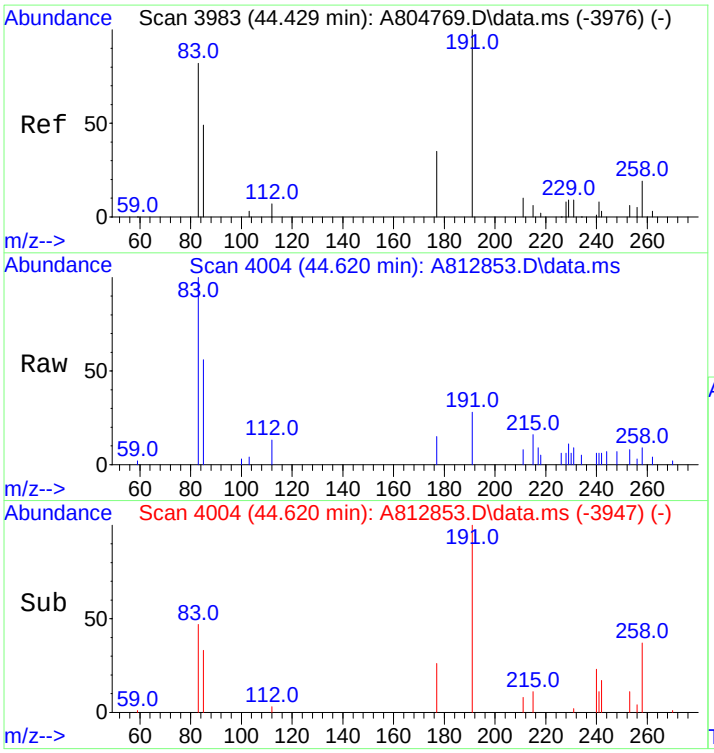




#98
C25 Tricyclic Terpane (T6)
Concen: 315.96 ng/ml m
RT: 43.296 min Scan# 3859
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

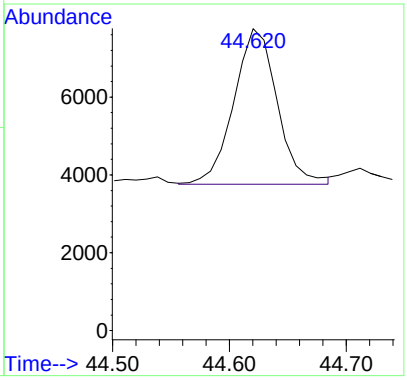
Tgt Ion:191 Resp: 22689

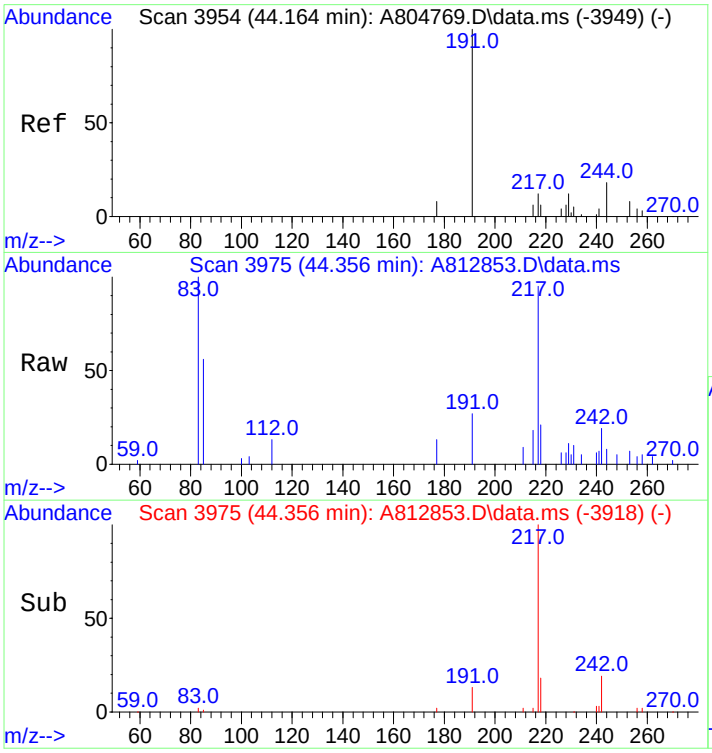




#99
C24 Tetracyclic Terpane (T6a)
Concen: 143.59 ng/ml m
RT: 44.620 min Scan# 4004
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

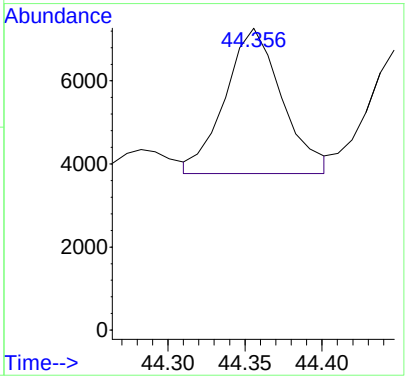
Tgt Ion:191 Resp: 10311

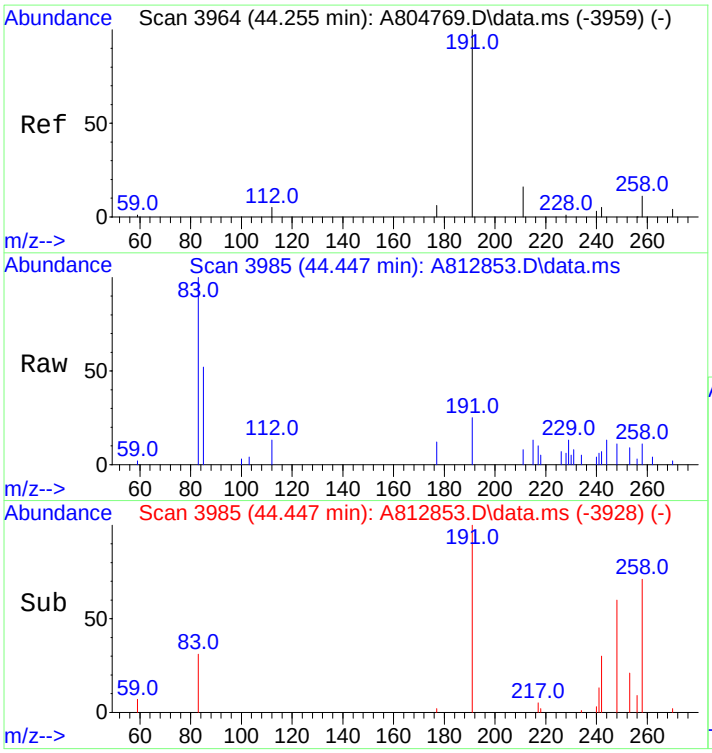




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 125.50 ng/ml m
RT: 44.356 min Scan# 3975
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

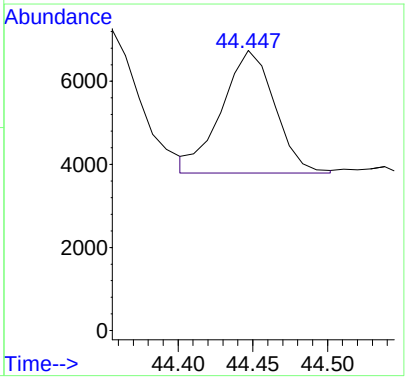
Tgt Ion:191 Resp: 9012

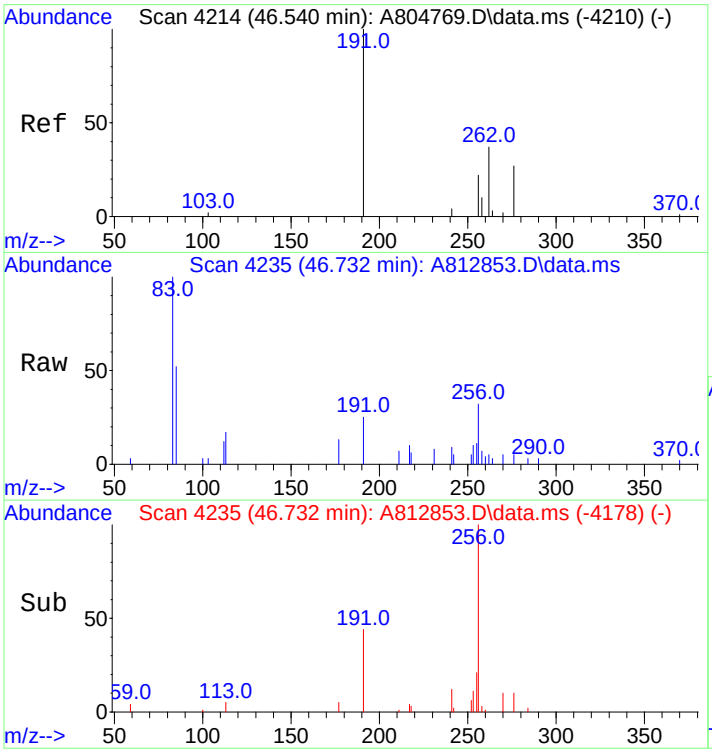




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 101.17 ng/ml m
RT: 44.447 min Scan# 3985
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

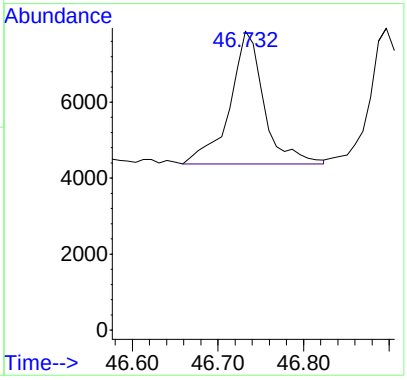
Tgt Ion:191 Resp: 7265

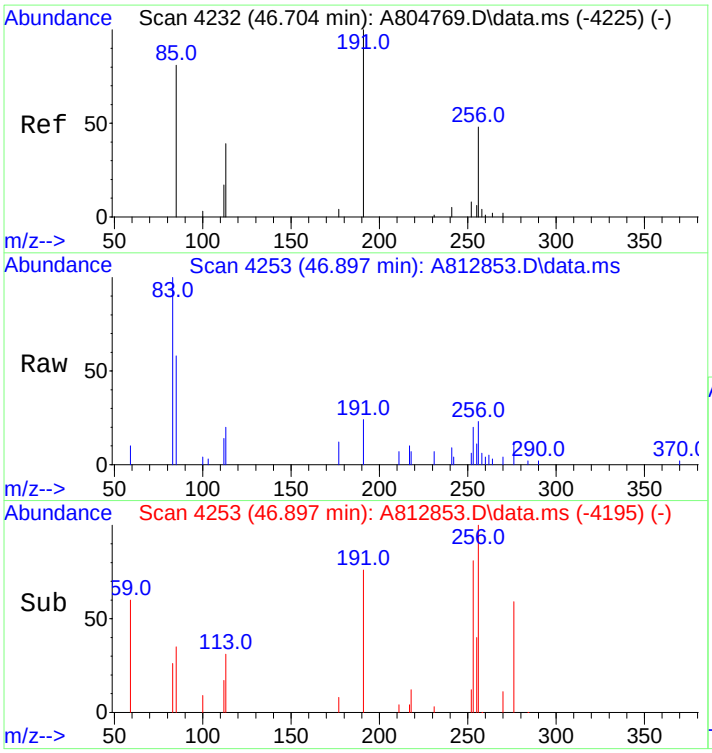




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 133.77 ng/ml
RT: 46.732 min Scan# 4235
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

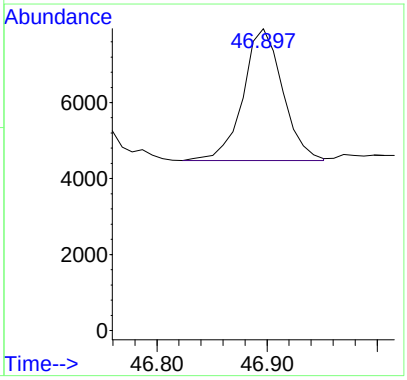
Tgt Ion:191 Resp: 9606

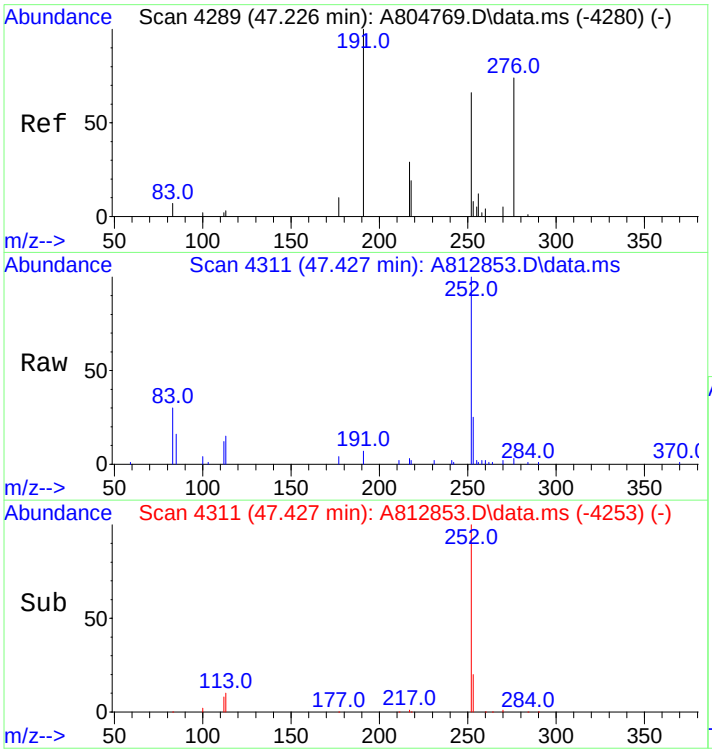




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 121.07 ng/ml
RT: 46.897 min Scan# 4253
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

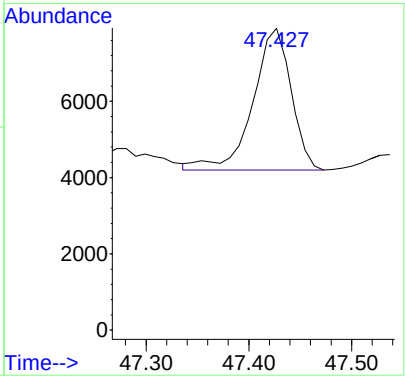
Tgt Ion:191 Resp: 8694

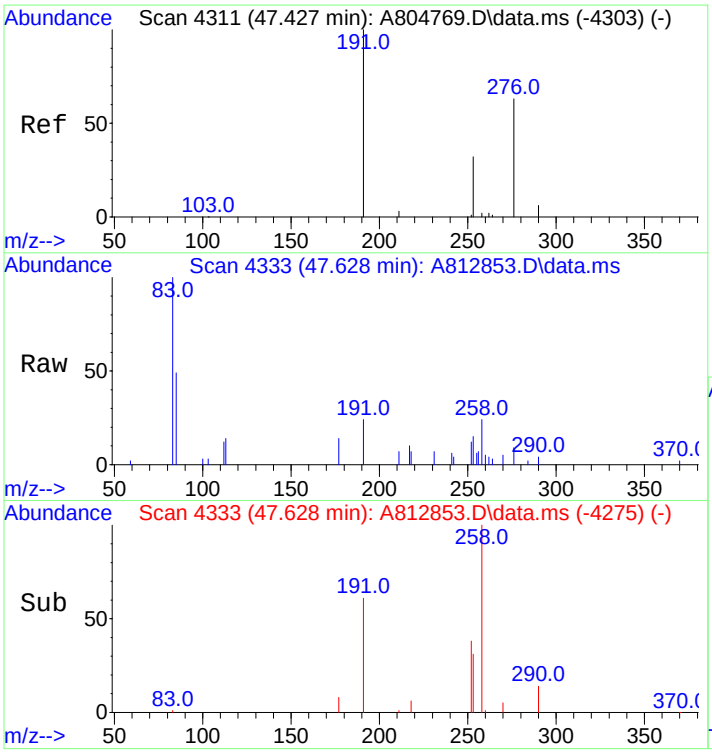




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 133.73 ng/ml
RT: 47.427 min Scan# 4311
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

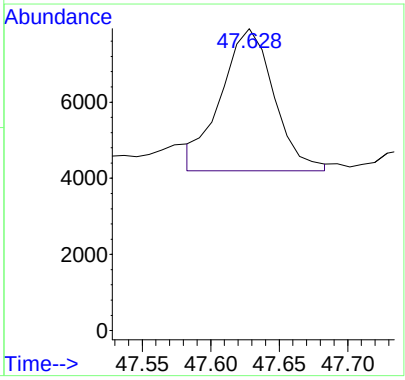
Tgt Ion:191 Resp: 9603

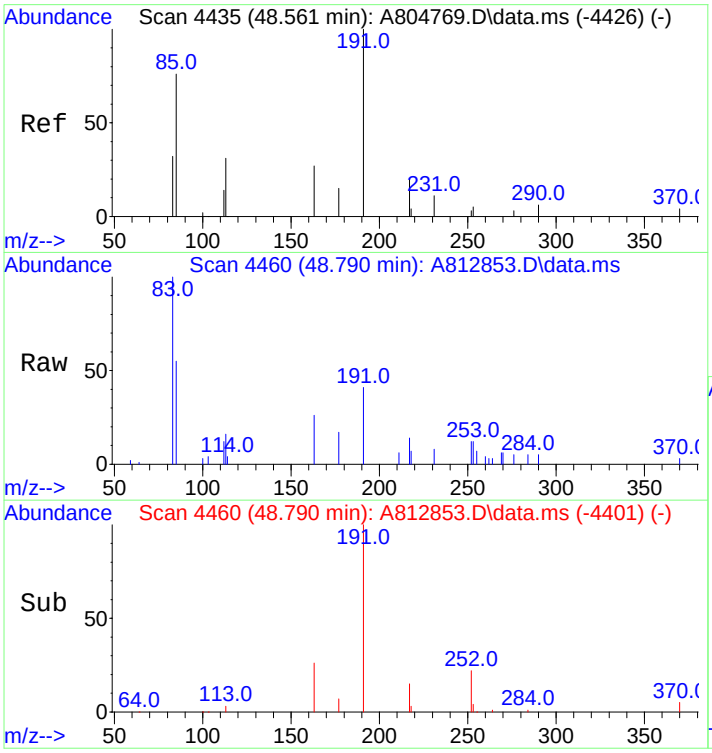




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 139.22 ng/ml m
RT: 47.628 min Scan# 4333
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

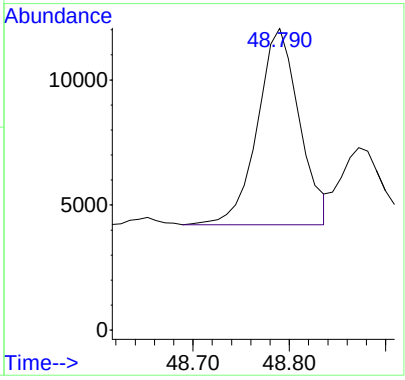
Tgt Ion:191 Resp: 9997

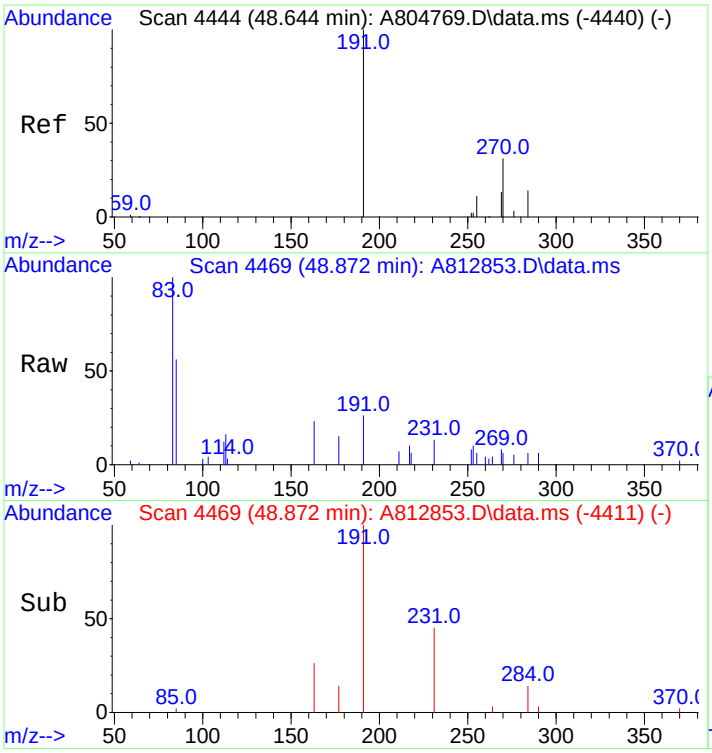




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 330.43 ng/ml
RT: 48.790 min Scan# 4460
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

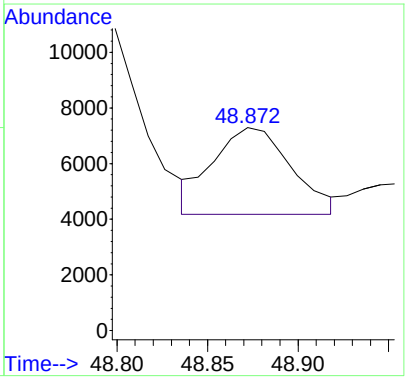
Tgt Ion:191 Resp: 23728

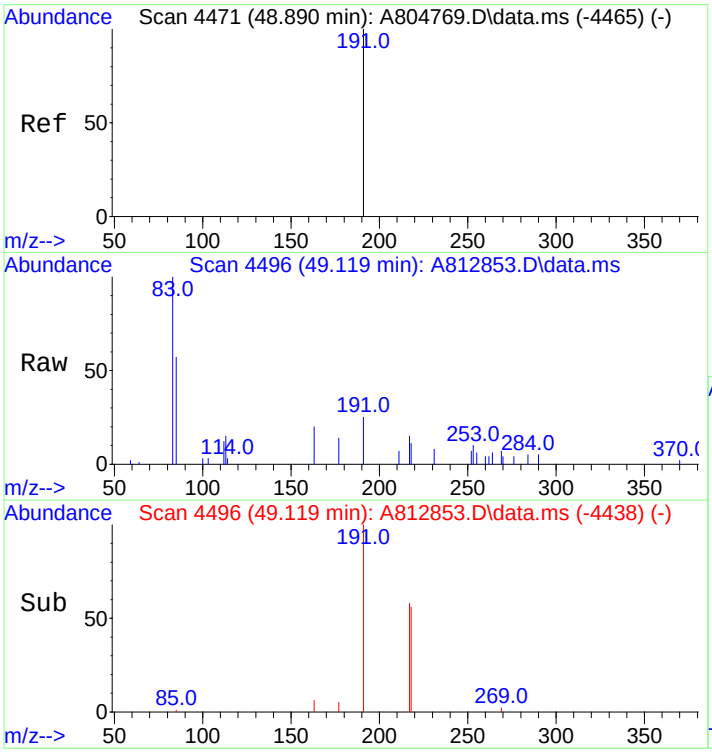




#107
C30 Tricyclic Terpane-22S
Concen: 130.99 ng/mL m
RT: 48.872 min Scan# 4469
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

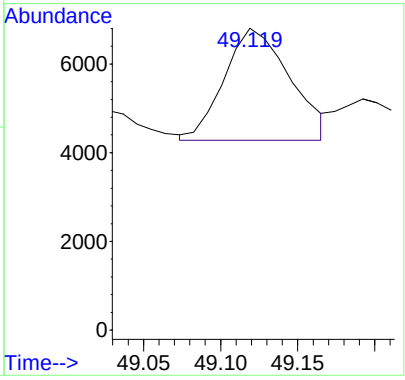
Tgt Ion:191 Resp: 9406

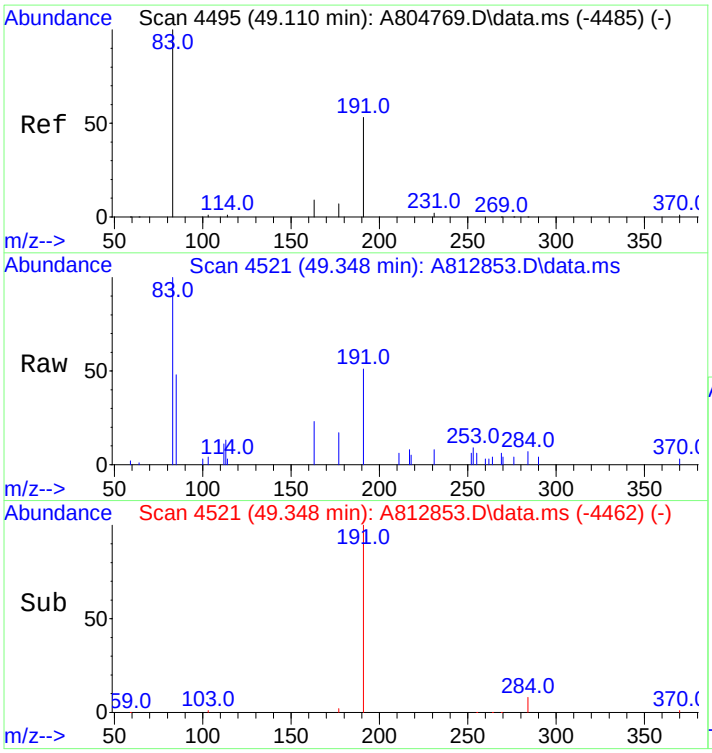




#108
C30 Tricyclic Terpane-22R
Concen: 103.62 ng/mL m
RT: 49.119 min Scan# 4496
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

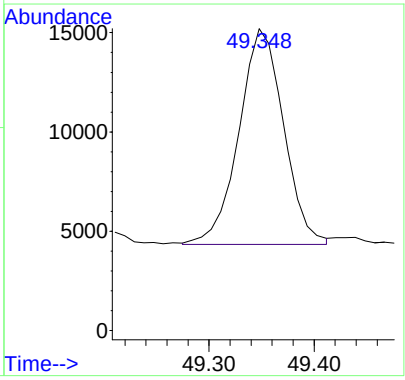
Tgt Ion:191 Resp: 7441

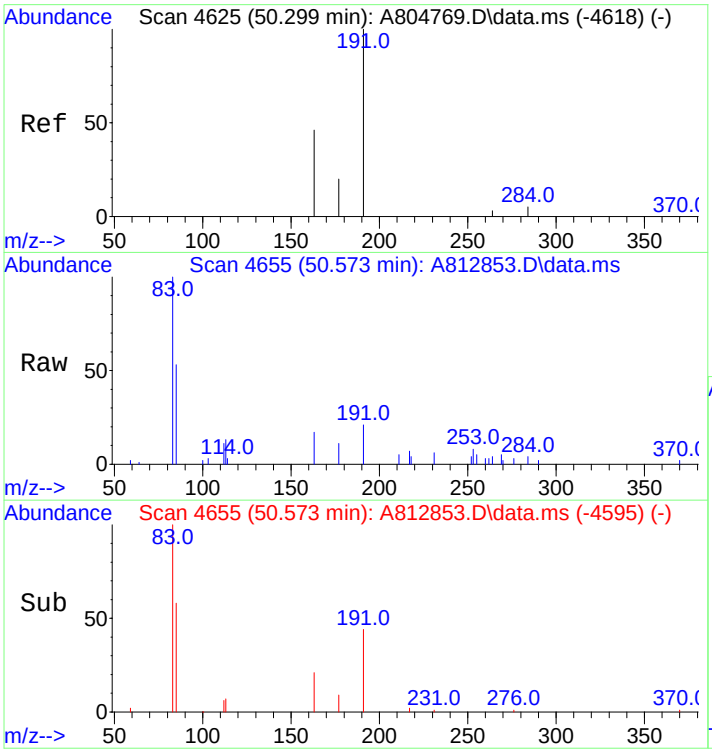




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 447.39 ng/ml m
RT: 49.348 min Scan# 4521
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

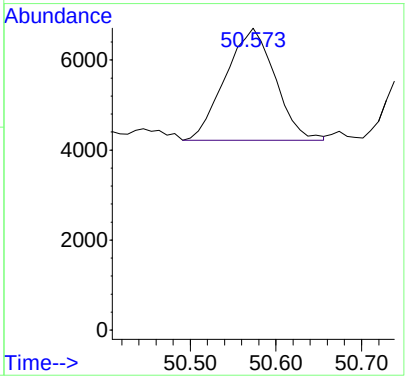
Tgt Ion:191 Resp: 32127

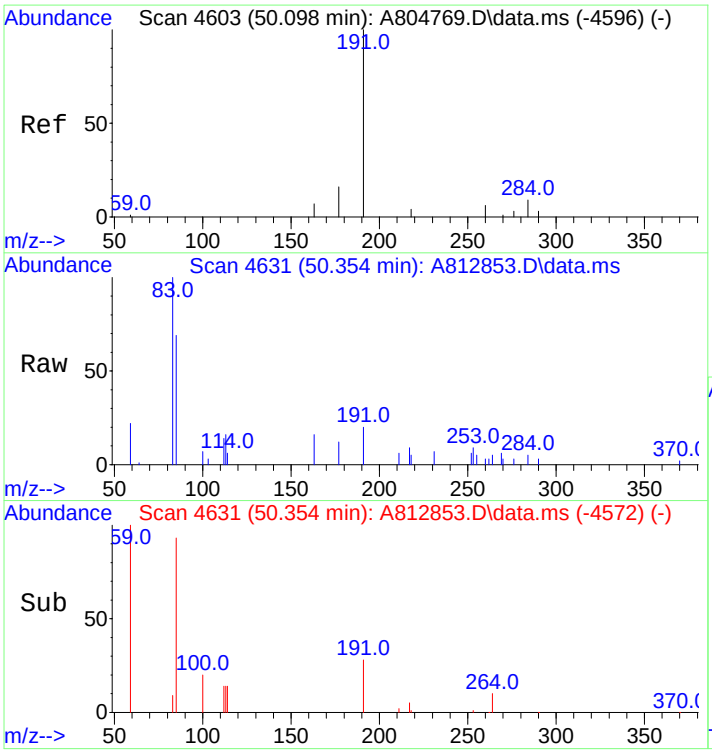




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 139.98 ng/ml
RT: 50.573 min Scan# 4655
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

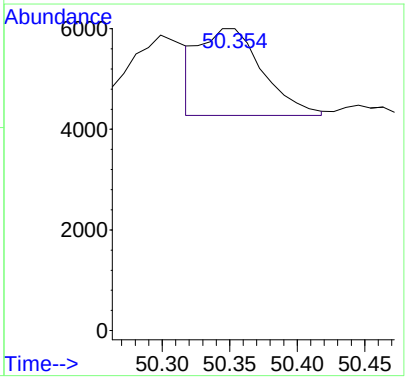
Tgt Ion:191 Resp: 10052

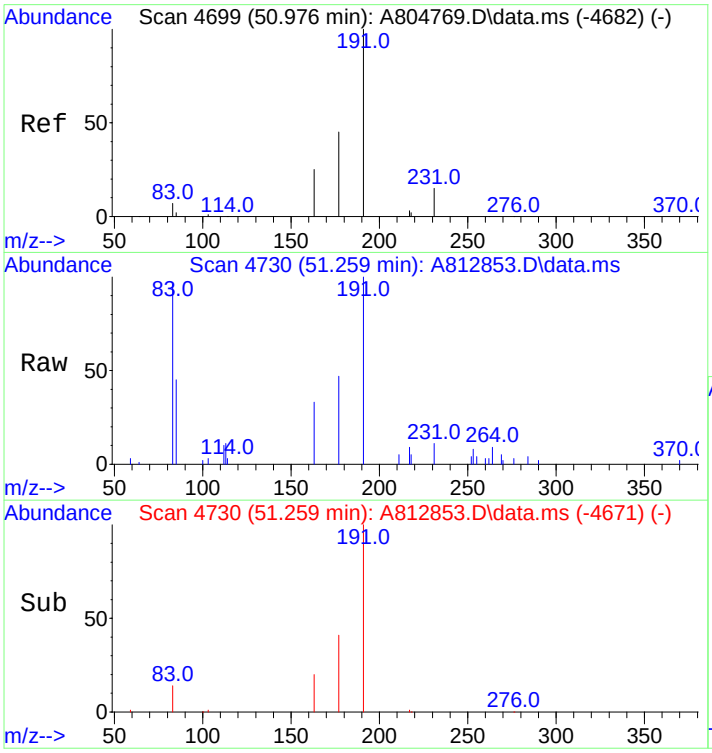




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 77.82 ng/ml m
RT: 50.354 min Scan# 4631
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

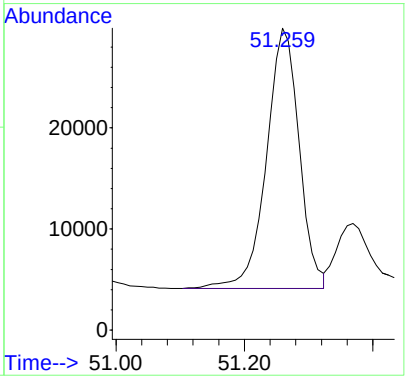
Tgt Ion:191 Resp: 5588

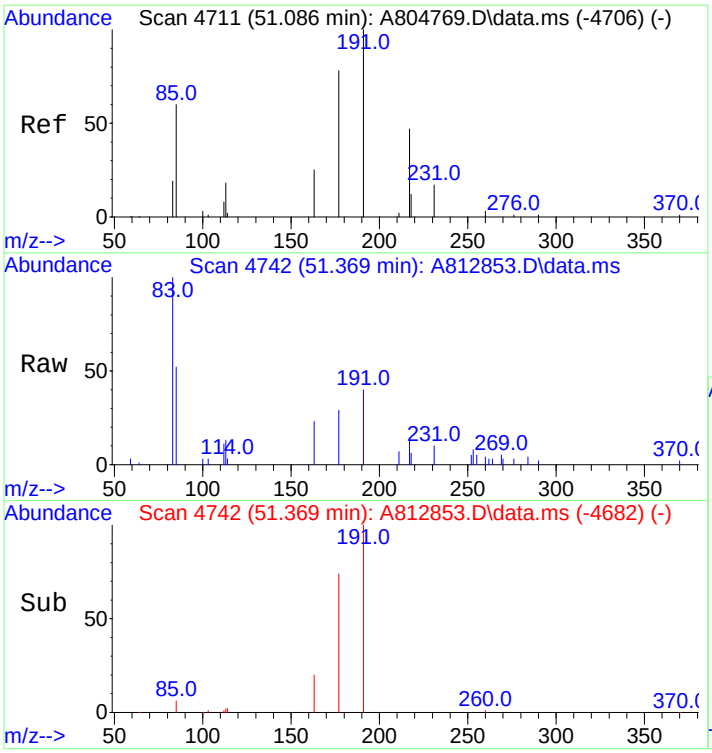




#112
30-Norhopane (T15)
Concen: 1271.33 ng/ml
RT: 51.259 min Scan# 4730
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

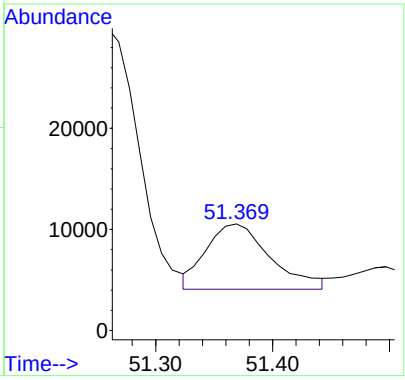
Tgt Ion:191 Resp: 91294

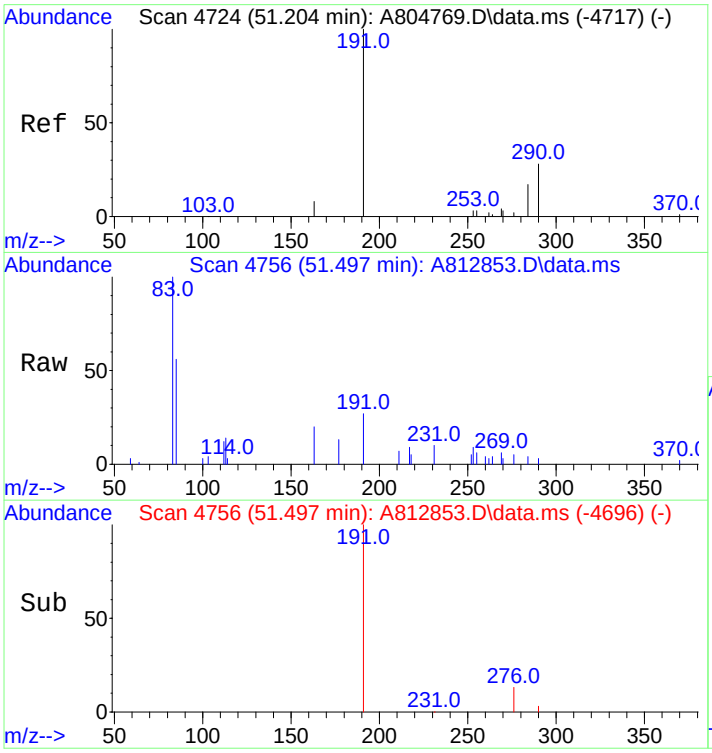




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 343.20 ng/ml m
RT: 51.369 min Scan# 4742
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

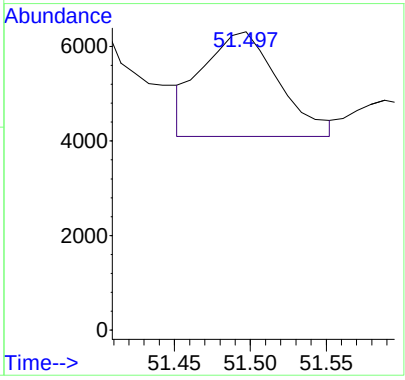
Tgt Ion:191 Resp: 24645

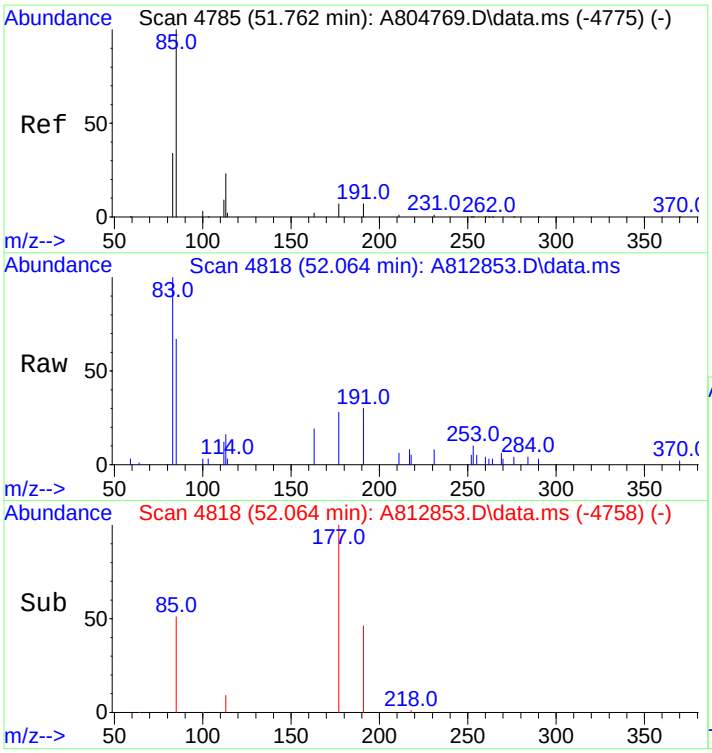




#114
17a(H)-Diahopane (X)
Concen: 107.06 ng/ml m
RT: 51.497 min Scan# 4756
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

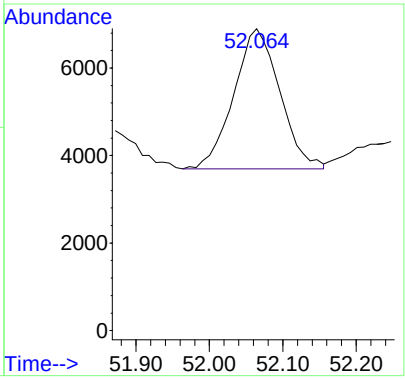
Tgt Ion:191 Resp: 7688

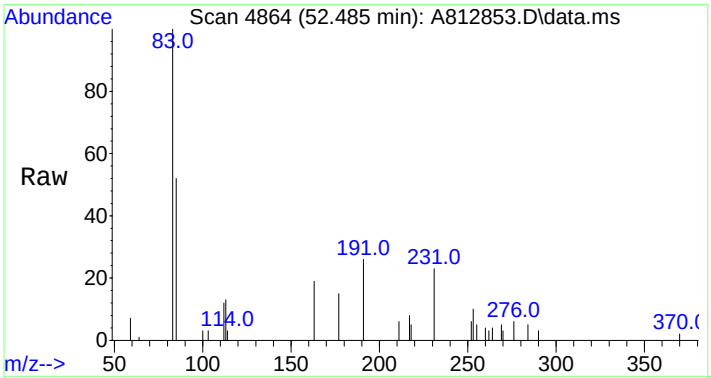




#115
30-Normoretane (T17)
Concen: 195.25 ng/ml
RT: 52.064 min Scan# 4818
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

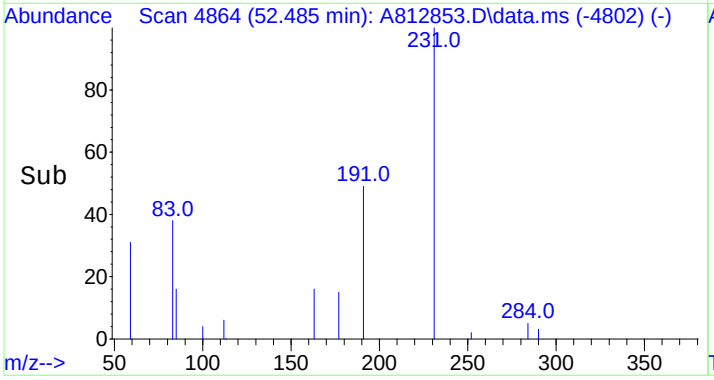
Tgt Ion:191 Resp: 14021

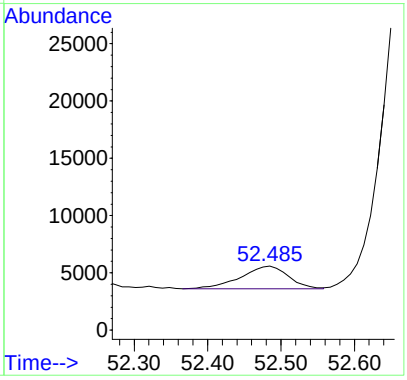


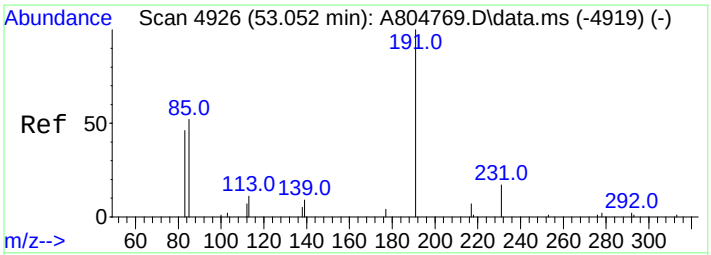


#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 123.95 ng/ml
RT: 52.485 min Scan# 4864
Delta R.T. 0.064 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:191 Resp: 8901

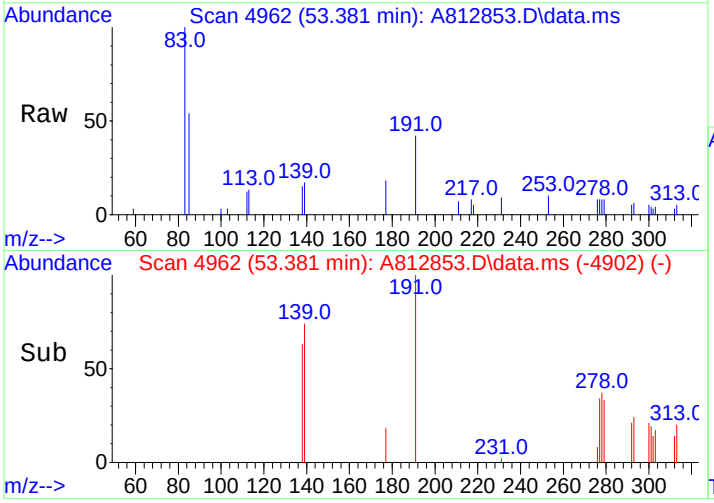


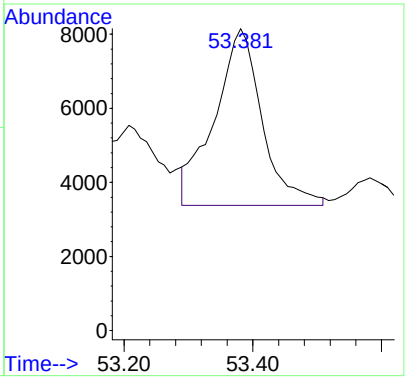


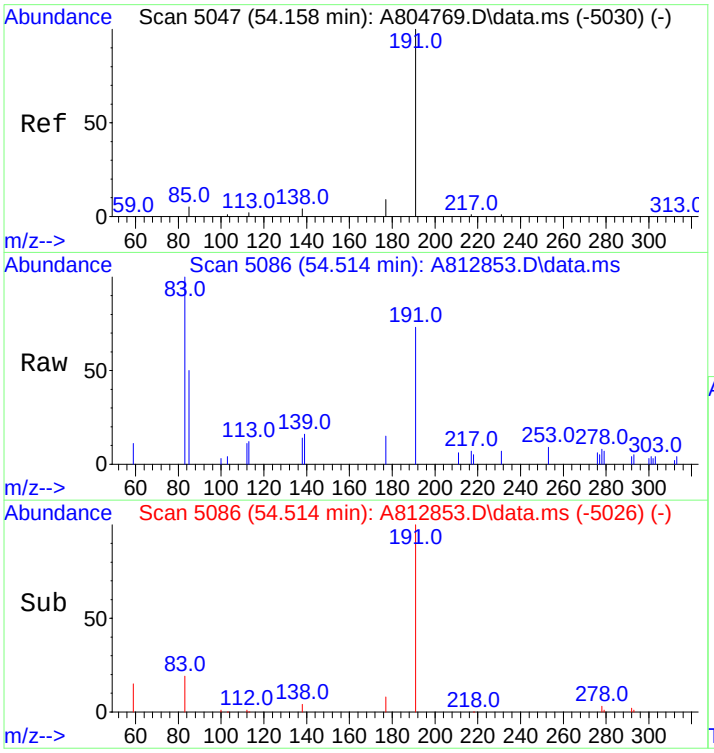


#117
Moretane (T20)
Concen: 340.97 ng/ml m
RT: 53.381 min Scan# 4962
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:191 Resp: 24485

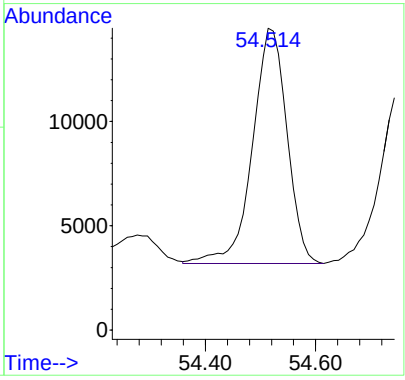


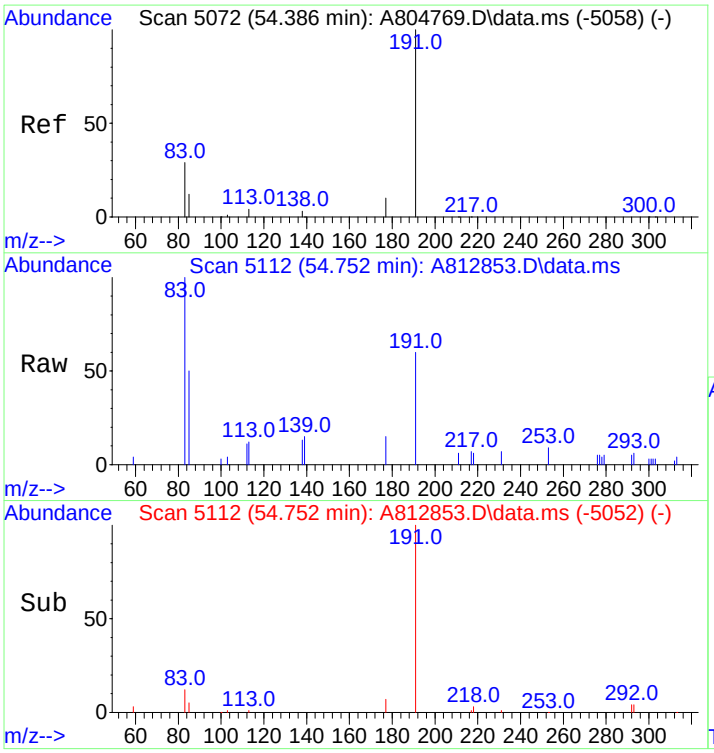




#118
30-Homohopane-22S (T21)
Concen: 682.61 ng/ml
RT: 54.514 min Scan# 5086
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

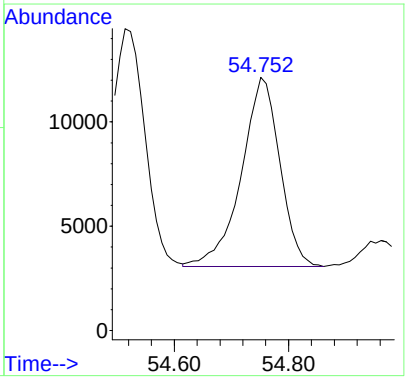
Tgt Ion:191 Resp: 49018

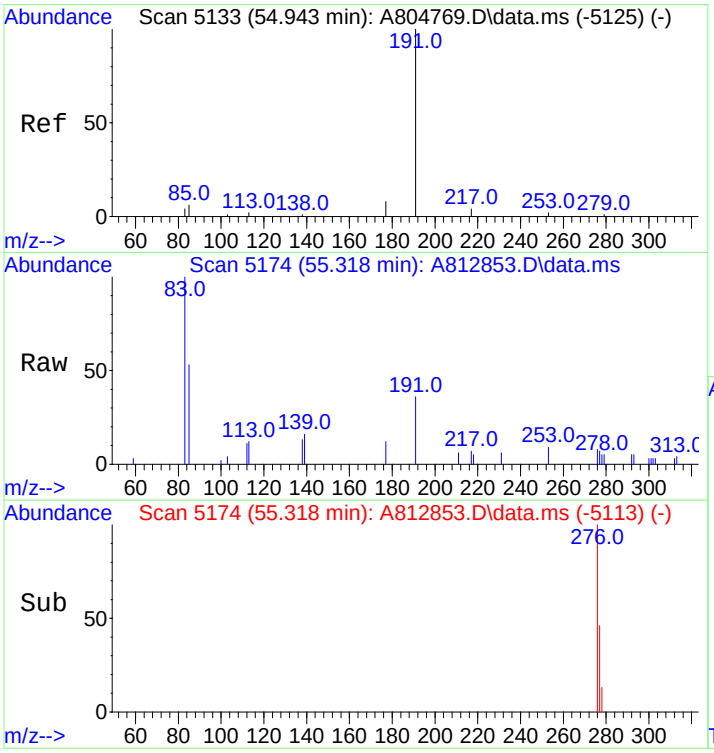




#119
30-Homohopane-22R (T22)
Concen: 592.02 ng/ml
RT: 54.752 min Scan# 5112
Delta R.T. 0.046 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

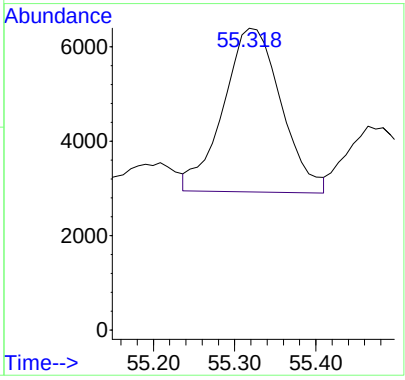
Tgt Ion:191 Resp: 42513

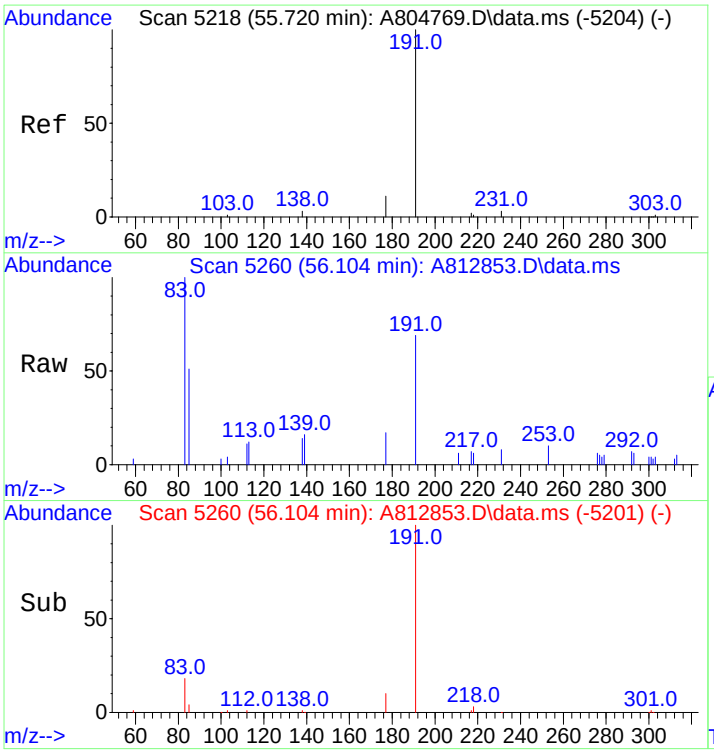




#120
Gammacerane/C32-diahopane
Concen: 238.69 ng/mL
RT: 55.318 min Scan# 5174
Delta R.T. 0.055 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

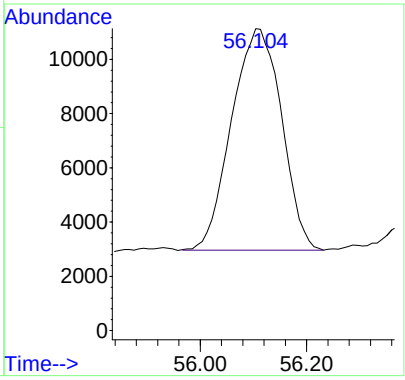
Tgt Ion:191 Resp: 17140

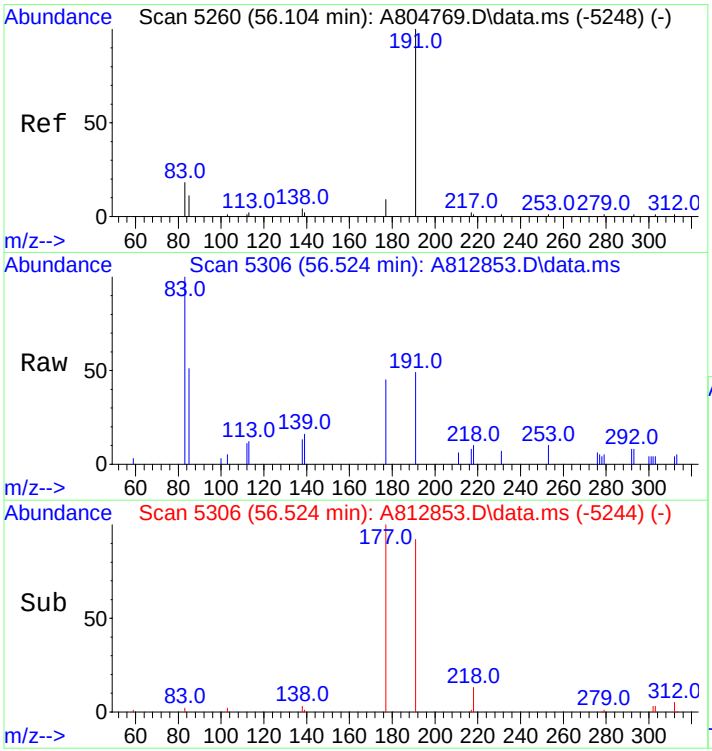




#121
30,31-Bishomohopane-22S (T26)
Concen: 741.07 ng/ml
RT: 56.104 min Scan# 5260
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

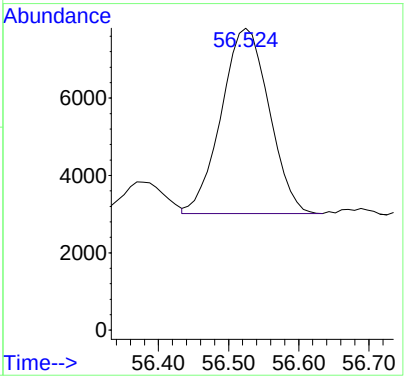
Tgt Ion:191 Resp: 53216

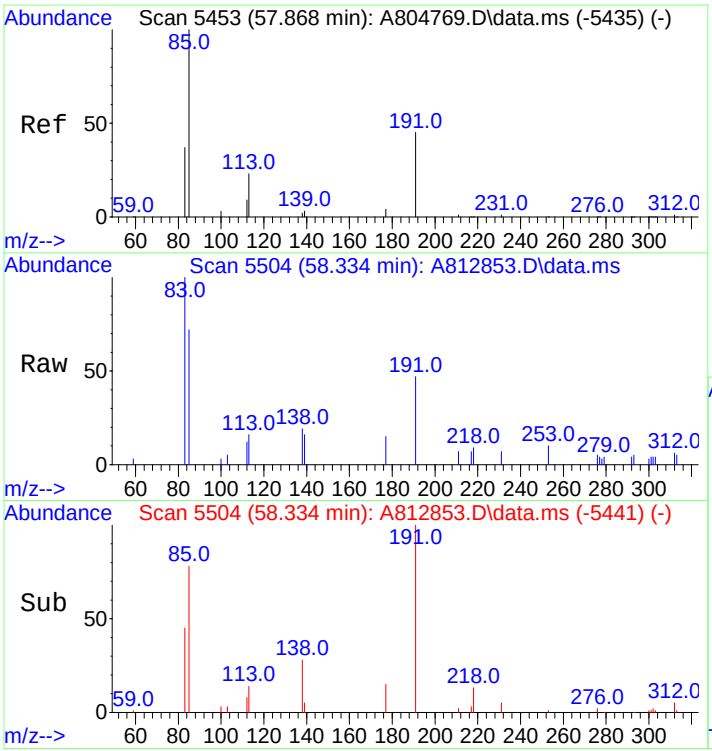




#122
30,31-Bishomohopane-22R (T27)
Concen: 316.32 ng/ml
RT: 56.524 min Scan# 5306
Delta R.T. 0.064 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

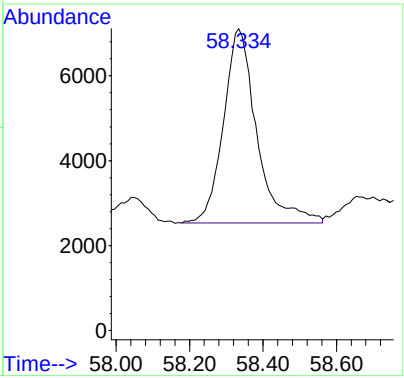
Tgt Ion:191 Resp: 22715

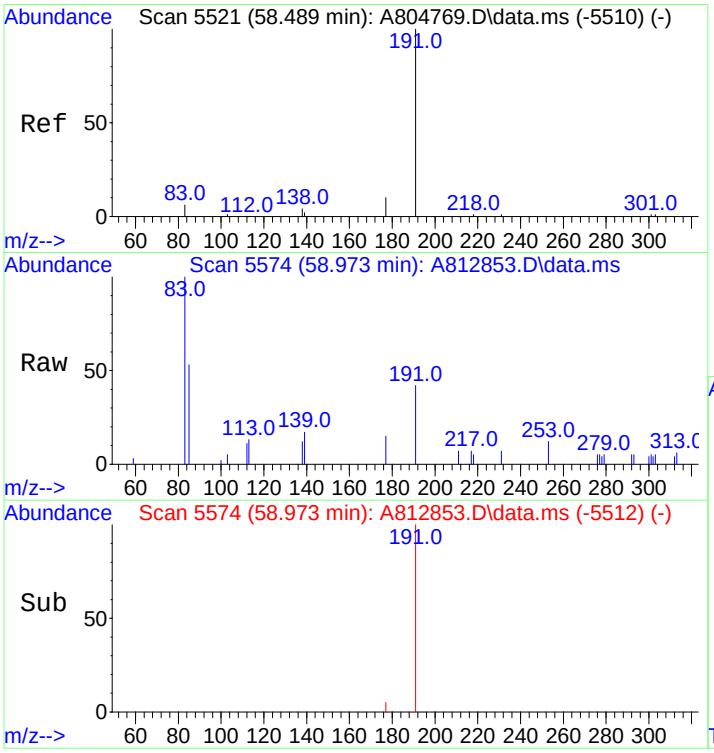




#123
30,31-Trishomohopane-22S (T30)
Concen: 403.08 ng/ml
RT: 58.334 min Scan# 5504
Delta R.T. 0.073 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

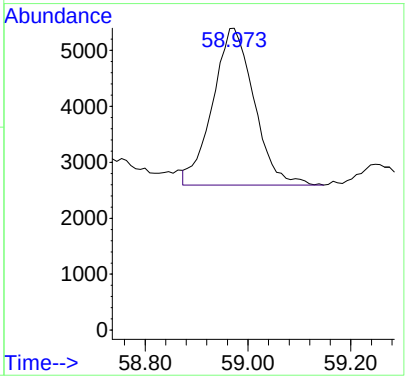
Tgt Ion:191 Resp: 28945

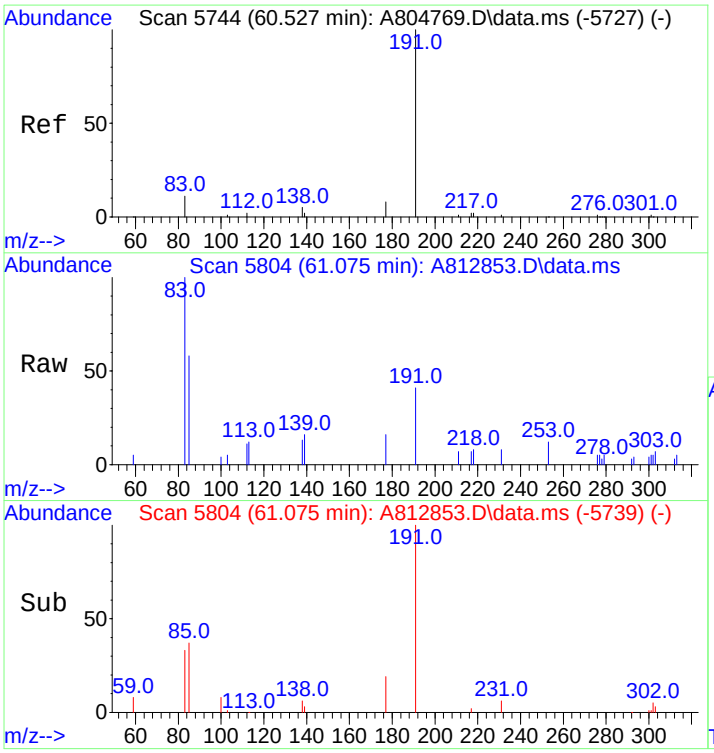




#124
30,31-Trishomohopane-22R (T31)
Concen: 218.44 ng/ml
RT: 58.973 min Scan# 5574
Delta R.T. 0.064 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

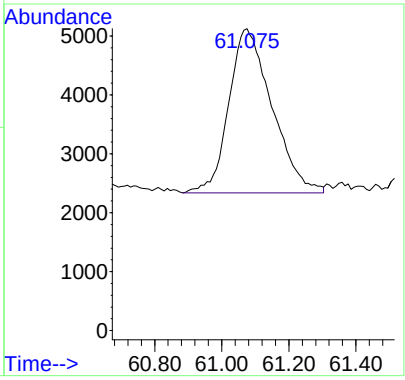
Tgt Ion:191 Resp: 15686

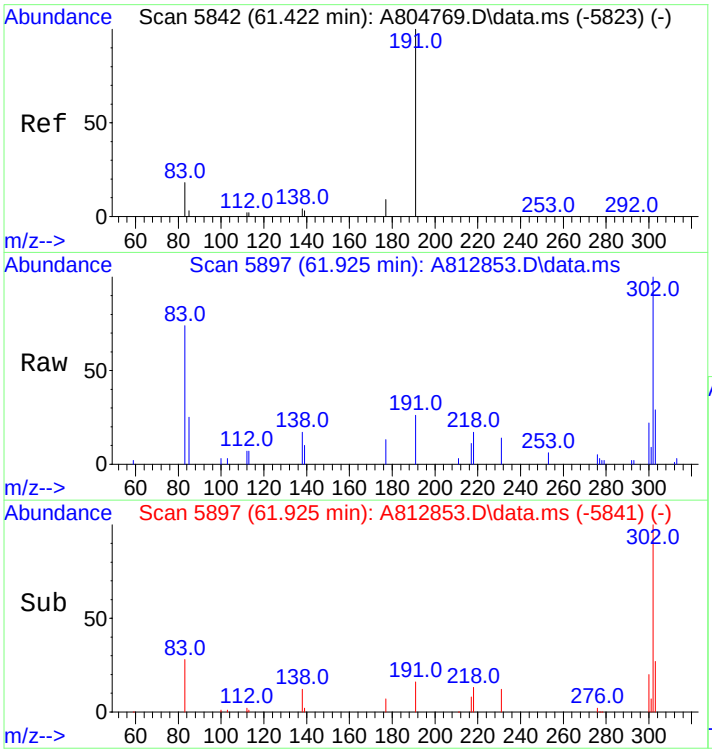




#125
Tetrakishomohopane-22S (T32)
Concen: 346.81 ng/ml
RT: 61.075 min Scan# 5804
Delta R.T. 0.091 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

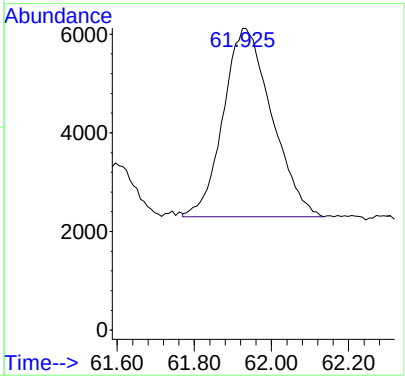
Tgt Ion:191 Resp: 24904

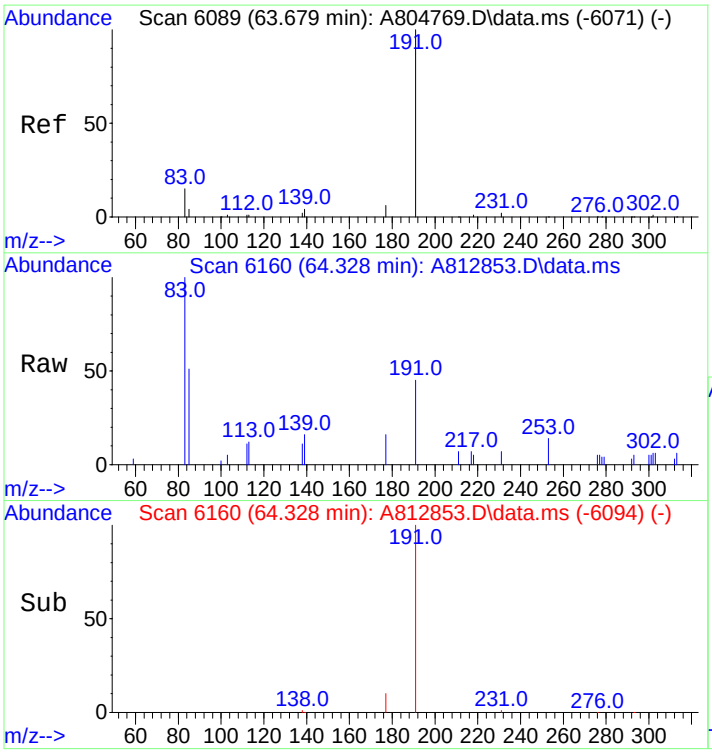




#126
Tetrakishomohopane-22R (T33)
Concen: 465.37 ng/ml
RT: 61.925 min Scan# 5897
Delta R.T. 0.009 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

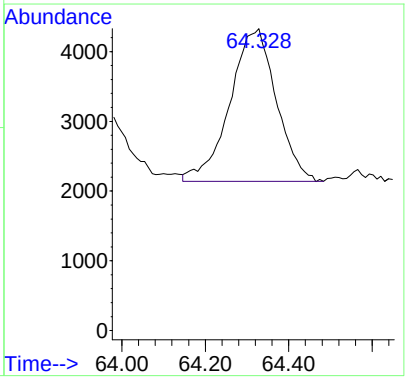
Tgt Ion:191 Resp: 33418

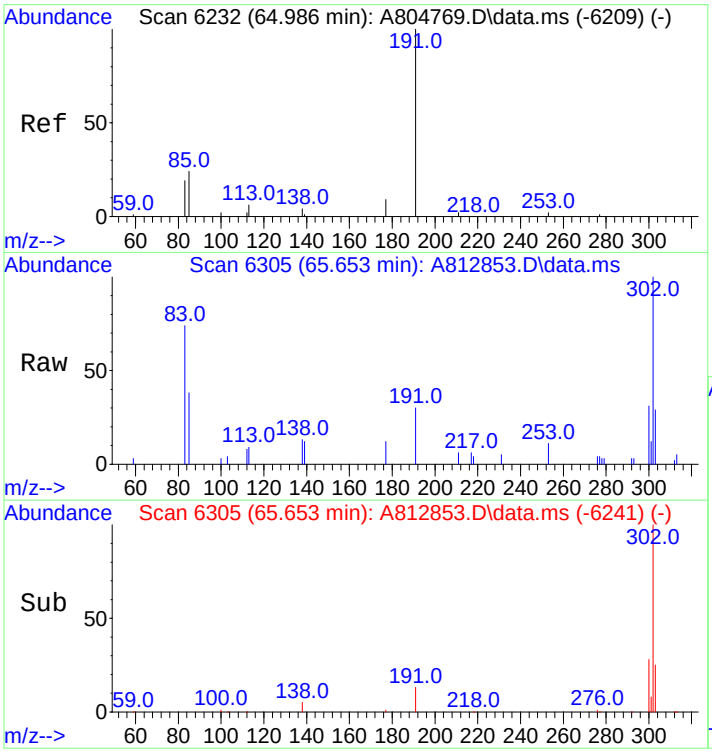




#127
Pentakishomohopane-22S (T34)
Concen: 235.65 ng/ml
RT: 64.328 min Scan# 6160
Delta R.T. 0.101 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

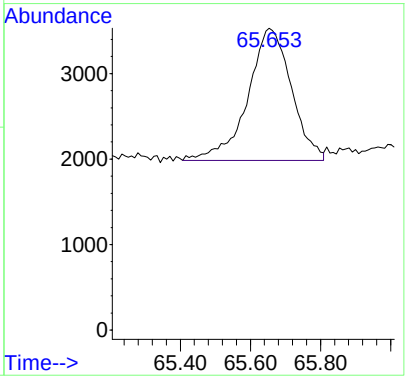
Tgt Ion:191 Resp: 16922

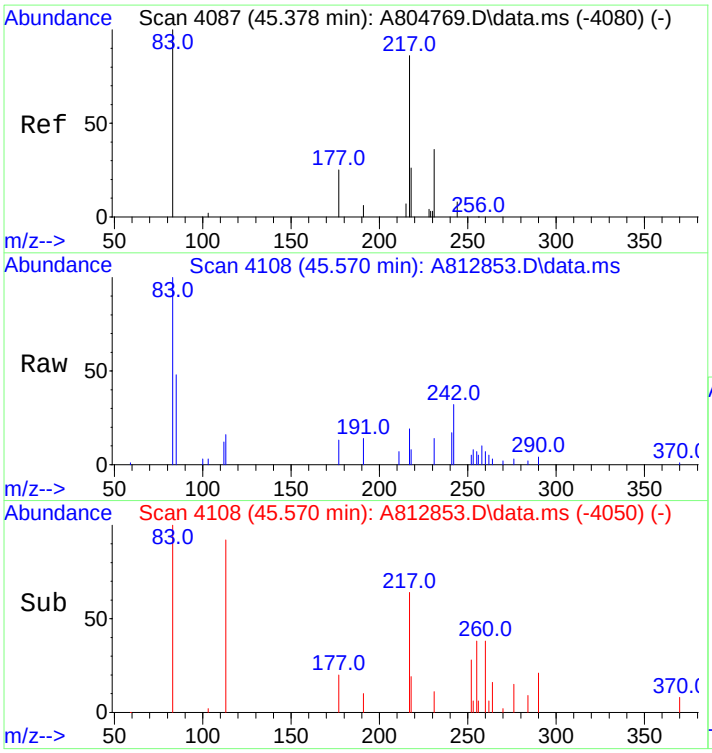




#128
Pentakishomohopane-22R (T35)
Concen: 186.88 ng/ml
RT: 65.653 min Scan# 6305
Delta R.T. 0.082 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

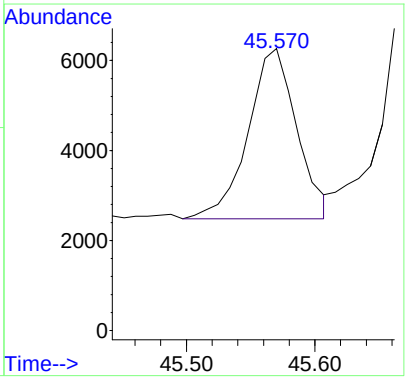
Tgt Ion:191 Resp: 13420

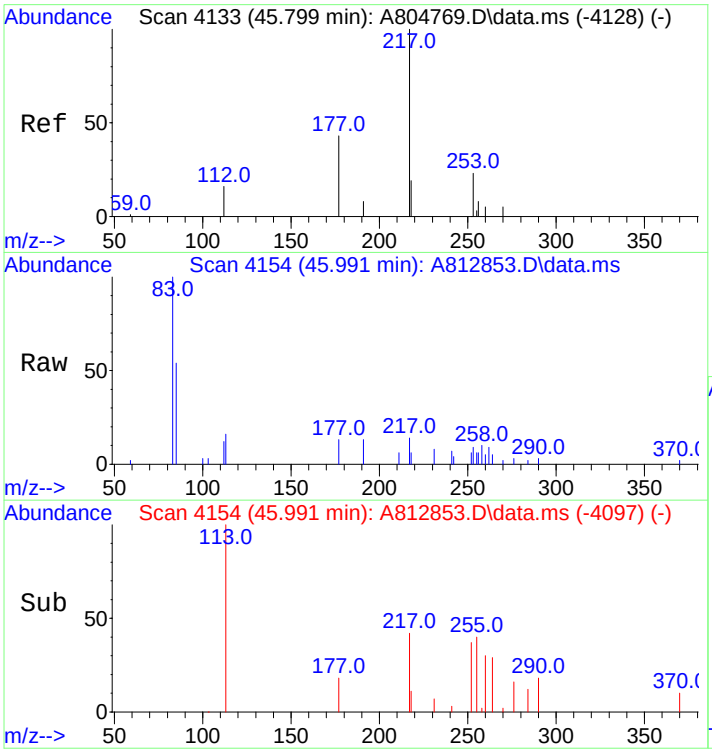




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 285.76 ng/ml
RT: 45.570 min Scan# 4108
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

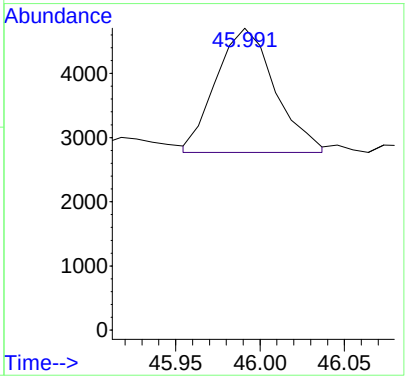
Tgt Ion:217 Resp: 9991

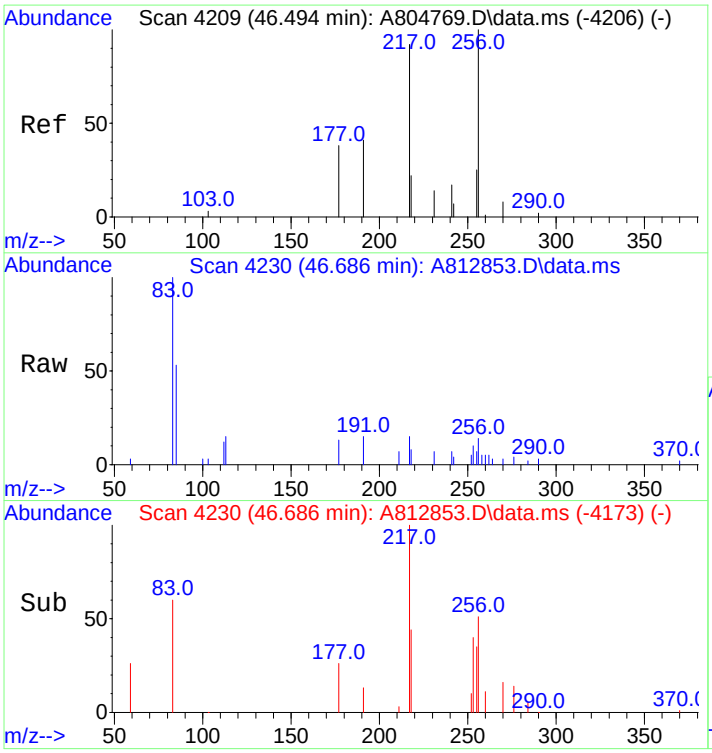




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 134.25 ng/ml m
RT: 45.991 min Scan# 4154
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

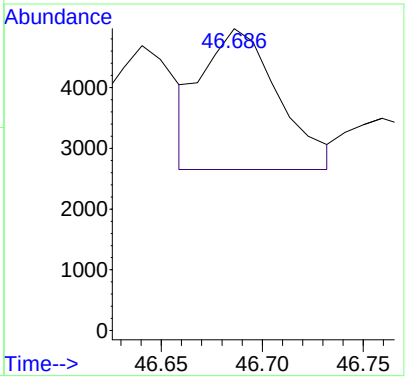
Tgt Ion:217 Resp: 4694

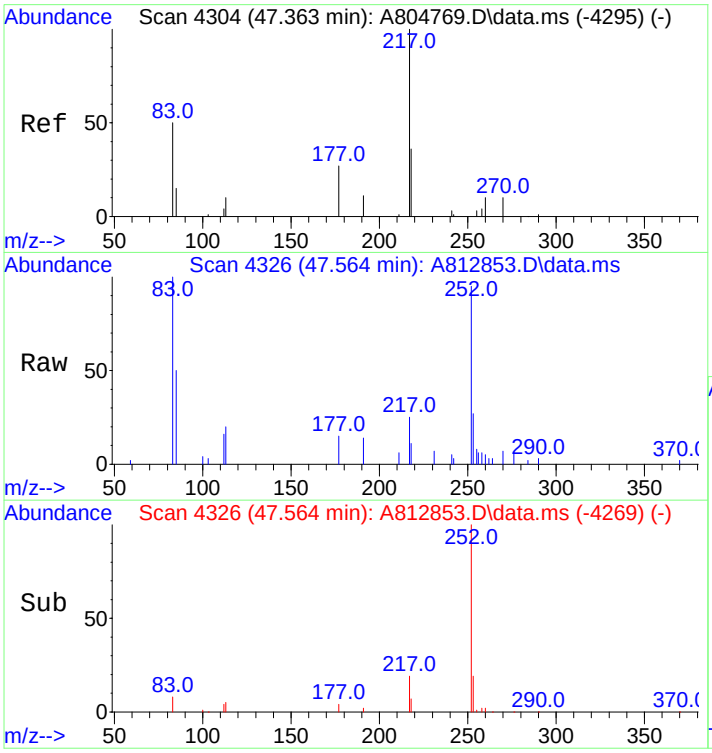




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 172.89 ng/ml m
RT: 46.686 min Scan# 4230
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

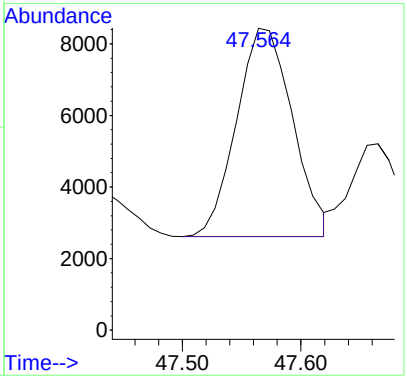
Tgt Ion:217 Resp: 6045

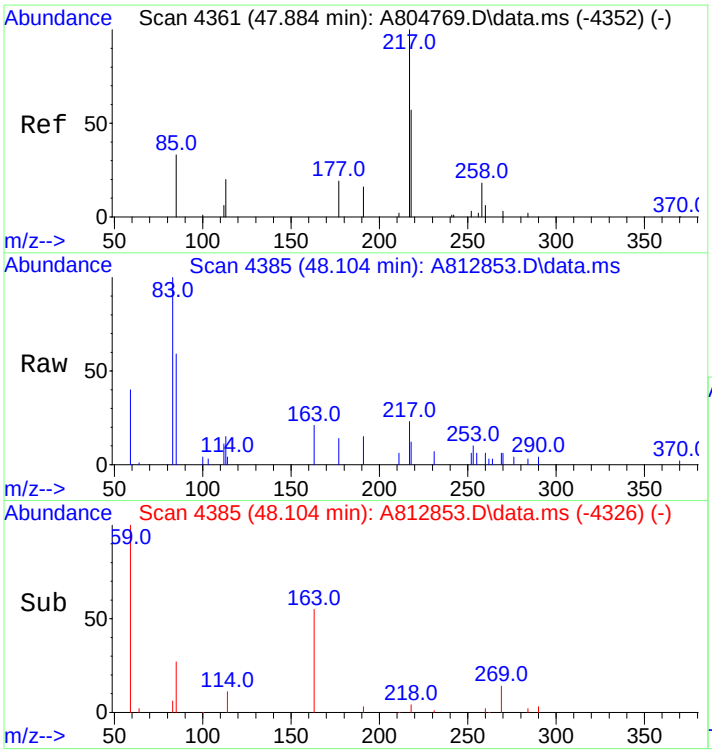




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 546.63 ng/ml
RT: 47.564 min Scan# 4326
Delta R.T. 0.018 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

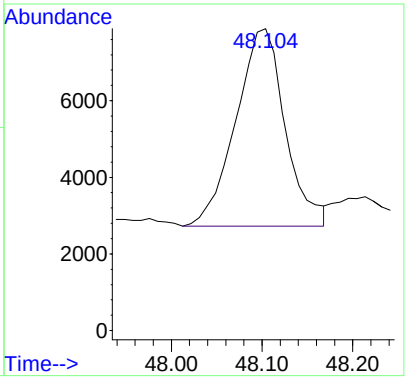
Tgt Ion:217 Resp: 19112

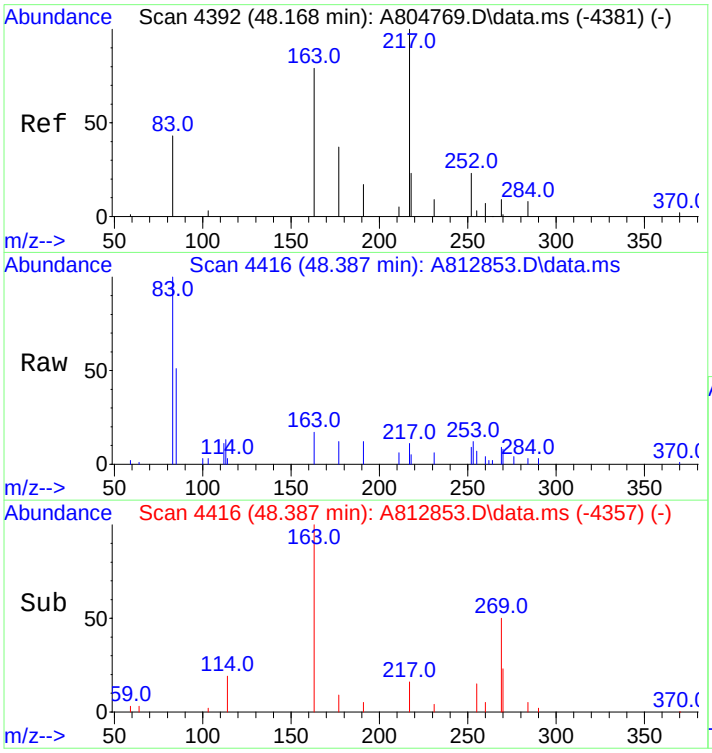




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 559.21 ng/ml
RT: 48.104 min Scan# 4385
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

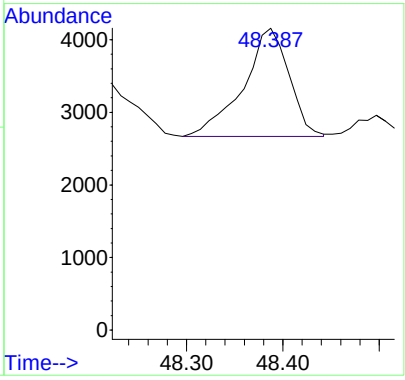
Tgt Ion:217 Resp: 19552

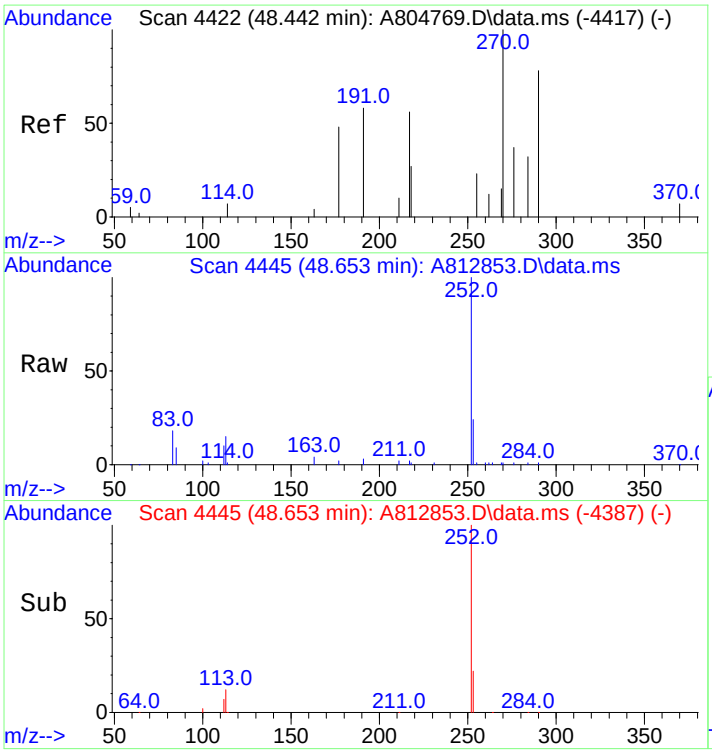




#135
Unknown Sterane (S18)
Concen: 140.83 ng/ml
RT: 48.387 min Scan# 4416
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

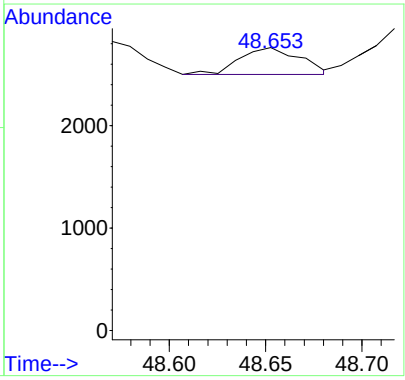
Tgt Ion:217 Resp: 4924

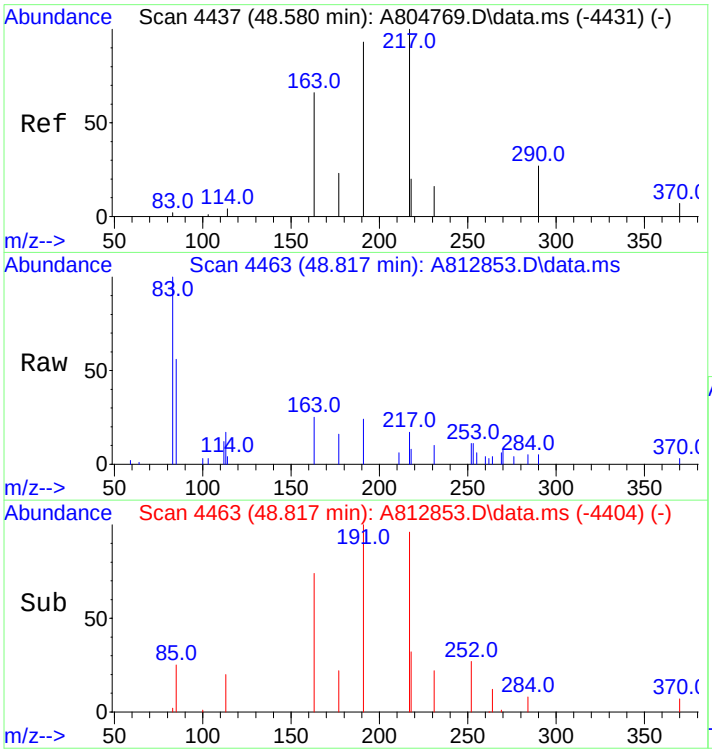




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 16.39 ng/ml
RT: 48.653 min Scan# 4445
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

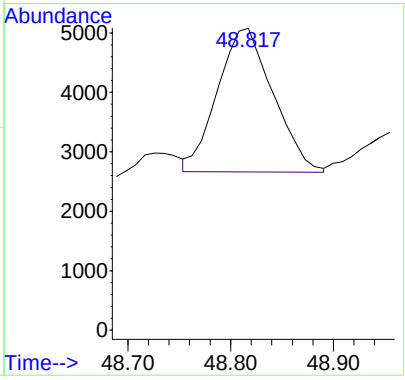
Tgt Ion:217 Resp: 573

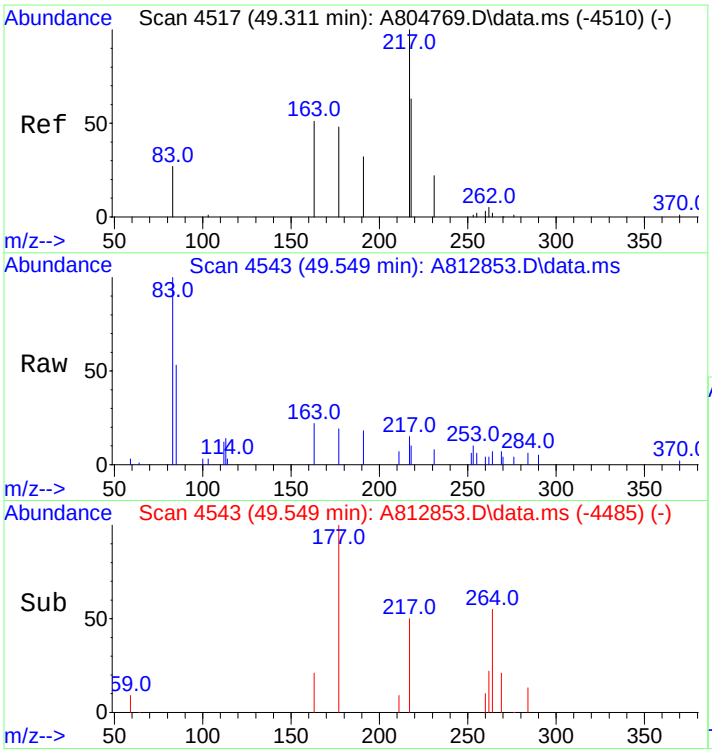




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 258.87 ng/ml
RT: 48.817 min Scan# 4463
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

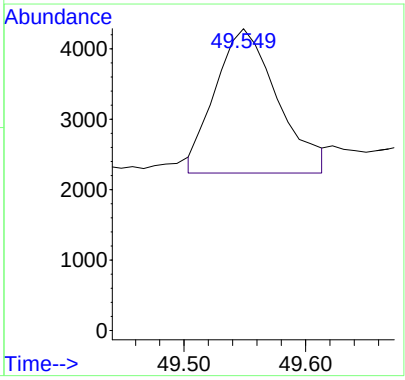
Tgt Ion:217 Resp: 9051

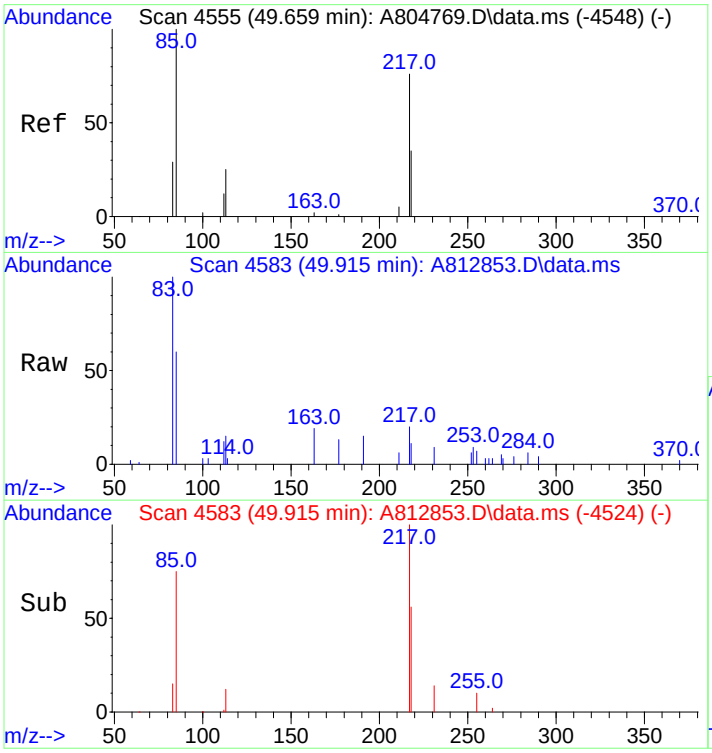




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 208.67 ng/ml m
RT: 49.549 min Scan# 4543
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

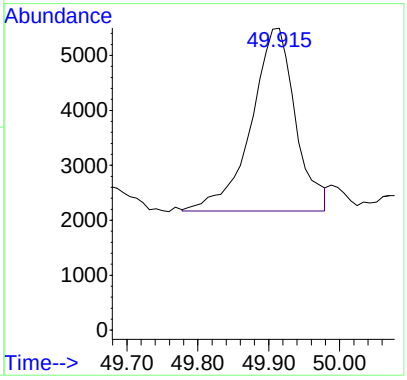
Tgt Ion:217 Resp: 7296

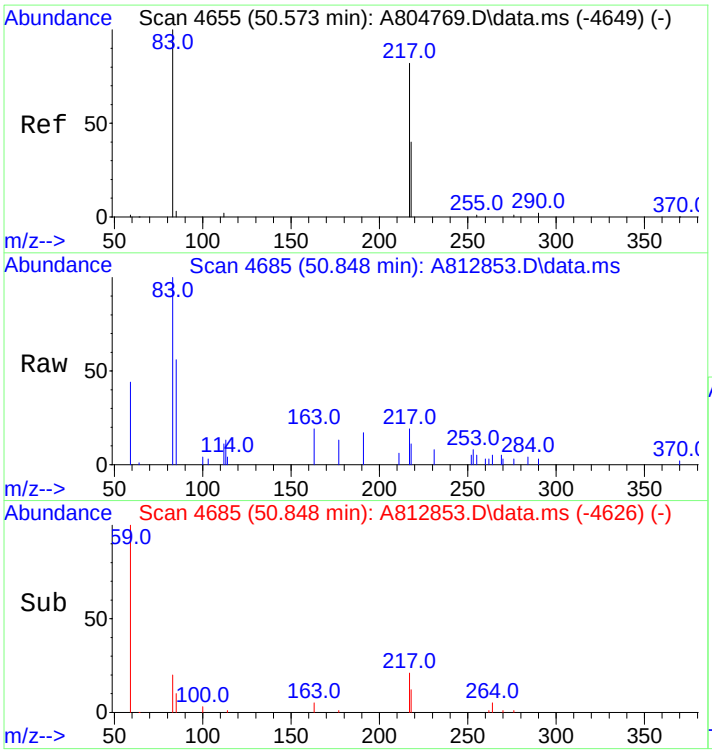




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 413.29 ng/ml m
RT: 49.915 min Scan# 4583
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

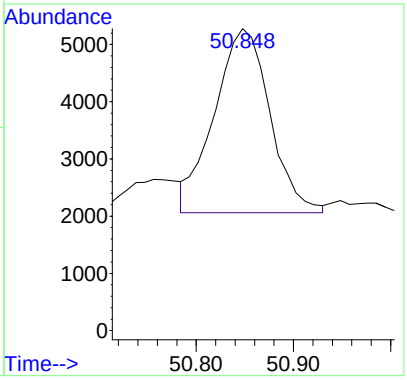
Tgt Ion:217 Resp: 14450

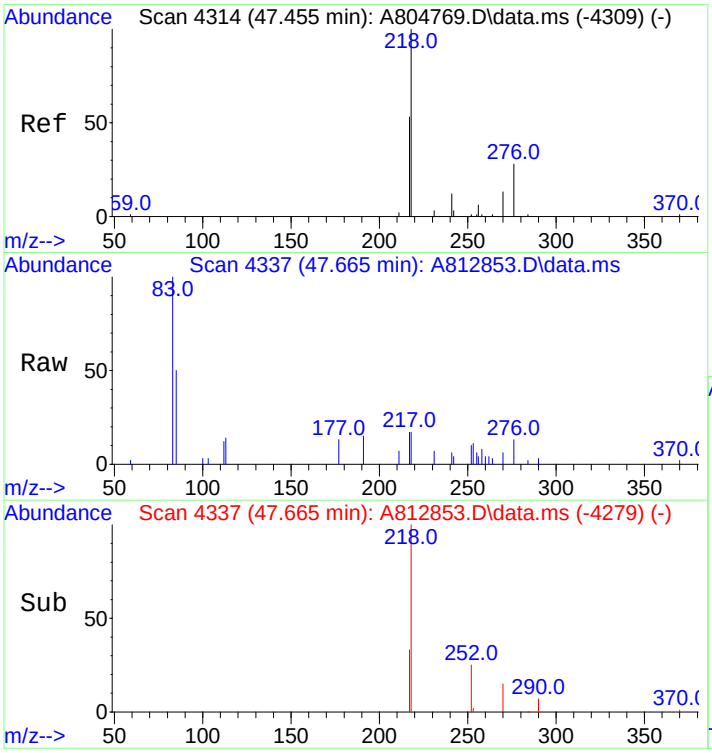




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 364.49 ng/ml m
RT: 50.848 min Scan# 4685
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

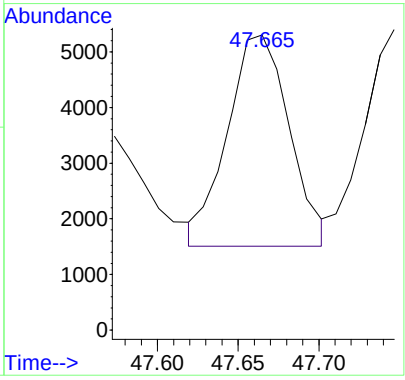
Tgt Ion:217 Resp: 12744

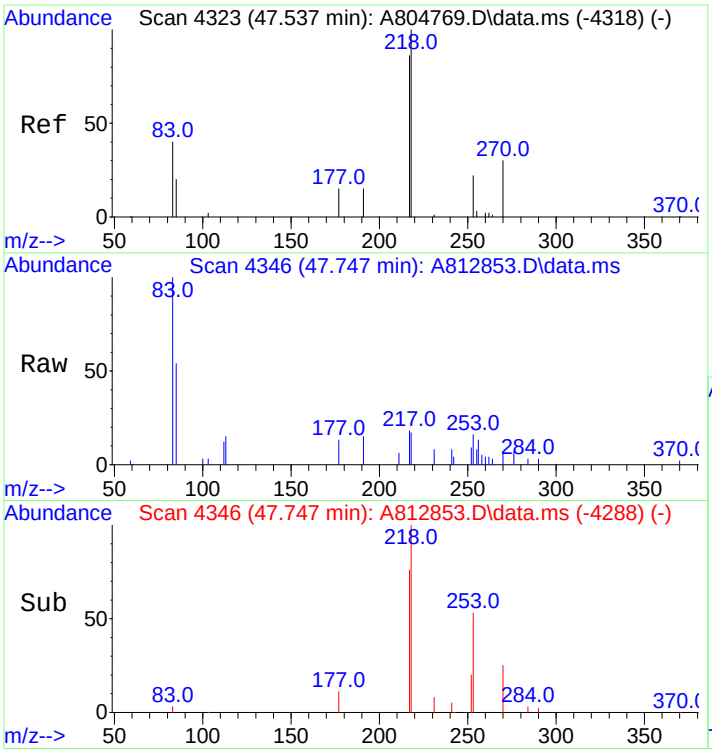




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 290.16 ng/ml m
RT: 47.665 min Scan# 4337
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

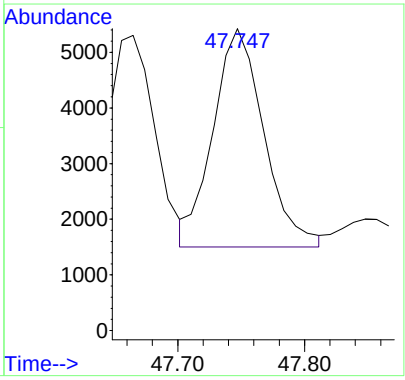
Tgt Ion:218 Resp: 10145

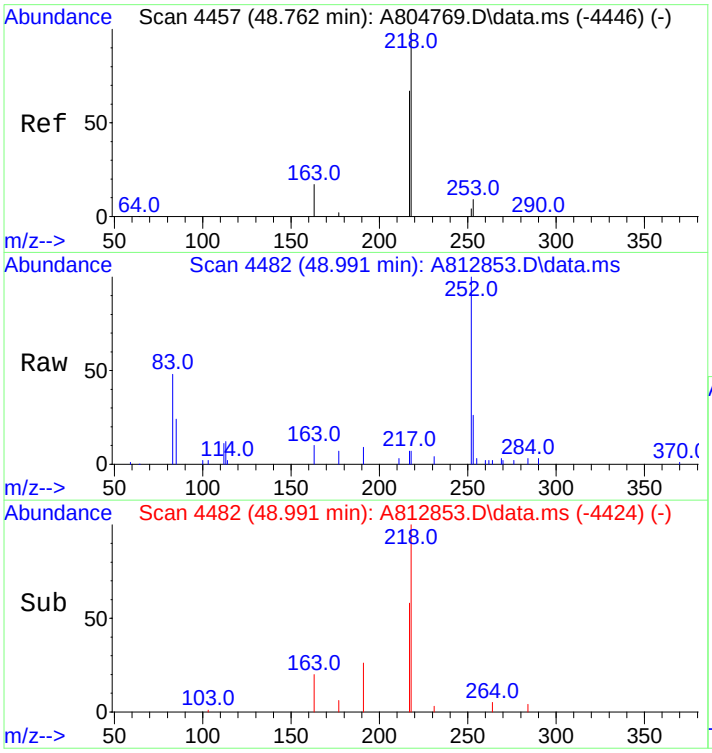




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 311.70 ng/ml m
RT: 47.747 min Scan# 4346
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

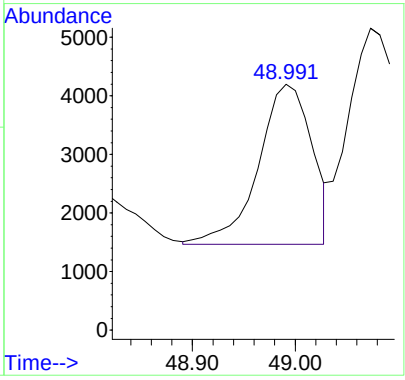
Tgt Ion:218 Resp: 10898

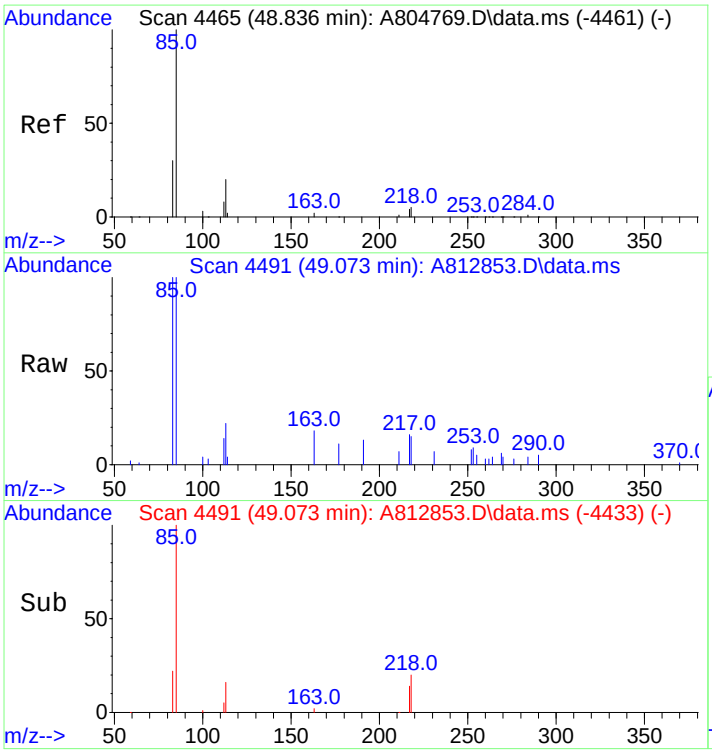




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 283.61 ng/ml
RT: 48.991 min Scan# 4482
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

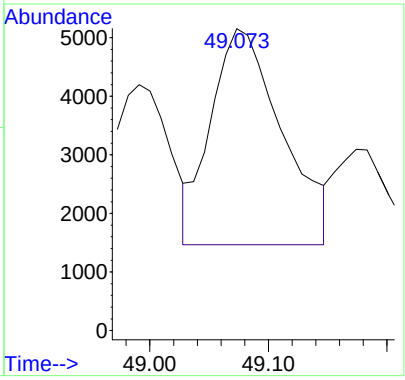
Tgt Ion:218 Resp: 9916

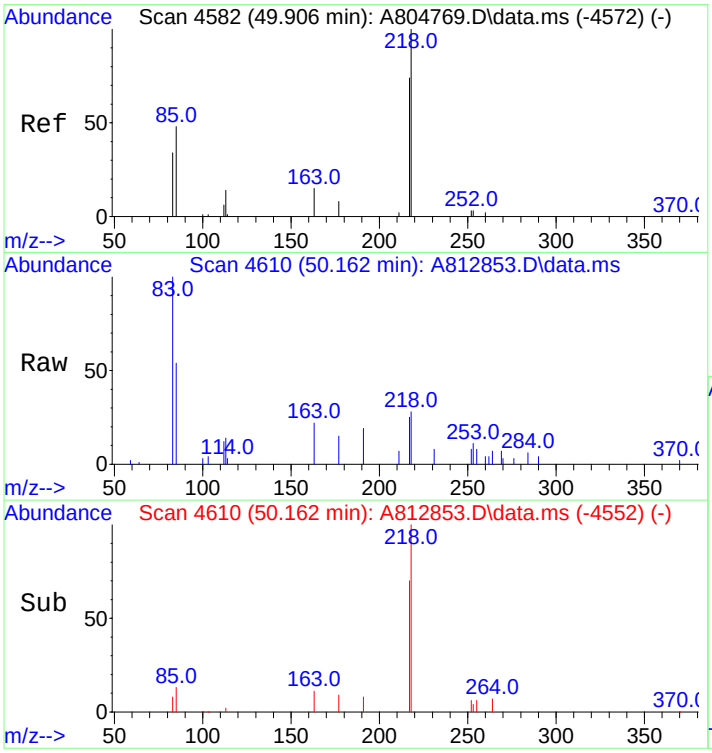




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 441.06 ng/ml
RT: 49.073 min Scan# 4491
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

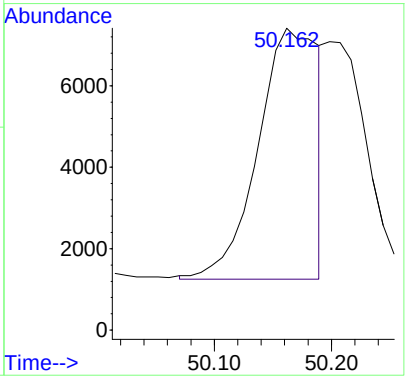
Tgt Ion:218 Resp: 15421

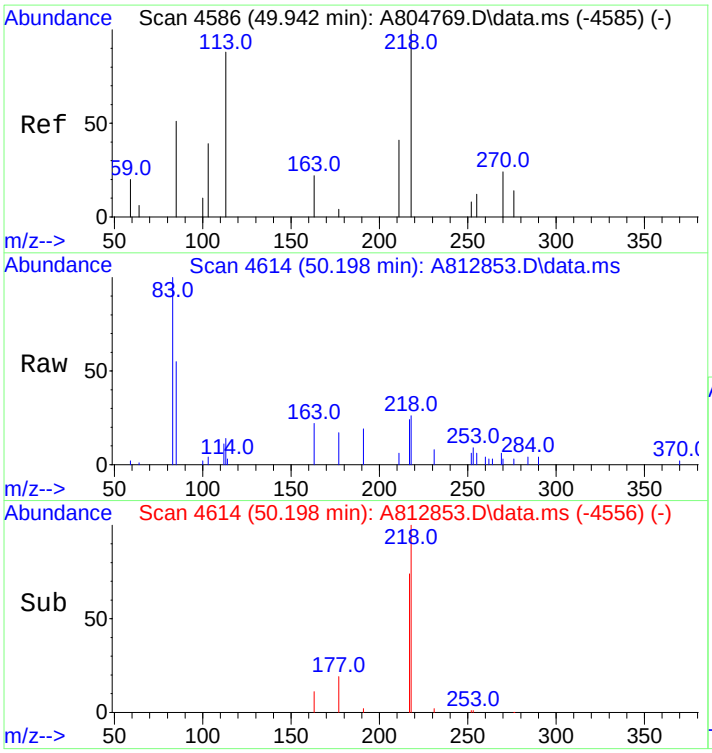




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 628.46 ng/ml m
RT: 50.162 min Scan# 4610
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

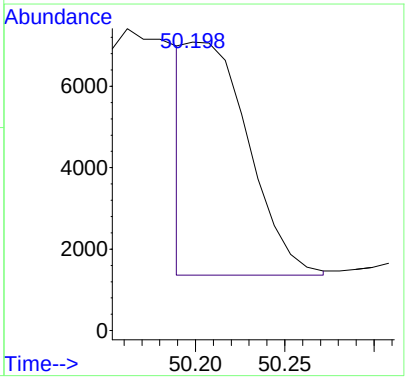
Tgt Ion:218 Resp: 21973

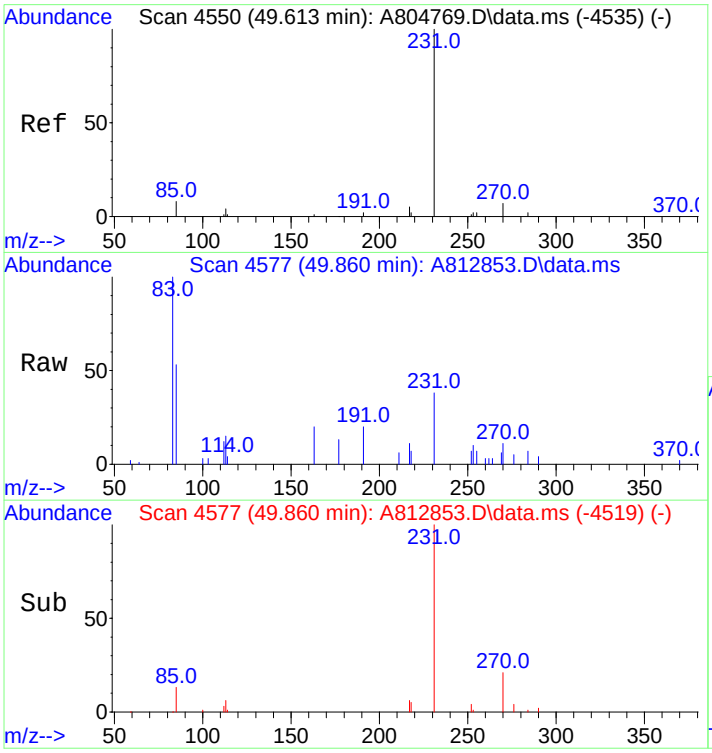




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 392.61 ng/ml m
RT: 50.198 min Scan# 4614
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

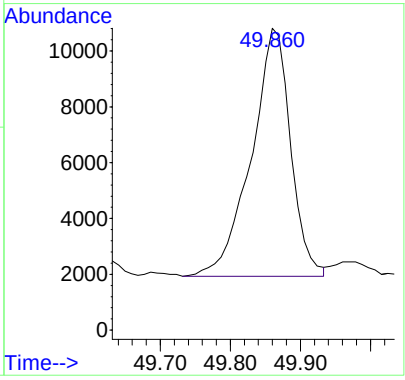
Tgt Ion:218 Resp: 13727

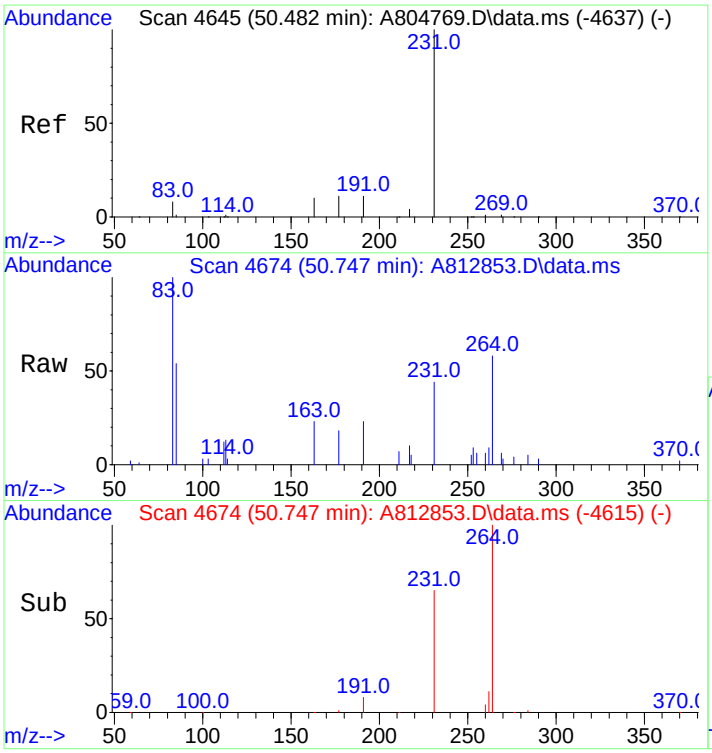




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 992.04 ng/mL
RT: 49.860 min Scan# 4577
Delta R.T. 0.028 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

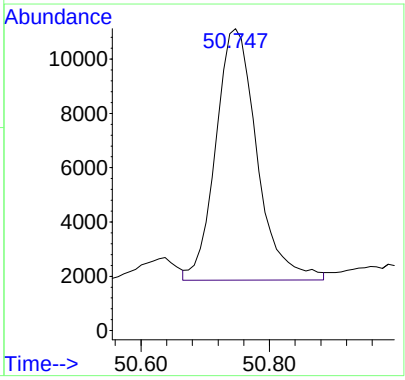
Tgt Ion:231 Resp: 34685

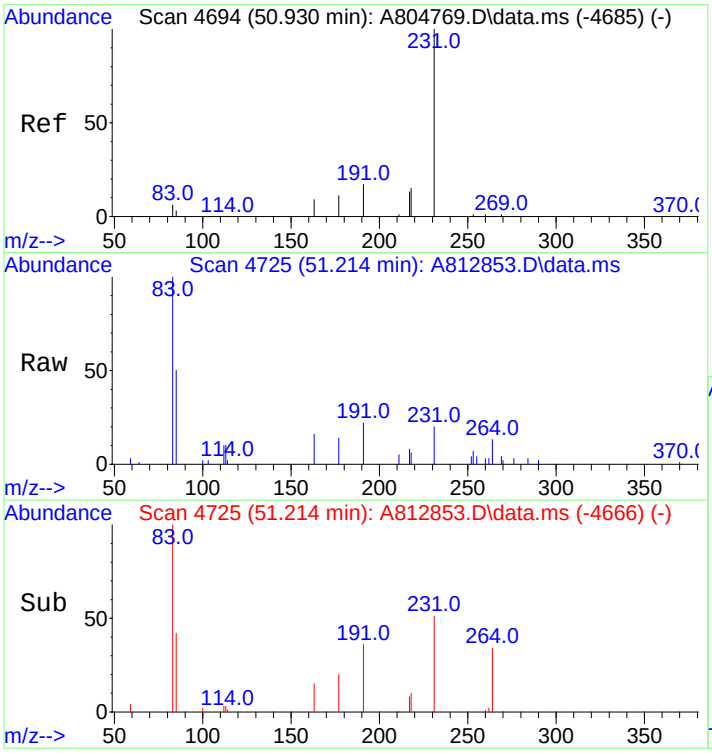




#148
C28,20S-triaromatic steroid
Concen: 1181.03 ng/mL
RT: 50.747 min Scan# 4674
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

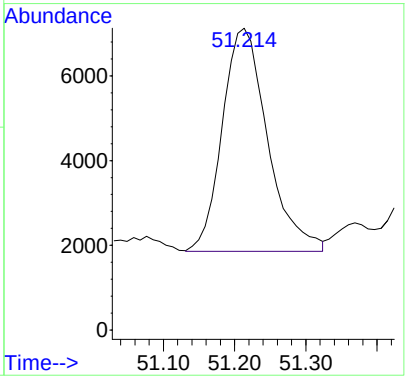
Tgt Ion:231 Resp: 41293

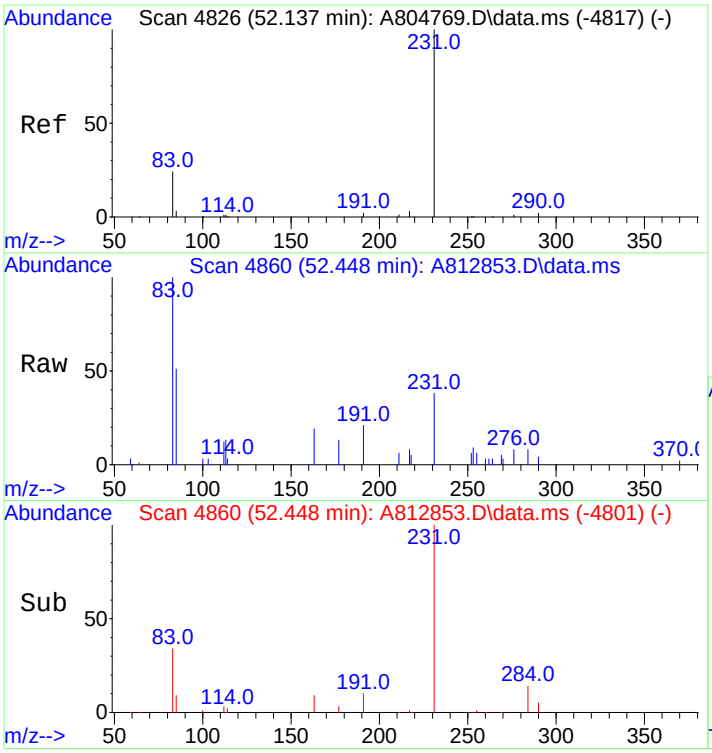




#149
C27,20R-triaromatic steroid
Concen: 668.55 ng/mL m
RT: 51.214 min Scan# 4725
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

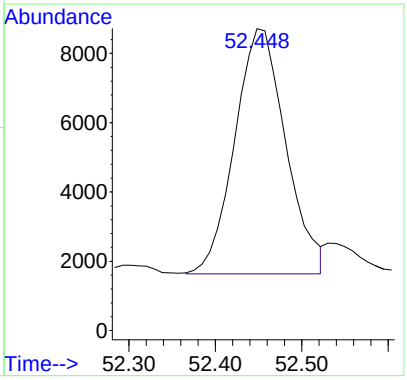
Tgt Ion:231 Resp: 23375





#150
C28,20R-triaromatic steroid
Concen: 831.30 ng/mL m
RT: 52.448 min Scan# 4860
Delta R.T. 0.037 min
Lab File: A812853.D
Acq: 20 Nov 2012 6:00 am

Tgt Ion:231 Resp: 29065



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812854.D
Acq On : 20 Nov 2012 7:25 am
Operator : AC
Sample : 1210082-07
Misc : 1x
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 20 15:16:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	62156	500.000	ng/mL	0.00
74) Chrysene-d12	43.451	240	102645	500.000	ng/mL	0.04
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	98330	399.186	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.92%#			
42) Phenanthrene-d10	32.861	188	93430	488.419	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.84%#			
83) Benzo[b]fluoranthene-d12	47.363	264	89285	456.406	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.64%#			
88) Benzo[a]pyrene-d12	48.579	264	80449	416.244	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.62%#			
129) 5B(H)Cholane - Surr	44.063	217	21476	572.185	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.22%			
Target Compounds						Qvalue
3) trans-Decalin	16.665	138	2331	42.201	ng/mL	100
4) cis-Decalin	17.878	138	116M3	2.867	ng/mL	
5) C1-Decalins	18.143	152	5029M5	91.046	ng/mL	
6) C2-Decalins	19.923	166	8694M5	157.398	ng/mL	
7) C3-Decalins	22.396	180	11112M5	201.174	ng/mL	
8) C4-Decalins	25.790	194	22938M5	415.274	ng/mL	
10) Naphthalene	20.087	128	113612	403.158	ng/mL#	100
11) C1-Naphthalenes	22.788	142	153035M5	543.053	ng/mL	
12) C2-Naphthalenes	25.626	156	320858M5	1138.582	ng/mL	
13) C3-Naphthalenes	28.309	170	479323M5	1700.904	ng/mL	
14) C4-Naphthalenes	30.736	184	452338M5	1605.146	ng/mL	
16) 2-Methylnaphthalene	22.788	142	87703	522.457	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	63713	405.325	ng/mL#	100
18) Benzothiophene	20.306	134	4689	20.586	ng/mL	100
19) C1-Benzo(b)thiophenes	23.180	148	13169M5	57.814	ng/mL	
20) C2-Benzo(b)thiophenes	25.827	162	32414M5	142.303	ng/mL	
21) C3-Benzo(b)thiophenes	27.798	176	70293M5	308.599	ng/mL	
22) C4-Benzo(b)thiophenes	29.906	190	81859M5	359.376	ng/mL	
23) Biphenyl	24.668	154	18342	85.882	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.288	156	72317	503.370	ng/mL#	100
25) Dibenzofuran	27.752	168	68329	303.261	ng/mL	98
26) Acenaphthylene	26.384	152	35986	140.685	ng/mL#	100
27) Acenaphthene	27.114	153	57009	373.399	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.665	170	35102M3	283.687	ng/mL	
29) Fluorene	29.130	166	80061M3	467.538	ng/mL	
30) C1-Fluorenes	31.493	180	75433M5	440.512	ng/mL	
31) C2-Fluorenes	33.692	194	183679M5	1072.644	ng/mL	
32) C3-Fluorenes	35.527	208	234035M5	1366.712	ng/mL	
33) Dibenzothiophene	32.460	184	100404	426.388	ng/mL#	74
34) 4-Methyldibenzothiophe...	34.230	198	91593	388.971	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.550	198	77603M3	329.559	ng/mL	
36) 1-Methyldibenzothiophe...	34.997	198	36928	156.823	ng/mL#	100
37) OTP	34.614	198	4996M3	21.217	ng/mL	
38) C1-Dibenzothiophenes	34.230	198	236036M5	1002.381	ng/mL	
39) C2-Dibenzothiophenes	35.919	212	417270M5	1772.032	ng/mL	
40) C3-Dibenzothiophenes	37.718	226	450605M5	1913.597	ng/mL	
41) C4-Dibenzothiophenes	39.407	240	297280M5	1262.467	ng/mL	
43) Phenanthrene	32.953	178	1063687	4693.219	ng/mL	100
44) 3-Methylphenanthrene(3MP)	34.906	192	150353	663.390	ng/mL	99
45) 2-Methylphenanthrene(2MP)	35.025	192	172781	762.347	ng/mL	96
46) 2-Methylanthracene(2MA)	35.180	192	39498	174.274	ng/mL#	42
47) 9/4-Methylphenanthrene...	35.362	192	171583	757.062	ng/mL	87
48) 1-Methylphenanthrene(1MP)	35.454	192	114746M3	506.284	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.025	192	659480M5	2909.770	ng/mL	

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Data File : A812854.D
Acq On : 20 Nov 2012 7:25 am
Operator : AC
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Misc : 1x
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 20 15:16:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.179	206	651966M5	2876.616	ng/mL	
52) C3-Phenanthrenes/Anthr...	39.014	220	465146M5	2052.326	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.196	234	247513M5	1092.081	ng/mL	
55) Anthracene	33.135	178	157227M3	744.631	ng/mL	
56) Carbazole	33.801	167	119932	544.356	ng/mL	99
57) 1-Methylphenanthrene	35.454	192	113276M3	705.072	ng/mL	
58) Fluoranthene	37.736	202	1666563	7138.675	ng/mL	99
59) Benzo(b)fluorene	40.247	216	85607M3	633.904	ng/mL	
60) Pyrene	38.612	202	1419770	6012.527	ng/mL	95
61) C1-Fluoranthenes/Pyrenes	40.000	216	727521M5	3080.949	ng/mL	
62) C2-Fluoranthenes/Pyrenes	42.045	230	528945M5	2240.008	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.935	244	346838M5	1468.810	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.214	258	302951M5	1282.955	ng/mL	
66) Naphthobenzothiophene	42.456	234	137261M3	626.181	ng/ml	
67) Naphthobenzothiophene-...	42.456	234	137146M3	625.656	ng/mL	
68) Naphthobenzothiophene-...	42.803	234	31479M3	143.606	ng/mL	
69) Naphthobenzothiophene-...	43.095	234	40100M3	182.935	ng/mL	
70) C1-Naphthobenzothiophenes	43.862	248	206299M5	941.130	ng/ml	
71) C2-Naphthobenzothiophenes	45.863	262	264039M5	1204.538	ng/ml	
72) C3-Naphthobenzothiophenes	47.473	276	205663M5	938.228	ng/ml	
73) C4-Naphthobenzothiophenes	48.570	290	139873M5	638.096	ng/mL	
75) Benz[a]anthracene	43.397	228	573274	2547.639	ng/mL	98
77) Chrysene/Triphenylene	43.552	228	764335	3355.665	ng/mL	99
78) C1-Chrysenes	45.022	242	368469M5	1617.692	ng/mL	
79) C2-Chrysenes	46.732	256	296397M5	1301.274	ng/mL	
80) BBF-D12 Surr BKGD	47.363	256	3902	17.131	ng/mL	100
81) C3-Chrysenes	47.793	270	246179M5	1080.801	ng/mL	
82) C4-Chrysenes	49.960	284	135831M5	596.340	ng/mL	
84) Benzo[b]fluoranthene	47.454	252	753915	3119.595	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.527	252	640778	2430.058	ng/mL	96
86) Benzo[a]fluoranthene	47.848	252	106426	403.605	ng/mL#	1
87) Benzo[e]pyrene	48.479	252	552934	2220.533	ng/mL	97
89) Benzo[a]pyrene	48.671	252	626364	2719.295	ng/mL	97
90) Perylene	48.982	252	198762	789.983	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.609	276	485119M3	1982.645	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.655	278	116178M6	484.394	ng/mL	
93) Benzo[g,h,i]perylene	54.952	276	513037	1847.603	ng/mL	100
94) Hopane (T19)	52.677	191	149371M3	1937.672	ng/mL	
96) C23 Tricyclic Terpane ...	41.087	191	29076	377.180	ng/ml	100
97) C24 Tricyclic Terpane ...	41.817	191	18733	243.008	ng/ml	100
98) C25 Tricyclic Terpane ...	43.305	191	24683M3	320.193	ng/ml	
99) C24 Tetracyclic Terpan...	44.629	191	11391M3	147.766	ng/ml	
100) C26 Tricyclic Terpane-...	44.355	191	10021M3	129.995	ng/ml	
101) C26 Tricyclic Terpane-...	44.447	191	8200M3	106.372	ng/ml	
102) C28 Tricyclic Terpane-...	46.741	191	9049M3	117.386	ng/ml	
103) C28 Tricyclic Terpane-...	46.896	191	9777	126.829	ng/ml	100
104) C29 Tricyclic Terpane-...	47.427	191	9751	126.492	ng/ml	100
105) C29 Tricyclic Terpane-...	47.628	191	10532M3	136.623	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.790	191	26999	350.237	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.881	191	10213M3	132.485	ng/mL	
108) C30 Tricyclic Terpane-22R	49.128	191	7814	101.365	ng/mL	100
109) 17a(H)-22,29,30-Trisno...	49.357	191	34276	444.636	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.573	191	9999	129.709	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.354	191	5233	67.884	ng/ml	100
112) 30-Norhopane (T15)	51.268	191	96899	1256.994	ng/ml	100
113) 18a(H)-30-Norneohopane...	51.369	191	27327M3	354.492	ng/ml	
114) 17a(H)-Diahopane (X)	51.497	191	8261M3	107.163	ng/ml	
115) 30-Normoretane (T17)	52.064	191	14997	194.544	ng/ml	100
116) 18a(H)&18b(H)-Oleanane...	52.485	191	10014M3	129.904	ng/ml	
117) Moretane (T20)	53.381	191	28183	365.596	ng/ml	100
118) 30-Homohopane-22S (T21)	54.523	191	51651	670.028	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812854.D
Acq On : 20 Nov 2012 7:25 am
Operator : AC
Sample : 1210082-07
Misc : 1x
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 20 15:16:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon		Response	Conc	Units	Dev(Min)
119)	30-Homohopane-22R (T22)	54.761	191		44740	580.377	ng/ml	100
120)	Gammacerane/C32-diahopane	55.327	191		17299M3	224.406	ng/mL	
121)	30,31-Bishomohopane-22...	56.113	191	G	56888	737.963	ng/ml	100
122)	30,31-Bishomohopane-22...	56.533	191		25657M3	332.828	ng/ml	
123)	30,31-Trishomohopane-2...	58.343	191		29496M3	382.628	ng/ml	
124)	30,31-Trishomohopane-2...	58.982	191		16269	211.045	ng/ml	100
125)	Tetrakishomohopane-22S...	61.084	191		25969	336.875	ng/ml	100
126)	Tetrakishomohopane-22R...	61.943	191	G	31755	411.933	ng/ml	100
127)	Pentakishomohopane-22S...	64.328	191		18180	235.835	ng/ml	100
128)	Pentakishomohopane-22R...	65.671	191		14653M3	190.082	ng/ml	
130)	13b(H),17a(H)-20S-Diac...	45.570	217		11162	297.389	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.991	217		5244M3	139.716	ng/ml	
132)	13b,17a-20S-Methyldiac...	46.695	217		5967M3	158.979	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.573	217		21239	565.870	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.104	217		22127	589.529	ng/ml	100
135)	Unknown Sterane (S18)	48.387	217		5370	143.073	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.652	217		521	13.881	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.817	217		9721	258.996	ng/ml	100
138)	14a,17a-20R-Methylchol...	49.558	217		8173M3	217.753	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.915	217		15328M3	408.384	ng/ml	
140)	14a(H),17a(H)-20R-Ethy...	50.857	217		13316	354.778	ng/ml	100
141)	14b(H),17b(H)-20R-Chol...	47.665	218		11167M3	297.522	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.747	218		10801	287.771	ng/ml	100
143)	14b,17b-20R-Methylchol...	49.000	218		11194M3	298.242	ng/ml	
144)	14b,17b-20S-Methylchol...	49.082	218		16330M3	435.080	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.171	218		22623	602.744	ng/ml	100
146)	14b(H),17b(H)-20S-Ethy...	50.207	218		17290M3	460.657	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.869	231		38486	1025.382	ng/mL	100
148)	C28,20S-triaromatic st...	50.747	231		43906	1169.787	ng/mL	100
149)	C27,20R-triaromatic st...	51.213	231		25081	668.233	ng/mL	100
150)	C28,20R-triaromatic st...	52.457	231		32754M3	872.664	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812854.D
Acq On : 20 Nov 2012 7:25 am
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
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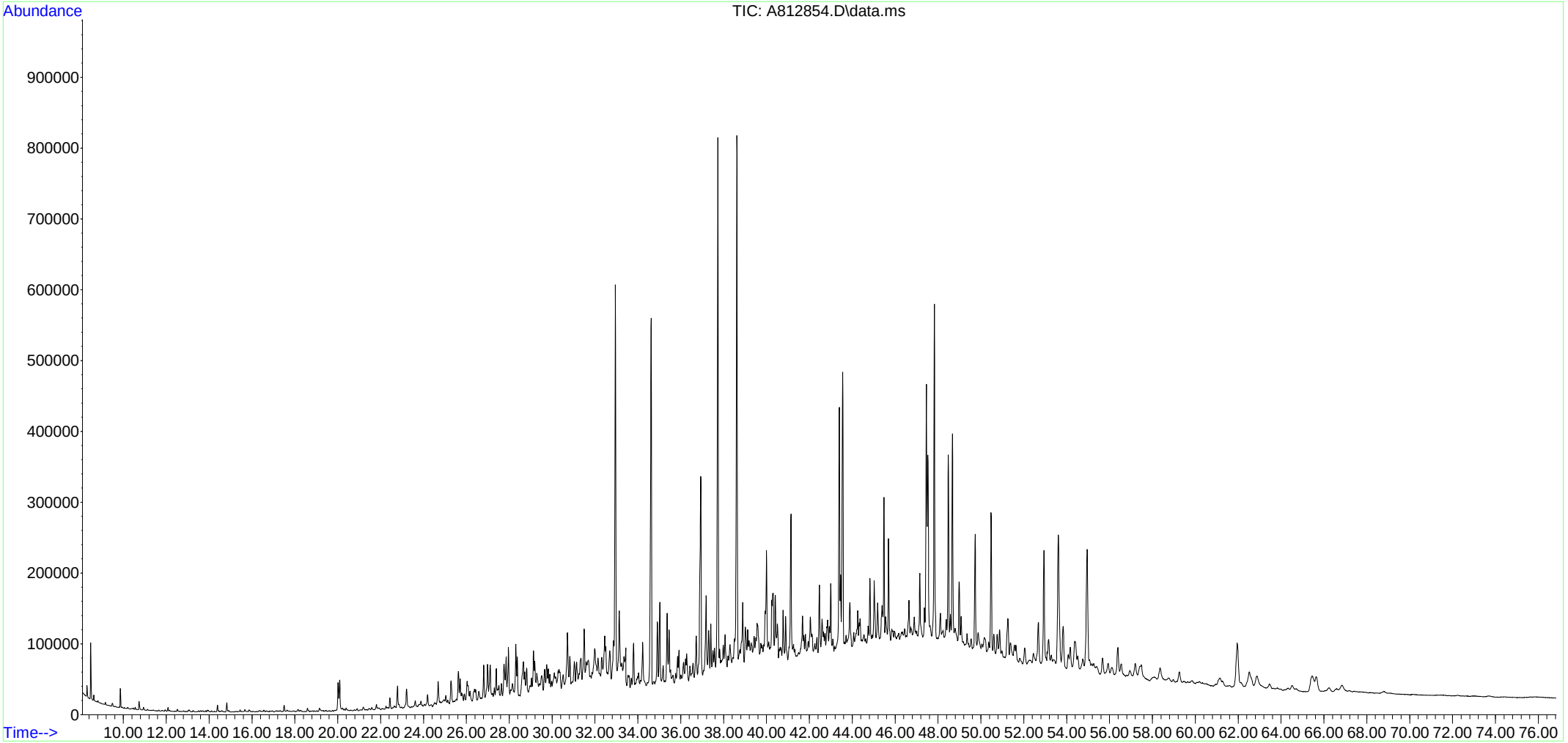
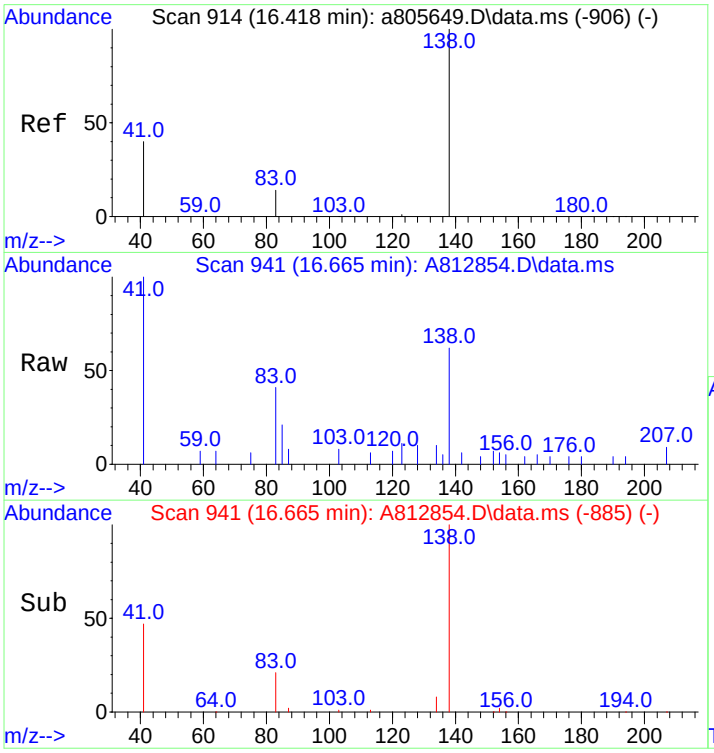
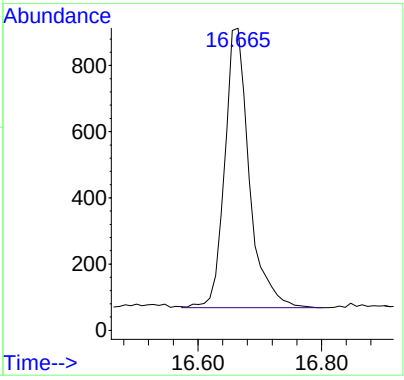
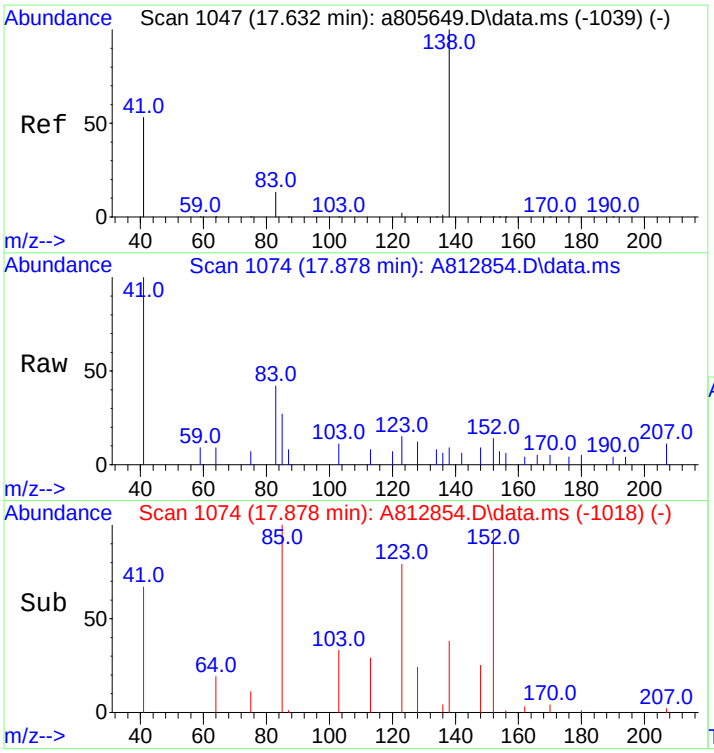




#3
trans-Decalin
Concen: 42.20 ng/mL
RT: 16.665 min Scan# 941
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

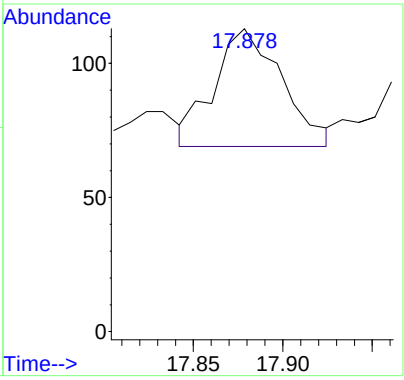
Tgt Ion:138 Resp: 2331

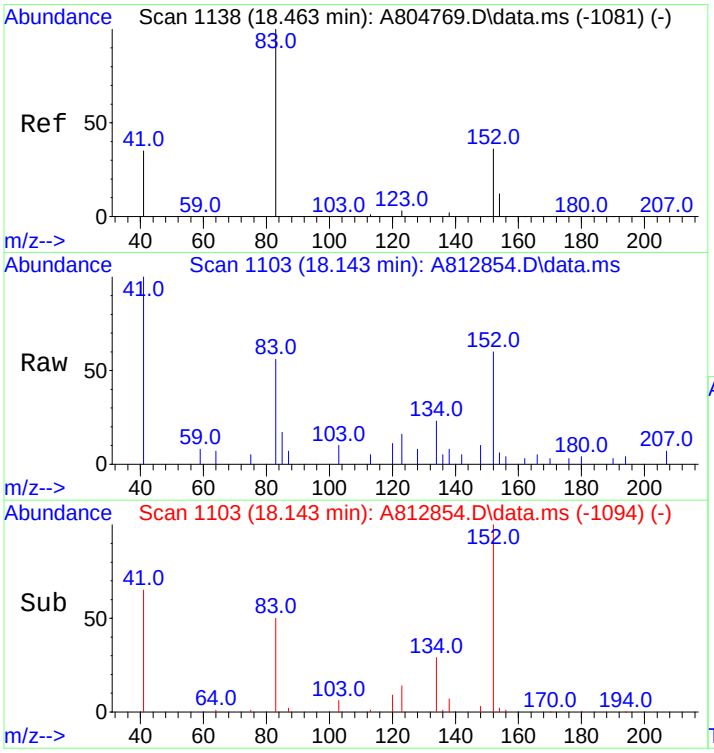




#4
cis-Decalin
Concen: 2.87 ng/mL m
RT: 17.878 min Scan# 1074
Delta R.T. 0.008 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

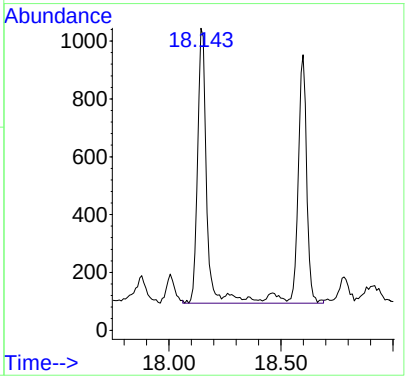
Tgt Ion:138 Resp: 116

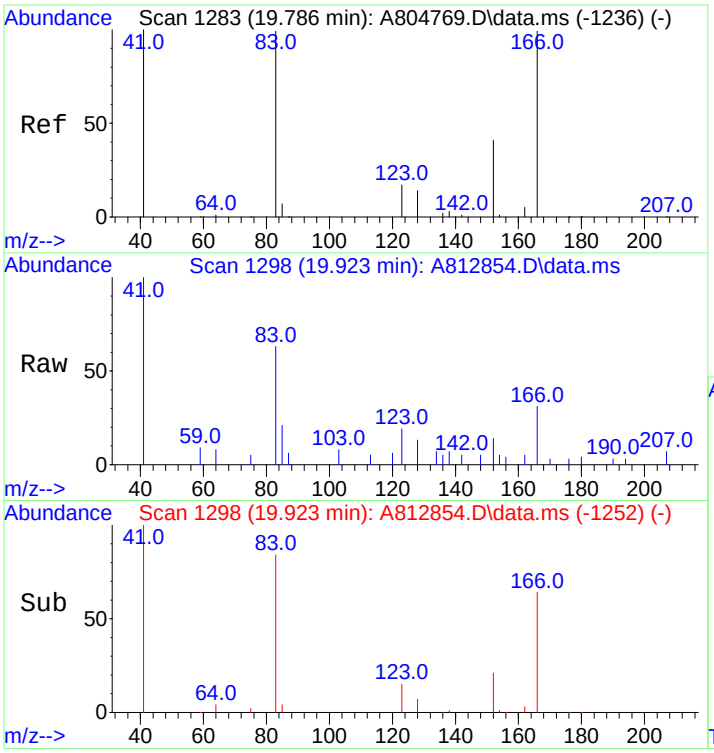




#5
C1-Decalins
Concen: 91.05 ng/mL m
RT: 18.143 min Scan# 1103
Delta R.T. -0.447 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

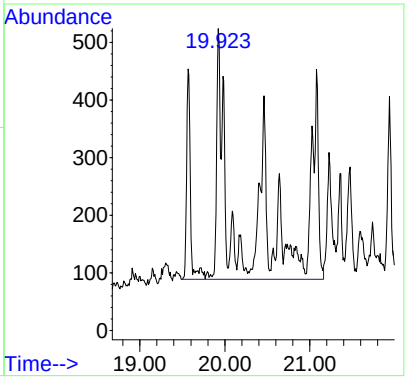
Tgt Ion:152 Resp: 5029

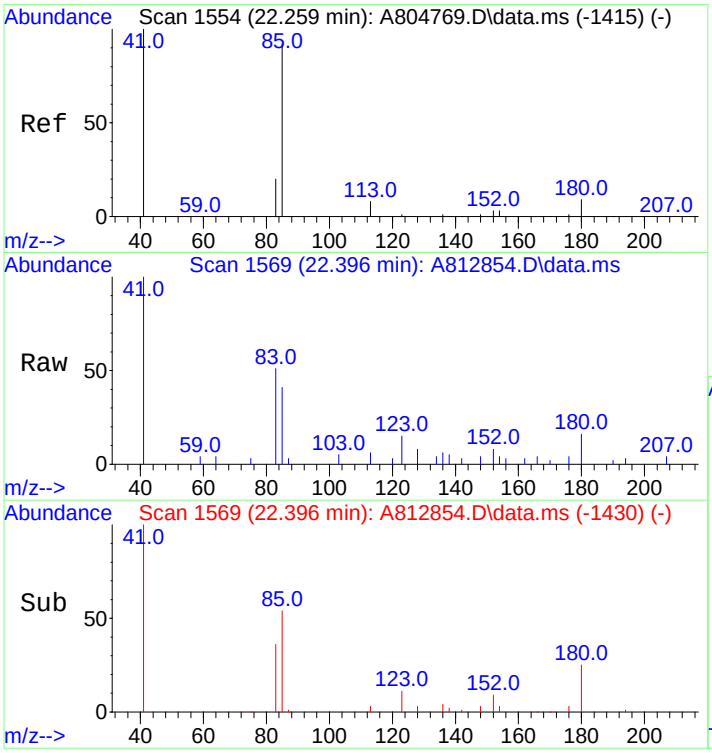




#6
C2-Decalins
Concen: 157.40 ng/mL m
RT: 19.923 min Scan# 1298
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

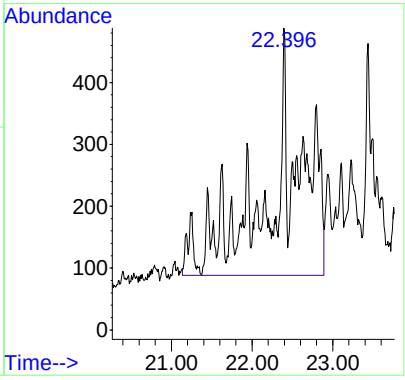
Tgt Ion:166 Resp: 8694

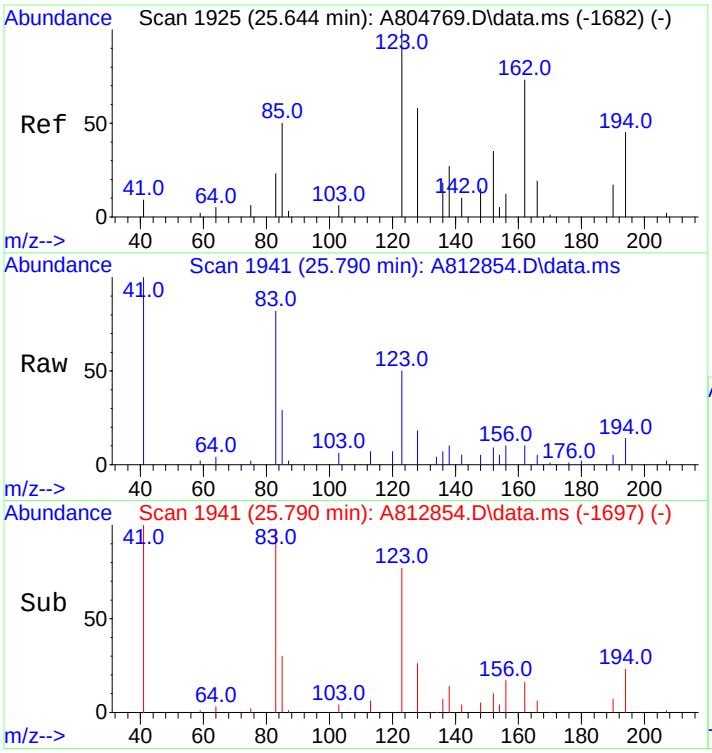




#7
C3-Decalins
Concen: 201.17 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

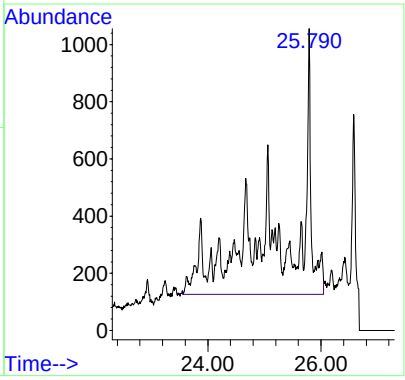
Tgt Ion:180 Resp: 11112

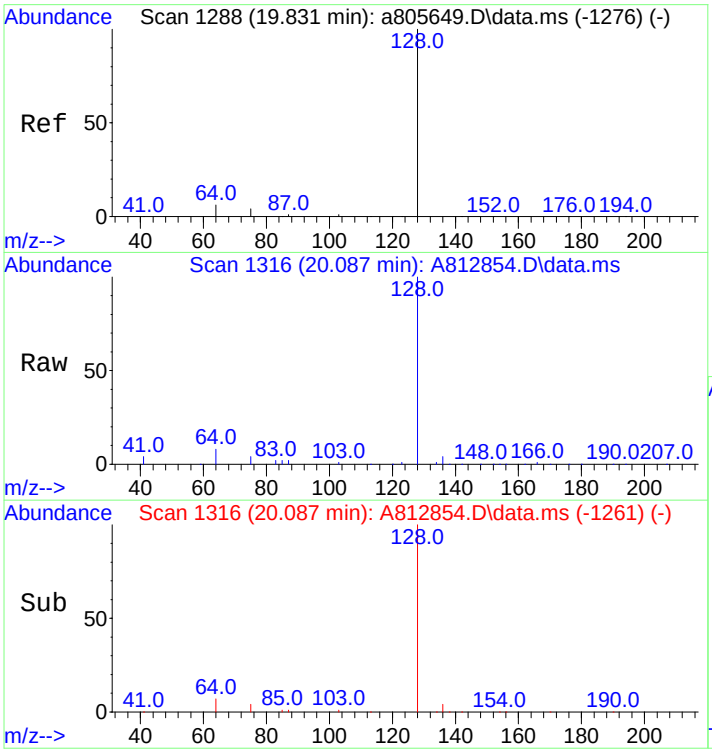




#8
C4-Decalins
Concen: 415.27 ng/mL m
RT: 25.790 min Scan# 1941
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:194 Resp: 22938

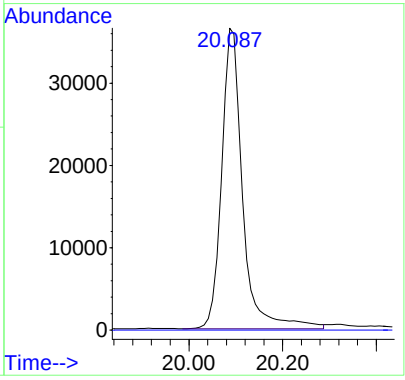


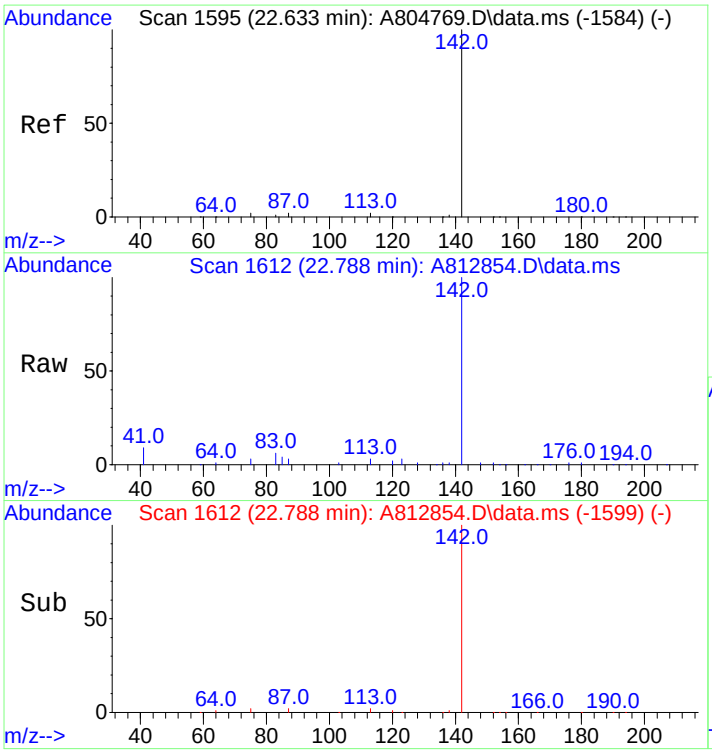


#10
Naphthalene
Concen: 403.16 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:128 Resp: 113612

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

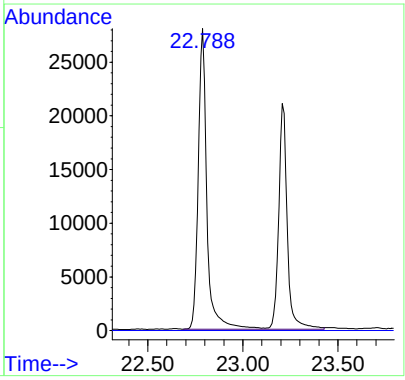


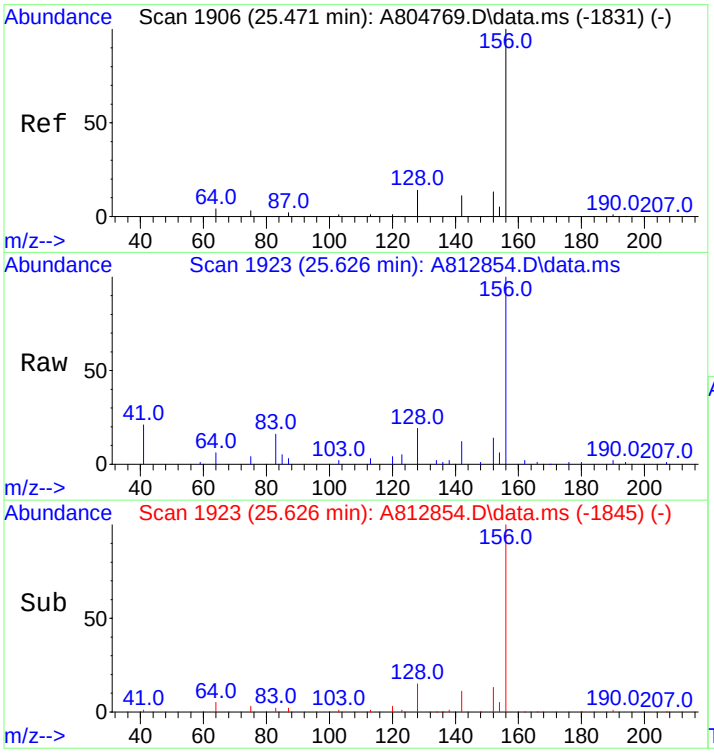


#11
C1-Naphthalenes
Concen: 543.05 ng/mL m
RT: 22.788 min Scan# 1612
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:142 Resp: 153035

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

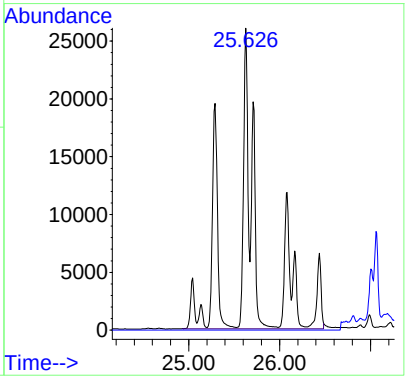


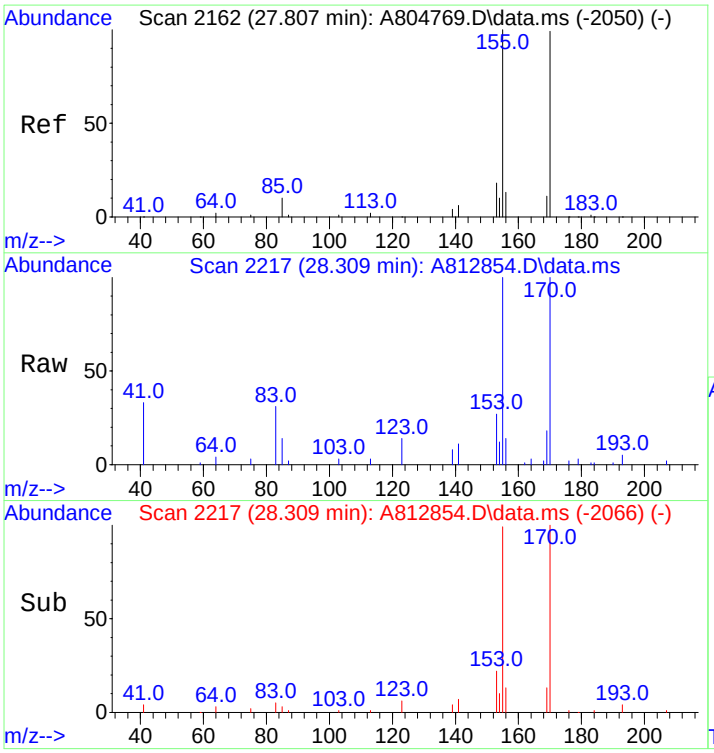


#12
C2-Naphthalenes
Concen: 1138.58 ng/mL m
RT: 25.626 min Scan# 1923
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:156 Resp: 320858

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

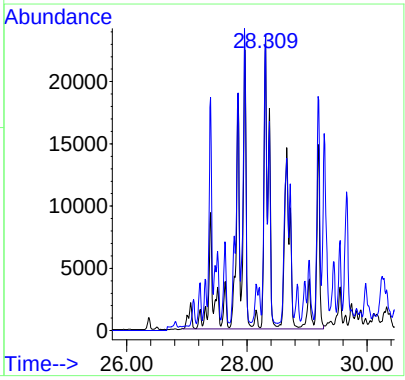


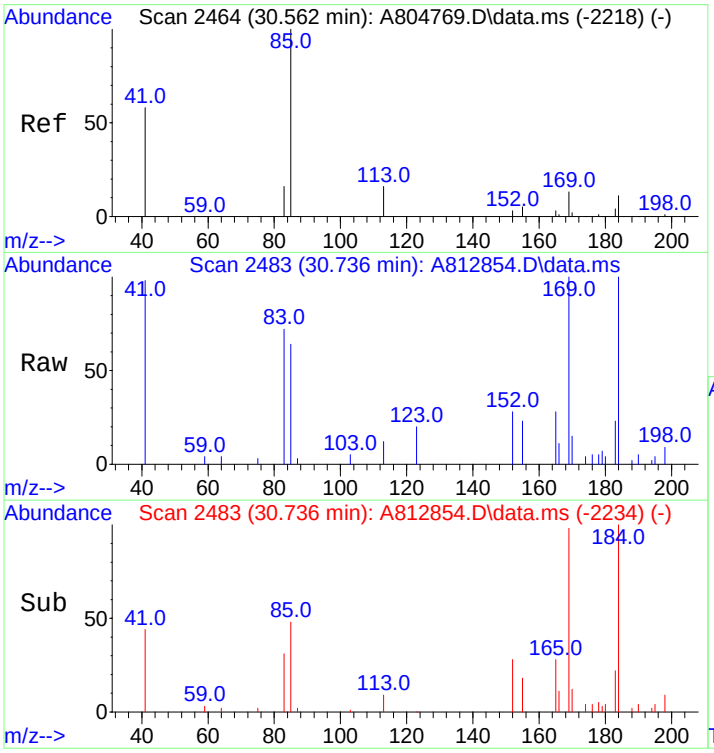


#13
C3-Naphthalenes
Concen: 1700.90 ng/mL m
RT: 28.309 min Scan# 2217
Delta R.T. 0.356 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:170 Resp: 479323

Ion	Ratio	Lower	Upper
170	100		
155	15.2	80.2	120.4#

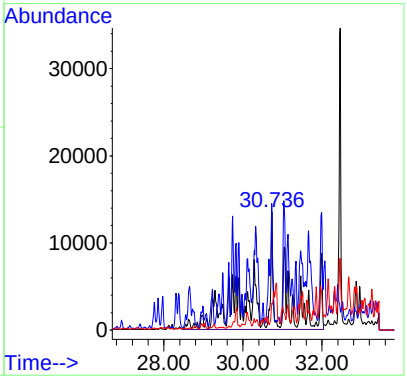


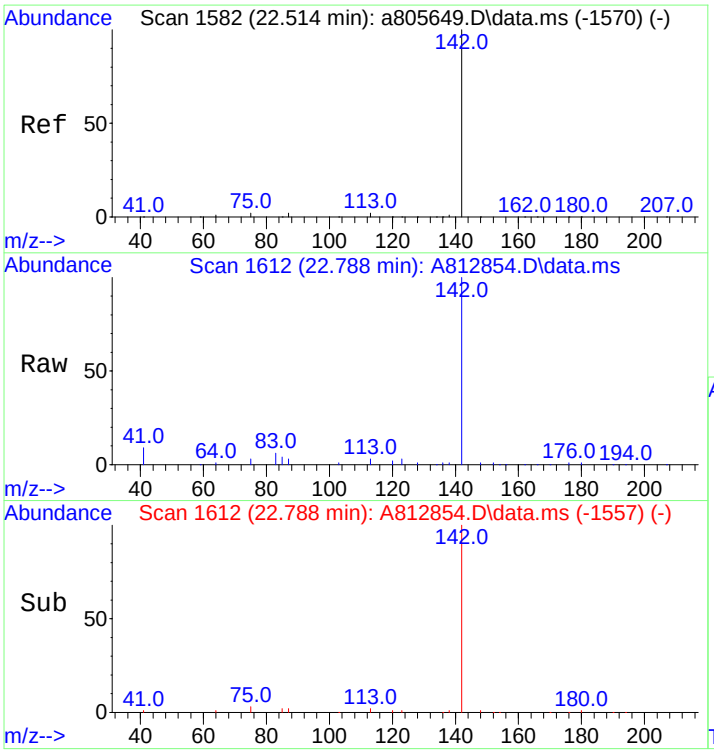


#14
C4-Naphthalenes
Concen: 1605.15 ng/mL m
RT: 30.736 min Scan# 2483
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:184 Resp: 452338

Ion	Ratio	Lower	Upper
184	100		
169	5.1	108.2	162.2#
183	1.6	29.7	44.5#

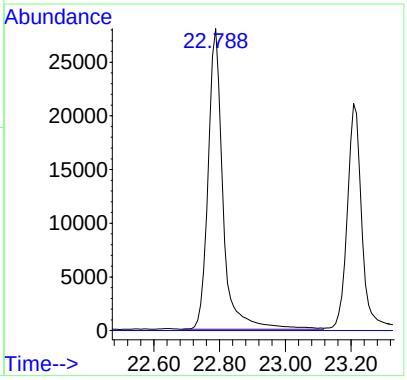


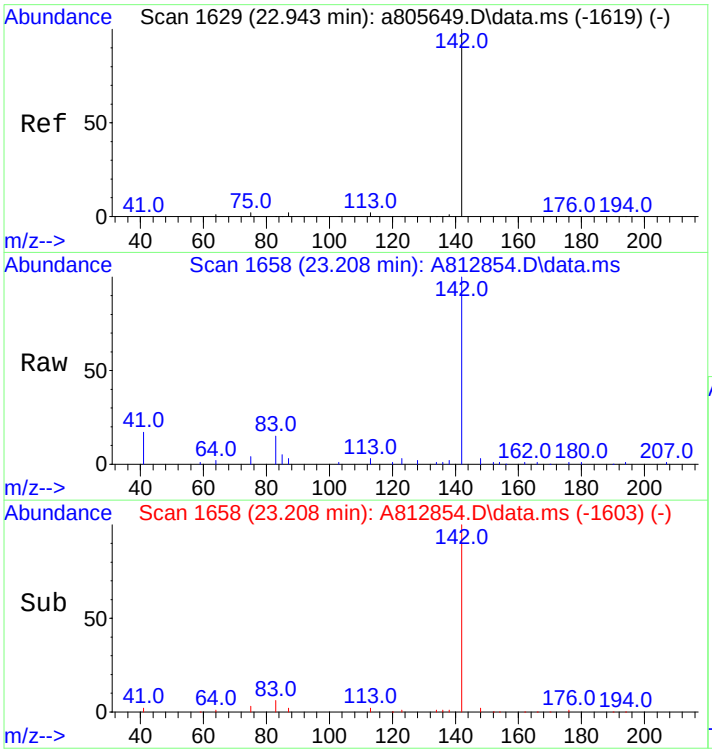


#16
2-Methylnaphthalene
Concen: 522.46 ng/mL
RT: 22.788 min Scan# 1612
Delta R.T. 0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:142 Resp: 87703

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

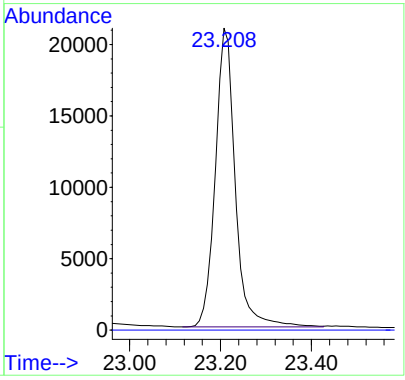


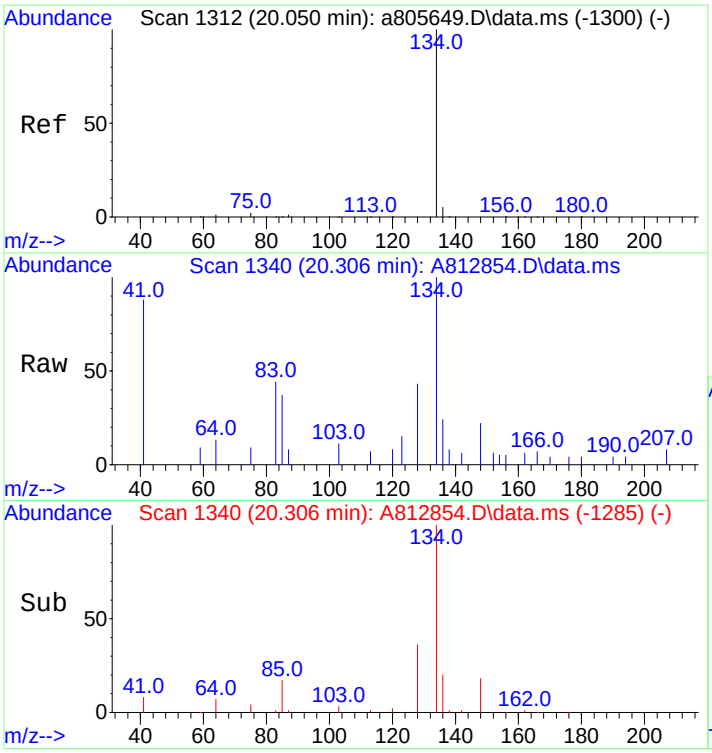


#17
1-Methylnaphthalene
Concen: 405.32 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:142 Resp: 63713

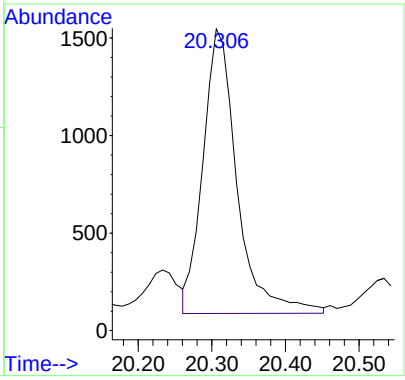
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

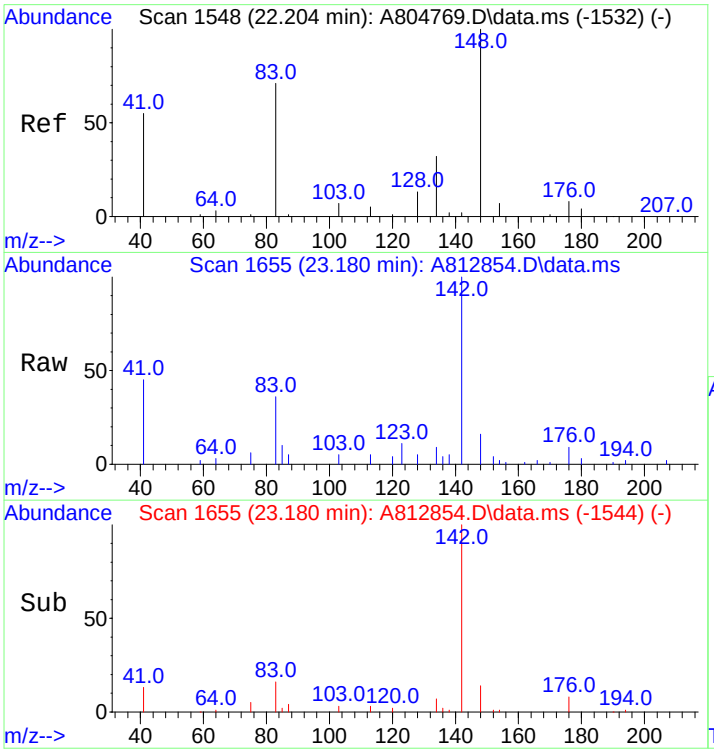




#18
Benzothiophene
Concen: 20.59 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

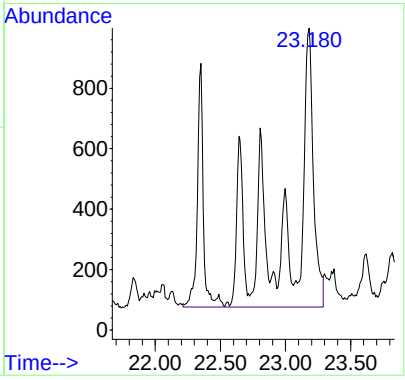
Tgt Ion:134 Resp: 4689

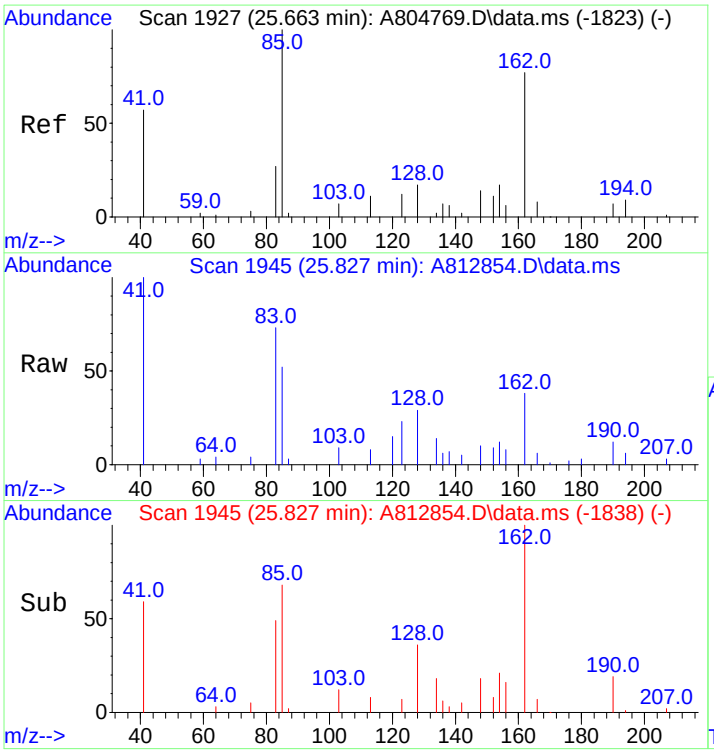




#19
C1-Benzo(b)thiophenes
Concen: 57.81 ng/mL m
RT: 23.180 min Scan# 1655
Delta R.T. 0.839 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

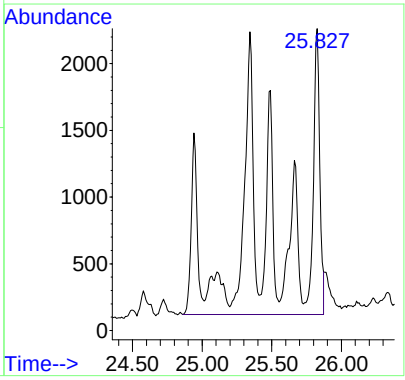
Tgt Ion:148 Resp: 13169

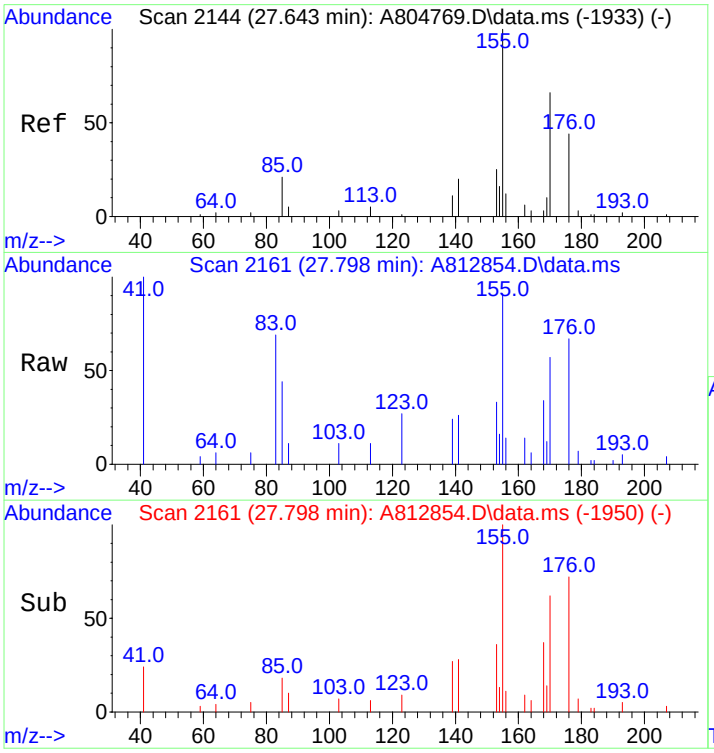




#20
C2-Benzo(b)thiophenes
Concen: 142.30 ng/mL m
RT: 25.827 min Scan# 1945
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

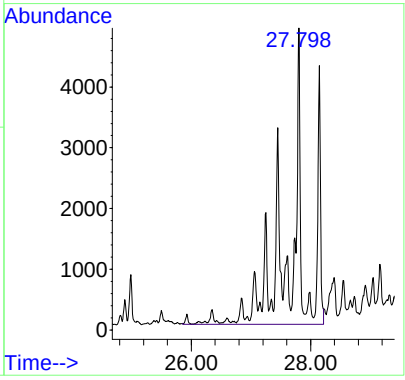
Tgt Ion:162 Resp: 32414

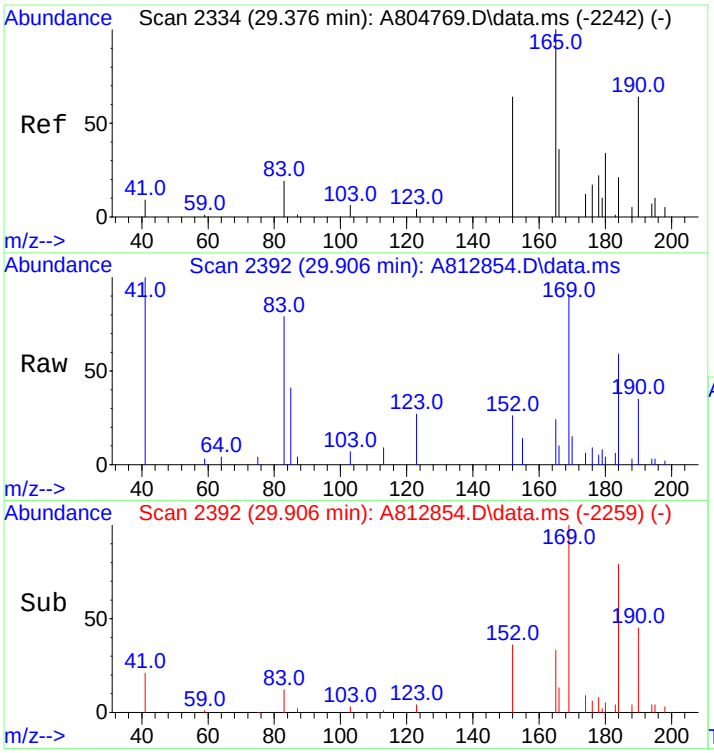




#21
C3-Benzo(b)thiophenes
Concen: 308.60 ng/mL m
RT: 27.798 min Scan# 2161
Delta R.T. 0.016 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

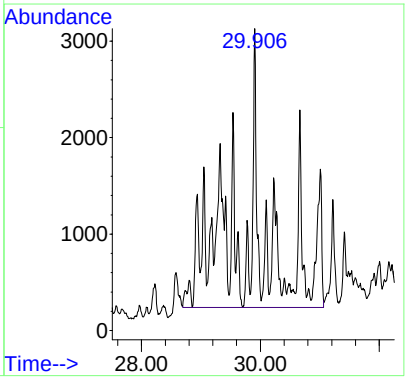
Tgt Ion:176 Resp: 70293

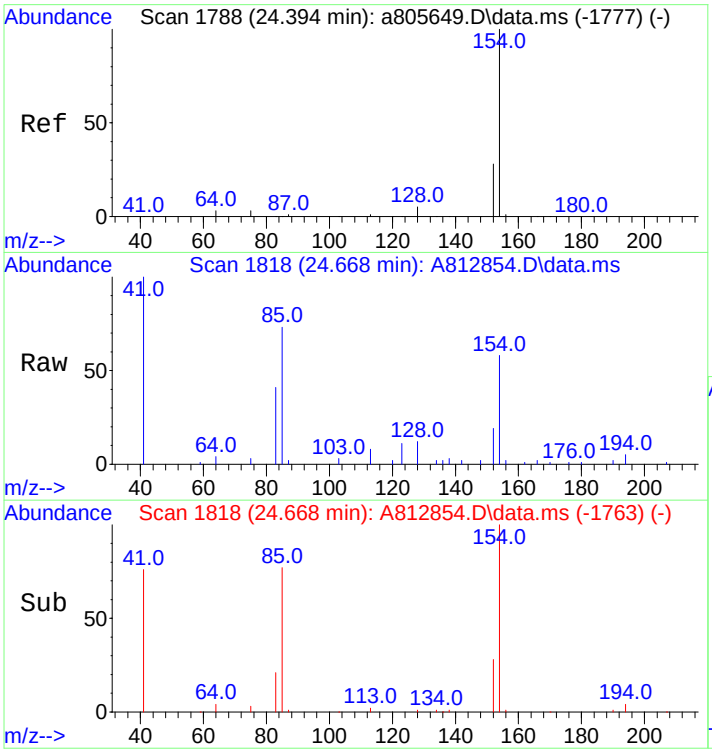




#22
C4-Benzo(b)thiophenes
Concen: 359.38 ng/mL m
RT: 29.906 min Scan# 2392
Delta R.T. 0.374 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:190 Resp: 81859

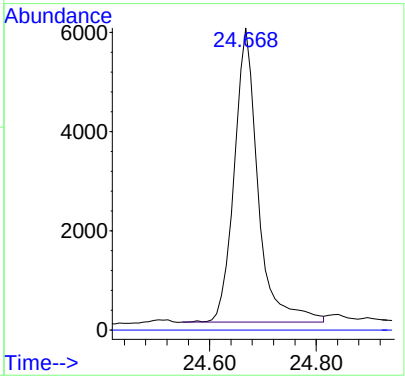


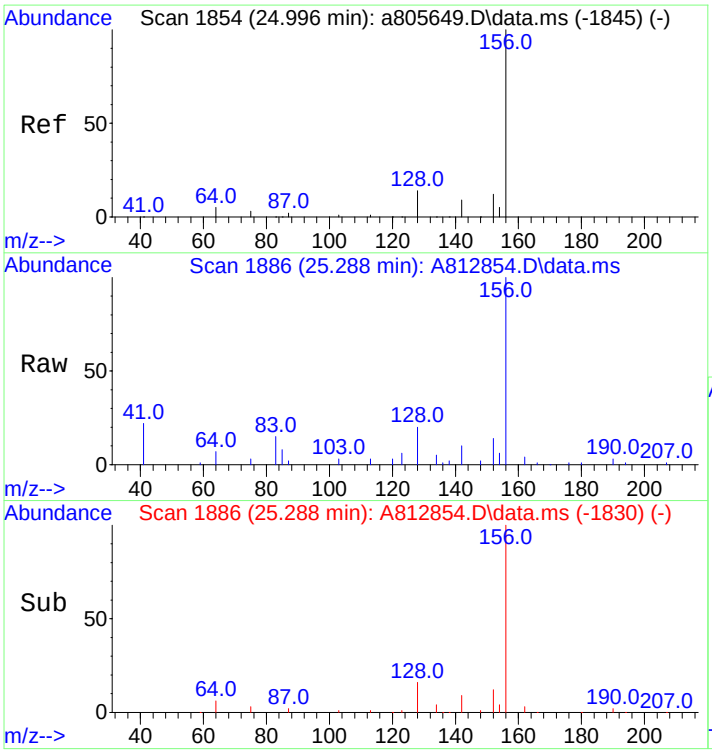


#23
Biphenyl
Concen: 85.88 ng/mL
RT: 24.668 min Scan# 1818
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:154 Resp: 18342

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

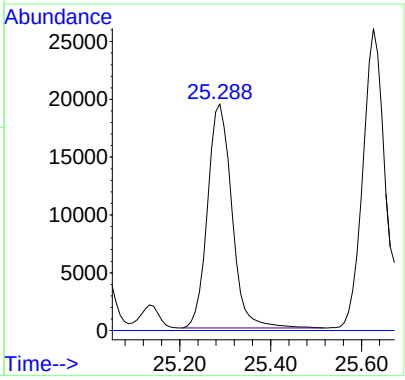


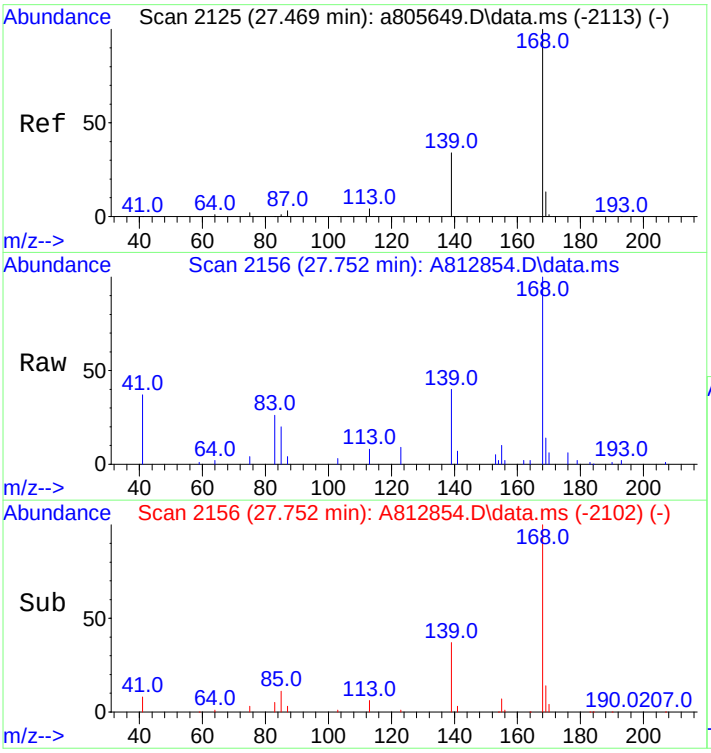


#24
2,6-Dimethylnaphthalene
Concen: 503.37 ng/mL
RT: 25.288 min Scan# 1886
Delta R.T. 0.008 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:156 Resp: 72317

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

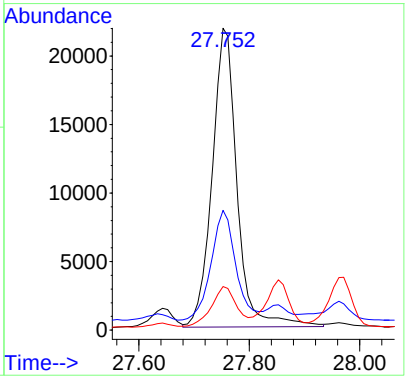


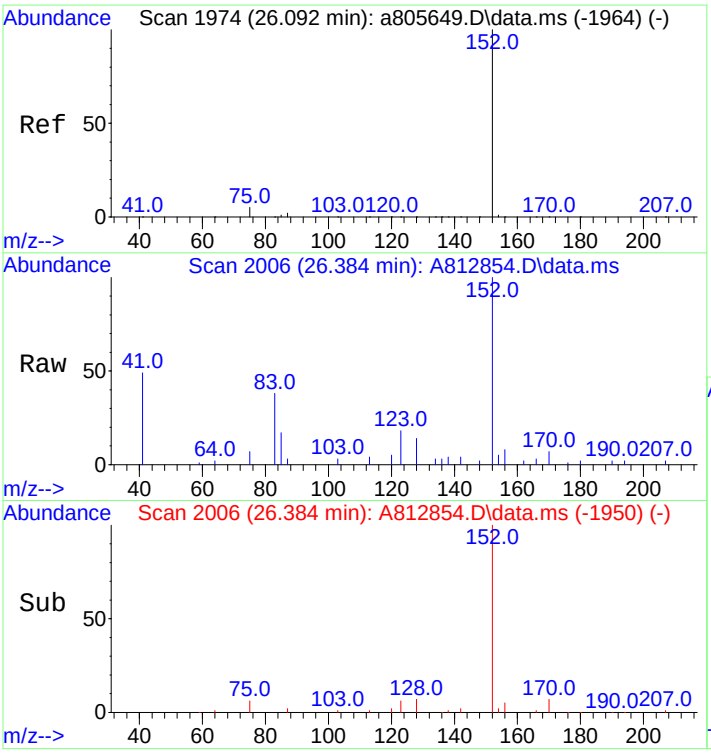


#25
Dibenzofuran
Concen: 303.26 ng/mL
RT: 27.752 min Scan# 2156
Delta R.T. -0.010 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:168 Resp: 68329

Ion	Ratio	Lower	Upper
168	100		
139	36.7	28.0	42.0
169	13.6	10.6	15.8

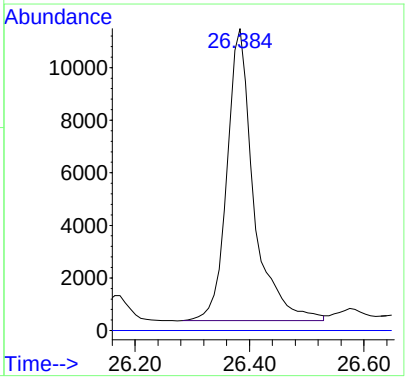


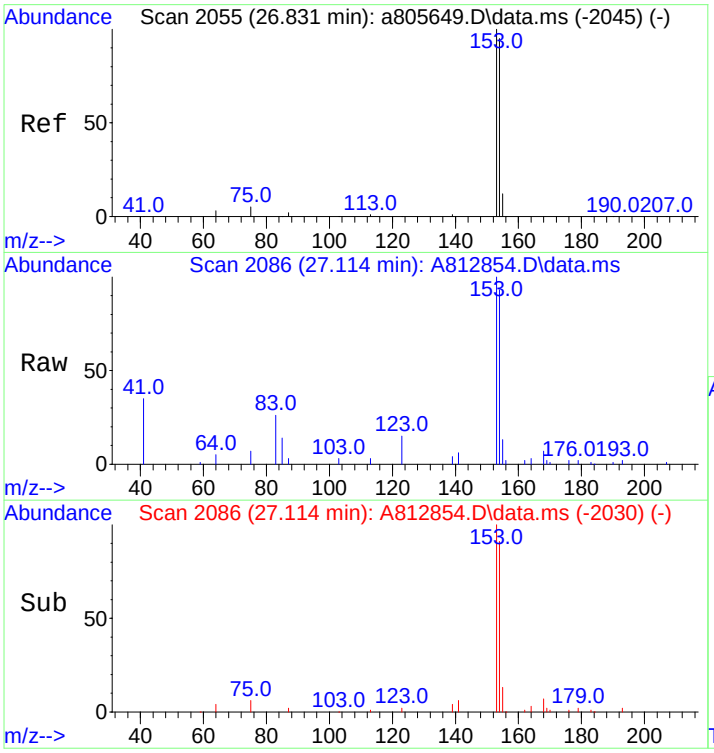


#26
Acenaphthylene
Concen: 140.69 ng/mL
RT: 26.384 min Scan# 2006
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:152 Resp: 35986

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

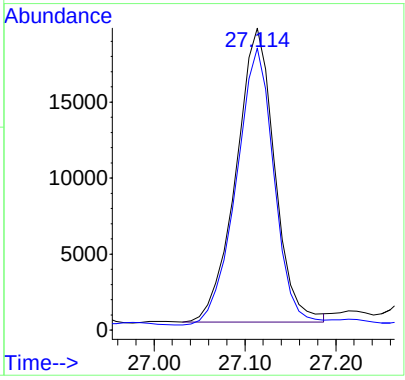


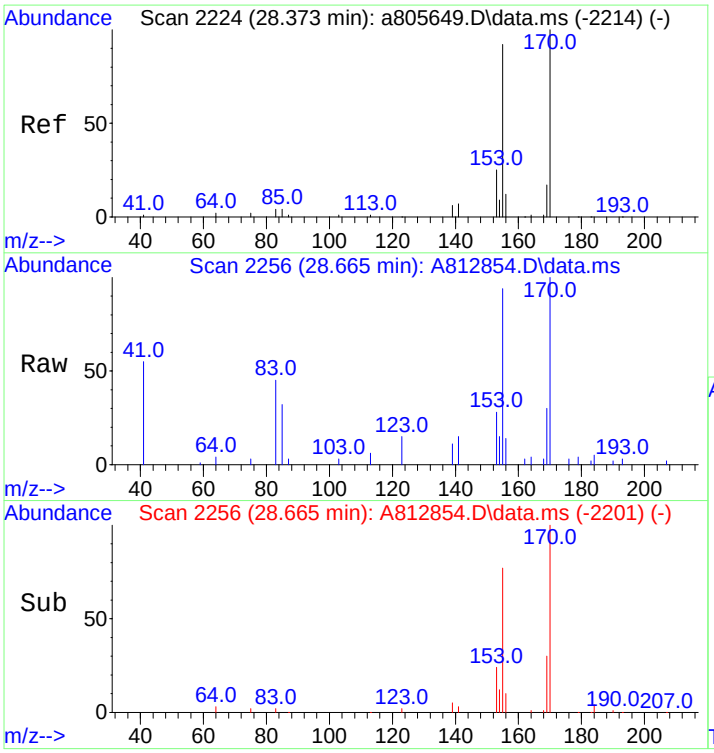


#27
Acenaphthene
Concen: 373.40 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:153 Resp: 57009

Ion	Ratio	Lower	Upper
153	100		
154	92.7	75.4	113.2

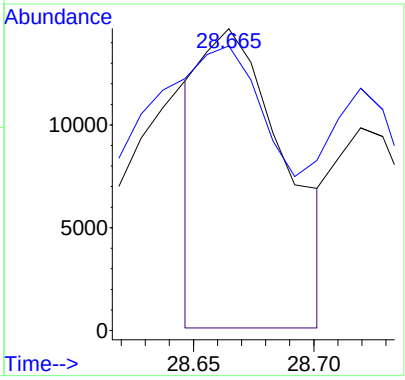


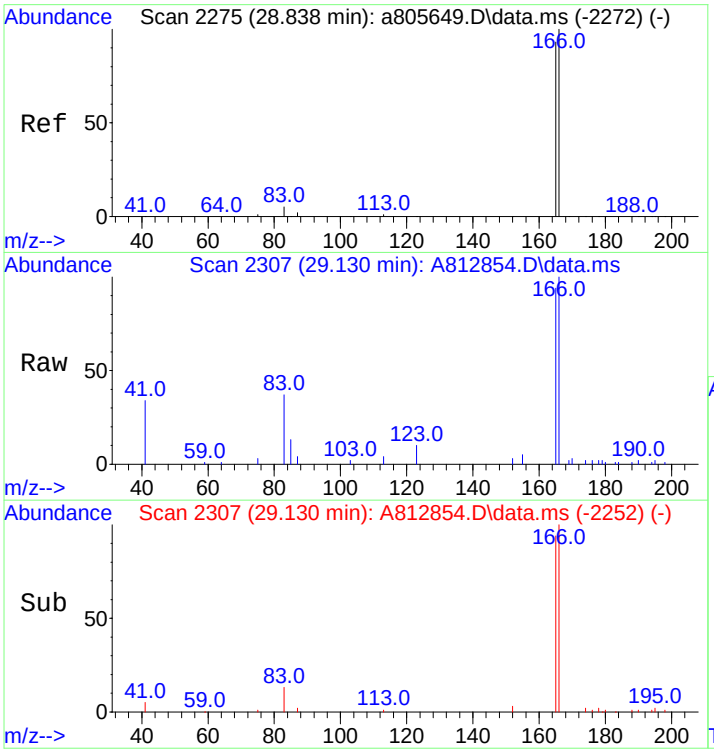


#28
2,3,5-Trimethylnaphthalene
Concen: 283.69 ng/mL m
RT: 28.665 min Scan# 2256
Delta R.T. -0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:170 Resp: 35102

Ion	Ratio	Lower	Upper
170	100		
155	164.5	71.7	107.5#

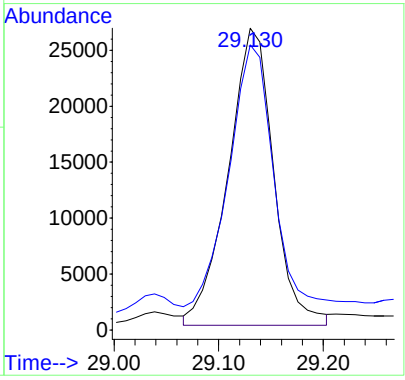


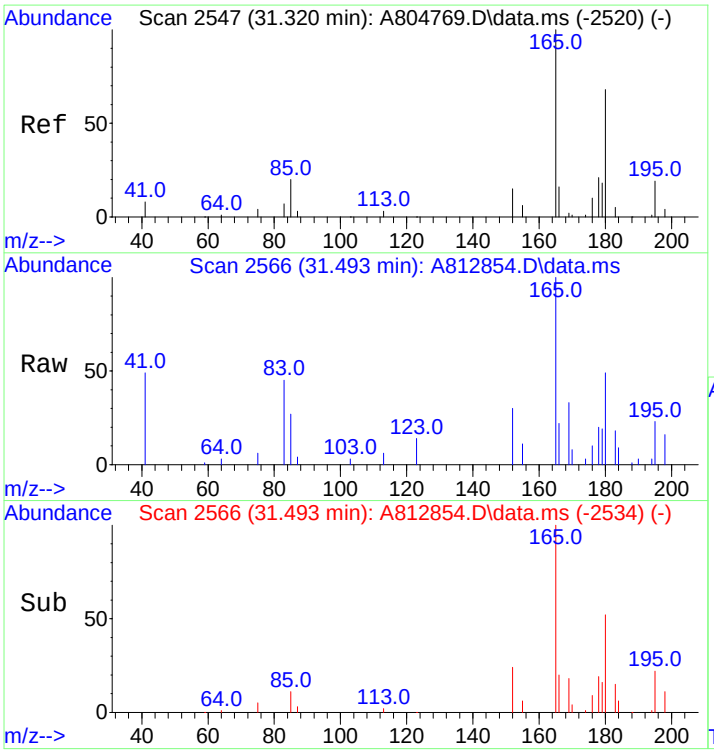


#29
Fluorene
Concen: 467.54 ng/mL m
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:166 Resp: 80061

Ion	Ratio	Lower	Upper
166	100		
165	89.8	74.2	111.2

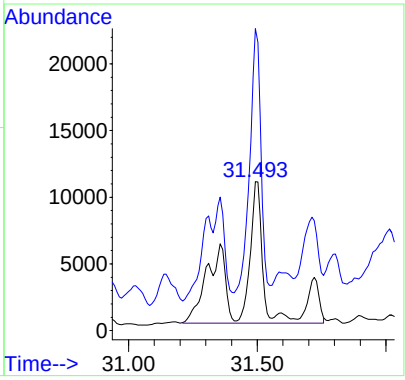


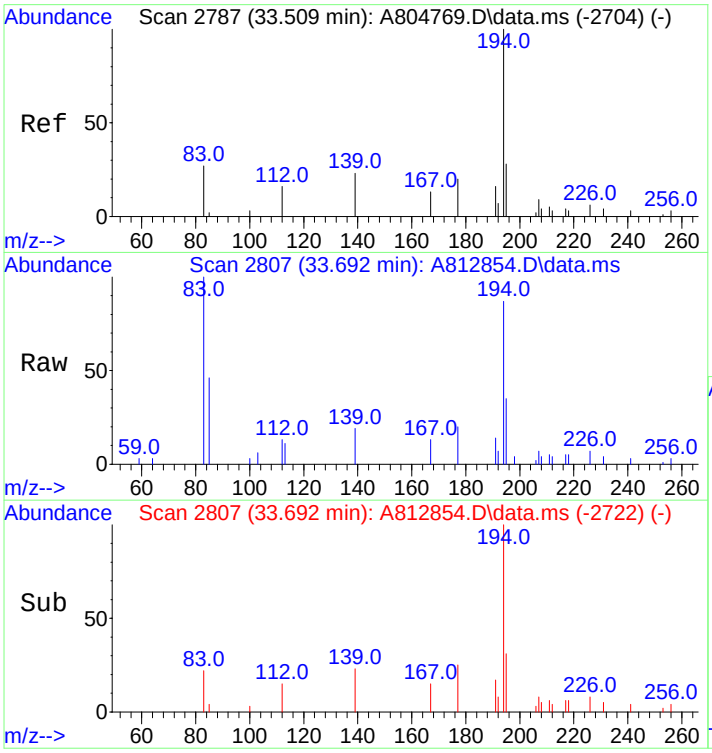


#30
C1-Fluorenes
Concen: 440.51 ng/mL m
RT: 31.493 min Scan# 2566
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:180 Resp: 75433

Ion	Ratio	Lower	Upper
180	100		
165	24.8	122.4	183.6#

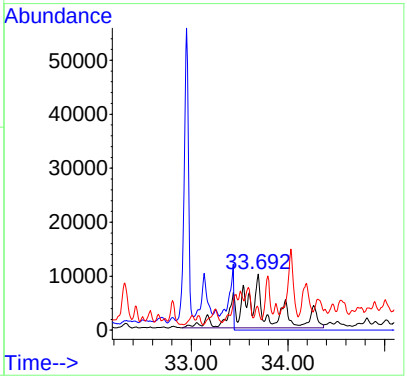


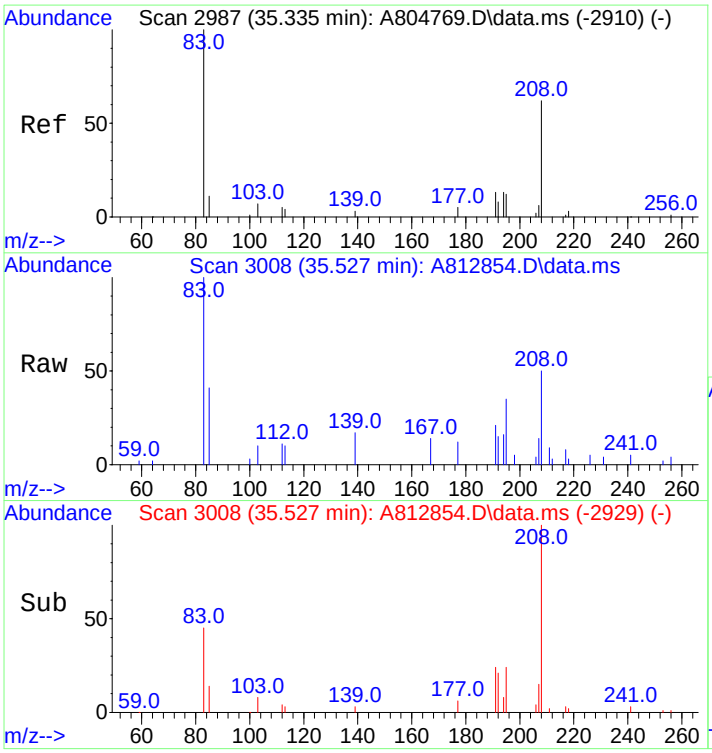


#31
C2-Fluorenes
Concen: 1072.64 ng/mL m
RT: 33.692 min Scan# 2807
Delta R.T. 0.086 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:194 Resp: 183679

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	9.5	27.4	41.0#

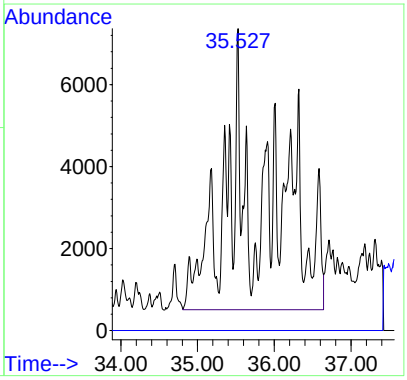


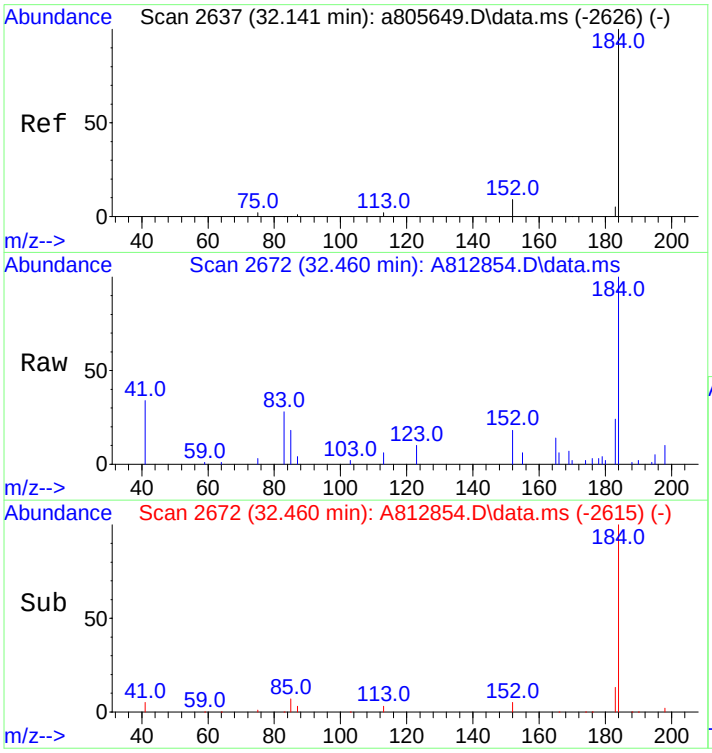


#32
C3-Fluorenes
Concen: 1366.71 ng/mL m
RT: 35.527 min Scan# 3008
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:208 Resp: 234035

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

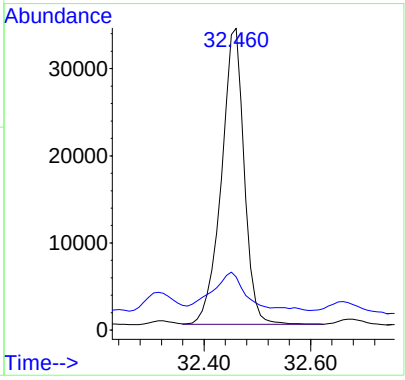


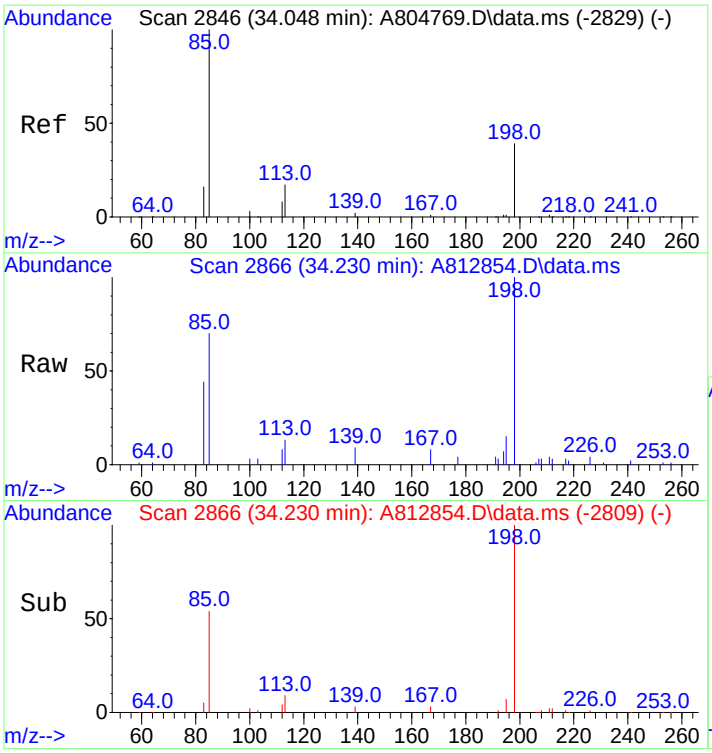


#33
Dibenzothiophene
Concen: 426.39 ng/mL
RT: 32.460 min Scan# 2672
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:184 Resp: 100404

Ion	Ratio	Lower	Upper
184	100		
152	19.4	7.8	11.8#

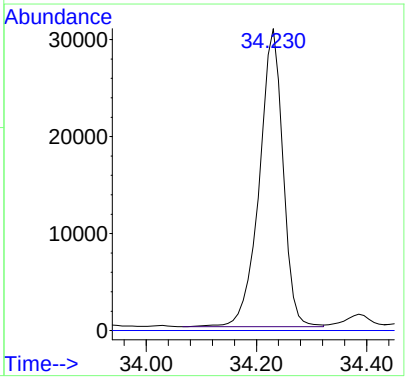


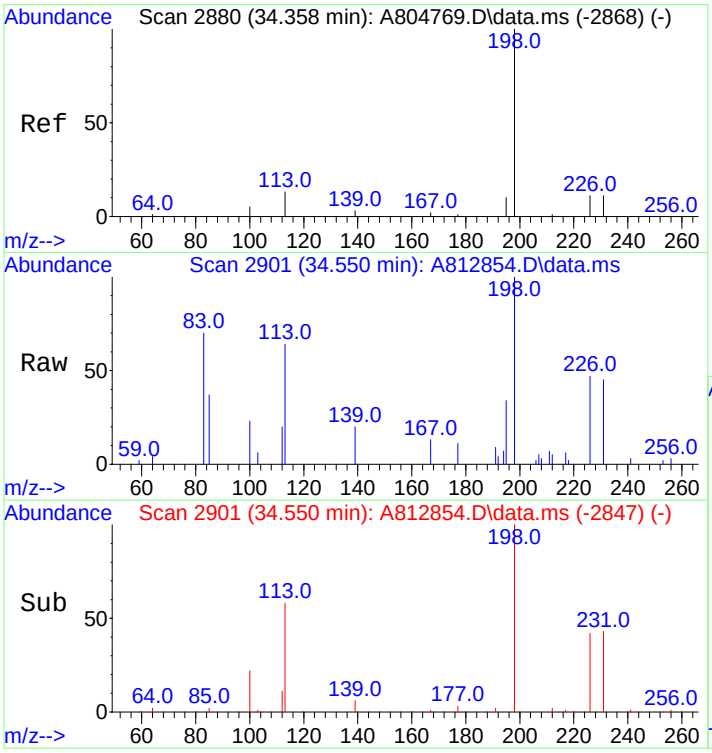


#34
4-Methyldibenzothiophene(4MDT)
Concen: 388.97 ng/mL
RT: 34.230 min Scan# 2866
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:198 Resp: 91593

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

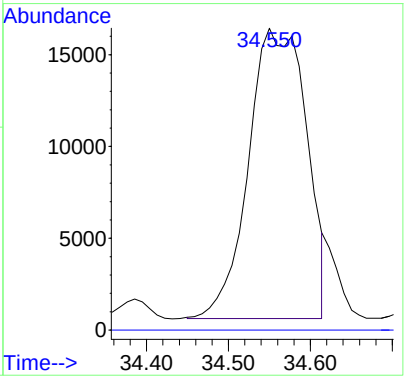


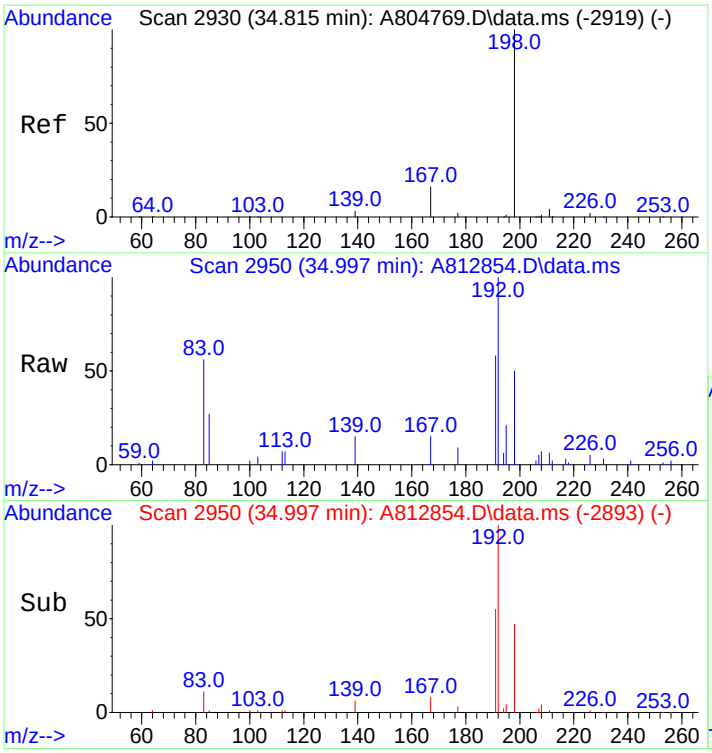


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 329.56 ng/mL m
RT: 34.550 min Scan# 2901
Delta R.T. -0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:198 Resp: 77603

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

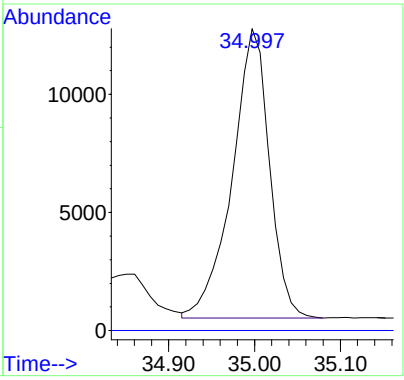


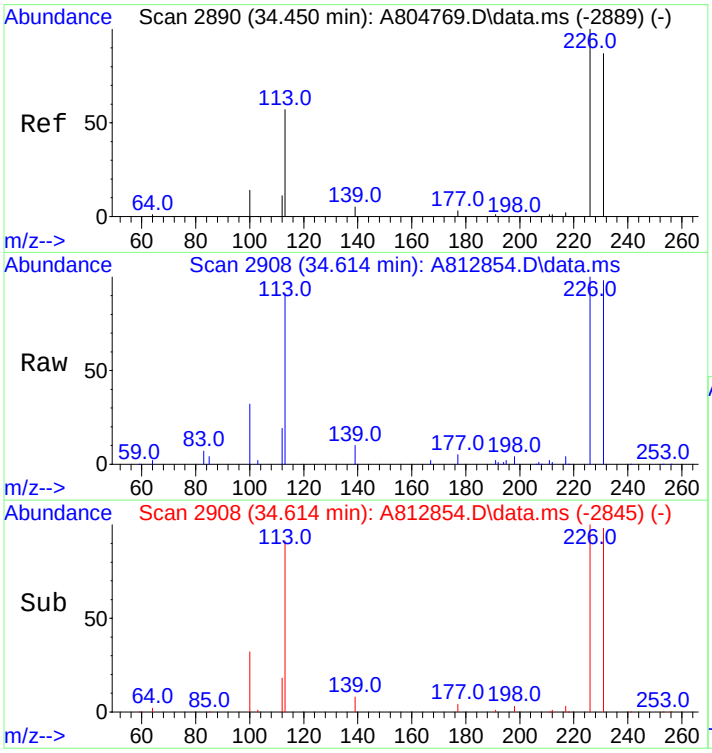


#36
1-Methyldibenzothiophene(1MDT)
Concen: 156.82 ng/mL
RT: 34.997 min Scan# 2950
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:198 Resp: 36928

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

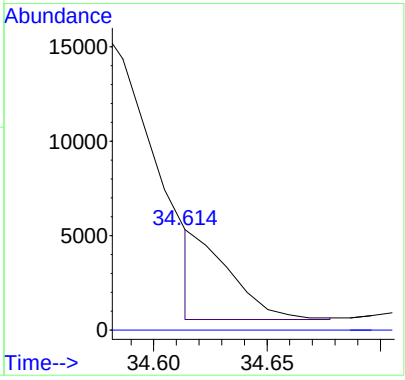


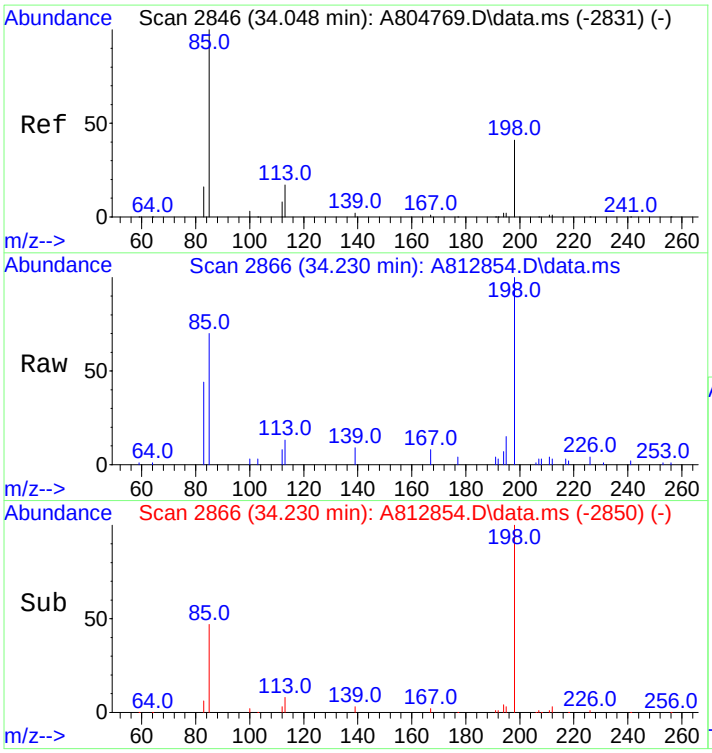


#37
OTP
Concen: 21.22 ng/mL m
RT: 34.614 min Scan# 2908
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:198 Resp: 4996

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

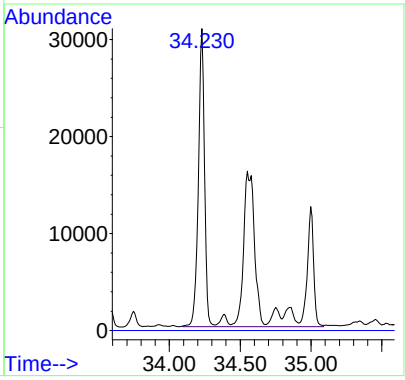


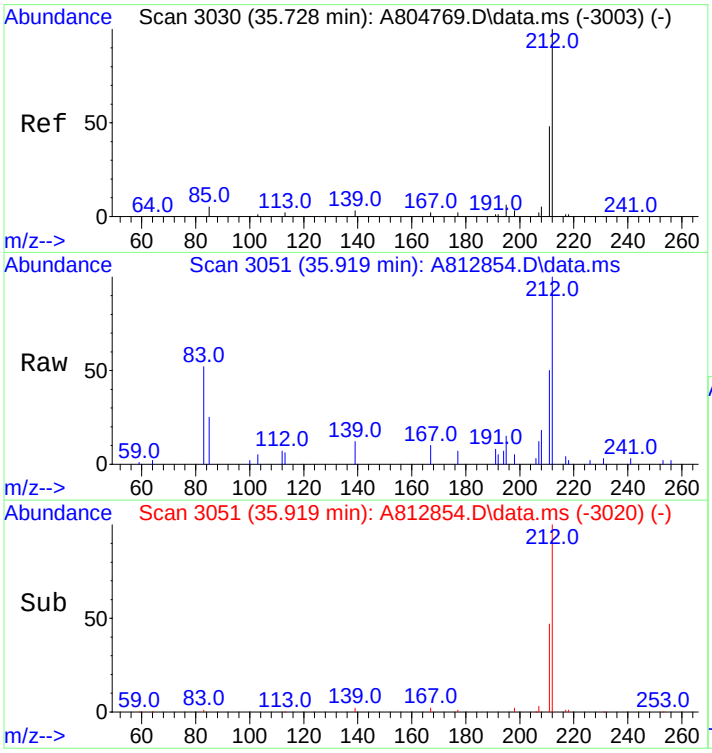


#38
C1-Dibenzothiophenes
Concen: 1002.38 ng/mL m
RT: 34.230 min Scan# 2866
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:198 Resp: 236036

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

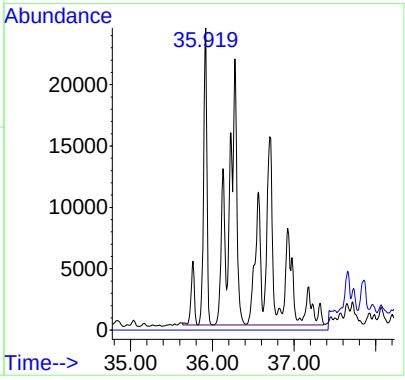


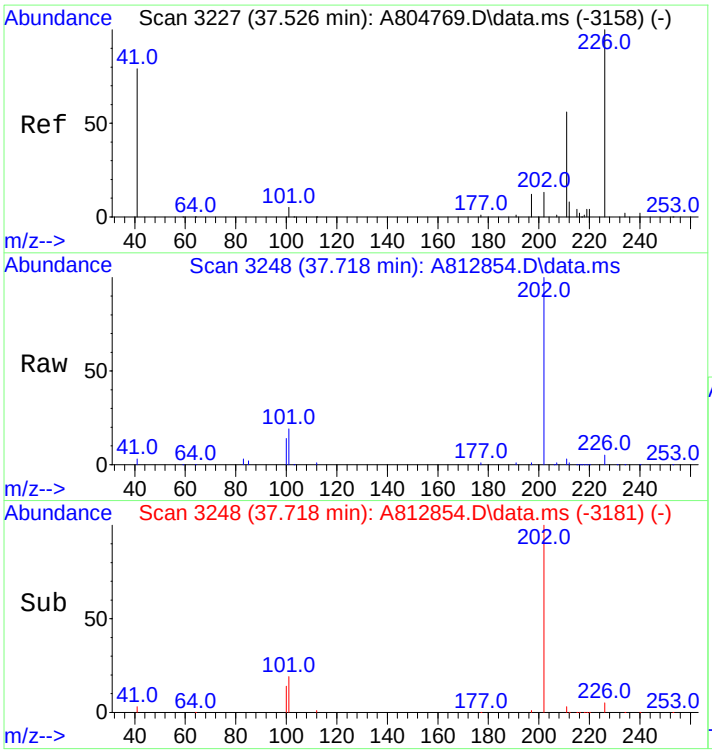


#39
C2-Dibenzothiophenes
Concen: 1772.03 ng/mL m
RT: 35.919 min Scan# 3051
Delta R.T. -0.338 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:212 Resp: 417270

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

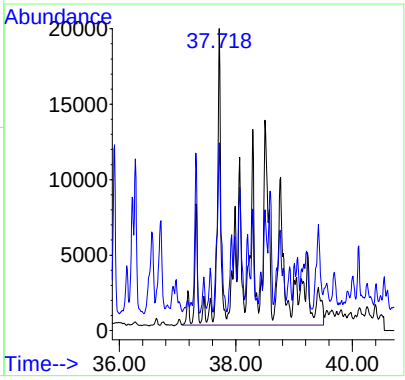


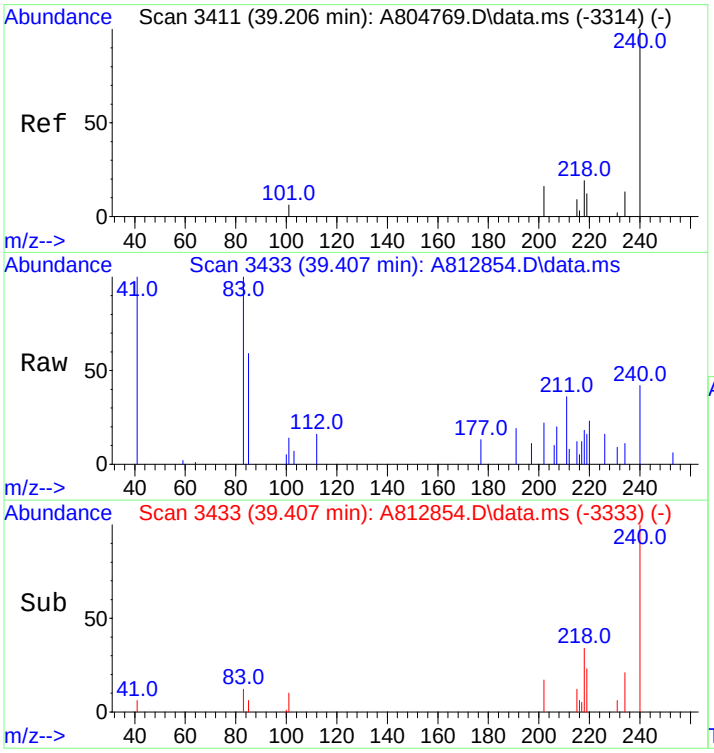


#40
C3-Dibenzothiophenes
Concen: 1913.60 ng/mL m
RT: 37.718 min Scan# 3248
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:226 Resp: 450605

Ion	Ratio	Lower	Upper
226	100		
211	11.9	50.2	75.2#

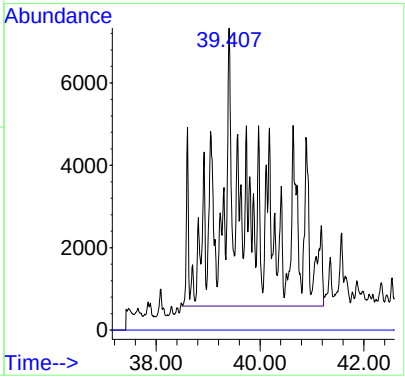


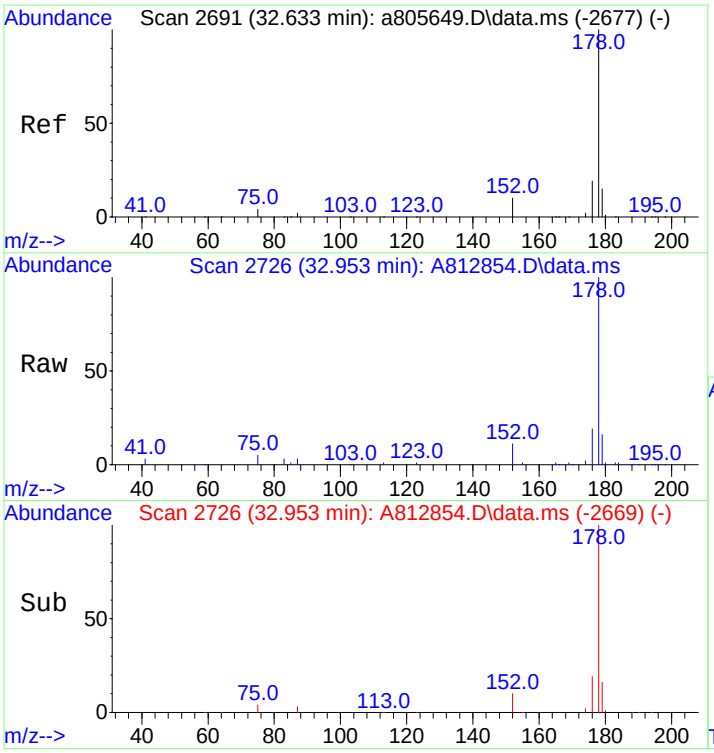


#41
C4-Dibenzothiophenes
Concen: 1262.47 ng/mL m
RT: 39.407 min Scan# 3433
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:240 Resp: 297280

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

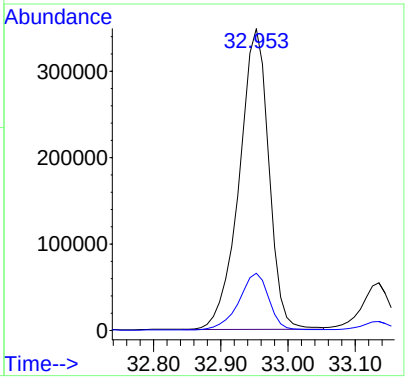


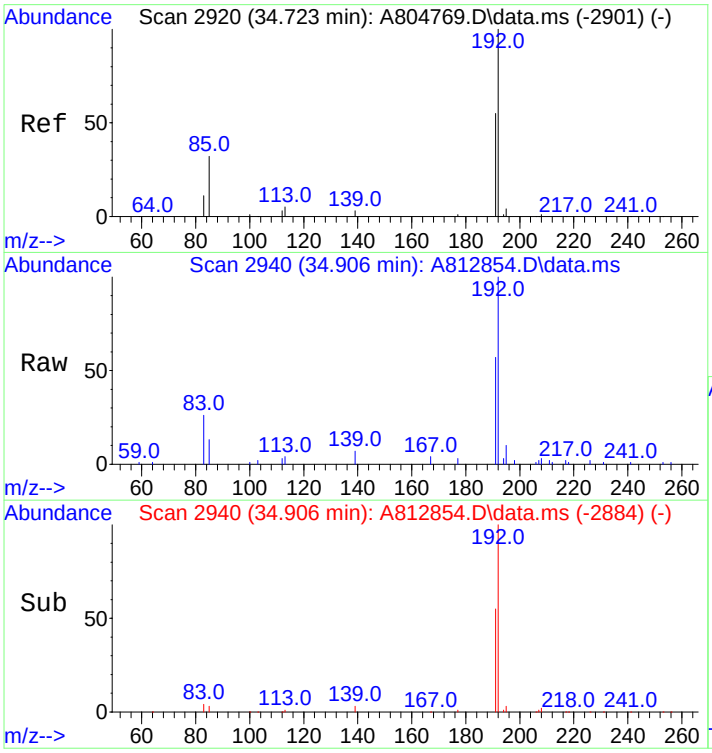


#43
Phenanthrene
Concen: 4693.22 ng/mL
RT: 32.953 min Scan# 2726
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:178 Resp: 1063687

Ion	Ratio	Lower	Upper
178	100		
176	19.1	15.2	22.8

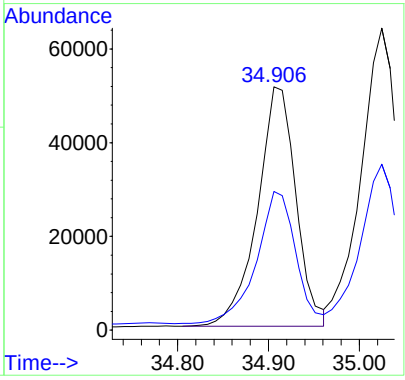


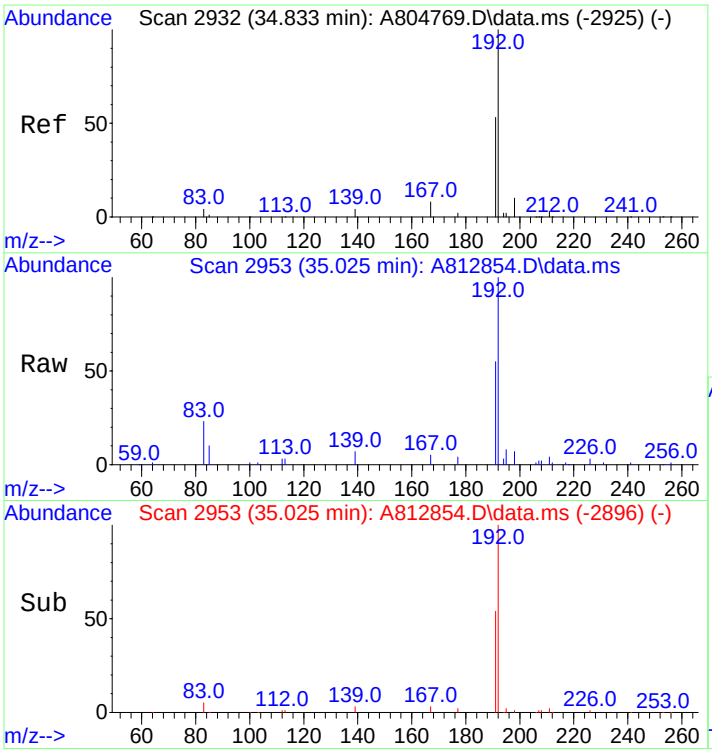


#44
3-Methylphenanthrene(3MP)
Concen: 663.39 ng/mL
RT: 34.906 min Scan# 2940
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 150353

Ion	Ratio	Lower	Upper
192	100		
191	55.9	45.5	68.3

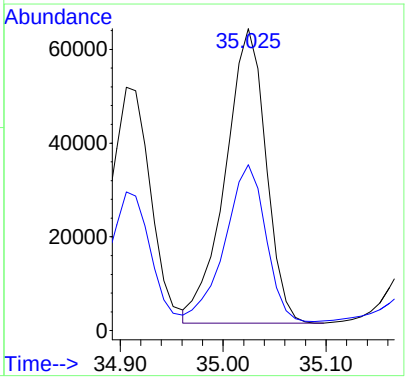


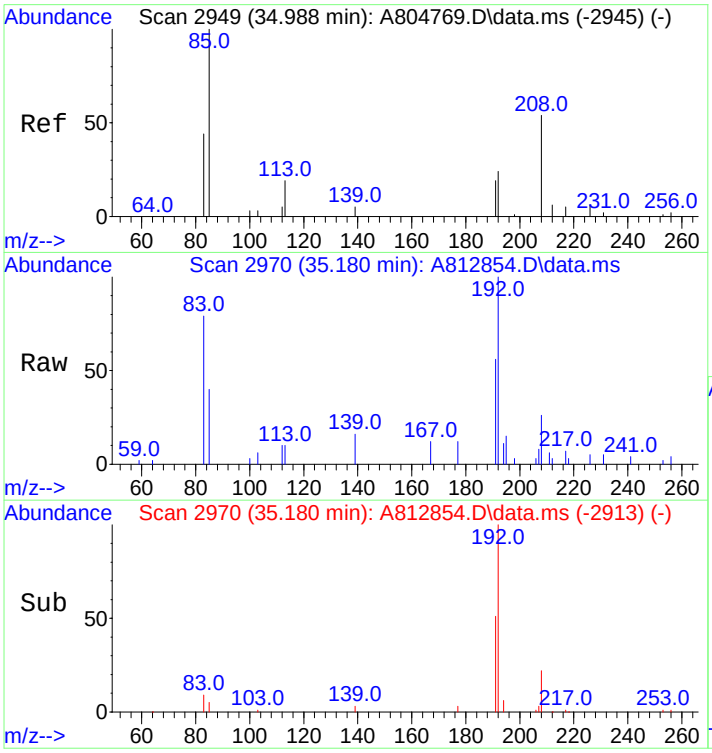


#45
2-Methylphenanthrene(2MP)
Concen: 762.35 ng/mL
RT: 35.025 min Scan# 2953
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 172781

Ion	Ratio	Lower	Upper
192	100		
191	53.1	44.6	67.0

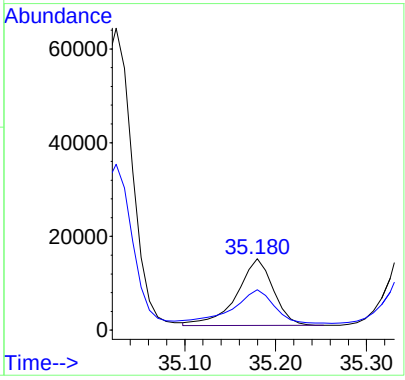


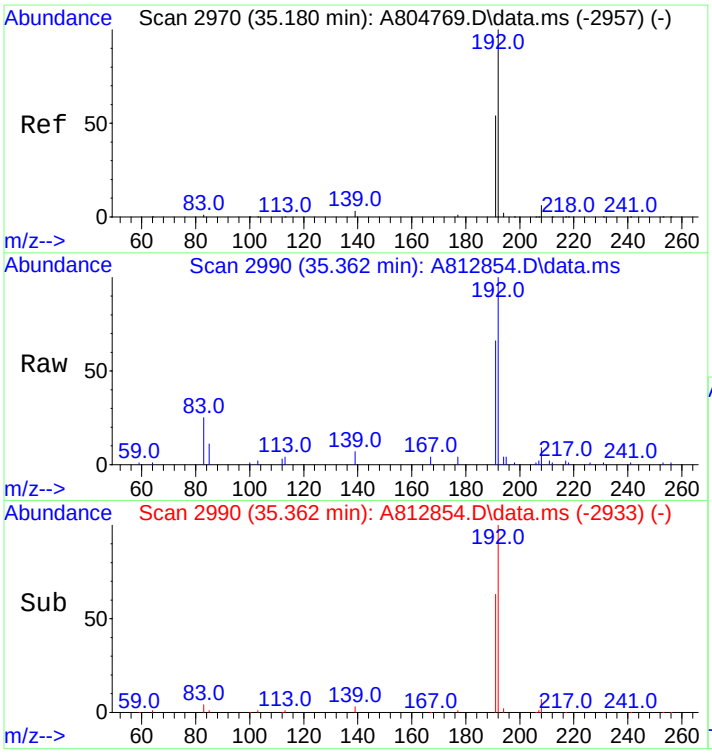


#46
2-Methylanthracene(2MA)
Concen: 174.27 ng/mL
RT: 35.180 min Scan# 2970
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 39498

Ion	Ratio	Lower	Upper
192	100		
191	56.8	96.9	145.3#

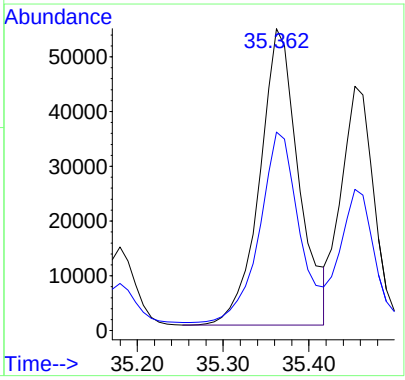


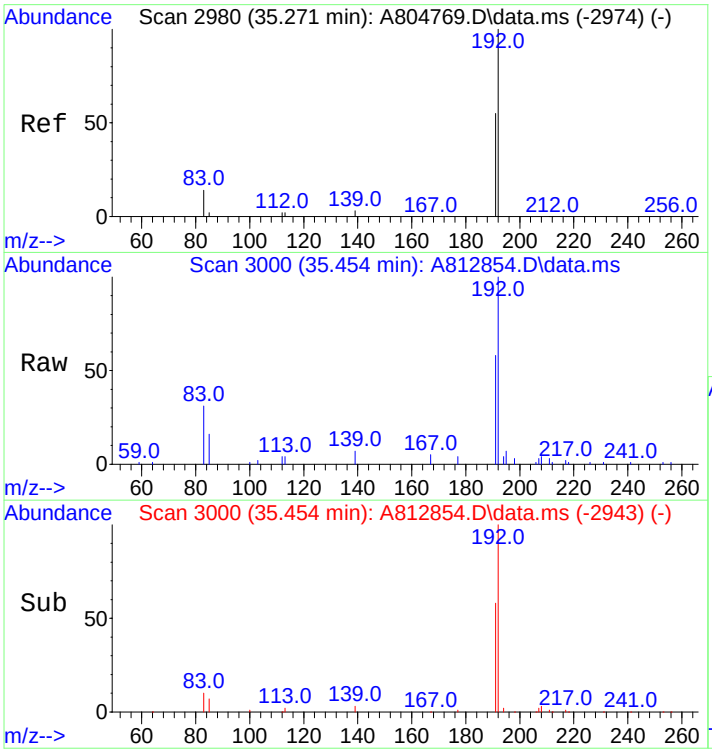


#47
9/4-Methylphenanthrene(9MP)
Concen: 757.06 ng/mL
RT: 35.362 min Scan# 2990
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 171583

Ion	Ratio	Lower	Upper
192	100		
191	65.0	44.5	66.7

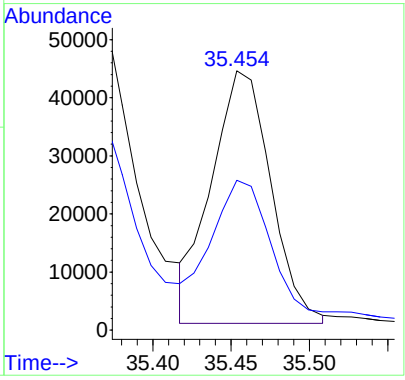


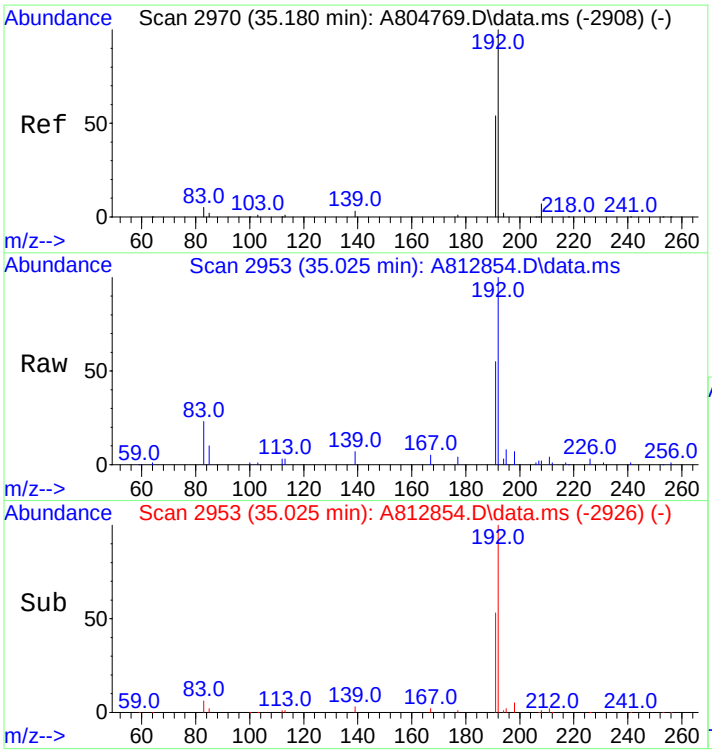


#48
1-Methylphenanthrene(1MP)
Concen: 506.28 ng/mL m
RT: 35.454 min Scan# 3000
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 114746

Ion	Ratio	Lower	Upper
192	100		
191	56.5	46.2	69.4

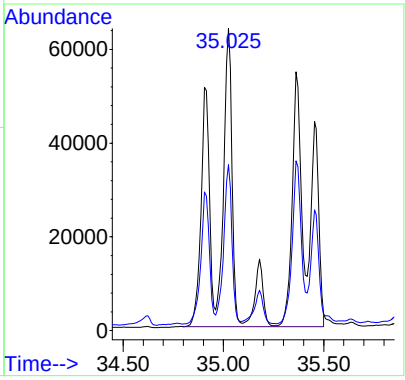


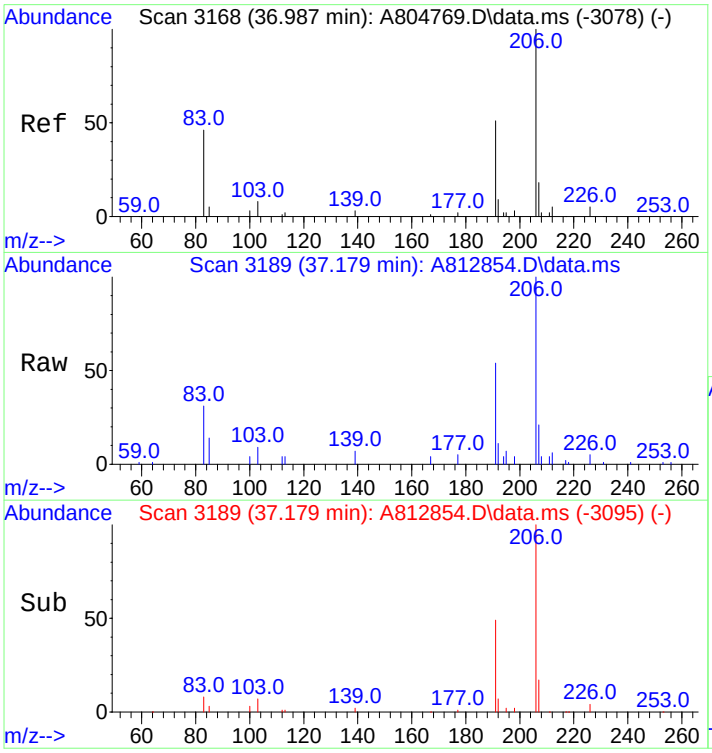


#49
C1-Phenanthrenes/Anthracenes
Concen: 2909.77 ng/mL m
RT: 35.025 min Scan# 2953
Delta R.T. -0.320 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 659480

Ion	Ratio	Lower	Upper
192	100		
191	16.9	44.5	66.7#

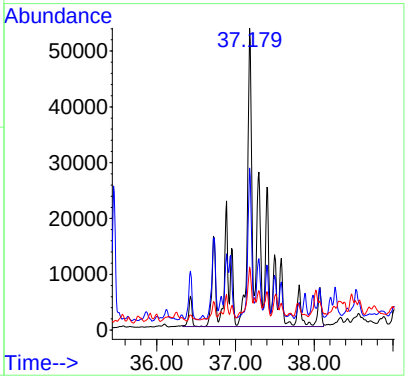


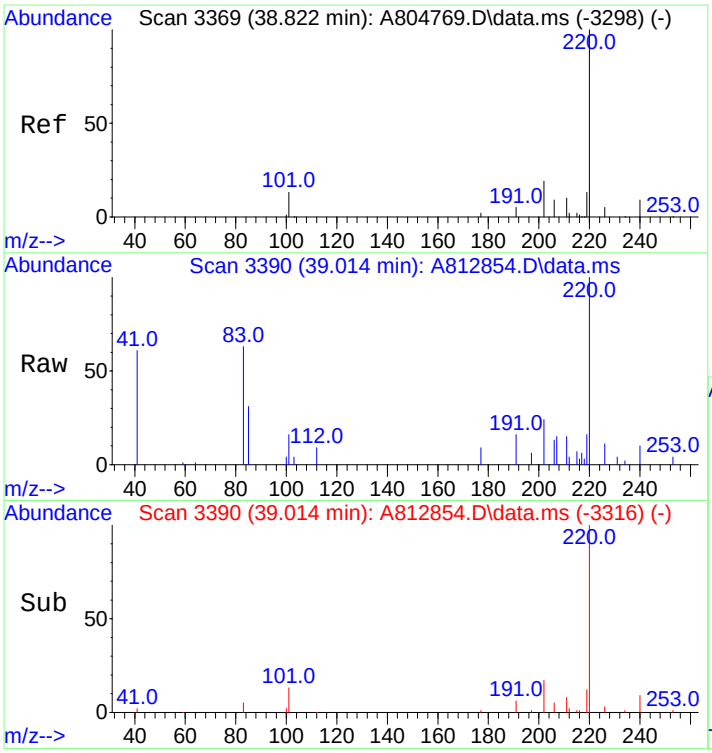


#50
C2-Phenanthrenes/Anthracenes
Concen: 2876.62 ng/mL m
RT: 37.179 min Scan# 3189
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:206 Resp: 651966

Ion	Ratio	Lower	Upper
206	100		
191	14.3	42.0	63.0#
207	5.2	16.2	24.4#

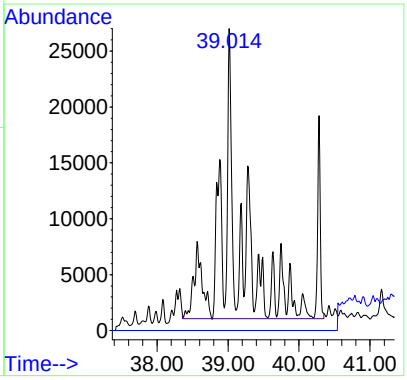


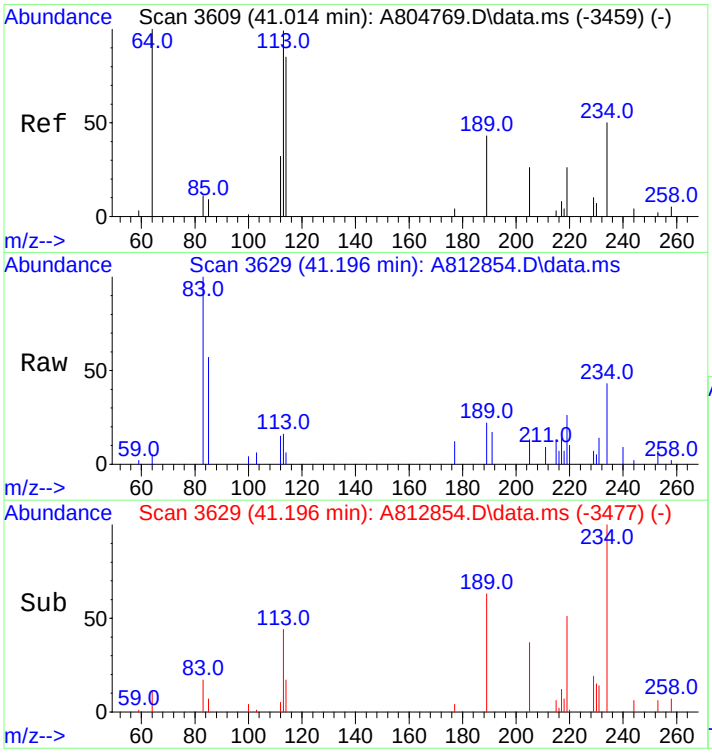


#52
C3-Phenanthrenes/Anthracenes
Concen: 2052.33 ng/mL m
RT: 39.014 min Scan# 3390
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:220 Resp: 465146

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

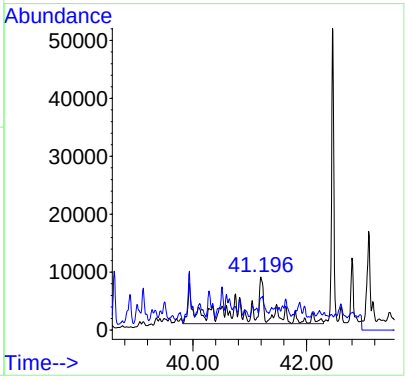


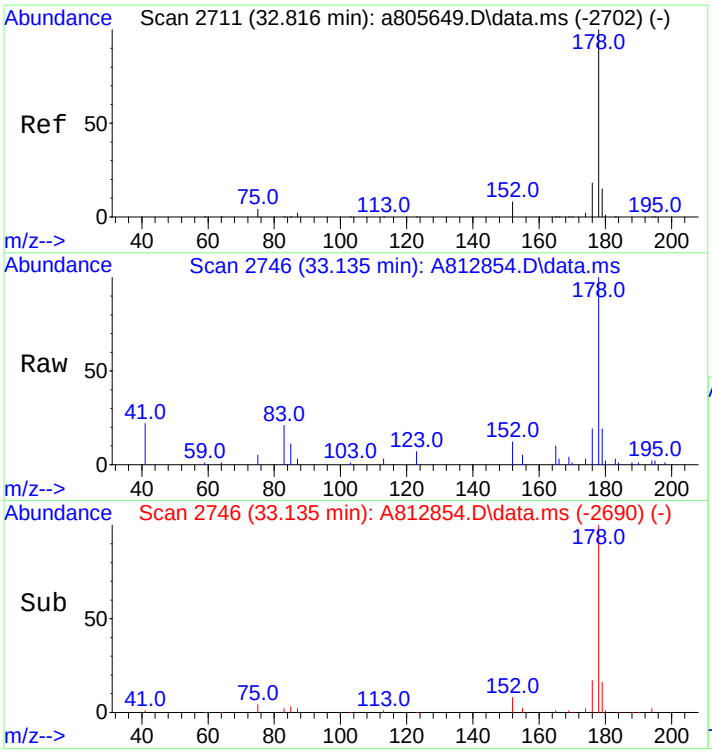


#53
C4-Phenanthrenes/Anthracenes
Concen: 1092.08 ng/mL m
RT: 41.196 min Scan# 3629
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:234 Resp: 247513

Ion	Ratio	Lower	Upper
234	100		
219	2.5	52.3	78.5#

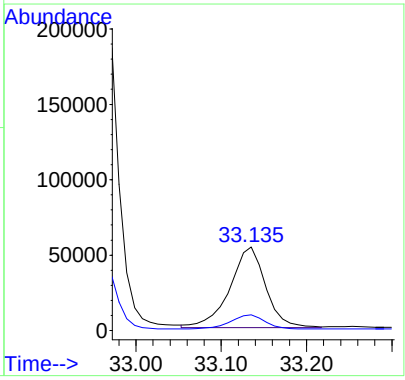


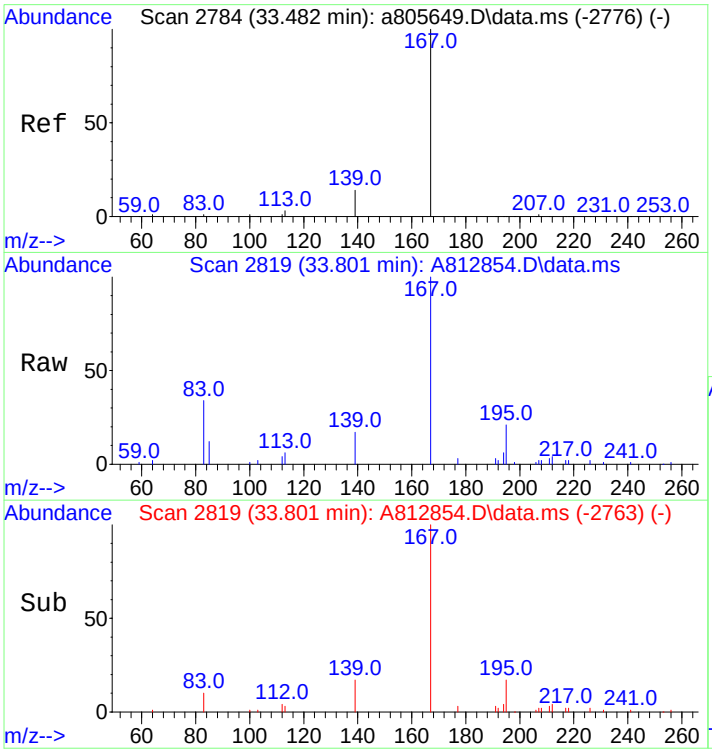


#55
Anthracene
Concen: 744.63 ng/mL m
RT: 33.135 min Scan# 2746
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:178 Resp: 157227

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

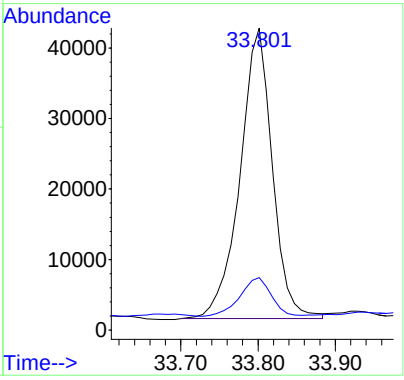


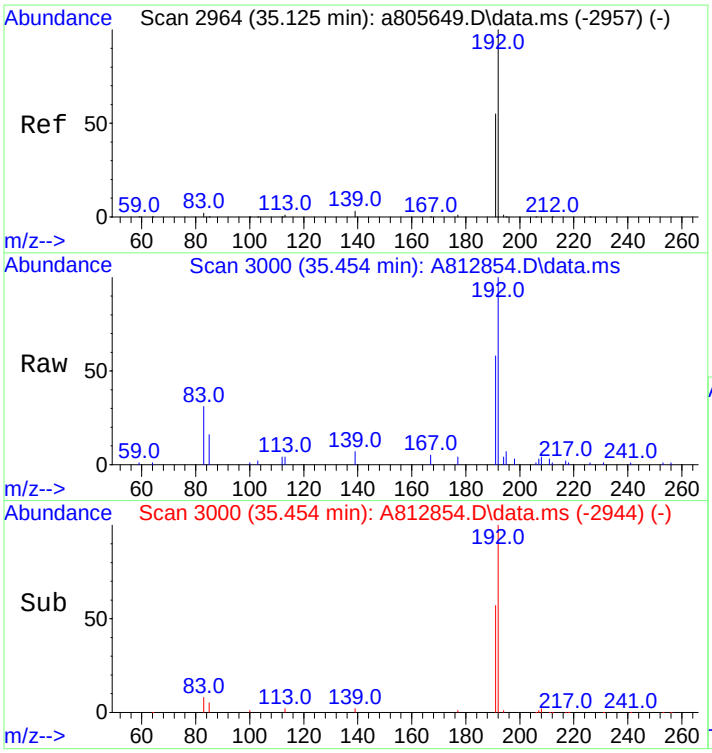


#56
Carbazole
Concen: 544.36 ng/mL
RT: 33.801 min Scan# 2819
Delta R.T. 0.008 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:167 Resp: 119932

Ion	Ratio	Lower	Upper
167	100		
139	12.8	10.6	16.0

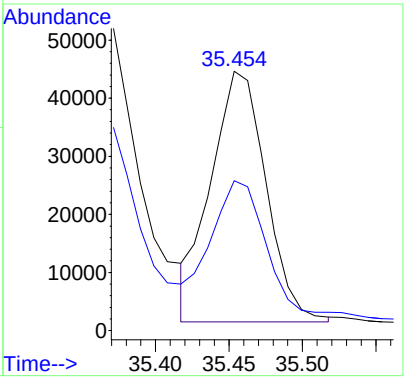


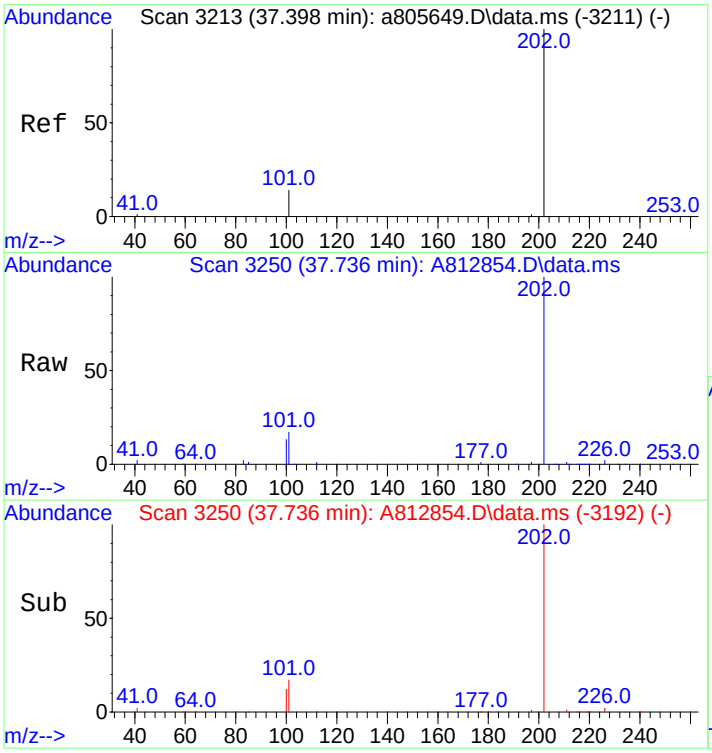


#57
1-Methylphenanthrene
Concen: 705.07 ng/mL m
RT: 35.454 min Scan# 3000
Delta R.T. 0.009 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:192 Resp: 113276

Ion	Ratio	Lower	Upper
192	100		
191	57.4	44.2	66.4

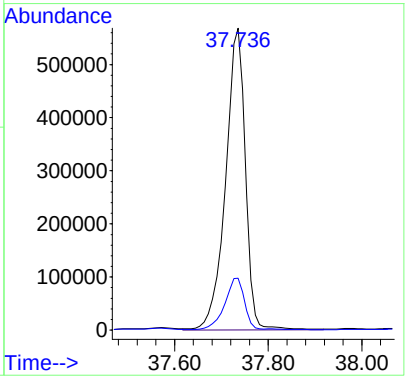


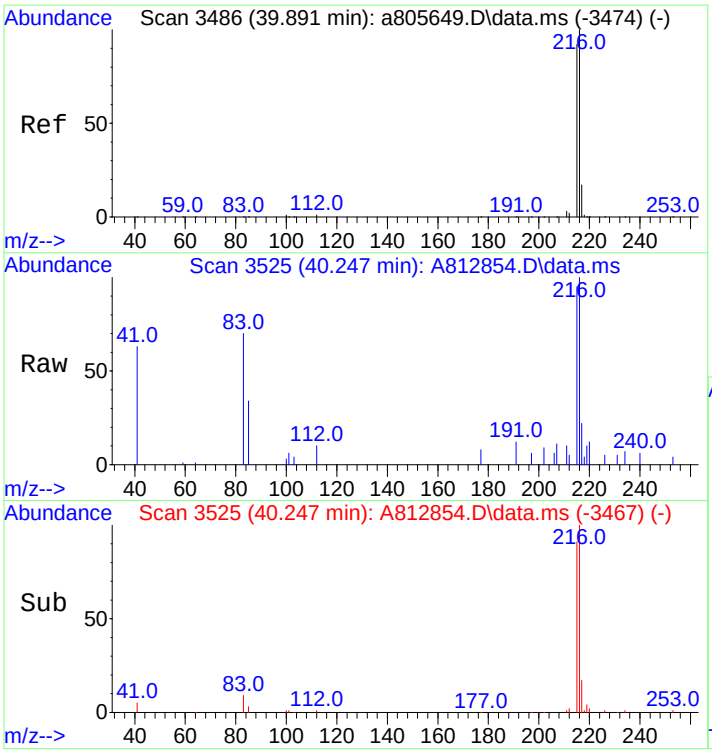


#58
Fluoranthene
Concen: 7138.67 ng/mL
RT: 37.736 min Scan# 3250
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:202 Resp: 1666563

Ion	Ratio	Lower	Upper
202	100		
101	16.8	13.6	20.4

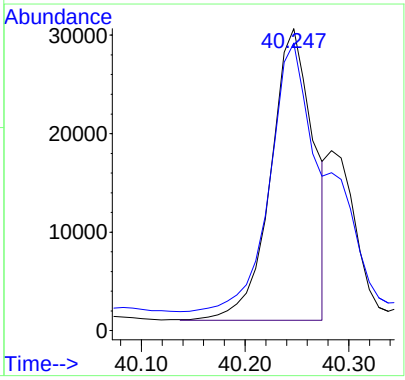


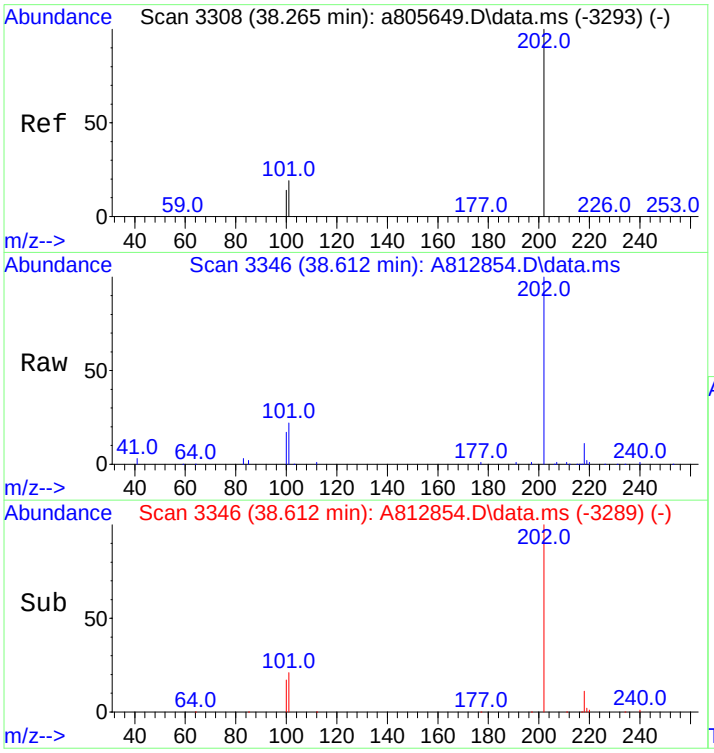


#59
Benzo(b)fluorene
Concen: 633.90 ng/mL m
RT: 40.247 min Scan# 3525
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:216 Resp: 85607

Ion	Ratio	Lower	Upper
216	100		
215	123.3	74.2	111.2#

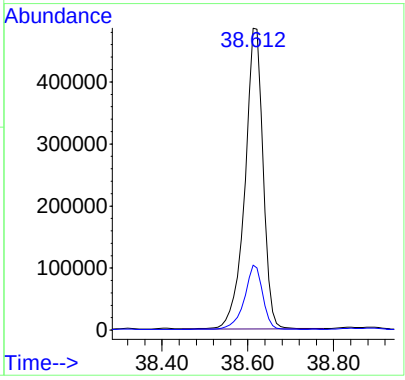


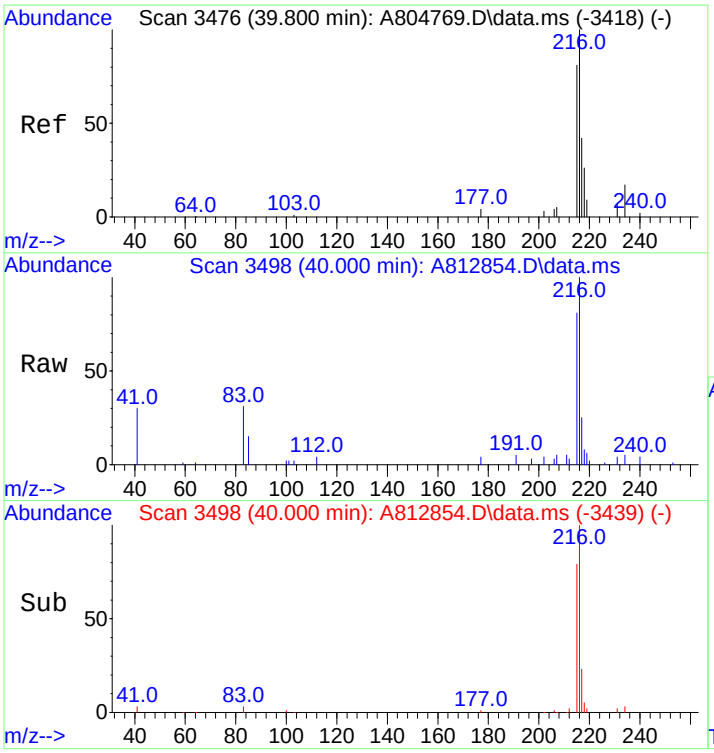


#60
Pyrene
Concen: 6012.53 ng/mL
RT: 38.612 min Scan# 3346
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:202 Resp: 1419770

Ion	Ratio	Lower	Upper
202	100		
101	21.7	15.4	23.2

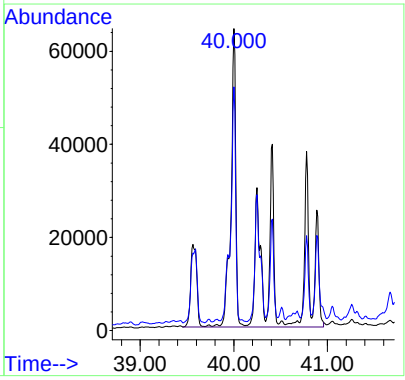


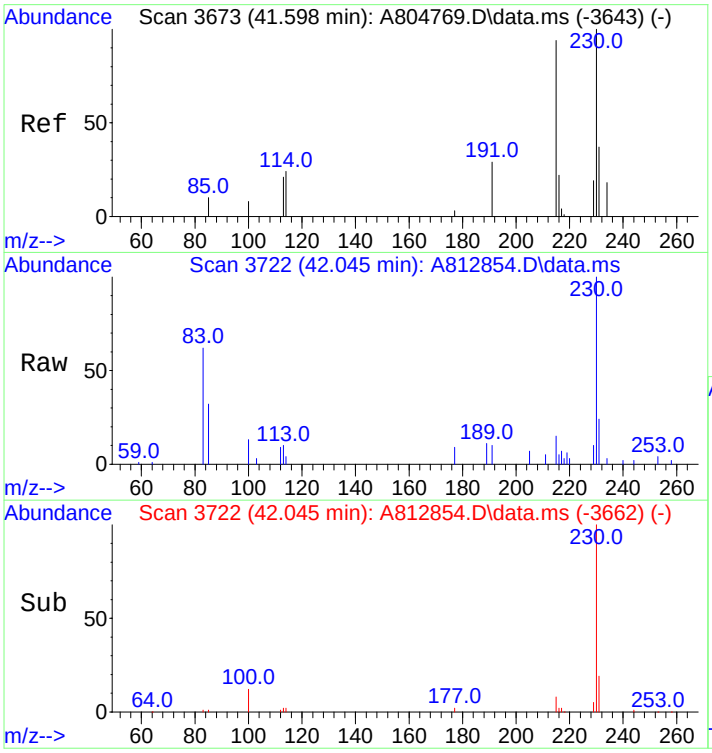


#61
C1-Fluoranthenes/Pyrenes
Concen: 3080.95 ng/mL m
RT: 40.000 min Scan# 3498
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:216 Resp: 727521

Ion	Ratio	Lower	Upper
216	100		
215	26.0	73.8	110.6#

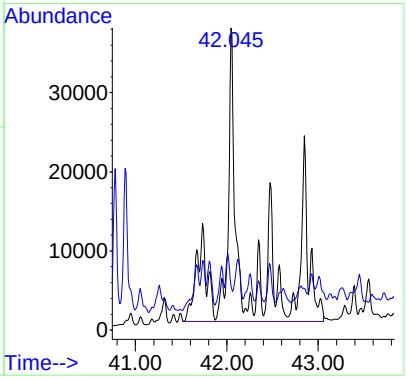


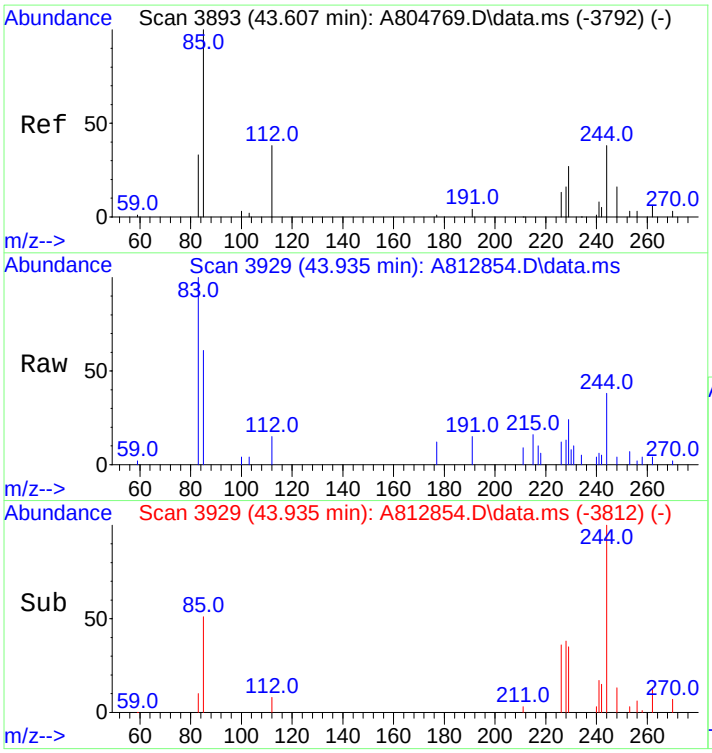


#62
C2-Fluoranthenes/Pyrenes
Concen: 2240.01 ng/mL m
RT: 42.045 min Scan# 3722
Delta R.T. 0.274 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:230 Resp: 528945

Ion	Ratio	Lower	Upper
230	100		
215	3.3	93.1	139.7#

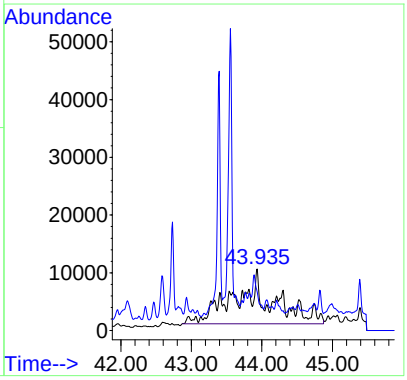


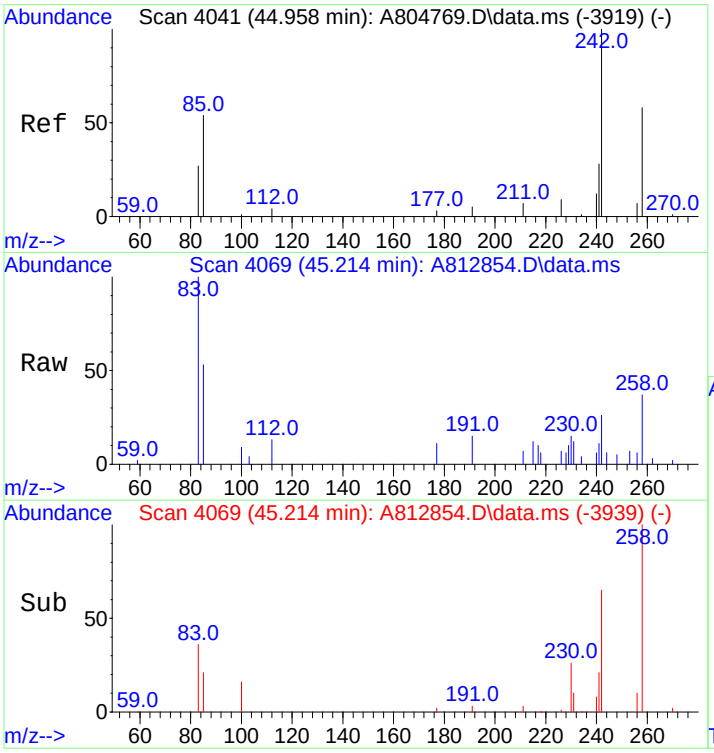


#63
C3-Fluoranthenes/Pyrenes
Concen: 1468.81 ng/mL m
RT: 43.935 min Scan# 3929
Delta R.T. 0.146 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:244 Resp: 346838

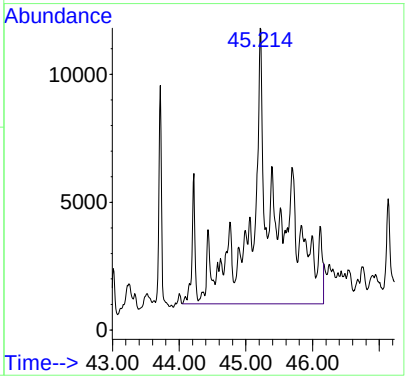
Ion	Ratio	Lower	Upper
244	100		
229	2.6	76.2	114.2#

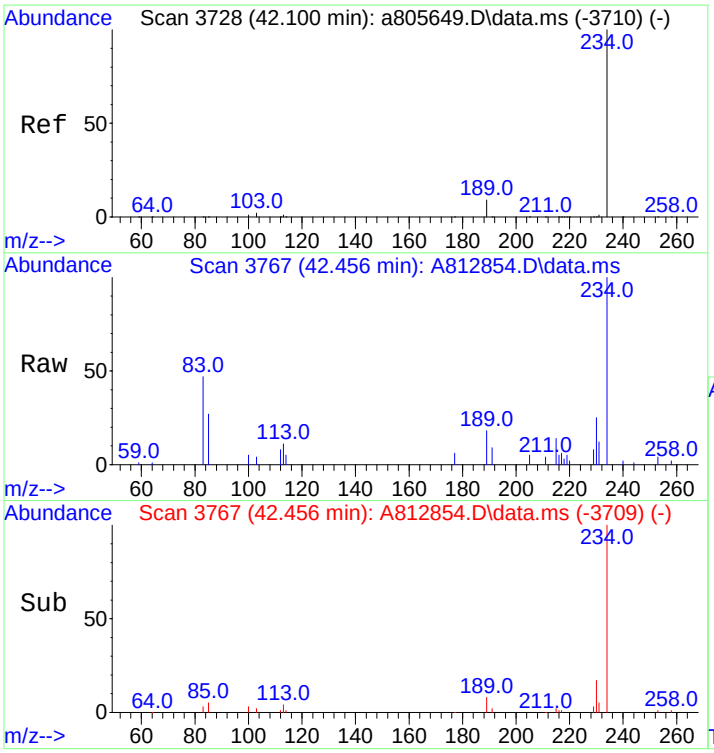




#64
C4-Fluoranthenes/Pyrenes
Concen: 1282.95 ng/mL m
RT: 45.214 min Scan# 4069
Delta R.T. 0.073 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:258 Resp: 302951

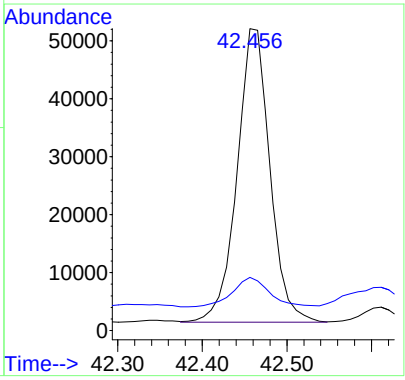


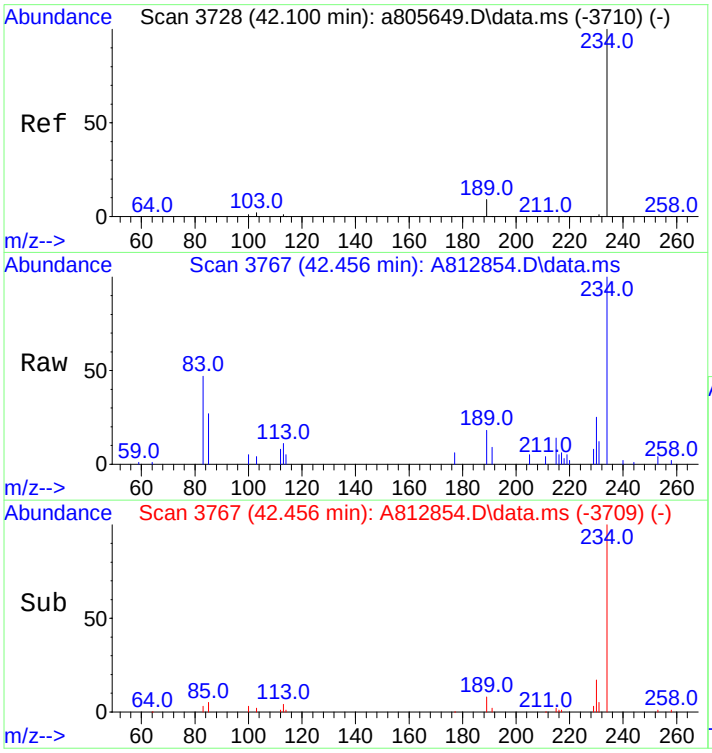


#66
Naphthobenzothiophene
Concen: 626.18 ng/ml m
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:234 Resp: 137261

Ion	Ratio	Lower	Upper
234	100		
189	1.1	22.3	33.5#

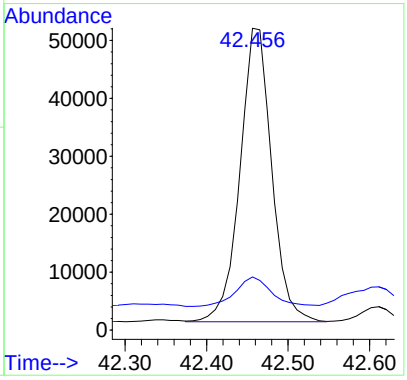


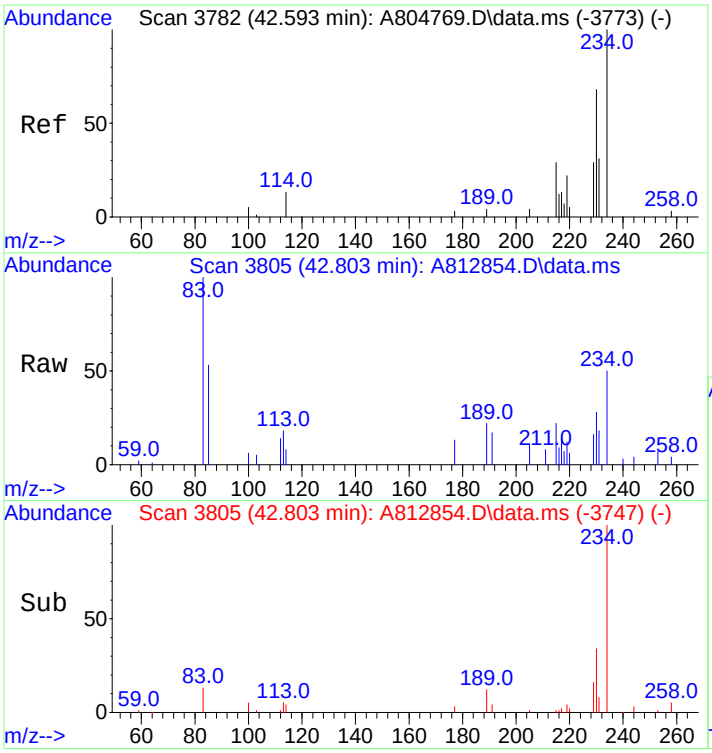


#67
Naphthobenzothiophene-2,1-D
Concen: 625.66 ng/mL m
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:234 Resp: 137146

Ion	Ratio	Lower	Upper
234	100		
189	1.1	22.3	33.5#

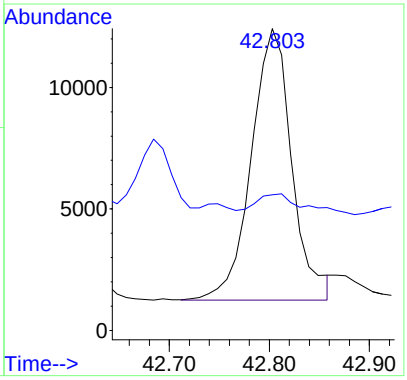


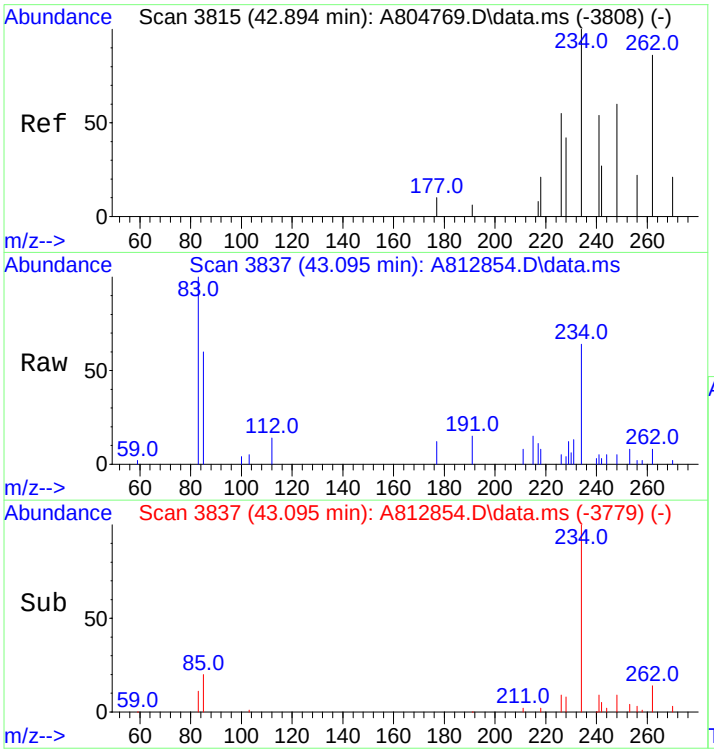


#68
Naphthobenzothiophene-1,2-D
Concen: 143.61 ng/mL m
RT: 42.803 min Scan# 3805
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:234 Resp: 31479

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

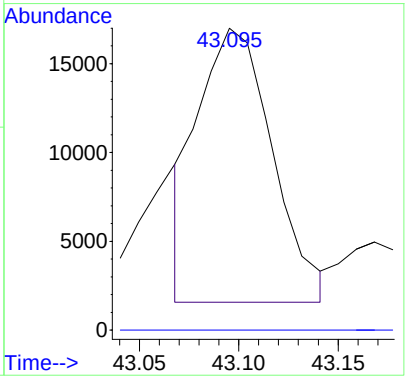


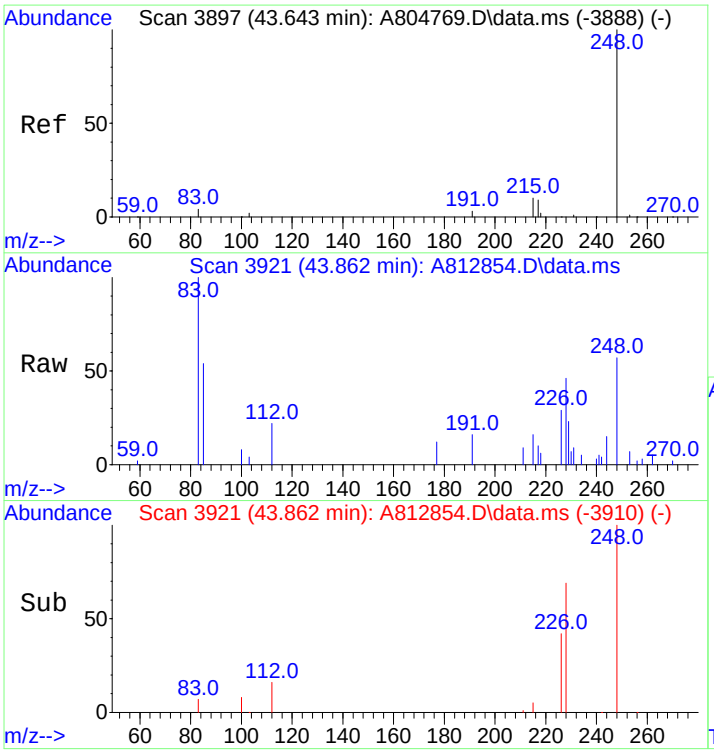


#69
Naphthobenzothiophene-2,3-D
Concen: 182.93 ng/mL m
RT: 43.095 min Scan# 3837
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:234 Resp: 40100

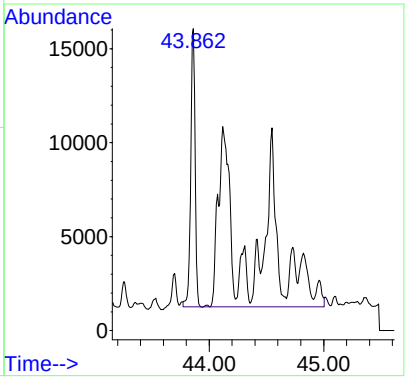
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

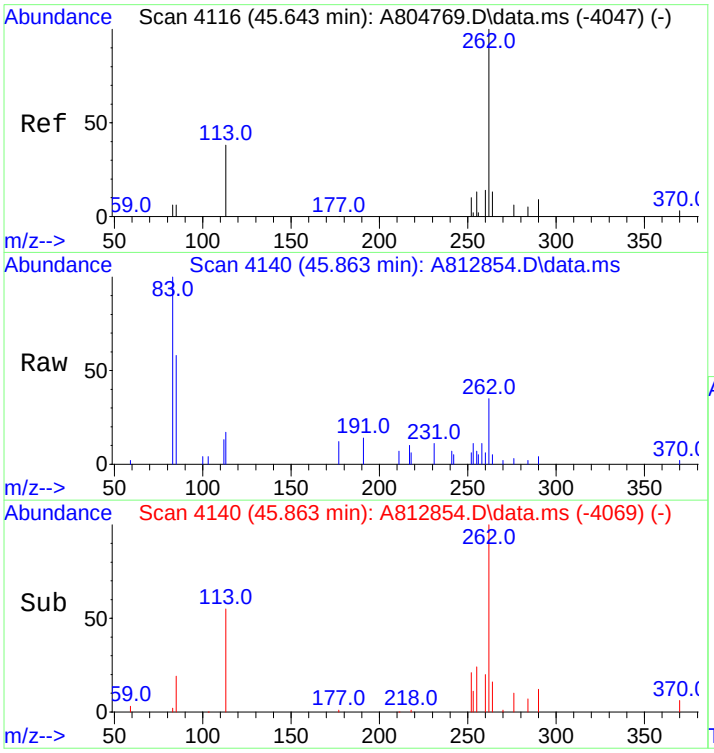




#70
C1-Naphthobenzothiophenes
Concen: 941.13 ng/ml m
RT: 43.862 min Scan# 3921
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

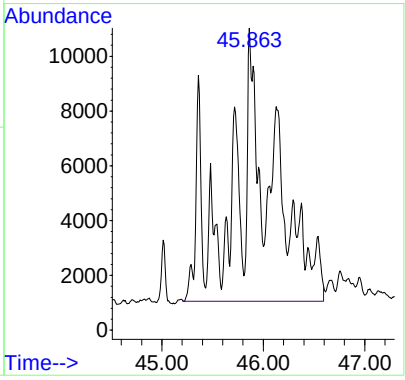
Tgt Ion:248 Resp: 206299

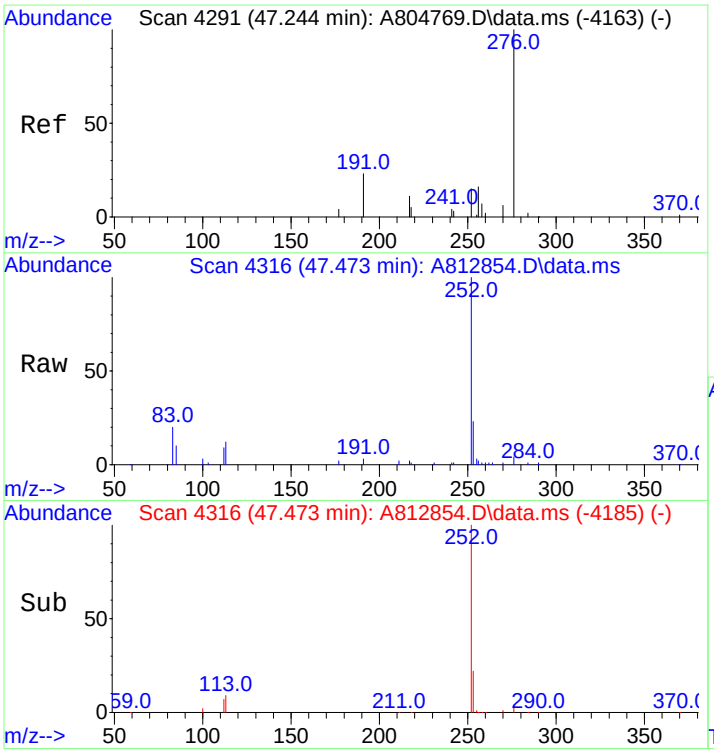




#71
C2-Naphthobenzothiophenes
Concen: 1204.54 ng/ml m
RT: 45.863 min Scan# 4140
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

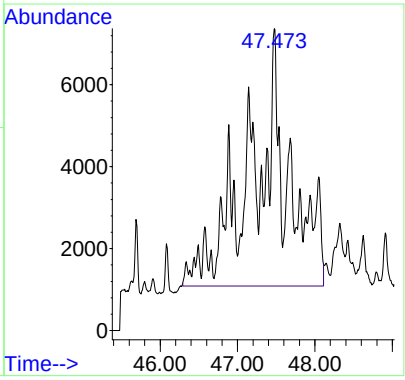
Tgt Ion:262 Resp: 264039

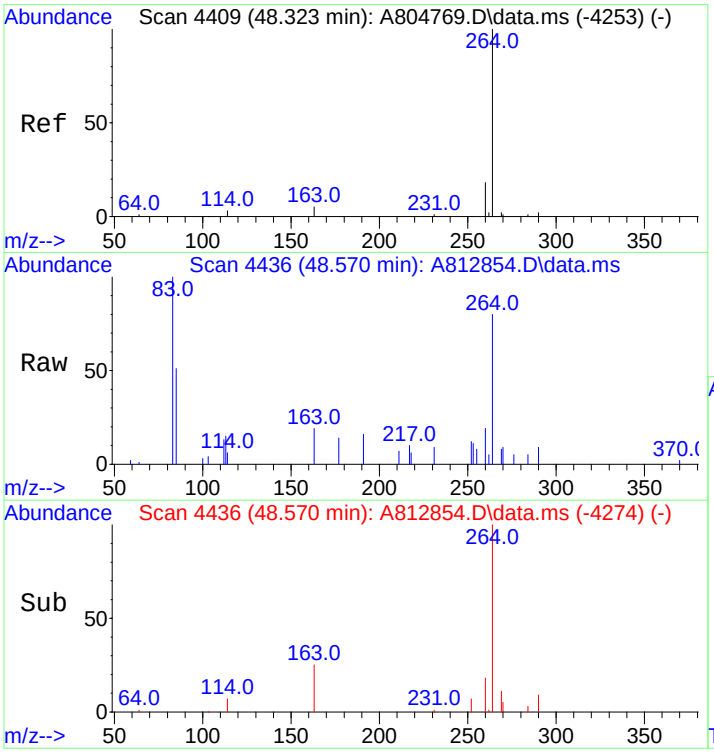




#72
C3-Naphthobenzothiophenes
Concen: 938.23 ng/ml m
RT: 47.473 min Scan# 4316
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

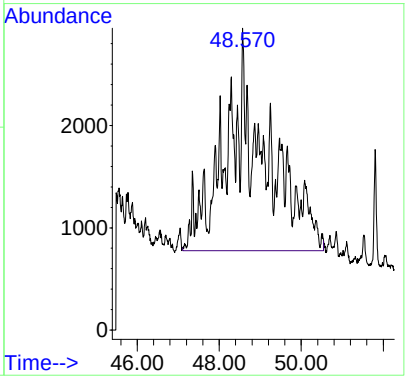
Tgt Ion:276 Resp: 205663

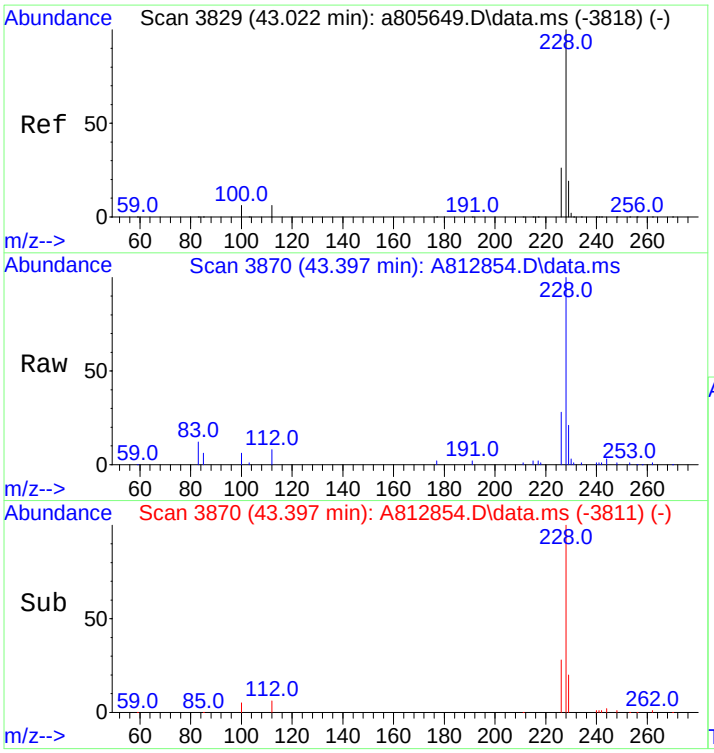




#73
C4-Naphthobenzothiophenes
Concen: 638.10 ng/mL m
RT: 48.570 min Scan# 4436
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:290 Resp: 139873

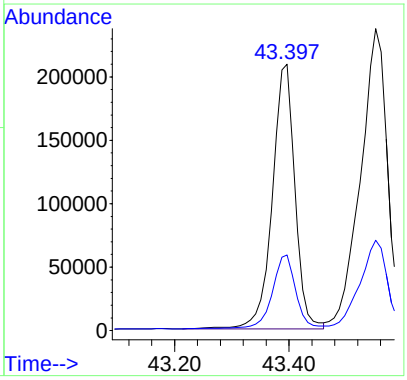


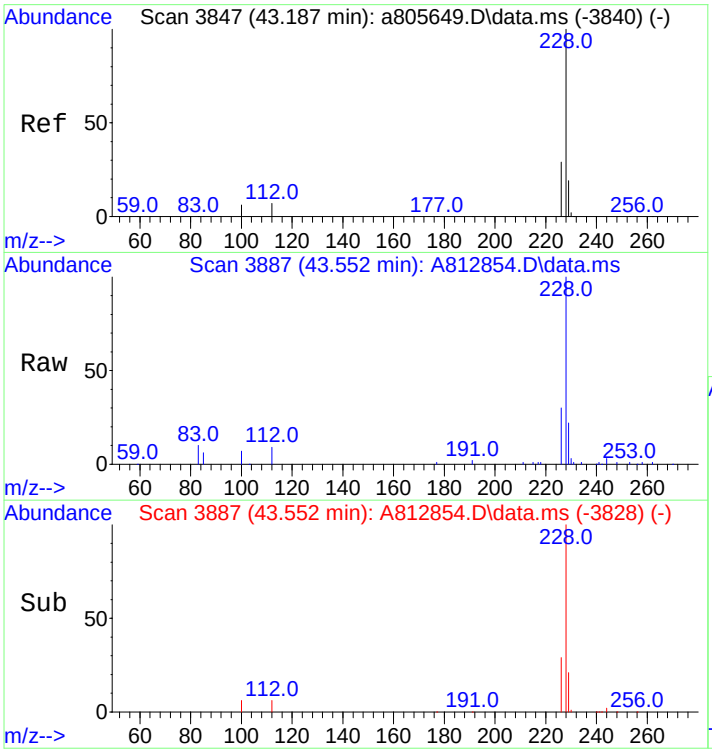


#75
Benz[a]anthracene
Concen: 2547.64 ng/mL
RT: 43.397 min Scan# 3870
Delta R.T. 0.037 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:228 Resp: 573274

Ion	Ratio	Lower	Upper
228	100		
226	27.6	21.3	31.9

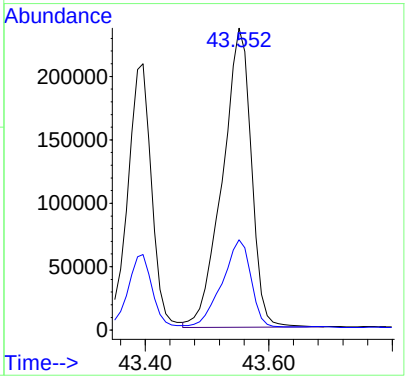


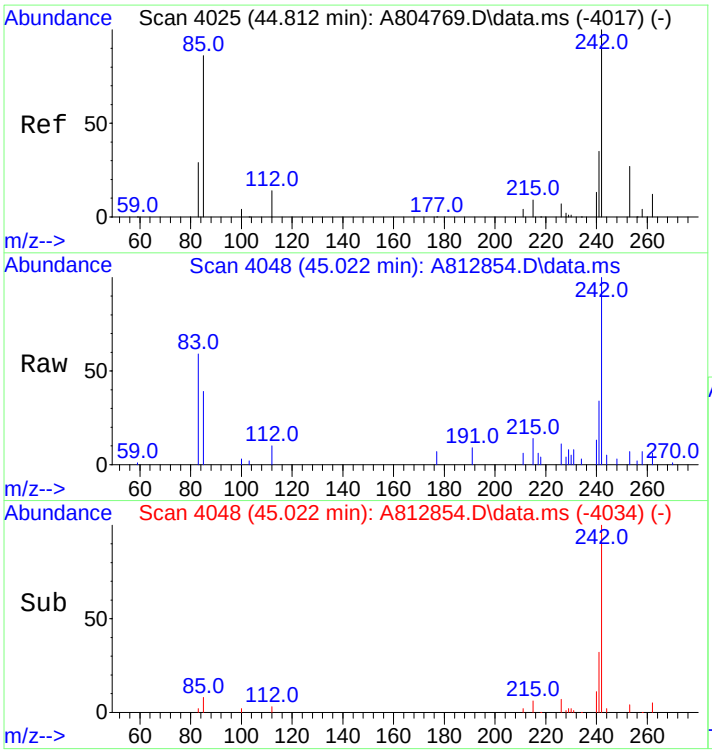


#77
Chrysene/Triphenylene
Concen: 3355.66 ng/mL
RT: 43.552 min Scan# 3887
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:228 Resp: 764335

Ion	Ratio	Lower	Upper
228	100		
226	29.2	23.6	35.4

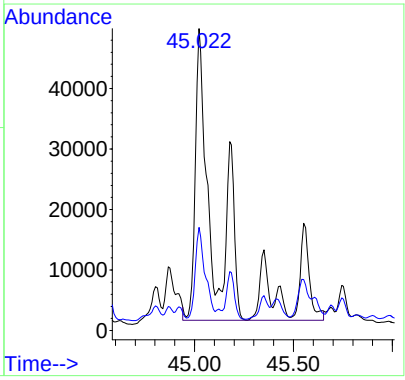


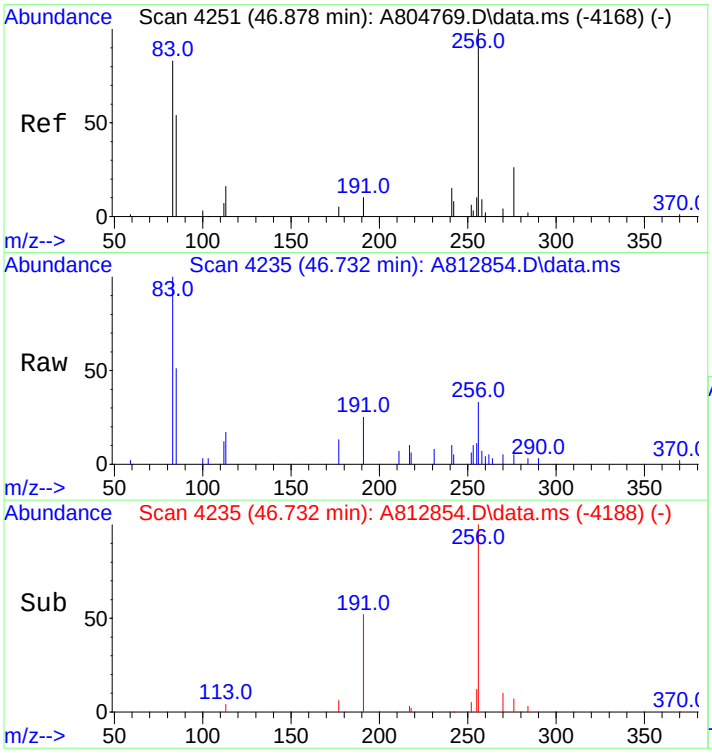


#78
C1-Chrysenes
Concen: 1617.69 ng/mL m
RT: 45.022 min Scan# 4048
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:242 Resp: 368469

Ion	Ratio	Lower	Upper
242	100		
241	3.1	33.5	50.3#

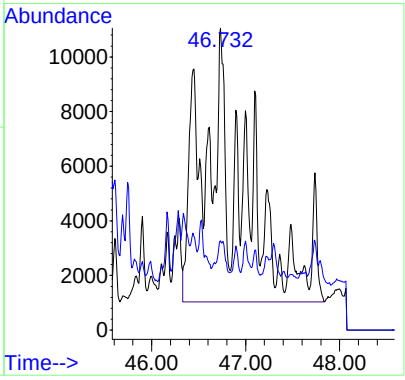


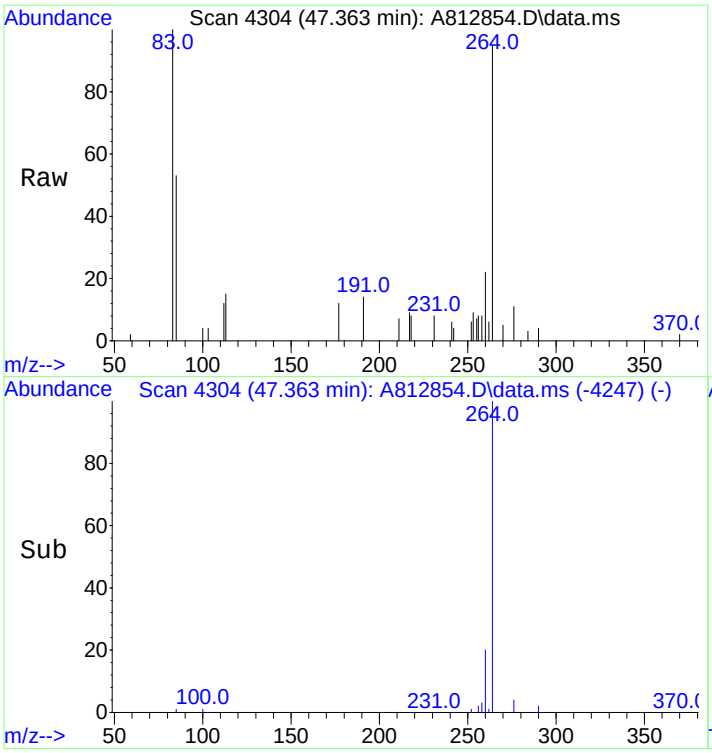


#79
C2-Chrysenes
Concen: 1301.27 ng/mL m
RT: 46.732 min Scan# 4235
Delta R.T. -0.329 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:256 Resp: 296397

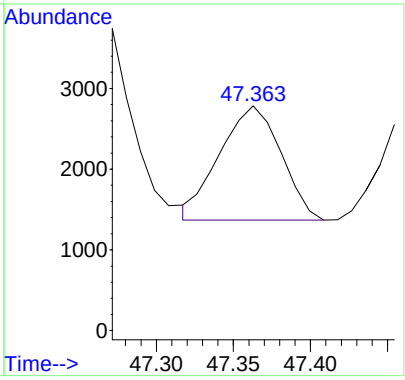
Ion	Ratio	Lower	Upper
256	100		
241	1.5	30.4	45.6#

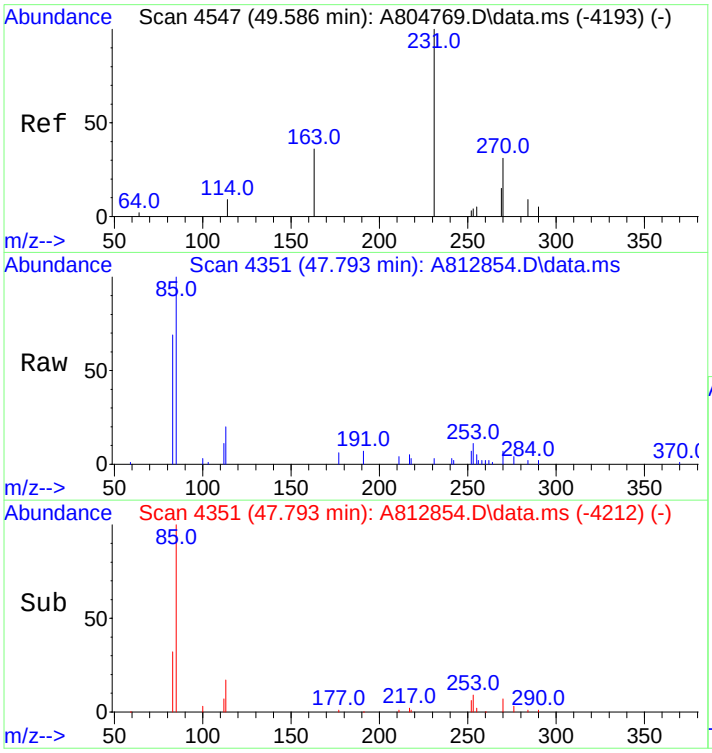




#80
BBF-D12 Surr BKGD
Concen: 17.13 ng/mL
RT: 47.363 min Scan# 4304
Delta R.T. 0.020 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:256 Resp: 3902

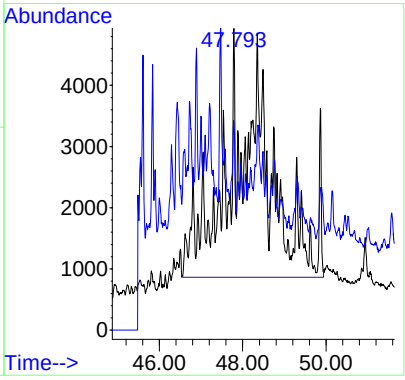


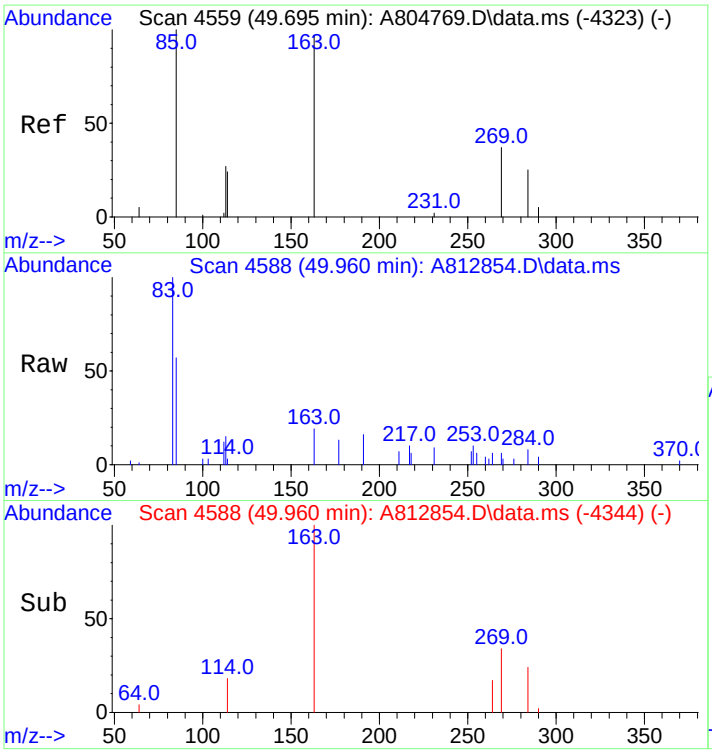


#81
C3-Chrysenes
Concen: 1080.80 ng/mL m
RT: 47.793 min Scan# 4351
Delta R.T. -2.021 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:270 Resp: 246179

Ion	Ratio	Lower	Upper
270	100		
255	0.5	42.9	64.3#

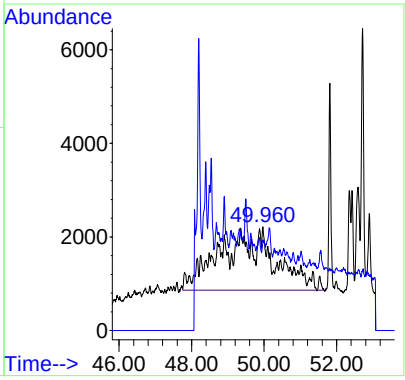


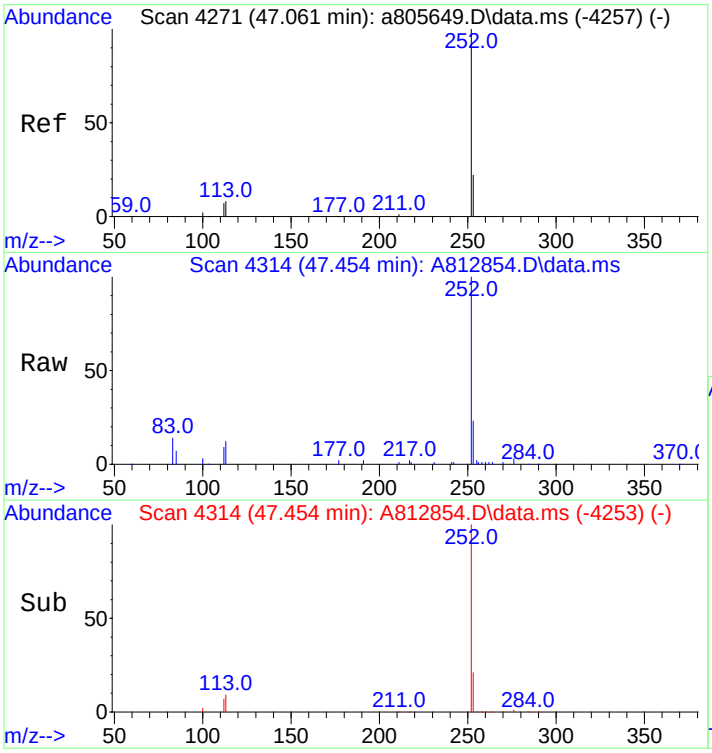


#82
C4-Chrysenes
Concen: 596.34 ng/mL m
RT: 49.960 min Scan# 4588
Delta R.T. 0.135 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:284 Resp: 135831

Ion	Ratio	Lower	Upper
284	100		
269	1.4	81.7	122.5#

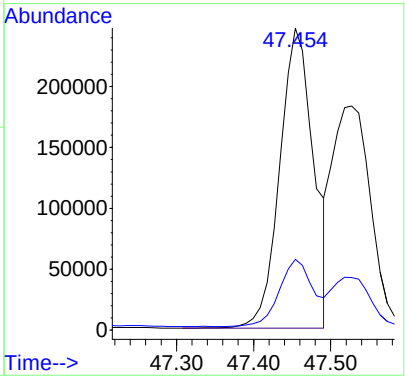


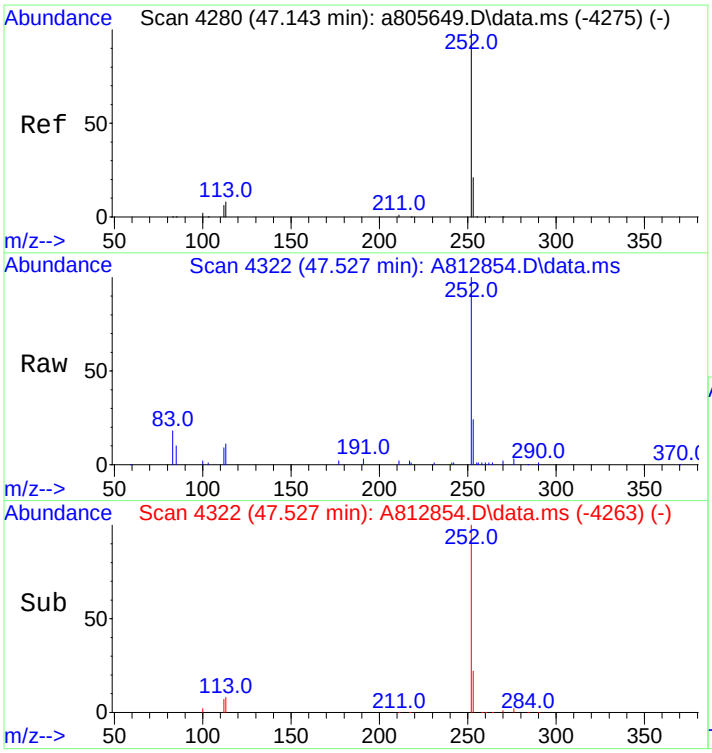


#84
Benzo[b]fluoranthene
Concen: 3119.59 ng/mL
RT: 47.454 min Scan# 4314
Delta R.T. 0.054 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:252 Resp: 753915

Ion	Ratio	Lower	Upper
252	100		
253	22.5	18.5	27.7

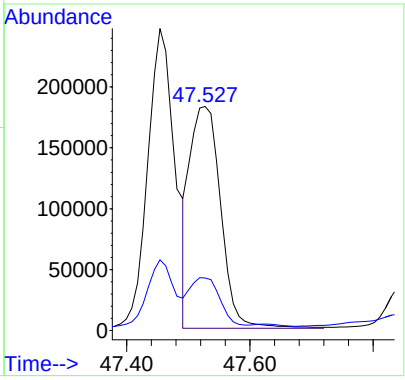


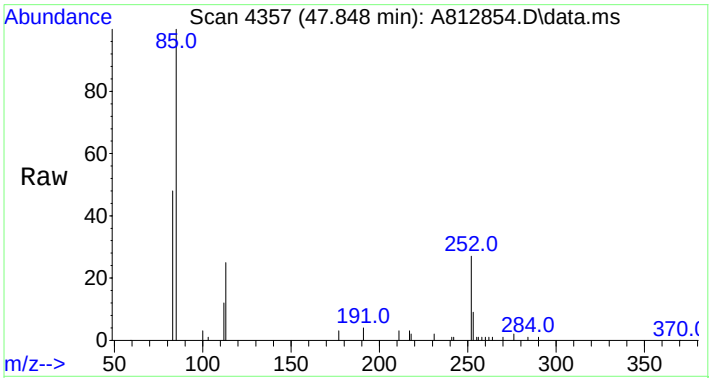


#85
Benzo[j]+[k]fluoranthene
Concen: 2430.06 ng/mL
RT: 47.527 min Scan# 4322
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:252 Resp: 640778

Ion	Ratio	Lower	Upper
252	100		
253	21.6	18.8	28.2

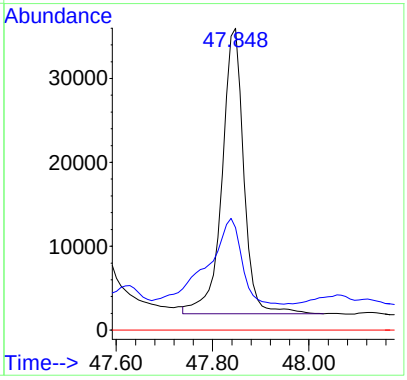


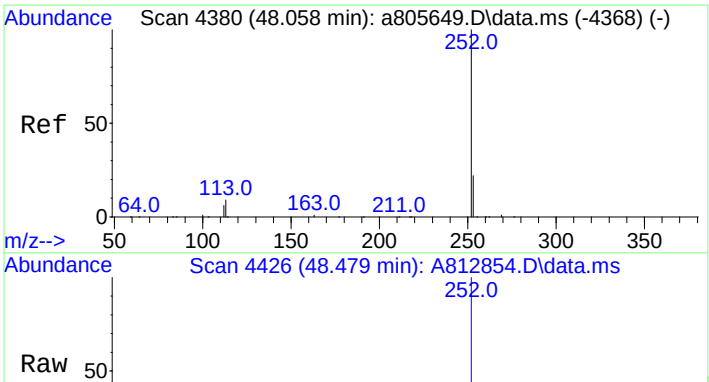


#86
Benzo[a]fluoranthene
Concen: 403.61 ng/mL
RT: 47.848 min Scan# 4357
Delta R.T. -0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:252 Resp: 106426

Ion	Ratio	Lower	Upper
252	100		
253	47.8	372.3	558.5#
125	0.0	0.0	0.0

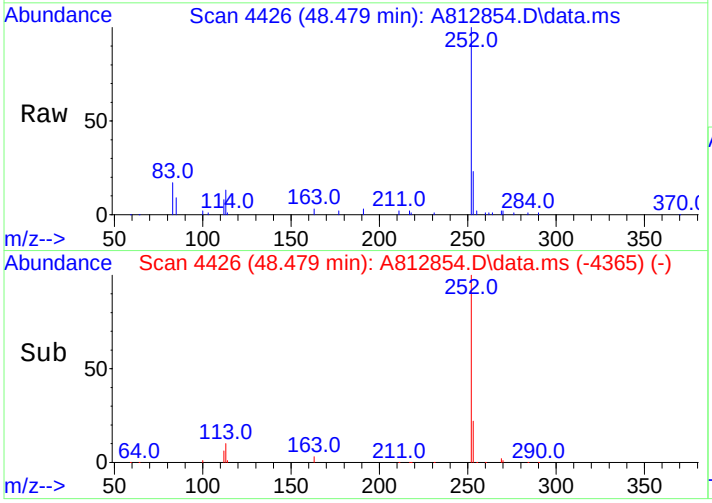


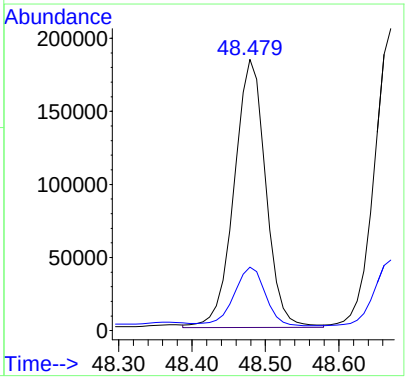


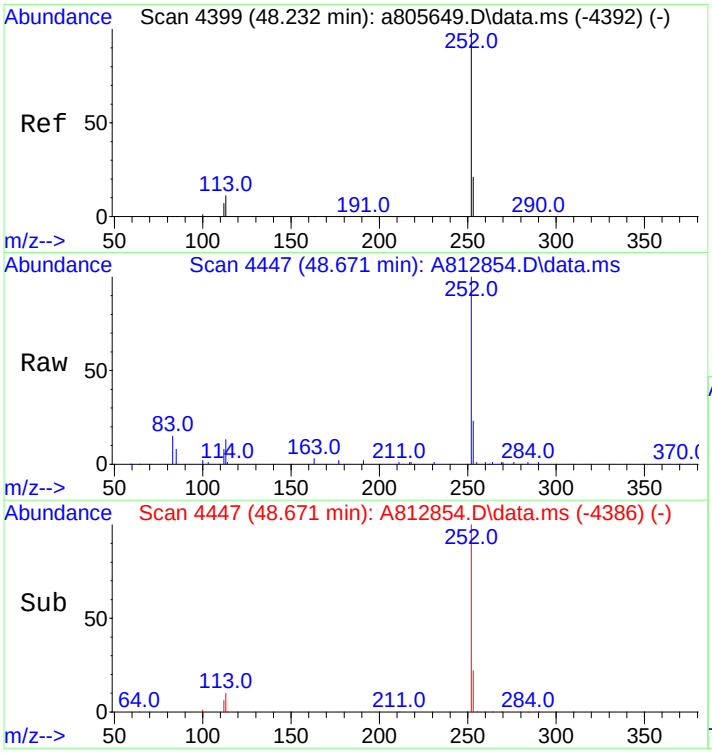
#87
Benzo[e]pyrene
Concen: 2220.53 ng/mL
RT: 48.479 min Scan# 4426
Delta R.T. 0.055 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:252 Resp: 552934

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.9	28.3



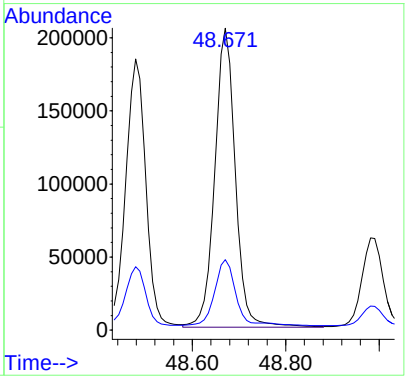


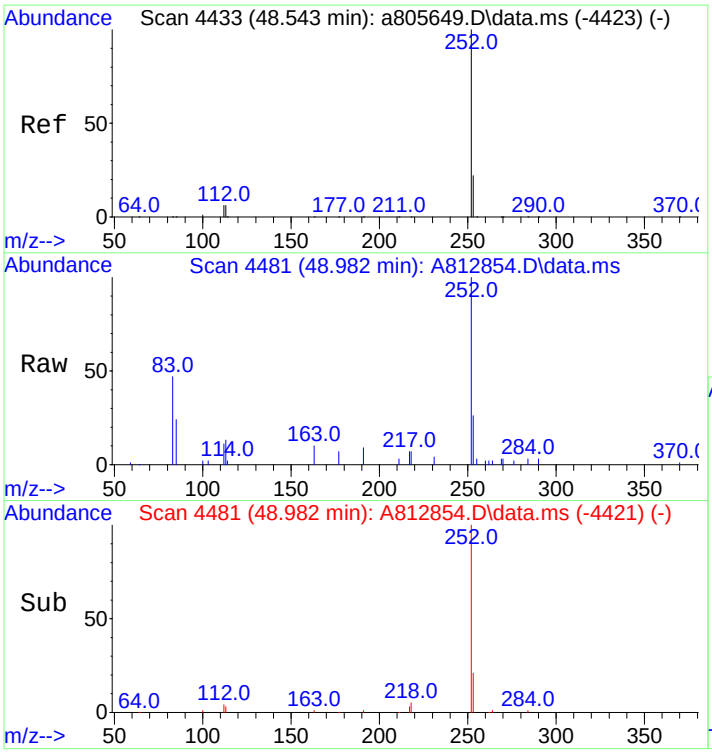


#89
Benzo[a]pyrene
Concen: 2719.30 ng/mL
RT: 48.671 min Scan# 4447
Delta R.T. 0.055 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:252 Resp: 626364

Ion	Ratio	Lower	Upper
252	100		
253	23.0	19.4	29.0

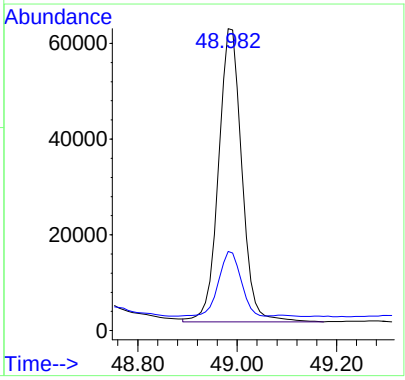


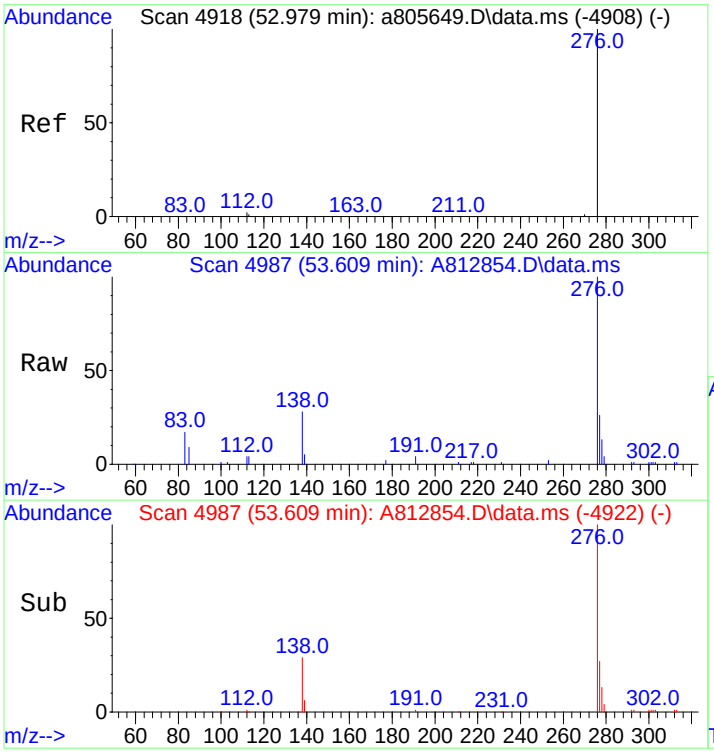


#90
Perylene
Concen: 789.98 ng/mL
RT: 48.982 min Scan# 4481
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:252 Resp: 198762

Ion	Ratio	Lower	Upper
252	100		
253	21.5	19.3	28.9

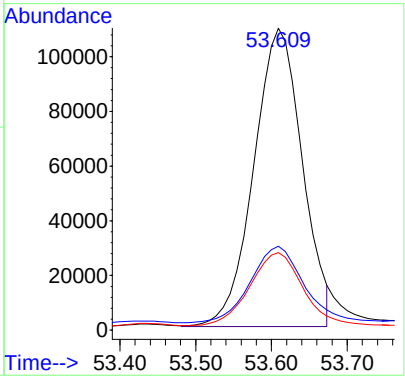


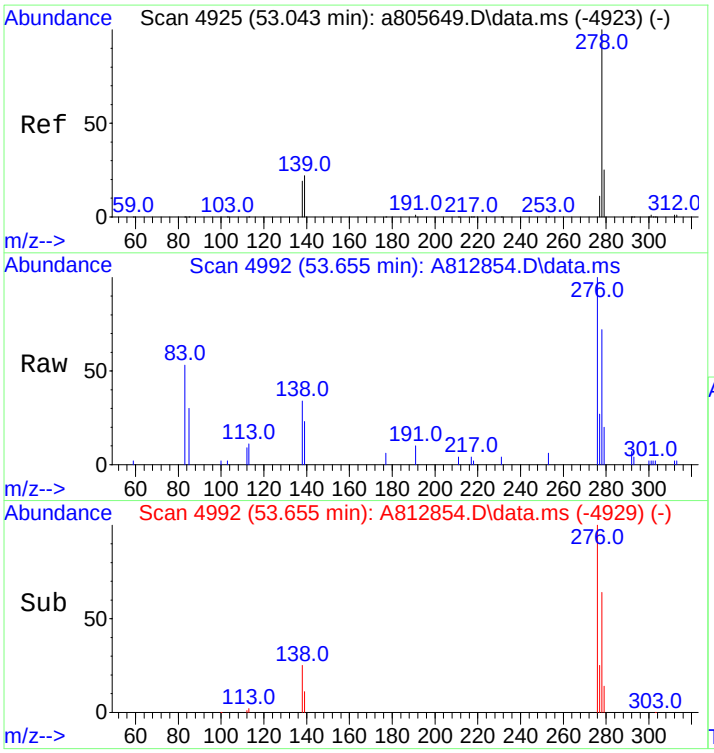


#91
Indeno[1,2,3-cd]pyrene
Concen: 1982.64 ng/mL m
RT: 53.609 min Scan# 4987
Delta R.T. 0.091 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:276 Resp: 485119

Ion	Ratio	Lower	Upper
276	100		
138	27.9	19.9	29.9
277	27.1	19.0	28.6

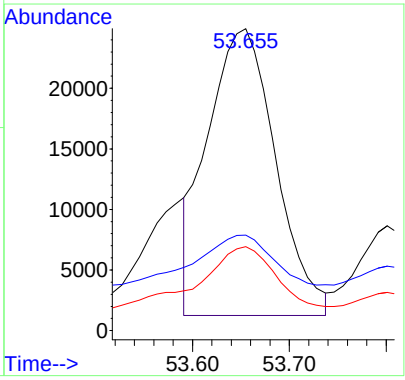


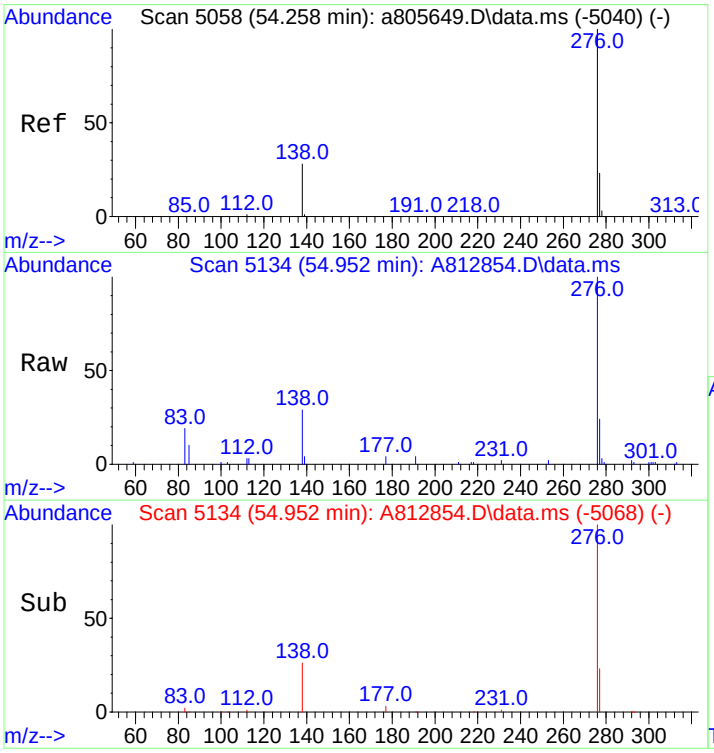


#92
Dibenz[ah]+[ac]anthracene
Concen: 484.39 ng/mL m
RT: 53.655 min Scan# 4992
Delta R.T. 0.073 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:278 Resp: 116178

Ion	Ratio	Lower	Upper
278	100		
139	23.3	16.6	25.0
279	28.7	19.1	28.7#

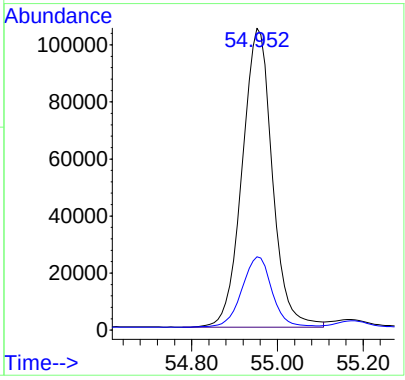


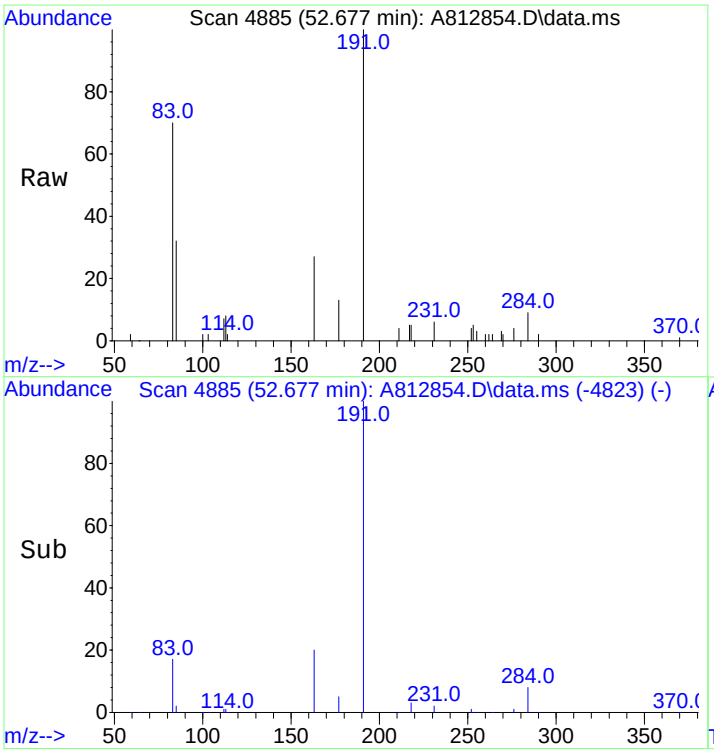


#93
Benzo[g,h,i]perylene
Concen: 1847.60 ng/mL
RT: 54.952 min Scan# 5134
Delta R.T. 0.100 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:276 Resp: 513037

Ion	Ratio	Lower	Upper
276	100		
277	23.8	18.9	28.3

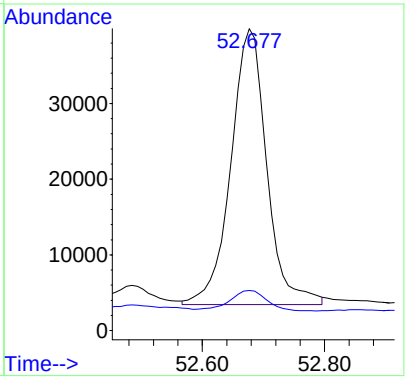


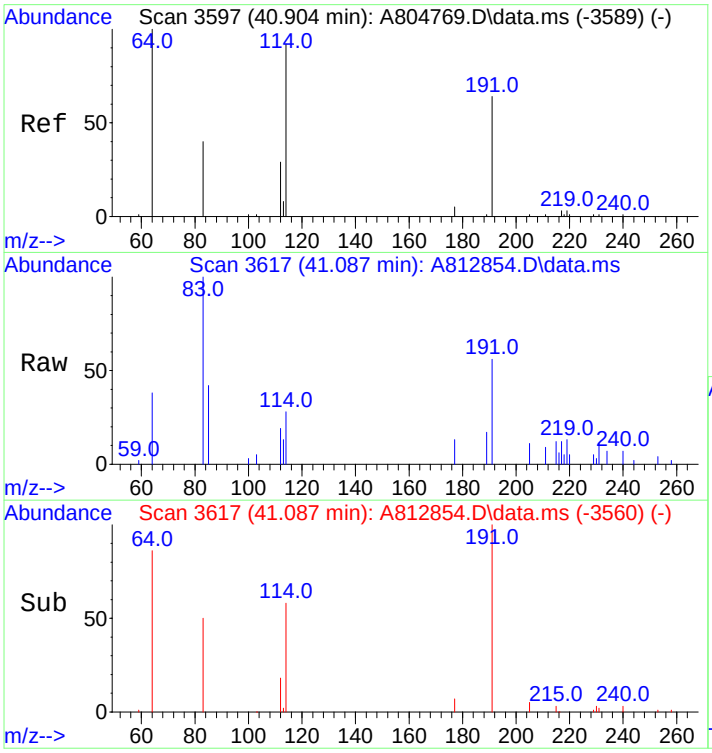


#94
Hopane (T19)
Concen: 1937.67 ng/mL m
RT: 52.677 min Scan# 4885
Delta R.T. 0.064 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:191 Resp: 149371

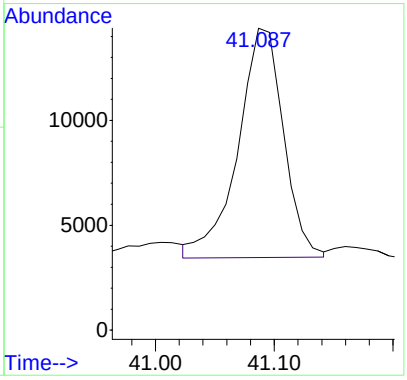
Ion	Ratio	Lower	Upper
191	100		
177	7.6	9.8	14.8#

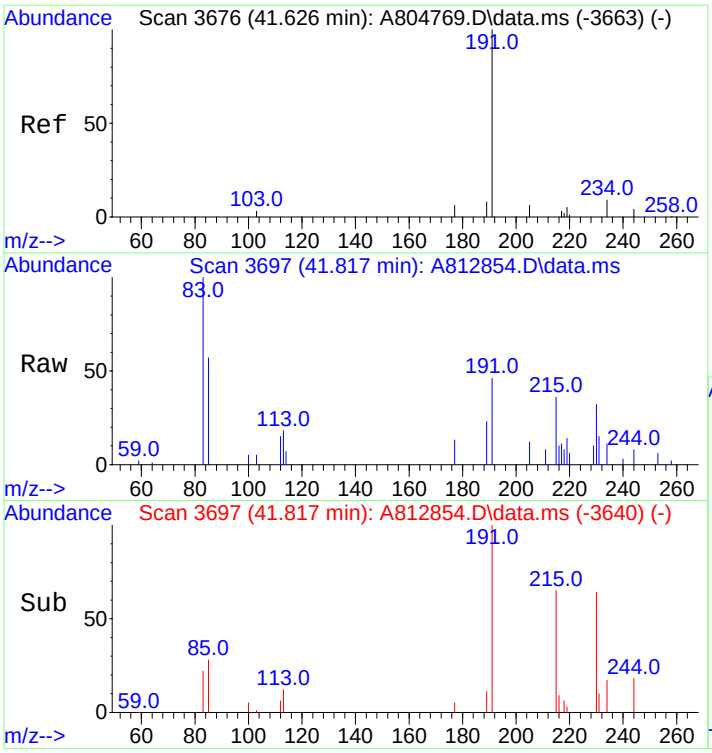




#96
C23 Tricyclic Terpane (T4)
Concen: 377.18 ng/ml
RT: 41.087 min Scan# 3617
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

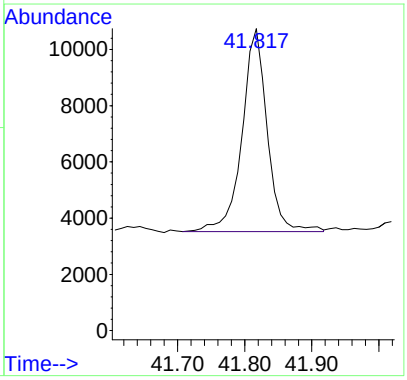
Tgt Ion:191 Resp: 29076

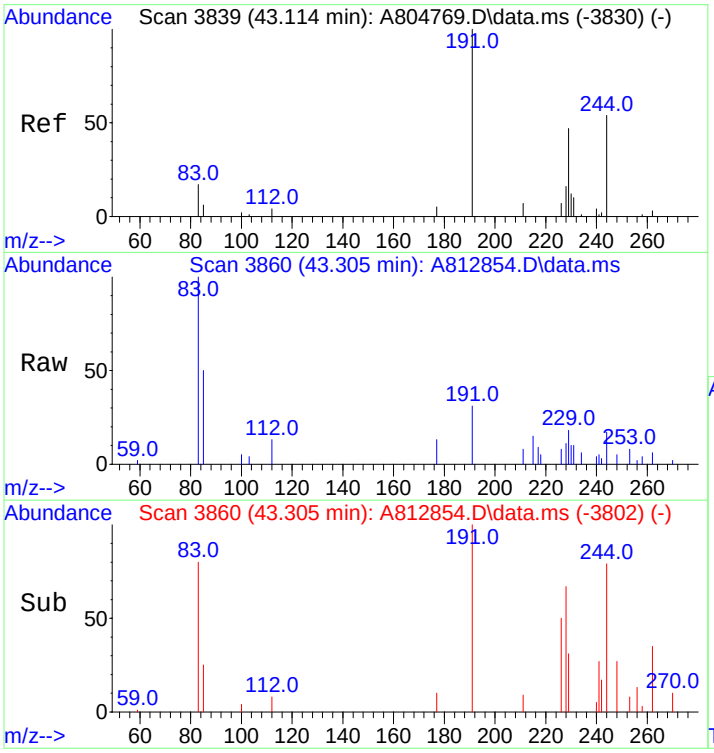




#97
C24 Tricyclic Terpane (T5)
Concen: 243.01 ng/ml
RT: 41.817 min Scan# 3697
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

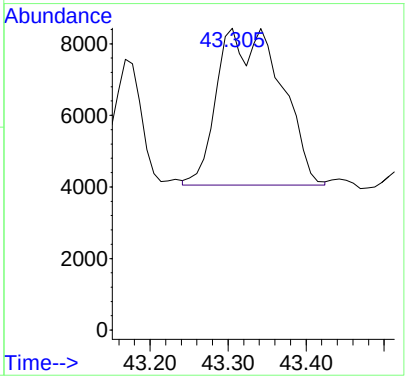
Tgt Ion:191 Resp: 18733

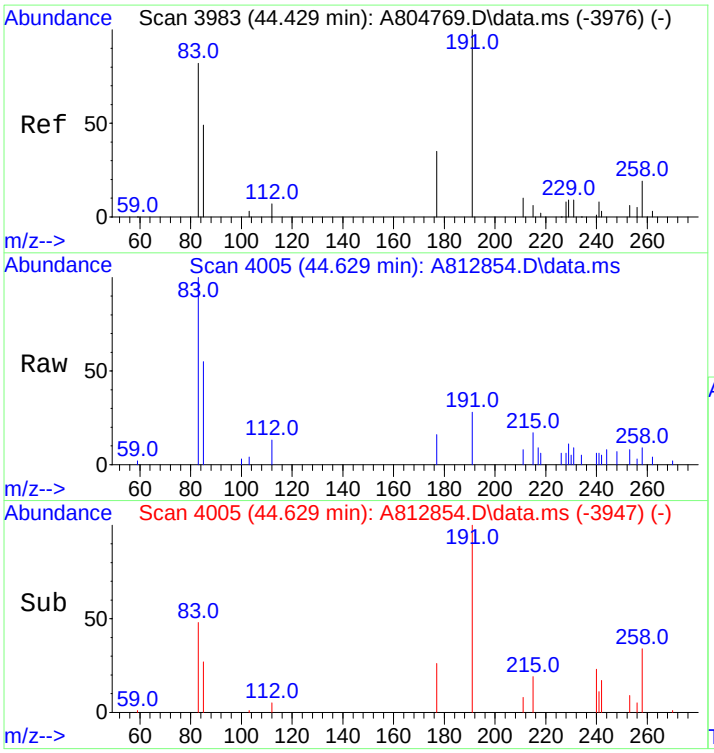




#98
C25 Tricyclic Terpane (T6)
Concen: 320.19 ng/ml m
RT: 43.305 min Scan# 3860
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

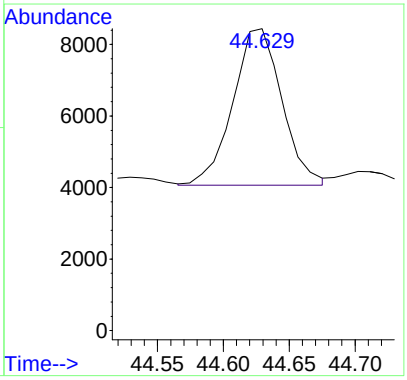
Tgt Ion:191 Resp: 24683

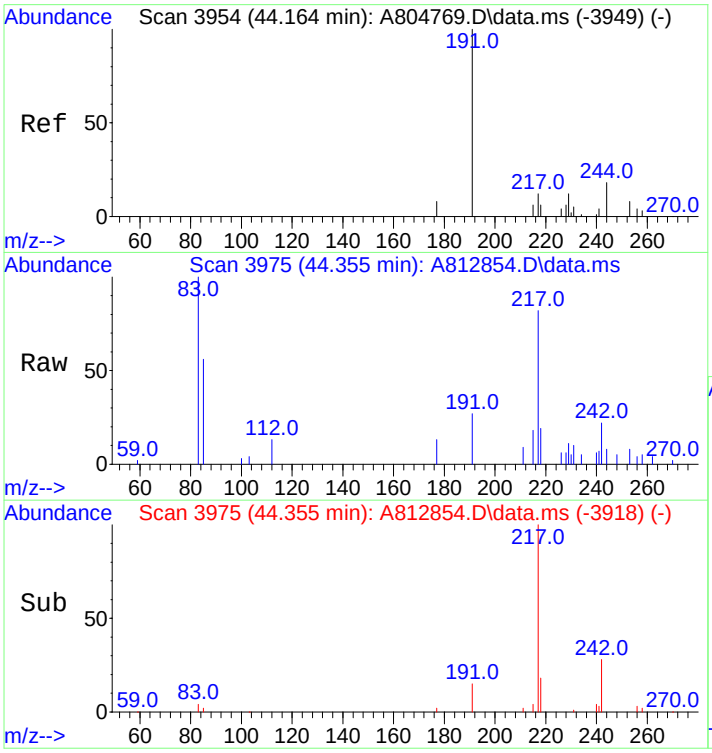




#99
C24 Tetracyclic Terpane (T6a)
Concen: 147.77 ng/ml m
RT: 44.629 min Scan# 4005
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

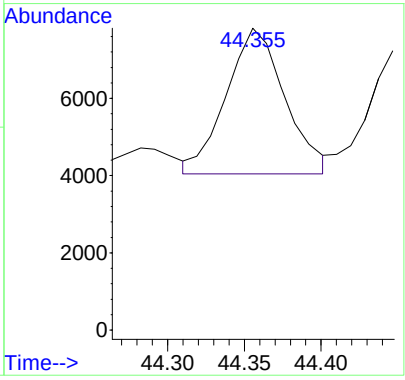
Tgt Ion:191 Resp: 11391

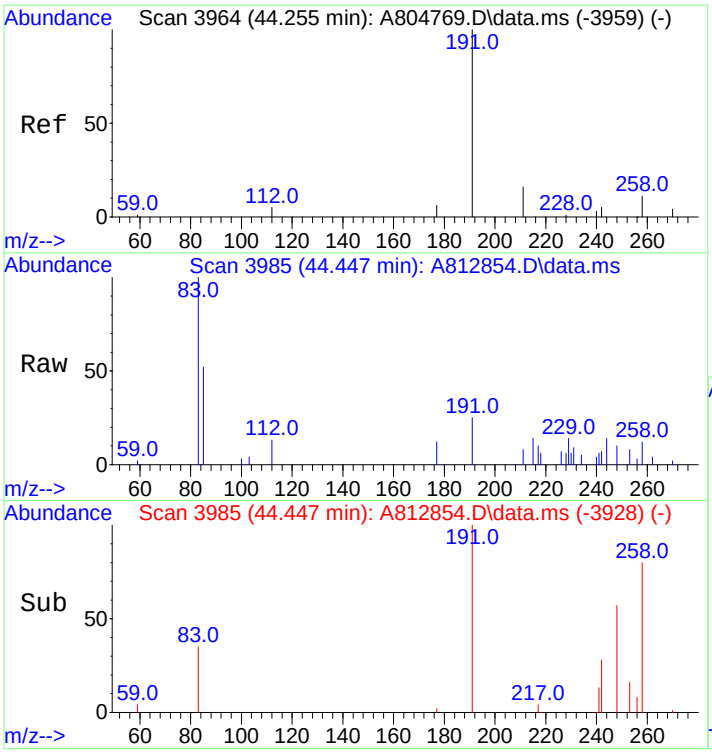




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 129.99 ng/ml m
RT: 44.355 min Scan# 3975
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

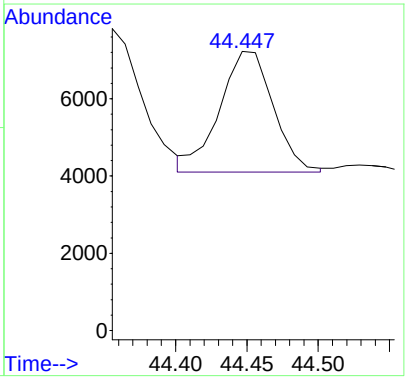
Tgt Ion:191 Resp: 10021

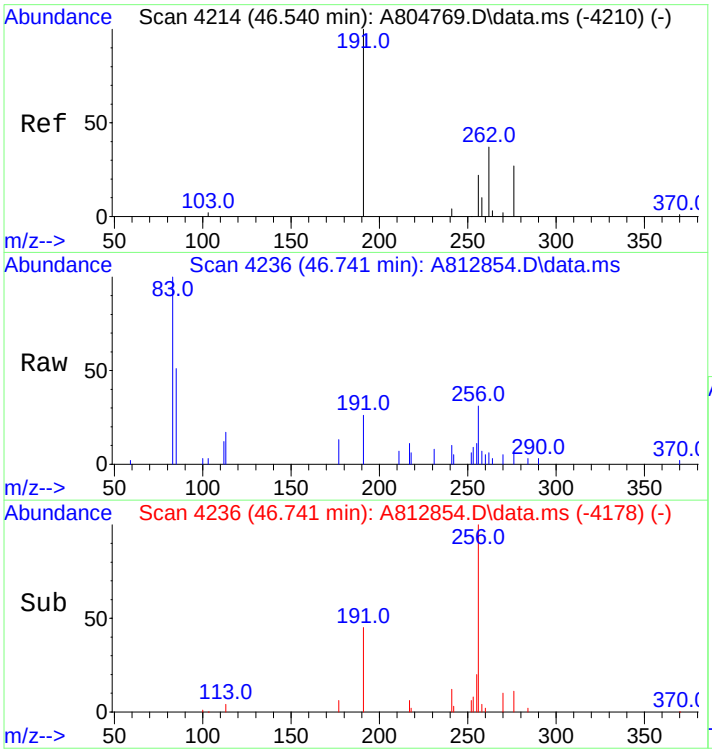




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 106.37 ng/ml m
RT: 44.447 min Scan# 3985
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

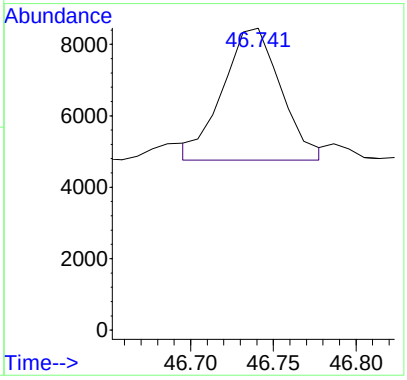
Tgt Ion:191 Resp: 8200

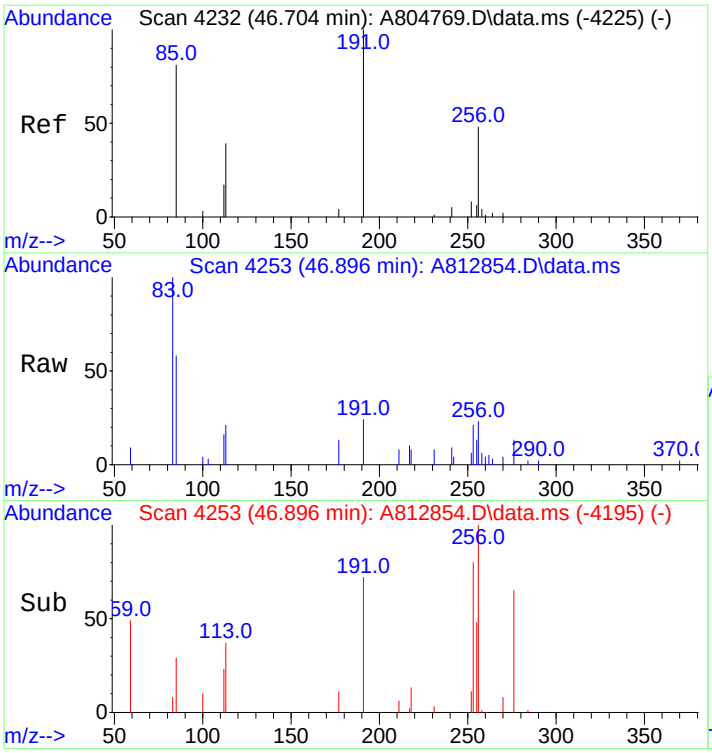




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 117.39 ng/ml m
RT: 46.741 min Scan# 4236
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

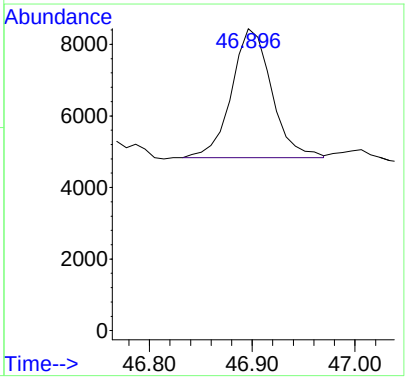
Tgt Ion:191 Resp: 9049

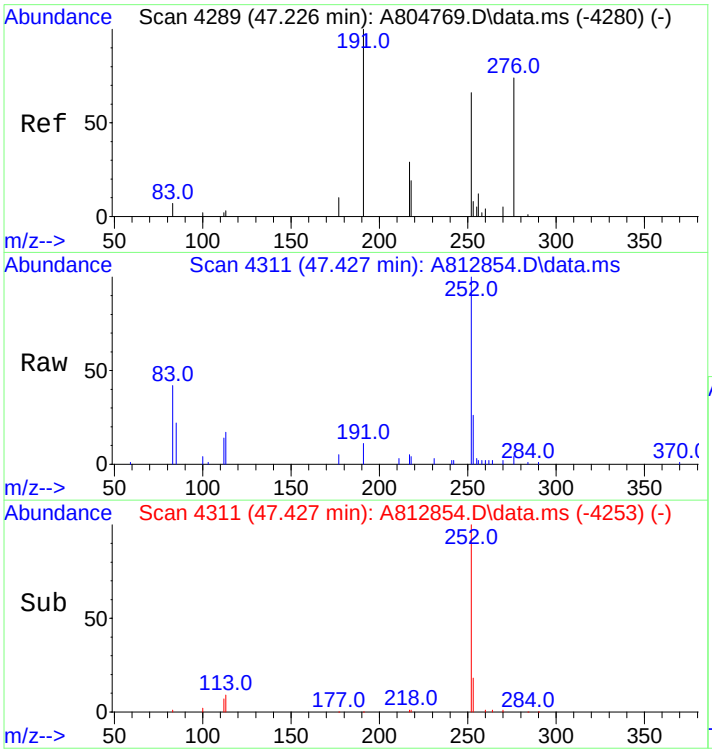




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 126.83 ng/ml
RT: 46.896 min Scan# 4253
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

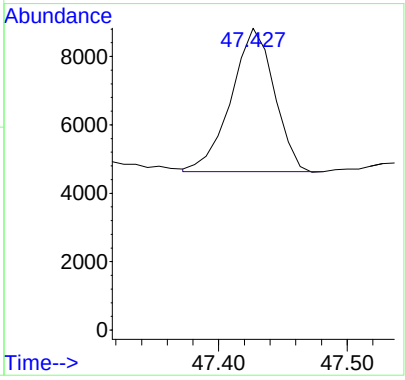
Tgt Ion:191 Resp: 9777

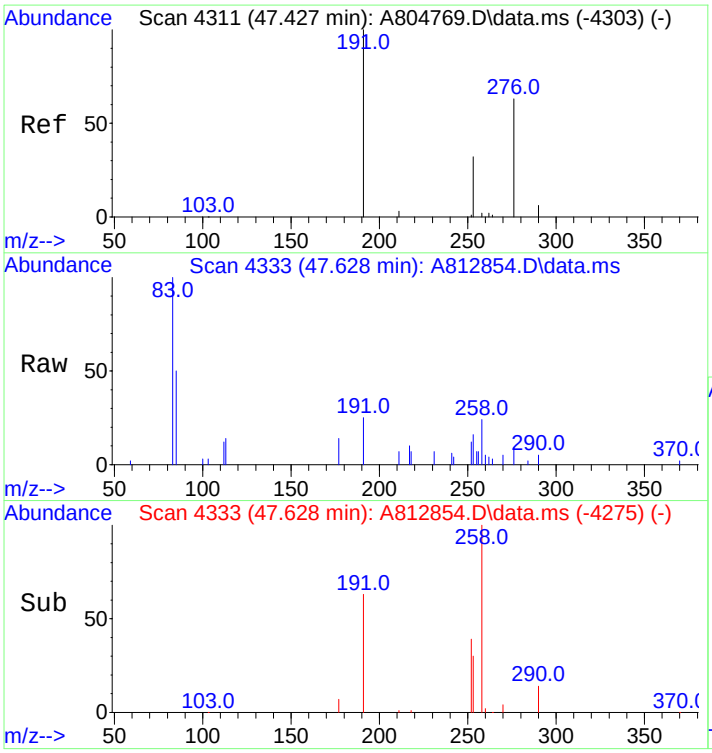




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 126.49 ng/ml
RT: 47.427 min Scan# 4311
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

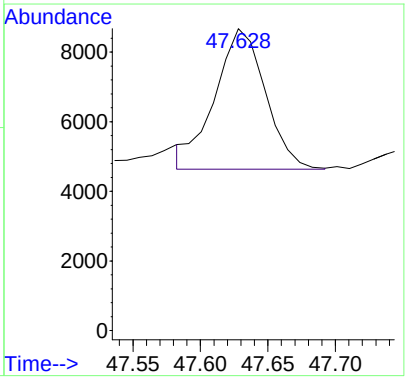
Tgt Ion:191 Resp: 9751

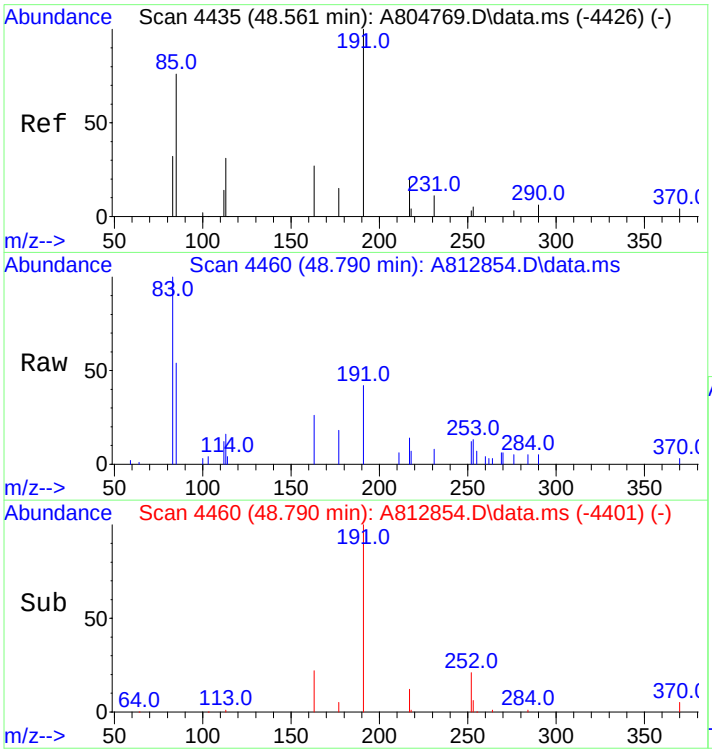




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 136.62 ng/ml m
RT: 47.628 min Scan# 4333
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

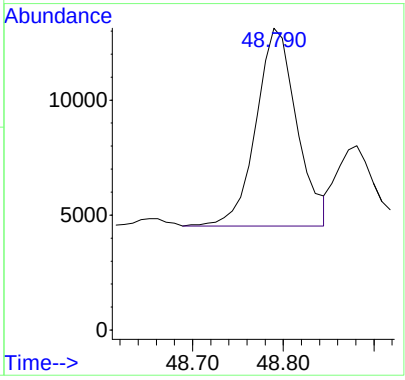
Tgt Ion:191 Resp: 10532

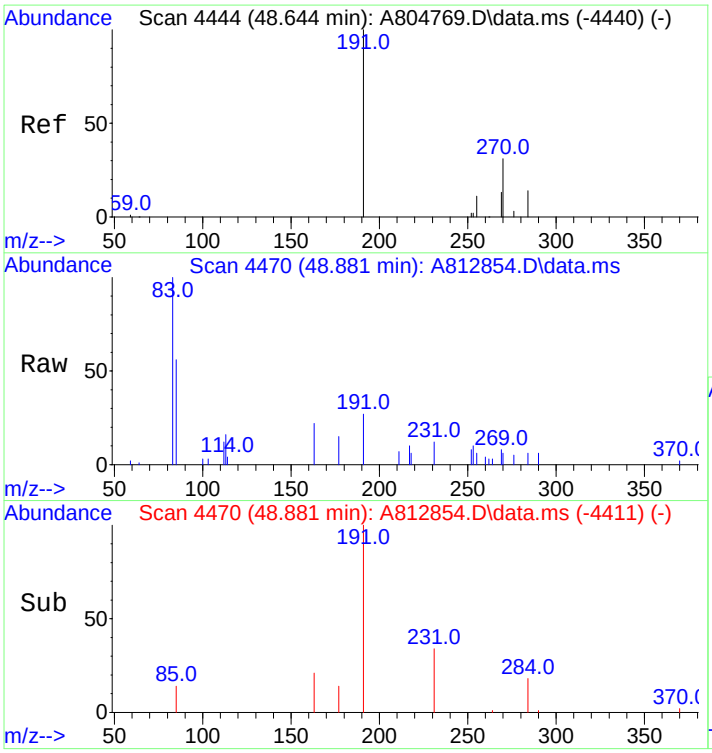




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 350.24 ng/ml
RT: 48.790 min Scan# 4460
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

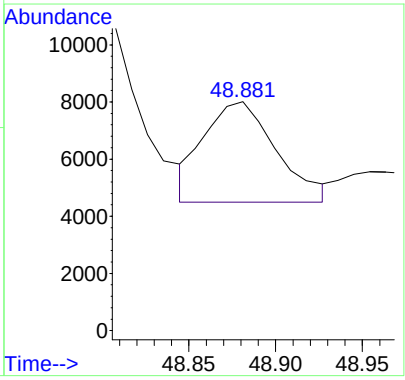
Tgt Ion:191 Resp: 26999

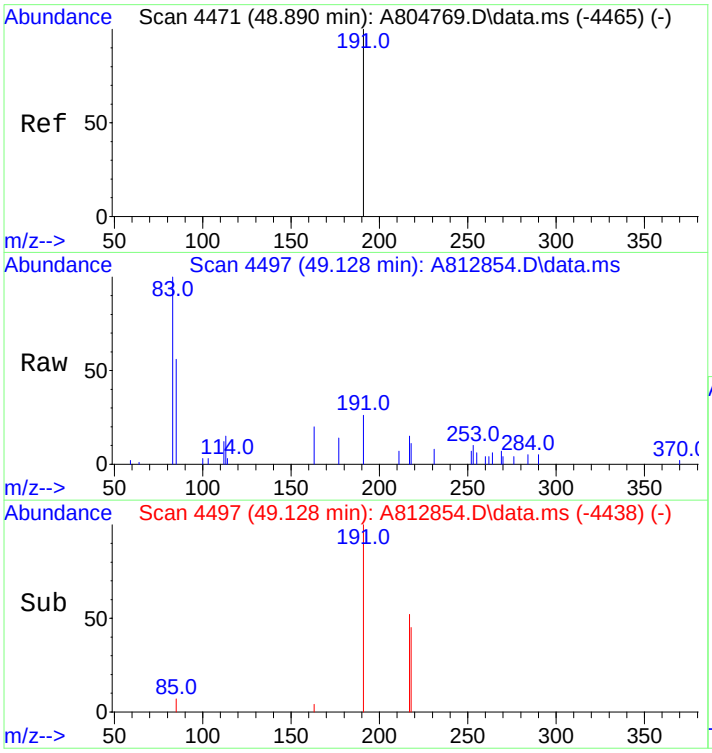




#107
C30 Tricyclic Terpane-22S
Concen: 132.49 ng/mL m
RT: 48.881 min Scan# 4470
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

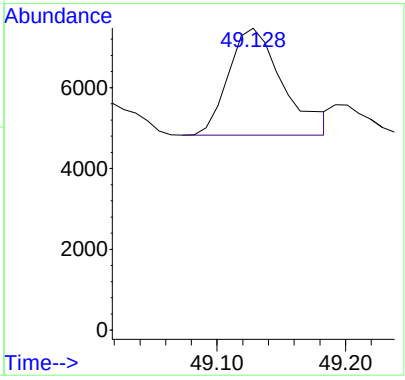
Tgt Ion:191 Resp: 10213

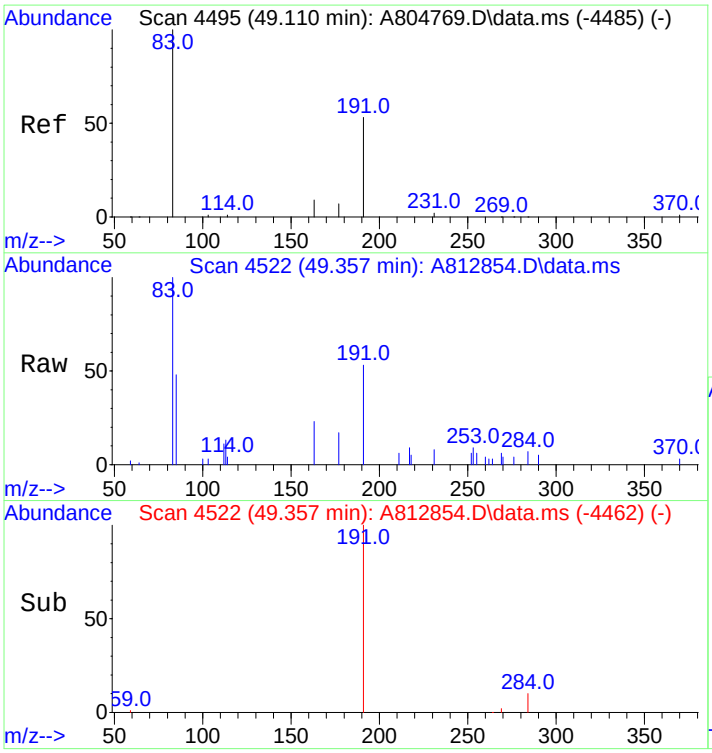




#108
C30 Tricyclic Terpane-22R
Concen: 101.36 ng/mL
RT: 49.128 min Scan# 4497
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

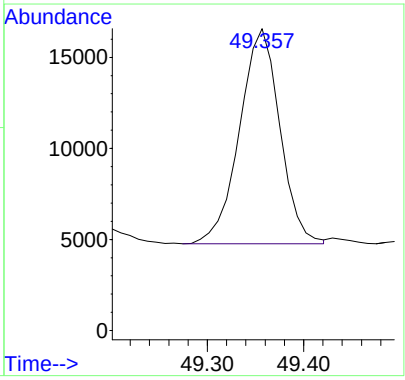
Tgt Ion:191 Resp: 7814

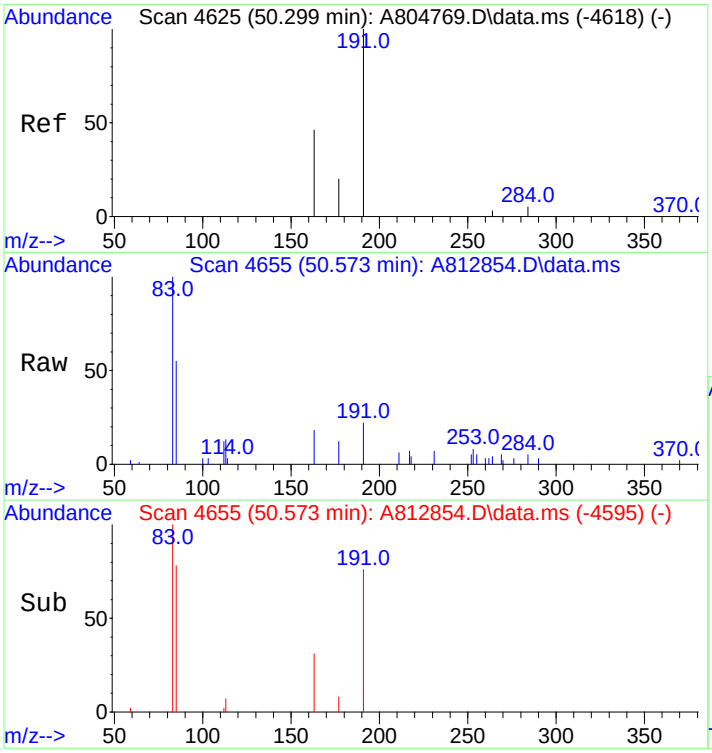




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 444.64 ng/ml
RT: 49.357 min Scan# 4522
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

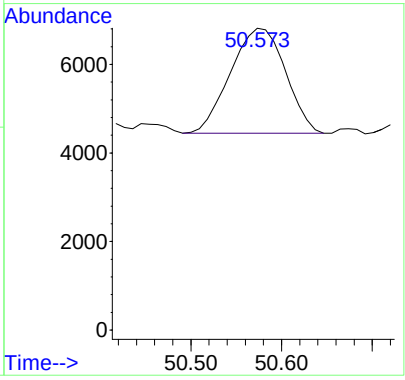
Tgt Ion:191 Resp: 34276

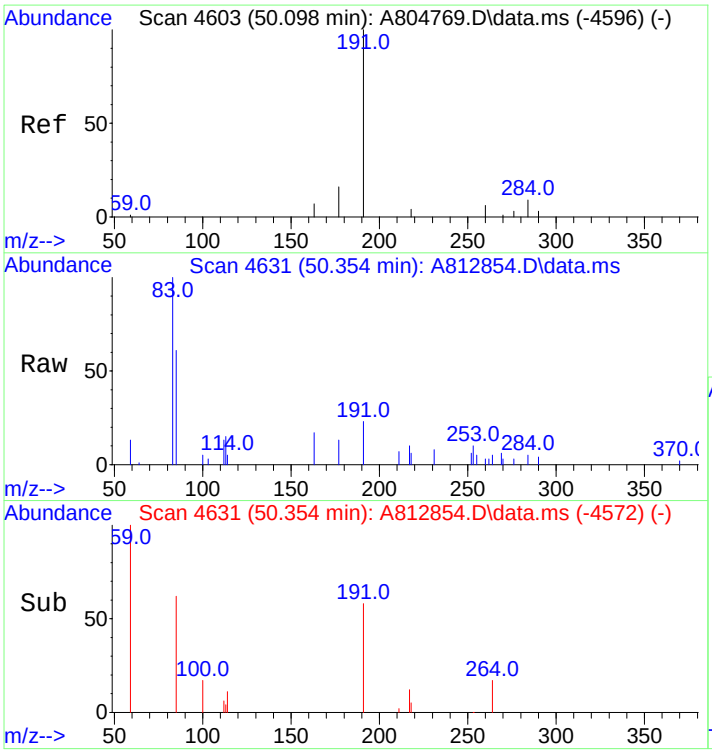




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 129.71 ng/ml
RT: 50.573 min Scan# 4655
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

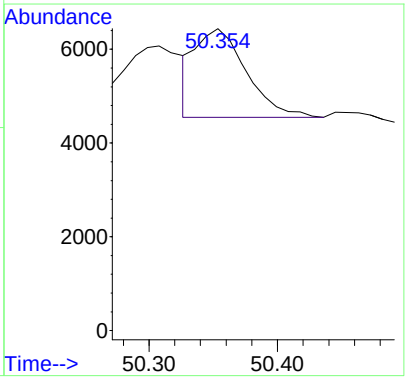
Tgt Ion:191 Resp: 9999

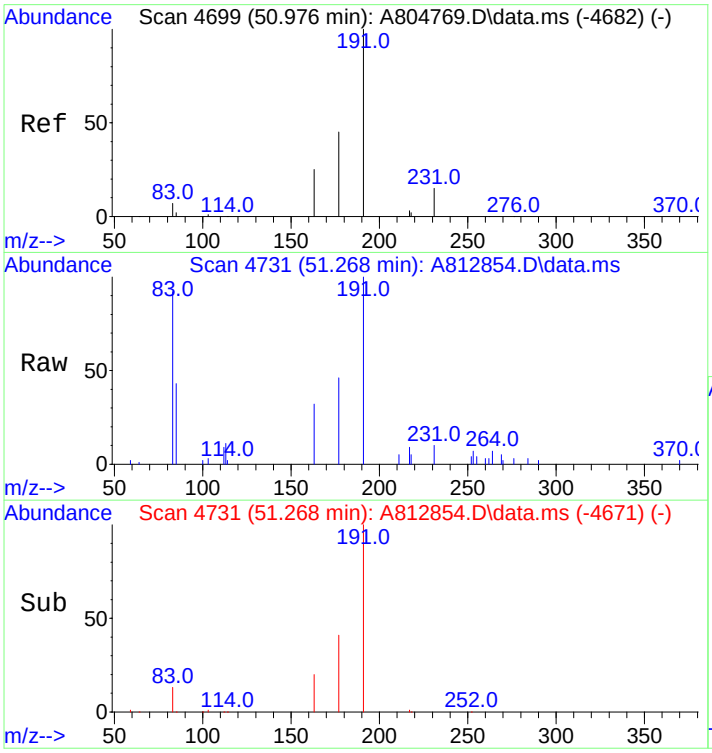




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 67.88 ng/ml
RT: 50.354 min Scan# 4631
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

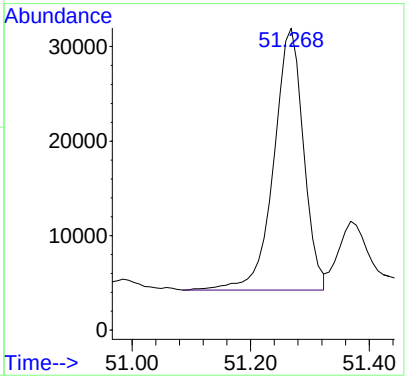
Tgt Ion:191 Resp: 5233

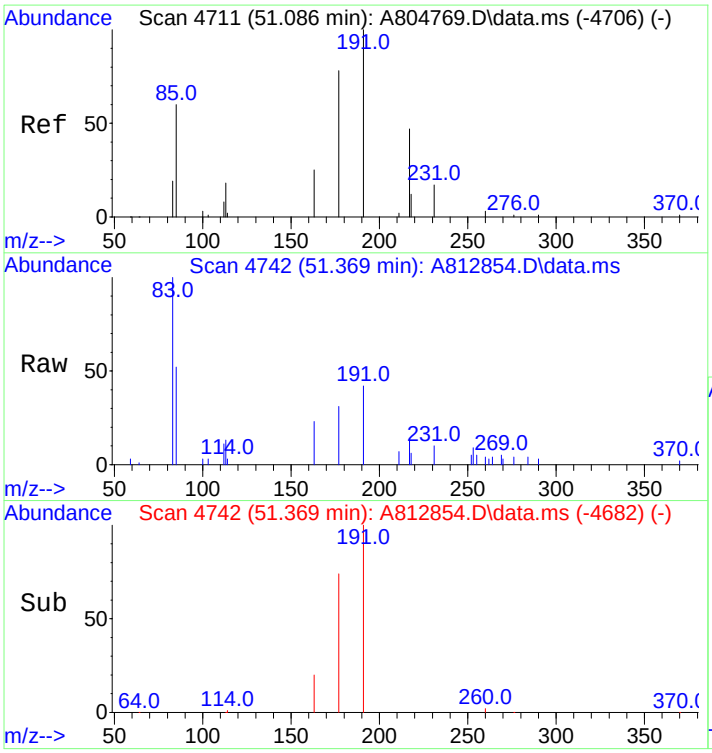




#112
30-Norhopane (T15)
Concen: 1256.99 ng/ml
RT: 51.268 min Scan# 4731
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

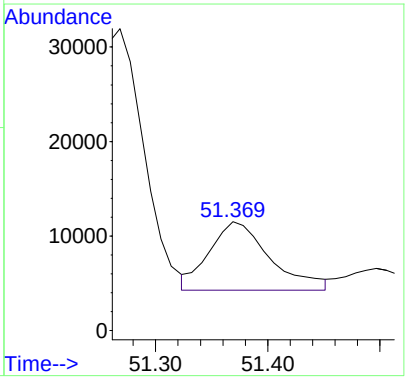
Tgt Ion:191 Resp: 96899

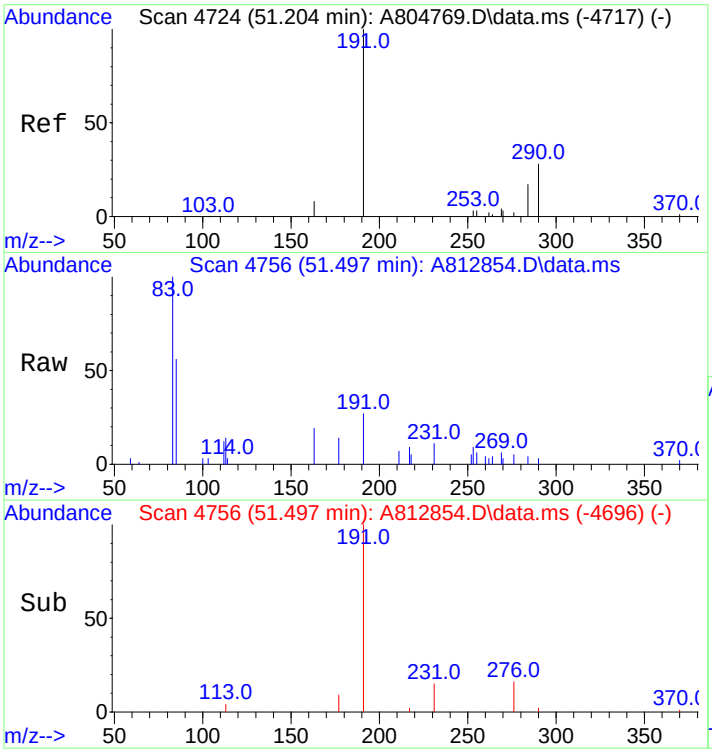




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 354.49 ng/ml m
RT: 51.369 min Scan# 4742
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

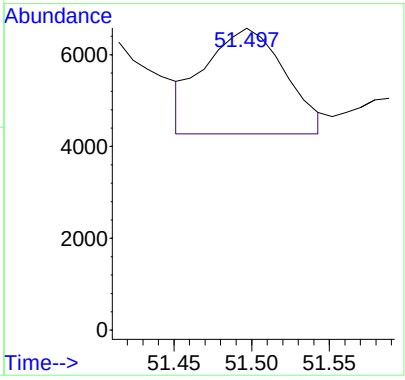
Tgt Ion:191 Resp: 27327

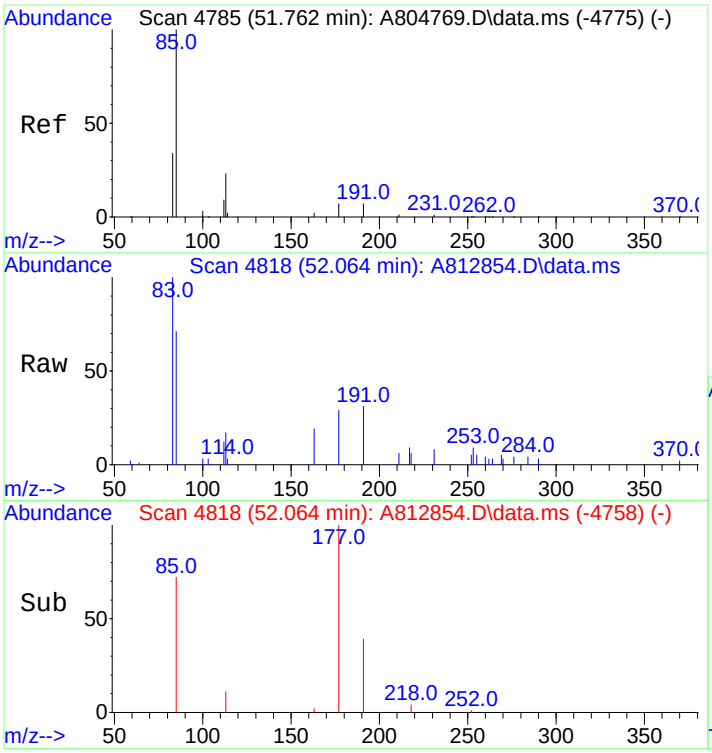




#114
17a(H)-Diahopane (X)
Concen: 107.16 ng/ml m
RT: 51.497 min Scan# 4756
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

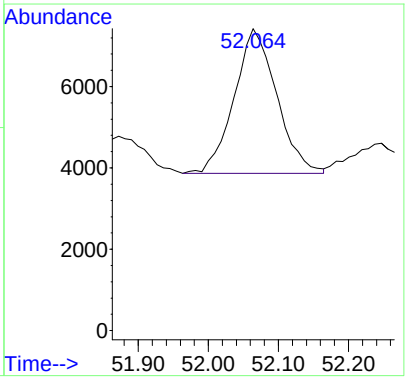
Tgt Ion:191 Resp: 8261

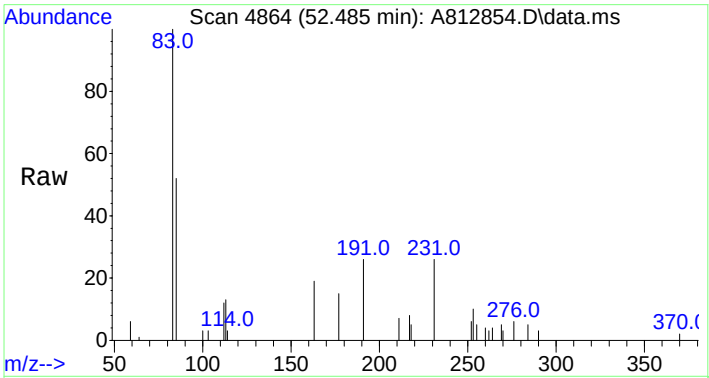




#115
30-Normoretane (T17)
Concen: 194.54 ng/ml
RT: 52.064 min Scan# 4818
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

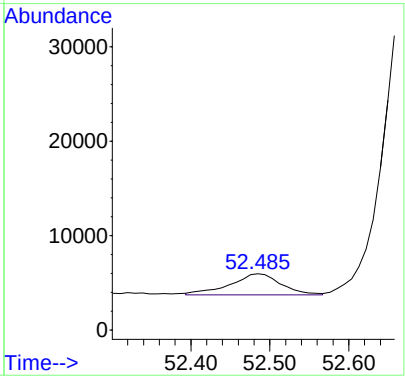
Tgt Ion:191 Resp: 14997

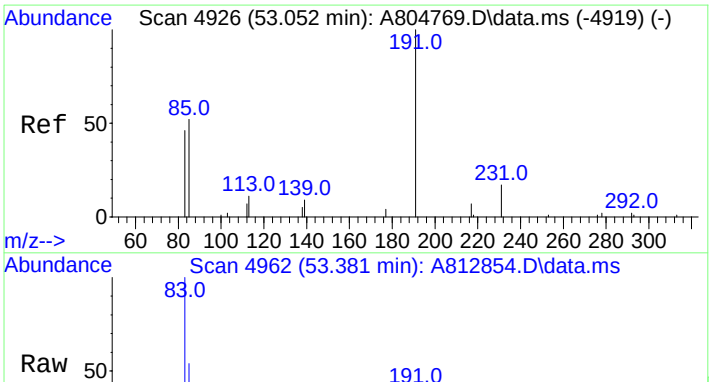




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 129.90 ng/ml m
RT: 52.485 min Scan# 4864
Delta R.T. 0.064 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

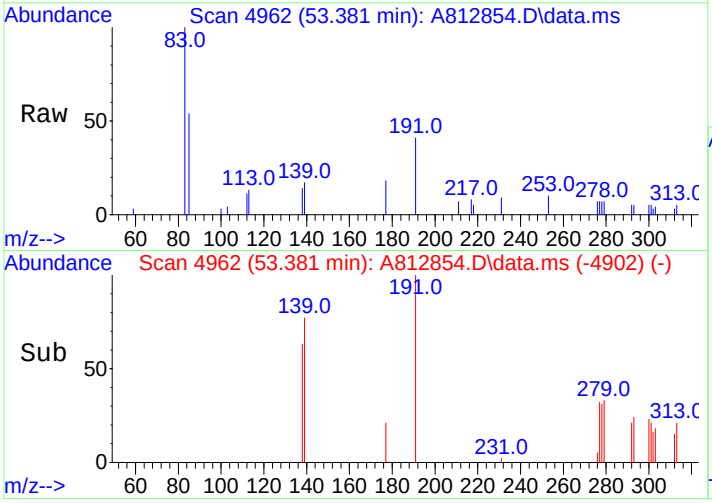
Tgt Ion:191 Resp: 10014

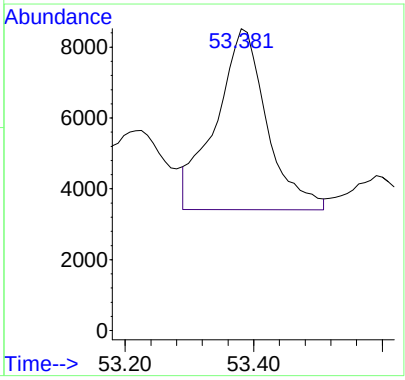


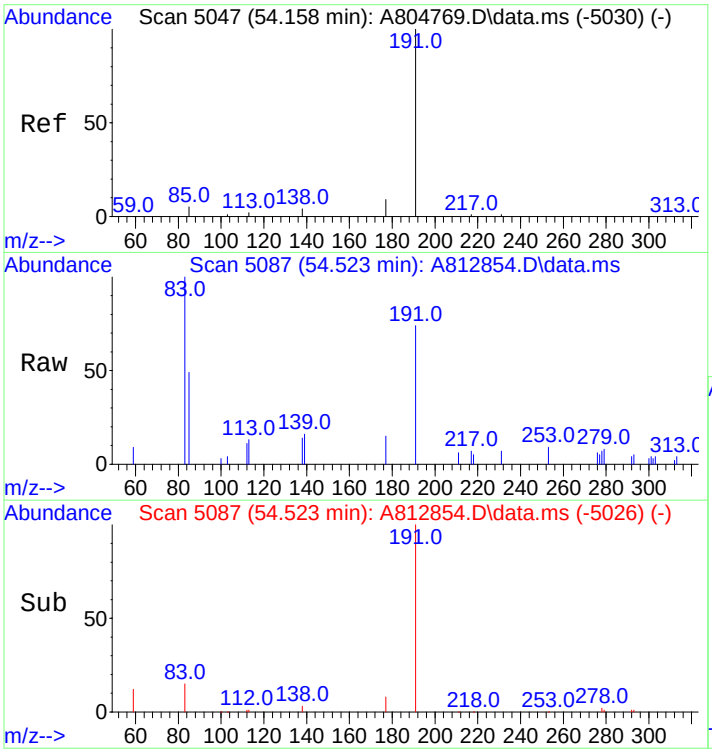


#117
Moretane (T20)
Concen: 365.60 ng/ml
RT: 53.381 min Scan# 4962
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:191 Resp: 28183

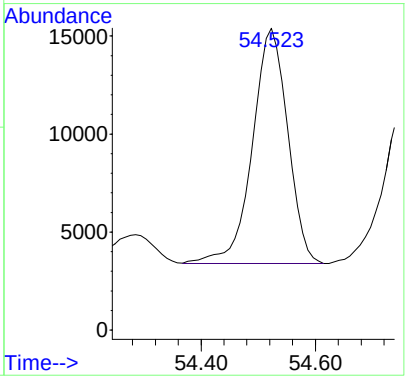


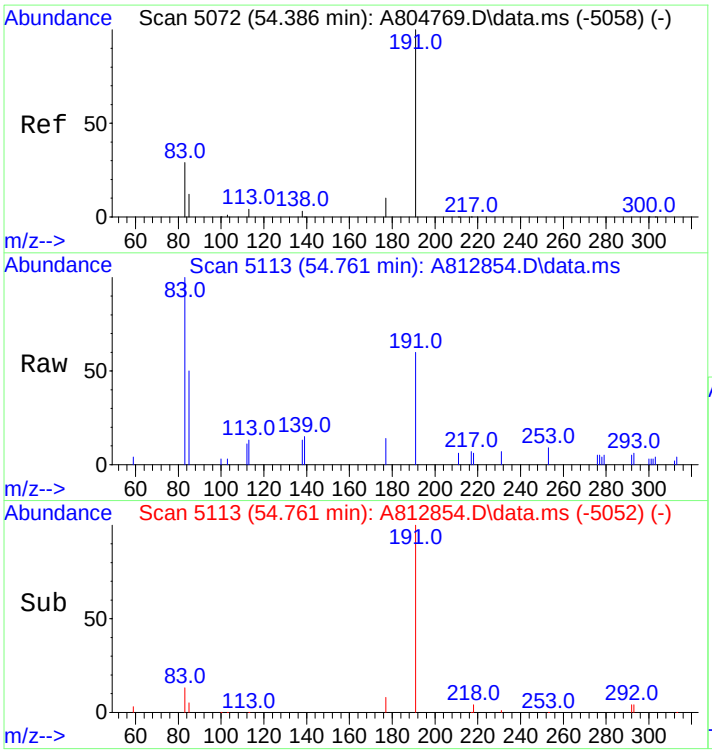




#118
30-Homohopane-22S (T21)
Concen: 670.03 ng/ml
RT: 54.523 min Scan# 5087
Delta R.T. 0.055 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

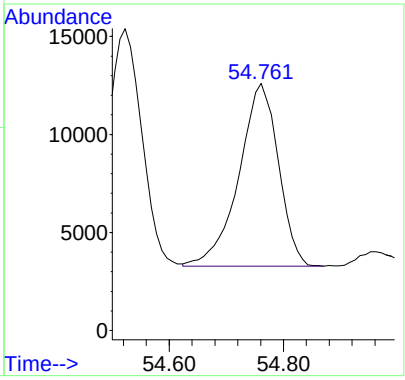
Tgt Ion:191 Resp: 51651

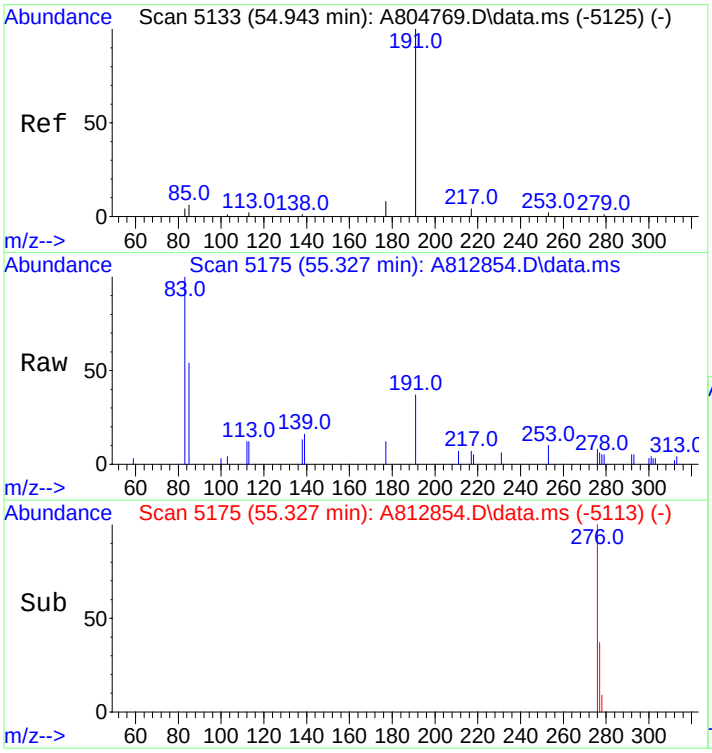




#119
30-Homohopane-22R (T22)
Concen: 580.38 ng/ml
RT: 54.761 min Scan# 5113
Delta R.T. 0.055 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

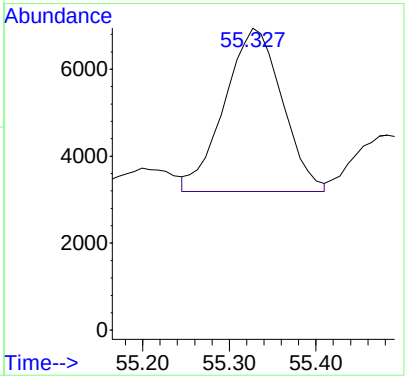
Tgt Ion:191 Resp: 44740

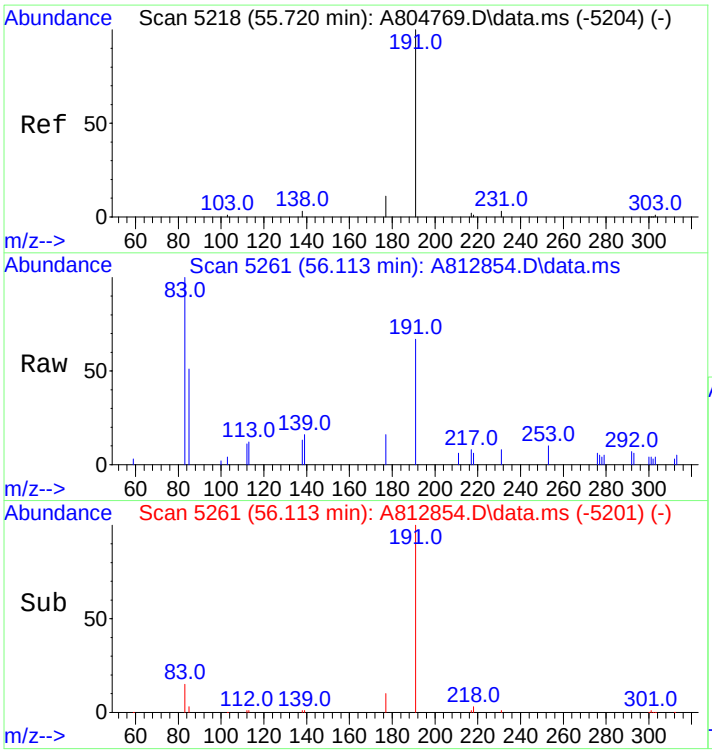




#120
Gammacerane/C32-diahopane
Concen: 224.41 ng/mL m
RT: 55.327 min Scan# 5175
Delta R.T. 0.064 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

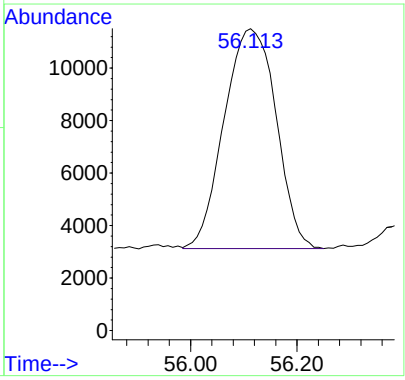
Tgt Ion:191 Resp: 17299

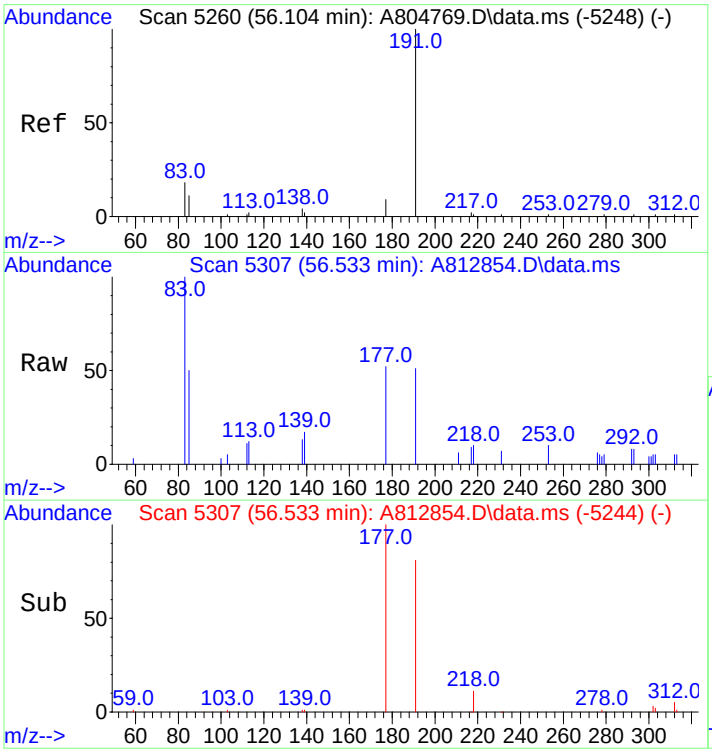




#121
30,31-Bishomohopane-22S (T26)
Concen: 737.96 ng/ml
RT: 56.113 min Scan# 5261
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

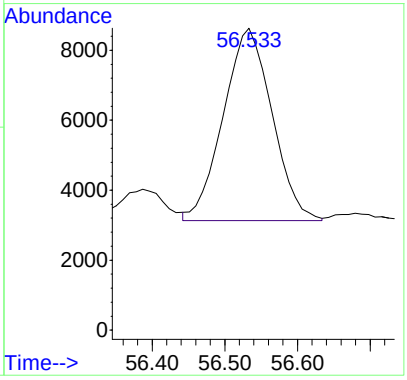
Tgt Ion:191 Resp: 56888

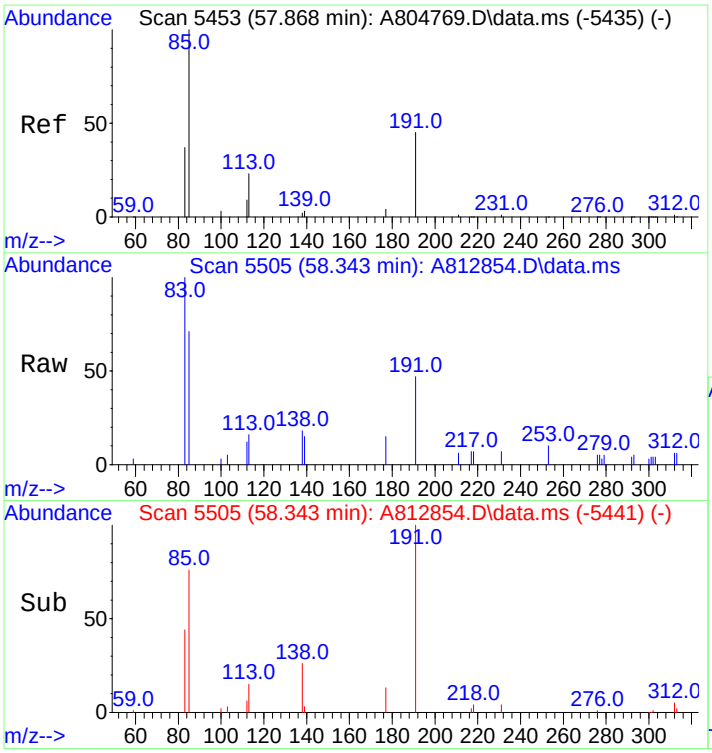




#122
30,31-Bishomohopane-22R (T27)
Concen: 332.83 ng/ml m
RT: 56.533 min Scan# 5307
Delta R.T. 0.073 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

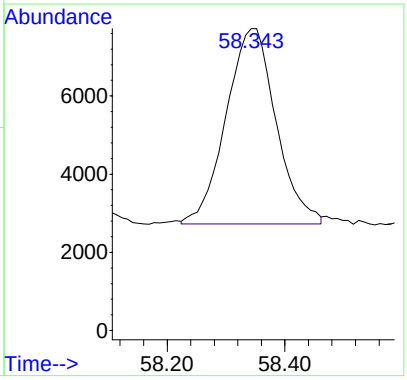
Tgt Ion:191 Resp: 25657

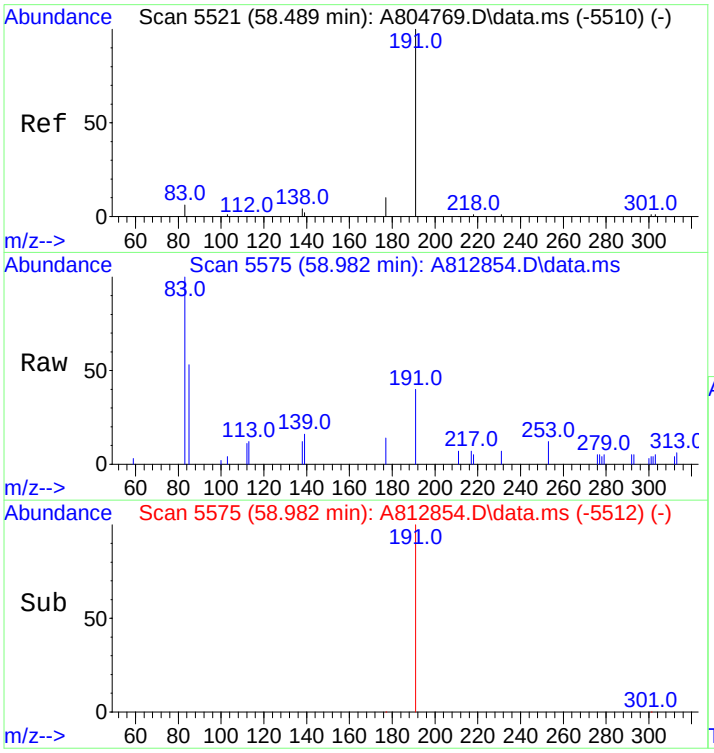




#123
30,31-Trishomohopane-22S (T30)
Concen: 382.63 ng/ml m
RT: 58.343 min Scan# 5505
Delta R.T. 0.082 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

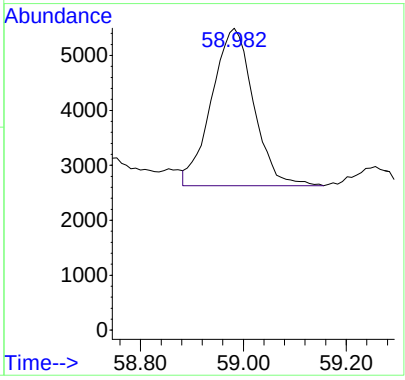
Tgt Ion:191 Resp: 29496

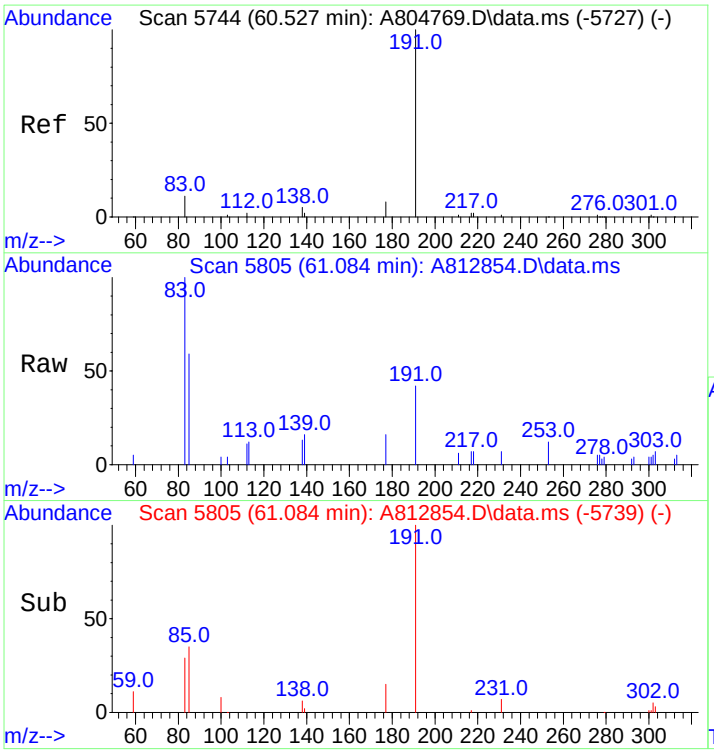




#124
30,31-Trishomohopane-22R (T31)
Concen: 211.04 ng/ml
RT: 58.982 min Scan# 5575
Delta R.T. 0.073 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

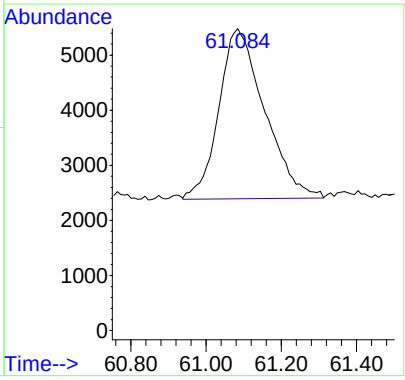
Tgt Ion:191 Resp: 16269

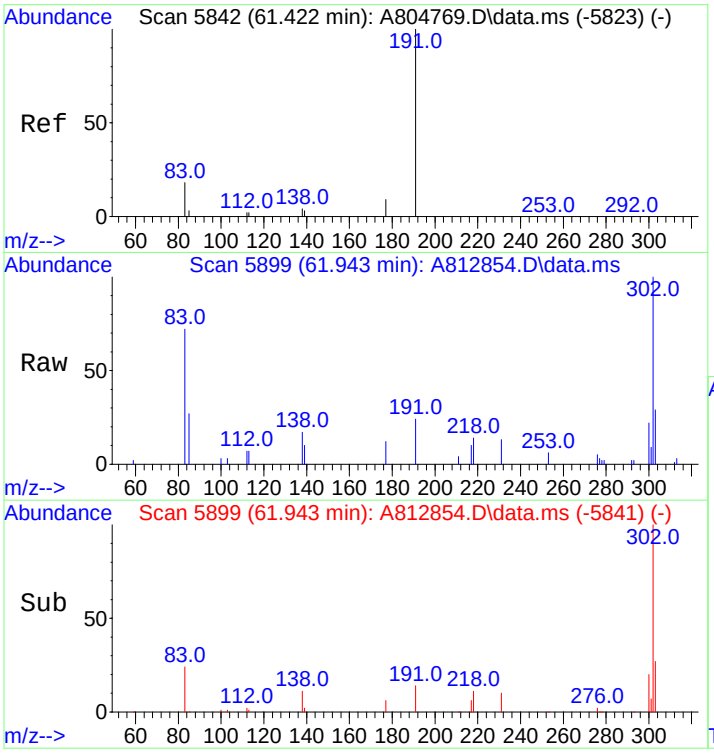




#125
Tetrakishomohopane-22S (T32)
Concen: 336.88 ng/ml
RT: 61.084 min Scan# 5805
Delta R.T. 0.100 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

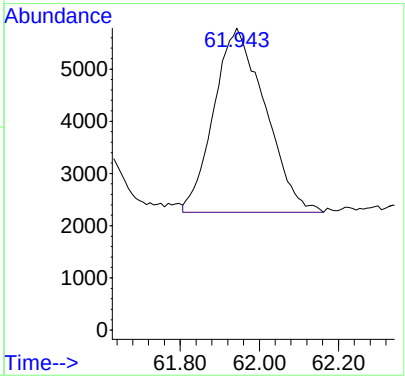
Tgt Ion:191 Resp: 25969

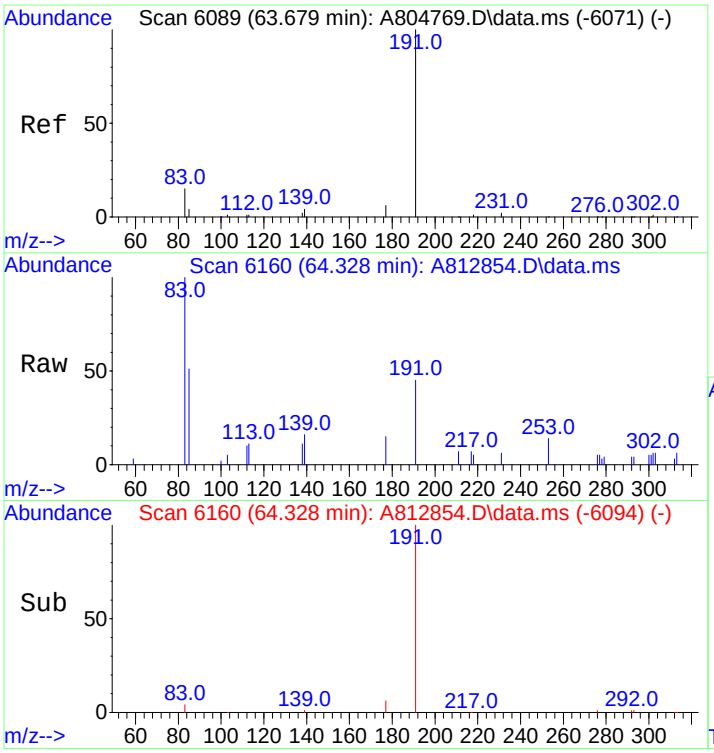




#126
Tetrakishomohopane-22R (T33)
Concen: 411.93 ng/ml
RT: 61.943 min Scan# 5899
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

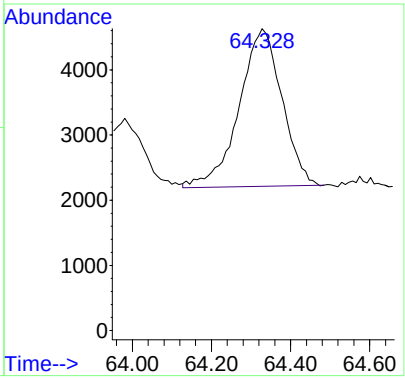
Tgt Ion:191 Resp: 31755

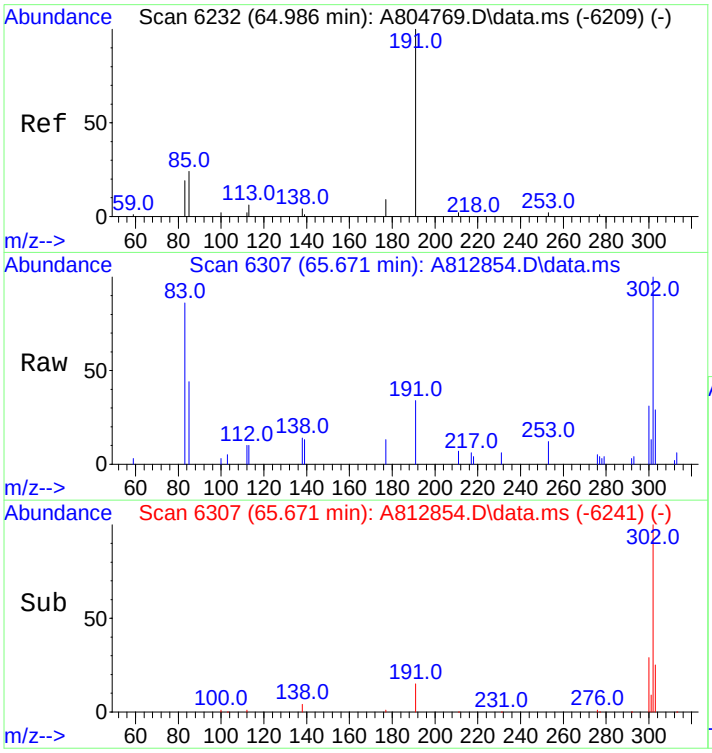




#127
Pentakishomohopane-22S (T34)
Concen: 235.83 ng/ml
RT: 64.328 min Scan# 6160
Delta R.T. 0.100 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

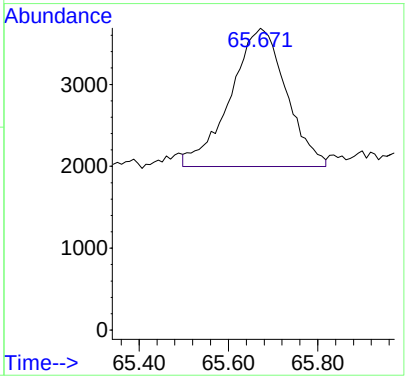
Tgt Ion:191 Resp: 18180

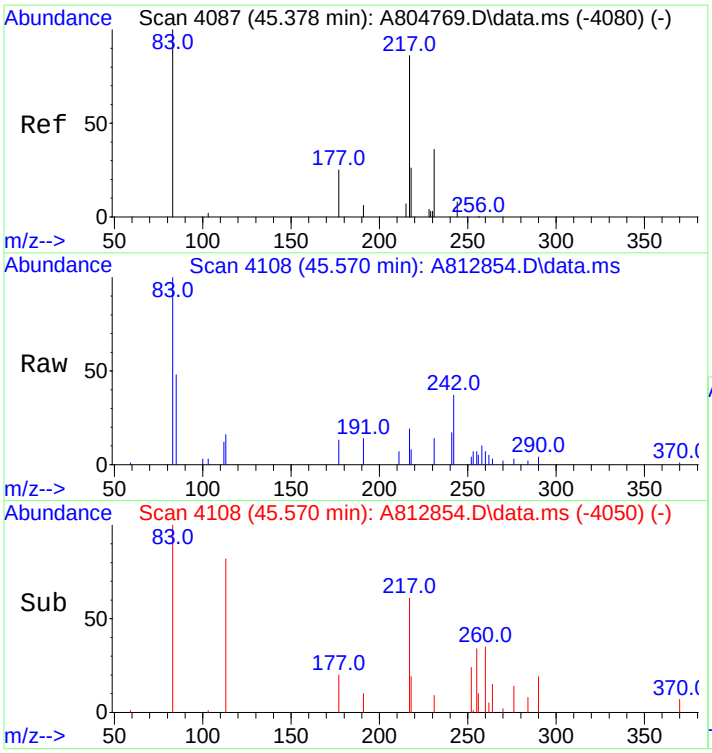




#128
Pentakishomohopane-22R (T35)
Concen: 190.08 ng/ml m
RT: 65.671 min Scan# 6307
Delta R.T. 0.100 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

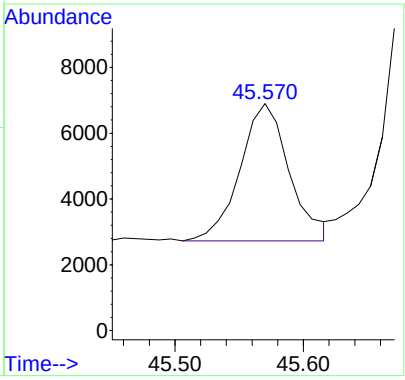
Tgt Ion:191 Resp: 14653

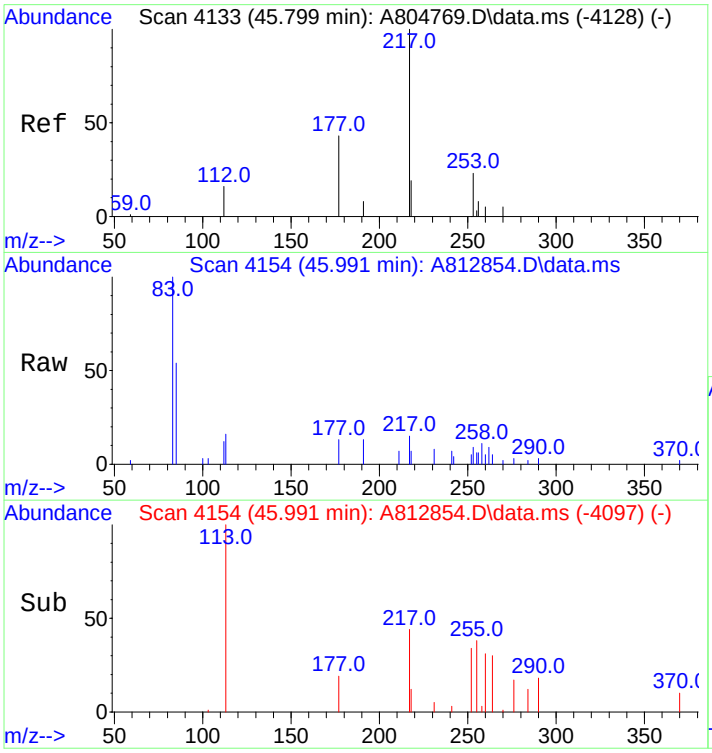




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 297.39 ng/ml
RT: 45.570 min Scan# 4108
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

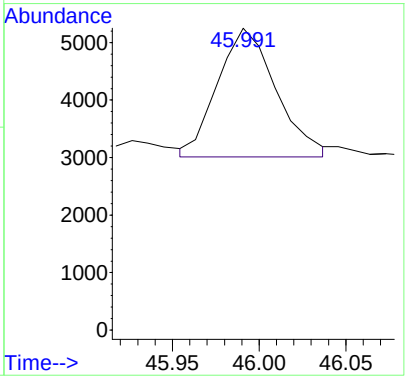
Tgt Ion:217 Resp: 11162

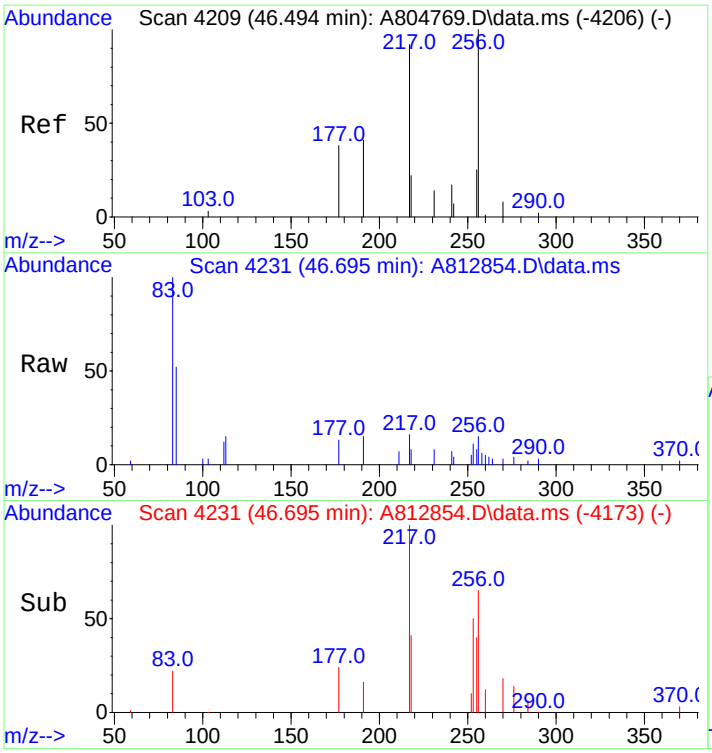




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 139.72 ng/ml m
RT: 45.991 min Scan# 4154
Delta R.T. 0.018 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

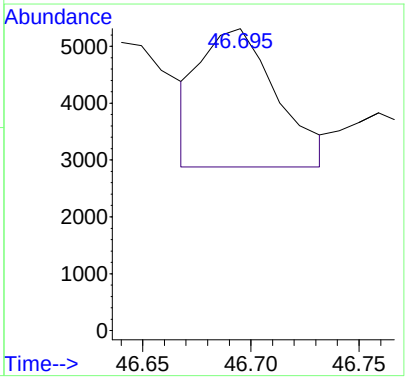
Tgt Ion:217 Resp: 5244

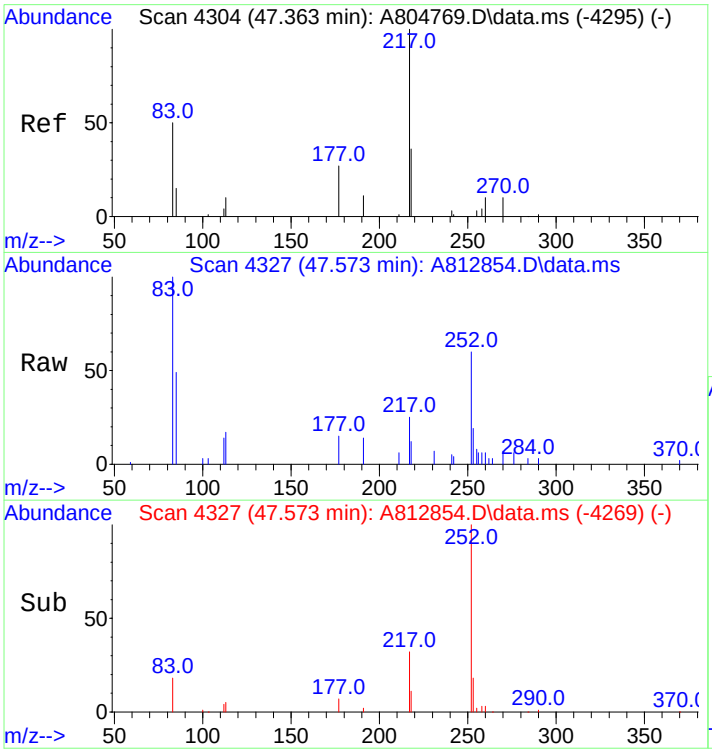




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 158.98 ng/ml m
RT: 46.695 min Scan# 4231
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

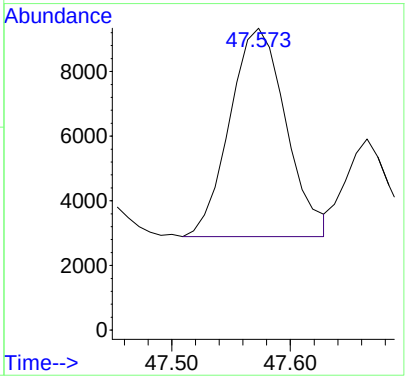
Tgt Ion:217 Resp: 5967

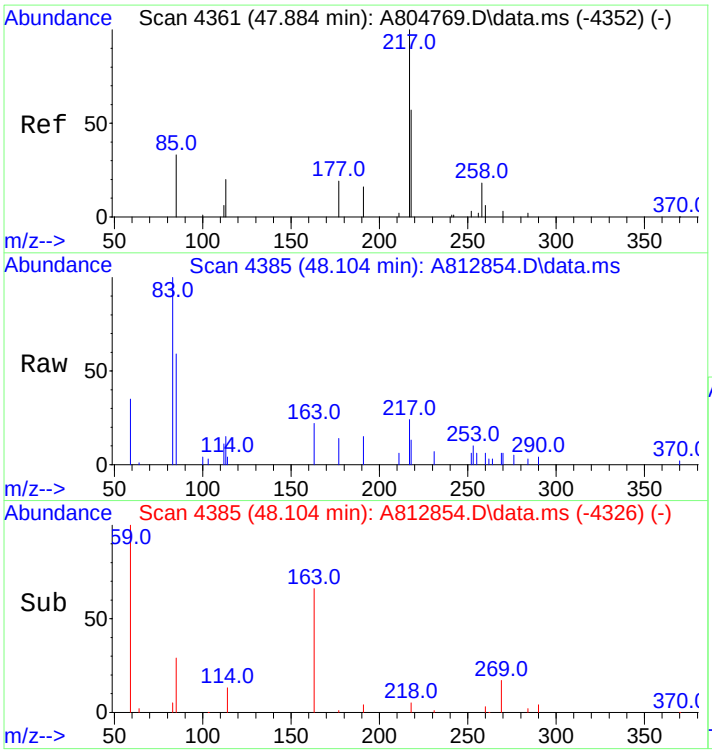




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 565.87 ng/ml
RT: 47.573 min Scan# 4327
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

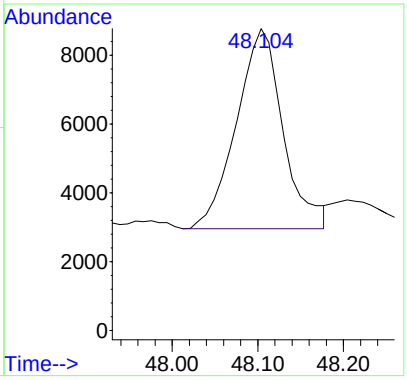
Tgt Ion:217 Resp: 21239

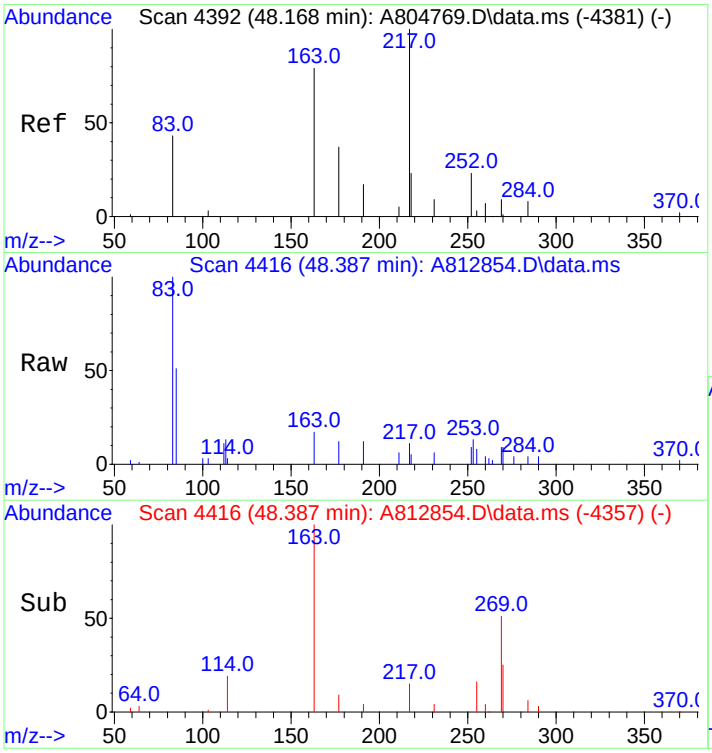




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 589.53 ng/ml
RT: 48.104 min Scan# 4385
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

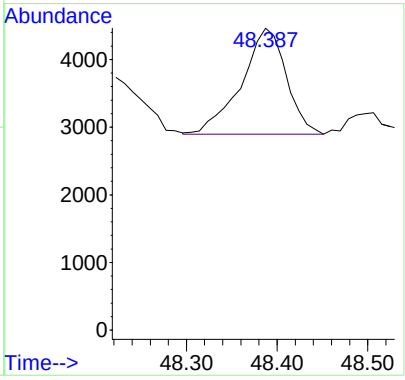
Tgt Ion:217 Resp: 22127

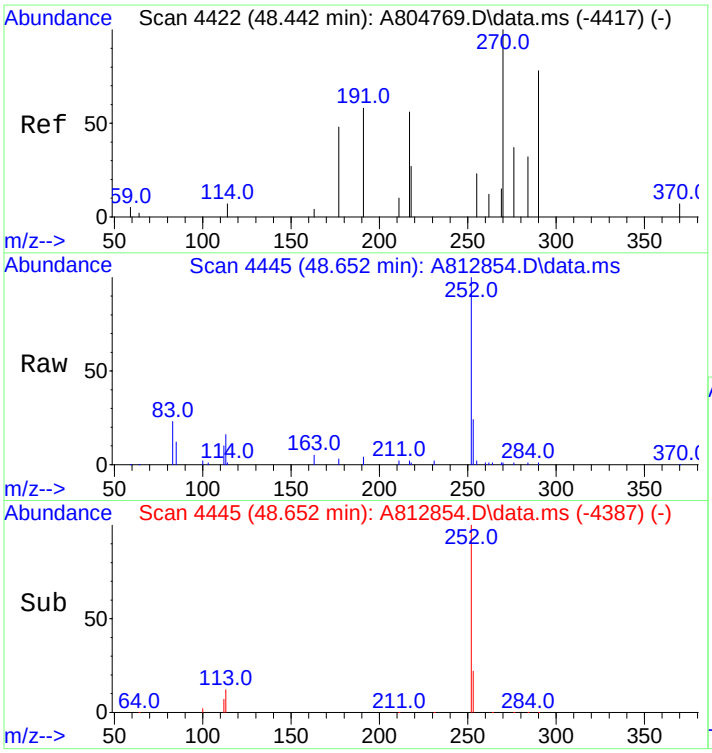




#135
Unknown Sterane (S18)
Concen: 143.07 ng/ml
RT: 48.387 min Scan# 4416
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

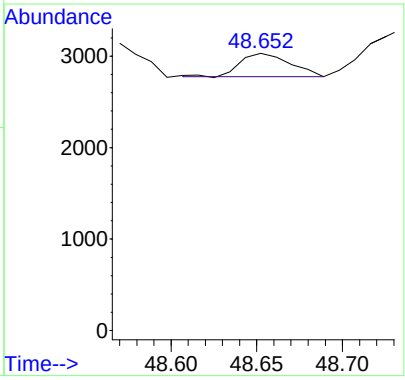
Tgt Ion:217 Resp: 5370

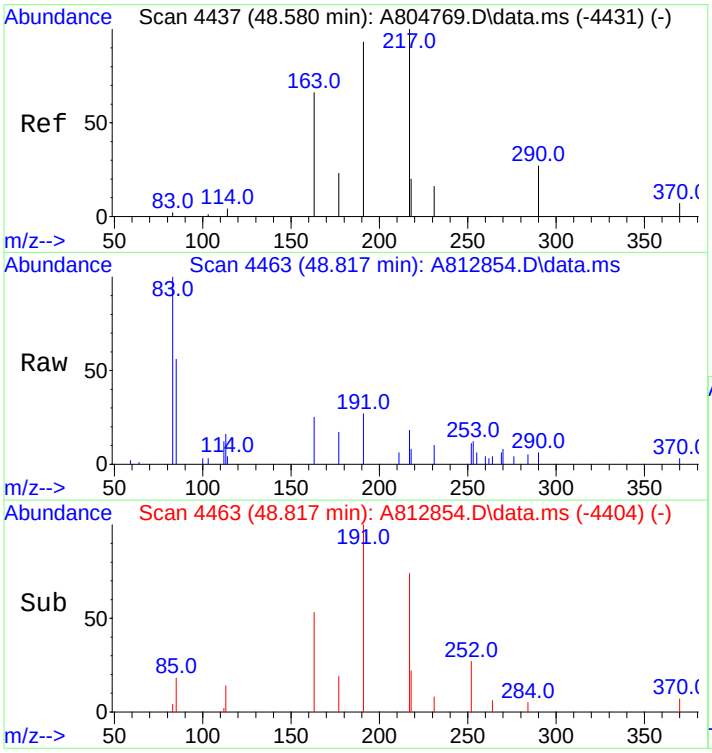




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 13.88 ng/ml
RT: 48.652 min Scan# 4445
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

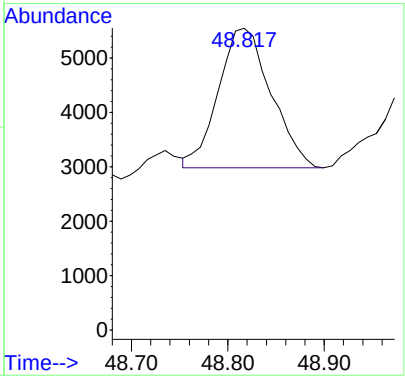
Tgt Ion:217 Resp: 521

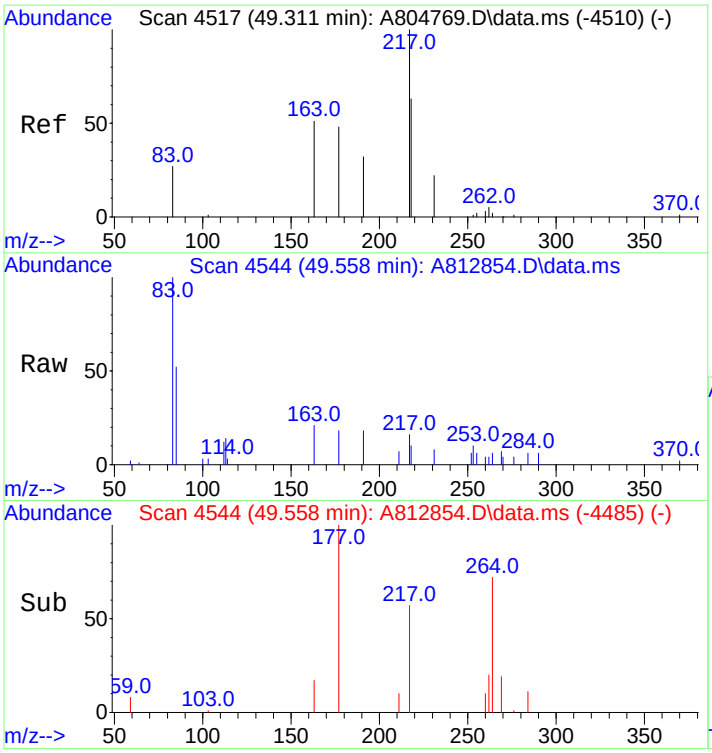




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 259.00 ng/ml
RT: 48.817 min Scan# 4463
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

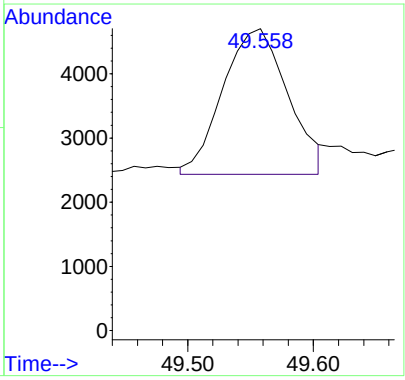
Tgt Ion:217 Resp: 9721

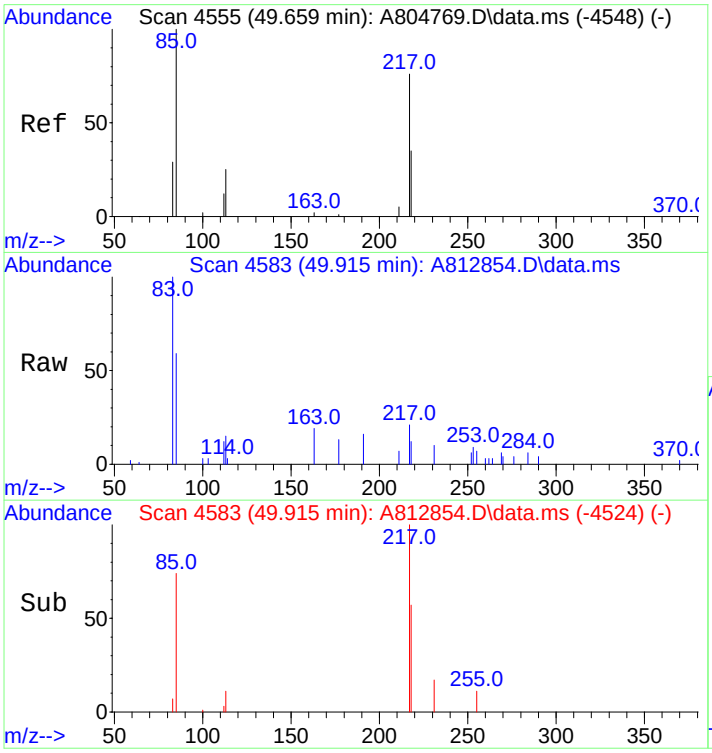




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 217.75 ng/ml m
RT: 49.558 min Scan# 4544
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

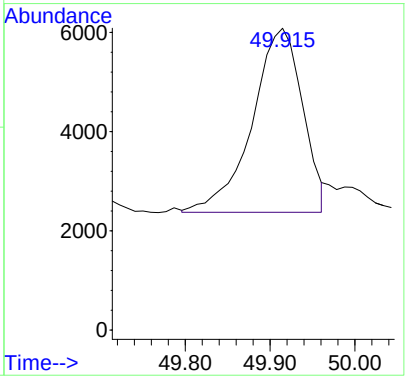
Tgt Ion:217 Resp: 8173

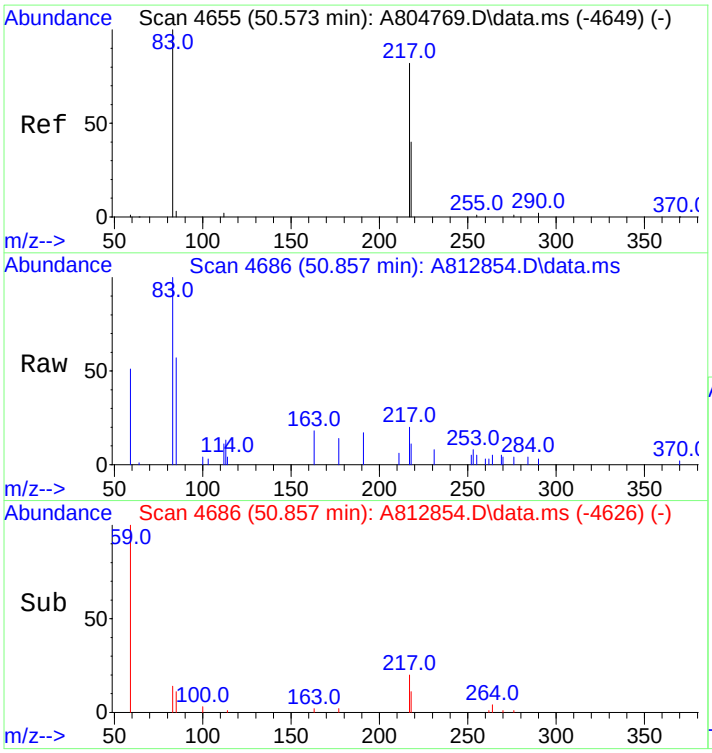




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 408.38 ng/ml m
RT: 49.915 min Scan# 4583
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

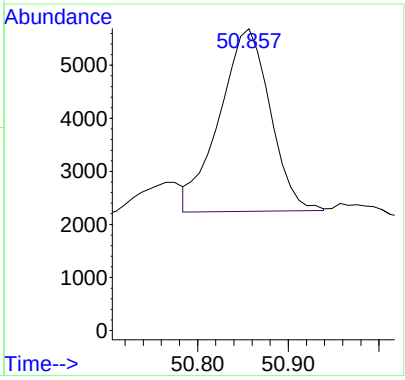
Tgt Ion:217 Resp: 15328

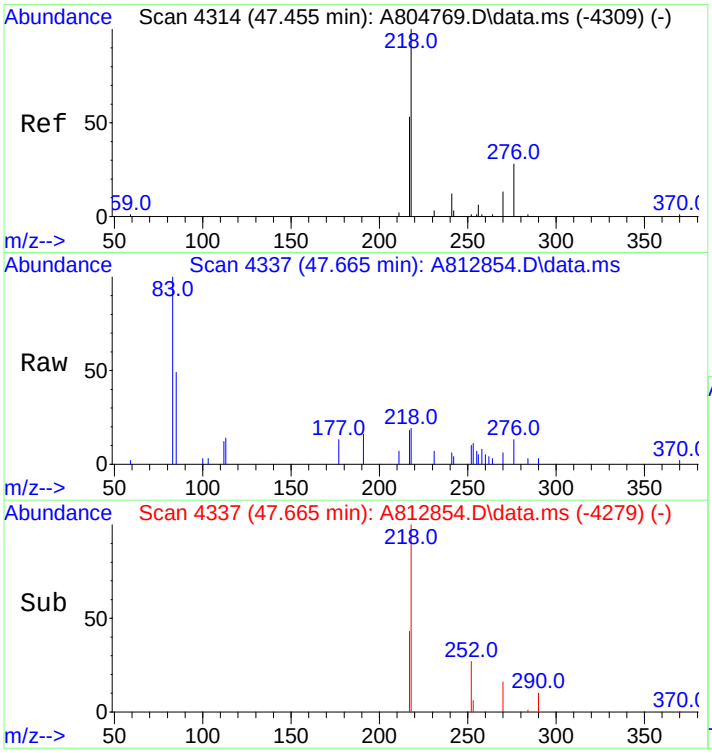




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 354.78 ng/ml
RT: 50.857 min Scan# 4686
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

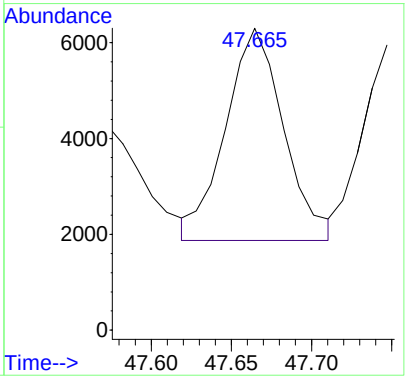
Tgt Ion:217 Resp: 13316

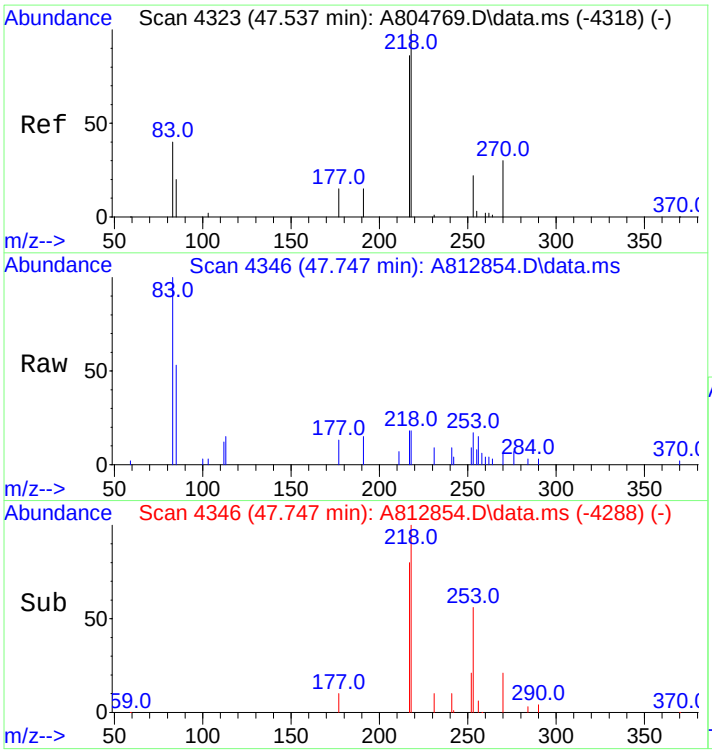




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 297.52 ng/ml m
RT: 47.665 min Scan# 4337
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

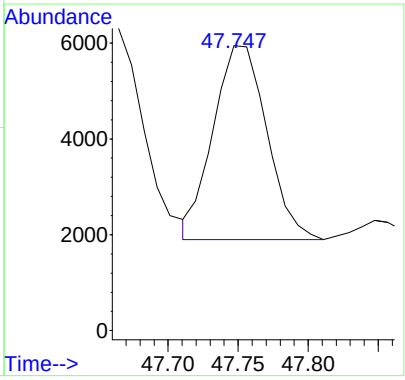
Tgt Ion:218 Resp: 11167

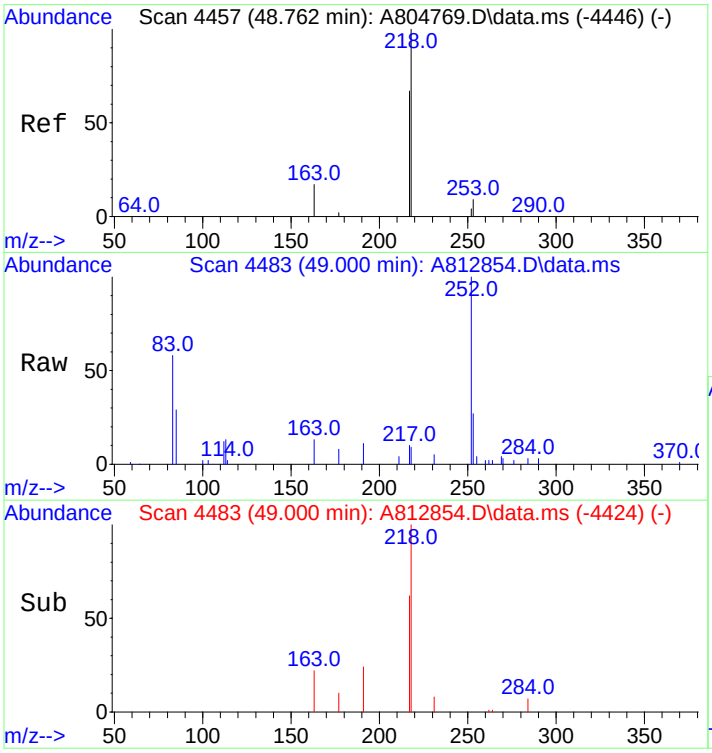




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 287.77 ng/ml
RT: 47.747 min Scan# 4346
Delta R.T. 0.027 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

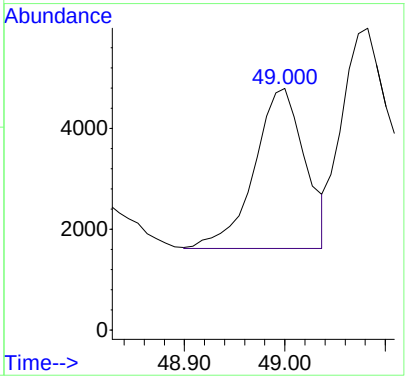
Tgt Ion:218 Resp: 10801

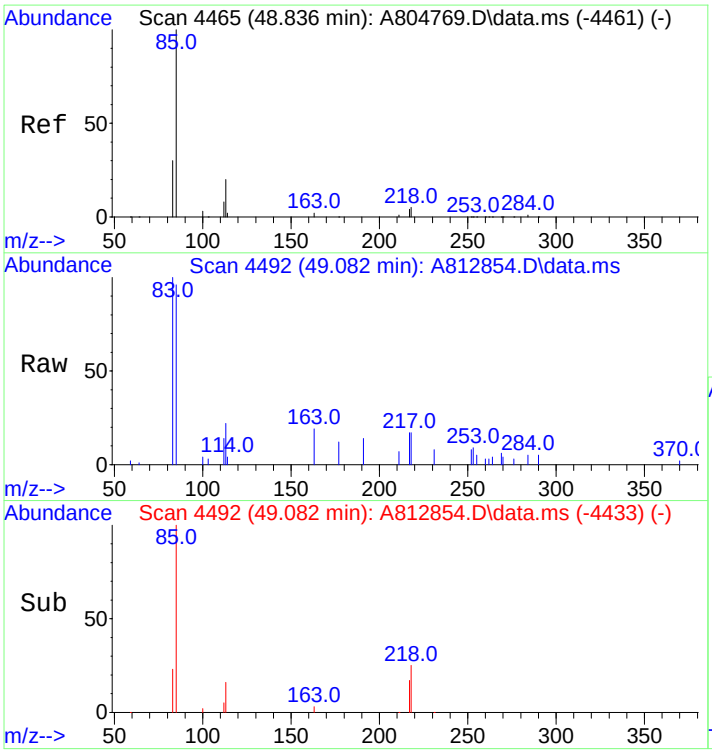




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 298.24 ng/ml m
RT: 49.000 min Scan# 4483
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

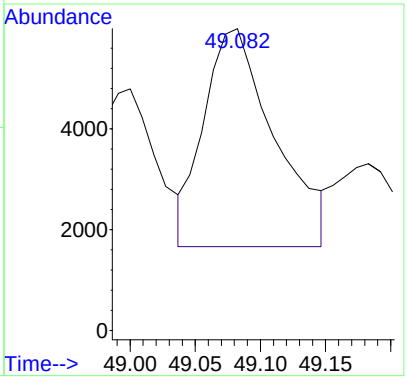
Tgt Ion:218 Resp: 11194

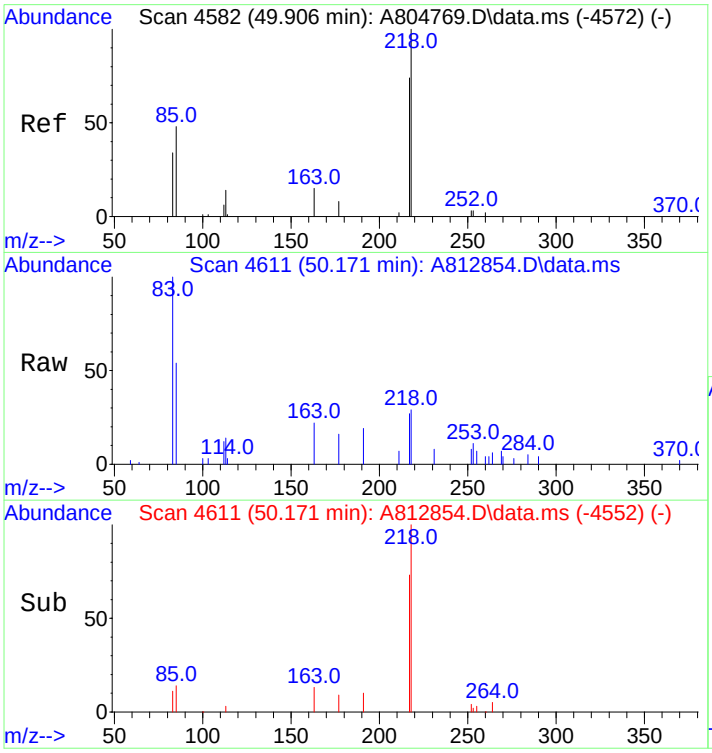




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 435.08 ng/ml m
RT: 49.082 min Scan# 4492
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

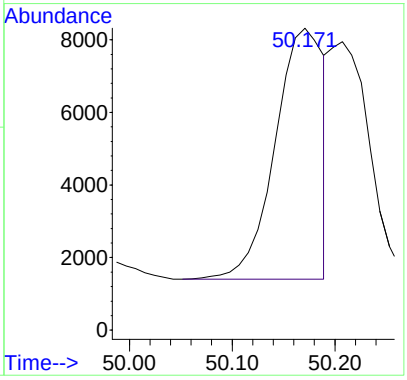
Tgt Ion:218 Resp: 16330

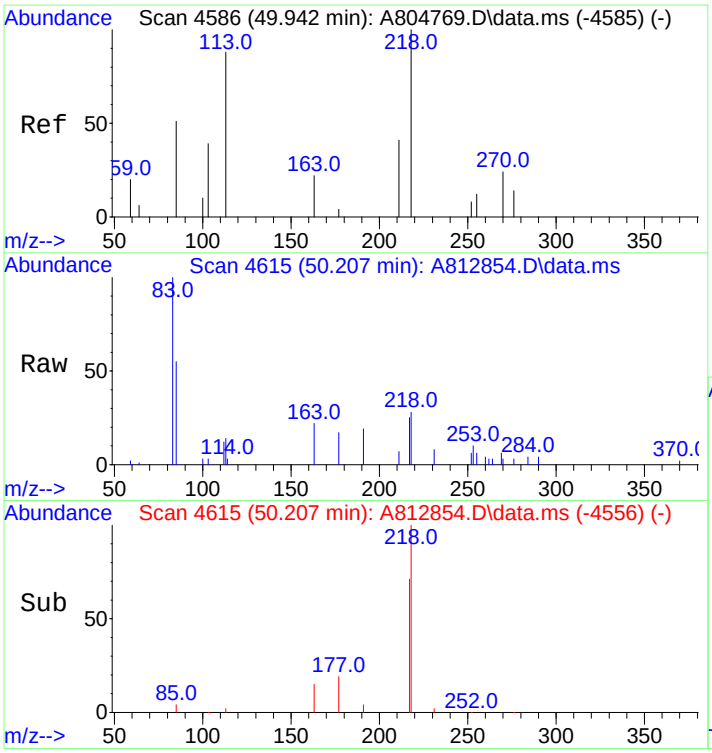




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 602.74 ng/ml
RT: 50.171 min Scan# 4611
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

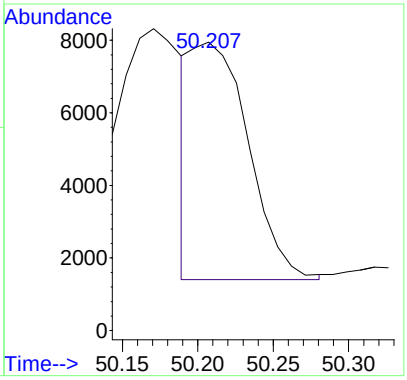
Tgt Ion:218 Resp: 22623

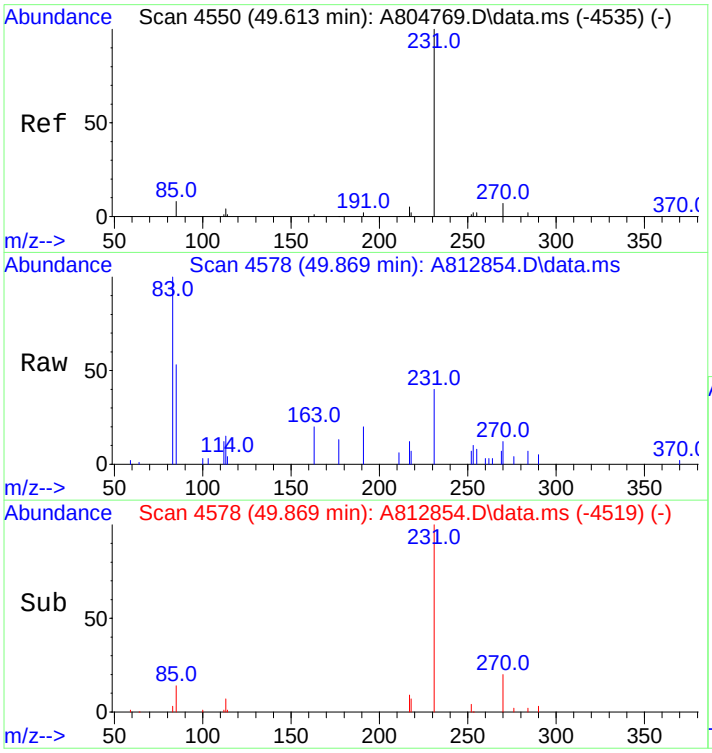




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 460.66 ng/ml m
RT: 50.207 min Scan# 4615
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

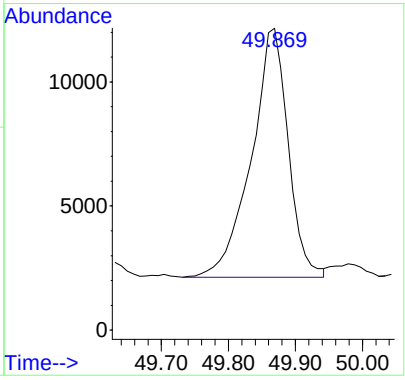
Tgt Ion:218 Resp: 17290

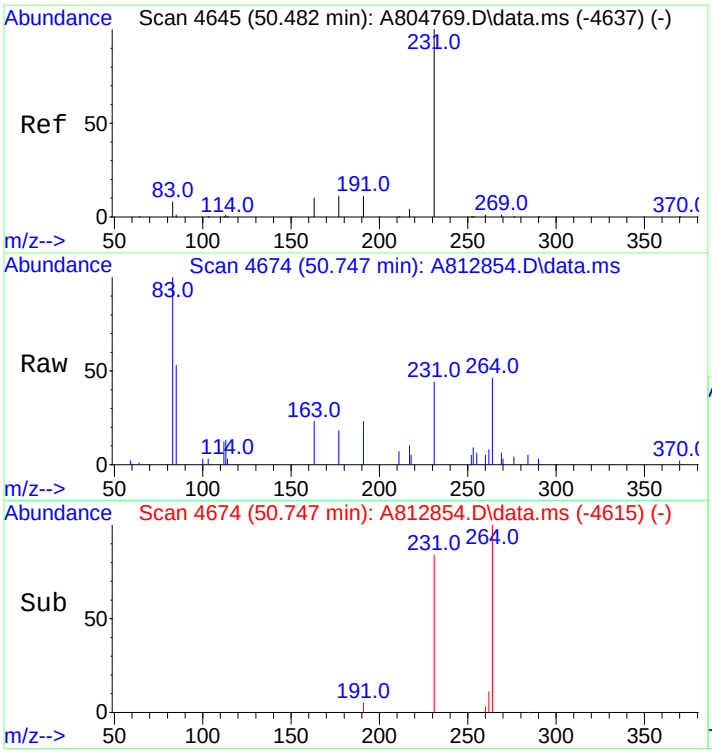




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1025.38 ng/mL
RT: 49.869 min Scan# 4578
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

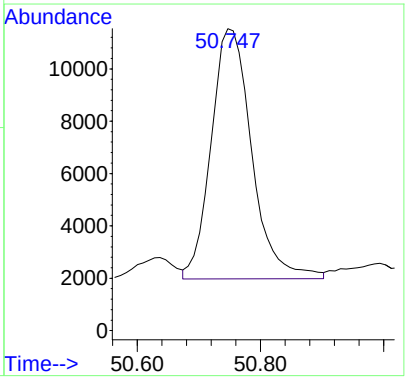
Tgt Ion:231 Resp: 38486

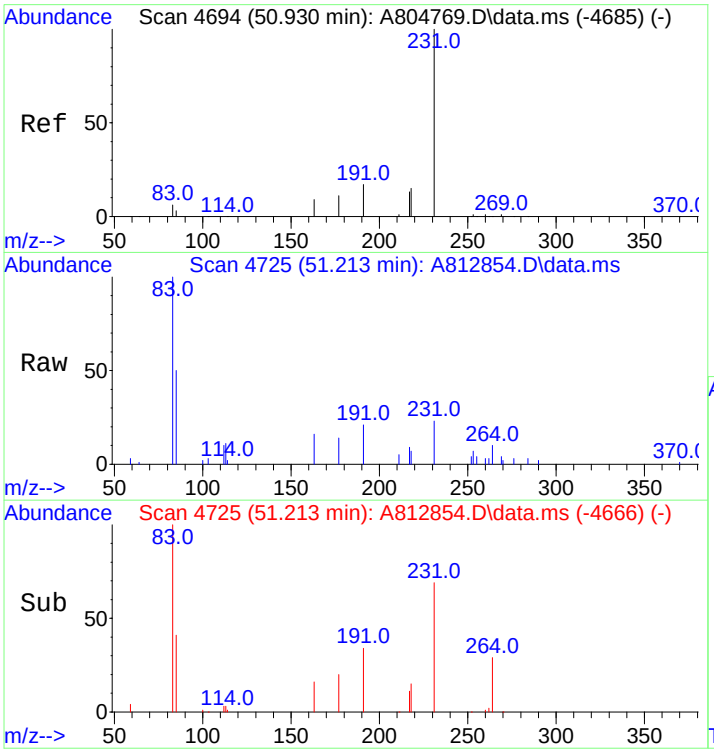




#148
C28,20S-triaromatic steroid
Concen: 1169.79 ng/mL
RT: 50.747 min Scan# 4674
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

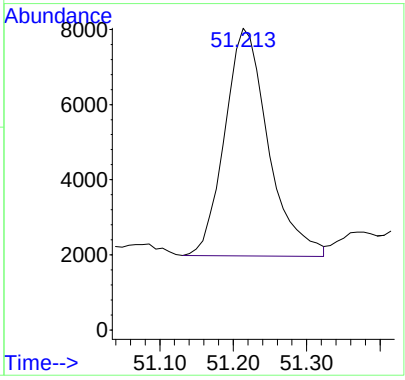
Tgt Ion:231 Resp: 43906

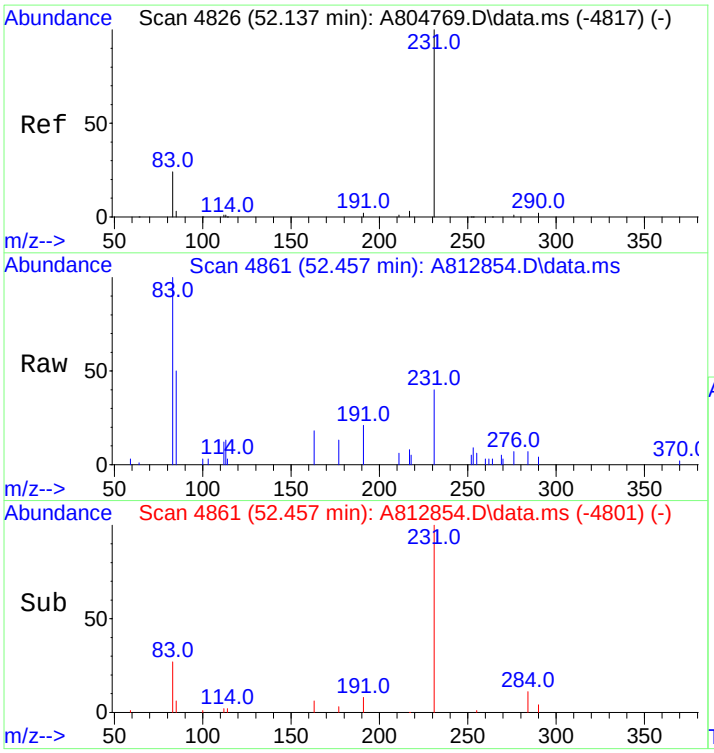




#149
C27,20R-triaromatic steroid
Concen: 668.23 ng/mL
RT: 51.213 min Scan# 4725
Delta R.T. 0.036 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

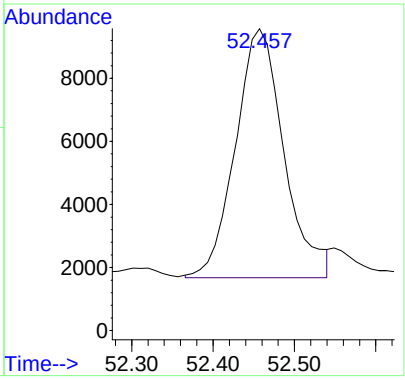
Tgt Ion:231 Resp: 25081





#150
C28,20R-triaromatic steroid
Concen: 872.66 ng/mL m
RT: 52.457 min Scan# 4861
Delta R.T. 0.046 min
Lab File: A812854.D
Acq: 20 Nov 2012 7:25 am

Tgt Ion:231 Resp: 32754



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812823.D
Acq On : 18 Nov 2012 9:44 am
Operator : AC
Sample : i811181201
Misc : l1 whaq83
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 19 12:13:28 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Sep 08 09:01:35 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

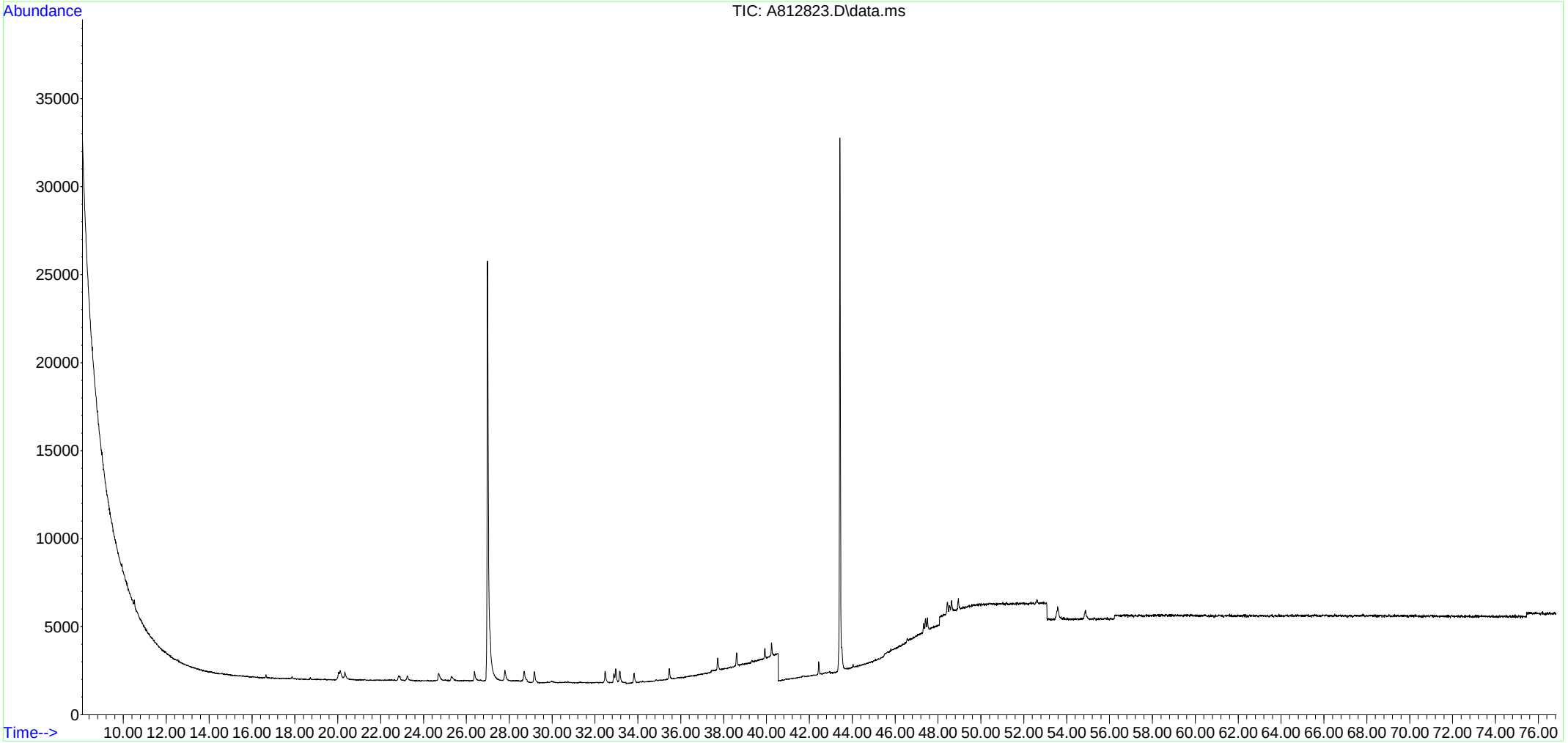
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	52596	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	71970	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.041	136	2167	9.504	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.95%#		
42) Phenanthrene-d10	32.880	188	1689	9.895	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.99%#		
83) Benzo[b]fluoranthene-d12	47.335	264	1330	8.644	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.86%#		
88) Benzo[a]pyrene-d12	48.543	264	1246	8.701	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.87%#		
129) 5B(H)Cholane - Surr	44.036	217	261	9.186	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.92%#		
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	247	5.132	ng/mL	100
4) cis-Decalin	17.870	138	193	5.369	ng/mL	100
10) Naphthalene	20.124	128	2515	9.409	ng/mL#	100
16) 2-Methylnaphthalene	22.843	142	1352	8.584	ng/mL#	100
17) 1-Methylnaphthalene	23.244	142	1266	8.421	ng/mL#	100
18) Benzothiophene	20.333	134	2069	9.733	ng/mL	100
23) Biphenyl	24.705	154	1921	9.870	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.325	156	1107	8.384	ng/mL#	100
25) Dibenzofuran	27.798	168	2055	10.069	ng/mL	96
26) Acenaphthylene	26.384	152	1987	8.224	ng/mL#	100
27) Acenaphthene	27.114	153	1264	8.847	ng/mL	95
28) 2,3,5-Trimethylnaphtha...	28.692	170	1077	9.696	ng/mL	95
29) Fluorene	29.167	166	1445M3	9.263	ng/mL	
33) Dibenzothiophene	32.478	184	2085	9.333	ng/mL	99
43) Phenanthrene	32.971	178	1988	9.226	ng/mL	94
54) Retene	39.927	234	396	8.634	ng/mL	87
55) Anthracene	33.154	178	1885M3	9.280	ng/mL	
56) Carbazole	33.820	167	1793	8.825	ng/mL	99
57) 1-Methylphenanthrene	35.463	192	1344	8.980	ng/mL	94
58) Fluoranthene	37.718	202	1919	8.676	ng/mL	99
59) Benzo(b)fluorene	40.238	216	974	7.792	ng/mL	100
60) Pyrene	38.603	202	1986	8.917	ng/mL	98
66) Naphthobenzothiophene	42.438	234	1832	8.916	ng/ml	100
67) Naphthobenzothiophene-...	42.438	234	1832	8.916	ng/mL	100
75) Benz[a]anthracene	43.360	228	1470M3	7.658	ng/mL	
76) Chrysene	43.525	228	1616	8.665	ng/mL	98
77) Chrysene/Triphenylene	43.525	228	1616	8.665	ng/mL	98
84) Benzo[b]fluoranthene	47.418	252	1622M3	7.755	ng/mL	
85) Benzo[j]+[k]fluoranthene	47.500	252	1707M3	7.927	ng/mL	
87) Benzo[e]pyrene	48.433	252	1684	8.118	ng/mL	95
89) Benzo[a]pyrene	48.625	252	1477	7.820	ng/mL	95
90) Perylene	48.945	252	1641	7.953	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.545	276	1487M3	7.057	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.591	278	1458	7.656	ng/mL	97
93) Benzo[g,h,i]perylene	54.861	276	1775	7.906	ng/mL	95
94) Hopane (T19)	52.613	191	534M3	8.110	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.613	191	519M3	7.882	ng/mL	

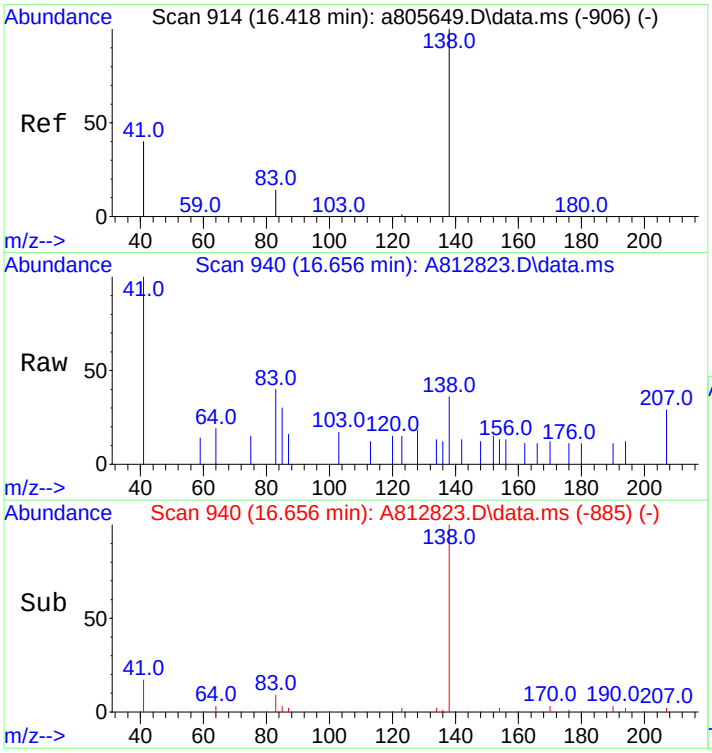
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812823.D
Acq On : 18 Nov 2012 9:44 am
Operator : AC
Sample : i811181201
Misc : l1 whaq83
ALS Vial : 4 Sample Multiplier: 1

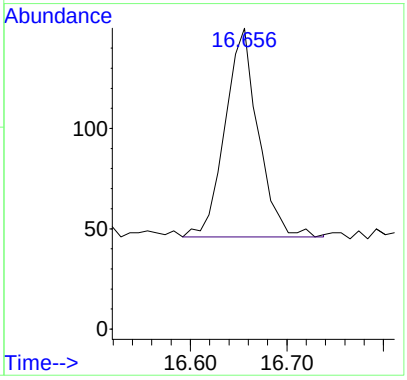
Quant Time: Nov 19 12:13:28 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Sep 08 09:01:35 2012
Response via : Initial Calibration

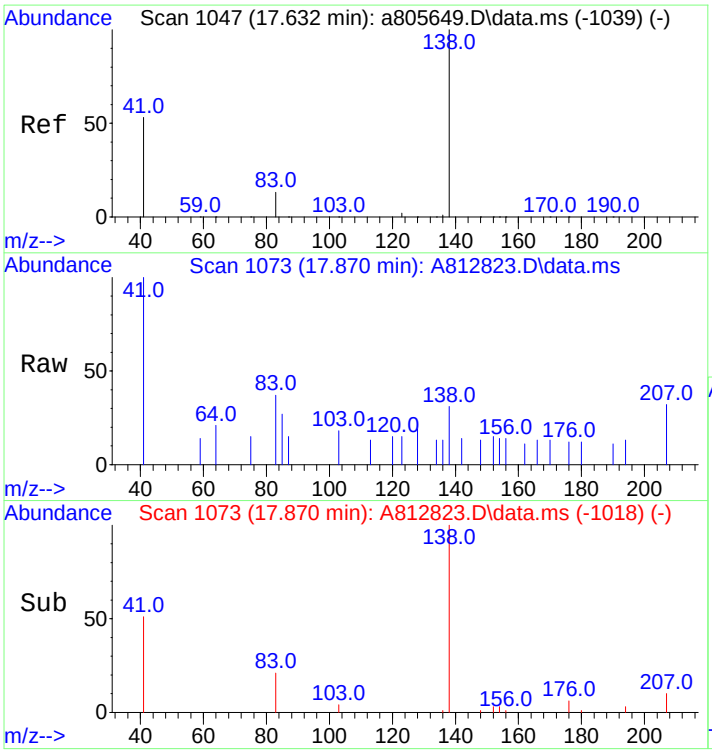




#3
trans-Decalin
Concen: 5.13 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

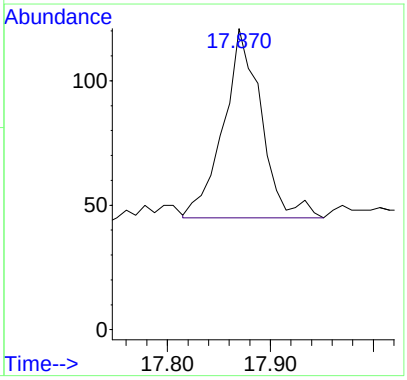
Tgt Ion:138 Resp: 247

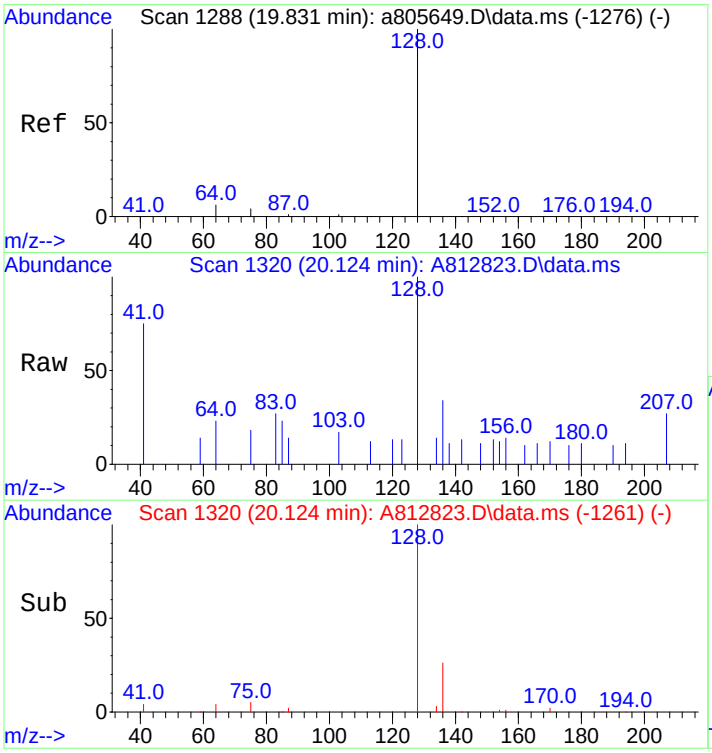




#4
cis-Decalin
Concen: 5.37 ng/mL
RT: 17.870 min Scan# 1073
Delta R.T. -0.000 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:138 Resp: 193

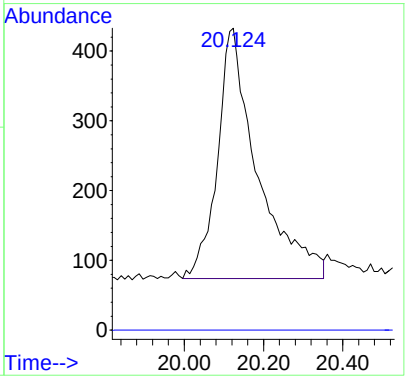


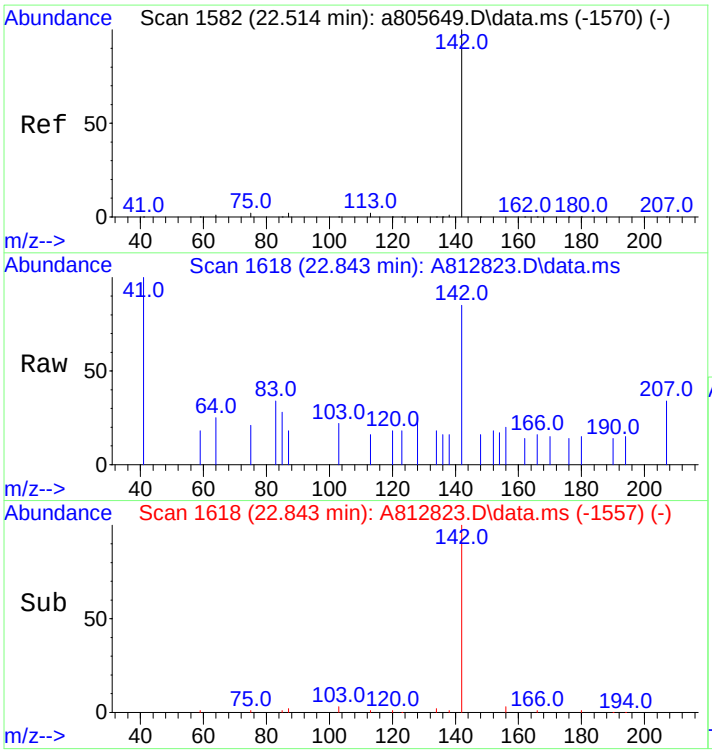


#10
Naphthalene
Concen: 9.41 ng/mL
RT: 20.124 min Scan# 1320
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:128 Resp: 2515

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

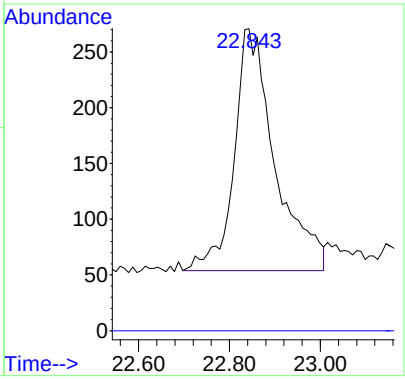


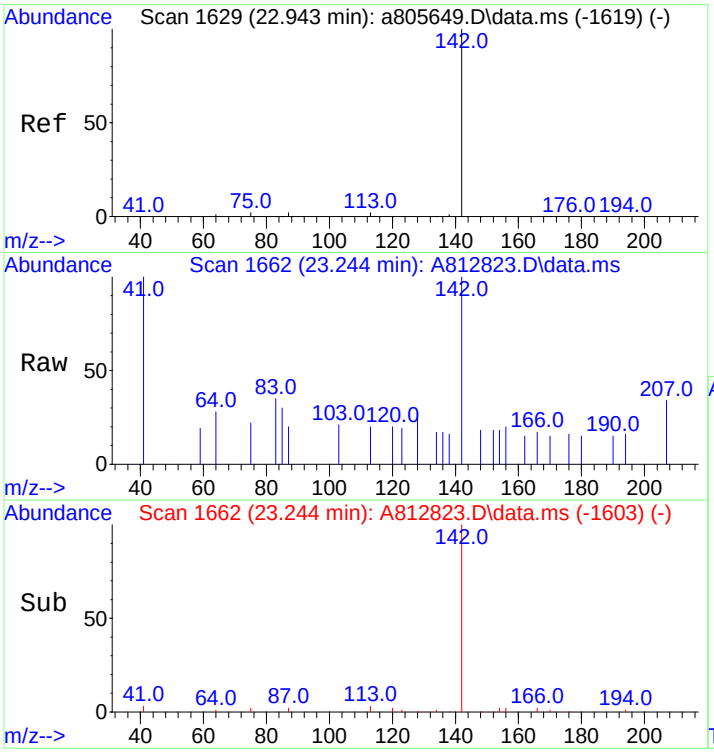


#16
2-Methylnaphthalene
Concen: 8.58 ng/mL
RT: 22.843 min Scan# 1618
Delta R.T. 0.055 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:142 Resp: 1352

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

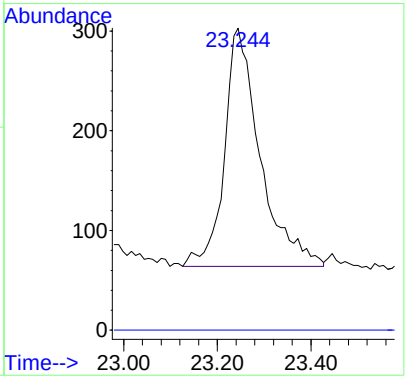


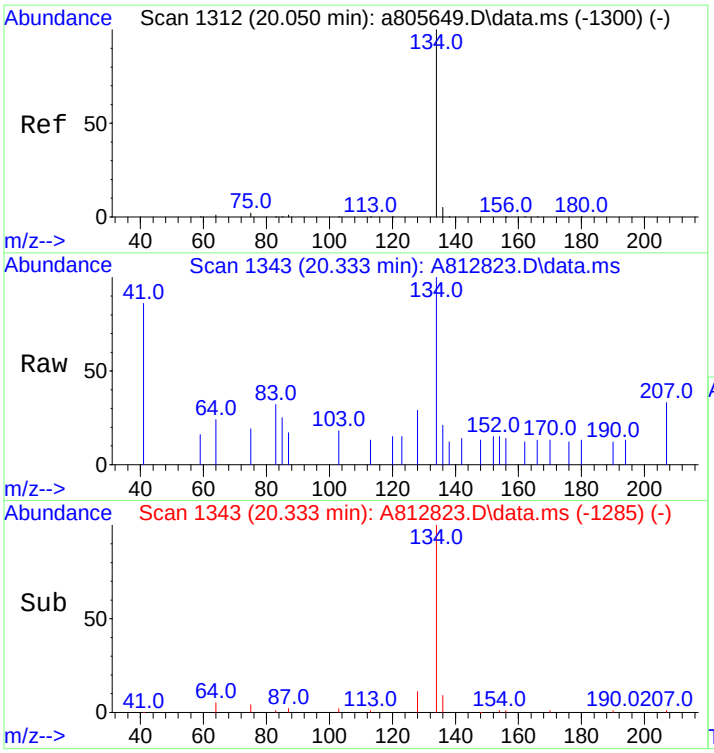


#17
1-Methylnaphthalene
Concen: 8.42 ng/mL
RT: 23.244 min Scan# 1662
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:142 Resp: 1266

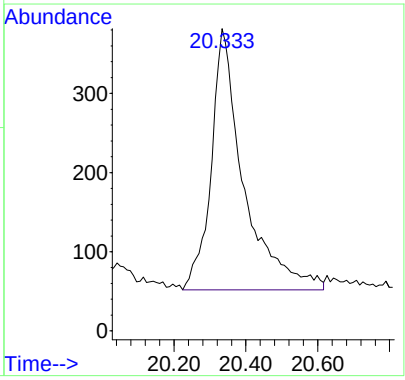
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

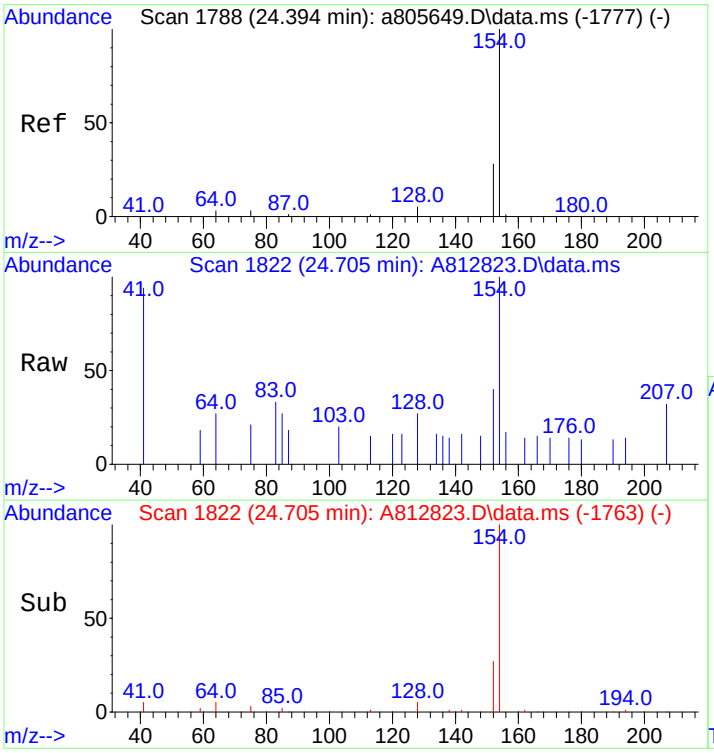




#18
Benzothiophene
Concen: 9.73 ng/mL
RT: 20.333 min Scan# 1343
Delta R.T. 0.027 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:134 Resp: 2069

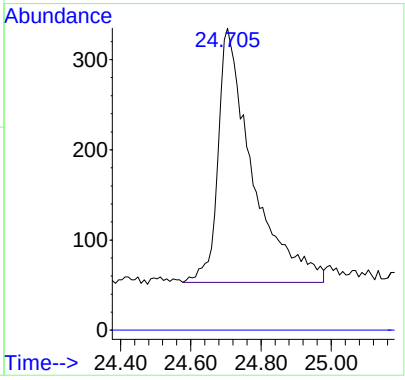


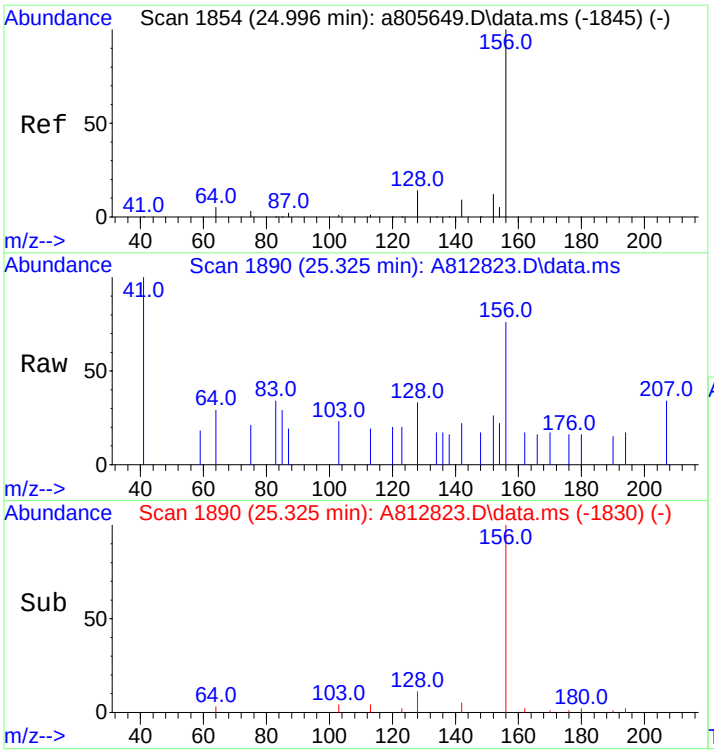


#23
Biphenyl
Concen: 9.87 ng/mL
RT: 24.705 min Scan# 1822
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:154 Resp: 1921

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

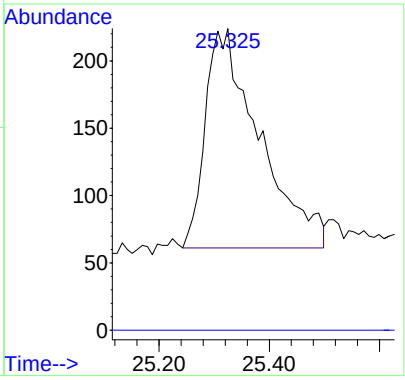


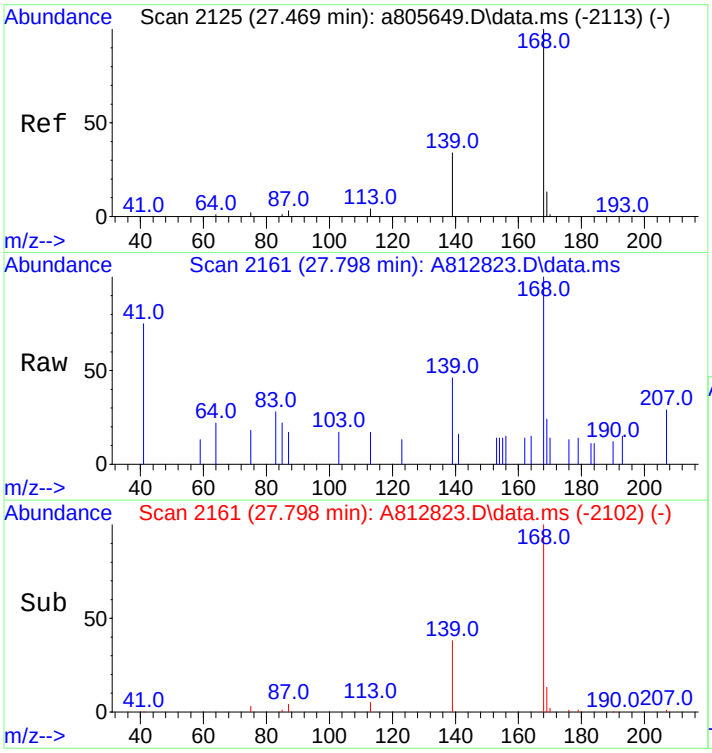


#24
2,6-Dimethylnaphthalene
Concen: 8.38 ng/mL
RT: 25.325 min Scan# 1890
Delta R.T. 0.046 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:156 Resp: 1107

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

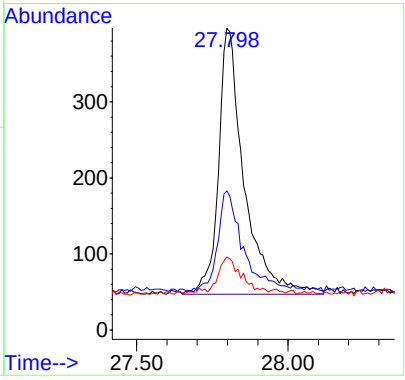


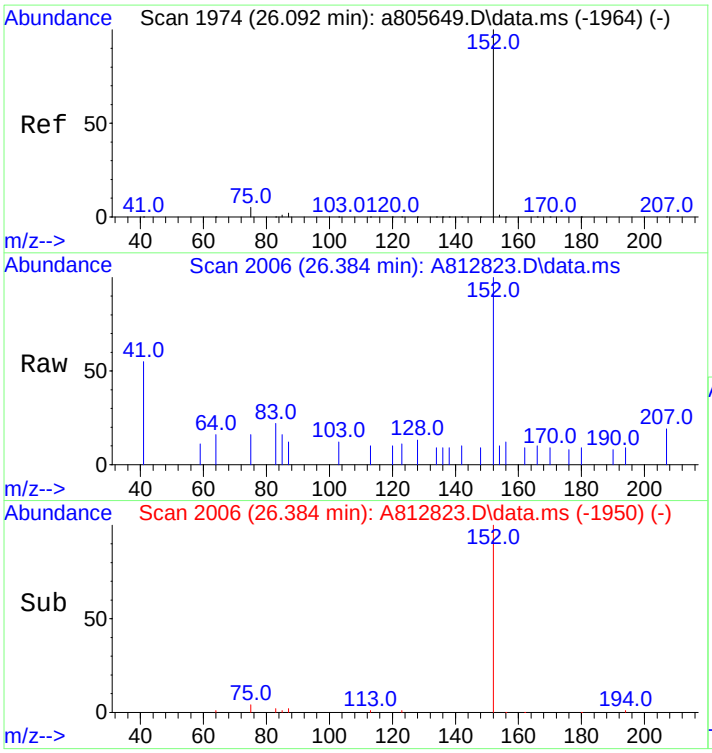


#25
Dibenzofuran
Concen: 10.07 ng/mL
RT: 27.798 min Scan# 2161
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:168 Resp: 2055

Ion	Ratio	Lower	Upper
168	100		
139	37.2	28.0	42.0
169	11.0	10.6	15.8

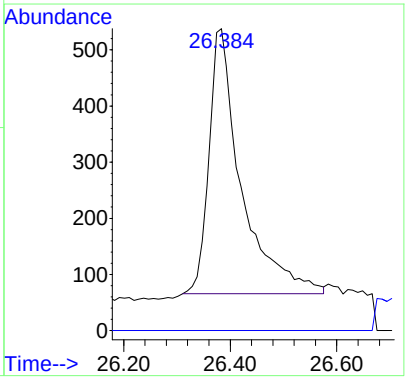


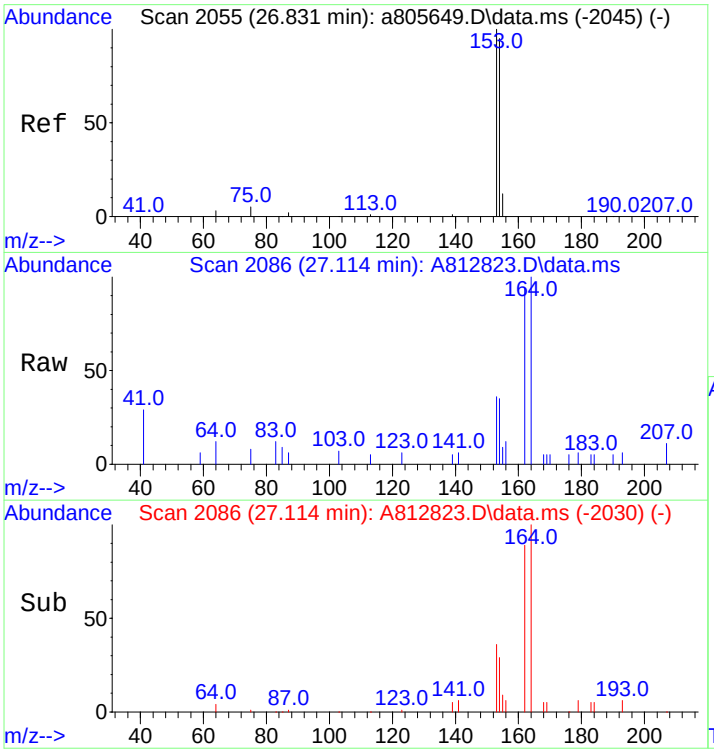


#26
Acenaphthylene
Concen: 8.22 ng/mL
RT: 26.384 min Scan# 2006
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:152 Resp: 1987

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

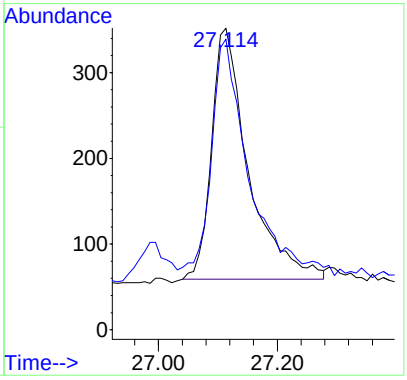


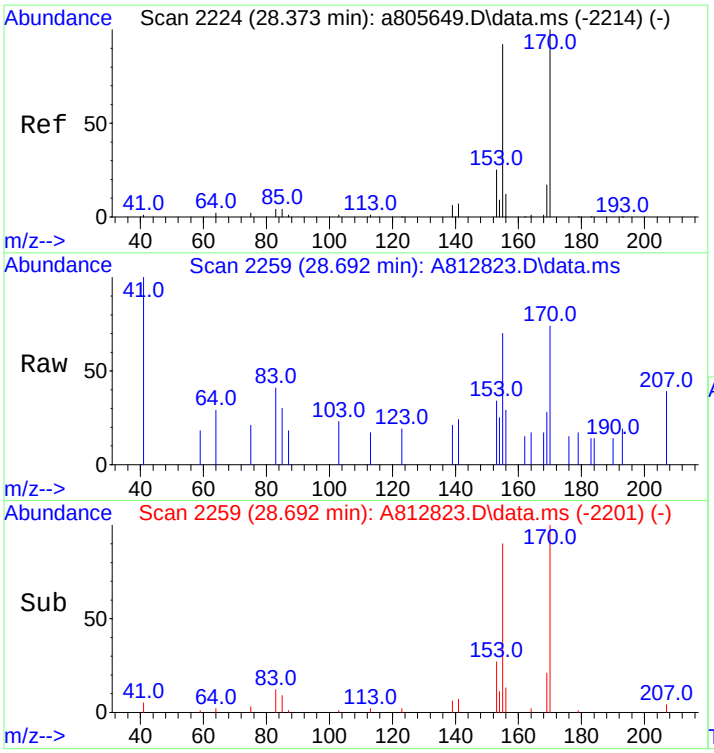


#27
Acenaphthene
Concen: 8.85 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:153 Resp: 1264

Ion	Ratio	Lower	Upper
153	100		
154	99.2	75.4	113.2

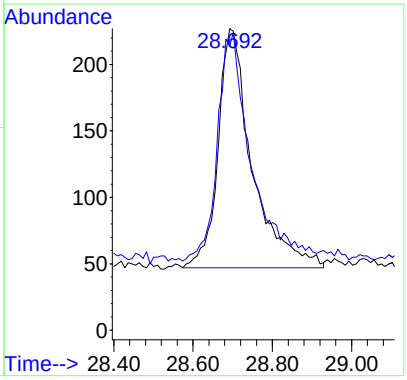


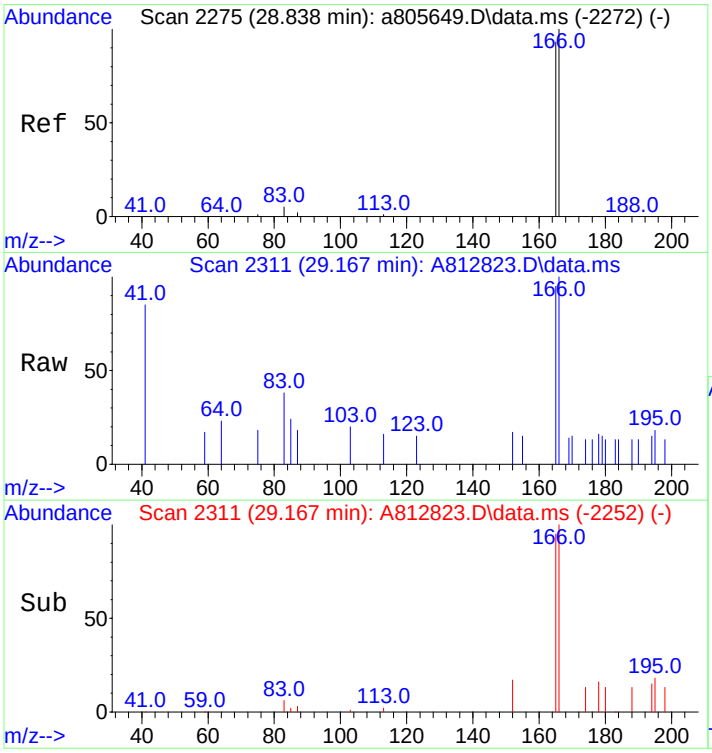


#28
2,3,5-Trimethylnaphthalene
Concen: 9.70 ng/mL
RT: 28.692 min Scan# 2259
Delta R.T. 0.027 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:170 Resp: 1077

Ion	Ratio	Lower	Upper
170	100		
155	94.2	71.7	107.5

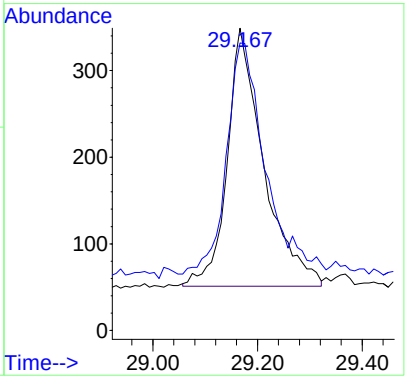


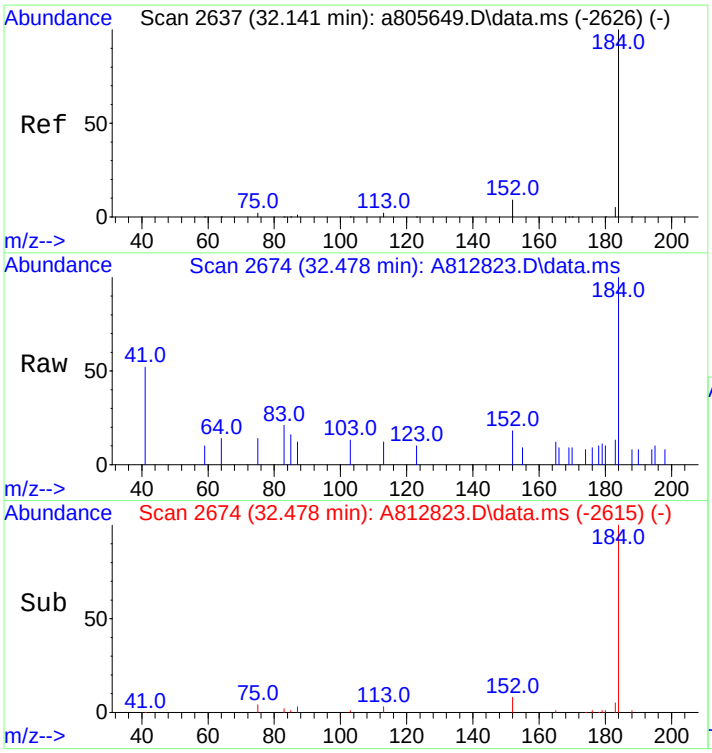


#29
Fluorene
Concen: 9.26 ng/mL m
RT: 29.167 min Scan# 2311
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:166 Resp: 1445

Ion	Ratio	Lower	Upper
166	100		
165	89.3	74.2	111.2

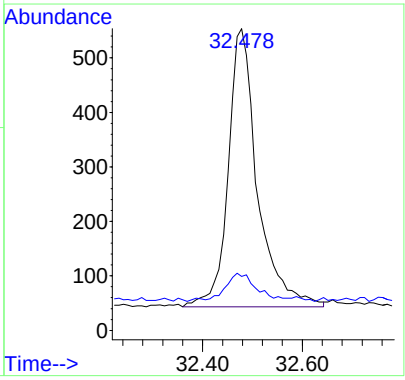


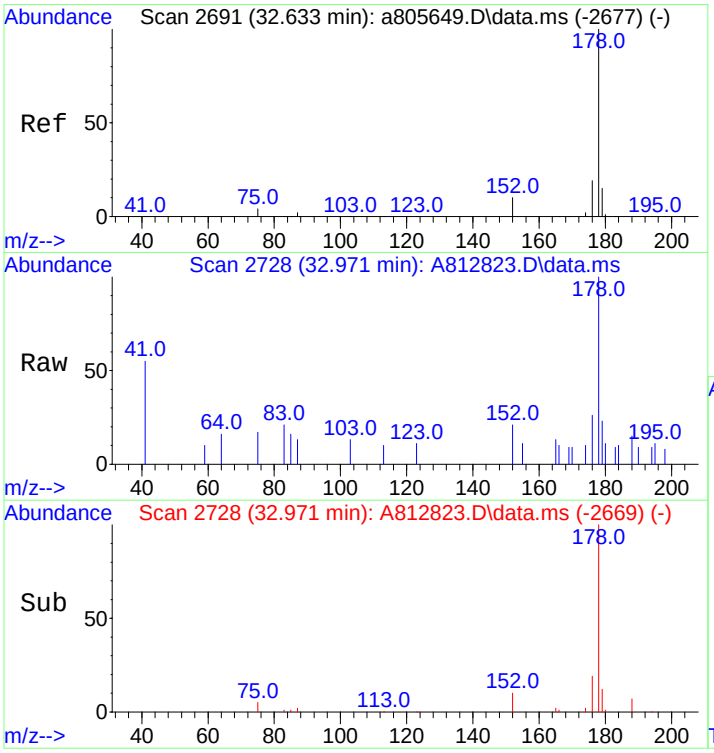


#33
Dibenzothiophene
Concen: 9.33 ng/mL
RT: 32.478 min Scan# 2674
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:184 Resp: 2085

Ion	Ratio	Lower	Upper
184	100		
152	9.3	7.8	11.8

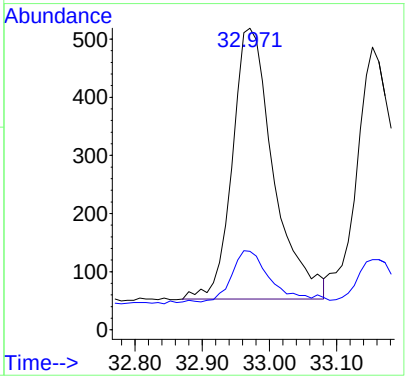


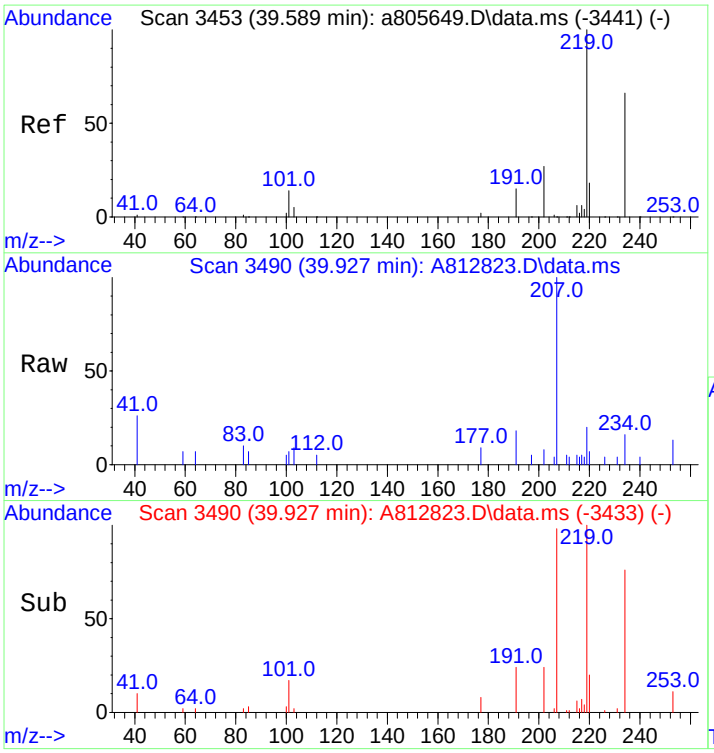


#43
Phenanthrene
Concen: 9.23 ng/mL
RT: 32.971 min Scan# 2728
Delta R.T. 0.036 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:178 Resp: 1988

Ion	Ratio	Lower	Upper
178	100		
176	16.5	15.2	22.8

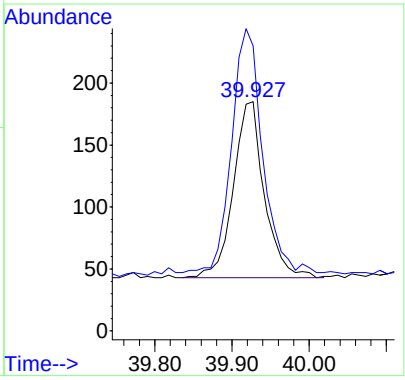


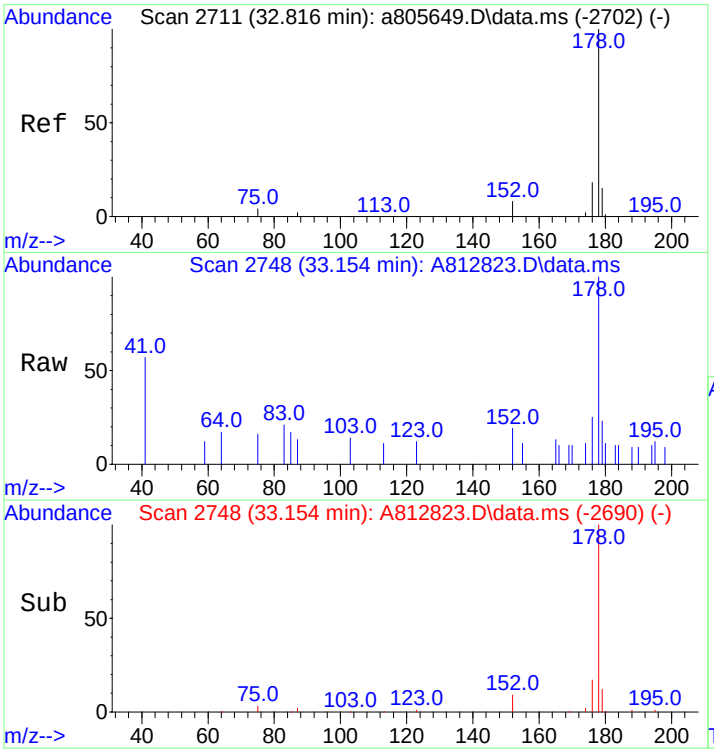


#54
Retene
Concen: 8.63 ng/mL
RT: 39.927 min Scan# 3490
Delta R.T. 0.018 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:234 Resp: 396

Ion	Ratio	Lower	Upper
234	100		
219	137.9	124.0	186.0

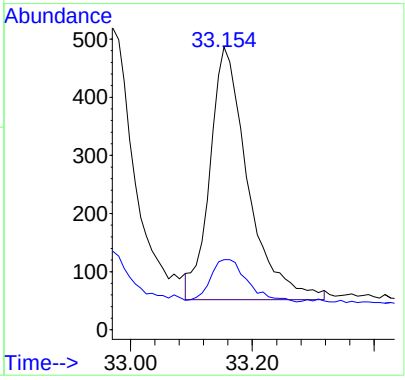


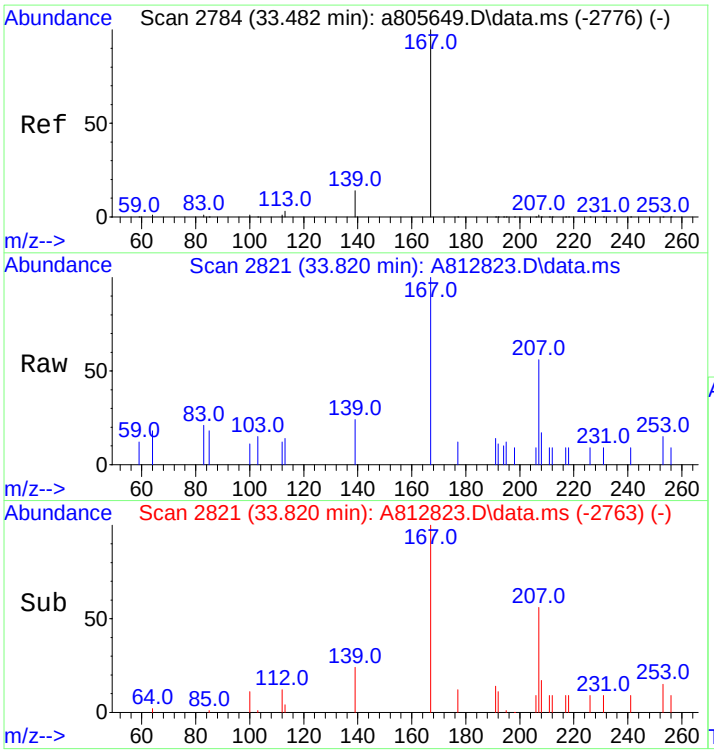


#55
Anthracene
Concen: 9.28 ng/mL m
RT: 33.154 min Scan# 2748
Delta R.T. 0.027 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:178 Resp: 1885

Ion	Ratio	Lower	Upper
178	100		
176	16.4	14.3	21.5

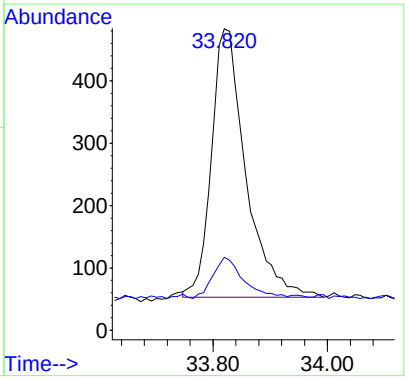


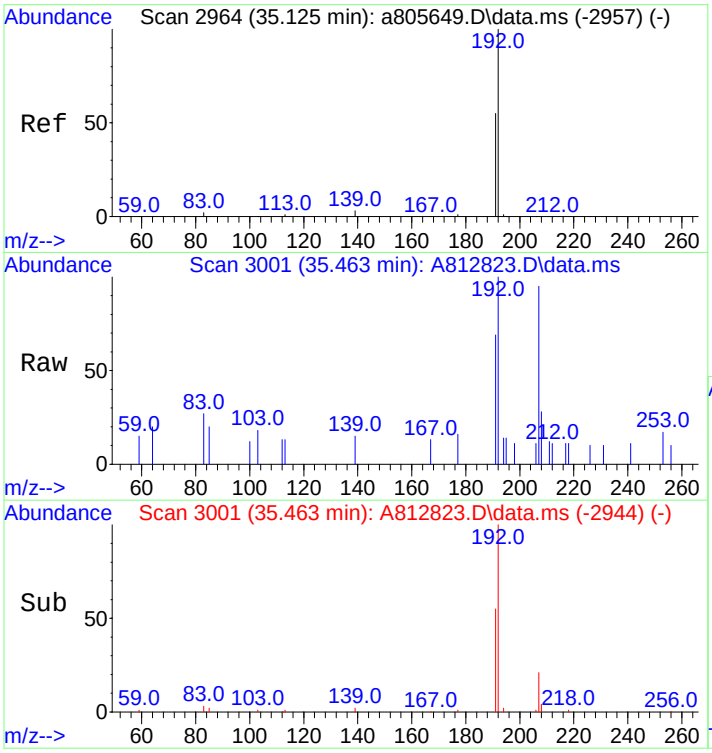


#56
Carbazole
Concen: 8.83 ng/mL
RT: 33.820 min Scan# 2821
Delta R.T. 0.027 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:167 Resp: 1793

Ion	Ratio	Lower	Upper
167	100		
139	13.8	10.6	16.0

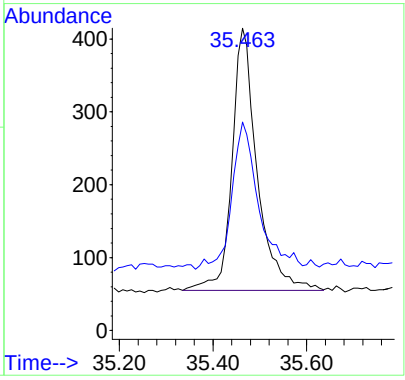


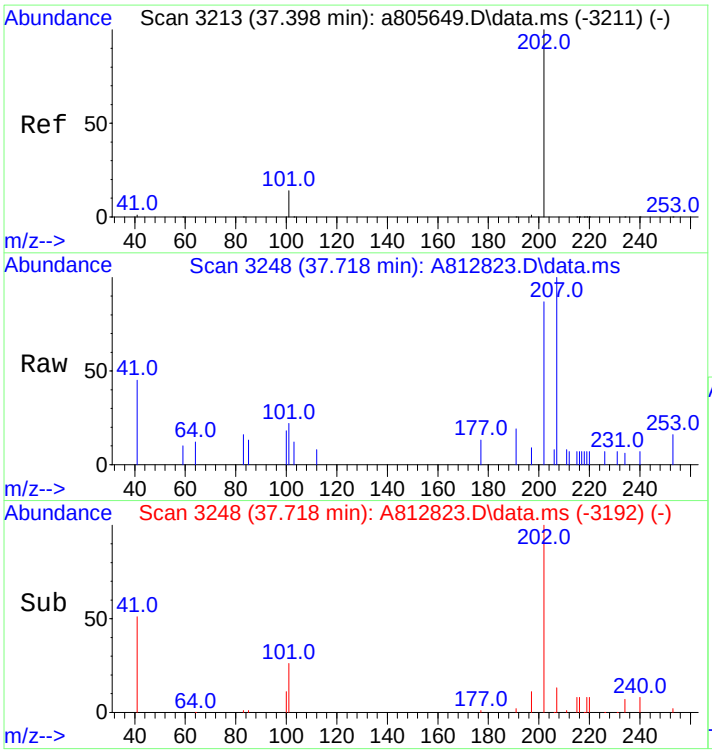


#57
1-Methylphenanthrene
Concen: 8.98 ng/mL
RT: 35.463 min Scan# 3001
Delta R.T. 0.018 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:192 Resp: 1344

Ion	Ratio	Lower	Upper
192	100		
191	59.9	44.2	66.4

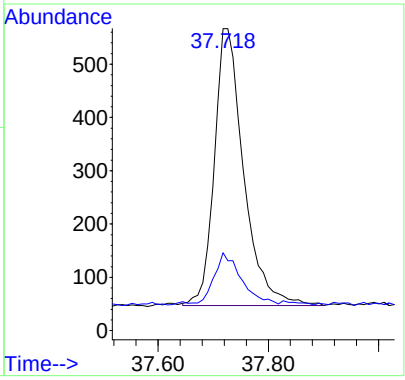


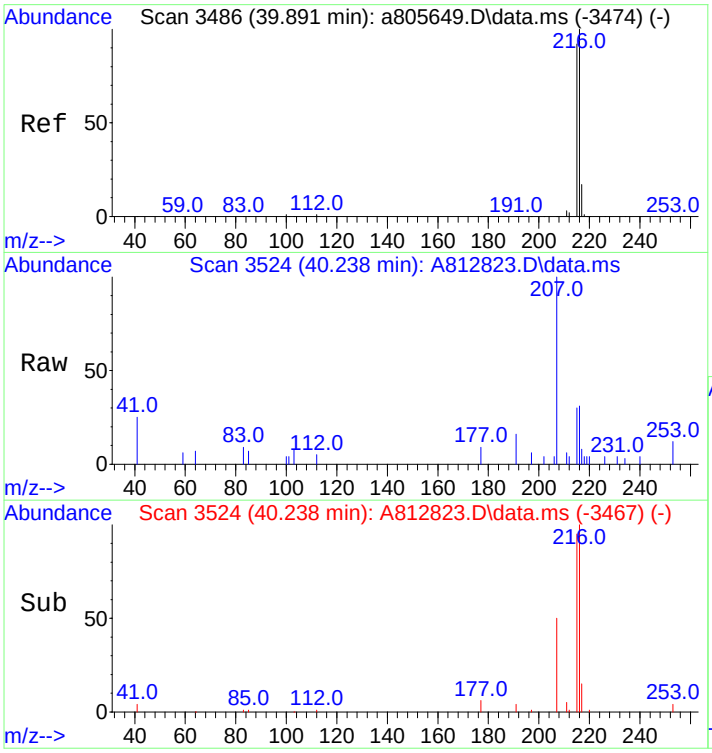


#58
Fluoranthene
Concen: 8.68 ng/mL
RT: 37.718 min Scan# 3248
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:202 Resp: 1919

Ion	Ratio	Lower	Upper
202	100		
101	16.6	13.6	20.4

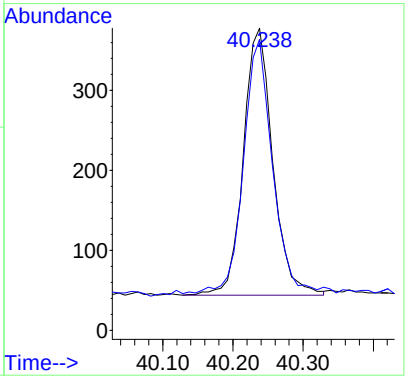


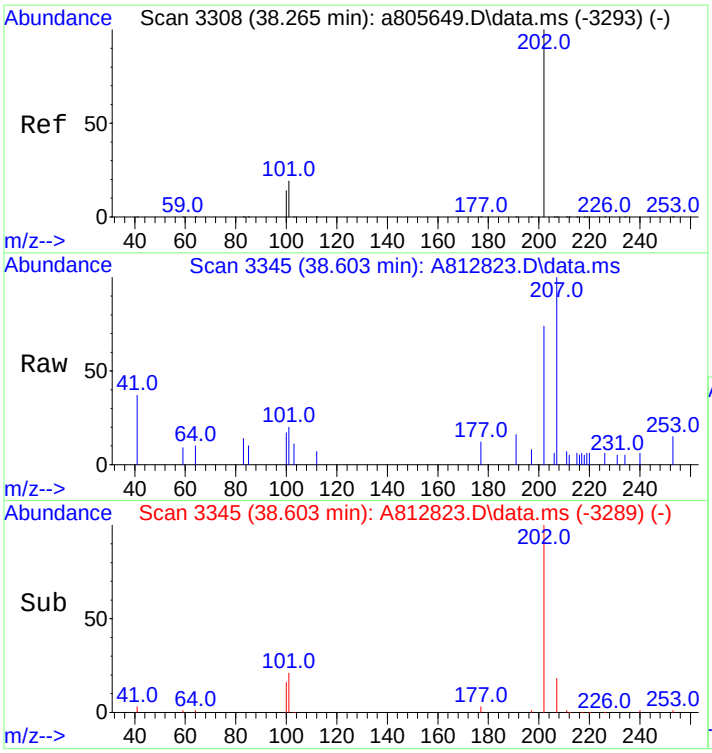


#59
Benzo(b)fluorene
Concen: 7.79 ng/mL
RT: 40.238 min Scan# 3524
Delta R.T. 0.018 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:216 Resp: 974

Ion	Ratio	Lower	Upper
216	100		
215	92.6	74.2	111.2

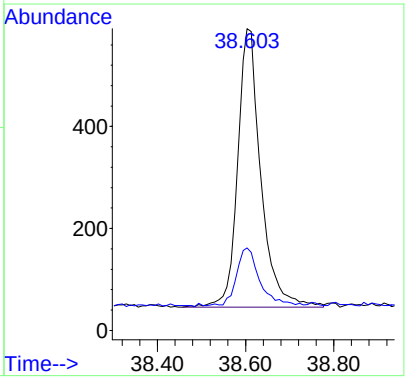


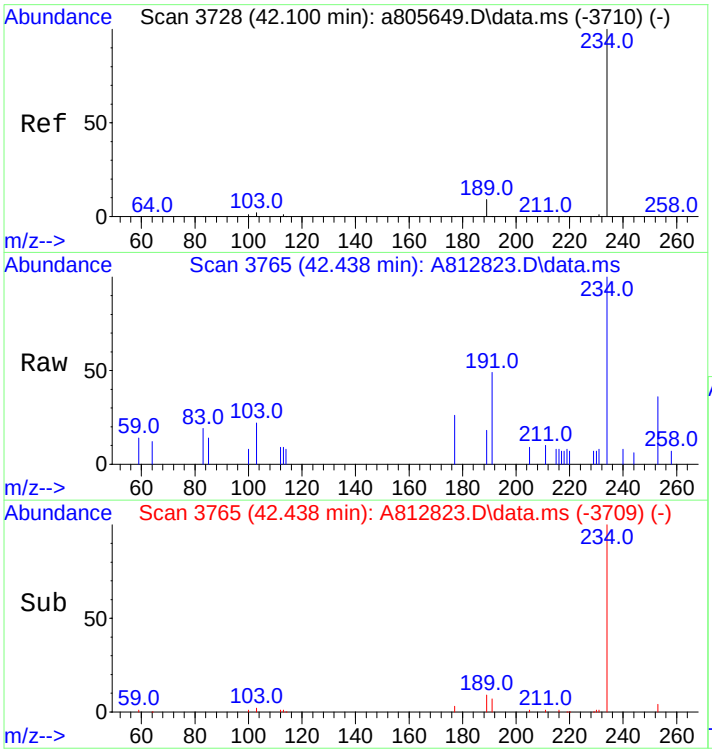


#60
Pyrene
Concen: 8.92 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:202 Resp: 1986

Ion	Ratio	Lower	Upper
202	100		
101	20.4	15.4	23.2

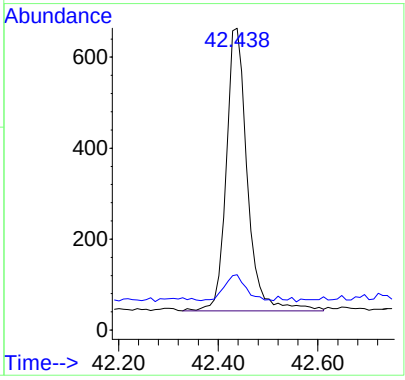


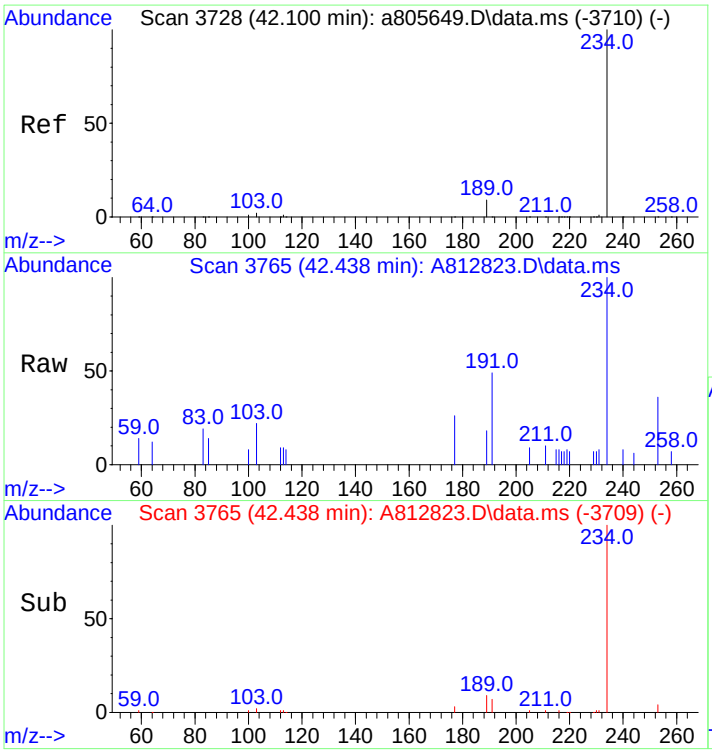


#66
Naphthobenzothiophene
Concen: 8.92 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:234 Resp: 1832

Ion	Ratio	Lower	Upper
234	100		
189	9.2	7.2	10.8

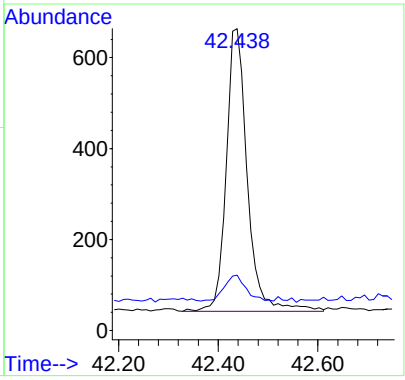


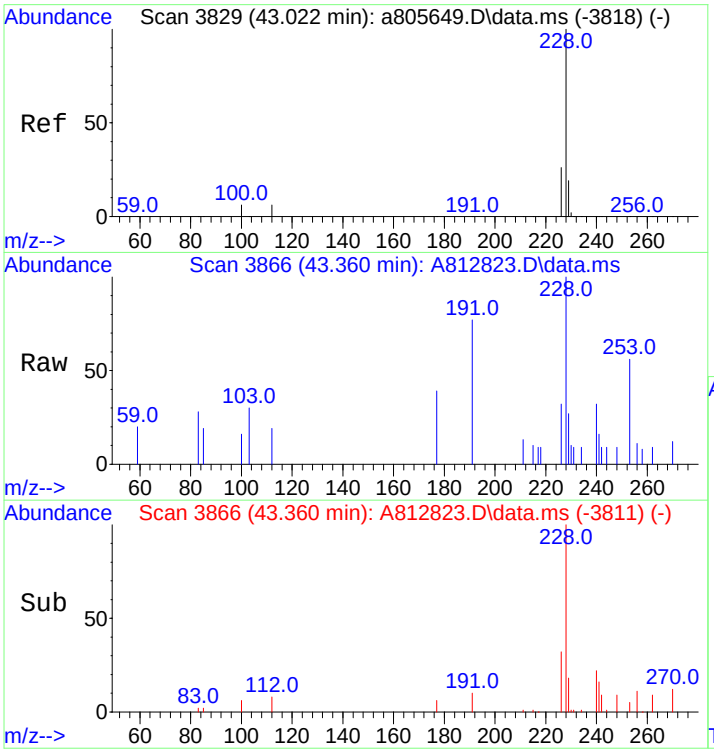


#67
Naphthobenzothiophene-2,1-D
Concen: 8.92 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:234 Resp: 1832

Ion	Ratio	Lower	Upper
234	100		
189	9.2	7.2	10.8

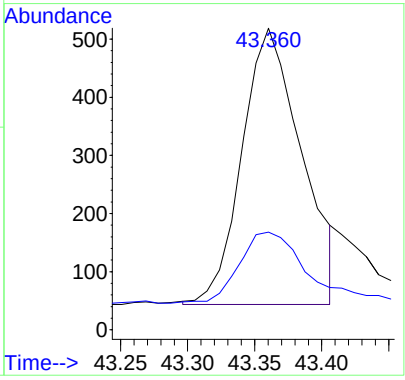


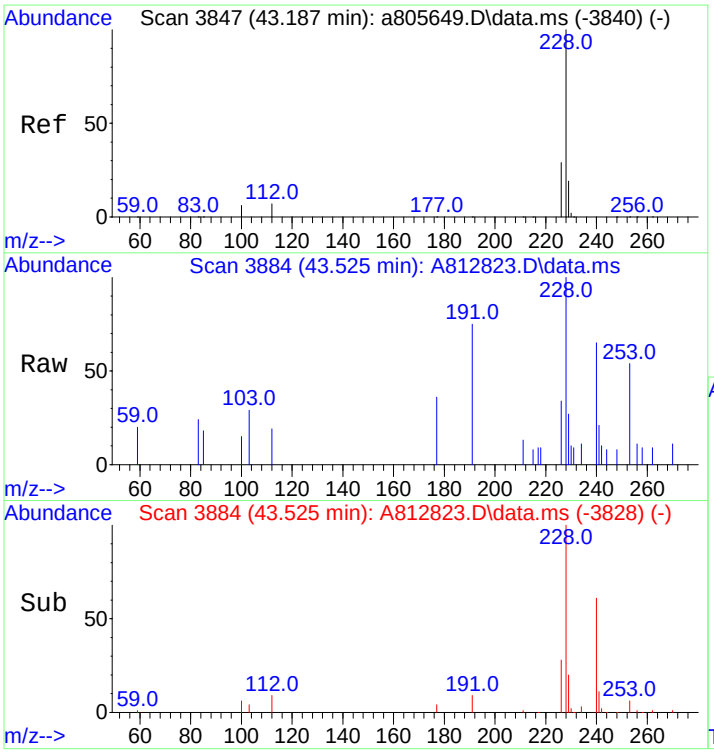


#75
Benz[a]anthracene
Concen: 7.66 ng/mL m
RT: 43.360 min Scan# 3866
Delta R.T. -0.000 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:228 Resp: 1470

Ion	Ratio	Lower	Upper
228	100		
226	27.8	21.3	31.9

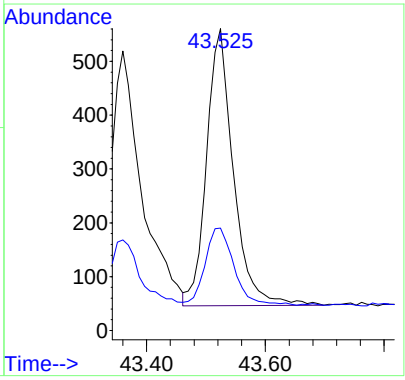


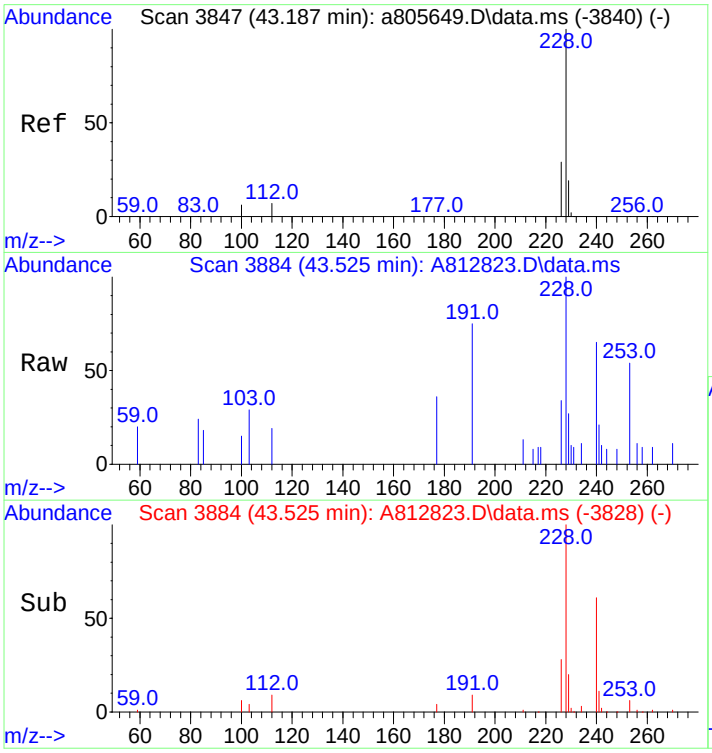


#76
Chrysene
Concen: 8.66 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:228 Resp: 1616

Ion	Ratio	Lower	Upper
228	100		
226	30.3	23.6	35.4

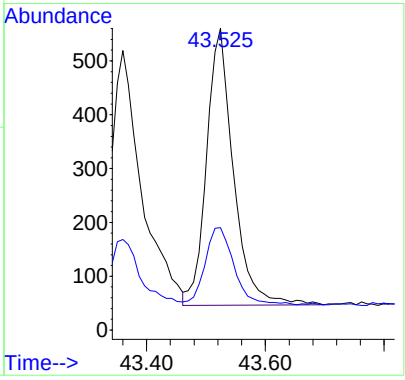


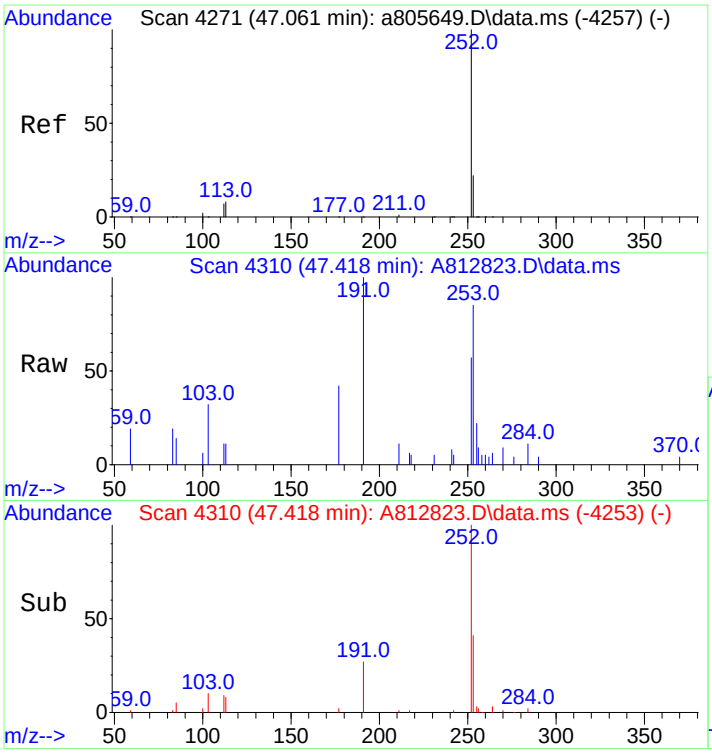


#77
Chrysene/Triphenylene
Concen: 8.66 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:228 Resp: 1616

Ion	Ratio	Lower	Upper
228	100		
226	30.3	23.6	35.4

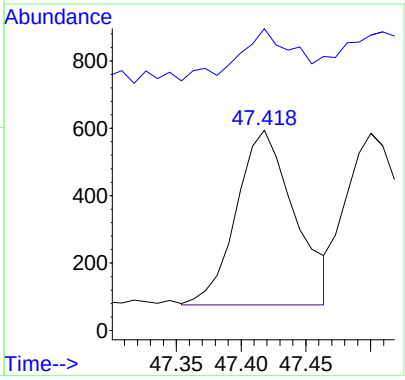


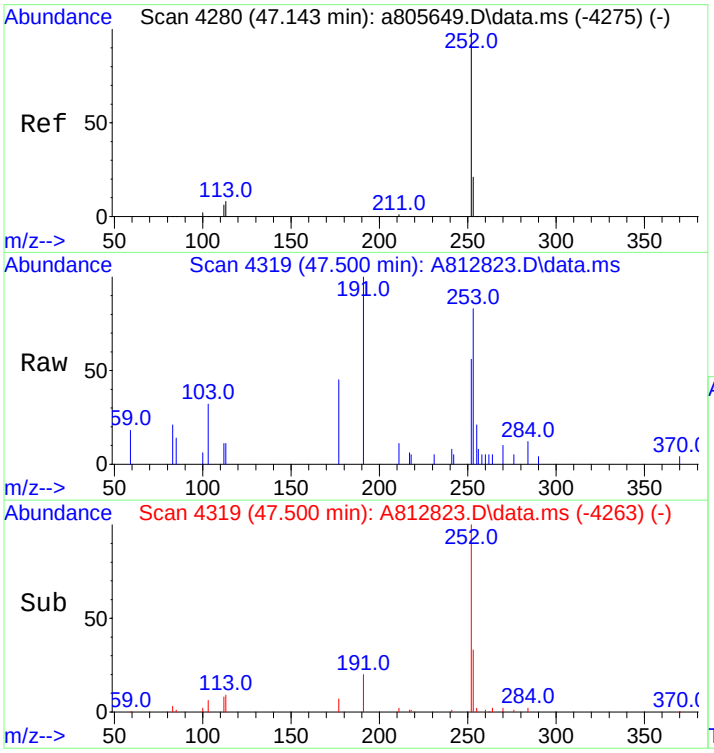


#84
Benzo[b]fluoranthene
Concen: 7.75 ng/mL m
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:252 Resp: 1622

Ion	Ratio	Lower	Upper
252	100		
253	21.1	18.5	27.7

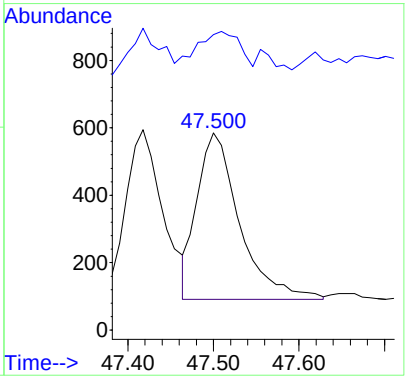


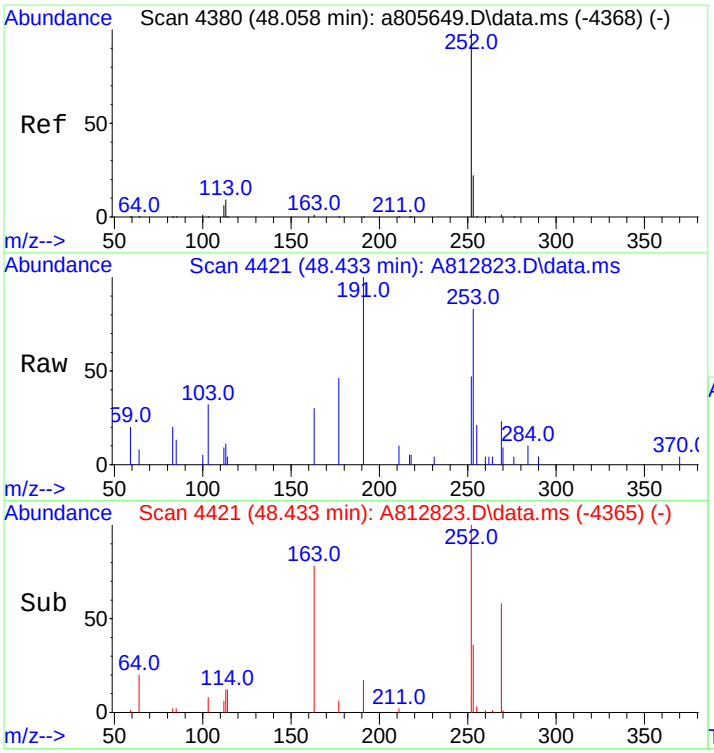


#85
Benzo[j]+[k]fluoranthene
Concen: 7.93 ng/mL m
RT: 47.500 min Scan# 4319
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:252 Resp: 1707

Ion	Ratio	Lower	Upper
252	100		
253	20.1	18.8	28.2

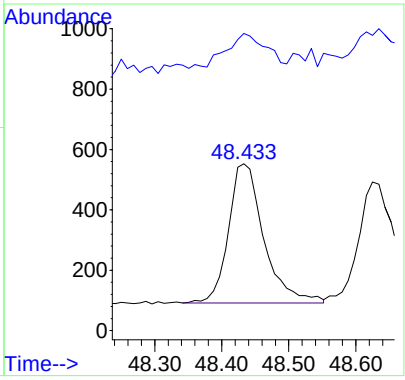


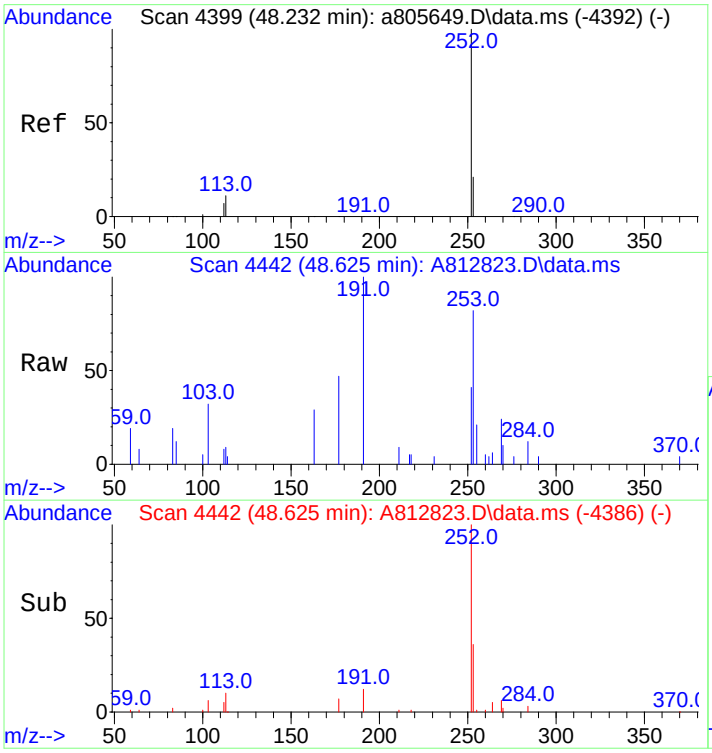


#87
Benzo[e]pyrene
Concen: 8.12 ng/mL
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:252 Resp: 1684

Ion	Ratio	Lower	Upper
252	100		
253	26.2	18.9	28.3

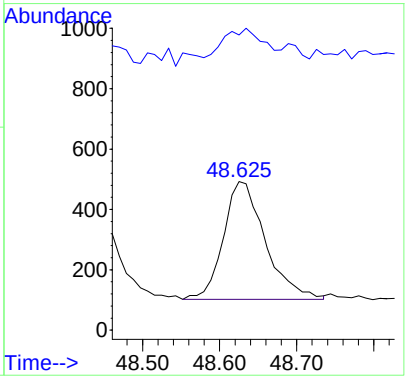


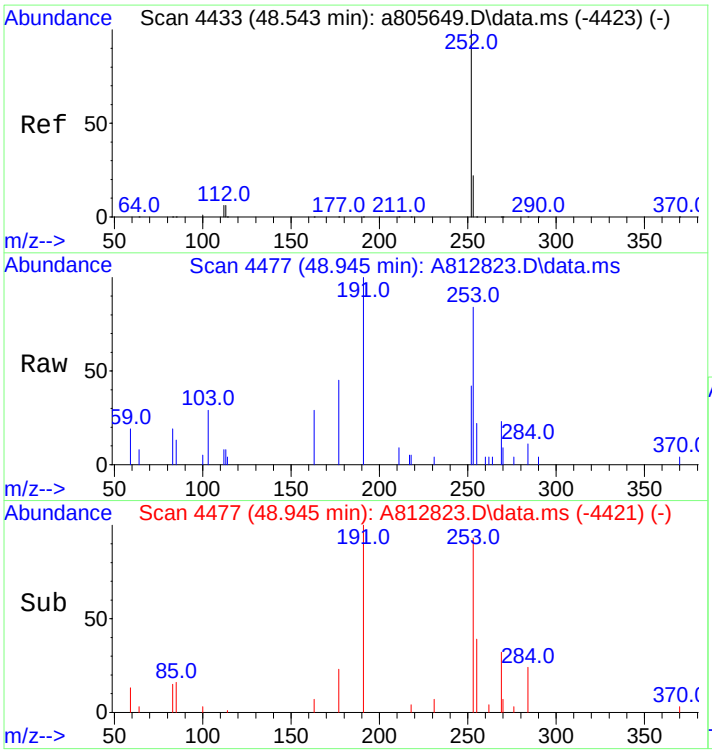


#89
Benzo[a]pyrene
Concen: 7.82 ng/mL
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:252 Resp: 1477

Ion	Ratio	Lower	Upper
252	100		
253	21.6	19.4	29.0

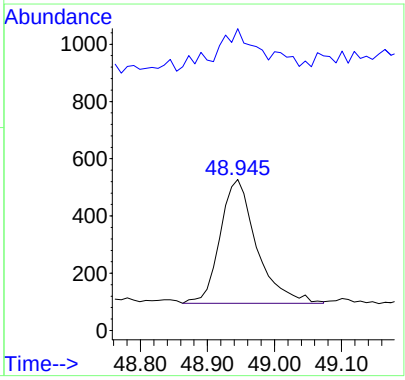


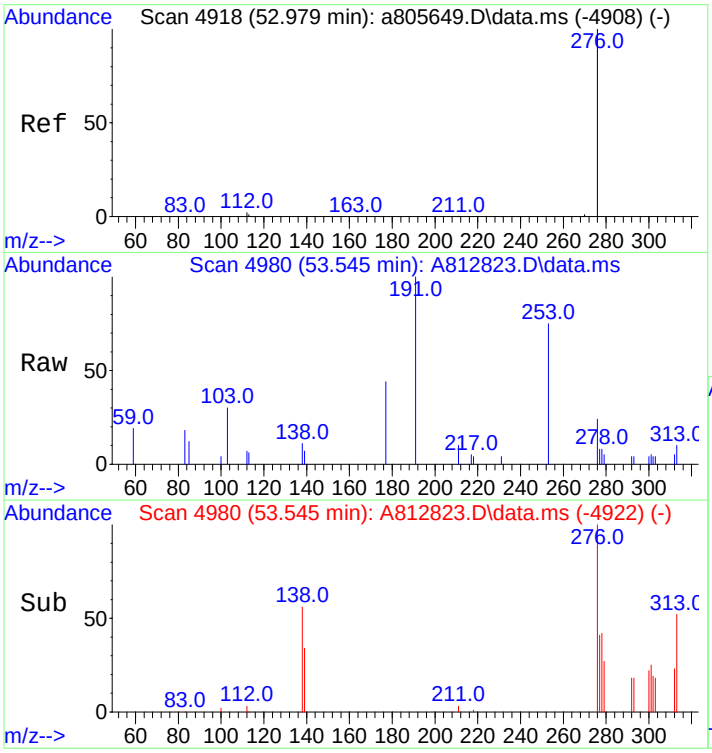


#90
Perylene
Concen: 7.95 ng/mL
RT: 48.945 min Scan# 4477
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:252 Resp: 1641

Ion	Ratio	Lower	Upper
252	100		
253	21.1	19.3	28.9

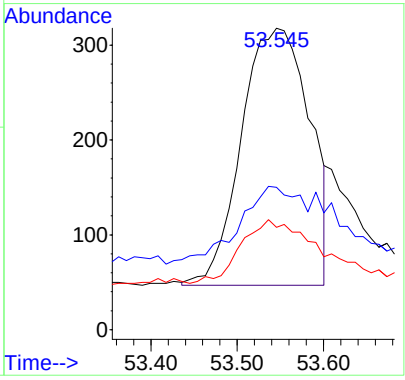


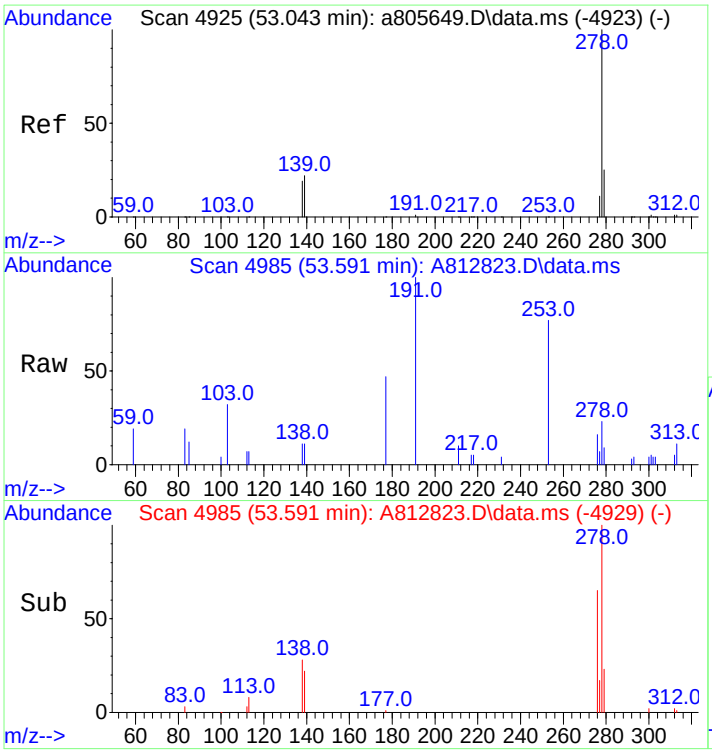


#91
Indeno[1,2,3-cd]pyrene
Concen: 7.06 ng/mL m
RT: 53.545 min Scan# 4980
Delta R.T. 0.027 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:276 Resp: 1487

Ion	Ratio	Lower	Upper
276	100		
138	15.7	19.9	29.9#
277	25.8	19.0	28.6

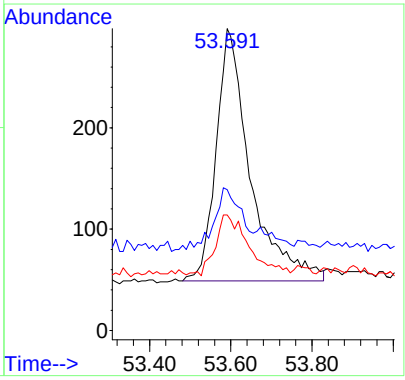


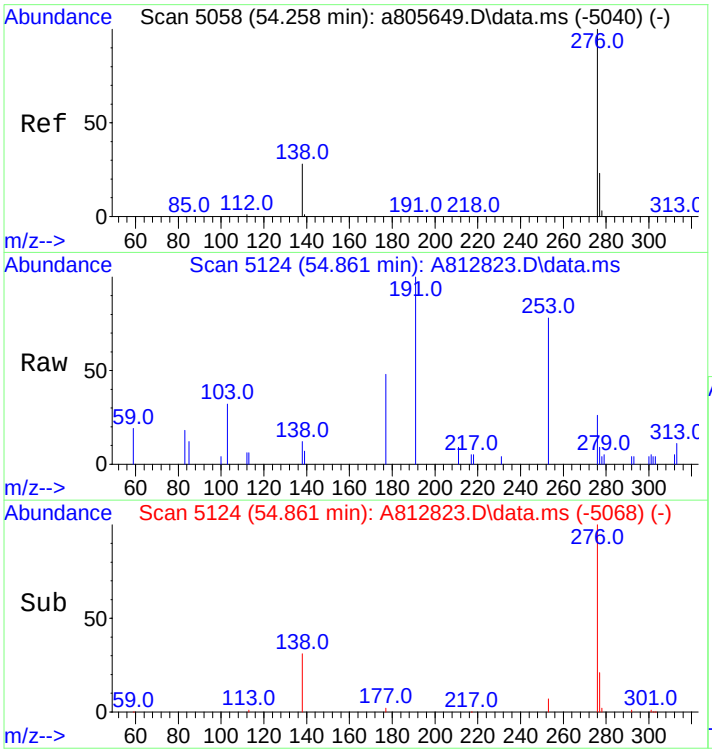


#92
Dibenz[ah]+[ac]anthracene
Concen: 7.66 ng/mL
RT: 53.591 min Scan# 4985
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:278 Resp: 1458

Ion	Ratio	Lower	Upper
278	100		
139	19.1	16.6	25.0
279	23.0	19.1	28.7

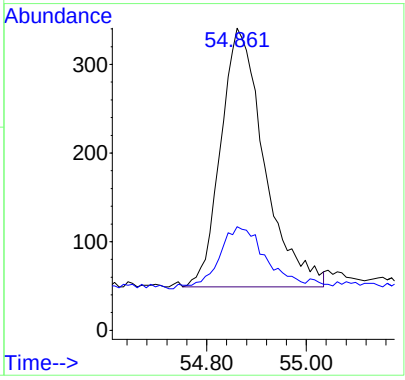


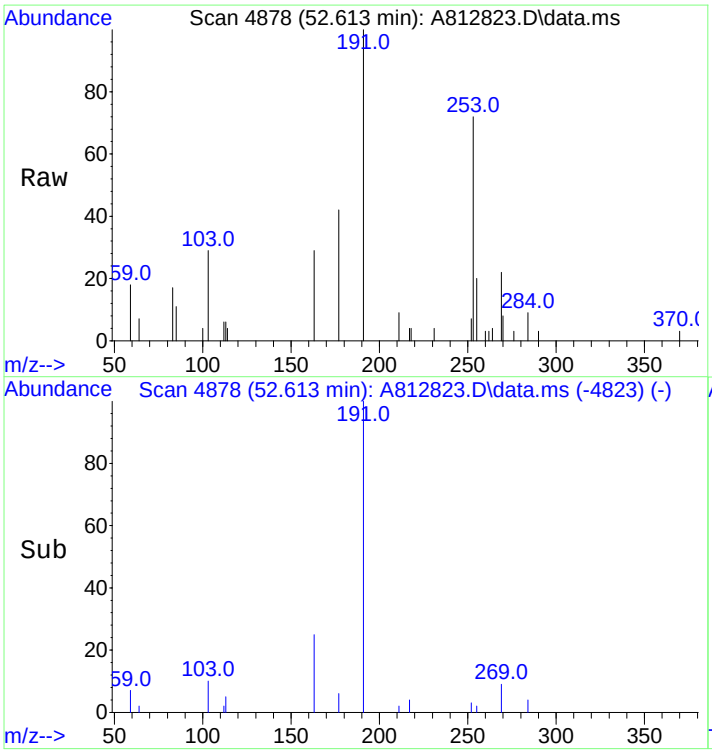


#93
Benzo[g,h,i]perylene
Concen: 7.91 ng/mL
RT: 54.861 min Scan# 5124
Delta R.T. 0.009 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:276 Resp: 1775

Ion	Ratio	Lower	Upper
276	100		
277	25.9	18.9	28.3

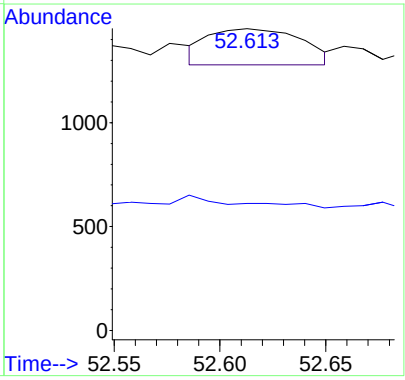


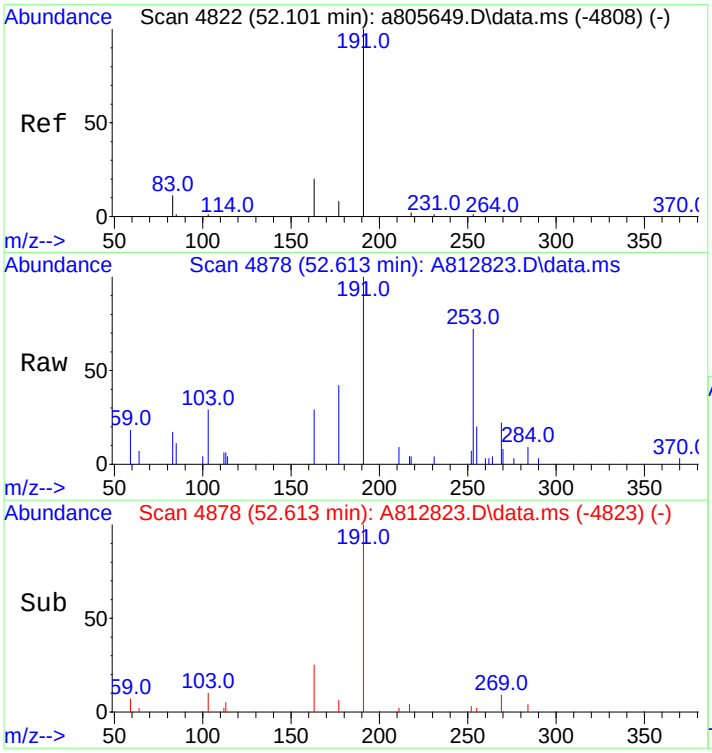


#94
Hopane (T19)
Concen: 8.11 ng/mL m
RT: 52.613 min Scan# 4878
Delta R.T. -0.000 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:191 Resp: 534

Ion	Ratio	Lower	Upper
191	100		
177	0.0	9.8	14.8#

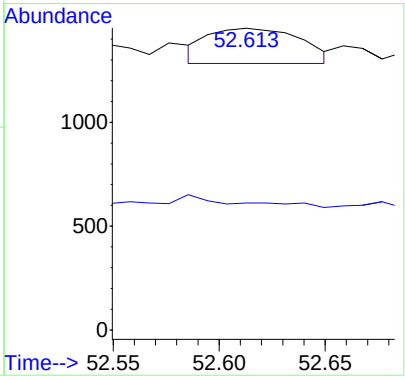




#95
17a(H),21B(H)-hopane - C30H52
Concen: 7.88 ng/mL m
RT: 52.613 min Scan# 4878
Delta R.T. -0.000 min
Lab File: A812823.D
Acq: 18 Nov 2012 9:44 am

Tgt Ion:191 Resp: 519

Ion	Ratio	Lower	Upper
191	100		
177	0.0	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812824.D
Acq On : 18 Nov 2012 11:08 am
Operator : AC
Sample : i811181202
Misc : l2 whaq84
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 19 12:13:33 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

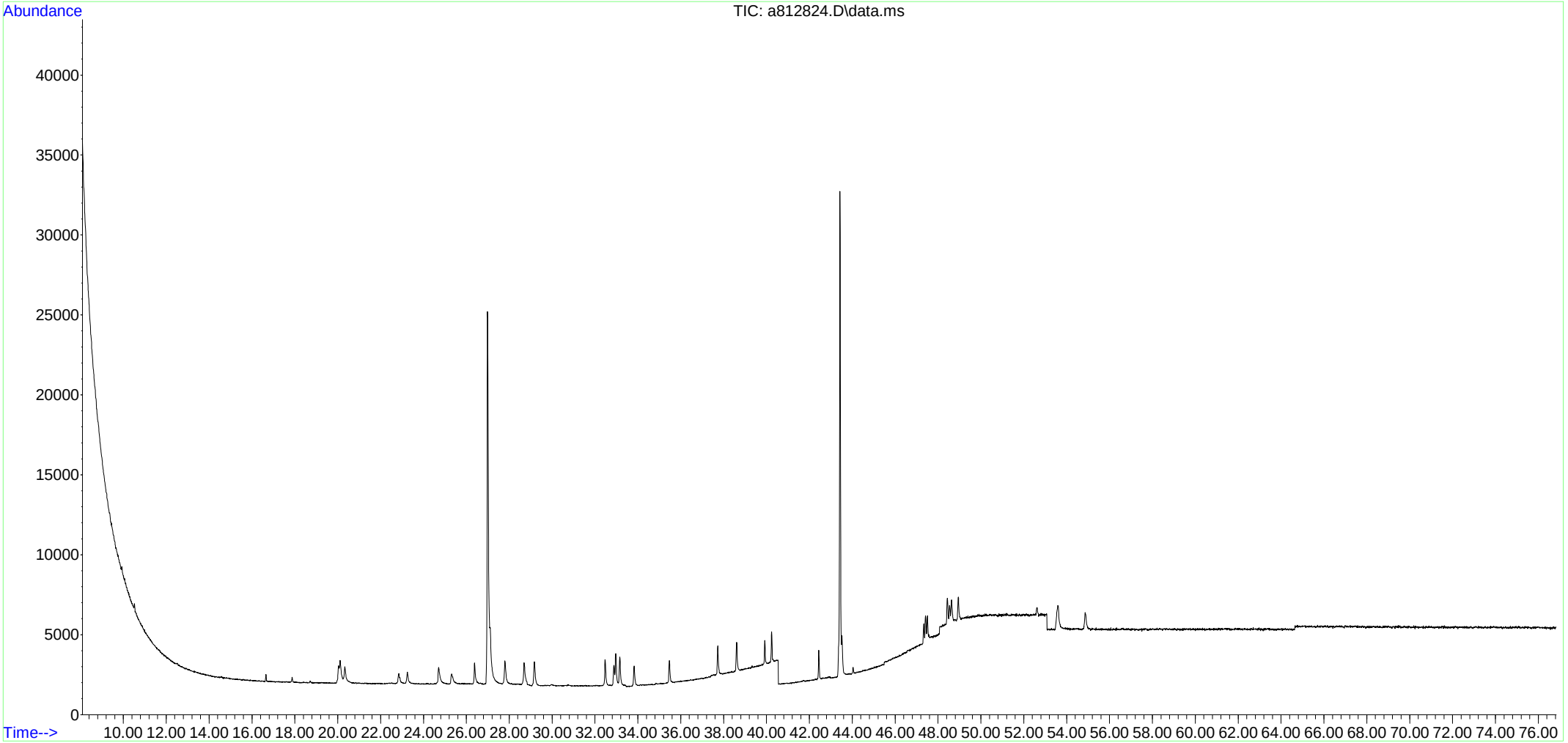
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	50747M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	71340	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.041	136	5427	24.670	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.47%#		
42) Phenanthrene-d10	32.880	188	4305	26.140	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.61%#		
83) Benzo[b]fluoranthene-d12	47.336	264	3090	20.261	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.03%#		
88) Benzo[a]pyrene-d12	48.534	264	3078	21.683	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.17%#		
129) 5B(H)Cholane - Surr	44.036	217	578	20.523	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.05%#		
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	617	13.288	ng/mL	100
4) cis-Decalin	17.870	138	412	11.878	ng/mL	100
10) Naphthalene	20.115	128	6354M3	24.637	ng/mL	
16) 2-Methylnaphthalene	22.843	142	3419	22.498	ng/mL#	100
17) 1-Methylnaphthalene	23.245	142	3101	21.378	ng/mL#	100
18) Benzothiophene	20.334	134	4874	23.764	ng/mL	100
23) Biphenyl	24.705	154	4569	24.331	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.316	156	3077	24.152	ng/mL#	100
25) Dibenzofuran	27.798	168	4936	25.066	ng/mL	98
26) Acenaphthylene	26.384	152	5454M3	23.395	ng/mL	
27) Acenaphthene	27.114	153	3354	24.332	ng/mL	96
28) 2,3,5-Trimethylnaphtha...	28.692	170	2628	24.521	ng/mL	97
29) Fluorene	29.176	166	3597	23.898	ng/mL	100
33) Dibenzothiophene	32.469	184	5122	23.763	ng/mL	97
43) Phenanthrene	32.971	178	4989	23.996	ng/mL	96
54) Retene	39.918	234	980	22.145	ng/mL	97
55) Anthracene	33.154	178	4656M3	23.758	ng/mL	
56) Carbazole	33.820	167	4429	22.594	ng/mL	98
57) 1-Methylphenanthrene	35.463	192	3308	22.907	ng/mL	97
58) Fluoranthene	37.727	202	4832	22.642	ng/mL	99
59) Benzo(b)fluorene	40.238	216	2562	21.242	ng/mL	98
60) Pyrene	38.603	202	4891	22.761	ng/mL	99
66) Naphthobenzothiophene	42.438	234	4245	21.412	ng/ml	99
67) Naphthobenzothiophene-...	42.438	234	4245	21.412	ng/mL	99
75) Benz[a]anthracene	43.360	228	3562M3	18.721	ng/mL	
76) Chrysene	43.525	228	3829	20.712	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	3829	20.712	ng/mL	100
84) Benzo[b]fluoranthene	47.418	252	3806	18.357	ng/mL	91
85) Benzo[j]+[k]fluoranthene	47.500	252	4145	19.417	ng/mL	93
87) Benzo[e]pyrene	48.433	252	4206	20.455	ng/mL	99
89) Benzo[a]pyrene	48.625	252	3814	20.373	ng/mL	98
90) Perylene	48.945	252	4038	19.742	ng/mL	96
91) Indeno[1,2,3-cd]pyrene	53.545	276	3622M3	17.340	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	3514	18.615	ng/mL	96
93) Benzo[g,h,i]perylene	54.870	276	4408	19.807	ng/mL	98
94) Hopane (T19)	52.604	191	1243M3	19.044	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.604	191	1279M3	19.596	ng/mL	

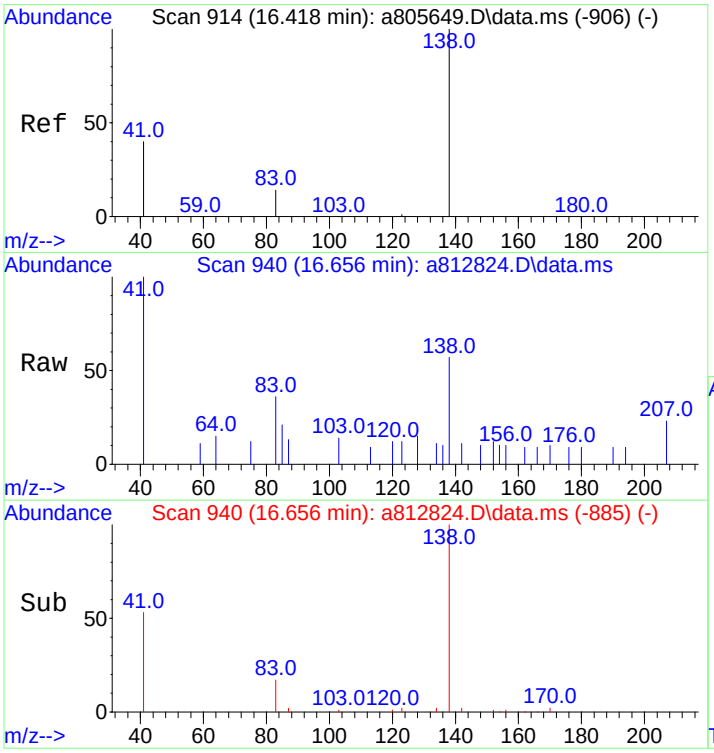
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812824.D
Acq On : 18 Nov 2012 11:08 am
Operator : AC
Sample : i811181202
Misc : l2 whaq84
ALS Vial : 5 Sample Multiplier: 1

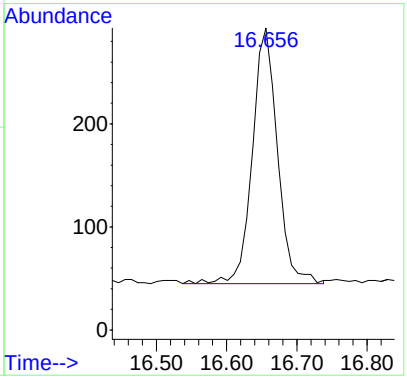
Quant Time: Nov 19 12:13:33 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

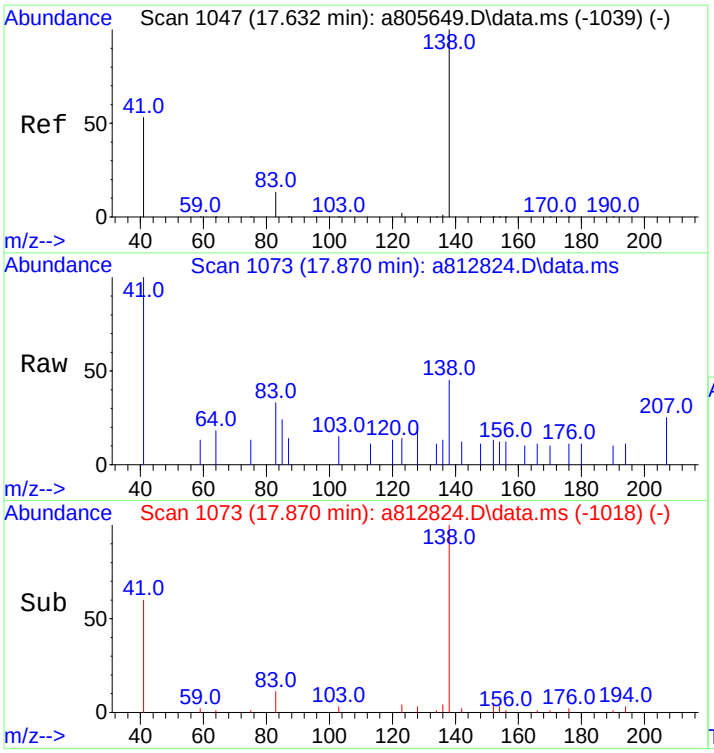




#3
trans-Decalin
Concen: 13.29 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

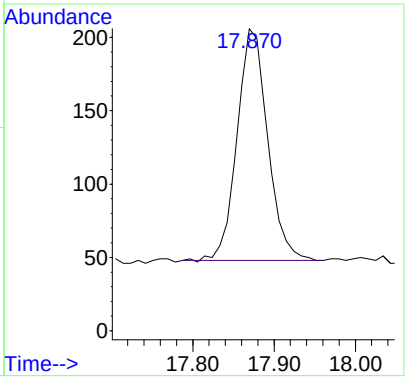
Tgt Ion:138 Resp: 617

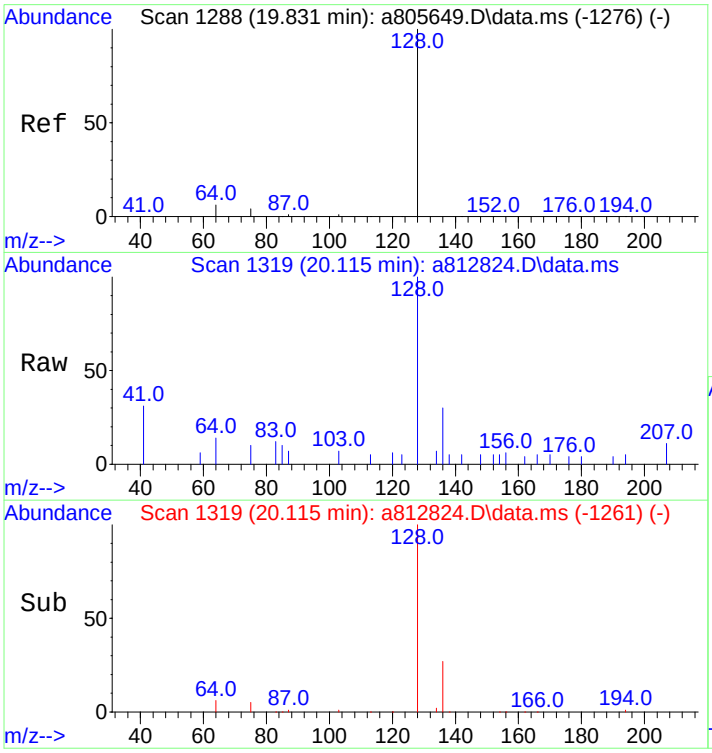




#4
cis-Decalin
Concen: 11.88 ng/mL
RT: 17.870 min Scan# 1073
Delta R.T. -0.000 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:138 Resp: 412

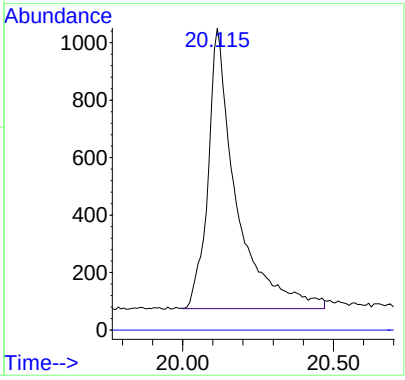


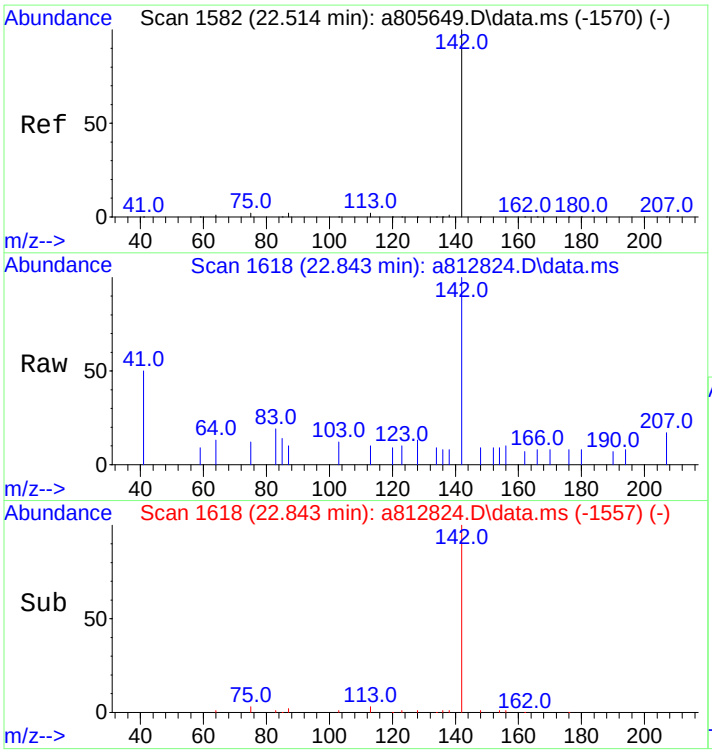


#10
Naphthalene
Concen: 24.64 ng/mL m
RT: 20.115 min Scan# 1319
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:128 Resp: 6354

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

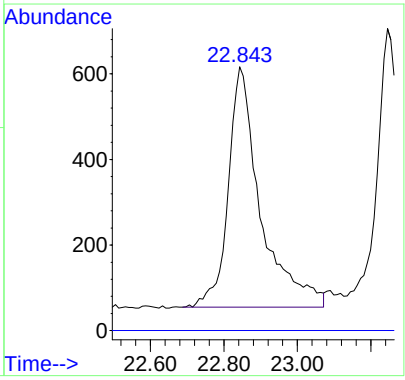


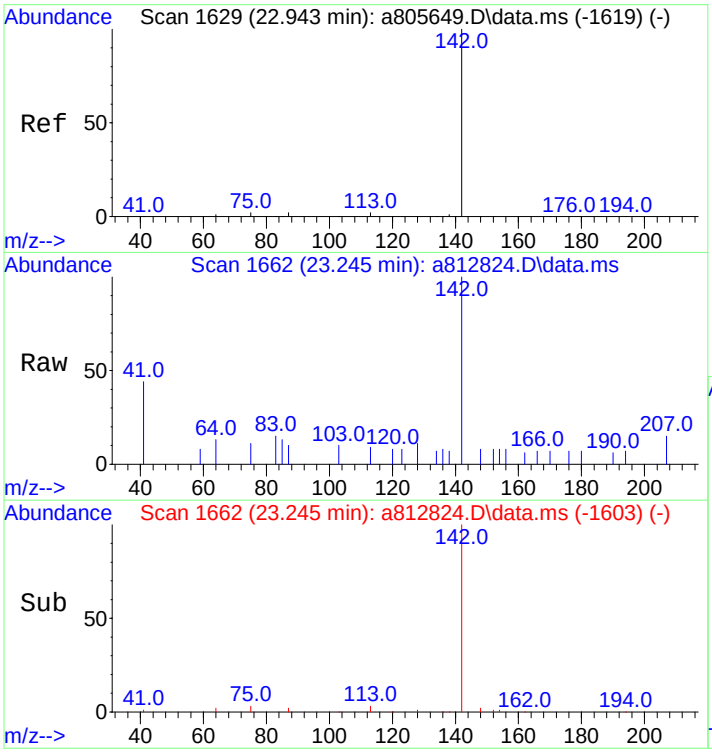


#16
2-Methylnaphthalene
Concen: 22.50 ng/mL
RT: 22.843 min Scan# 1618
Delta R.T. 0.055 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:142 Resp: 3419

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

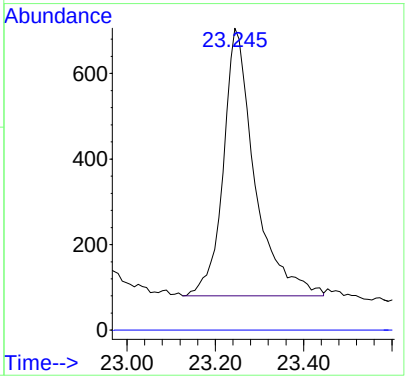


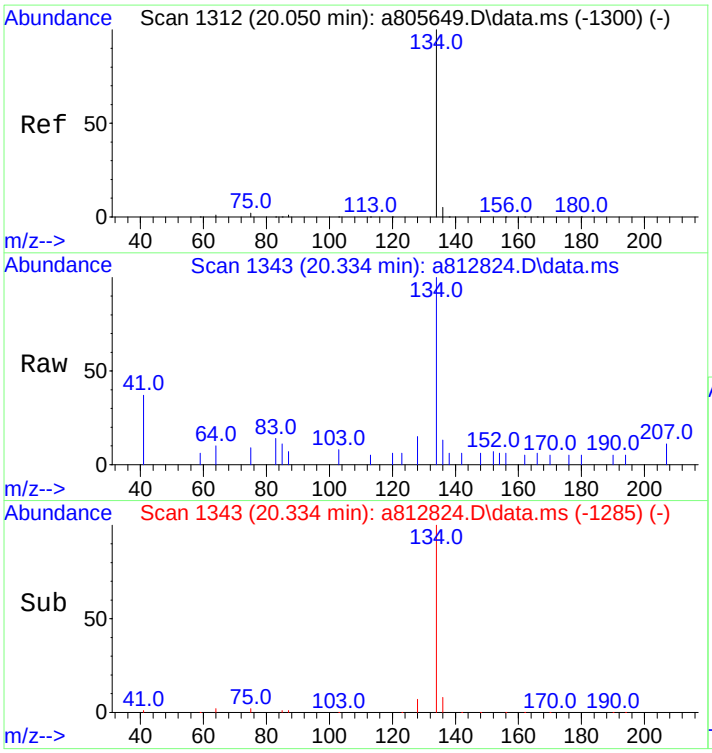


#17
1-Methylnaphthalene
Concen: 21.38 ng/mL
RT: 23.245 min Scan# 1662
Delta R.T. 0.036 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:142 Resp: 3101

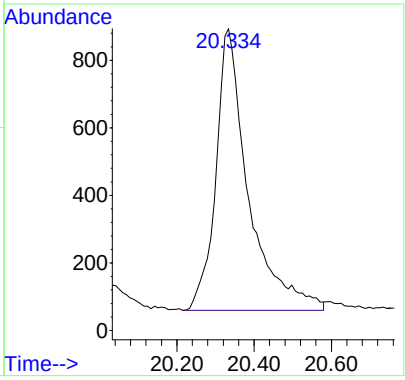
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

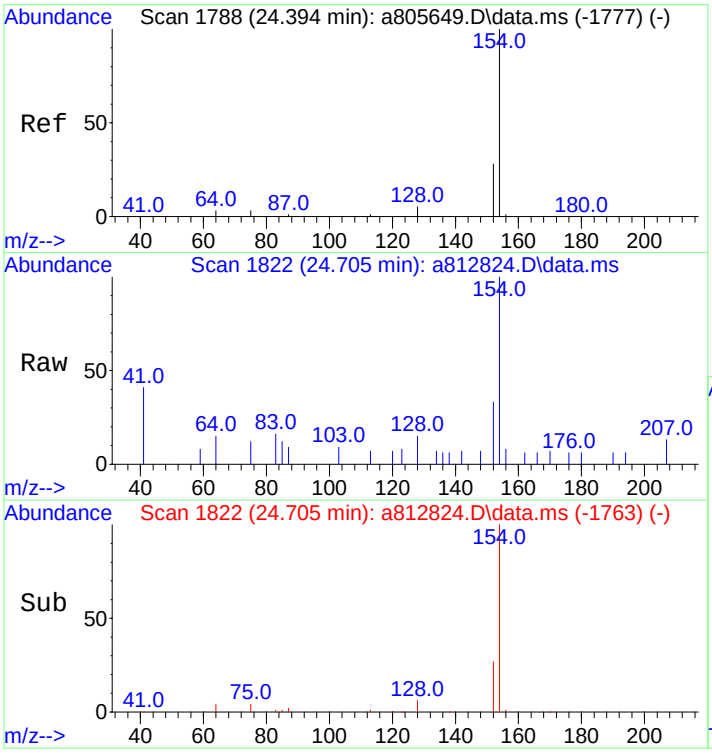




#18
Benzothiophene
Concen: 23.76 ng/mL
RT: 20.334 min Scan# 1343
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:134 Resp: 4874

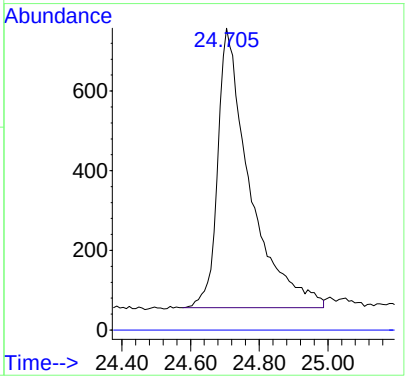


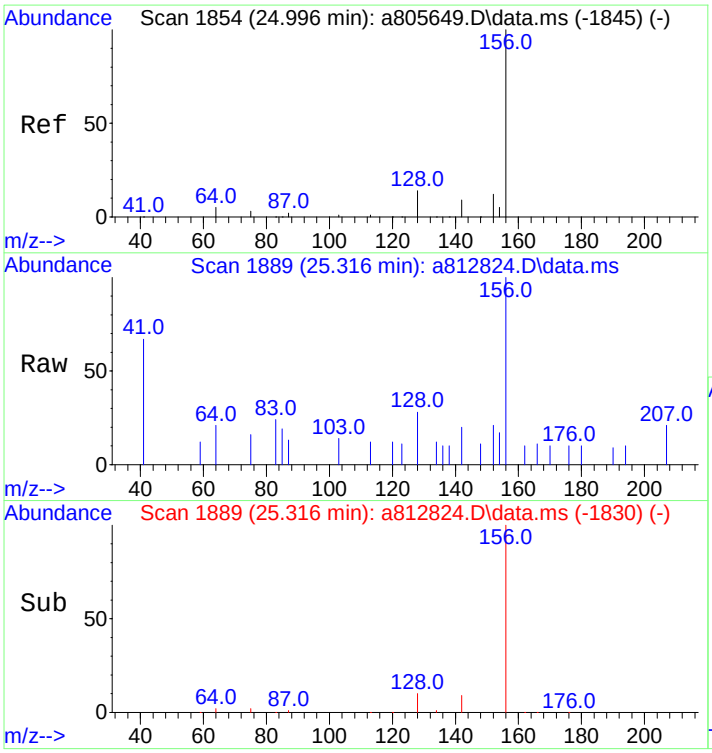


#23
Biphenyl
Concen: 24.33 ng/mL
RT: 24.705 min Scan# 1822
Delta R.T. 0.036 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:154 Resp: 4569

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

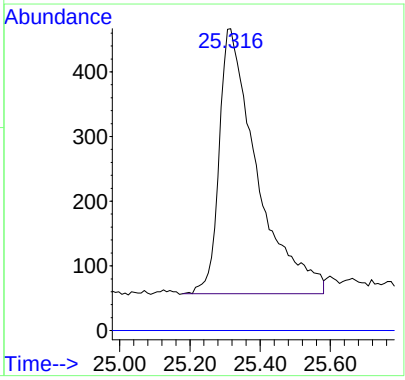


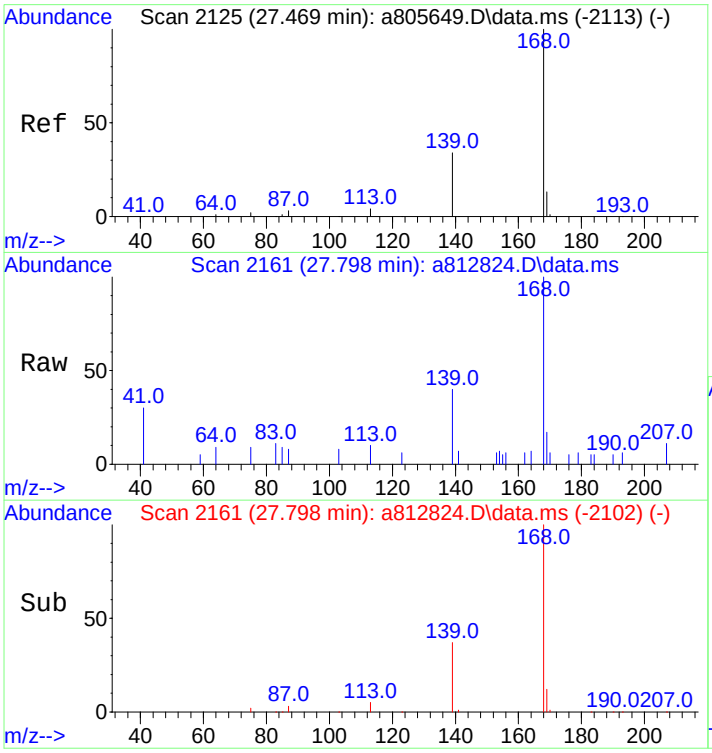


#24
2,6-Dimethylnaphthalene
Concen: 24.15 ng/mL
RT: 25.316 min Scan# 1889
Delta R.T. 0.036 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:156 Resp: 3077

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

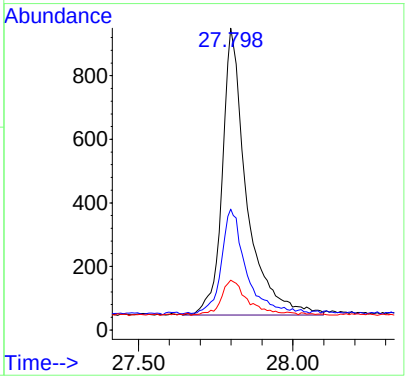


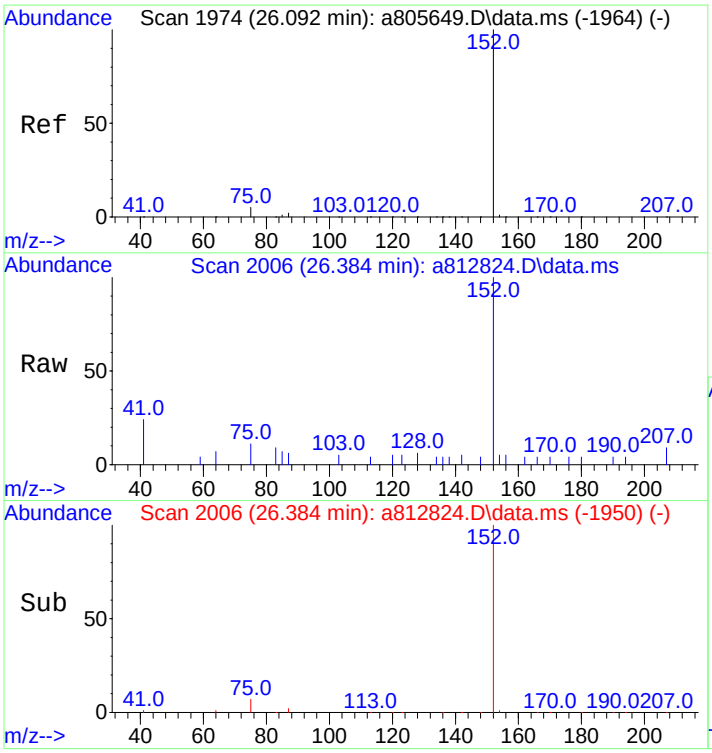


#25
Dibenzofuran
Concen: 25.07 ng/mL
RT: 27.798 min Scan# 2161
Delta R.T. 0.036 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:168 Resp: 4936

Ion	Ratio	Lower	Upper
168	100		
139	36.5	28.0	42.0
169	12.2	10.6	15.8

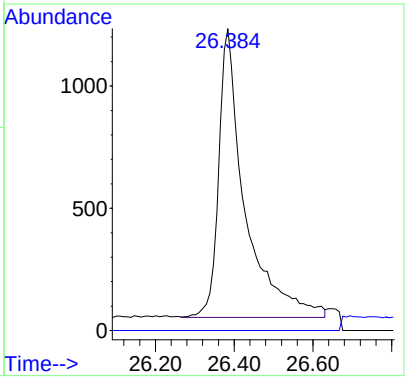


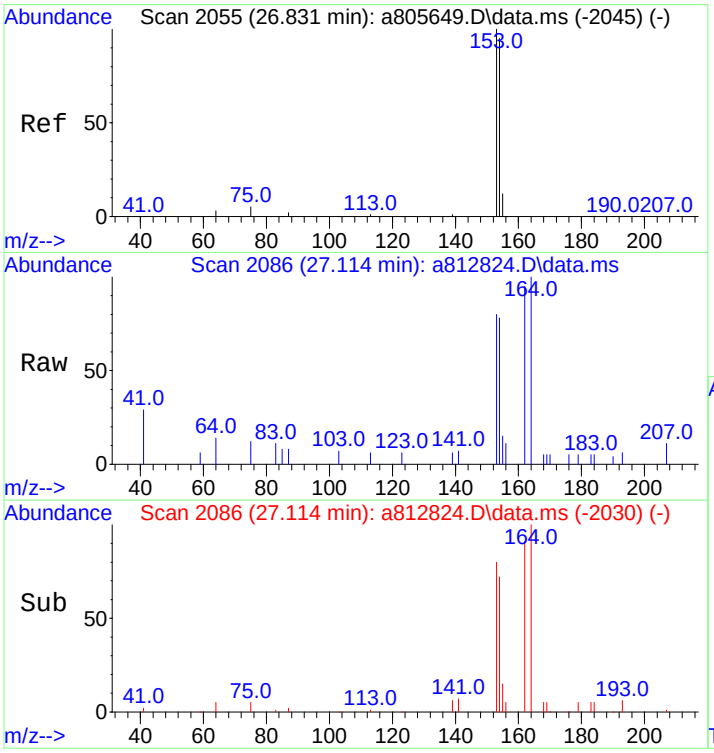


#26
Acenaphthylene
Concen: 23.40 ng/mL m
RT: 26.384 min Scan# 2006
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:152 Resp: 5454

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

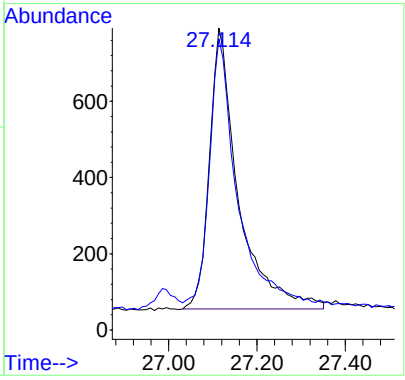


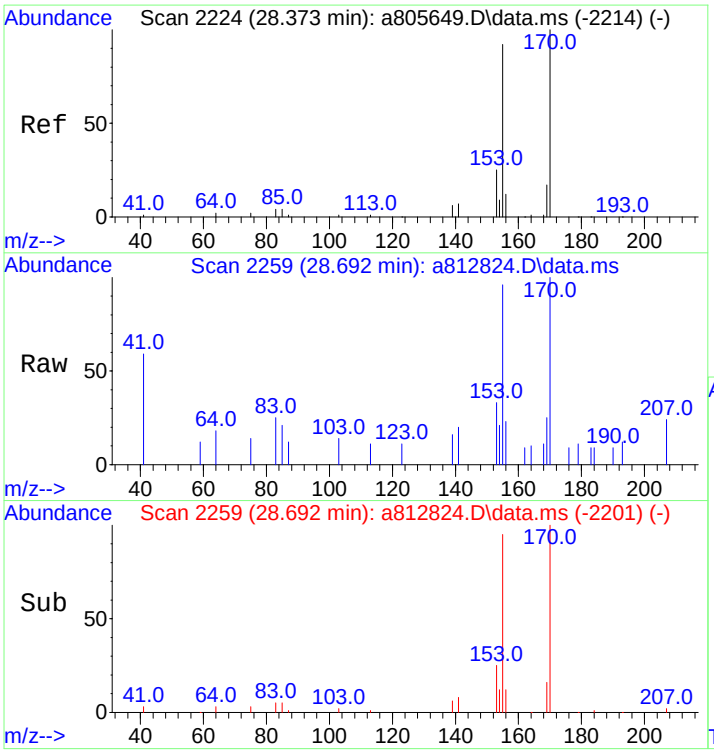


#27
Acenaphthene
Concen: 24.33 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:153 Resp: 3354

Ion	Ratio	Lower	Upper
153	100		
154	90.3	75.4	113.2

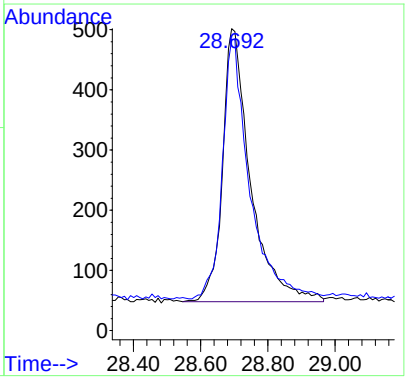


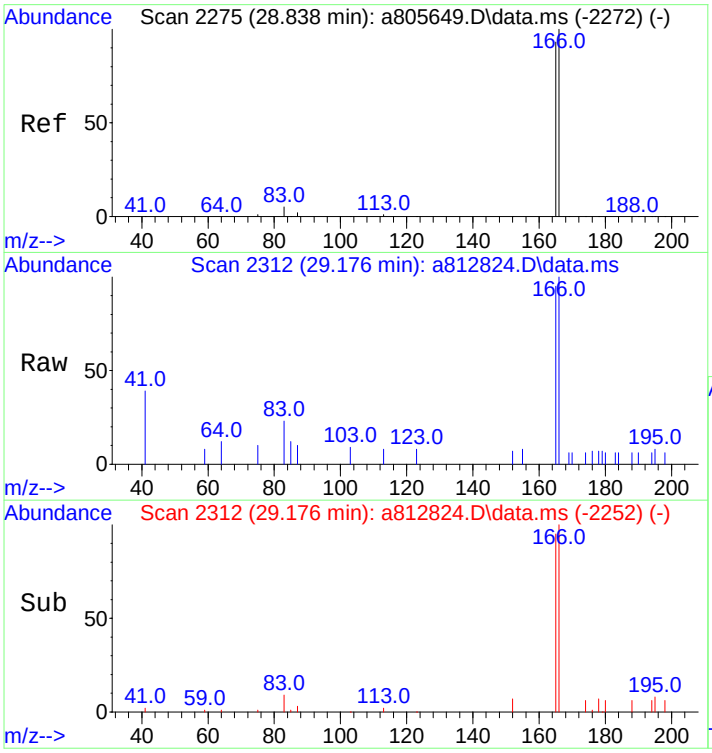


#28
2,3,5-Trimethylnaphthalene
Concen: 24.52 ng/mL
RT: 28.692 min Scan# 2259
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:170 Resp: 2628

Ion	Ratio	Lower	Upper
170	100		
155	92.3	71.7	107.5

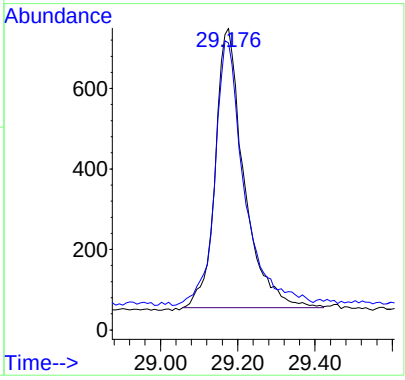


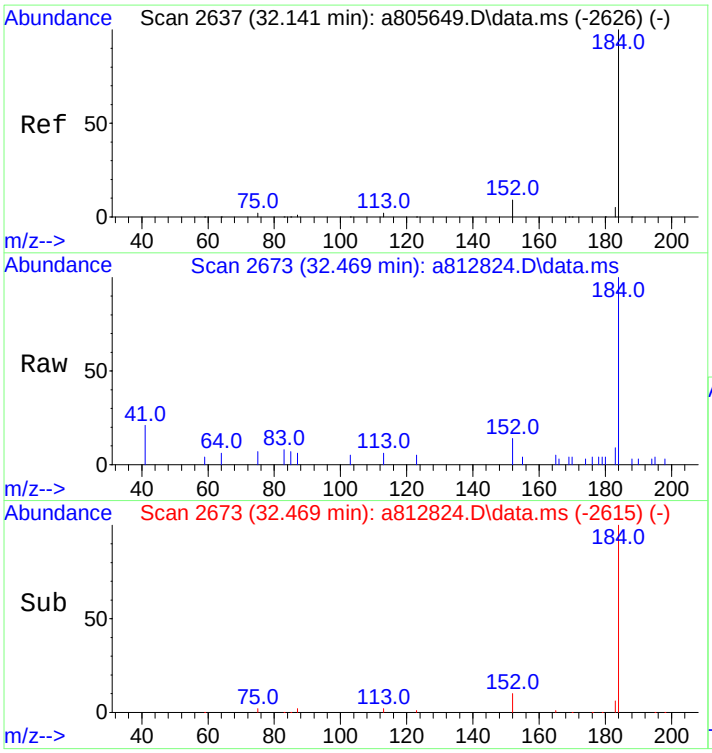


#29
Fluorene
Concen: 23.90 ng/mL
RT: 29.176 min Scan# 2312
Delta R.T. 0.046 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:166 Resp: 3597

Ion	Ratio	Lower	Upper
166	100		
165	93.0	74.2	111.2

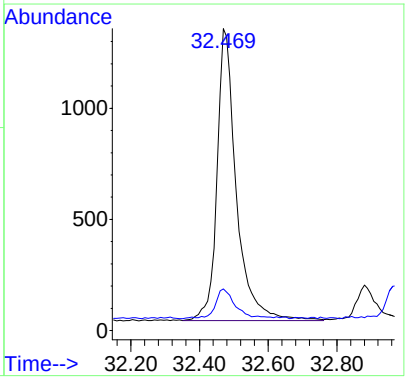


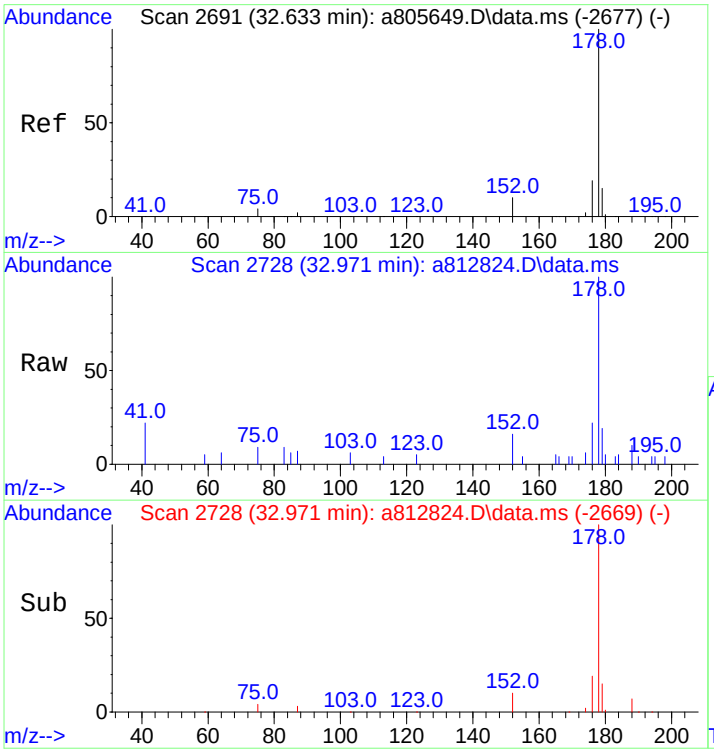


#33
Dibenzothiophene
Concen: 23.76 ng/mL
RT: 32.469 min Scan# 2673
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:184 Resp: 5122

Ion	Ratio	Lower	Upper
184	100		
152	10.8	7.8	11.8

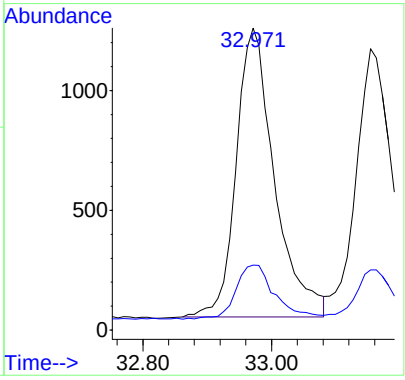


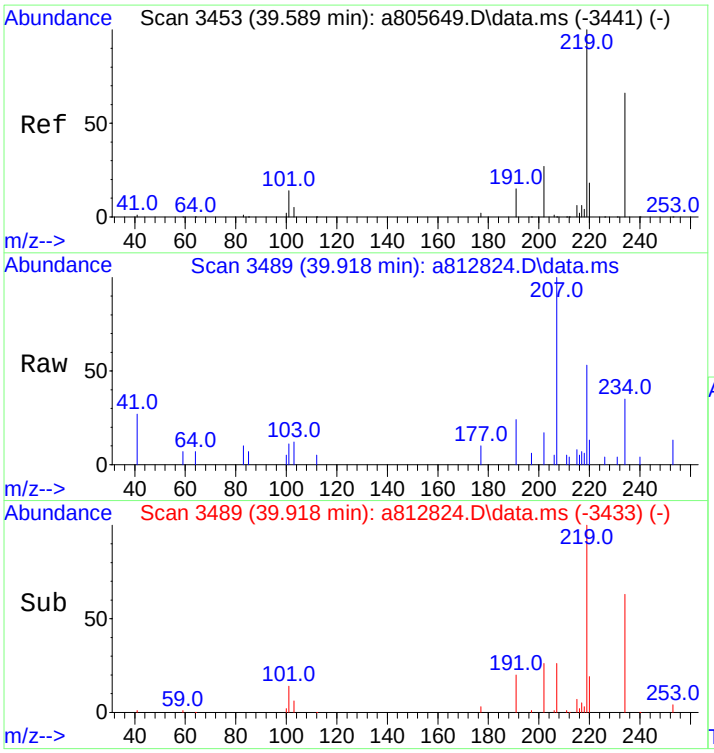


#43
Phenanthrene
Concen: 24.00 ng/mL
RT: 32.971 min Scan# 2728
Delta R.T. 0.036 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:178 Resp: 4989

Ion	Ratio	Lower	Upper
178	100		
176	17.3	15.2	22.8

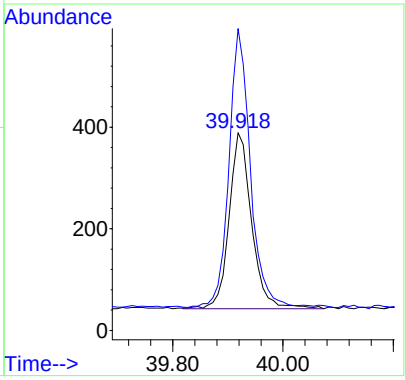


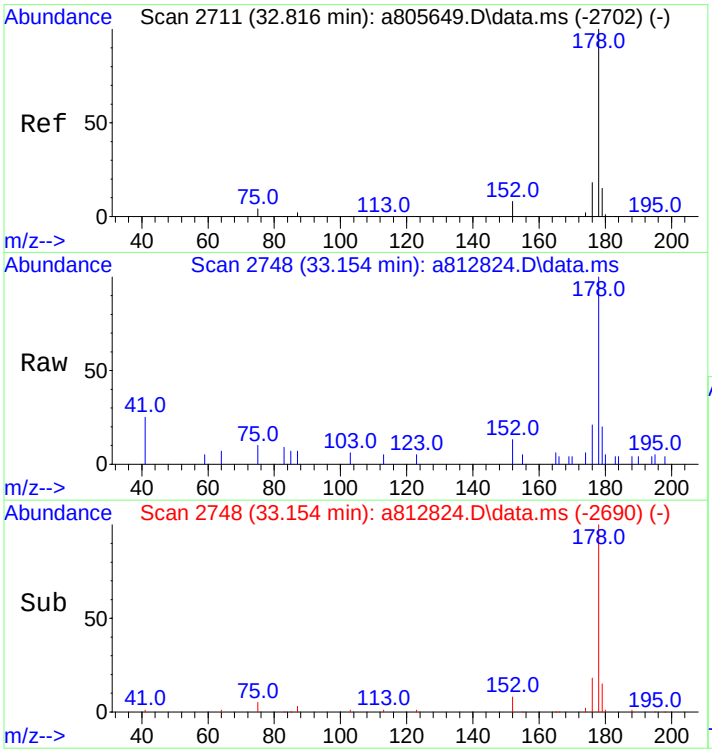


#54
Retene
Concen: 22.15 ng/mL
RT: 39.918 min Scan# 3489
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:234 Resp: 980

Ion	Ratio	Lower	Upper
234	100		
219	150.6	124.0	186.0

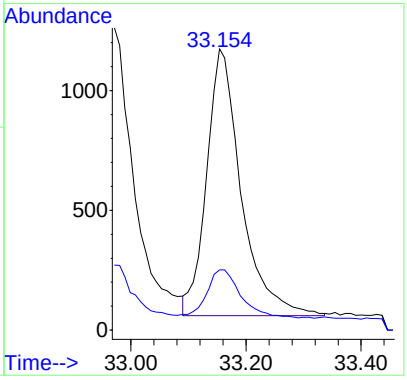


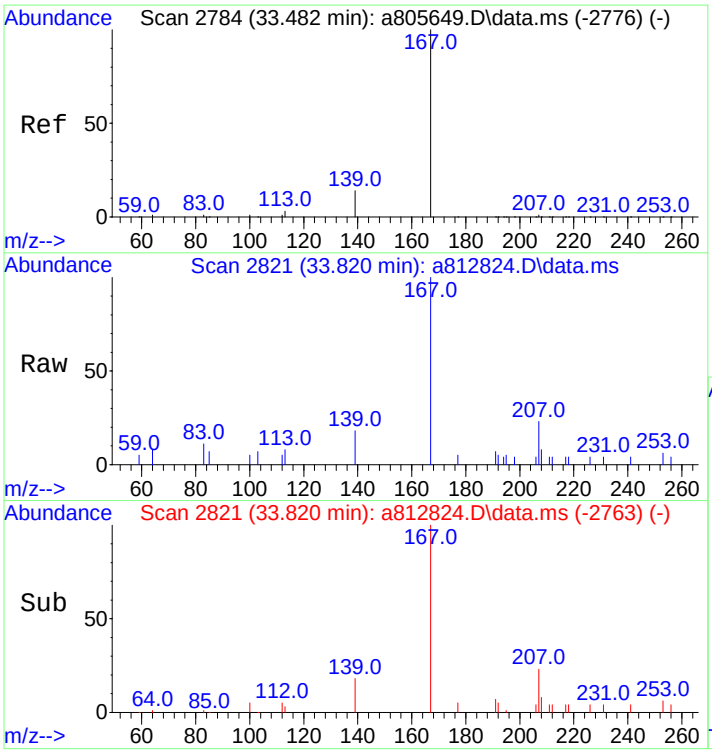


#55
Anthracene
Concen: 23.76 ng/mL m
RT: 33.154 min Scan# 2748
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:178 Resp: 4656

Ion	Ratio	Lower	Upper
178	100		
176	18.1	14.3	21.5

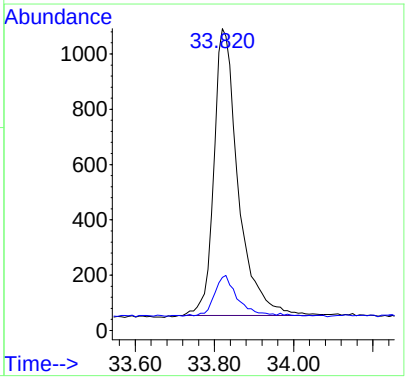


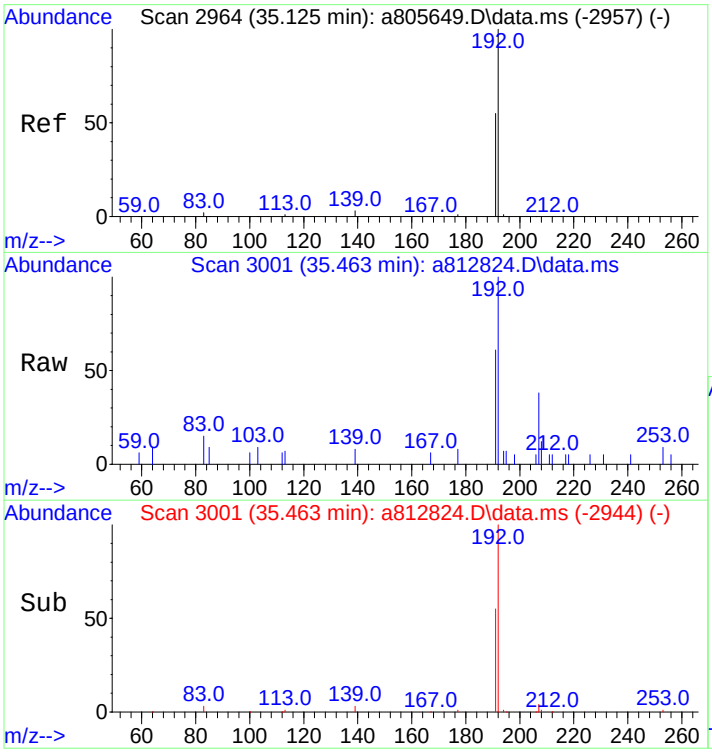


#56
Carbazole
Concen: 22.59 ng/mL
RT: 33.820 min Scan# 2821
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:167 Resp: 4429

Ion	Ratio	Lower	Upper
167	100		
139	12.3	10.6	16.0

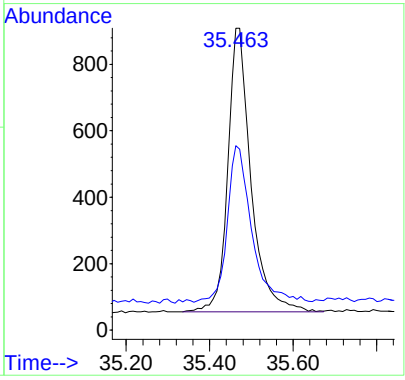


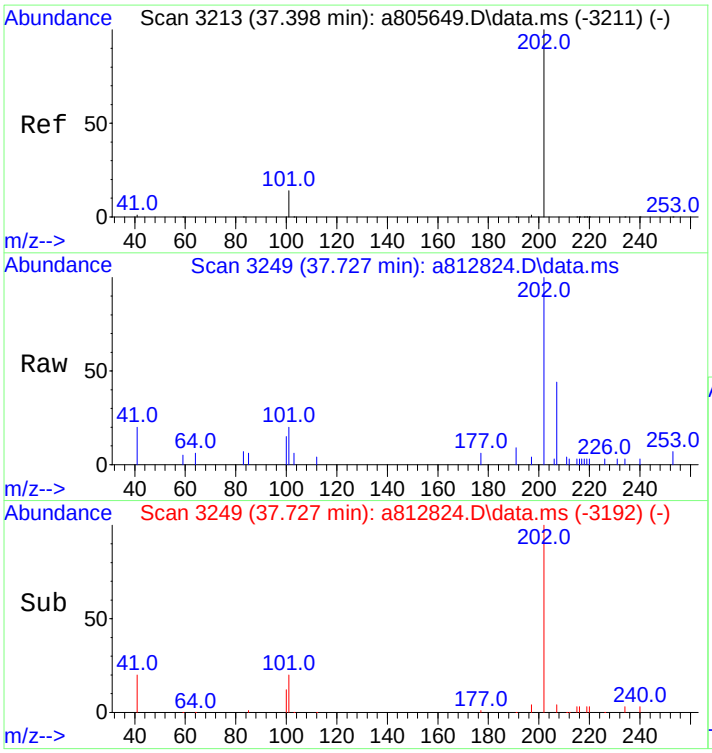


#57
1-Methylphenanthrene
Concen: 22.91 ng/mL
RT: 35.463 min Scan# 3001
Delta R.T. 0.018 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:192 Resp: 3308

Ion	Ratio	Lower	Upper
192	100		
191	57.8	44.2	66.4

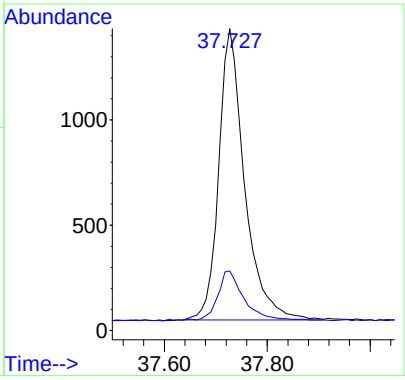


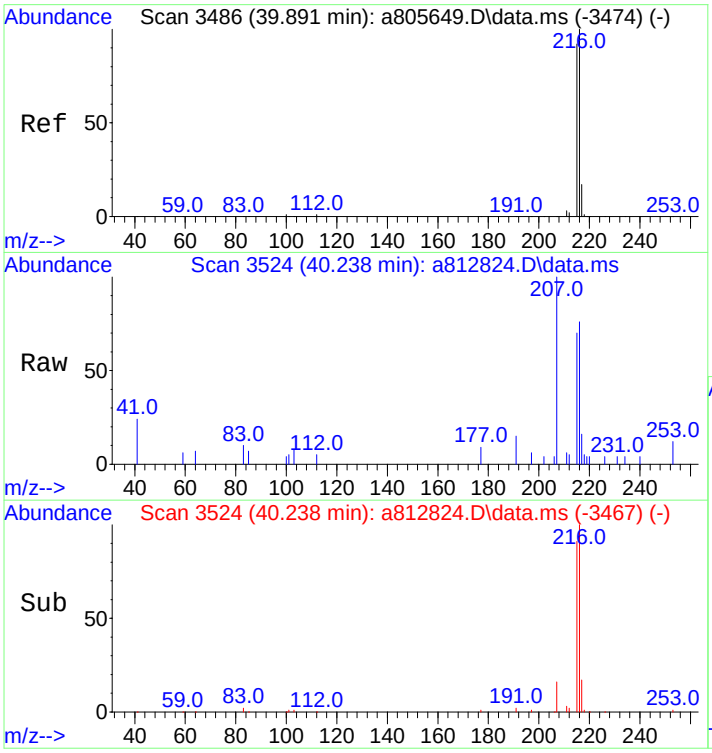


#58
Fluoranthene
Concen: 22.64 ng/mL
RT: 37.727 min Scan# 3249
Delta R.T. 0.018 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:202 Resp: 4832

Ion	Ratio	Lower	Upper
202	100		
101	16.5	13.6	20.4

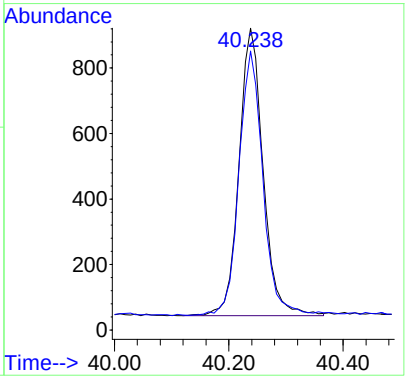


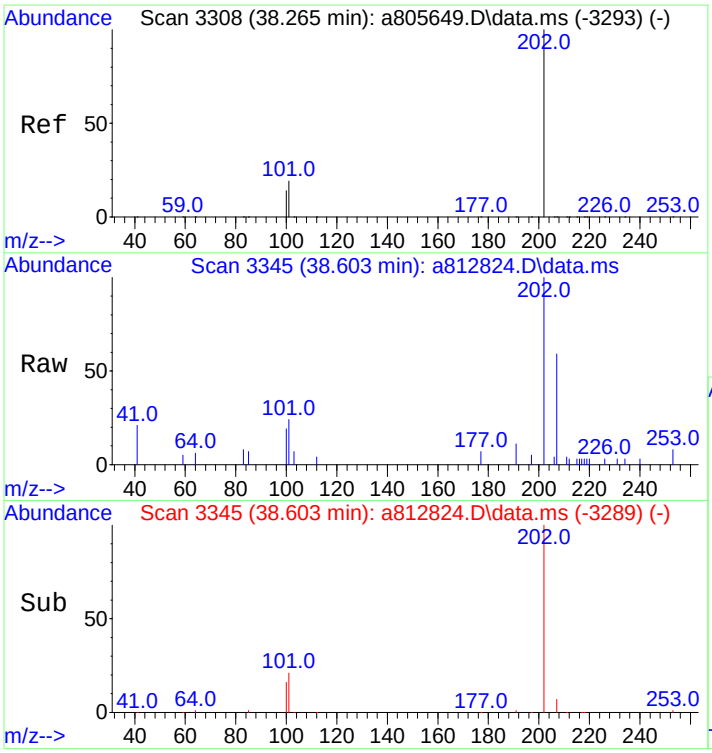


#59
Benzo(b)fluorene
Concen: 21.24 ng/mL
RT: 40.238 min Scan# 3524
Delta R.T. 0.018 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:216 Resp: 2562

Ion	Ratio	Lower	Upper
216	100		
215	91.3	74.2	111.2

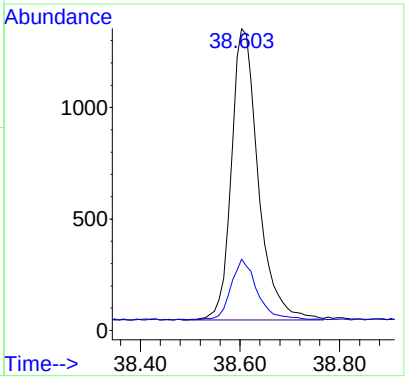


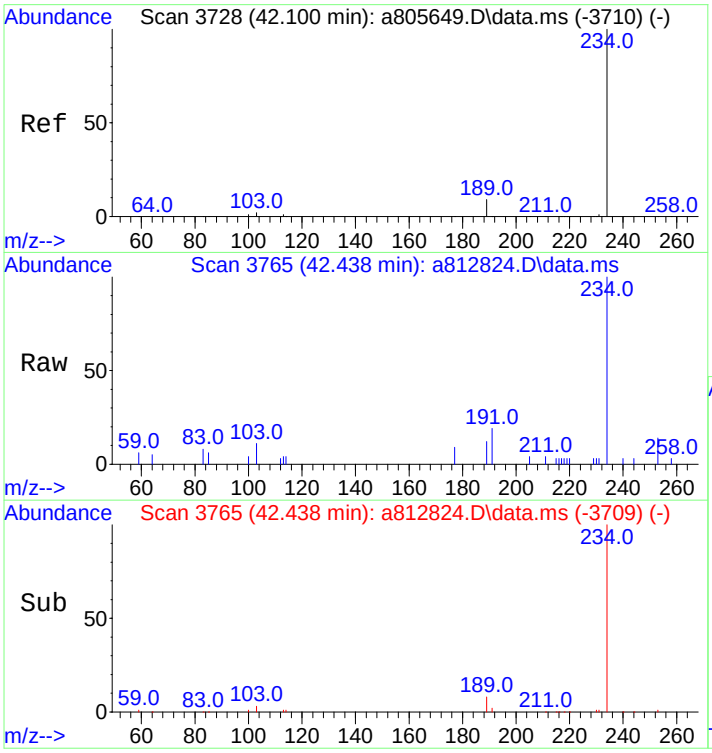


#60
Pyrene
Concen: 22.76 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:202 Resp: 4891

Ion	Ratio	Lower	Upper
202	100		
101	19.9	15.4	23.2

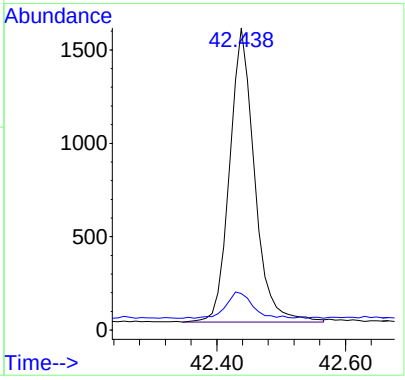


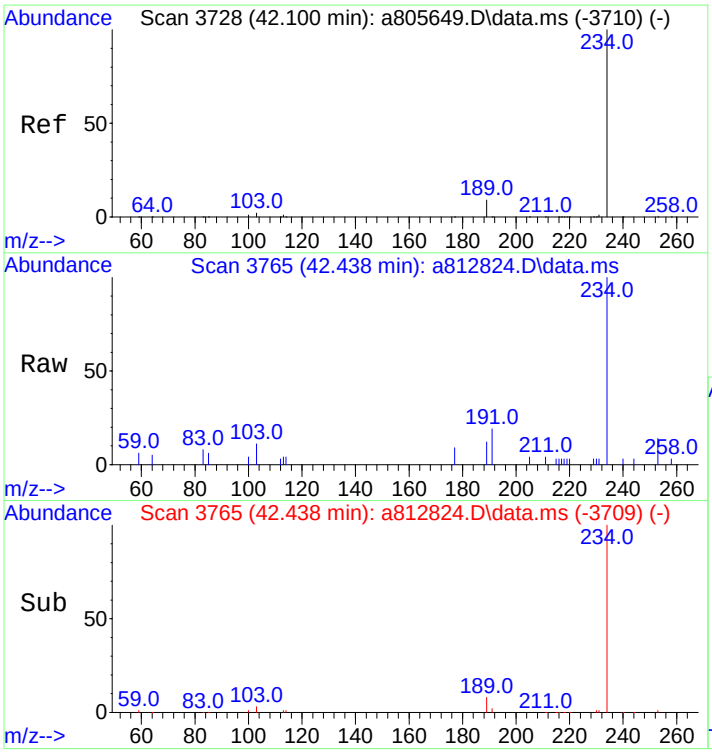


#66
Naphthobenzothiophene
Concen: 21.41 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:234 Resp: 4245

Ion	Ratio	Lower	Upper
234	100		
189	9.5	7.2	10.8

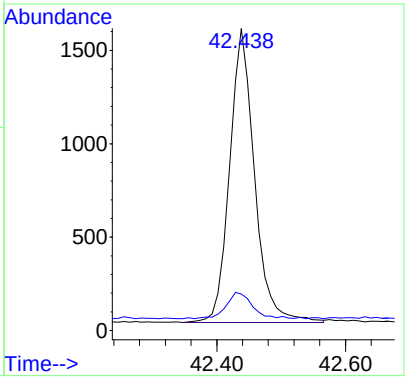


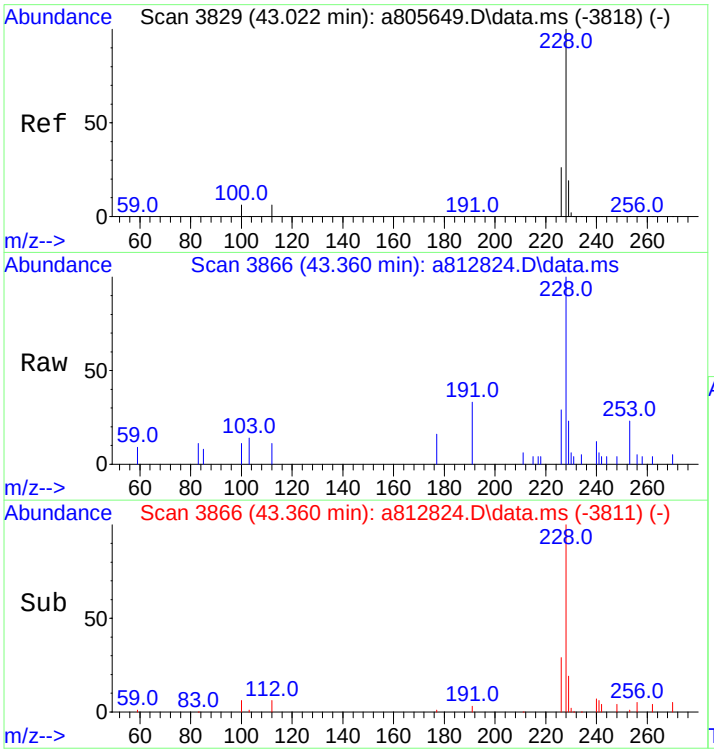


#67
Naphthobenzothiophene-2,1-D
Concen: 21.41 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:234 Resp: 4245

Ion	Ratio	Lower	Upper
234	100		
189	9.5	7.2	10.8

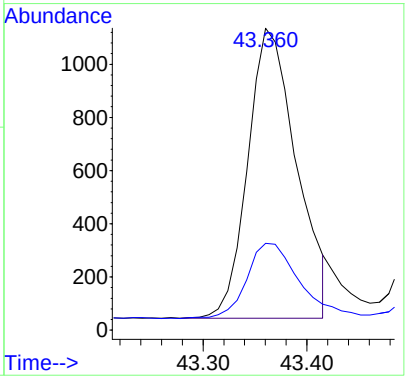


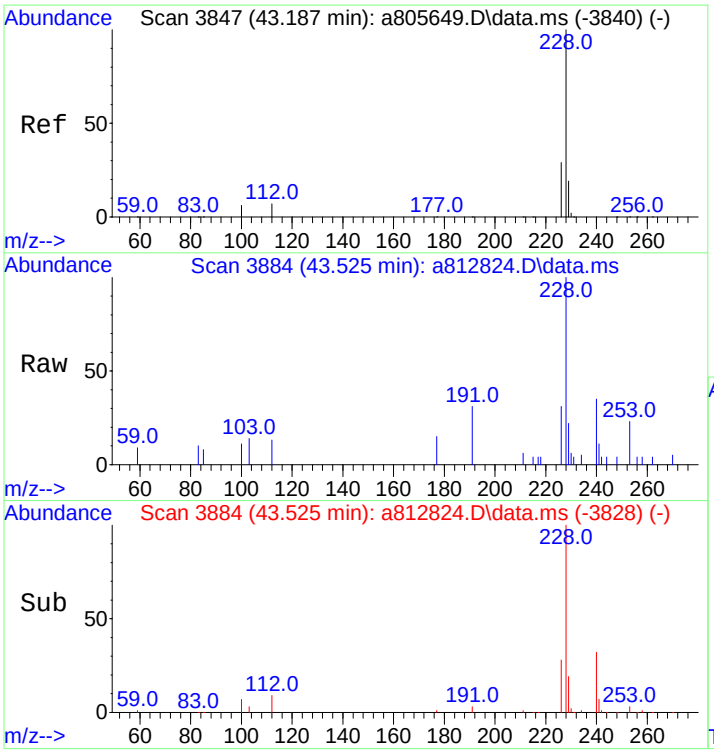


#75
Benz[a]anthracene
Concen: 18.72 ng/mL m
RT: 43.360 min Scan# 3866
Delta R.T. -0.000 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:228 Resp: 3562

Ion	Ratio	Lower	Upper
228	100		
226	27.1	21.3	31.9

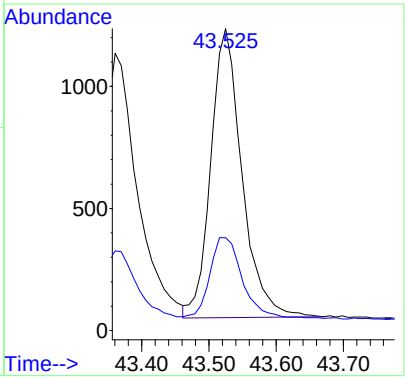


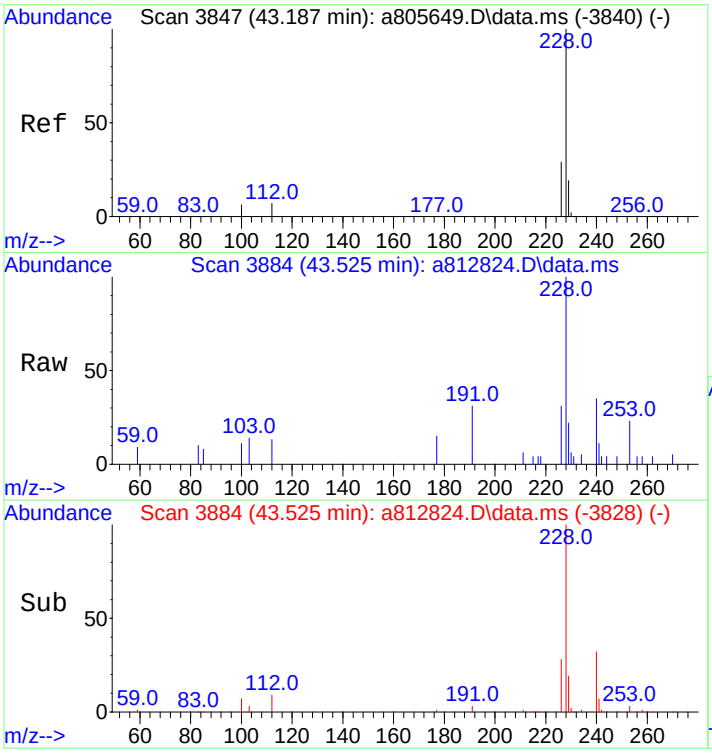


#76
Chrysene
Concen: 20.71 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:228 Resp: 3829

Ion	Ratio	Lower	Upper
228	100		
226	29.6	23.6	35.4

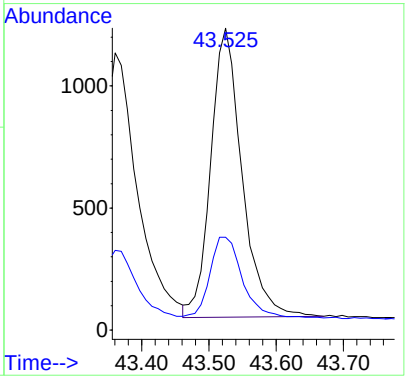


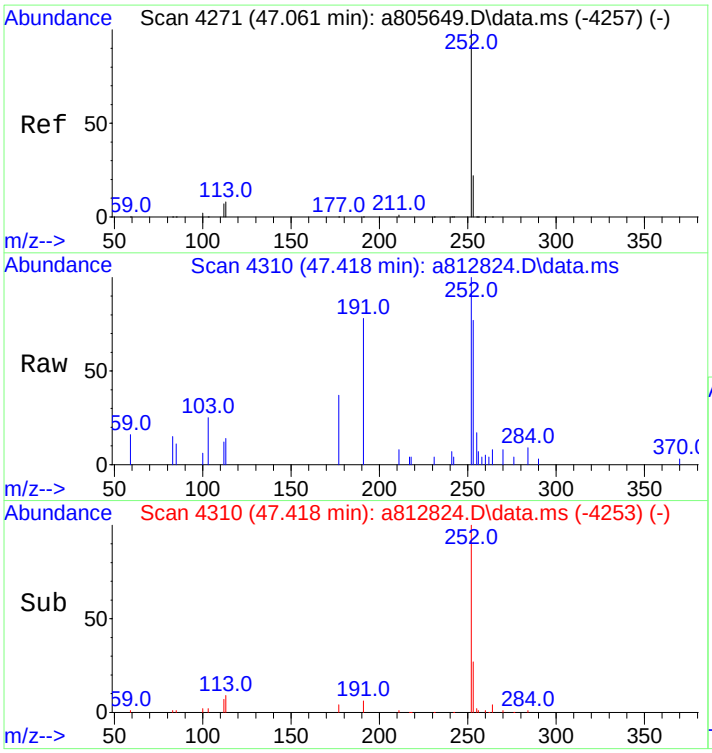


#77
Chrysene/Triphenylene
Concen: 20.71 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:228 Resp: 3829

Ion	Ratio	Lower	Upper
228	100		
226	29.6	23.6	35.4

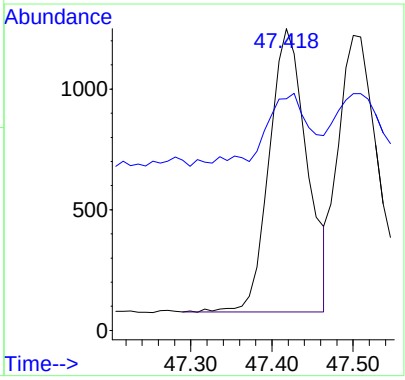


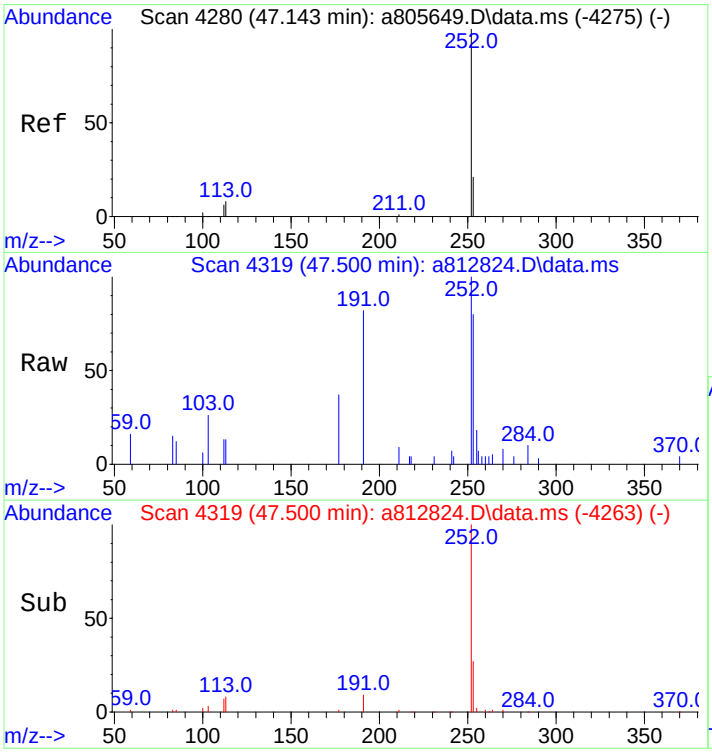


#84
Benzo[b]fluoranthene
Concen: 18.36 ng/mL
RT: 47.418 min Scan# 4310
Delta R.T. 0.018 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:252 Resp: 3806

Ion	Ratio	Lower	Upper
252	100		
253	27.2	18.5	27.7

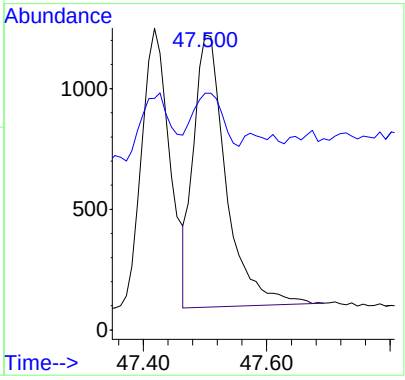


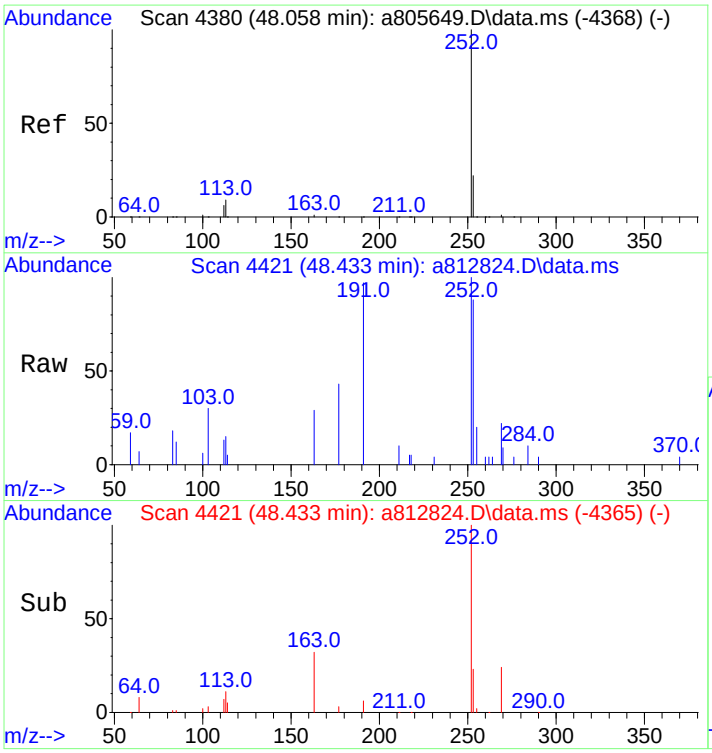


#85
Benzo[j]+[k]fluoranthene
Concen: 19.42 ng/mL
RT: 47.500 min Scan# 4319
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:252 Resp: 4145

Ion	Ratio	Lower	Upper
252	100		
253	19.9	18.8	28.2

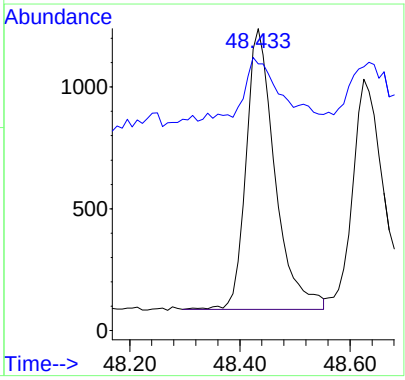


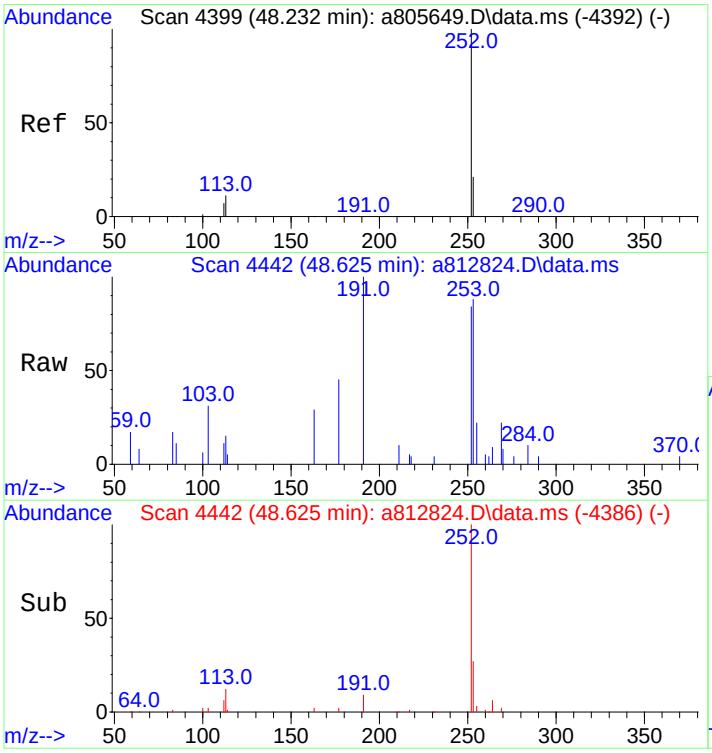


#87
Benzo[e]pyrene
Concen: 20.45 ng/mL
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:252 Resp: 4206

Ion	Ratio	Lower	Upper
252	100		
253	23.1	18.9	28.3

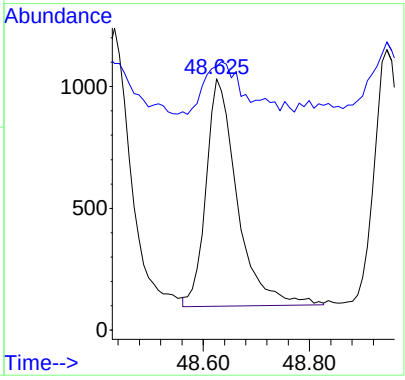


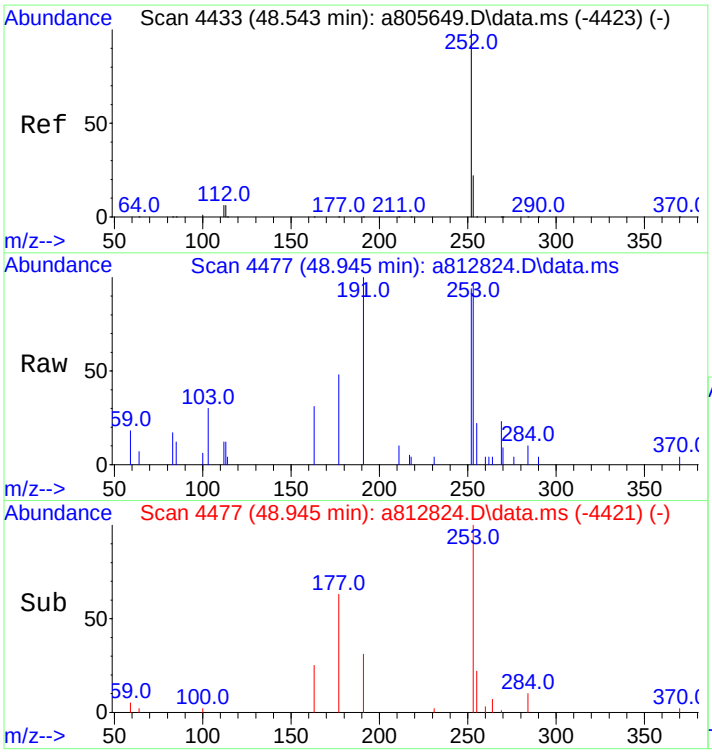


#89
Benzo[a]pyrene
Concen: 20.37 ng/mL
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:252 Resp: 3814

Ion	Ratio	Lower	Upper
252	100		
253	25.1	19.4	29.0

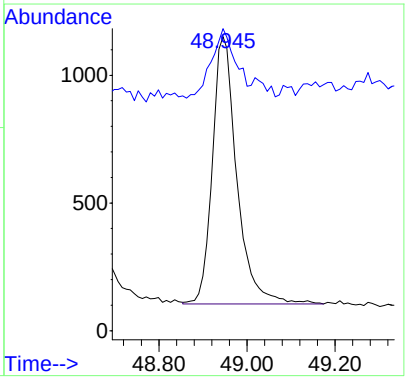


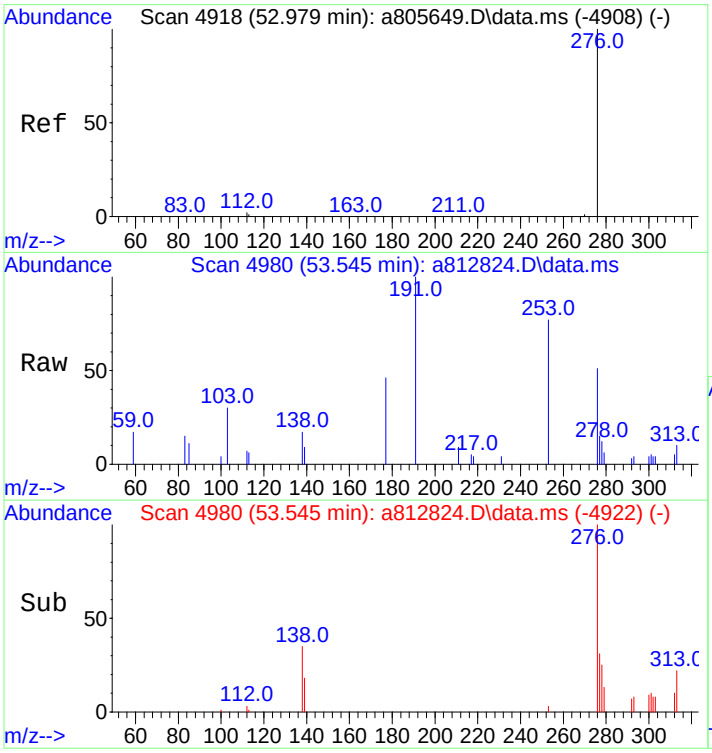


#90
Perylene
Concen: 19.74 ng/mL
RT: 48.945 min Scan# 4477
Delta R.T. 0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:252 Resp: 4038

Ion	Ratio	Lower	Upper
252	100		
253	26.2	19.3	28.9

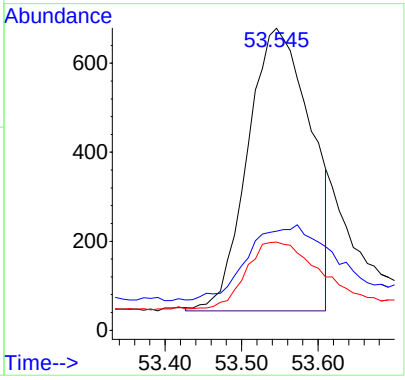


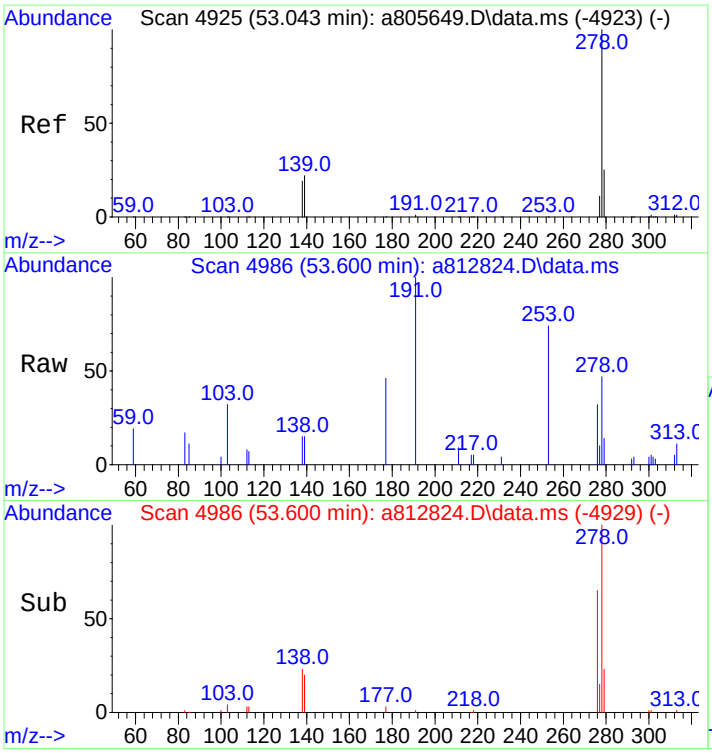


#91
Indeno[1,2,3-cd]pyrene
Concen: 17.34 ng/mL m
RT: 53.545 min Scan# 4980
Delta R.T. 0.027 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:276 Resp: 3622

Ion	Ratio	Lower	Upper
276	100		
138	0.0	19.9	29.9#
277	29.1	19.0	28.6#

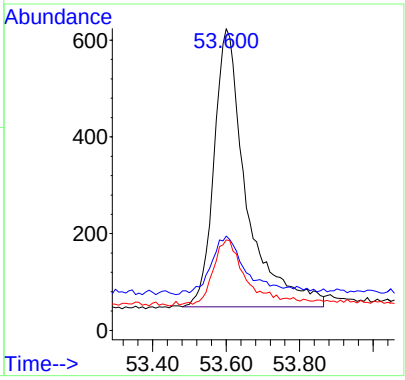


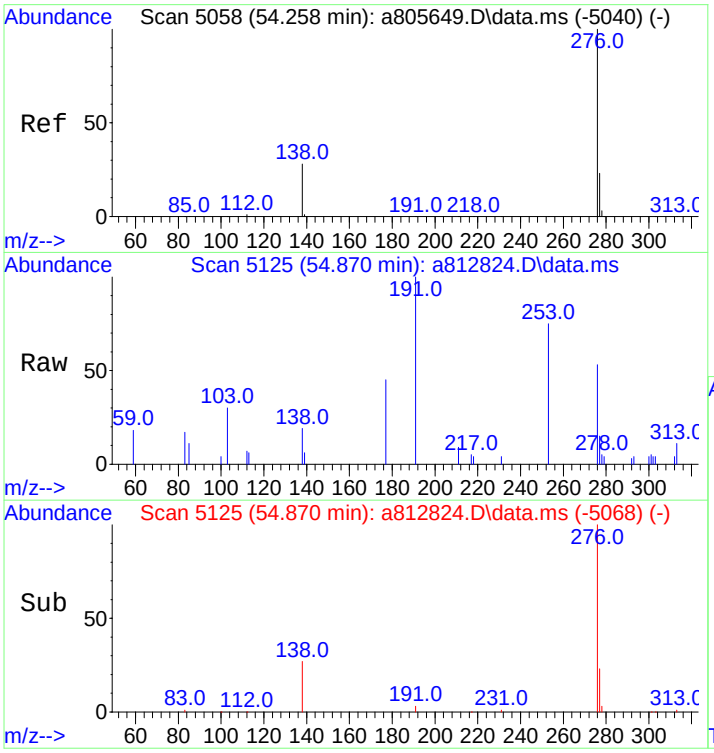


#92
Dibenz[ah]+[ac]anthracene
Concen: 18.62 ng/mL
RT: 53.600 min Scan# 4986
Delta R.T. 0.018 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:278 Resp: 3514

Ion	Ratio	Lower	Upper
278	100		
139	22.4	16.6	25.0
279	21.9	19.1	28.7

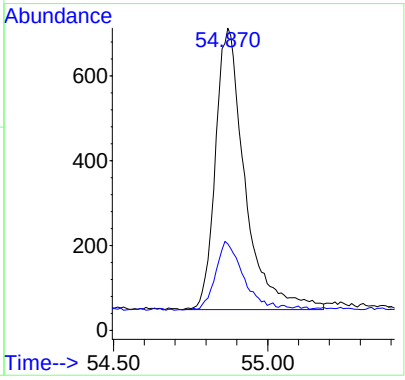


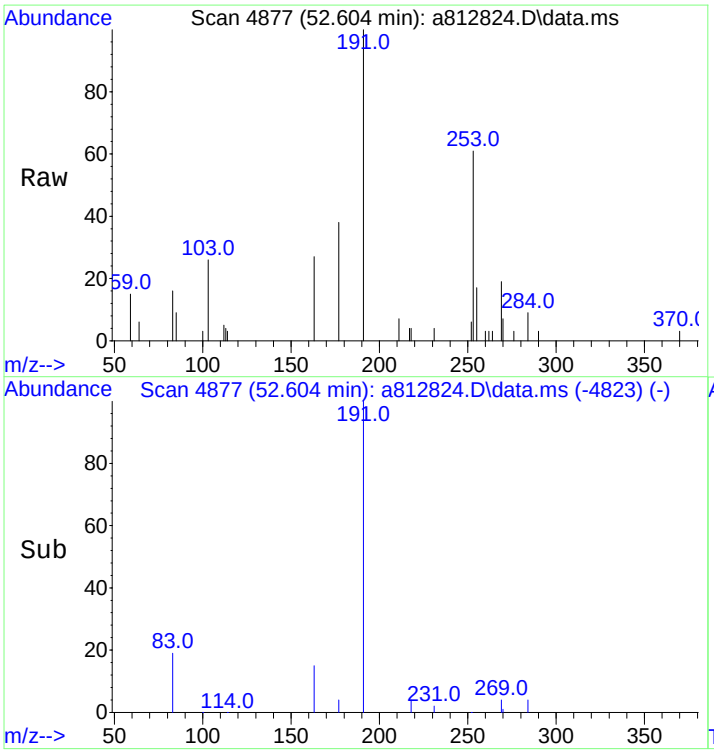


#93
Benzo[g,h,i]perylene
Concen: 19.81 ng/mL
RT: 54.870 min Scan# 5125
Delta R.T. 0.018 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:276 Resp: 4408

Ion	Ratio	Lower	Upper
276	100		
277	22.8	18.9	28.3

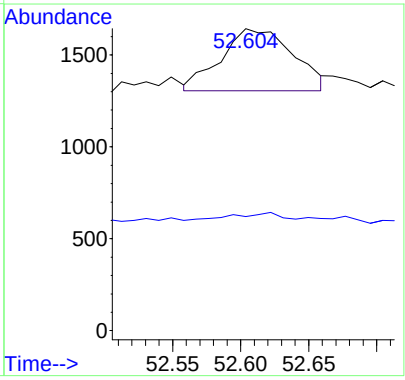


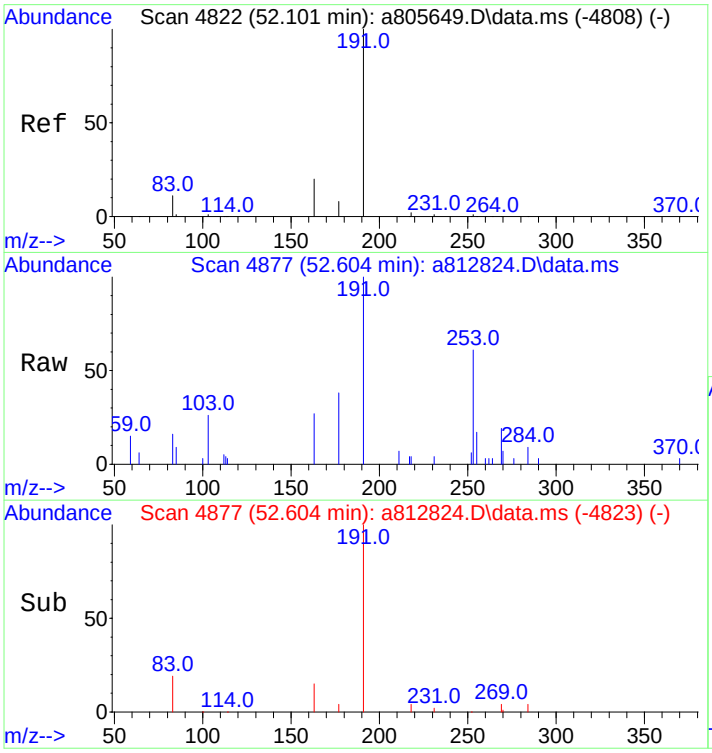


#94
Hopane (T19)
Concen: 19.04 ng/mL m
RT: 52.604 min Scan# 4877
Delta R.T. -0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:191 Resp: 1243

Ion	Ratio	Lower	Upper
191	100		
177	8.3	9.8	14.8#

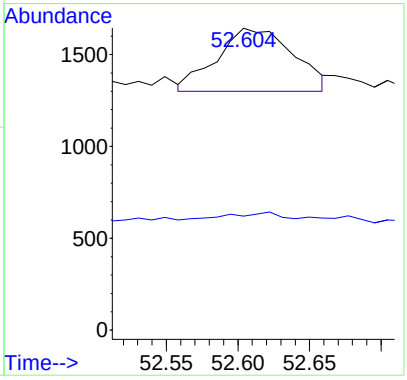




#95
17a(H),21B(H)-hopane - C30H52
Concen: 19.60 ng/mL m
RT: 52.604 min Scan# 4877
Delta R.T. -0.009 min
Lab File: a812824.D
Acq: 18 Nov 2012 11:08 am

Tgt Ion:191 Resp: 1279

Ion	Ratio	Lower	Upper
191	100		
177	8.1	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812825.D
Acq On : 18 Nov 2012 12:33 pm
Operator : AC
Sample : i811181203
Misc : l3 whaq85
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 12:13:38 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

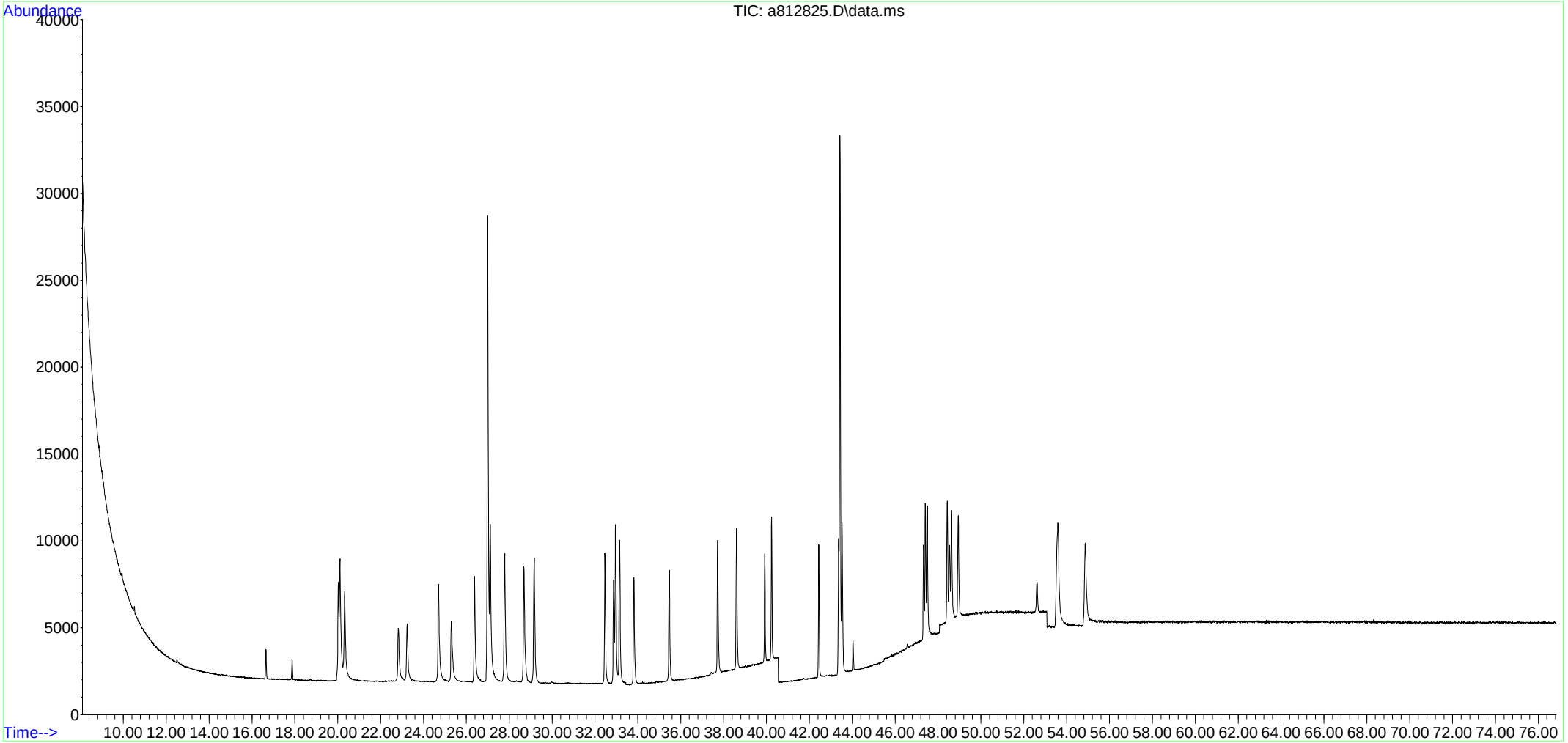
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	54704	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	73711	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.032	136	23323	98.353	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	9.84%#		
42) Phenanthrene-d10	32.871	188	17622	99.261	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	9.93%#		
83) Benzo[b]fluoranthene-d12	47.326	264	13723	87.087	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	8.71%#		
88) Benzo[a]pyrene-d12	48.534	264	12604	85.933	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	8.59%#		
129) 5B(H)Cholane - Surr	44.036	217	2394	82.270	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	8.23%#		
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	2350	46.948	ng/mL	100
4) cis-Decalin	17.869	138	1662	44.451	ng/mL	100
10) Naphthalene	20.105	128	27453	98.745	ng/mL#	100
16) 2-Methylnaphthalene	22.825	142	15141	92.427	ng/mL#	100
17) 1-Methylnaphthalene	23.235	142	14478	92.589	ng/mL#	100
18) Benzothiophene	20.324	134	21521	97.337	ng/mL	100
23) Biphenyl	24.695	154	19957	98.587	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.298	156	12975	94.478	ng/mL#	100
25) Dibenzofuran	27.789	168	20833	98.141	ng/mL	97
26) Acenaphthylene	26.384	152	23128M3	92.032	ng/mL	
27) Acenaphthene	27.114	153	14315	96.336	ng/mL	96
28) 2,3,5-Trimethylnaphtha...	28.683	170	11003	95.237	ng/mL	96
29) Fluorene	29.167	166	15645	96.426	ng/mL	100
33) Dibenzothiophene	32.460	184	20981	90.298	ng/mL	100
43) Phenanthrene	32.962	178	20842	92.993	ng/mL	99
54) Retene	39.918	234	4154	87.078	ng/mL	98
55) Anthracene	33.144	178	19707M3	93.285	ng/mL	
56) Carbazole	33.811	167	18663	88.319	ng/mL	100
57) 1-Methylphenanthrene	35.463	192	13779	88.513	ng/mL	100
58) Fluoranthene	37.727	202	20124	87.475	ng/mL	100
59) Benzo(b)fluorene	40.238	216	10877	83.661	ng/mL	99
60) Pyrene	38.603	202	20326	87.749	ng/mL	98
66) Naphthobenzothiophene	42.438	234	17795	83.268	ng/ml	100
67) Naphthobenzothiophene-...	42.438	234	17795	83.268	ng/mL	100
75) Benz[a]anthracene	43.369	228	15605	79.377	ng/mL	100
76) Chrysene	43.525	228	16391	85.811	ng/mL	98
77) Chrysene/Triphenylene	43.525	228	16391	85.811	ng/mL	98
84) Benzo[b]fluoranthene	47.409	252	16084	75.082	ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.500	252	18571	84.198	ng/mL	97
87) Benzo[e]pyrene	48.433	252	16666	78.444	ng/mL	100
89) Benzo[a]pyrene	48.625	252	15297	79.082	ng/mL	99
90) Perylene	48.945	252	16399	77.595	ng/mL	100
91) Indeno[1,2,3-cd]pyrene	53.536	276	15591M3	72.240	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.600	278	15225	78.059	ng/mL	98
93) Benzo[g,h,i]perylene	54.870	276	19038	82.793	ng/mL	100
94) Hopane (T19)	52.622	191	4748M3	70.405	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.622	191	4728M3	70.108	ng/mL	

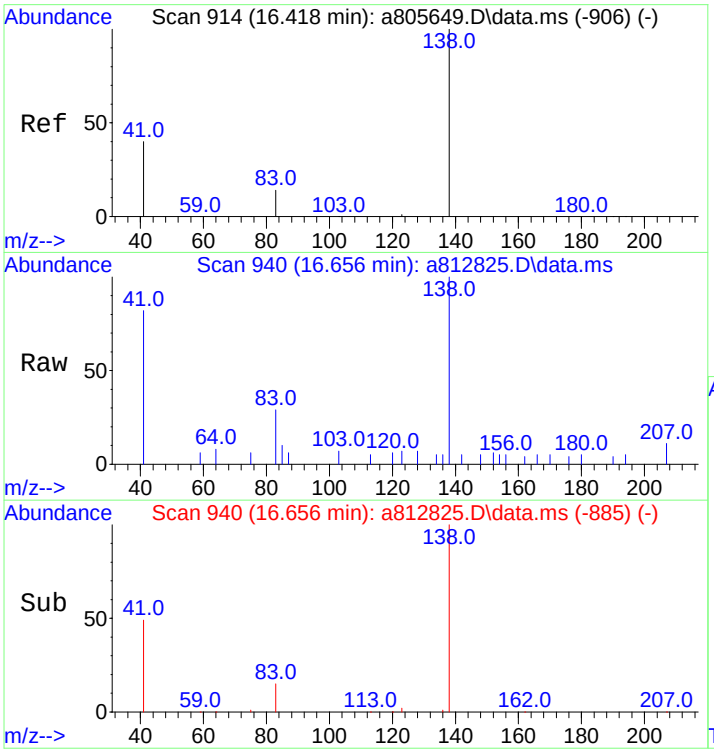
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812825.D
Acq On : 18 Nov 2012 12:33 pm
Operator : AC
Sample : i811181203
Misc : l3 whaq85
ALS Vial : 6 Sample Multiplier: 1

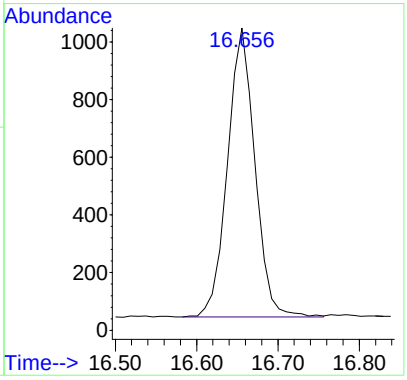
Quant Time: Nov 19 12:13:38 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

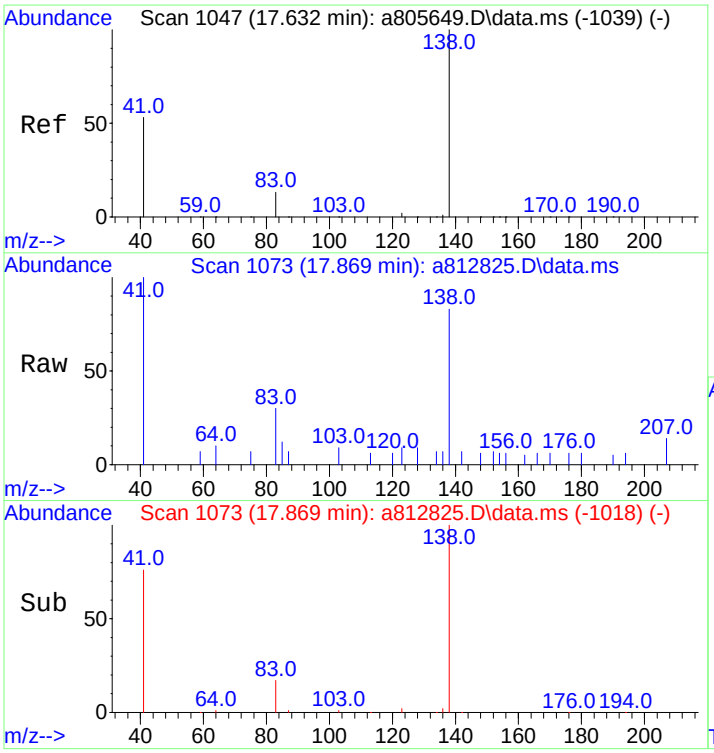




#3
trans-Decalin
Concen: 46.95 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

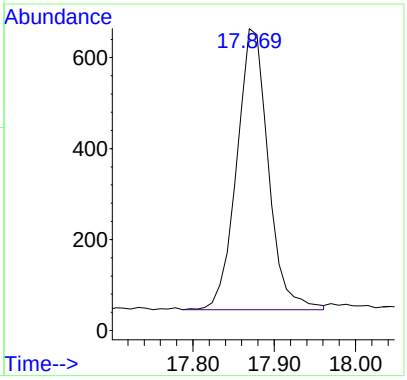
Tgt Ion:138 Resp: 2350

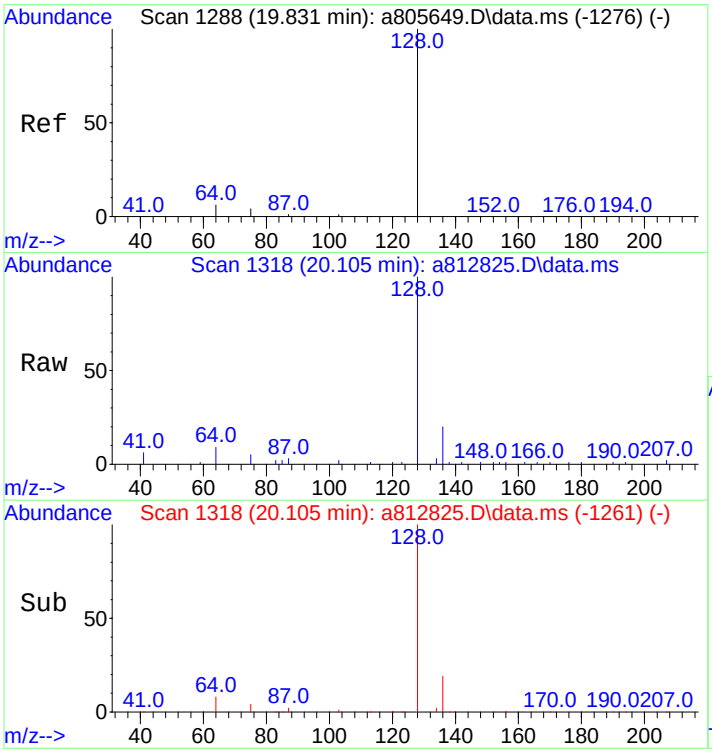




#4
cis-Decalin
Concen: 44.45 ng/mL
RT: 17.869 min Scan# 1073
Delta R.T. -0.000 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:138 Resp: 1662

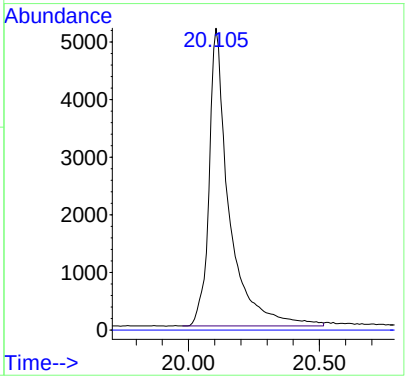


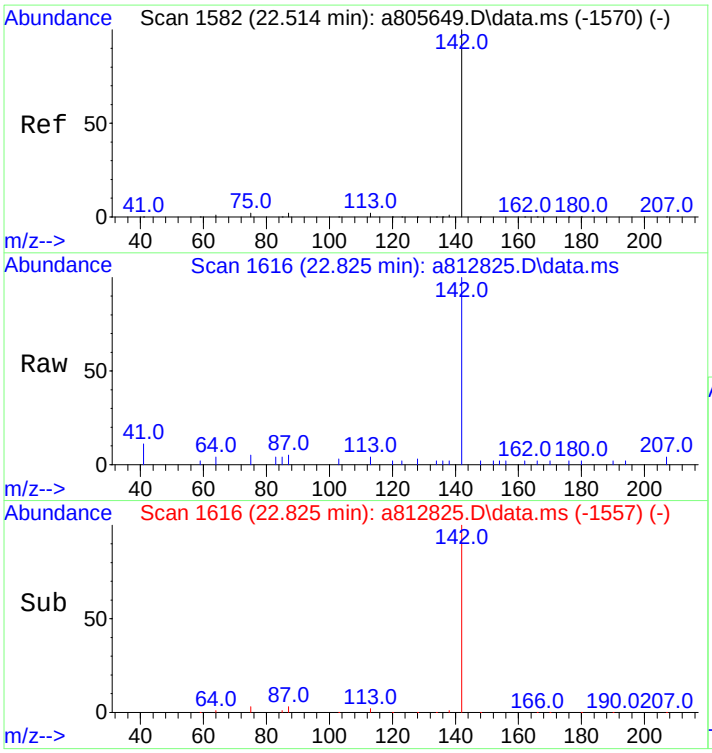


#10
Naphthalene
Concen: 98.75 ng/mL
RT: 20.105 min Scan# 1318
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:128 Resp: 27453

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

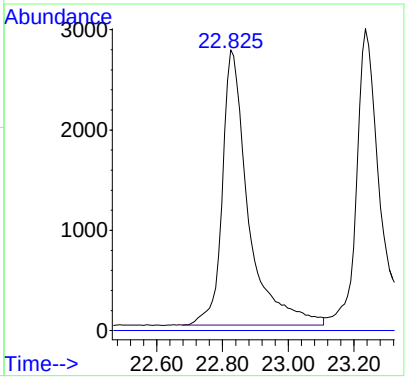


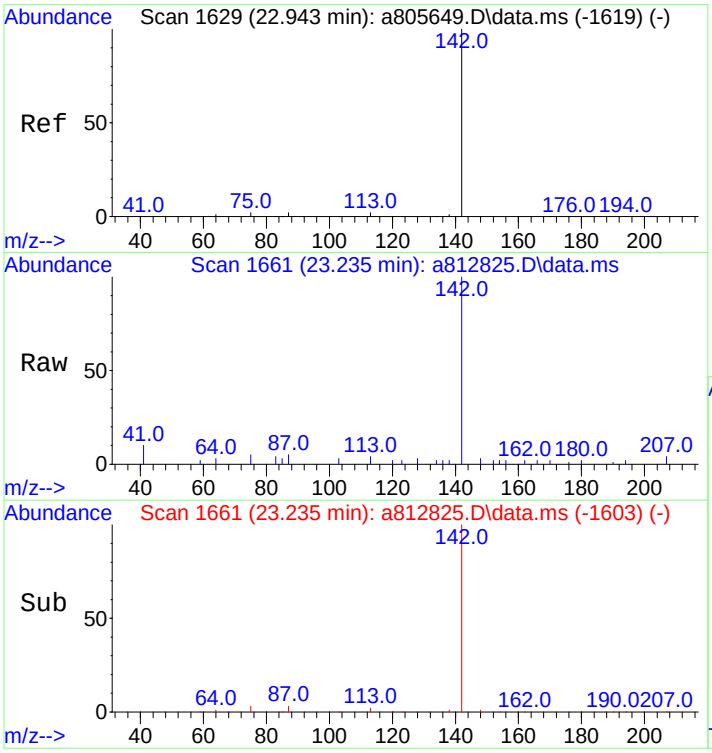


#16
2-Methylnaphthalene
Concen: 92.43 ng/mL
RT: 22.825 min Scan# 1616
Delta R.T. 0.036 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:142 Resp: 15141

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

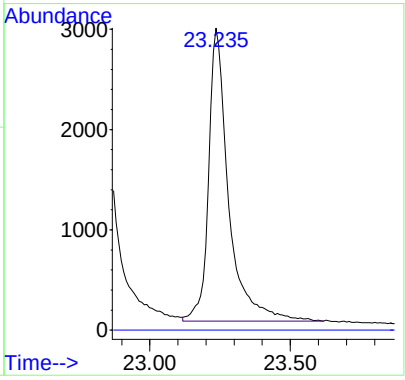


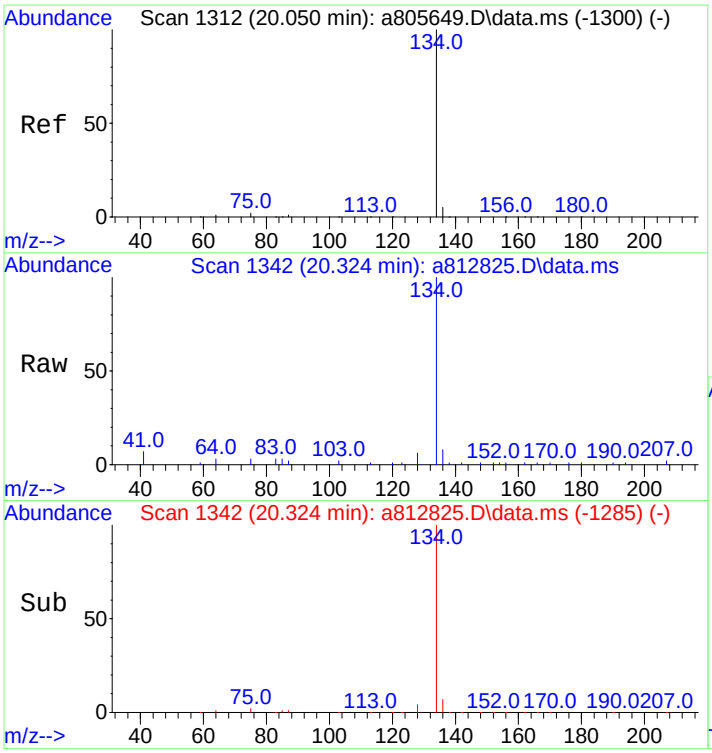


#17
1-Methylnaphthalene
Concen: 92.59 ng/mL
RT: 23.235 min Scan# 1661
Delta R.T. 0.027 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:142 Resp: 14478

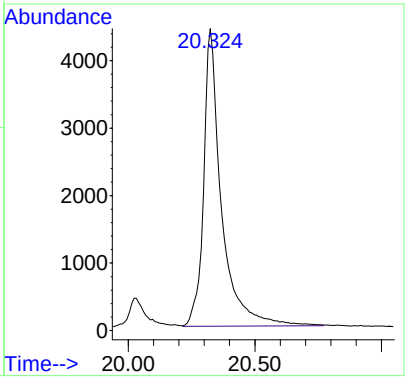
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

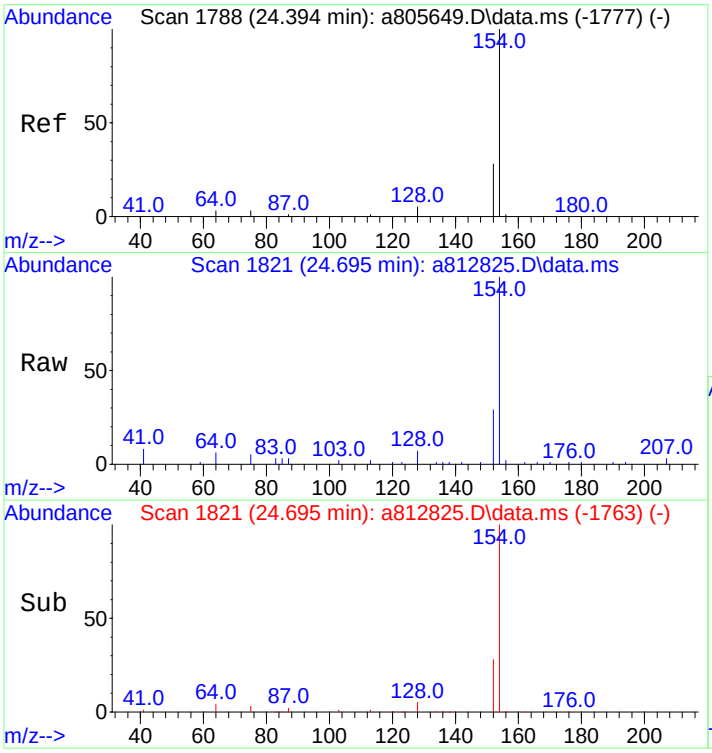




#18
Benzothiophene
Concen: 97.34 ng/mL
RT: 20.324 min Scan# 1342
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:134 Resp: 21521

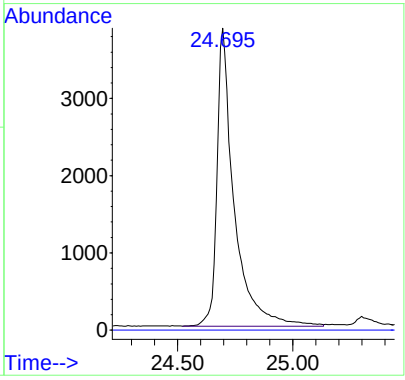


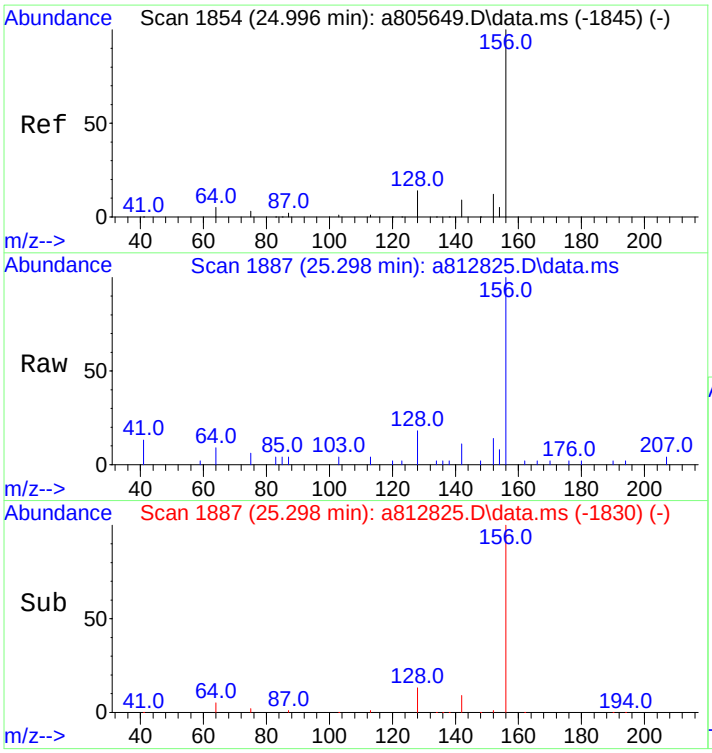


#23
Biphenyl
Concen: 98.59 ng/mL
RT: 24.695 min Scan# 1821
Delta R.T. 0.027 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:154 Resp: 19957

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

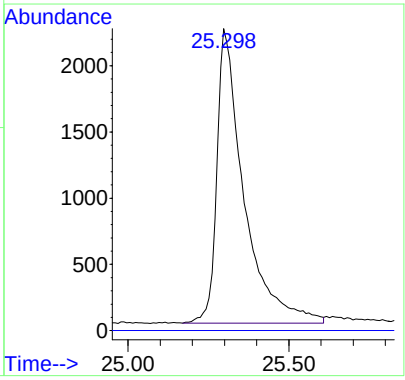


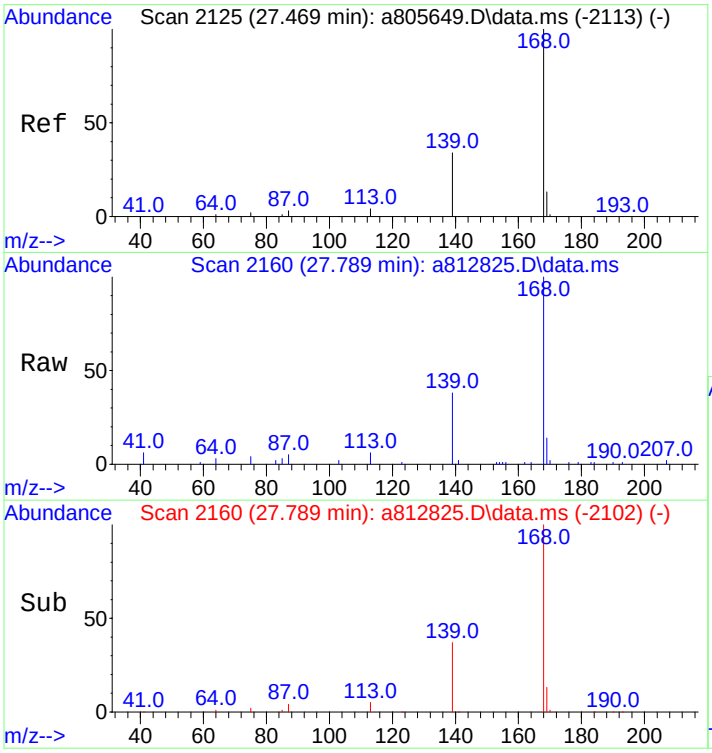


#24
2,6-Dimethylnaphthalene
Concen: 94.48 ng/mL
RT: 25.298 min Scan# 1887
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:156 Resp: 12975

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

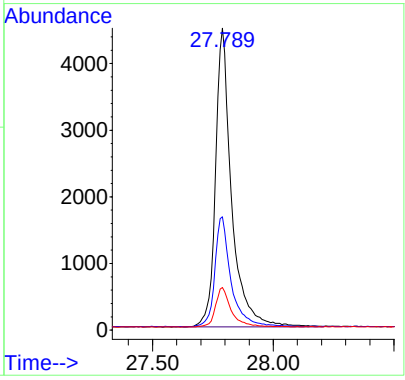


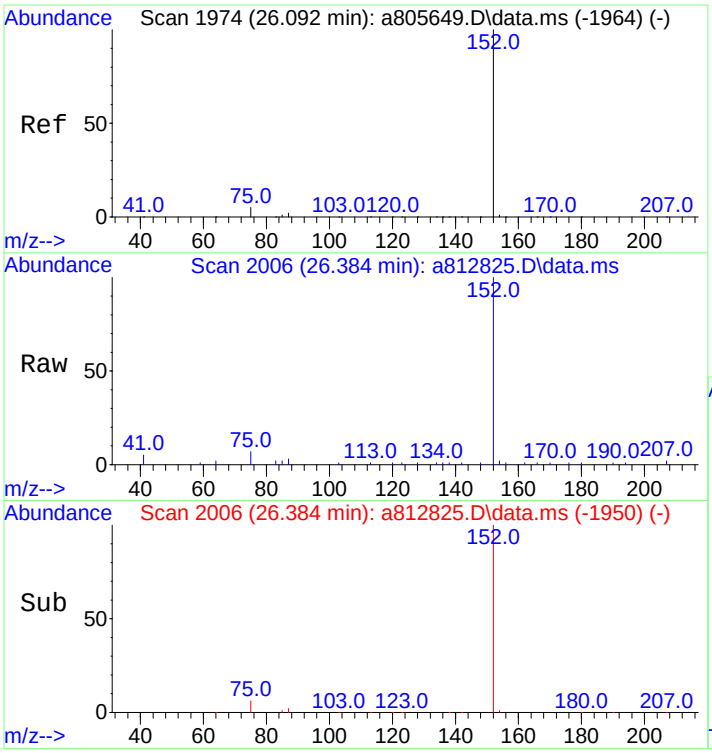


#25
Dibenzofuran
Concen: 98.14 ng/mL
RT: 27.789 min Scan# 2160
Delta R.T. 0.027 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:168 Resp: 20833

Ion	Ratio	Lower	Upper
168	100		
139	37.1	28.0	42.0
169	12.9	10.6	15.8

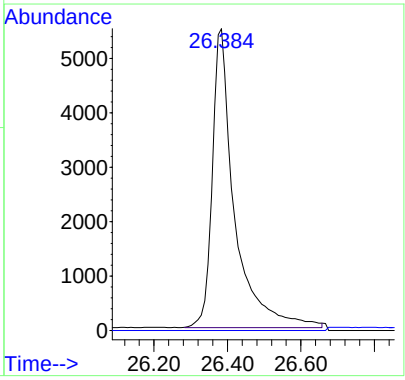


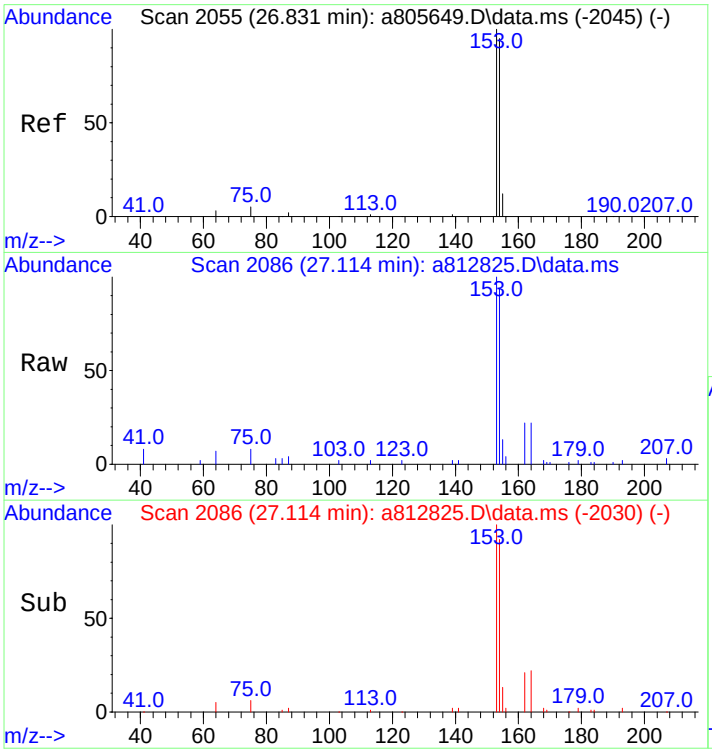


#26
Acenaphthylene
Concen: 92.03 ng/mL m
RT: 26.384 min Scan# 2006
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:152 Resp: 23128

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

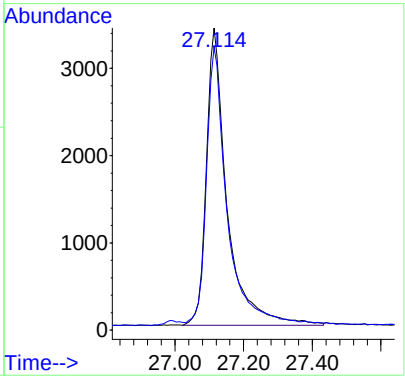


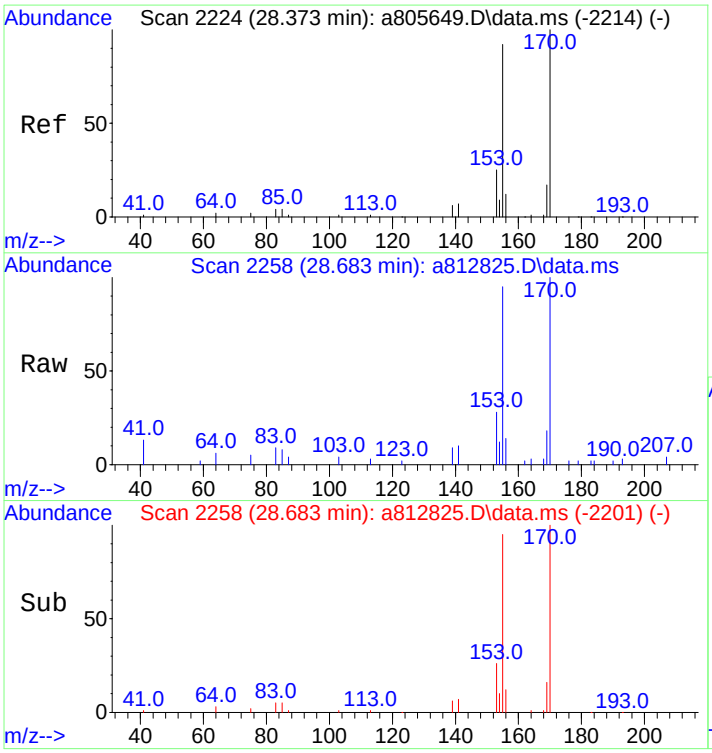


#27
Acenaphthene
Concen: 96.34 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:153 Resp: 14315

Ion	Ratio	Lower	Upper
153	100		
154	90.7	75.4	113.2

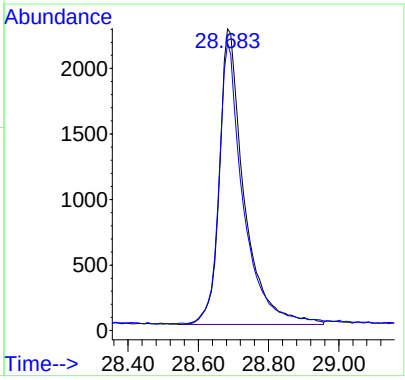


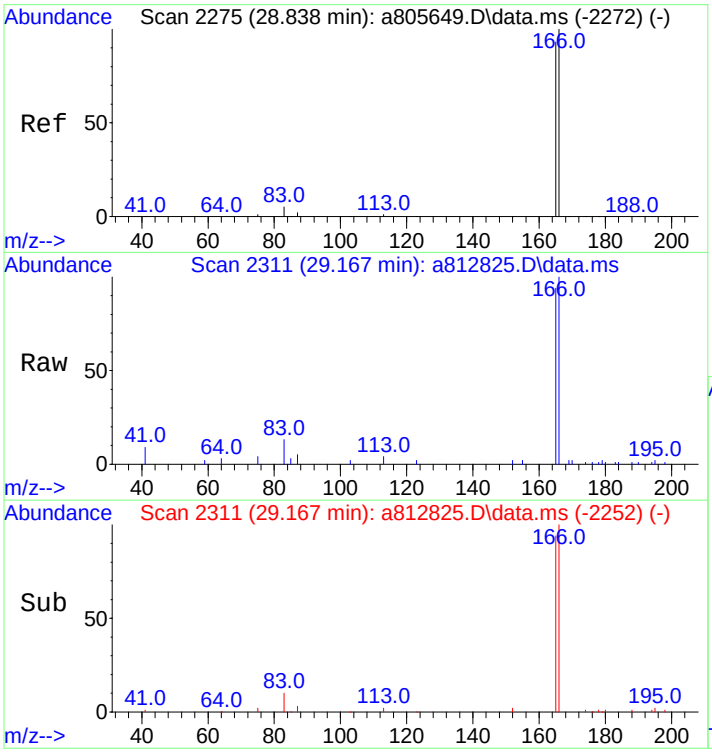


#28
2,3,5-Trimethylnaphthalene
Concen: 95.24 ng/mL
RT: 28.683 min Scan# 2258
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:170 Resp: 11003

Ion	Ratio	Lower	Upper
170	100		
155	93.8	71.7	107.5

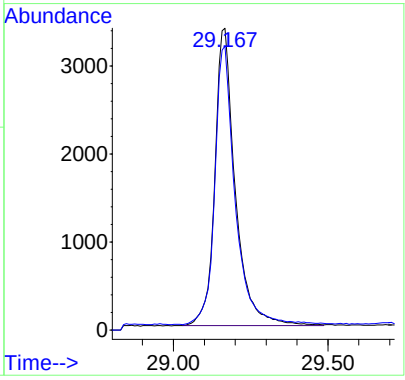


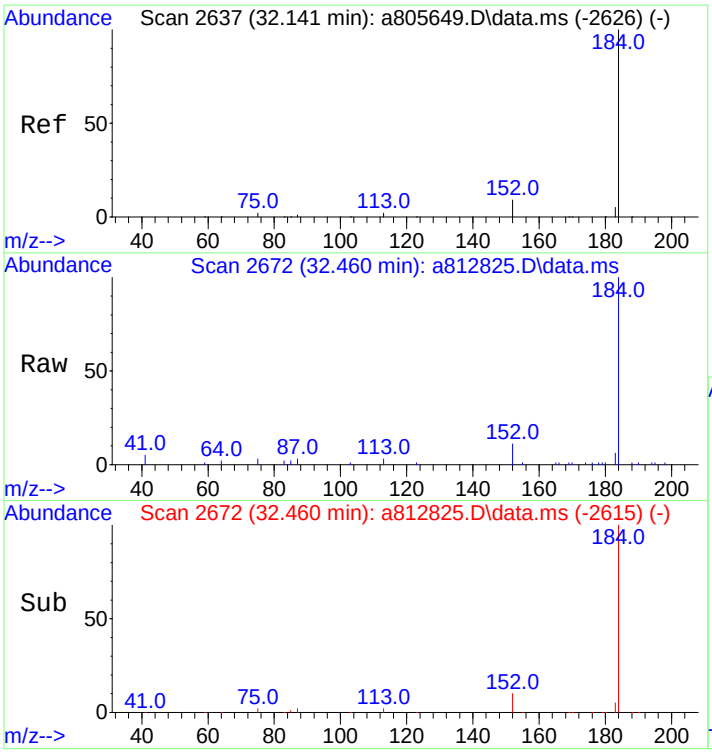


#29
Fluorene
Concen: 96.43 ng/mL
RT: 29.167 min Scan# 2311
Delta R.T. 0.036 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:166 Resp: 15645

Ion	Ratio	Lower	Upper
166	100		
165	92.7	74.2	111.2

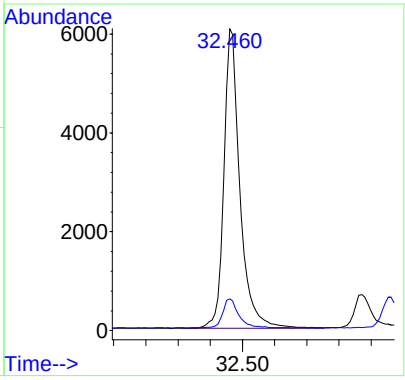


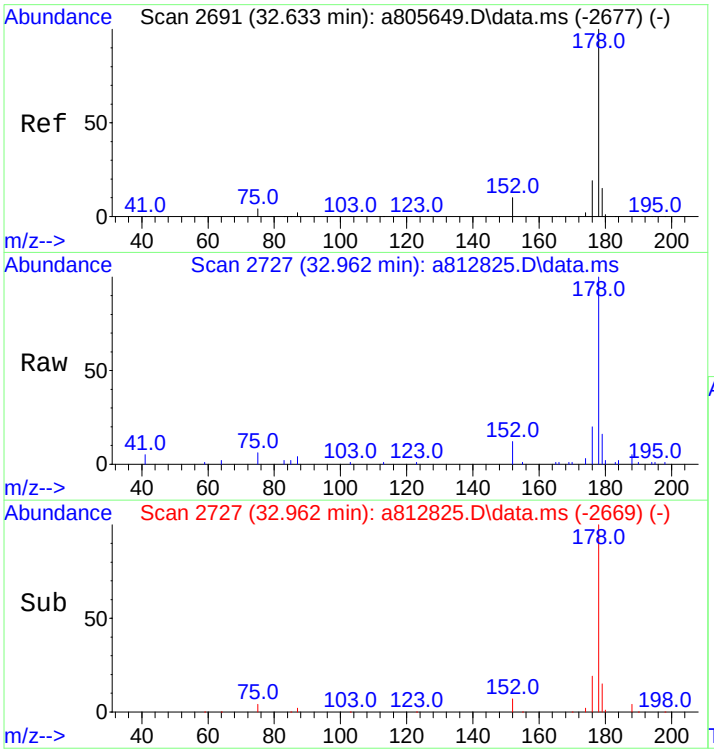


#33
Dibenzothiophene
Concen: 90.30 ng/mL
RT: 32.460 min Scan# 2672
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:184 Resp: 20981

Ion	Ratio	Lower	Upper
184	100		
152	9.8	7.8	11.8

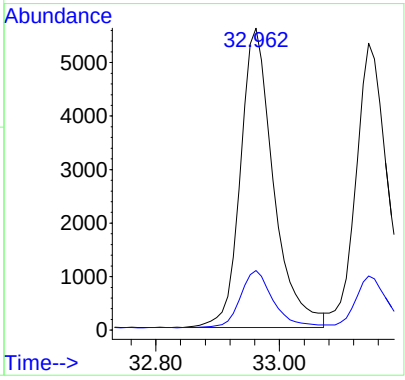


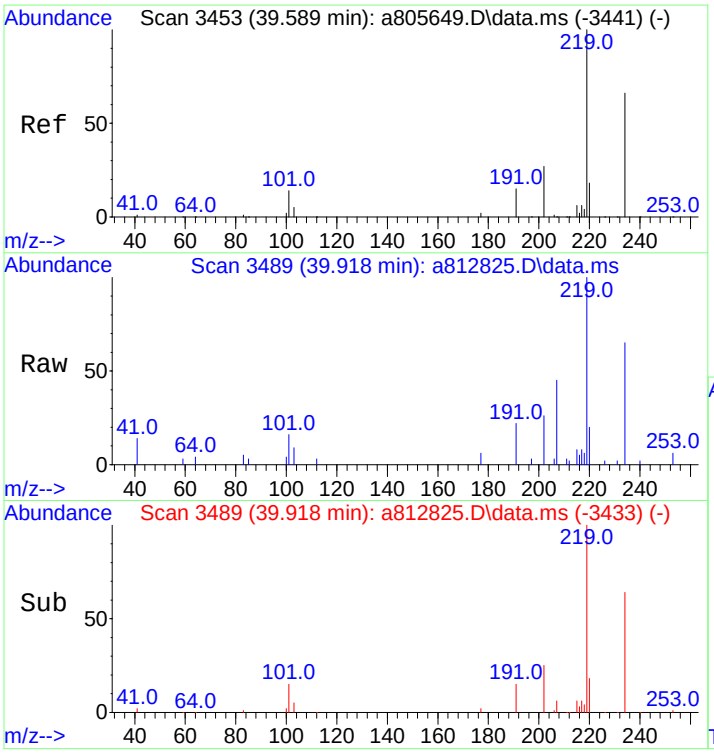


#43
Phenanthrene
Concen: 92.99 ng/mL
RT: 32.962 min Scan# 2727
Delta R.T. 0.027 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:178 Resp: 20842

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

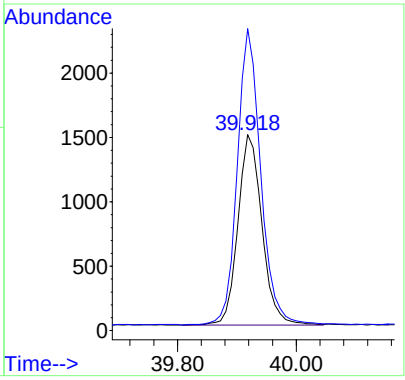


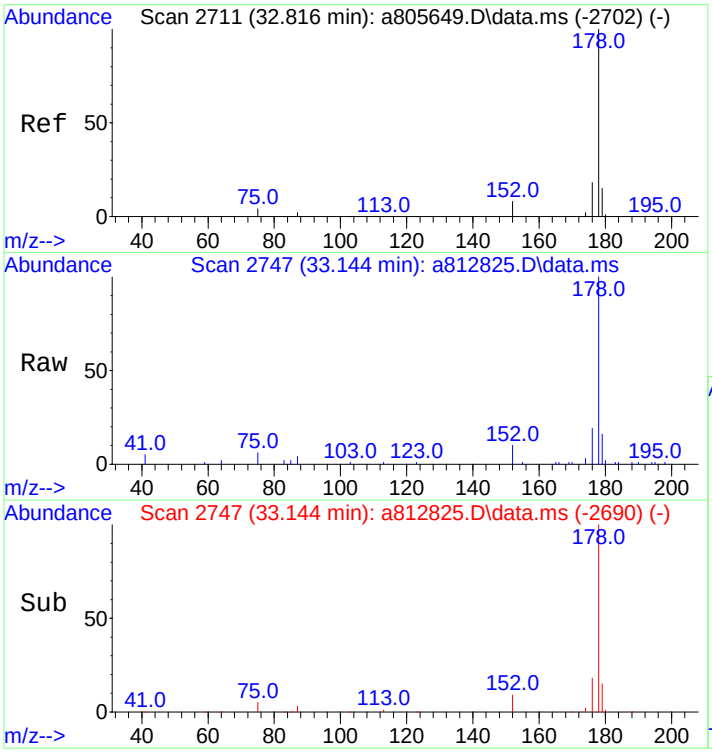


#54
Retene
Concen: 87.08 ng/mL
RT: 39.918 min Scan# 3489
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:234 Resp: 4154

Ion	Ratio	Lower	Upper
234	100		
219	152.1	124.0	186.0

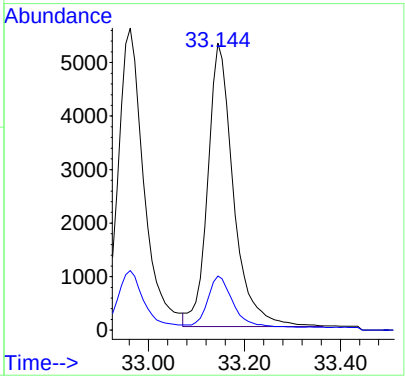


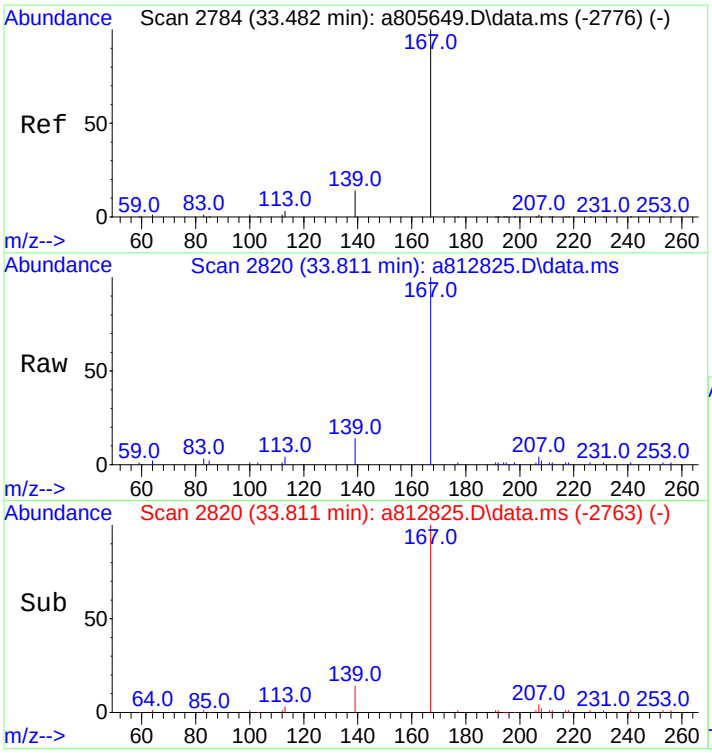


#55
Anthracene
Concen: 93.28 ng/mL m
RT: 33.144 min Scan# 2747
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:178 Resp: 19707

Ion	Ratio	Lower	Upper
178	100		
176	18.1	14.3	21.5

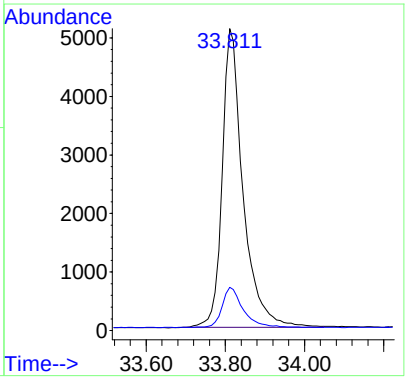


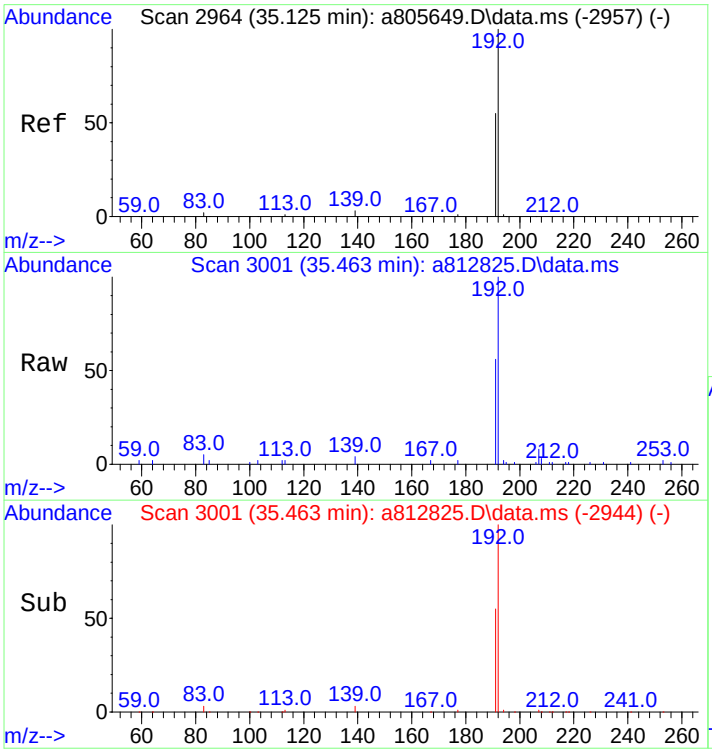


#56
Carbazole
Concen: 88.32 ng/mL
RT: 33.811 min Scan# 2820
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:167 Resp: 18663

Ion	Ratio	Lower	Upper
167	100		
139	13.3	10.6	16.0

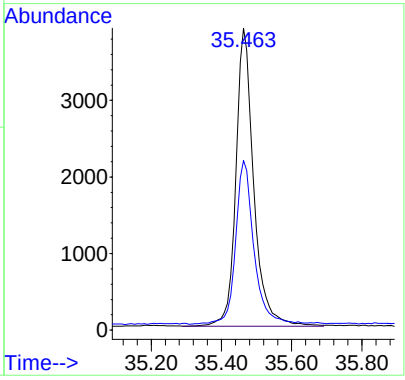


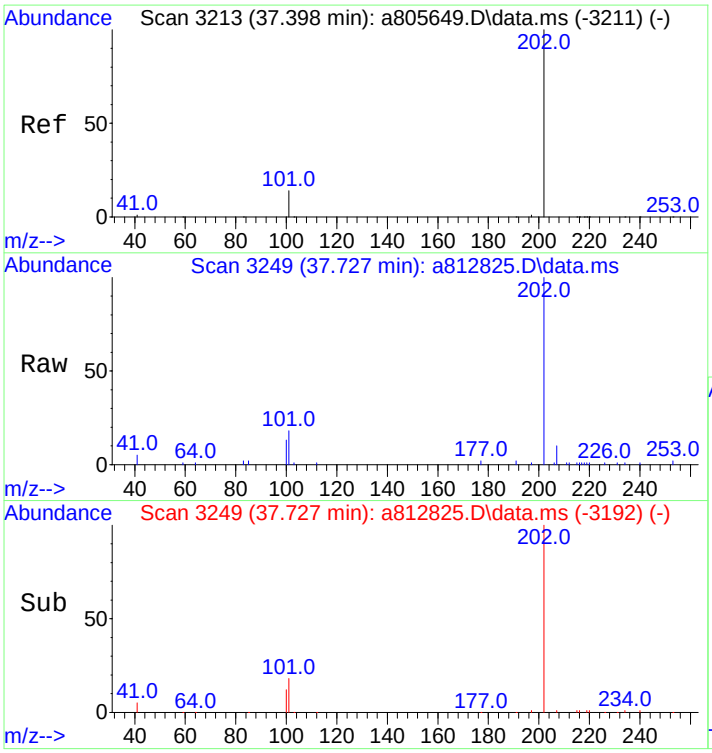


#57
1-Methylphenanthrene
Concen: 88.51 ng/mL
RT: 35.463 min Scan# 3001
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:192 Resp: 13779

Ion	Ratio	Lower	Upper
192	100		
191	55.4	44.2	66.4

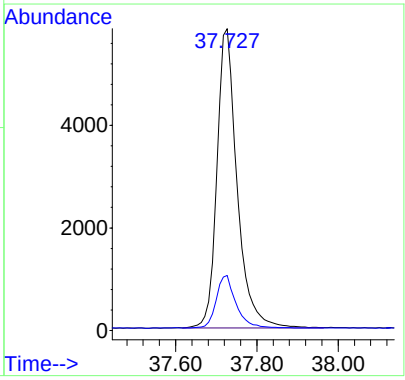


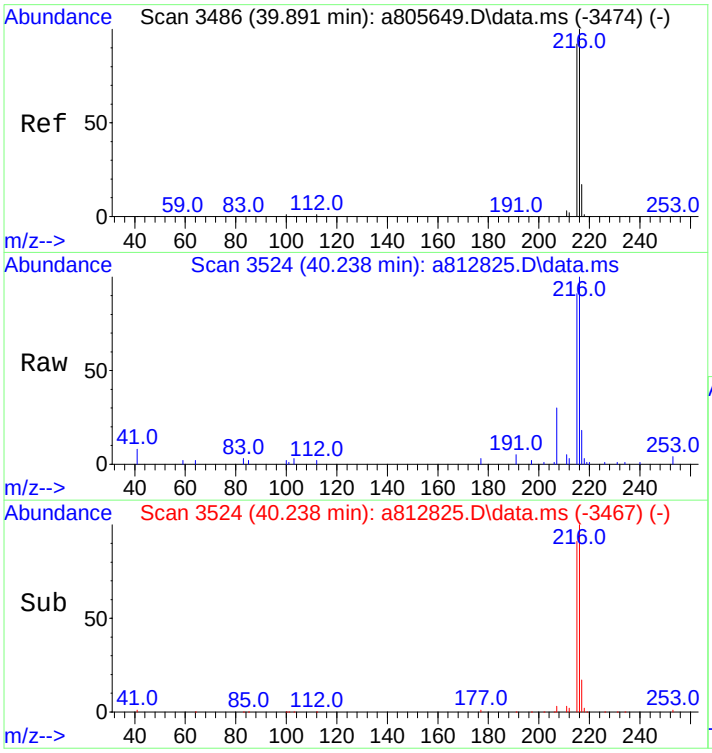


#58
Fluoranthene
Concen: 87.48 ng/mL
RT: 37.727 min Scan# 3249
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:202 Resp: 20124

Ion	Ratio	Lower	Upper
202	100		
101	17.1	13.6	20.4

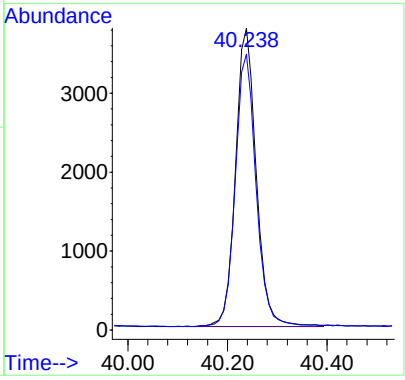


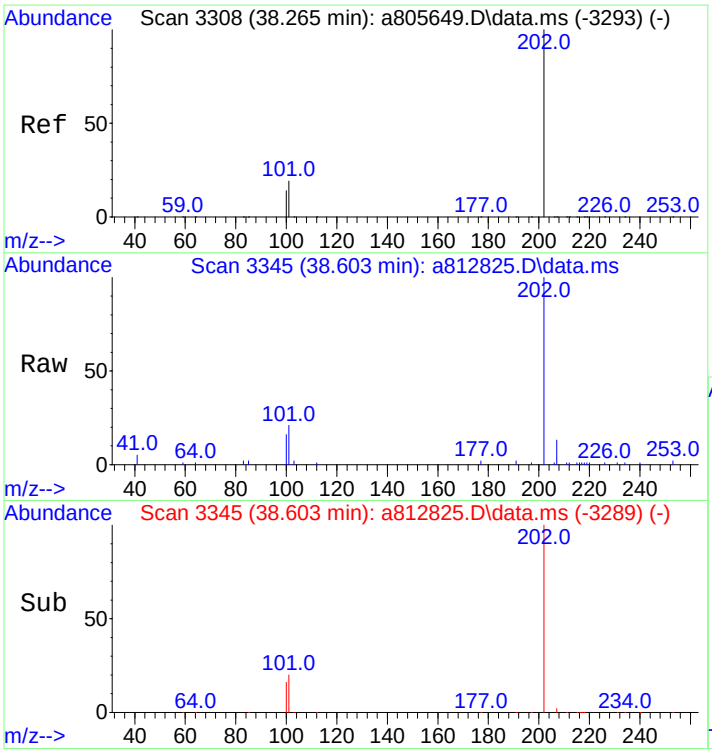


#59
Benzo(b)fluorene
Concen: 83.66 ng/mL
RT: 40.238 min Scan# 3524
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:216 Resp: 10877

Ion	Ratio	Lower	Upper
216	100		
215	92.1	74.2	111.2

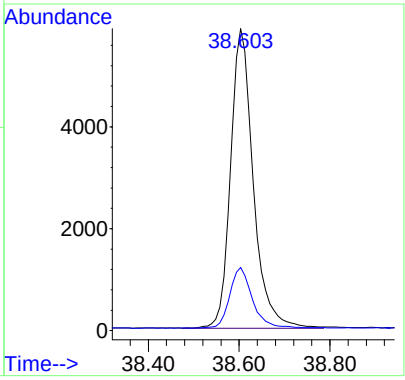


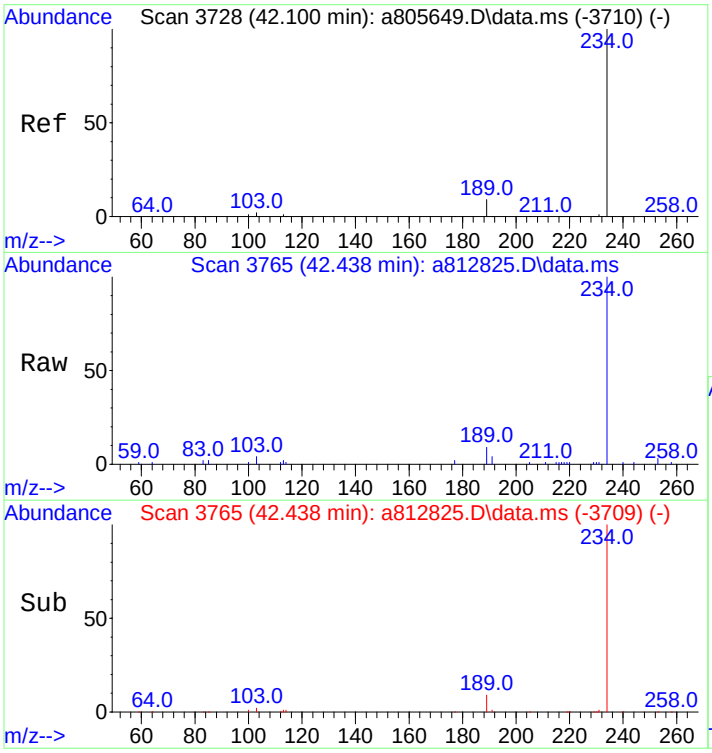


#60
Pyrene
Concen: 87.75 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:202 Resp: 20326

Ion	Ratio	Lower	Upper
202	100		
101	20.4	15.4	23.2

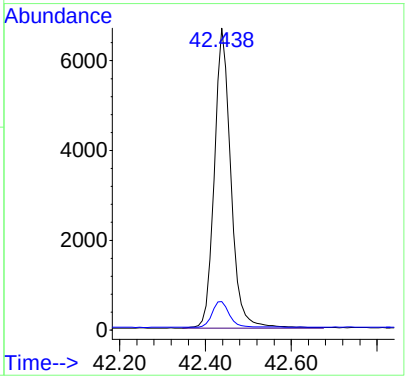


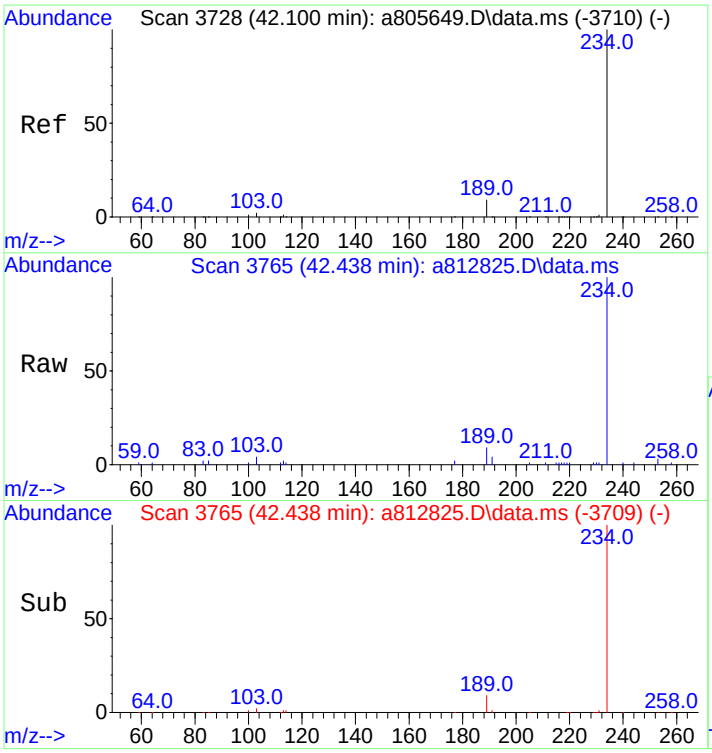


#66
Naphthobenzothiophene
Concen: 83.27 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:234 Resp: 17795

Ion	Ratio	Lower	Upper
234	100		
189	8.9	7.2	10.8

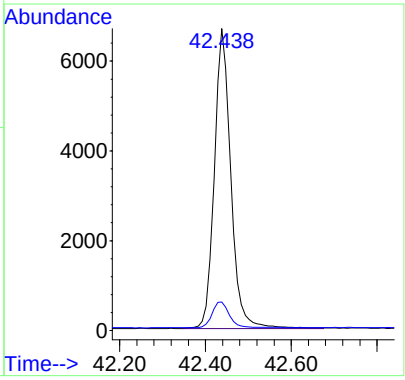


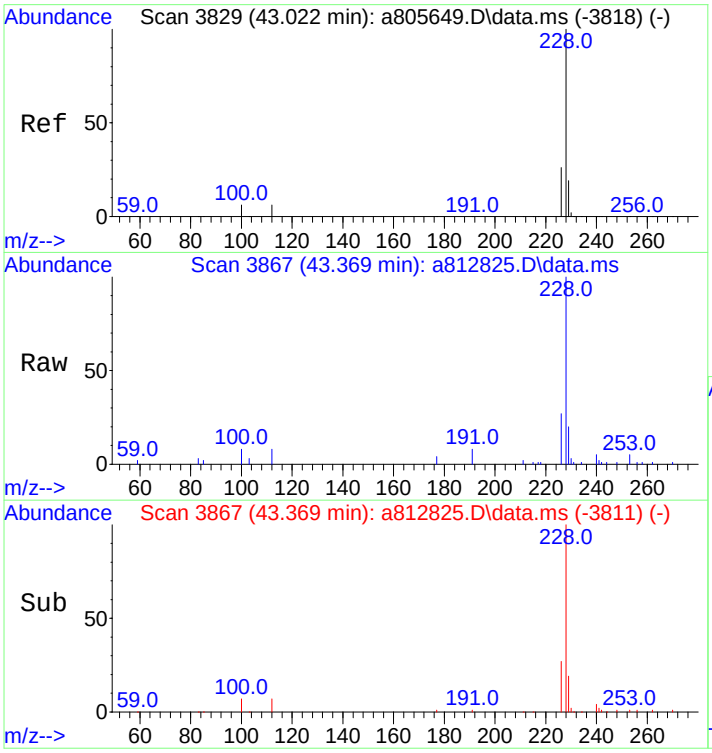


#67
Naphthobenzothiophene-2,1-D
Concen: 83.27 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:234 Resp: 17795

Ion	Ratio	Lower	Upper
234	100		
189	8.9	7.2	10.8

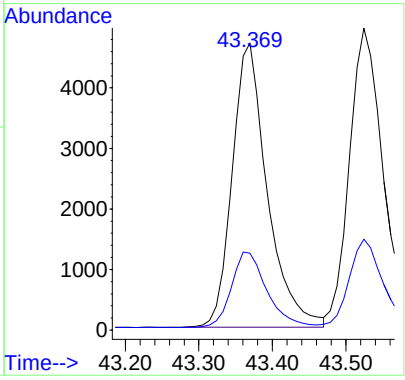


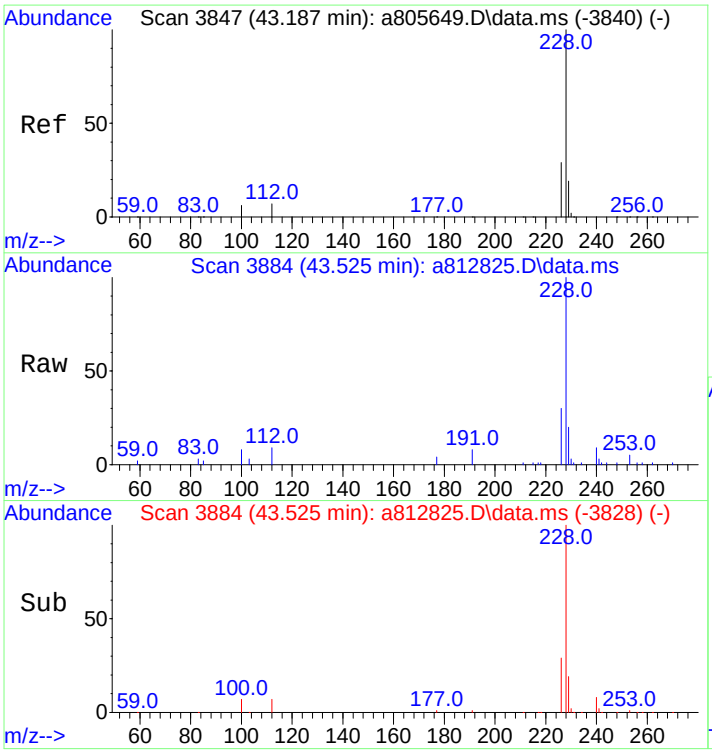


#75
Benz[a]anthracene
Concen: 79.38 ng/mL
RT: 43.369 min Scan# 3867
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:228 Resp: 15605

Ion	Ratio	Lower	Upper
228	100		
226	26.7	21.3	31.9

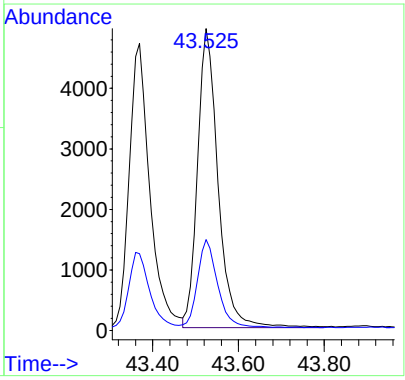


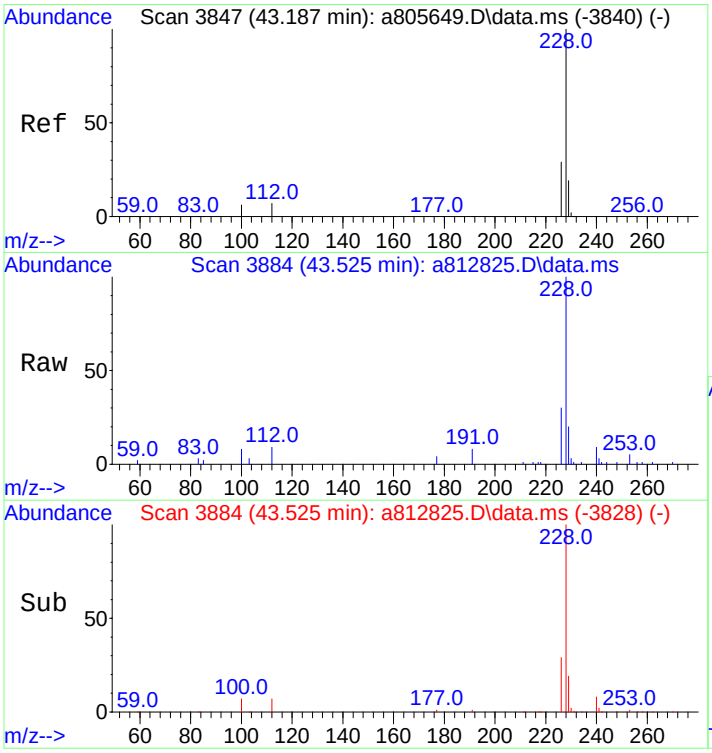


#76
Chrysene
Concen: 85.81 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:228 Resp: 16391

Ion	Ratio	Lower	Upper
228	100		
226	28.5	23.6	35.4

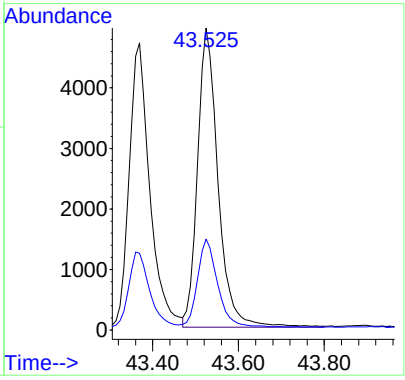


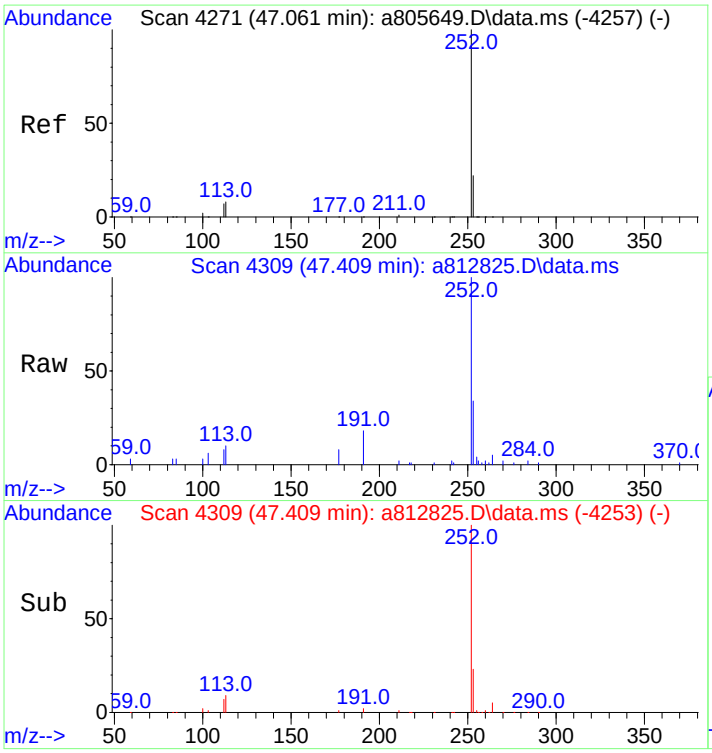


#77
Chrysene/Triphenylene
Concen: 85.81 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:228 Resp: 16391

Ion	Ratio	Lower	Upper
228	100		
226	28.5	23.6	35.4

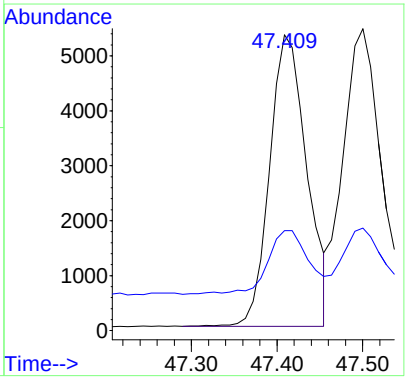


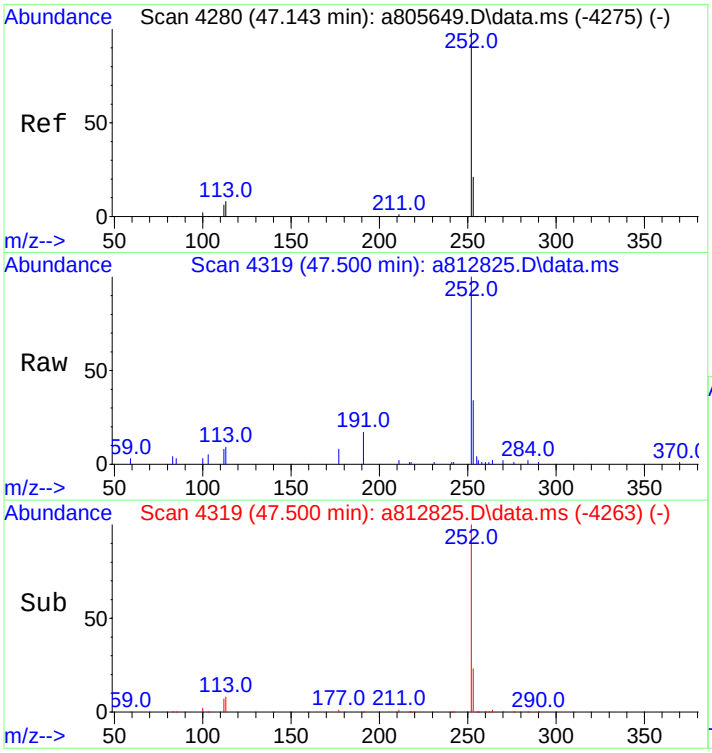


#84
Benzo[b]fluoranthene
Concen: 75.08 ng/mL
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:252 Resp: 16084

Ion	Ratio	Lower	Upper
252	100		
253	23.2	18.5	27.7

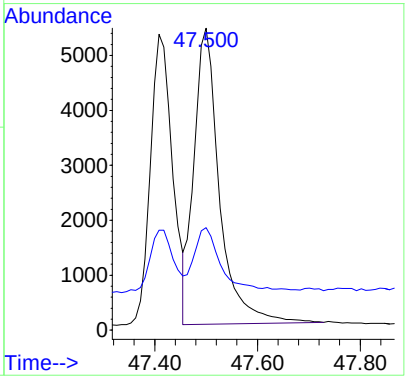


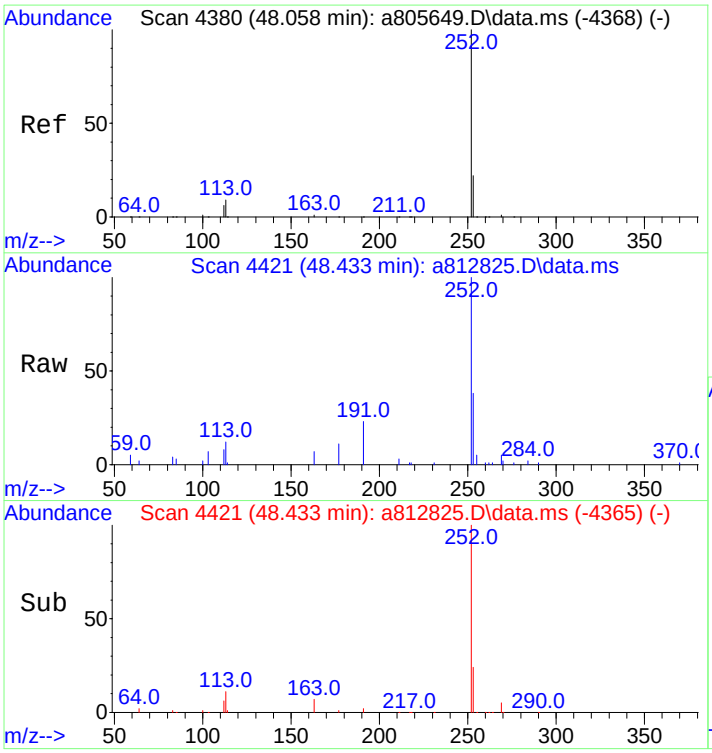


#85
Benzo[j]+[k]fluoranthene
Concen: 84.20 ng/mL
RT: 47.500 min Scan# 4319
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:252 Resp: 18571

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.8	28.2

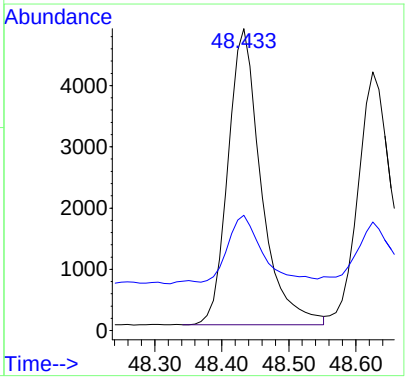


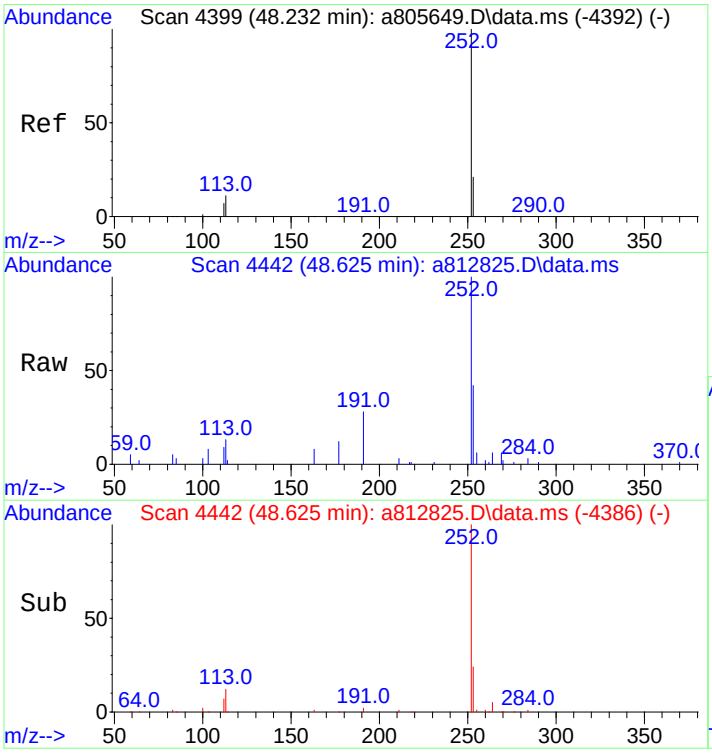


#87
Benzo[e]pyrene
Concen: 78.44 ng/mL
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:252 Resp: 16666

Ion	Ratio	Lower	Upper
252	100		
253	23.7	18.9	28.3

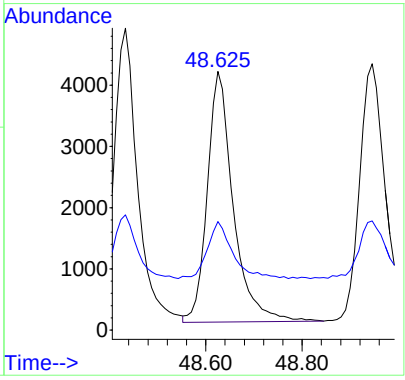


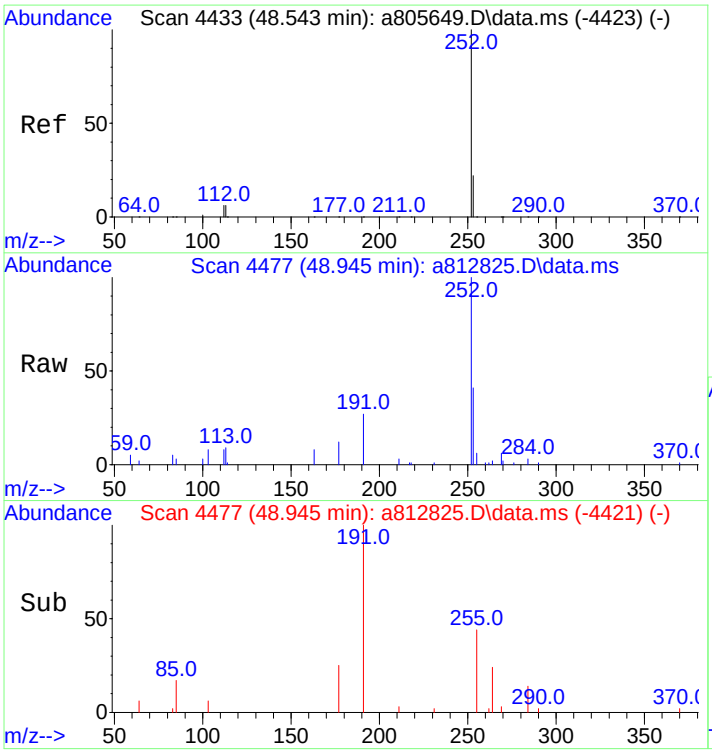


#89
Benzo[a]pyrene
Concen: 79.08 ng/mL
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:252 Resp: 15297

Ion	Ratio	Lower	Upper
252	100		
253	23.9	19.4	29.0

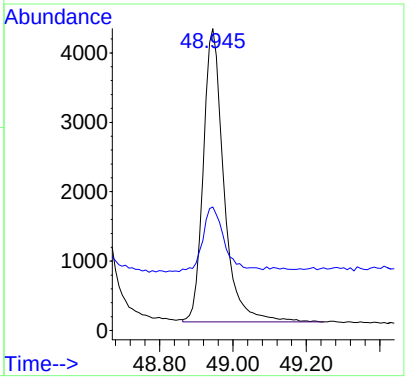


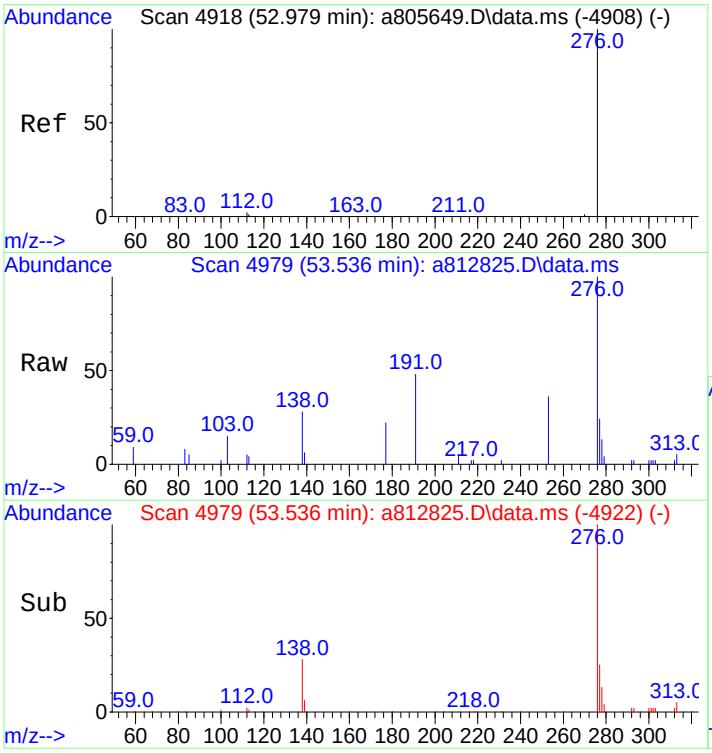


#90
Perylene
Concen: 77.60 ng/mL
RT: 48.945 min Scan# 4477
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:252 Resp: 16399

Ion	Ratio	Lower	Upper
252	100		
253	23.9	19.3	28.9

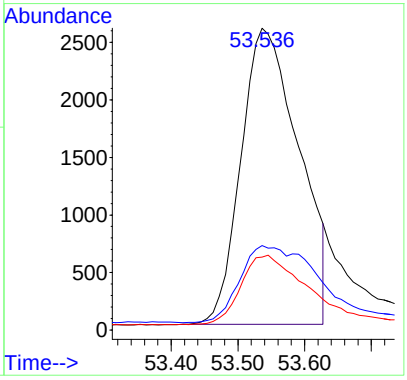


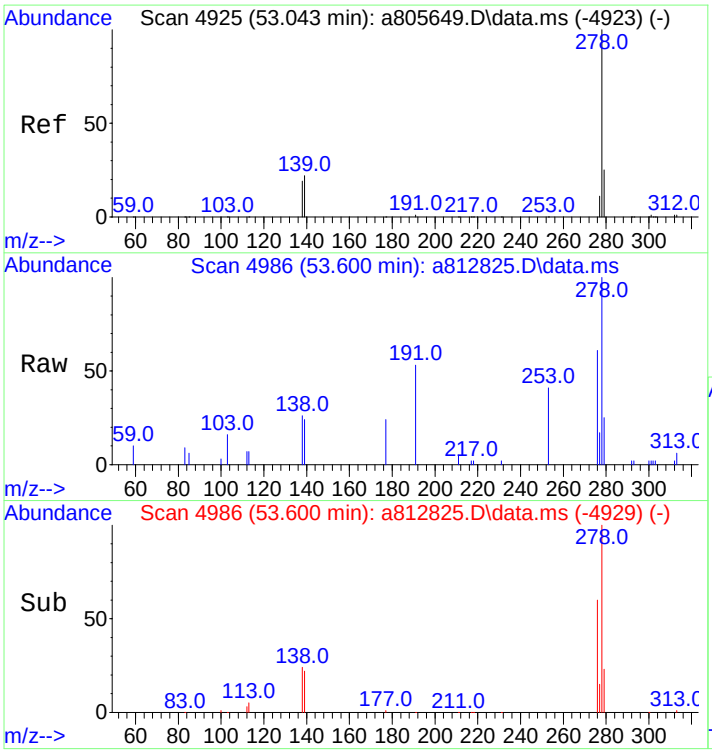


#91
Indeno[1,2,3-cd]pyrene
Concen: 72.24 ng/mL m
RT: 53.536 min Scan# 4979
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:276 Resp: 15591

Ion	Ratio	Lower	Upper
276	100		
138	37.9	19.9	29.9#
277	28.4	19.0	28.6

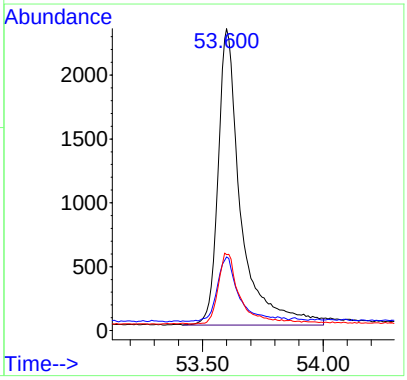


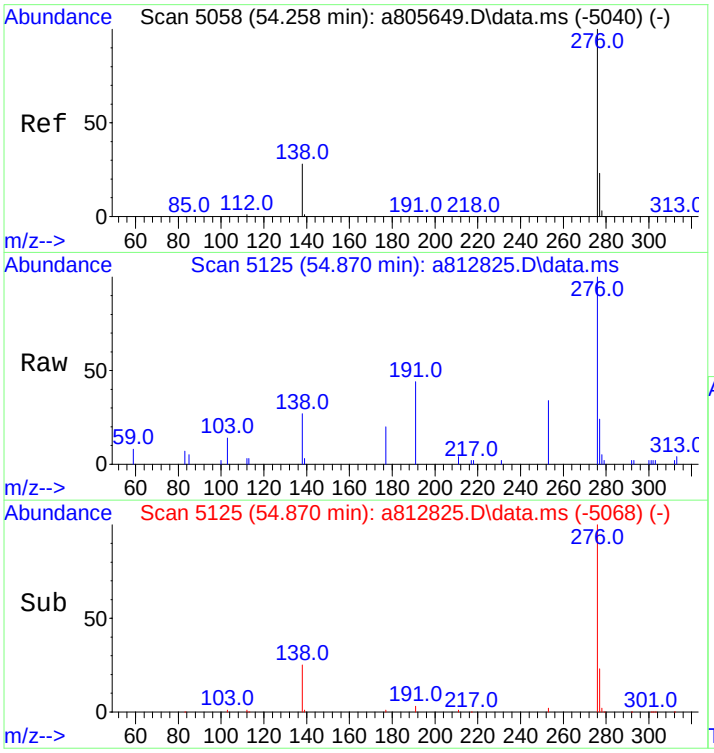


#92
Dibenz[ah]+[ac]anthracene
Concen: 78.06 ng/mL
RT: 53.600 min Scan# 4986
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:278 Resp: 15225

Ion	Ratio	Lower	Upper
278	100		
139	20.3	16.6	25.0
279	22.1	19.1	28.7

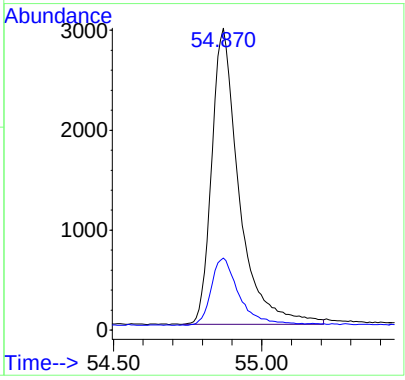


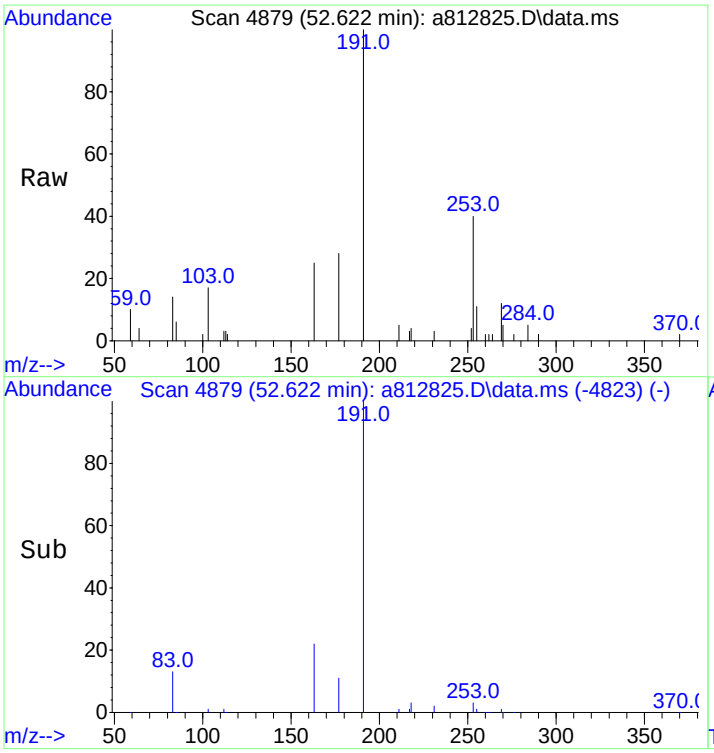


#93
Benzo[g,h,i]perylene
Concen: 82.79 ng/mL
RT: 54.870 min Scan# 5125
Delta R.T. 0.018 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:276 Resp: 19038

Ion	Ratio	Lower	Upper
276	100		
277	23.4	18.9	28.3

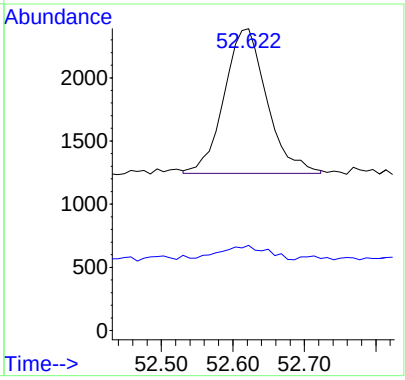


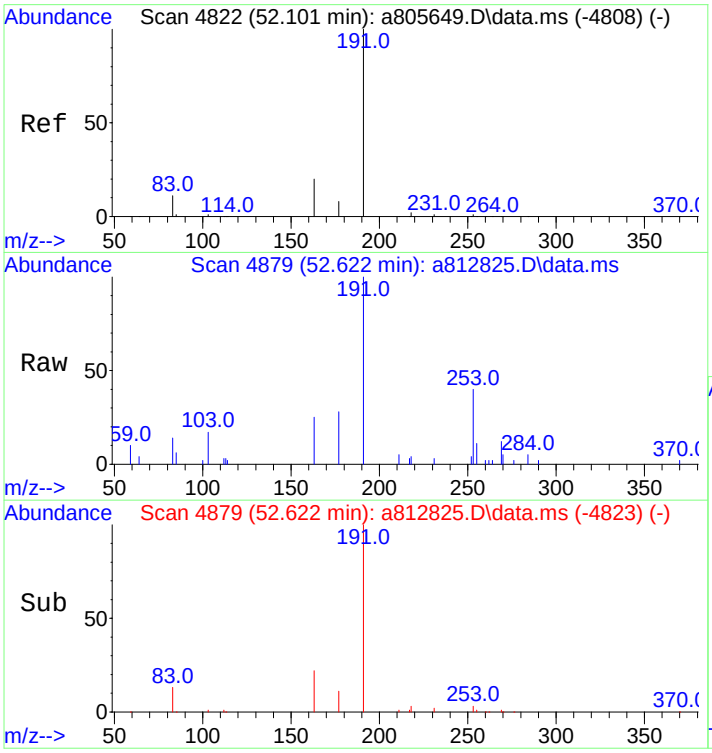


#94
Hopane (T19)
Concen: 70.40 ng/mL m
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:191 Resp: 4748

Ion	Ratio	Lower	Upper
191	100		
177	10.4	9.8	14.8

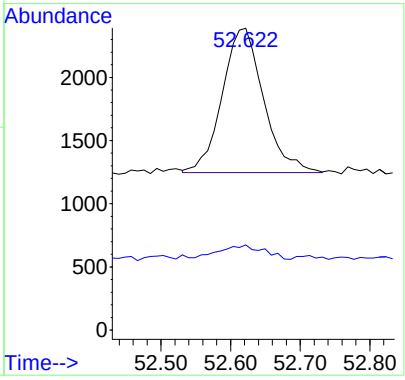




#95
17a(H),21B(H)-hopane - C30H52
Concen: 70.11 ng/mL m
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: a812825.D
Acq: 18 Nov 2012 12:33 pm

Tgt Ion:191 Resp: 4728

Ion	Ratio	Lower	Upper
191	100		
177	10.4	9.8	14.8



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812826.D
Acq On : 18 Nov 2012 1:58 pm
Operator : AC
Sample : i811181204
Misc : l4 whaq86
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 12:13:45 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

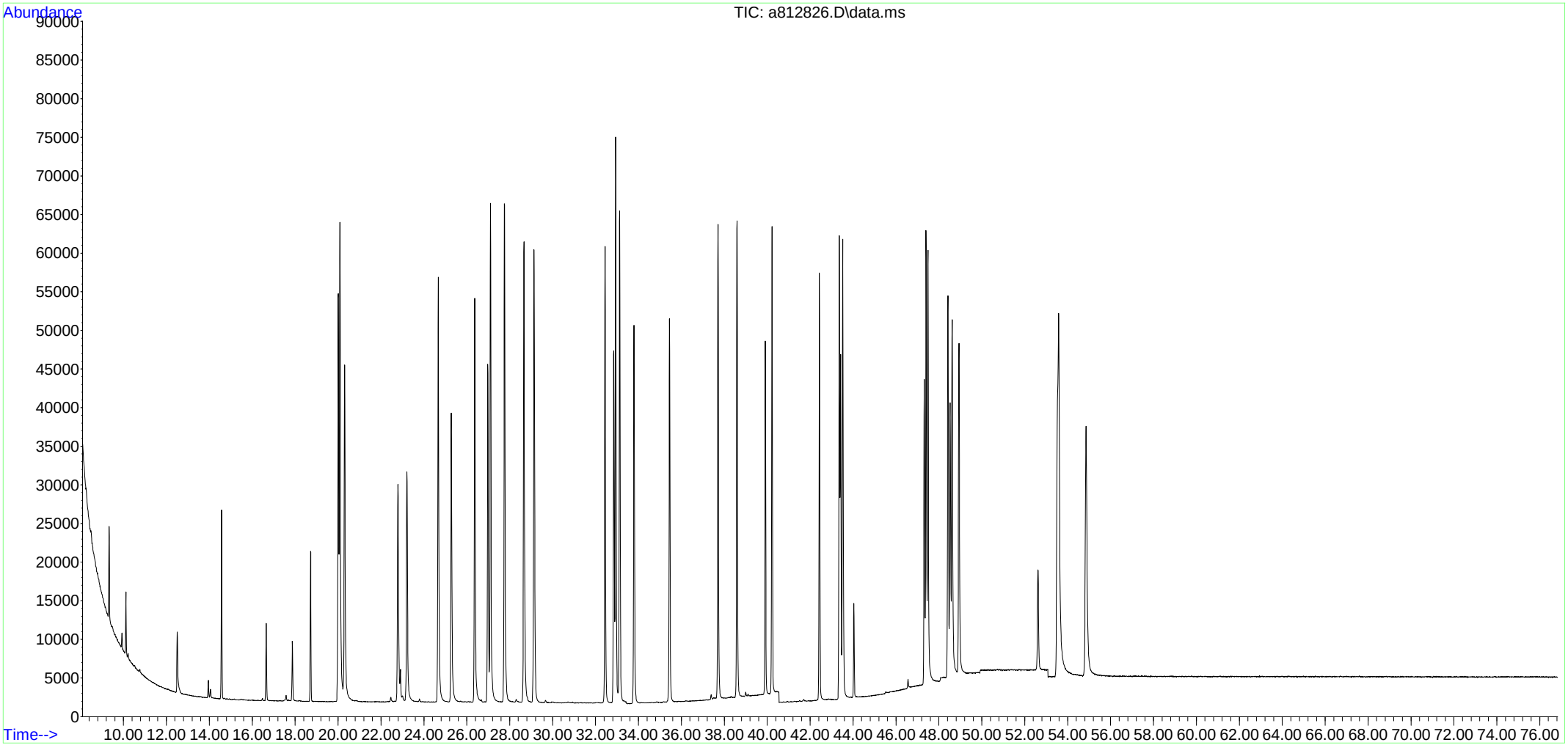
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	67006	500.000	ng/mL	0.00
74) Chrysene-d12	43.415	240	93688	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	149390	514.314	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.43%			
42) Phenanthrene-d10	32.853	188	114047	524.462	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.45%			
83) Benzo[b]fluoranthene-d12	47.317	264	90585	452.281	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.23%#			
88) Benzo[a]pyrene-d12	48.525	264	91270	489.583	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.96%#			
129) 5B(H)Cholane - Surr	44.036	217	16432	444.281	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.43%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	14140	230.625	ng/mL	100
4) cis-Decalin	17.870	138	10387	226.803	ng/mL	100
10) Naphthalene	20.087	128	168604	495.107	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	97786	487.334	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	93781	489.635	ng/mL#	100
18) Benzothiophene	20.306	134	131744	486.467	ng/mL	100
23) Biphenyl	24.668	154	123610	498.520	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.280	156	83899	498.753	ng/mL#	100
25) Dibenzofuran	27.762	168	129248	497.081	ng/mL	98
26) Acenaphthylene	26.375	152	149554M3	485.855	ng/mL	
27) Acenaphthene	27.105	153	89436	491.377	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.665	170	70621	499.040	ng/mL	97
29) Fluorene	29.130	166	98319	494.725	ng/mL	100
33) Dibenzothiophene	32.442	184	133621	469.495	ng/mL	100
43) Phenanthrene	32.935	178	132785	483.690	ng/mL	100
54) Retene	39.909	234	28750	492.024	ng/mL	98
55) Anthracene	33.126	178	125886M3	486.488	ng/mL	
56) Carbazole	33.793	167	124597	481.379	ng/mL	100
57) 1-Methylphenanthrene	35.445	192	90715	475.743	ng/mL	100
58) Fluoranthene	37.709	202	134559M3	477.517	ng/mL	
59) Benzo(b)fluorene	40.220	216	74840	469.953	ng/mL	100
60) Pyrene	38.594	202	134856	475.297	ng/mL	99
66) Naphthobenzothiophene	42.429	234	122309	467.242	ng/ml	100
67) Naphthobenzothiophene-...	42.429	234	122309	467.242	ng/mL	100
75) Benz[a]anthracene	43.360	228	107258	429.248	ng/mL	100
76) Chrysene	43.516	228	108112	445.310	ng/mL	99
77) Chrysene/Triphenylene	43.516	228	108112	445.310	ng/mL	99
84) Benzo[b]fluoranthene	47.400	252	111215	408.464	ng/mL	97
85) Benzo[j]+[k]fluoranthene	47.491	252	125366	447.193	ng/mL	95
87) Benzo[e]pyrene	48.424	252	110422	408.915	ng/mL	97
89) Benzo[a]pyrene	48.616	252	103362M3	420.418	ng/mL	
90) Perylene	48.936	252	110108	409.905	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.518	276	102713M3	374.436	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.582	278	113568	458.112	ng/mL	99
93) Benzo[g,h,i]perylene	54.852	276	126588	433.125	ng/mL	99
94) Hopane (T19)	52.613	191	33302	388.516	ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.613	191	33302	388.516	ng/mL#	90

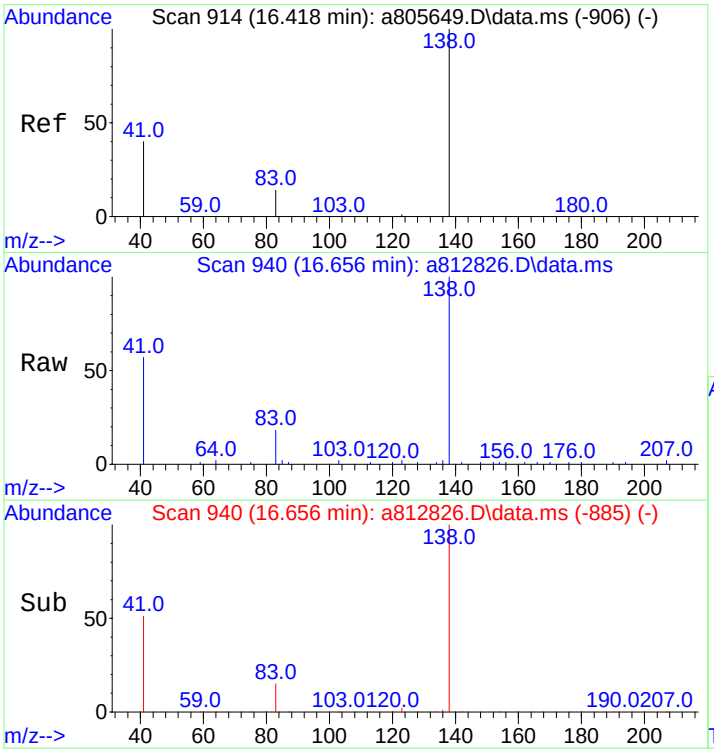
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812826.D
Acq On : 18 Nov 2012 1:58 pm
Operator : AC
Sample : i811181204
Misc : l4 whaq86
ALS Vial : 7 Sample Multiplier: 1

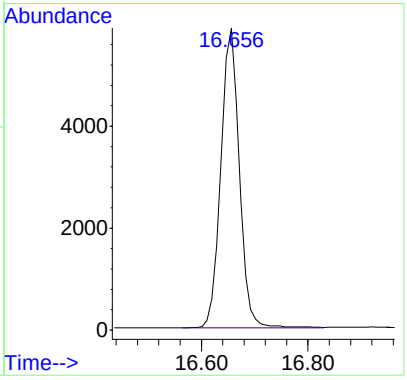
Quant Time: Nov 19 12:13:45 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

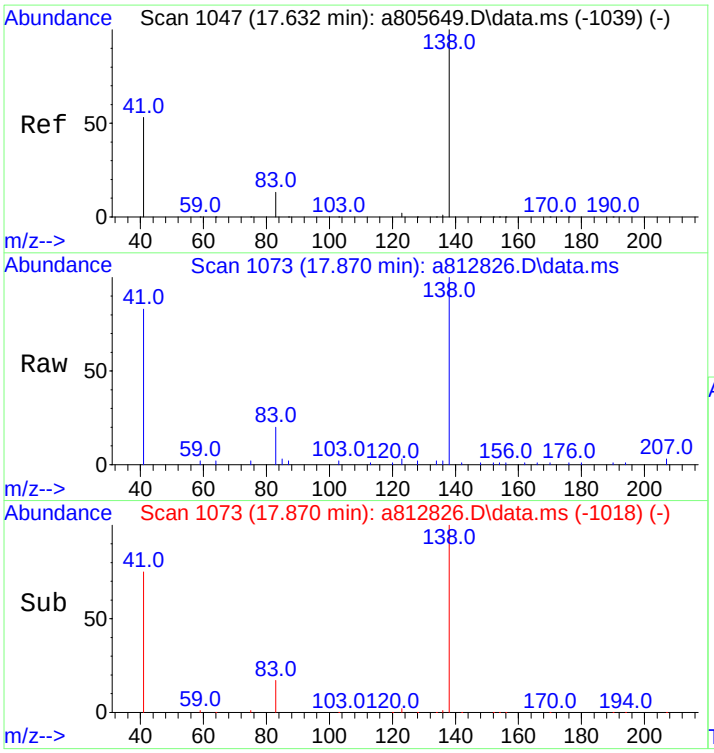




#3
trans-Decalin
Concen: 230.62 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

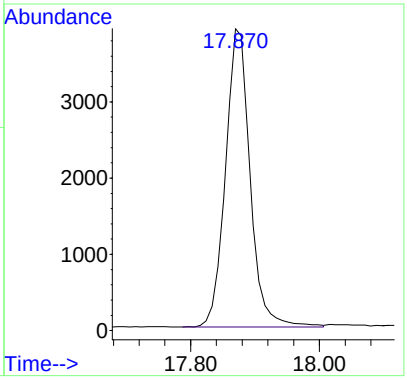
Tgt Ion:138 Resp: 14140

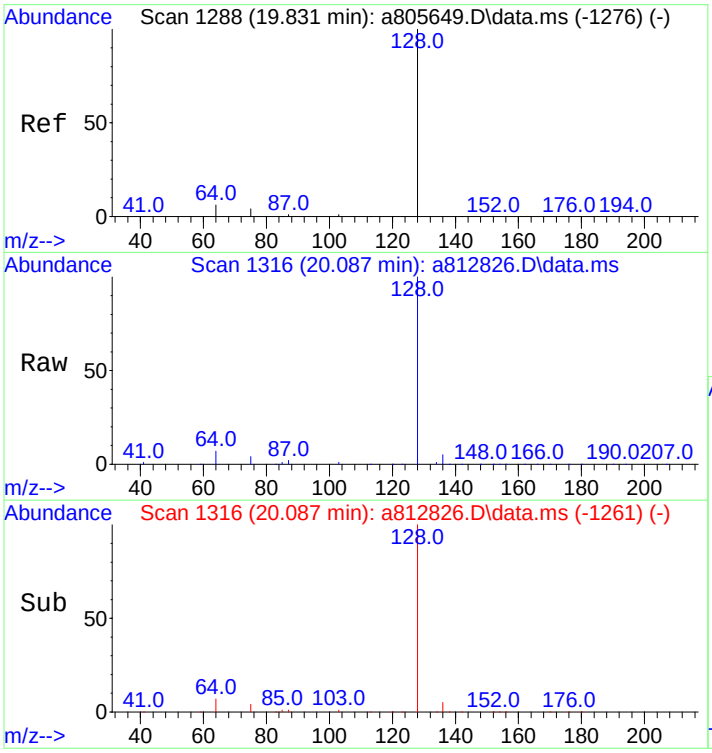




#4
cis-Decalin
Concen: 226.80 ng/mL
RT: 17.870 min Scan# 1073
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:138 Resp: 10387

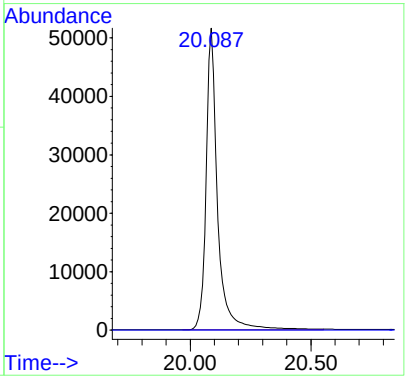


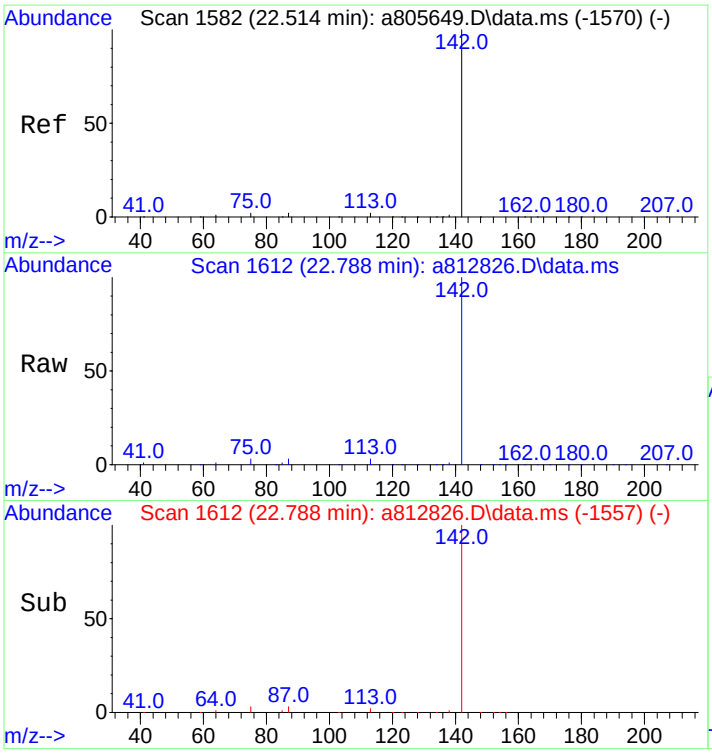


#10
Naphthalene
Concen: 495.11 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:128 Resp: 168604

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

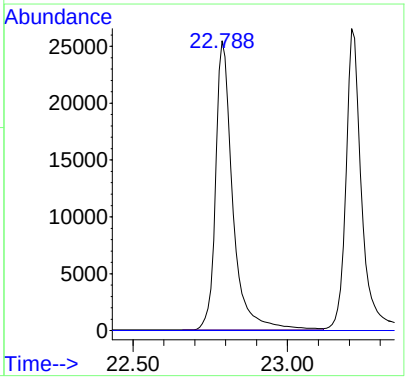


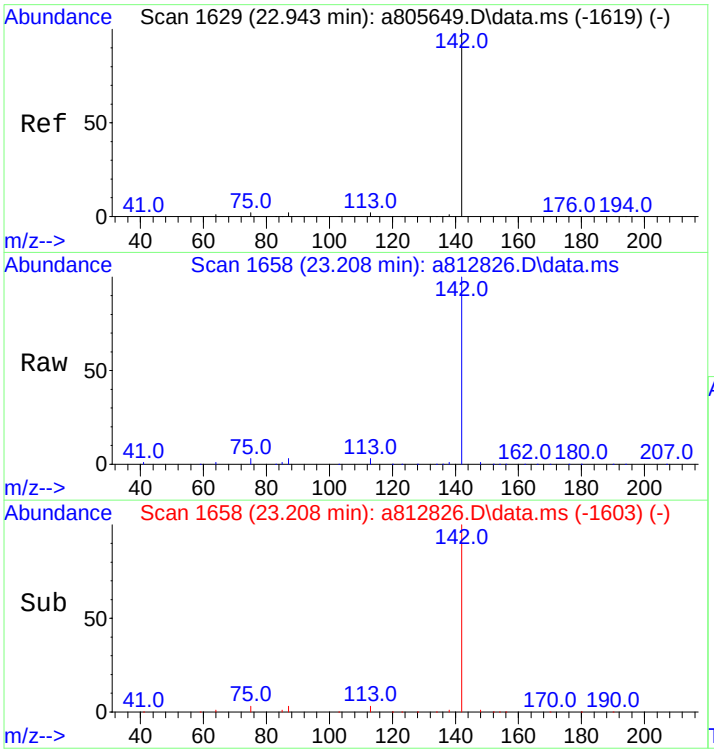


#16
2-Methylnaphthalene
Concen: 487.33 ng/mL
RT: 22.788 min Scan# 1612
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:142 Resp: 97786

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

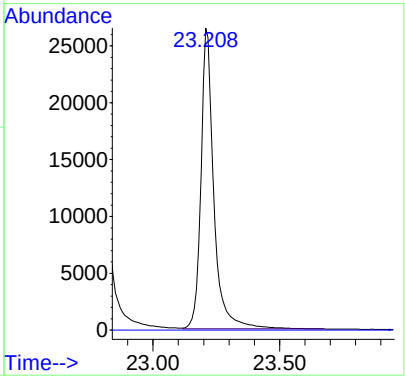


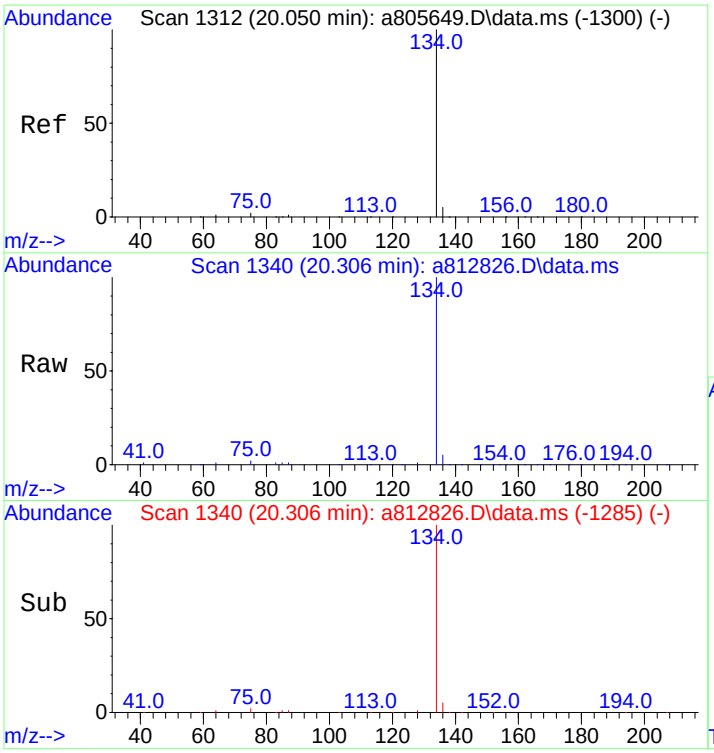


#17
1-Methylnaphthalene
Concen: 489.64 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:142 Resp: 93781

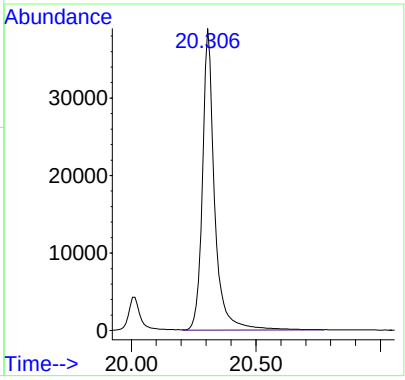
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

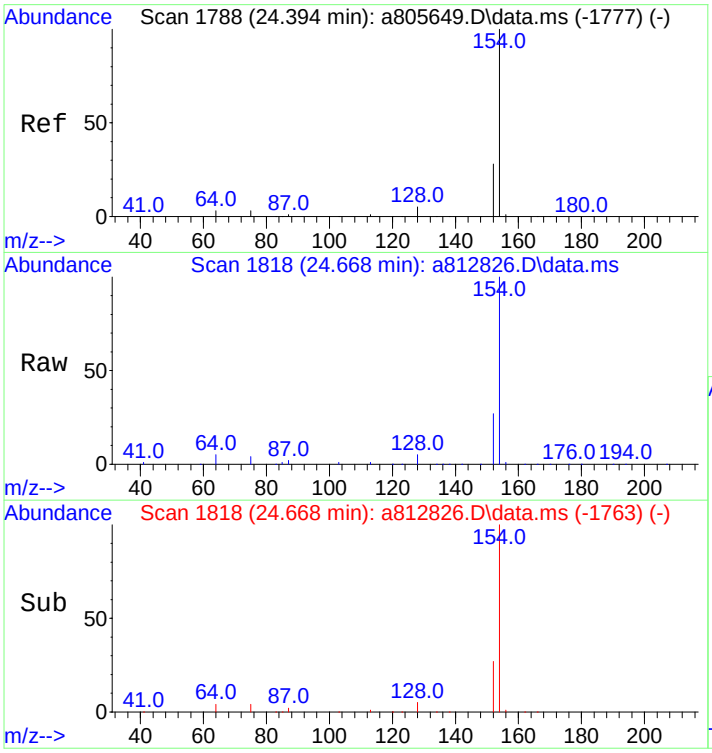




#18
Benzothiophene
Concen: 486.47 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:134 Resp: 131744

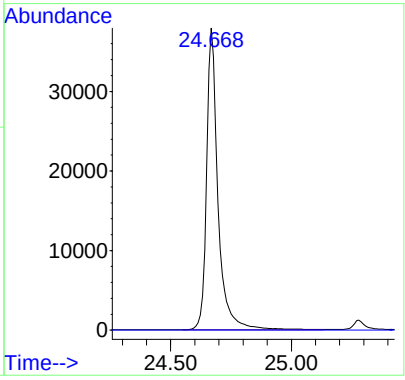


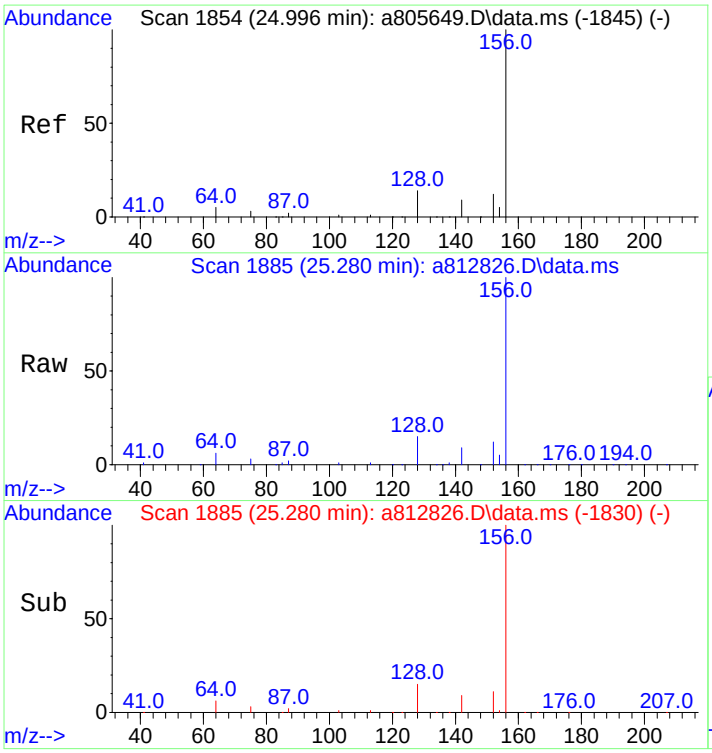


#23
Biphenyl
Concen: 498.52 ng/mL
RT: 24.668 min Scan# 1818
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:154 Resp: 123610

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

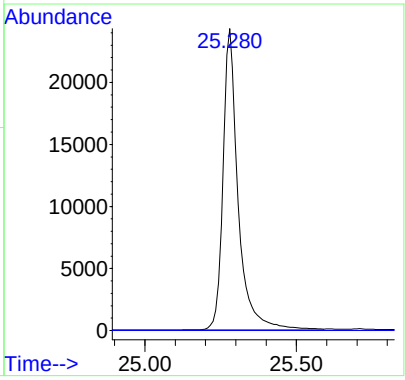


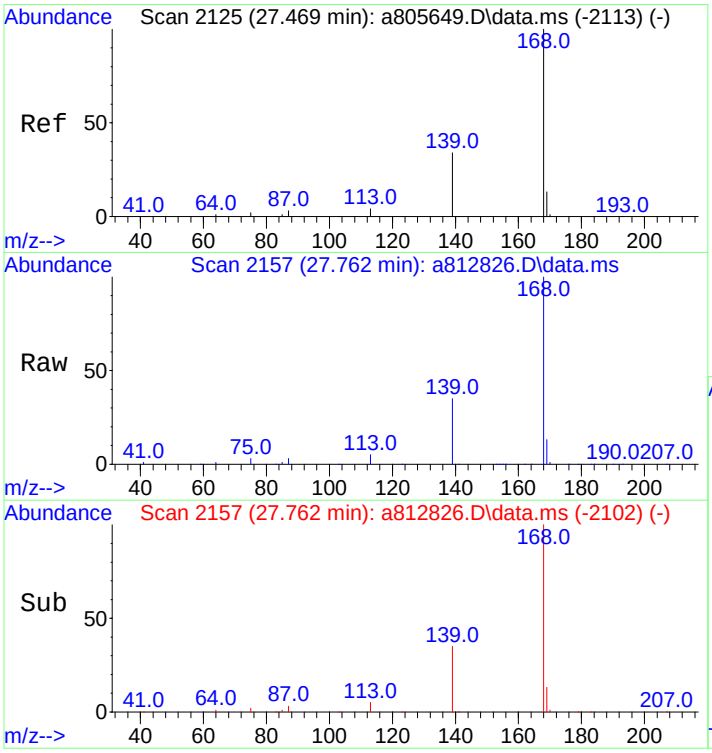


#24
2,6-Dimethylnaphthalene
Concen: 498.75 ng/mL
RT: 25.280 min Scan# 1885
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:156 Resp: 83899

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

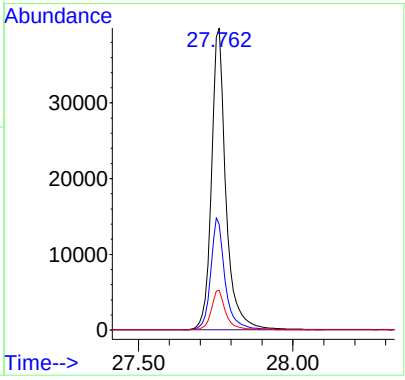


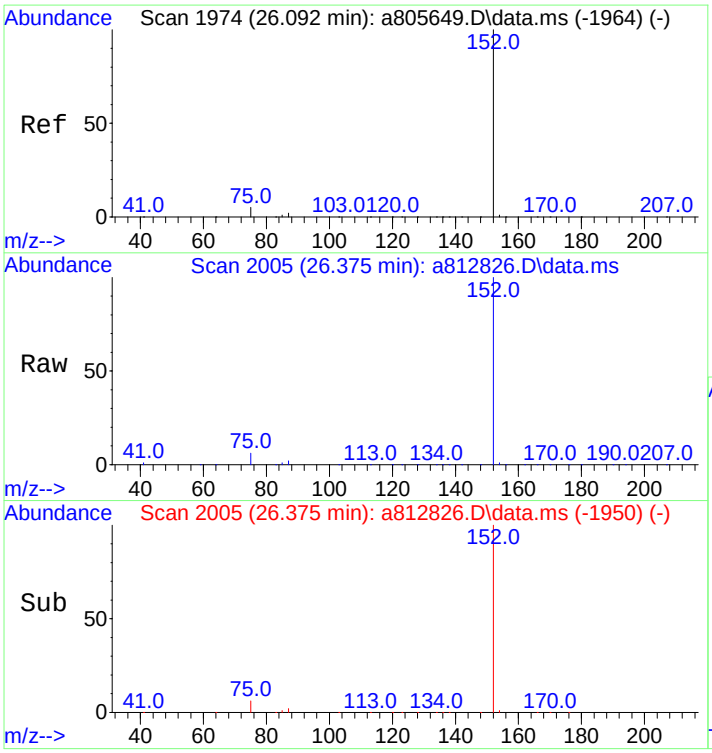


#25
Dibenzofuran
Concen: 497.08 ng/mL
RT: 27.762 min Scan# 2157
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:168 Resp: 129248

Ion	Ratio	Lower	Upper
168	100		
139	36.9	28.0	42.0
169	13.1	10.6	15.8

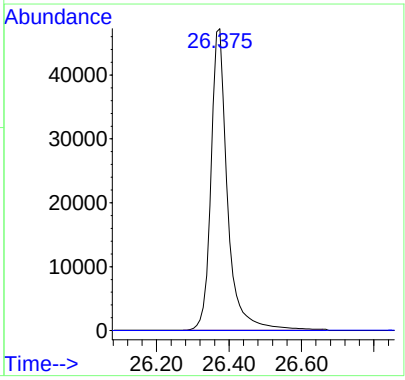


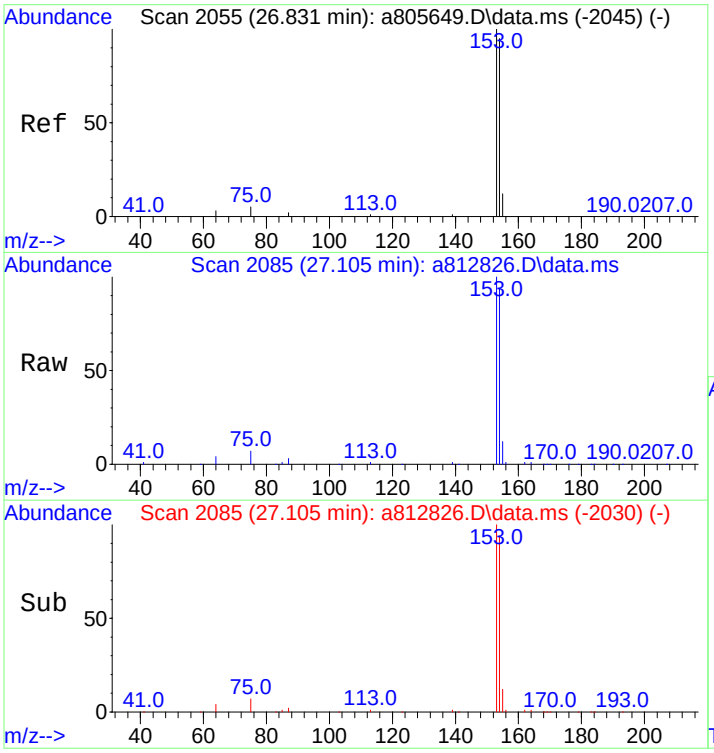


#26
Acenaphthylene
Concen: 485.85 ng/mL m
RT: 26.375 min Scan# 2005
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:152 Resp: 149554

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

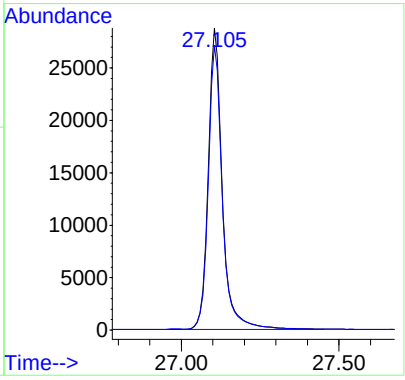


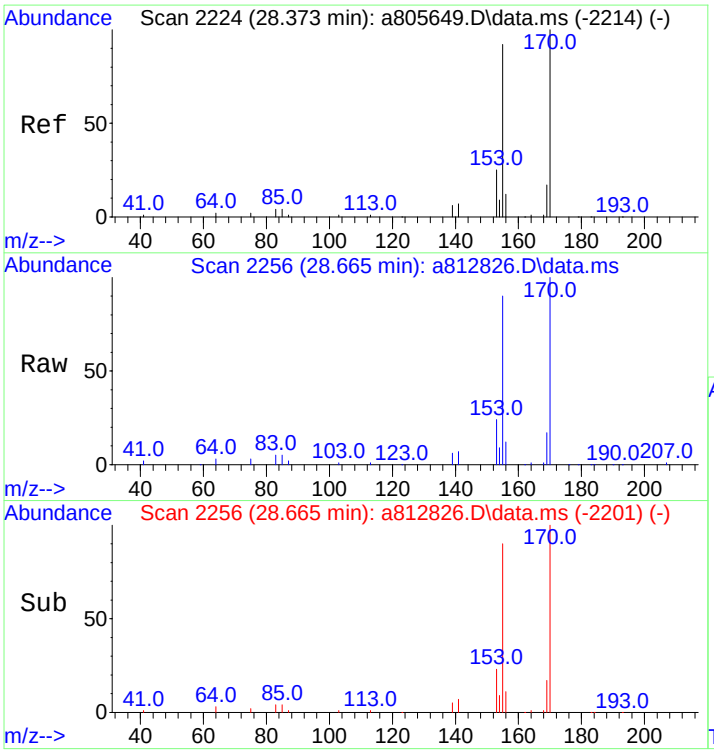


#27
Acenaphthene
Concen: 491.38 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:153 Resp: 89436

Ion	Ratio	Lower	Upper
153	100		
154	94.3	75.4	113.2

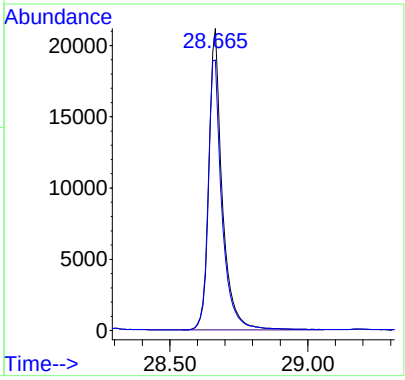


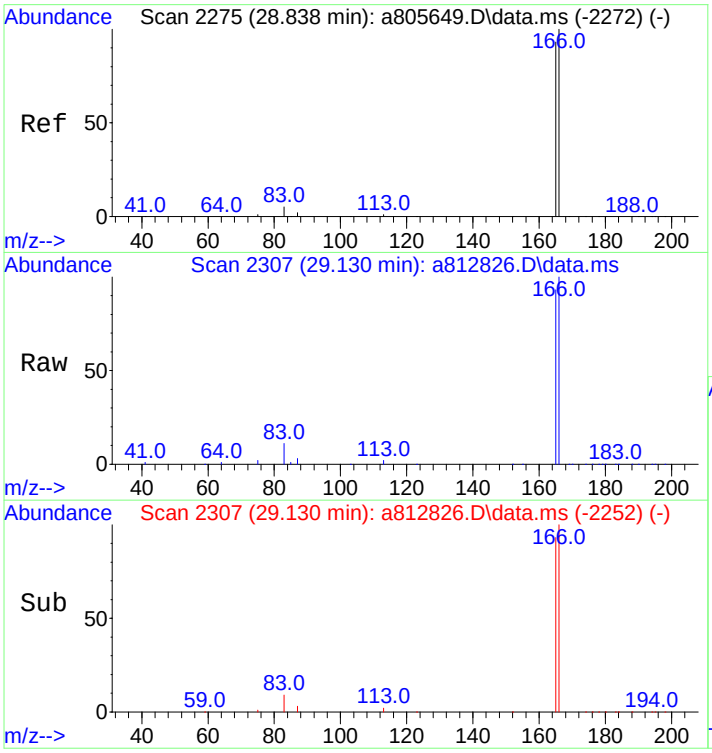


#28
2,3,5-Trimethylnaphthalene
Concen: 499.04 ng/mL
RT: 28.665 min Scan# 2256
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:170 Resp: 70621

Ion	Ratio	Lower	Upper
170	100		
155	92.7	71.7	107.5

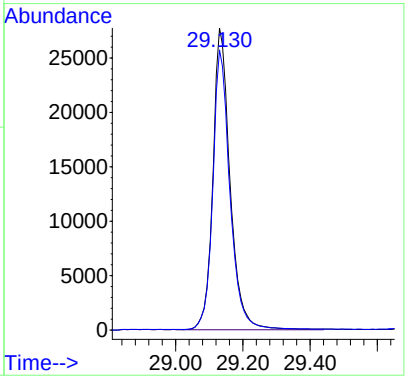


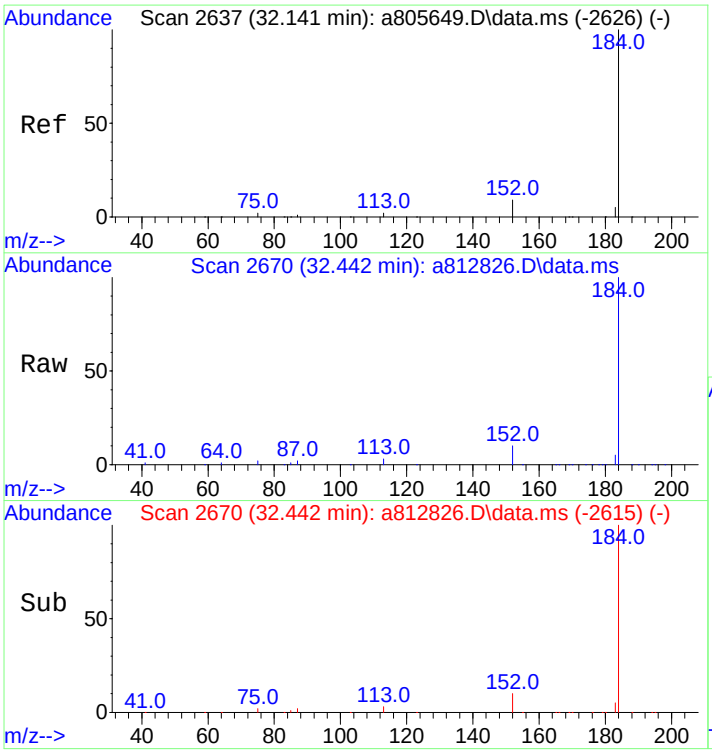


#29
Fluorene
Concen: 494.72 ng/mL
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:166 Resp: 98319

Ion	Ratio	Lower	Upper
166	100		
165	92.7	74.2	111.2

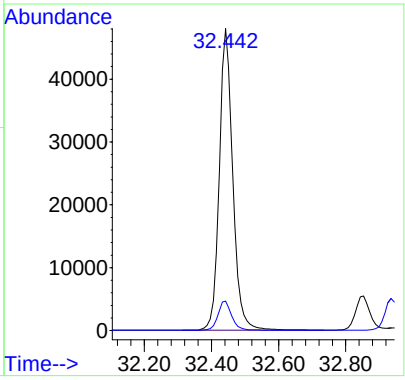


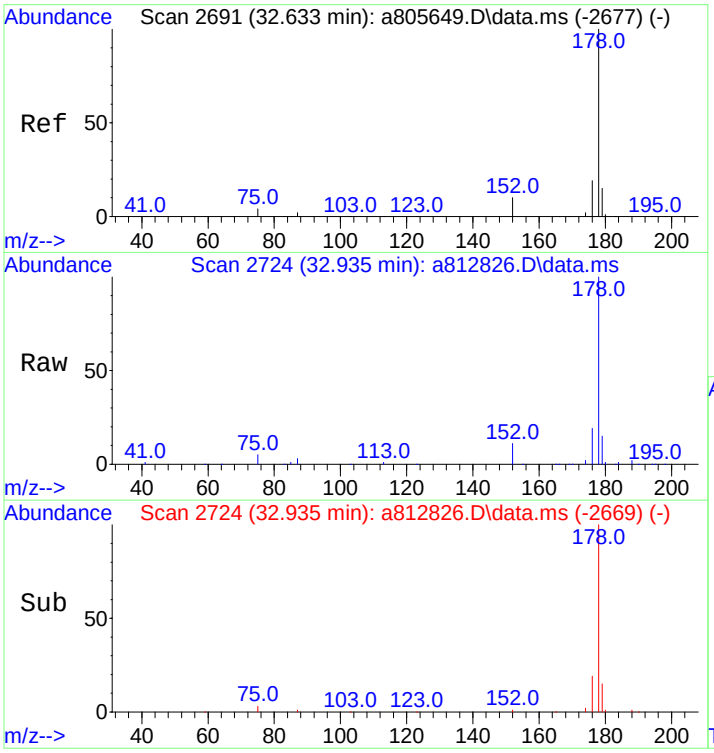


#33
Dibenzothiophene
Concen: 469.49 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:184 Resp: 133621

Ion	Ratio	Lower	Upper
184	100		
152	9.8	7.8	11.8

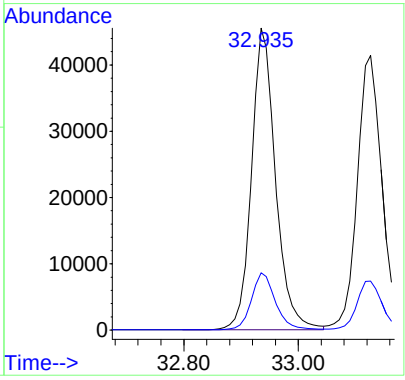


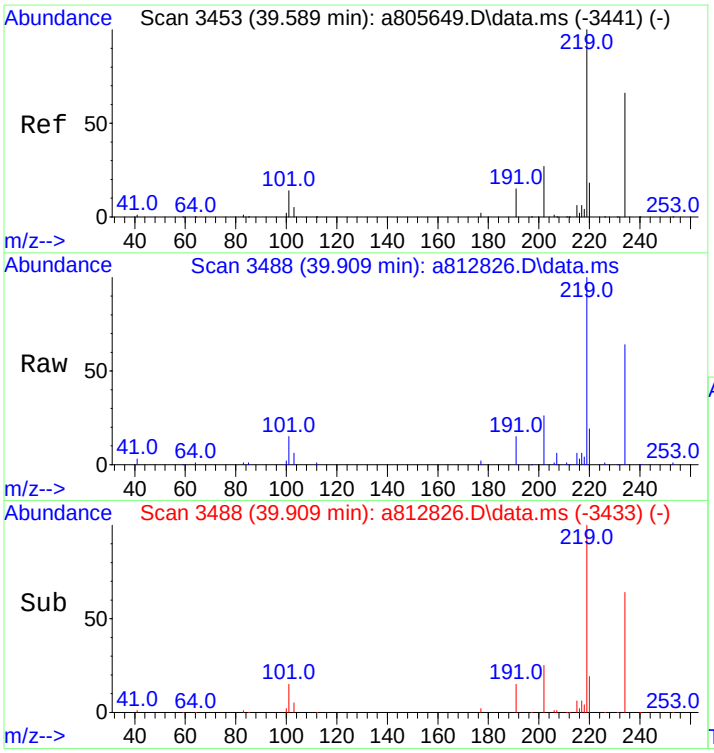


#43
Phenanthrene
Concen: 483.69 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:178 Resp: 132785

Ion	Ratio	Lower	Upper
178	100		
176	18.9	15.2	22.8

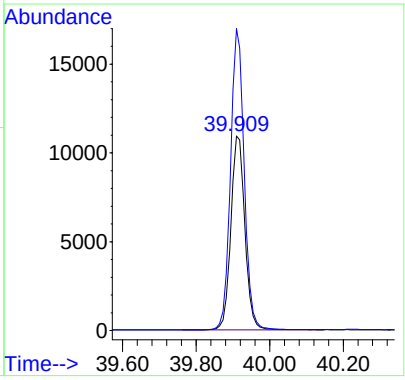


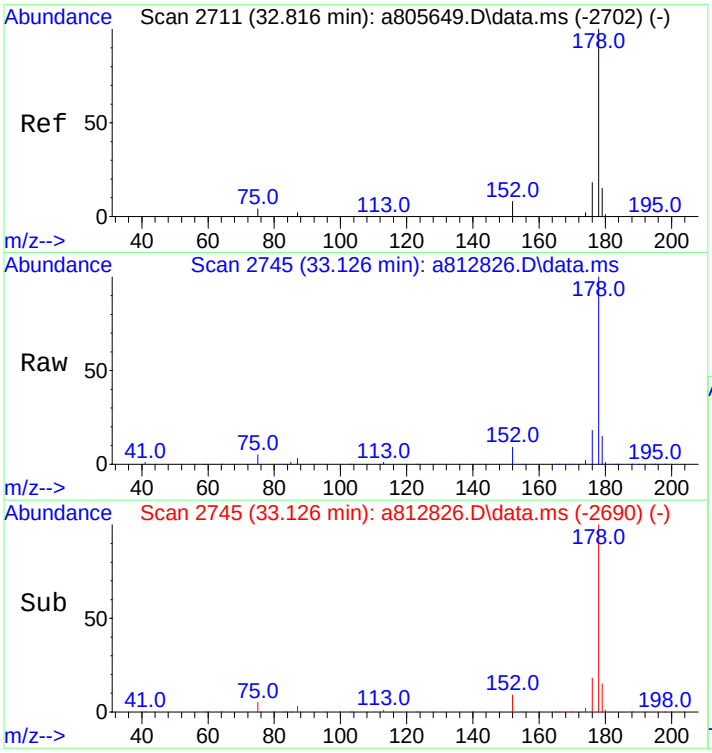


#54
Retene
Concen: 492.02 ng/mL
RT: 39.909 min Scan# 3488
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:234 Resp: 28750

Ion	Ratio	Lower	Upper
234	100		
219	151.9	124.0	186.0

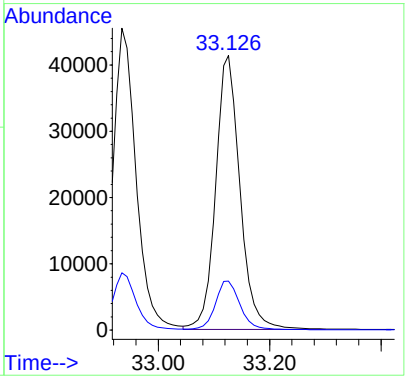


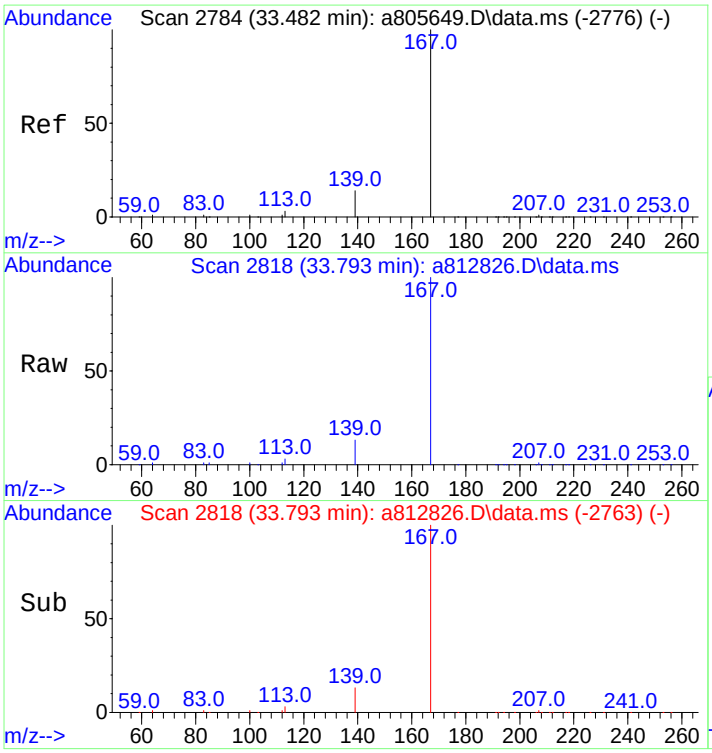


#55
Anthracene
Concen: 486.49 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:178 Resp: 125886

Ion	Ratio	Lower	Upper
178	100		
176	18.3	14.3	21.5

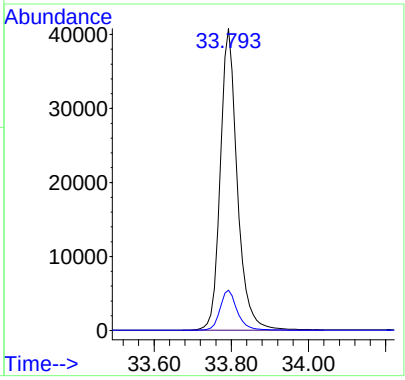


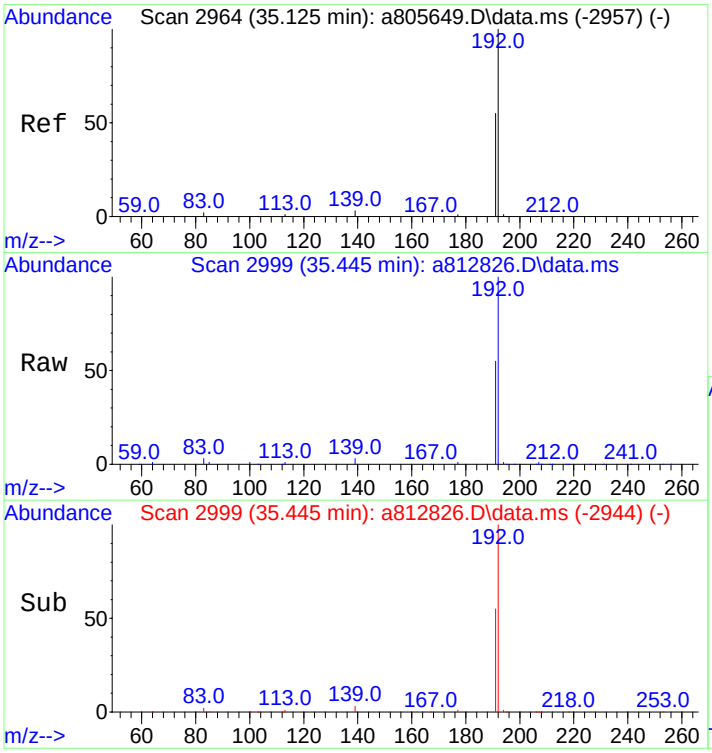


#56
Carbazole
Concen: 481.38 ng/mL
RT: 33.793 min Scan# 2818
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:167 Resp: 124597

Ion	Ratio	Lower	Upper
167	100		
139	13.4	10.6	16.0

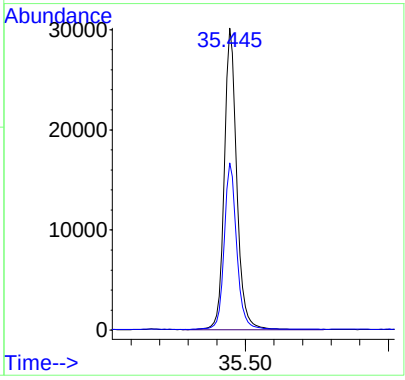


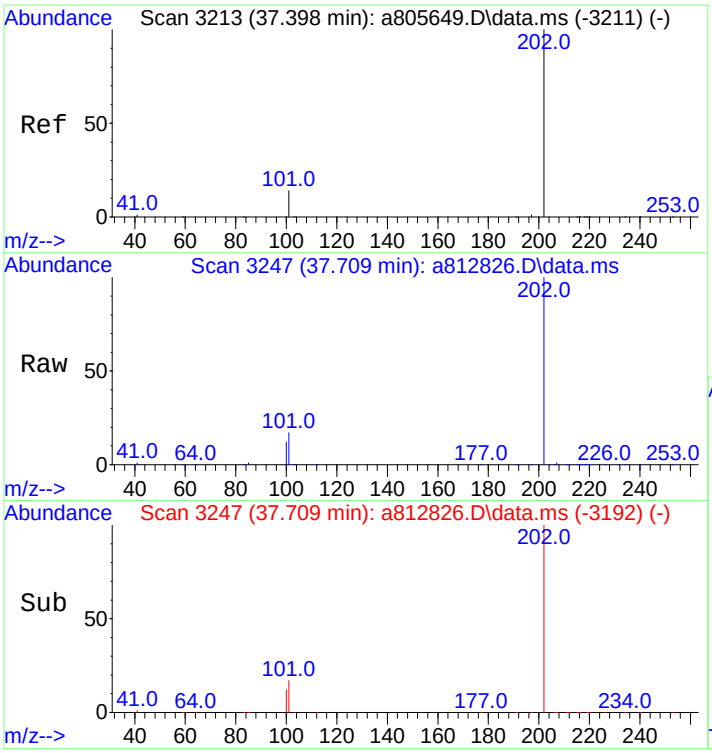


#57
1-Methylphenanthrene
Concen: 475.74 ng/mL
RT: 35.445 min Scan# 2999
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:192 Resp: 90715

Ion	Ratio	Lower	Upper
192	100		
191	55.2	44.2	66.4

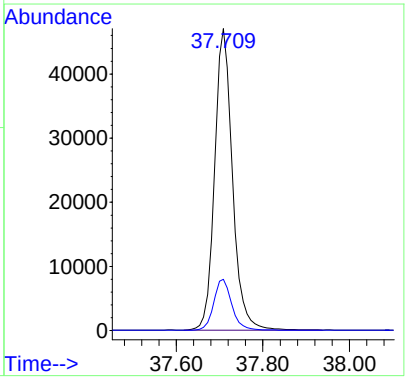


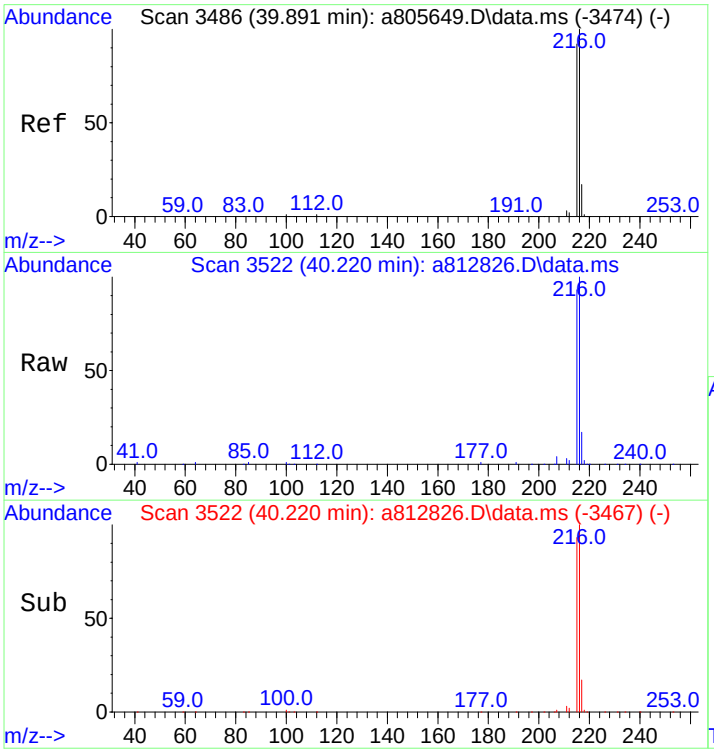


#58
Fluoranthene
Concen: 477.52 ng/mL m
RT: 37.709 min Scan# 3247
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:202 Resp: 134559

Ion	Ratio	Lower	Upper
202	100		
101	17.2	13.6	20.4

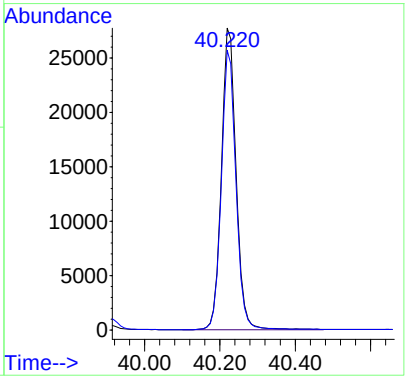


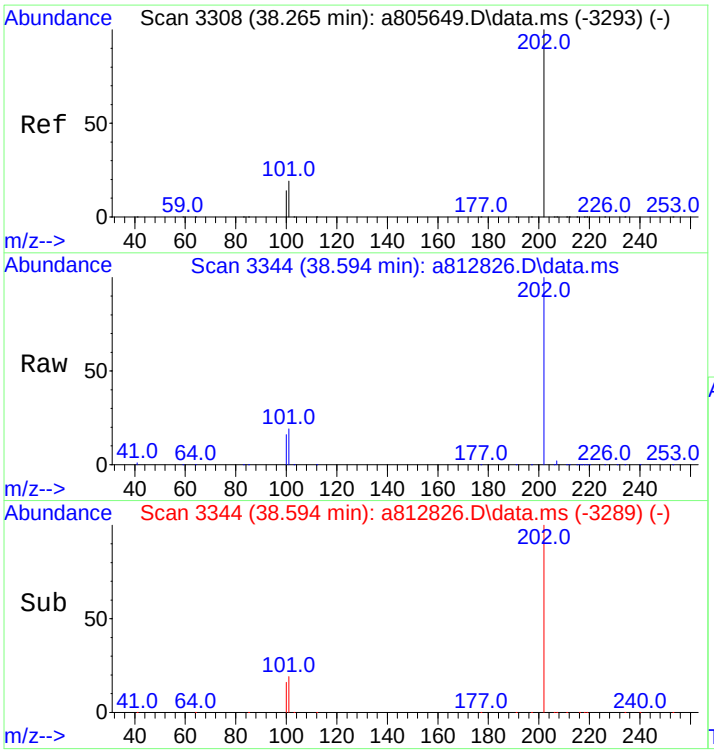


#59
Benzo(b)fluorene
Concen: 469.95 ng/mL
RT: 40.220 min Scan# 3522
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:216 Resp: 74840

Ion	Ratio	Lower	Upper
216	100		
215	92.3	74.2	111.2

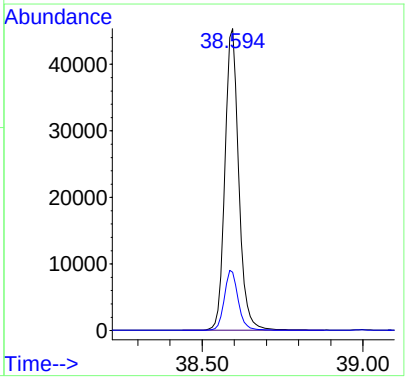


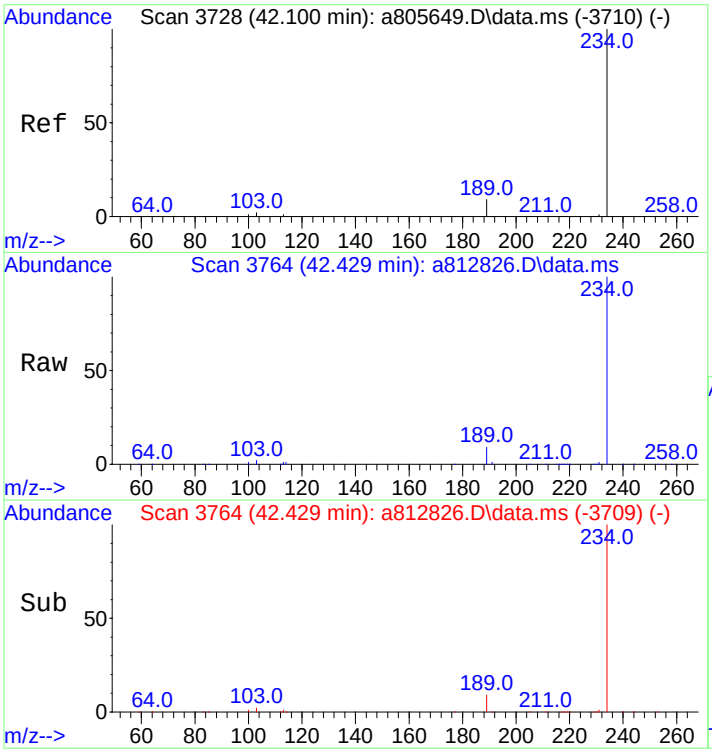


#60
Pyrene
Concen: 475.30 ng/mL
RT: 38.594 min Scan# 3344
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:202 Resp: 134856

Ion	Ratio	Lower	Upper
202	100		
101	20.0	15.4	23.2

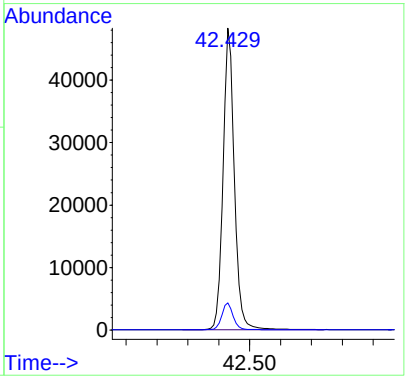


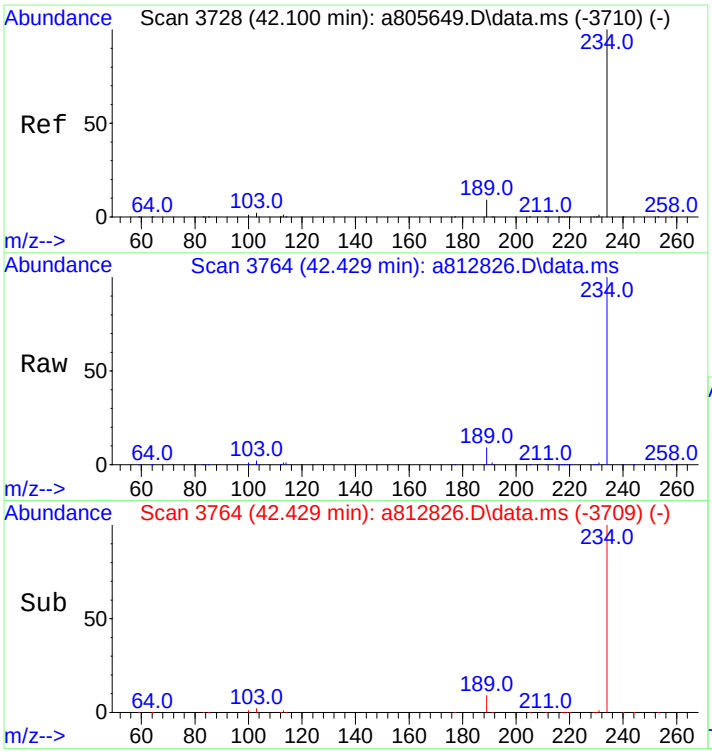


#66
Naphthobenzothiophene
Concen: 467.24 ng/ml
RT: 42.429 min Scan# 3764
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:234 Resp: 122309

Ion	Ratio	Lower	Upper
234	100		
189	8.8	7.2	10.8

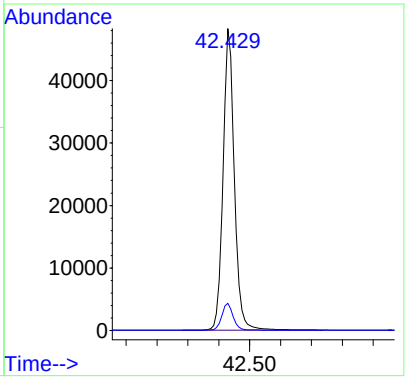


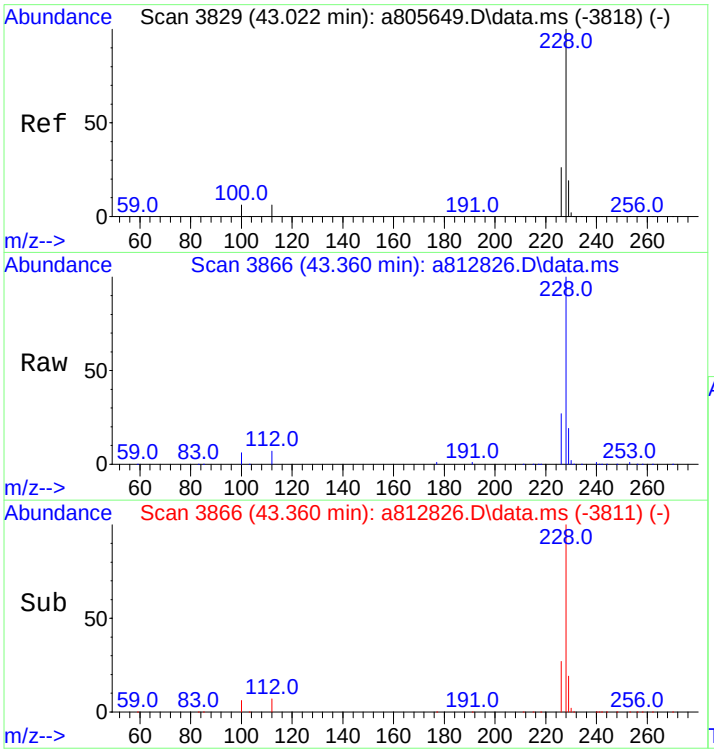


#67
Naphthobenzothiophene-2,1-D
Concen: 467.24 ng/mL
RT: 42.429 min Scan# 3764
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:234 Resp: 122309

Ion	Ratio	Lower	Upper
234	100		
189	8.8	7.2	10.8

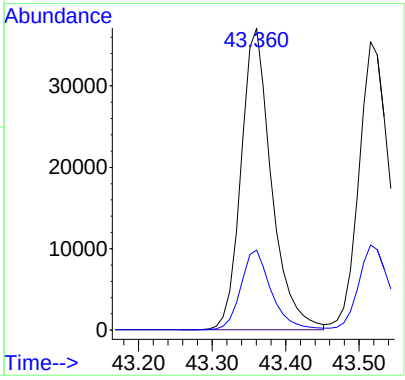


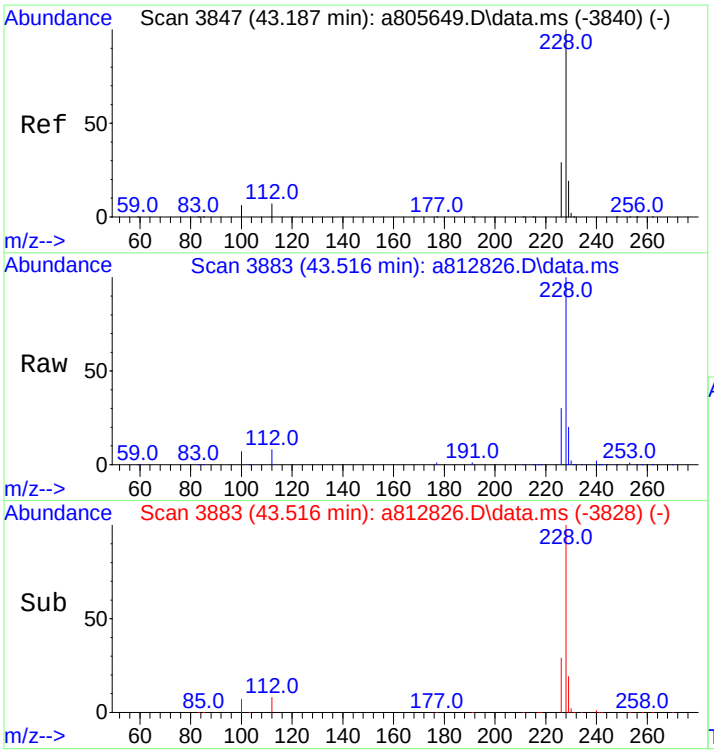


#75
Benz[a]anthracene
Concen: 429.25 ng/mL
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:228 Resp: 107258

Ion	Ratio	Lower	Upper
228	100		
226	26.4	21.3	31.9

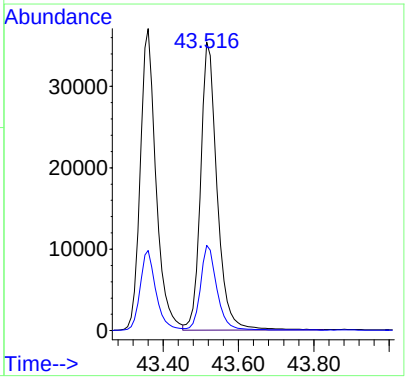


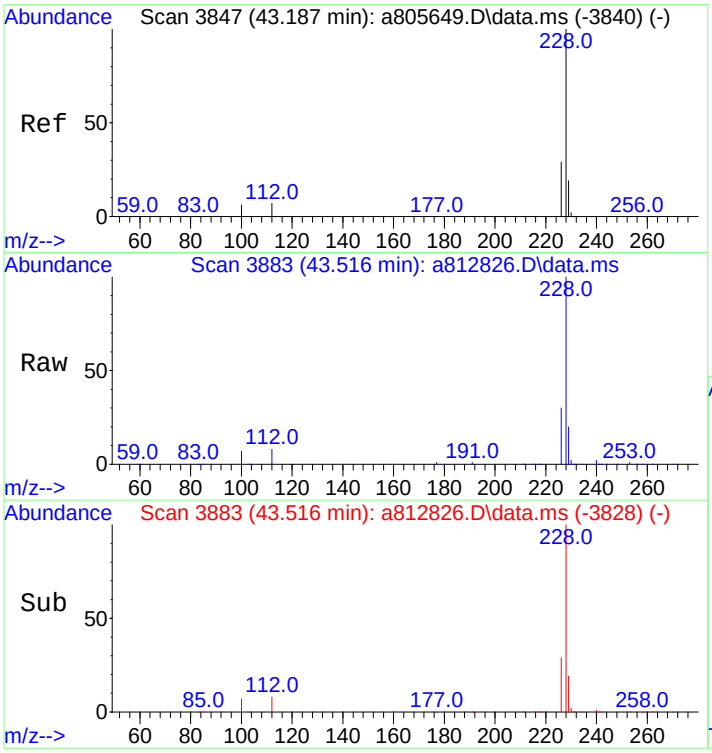


#76
Chrysene
Concen: 445.31 ng/mL
RT: 43.516 min Scan# 3883
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:228 Resp: 108112

Ion	Ratio	Lower	Upper
228	100		
226	29.2	23.6	35.4

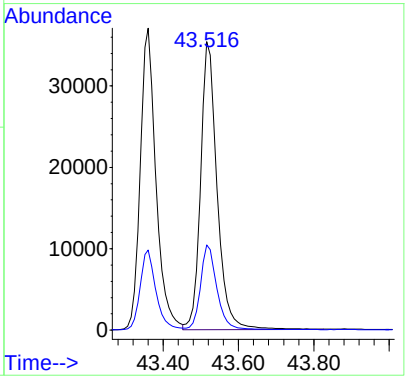


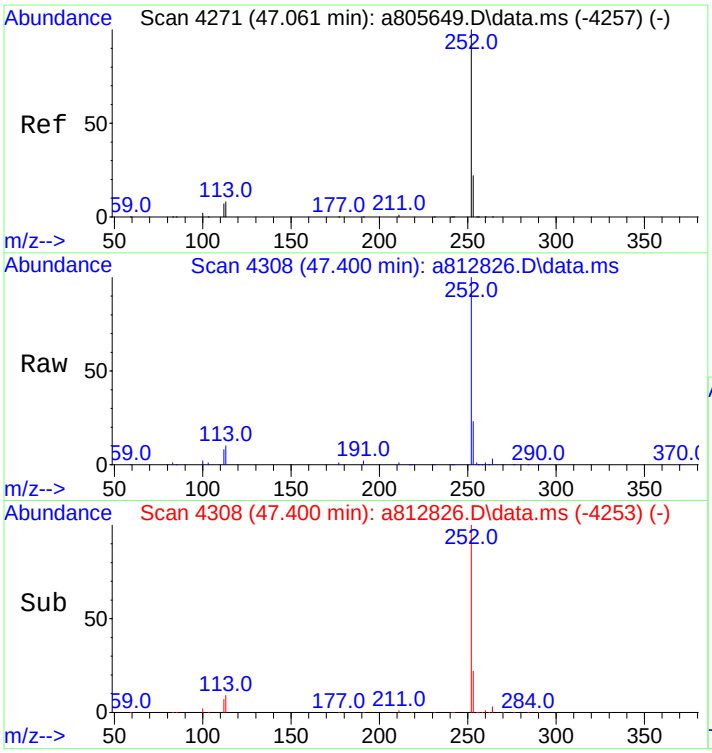


#77
Chrysene/Triphenylene
Concen: 445.31 ng/mL
RT: 43.516 min Scan# 3883
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:228 Resp: 108112

Ion	Ratio	Lower	Upper
228	100		
226	29.2	23.6	35.4

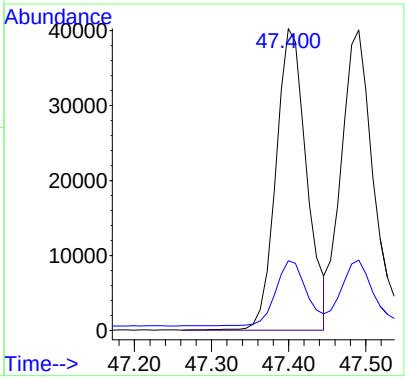


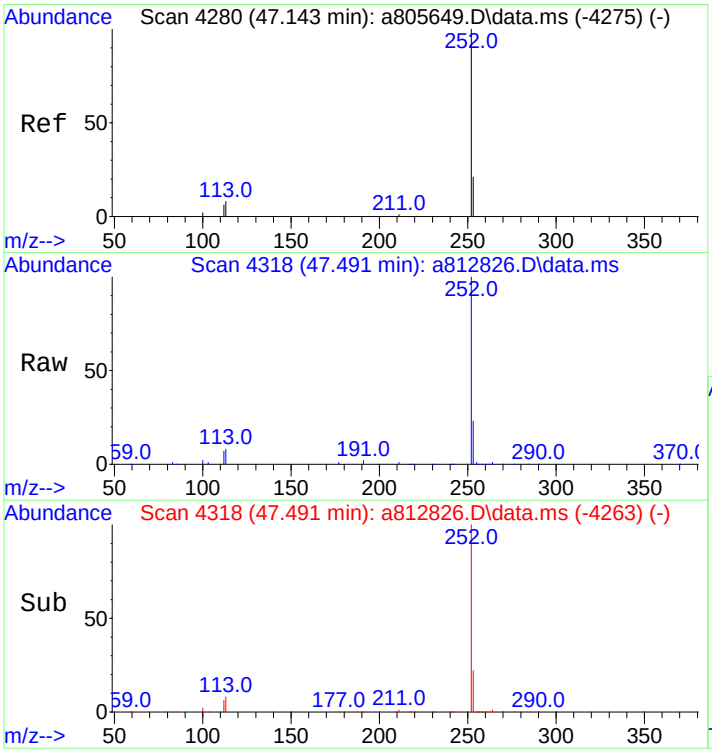


#84
Benzo[b]fluoranthene
Concen: 408.46 ng/mL
RT: 47.400 min Scan# 4308
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:252 Resp: 111215

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.5	27.7

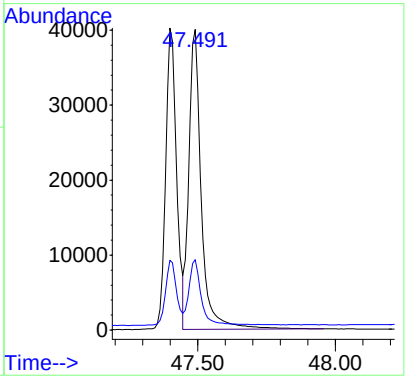


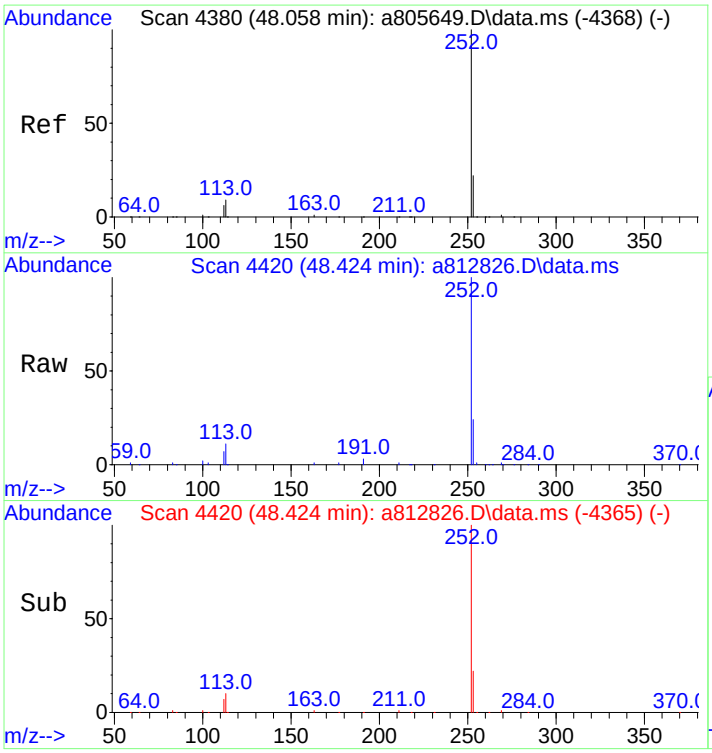


#85
Benzo[j]+[k]fluoranthene
Concen: 447.19 ng/mL
RT: 47.491 min Scan# 4318
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:252 Resp: 125366

Ion	Ratio	Lower	Upper
252	100		
253	21.0	18.8	28.2

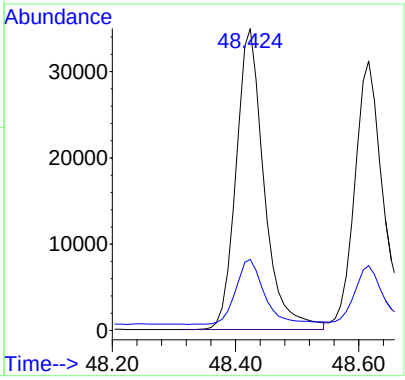


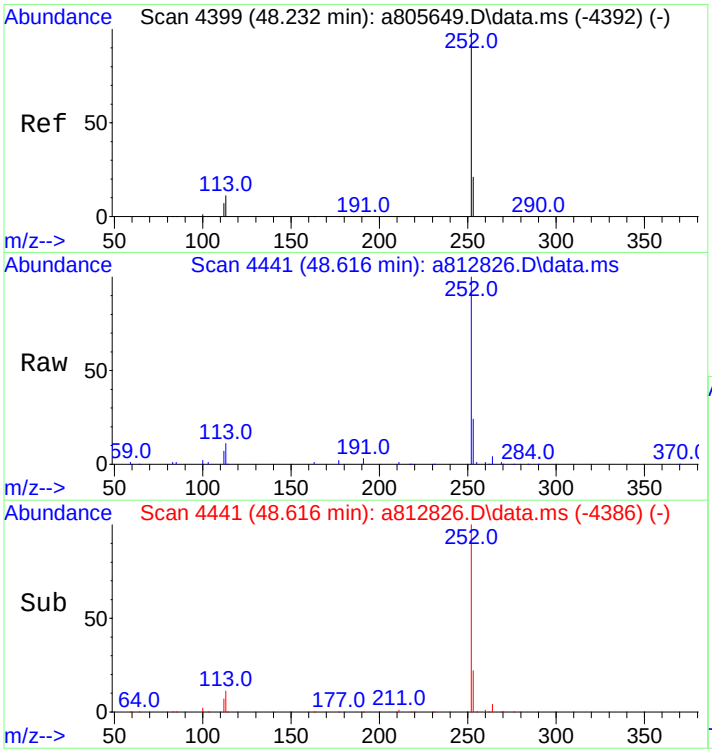


#87
Benzo[e]pyrene
Concen: 408.91 ng/mL
RT: 48.424 min Scan# 4420
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:252 Resp: 110422

Ion	Ratio	Lower	Upper
252	100		
253	22.2	18.9	28.3

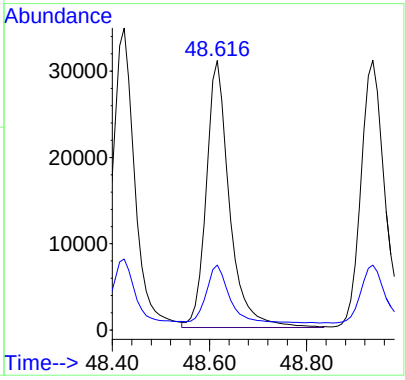


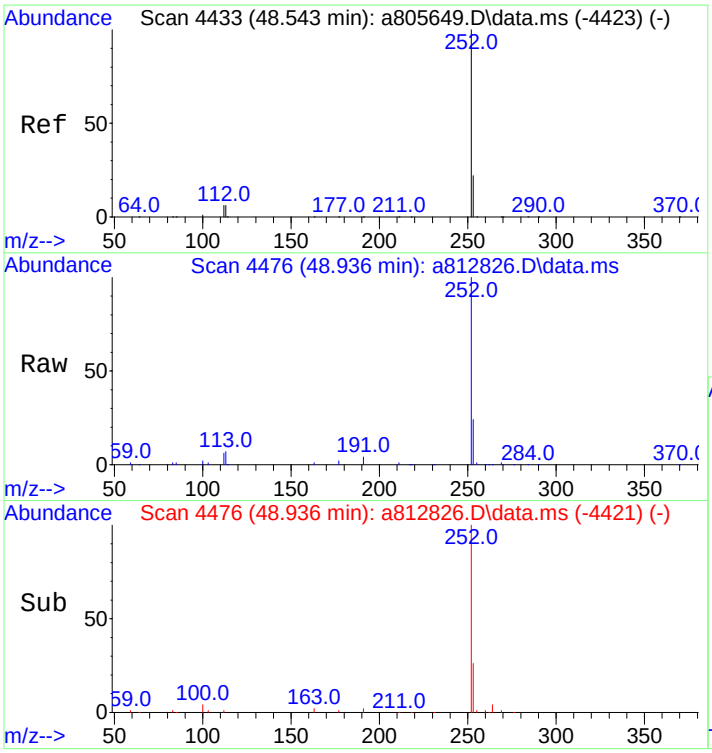


#89
Benzo[a]pyrene
Concen: 420.42 ng/mL m
RT: 48.616 min Scan# 4441
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:252 Resp: 103362

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.4	29.0

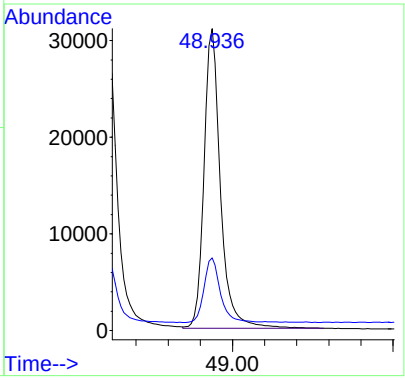


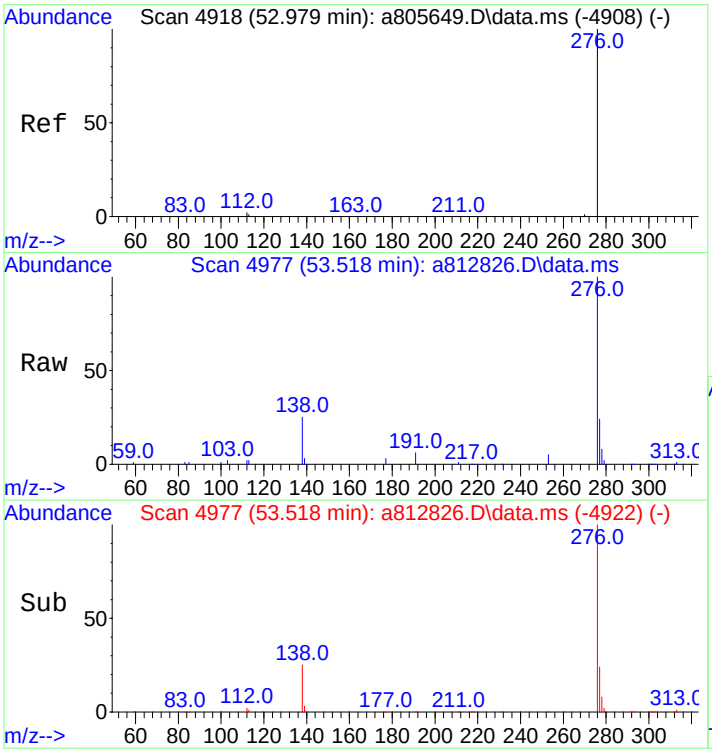


#90
Perylene
Concen: 409.91 ng/mL
RT: 48.936 min Scan# 4476
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:252 Resp: 110108

Ion	Ratio	Lower	Upper
252	100		
253	21.5	19.3	28.9

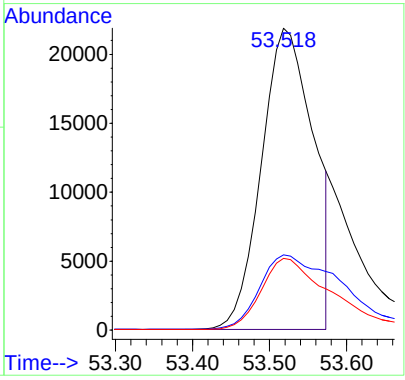


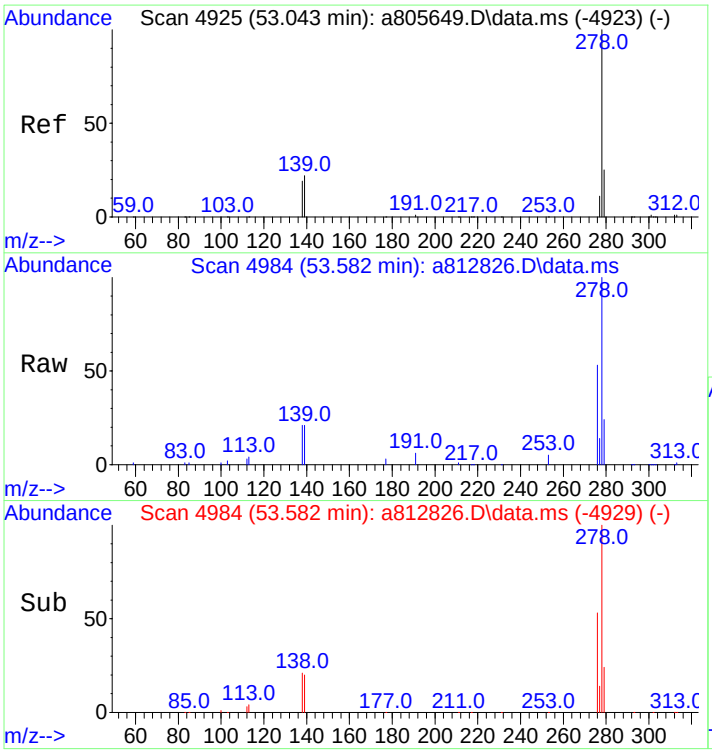


#91
Indeno[1,2,3-cd]pyrene
Concen: 374.44 ng/mL m
RT: 53.518 min Scan# 4977
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:276 Resp: 102713

Ion	Ratio	Lower	Upper
276	100		
138	41.9	19.9	29.9#
277	34.2	19.0	28.6#

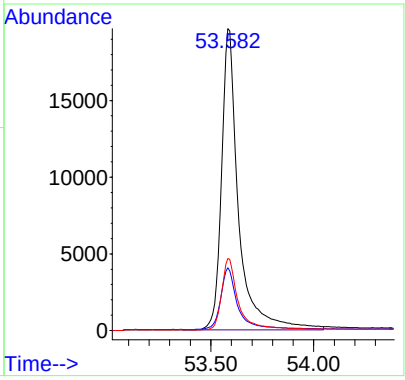


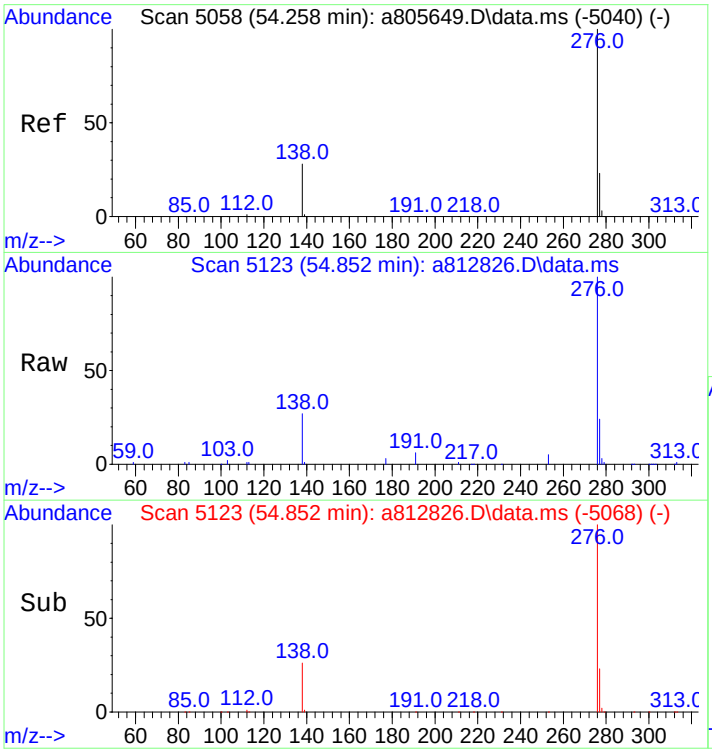


#92
Dibenz[ah]+[ac]anthracene
Concen: 458.11 ng/mL
RT: 53.582 min Scan# 4984
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:278 Resp: 113568

Ion	Ratio	Lower	Upper
278	100		
139	20.2	16.6	25.0
279	23.2	19.1	28.7

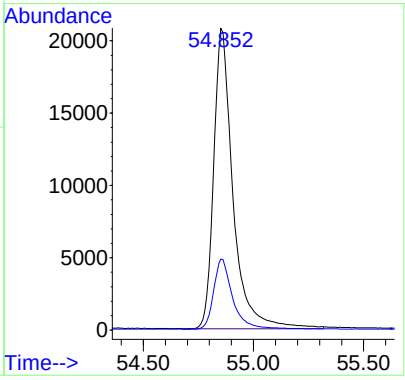


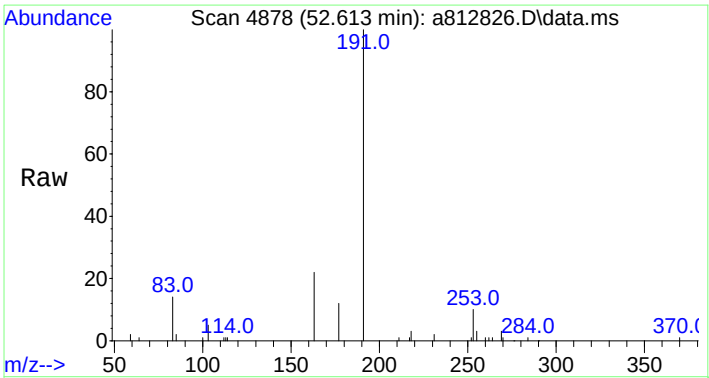


#93
Benzo[g,h,i]perylene
Concen: 433.12 ng/mL
RT: 54.852 min Scan# 5123
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:276 Resp: 126588

Ion	Ratio	Lower	Upper
276	100		
277	23.2	18.9	28.3

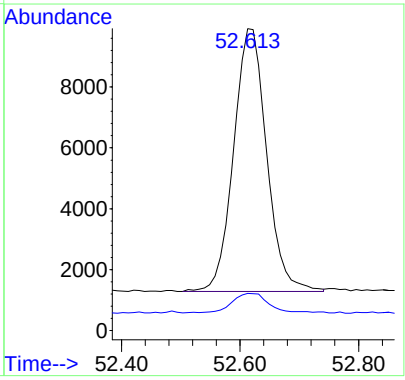


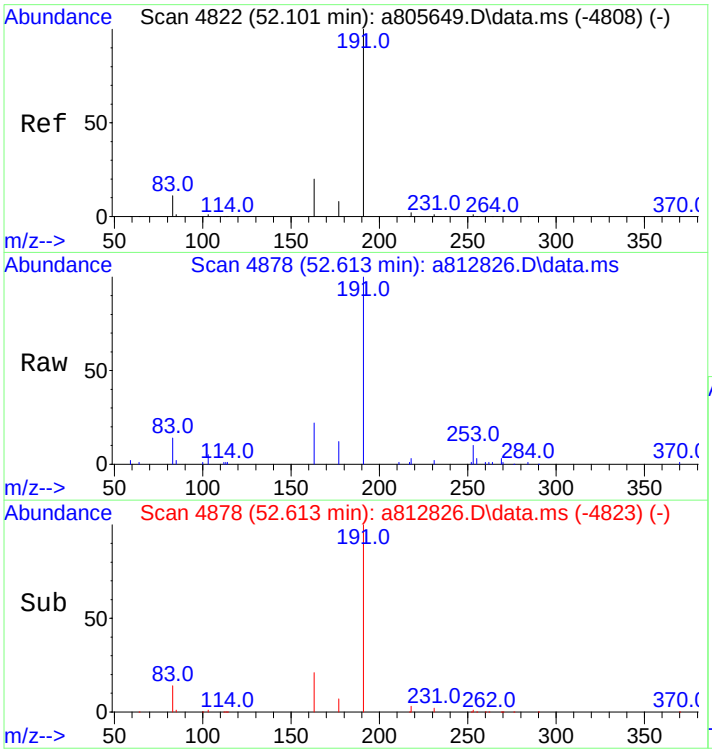


#94
Hopane (T19)
Concen: 388.52 ng/mL
RT: 52.613 min Scan# 4878
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:191 Resp: 33302

Ion	Ratio	Lower	Upper
191	100		
177	8.3	9.8	14.8#

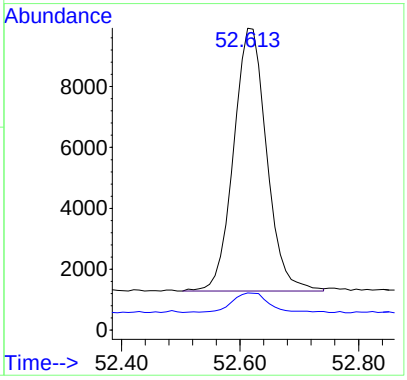




#95
17a(H),21B(H)-hopane - C30H52
Concen: 388.52 ng/mL
RT: 52.613 min Scan# 4878
Delta R.T. 0.000 min
Lab File: a812826.D
Acq: 18 Nov 2012 1:58 pm

Tgt Ion:191 Resp: 33302

Ion	Ratio	Lower	Upper
191	100		
177	8.3	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812827.D
Acq On : 18 Nov 2012 3:23 pm
Operator : AC
Sample : i811181205
Misc : l5 whaq87
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 12:13:51 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

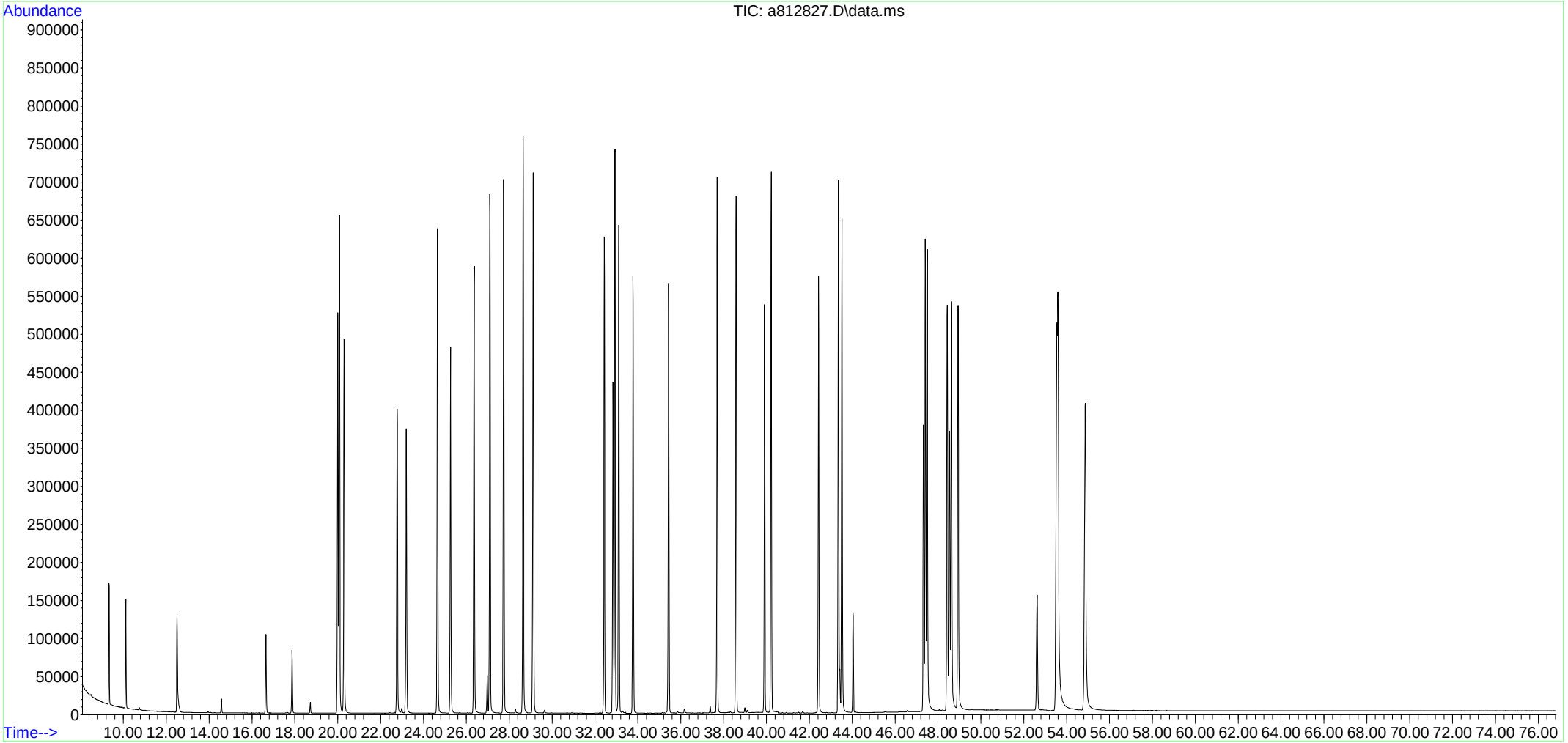
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	63957	500.000	ng/mL	0.00
74) Chrysene-d12	43.415	240	86989	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	1234387	4452.292	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 445.23%#			
42) Phenanthrene-d10	32.843	188	929087	4476.226	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 447.62%#			
83) Benzo[b]fluoranthene-d12	47.326	264	855160	4598.526	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 459.85%#			
88) Benzo[a]pyrene-d12	48.534	264	850933	4916.016	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 491.60%#			
129) 5B(H)Cholane - Surr	44.036	217	177415	5166.275	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 516.63%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	149209	2549.632	ng/mL	100
4) cis-Decalin	17.869	138	110452	2526.728	ng/mL	100
10) Naphthalene	20.078	128	1473117	4532.047	ng/mL#	100
16) 2-Methylnaphthalene	22.770	142	959169	5008.078	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	889143	4863.570	ng/mL#	100
18) Benzothiophene	20.297	134	1202701	4652.709	ng/mL	100
23) Biphenyl	24.650	154	1145791	4841.280	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.261	156	811582	5054.602	ng/mL#	100
25) Dibenzofuran	27.743	168	1185404	4776.342	ng/mL	97
26) Acenaphthylene	26.365	152	1446981M3	4924.891	ng/mL	
27) Acenaphthene	27.095	153	832819	4793.789	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.647	170	682182	5050.417	ng/mL	97
29) Fluorene	29.112	166	946001	4987.046	ng/mL	98
33) Dibenzothiophene	32.433	184	1286658	4736.360	ng/mL	100
43) Phenanthrene	32.935	178	1197020	4568.202	ng/mL	100
54) Retene	39.909	234	319619	5730.692	ng/mL	96
55) Anthracene	33.108	178	1105404M3	4475.500	ng/mL	
56) Carbazole	33.774	167	1258155	5092.597	ng/mL	100
57) 1-Methylphenanthrene	35.435	192	913044	5016.618	ng/mL	99
58) Fluoranthene	37.699	202	1334604M3	4961.972	ng/mL	
59) Benzo(b)fluorene	40.220	216	821132	5402.055	ng/mL	98
60) Pyrene	38.585	202	1321312	4878.942	ng/mL	98
66) Naphthobenzothiophene	42.429	234	1270197	5083.707	ng/ml	100
67) Naphthobenzothiophene-...	42.429	234	1270197	5083.707	ng/mL	100
75) Benz[a]anthracene	43.351	228	1112740	4796.146	ng/mL	100
76) Chrysene	43.515	228	1060150	4703.001	ng/mL	100
77) Chrysene/Triphenylene	43.515	228	1060150	4703.001	ng/mL	100
84) Benzo[b]fluoranthene	47.409	252	1171928	4635.656	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.500	252	1245688	4785.689	ng/mL	97
87) Benzo[e]pyrene	48.433	252	1171423	4672.085	ng/mL	97
89) Benzo[a]pyrene	48.625	252	1101087	4823.492	ng/mL	96
90) Perylene	48.936	252	1221343	4896.910	ng/mL	96
91) Indeno[1,2,3-cd]pyrene	53.536	276	1267773M3	4977.518	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.591	278	1246307	5414.522	ng/mL	99
93) Benzo[g,h,i]perylene	54.870	276	1377844	5077.388	ng/mL	100
94) Hopane (T19)	52.622	191	368264	4627.197	ng/mL#	88
95) 17a(H),21B(H)-hopane -...	52.622	191	368264	4627.197	ng/mL#	88

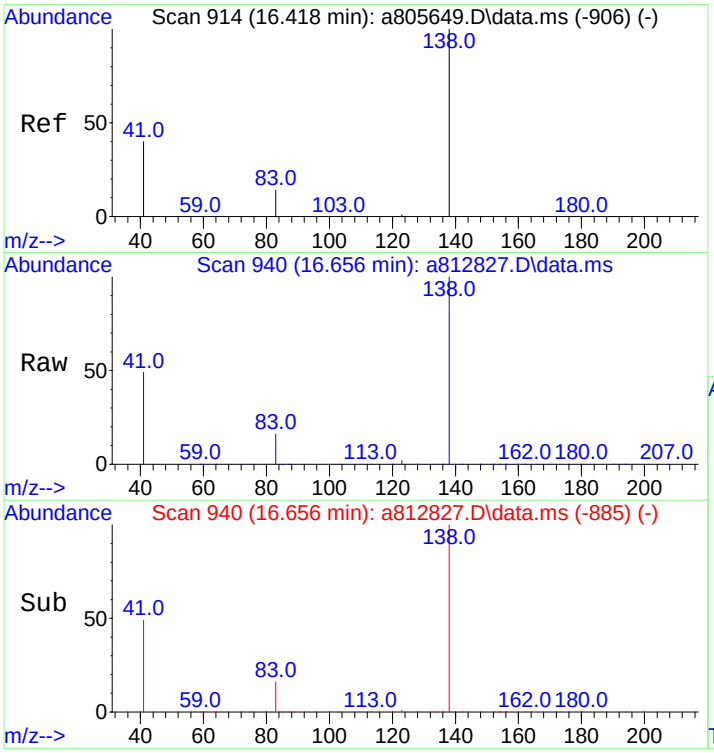
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812827.D
Acq On : 18 Nov 2012 3:23 pm
Operator : AC
Sample : i811181205
Misc : l5 whaq87
ALS Vial : 8 Sample Multiplier: 1

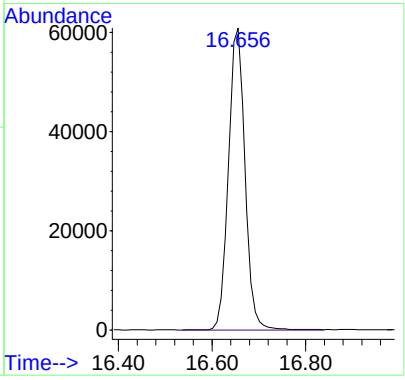
Quant Time: Nov 19 12:13:51 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

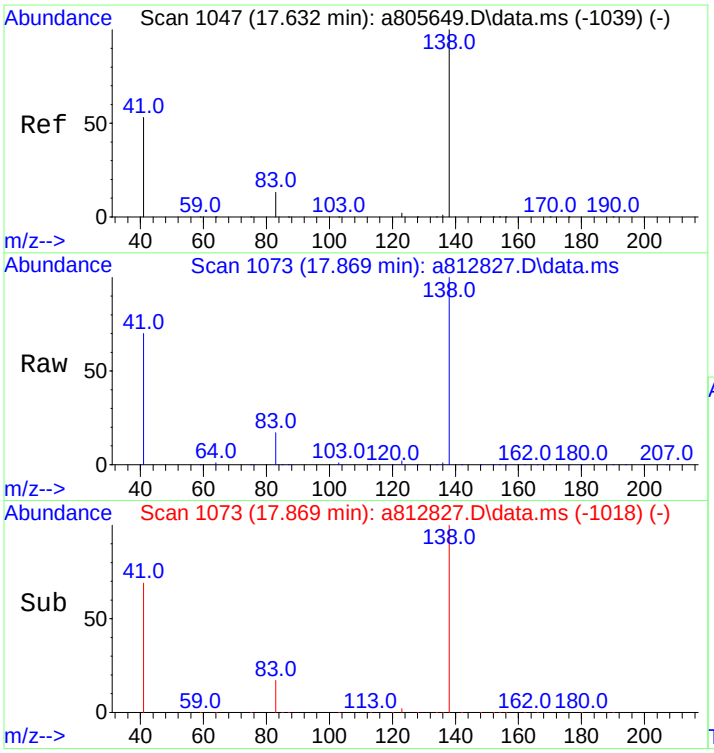




#3
trans-Decalin
Concen: 2549.63 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

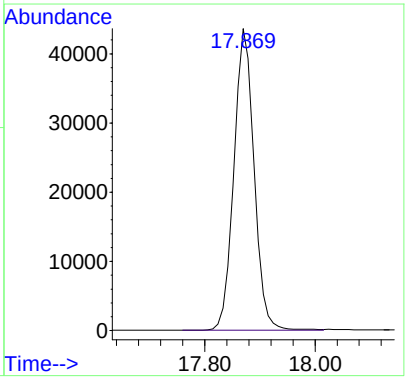
Tgt Ion:138 Resp: 149209

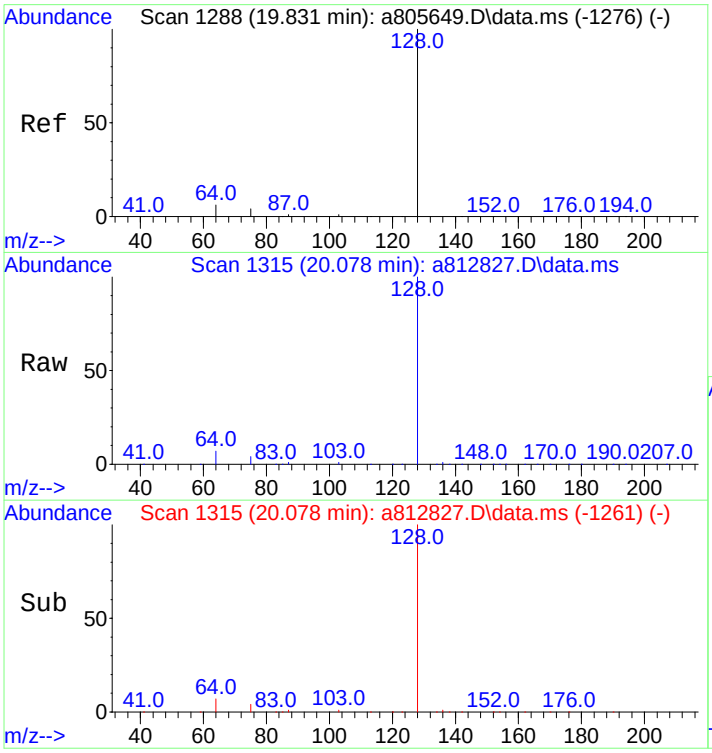




#4
cis-Decalin
Concen: 2526.73 ng/mL
RT: 17.869 min Scan# 1073
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:138 Resp: 110452

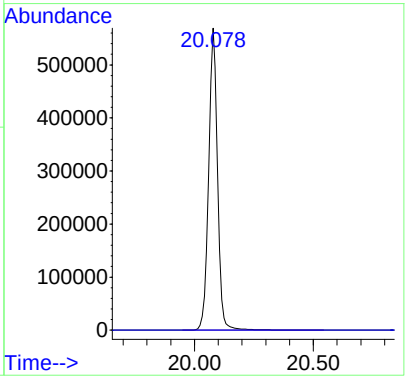


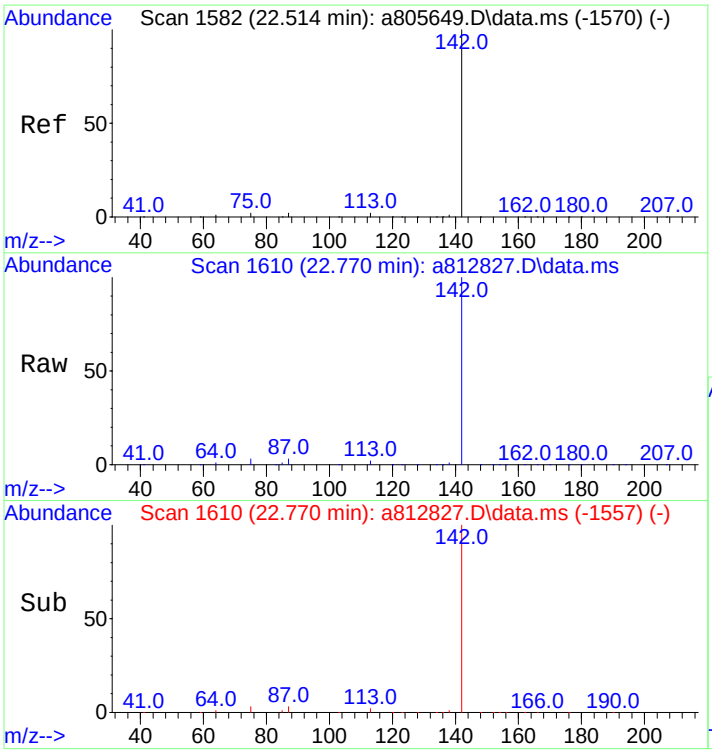


#10
Naphthalene
Concen: 4532.05 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:128 Resp: 1473117

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

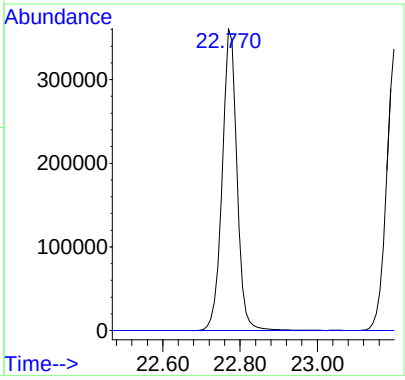


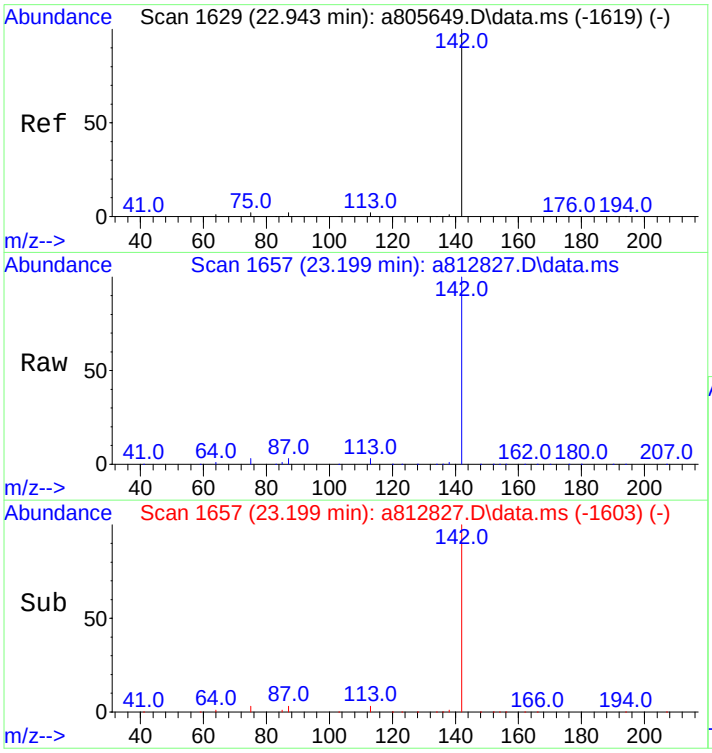


#16
2-Methylnaphthalene
Concen: 5008.08 ng/mL
RT: 22.770 min Scan# 1610
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:142 Resp: 959169

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

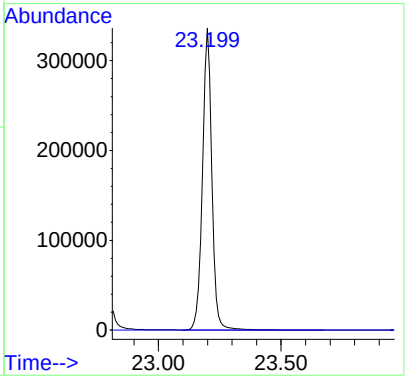


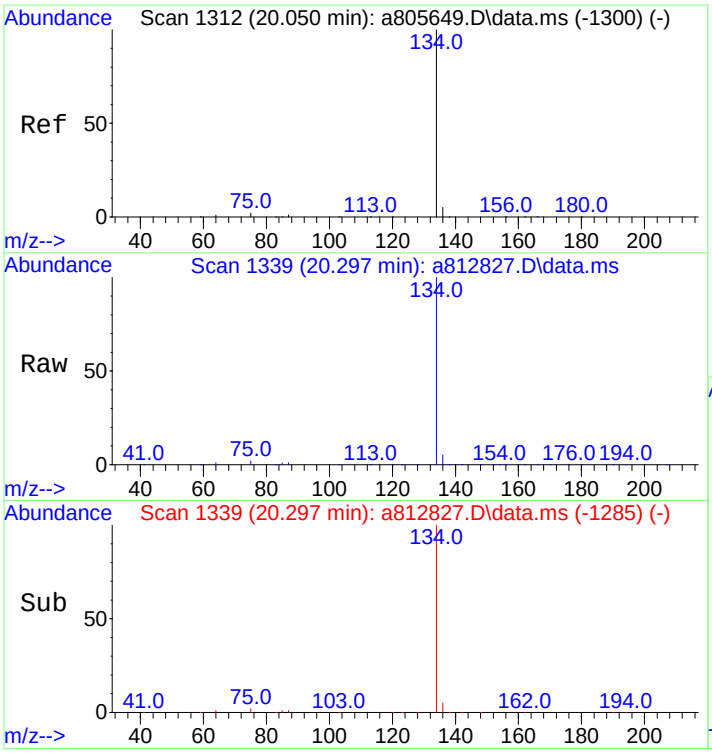


#17
1-Methylnaphthalene
Concen: 4863.57 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:142 Resp: 889143

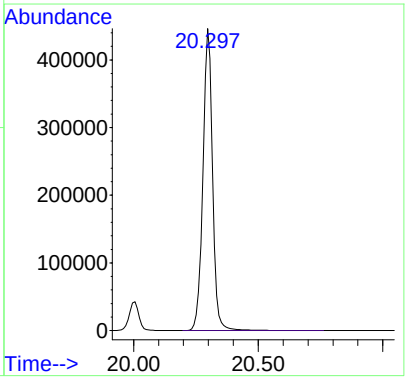
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

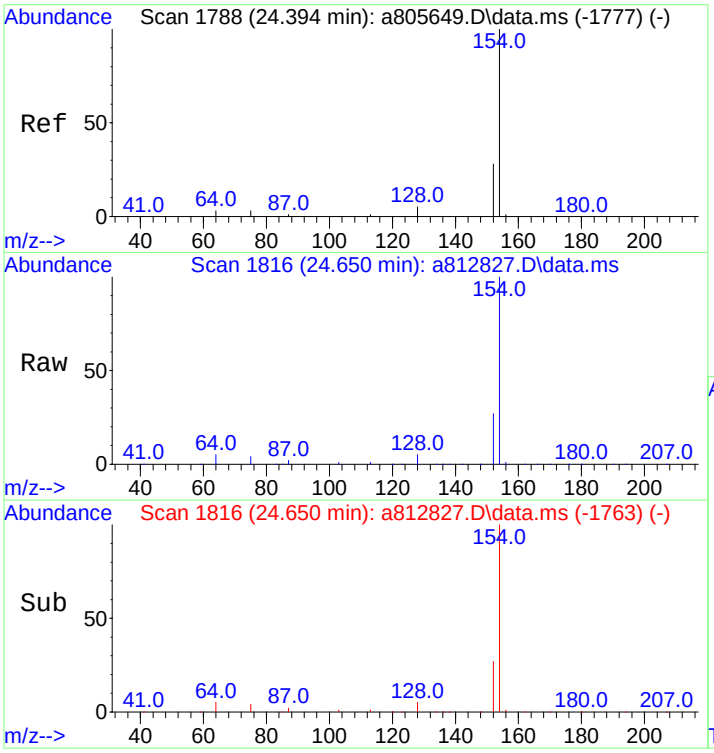




#18
Benzothiophene
Concen: 4652.71 ng/mL
RT: 20.297 min Scan# 1339
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:134 Resp: 1202701

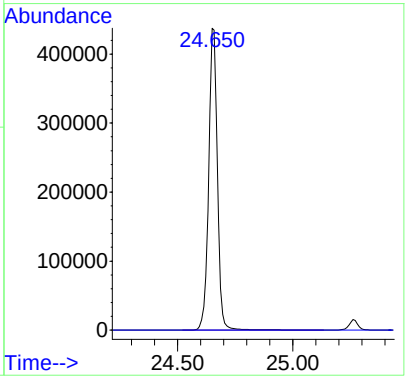


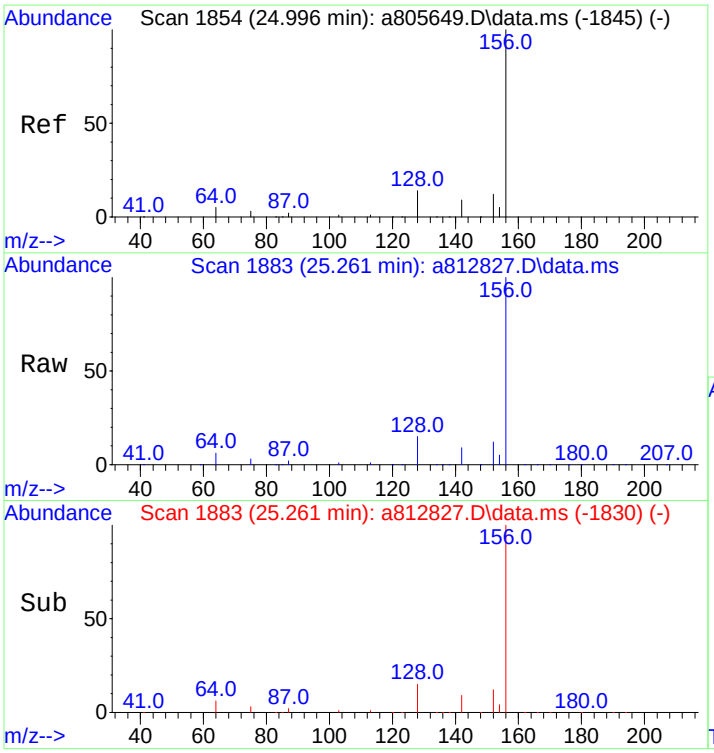


#23
Biphenyl
Concen: 4841.28 ng/mL
RT: 24.650 min Scan# 1816
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:154 Resp: 1145791

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

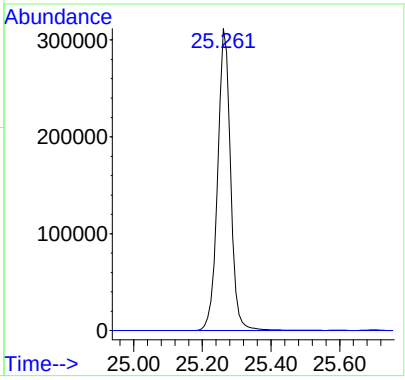


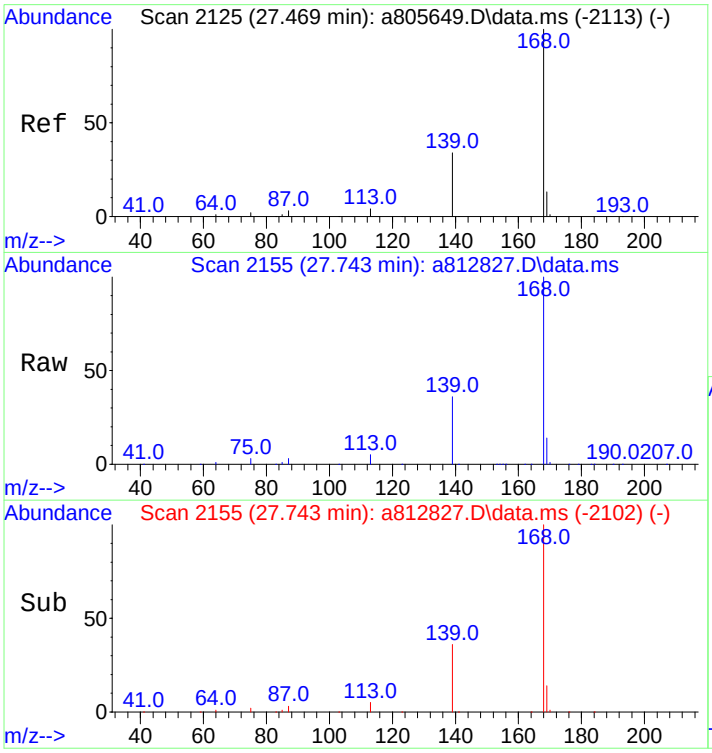


#24
2,6-Dimethylnaphthalene
Concen: 5054.60 ng/mL
RT: 25.261 min Scan# 1883
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:156 Resp: 811582

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

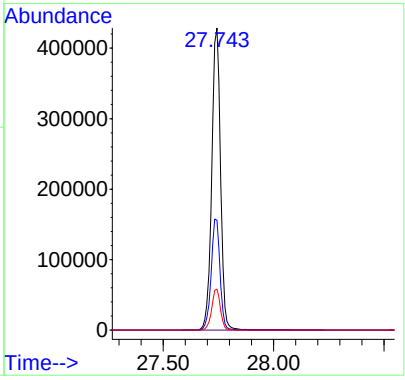


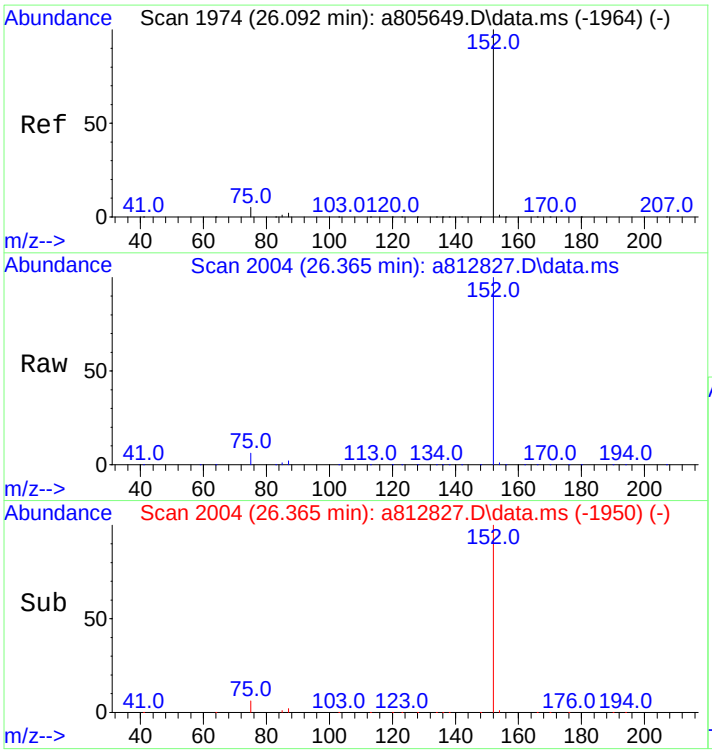


#25
Dibenzofuran
Concen: 4776.34 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:168 Resp: 1185404

Ion	Ratio	Lower	Upper
168	100		
139	37.0	28.0	42.0
169	13.5	10.6	15.8

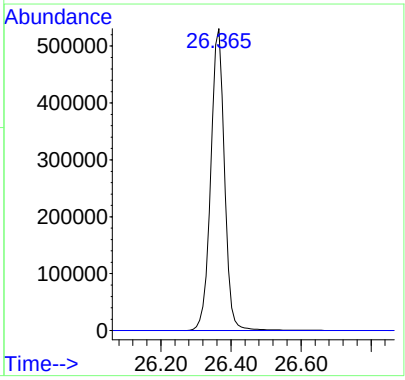


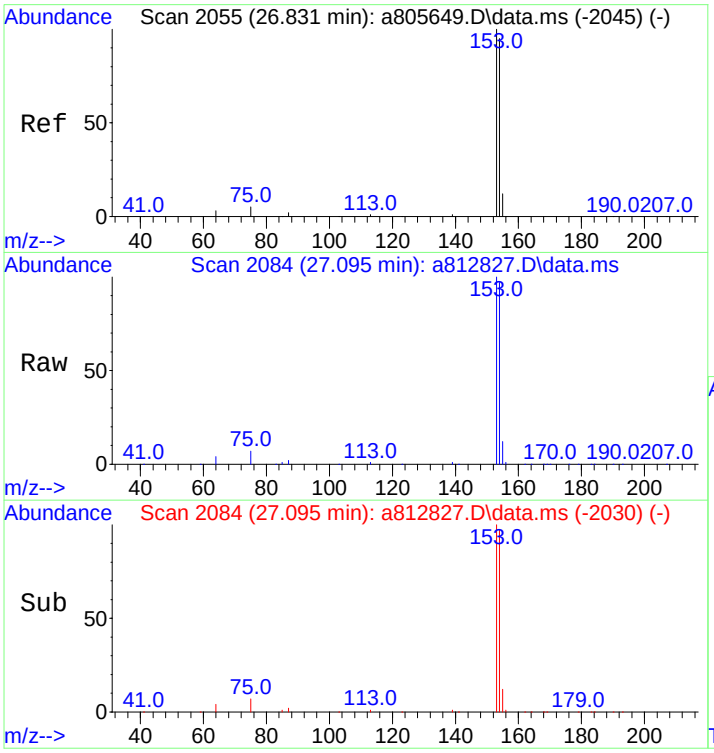


#26
Acenaphthylene
Concen: 4924.89 ng/mL m
RT: 26.365 min Scan# 2004
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:152 Resp: 1446981

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

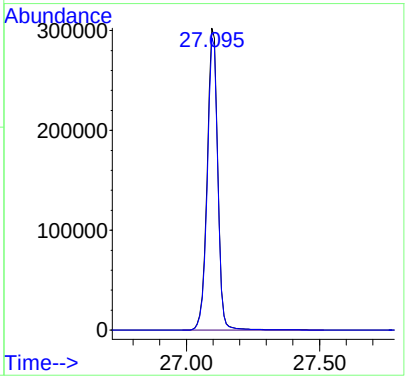


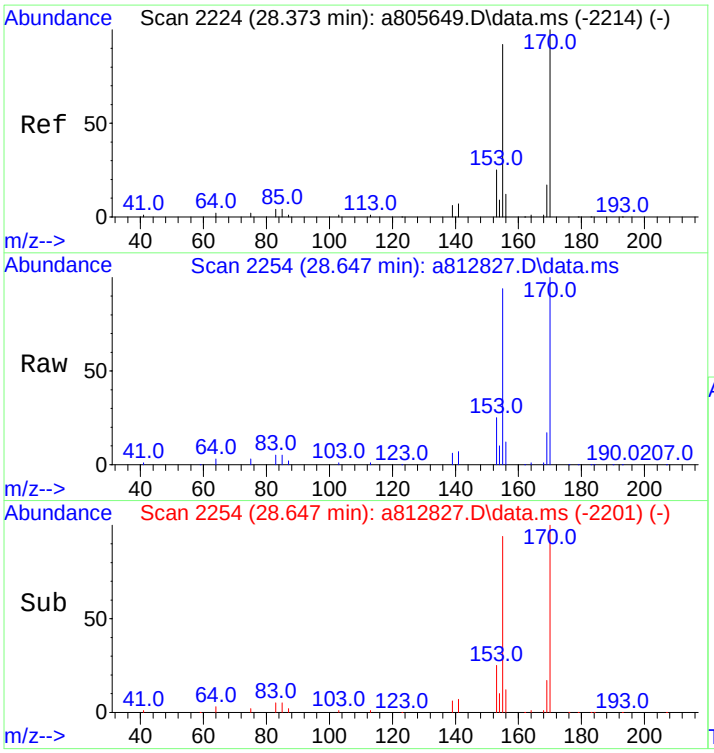


#27
Acenaphthene
Concen: 4793.79 ng/mL
RT: 27.095 min Scan# 2084
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:153 Resp: 832819

Ion	Ratio	Lower	Upper
153	100		
154	96.0	75.4	113.2

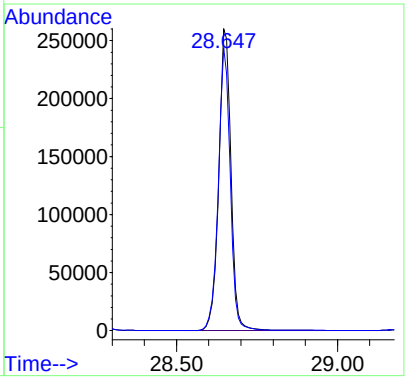


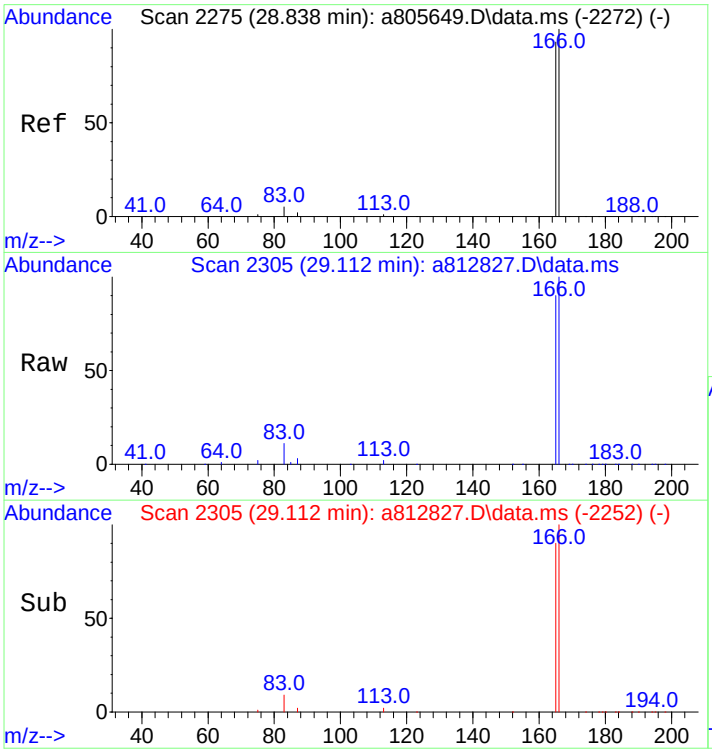


#28
2,3,5-Trimethylnaphthalene
Concen: 5050.42 ng/mL
RT: 28.647 min Scan# 2254
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:170 Resp: 682182

Ion	Ratio	Lower	Upper
170	100		
155	92.3	71.7	107.5

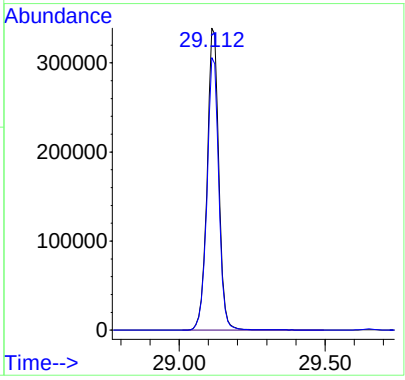


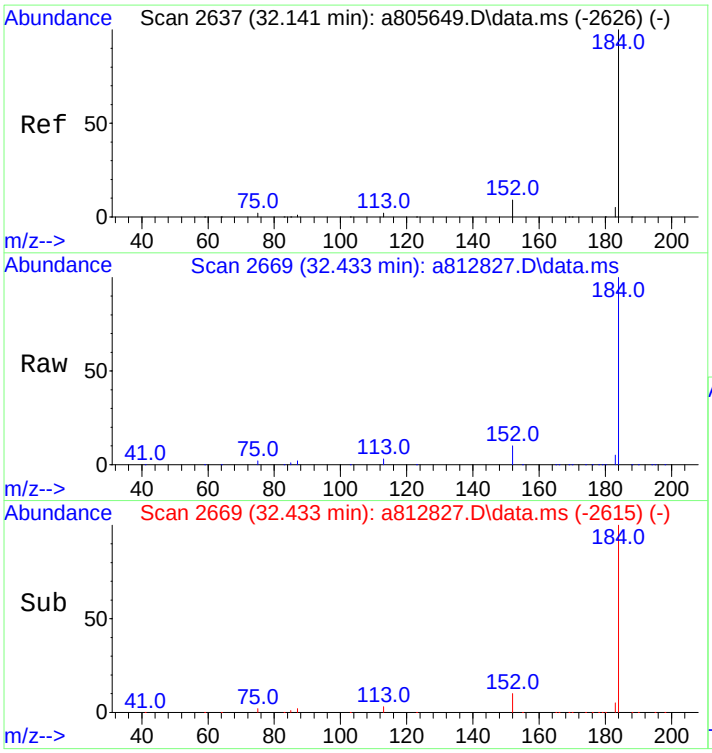


#29
Fluorene
Concen: 4987.05 ng/mL
RT: 29.112 min Scan# 2305
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:166 Resp: 946001

Ion	Ratio	Lower	Upper
166	100		
165	90.9	74.2	111.2

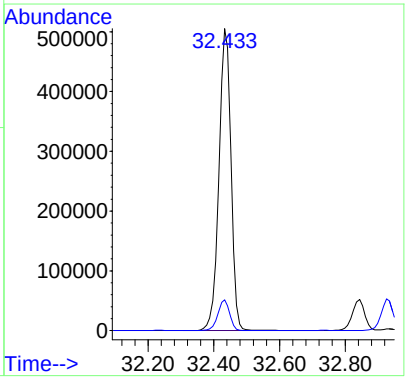


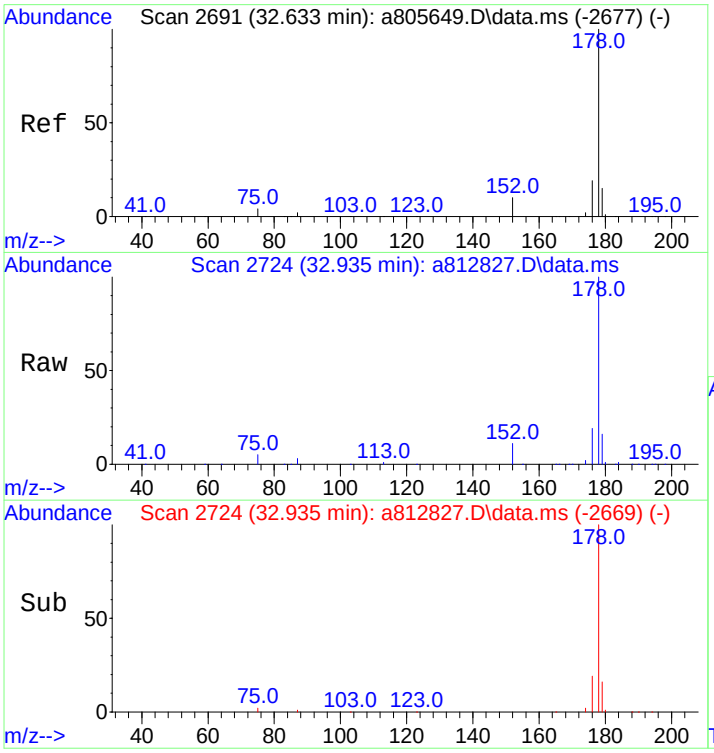


#33
Dibenzothiophene
Concen: 4736.36 ng/mL
RT: 32.433 min Scan# 2669
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:184 Resp: 1286658

Ion	Ratio	Lower	Upper
184	100		
152	9.9	7.8	11.8

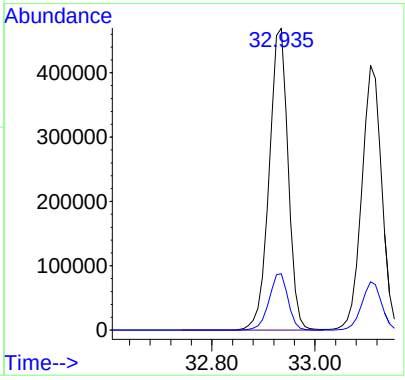


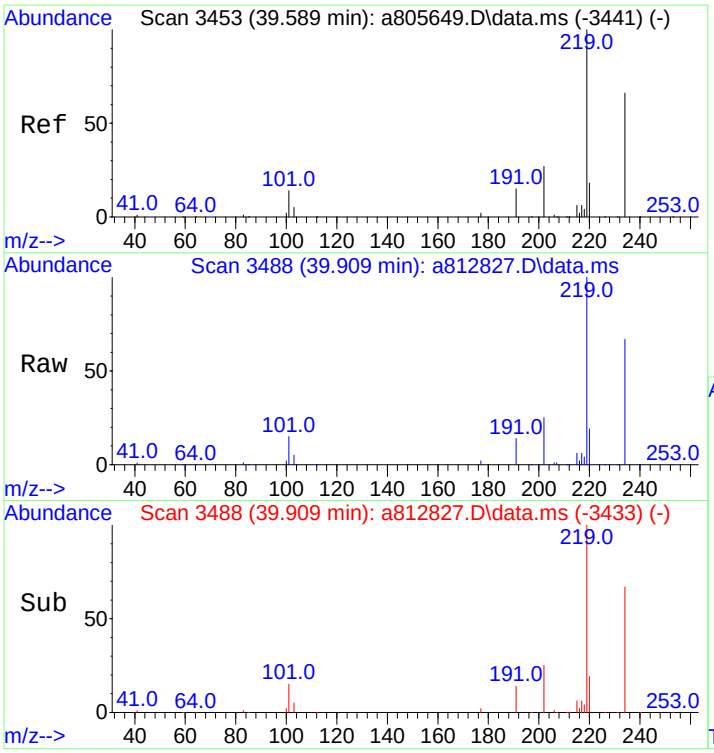


#43
Phenanthrene
Concen: 4568.20 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:178 Resp: 1197020

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

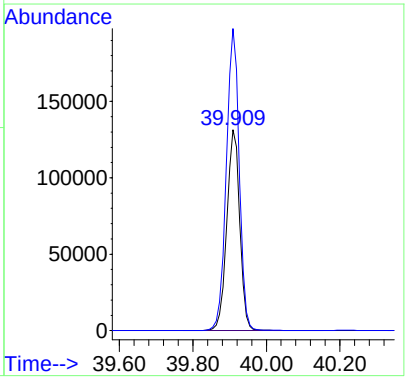


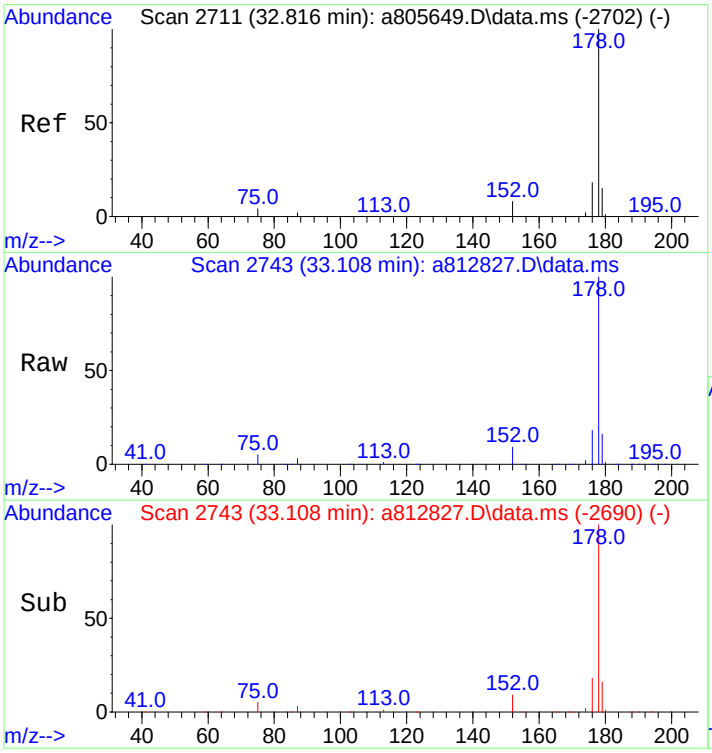


#54
Retene
Concen: 5730.69 ng/mL
RT: 39.909 min Scan# 3488
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:234 Resp: 319619

Ion	Ratio	Lower	Upper
234	100		
219	150.3	124.0	186.0

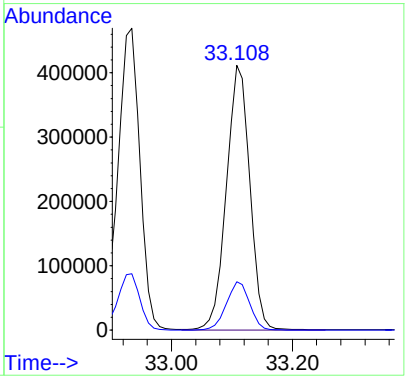


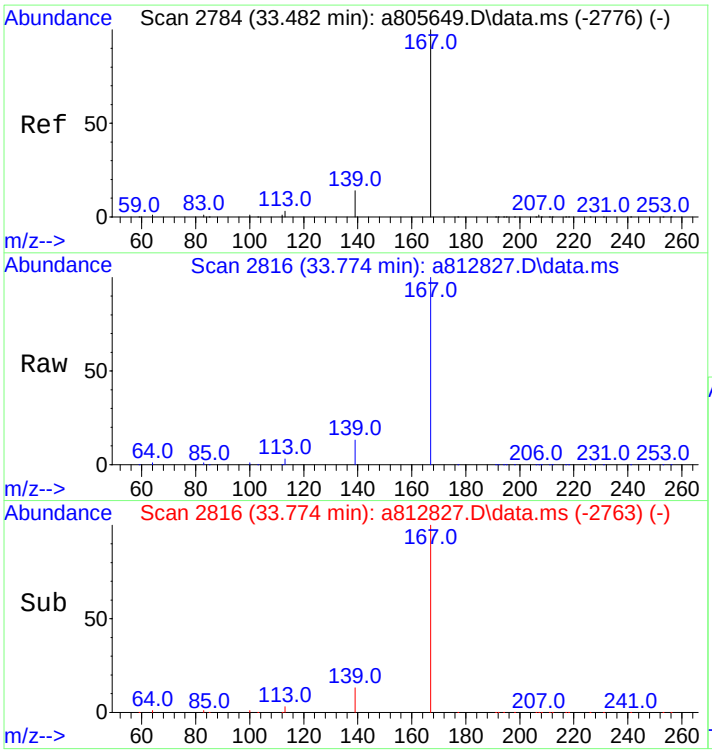


#55
Anthracene
Concen: 4475.50 ng/mL m
RT: 33.108 min Scan# 2743
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:178 Resp: 1105404

Ion	Ratio	Lower	Upper
178	100		
176	18.1	14.3	21.5

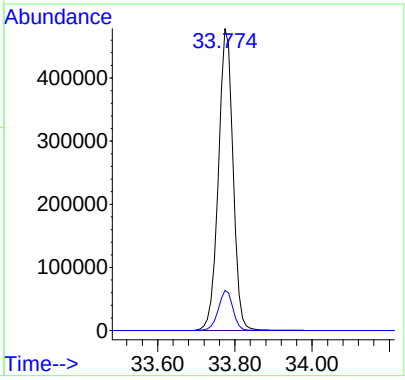


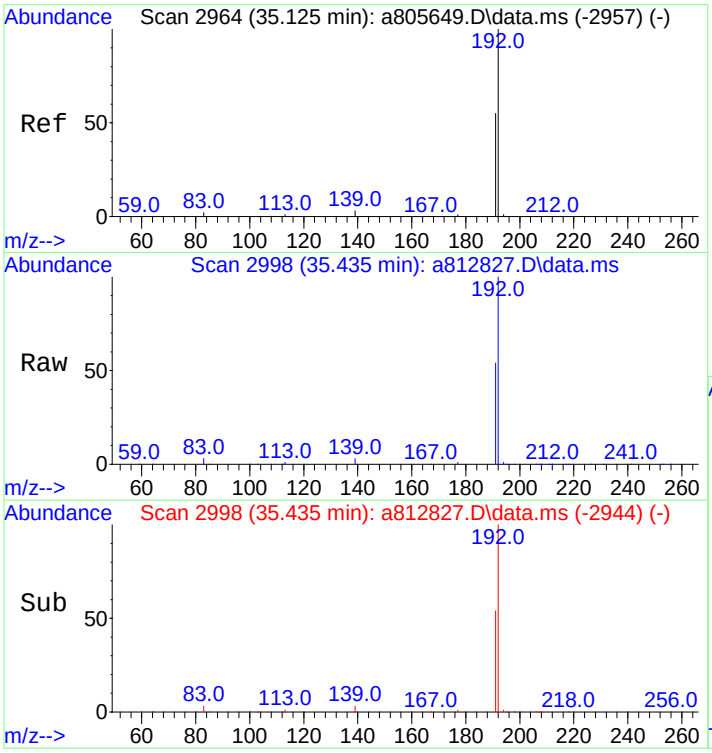


#56
Carbazole
Concen: 5092.60 ng/mL
RT: 33.774 min Scan# 2816
Delta R.T. -0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:167 Resp: 1258155

Ion	Ratio	Lower	Upper
167	100		
139	13.3	10.6	16.0

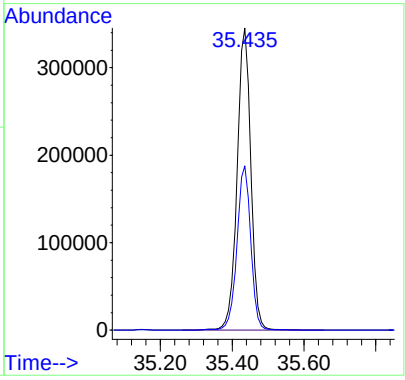


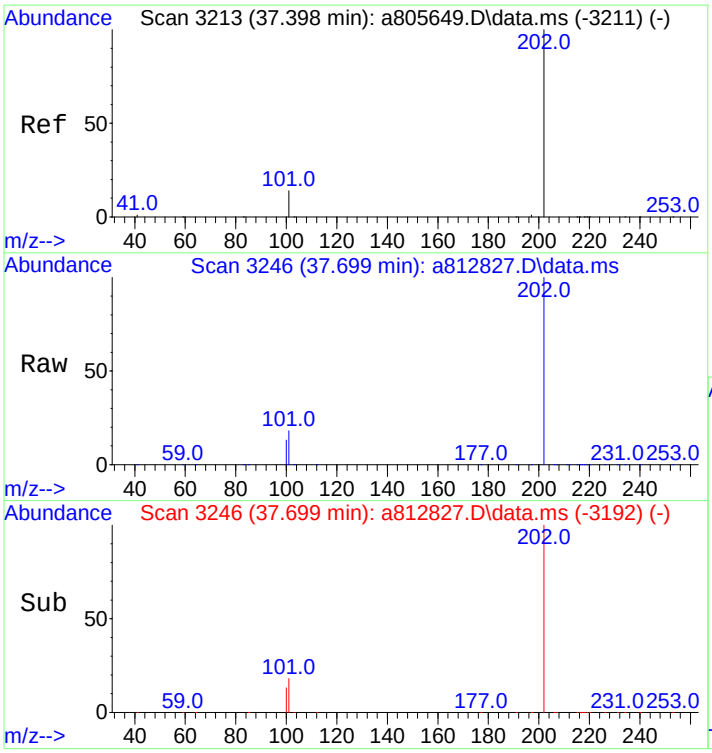


#57
1-Methylphenanthrene
Concen: 5016.62 ng/mL
RT: 35.435 min Scan# 2998
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:192 Resp: 913044

Ion	Ratio	Lower	Upper
192	100		
191	54.8	44.2	66.4

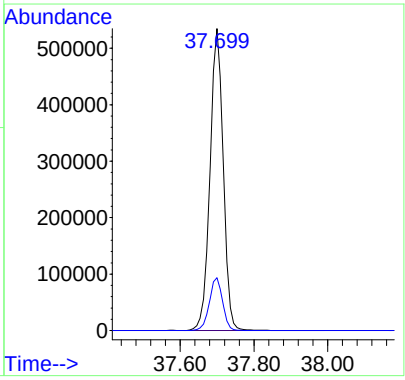


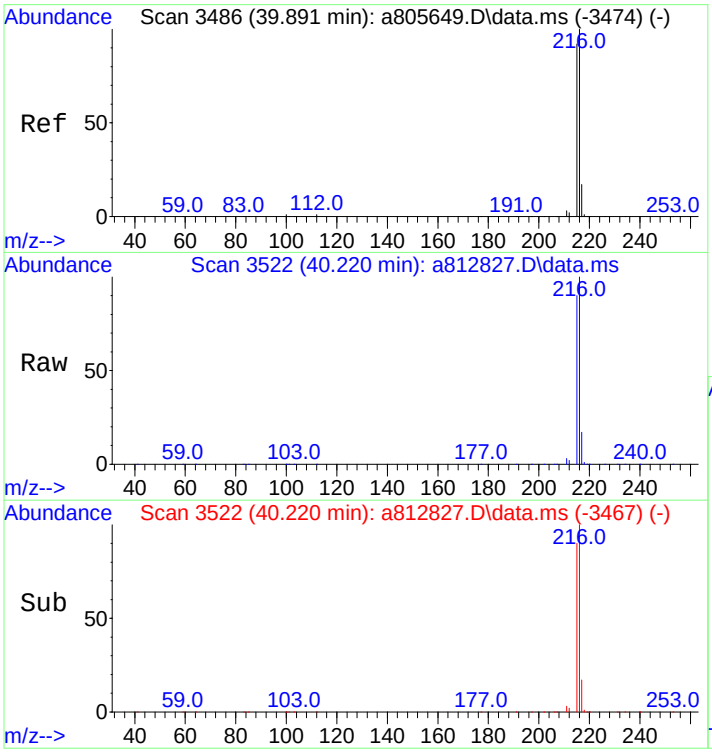


#58
Fluoranthene
Concen: 4961.97 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:202 Resp: 1334604

Ion	Ratio	Lower	Upper
202	100		
101	17.5	13.6	20.4

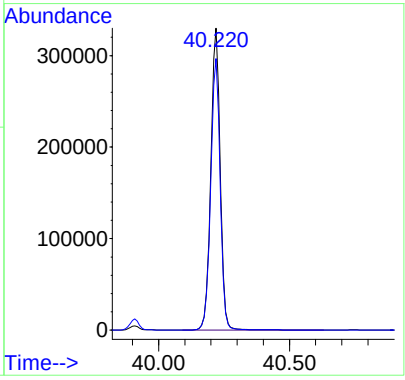


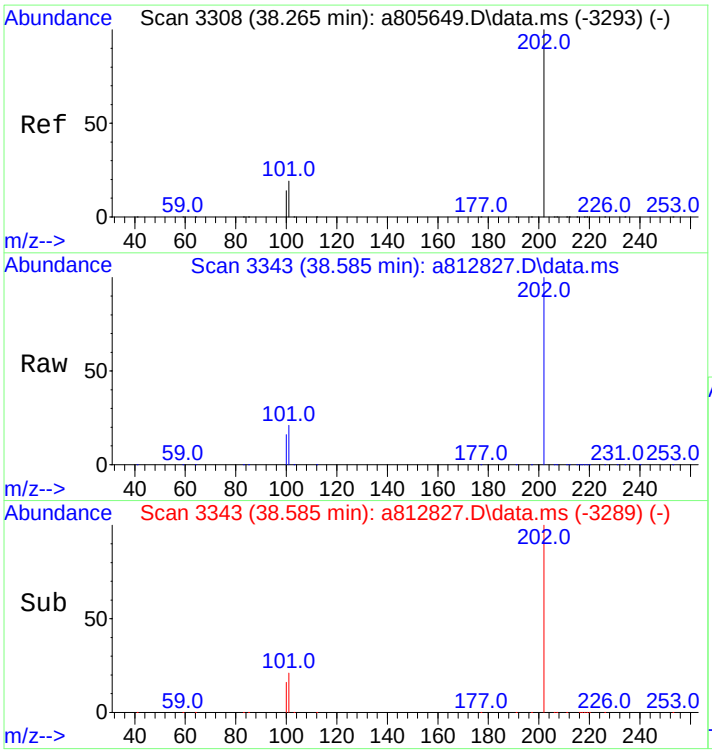


#59
Benzo(b)fluorene
Concen: 5402.06 ng/mL
RT: 40.220 min Scan# 3522
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:216 Resp: 821132

Ion	Ratio	Lower	Upper
216	100		
215	90.6	74.2	111.2

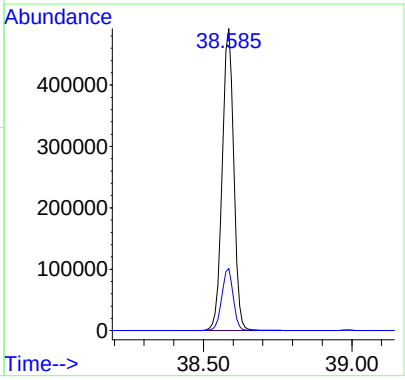


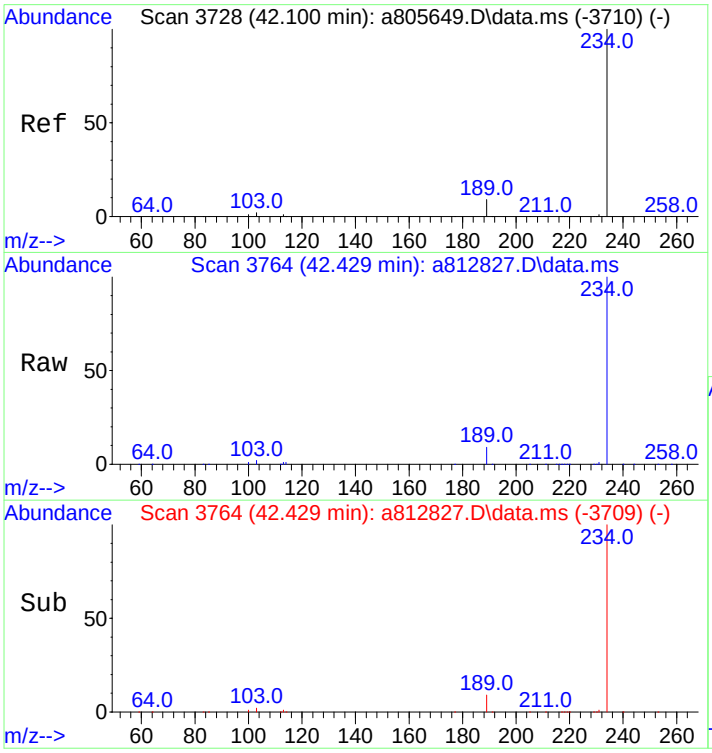


#60
Pyrene
Concen: 4878.94 ng/mL
RT: 38.585 min Scan# 3343
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:202 Resp: 1321312

Ion	Ratio	Lower	Upper
202	100		
101	20.4	15.4	23.2

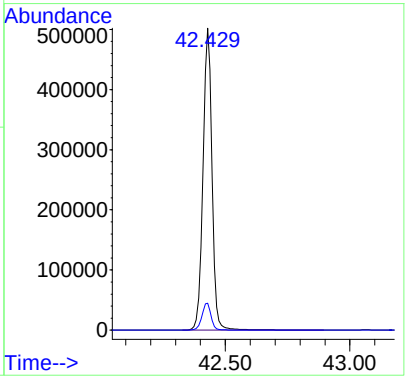


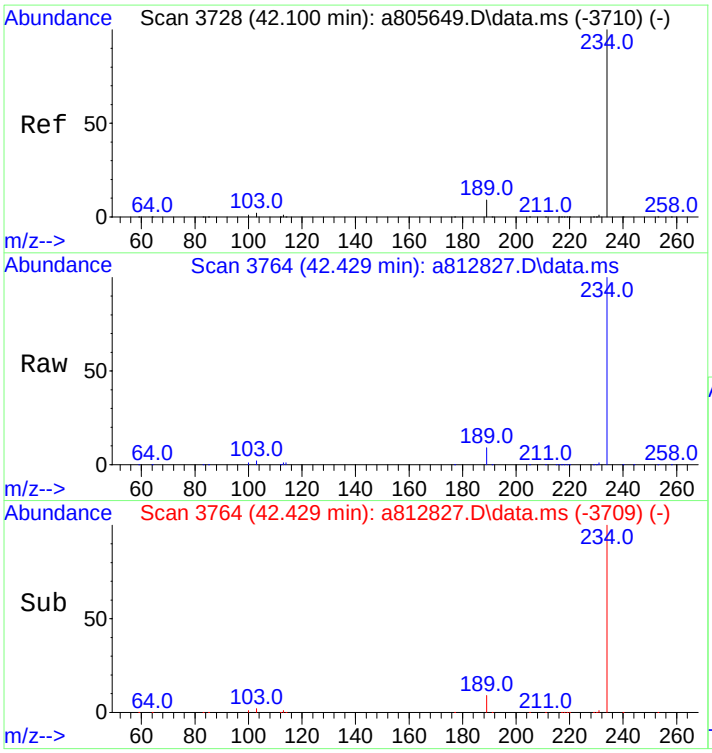


#66
Naphthobenzothiophene
Concen: 5083.71 ng/ml
RT: 42.429 min Scan# 3764
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:234 Resp: 1270197

Ion	Ratio	Lower	Upper
234	100		
189	9.0	7.2	10.8

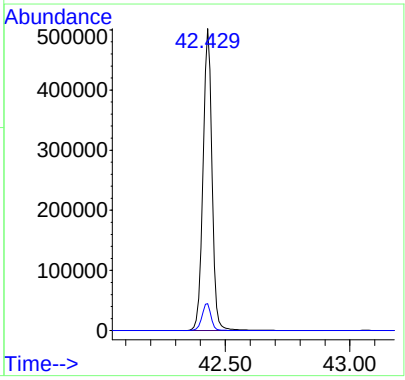


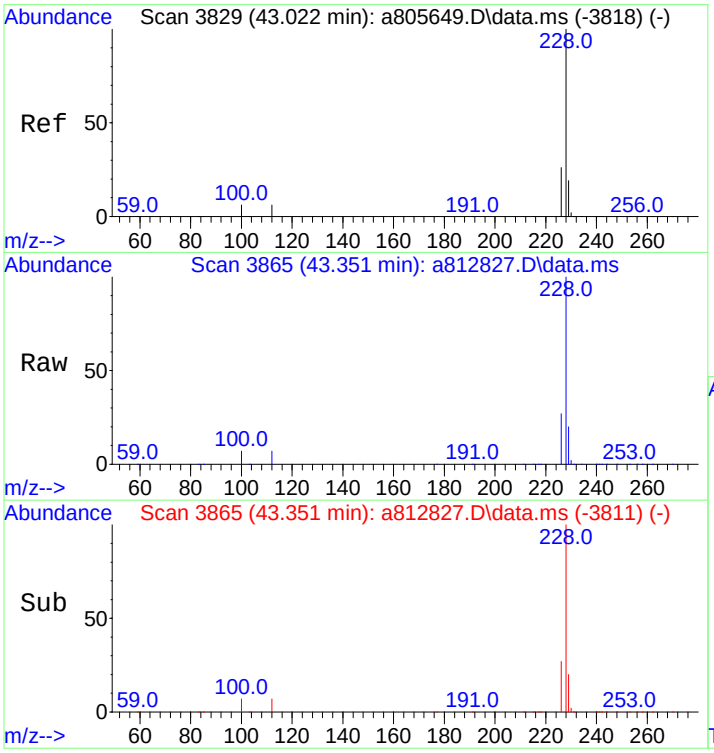


#67
Naphthobenzothiophene-2,1-D
Concen: 5083.71 ng/mL
RT: 42.429 min Scan# 3764
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:234 Resp: 1270197

Ion	Ratio	Lower	Upper
234	100		
189	9.0	7.2	10.8

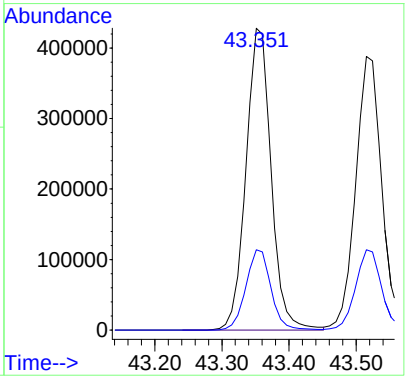


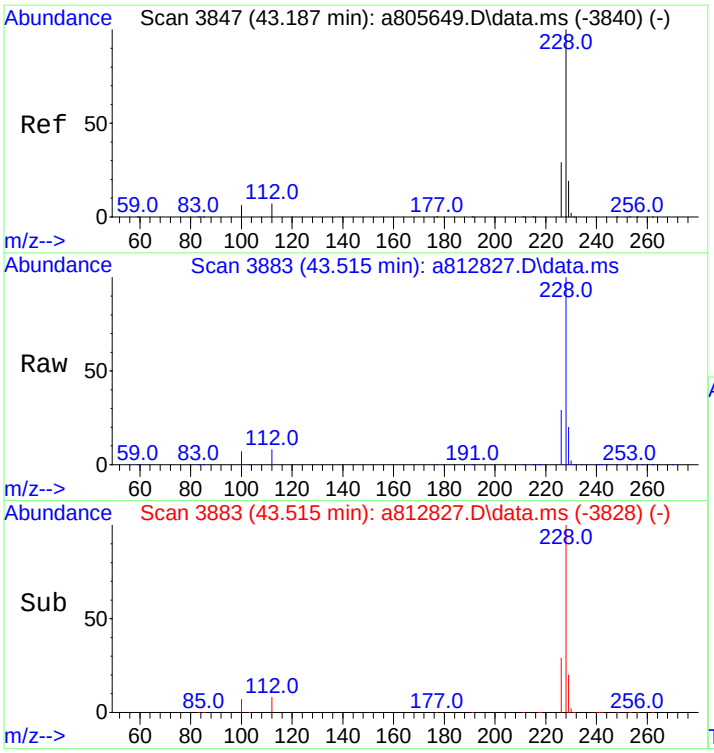


#75
Benz[a]anthracene
Concen: 4796.15 ng/mL
RT: 43.351 min Scan# 3865
Delta R.T. -0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:228 Resp: 1112740

Ion	Ratio	Lower	Upper
228	100		
226	26.5	21.3	31.9

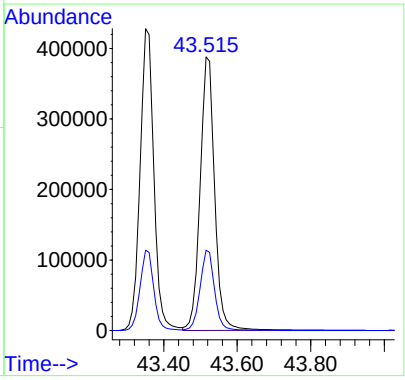


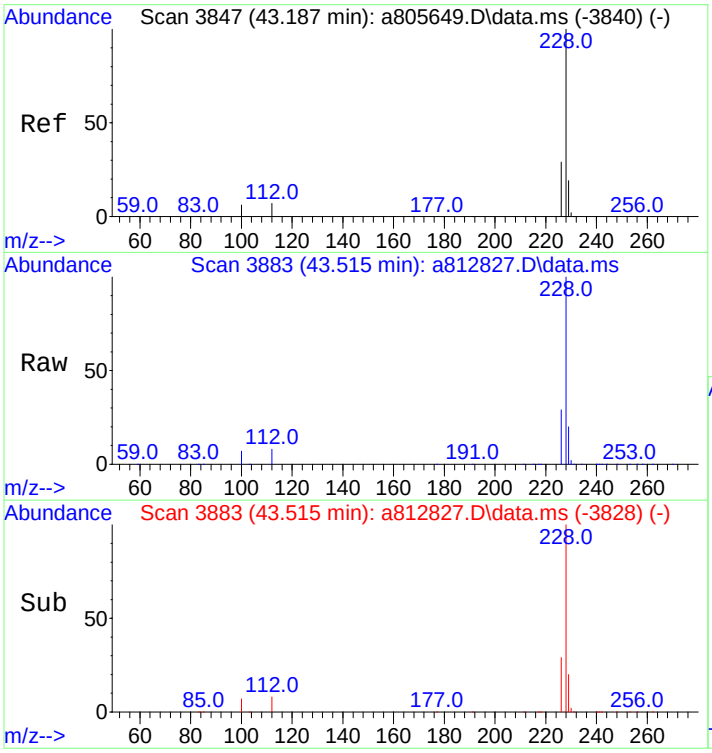


#76
Chrysene
Concen: 4703.00 ng/mL
RT: 43.515 min Scan# 3883
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:228 Resp: 1060150

Ion	Ratio	Lower	Upper
228	100		
226	29.4	23.6	35.4

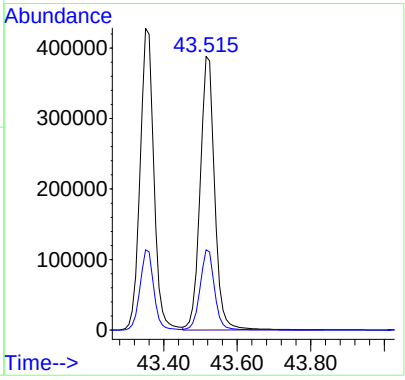


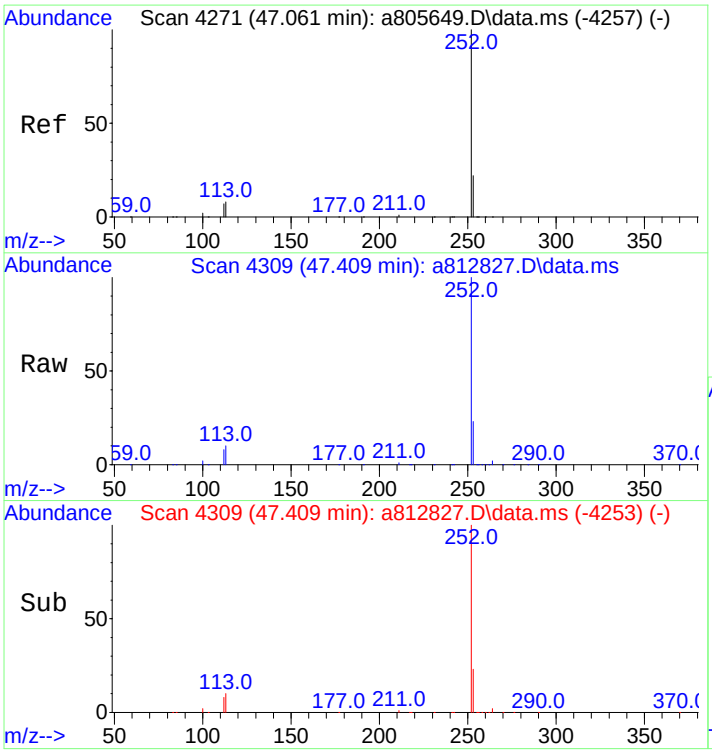


#77
Chrysene/Triphenylene
Concen: 4703.00 ng/mL
RT: 43.515 min Scan# 3883
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:228 Resp: 1060150

Ion	Ratio	Lower	Upper
228	100		
226	29.4	23.6	35.4

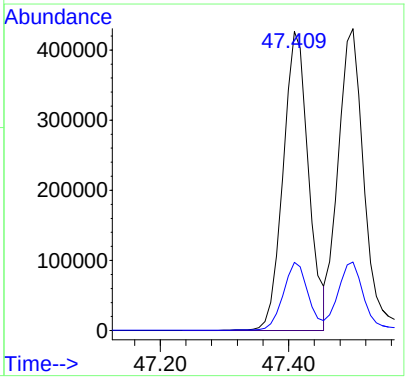


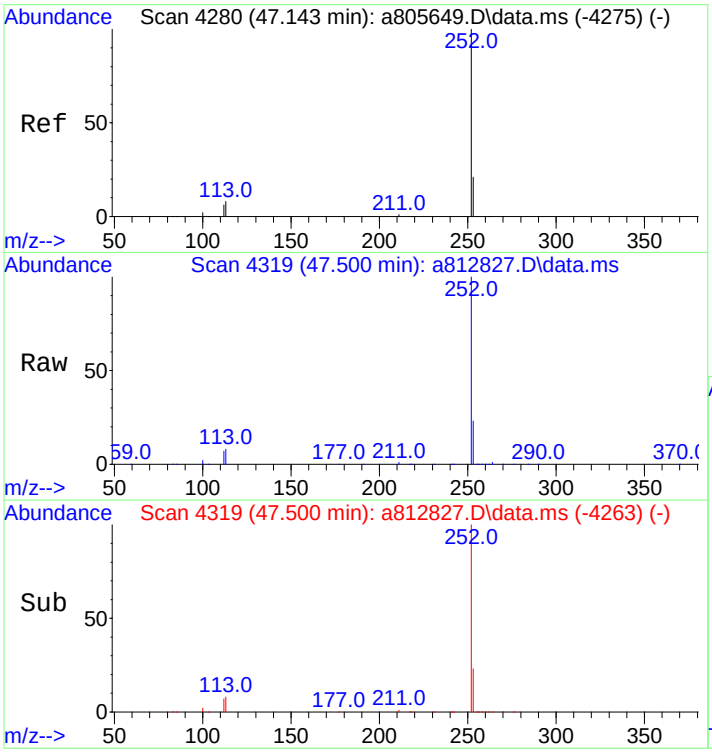


#84
Benzo[b]fluoranthene
Concen: 4635.66 ng/mL
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:252 Resp: 1171928

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.5	27.7

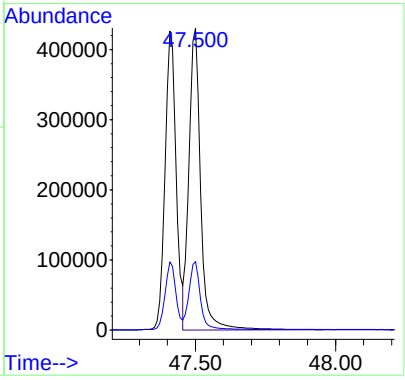


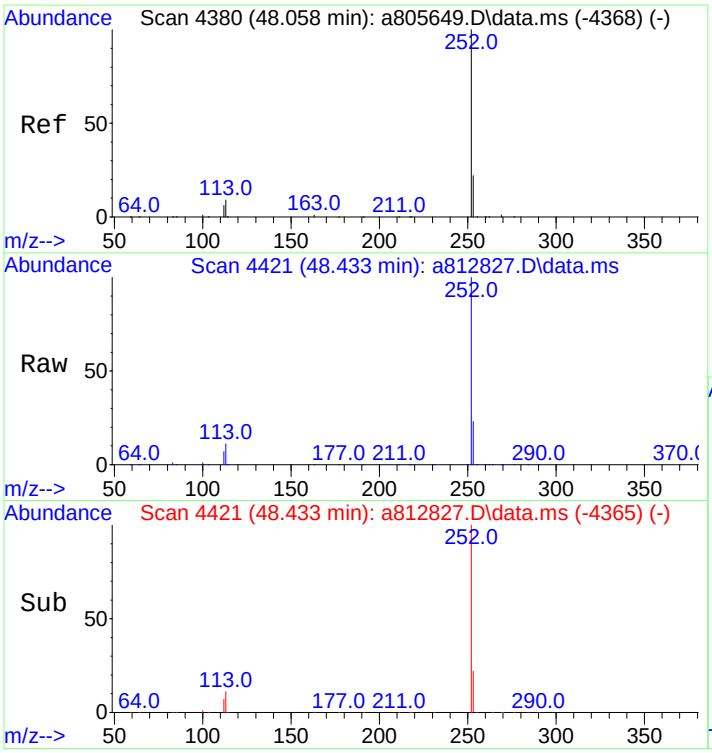


#85
Benzo[j]+[k]fluoranthene
Concen: 4785.69 ng/mL
RT: 47.500 min Scan# 4319
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:252 Resp: 1245688

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.8	28.2

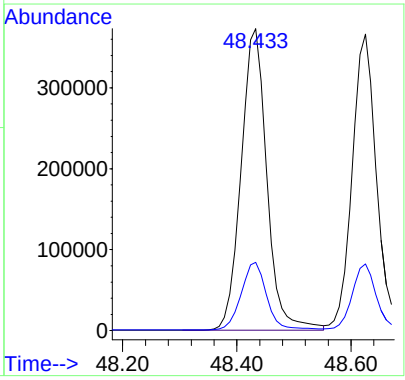


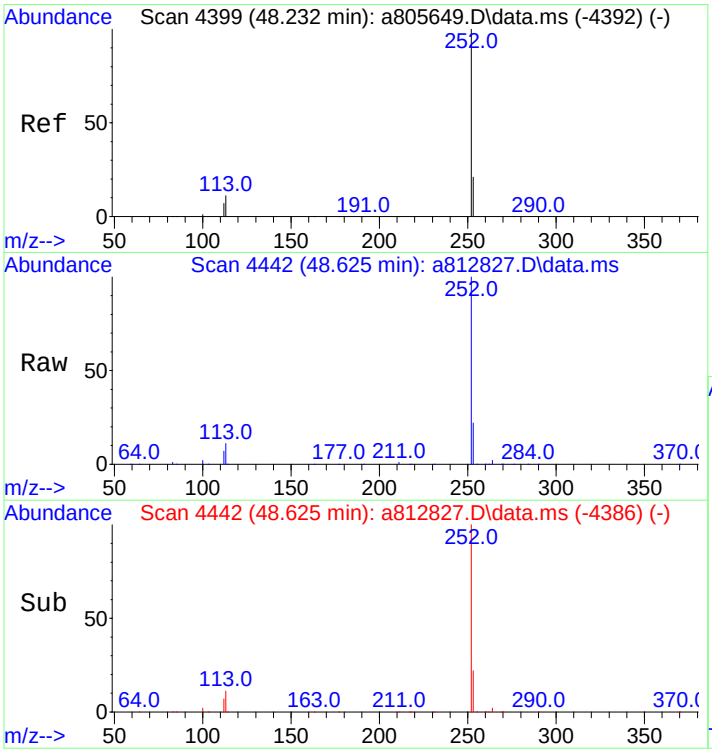


#87
Benzo[e]pyrene
Concen: 4672.08 ng/mL
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:252 Resp: 1171423

Ion	Ratio	Lower	Upper
252	100		
253	22.2	18.9	28.3

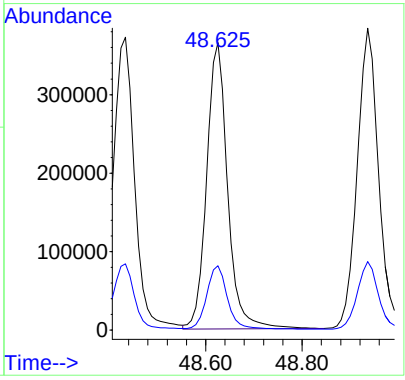


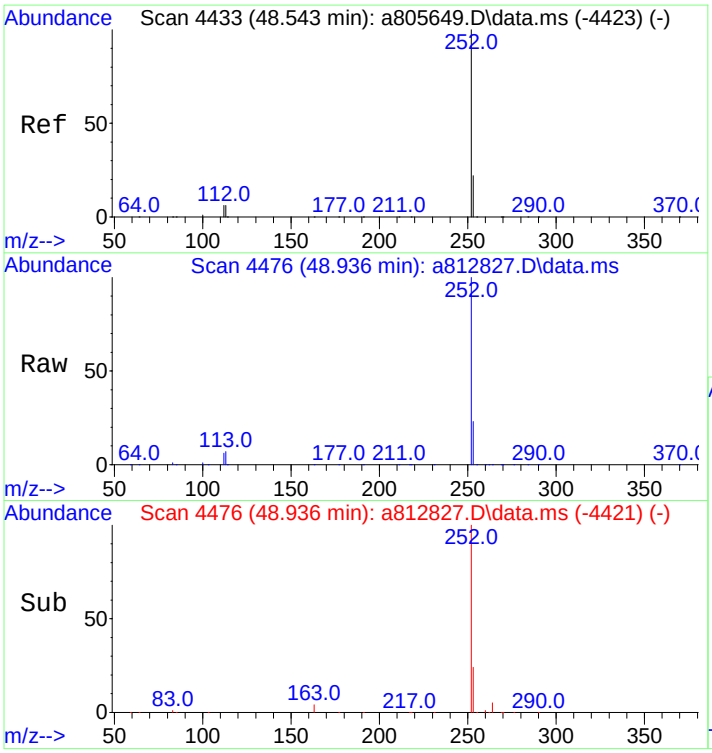


#89
Benzo[a]pyrene
Concen: 4823.49 ng/mL
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:252 Resp: 1101087

Ion	Ratio	Lower	Upper
252	100		
253	22.1	19.4	29.0

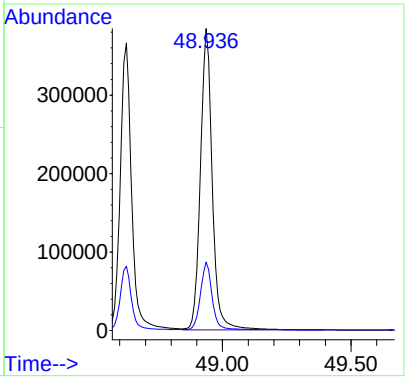


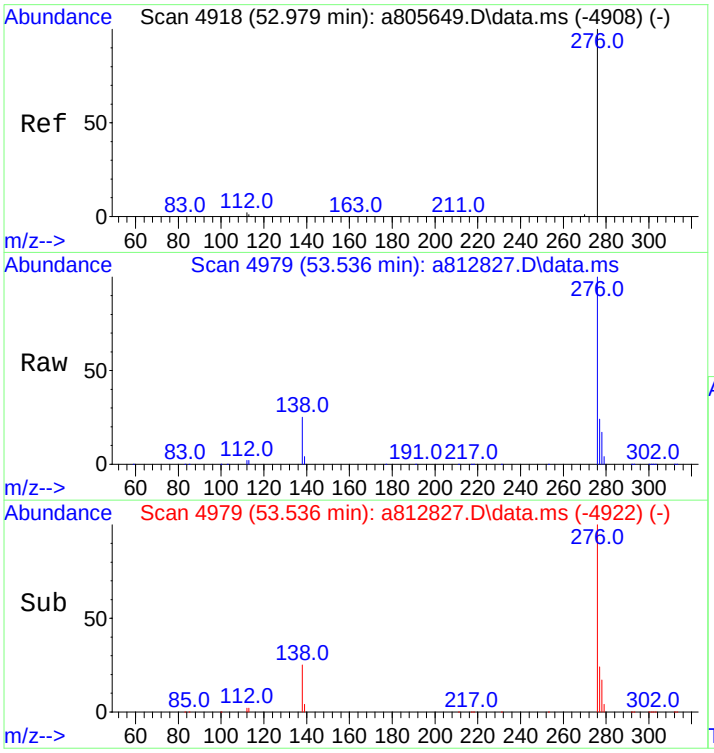


#90
Perylene
Concen: 4896.91 ng/mL
RT: 48.936 min Scan# 4476
Delta R.T. -0.000 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:252 Resp: 1221343

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.3	28.9

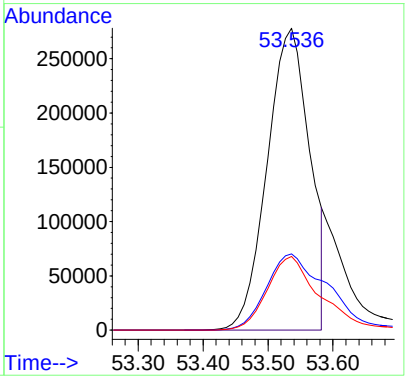


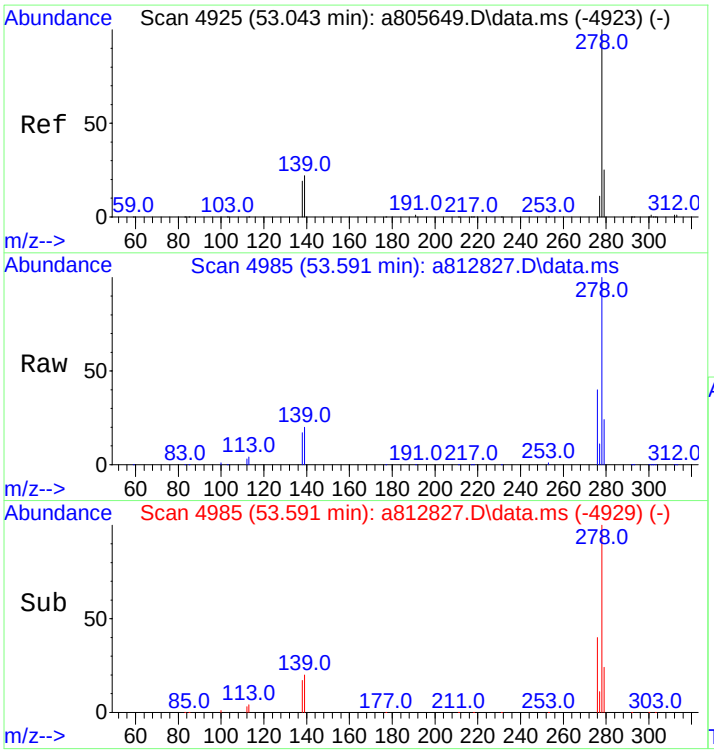


#91
Indeno[1,2,3-cd]pyrene
Concen: 4977.52 ng/mL m
RT: 53.536 min Scan# 4979
Delta R.T. 0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:276 Resp: 1267773

Ion	Ratio	Lower	Upper
276	100		
138	37.9	19.9	29.9#
277	31.4	19.0	28.6#

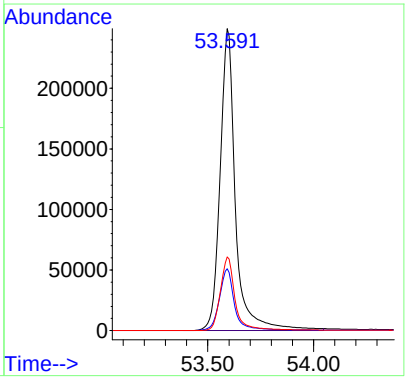


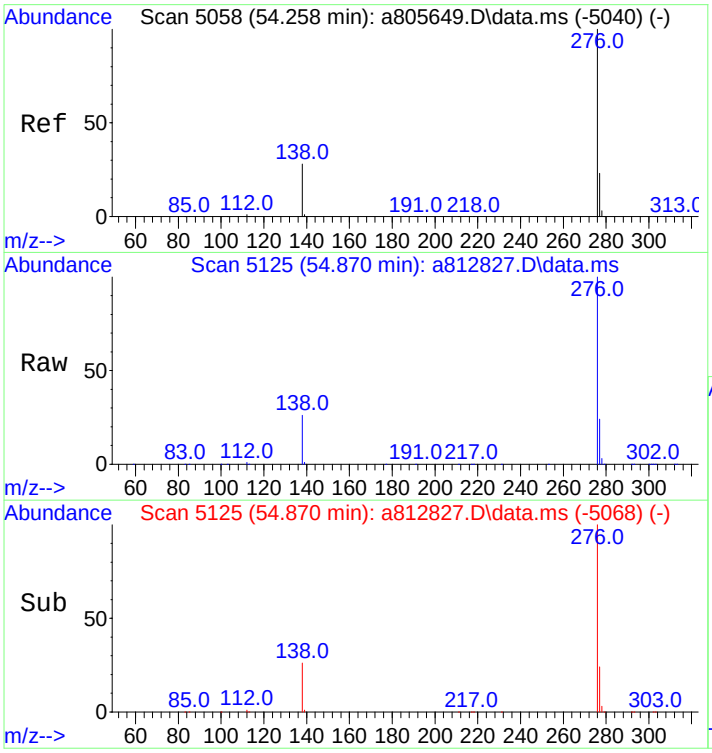


#92
Dibenz[ah]+[ac]anthracene
Concen: 5414.52 ng/mL
RT: 53.591 min Scan# 4985
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:278 Resp: 1246307

Ion	Ratio	Lower	Upper
278	100		
139	20.5	16.6	25.0
279	23.7	19.1	28.7

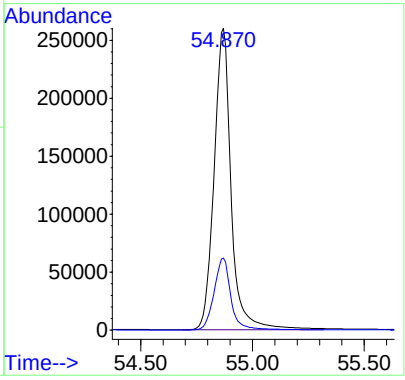


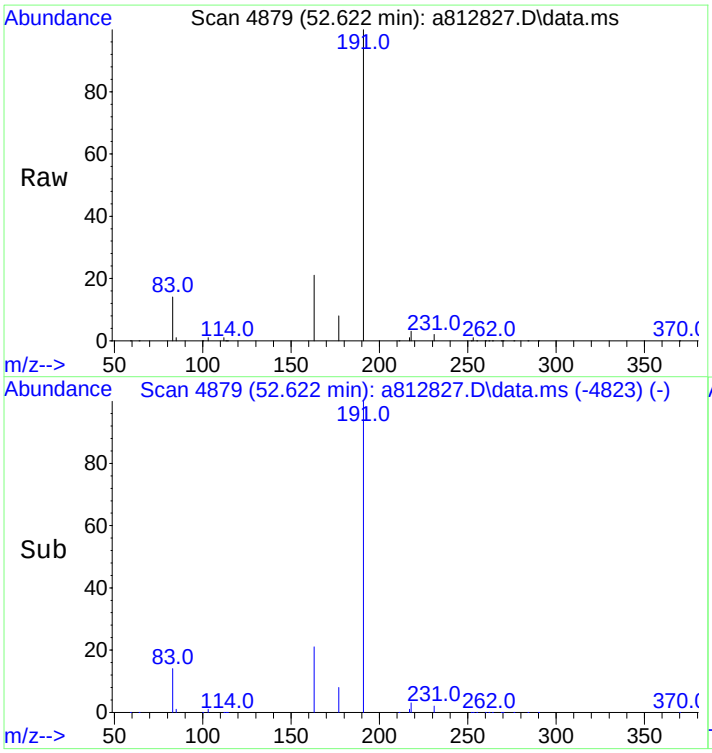


#93
Benzo[g,h,i]perylene
Concen: 5077.39 ng/mL
RT: 54.870 min Scan# 5125
Delta R.T. 0.018 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:276 Resp: 1377844

Ion	Ratio	Lower	Upper
276	100		
277	23.8	18.9	28.3

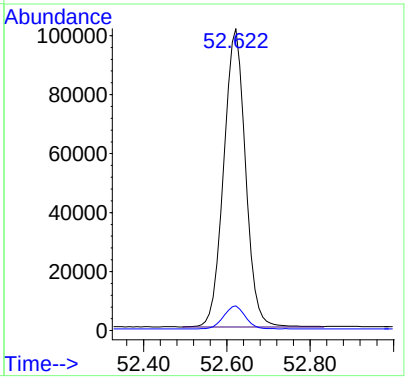


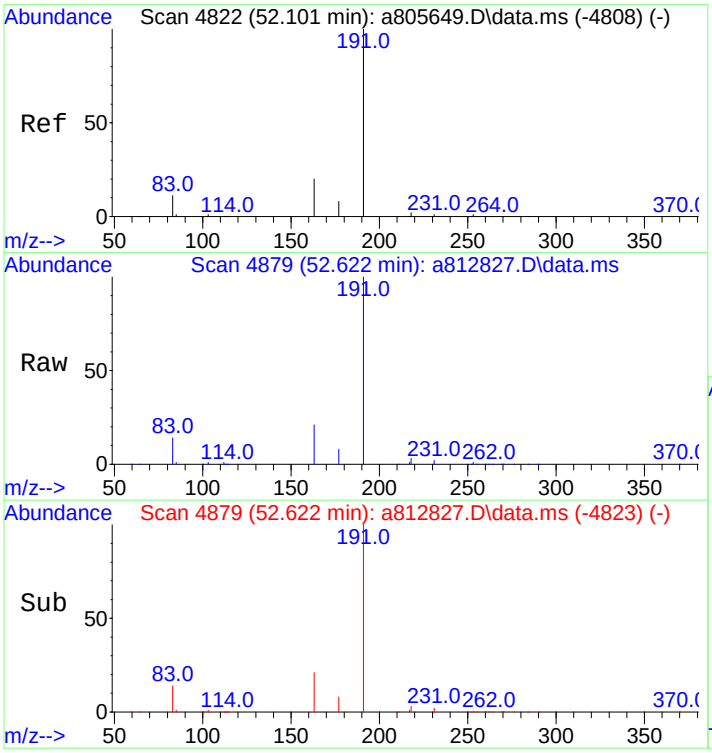


#94
Hopane (T19)
Concen: 4627.20 ng/mL
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:191 Resp: 368264

Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#

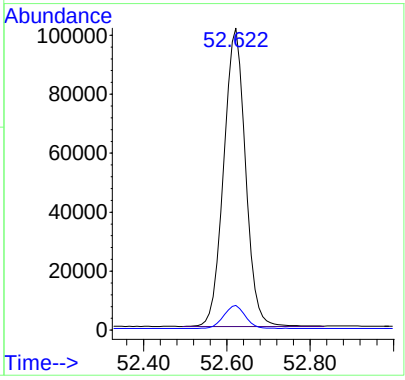




#95
17a(H),21B(H)-hopane - C30H52
Concen: 4627.20 ng/mL
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: a812827.D
Acq: 18 Nov 2012 3:23 pm

Tgt Ion:191 Resp: 368264

Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812828.D
Acq On : 18 Nov 2012 4:48 pm
Operator : AC
Sample : i811181206
Misc : l6 whaq88
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 12:13:56 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

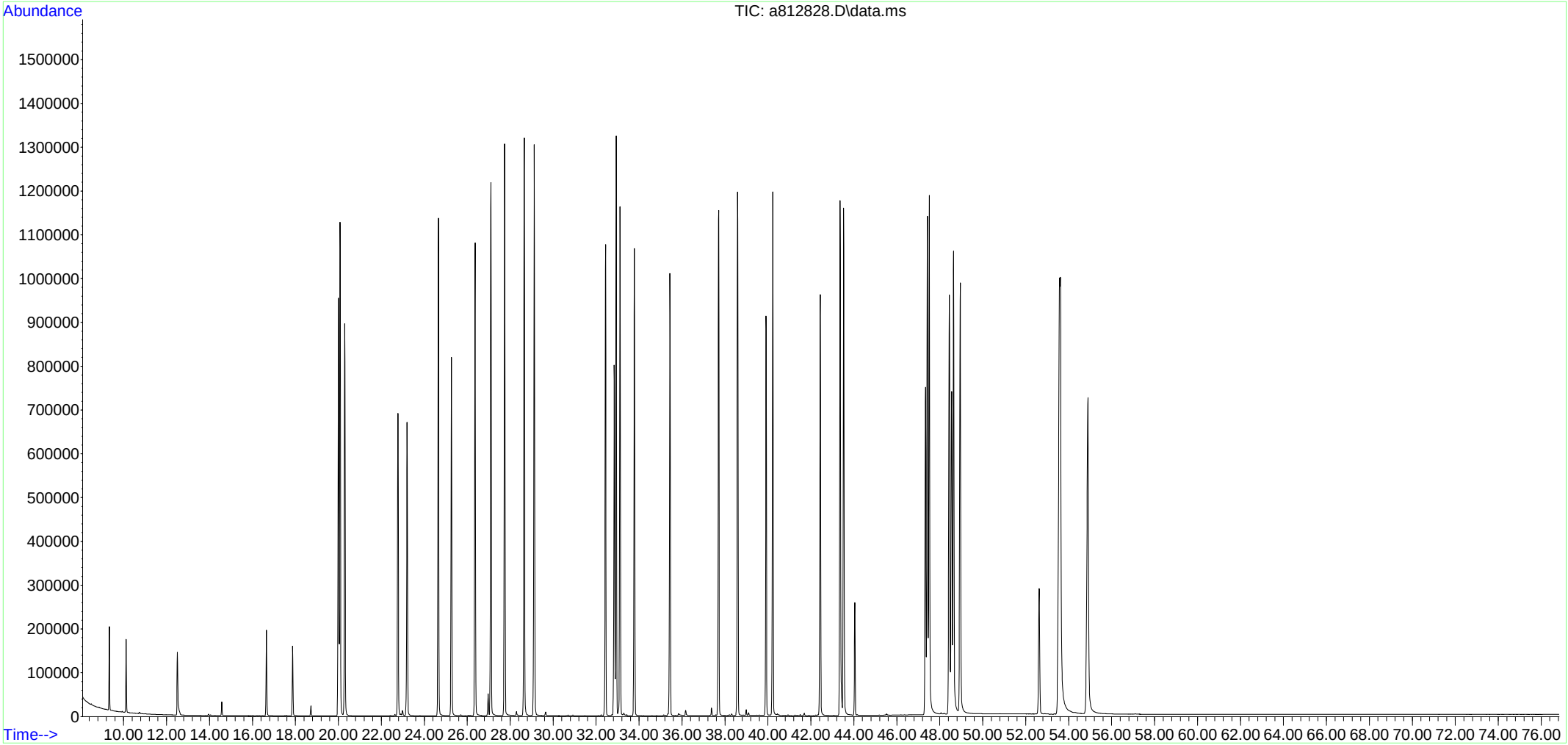
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	62717	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	84324	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	2243293	8251.275	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 825.13%#			
42) Phenanthrene-d10	32.843	188	1750382	8599.859	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 859.99%#			
83) Benzo[b]fluoranthene-d12	47.336	264	1794384	9954.050	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 995.40%#			
88) Benzo[a]pyrene-d12	48.552	264	1825875	10881.834	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1088.18%#			
129) 5B(H)Cholane - Surr	44.045	217	341307	10252.871	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1025.29%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	272687	4751.709	ng/mL	100
4) cis-Decalin	17.870	138	204233	4764.459	ng/mL	100
10) Naphthalene	20.078	128	2483855	7792.668	ng/mL#	100
16) 2-Methylnaphthalene	22.779	142	1680763	8949.222	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	1564208	8725.310	ng/mL#	100
18) Benzothiophene	20.297	134	2103031	8296.534	ng/mL	100
23) Biphenyl	24.659	154	1988254	8567.014	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	1422008	9031.489	ng/mL#	100
25) Dibenzofuran	27.743	168	2088843	8582.971	ng/mL	97
26) Acenaphthylene	26.365	152	2536226M3	8802.876	ng/mL	
27) Acenaphthene	27.105	153	1443026	8470.425	ng/mL	97
28) 2,3,5-Trimethylnaphtha...	28.656	170	1195174	9023.207	ng/mL	97
29) Fluorene	29.121	166	1658711	8917.135	ng/mL	97
33) Dibenzothiophene	32.442	184	2249309	8443.714	ng/mL	99
43) Phenanthrene	32.935	178	2094328	8150.635	ng/mL	100
54) Retene	39.918	234	569687	10416.303	ng/mL	96
55) Anthracene	33.117	178	1941491M3	8016.019	ng/mL	
56) Carbazole	33.783	167	2301555	9500.125	ng/mL	100
57) 1-Methylphenanthrene	35.436	192	1651894	9255.595	ng/mL	99
58) Fluoranthene	37.709	202	2378887M3	9019.418	ng/mL	
59) Benzo(b)fluorene	40.229	216	1463342	9817.360	ng/mL	97
60) Pyrene	38.585	202	2370763	8927.118	ng/mL	97
66) Naphthobenzothiophene	42.438	234	2273683	9279.875	ng/ml	100
67) Naphthobenzothiophene-...	42.438	234	2273683	9279.875	ng/mL	100
75) Benz[a]anthracene	43.360	228	1961481	8721.595	ng/mL	100
76) Chrysene	43.525	228	1868807	8552.347	ng/mL	100
77) Chrysene/Triphenylene	43.525	228	1868807	8552.347	ng/mL	100
84) Benzo[b]fluoranthene	47.427	252	2237296	9129.497	ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.509	252	2431044	9634.766	ng/mL	99
87) Benzo[e]pyrene	48.442	252	2278975	9376.692	ng/mL	98
89) Benzo[a]pyrene	48.643	252	2183012	9865.275	ng/mL	97
90) Perylene	48.954	252	2416323	9994.305	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.564	276	2431926M3	9849.968	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.618	278	2315295	10376.588	ng/mL	100
93) Benzo[g,h,i]perylene	54.898	276	2534537	9635.008	ng/mL	99
94) Hopane (T19)	52.622	191	729760M3	9459.147	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.622	191	729556M3	9456.503	ng/mL	

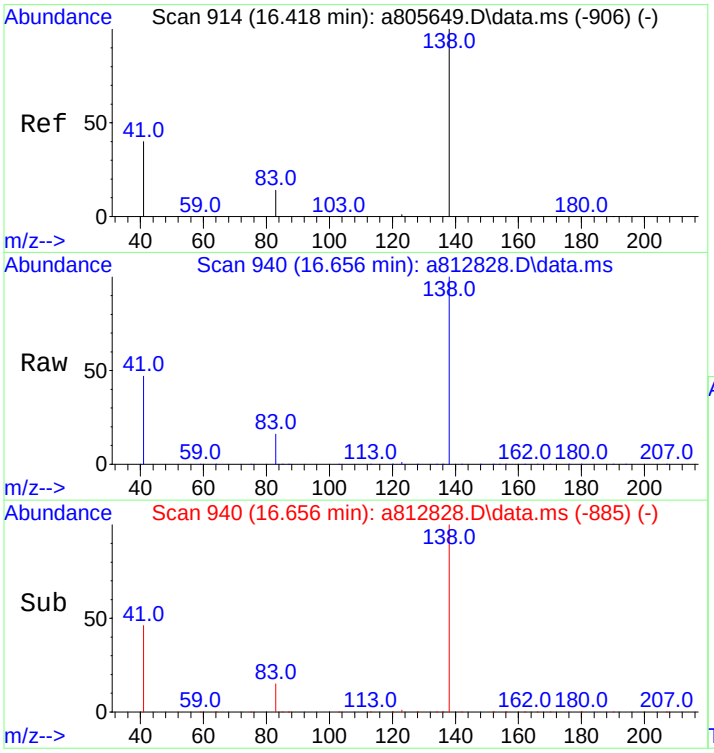
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812828.D
Acq On : 18 Nov 2012 4:48 pm
Operator : AC
Sample : i811181206
Misc : l6 whaq88
ALS Vial : 9 Sample Multiplier: 1

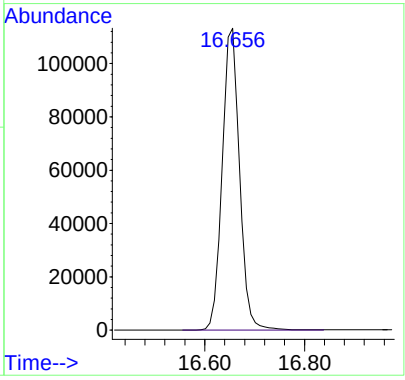
Quant Time: Nov 19 12:13:56 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

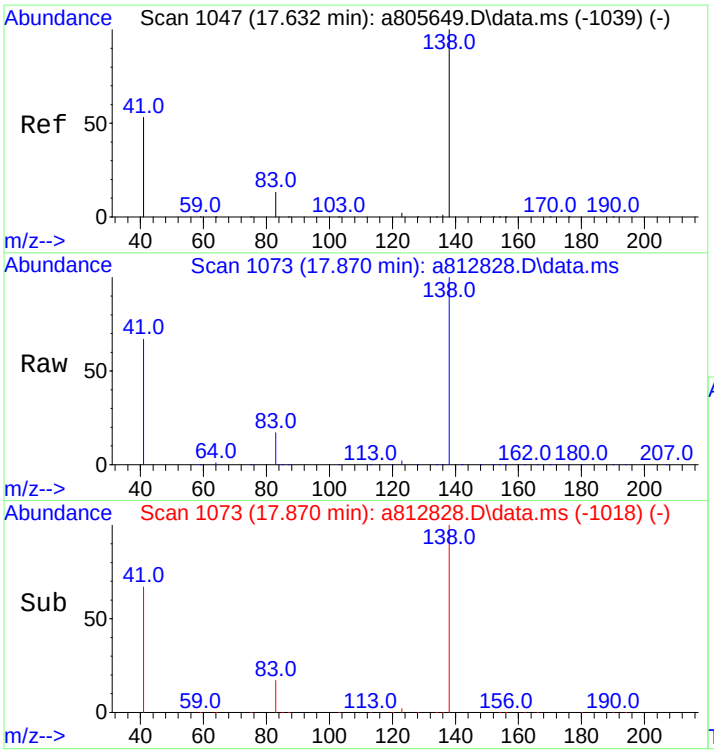




#3
trans-Decalin
Concen: 4751.71 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

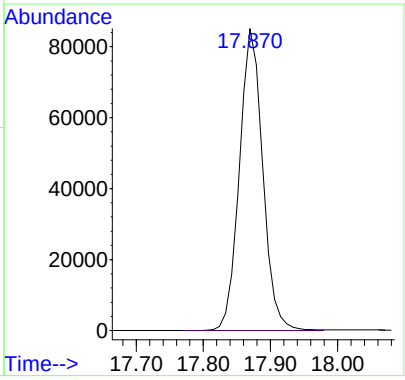
Tgt Ion:138 Resp: 272687

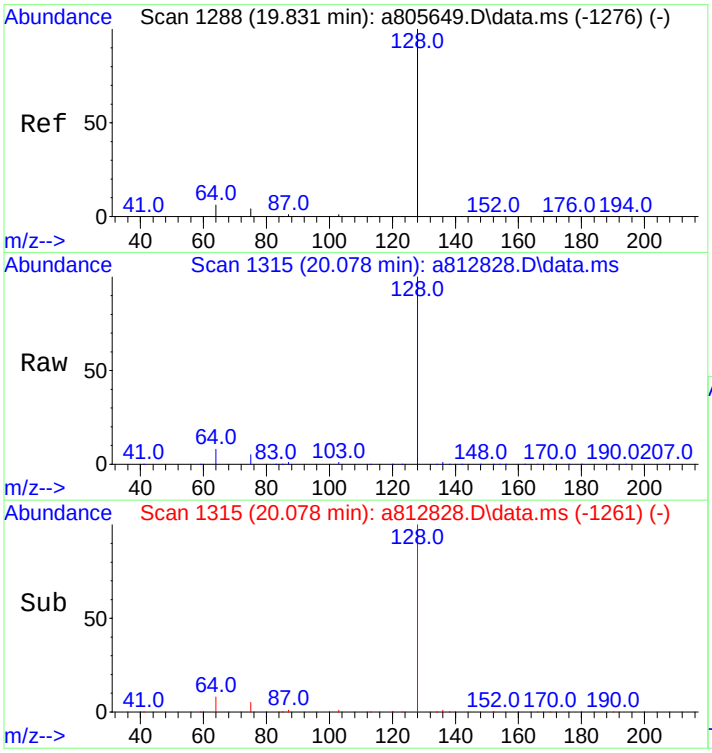




#4
cis-Decalin
Concen: 4764.46 ng/mL
RT: 17.870 min Scan# 1073
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:138 Resp: 204233

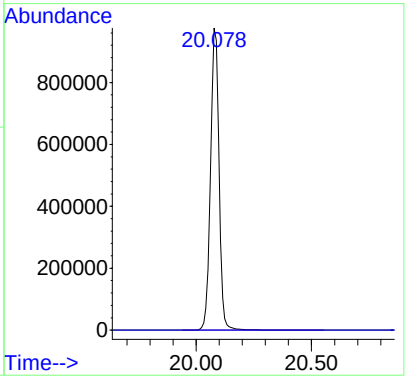


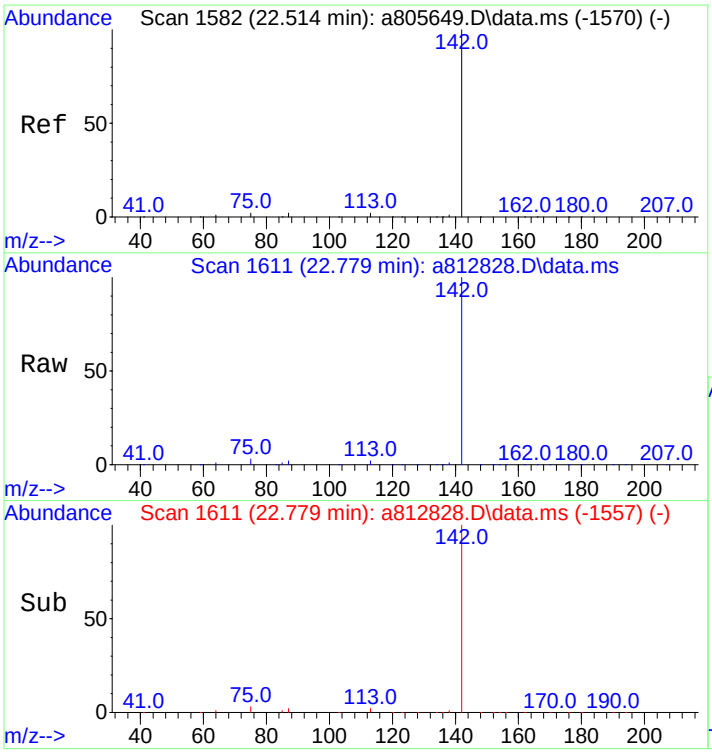


#10
Naphthalene
Concen: 7792.67 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:128 Resp: 2483855

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

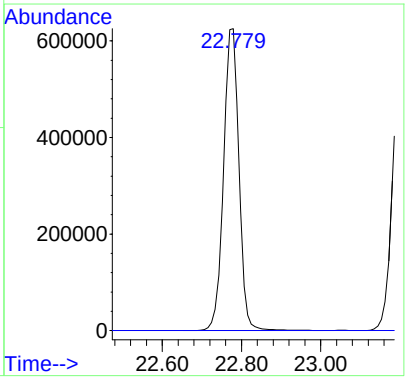


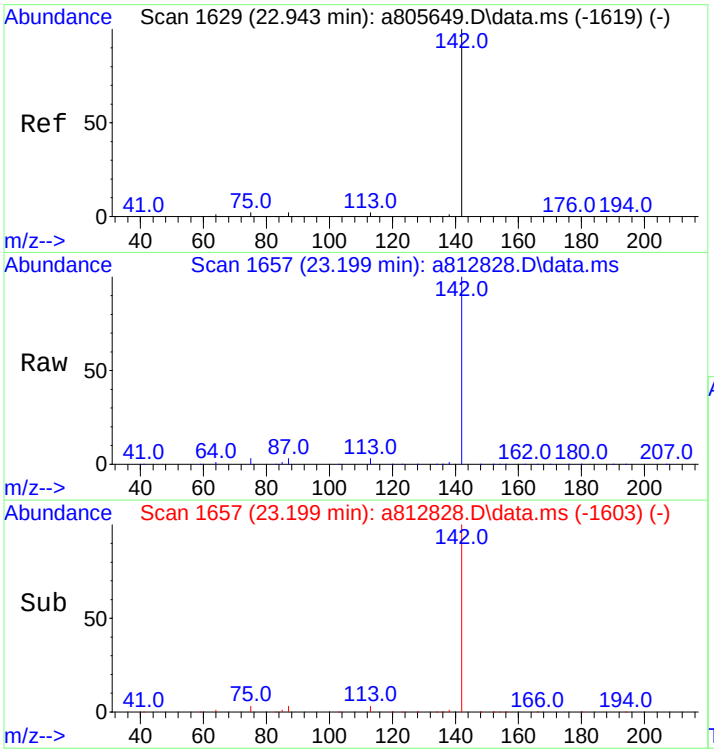


#16
2-Methylnaphthalene
Concen: 8949.22 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:142 Resp: 1680763

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

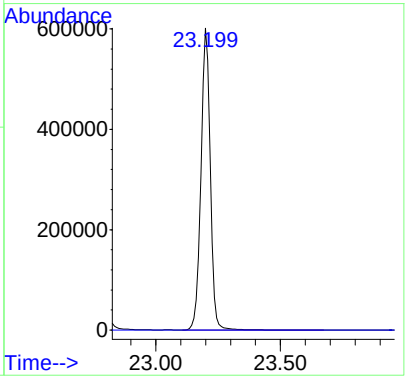


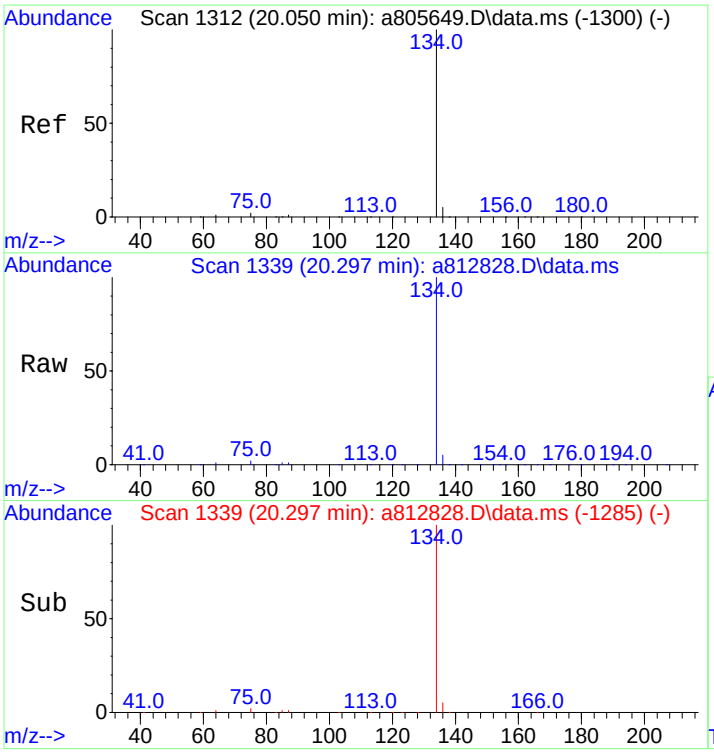


#17
1-Methylnaphthalene
Concen: 8725.31 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:142 Resp: 1564208

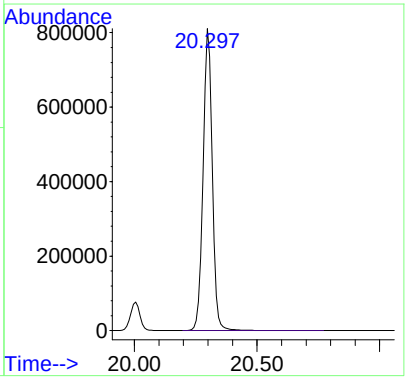
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

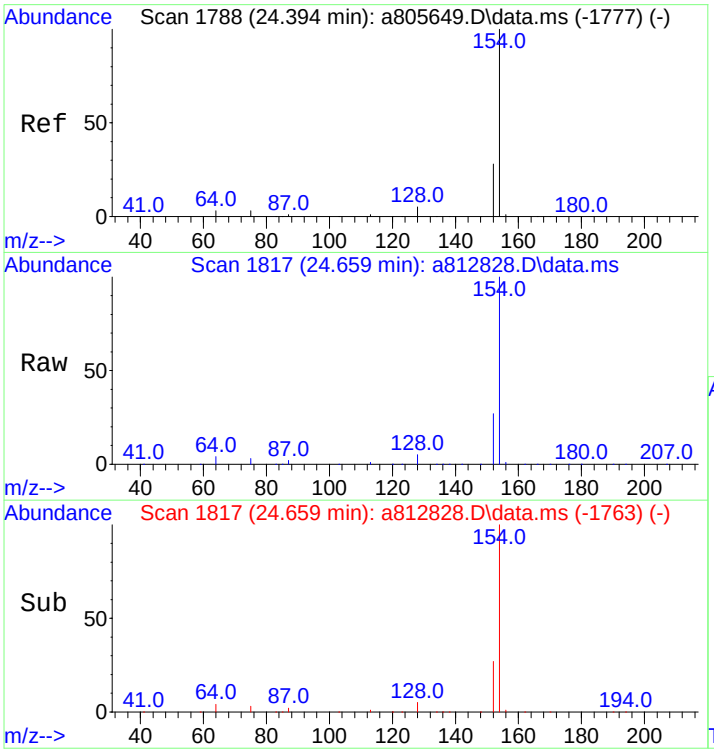




#18
Benzothiophene
Concen: 8296.53 ng/mL
RT: 20.297 min Scan# 1339
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:134 Resp: 2103031

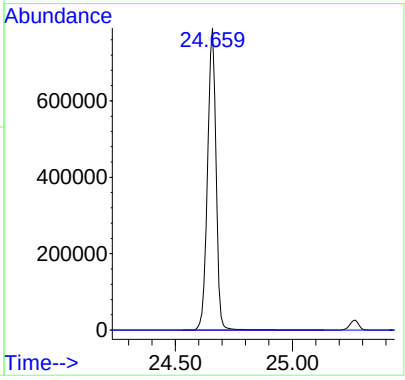


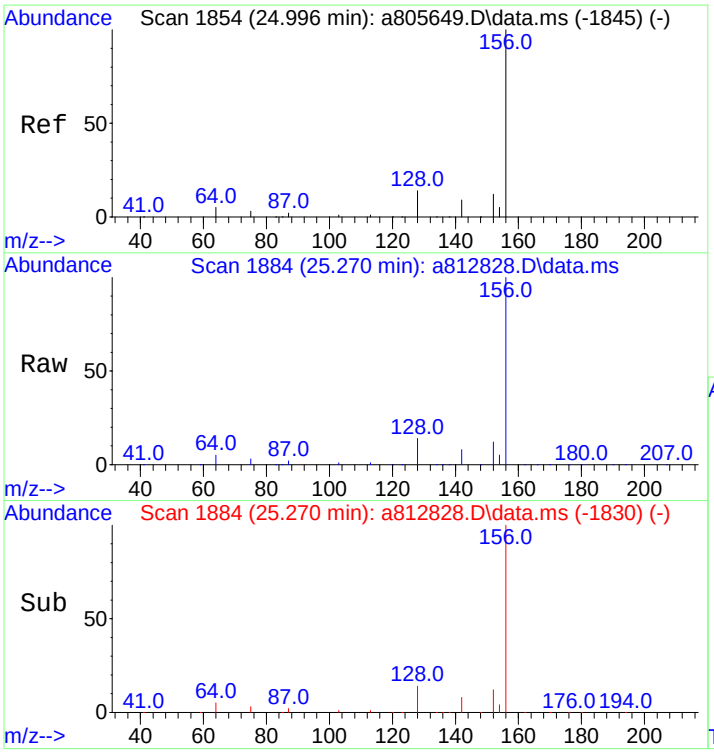


#23
Biphenyl
Concen: 8567.01 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:154 Resp: 1988254

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

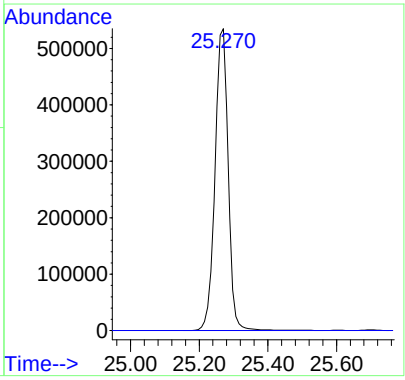


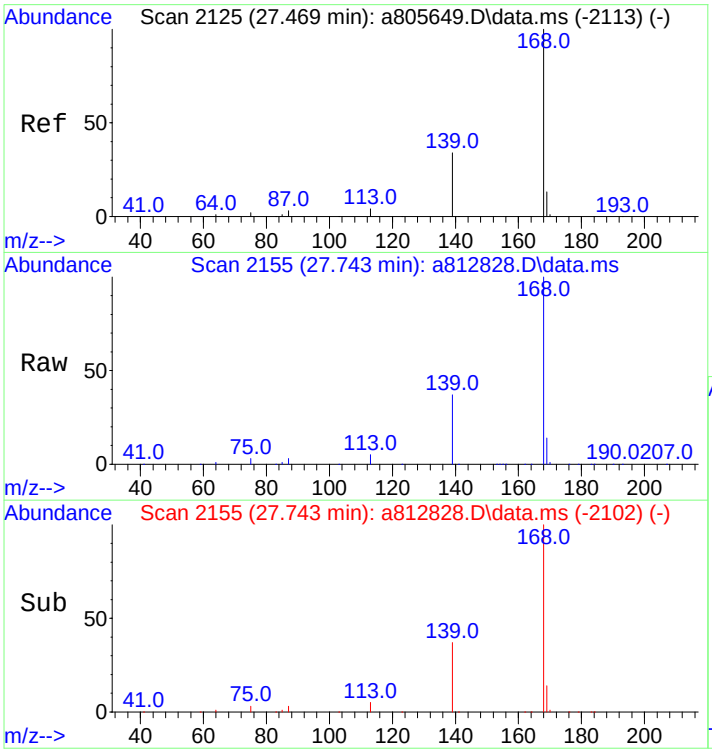


#24
2,6-Dimethylnaphthalene
Concen: 9031.49 ng/mL
RT: 25.270 min Scan# 1884
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:156 Resp: 1422008

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

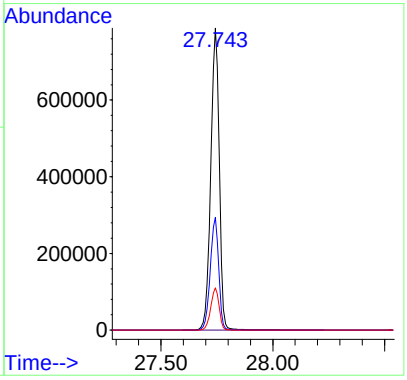


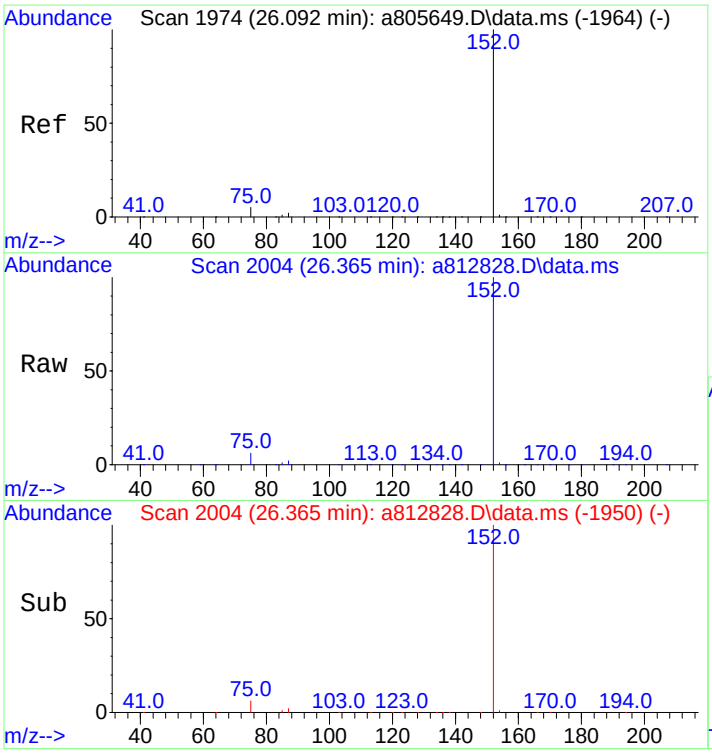


#25
Dibenzofuran
Concen: 8582.97 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.018 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:168 Resp: 2088843

Ion	Ratio	Lower	Upper
168	100		
139	37.1	28.0	42.0
169	13.8	10.6	15.8

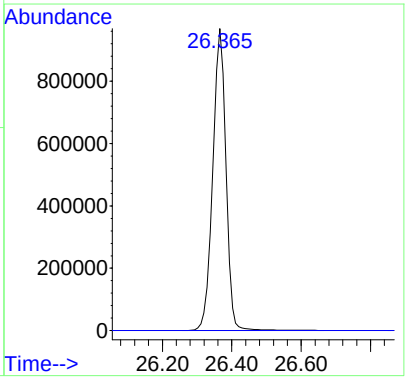


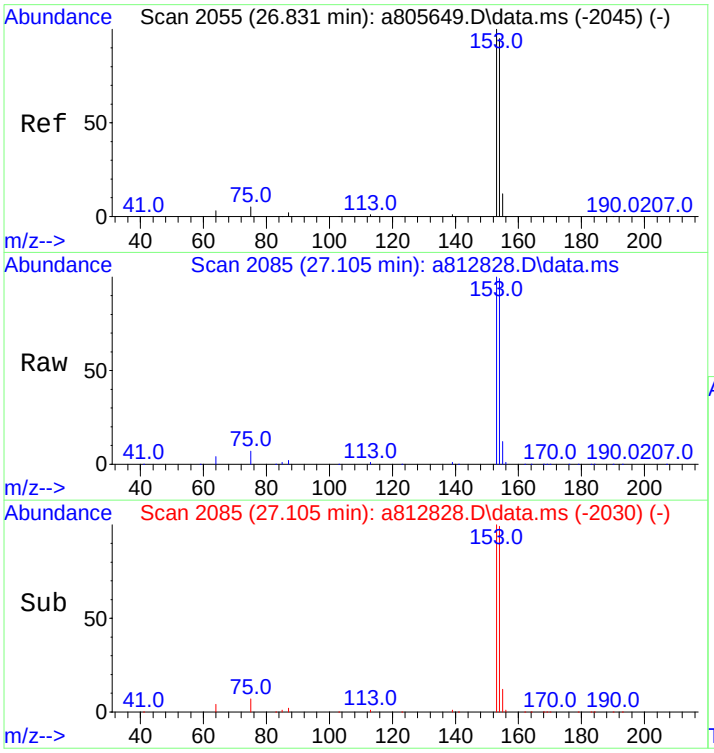


#26
Acenaphthylene
Concen: 8802.88 ng/mL m
RT: 26.365 min Scan# 2004
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:152 Resp: 2536226

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

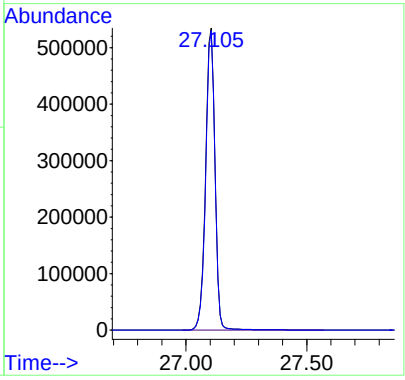


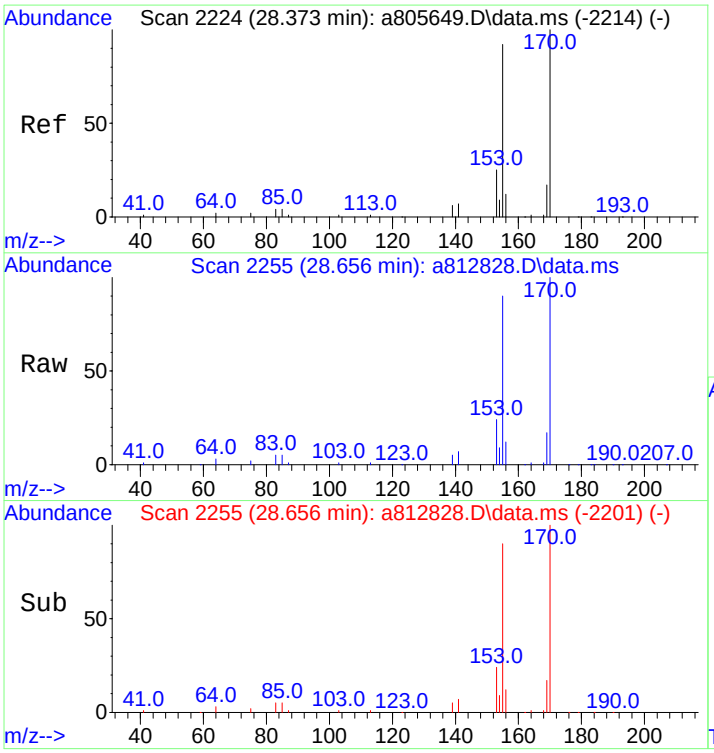


#27
Acenaphthene
Concen: 8470.43 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:153 Resp: 1443026

Ion	Ratio	Lower	Upper
153	100		
154	97.4	75.4	113.2

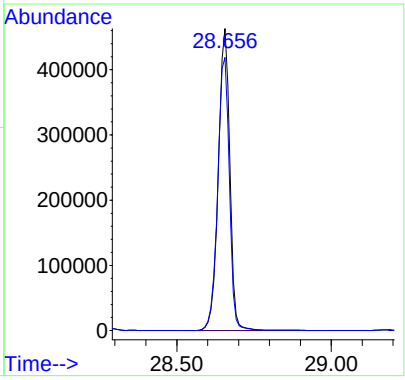


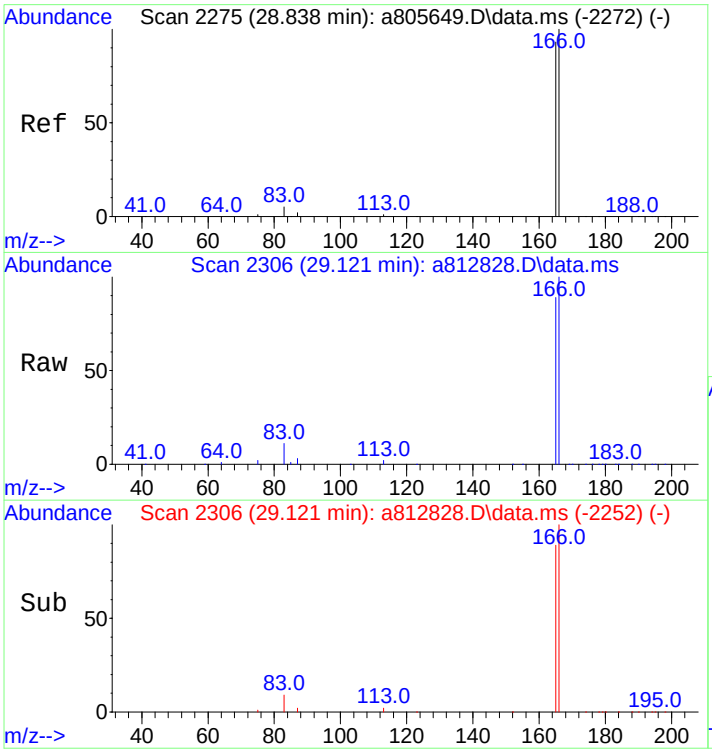


#28
2,3,5-Trimethylnaphthalene
Concen: 9023.21 ng/mL
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:170 Resp: 1195174

Ion	Ratio	Lower	Upper
170	100		
155	92.2	71.7	107.5

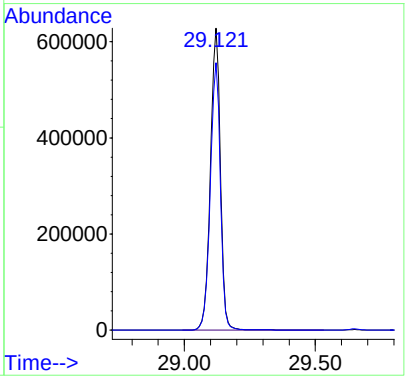


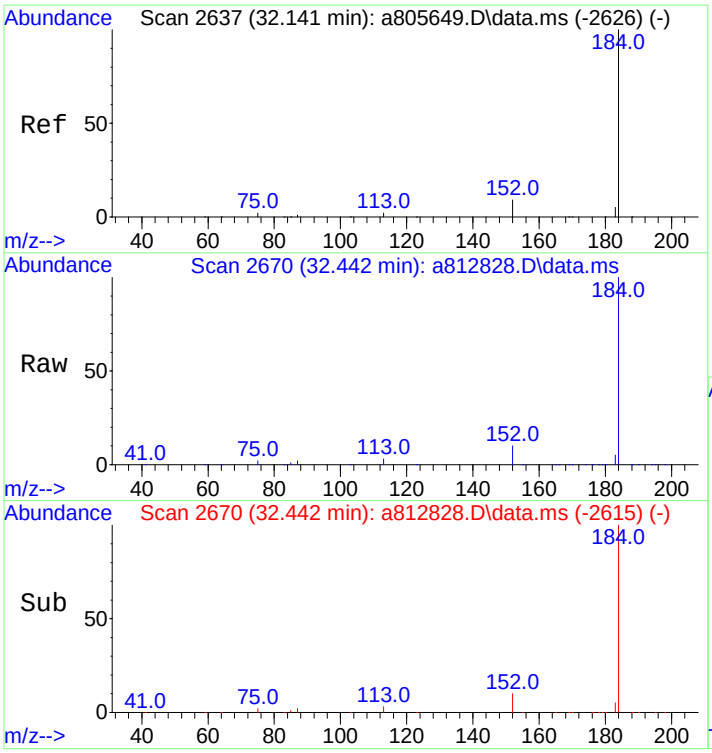


#29
Fluorene
Concen: 8917.13 ng/mL
RT: 29.121 min Scan# 2306
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:166 Resp: 1658711

Ion	Ratio	Lower	Upper
166	100		
165	89.6	74.2	111.2

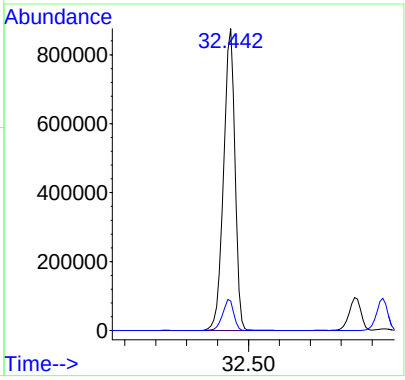


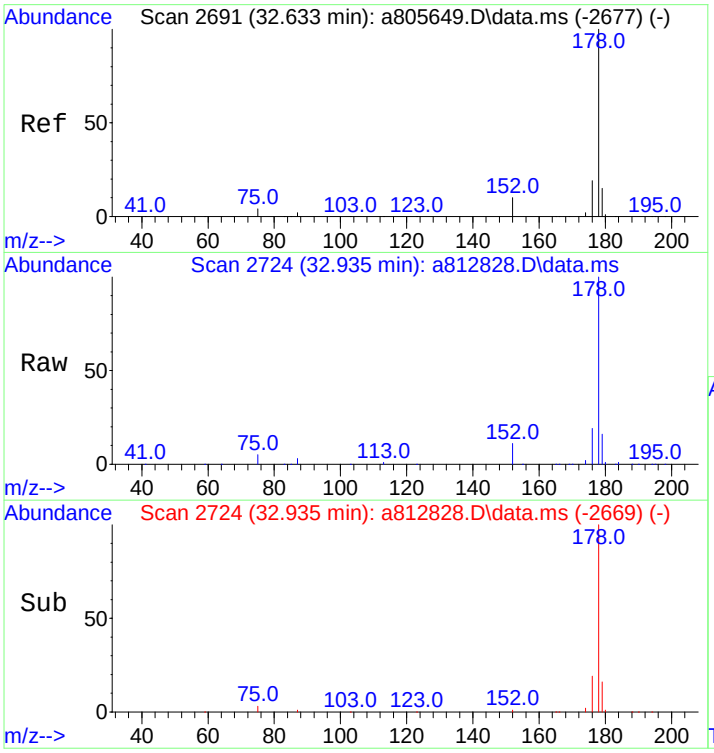


#33
Dibenzothiophene
Concen: 8443.71 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:184 Resp: 2249309

Ion	Ratio	Lower	Upper
184	100		
152	10.1	7.8	11.8

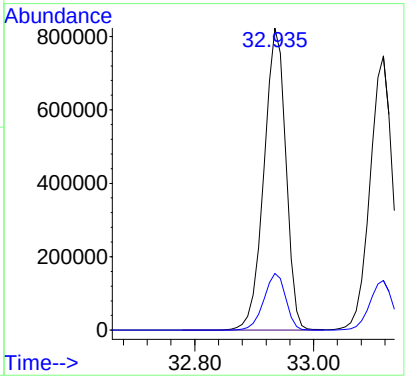


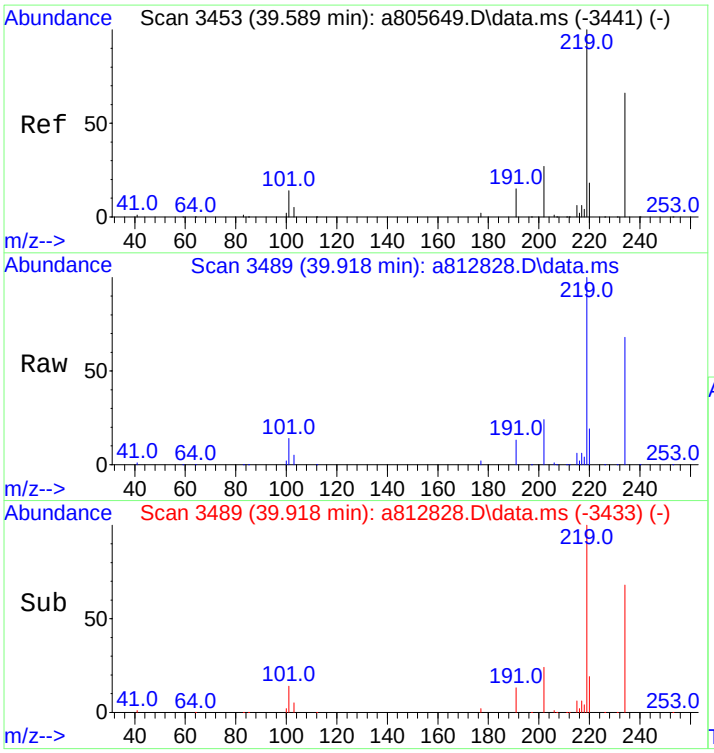


#43
Phenanthrene
Concen: 8150.63 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:178 Resp: 2094328

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

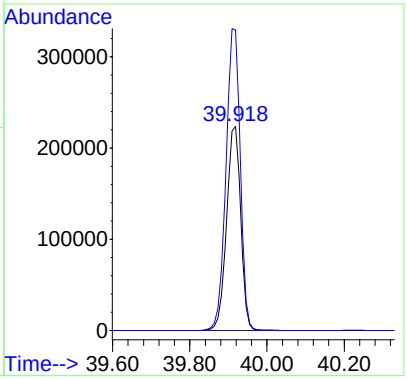


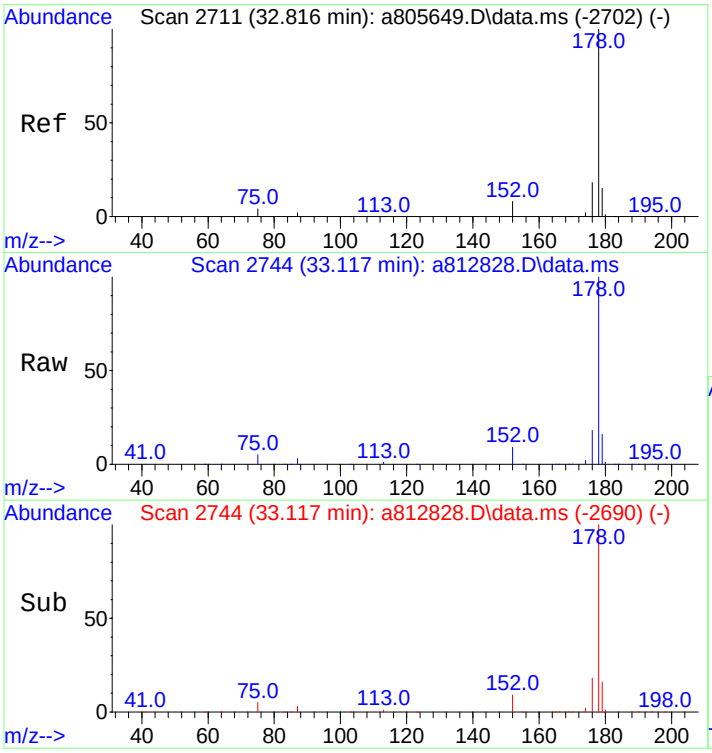


#54
Retene
Concen: 10416.30 ng/mL
RT: 39.918 min Scan# 3489
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:234 Resp: 569687

Ion	Ratio	Lower	Upper
234	100		
219	149.9	124.0	186.0

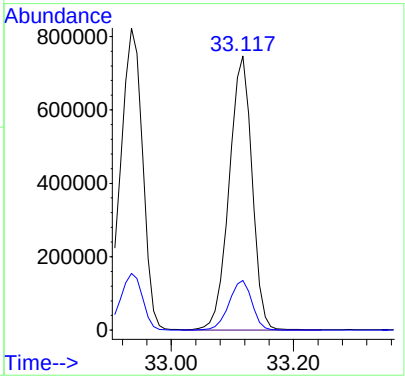


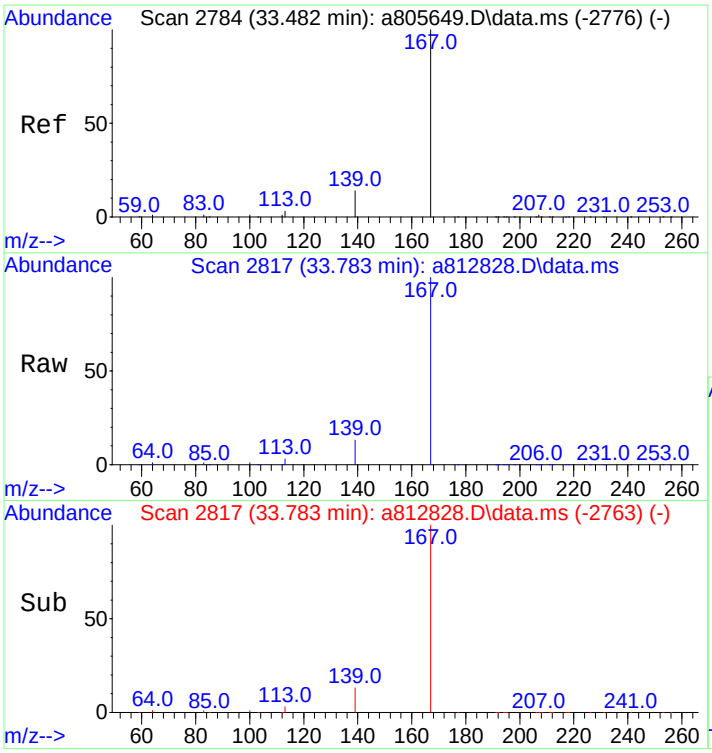


#55
Anthracene
Concen: 8016.02 ng/mL m
RT: 33.117 min Scan# 2744
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:178 Resp: 1941491

Ion	Ratio	Lower	Upper
178	100		
176	18.1	14.3	21.5

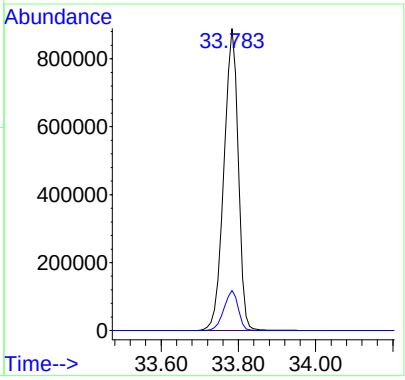


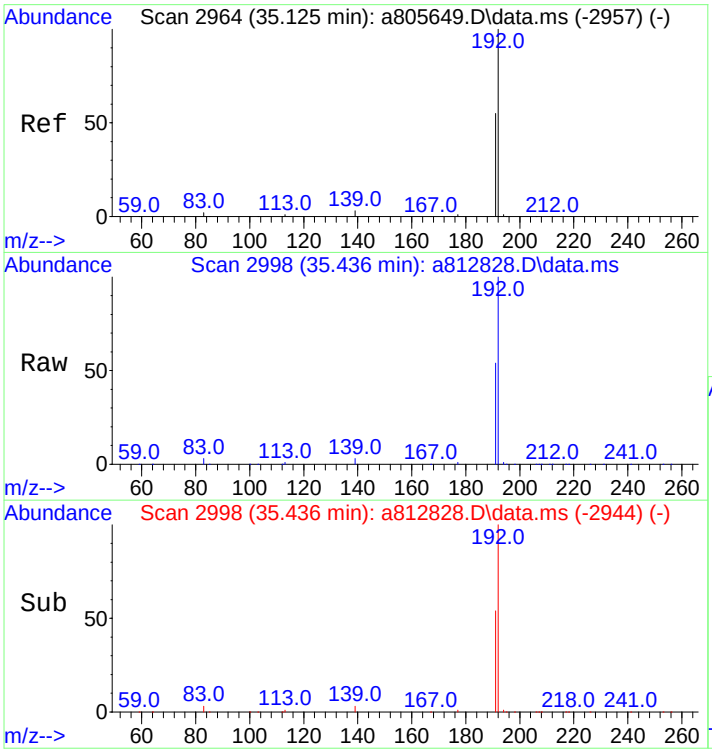


#56
Carbazole
Concen: 9500.12 ng/mL
RT: 33.783 min Scan# 2817
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:167 Resp: 2301555

Ion	Ratio	Lower	Upper
167	100		
139	13.2	10.6	16.0

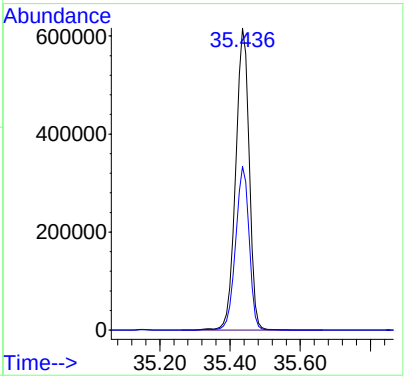


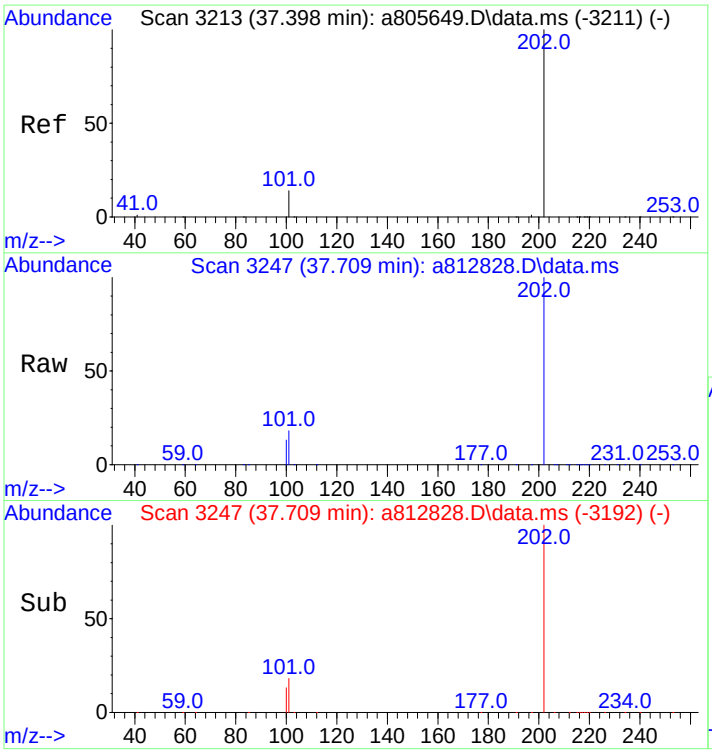


#57
1-Methylphenanthrene
Concen: 9255.59 ng/mL
RT: 35.436 min Scan# 2998
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:192 Resp: 1651894

Ion	Ratio	Lower	Upper
192	100		
191	54.3	44.2	66.4

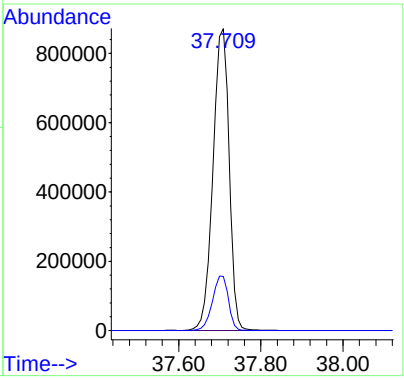


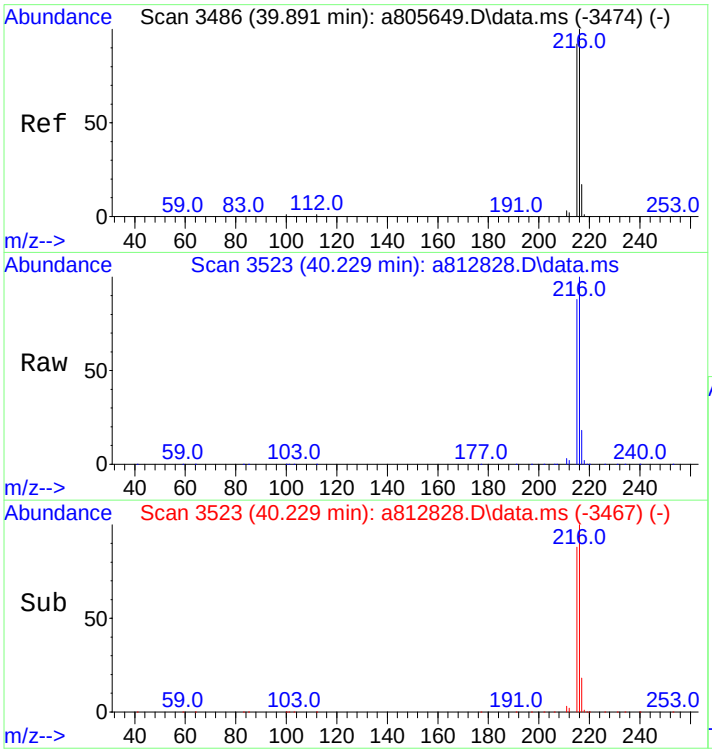


#58
Fluoranthene
Concen: 9019.42 ng/mL m
RT: 37.709 min Scan# 3247
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:202 Resp: 2378887

Ion	Ratio	Lower	Upper
202	100		
101	17.9	13.6	20.4

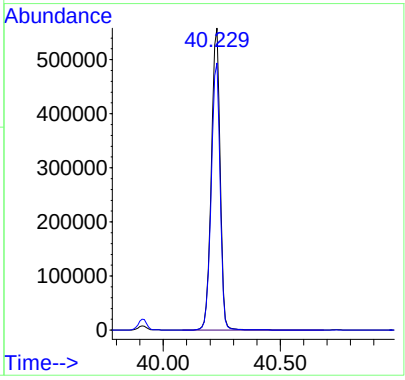


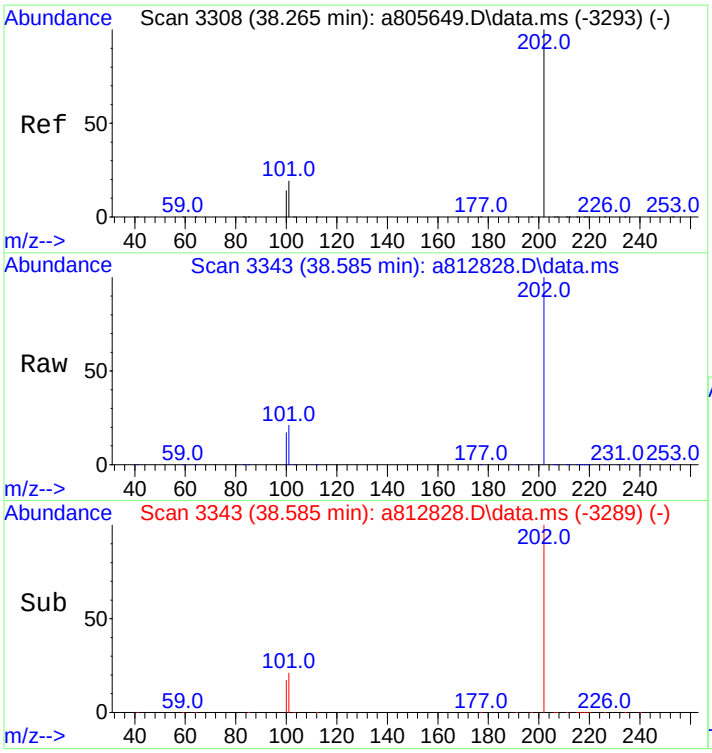


#59
Benzo(b)fluorene
Concen: 9817.36 ng/mL
RT: 40.229 min Scan# 3523
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:216 Resp: 1463342

Ion	Ratio	Lower	Upper
216	100		
215	89.5	74.2	111.2

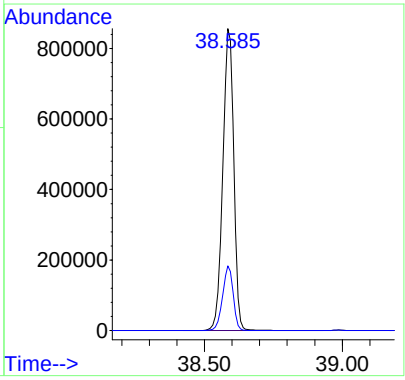


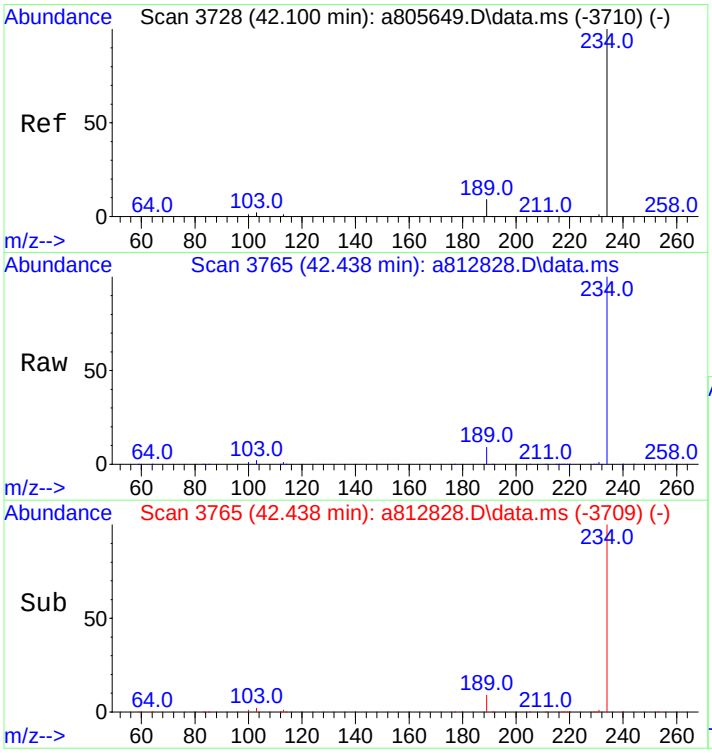


#60
Pyrene
Concen: 8927.12 ng/mL
RT: 38.585 min Scan# 3343
Delta R.T. -0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:202 Resp: 2370763

Ion	Ratio	Lower	Upper
202	100		
101	20.7	15.4	23.2

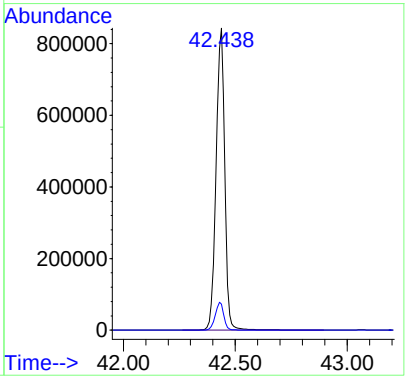


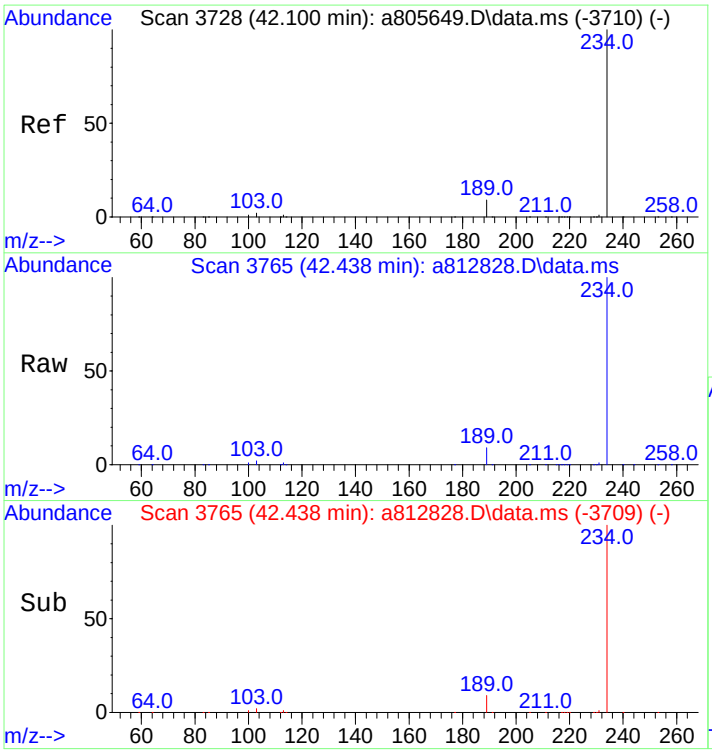


#66
Naphthobenzothiophene
Concen: 9279.87 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:234 Resp: 2273683

Ion	Ratio	Lower	Upper
234	100		
189	9.1	7.2	10.8

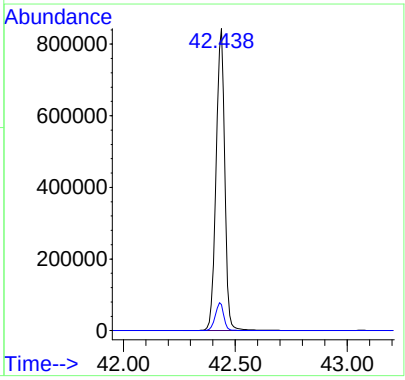


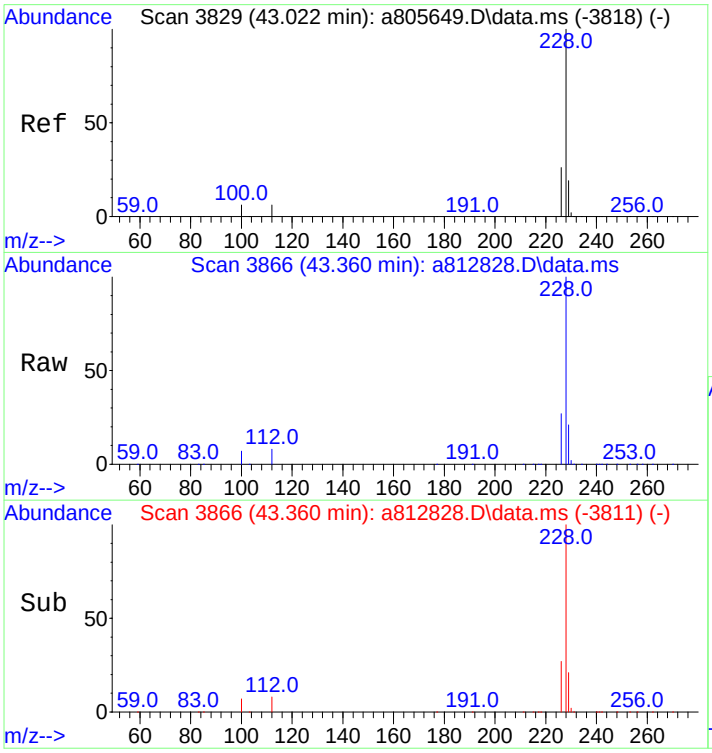


#67
Naphthobenzothiophene-2,1-D
Concen: 9279.87 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:234 Resp: 2273683

Ion	Ratio	Lower	Upper
234	100		
189	9.1	7.2	10.8

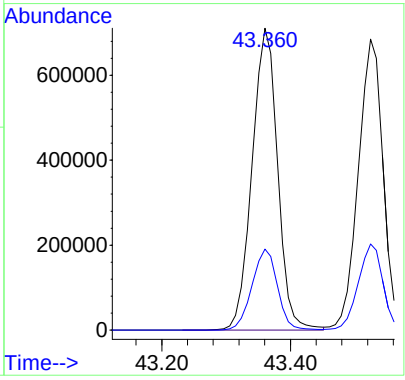


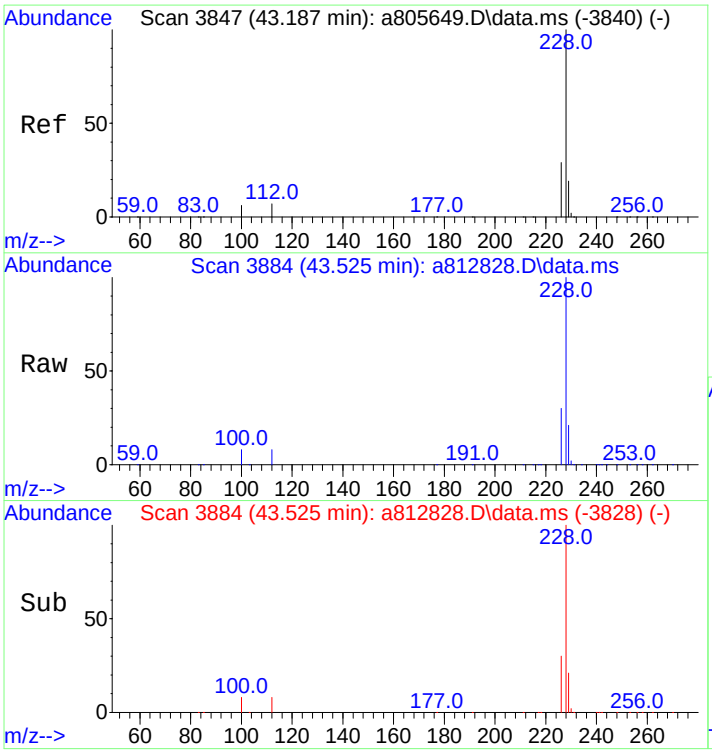


#75
Benz[a]anthracene
Concen: 8721.60 ng/mL
RT: 43.360 min Scan# 3866
Delta R.T. -0.000 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:228 Resp: 1961481

Ion	Ratio	Lower	Upper
228	100		
226	26.7	21.3	31.9

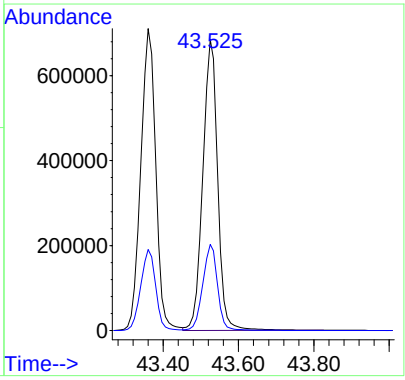


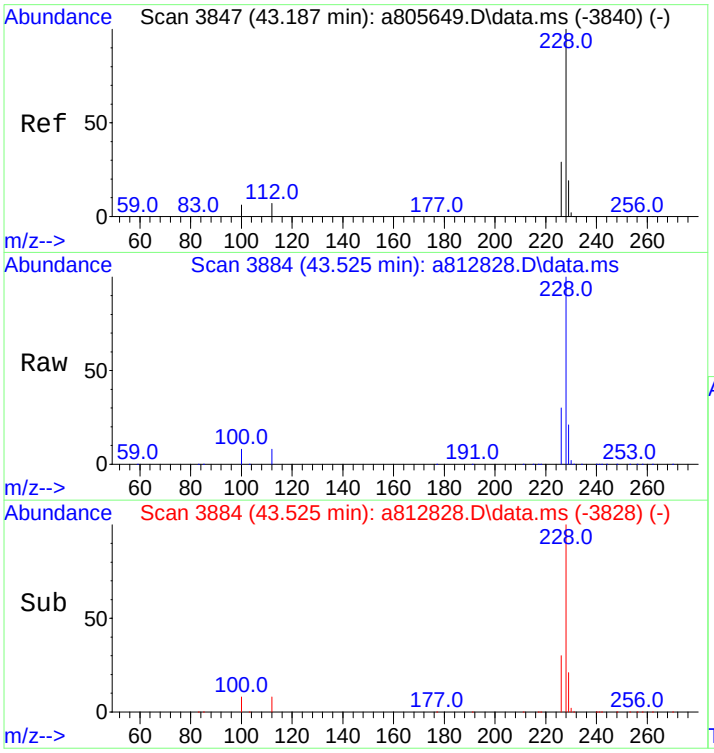


#76
Chrysene
Concen: 8552.35 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:228 Resp: 1868807

Ion	Ratio	Lower	Upper
228	100		
226	29.4	23.6	35.4

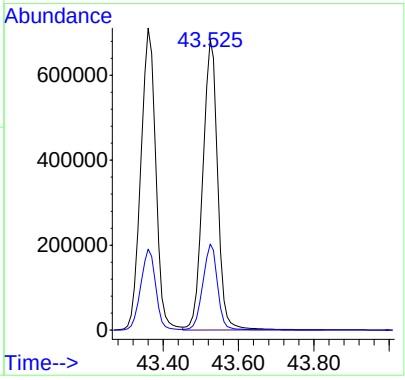


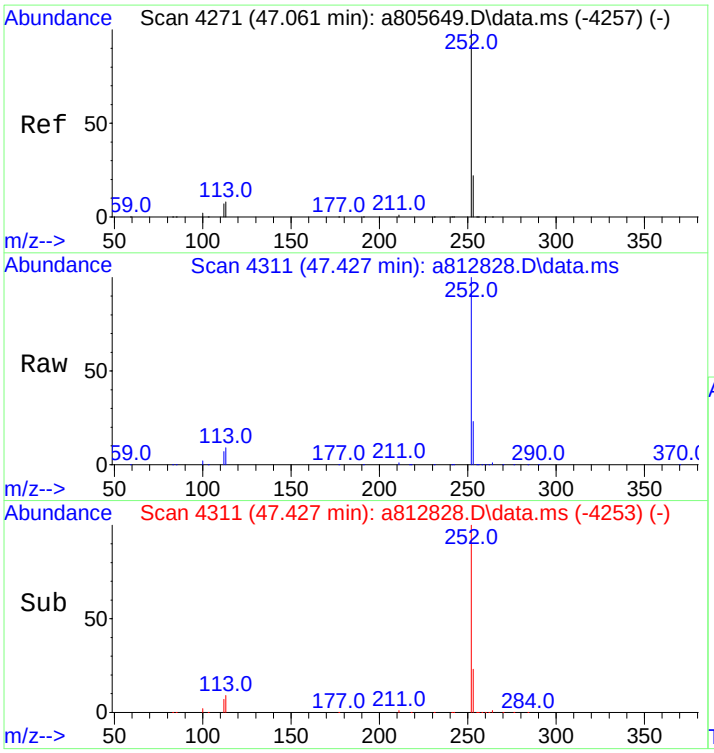


#77
Chrysene/Triphenylene
Concen: 8552.35 ng/mL
RT: 43.525 min Scan# 3884
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:228 Resp: 1868807

Ion	Ratio	Lower	Upper
228	100		
226	29.4	23.6	35.4

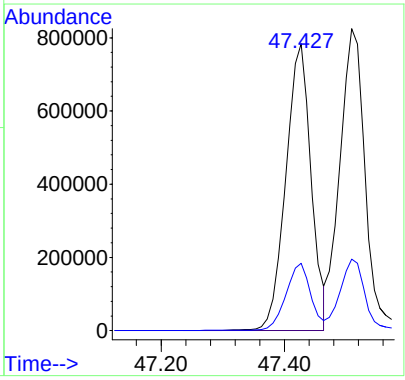


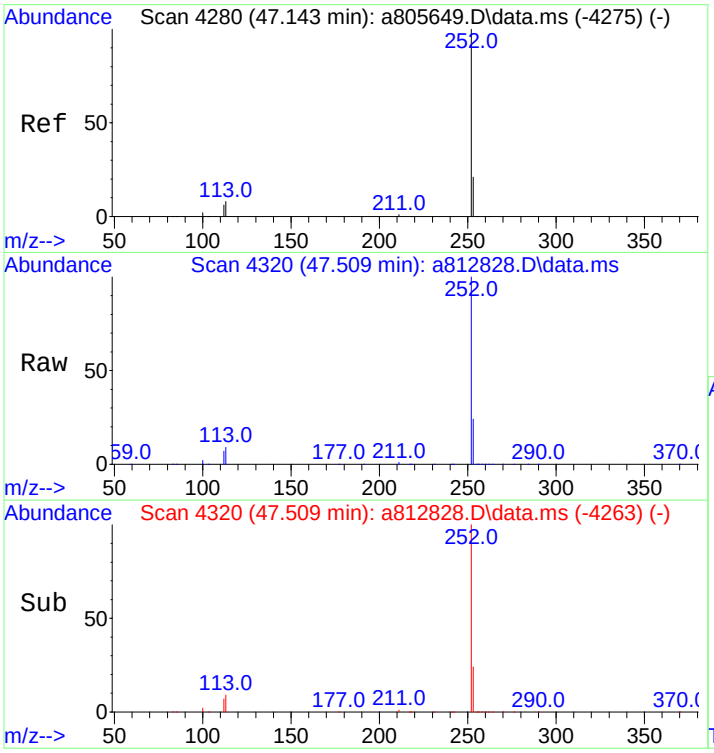


#84
Benzo[b]fluoranthene
Concen: 9129.50 ng/mL
RT: 47.427 min Scan# 4311
Delta R.T. 0.027 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:252 Resp: 2237296

Ion	Ratio	Lower	Upper
252	100		
253	22.9	18.5	27.7

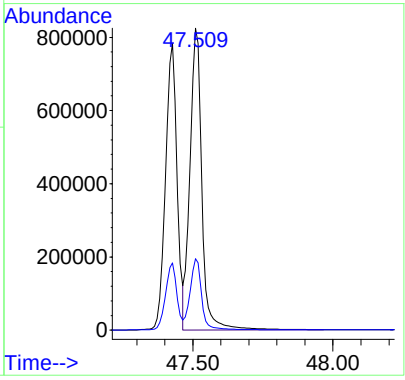


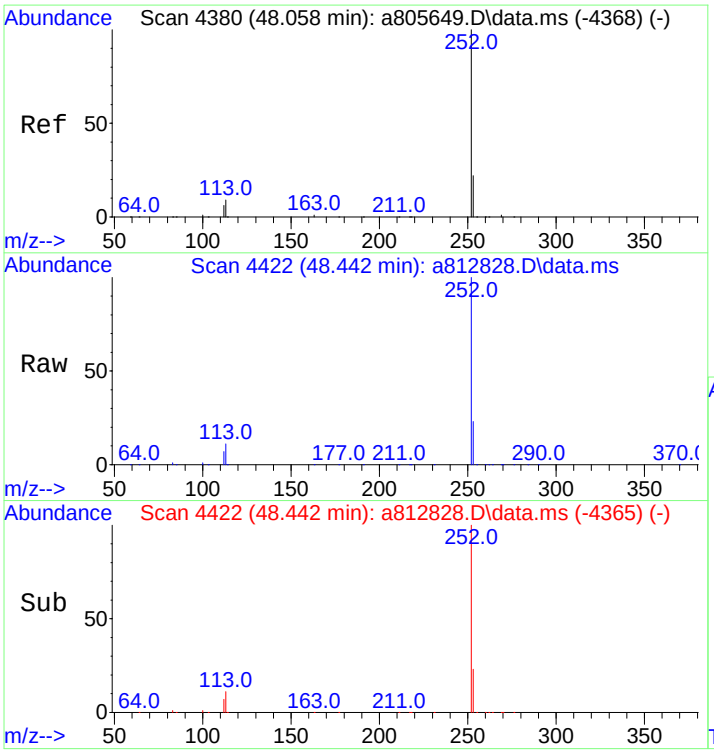


#85
Benzo[j]+[k]fluoranthene
Concen: 9634.77 ng/mL
RT: 47.509 min Scan# 4320
Delta R.T. 0.018 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:252 Resp: 2431044

Ion	Ratio	Lower	Upper
252	100		
253	23.0	18.8	28.2

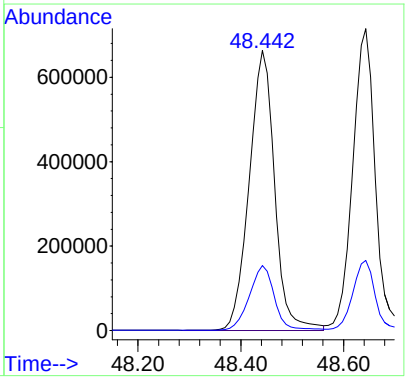


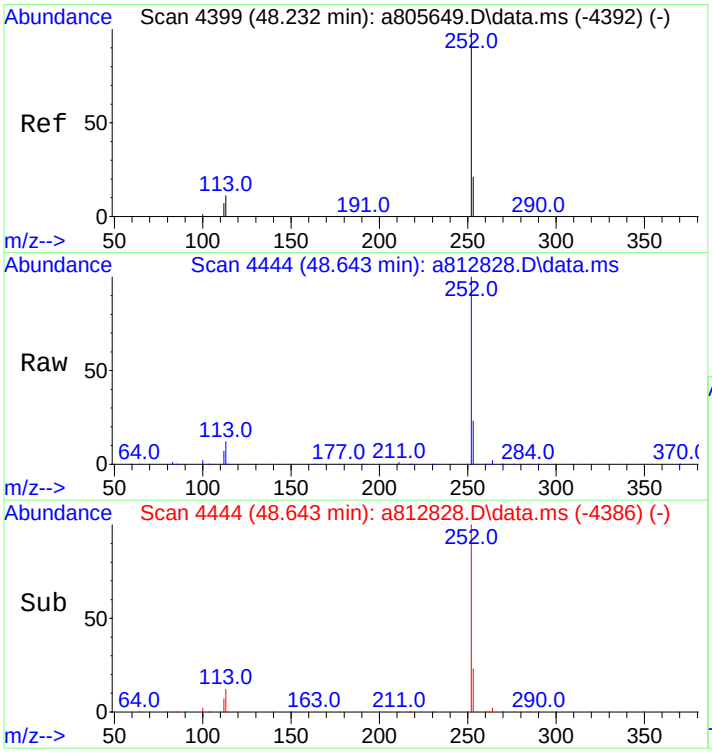


#87
Benzo[e]pyrene
Concen: 9376.69 ng/mL
RT: 48.442 min Scan# 4422
Delta R.T. 0.018 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:252 Resp: 2278975

Ion	Ratio	Lower	Upper
252	100		
253	22.7	18.9	28.3

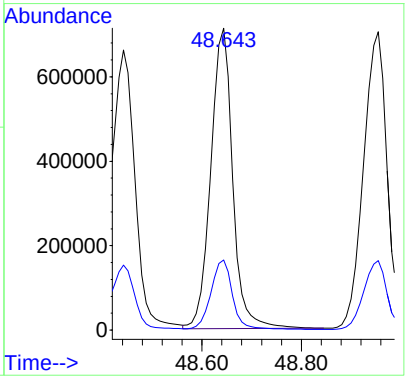


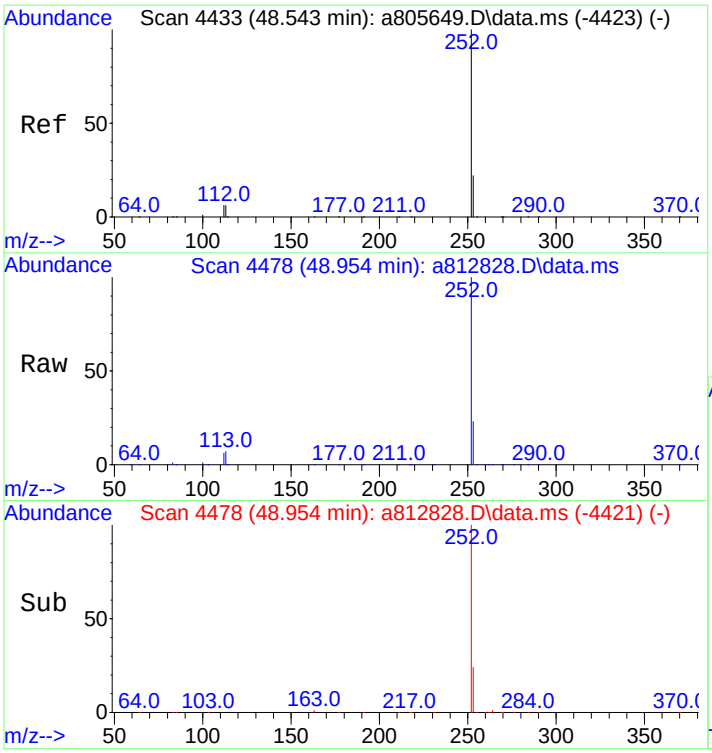


#89
Benzo[a]pyrene
Concen: 9865.27 ng/mL
RT: 48.643 min Scan# 4444
Delta R.T. 0.027 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:252 Resp: 2183012

Ion	Ratio	Lower	Upper
252	100		
253	22.7	19.4	29.0

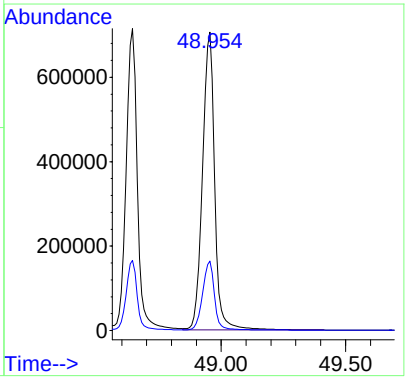


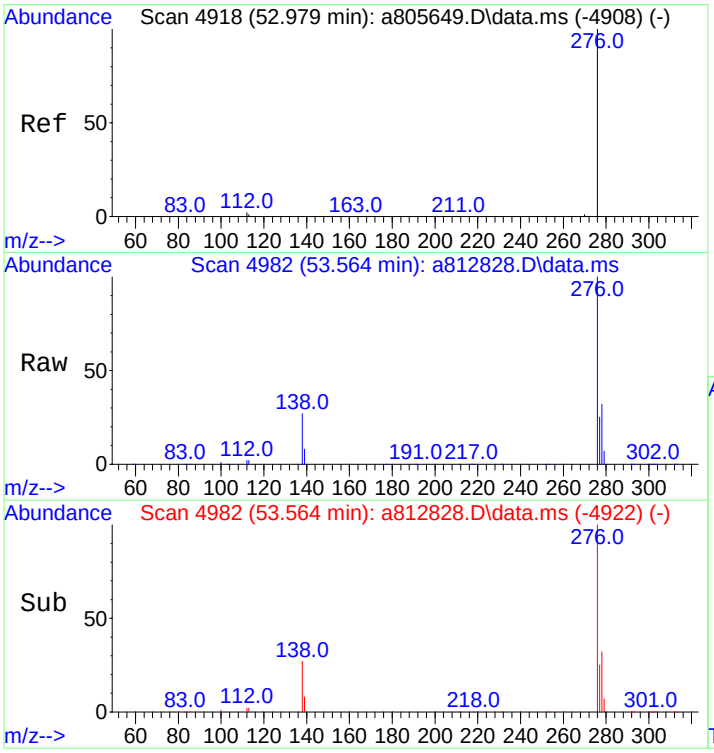


#90
Perylene
Concen: 9994.30 ng/mL
RT: 48.954 min Scan# 4478
Delta R.T. 0.018 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:252 Resp: 2416323

Ion	Ratio	Lower	Upper
252	100		
253	22.6	19.3	28.9

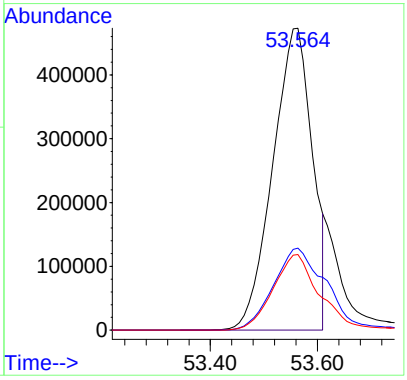


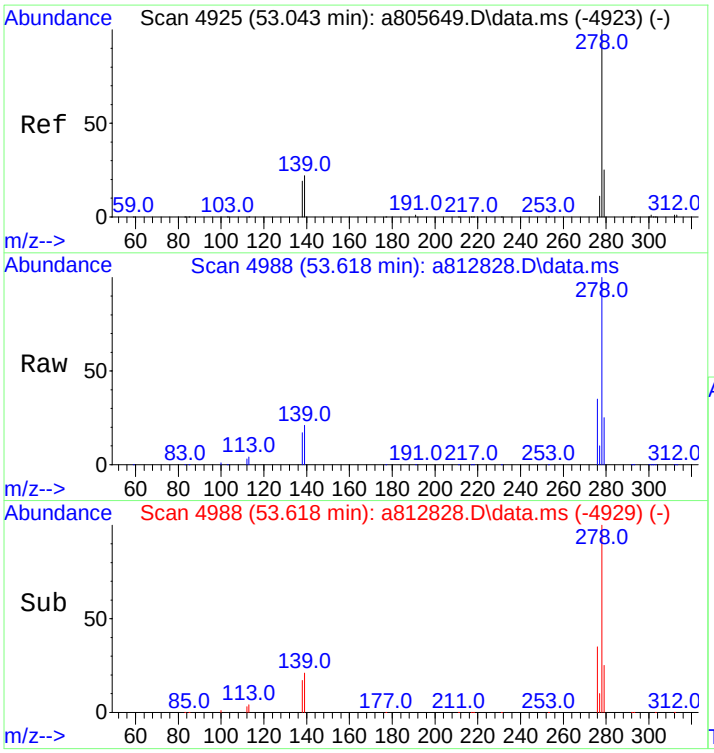


#91
Indeno[1,2,3-cd]pyrene
Concen: 9849.97 ng/mL m
RT: 53.564 min Scan# 4982
Delta R.T. 0.046 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:276 Resp: 2431926

Ion	Ratio	Lower	Upper
276	100		
138	37.2	19.9	29.9#
277	30.4	19.0	28.6#

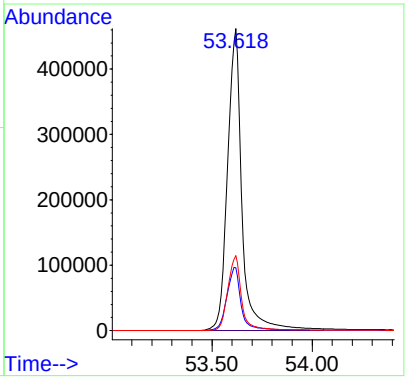


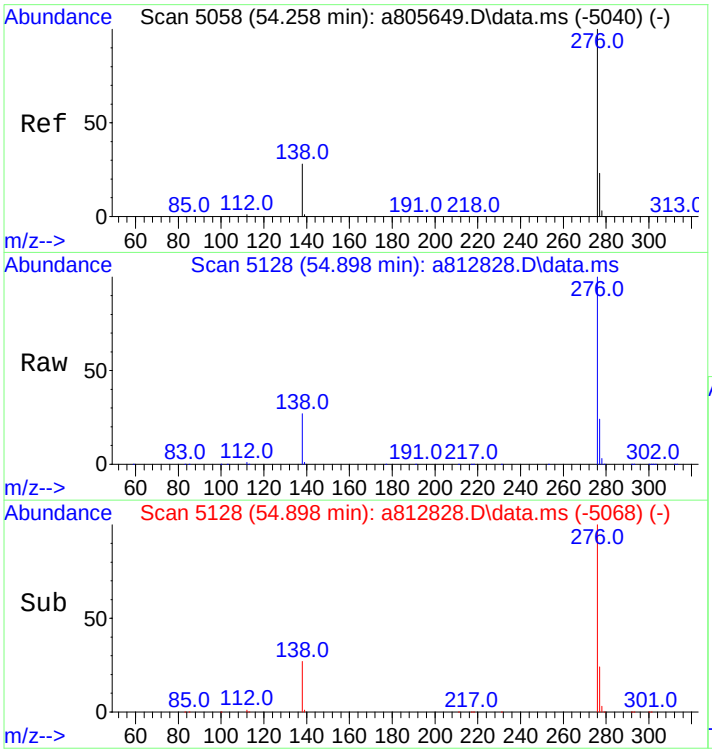


#92
Dibenz[ah]+[ac]anthracene
Concen: 10376.59 ng/mL
RT: 53.618 min Scan# 4988
Delta R.T. 0.036 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:278 Resp: 2315295

Ion	Ratio	Lower	Upper
278	100		
139	21.0	16.6	25.0
279	24.0	19.1	28.7

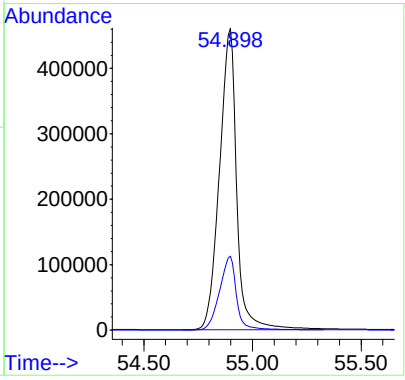


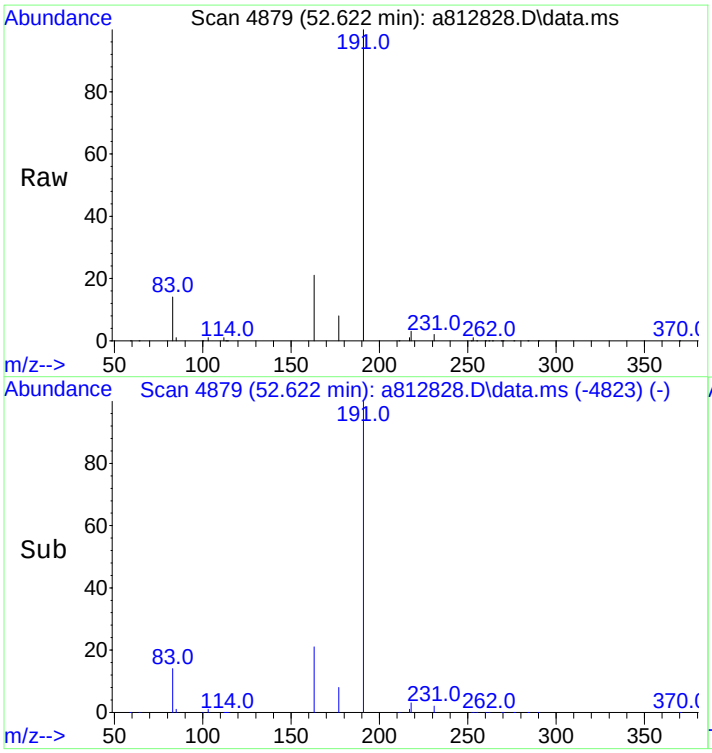


#93
Benzo[g,h,i]perylene
Concen: 9635.01 ng/mL
RT: 54.898 min Scan# 5128
Delta R.T. 0.046 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:276 Resp: 2534537

Ion	Ratio	Lower	Upper
276	100		
277	24.2	18.9	28.3

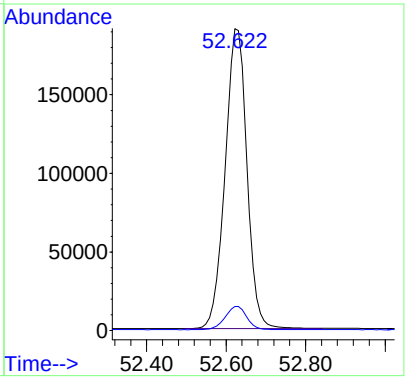


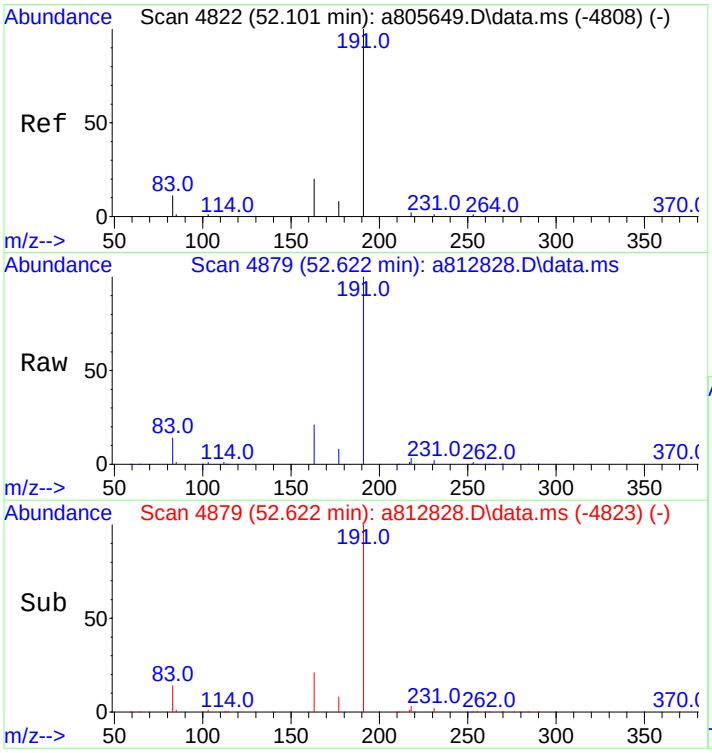


#94
Hopane (T19)
Concen: 9459.15 ng/mL m
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:191 Resp: 729760

Ion	Ratio	Lower	Upper
191	100		
177	0.0	9.8	14.8#

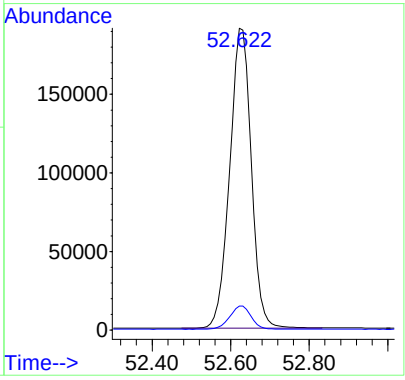




#95
17a(H),21B(H)-hopane - C30H52
Concen: 9456.50 ng/mL m
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: a812828.D
Acq: 18 Nov 2012 4:48 pm

Tgt Ion:191 Resp: 729556

Ion	Ratio	Lower	Upper
191	100		
177	0.0	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812829.D
Acq On : 18 Nov 2012 6:13 pm
Operator : AC
Sample : i811181207
Misc : l7 whaq89
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 12:14:02 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

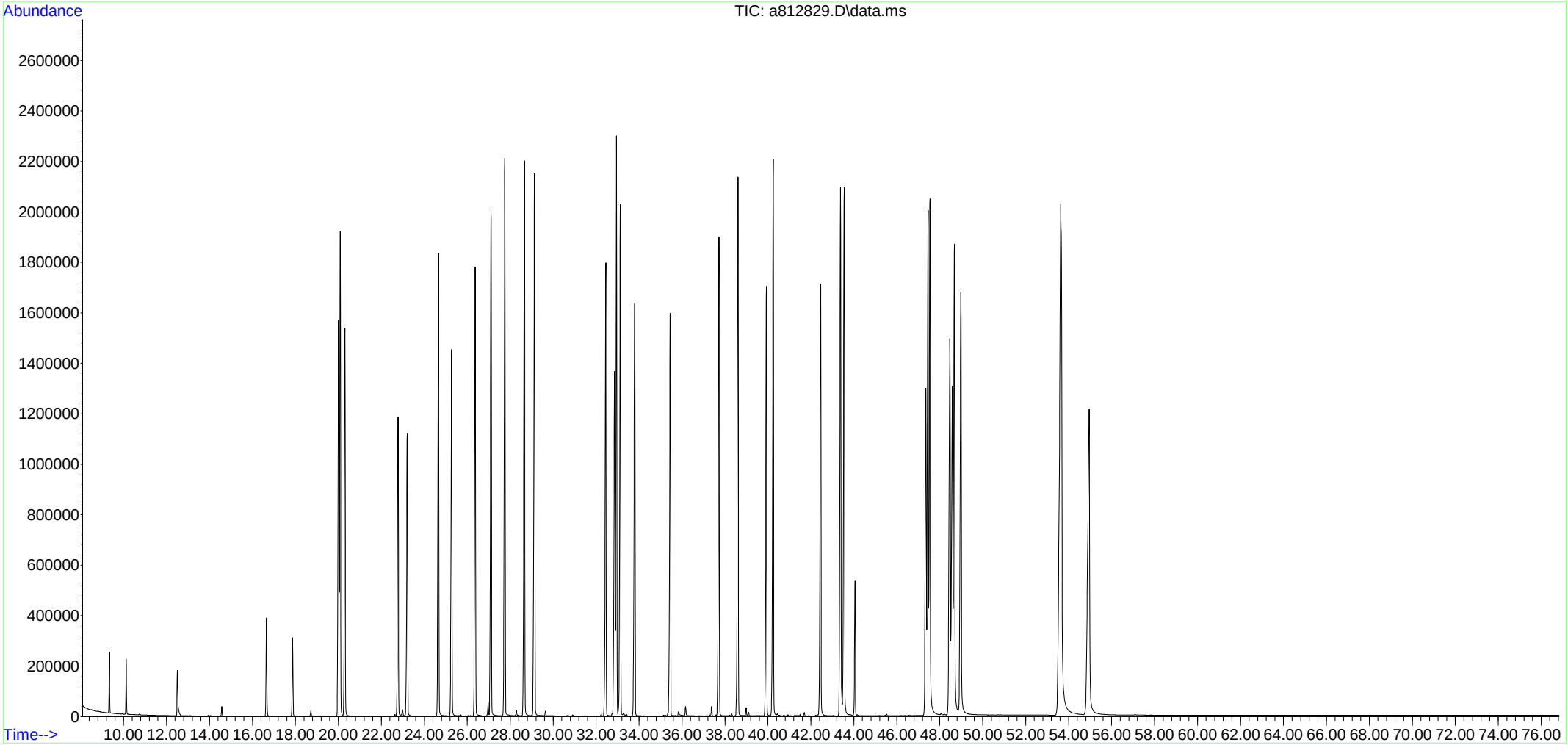
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	70560	500.000	ng/mL	0.00
74) Chrysene-d12	43.433	240	100672	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	4493321	14690.252	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1469.03%#			
42) Phenanthrene-d10	32.862	188	3692936	16127.125	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1612.71%#			
83) Benzo[b]fluoranthene-d12	47.354	264	3766833	17502.629	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1750.26%#			
88) Benzo[a]pyrene-d12	48.579	264	3912959	19533.446	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1953.34%#			
129) 5B(H)Cholane - Surr	44.054	217	774523	19488.443	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1948.84%#			
Target Compounds						Qvalue
3) trans-Decalin	16.647	138	566393	8772.633	ng/mL	100
4) cis-Decalin	17.870	138	426164	8836.722	ng/mL	100
10) Naphthalene	20.087	128	4697526	13099.534	ng/mL#	100
16) 2-Methylnaphthalene	22.779	142	3208746	15185.911	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	3007405	14910.938	ng/mL#	100
18) Benzothiophene	20.306	134	4087586	14333.249	ng/mL	100
23) Biphenyl	24.659	154	3821313	14635.142	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	2777523	15679.843	ng/mL#	100
25) Dibenzofuran	27.752	168	4055074	14810.078	ng/mL	96
26) Acenaphthylene	26.375	152	4896532M3	15106.085	ng/mL	
27) Acenaphthene	27.105	153	2760237	14401.381	ng/mL	95
28) 2,3,5-Trimethylnaphtha...	28.665	170	2339310	15697.998	ng/mL	98
29) Fluorene	29.130	166	3252529	15541.842	ng/mL	95
33) Dibenzothiophene	32.451	184	4352279	14522.047	ng/mL	98
43) Phenanthrene	32.953	178	4172174	14432.310	ng/mL	100
54) Retene	39.927	234	1225939	19923.832	ng/mL	94
55) Anthracene	33.126	178	3687788M3	13533.684	ng/mL	
56) Carbazole	33.802	167	4484087	16451.620	ng/mL	100
57) 1-Methylphenanthrene	35.454	192	3125863	15567.497	ng/mL	98
58) Fluoranthene	37.718	202	4477650M3	15089.732	ng/mL	
59) Benzo(b)fluorene	40.247	216	3125153	18635.749	ng/mL	95
60) Pyrene	38.603	202	4670472	15631.858	ng/mL	95
66) Naphthobenzothiophene	42.456	234	4736721	17183.701	ng/ml	99
67) Naphthobenzothiophene-...	42.456	234	4736721	17183.701	ng/mL	99
75) Benz[a]anthracene	43.378	228	4056482	15107.893	ng/mL	99
76) Chrysene	43.552	228	3937928	15094.932	ng/mL	100
77) Chrysene/Triphenylene	43.552	228	3937928	15094.932	ng/mL	100
84) Benzo[b]fluoranthene	47.454	252	4408379	15067.626	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.546	252	4719440	15666.836	ng/mL	99
87) Benzo[e]pyrene	48.470	252	4568966	15746.010	ng/mL	99
89) Benzo[a]pyrene	48.680	252	4259318	16122.620	ng/mL	99
90) Perylene	48.982	252	4762410	16499.352	ng/mL	99
91) Indeno[1,2,3-cd]pyrene	53.600	276	4999033M3	16959.496	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.655	278	4548665	17075.550	ng/mL	97
93) Benzo[g,h,i]perylene	54.953	276	5114113	16284.193	ng/mL	98

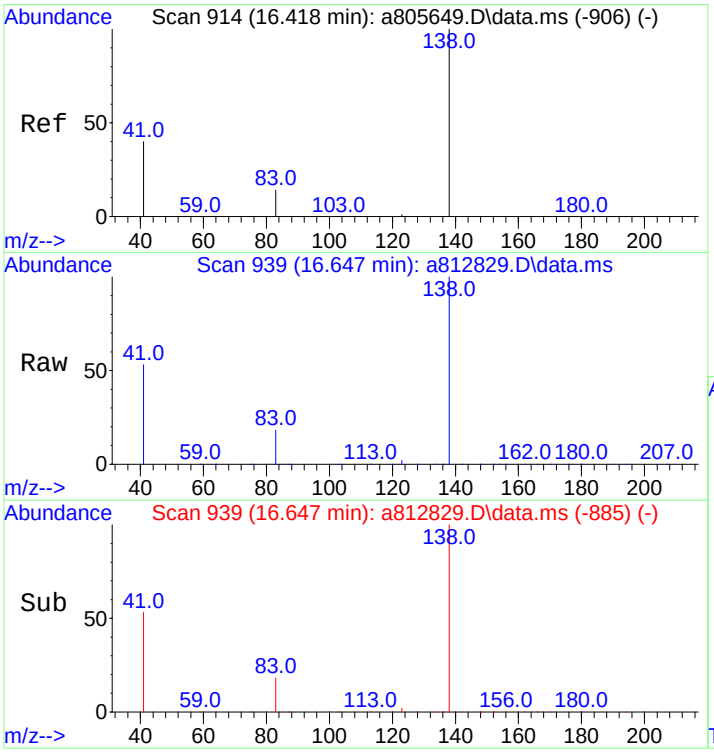
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : a812829.D
Acq On : 18 Nov 2012 6:13 pm
Operator : AC
Sample : i811181207
Misc : l7 whaq89
ALS Vial : 10 Sample Multiplier: 1

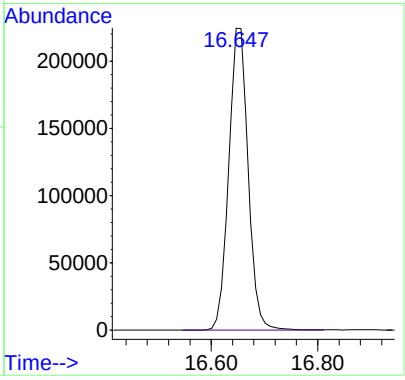
Quant Time: Nov 19 12:14:02 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:13:01 2012
Response via : Initial Calibration

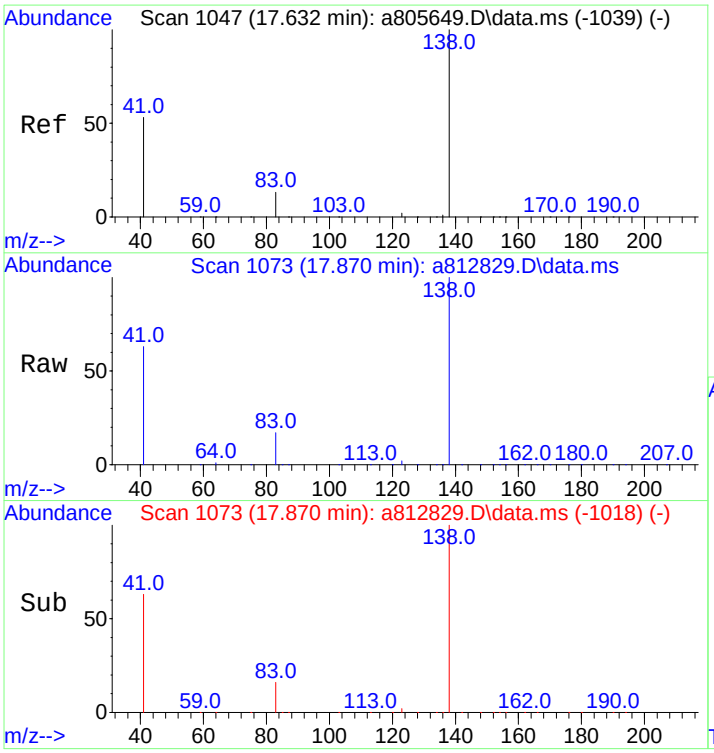




#3
trans-Decalin
Concen: 8772.63 ng/mL
RT: 16.647 min Scan# 939
Delta R.T. -0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

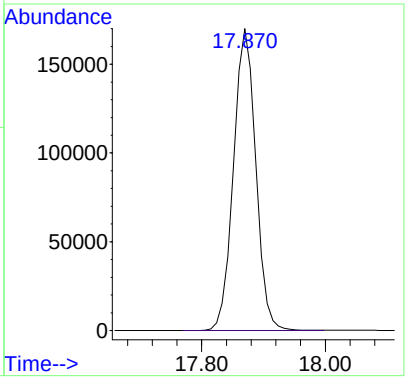
Tgt Ion:138 Resp: 566393

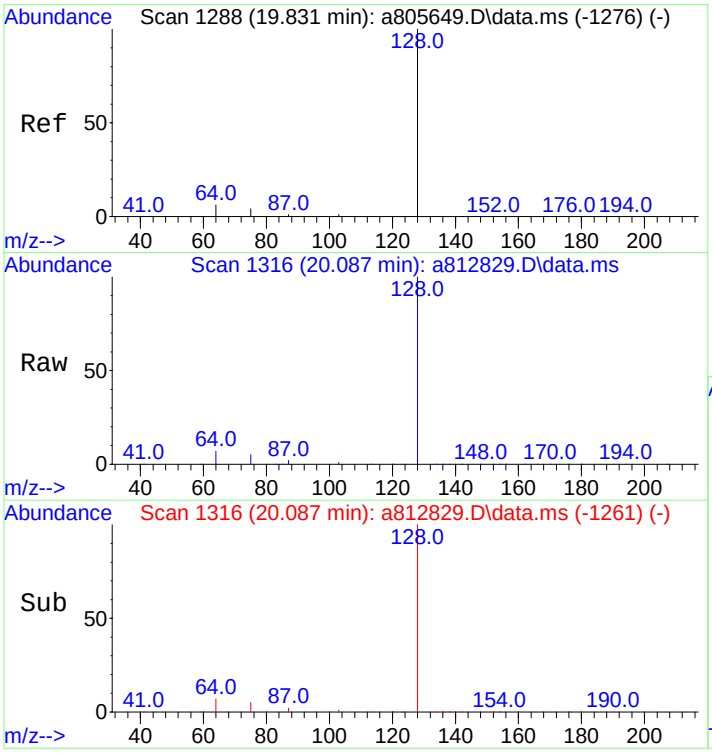




#4
cis-Decalin
Concen: 8836.72 ng/mL
RT: 17.870 min Scan# 1073
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:138 Resp: 426164

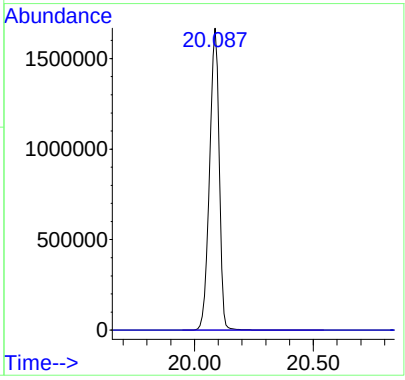


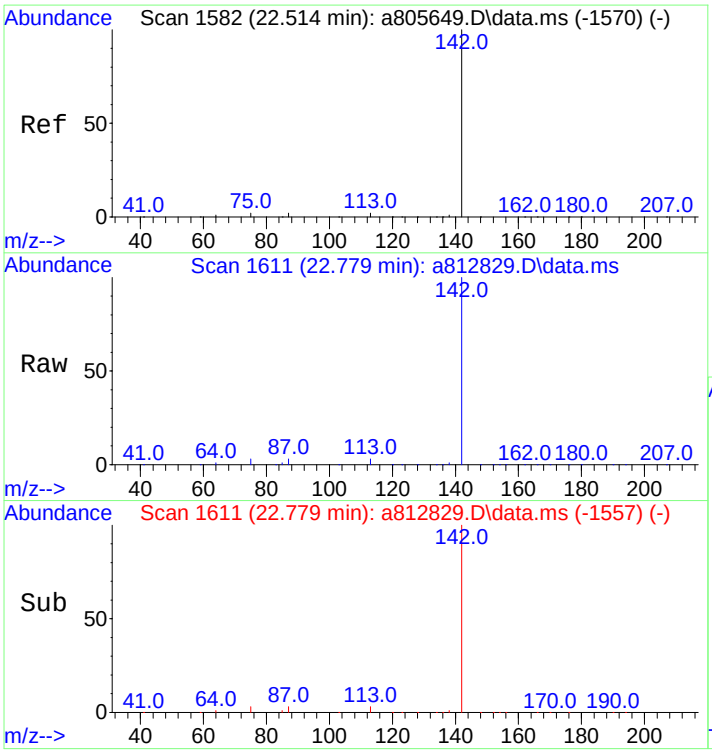


#10
Naphthalene
Concen: 13099.53 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:128 Resp: 4697526

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

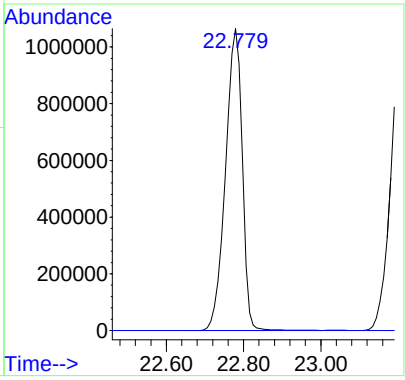


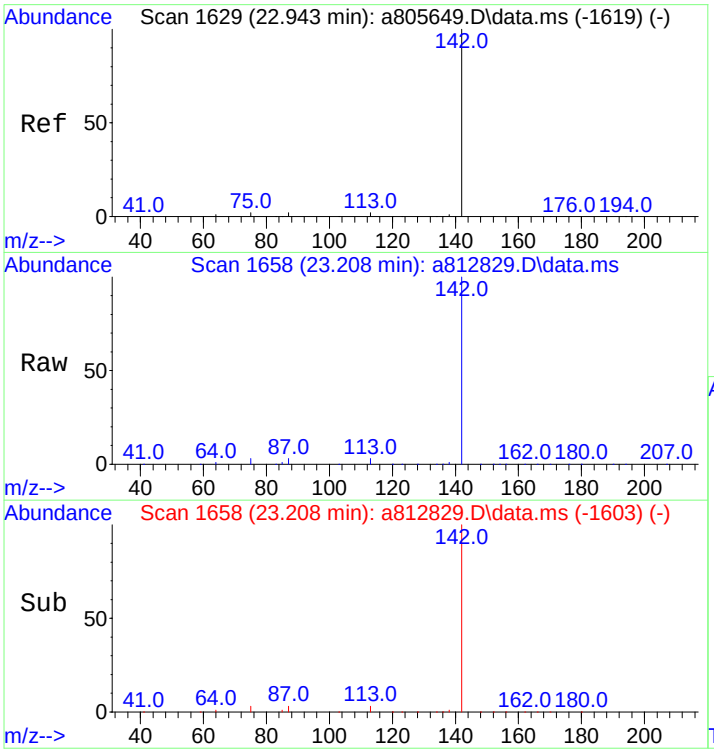


#16
2-Methylnaphthalene
Concen: 15185.91 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:142 Resp: 3208746

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

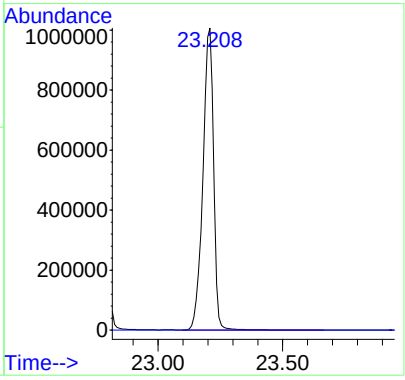


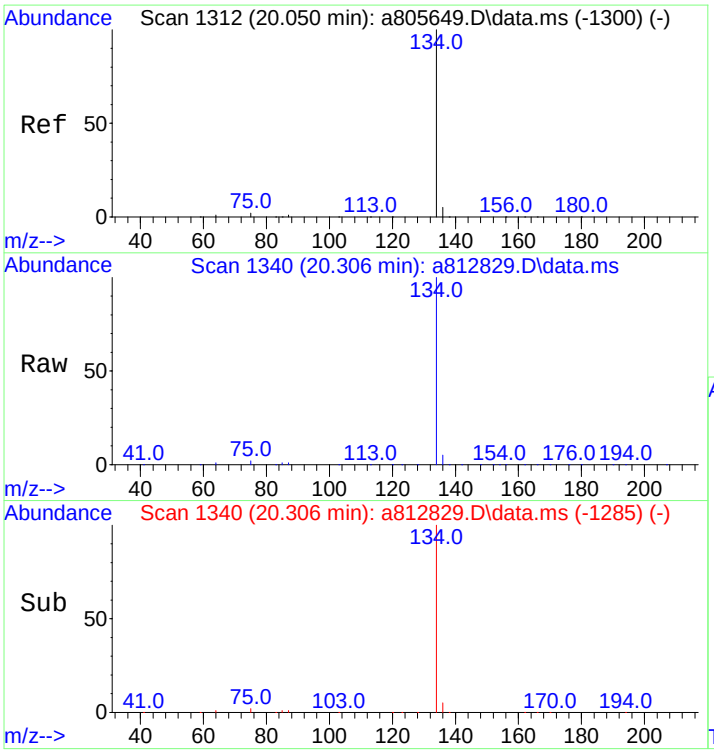


#17
1-Methylnaphthalene
Concen: 14910.94 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:142 Resp: 3007405

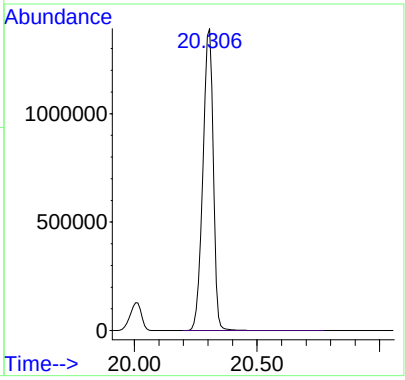
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

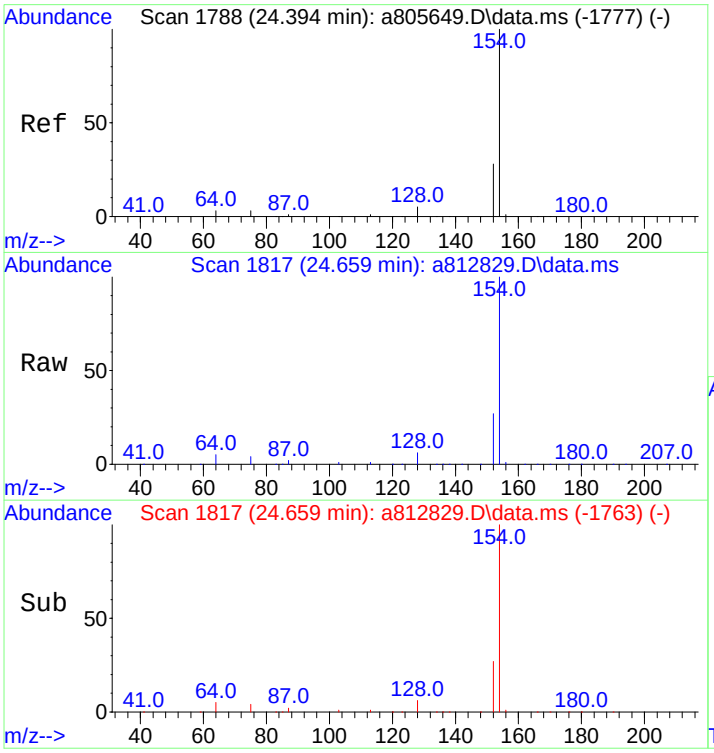




#18
Benzothiophene
Concen: 14333.25 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:134 Resp: 4087586

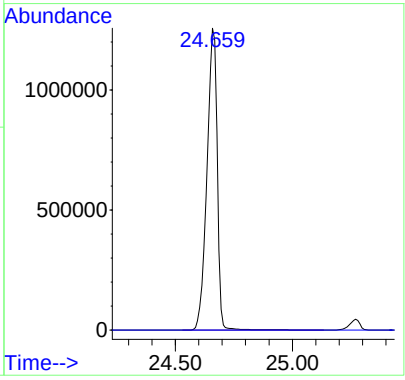


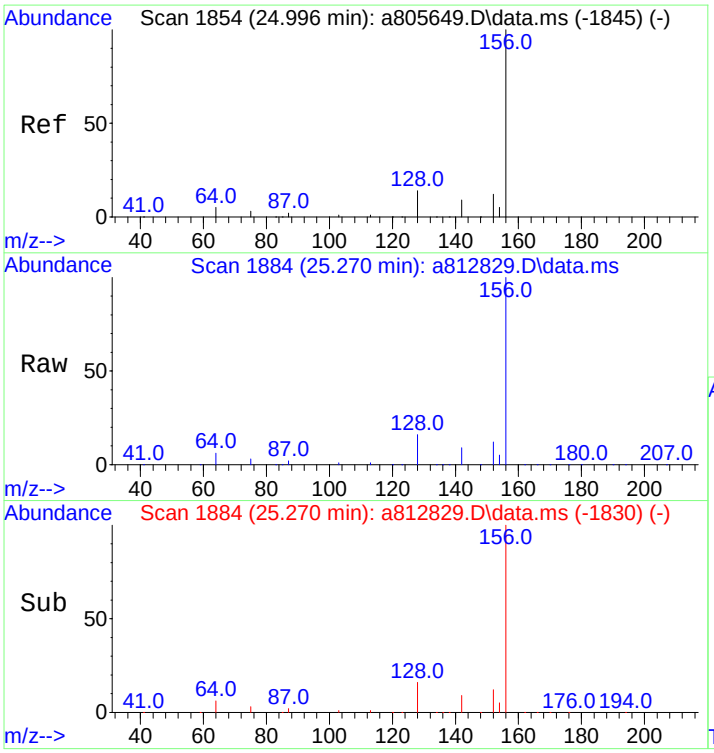


#23
Biphenyl
Concen: 14635.14 ng/mL
RT: 24.659 min Scan# 1817
Delta R.T. -0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:154 Resp: 3821313

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

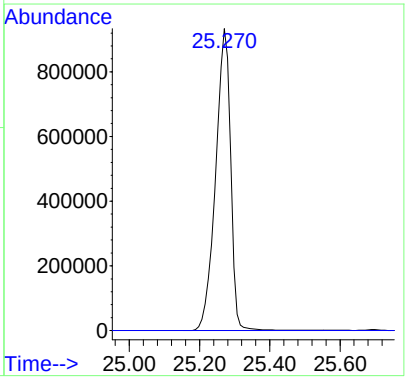


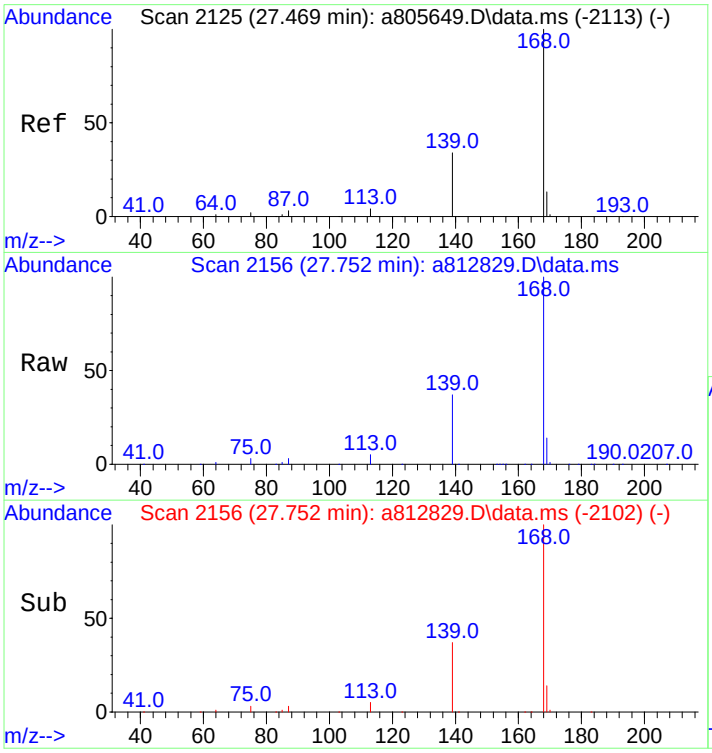


#24
2,6-Dimethylnaphthalene
Concen: 15679.84 ng/mL
RT: 25.270 min Scan# 1884
Delta R.T. -0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:156 Resp: 2777523

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

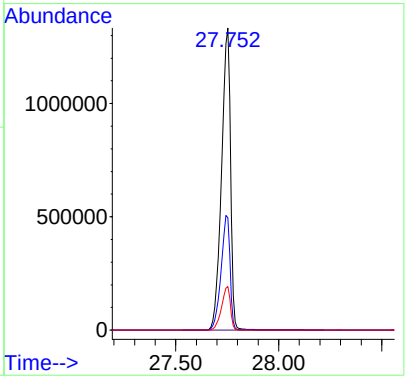


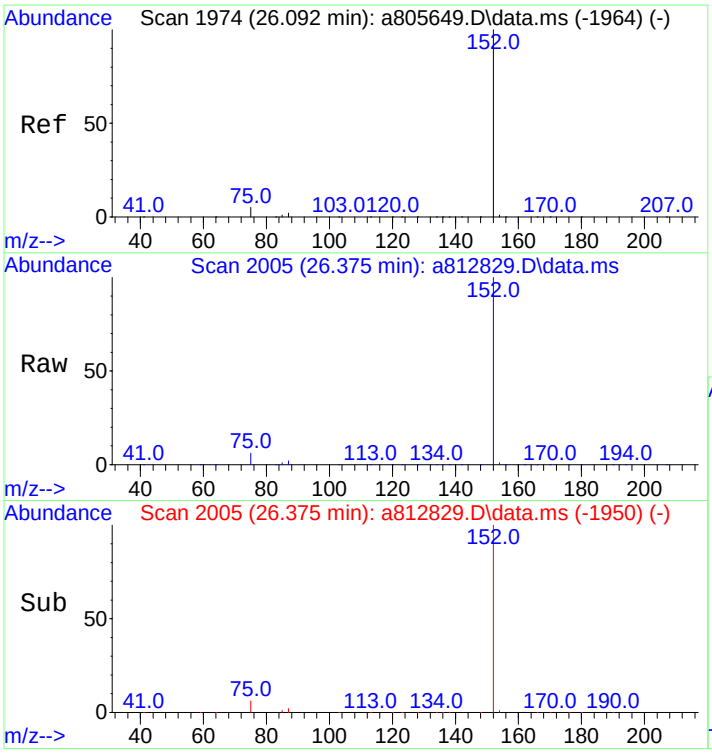


#25
Dibenzofuran
Concen: 14810.08 ng/mL
RT: 27.752 min Scan# 2156
Delta R.T. -0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:168 Resp: 4055074

Ion	Ratio	Lower	Upper
168	100		
139	37.8	28.0	42.0
169	14.2	10.6	15.8

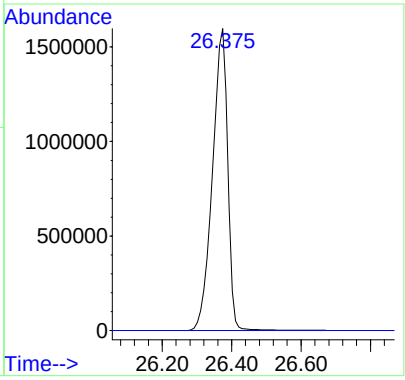


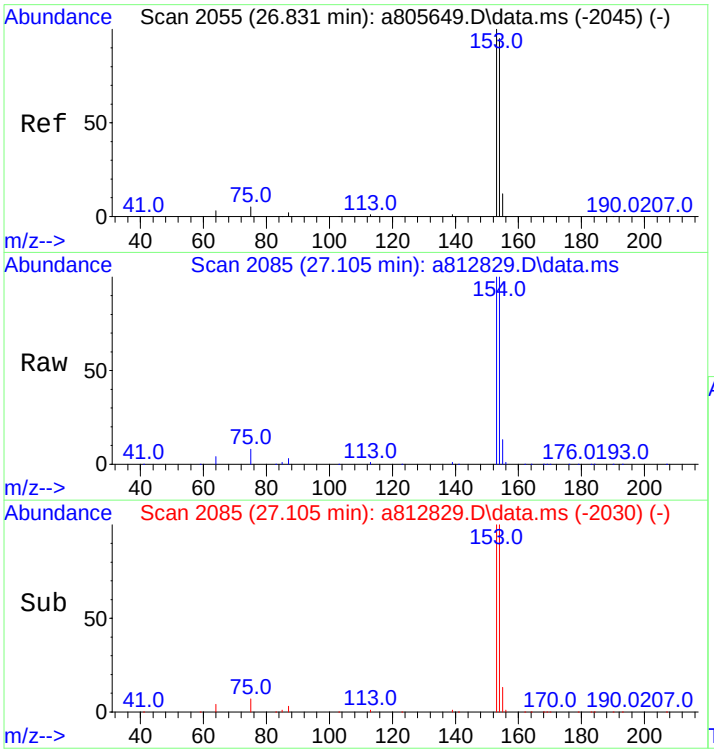


#26
Acenaphthylene
Concen: 15106.09 ng/mL m
RT: 26.375 min Scan# 2005
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:152 Resp: 4896532

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

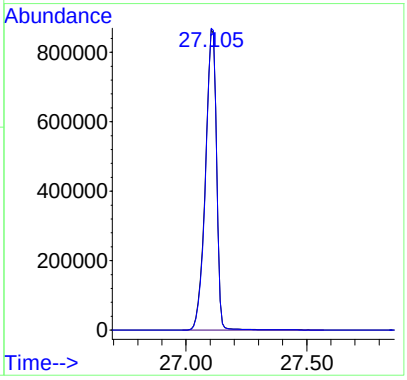


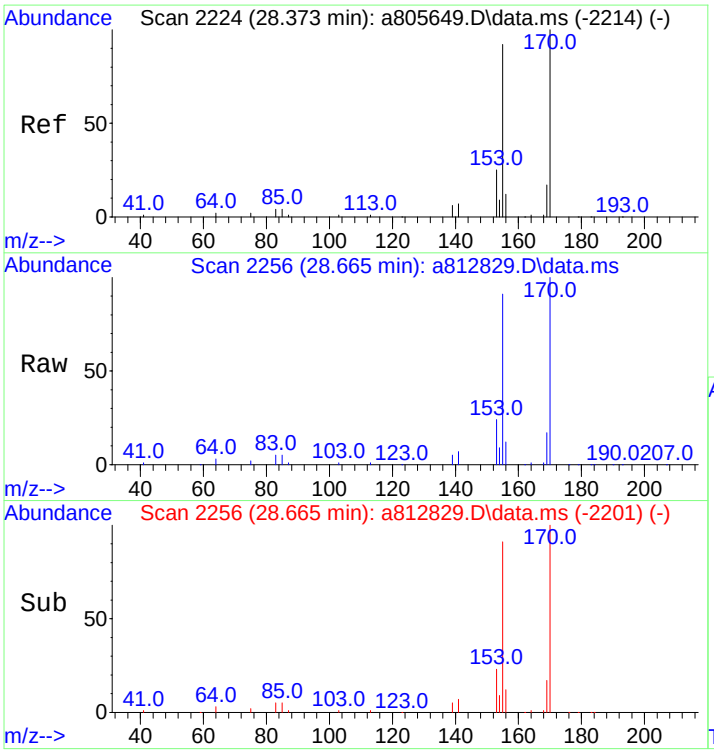


#27
Acenaphthene
Concen: 14401.38 ng/mL
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:153 Resp: 2760237

Ion	Ratio	Lower	Upper
153	100		
154	99.0	75.4	113.2

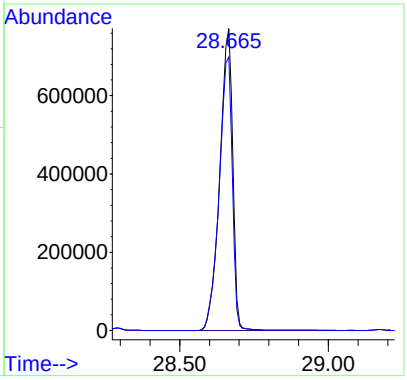


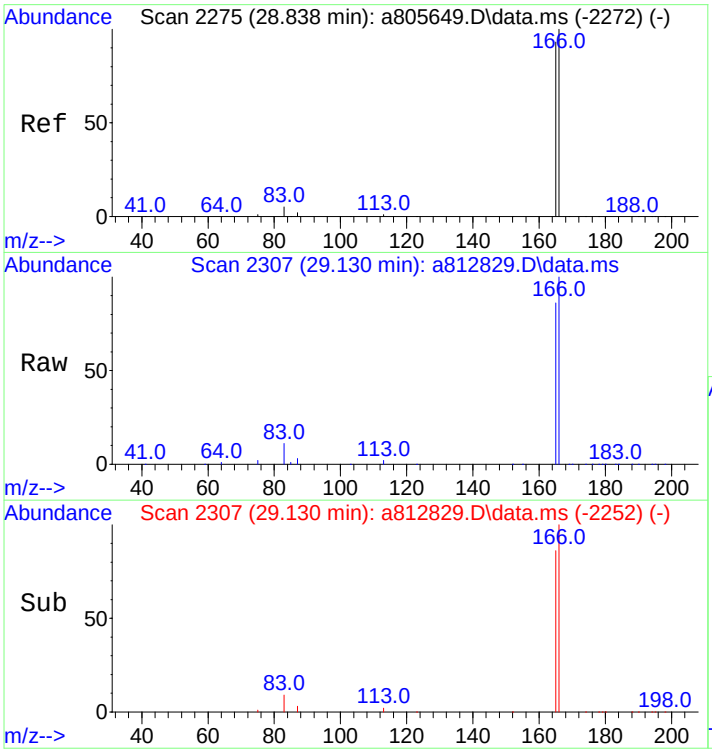


#28
2,3,5-Trimethylnaphthalene
Concen: 15698.00 ng/mL
RT: 28.665 min Scan# 2256
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:170 Resp: 2339310

Ion	Ratio	Lower	Upper
170	100		
155	91.9	71.7	107.5

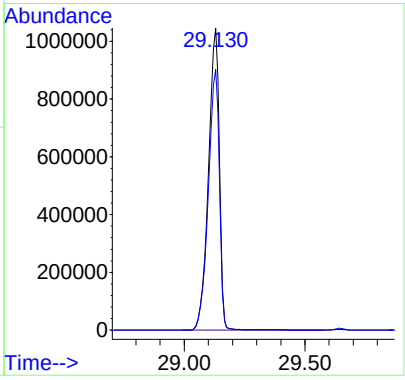


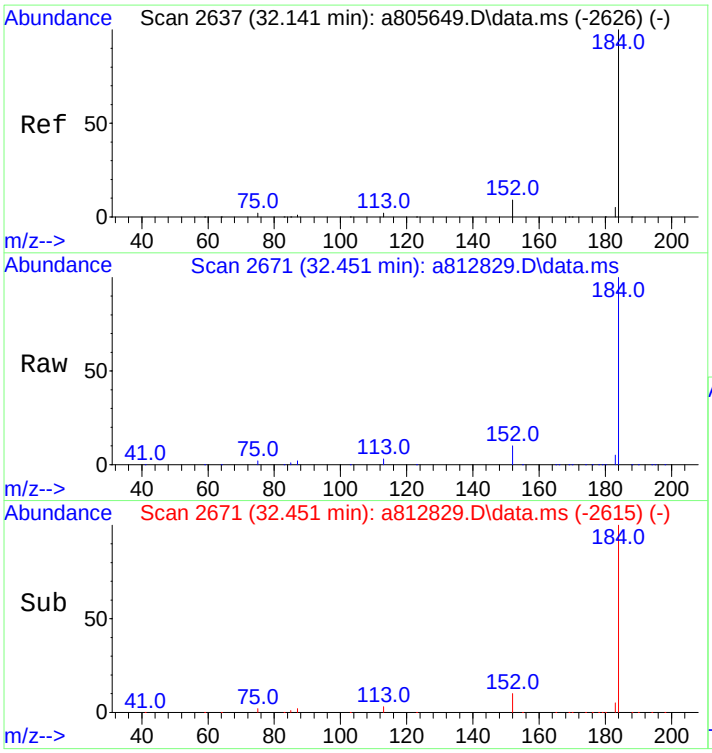


#29
Fluorene
Concen: 15541.84 ng/mL
RT: 29.130 min Scan# 2307
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:166 Resp: 3252529

Ion	Ratio	Lower	Upper
166	100		
165	88.0	74.2	111.2

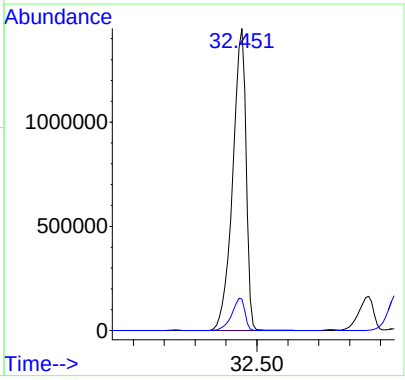


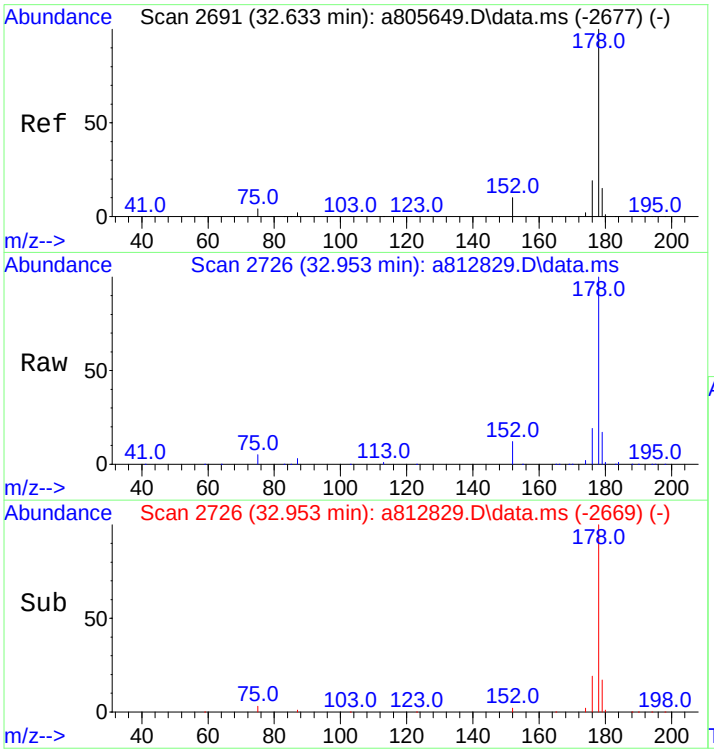


#33
Dibenzothiophene
Concen: 14522.05 ng/mL
RT: 32.451 min Scan# 2671
Delta R.T. 0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:184 Resp: 4352279

Ion	Ratio	Lower	Upper
184	100		
152	10.4	7.8	11.8

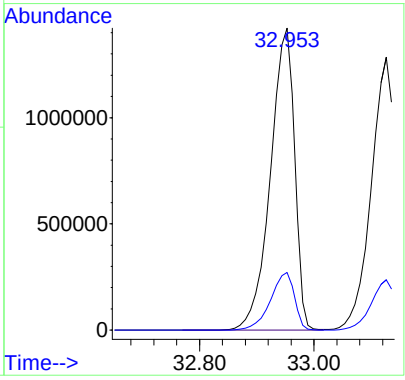


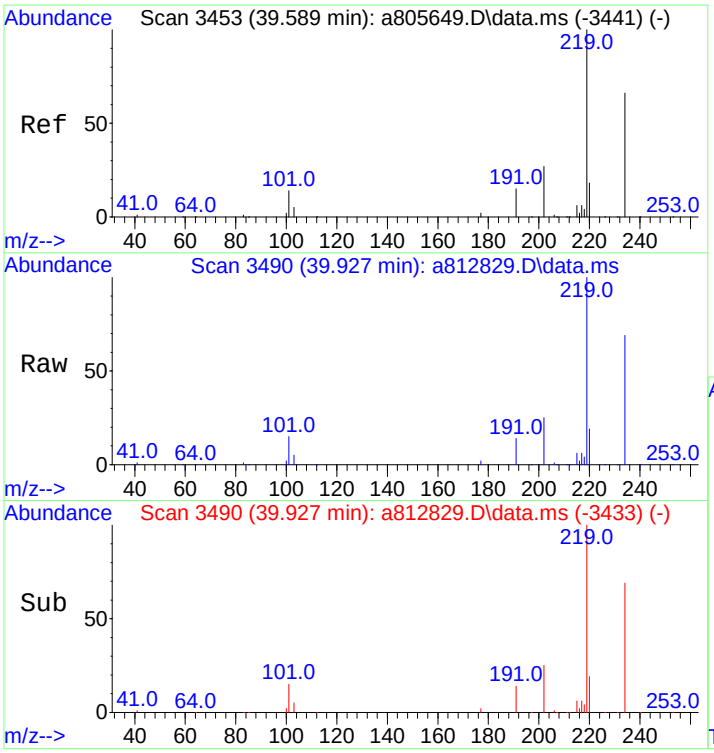


#43
Phenanthrene
Concen: 14432.31 ng/mL
RT: 32.953 min Scan# 2726
Delta R.T. 0.018 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:178 Resp: 4172174

Ion	Ratio	Lower	Upper
178	100		
176	18.9	15.2	22.8

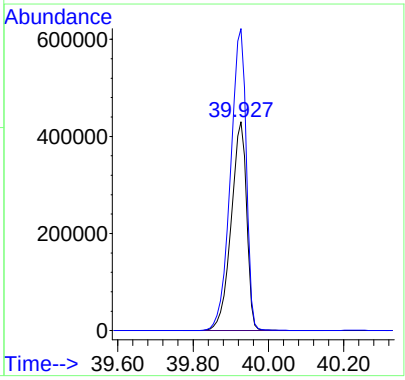


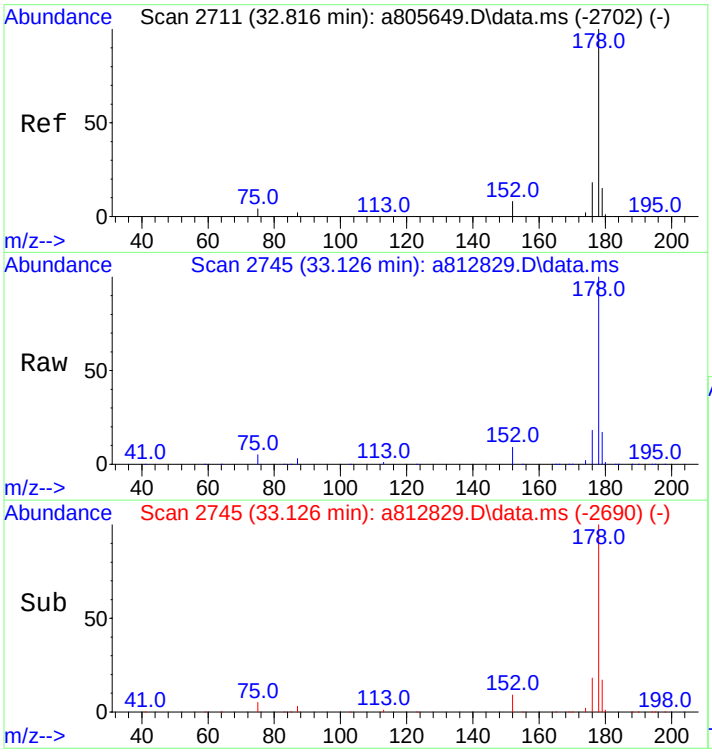


#54
Retene
Concen: 19923.83 ng/mL
RT: 39.927 min Scan# 3490
Delta R.T. 0.018 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:234 Resp: 1225939

Ion	Ratio	Lower	Upper
234	100		
219	147.4	124.0	186.0

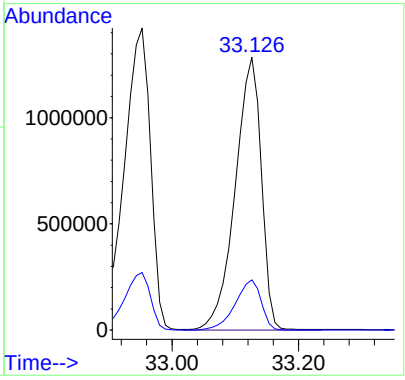


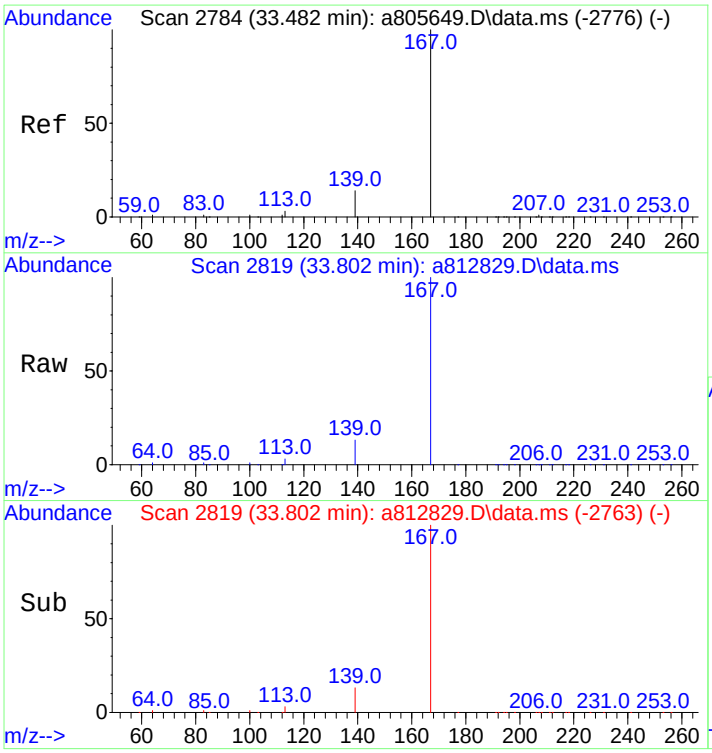


#55
Anthracene
Concen: 13533.68 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. -0.000 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:178 Resp: 3687788

Ion	Ratio	Lower	Upper
178	100		
176	18.5	14.3	21.5

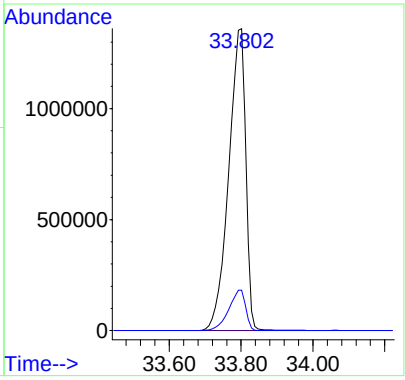


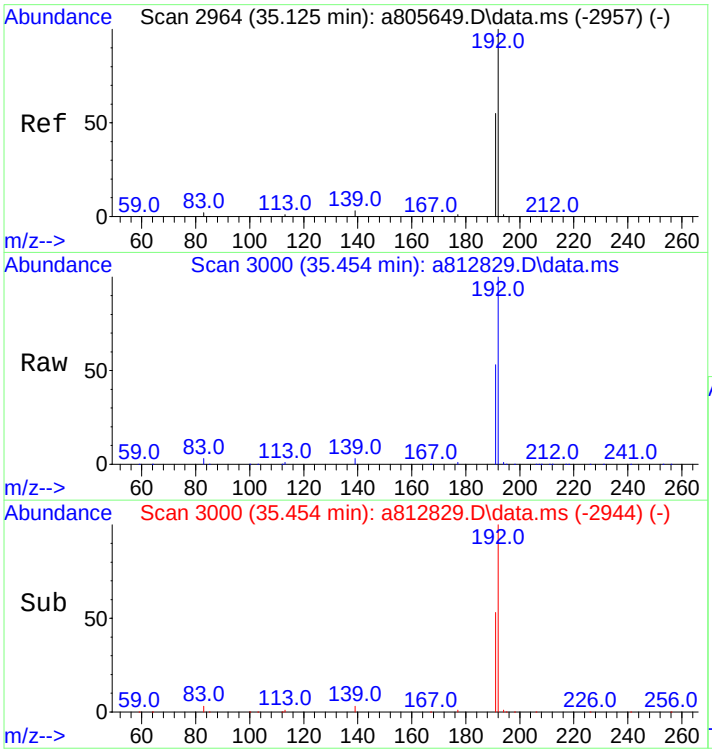


#56
Carbazole
Concen: 16451.62 ng/mL
RT: 33.802 min Scan# 2819
Delta R.T. 0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:167 Resp: 4484087

Ion	Ratio	Lower	Upper
167	100		
139	13.3	10.6	16.0

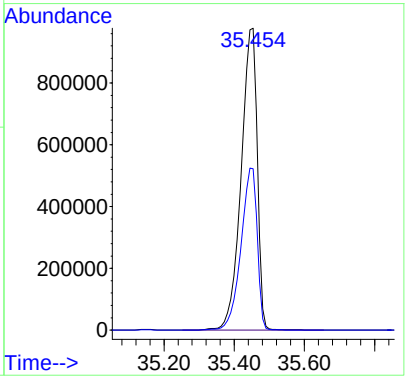


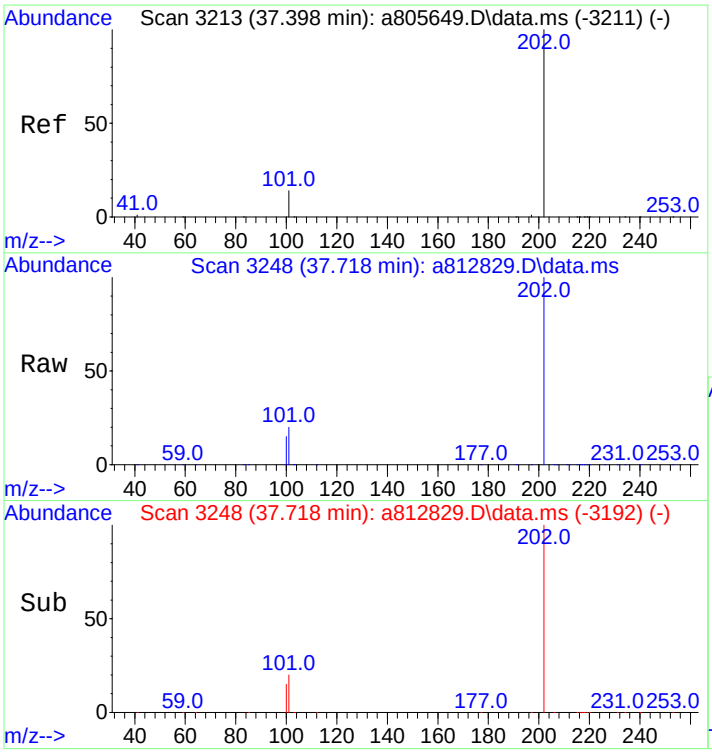


#57
1-Methylphenanthrene
Concen: 15567.50 ng/mL
RT: 35.454 min Scan# 3000
Delta R.T. 0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:192 Resp: 3125863

Ion	Ratio	Lower	Upper
192	100		
191	54.1	44.2	66.4

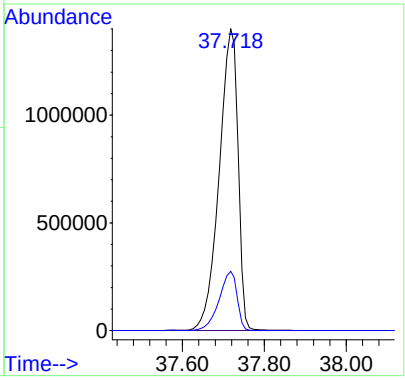


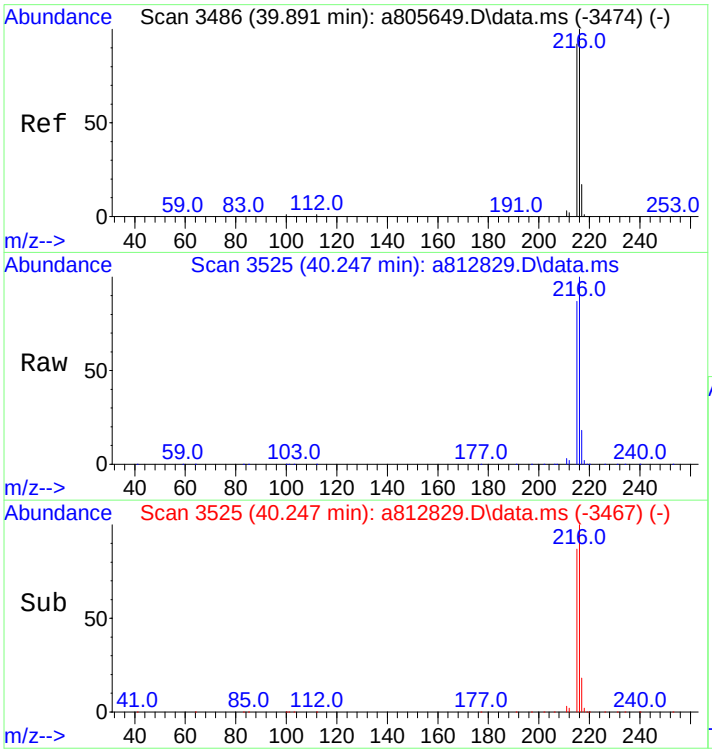


#58
Fluoranthene
Concen: 15089.73 ng/mL m
RT: 37.718 min Scan# 3248
Delta R.T. 0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:202 Resp: 4477650

Ion	Ratio	Lower	Upper
202	100		
101	18.7	13.6	20.4

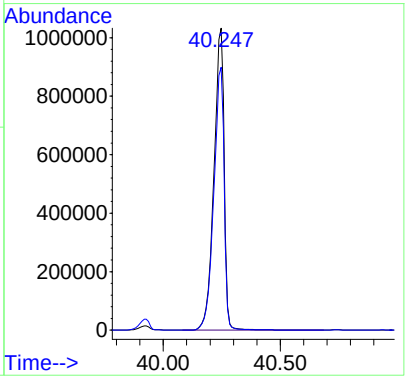


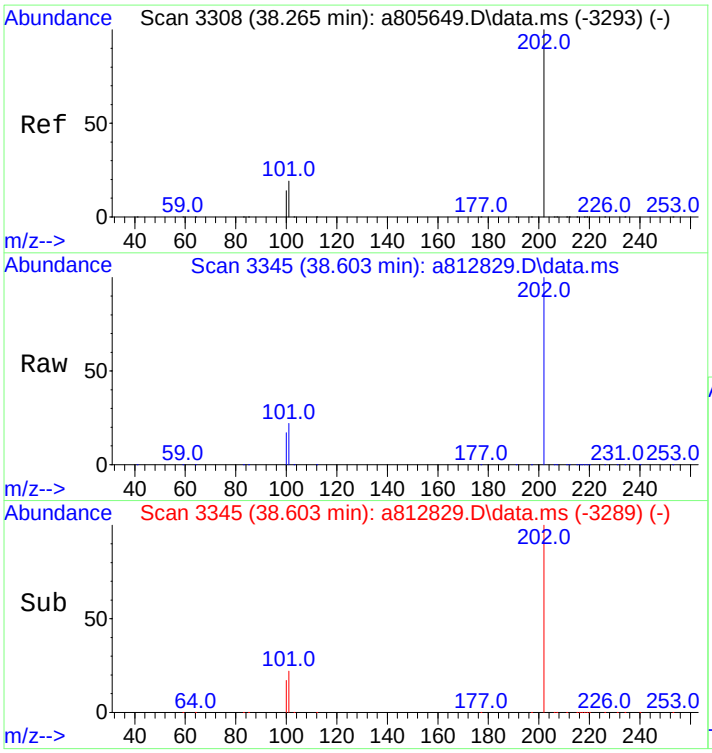


#59
Benzo(b)fluorene
Concen: 18635.75 ng/mL
RT: 40.247 min Scan# 3525
Delta R.T. 0.027 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:216 Resp: 3125153

Ion	Ratio	Lower	Upper
216	100		
215	88.2	74.2	111.2

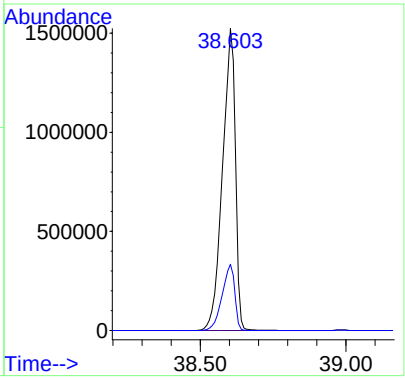


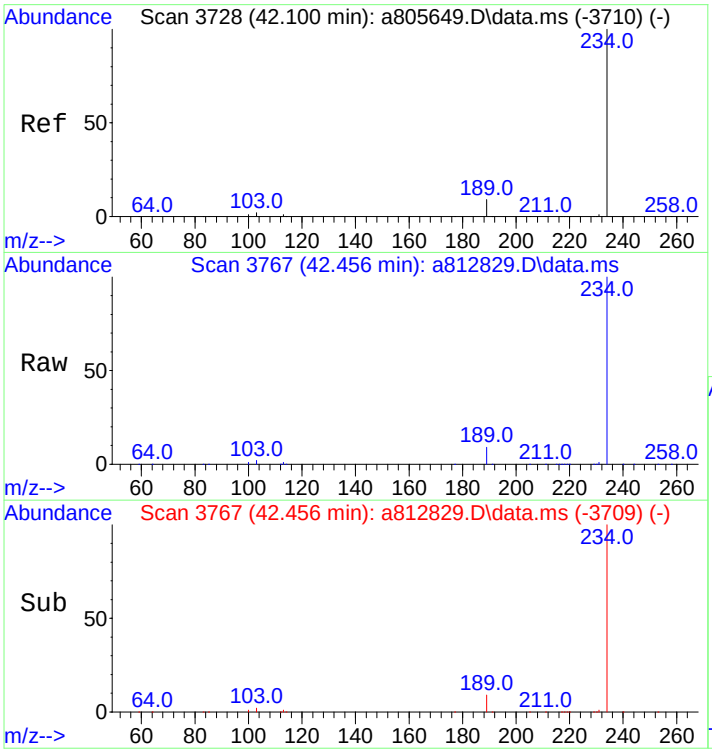


#60
Pyrene
Concen: 15631.86 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:202 Resp: 4670472

Ion	Ratio	Lower	Upper
202	100		
101	21.5	15.4	23.2

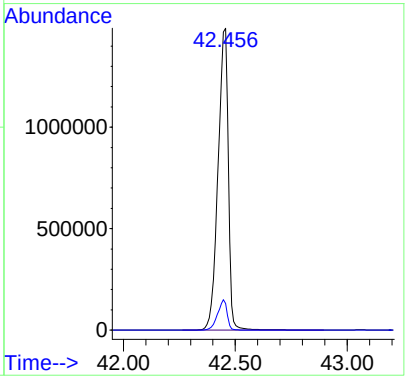


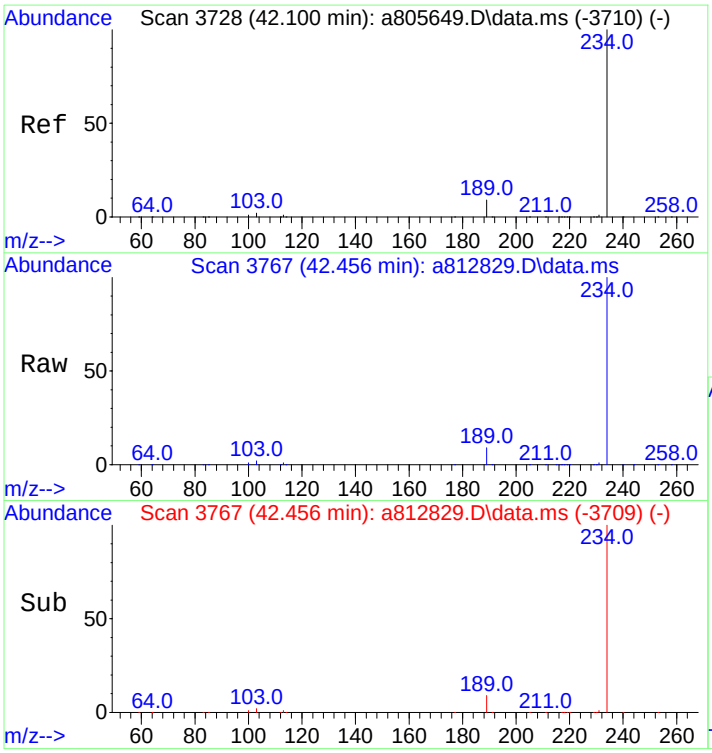


#66
Naphthobenzothiophene
Concen: 17183.70 ng/ml
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:234 Resp: 4736721

Ion	Ratio	Lower	Upper
234	100		
189	9.4	7.2	10.8

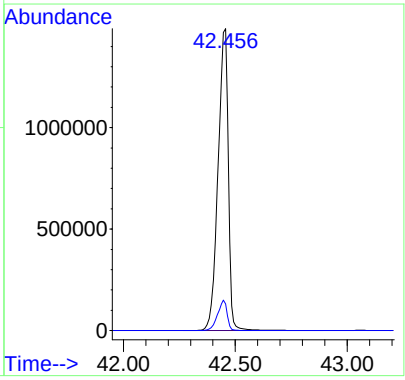


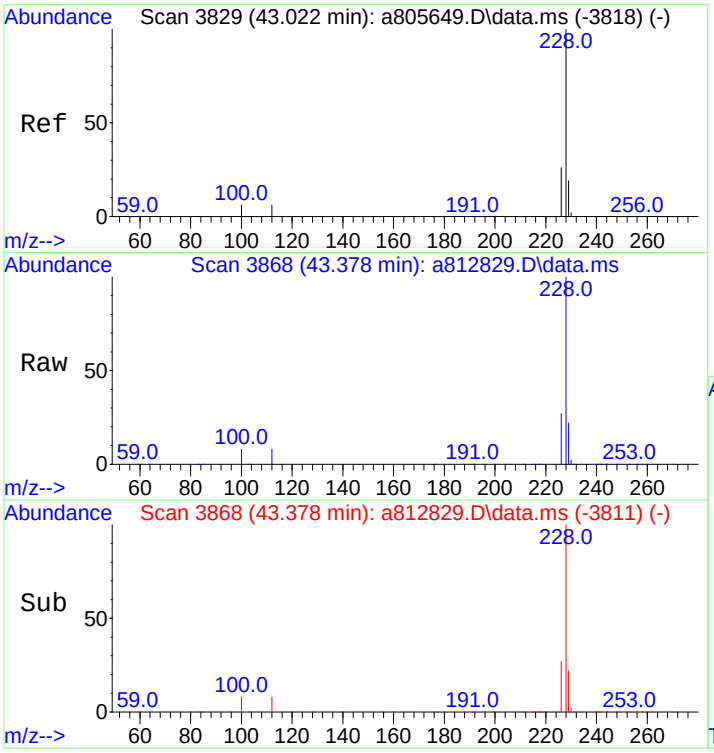


#67
Naphthobenzothiophene-2,1-D
Concen: 17183.70 ng/mL
RT: 42.456 min Scan# 3767
Delta R.T. 0.027 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:234 Resp: 4736721

Ion	Ratio	Lower	Upper
234	100		
189	9.4	7.2	10.8

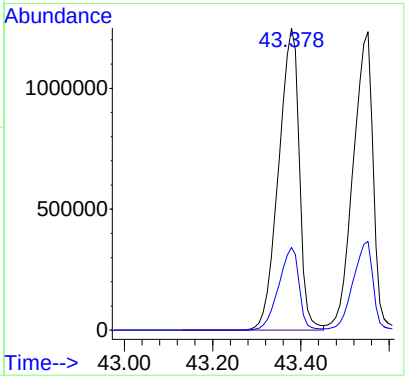


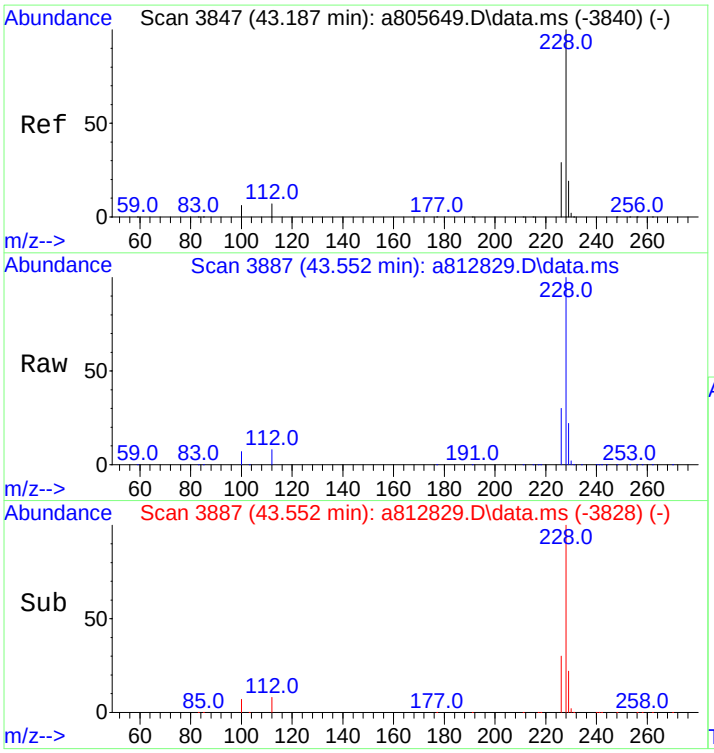


#75
Benz[a]anthracene
Concen: 15107.89 ng/mL
RT: 43.378 min Scan# 3868
Delta R.T. 0.018 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:228 Resp: 4056482

Ion	Ratio	Lower	Upper
228	100		
226	27.0	21.3	31.9

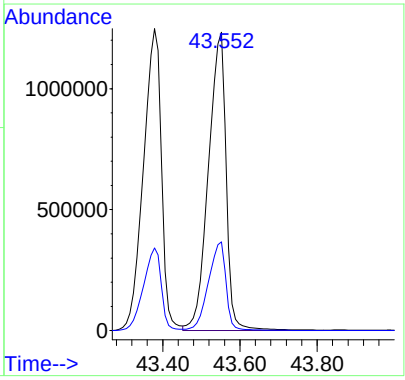


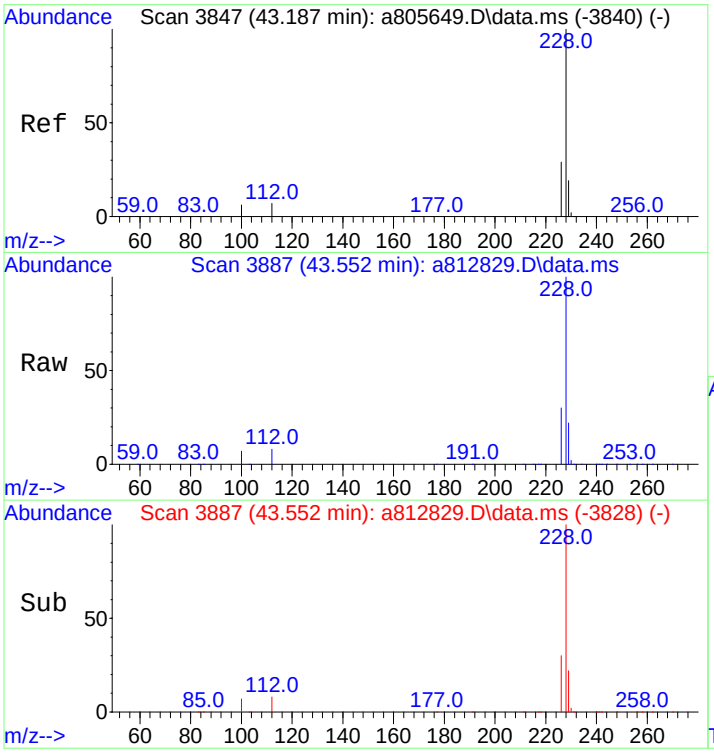


#76
Chrysene
Concen: 15094.93 ng/mL
RT: 43.552 min Scan# 3887
Delta R.T. 0.036 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:228 Resp: 3937928

Ion	Ratio	Lower	Upper
228	100		
226	29.5	23.6	35.4

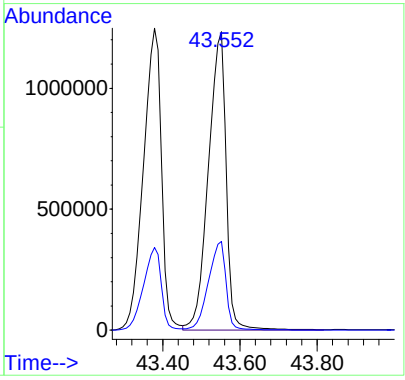


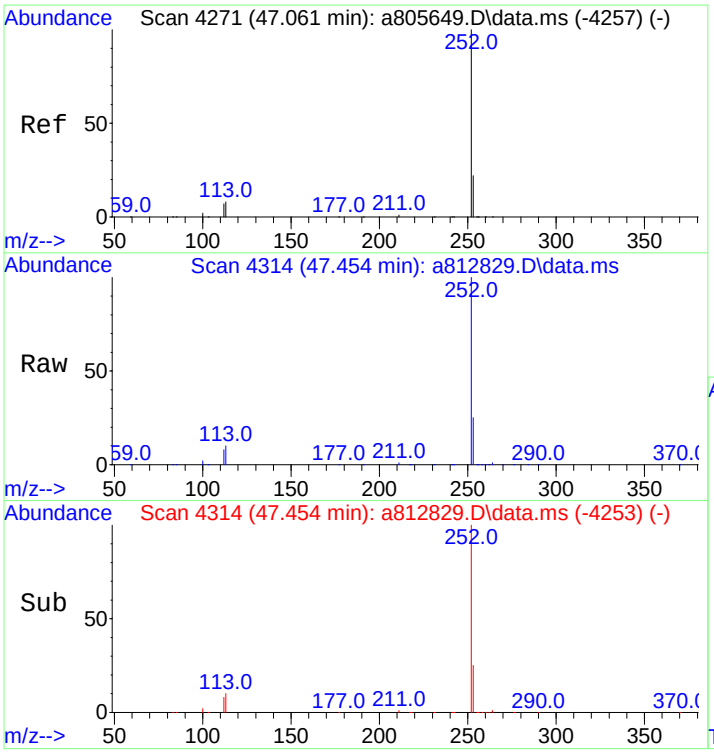


#77
Chrysene/Triphenylene
Concen: 15094.93 ng/mL
RT: 43.552 min Scan# 3887
Delta R.T. 0.036 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:228 Resp: 3937928

Ion	Ratio	Lower	Upper
228	100		
226	29.5	23.6	35.4

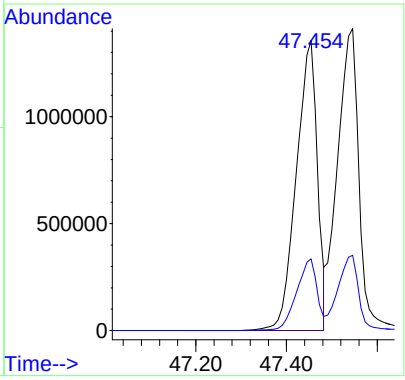


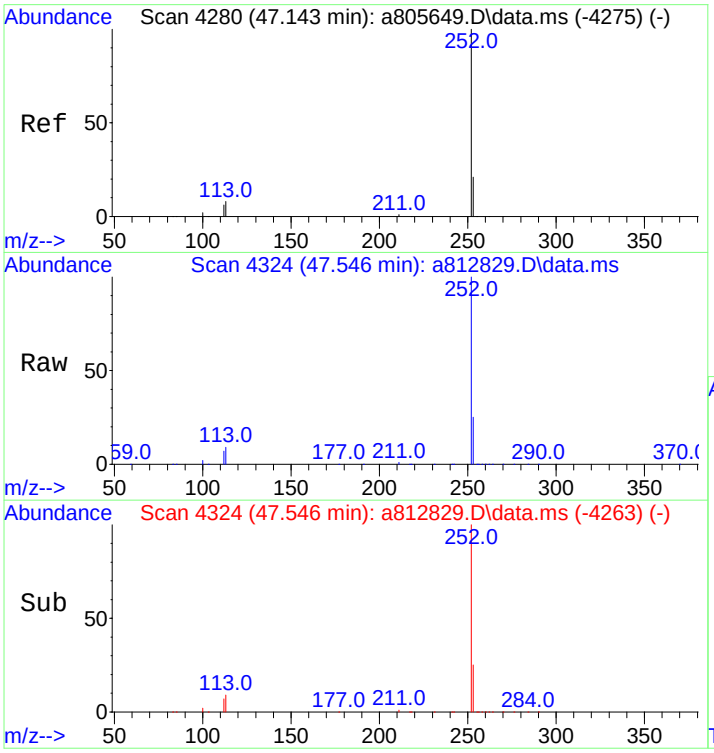


#84
Benzo[b]fluoranthene
Concen: 15067.63 ng/mL
RT: 47.454 min Scan# 4314
Delta R.T. 0.055 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:252 Resp: 4408379

Ion	Ratio	Lower	Upper
252	100		
253	24.0	18.5	27.7

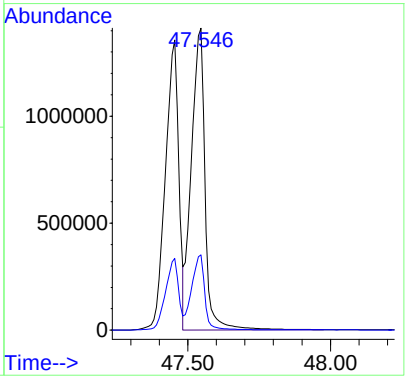


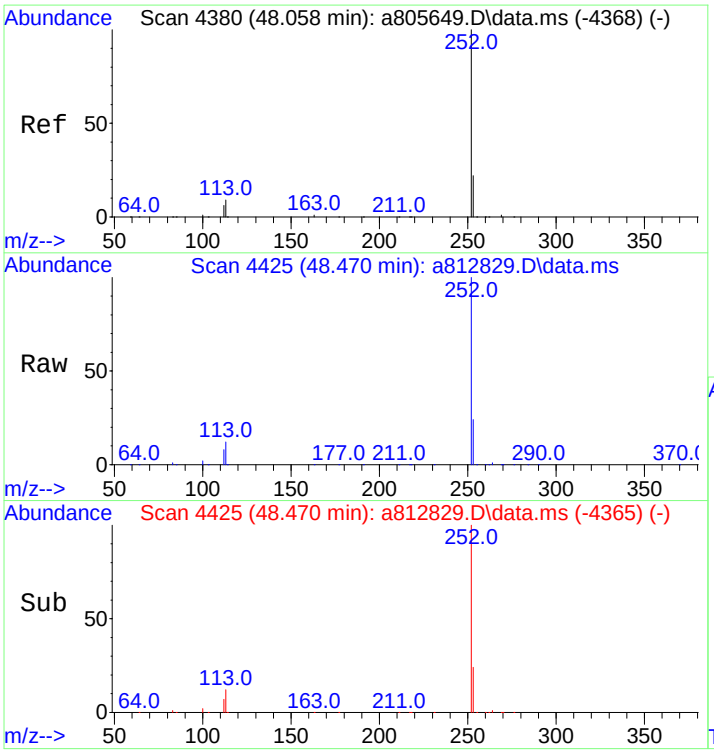


#85
Benzo[j]+[k]fluoranthene
Concen: 15666.84 ng/mL
RT: 47.546 min Scan# 4324
Delta R.T. 0.055 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:252 Resp: 4719440

Ion	Ratio	Lower	Upper
252	100		
253	24.1	18.8	28.2

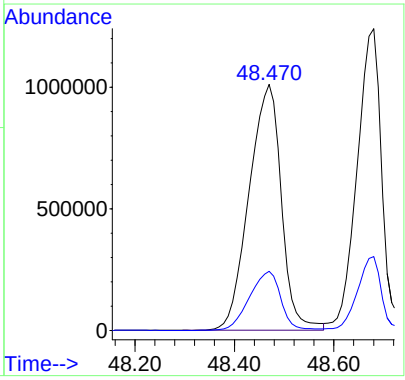


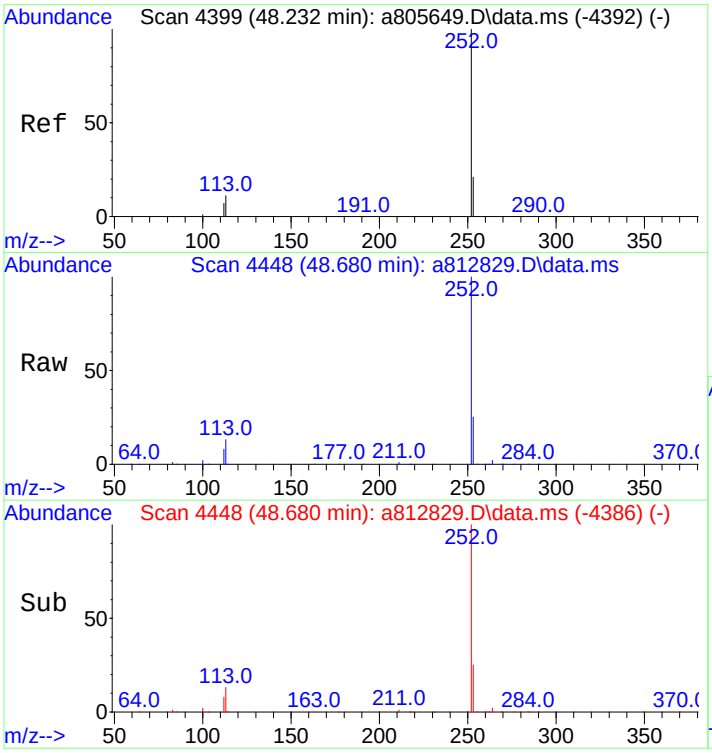


#87
Benzo[e]pyrene
Concen: 15746.01 ng/mL
RT: 48.470 min Scan# 4425
Delta R.T. 0.046 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:252 Resp: 4568966

Ion	Ratio	Lower	Upper
252	100		
253	23.3	18.9	28.3

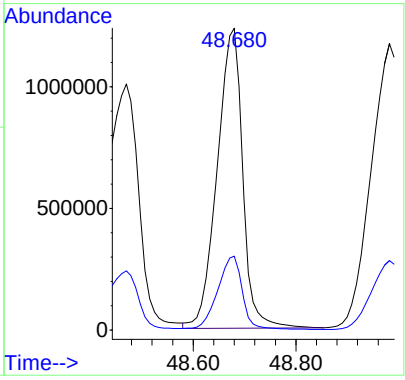


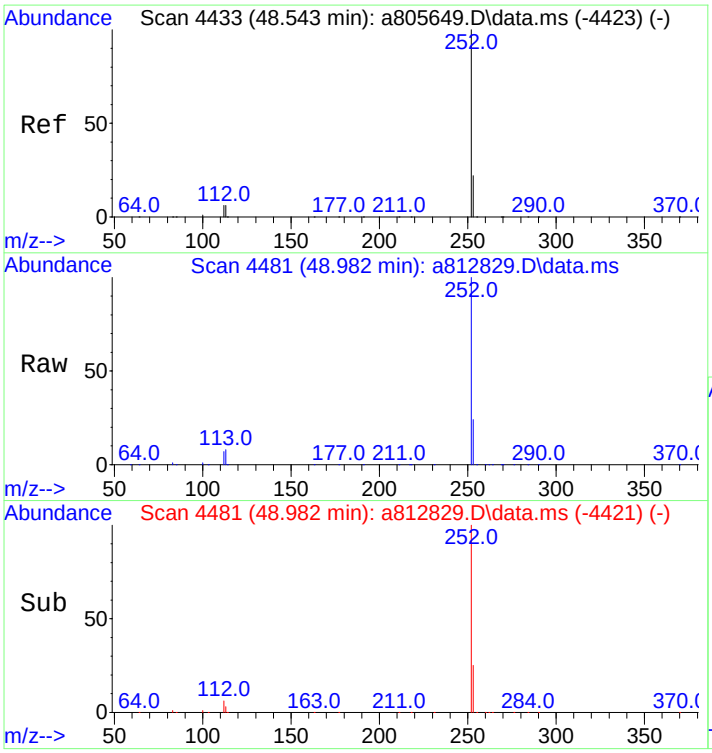


#89
Benzo[a]pyrene
Concen: 16122.62 ng/mL
RT: 48.680 min Scan# 4448
Delta R.T. 0.064 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:252 Resp: 4259318

Ion	Ratio	Lower	Upper
252	100		
253	23.7	19.4	29.0

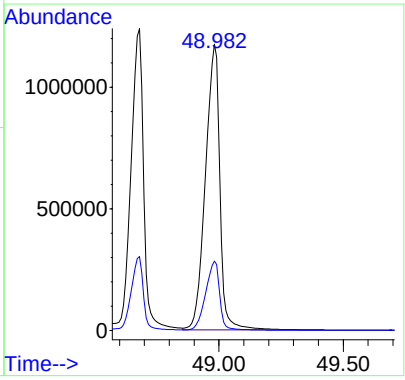


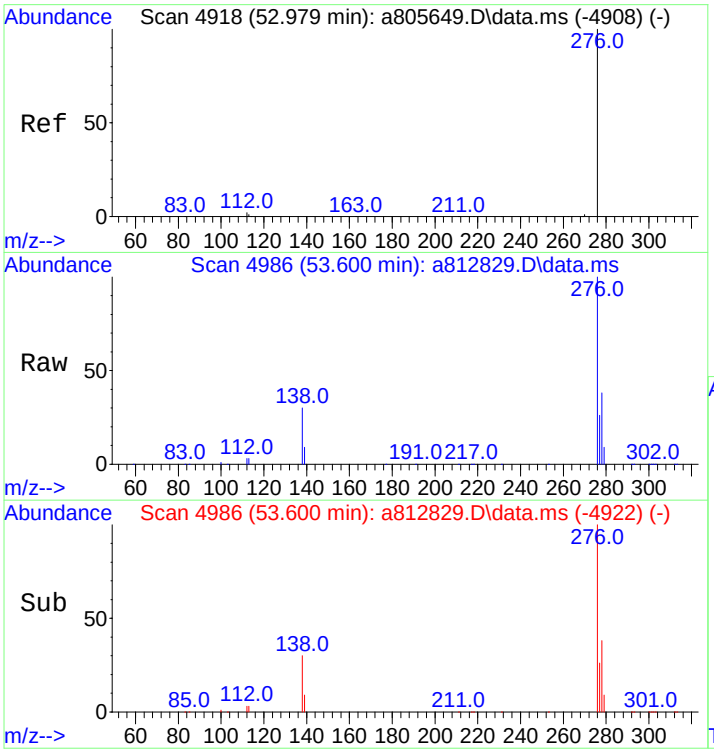


#90
Perylene
Concen: 16499.35 ng/mL
RT: 48.982 min Scan# 4481
Delta R.T. 0.046 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:252 Resp: 4762410

Ion	Ratio	Lower	Upper
252	100		
253	23.5	19.3	28.9

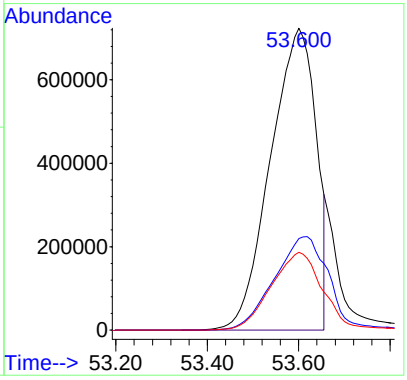


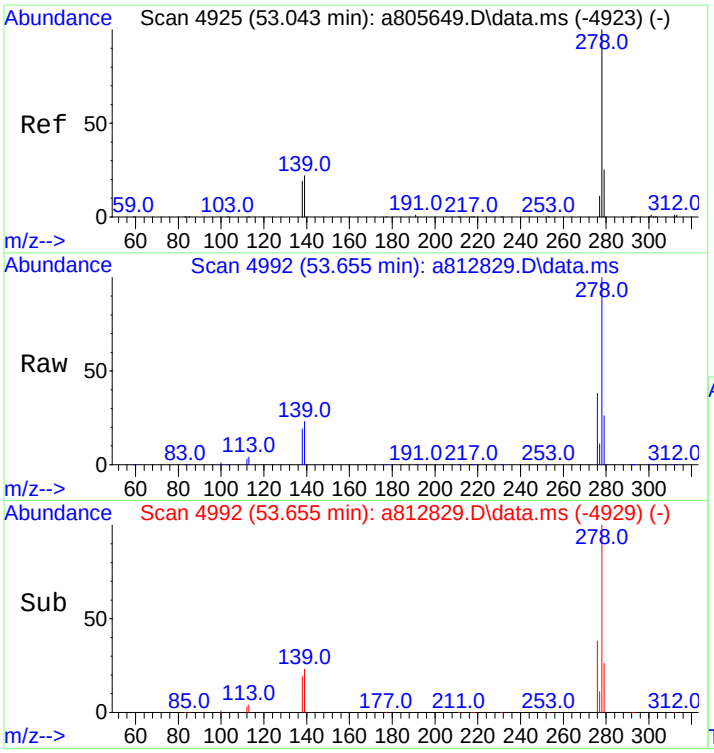


#91
Indeno[1,2,3-cd]pyrene
Concen: 16959.50 ng/mL m
RT: 53.600 min Scan# 4986
Delta R.T. 0.082 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:276 Resp: 4999033

Ion	Ratio	Lower	Upper
276	100		
138	37.7	19.9	29.9#
277	29.9	19.0	28.6#

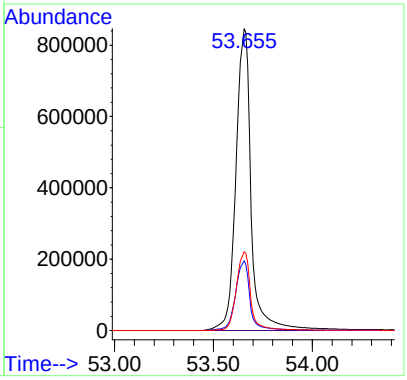


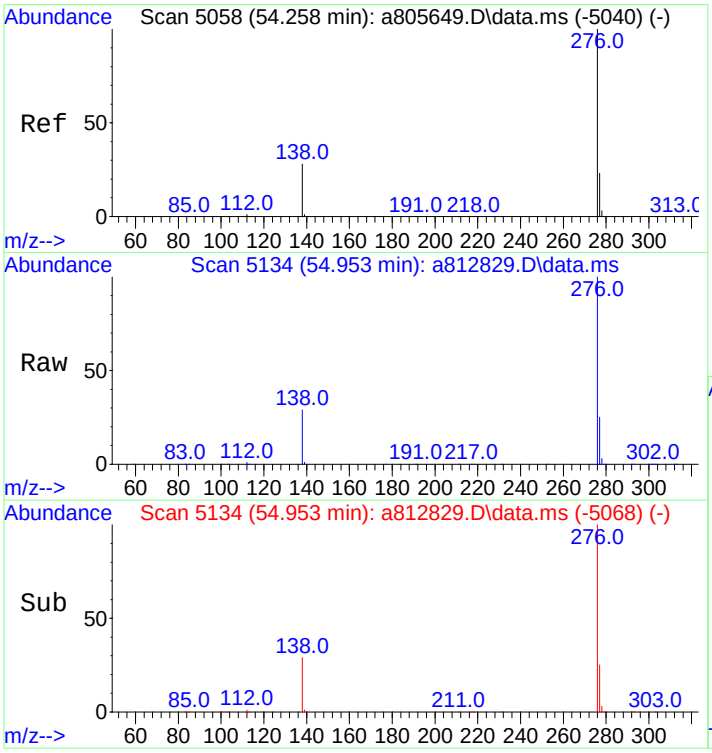


#92
Dibenz[ah]+[ac]anthracene
Concen: 17075.55 ng/mL
RT: 53.655 min Scan# 4992
Delta R.T. 0.073 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:278 Resp: 4548665

Ion	Ratio	Lower	Upper
278	100		
139	22.3	16.6	25.0
279	24.9	19.1	28.7

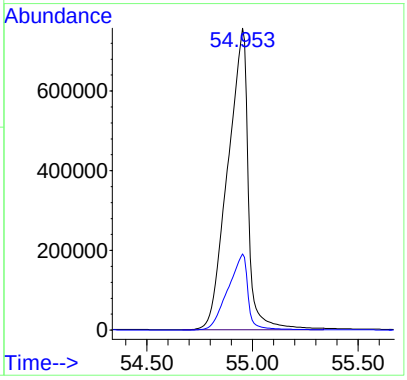




#93
Benzo[g,h,i]perylene
Concen: 16284.19 ng/mL
RT: 54.953 min Scan# 5134
Delta R.T. 0.100 min
Lab File: a812829.D
Acq: 18 Nov 2012 6:13 pm

Tgt Ion:276 Resp: 5114113

Ion	Ratio	Lower	Upper
276	100		
277	24.8	18.9	28.3



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	78991M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	124160	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.005	136	262683	839.125	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 83.91%			
42) Phenanthrene-d10	32.843	188	235516	968.795	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.88%			
83) Benzo[b]fluoranthene-d12	47.326	264	243327	1028.298	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.83%			
88) Benzo[a]pyrene-d12	48.534	264	238405	1019.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.98%			
129) 5B(H)Cholane - Surr	44.045	217	49287M3	1085.604	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.56%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	140424	2000.442	ng/mL	100
4) cis-Decalin	17.879	138	6223M3	121.012	ng/mL	
5) C1-Decalins	18.590	152	225633M5	3214.307	ng/mL	
6) C2-Decalins	19.923	166	197945M5	2819.871	ng/mL	
7) C3-Decalins	22.396	180	86941M5	1238.538	ng/mL	
8) C4-Decalins	25.781	194	98332M5	1400.811	ng/mL	
10) Naphthalene	20.078	128	893038	2493.601	ng/mL#	100
11) C1-Naphthalenes	22.779	142	1892183M5	5283.480	ng/mL	
12) C2-Naphthalenes	25.617	156	2429476M5	6783.746	ng/mL	
13) C3-Naphthalenes	27.953	170	1779439M5	4968.669	ng/mL	
14) C4-Naphthalenes	30.709	184	926139M5	2586.028	ng/mL	
16) 2-Methylnaphthalene	22.779	142	1098352	5148.524	ng/mL#	100
17) 1-Methylnaphthalene	23.199	142	795886	3984.112	ng/mL#	100
18) Benzothiophene	20.288	134	7480M3	25.840	ng/mL	
19) C1-Benzo(b)thiophenes	22.341	148	39206M5	135.438	ng/mL	
20) C2-Benzo(b)thiophenes	25.809	162	72234M5	249.534	ng/mL	
21) C3-Benzo(b)thiophenes	27.789	176	139278M5	481.139	ng/mL	
22) C4-Benzo(b)thiophenes	29.532	190	121540M5	419.863	ng/mL	
23) Biphenyl	24.650	154	186634	687.624	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.270	156	605392	3315.806	ng/mL#	100
25) Dibenzofuran	27.743	168	75894	265.048	ng/mL#	85
26) Acenaphthylene	26.356	152	11000	33.839	ng/mL#	100
27) Acenaphthene	27.105	153	18184M3	93.718	ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.656	170	124200M3	789.833	ng/mL	
29) Fluorene	29.112	166	85680M3	393.714	ng/mL	
30) C1-Fluorenes	31.484	180	184625M5	848.383	ng/mL	
31) C2-Fluorenes	33.674	194	278786M5	1281.069	ng/mL	
32) C3-Fluorenes	35.499	208	275240M5	1264.775	ng/mL	
33) Dibenzothiophene	32.433	184	212077	708.685	ng/mL#	85
34) 4-Methyldibenzothiophe...	34.212	198	196394	656.278	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.559	198	155047	518.111	ng/mL#	100
36) 1-Methyldibenzothiophe...	34.979	198	73034	244.053	ng/mL#	100
37) OTP	34.623	198	14139M3	47.247	ng/mL	
38) C1-Dibenzothiophenes	34.212	198	446536M5	1492.163	ng/mL	
39) C2-Dibenzothiophenes	36.257	212	628709M5	2100.920	ng/mL	
40) C3-Dibenzothiophenes	37.690	226	542766M5	1813.729	ng/mL	
41) C4-Dibenzothiophenes	39.379	240	299645M5	1001.306	ng/mL	
43) Phenanthrene	32.935	178	316886	1100.184	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.897	192	146687	509.277	ng/mL	99
45) 2-Methylphenanthrene(2MP)	35.006	192	155574	540.131	ng/mL	97
46) 2-Methylanthracene(2MA)	35.162	192	5018M3	17.422	ng/mL	
47) 9/4-Methylphenanthrene...	35.344	192	237440	824.359	ng/mL	99
48) 1-Methylphenanthrene(1MP)	35.435	192	150356M3	522.015	ng/mL	
49) C1-Phenanthrenes/Anthr...	35.344	192	708112M5	2458.467	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) C2-Phenanthrenes/Anthr...	37.161	206	754557M5	2619.718	ng/mL	
52) C3-Phenanthrenes/Anthr...	38.996	220	484184M5	1681.020	ng/mL	
53) C4-Phenanthrenes/Anthr...	41.178	234	201655M5	700.118	ng/mL	
56) Carbazole	33.774	167	9037M4	32.276	ng/mL	
57) 1-Methylphenanthrene	35.435	192	153338M3	751.019	ng/mL	
58) Fluoranthene	37.699	202	6289M3	21.197	ng/mL	
59) Benzo(b)fluorene	40.220	216	6189M3	36.061	ng/mL	
60) Pyrene	38.585	202	19232M3	64.087	ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.973	216	107991M5	359.859	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.772	230	169671M5	565.395	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.789	244	195654M5	651.978	ng/mL	
64) C4-Fluoranthenes/Pyrenes	45.141	258	155110M5	516.874	ng/mL	
66) Naphthobenzothiophene	42.429	234	49992M3	179.456	ng/ml	
67) Naphthobenzothiophene-...	42.429	234	49921M3	179.201	ng/mL	
68) Naphthobenzothiophene-...	42.776	234	12190	43.758	ng/mL#	10
69) Naphthobenzothiophene-...	43.068	234	5647M3	20.271	ng/mL	
70) C1-Naphthobenzothiophenes	43.826	248	166798M5	598.754	ng/ml	
71) C2-Naphthobenzothiophenes	45.826	262	249402M5	895.278	ng/ml	
72) C3-Naphthobenzothiophenes	47.436	276	181212M5	650.496	ng/ml	
73) C4-Naphthobenzothiophenes	48.525	290	122522M5	439.817	ng/mL	
75) Benz[a]anthracene	43.360	228	3229M3	11.863	ng/mL	
76) Chrysene	43.488	228	53021M3	192.442	ng/mL	
77) Chrysene/Triphenylene	43.488	228	53597M3	194.532	ng/mL	
78) C1-Chrysenes	44.986	242	93757M5	340.294	ng/mL	
79) C2-Chrysenes	47.061	256	131721M5	478.086	ng/mL	
80) BBF-D12 Surr BKGD	47.326	256	8334	30.249	ng/mL	100
81) C3-Chrysenes	49.814	270	136635M5	495.921	ng/mL	
82) C4-Chrysenes	49.906	284	83967M5	304.761	ng/mL	
84) Benzo[b]fluoranthene	47.409	252	7917M3	27.083	ng/mL	
85) Benzo[j]+[k]fluoranthene	47.464	252	754M3	2.364	ng/mL	
87) Benzo[e]pyrene	48.433	252	15308M3	50.823	ng/mL	
89) Benzo[a]pyrene	48.625	252	2919M3	10.477	ng/mL	
90) Perylene	48.936	252	4273	14.040	ng/mL#	29
91) Indeno[1,2,3-cd]pyrene	53.518	276	1158M3	3.913	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.573	278	1684M3	5.805	ng/mL	
93) Benzo[g,h,i]perylene	54.861	276	5336	15.887	ng/mL	91
94) Hopane (T19)	52.622	191	76529	820.722	ng/mL#	88
95) 17a(H),21B(H)-hopane -...	52.622	191	76529	820.722	ng/mL#	88
96) C23 Tricyclic Terpane ...	41.069	191	30142	323.253	ng/ml	100
97) C24 Tricyclic Terpane ...	41.799	191	20520	220.063	ng/ml	100
98) C25 Tricyclic Terpane ...	43.278	191	18397M3	197.296	ng/ml	
99) C24 Tetracyclic Terpan...	44.602	191	6107M3	65.493	ng/ml	
100) C26 Tricyclic Terpane-...	44.337	191	6784M3	72.754	ng/ml	
101) C26 Tricyclic Terpane-...	44.429	191	6272	67.263	ng/ml	100
102) C28 Tricyclic Terpane-...	46.713	191	7467	80.079	ng/ml	100
103) C28 Tricyclic Terpane-...	46.869	191	7677M3	82.331	ng/ml	
104) C29 Tricyclic Terpane-...	47.399	191	8171	87.629	ng/ml	100
105) C29 Tricyclic Terpane-...	47.601	191	8732M3	93.645	ng/ml	
106) 18a-22,29,30-Trisnorne...	48.753	191	12689	136.081	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.845	191	7247M3	77.719	ng/mL	
108) C30 Tricyclic Terpane-22R	49.092	191	6548M3	70.223	ng/mL	
109) 17a(H)-22,29,30-Trisno...	49.311	191	16155	173.252	ng/ml	100
110) 17a/b,21b/a 28,30-Bisn...	50.528	191	3002	32.194	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	50.317	191	3522	37.771	ng/ml	100
112) 30-Norhopane (T15)	51.223	191	43079M3	461.993	ng/ml	
113) 18a(H)-30-Norneohopane...	51.323	191	10404M3	111.576	ng/ml	
114) 17a(H)-Diahopane (X)	51.451	191	6338M3	67.971	ng/ml	
115) 30-Normoretane (T17)	52.018	191	5234	56.131	ng/ml	100
117) Moretane (T20)	53.335	191	8314M3	89.162	ng/ml	
118) 30-Homohopane-22S (T21)	54.468	191	31628	339.189	ng/ml	100
119) 30-Homohopane-22R (T22)	54.706	191	26440	283.551	ng/ml	100

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

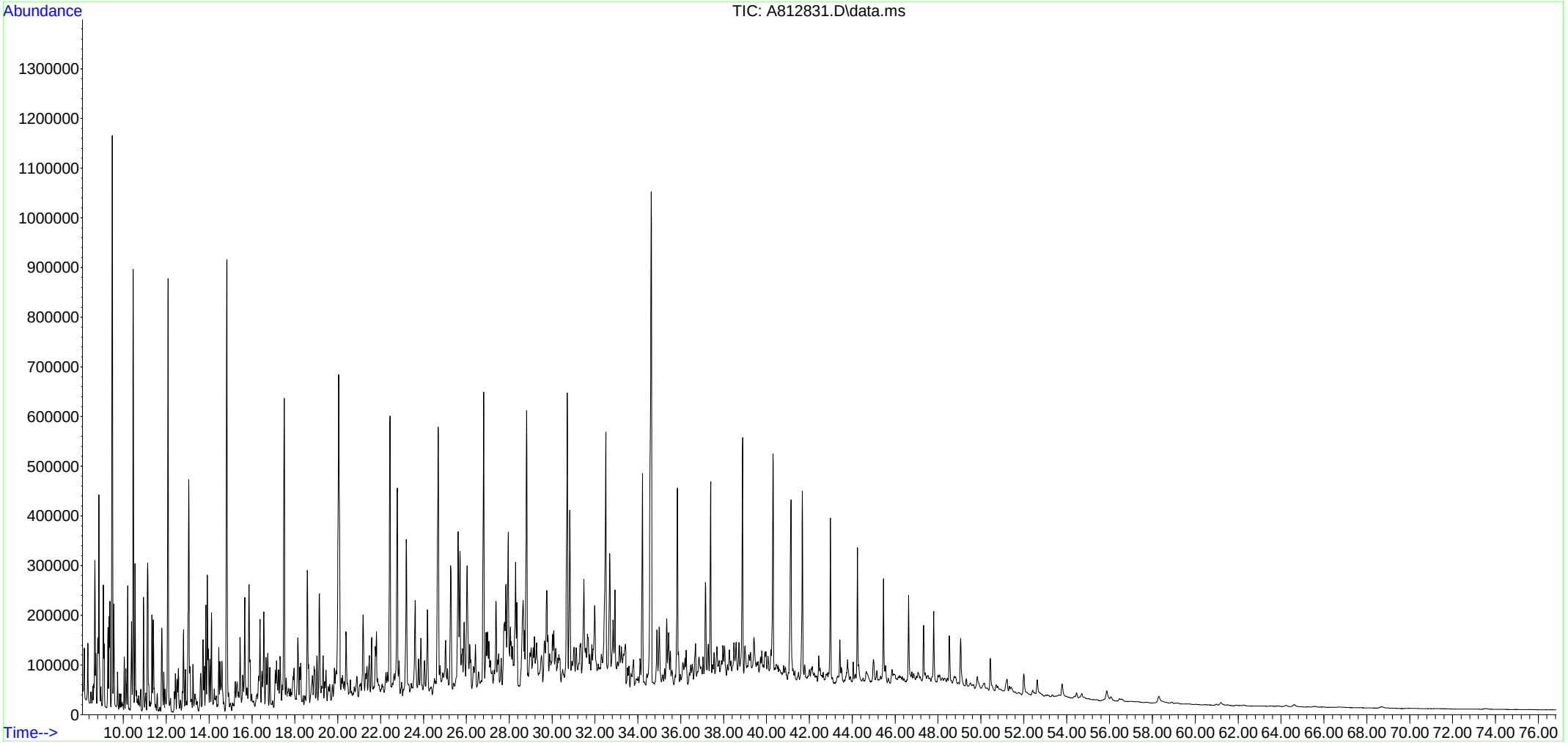
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
120)	Gammacerane/C32-diahopane	55.263	191	5656	60.657	ng/mL	100
121)	30,31-Bishomohopane-22...	56.067	191	22510M3	241.405	ng/ml	
122)	30,31-Bishomohopane-22...	56.460	191	16361	175.461	ng/ml	100
123)	30,31-Trishomohopane-2...	58.261	191	17135	183.761	ng/ml	100
124)	30,31-Trishomohopane-2...	58.909	191	11749	126.000	ng/ml	100
125)	Tetrakishomohopane-22S...	60.984	191	12977	139.170	ng/ml	100
126)	Tetrakishomohopane-22R...	61.916	191	8321	89.237	ng/ml	100
127)	Pentakishomohopane-22S...	64.228	191	12785	137.111	ng/ml	100
128)	Pentakishomohopane-22R...	65.571	191	10409	111.630	ng/ml	100
130)	13b(H),17a(H)-20S-Diac...	45.543	217	11631	256.186	ng/ml	100
131)	13b(H),17a(H)-20R-Diac...	45.973	217	5823M3	128.258	ng/ml	
132)	13b,17a-20S-Methyldiac...	46.668	217	5227M3	115.131	ng/ml	
133)	14a,17a-20S-Chol/13b,1...	47.546	217	13402	295.195	ng/ml	100
134)	14a,17a-20R-Chol/13b,1...	48.067	217	16410M3	361.449	ng/ml	
135)	Unknown Sterane (S18)	48.351	217	4336	95.505	ng/ml	100
136)	13a,17b-20S-Ethyldiach...	48.625	217	815	17.951	ng/ml	100
137)	14a,17a-20S-Methylchol...	48.781	217	8320M3	183.258	ng/ml	
138)	14a,17a-20R-Methylchol...	49.521	217	7349M3	161.870	ng/ml	
139)	14a(H),17a(H)-20S-Ethy...	49.878	217	11898	262.067	ng/ml	100
140)	14a(H),17a(H)-20R-Ethy...	50.811	217	9006M3	198.368	ng/ml	
141)	14b(H),17b(H)-20R-Chol...	47.637	218	8824M3	194.359	ng/ml	
142)	14b(H),17b(H)-20S-Chol...	47.720	218	8873M3	195.438	ng/ml	
143)	14b,17b-20R-Methylchol...	48.964	218	9597	211.385	ng/ml	100
144)	14b,17b-20S-Methylchol...	49.046	218	12292M3	270.746	ng/ml	
145)	14b(H),17b(H)-20R-Ethy...	50.134	218	12571M3	276.891	ng/ml	
146)	14b(H),17b(H)-20S-Ethy...	50.171	218	9254M3	203.830	ng/ml	
147)	C26,20R- +C27,20S- tri...	49.832	231	61216M3	1348.354	ng/mL	
148)	C28,20S-triaromatic st...	50.710	231	38935	857.589	ng/mL	100
149)	C27,20R-triaromatic st...	51.177	231	38396	845.717	ng/mL	100
150)	C28,20R-triaromatic st...	52.412	231	31233	687.943	ng/mL	100

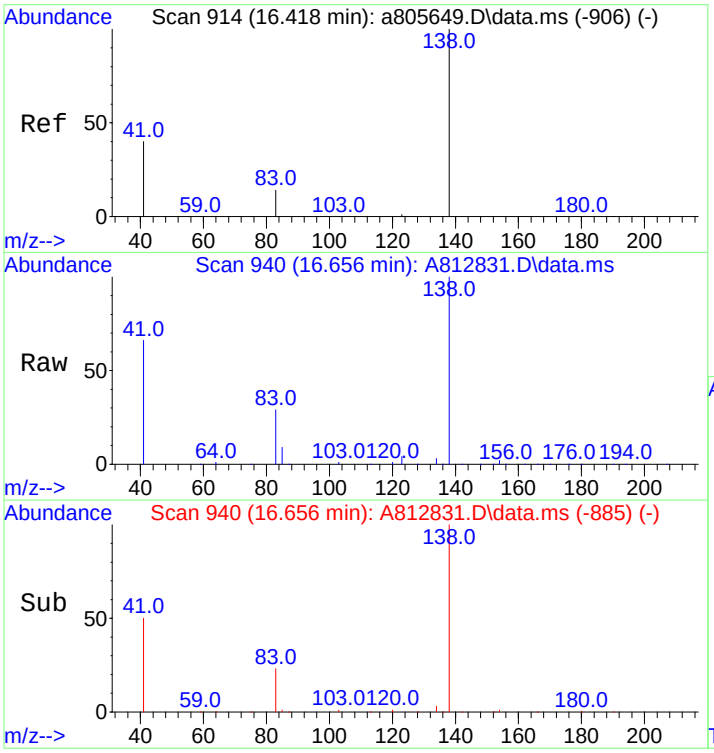
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : Default - All compounds listedort (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812831.D
Acq On : 18 Nov 2012 9:02 pm
Operator : AC
Sample : SS112012ANC01
Misc : whaq46 5.076
ALS Vial : 12 Sample Multiplier: 1

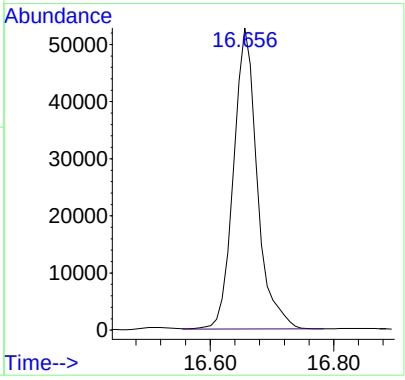
Quant Time: Nov 20 12:55:48 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:36:09 2012
Response via : Initial Calibration

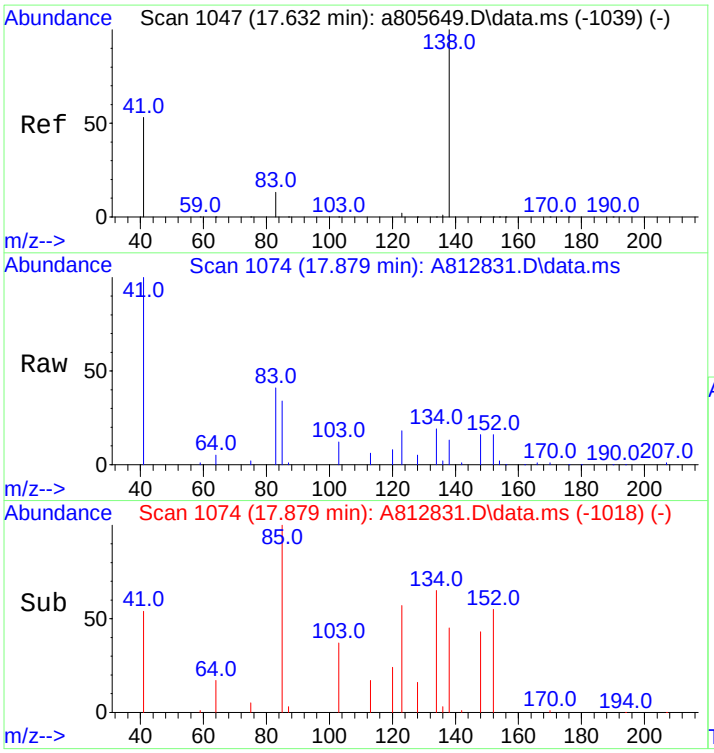




#3
trans-Decalin
Concen: 2000.44 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

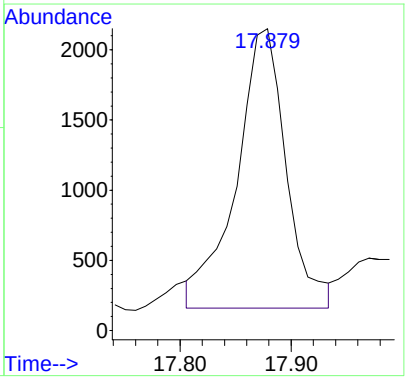
Tgt Ion:138 Resp: 140424

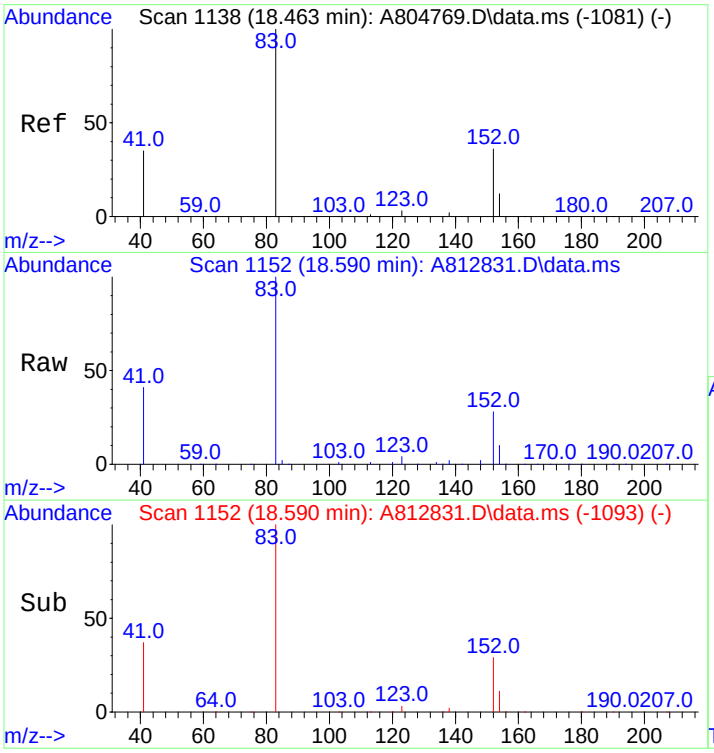




#4
cis-Decalin
Concen: 121.01 ng/mL m
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

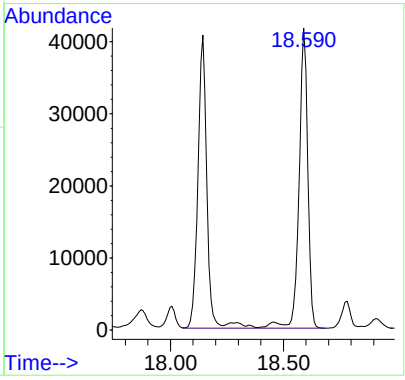
Tgt Ion:138 Resp: 6223

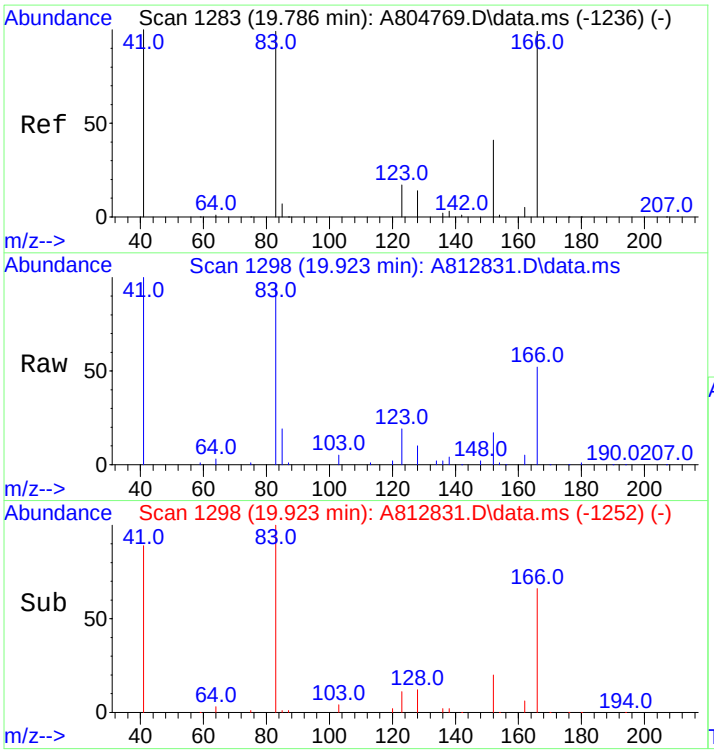




#5
C1-Decalins
Concen: 3214.31 ng/mL m
RT: 18.590 min Scan# 1152
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

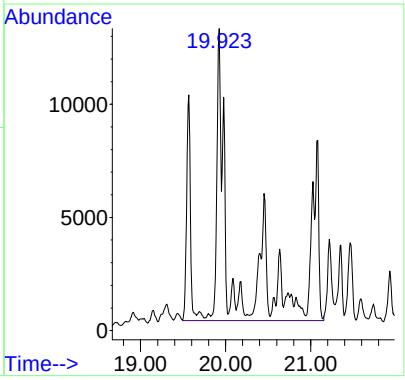
Tgt Ion:152 Resp: 225633

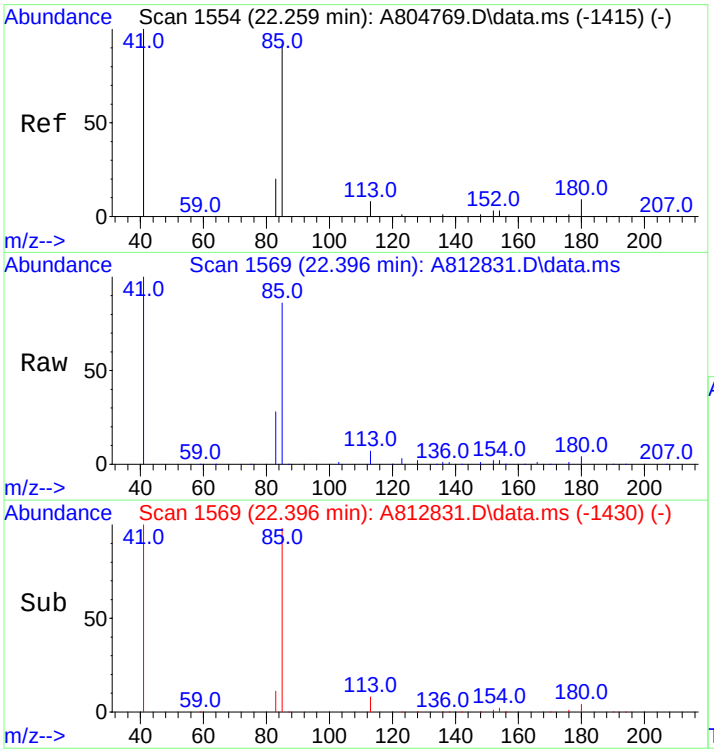




#6
C2-Decalins
Concen: 2819.87 ng/mL m
RT: 19.923 min Scan# 1298
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

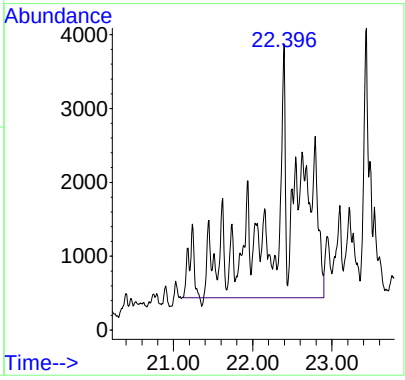
Tgt Ion:166 Resp: 197945

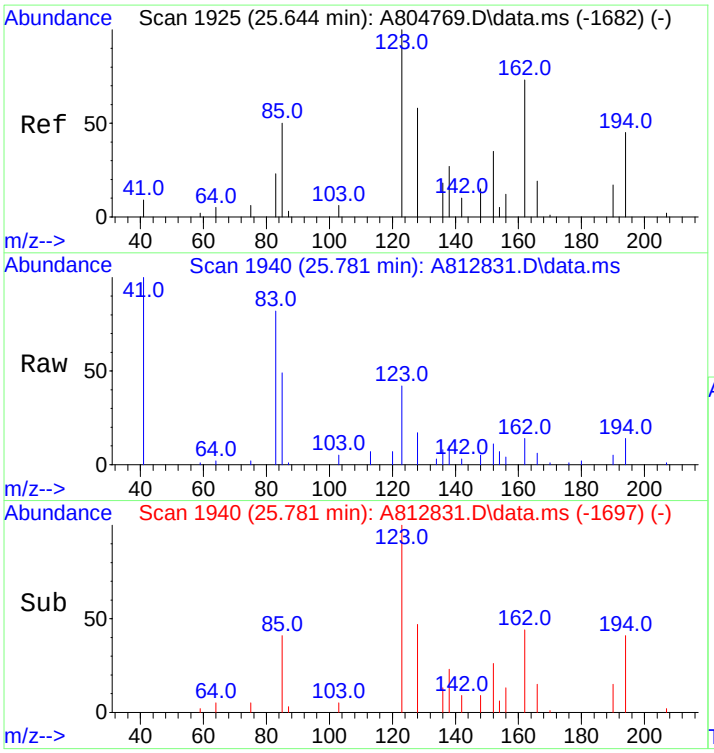




#7
C3-Decalins
Concen: 1238.54 ng/mL m
RT: 22.396 min Scan# 1569
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

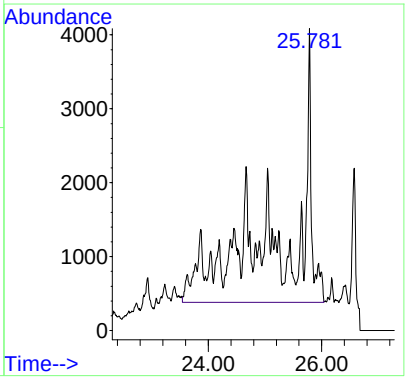
Tgt Ion:180 Resp: 86941

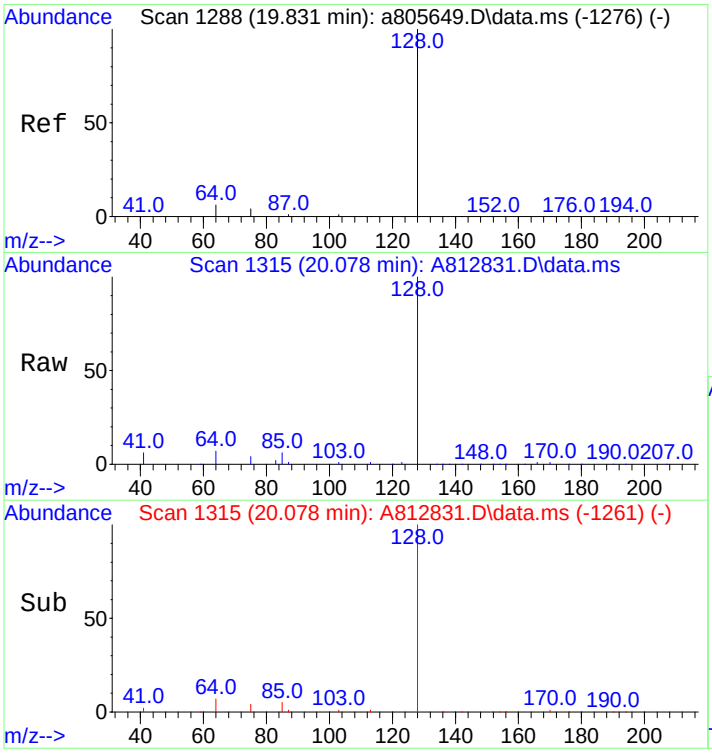




#8
C4-Decalins
Concen: 1400.81 ng/mL m
RT: 25.781 min Scan# 1940
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:194 Resp: 98332

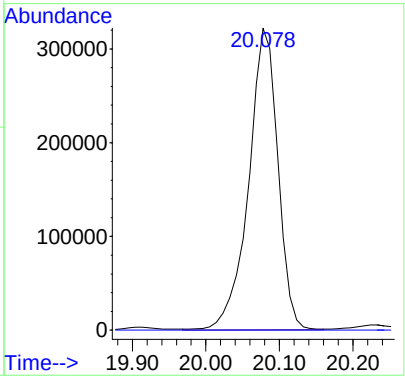


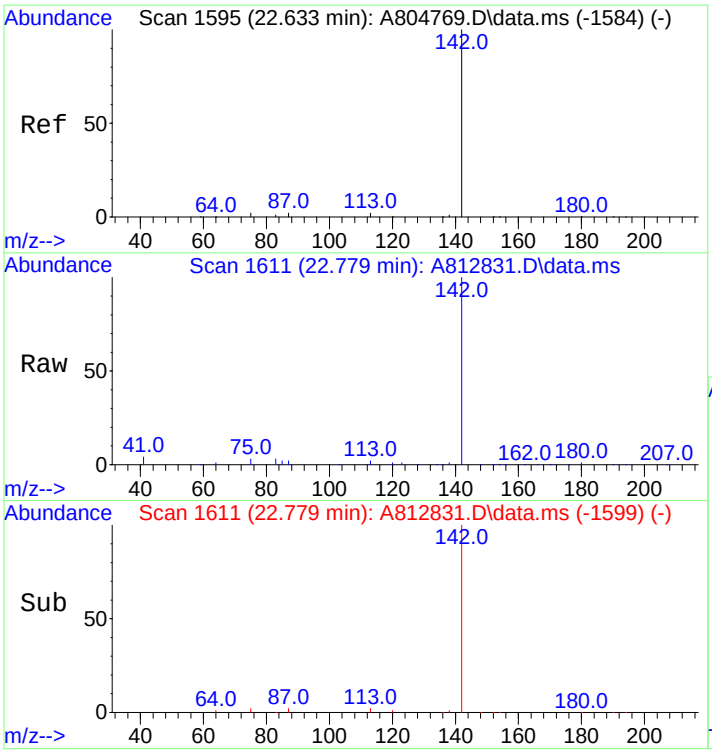


#10
Naphthalene
Concen: 2493.60 ng/mL
RT: 20.078 min Scan# 1315
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:128 Resp: 893038

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

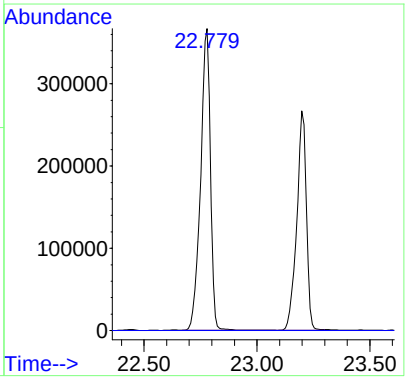


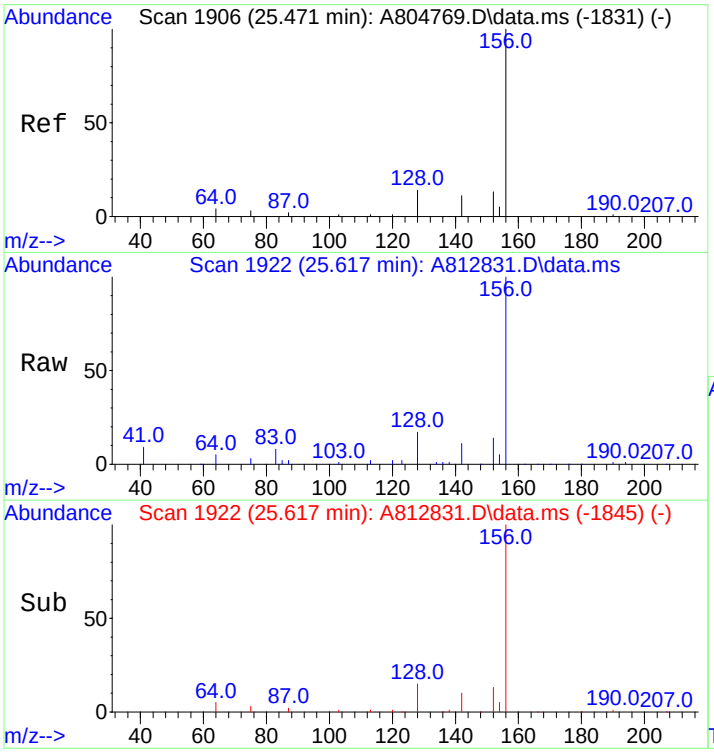


#11
C1-Naphthalenes
Concen: 5283.48 ng/mL m
RT: 22.779 min Scan# 1611
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:142 Resp: 1892183

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

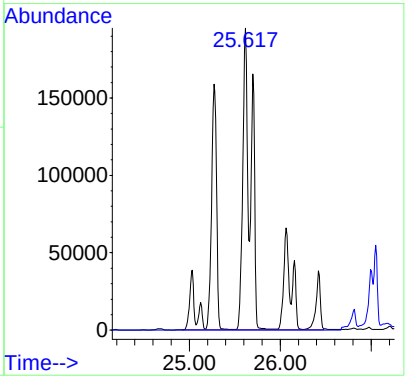


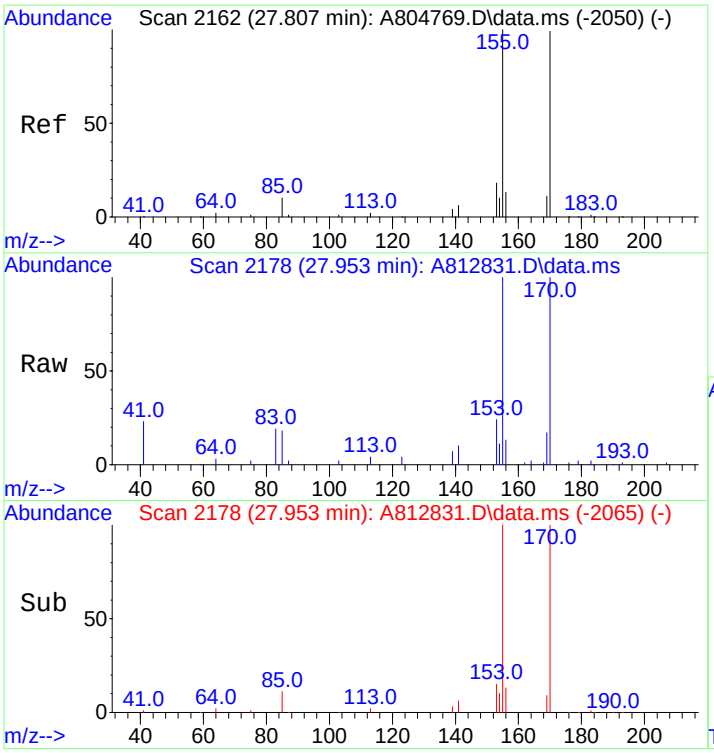


#12
C2-Naphthalenes
Concen: 6783.75 ng/mL m
RT: 25.617 min Scan# 1922
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:156 Resp: 2429476

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

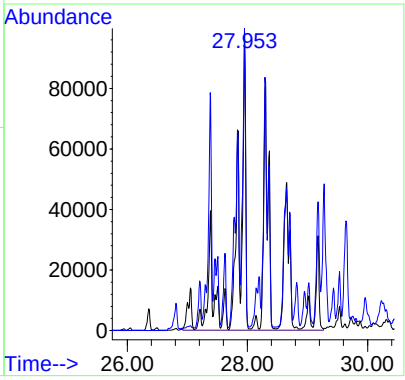


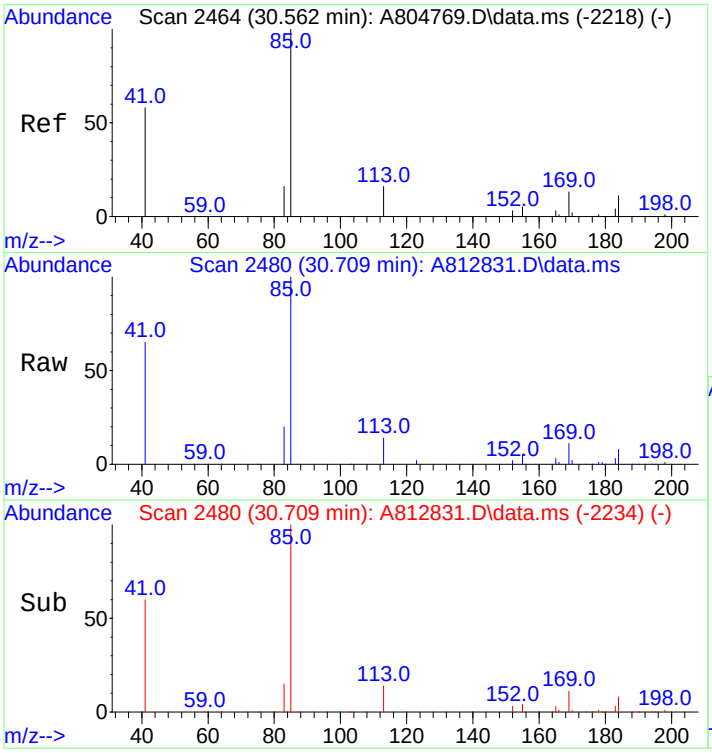


#13
C3-Naphthalenes
Concen: 4968.67 ng/mL m
RT: 27.953 min Scan# 2178
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:170 Resp: 1779439

Ion	Ratio	Lower	Upper
170	100		
155	18.5	80.2	120.4#

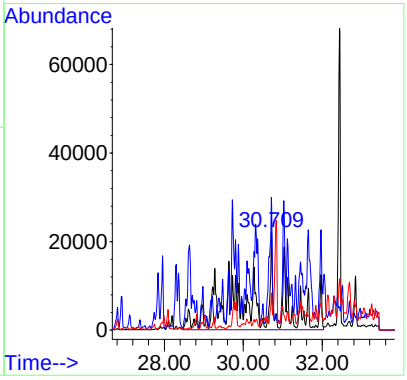


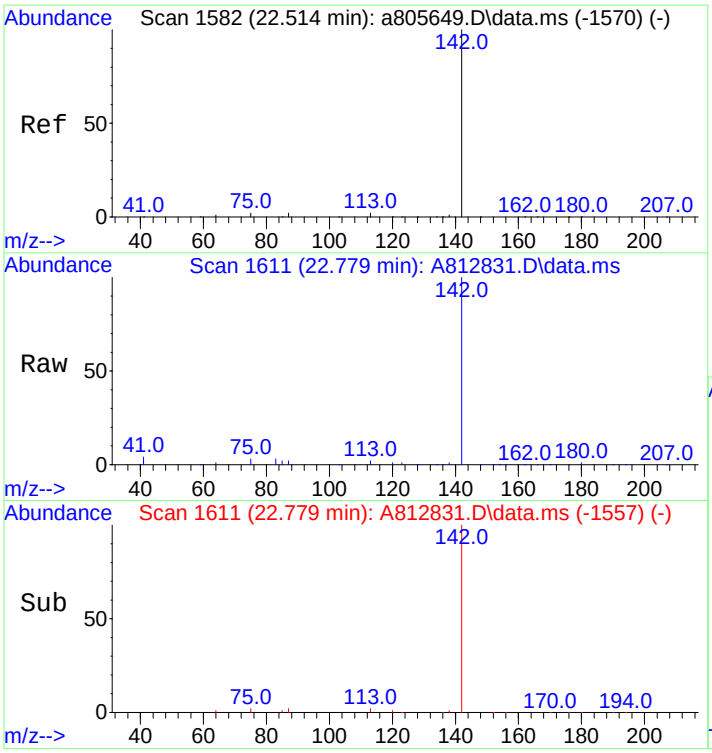


#14
C4-Naphthalenes
Concen: 2586.03 ng/mL m
RT: 30.709 min Scan# 2480
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:184 Resp: 926139

Ion	Ratio	Lower	Upper
184	100		
169	16.4	108.2	162.2#
183	2.3	29.7	44.5#

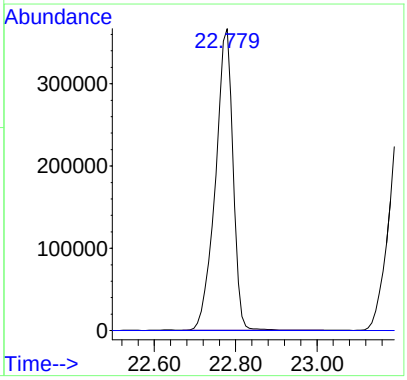


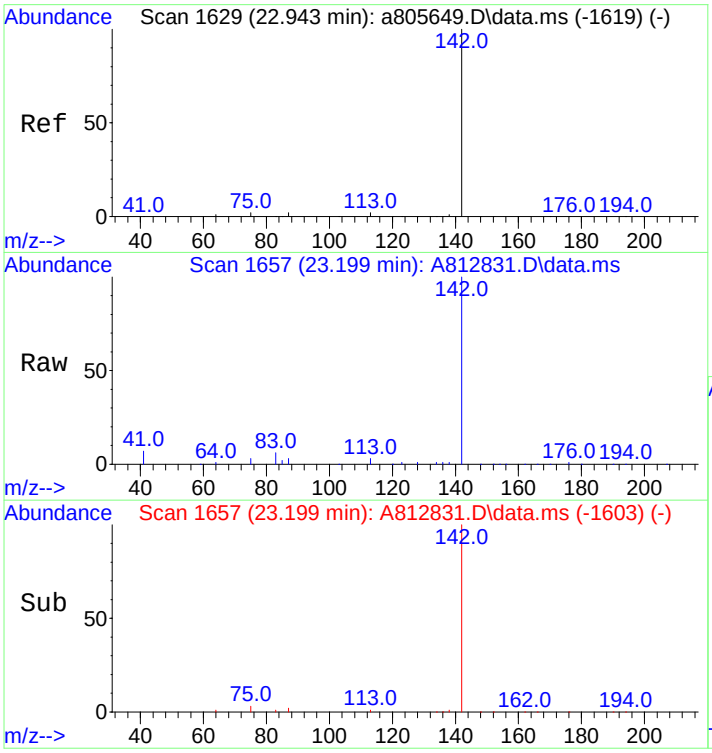


#16
2-Methylnaphthalene
Concen: 5148.52 ng/mL
RT: 22.779 min Scan# 1611
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:142 Resp: 1098352

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

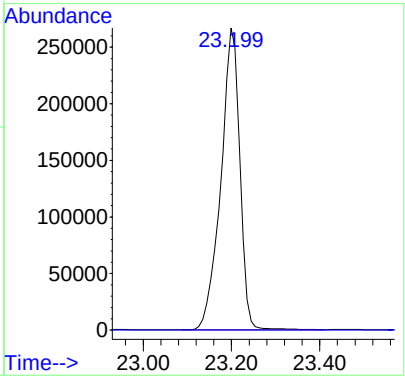


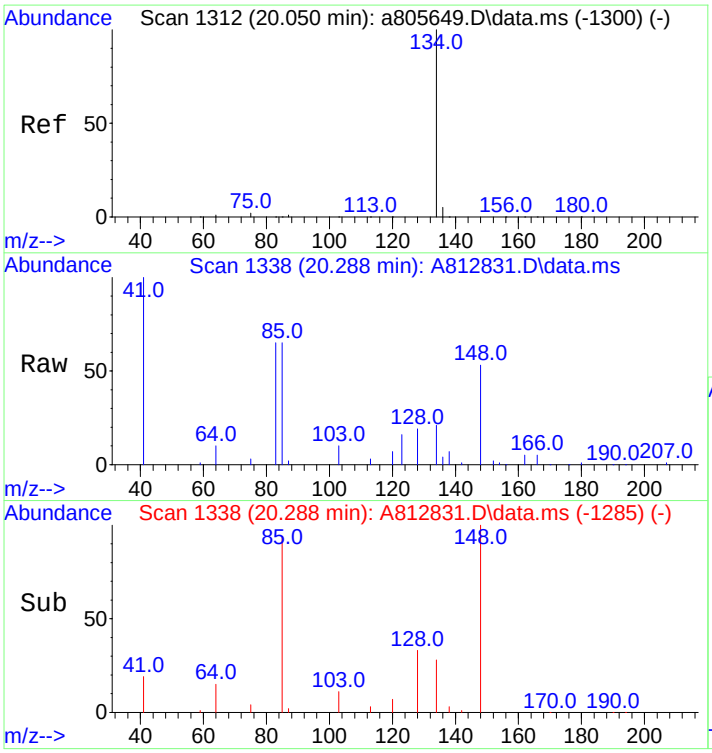


#17
1-Methylnaphthalene
Concen: 3984.11 ng/mL
RT: 23.199 min Scan# 1657
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:142 Resp: 795886

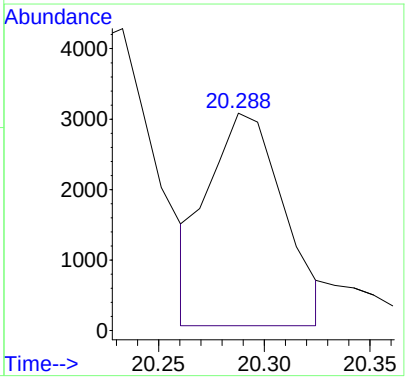
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

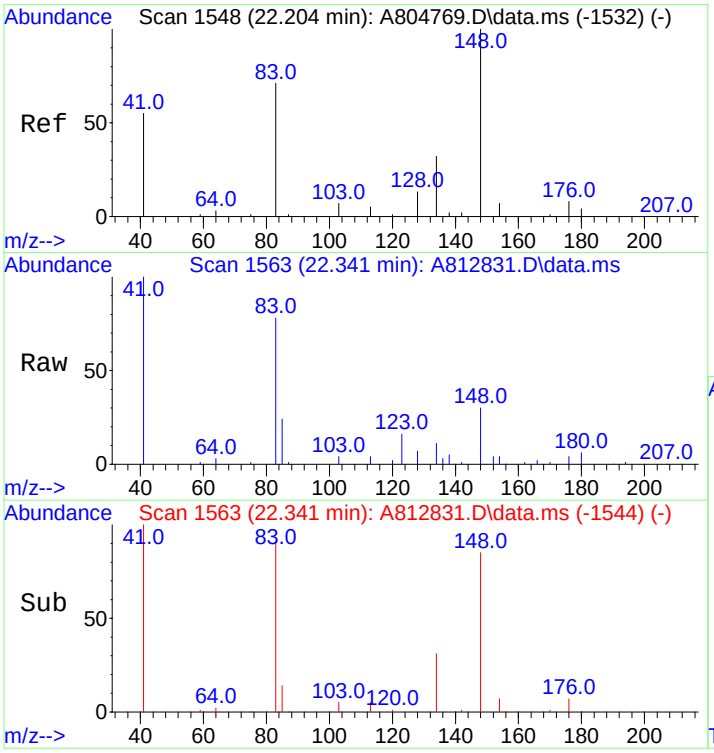




#18
Benzothiophene
Concen: 25.84 ng/mL m
RT: 20.288 min Scan# 1338
Delta R.T. -0.018 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

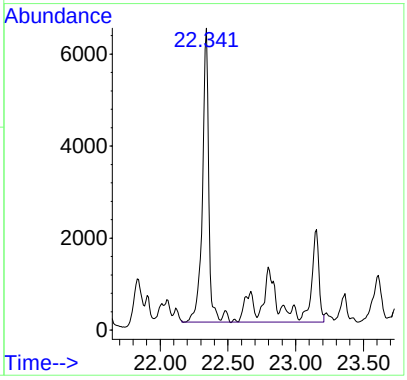
Tgt Ion:134 Resp: 7480

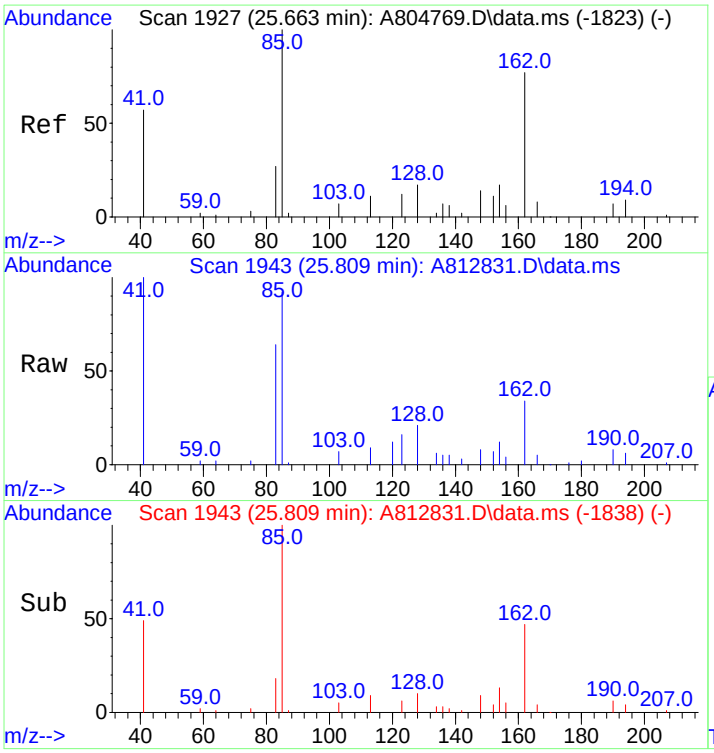




#19
C1-Benzo(b)thiophenes
Concen: 135.44 ng/mL m
RT: 22.341 min Scan# 1563
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

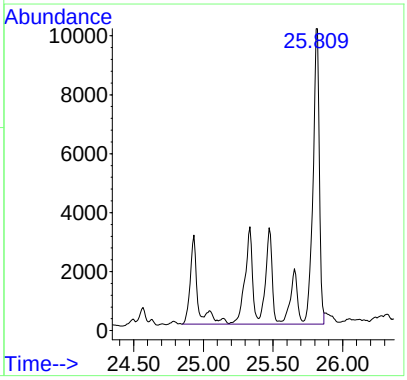
Tgt Ion:148 Resp: 39206

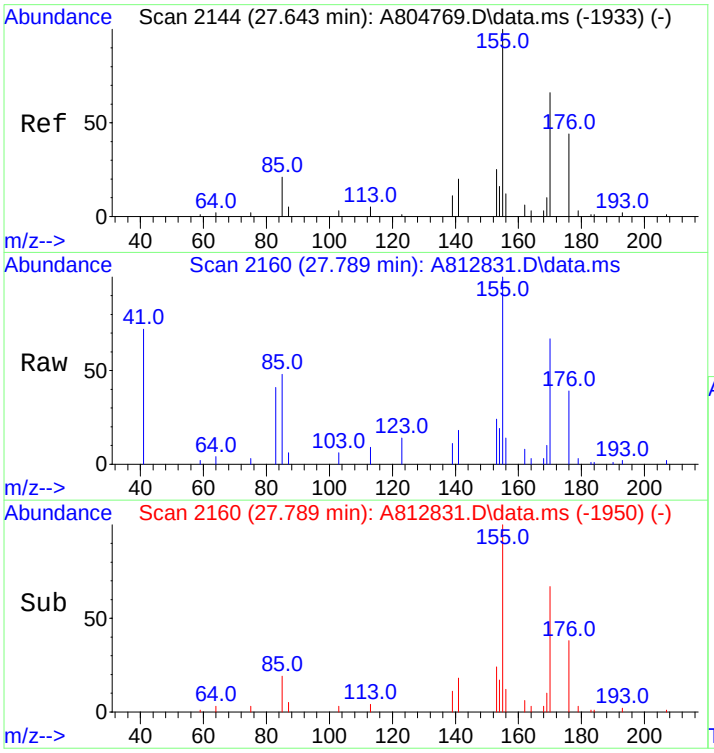




#20
C2-Benzo(b)thiophenes
Concen: 249.53 ng/mL m
RT: 25.809 min Scan# 1943
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

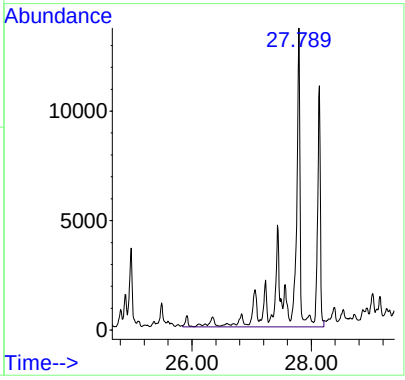
Tgt Ion:162 Resp: 72234

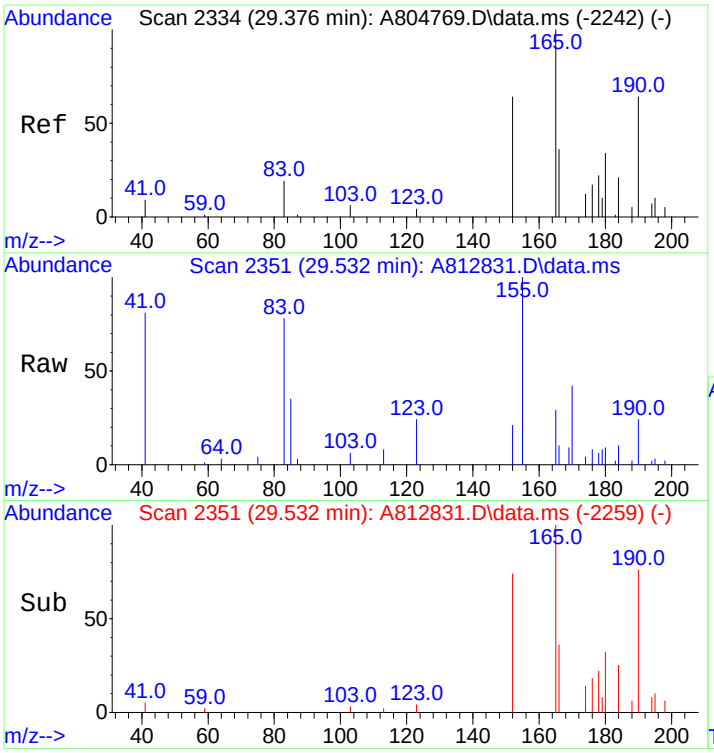




#21
C3-Benzo(b)thiophenes
Concen: 481.14 ng/mL m
RT: 27.789 min Scan# 2160
Delta R.T. 0.007 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

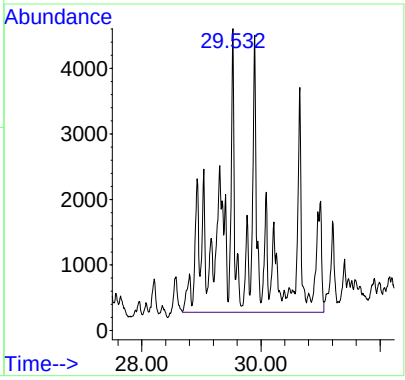
Tgt Ion:176 Resp: 139278

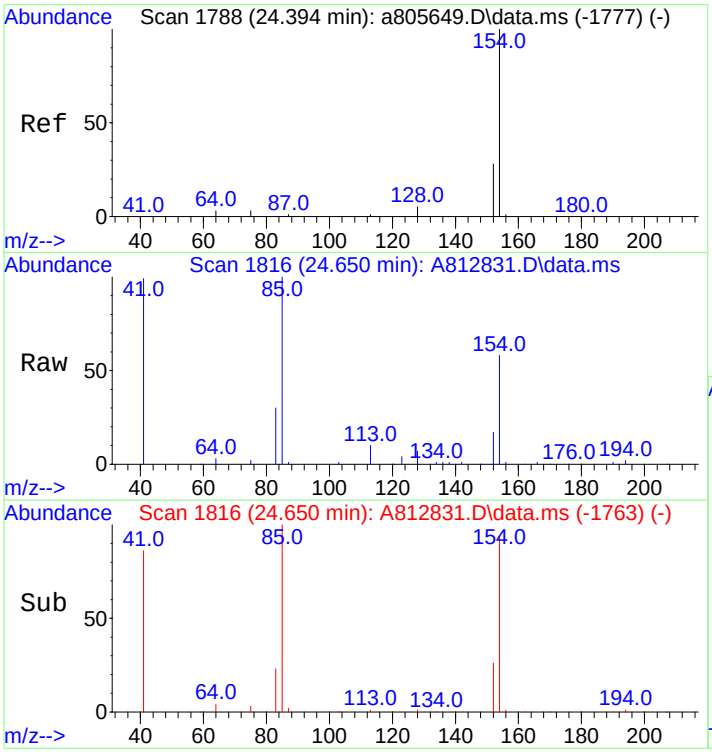




#22
C4-Benzo(b)thiophenes
Concen: 419.86 ng/mL m
RT: 29.532 min Scan# 2351
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:190 Resp: 121540

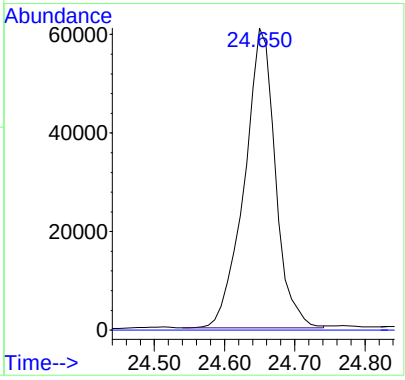


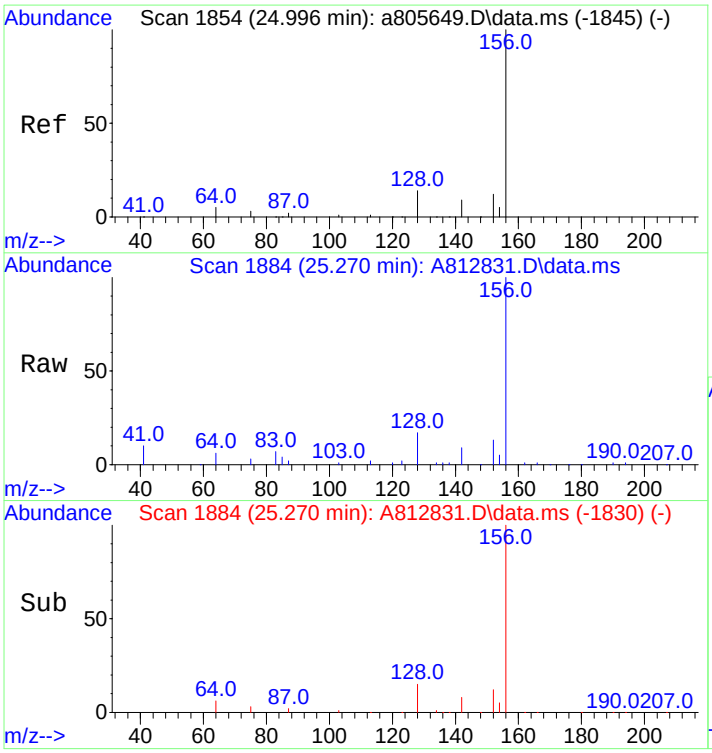


#23
Biphenyl
Concen: 687.62 ng/mL
RT: 24.650 min Scan# 1816
Delta R.T. -0.018 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:154 Resp: 186634

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

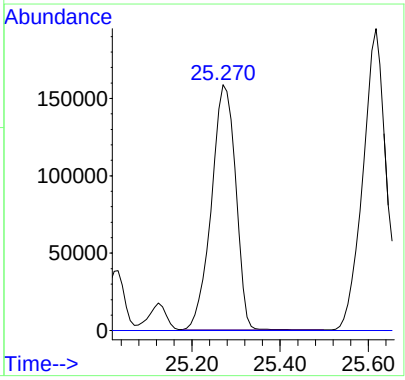


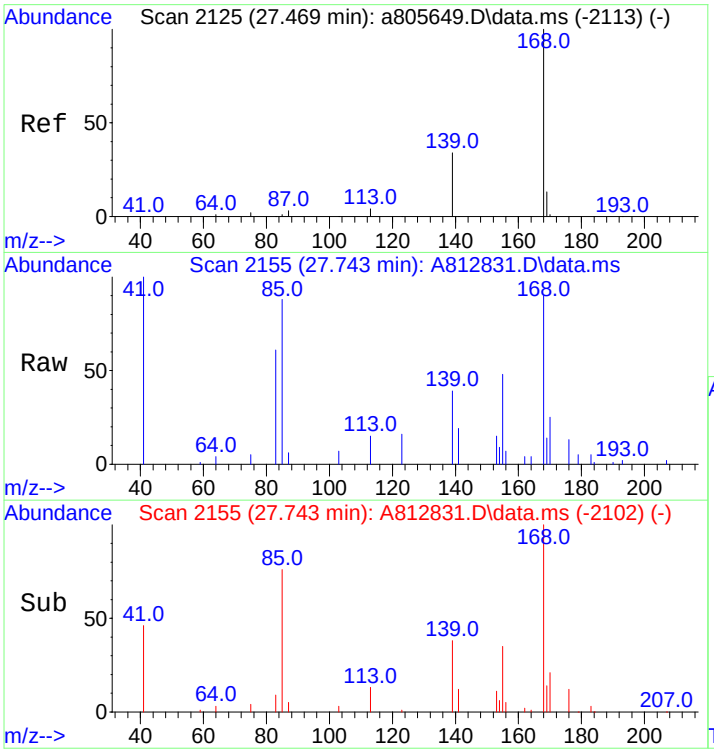


#24
2,6-Dimethylnaphthalene
Concen: 3315.81 ng/mL
RT: 25.270 min Scan# 1884
Delta R.T. -0.010 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:156 Resp: 605392

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

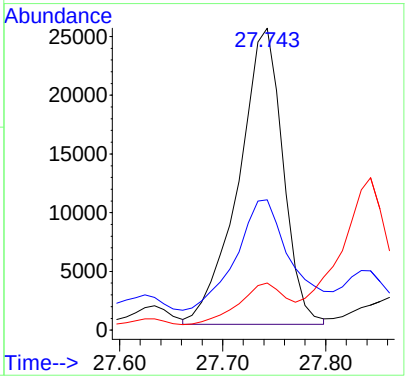


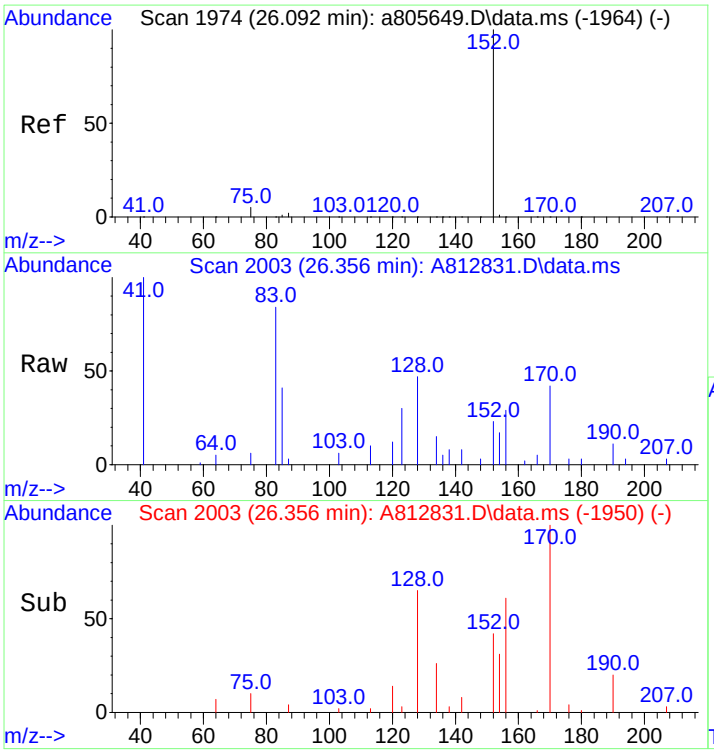


#25
Dibenzofuran
Concen: 265.05 ng/mL
RT: 27.743 min Scan# 2155
Delta R.T. -0.019 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:168 Resp: 75894

Ion	Ratio	Lower	Upper
168	100		
139	45.7	28.0	42.0#
169	15.4	10.6	15.8

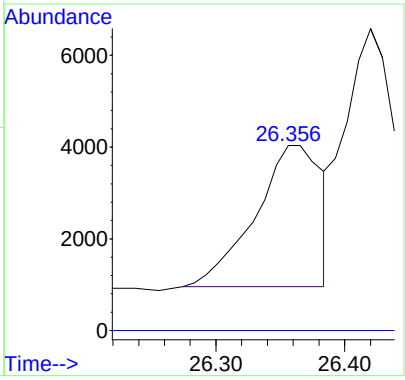


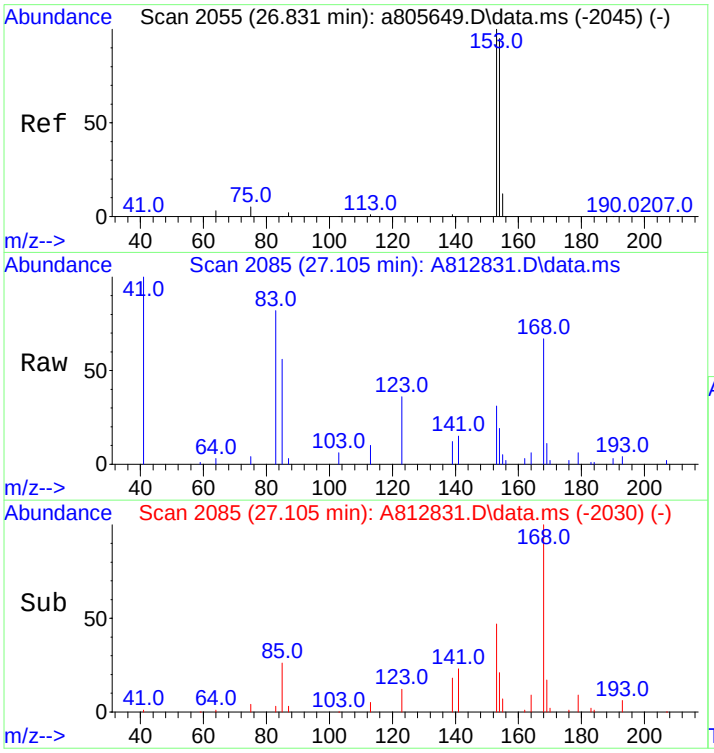


#26
Acenaphthylene
Concen: 33.84 ng/mL
RT: 26.356 min Scan# 2003
Delta R.T. -0.019 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:152 Resp: 11000

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

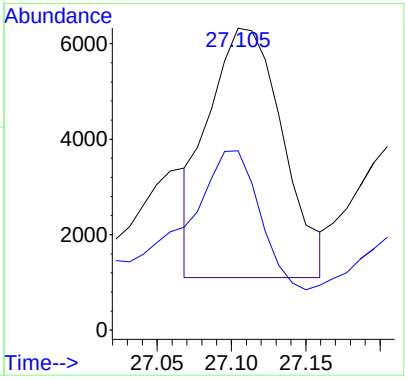


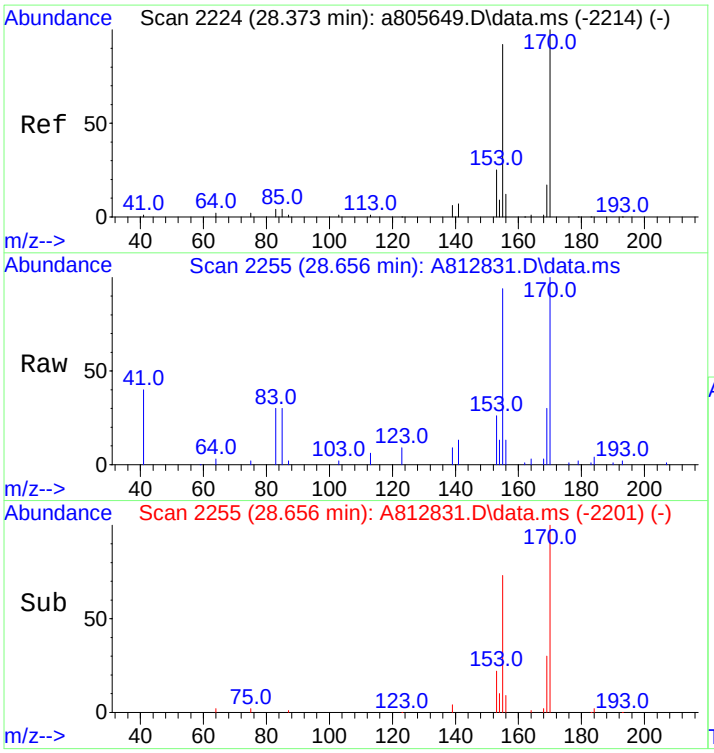


#27
Acenaphthene
Concen: 93.72 ng/mL m
RT: 27.105 min Scan# 2085
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:153 Resp: 18184

Ion	Ratio	Lower	Upper
153	100		
154	74.7	75.4	113.2#

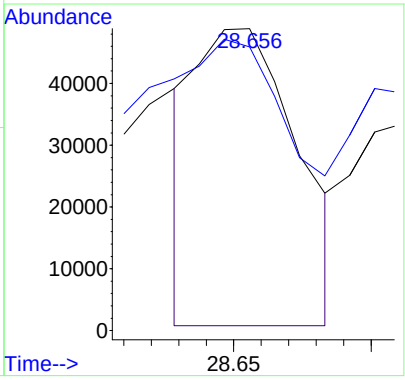


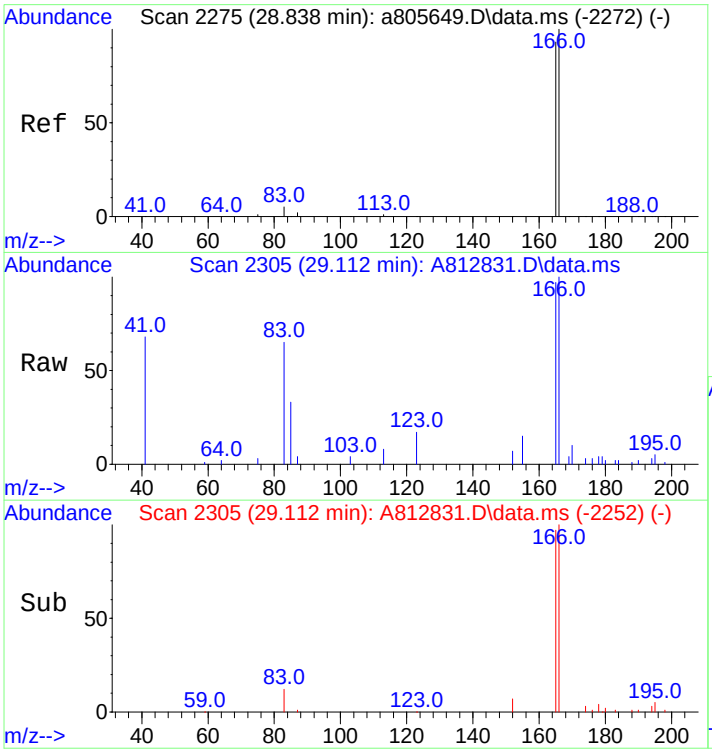


#28
2,3,5-Trimethylnaphthalene
Concen: 789.83 ng/mL m
RT: 28.656 min Scan# 2255
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:170 Resp: 124200

Ion	Ratio	Lower	Upper
170	100		
155	177.9	71.7	107.5#

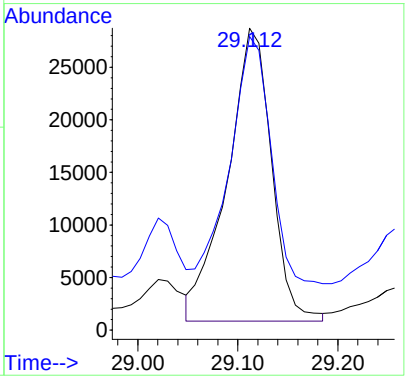


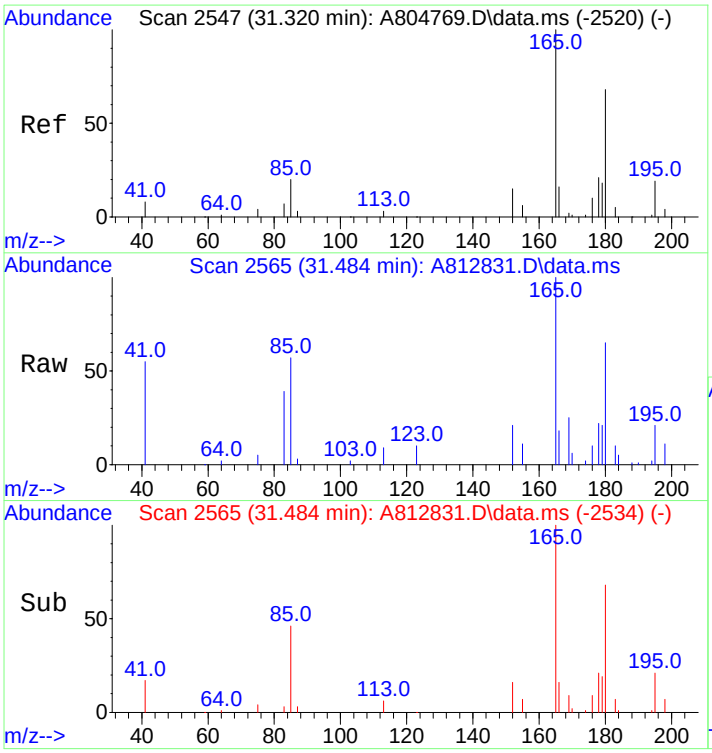


#29
Fluorene
Concen: 393.71 ng/mL m
RT: 29.112 min Scan# 2305
Delta R.T. -0.018 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:166 Resp: 85680

Ion	Ratio	Lower	Upper
166	100		
165	105.9	74.2	111.2

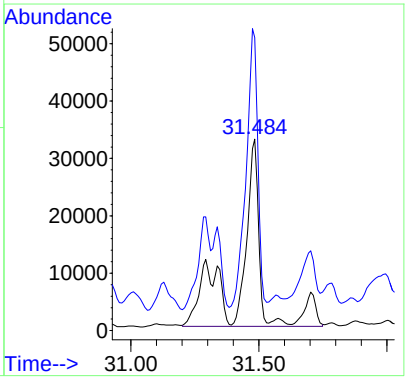


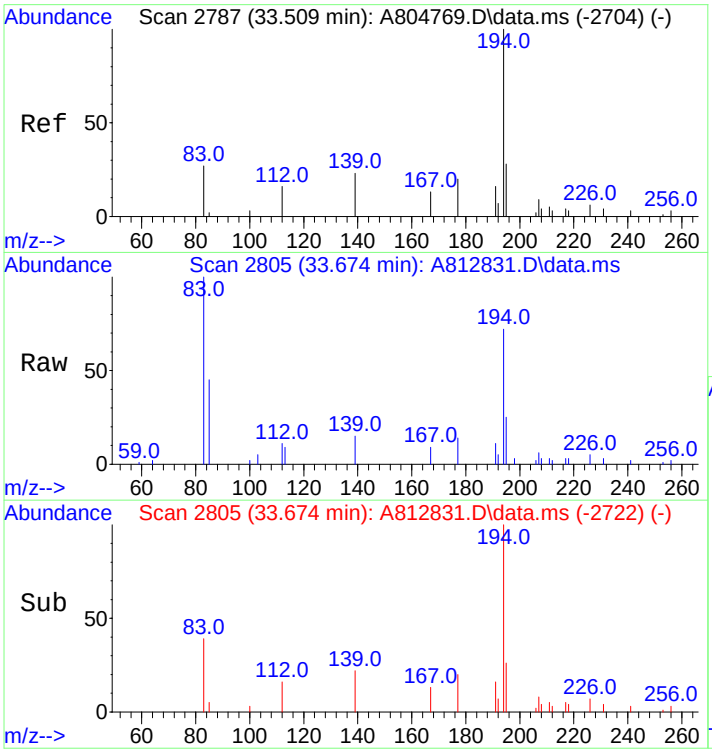


#30
C1-Fluorenes
Concen: 848.38 ng/mL m
RT: 31.484 min Scan# 2565
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:180 Resp: 184625

Ion	Ratio	Lower	Upper
180	100		
165	82.7	122.4	183.6#

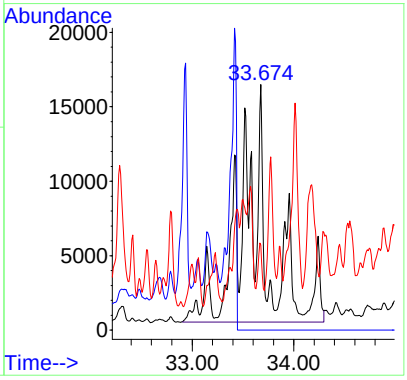


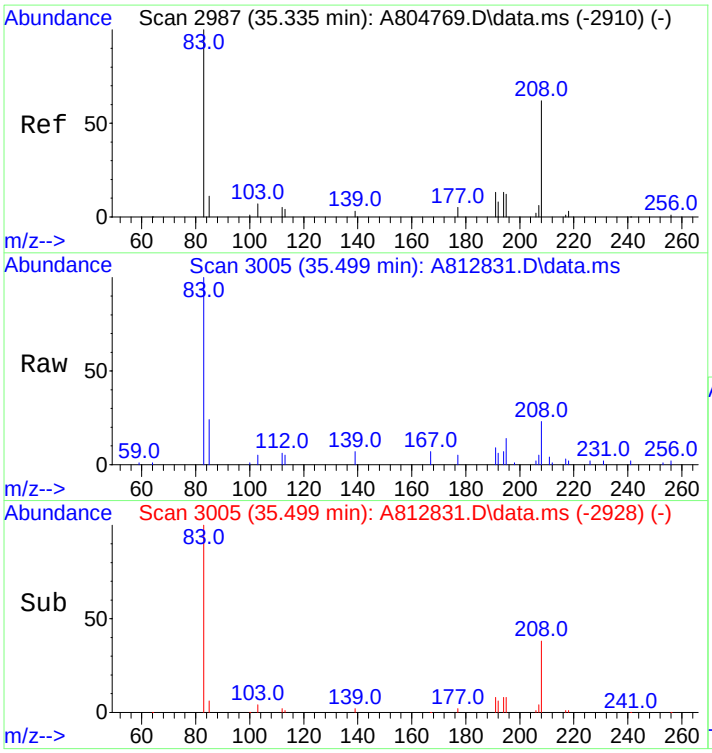


#31
C2-Fluorenes
Concen: 1281.07 ng/mL m
RT: 33.674 min Scan# 2805
Delta R.T. 0.068 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:194 Resp: 278786

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.4	41.0#

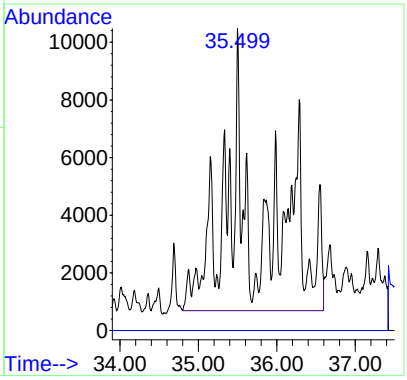


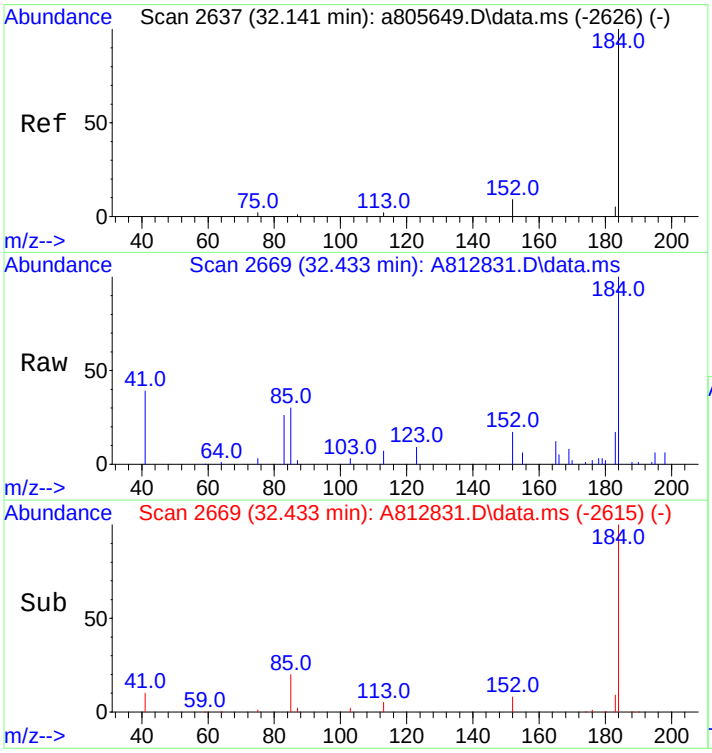


#32
C3-Fluorenes
Concen: 1264.77 ng/mL m
RT: 35.499 min Scan# 3005
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:208 Resp: 275240

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

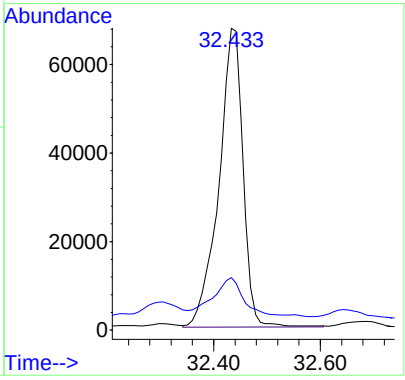


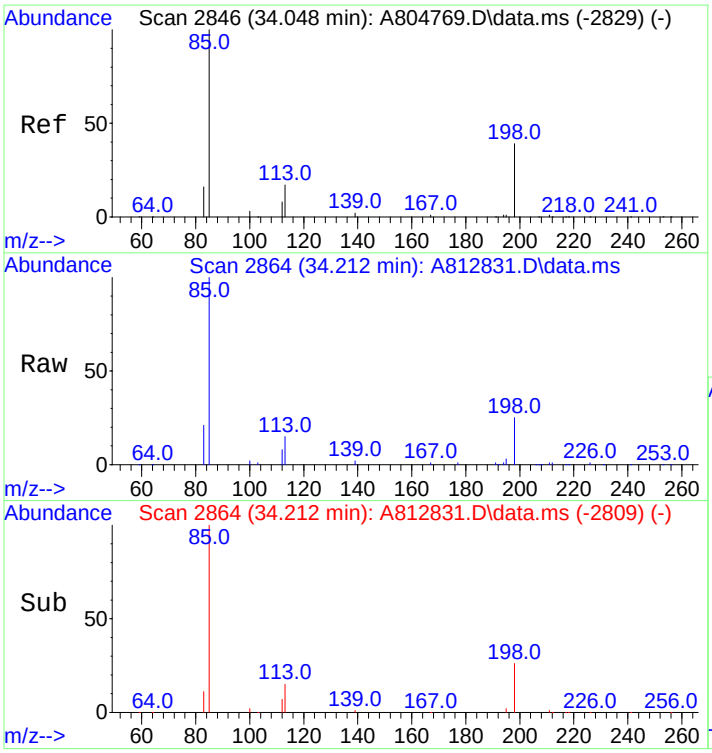


#33
Dibenzothiophene
Concen: 708.69 ng/mL
RT: 32.433 min Scan# 2669
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:184 Resp: 212077

Ion	Ratio	Lower	Upper
184	100		
152	15.4	7.8	11.8#

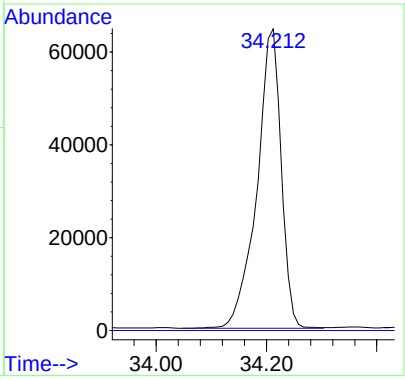


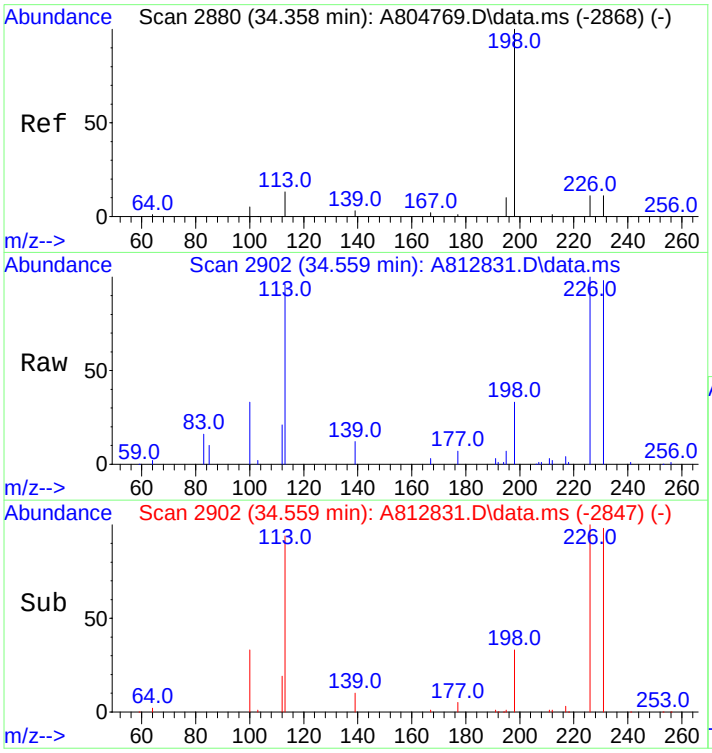


#34
4-Methyldibenzothiophene(4MDT)
Concen: 656.28 ng/mL
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 196394

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

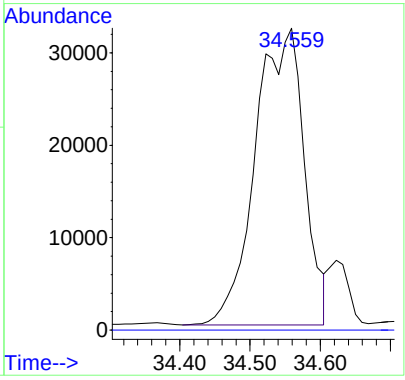


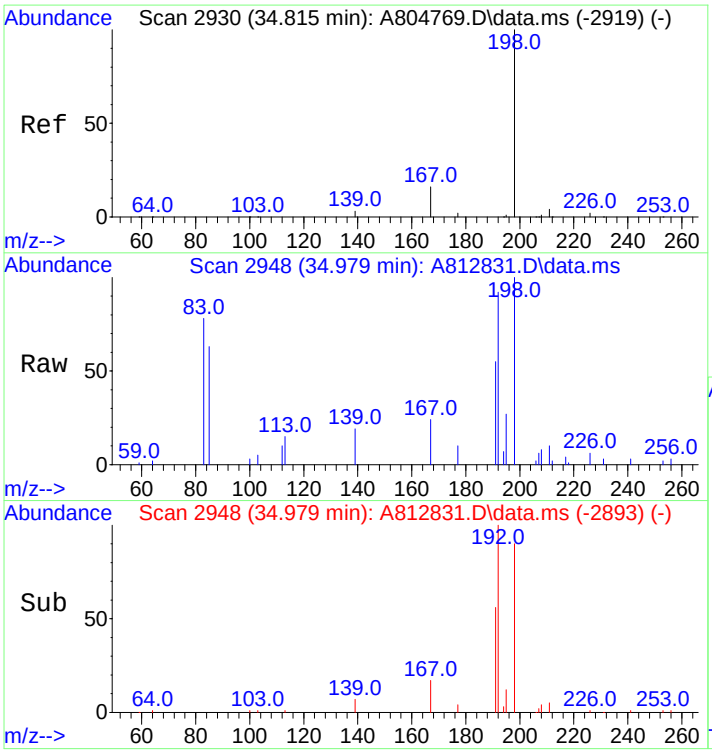


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 518.11 ng/mL
RT: 34.559 min Scan# 2902
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 155047

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

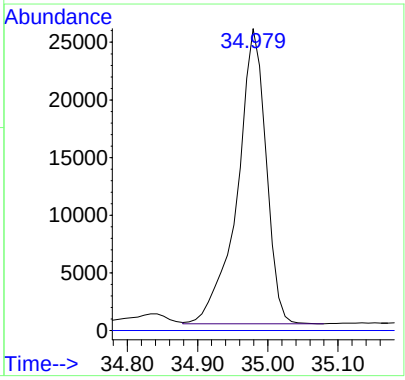


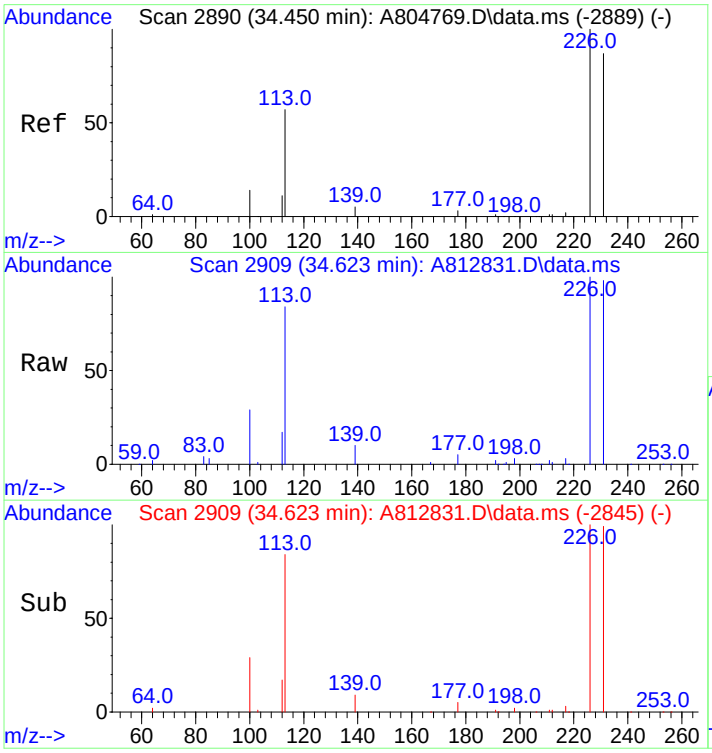


#36
1-Methyldibenzothiophene(1MDT)
Concen: 244.05 ng/mL
RT: 34.979 min Scan# 2948
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 73034

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

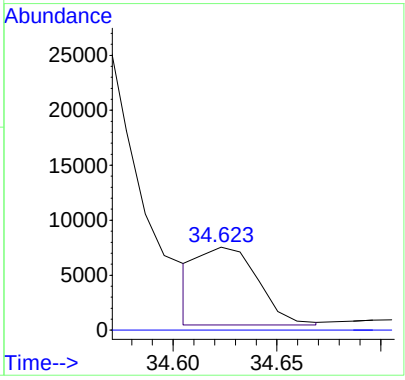


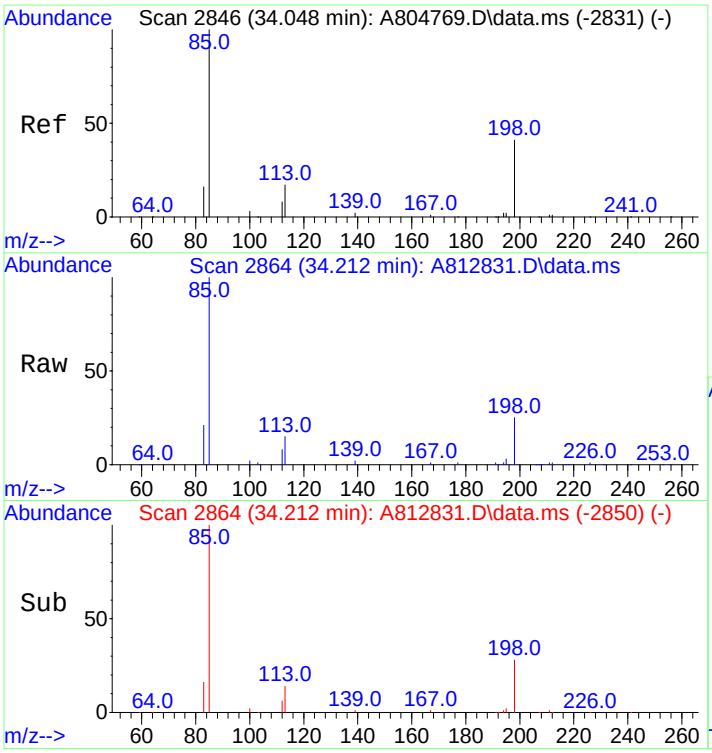


#37
OTP
Concen: 47.25 ng/mL m
RT: 34.623 min Scan# 2909
Delta R.T. 0.037 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 14139

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

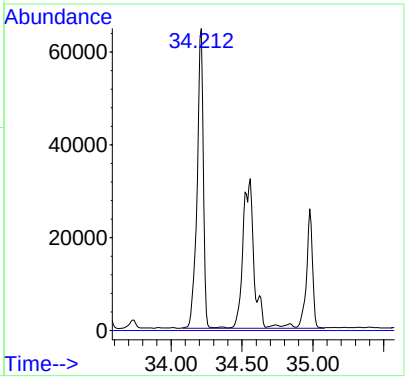


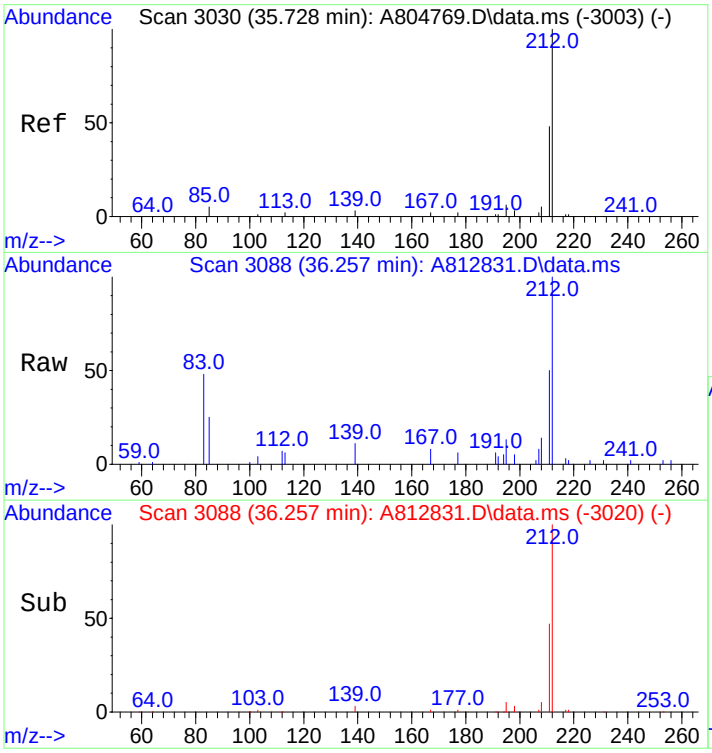


#38
C1-Dibenzothiophenes
Concen: 1492.16 ng/mL m
RT: 34.212 min Scan# 2864
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:198 Resp: 446536

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

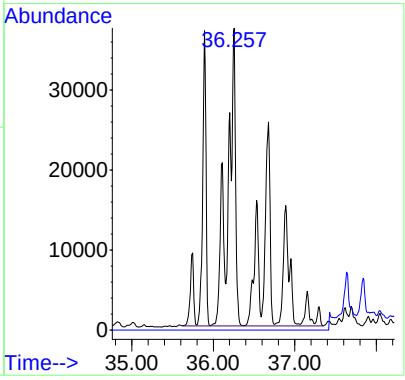


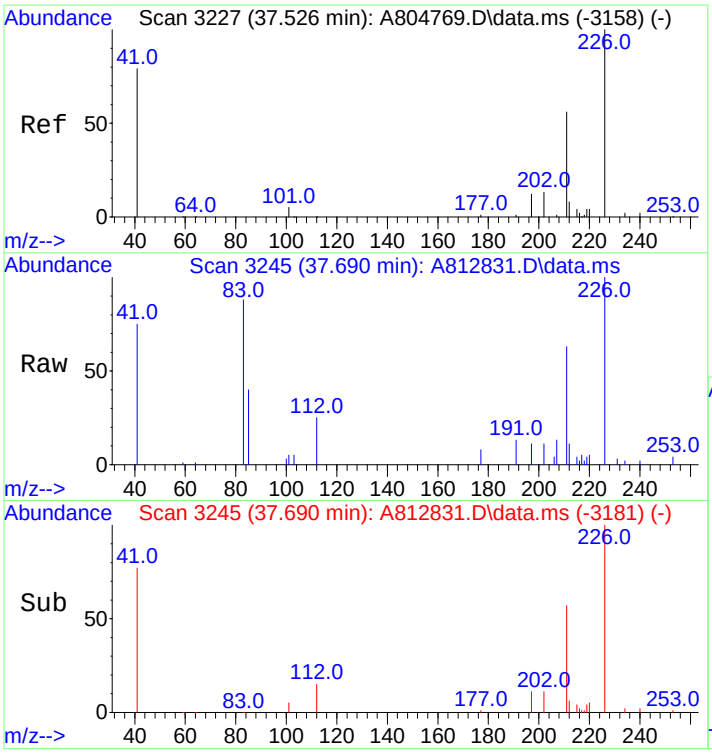


#39
C2-Dibenzothiophenes
Concen: 2100.92 ng/mL m
RT: 36.257 min Scan# 3088
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:212 Resp: 628709

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

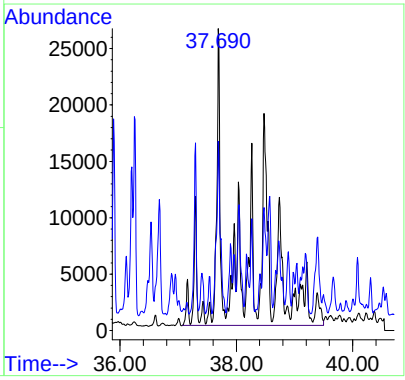


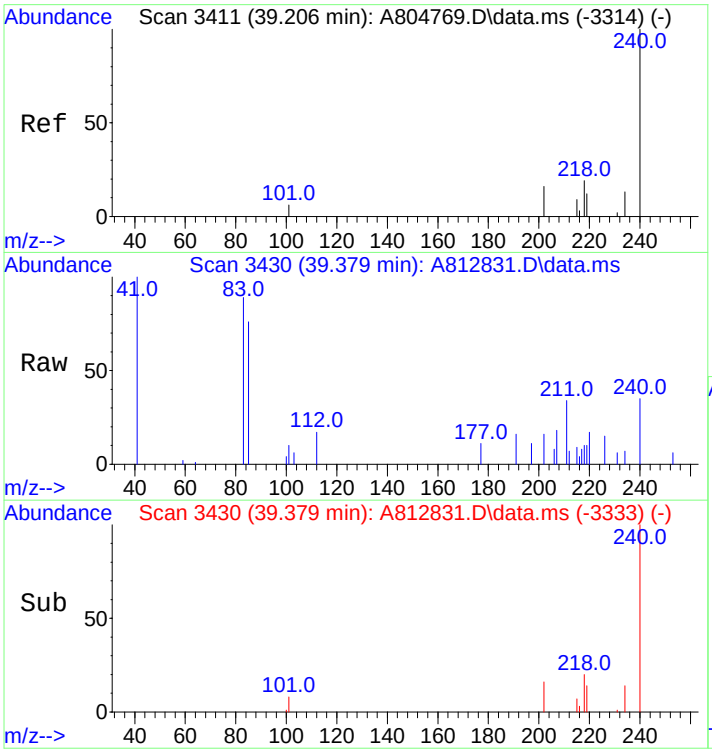


#40
C3-Dibenzothiophenes
Concen: 1813.73 ng/mL m
RT: 37.690 min Scan# 3245
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:226 Resp: 542766

Ion	Ratio	Lower	Upper
226	100		
211	2.4	50.2	75.2#

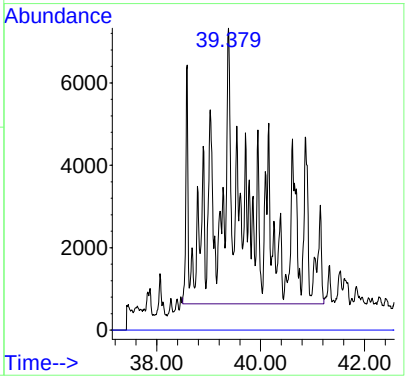


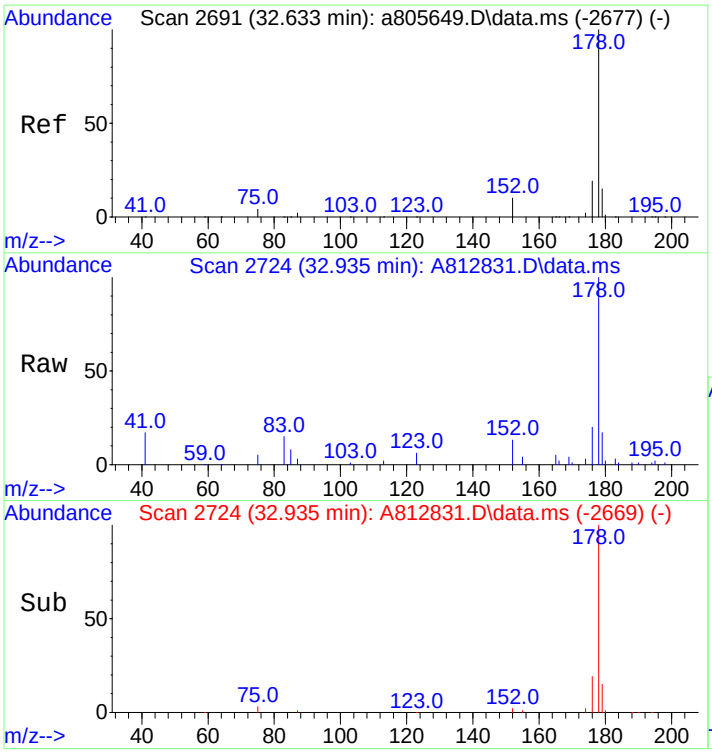


#41
C4-Dibenzothiophenes
Concen: 1001.31 ng/mL m
RT: 39.379 min Scan# 3430
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:240 Resp: 299645

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

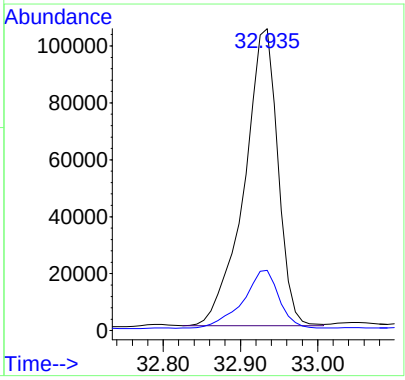


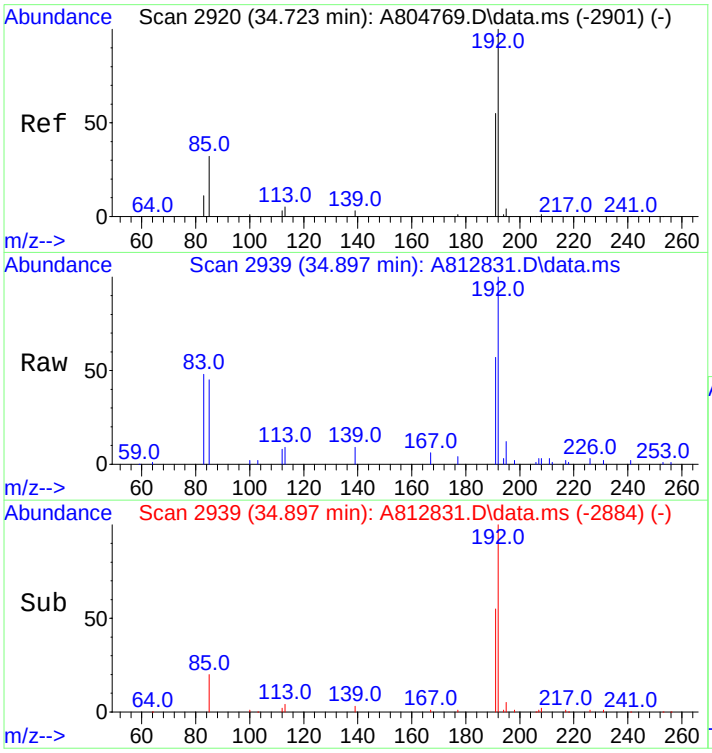


#43
Phenanthrene
Concen: 1100.18 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:178 Resp: 316886

Ion	Ratio	Lower	Upper
178	100		
176	21.0	15.2	22.8

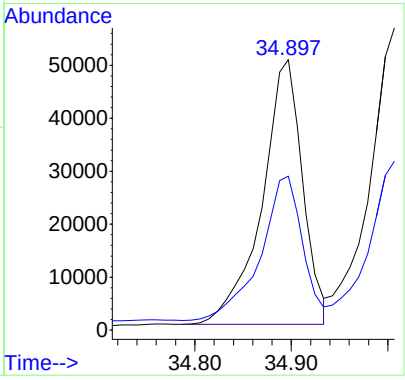


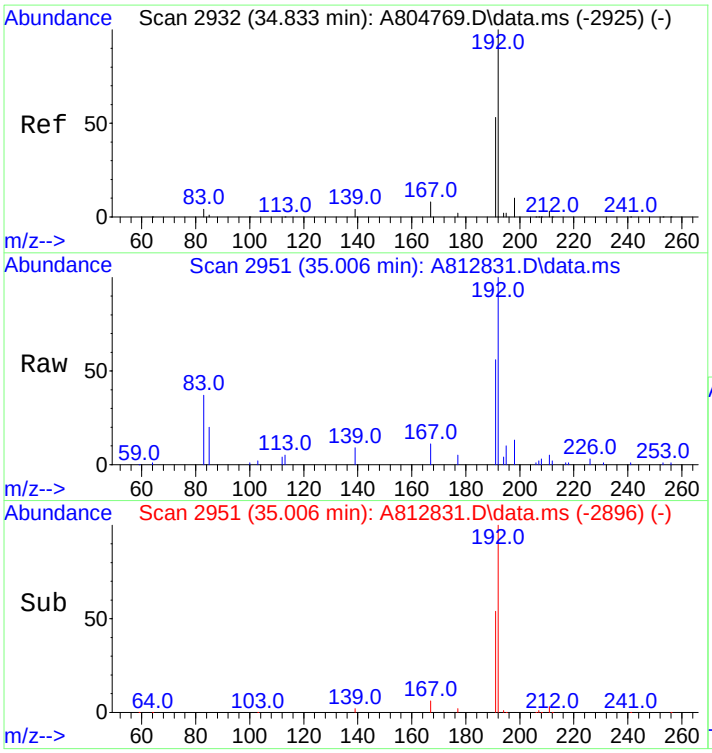


#44
3-Methylphenanthrene(3MP)
Concen: 509.28 ng/mL
RT: 34.897 min Scan# 2939
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 146687

Ion	Ratio	Lower	Upper
192	100		
191	56.1	45.5	68.3

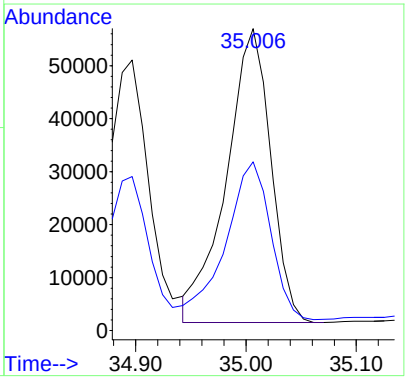


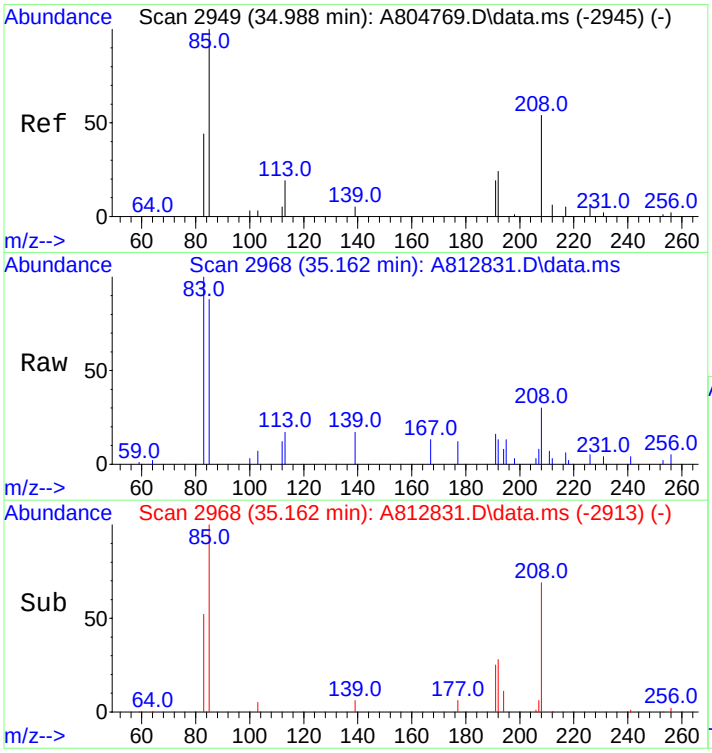


#45
2-Methylphenanthrene(2MP)
Concen: 540.13 ng/mL
RT: 35.006 min Scan# 2951
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 155574

Ion	Ratio	Lower	Upper
192	100		
191	53.5	44.6	67.0

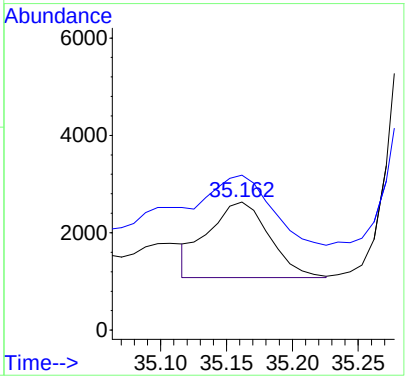


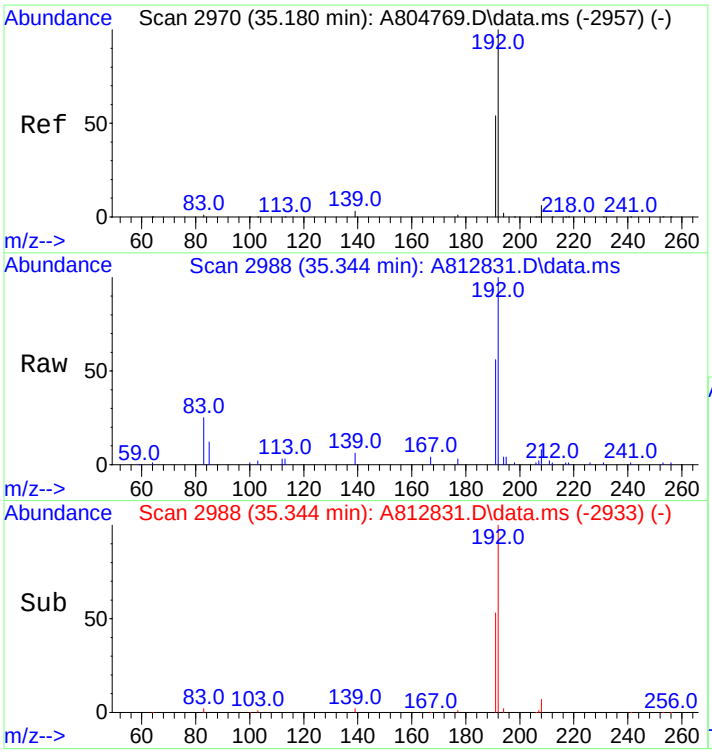


#46
2-Methylanthracene(2MA)
Concen: 17.42 ng/mL m
RT: 35.162 min Scan# 2968
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 5018

Ion	Ratio	Lower	Upper
192	100		
191	135.5	96.9	145.3

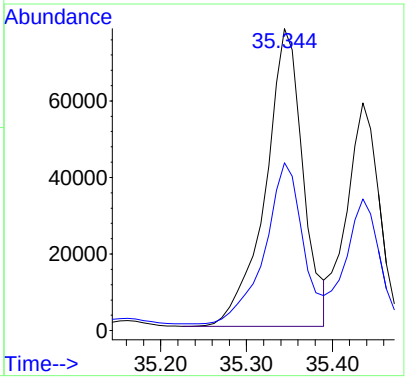


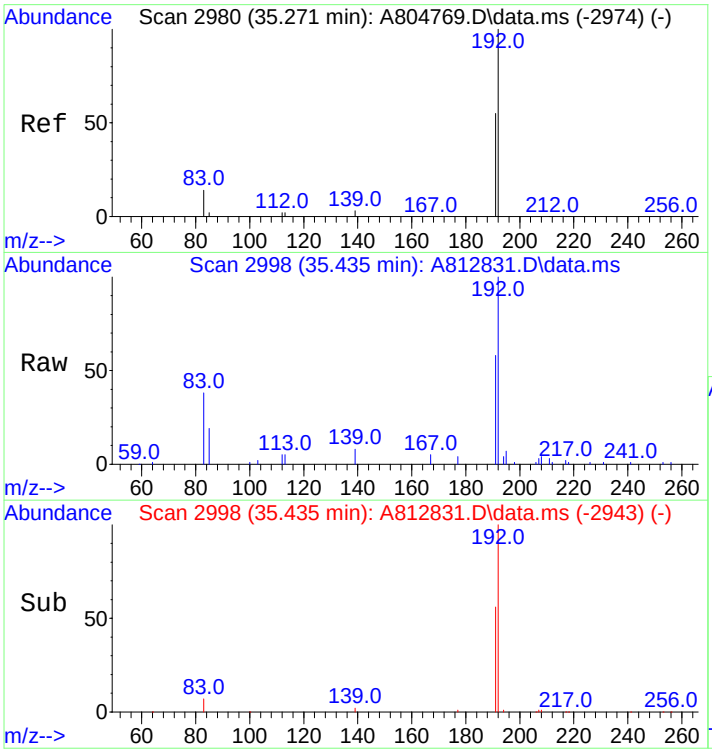


#47
9/4-Methylphenanthrene(9MP)
Concen: 824.36 ng/mL
RT: 35.344 min Scan# 2988
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 237440

Ion	Ratio	Lower	Upper
192	100		
191	55.0	44.5	66.7

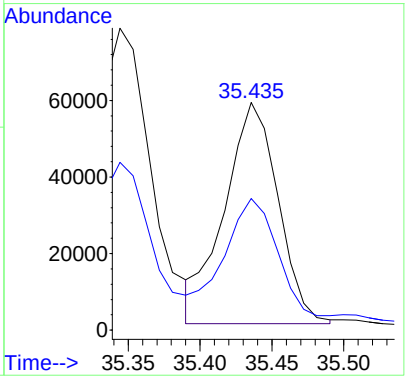


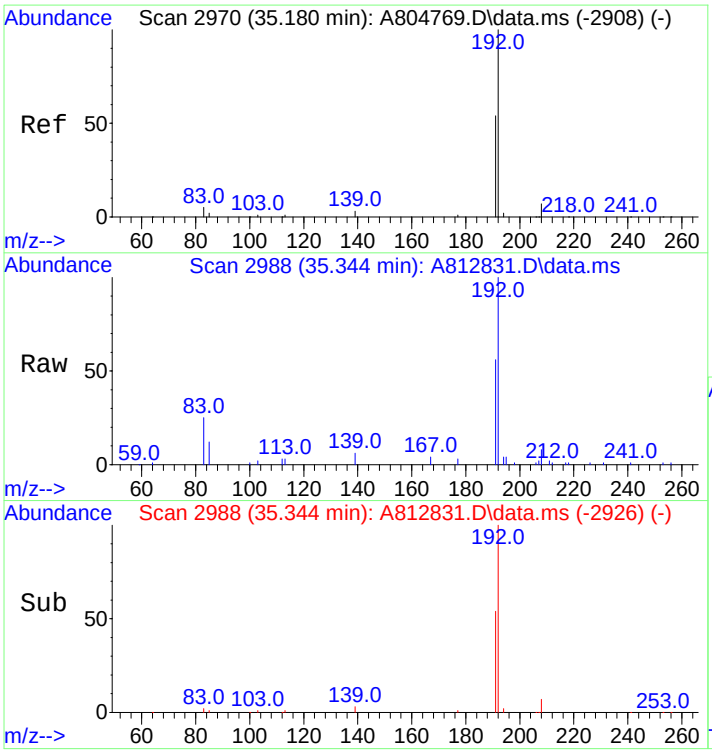


#48
1-Methylphenanthrene(1MP)
Concen: 522.02 ng/mL m
RT: 35.435 min Scan# 2998
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 150356

Ion	Ratio	Lower	Upper
192	100		
191	51.6	46.2	69.4

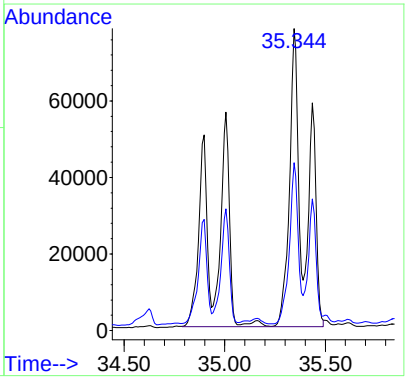


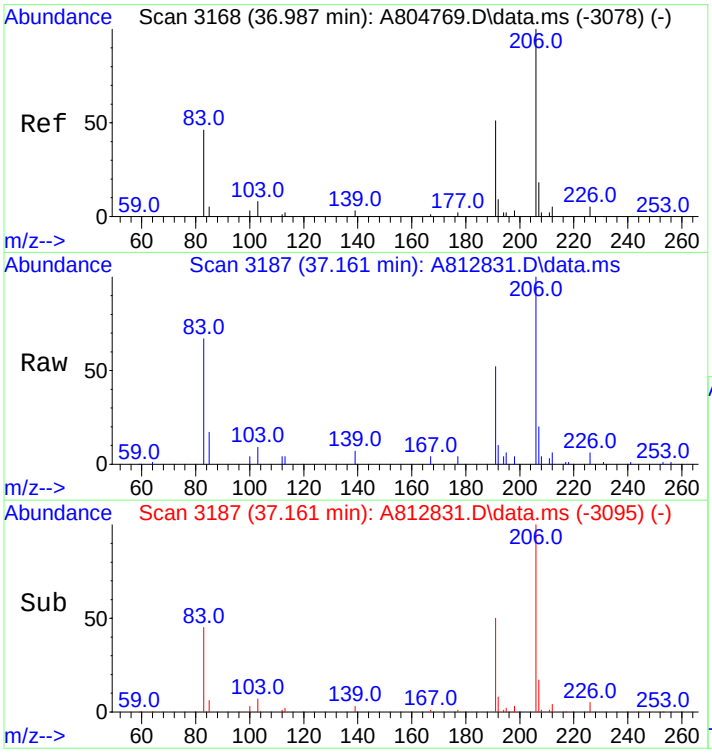


#49
C1-Phenanthrenes/Anthracenes
Concen: 2458.47 ng/mL m
RT: 35.344 min Scan# 2988
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 708112

Ion	Ratio	Lower	Upper
192	100		
191	18.4	44.5	66.7#

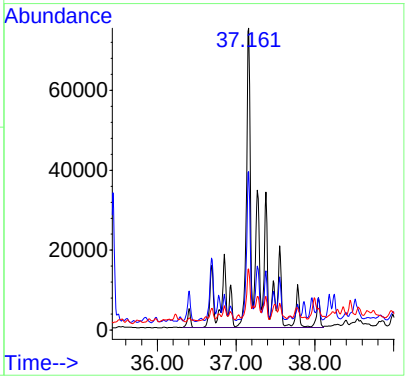


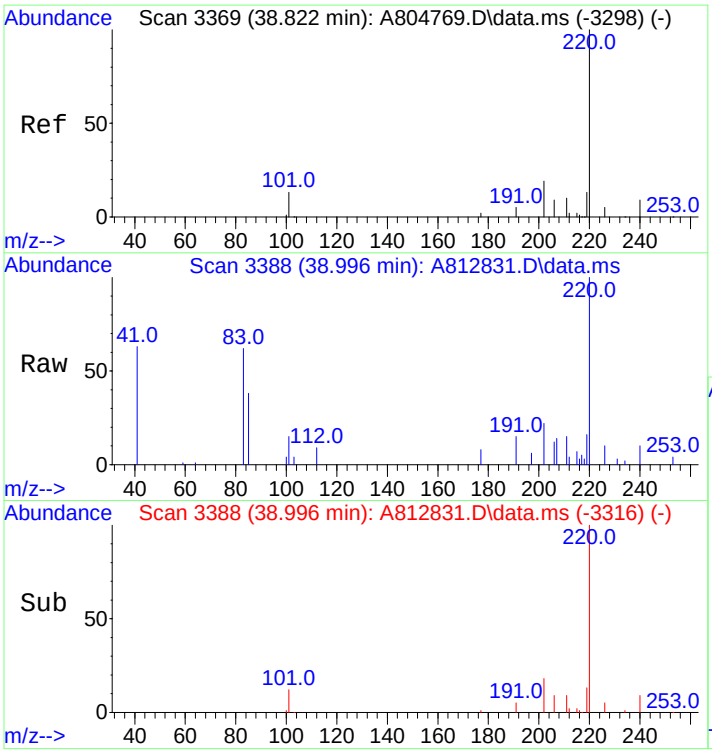


#50
C2-Phenanthrenes/Anthracenes
Concen: 2619.72 ng/mL m
RT: 37.161 min Scan# 3187
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:206 Resp: 754557

Ion	Ratio	Lower	Upper
206	100		
191	16.4	42.0	63.0#
207	5.7	16.2	24.4#

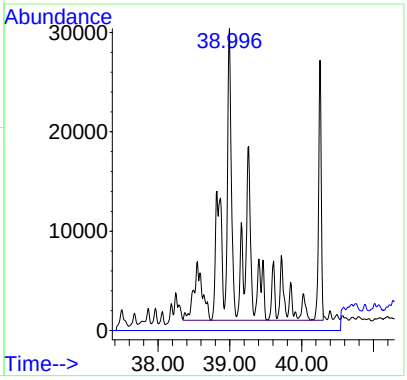


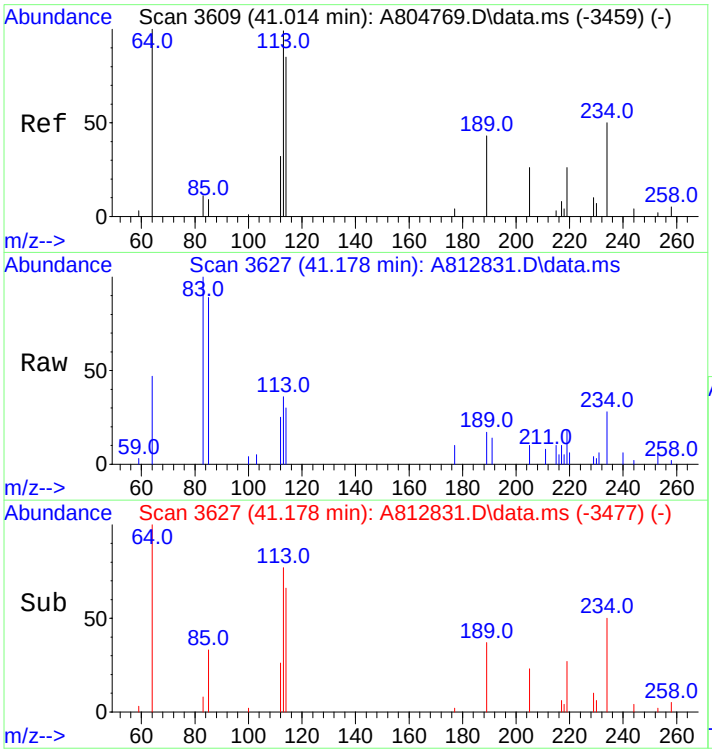


#52
C3-Phenanthrenes/Anthracenes
Concen: 1681.02 ng/mL m
RT: 38.996 min Scan# 3388
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:220 Resp: 484184

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

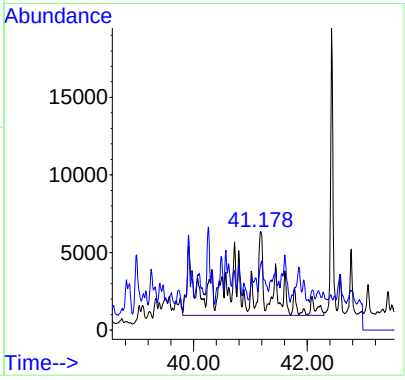


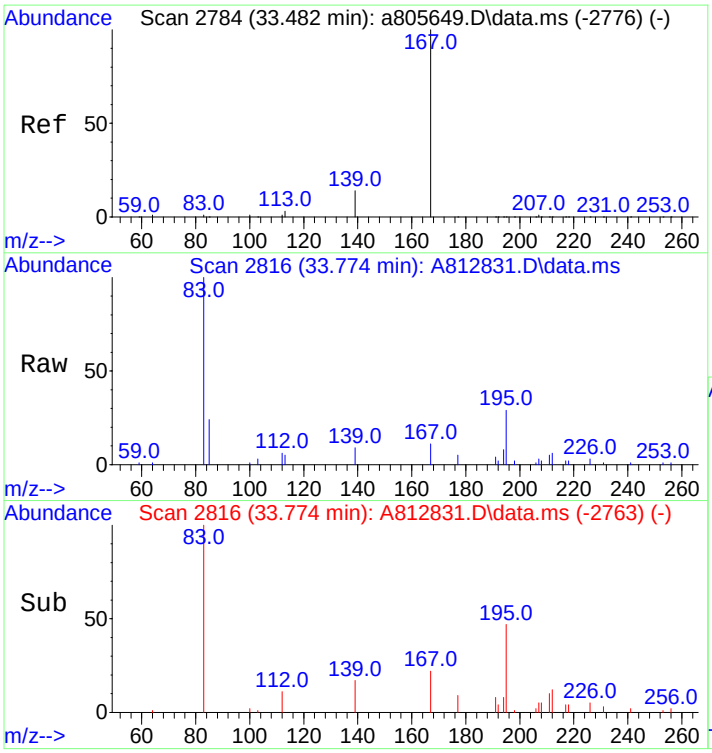


#53
C4-Phenanthrenes/Anthracenes
Concen: 700.12 ng/mL m
RT: 41.178 min Scan# 3627
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 201655

Ion	Ratio	Lower	Upper
234	100		
219	2.6	52.3	78.5#

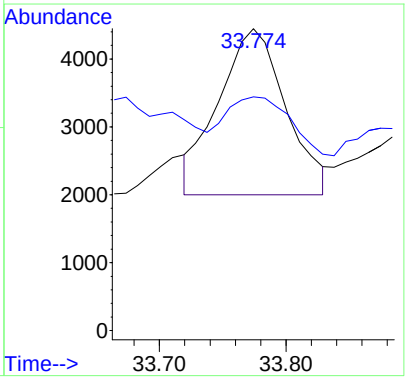


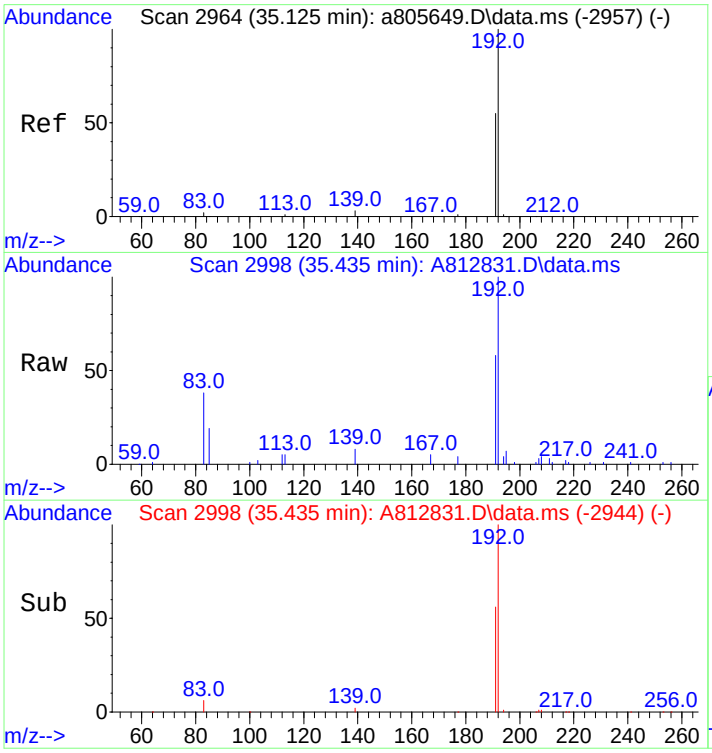


#56
Carbazole
Concen: 32.28 ng/mL m
RT: 33.774 min Scan# 2816
Delta R.T. -0.019 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:167 Resp: 9037

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.6	16.0#

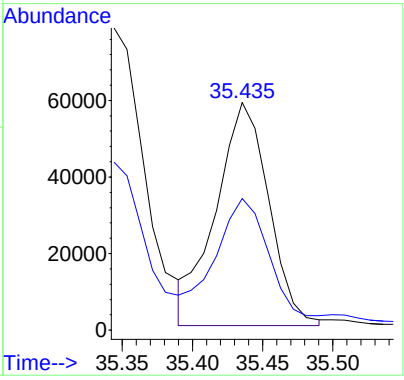


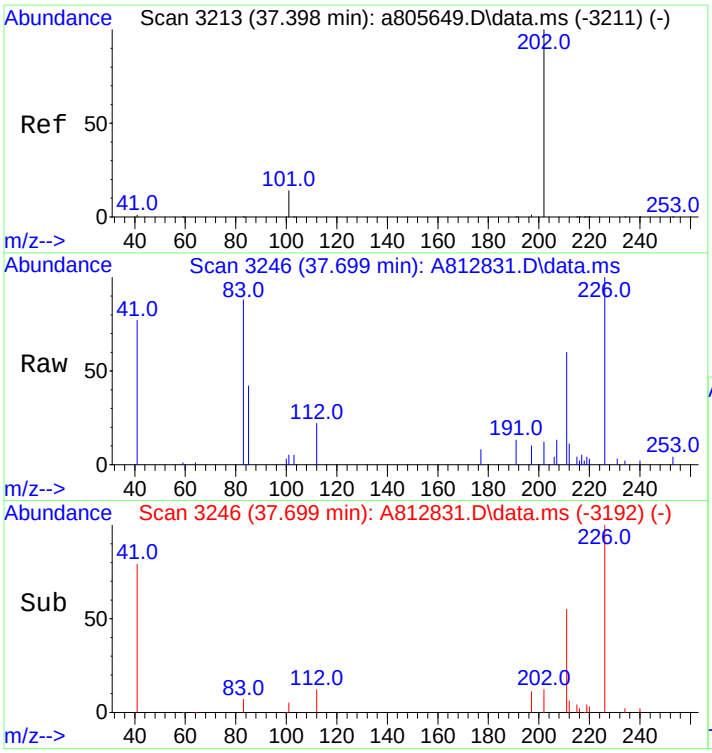


#57
1-Methylphenanthrene
Concen: 751.02 ng/mL m
RT: 35.435 min Scan# 2998
Delta R.T. -0.010 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:192 Resp: 153338

Ion	Ratio	Lower	Upper
192	100		
191	50.6	44.2	66.4

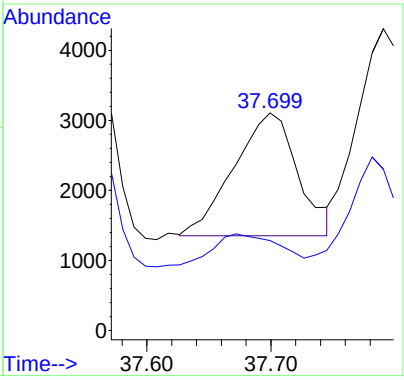


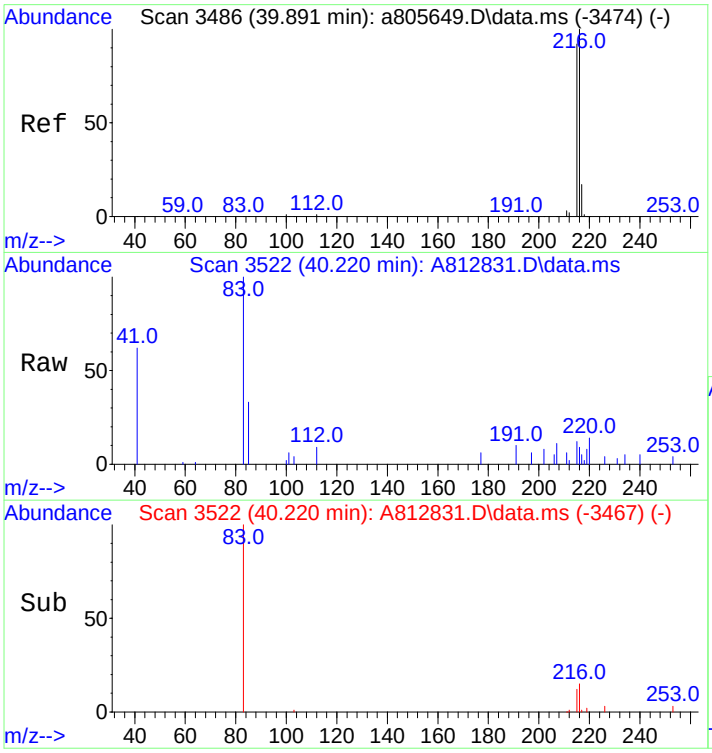


#58
Fluoranthene
Concen: 21.20 ng/mL m
RT: 37.699 min Scan# 3246
Delta R.T. -0.010 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:202 Resp: 6289

Ion	Ratio	Lower	Upper
202	100		
101	0.0	13.6	20.4#

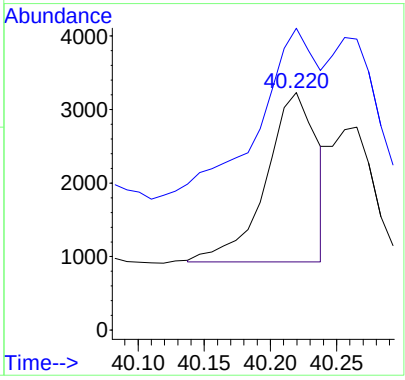


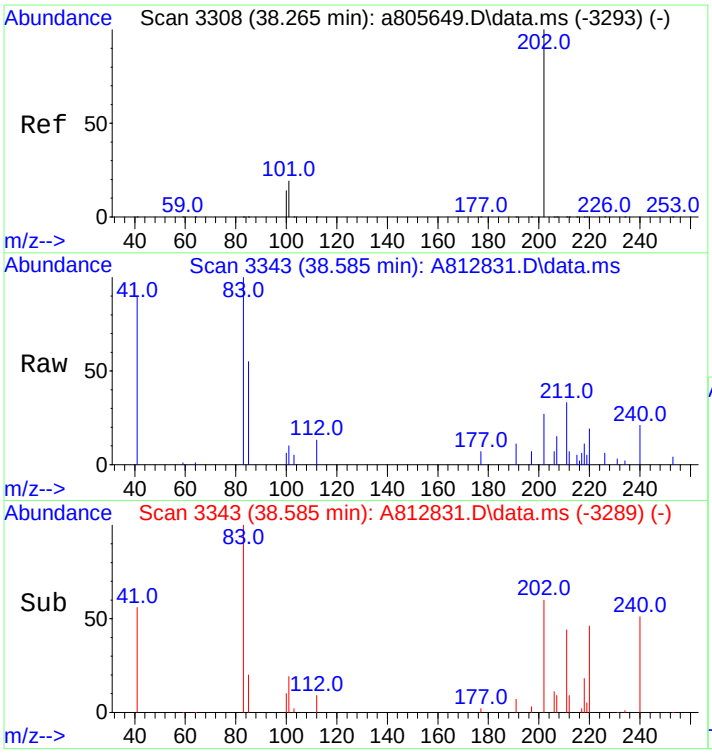


#59
Benzo(b)fluorene
Concen: 36.06 ng/mL m
RT: 40.220 min Scan# 3522
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:216 Resp: 6189

Ion	Ratio	Lower	Upper
216	100		
215	504.7	74.2	111.2#

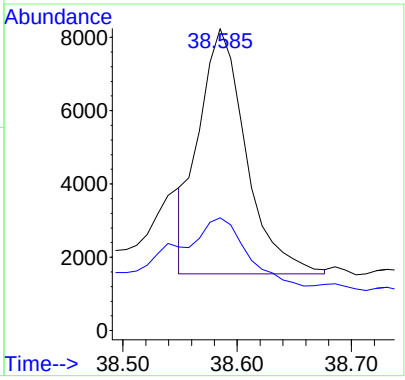


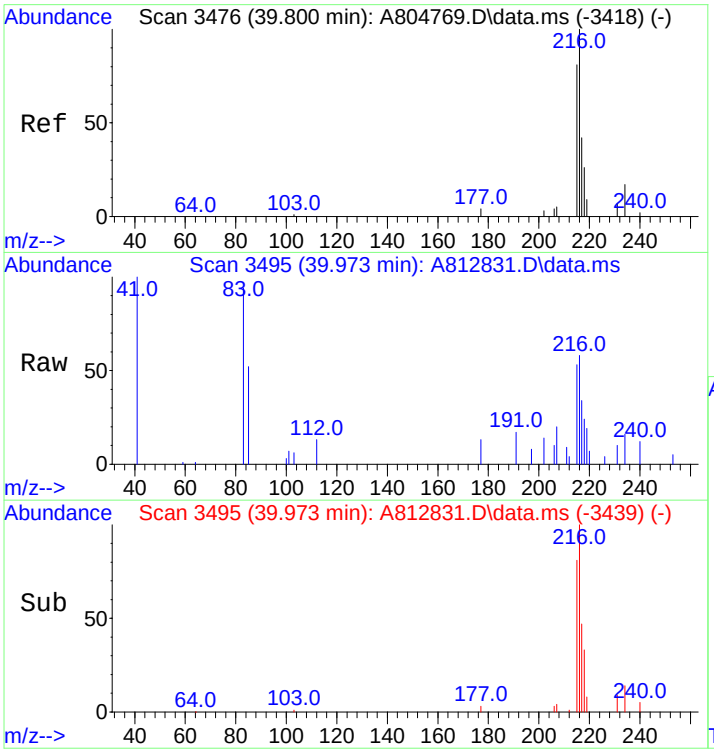


#60
Pyrene
Concen: 64.09 ng/mL m
RT: 38.585 min Scan# 3343
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:202 Resp: 19232

Ion	Ratio	Lower	Upper
202	100		
101	56.1	15.4	23.2#

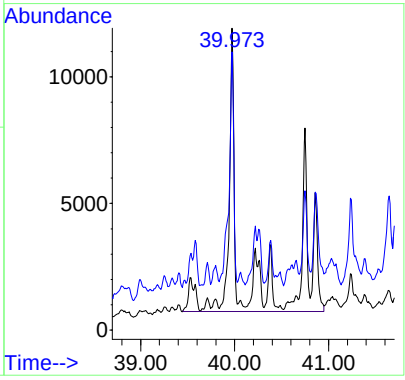


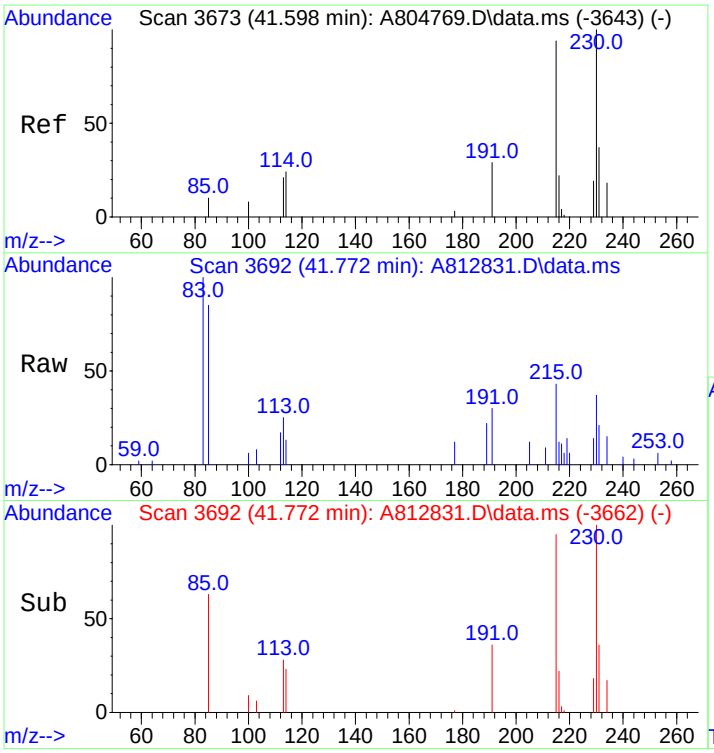


#61
C1-Fluoranthenes/Pyrenes
Concen: 359.86 ng/mL m
RT: 39.973 min Scan# 3495
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:216 Resp: 107991

Ion	Ratio	Lower	Upper
216	100		
215	28.9	73.8	110.6#

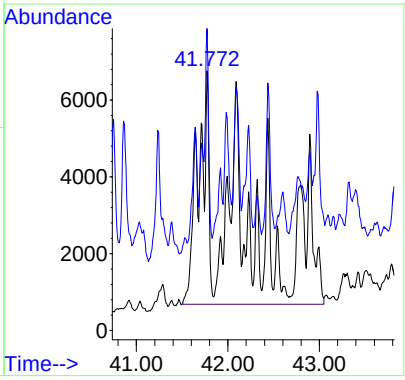


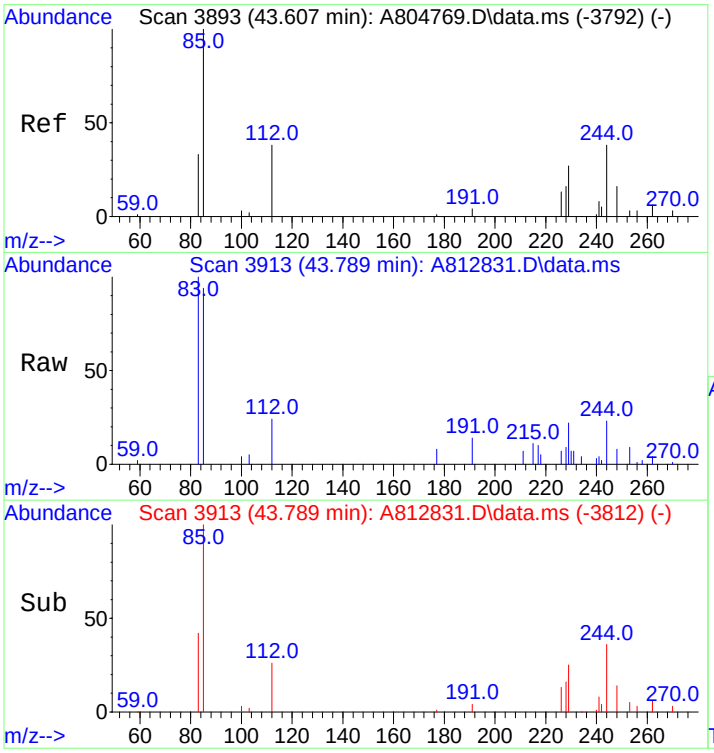


#62
C2-Fluoranthenes/Pyrenes
Concen: 565.40 ng/mL m
RT: 41.772 min Scan# 3692
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:230 Resp: 169671

Ion	Ratio	Lower	Upper
230	100		
215	8.1	93.1	139.7#

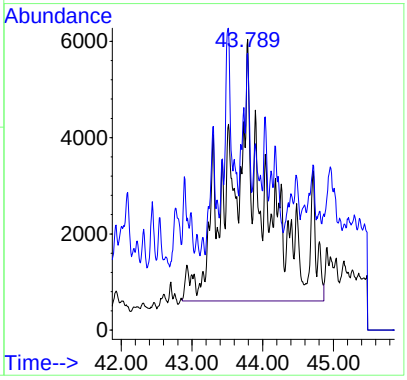


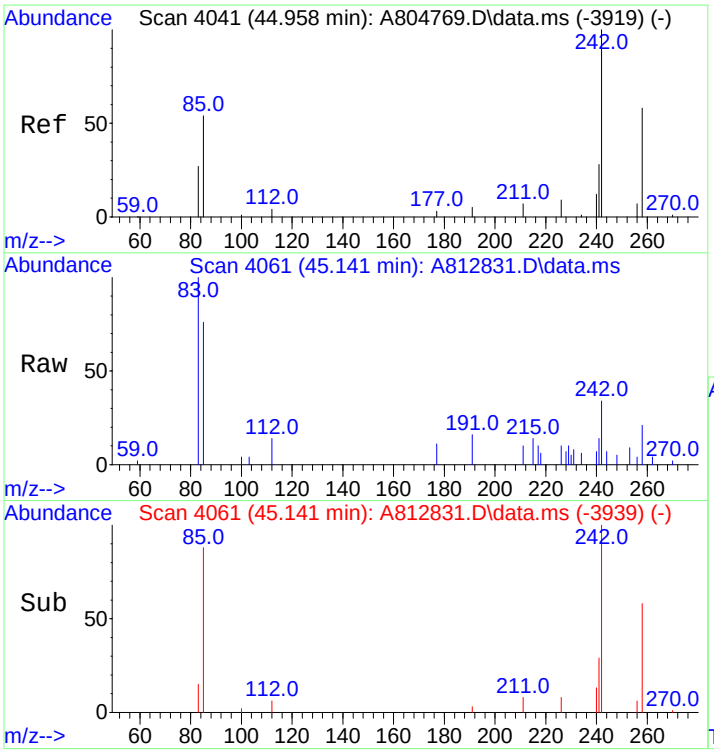


#63
C3-Fluoranthenes/Pyrenes
Concen: 651.98 ng/mL m
RT: 43.789 min Scan# 3913
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:244 Resp: 195654

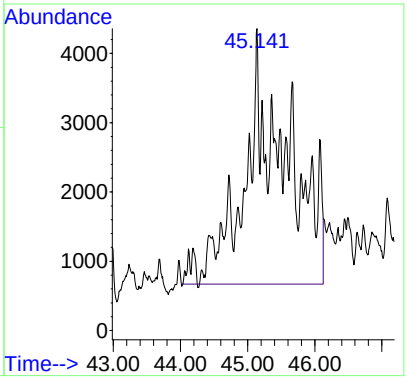
Ion	Ratio	Lower	Upper
244	100		
229	2.6	76.2	114.2#

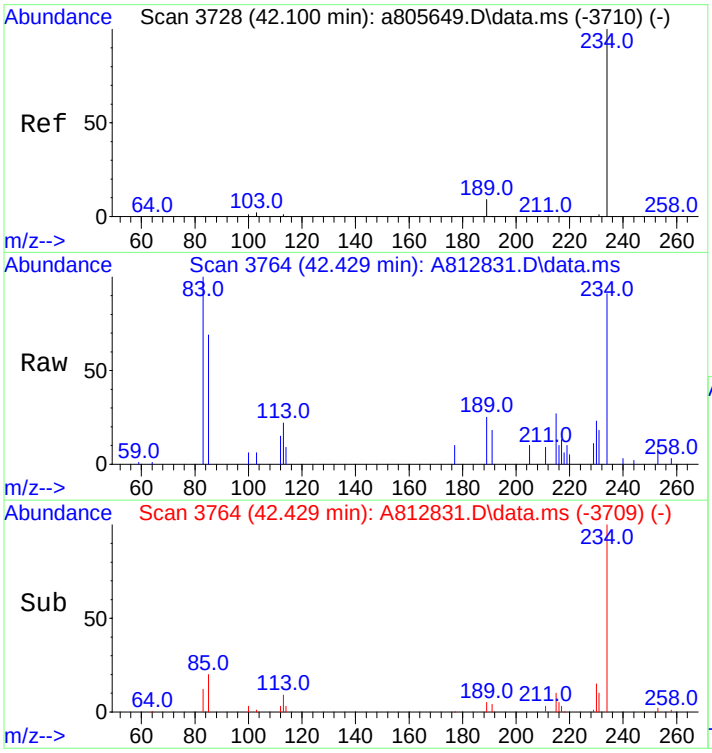




#64
C4-Fluoranthenes/Pyrenes
Concen: 516.87 ng/mL m
RT: 45.141 min Scan# 4061
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:258 Resp: 155110

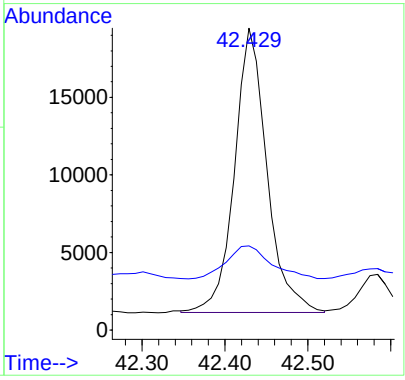


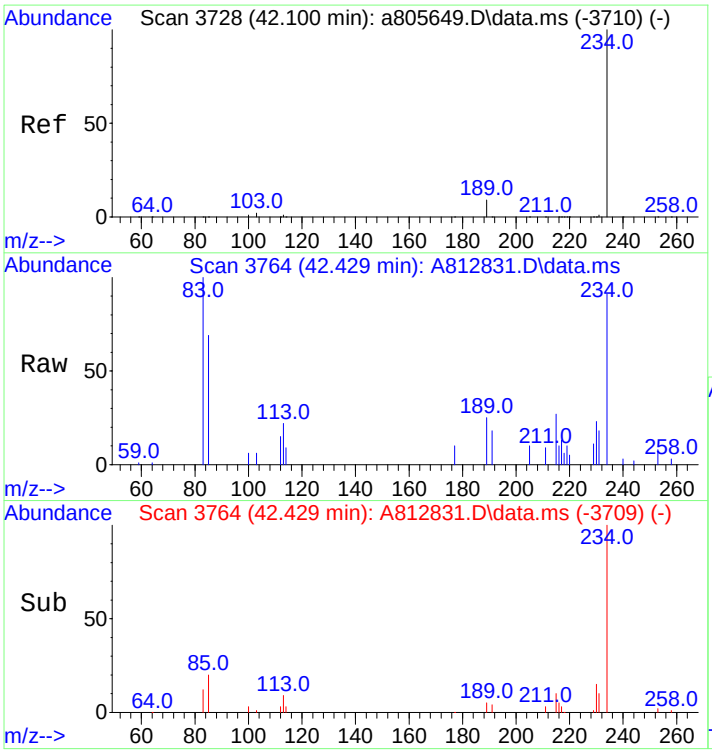


#66
Naphthobenzothiophene
Concen: 179.46 ng/ml m
RT: 42.429 min Scan# 3764
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 49992

Ion	Ratio	Lower	Upper
234	100		
189	4.1	22.3	33.5#

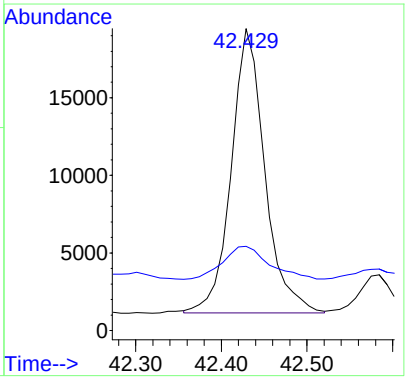


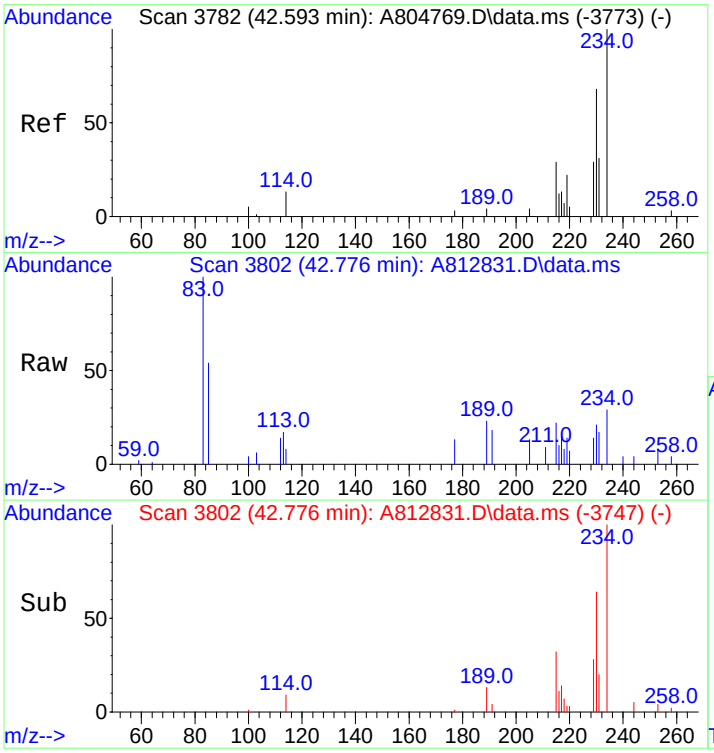


#67
Naphthobenzothiophene-2,1-D
Concen: 179.20 ng/mL m
RT: 42.429 min Scan# 3764
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 49921

Ion	Ratio	Lower	Upper
234	100		
189	4.1	22.3	33.5#

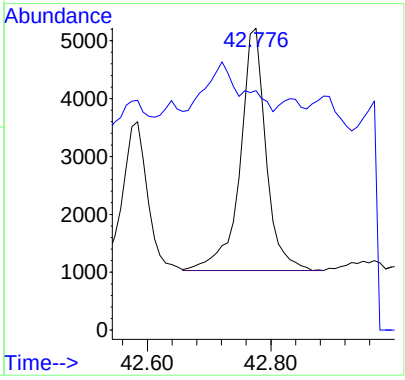


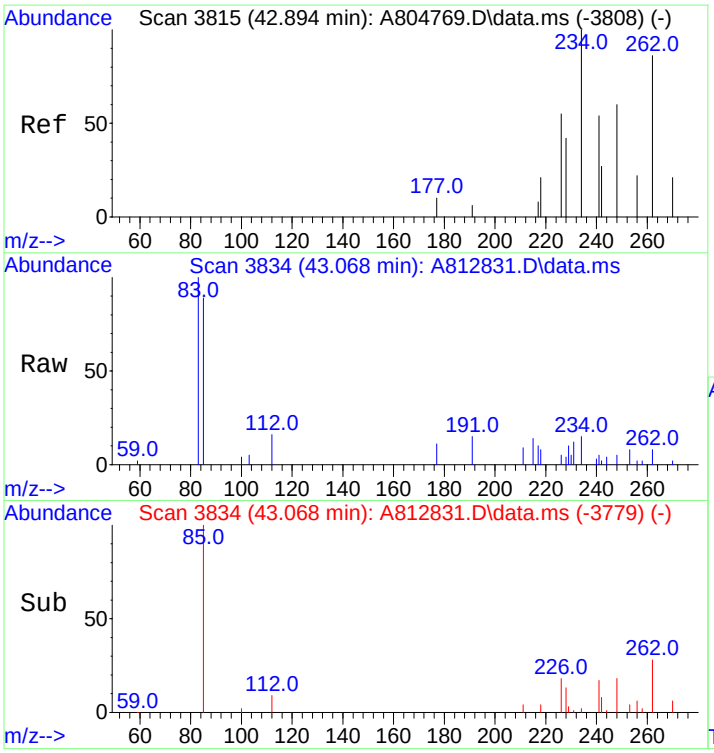


#68
Naphthobenzothiophene-1,2-D
Concen: 43.76 ng/mL
RT: 42.776 min Scan# 3802
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 12190

Ion	Ratio	Lower	Upper
234	100		
189	0.0	63.4	95.2#

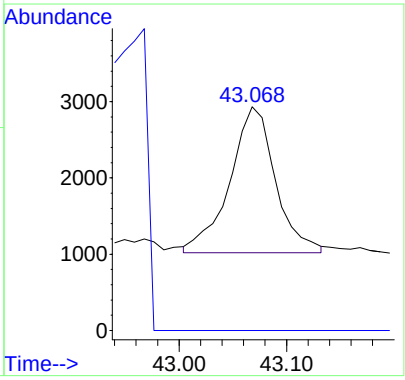


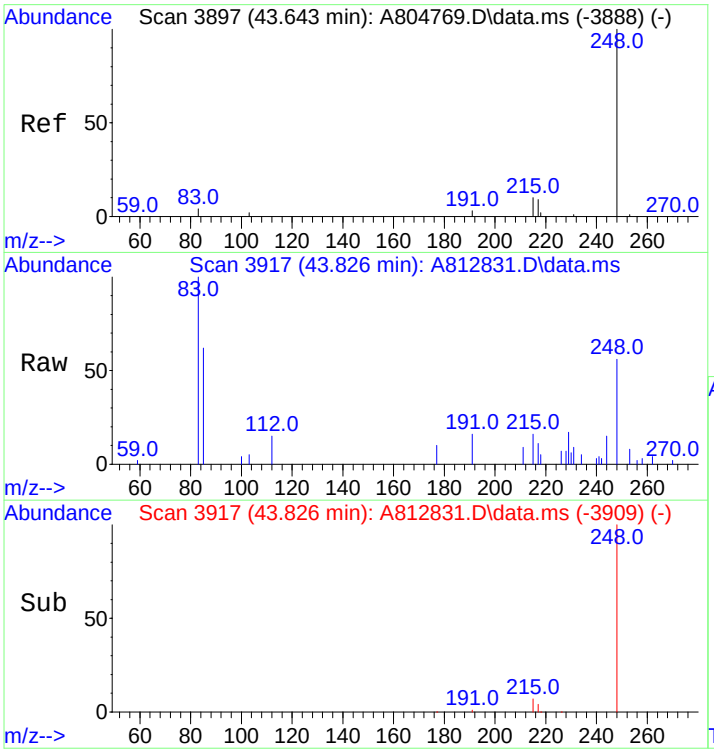


#69
Naphthobenzothiophene-2,3-D
Concen: 20.27 ng/mL m
RT: 43.068 min Scan# 3834
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:234 Resp: 5647

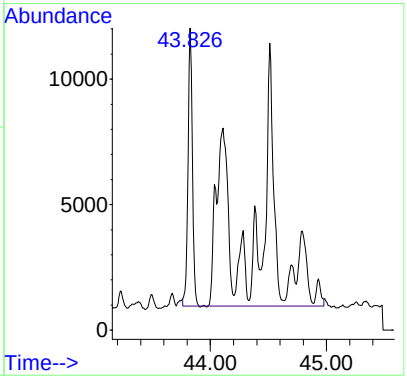
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

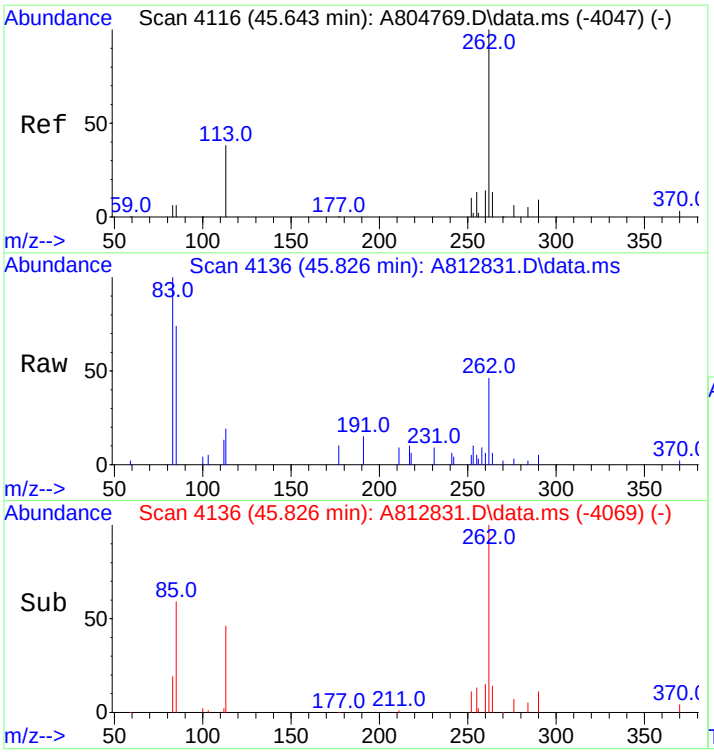




#70
C1-Naphthobenzothiophenes
Concen: 598.75 ng/ml m
RT: 43.826 min Scan# 3917
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

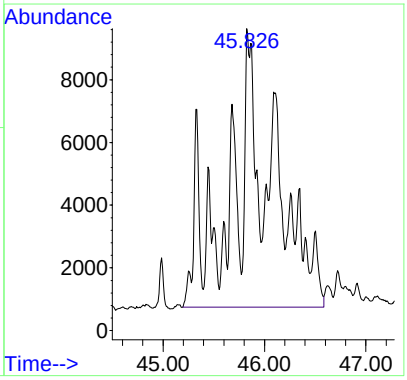
Tgt Ion:248 Resp: 166798

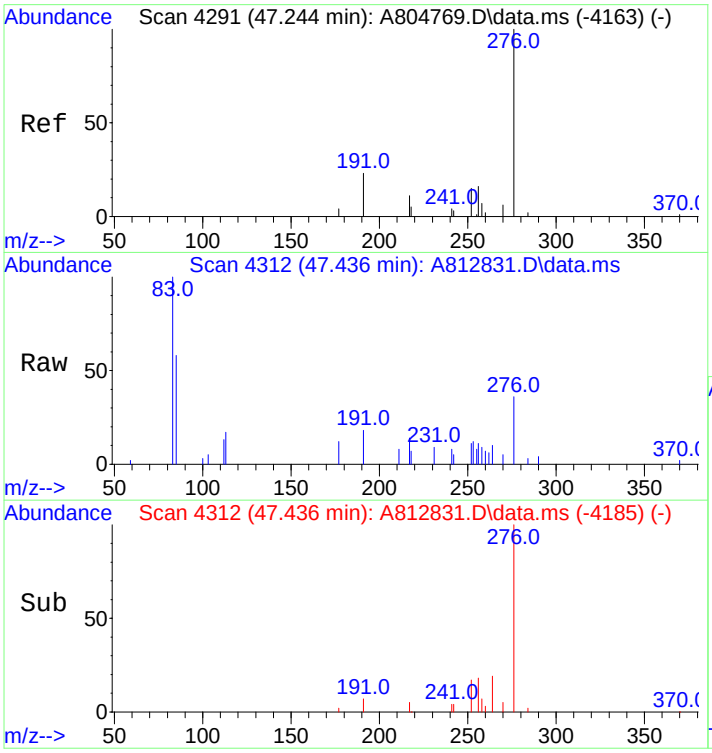




#71
C2-Naphthobenzothiophenes
Concen: 895.28 ng/ml m
RT: 45.826 min Scan# 4136
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

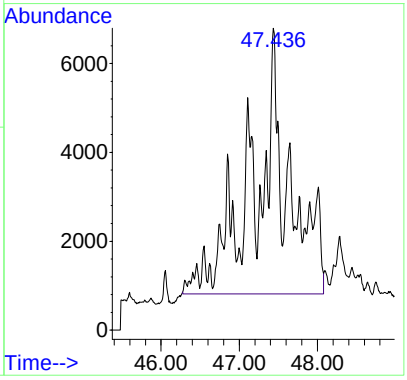
Tgt Ion:262 Resp: 249402

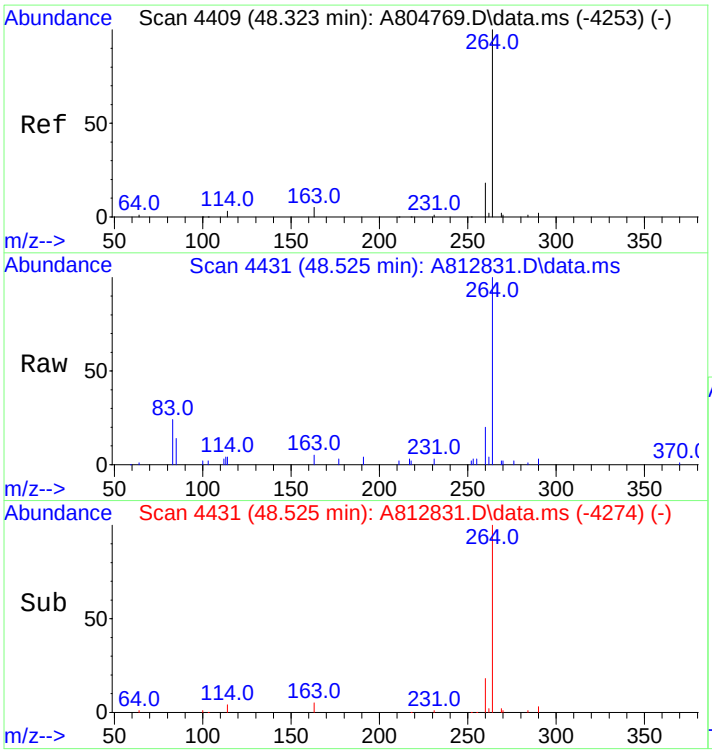




#72
C3-Naphthobenzothiophenes
Concen: 650.50 ng/ml m
RT: 47.436 min Scan# 4312
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

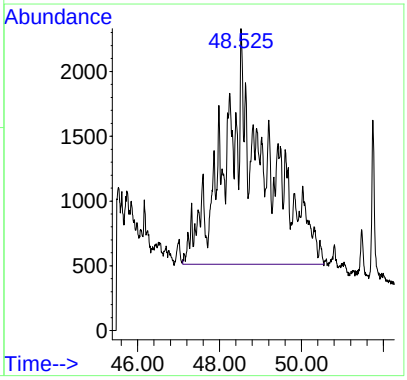
Tgt Ion:276 Resp: 181212

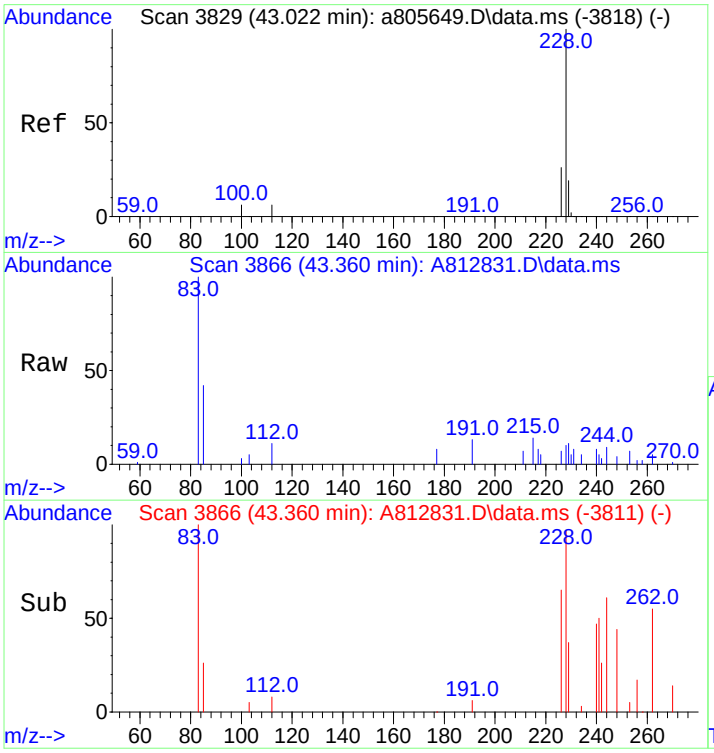




#73
C4-Naphthobenzothiophenes
Concen: 439.82 ng/mL m
RT: 48.525 min Scan# 4431
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:290 Resp: 122522

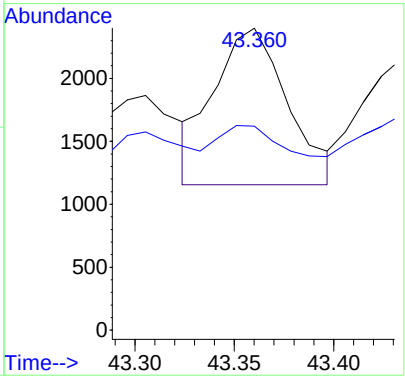


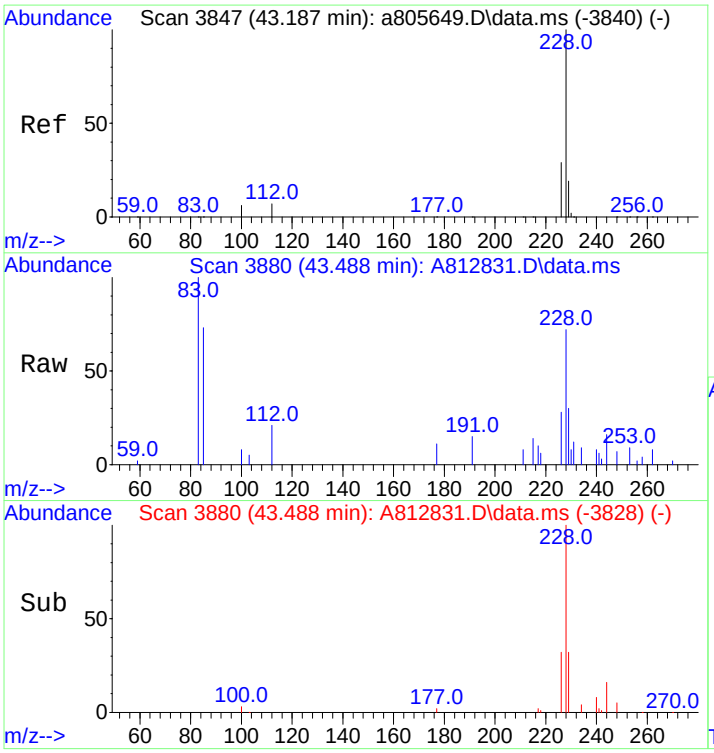


#75
Benz[a]anthracene
Concen: 11.86 ng/mL m
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:228 Resp: 3229

Ion	Ratio	Lower	Upper
228	100		
226	467.3	21.3	31.9#

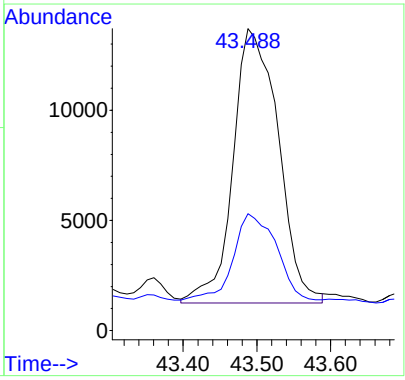


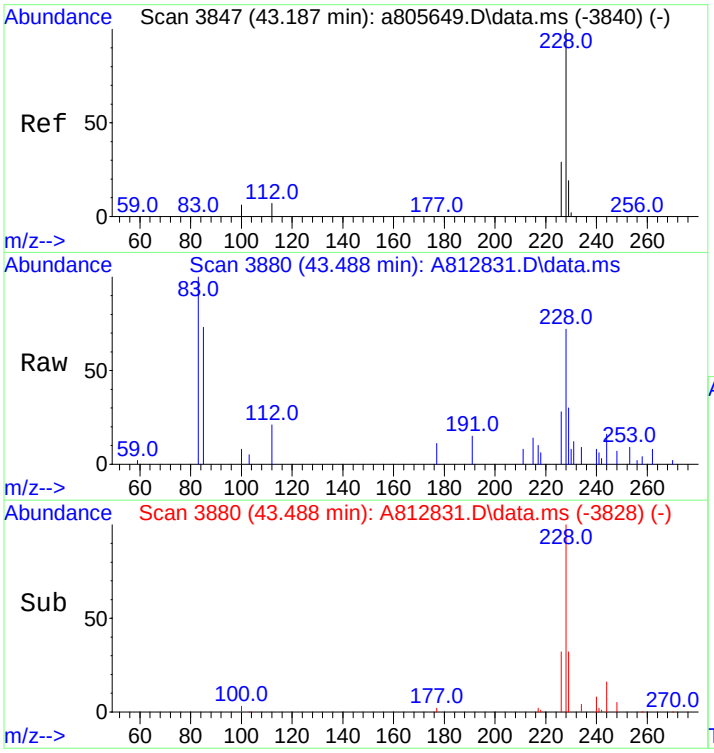


#76
Chrysene
Concen: 192.44 ng/mL m
RT: 43.488 min Scan# 3880
Delta R.T. -0.028 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:228 Resp: 53021

Ion	Ratio	Lower	Upper
228	100		
226	31.2	23.6	35.4

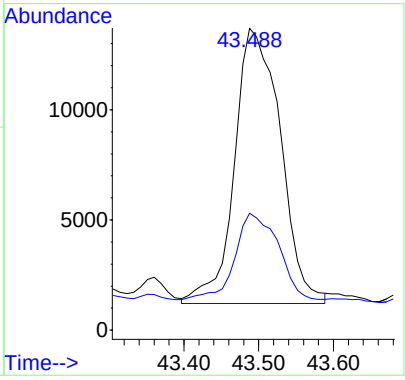


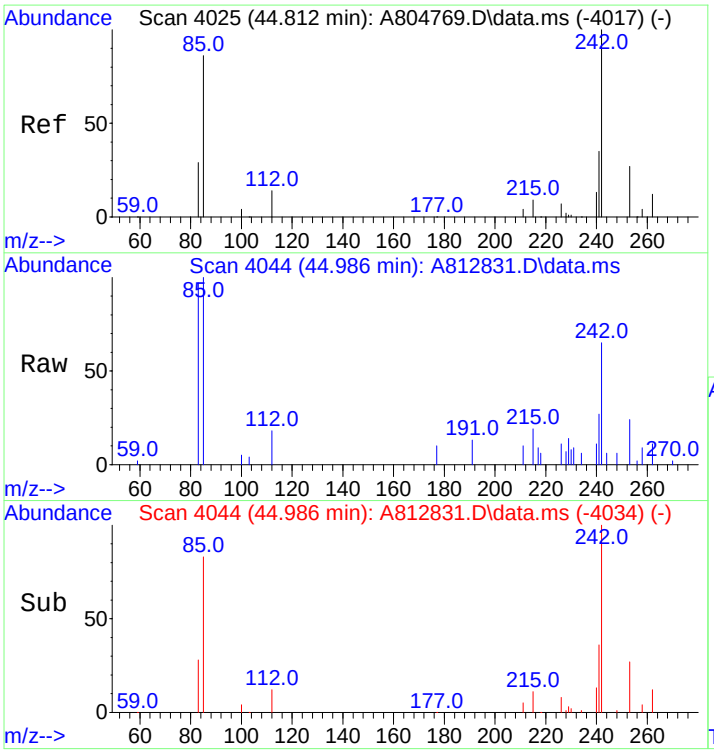


#77
Chrysene/Triphenylene
Concen: 194.53 ng/mL m
RT: 43.488 min Scan# 3880
Delta R.T. -0.028 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:228 Resp: 53597

Ion	Ratio	Lower	Upper
228	100		
226	30.9	23.6	35.4

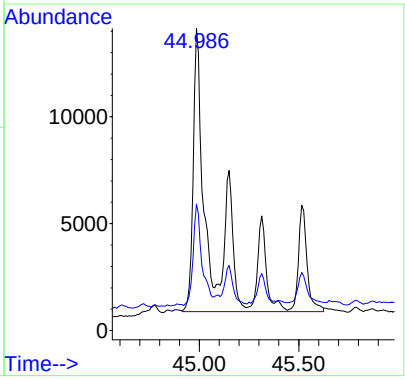


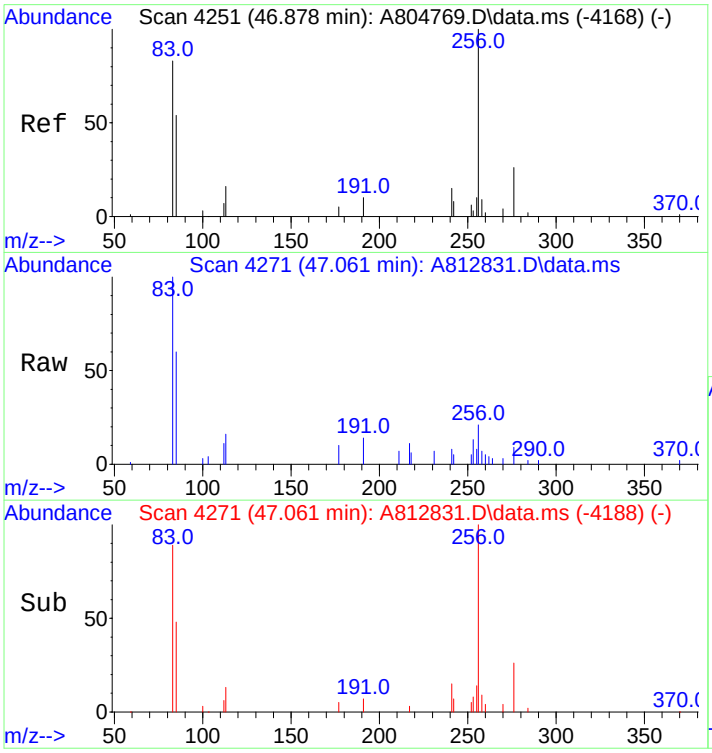


#78
C1-Chrysenes
Concen: 340.29 ng/mL m
RT: 44.986 min Scan# 4044
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:242 Resp: 93757

Ion	Ratio	Lower	Upper
242	100		
241	14.9	33.5	50.3#

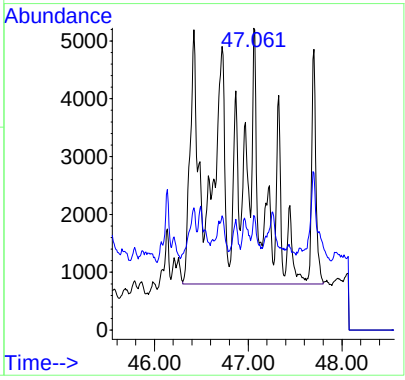


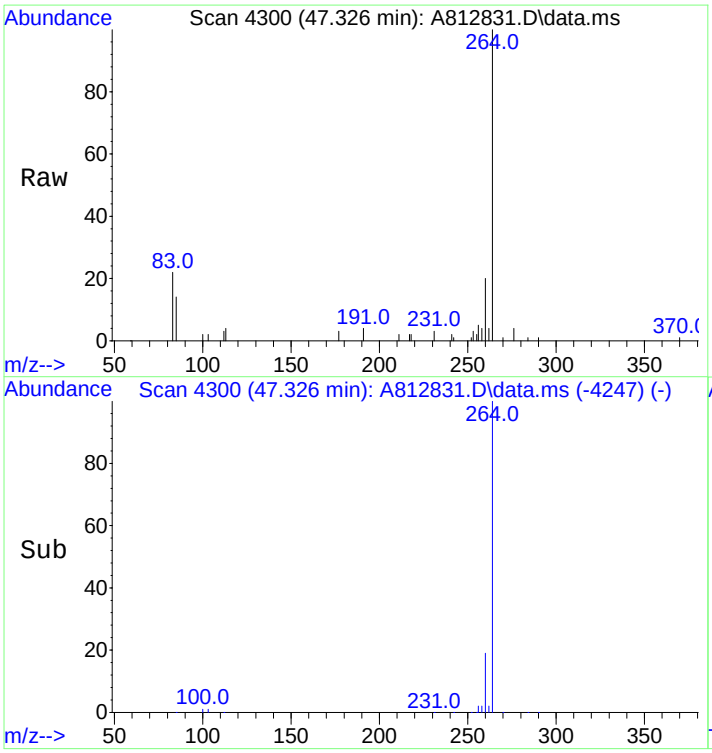


#79
C2-Chrysenes
Concen: 478.09 ng/mL m
RT: 47.061 min Scan# 4271
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:256 Resp: 131721

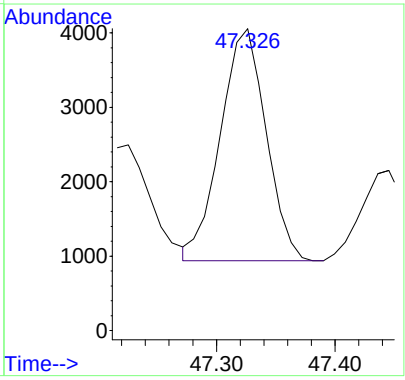
Ion	Ratio	Lower	Upper
256	100		
241	4.0	30.4	45.6#

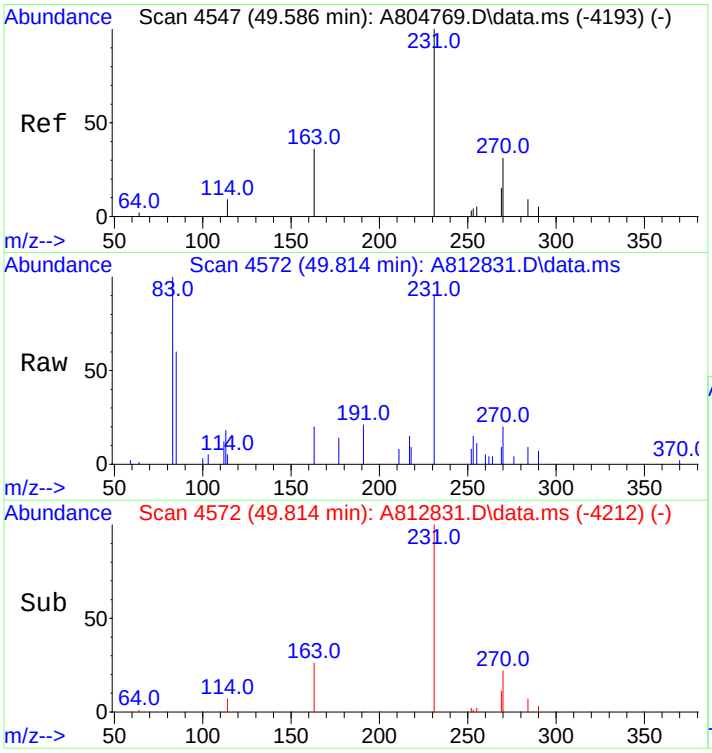




#80
BBF-D12 Surr BKGD
Concen: 30.25 ng/mL
RT: 47.326 min Scan# 4300
Delta R.T. -0.017 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:256 Resp: 8334

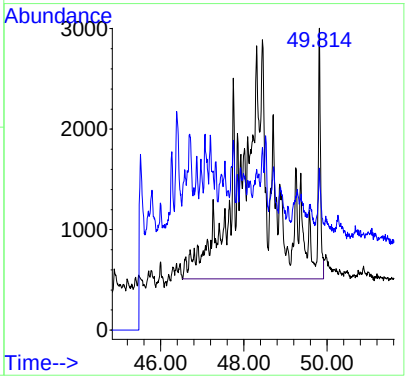


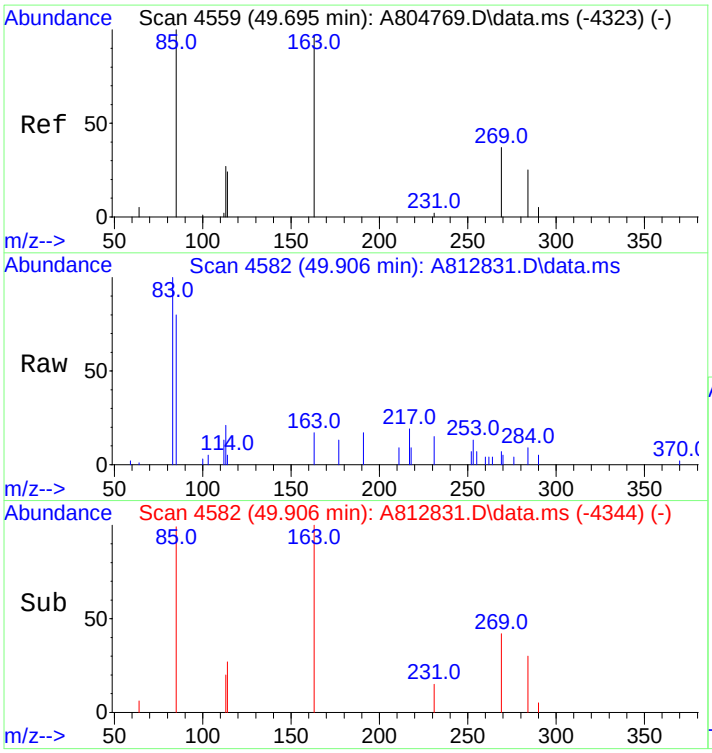


#81
C3-Chrysenes
Concen: 495.92 ng/mL m
RT: 49.814 min Scan# 4572
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:270 Resp: 136635

Ion	Ratio	Lower	Upper
270	100		
255	1.8	42.9	64.3#

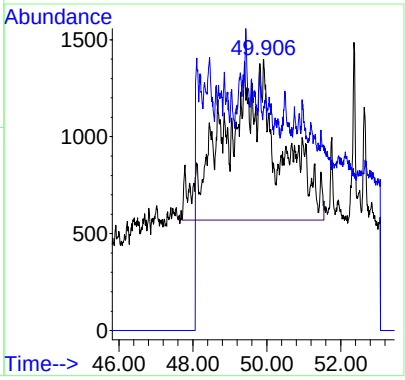


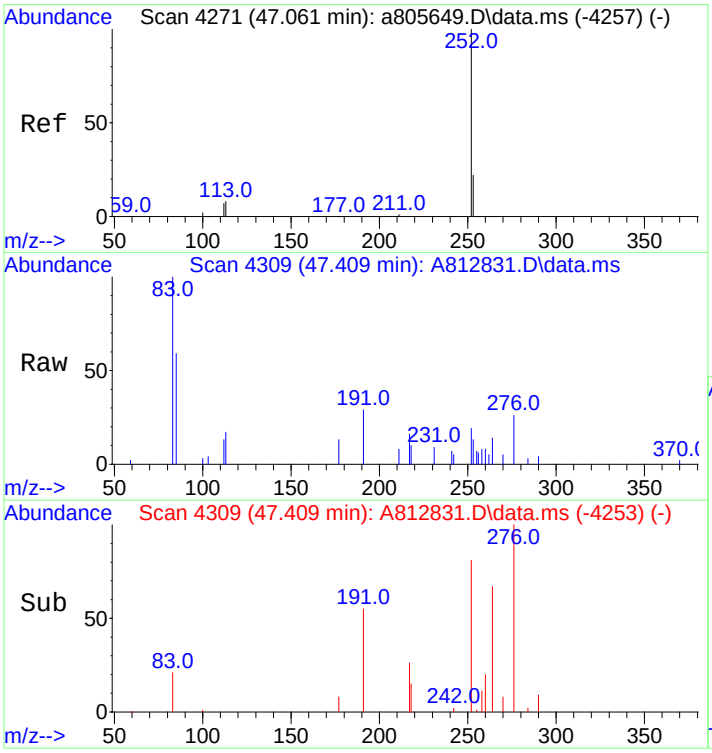


#82
C4-Chrysenes
Concen: 304.76 ng/mL m
RT: 49.906 min Scan# 4582
Delta R.T. 0.081 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:284 Resp: 83967

Ion	Ratio	Lower	Upper
284	100		
269	0.0	81.7	122.5#

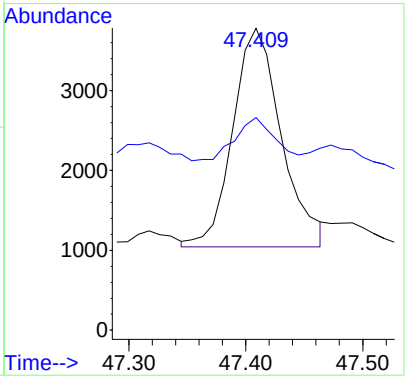


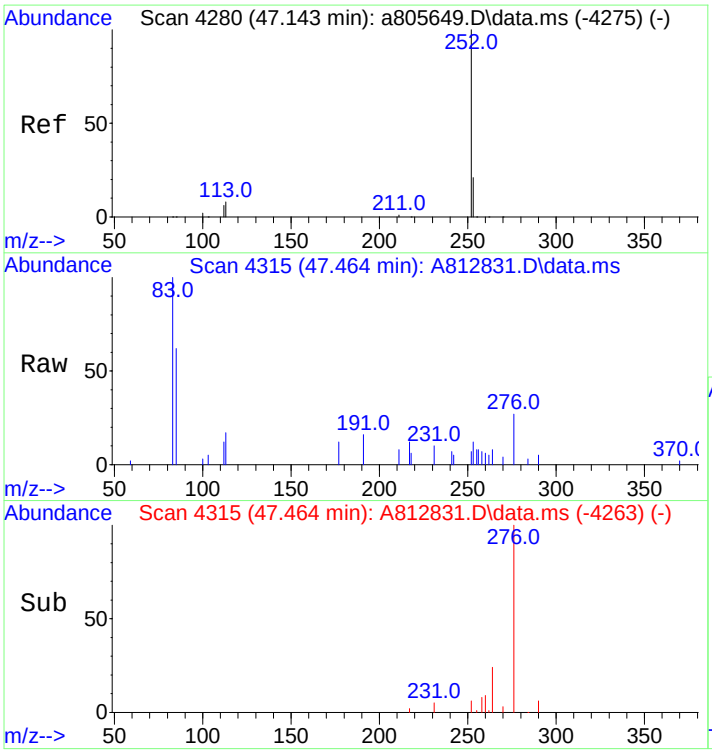


#84
Benzo[b]fluoranthene
Concen: 27.08 ng/mL m
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 7917

Ion	Ratio	Lower	Upper
252	100		
253	14.7	18.5	27.7#

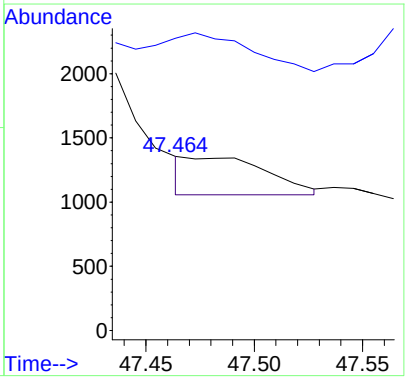


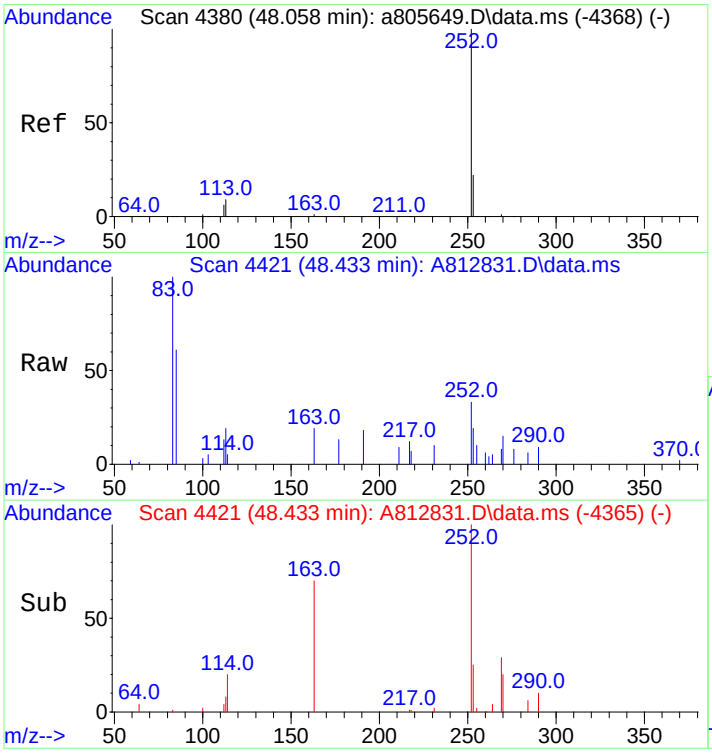


#85
Benzo[j]+[k]fluoranthene
Concen: 2.36 ng/mL m
RT: 47.464 min Scan# 4315
Delta R.T. -0.027 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 754

Ion	Ratio	Lower	Upper
252	100		
253	154.0	18.8	28.2#

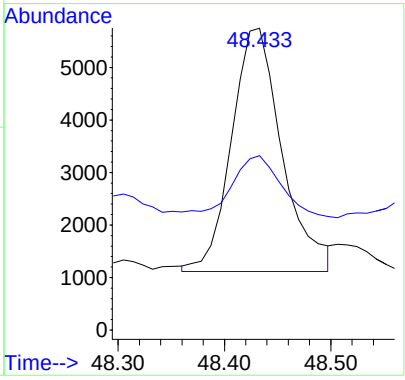


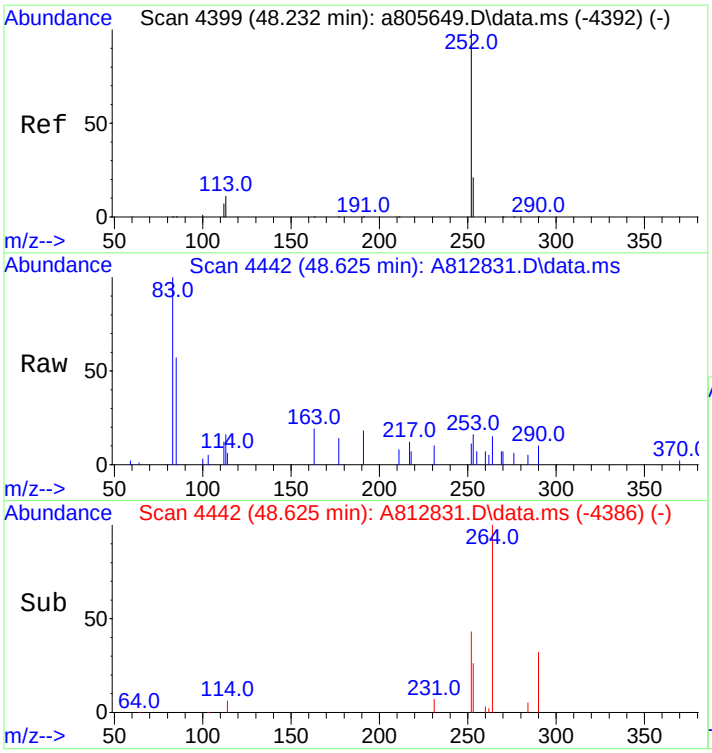


#87
Benzo[e]pyrene
Concen: 50.82 ng/mL m
RT: 48.433 min Scan# 4421
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 15308

Ion	Ratio	Lower	Upper
252	100		
253	24.2	18.9	28.3

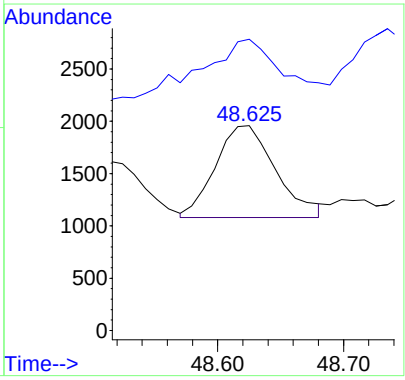


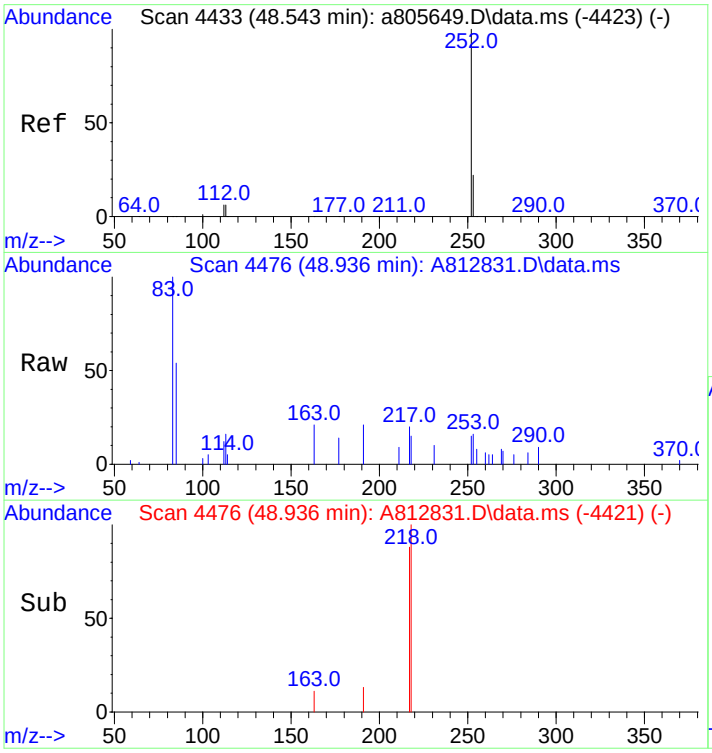


#89
Benzo[a]pyrene
Concen: 10.48 ng/mL m
RT: 48.625 min Scan# 4442
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 2919

Ion	Ratio	Lower	Upper
252	100		
253	126.0	19.4	29.0#

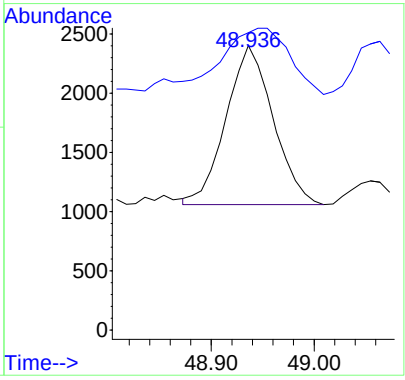


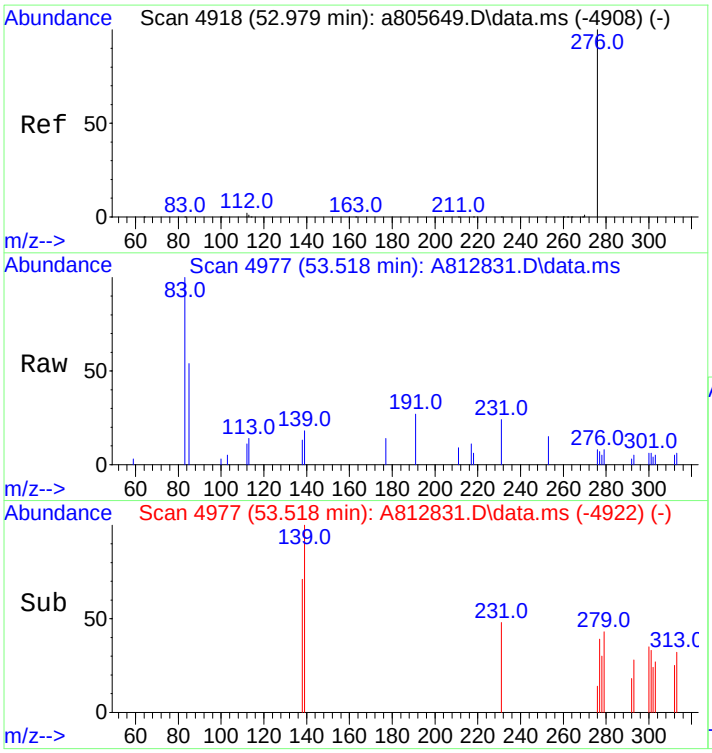


#90
Perylene
Concen: 14.04 ng/mL
RT: 48.936 min Scan# 4476
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:252 Resp: 4273

Ion	Ratio	Lower	Upper
252	100		
253	59.2	19.3	28.9#

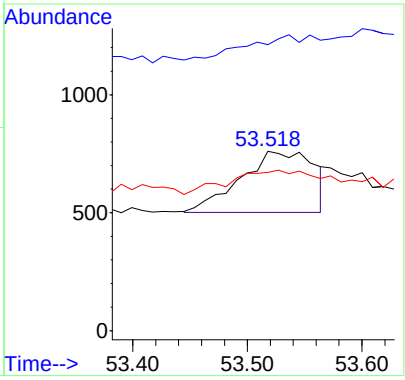


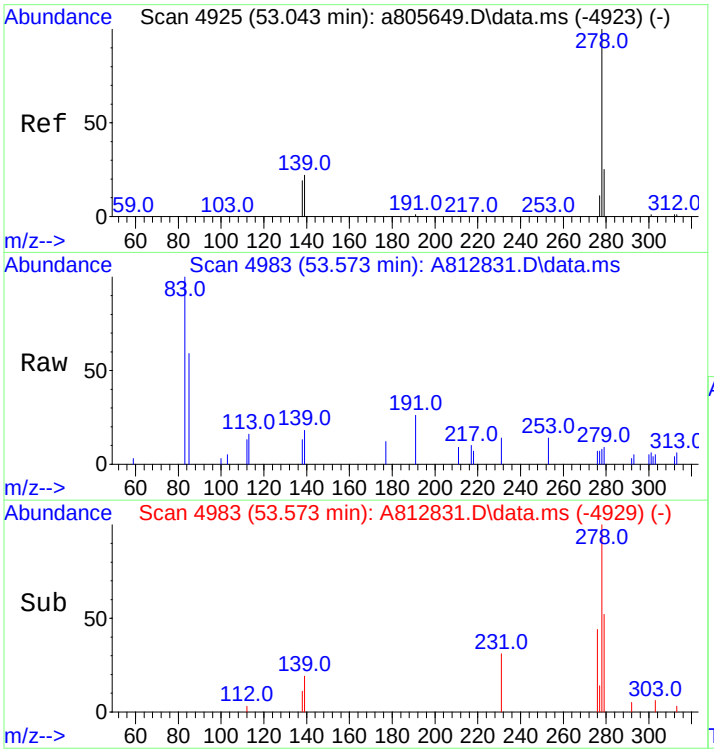


#91
Indeno[1,2,3-cd]pyrene
Concen: 3.91 ng/mL m
RT: 53.518 min Scan# 4977
Delta R.T. -0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:276 Resp: 1158

Ion	Ratio	Lower	Upper
276	100		
138	0.0	19.9	29.9#
277	0.0	19.0	28.6#

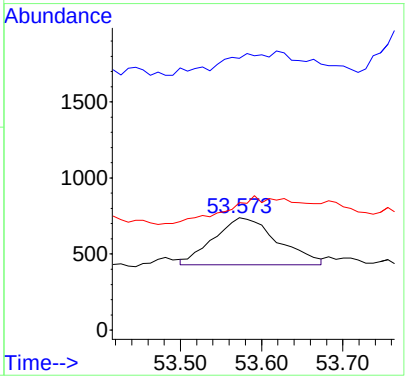


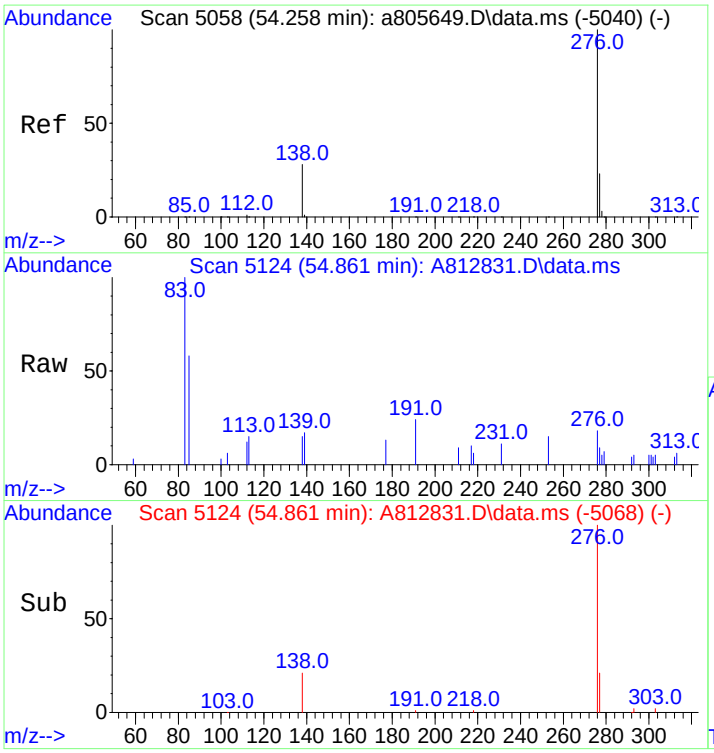


#92
Dibenz[ah]+[ac]anthracene
Concen: 5.80 ng/mL m
RT: 53.573 min Scan# 4983
Delta R.T. -0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:278 Resp: 1684

Ion	Ratio	Lower	Upper
278	100		
139	28.6	16.6	25.0#
279	32.8	19.1	28.7#

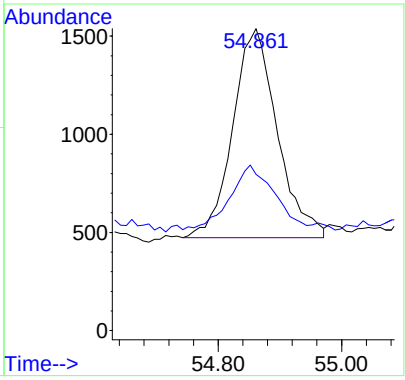


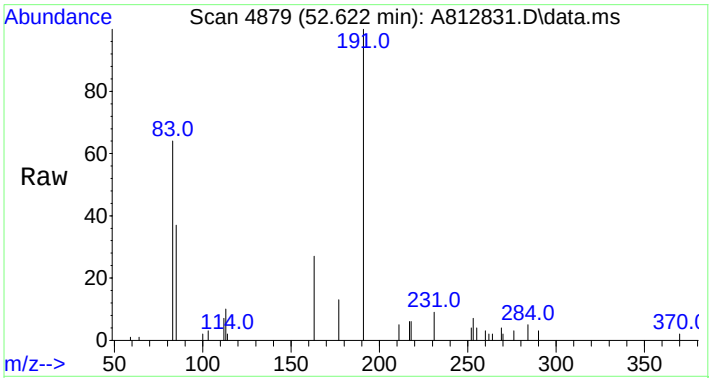


#93
Benzo[g,h,i]perylene
Concen: 15.89 ng/mL
RT: 54.861 min Scan# 5124
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:276 Resp: 5336

Ion	Ratio	Lower	Upper
276	100		
277	28.1	18.9	28.3

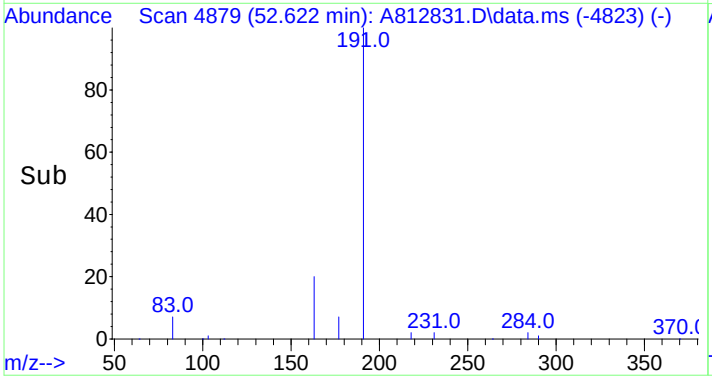


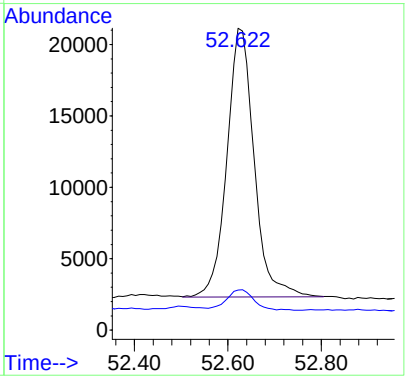


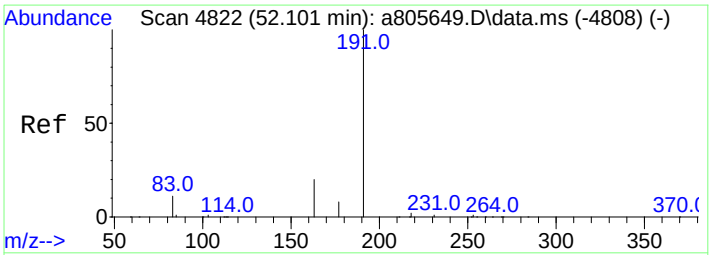
#94
Hopane (T19)
Concen: 820.72 ng/mL
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

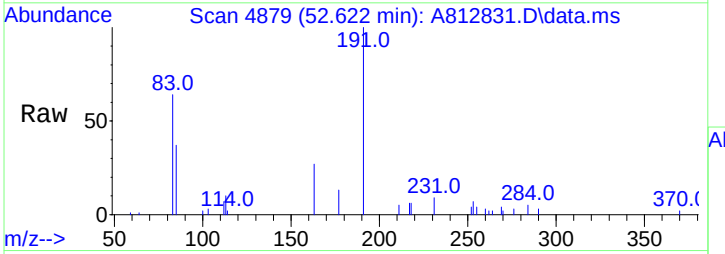
Tgt Ion:191 Resp: 76529

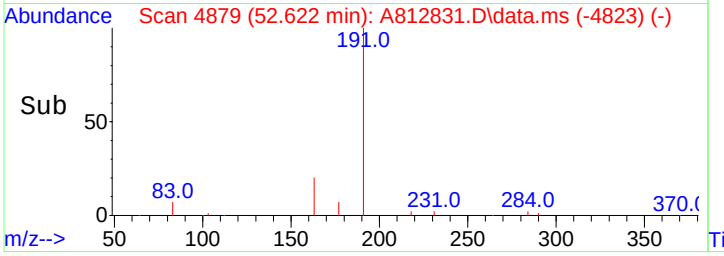
Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#







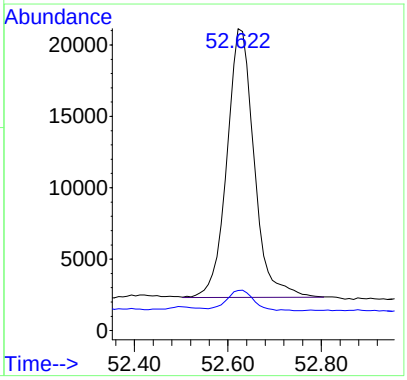


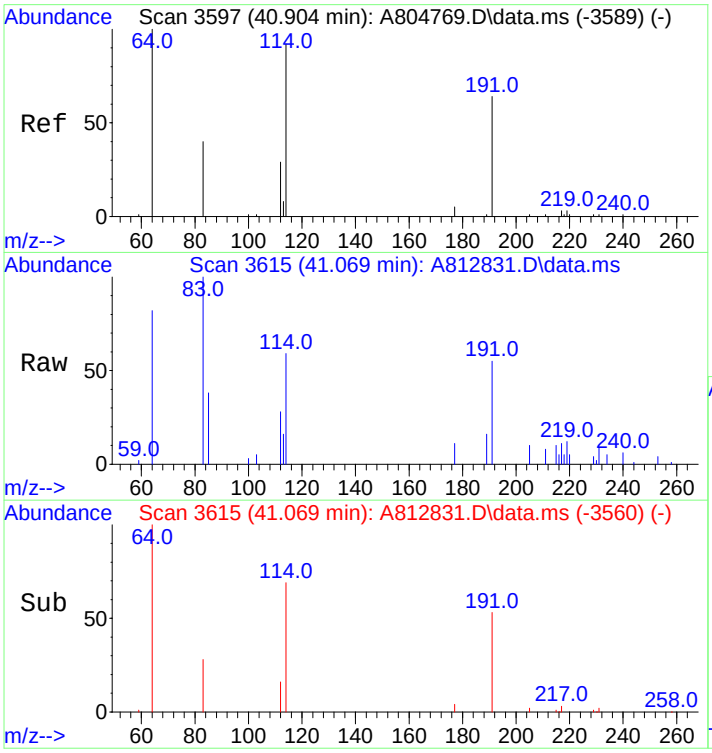


#95
17a(H),21B(H)-hopane - C30H52
Concen: 820.72 ng/mL
RT: 52.622 min Scan# 4879
Delta R.T. 0.009 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:191 Resp: 76529

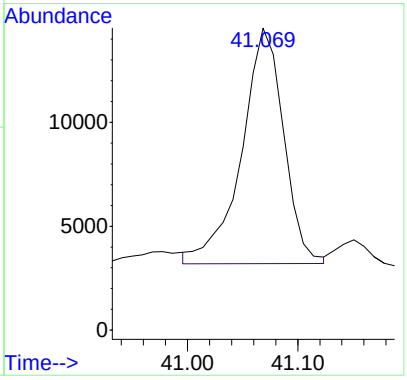
Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#

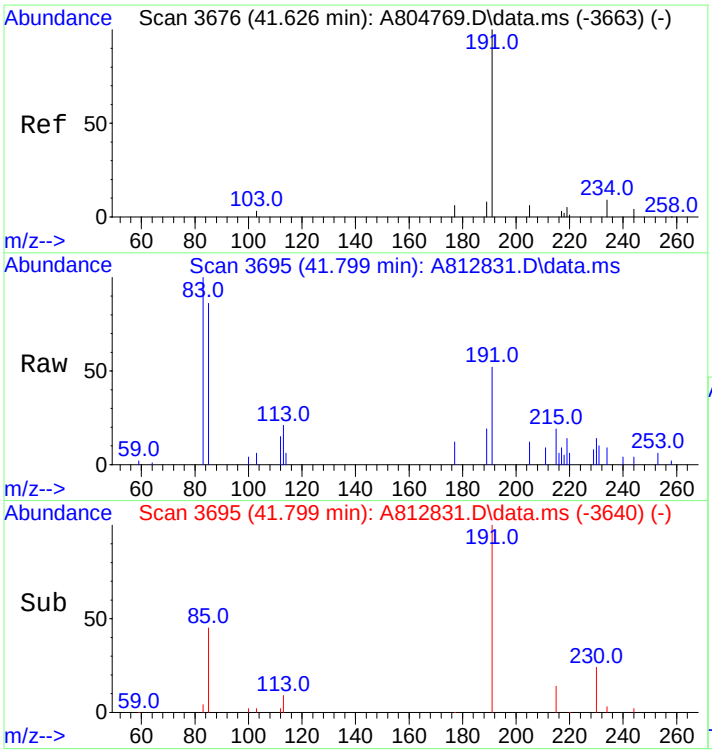




#96
C23 Tricyclic Terpane (T4)
Concen: 323.25 ng/ml
RT: 41.069 min Scan# 3615
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

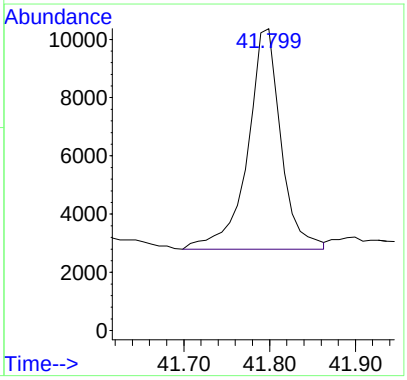
Tgt Ion:191 Resp: 30142

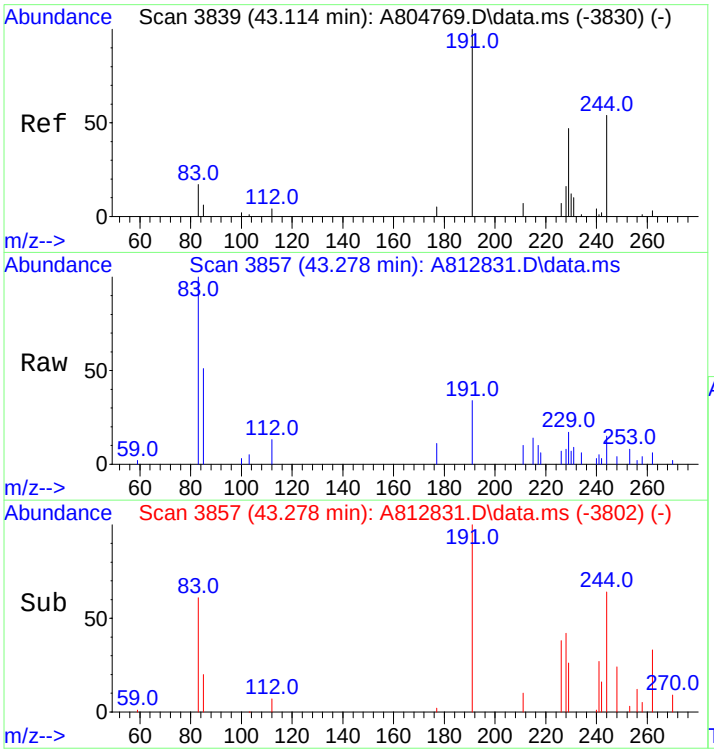




#97
C24 Tricyclic Terpane (T5)
Concen: 220.06 ng/ml
RT: 41.799 min Scan# 3695
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

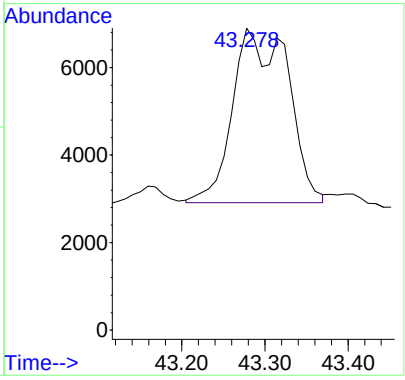
Tgt Ion:191 Resp: 20520

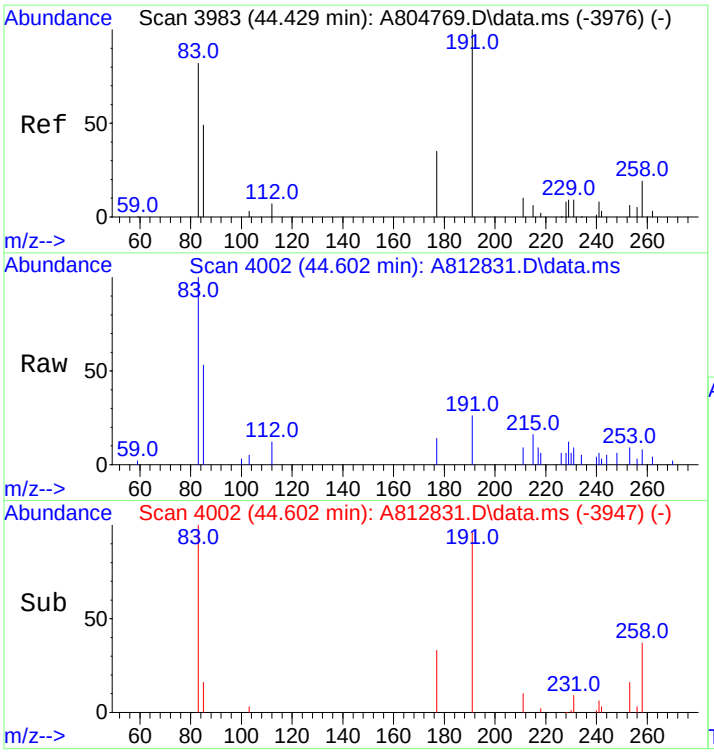




#98
C25 Tricyclic Terpane (T6)
Concen: 197.30 ng/ml m
RT: 43.278 min Scan# 3857
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

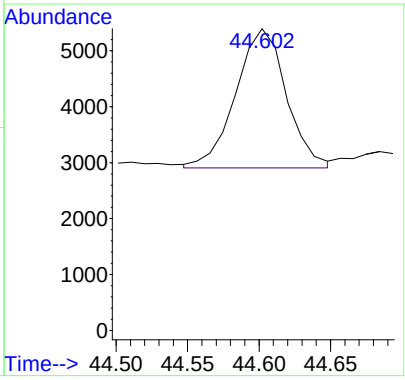
Tgt Ion:191 Resp: 18397

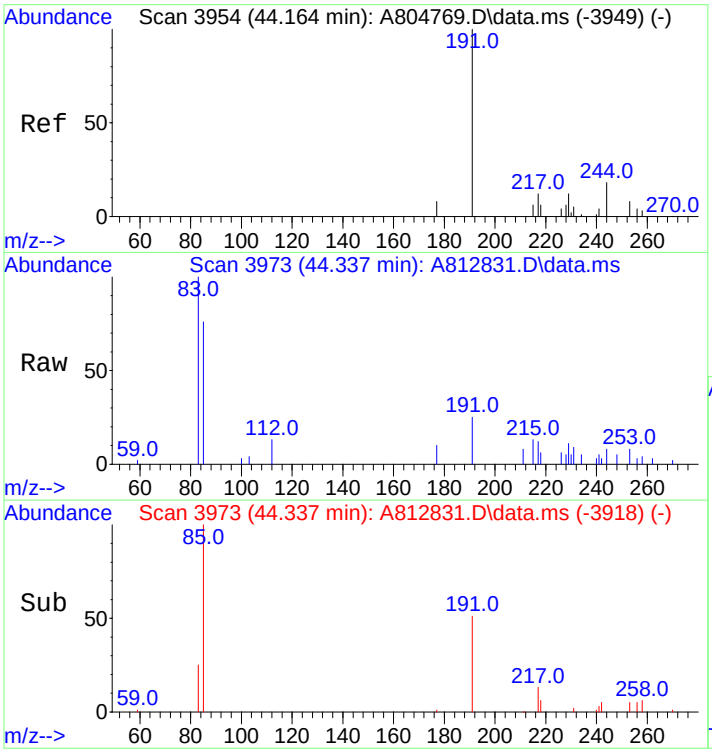




#99
C24 Tetracyclic Terpane (T6a)
Concen: 65.49 ng/ml m
RT: 44.602 min Scan# 4002
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

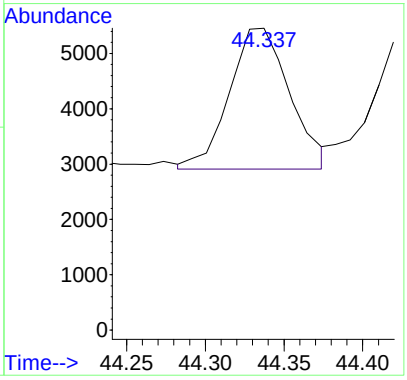
Tgt Ion:191 Resp: 6107

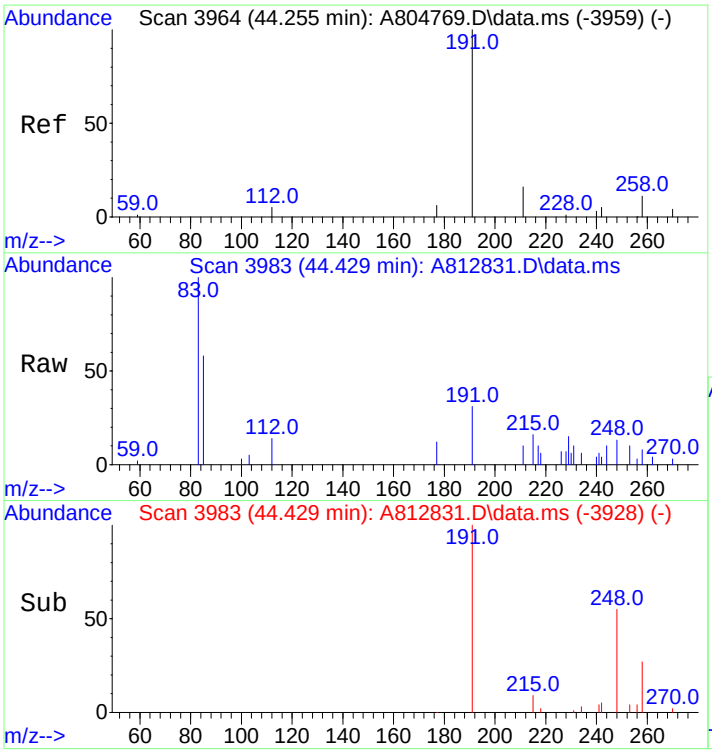




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 72.75 ng/ml m
RT: 44.337 min Scan# 3973
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

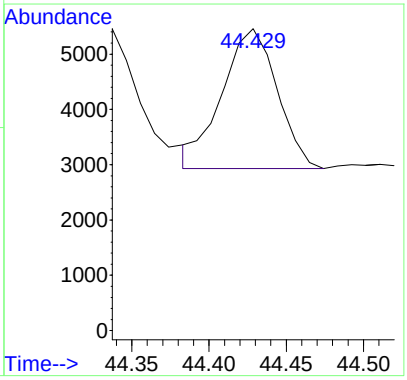
Tgt Ion:191 Resp: 6784

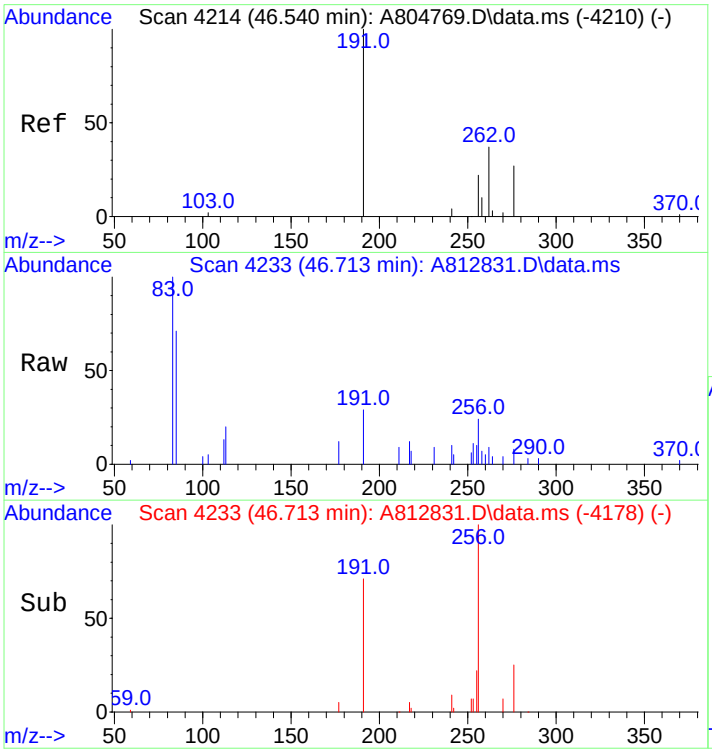




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 67.26 ng/ml
RT: 44.429 min Scan# 3983
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

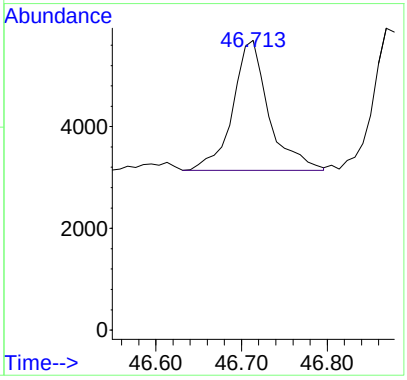
Tgt Ion:191 Resp: 6272

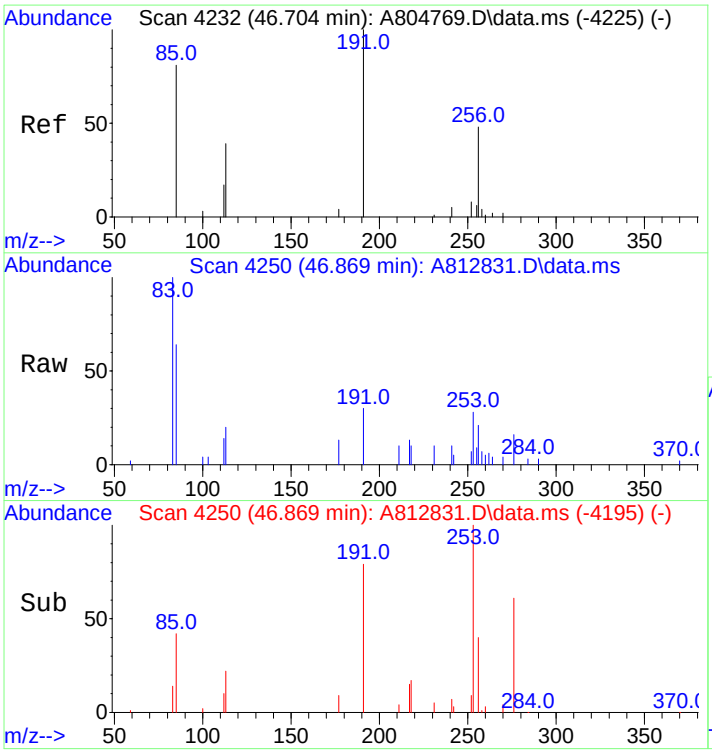




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 80.08 ng/ml
RT: 46.713 min Scan# 4233
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

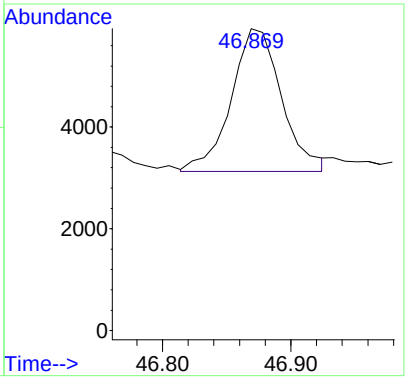
Tgt Ion:191 Resp: 7467

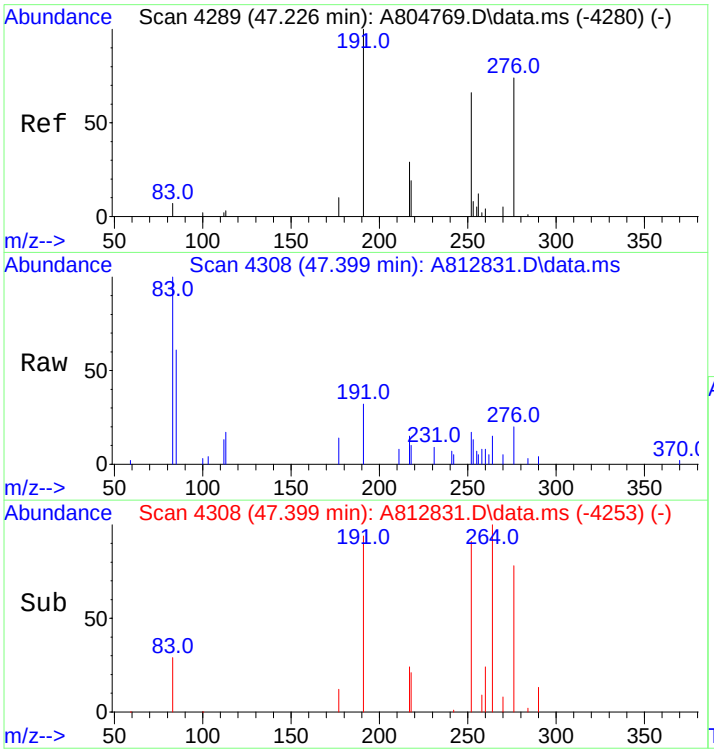




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 82.33 ng/ml m
RT: 46.869 min Scan# 4250
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

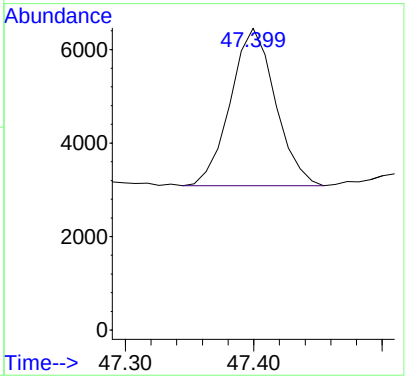
Tgt Ion:191 Resp: 7677

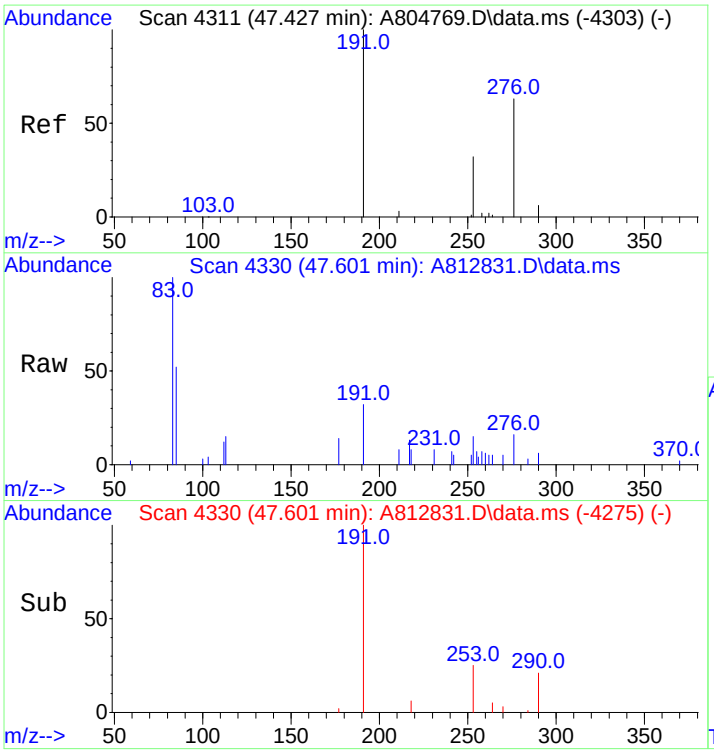




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 87.63 ng/ml
RT: 47.399 min Scan# 4308
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

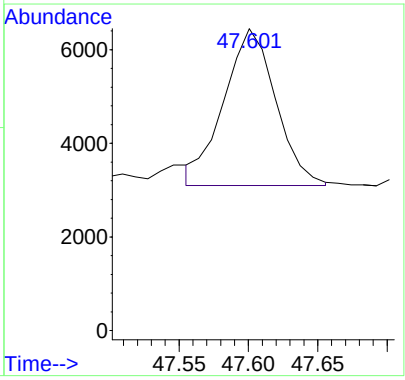
Tgt Ion:191 Resp: 8171

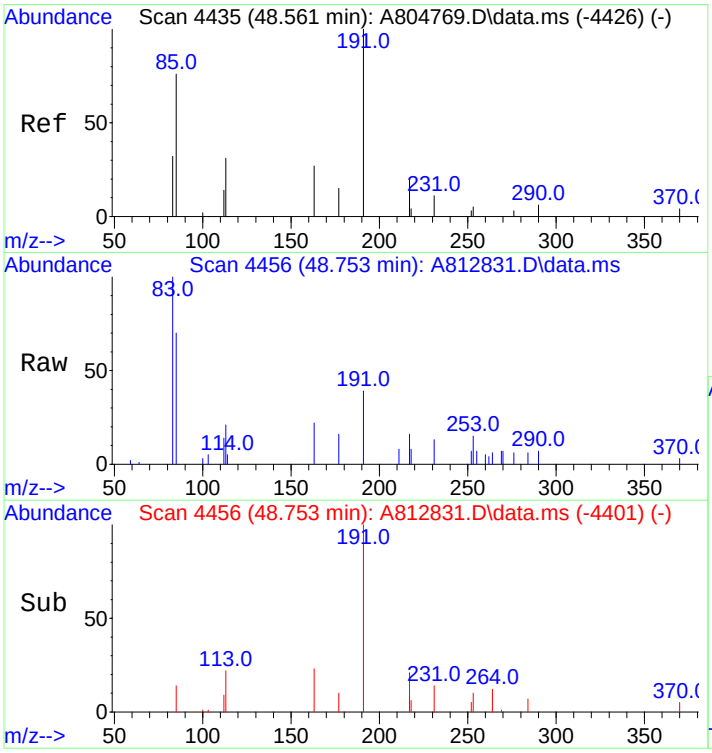




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 93.64 ng/ml m
RT: 47.601 min Scan# 4330
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

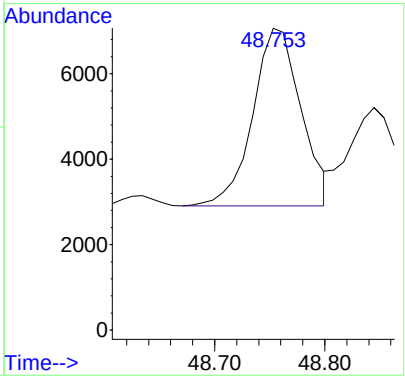
Tgt Ion:191 Resp: 8732

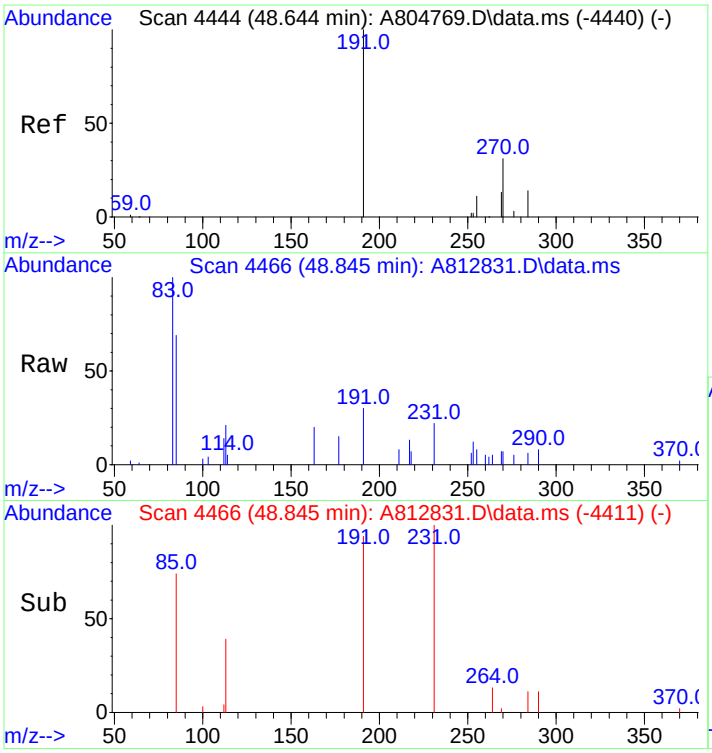




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 136.08 ng/ml
RT: 48.753 min Scan# 4456
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

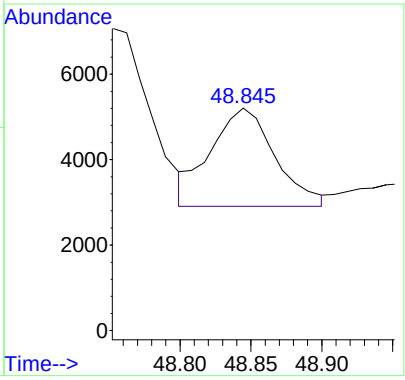
Tgt Ion:191 Resp: 12689

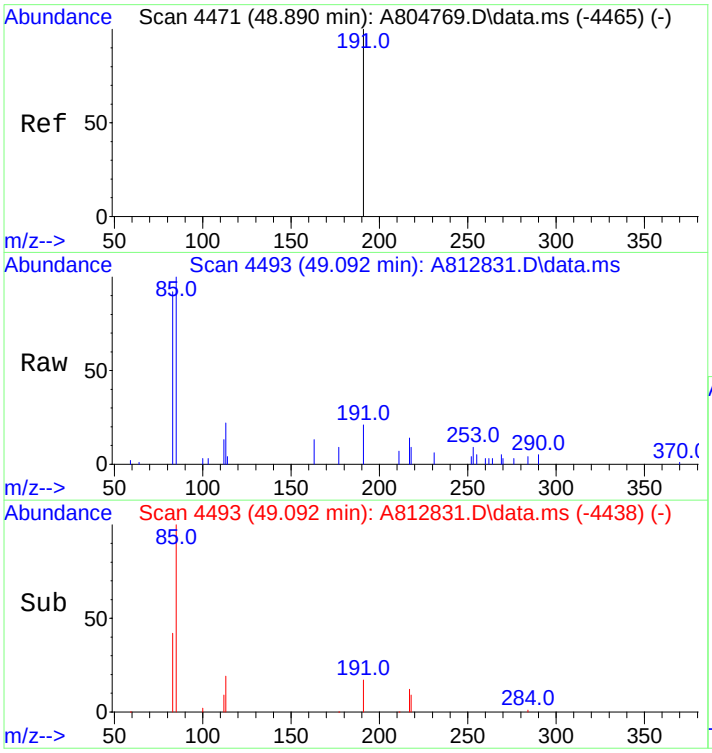




#107
C30 Tricyclic Terpane-22S
Concen: 77.72 ng/mL m
RT: 48.845 min Scan# 4466
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

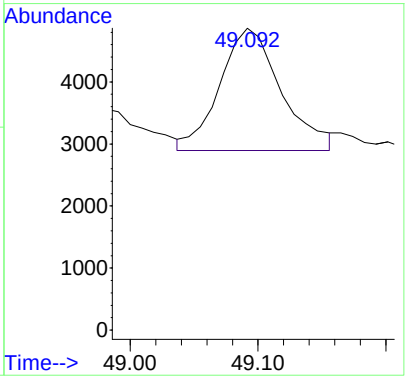
Tgt Ion:191 Resp: 7247

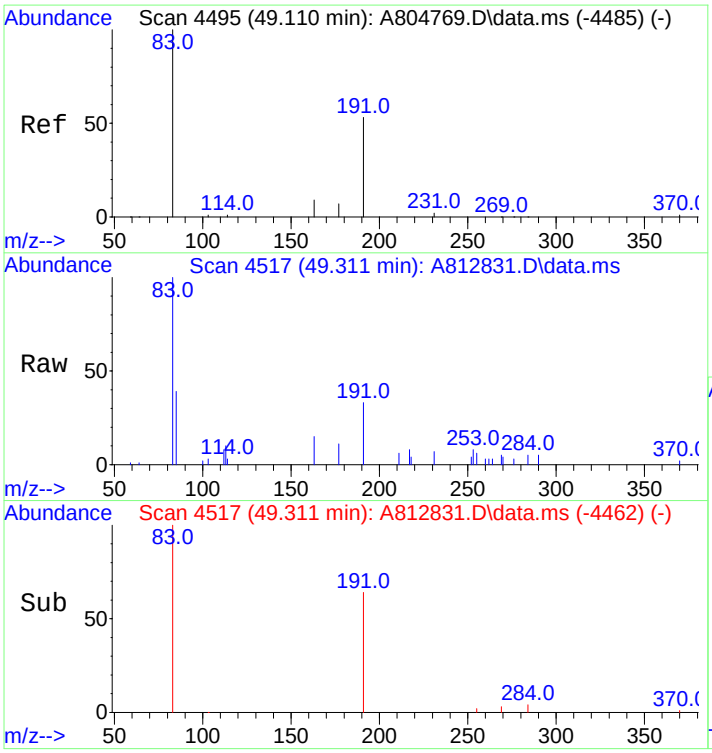




#108
C30 Tricyclic Terpane-22R
Concen: 70.22 ng/mL m
RT: 49.092 min Scan# 4493
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

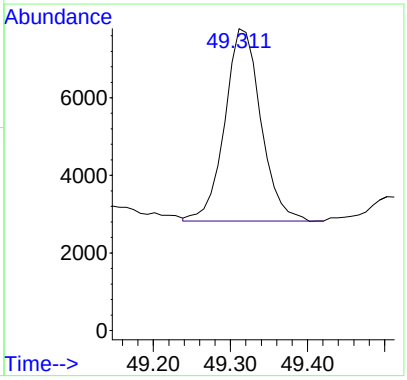
Tgt Ion:191 Resp: 6548

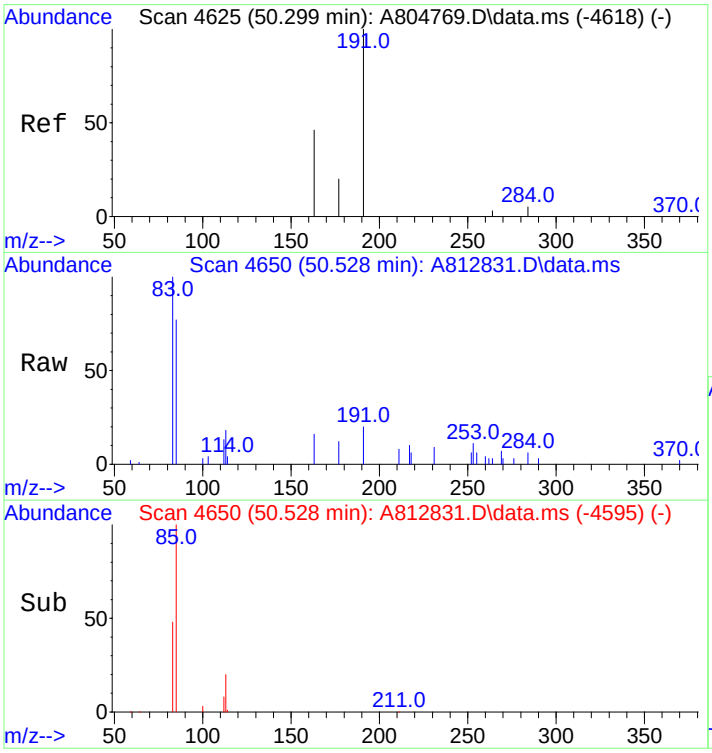




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 173.25 ng/ml
RT: 49.311 min Scan# 4517
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

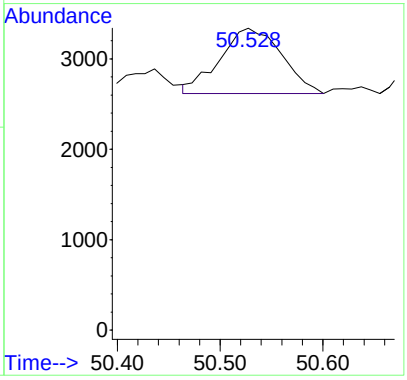
Tgt Ion:191 Resp: 16155

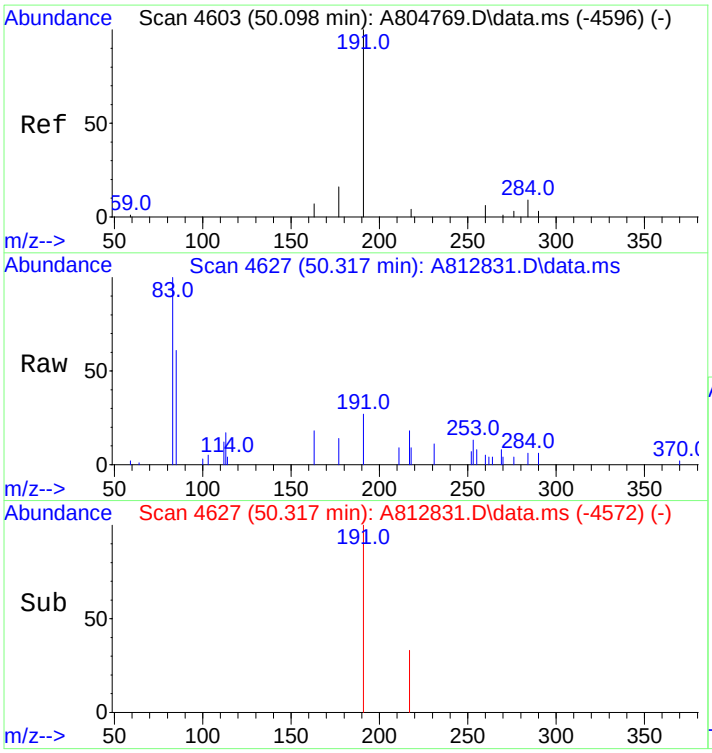




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 32.19 ng/ml
RT: 50.528 min Scan# 4650
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

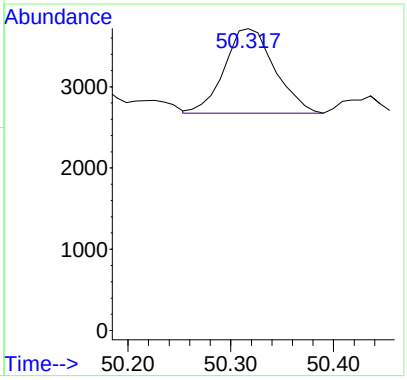
Tgt Ion:191 Resp: 3002

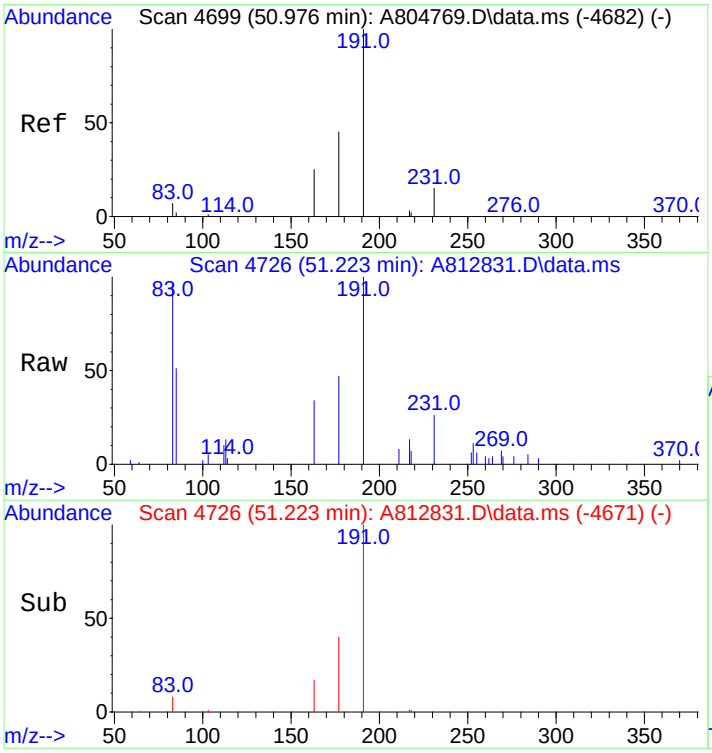




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 37.77 ng/ml
RT: 50.317 min Scan# 4627
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

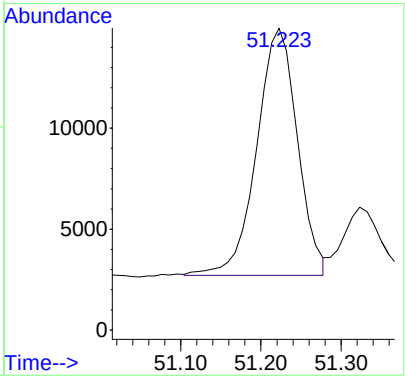
Tgt Ion:191 Resp: 3522

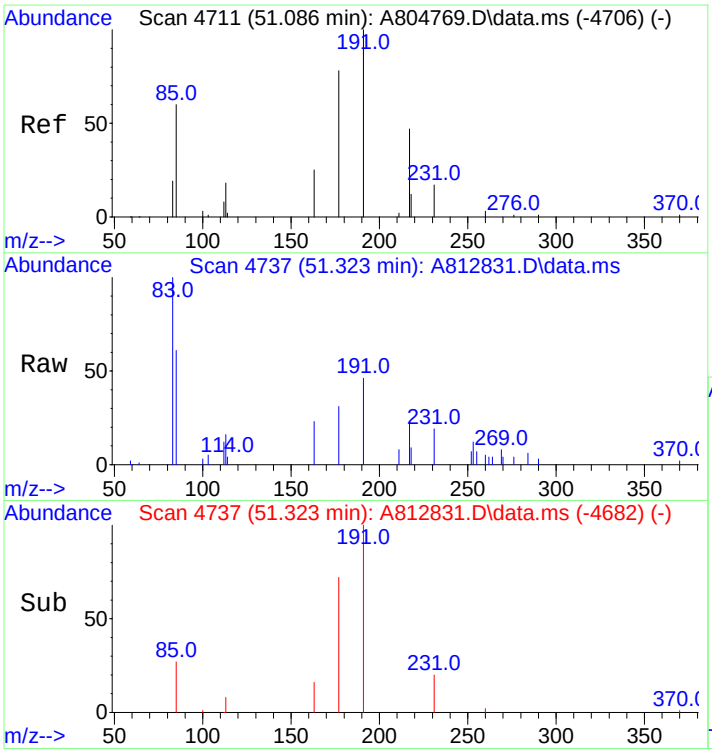




#112
30-Norhopane (T15)
Concen: 461.99 ng/ml m
RT: 51.223 min Scan# 4726
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

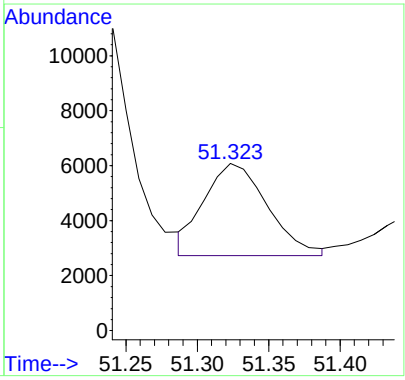
Tgt Ion:191 Resp: 43079

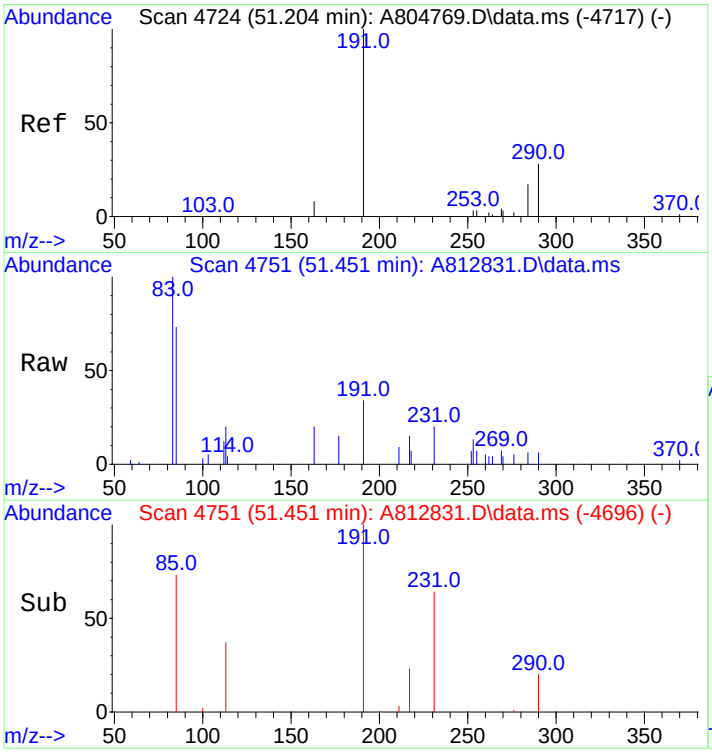




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 111.58 ng/ml m
RT: 51.323 min Scan# 4737
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

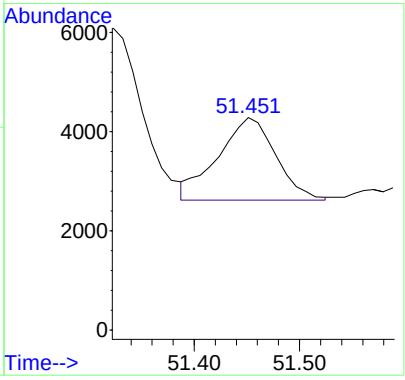
Tgt Ion:191 Resp: 10404

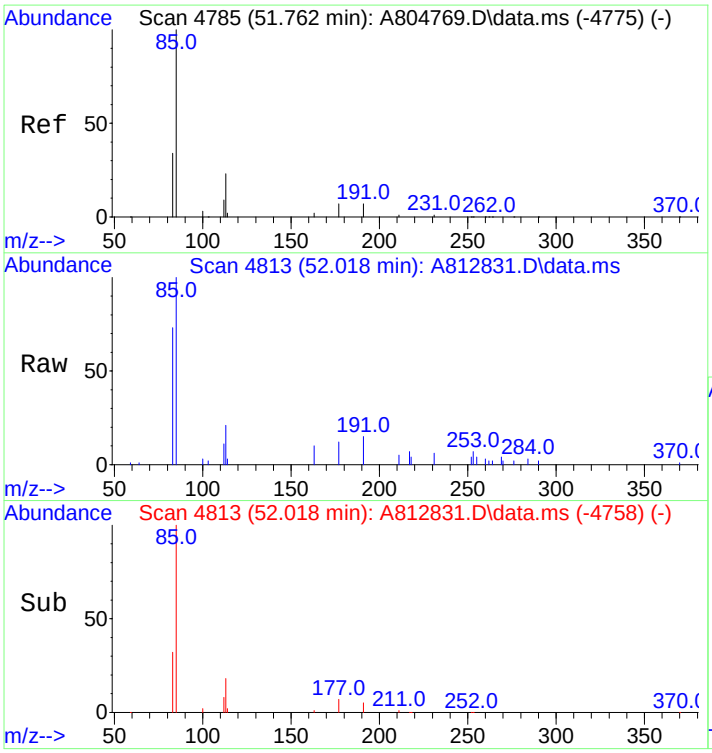




#114
17a(H)-Diahopane (X)
Concen: 67.97 ng/ml m
RT: 51.451 min Scan# 4751
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

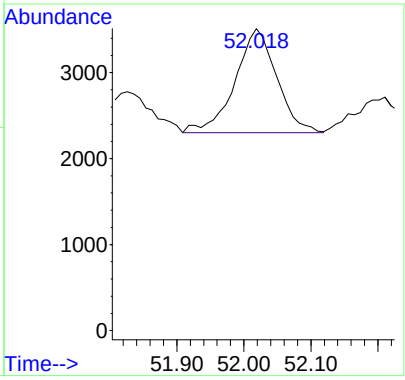
Tgt Ion:191 Resp: 6338

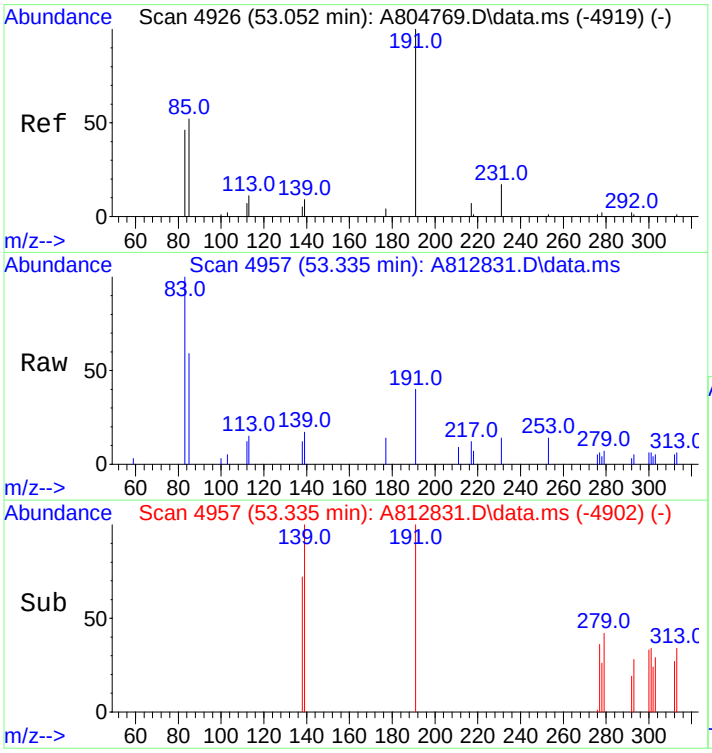




#115
30-Normoretane (T17)
Concen: 56.13 ng/ml
RT: 52.018 min Scan# 4813
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

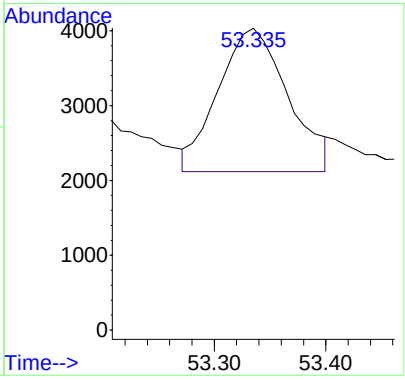
Tgt Ion:191 Resp: 5234

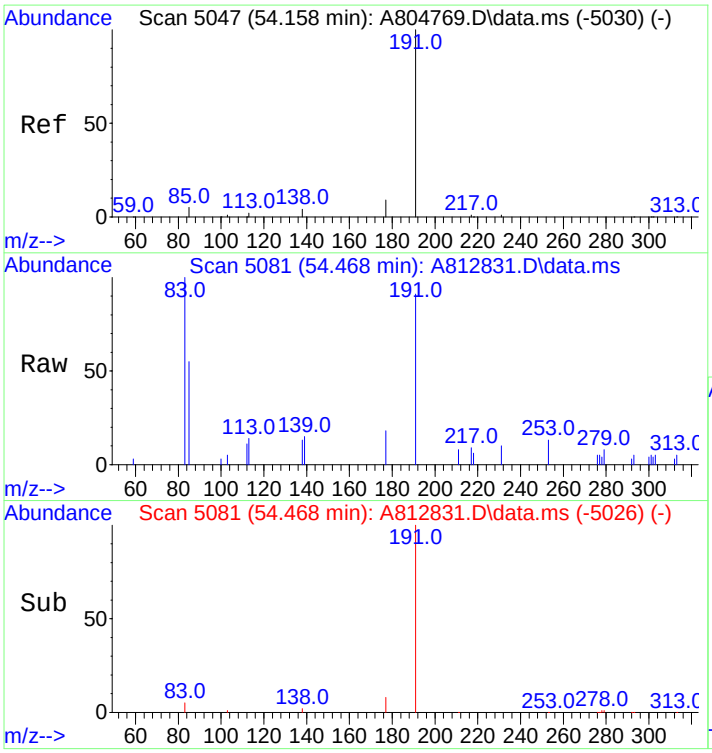




#117
Moretane (T20)
Concen: 89.16 ng/ml m
RT: 53.335 min Scan# 4957
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

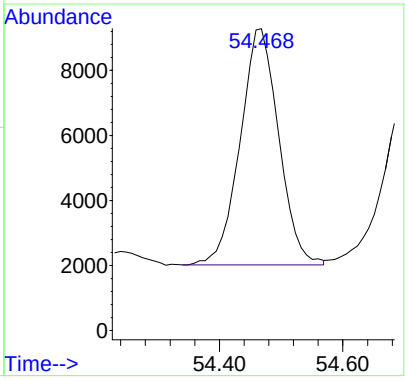
Tgt Ion:191 Resp: 8314

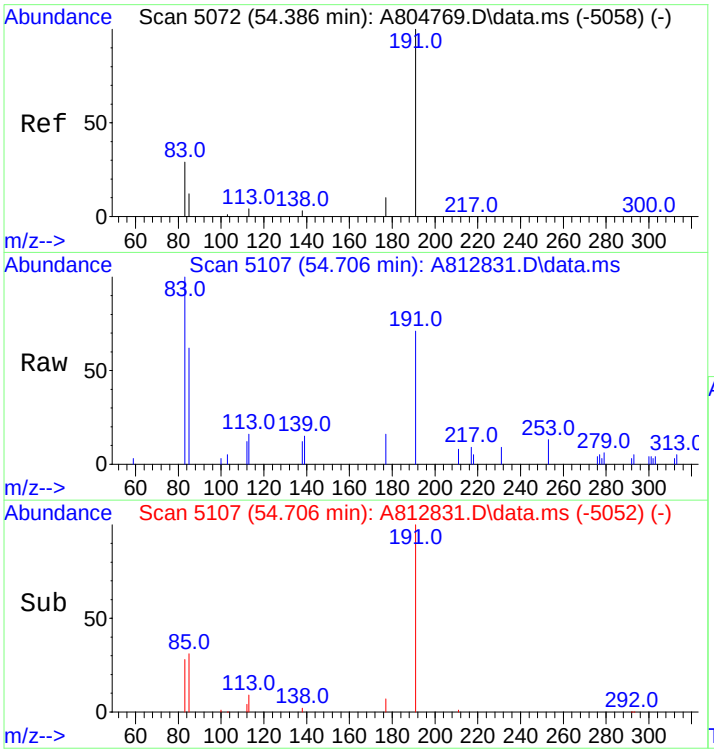




#118
30-Homohopane-22S (T21)
Concen: 339.19 ng/ml
RT: 54.468 min Scan# 5081
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

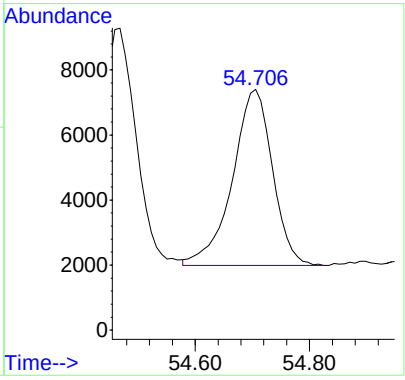
Tgt Ion:191 Resp: 31628

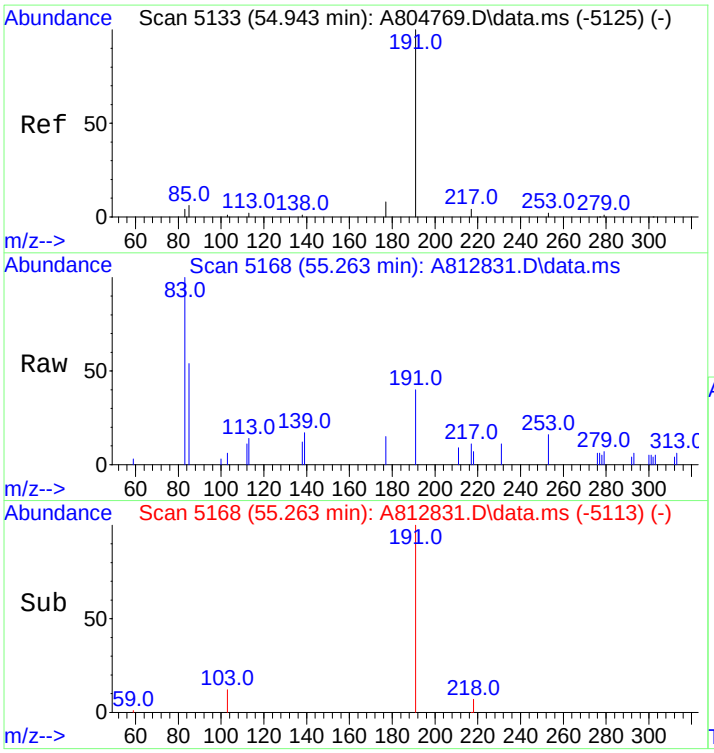




#119
30-Homohopane-22R (T22)
Concen: 283.55 ng/ml
RT: 54.706 min Scan# 5107
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

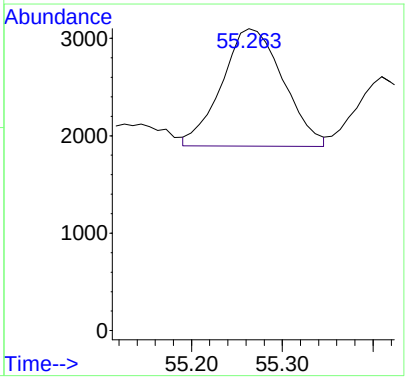
Tgt Ion:191 Resp: 26440

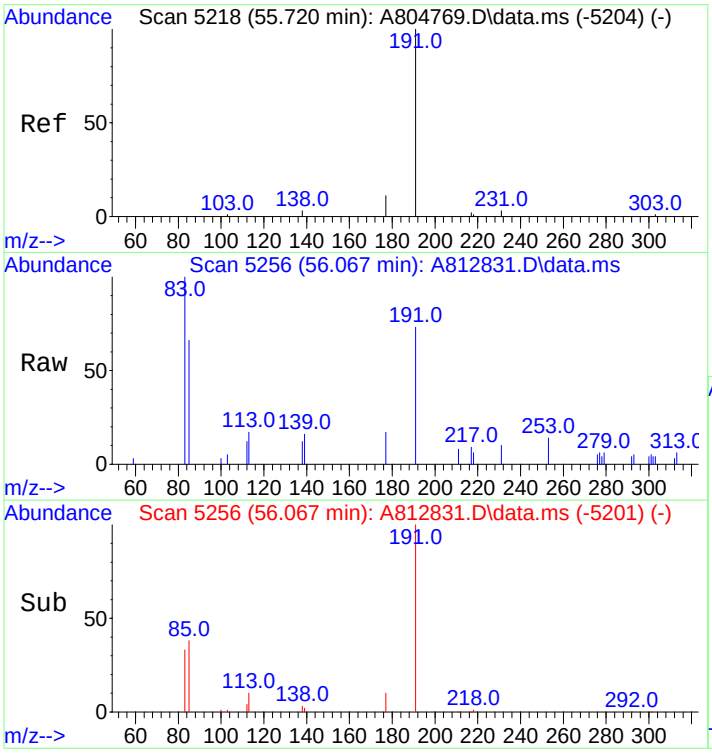




#120
Gammacerane/C32-diahopane
Concen: 60.66 ng/mL
RT: 55.263 min Scan# 5168
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

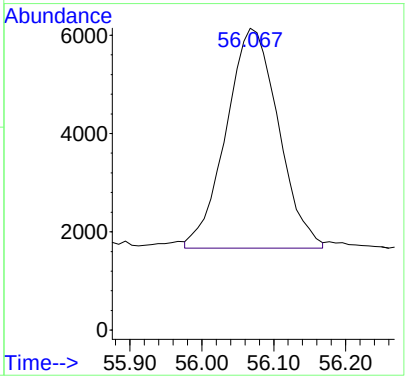
Tgt Ion:191 Resp: 5656

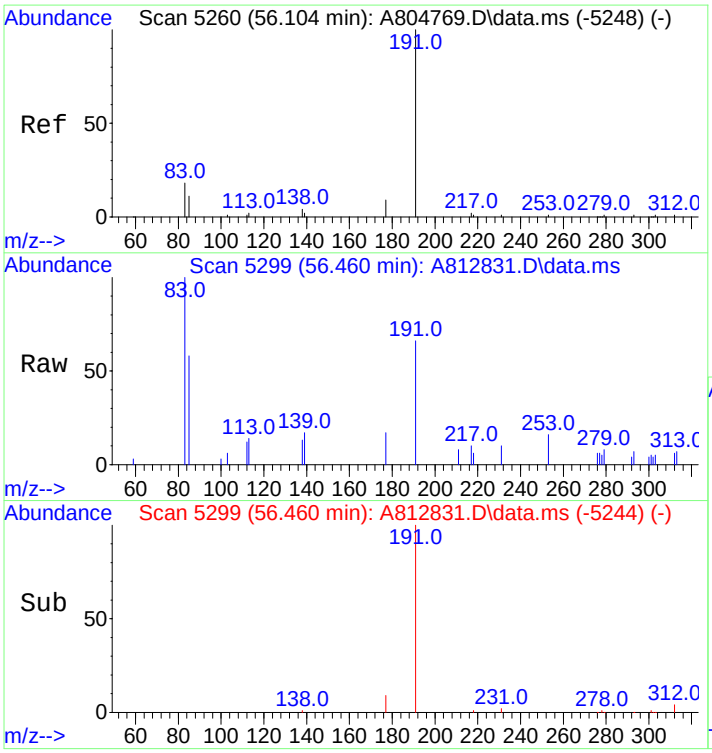




#121
30,31-Bishomohopane-22S (T26)
Concen: 241.40 ng/ml m
RT: 56.067 min Scan# 5256
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

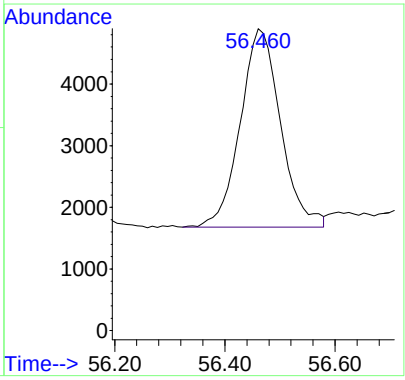
Tgt Ion:191 Resp: 22510

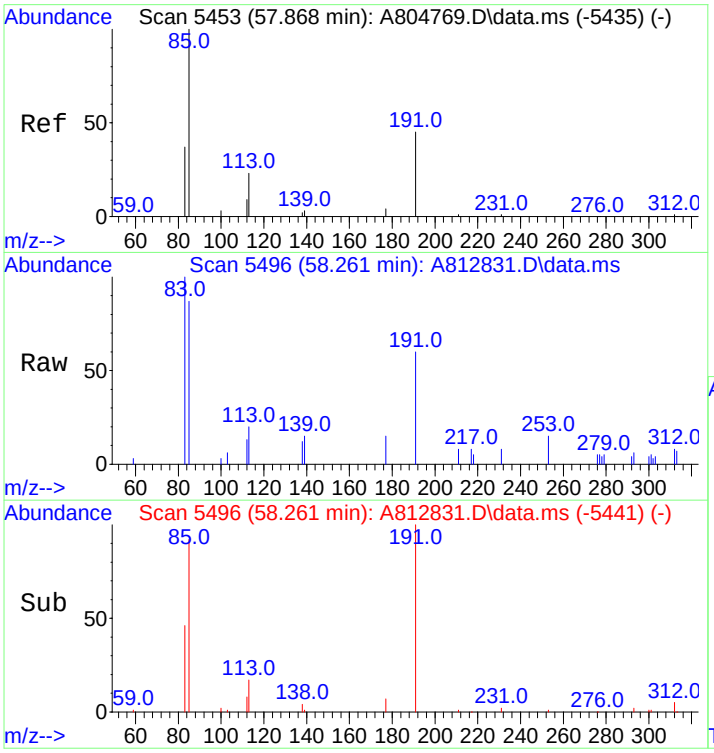




#122
30,31-Bishomohopane-22R (T27)
Concen: 175.46 ng/ml
RT: 56.460 min Scan# 5299
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

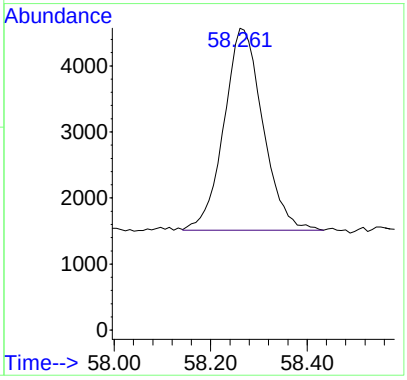
Tgt Ion:191 Resp: 16361

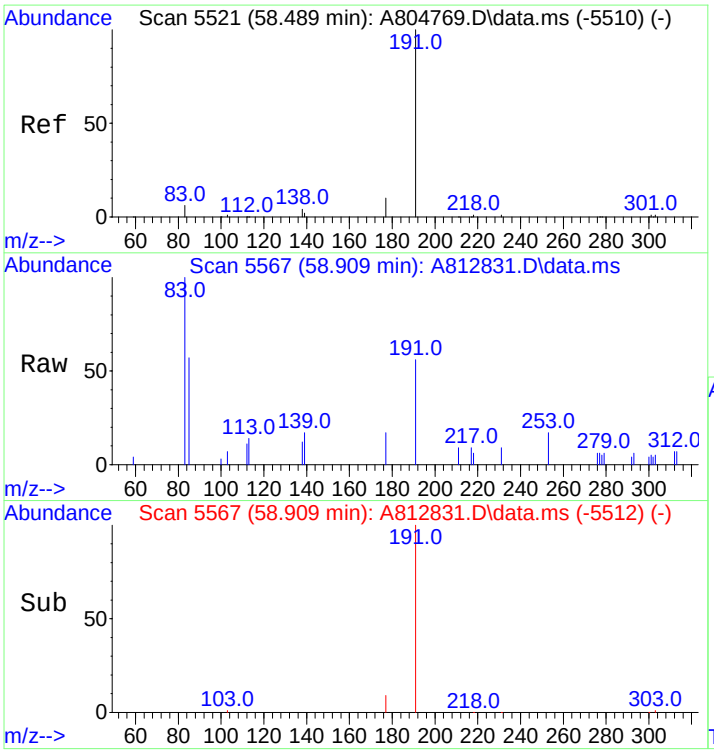




#123
30,31-Trishomohopane-22S (T30)
Concen: 183.76 ng/ml
RT: 58.261 min Scan# 5496
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

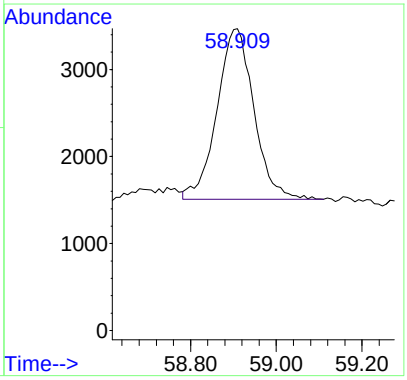
Tgt Ion:191 Resp: 17135

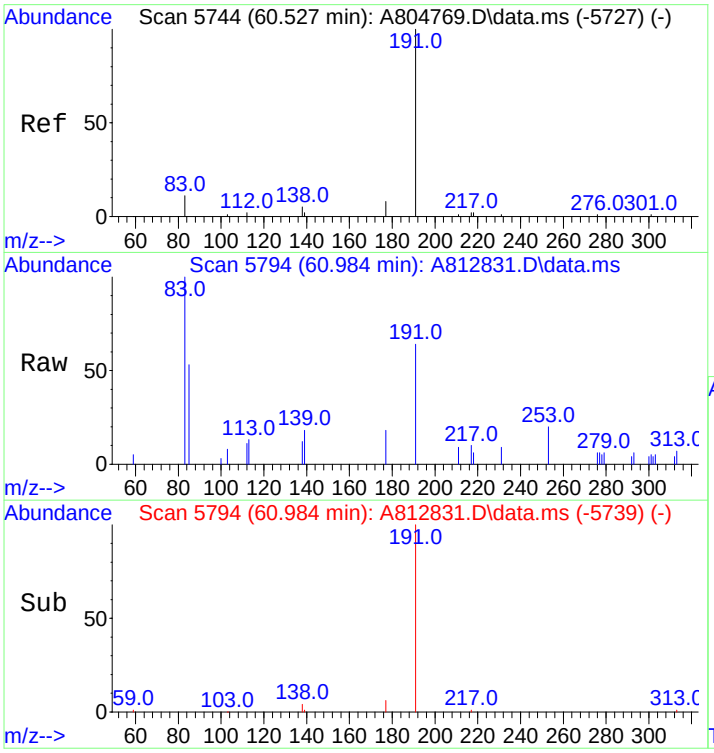




#124
30,31-Trishomohopane-22R (T31)
Concen: 126.00 ng/ml
RT: 58.909 min Scan# 5567
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

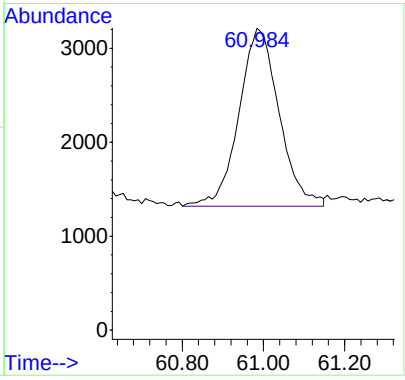
Tgt Ion:191 Resp: 11749

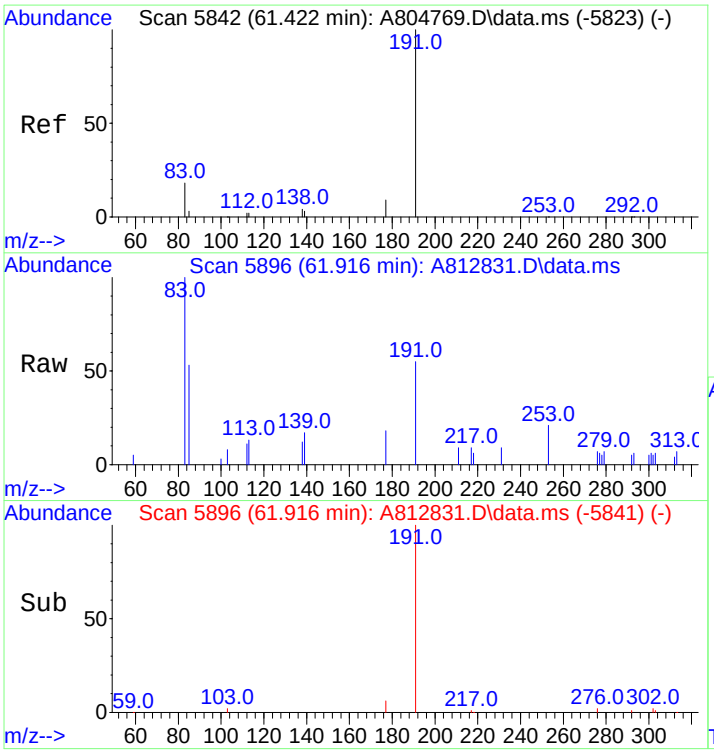




#125
Tetrakishomohopane-22S (T32)
Concen: 139.17 ng/ml
RT: 60.984 min Scan# 5794
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

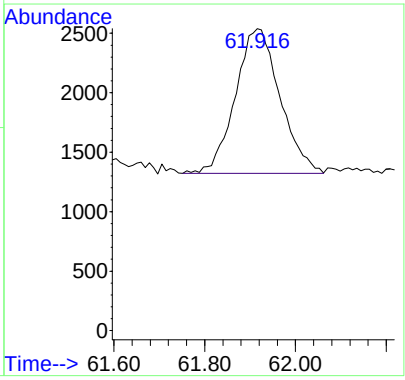
Tgt Ion:191 Resp: 12977

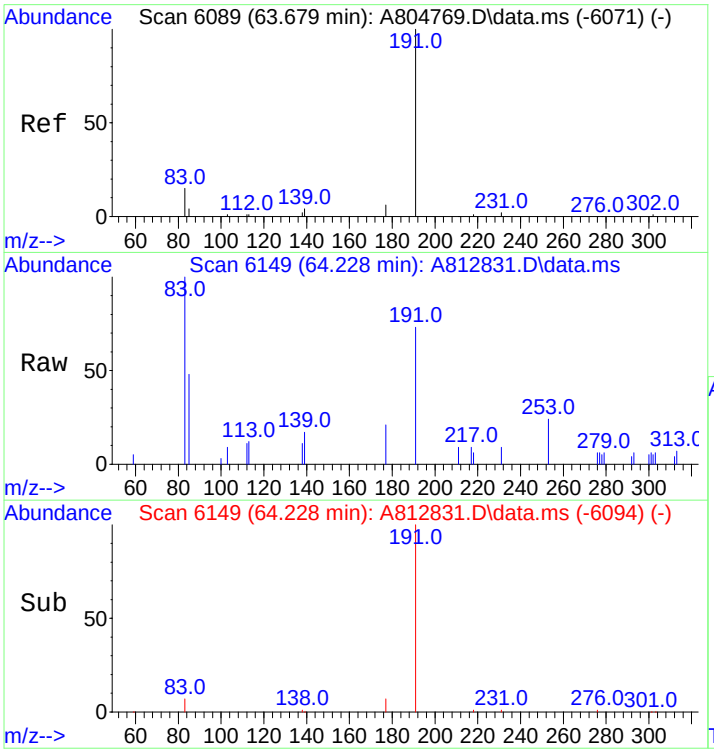




#126
Tetrakishomohopane-22R (T33)
Concen: 89.24 ng/ml
RT: 61.916 min Scan# 5896
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

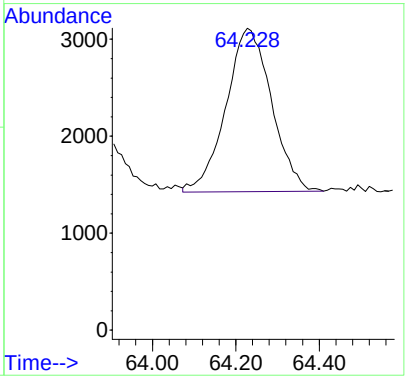
Tgt Ion:191 Resp: 8321

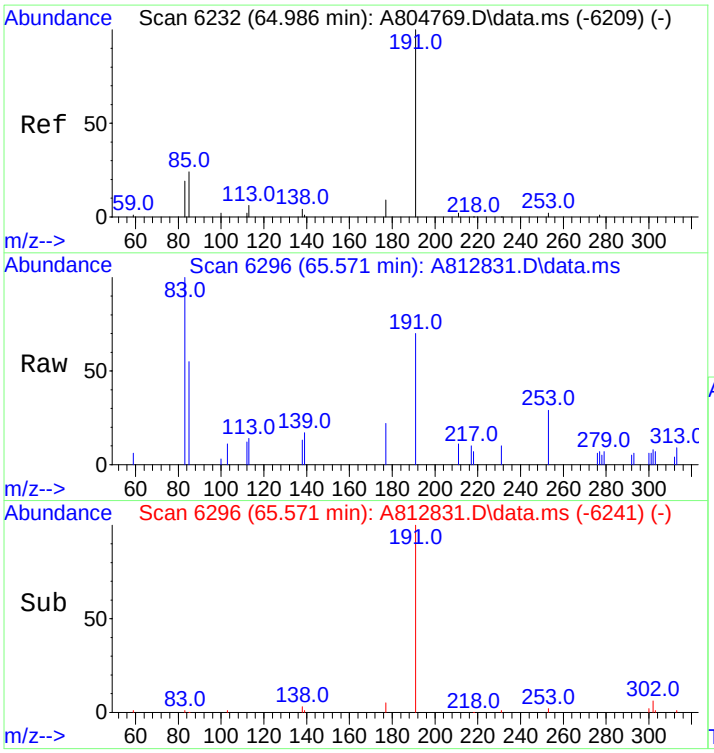




#127
Pentakishomohopane-22S (T34)
Concen: 137.11 ng/ml
RT: 64.228 min Scan# 6149
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

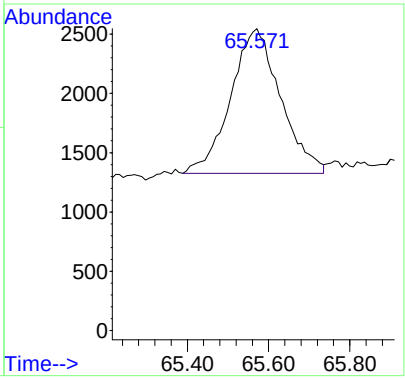
Tgt Ion:191 Resp: 12785

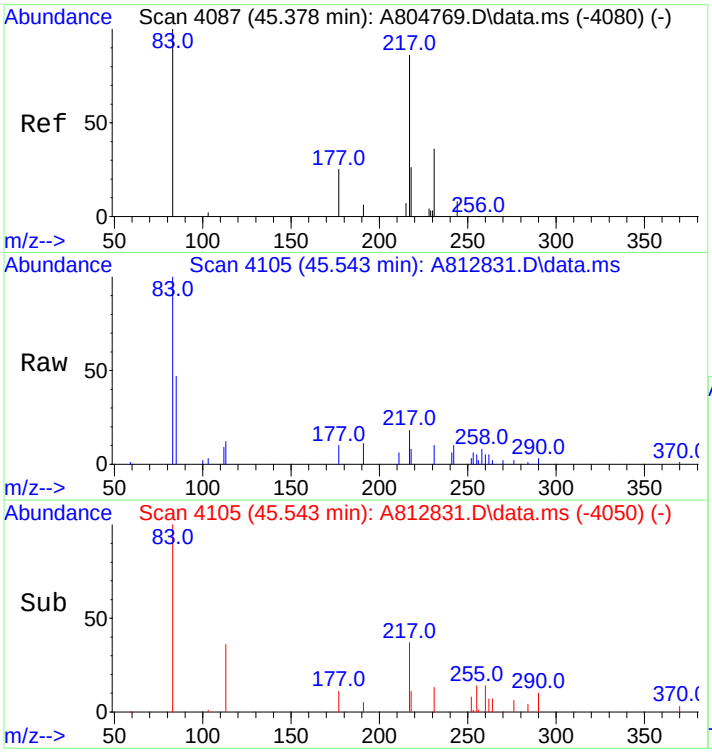




#128
Pentakishomohopane-22R (T35)
Concen: 111.63 ng/ml
RT: 65.571 min Scan# 6296
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

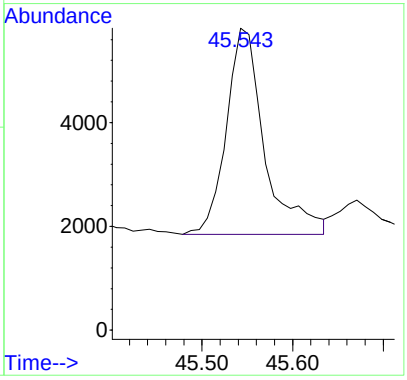
Tgt Ion:191 Resp: 10409

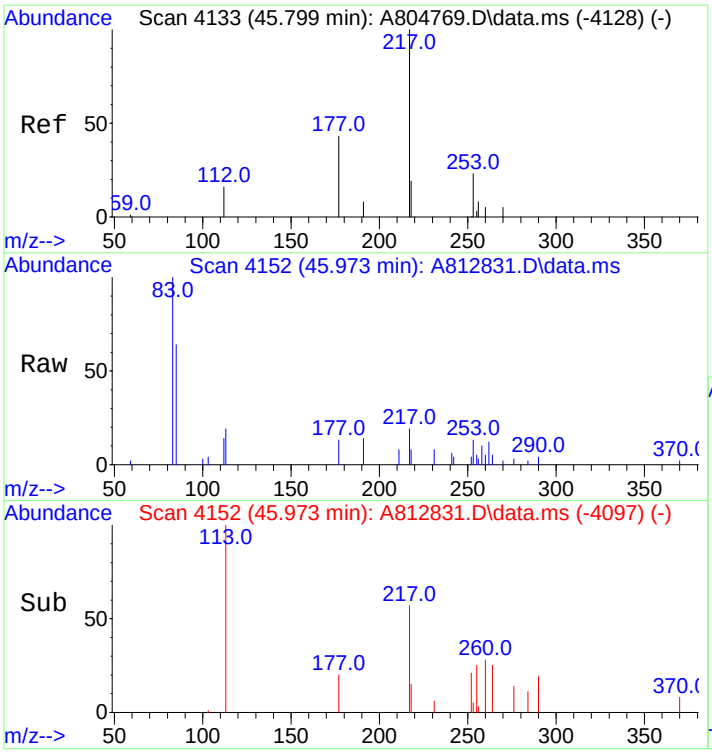




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 256.19 ng/ml
RT: 45.543 min Scan# 4105
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

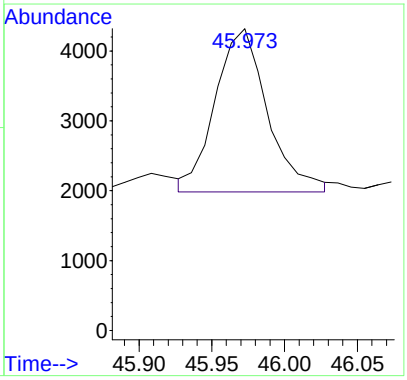
Tgt Ion:217 Resp: 11631

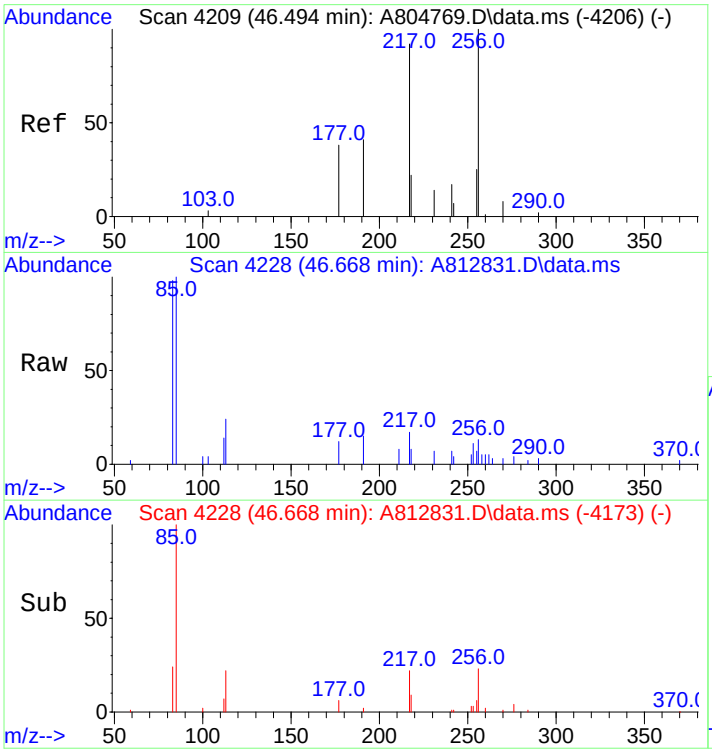




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 128.26 ng/ml m
RT: 45.973 min Scan# 4152
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

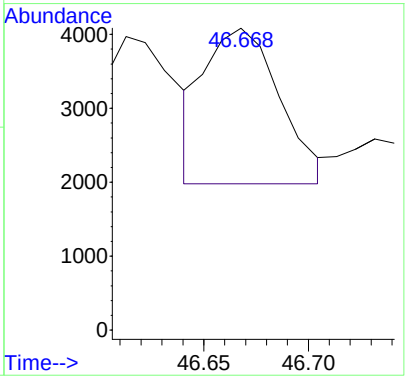
Tgt Ion:217 Resp: 5823

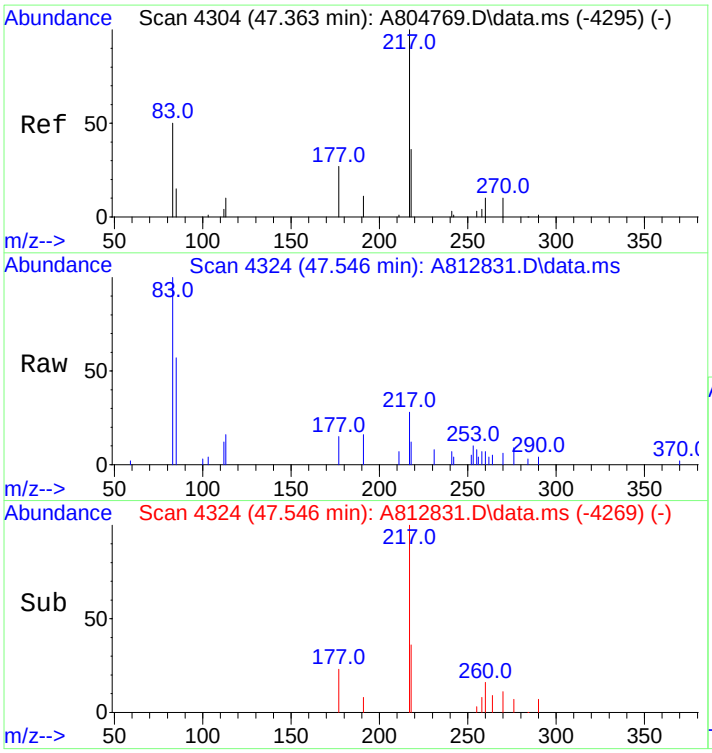




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 115.13 ng/ml m
RT: 46.668 min Scan# 4228
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

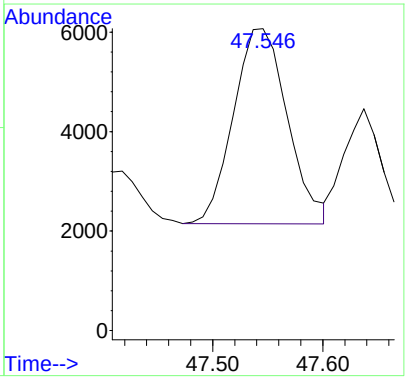
Tgt Ion:217 Resp: 5227

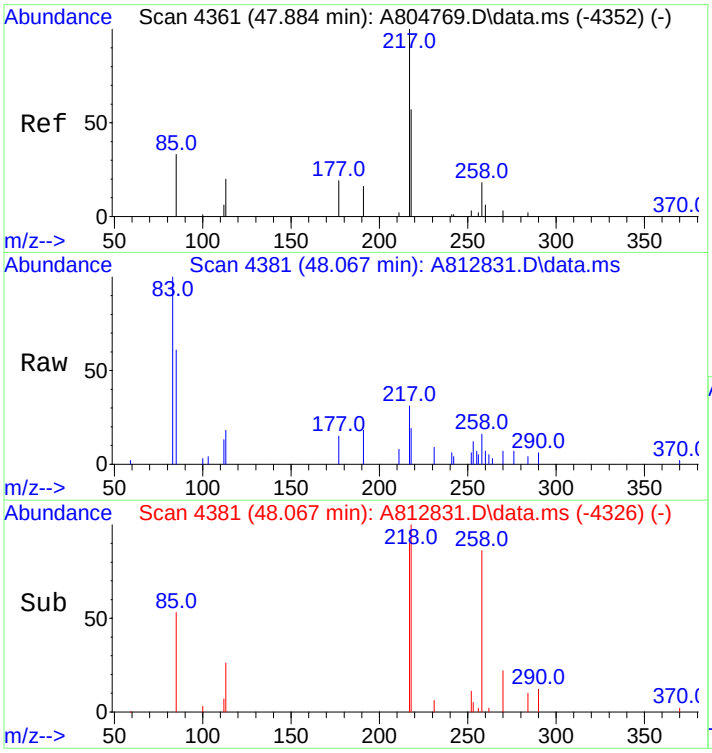




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 295.19 ng/ml
RT: 47.546 min Scan# 4324
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

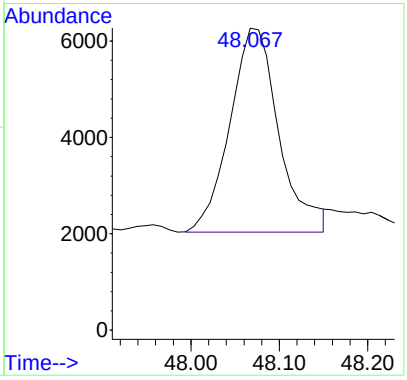
Tgt Ion:217 Resp: 13402

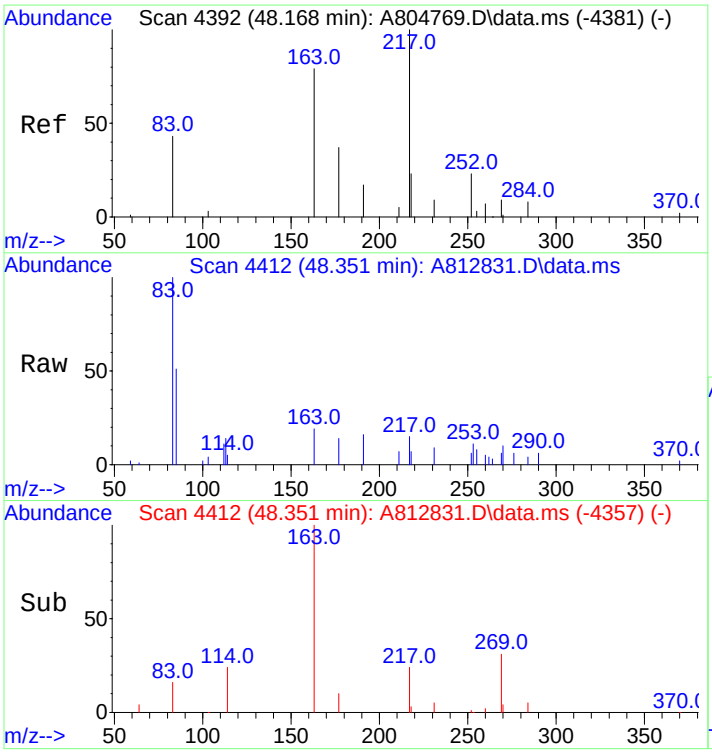




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 361.45 ng/ml m
RT: 48.067 min Scan# 4381
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

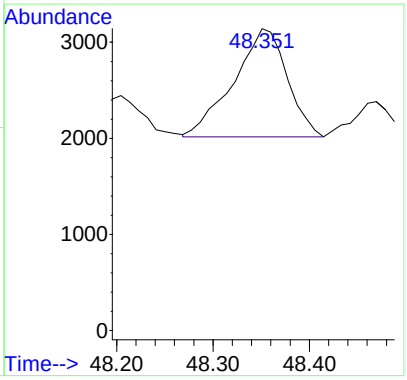
Tgt Ion:217 Resp: 16410

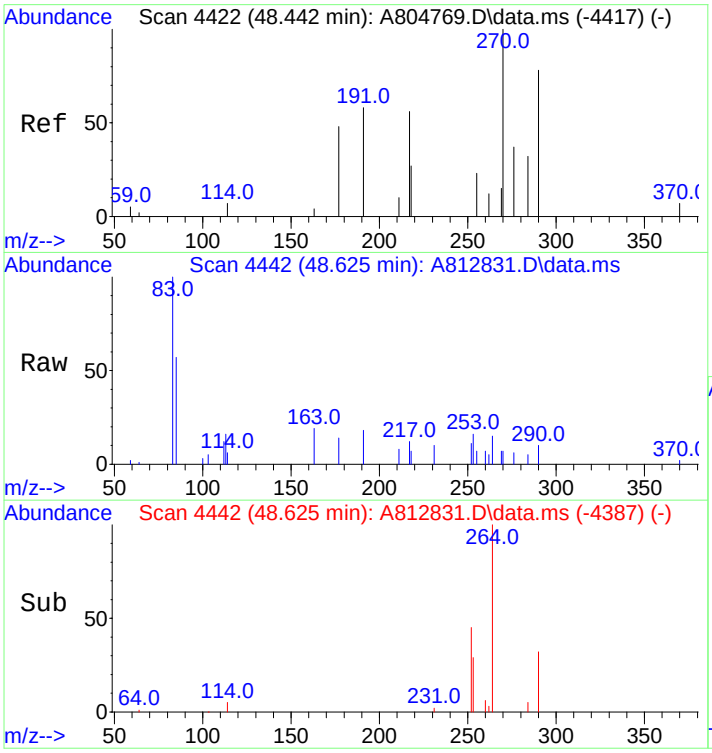




#135
Unknown Sterane (S18)
Concen: 95.51 ng/ml
RT: 48.351 min Scan# 4412
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

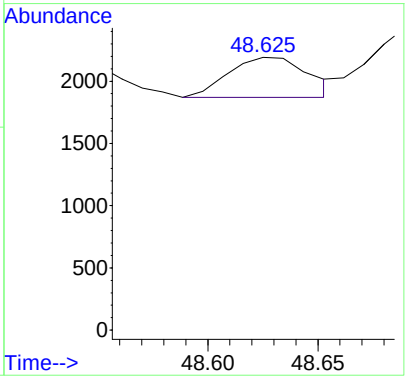
Tgt Ion:217 Resp: 4336

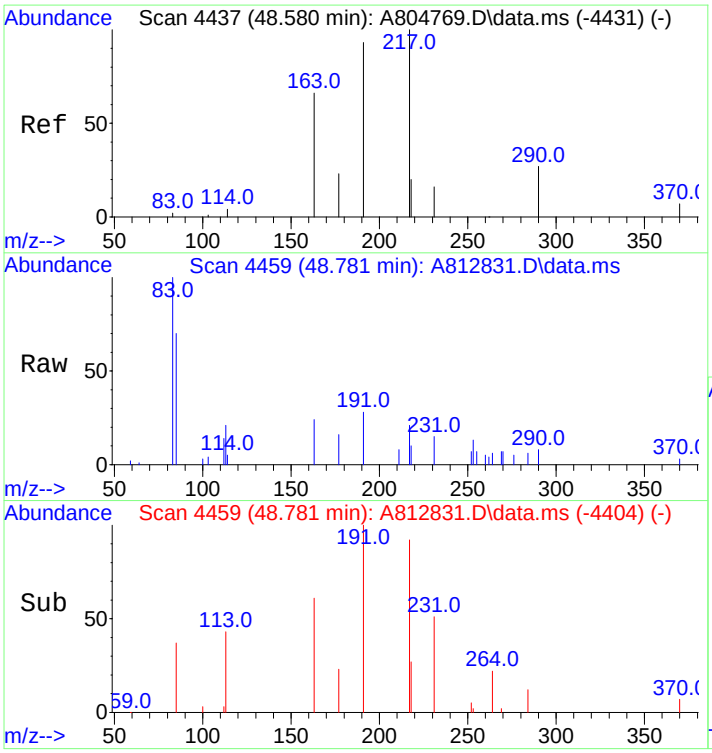




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 17.95 ng/ml
RT: 48.625 min Scan# 4442
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

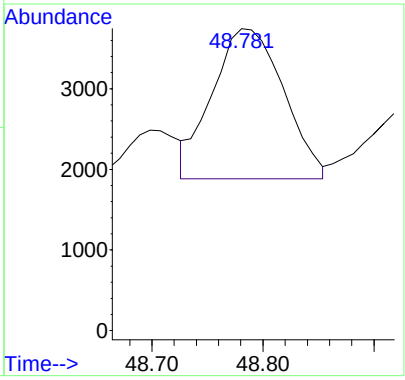
Tgt Ion:217 Resp: 815

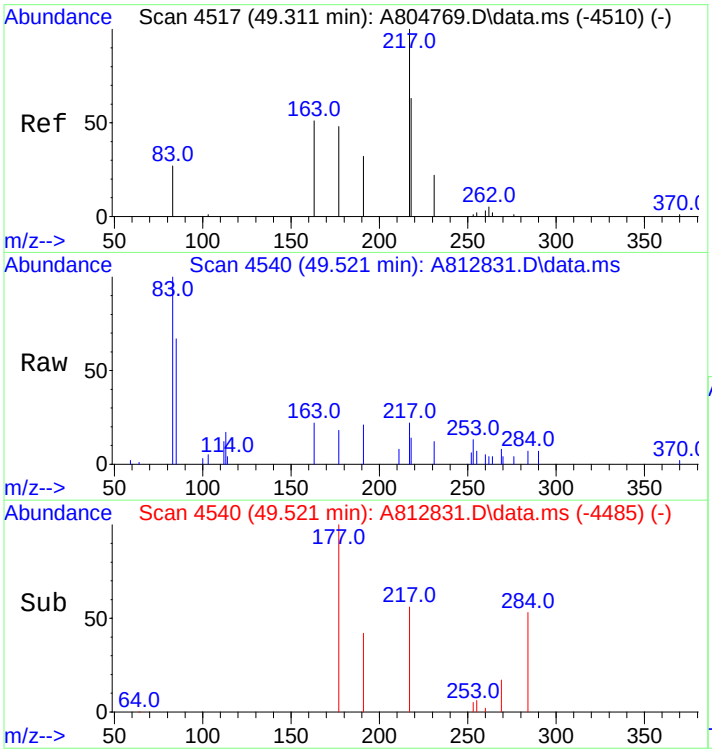




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 183.26 ng/ml m
RT: 48.781 min Scan# 4459
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

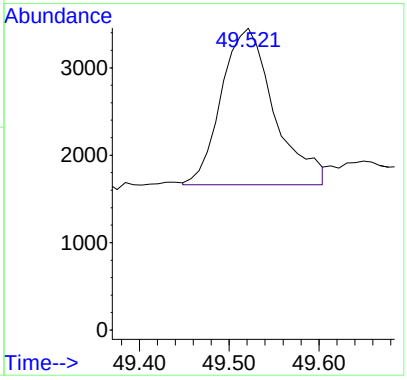
Tgt Ion:217 Resp: 8320

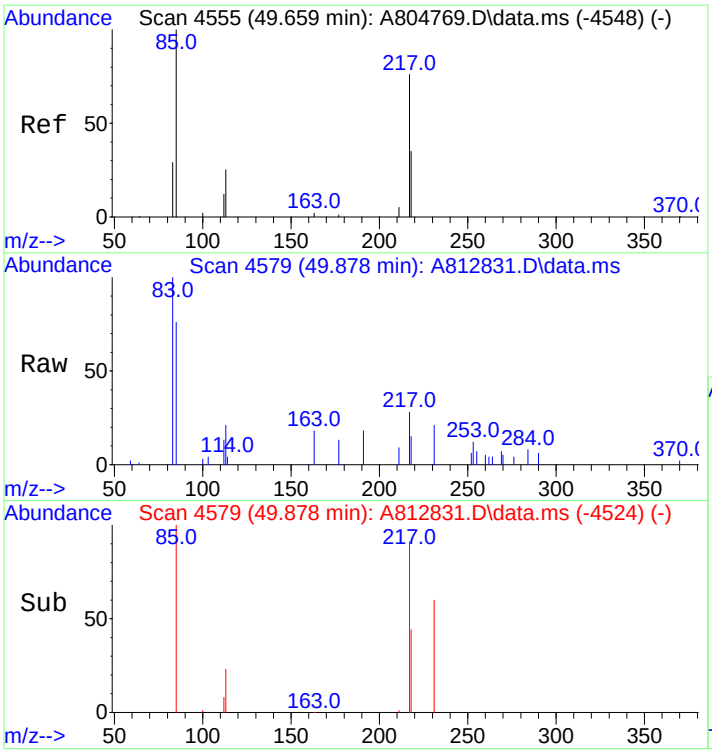




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 161.87 ng/ml m
RT: 49.521 min Scan# 4540
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

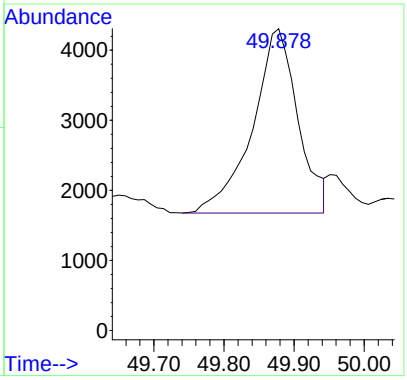
Tgt Ion:217 Resp: 7349

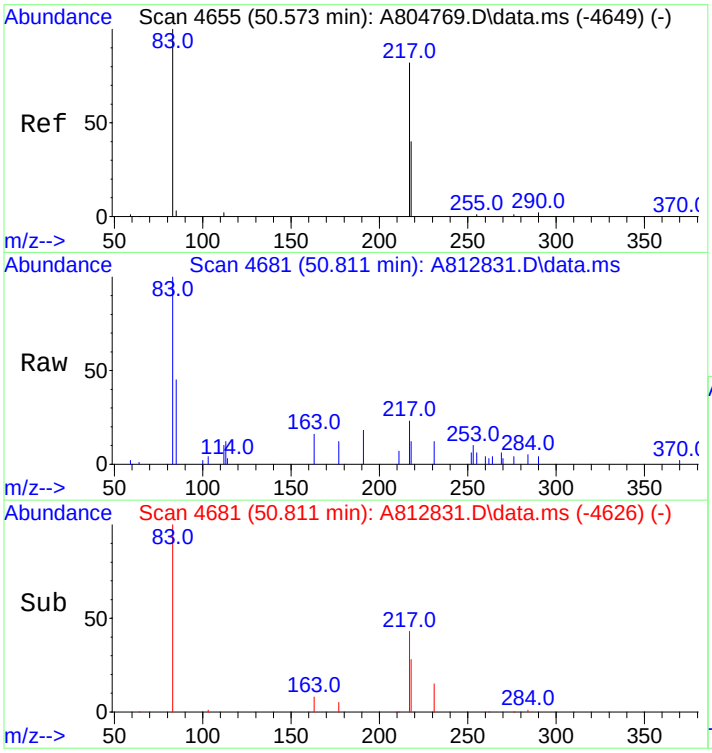




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 262.07 ng/ml
RT: 49.878 min Scan# 4579
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

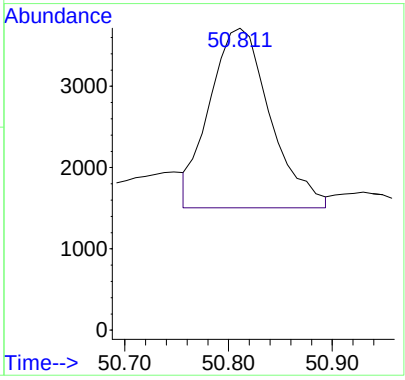
Tgt Ion:217 Resp: 11898

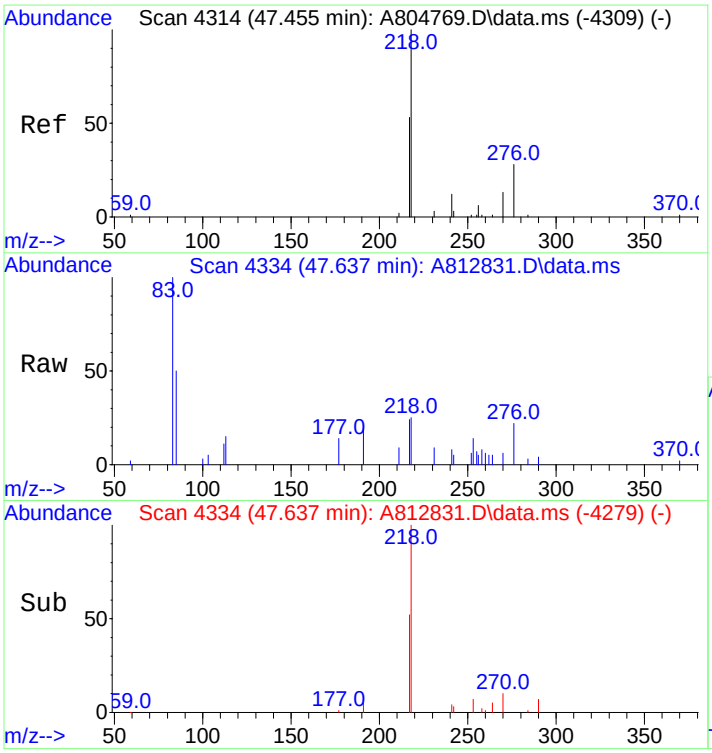




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 198.37 ng/ml m
RT: 50.811 min Scan# 4681
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

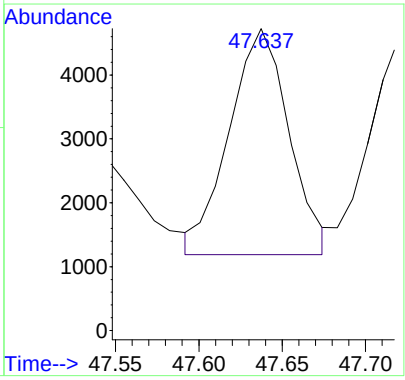
Tgt Ion:217 Resp: 9006

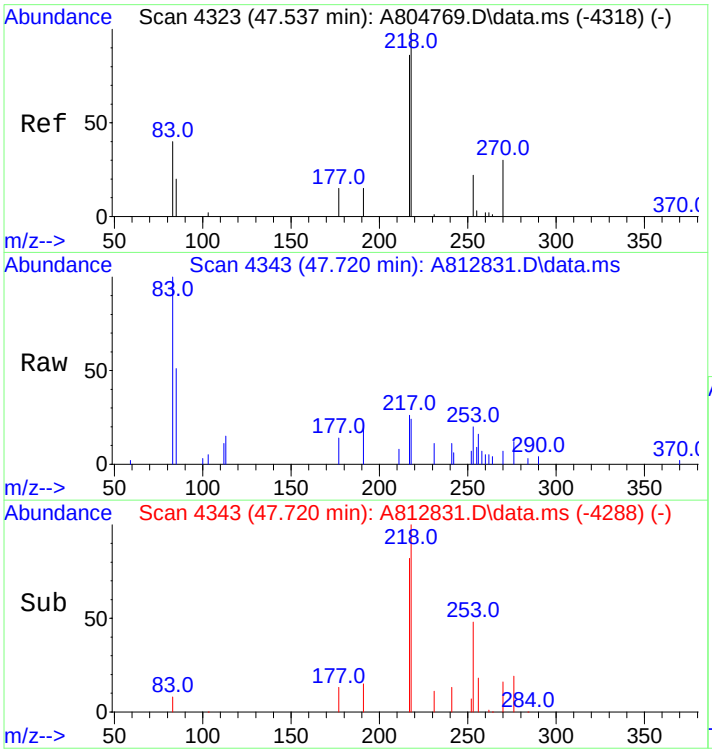




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 194.36 ng/ml m
RT: 47.637 min Scan# 4334
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

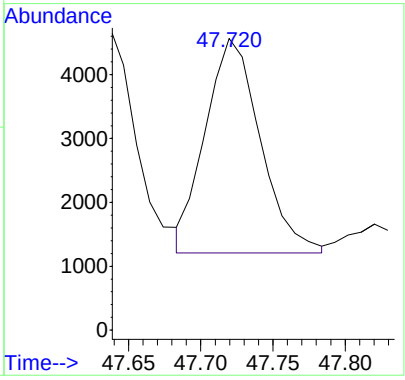
Tgt Ion:218 Resp: 8824

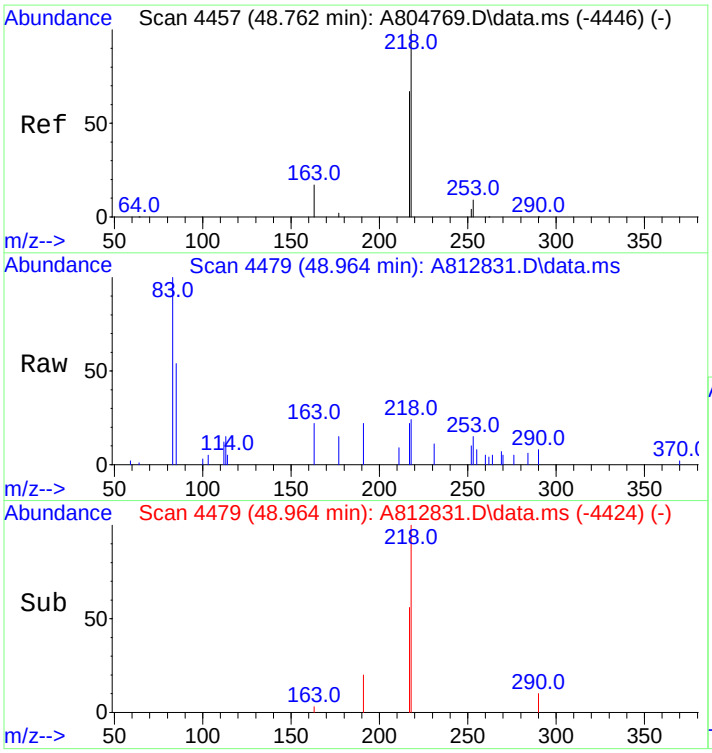




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 195.44 ng/ml m
RT: 47.720 min Scan# 4343
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

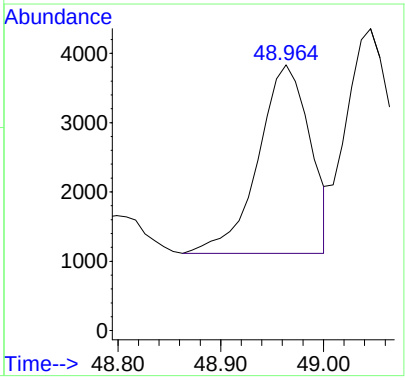
Tgt Ion:218 Resp: 8873

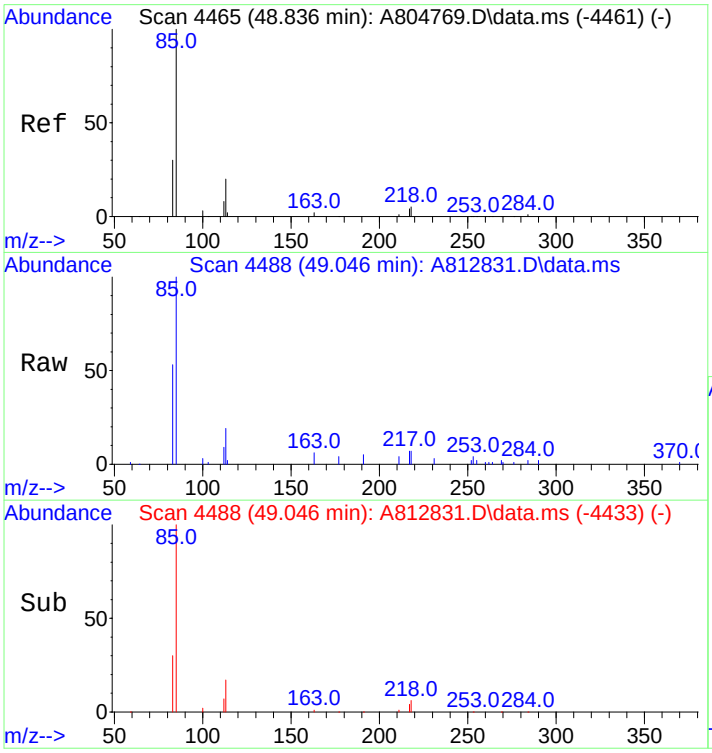




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 211.39 ng/ml
RT: 48.964 min Scan# 4479
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

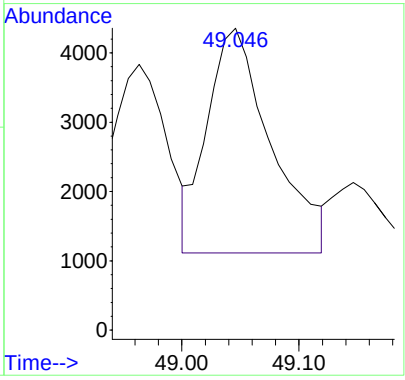
Tgt Ion:218 Resp: 9597

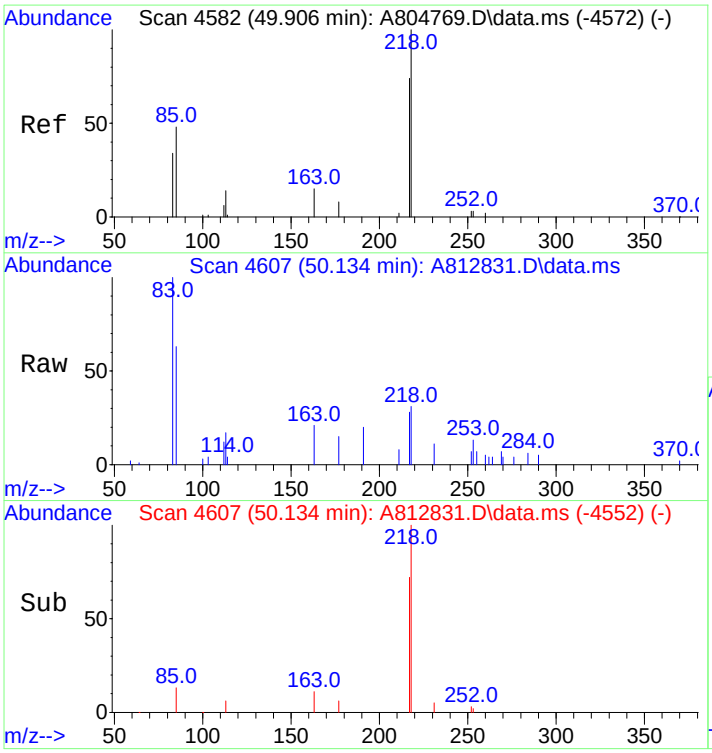




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 270.75 ng/ml m
RT: 49.046 min Scan# 4488
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

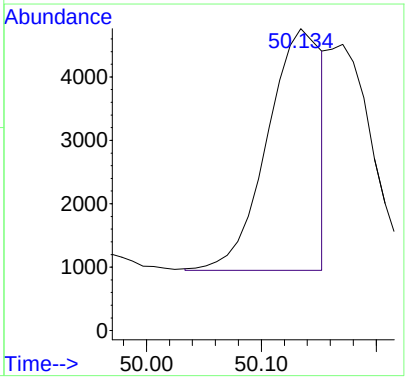
Tgt Ion:218 Resp: 12292

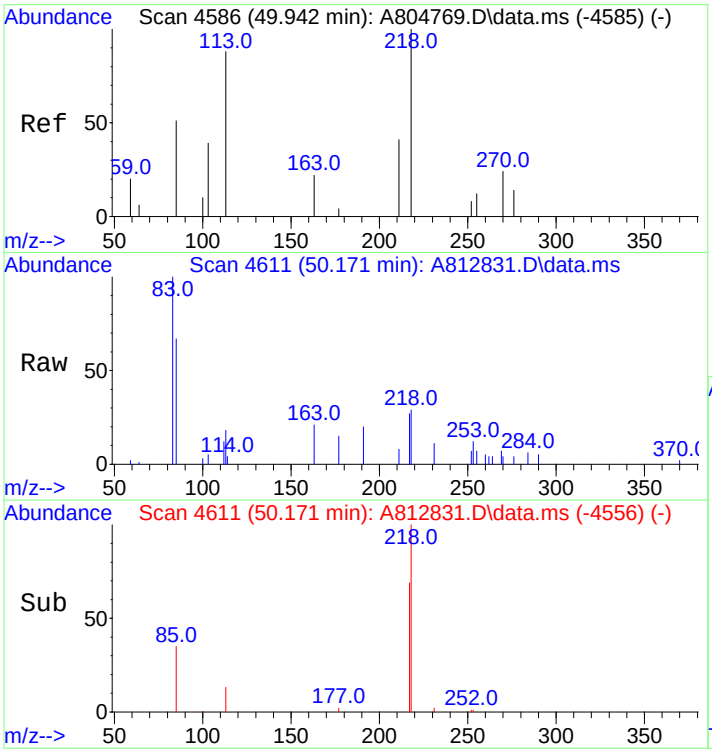




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 276.89 ng/ml m
RT: 50.134 min Scan# 4607
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

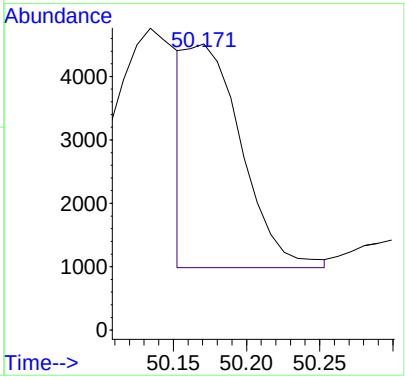
Tgt Ion:218 Resp: 12571

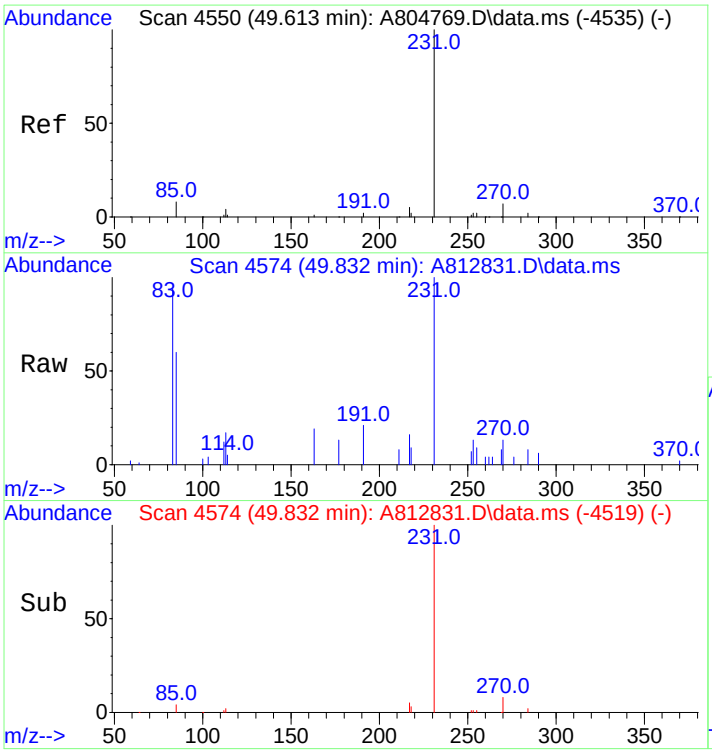




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 203.83 ng/ml m
RT: 50.171 min Scan# 4611
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

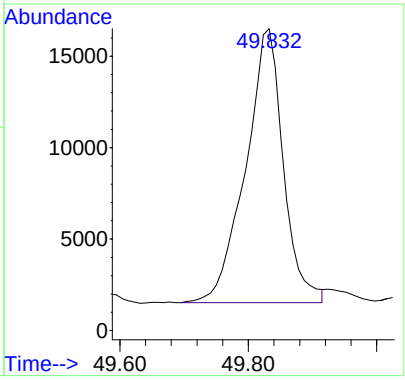
Tgt Ion:218 Resp: 9254

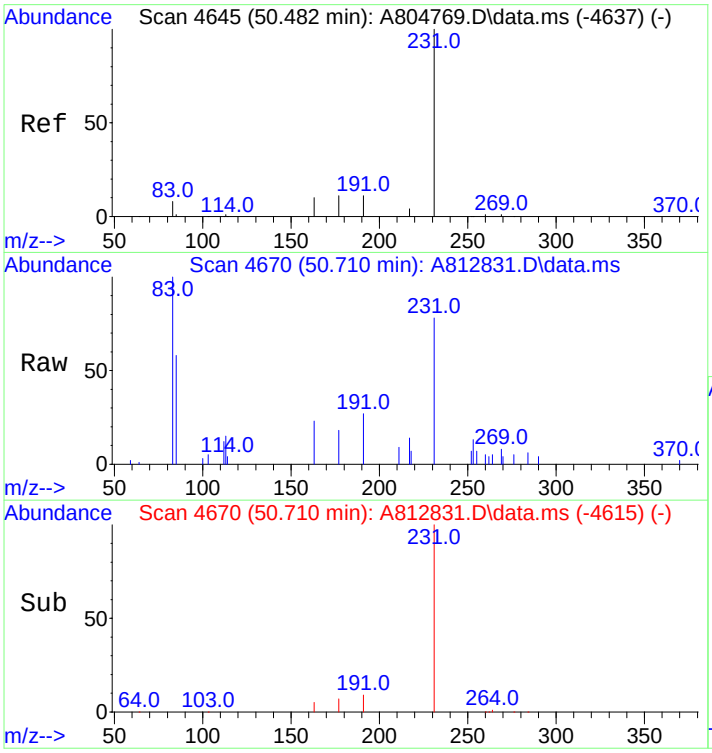




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1348.35 ng/mL m
RT: 49.832 min Scan# 4574
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

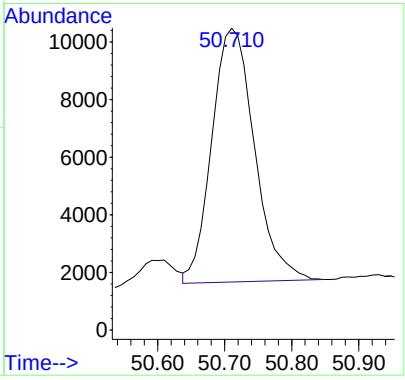
Tgt Ion:231 Resp: 61216

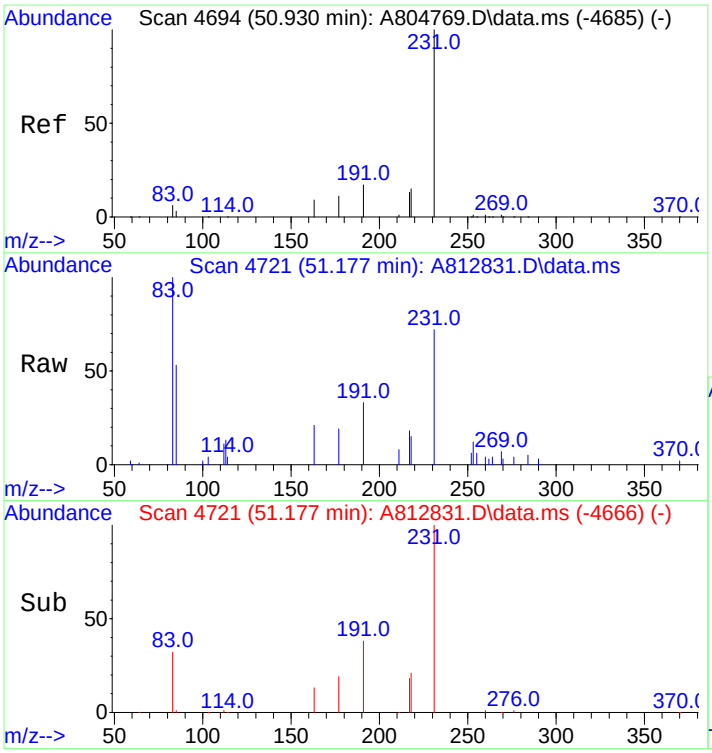




#148
C28,20S-triaromatic steroid
Concen: 857.59 ng/mL
RT: 50.710 min Scan# 4670
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

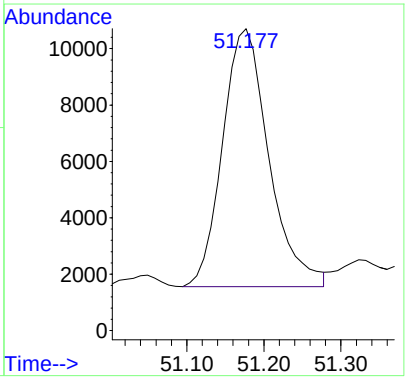
Tgt Ion:231 Resp: 38935

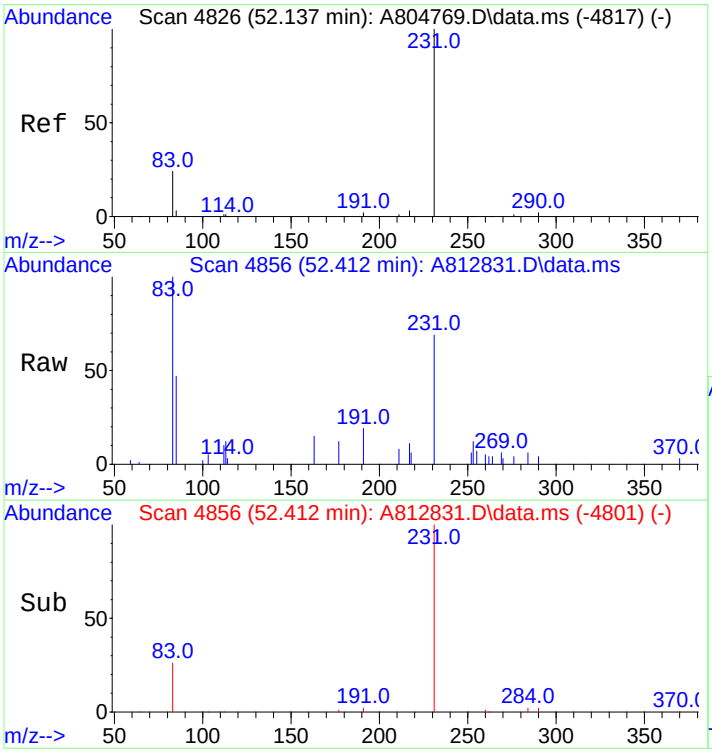




#149
C27,20R-triaromatic steroid
Concen: 845.72 ng/mL
RT: 51.177 min Scan# 4721
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

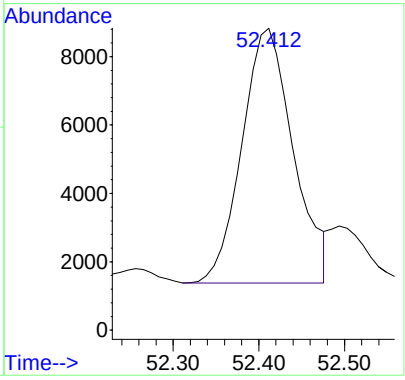
Tgt Ion:231 Resp: 38396





#150
C28,20R-triaromatic steroid
Concen: 687.94 ng/mL
RT: 52.412 min Scan# 4856
Delta R.T. 0.000 min
Lab File: A812831.D
Acq: 18 Nov 2012 9:02 pm

Tgt Ion:231 Resp: 31233



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

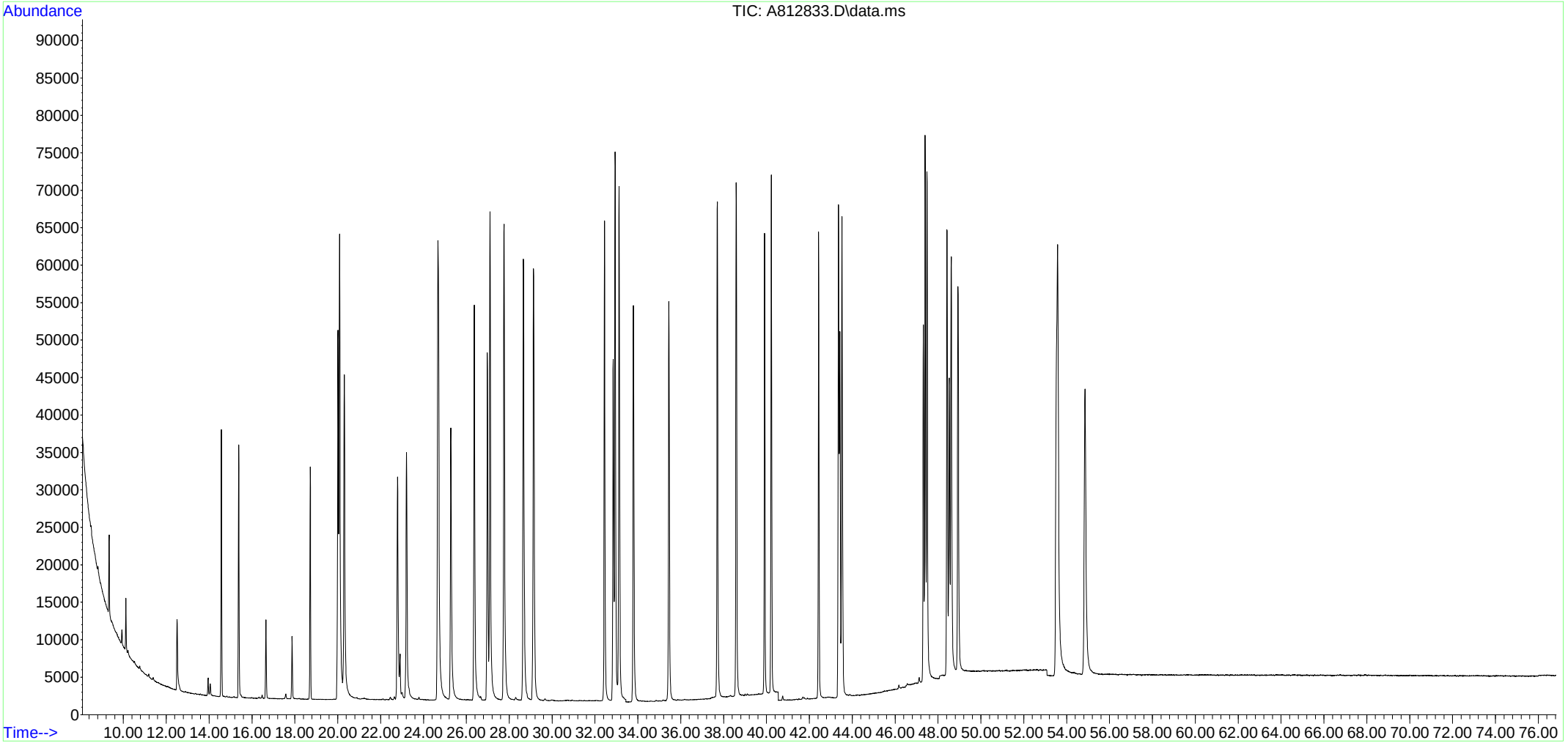
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.977	164	76200	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	108107	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	149700	495.723	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.57%#			
42) Phenanthrene-d10	32.852	188	119182	508.212	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.82%			
83) Benzo[b]fluoranthene-d12	47.317	264	108723	527.689	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.77%			
88) Benzo[a]pyrene-d12	48.524	264	101902	500.603	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.06%			
129) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	15182	224.200	ng/mL	100
4) cis-Decalin	17.869	138	11364	229.077	ng/mL	100
10) Naphthalene	20.087	128	183554	531.304	ng/mL#	100
16) 2-Methylnaphthalene	22.788	142	104911	509.782	ng/mL#	100
17) 1-Methylnaphthalene	23.208	142	105607	548.020	ng/mL#	100
18) Benzothiophene	20.306	134	142658	510.866	ng/mL	100
23) Biphenyl	24.668	154	136659	521.940	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.279	156	92071	522.755	ng/mL#	100
25) Dibenzofuran	27.761	168	142154	514.633	ng/mL	98
26) Acenaphthylene	26.365	152	163856M3	522.523	ng/mL	
27) Acenaphthene	27.104	153	98512	526.316	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.665	170	78294	516.137	ng/mL	96
29) Fluorene	29.130	166	109490	521.553	ng/mL	100
33) Dibenzothiophene	32.442	184	152334	527.691	ng/mL	100
43) Phenanthrene	32.935	178	148490	534.419	ng/mL	100
54) Retene	39.909	234	38463	596.909	ng/mL	98
55) Anthracene	33.126	178	146151M3	564.604	ng/mL	
56) Carbazole	33.792	167	144987	536.791	ng/mL	100
57) 1-Methylphenanthrene	35.445	192	105021	533.212	ng/mL	99
58) Fluoranthene	37.708	202	156178	545.687	ng/mL	100
59) Benzo(b)fluorene	40.219	216	89486	540.502	ng/mL	99
60) Pyrene	38.585	202	156214	539.619	ng/mL	98
66) Naphthobenzothiophene	42.429	234	139506	519.127	ng/ml#	64
67) Naphthobenzothiophene-...	42.429	234	139506	519.127	ng/mL#	64
75) Benz[a]anthracene	43.360	228	124735	526.318	ng/mL	100
76) Chrysene	43.524	228	125061	521.316	ng/mL	100
77) Chrysene/Triphenylene	43.524	228	125061	521.316	ng/mL	100
84) Benzo[b]fluoranthene	47.399	252	139628	548.570	ng/mL	97
85) Benzo[j]+[k]fluoranthene	47.482	252	154164	555.106	ng/mL	95
87) Benzo[e]pyrene	48.424	252	137633	524.796	ng/mL	96
89) Benzo[a]pyrene	48.616	252	133173	548.946	ng/mL	95
90) Perylene	48.927	252	139465	526.300	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	53.518	276	138611M3	537.871	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.582	278	137662	544.970	ng/mL	99
93) Benzo[g,h,i]perylene	54.852	276	151193	516.982	ng/mL	99

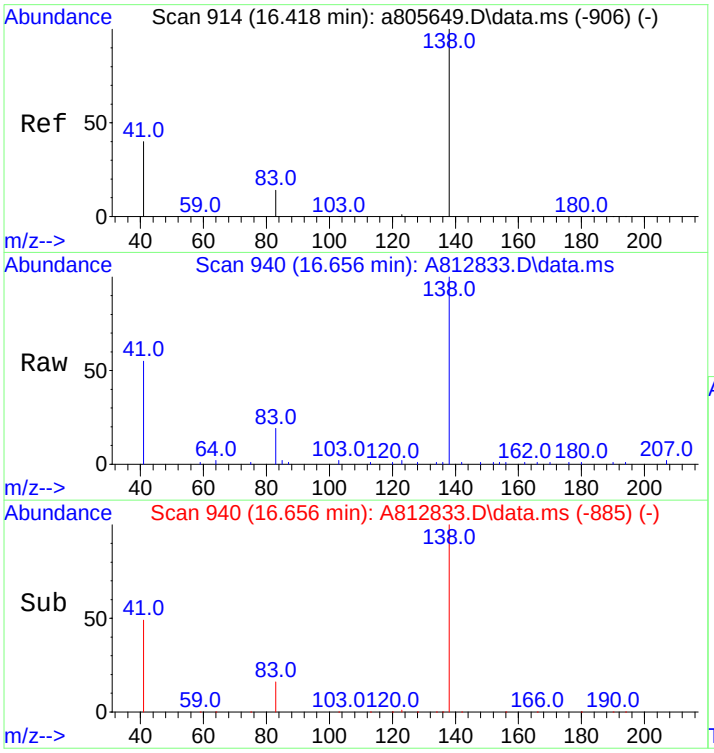
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812833.D
Acq On : 18 Nov 2012 11:50 pm
Operator : AC
Sample : q811181201
Misc : icc whaq50
ALS Vial : 14 Sample Multiplier: 1

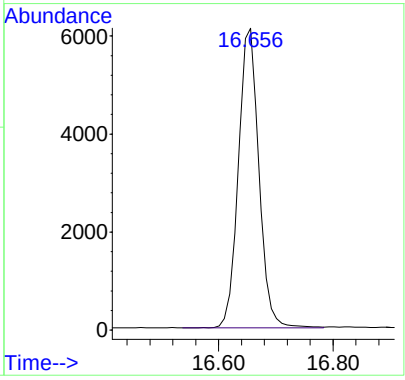
Quant Time: Nov 19 12:14:14 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

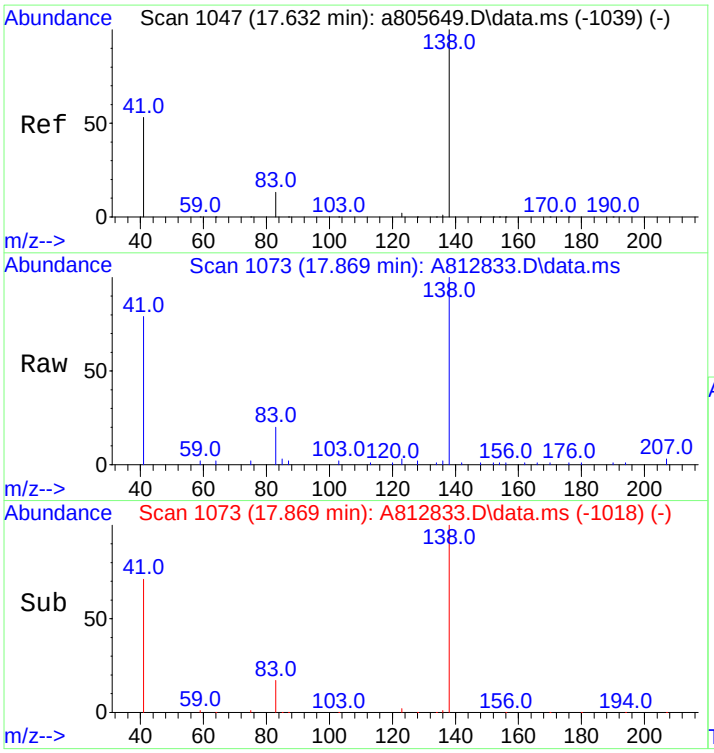




#3
trans-Decalin
Concen: 224.20 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

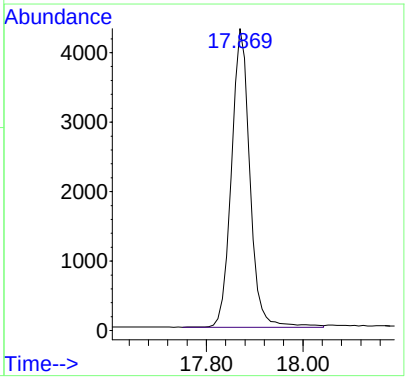
Tgt Ion:138 Resp: 15182

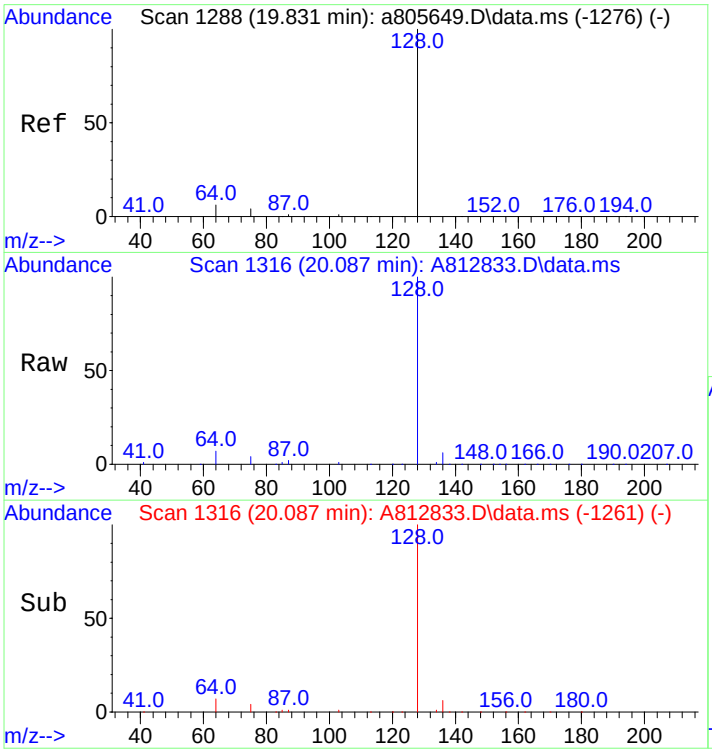




#4
cis-Decalin
Concen: 229.08 ng/mL
RT: 17.869 min Scan# 1073
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:138 Resp: 11364

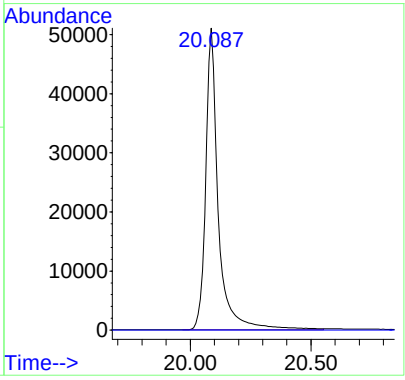


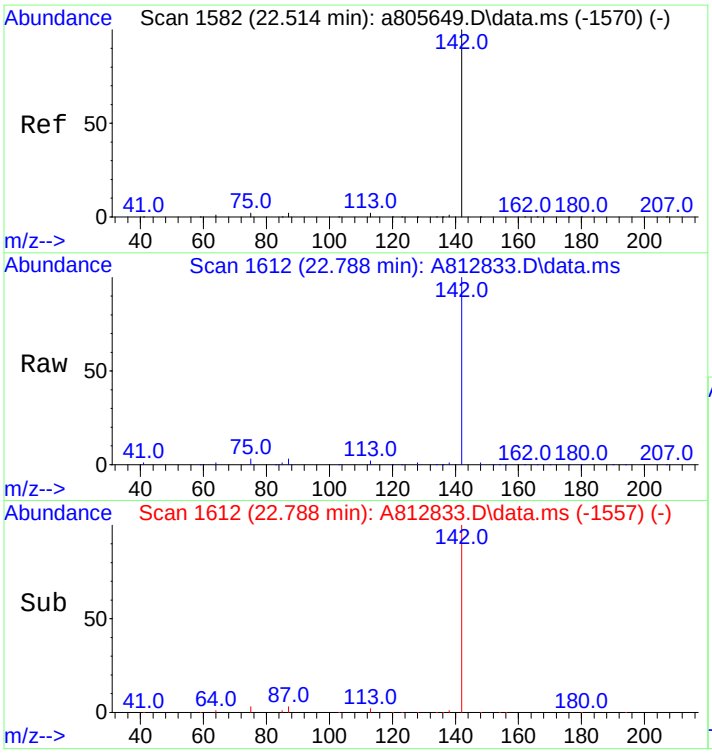


#10
Naphthalene
Concen: 531.30 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:128 Resp: 183554

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

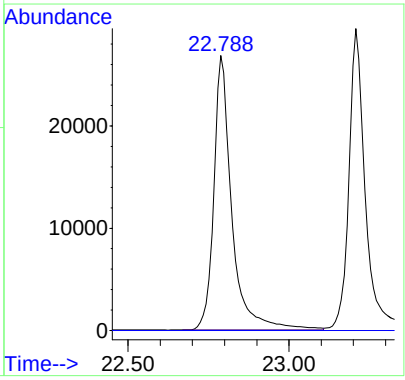


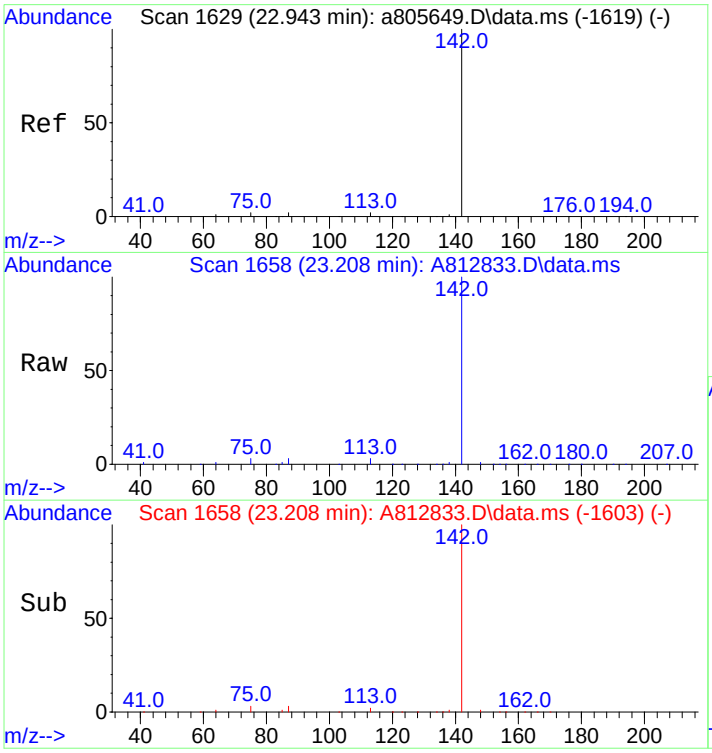


#16
2-Methylnaphthalene
Concen: 509.78 ng/mL
RT: 22.788 min Scan# 1612
Delta R.T. 0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:142 Resp: 104911

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

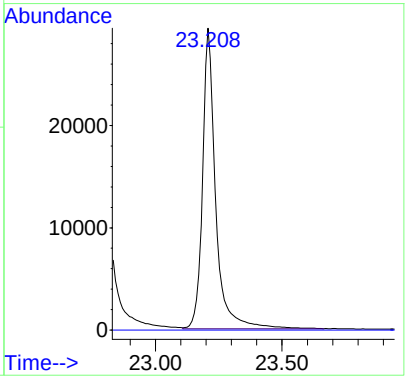


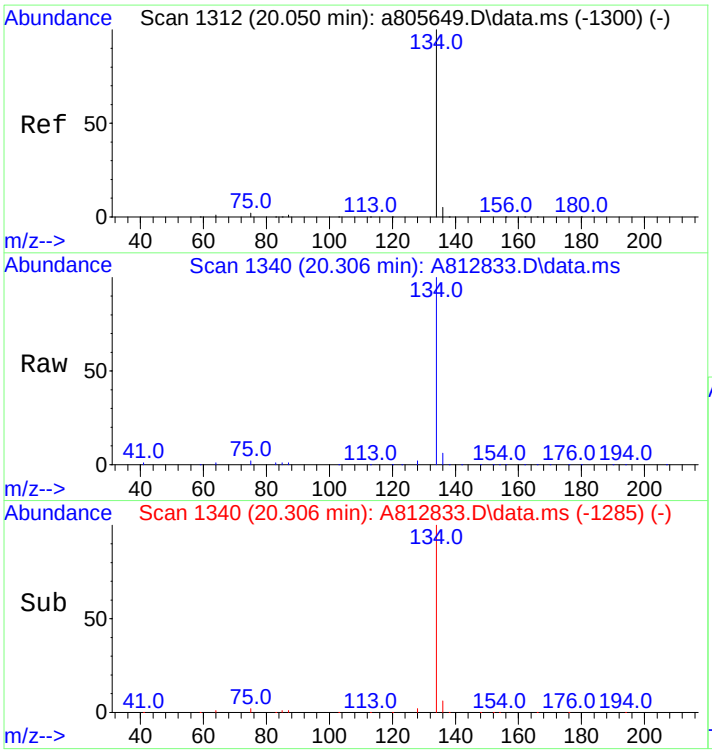


#17
1-Methylnaphthalene
Concen: 548.02 ng/mL
RT: 23.208 min Scan# 1658
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:142 Resp: 105607

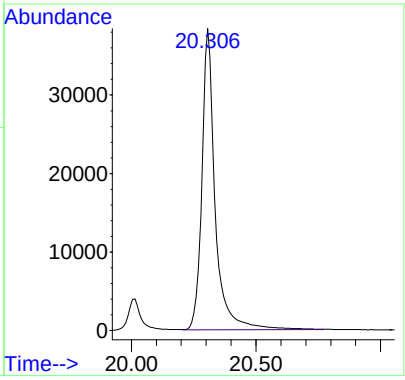
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

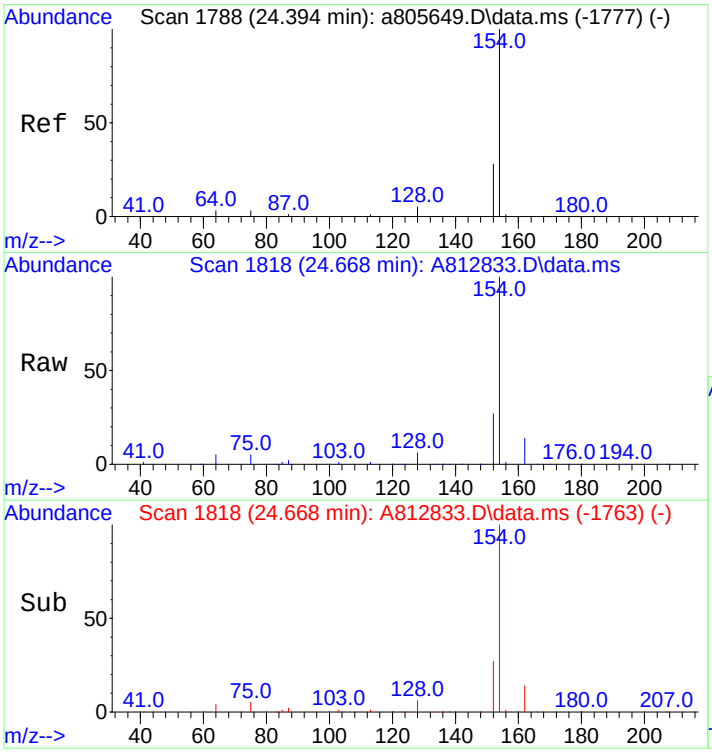




#18
Benzothiophene
Concen: 510.87 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:134 Resp: 142658

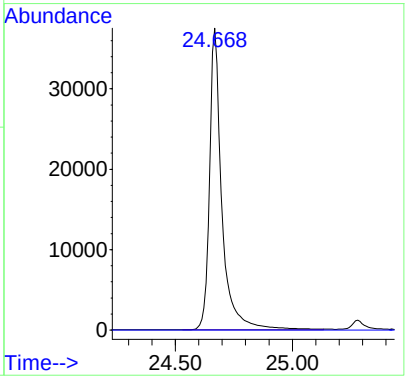


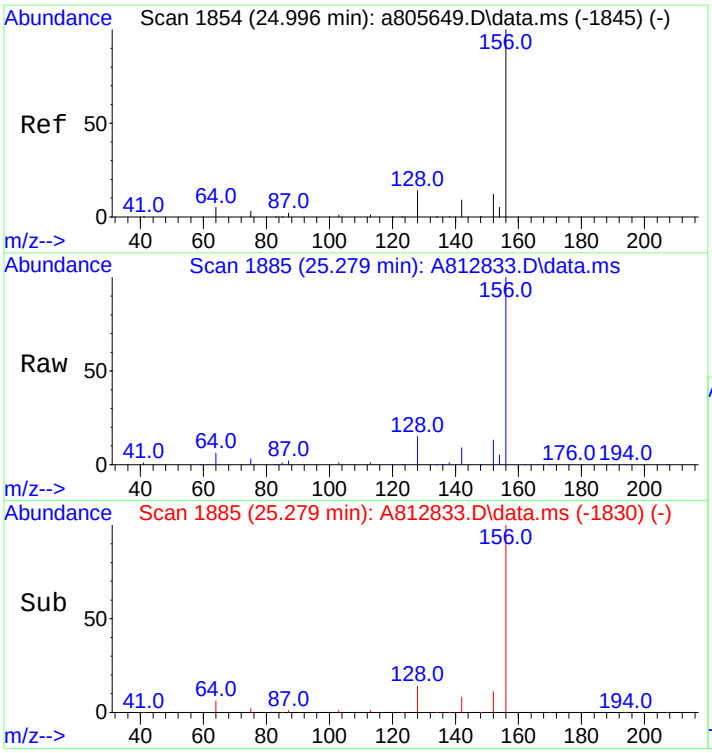


#23
Biphenyl
Concen: 521.94 ng/mL
RT: 24.668 min Scan# 1818
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:154 Resp: 136659

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

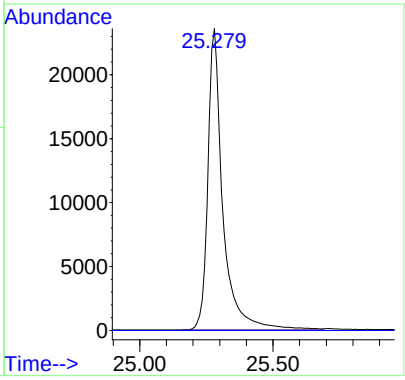


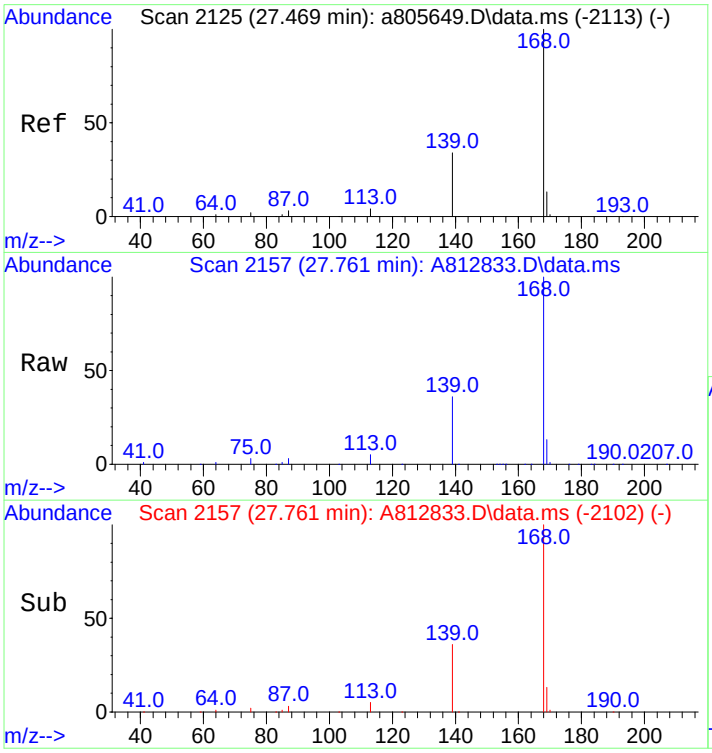


#24
2,6-Dimethylnaphthalene
Concen: 522.75 ng/mL
RT: 25.279 min Scan# 1885
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:156 Resp: 92071

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

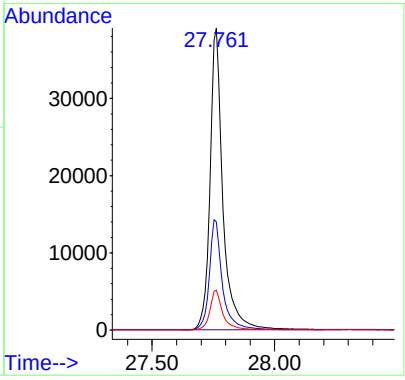


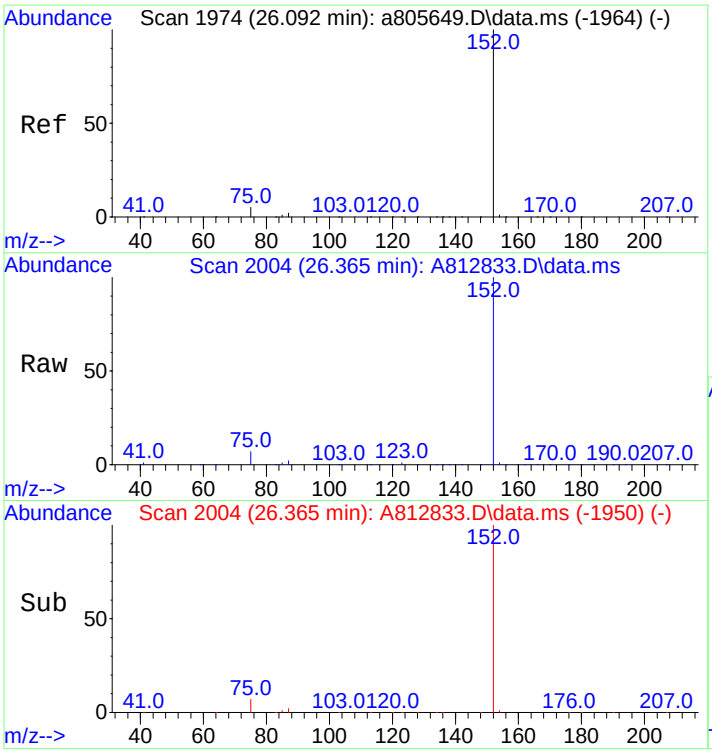


#25
Dibenzofuran
Concen: 514.63 ng/mL
RT: 27.761 min Scan# 2157
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:168 Resp: 142154

Ion	Ratio	Lower	Upper
168	100		
139	36.9	28.0	42.0
169	13.0	10.6	15.8

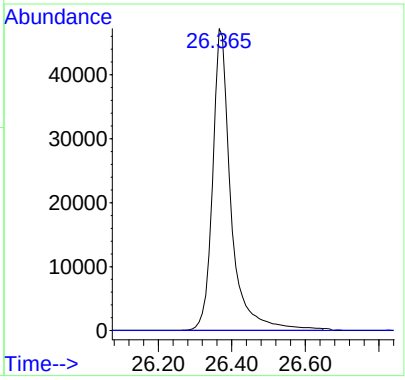


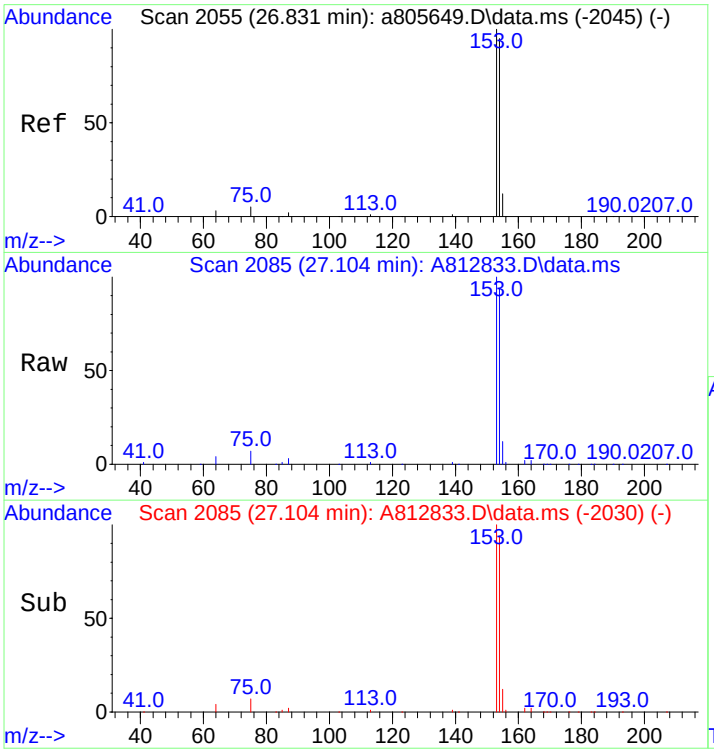


#26
Acenaphthylene
Concen: 522.52 ng/mL m
RT: 26.365 min Scan# 2004
Delta R.T. -0.010 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:152 Resp: 163856

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

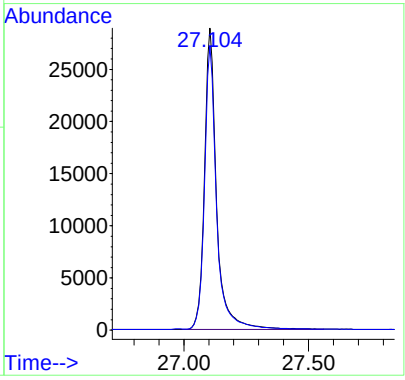


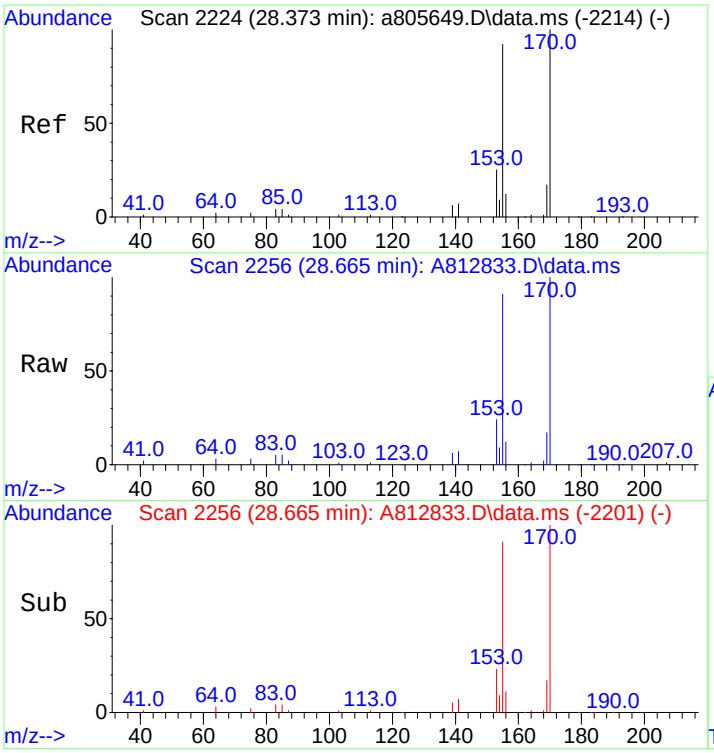


#27
Acenaphthene
Concen: 526.32 ng/mL
RT: 27.104 min Scan# 2085
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:153 Resp: 98512

Ion	Ratio	Lower	Upper
153	100		
154	93.6	75.4	113.2

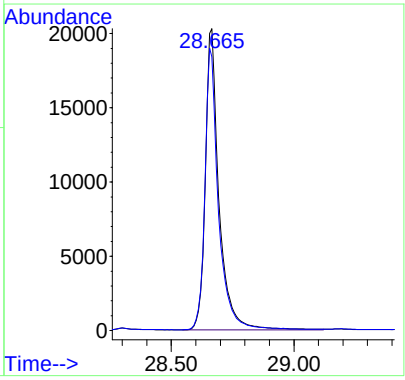


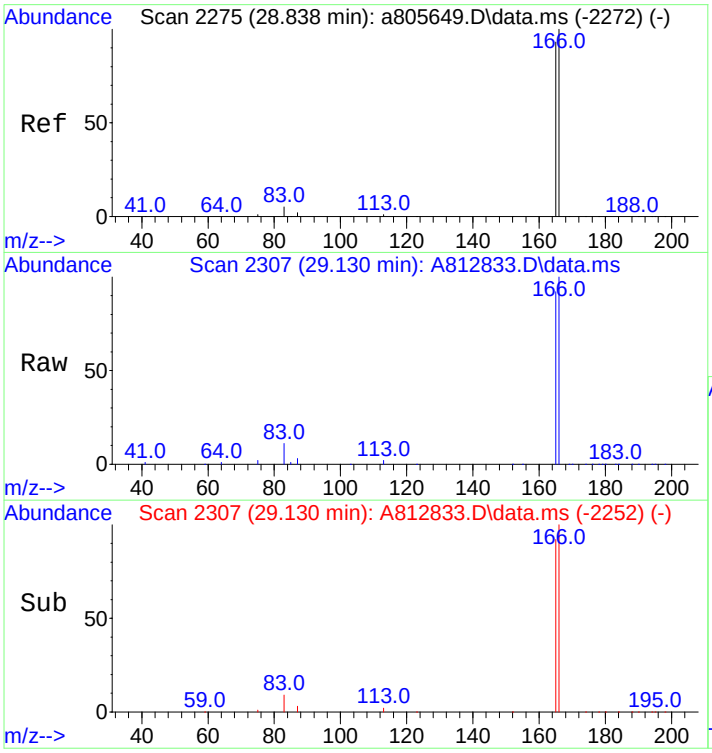


#28
2,3,5-Trimethylnaphthalene
Concen: 516.14 ng/mL
RT: 28.665 min Scan# 2256
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:170 Resp: 78294

Ion	Ratio	Lower	Upper
170	100		
155	92.9	71.7	107.5

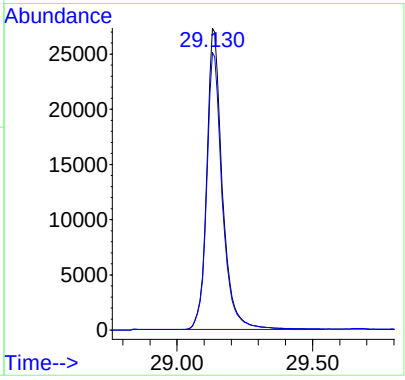


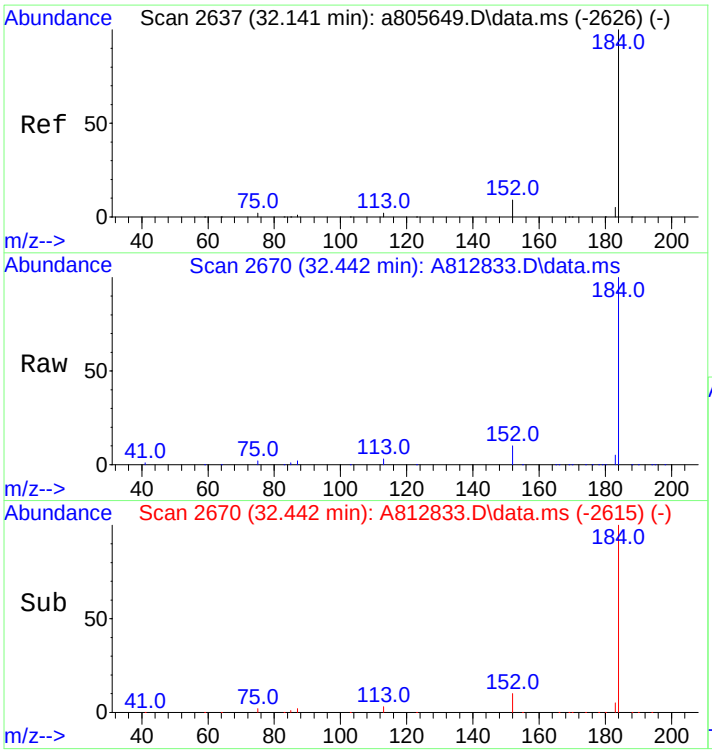


#29
Fluorene
Concen: 521.55 ng/mL
RT: 29.130 min Scan# 2307
Delta R.T. 0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:166 Resp: 109490

Ion	Ratio	Lower	Upper
166	100		
165	92.3	74.2	111.2

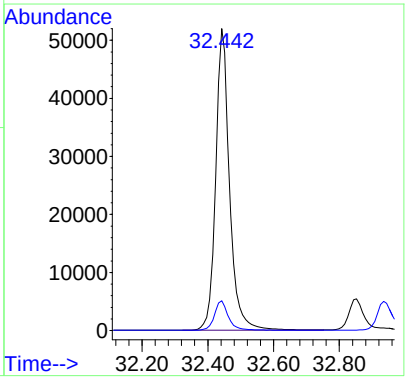


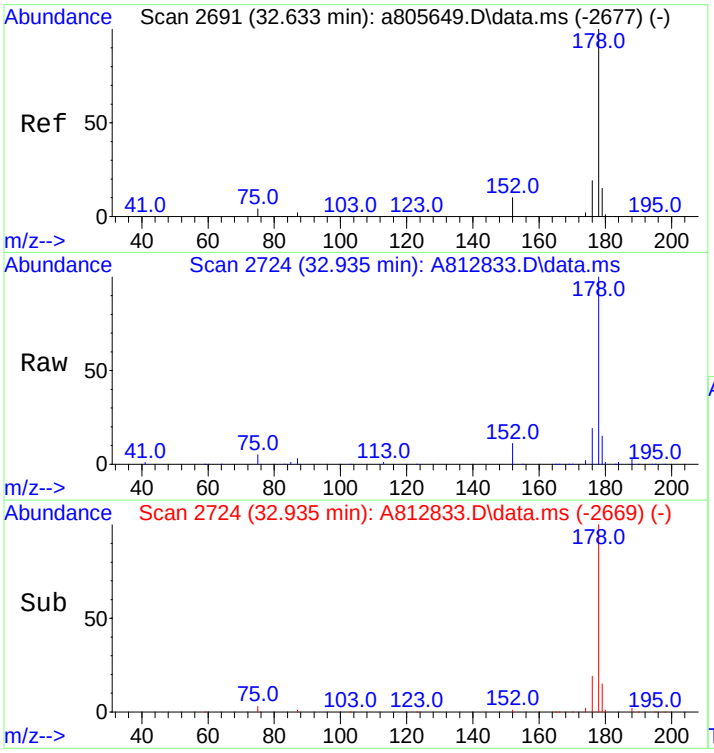


#33
Dibenzothiophene
Concen: 527.69 ng/mL
RT: 32.442 min Scan# 2670
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:184 Resp: 152334

Ion	Ratio	Lower	Upper
184	100		
152	9.7	7.8	11.8

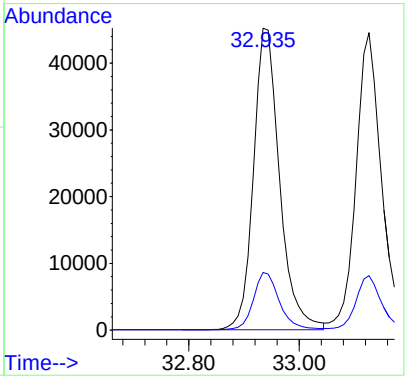


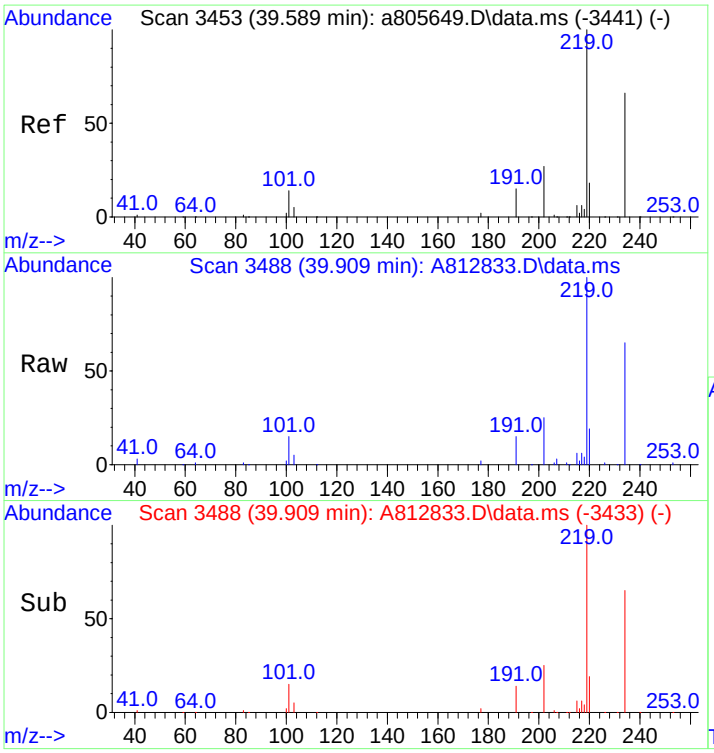


#43
Phenanthrene
Concen: 534.42 ng/mL
RT: 32.935 min Scan# 2724
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:178 Resp: 148490

Ion	Ratio	Lower	Upper
178	100		
176	18.9	15.2	22.8

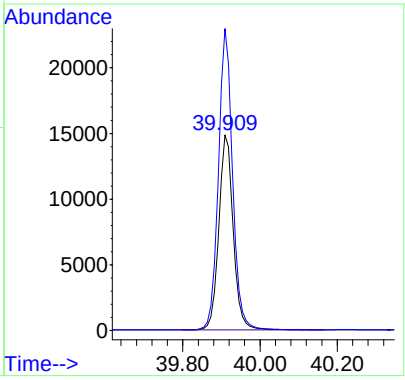


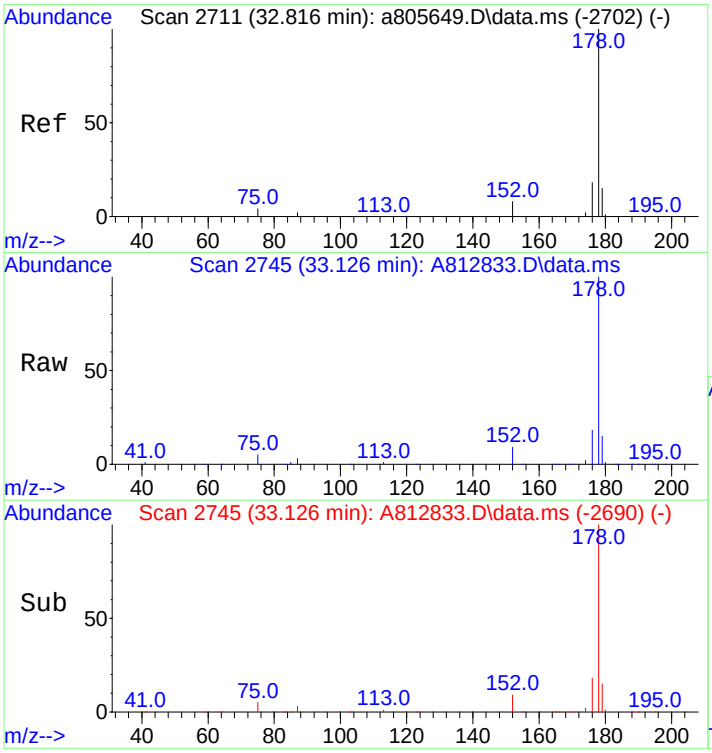


#54
Retene
Concen: 596.91 ng/mL
RT: 39.909 min Scan# 3488
Delta R.T. 0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:234 Resp: 38463

Ion	Ratio	Lower	Upper
234	100		
219	152.1	124.0	186.0

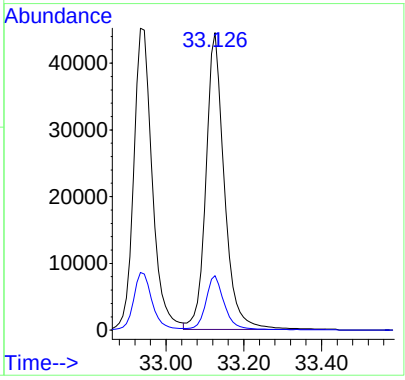


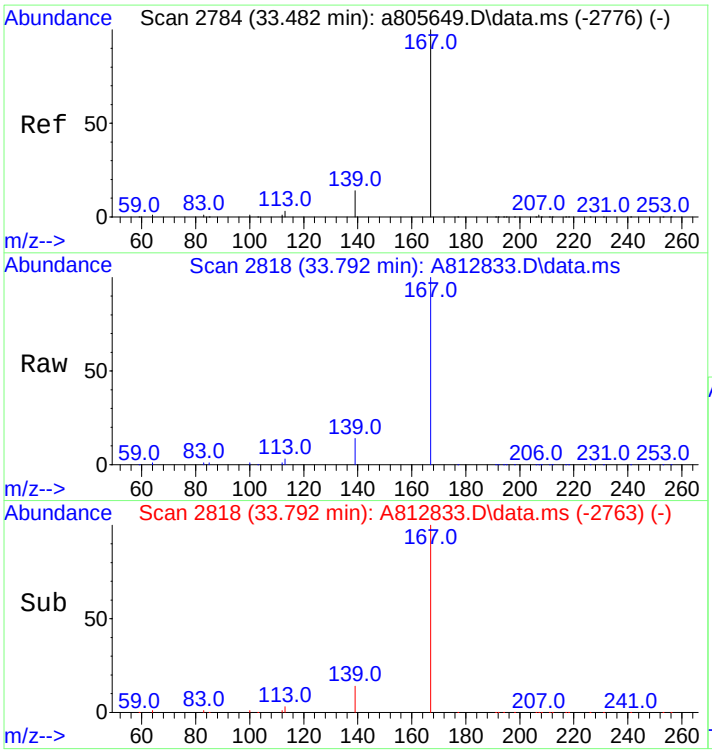


#55
Anthracene
Concen: 564.60 ng/mL m
RT: 33.126 min Scan# 2745
Delta R.T. 0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:178 Resp: 146151

Ion	Ratio	Lower	Upper
178	100		
176	18.2	14.3	21.5

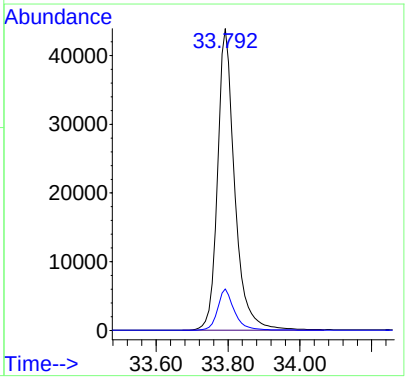


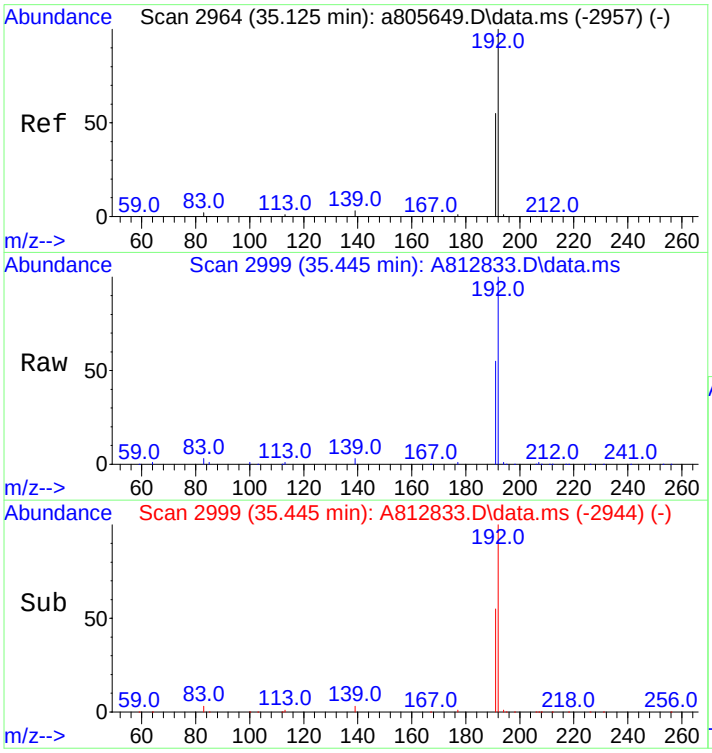


#56
Carbazole
Concen: 536.79 ng/mL
RT: 33.792 min Scan# 2818
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:167 Resp: 144987

Ion	Ratio	Lower	Upper
167	100		
139	13.3	10.6	16.0

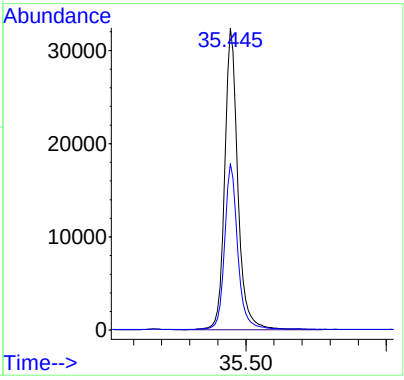


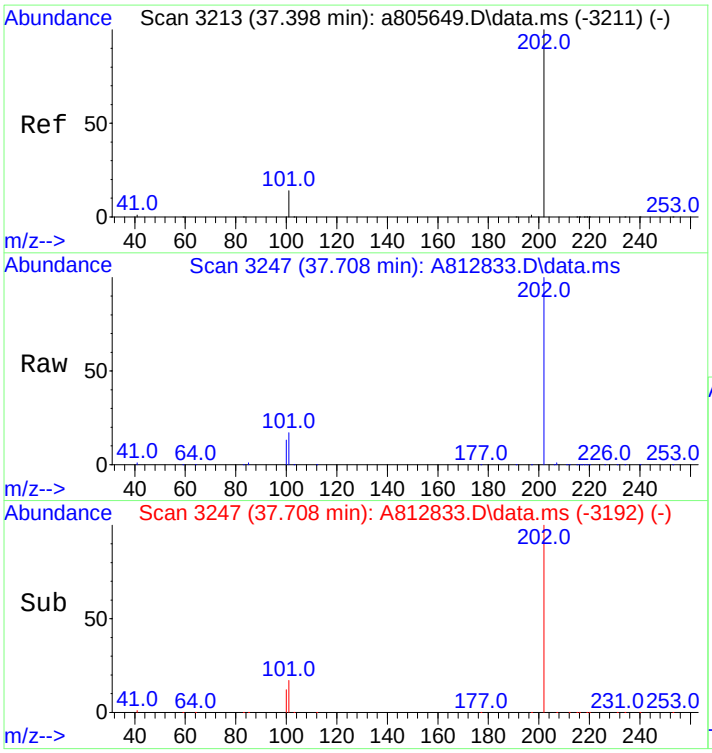


#57
1-Methylphenanthrene
Concen: 533.21 ng/mL
RT: 35.445 min Scan# 2999
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:192 Resp: 105021

Ion	Ratio	Lower	Upper
192	100		
191	54.8	44.2	66.4

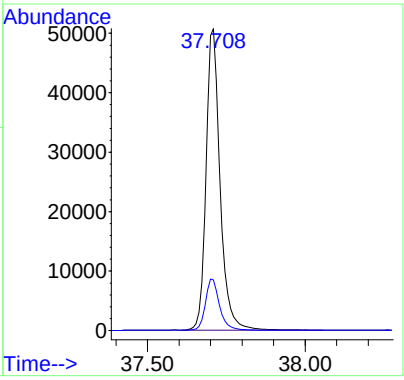


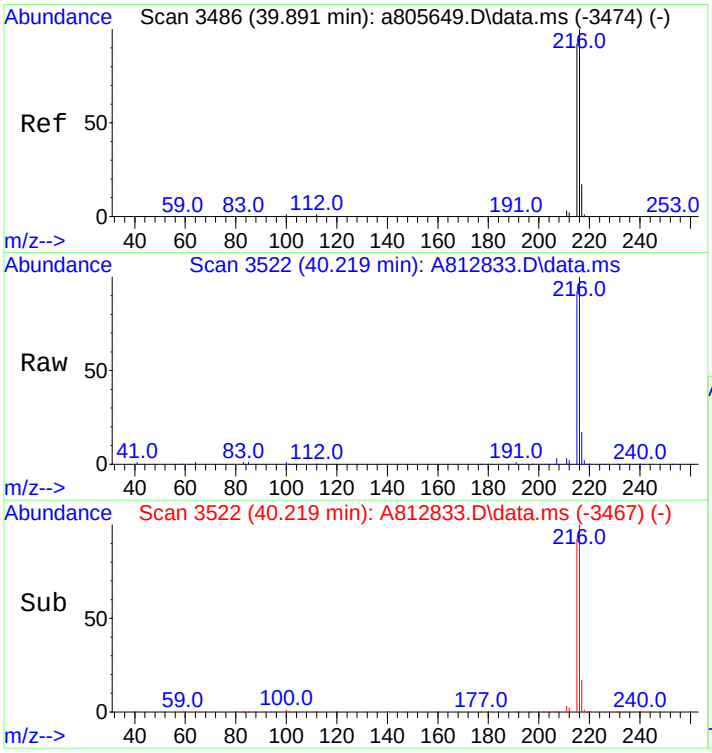


#58
Fluoranthene
Concen: 545.69 ng/mL
RT: 37.708 min Scan# 3247
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:202 Resp: 156178

Ion	Ratio	Lower	Upper
202	100		
101	17.1	13.6	20.4

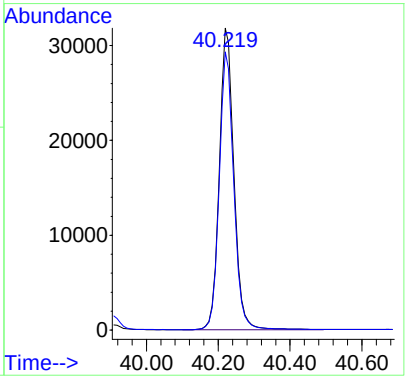


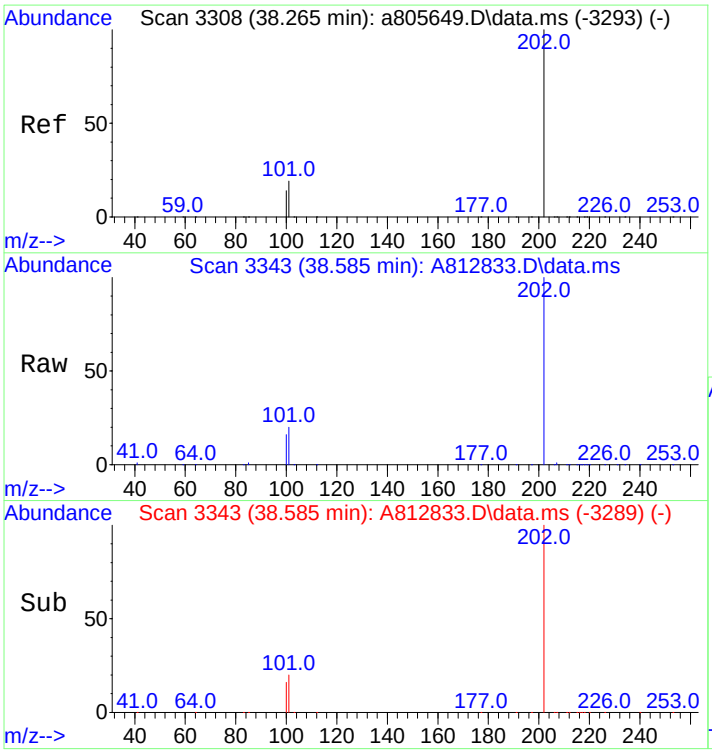


#59
Benzo(b)fluorene
Concen: 540.50 ng/mL
RT: 40.219 min Scan# 3522
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:216 Resp: 89486

Ion	Ratio	Lower	Upper
216	100		
215	91.9	74.2	111.2

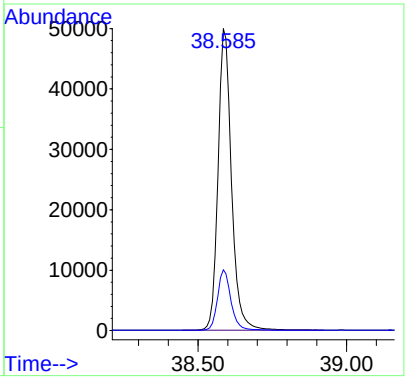


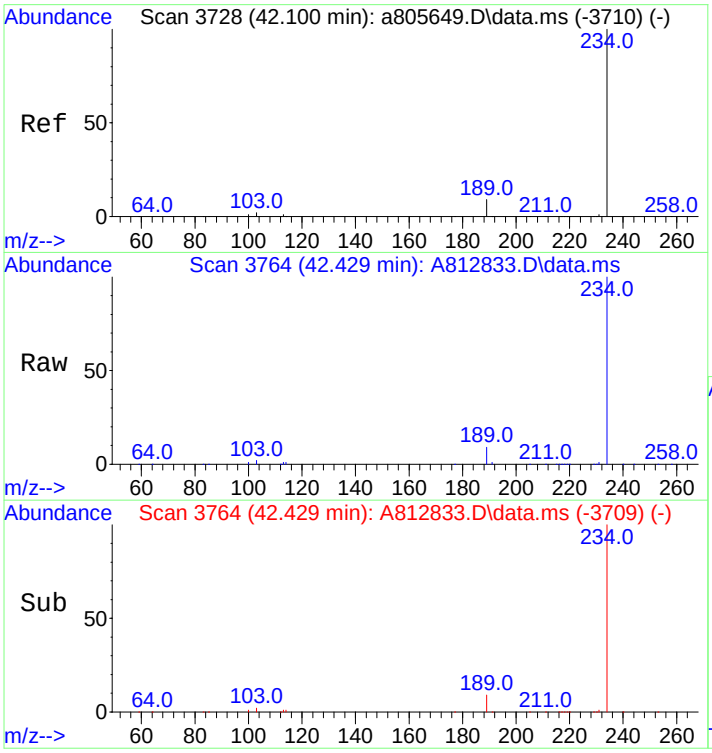


#60
Pyrene
Concen: 539.62 ng/mL
RT: 38.585 min Scan# 3343
Delta R.T. -0.009 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:202 Resp: 156214

Ion	Ratio	Lower	Upper
202	100		
101	20.1	15.4	23.2

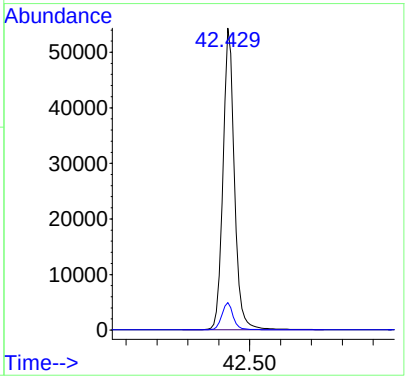


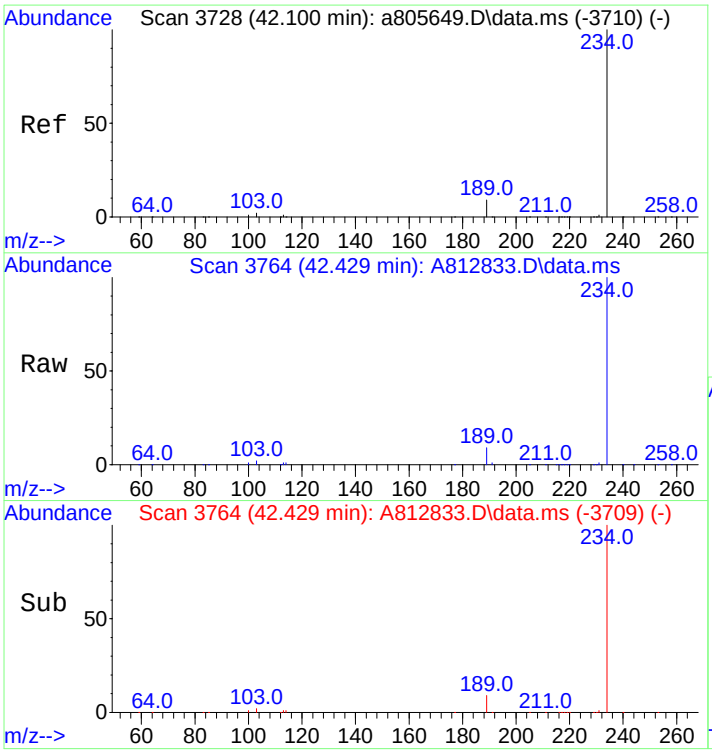


#66
Naphthobenzothiophene
Concen: 519.13 ng/ml
RT: 42.429 min Scan# 3764
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:234 Resp: 139506

Ion	Ratio	Lower	Upper
234	100		
189	8.9	22.3	33.5#

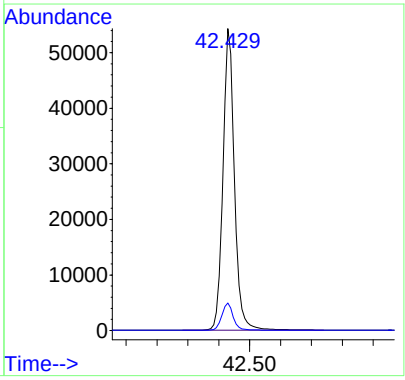


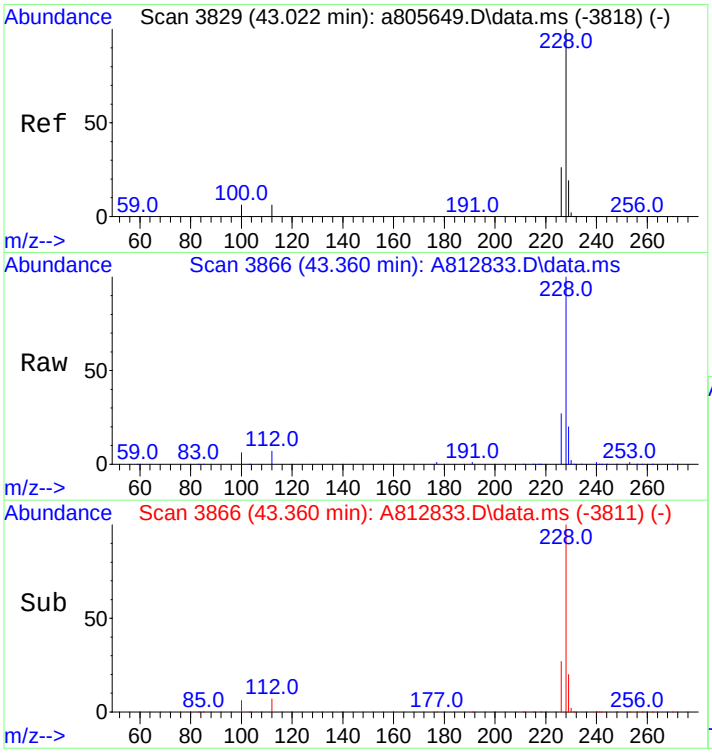


#67
Naphthobenzothiophene-2,1-D
Concen: 519.13 ng/mL
RT: 42.429 min Scan# 3764
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:234 Resp: 139506

Ion	Ratio	Lower	Upper
234	100		
189	8.9	22.3	33.5#

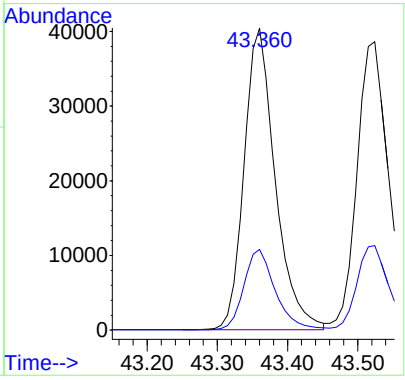


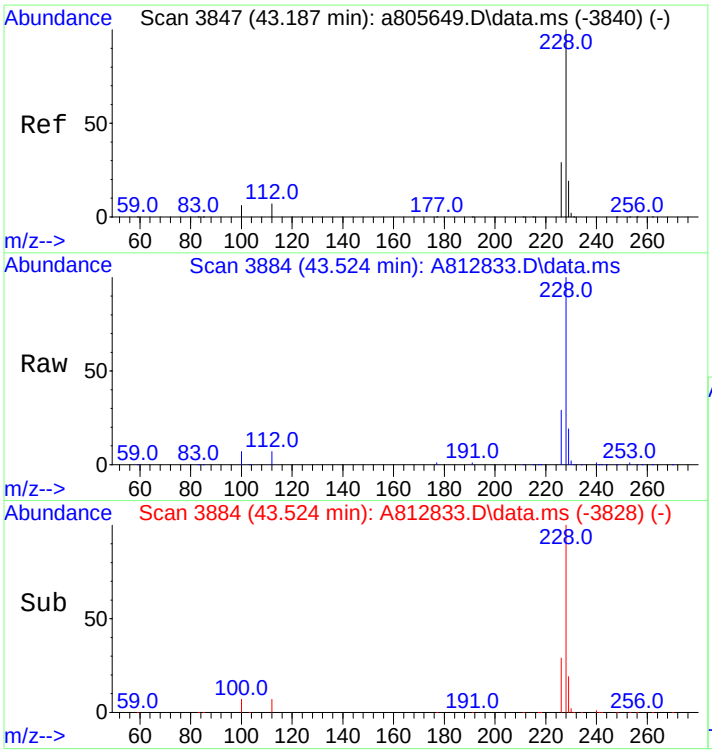


#75
Benz[a]anthracene
Concen: 526.32 ng/mL
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:228 Resp: 124735

Ion	Ratio	Lower	Upper
228	100		
226	26.8	21.3	31.9

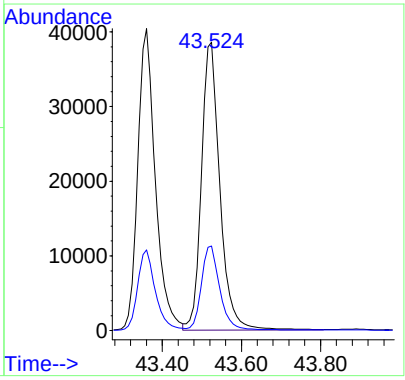


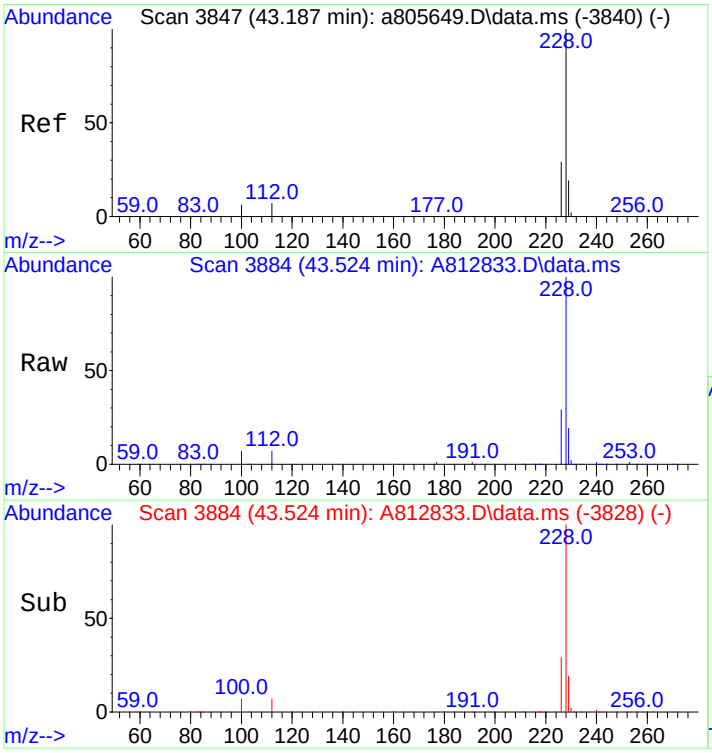


#76
Chrysene
Concen: 521.32 ng/mL
RT: 43.524 min Scan# 3884
Delta R.T. 0.008 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:228 Resp: 125061

Ion	Ratio	Lower	Upper
228	100		
226	29.2	23.6	35.4

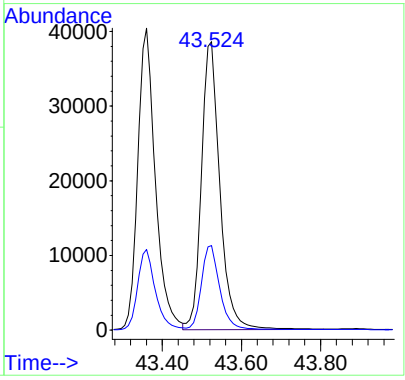


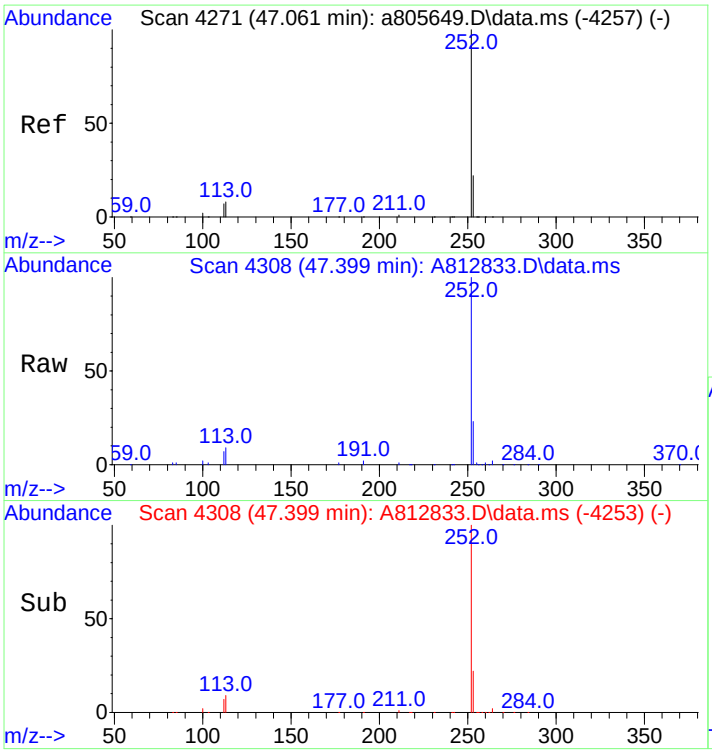


#77
Chrysene/Triphenylene
Concen: 521.32 ng/mL
RT: 43.524 min Scan# 3884
Delta R.T. 0.008 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:228 Resp: 125061

Ion	Ratio	Lower	Upper
228	100		
226	29.2	23.6	35.4

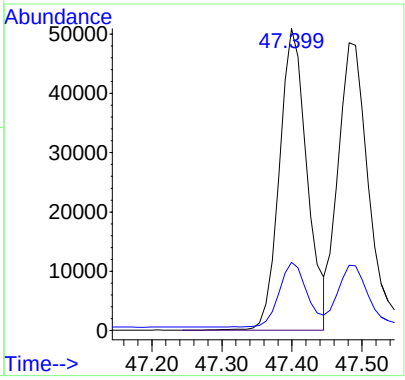


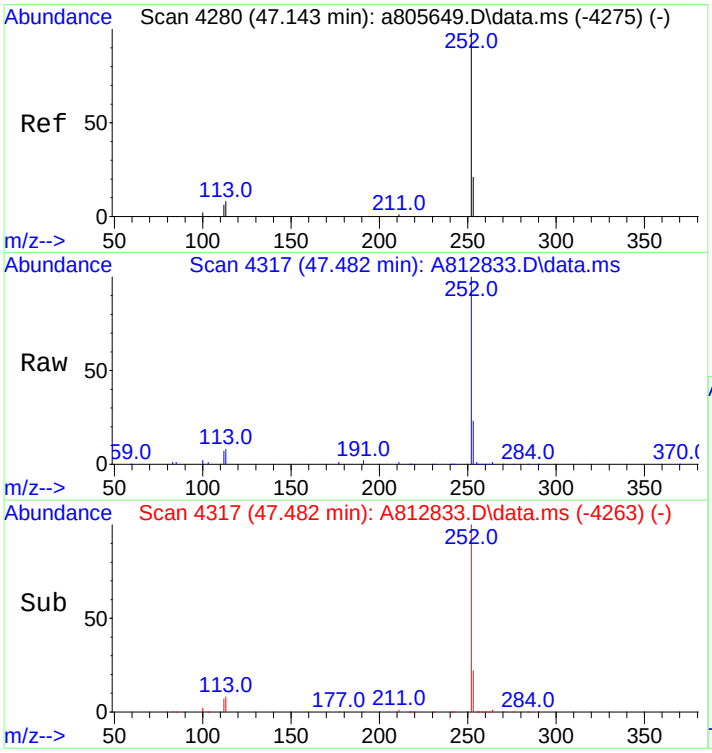


#84
Benzo[b]fluoranthene
Concen: 548.57 ng/mL
RT: 47.399 min Scan# 4308
Delta R.T. -0.001 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:252 Resp: 139628

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.5	27.7

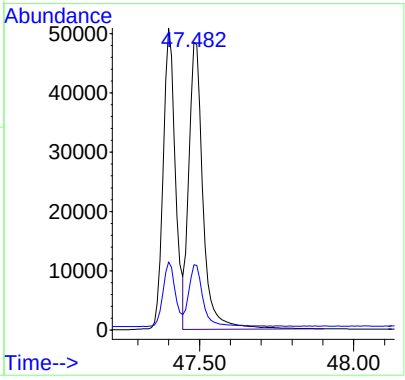


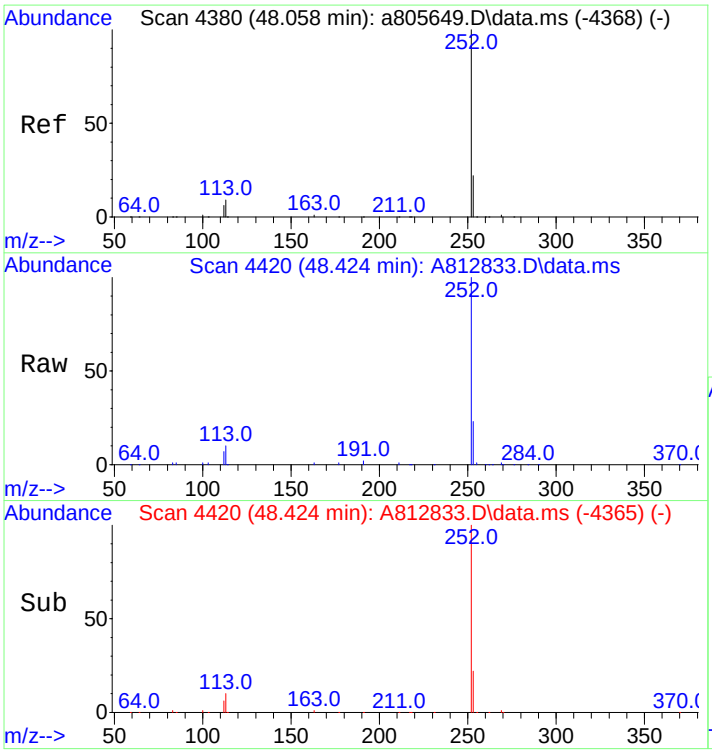


#85
Benzo[j]+[k]fluoranthene
Concen: 555.11 ng/mL
RT: 47.482 min Scan# 4317
Delta R.T. -0.009 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:252 Resp: 154164

Ion	Ratio	Lower	Upper
252	100		
253	20.9	18.8	28.2

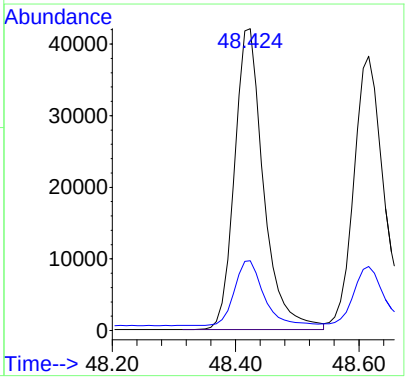


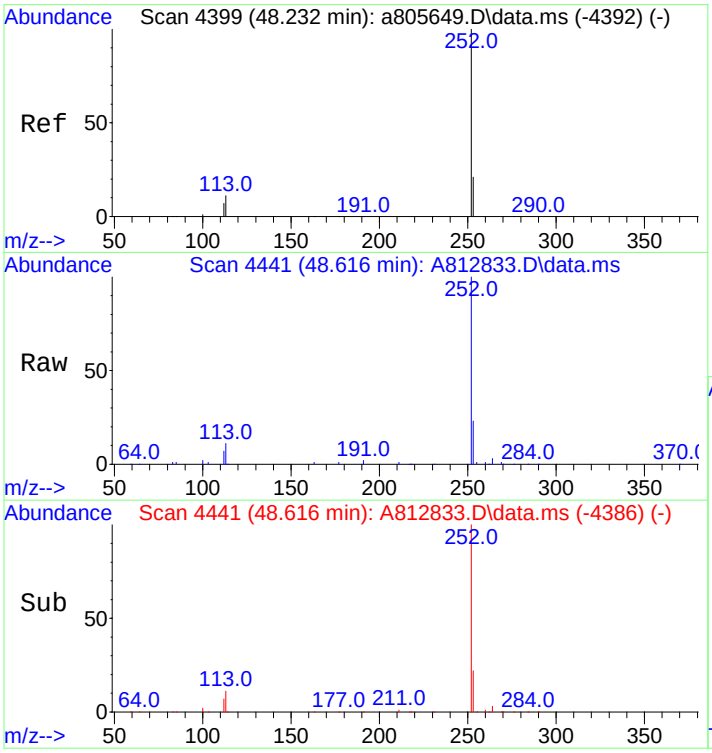


#87
Benzo[e]pyrene
Concen: 524.80 ng/mL
RT: 48.424 min Scan# 4420
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:252 Resp: 137633

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.9	28.3

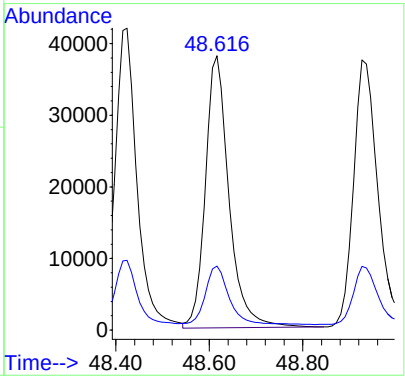


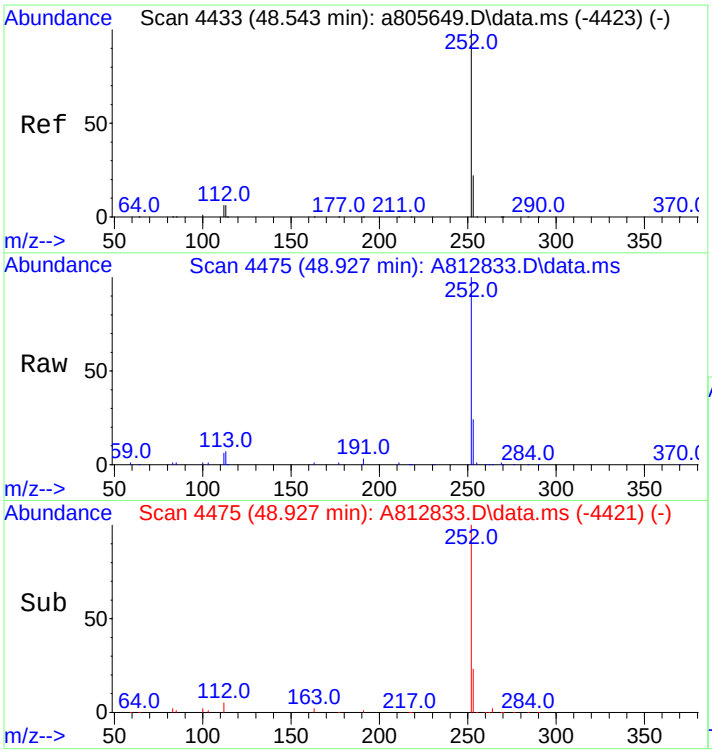


#89
Benzo[a]pyrene
Concen: 548.95 ng/mL
RT: 48.616 min Scan# 4441
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:252 Resp: 133173

Ion	Ratio	Lower	Upper
252	100		
253	21.6	19.4	29.0

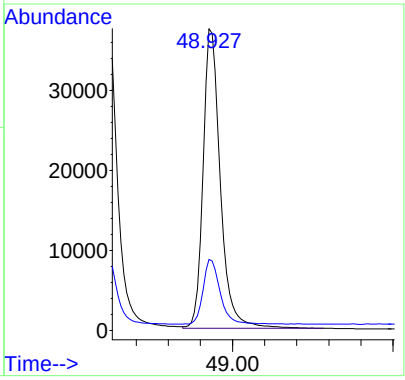


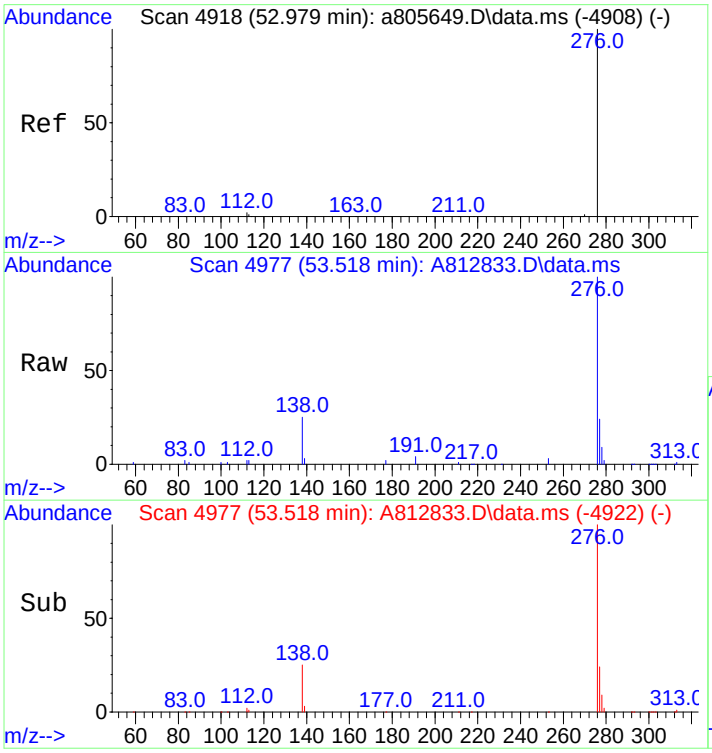


#90
Perylene
Concen: 526.30 ng/mL
RT: 48.927 min Scan# 4475
Delta R.T. -0.009 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:252 Resp: 139465

Ion	Ratio	Lower	Upper
252	100		
253	21.5	19.3	28.9

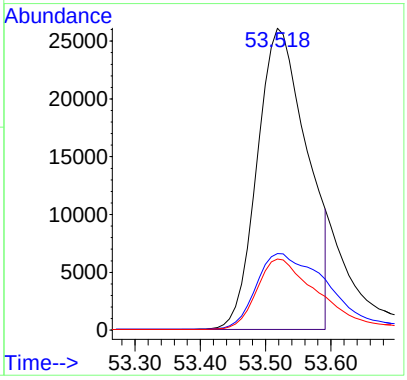


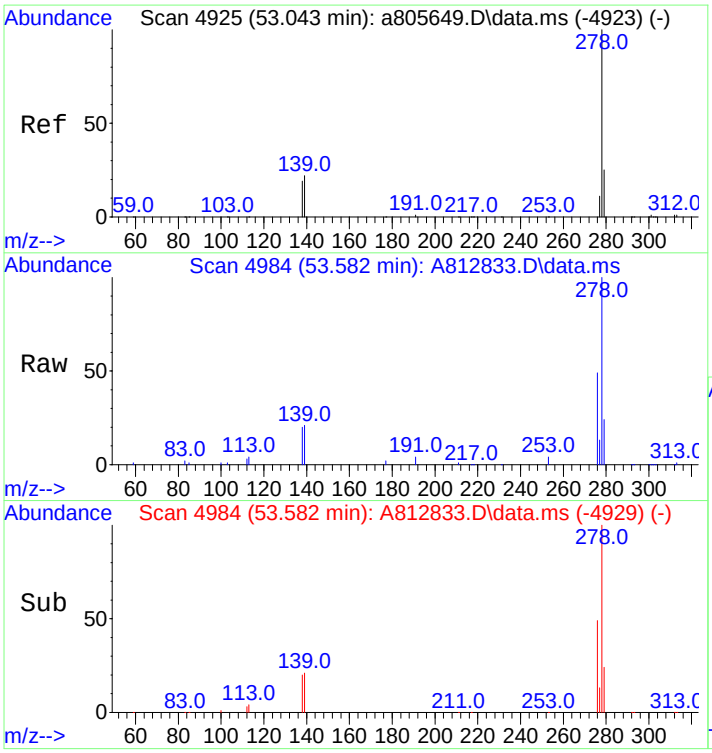


#91
Indeno[1,2,3-cd]pyrene
Concen: 537.87 ng/mL m
RT: 53.518 min Scan# 4977
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:276 Resp: 138611

Ion	Ratio	Lower	Upper
276	100		
138	37.9	19.9	29.9#
277	30.3	19.0	28.6#

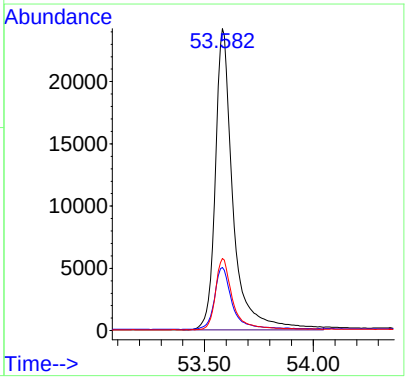


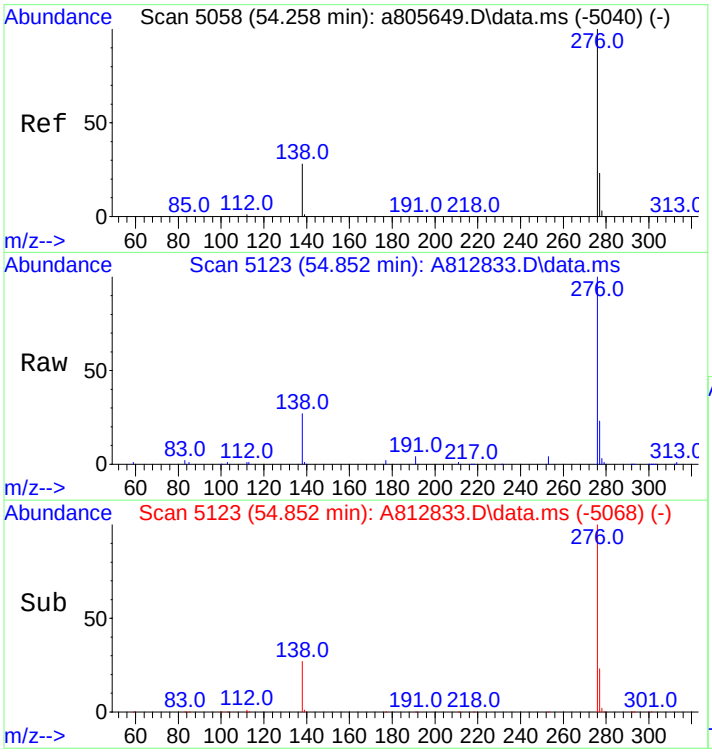


#92
Dibenz[ah]+[ac]anthracene
Concen: 544.97 ng/mL
RT: 53.582 min Scan# 4984
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:278 Resp: 137662

Ion	Ratio	Lower	Upper
278	100		
139	20.6	16.6	25.0
279	23.0	19.1	28.7

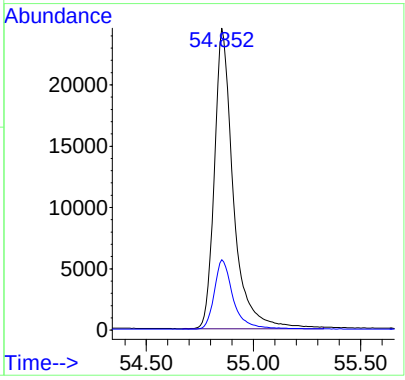




#93
Benzo[g,h,i]perylene
Concen: 516.98 ng/mL
RT: 54.852 min Scan# 5123
Delta R.T. -0.000 min
Lab File: A812833.D
Acq: 18 Nov 2012 11:50 pm

Tgt Ion:276 Resp: 151193

Ion	Ratio	Lower	Upper
276	100		
277	23.2	18.9	28.3



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812838.D
Acq On : 19 Nov 2012 6:52 am
Operator : AC
Sample : c811181201
Misc : cc whaq86 500ng/ml
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Nov 20 14:17:42 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

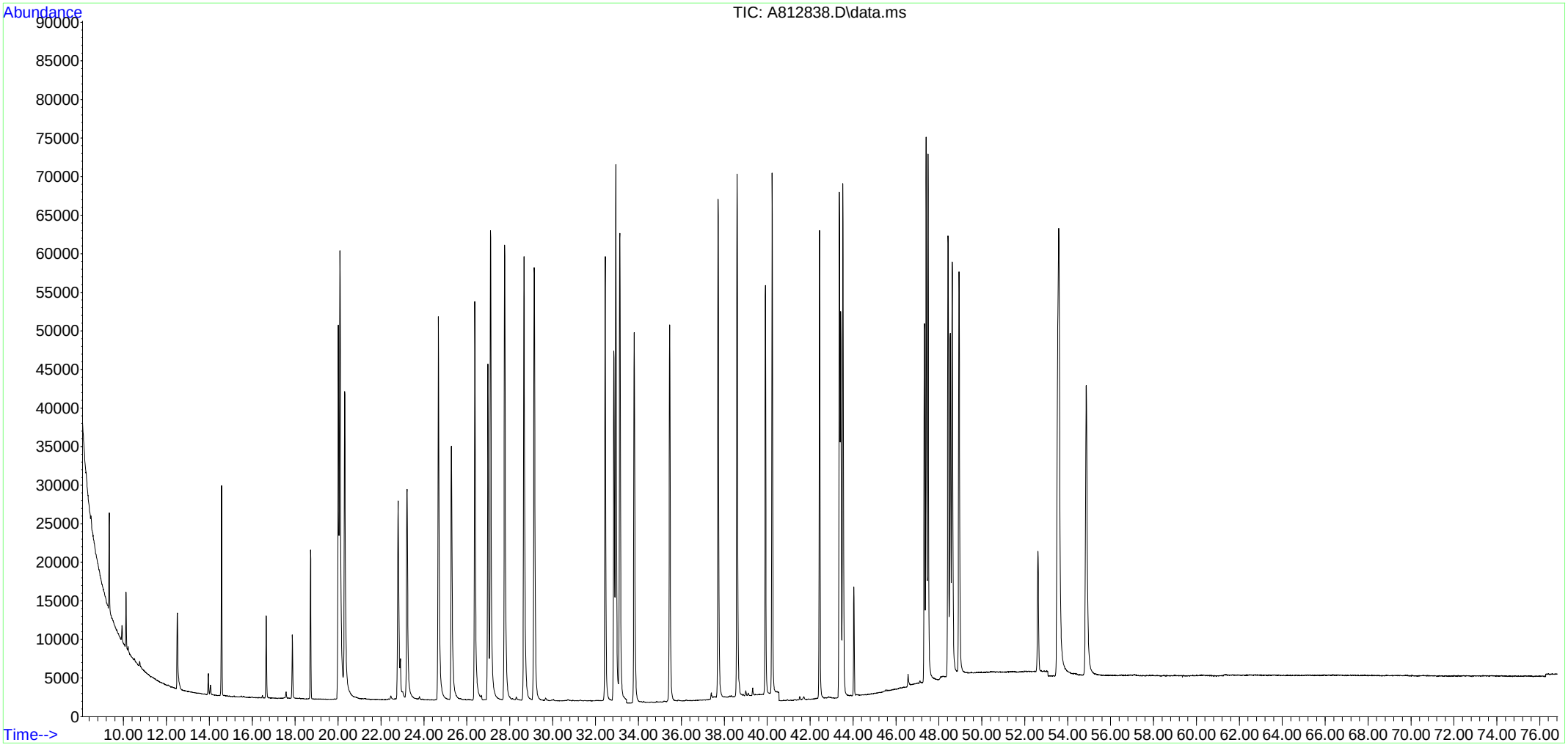
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.986	164	73404	500.000	ng/mL	0.00
74) Chrysene-d12	43.424	240	107647	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	20.014	136	155634	535.004	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.50%			
42) Phenanthrene-d10	32.852	188	123911	548.503	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.85%			
83) Benzo[b]fluoranthene-d12	47.326	264	109497	533.717	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.37%			
88) Benzo[a]pyrene-d12	48.534	264	112215	553.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.36%			
129) 5B(H)Cholane - Surr	44.036	217	19503	495.473	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.55%#			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	14826	227.283	ng/mL	100
4) cis-Decalin	17.869	138	11042	231.065	ng/mL	100
10) Naphthalene	20.087	128	178151	535.307	ng/mL#	100
16) 2-Methylnaphthalene	22.797	142	105345	531.390	ng/mL#	100
17) 1-Methylnaphthalene	23.217	142	99847	537.865	ng/mL#	100
18) Benzothiophene	20.306	134	139708	519.359	ng/mL	100
23) Biphenyl	24.677	154	132977	527.223	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.288	156	91613	539.967	ng/mL#	100
25) Dibenzofuran	27.761	168	140286	527.216	ng/mL	98
26) Acenaphthylene	26.374	152	163562M3	541.453	ng/mL	
27) Acenaphthene	27.104	153	97228	539.242	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.665	170	77925	533.271	ng/mL	97
29) Fluorene	29.139	166	108649	537.261	ng/mL	99
33) Dibenzothiophene	32.451	184	145906	524.676	ng/mL	100
43) Phenanthrene	32.944	178	142661	532.998	ng/mL	100
54) Retene	39.918	234	35024	564.243	ng/mL	97
55) Anthracene	33.135	178	139782M3	560.568	ng/mL	
56) Carbazole	33.801	167	139814	537.356	ng/mL	100
57) 1-Methylphenanthrene	35.454	192	101059	532.640	ng/mL	100
58) Fluoranthene	37.708	202	156963	569.320	ng/mL	100
59) Benzo(b)fluorene	40.229	216	91532	573.919	ng/mL	100
60) Pyrene	38.594	202	158428	568.112	ng/mL	99
66) Naphthobenzothiophene	42.438	234	143309	553.591	ng/ml#	64
67) Naphthobenzothiophene-...	42.438	234	143309	553.591	ng/mL#	64
75) Benz[a]anthracene	43.360	228	129229	547.610	ng/mL	100
76) Chrysene	43.524	228	125453	525.184	ng/mL	99
77) Chrysene/Triphenylene	43.524	228	125453	525.184	ng/mL	99
84) Benzo[b]fluoranthene	47.409	252	138245	545.458	ng/mL	97
85) Benzo[j]+[k]fluoranthene	47.491	252	146517	529.826	ng/mL	95
87) Benzo[e]pyrene	48.424	252	132726	508.248	ng/mL	96
89) Benzo[a]pyrene	48.616	252	126307	522.869	ng/mL	95
90) Perylene	48.936	252	137308	520.374	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.536	276	142093M3	553.739	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.591	278	135598	539.093	ng/mL	99
93) Benzo[g,h,i]perylene	54.870	276	146421	502.804	ng/mL	99
94) Hopane (T19)	52.613	191	38926	481.493	ng/mL#	91
95) 17a(H),21B(H)-hopane -...	52.613	191	38926	481.493	ng/mL#	91

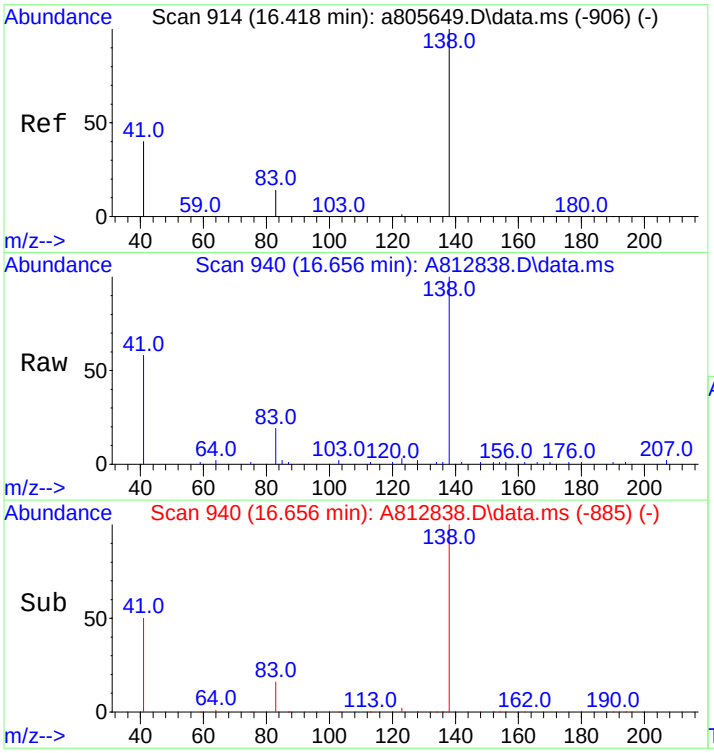
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812838.D
Acq On : 19 Nov 2012 6:52 am
Operator : AC
Sample : c811181201
Misc : cc whaq86 500ng/ml
ALS Vial : 19 Sample Multiplier: 1

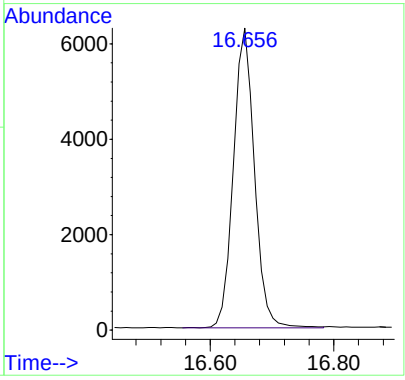
Quant Time: Nov 20 14:17:42 2012
Quant Method : C:\msdchem\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 09:45:59 2012
Response via : Initial Calibration

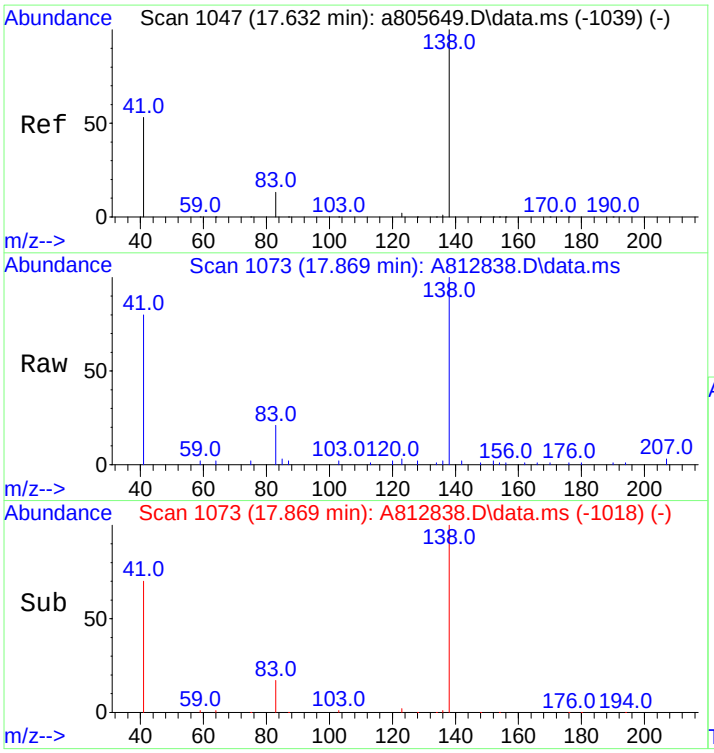




#3
trans-Decalin
Concen: 227.28 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

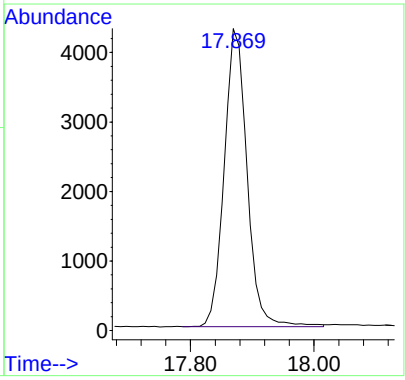
Tgt Ion:138 Resp: 14826

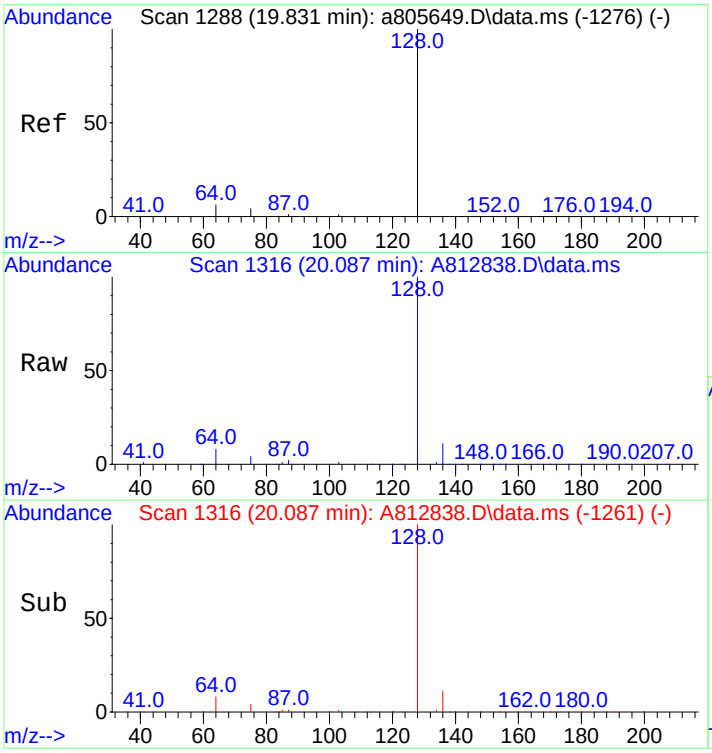




#4
cis-Decalin
Concen: 231.06 ng/mL
RT: 17.869 min Scan# 1073
Delta R.T. -0.001 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:138 Resp: 11042

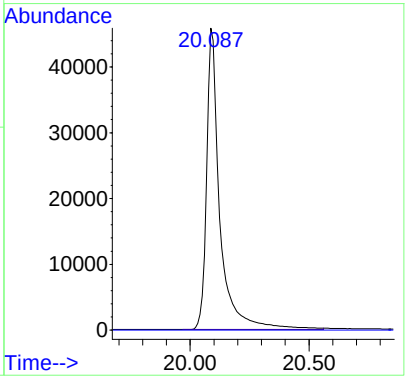


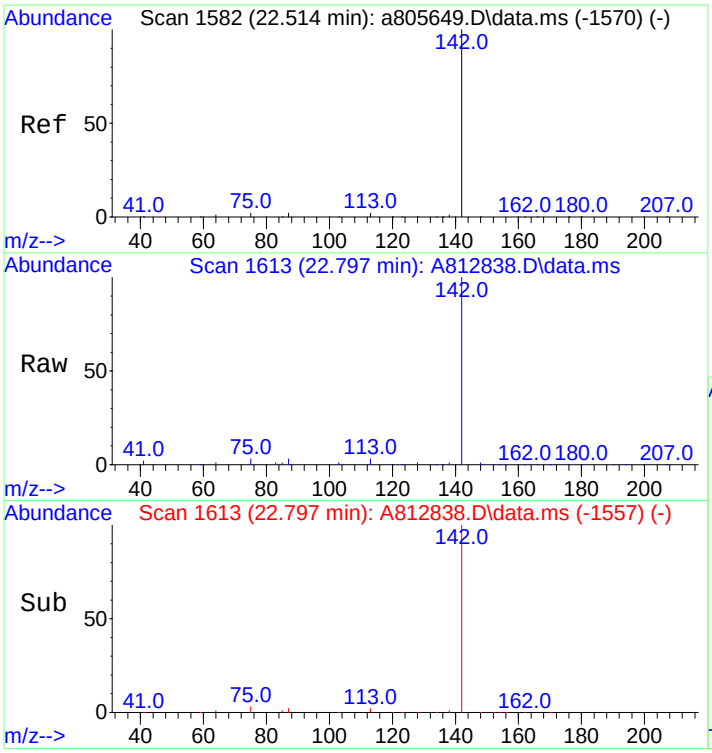


#10
Naphthalene
Concen: 535.31 ng/mL
RT: 20.087 min Scan# 1316
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:128 Resp: 178151

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

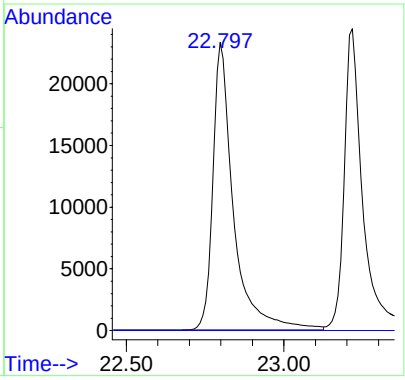


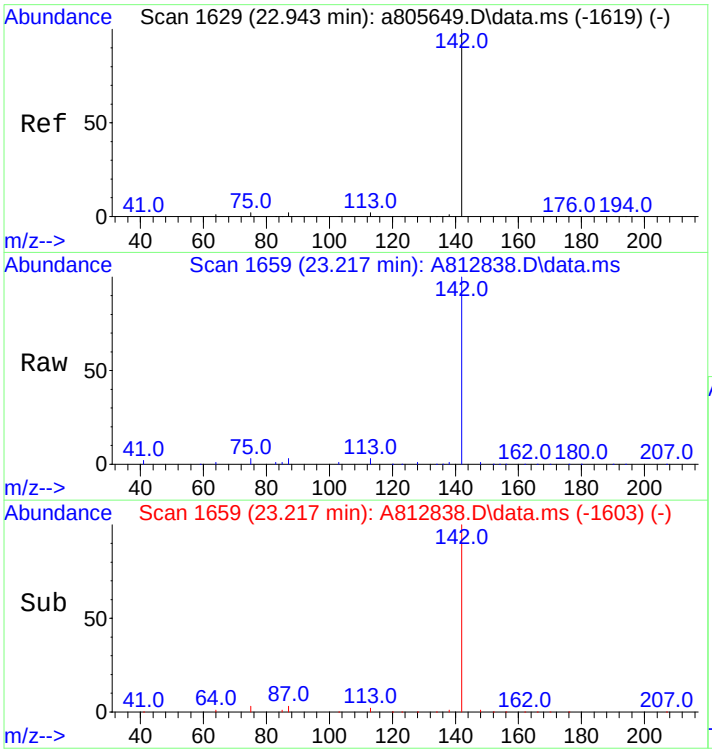


#16
2-Methylnaphthalene
Concen: 531.39 ng/mL
RT: 22.797 min Scan# 1613
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:142 Resp: 105345

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

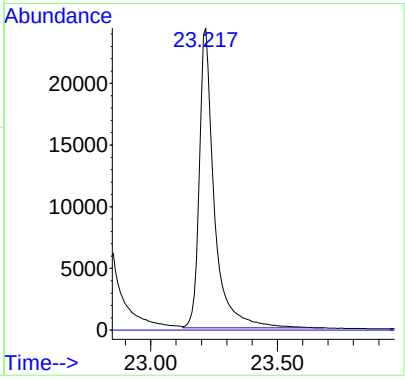


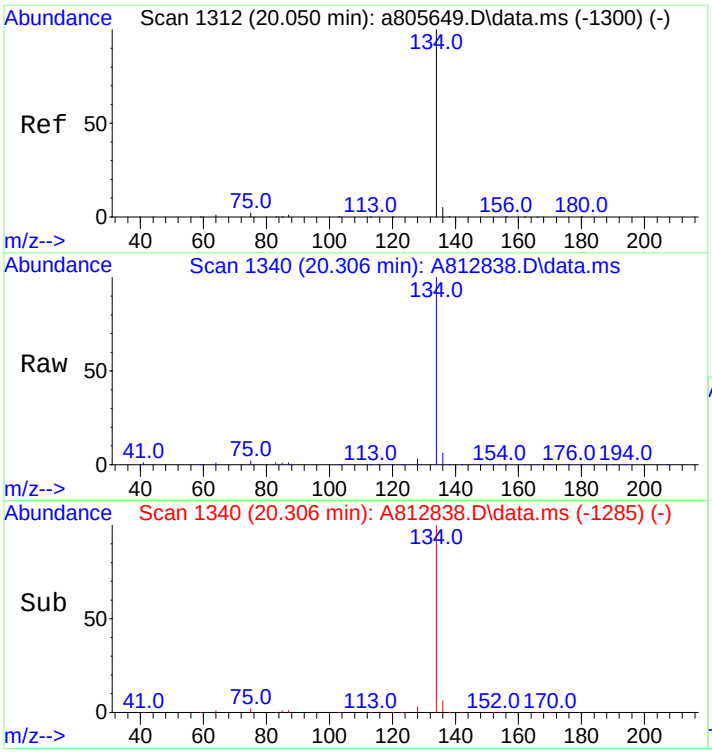


#17
1-Methylnaphthalene
Concen: 537.87 ng/mL
RT: 23.217 min Scan# 1659
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:142 Resp: 99847

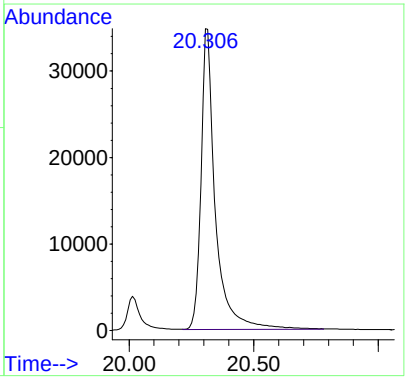
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

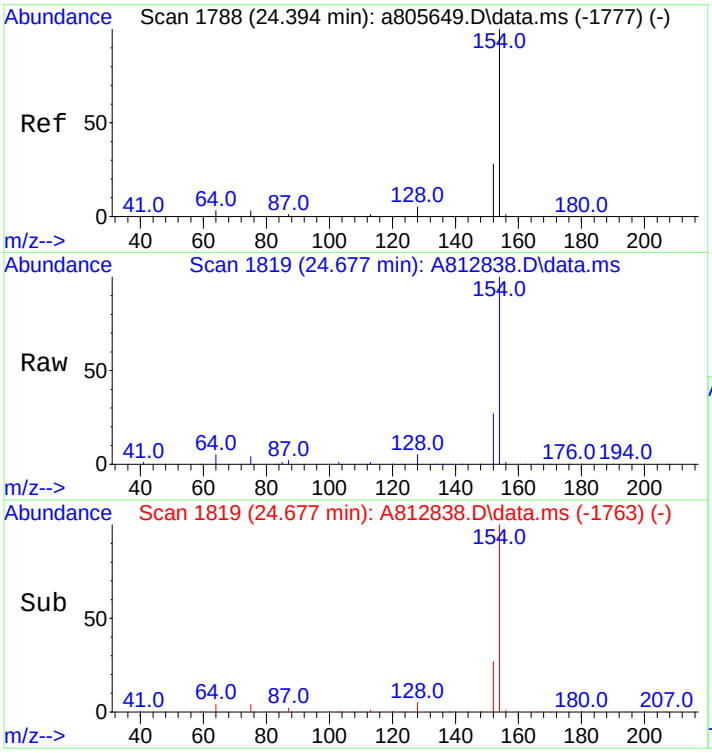




#18
Benzothiophene
Concen: 519.36 ng/mL
RT: 20.306 min Scan# 1340
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:134 Resp: 139708

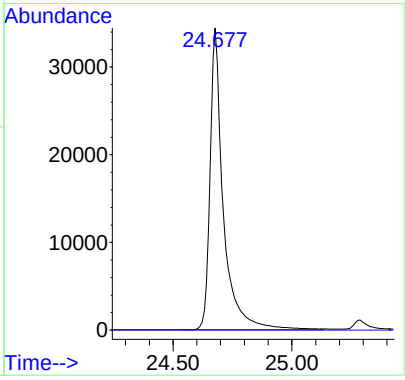


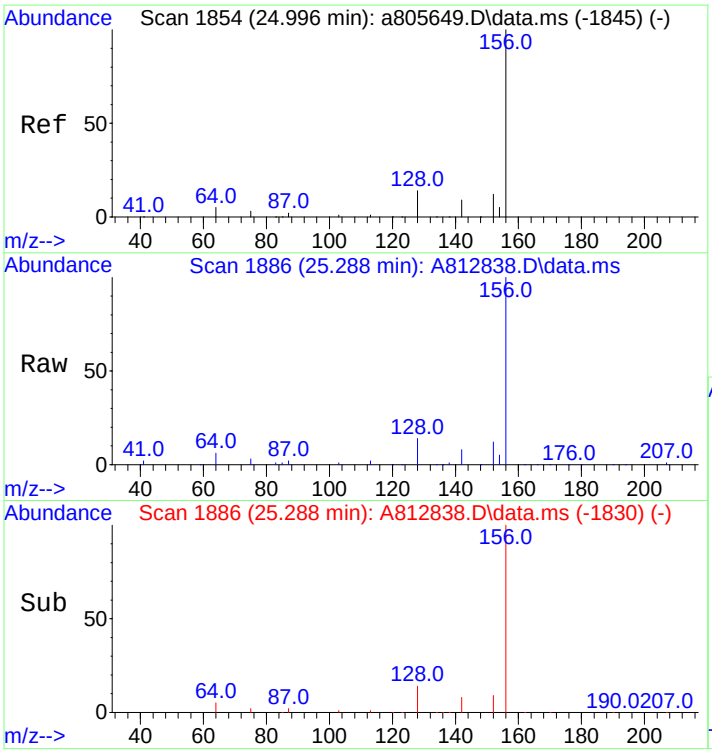


#23
Biphenyl
Concen: 527.22 ng/mL
RT: 24.677 min Scan# 1819
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:154 Resp: 132977

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

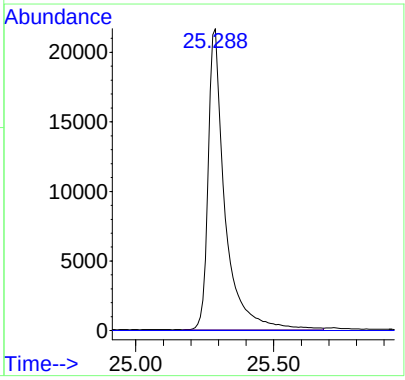


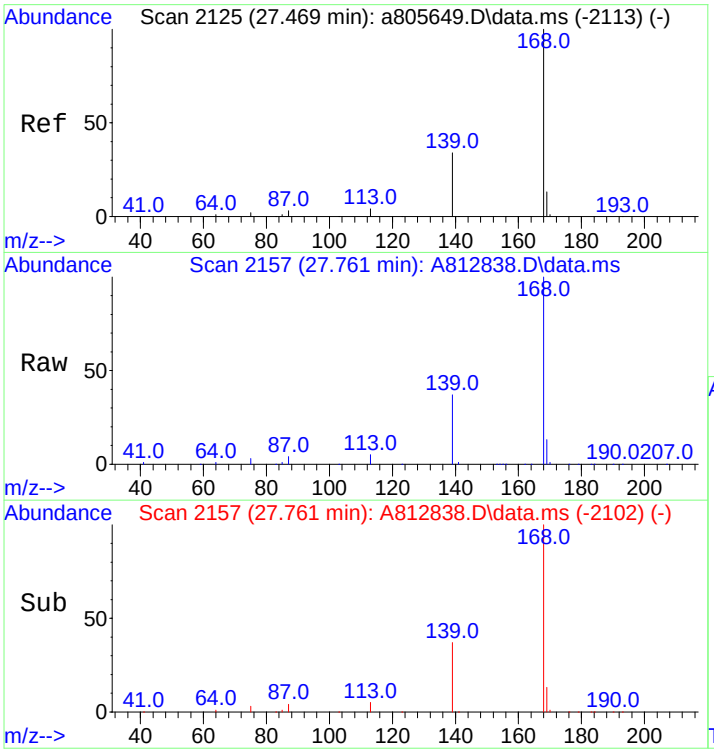


#24
2,6-Dimethylnaphthalene
Concen: 539.97 ng/mL
RT: 25.288 min Scan# 1886
Delta R.T. 0.008 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:156 Resp: 91613

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

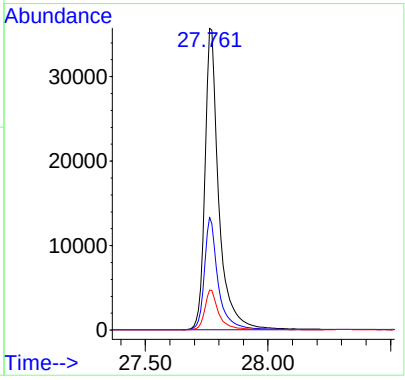


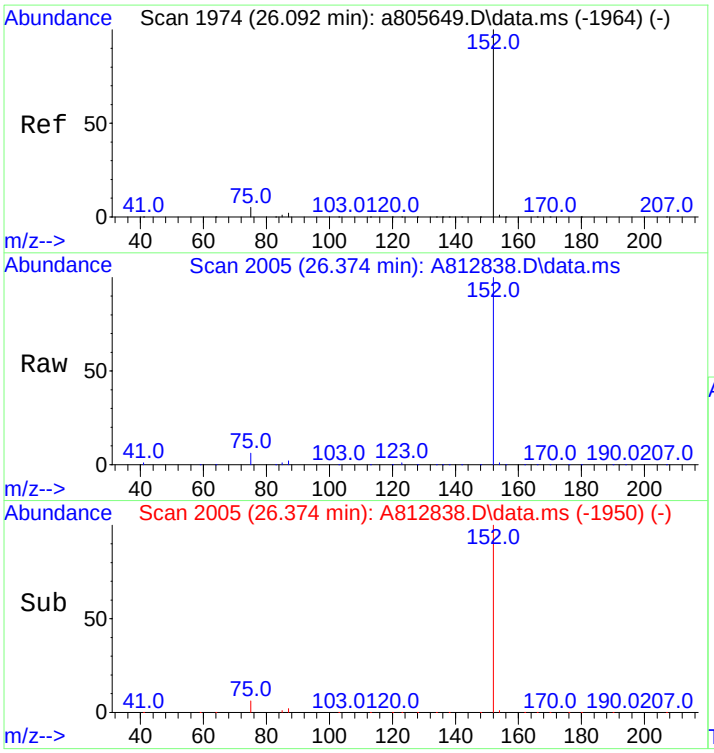


#25
Dibenzofuran
Concen: 527.22 ng/mL
RT: 27.761 min Scan# 2157
Delta R.T. -0.001 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:168 Resp: 140286

Ion	Ratio	Lower	Upper
168	100		
139	36.8	28.0	42.0
169	13.1	10.6	15.8

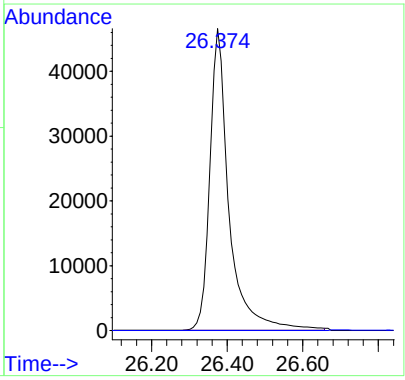


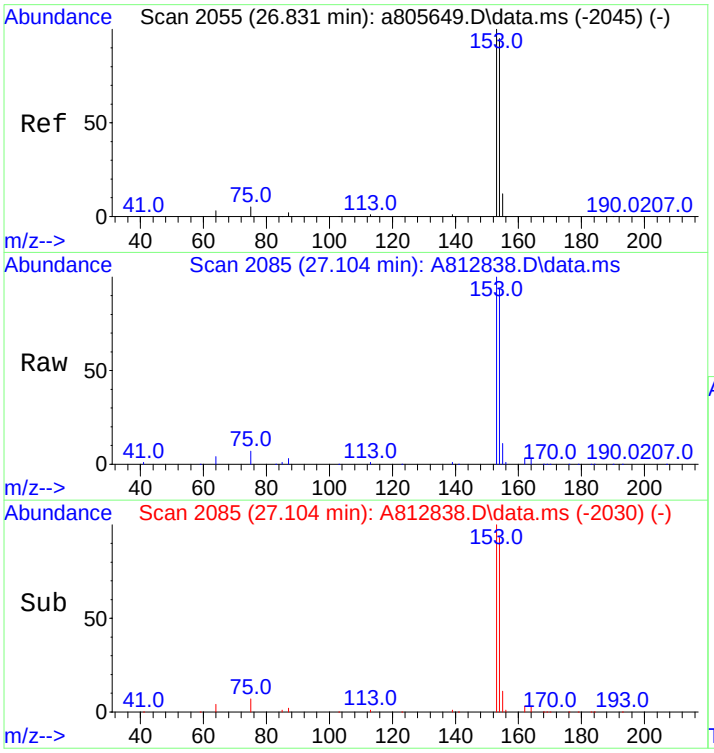


#26
Acenaphthylene
Concen: 541.45 ng/mL m
RT: 26.374 min Scan# 2005
Delta R.T. -0.001 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:152 Resp: 163562

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

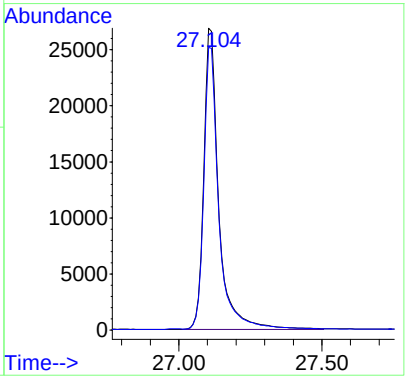


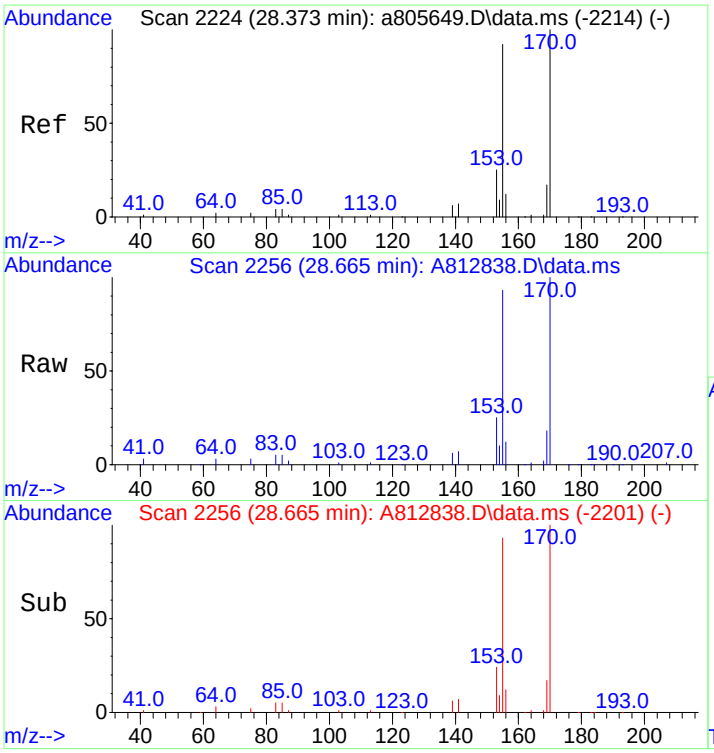


#27
Acenaphthene
Concen: 539.24 ng/mL
RT: 27.104 min Scan# 2085
Delta R.T. -0.001 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:153 Resp: 97228

Ion	Ratio	Lower	Upper
153	100		
154	94.0	75.4	113.2

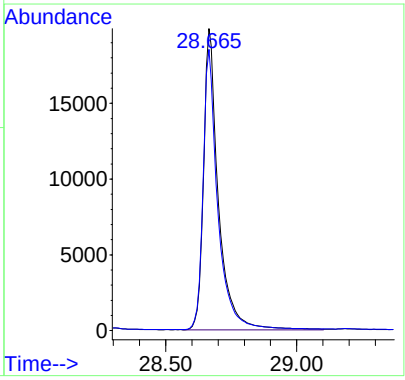


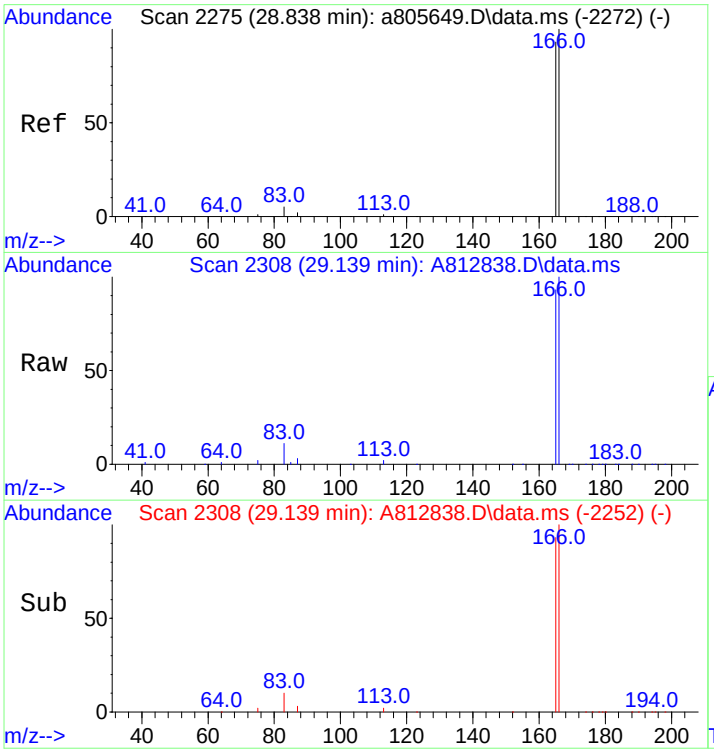


#28
2,3,5-Trimethylnaphthalene
Concen: 533.27 ng/mL
RT: 28.665 min Scan# 2256
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:170 Resp: 77925

Ion	Ratio	Lower	Upper
170	100		
155	92.7	71.7	107.5

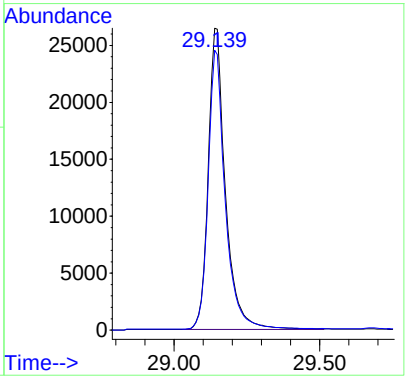


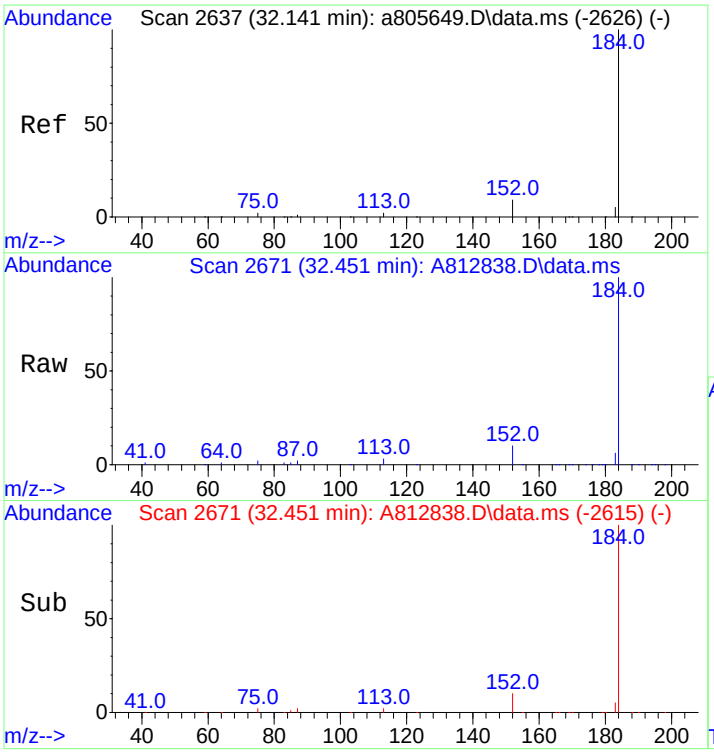


#29
Fluorene
Concen: 537.26 ng/mL
RT: 29.139 min Scan# 2308
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:166 Resp: 108649

Ion	Ratio	Lower	Upper
166	100		
165	92.1	74.2	111.2

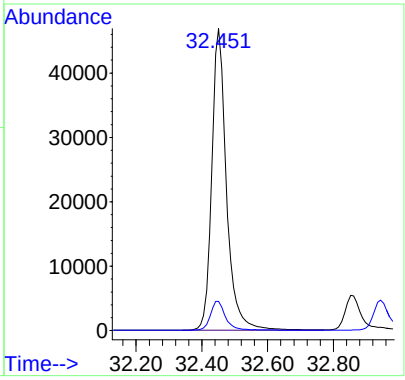


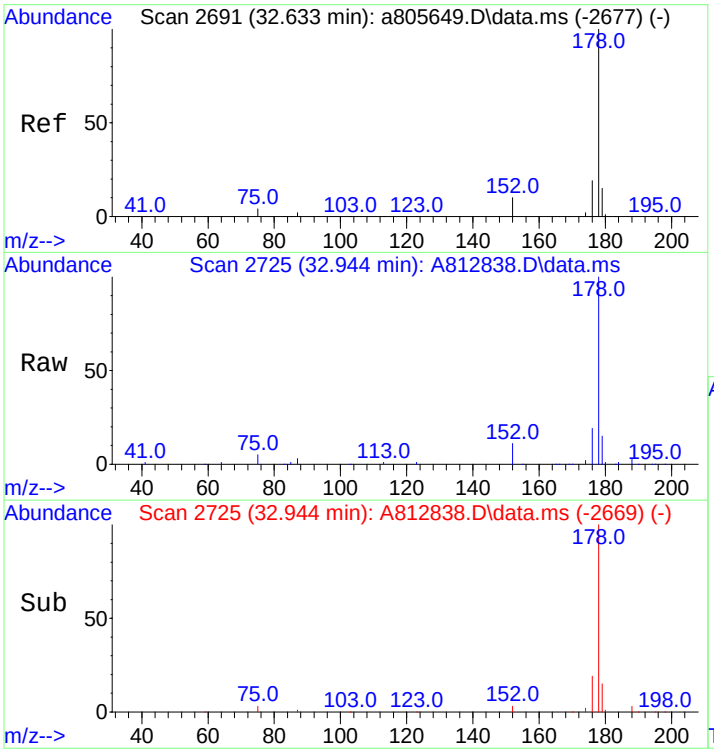


#33
Dibenzothiophene
Concen: 524.68 ng/mL
RT: 32.451 min Scan# 2671
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:184 Resp: 145906

Ion	Ratio	Lower	Upper
184	100		
152	9.8	7.8	11.8

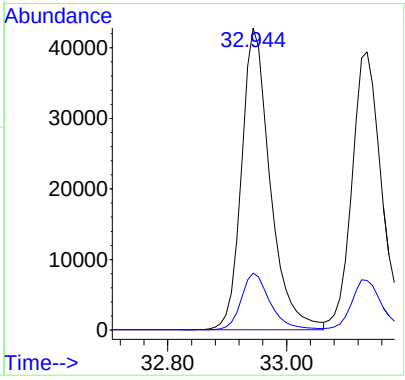


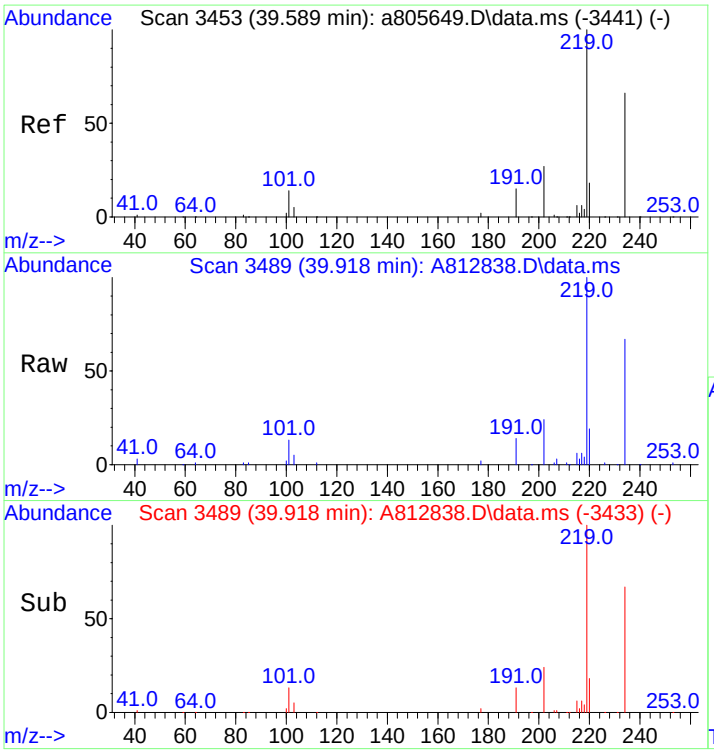


#43
Phenanthrene
Concen: 533.00 ng/mL
RT: 32.944 min Scan# 2725
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:178 Resp: 142661

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

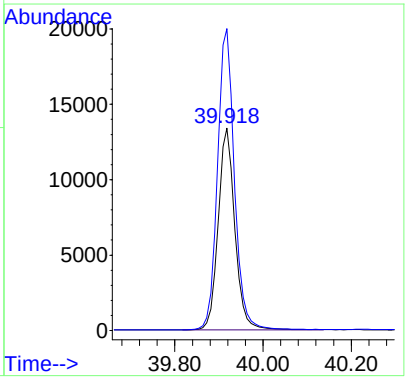


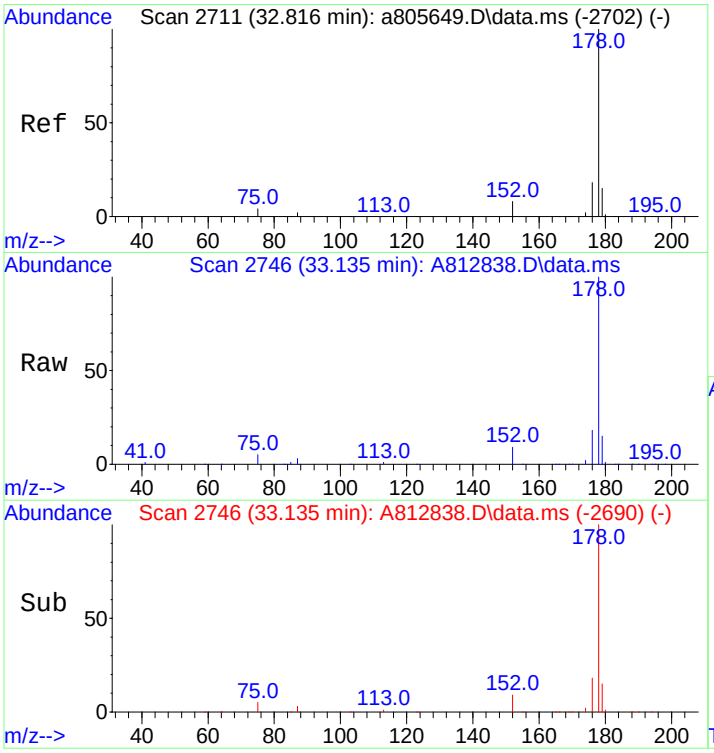


#54
Retene
Concen: 564.24 ng/mL
RT: 39.918 min Scan# 3489
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:234 Resp: 35024

Ion	Ratio	Lower	Upper
234	100		
219	151.5	124.0	186.0

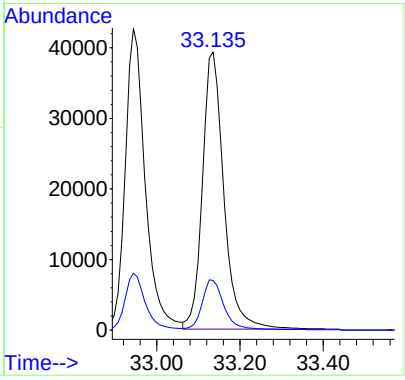


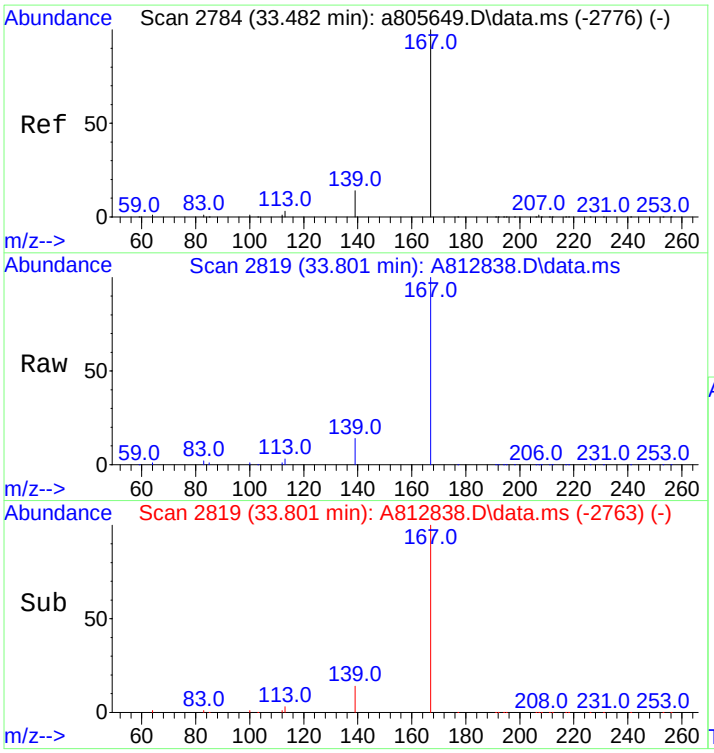


#55
Anthracene
Concen: 560.57 ng/mL m
RT: 33.135 min Scan# 2746
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:178 Resp: 139782

Ion	Ratio	Lower	Upper
178	100		
176	18.3	14.3	21.5

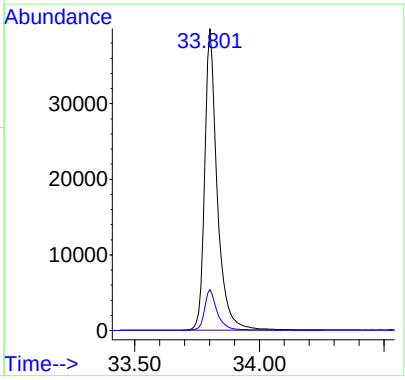


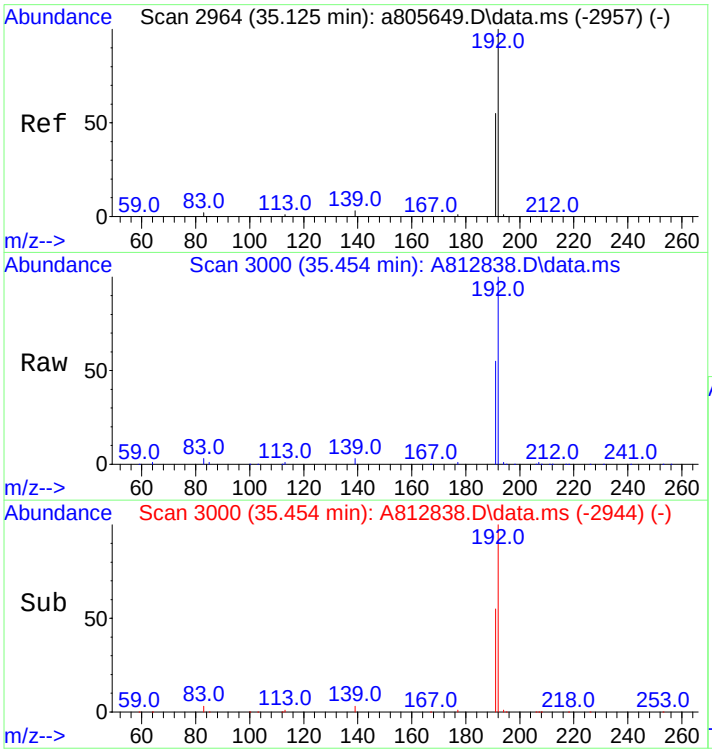


#56
Carbazole
Concen: 537.36 ng/mL
RT: 33.801 min Scan# 2819
Delta R.T. 0.008 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:167 Resp: 139814

Ion	Ratio	Lower	Upper
167	100		
139	13.3	10.6	16.0

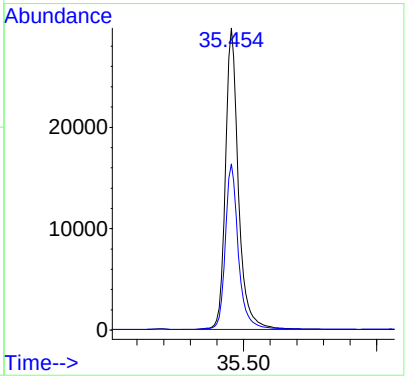


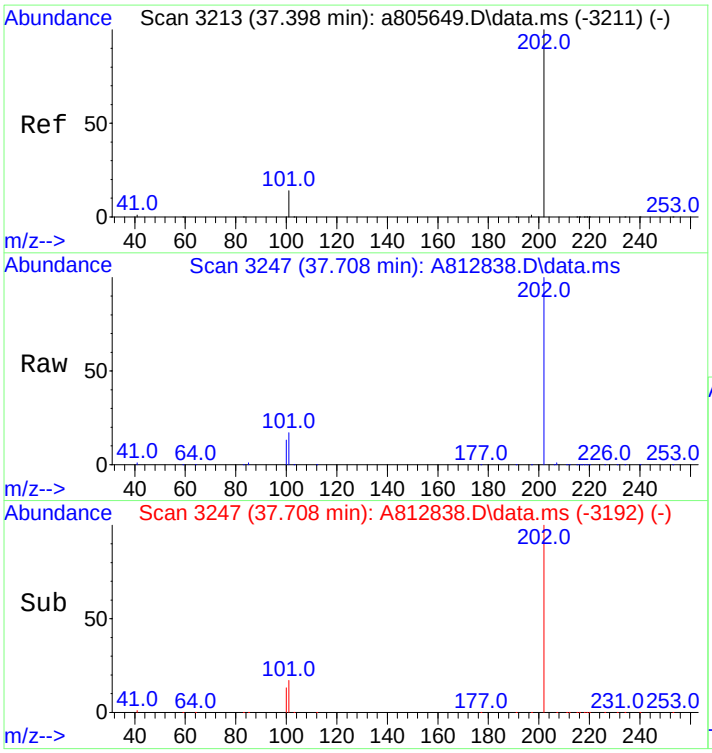


#57
1-Methylphenanthrene
Concen: 532.64 ng/mL
RT: 35.454 min Scan# 3000
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:192 Resp: 101059

Ion	Ratio	Lower	Upper
192	100		
191	55.2	44.2	66.4

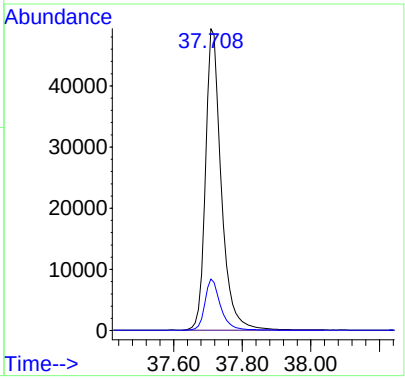


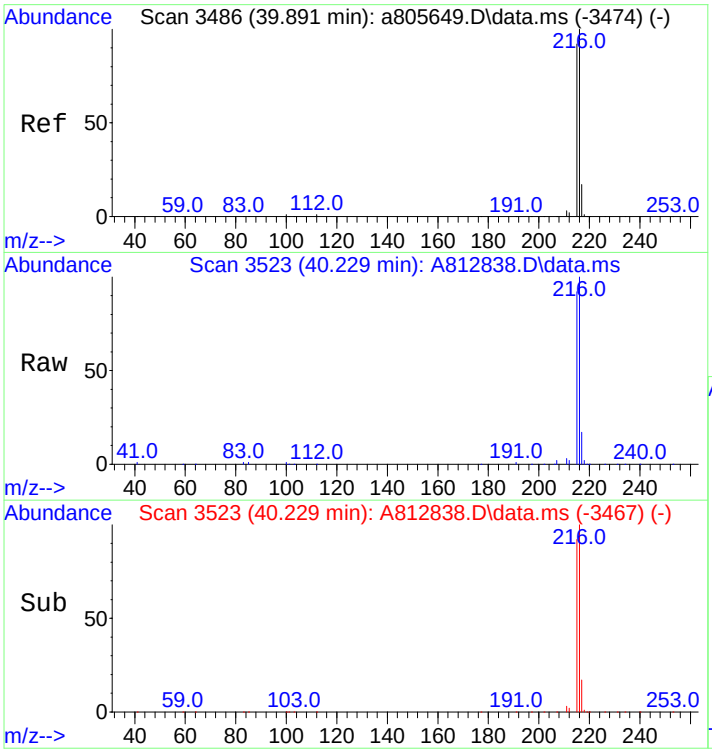


#58
Fluoranthene
Concen: 569.32 ng/mL
RT: 37.708 min Scan# 3247
Delta R.T. -0.001 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:202 Resp: 156963

Ion	Ratio	Lower	Upper
202	100		
101	16.9	13.6	20.4

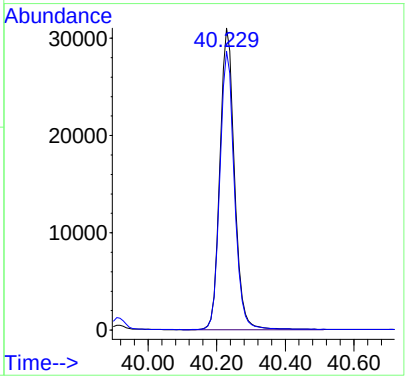


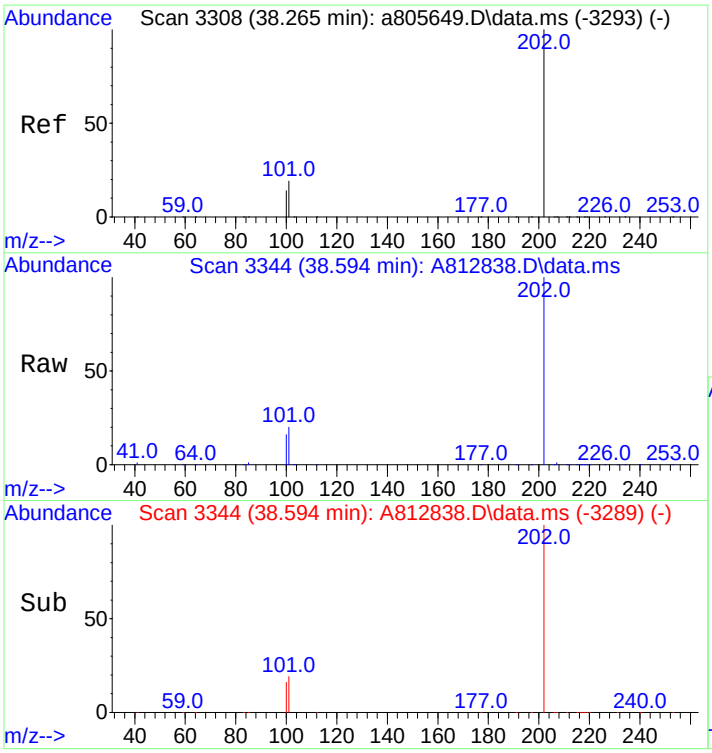


#59
Benzo(b)fluorene
Concen: 573.92 ng/mL
RT: 40.229 min Scan# 3523
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:216 Resp: 91532

Ion	Ratio	Lower	Upper
216	100		
215	92.3	74.2	111.2

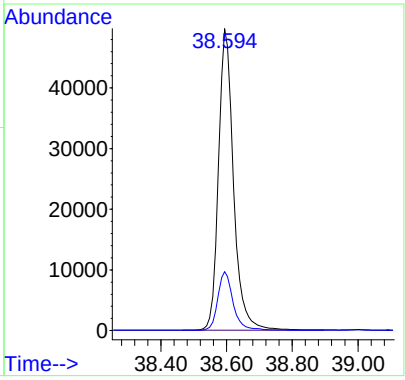


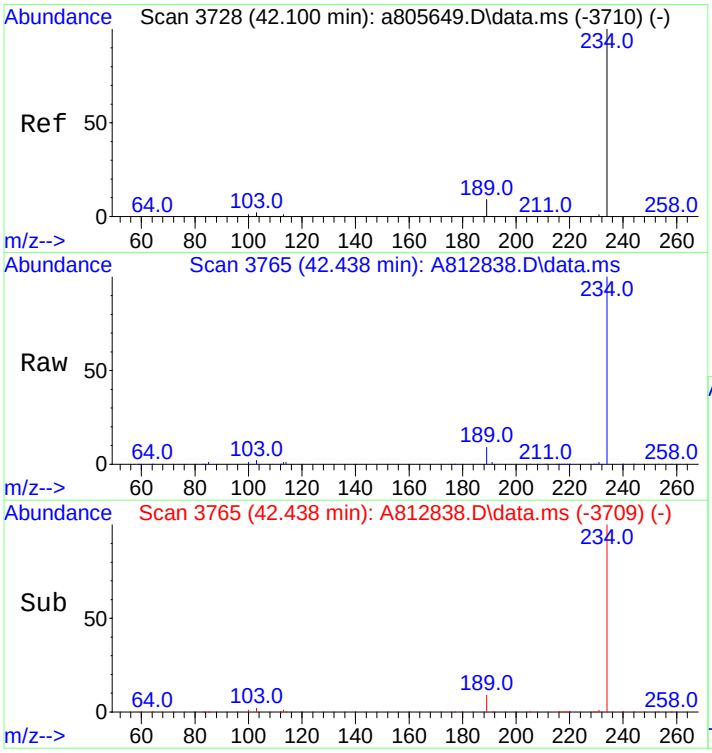


#60
Pyrene
Concen: 568.11 ng/mL
RT: 38.594 min Scan# 3344
Delta R.T. 0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:202 Resp: 158428

Ion	Ratio	Lower	Upper
202	100		
101	19.8	15.4	23.2

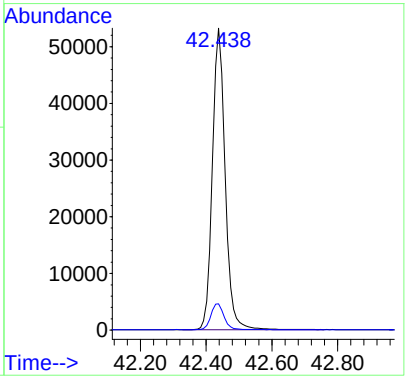


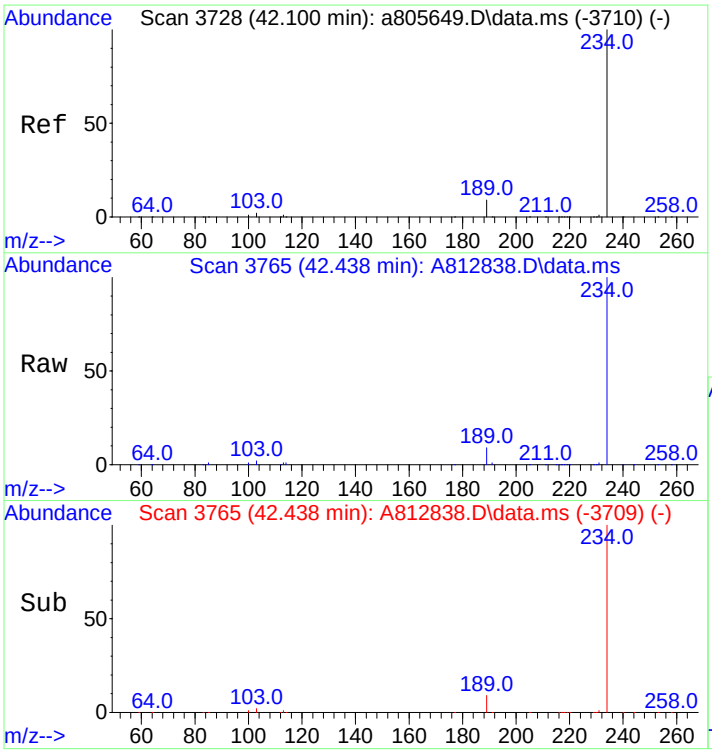


#66
Naphthobenzothiophene
Concen: 553.59 ng/ml
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:234 Resp: 143309

Ion	Ratio	Lower	Upper
234	100		
189	8.8	22.3	33.5#

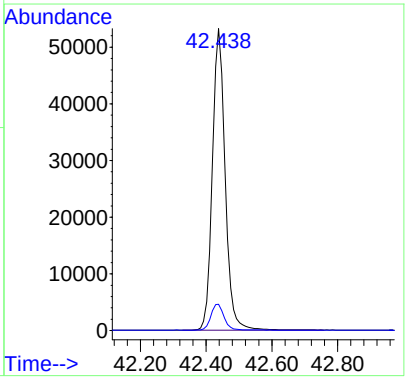


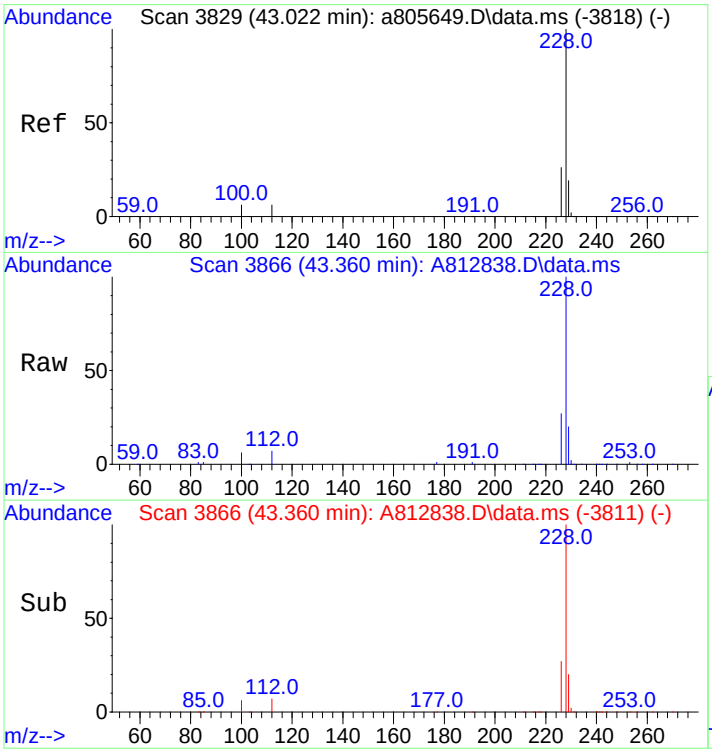


#67
Naphthobenzothiophene-2,1-D
Concen: 553.59 ng/mL
RT: 42.438 min Scan# 3765
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:234 Resp: 143309

Ion	Ratio	Lower	Upper
234	100		
189	8.8	22.3	33.5#

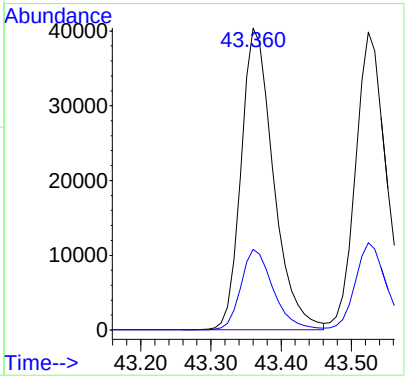


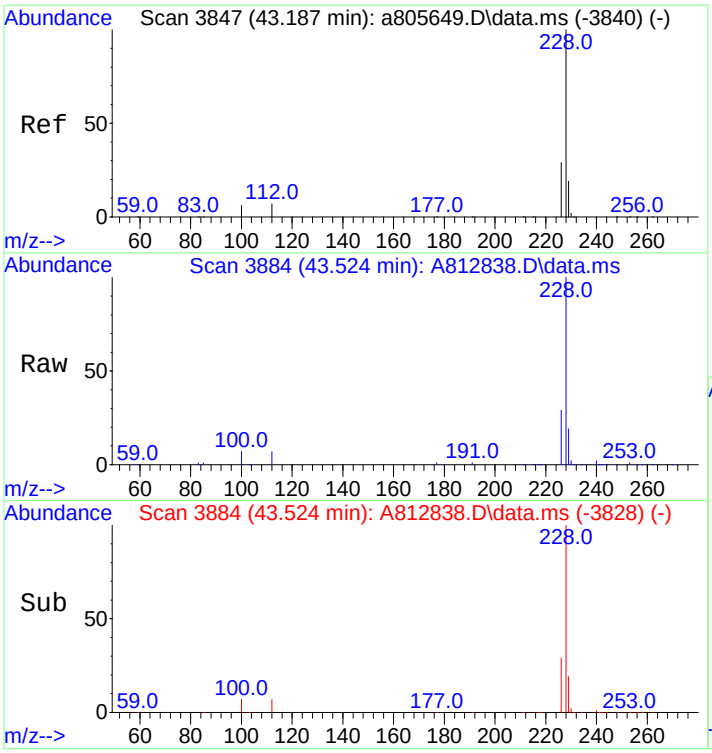


#75
Benz[a]anthracene
Concen: 547.61 ng/mL
RT: 43.360 min Scan# 3866
Delta R.T. 0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:228 Resp: 129229

Ion	Ratio	Lower	Upper
228	100		
226	26.5	21.3	31.9

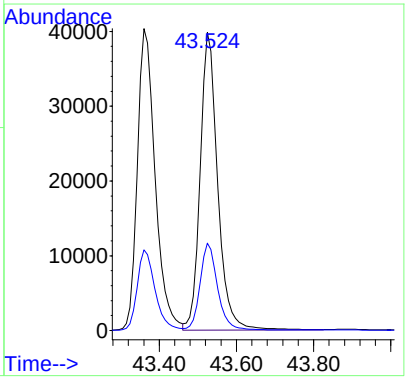


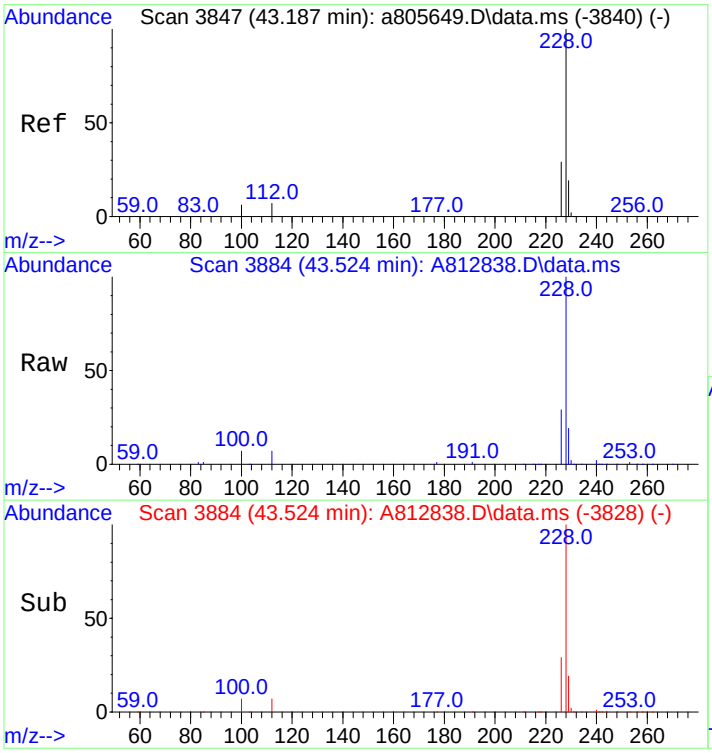


#76
Chrysene
Concen: 525.18 ng/mL
RT: 43.524 min Scan# 3884
Delta R.T. 0.008 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:228 Resp: 125453

Ion	Ratio	Lower	Upper
228	100		
226	29.0	23.6	35.4

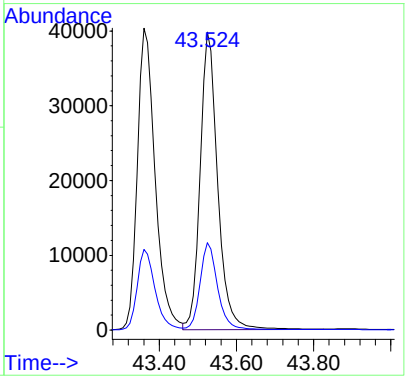


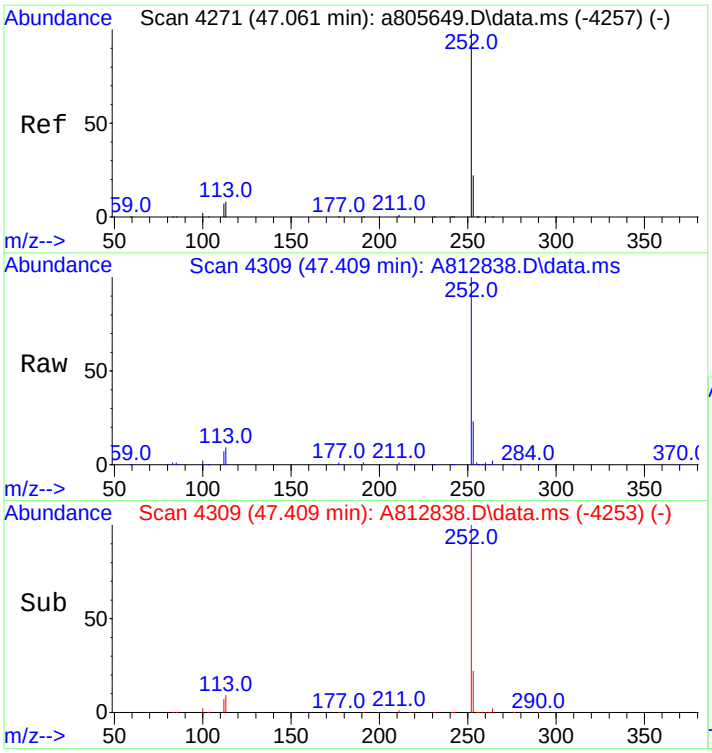


#77
Chrysene/Triphenylene
Concen: 525.18 ng/mL
RT: 43.524 min Scan# 3884
Delta R.T. 0.008 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:228 Resp: 125453

Ion	Ratio	Lower	Upper
228	100		
226	29.0	23.6	35.4

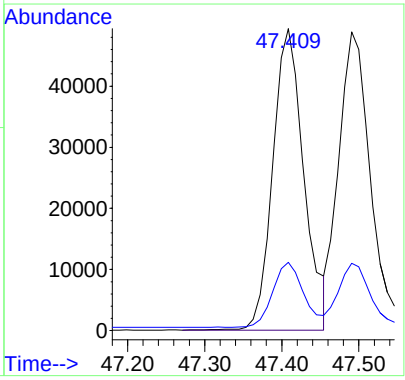


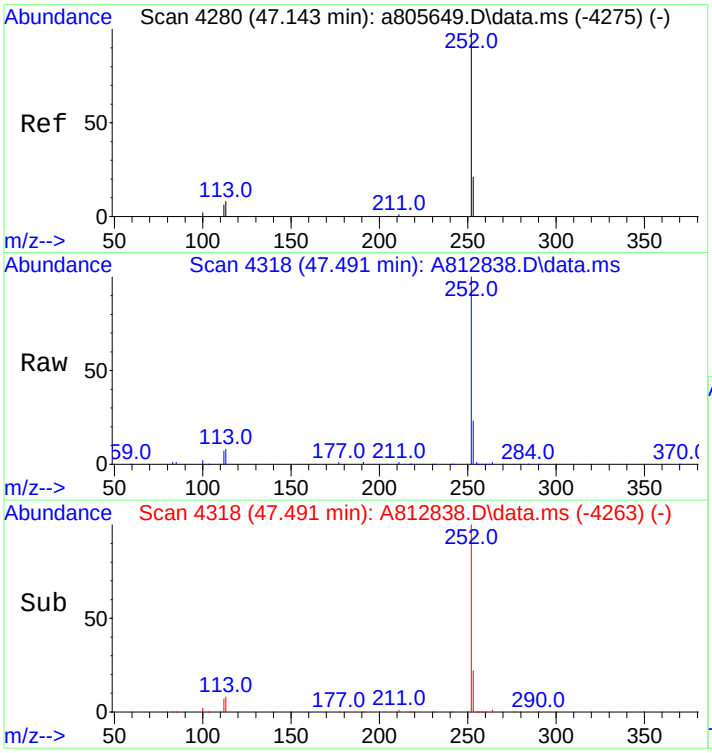


#84
Benzo[b]fluoranthene
Concen: 545.46 ng/mL
RT: 47.409 min Scan# 4309
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:252 Resp: 138245

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.5	27.7

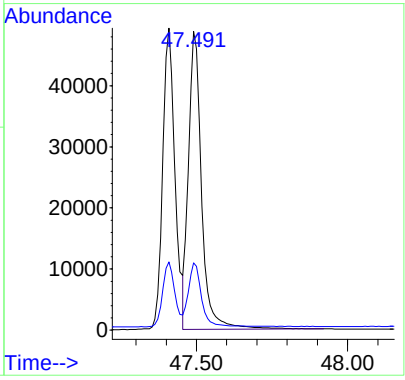


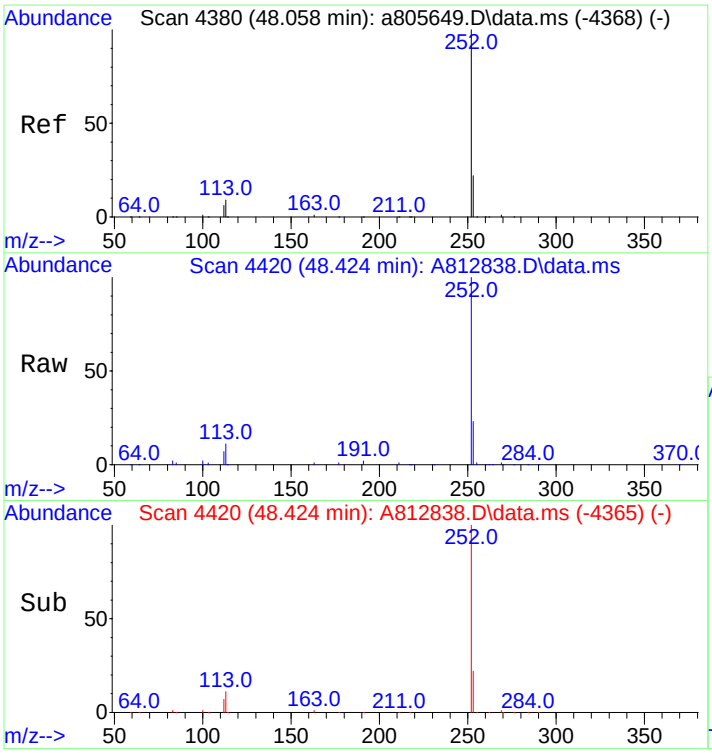


#85
Benzo[j]+[k]fluoranthene
Concen: 529.83 ng/mL
RT: 47.491 min Scan# 4318
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:252 Resp: 146517

Ion	Ratio	Lower	Upper
252	100		
253	20.9	18.8	28.2

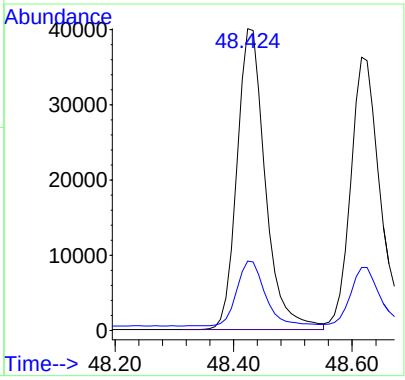


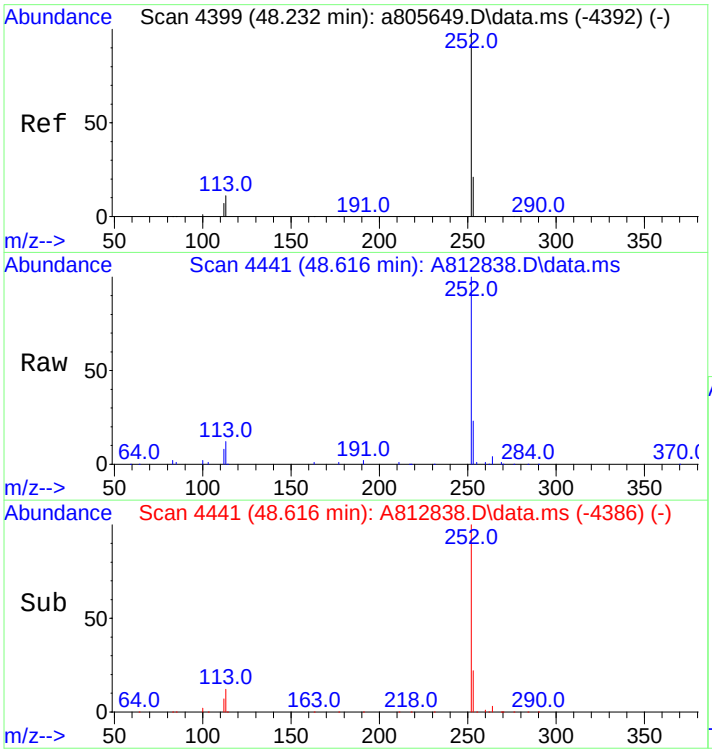


#87
Benzo[e]pyrene
Concen: 508.25 ng/mL
RT: 48.424 min Scan# 4420
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:252 Resp: 132726

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.9	28.3

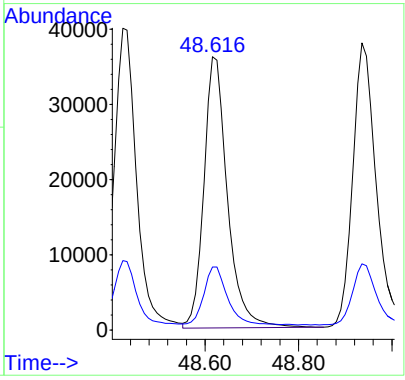


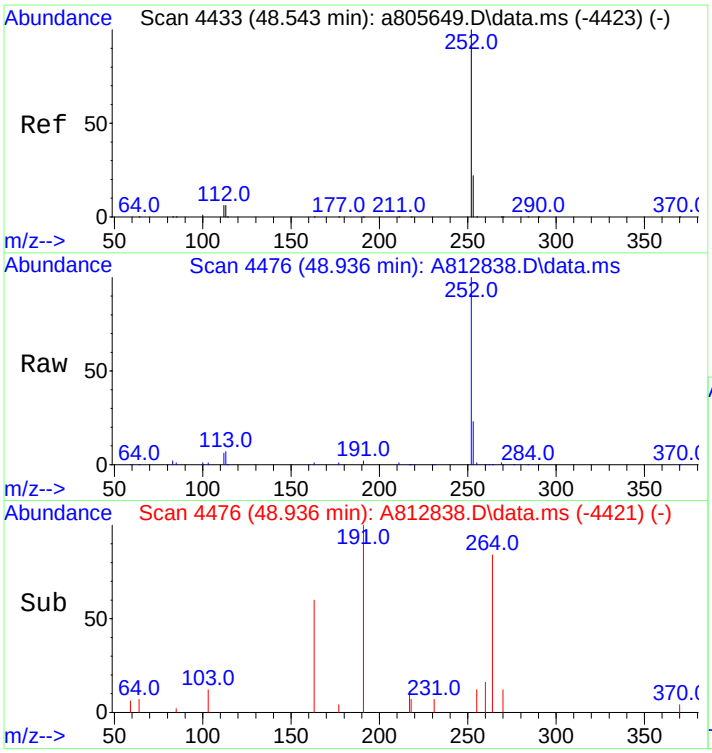


#89
Benzo[a]pyrene
Concen: 522.87 ng/mL
RT: 48.616 min Scan# 4441
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:252 Resp: 126307

Ion	Ratio	Lower	Upper
252	100		
253	21.5	19.4	29.0

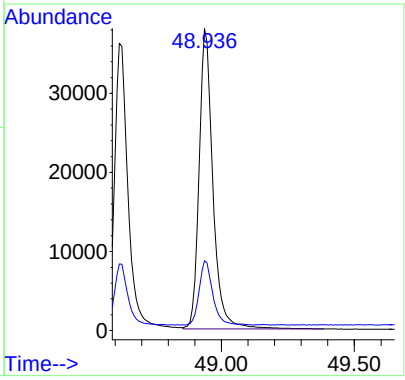


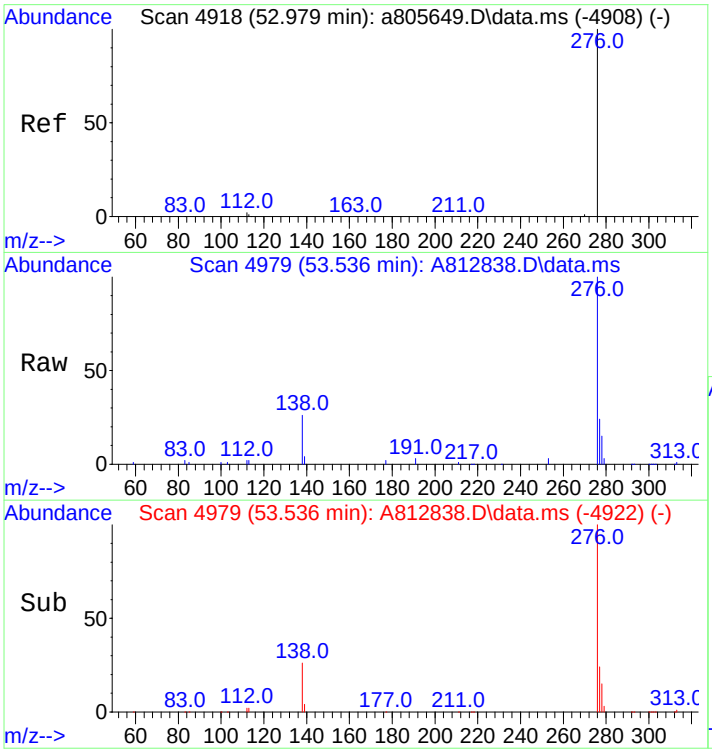


#90
Perylene
Concen: 520.37 ng/mL
RT: 48.936 min Scan# 4476
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:252 Resp: 137308

Ion	Ratio	Lower	Upper
252	100		
253	21.0	19.3	28.9

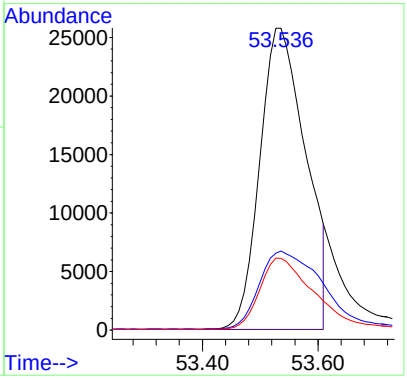


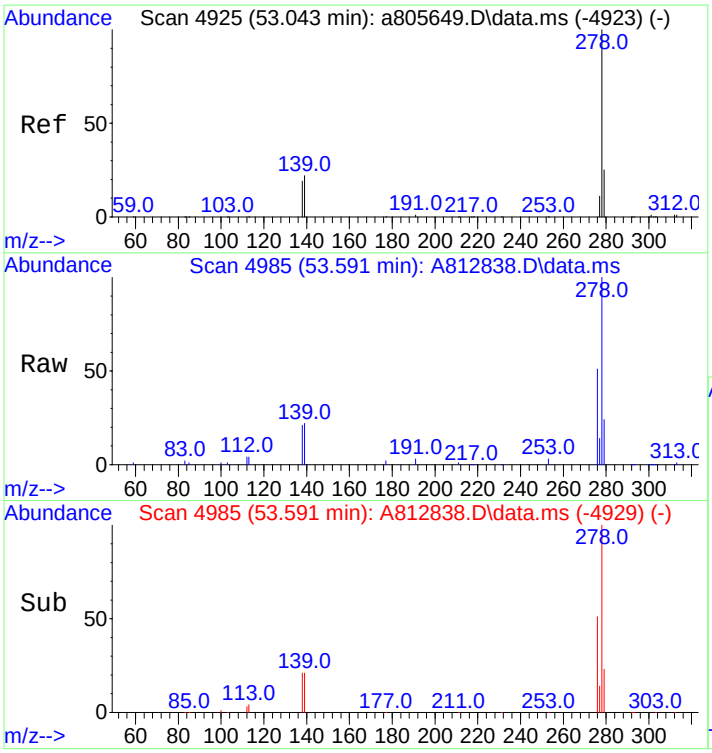


#91
Indeno[1,2,3-cd]pyrene
Concen: 553.74 ng/mL m
RT: 53.536 min Scan# 4979
Delta R.T. 0.018 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:276 Resp: 142093

Ion	Ratio	Lower	Upper
276	100		
138	36.8	19.9	29.9#
277	29.2	19.0	28.6#

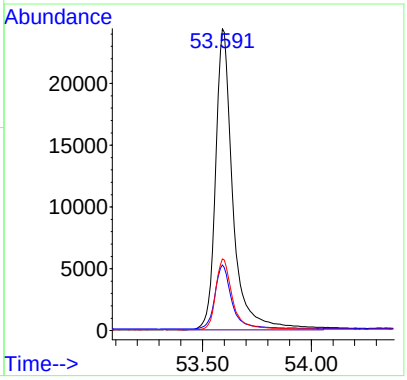


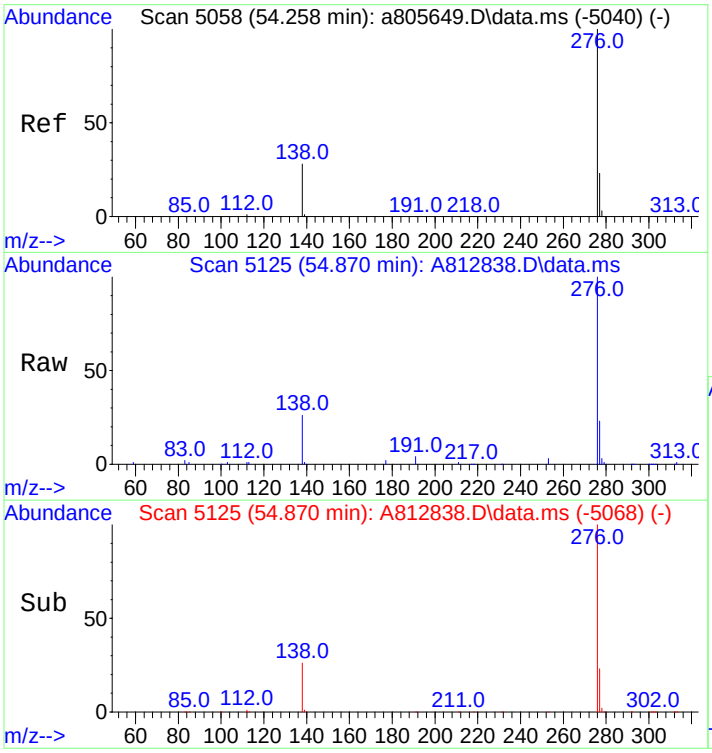


#92
Dibenz[ah]+[ac]anthracene
Concen: 539.09 ng/mL
RT: 53.591 min Scan# 4985
Delta R.T. 0.009 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:278 Resp: 135598

Ion	Ratio	Lower	Upper
278	100		
139	20.9	16.6	25.0
279	22.9	19.1	28.7

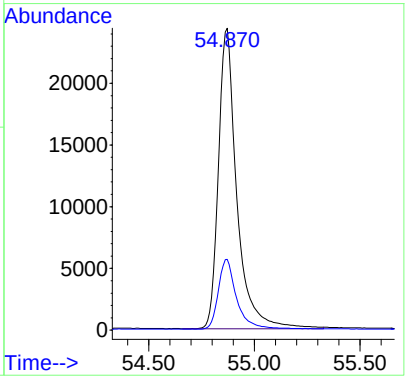


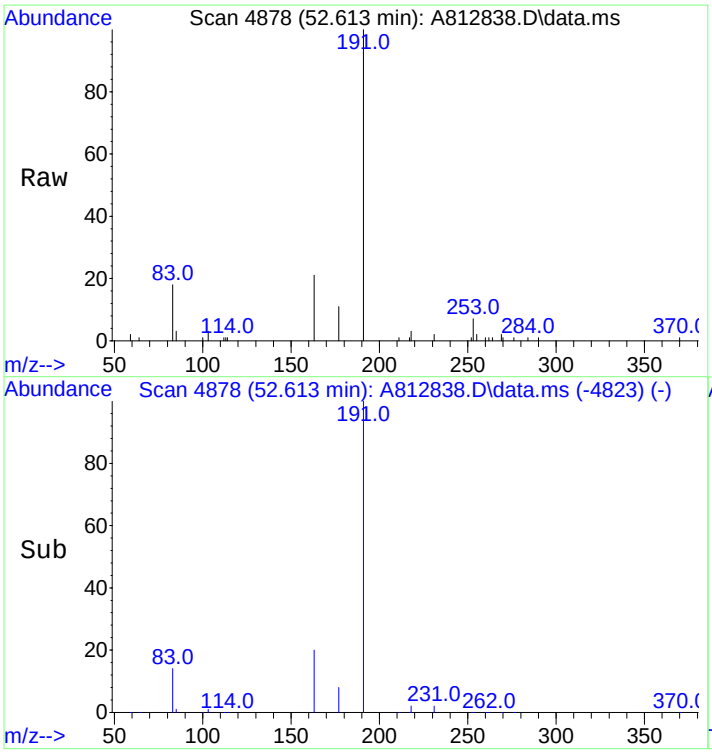


#93
Benzo[g,h,i]perylene
Concen: 502.80 ng/mL
RT: 54.870 min Scan# 5125
Delta R.T. 0.018 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:276 Resp: 146421

Ion	Ratio	Lower	Upper
276	100		
277	23.3	18.9	28.3

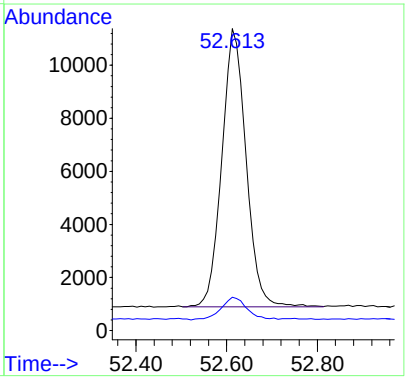


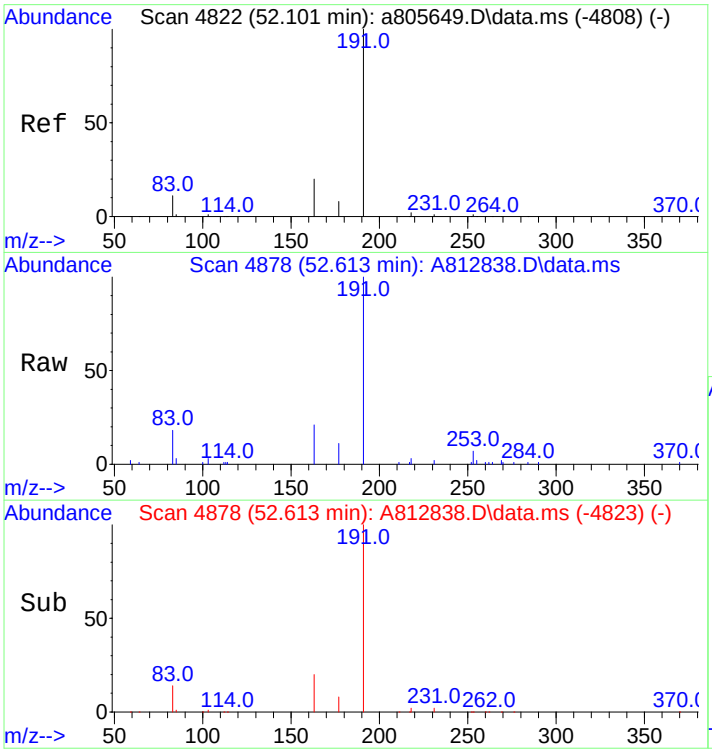


#94
Hopane (T19)
Concen: 481.49 ng/mL
RT: 52.613 min Scan# 4878
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:191 Resp: 38926

Ion	Ratio	Lower	Upper
191	100		
177	8.7	9.8	14.8#

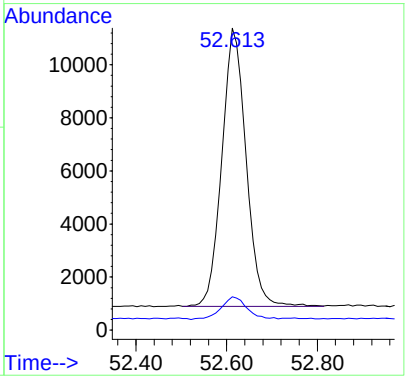




#95
17a(H),21B(H)-hopane - C30H52
Concen: 481.49 ng/mL
RT: 52.613 min Scan# 4878
Delta R.T. -0.000 min
Lab File: A812838.D
Acq: 19 Nov 2012 6:52 am

Tgt Ion:191 Resp: 38926

Ion	Ratio	Lower	Upper
191	100		
177	8.7	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

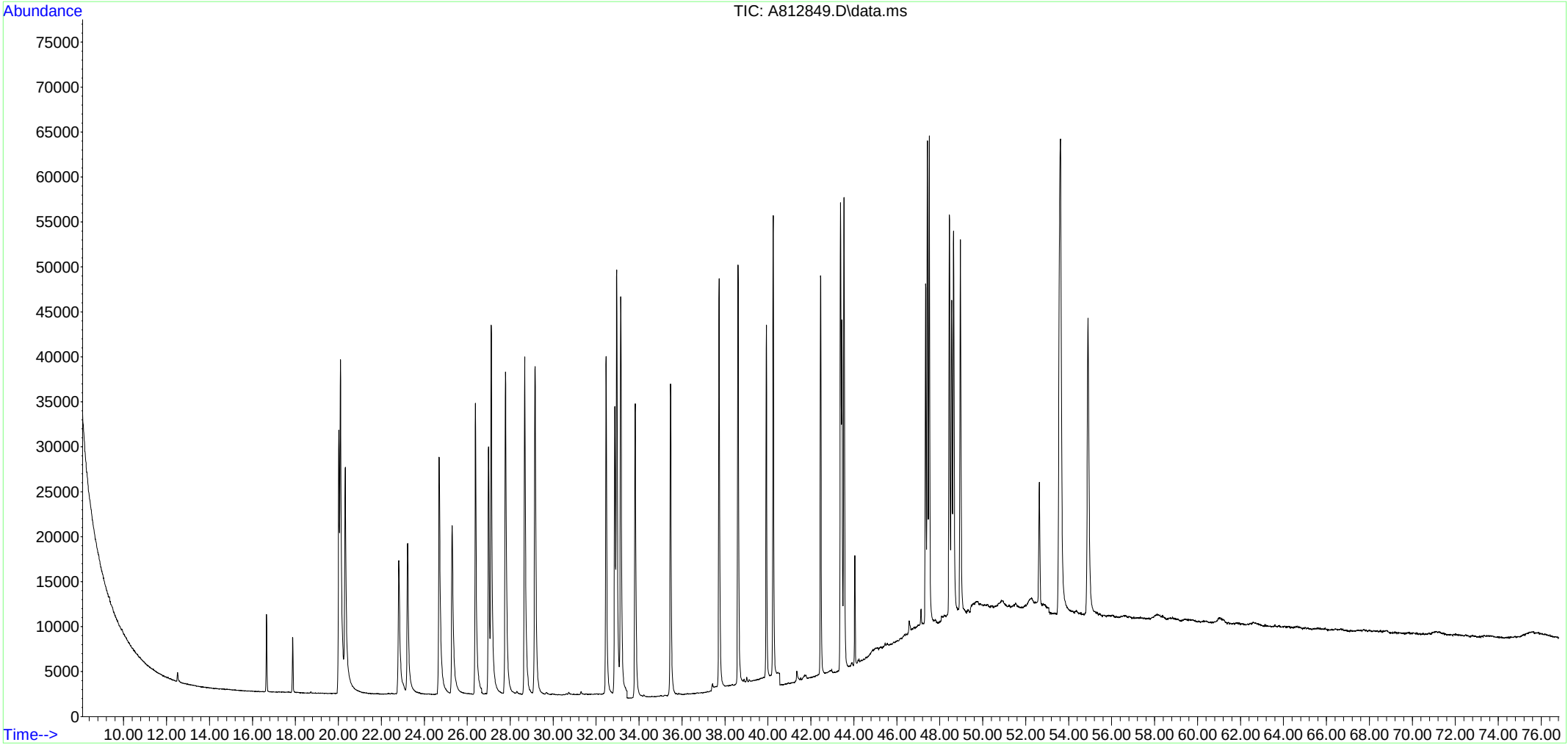
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.995	164	58340	500.000	ng/mL	0.02
74) Chrysene-d12	43.442	240	85651	500.000	ng/mL	0.03
System Monitoring Compounds						
9) Naphthalene-d8	20.023	136	118675	513.293	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.33%			
42) Phenanthrene-d10	32.871	188	98130	546.543	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.65%			
83) Benzo[b]fluoranthene-d12	47.336	264	88067	539.500	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.95%			
88) Benzo[a]pyrene-d12	48.552	264	93140	577.522	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.75%			
129) 5B(H)Cholane - Surr	44.045	217	16203	517.349	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.73%			
Target Compounds						Qvalue
3) trans-Decalin	16.656	138	12129	233.949	ng/mL	100
4) cis-Decalin	17.879	138	8852	233.067	ng/mL	100
10) Naphthalene	20.096	128	138614	524.053	ng/mL#	100
16) 2-Methylnaphthalene	22.816	142	80683	512.076	ng/mL#	100
17) 1-Methylnaphthalene	23.226	142	76391	517.767	ng/mL#	100
18) Benzothiophene	20.324	134	108070	505.481	ng/mL	100
23) Biphenyl	24.686	154	104527	521.434	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.298	156	72370	536.688	ng/mL#	100
25) Dibenzofuran	27.780	168	111571	527.568	ng/mL	98
26) Acenaphthylene	26.384	152	128850M3	536.681	ng/mL	
27) Acenaphthene	27.114	153	76915	536.731	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.674	170	61753	531.720	ng/mL	97
29) Fluorene	29.158	166	86931	540.863	ng/mL	100
33) Dibenzothiophene	32.469	184	115967	524.693	ng/mL	100
43) Phenanthrene	32.962	178	111807	525.585	ng/mL	100
54) Retene	39.927	234	27799	563.485	ng/mL	96
55) Anthracene	33.145	178	117806M4	594.426	ng/mL	
56) Carbazole	33.820	167	113104	546.944	ng/mL	99
57) 1-Methylphenanthrene	35.463	192	81232	538.690	ng/mL	100
58) Fluoranthene	37.727	202	121670	555.259	ng/mL	100
59) Benzo(b)fluorene	40.247	216	74023	583.980	ng/mL	99
60) Pyrene	38.603	202	122261	551.625	ng/mL	99
66) Naphthobenzothiophene	42.456	234	114718	557.572	ng/ml#	63
67) Naphthobenzothiophene-...	42.456	234	114718	557.572	ng/mL#	63
75) Benz[a]anthracene	43.379	228	104982	559.108	ng/mL	100
76) Chrysene	43.543	228	101038	531.600	ng/mL	99
77) Chrysene/Triphenylene	43.543	228	101038	531.600	ng/mL	99
84) Benzo[b]fluoranthene	47.427	252	112219	556.477	ng/mL	95
85) Benzo[j]+[k]fluoranthene	47.509	252	117688	534.868	ng/mL	97
87) Benzo[e]pyrene	48.451	252	107811	518.863	ng/mL	96
89) Benzo[a]pyrene	48.644	252	105018	546.385	ng/mL	94
90) Perylene	48.964	252	112960	538.040	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.564	276	121870M3	596.896	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.628	278	123844	618.807	ng/mL	98
93) Benzo[g,h,i]perylene	54.898	276	131455	567.339	ng/mL	100
94) Hopane (T19)	52.631	191	33536	521.352	ng/mL#	89
95) 17a(H),21B(H)-hopane -...	52.631	191	33536	521.352	ng/mL#	89

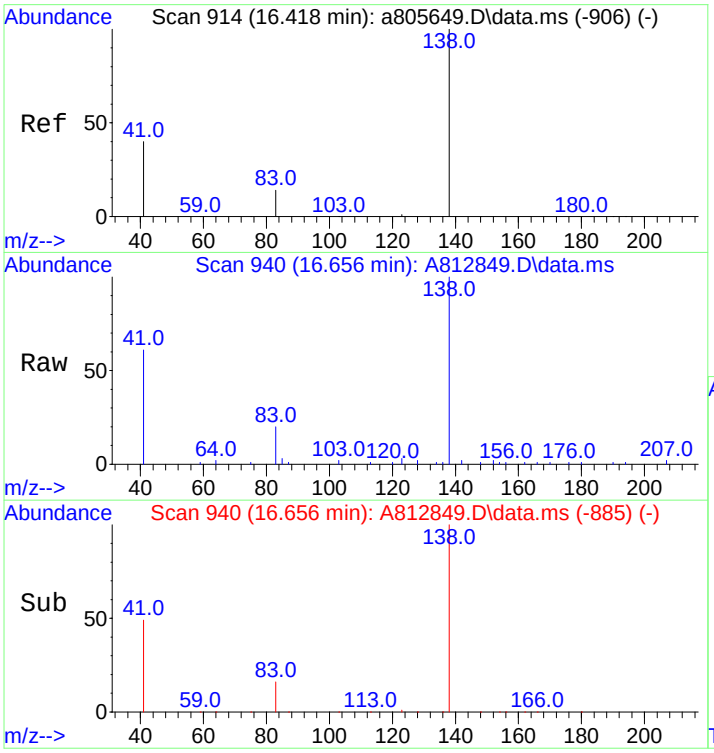
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812849.D
Acq On : 20 Nov 2012 12:24 am
Operator : AC
Sample : c811181203
Misc : cc whaq86 500ng/ml
ALS Vial : 30 Sample Multiplier: 1

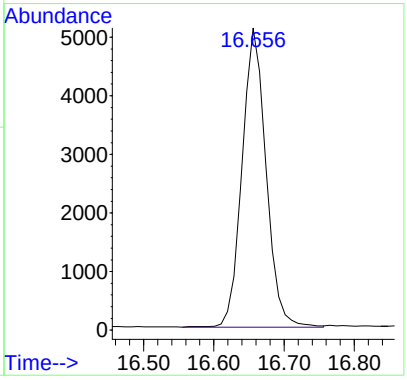
Quant Time: Nov 20 14:47:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

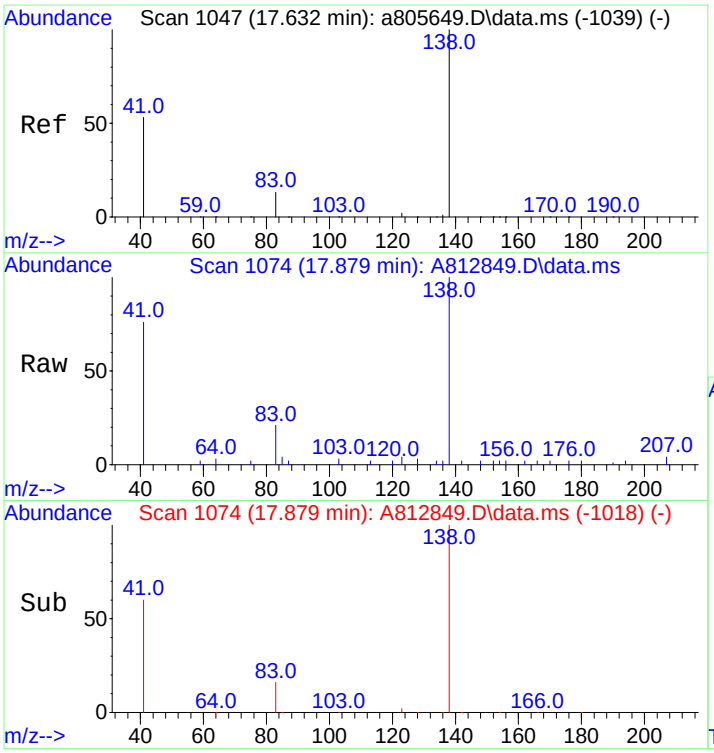




#3
trans-Decalin
Concen: 233.95 ng/mL
RT: 16.656 min Scan# 940
Delta R.T. -0.000 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

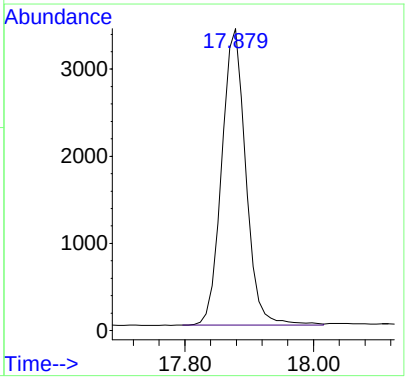
Tgt Ion:138 Resp: 12129

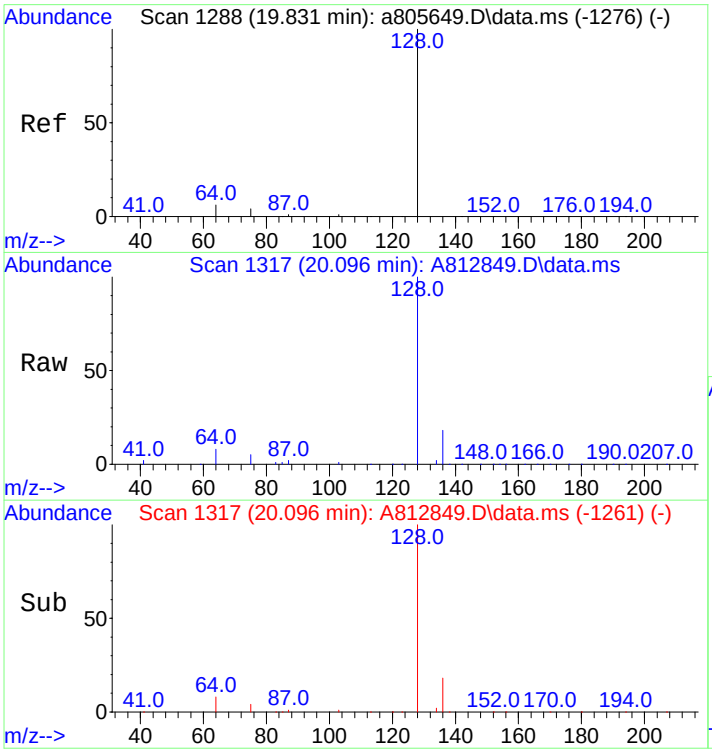




#4
cis-Decalin
Concen: 233.07 ng/mL
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:138 Resp: 8852

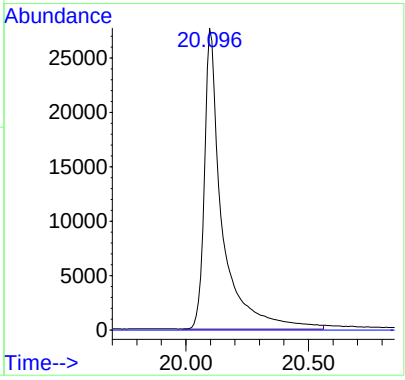


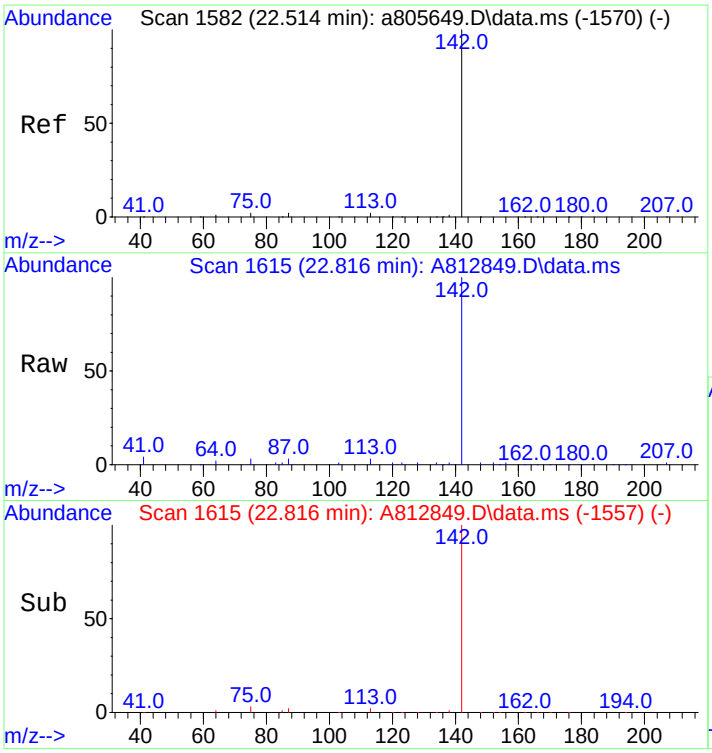


#10
Naphthalene
Concen: 524.05 ng/mL
RT: 20.096 min Scan# 1317
Delta R.T. 0.009 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:128 Resp: 138614

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

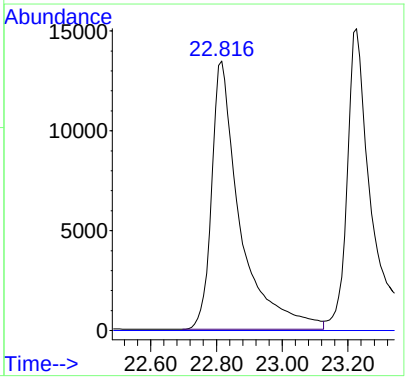


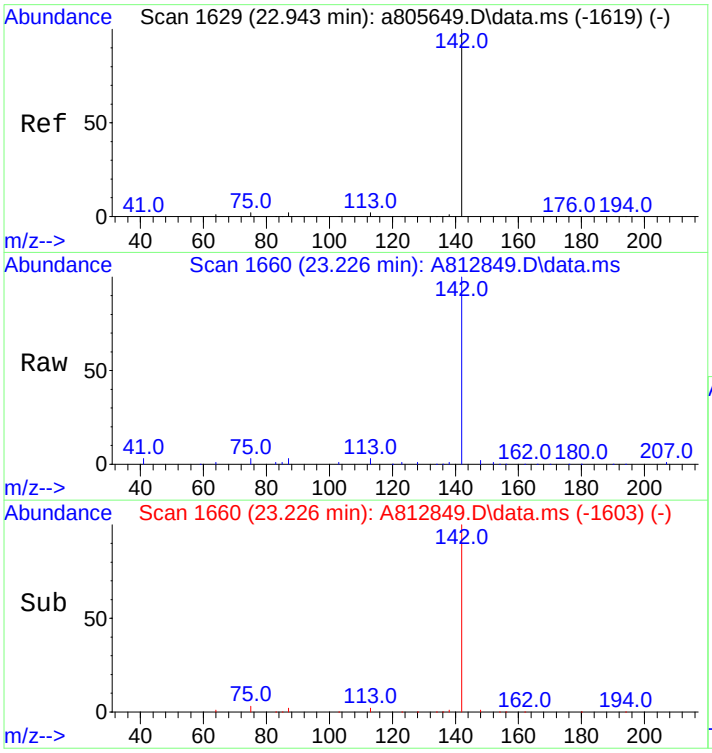


#16
2-Methylnaphthalene
Concen: 512.08 ng/mL
RT: 22.816 min Scan# 1615
Delta R.T. 0.028 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:142 Resp: 80683

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

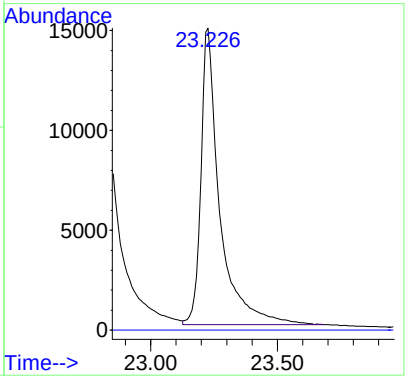


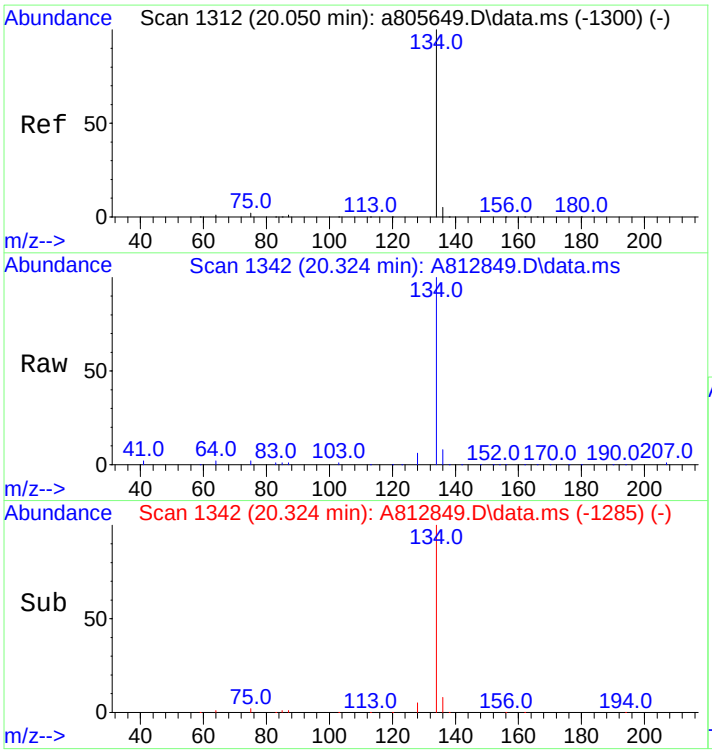


#17
1-Methylnaphthalene
Concen: 517.77 ng/mL
RT: 23.226 min Scan# 1660
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:142 Resp: 76391

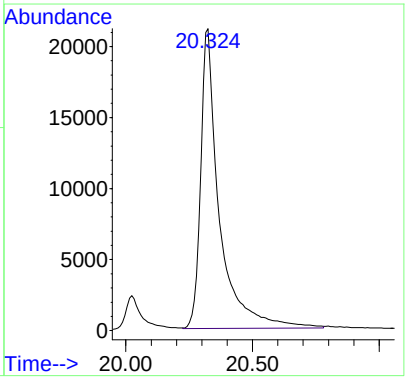
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

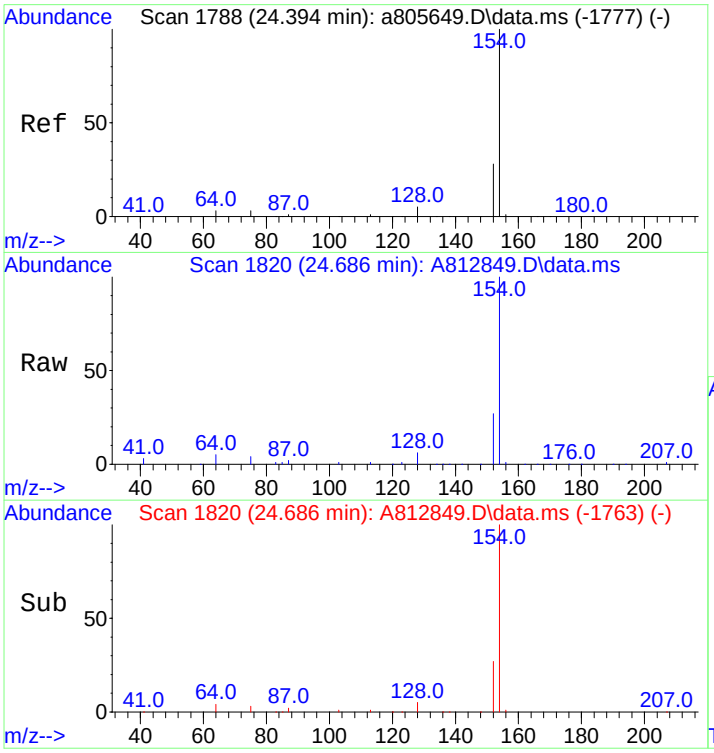




#18
Benzothiophene
Concen: 505.48 ng/mL
RT: 20.324 min Scan# 1342
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:134 Resp: 108070

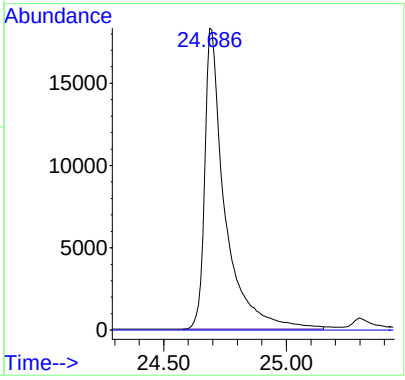


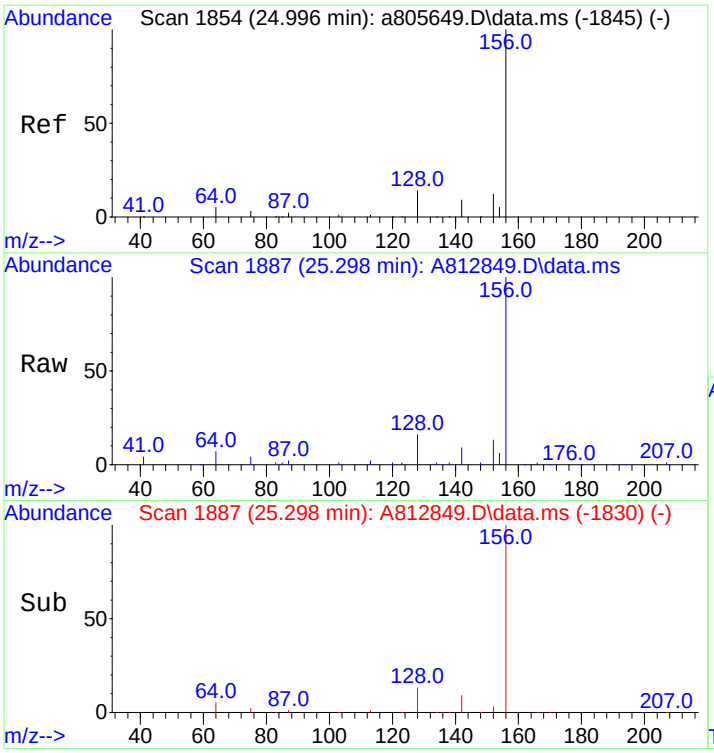


#23
Biphenyl
Concen: 521.43 ng/mL
RT: 24.686 min Scan# 1820
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:154 Resp: 104527

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

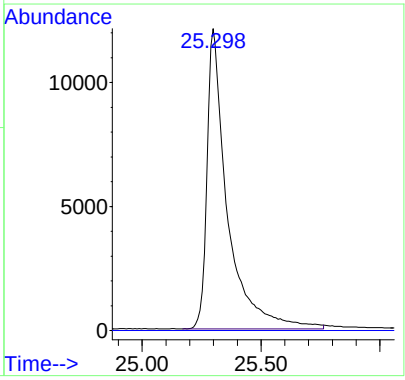


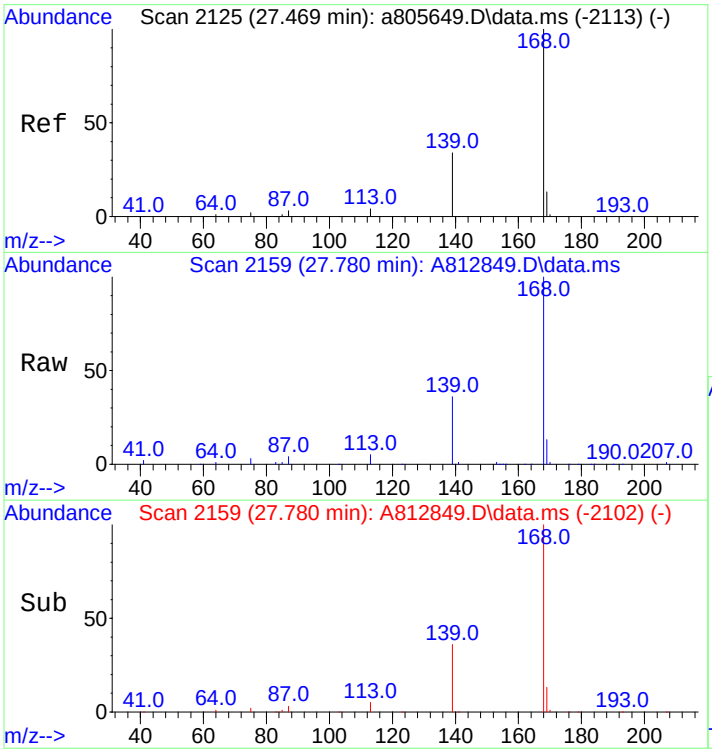


#24
2,6-Dimethylnaphthalene
Concen: 536.69 ng/mL
RT: 25.298 min Scan# 1887
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:156 Resp: 72370

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

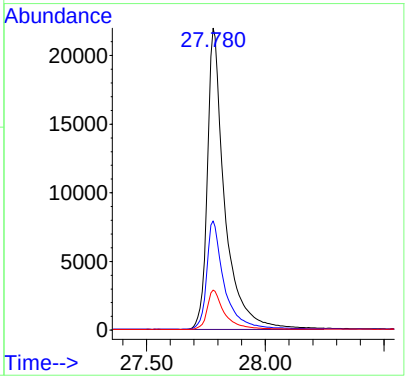


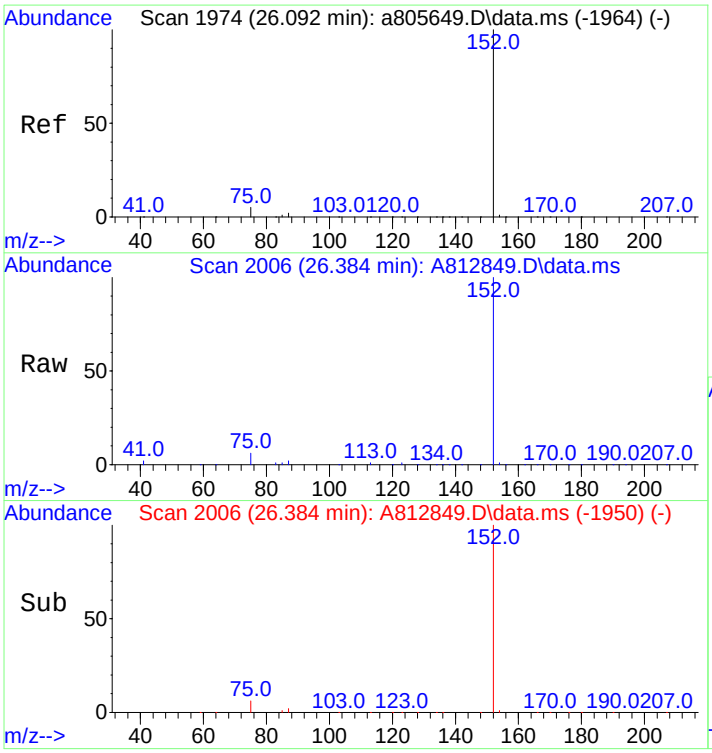


#25
Dibenzofuran
Concen: 527.57 ng/mL
RT: 27.780 min Scan# 2159
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:168 Resp: 111571

Ion	Ratio	Lower	Upper
168	100		
139	36.4	28.0	42.0
169	13.2	10.6	15.8

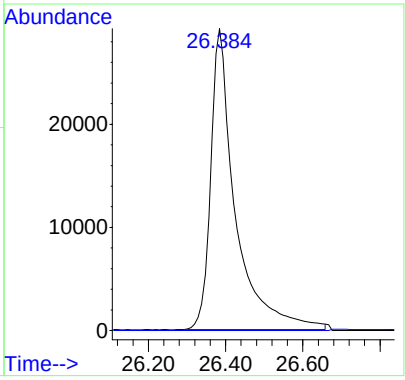


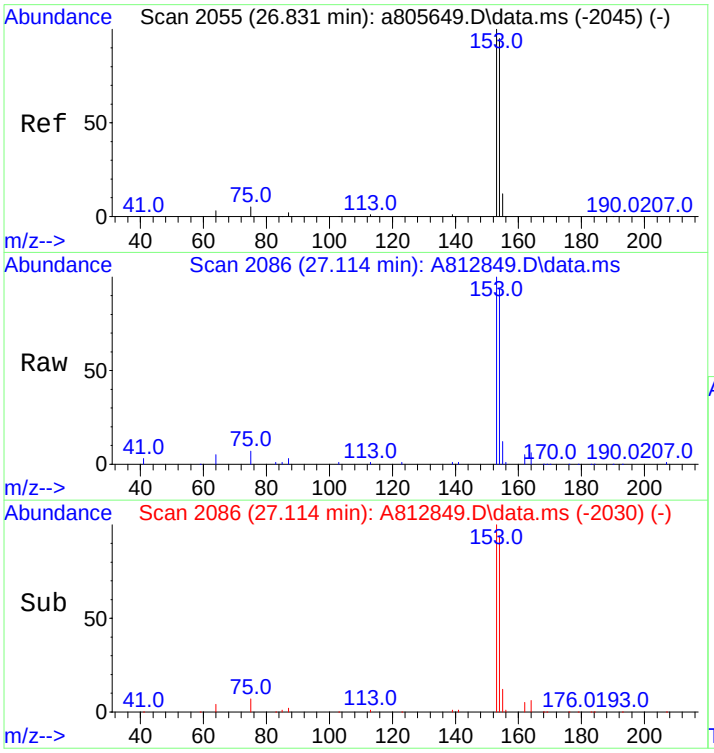


#26
Acenaphthylene
Concen: 536.68 ng/mL m
RT: 26.384 min Scan# 2006
Delta R.T. 0.009 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:152 Resp: 128850

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

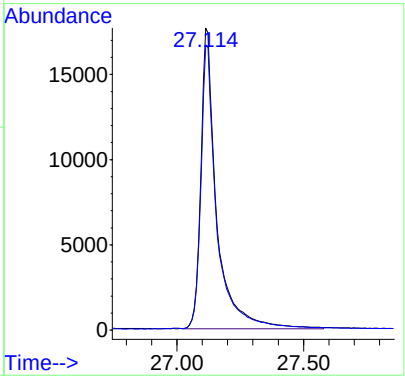


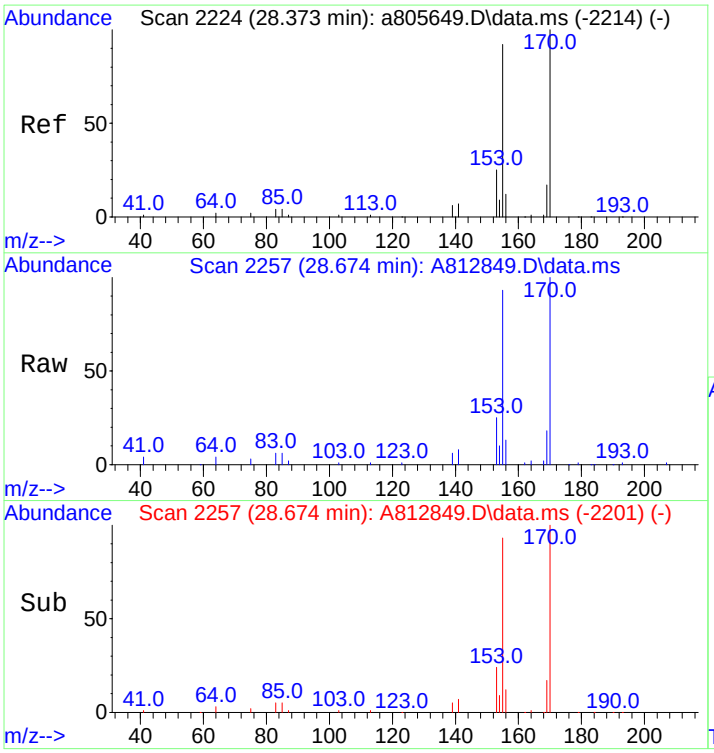


#27
Acenaphthene
Concen: 536.73 ng/mL
RT: 27.114 min Scan# 2086
Delta R.T. 0.009 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:153 Resp: 76915

Ion	Ratio	Lower	Upper
153	100		
154	94.2	75.4	113.2

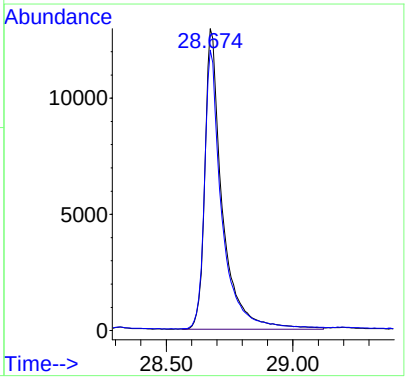


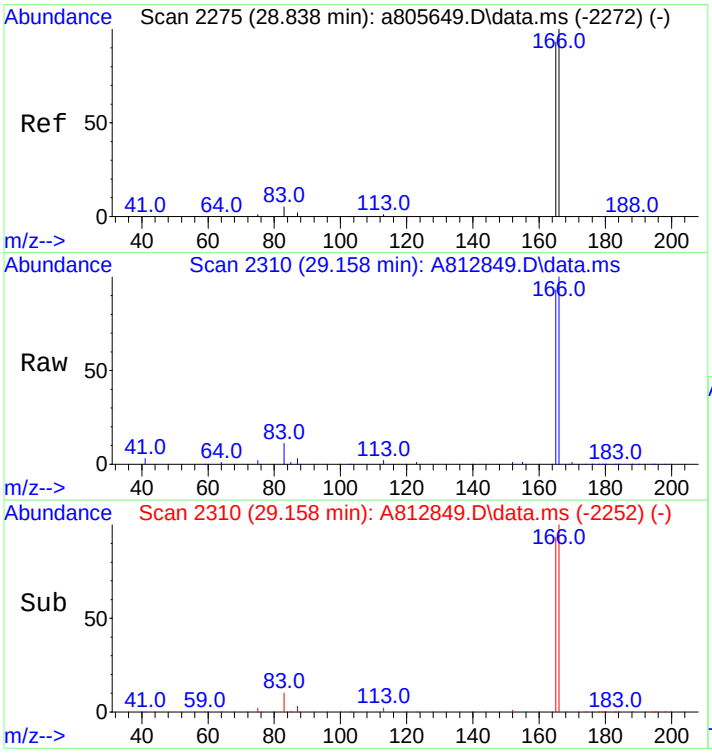


#28
2,3,5-Trimethylnaphthalene
Concen: 531.72 ng/mL
RT: 28.674 min Scan# 2257
Delta R.T. 0.009 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:170 Resp: 61753

Ion	Ratio	Lower	Upper
170	100		
155	92.2	71.7	107.5

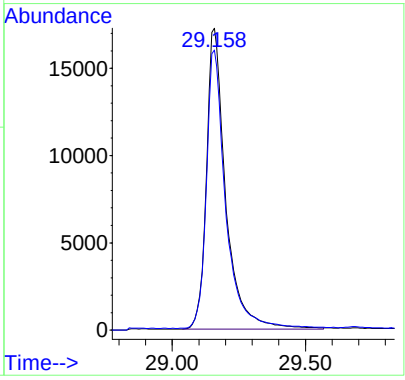


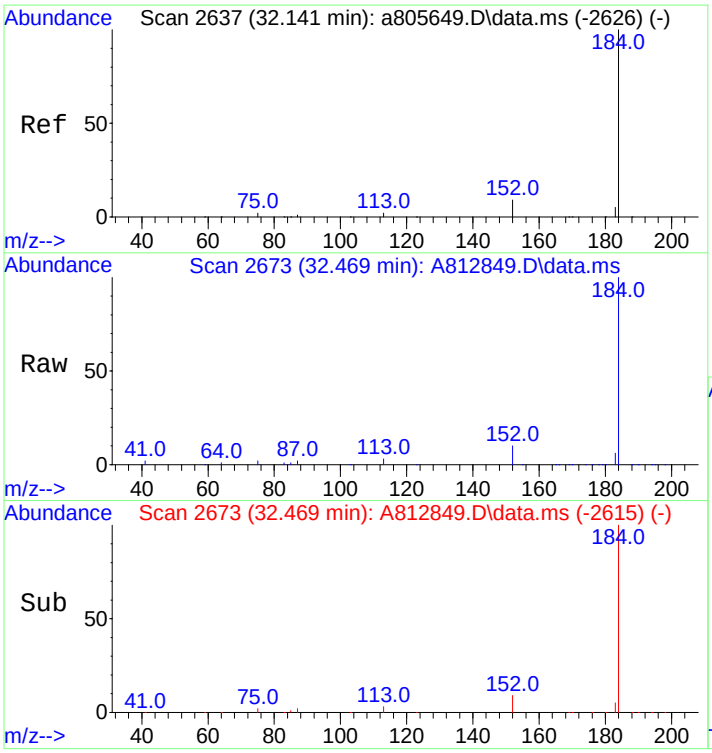


#29
Fluorene
Concen: 540.86 ng/mL
RT: 29.158 min Scan# 2310
Delta R.T. 0.028 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:166 Resp: 86931

Ion	Ratio	Lower	Upper
166	100		
165	92.6	74.2	111.2

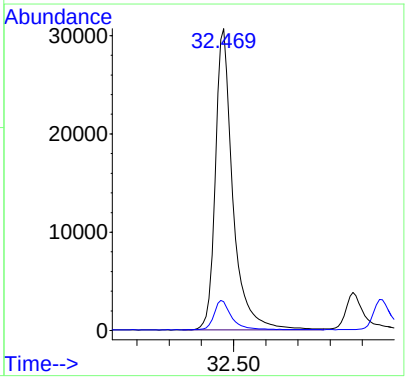


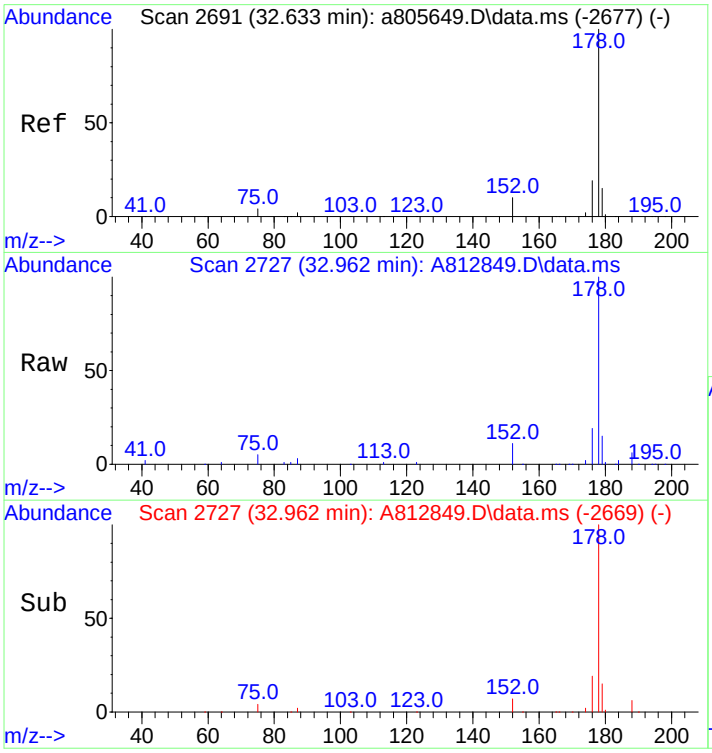


#33
Dibenzothiophene
Concen: 524.69 ng/mL
RT: 32.469 min Scan# 2673
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:184 Resp: 115967

Ion	Ratio	Lower	Upper
184	100		
152	9.9	7.8	11.8

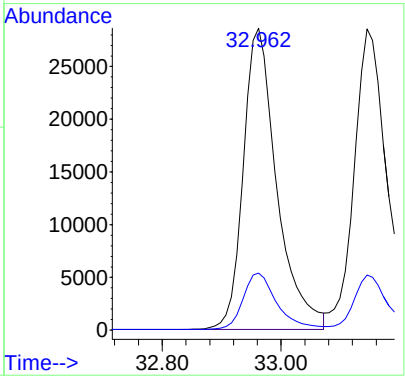


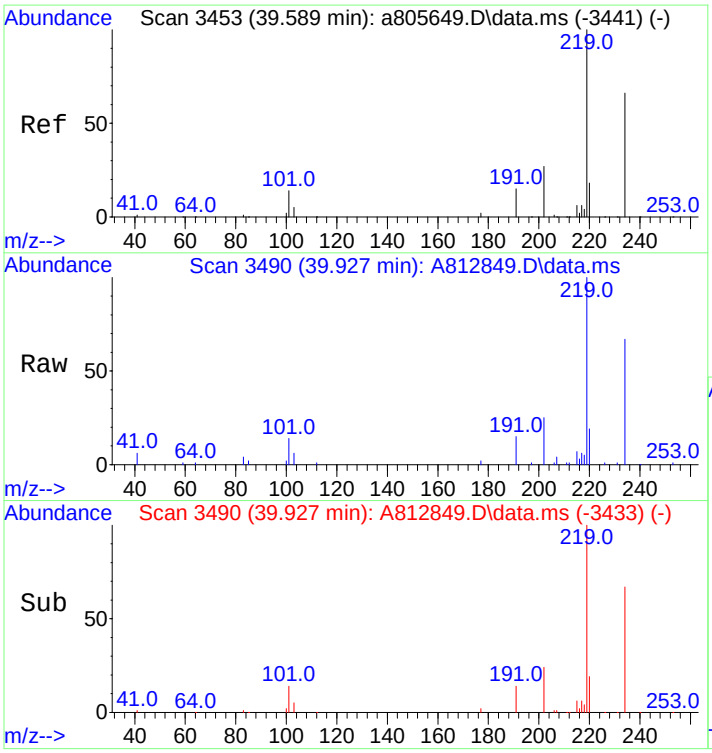


#43
Phenanthrene
Concen: 525.58 ng/mL
RT: 32.962 min Scan# 2727
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:178 Resp: 111807

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.2	22.8

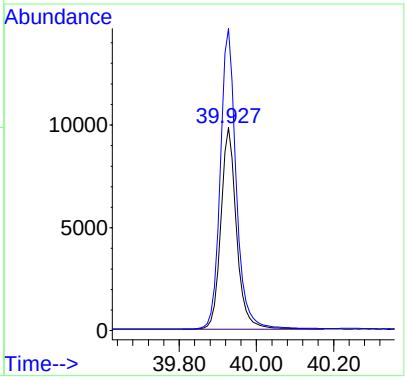


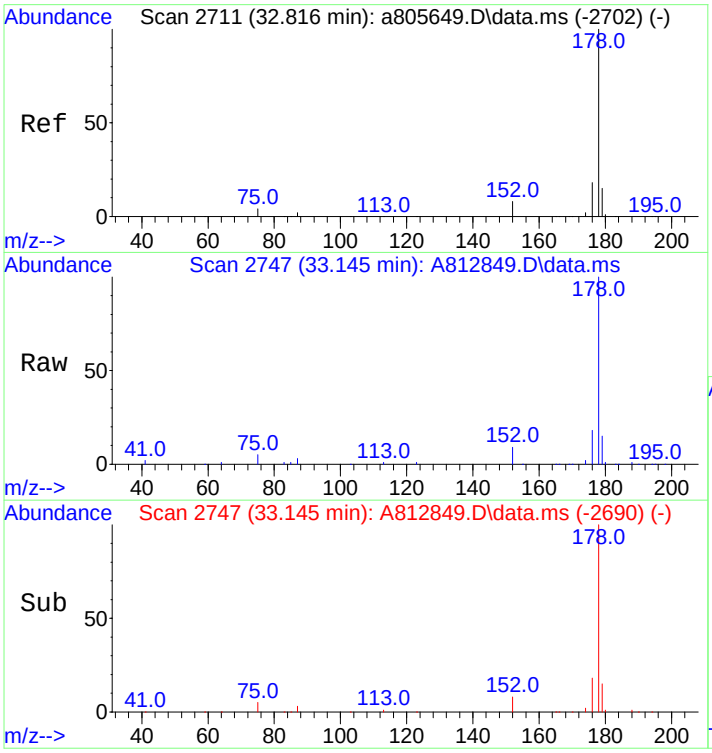


#54
Retene
Concen: 563.49 ng/mL
RT: 39.927 min Scan# 3490
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:234 Resp: 27799

Ion	Ratio	Lower	Upper
234	100		
219	150.1	124.0	186.0

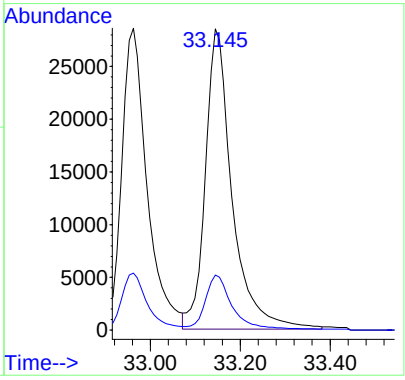


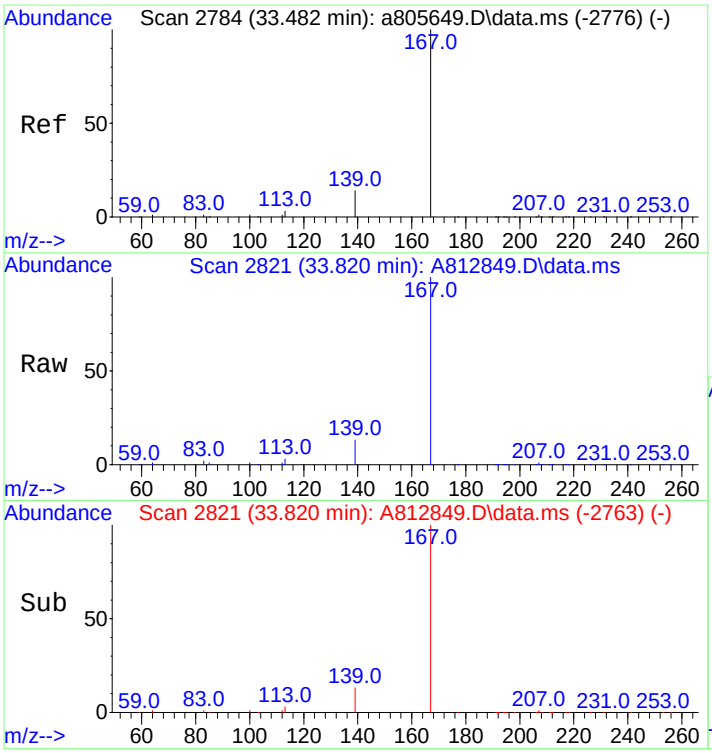


#55
Anthracene
Concen: 594.43 ng/mL m
RT: 33.145 min Scan# 2747
Delta R.T. 0.019 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:178 Resp: 117806

Ion	Ratio	Lower	Upper
178	100		
176	19.5	14.3	21.5

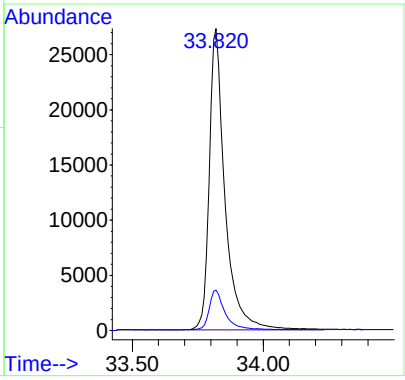


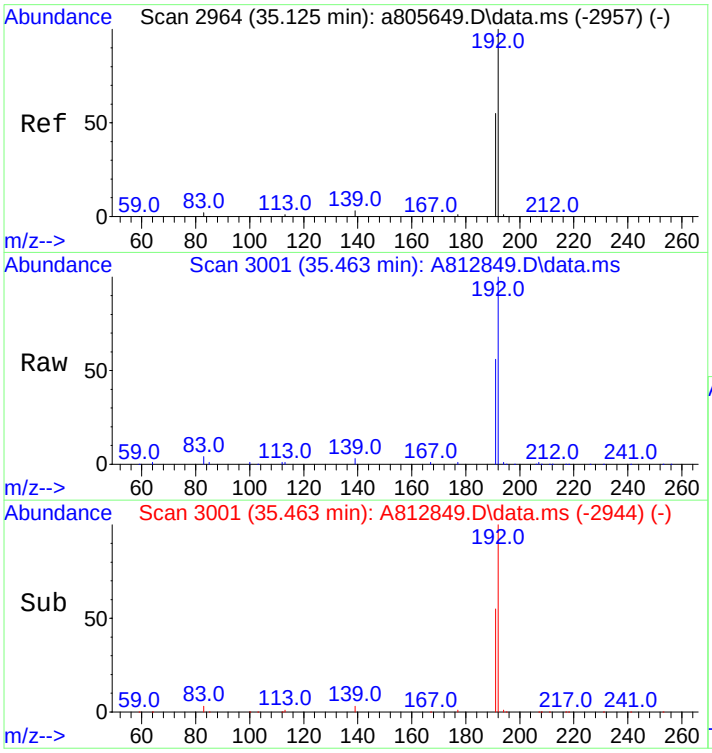


#56
Carbazole
Concen: 546.94 ng/mL
RT: 33.820 min Scan# 2821
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:167 Resp: 113104

Ion	Ratio	Lower	Upper
167	100		
139	13.1	10.6	16.0

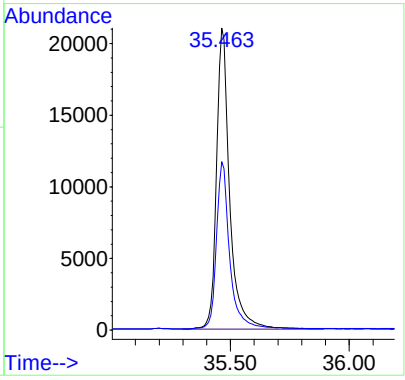


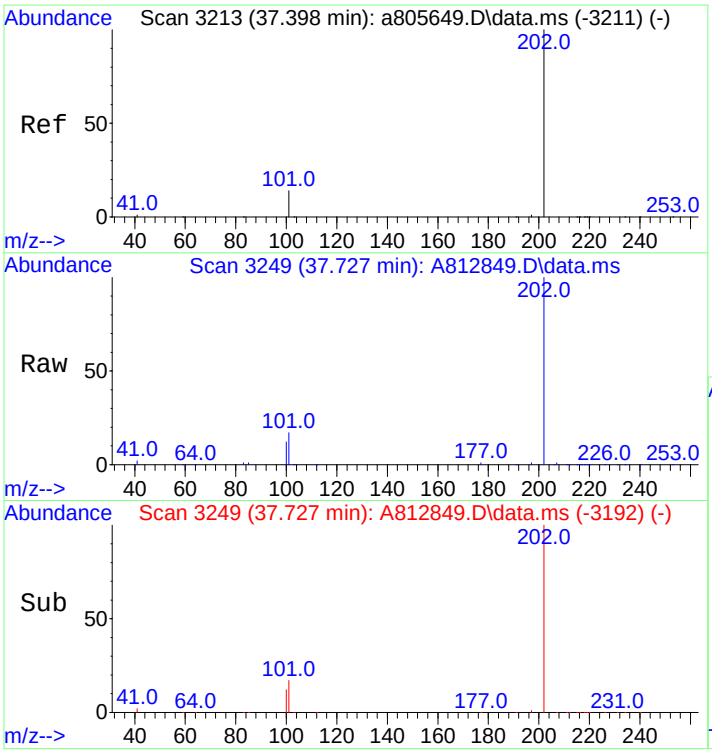


#57
1-Methylphenanthrene
Concen: 538.69 ng/mL
RT: 35.463 min Scan# 3001
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:192 Resp: 81232

Ion	Ratio	Lower	Upper
192	100		
191	55.6	44.2	66.4

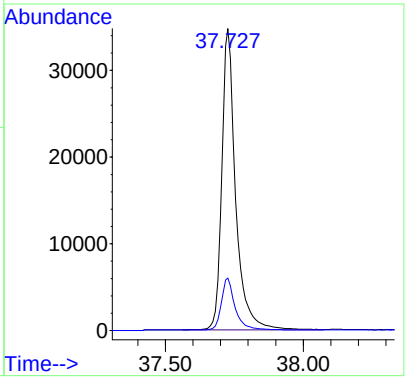


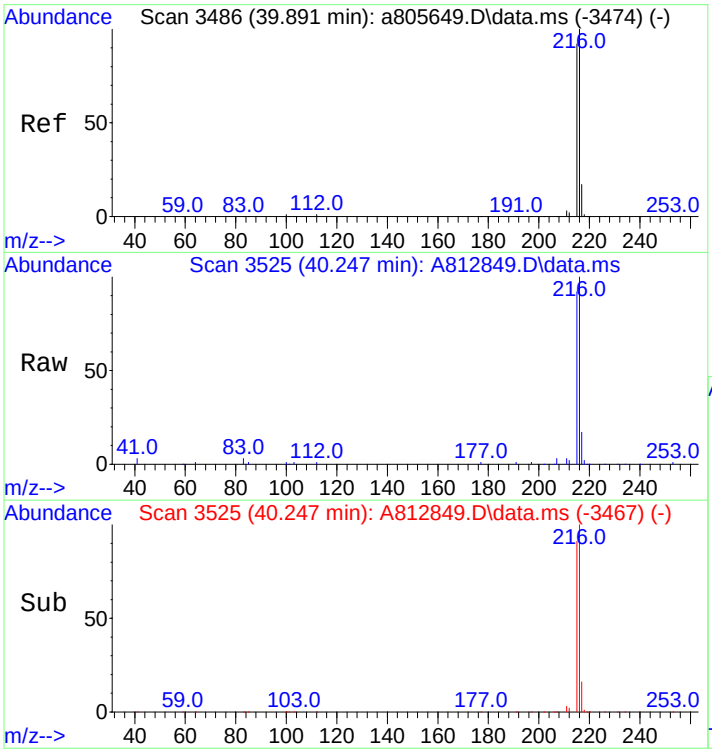


#58
Fluoranthene
Concen: 555.26 ng/mL
RT: 37.727 min Scan# 3249
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:202 Resp: 121670

Ion	Ratio	Lower	Upper
202	100		
101	17.0	13.6	20.4

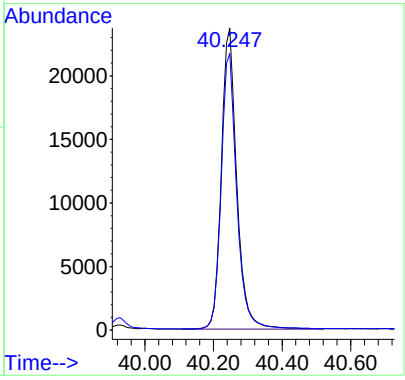


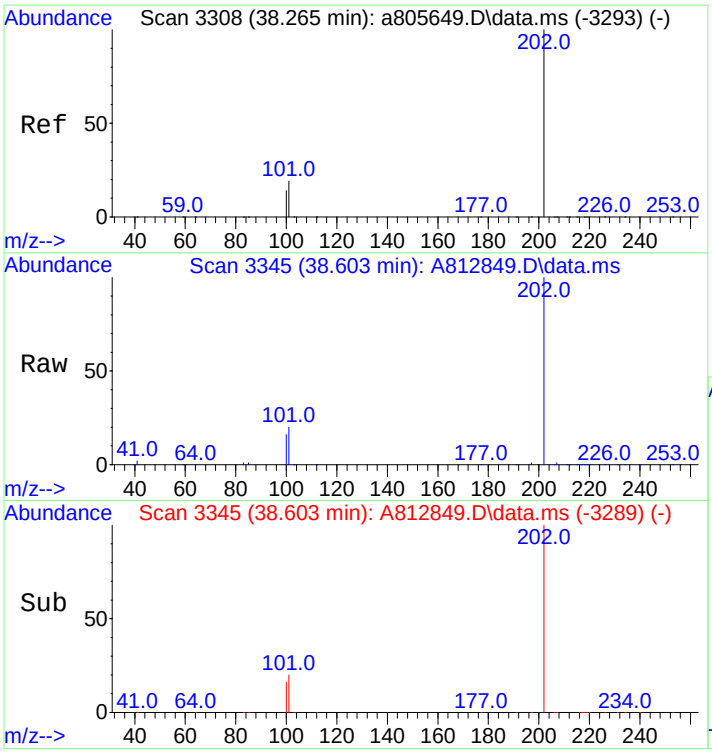


#59
Benzo(b)fluorene
Concen: 583.98 ng/mL
RT: 40.247 min Scan# 3525
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:216 Resp: 74023

Ion	Ratio	Lower	Upper
216	100		
215	91.8	74.2	111.2

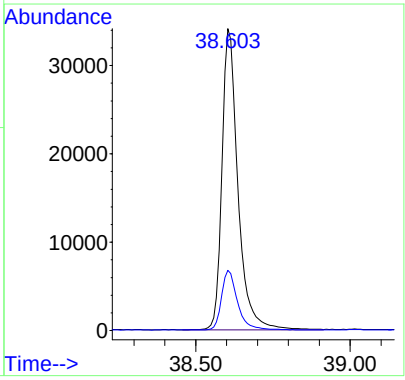


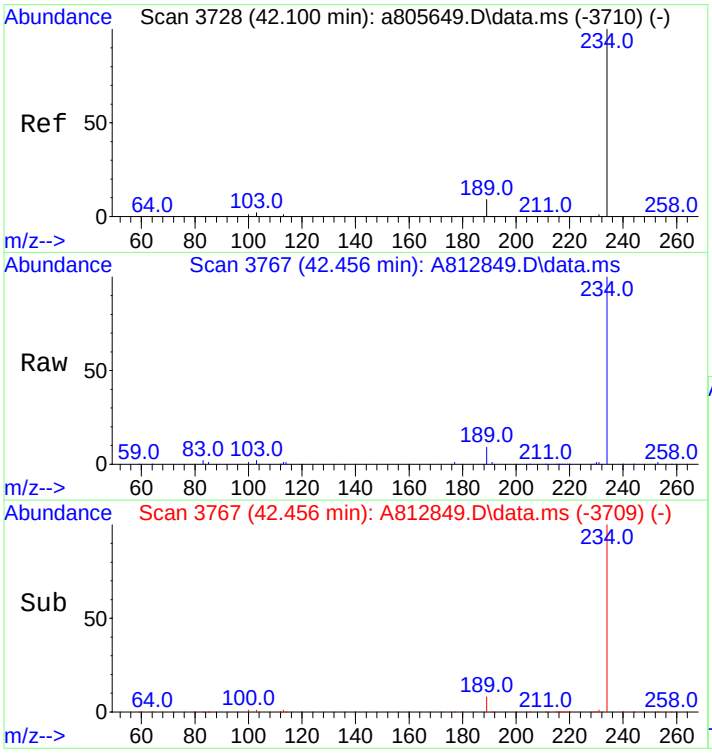


#60
Pyrene
Concen: 551.62 ng/mL
RT: 38.603 min Scan# 3345
Delta R.T. 0.009 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:202 Resp: 122261

Ion	Ratio	Lower	Upper
202	100		
101	20.0	15.4	23.2

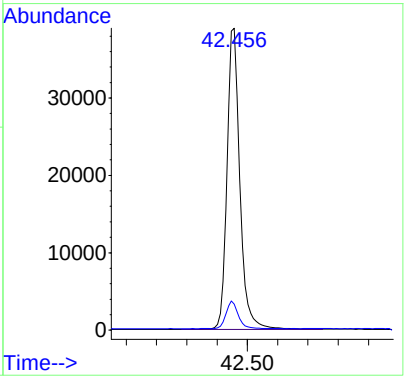


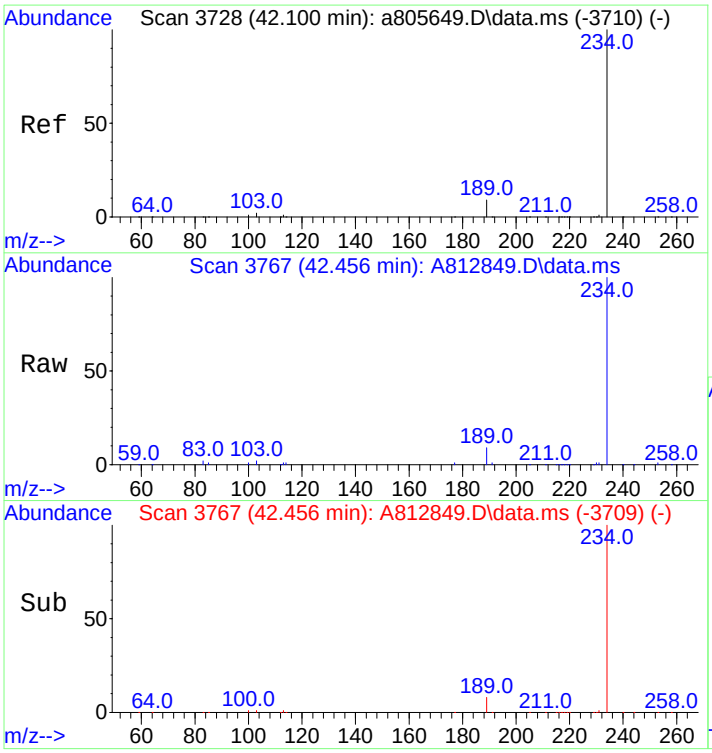


#66
Naphthobenzothiophene
Concen: 557.57 ng/ml
RT: 42.456 min Scan# 3767
Delta R.T. 0.028 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:234 Resp: 114718

Ion	Ratio	Lower	Upper
234	100		
189	8.6	22.3	33.5#

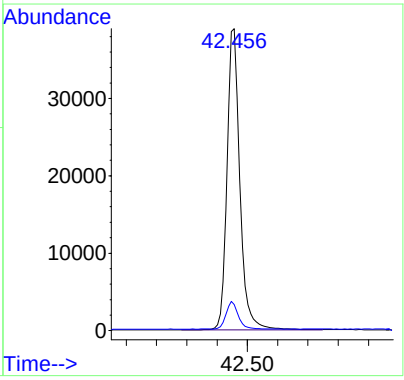


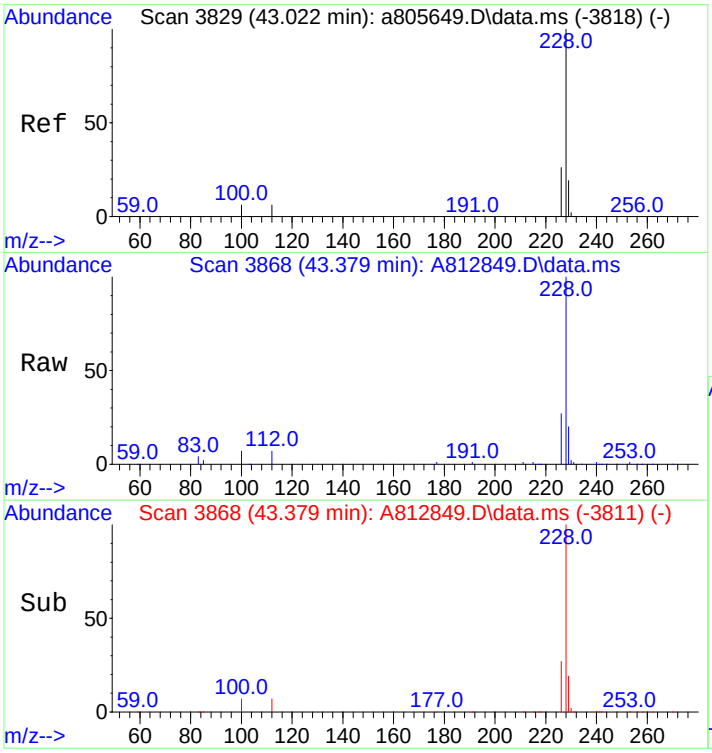


#67
Naphthobenzothiophene-2,1-D
Concen: 557.57 ng/mL
RT: 42.456 min Scan# 3767
Delta R.T. 0.028 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:234 Resp: 114718

Ion	Ratio	Lower	Upper
234	100		
189	8.6	22.3	33.5#

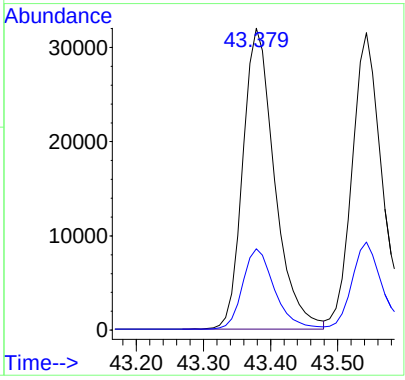


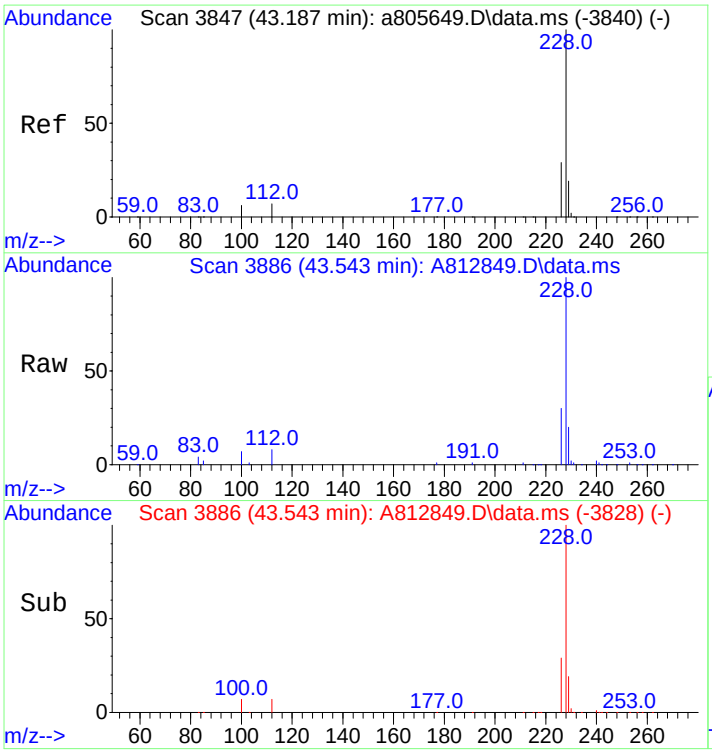


#75
Benz[a]anthracene
Concen: 559.11 ng/mL
RT: 43.379 min Scan# 3868
Delta R.T. 0.019 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:228 Resp: 104982

Ion	Ratio	Lower	Upper
228	100		
226	26.6	21.3	31.9

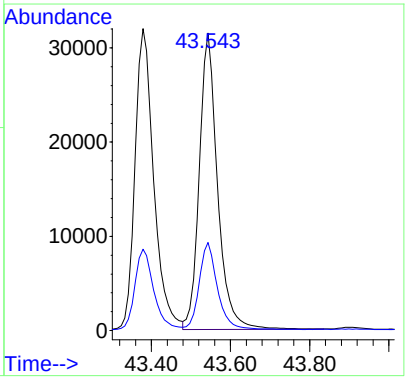


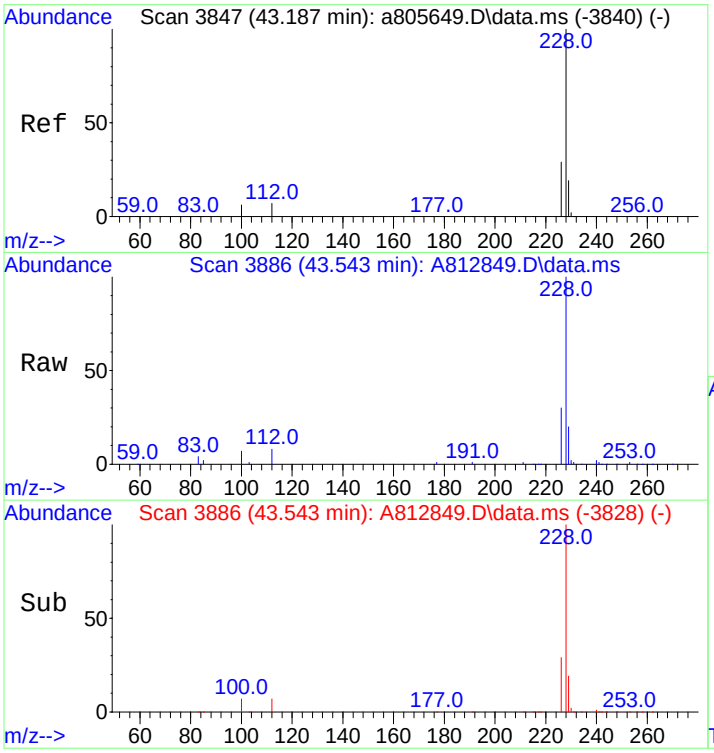


#76
Chrysene
Concen: 531.60 ng/mL
RT: 43.543 min Scan# 3886
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:228 Resp: 101038

Ion	Ratio	Lower	Upper
228	100		
226	29.1	23.6	35.4

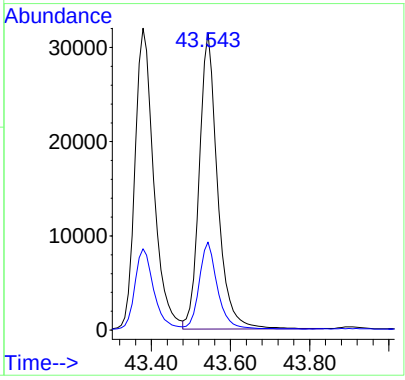


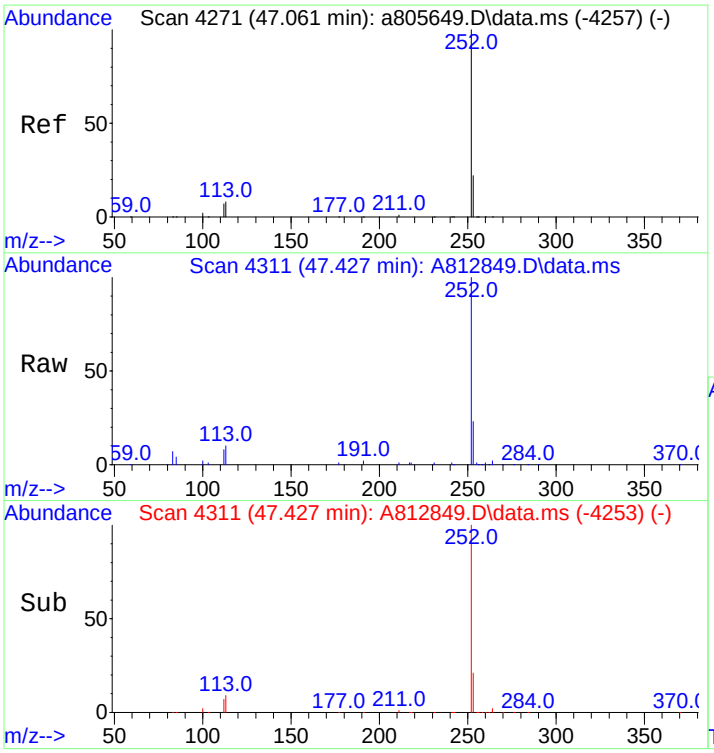


#77
Chrysene/Triphenylene
Concen: 531.60 ng/mL
RT: 43.543 min Scan# 3886
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:228 Resp: 101038

Ion	Ratio	Lower	Upper
228	100		
226	29.1	23.6	35.4

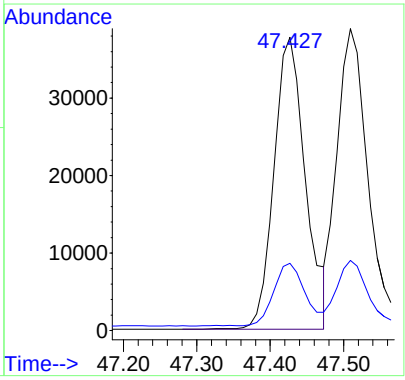


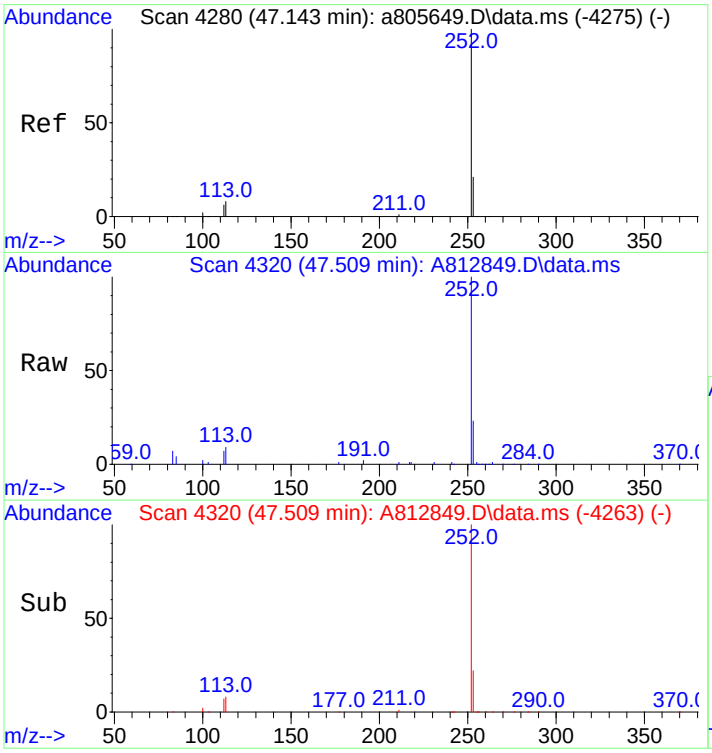


#84
Benzo[b]fluoranthene
Concen: 556.48 ng/mL
RT: 47.427 min Scan# 4311
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:252 Resp: 112219

Ion	Ratio	Lower	Upper
252	100		
253	20.6	18.5	27.7

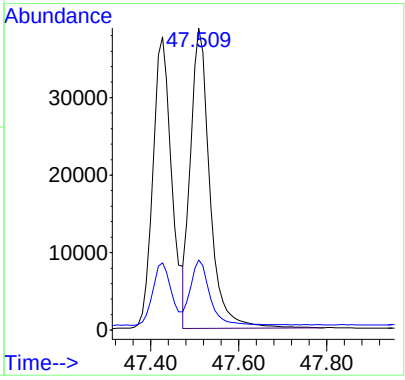


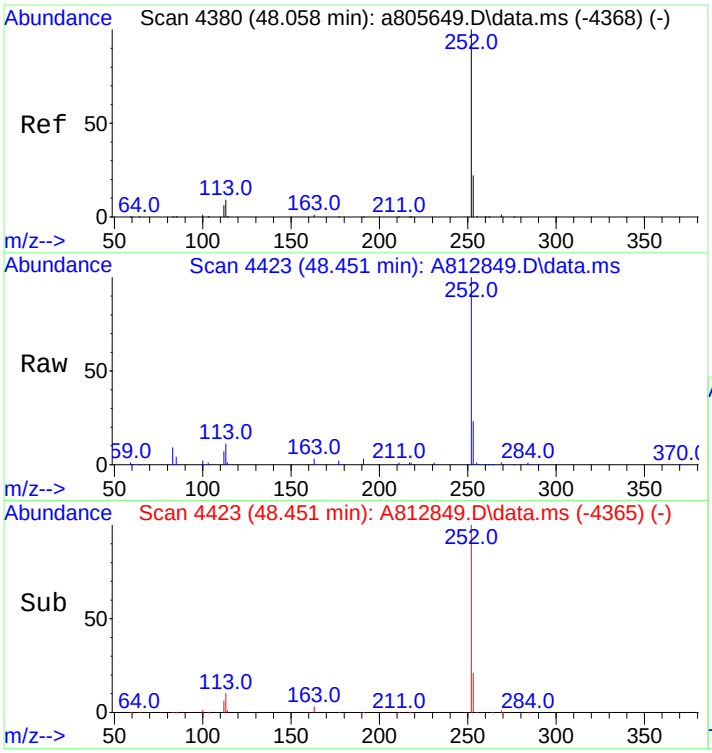


#85
Benzo[j]+[k]fluoranthene
Concen: 534.87 ng/mL
RT: 47.509 min Scan# 4320
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:252 Resp: 117688

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

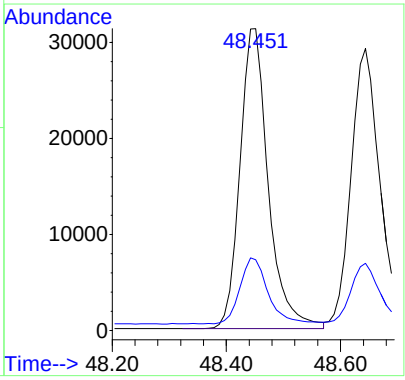


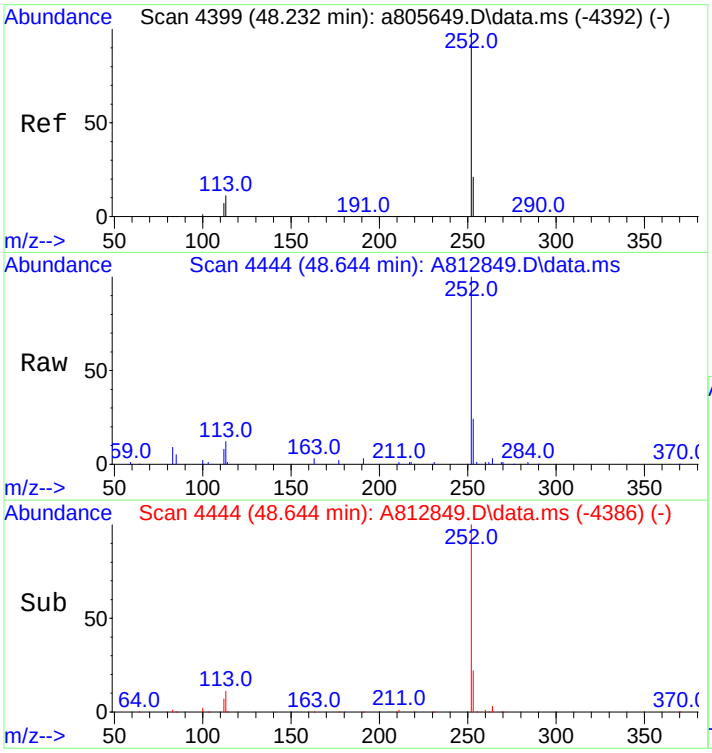


#87
Benzo[e]pyrene
Concen: 518.86 ng/mL
RT: 48.451 min Scan# 4423
Delta R.T. 0.027 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:252 Resp: 107811

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.9	28.3

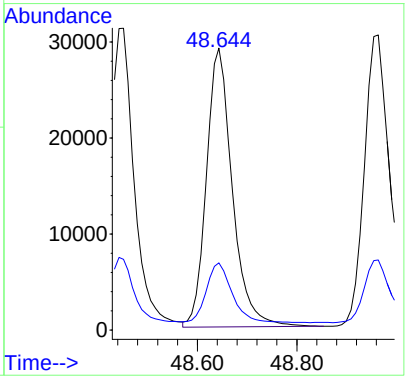


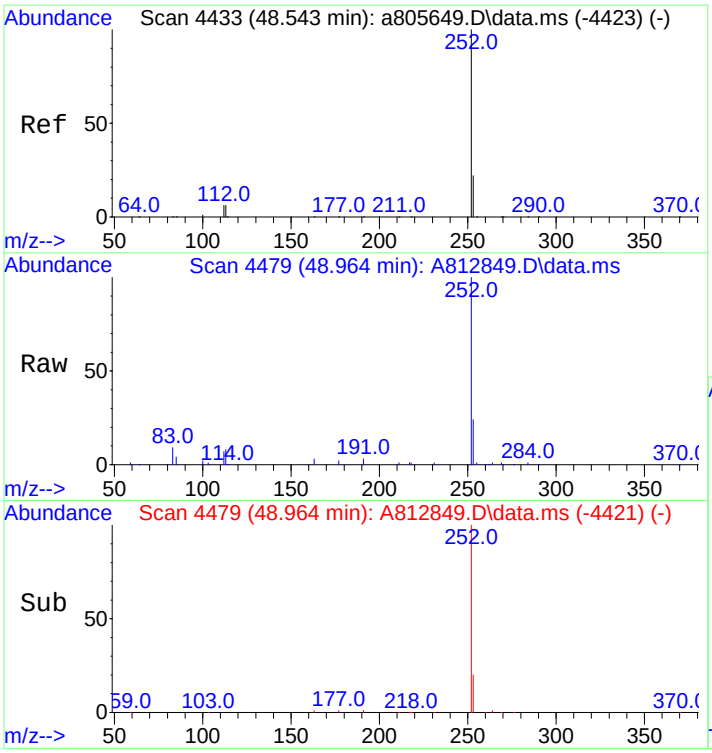


#89
Benzo[a]pyrene
Concen: 546.38 ng/mL
RT: 48.644 min Scan# 4444
Delta R.T. 0.028 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:252 Resp: 105018

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.4	29.0

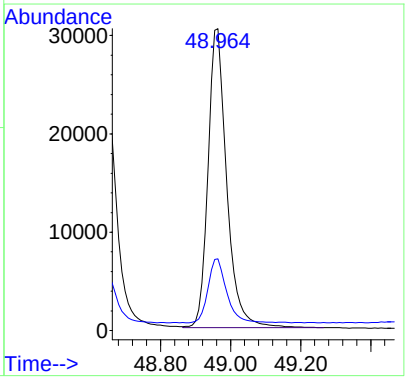


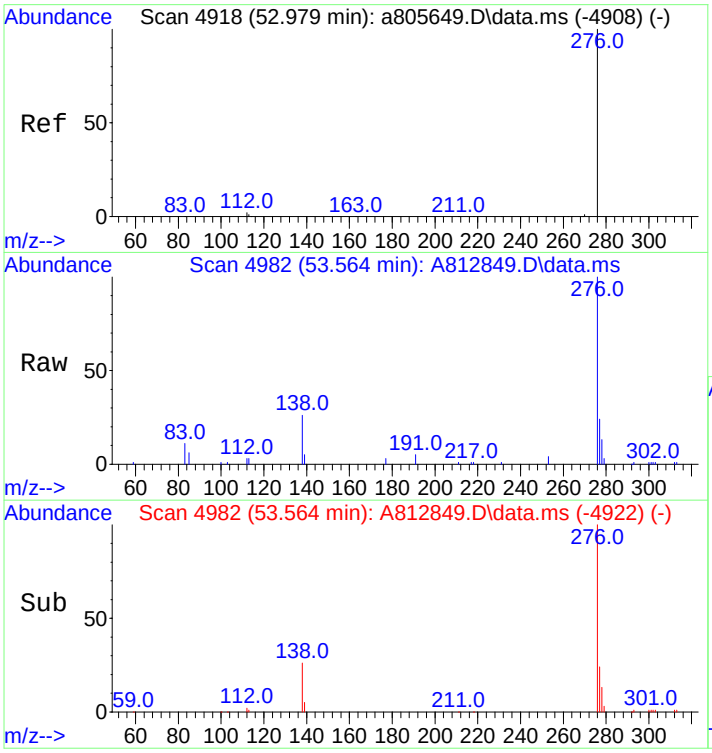


#90
Perylene
Concen: 538.04 ng/mL
RT: 48.964 min Scan# 4479
Delta R.T. 0.028 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:252 Resp: 112960

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.3	28.9

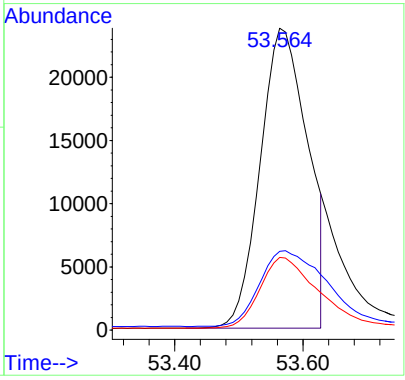


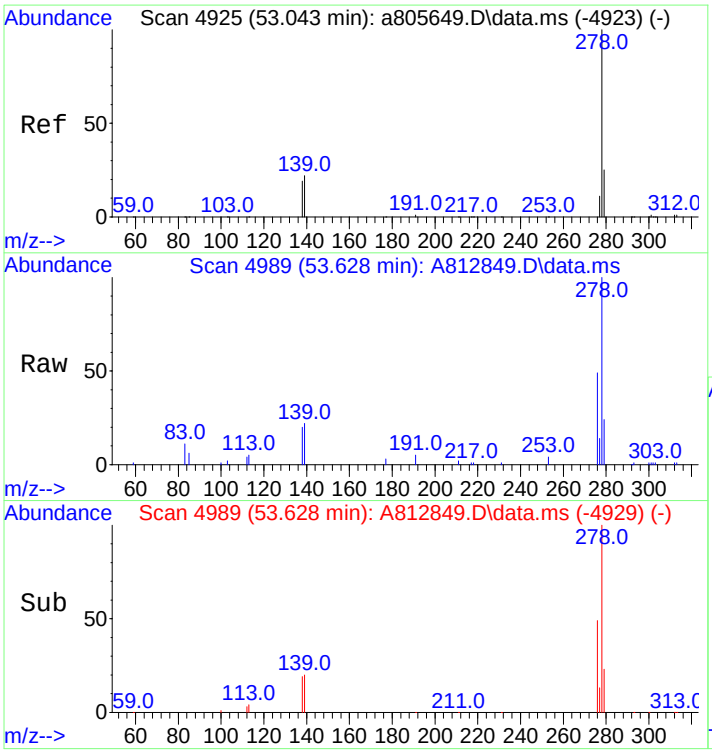


#91
Indeno[1,2,3-cd]pyrene
Concen: 596.90 ng/mL m
RT: 53.564 min Scan# 4982
Delta R.T. 0.046 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:276 Resp: 121870

Ion	Ratio	Lower	Upper
276	100		
138	37.6	19.9	29.9#
277	30.8	19.0	28.6#

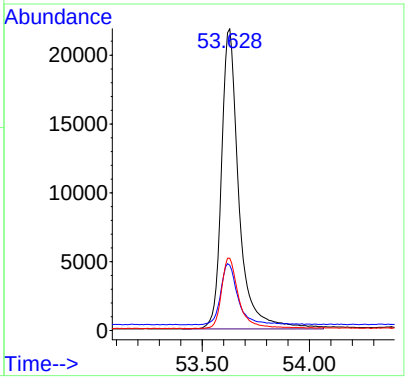


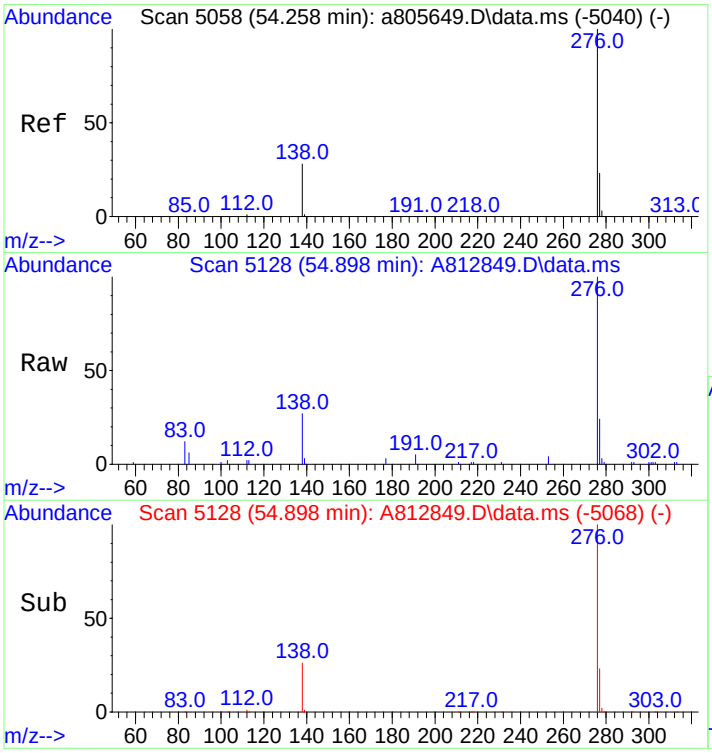


#92
Dibenz[ah]+[ac]anthracene
Concen: 618.81 ng/mL
RT: 53.628 min Scan# 4989
Delta R.T. 0.046 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:278 Resp: 123844

Ion	Ratio	Lower	Upper
278	100		
139	20.2	16.6	25.0
279	22.7	19.1	28.7

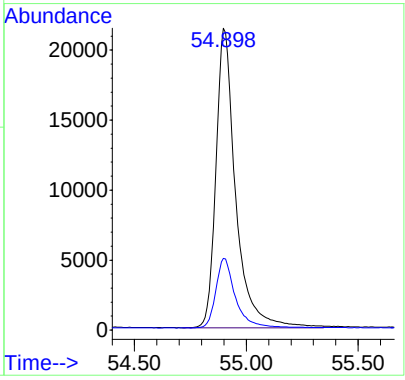


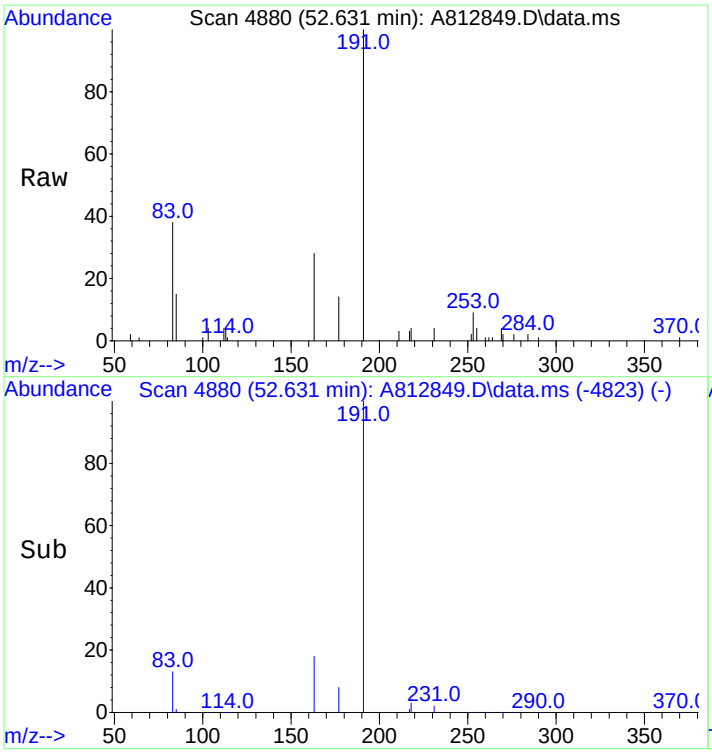


#93
Benzo[g,h,i]perylene
Concen: 567.34 ng/mL
RT: 54.898 min Scan# 5128
Delta R.T. 0.046 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:276 Resp: 131455

Ion	Ratio	Lower	Upper
276	100		
277	23.4	18.9	28.3

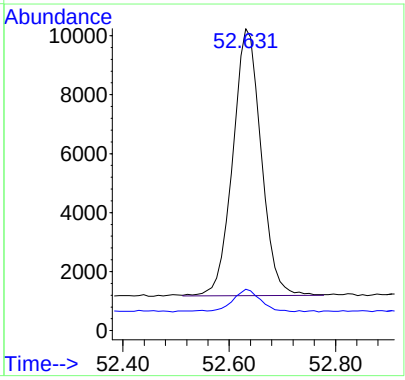


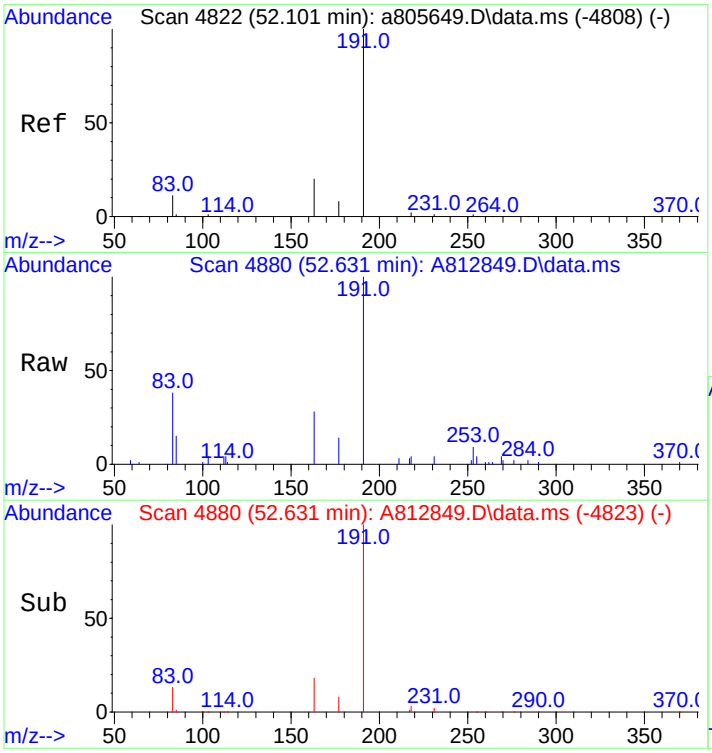


#94
Hopane (T19)
Concen: 521.35 ng/mL
RT: 52.631 min Scan# 4880
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:191 Resp: 33536

Ion	Ratio	Lower	Upper
191	100		
177	8.0	9.8	14.8#

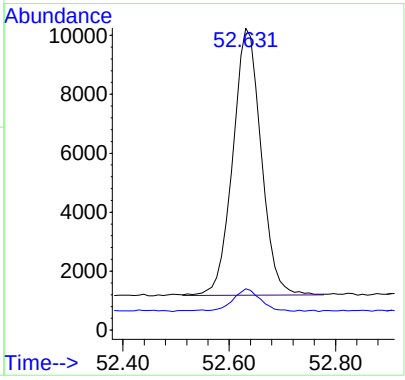




#95
17a(H),21B(H)-hopane - C30H52
Concen: 521.35 ng/mL
RT: 52.631 min Scan# 4880
Delta R.T. 0.018 min
Lab File: A812849.D
Acq: 20 Nov 2012 12:24 am

Tgt Ion:191 Resp: 33536

Ion	Ratio	Lower	Upper
191	100		
177	8.0	9.8	14.8#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

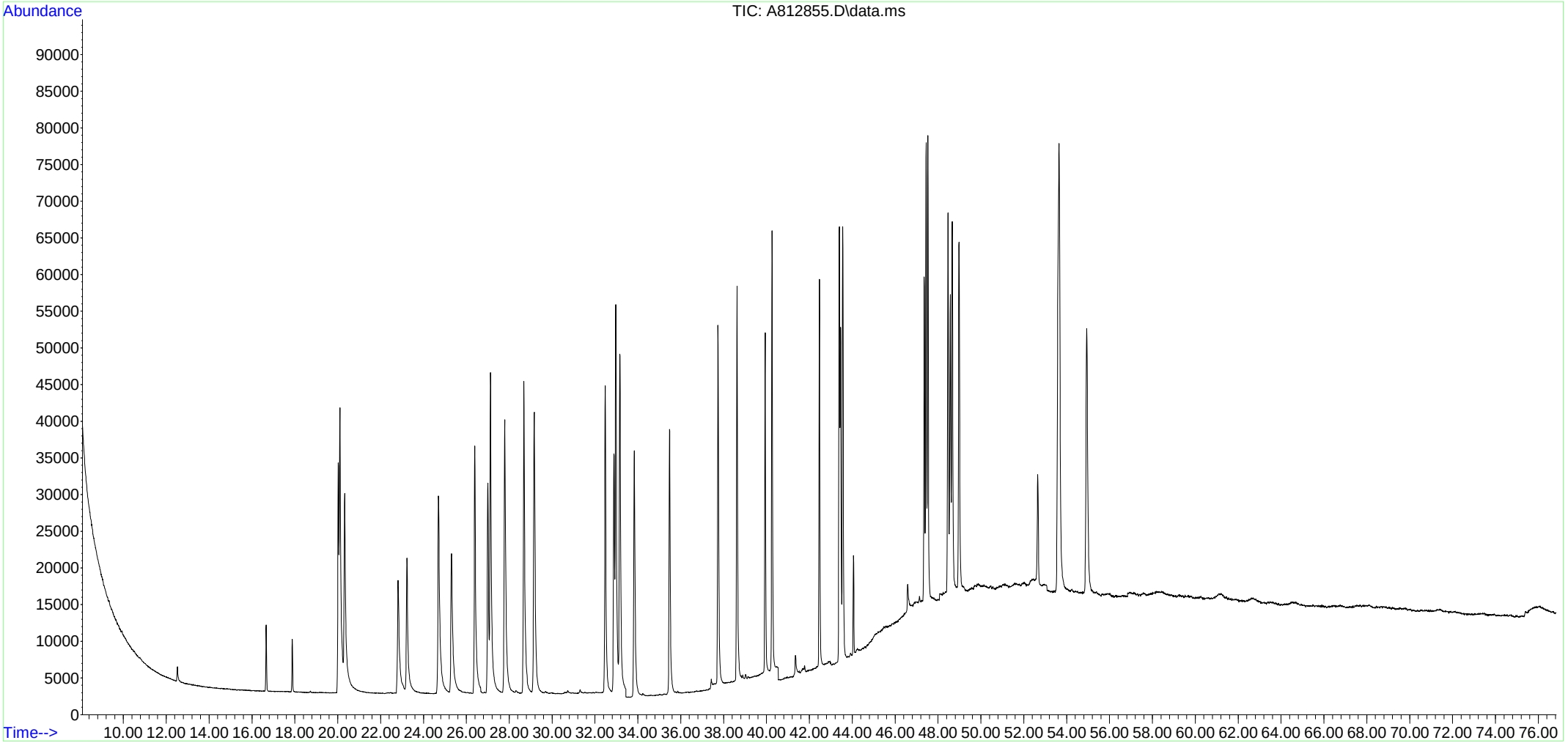
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.004	164	64940	500.000	ng/mL	0.03
74) Chrysene-d12	43.452	240	99128	500.000	ng/mL	0.04
System Monitoring Compounds						
9) Naphthalene-d8	20.023	136	128810	500.507	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.05%			
42) Phenanthrene-d10	32.880	188	113702	568.912	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 56.89%			
83) Benzo[b]fluoranthene-d12	47.354	264	103295	546.756	ng/mL	0.04
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.68%			
88) Benzo[a]pyrene-d12	48.570	264	108978	583.858	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 58.39%			
129) 5B(H)Cholane - Surr	44.054	217	18666	514.962	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.50%			
Target Compounds						Qvalue
3) trans-Decalin	16.665	138	13369	231.659	ng/mL	100
4) cis-Decalin	17.879	138	9955	235.470	ng/mL	100
10) Naphthalene	20.105	128	150630	511.604	ng/mL#	100
16) 2-Methylnaphthalene	22.816	142	88546	504.865	ng/mL#	100
17) 1-Methylnaphthalene	23.226	142	84441	514.161	ng/mL#	100
18) Benzothiophene	20.324	134	118225	496.778	ng/mL	100
23) Biphenyl	24.696	154	115810	519.005	ng/mL#	100
24) 2,6-Dimethylnaphthalene	25.307	156	80624	537.133	ng/mL#	100
25) Dibenzofuran	27.789	168	124673	529.607	ng/mL	99
26) Acenaphthylene	26.393	152	142327M3	532.566	ng/mL	
27) Acenaphthene	27.123	153	85902	538.522	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.683	170	69755	539.578	ng/mL	97
29) Fluorene	29.167	166	97149	543.007	ng/mL	100
33) Dibenzothiophene	32.479	184	131301	533.695	ng/mL	99
43) Phenanthrene	32.971	178	124571	526.071	ng/mL	100
54) Retene	39.937	234	33166	603.950	ng/mL	97
55) Anthracene	33.163	178	129075M3	585.096	ng/mL	
56) Carbazole	33.829	167	127771	555.074	ng/mL	99
57) 1-Methylphenanthrene	35.472	192	92360	550.237	ng/mL	100
58) Fluoranthene	37.736	202	137280	562.826	ng/mL	99
59) Benzo(b)fluorene	40.256	216	87662	621.293	ng/mL	99
60) Pyrene	38.622	202	138267	560.439	ng/mL	99
66) Naphthobenzothiophene	42.466	234	131927	576.046	ng/ml#	63
67) Naphthobenzothiophene-...	42.466	234	131927	576.046	ng/mL#	63
75) Benz[a]anthracene	43.397	228	122582	564.084	ng/mL	100
76) Chrysene	43.552	228	116659	530.340	ng/mL	100
77) Chrysene/Triphenylene	43.552	228	116659	530.340	ng/mL	100
84) Benzo[b]fluoranthene	47.445	252	125543	537.910	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.528	252	141528	555.767	ng/mL	95
87) Benzo[e]pyrene	48.461	252	125030	519.924	ng/mL	96
89) Benzo[a]pyrene	48.662	252	122246	549.548	ng/mL	94
90) Perylene	48.982	252	132915	547.015	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	53.591	276	137867M3	583.443	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.655	278	135065	583.122	ng/mL	99
93) Benzo[g,h,i]perylene	54.934	276	141670	528.298	ng/mL	100
94) Hopane (T19)	52.650	191	36390	488.807	ng/mL#	88
95) 17a(H),21B(H)-hopane -...	52.650	191	36390	488.807	ng/mL#	88

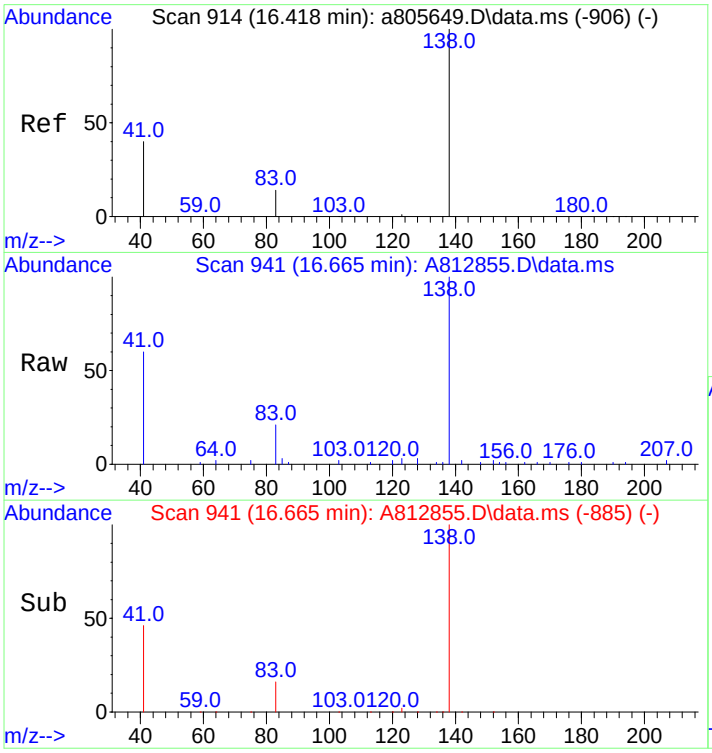
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH8\NOV12\NOV18\
Data File : A812855.D
Acq On : 20 Nov 2012 8:49 am
Operator : AC
Sample : c811181205
Misc : cc whaq86 500ng/ml
ALS Vial : 36 Sample Multiplier: 1

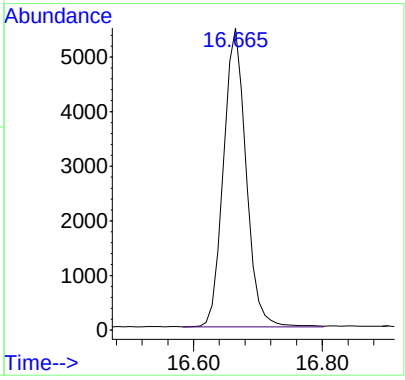
Quant Time: Nov 20 14:19:12 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH8\2012\NOV2012\NOV18\PAH8111812.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Nov 19 13:47:27 2012
Response via : Initial Calibration

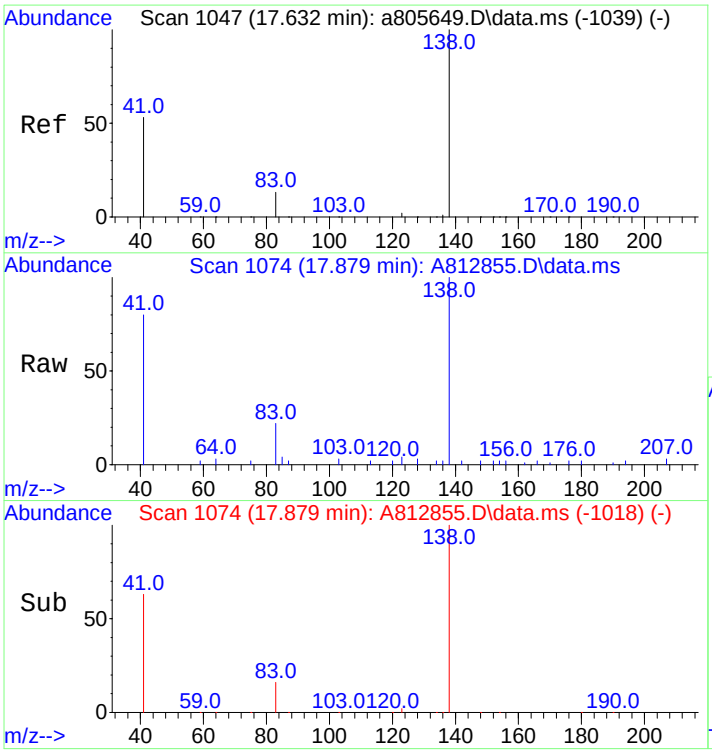




#3
trans-Decalin
Concen: 231.66 ng/mL
RT: 16.665 min Scan# 941
Delta R.T. 0.009 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

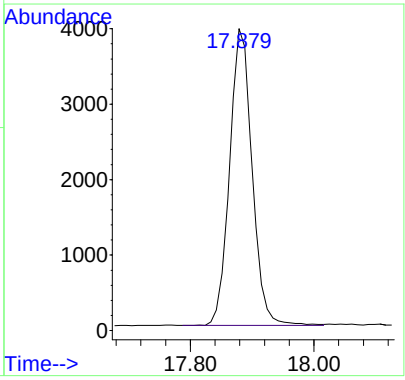
Tgt Ion:138 Resp: 13369

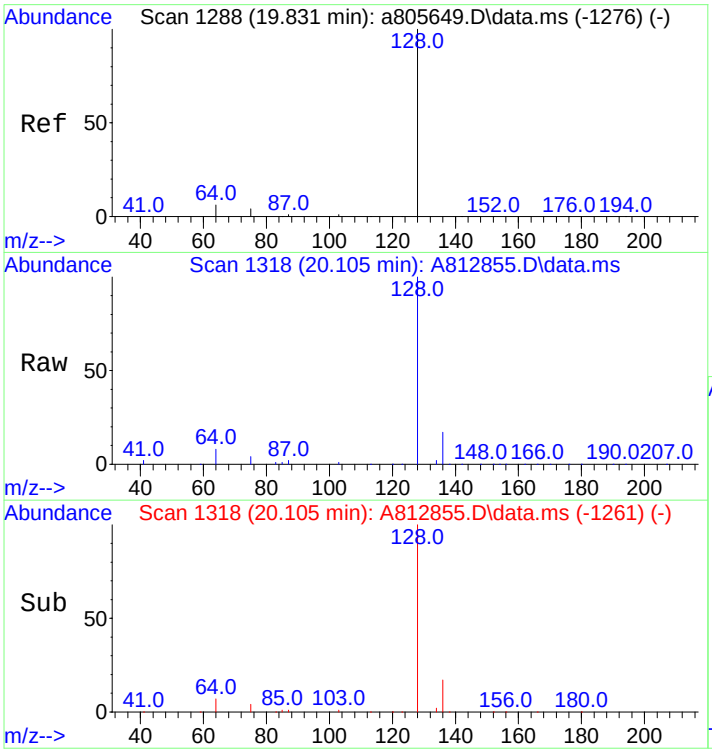




#4
cis-Decalin
Concen: 235.47 ng/mL
RT: 17.879 min Scan# 1074
Delta R.T. 0.009 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:138 Resp: 9955

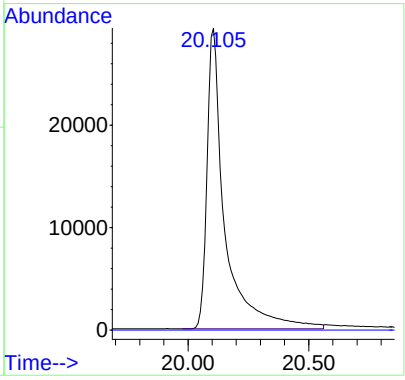


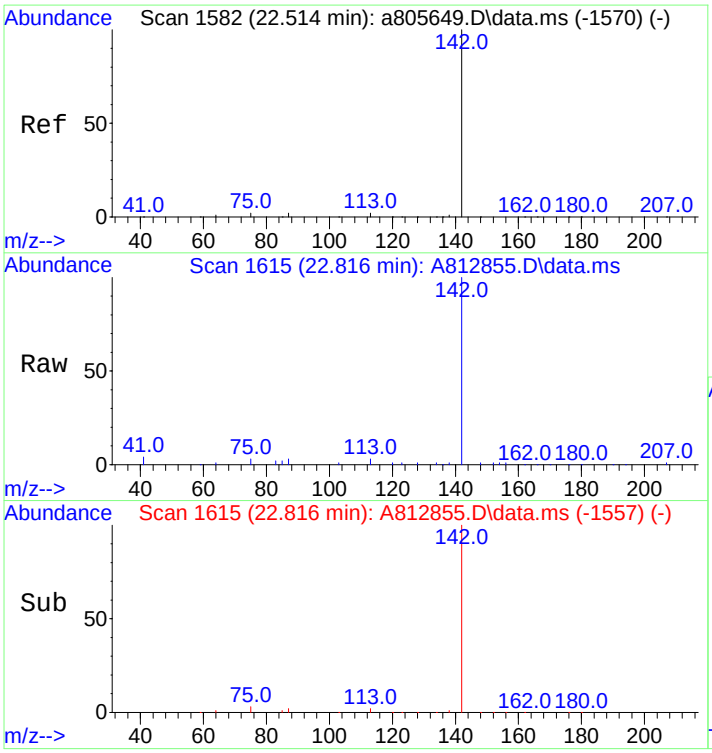


#10
Naphthalene
Concen: 511.60 ng/mL
RT: 20.105 min Scan# 1318
Delta R.T. 0.018 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:128 Resp: 150630

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

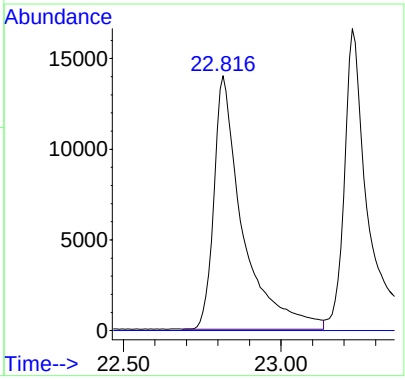


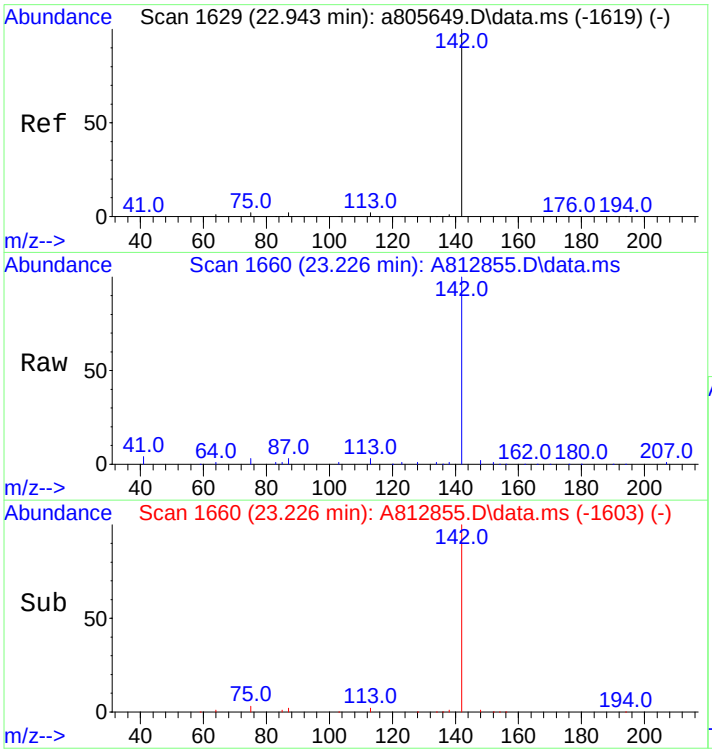


#16
2-Methylnaphthalene
Concen: 504.87 ng/mL
RT: 22.816 min Scan# 1615
Delta R.T. 0.028 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:142 Resp: 88546

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

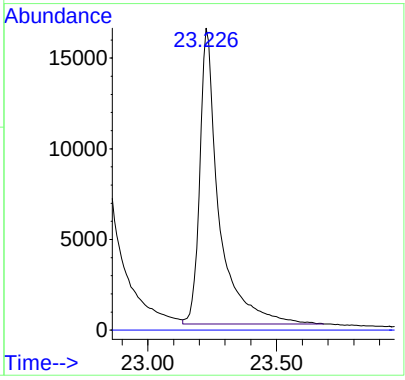


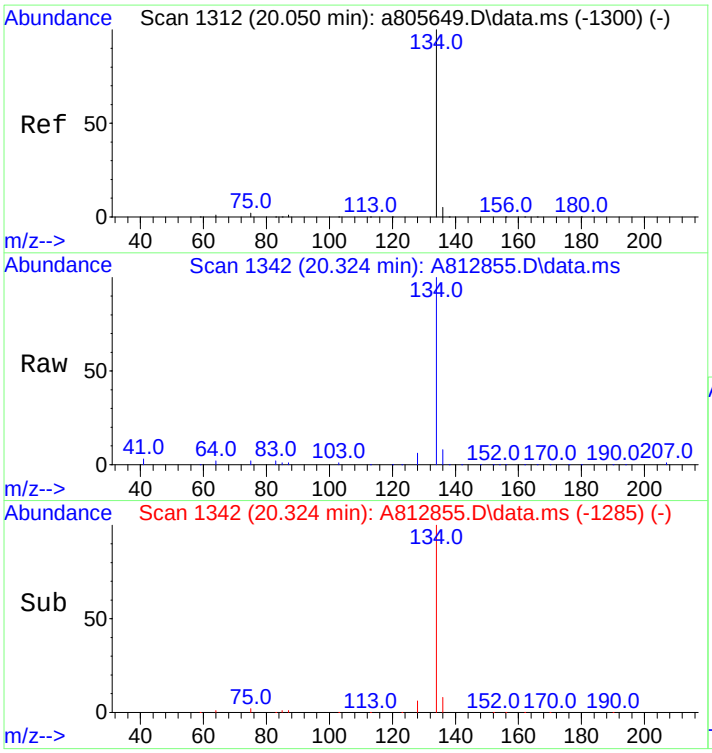


#17
1-Methylnaphthalene
Concen: 514.16 ng/mL
RT: 23.226 min Scan# 1660
Delta R.T. 0.018 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:142 Resp: 84441

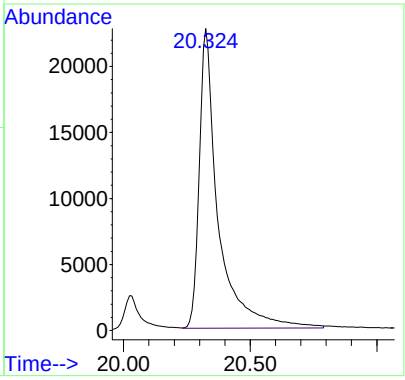
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

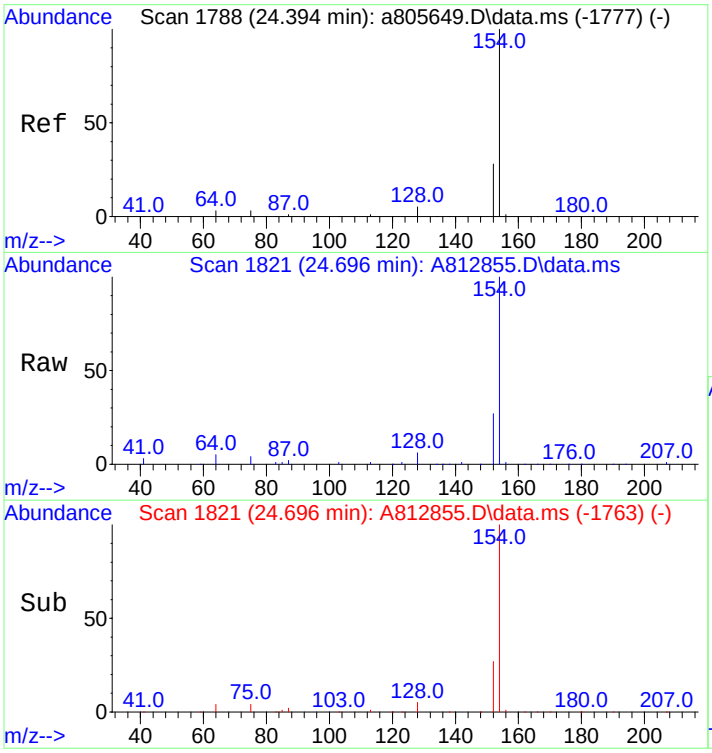




#18
Benzothiophene
Concen: 496.78 ng/mL
RT: 20.324 min Scan# 1342
Delta R.T. 0.018 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:134 Resp: 118225

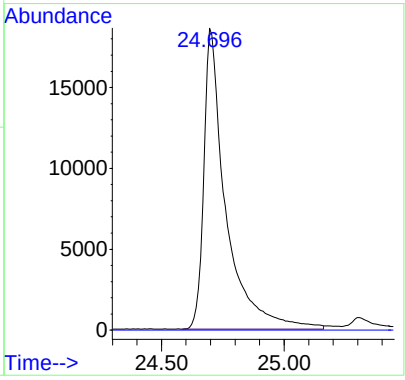


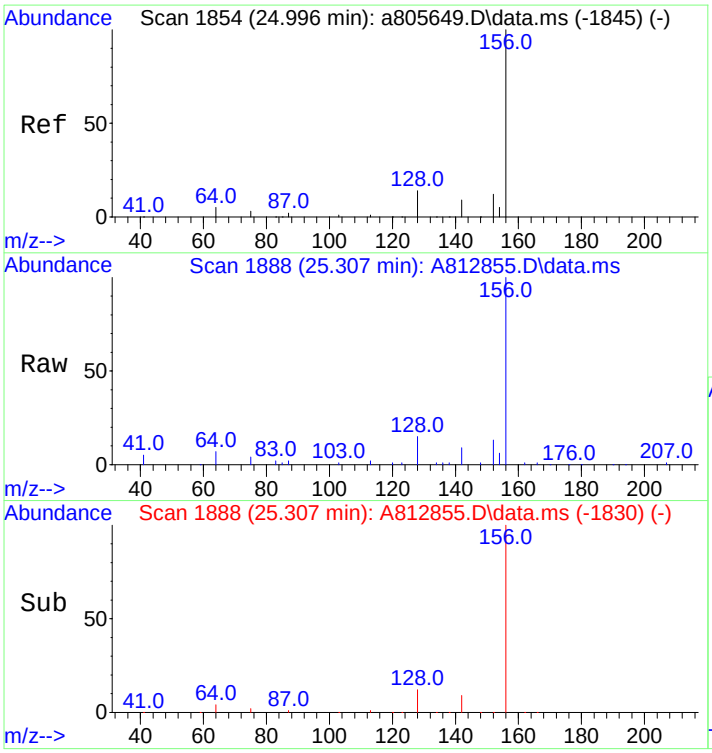


#23
Biphenyl
Concen: 519.00 ng/mL
RT: 24.696 min Scan# 1821
Delta R.T. 0.028 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:154 Resp: 115810

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

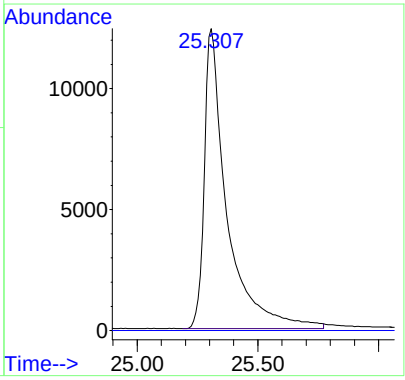


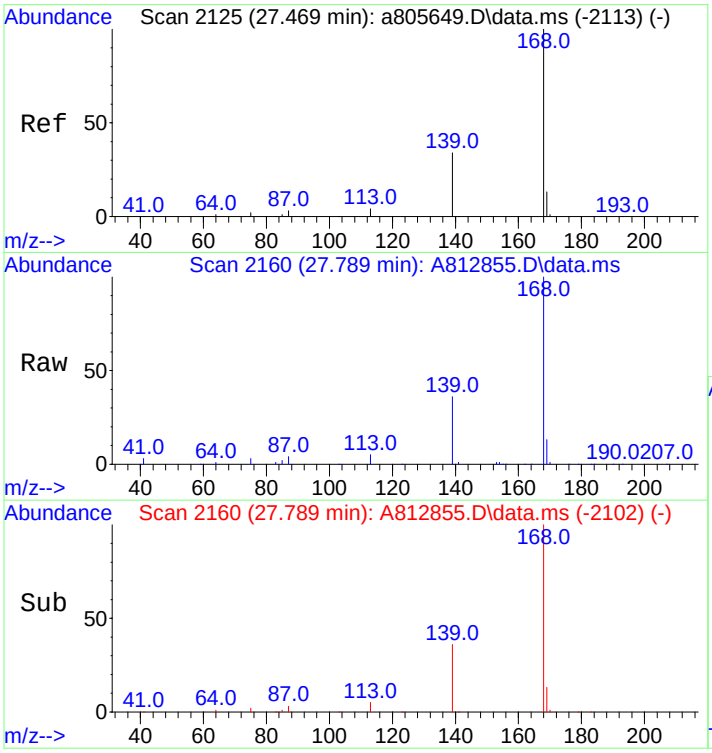


#24
2,6-Dimethylnaphthalene
Concen: 537.13 ng/mL
RT: 25.307 min Scan# 1888
Delta R.T. 0.027 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:156 Resp: 80624

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

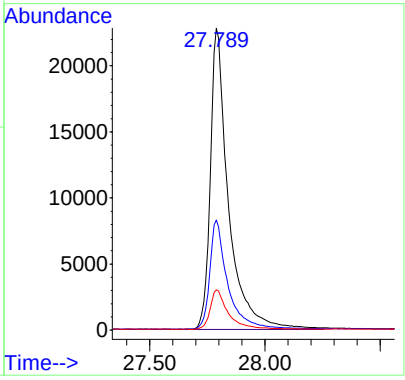


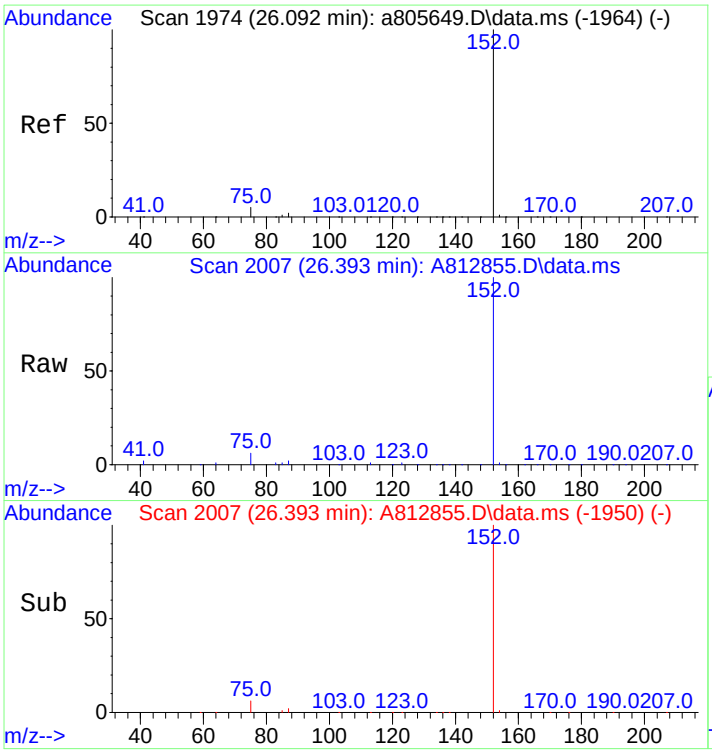


#25
Dibenzofuran
Concen: 529.61 ng/mL
RT: 27.789 min Scan# 2160
Delta R.T. 0.027 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:168 Resp: 124673

Ion	Ratio	Lower	Upper
168	100		
139	36.0	28.0	42.0
169	13.0	10.6	15.8

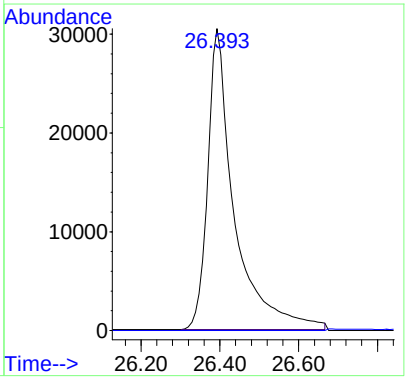


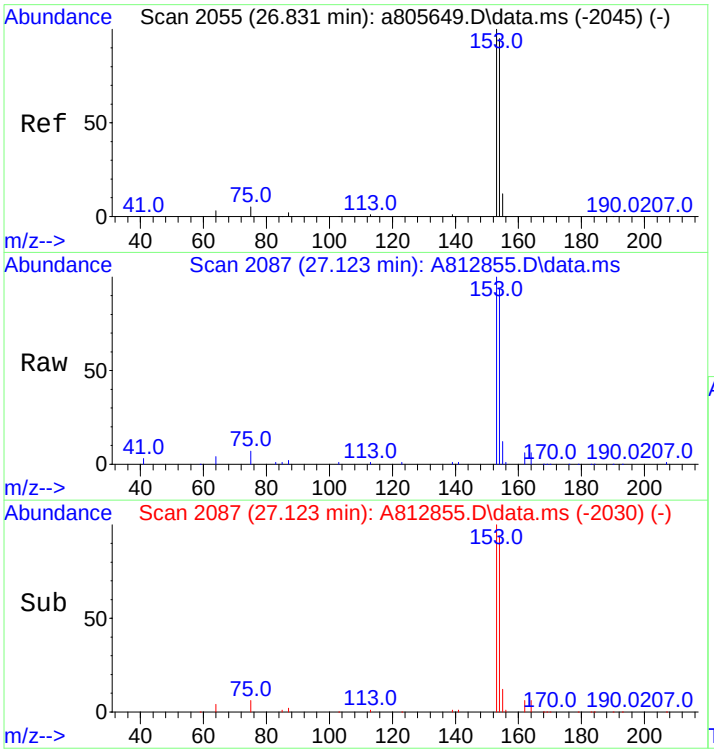


#26
Acenaphthylene
Concen: 532.57 ng/mL m
RT: 26.393 min Scan# 2007
Delta R.T. 0.018 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:152 Resp: 142327

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

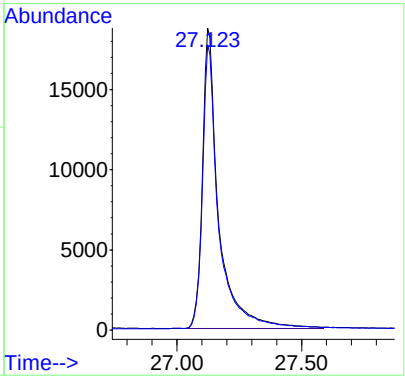


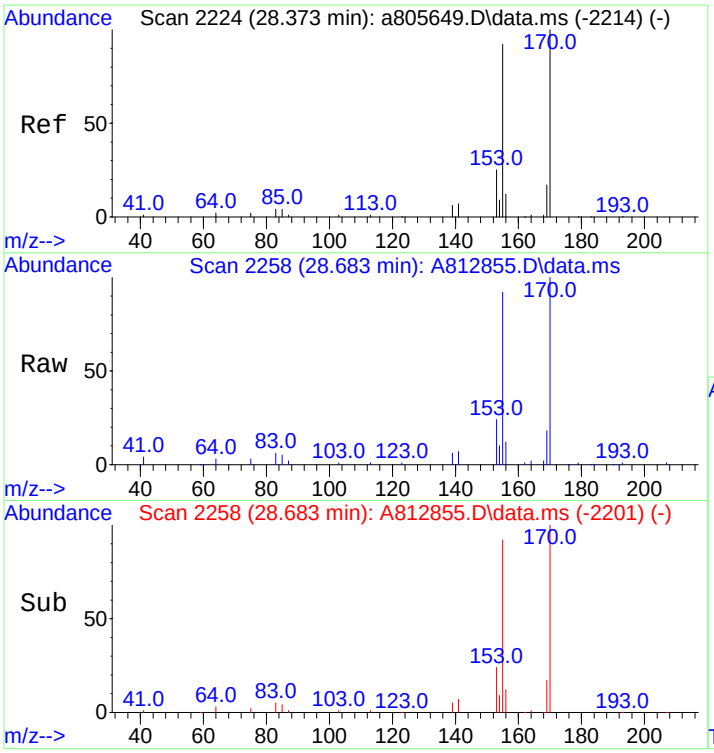


#27
Acenaphthene
Concen: 538.52 ng/mL
RT: 27.123 min Scan# 2087
Delta R.T. 0.018 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:153 Resp: 85902

Ion	Ratio	Lower	Upper
153	100		
154	93.8	75.4	113.2

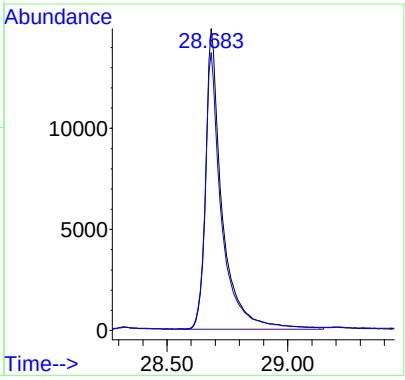


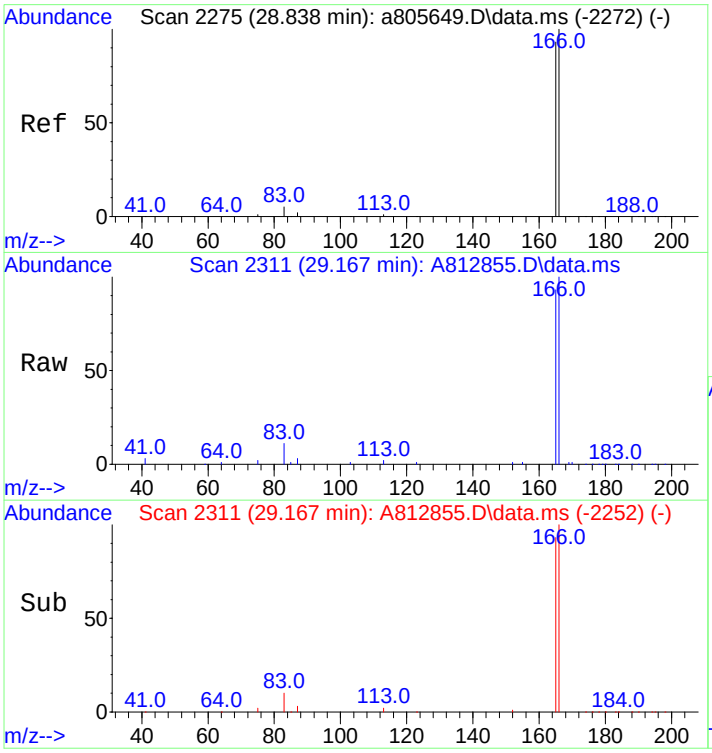


#28
2,3,5-Trimethylnaphthalene
Concen: 539.58 ng/mL
RT: 28.683 min Scan# 2258
Delta R.T. 0.018 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:170 Resp: 69755

Ion	Ratio	Lower	Upper
170	100		
155	92.0	71.7	107.5

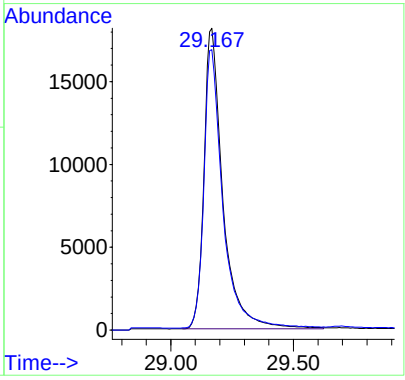


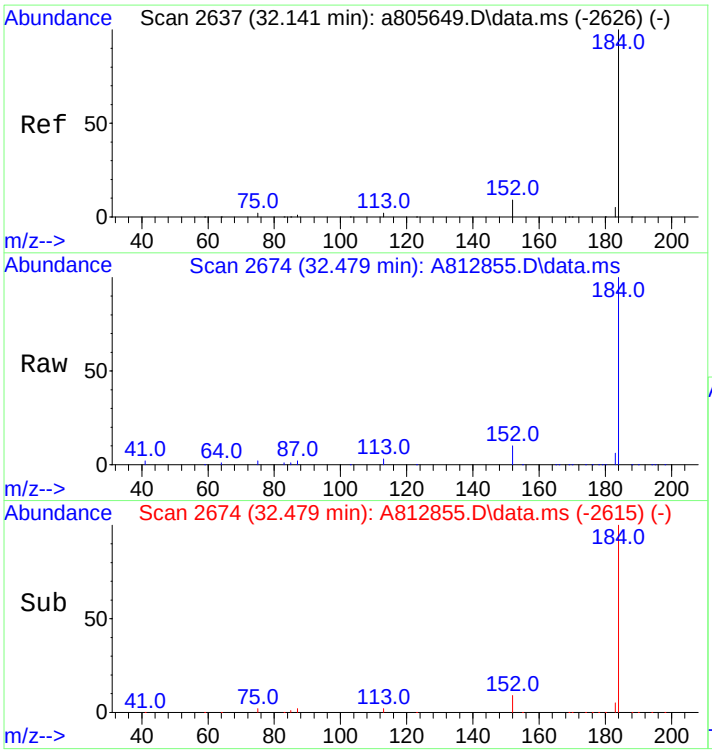


#29
Fluorene
Concen: 543.01 ng/mL
RT: 29.167 min Scan# 2311
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:166 Resp: 97149

Ion	Ratio	Lower	Upper
166	100		
165	92.6	74.2	111.2

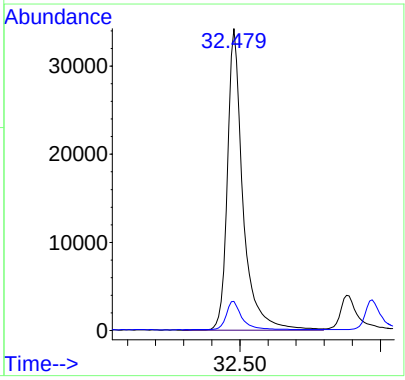


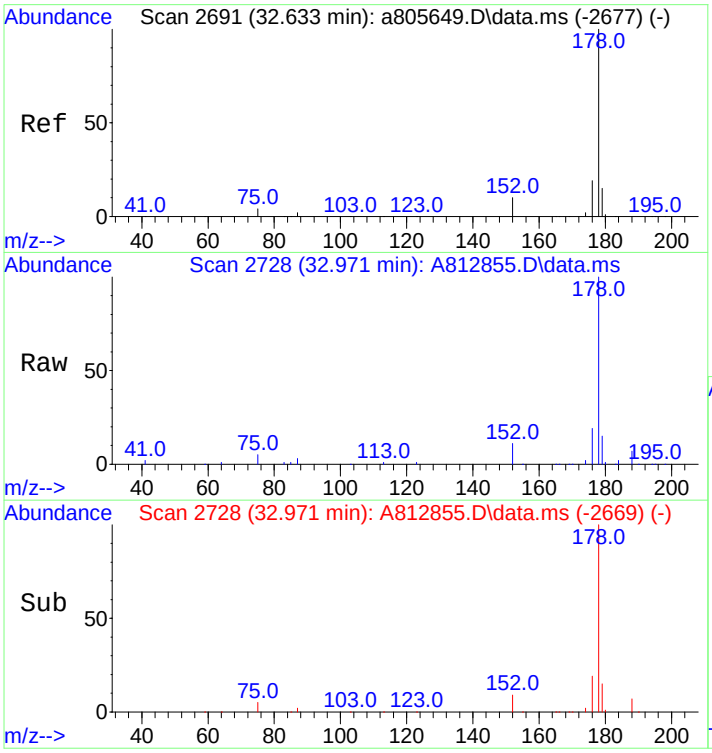


#33
Dibenzothiophene
Concen: 533.70 ng/mL
RT: 32.479 min Scan# 2674
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:184 Resp: 131301

Ion	Ratio	Lower	Upper
184	100		
152	9.6	7.8	11.8

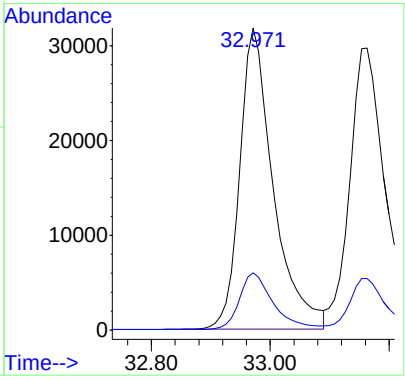


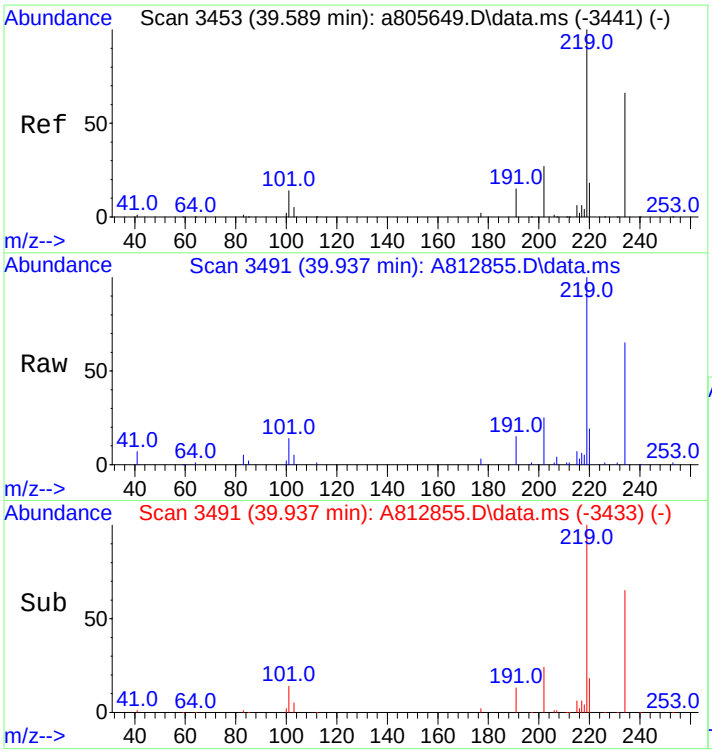


#43
Phenanthrene
Concen: 526.07 ng/mL
RT: 32.971 min Scan# 2728
Delta R.T. 0.036 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:178 Resp: 124571

Ion	Ratio	Lower	Upper
178	100		
176	19.0	15.2	22.8

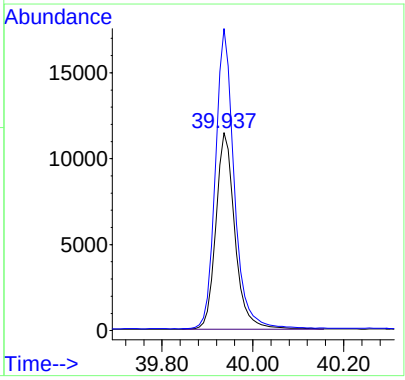


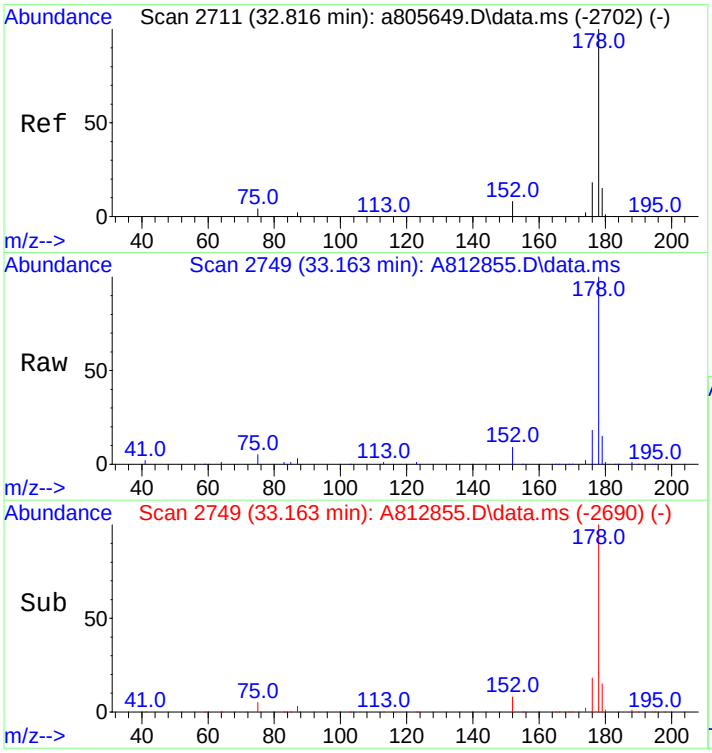


#54
Retene
Concen: 603.95 ng/mL
RT: 39.937 min Scan# 3491
Delta R.T. 0.028 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:234 Resp: 33166

Ion	Ratio	Lower	Upper
234	100		
219	151.0	124.0	186.0

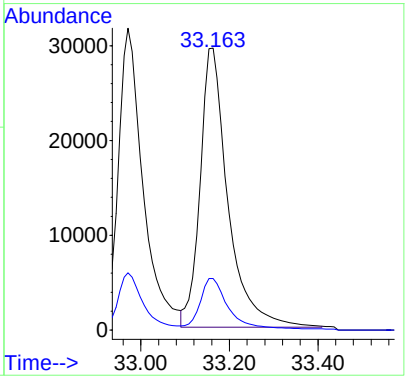


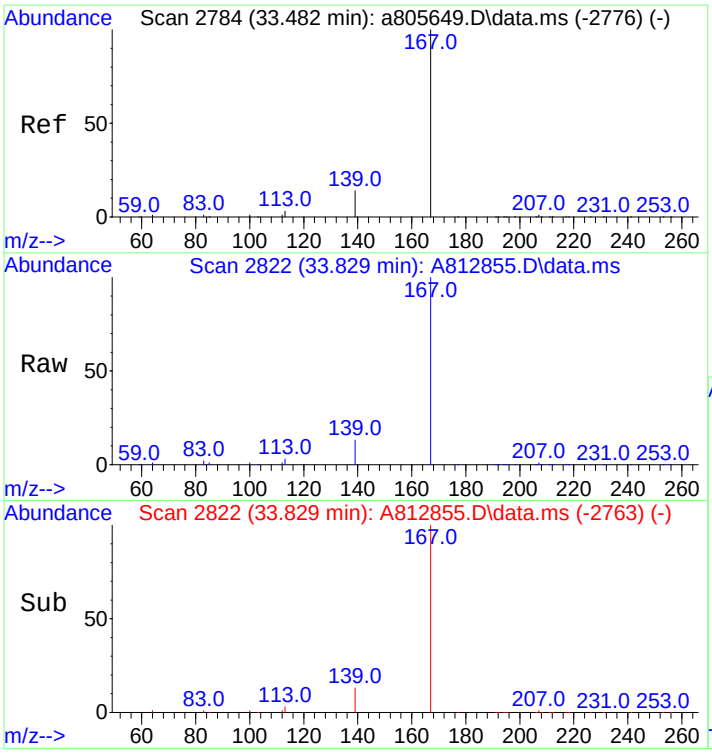


#55
Anthracene
Concen: 585.10 ng/mL m
RT: 33.163 min Scan# 2749
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:178 Resp: 129075

Ion	Ratio	Lower	Upper
178	100		
176	20.0	14.3	21.5

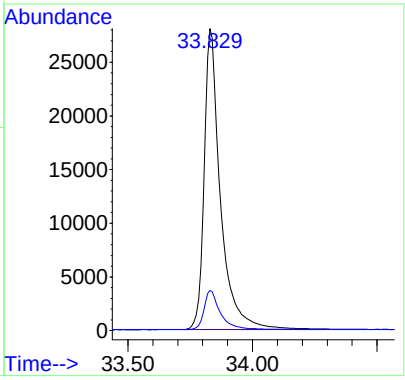


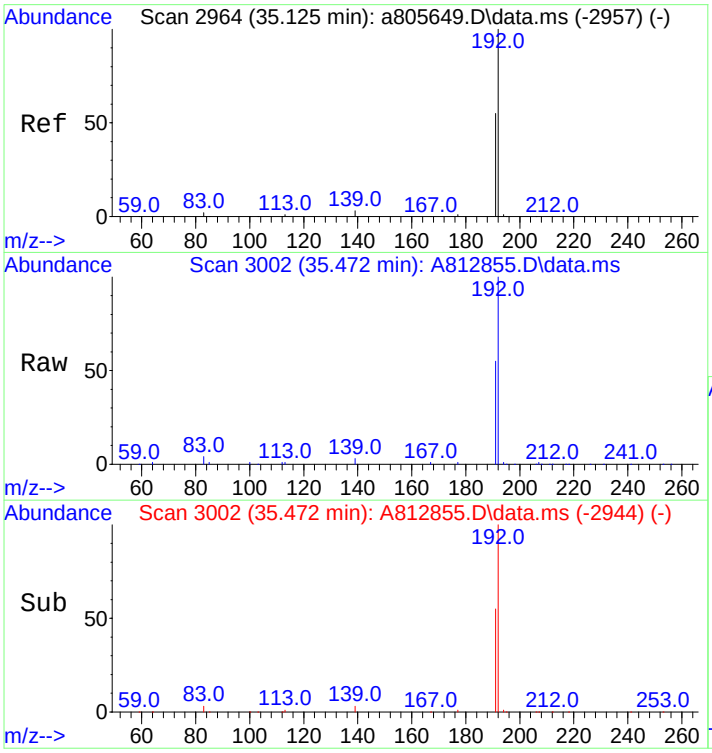


#56
Carbazole
Concen: 555.07 ng/mL
RT: 33.829 min Scan# 2822
Delta R.T. 0.036 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:167 Resp: 127771

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.6	16.0

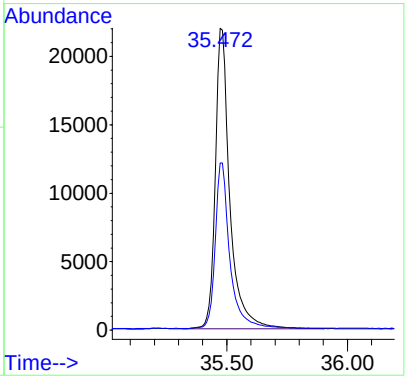


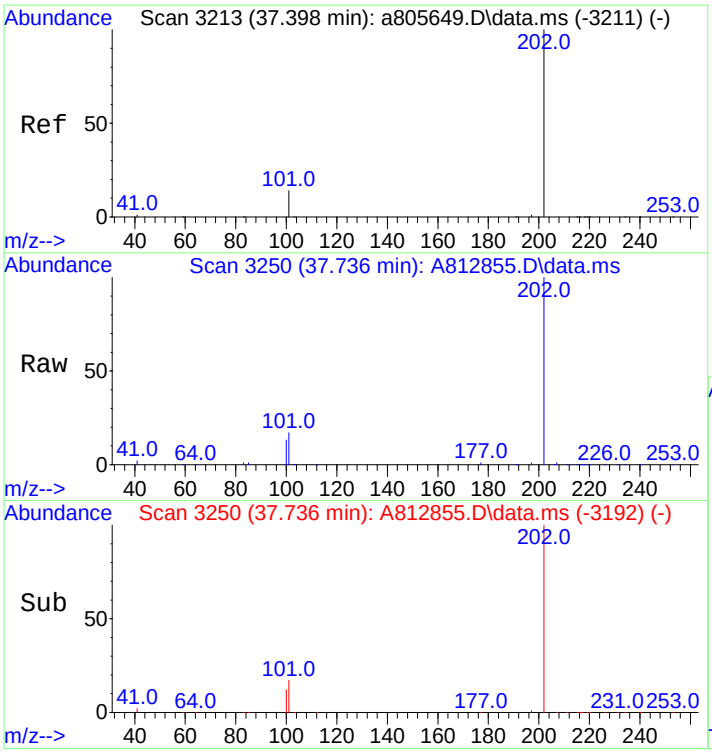


#57
1-Methylphenanthrene
Concen: 550.24 ng/mL
RT: 35.472 min Scan# 3002
Delta R.T. 0.027 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:192 Resp: 92360

Ion	Ratio	Lower	Upper
192	100		
191	55.4	44.2	66.4

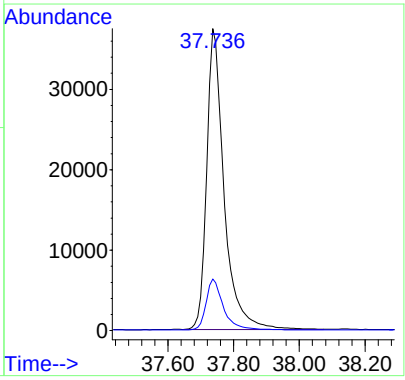


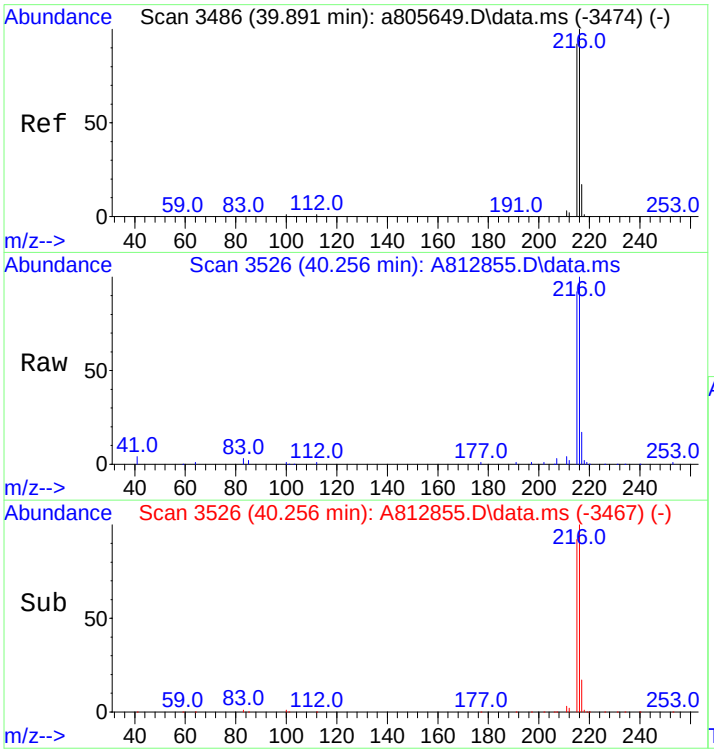


#58
Fluoranthene
Concen: 562.83 ng/mL
RT: 37.736 min Scan# 3250
Delta R.T. 0.027 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:202 Resp: 137280

Ion	Ratio	Lower	Upper
202	100		
101	16.8	13.6	20.4

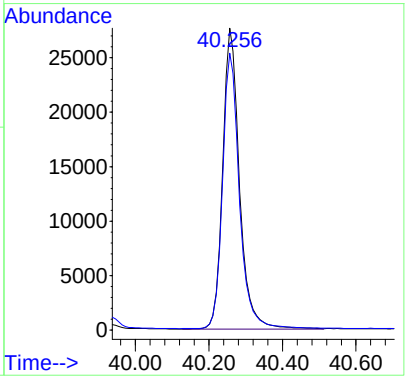


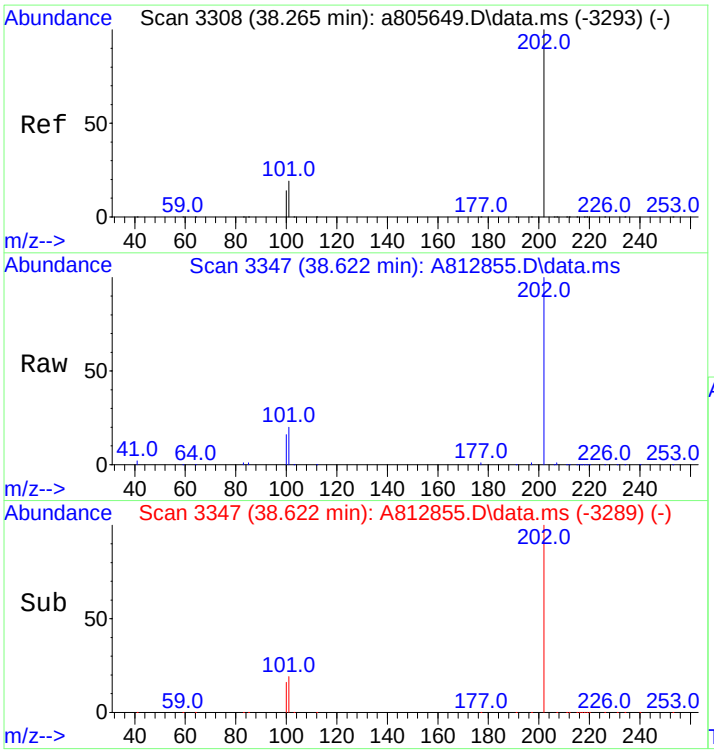


#59
Benzo(b)fluorene
Concen: 621.29 ng/mL
RT: 40.256 min Scan# 3526
Delta R.T. 0.036 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:216 Resp: 87662

Ion	Ratio	Lower	Upper
216	100		
215	91.8	74.2	111.2

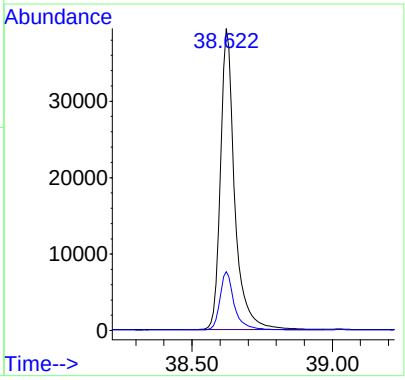


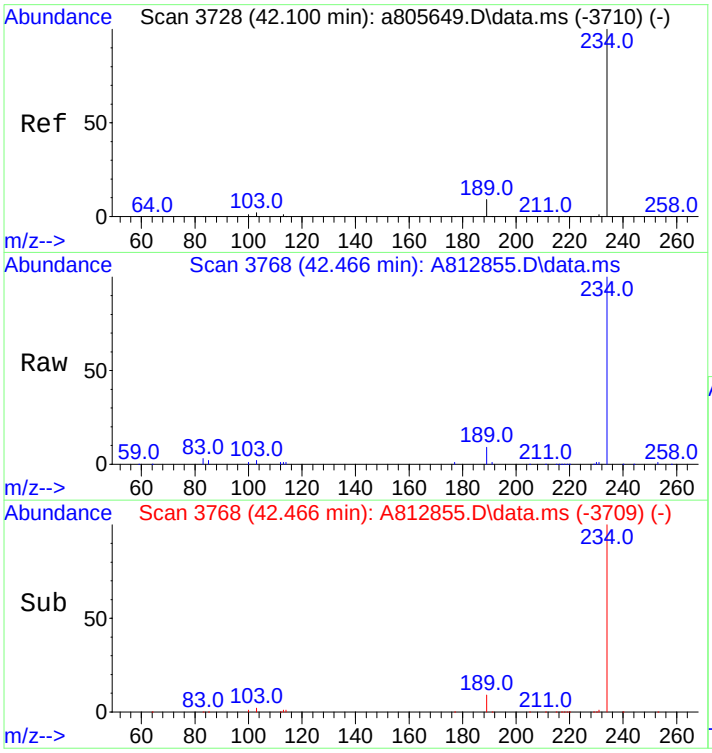


#60
Pyrene
Concen: 560.44 ng/mL
RT: 38.622 min Scan# 3347
Delta R.T. 0.028 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:202 Resp: 138267

Ion	Ratio	Lower	Upper
202	100		
101	19.7	15.4	23.2

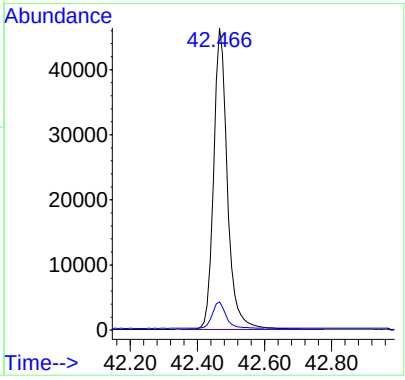


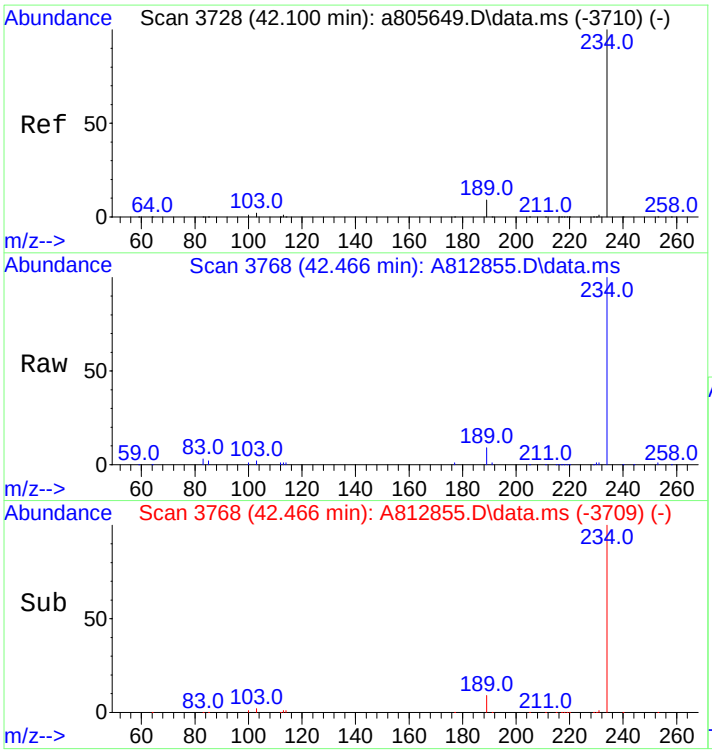


#66
Naphthobenzothiophene
Concen: 576.05 ng/ml
RT: 42.466 min Scan# 3768
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:234 Resp: 131927

Ion	Ratio	Lower	Upper
234	100		
189	8.7	22.3	33.5#

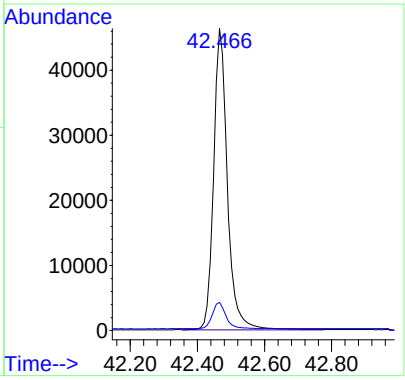


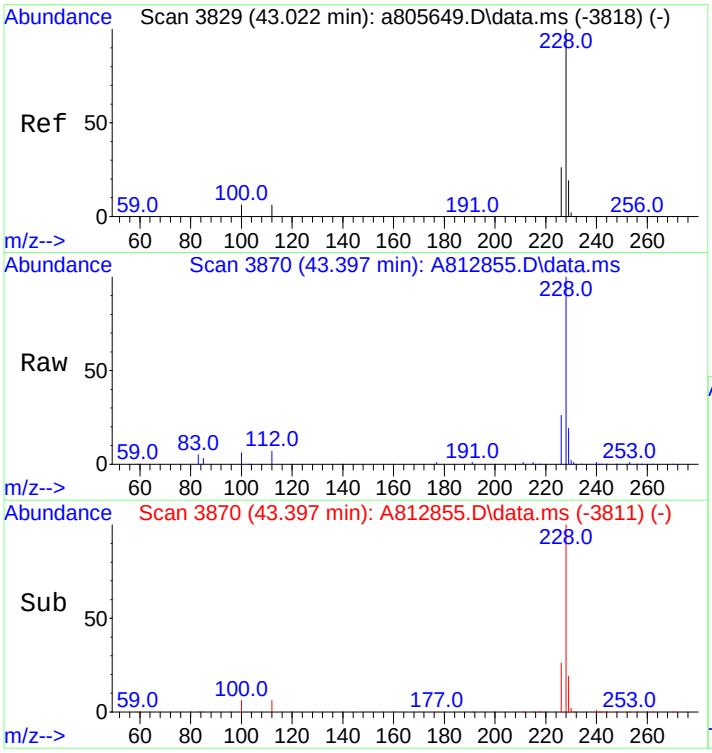


#67
Naphthobenzothiophene-2,1-D
Concen: 576.05 ng/mL
RT: 42.466 min Scan# 3768
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:234 Resp: 131927

Ion	Ratio	Lower	Upper
234	100		
189	8.7	22.3	33.5#

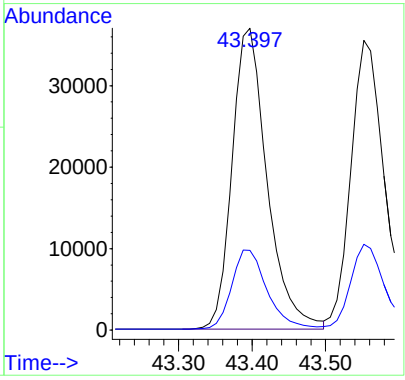


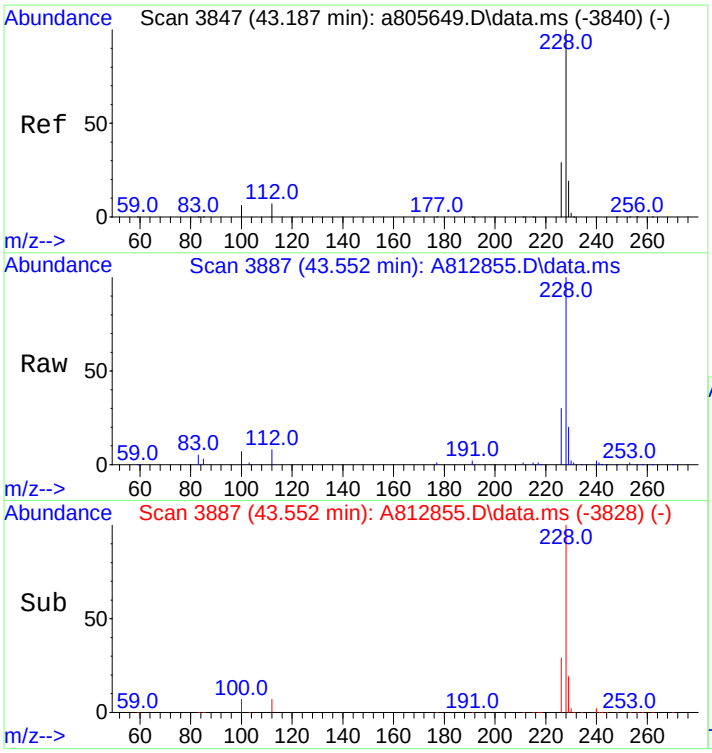


#75
Benz[a]anthracene
Concen: 564.08 ng/mL
RT: 43.397 min Scan# 3870
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:228 Resp: 122582

Ion	Ratio	Lower	Upper
228	100		
226	26.6	21.3	31.9

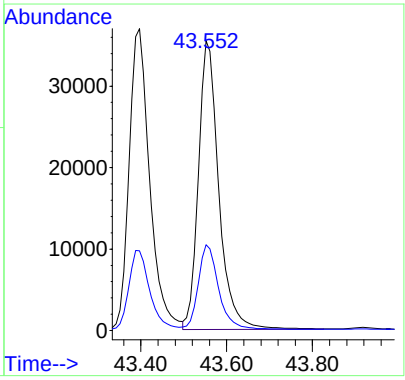


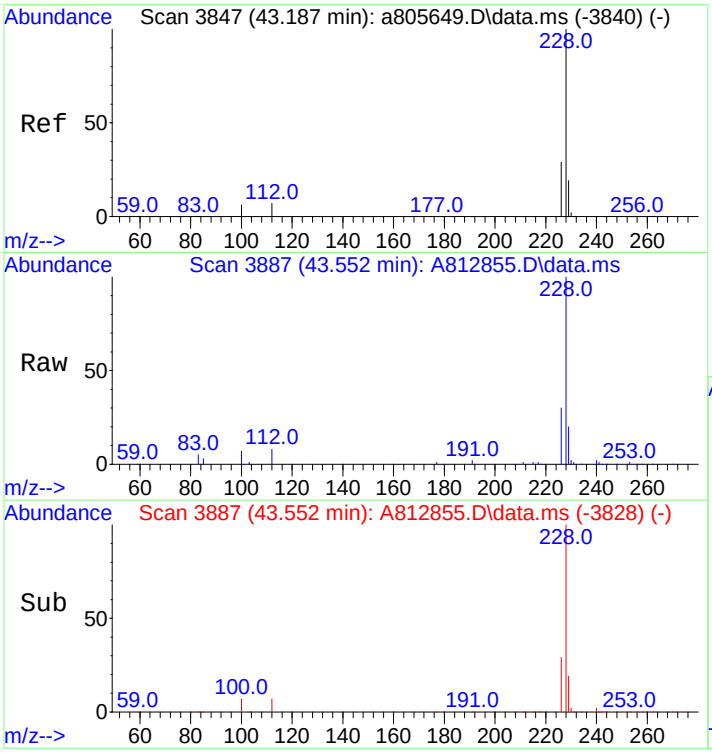


#76
Chrysene
Concen: 530.34 ng/mL
RT: 43.552 min Scan# 3887
Delta R.T. 0.036 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:228 Resp: 116659

Ion	Ratio	Lower	Upper
228	100		
226	29.3	23.6	35.4

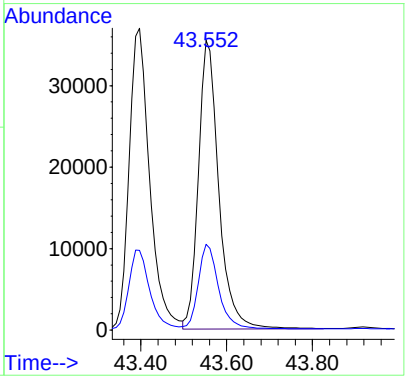


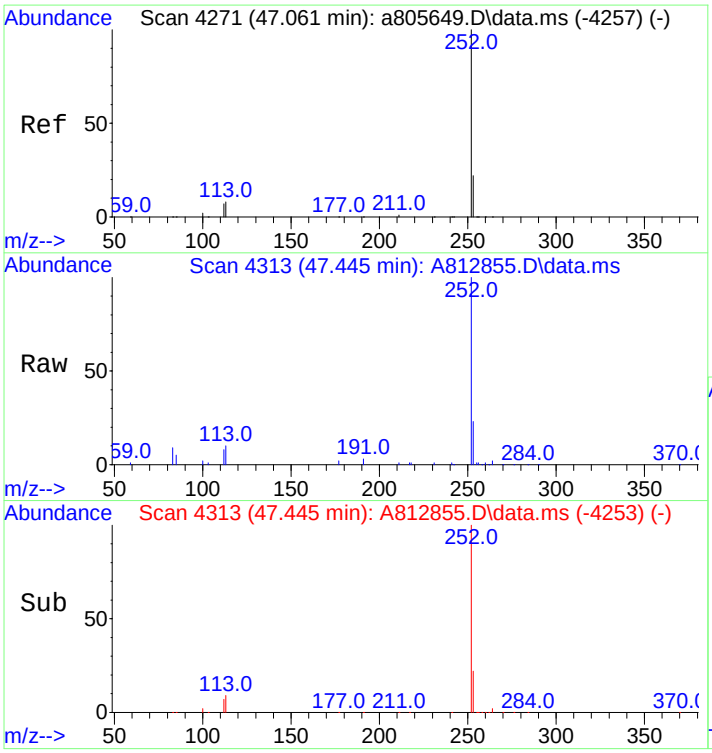


#77
Chrysene/Triphenylene
Concen: 530.34 ng/mL
RT: 43.552 min Scan# 3887
Delta R.T. 0.036 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:228 Resp: 116659

Ion	Ratio	Lower	Upper
228	100		
226	29.3	23.6	35.4

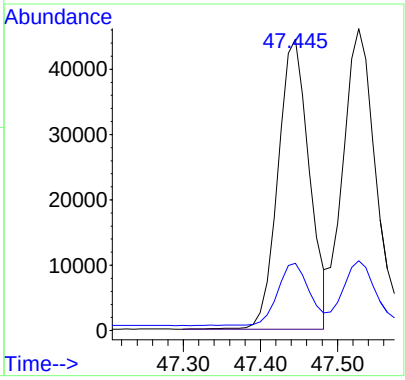


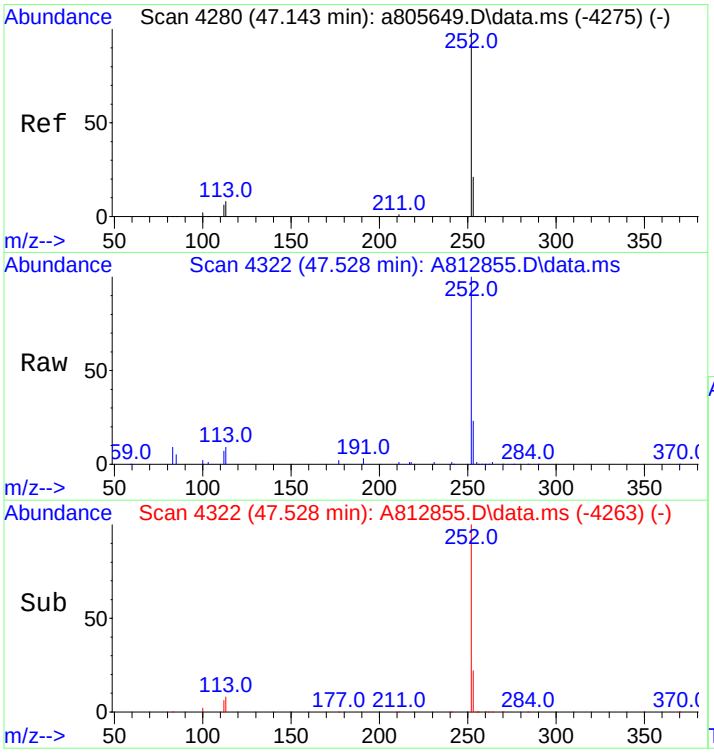


#84
Benzo[b]fluoranthene
Concen: 537.91 ng/mL
RT: 47.445 min Scan# 4313
Delta R.T. 0.045 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:252 Resp: 125543

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.5	27.7

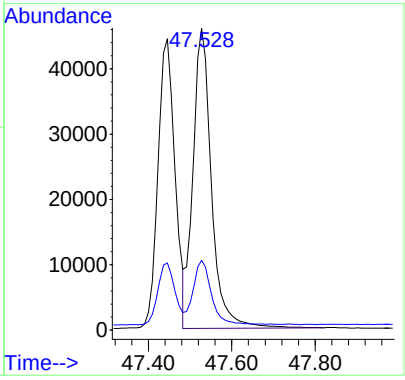


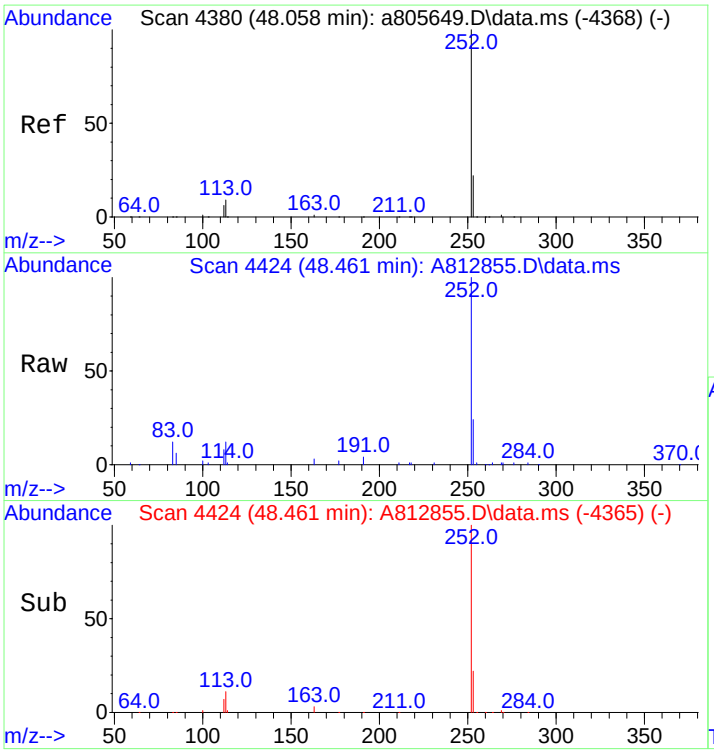


#85
Benzo[j]+[k]fluoranthene
Concen: 555.77 ng/mL
RT: 47.528 min Scan# 4322
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:252 Resp: 141528

Ion	Ratio	Lower	Upper
252	100		
253	21.0	18.8	28.2

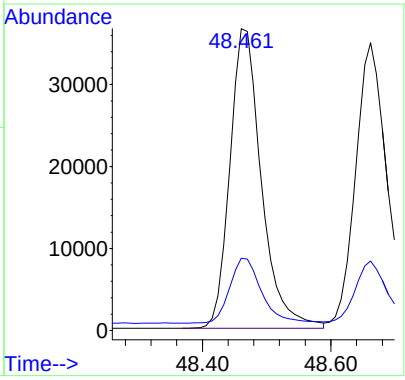


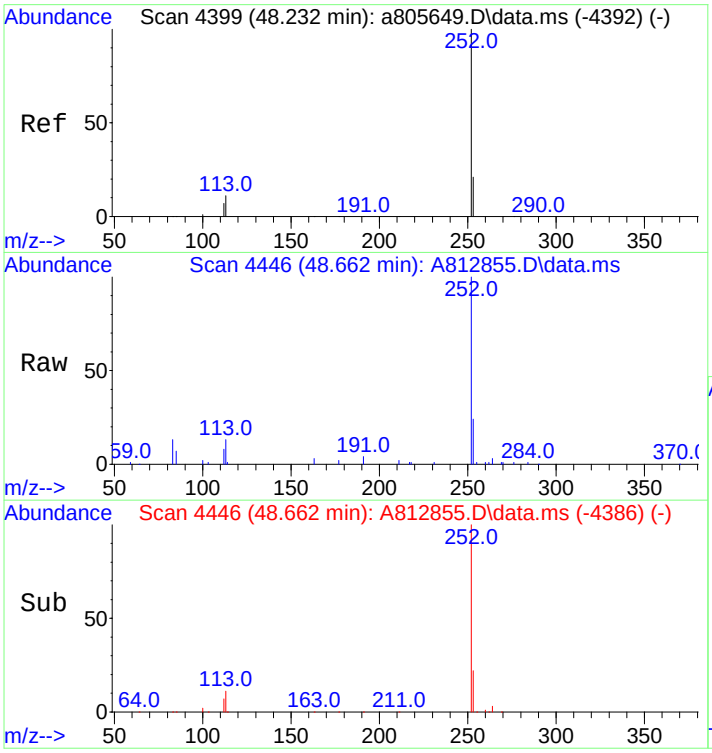


#87
Benzo[e]pyrene
Concen: 519.92 ng/mL
RT: 48.461 min Scan# 4424
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:252 Resp: 125030

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.9	28.3

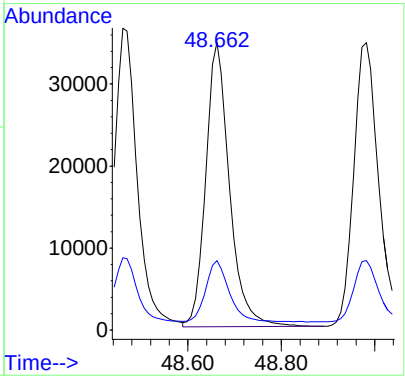


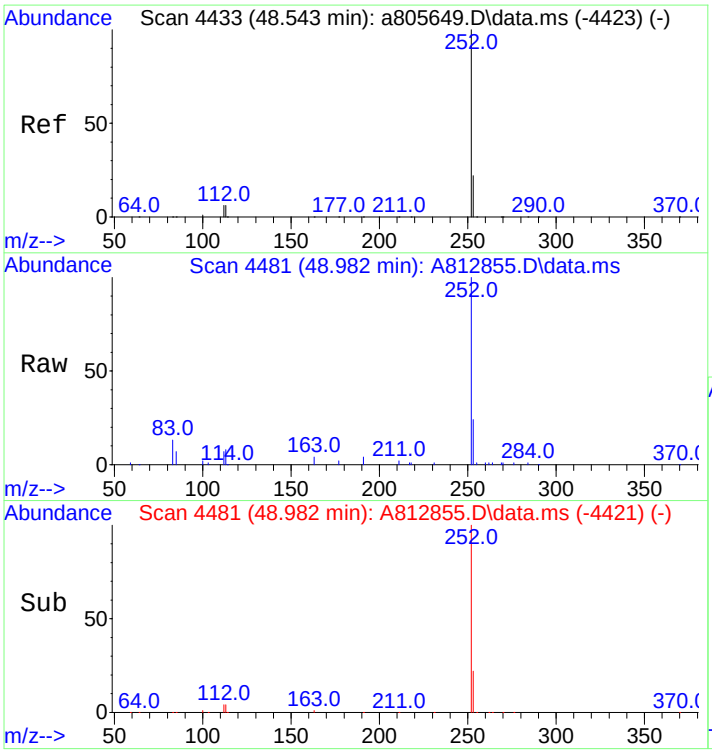


#89
Benzo[a]pyrene
Concen: 549.55 ng/mL
RT: 48.662 min Scan# 4446
Delta R.T. 0.046 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:252 Resp: 122246

Ion	Ratio	Lower	Upper
252	100		
253	21.5	19.4	29.0

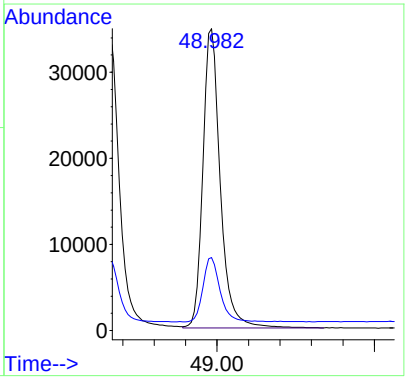


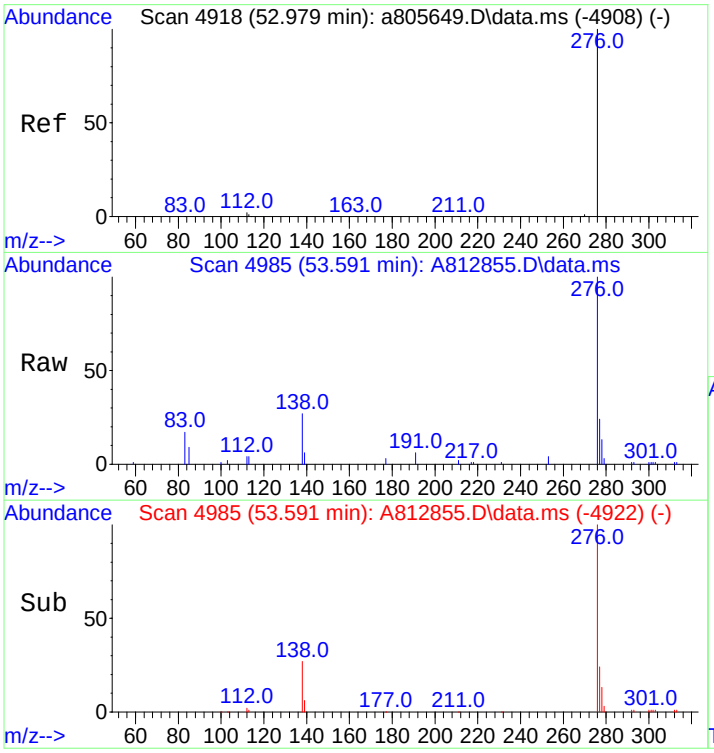


#90
Perylene
Concen: 547.02 ng/mL
RT: 48.982 min Scan# 4481
Delta R.T. 0.046 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:252 Resp: 132915

Ion	Ratio	Lower	Upper
252	100		
253	21.1	19.3	28.9

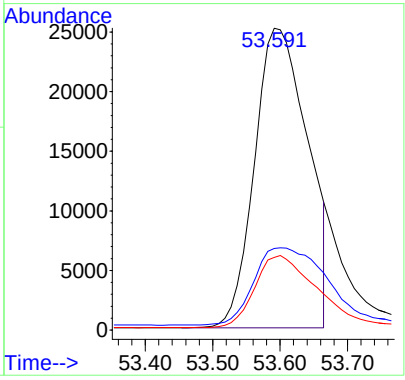


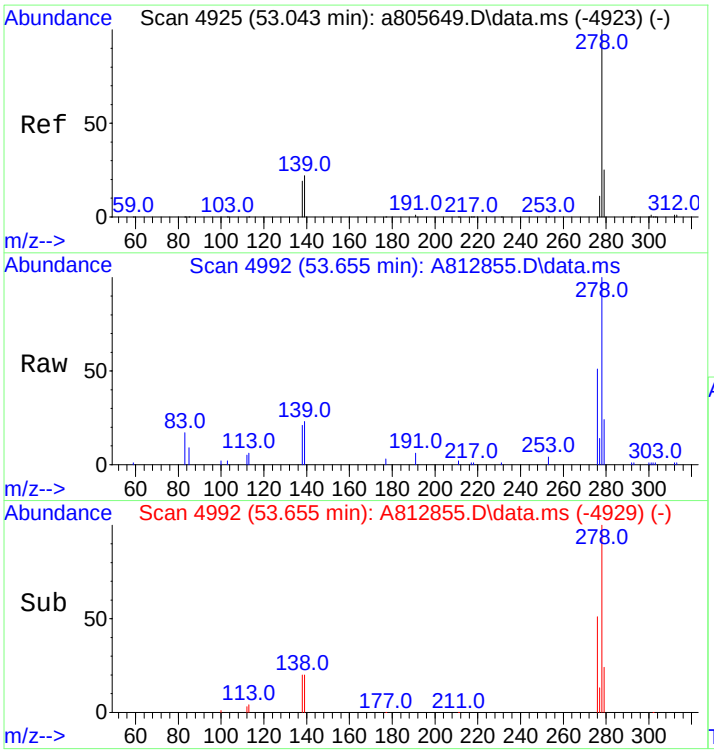


#91
Indeno[1,2,3-cd]pyrene
Concen: 583.44 ng/mL m
RT: 53.591 min Scan# 4985
Delta R.T. 0.073 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:276 Resp: 137867

Ion	Ratio	Lower	Upper
276	100		
138	36.4	19.9	29.9#
277	29.2	19.0	28.6#

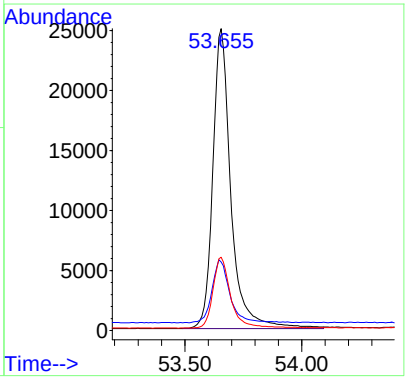


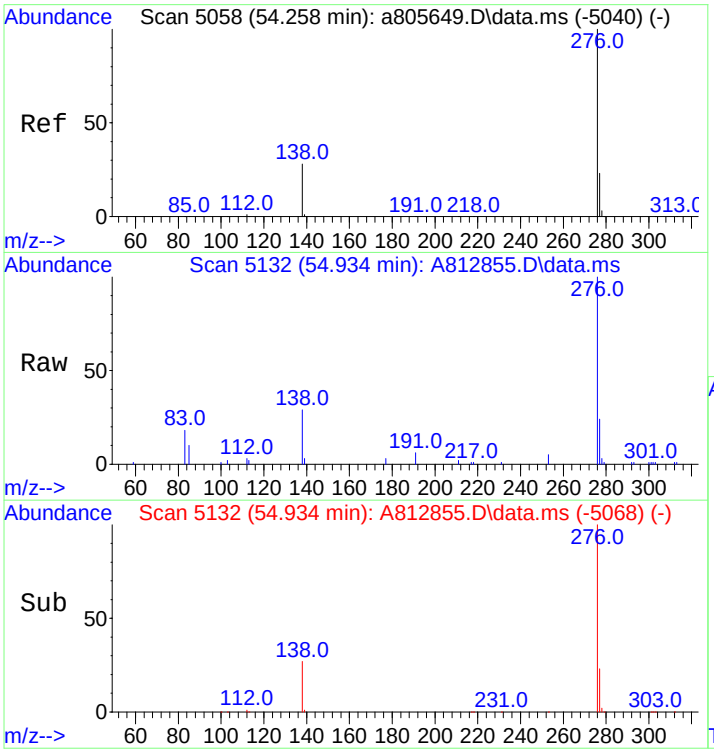


#92
Dibenz[ah]+[ac]anthracene
Concen: 583.12 ng/mL
RT: 53.655 min Scan# 4992
Delta R.T. 0.073 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:278 Resp: 135065

Ion	Ratio	Lower	Upper
278	100		
139	20.7	16.6	25.0
279	23.4	19.1	28.7

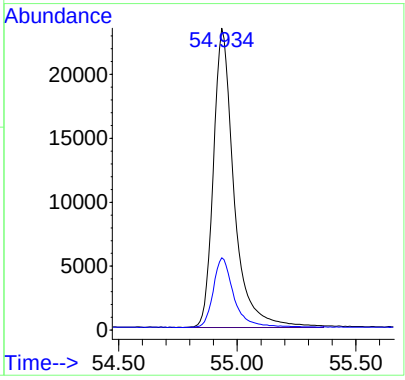


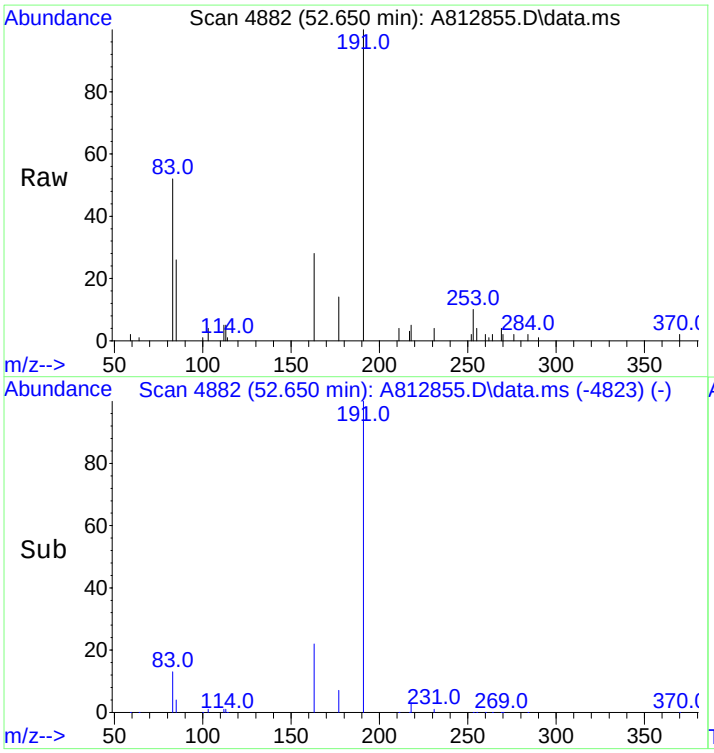


#93
Benzo[g,h,i]perylene
Concen: 528.30 ng/mL
RT: 54.934 min Scan# 5132
Delta R.T. 0.082 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:276 Resp: 141670

Ion	Ratio	Lower	Upper
276	100		
277	23.5	18.9	28.3

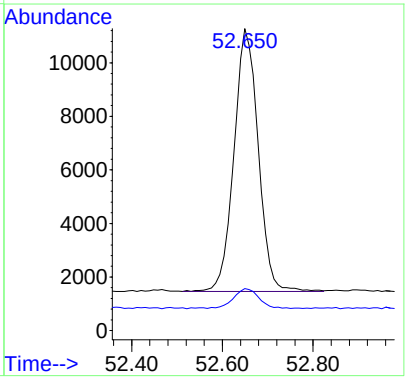


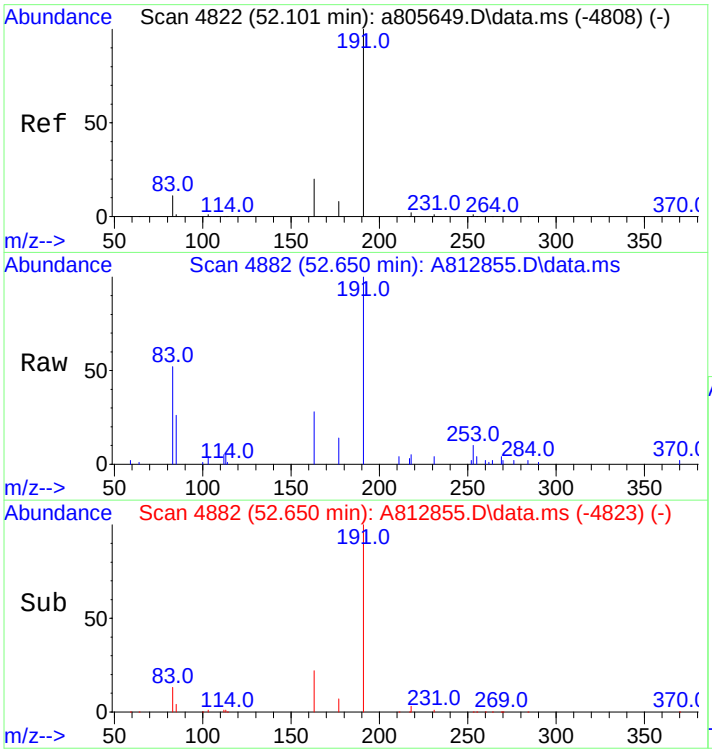


#94
Hopane (T19)
Concen: 488.81 ng/mL
RT: 52.650 min Scan# 4882
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:191 Resp: 36390

Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#

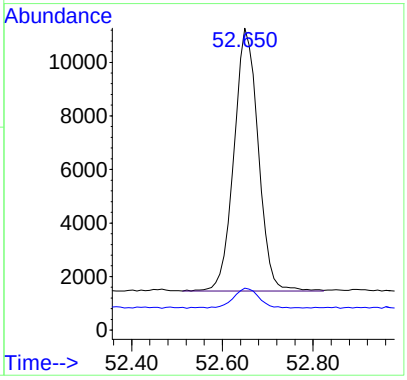




#95
17a(H),21B(H)-hopane - C30H52
Concen: 488.81 ng/mL
RT: 52.650 min Scan# 4882
Delta R.T. 0.037 min
Lab File: A812855.D
Acq: 20 Nov 2012 8:49 am

Tgt Ion:191 Resp: 36390

Ion	Ratio	Lower	Upper
191	100		
177	7.7	9.8	14.8#



ANALYTICAL REPORT

Prepared for:
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Project:	Enbridge Line 6B MP 608
ETR:	1210083
Report Date:	November 19, 2012

Certifications and Accreditations
Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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Sample ID Cross Reference

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210083**

Lab Sample ID	Client Sample ID	Matrix
1210083-01	SEKR3510R018S092112D004_MDL1	Sediment
1210083-02	SEKR3510R018S092112D004_MDL2	Sediment
1210083-03	SEKR3510R018S092112D004_MDL3	Sediment
1210083-04	SEKR3510R018S092112D004_MDL4	Sediment
1210083-05	SEKR3510R018S092112D004_MDL5	Sediment
1210083-06	SEKR3510R018S092112D004_MDL6	Sediment
1210083-07	SEKR3510R018S092112D004_MDL7	Sediment

Certificate/Approval Program Summary

Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID : PH-0141 - *Wastewater* (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) *Solid Waste/Soil* (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID : E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID : 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Solid and Hazardous Waste* (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID : MA0030 - *Wastewater* (General Chemistry: EPA 120.1/ SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624).

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID : MA015 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). *Solid & Hazardous Waste* (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID : 11627 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: EPA 1010, 1311; : 245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID : LAO00289 - Chemistry: *Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil* (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy

CASE NARRATIVE
Alpha Analytical

ETR: 1210083
Project: Enbridge Line 6B MP 608

All analyses were performed according to the Alpha Analytical quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Alpha Analytical certifies that the test results within meet all of the requirements of NELAC, for all NELAC accredited parameters.

Sample Receipt

The background sediment sample SEKR3510R018S092112D004 was received in good condition, between 2° and 6°C, and without discrepancies.

The sample received was initially logged into ETR 1209034 as sample (1209034-03). The jars received were homogenized and aliquots were removed to create samples (1210083-01 through -07).

Samples were released for analysis on 10-30-2012. Samples were frozen until scheduled for analysis. Per the customer's request, all samples (1210083-01 through -07) were analyzed for PAH, BIO and SHC.

Sample Preparation and Extraction

Samples were extracted on 11-06-2012 (prep batch 1210083). The extraction and preparation procedure was performed according to the Alpha Analytical SOP (stated below) with the following deviations:

1. Samples were prepared according to the MDL Range Finding Procedure provided by AECOM.

2. Prior to extraction the Cold Lake Crude was artificially weathered through evaporation using a "Topping" procedure provided by the client. Each selected sediment sample is spiked with 300uL of this topped oil and extracted as stated below.

3. Sample SEKR3510R018S092112D004 was originally logged into ETR 1210004 as sample 1210004-01. A percent solid determination was performed on this sample (1210004-01) and was used for samples (1210083-01 through -07).

4. It was noted prior to silica column cleanup that the vial containing sample 1210083-06, which contained 4mL of solvent, broke and 1mL of solvent was lost. This sample, after gravimetric weight determination, has a 950ul pre-silica archive.

The observations noted on the *Forensic Preparation Checklist* should neither have any adverse affect on the analysis nor should they impact data quality for samples in this ETR.

Alkylated Polynuclear Aromatic Hydrocarbons, Steranes, Triterpanes, and Triaromatic Steroids – Sediments

Polynuclear aromatic hydrocarbons and geochemical biomarkers were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP O-008, Issue No. 7,*

07/07/2011). Sediment samples are spiked with surrogate compounds and extracted by *Shaker Table Extraction (SOP OP-013, Issue No. 5, 07/14/2011)*. Solvent extracts are dried over sodium sulfate and concentrated to a 4mL volume. A 2mL aliquot of the extract is processed through a silica column (*Silica Gel Cleanup Preparation (Manual), SOP 2267, Rev. 2, 03/21/2012*) and concentrated to a 900uL volume. A 450uL aliquot is taken and spiked with internal standard for instrument analysis. The average weight of all samples included in the extraction batch is used as the weight for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples, comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Alkyl homologues are quantified using the response factor of the parent PAH compound. Target triterpane biomarker concentrations are quantified using the response factor of Hopane and the steranes and steroids are quantified using the response factor of 5β(H)Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific method detection limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensics Preparation Checklist* located in the sample preparation document.

1. The method blank SS110612B09 contained low-level target compounds. The single component compounds were detected at less than 5x the sample specific method detection limit (MDL), the multi-component compounds were detected at less than 10x the MDL of the associated single component compound, with the exception of C2-Dibenzothiophenes, C2-Phenanthrene/Anthracenes, and C3-Phenanthrene/Anthracenes which are "B" qualified on the quantitation report. The method blank did not meet the acceptance criteria (with no more than two compounds outside criteria), however all the samples were detected above 10X the concentration of the blank for these compounds, therefore no corrective action was taken.

1. The following continuing calibration verifications (CCV) had the percent deviation above the 25%D acceptance criteria as follows:

   CCV C211131204: Indeno[1,2,3-cd]pyrene at 25.2%D
   CCV C211131205: Indeno[1,2,3-cd]pyrene at 27.6%D
   CCV C211131208: Indeno[1,2,3-cd]pyrene at 26.2%D
   CCV C211131209: Indeno[1,2,3-cd]pyrene at 25.9%D

   In each case, the values are below 35%D and represent less than 10% of all compounds; therefore the calibration is deemed acceptable. No corrective action was taken.

2. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

Total Saturated Hydrocarbons and Total Petroleum Hydrocarbons by GC/FID – Sediments

Samples for total saturated hydrocarbons and total petroleum hydrocarbons were analyzed following the procedures in Alpha Analytical SOP *Total Petroleum and Saturated Hydrocarbons by Gas Chromatography/Flame Ionization Detector (SOP O-003, Issue No.7, 08/15/2011)* Method 8100/8015mod. Samples were prepared as stated above for the PAH analysis. A portion of the final extract was analyzed for GC/FID (gas chromatography with flame ionization detection). A multi-level initial calibration over the n-alkane range from C9-C40 was evaluated and quantified using internal standard techniques prior to sample analysis. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific method detection limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensics Preparation Checklist* located in the sample preparation document.

The following compounds co-elute with PAH surrogates and/or internal standards which potentially bias the results high: n-Octadecane (Cl8) - Phenanthrene-d10, n-Pentacosane (C25) - Chrysene-d12 and n-Nonacosane (C29) - Benzo(a)pyrene-d12. If a positive bias is determined to be present the compounds will be reported with a "C" qualifier.

1. The method blank XXXXXX contained low-level target compounds detected at less than 5x the sample specific method detection limit (MDL) with the exception of n-Octadecane (C18) which is "B" qualified on the Quantitation Report. The method blank met the acceptance criteria (with no more than two compounds outside criteria) therefore no corrective

action was required. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10x the concentration in the blank.

2. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Analytical makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Analytical. To the best of my knowledge, the information contained in this report is accurate and complete. For any questions regarding this report, please contact the signatory below at 508-822-9300.

Approved by: Normand Laurianno Jr. Title: **Technical Representative** Date: 11/20/2012

Normand Laurianno Jr.

Alkylated Polynuclear Aromatic Hydrocarbons, Steranes, Triterpanes, and Triaromatic Steroids By GC/MS-SIM

Form II
Surrogate Recovery
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210083**
Matrix: **Sediment**

Case: **N/A** SDG: **N/A**

Client ID	Lab ID	Naphthalene-d8	Phenanthrene-d10	Benzo[a]pyrene-d12	5B(H)Cholan
Blank	SS110612B09	82	90	92	96
LCS	SS110612LCS05	86	88	90	92
LCSD	SS110612LCSD05	68	71	72	76
SEKR3510R018S092112D004_MDL1	1210083-01	70	89	80	96
SEKR3510R018S092112D004_MDL2	1210083-02	69	89	82	97
SEKR3510R018S092112D004_MDL3	1210083-03	72	91	84	97
SEKR3510R018S092112D004_MDL4	1210083-04	70	88	79	93
SEKR3510R018S092112D004_MDL5	1210083-05	67	84	78	92
SEKR3510R018S092112D004_MDL6	1210083-06	78	100	92	108
SEKR3510R018S092112D004_MDL7	1210083-07	73	91	83	99

N/A - Not Applicable

Surrogate	QC Limit
Naphthalene-d8	40-120
Phenanthrene-d10	40-120
Benzo[a]pyrene-d12	40-120
5B(H)Cholane	50-130

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **See Below**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/06/12	100	AC

Lab ID: SS110612B09 SS110612LCS05 SS110612LCSD05

Parameter	Blank Conc.	LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
Naphthalene	0.0795	60.6	91	50.0	75	19	30	50-125
Acenaphthylene	0.0576	61.5	92	49.5	74	22	30	50-125
Acenaphthene	0.0537 U	59.2	89	48.9	73	19	30	50-125
Fluorene	0.106	61.0	92	49.7	75	20	30	50-125
Anthracene	0.0936 U	67.7	101	55.2	83	20	30	50-125
Phenanthrene	0.170	60.1	90	48.4	73	22	30	50-125
Fluoranthene	0.0695	64.3	96	51.4	77	22	30	50-125
Pyrene	0.152	65.5	98	52.3	78	22	30	50-125
Benz[a]anthracene	0.0439	63.6	95	52.6	79	19	30	50-125
Chrysene/Triphenylene	0.0609	60.6	91	50.2	75	19	30	50-125
Benzo[b]fluoranthene	0.0636	66.7	100	54.4	82	20	30	50-125
Benzo[j]fluoranthene/ Benzo[k]fluoranthene	0.0439	61.4	92	50.6	76	19	30	50-125
Benzo[a]pyrene	0.204	66.2	99	53.8	81	21	30	50-125
Indeno[1,2,3-cd]pyrene	0.164	73.1	110	59.0	89	21	30	50-125
Dibenz[ah]anthracene/ Dibenz[ac]anthracene	0.275 U	63.7	96	51.9	78	20	30	50-125
Benzo[g,h,i]perylene	0.165	60.6	91	49.6	74	20	30	50-125

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	86	68	40-120
Phenanthrene-d10	88	71	40-120
Benzo[a]pyrene-d12	90	72	40-120
5B(H)Cholane	92	76	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
cis/trans-Decalin	479.2	468	98	65-135
C1-Decalins	728.9	763	105	65-135
C2-Decalins	635.5	716	113	65-135
C3-Decalins	329.8	410	124	65-135
C4-Decalins	326.5	436	134	65-135
Benzothiophene	5.4	5.40	100	65-135
C1-Benzo(b)thiophenes	28.9	31.6	109	65-135
C2-Benzo(b)thiophenes	49.6	55.4	112	65-135
C3-Benzo(b)thiophenes	99.0	120	121	65-135
C4-Benzo(b)thiophenes	87.1	105	121	65-135
Naphthalene	555.8	584	105	65-135
C1-Naphthalenes	1167.3	1240	106	65-135
C2-Naphthalenes	1409.7	1550	110	65-135
C3-Naphthalenes	1035.9	1180	114	65-135
C4-Naphthalenes	561.1	692	123	65-135
Biphenyl	145.7	143	98	65-135
Dibenzofuran	51.2	54.1	106	65-135
Acenaphthylene	6.5	6.98	107	65-135
Acenaphthene	18.7	14.1	76	65-135
Fluorene	74.6	77.9	104	65-135
C1-Fluorenes	170.2	177	104	65-135
C2-Fluorenes	255.4	299	117	65-135
C3-Fluorenes	238.5	297	124	65-135
Phenanthrene	212.2	224	105	65-135
C1-Phenanthrenes/Anthracenes	432.7	502	116	65-135
C2-Phenanthrenes/Anthracenes	465.9	572	123	65-135
C3-Phenanthrenes/Anthracenes	317.4	419	132	65-135
C4-Phenanthrenes/Anthracenes	129	169	131	65-135
Dibenzothiophene	138.9	146	105	65-135
C1-Dibenzothiophenes	278.6	324	116	65-135
C2-Dibenzothiophenes	377.5	465	123	65-135
C3-Dibenzothiophenes	341.4	428	125	65-135
C4-Dibenzothiophenes	183.4	235	128	65-135

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Fluoranthene	4.00	4.40	110	65-135
Pyrene	13.0	14.9	114	65-135
C1-Fluoranthenes/Pyrenes	63.1	73.8	117	65-135
C2-Fluoranthenes/Pyrenes	102.2	122	119	65-135
C3-Fluoranthenes/Pyrenes	119.6	151	126	65-135
C4-Fluoranthenes/Pyrenes	104	137	131	65-135
Naphthobenzothiophenes	43.8	46.1	105	65-135
C1-Naphthobenzothiophenes	117.2	129	110	65-135
C2-Naphthobenzothiophenes	163.3	184	113	65-135
C3-Naphthobenzothiophenes	128.7	141	110	65-135
C4-Naphthobenzothiophenes	89.0	99.8	112	65-135
Benz[a]anthracene	2.1	2.08	99	65-135
Chrysene/Triphenylene	35.2	39.8	113	65-135
C1-Chrysenes	62.8	71.6	114	65-135
C2-Chrysenes	86.0	102	119	65-135
C3-Chrysenes	97.6	125	129	65-135
C4-Chrysenes	59.4	78.4	132	65-135
Benzo[b]fluoranthene	5.2	5.45	105	65-135
Benzo[e]pyrene	9.8	9.85	100	65-135
Benzo[a]pyrene	1.9	1.84	97	65-135
Perylene	2.8	3.44	123	65-135
Benzo[g,h,i]perylene	3.1	3.62	117	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

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Form III
Spike Recovery Summary
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Carbazole	6.00	7.12	119	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

11/19/12 12:43

Form III
Spike Recovery Summary
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
4-Methyldibenzothiophene	131.8	155	118	65-135
2/3-Methyldibenzothiophene	97.5	115	118	65-135
1-Methyldibenzothiophene	44.2	50.6	114	65-135
3-Methylphenanthrene	89.4	105	117	65-135
2-Methylphenanthrene	97.7	112	114	65-135
2-Methylanthracene	3.2	3.96	124	65-135
9/4-Methylphenanthrene	141.2	163	115	65-135
1-Methylphenanthrene	97.4	112	115	65-135
2-Methylnaphthalene	1081.8	1150	106	65-135
1-Methylnaphthalene	784.8	823	105	65-135
2,6-Dimethylnaphthalene	649.9	661	102	65-135
2,3,5-Trimethylnaphthalene	152	135	89	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C23 Tricyclic Terpane	67.3	59.2	88	65-135
C24 Tricyclic Terpane	43.0	38.1	89	65-135
C25 Tricyclic Terpane	42.0	35.3	84	65-135
C24 Tetracyclic Terpane	14.8	11.8	80	65-135
C26 Tricyclic Terpane-22S	17.7	13.8	78	65-135
C26 Tricyclic Terpane-22R	15.4	12.7	82	65-135
C28 Tricyclic Terpane-22S	16.8	13.1	78	65-135
C28 Tricyclic Terpane-22R	18.1	14.4	80	65-135
C29 Tricyclic Terpane-22S	20.8	18.2	87	65-135
C29 Tricyclic Terpane-22R	22.6	20.8	92	65-135
18a-22,29,30-Trisnorneohopane-TS	31.3	28.6	91	65-135
C30 Tricyclic Terpane-22S	16.2	17.3	107	65-135
C30 Tricyclic Terpane-22R	16.4	14.3	87	65-135
17a(H)-22,29,30-Trisnorhopane-TM	37.8	31.6	84	65-135
17a/b,21b/a 28,30-Bisnorhopane	7.00	7.27	104	65-135
17a(H),21b(H)-25-Norhopane	8.7	7.55	87	65-135
30-Norhopane	99.7	91.6	92	65-135
18a(H)-30-Norneohopane-C29Ts	25.2	22.9	91	65-135
17a(H)-Diahopane	14.2	12.9	91	65-135
30-Normoretane	11.6	10.1	87	65-135
Hopane	173.6	158	91	65-135
Moretane	17.5	14.4	82	65-135
30-Homohopane-22S	75.1	66.0	88	65-135
30-Homohopane-22R	64.1	57.0	89	65-135
30,31-Bishomohopane-22S	53.6	49.3	92	65-135
30,31-Bishomohopane-22R	39.6	35.0	88	65-135
30,31-Trishomohopane-22S	41.8	37.0	89	65-135
30,31-Trishomohopane-22R	27.2	25.7	94	65-135
Tetrakishomohopane-22S	29.8	29.1	98	65-135
Tetrakishomohopane-22R	21.2	19.4	91	65-135
Pentakishomohopane-22S	30.2	31.3	104	65-135
Pentakishomohopane-22R	23.5	23.8	101	65-135
13b(H),17a(H)-20S-Diacholestane	50.0	52.8	106	65-135

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
13b(H),17a(H)-20R-Diacholestane	26.3	26.4	100	65-135
13b,17a-20S-Methyldiacholestane	25.7	28.9	112	65-135
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	65.0	66.9	103	65-135
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	75.8	74.1	98	65-135
Unknown Sterane (S18)	21.3	19.7	92	65-135
13a,17b-20S-Ethyldiacholestane	3.9	3.23	83	65-135
14a,17a-20S-Methylcholestane	37.3	33.4	90	65-135
14a,17a-20R-Methylcholestane	34.5	34.1	99	65-135
14a(H),17a(H)-20S-Ethylcholestane	51.0	51.1	100	65-135
14a(H),17a(H)-20R-Ethylcholestane	39.5	44.1	112	65-135
14b(H),17b(H)-20R-Cholestane	41.5	44.8	108	65-135
14b(H),17b(H)-20S-Cholestane	42.5	42.4	100	65-135
14b,17b-20R-Methylcholestane	44.8	49.2	110	65-135
14b,17b-20S-Methylcholestane	55.4	55.2	100	65-135
14b(H),17b(H)-20R-Ethylcholestane	60.9	64.6	106	65-135
14b(H),17b(H)-20S-Ethylcholestane	40.3	40.5	100	65-135
C26,20R- +C27,20S- triaromatic steroid	293.9	246	84	65-135
C28,20S-triaromatic steroid	187.6	158	84	65-135
C27,20R-triaromatic steroid	180.2	148	82	65-135
C28,20R-triaromatic steroid	150.5	126	84	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

11/19/12 12:43

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
cis/trans-Decalin	479.2	396	83	65-135
C1-Decalins	728.9	722	99	65-135
C2-Decalins	635.5	695	109	65-135
C3-Decalins	329.8	381	115	65-135
C4-Decalins	326.5	435	133	65-135
Benzothiophene	5.4	5.58	103	65-135
C1-Benzo(b)thiophenes	28.9	30.8	107	65-135
C2-Benzo(b)thiophenes	49.6	51.5	104	65-135
C3-Benzo(b)thiophenes	99.0	108	109	65-135
C4-Benzo(b)thiophenes	87.1	101	116	65-135
Naphthalene	555.8	518	93	65-135
C1-Naphthalenes	1167.3	1140	98	65-135
C2-Naphthalenes	1409.7	1460	103	65-135
C3-Naphthalenes	1035.9	1150	111	65-135
C4-Naphthalenes	561.1	671	120	65-135
Biphenyl	145.7	135	93	65-135
Dibenzofuran	51.2	50.5	99	65-135
Acenaphthylene	6.5	7.13	110	65-135
Acenaphthene	18.7	18.0	96	65-135
Fluorene	74.6	71.6	96	65-135
C1-Fluorenes	170.2	176	103	65-135
C2-Fluorenes	255.4	288	113	65-135
C3-Fluorenes	238.5	281	118	65-135
Phenanthrene	212.2	208	98	65-135
C1-Phenanthrenes/Anthracenes	432.7	470	109	65-135
C2-Phenanthrenes/Anthracenes	465.9	543	116	65-135
C3-Phenanthrenes/Anthracenes	317.4	399	126	65-135
C4-Phenanthrenes/Anthracenes	129	164	127	65-135
Dibenzothiophene	138.9	138	99	65-135
C1-Dibenzothiophenes	278.6	300	108	65-135
C2-Dibenzothiophenes	377.5	437	116	65-135
C3-Dibenzothiophenes	341.4	410	120	65-135
C4-Dibenzothiophenes	183.4	232	126	65-135

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Fluoranthene	4.00	4.04	101	65-135
Pyrene	13.0	14.9	115	65-135
C1-Fluoranthenes/Pyrenes	63.1	72.9	116	65-135
C2-Fluoranthenes/Pyrenes	102.2	118	116	65-135
C3-Fluoranthenes/Pyrenes	119.6	146	122	65-135
C4-Fluoranthenes/Pyrenes	104	133	128	65-135
Naphthobenzothiophenes	43.8	44.2	101	65-135
C1-Naphthobenzothiophenes	117.2	123	105	65-135
C2-Naphthobenzothiophenes	163.3	178	109	65-135
C3-Naphthobenzothiophenes	128.7	146	114	65-135
C4-Naphthobenzothiophenes	89.0	110	124	65-135
Benz[a]anthracene	2.1	2.20	105	65-135
Chrysene/Triphenylene	35.2	37.8	107	65-135
C1-Chrysenes	62.8	70.2	112	65-135
C2-Chrysenes	86.0	95.1	111	65-135
C3-Chrysenes	97.6	115	118	65-135
C4-Chrysenes	59.4	74.1	125	65-135
Benzo[b]fluoranthene	5.2	5.18	100	65-135
Benzo[e]pyrene	9.8	9.71	99	65-135
Benzo[a]pyrene	1.9	1.66	87	65-135
Perylene	2.8	2.96	106	65-135
Benzo[g,h,i]perylene	3.1	3.15	102	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Carbazole	6.00	7.94	132	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
4-Methyldibenzothiophene	131.8	142	108	65-135
2/3-Methyldibenzothiophene	97.5	103	106	65-135
1-Methyldibenzothiophene	44.2	47.2	107	65-135
3-Methylphenanthrene	89.4	99.6	111	65-135
2-Methylphenanthrene	97.7	108	110	65-135
2-Methylanthracene	3.2	2.41	75	65-135
9/4-Methylphenanthrene	141.2	152	108	65-135
1-Methylphenanthrene	97.4	107	109	65-135
2-Methylnaphthalene	1081.8	1050	97	65-135
1-Methylnaphthalene	784.8	758	97	65-135
2,6-Dimethylnaphthalene	649.9	624	96	65-135
2,3,5-Trimethylnaphthalene	152	164	108	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C23 Tricyclic Terpane	67.3	57.6	86	65-135
C24 Tricyclic Terpane	43.0	35.7	83	65-135
C25 Tricyclic Terpane	42.0	35.3	84	65-135
C24 Tetracyclic Terpane	14.8	12.3	83	65-135
C26 Tricyclic Terpane-22S	17.7	14.4	81	65-135
C26 Tricyclic Terpane-22R	15.4	13.0	84	65-135
C28 Tricyclic Terpane-22S	16.8	14.5	86	65-135
C28 Tricyclic Terpane-22R	18.1	15.8	87	65-135
C29 Tricyclic Terpane-22S	20.8	17.9	86	65-135
C29 Tricyclic Terpane-22R	22.6	18.1	80	65-135
18a-22,29,30-Trisnorneohopane-TS	31.3	26.7	85	65-135
C30 Tricyclic Terpane-22S	16.2	14.4	89	65-135
C30 Tricyclic Terpane-22R	16.4	14.9	91	65-135
17a(H)-22,29,30-Trisnorhopane-TM	37.8	31.6	84	65-135
17a/b,21b/a 28,30-Bisnorhopane	7.00	7.02	100	65-135
17a(H),21b(H)-25-Norhopane	8.7	7.91	91	65-135
30-Norhopane	99.7	87.9	88	65-135
18a(H)-30-Norneohopane-C29Ts	25.2	23.1	92	65-135
17a(H)-Diahopane	14.2	13.7	96	65-135
30-Normoretane	11.6	9.85	85	65-135
Hopane	173.6	152	88	65-135
Moretane	17.5	14.9	85	65-135
30-Homohopane-22S	75.1	64.1	85	65-135
30-Homohopane-22R	64.1	54.1	84	65-135
30,31-Bishomohopane-22S	53.6	46.1	86	65-135
30,31-Bishomohopane-22R	39.6	33.5	85	65-135
30,31-Trishomohopane-22S	41.8	37.0	88	65-135
30,31-Trishomohopane-22R	27.2	24.5	90	65-135
Tetrakishomohopane-22S	29.8	26.9	90	65-135
Tetrakishomohopane-22R	21.2	19.7	93	65-135
Pentakishomohopane-22S	30.2	27.6	91	65-135
Pentakishomohopane-22R	23.5	24.7	105	65-135
13b(H),17a(H)-20S-Diacholestane	50.0	50.7	101	65-135

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
13b(H),17a(H)-20R-Diacholestane	26.3	26.4	100	65-135
13b,17a-20S-Methyldiacholestane	25.7	20.8	81	65-135
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	65.0	61.2	94	65-135
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	75.8	70.9	94	65-135
Unknown Sterane (S18)	21.3	19.5	91	65-135
13a,17b-20S-Ethyldiacholestane	3.9	4.77	122	65-135
14a,17a-20S-Methylcholestane	37.3	32.0	86	65-135
14a,17a-20R-Methylcholestane	34.5	34.6	100	65-135
14a(H),17a(H)-20S-Ethylcholestane	51.0	43.0	84	65-135
14a(H),17a(H)-20R-Ethylcholestane	39.5	41.2	104	65-135
14b(H),17b(H)-20R-Cholestane	41.5	39.8	96	65-135
14b(H),17b(H)-20S-Cholestane	42.5	39.7	93	65-135
14b,17b-20R-Methylcholestane	44.8	45.2	101	65-135
14b,17b-20S-Methylcholestane	55.4	55.6	100	65-135
14b(H),17b(H)-20R-Ethylcholestane	60.9	62.5	103	65-135
14b(H),17b(H)-20S-Ethylcholestane	40.3	41.0	102	65-135
C26,20R- +C27,20S- triaromatic steroid	293.9	228	77	65-135
C28,20S-triaromatic steroid	187.6	149	80	65-135
C27,20R-triaromatic steroid	180.2	140	78	65-135
C28,20R-triaromatic steroid	150.5	119	79	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form IV
Method Blank Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Date Analyzed: **11/17/12 05:50**

Client ID	Lab ID	Date/Time Analyzed
LCS	SS110612LCS05	11/17/12 07:18
LCSD	SS110612LCSD05	11/17/12 08:46
SEKR3510R018S092112D004_MDL1	1210083-01	11/17/12 10:14
SEKR3510R018S092112D004_MDL2	1210083-02	11/17/12 11:42
SEKR3510R018S092112D004_MDL3	1210083-03	11/17/12 13:11
SEKR3510R018S092112D004_MDL4	1210083-04	11/17/12 14:40
SEKR3510R018S092112D004_MDL5	1210083-05	11/17/12 16:09
SEKR3510R018S092112D004_MDL6	1210083-06	11/17/12 17:37
SEKR3510R018S092112D004_MDL7	1210083-07	11/17/12 19:05

N/A - Not Applicable

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **C211131208**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	**RT**	**Area**	**RT**
Standard:		108515	42.76	47950	26.21
Upper Limit:		217030	43.26	95900	26.71
Lower Limit:		54258	42.26	23975	25.71
Client ID	**Lab ID**				
Blank	SS110612B09	79653	42.76	35406	26.21
LCS	SS110612LCS05	83224	42.75	36962	26.21
LCSD	SS110612LCSD05	77805	42.75	35691	26.21
SEKR3510R018S092112D004_MDL1	1210083-01	97491	42.76	39752	26.21
SEKR3510R018S092112D004_MDL2	1210083-02	98217	42.76	40349	26.20
SEKR3510R018S092112D004_MDL3	1210083-03	96149	42.76	38910	26.21
SEKR3510R018S092112D004_MDL4	1210083-04	95114	42.76	38708	26.21
SEKR3510R018S092112D004_MDL5	1210083-05	92294	42.76	37581	26.21
SEKR3510R018S092112D004_MDL6	1210083-06	107331	42.76	43317	26.21
SEKR3510R018S092112D004_MDL7	1210083-07	96027	42.78	39090	26.21
CCV	C211131209	85688	42.76	38690	26.21

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-01**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	1.71	J	C3-Dibenzothiophenes	317
C1-Decalins	5.83		C4-Dibenzothiophenes	218
C2-Decalins	21.5		Benzo(b)fluorene	155
C3-Decalins	38.2		Fluoranthene	1110
C4-Decalins	86.9		Pyrene	1090
Benzothiophene	1.20	J	C1-Fluoranthenes/Pyrenes	775
C1-Benzo(b)thiophenes	5.85		C2-Fluoranthenes/Pyrenes	411
C2-Benzo(b)thiophenes	20.5		C3-Fluoranthenes/Pyrenes	247
C3-Benzo(b)thiophenes	53.1		C4-Fluoranthenes/Pyrenes	218
C4-Benzo(b)thiophenes	67.5		Naphthobenzothiophenes	206
Naphthalene	28.2		C1-Naphthobenzothiophenes	231
C1-Naphthalenes	35.8		C2-Naphthobenzothiophenes	253
C2-Naphthalenes	115		C3-Naphthobenzothiophenes	192
C3-Naphthalenes	196		C4-Naphthobenzothiophenes	145
C4-Naphthalenes	184		Benz[a]anthracene	592
Biphenyl	8.61		Chrysene/Triphenylene	701
Dibenzofuran	18.4		C1-Chrysenes	410
Acenaphthylene	82.2		C2-Chrysenes	259
Acenaphthene	22.5		C3-Chrysenes	198
Fluorene	39.8		C4-Chrysenes	118
C1-Fluorenes	47.9		Benzo[b]fluoranthene	698
C2-Fluorenes	111		Benzo[j]fluoranthene/Benzo[k]fluoranthene	541
C3-Fluorenes	153		Benzo[a]fluoranthene	139
Anthracene	111		Benzo[e]pyrene	526
Phenanthrene	441		Benzo[a]pyrene	722
C1-Phenanthrenes/Anthracenes	360		Perylene	228
C2-Phenanthrenes/Anthracenes	418		Indeno[1,2,3-cd]pyrene	509
C3-Phenanthrenes/Anthracenes	314		Dibenz[ah]anthracene/Dibenz[ac]anthracene	120
C4-Phenanthrenes/Anthracenes	158		Benzo[g,h,i]perylene	489
Retene	0.185	U		
Dibenzothiophene	49.9			
C1-Dibenzothiophenes	131			
C2-Dibenzothiophenes	272			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	80	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-01**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result
Carbazole	**41.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	80	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-01**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**51.1**
2/3-Methyldibenzothiophene	**45.8**
1-Methyldibenzothiophene	**24.4**
3-Methylphenanthrene	**73.2**
2-Methylphenanthrene	**87.4**
2-Methylanthracene	**29.2**
9/4-Methylphenanthrene	**97.9**
1-Methylphenanthrene	**63.9**
2-Methylnaphthalene	**33.0**
1-Methylnaphthalene	**24.0**
2,6-Dimethylnaphthalene	**45.2**
2,3,5-Trimethylnaphthalene	**27.3**
Naphthobenzothiophene-2,1-D	**136**
Naphthobenzothiophene-1,2-D	**28.9**
Naphthobenzothiophene-2,3-D	**41.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	80	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-01**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	73.3	
C24 Tricyclic Terpane	43.5	
C25 Tricyclic Terpane	60.5	
C24 Tetracyclic Terpane	22.6	
C26 Tricyclic Terpane-22S	20.7	
C26 Tricyclic Terpane-22R	18.1	
C28 Tricyclic Terpane-22S	20.4	
C28 Tricyclic Terpane-22R	25.4	
C29 Tricyclic Terpane-22S	25.1	
C29 Tricyclic Terpane-22R	25.9	
18a-22,29,30-Trisnorneohopane-TS	50.1	
C30 Tricyclic Terpane-22S	21.4	
C30 Tricyclic Terpane-22R	33.9	
17a(H)-22,29,30-Trisnorhopane-TM	83.8	
17a/b,21b/a 28,30-Bisnorhopane	35.3	
17a(H),21b(H)-25-Norhopane	38.6	
30-Norhopane	243	
18a(H)-30-Norneohopane-C29Ts	64.1	
17a(H)-Diahopane	19.5	
30-Normoretane	35.9	
18a(H)&18b(H)-Oleananes	18.4	
Hopane	346	
Moretane	56.4	
30-Homohopane-22S	125	
30-Homohopane-22R	114	
T22a-Gammacerane/C32-diahopane	44.6	
30,31-Bishomohopane-22S	252	G
30,31-Bishomohopane-22R	79.6	

Parameter	Result	
30,31-Trishomohopane-22S	86.8	
30,31-Trishomohopane-22R	40.3	
Tetrakishomohopane-22S	73.2	
Tetrakishomohopane-22R	162	G
Pentakishomohopane-22S	44.8	
Pentakishomohopane-22R	31.8	
13b(H),17a(H)-20S-Diacholestane	48.7	
13b(H),17a(H)-20R-Diacholestane	27.0	
13b,17a-20S-Methyldiacholestane	25.7	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	98.4	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	97.3	
Unknown Sterane (S18)	19.7	
13a,17b-20S-Ethyldiacholestane	5.11	
14a,17a-20S-Methylcholestane	43.2	
14a,17a-20R-Methylcholestane	38.9	
14a(H),17a(H)-20S-Ethylcholestane	66.2	
14a(H),17a(H)-20R-Ethylcholestane	67.7	
14b(H),17b(H)-20R-Cholestane	53.4	
14b(H),17b(H)-20S-Cholestane	52.4	
14b,17b-20R-Methylcholestane	54.8	
14b,17b-20S-Methylcholestane	78.7	
14b(H),17b(H)-20R-Ethylcholestane	123	
14b(H),17b(H)-20S-Ethylcholestane	61.7	
C26,20R- +C27,20S- triaromatic steroid	184	
C28,20S-triaromatic steroid	158	
C27,20R-triaromatic steroid	113	
C28,20R-triaromatic steroid	134	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

K Kofoth 11/19/12

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	39752M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	97491	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	49234	352.114	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.21%#			
42) Phenanthrene-d10	32.100	188	63533	443.499	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.35%#			
83) Benzo[b]fluoranthene-d12	46.690	264	88011	439.462	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.95%#			
88) Benzo[a]pyrene-d12	47.850	264	77463	399.192	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.92%#			
129) 5B(H)Cholane - Surr	43.362	217	18379	478.329	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.83%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	239	7.516	ng/mL	100
5) C1-Decalins	17.814	152	817M5	25.693	ng/mL	
6) C2-Decalins	18.792	166	3010M5	94.660	ng/mL	
7) C3-Decalins	21.623	180	5346M5	168.124	ng/mL	
8) C4-Decalins	24.995	194	12173M5	382.824	ng/mL	
10) Naphthalene	19.304	128	19433	124.279	ng/mL#	100
11) C1-Naphthalenes	22.014	142	24651M5	157.650	ng/mL	
12) C2-Naphthalenes	24.859	156	79488M5	508.347	ng/mL	
13) C3-Naphthalenes	27.539	170	134715M5	861.539	ng/mL	
14) C4-Naphthalenes	29.978	184	126971M5	812.014	ng/mL	
16) 2-Methylnaphthalene	22.014	142	14487	145.465	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	10236	105.776	ng/mL#	100
18) Benzothiophene	19.530	134	685M3	5.299	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	3334M5	25.792	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	11651M5	90.132	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	30266M5	234.137	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	38446M5	297.418	ng/mL	
23) Biphenyl	23.896	154	4774	37.929	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	17890	199.293	ng/mL#	100
25) Dibenzofuran	26.982	168	11266	80.848	ng/mL	93
26) Acenaphthylene	25.597	152	56497	362.401	ng/mL#	100
27) Acenaphthene	26.335	153	9936	99.014	ng/mL	91
28) 2,3,5-Trimethylnaphthalen	27.900	170	10088M3	120.115	ng/mL	
29) Fluorene	28.367	166	19605M3	175.169	ng/mL	
30) C1-Fluorenes	30.746	180	23639M5	211.213	ng/mL	
31) C2-Fluorenes	32.943	194	54581M5	487.678	ng/mL	
32) C3-Fluorenes	34.795	208	75642M5	675.856	ng/mL	
33) Dibenzothiophene	31.694	184	33791	220.014	ng/mL#	73
34) 4-Methyldibenzothiophene(	33.470	198	34567	225.067	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	31026M3	202.011	ng/mL	
36) 1-Methyldibenzothiophene(	34.238	198	16482	107.315	ng/mL#	100
37) OTP	33.862	198	5128M3	33.389	ng/mL	
38) C1-Dibenzothiophenes	33.470	198	94041M5	612.303	ng/mL	
38) C1-Dibenzothiophenes BS	33.470	198	88913m	578.915	ng/mL	
39) C2-Dibenzothiophenes	35.172	212	183888M5	1197.299	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	214271M5	1395.123	ng/mL	
41) C4-Dibenzothiophenes	38.695	240	147336M5	959.308	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.191	178	303894	1944.839	ng/mL	99
44) 3-Methylphenanthrene(3MP)	34.163	192	50362	322.303	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.283	192	60163	385.027	ng/mL	95
46) 2-Methylanthracene(2MA)	34.434	192	20102M3	128.647	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.615	192	67374	431.175	ng/mL	87
48) 1-Methylphenanthrene(1MP)	34.705	192	43982M3	281.473	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.615	192	247870M5	1586.301	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	288154M5	1844.108	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	288154m	1844.108	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	216020M5	1382.469	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	109007M5	697.615	ng/mL	
55) Anthracene	32.371	178	65874M3	487.736	ng/mL	
56) Carbazole	33.064	167	25168	181.063	ng/mL	95
57) 1-Methylphenanthrene	34.705	192	44213M3	370.880	ng/mL	
58) Fluoranthene	36.993	202	844552M3	4894.199	ng/mL	
59) Benzo(b)fluorene	39.523	216	78556M3	683.173	ng/mL	
60) Pyrene	37.882	202	841418	4797.289	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	599097M5	3415.712	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	317810M5	1811.973	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	191093M5	1089.504	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	168700M5	961.832	ng/mL	
66) Naphthobenzothiophene	41.751	234	103765	599.833	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.751	234	103765	599.833	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.098	234	22047	127.447	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	31292M3	180.889	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	176011M5	1017.464	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	192727M5	1114.094	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	146123M5	844.691	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	110345M5	637.870	ng/mL	
75) Benz[a]anthracene	42.685	228	495075M3	2607.784	ng/mL	
77) Chrysene/Triphenylene	42.850	228	603962	3090.124	ng/mL	99
78) C1-Chrysenes	44.341	242	352994M5	1806.066	ng/mL	
79) C2-Chrysenes	46.073	256	226064M5	1156.639	ng/mL	
79) C2-Chrysenes BS	46.073	256	223235m	1142.164	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	2829	14.474	ng/mL	100
81) C3-Chrysenes	47.639	270	170418M5	871.930	ng/mL	
82) C4-Chrysenes	49.100	284	101735M5	520.519	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	678996	3077.063	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	540778	2382.025	ng/mL	94
86) Benzo[a]fluoranthene	47.157	252	139239M3	613.321	ng/mL	
87) Benzo[e]pyrene	47.759	252	498966M4	2315.798	ng/mL	
89) Benzo[a]pyrene	47.940	252	656082	3182.259	ng/mL	96
90) Perylene	48.241	252	219241	1005.642	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.639	276	544335M3	2243.436	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	136586M4	528.679	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	563333	2153.251	ng/mL	100
94) Hopane (T19)	51.690	191	111527	1524.306	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	23615M3	322.760	ng/ml	
97) C24 Tricyclic Terpane (T5	41.104	191	14017M3	191.579	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	19499	266.504	ng/ml	100
99) C24 Tetracyclic Terpane (	43.919	191	7295M3	99.705	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6664M3	91.081	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5831	79.696	ng/ml	100
102) C28 Tricyclic Terpane-22S	46.073	191	6586	90.015	ng/ml	100

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.238	191	8194M3	111.992	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	8099	110.694	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	8335	113.919	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	16162	220.896	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.151	191	6914M3	94.498	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10920	149.250	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	27021M3	369.312	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	11369	155.387	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	12432	169.916	ng/ml	100
112) 30-Norhopane (T15)	50.365	191	78247	1069.448	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	20664M3	282.427	ng/ml	
114) 17a(H)-Diahopane (X)	50.591	191	6287M3	85.928	ng/ml	
115) 30-Normoretane (T17)	51.118	191	11577	158.230	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.509	191	5922	80.940	ng/ml	100
117) Moretane (T20)	52.368	191	18174M3	248.395	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	40268M3	550.367	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	36758	502.394	ng/ml	100
120) Gammacerane/C32-diahopane	54.175	191	14375	196.472	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.898	191G	81071	1108.046	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.319	191	25657	350.670	ng/ml	100
123) 30,31-Trishomohopane-22S	57.006	191	27992	382.583	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	12976	177.351	ng/ml	100
125) Tetrakishomohopane-22S (T	59.581	191	23614M3	322.747	ng/ml	
126) Tetrakishomohopane-22R (T	60.364	191G	52224	713.777	ng/ml	100
127) Pentakishomohopane-22S (T	62.592	191	14453M3	197.538	ng/ml	
128) Pentakishomohopane-22R (T	63.842	191	10252	140.120	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8252M3	214.765	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4572M3	118.990	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	4354M3	113.316	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16661	433.616	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16470	428.645	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3329	86.640	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	865	22.512	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	7319M3	190.483	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6579M3	171.224	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.115	217	11201M3	291.515	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.003	217	11459M3	298.230	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9034M3	235.117	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	8868M3	230.797	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9276	241.416	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13325M3	346.794	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	20784M3	540.921	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	10443M3	271.788	ng/ml	
147) C26,20R- +C27,20S- triaro	49.070	231	31192M3	811.798	ng/mL	
148) C28,20S-triaromatic stero	49.913	231	26778	696.920	ng/mL	100
149) C27,20R-triaromatic stero	50.350	231	19203M4	499.774	ng/mL	
150) C28,20R-triaromatic stero	51.525	231	22662M3	589.797	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

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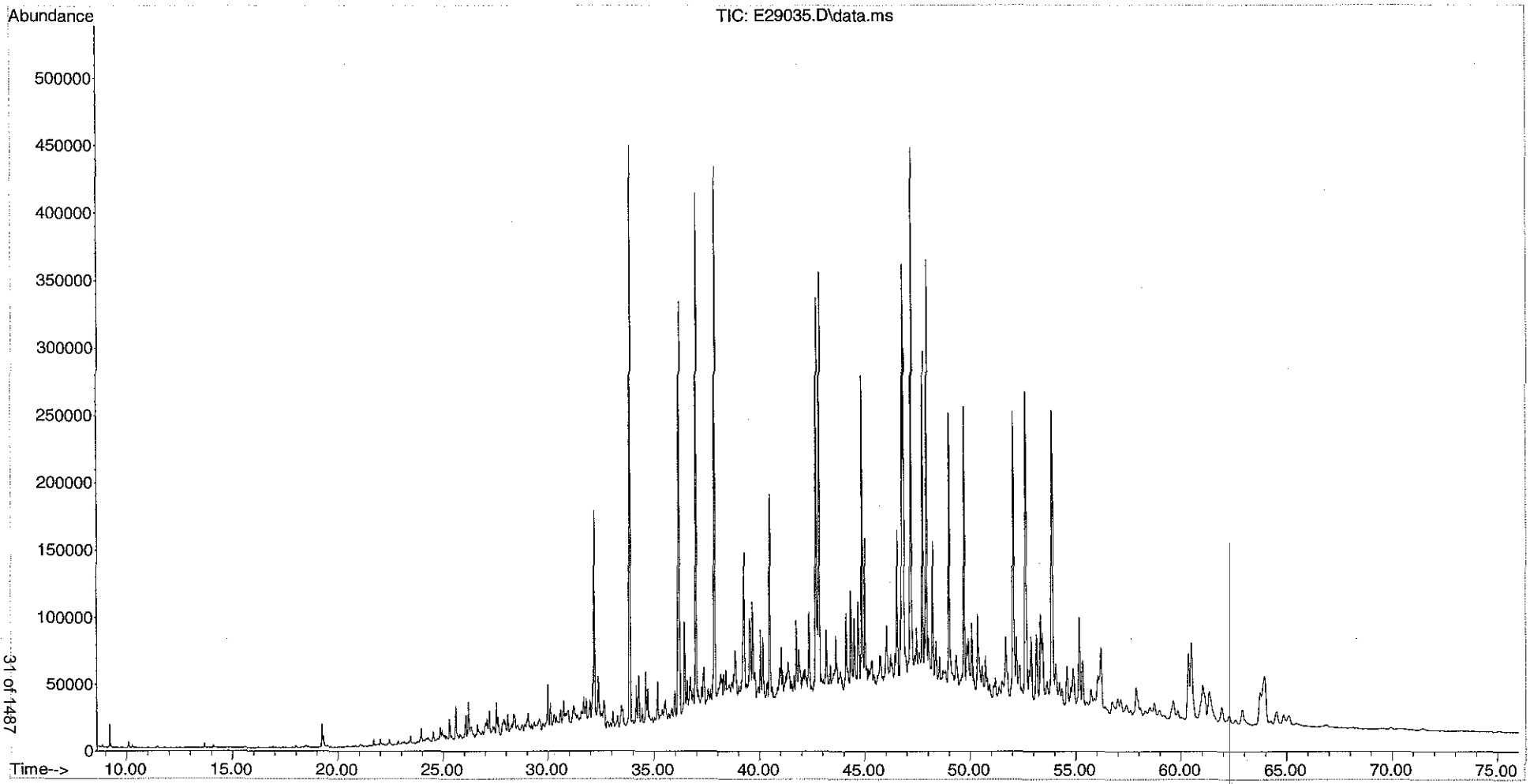
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-02**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	1.68	J	C3-Dibenzothiophenes	304
C1-Decalins	5.51		C4-Dibenzothiophenes	221
C2-Decalins	19.9		Benzo(b)fluorene	144
C3-Decalins	37.0		Fluoranthene	1090
C4-Decalins	88.2		Pyrene	1020
Benzothiophene	0.971	J	C1-Fluoranthenes/Pyrenes	708
C1-Benzo(b)thiophenes	5.72		C2-Fluoranthenes/Pyrenes	378
C2-Benzo(b)thiophenes	21.4		C3-Fluoranthenes/Pyrenes	227
C3-Benzo(b)thiophenes	52.9		C4-Fluoranthenes/Pyrenes	202
C4-Benzo(b)thiophenes	66.7		Naphthobenzothiophenes	184
Naphthalene	22.4		C1-Naphthobenzothiophenes	201
C1-Naphthalenes	33.9		C2-Naphthobenzothiophenes	225
C2-Naphthalenes	109		C3-Naphthobenzothiophenes	194
C3-Naphthalenes	190		C4-Naphthobenzothiophenes	146
C4-Naphthalenes	185		Benz[a]anthracene	558
Biphenyl	7.31		Chrysene/Triphenylene	643
Dibenzofuran	15.6		C1-Chrysenes	350
Acenaphthylene	69.0		C2-Chrysenes	232
Acenaphthene	18.4		C3-Chrysenes	186
Fluorene	33.3		C4-Chrysenes	104
C1-Fluorenes	47.2		Benzo[b]fluoranthene	642
C2-Fluorenes	109		Benzo[j]fluoranthene/Benzo[k]fluoranthene	511
C3-Fluorenes	149		Benzo[a]fluoranthene	123
Anthracene	102		Benzo[e]pyrene	473
Phenanthrene	389		Benzo[a]pyrene	645
C1-Phenanthrenes/Anthracenes	334		Perylene	217
C2-Phenanthrenes/Anthracenes	385		Indeno[1,2,3-cd]pyrene	468
C3-Phenanthrenes/Anthracenes	295		Dibenz[ah]anthracene/Dibenz[ac]anthracene	110
C4-Phenanthrenes/Anthracenes	161		Benzo[g,h,i]perylene	432
Retene	0.186	U		
Dibenzothiophene	45.8			
C1-Dibenzothiophenes	129			
C2-Dibenzothiophenes	258			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	69	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-02**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result
Carbazole	**34.5**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	69	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-02**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**48.0**
2/3-Methyldibenzothiophene	**44.1**
1-Methyldibenzothiophene	**24.0**
3-Methylphenanthrene	**68.6**
2-Methylphenanthrene	**81.9**
2-Methylanthracene	**26.1**
9/4-Methylphenanthrene	**88.5**
1-Methylphenanthrene	**58.5**
2-Methylnaphthalene	**30.6**
1-Methylnaphthalene	**23.6**
2,6-Dimethylnaphthalene	**43.6**
2,3,5-Trimethylnaphthalene	**26.4**
Naphthobenzothiophene-2,1-D	**120**
Naphthobenzothiophene-1,2-D	**26.9**
Naphthobenzothiophene-2,3-D	**37.5**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	69	40-120
Phenanthrene-d10	89	40-120
Benzo[a]pyrene-d12	82	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-02**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**69.6**	
C24 Tricyclic Terpane	**43.7**	
C25 Tricyclic Terpane	**59.0**	
C24 Tetracyclic Terpane	**23.6**	
C26 Tricyclic Terpane-22S	**21.5**	
C26 Tricyclic Terpane-22R	**17.8**	
C28 Tricyclic Terpane-22S	**17.1**	
C28 Tricyclic Terpane-22R	**26.6**	
C29 Tricyclic Terpane-22S	**24.2**	
C29 Tricyclic Terpane-22R	**24.8**	
18a-22,29,30-Trisnorneohopane-TS	**50.7**	
C30 Tricyclic Terpane-22S	**24.0**	
C30 Tricyclic Terpane-22R	**33.1**	
17a(H)-22,29,30-Trisnorhopane-TM	**82.5**	
17a/b,21b/a 28,30-Bisnorhopane	**33.8**	
17a(H),21b(H)-25-Norhopane	**42.2**	
30-Norhopane	**236**	
18a(H)-30-Norneohopane-C29Ts	**64.8**	
17a(H)-Diahopane	**20.0**	
30-Normoretane	**34.8**	
18a(H)&18b(H)-Oleananes	**18.8**	
Hopane	**339**	
Moretane	**49.1**	
30-Homohopane-22S	**124**	
30-Homohopane-22R	**114**	
T22a-Gammacerane/C32-diahopane	**44.6**	
30,31-Bishomohopane-22S	**271**	G
30,31-Bishomohopane-22R	**73.4**	

Parameter	Result	
30,31-Trishomohopane-22S	**87.6**	
30,31-Trishomohopane-22R	**38.1**	
Tetrakishomohopane-22S	**79.9**	
Tetrakishomohopane-22R	**140**	G
Pentakishomohopane-22S	**47.1**	
Pentakishomohopane-22R	**31.5**	
13b(H),17a(H)-20S-Diacholestane	**50.0**	
13b(H),17a(H)-20R-Diacholestane	**26.8**	
13b,17a-20S-Methyldiacholestane	**28.3**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**98.5**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**98.8**	
Unknown Sterane (S18)	**19.6**	
13a,17b-20S-Ethyldiacholestane	**5.03**	
14a,17a-20S-Methylcholestane	**46.9**	
14a,17a-20R-Methylcholestane	**37.2**	
14a(H),17a(H)-20S-Ethylcholestane	**68.0**	
14a(H),17a(H)-20R-Ethylcholestane	**71.2**	
14b(H),17b(H)-20R-Cholestane	**55.7**	
14b(H),17b(H)-20S-Cholestane	**56.4**	
14b,17b-20R-Methylcholestane	**56.9**	
14b,17b-20S-Methylcholestane	**81.3**	
14b(H),17b(H)-20R-Ethylcholestane	**121**	
14b(H),17b(H)-20S-Ethylcholestane	**64.4**	
C26,20R- +C27,20S- triaromatic steroid	**173**	
C28,20S-triaromatic steroid	**175**	
C27,20R-triaromatic steroid	**113**	
C28,20R-triaromatic steroid	**130**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	97	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	40349M3	500.000	ng/mL	-0.01
74) Chrysene-d12	42.760	240	98217	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	49180	346.523	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 34.65%#			
42) Phenanthrene-d10	32.100	188	64994	446.985	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.70%#			
83) Benzo[b]fluoranthene-d12	46.690	264	90756	449.819	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.98%#			
88) Benzo[a]pyrene-d12	47.850	264	80383	411.178	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.12%#			
129) 5B(H)Cholane - Surr	43.362	217	18687	482.750	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.27%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	239	7.405	ng/mL	100
5) C1-Decalins	17.814	152	782M5	24.229	ng/mL	
6) C2-Decalins	19.139	166	2828M5	87.621	ng/mL	
7) C3-Decalins	21.623	180	5246M5	162.538	ng/mL	
8) C4-Decalins	25.010	194	12514M5	387.725	ng/mL	
10) Naphthalene	19.304	128	15588	98.214	ng/mL#	100
11) C1-Naphthalenes	22.014	142	23635M5	148.916	ng/mL	
12) C2-Naphthalenes	24.859	156	76294M5	480.701	ng/mL	
13) C3-Naphthalenes	27.539	170	132767M5	836.518	ng/mL	
14) C4-Naphthalenes	29.978	184	128976M5	812.632	ng/mL	
16) 2-Methylnaphthalene	22.014	142	13591	134.449	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	10194	103.783	ng/mL#	100
18) Benzothiophene	19.530	134	560M3	4.268	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	3297M5	25.128	ng/mL	
20) C2-Benzo(b)thiophenes	24.709	162	12366M5	94.248	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	30498M5	232.441	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	38432M5	292.910	ng/mL	
23) Biphenyl	23.896	154	4103M3	32.116	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	17464	191.669	ng/mL#	100
25) Dibenzofuran	26.982	168	9716M3	68.693	ng/mL	
26) Acenaphthylene	25.597	152	47944	302.988	ng/mL#	100
27) Acenaphthene	26.335	153	8222	80.722	ng/mL	96
28) 2,3,5-Trimethylnaphthalen	27.900	170	9910M3	116.250	ng/mL	
29) Fluorene	28.367	166	16617M3	146.275	ng/mL	
30) C1-Fluorenes	30.746	180	23553M5	207.331	ng/mL	
31) C2-Fluorenes	32.943	194	54456M5	479.362	ng/mL	
32) C3-Fluorenes	34.795	208	74356M5	654.536	ng/mL	
33) Dibenzothiophene	31.694	184	31345	201.068	ng/mL#	67
34) 4-Methyldibenzothiophene(	33.470	198	32886	210.953	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	30212M3	193.801	ng/mL	
36) 1-Methyldibenzothiophene(	34.238	198	16414	105.291	ng/mL#	100
37) OTP	33.862	198	4914M3	31.522	ng/mL	
38) C1-Dibenzothiophenes	33.470	198	93424M5	599.286	ng/mL	
38) C1-Dibenzothiophenes BS	33.470	198	88510m	567.764	ng/mL	
39) C2-Dibenzothiophenes	35.172	212	176475M5	1132.032	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	208148M5	1335.204	ng/mL	
41) C4-Dibenzothiophenes	38.695	240	151492M5	971.774	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43)	Phenanthrene	32.191	178	271011	1708.735	ng/mL	98
44)	3-Methylphenanthrene(3MP)	34.163	192	47841	301.639	ng/mL	100
45)	2-Methylphenanthrene(2MP)	34.283	192	57083	359.911	ng/mL	96
46)	2-Methylanthracene(2MA)	34.434	192	18187	114.670	ng/mL#	40
47)	9/4-Methylphenanthrene(9M	34.615	192	61678	388.882	ng/mL	85
48)	1-Methylphenanthrene(1MP)	34.705	192	40752M3	256.943	ng/mL	
49)	C1-Phenanthrenes/Anthrace	34.283	192	232659M5	1466.924	ng/mL	
50)	C2-Phenanthrenes/Anthrace	36.451	206	268332M5	1691.844	ng/mL	
50)	C2-Phenanthrenes/Anthr BS	36.451	206	268332m	1691.844	ng/mL	
52)	C3-Phenanthrenes/Anthrace	38.303	220	205881M5	1298.088	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.502	234	112098M5	706.782	ng/mL	
55)	Anthracene	32.371	178	61570M3	449.124	ng/mL	
56)	Carbazole	33.064	167	21372	151.479	ng/mL	97
57)	1-Methylphenanthrene	34.705	192	41133M3	339.939	ng/mL	
58)	Fluoranthene	36.993	202	837577	4781.963	ng/mL	100
59)	Benzo(b)fluorene	39.538	216	73888M3	633.070	ng/mL	
60)	Pyrene	37.882	202	798955	4487.791	ng/mL	97
61)	C1-Fluoranthenes/Pyrenes	39.282	216	554127M5	3112.573	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.360	230	296055M5	1662.963	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.257	244	177307M5	995.947	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.567	258	158360M5	889.520	ng/mL	
66)	Naphthobenzothiophene	41.751	234	92584	527.280	ng/ml#	94
67)	Naphthobenzothiophene-2,1	41.751	234	92584	527.280	ng/mL#	94
68)	Naphthobenzothiophene-1,2	42.098	234	20786	118.379	ng/mL#	5
69)	Naphthobenzothiophene-2,3	42.399	234	28945M3	164.846	ng/mL	
70)	C1-Naphthobenzothiophenes	43.167	248	154838M5	881.826	ng/ml	
71)	C2-Naphthobenzothiophenes	45.229	262	173544M5	988.360	ng/ml	
72)	C3-Naphthobenzothiophenes	46.796	276	149550M5	851.710	ng/ml	
73)	C4-Naphthobenzothiophenes	47.850	290	112444M5	640.386	ng/mL	
75)	Benz[a]anthracene	42.700	228	469360M3	2454.056	ng/mL	
77)	Chrysene/Triphenylene	42.850	228	556293	2825.191	ng/mL	98
78)	C1-Chrysenes	44.341	242	302735M5	1537.471	ng/mL	
79)	C2-Chrysenes	46.073	256	203916M5	1035.608	ng/mL	
79)	C2-Chrysenes BS	46.073	256	200901m	1020.296	ng/mL	
80)	BBF-D12 Surr BKGD	46.690	256	3015	15.312	ng/mL	100
81)	C3-Chrysenes	47.639	270	160523M5	815.232	ng/mL	
82)	C4-Chrysenes	49.190	284	90324M5	458.720	ng/mL	
84)	Benzo[b]fluoranthene	46.780	252	627538	2822.846	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	46.841	252	513778	2246.366	ng/mL	94
86)	Benzo[a]fluoranthene	47.157	252	123184M3	538.591	ng/mL	
87)	Benzo[e]pyrene	47.759	252	451285M4	2079.019	ng/mL	
89)	Benzo[a]pyrene	47.940	252	589043	2835.974	ng/mL	96
90)	Perylene	48.241	252	209780	955.133	ng/mL	94
91)	Indeno[1,2,3-cd]pyrene	52.639	276	502245M3	2054.665	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.669	278	126086M3	484.430	ng/mL	
93)	Benzo[g,h,i]perylene	53.904	276	500623	1899.407	ng/mL	100
94)	Hopane (T19)	51.705	191	109901	1490.979	ng/mL#	85
96)	C23 Tricyclic Terpane (T4	40.381	191	22560M3	306.062	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.104	191	14162M3	192.130	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.655	191	19117M3	259.352	ng/ml	
99)	C24 Tetracyclic Terpane (	43.919	191	7629M3	103.499	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.678	191	6979M3	94.681	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.769	191	5748M3	77.981	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.073	191	5551M3	75.308	ng/ml	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.238	191	8623	116.985	ng/ml	100
104) C29 Tricyclic Terpane-22S	46.765	191	7836	106.308	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	8022M3	108.831	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.030	191	16414	222.682	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.151	191	7781M3	105.561	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10715	145.366	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	26729M3	362.621	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10939	148.405	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	13670	185.455	ng/ml	100
112) 30-Norhopane (T15)	50.365	191	76309	1035.251	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	21003M3	284.939	ng/ml	
114) 17a(H)-Diahopane (X)	50.591	191	6492M3	88.074	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11273	152.936	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.509	191	6100	82.756	ng/ml	100
117) Moretane (T20)	52.368	191	15913M3	215.885	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	40092M3	543.911	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	36973	501.597	ng/ml	100
120) Gammacerane/C32-diahopane	54.175	191	14441	195.915	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.913	191G	87694M3	1189.707	ng/ml	
122) 30,31-Bishomohopane-22R (	55.319	191	23777	322.572	ng/ml	100
123) 30,31-Trishomohopane-22S	57.006	191	28387M3	385.114	ng/ml	
124) 30,31-Trishomohopane-22R	57.608	191	12347	167.506	ng/ml	100
125) Tetrakishomohopane-22S (T	59.581	191	25880	351.103	ng/ml	100
126) Tetrakishomohopane-22R (T	60.364	191G	45261	614.036	ng/ml	100
127) Pentakishomohopane-22S (T	62.592	191	15266	207.107	ng/ml	100
128) Pentakishomohopane-22R (T	63.842	191	10217	138.610	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8509M3	219.817	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4567M3	117.981	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.028	217	4811M3	124.285	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16761	432.994	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16806	434.157	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3325	85.896	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	855	22.088	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	7985M3	206.280	ng/ml	
138) 14a,17a-20R-Methylcholest	48.768	217	6328M3	163.474	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.115	217	11558M3	298.583	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.003	217	12104M3	312.688	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9482M3	244.953	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	9592M3	247.794	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9686	250.223	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13833M3	357.354	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	20643M3	533.280	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	10950M3	282.876	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	29475	761.441	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	29713	767.589	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	19154	494.814	ng/mL	100
150) C28,20R-triaromatic stero	51.525	231	22056M3	569.783	ng/mL	

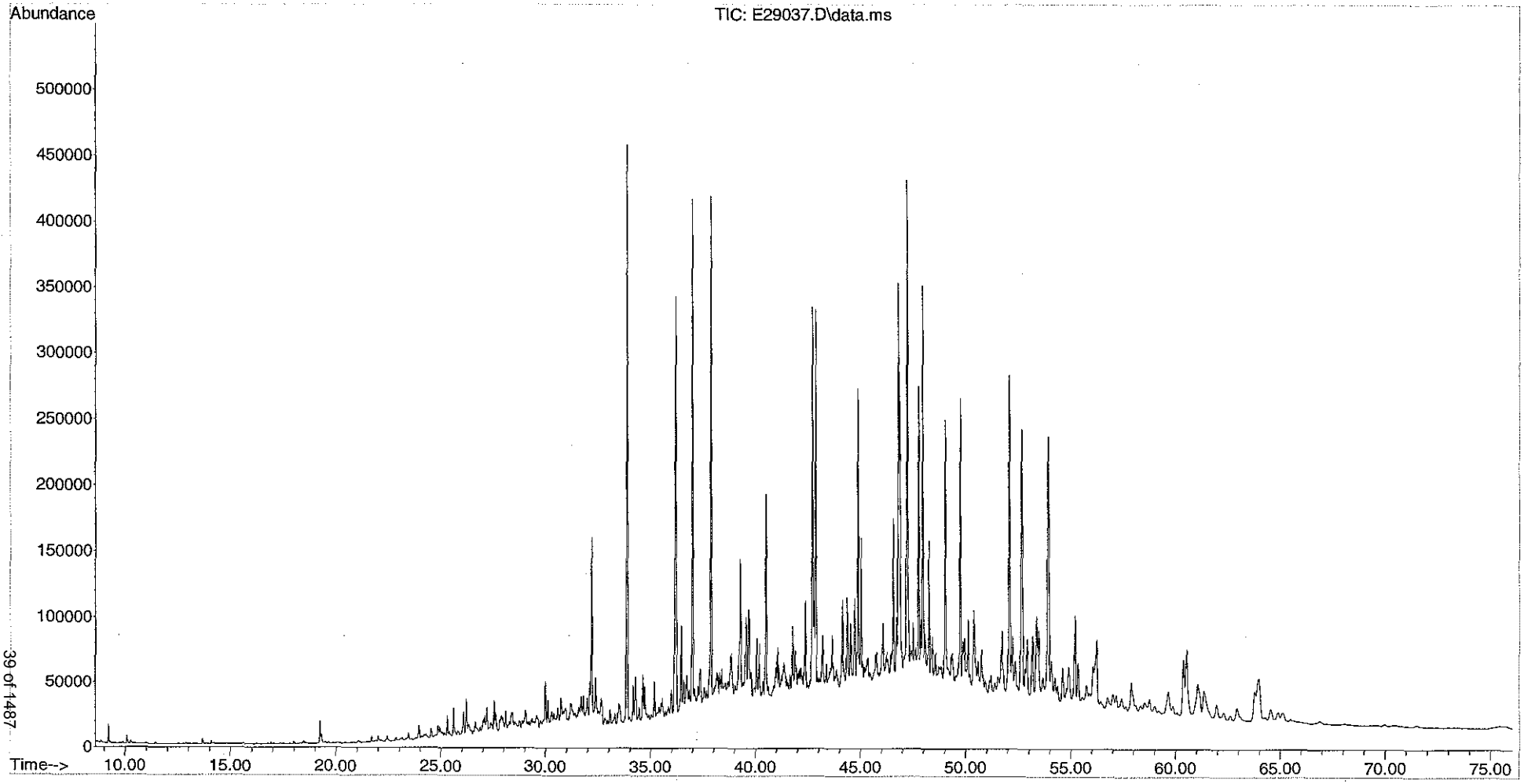
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-03**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.01	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**1.81**	J	C3-Dibenzothiophenes	**320**
C1-Decalins	**6.13**		C4-Dibenzothiophenes	**222**
C2-Decalins	**22.6**		Benzo(b)fluorene	**116**
C3-Decalins	**40.4**		Fluoranthene	**978**
C4-Decalins	**96.4**		Pyrene	**923**
Benzothiophene	**1.02**	J	C1-Fluoranthenes/Pyrenes	**613**
C1-Benzo(b)thiophenes	**5.93**		C2-Fluoranthenes/Pyrenes	**353**
C2-Benzo(b)thiophenes	**22.6**		C3-Fluoranthenes/Pyrenes	**231**
C3-Benzo(b)thiophenes	**55.2**		C4-Fluoranthenes/Pyrenes	**209**
C4-Benzo(b)thiophenes	**68.2**		Naphthobenzothiophenes	**171**
Naphthalene	**24.6**		C1-Naphthobenzothiophenes	**194**
C1-Naphthalenes	**36.4**		C2-Naphthobenzothiophenes	**240**
C2-Naphthalenes	**114**		C3-Naphthobenzothiophenes	**198**
C3-Naphthalenes	**195**		C4-Naphthobenzothiophenes	**152**
C4-Naphthalenes	**188**		Benz[a]anthracene	**464**
Biphenyl	**6.91**		Chrysene/Triphenylene	**570**
Dibenzofuran	**18.2**		C1-Chrysenes	**326**
Acenaphthylene	**58.5**		C2-Chrysenes	**220**
Acenaphthene	**18.9**		C3-Chrysenes	**198**
Fluorene	**37.0**		C4-Chrysenes	**103**
C1-Fluorenes	**46.6**		Benzo[b]fluoranthene	**568**
C2-Fluorenes	**111**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**472**
C3-Fluorenes	**148**		Benzo[a]fluoranthene	**108**
Anthracene	**92.9**		Benzo[e]pyrene	**429**
Phenanthrene	**388**		Benzo[a]pyrene	**577**
C1-Phenanthrenes/Anthracenes	**305**		Perylene	**204**
C2-Phenanthrenes/Anthracenes	**368**		Indeno[1,2,3-cd]pyrene	**429**
C3-Phenanthrenes/Anthracenes	**310**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**99.0**
C4-Phenanthrenes/Anthracenes	**165**		Benzo[g,h,i]perylene	**399**
Retene	0.186	U		
Dibenzothiophene	**47.5**			
C1-Dibenzothiophenes	**126**			
C2-Dibenzothiophenes	**259**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	84	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-03**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.01	2	1	AC

Parameter	Result
Carbazole	**36.6**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	84	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-03**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.01	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**49.2**
2/3-Methyldibenzothiophene	**43.2**
1-Methyldibenzothiophene	**24.7**
3-Methylphenanthrene	**62.5**
2-Methylphenanthrene	**73.7**
2-Methylanthracene	**22.2**
9/4-Methylphenanthrene	**86.5**
1-Methylphenanthrene	**49.9**
2-Methylnaphthalene	**33.0**
1-Methylnaphthalene	**25.4**
2,6-Dimethylnaphthalene	**45.8**
2,3,5-Trimethylnaphthalene	**20.8**
Naphthobenzothiophene-2,1-D	**113**
Naphthobenzothiophene-1,2-D	**24.4**
Naphthobenzothiophene-2,3-D	**34.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	84	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-03**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.01	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**79.0**	
C24 Tricyclic Terpane	**44.9**	
C25 Tricyclic Terpane	**65.2**	
C24 Tetracyclic Terpane	**23.7**	
C26 Tricyclic Terpane-22S	**22.0**	
C26 Tricyclic Terpane-22R	**18.9**	
C28 Tricyclic Terpane-22S	**20.2**	
C28 Tricyclic Terpane-22R	**29.2**	
C29 Tricyclic Terpane-22S	**26.2**	
C29 Tricyclic Terpane-22R	**26.8**	
18a-22,29,30-Trisnorneohopane-TS	**53.0**	
C30 Tricyclic Terpane-22S	**24.4**	
C30 Tricyclic Terpane-22R	**32.8**	
17a(H)-22,29,30-Trisnorhopane-TM	**87.1**	
17a/b,21b/a 28,30-Bisnorhopane	**33.9**	
17a(H),21b(H)-25-Norhopane	**44.2**	
30-Norhopane	**245**	
18a(H)-30-Norneohopane-C29Ts	**65.6**	
17a(H)-Diahopane	**21.1**	
30-Normoretane	**37.0**	
18a(H)&18b(H)-Oleananes	**19.0**	
Hopane	**353**	
Moretane	**56.4**	
30-Homohopane-22S	**131**	
30-Homohopane-22R	**116**	
T22a-Gammacerane/C32-diahopane	**43.1**	
30,31-Bishomohopane-22S	**276**	G
30,31-Bishomohopane-22R	**77.9**	

Parameter	Result	
30,31-Trishomohopane-22S	**92.3**	
30,31-Trishomohopane-22R	**41.1**	
Tetrakishomohopane-22S	**74.5**	
Tetrakishomohopane-22R	**140**	G
Pentakishomohopane-22S	**49.7**	
Pentakishomohopane-22R	**34.4**	
13b(H),17a(H)-20S-Diacholestane	**52.9**	
13b(H),17a(H)-20R-Diacholestane	**27.0**	
13b,17a-20S-Methyldiacholestane	**30.1**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**102**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**99.5**	
Unknown Sterane (S18)	**21.0**	
13a,17b-20S-Ethyldiacholestane	**5.65**	
14a,17a-20S-Methylcholestane	**48.4**	
14a,17a-20R-Methylcholestane	**40.8**	
14a(H),17a(H)-20S-Ethylcholestane	**68.7**	
14a(H),17a(H)-20R-Ethylcholestane	**72.2**	
14b(H),17b(H)-20R-Cholestane	**58.4**	
14b(H),17b(H)-20S-Cholestane	**59.6**	
14b,17b-20R-Methylcholestane	**58.0**	
14b,17b-20S-Methylcholestane	**82.6**	
14b(H),17b(H)-20R-Ethylcholestane	**127**	
14b(H),17b(H)-20S-Ethylcholestane	**67.4**	
C26,20R- +C27,20S- triaromatic steroid	**188**	
C28,20S-triaromatic steroid	**188**	
C27,20R-triaromatic steroid	**121**	
C28,20R-triaromatic steroid	**139**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	97	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	38910M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	96149	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	49282	360.084	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.01%#			
42) Phenanthrene-d10	32.100	188	63866	455.471	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.55%#			
83) Benzo[b]fluoranthene-d12	46.690	264	89725	454.274	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.43%#			
88) Benzo[a]pyrene-d12	47.850	264	80732	421.845	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.18%#			
129) 5B(H)Cholane - Surr	43.377	217	18337	483.897	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.39%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	248	7.968	ng/mL	100
5) C1-Decalins	17.814	152	839M5	26.956	ng/mL	
6) C2-Decalins	19.139	166	3097M5	99.504	ng/mL	
7) C3-Decalins	21.622	180	5530M5	177.674	ng/mL	
8) C4-Decalins	25.010	194	13200M5	424.104	ng/mL	
10) Naphthalene	19.304	128	16559	108.191	ng/mL#	100
11) C1-Naphthalenes	22.014	142	24520M5	160.205	ng/mL	
12) C2-Naphthalenes	24.859	156	76971M5	502.902	ng/mL	
13) C3-Naphthalenes	27.539	170	131442M5	858.797	ng/mL	
14) C4-Naphthalenes	29.978	184	126474M5	826.338	ng/mL	
16) 2-Methylnaphthalene	22.014	142	14156	145.218	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	10593	111.834	ng/mL#	100
18) Benzothiophene	19.530	134	569M3	4.497	ng/mL	
19) C1-Benzo(b)thiophenes	22.405	148	3301M5	26.089	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	12566M5	99.314	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	30682M5	242.492	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	37967M5	300.068	ng/mL	
23) Biphenyl	23.896	154	3743M4	30.381	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	17690	201.329	ng/mL#	100
25) Dibenzofuran	26.982	168	10904M3	79.943	ng/mL	
26) Acenaphthylene	25.597	152	39245	257.185	ng/mL#	100
27) Acenaphthene	26.335	153	8145	82.923	ng/mL	97
28) 2,3,5-Trimethylnaphthalen	27.900	170	7525M3	91.537	ng/mL	
29) Fluorene	28.367	166	17809M3	162.566	ng/mL	
30) C1-Fluorenes	30.745	180	22422M5	204.674	ng/mL	
31) C2-Fluorenes	32.943	194	53255M5	486.127	ng/mL	
32) C3-Fluorenes	34.795	208	71530M5	652.946	ng/mL	
33) Dibenzothiophene	31.694	184	31398	208.857	ng/mL#	76
34) 4-Methyldibenzothiophene(	33.485	198	32545	216.487	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	28543M3	189.866	ng/mL	
36) 1-Methyldibenzothiophene(	34.238	198	16305	108.460	ng/mL#	100
37) OTP	33.862	198	5343M3	35.541	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	88949M5	591.682	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	83606m	556.140	ng/mL	
39) C2-Dibenzothiophenes	35.172	212	171482M5	1140.685	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	211257M5	1405.265	ng/mL	
41) C4-Dibenzothiophenes	38.695	240	146930M5	977.367	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.191	178	260594	1703.820	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.163	192	42057	274.978	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.283	192	49536	323.877	ng/mL	95
46) 2-Methylanthracene(2MA)	34.434	192	14901M3	97.426	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.615	192	58211	380.596	ng/mL	91
48) 1-Methylphenanthrene(1MP)	34.705	192	33584M3	219.579	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	204822M5	1339.171	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	247209M5	1616.306	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	247209m	1616.306	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	208194M5	1361.218	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	110968M5	725.533	ng/mL	
55) Anthracene	32.371	178	53994M3	408.426	ng/mL	
56) Carbazole	33.064	167	21892	160.903	ng/mL	100
57) 1-Methylphenanthrene	34.705	192	33676M3	288.604	ng/mL	
58) Fluoranthene	36.993	202	726217M3	4299.514	ng/mL	
59) Benzo(b)fluorene	39.538	216	57477M3	510.674	ng/mL	
60) Pyrene	37.882	202	696927	4059.468	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	462739M5	2695.367	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	266572M5	1552.732	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	174696M5	1017.571	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	157983M5	920.221	ng/mL	
66) Naphthobenzothiophene	41.751	234	84061	496.446	ng/mL#	92
67) Naphthobenzothiophene-2,1	41.751	234	84061	496.446	ng/mL#	92
68) Naphthobenzothiophene-1,2	42.097	234	18203	107.503	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	25368M3	149.818	ng/mL	
70) C1-Naphthobenzothiophenes	43.166	248	144717M5	854.666	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	178391M5	1053.537	ng/ml	
72) C3-Naphthobenzothiophenes	46.810	276	147202M5	869.342	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	113289M5	669.060	ng/mL	
75) Benz[a]anthracene	42.700	228	382421M3	2042.500	ng/mL	
77) Chrysene/Triphenylene	42.850	228	483474	2508.183	ng/mL	99
78) C1-Chrysenes	44.341	242	276071M5	1432.211	ng/mL	
79) C2-Chrysenes	46.073	256	189338M5	982.254	ng/mL	
79) C2-Chrysenes BS	46.073	256	186267m	966.322	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	3071	15.932	ng/mL	100
81) C3-Chrysenes	47.639	270	167729M5	870.150	ng/mL	
82) C4-Chrysenes	49.190	284	87572M5	454.309	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	543658	2498.129	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	464775M3	2075.820	ng/mL	
86) Benzo[a]fluoranthene	47.157	252	106399M3	475.209	ng/mL	
87) Benzo[e]pyrene	47.759	252	400764M4	1885.984	ng/mL	
89) Benzo[a]pyrene	47.940	252	515681	2536.169	ng/mL	96
90) Perylene	48.241	252	192573	895.647	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.639	276	451266M3	1885.818	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	110861M4	435.095	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	452893	1755.273	ng/mL	100
94) Hopane (T19)	51.705	191	111915	1550.959	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	25083	347.609	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.104	191	14252M3	197.509	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	20697	286.827	ng/ml	100
99) C24 Tetracyclic Terpane (	43.919	191	7528M3	104.326	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6968M3	96.565	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5991	83.025	ng/ml	100
102) C28 Tricyclic Terpane-22S	46.088	191	6425M3	89.040	ng/ml	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.238	191	9281M3	128.619	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	8310	115.163	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	8495	117.727	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	16819	233.084	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.151	191	7757M3	107.499	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10417	144.363	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.557	191	27630M3	382.907	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10764M3	149.171	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.536	191	14025	194.364	ng/ml	100
112) 30-Norhopane (T15)	50.365	191	77614	1075.603	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	20800	288.254	ng/ml	100
114) 17a(H)-Diahopane (X)	50.606	191	6696M3	92.796	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11730	162.559	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.524	191	6033	83.607	ng/ml	100
117) Moretane (T20)	52.368	191	17910M3	248.203	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	41463M3	574.609	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	36825	510.334	ng/ml	100
120) Gammacerane/C32-diahopane	54.190	191	13684M3	189.638	ng/mL	
121) 30,31-Bishomohopane-22S (	54.913	191G	87548M2	1213.272	ng/ml	
122) 30,31-Bishomohopane-22R (	55.319	191	24717	342.537	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	29281	405.787	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	13028M3	180.547	ng/ml	
125) Tetrakishomohopane-22S (T	59.596	191	23630M3	327.473	ng/ml	
126) Tetrakishomohopane-22R (T	60.364	191G	44256	613.316	ng/ml	100
127) Pentakishomohopane-22S (T	62.607	191	15776	218.630	ng/ml	100
128) Pentakishomohopane-22R (T	63.857	191	10912	151.222	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8814	232.593	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4490M3	118.487	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	5018M3	132.420	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16979	448.060	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16582	437.584	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3499	92.335	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	942	24.859	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	8063M3	212.775	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6801M3	179.472	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	11453M3	302.234	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	12024M3	317.302	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9733M3	256.845	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	9936M3	262.202	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9657	254.839	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13767M3	363.298	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	21169M3	558.630	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	11226M3	296.244	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	31373	827.905	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	31350	827.298	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	20121	530.975	ng/mL	100
150) C28,20R-triaromatic stero	51.524	231	23165M3	611.303	ng/mL	

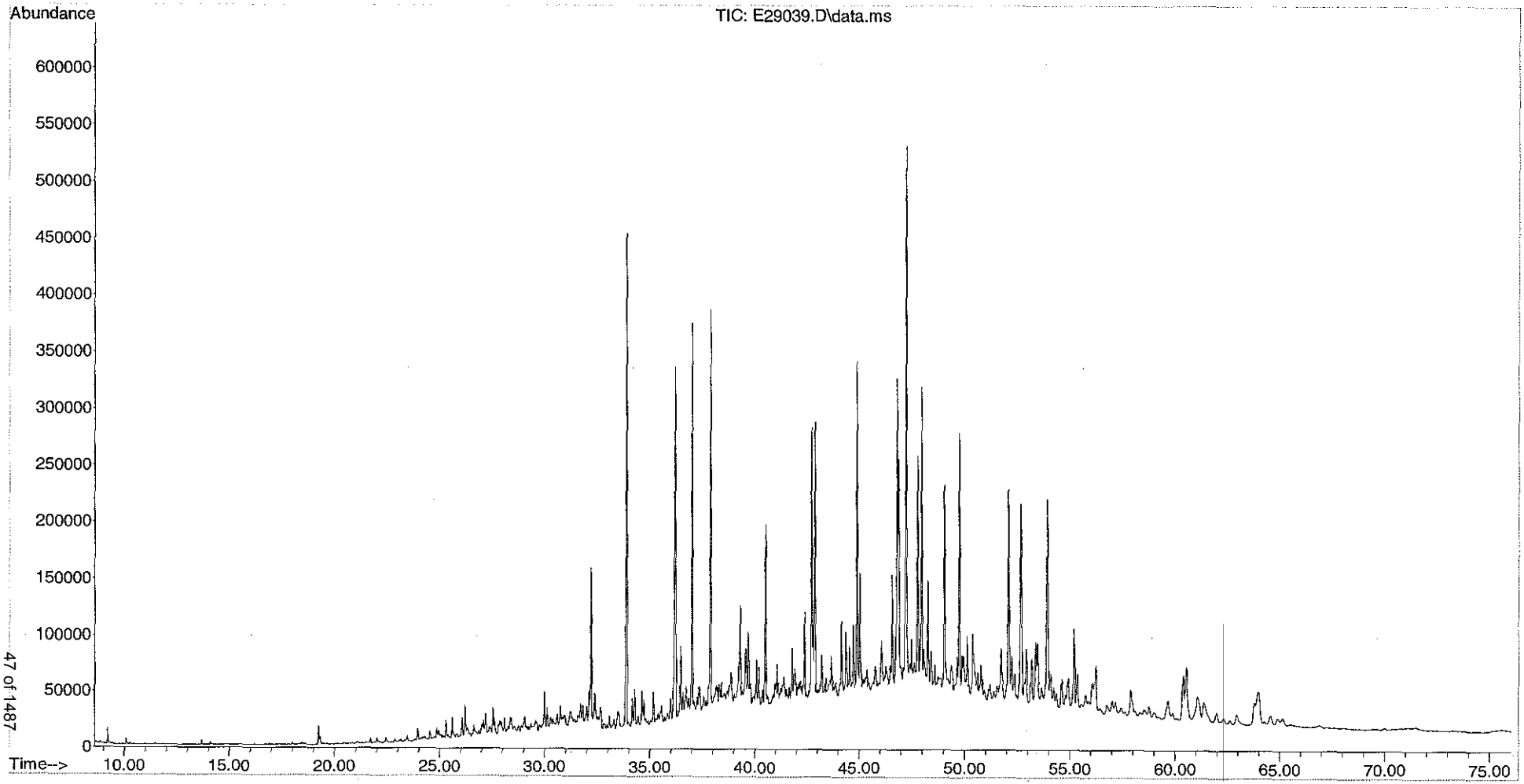
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-04**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**1.64**	J	C3-Dibenzothiophenes	**292**
C1-Decalins	**5.10**		C4-Dibenzothiophenes	**208**
C2-Decalins	**19.5**		Benzo(b)fluorene	**116**
C3-Decalins	**36.8**		Fluoranthene	**1020**
C4-Decalins	**84.6**		Pyrene	**961**
Benzothiophene	**1.11**	J	C1-Fluoranthenes/Pyrenes	**608**
C1-Benzo(b)thiophenes	**5.83**		C2-Fluoranthenes/Pyrenes	**325**
C2-Benzo(b)thiophenes	**20.9**		C3-Fluoranthenes/Pyrenes	**208**
C3-Benzo(b)thiophenes	**54.0**		C4-Fluoranthenes/Pyrenes	**190**
C4-Benzo(b)thiophenes	**66.2**		Naphthobenzothiophenes	**162**
Naphthalene	**31.7**		C1-Naphthobenzothiophenes	**185**
C1-Naphthalenes	**39.5**		C2-Naphthobenzothiophenes	**213**
C2-Naphthalenes	**114**		C3-Naphthobenzothiophenes	**177**
C3-Naphthalenes	**190**		C4-Naphthobenzothiophenes	**150**
C4-Naphthalenes	**181**		Benz[a]anthracene	**477**
Biphenyl	**7.46**		Chrysene/Triphenylene	**575**
Dibenzofuran	**22.4**		C1-Chrysenes	**306**
Acenaphthylene	**48.7**		C2-Chrysenes	**200**
Acenaphthene	**31.8**		C3-Chrysenes	**184**
Fluorene	**47.2**		C4-Chrysenes	**96.4**
C1-Fluorenes	**46.3**		Benzo[b]fluoranthene	**552**
C2-Fluorenes	**104**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**477**
C3-Fluorenes	**148**		Benzo[a]fluoranthene	**101**
Anthracene	**100**		Benzo[e]pyrene	**426**
Phenanthrene	**451**		Benzo[a]pyrene	**563**
C1-Phenanthrenes/Anthracenes	**320**		Perylene	**195**
C2-Phenanthrenes/Anthracenes	**351**		Indeno[1,2,3-cd]pyrene	**416**
C3-Phenanthrenes/Anthracenes	**279**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**98.7**
C4-Phenanthrenes/Anthracenes	**152**		Benzo[g,h,i]perylene	**392**
Retene	0.185	U		
Dibenzothiophene	**49.7**			
C1-Dibenzothiophenes	**125**			
C2-Dibenzothiophenes	**246**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	79	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-04**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result
Carbazole	**45.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	79	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-04**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**48.6**
2/3-Methyldibenzothiophene	**42.5**
1-Methyldibenzothiophene	**24.3**
3-Methylphenanthrene	**67.6**
2-Methylphenanthrene	**77.8**
2-Methylanthracene	**21.7**
9/4-Methylphenanthrene	**89.0**
1-Methylphenanthrene	**54.1**
2-Methylnaphthalene	**35.6**
1-Methylnaphthalene	**27.4**
2,6-Dimethylnaphthalene	**45.6**
2,3,5-Trimethylnaphthalene	**21.0**
Naphthobenzothiophene-2,1-D	**110**
Naphthobenzothiophene-1,2-D	**24.3**
Naphthobenzothiophene-2,3-D	**27.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	79	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-04**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.04	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**72.9**	
C24 Tricyclic Terpane	**45.1**	
C25 Tricyclic Terpane	**66.8**	
C24 Tetracyclic Terpane	**22.6**	
C26 Tricyclic Terpane-22S	**19.9**	
C26 Tricyclic Terpane-22R	**17.7**	
C28 Tricyclic Terpane-22S	**18.8**	
C28 Tricyclic Terpane-22R	**23.1**	
C29 Tricyclic Terpane-22S	**23.7**	
C29 Tricyclic Terpane-22R	**24.0**	
18a-22,29,30-Trisnorneohopane-TS	**50.2**	
C30 Tricyclic Terpane-22S	**23.2**	
C30 Tricyclic Terpane-22R	**34.6**	
17a(H)-22,29,30-Trisnorhopane-TM	**84.1**	
17a/b,21b/a 28,30-Bisnorhopane	**32.7**	
17a(H),21b(H)-25-Norhopane	**38.0**	
30-Norhopane	**230**	
18a(H)-30-Norneohopane-C29Ts	**64.3**	
17a(H)-Diahopane	**18.7**	
30-Normoretane	**34.8**	
18a(H)&18b(H)-Oleananes	**16.6**	
Hopane	**321**	
Moretane	**48.9**	
30-Homohopane-22S	**122**	
30-Homohopane-22R	**109**	
T22a-Gammacerane/C32-diahopane	**44.1**	
30,31-Bishomohopane-22S	**256**	G
30,31-Bishomohopane-22R	**67.0**	

Parameter	Result	
30,31-Trishomohopane-22S	**85.9**	
30,31-Trishomohopane-22R	**38.0**	
Tetrakishomohopane-22S	**62.3**	
Tetrakishomohopane-22R	**89.1**	G
Pentakishomohopane-22S	**45.7**	
Pentakishomohopane-22R	**32.6**	
13b(H),17a(H)-20S-Diacholestane	**51.4**	
13b(H),17a(H)-20R-Diacholestane	**26.3**	
13b,17a-20S-Methyldiacholestane	**30.0**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**97.1**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**98.5**	
Unknown Sterane (S18)	**18.6**	
13a,17b-20S-Ethyldiacholestane	**5.57**	
14a,17a-20S-Methylcholestane	**38.4**	
14a,17a-20R-Methylcholestane	**35.6**	
14a(H),17a(H)-20S-Ethylcholestane	**63.3**	
14a(H),17a(H)-20R-Ethylcholestane	**67.2**	
14b(H),17b(H)-20R-Cholestane	**55.5**	
14b(H),17b(H)-20S-Cholestane	**54.3**	
14b,17b-20R-Methylcholestane	**53.9**	
14b,17b-20S-Methylcholestane	**78.6**	
14b(H),17b(H)-20R-Ethylcholestane	**114**	
14b(H),17b(H)-20S-Ethylcholestane	**70.1**	
C26,20R- +C27,20S- triaromatic steroid	**170**	
C28,20S-triaromatic steroid	**173**	
C27,20R-triaromatic steroid	**111**	
C28,20R-triaromatic steroid	**127**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	93	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	38708	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	95114	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	47585	349.499	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 34.95%#			
42) Phenanthrene-d10	32.100	188	61631	441.825	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.18%#			
83) Benzo[b]fluoranthene-d12	46.705	264	85641	438.315	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.83%#			
88) Benzo[a]pyrene-d12	47.850	264	75200	397.215	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.72%#			
129) 5B(H)Cholane - Surr	43.377	217	17401	464.193	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.42%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	224M3	7.234	ng/mL	
5) C1-Decalins	17.814	152	696M5	22.479	ng/mL	
6) C2-Decalins	19.139	166	2659M5	85.877	ng/mL	
7) C3-Decalins	21.623	180	5020M5	162.130	ng/mL	
8) C4-Decalins	25.010	194	11548M5	372.963	ng/mL	
10) Naphthalene	19.304	128	21271	139.703	ng/mL#	100
11) C1-Naphthalenes	22.014	142	26498M5	174.032	ng/mL	
12) C2-Naphthalenes	24.859	156	76760M5	504.141	ng/mL	
13) C3-Naphthalenes	27.554	170	127686M5	838.611	ng/mL	
14) C4-Naphthalenes	29.978	184	121290M5	796.603	ng/mL	
16) 2-Methylnaphthalene	22.014	142	15218	156.927	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	11364	120.600	ng/mL#	100
18) Benzothiophene	19.530	134	618M3	4.910	ng/mL	
19) C1-Benzo(b)thiophenes	22.406	148	3232M5	25.677	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	11597M5	92.134	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	29941M5	237.870	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	36709M5	291.639	ng/mL	
23) Biphenyl	23.896	154	4028M4	32.865	ng/mL	
24) 2,6-Dimethylnaphthalene	24.528	156	17552	200.801	ng/mL#	100
25) Dibenzofuran	26.982	168	13412	98.844	ng/mL#	93
26) Acenaphthylene	25.597	152	32579	214.615	ng/mL#	100
27) Acenaphthene	26.335	153	13685M3	140.052	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.900	170	7560M3	92.443	ng/mL	
29) Fluorene	28.367	166	22675M3	208.064	ng/mL	
30) C1-Fluorenes	30.746	180	22234M5	204.017	ng/mL	
31) C2-Fluorenes	32.959	194	49880M5	457.695	ng/mL	
32) C3-Fluorenes	34.795	208	70913M5	650.692	ng/mL	
33) Dibenzothiophene	31.694	184	32773	219.141	ng/mL#	77
34) 4-Methyldibenzothiophene(	33.486	198	32029	214.166	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	27987M3	187.139	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	16007	107.033	ng/mL#	100
37) OTP	33.862	198	5301M3	35.446	ng/mL	
38) C1-Dibenzothiophenes	33.486	198	87872M5	587.568	ng/mL	
38) C1-Dibenzothiophenes BS	33.486	198	82571m	552.122	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	162180M5	1084.438	ng/mL	
40) C3-Dibenzothiophenes	36.994	226	192285M5	1285.739	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	137145M5	917.038	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.191	178	302367	1987.258	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.163	192	45307	297.773	ng/mL	99
45) 2-Methylphenanthrene(2MP)	34.283	192	52175	342.912	ng/mL	96
46) 2-Methylanthracene(2MA)	34.434	192	14531	95.503	ng/mL#	42
47) 9/4-Methylphenanthrene(9M	34.630	192	59632	391.922	ng/mL	85
48) 1-Methylphenanthrene(1MP)	34.720	192	36288M3	238.497	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	214227M5	1407.972	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.452	206	235566M5	1548.219	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.452	206	235566m	1548.219	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	187163M5	1230.098	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	102239M5	671.949	ng/mL	
55) Anthracene	32.387	178	58259M3	442.988	ng/mL	
56) Carbazole	33.064	167	27063	199.947	ng/mL	96
57) 1-Methylphenanthrene	34.720	192	36123M3	311.190	ng/mL	
58) Fluoranthene	36.994	202	756731	4503.550	ng/mL	100
59) Benzo(b)fluorene	39.538	216	57270M3	511.490	ng/mL	
60) Pyrene	37.882	202	722866	4232.531	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	457844M5	2680.772	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	244464M5	1431.388	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	156575M5	916.779	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	143131M5	838.062	ng/mL	
66) Naphthobenzothiophene	41.766	234	81543	484.088	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	81543	484.088	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.098	234	18019	106.972	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	20342M3	120.762	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	137039M5	813.545	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	157932M5	937.579	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	131542M5	780.912	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	110997M5	658.944	ng/mL	
75) Benz[a]anthracene	42.700	228	389534M3	2103.129	ng/mL	
77) Chrysene/Triphenylene	42.865	228	483239	2534.244	ng/mL	99
78) C1-Chrysenes	44.356	242	256746M5	1346.450	ng/mL	
79) C2-Chrysenes	46.073	256	171197M5	897.806	ng/mL	
79) C2-Chrysenes BS	46.073	256	168380m	883.033	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	2817	14.773	ng/mL	100
81) C3-Chrysenes	47.639	270	155047M5	813.111	ng/mL	
82) C4-Chrysenes	49.190	284	81008M5	424.829	ng/mL	
84) Benzo[b]fluoranthene	46.781	252	523116	2429.894	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	465825M3	2103.149	ng/mL	
86) Benzo[a]fluoranthene	47.157	252	98688M3	445.566	ng/mL	
87) Benzo[e]pyrene	47.759	252	394829M4	1878.273	ng/mL	
89) Benzo[a]pyrene	47.940	252	498765	2479.667	ng/mL	96
90) Perylene	48.241	252	182744	859.181	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.654	276	434158M3	1834.068	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	109598M3	434.819	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	441287	1728.903	ng/mL	100
94) Hopane (T19)	51.705	191	100860M3	1412.964	ng/mL	
96) C23 Tricyclic Terpane (T4	40.381	191	22927	321.188	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.119	191	14187M3	198.748	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	21016	294.417	ng/ml	100
99) C24 Tetracyclic Terpane (	43.919	191	7119M3	99.731	ng/ml	
100) C26 Tricyclic Terpane-22S	43.679	191	6263M3	87.739	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5565M3	77.961	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	5923M3	82.976	ng/ml	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.253	191	7275M3	101.917	ng/ml	
104) C29 Tricyclic Terpane-22S	46.766	191	7438	104.200	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	7534M3	105.545	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.031	191	15779	221.051	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.151	191	7309M3	102.393	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10871	152.294	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	26443M3	370.444	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10283	144.056	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	11965	167.620	ng/ml	100
112) 30-Norhopane (T15)	50.380	191	72454	1015.020	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	20232M3	283.433	ng/ml	
114) 17a(H)-Diahopane (X)	50.606	191	5879M3	82.360	ng/ml	
115) 30-Normoretane (T17)	51.133	191	10929	153.106	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.525	191	5209M3	72.974	ng/ml	
117) Moretane (T20)	52.368	191	15390M3	215.601	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	38507M3	539.451	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	34253	479.856	ng/ml	100
120) Gammacerane/C32-diahopane	54.190	191	13881M3	194.461	ng/mL	
121) 30,31-Bishomohopane-22S (	54.898	191G	80643M3	1129.741	ng/ml	
122) 30,31-Bishomohopane-22R (	55.319	191	21086	295.397	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	27024	378.584	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	11957	167.508	ng/ml	100
125) Tetrakishomohopane-22S (T	59.581	191	19606	274.664	ng/ml	100
126) Tetrakishomohopane-22R (T	60.349	191G	28039	392.803	ng/ml	100
127) Pentakishomohopane-22S (T	62.608	191	14383M3	201.494	ng/ml	
128) Pentakishomohopane-22R (T	63.857	191	10258	143.706	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8491M3	226.508	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4337M3	115.695	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.028	217	4955M3	132.181	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16033	427.700	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16260	433.756	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3077	82.083	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	920	24.542	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	6339M3	169.101	ng/ml	
138) 14a,17a-20R-Methylcholest	48.784	217	5880M3	156.856	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	10462M3	279.087	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.019	217	11096M3	296.000	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9163M3	244.434	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	8961M3	239.046	ng/ml	
143) 14b,17b-20R-Methylcholest	48.256	218	8896	237.312	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	12982M3	346.311	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.371	218	18870M3	503.381	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	11579M3	308.884	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	27993	746.748	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	28552	761.660	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	18381	490.336	ng/mL	100
150) C28,20R-triaromatic stero	51.525	231	21036M3	561.161	ng/mL	

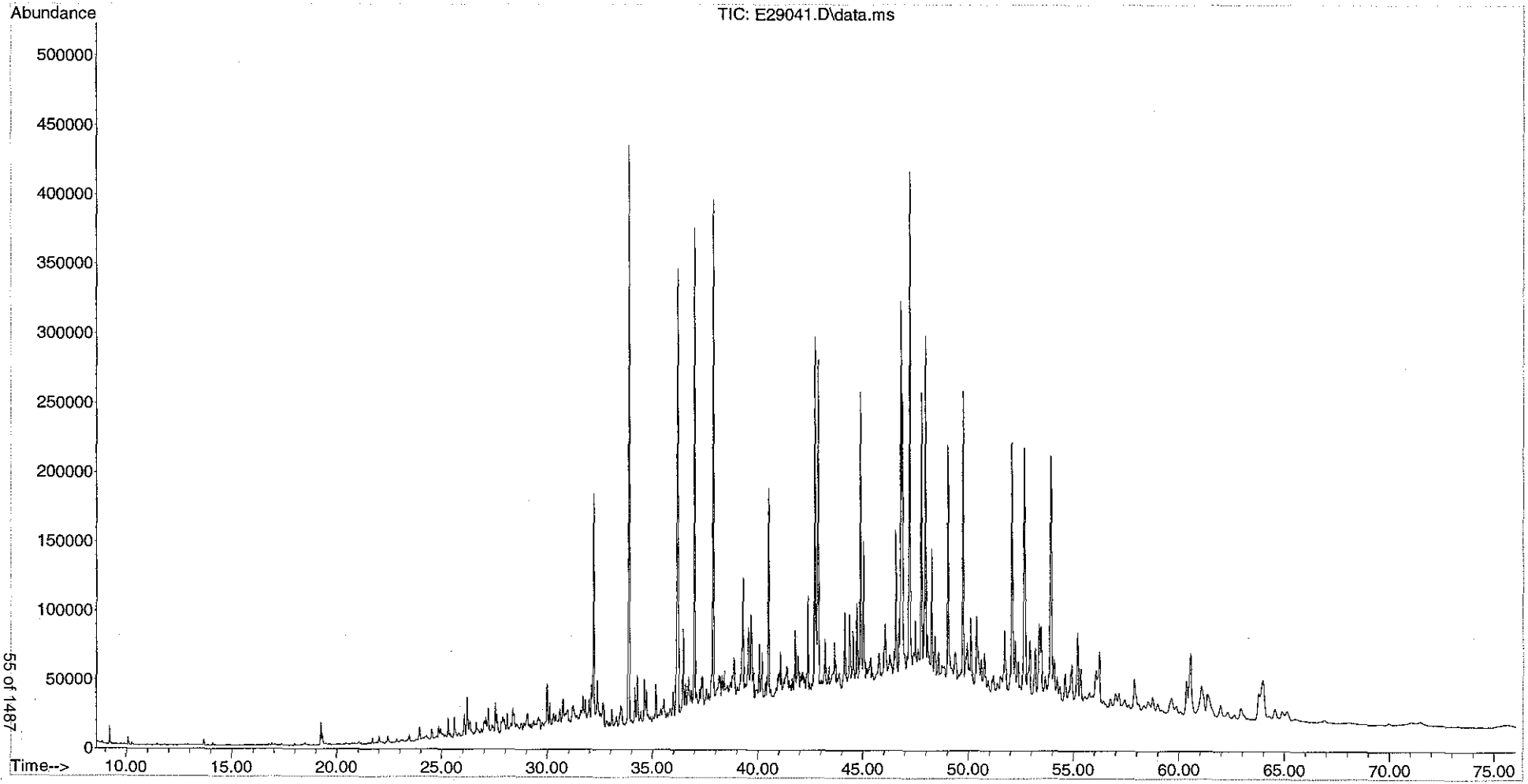
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.05	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**2.39**		C3-Dibenzothiophenes	**318**
C1-Decalins	**6.66**		C4-Dibenzothiophenes	**225**
C2-Decalins	**22.3**		Benzo(b)fluorene	**144**
C3-Decalins	**36.9**		Fluoranthene	**1130**
C4-Decalins	**90.7**		Pyrene	**1120**
Benzothiophene	**1.10**	J	C1-Fluoranthenes/Pyrenes	**736**
C1-Benzo(b)thiophenes	**5.86**		C2-Fluoranthenes/Pyrenes	**414**
C2-Benzo(b)thiophenes	**21.8**		C3-Fluoranthenes/Pyrenes	**249**
C3-Benzo(b)thiophenes	**53.8**		C4-Fluoranthenes/Pyrenes	**216**
C4-Benzo(b)thiophenes	**63.4**		Naphthobenzothiophenes	**180**
Naphthalene	**26.3**		C1-Naphthobenzothiophenes	**205**
C1-Naphthalenes	**38.6**		C2-Naphthobenzothiophenes	**236**
C2-Naphthalenes	**114**		C3-Naphthobenzothiophenes	**207**
C3-Naphthalenes	**212**		C4-Naphthobenzothiophenes	**153**
C4-Naphthalenes	**196**		Benz[a]anthracene	**557**
Biphenyl	**7.00**		Chrysene/Triphenylene	**658**
Dibenzofuran	**19.7**		C1-Chrysenes	**362**
Acenaphthylene	**57.5**		C2-Chrysenes	**234**
Acenaphthene	**28.8**		C3-Chrysenes	**213**
Fluorene	**45.8**		C4-Chrysenes	**112**
C1-Fluorenes	**70.6**		Benzo[b]fluoranthene	**609**
C2-Fluorenes	**123**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**548**
C3-Fluorenes	**163**		Benzo[a]fluoranthene	**120**
Anthracene	**114**		Benzo[e]pyrene	**480**
Phenanthrene	**455**		Benzo[a]pyrene	**647**
C1-Phenanthrenes/Anthracenes	**373**		Perylene	**225**
C2-Phenanthrenes/Anthracenes	**404**		Indeno[1,2,3-cd]pyrene	**465**
C3-Phenanthrenes/Anthracenes	**318**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**113**
C4-Phenanthrenes/Anthracenes	**168**		Benzo[g,h,i]perylene	**440**
Retene	0.185	U		
Dibenzothiophene	**58.0**			
C1-Dibenzothiophenes	**131**			
C2-Dibenzothiophenes	**259**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	67	40-120
Phenanthrene-d10	84	40-120
Benzo[a]pyrene-d12	78	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.05	2	1	AC

Parameter	Result
Carbazole	**44.8**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	67	40-120
Phenanthrene-d10	84	40-120
Benzo[a]pyrene-d12	78	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.05	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**50.6**
2/3-Methyldibenzothiophene	**44.4**
1-Methyldibenzothiophene	**24.9**
3-Methylphenanthrene	**78.9**
2-Methylphenanthrene	**87.8**
2-Methylanthracene	**28.8**
9/4-Methylphenanthrene	**106**
1-Methylphenanthrene	**62.9**
2-Methylnaphthalene	**34.6**
1-Methylnaphthalene	**26.7**
2,6-Dimethylnaphthalene	**44.8**
2,3,5-Trimethylnaphthalene	**24.6**
Naphthobenzothiophene-2,1-D	**122**
Naphthobenzothiophene-1,2-D	**27.4**
Naphthobenzothiophene-2,3-D	**31.6**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	67	40-120
Phenanthrene-d10	84	40-120
Benzo[a]pyrene-d12	78	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.05	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**75.2**	
C24 Tricyclic Terpane	**47.6**	
C25 Tricyclic Terpane	**61.1**	
C24 Tetracyclic Terpane	**23.1**	
C26 Tricyclic Terpane-22S	**20.7**	
C26 Tricyclic Terpane-22R	**18.6**	
C28 Tricyclic Terpane-22S	**19.4**	
C28 Tricyclic Terpane-22R	**26.9**	
C29 Tricyclic Terpane-22S	**25.0**	
C29 Tricyclic Terpane-22R	**23.9**	
18a-22,29,30-Trisnorneohopane-TS	**51.4**	
C30 Tricyclic Terpane-22S	**23.1**	
C30 Tricyclic Terpane-22R	**34.4**	
17a(H)-22,29,30-Trisnorhopane-TM	**88.4**	
17a/b,21b/a 28,30-Bisnorhopane	**37.6**	
17a(H),21b(H)-25-Norhopane	**38.8**	
30-Norhopane	**244**	
18a(H)-30-Norneohopane-C29Ts	**62.5**	
17a(H)-Diahopane	**20.2**	
30-Normoretane	**37.1**	
18a(H)&18b(H)-Oleananes	**19.2**	
Hopane	**354**	
Moretane	**54.0**	
30-Homohopane-22S	**131**	
30-Homohopane-22R	**118**	
T22a-Gammacerane/C32-diahopane	**45.2**	
30,31-Bishomohopane-22S	**262**	G
30,31-Bishomohopane-22R	**78.2**	

Parameter	Result	
30,31-Trishomohopane-22S	**87.0**	
30,31-Trishomohopane-22R	**40.4**	
Tetrakishomohopane-22S	**75.4**	
Tetrakishomohopane-22R	**210**	G
Pentakishomohopane-22S	**49.2**	
Pentakishomohopane-22R	**29.6**	
13b(H),17a(H)-20S-Diacholestane	**48.8**	
13b(H),17a(H)-20R-Diacholestane	**24.9**	
13b,17a-20S-Methyldiacholestane	**30.6**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**99.4**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**100**	
Unknown Sterane (S18)	**22.2**	
13a,17b-20S-Ethyldiacholestane	**4.48**	
14a,17a-20S-Methylcholestane	**46.5**	
14a,17a-20R-Methylcholestane	**43.2**	
14a(H),17a(H)-20S-Ethylcholestane	**65.6**	
14a(H),17a(H)-20R-Ethylcholestane	**70.0**	
14b(H),17b(H)-20R-Cholestane	**54.1**	
14b(H),17b(H)-20S-Cholestane	**56.0**	
14b,17b-20R-Methylcholestane	**57.5**	
14b,17b-20S-Methylcholestane	**82.6**	
14b(H),17b(H)-20R-Ethylcholestane	**119**	
14b(H),17b(H)-20S-Ethylcholestane	**74.6**	
C26,20R- +C27,20S- triaromatic steroid	**187**	
C28,20S-triaromatic steroid	**183**	
C27,20R-triaromatic steroid	**121**	
C28,20R-triaromatic steroid	**144**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	92	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	37581M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	92294	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	44044	333.193	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 33.32%#			
42) Phenanthrene-d10	32.100	188	57067	421.375	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.14%#			
83) Benzo[b]fluoranthene-d12	46.705	264	80517	424.682	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.47%#			
88) Benzo[a]pyrene-d12	47.850	264	71279	388.008	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 38.80%#			
129) 5B(H)Cholane - Surr	43.377	217	16801	461.882	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.19%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	317M3	10.545	ng/mL	
5) C1-Decalins	17.814	152	883M5	29.373	ng/mL	
6) C2-Decalins	19.681	166	2956M5	98.332	ng/mL	
7) C3-Decalins	21.623	180	4893M5	162.767	ng/mL	
8) C4-Decalins	25.010	194	12028M5	400.115	ng/mL	
10) Naphthalene	19.304	128	17133	115.900	ng/mL#	100
11) C1-Naphthalenes	22.014	142	25188M5	170.390	ng/mL	
12) C2-Naphthalenes	24.859	156	74655M5	505.020	ng/mL	
13) C3-Naphthalenes	27.554	170	138503M5	936.933	ng/mL	
14) C4-Naphthalenes	29.993	184	127680M5	863.719	ng/mL	
16) 2-Methylnaphthalene	22.014	142	14384	152.775	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	10761M4	117.625	ng/mL	
18) Benzothiophene	19.530	134	592M3	4.844	ng/mL	
19) C1-Benzo(b)thiophenes	22.405	148	3158M5	25.842	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	11763M5	96.255	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	28960M5	236.976	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	34139M5	279.355	ng/mL	
23) Biphenyl	23.896	154	3671M4	30.851	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	16754	197.420	ng/mL#	100
25) Dibenzofuran	26.982	168	11416M4	86.657	ng/mL	
26) Acenaphthylene	25.597	152	37335	253.321	ng/mL#	100
27) Acenaphthene	26.335	153	12044	126.955	ng/mL	95
28) 2,3,5-Trimethylnaphthalen	27.900	170	8626M3	108.641	ng/mL	
29) Fluorene	28.367	166	21377M3	202.036	ng/mL	
30) C1-Fluorenes	30.746	180	32942M5	311.338	ng/mL	
31) C2-Fluorenes	32.958	194	57282M5	541.378	ng/mL	
32) C3-Fluorenes	34.795	208	76131M5	719.521	ng/mL	
33) Dibenzothiophene	31.694	184	37112	255.596	ng/mL#	78
34) 4-Methyldibenzothiophene(	33.485	198	32405	223.178	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	28400M3	195.595	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	15918	109.630	ng/mL#	100
37) OTP	33.862	198	4902M3	33.761	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	88971M5	612.757	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	84069m	578.996	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	165578M5	1140.361	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	203723M5	1403.072	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	144058M5	992.150	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.191	178	296182	2004.984	ng/mL	99
44) 3-Methylphenanthrene(3MP)	34.163	192	51362	347.692	ng/mL	99
45) 2-Methylphenanthrene(2MP)	34.283	192	57159	386.934	ng/mL	96
46) 2-Methylanthracene(2MA)	34.449	192	18737	126.839	ng/mL#	40
47) 9/4-Methylphenanthrene(9M	34.615	192	69307M3	469.169	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.720	192	40960M3	277.276	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	243113M5	1645.737	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	263192M5	1781.660	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	263192m	1781.660	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	207455M5	1404.353	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	109482M5	741.131	ng/mL	
55) Anthracene	32.386	178	64308M3	503.647	ng/mL	
56) Carbazole	33.064	167	25933	197.344	ng/mL	98
57) 1-Methylphenanthrene	34.720	192	41302M3	366.476	ng/mL	
58) Fluoranthene	36.993	202	812204M4	4978.643	ng/mL	
59) Benzo(b)fluorene	39.538	216	68886M3	633.685	ng/mL	
60) Pyrene	37.882	202	817743	4931.642	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.297	216	538054M5	3244.895	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	302773M5	1825.963	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	181878M5	1096.869	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	157682M5	950.948	ng/mL	
66) Naphthobenzothiophene	41.766	234	87653	535.965	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	87653	535.965	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.098	234	19717	120.562	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	22803M3	139.432	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	147858M5	904.096	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	170322M5	1041.455	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	149301M5	912.920	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	110083M5	673.116	ng/mL	
75) Benz[a]anthracene	42.700	228	441568M3	2456.910	ng/mL	
77) Chrysene/Triphenylene	42.865	228	536507	2899.565	ng/mL	99
78) C1-Chrysenes	44.356	242	295350M5	1596.226	ng/mL	
79) C2-Chrysenes	46.073	256	193645M5	1046.559	ng/mL	
79) C2-Chrysenes BS	46.073	256	191006m	1032.296	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	2639	14.263	ng/mL	100
81) C3-Chrysenes	47.654	270	173571M5	938.068	ng/mL	
82) C4-Chrysenes	49.190	284	91559M5	494.833	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	560919	2685.100	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	519452M3	2416.928	ng/mL	
86) Benzo[a]fluoranthene	47.157	252	114146M3	531.103	ng/mL	
87) Benzo[e]pyrene	47.759	252	431565M4	2115.763	ng/mL	
89) Benzo[a]pyrene	47.940	252	556660	2852.059	ng/mL	96
90) Perylene	48.241	252	204992	993.230	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.654	276	471074M3	2050.821	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.684	278	121671M4	497.467	ng/mL	
93) Benzo[g,h,i]perylene	53.919	276	480852	1941.475	ng/mL	100
94) Hopane (T19)	51.705	191	108018	1559.478	ng/mL#	83
96) C23 Tricyclic Terpane (T4	40.381	191	22963M4	331.522	ng/ml	
97) C24 Tricyclic Terpane (T5	41.119	191	14521M3	209.643	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	18664M3	269.456	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	7055M3	101.854	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6335M3	91.460	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5670M3	81.859	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	5932M3	85.642	ng/ml	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.253	191	8227M3	118.775	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	7619	109.997	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	7295M3	105.319	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.030	191	15691M3	226.534	ng/ml	
107) C30 Tricyclic Terpane-22S	48.151	191	7039M3	101.624	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10503	151.634	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	26987M3	389.617	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	11494	165.941	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	11834M4	170.850	ng/ml	
112) 30-Norhopane (T15)	50.380	191	74393	1074.027	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	19079M3	275.447	ng/ml	
114) 17a(H)-Diahopane (X)	50.606	191	6172M3	89.106	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11319	163.415	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.525	191	5878	84.862	ng/ml	100
117) Moretane (T20)	52.368	191	16491M3	238.084	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	39981M3	577.214	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	35949	519.003	ng/ml	100
120) Gammacerane/C32-diahopane	54.190	191	13808M3	199.349	ng/mL	
121) 30,31-Bishomohopane-22S (	54.913	191G	80134M3	1156.911	ng/ml	
122) 30,31-Bishomohopane-22R (	55.334	191	23865	344.544	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	26563	383.496	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	12330	178.011	ng/ml	100
125) Tetrakishomohopane-22S (T	59.596	191	23019M3	332.330	ng/ml	
126) Tetrakishomohopane-22R (T	60.379	191G	64158	926.262	ng/ml	100
127) Pentakishomohopane-22S (T	62.608	191	15033	217.035	ng/ml	100
128) Pentakishomohopane-22R (T	63.857	191	9032	130.397	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	7828M3	215.202	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	3988M3	109.635	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	4916M3	135.147	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	15945	438.349	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16115	443.023	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3552	97.649	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.940	217	719	19.766	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	7464M3	205.195	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6932M3	190.570	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	10514M3	289.044	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	11235M3	308.865	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	8674M3	238.460	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	8975M3	246.735	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9222	253.525	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13252M3	364.315	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	19140M3	526.184	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	11970M3	329.071	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	30057	826.307	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	29402M3	808.300	ng/mL	
149) C27,20R-triaromatic stero	50.365	231	19413M3	533.689	ng/mL	
150) C28,20R-triaromatic stero	51.525	231	23165M3	636.836	ng/mL	

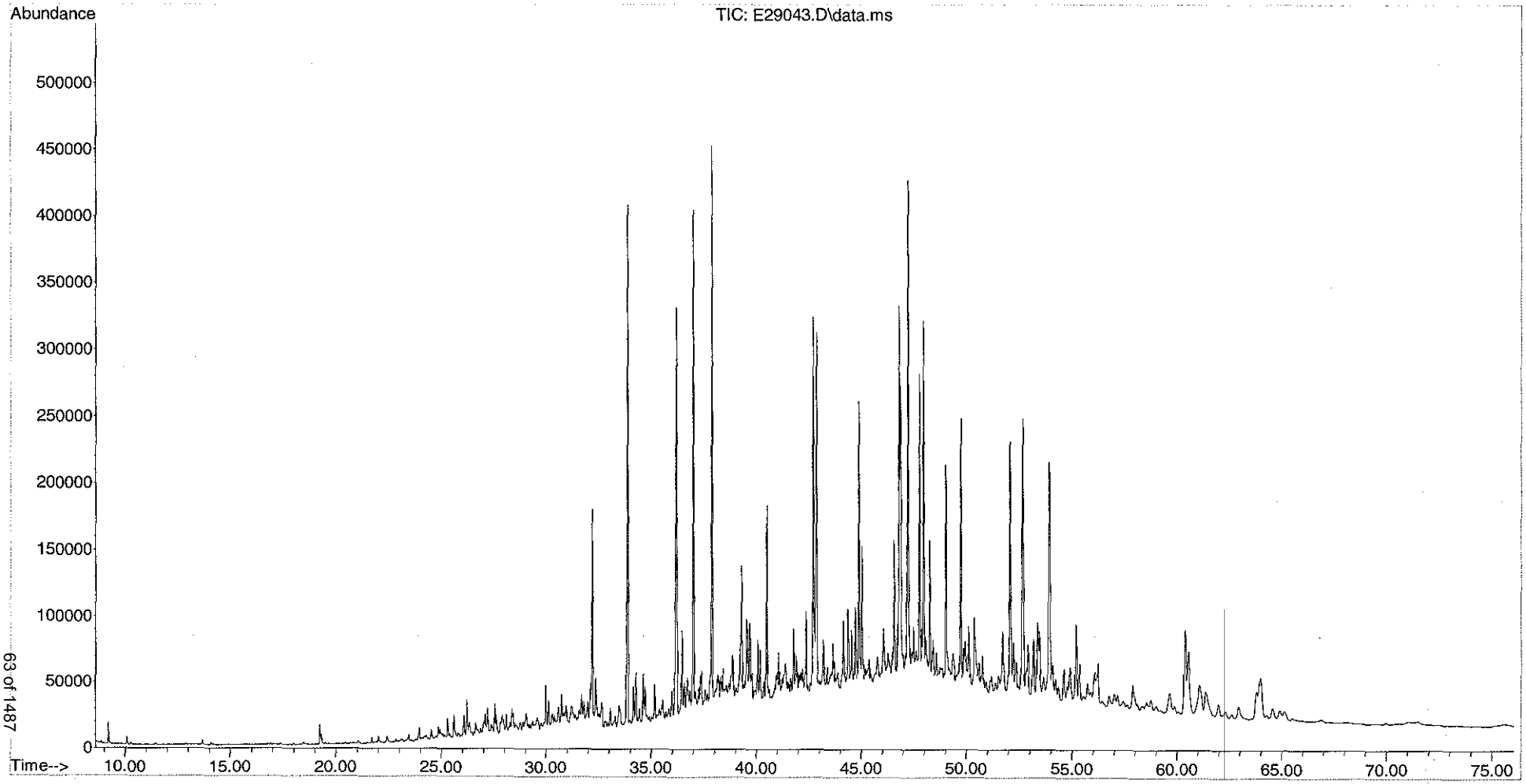
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-06**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**1.88**	J	C3-Dibenzothiophenes	**348**
C1-Decalins	**5.92**		C4-Dibenzothiophenes	**249**
C2-Decalins	**22.7**		Benzo(b)fluorene	**172**
C3-Decalins	**39.6**		Fluoranthene	**1240**
C4-Decalins	**103**		Pyrene	**1190**
Benzothiophene	**1.26**	J	C1-Fluoranthenes/Pyrenes	**804**
C1-Benzo(b)thiophenes	**6.84**		C2-Fluoranthenes/Pyrenes	**409**
C2-Benzo(b)thiophenes	**24.5**		C3-Fluoranthenes/Pyrenes	**254**
C3-Benzo(b)thiophenes	**58.5**		C4-Fluoranthenes/Pyrenes	**226**
C4-Benzo(b)thiophenes	**75.1**		Naphthobenzothiophenes	**198**
Naphthalene	**31.2**		C1-Naphthobenzothiophenes	**222**
C1-Naphthalenes	**41.9**		C2-Naphthobenzothiophenes	**259**
C2-Naphthalenes	**126**		C3-Naphthobenzothiophenes	**221**
C3-Naphthalenes	**218**		C4-Naphthobenzothiophenes	**167**
C4-Naphthalenes	**208**		Benz[a]anthracene	**596**
Biphenyl	**7.82**		Chrysene/Triphenylene	**703**
Dibenzofuran	**19.5**		C1-Chrysenes	**385**
Acenaphthylene	**74.1**		C2-Chrysenes	**253**
Acenaphthene	**22.8**		C3-Chrysenes	**220**
Fluorene	**42.8**		C4-Chrysenes	**114**
C1-Fluorenes	**56.2**		Benzo[b]fluoranthene	**713**
C2-Fluorenes	**124**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**547**
C3-Fluorenes	**172**		Benzo[a]fluoranthene	**138**
Anthracene	**129**		Benzo[e]pyrene	**528**
Phenanthrene	**486**		Benzo[a]pyrene	**717**
C1-Phenanthrenes/Anthracenes	**414**		Perylene	**238**
C2-Phenanthrenes/Anthracenes	**437**		Indeno[1,2,3-cd]pyrene	**510**
C3-Phenanthrenes/Anthracenes	**336**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**122**
C4-Phenanthrenes/Anthracenes	**180**		Benzo[g,h,i]perylene	**482**
Retene	0.186	U		
Dibenzothiophene	**54.5**			
C1-Dibenzothiophenes	**150**			
C2-Dibenzothiophenes	**292**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	78	40-120
Phenanthrene-d10	100	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-06**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result
Carbazole	**42.1**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	78	40-120
Phenanthrene-d10	100	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-06**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**56.3**
2/3-Methyldibenzothiophene	**52.8**
1-Methyldibenzothiophene	**27.7**
3-Methylphenanthrene	**85.5**
2-Methylphenanthrene	**99.5**
2-Methylanthracene	**32.7**
9/4-Methylphenanthrene	**116**
1-Methylphenanthrene	**71.6**
2-Methylnaphthalene	**38.5**
1-Methylnaphthalene	**28.3**
2,6-Dimethylnaphthalene	**50.3**
2,3,5-Trimethylnaphthalene	**32.4**
Naphthobenzothiophene-2,1-D	**132**
Naphthobenzothiophene-1,2-D	**29.6**
Naphthobenzothiophene-2,3-D	**36.2**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	78	40-120
Phenanthrene-d10	100	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-06**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**85.1**	
C24 Tricyclic Terpane	**51.9**	
C25 Tricyclic Terpane	**70.2**	
C24 Tetracyclic Terpane	**25.4**	
C26 Tricyclic Terpane-22S	**22.1**	
C26 Tricyclic Terpane-22R	**20.8**	
C28 Tricyclic Terpane-22S	**21.6**	
C28 Tricyclic Terpane-22R	**28.8**	
C29 Tricyclic Terpane-22S	**29.0**	
C29 Tricyclic Terpane-22R	**28.5**	
18a-22,29,30-Trisnorneohopane-TS	**62.4**	
C30 Tricyclic Terpane-22S	**29.3**	
C30 Tricyclic Terpane-22R	**36.6**	
17a(H)-22,29,30-Trisnorhopane-TM	**96.5**	
17a/b,21b/a 28,30-Bisnorhopane	**41.8**	
17a(H),21b(H)-25-Norhopane	**45.2**	
30-Norhopane	**274**	
18a(H)-30-Norneohopane-C29Ts	**72.5**	
17a(H)-Diahopane	**20.4**	
30-Normoretane	**41.1**	
18a(H)&18b(H)-Oleananes	**21.7**	
Hopane	**396**	
Moretane	**57.7**	
30-Homohopane-22S	**142**	
30-Homohopane-22R	**127**	
T22a-Gammacerane/C32-diahopane	**47.7**	
30,31-Bishomohopane-22S	**300**	G
30,31-Bishomohopane-22R	**82.7**	

Parameter	Result	
30,31-Trishomohopane-22S	**94.2**	
30,31-Trishomohopane-22R	**44.2**	
Tetrakishomohopane-22S	**75.0**	
Tetrakishomohopane-22R	**123**	G
Pentakishomohopane-22S	**54.0**	
Pentakishomohopane-22R	**38.0**	
13b(H),17a(H)-20S-Diacholestane	**53.2**	
13b(H),17a(H)-20R-Diacholestane	**28.2**	
13b,17a-20S-Methyldiacholestane	**26.6**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**111**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**116**	
Unknown Sterane (S18)	**20.7**	
13a,17b-20S-Ethyldiacholestane	**6.79**	
14a,17a-20S-Methylcholestane	**48.0**	
14a,17a-20R-Methylcholestane	**42.4**	
14a(H),17a(H)-20S-Ethylcholestane	**76.6**	
14a(H),17a(H)-20R-Ethylcholestane	**80.5**	
14b(H),17b(H)-20R-Cholestane	**59.2**	
14b(H),17b(H)-20S-Cholestane	**63.4**	
14b,17b-20R-Methylcholestane	**67.1**	
14b,17b-20S-Methylcholestane	**85.2**	
14b(H),17b(H)-20R-Ethylcholestane	**119**	
14b(H),17b(H)-20S-Ethylcholestane	**97.6**	
C26,20R- +C27,20S- triaromatic steroid	**208**	
C28,20S-triaromatic steroid	**205**	
C27,20R-triaromatic steroid	**129**	
C28,20R-triaromatic steroid	**150**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	108	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29045.D
Acq On : 17 Nov 2012 5:37 pm
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 10:24:47 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	43317M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	107331	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	59518	390.631	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.06%#			
42) Phenanthrene-d10	32.100	188	77998	499.663	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.97%#			
83) Benzo[b]fluoranthene-d12	46.705	264	109666	497.389	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.74%#			
88) Benzo[a]pyrene-d12	47.865	264	98791	462.429	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.24%#			
129) 5B(H)Cholane - Surr	43.377	217	22888	541.068	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.11%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	286	8.254	ng/mL	100
5) C1-Decalins	17.814	152	901M5	26.003	ng/mL	
6) C2-Decalins	19.139	166	3450M5	99.568	ng/mL	
7) C3-Decalins	21.638	180	6037M5	174.230	ng/mL	
8) C4-Decalins	25.010	194	15766M5	455.012	ng/mL	
10) Naphthalene	19.304	128	23339	136.975	ng/mL#	100
11) C1-Naphthalenes	22.014	142	31384M5	184.191	ng/mL	
12) C2-Naphthalenes	24.859	156	94595M5	555.172	ng/mL	
13) C3-Naphthalenes	27.554	170	163428M5	959.149	ng/mL	
14) C4-Naphthalenes	29.993	184	155439M5	912.262	ng/mL	
16) 2-Methylnaphthalene	22.014	142	18368	169.256	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	13107	124.297	ng/mL#	100
18) Benzothiophene	19.530	134	782M3	5.552	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	4234M5	30.058	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	15146M5	107.526	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	36194M5	256.952	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	46488M5	330.033	ng/mL	
23) Biphenyl	23.896	154	4712M4	34.355	ng/mL	
24) 2,6-Dimethylnaphthalene	24.528	156	21611	220.931	ng/mL#	100
25) Dibenzofuran	26.982	168	13008	85.666	ng/mL#	93
26) Acenaphthylene	25.597	152	55331	325.712	ng/mL#	100
27) Acenaphthene	26.335	153	10980	100.413	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.900	170	13039M3	142.475	ng/mL	
29) Fluorene	28.367	166	22945M3	188.140	ng/mL	
30) C1-Fluorenes	30.745	180	30099M5	246.799	ng/mL	
31) C2-Fluorenes	32.958	194	66186M5	542.698	ng/mL	
32) C3-Fluorenes	34.810	208	92119M5	755.338	ng/mL	
33) Dibenzothiophene	31.694	184	40050	239.305	ng/mL#	77
34) 4-Methyldibenzothiophene(	33.485	198	41381	247.258	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.847	198	38853M3	232.153	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	20384	121.798	ng/mL#	100
37) OTP	33.877	198	4436M3	26.506	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	114658M5	685.100	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	110222m	658.595	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	214392M5	1281.027	ng/mL	
40) C3-Dibenzothiophenes	37.008	226	255824M5	1528.590	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	183411M5	1095.911	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
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Operator : AC
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Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.191	178	363905	2137.225	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.178	192	63946	375.557	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.283	192	74432	437.141	ng/mL	96
46) 2-Methylanthracene(2MA)	34.449	192	24435M3	143.507	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.630	192	87195	512.099	ng/mL	86
48) 1-Methylphenanthrene(1MP)	34.720	192	53598M3	314.783	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.630	192	309937M5	1820.269	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	326759M5	1919.065	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	326759m	1919.065	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.583	220	251583M5	1477.554	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	134377M5	789.200	ng/mL	
55) Anthracene	32.386	178	83482M3	567.236	ng/mL	
56) Carbazole	33.064	167	28014M3	184.951	ng/mL	
57) 1-Methylphenanthrene	34.720	192	53718M3	413.527	ng/mL	
58) Fluoranthene	37.008	202	1020486	5427.038	ng/mL	100
59) Benzo(b)fluorene	39.538	216	94987M3	758.082	ng/mL	
60) Pyrene	37.882	202	1002979	5247.791	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.297	216	675681M5	3535.301	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.375	230	343503M5	1797.278	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	212961M5	1114.255	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.582	258	190056M5	994.412	ng/mL	
66) Naphthobenzothiophene	41.766	234	109441	580.577	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	109441	580.577	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.113	234	24480	129.865	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.414	234	29973M3	159.005	ng/mL	
70) C1-Naphthobenzothiophenes	43.182	248	183990M5	976.055	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	214824M5	1139.627	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	183201M5	971.869	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	138509M5	734.781	ng/mL	
75) Benz[a]anthracene	42.700	228	547047M3	2617.366	ng/mL	
77) Chrysene/Triphenylene	42.865	228	664702	3089.105	ng/mL	99
78) C1-Chrysenes	44.356	242	363656M5	1690.038	ng/mL	
79) C2-Chrysenes	46.088	256	242969M5	1129.163	ng/mL	
79) C2-Chrysenes BS	46.088	256	239157m	1111.447	ng/mL	
80) BBF-D12 Surr BKGD	46.705	256	3812	17.716	ng/mL	100
81) C3-Chrysenes	47.654	270	207866M5	966.027	ng/mL	
82) C4-Chrysenes	49.190	284	107828M5	501.115	ng/mL	
84) Benzo[b]fluoranthene	46.795	252	760681	3131.203	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	600653	2403.202	ng/mL	96
86) Benzo[a]fluoranthene	47.172	252	152126M3	608.653	ng/mL	
87) Benzo[e]pyrene	47.774	252	550134M4	2319.196	ng/mL	
89) Benzo[a]pyrene	47.955	252	715220	3151.058	ng/mL	98
90) Perylene	48.256	252	251521	1047.937	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.669	276	598903M3	2242.040	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.699	278	152330M4	535.563	ng/mL	
93) Benzo[g,h,i]perylene	53.934	276	610518	2119.665	ng/mL	100
94) Hopane (T19)	51.720	191	140171	1740.162	ng/mL#	84
96) C23 Tricyclic Terpane (T4	40.381	191	30114	373.852	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.119	191	18363M3	227.969	ng/ml	
98) C25 Tricyclic Terpane (T6	42.670	191	24837M3	308.341	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	9003M3	111.768	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	7824M3	97.132	ng/ml	
101) C26 Tricyclic Terpane-22R	43.784	191	7368M3	91.471	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	7656M3	95.046	ng/ml	

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Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 19 10:24:47 2012
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.253	191	10198M3	126.604	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	10263	127.411	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	10100	125.387	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	22073M3	274.027	ng/ml	
107) C30 Tricyclic Terpane-22S	48.166	191	10368M3	128.714	ng/mL	
108) C30 Tricyclic Terpane-22R	48.407	191	12940	160.644	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.573	191	34160M3	424.082	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.747	191	14814M3	183.909	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.552	191	16011	198.770	ng/ml	100
112) 30-Norhopane (T15)	50.380	191	96932	1203.369	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.485	191	25669	318.669	ng/ml	100
114) 17a(H)-Diahopane (X)	50.606	191	7240M3	89.881	ng/ml	
115) 30-Normoretane (T17)	51.148	191	14537	180.471	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.524	191	7674	95.269	ng/ml	100
117) Moretane (T20)	52.383	191	20430M3	253.630	ng/ml	
118) 30-Homohopane-22S (T21)	53.452	191	50418M3	625.918	ng/ml	
119) 30-Homohopane-22R (T22)	53.678	191	44889	557.277	ng/ml	100
120) Gammacerane/C32-diahopane	54.205	191	16884M3	209.608	ng/mL	
121) 30,31-Bishomohopane-22S (	54.928	191G	106038M3	1316.416	ng/ml	
122) 30,31-Bishomohopane-22R (	55.334	191	29278	363.474	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	33358	414.125	ng/ml	100
124) 30,31-Trishomohopane-22R	57.638	191	15629	194.027	ng/ml	100
125) Tetrakishomohopane-22S (T	59.611	191	26562	329.756	ng/ml	100
126) Tetrakishomohopane-22R (T	60.394	191G	43414	538.966	ng/ml	100
127) Pentakishomohopane-22S (T	62.623	191	19095	237.056	ng/ml	100
128) Pentakishomohopane-22R (T	63.887	191	13445M3	166.914	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.898	217	9888M3	233.750	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.335	217	5243	123.943	ng/ml	100
132) 13b,17a-20S-Methyldiachol	46.027	217	4953M3	117.088	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.901	217	20615	487.335	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.413	217	21461	507.334	ng/ml	100
135) Unknown Sterane (S18)	47.684	217	3847	90.942	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.940	217	1262	29.833	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.091	217	8920M3	210.867	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	7891M3	186.542	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	14245M3	336.749	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	14970M3	353.888	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.991	218	11003M3	260.109	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	11793M3	278.784	ng/ml	
143) 14b,17b-20R-Methylcholest	48.256	218	12476	294.930	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	15841M3	374.478	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.371	218	22094M3	522.298	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.416	218	18142M3	428.873	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	38708	915.050	ng/mL	100
148) C28,20S-triaromatic stero	49.928	231	38025	898.904	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	23978	566.835	ng/mL	100
150) C28,20R-triaromatic stero	51.539	231	27937M3	660.425	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29045.D
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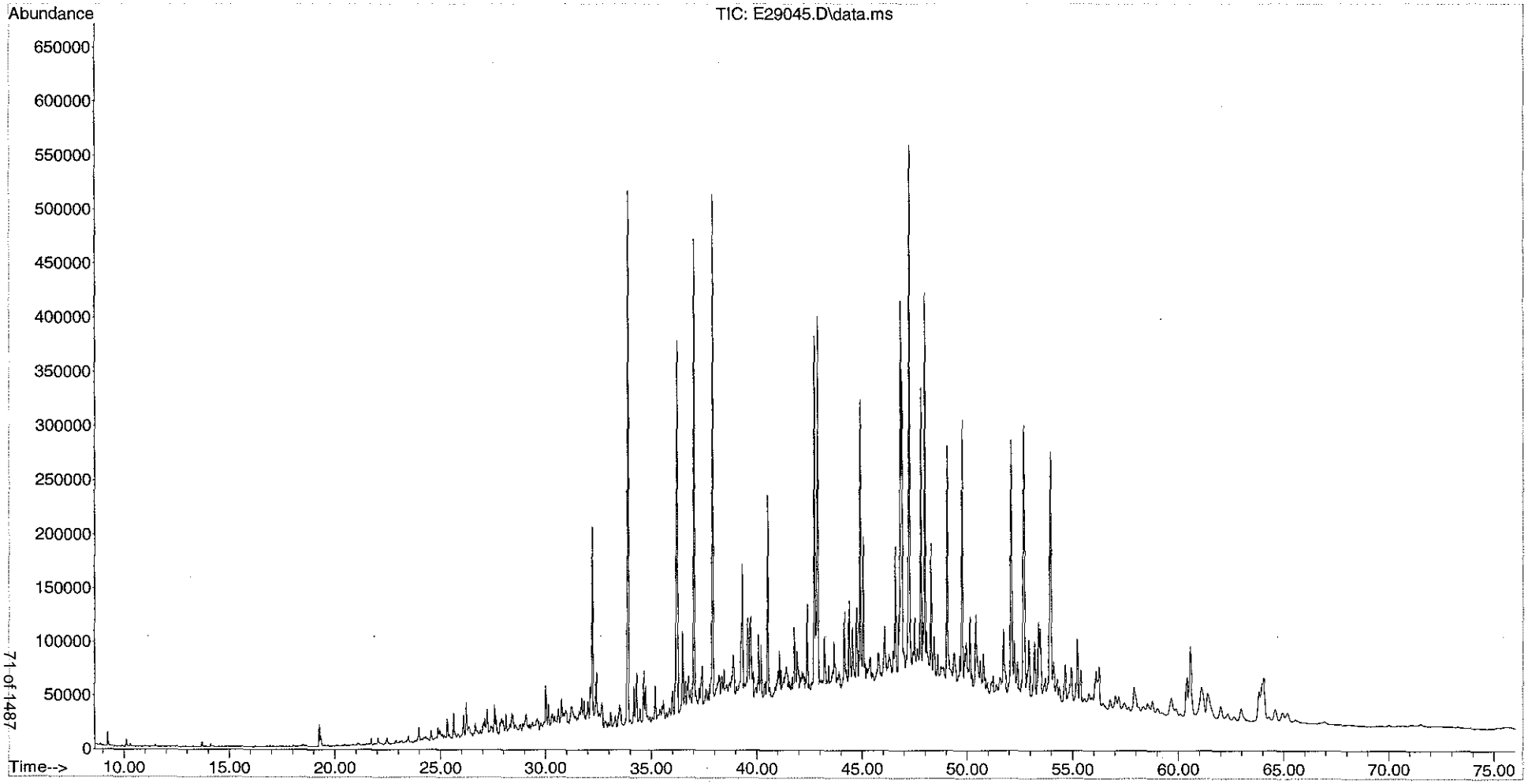
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-07**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**2.06**	J	C3-Dibenzothiophenes	**317**
C1-Decalins	**5.98**		C4-Dibenzothiophenes	**225**
C2-Decalins	**20.0**		Benzo(b)fluorene	**174**
C3-Decalins	**37.6**		Fluoranthene	**1170**
C4-Decalins	**89.1**		Pyrene	**1140**
Benzothiophene	**1.35**	J	C1-Fluoranthenes/Pyrenes	**782**
C1-Benzo(b)thiophenes	**5.79**		C2-Fluoranthenes/Pyrenes	**389**
C2-Benzo(b)thiophenes	**22.6**		C3-Fluoranthenes/Pyrenes	**238**
C3-Benzo(b)thiophenes	**54.9**		C4-Fluoranthenes/Pyrenes	**210**
C4-Benzo(b)thiophenes	**67.3**		Naphthobenzothiophenes	**190**
Naphthalene	**30.4**		C1-Naphthobenzothiophenes	**199**
C1-Naphthalenes	**40.6**		C2-Naphthobenzothiophenes	**235**
C2-Naphthalenes	**118**		C3-Naphthobenzothiophenes	**193**
C3-Naphthalenes	**205**		C4-Naphthobenzothiophenes	**152**
C4-Naphthalenes	**193**		Benz[a]anthracene	**586**
Biphenyl	**8.41**		Chrysene/Triphenylene	**673**
Dibenzofuran	**17.8**		C1-Chrysenes	**363**
Acenaphthylene	**66.9**		C2-Chrysenes	**235**
Acenaphthene	**19.9**		C3-Chrysenes	**199**
Fluorene	**36.1**		C4-Chrysenes	**102**
C1-Fluorenes	**52.2**		Benzo[b]fluoranthene	**686**
C2-Fluorenes	**119**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**523**
C3-Fluorenes	**158**		Benzo[a]fluoranthene	**136**
Anthracene	**107**		Benzo[e]pyrene	**497**
Phenanthrene	**405**		Benzo[a]pyrene	**675**
C1-Phenanthrenes/Anthracenes	**387**		Perylene	**219**
C2-Phenanthrenes/Anthracenes	**415**		Indeno[1,2,3-cd]pyrene	**477**
C3-Phenanthrenes/Anthracenes	**317**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**116**
C4-Phenanthrenes/Anthracenes	**169**		Benzo[g,h,i]perylene	**448**
Retene	0.186	U		
Dibenzothiophene	**48.8**			
C1-Dibenzothiophenes	**134**			
C2-Dibenzothiophenes	**264**			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	73	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-07**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result
Carbazole	**34.2**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	73	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-07**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result
4-Methyldibenzothiophene	**52.5**
2/3-Methyldibenzothiophene	**44.7**
1-Methyldibenzothiophene	**25.0**
3-Methylphenanthrene	**79.3**
2-Methylphenanthrene	**93.1**
2-Methylanthracene	**30.5**
9/4-Methylphenanthrene	**107**
1-Methylphenanthrene	**67.2**
2-Methylnaphthalene	**37.3**
1-Methylnaphthalene	**27.7**
2,6-Dimethylnaphthalene	**46.6**
2,3,5-Trimethylnaphthalene	**27.5**
Naphthobenzothiophene-2,1-D	**124**
Naphthobenzothiophene-1,2-D	**28.0**
Naphthobenzothiophene-2,3-D	**38.3**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	73	40-120
Phenanthrene-d10	91	40-120
Benzo[a]pyrene-d12	83	40-120

N/A - Not Applicable

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-07**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/17/12	58.6	15.00	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**78.1**	
C24 Tricyclic Terpane	**48.1**	
C25 Tricyclic Terpane	**63.6**	
C24 Tetracyclic Terpane	**22.4**	
C26 Tricyclic Terpane-22S	**20.7**	
C26 Tricyclic Terpane-22R	**19.2**	
C28 Tricyclic Terpane-22S	**22.2**	
C28 Tricyclic Terpane-22R	**26.2**	
C29 Tricyclic Terpane-22S	**26.2**	
C29 Tricyclic Terpane-22R	**25.7**	
18a-22,29,30-Trisnorneohopane-TS	**53.7**	
C30 Tricyclic Terpane-22S	**24.4**	
C30 Tricyclic Terpane-22R	**35.1**	
17a(H)-22,29,30-Trisnorhopane-TM	**87.1**	
17a/b,21b/a 28,30-Bisnorhopane	**34.2**	
17a(H),21b(H)-25-Norhopane	**44.6**	
30-Norhopane	**247**	
18a(H)-30-Norneohopane-C29Ts	**65.3**	
17a(H)-Diahopane	**19.0**	
30-Normoretane	**36.0**	
18a(H)&18b(H)-Oleananes	**20.4**	
Hopane	**351**	
Moretane	**50.7**	
30-Homohopane-22S	**133**	
30-Homohopane-22R	**116**	
T22a-Gammacerane/C32-diahopane	**46.9**	
30,31-Bishomohopane-22S	**275**	G
30,31-Bishomohopane-22R	**75.2**	

Parameter	Result	
30,31-Trishomohopane-22S	**86.6**	
30,31-Trishomohopane-22R	**40.4**	
Tetrakishomohopane-22S	**70.1**	
Tetrakishomohopane-22R	**108**	G
Pentakishomohopane-22S	**47.9**	
Pentakishomohopane-22R	**33.6**	
13b(H),17a(H)-20S-Diacholestane	**54.0**	
13b(H),17a(H)-20R-Diacholestane	**29.3**	
13b,17a-20S-Methyldiacholestane	**26.3**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**103**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**104**	
Unknown Sterane (S18)	**20.5**	
13a,17b-20S-Ethyldiacholestane	**5.47**	
14a,17a-20S-Methylcholestane	**44.2**	
14a,17a-20R-Methylcholestane	**40.6**	
14a(H),17a(H)-20S-Ethylcholestane	**71.2**	
14a(H),17a(H)-20R-Ethylcholestane	**72.0**	
14b(H),17b(H)-20R-Cholestane	**57.5**	
14b(H),17b(H)-20S-Cholestane	**59.5**	
14b,17b-20R-Methylcholestane	**60.6**	
14b,17b-20S-Methylcholestane	**87.2**	
14b(H),17b(H)-20R-Ethylcholestane	**110**	
14b(H),17b(H)-20S-Ethylcholestane	**83.9**	
C26,20R- +C27,20S- triaromatic steroid	**186**	
C28,20S-triaromatic steroid	**168**	
C27,20R-triaromatic steroid	**121**	
C28,20R-triaromatic steroid	**138**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	99	50-130

N/A - Not Applicable
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	39090	500.000	ng/mL	0.00
74) Chrysene-d12	42.775	240	96027	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	50455	366.957	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.70%#			
42) Phenanthrene-d10	32.115	188	63908	453.672	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.37%#			
83) Benzo[b]fluoranthene-d12	46.705	264	89229	452.337	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.23%#			
88) Benzo[a]pyrene-d12	47.865	264	79063	413.649	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.36%#			
129) 5B(H)Cholane - Surr	43.377	217	18739	495.133	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.51%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	283	9.051	ng/mL	100
5) C1-Decalins	17.814	152	821M5	26.257	ng/mL	
6) C2-Decalins	19.154	166	2754M5	88.076	ng/mL	
7) C3-Decalins	21.638	180	5163M5	165.119	ng/mL	
8) C4-Decalins	25.010	194	12244M5	391.577	ng/mL	
10) Naphthalene	19.319	128	20528	133.505	ng/mL#	100
11) C1-Naphthalenes	22.014	142	27445M5	178.491	ng/mL	
12) C2-Naphthalenes	24.859	156	79748M5	518.647	ng/mL	
13) C3-Naphthalenes	27.554	170	138734M5	902.267	ng/mL	
14) C4-Naphthalenes	29.993	184	130459M5	848.450	ng/mL	
16) 2-Methylnaphthalene	22.014	142	16061	164.001	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	11569	121.575	ng/mL#	100
18) Benzothiophene	19.530	134	755M3	5.940	ng/mL	
19) C1-Benzo(b)thiophenes	22.405	148	3233M5	25.434	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	12604M5	99.156	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	30681M5	241.367	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	37609M5	295.870	ng/mL	
23) Biphenyl	23.911	154	4574	36.956	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.528	156	18080	204.820	ng/mL#	100
25) Dibenzofuran	26.997	168	10749M4	78.444	ng/mL	
26) Acenaphthylene	25.612	152	45062	293.946	ng/mL#	100
27) Acenaphthene	26.335	153	8632M3	87.477	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.900	170	9977M3	120.806	ng/mL	
29) Fluorene	28.367	166	17437M3	158.437	ng/mL	
30) C1-Fluorenes	30.745	180	25224M5	229.192	ng/mL	
31) C2-Fluorenes	32.958	194	57516M5	522.605	ng/mL	
32) C3-Fluorenes	34.810	208	76281M5	693.108	ng/mL	
33) Dibenzothiophene	31.694	184	32357	214.245	ng/mL#	74
34) 4-Methyldibenzothiophene(	33.485	198	34836	230.659	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.847	198	29642M3	196.268	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	16626	110.086	ng/mL#	100
37) OTP	33.862	198	5734M3	37.966	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	94555M5	626.076	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	88821m	588.110	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	175479M5	1161.897	ng/mL	
40) C3-Dibenzothiophenes	37.008	226	210546M5	1394.086	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	149374M5	989.048	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
43) Phenanthrene	32.191	178	273686	1781.179	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.178	192	53523	348.334	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.283	192	62834	408.931	ng/mL	95
46) 2-Methylanthracene(2MA)	34.449	192	20604M3	134.093	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.630	192	72379	471.051	ng/mL	86
48) 1-Methylphenanthrene(1MP)	34.720	192	45356M3	295.182	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	261390M5	1701.155	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	280289M5	1824.152	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	280289m	1824.152	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.318	220	213953M5	1392.430	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	114268M5	743.669	ng/mL	
55) Anthracene	32.386	178	62286M3	468.980	ng/mL	
56) Carbazole	33.079	167	20547	150.322	ng/mL	100
57) 1-Methylphenanthrene	34.720	192	45561M3	388.661	ng/mL	
58) Fluoranthene	37.008	202	873880M3	5149.918	ng/mL	
59) Benzo(b)fluorene	39.538	216	86517M3	765.150	ng/mL	
60) Pyrene	37.882	202	865309	5017.052	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.297	216	592408M5	3434.775	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.375	230	294946M5	1710.094	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	180060M5	1043.986	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.582	258	159502M5	924.791	ng/mL	
66) Naphthobenzothiophene	41.766	234	92838	545.756	ng/mL#	93
67) Naphthobenzothiophene-2,1	41.766	234	92838	545.756	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.113	234	20970	123.274	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.414	234	28612M3	168.198	ng/mL	
70) C1-Naphthobenzothiophenes	43.182	248	149075M5	876.350	ng/ml	
71) C2-Naphthobenzothiophenes	45.244	262	175996M5	1034.607	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	143950M5	846.222	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	113256M5	665.785	ng/mL	
75) Benz[a]anthracene	42.700	228	481544M3	2575.181	ng/mL	
77) Chrysene/Triphenylene	42.865	228	569040	2955.836	ng/mL	99
78) C1-Chrysenes	44.356	242	306722M5	1593.244	ng/mL	
79) C2-Chrysenes	46.088	256	201460M5	1046.469	ng/mL	
79) C2-Chrysenes BS	46.088	256	198566m	1031.436	ng/mL	
80) BBF-D12 Surr BKGD	46.705	256	2894	15.033	ng/mL	100
81) C3-Chrysenes	47.654	270	167982M5	872.570	ng/mL	
82) C4-Chrysenes	49.205	284	85928M5	446.347	ng/mL	
84) Benzo[b]fluoranthene	46.795	252	654908	3013.150	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	513847	2297.906	ng/mL	96
86) Benzo[a]fluoranthene	47.172	252	133819M3	598.434	ng/mL	
87) Benzo[e]pyrene	47.759	252	463199M4	2182.571	ng/mL	
89) Benzo[a]pyrene	47.955	252	602261	2965.741	ng/mL	98
90) Perylene	48.256	252	207168	964.752	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.669	276	501314M3	2097.628	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.684	278	129859M3	510.304	ng/mL	
93) Benzo[g,h,i]perylene	53.934	276	507787	1970.526	ng/mL	100
94) Hopane (T19)	51.705	191	111262	1543.868	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	24728	343.125	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.119	191	15223	211.234	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.655	191	20131M3	279.337	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	7097M3	98.478	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6560M3	91.026	ng/ml	
101) C26 Tricyclic Terpane-22R	43.784	191	6073M3	84.269	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	7046M3	97.770	ng/ml	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
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Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.253	191	8301M3	115.184	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	8295M3	115.101	ng/ml	
105) C29 Tricyclic Terpane-22R	46.961	191	8151	113.103	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	17012	236.058	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.166	191	7733M3	107.303	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	11122	154.329	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.573	191	27574M3	382.616	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10846	150.499	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.536	191	14130	196.067	ng/ml	100
112) 30-Norhopane (T15)	50.380	191	78268	1086.044	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.485	191	20679	286.941	ng/ml	100
114) 17a(H)-Diahopane (X)	50.621	191	6010M3	83.395	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11406	158.269	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.524	191	6466	89.722	ng/ml	100
117) Moretane (T20)	52.383	191	16044M3	222.626	ng/ml	
118) 30-Homohopane-22S (T21)	53.452	191	42119M3	584.442	ng/ml	
119) 30-Homohopane-22R (T22)	53.678	191	36794	510.552	ng/ml	100
120) Gammacerane/C32-diahopane	54.205	191	14865	206.266	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.913	191G	87011M3	1207.362	ng/ml	
122) 30,31-Bishomohopane-22R (	55.334	191	23826	330.609	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	27427	380.576	ng/ml	100
124) 30,31-Trishomohopane-22R	57.623	191	12803	177.654	ng/ml	100
125) Tetrakishomohopane-22S (T	59.596	191	22202	308.074	ng/ml	100
126) Tetrakishomohopane-22R (T	60.394	191G	34222	474.863	ng/ml	100
127) Pentakishomohopane-22S (T	62.622	191	15180M3	210.637	ng/ml	
128) Pentakishomohopane-22R (T	63.872	191	10624M3	147.418	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8987	237.460	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.335	217	4870M3	128.678	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	4377M3	115.652	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.901	217	17117	452.276	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.413	217	17281	456.609	ng/ml	100
135) Unknown Sterane (S18)	47.684	217	3407	90.022	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.940	217	909	24.018	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.091	217	7345M3	194.074	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6746M3	178.247	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	11836M3	312.738	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	11978M3	316.490	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.991	218	9562M3	252.653	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	9900M3	261.584	ng/ml	
143) 14b,17b-20R-Methylcholest	48.256	218	10084	266.446	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	14497M3	383.049	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.371	218	18380M3	485.648	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.416	218	13949M3	368.569	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	30890	816.194	ng/mL	100
148) C28,20S-triaromatic stero	49.928	231	28021	740.388	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	20111M3	531.385	ng/mL	
150) C28,20R-triaromatic stero	51.539	231	22994M3	607.561	ng/mL	

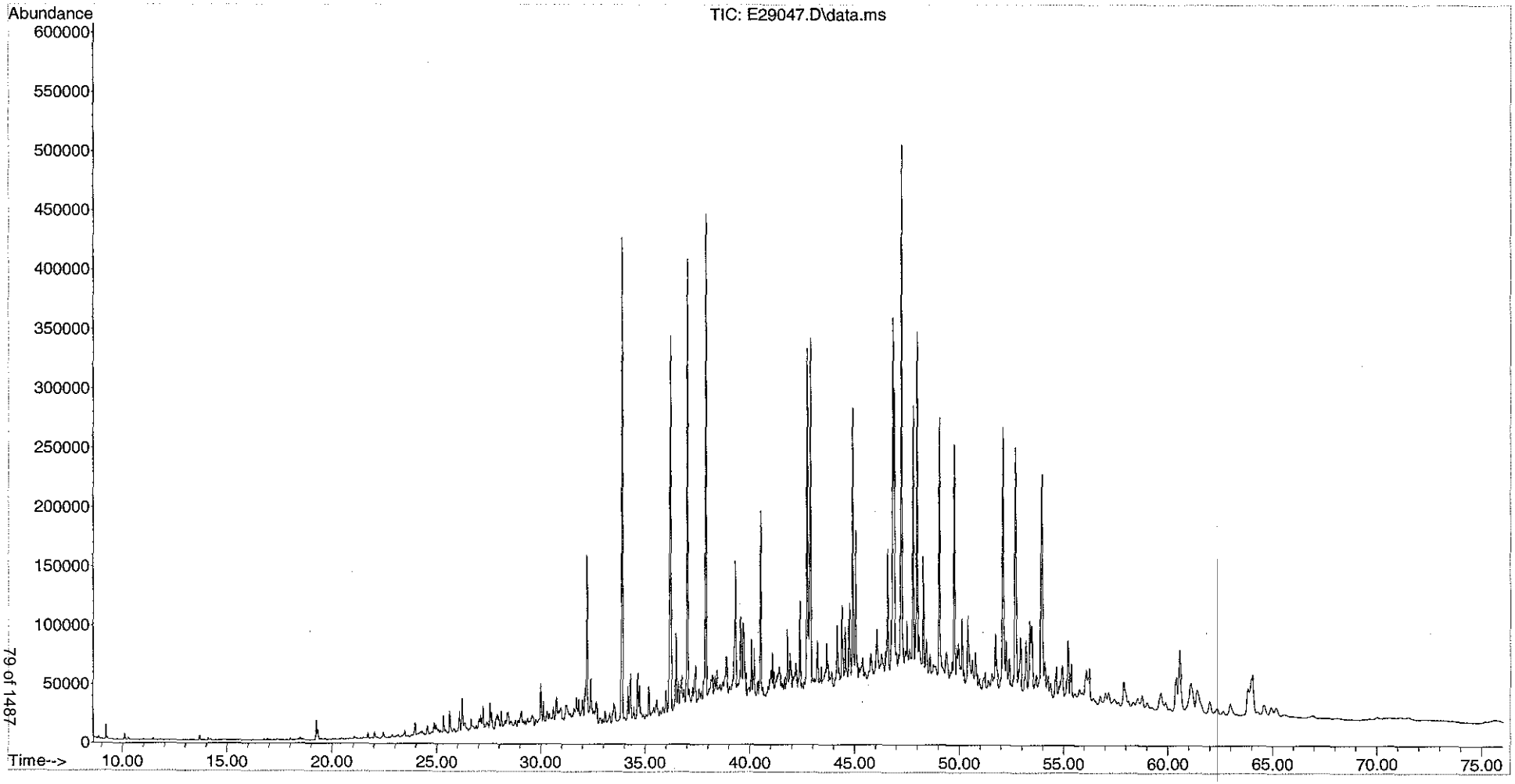
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Method File : PAH2102912.M
Title : Decalins & Alkylated PAH's
Last Update : Tue Oct 30 11:49:46 2012
Response Via : Initial Calibration

JJK (11/05/12)

11/7/12.

Calibration Files
10 =E28517.D 25 =E28519.D 100 =E28521.D 500 =E28523.D 5000=E28525.D 1e4 =E28527.D 2e4 =E28529.D

		Compound	10	25	100	500	5000	1e4	2e4	Avg	%RSD
1)	i	Acenaphthene-d10	----------ISTD----------								
2)	t	2-butoxyethanol	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
3)	A1	trans-Decalin	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
4)	t	cis-Decalin	0.331	0.315	0.328	0.294	0.299	0.290	0.269	0.304	7.39
5)	A2	C1-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
6)	A2	C2-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
7)	A2	C3-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
8)	A2	C4-Decalins	0.443	0.445	0.426	0.380	0.386	0.375	0.345	0.400	9.56
9)	s	Naphthalene-d8	1.738	1.812	1.914	1.880	1.630	1.824	1.514	1.759	8.13
10)	A1	Naphthalene	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
11)	A2	C1-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
12)	A2	C2-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
13)	A2	C3-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
14)	A2	C4-Naphthalenes	2.094	2.027	2.099	1.985	1.969	1.881	1.712	1.967	6.87
15)	t	Glycol Ether I...	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
16)	t	2-Methylnaphth...	1.314	1.250	1.284	1.236	1.284	1.246	1.154	1.253	4.10
17)	t	1-Methylnaphth...	1.244	1.216	1.282	1.218	1.236	1.204	1.120	1.217	4.09
18)	A1	Benzothiophene	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
19)	A2	C1-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
20)	A2	C2-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
21)	A2	C3-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
22)	A2	C4-Benzo(b)thi...	1.634	1.624	1.745	1.652	1.656	1.600	1.472	1.626	5.03
23)	t	Biphenyl	1.659	1.533	1.635	1.576	1.627	1.584	1.469	1.583	4.15
24)	t	2,6-Dimethylna...	1.113	1.083	1.144	1.133	1.183	1.158	1.089	1.129	3.21
25)	t	Dibenzofuran	1.682	1.677	1.793	1.765	1.844	1.815	1.693	1.753	3.92
26)	t	Acenaphthylene	1.897	1.870	1.998	1.941	2.086	2.030	1.904	1.961	4.04
27)	t	Acenaphthene	1.291	1.252	1.304	1.251	1.288	1.260	1.188	1.262	3.06
28)	t	2,3,5-Trimethy...	1.015	1.016	1.066	1.043	1.113	1.102	1.039	1.056	3.69
29)	A1	Fluorene	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85
30)	A2	C1-Fluorenes	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85
31)	A2	C2-Fluorenes	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85
32)	A2	C3-Fluorenes	1.294	1.370	1.425	1.401	1.501	1.473	1.389	1.408	4.85

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Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Method File : PAH2102912.M

19k (11/05/12)

33)	A1	Dibenzothiophene	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
34)	A2	4-Methyldibenz...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
35)	A2	2/3-Methyldibe...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
36)	A2	1-Methyldibenz...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
37)	A2	OTP	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
38)	A2	C1-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
39)	A2	C2-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
40)	A2	C3-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
41)	A2	C4-Dibenzothio...	1.770	1.835	1.969	1.946	2.074	2.036	1.891	1.932	5.58
42)	s	Phenanthrene-d10	1.643	1.709	1.828	1.910	1.748	2.018	1.756	1.802	7.08
43)	A1	Phenanthrene	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
44)	A2	3-Methylphenan...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
45)	A2	2-Methylphenan...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
46)	A2	2-Methylanthra...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
47)	A2	9/4-Methylphen...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
48)	A2	1-Methylphenan...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
49)	A2	C1-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
50)	A2	C2-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
51)	A2	5AA IS BKGD	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
52)	A2	C3-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
53)	A2	C4-Phenanthren...	1.778	1.804	1.996	2.024	2.114	2.088	1.954	1.965	6.65
54)	t	Retene	0.584	0.564	0.588	0.604	0.710	0.709	0.670	0.632	9.82
55)	t	Anthracene	1.580	1.723	1.938	1.825	1.841	1.601	1.384	1.699	11.18
56)	t	Carbazole	1.474	1.546	1.653	1.751	1.986	1.981	1.847	1.748	11.58
57)	t	1-Methylphenan...	1.316	1.410	1.489	1.490	1.646	1.629	1.516	1.499	7.73
58)	A1	Fluoranthene	1.905	2.050	2.151	2.167	2.401	2.354	2.166	2.170	7.81
59)	t	Benzo(b)fluorene	1.206	1.265	1.366	1.426	1.666	1.646	1.550	1.446	12.50
60)	A1	Pyrene	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
61)	A2	C1-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
62)	A2	C2-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
63)	A2	C3-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
64)	A2	C4-Fluoranthen...	2.059	2.052	2.180	2.199	2.397	2.373	2.182	2.206	6.17
65)	t	Bis-(2-ethylhe...	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.00
66)	A1	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
67)	A2	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
68)	A2	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
69)	A2	Naphthobenzoth...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
70)	A2	C1-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
71)	A2	C2-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
72)	A2	C3-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38
73)	A2	C4-Naphthobenz...	1.913	2.020	2.130	2.154	2.417	2.385	2.212	2.176	8.38

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Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\

Method File : PAH2102912.M

JGK (11/05/12)

74)	i	Chrysene-d12	ISTD								
75)	t	Benz[a]anthracene	0.919	0.949	0.978	1.011	1.050	0.970	0.938	0.974	4.61
76)	A1	Chrysene	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
77)	A2	Chrysene/Triph...	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
78)	A2	C1-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
79)	A2	C2-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
80)	A2	BBF-D12 Surr BKGD	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
81)	A2	C3-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
82)	A2	C4-Chrysenes	1.029	1.029	1.024	1.033	1.025	0.948	0.928	1.002	4.43
83)	s	Benzo[b]fluora...	1.062	1.046	1.006	1.086	0.970	1.065	0.956	1.027	4.89
84)	t	Benzo[b]fluora...	1.138	1.056	1.108	1.156	1.215	1.146	1.103	1.132	4.41
85)	A1	Benzo[j]+[k]fl...	1.158	1.177	1.192	1.207	1.213	1.104	1.100	1.164	3.99
86)	A2	Benzo[a]fluora...	1.158	1.177	1.192	1.207	1.213	1.104	1.100	1.164	3.99
87)	t	Benzo[e]pyrene	1.215	1.106	1.083	1.098	1.141	1.056	1.036	1.105	5.35
88)	s	Benzo[a]pyrene...	1.030	0.969	0.974	1.015	0.967	1.044	0.967	0.995	3.36
89)	t	Benzo[a]pyrene	1.155	1.023	1.027	1.035	1.120	1.023	1.019	1.057	5.28
90)	t	Perylene	1.169	1.084	1.091	1.101	1.199	1.101	1.084	1.118	4.12
91)	t	Indeno[1,2,3-c...	1.264	1.161	1.112	1.218	1.346	1.303	1.308	1.244	6.82
92)	t	Dibenz[ah]+[ac...	1.350	1.276	1.268	1.324	1.424	1.336	1.296	1.325	4.02
93)	t	Benzo[g,h,i]pe...	1.503	1.393	1.297	1.304	1.371	1.277	1.246	1.342	6.55
94)	A1	Hopane (T19)	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
95)	A2	17a(H),21B(H)-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
96)	A2	C23 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
97)	A2	C24 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
98)	A2	C25 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
99)	A2	C24 Tetracycli...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
100)	A2	C26 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
101)	A2	C26 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
102)	A2	C28 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
103)	A2	C28 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
104)	A2	C29 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
105)	A2	C29 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
106)	A2	18a-22,29,30-T...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
107)	A2	C30 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
108)	A2	C30 Tricyclic ...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
109)	A2	17a(H)-22,29,3...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
110)	A2	17a/b,21b/a 28...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
111)	A2	17a(H),21b(H)-...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
112)	A2	30-Norhopane (...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
113)	A2	18a(H)-30-Norn...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
114)	A2	17a(H)-Diahopa...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06
115)	A2	30-Normoretane...	0.411	0.390	0.349	0.371	0.377	0.355		0.375	6.06

Method Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Method File : PAH2102912.M

116)	A2	18a(H)&18b(H)-...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
117)	A2	Moretane (T20)	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
118)	A2	30-Homohopane-...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
119)	A2	30-Homohopane-...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
120)	A2	Gammacerane/C3...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
121)	A2	30,31-Bishomoh...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
122)	A2	30,31-Bishomoh...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
123)	A2	30,31-Trishomo...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
124)	A2	30,31-Trishomo...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
125)	A2	Tetrakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
126)	A2	Tetrakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
127)	A2	Pentakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
128)	A2	Pentakishomoho...	0.411	0.390	0.349	0.371	0.377	0.355	0.375	6.06
129)	SA1	5B(H)Cholane -...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
130)	A2	13b(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
131)	A2	13b(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
132)	A2	13b,17a-20S-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
133)	A2	14a,17a-20S-Ch...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
134)	A2	14a,17a-20R-Ch...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
135)	A2	Unknown Steran...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
136)	A2	13a,17b-20S-Et...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
137)	A2	14a,17a-20S-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
138)	A2	14a,17a-20R-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
139)	A2	14a(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
140)	A2	14a(H),17a(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
141)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
142)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
143)	A2	14b,17b-20R-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
144)	A2	14b,17b-20S-Me...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
145)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
146)	A2	14b(H),17b(H)-...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
147)	A2	C26,20R- +C27,...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
148)	A2	C28,20S-triaro...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
149)	A2	C27,20R-triaro...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47
150)	A2	C28,20R-triaro...	0.189	0.198	0.196	0.193	0.211	0.194	0.197	0.197	3.47

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

JJK (11/5/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	25956	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51989	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	902	9.329	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.93%#		
42) Phenanthrene-d10	32.462	188	853	8.754	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.88%#		
83) Benzo[b]fluoranthene-d12	46.991	264	1104	11.216	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	1.12%#		
88) Benzo[a]pyrene-d12	48.166	264	1071	11.998	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	1.20%#		
129) 5B(H)Cholane - Surr	43.724	217	197	10.279	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	1.03%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	115	5.322	ng/mL	100
4) cis-Decalin	17.483	138	86M2	5.240	ng/mL	
10) Naphthalene	19.696	128	1087	10.481	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	682	10.161	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	646	10.036	ng/mL#	100
18) Benzothiophene	19.906	134	848	10.023	ng/mL	100
23) Biphenyl	24.272	154	861	10.128	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.875	156	578	9.446	ng/mL#	100
25) Dibenzofuran	27.358	168	873	9.503	ng/mL#	90
26) Acenaphthylene	25.973	152	985	9.620	ng/mL#	100
27) Acenaphthene	26.711	153	670	10.499	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.277	170	527	9.528	ng/mL	94
29) Fluorene	28.728	166	672	9.057	ng/mL	98
33) Dibenzothiophene	32.055	184	919	8.846	ng/mL#	81
43) Phenanthrene	32.552	178	923	8.519	ng/mL	99
54) Retene	39.568	234	303	9.135	ng/mL	99
55) Anthracene	32.733	178	820M3	8.076	ng/mL	
56) Carbazole	33.425	167	765	7.978	ng/mL	96
57) 1-Methylphenanthrene	35.066	192	683M3	8.463	ng/mL	
58) Fluoranthene	37.340	202	989	8.376	ng/mL	97
59) Benzo(b)fluorene	39.869	216	626	8.335	ng/mL	99
60) Pyrene	38.213	202	1069	8.993	ng/mL	97
66) Naphthobenzothiophene	42.083	234	993	8.854	ng/ml#	86
67) Naphthobenzothiophene-...	42.083	234	993	8.854	ng/mL#	86

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 13:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

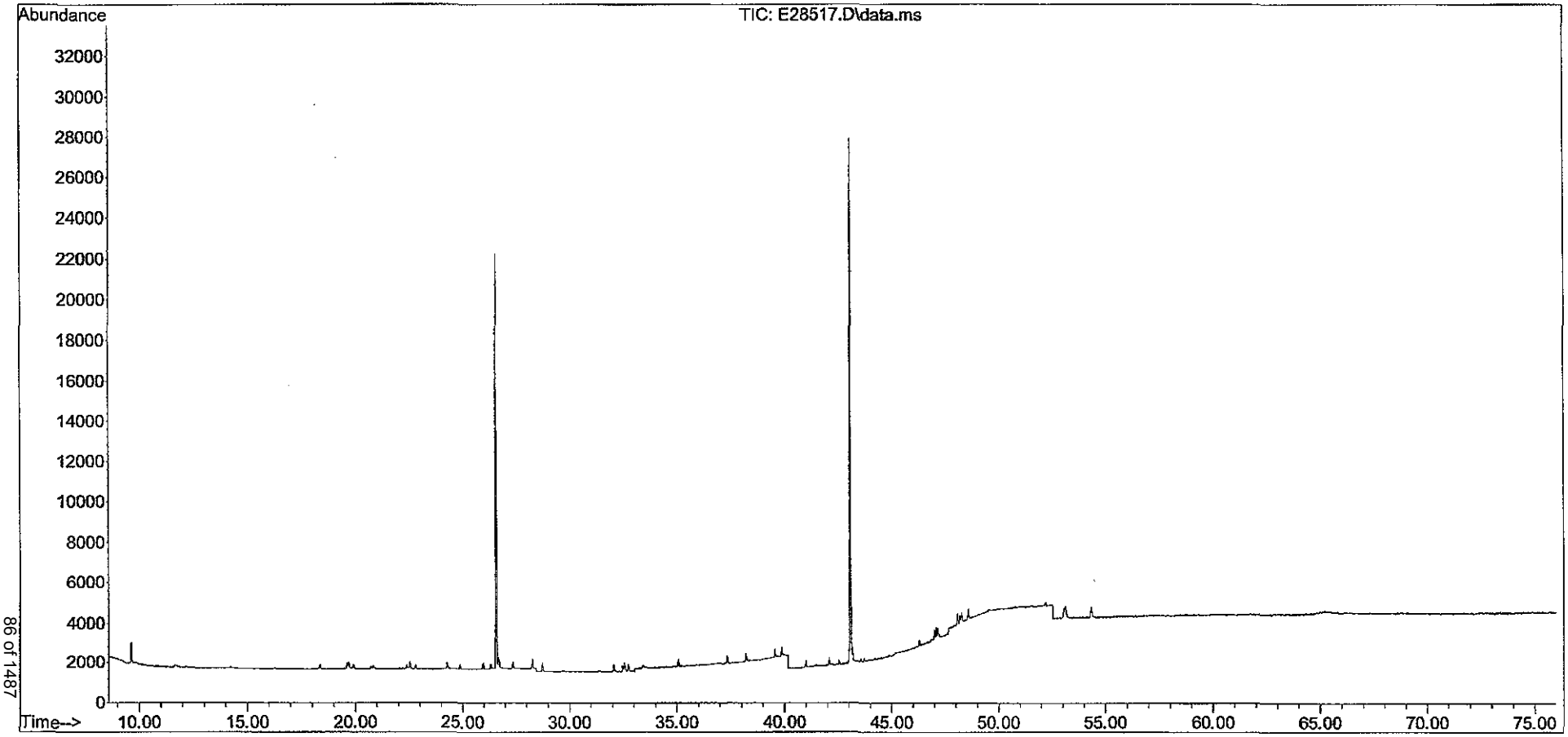
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.016	228	956M3	8.294	ng/mL	
76) Chrysene	43.167	228	1070	9.484	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	1070	9.484	ng/mL	100
84) Benzo[b]fluoranthene	47.082	252	1183	9.748	ng/mL#	84
85) Benzo[j]+[k]fluoranthene	47.157	252	1204	10.543	ng/mL#	88
87) Benzo[e]pyrene	48.076	252	1263	11.728	ng/mL#	84
89) Benzo[a]pyrene	48.256	252	1201	11.796	ng/mL#	77
90) Perylene	48.573	252	1215	11.213	ng/mL#	84
91) Indeno[1,2,3-cd]pyrene	53.045	276	1314M3	10.690	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	1404	11.876	ng/mL	97
93) Benzo[g,h,i]perylene	54.325	276	1563	12.940	ng/mL	100
94) Hopane (T19)	52.187	191	427M3	14.965	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.187	191	416M3	14.579	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 13:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	25519	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51858	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	2312	24.321	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.43%#		
42) Phenanthrene-d10	32.462	188	2181	22.766	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.28%#		
83) Benzo[b]fluoranthene-d12	46.991	264	2711	27.613	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.76%#		
88) Benzo[a]pyrene-d12	48.166	264	2513	28.222	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.82%#		
129) 5B(H)Cholane - Surr	43.723	217	514	26.886	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.69%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	284	13.369	ng/mL	100
4) cis-Decalin	17.482	138	201	12.456	ng/mL	100
10) Naphthalene	19.680	128	2586	25.362	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1595	24.170	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1551	24.508	ng/mL#	100
18) Benzothiophene	19.906	134	2072	24.909	ng/mL	100
23) Biphenyl	24.272	154	1956	23.403	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	1382	22.973	ng/mL#	100
25) Dibenzofuran	27.358	168	2140	23.693	ng/mL	94
26) Acenaphthylene	25.973	152	2386	23.701	ng/mL#	100
27) Acenaphthene	26.696	153	1598	25.471	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.262	170	1297	23.852	ng/mL	98
29) Fluorene	28.728	166	1748	23.964	ng/mL	97
33) Dibenzothiophene	32.055	184	2342	22.930	ng/mL#	94
43) Phenanthrene	32.552	178	2302	21.610	ng/mL	100
54) Retene	39.568	234	719	22.048	ng/mL	93
55) Anthracene	32.733	178	2199M3	22.030	ng/mL	
56) Carbazole	33.425	167	1973	20.927	ng/mL	98
57) 1-Methylphenanthrene	35.066	192	1799	22.673	ng/mL	100
58) Fluoranthene	37.340	202	2616	22.534	ng/mL	98
59) Benzo(b)fluorene	39.869	216	1614	21.858	ng/mL	100
60) Pyrene	38.213	202	2618	22.402	ng/mL	95
66) Naphthobenzothiophene	42.082	234	2577	23.370	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	2577	23.370	ng/mL#	95

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 13:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

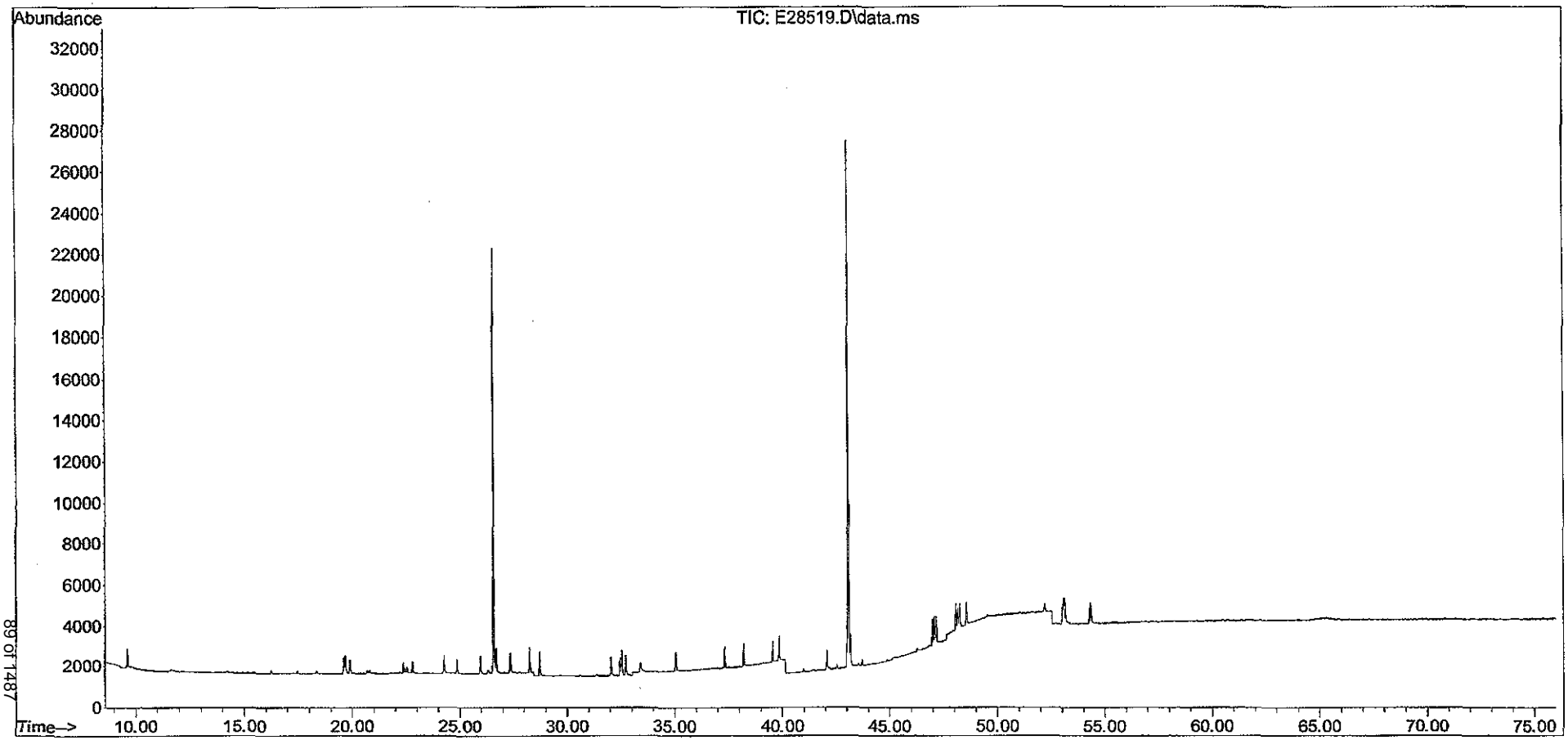
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75)	Benz[a]anthracene	43.016	228	2460M3	21.396	ng/mL	
76)	Chrysene	43.166	228	2669	23.716	ng/mL	98
77)	Chrysene/Triphenylene	43.166	228	2669	23.716	ng/mL	98
84)	Benzo[b]fluoranthene	47.081	252	2739	22.626	ng/mL	92
85)	Benzo[j]+[k]fluoranthene	47.157	252	3051	26.783	ng/mL	97
87)	Benzo[e]pyrene	48.075	252	2868M3	26.699	ng/mL	
89)	Benzo[a]pyrene	48.256	252	2653	26.124	ng/mL	94
90)	Perylene	48.572	252	2810	25.999	ng/mL	97
91)	Indeno[1,2,3-cd]pyrene	53.045	276	3010M3	24.550	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.121	278	3309	28.060	ng/mL	97
93)	Benzo[g,h,i]perylene	54.325	276	3613	29.988	ng/mL	98
94)	Hopane (T19)	52.187	191	1010M3	35.486	ng/mL	
95)	17a(H),21B(H)-hopane -...	52.187	191	1032M3	36.259	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 13:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



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2896

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	23755M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	50831	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	9092	102.746	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	10.27%#		
42) Phenanthrene-d10	32.462	188	8686	97.402	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	9.74%#		
83) Benzo[b]fluoranthene-d12	46.991	264	10225	106.250	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	10.63%#		
88) Benzo[a]pyrene-d12	48.166	264	9905	113.485	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	11.35%#		
129) 5B(H)Cholane - Surr	43.708	217	1989	106.142	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery =	10.61%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	1011	51.127	ng/mL	100
4) cis-Decalin	17.482	138	780	51.928	ng/mL	100
10) Naphthalene	19.680	128	9972	105.060	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	6102	99.335	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	6090	103.378	ng/mL#	100
18) Benzothiophene	19.906	134	8289	107.049	ng/mL	100
23) Biphenyl	24.272	154	7767	99.833	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	5433	97.018	ng/mL#	100
25) Dibenzofuran	27.358	168	8518	101.311	ng/mL	97
26) Acenaphthylene	25.973	152	9493M3	101.299	ng/mL	
27) Acenaphthene	26.696	153	6196	106.092	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.262	170	5064	100.043	ng/mL	95
29) Fluorene	28.728	166	6771	99.718	ng/mL	99
33) Dibenzothiophene	32.055	184	9356	98.404	ng/mL#	96
43) Phenanthrene	32.552	178	9481	95.610	ng/mL	99
54) Retene	39.568	234	2793	92.007	ng/mL	90
55) Anthracene	32.733	178	9206M3	99.074	ng/mL	
56) Carbazole	33.410	167	7855	89.504	ng/mL	100
57) 1-Methylphenanthrene	35.066	192	7075	95.788	ng/mL	98
58) Fluoranthene	37.325	202	10218	94.551	ng/mL	99
59) Benzo(b)fluorene	39.854	216	6491	94.432	ng/mL	100
60) Pyrene	38.213	202	10358	95.214	ng/mL	99
66) Naphthobenzothiophene	42.082	234	10119	98.581	ng/ml	96
67) Naphthobenzothiophene-...	42.082	234	10119	98.581	ng/mL	96

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 13:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

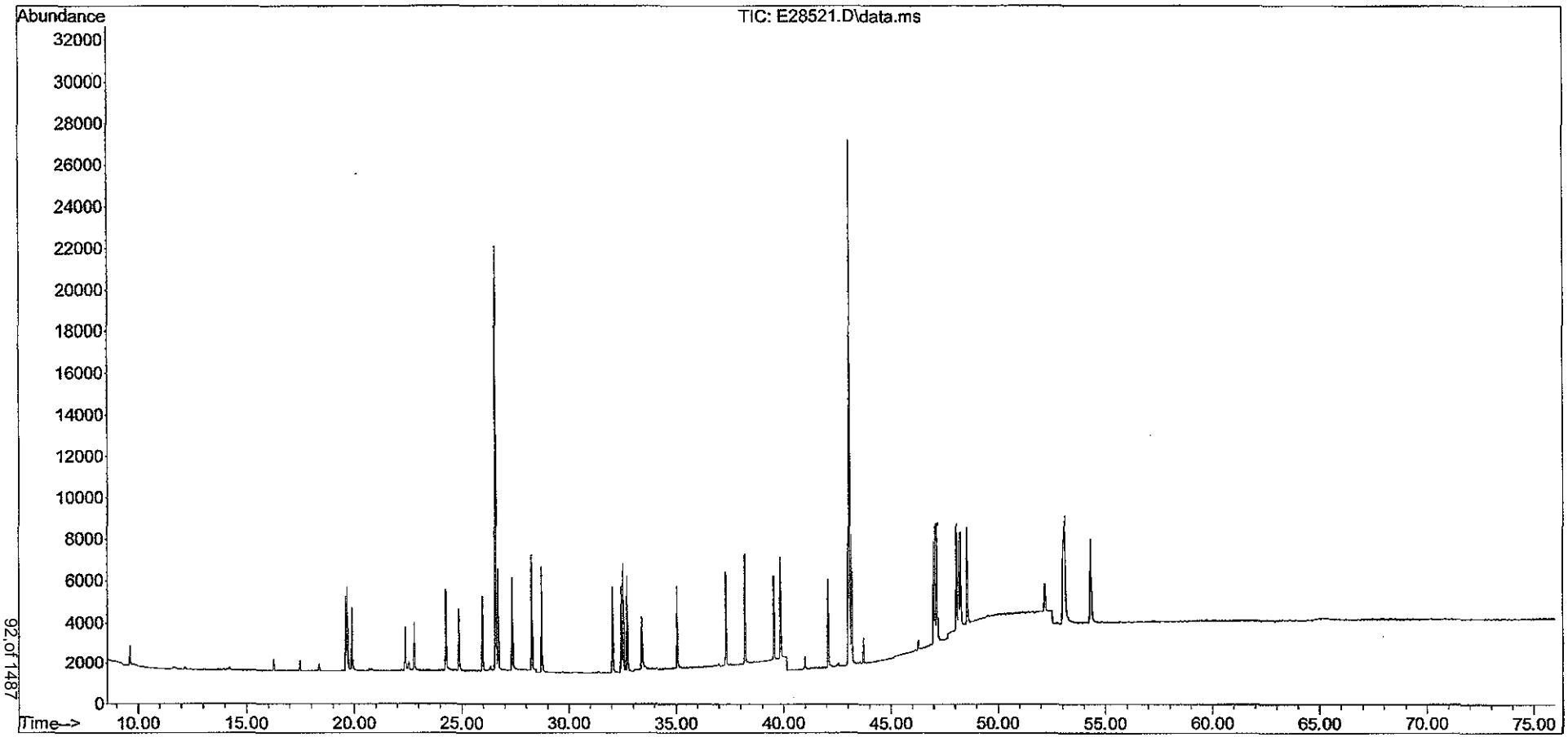
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75)	Benz[a]anthracene	43.016	228	9939	88.192	ng/mL	99
76)	Chrysene	43.166	228	10414	94.407	ng/mL	99
77)	Chrysene/Triphenylene	43.166	228	10414	94.407	ng/mL	99
84)	Benzo[b]fluoranthene	47.066	252	11264	94.928	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	47.157	252	12115	108.499	ng/mL	97
87)	Benzo[e]pyrene	48.060	252	11009	104.557	ng/mL	98
89)	Benzo[a]pyrene	48.256	252	10439	104.868	ng/mL	100
90)	Perylene	48.557	252	11087	104.654	ng/mL	99
91)	Indeno[1,2,3-cd]pyrene	53.045	276	11305M3	94.067	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.106	278	12888	111.498	ng/mL	100
93)	Benzo[g,h,i]perylene	54.325	276	13189	111.682	ng/mL	99
94)	Hopane (T19)	52.187	191	3549M3	127.214	ng/mL	
95)	17a(H),21B(H)-hopane -...	52.187	191	3538M3	126.820	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : TCAL_CCALT_NEW_Default_REV2 CC with 5 Surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 13:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JGK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	36682	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	77083	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	68946	504.564	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.46%			
42) Phenanthrene-d10	32.462	188	70047	508.673	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.87%			
83) Benzo[b]fluoranthene-d12	46.991	264	83676	573.370	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.34%			
88) Benzo[a]pyrene-d12	48.166	264	78237	591.107	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 59.11%			
129) 5B(H)Cholane - Surr	43.724	217	14895	524.160	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.42%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	6961	227.966	ng/mL	100
4) cis-Decalin	17.483	138	5393	232.508	ng/mL	100
10) Naphthalene	19.681	128	72826	496.872	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	45351	478.102	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	44682	491.184	ng/mL#	100
18) Benzothiophene	19.891	134	60586	506.706	ng/mL	100
23) Biphenyl	24.257	154	57808	481.183	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	41569	480.711	ng/mL#	100
25) Dibenzofuran	27.343	168	64736	498.617	ng/mL	98
26) Acenaphthylene	25.958	152	71193M3	491.972	ng/mL	
27) Acenaphthene	26.696	153	45899	508.953	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.262	170	38267	489.576	ng/mL	96
29) Fluorene	28.728	166	51400	490.213	ng/mL	99
33) Dibenzothiophene	32.055	184	71389	486.246	ng/mL#	95
43) Phenanthrene	32.537	178	74232	484.778	ng/mL	99
54) Retene	39.568	234	22141	472.333	ng/mL	92
55) Anthracene	32.718	178	66927M3	466.436	ng/mL	
56) Carbazole	33.395	167	64221	473.886	ng/mL	100
57) 1-Methylphenanthrene	35.051	192	54645	479.112	ng/mL	99
58) Fluoranthene	37.325	202	79475	476.249	ng/mL	99
59) Benzo(b)fluorene	39.854	216	52291	492.646	ng/mL	99
60) Pyrene	38.213	202	80681	480.284	ng/mL	99
66) Naphthobenzothiophene	42.082	234	79024	498.558	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	79024	498.558	ng/mL#	95

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 13:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

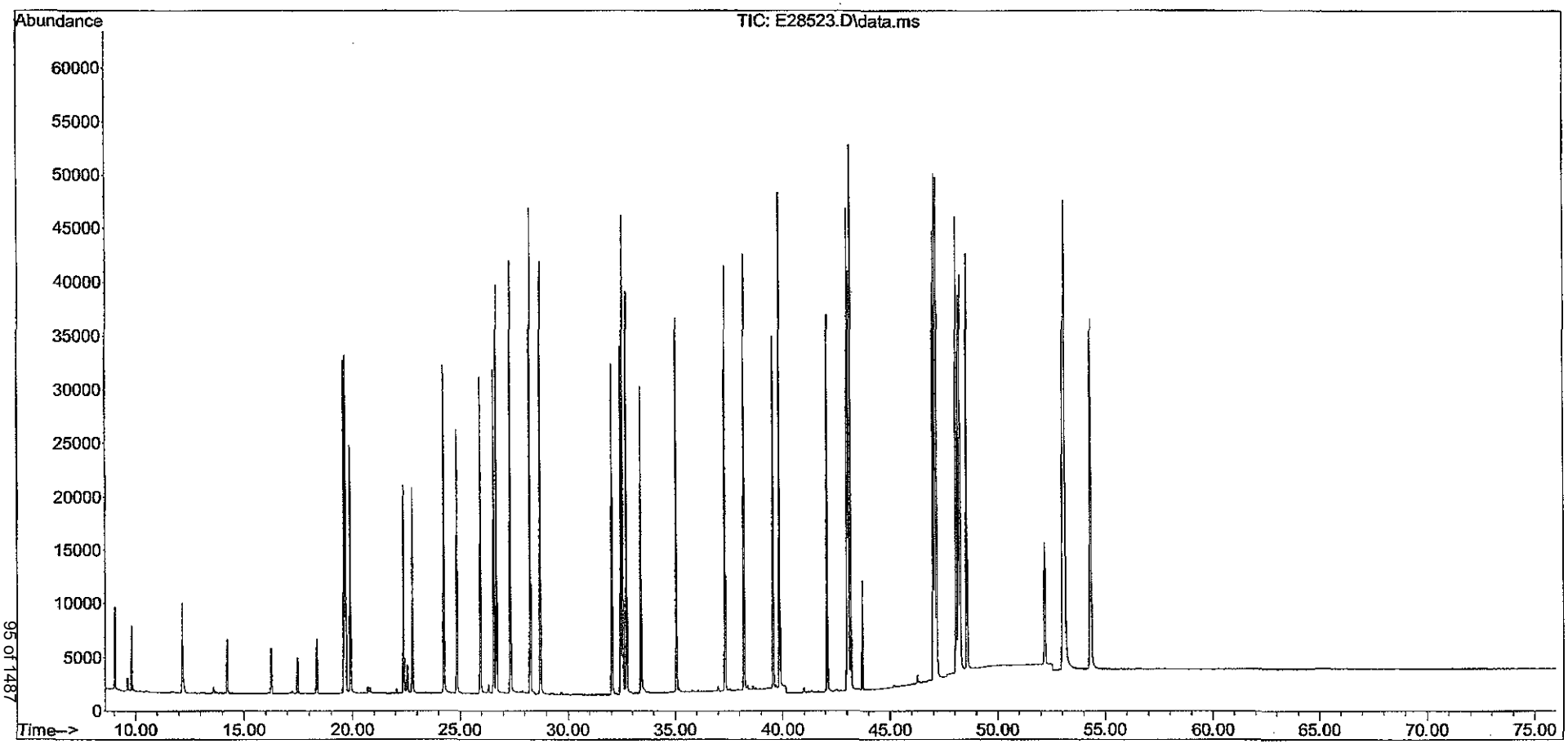
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.016	228	77932	456.006	ng/mL	100
76) Chrysene	43.167	228	79635	476.059	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	79635	476.059	ng/mL	100
84) Benzo[b]fluoranthene	47.067	252	89104	495.187	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	93062	549.600	ng/mL	98
87) Benzo[e]pyrene	48.060	252	84646	530.127	ng/mL	97
89) Benzo[a]pyrene	48.256	252	79782	528.520	ng/mL	97
90) Perylene	48.557	252	84830	528.035	ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.030	276	93871M3	515.074	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.106	278	102096	582.452	ng/mL	99
93) Benzo[g,h,i]perylene	54.325	276	100489	561.124	ng/mL	100
94) Hopane (T19)	52.187	191	28585	675.673	ng/mL#	91
95) 17a(H),21B(H)-hopane -...	52.187	191	28585	675.673	ng/mL#	91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALI_NEW_Default_Rev2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 13:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.575	164	33843	500.000 ng/mL	0.00
74) Chrysene-d12	43.076	240	78030	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.605	136	551490	4374.510 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 437.45%#		
42) Phenanthrene-d10	32.462	188	591656	4656.961 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 465.70%#		
83) Benzo[b]fluoranthene-d12	47.006	264	757059	5124.613 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 512.46%#		
88) Benzo[a]pyrene-d12	48.181	264	754524	5631.502 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 563.15%#		
129) 5B(H)Cholane - Surr	43.723	217	164748	5727.173 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 572.72%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	65353	2319.785 ng/mL	100
4) cis-Decalin	17.482	138	50652	2366.946 ng/mL	100
10) Naphthalene	19.680	128	666336	4927.599 ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	434650	4966.577 ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	418300	4984.067 ng/mL#	100
18) Benzothiophene	19.891	134	560368	5079.742 ng/mL	100
23) Biphenyl	24.272	154	550566	4967.246 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	400289	5017.330 ng/mL#	100
25) Dibenzofuran	27.343	168	624188	5210.994 ng/mL	98
26) Acenaphthylene	25.958	152	705912M3	5287.347 ng/mL	
27) Acenaphthene	26.711	153	436058	5240.867 ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	376690	5223.527 ng/mL	97
29) Fluorene	28.728	166	508103	5252.399 ng/mL	100
33) Dibenzothiophene	32.055	184	701873	5181.642 ng/mL#	95
43) Phenanthrene	32.552	178	715454	5064.281 ng/mL	99
54) Retene	39.568	234	240302	5556.394 ng/mL	93
55) Anthracene	32.733	178	623046M3	4706.465 ng/mL	
56) Carbazole	33.395	167	672100	5375.448 ng/mL	99
57) 1-Methylphenanthrene	35.066	192	557136	5294.589 ng/mL	99

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 13:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

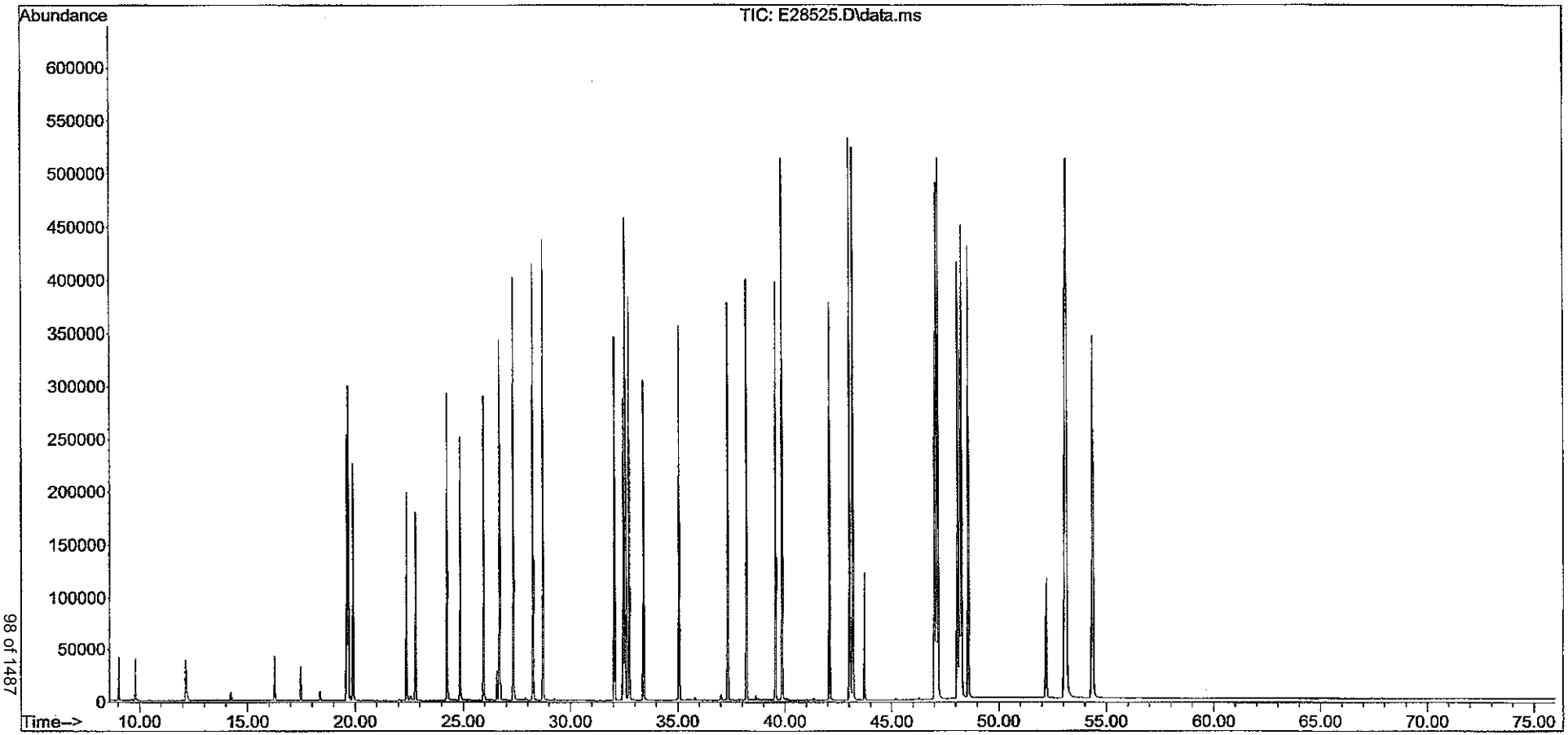
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
58)	Fluoranthene	37.340	202	812711M3	5278.661	ng/mL	
59)	Benzo(b)fluorene	39.869	216	563733	5756.591	ng/mL	99
60)	Pyrene	38.213	202	811273	5234.531	ng/mL	98
66)	Naphthobenzothiophene	42.082	234	818126	5594.497	ng/ml#	95
67)	Naphthobenzothiophene-...	42.082	234	818126	5594.497	ng/mL#	95
75)	Benz[a]anthracene	43.016	228	819446	4736.655	ng/mL	99
76)	Chrysene	43.181	228	799496	4721.396	ng/mL	100
77)	Chrysene/Triphenylene	43.181	228	799496	4721.396	ng/mL	100
84)	Benzo[b]fluoranthene	47.081	252	948454	5206.972	ng/mL	99
85)	Benzo[j]+[k]fluoranthene	47.172	252	946512	5522.013	ng/mL	98
87)	Benzo[e]pyrene	48.075	252	890237	5507.774	ng/mL	97
89)	Benzo[a]pyrene	48.271	252	873584	5716.864	ng/mL	97
90)	Perylene	48.572	252	935392	5751.798	ng/mL	97
91)	Indeno[1,2,3-cd]pyrene	53.060	276	1049897M3	5690.915	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.121	278	1111133	6262.016	ng/mL	99
93)	Benzo[g,h,i]perylene	54.355	276	1070138	5903.057	ng/mL	100
94)	Hopane (T19)	52.202	191	293886	6862.372	ng/mL#	90
95)	17a(H),21B(H)-hopane -...	52.202	191	293886	6862.372	ng/mL#	90

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALI_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 13:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



98 of 1487
2905

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JQIC (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.575	164	34237M3	500.000 ng/mL	0.00
74) Chrysene-d12	43.076	240	83845	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.605	136	1249184	9794.704 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 979.47%#		
42) Phenanthrene-d10	32.462	188	1381837	10751.358 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1075.14%#		
83) Benzo[b]fluoranthene-d12	47.021	264	1786107	11251.833 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1125.18%#		
88) Benzo[a]pyrene-d12	48.196	264	1750732	12160.609 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1216.06%#		
129) 5B(H)Cholane - Surr	43.723	217	325906	10543.794 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1054.38%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	128304	4501.898 ng/mL	100
4) cis-Decalin	17.483	138	99422	4592.482 ng/mL	100
10) Naphthalene	19.680	128	1288199	9416.689 ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	853166	9636.608 ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	824452	9710.342 ng/mL#	100
18) Benzothiophene	19.906	134	1095341	9815.012 ng/mL	100
23) Biphenyl	24.272	154	1084695	9673.576 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	792979	9825.029 ng/mL#	100
25) Dibenzofuran	27.358	168	1242869	10256.606 ng/mL	97
26) Acenaphthylene	25.973	152	1390024M3	10291.595 ng/mL	
27) Acenaphthene	26.711	153	862774	10250.123 ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	754332	10339.879 ng/mL	95
29) Fluorene	28.728	166	1008743	10307.649 ng/mL	100
33) Dibenzothiophene	32.055	184	1394373	10175.622 ng/mL#	95
43) Phenanthrene	32.552	178	1429622	10003.004 ng/mL	100
54) Retene	39.583	234	485174	11089.355 ng/mL	94
55) Anthracene	32.733	178	1096223M3	8185.530 ng/mL	
56) Carbazole	33.410	167	1356581	10725.058 ng/mL	99
57) 1-Methylphenanthrene	35.066	192	1115333	10477.285 ng/mL	99

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 13:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

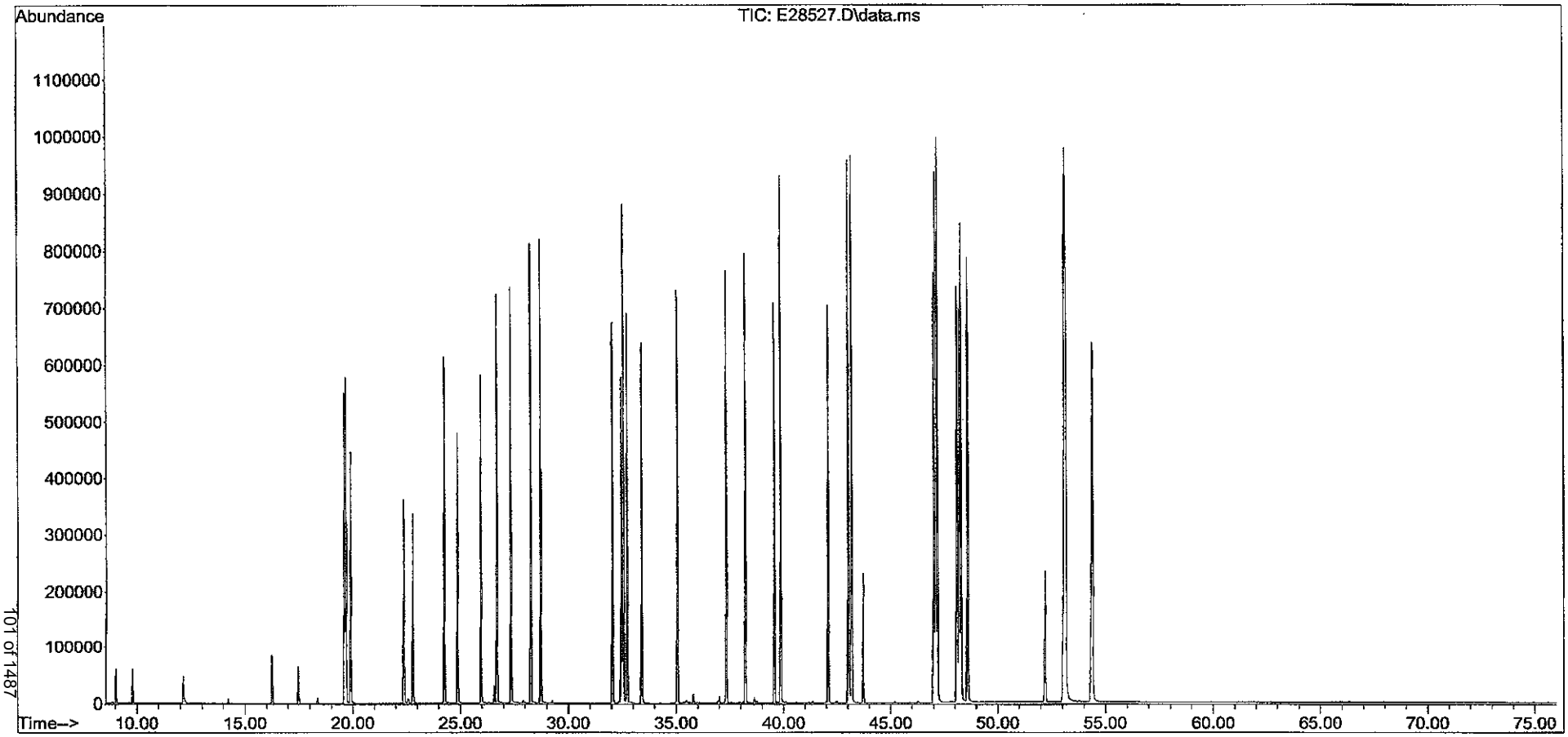
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
58) Fluoranthene	37.340	202	1611679M3	10347.593 ng/mL	
59) Benzo(b)fluorene	39.884	216	1126932	11375.299 ng/mL	99
60) Pyrene	38.228	202	1624916	10363.699 ng/mL	98
66) Naphthobenzothiophene	42.097	234	1632867	11037.350 ng/ml#	95
67) Naphthobenzothiophene-...	42.097	234	1632867	11037.350 ng/mL#	95
75) Benz[a]anthracene	43.031	228	1626986M3	8752.250 ng/mL	
76) Chrysene	43.197	228	1589503	8735.745 ng/mL	99
77) Chrysene/Triphenylene	43.197	228	1589503	8735.745 ng/mL	99
84) Benzo[b]fluoranthene	47.097	252	1921388	9816.767 ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.187	252	1850530	10047.358 ng/mL	99
87) Benzo[e]pyrene	48.090	252	1770929	10196.616 ng/mL	98
89) Benzo[a]pyrene	48.286	252	1716035	10451.142 ng/mL	98
90) Perylene	48.587	252	1845721	10562.348 ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.090	276	2185546M3	11025.031 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.151	278	2240598	11751.587 ng/mL	100
93) Benzo[g,h,i]perylene	54.386	276	2141401	10993.087 ng/mL	99
94) Hopane (T19)	52.202	191	594811	12925.841 ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	594811	12925.841 ng/mL#	90

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCAL1_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 13:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.576	164	37912	500.000 ng/mL	0.00
74) Chrysene-d12	43.091	240	88160	500.000 ng/mL	0.01
System Monitoring Compounds					
9) Naphthalene-d8	19.620	136	2296353	16260.075 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1626.01%#		
42) Phenanthrene-d10	32.477	188	2663465	18714.253 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1871.43%#		
83) Benzo[b]fluoranthene-d12	47.036	264	3370773	20195.327 ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2019.53%#		
88) Benzo[a]pyrene-d12	48.226	264	3410139	22527.516 ng/mL	0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2252.75%#		
129) 5B(H)Cholane - Surr	43.739	217	695988	21414.696 ng/ml	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2141.47%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	261873	8297.842 ng/mL	100
4) cis-Decalin	17.483	138	203630	8494.264 ng/mL	100
10) Naphthalene	19.696	128	2596569	17140.920 ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1749682	17847.146 ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1698936	18070.292 ng/mL#	100
18) Benzothiophene	19.906	134	2232488	18065.485 ng/mL	100
23) Biphenyl	24.272	154	2227434	17939.207 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.889	156	1652186	18486.304 ng/mL#	100
25) Dibenzofuran	27.358	168	2567457	19133.769 ng/mL	98
26) Acenaphthylene	25.973	152	2887125M3	19303.898 ng/mL	
27) Acenaphthene	26.711	153	1802150	19334.902 ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.292	170	1575864	19507.008 ng/mL	94
29) Fluorene	28.743	166	2105968	19433.448 ng/mL	100
33) Dibenzothiophene	32.070	184	2867812	18899.560 ng/mL#	95
43) Phenanthrene	32.567	178	2963936	18728.244 ng/mL	99
54) Retene	39.583	234	1015806	20967.109 ng/mL	96
55) Anthracene	32.748	178	2099409M3	14156.763 ng/mL	
56) Carbazole	33.425	167	2801542M3	20001.846 ng/mL	
57) 1-Methylphenanthrene	35.081	192	2299712	19509.074 ng/mL	99

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 31 13:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

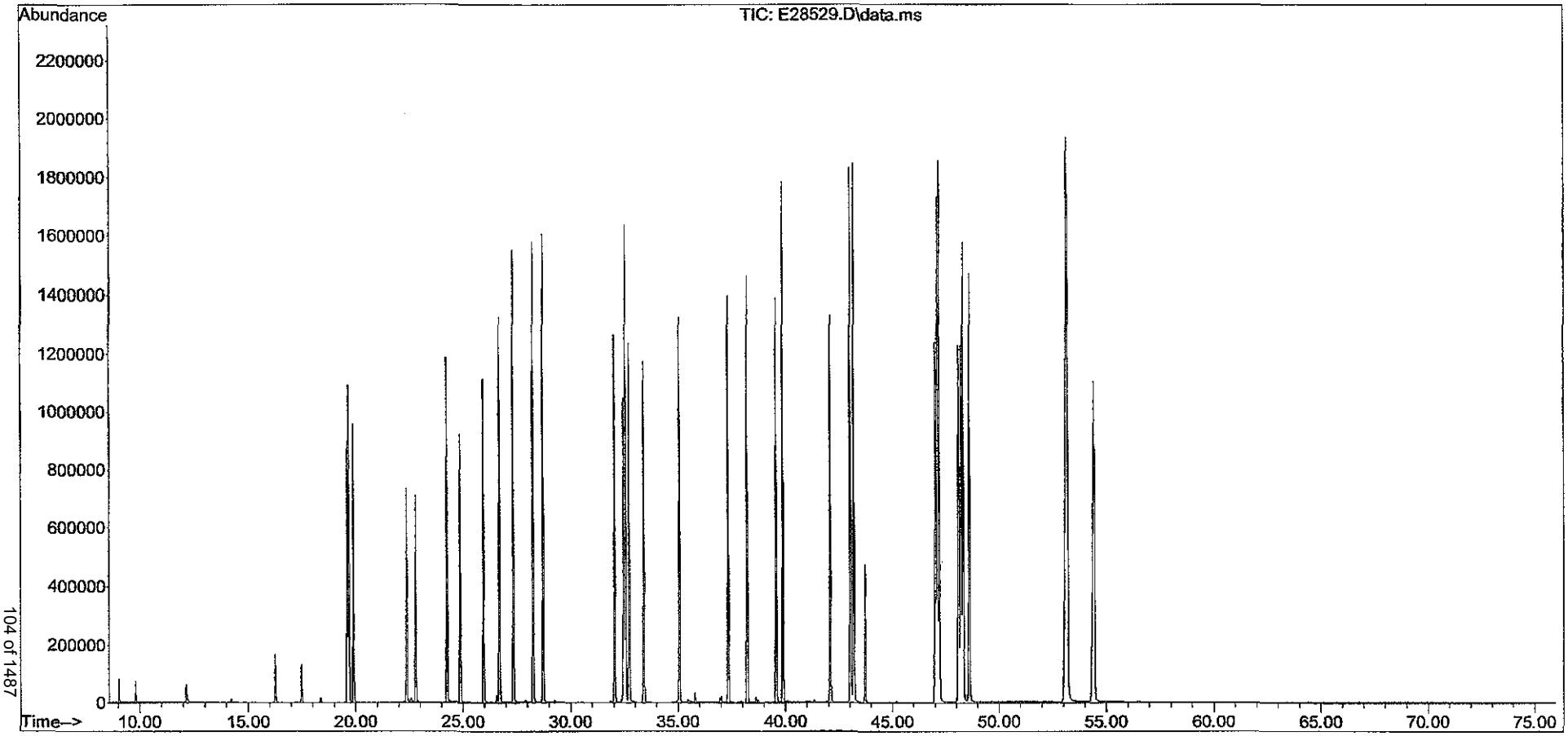
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
58) Fluoranthene	37.355	202	3284016M3	19040.795	ng/mL	
59) Benzo(b)fluorene	39.899	216	2350585	21426.936	ng/mL	99
60) Pyrene	38.243	202	3308735	19057.454	ng/mL	97
66) Naphthobenzothiophene	42.112	234	3354891	20479.127	ng/ml#	94
67) Naphthobenzothiophene-...	42.112	234	3354891	20479.127	ng/mL#	94
75) Benz[a]anthracene	43.046	228	3308979	16929.163	ng/mL	98
76) Chrysene	43.212	228	3273879	17112.238	ng/mL	98
77) Chrysene/Triphenylene	43.212	228	3273879	17112.238	ng/mL	98
84) Benzo[b]fluoranthene	47.127	252	3888463	18894.567	ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.217	252	3879730	20033.777	ng/mL	99
87) Benzo[e]pyrene	48.121	252	3655053	20014.936	ng/mL	99
89) Benzo[a]pyrene	48.331	252	3592144	20806.399	ng/mL	99
90) Perylene	48.633	252	3822620	20804.685	ng/mL	99
91) Indeno[1,2,3-cd]pyrene	53.136	276	4610873M3	22121.197	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.196	278	4571116	22801.341	ng/mL	99
93) Benzo[g,h,i]perylene	54.446	276	4394931	21457.509	ng/mL	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 31 13:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

11/5/12.

Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

JJK (11/05/12)

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	74	0.00
3	A1	trans-Decalin	0.400	0.387	3.3	75	0.00
4	t	cis-Decalin	0.304	0.295	3.0	74	0.00
9	s	Naphthalene-d8	1.759	1.700	3.4	67	0.00
10	A1	Naphthalene	1.967	1.975	-0.4	74	0.00
16	t	2-Methylnaphthalene	1.253	1.205	3.8	72	0.00
17	t	1-Methylnaphthalene	1.217	1.245	-2.3	76	0.00
18	A1	Benzothiophene	1.626	1.641	-0.9	73	0.02
23	t	Biphenyl	1.583	1.598	-0.9	75	0.00
24	t	2,6-Dimethylnaphthalene	1.129	1.137	-0.7	74	0.00
25	t	Dibenzofuran	1.753	1.769	-0.9	74	0.00
26	t	Acenaphthylene	1.961	1.967	-0.3	75	0.00
27	t	Acenaphthene	1.262	1.250	1.0	74	0.00
28	t	2,3,5-Trimethylnaphthalene	1.056	1.048	0.8	74	0.00
29	A1	Fluorene	1.408	1.420	-0.9	75	0.00
33	A1	Dibenzothiophene	1.932	1.953	-1.1	74	0.00
42	s	Phenanthrene-d10	1.802	1.715	4.8	66	0.00
43	A1	Phenanthrene	1.965	1.978	-0.7	72	0.00
54	t	Retene	0.632	0.694	-9.8	85	0.00
55	t	Anthracene	1.699	1.969	-15.9	80	0.00
56	t	Carbazole	1.748	1.775	-1.5	75	0.00
57	t	1-Methylphenanthrene	1.499	1.491	0.5	74	0.00
58	A1	Fluoranthene	2.170	2.178	-0.4	74	0.00
59	t	Benzo(b)fluorene	1.446	1.430	1.1	74	0.00
60	A1	Pyrene	2.206	2.208	-0.1	74	0.00
66	A1	Naphthobenzothiophene	2.176	2.179	-0.1	75	-0.02
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.179	-0.1	75	-0.02
74	i	Chrysene-d12	1.000	1.000	0.0	74	0.00
75	t	Benz[a]anthracene	0.974	1.043	-7.1	76	-0.02
76	A1	Chrysene	1.002	1.050	-4.8	75	0.00
77	A2	Chrysene/Triphenylene	1.002	1.050	-4.8	75	0.00
83	s	Benzo[b]fluoranthene-d12	1.027	1.009	1.8	69	0.00
84	t	Benzo[b]fluoranthene	1.132	1.189	-5.0	76	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.213	-4.2	74	0.00
87	t	Benzo[e]pyrene	1.105	1.125	-1.8	76	0.00
88	s	Benzo[a]pyrene-d12	0.995	0.994	0.1	72	0.00
89	t	Benzo[a]pyrene	1.057	1.130	-6.9	81	-0.01
90	t	Perylene	1.118	1.180	-5.5	79	0.00

Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.267	-1.8	77	0.00
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.413	-6.6	79	-0.02
93	t	Benzo[g,h,i]perylene	1.342	1.395	-3.9	79	-0.01
94	A1	Hopane (T19)	0.375	0.000#	100.0#	0#	-52.19#
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.000#	100.0#	0#	-52.19#
129	SA1	5B(H)Cholane - Surr	0.197	0.000#	100.0#	0#	-43.72#

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.03	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

10/31/12.

Quant Time: Oct 31 13:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

JJK (11/05/12)

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	27127M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	56880	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	46123	483.384	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	48.34%#		
42) Phenanthrene-d10	32.462	188	46524	475.913	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	47.59%#		
83) Benzo[b]fluoranthene-d12	46.991	264	57405	491.292	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	49.13%#		
88) Benzo[a]pyrene-d12	48.166	264	56528	499.294	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	49.93%#		
129) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.00%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	5245	241.715	ng/mL	100
4) cis-Decalin	17.483	138	4006	242.994	ng/mL	100
10) Naphthalene	19.681	128	53569	502.030	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	32688	480.979	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	33765	511.305	ng/mL#	100
18) Benzothiophene	19.906	134	44511	504.592	ng/mL	100
23) Biphenyl	24.257	154	43356	504.773	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	30856	503.707	ng/mL#	100
25) Dibenzofuran	27.343	168	47975	504.511	ng/mL	96
26) Acenaphthylene	25.958	152	53359M3	501.567	ng/mL	
27) Acenaphthene	26.696	153	33896	494.986	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.262	170	28417	495.826	ng/mL	96
29) Fluorene	28.728	166	38522	504.380	ng/mL	100
33) Dibenzothiophene	32.055	184	52969	505.392	ng/mL#	95
43) Phenanthrene	32.537	178	53667	503.299	ng/mL	99
54) Retene	39.568	234	18816	548.371	ng/mL	91
55) Anthracene	32.718	178	53410M3	579.496	ng/mL	
56) Carbazole	33.395	167	48151	507.624	ng/mL	99
57) 1-Methylphenanthrene	35.051	192	40451	497.245	ng/mL	99
58) Fluoranthene	37.325	202	59089	501.787	ng/mL	100
59) Benzo(b)fluorene	39.854	216	38785	494.279	ng/mL	100
60) Pyrene	38.213	202	59885	500.333	ng/mL	98
66) Naphthobenzothiophene	42.082	234	59101	500.647	ng/ml#	96
67) Naphthobenzothiophene-...	42.082	234	59101	500.647	ng/mL#	96

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 13:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

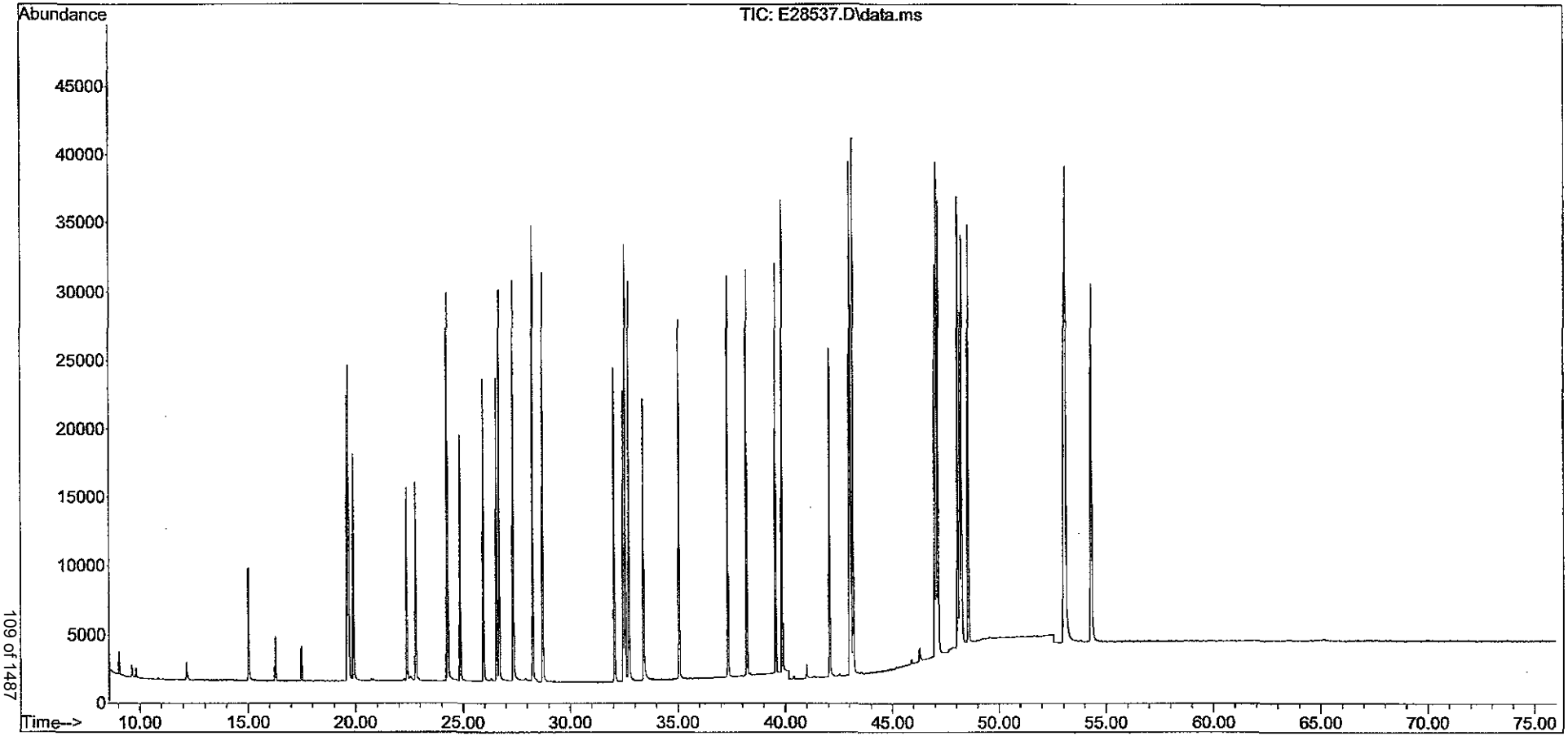
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) Benz[a]anthracene	43.001	228	59298	535.360	ng/mL	100
76) Chrysene	43.166	228	59717	523.684	ng/mL	99
77) Chrysene/Triphenylene	43.166	228	59717	523.684	ng/mL	99
84) Benzo[b]fluoranthene	47.066	252	67639	525.377	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	69005	520.970	ng/mL	97
87) Benzo[e]pyrene	48.060	252	63965	508.835	ng/mL	98
89) Benzo[a]pyrene	48.241	252	64274	534.340	ng/mL	96
90) Perylene	48.557	252	67099	527.525	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.030	276	72058M3	509.020	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.091	278	80373	533.213	ng/mL	99
93) Benzo[g,h,i]perylene	54.310	276	79347	519.834	ng/mL	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 13:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	61	0.00
3	A1	trans-Decalin	0.400	0.411	-2.7	66	0.00
4	t	cis-Decalin	0.304	0.316	-3.9	66	0.00
9	s	Naphthalene-d8	1.759	1.809	-2.8	59	0.00
10	A1	Naphthalene	1.967	2.194	-11.5	67	0.00
16	t	2-Methylnaphthalene	1.253	1.343	-7.2	66	0.00
17	t	1-Methylnaphthalene	1.217	1.322	-8.6	66	0.00
18	A1	Benzothiophene	1.626	1.826	-12.3	68	0.00
23	t	Biphenyl	1.583	1.711	-8.1	66	0.00
24	t	2,6-Dimethylnaphthalene	1.129	1.192	-5.6	64	0.00
25	t	Dibenzofuran	1.753	1.923	-9.7	67	0.00
26	t	Acenaphthylene	1.961	2.162	-10.2	68	0.00
27	t	Acenaphthene	1.262	1.351	-7.1	66	0.00
28	t	2,3,5-Trimethylnaphthalene	1.056	1.083	-2.6	63	0.00
29	A1	Fluorene	1.408	1.502	-6.7	65	0.00
33	A1	Dibenzothiophene	1.932	2.092	-8.3	66	0.00
42	s	Phenanthrene-d10	1.802	1.730	4.0	55	0.00
43	A1	Phenanthrene	1.965	2.126	-8.2	64	0.00
54	t	Retene	0.632	0.592	6.3	60	0.00
55	t	Anthracene	1.699	2.027	-19.3	68	0.00
56	t	Carbazole	1.748	1.889	-8.1	66	0.00
57	t	1-Methylphenanthrene	1.499	1.550	-3.4	64	0.00
58	A1	Fluoranthene	2.170	2.302	-6.1	65	0.00
59	t	Benzo(b)fluorene	1.446	1.487	-2.8	64	0.00
60	A1	Pyrene	2.206	2.294	-4.0	64	0.00
66	A1	Naphthobenzothiophene	2.176	2.264	-4.0	64	0.00
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.264	-4.0	64	0.00
74	i	Chrysene-d12	1.000	1.000	0.0	59	0.00
75	t	Benz[a]anthracene	0.974	1.082	-11.1	63	0.00
76	A1	Chrysene	1.002	1.090	-8.8	62	0.00
77	A2	Chrysene/Triphenylene	1.002	1.090	-8.8	62	0.00
83	s	Benzo[b]fluoranthene-d12	1.027	0.993	3.3	54	0.00
84	t	Benzo[b]fluoranthene	1.132	1.229	-8.6	62	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.282	-10.1	62	0.00
87	t	Benzo[e]pyrene	1.105	1.185	-7.2	63	0.00
88	s	Benzo[a]pyrene-d12	0.995	0.969	2.6	56	0.00
89	t	Benzo[a]pyrene	1.057	1.141	-7.9	65	0.00
90	t	Perylene	1.118	1.227	-9.7	65	0.00
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.519	-22.1	73	0.00
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.491	-12.5	66	0.00
93	t	Benzo[g,h,i]perylene	1.342	1.484	-10.6	67	0.00
94	A1	Hopane (T19)	0.375	0.357	4.8	56	0.00
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.357	4.8	56	0.00
129	SA1	5B(H)Cholane - Surr	0.197	0.202	-2.5	61	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.02	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

KW fosh 11/19/12

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22394	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	45130	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	40509	514.277	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.43%			
42) Phenanthrene-d10	32.085	188	38736	479.993	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.00%#			
83) Benzo[b]fluoranthene-d12	46.630	264	44824	483.498	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.35%#			
88) Benzo[a]pyrene-d12	47.774	264	43715	486.651	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.67%#			
129) 5B(H)Cholane - Surr	43.332	217	9128	513.191	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.32%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4605	257.074	ng/mL	100
4) cis-Decalin	17.091	138	3538	259.964	ng/mL	100
10) Naphthalene	19.304	128	49129	557.730	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	30072	536.007	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	29611	543.171	ng/mL#	100
18) Benzothiophene	19.515	134	40900	561.650	ng/mL	100
23) Biphenyl	23.881	154	38319	540.420	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	26701	528.002	ng/mL#	100
25) Dibenzofuran	26.967	168	43064	548.580	ng/mL	97
26) Acenaphthylene	25.582	152	48407M3	551.188	ng/mL	
27) Acenaphthene	26.320	153	30245	535.018	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	24255	512.652	ng/mL	96
29) Fluorene	28.352	166	33635	533.470	ng/mL	98
33) Dibenzothiophene	31.664	184	46858	541.577	ng/mL	98
43) Phenanthrene	32.161	178	47604	540.795	ng/mL	99
54) Retene	39.192	234	13249	467.736	ng/mL	88
55) Anthracene	32.356	178	45383M3	596.473	ng/mL	
56) Carbazole	33.034	167	42309	540.306	ng/mL	99
57) 1-Methylphenanthrene	34.690	192	34717	516.956	ng/mL	99
58) Fluoranthene	36.963	202	51557	530.359	ng/mL	98
59) Benzo(b)fluorene	39.493	216	33310	514.225	ng/mL	99
60) Pyrene	37.837	202	51369	519.891	ng/mL	98
66) Naphthobenzothiophene	41.706	234	50698	520.232	ng/ml	98
67) Naphthobenzothiophene-2,1	41.706	234	50698	520.232	ng/mL	98
75) Benz[a]anthracene	42.640	228	48820	555.517	ng/mL	99
76) Chrysene	42.805	228	49206	543.856	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	49206	543.856	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	55487	543.200	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.796	252	57848	550.446	ng/mL	95
87) Benzo[e]pyrene	47.684	252	53477	536.162	ng/mL	93
89) Benzo[a]pyrene	47.865	252	51512	539.740	ng/mL	93
90) Perylene	48.166	252	55381	548.759	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.518	276	68575M3	610.538	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	67308	562.797	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	66993	553.169	ng/mL	100
94) Hopane (T19)	51.630	191	16129	476.210	ng/mL#	83
95) 17a(H),21B(H)-hopane - C3	51.630	191	16129	476.210	ng/mL#	83

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

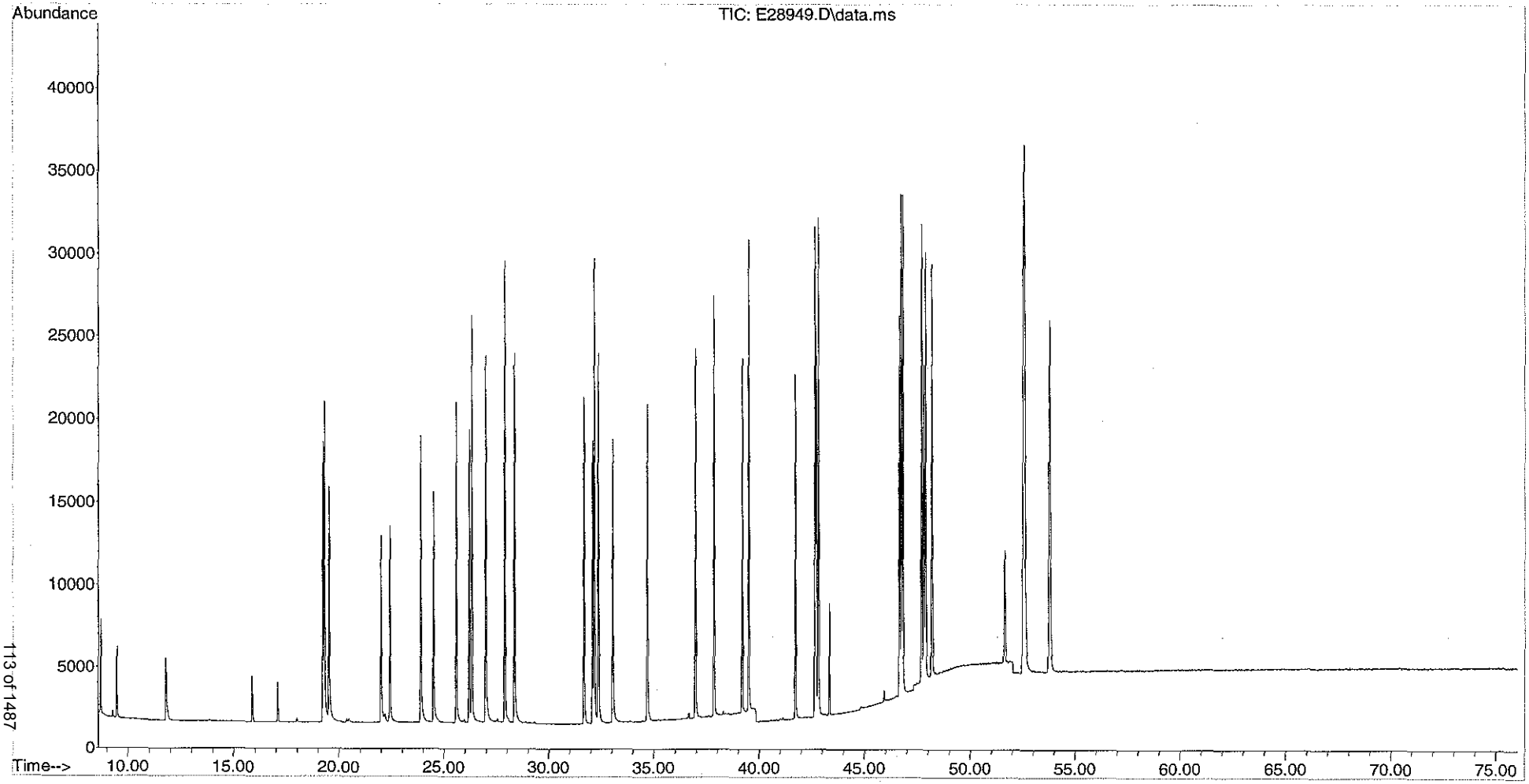
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

AG Bush 11/19/12

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	66	0.00
3	A1	trans-Decalin	0.400	0.404	-1.0	71	-0.02
4	t	cis-Decalin	0.304	0.314	-3.3	71	0.00
9	s	Naphthalene-d8	1.759	1.798	-2.2	64	0.00
10	A1	Naphthalene	1.967	2.194	-11.5	73	0.00
16	t	2-Methylnaphthalene	1.253	1.342	-7.1	72	0.00
17	t	1-Methylnaphthalene	1.217	1.317	-8.2	72	0.00
18	A1	Benzothiophene	1.626	1.824	-12.2	73	0.00
23	t	Biphenyl	1.583	1.698	-7.3	72	0.00
24	t	2,6-Dimethylnaphthalene	1.129	1.195	-5.8	70	0.00
25	t	Dibenzofuran	1.753	1.905	-8.7	72	0.00
26	t	Acenaphthylene	1.961	2.202	-12.3	75	0.00
27	t	Acenaphthene	1.262	1.346	-6.7	71	0.00
28	t	2,3,5-Trimethylnaphthalene	1.056	1.086	-2.8	69	0.00
29	A1	Fluorene	1.408	1.510	-7.2	72	-0.02
33	A1	Dibenzothiophene	1.932	2.104	-8.9	72	0.00
42	s	Phenanthrene-d10	1.802	1.734	3.8	60	-0.02
43	A1	Phenanthrene	1.965	2.108	-7.3	69	0.00
54	t	Retene	0.632	0.640	-1.3	70	0.00
55	t	Anthracene	1.699	2.039	-20.0	74	0.00
56	t	Carbazole	1.748	1.955	-11.8	74	0.00
57	t	1-Methylphenanthrene	1.499	1.585	-5.7	71	-0.02
58	A1	Fluoranthene	2.170	2.342	-7.9	72	-0.02
59	t	Benzo(b)fluorene	1.446	1.587	-9.8	74	0.00
60	A1	Pyrene	2.206	2.376	-7.7	72	0.00
66	A1	Naphthobenzothiophene	2.176	2.423	-11.4	75	0.00
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.423	-11.4	75	0.00
74	i	Chrysene-d12	1.000	1.000	0.0	68	-0.02
75	t	Benz[a]anthracene	0.974	1.106	-13.6	74	0.00
76	A1	Chrysene	1.002	1.084	-8.2	71	0.00
77	A2	Chrysene/Triphenylene	1.002	1.084	-8.2	71	0.00
83	s	Benzo[b]fluoranthene-d12	1.027	1.060	-3.2	66	0.00
84	t	Benzo[b]fluoranthene	1.132	1.293	-14.2	76	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.349	-15.9	76	0.00
87	t	Benzo[e]pyrene	1.105	1.239	-12.1	77	0.00
88	s	Benzo[a]pyrene-d12	0.995	1.046	-5.1	70	0.00
89	t	Benzo[a]pyrene	1.057	1.212	-14.7	80	0.00
90	t	Perylene	1.118	1.300	-16.3	80	0.00
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.524	-22.5	85	0.00
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.568	-18.3	81	-0.02
93	t	Benzo[g,h,i]perylene	1.342	1.533	-14.2	80	0.00
94	A1	Hopane (T19)	0.375	0.380	-1.3	70	0.00
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.380	-1.3	70	0.00
129	SA1	5B(H)Cholane - Surr	0.197	0.214	-8.6	75	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.07	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24365	500.000	ng/mL	0.00
74) Chrysene-d12	42.700	240	52429	500.000	ng/mL	-0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43806	511.145	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
42) Phenanthrene-d10	32.070	188	42246	481.140	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.11%#			
83) Benzo[b]fluoranthene-d12	46.630	264	55562	515.888	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.59%			
88) Benzo[a]pyrene-d12	47.774	264	54860	525.698	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.57%			
129) 5B(H)Cholane - Surr	43.332	217	11210	542.504	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.25%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4924	252.646	ng/mL	100
4) cis-Decalin	17.091	138	3820	257.979	ng/mL	100
10) Naphthalene	19.304	128	53459	557.792	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32688	535.503	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	32095	541.111	ng/mL#	100
18) Benzothiophene	19.515	134	44435	560.833	ng/mL	100
23) Biphenyl	23.881	154	41378	536.354	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	29119	529.237	ng/mL#	100
25) Dibenzofuran	26.967	168	46406	543.332	ng/mL	98
26) Acenaphthylene	25.582	152	53648M3	561.449	ng/mL	
27) Acenaphthene	26.320	153	32791	533.132	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	26457	513.957	ng/mL	96
29) Fluorene	28.337	166	36791	536.322	ng/mL	99
33) Dibenzothiophene	31.664	184	51254	544.465	ng/mL	99
43) Phenanthrene	32.161	178	51355	536.212	ng/mL	99
54) Retene	39.192	234	15584	505.663	ng/mL	91
55) Anthracene	32.356	178	49682M3	600.153	ng/mL	
56) Carbazole	33.034	167	47641	559.182	ng/mL	100
57) 1-Methylphenanthrene	34.675	192	38623	528.594	ng/mL	99
58) Fluoranthene	36.948	202	57063	539.514	ng/mL	99
59) Benzo(b)fluorene	39.493	216	38675	548.750	ng/mL	99
60) Pyrene	37.837	202	57901	538.596	ng/mL	98
66) Naphthobenzothiophene	41.706	234	59037	556.796	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.706	234	59037	556.796	ng/mL#	64
75) Benz[a]anthracene	42.639	228	57961	567.714	ng/mL	99
76) Chrysene	42.805	228	56830	540.676	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	56830	540.676	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	67802	571.353	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.795	252	70705	579.122	ng/mL	93
87) Benzo[e]pyrene	47.684	252	64947	560.508	ng/mL	94
89) Benzo[a]pyrene	47.865	252	63567	573.327	ng/mL	92
90) Perylene	48.166	252	68142	581.205	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.518	276	79882M3	612.194	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	82188	591.544	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	80391	571.386	ng/mL	100
94) Hopane (T19)	51.630	191	19942	506.820	ng/mL#	82
95) 17a(H),21B(H)-hopane - C3	51.630	191	19942	506.820	ng/mL#	82

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

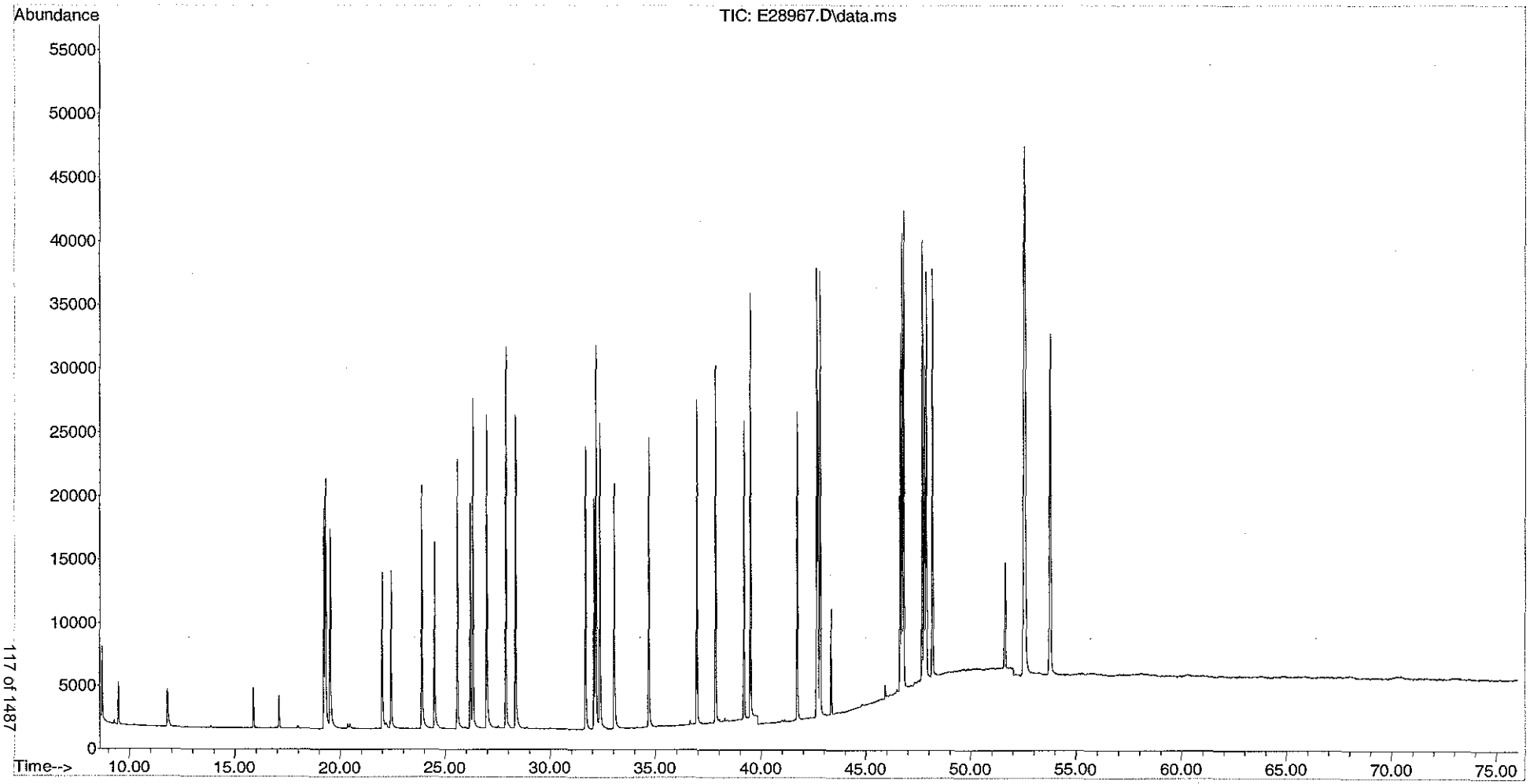
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

AG 11/19/12

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	66	0.00
3	A1	trans-Decalin	0.400	0.413	-3.2	71	-0.02
4	t	cis-Decalin	0.304	0.313	-3.0	70	0.00
9	s	Naphthalene-d8	1.759	1.793	-1.9	63	0.00
10	A1	Naphthalene	1.967	2.166	-10.1	72	0.00
16	t	2-Methylnaphthalene	1.253	1.333	-6.4	71	0.00
17	t	1-Methylnaphthalene	1.217	1.300	-6.8	70	0.00
18	A1	Benzothiophene	1.626	1.801	-10.8	72	0.00
23	t	Biphenyl	1.583	1.686	-6.5	70	0.02
24	t	2,6-Dimethylnaphthalene	1.129	1.184	-4.9	69	0.00
25	t	Dibenzofuran	1.753	1.879	-7.2	70	0.00
26	t	Acenaphthylene	1.961	2.180	-11.2	74	0.00
27	t	Acenaphthene	1.262	1.332	-5.5	70	0.00
28	t	2,3,5-Trimethylnaphthalene	1.056	1.083	-2.6	68	0.00
29	A1	Fluorene	1.408	1.507	-7.0	71	0.00
33	A1	Dibenzothiophene	1.932	2.116	-9.5	71	0.02
42	s	Phenanthrene-d10	1.802	1.764	2.1	61	0.00
43	A1	Phenanthrene	1.965	2.107	-7.2	68	0.02
54	t	Retene	0.632	0.652	-3.2	71	0.00
55	t	Anthracene	1.699	2.019	-18.8	73	0.00
56	t	Carbazole	1.748	1.945	-11.3	73	0.00
57	t	1-Methylphenanthrene	1.499	1.591	-6.1	70	0.00
58	A1	Fluoranthene	2.170	2.368	-9.1	72	0.00
59	t	Benzo(b)fluorene	1.446	1.597	-10.4	73	0.00
60	A1	Pyrene	2.206	2.379	-7.8	71	0.00
66	A1	Naphthobenzothiophene	2.176	2.449	-12.5	75	0.02
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.449	-12.5	75	0.02
74	i	Chrysene-d12	1.000	1.000	0.0	69	0.00
75	t	Benz[a]anthracene	0.974	1.113	-14.3	75	0.02
76	A1	Chrysene	1.002	1.096	-9.4	73	0.00
77	A2	Chrysene/Triphenylene	1.002	1.096	-9.4	73	0.00
83	s	Benzo[b]fluoranthene-d12	1.027	1.072	-4.4	68	0.02
84	t	Benzo[b]fluoranthene	1.132	1.341	-18.5	80	0.00
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.313	-12.8	75	0.02
87	t	Benzo[e]pyrene	1.105	1.253	-13.4	78	0.02
88	s	Benzo[a]pyrene-d12	0.995	1.072	-7.7	72	0.02
89	t	Benzo[a]pyrene	1.057	1.224	-15.8	81	0.02
90	t	Perylene	1.118	1.310	-17.2	82	0.02
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.558	-25.2#	88	0.02
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.599	-20.7	83	0.02
93	t	Benzo[g,h,i]perylene	1.342	1.555	-15.9	82	0.02
94	A1	Hopane (T19)	0.375	0.383	-2.1	71	0.00
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.383	-2.1	71	0.00
129	SA1	5B(H)Cholane - Surr	0.197	0.213	-8.1	75	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.08	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

WG Parish 11/19/12

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24064M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	52839	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43136	509.623	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.96%			
42) Phenanthrene-d10	32.085	188	42450	489.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.95%#			
83) Benzo[b]fluoranthene-d12	46.645	264	56634	521.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.18%			
88) Benzo[a]pyrene-d12	47.790	264	56653	538.668	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.87%			
129) 5B(H)Cholane - Surr	43.332	217	11232	539.351	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.94%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4966	257.988	ng/mL	100
4) cis-Decalin	17.091	138	3762	257.240	ng/mL	100
10) Naphthalene	19.304	128	52132	550.750	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32089	532.265	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	31273	533.847	ng/mL#	100
18) Benzothiophene	19.515	134	43328	553.701	ng/mL	100
23) Biphenyl	23.896	154	40583	532.629	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	28488	524.245	ng/mL#	100
25) Dibenzofuran	26.967	168	45217	536.033	ng/mL	97
26) Acenaphthylene	25.582	152	52457M3	555.852	ng/mL	
27) Acenaphthene	26.320	153	32046	527.536	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	27.885	170	26065	512.676	ng/mL	97
29) Fluorene	28.352	166	36253	535.090	ng/mL	100
33) Dibenzothiophene	31.679	184	50924	547.725	ng/mL	99
43) Phenanthrene	32.176	178	50714	536.143	ng/mL	99
54) Retene	39.192	234	15693	515.569	ng/mL	94
55) Anthracene	32.356	178	48591M3	594.316	ng/mL	
56) Carbazole	33.034	167	46813	556.336	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38281	530.467	ng/mL	99
58) Fluoranthene	36.963	202	56975	545.420	ng/mL	98
59) Benzo(b)fluorene	39.493	216	38424	552.008	ng/mL	99
60) Pyrene	37.837	202	57258	539.276	ng/mL	99
66) Naphthobenzothiophene	41.721	234	58939	562.825	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.721	234	58939	562.825	ng/mL#	64
75) Benz[a]anthracene	42.655	228	58810	571.560	ng/mL	99
76) Chrysene	42.805	228	57925	546.817	ng/mL	100
77) Chrysene/Triphenylene	42.805	228	57925	546.817	ng/mL	100
84) Benzo[b]fluoranthene	46.720	252	70856	592.456	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.811	252	69397	563.998	ng/mL	93
87) Benzo[e]pyrene	47.699	252	66232	567.162	ng/mL	94
89) Benzo[a]pyrene	47.880	252	64662	578.677	ng/mL	92
90) Perylene	48.181	252	69214	585.768	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	52.533	276	82316M2	625.953	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	84503	603.487	ng/mL	99
93) Benzo[g,h,i]perylene	53.783	276	82167	579.478	ng/mL	100
94) Hopane (T19)	51.630	191	20233	510.226	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.630	191	20233	510.226	ng/mL#	84

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

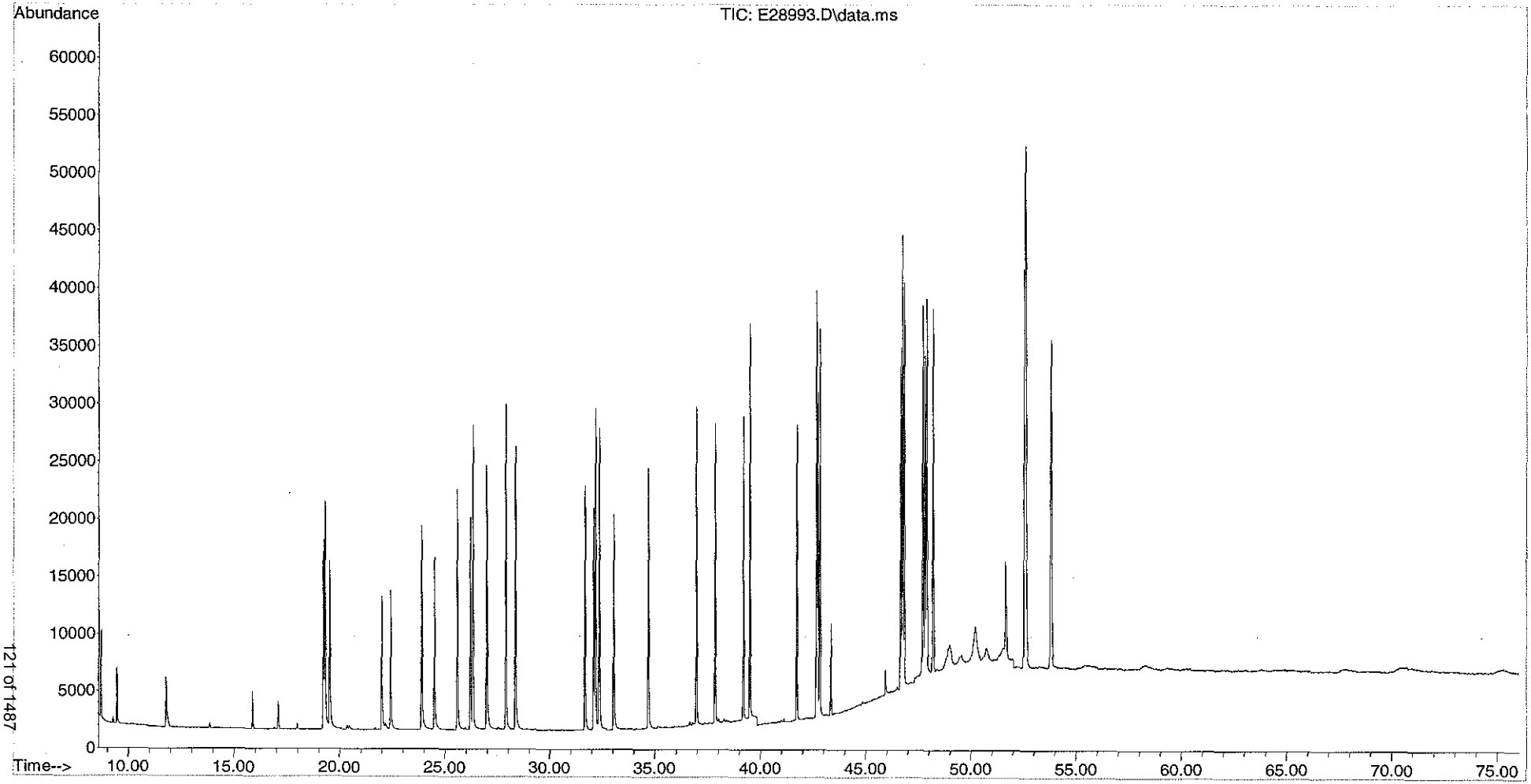
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Rfish 11/19/12

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	65	0.01
3	A1	trans-Decalin	0.400	0.401	-0.3	69	0.00
4	t	cis-Decalin	0.304	0.307	-1.0	68	0.01
9	s	Naphthalene-d8	1.759	1.752	0.4	61	0.01
10	A1	Naphthalene	1.967	2.109	-7.2	70	0.01
16	t	2-Methylnaphthalene	1.253	1.305	-4.2	69	0.01
17	t	1-Methylnaphthalene	1.217	1.261	-3.6	68	0.01
18	A1	Benzothiophene	1.626	1.783	-9.7	71	0.01
23	t	Biphenyl	1.583	1.656	-4.6	69	0.01
24	t	2,6-Dimethylnaphthalene	1.129	1.177	-4.3	68	0.01
25	t	Dibenzofuran	1.753	1.878	-7.1	70	0.01
26	t	Acenaphthylene	1.961	2.128	-8.5	72	0.01
27	t	Acenaphthene	1.262	1.302	-3.2	68	0.01
28	t	2,3,5-Trimethylnaphthalene	1.056	1.088	-3.0	68	0.01
29	A1	Fluorene	1.408	1.477	-4.9	69	0.00
33	A1	Dibenzothiophene	1.932	2.144	-11.0	72	0.01
42	s	Phenanthrene-d10	1.802	1.761	2.3	60	0.00
43	A1	Phenanthrene	1.965	2.102	-7.0	68	0.01
54	t	Retene	0.632	0.649	-2.7	70	0.01
55	t	Anthracene	1.699	2.018	-18.8	72	0.01
56	t	Carbazole	1.748	1.948	-11.4	73	0.01
57	t	1-Methylphenanthrene	1.499	1.592	-6.2	70	0.00
58	A1	Fluoranthene	2.170	2.342	-7.9	71	0.00
59	t	Benzo(b)fluorene	1.446	1.588	-9.8	73	0.01
60	A1	Pyrene	2.206	2.382	-8.0	71	0.01
66	A1	Naphthobenzothiophene	2.176	2.384	-9.6	72	0.03
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.384	-9.6	72	0.03
74	i	Chrysene-d12	1.000	1.000	0.0	67	0.01
75	t	Benz[a]anthracene	0.974	1.088	-11.7	73	0.01
76	A1	Chrysene	1.002	1.075	-7.3	70	0.01
77	A2	Chrysene/Triphenylene	1.002	1.075	-7.3	70	0.01
83	s	Benzo[b]fluoranthene-d12	1.027	1.030	-0.3	64	0.01
84	t	Benzo[b]fluoranthene	1.132	1.310	-15.7	76	0.02
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.258	-8.1	70	0.02
87	t	Benzo[e]pyrene	1.105	1.218	-10.2	75	0.02
88	s	Benzo[a]pyrene-d12	0.995	1.017	-2.2	68	0.03
89	t	Benzo[a]pyrene	1.057	1.184	-12.0	77	0.03
90	t	Perylene	1.118	1.264	-13.1	77	0.03
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.587	-27.6#	88	0.03
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.553	-17.2	79	0.01
93	t	Benzo[g,h,i]perylene	1.342	1.524	-13.6	79	0.05
94	A1	Hopane (T19)	0.375	0.387	-3.2	70	0.01
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.387	-3.2	70	0.01
129	SA1	5B(H)Cholane - Surr	0.197	0.210	-6.6	73	0.01

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.06	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

MGfresh 11/19/12

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	24018	500.000	ng/mL	0.02
74) Chrysene-d12	42.730	240	51970	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	42087	498.182	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.82%#			
42) Phenanthrene-d10	32.085	188	42292	488.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.86%#			
83) Benzo[b]fluoranthene-d12	46.645	264	53512	501.242	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.12%			
88) Benzo[a]pyrene-d12	47.805	264	52874	511.142	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
129) 5B(H)Cholane - Surr	43.347	217	10939	534.065	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.41%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4810	250.362	ng/mL	100
4) cis-Decalin	17.106	138	3688	252.663	ng/mL	100
10) Naphthalene	19.319	128	50662	536.245	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	31345	520.920	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	30282	517.920	ng/mL#	100
18) Benzothiophene	19.530	134	42828	548.360	ng/mL	100
23) Biphenyl	23.896	154	39765	522.893	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	28258	521.008	ng/mL#	100
25) Dibenzofuran	26.982	168	45112	535.812	ng/mL	96
26) Acenaphthylene	25.597	152	51113M3	542.648	ng/mL	
27) Acenaphthene	26.335	153	31260	515.583	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.900	170	26129	514.919	ng/mL	96
29) Fluorene	28.352	166	35474	524.595	ng/mL	99
33) Dibenzothiophene	31.679	184	51505	555.036	ng/mL	98
43) Phenanthrene	32.176	178	50492	534.818	ng/mL	99
54) Retene	39.207	234	15591	513.199	ng/mL	92
55) Anthracene	32.371	178	48471M3	593.984	ng/mL	
56) Carbazole	33.049	167	46782	557.033	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38225	530.705	ng/mL	99
58) Fluoranthene	36.963	202	56249	539.501	ng/mL	98
59) Benzo(b)fluorene	39.508	216	38135	548.905	ng/mL	99
60) Pyrene	37.852	202	57209	539.847	ng/mL	99
66) Naphthobenzothiophene	41.736	234	57263	547.867	ng/ml#	65
67) Naphthobenzothiophene-2,1	41.736	234	57263	547.867	ng/mL#	65
75) Benz[a]anthracene	42.655	228	56552	558.805	ng/mL	100
76) Chrysene	42.820	228	55852	536.064	ng/mL	99
77) Chrysene/Triphenylene	42.820	228	55852	536.064	ng/mL	99
84) Benzo[b]fluoranthene	46.735	252	68060	578.593	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.811	252	65403	540.427	ng/mL	94
87) Benzo[e]pyrene	47.699	252	63310	551.206	ng/mL	92
89) Benzo[a]pyrene	47.895	252	61523	559.792	ng/mL	92
90) Perylene	48.196	252	65712	565.429	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.548	276	82475M3	637.649	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	80707	586.015	ng/mL	98
93) Benzo[g,h,i]perylene	53.813	276	79225	568.072	ng/mL	99
94) Hopane (T19)	51.645	191	20115	515.732	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.645	191	20115	515.732	ng/mL#	84

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

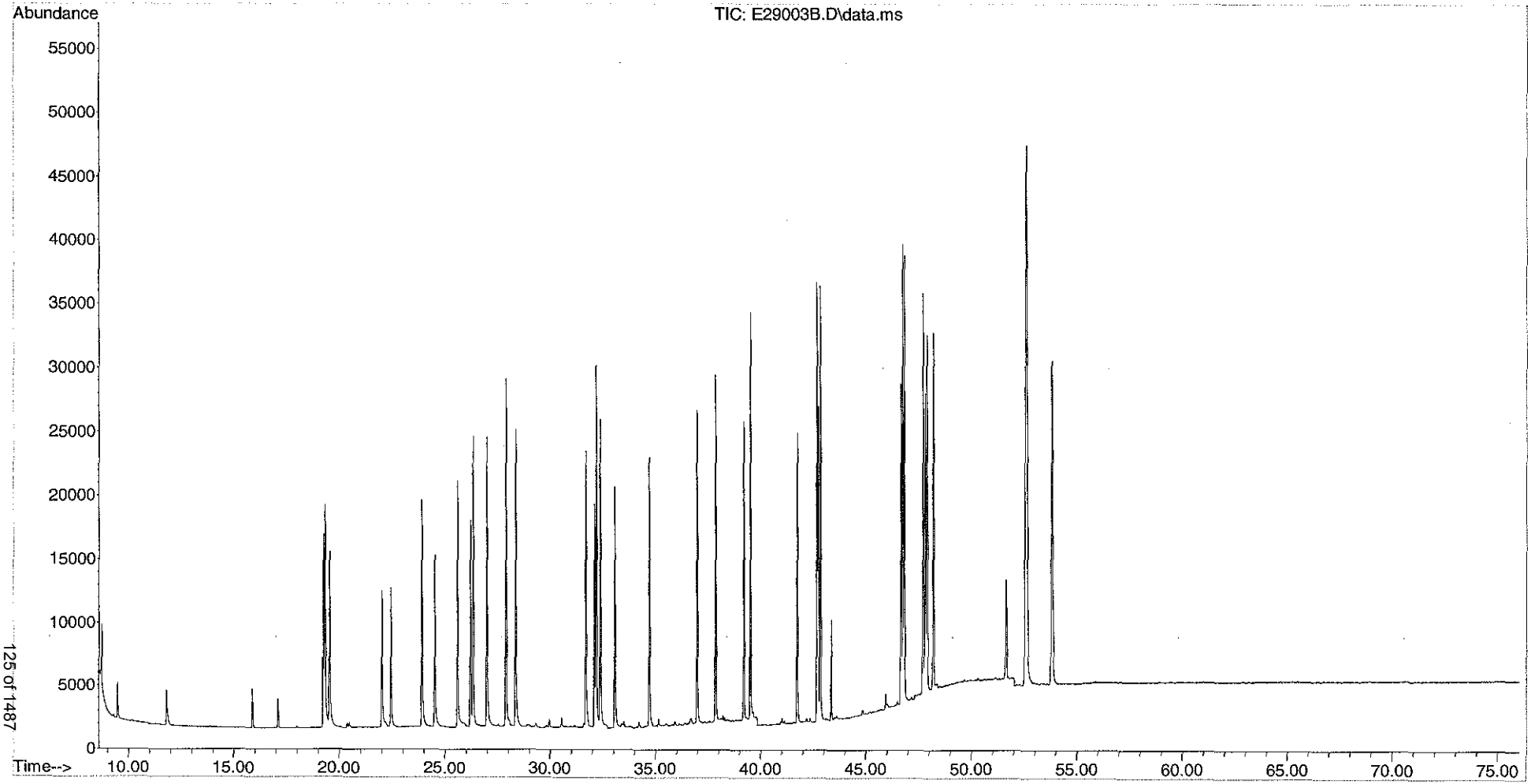
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	131	0.01
3	A1	trans-Decalin	0.400	0.387	3.3	133	0.00
4	t	cis-Decalin	0.304	0.289	4.9	128	0.00
9	s	Naphthalene-d8	1.759	1.745	0.8	121	0.01
10	A1	Naphthalene	1.967	2.120	-7.8	140	0.01
16	t	2-Methylnaphthalene	1.253	1.324	-5.7	140	0.01
17	t	1-Methylnaphthalene	1.217	1.271	-4.4	136	0.01
18	A1	Benzothiophene	1.626	1.763	-8.4	140	0.01
23	t	Biphenyl	1.583	1.673	-5.7	139	0.03
24	t	2,6-Dimethylnaphthalene	1.129	1.183	-4.8	136	0.01
25	t	Dibenzofuran	1.753	1.897	-8.2	140	0.03
26	t	Acenaphthylene	1.961	2.175	-10.9	146	0.03
27	t	Acenaphthene	1.262	1.319	-4.5	138	0.01
28	t	2,3,5-Trimethylnaphthalene	1.056	1.081	-2.4	135	0.03
29	A1	Fluorene	1.408	1.502	-6.7	140	0.01
33	A1	Dibenzothiophene	1.932	2.107	-9.1	142	0.04
42	s	Phenanthrene-d10	1.802	1.756	2.6	120	0.03
43	A1	Phenanthrene	1.965	2.106	-7.2	136	0.04
54	t	Retene	0.632	0.665	-5.2	144	0.03
55	t	Anthracene	1.699	2.035	-19.8	146	0.03
56	t	Carbazole	1.748	1.978	-13.2	148	0.03
57	t	1-Methylphenanthrene	1.499	1.602	-6.9	141	0.03
58	A1	Fluoranthene	2.170	2.381	-9.7	144	0.03
59	t	Benzo(b)fluorene	1.446	1.630	-12.7	149	0.05
60	A1	Pyrene	2.206	2.397	-8.7	142	0.04
66	A1	Naphthobenzothiophene	2.176	2.467	-13.4	150	0.06
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.467	-13.4	150	0.06
74	i	Chrysene-d12	1.000	1.000	0.0	141	0.04
75	t	Benz[a]anthracene	0.974	1.105	-13.4	154	0.06
76	A1	Chrysene	1.002	1.061	-5.9	145	0.04
77	A2	Chrysene/Triphenylene	1.002	1.061	-5.9	145	0.04
83	s	Benzo[b]fluoranthene-d12	1.027	1.082	-5.4	140	0.06
84	t	Benzo[b]fluoranthene	1.132	1.304	-15.2	159	0.05
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.318	-13.2	154	0.06
87	t	Benzo[e]pyrene	1.105	1.236	-11.9	158	0.06
88	s	Benzo[a]pyrene-d12	0.995	1.079	-8.4	150	0.08
89	t	Benzo[a]pyrene	1.057	1.216	-15.0	165	0.06
90	t	Perylene	1.118	1.310	-17.2	168	0.08
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.570	-26.2#	182	0.11
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.583	-19.5	168	0.09
93	t	Benzo[g,h,i]perylene	1.342	1.525	-13.6	165	0.12
94	A1	Hopane (T19)	0.375	0.386	-2.9	147	0.06
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.386	-2.9	147	0.06
129	SA1	5B(H)Cholane - Surr	0.197	0.211	-7.1	154	0.04

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.06	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	47950	500.000	ng/mL	0.01
74) Chrysene-d12	42.760	240	108515	500.000	ng/mL	0.05
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	83664	496.052	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.61%#			
42) Phenanthrene-d10	32.115	188	84186	487.196	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.72%#			
83) Benzo[b]fluoranthene-d12	46.690	264	117445	526.858	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.69%			
88) Benzo[a]pyrene-d12	47.850	264	117125	542.266	ng/mL	0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.23%			
129) 5B(H)Cholane - Surr	43.377	217	22890	535.211	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.52%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	9281	241.973	ng/mL	100
4) cis-Decalin	17.091	138	6925	237.639	ng/mL	100
10) Naphthalene	19.319	128	101638	538.872	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	63506	528.647	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	60952	522.173	ng/mL#	100
18) Benzothiophene	19.530	134	84534	542.147	ng/mL	100
23) Biphenyl	23.911	154	80210	528.310	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	56731	523.928	ng/mL#	100
25) Dibenzofuran	26.997	168	90942	541.045	ng/mL	98
26) Acenaphthylene	25.612	152	104278M3	554.533	ng/mL	
27) Acenaphthene	26.335	153	63230	522.373	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.915	170	51839	511.706	ng/mL	97
29) Fluorene	28.367	166	72042	533.639	ng/mL	99
33) Dibenzothiophene	31.709	184	101024	545.311	ng/mL	99
43) Phenanthrene	32.206	178	100960	535.650	ng/mL	99
54) Retene	39.222	234	31882	525.661	ng/mL	92
55) Anthracene	32.386	178	97562M3	598.855	ng/mL	
56) Carbazole	33.064	167	94852	565.714	ng/mL	100
57) 1-Methylphenanthrene	34.720	192	76837	534.349	ng/mL	99
58) Fluoranthene	36.993	202	114151M3	548.410	ng/mL	
59) Benzo(b)fluorene	39.538	216	78136	563.343	ng/mL	100
60) Pyrene	37.882	202	114958	543.368	ng/mL	97
66) Naphthobenzothiophene	41.766	234	118303	566.951	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.766	234	118303	566.951	ng/mL#	64
75) Benz[a]anthracene	42.700	228	119874	567.284	ng/mL	99
76) Chrysene	42.850	228	115113	529.134	ng/mL	99
77) Chrysene/Triphenylene	42.850	228	115113	529.134	ng/mL	99
84) Benzo[b]fluoranthene	46.765	252	141533	576.238	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.856	252	142986	565.842	ng/mL	94
87) Benzo[e]pyrene	47.744	252	134099	559.152	ng/mL	93
89) Benzo[a]pyrene	47.925	252	131938M4	574.939	ng/mL	
90) Perylene	48.241	252	142179	585.911	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.624	276	170389M3	630.905	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	171816	597.481	ng/mL	99
93) Benzo[g,h,i]perylene	53.889	276	165444	568.140	ng/mL	99
94) Hopane (T19)	51.690	191	41907	514.581	ng/mL#	82
95) 17a(H),21B(H)-hopane - C3	51.690	191	41907	514.581	ng/mL#	82

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

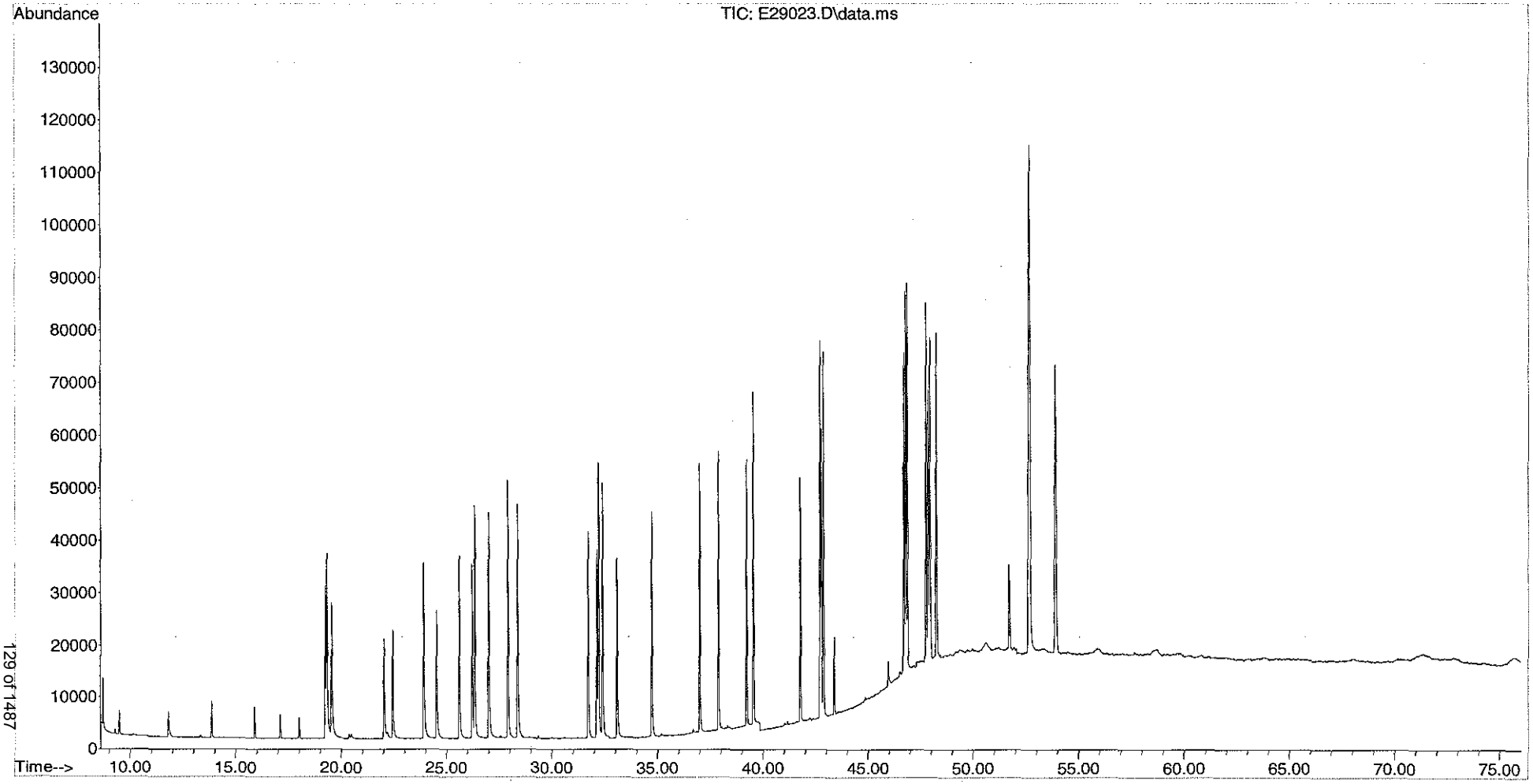
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



Evaluate Continuing Calibration Report

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	105	0.01
3	A1	trans-Decalin	0.400	0.378	5.5	105	0.00
4	t	cis-Decalin	0.304	0.288	5.3	103	0.00
9	s	Naphthalene-d8	1.759	1.758	0.1	99	0.01
10	A1	Naphthalene	1.967	2.161	-9.9	115	0.01
16	t	2-Methylnaphthalene	1.253	1.336	-6.6	114	0.03
17	t	1-Methylnaphthalene	1.217	1.289	-5.9	112	0.03
18	A1	Benzothiophene	1.626	1.805	-11.0	115	0.03
23	t	Biphenyl	1.583	1.691	-6.8	113	0.03
24	t	2,6-Dimethylnaphthalene	1.129	1.200	-6.3	112	0.03
25	t	Dibenzofuran	1.753	1.890	-7.8	113	0.05
26	t	Acenaphthylene	1.961	2.179	-11.1	118	0.03
27	t	Acenaphthene	1.262	1.337	-5.9	113	0.03
28	t	2,3,5-Trimethylnaphthalene	1.056	1.078	-2.1	109	0.03
29	A1	Fluorene	1.408	1.503	-6.7	113	0.03
33	A1	Dibenzothiophene	1.932	2.116	-9.5	115	0.05
42	s	Phenanthrene-d10	1.802	1.747	3.1	96	0.03
43	A1	Phenanthrene	1.965	2.085	-6.1	109	0.05
54	t	Retene	0.632	0.664	-5.1	116	0.03
55	t	Anthracene	1.699	1.978	-16.4	114	0.03
56	t	Carbazole	1.748	1.958	-12.0	118	0.05
57	t	1-Methylphenanthrene	1.499	1.586	-5.8	112	0.03
58	A1	Fluoranthene	2.170	2.374	-9.4	116	0.05
59	t	Benzo(b)fluorene	1.446	1.598	-10.5	118	0.05
60	A1	Pyrene	2.206	2.399	-8.7	115	0.05
66	A1	Naphthobenzothiophene	2.176	2.424	-11.4	119	0.06
67	A2	Naphthobenzothiophene-2,1-D	2.176	2.424	-11.4	119	0.06
74	i	Chrysene-d12	1.000	1.000	0.0	111	0.05
75	t	Benz[a]anthracene	0.974	1.096	-12.5	120	0.06
76	A1	Chrysene	1.002	1.068	-6.6	115	0.06
77	A2	Chrysene/Triphenylene	1.002	1.068	-6.6	115	0.06
83	s	Benzo[b]fluoranthene-d12	1.027	1.066	-3.8	109	0.06
84	t	Benzo[b]fluoranthene	1.132	1.275	-12.6	123	0.06
85	A1	Benzo[j]+[k]fluoranthene	1.164	1.350	-16.0	124	0.06
87	t	Benzo[e]pyrene	1.105	1.235	-11.8	125	0.08
88	s	Benzo[a]pyrene-d12	0.995	1.052	-5.7	115	0.08
89	t	Benzo[a]pyrene	1.057	1.202	-13.7	129	0.08
90	t	Perylene	1.118	1.290	-15.4	130	0.08
91	t	Indeno[1,2,3-cd]pyrene	1.244	1.566	-25.9#	143	0.12
92	t	Dibenz[ah]+[ac]anthracene	1.325	1.563	-18.0	131	0.11
93	t	Benzo[g,h,i]perylene	1.342	1.510	-12.5	129	0.14
94	A1	Hopane (T19)	0.375	0.387	-3.2	116	0.06
95	A2	17a(H),21B(H)-hopane - C30H	0.375	0.387	-3.2	116	0.06
129	SA1	5B(H)Cholane - Surr	0.197	0.210	-6.6	121	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.06	0.70 - 1.30

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

MG 11/19/12

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	38690	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	85688	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	68033	499.917	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.99%#			
42) Phenanthrene-d10	32.115	188	67592	484.784	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.48%#			
83) Benzo[b]fluoranthene-d12	46.690	264	91324	518.817	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.88%			
88) Benzo[a]pyrene-d12	47.850	264	90126	528.424	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.84%			
129) 5B(H)Cholane - Surr	43.362	217	18013	533.378	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.34%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	7320	236.522	ng/mL	100
4) cis-Decalin	17.091	138	5575	237.101	ng/mL	100
10) Naphthalene	19.319	128	83623	549.471	ng/mL#	100
16) 2-Methylnaphthalene	22.029	142	51703	533.404	ng/mL#	100
17) 1-Methylnaphthalene	22.451	142	49856	529.339	ng/mL#	100
18) Benzothiophene	19.545	134	69843	555.135	ng/mL	100
23) Biphenyl	23.911	154	65420	534.024	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.528	156	46424	531.354	ng/mL#	100
25) Dibenzofuran	27.012	168	73121	539.139	ng/mL	100
26) Acenaphthylene	25.612	152	84317M3	555.699	ng/mL	
27) Acenaphthene	26.350	153	51729	529.641	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	27.915	170	41720	510.385	ng/mL	95
29) Fluorene	28.382	166	58136	533.700	ng/mL	100
33) Dibenzothiophene	31.709	184	81861	547.629	ng/mL	96
43) Phenanthrene	32.206	178	80662	530.385	ng/mL	100
54) Retene	39.222	234	25681	524.762	ng/mL	96
55) Anthracene	32.386	178	76547M3	582.316	ng/mL	
56) Carbazole	33.079	167	75746	559.886	ng/mL	98
57) 1-Methylphenanthrene	34.720	192	61377	528.993	ng/mL	99
58) Fluoranthene	37.008	202	91845	546.854	ng/mL	99
59) Benzo(b)fluorene	39.538	216	61823	552.410	ng/mL	100
60) Pyrene	37.882	202	92803	543.634	ng/mL	99
66) Naphthobenzothiophene	41.766	234	93797	557.094	ng/ml	97
67) Naphthobenzothiophene-2,1	41.766	234	93797	557.094	ng/mL	97
75) Benz[a]anthracene	42.700	228	93896	562.720	ng/mL	99
76) Chrysene	42.865	228	91500	532.638	ng/mL	99
77) Chrysene/Triphenylene	42.865	228	91500	532.638	ng/mL	99
84) Benzo[b]fluoranthene	46.780	252	109237	563.227	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	115686	579.766	ng/mL	95
87) Benzo[e]pyrene	47.759	252	105820	558.781	ng/mL	96
89) Benzo[a]pyrene	47.940	252	102998	568.396	ng/mL	94
90) Perylene	48.241	252	110508	576.713	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.639	276	134194M3	629.253	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.684	278	133950	589.893	ng/mL	98
93) Benzo[g,h,i]perylene	53.904	276	129354	562.541	ng/mL	98
94) Hopane (T19)	51.690	191	33169	515.785	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.690	191	33169	515.785	ng/mL#	84

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

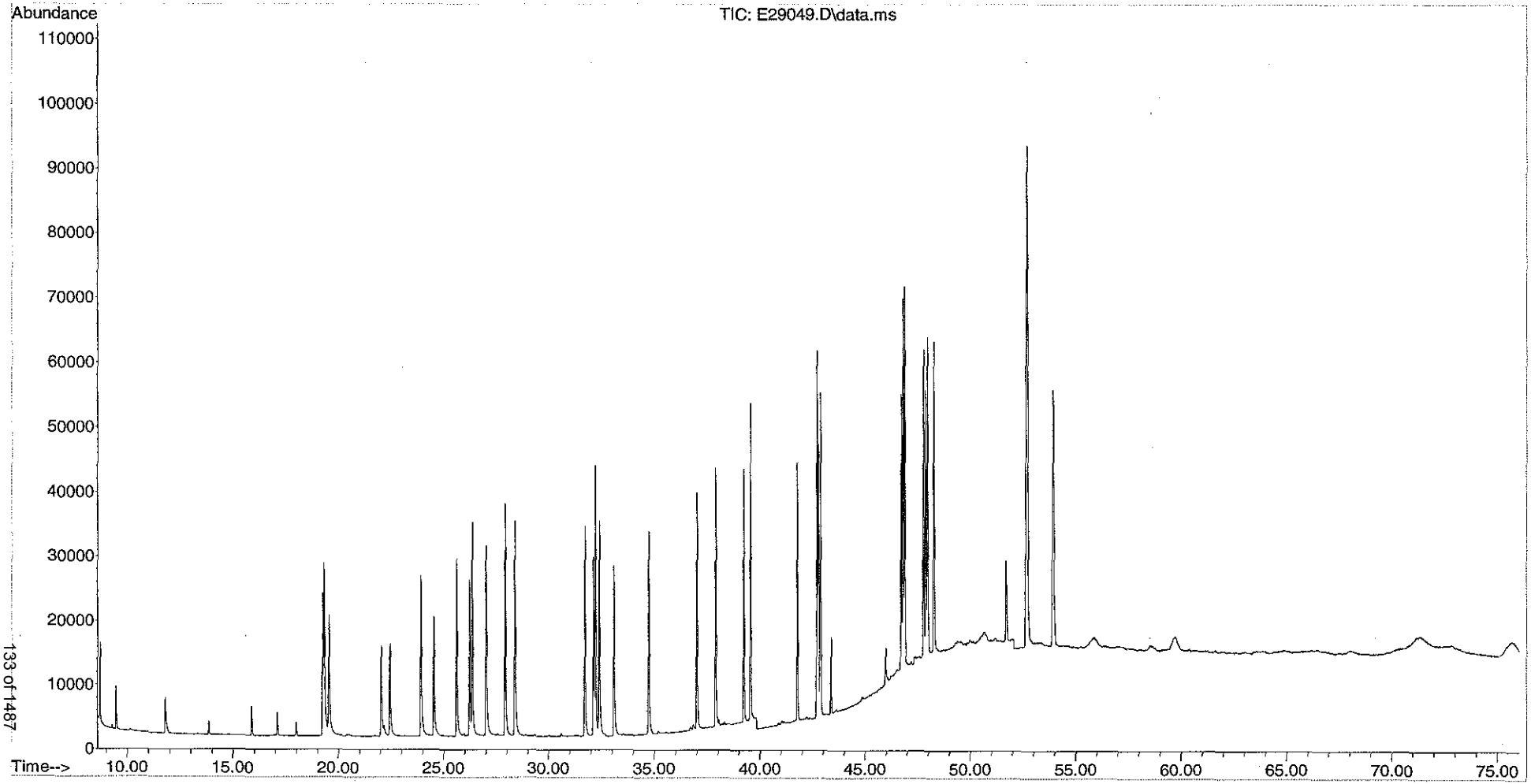
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates



cnorm.ini OCT12|OCT28|E28517

11/2/12.

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[targets]
base=69
masses=5
mass1=50
mass2=131
mass3=219
mass4=414
mass5=502
target1=1
target2=45
target3=55
target4=2.5
target5=2
[PFTBA.cnorm]
masses=5
69=789376 - Base
50=7627
131=401280 ✓
219=447872 - 56.73% ✓
414=71392
502=80896 - 10.24% ✓
```

JJK (11/05/12)

PAH2/NOV13/E28949

```
[targets]
base=69
masses=5
mass1=50
mass2=131
mass3=219
mass4=414
mass5=502
target1=1
target2=45
target3=55
target4=2.5
target5=2
[PFTBA.cnorm]
masses=5
69=789376
50=7627
131=401280
219=447872
414=71392
502=80896
```

KMR for MT
11/19/12

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**0.0695**	J
C4-Decalins	0.191	U	Pyrene	**0.152**	J
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	**0.947**	J
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	**0.984**	J
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**0.0795**	J	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**0.0439**	J
Biphenyl	0.0604	U	Chrysene/Triphenylene	**0.0609**	J
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**0.0576**	J	C2-Chrysenes	0.104	U
Acenaphthene	0.0537	U	C3-Chrysenes	0.104	U
Fluorene	**0.106**	J	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**0.0636**	J
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**0.0439**	J
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	0.0936	U	Benzo[e]pyrene	**0.182**	J
Phenanthrene	**0.170**	J	Benzo[a]pyrene	**0.204**	J
C1-Phenanthrenes/Anthracenes	**0.454**	J	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	**1.25**	J	Indeno[1,2,3-cd]pyrene	**0.164**	J
C3-Phenanthrenes/Anthracenes	**1.31**	J	Dibenz[ah]anthracene/Dibenz[ac]anthracene	0.275	U
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**0.165**	J
Retene	0.109	U			
Dibenzothiophene	**0.113**	J			
C1-Dibenzothiophenes	**0.563**	J			
C2-Dibenzothiophenes	**0.945**	J			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	82	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	82	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	**0.135**	J
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	**0.178**	J
3-Methylphenanthrene	**0.0929**	J
2-Methylphenanthrene	**0.0948**	J
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	**0.0852**	J
1-Methylphenanthrene	**0.0815**	J
2-Methylnaphthalene	0.0863	U
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	82	40-120
Phenanthrene-d10	90	40-120
Benzo[a]pyrene-d12	92	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Associated Blank: **N/A**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	**1.16**	J
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	**0.684**	J
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	**0.650**	J
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29029.D
Acq On : 17 Nov 2012 5:50 am
Operator : AC
Sample : SS110612B09
Misc : 1X ETR1210083
ALS Vial : 3 Sample Multiplier: 1

MWash 11/19/12

Quant Time: Nov 19 09:45:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	35406	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	79653	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	51089	410.230	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.02%#			
42) Phenanthrene-d10	32.115	188	57599	451.430	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.14%#			
83) Benzo[b]fluoranthene-d12	46.690	264	76992	470.536	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.05%#			
88) Benzo[a]pyrene-d12	47.850	264	73150	461.386	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.14%#			
129) 5B(H)Cholane - Surr	43.362	217	15107	481.222	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.12%#			
Target Compounds						Qvalue
10) Naphthalene	19.319	128	83M3	0.596	ng/mL	
26) Acenaphthylene	25.612	152	60M4	0.432	ng/mL	
29) Fluorene	28.397	166	79M2	0.793	ng/mL	
33) Dibenzothiophene	31.709	184	116M3	0.848	ng/mL	
34) 4-Methyldibenzothiophene(	33.500	198	139M3	1.016	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	183	1.338	ng/mL#	100
37) OTP	33.877	198	8302	60.690	ng/mL#	100
38) C1-Dibenzothiophenes	33.877	198	8880M5	64.915	ng/mL	
38) C1-Dibenzothiophenes BS	33.877	198	578m	4.225	ng/mL	
39) C2-Dibenzothiophenes	36.180	212-B	970M5	7.091	ng/mL	
43) Phenanthrene	32.206	178	177	1.272	ng/mL#	59
44) 3-Methylphenanthrene(3MP)	34.178	192	97M4	0.697	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.298	192	99M3	0.711	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.630	192	89M2	0.639	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.720	192	85M3	0.611	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.630	192	474M5	3.406	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.180	206-B KMW 11/19/12	7471M5	53.681	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.180	206-B	1305m	9.377	ng/mL	
51) 5AA IS BKGD	36.180	206	6166	44.304	ng/mL	100
52) C3-Phenanthrenes/Anthrace	38.318	220-B	1367M5	9.822	ng/mL	
57) 1-Methylphenanthrene	34.720	192	85M3	0.801	ng/mL	
58) Fluoranthene	36.993	202	80M3	0.521	ng/mL	
60) Pyrene	37.897	202	178	1.139	ng/mL#	65
61) C1-Fluoranthenes/Pyrenes	40.065	216	1110M5	7.105	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.766	230	1153M5	7.381	ng/mL	
75) Benz[a]anthracene	42.700	228	51M3	0.329	ng/mL	
77) Chrysene/Triphenylene	42.835	228	73M3	0.457	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	86M3	0.477	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.841	252	61M3	0.329	ng/mL	
87) Benzo[e]pyrene	47.744	252	240	1.363	ng/mL#	51
89) Benzo[a]pyrene	47.925	252	258	1.532	ng/mL#	71
91) Indeno[1,2,3-cd]pyrene	52.654	276	244M4	1.231	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	265M3	1.240	ng/mL	
147) C26,20R- +C27,20S- triaro	49.054	231	273M3	8.696	ng/mL	
148) C28,20S-triaromatic stero	49.868	231	161	5.129	ng/mL	100
149) C27,20R-triaromatic stero	50.335	231	153M3	4.874	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29029.D
Acq On : 17 Nov 2012 5:50 am
Operator : AC
Sample : SS110612B09
Misc : 1X ETR1210083
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 19 09:45:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

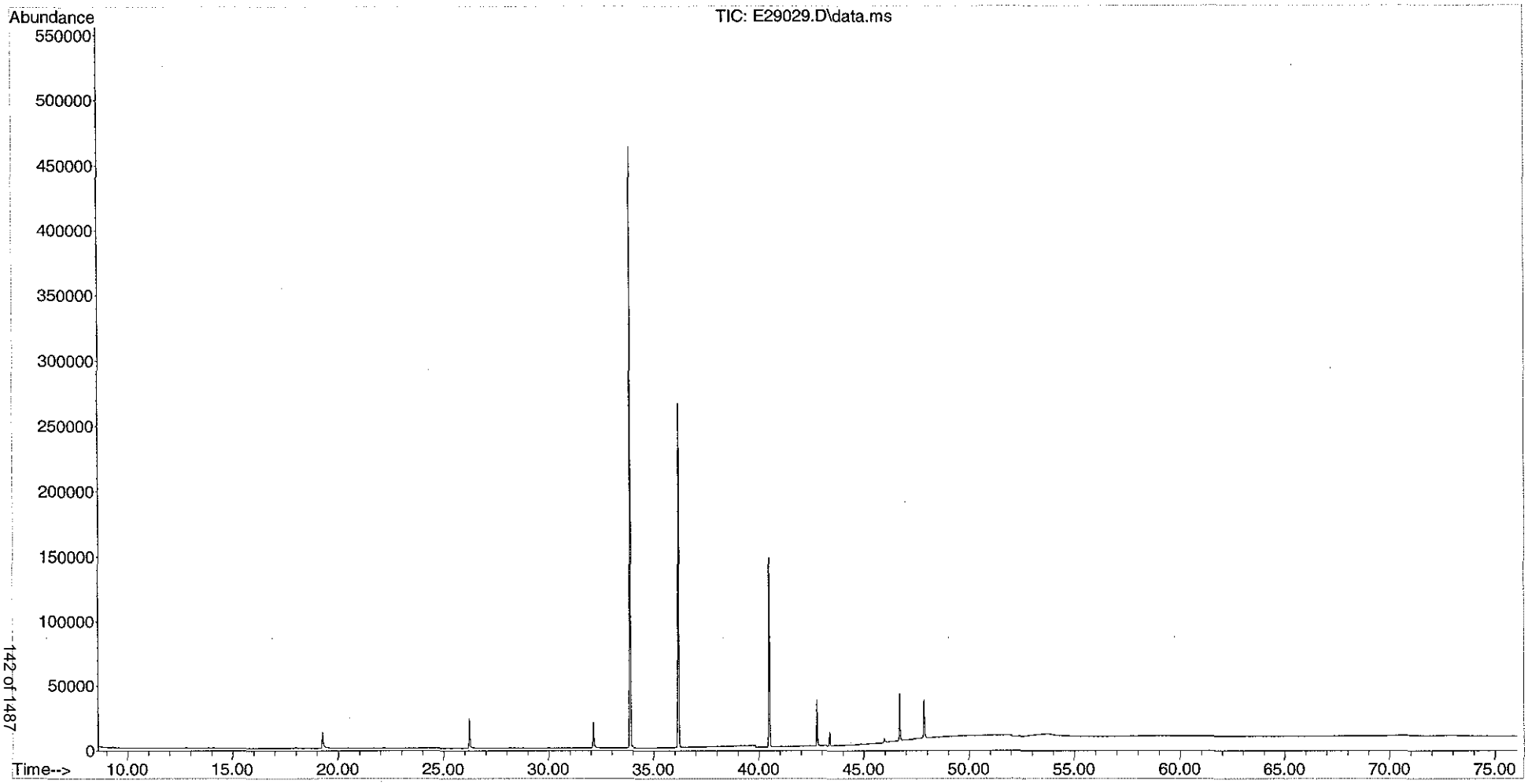
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29029.D
Acq On : 17 Nov 2012 5:50 am
Operator : AC
Sample : SS110612B09
Misc : 1X ETR1210083
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 19 09:45:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCS05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**64.3**	S
C4-Decalins	0.191	U	Pyrene	**65.5**	S
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**60.6**	S	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**63.6**	S
Biphenyl	0.0604	U	Chrysene/Triphenylene	**60.6**	S
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**61.5**	S	C2-Chrysenes	0.104	U
Acenaphthene	**59.2**	S	C3-Chrysenes	0.104	U
Fluorene	**61.0**	S	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**66.7**	S
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**61.4**	S
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	**67.7**	S	Benzo[e]pyrene	0.107	U
Phenanthrene	**60.1**	S	Benzo[a]pyrene	**66.2**	S
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**73.1**	S
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**63.7**	S
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**60.6**	S
Retene	0.109	U			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	86	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	90	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCS05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	86	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	90	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCS05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	**61.2**	
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	86	40-120
Phenanthrene-d10	88	40-120
Benzo[a]pyrene-d12	90	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCS05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	92	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29031.D
Acq On : 17 Nov 2012 7:18 am
Operator : AC
Sample : SS110612LCS05
Misc : 1X ETR1210083
ALS Vial : 4 Sample Multiplier: 1

11/18/12

Quant Time: Nov 19 09:55:22 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	36962M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.745	240	83224	500.000	ng/mL	-0.01
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	55782	429.057	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.91%#			
42) Phenanthrene-d10	32.100	188	58821	441.600	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.16%#			
83) Benzo[b]fluoranthene-d12	46.690	264	77019	450.504	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.05%#			
88) Benzo[a]pyrene-d12	47.835	264	74320	448.652	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.87%#			
129) 5B(H)Cholane - Surr	43.362	217	15013	457.707	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.77%#			
Target Compounds						Qvalue
10) Naphthalene	19.319	128	66062	454.375	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	42481	458.753	ng/mL#	100
26) Acenaphthylene	25.597	152	66833M3	461.061	ng/mL	
27) Acenaphthene	26.335	153	41441	444.141	ng/mL	99
29) Fluorene	28.367	166	47633M4	457.723	ng/mL	
43) Phenanthrene	32.191	178	65518	450.947	ng/mL	100
55) Anthracene	32.387	178	63724M3	507.431	ng/mL	
58) Fluoranthene	36.994	202	77358	482.130	ng/mL	99
60) Pyrene	37.882	202	80160	491.525	ng/mL	99
75) Benz[a]anthracene	42.685	228	77336	477.198	ng/mL	100
77) Chrysene/Triphenylene	42.850	228	75811	454.375	ng/mL	100
84) Benzo[b]fluoranthene	46.766	252	94219	500.177	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	89287	460.714	ng/mL	96
89) Benzo[a]pyrene	47.925	252	87402	496.609	ng/mL	96
91) Indeno[1,2,3-cd]pyrene	52.624	276	113503M3	547.988	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.654	278	105333	477.602	ng/mL	98
93) Benzo[g,h,i]perylene	53.874	276	101424	454.136	ng/mL	99

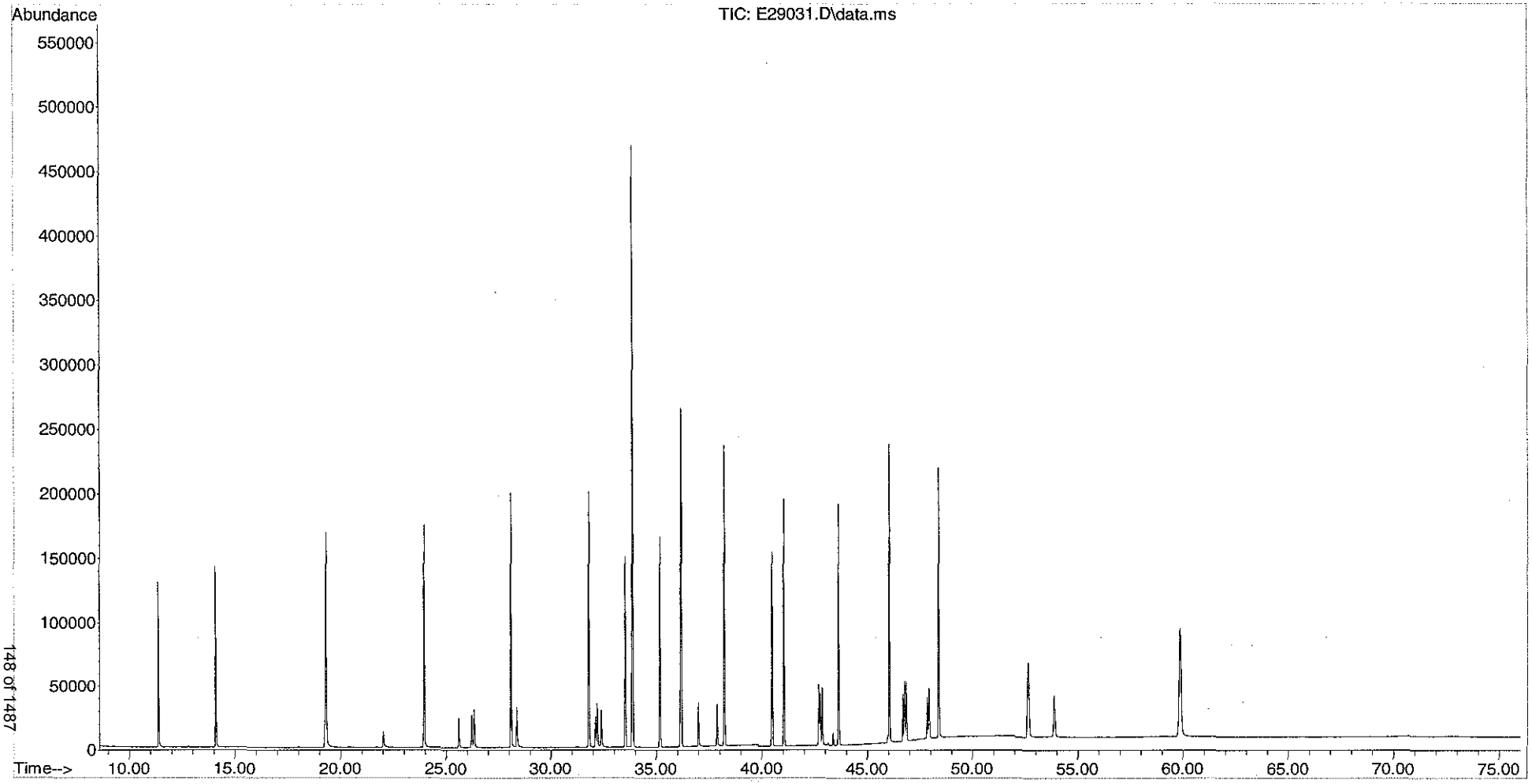
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29031.D
Acq On : 17 Nov 2012 7:18 am
Operator : AC
Sample : SS110612LCS05
Misc : 1X ETR1210083
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 19 09:55:22 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCSD05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	0.191	U	C3-Dibenzothiophenes	0.0580	U
C1-Decalins	0.191	U	C4-Dibenzothiophenes	0.0580	U
C2-Decalins	0.191	U	Benzo(b)fluorene	0.120	U
C3-Decalins	0.191	U	Fluoranthene	**51.4**	S
C4-Decalins	0.191	U	Pyrene	**52.3**	S
Benzothiophene	0.155	U	C1-Fluoranthenes/Pyrenes	0.0993	U
C1-Benzo(b)thiophenes	0.155	U	C2-Fluoranthenes/Pyrenes	0.0993	U
C2-Benzo(b)thiophenes	0.155	U	C3-Fluoranthenes/Pyrenes	0.0993	U
C3-Benzo(b)thiophenes	0.155	U	C4-Fluoranthenes/Pyrenes	0.0993	U
C4-Benzo(b)thiophenes	0.155	U	Naphthobenzothiophenes	0.0645	U
Naphthalene	**50.0**	S	C1-Naphthobenzothiophenes	0.0645	U
C1-Naphthalenes	0.130	U	C2-Naphthobenzothiophenes	0.0645	U
C2-Naphthalenes	0.130	U	C3-Naphthobenzothiophenes	0.0645	U
C3-Naphthalenes	0.130	U	C4-Naphthobenzothiophenes	0.0645	U
C4-Naphthalenes	0.130	U	Benz[a]anthracene	**52.6**	S
Biphenyl	0.0604	U	Chrysene/Triphenylene	**50.2**	S
Dibenzofuran	0.0567	U	C1-Chrysenes	0.104	U
Acenaphthylene	**49.5**	S	C2-Chrysenes	0.104	U
Acenaphthene	**48.9**	S	C3-Chrysenes	0.104	U
Fluorene	**49.7**	S	C4-Chrysenes	0.104	U
C1-Fluorenes	0.0637	U	Benzo[b]fluoranthene	**54.4**	S
C2-Fluorenes	0.0637	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**50.6**	S
C3-Fluorenes	0.0637	U	Benzo[a]fluoranthene	0.119	U
Anthracene	**55.2**	S	Benzo[e]pyrene	0.107	U
Phenanthrene	**48.4**	S	Benzo[a]pyrene	**53.8**	S
C1-Phenanthrenes/Anthracenes	0.113	U	Perylene	0.217	U
C2-Phenanthrenes/Anthracenes	0.113	U	Indeno[1,2,3-cd]pyrene	**59.0**	S
C3-Phenanthrenes/Anthracenes	0.113	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**51.9**	S
C4-Phenanthrenes/Anthracenes	0.113	U	Benzo[g,h,i]perylene	**49.6**	S
Retene	0.109	U			
Dibenzothiophene	0.0580	U			
C1-Dibenzothiophenes	0.0580	U			
C2-Dibenzothiophenes	0.0580	U			

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	68	40-120
Phenanthrene-d10	71	40-120
Benzo[a]pyrene-d12	72	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Form I
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCSD05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result
Carbazole	0.126 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	68	40-120
Phenanthrene-d10	71	40-120
Benzo[a]pyrene-d12	72	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCSD05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result	
4-Methyldibenzothiophene	0.0580	U
2/3-Methyldibenzothiophene	0.0580	U
1-Methyldibenzothiophene	0.0580	U
3-Methylphenanthrene	0.113	U
2-Methylphenanthrene	0.113	U
2-Methylanthracene	0.113	U
9/4-Methylphenanthrene	0.113	U
1-Methylphenanthrene	0.113	U
2-Methylnaphthalene	**49.6**	
1-Methylnaphthalene	0.0864	U
2,6-Dimethylnaphthalene	0.0913	U
2,3,5-Trimethylnaphthalene	0.0720	U
Naphthobenzothiophene-2,1-D	0.0645	U
Naphthobenzothiophene-1,2-D	0.0645	U
Naphthobenzothiophene-2,3-D	0.0645	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	68	40-120
Phenanthrene-d10	71	40-120
Benzo[a]pyrene-d12	72	40-120

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCSD05**
Associated Blank: **SS110612B09**
Concentration Units: **µg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/17/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
C23 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22S	1.06	U
C24 Tricyclic Terpane	1.06	U	30,31-Trishomohopane-22R	1.06	U
C25 Tricyclic Terpane	1.06	U	Tetrakishomohopane-22S	1.06	U
C24 Tetracyclic Terpane	1.06	U	Tetrakishomohopane-22R	1.06	U
C26 Tricyclic Terpane-22S	1.06	U	Pentakishomohopane-22S	1.06	U
C26 Tricyclic Terpane-22R	1.06	U	Pentakishomohopane-22R	1.06	U
C28 Tricyclic Terpane-22S	1.06	U	13b(H),17a(H)-20S-Diacholestane	1.06	U
C28 Tricyclic Terpane-22R	1.06	U	13b(H),17a(H)-20R-Diacholestane	1.06	U
C29 Tricyclic Terpane-22S	1.06	U	13b,17a-20S-Methyldiacholestane	1.06	U
C29 Tricyclic Terpane-22R	1.06	U	14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	1.06	U
18a-22,29,30-Trisnorneohopane-TS	1.06	U	14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	1.06	U
C30 Tricyclic Terpane-22S	1.06	U	Unknown Sterane (S18)	1.06	U
C30 Tricyclic Terpane-22R	1.06	U	13a,17b-20S-Ethyldiacholestane	1.06	U
17a(H)-22,29,30-Trisnorhopane-TM	1.06	U	14a,17a-20S-Methylcholestane	1.06	U
17a/b,21b/a 28,30-Bisnorhopane	1.06	U	14a,17a-20R-Methylcholestane	1.06	U
17a(H),21b(H)-25-Norhopane	1.06	U	14a(H),17a(H)-20S-Ethylcholestane	1.06	U
30-Norhopane	1.06	U	14a(H),17a(H)-20R-Ethylcholestane	1.06	U
18a(H)-30-Norneohopane-C29Ts	1.06	U	14b(H),17b(H)-20R-Cholestane	1.06	U
17a(H)-Diahopane	1.06	U	14b(H),17b(H)-20S-Cholestane	1.06	U
30-Normoretane	1.06	U	14b,17b-20R-Methylcholestane	1.06	U
18a(H)&18b(H)-Oleananes	1.06	U	14b,17b-20S-Methylcholestane	1.06	U
Hopane	1.06	U	14b(H),17b(H)-20R-Ethylcholestane	1.06	U
Moretane	1.06	U	14b(H),17b(H)-20S-Ethylcholestane	1.06	U
30-Homohopane-22S	1.06	U	C26,20R- +C27,20S- triaromatic steroid	1.06	U
30-Homohopane-22R	1.06	U	C28,20S-triaromatic steroid	1.06	U
T22a-Gammacerane/C32-diahopane	1.06	U	C27,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22S	1.06	U	C28,20R-triaromatic steroid	1.06	U
30,31-Bishomohopane-22R	1.06	U			

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	76	50-130

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29033.D
Acq On : 17 Nov 2012 8:46 am
Operator : AC
Sample : SS110612LCSD05
Misc : 1X ETR1210083
ALS Vial : 5 Sample Multiplier: 1

11/19/12

Quant Time: Nov 19 09:56:36 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	35691	500.000	ng/mL	0.00
74) Chrysene-d12	42.745	240	77805	500.000	ng/mL	-0.01
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	42624	339.525	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 33.95%#			
42) Phenanthrene-d10	32.100	188	45804	356.120	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.61%#			
83) Benzo[b]fluoranthene-d12	46.690	264	59135	369.987	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 37.00%#			
88) Benzo[a]pyrene-d12	47.835	264	56115	362.346	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.23%#			
129) 5B(H)Cholane - Surr	43.362	217	11669	380.536	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 38.05%#			
Target Compounds						Qvalue
10) Naphthalene	19.319	128	52593	374.617	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	33281	372.201	ng/mL#	100
26) Acenaphthylene	25.597	152	51988M3	371.422	ng/mL	
27) Acenaphthene	26.335	153	33014	366.425	ng/mL	98
29) Fluorene	28.367	166	37466	372.846	ng/mL	99
43) Phenanthrene	32.191	178	50929	363.017	ng/mL	100
55) Anthracene	32.386	178	50174M3	413.761	ng/mL	
58) Fluoranthene	36.993	202	59745	385.618	ng/mL	100
60) Pyrene	37.882	202	61797	392.421	ng/mL	99
75) Benz[a]anthracene	42.685	228	59807	394.739	ng/mL	100
77) Chrysene/Triphenylene	42.850	228	58734	376.542	ng/mL	100
84) Benzo[b]fluoranthene	46.765	252	71803	407.726	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.841	252	68770	379.562	ng/mL	96
89) Benzo[a]pyrene	47.925	252	66428	403.725	ng/mL	98
91) Indeno[1,2,3-cd]pyrene	52.624	276	85697M3	442.558	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.654	278	80270	389.311	ng/mL	98
93) Benzo[g,h,i]perylene	53.874	276	77664	371.969	ng/mL	99

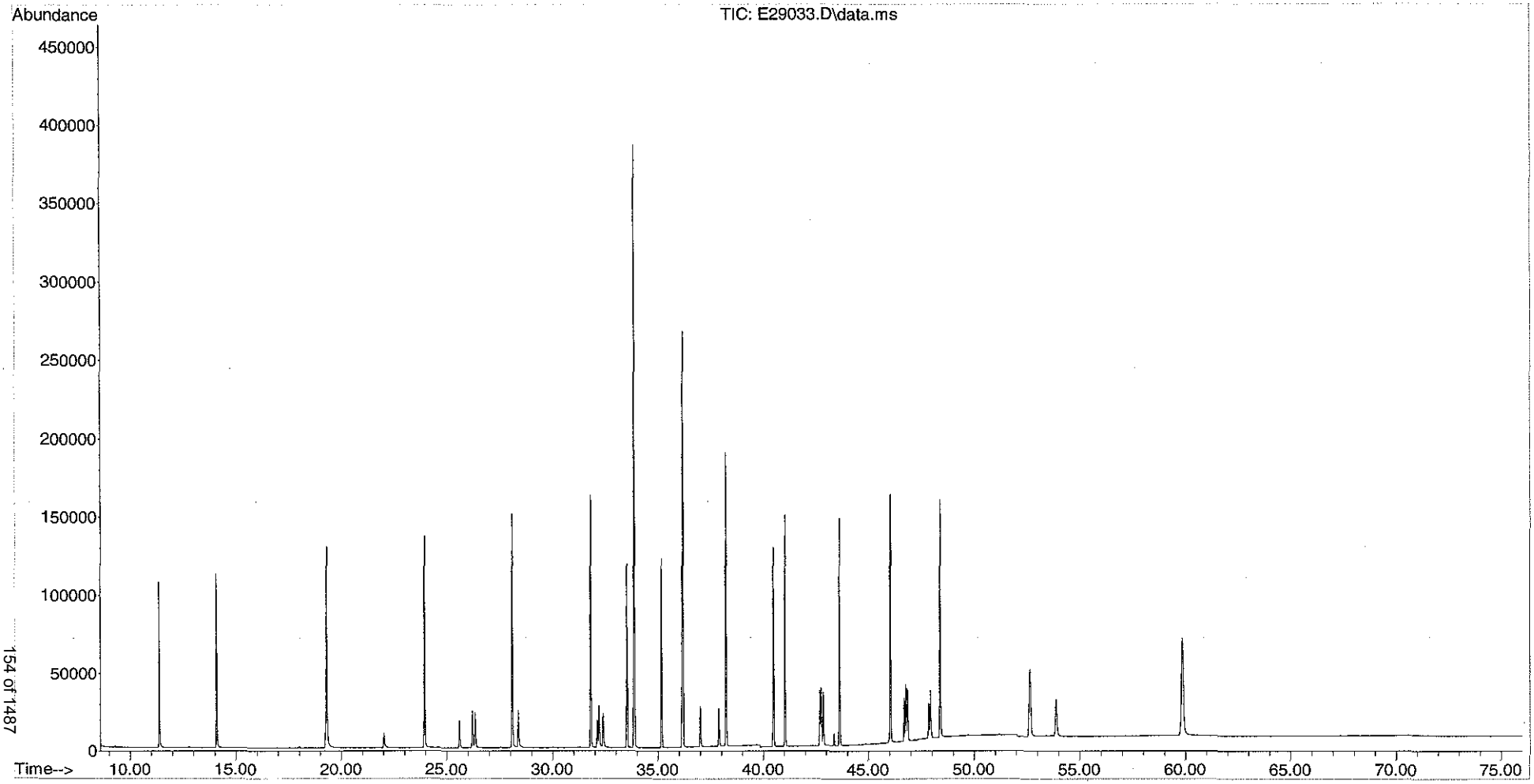
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29033.D
Acq On : 17 Nov 2012 8:46 am
Operator : AC
Sample : SS110612LCSD05
Misc : 1X ETR1210083
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 19 09:56:36 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Cold Lake Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result	
cis/trans-Decalin	140	
C1-Decalins	297	
C2-Decalins	461	
C3-Decalins	354	
C4-Decalins	378	
Benzothiophene	9.60	
C1-Benzo(b)thiophenes	49.8	
C2-Benzo(b)thiophenes	92.9	
C3-Benzo(b)thiophenes	165	
C4-Benzo(b)thiophenes	176	
Naphthalene	66.7	
C1-Naphthalenes	189	
C2-Naphthalenes	404	
C3-Naphthalenes	508	
C4-Naphthalenes	430	
Biphenyl	16.0	
Dibenzofuran	8.46	
Acenaphthylene	3.56	
Acenaphthene	13.1	
Fluorene	28.8	
C1-Fluorenes	82.2	
C2-Fluorenes	193	
C3-Fluorenes	232	
Anthracene	5.53	
Phenanthrene	83.7	
C1-Phenanthrenes/Anthracenes	246	
C2-Phenanthrenes/Anthracenes	372	
C3-Phenanthrenes/Anthracenes	356	
C4-Phenanthrenes/Anthracenes	165	
Retene	1.98	U
Dibenzothiophene	70.0	
C1-Dibenzothiophenes	244	
C2-Dibenzothiophenes	461	
C3-Dibenzothiophenes	506	
C4-Dibenzothiophenes	351	
Benzo(b)fluorene	7.71	
Fluoranthene	6.11	
Pyrene	19.6	
C1-Fluoranthenes/Pyrenes	74.0	
C2-Fluoranthenes/Pyrenes	114	
C3-Fluoranthenes/Pyrenes	139	
C4-Fluoranthenes/Pyrenes	142	
Naphthobenzothiophenes	42.3	
C1-Naphthobenzothiophenes	146	
C2-Naphthobenzothiophenes	233	
C3-Naphthobenzothiophenes	197	
C4-Naphthobenzothiophenes	161	
Benz[a]anthracene	3.71	
Chrysene/Triphenylene	22.5	
C1-Chrysenes	62.2	
C2-Chrysenes	101	
C3-Chrysenes	120	
C4-Chrysenes	80.8	
Benzo[b]fluoranthene	5.79	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	1.76	J
Benzo[a]fluoranthene	1.98	U
Benzo[e]pyrene	9.29	
Benzo[a]pyrene	5.32	
Perylene	11.3	
Indeno[1,2,3-cd]pyrene	3.24	
Dibenz[ah]anthracene/Dibenz[ac]anthracene	1.23	J
Benzo[g,h,i]perylene	6.82	

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	40-120
Phenanthrene-d10	103	40-120
Benzo[a]pyrene-d12	104	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Cold Lake Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result
Carbazole	**7.30**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	40-120
Phenanthrene-d10	103	40-120
Benzo[a]pyrene-d12	104	40-120

N/A - Not Applicable

Form I
Cold Lake Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**95.2**
2/3-Methyldibenzothiophene	**80.0**
1-Methyldibenzothiophene	**52.0**
3-Methylphenanthrene	**47.6**
2-Methylphenanthrene	**53.8**
2-Methylanthracene	**5.05**
9/4-Methylphenanthrene	**84.1**
1-Methylphenanthrene	**47.6**
2-Methylnaphthalene	**178**
1-Methylnaphthalene	**122**
2,6-Dimethylnaphthalene	**172**
2,3,5-Trimethylnaphthalene	**49.8**
Naphthobenzothiophene-2,1-D	**29.6**
Naphthobenzothiophene-1,2-D	**7.70**
Naphthobenzothiophene-2,3-D	**4.95**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	40-120
Phenanthrene-d10	103	40-120
Benzo[a]pyrene-d12	104	40-120

N/A - Not Applicable

Form I
Cold Lake Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05064	10	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**99.8**	
C24 Tricyclic Terpane	**53.7**	
C25 Tricyclic Terpane	**50.5**	
C24 Tetracyclic Terpane	**19.0**	
C26 Tricyclic Terpane-22S	**19.2**	
C26 Tricyclic Terpane-22R	**18.3**	
C28 Tricyclic Terpane-22S	**22.1**	
C28 Tricyclic Terpane-22R	**22.8**	
C29 Tricyclic Terpane-22S	**27.2**	
C29 Tricyclic Terpane-22R	**25.8**	
18a-22,29,30-Trisnorneohopane-TS	**27.8**	
C30 Tricyclic Terpane-22S	**22.2**	
C30 Tricyclic Terpane-22R	**22.5**	
17a(H)-22,29,30-Trisnorhopane-TM	**68.2**	
17a/b,21b/a 28,30-Bisnorhopane	**44.2**	
17a(H),21b(H)-25-Norhopane	**12.7**	
30-Norhopane	**188**	
18a(H)-30-Norneohopane-C29Ts	**25.7**	
17a(H)-Diahopane	**8.87**	
30-Normoretane	**18.1**	
18a(H)&18b(H)-Oleananes	**1.26**	J
Hopane	**254**	
Moretane	**20.4**	
30-Homohopane-22S	**115**	
30-Homohopane-22R	**90.0**	
T22a-Gammacerane/C32-diahopane	**42.8**	
30,31-Bishomohopane-22S	**75.1**	
30,31-Bishomohopane-22R	**54.2**	

Parameter	Result
30,31-Trishomohopane-22S	**59.3**
30,31-Trishomohopane-22R	**38.9**
Tetrakishomohopane-22S	**38.4**
Tetrakishomohopane-22R	**27.0**
Pentakishomohopane-22S	**51.7**
Pentakishomohopane-22R	**34.9**
13b(H),17a(H)-20S-Diacholestane	**35.7**
13b(H),17a(H)-20R-Diacholestane	**16.7**
13b,17a-20S-Methyldiacholestane	**13.4**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**61.9**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**72.6**
Unknown Sterane (S18)	**12.2**
13a,17b-20S-Ethyldiacholestane	**7.87**
14a,17a-20S-Methylcholestane	**24.3**
14a,17a-20R-Methylcholestane	**27.0**
14a(H),17a(H)-20S-Ethylcholestane	**57.3**
14a(H),17a(H)-20R-Ethylcholestane	**56.2**
14b(H),17b(H)-20R-Cholestane	**54.0**
14b(H),17b(H)-20S-Cholestane	**52.6**
14b,17b-20R-Methylcholestane	**45.0**
14b,17b-20S-Methylcholestane	**59.7**
14b(H),17b(H)-20R-Ethylcholestane	**75.7**
14b(H),17b(H)-20S-Ethylcholestane	**58.5**
C26,20R- +C27,20S- triaromatic steroid	**229**
C28,20S-triaromatic steroid	**200**
C27,20R-triaromatic steroid	**151**
C28,20R-triaromatic steroid	**164**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	108	50-130

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22488M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.730	240	52371	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	75708	957.123	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.71%			
42) Phenanthrene-d10	32.085	188	83705	1032.886	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.29%			
83) Benzo[b]fluoranthene-d12	46.660	264	112882	1049.260	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.93%			
88) Benzo[a]pyrene-d12	47.805	264	108509	1040.944	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.09%			
129) 5B(H)Cholane - Surr	43.347	217	22224	1076.714	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.67%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	11487	638.581	ng/mL	100
4) cis-Decalin	17.091	138	961	70.317	ng/mL	100
5) C1-Decalins	17.362	152	27034M5	1502.863	ng/mL	
6) C2-Decalins	18.792	166	41962m	2332.735	ng/mL	
7) C3-Decalins	21.623	180	32282m	1794.608	ng/mL	
8) C4-Decalins	24.272	194	34396M5	1912.129	ng/mL	
10) Naphthalene	19.304	128	29886	337.858	ng/mL#	100
11) C1-Naphthalenes	21.999	142	84491M5	955.163	ng/mL	
12) C2-Naphthalenes	24.844	156	181124m	2047.590	ng/mL	
13) C3-Naphthalenes	27.539	170	227398m	2570.713	ng/mL	
14) C4-Naphthalenes	29.963	184	192482M5	2175.991	ng/mL	
16) 2-Methylnaphthalene	21.999	142	50808	901.822	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	33707	615.722	ng/mL#	100
18) Benzothiophene	19.515	134	3555M3	48.614	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	18443M5	252.206	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	34386m	470.225	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	61203m	836.944	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	65139M5	890.768	ng/mL	
23) Biphenyl	23.881	154	5778M3	81.148	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	44230	870.976	ng/mL#	100
25) Dibenzofuran	26.982	168	3377M4	42.839	ng/mL	
26) Acenaphthylene	25.597	152	1589M3	18.018	ng/mL	
27) Acenaphthene	26.320	153	3771M3	66.428	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	11977M3	252.087	ng/mL	
29) Fluorene	28.352	166	9231M3	145.797	ng/mL	
30) C1-Fluorenes	30.730	180	26347M5	416.132	ng/mL	
31) C2-Fluorenes	32.928	194	61879M5	977.334	ng/mL	
32) C3-Fluorenes	34.780	208	74460m	1176.041	ng/mL	
33) Dibenzothiophene	31.679	184	30776	354.217	ng/mL#	69
34) 4-Methyldibenzothiophene(	33.455	198	41863	481.823	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	35209M3	405.239	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	22874	263.269	ng/mL#	100
37) OTP	33.877	198	8248M3	94.931	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	115363m	1327.773	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	107115m	1232.843	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	202640M5	2332.290	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	222481m	2560.651	ng/mL	

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ALS Vial : 37 Sample Multiplier: 1

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	38.680	240	154353M5	1776.530	ng/mL	
43) Phenanthrene	32.176	178	37460M3	423.777	ng/mL	
44) 3-Methylphenanthrene(3MP)	34.148	192	21283M3	240.770	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.268	192	24068	272.276	ng/mL	93
46) 2-Methylanthracene(2MA)	34.419	192	2262M3	25.590	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	37627	425.666	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	21311M3	241.087	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	110226M5	1246.964	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	166742M5	1886.317	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	166742m	1886.317	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.553	220	159437M5	1803.677	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	73850M5	835.450	ng/mL	
55) Anthracene	32.386	178	2138M3	27.982	ng/mL	
56) Carbazole	33.034	167	2907M3	36.969	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21431M3	317.786	ng/mL	
58) Fluoranthene	36.963	202	3019M3	30.926	ng/mL	
59) Benzo(b)fluorene	39.508	216	2540M3	39.048	ng/mL	
60) Pyrene	37.852	202	9821	98.980	ng/mL#	58
61) C1-Fluoranthenes/Pyrenes	39.267	216	37164m	374.554	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.074	230	57475M5	579.257	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	70060m	706.094	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.476	258	71175M5	717.331	ng/mL	
66) Naphthobenzothiophene	41.721	234	14696	150.171	ng/ml#	83
67) Naphthobenzothiophene-2,1	41.721	234	14696	150.171	ng/mL#	83
68) Naphthobenzothiophene-1,2	42.067	234	3816M3	38.994	ng/mL	
69) Naphthobenzothiophene-2,3	42.369	234	2452M3	25.056	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	72458M5	740.413	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	115439M5	1179.614	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	97784M5	999.206	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	79999M5	817.470	ng/mL	
75) Benz[a]anthracene	42.670	228	1916M3	18.788	ng/mL	
77) Chrysene/Triphenylene	42.790	228	11966M3	113.970	ng/mL	
78) C1-Chrysenes	44.311	242	33088M5	315.145	ng/mL	
79) C2-Chrysenes	46.404	256	57413M5	546.827	ng/mL	
79) C2-Chrysenes BS	46.404	256	53727m	511.720	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3686	35.107	ng/mL	100
81) C3-Chrysenes	49.039	270	63858M5	608.212	ng/mL	
82) C4-Chrysenes	49.145	284	42938M5	408.961	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	3474M3	29.307	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1089M3	8.930	ng/mL	
87) Benzo[e]pyrene	47.699	252	5445	47.044	ng/mL#	86
89) Benzo[a]pyrene	47.895	252	2983M3	26.934	ng/mL	
90) Perylene	48.196	252	6676	57.005	ng/mL#	65
91) Indeno[1,2,3-cd]pyrene	52.564	276	2135M3	16.380	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	861M3	6.204	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	4854	34.538	ng/mL#	80
94) Hopane (T19)	51.645	191	50509M3	1285.093	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19859	505.270	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10693	272.060	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	10049M3	255.675	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3791M3	96.454	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3812M3	96.988	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3647M3	92.790	ng/ml	
102) C28 Tricyclic Terpane-22S	46.058	191	4407M3	112.127	ng/ml	

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Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103) C28 Tricyclic Terpane-22R	46.208	191	4541M3	115.536	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5414	137.748	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5133M3	130.598	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5539	140.928	ng/ml	100
107) C30 Tricyclic Terpane-22S	48.121	191	4416M3	112.356	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4472M3	113.780	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.527	191	13579	345.488	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8803	223.973	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.521	191	2536	64.523	ng/ml	100
112) 30-Norhopane (T15)	50.335	191	37394M3	951.410	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5112M3	130.064	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1765M3	44.907	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3598	91.543	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.494	191	251	6.386	ng/ml	100
117) Moretane (T20)	52.308	191	4056M3	103.196	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	22831	580.886	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17916	455.834	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8524	216.875	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.883	191	14956	380.523	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10789	274.503	ng/ml	100
123) 30,31-Trishomohopane-22S	56.946	191	11804	300.327	ng/ml	100
124) 30,31-Trishomohopane-22R	57.548	191	7741	196.953	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	7651M3	194.663	ng/ml	
126) Tetrakishomohopane-22R (T	60.349	191	5366	136.526	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	10288	261.756	ng/ml	100
128) Pentakishomohopane-22R (T	63.767	191	6944	176.675	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	3728M3	180.615	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.305	217	1746M3	84.591	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1405M3	68.070	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6470	313.460	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7592M3	367.819	ng/ml	
135) Unknown Sterane (S18)	47.639	217	1270	61.529	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	823	39.873	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2543	123.204	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2819M2	136.576	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5989M3	290.157	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5879M3	284.827	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5640M3	273.248	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	5501M3	266.514	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4708	228.094	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6238M3	302.220	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7915M3	383.468	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.371	218	6112M3	296.116	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23951	1160.384	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	20900	1012.569	ng/mL	100
149) C27,20R-triaromatic stero	50.320	231	15762	763.641	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17097M3	828.320	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
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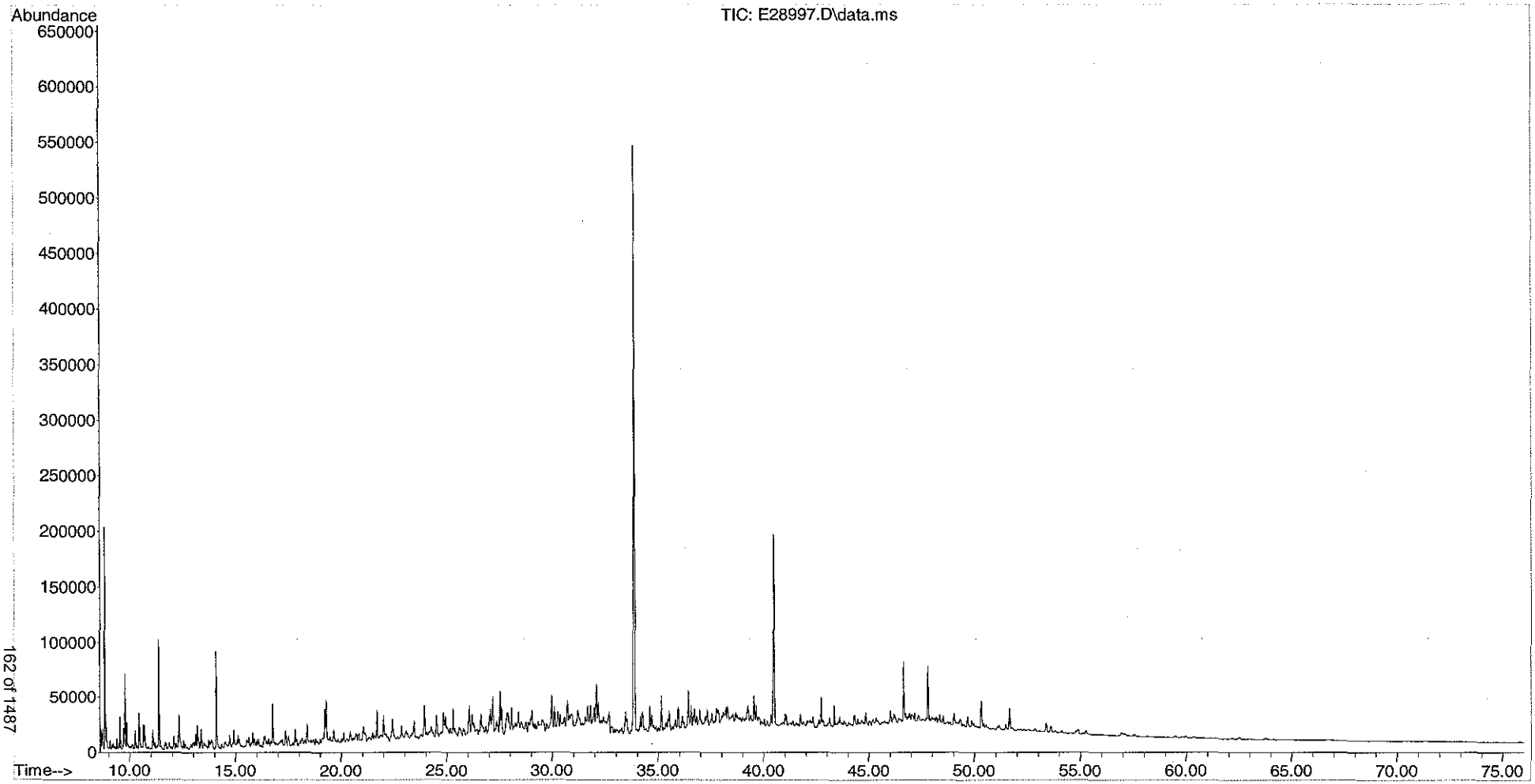
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



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2969

Form I
Western Canadian Select
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	165		C3-Dibenzothiophenes	457	
C1-Decalins	337		C4-Dibenzothiophenes	315	
C2-Decalins	483		Benzo(b)fluorene	1.99	U
C3-Decalins	381		Fluoranthene	7.16	
C4-Decalins	425		Pyrene	24.8	
Benzothiophene	7.27		C1-Fluoranthenes/Pyrenes	86.6	
C1-Benzo(b)thiophenes	38.5		C2-Fluoranthenes/Pyrenes	128	
C2-Benzo(b)thiophenes	65.3		C3-Fluoranthenes/Pyrenes	150	
C3-Benzo(b)thiophenes	138		C4-Fluoranthenes/Pyrenes	153	
C4-Benzo(b)thiophenes	148		Naphthobenzothiophenes	38.6	
Naphthalene	73.0		C1-Naphthobenzothiophenes	136	
C1-Naphthalenes	209		C2-Naphthobenzothiophenes	221	
C2-Naphthalenes	514		C3-Naphthobenzothiophenes	184	
C3-Naphthalenes	614		C4-Naphthobenzothiophenes	156	
C4-Naphthalenes	484		Benz[a]anthracene	4.55	
Biphenyl	16.9		Chrysene/Triphenylene	23.1	
Dibenzofuran	8.63		C1-Chrysenes	63.8	
Acenaphthylene	4.61		C2-Chrysenes	103	
Acenaphthene	14.3		C3-Chrysenes	139	
Fluorene	34.8		C4-Chrysenes	90.3	
C1-Fluorenes	91.6		Benzo[b]fluoranthene	6.96	
C2-Fluorenes	221		Benzo[j]fluoranthene/Benzo[k]fluoranthene	2.04	
C3-Fluorenes	248		Benzo[a]fluoranthene	1.99	U
Anthracene	5.67		Benzo[e]pyrene	10.7	
Phenanthrene	90.9		Benzo[a]pyrene	6.11	
C1-Phenanthrenes/Anthracenes	259		Perylene	12.2	
C2-Phenanthrenes/Anthracenes	387		Indeno[1,2,3-cd]pyrene	3.40	
C3-Phenanthrenes/Anthracenes	359		Dibenz[ah]anthracene/Dibenz[ac]anthracene	1.58	J
C4-Phenanthrenes/Anthracenes	190		Benzo[g,h,i]perylene	8.38	
Retene	67.3				
Dibenzothiophene	65.3				
C1-Dibenzothiophenes	219				
C2-Dibenzothiophenes	423				

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	98	40-120
Phenanthrene-d10	106	40-120
Benzo[a]pyrene-d12	107	40-120

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Western Canadian Select
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result
Carbazole	**6.28**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	98	40-120
Phenanthrene-d10	106	40-120
Benzo[a]pyrene-d12	107	40-120

N/A - Not Applicable

Form I
Western Canadian Select
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**87.3**
2/3-Methyldibenzothiophene	**75.0**
1-Methyldibenzothiophene	**46.8**
3-Methylphenanthrene	**52.6**
2-Methylphenanthrene	**58.7**
2-Methylanthracene	**3.99**
9/4-Methylphenanthrene	**86.2**
1-Methylphenanthrene	**50.7**
2-Methylnaphthalene	**202**
1-Methylnaphthalene	**130**
2,6-Dimethylnaphthalene	**224**
2,3,5-Trimethylnaphthalene	**85.5**
Naphthobenzothiophene-2,1-D	**26.8**
Naphthobenzothiophene-1,2-D	**7.04**
Naphthobenzothiophene-2,3-D	**4.74**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	98	40-120
Phenanthrene-d10	106	40-120
Benzo[a]pyrene-d12	107	40-120

N/A - Not Applicable

Form I
Western Canadian Select
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/15/12	100	0.05036	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	**101**
C24 Tricyclic Terpane	**54.6**
C25 Tricyclic Terpane	**49.9**
C24 Tetracyclic Terpane	**17.6**
C26 Tricyclic Terpane-22S	**18.4**
C26 Tricyclic Terpane-22R	**18.4**
C28 Tricyclic Terpane-22S	**20.2**
C28 Tricyclic Terpane-22R	**23.5**
C29 Tricyclic Terpane-22S	**26.3**
C29 Tricyclic Terpane-22R	**26.7**
18a-22,29,30-Trisnorneohopane-TS	**28.2**
C30 Tricyclic Terpane-22S	**21.1**
C30 Tricyclic Terpane-22R	**21.9**
17a(H)-22,29,30-Trisnorhopane-TM	**64.4**
17a/b,21b/a 28,30-Bisnorhopane	**42.0**
17a(H),21b(H)-25-Norhopane	**12.3**
30-Norhopane	**178**
18a(H)-30-Norneohopane-C29Ts	**28.1**
17a(H)-Diahopane	**9.14**
30-Normoretane	**18.7**
18a(H)&18b(H)-Oleananes	**2.04**
Hopane	**245**
Moretane	**19.9**
30-Homohopane-22S	**109**
30-Homohopane-22R	**89.2**
T22a-Gammacerane/C32-diahopane	**41.1**
30,31-Bishomohopane-22S	**71.9**
30,31-Bishomohopane-22R	**52.1**

Parameter	Result
30,31-Trishomohopane-22S	**57.4**
30,31-Trishomohopane-22R	**39.4**
Tetrakishomohopane-22S	**38.0**
Tetrakishomohopane-22R	**28.4**
Pentakishomohopane-22S	**50.1**
Pentakishomohopane-22R	**34.5**
13b(H),17a(H)-20S-Diacholestane	**40.4**
13b(H),17a(H)-20R-Diacholestane	**16.9**
13b,17a-20S-Methyldiacholestane	**19.2**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**62.0**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**71.4**
Unknown Sterane (S18)	**14.4**
13a,17b-20S-Ethyldiacholestane	**5.95**
14a,17a-20S-Methylcholestane	**26.4**
14a,17a-20R-Methylcholestane	**27.8**
14a(H),17a(H)-20S-Ethylcholestane	**57.4**
14a(H),17a(H)-20R-Ethylcholestane	**48.8**
14b(H),17b(H)-20R-Cholestane	**50.3**
14b(H),17b(H)-20S-Cholestane	**48.2**
14b,17b-20R-Methylcholestane	**42.0**
14b,17b-20S-Methylcholestane	**56.4**
14b(H),17b(H)-20R-Ethylcholestane	**74.0**
14b(H),17b(H)-20S-Ethylcholestane	**51.6**
C26,20R- +C27,20S- triaromatic steroid	**232**
C28,20S-triaromatic steroid	**195**
C27,20R-triaromatic steroid	**150**
C28,20R-triaromatic steroid	**167**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	108	50-130

N/A - Not Applicable

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.199	164	21842M3	500.000 ng/mL	0.00
74) Chrysene-d12	42.715	240	51901	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.229	136	75122	977.804 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.78%		
42) Phenanthrene-d10	32.085	188	83311	1058.430 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 105.84%		
83) Benzo[b]fluoranthene-d12	46.660	264	111635	1047.066 ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.71%		
88) Benzo[a]pyrene-d12	47.804	264	110822	1072.760 ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.28%		
129) 5B(H)Cholane - Surr	43.347	217	22186	1084.607 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.46%		
Target Compounds					Qvalue
3) trans-Decalin	15.872	138	13052	747.041 ng/mL	100
4) cis-Decalin	17.091	138	1124	84.676 ng/mL	100
5) C1-Decalins	17.362	152	29663M5	1697.785 ng/mL	
6) C2-Decalins	18.792	166	42504m	2432.750 ng/mL	
7) C3-Decalins	21.622	180	33554m	1920.489 ng/mL	
8) C4-Decalins	24.995	194	37420M5	2141.763 ng/mL	
10) Naphthalene	19.304	128	31606	367.870 ng/mL#	100
11) C1-Naphthalenes	21.999	142	90373M5	1051.875 ng/mL	
12) C2-Naphthalenes	24.844	156	222589m	2590.771 ng/mL	
13) C3-Naphthalenes	27.193	170	265450m	3089.642 ng/mL	
14) C4-Naphthalenes	29.963	184	209560M5	2439.123 ng/mL	
16) 2-Methylnaphthalene	21.999	142	55769	1019.155 ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	34727	653.116 ng/mL#	100
18) Benzothiophene	19.515	134	2602	36.634 ng/mL	100
19) C1-Benzo(b)thiophenes	21.562	148	13786M5	194.098 ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	23346m	328.696 ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49201m	692.717 ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	52800M5	743.389 ng/mL	
23) Biphenyl	23.881	154	5881M3	85.037 ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	55634	1127.945 ng/mL#	100
25) Dibenzofuran	26.967	168	3329	43.479 ng/mL#	50
26) Acenaphthylene	25.597	152	1987	23.197 ng/mL#	100
27) Acenaphthene	26.320	153	3961M3	71.839 ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	19874M3	430.671 ng/mL	
29) Fluorene	28.352	166	10777M3	175.249 ng/mL	
30) C1-Fluorenes	30.730	180	28376M5	461.434 ng/mL	
31) C2-Fluorenes	32.928	194	68351M5	1111.483 ng/mL	
32) C3-Fluorenes	34.780	208	76967m	1251.591 ng/mL	
33) Dibenzothiophene	31.679	184	27741	328.729 ng/mL#	65
34) 4-Methyldibenzothiophene(	33.455	198	37118	439.846 ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	31892M3	377.918 ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	19883	235.612 ng/mL#	100
37) OTP	33.877	198	8252M3	97.786 ng/mL	
38) C1-Dibenzothiophenes	33.455	198	101204m	1199.260 ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	92952m	1101.475 ng/mL	
39) C2-Dibenzothiophenes	35.157	212	179953M5	2132.431 ng/mL	
40) C3-Dibenzothiophenes	36.978	226	194163m	2300.818 ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
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Operator : AC
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Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41)	C4-Dibenzothiophenes	38.680	240	133970M5	1587.535	ng/mL	
43)	Phenanthrene	32.176	178	39318M3	457.952	ng/mL	
44)	3-Methylphenanthrene(3MP)	34.148	192	22758	265.071	ng/mL	91
45)	2-Methylphenanthrene(2MP)	34.253	192	25392	295.750	ng/mL	96
46)	2-Methylanthracene(2MA)	34.419	192	1724M3	20.080	ng/mL	
47)	9/4-Methylphenanthrene(9M	34.599	192	37285	434.272	ng/mL	98
48)	1-Methylphenanthrene(1MP)	34.690	192	21928M3	255.404	ng/mL	
49)	C1-Phenanthrenes/Anthrace	34.599	192	111975M5	1304.215	ng/mL	
50)	C2-Phenanthrenes/Anthrace	36.421	206	167293M5	1948.525	ng/mL	
50)	C2-Phenanthrenes/Anthr BS	36.421	206	167293m	1948.525	ng/mL	
52)	C3-Phenanthrenes/Anthrace	39.538	220	155088M5	1806.369	ng/mL	
53)	C4-Phenanthrenes/Anthrace	39.192	234	82125M5	956.541	ng/mL	
54)	Retene	39.192	234	9360M3	338.791	ng/mL	
55)	Anthracene	32.401	178	2120M3	28.568	ng/mL	
56)	Carbazole	33.019	167	2417M3	31.646	ng/mL	
57)	1-Methylphenanthrene	34.690	192	21795M3	332.742	ng/mL	
58)	Fluoranthene	36.963	202	3417M3	36.039	ng/mL	
60)	Pyrene	37.852	202	12034	124.871	ng/mL#	72
61)	C1-Fluoranthenes/Pyrenes	39.252	216	42027m	436.093	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.736	230	61979M5	643.125	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.106	244	72727m	754.651	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.461	258	74298M5	770.953	ng/mL	
66)	Naphthobenzothiophene	41.721	234	13161M3	138.463	ng/ml	
67)	Naphthobenzothiophene-2,1	41.721	234	12820M3	134.876	ng/mL	
68)	Naphthobenzothiophene-1,2	42.067	234	3370M3	35.455	ng/mL	
69)	Naphthobenzothiophene-2,3	42.368	234	2267M3	23.850	ng/mL	
70)	C1-Naphthobenzothiophenes	43.829	248	64936M5	683.174	ng/ml	
71)	C2-Naphthobenzothiophenes	45.199	262	105816M5	1113.262	ng/ml	
72)	C3-Naphthobenzothiophenes	46.765	276	87977M5	925.582	ng/ml	
73)	C4-Naphthobenzothiophenes	47.804	290	74820M5	787.161	ng/mL	
75)	Benz[a]anthracene	42.655	228	2315M3	22.906	ng/mL	
77)	Chrysene/Triphenylene	42.805	228	12114M3	116.424	ng/mL	
78)	C1-Chrysenes	44.311	242	33434M5	321.324	ng/mL	
79)	C2-Chrysenes	46.404	256	57755M5	555.066	ng/mL	
79)	C2-Chrysenes BS	46.404	256	54167m	520.583	ng/mL	
80)	BBF-D12 Surr BKGD	46.645	256	3588M6	34.483	ng/mL	
81)	C3-Chrysenes	47.729	270	72854M5	700.178	ng/mL	
82)	C4-Chrysenes	49.130	284	47325M5	454.826	ng/mL	
84)	Benzo[b]fluoranthene	46.735	252	4119M3	35.063	ng/mL	
85)	Benzo[j]+[k]fluoranthene	46.795	252	1239M3	10.251	ng/mL	
87)	Benzo[e]pyrene	47.699	252	6166M3	53.755	ng/mL	
89)	Benzo[a]pyrene	47.895	252	3378M3	30.777	ng/mL	
90)	Perylene	48.196	252	7151	61.614	ng/mL#	74
91)	Indeno[1,2,3-cd]pyrene	52.563	276	2214M3	17.140	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.594	278	1098M3	7.983	ng/mL	
93)	Benzo[g,h,i]perylene	53.813	276	5879	42.211	ng/mL#	86
94)	Hopane (T19)	51.645	191	48000M3	1232.316	ng/mL	
96)	C23 Tricyclic Terpane (T4	40.351	191	19756	507.201	ng/ml	100
97)	C24 Tricyclic Terpane (T5	41.089	191	10718	275.166	ng/ml	100
98)	C25 Tricyclic Terpane (T6	42.579	191	9782M3	251.136	ng/ml	
99)	C24 Tetracyclic Terpane (	43.889	191	3461M3	88.855	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	3617M3	92.860	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.739	191	3620M3	92.937	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.057	191	3973M3	102.000	ng/ml	

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
103)	C28 Tricyclic Terpane-22R	46.208	191	4617M3	118.533	ng/ml	
104)	C29 Tricyclic Terpane-22S	46.735	191	5151	132.243	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.931	191	5229M3	134.245	ng/ml	
106)	18a-22,29,30-Trisnorneoho	47.985	191	5523	141.793	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.106	191	4143M3	106.364	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.347	191	4289M3	110.113	ng/mL	
109)	17a(H)-22,29,30-Trisnorho	48.512	191	12637	324.433	ng/ml	100
110)	17a/b,21b/a 28,30-Bisnorh	49.687	191	8237M3	211.471	ng/ml	
111)	17a(H),21b(H)-25-Norhopan	49.506	191	2402	61.667	ng/ml	100
112)	30-Norhopane (T15)	50.320	191	35007M3	898.744	ng/ml	
113)	18a(H)-30-Norneohopane-C2	50.425	191	5508M3	141.408	ng/ml	
114)	17a(H)-Diahopane (X)	50.561	191	1793M3	46.032	ng/ml	
115)	30-Normoretane (T17)	51.088	191	3674	94.324	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	51.479	191	401M3	10.295	ng/ml	
117)	Moretane (T20)	52.308	191	3900M3	100.126	ng/ml	
118)	30-Homohopane-22S (T21)	53.377	191	21315	547.225	ng/ml	100
119)	30-Homohopane-22R (T22)	53.603	191	17506	449.436	ng/ml	100
120)	Gammacerane/C32-diahopane	54.115	191	8063	207.003	ng/mL	100
121)	30,31-Bishomohopane-22S (	54.882	191	14103	362.070	ng/ml	100
122)	30,31-Bishomohopane-22R (	55.259	191	10222	262.432	ng/ml	100
123)	30,31-Trishomohopane-22S	56.945	191	11269	289.312	ng/ml	100
124)	30,31-Trishomohopane-22R	57.533	191	7735	198.583	ng/ml	100
125)	Tetrakishomohopane-22S (T	59.475	191	7464	191.625	ng/ml	100
126)	Tetrakishomohopane-22R (T	60.349	191	5563	142.820	ng/ml	100
127)	Pentakishomohopane-22S (T	62.517	191	9828	252.317	ng/ml	100
128)	Pentakishomohopane-22R (T	63.752	191	6771M3	173.834	ng/ml	
130)	13b(H),17a(H)-20S-Diachol	44.868	217	4167	203.712	ng/ml	100
131)	13b(H),17a(H)-20R-Diachol	45.289	217	1740M3	85.063	ng/ml	
132)	13b,17a-20S-Methyldiachol	45.997	217	1973M3	96.454	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	46.856	217	6392	312.486	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	47.368	217	7357	359.662	ng/ml	100
135)	Unknown Sterane (S18)	47.639	217	1488	72.744	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	47.895	217	613	29.968	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.045	217	2720	132.973	ng/ml	100
138)	14a,17a-20R-Methylcholest	48.738	217	2868M3	140.208	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.085	217	5917M3	289.264	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	49.973	217	5030M3	245.902	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	46.946	218	5183M3	253.381	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.036	218	4969M3	242.919	ng/ml	
143)	14b,17b-20R-Methylcholest	48.211	218	4326	211.485	ng/ml	100
144)	14b,17b-20S-Methylcholest	48.286	218	5806M3	283.838	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	49.326	218	7623M3	372.666	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	49.356	218	5312M3	259.688	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.039	231	23942	1170.452	ng/mL	100
148)	C28,20S-triaromatic stero	49.883	231	20094M3	982.335	ng/mL	
149)	C27,20R-triaromatic stero	50.304	231	15473	756.428	ng/mL	100
150)	C28,20R-triaromatic stero	51.479	231	17191M3	840.416	ng/mL	

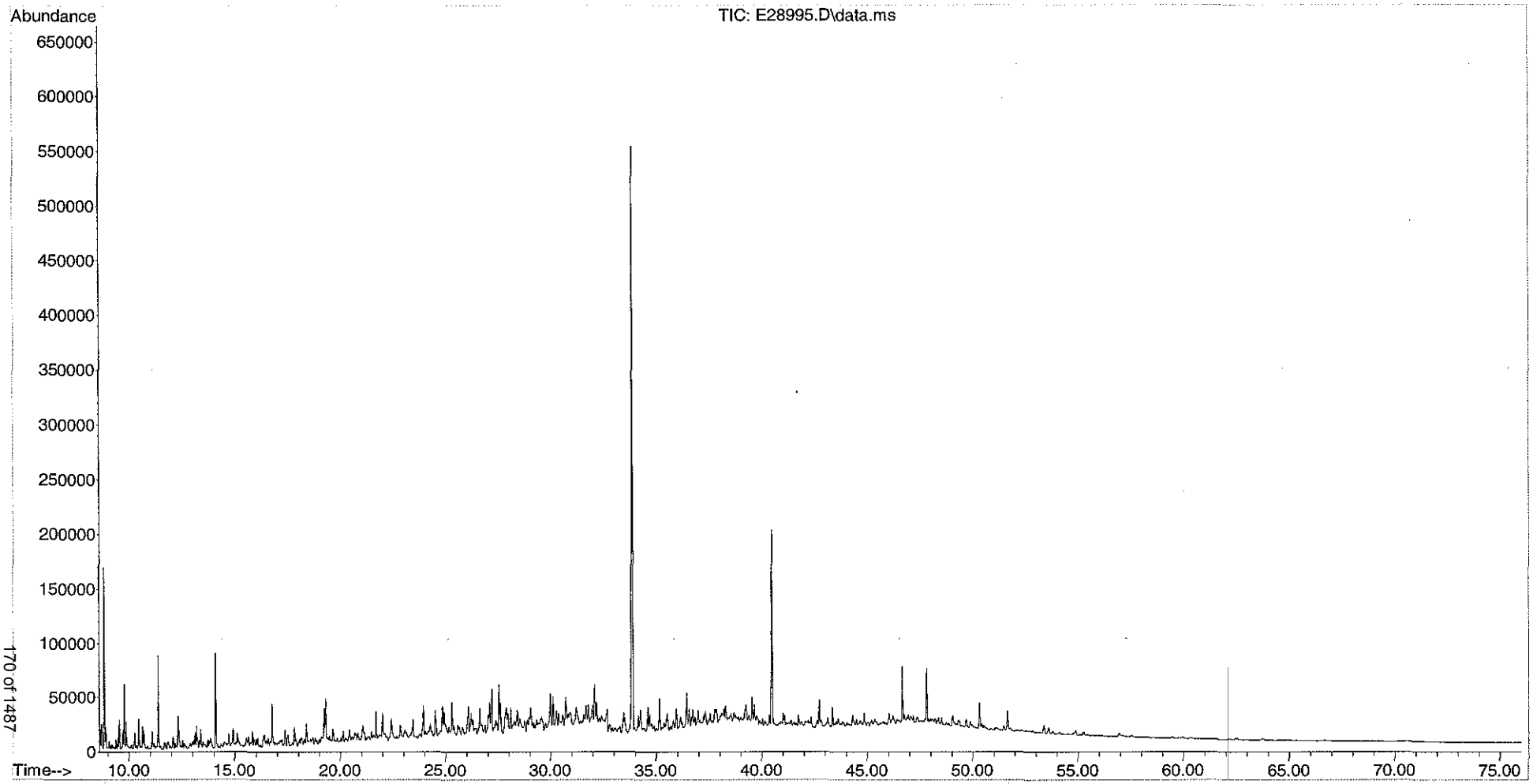
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alaska North Slope Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result	
cis/trans-Decalin	**468**	
C1-Decalins	**763**	
C2-Decalins	**716**	
C3-Decalins	**410**	
C4-Decalins	**436**	
Benzothiophene	**5.40**	
C1-Benzo(b)thiophenes	**31.6**	
C2-Benzo(b)thiophenes	**55.4**	
C3-Benzo(b)thiophenes	**120**	
C4-Benzo(b)thiophenes	**105**	
Naphthalene	**584**	
C1-Naphthalenes	**1240**	
C2-Naphthalenes	**1550**	
C3-Naphthalenes	**1180**	
C4-Naphthalenes	**692**	
Biphenyl	**143**	
Dibenzofuran	**54.1**	
Acenaphthylene	**6.98**	
Acenaphthene	**14.1**	
Fluorene	**77.9**	
C1-Fluorenes	**177**	
C2-Fluorenes	**299**	
C3-Fluorenes	**297**	
Anthracene	1.97	U
Phenanthrene	**224**	
C1-Phenanthrenes/Anthracenes	**502**	
C2-Phenanthrenes/Anthracenes	**572**	
C3-Phenanthrenes/Anthracenes	**419**	
C4-Phenanthrenes/Anthracenes	**169**	
Retene	1.97	U
Dibenzothiophene	**146**	
C1-Dibenzothiophenes	**324**	
C2-Dibenzothiophenes	**465**	

Parameter	Result	
C3-Dibenzothiophenes	**428**	
C4-Dibenzothiophenes	**235**	
Benzo(b)fluorene	**7.59**	
Fluoranthene	**4.40**	
Pyrene	**14.9**	
C1-Fluoranthenes/Pyrenes	**73.8**	
C2-Fluoranthenes/Pyrenes	**122**	
C3-Fluoranthenes/Pyrenes	**151**	
C4-Fluoranthenes/Pyrenes	**137**	
Naphthobenzothiophenes	**46.1**	
C1-Naphthobenzothiophenes	**129**	
C2-Naphthobenzothiophenes	**184**	
C3-Naphthobenzothiophenes	**141**	
C4-Naphthobenzothiophenes	**99.8**	
Benz[a]anthracene	**2.08**	
Chrysene/Triphenylene	**39.8**	
C1-Chrysenes	**71.6**	
C2-Chrysenes	**102**	
C3-Chrysenes	**125**	
C4-Chrysenes	**78.4**	
Benzo[b]fluoranthene	**5.45**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	1.97	U
Benzo[a]fluoranthene	1.97	U
Benzo[e]pyrene	**9.85**	
Benzo[a]pyrene	**1.84**	J
Perylene	**3.44**	
Indeno[1,2,3-cd]pyrene	**0.904**	J
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**0.885**	J
Benzo[g,h,i]perylene	**3.62**	

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Alaska North Slope Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result
Carbazole	7.12

N/A - Not Applicable

Form I
Alaska North Slope Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**155**
2/3-Methyldibenzothiophene	**115**
1-Methyldibenzothiophene	**50.6**
3-Methylphenanthrene	**105**
2-Methylphenanthrene	**112**
2-Methylanthracene	**3.96**
9/4-Methylphenanthrene	**163**
1-Methylphenanthrene	**112**
2-Methylnaphthalene	**1150**
1-Methylnaphthalene	**823**
2,6-Dimethylnaphthalene	**661**
2,3,5-Trimethylnaphthalene	**135**
Naphthobenzothiophene-2,1-D	**34.1**
Naphthobenzothiophene-1,2-D	**7.95**
Naphthobenzothiophene-2,3-D	**4.00**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS111612ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/14/12	100	0.05076	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	**59.2**
C24 Tricyclic Terpane	**38.1**
C25 Tricyclic Terpane	**35.3**
C24 Tetracyclic Terpane	**11.8**
C26 Tricyclic Terpane-22S	**13.8**
C26 Tricyclic Terpane-22R	**12.7**
C28 Tricyclic Terpane-22S	**13.1**
C28 Tricyclic Terpane-22R	**14.4**
C29 Tricyclic Terpane-22S	**18.2**
C29 Tricyclic Terpane-22R	**20.8**
18a-22,29,30-Trisnorneohopane-TS	**28.6**
C30 Tricyclic Terpane-22S	**17.3**
C30 Tricyclic Terpane-22R	**14.3**
17a(H)-22,29,30-Trisnorhopane-TM	**31.6**
17a/b,21b/a 28,30-Bisnorhopane	**7.27**
17a(H),21b(H)-25-Norhopane	**7.55**
30-Norhopane	**91.6**
18a(H)-30-Norneohopane-C29Ts	**22.9**
17a(H)-Diahopane	**12.9**
30-Normoretane	**10.1**
18a(H)&18b(H)-Oleananes	1.97 U
Hopane	**158**
Moretane	**14.4**
30-Homohopane-22S	**66.0**
30-Homohopane-22R	**57.0**
T22a-Gammacerane/C32-diahopane	**11.7**
30,31-Bishomohopane-22S	**49.3**
30,31-Bishomohopane-22R	**35.0**

Parameter	Result
30,31-Trishomohopane-22S	**37.0**
30,31-Trishomohopane-22R	**25.7**
Tetrakishomohopane-22S	**29.1**
Tetrakishomohopane-22R	**19.4**
Pentakishomohopane-22S	**31.3**
Pentakishomohopane-22R	**23.8**
13b(H),17a(H)-20S-Diacholestane	**52.8**
13b(H),17a(H)-20R-Diacholestane	**26.4**
13b,17a-20S-Methyldiacholestane	**28.9**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**66.9**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**74.1**
Unknown Sterane (S18)	**19.7**
13a,17b-20S-Ethyldiacholestane	**3.23**
14a,17a-20S-Methylcholestane	**33.4**
14a,17a-20R-Methylcholestane	**34.1**
14a(H),17a(H)-20S-Ethylcholestane	**51.1**
14a(H),17a(H)-20R-Ethylcholestane	**44.1**
14b(H),17b(H)-20R-Cholestane	**44.8**
14b(H),17b(H)-20S-Cholestane	**42.4**
14b,17b-20R-Methylcholestane	**49.2**
14b,17b-20S-Methylcholestane	**55.2**
14b(H),17b(H)-20R-Ethylcholestane	**64.6**
14b(H),17b(H)-20S-Ethylcholestane	**40.5**
C26,20R- +C27,20S- triaromatic steroid	**246**
C28,20S-triaromatic steroid	**158**
C27,20R-triaromatic steroid	**148**
C28,20R-triaromatic steroid	**126**

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Rerun 11/19/12

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24994M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	55363	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	80738	918.373	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 91.84%			
42) Phenanthrene-d10	32.085	188	87554	972.058	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.21%			
83) Benzo[b]fluoranthene-d12	46.645	264	115728	1017.579	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.76%			
88) Benzo[a]pyrene-d12	47.789	264	115547	1048.556	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.86%			
129) 5B(H)Cholane - Surr	43.347	217	23525	1078.150	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.82%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	44708	2236.194	ng/mL	100
4) cis-Decalin	17.091	138	2137	140.688	ng/mL	100
5) C1-Decalins	17.814	152	77413M5	3872.025	ng/mL	
6) C2-Decalins	19.154	166	72612m	3631.890	ng/mL	
7) C3-Decalins	21.623	180	41578m	2079.639	ng/mL	
8) C4-Decalins	25.010	194	44247M5	2213.136	ng/mL	
10) Naphthalene	19.304	128	291700	2967.006	ng/mL#	100
11) C1-Naphthalenes	21.999	142	619164M5	6297.783	ng/mL	
12) C2-Naphthalenes	24.844	156	774255m	7875.280	ng/mL	
13) C3-Naphthalenes	27.193	170	588218m	5983.018	ng/mL	
14) C4-Naphthalenes	29.963	184	345196M5	3511.137	ng/mL	
16) 2-Methylnaphthalene	21.999	142	364688	5824.053	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	254143	4176.935	ng/mL#	100
18) Benzothiophene	19.530	134	2230M3	27.437	ng/mL	
19) C1-Benzo(b)thiophenes	21.577	148	13032m	160.343	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	22864m	281.314	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49308m	606.675	ng/mL	
22) C4-Benzo(b)thiophenes	28.773	190	43322M5	533.025	ng/mL	
23) Biphenyl	23.881	154	57406M3	725.388	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	189324	3354.362	ng/mL#	100
25) Dibenzofuran	26.967	168	24057	274.576	ng/mL#	84
26) Acenaphthylene	25.597	152	3471M3	35.411	ng/mL	
27) Acenaphthene	26.320	153	4522M3	71.671	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	36242M3	686.324	ng/mL	
29) Fluorene	28.352	166	27831M3	395.497	ng/mL	
30) C1-Fluorenes	30.730	180	63133M5	897.162	ng/mL	
31) C2-Fluorenes	32.928	194	106713M5	1516.464	ng/mL	
32) C3-Fluorenes	34.780	208	106052M5	1507.070	ng/mL	
33) Dibenzothiophene	31.679	184	71705	742.544	ng/mL#	88
34) 4-Methyldibenzothiophene(	33.455	198	76022	787.248	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	56514	585.233	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.223	198	24786	256.672	ng/mL#	100
37) OTP	33.877	198	7808M3	80.856	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	166611m	1725.346	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	158803m	1644.490	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	227794M5	2358.928	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	209778m	2172.363	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
41) C4-Dibenzothiophenes	38.665	240	115055M5	1191.456	ng/mL	
43) Phenanthrene	32.176	178	111573	1135.648	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.148	192	52275	532.082	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.253	192	55603	565.956	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1976	20.113	ng/mL	92
47) 9/4-Methylphenanthrene(9M	34.600	192	81325	827.768	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	55944M3	569.427	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	250470M5	2549.415	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	284998M5	2900.859	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	284998m	2900.859	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.273	220	209062M5	2127.943	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	84348M5	858.538	ng/mL	
56) Carbazole	33.034	167	3161M2	36.168	ng/mL	
57) 1-Methylphenanthrene	34.690	192	54755M3	730.518	ng/mL	
58) Fluoranthene	36.963	202	2424M3	22.341	ng/mL	
59) Benzo(b)fluorene	39.508	216	2784M3	38.507	ng/mL	
60) Pyrene	37.852	202	8320M3	75.445	ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.252	216	41317m	374.659	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.074	230	68144M5	617.924	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	84441M5	765.704	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.461	258	76445M5	693.197	ng/mL	
66) Naphthobenzothiophene	41.721	234	18944M3	174.170	ng/ml	
67) Naphthobenzothiophene-2,1	41.721	234	18844M3	173.251	ng/mL	
68) Naphthobenzothiophene-1,2	42.067	234	4387M6	40.334	ng/mL	
69) Naphthobenzothiophene-2,3	42.369	234	2206M3	20.282	ng/mL	
70) C1-Naphthobenzothiophenes	43.121	248	71342M5	655.915	ng/ml	
71) C2-Naphthobenzothiophenes	45.139	262	101492M5	933.113	ng/ml	
72) C3-Naphthobenzothiophenes	46.750	276	77926M5	716.448	ng/ml	
73) C4-Naphthobenzothiophenes	47.805	290	55098M5	506.569	ng/mL	
75) Benz[a]anthracene	42.655	228	1139M3	10.565	ng/mL	
77) Chrysene/Triphenylene	42.790	228	22405M3	201.863	ng/mL	
78) C1-Chrysenes	44.296	242	40335M5	363.407	ng/mL	
79) C2-Chrysenes	47.006	256	61351M5	552.755	ng/mL	
79) C2-Chrysenes BS	47.006	256	57619m	519.131	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3732	33.624	ng/mL	100
81) C3-Chrysenes	49.024	270	70695M5	636.942	ng/mL	
82) C4-Chrysenes	49.130	284	44151M5	397.788	ng/mL	
84) Benzo[b]fluoranthene	46.720	252	3466M3	27.659	ng/mL	
87) Benzo[e]pyrene	47.699	252	6116M3	49.985	ng/mL	
89) Benzo[a]pyrene	47.880	252	1096M3	9.361	ng/mL	
90) Perylene	48.181	252	2160M3	17.447	ng/mL	
91) Indeno[1,2,3-cd]pyrene	52.549	276	632M3	4.587	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	659M3	4.492	ng/mL	
93) Benzo[g,h,i]perylene	53.798	276	2734	18.402	ng/mL#	77
94) Hopane (T19)	51.645	191	33249	800.231	ng/mL#	84
96) C23 Tricyclic Terpane (T4	40.351	191	12477M2	300.294	ng/ml	
97) C24 Tricyclic Terpane (T5	41.089	191	8030M3	193.265	ng/ml	
98) C25 Tricyclic Terpane (T6	42.579	191	7444M3	179.161	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	2483M3	59.760	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	2905M3	69.917	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	2670M3	64.261	ng/ml	
102) C28 Tricyclic Terpane-22S	46.043	191	2772M3	66.716	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	3041M3	73.190	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	3836	92.324	ng/ml	100

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
105)	C29 Tricyclic Terpane-22R	46.931	191	4396M3	105.802	ng/ml	
106)	18a-22,29,30-Trisnorneoho	47.985	191	6025	145.009	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.106	191	3655M3	87.968	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.347	191	3018M3	72.637	ng/mL	
109)	17a(H)-22,29,30-Trisnorho	48.512	191	6658M3	160.244	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	49.672	191	1533	36.896	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	49.506	191	1593M4	38.340	ng/ml	
112)	30-Norhopane (T15)	50.320	191	19328	465.183	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	50.425	191	4835	116.368	ng/ml	100
114)	17a(H)-Diahopane (X)	50.546	191	2730M3	65.705	ng/ml	
115)	30-Normoretane (T17)	51.073	191	2128	51.216	ng/ml	100
117)	Moretane (T20)	52.308	191	3031M3	72.950	ng/ml	
118)	30-Homohopane-22S (T21)	53.362	191	13928	335.217	ng/ml	100
119)	30-Homohopane-22R (T22)	53.588	191	12032	289.584	ng/ml	100
120)	Gammacerane/C32-diahopane	54.115	191	2467M3	59.375	ng/mL	
121)	30,31-Bishomohopane-22S (	54.868	191	10409	250.522	ng/ml	100
122)	30,31-Bishomohopane-22R (	55.244	191	7380	177.621	ng/ml	100
123)	30,31-Trishomohopane-22S	56.931	191	7813	188.042	ng/ml	100
124)	30,31-Trishomohopane-22R	57.518	191	5411	130.231	ng/ml	100
125)	Tetrakishomohopane-22S (T	59.460	191	6144	147.873	ng/ml	100
126)	Tetrakishomohopane-22R (T	60.334	191	4086	98.341	ng/ml	100
127)	Pentakishomohopane-22S (T	62.502	191	6600	158.848	ng/ml	100
128)	Pentakishomohopane-22R (T	63.737	191	5017	120.748	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	44.868	217	5848M3	268.014	ng/ml	
131)	13b(H),17a(H)-20R-Diachol	45.290	217	2922M3	133.915	ng/ml	
132)	13b,17a-20S-Methyldiachol	45.997	217	3198M3	146.564	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	46.856	217	7405	339.371	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	47.368	217	8209M3	376.218	ng/ml	
135)	Unknown Sterane (S18)	47.639	217	2180	99.909	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	47.895	217	358	16.407	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.046	217	3700M3	169.571	ng/ml	
138)	14a,17a-20R-Methylcholest	48.738	217	3776M3	173.054	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.085	217	5663M3	259.535	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	49.958	217	4884M3	223.834	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	46.946	218	4962M3	227.408	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.036	218	4692M3	215.034	ng/ml	
143)	14b,17b-20R-Methylcholest	48.211	218	5446	249.590	ng/ml	100
144)	14b,17b-20S-Methylcholest	48.286	218	6112M3	280.113	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	49.311	218	7154M3	327.867	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	49.356	218	4482M3	205.410	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.040	231	27203	1246.712	ng/mL	100
148)	C28,20S-triaromatic stero	49.868	231	17445	799.504	ng/mL	100
149)	C27,20R-triaromatic stero	50.305	231	16412	752.161	ng/mL	100
150)	C28,20R-triaromatic stero	51.464	231	13961M3	639.832	ng/mL	

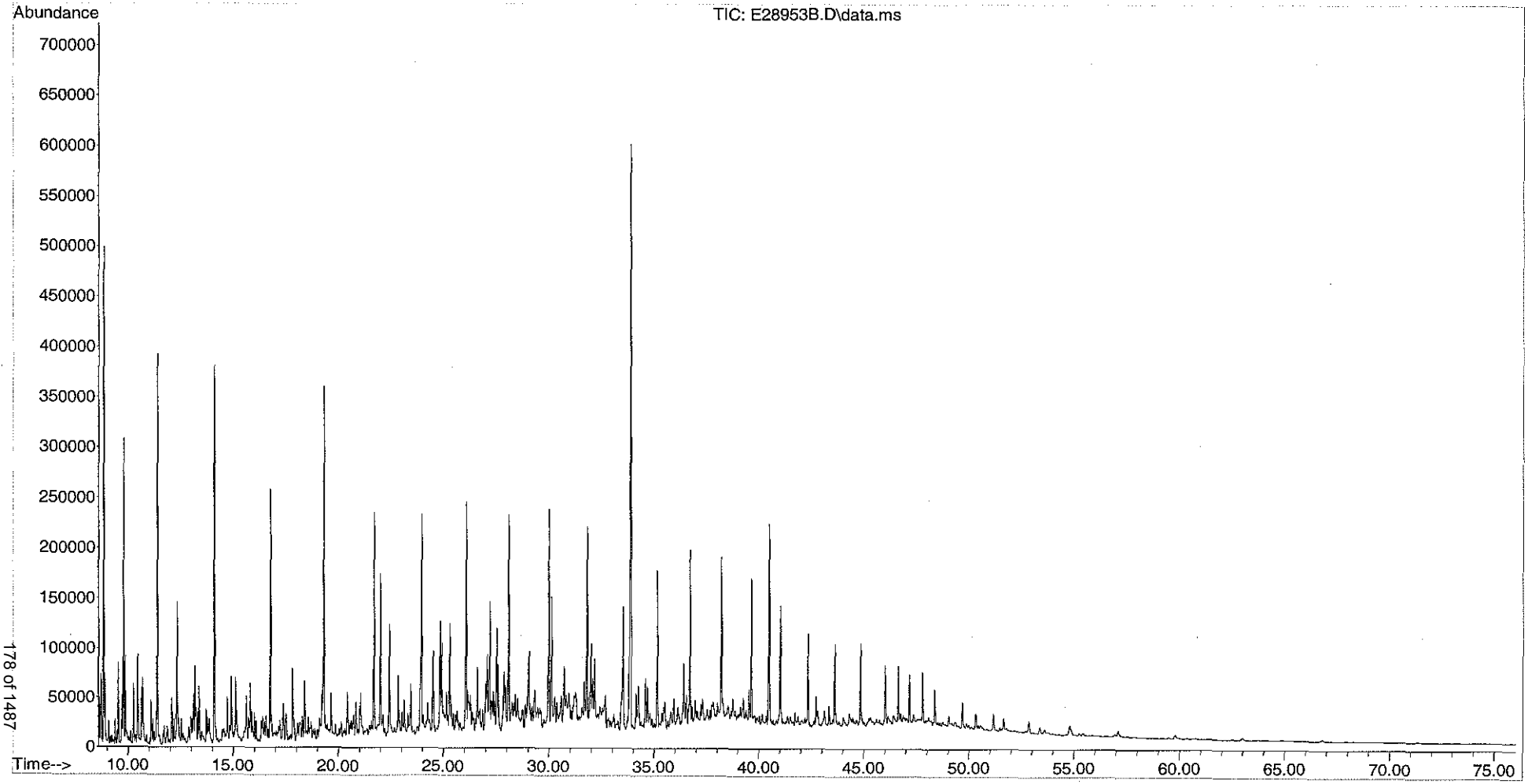
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES



Form I
Alaska North Slope Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	**396**		C3-Dibenzothiophenes	**410**	
C1-Decalins	**722**		C4-Dibenzothiophenes	**232**	
C2-Decalins	**695**		Benzo(b)fluorene	**7.52**	
C3-Decalins	**381**		Fluoranthene	**4.04**	
C4-Decalins	**435**		Pyrene	**14.9**	
Benzothiophene	**5.58**		C1-Fluoranthenes/Pyrenes	**72.9**	
C1-Benzo(b)thiophenes	**30.8**		C2-Fluoranthenes/Pyrenes	**118**	
C2-Benzo(b)thiophenes	**51.5**		C3-Fluoranthenes/Pyrenes	**146**	
C3-Benzo(b)thiophenes	**108**		C4-Fluoranthenes/Pyrenes	**133**	
C4-Benzo(b)thiophenes	**101**		Naphthobenzothiophenes	**44.2**	
Naphthalene	**518**		C1-Naphthobenzothiophenes	**123**	
C1-Naphthalenes	**1140**		C2-Naphthobenzothiophenes	**178**	
C2-Naphthalenes	**1460**		C3-Naphthobenzothiophenes	**146**	
C3-Naphthalenes	**1150**		C4-Naphthobenzothiophenes	**110**	
C4-Naphthalenes	**671**		Benz[a]anthracene	**2.20**	
Biphenyl	**135**		Chrysene/Triphenylene	**37.8**	
Dibenzofuran	**50.5**		C1-Chrysenes	**70.2**	
Acenaphthylene	**7.13**		C2-Chrysenes	**95.1**	
Acenaphthene	**18.0**		C3-Chrysenes	**115**	
Fluorene	**71.6**		C4-Chrysenes	**74.1**	
C1-Fluorenes	**176**		Benzo[b]fluoranthene	**5.18**	
C2-Fluorenes	**288**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**0.440**	J
C3-Fluorenes	**281**		Benzo[a]fluoranthene	1.97	U
Anthracene	1.97	U	Benzo[e]pyrene	**9.71**	
Phenanthrene	**208**		Benzo[a]pyrene	**1.66**	J
C1-Phenanthrenes/Anthracenes	**470**		Perylene	**2.96**	
C2-Phenanthrenes/Anthracenes	**543**		Indeno[1,2,3-cd]pyrene	**0.816**	J
C3-Phenanthrenes/Anthracenes	**399**		Dibenz[ah]anthracene/Dibenz[ac]anthracene	**1.14**	J
C4-Phenanthrenes/Anthracenes	**164**		Benzo[g,h,i]perylene	**3.15**	
Retene	1.97	U			
Dibenzothiophene	**138**				
C1-Dibenzothiophenes	**300**				
C2-Dibenzothiophenes	**437**				

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Form I
Alaska North Slope Crude
Carbazole

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result
Carbazole	**7.94**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**142**
2/3-Methyldibenzothiophene	**103**
1-Methyldibenzothiophene	**47.2**
3-Methylphenanthrene	**99.6**
2-Methylphenanthrene	**108**
2-Methylanthracene	**2.41**
9/4-Methylphenanthrene	**152**
1-Methylphenanthrene	**107**
2-Methylnaphthalene	**1050**
1-Methylnaphthalene	**758**
2,6-Dimethylnaphthalene	**624**
2,3,5-Trimethylnaphthalene	**164**
Naphthobenzothiophene-2,1-D	**32.8**
Naphthobenzothiophene-1,2-D	**7.89**
Naphthobenzothiophene-2,3-D	**3.51**

N/A - Not Applicable

Form I
Alaska North Slope Crude
Steranes and Triterpanes

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110512ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/30/12	100	0.05076	10	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**57.6**	
C24 Tricyclic Terpane	**35.7**	
C25 Tricyclic Terpane	**35.3**	
C24 Tetracyclic Terpane	**12.3**	
C26 Tricyclic Terpane-22S	**14.4**	
C26 Tricyclic Terpane-22R	**13.0**	
C28 Tricyclic Terpane-22S	**14.5**	
C28 Tricyclic Terpane-22R	**15.8**	
C29 Tricyclic Terpane-22S	**17.9**	
C29 Tricyclic Terpane-22R	**18.1**	
18a-22,29,30-Trisnorneohopane-TS	**26.7**	
C30 Tricyclic Terpane-22S	**14.4**	
C30 Tricyclic Terpane-22R	**14.9**	
17a(H)-22,29,30-Trisnorhopane-TM	**31.6**	
17a/b,21b/a 28,30-Bisnorhopane	**7.02**	
17a(H),21b(H)-25-Norhopane	**7.91**	
30-Norhopane	**87.9**	
18a(H)-30-Norneohopane-C29Ts	**23.1**	
17a(H)-Diahopane	**13.7**	
30-Normoretane	**9.85**	
18a(H)&18b(H)-Oleananes	1.97	U
Hopane	**152**	
Moretane	**14.9**	
30-Homohopane-22S	**64.1**	
30-Homohopane-22R	**54.1**	
T22a-Gammacerane/C32-diahopane	**11.2**	
30,31-Bishomohopane-22S	**46.1**	
30,31-Bishomohopane-22R	**33.5**	

Parameter	Result
30,31-Trishomohopane-22S	**37.0**
30,31-Trishomohopane-22R	**24.5**
Tetrakishomohopane-22S	**26.9**
Tetrakishomohopane-22R	**19.7**
Pentakishomohopane-22S	**27.6**
Pentakishomohopane-22R	**24.7**
13b(H),17a(H)-20S-Diacholestane	**50.7**
13b(H),17a(H)-20R-Diacholestane	**26.4**
13b,17a-20S-Methyldiacholestane	**20.8**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**61.2**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**70.9**
Unknown Sterane (S18)	**19.5**
13a,17b-20S-Ethyldiacholestane	**4.77**
14a,17a-20S-Methylcholestane	**32.0**
14a,17a-20R-Methylcholestane	**34.6**
14a(H),17a(H)-20S-Ethylcholestane	**43.0**
14a(H),17a(H)-20R-Ethylcholestane	**41.2**
14b(H),17b(H)-20R-Cholestane	**39.8**
14b(H),17b(H)-20S-Cholestane	**39.7**
14b,17b-20R-Methylcholestane	**45.2**
14b,17b-20S-Methylcholestane	**55.6**
14b(H),17b(H)-20R-Ethylcholestane	**62.5**
14b(H),17b(H)-20S-Ethylcholestane	**41.0**
C26,20R- +C27,20S- triaromatic steroid	**228**
C28,20S-triaromatic steroid	**149**
C27,20R-triaromatic steroid	**140**
C28,20R-triaromatic steroid	**119**

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

11/05/12

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

JJK (11/08/12)

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.591	164	47144M3	500.000	ng/mL	0.01
74) Chrysene-d12	43.091	240	105852	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	140871	849.517	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 84.95%			
42) Phenanthrene-d10	32.462	188	163907	964.768	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.48%			
83) Benzo[b]fluoranthene-d12	47.006	264	220790	1015.382	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.54%			
88) Benzo[a]pyrene-d12	48.181	264	210972	1001.332	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 100.13%			
129) 5B(H)Cholane - Surr	43.724	217	46433	1113.004	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.30%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	71200	1888.050	ng/mL	100
4) cis-Decalin	17.483	138	3514	122.649	ng/mL	100
5) C1-Decalins	18.205	152	138309M5	3667.617	ng/mL	
6) C2-Decalins	19.530	166	133037M5	3527.817	ng/mL	
7) C3-Decalins	22.014	180	72889M5	1932.839	ng/mL	
8) C4-Decalins	25.401	194	83324M5	2209.549	ng/mL	
10) Naphthalene	19.681	128	487082	2626.597	ng/mL#	100
11) C1-Naphthalenes	22.390	142	1071394M5	5777.508	ng/mL	
12) C2-Naphthalenes	25.236	156	1371191M5	7394.168	ng/mL	
13) C3-Naphthalenes	27.569	170	1083568M5	5843.156	ng/mL	
14) C4-Naphthalenes	30.339	184	632028M5	3408.220	ng/mL	
16) 2-Methylnaphthalene	22.390	142	627593	5313.630	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	441379	3845.923	ng/mL#	100
18) Benzothiophene	19.906	134	4341M3	28.316	ng/mL	
19) C1-Benzo(b)thiophenes	21.954	148	23978M5	156.409	ng/mL	
20) C2-Benzo(b)thiophenes	25.431	162	40049M5	261.240	ng/mL	
21) C3-Benzo(b)thiophenes	27.404	176	84299M5	549.883	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	78691M5	513.302	ng/mL	
23) Biphenyl	24.272	154	102541	686.942	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.890	156	337170	3167.106	ng/mL#	100
25) Dibenzofuran	27.358	168	42393	256.522	ng/mL	89

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
26) Acenaphthylene	25.973	152	6691M3	36.190 ng/mL	
27) Acenaphthene	26.741	153	10860M3	91.253 ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.277	170	83122M3	834.531 ng/mL	
29) Fluorene	28.728	166	48225M3	363.326 ng/mL	
30) C1-Fluorenes	31.107	180	118539M5	893.069 ng/mL	
31) C2-Fluorenes	33.305	194	193676M5	1459.150 ng/mL	
32) C3-Fluorenes	35.142	208	189287M5	1426.083 ng/mL	
33) Dibenzothiophene	32.055	184	127296	698.870 ng/mL#	71
34) 4-Methyldibenzothiophe...	33.832	198	131601	722.505 ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.193	198	95587	524.784 ng/mL#	100
36) 1-Methyldibenzothiophe...	34.615	198	43667	239.737 ng/mL#	100
37) OTP	34.283	198	18036	99.020 ng/mL#	100
38) C1-Dibenzothiophenes	33.832	198	294951M5	1619.316 ng/mL	
39) C2-Dibenzothiophenes	35.533	212	404348M5	2219.919 ng/mL	
40) C3-Dibenzothiophenes	37.340	226	379093M5	2081.266 ng/mL	
41) C4-Dibenzothiophenes	39.041	240	214446M5	1177.334 ng/mL	
43) Phenanthrene	32.552	178	195639	1055.722 ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.524	192	93705	505.658 ng/mL	98
45) 2-Methylphenanthrene(2MP)	34.645	192	101546	547.970 ng/mL	97
46) 2-Methylanthracene(2MA)	34.795	192	2266M3	12.228 ng/mL	
47) 9/4-Methylphenanthrene...	34.976	192	143377	773.702 ng/mL	97
48) 1-Methylphenanthrene(1MP)	35.066	192	100277M3	541.122 ng/mL	
49) C1-Phenanthrenes/Anthr...	34.976	192	441690M5	2383.481 ng/mL	
50) C2-Phenanthrenes/Anthr...	36.798	206	510520M5	2754.907 ng/mL	
52) C3-Phenanthrenes/Anthr...	38.650	220	375728M5	2027.532 ng/mL	
53) C4-Phenanthrenes/Anthr...	40.833	234	154244M5	832.343 ng/mL	
56) Carbazole	33.410	167	6647M3	40.322 ng/mL	
57) 1-Methylphenanthrene	35.066	192	100650M3	711.918 ng/mL	
58) Fluoranthene	37.340	202	4201M3	20.528 ng/mL	
59) Benzo(b)fluorene	39.869	216	5205M3	38.168 ng/mL	
60) Pyrene	38.228	202	15722M3	75.583 ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.628	216	77003M5	370.190 ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.435	230	124873M5	600.323 ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.468	244	153640M5	738.620 ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.823	258	140363M5	674.791 ng/mL	
66) Naphthobenzothiophene	42.098	234	34132	166.369 ng/ml#	72
67) Naphthobenzothiophene-...	42.098	234	34132	166.369 ng/mL#	72
68) Naphthobenzothiophene-...	42.429	234	8220	40.067 ng/mL#	5
69) Naphthobenzothiophene-...	42.730	234	3653M3	17.806 ng/mL	
70) C1-Naphthobenzothiophenes	43.498	248	127630M5	622.106 ng/ml	
71) C2-Naphthobenzothiophenes	45.515	262	185905M5	906.156 ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
72)	C3-Naphthobenzothiophenes	47.112	276	152145M5	741.600	ng/ml	
73)	C4-Naphthobenzothiophenes	48.196	290	114807M5	559.603	ng/mL	
75)	Benz[a]anthracene	43.016	228	2301M3	11.163	ng/mL	
76)	Chrysene	43.151	228	39715M3	187.149	ng/mL	
77)	Chrysene/Triphenylene	43.151	228	40725M3	191.908	ng/mL	
78)	C1-Chrysenes	44.672	242	75676M5	356.607	ng/mL	
79)	C2-Chrysenes	46.750	256	109371M5	515.388	ng/mL	
80)	BBF-D12 Surr BKGD	47.006	256	6935	32.680	ng/mL	100
81)	C3-Chrysenes	49.446	270	124142M5	584.993	ng/mL	
82)	C4-Chrysenes	49.567	284	79808M5	376.078	ng/mL	
84)	Benzo[b]fluoranthene	47.082	252	6298M3	26.287	ng/mL	
85)	Benzo[j]+[k]fluoranthene	47.142	252	550M3	2.231	ng/mL	
87)	Benzo[e]pyrene	48.076	252	11528	49.278	ng/mL	91
89)	Benzo[a]pyrene	48.271	252	1881M3	8.403	ng/mL	
90)	Perylene	48.588	252	3561M3	15.044	ng/mL	
91)	Indeno[1,2,3-cd]pyrene	53.076	276	1091M3	4.141	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.106	278	1624M3	5.789	ng/mL	
93)	Benzo[g,h,i]perylene	54.340	276	4537	15.972	ng/mL#	68
94)	Hopane (T19)	52.202	191	61269	771.256	ng/mL#	90
95)	17a(H),21B(H)-hopane -...	52.202	191	61269	771.256	ng/mL#	90
96)	C23 Tricyclic Terpane ...	40.743	191	23215	292.231	ng/ml	100
97)	C24 Tricyclic Terpane ...	41.480	191	14405M3	181.331	ng/ml	
98)	C25 Tricyclic Terpane ...	42.971	191	14231M3	179.140	ng/ml	
99)	C24 Tetracyclic Terpan...	44.281	191	4971M3	62.575	ng/ml	
100)	C26 Tricyclic Terpane-...	44.025	191	5793M3	72.922	ng/ml	
101)	C26 Tricyclic Terpane-...	44.130	191	5231	65.848	ng/ml	100
102)	C28 Tricyclic Terpane-...	46.419	191	5851M3	73.653	ng/ml	
103)	C28 Tricyclic Terpane-...	46.585	191	6386M3	80.387	ng/ml	
104)	C29 Tricyclic Terpane-...	47.112	191	7224	90.936	ng/ml	100
105)	C29 Tricyclic Terpane-...	47.307	191	7284M3	91.691	ng/ml	
106)	18a-22,29,30-Trisnorne...	48.422	191	10760	135.447	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.527	191	5804M3	73.061	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.768	191	5992M3	75.427	ng/mL	
109)	17a(H)-22,29,30-Trisno...	48.964	191	12728M3	160.220	ng/ml	
110)	17a/b,21b/a 28,30-Bisn...	50.154	191	2831	35.637	ng/ml	100
111)	17a(H),21b(H)-25-Norho...	49.973	191	3191	40.168	ng/ml	100
112)	30-Norhopane (T15)	50.832	191	35454	446.296	ng/ml	100
113)	18a(H)-30-Norneohopane...	50.937	191	9313M3	117.232	ng/ml	
114)	17a(H)-Diahopane (X)	51.073	191	5508M3	69.335	ng/ml	
115)	30-Normoretane (T17)	51.615	191	3970	49.974	ng/ml	100
117)	Moretane (T20)	52.895	191	6020M3	75.780	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
118) 30-Homohopane-22S (T21)	53.994	191	25836	325.224	ng/ml	100
119) 30-Homohopane-22R (T22)	54.235	191	21801	274.432	ng/ml	100
120) Gammacerane/C32-diahopane	54.777	191	4499	56.634	ng/mL	100
121) 30,31-Bishomohopane-22...	55.575	191	18579	233.873	ng/ml	100
122) 30,31-Bishomohopane-22...	55.952	191	13513	170.102	ng/ml	100
123) 30,31-Trishomohopane-2...	57.714	191	14906	187.637	ng/ml	100
124) 30,31-Trishomohopane-2...	58.331	191	9896M3	124.571	ng/ml	
125) Tetrakishomohopane-22S...	60.349	191	10857	136.668	ng/ml	100
126) Tetrakishomohopane-22R...	61.252	191	7957	100.163	ng/ml	100
127) Pentakishomohopane-22S...	63.511	191	11110	139.853	ng/ml	100
128) Pentakishomohopane-22R...	64.806	191	9965	125.440	ng/ml	100
130) 13b(H),17a(H)-20S-Diac...	45.244	217	10733M3	257.271	ng/ml	
131) 13b(H),17a(H)-20R-Diac...	45.681	217	5589M3	133.969	ng/ml	
132) 13b,17a-20S-Methyldiac...	46.374	217	4399M3	105.445	ng/ml	
133) 14a,17a-20S-Chol/13b,1...	47.247	217	12966	310.796	ng/ml	100
134) 14a,17a-20R-Chol/13b,1...	47.759	217	15015M3	359.911	ng/ml	
135) Unknown Sterane (S18)	48.045	217	4124	98.853	ng/ml	100
136) 13a,17b-20S-Ethyldiach...	48.317	217	1011	24.234	ng/ml	100
137) 14a,17a-20S-Methylchol...	48.467	217	6766M3	162.182	ng/ml	
138) 14a,17a-20R-Methylchol...	49.190	217	7334M3	175.797	ng/ml	
139) 14a(H),17a(H)-20S-Ethy...	49.536	217	9103M3	218.200	ng/ml	
140) 14a(H),17a(H)-20R-Ethy...	50.455	217	8734M3	209.355	ng/ml	
141) 14b(H),17b(H)-20R-Chol...	47.338	218	8433M3	202.140	ng/ml	
142) 14b(H),17b(H)-20S-Chol...	47.413	218	8412M3	201.637	ng/ml	
143) 14b,17b-20R-Methylchol...	48.633	218	9575	229.514	ng/ml	100
144) 14b,17b-20S-Methylchol...	48.723	218	11768M3	282.080	ng/ml	
145) 14b(H),17b(H)-20R-Ethy...	49.777	218	13230M3	317.125	ng/ml	
146) 14b(H),17b(H)-20S-Ethy...	49.823	218	8678M3	208.013	ng/ml	
147) C26,20R- +C27,20S- tri...	49.476	231	48173	1154.712	ng/mL	100
148) C28,20S-triaromatic st...	50.350	231	31642	758.462	ng/mL	100
149) C27,20R-triaromatic st...	50.801	231	29597	709.443	ng/mL	100
150) C28,20R-triaromatic st...	52.006	231	25116M3	602.033	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : Default All compounds listed reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
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Quant Time: Oct 31 12:59:11 2012
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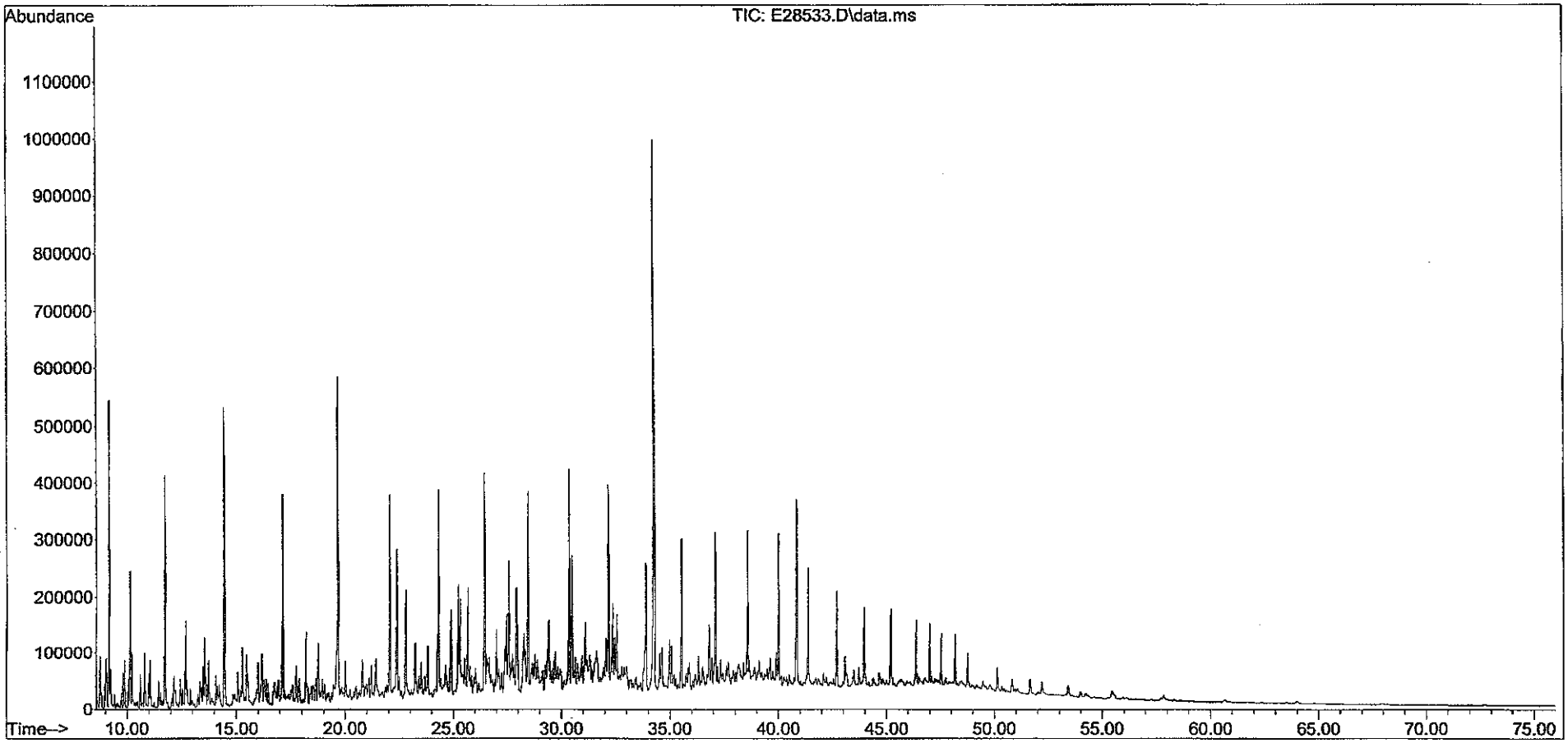
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration



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2994

Alpha Woods Hole Lab
Batch Weight Report
10/05/2012

Lab ID	QC Type	PS1210004 - Pan Weight	PS1210004 - Wet Weight	PS1210004 - Dry Weight	PS1210004 - Dry Weight #2	PS1210004 - Dry Weight #3	Percent Solid
1210004-01	SAM 1210083-01	1.31	8.12	5.31	5.3		58.59
1210004-02	SAM 1210083-02	1.31	8.12	5.31	5.3		58.59
1210004-03	SAM 1210083-03	1.31	8.12	5.31	5.3		58.59
1210004-04	SAM 1210083-04	1.31	8.12	5.31	5.3		58.59
1210004-05	SAM 1210083-05	1.31	8.12	5.31	5.3		58.59
1210004-06	SAM 1210083-06	1.31	8.12	5.31	5.3		58.59
1210004-07	SAM 1210083-07	1.31	8.12	5.31	5.3		58.59
PSS100512B06	B	1.3	1.3	1.31	1.31		100.00

KMC 11/16/12

Initial: 10/5/2012 12:32:03 PM wr
Weight #1: 10/9/2012 8:20:15 AM ctk
Weight #2: 10/10/2012 12:20:58 PM bls

2995

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210083 - OP NEWFIE

Lab ID	QC Type	Prep Method	Analyst	Prep Start Date	Prep Completed Date	TCLP	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1210083-01	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.04	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-02	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-03	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.01	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-04	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.04	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-05	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.05	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-06	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-07	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612B09	B	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCS05	LCS	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCSD05	LCSD	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012

Alpha Woods Hole Lab
Batch Prep Report

11/06/2012 1210083 - OP NEWFIE

Lab ID	Notes
1210083-01	1st Prep
1210083-02	1st Prep
1210083-03	1st Prep
1210083-04	1st Prep
1210083-05	1st Prep
1210083-06	1st Prep: Sample lost 1mL out of 4mL due to broken 4mL vial. Sample was graved at 3 mL CTK 11/7/12
1210083-07	1st Prep
SS110612B09	1st Prep
SS110612LCS05	1st Prep
SS110612LCSD05	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210083 - OP NEWFIE Analyst: CTK Witness: AMK

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1210083-01	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-02	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-03	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-04	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-05	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-06	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-07	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612B09	B	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612LCS05	LCS	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl
SS110612LCSD05	LCSD	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ65	Biomarker Surrogate	5b(H) Cholane = 10 ug/mL	DCM	7787
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210083 - OP SHC Analyst: CTK Witness: AMK

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1210083-01	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-02	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-03	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-04	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-05	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-06	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-07	SAM	WHAQ79	100	µl				WHAQ72	50	µl
SS110612B09	B	WHAQ79	100	µl				WHAQ72	50	µl
SS110612LCS05	LCS	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl
SS110612LCSD05	LCSD	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ72	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene-d10, Chrysene-d12 = 5 ug/mL	DCM	L14S03
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

ETR 1210083

Alpha Analytical

Analyst AMK

Date 11/07/2012

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	0.280	56.00	N/A	N/A	N/A	104%
1210083	1		4000	50	0.198	15.84	2000	7.92	2.00	
	2		4000	50	0.202	16.16	2000	8.08	2.00	
	3		4000	50	0.205	16.40	2000	8.20	2.00	
	4		4000	50	0.215	17.20	2000	8.60	2.00	
	5		4000	50	0.198	15.84	2000	7.92	2.00	
	6		4000	50	0.212	16.96	2000	8.48	2.00	
	7		4000	50	0.198	15.84	2000	7.92	2.00	

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: AMK

Date: 11/20/12

ETR 1210083

Analyst

Date 11/07/2012

Alpha Analytical

- [ ] Pre-Alumina
- [ ] Post-Alumina
- [x] Pre-Silica
- [ ] Oily Material Prep.
- [ ] Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	.280		N/A	N/A	N/A	0%
1210083	1		4000	50	.198					
11/20/12	2		4000	50	.202					
	3		4000	50	.205					
	4		4000	50	.215					
	5		4000	50	.198					
	6	AMK 11/7/12 ~~3000~~	~~4000~~ 4000	50	~~.138~~ .212	AMK 11/7/12				
	7	11/20/12	4000	50	.198					

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: AMK

Date: 11/7/12

Alpha Woods Hole Lab
Batch Weight Report
11/06/2012

Lab ID	QC Type	1210083 - Sample
1210083-01	SAM	15.04
1210083-02	SAM	15
1210083-03	SAM	15.01
1210083-04	SAM	15.04
1210083-05	SAM	15.05
1210083-06	SAM	15
1210083-07	SAM	15
SS110612B09	B	15
SS110612LCS05LCS	OP NEWFIE	15
SS110612LCS05LCS	OP SHC	15
SS110612LCS05LCS	OP Steranes/Triterpanes	
SS110612LCSD05LCSD	OP NEWFIE	15
SS110612LCSD05LCSD	OP SHC	15
SS110612LCSD05LCSD	OP Steranes/Triterpanes	

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210083 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210083-01	SAM	3660B	CTK	11/7/2012												True
1210083-02	SAM	3660B	CTK	11/7/2012												True
1210083-03	SAM	3660B	CTK	11/7/2012												True
1210083-04	SAM	3660B	CTK	11/7/2012												True
1210083-05	SAM	3660B	CTK	11/7/2012												True
1210083-06	SAM	3660B	CTK	11/7/2012												True
1210083-07	SAM	3660B	CTK	11/7/2012												True
SS110612B09	B	3660B	CTK	11/7/2012												True
SS110612LCS05	LCS	3660B	CTK	11/7/2012												True
SS110612LCSD05	LCSD	3660B	CTK	11/7/2012												True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210083 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210083-01	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-02	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-03	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-04	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-05	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-06	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-07	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
SS110612B09	B	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
SS110612LCS05	LCS	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
SS110612LCSD05	LCSD	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True

Alpha Woods Hole Lab
Batch Clean Up Report

11/06/2012 1210083 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210083-01	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-02	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-03	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-04	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-05	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-06	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-07	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612B09	B	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCS05	LCS	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCSD05	LCSD	split	KJD	11/8/2012							0.9	0.45	2			True

Forensic Preparation Checklist

Batch ID: 12100083 **Client:** AECOM **Project:** Enbridge MDL

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil Product • PUF • Sediment • Sheen Soil • Solid • SPMD • Tissue 1L Water • 4L Water • Floc Water

Extraction HT:
9/2/12 0 13

	Date:	Initials:
COC/ETR Check:	11/6/12	CTK
1st Extraction:	11/6/12	CTK
2nd Extraction:	11/6/12	CTK
3rd Extraction:	11/7/12	WR/MH

Cleanup Methods:		Date/Initials:
No Cleanup Required		
Alumina Column (3610)		
Silica Column (3630)	X	11/7/12 AMK
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)	X	11/7/12 CTK
Water pH<2 verified		

Date/Initials:		ID & Amount:
RIS Spike Analyst:	11/8/12 CJP	WHAQ 72 50 uL
RIS Spike Witness:	11/8/12 BLS	

Prep Process Notes

Sample 6 lost ~~2~~ 1mL due to broken 4mL vial. CTK 11/7/12
11/7/12 CTK CTK 11/6/12 exactly V out V of 4mL CTK 11/7/12

Samples 1-7 spiked with 300uL WHAQ62. CTK 11/7/12

Sample 6 was graved @ 3mL's. CTK 11/7/12

REAGENT	LOT #
DCM	000015769
SODIUM SULFATE	000011407
SILICA GEL	BCBH9150V
ALUMINA	n/a

REAGENT	LOT #
COPPER	QWR110712B
GLASS WOOL	05112999

BATCH COMPLETE Analyst:	KJD	Date:	11/8/12
BATCH REVIEWED Analyst:	BLS	Date:	11/12/12

Injection Log

Directory: O:\FORENSICS\DATA\PAH2\2012\OCT12\OCT28

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	E28479.d	0.	PRIME		28 Oct 2012 12:20
2	1	E28481.d	0.	PRIME		28 Oct 2012 13:49
3	2	E28483.d	0.	DCM		28 Oct 2012 15:18
4	3	E28485.d	0.	DCM		28 Oct 2012 16:46
5	4	E28487.d	0.	I210281201		28 Oct 2012 18:15
6	5	E28489.d	0.	I210281202		28 Oct 2012 19:44
7	6	E28491.d	0.	I210281203		28 Oct 2012 21:12
8	7	E28493.d	0.	I210281204		28 Oct 2012 22:41
9	8	E28495.d	0.	I210281205		29 Oct 2012 00:09
10	9	E28497.d	0.	I210281206		29 Oct 2012 01:37
11	10	E28499.d	0.	I210281207		29 Oct 2012 03:06
12	11	E28501.d	0.	DCM		29 Oct 2012 04:34
13	12	E28503.d	0.	ss110412ans01	whaq46 5.076	29 Oct 2012 06:03
14	13	E28505.d	0.	DCM		29 Oct 2012 07:32
15	14	E28507.d	0.	Q210281201	PAH2102912.M JqK (11/05/12)	29 Oct 2012 09:01
16	15	E28509.d	0.	MC252		29 Oct 2012 10:30
17	1	E28511.d	0.	DCM		29 Oct 2012 12:01
18	2	E28513.d	0.	DCM		29 Oct 2012 13:30
19	3	E28515.d	0.	DCM	DCM	29 Oct 2012 15:00
20	4	E28517.d	0.	I210291201	L1 WHAQ33	29 Oct 2012 16:29
21	5	E28519.d	0.	I210291202	L2 WHAQ34	29 Oct 2012 17:58
22	6	E28521.d	0.	I210291203	L3 WHAQ35	29 Oct 2012 19:27
23	7	E28523.d	0.	I210291204	L4 WHAQ66	29 Oct 2012 20:56
24	8	E28525.d	0.	I210291205	L5 WHAQ38	29 Oct 2012 22:25
25	9	E28527.d	0.	I210291206	L6 WHAQ39	29 Oct 2012 23:54
26	10	E28529.d	0.	I210291207	KAL. L7 WHAQ40	30 Oct 2012 01:23
27	11	E28531.d	0.	DCM	DCM	30 Oct 2012 02:52
28	12	E28533.d	0.	ss110512anc02	ANS WHAQ46 5.076M...	30 Oct 2012 04:21
29	13	E28535.d	0.	DCM	DCM	30 Oct 2012 05:50
30	14	E28537.d	0.	Q210291201	ICC WHAQ50	30 Oct 2012 07:19
31	15	E28539.d	0.	MC252210291201	MC252 5.205MG/ML-WHAQ 47	30 Oct 2012 09:16
32	16	E28541.d	0.	SRM210291201	SRM1582	30 Oct 2012 10:47
33	17	E28543.d	0.	COREXIT	RT ONLY	30 Oct 2012 12:21
34	18	E28545.d	0.	C210291201	CC WHAQ66 500NG/ML	30 Oct 2012 13:52
35	19	E28547.d	0.	DCM		30 Oct 2012 15:24
36	20	E28549.d	0.	DCM		30 Oct 2012 16:57
37	21	E28551.d	0.	SS102412B10	1X ETR121001XX	30 Oct 2012 18:30
38	22	E28553.d	0.	SS102412C41BN02	1X ETR121001XX	30 Oct 2012 20:04
39	23	E28555.d	0.	SS102412LCS03	1X ETR121001XX	30 Oct 2012 21:37
40	24	E28557.d	0.	SS102412LCSD03	1X ETR121001XX	30 Oct 2012 23:11
41	25	E28559.d	0.	1200010-01	1X	31 Oct 2012 00:45
42	26	E28561.d	0.	1200010-01D	1X	31 Oct 2012 02:18
43	27	E28563.d	0.	1210001-02	1X	31 Oct 2012 03:51
44	28	E28565.d	0.	1210001-03	1X	31 Oct 2012 05:24
45	29	E28567.d	0.	1210001-04	1X	31 Oct 2012 06:56
46	30	E28569.d	0.	1210001-05	1X	31 Oct 2012 08:29
47	31	E28571.d	0.	C210291202	CC HWAQ66 500NG/ML	31 Oct 2012 11:26
48	100	E28571b.d	0.	SS1024112C41BN02C41	RA	31 Oct 2012 13:00
49	99	E28571d.d	0.	SS1024112C41BN02C41	PRE	31 Oct 2012 14:36
50	32	E28573.d	0.	EN103012WCS01	WHAQ73 WCS 5.036	31 Oct 2012 16:10
51	33	E28575.d	0.	EN103012CL01	WHAQ74 CL 5.064	31 Oct 2012 17:44
52	34	E28577.d	0.	120001-06	1X	31 Oct 2012 19:16
53	35	E28579.d	0.	120001-07	1X	31 Oct 2012 20:50
54	36	E28581.d	0.	120001-08	1X	31 Oct 2012 22:24
55	37	E28583.d	0.	120001-09	1X	31 Oct 2012 23:57

Analysis log File

Total Files Reported in Log : 90
Log Generated From Directory: O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E28925.D	PRIME	1X	11/13/2012 10:53 am
2	E28927.D			11/13/2012 12:21 pm
3	E28929.D	C211131201 PASS	CC WHAQ80 500NG/ML	11/13/2012 2:01 pm
4	E28931.D	ANS211131201	WHAQ46 5.076	11/13/2012 3:30 pm
5	E28933.D	DCM	DCM	11/13/2012 4:59 pm
6	E28935.D	DCM	DCM	11/13/2012 6:28 pm
7	E28937.D	SS110812B06	1X ETR1209049_50_53_54	11/13/2012 7:58 pm
8	E28939.D	SS110812LCS05	1X ETR1209049_50_53_54	11/13/2012 9:27 pm
9	E28941.D	SS110812LCSD05	1X ETR1209049_50_53_54	11/13/2012 10:55 pm
10	E28943.D	SS110812C41BN01	1X ETR1209049_50_53_54	11/14/2012 12:24 am
11	E28945.D	1209049-15	1X	11/14/2012 1:53 am
12	E28947.D	1209050-03	1X	11/14/2012 3:22 am
13	E28949.D	✓C211131202 PASS	CC WHAQ80 500NG/ML	11/14/2012 4:50 am
14	E28951.D	SS111412MC201	WHAQ47 5.205	11/14/2012 6:18 am
15	E28953.D	1209050-04	1X	11/14/2012 7:47 am
16	E28953B.D	✓SS111612ANC01	WHAQ46, 5.076	11/14/2012 9:16 am
17	E28955.D	1209050-04M	1X	11/14/2012 10:45 am
18	E28957.D	1209050-04S	1X	11/14/2012 12:23 pm
19	E28959.D	1209053-09	1X	11/14/2012 2:01 pm
20	E28961.D	1209054-11	1X	11/14/2012 3:31 pm
21	E28963.D	1209054-11D	1X	11/14/2012 5:01 pm
22	E28965.D	ss1114121582c01	WHAQ46 5.437	11/14/2012 6:30 pm
23	E28967.D	✓C211131203 PASS	CC WHAQ80 500NG/ML	11/14/2012 7:59 pm
24	E28969.D	DCM		11/14/2012 9:27 pm
25	E28971.D	DCM		11/14/2012 10:55 pm
26	E28973.D	SS110612B07	1X ETR1210081	11/15/2012 12:24 am
27	E28975.D	SS110612LCS03	1X ETR1210081	11/15/2012 1:52 am
28	E28977.D	SS110612LCSD03	1X ETR1210081	11/15/2012 3:21 am
29	E28979.D	1210081-01	1X	11/15/2012 4:49 am
30	E28981.D	1210081-02	1X	11/15/2012 6:17 am
31	E28983.D	1210081-03	1X	11/15/2012 7:45 am
32	E28985.D	1210081-04	1X	11/15/2012 9:14 am
33	E28987.D	1210081-05	1X	11/15/2012 10:42 am
34	E28989.D	1210081-06	1X	11/15/2012 12:09 pm
35	E28991.D	1210081-07	1X	11/15/2012 1:47 pm
36	E28993.D	✓C211131204 PASS	CC WHAQ80 500NG/ML	11/15/2012 3:14 pm
37	E28995.D	✓SS111612WCS01	WCS WHAQ73 5.036	11/15/2012 4:42 pm
38	E28997.D	✓SS111612CL01	CL WHAQ74 5.064	11/15/2012 6:10 pm
39	E28999.D	DCM	DCM	11/15/2012 7:37 pm
40	E29001.D	DCM	DCM	11/15/2012 9:05 pm
41	E29003.D	SS10612B08	1X ETR1210082	11/15/2012 10:32 pm
42	E29003B.D	✓C211131205 PASS	CC WHAQ80 500NG/ML	11/16/2012 7:41 am
43	E29005.D	SS110612LCS04	1X ETR1210082	11/16/2012 9:08 am
44	E29007.D	SS110612LCSD04	1X ETR1210082	11/16/2012 10:36 am
45	E29007B.D	C211131206 PASS	CC WHAQ80 500NG/ML EM ..	11/16/2012 12:04 pm
46	E29009.D	1210082-01	1X	11/16/2012 1:34 pm
47	E29009B.D	C211131207 PASS	CC WHAQ80 500NG/ML EM ..	11/16/2012 3:07 pm
48	E29011.D	1210082-02	1X	11/16/2012 4:36 pm
49	E29013.D	1210082-03	1X	11/16/2012 6:05 pm
50	E29015.D	1210082-04	1X	11/16/2012 7:34 pm
51	E29017.D	1210082-05	1X	11/16/2012 9:02 pm
52	E29019.D	1210082-06	1X	11/16/2012 10:31 pm
53	E29021.D	1210082-07	1X	11/16/2012 11:59 pm
54	E29023.D	✓C211131208 PASS	CC WHAQ86 500NG/ML	11/17/2012 1:27 am

Total Files Reported in Log : 90
Log Generated From Directory: O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
55	E29025.D	DCM	DCM	11/17/2012 2:55 am
56	E29027.D	DCM	DCM	11/17/2012 4:23 am
57	E29029.D	✓SS110612B09	1X ETR1210083	11/17/2012 5:50 am
58	E29031.D	✓SS110612LCS05	1X ETR1210083	11/17/2012 7:18 am
59	E29033.D	✓SS110612LCSD05	1X ETR1210083	11/17/2012 8:46 am
60	E29035.D	✓1210083-01	1X	11/17/2012 10:14 am
61	E29037.D	✓1210083-02	1X	11/17/2012 11:42 am
62	E29039.D	✓1210083-03	1X	11/17/2012 1:11 pm
63	E29041.D	✓1210083-04	1X	11/17/2012 2:40 pm
64	E29043.D	✓1210083-05	1X	11/17/2012 4:09 pm
65	E29045.D	✓1210083-06	1X	11/17/2012 5:37 pm
66	E29047.D	✓1210083-07	1X	11/17/2012 7:05 pm
67	E29049.D	✓C211131209 pass	CC WHAQ86 500NG/ML	11/17/2012 8:33 pm
68	E29051.D	DCM		11/17/2012 10:00 pm
69	E29053.D	DCM		11/17/2012 11:28 pm
70	E29055.D	SS10612B08	1X RA ETR 1210082	11/18/2012 12:56 am
71	E29057.D	C211131210 pass	CC WHAQ86 500NG/ML	11/18/2012 2:23 am
72	E29059.D			11/18/2012 3:51 am
73	E29061.D			11/18/2012 5:18 am
74	E29063.D			11/18/2012 6:45 am
75	E29065.D	C211131211 pass	CC WHAQ86 500NG/ML	11/18/2012 8:13 am
76	E29067.D	DCM	DCM	11/18/2012 9:41 am
77	E29069.D	SS110612B08	1X ETR1210082 PRE RA	11/18/2012 11:10 am
78	E29069B.D	SS110612B08	1X ETR1210082 POST RA	11/18/2012 12:40 pm
79	E29071.D	WG573845-1	WG,BLK	11/18/2012 2:10 pm
80	E29073.D	WG573845-2	WG,LCS	11/18/2012 3:39 pm
81	E29075.D	WG573845-3	WG,LCSD	11/18/2012 5:08 pm
82	E29077.D	L1220430-01	WG	11/18/2012 6:37 pm
83	E29079.D	L1220430-04	WG	11/18/2012 8:05 pm
84	E29081.D	L1220430-07	WG	11/18/2012 9:33 pm
85	E29083.D	L1220430-10	WG	11/18/2012 11:01 pm
86	E29085.D	L1220430-13	WG	11/19/2012 12:29 am
87	E29087.D	C211131212 pass	CC WHAQ86 500NG/ML	11/19/2012 1:57 am
88	E29089.D	L1220430-16	WG	11/19/2012 3:25 am
89	E29091.D	L1220430-20	WG	11/19/2012 4:53 am
90	E29093.D	L1220430-23	WG	11/19/2012 6:21 am

PAH2102912.M

CCV = WHAQ86 @500ng/ml

DKG 11/19/12

Total Saturated Hydrocarbons By GC/FID

Form II
Surrogate Recovery
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Lab Code: **MA00030**
ETR: **1210083**
Matrix: **Sediment**

Case: **N/A** SDG: **N/A**

Client ID	Lab ID	ortho-Terphenyl	d50-Tetracosane
Blank	SS110612B09	91	89
LCS	SS110612LCS05	89	88
LCSD	SS110612LCSD05	73	72
SEKR3510R018S092112D004_MDL4	1210083-04	85	84
SEKR3510R018S092112D004_MDL5	1210083-05	82	84
SEKR3510R018S092112D004_MDL6	1210083-06	96	98
SEKR3510R018S092112D004_MDL7	1210083-07	87	86
SEKR3510R018S092112D004_MDL1	1210083-01	86	84
SEKR3510R018S092112D004_MDL2	1210083-02	88	86
SEKR3510R018S092112D004_MDL3	1210083-03	88	86

N/A - Not Applicable

Surrogate	QC Limit
ortho-Terphenyl	40-125
d50-Tetracosane	40-125

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **See Below**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/06/12	100	AC

Lab ID: SS110612B09 SS110612LCS05 SS110612LCSD05

Parameter	Blank Conc.	LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
n-Nonane (C9)	0.0181 U	0.910	68	0.770	58	17	30	50-125
n-Decane (C10)	0.00733	1.04	78	0.861	65	19	30	50-125
n-Dodecane (C12)	0.0188 U	1.10	82	0.890	67	21	30	50-125
n-Tetradecane (C14)	0.0139 U	1.15	86	0.930	70	21	30	50-125
n-Hexadecane (C16)	0.0128 U	1.23	92	1.00	75	21	30	50-125
n-Octadecane (C18)	0.0613	1.24	93	1.01	76	21	30	50-125
n-Nonadecane (C19)	0.0108 U	1.15	86	0.922	69	22	30	50-125
n-Eicosane (C20)	0.00741 U	1.18	88	0.951	71	21	30	50-125
n-Docosane (C22)	0.00120	1.19	89	0.965	72	21	30	50-125
n-Tetracosane (C24)	0.0124 U	1.23	92	0.998	75	21	30	50-125
n-Hexacosane (C26)	0.00240	1.22	91	0.988	74	21	30	50-125
n-Octacosane (C28)	0.00573	1.23	92	1.00	75	20	30	50-125
n-Triacontane (C30)	0.00213	1.24	93	0.991	74	22	30	50-125
n-Hexatriacontane (C36)	0.0221 U	1.19	89	0.949	71	23	30	50-125

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	89	73	40-125
d50-Tetracosane	88	72	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Nonane (C9)	6286	7340	117	65-135
n-Decane (C10)	5047	5900	117	65-135
n-Undecane (C11)	4703	5390	115	65-135
n-Dodecane (C12)	4155	5000	120	65-135
n-Tridecane (C13)	4058	4780	118	65-135
2,6,10 Trimethyldodecane (1380)	845	914	108	65-135
n-Tetradecane (C14)	3670	4170	114	65-135
2,6,10 Trimethyltridecane (1470)	1367	1580	115	65-135
n-Pentadecane (C15)	3660	4060	111	65-135
n-Hexadecane (C16)	3330	3940	118	65-135
Norpristane (1650)	1093	1240	113	65-135
n-Heptadecane (C17)	3012	3540	117	65-135
Pristane	2145	2370	110	65-135
n-Octadecane (C18)	2700	3060	114	65-135
Phytane	1215	1410	116	65-135
n-Nonadecane (C19)	2305	2680	116	65-135
n-Eicosane (C20)	2337	2570	110	65-135
n-Heneicosane (C21)	2044	2280	112	65-135
n-Docosane (C22)	1972	2220	112	65-135
n-Tricosane (C23)	1745	1940	111	65-135
n-Tetracosane (C24)	1641	1960	119	65-135
n-Pentacosane (C25)	1562	1730	110	65-135
n-Hexacosane (C26)	1378	1530	111	65-135
n-Heptacosane (C27)	1083	1190	110	65-135
n-Octacosane (C28)	776	881	114	65-135
n-Nonacosane (C29)	734	776	106	65-135
n-Triacontane (C30)	627	724	116	65-135
n-Hentriacontane (C31)	514	674	131	65-135
n-Dotriacontane (C32)	458	446	97	65-135
n-Tritriacontane (C33)	388	371	96	65-135
n-Tetratriacontane (C34)	347	366	105	65-135
n-Pentatriacontane (C35)	278	333	120	65-135
n-Hexatriacontane (C36)	186	219	118	65-135

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Heptatriacontane (C37)	152	169	111	65-135
n-Octatriacontane (C38)	131	154	118	65-135
n-Nonatriacontane (C39)	88.7	99.3	112	65-135
n-Tetracontane (C40)	92.3	99.3	108	65-135
Total Petroleum Hydrocarbons (C9-C44)	554993	627000	113	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Nonane (C9)	6204	6790	109	65-135
n-Decane (C10)	5060	5470	108	65-135
n-Undecane (C11)	4640	5000	108	65-135
n-Dodecane (C12)	4121	4300	104	65-135
n-Tridecane (C13)	3859	4300	111	65-135
2,6,10 Trimethyldodecane (1380)	914	914	100	65-135
n-Tetradecane (C14)	3500	3750	107	65-135
2,6,10 Trimethyltridecane (1470)	1316	1520	115	65-135
n-Pentadecane (C15)	3836	3830	100	65-135
n-Hexadecane (C16)	3174	3530	111	65-135
Norpristane (1650)	1030	1050	102	65-135
n-Heptadecane (C17)	2818	3210	114	65-135
Pristane	2093	2150	103	65-135
n-Octadecane (C18)	2460	2850	116	65-135
Phytane	1213	1260	104	65-135
n-Nonadecane (C19)	2354	2410	103	65-135
n-Eicosane (C20)	2305	2560	111	65-135
n-Heneicosane (C21)	2077	2120	102	65-135
n-Docosane (C22)	2010	2070	103	65-135
n-Tricosane (C23)	1735	1850	107	65-135
n-Tetracosane (C24)	1629	1710	105	65-135
n-Pentacosane (C25)	1607	1630	102	65-135
n-Hexacosane (C26)	1333	1470	110	65-135
n-Heptacosane (C27)	1085	1100	101	65-135
n-Octacosane (C28)	770	782	102	65-135
n-Nonacosane (C29)	774	770	100	65-135
n-Triacontane (C30)	595	655	110	65-135
n-Hentriacontane (C31)	534	493	92	65-135
n-Dotriacontane (C32)	501	441	88	65-135
n-Tritriacontane (C33)	322	403	125	65-135
n-Tetratriacontane (C34)	289	378	131	65-135
n-Pentatriacontane (C35)	271	283	104	65-135
n-Hexatriacontane (C36)	166	207	125	65-135

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
n-Heptatriacontane (C37)	145	172	118	65-135
n-Octatriacontane (C38)	136	136	100	65-135
n-Nonatriacontane (C39)	94.3	104	110	65-135
n-Tetracontane (C40)	86.5	98.2	114	65-135
Total Petroleum Hydrocarbons (C9-C44)	544000	590000	109	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

Form IV
Method Blank Summary
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Date Analyzed: **11/09/12 20:48**

Client ID	Lab ID	Date/Time Analyzed
LCS	SS110612LCS05	11/10/12 01:15
LCSD	SS110612LCSD05	11/10/12 05:41
SEKR3510R018S092112D004_MDL4	1210083-04	11/12/12 05:50
SEKR3510R018S092112D004_MDL5	1210083-05	11/12/12 08:49
SEKR3510R018S092112D004_MDL6	1210083-06	11/12/12 10:18
SEKR3510R018S092112D004_MDL7	1210083-07	11/12/12 11:48
SEKR3510R018S092112D004_MDL1	1210083-01	11/12/12 13:18
SEKR3510R018S092112D004_MDL2	1210083-02	11/12/12 14:48
SEKR3510R018S092112D004_MDL3	1210083-03	11/12/12 16:17

N/A - Not Applicable

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28814.D
Time Acquired : 09 Nov 2012 11:49 am

C211091201R 59338300

File	Sample	Internal Standard Responses
e28826.D	SS110612B09	69514735
e28832.D	SS110612LCS05	69712484
e28838.D	SS110612LCSD05	68852339
e28840.D	C211091202R	62613621

(fails) - fails 24hr time check * - fails criteria

Created: Mon Nov 19 15:07:48 2012 PAH2

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28880.D
Time Acquired : 11 Nov 2012 2:32 pm

	C211091204R	61473600

File	Sample	Internal Standard Responses
e28892.D	1210083-04	77836261
e28893a.D	C211091205R	64507890

(fails) - fails 24hr time check * - fails criteria

Created: Mon Nov 19 15:09:57 2012 PAH2

GC QA-QC Check Report

Daily Calibration File : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28893a.D
Time Acquired : 12 Nov 2012 7:20 am

C211091205R 64507900

File	Sample	Internal Standard Responses
e28894.D	1210083-05	71425455
e28896.D	1210083-06	71889570
e28898.D	1210083-07	68340522
e28900.D	1210083-01	64882779
e28902.D	1210083-02	62470041
e28904.D	1210083-03	65848500
e28906.D	C211091206R	58151868

(fails) - fails 24hr time check * - fails criteria

Created: Mon Nov 19 15:11:35 2012 PAH2

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL1**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-01**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.04	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00386**	J	n-Tricosane (C23)	**0.390**	
n-Decane (C10)	**0.0184**	JB	n-Tetracosane (C24)	**0.172**	J
n-Undecane (C11)	**0.0129**	JB	n-Pentacosane (C25)	**1.75**	G
n-Dodecane (C12)	**0.0138**	J	n-Hexacosane (C26)	**0.305**	
n-Tridecane (C13)	**0.0601**	J	n-Heptacosane (C27)	**2.58**	
2,6,10 Trimethyldodecane (1380)	**0.0604**	J	n-Octacosane (C28)	**0.412**	
n-Tetradecane (C14)	**0.133**	J	n-Nonacosane (C29)	**5.24**	
2,6,10 Trimethyltridecane (1470)	**0.230**	G	n-Triacontane (C30)	**0.436**	
n-Pentadecane (C15)	**0.187**	J	n-Hentriacontane (C31)	**2.34**	
n-Hexadecane (C16)	**0.272**		n-Dotriacontane (C32)	**0.229**	
Norpristane (1650)	**0.112**	J	n-Tritriacontane (C33)	**0.712**	
n-Heptadecane (C17)	**0.307**		n-Tetratriacontane (C34)	**0.718**	
Pristane	**0.244**		n-Pentatriacontane (C35)	**0.224**	J
n-Octadecane (C18)	**0.540**	GB	n-Hexatriacontane (C36)	**0.0899**	J
Phytane	**0.262**	G	n-Heptatriacontane (C37)	**0.213**	J
n-Nonadecane (C19)	**0.185**	J	n-Octatriacontane (C38)	**0.139**	J
n-Eicosane (C20)	**0.241**		n-Nonatriacontane (C39)	**0.0434**	J
n-Heneicosane (C21)	**0.197**	J	n-Tetracontane (C40)	**0.0942**	J
n-Docosane (C22)	**0.162**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**19.3**
Total Petroleum Hydrocarbons (C9-C44)	**500**
Total Resolved Hydrocarbons	**91.5**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	86	40-125
d50-Tetracosane	84	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28900.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 1:18 pm
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 54 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:52:12 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.661	64882779	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.636	29404797	21.458 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.92%#
24) s	d50-Tetracosane	35.359	23321370	21.006 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.01%#
	Target Compounds			
2) t	n-Octane (C8)	5.212	22947	0.022 ug/mL M4
3) t	n-Nonane (C9)	7.359	18526	0.017 ug/mL M4
4) t	n-Decane (C10)	9.809	89423	0.081 ug/mL M4
5) t	n-Undecane (C11)	12.302	64414	0.057 ug/mL M4
6) t	n-Dodecane (C12)	14.721	69729	0.061 ug/mL M4
7) t	n-Tridecane (C13)	17.025	303966	0.265 ug/mL M4
8) t	1380	18.701	307755	0.266 ug/mL M4
9) t	n-Tetradecane (C14)	19.202	679587	0.588 ug/mL M4
10) t	1470	20.486	1175863G	1.015 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	955144	0.824 ug/mL M4
12) t	n-Hexadecane (C16)	23.216	1399447	1.198 ug/mL M4
13) t	1650	24.128	572817	0.493 ug/mL M4
14) t	n-Heptadecane (C17)	25.071	1568149	1.351 ug/mL M4
15) t	Pristane	25.167	1273809	1.074 ug/mL M4
16) t	n-Octadecane (C18)	26.811	2825896G	2.380 ug/mL M4
17) t	Phytane	26.990	1355106G	1.154 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	966798	0.815 ug/mL M4
20) t	n-Eicosane (C20)	30.122	1270302	1.061 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	1043113	0.868 ug/mL M4
22) t	n-Docosane (C22)	33.125	860779	0.714 ug/mL M4
23) t	n-Tricosane (C23)	34.535	2101219	1.717 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	914193	0.760 ug/mL M4
26) t	n-Pentacosane (C25)	37.186	9456585G	7.713 ug/mL M4
27) t	n-Hexacosane (C26)	38.448	1636374	1.343 ug/mL M4
28) t	n-Heptacosane (C27)	39.662	13600938	11.385 ug/mL M4
29) t	n-Octacosane (C28)	40.834	2190488	1.815 ug/mL M4
30) t	n-Nonacosane (C29)	41.971	27878551	23.108 ug/mL M4
31) t	n-Triacontane (C30)	43.051	2290114	1.920 ug/mL M4
32) t	n-Hentriacontane (C31)	44.117	12399555	10.302 ug/mL M4
33) t	n-Dotriacontane (C32)	45.132	1212037	1.011 ug/mL M4
34) t	n-Tritriacontane (C33)	46.132	3594400	3.138 ug/mL M4
35) t	n-tetratriacontane (C34)	47.061	3739915	3.162 ug/mL M3
36) t	n-Pentatriacontane (C35)	48.138	1185516	0.985 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.283	487424	0.396 ug/mL M4

11-12-12

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28900.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 1:18 pm
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 54 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:52:12 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

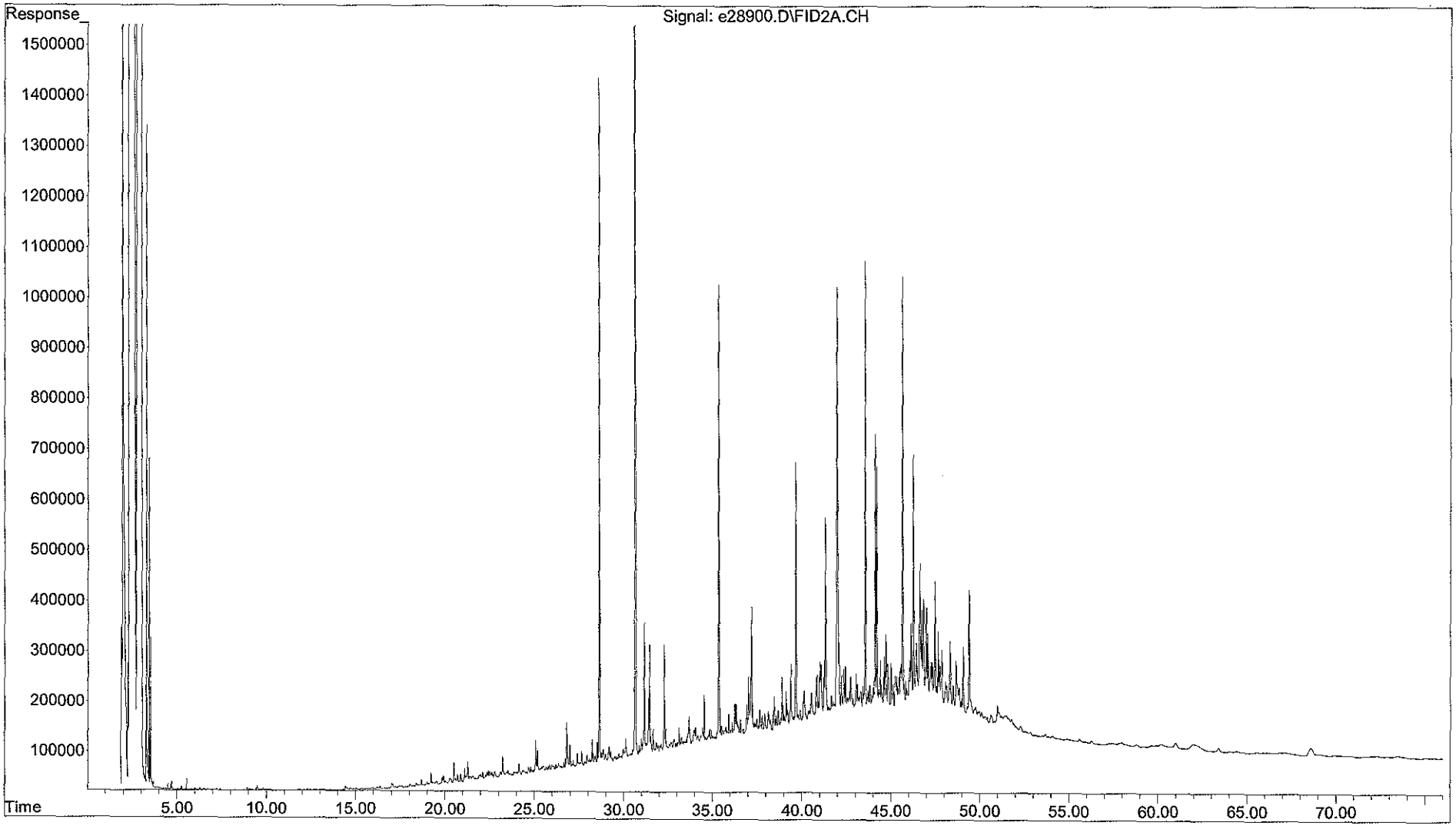
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.612	1127884	0.938	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.249	734684	0.614	ug/mL	M4
40) t	n-Nonatriacontane (C39)	54.082	217004	0.191	ug/mL	M4
41) t	n-Tetracontane (C40)	56.259	470903	0.415	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	3646077447	3090.202	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	2601574772	2204.943	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	475740026	403.209	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28900.D
Operator : AC
Acquired : 12 Nov 2012 1:18 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-01
Misc Info : 1X
ALS Vial : 54



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL2**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-02**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00296**	J	n-Tricosane (C23)	**0.405**	
n-Decane (C10)	**0.0175**	JB	n-Tetracosane (C24)	**0.169**	J
n-Undecane (C11)	**0.0123**	JB	n-Pentacosane (C25)	**1.83**	G
n-Dodecane (C12)	**0.0141**	J	n-Hexacosane (C26)	**0.310**	
n-Tridecane (C13)	**0.0519**	J	n-Heptacosane (C27)	**2.59**	
2,6,10 Trimethyldodecane (1380)	**0.0564**	J	n-Octacosane (C28)	**0.381**	
n-Tetradecane (C14)	**0.127**	J	n-Nonacosane (C29)	**5.81**	
2,6,10 Trimethyltridecane (1470)	**0.217**	GJ	n-Triacontane (C30)	**0.406**	
n-Pentadecane (C15)	**0.177**	J	n-Hentriacontane (C31)	**2.34**	
n-Hexadecane (C16)	**0.256**		n-Dotriacontane (C32)	**0.179**	J
Norpristane (1650)	**0.105**	J	n-Tritriacontane (C33)	**0.646**	
n-Heptadecane (C17)	**0.318**		n-Tetratriacontane (C34)	**0.629**	
Pristane	**0.245**		n-Pentatriacontane (C35)	**0.205**	J
n-Octadecane (C18)	**0.521**	GB	n-Hexatriacontane (C36)	**0.0979**	J
Phytane	**0.258**	G	n-Heptatriacontane (C37)	**0.232**	
n-Nonadecane (C19)	**0.190**	J	n-Octatriacontane (C38)	**0.210**	J
n-Eicosane (C20)	**0.228**		n-Nonatriacontane (C39)	**0.0539**	J
n-Heneicosane (C21)	**0.197**	J	n-Tetracontane (C40)	**0.113**	J
n-Docosane (C22)	**0.153**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**19.8**
Total Petroleum Hydrocarbons (C9-C44)	**501**
Total Resolved Hydrocarbons	**91.7**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	88	40-125
d50-Tetracosane	86	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28902.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 2:48 pm
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 55 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:53:40 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.661	62470041	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.637	29011224	21.988 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	43.98%#
24) s	d50-Tetracosane	35.360	22955074	21.475 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.95%#
	Target Compounds			
2) t	n-Octane (C8)	5.217	18018	0.018 ug/mL M4
3) t	n-Nonane (C9)	7.361	13023	0.013 ug/mL M4
4) t	n-Decane (C10)	9.810	82264	0.077 ug/mL M4
5) t	n-Undecane (C11)	12.303	57830	0.054 ug/mL M4
6) t	n-Dodecane (C12)	14.726	67531	0.062 ug/mL M4
7) t	n-Tridecane (C13)	17.026	251800	0.228 ug/mL M4
8) t	1380	18.703	276041	0.248 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	618532	0.556 ug/mL M4
10) t	1470	20.489	1063859G	0.953 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	869018	0.779 ug/mL M4
12) t	n-Hexadecane (C16)	23.217	1267132	1.126 ug/mL M4
13) t	1650	24.127	513817	0.460 ug/mL M4
14) t	n-Heptadecane (C17)	25.074	1564369	1.399 ug/mL M4
15) t	Pristane	25.171	1229761	1.077 ug/mL M4
16) t	n-Octadecane (C18)	26.814	2617817G	2.289 ug/mL M4
17) t	Phytane	26.995	1281232G	1.133 ug/mL M4
18) t	n-Nonadecane (C19)	28.518	951068	0.833 ug/mL M4
20) t	n-Eicosane (C20)	30.121	1155013	1.002 ug/mL M4
21) t	n-Heneicosane (C21)	31.659	999480	0.864 ug/mL M4
22) t	n-Docosane (C22)	33.126	780643	0.673 ug/mL M4
23) t	n-Tricosane (C23)	34.536	2097223	1.780 ug/mL M4
25) t	n-Tetracosane (C24)	35.889	862123	0.744 ug/mL M4
26) t	n-Pentacosane (C25)	37.190	9475330G	8.027 ug/mL M4
27) t	n-Hexacosane (C26)	38.448	1598972	1.363 ug/mL M4
28) t	n-Heptacosane (C27)	39.662	13111542	11.399 ug/mL M4
29) t	n-Octacosane (C28)	40.831	1946667	1.675 ug/mL M4
30) t	n-Nonacosane (C29)	41.972	29648914	25.524 ug/mL M4
31) t	n-Triacontane (C30)	43.050	2046782	1.782 ug/mL M4
32) t	n-Hentriacontane (C31)	44.116	11919280	10.286 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	906472	0.785 ug/mL M4
34) t	n-Tritriacontane (C33)	46.130	3130018	2.838 ug/mL M4
35) t	n-tetratriacontane (C34)	47.062	3145533	2.762 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.132	1042448	0.900 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.277	509624	0.430 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28902.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 2:48 pm
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 55 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:53:40 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

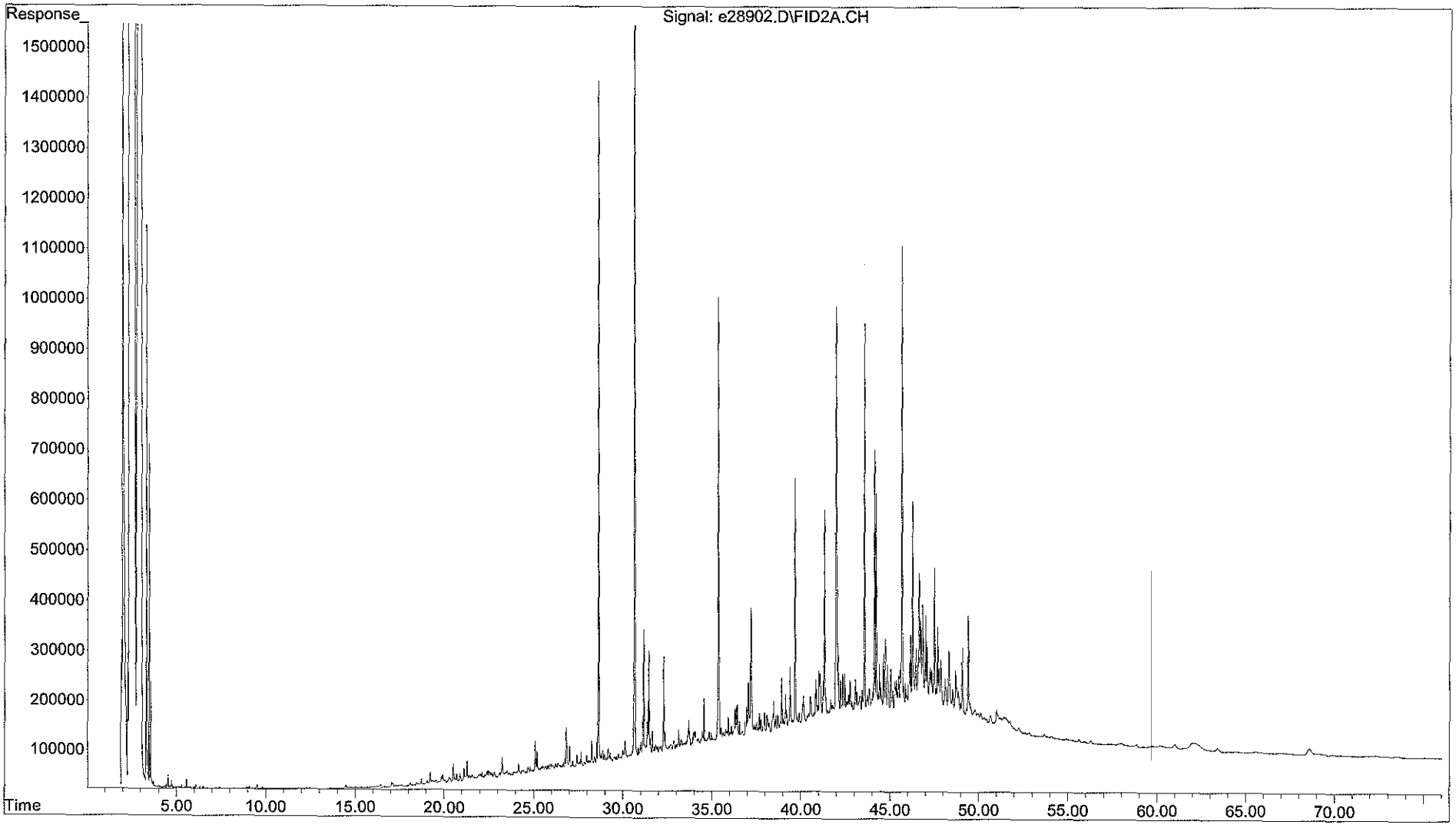
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.610	1182540	1.021	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.254	1065013	0.924	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.080	259253	0.237	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.279	542344	0.497	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	3544548956	3120.180	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	2500046281	2200.730	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	457789079	402.981	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28902.D
Operator : AC
Acquired : 12 Nov 2012 2:48 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-02
Misc Info : 1X
ALS Vial : 55



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL3**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-03**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.01	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00341**	J	n-Tricosane (C23)	**0.402**	
n-Decane (C10)	**0.0196**	JB	n-Tetracosane (C24)	**0.166**	J
n-Undecane (C11)	**0.0132**	JB	n-Pentacosane (C25)	**1.86**	G
n-Dodecane (C12)	**0.0155**	J	n-Hexacosane (C26)	**0.293**	
n-Tridecane (C13)	**0.0541**	J	n-Heptacosane (C27)	**3.15**	
2,6,10 Trimethyldodecane (1380)	**0.0582**	J	n-Octacosane (C28)	**0.401**	
n-Tetradecane (C14)	**0.131**	J	n-Nonacosane (C29)	**6.75**	
2,6,10 Trimethyltridecane (1470)	**0.213**	GJ	n-Triacontane (C30)	**0.433**	
n-Pentadecane (C15)	**0.179**	J	n-Hentriacontane (C31)	**2.50**	
n-Hexadecane (C16)	**0.259**		n-Dotriacontane (C32)	**0.221**	J
Norpristane (1650)	**0.106**	J	n-Tritriacontane (C33)	**0.742**	
n-Heptadecane (C17)	**0.310**		n-Tetratriacontane (C34)	**0.674**	
Pristane	**0.259**		n-Pentatriacontane (C35)	**0.224**	J
n-Octadecane (C18)	**0.513**	GB	n-Hexatriacontane (C36)	**0.103**	J
Phytane	**0.250**	G	n-Heptatriacontane (C37)	**0.232**	
n-Nonadecane (C19)	**0.193**	J	n-Octatriacontane (C38)	**0.161**	J
n-Eicosane (C20)	**0.257**		n-Nonatriacontane (C39)	**0.0362**	J
n-Heneicosane (C21)	**0.202**	J	n-Tetracontane (C40)	**0.0730**	J
n-Docosane (C22)	**0.154**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**21.6**
Total Petroleum Hydrocarbons (C9-C44)	**509**
Total Resolved Hydrocarbons	**89.3**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	88	40-125
d50-Tetracosane	86	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28904.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 4:17 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 09:02:20 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	65848500	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.638	30743972	22.106 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.21%#
24) s	d50-Tetracosane	35.364	24177642	21.458 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.92%#
	Target Compounds			
2) t	n-Octane (C8)	5.212	22578	0.021 ug/mL M4
3) t	n-Nonane (C9)	7.359	16428	0.015 ug/mL M4
4) t	n-Decane (C10)	9.810	96624	0.086 ug/mL M4
5) t	n-Undecane (C11)	12.302	66432	0.058 ug/mL M4
6) t	n-Dodecane (C12)	14.726	78420	0.068 ug/mL M4
7) t	n-Tridecane (C13)	17.026	276495	0.238 ug/mL M4
8) t	1380	18.704	299974	0.256 ug/mL M4
9) t	n-Tetradecane (C14)	19.202	675257	0.575 ug/mL M4
10) t	1470	20.489	1102669G	0.938 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	927378	0.789 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	1349269	1.138 ug/mL M4
13) t	1650	24.127	547872	0.465 ug/mL M4
14) t	n-Heptadecane (C17)	25.074	1606426	1.363 ug/mL M4
15) t	Pristane	25.169	1373686	1.141 ug/mL M4
16) t	n-Octadecane (C18)	26.813	2719590G	2.256 ug/mL M4
17) t	Phytane	26.994	1312576G	1.101 ug/mL M4
18) t	n-Nonadecane (C19)	28.518	1020908	0.849 ug/mL M4
20) t	n-Eicosane (C20)	30.121	1374751	1.132 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	1081719	0.887 ug/mL M4
22) t	n-Docosane (C22)	33.125	825315	0.675 ug/mL M4
23) t	n-Tricosane (C23)	34.535	2194148	1.766 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	891658	0.730 ug/mL M4
26) t	n-Pentacosane (C25)	37.193	10203544G	8.200 ug/mL M4
27) t	n-Hexacosane (C26)	38.449	1591828	1.288 ug/mL M4
28) t	n-Heptacosane (C27)	39.666	16809213	13.864 ug/mL M4
29) t	n-Octacosane (C28)	40.835	2160054	1.764 ug/mL M4
30) t	n-Nonacosane (C29)	41.978	36329285	29.671 ug/mL M4
31) t	n-Triacontane (C30)	43.052	2305299	1.904 ug/mL M4
32) t	n-Hentriacontane (C31)	44.117	13425312	10.991 ug/mL M4
33) t	n-Dotriacontane (C32)	45.133	1180063	0.970 ug/mL M4
34) t	n-Tritriacontane (C33)	46.134	3791887	3.261 ug/mL M4
35) t	n-tetratriacontane (C34)	47.062	3555805	2.963 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.138	1200692	0.983 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.280	565639	0.453 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28904.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 4:17 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 09:02:20 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

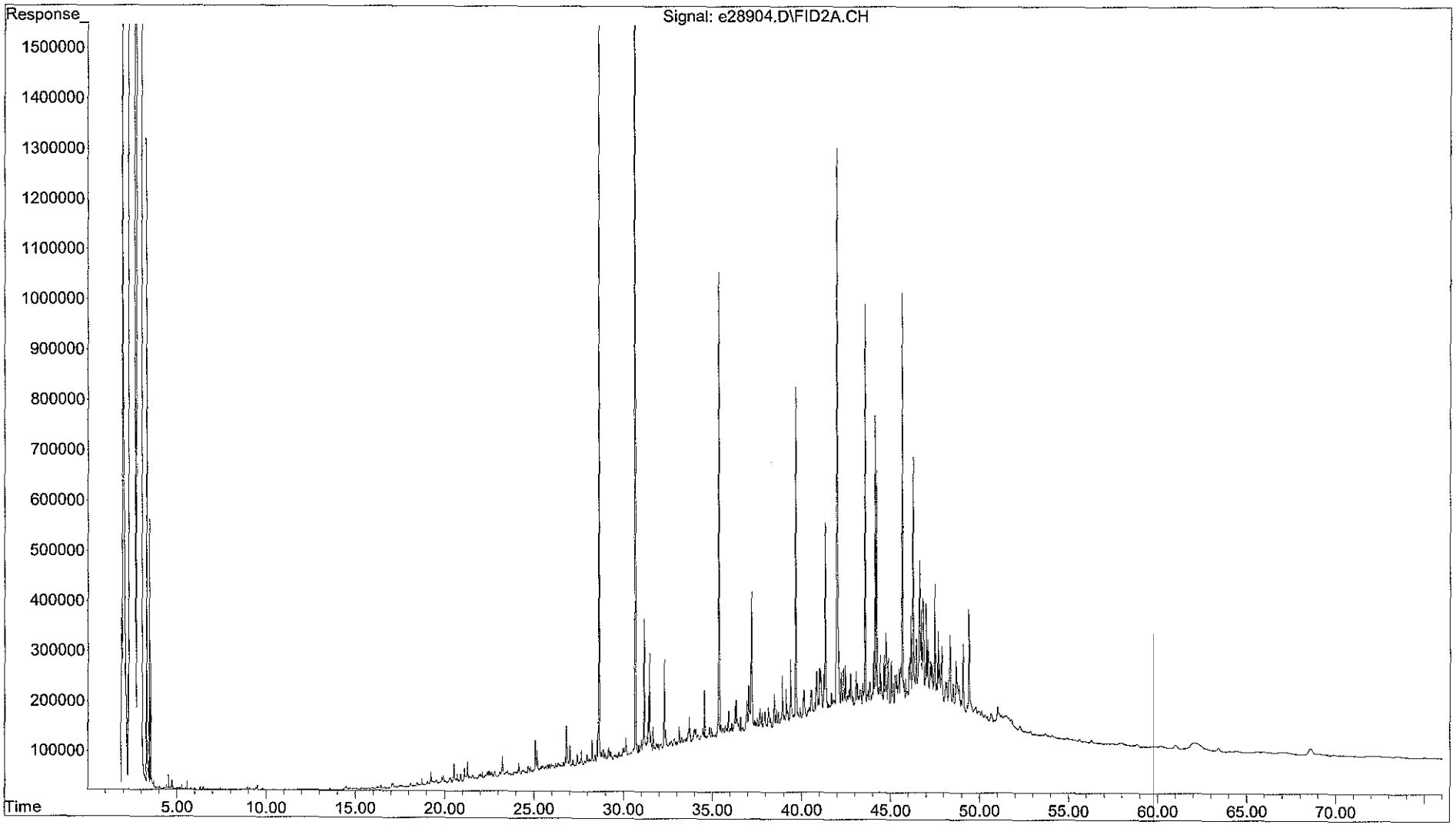
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.615	1247457	1.022	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.259	861405	0.709	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.068	182958	0.159	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.278	369524	0.321	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	3724259122	3110.172	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	2679756447	2237.896	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	470306703	392.759	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28904.D
Operator : AC
Acquired : 12 Nov 2012 4:17 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-03
Misc Info : 1X
ALS Vial : 56



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL4**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-04**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.04	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00295**	J	n-Tricosane (C23)	**0.375**	
n-Decane (C10)	**0.0250**	JB	n-Tetracosane (C24)	**0.170**	J
n-Undecane (C11)	**0.0134**	JB	n-Pentacosane (C25)	**1.60**	G
n-Dodecane (C12)	**0.0163**	J	n-Hexacosane (C26)	**0.277**	
n-Tridecane (C13)	**0.0631**	J	n-Heptacosane (C27)	**2.13**	
2,6,10 Trimethyldodecane (1380)	**0.0533**	J	n-Octacosane (C28)	**0.297**	
n-Tetradecane (C14)	**0.132**	J	n-Nonacosane (C29)	**4.85**	
2,6,10 Trimethyltridecane (1470)	**0.190**	GJ	n-Triacontane (C30)	**0.427**	
n-Pentadecane (C15)	**0.195**	J	n-Hentriacontane (C31)	**2.21**	
n-Hexadecane (C16)	**0.199**	J	n-Dotriacontane (C32)	**0.200**	J
Norpristane (1650)	**0.109**	J	n-Tritriacontane (C33)	**0.584**	
n-Heptadecane (C17)	**0.309**		n-Tetratriacontane (C34)	**0.544**	
Pristane	**0.240**		n-Pentatriacontane (C35)	**0.197**	J
n-Octadecane (C18)	**0.591**	GB	n-Hexatriacontane (C36)	**0.0858**	J
Phytane	**0.245**	G	n-Heptatriacontane (C37)	**0.208**	J
n-Nonadecane (C19)	**0.184**	J	n-Octatriacontane (C38)	**0.205**	J
n-Eicosane (C20)	**0.287**		n-Nonatriacontane (C39)	**0.0365**	J
n-Heneicosane (C21)	**0.192**	J	n-Tetracontane (C40)	**0.0924**	J
n-Docosane (C22)	**0.145**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**17.7**
Total Petroleum Hydrocarbons (C9-C44)	**460**
Total Resolved Hydrocarbons	**80.2**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	85	40-125
d50-Tetracosane	84	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28892.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:50 am
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 91 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:34:29 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.667	77836261	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.642	35119017	21.363 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.73%#
24) s	d50-Tetracosane	35.364	27928044	20.969 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	41.94%#
	Target Compounds			
2) t	n-Octane (C8)	5.211	24384	0.019 ug/mL M4
3) t	n-Nonane (C9)	7.357	17064	0.013 ug/mL M4
4) t	n-Decane (C10)	9.808	146471	0.110 ug/mL M4
5) t	n-Undecane (C11)	12.304	79395	0.059 ug/mL M4
6) t	n-Dodecane (C12)	14.724	99091	0.072 ug/mL M4
7) t	n-Tridecane (C13)	17.026	382705	0.278 ug/mL M4
8) t	1380	18.704	326409	0.235 ug/mL M4
9) t	n-Tetradecane (C14)	19.203	804100	0.580 ug/mL M4
10) t	1470	20.489	1166398G	0.839 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1192754	0.858 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	1226140	0.875 ug/mL M4
13) t	1650	24.128	669491	0.481 ug/mL M4
14) t	n-Heptadecane (C17)	25.073	1893781	1.360 ug/mL M4
15) t	Pristane	25.168	1502002	1.056 ug/mL M4
16) t	n-Octadecane (C18)	26.812	3707501G	2.602 ug/mL M4
17) t	Phytane	26.996	1522155G	1.080 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1154488	0.812 ug/mL M4
20) t	n-Eicosane (C20)	30.125	1817066	1.265 ug/mL M4
21) t	n-Heneicosane (C21)	31.659	1218958	0.845 ug/mL M4
22) t	n-Docosane (C22)	33.129	922654	0.638 ug/mL M4
23) t	n-Tricosane (C23)	34.537	2428654	1.654 ug/mL M4
25) t	n-Tetracosane (C24)	35.891	1080582	0.749 ug/mL M4
26) t	n-Pentacosane (C25)	37.193	10401816G	7.072 ug/mL M4
27) t	n-Hexacosane (C26)	38.450	1785117	1.222 ug/mL M4
28) t	n-Heptacosane (C27)	39.667	13434243	9.374 ug/mL M4
29) t	n-Octacosane (C28)	40.832	1895801	1.310 ug/mL M4
30) t	n-Nonacosane (C29)	41.974	30919956	21.364 ug/mL M4
31) t	n-Triacontane (C30)	43.052	2695504	1.883 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	14044591	9.727 ug/mL M4
33) t	n-Dotriacontane (C32)	45.134	1268547	0.882 ug/mL M4
34) t	n-Tritriacontane (C33)	46.131	3534660	2.572 ug/mL M4
35) t	n-tetratriacontane (C34)	47.065	3397404	2.395 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.136	1251228	0.867 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.274	557444	0.378 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28892.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:50 am
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 91 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 10:34:29 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

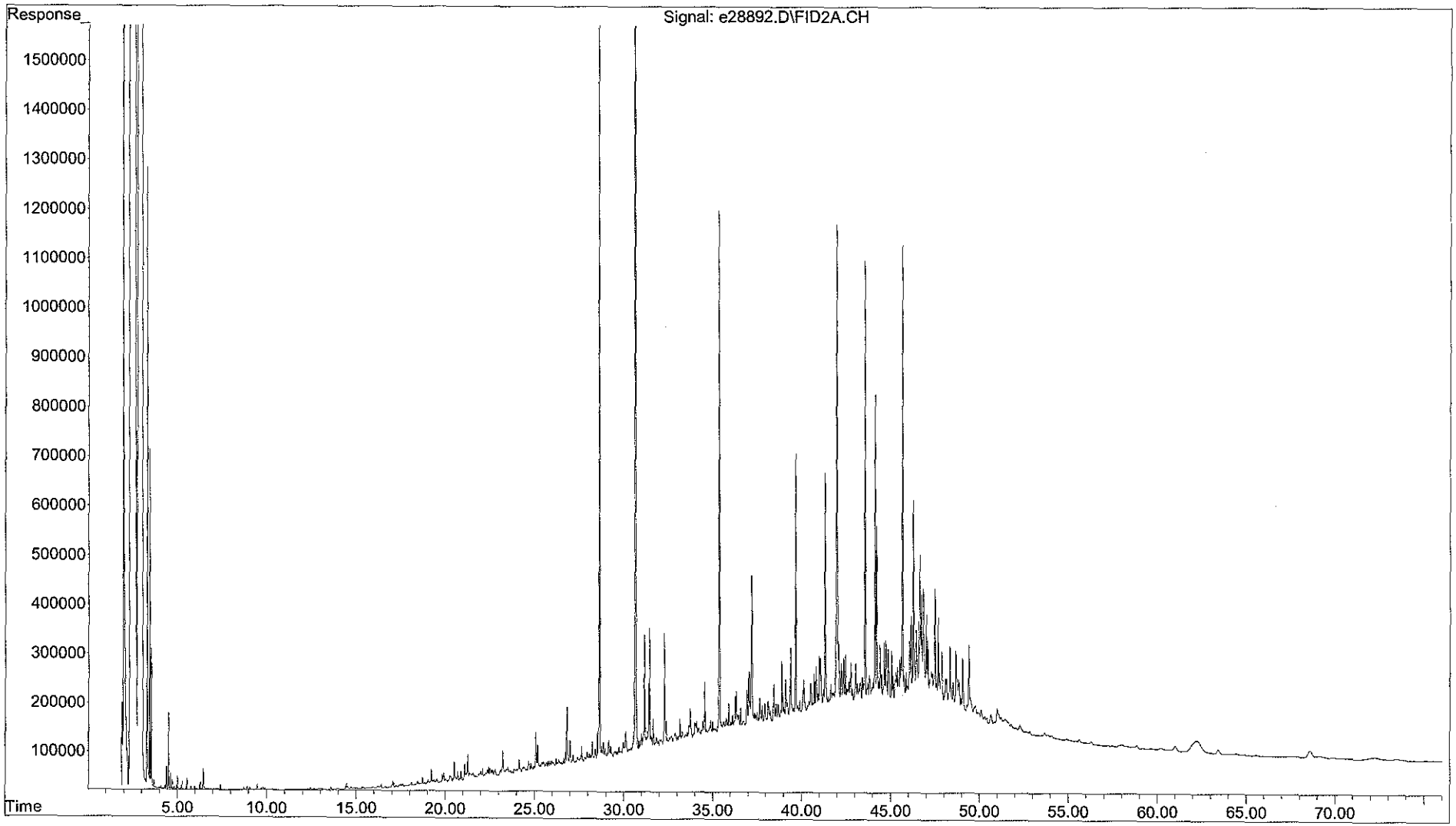
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.620	1322919	0.917	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.249	1296491	0.902	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.079	218868	0.161	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.282	554481	0.407	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	3911318915	2763.323	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	2866816240	2025.388	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	500240053	353.417	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28892.D
Operator : AC
Acquired : 12 Nov 2012 5:50 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-04
Misc Info : 1X
ALS Vial : 91



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL5**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-05**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.05	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.0227**	J	n-Tricosane (C23)	**0.438**	
n-Decane (C10)	**0.0433**	JB	n-Tetracosane (C24)	**0.191**	J
n-Undecane (C11)	**0.0329**	J	n-Pentacosane (C25)	**1.80**	G
n-Dodecane (C12)	**0.0445**	J	n-Hexacosane (C26)	**0.325**	
n-Tridecane (C13)	**0.0912**	J	n-Heptacosane (C27)	**2.48**	
2,6,10 Trimethyldodecane (1380)	**0.0522**	J	n-Octacosane (C28)	**0.367**	
n-Tetradecane (C14)	**0.168**	J	n-Nonacosane (C29)	**5.82**	
2,6,10 Trimethyltridecane (1470)	**0.201**	GJ	n-Triacontane (C30)	**0.429**	
n-Pentadecane (C15)	**0.211**	J	n-Hentriacontane (C31)	**2.27**	
n-Hexadecane (C16)	**0.250**		n-Dotriacontane (C32)	**0.249**	
Norpristane (1650)	**0.114**	J	n-Tritriacontane (C33)	**0.685**	
n-Heptadecane (C17)	**0.333**		n-Tetratriacontane (C34)	**0.701**	
Pristane	**0.296**		n-Pentatriacontane (C35)	**0.254**	
n-Octadecane (C18)	**0.626**	G	n-Hexatriacontane (C36)	**0.137**	J
Phytane	**0.281**	G	n-Heptatriacontane (C37)	**0.303**	
n-Nonadecane (C19)	**0.221**	J	n-Octatriacontane (C38)	**0.188**	J
n-Eicosane (C20)	**0.292**		n-Nonatriacontane (C39)	**0.0488**	J
n-Heneicosane (C21)	**0.245**		n-Tetracontane (C40)	**0.129**	J
n-Docosane (C22)	**0.196**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**20.5**
Total Petroleum Hydrocarbons (C9-C44)	**464**
Total Resolved Hydrocarbons	**85.4**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	82	40-125
d50-Tetracosane	84	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28894.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 8:49 am
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 92 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:41:02 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	71425455	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.636	31096006	20.613 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	41.23%#
24) s	d50-Tetracosane	35.359	25668315	21.002 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	42.00%#
	Target Compounds			
2) t	n-Octane (C8)	5.221	107981	0.094 ug/mL M4
3) t	n-Nonane (C9)	7.364	118105	0.100 ug/mL M4
4) t	n-Decane (C10)	9.812	233103	0.191 ug/mL M4
5) t	n-Undecane (C11)	12.306	179387	0.145 ug/mL M4
6) t	n-Dodecane (C12)	14.724	245373	0.196 ug/mL M4
7) t	n-Tridecane (C13)	17.024	507225	0.402 ug/mL M4
8) t	1380	18.702	292507	0.230 ug/mL M4
9) t	n-Tetradecane (C14)	19.201	940317	0.739 ug/mL M4
10) t	1470	20.486	1132603G	0.888 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1187192	0.931 ug/mL M4
12) t	n-Hexadecane (C16)	23.217	1417751	1.102 ug/mL M4
13) t	1650	24.127	640055	0.501 ug/mL M4
14) t	n-Heptadecane (C17)	25.072	1877373	1.469 ug/mL M4
15) t	Pristane	25.173	1701474	1.303 ug/mL M4
16) t	n-Octadecane (C18)	26.811	3607689G	2.760 ug/mL M4
17) t	Phytane	26.991	1601236G	1.238 ug/mL M4
18) t	n-Nonadecane (C19)	28.517	1270089	0.973 ug/mL M4
20) t	n-Eicosane (C20)	30.123	1696265	1.287 ug/mL M4
21) t	n-Heneicosane (C21)	31.653	1425894	1.078 ug/mL M4
22) t	n-Docosane (C22)	33.124	1144998	0.863 ug/mL M4
23) t	n-Tricosane (C23)	34.533	2603779	1.933 ug/mL M4
25) t	n-Tetracosane (C24)	35.890	1114404	0.841 ug/mL M4
26) t	n-Pentacosane (C25)	37.187	10735422G	7.954 ug/mL M4
27) t	n-Hexacosane (C26)	38.449	1921718	1.433 ug/mL M4
28) t	n-Heptacosane (C27)	39.664	14404854	10.953 ug/mL M4
29) t	n-Octacosane (C28)	40.830	2149496	1.618 ug/mL M4
30) t	n-Nonacosane (C29)	41.972	34051229	25.639 ug/mL M4
31) t	n-Triacontane (C30)	43.049	2481730	1.890 ug/mL M4
32) t	n-Hentriacontane (C31)	44.116	13281467	10.024 ug/mL M4
33) t	n-Dotriacontane (C32)	45.128	1449544	1.098 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	3807090	3.019 ug/mL M4
35) t	n-tetratriacontane (C34)	47.061	4025547	3.092 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.130	1482787	1.119 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.307	817037	0.603 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28894.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 8:49 am
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 92 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:41:02 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

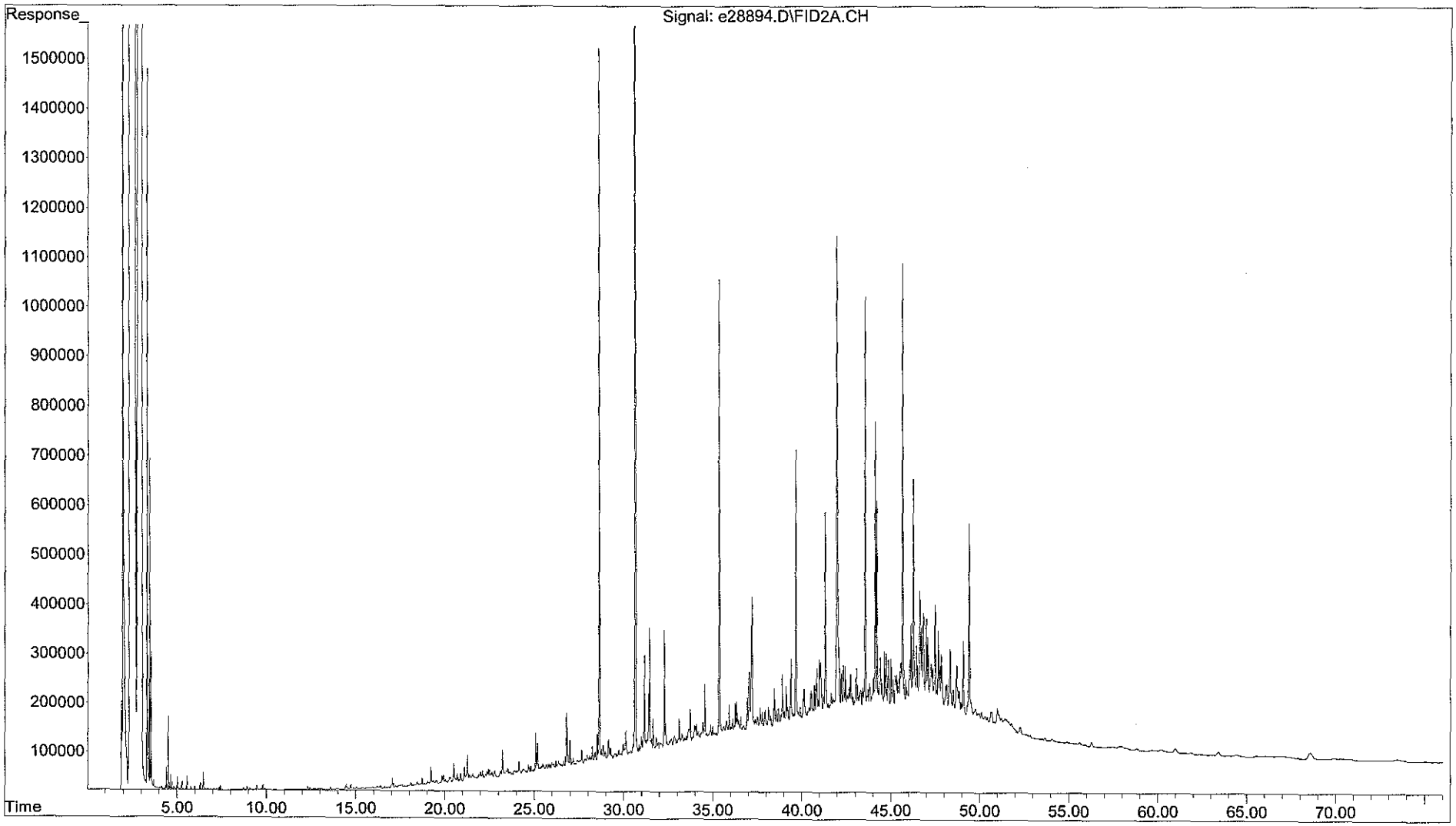
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.638	1770031	1.337	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.245	1095366	0.831	ug/mL	M4
40) t	n-Nonatriacontane (C39)	54.086	268612	0.215	ug/mL	M4
41) t	n-Tetracontane (C40)	56.268	709453	0.568	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	3703663481	2851.471	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	2659160806	2047.302	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	488781600	376.316	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28894.D
Operator : AC
Acquired : 12 Nov 2012 8:49 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-05
Misc Info : 1X
ALS Vial : 92



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL6**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-06**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00364**	J	n-Tricosane (C23)	**0.441**	
n-Decane (C10)	**0.0250**	JB	n-Tetracosane (C24)	**0.188**	J
n-Undecane (C11)	**0.0141**	JB	n-Pentacosane (C25)	**1.87**	G
n-Dodecane (C12)	**0.0168**	J	n-Hexacosane (C26)	**0.329**	
n-Tridecane (C13)	**0.0662**	J	n-Heptacosane (C27)	**2.70**	
2,6,10 Trimethyldodecane (1380)	**0.0660**	J	n-Octacosane (C28)	**0.372**	
n-Tetradecane (C14)	**0.151**	J	n-Nonacosane (C29)	**5.46**	
2,6,10 Trimethyltridecane (1470)	**0.242**	G	n-Triacontane (C30)	**0.487**	
n-Pentadecane (C15)	**0.200**	J	n-Hentriacontane (C31)	**2.51**	
n-Hexadecane (C16)	**0.232**		n-Dotriacontane (C32)	**0.241**	
Norpristane (1650)	**0.122**	J	n-Tritriacontane (C33)	**0.741**	
n-Heptadecane (C17)	**0.354**		n-Tetratriacontane (C34)	**0.615**	
Pristane	**0.271**		n-Pentatriacontane (C35)	**0.211**	J
n-Octadecane (C18)	**0.612**	GB	n-Hexatriacontane (C36)	**0.105**	J
Phytane	**0.274**	G	n-Heptatriacontane (C37)	**0.261**	
n-Nonadecane (C19)	**0.203**	J	n-Octatriacontane (C38)	**0.194**	J
n-Eicosane (C20)	**0.315**		n-Nonatriacontane (C39)	**0.0496**	J
n-Heneicosane (C21)	**0.232**		n-Tetracontane (C40)	**0.0892**	J
n-Docosane (C22)	**0.159**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**20.4**
Total Petroleum Hydrocarbons (C9-C44)	**538**
Total Resolved Hydrocarbons	**94.0**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	96	40-125
d50-Tetracosane	98	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28896.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:18 am
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 93 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:46:45 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	71889570	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.640	36563561	24.081 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	48.16%#
24) s	d50-Tetracosane	35.363	30113765	24.480 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	48.96%#
	Target Compounds			
2) t	n-Octane (C8)	5.221	23679	0.020 ug/mL M4
3) t	n-Nonane (C9)	7.366	19370	0.016 ug/mL M4
4) t	n-Decane (C10)	9.811	134923	0.110 ug/mL M4
5) t	n-Undecane (C11)	12.304	76704	0.062 ug/mL M4
6) t	n-Dodecane (C12)	14.725	93060	0.074 ug/mL M4
7) t	n-Tridecane (C13)	17.025	369452	0.291 ug/mL M4
8) t	1380	18.704	371812	0.290 ug/mL M4
9) t	n-Tetradecane (C14)	19.202	848370	0.662 ug/mL M4
10) t	1470	20.488	1363748G	1.062 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1129568	0.880 ug/mL M4
12) t	n-Hexadecane (C16)	23.216	1319860	1.020 ug/mL M4
13) t	1650	24.127	692620	0.538 ug/mL M4
14) t	n-Heptadecane (C17)	25.070	2002689	1.557 ug/mL M4
15) t	Pristane	25.168	1565364	1.191 ug/mL M4
16) t	n-Octadecane (C18)	26.810	3538536G	2.689 ug/mL M4
17) t	Phytane	26.993	1568896G	1.206 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1168723	0.890 ug/mL M4
20) t	n-Eicosane (C20)	30.121	1838656	1.386 ug/mL M4
21) t	n-Heneicosane (C21)	31.656	1355824	1.018 ug/mL M4
22) t	n-Docosane (C22)	33.126	930524	0.697 ug/mL M4
23) t	n-Tricosane (C23)	34.536	2625746	1.936 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	1102675	0.827 ug/mL M4
26) t	n-Pentacosane (C25)	37.188	11146177G	8.205 ug/mL M4
27) t	n-Hexacosane (C26)	38.449	1950829	1.445 ug/mL M4
28) t	n-Heptacosane (C27)	39.666	15683567	11.849 ug/mL M4
29) t	n-Octacosane (C28)	40.834	2186844	1.636 ug/mL M4
30) t	n-Nonacosane (C29)	41.974	32090354	24.006 ug/mL M4
31) t	n-Triacontane (C30)	43.050	2830304	2.141 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	14692343	11.017 ug/mL M4
33) t	n-Dotriacontane (C32)	45.134	1405421	1.058 ug/mL M4
34) t	n-Tritriacontane (C33)	46.133	4132654	3.256 ug/mL M4
35) t	n-tetratriacontane (C34)	47.060	3543807	2.704 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.133	1233178	0.925 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.273	627413	0.460 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28896.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:18 am
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 93 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:46:45 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

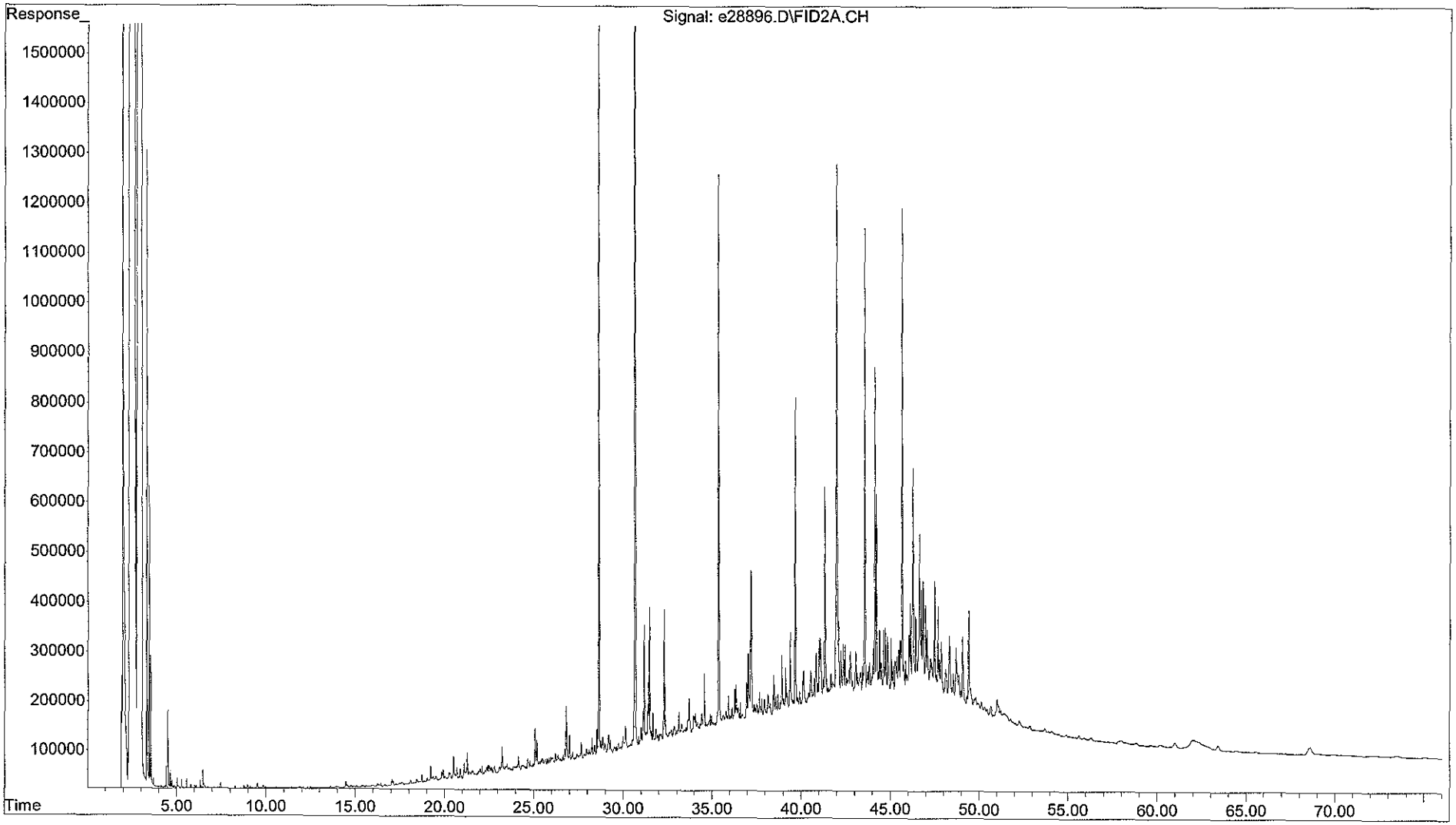
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.610	1526864	1.146	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.255	1131735	0.853	ug/mL	M4
40) t	n-Nonatriacontane (C39)	54.070	274563	0.218	ug/mL	M4
41) t	n-Tetracontane (C40)	56.271	492180	0.392	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	4136634517	3164.257	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	3092131842	2365.280	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	539803841	412.915	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28896.D
Operator : AC
Acquired : 12 Nov 2012 10:18 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-06
Misc Info : 1X
ALS Vial : 93



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **SEKR3510R018S092112D004_MDL7**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **1210083-07**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
09/21/12	09/25/12	11/06/12	11/12/12	58.6	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.00250**	J	n-Tricosane (C23)	**0.411**	
n-Decane (C10)	**0.0239**	JB	n-Tetracosane (C24)	**0.165**	J
n-Undecane (C11)	**0.0150**	JB	n-Pentacosane (C25)	**1.76**	G
n-Dodecane (C12)	**0.0205**	J	n-Hexacosane (C26)	**0.307**	
n-Tridecane (C13)	**0.0685**	J	n-Heptacosane (C27)	**2.60**	
2,6,10 Trimethyldodecane (1380)	**0.0610**	J	n-Octacosane (C28)	**0.338**	
n-Tetradecane (C14)	**0.142**	J	n-Nonacosane (C29)	**5.24**	
2,6,10 Trimethyltridecane (1470)	**0.220**	GJ	n-Triacontane (C30)	**0.436**	
n-Pentadecane (C15)	**0.200**	J	n-Hentriacontane (C31)	**2.37**	
n-Hexadecane (C16)	**0.222**	J	n-Dotriacontane (C32)	**0.206**	J
Norpristane (1650)	**0.114**	J	n-Tritriacontane (C33)	**0.638**	
n-Heptadecane (C17)	**0.319**		n-Tetratriacontane (C34)	**0.630**	
Pristane	**0.248**		n-Pentatriacontane (C35)	**0.228**	
n-Octadecane (C18)	**0.542**	GB	n-Hexatriacontane (C36)	**0.0997**	J
Phytane	**0.236**	G	n-Heptatriacontane (C37)	**0.224**	J
n-Nonadecane (C19)	**0.195**	J	n-Octatriacontane (C38)	**0.181**	J
n-Eicosane (C20)	**0.272**		n-Nonatriacontane (C39)	**0.0665**	J
n-Heneicosane (C21)	**0.207**	J	n-Tetracontane (C40)	**0.0899**	J
n-Docosane (C22)	**0.151**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**19.2**
Total Petroleum Hydrocarbons (C9-C44)	**499**
Total Resolved Hydrocarbons	**88.3**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	87	40-125
d50-Tetracosane	86	40-125

N/A - Not Applicable
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
G - Matrix Interference

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28898.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:48 am
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 94 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:49:00 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

Sub List : SHC - SHC

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.662	68340522	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.637	31452888	21.791 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.58%#
24) s	d50-Tetracosane	35.361	25166745	21.521 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.04%#
	Target Compounds			
2) t	n-Octane (C8)	5.213	25598	0.023 ug/mL M4
3) t	n-Nonane (C9)	7.360	12885	0.011 ug/mL M4
4) t	n-Decane (C10)	9.810	122314	0.105 ug/mL M4
5) t	n-Undecane (C11)	12.305	78204	0.066 ug/mL M4
6) t	n-Dodecane (C12)	14.724	108098	0.090 ug/mL M4
7) t	n-Tridecane (C13)	17.025	362678	0.301 ug/mL M4
8) t	1380	18.702	326781	0.268 ug/mL M4
9) t	n-Tetradecane (C14)	19.202	758082	0.622 ug/mL M4
10) t	1470	20.487	1179015G	0.966 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	1072507	0.879 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	1198057	0.974 ug/mL M4
13) t	1650	24.125	611239	0.500 ug/mL M4
14) t	n-Heptadecane (C17)	25.072	1713855	1.401 ug/mL M4
15) t	Pristane	25.169	1360517	1.089 ug/mL M4
16) t	n-Octadecane (C18)	26.814	2977671G	2.380 ug/mL M4
17) t	Phytane	26.993	1285779G	1.039 ug/mL M4
18) t	n-Nonadecane (C19)	28.519	1071356	0.858 ug/mL M4
20) t	n-Eicosane (C20)	30.121	1505554	1.194 ug/mL M4
21) t	n-Heneicosane (C21)	31.655	1150548	0.909 ug/mL M4
22) t	n-Docosane (C22)	33.125	843410	0.664 ug/mL M4
23) t	n-Tricosane (C23)	34.535	2326652	1.805 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	916179	0.723 ug/mL M4
26) t	n-Pentacosane (C25)	37.191	9986761G	7.733 ug/mL M4
27) t	n-Hexacosane (C26)	38.449	1727988	1.347 ug/mL M4
28) t	n-Heptacosane (C27)	39.667	14381467	11.429 ug/mL M4
29) t	n-Octacosane (C28)	40.831	1889493	1.487 ug/mL M4
30) t	n-Nonacosane (C29)	41.972	29250938	23.019 ug/mL M4
31) t	n-Triacontane (C30)	43.051	2409089	1.917 ug/mL M4
32) t	n-Hentriacontane (C31)	44.117	13181047	10.397 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	1143586	0.905 ug/mL M4
34) t	n-Tritriacontane (C33)	46.130	3384864	2.805 ug/mL M4
35) t	n-tetratriacontane (C34)	47.062	3450873	2.770 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.131	1267914	1.000 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.276	567676	0.438 ug/mL M4

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28898.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:48 am
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 94 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:49:00 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091205R
Blank File : e28910.D

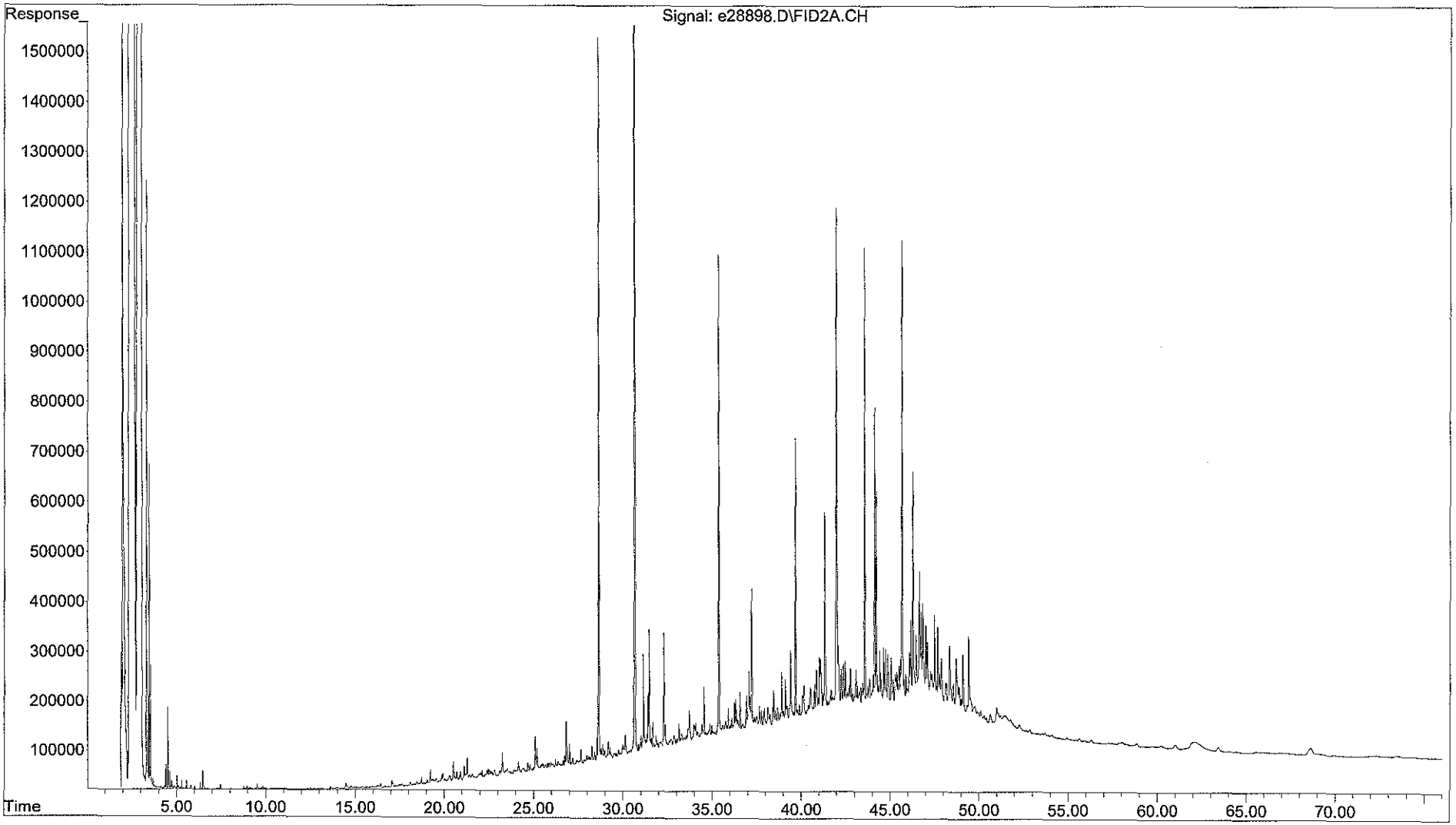
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.615	1247051	0.984	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.249	1001334	0.794	ug/mL	M4
40) t	n-Nonatriacontane (C39)	54.082	349177	0.292	ug/mL	M4
41) t	n-Tetracontane (C40)	56.278	471882	0.395	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	3770304315	3033.811	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	2725801640	2193.342	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	482288640	388.078	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28898.D
Operator : AC
Acquired : 12 Nov 2012 11:48 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : 1210083-07
Misc Info : 1X
ALS Vial : 94



Response Factor Report PAH2

Method Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Method File : HC2090412R.M
Title : FID Forensics
Last Update : Fri Sep 07 14:14:19 2012
Response Via : Initial Calibration

Calibration Files
1 =E27100.D 10 =E27102.D 50 =E27104.D 100 =E27106.D 200 =E27108.D 500 =E27110.D

		Compound	1	10	50	100	200	500	Avg	%RSD
1)	I	5-alpha-androstane	----------ISTD----------							
2)	t	n-Octane (C8)	0.811	0.826	0.805	0.799	0.784		0.805	1.89
3)	t	n-Nonane (C9)	0.827	0.841	0.820	0.824	0.802		0.823	1.70
4)	t	n-Decane (C10)	0.845	0.875	0.852	0.863	0.836		0.854	1.77
5)	t	n-Undecane (C11)	0.852	0.884	0.862	0.874	0.846		0.864	1.79
6)	t	n-Dodecane (C12)	0.860	0.900	0.878	0.891	0.861		0.878	2.06
7)	t	n-Tridecane (...	0.874	0.904	0.882	0.894	0.862		0.883	1.86
8)	t	1380	0.885	0.912	0.889	0.901	0.868		0.891	1.89
9)	t	n-Tetradecane...	0.885	0.912	0.889	0.901	0.868		0.891	1.89
10)	t	1470	0.900	0.912	0.889	0.899	0.865		0.893	1.98
11)	t	n-Pentadecane...	0.900	0.912	0.889	0.899	0.865		0.893	1.98
12)	t	n-Hexadecane ...	0.897	0.923	0.899	0.909	0.875		0.900	1.95
13)	t	1650	0.889	0.914	0.891	0.904	0.876		0.895	1.64
14)	t	n-Heptadecane...	0.889	0.914	0.891	0.904	0.876		0.895	1.64
15)	t	Pristane	0.917	0.943	0.915	0.921	0.874		0.914	2.72
16)	t	n-Octadecane ...	0.916	0.939	0.913	0.923	0.885		0.915	2.15
17)	t	Phytane	0.906	0.930	0.903	0.912	0.874		0.905	2.26
18)	t	n-Nonadecane ...	0.915	0.939	0.912	0.920	0.882		0.914	2.23
19)	s	ortho-terphenyl	1.059	1.146	0.999	1.018	0.983	1.131	1.056	6.50
20)	t	n-Eicosane (C20)	0.930	0.948	0.920	0.927	0.887		0.922	2.40
21)	t	n-Heneicosane...	0.952	0.950	0.919	0.925	0.885		0.926	2.96
22)	t	n-Docosane (C22)	0.939	0.957	0.927	0.931	0.890		0.929	2.64
23)	t	n-Tricosane (...	1.012	0.958	0.926	0.930	0.888		0.943	4.88
24)	s	d50-Tetracosane	0.856	0.953	0.833	0.811	0.780	0.901	0.856	7.35
25)	t	n-Tetracosane...	0.950	0.956	0.923	0.925	0.882		0.927	3.13
26)	t	n-Pentacosane...	0.962	0.977	0.943	0.943	0.900		0.945	3.07
27)	t	n-Hexacosane ...	0.959	0.972	0.936	0.935	0.891		0.939	3.27
28)	t	n-Heptacosane...	0.949	0.952	0.916	0.914	0.871		0.921	3.58
29)	t	n-Octacosane ...	0.961	0.963	0.924	0.922	0.879		0.930	3.68
30)	t	n-Nonacosane ...	0.954	0.965	0.925	0.923	0.881		0.930	3.51
31)	t	n-Triacontane...	0.953	0.952	0.911	0.910	0.870		0.919	3.77
32)	t	n-Hentriacont...	0.958	0.962	0.920	0.919	0.879		0.928	3.63
33)	t	n-Dotriaconta...	0.953	0.958	0.916	0.916	0.878		0.924	3.54
34)	t	n-Tritriacont...	0.910	0.915	0.874	0.876	0.839		0.883	3.48
35)	t	n-tetratriaco...	0.939	0.943	0.902	0.905	0.867		0.911	3.40
36)	t	n-Pentatriaco...	0.952	0.960	0.919	0.922	0.884		0.927	3.24
37)	t	n-Hexatriacon...	0.981	0.978	0.938	0.941	0.902		0.948	3.46
38)	t	n-Heptatriaco...	0.951	0.958	0.920	0.923	0.884		0.927	3.16
39)	t	n-Octatriacon...	0.952	0.951	0.915	0.918	0.879		0.923	3.26
40)	t	n-Nonatriacon...	0.899	0.901	0.867	0.870	0.834		0.874	3.15
41)	t	n-Tetracontan...	0.899	0.901	0.867	0.870	0.834		0.874	3.15
42)	h	C9-C44 Total ...	0.924	0.936	0.904	0.909	0.872		0.909	2.67
43)	h	C9-C40 Total ...	0.924	0.936	0.904	0.909	0.872		0.909	2.67
44)	h	C10-C28 DRO	0.924	0.936	0.904	0.909	0.872		0.909	2.67
45)	h	Total Resolve...	0.924	0.936	0.904	0.909	0.872		0.909	2.67

(#) = Out of Range

HC2090412R.M Fri Sep 07 14:43:18 2012

rfupdate

RSF Update Summary Report

Method Path.....: O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Method File.....: HC2090412R.M
Method Title.....: FID Forensics
Last Update.....: Fri Sep 07 13:35:53 2012

Generating Average Response Factor For: C9-C44 Total Petroleum Hydrocarbons

No	Compound	Level	Conc	Response
1	n-Nonane (C9)	1	1.00000	1058594.832
2	n-Decane (C10)	1	1.00000	1081680.094
3	n-Undecane (C11)	1	1.00000	1090605.419
4	n-Dodecane (C12)	1	1.00000	1100096.066
5	n-Tridecane (C13)	1	1.00000	1118594.131
6	n-Tetradecane (C14)	1	1.00000	1131811.217
7	n-Pentadecane (C15)	1	1.00000	1152025.742
8	n-Hexadecane (C16)	1	1.00000	1147414.030
9	n-Heptadecane (C17)	1	1.00000	1137165.347
10	Pristane	1	1.00000	1173645.774
11	n-Octadecane (C18)	1	1.00000	1172041.065
12	Phytane	1	1.00000	1159670.706
13	n-Nonadecane (C19)	1	1.00000	1170948.694
14	n-Eicosane (C20)	1	1.00000	1189205.460
15	n-Heneicosane (C21)	1	1.00000	1218462.382
16	n-Docosane (C22)	1	1.00000	1200777.971
17	n-Tricosane (C23)	1	1.00000	1295230.182
18	n-Tetracosane (C24)	1	1.00000	1215267.007
19	n-Pentacosane (C25)	1	1.00000	1230493.463
20	n-Hexacosane (C26)	1	1.00000	1227506.722
21	n-Heptacosane (C27)	1	1.00000	1214572.774
22	n-Octacosane (C28)	1	1.00000	1229079.729
23	n-Nonacosane (C29)	1	1.00000	1220303.287
24	n-Triacontane (C30)	1	1.00000	1219155.295
25	n-Hentriacontane (C31)	1	1.00000	1225588.003
26	n-Dotriacontane (C32)	1	1.00000	1219518.985
27	n-Tritriacontane (C33)	1	1.00000	1163577.647
28	n-tetratriacontane (C34)	1	1.00000	1201629.642
29	n-Pentatriacontane (C35)	1	1.00000	1217652.701
30	n-Hexatriacontane (C36)	1	1.00000	1255297.278
31	n-Heptatriacontane (C37)	1	1.00000	1216439.627
32	n-Octatriacontane (C38)	1	1.00000	1217319.017
33	n-Tetracontane (C40)	1	1.00000	1150188.078
Avg RSF For: C9-C44 Total Petroleum			1.00000	1182471.466
1	n-Nonane (C9)	2	10.00000	10984036.148
2	n-Decane (C10)	2	10.00000	11426913.435
3	n-Undecane (C11)	2	10.00000	11541092.695
4	n-Dodecane (C12)	2	10.00000	11759368.321
5	n-Tridecane (C13)	2	10.00000	11803720.967
6	n-Tetradecane (C14)	2	10.00000	11918135.542
7	n-Pentadecane (C15)	2	10.00000	11911917.164
8	n-Hexadecane (C16)	2	10.00000	12051235.427
9	n-Heptadecane (C17)	2	10.00000	11942187.715

			rfupdate	
10	Pristane	2	10.00000	12312714.192
11	n-Octadecane (C18)	2	10.00000	12267744.016
12	Phytane	2	10.00000	12154748.453
13	n-Nonadecane (C19)	2	10.00000	12262858.725
14	n-Eicosane (C20)	2	10.00000	12385892.855
15	n-Heneicosane (C21)	2	10.00000	12409357.102
16	n-Docosane (C22)	2	10.00000	12501279.532
17	n-Tricosane (C23)	2	10.00000	12518262.662
18	n-Tetracosane (C24)	2	10.00000	12486435.610
19	n-Pentacosane (C25)	2	10.00000	12760359.164
20	n-Hexacosane (C26)	2	10.00000	12692005.077
21	n-Heptacosane (C27)	2	10.00000	12441614.096
22	n-Octacosane (C28)	2	10.00000	12578571.784
23	n-Nonacosane (C29)	2	10.00000	12608505.444
24	n-Triacontane (C30)	2	10.00000	12441268.160
25	n-Hentriacontane (C31)	2	10.00000	12562193.326
26	n-Dotriacontane (C32)	2	10.00000	12516087.109
27	n-Tritriacontane (C33)	2	10.00000	11955175.333
28	n-tetratriacontane (C34)	2	10.00000	12319701.907
29	n-Pentatriacontane (C35)	2	10.00000	12536902.969
30	n-Hexatriacontane (C36)	2	10.00000	12781199.118
31	n-Heptatriacontane (C37)	2	10.00000	12507537.054
32	n-Octatriacontane (C38)	2	10.00000	12423624.790
33	n-Tetracontane (C40)	2	10.00000	11764410.929
Avg RSF For: C9-C44 Total Petroleum			10.00000	12228092.631

1	n-Nonane (C9)	3	50.00000	51431899.250
2	n-Decane (C10)	3	50.00000	53477708.452
3	n-Undecane (C11)	3	50.00000	54086162.221
4	n-Dodecane (C12)	3	50.00000	55112695.928
5	n-Tridecane (C13)	3	50.00000	55323499.897
6	n-Tetradecane (C14)	3	50.00000	55819898.370
7	n-Pentadecane (C15)	3	50.00000	55798198.582
8	n-Hexadecane (C16)	3	50.00000	56395639.587
9	n-Heptadecane (C17)	3	50.00000	55912409.212
10	Pristane	3	50.00000	57437430.240
11	n-Octadecane (C18)	3	50.00000	57286525.276
12	Phytane	3	50.00000	56698111.863
13	n-Nonadecane (C19)	3	50.00000	57214049.606
14	n-Eicosane (C20)	3	50.00000	57746295.867
15	n-Heneicosane (C21)	3	50.00000	57661836.730
16	n-Docosane (C22)	3	50.00000	58144372.499
17	n-Tricosane (C23)	3	50.00000	58140566.950
18	n-Tetracosane (C24)	3	50.00000	57910263.550
19	n-Pentacosane (C25)	3	50.00000	59153058.151
20	n-Hexacosane (C26)	3	50.00000	58717976.872
21	n-Heptacosane (C27)	3	50.00000	57481187.004
22	n-Octacosane (C28)	3	50.00000	58008772.195
23	n-Nonacosane (C29)	3	50.00000	58069091.972
24	n-Triacontane (C30)	3	50.00000	57200513.657
25	n-Hentriacontane (C31)	3	50.00000	57723927.186
26	n-Dotriacontane (C32)	3	50.00000	57470436.162
27	n-Tritriacontane (C33)	3	50.00000	54868096.236
28	n-tetratriacontane (C34)	3	50.00000	56607059.512
29	n-Pentatriacontane (C35)	3	50.00000	57676295.954
30	n-Hexatriacontane (C36)	3	50.00000	58855677.139
31	n-Heptatriacontane (C37)	3	50.00000	57717954.923
32	n-Octatriacontane (C38)	3	50.00000	57409255.550
33	n-Tetracontane (C40)	3	50.00000	54429678.824
Avg RSF For: C9-C44 Total Petroleum			50.00000	56757168.043

1	n-Nonane (C9)	4	100.00000	111752271.345
2	n-Decane (C10)	4	100.00000	116984897.373
3	n-Undecane (C11)	4	100.00000	118514867.736
4	n-Dodecane (C12)	4	100.00000	120843203.816
5	n-Tridecane (C13)	4	100.00000	121149783.816
6	n-Tetradecane (C14)	4	100.00000	122139240.252
7	n-Pentadecane (C15)	4	100.00000	121857533.730
8	n-Hexadecane (C16)	4	100.00000	123242271.456
9	n-Heptadecane (C17)	4	100.00000	122526770.850
10	Pristane	4	100.00000	124809058.330
11	n-Octadecane (C18)	4	100.00000	125112512.642
12	Phytane	4	100.00000	123586542.283
13	n-Nonadecane (C19)	4	100.00000	124732127.711
14	n-Eicosane (C20)	4	100.00000	125691042.797
15	n-Heneicosane (C21)	4	100.00000	125366878.886
16	n-Docosane (C22)	4	100.00000	126233873.550
17	n-Tricosane (C23)	4	100.00000	126131442.518
18	n-Tetracosane (C24)	4	100.00000	125399621.174
19	n-Pentacosane (C25)	4	100.00000	127879101.521
20	n-Hexacosane (C26)	4	100.00000	126799057.051
21	n-Heptacosane (C27)	4	100.00000	123932414.032
22	n-Octacosane (C28)	4	100.00000	125029911.858
23	n-Nonacosane (C29)	4	100.00000	125125083.556
24	n-Triacontane (C30)	4	100.00000	123385317.523
25	n-Hentriacontane (C31)	4	100.00000	124529688.560
26	n-Dotriacontane (C32)	4	100.00000	124184813.333
27	n-Tritriacontane (C33)	4	100.00000	118737875.555
28	n-tetratriacontane (C34)	4	100.00000	122711891.431
29	n-Pentatriacontane (C35)	4	100.00000	125058476.886
30	n-Hexatriacontane (C36)	4	100.00000	127622682.143
31	n-Heptatriacontane (C37)	4	100.00000	125075125.481
32	n-Octatriacontane (C38)	4	100.00000	124388237.286
33	n-Tetracontane (C40)	4	100.00000	117936987.855
Avg RSF For: C9-C44 Total Petroleum			100.00000	123286988.010

1	n-Nonane (C9)	5	200.00000	218945844.183
2	n-Decane (C10)	5	200.00000	228110991.458
3	n-Undecane (C11)	5	200.00000	230818796.408
4	n-Dodecane (C12)	5	200.00000	234831426.459
5	n-Tridecane (C13)	5	200.00000	235100149.350
6	n-Tetradecane (C14)	5	200.00000	236826645.070
7	n-Pentadecane (C15)	5	200.00000	236005456.586
8	n-Hexadecane (C16)	5	200.00000	238720267.241
9	n-Heptadecane (C17)	5	200.00000	239070404.726
10	Pristane	5	200.00000	238512894.131
11	n-Octadecane (C18)	5	200.00000	241489233.828
12	Phytane	5	200.00000	238431706.212
13	n-Nonadecane (C19)	5	200.00000	240747450.530
14	n-Eicosane (C20)	5	200.00000	242168551.102
15	n-Heneicosane (C21)	5	200.00000	241506941.187
16	n-Docosane (C22)	5	200.00000	242910758.874
17	n-Tricosane (C23)	5	200.00000	242370056.561
18	n-Tetracosane (C24)	5	200.00000	240808405.475
19	n-Pentacosane (C25)	5	200.00000	245473132.745
20	n-Hexacosane (C26)	5	200.00000	243267757.250
21	n-Heptacosane (C27)	5	200.00000	237743444.733
22	n-Octacosane (C28)	5	200.00000	239982573.735
23	n-Nonacosane (C29)	5	200.00000	240486580.739
24	n-Triacontane (C30)	5	200.00000	237389922.184

		rfupdate		
25	n-Hentriacontane (C31)	5	200.00000	239996685.433
26	n-Dotriacontane (C32)	5	200.00000	239559495.241
27	n-Tritriacontane (C33)	5	200.00000	229022990.546
28	n-tetratriacontane (C34)	5	200.00000	236682062.459
29	n-Pentatriacontane (C35)	5	200.00000	241226825.797
30	n-Hexatriacontane (C36)	5	200.00000	246080144.446
31	n-Heptatriacontane (C37)	5	200.00000	241177910.897
32	n-Octatriacontane (C38)	5	200.00000	239930610.526
33	n-Tetracontane (C40)	5	200.00000	227487481.370
Avg RSF For: C9-C44 Total Petroleum			200.00000	237966169.621

Generating Reference Response Factors

No	Compound	No	Refrence Compound
8	1380	9	n-Tetradecane (C14)
10	1470	11	n-Pentadecane (C15)
13	1650	14	n-Heptadecane (C17)
40	n-Nonatriacontane (C39)	41	n-Tetracontane (C40)
43	C9-C40 Total Petroleum Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons
44	C10-C28 DRO	42	C9-C44 Total Petroleum Hydrocarbons
45	Total Resolved Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons

Abacus Response Factor Update Macro Ver. 1.0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27100.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 4:46 pm
Operator : AC
Sample : I209041201R
Misc : WHAO93
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 11:46:48 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

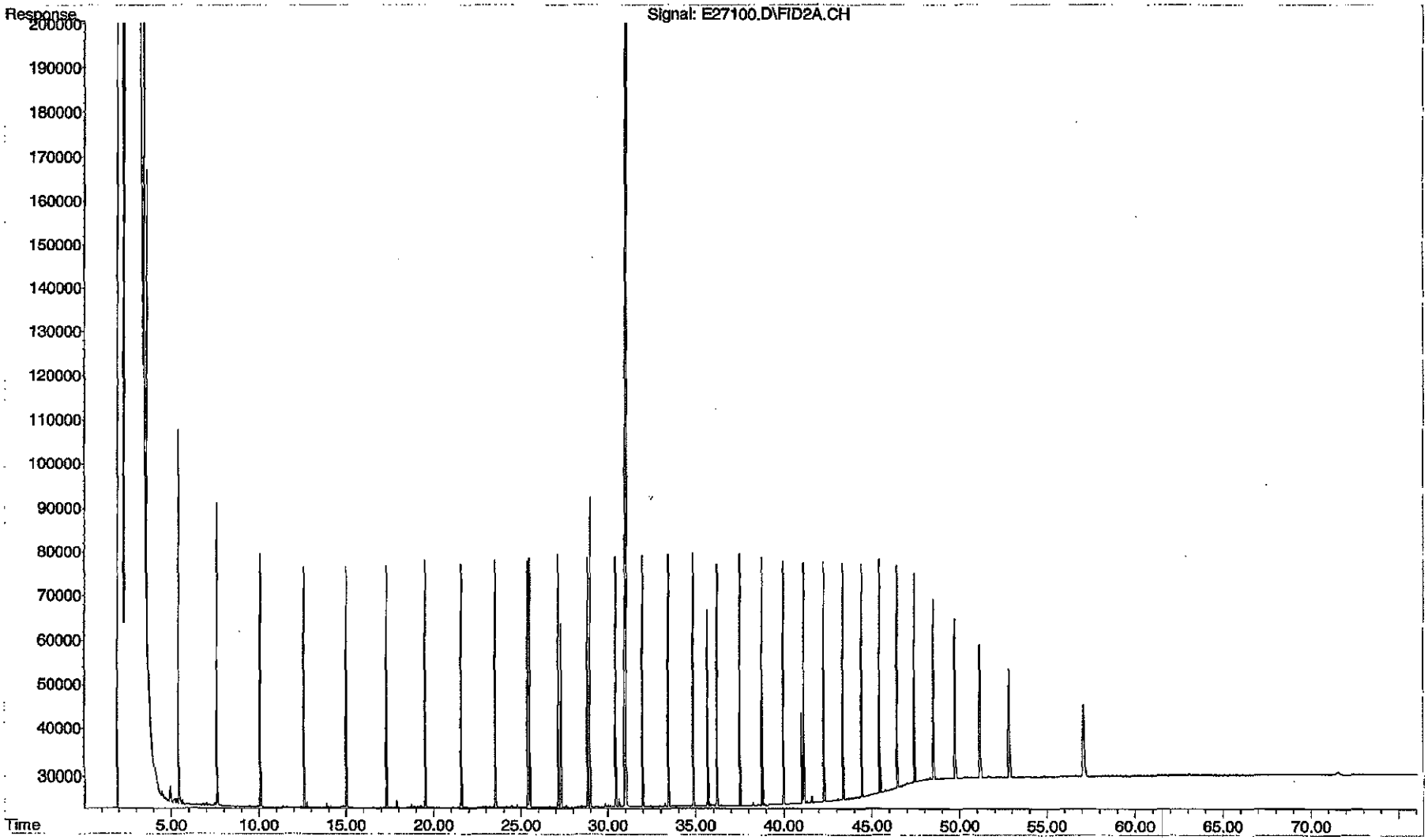
Sub List : CCAL - CCAL

9-7-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.020	63967821	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.981	1355313	1.013 ug/mL M4
Spiked Amount	50.000 Range 50 - 130	Recovery =	2.03%#	
24) s	d50-Tetracosane	35.663	1095582	0.986 ug/mL M4
Spiked Amount	50.000 Range 50 - 130	Recovery =	1.97%#	
	Target Compounds			
2) t	n-Octane (C8)	5.423	1037454	0.997 ug/mL M4
3) t	n-Nonane (C9)	7.608	1058595	1.003 ug/mL M4
4) t	n-Decane (C10)	10.084	1081680	0.991 ug/mL M4
5) t	n-Undecane (C11)	12.592	1090605	0.994 ug/mL M4
6) t	n-Dodecane (C12)	15.017	1100096	0.983 ug/mL M4
7) t	n-Tridecane (C13)	17.323	1118594	0.991 ug/mL M4
9) t	n-Tetradecane (C14)	19.505	1131811	0.995 ug/mL M4
11) t	n-Pentadecane (C15)	21.569	1152026	1.010 ug/mL M4
12) t	n-Hexadecane (C16)	23.525	1147414	0.992 ug/mL M4
14) t	n-Heptadecane (C17)	25.381	1137165	0.999 ug/mL M4
15) t	Pristane	25.492	1173646	0.986 ug/mL M4
16) t	n-Octadecane (C18)	27.146	1172041	0.997 ug/mL M4
17) t	Phytane	27.310	1159671	0.990 ug/mL M4
18) t	n-Nonadecane (C19)	28.830	1170949	0.987 ug/mL M4
20) t	n-Eicosane (C20)	30.435	1189205	1.000 ug/mL M4
21) t	n-Heneicosane (C21)	31.968	1218462	1.024 ug/mL M4
22) t	n-Docosane (C22)	33.440	1200778	0.998 ug/mL M4
23) t	n-Tricosane (C23)	34.850	1295230	1.056 ug/mL M4
25) t	n-Tetracosane (C24)	36.206	1215267	1.004 ug/mL M4
26) t	n-Pentacosane (C25)	37.506	1230493	0.997 ug/mL M4
27) t	n-Hexacosane (C26)	38.761	1227507	1.000 ug/mL M4
28) t	n-Heptacosane (C27)	39.972	1214573	1.003 ug/mL M4
29) t	n-Octacosane (C28)	41.138	1229080	1.005 ug/mL M4
30) t	n-Nonacosane (C29)	42.269	1220303	0.992 ug/mL M4
31) t	n-Triacontane (C30)	43.358	1219155	1.000 ug/mL M4
32) t	n-Hentriacontane (C31)	44.415	1225588	0.990 ug/mL M4
33) t	n-Dotriacontane (C32)	45.439	1219519	0.986 ug/mL M4
34) t	n-Tritriacontane (C33)	46.431	1163578	0.980 ug/mL M4
35) t	n-tetratriacontane (C34)	47.414	1201630	0.977 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.499	1217653	0.970 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.738	1255297	0.980 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.167	1216440	0.966 ug/mL M4
39) t	n-Octatriacontane (C38)	52.830	1217319	0.969 ug/mL M4
41) t	n-Tetracontane (C40)	57.089	1150188	0.964 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27100.D
Operator : AC
Acquired : 04 Sep 2012 4:46 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041201R
Misc Info : WHAO93
ALS Vial : 56



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27102.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 6:18 pm
Operator : AC
Sample : I209041202R
Misc : WHAP92
ALS Vial : 57 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 12:31:19 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

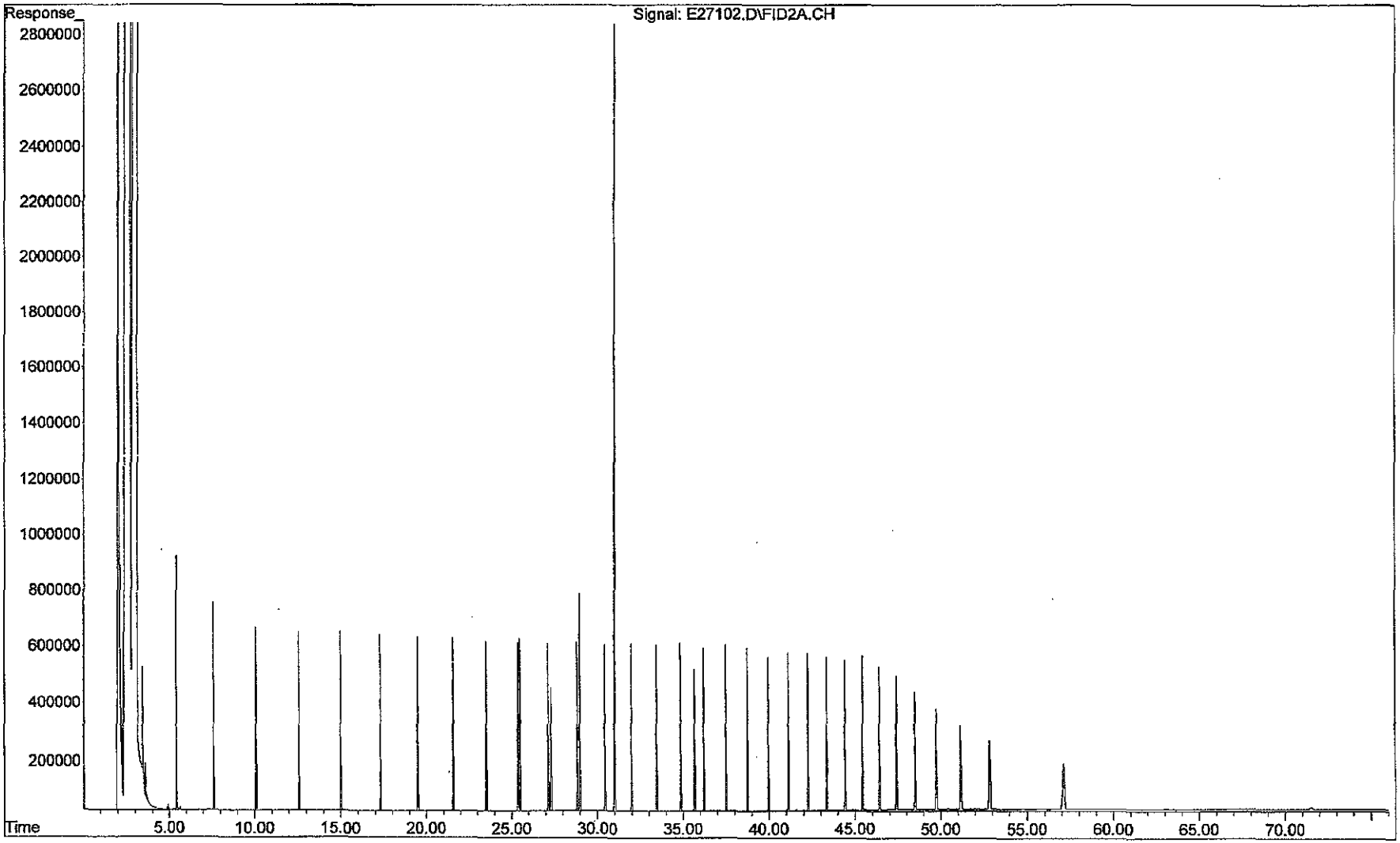
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.021	65313442	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.987	14965081	10.953 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	21.91%#
24) s	d50-Tetracosane	35.669	12446669	10.975 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	21.95%#
	Target Compounds			
2) t	n-Octane (C8)	5.429	10787663	10.152 ug/mL M4
3) t	n-Nonane (C9)	7.611	10984036	10.192 ug/mL M4
4) t	n-Decane (C10)	10.088	11426913	10.253 ug/mL M4
5) t	n-Undecane (C11)	12.595	11541093	10.300 ug/mL M4
6) t	n-Dodecane (C12)	15.021	11759368	10.295 ug/mL M4
7) t	n-Tridecane (C13)	17.327	11803721	10.240 ug/mL M4
9) t	n-Tetradecane (C14)	19.509	11918136	10.260 ug/mL M4
11) t	n-Pentadecane (C15)	21.573	11911917	10.224 ug/mL M4
12) t	n-Hexadecane (C16)	23.529	12051235	10.202 ug/mL M4
14) t	n-Heptadecane (C17)	25.385	11942188	10.280 ug/mL M4
15) t	Pristane	25.496	12312714	10.129 ug/mL M4
16) t	n-Octadecane (C18)	27.151	12267744	10.217 ug/mL M4
17) t	Phytane	27.314	12154748	10.167 ug/mL M4
18) t	n-Nonadecane (C19)	28.836	12262859	10.121 ug/mL M4
20) t	n-Eicosane (C20)	30.440	12385893	10.206 ug/mL M4
21) t	n-Heneicosane (C21)	31.974	12409357	10.210 ug/mL M4
22) t	n-Docosane (C22)	33.445	12501280	10.177 ug/mL M4
23) t	n-Tricosane (C23)	34.856	12518263	9.998 ug/mL M4
25) t	n-Tetracosane (C24)	36.209	12486436	10.102 ug/mL M4
26) t	n-Pentacosane (C25)	37.514	12760359	10.128 ug/mL M4
27) t	n-Hexacosane (C26)	38.769	12692005	10.124 ug/mL M4
28) t	n-Heptacosane (C27)	39.978	12441614	10.067 ug/mL M4
29) t	n-Octacosane (C28)	41.145	12578572	10.074 ug/mL M4
30) t	n-Nonacosane (C29)	42.273	12608505	10.041 ug/mL M4
31) t	n-Triacontane (C30)	43.365	12441268	9.998 ug/mL M4
32) t	n-Hentriacontane (C31)	44.423	12562193	9.941 ug/mL M4
33) t	n-Dotriacontane (C32)	45.443	12516087	9.914 ug/mL M4
34) t	n-Tritriacontane (C33)	46.436	11955175	9.860 ug/mL M4
35) t	n-tetratriacontane (C34)	47.421	12319702	9.810 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.509	12536903	9.781 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.746	12781199	9.768 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.176	12507537	9.727 ug/mL M4
39) t	n-Octatriacontane (C38)	52.842	12423625	9.686 ug/mL M4
41) t	n-Tetracontane (C40)	57.111	11764411	9.660 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27102.D
Operator : AC
Acquired : 04 Sep 2012 6:18 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041202R
Misc Info : WHAP92
ALS Vial : 57



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27104.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 7:50 pm
Operator : AC
Sample : I209041203R
Misc : WHAQ26
ALS Vial : 58 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 12:44:59 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

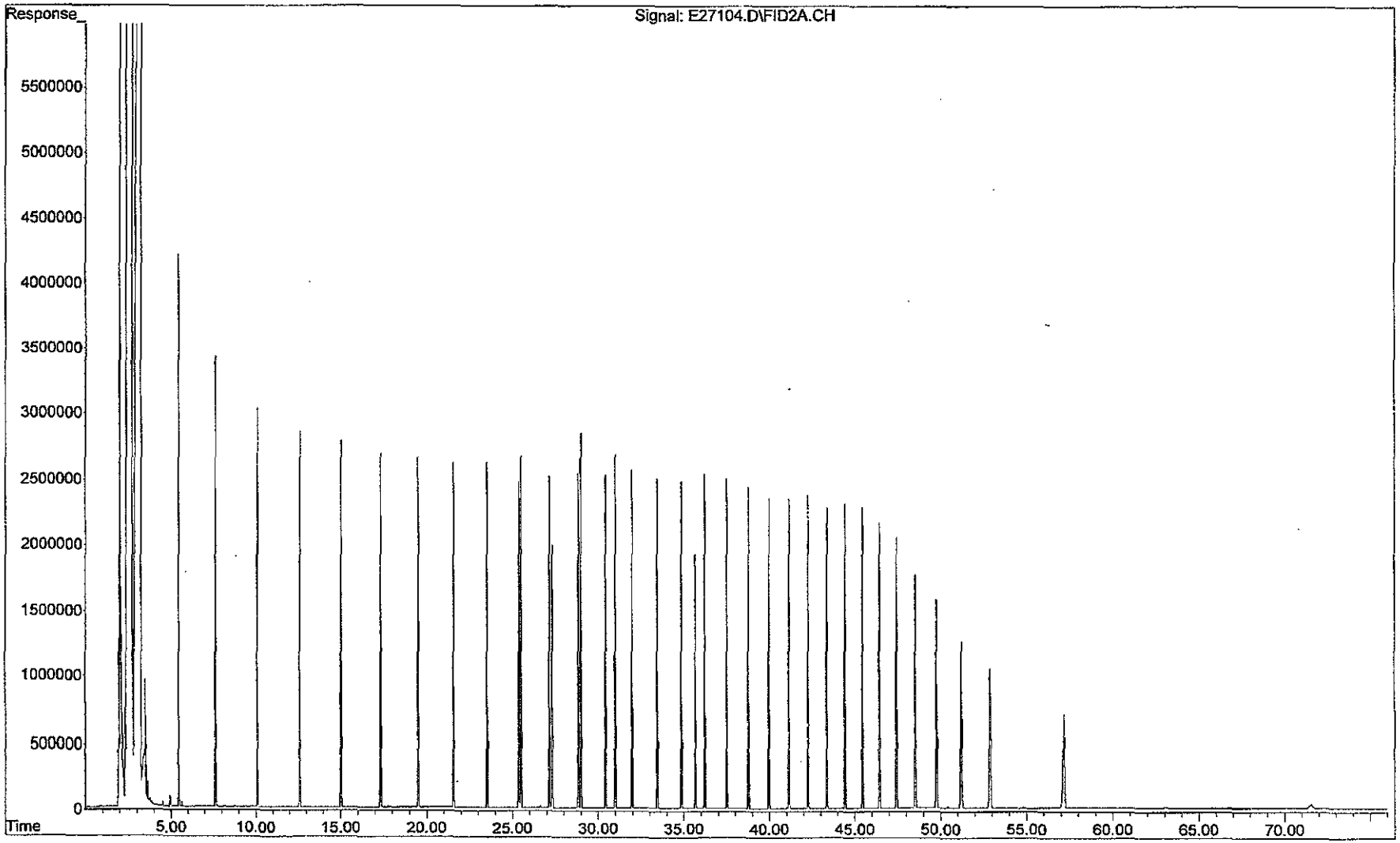
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.022	62756803	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.010	62693889	47.757 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	95.51%
24) s	d50-Tetracosane	35.687	52247168	47.945 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	95.89%
	Target Compounds			
2) t	n-Octane (C8)	5.453	50532455	49.490 ug/mL M4
3) t	n-Nonane (C9)	7.629	51431899	49.669 ug/mL M4
4) t	n-Decane (C10)	10.104	53477708	49.937 ug/mL M4
5) t	n-Undecane (C11)	12.610	54086162	50.236 ug/mL M4
6) t	n-Dodecane (C12)	15.035	55112696	50.215 ug/mL M4
7) t	n-Tridecane (C13)	17.343	55323500	49.950 ug/mL M4
9) t	n-Tetradecane (C14)	19.525	55819898	50.011 ug/mL M4
11) t	n-Pentadecane (C15)	21.590	55798199	49.844 ug/mL M4
12) t	n-Hexadecane (C16)	23.547	56395640	49.688 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	55912409	50.090 ug/mL M4
15) t	Pristane	25.517	57437430	49.177 ug/mL M4
16) t	n-Octadecane (C18)	27.170	57286525	49.653 ug/mL M4
17) t	Phytane	27.336	56698112	49.359 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	57214050	49.147 ug/mL M4
20) t	n-Eicosane (C20)	30.460	57746296	49.519 ug/mL M4
21) t	n-Heneicosane (C21)	31.995	57661837	49.376 ug/mL M4
22) t	n-Docosane (C22)	33.466	58144372	49.262 ug/mL M4
23) t	n-Tricosane (C23)	34.876	58140567	48.328 ug/mL M4
25) t	n-Tetracosane (C24)	36.233	57910264	48.762 ug/mL M4
26) t	n-Pentacosane (C25)	37.536	59153058	48.864 ug/mL M4
27) t	n-Hexacosane (C26)	38.791	58717977	48.747 ug/mL M4
28) t	n-Heptacosane (C27)	40.000	57481187	48.405 ug/mL M4
29) t	n-Octacosane (C28)	41.169	58008772	48.351 ug/mL M4
30) t	n-Nonacosane (C29)	42.297	58069092	48.126 ug/mL M4
31) t	n-Triacontane (C30)	43.386	57200514	47.840 ug/mL M4
32) t	n-Hentriacontane (C31)	44.446	57723927	47.541 ug/mL M4
33) t	n-Dotriacontane (C32)	45.469	57470436	47.378 ug/mL M4
34) t	n-Tritriacontane (C33)	46.459	54868096	47.094 ug/mL M4
35) t	n-tetratriacontane (C34)	47.446	56607060	46.909 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.539	57676296	46.830 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.783	58855677	46.815 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.219	57717955	46.716 ug/mL M4
39) t	n-Octatriacontane (C38)	52.895	57409256	46.580 ug/mL M4
41) t	n-Tetracontane (C40)	57.178	54429679	46.515 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27104.D
Operator : AC
Acquired : 04 Sep 2012 7:50 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041203R
Misc Info : WHAQ26
ALS Vial : 58



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27106.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 9:22 pm
Operator : AC
Sample : I209041204R
Misc : WHA095
ALS Vial : 59 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:07:59 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

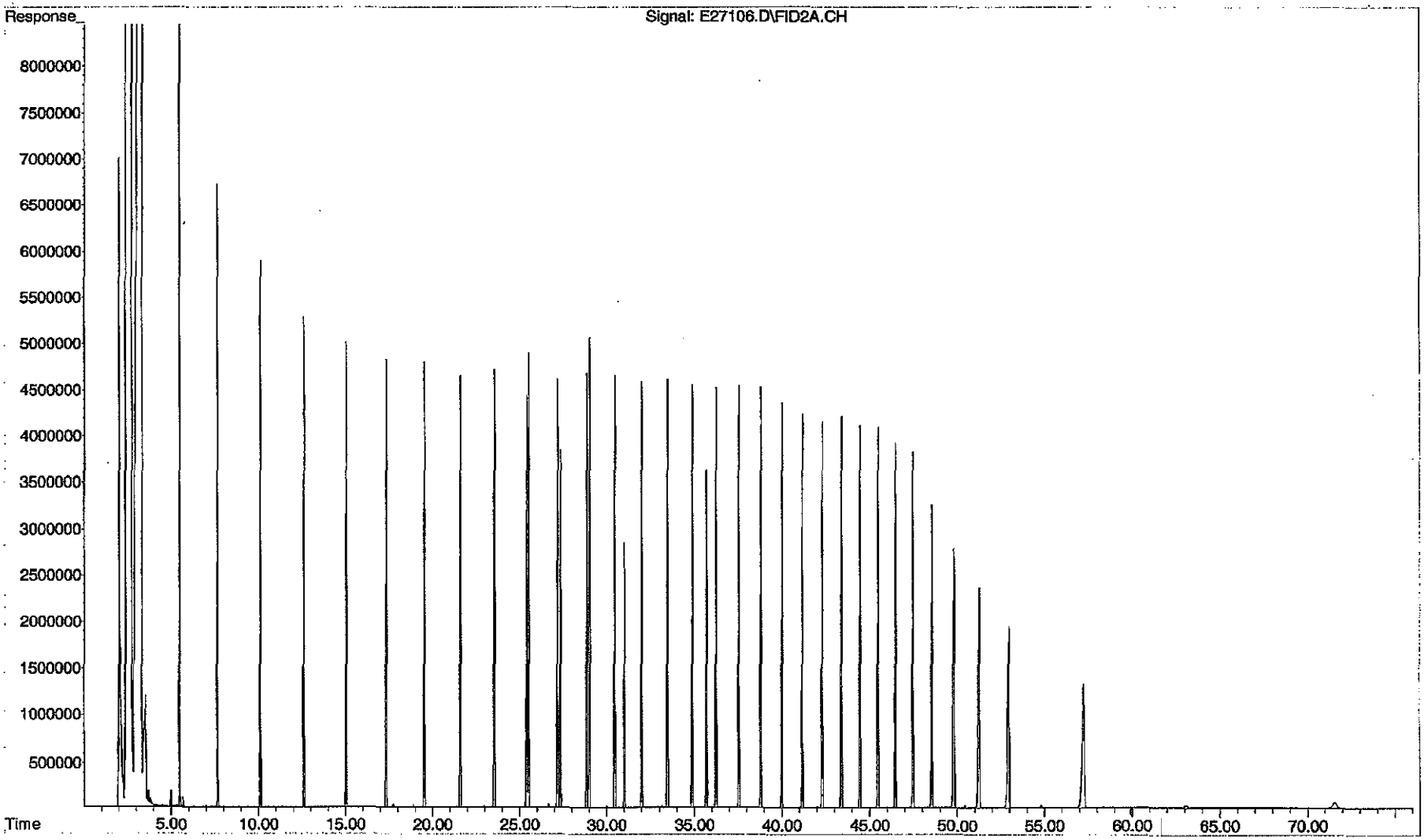
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.027	67785779	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.035	138056751	97.363 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	194.73%#
24) s	d50-Tetracosane	35.709	109892560	93.362 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	186.72%#
	Target Compounds			
2) t	n-Octane (C8)	5.486	108325396	98.220 ug/mL M4
3) t	n-Nonane (C9)	7.654	111752271	99.915 ug/mL M4
4) t	n-Decane (C10)	10.122	116984897	101.135 ug/mL M4
5) t	n-Undecane (C11)	12.626	118514868	101.911 ug/mL M4
6) t	n-Dodecane (C12)	15.051	120843204	101.935 ug/mL M4
7) t	n-Tridecane (C13)	17.357	121149784	101.267 ug/mL M4
9) t	n-Tetradecane (C14)	19.541	122139240	101.311 ug/mL M4
11) t	n-Pentadecane (C15)	21.608	121857534	100.779 ug/mL M4
12) t	n-Hexadecane (C16)	23.565	123242271	100.529 ug/mL M4
14) t	n-Heptadecane (C17)	25.424	122526771	101.625 ug/mL M4
15) t	Pristane	25.539	124809058	98.931 ug/mL M4
16) t	n-Octadecane (C18)	27.193	125112513	100.395 ug/mL M4
17) t	Phytane	27.360	123586542	99.608 ug/mL M4
18) t	n-Nonadecane (C19)	28.879	124732128	99.195 ug/mL M4
20) t	n-Eicosane (C20)	30.483	125691043	99.787 ug/mL M4
21) t	n-Heneicosane (C21)	32.018	125366879	99.387 ug/mL M4
22) t	n-Docosane (C22)	33.488	126233874	99.015 ug/mL M4
23) t	n-Tricosane (C23)	34.900	126131443	97.066 ug/mL M4
25) t	n-Tetracosane (C24)	36.258	125399621	97.756 ug/mL M4
26) t	n-Pentacosane (C25)	37.561	127879102	97.799 ug/mL M4
27) t	n-Hexacosane (C26)	38.816	126799057	97.457 ug/mL M4
28) t	n-Heptacosane (C27)	40.026	123932414	96.620 ug/mL M4
29) t	n-Octacosane (C28)	41.194	125029912	96.483 ug/mL M4
30) t	n-Nonacosane (C29)	42.322	125125084	96.008 ug/mL M4
31) t	n-Triacontane (C30)	43.414	123385318	95.538 ug/mL M4
32) t	n-Hentriacontane (C31)	44.471	124529689	94.952 ug/mL M4
33) t	n-Dotriacontane (C32)	45.494	124184813	94.781 ug/mL M4
34) t	n-Tritriacontane (C33)	46.486	118737876	94.353 ug/mL M4
35) t	n-tetratriacontane (C34)	47.475	122711891	94.145 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.572	125058477	94.007 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.826	127622682	93.982 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.271	125075125	93.722 ug/mL M4
39) t	n-Octatriacontane (C38)	52.951	124388237	93.437 ug/mL M4
41) t	n-Tetracontane (C40)	57.256	117936988	93.310 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27106.D
Operator : AC
Acquired : 04 Sep 2012 9:22 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041204R
Misc Info : WHAO95
ALS Vial : 59



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27108.D
Signal(s) : FID2A.CH
Acq On : 04 Sep 2012 10:53 pm
Operator : AC
Sample : I209041205R
Misc : WHAO96
ALS Vial : 60 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:35:38 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

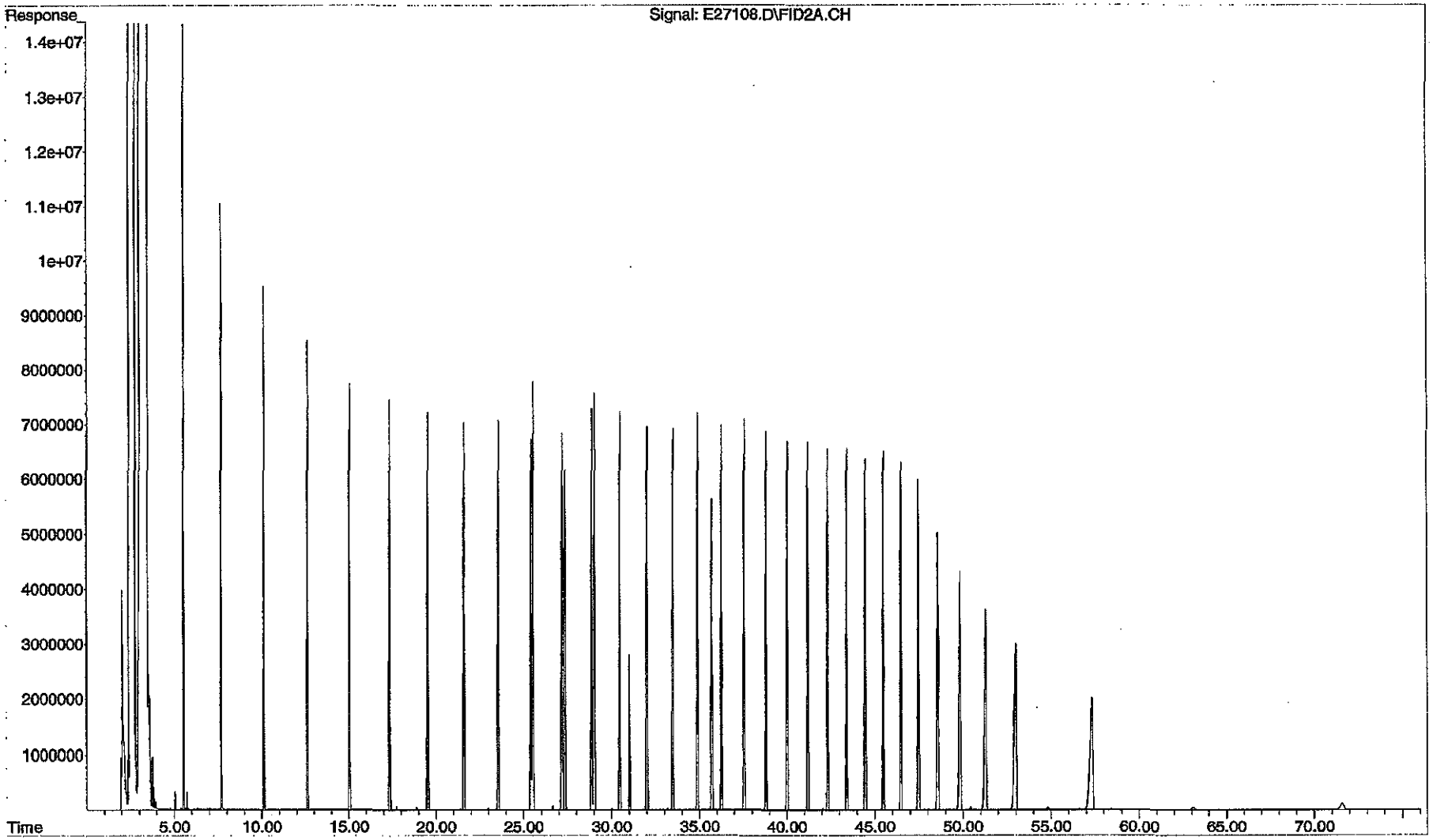
Sub List : CCAL - CCAL

9-7-12

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.033	68220607	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.064	268314389	188.019 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery = 376.04%#	
24) s d50-Tetracosane	35.737	212880617	179.706 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery = 359.41%#	
Target Compounds			
2) t n-Octane (C8)	5.549	214066752	192.861 ug/mL M4
3) t n-Nonane (C9)	7.699	218945844	194.507 ug/mL M4
4) t n-Decane (C10)	10.149	228110991	195.947 ug/mL M4
5) t n-Undecane (C11)	12.647	230818796	197.216 ug/mL M4
6) t n-Dodecane (C12)	15.070	234831426	196.825 ug/mL M4
7) t n-Tridecane (C13)	17.376	235100149	195.264 ug/mL M4
9) t n-Tetradecane (C14)	19.561	236826645	195.189 ug/mL M4
11) t n-Pentadecane (C15)	21.627	236005457	193.938 ug/mL M4
12) t n-Hexadecane (C16)	23.586	238720267	193.483 ug/mL M4
14) t n-Heptadecane (C17)	25.450	239070405	197.023 ug/mL M4
15) t Pristane	25.566	238512894	187.854 ug/mL M4
16) t n-Octadecane (C18)	27.219	241489234	192.546 ug/mL M4
17) t Phytane	27.389	238431706	190.945 ug/mL M4
18) t n-Nonadecane (C19)	28.905	240747451	190.238 ug/mL M4
20) t n-Eicosane (C20)	30.509	242168551	191.035 ug/mL M4
21) t n-Heneicosane (C21)	32.045	241506941	190.239 ug/mL M4
22) t n-Docosane (C22)	33.517	242910759	189.320 ug/mL M4
23) t n-Tricosane (C23)	34.928	242370057	185.330 ug/mL M4
25) t n-Tetracosane (C24)	36.287	240808405	186.527 ug/mL M4
26) t n-Pentacosane (C25)	37.590	245473133	186.536 ug/mL M4
27) t n-Hexacosane (C26)	38.846	243267757	185.782 ug/mL M4
28) t n-Heptacosane (C27)	40.056	237743445	184.168 ug/mL M4
29) t n-Octacosane (C28)	41.225	239982574	184.009 ug/mL M4
30) t n-Nonacosane (C29)	42.354	240486581	183.347 ug/mL M4
31) t n-Triacontane (C30)	43.446	237389922	182.641 ug/mL M4
32) t n-Hentriacontane (C31)	44.502	239996685	181.828 ug/mL M4
33) t n-Dotriacontane (C32)	45.529	239559495	181.672 ug/mL M4
34) t n-Tritriacontane (C33)	46.516	229022991	180.828 ug/mL M4
35) t n-tetratriacontane (C34)	47.510	236682062	180.426 ug/mL M4
36) t n-Pentatriacontane (C35)	48.614	241226826	180.175 ug/mL M4
37) t n-Hexatriacontane (C36)	49.877	246080144	180.060 ug/mL M4
38) t n-Heptatriacontane (C37)	51.328	241177911	179.570 ug/mL M4
39) t n-Octatriacontane (C38)	53.022	239930611	179.081 ug/mL M4
41) t n-Tetracontane (C40)	57.347	227487481	178.837 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27108.D
Operator : AC
Acquired : 04 Sep 2012 10:53 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041205R
Misc Info : WHAO96
ALS Vial : 60



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27110.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 12:26 am
Operator : AC
Sample : I209041206R
Misc : WHAP58
ALS Vial : 61 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 13:32:09 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 11:23:43 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

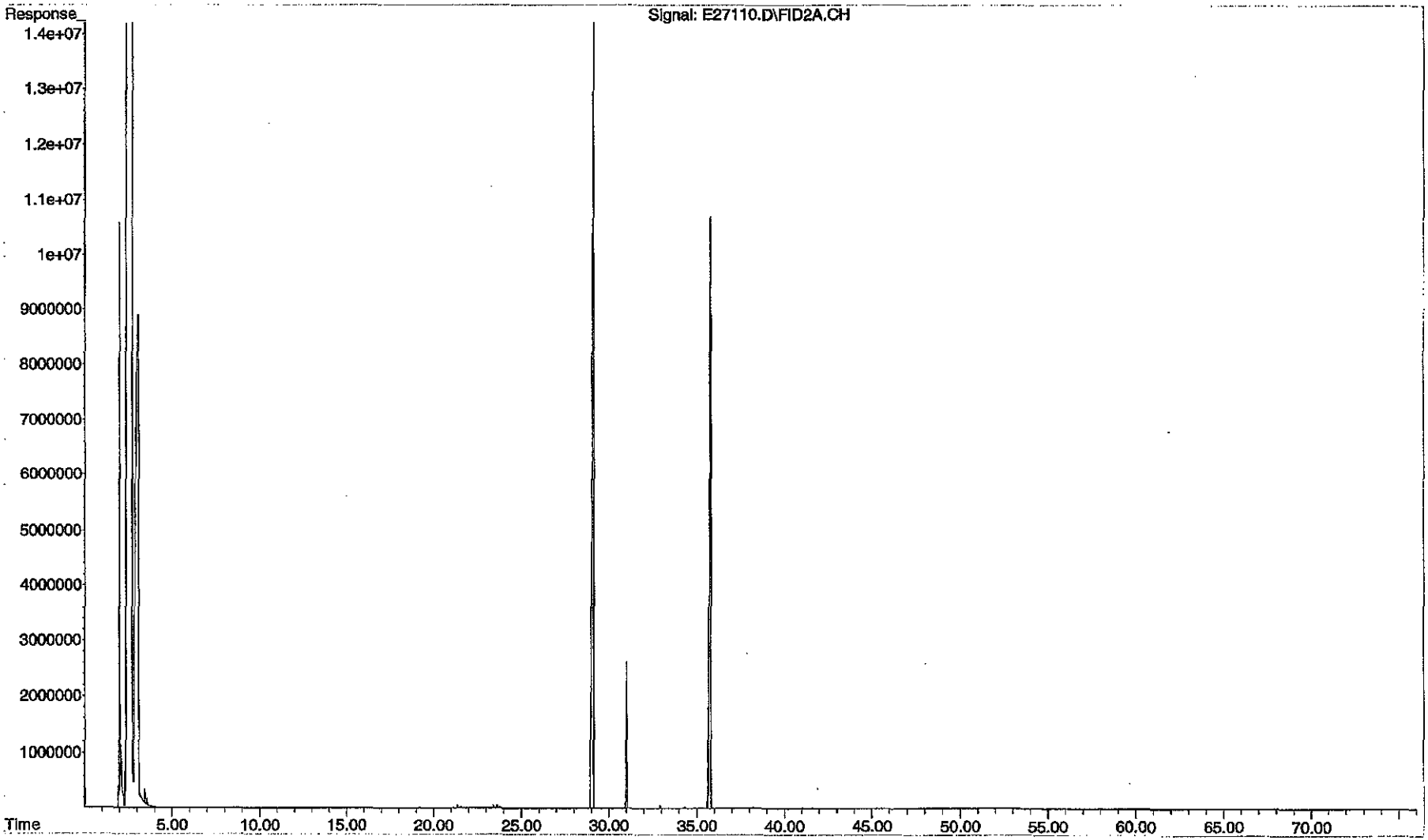
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.025	61806277	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.116f	698740911	540.453 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1080.91%#
24) s d50-Tetracosane	35.785	556842709	518.851 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1037.70%#
Target Compounds			
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27110.D
Operator : AC
Acquired : 05 Sep 2012 12:26 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : I209041206R
Misc Info : WHAP58
ALS Vial : 61



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27114.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 3:31 am
Operator : AC
Sample : CQ209041201R
Misc : WHAQ27
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:25:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	104	0.00
2	t	n-Octane (C8)	50.000	47.063	5.9	98	0.00
3	t	n-Nonane (C9)	50.000	49.007	2.0	103	0.00
4	t	n-Decane (C10)	50.000	50.320	-0.6	105	0.00
5	t	n-Undecane (C11)	50.000	49.146	1.7	103	0.00
6	t	n-Dodecane (C12)	50.000	48.915	2.2	102	0.00
7	t	n-Tridecane (C13)	50.000	48.760	2.5	102	0.00
9	t	n-Tetradecane (C14)	50.000	50.157	-0.3	105	0.00
11	t	n-Pentadecane (C15)	50.000	49.481	1.0	104	0.00
12	t	n-Hexadecane (C16)	50.000	49.370	1.3	103	0.00
14	t	n-Heptadecane (C17)	50.000	50.050	-0.1	105	0.00
15	t	Pristane	50.000	48.998	2.0	102	0.00
16	t	n-Octadecane (C18)	50.000	48.584	2.8	102	0.00
17	t	Phytane	50.000	49.812	0.4	104	0.00
18	t	n-Nonadecane (C19)	50.000	48.354	3.3	101	0.00
19	s	ortho-terphenyl	50.000	46.094	7.8	102	0.00
20	t	n-Eicosane (C20)	50.000	48.032	3.9	101	0.00
21	t	n-Heneicosane (C21)	50.000	48.244	3.5	102	0.00
22	t	n-Docosane (C22)	50.000	48.375	3.3	101	0.00
23	t	n-Tricosane (C23)	50.000	47.726	4.5	102	0.00
24	s	d50-Tetracosane	50.000	47.325	5.3	102	0.00
25	t	n-Tetracosane (C24)	50.000	48.418	3.2	102	0.00
26	t	n-Pentacosane (C25)	50.000	47.522	5.0	100	0.00
27	t	n-Hexacosane (C26)	50.000	48.612	2.8	102	0.00
28	t	n-Heptacosane (C27)	50.000	48.885	2.2	103	0.00
29	t	n-Octacosane (C28)	50.000	48.281	3.4	102	0.00
30	t	n-Nonacosane (C29)	50.000	48.446	3.1	102	0.00
31	t	n-Triacontane (C30)	50.000	48.776	2.4	103	0.00
32	t	n-Hentriacontane (C31)	50.000	48.323	3.4	102	0.00
33	t	n-Dotriacontane (C32)	50.000	47.821	4.4	101	0.00
34	t	n-Tritriacontane (C33)	50.000	48.228	3.5	102	0.00
35	t	n-tetratriacontane (C34)	50.000	49.219	1.6	104	0.00
36	t	n-Pentatriacontane (C35)	50.000	48.298	3.4	102	0.00
37	t	n-Hexatriacontane (C36)	50.000	50.607	-1.2	107	0.00
38	t	n-Heptatriacontane (C37)	50.000	48.327	3.3	102	0.00
39	t	n-Octatriacontane (C38)	50.000	48.341	3.3	102	0.00
41	t	n-Tetracontane (C40)	50.000	48.568	2.9	102	-0.02

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.08	0.85 - 1.15

HC2090412R.M Fri Sep 07 14:40:59 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27114.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 3:31 am
Operator : AC
Sample : CQ209041201R
Misc : WHAQ27
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:25:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

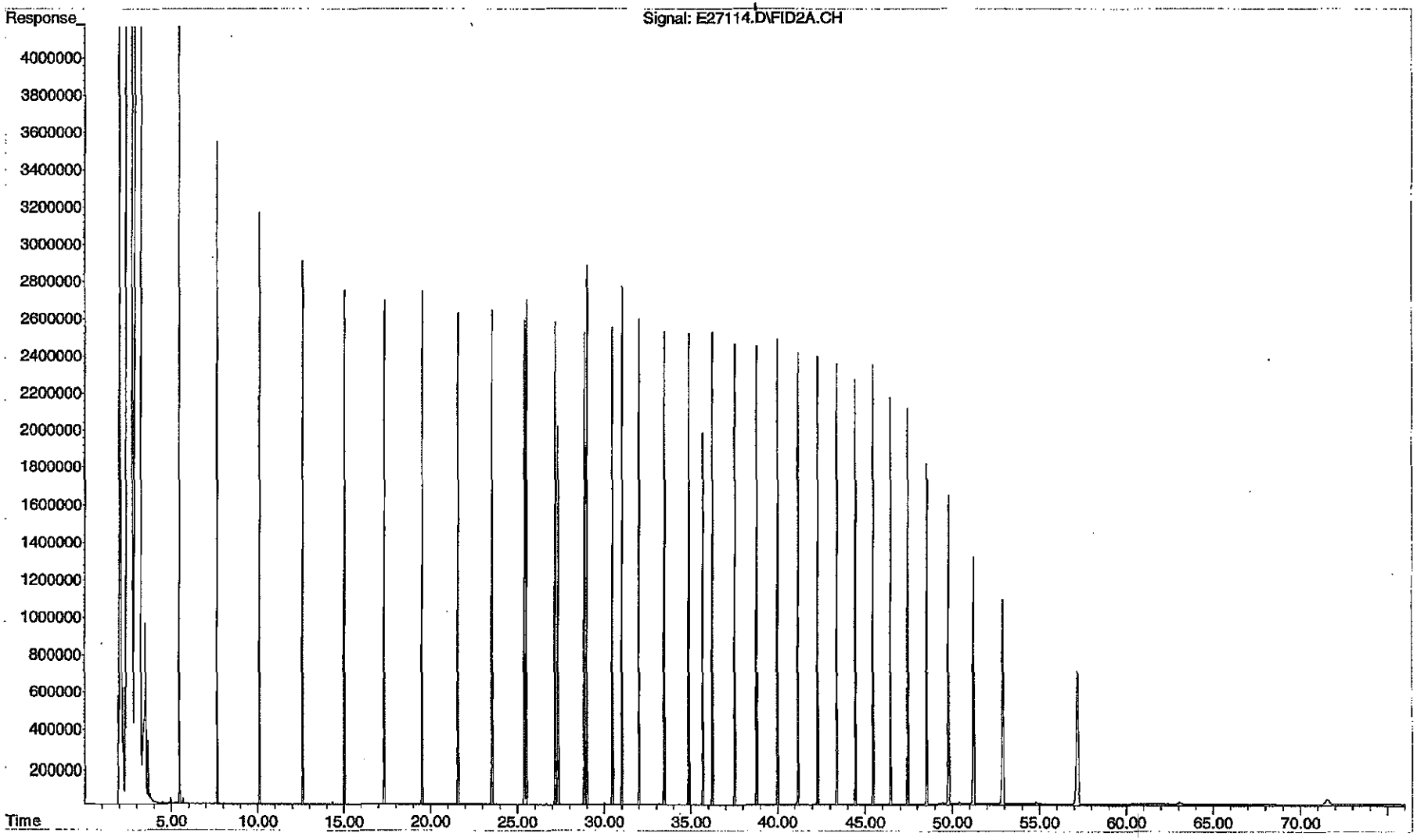
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.024	65571366	50.000 ug/mL
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.012	63835564	46.094 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	92.19%
24) s	d50-Tetracosane	35.689	53098557	47.325 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	94.65%
	Target Compounds			
2) t	n-Octane (C8)	5.453	49690127	47.063 ug/mL M4
3) t	n-Nonane (C9)	7.630	52887630	49.007 ug/mL M4
4) t	n-Decane (C10)	10.102	56372966	50.320 ug/mL M4
5) t	n-Undecane (C11)	12.609	55658323	49.146 ug/mL M4
6) t	n-Dodecane (C12)	15.035	56324963	48.915 ug/mL M4
7) t	n-Tridecane (C13)	17.342	56459788	48.760 ug/mL M4
9) t	n-Tetradecane (C14)	19.526	58612103	50.157 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	57949659	49.481 ug/mL M4
12) t	n-Hexadecane (C16)	23.547	58296284	49.370 ug/mL M4
14) t	n-Heptadecane (C17)	25.406	58730121	50.050 ug/mL M4
15) t	Pristane	25.519	58729630	48.998 ug/mL M4
16) t	n-Octadecane (C18)	27.172	58310676	48.584 ug/mL M4
17) t	Phytane	27.337	59128171	49.812 ug/mL M4
18) t	n-Nonadecane (C19)	28.857	57933404	48.354 ug/mL M4
20) t	n-Eicosane (C20)	30.460	58108037	48.032 ug/mL M4
21) t	n-Heneicosane (C21)	31.997	58598806	48.244 ug/mL M4
22) t	n-Docosane (C22)	33.468	58916110	48.375 ug/mL M4
23) t	n-Tricosane (C23)	34.880	59031115	47.726 ug/mL M4
25) t	n-Tetracosane (C24)	36.236	58874577	48.418 ug/mL M4
26) t	n-Pentacosane (C25)	37.538	58882462	47.522 ug/mL M4
27) t	n-Hexacosane (C26)	38.793	59842693	48.612 ug/mL M4
28) t	n-Heptacosane (C27)	40.004	59020259	48.885 ug/mL M4
29) t	n-Octacosane (C28)	41.170	58880667	48.281 ug/mL M4
30) t	n-Nonacosane (C29)	42.300	59068845	48.446 ug/mL M4
31) t	n-Triacontane (C30)	43.391	58809464	48.776 ug/mL M4
32) t	n-Hentriacontane (C31)	44.447	58777847	48.323 ug/mL M4
33) t	n-Dotriacontane (C32)	45.469	57961177	47.821 ug/mL M4
34) t	n-Tritriacontane (C33)	46.464	55836240	48.228 ug/mL M4
35) t	n-tetratriacontane (C34)	47.449	58826487	49.219 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.542	58740743	48.298 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.790	62924218	50.607 ug/mL M4
38) t	n-Heptatriacontane (C37)	51.227	58743156	48.327 ug/mL M4
39) t	n-Octatriacontane (C38)	52.903	58503229	48.341 ug/mL M4
41) t	n-Tetracontane (C40)	57.180	55675313	48.568 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27114.D
Operator : AC
Acquired : 05 Sep 2012 3:31 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : CQ209041201R
Misc Info : WHAQ27
ALS Vial : 63



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.032	67666055	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.018	69566380	48.677 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	97.35%
24) s	d50-Tetracosane	35.697	57141267	49.351 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	98.70%
	Target Compounds			
2) t	n-Octane (C8)	5.422	102285134	93.879 ug/mL M4
3) t	n-Nonane (C9)	7.619	76013115	68.256 ug/mL M4
4) t	n-Decane (C10)	10.101	63613609	55.026 ug/mL M4
5) t	n-Undecane (C11)	12.611	58788004	50.302 ug/mL M4
6) t	n-Dodecane (C12)	15.036	51442150	43.291 ug/mL M4
7) t	n-Tridecane (C13)	17.344	51674013	43.246 ug/mL M4
8) t	1380	19.019	11081649	9.190 ug/mL M4
9) t	n-Tetradecane (C14)	19.527	45446037	37.687 ug/mL M4
10) t	1470	20.811	18437347	15.256 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	46510985	38.484 ug/mL M4
12) t	n-Hexadecane (C16)	23.546	43300293	35.535 ug/mL M4
13) t	1650	24.454	12821499	10.588 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	39092129	32.283 ug/mL M4
15) t	Pristane	25.504	26773773	21.646 ug/mL M4
16) t	n-Octadecane (C18)	27.170	35486858	28.652 ug/mL M4
17) t	Phytane	27.326	15485089	12.641 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	30026103	24.285 ug/mL M4
20) t	n-Eicosane (C20)	30.459	32191313	25.786 ug/mL M4
21) t	n-Heneicosane (C21)	31.993	26761484	21.351 ug/mL M4
22) t	n-Docosane (C22)	33.463	26156955	20.812 ug/mL M4
23) t	n-Tricosane (C23)	34.874	23790002	18.639 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

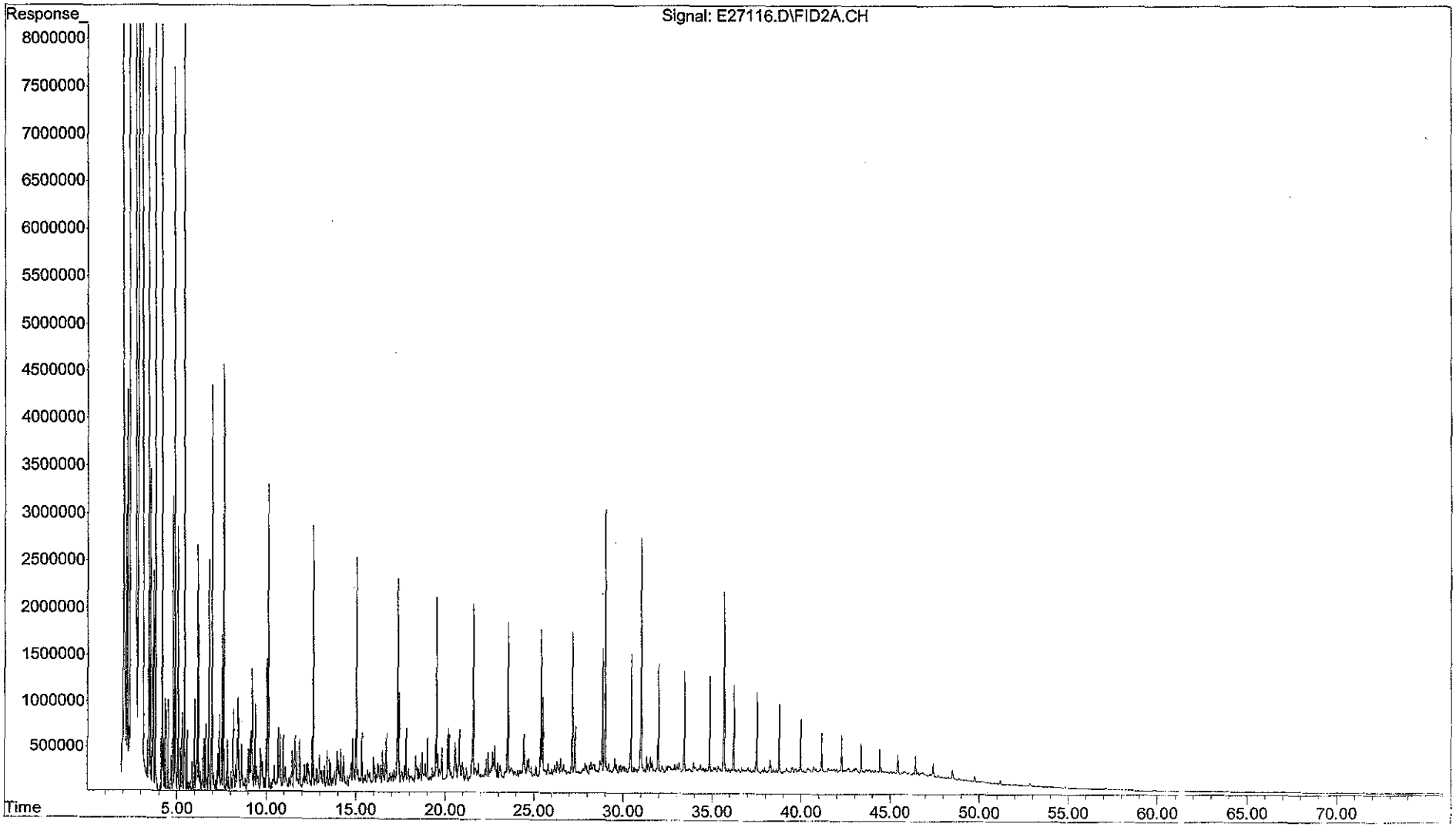
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units
25)	t	n-Tetracosane (C24)	36.229	21569823	17.190	ug/mL M4
26)	t	n-Pentacosane (C25)	37.530	21011766	16.433	ug/mL M4
27)	t	n-Hexacosane (C26)	38.784	18776288	14.780	ug/mL M4
28)	t	n-Heptacosane (C27)	39.993	13757353	11.042	ug/mL M4
29)	t	n-Octacosane (C28)	41.160	9894280	7.862	ug/mL M4
30)	t	n-Nonacosane (C29)	42.290	9748811	7.748	ug/mL M4
31)	t	n-Triacontane (C30)	43.376	8202260	6.592	ug/mL M4
32)	t	n-Hentriacontane (C31)	44.435	6227691	4.961	ug/mL M4
33)	t	n-Dotriacontane (C32)	45.452	5544934	4.433	ug/mL M4
34)	t	n-Tritriacontane (C33)	46.450	4844041	4.054	ug/mL M4
35)	t	n-tetratriacontane (C34)	47.431	4685802	3.799	ug/mL M4
36)	t	n-Pentatriacontane (C35)	48.521	3574400	2.848	ug/mL M4
37)	t	n-Hexatriacontane (C36)	49.764	2674892	2.085	ug/mL M4
38)	t	n-Heptatriacontane (C37)	51.193	2164492	1.726	ug/mL M4
39)	t	n-Octatriacontane (C38)	52.859	1707302	1.367	ug/mL M4
40)	t	n-Nonatriacontane (C39)	54.811	1232956	1.042	ug/mL M4
41)	t	n-Tetracontane (C40)	57.125	1168429	0.988	ug/mL M4
42)	h	C9-C44 Total Petroleu...	39.610	7428814548	6037.249	ug/mL M4
42)	h	C9-C44 Total Petroleu BS	39.610	7306360378	5937.733	ug/mLM4
45)	h	Total Resolved Hydroc...	39.151	2429958845	1974.779	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27116.D
Operator : AC
Acquired : 05 Sep 2012 5:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TW090712ANS01
Misc Info : WHAP13
ALS Vial : 64



Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28814.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:49 am
Operator : AC
Sample : C211091201R
Misc : WHAQ67
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:34:46 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

11-19-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	95	0.02
2	t	n-Octane (C8)	50.000	52.684	-5.4	100	0.01
3	t	n-Nonane (C9)	50.000	52.703	-5.4	100	0.01
4	t	n-Decane (C10)	50.000	52.442	-4.9	99	0.01
5	t	n-Undecane (C11)	50.000	52.383	-4.8	99	0.01
6	t	n-Dodecane (C12)	50.000	52.518	-5.0	99	0.01
7	t	n-Tridecane (C13)	50.000	52.340	-4.7	99	0.01
9	t	n-Tetradecane (C14)	50.000	52.078	-4.2	99	0.01
11	t	n-Pentadecane (C15)	50.000	51.863	-3.7	99	0.02
12	t	n-Hexadecane (C16)	50.000	52.102	-4.2	99	0.01
14	t	n-Heptadecane (C17)	50.000	51.282	-2.6	97	0.02
15	t	Pristane	50.000	52.310	-4.6	99	0.02
16	t	n-Octadecane (C18)	50.000	51.646	-3.3	98	0.02
17	t	Phytane	50.000	51.732	-3.5	98	0.02
18	t	n-Nonadecane (C19)	50.000	51.545	-3.1	98	0.02
19	s	ortho-terphenyl	50.000	50.005	-0.0	100	0.02
20	t	n-Eicosane (C20)	50.000	51.665	-3.3	98	0.02
21	t	n-Heneicosane (C21)	50.000	51.345	-2.7	98	0.02
22	t	n-Docosane (C22)	50.000	51.572	-3.1	98	0.02
23	t	n-Tricosane (C23)	50.000	50.839	-1.7	98	0.02
24	s	d50-Tetracosane	50.000	51.404	-2.8	100	0.02
25	t	n-Tetracosane (C24)	50.000	54.645	-9.3	104	0.02
26	t	n-Pentacosane (C25)	50.000	51.600	-3.2	98	0.02
27	t	n-Hexacosane (C26)	50.000	51.587	-3.2	98	0.04
28	t	n-Heptacosane (C27)	50.000	51.557	-3.1	98	0.04
29	t	n-Octacosane (C28)	50.000	51.560	-3.1	98	0.04
30	t	n-Nonacosane (C29)	50.000	51.766	-3.5	98	0.04
31	t	n-Triacontane (C30)	50.000	51.676	-3.4	99	0.04
32	t	n-Hentriacontane (C31)	50.000	51.809	-3.6	99	0.05
33	t	n-Dotriacontane (C32)	50.000	51.869	-3.7	99	0.05
34	t	n-Tritriacontane (C33)	50.000	51.965	-3.9	99	0.05
35	t	n-tetratriacontane (C34)	50.000	52.016	-4.0	99	0.05
36	t	n-Pentatriacontane (C35)	50.000	52.017	-4.0	99	0.06
37	t	n-Hexatriacontane (C36)	50.000	51.862	-3.7	99	0.06
38	t	n-Heptatriacontane (C37)	50.000	51.978	-4.0	99	0.08
39	t	n-Octatriacontane (C38)	50.000	51.908	-3.8	99	0.08
41	t	n-Tetracontane (C40)	50.000	51.924	-3.8	99	0.11

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.03	0.85 - 1.15

HC2090412R.M Mon Nov 19 10:30:23 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28814.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 11:49 am
Operator : AC
Sample : C211091201R
Misc : WHAQ67
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:34:46 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

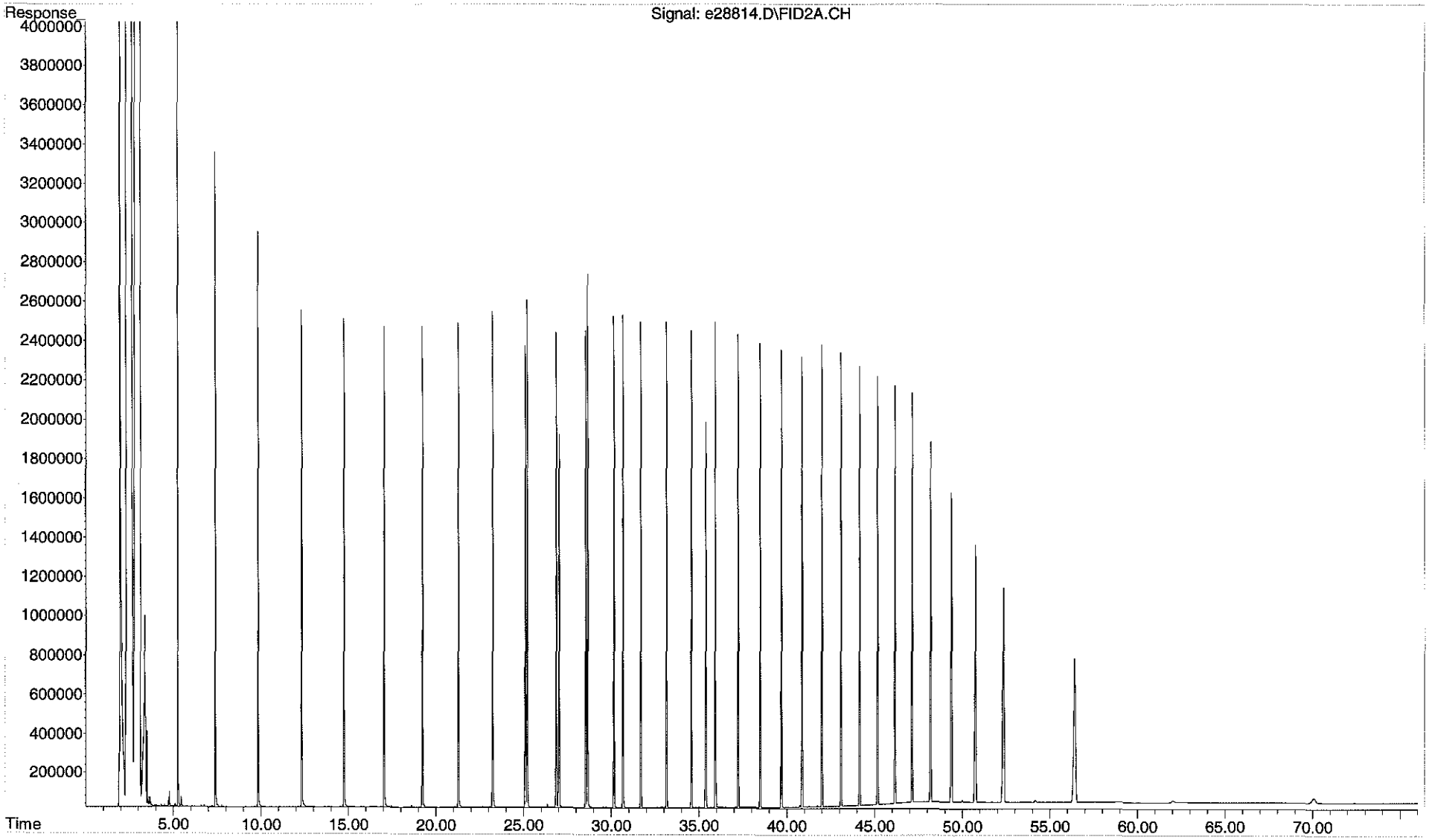
Sub List : CCAL - CCAL

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.682	59338325	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.673	62668313	50.005 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	100.01%
24) s	d50-Tetracosane	35.392	52193464	51.404 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	102.81%
	Target Compounds			
2) t	n-Octane (C8)	5.255	50337544	52.684 ug/mL M4
3) t	n-Nonane (C9)	7.396	51469196	52.703 ug/mL M4
4) t	n-Decane (C10)	9.840	53164966	52.442 ug/mL M4
5) t	n-Undecane (C11)	12.334	53685449	52.383 ug/mL M4
6) t	n-Dodecane (C12)	14.754	54725925	52.518 ug/mL M4
7) t	n-Tridecane (C13)	17.057	54844079	52.340 ug/mL M4
9) t	n-Tetradecane (C14)	19.237	55071777	52.078 ug/mL M4
11) t	n-Pentadecane (C15)	21.300	54966349	51.863 ug/mL M4
12) t	n-Hexadecane (C16)	23.254	55673725	52.102 ug/mL M4
14) t	n-Heptadecane (C17)	25.111	54455883	51.282 ug/mL M4
15) t	Pristane	25.224	56739504	52.310 ug/mL M4
16) t	n-Octadecane (C18)	26.877	56092925	51.646 ug/mL M4
17) t	Phytane	27.040	55570435	51.732 ug/mL M4
18) t	n-Nonadecane (C19)	28.560	55886648	51.545 ug/mL M4
20) t	n-Eicosane (C20)	30.163	56562006	51.665 ug/mL M4
21) t	n-Heneicosane (C21)	31.698	56437101	51.345 ug/mL M4
22) t	n-Docosane (C22)	33.169	56838486	51.572 ug/mL M4
23) t	n-Tricosane (C23)	34.582	56904124	50.839 ug/mL M4
25) t	n-Tetracosane (C24)	35.939	60129103	54.645 ug/mL M4
26) t	n-Pentacosane (C25)	37.242	57857579	51.600 ug/mL M4
27) t	n-Hexacosane (C26)	38.496	57468791	51.587 ug/mL M4
28) t	n-Heptacosane (C27)	39.708	56329431	51.557 ug/mL M4
29) t	n-Octacosane (C28)	40.876	56901866	51.560 ug/mL M4
30) t	n-Nonacosane (C29)	42.007	57116400	51.766 ug/mL M4
31) t	n-Triacontane (C30)	43.099	56382835	51.676 ug/mL M4
32) t	n-Hentriacontane (C31)	44.157	57027946	51.809 ug/mL M4
33) t	n-Dotriacontane (C32)	45.184	56891160	51.869 ug/mL M4
34) t	n-Tritriacontane (C33)	46.178	54444135	51.965 ug/mL M4
35) t	n-tetratriacontane (C34)	47.150	56259465	52.016 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.201	57249960	52.017 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.392	58355104	51.862 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.765	57175973	51.978 ug/mL M4
39) t	n-Octatriacontane (C38)	52.357	56848642	51.908 ug/mL M4
41) t	n-Tetracontane (C40)	56.435	53864301	51.924 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28814.D
Operator : AC
Acquired : 09 Nov 2012 11:49 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091201R
Misc Info : WHAQ67
ALS Vial : 52



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28840.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:10 am
Operator : AC
Sample : C211091202R
Misc : WHAQ67
ALS Vial : 65 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:59:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	100	0.00
2	t	n-Octane (C8)	50.000	50.921	-1.8	102	0.00
3	t	n-Nonane (C9)	50.000	51.309	-2.6	103	0.00
4	t	n-Decane (C10)	50.000	51.582	-3.2	103	0.00
5	t	n-Undecane (C11)	50.000	50.532	-1.1	101	0.00
6	t	n-Dodecane (C12)	50.000	51.614	-3.2	103	0.00
7	t	n-Tridecane (C13)	50.000	51.734	-3.5	103	0.00
9	t	n-Tetradecane (C14)	50.000	51.534	-3.1	103	0.00
11	t	n-Pentadecane (C15)	50.000	51.344	-2.7	103	0.00
12	t	n-Hexadecane (C16)	50.000	51.669	-3.3	103	0.00
14	t	n-Heptadecane (C17)	50.000	50.856	-1.7	102	0.00
15	t	Pristane	50.000	52.019	-4.0	104	0.00
16	t	n-Octadecane (C18)	50.000	51.290	-2.6	103	0.00
17	t	Phytane	50.000	51.754	-3.5	103	0.00
18	t	n-Nonadecane (C19)	50.000	51.217	-2.4	102	0.00
19	s	ortho-terphenyl	50.000	49.941	0.1	105	0.00
20	t	n-Eicosane (C20)	50.000	51.292	-2.6	103	0.00
21	t	n-Heneicosane (C21)	50.000	51.010	-2.0	103	0.00
22	t	n-Docosane (C22)	50.000	51.223	-2.4	102	0.00
23	t	n-Tricosane (C23)	50.000	50.509	-1.0	103	0.00
24	s	d50-Tetracosane	50.000	51.064	-2.1	105	0.00
25	t	n-Tetracosane (C24)	50.000	51.186	-2.4	103	0.00
26	t	n-Pentacosane (C25)	50.000	51.228	-2.5	102	0.00
27	t	n-Hexacosane (C26)	50.000	51.194	-2.4	102	0.02
28	t	n-Heptacosane (C27)	50.000	51.118	-2.2	103	0.03
29	t	n-Octacosane (C28)	50.000	51.147	-2.3	103	0.03
30	t	n-Nonacosane (C29)	50.000	51.147	-2.3	103	0.03
31	t	n-Triacontane (C30)	50.000	50.916	-1.8	102	0.03
32	t	n-Hentriacontane (C31)	50.000	50.904	-1.8	102	0.03
33	t	n-Dotriacontane (C32)	50.000	50.870	-1.7	102	0.03
34	t	n-Tritriacontane (C33)	50.000	50.798	-1.6	102	0.03
35	t	n-tetratriacontane (C34)	50.000	50.713	-1.4	102	0.03
36	t	n-Pentatriacontane (C35)	50.000	50.602	-1.2	102	0.03
37	t	n-Hexatriacontane (C36)	50.000	50.342	-0.7	102	0.03
38	t	n-Heptatriacontane (C37)	50.000	50.296	-0.6	101	0.03
39	t	n-Octatriacontane (C38)	50.000	50.047	-0.1	101	0.03
41	t	n-Tetracontane (C40)	50.000	49.647	0.7	100	0.04

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.01	0.85 - 1.15

HC2090412R.M Mon Nov 19 10:30:48 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28840.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 7:10 am
Operator : AC
Sample : C211091202R
Misc : WHAQ67
ALS Vial : 65 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 11:59:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

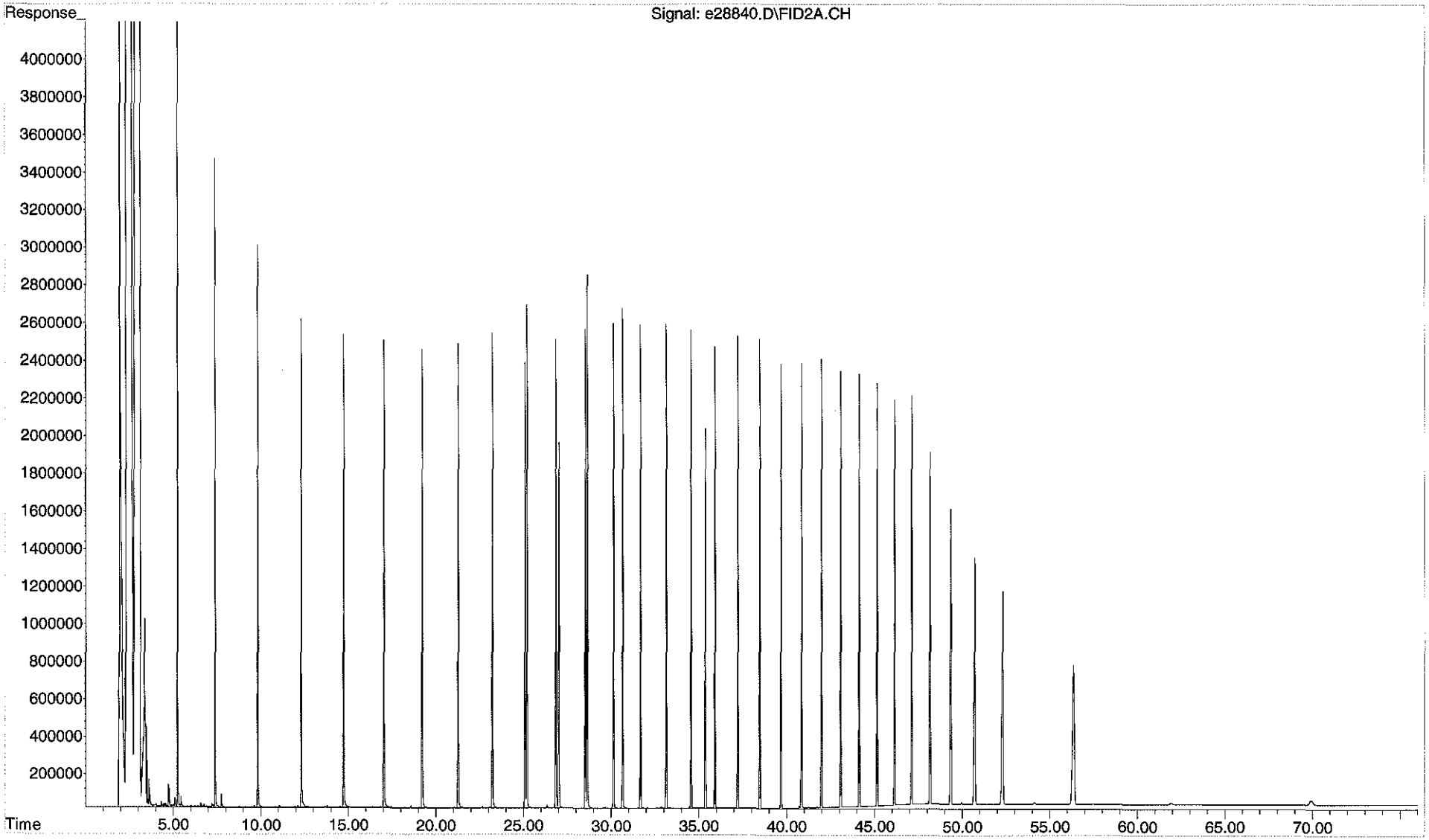
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.667	62613621	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.660	66042741	49.941 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	99.88%
24) s	d50-Tetracosane	35.378	54709612	51.064 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	102.13%
	Target Compounds			
2) t	n-Octane (C8)	5.250	51337889	50.921 ug/mL M4
3) t	n-Nonane (C9)	7.388	52873524	51.309 ug/mL M4
4) t	n-Decane (C10)	9.831	55179452	51.582 ug/mL M4
5) t	n-Undecane (C11)	12.324	54646866	50.532 ug/mL M4
6) t	n-Dodecane (C12)	14.744	56752330	51.614 ug/mL M4
7) t	n-Tridecane (C13)	17.047	57201404	51.734 ug/mL M4
9) t	n-Tetradecane (C14)	19.226	57504724	51.534 ug/mL M4
11) t	n-Pentadecane (C15)	21.289	57419940	51.344 ug/mL M4
12) t	n-Hexadecane (C16)	23.243	58258144	51.669 ug/mL M4
14) t	n-Heptadecane (C17)	25.099	56984355	50.856 ug/mL M4
15) t	Pristane	25.211	59537775	52.019 ug/mL M4
16) t	n-Octadecane (C18)	26.864	58781589	51.290 ug/mL M4
17) t	Phytane	27.029	58662983	51.754 ug/mL M4
18) t	n-Nonadecane (C19)	28.547	58595574	51.217 ug/mL M4
20) t	n-Eicosane (C20)	30.150	59252937	51.292 ug/mL M4
21) t	n-Heneicosane (C21)	31.685	59163614	51.010 ug/mL M4
22) t	n-Docosane (C22)	33.154	59570222	51.223 ug/mL M4
23) t	n-Tricosane (C23)	34.566	59654582	50.509 ug/mL M4
25) t	n-Tetracosane (C24)	35.921	59432710	51.186 ug/mL M4
26) t	n-Pentacosane (C25)	37.226	60611235	51.228 ug/mL M4
27) t	n-Hexacosane (C26)	38.480	60179189	51.194 ug/mL M4
28) t	n-Heptacosane (C27)	39.691	58932628	51.118 ug/mL M4
29) t	n-Octacosane (C28)	40.861	59562569	51.147 ug/mL M4
30) t	n-Nonacosane (C29)	41.988	59548759	51.147 ug/mL M4
31) t	n-Triacontane (C30)	43.081	58620633	50.916 ug/mL M4
32) t	n-Hentriacontane (C31)	44.140	59124345	50.904 ug/mL M4
33) t	n-Dotriacontane (C32)	45.165	58874892	50.870 ug/mL M4
34) t	n-Tritriacontane (C33)	46.157	56159221	50.798 ug/mL M4
35) t	n-tetratriacontane (C34)	47.127	57877859	50.713 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.172	58766768	50.602 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.362	59772034	50.342 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.724	58379594	50.296 ug/mL M4
39) t	n-Octatriacontane (C38)	52.313	57835381	50.047 ug/mL M4
41) t	n-Tetracontane (C40)	56.370	54344567	49.647 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28840.D
Operator : AC
Acquired : 10 Nov 2012 7:10 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091202R
Misc Info : WHAQ67
ALS Vial : 65



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28880.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 2:32 pm
Operator : AC
Sample : C211091204R
Misc : WHAQ67
ALS Vial : 85 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:17:02 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	98	0.00
2	t	n-Octane (C8)	50.000	50.137	-0.3	98	0.00
3	t	n-Nonane (C9)	50.000	49.841	0.3	98	0.00
4	t	n-Decane (C10)	50.000	50.402	-0.8	99	0.00
5	t	n-Undecane (C11)	50.000	49.604	0.8	97	0.00
6	t	n-Dodecane (C12)	50.000	51.217	-2.4	100	0.00
7	t	n-Tridecane (C13)	50.000	51.384	-2.8	101	0.00
9	t	n-Tetradecane (C14)	50.000	51.282	-2.6	101	0.00
11	t	n-Pentadecane (C15)	50.000	51.258	-2.5	101	0.00
12	t	n-Hexadecane (C16)	50.000	51.642	-3.3	101	0.00
14	t	n-Heptadecane (C17)	50.000	50.737	-1.5	100	0.00
15	t	Pristane	50.000	52.242	-4.5	102	0.00
16	t	n-Octadecane (C18)	50.000	51.395	-2.8	101	0.00
17	t	Phytane	50.000	51.824	-3.6	102	0.00
18	t	n-Nonadecane (C19)	50.000	51.327	-2.7	101	0.00
19	s	ortho-terphenyl	50.000	49.687	0.6	103	0.00
20	t	n-Eicosane (C20)	50.000	51.321	-2.6	101	0.00
21	t	n-Heneicosane (C21)	50.000	51.026	-2.1	101	0.00
22	t	n-Docosane (C22)	50.000	51.159	-2.3	100	0.00
23	t	n-Tricosane (C23)	50.000	50.466	-0.9	101	0.00
24	s	d50-Tetracosane	50.000	51.001	-2.0	103	0.00
25	t	n-Tetracosane (C24)	50.000	51.092	-2.2	101	0.00
26	t	n-Pentacosane (C25)	50.000	51.171	-2.3	100	0.00
27	t	n-Hexacosane (C26)	50.000	51.119	-2.2	100	0.02
28	t	n-Heptacosane (C27)	50.000	51.080	-2.2	101	0.02
29	t	n-Octacosane (C28)	50.000	51.100	-2.2	101	0.02
30	t	n-Nonacosane (C29)	50.000	51.187	-2.4	101	0.02
31	t	n-Triacontane (C30)	50.000	51.277	-2.6	101	0.02
32	t	n-Hentriacontane (C31)	50.000	51.439	-2.9	102	0.02
33	t	n-Dotriacontane (C32)	50.000	51.510	-3.0	102	0.02
34	t	n-Tritriacontane (C33)	50.000	51.577	-3.2	102	0.02
35	t	n-tetratriacontane (C34)	50.000	51.457	-2.9	102	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.321	-2.6	101	0.02
37	t	n-Hexatriacontane (C36)	50.000	50.943	-1.9	101	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.975	-2.0	101	0.03
39	t	n-Octatriacontane (C38)	50.000	50.554	-1.1	100	0.02
41	t	n-Tetracontane (C40)	50.000	49.892	0.2	99	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Mon Nov 19 10:31:12 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28880.D
Signal(s) : FID2A.CH
Acq On : 11 Nov 2012 2:32 pm
Operator : AC
Sample : C211091204R
Misc : WHAQ67
ALS Vial : 85 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:17:02 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

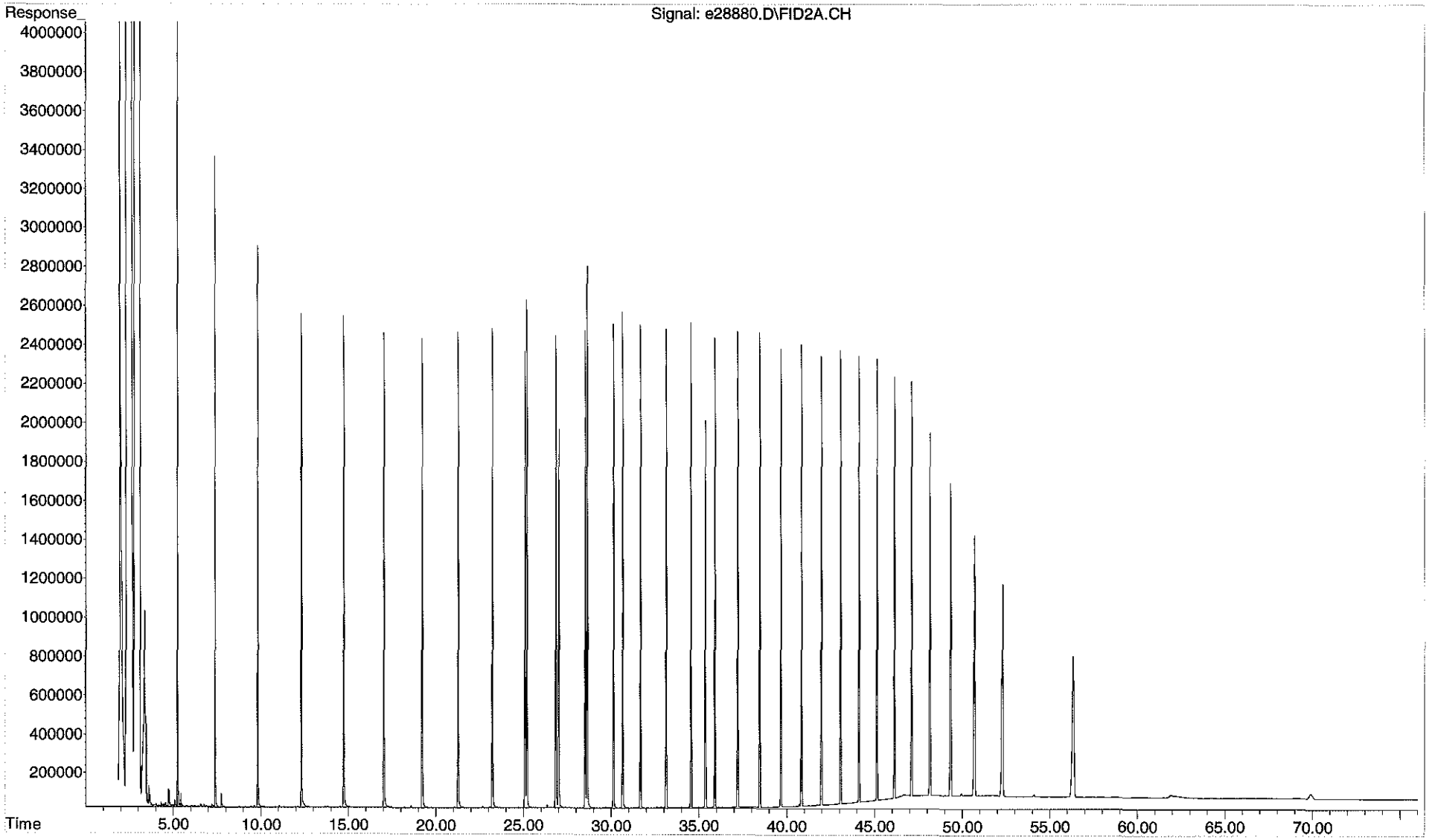
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	61473588	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.655	64511644	49.687 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	99.37%
24) s	d50-Tetracosane	35.372	53647584	51.001 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	102.00%
	Target Compounds			
2) t	n-Octane (C8)	5.245	49627633	50.137 ug/mL M4
3) t	n-Nonane (C9)	7.384	50426020	49.841 ug/mL M4
4) t	n-Decane (C10)	9.830	52935798	50.402 ug/mL M4
5) t	n-Undecane (C11)	12.323	52666087	49.604 ug/mL M4
6) t	n-Dodecane (C12)	14.743	55290636	51.217 ug/mL M4
7) t	n-Tridecane (C13)	17.045	55779756	51.384 ug/mL M4
9) t	n-Tetradecane (C14)	19.225	56181156	51.282 ug/mL M4
11) t	n-Pentadecane (C15)	21.286	56280028	51.258 ug/mL M4
12) t	n-Hexadecane (C16)	23.240	57168308	51.642 ug/mL M4
14) t	n-Heptadecane (C17)	25.096	55815477	50.737 ug/mL M4
15) t	Pristane	25.208	58704110	52.242 ug/mL M4
16) t	n-Octadecane (C18)	26.862	57829061	51.395 ug/mL M4
17) t	Phytane	27.025	57672264	51.824 ug/mL M4
18) t	n-Nonadecane (C19)	28.544	57652279	51.327 ug/mL M4
20) t	n-Eicosane (C20)	30.148	58206536	51.321 ug/mL M4
21) t	n-Heneicosane (C21)	31.681	58105105	51.026 ug/mL M4
22) t	n-Docosane (C22)	33.152	58412102	51.159 ug/mL M4
23) t	n-Tricosane (C23)	34.562	58519204	50.466 ug/mL M4
25) t	n-Tetracosane (C24)	35.917	58243566	51.092 ug/mL M4
26) t	n-Pentacosane (C25)	37.221	59441590	51.171 ug/mL M4
27) t	n-Hexacosane (C26)	38.476	58996456	51.119 ug/mL M4
28) t	n-Heptacosane (C27)	39.685	57817173	51.080 ug/mL M4
29) t	n-Octacosane (C28)	40.854	58423884	51.100 ug/mL M4
30) t	n-Nonacosane (C29)	41.983	58510359	51.187 ug/mL M4
31) t	n-Triacontane (C30)	43.076	57961319	51.277 ug/mL M4
32) t	n-Hentriacontane (C31)	44.133	58657300	51.439 ug/mL M4
33) t	n-Dotriacontane (C32)	45.159	58530655	51.510 ug/mL M4
34) t	n-Tritriacontane (C33)	46.152	55981757	51.577 ug/mL M4
35) t	n-tetratriacontane (C34)	47.120	57657556	51.457 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.165	58516558	51.321 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.352	59383519	50.943 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.719	58090351	50.975 ug/mL M4
39) t	n-Octatriacontane (C38)	52.305	57357763	50.554 ug/mL M4
41) t	n-Tetracontane (C40)	56.353	53618524	49.892 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28880.D
Operator : AC
Acquired : 11 Nov 2012 2:32 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091204R
Misc Info : WHAQ67
ALS Vial : 85



Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28893a.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 7:20 am
Operator : AC
Sample : C211091205R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:28:29 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	103	0.00
2	t	n-Octane (C8)	50.000	48.339	3.3	99	0.00
3	t	n-Nonane (C9)	50.000	49.021	2.0	101	0.00
4	t	n-Decane (C10)	50.000	49.065	1.9	101	0.00
5	t	n-Undecane (C11)	50.000	49.397	1.2	102	0.00
6	t	n-Dodecane (C12)	50.000	51.272	-2.5	105	0.00
7	t	n-Tridecane (C13)	50.000	51.349	-2.7	106	0.00
9	t	n-Tetradecane (C14)	50.000	51.213	-2.4	105	0.00
11	t	n-Pentadecane (C15)	50.000	51.170	-2.3	106	0.00
12	t	n-Hexadecane (C16)	50.000	51.567	-3.1	106	0.00
14	t	n-Heptadecane (C17)	50.000	50.688	-1.4	105	0.00
15	t	Pristane	50.000	52.202	-4.4	107	0.00
16	t	n-Octadecane (C18)	50.000	51.369	-2.7	106	0.00
17	t	Phytane	50.000	51.779	-3.6	107	0.00
18	t	n-Nonadecane (C19)	50.000	51.175	-2.3	105	0.00
19	s	ortho-terphenyl	50.000	50.020	-0.0	109	0.00
20	t	n-Eicosane (C20)	50.000	51.283	-2.6	106	0.00
21	t	n-Heneicosane (C21)	50.000	51.005	-2.0	106	0.00
22	t	n-Docosane (C22)	50.000	51.100	-2.2	105	0.00
23	t	n-Tricosane (C23)	50.000	50.379	-0.8	105	0.00
24	s	d50-Tetracosane	50.000	50.981	-2.0	108	0.00
25	t	n-Tetracosane (C24)	50.000	50.952	-1.9	105	0.00
26	t	n-Pentacosane (C25)	50.000	51.131	-2.3	105	0.00
27	t	n-Hexacosane (C26)	50.000	51.002	-2.0	105	0.00
28	t	n-Heptacosane (C27)	50.000	50.972	-1.9	105	0.00
29	t	n-Octacosane (C28)	50.000	50.964	-1.9	105	0.00
30	t	n-Nonacosane (C29)	50.000	51.198	-2.4	106	0.00
31	t	n-Triacontane (C30)	50.000	50.987	-2.0	106	0.00
32	t	n-Hentriacontane (C31)	50.000	51.165	-2.3	106	0.00
33	t	n-Dotriacontane (C32)	50.000	51.093	-2.2	106	0.00
34	t	n-Tritriacontane (C33)	50.000	51.248	-2.5	106	0.00
35	t	n-tetratriacontane (C34)	50.000	51.094	-2.2	106	0.00
36	t	n-Pentatriacontane (C35)	50.000	50.866	-1.7	106	0.00
37	t	n-Hexatriacontane (C36)	50.000	50.428	-0.9	105	0.00
38	t	n-Heptatriacontane (C37)	50.000	50.216	-0.4	104	0.00
39	t	n-Octatriacontane (C38)	50.000	50.166	-0.3	104	0.00
41	t	n-Tetracontane (C40)	50.000	49.059	1.9	102	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.01	0.85 - 1.15

HC2090412R.M Mon Nov 19 10:31:30 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28893a.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 7:20 am
Operator : AC
Sample : C211091205R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:28:29 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

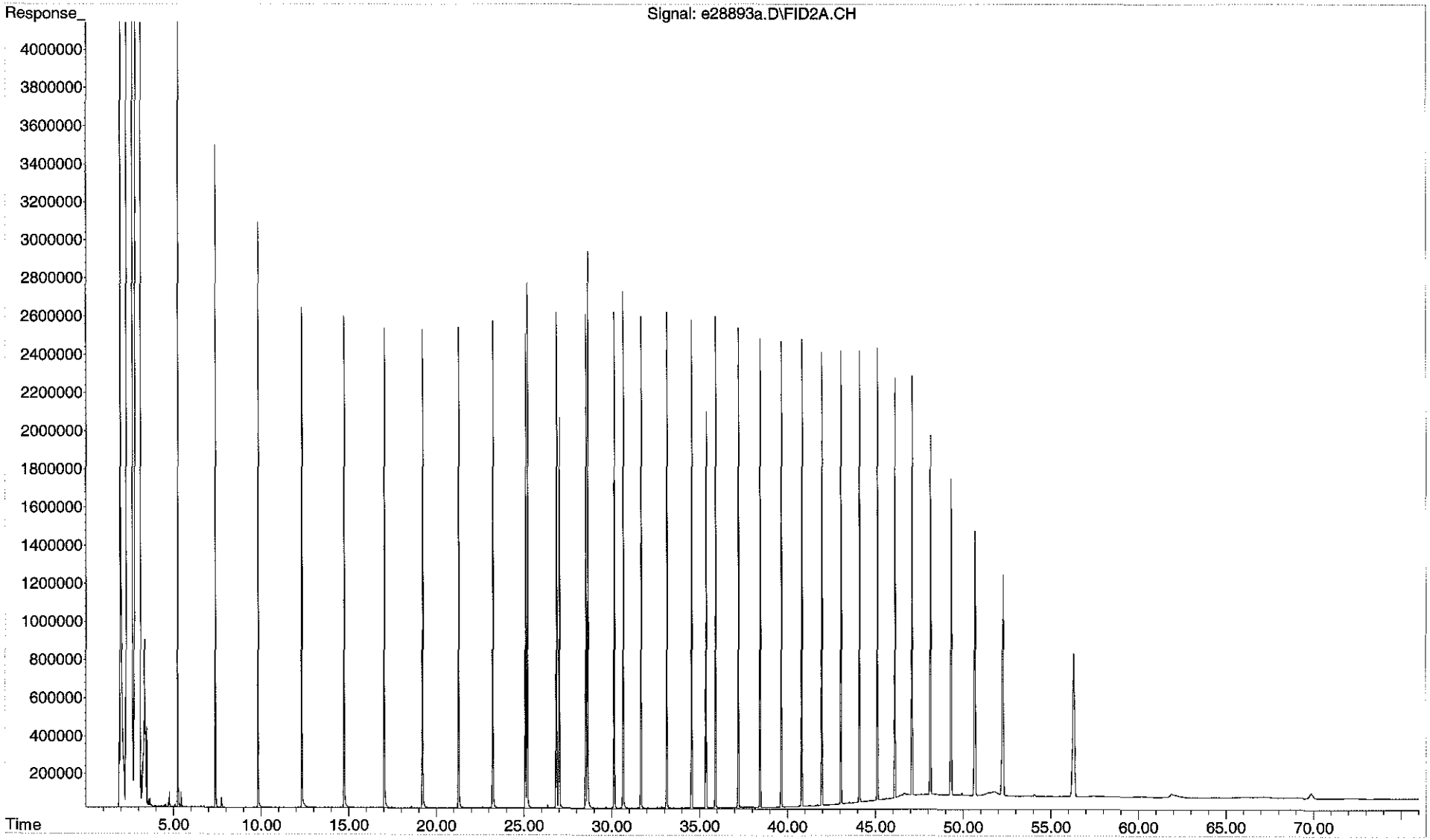
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.663	64507890	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	68148524	50.020 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	100.04%
24) s	d50-Tetracosane	35.371	56273407	50.981 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	101.96%
	Target Compounds			
2) t	n-Octane (C8)	5.244	50209381	48.339 ug/mL M4
3) t	n-Nonane (C9)	7.386	52044322	49.021 ug/mL M4
4) t	n-Decane (C10)	9.829	54075668	49.065 ug/mL M4
5) t	n-Undecane (C11)	12.323	55035598	49.397 ug/mL M4
6) t	n-Dodecane (C12)	14.743	58081561	51.272 ug/mL M4
7) t	n-Tridecane (C13)	17.045	58493225	51.349 ug/mL M4
9) t	n-Tetradecane (C14)	19.223	58875093	51.213 ug/mL M4
11) t	n-Pentadecane (C15)	21.285	58956050	51.170 ug/mL M4
12) t	n-Hexadecane (C16)	23.239	59902395	51.567 ug/mL M4
14) t	n-Heptadecane (C17)	25.095	58513930	50.688 ug/mL M4
15) t	Pristane	25.206	61555063	52.202 ug/mL M4
16) t	n-Octadecane (C18)	26.859	60652378	51.369 ug/mL M4
17) t	Phytane	27.023	60466332	51.779 ug/mL M4
18) t	n-Nonadecane (C19)	28.543	60319672	51.175 ug/mL M4
20) t	n-Eicosane (C20)	30.147	61034381	51.283 ug/mL M4
21) t	n-Heneicosane (C21)	31.680	60947611	51.005 ug/mL M4
22) t	n-Docosane (C22)	33.151	61224725	51.100 ug/mL M4
23) t	n-Tricosane (C23)	34.560	61301724	50.379 ug/mL M4
25) t	n-Tetracosane (C24)	35.917	60950942	50.952 ug/mL M4
26) t	n-Pentacosane (C25)	37.219	62326091	51.131 ug/mL M4
27) t	n-Hexacosane (C26)	38.456	61767000	51.002 ug/mL M4
28) t	n-Heptacosane (C27)	39.664	60541639	50.972 ug/mL M4
29) t	n-Octacosane (C28)	40.833	61144750	50.964 ug/mL M4
30) t	n-Nonacosane (C29)	41.962	61411783	51.198 ug/mL M4
31) t	n-Triacontane (C30)	43.054	60478276	50.987 ug/mL M4
32) t	n-Hentriacontane (C31)	44.112	61224776	51.165 ug/mL M4
33) t	n-Dotriacontane (C32)	45.136	60922560	51.093 ug/mL M4
34) t	n-Tritriacontane (C33)	46.130	58371057	51.248 ug/mL M4
35) t	n-tetratriacontane (C34)	47.102	60076452	51.094 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.144	60860857	50.866 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.328	61685755	50.428 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.690	60049942	50.216 ug/mL M4
39) t	n-Octatriacontane (C38)	52.281	59727493	50.166 ug/mL M4
41) t	n-Tetracontane (C40)	56.327	55325415	49.059 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28893a.D
Operator : AC
Acquired : 12 Nov 2012 7:20 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091205R
Misc Info : WHAQ67
ALS Vial : 95



Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28906.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:47 pm
Operator : AC
Sample : C211091206R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:44:13 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

B 11-19-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	93	0.00
2	t	n-Octane (C8)	50.000	53.214	-6.4	99	0.00
3	t	n-Nonane (C9)	50.000	52.183	-4.4	97	0.00
4	t	n-Decane (C10)	50.000	51.076	-2.2	95	0.00
5	t	n-Undecane (C11)	50.000	50.552	-1.1	94	0.00
6	t	n-Dodecane (C12)	50.000	52.293	-4.6	97	0.00
7	t	n-Tridecane (C13)	50.000	52.312	-4.6	97	0.00
9	t	n-Tetradecane (C14)	50.000	52.096	-4.2	97	0.00
11	t	n-Pentadecane (C15)	50.000	51.870	-3.7	97	0.00
12	t	n-Hexadecane (C16)	50.000	52.263	-4.5	97	0.00
14	t	n-Heptadecane (C17)	50.000	51.228	-2.5	95	0.00
15	t	Pristane	50.000	53.135	-6.3	98	0.00
16	t	n-Octadecane (C18)	50.000	51.908	-3.8	96	0.00
17	t	Phytane	50.000	52.389	-4.8	97	0.00
18	t	n-Nonadecane (C19)	50.000	51.825	-3.7	96	0.00
19	s	ortho-terphenyl	50.000	50.302	-0.6	99	0.00
20	t	n-Eicosane (C20)	50.000	52.013	-4.0	97	0.00
21	t	n-Heneicosane (C21)	50.000	51.851	-3.7	97	0.00
22	t	n-Docosane (C22)	50.000	51.905	-3.8	96	0.00
23	t	n-Tricosane (C23)	50.000	51.240	-2.5	97	0.00
24	s	d50-Tetracosane	50.000	51.902	-3.8	99	0.00
25	t	n-Tetracosane (C24)	50.000	52.000	-4.0	97	0.00
26	t	n-Pentacosane (C25)	50.000	52.206	-4.4	97	0.00
27	t	n-Hexacosane (C26)	50.000	52.323	-4.6	97	0.02
28	t	n-Heptacosane (C27)	50.000	52.445	-4.9	98	0.02
29	t	n-Octacosane (C28)	50.000	52.742	-5.5	98	0.02
30	t	n-Nonacosane (C29)	50.000	52.990	-6.0	99	0.02
31	t	n-Triacontane (C30)	50.000	53.030	-6.1	99	0.02
32	t	n-Hentriacontane (C31)	50.000	53.196	-6.4	99	0.02
33	t	n-Dotriacontane (C32)	50.000	53.319	-6.6	100	0.02
34	t	n-Tritriacontane (C33)	50.000	53.357	-6.7	100	0.02
35	t	n-tetratriacontane (C34)	50.000	53.057	-6.1	99	0.02
36	t	n-Pentatriacontane (C35)	50.000	52.981	-6.0	99	0.02
37	t	n-Hexatriacontane (C36)	50.000	52.653	-5.3	99	0.02
38	t	n-Heptatriacontane (C37)	50.000	52.605	-5.2	98	0.02
39	t	n-Octatriacontane (C38)	50.000	52.261	-4.5	98	0.01
41	t	n-Tetracontane (C40)	50.000	51.515	-3.0	96	0.02

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.04	0.85 - 1.15

HC2090412R.M Mon Nov 19 10:31:52 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28906.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 5:47 pm
Operator : AC
Sample : C211091206R
Misc : WHAQ67
ALS Vial : 95 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 13:44:13 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

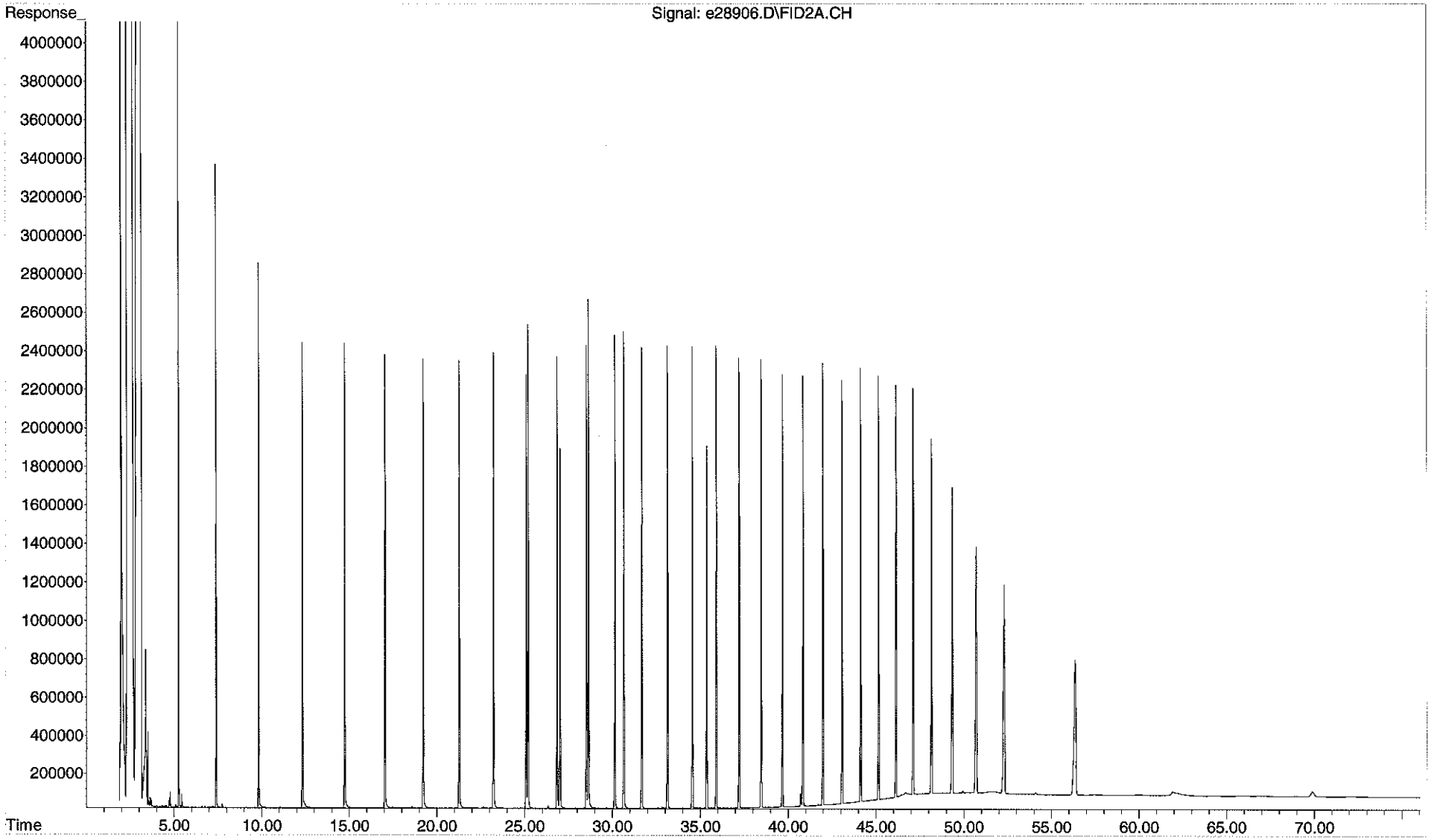
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.658	58151868	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.650	61780706	50.302 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	100.60%
24) s	d50-Tetracosane	35.369	51644987	51.902 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	103.80%
	Target Compounds			
2) t	n-Octane (C8)	5.253	49826989	53.214 ug/mL M4
3) t	n-Nonane (C9)	7.389	49942317	52.183 ug/mL M4
4) t	n-Decane (C10)	9.829	50744703	51.076 ug/mL M4
5) t	n-Undecane (C11)	12.320	50772546	50.552 ug/mL M4
6) t	n-Dodecane (C12)	14.739	53401489	52.293 ug/mL M4
7) t	n-Tridecane (C13)	17.041	53718453	52.312 ug/mL M4
9) t	n-Tetradecane (C14)	19.220	53988970	52.096 ug/mL M4
11) t	n-Pentadecane (C15)	21.282	53873916	51.870 ug/mL M4
12) t	n-Hexadecane (C16)	23.235	54728697	52.263 ug/mL M4
14) t	n-Heptadecane (C17)	25.092	53310847	51.228 ug/mL M4
15) t	Pristane	25.203	56481520	53.135 ug/mL M4
16) t	n-Octadecane (C18)	26.856	55250547	51.908 ug/mL M4
17) t	Phytane	27.021	55151283	52.389 ug/mL M4
18) t	n-Nonadecane (C19)	28.538	55066508	51.825 ug/mL M4
20) t	n-Eicosane (C20)	30.143	55803773	52.013 ug/mL M4
21) t	n-Heneicosane (C21)	31.676	55853174	51.851 ug/mL M4
22) t	n-Docosane (C22)	33.146	56062300	51.905 ug/mL M4
23) t	n-Tricosane (C23)	34.558	56205678	51.240 ug/mL M4
25) t	n-Tetracosane (C24)	35.913	56074926	52.000 ug/mL M4
26) t	n-Pentacosane (C25)	37.217	57367000	52.206 ug/mL M4
27) t	n-Hexacosane (C26)	38.472	57123451	52.323 ug/mL M4
28) t	n-Heptacosane (C27)	39.680	56154306	52.445 ug/mL M4
29) t	n-Octacosane (C28)	40.849	57042504	52.742 ug/mL M4
30) t	n-Nonacosane (C29)	41.979	57298458	52.990 ug/mL M4
31) t	n-Triacontane (C30)	43.072	56703611	53.030 ug/mL M4
32) t	n-Hentriacontane (C31)	44.129	57383852	53.196 ug/mL M4
33) t	n-Dotriacontane (C32)	45.154	57311932	53.319 ug/mL M4
34) t	n-Tritriacontane (C33)	46.146	54784413	53.357 ug/mL M4
35) t	n-tetratriacontane (C34)	47.119	56238234	53.057 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.160	57145086	52.981 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.343	58060296	52.653 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.708	56708434	52.605 ug/mL M4
39) t	n-Octatriacontane (C38)	52.293	56090620	52.261 ug/mL M4
41) t	n-Tetracontane (C40)	56.344	52371393	51.515 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28906.D
Operator : AC
Acquired : 12 Nov 2012 5:47 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091206R
Misc Info : WHAQ67
ALS Vial : 95



Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28918.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 2:43 am
Operator : AC
Sample : C211091207R
Misc : WHAQ67
ALS Vial : 51 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:33:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 15% Max. Rel. Area : 200%

GT 11-19-12

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	108	0.00
2	t	n-Octane (C8)	50.000	47.561	4.9	103	0.00
3	t	n-Nonane (C9)	50.000	49.337	1.3	107	0.00
4	t	n-Decane (C10)	50.000	50.284	-0.6	109	0.00
5	t	n-Undecane (C11)	50.000	49.835	0.3	108	0.00
6	t	n-Dodecane (C12)	50.000	51.373	-2.7	111	0.00
7	t	n-Tridecane (C13)	50.000	51.578	-3.2	112	0.00
9	t	n-Tetradecane (C14)	50.000	51.411	-2.8	112	0.00
11	t	n-Pentadecane (C15)	50.000	51.536	-3.1	112	0.00
12	t	n-Hexadecane (C16)	50.000	51.849	-3.7	113	0.00
14	t	n-Heptadecane (C17)	50.000	50.794	-1.6	111	0.00
15	t	Pristane	50.000	52.771	-5.5	114	0.00
16	t	n-Octadecane (C18)	50.000	51.576	-3.2	112	0.00
17	t	Phytane	50.000	51.570	-3.1	112	0.00
18	t	n-Nonadecane (C19)	50.000	51.450	-2.9	112	0.00
19	s	ortho-terphenyl	50.000	50.301	-0.6	115	0.00
20	t	n-Eicosane (C20)	50.000	51.643	-3.3	112	0.00
21	t	n-Heneicosane (C21)	50.000	51.435	-2.9	112	0.00
22	t	n-Docosane (C22)	50.000	51.508	-3.0	112	0.00
23	t	n-Tricosane (C23)	50.000	50.776	-1.6	112	0.00
24	s	d50-Tetracosane	50.000	51.356	-2.7	114	0.00
25	t	n-Tetracosane (C24)	50.000	51.360	-2.7	112	0.00
26	t	n-Pentacosane (C25)	50.000	51.483	-3.0	112	0.00
27	t	n-Hexacosane (C26)	50.000	51.494	-3.0	112	0.02
28	t	n-Heptacosane (C27)	50.000	51.491	-3.0	112	0.02
29	t	n-Octacosane (C28)	50.000	51.648	-3.3	113	0.02
30	t	n-Nonacosane (C29)	50.000	51.822	-3.6	113	0.02
31	t	n-Triacontane (C30)	50.000	51.778	-3.6	113	0.02
32	t	n-Hentriacontane (C31)	50.000	51.906	-3.8	113	0.02
33	t	n-Dotriacontane (C32)	50.000	51.937	-3.9	114	0.02
34	t	n-Tritriacontane (C33)	50.000	51.942	-3.9	114	0.02
35	t	n-tetratriacontane (C34)	50.000	51.812	-3.6	113	0.02
36	t	n-Pentatriacontane (C35)	50.000	51.485	-3.0	113	0.02
37	t	n-Hexatriacontane (C36)	50.000	51.129	-2.3	112	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.834	-1.7	111	0.02
39	t	n-Octatriacontane (C38)	50.000	50.409	-0.8	110	0.02
41	t	n-Tetracontane (C40)	50.000	49.602	0.8	108	0.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.02	0.85 - 1.15

HC2090412R.M Mon Nov 19 10:32:08 2012

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28918.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 2:43 am
Operator : AC
Sample : C211091207R
Misc : WHAQ67
ALS Vial : 51 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:33:26 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

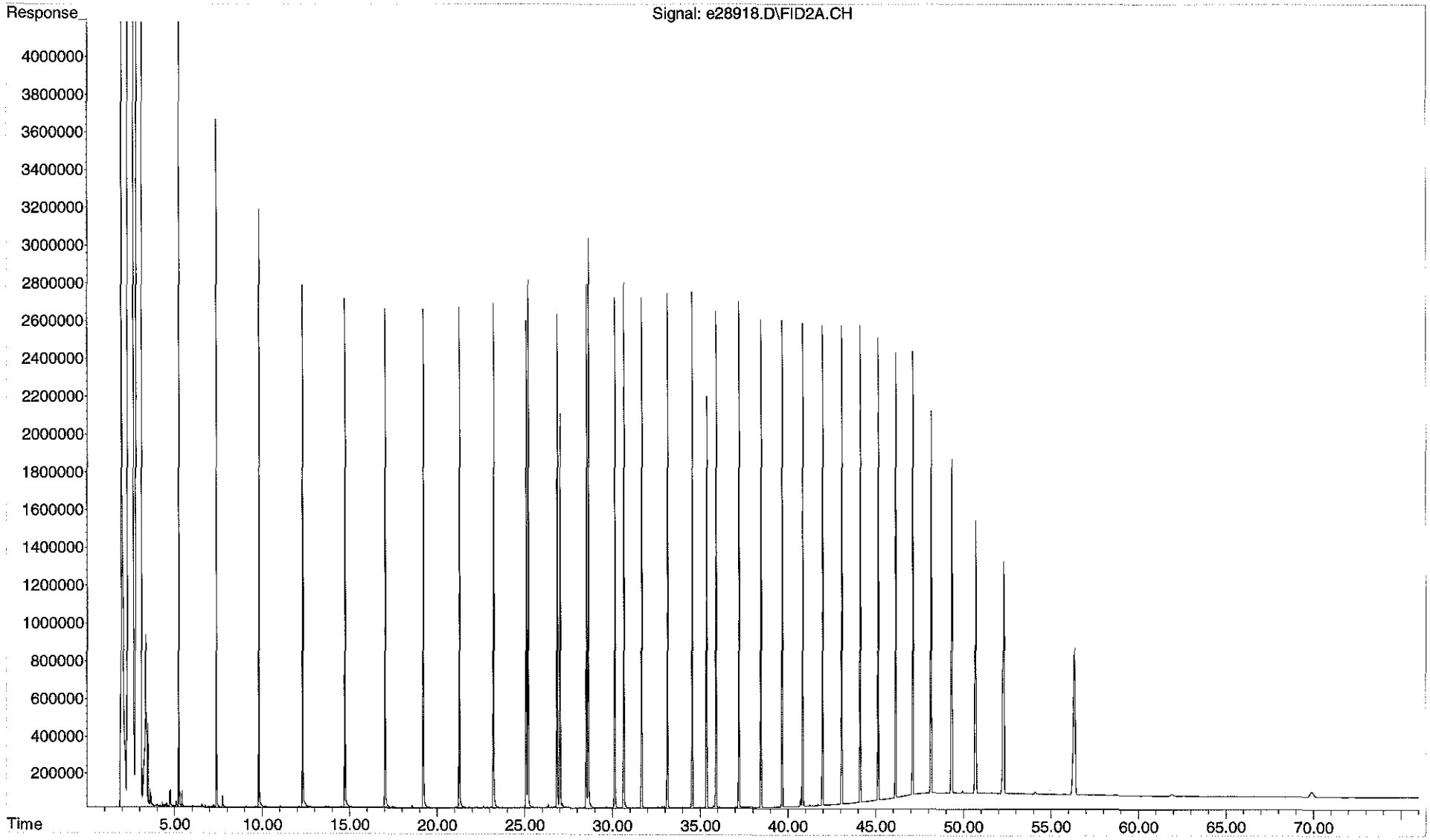
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.659	67988757	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.652	72230407	50.301 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	100.60%
24) s	d50-Tetracosane	35.369	59745833	51.356 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	102.71%
	Target Compounds			
2) t	n-Octane (C8)	5.241	52067502	47.561 ug/mL M4
3) t	n-Nonane (C9)	7.382	55206171	49.337 ug/mL M4
4) t	n-Decane (C10)	9.824	58408886	50.284 ug/mL M4
5) t	n-Undecane (C11)	12.317	58519851	49.835 ug/mL M4
6) t	n-Dodecane (C12)	14.737	61336288	51.373 ug/mL M4
7) t	n-Tridecane (C13)	17.040	61924069	51.578 ug/mL M4
9) t	n-Tetradecane (C14)	19.220	62292362	51.411 ug/mL M4
11) t	n-Pentadecane (C15)	21.281	62581928	51.536 ug/mL M4
12) t	n-Hexadecane (C16)	23.235	63480076	51.849 ug/mL M4
14) t	n-Heptadecane (C17)	25.093	61800397	50.794 ug/mL M4
15) t	Pristane	25.205	65583341	52.771 ug/mL M4
16) t	n-Octadecane (C18)	26.856	64183124	51.576 ug/mL M4
17) t	Phytane	27.022	63472368	51.570 ug/mL M4
18) t	n-Nonadecane (C19)	28.540	63915448	51.450 ug/mL M4
20) t	n-Eicosane (C20)	30.145	64779741	51.643 ug/mL M4
21) t	n-Heneicosane (C21)	31.679	64778126	51.435 ug/mL M4
22) t	n-Docosane (C22)	33.150	65043518	51.508 ug/mL M4
23) t	n-Tricosane (C23)	34.560	65118989	50.776 ug/mL M4
25) t	n-Tetracosane (C24)	35.916	64753702	51.360 ug/mL M4
26) t	n-Pentacosane (C25)	37.219	66141640	51.483 ug/mL M4
27) t	n-Hexacosane (C26)	38.476	65728239	51.494 ug/mL M4
28) t	n-Heptacosane (C27)	39.683	64459250	51.491 ug/mL M4
29) t	n-Octacosane (C28)	40.853	65308380	51.648 ug/mL M4
30) t	n-Nonacosane (C29)	41.982	65514519	51.822 ug/mL M4
31) t	n-Triacontane (C30)	43.075	64730471	51.778 ug/mL M4
32) t	n-Hentriacontane (C31)	44.132	65463535	51.906 ug/mL M4
33) t	n-Dotriacontane (C32)	45.157	65270107	51.937 ug/mL M4
34) t	n-Tritriacontane (C33)	46.149	62353361	51.942 ug/mL M4
35) t	n-tetratriacontane (C34)	47.121	64208419	51.812 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.163	64925963	51.485 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.350	65917470	51.129 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.714	64068968	50.834 ug/mL M4
39) t	n-Octatriacontane (C38)	52.302	63254438	50.409 ug/mL M4
41) t	n-Tetracontane (C40)	56.354	58956520	49.602 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28918.D
Operator : AC
Acquired : 13 Nov 2012 2:43 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : C211091207R
Misc Info : WHAQ67
ALS Vial : 51



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Raw Data

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27112.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 1:58 am
Operator : AC
Sample : IB209041203R
Misc : DCM
ALS Vial : 62 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:35:50 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

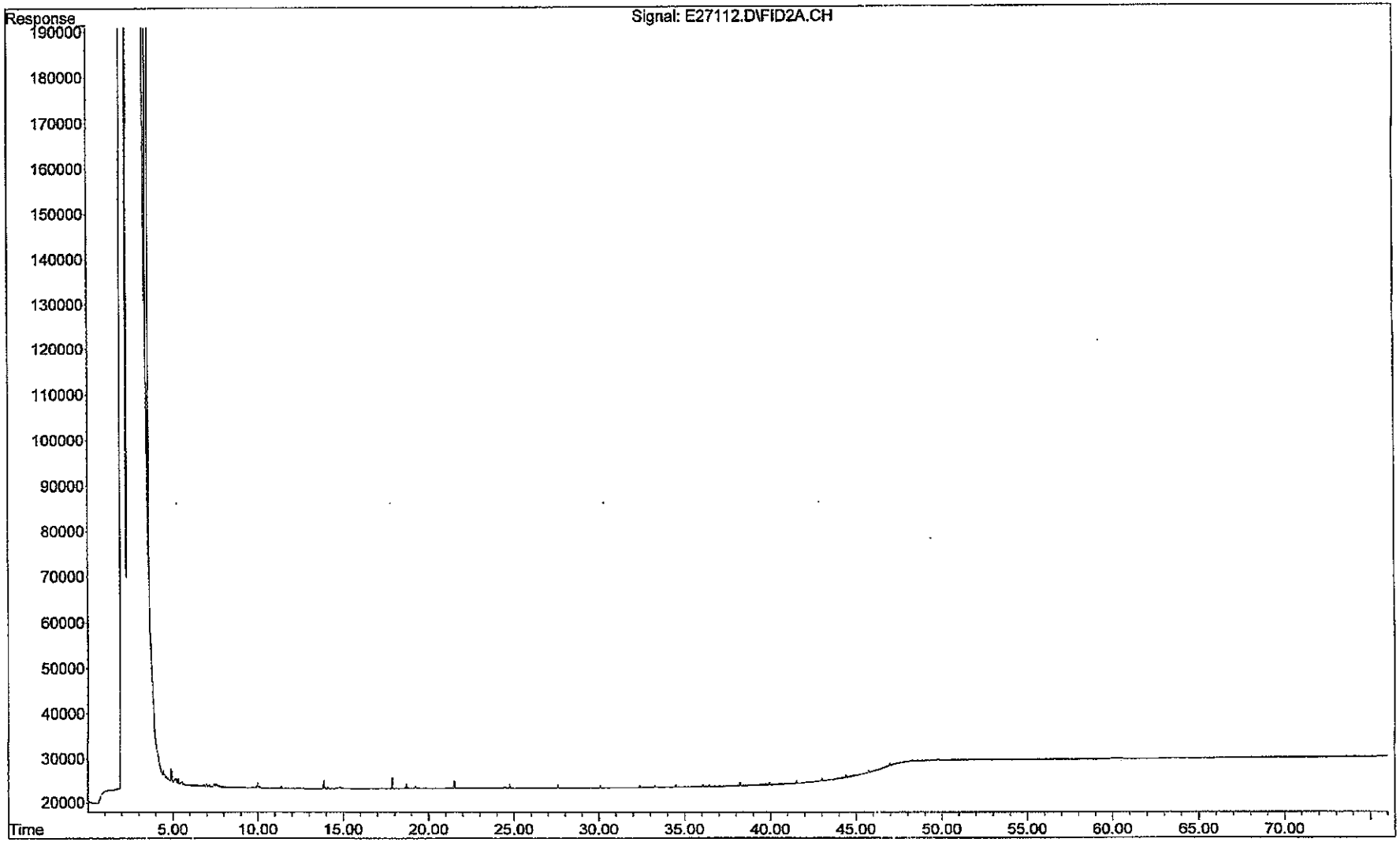
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.016	1184	50.000 ug/mL M4
System Monitoring Compounds			
Target Compounds			
42) h C9-C44 Total Petroleu...	39.610	122454170	5687693.907 ug/mL M5
45) h Total Resolved Hydroc...	39.151	1666475	77403.663 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27112.D
Operator : AC
Acquired : 05 Sep 2012 1:58 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB209041203R
Misc Info : DCM
ALS Vial : 62



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28820.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 4:19 pm
Operator : AC
Sample : IB211091201R
Misc : DCM
ALS Vial : 55 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:42:03 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

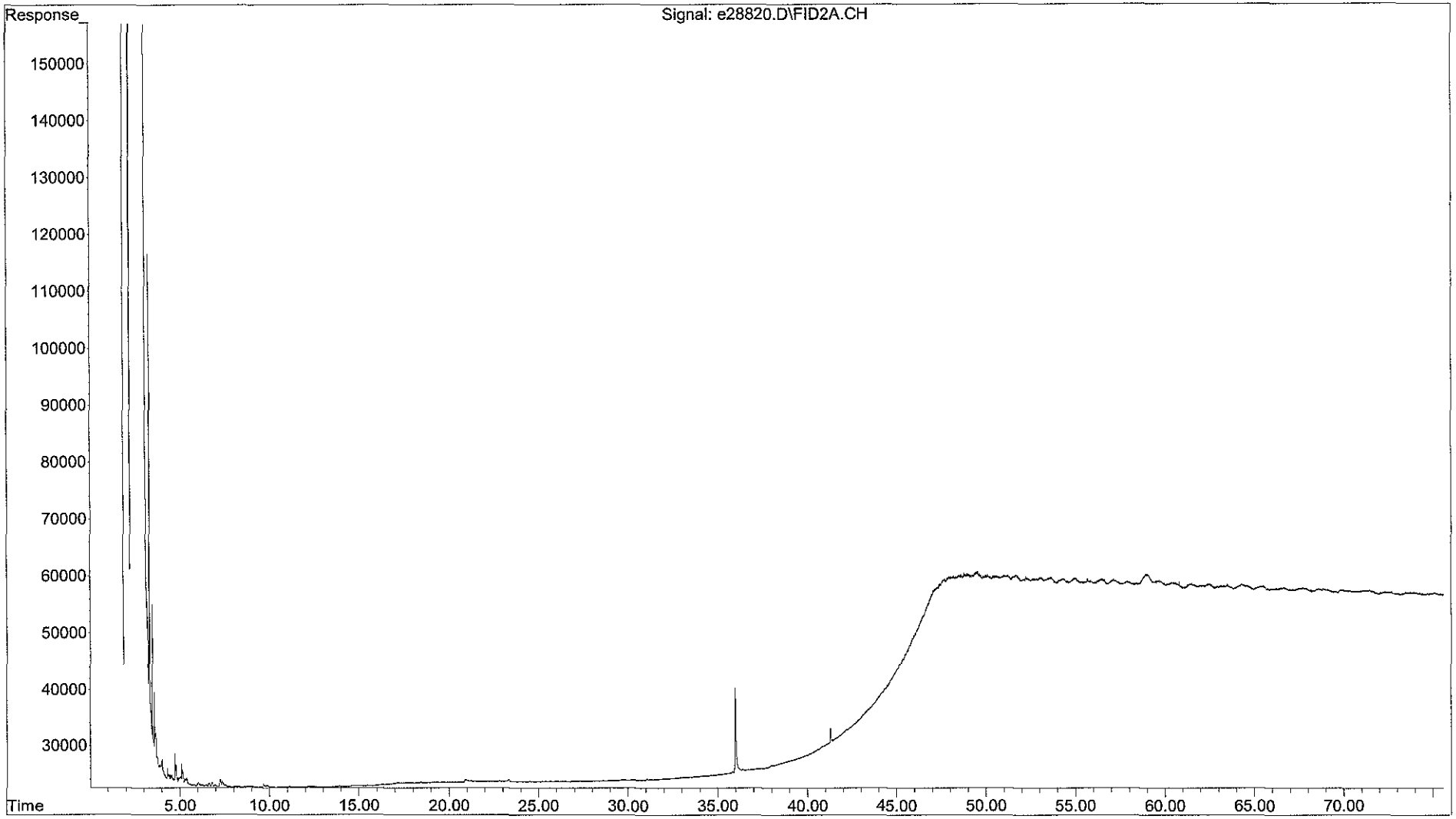
Sub List : TPH - TPH

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.710	3120	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	660485366	11640050.890 ug/mL M5
45) h	Total Resolved Hydroc...	38.728	5850614	103108.185 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28820.D
Operator : AC
Acquired : 09 Nov 2012 4:19 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091201R
Misc Info : DCM
ALS Vial : 55



Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28844.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 10:08 am
Operator : AC
Sample : IB211091202R
Misc : DCM
ALS Vial : 67 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 09:55:41 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

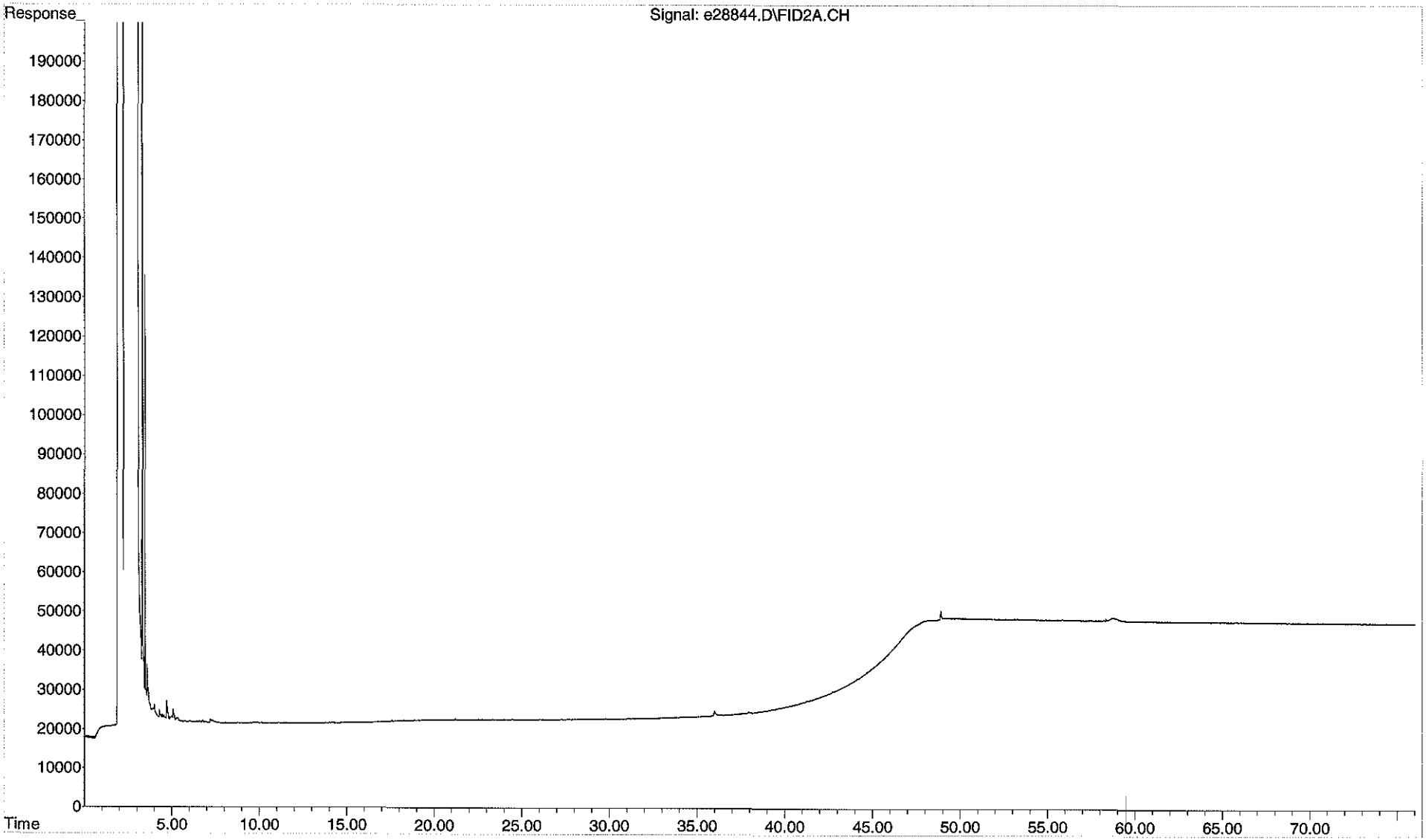
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.637	1761	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	459452277	14343798.049 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	1493403	46623.071 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28844.D
Operator : AC
Acquired : 10 Nov 2012 10:08 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091202R
Misc Info : DCM
ALS Vial : 67



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28910.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 8:46 pm
Operator : AC
Sample : IB211091205R
Misc : DCM
ALS Vial : 97 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:47:15 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

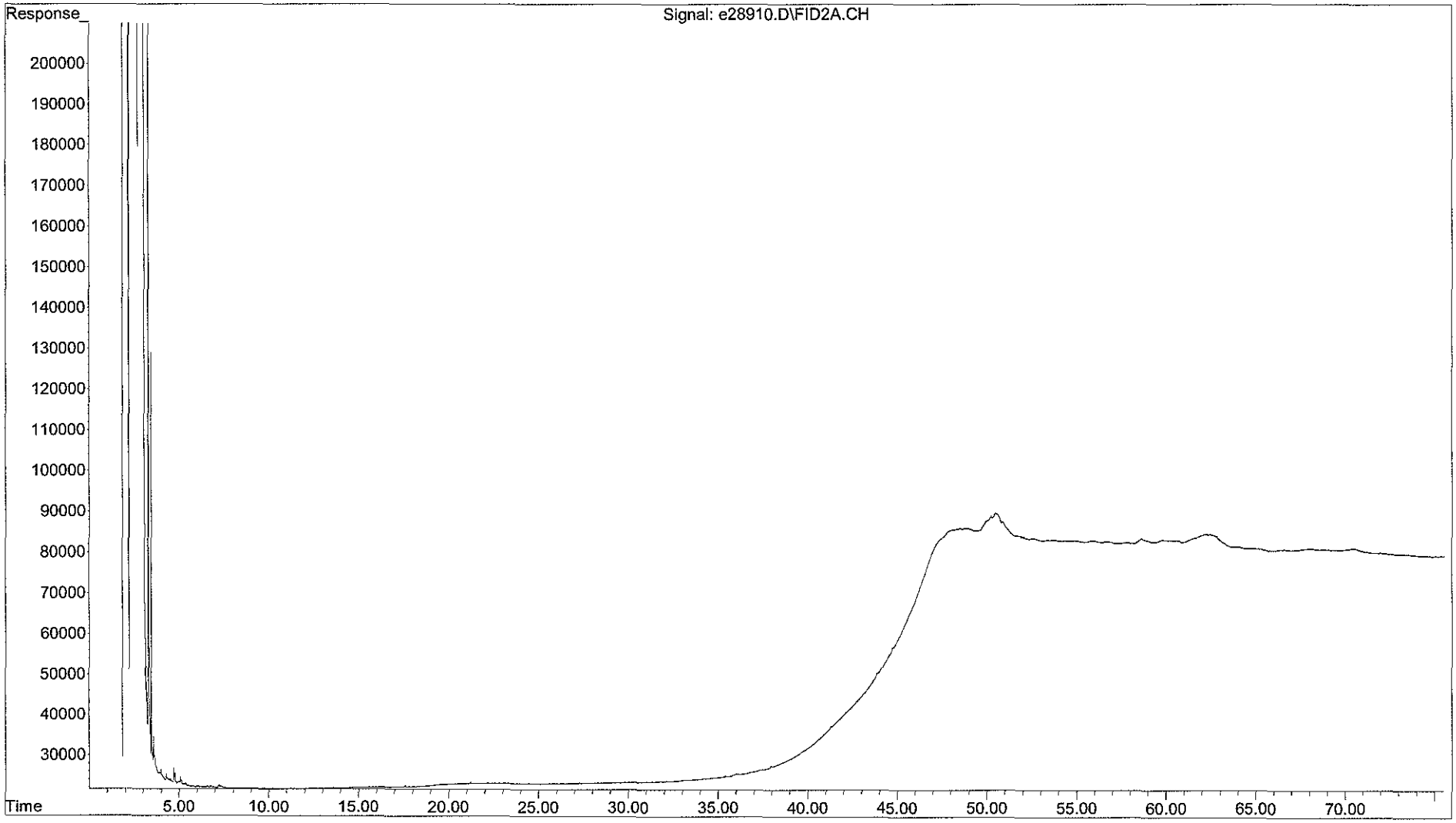
Sub List : TPH - TPH

GT 11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.662	1788	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	1044502675	32131218.080 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	5219472	160562.526 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28910.D
Operator : AC
Acquired : 12 Nov 2012 8:46 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091205R
Misc Info : DCM
ALS Vial : 97



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28922.D
Signal(s) : FID2A.CH
Acq On : 13 Nov 2012 5:41 am
Operator : AC
Sample : IB211091206R
Misc : DCM
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:28 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

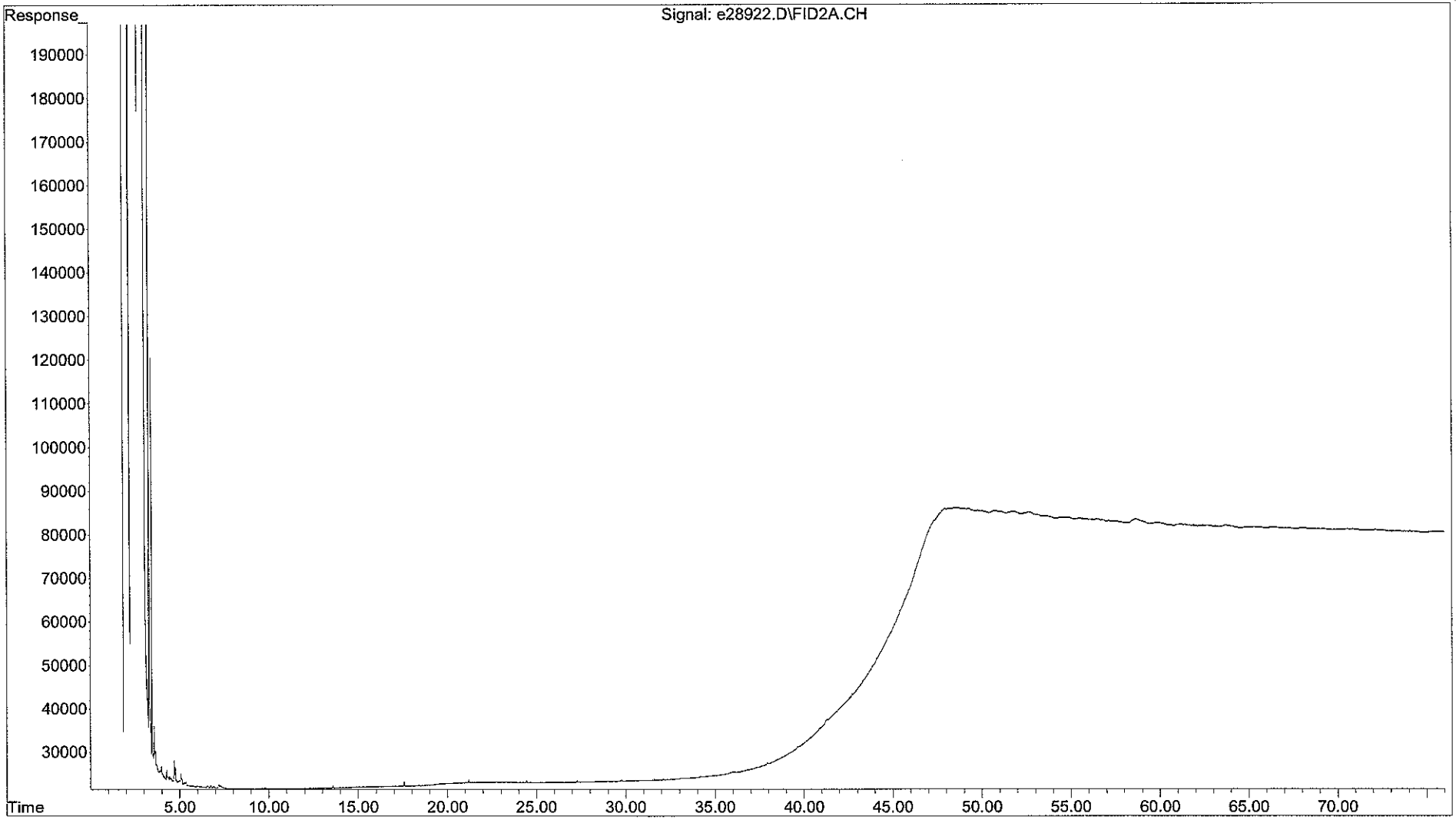
Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.696	5463	50.000 ug/mL M4
	System Monitoring Compounds			
	Target Compounds			
42) h	C9-C44 Total Petroleu...	38.728	1041692890	10485840.730 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	4731261	47625.603 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28922.D
Operator : AC
Acquired : 13 Nov 2012 5:41 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : IB211091206R
Misc Info : DCM
ALS Vial : 53



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612B09**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/09/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	0.0181	U	n-Tricosane (C23)	**0.00507**	J
n-Decane (C10)	**0.00733**	J	n-Tetracosane (C24)	0.0124	U
n-Undecane (C11)	**0.00160**	J	n-Pentacosane (C25)	**0.0685**	CJ
n-Dodecane (C12)	0.0188	U	n-Hexacosane (C26)	**0.00240**	J
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	**0.00453**	J
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**0.00573**	J
n-Tetradecane (C14)	0.0139	U	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**0.00213**	J
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	**0.00293**	J
n-Hexadecane (C16)	0.0128	U	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	**0.00133**	J	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**0.0613**	CJ	n-Hexatriacontane (C36)	0.0221	U
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	0.0108	U	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	0.00741	U	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**0.00120**	J			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**0.164**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	91	40-125
d50-Tetracosane	89	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.
C - Co-elution

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28826.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 8:48 pm
Operator : AC
Sample : SS110612B09
Misc : 1X
ALS Vial : 58 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 14:46:48 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

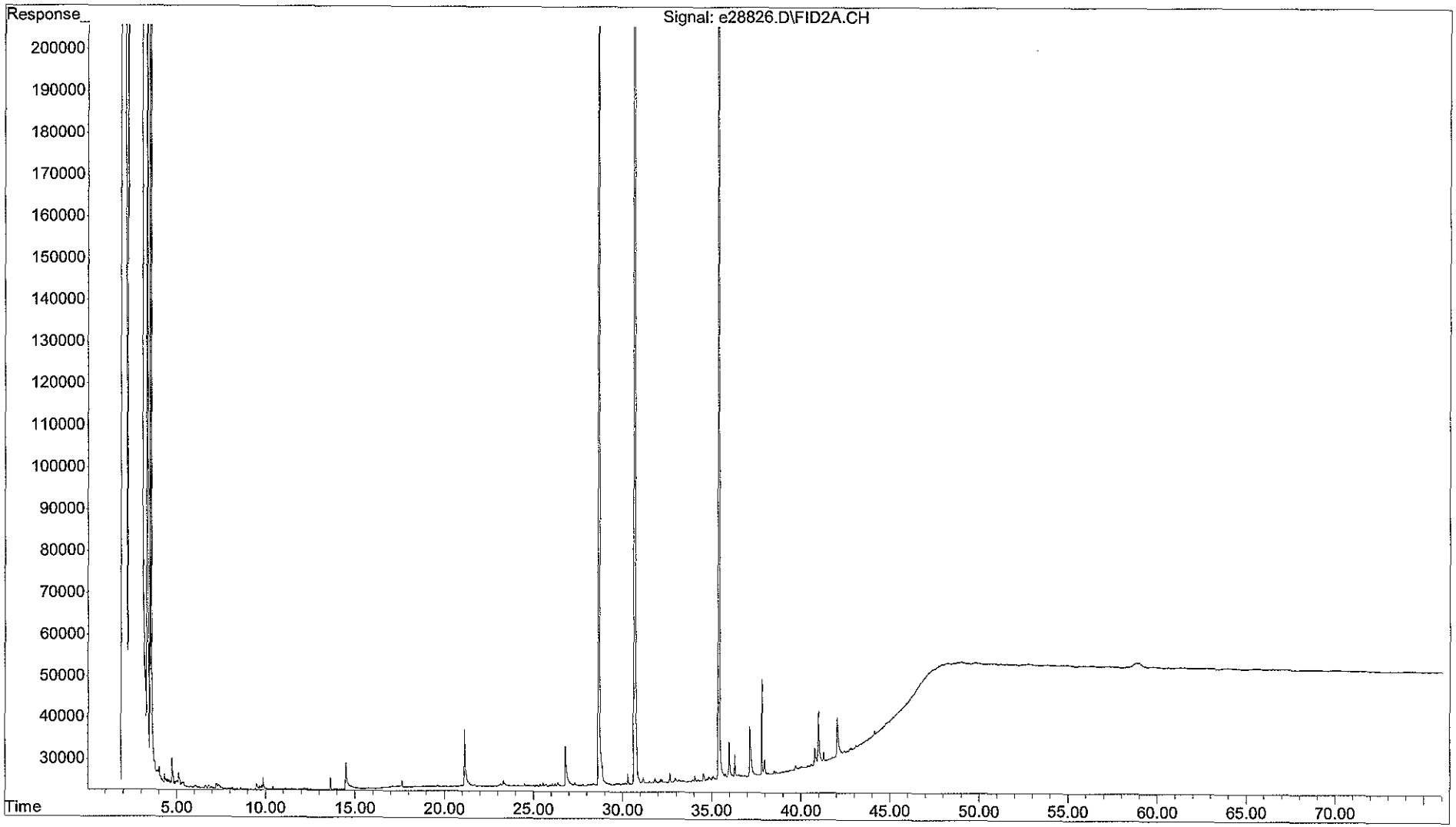
Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	30.674	69514735	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	28.651	33248182	22.646	ug/mL	M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	45.29%#		
24) s	d50-Tetracosane	35.371	26612732	22.373	ug/mL	M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	44.75%#		
	Target Compounds					
2) t	n-Octane (C8)	5.228	9085	0.008	ug/mL	M4
4) t	n-Decane (C10)	9.818	65907	0.055	ug/mL	M4
5) t	n-Undecane (C11)	12.318	13962	0.012	ug/mL	M4
14) t	n-Heptadecane (C17)	25.103	12754	0.010	ug/mL	M4
16) t	n-Octadecane (C18)	26.763	585216C	0.460	ug/mL	M4
22) t	n-Docosane (C22)	33.144	12117	0.009	ug/mL	M4
23) t	n-Tricosane (C23)	34.501	49235	0.038	ug/mL	M4
26) t	n-Pentacosane (C25)	37.115f	675109C	0.514	ug/mL	M4
27) t	n-Hexacosane (C26)	38.469	24072	0.018	ug/mL	M4
28) t	n-Heptacosane (C27)	39.676	44018	0.034	ug/mL	M4
29) t	n-Octacosane (C28)	40.843	55453	0.043	ug/mL	M4
31) t	n-Triacontane (C30)	43.072	20469	0.016	ug/mL	M4
32) t	n-Hentriacontane (C31)	44.127	28492	0.022	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	586991845	464.350	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	-73493521	N.D.	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	9701119	7.674	ug/mL	m
	SemiQuant Compounds - Not Calibrated on this Instrument					

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28826.D
Operator : AC
Acquired : 09 Nov 2012 8:48 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612B09
Misc Info : 1X
ALS Vial : 58



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCS05**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/10/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.910**	S	n-Tricosane (C23)	0.00793	U
n-Decane (C10)	**1.04**	S	n-Tetracosane (C24)	**1.23**	S
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	0.0781	U
n-Dodecane (C12)	**1.10**	S	n-Hexacosane (C26)	**1.22**	S
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	0.0104	U
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**1.23**	S
n-Tetradecane (C14)	**1.15**	S	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**1.24**	S
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	0.0143	U
n-Hexadecane (C16)	**1.23**	S	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	0.0161	U	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**1.24**	S	n-Hexatriacontane (C36)	**1.19**	S
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	**1.15**	S	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	**1.18**	S	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**1.19**	S			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**16.3**	
Total Petroleum Hydrocarbons (C9-C44)	**27.7**	
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	89	40-125
d50-Tetracosane	88	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28832.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 1:15 am
Operator : AC
Sample : SS110612LCS05
Misc : 1X
ALS Vial : 61 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 09:57:27 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091202R
Blank File : e28844.D

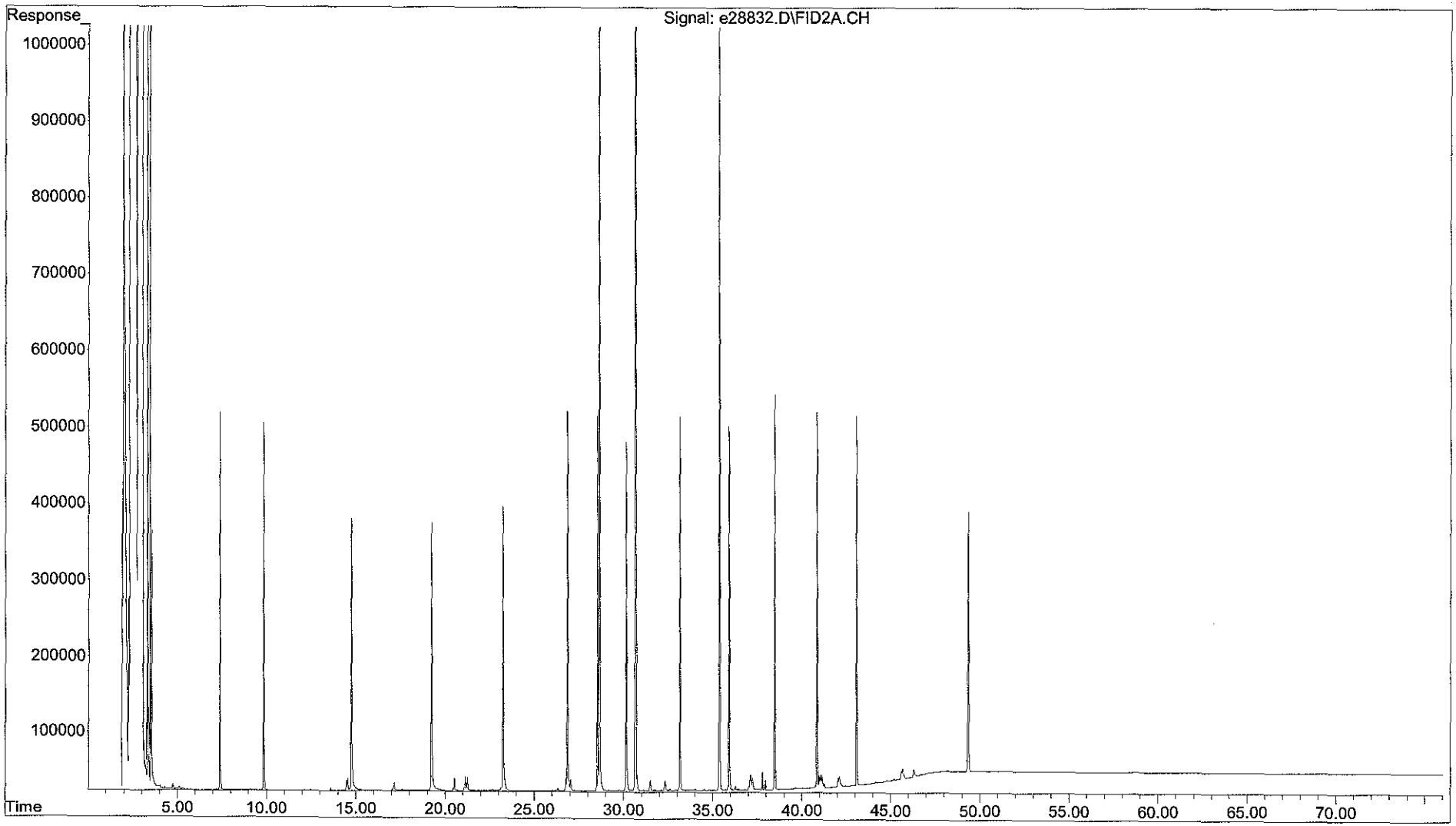
Sub List : SHC - SHC

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.669	69712484	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.646	32942694	22.374 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	44.75%#
24) s	d50-Tetracosane	35.368	26162034	21.932 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	43.86%#
	Target Compounds			
3) t	n-Nonane (C9)	7.363	7831485	6.826 ug/mL M4
4) t	n-Decane (C10)	9.815	9294739	7.804 ug/mL M4
6) t	n-Dodecane (C12)	14.732	10068452	8.224 ug/mL M4
9) t	n-Tetradecane (C14)	19.213	10681496	8.598 ug/mL M4
12) t	n-Hexadecane (C16)	23.229	11585822	9.229 ug/mL M4
16) t	n-Octadecane (C18)	26.846	11891783	9.320 ug/mL M4
18) t	n-Nonadecane (C19)	28.530	10964114	8.608 ug/mL M4
20) t	n-Eicosane (C20)	30.135	11339480	8.816 ug/mL M4
22) t	n-Docosane (C22)	33.138	11536037	8.909 ug/mL M4
25) t	n-Tetracosane (C24)	35.903	11956289	9.249 ug/mL M4
27) t	n-Hexacosane (C26)	38.462	11961603	9.139 ug/mL M4
29) t	n-Octacosane (C28)	40.841	11936303	9.206 ug/mL M4
31) t	n-Triacontane (C30)	43.061	11932141	9.309 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.331	11809760	8.934 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.728	722746815	570.120 ug/mL M4
42) h	C9-C44 Total Petroleu BS	38.728	263294538	207.693 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	170569644	134.549 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28832.D
Operator : AC
Acquired : 10 Nov 2012 1:15 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612LCS05
Misc Info : 1X
ALS Vial : 61



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Sediment**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **SS110612LCSD05**
Associated Blank: **SS110612B09**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/06/12	11/10/12	100	15.00	2	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**0.770**	S	n-Tricosane (C23)	0.00793	U
n-Decane (C10)	**0.861**	S	n-Tetracosane (C24)	**0.998**	S
n-Undecane (C11)	0.0145	U	n-Pentacosane (C25)	0.0781	U
n-Dodecane (C12)	**0.890**	S	n-Hexacosane (C26)	**0.988**	S
n-Tridecane (C13)	0.0777	U	n-Heptacosane (C27)	0.0104	U
2,6,10 Trimethyldodecane (1380)	0.0139	U	n-Octacosane (C28)	**1.00**	S
n-Tetradecane (C14)	**0.930**	S	n-Nonacosane (C29)	0.0125	U
2,6,10 Trimethyltridecane (1470)	0.0596	U	n-Triacontane (C30)	**0.991**	S
n-Pentadecane (C15)	0.0596	U	n-Hentriacontane (C31)	0.0143	U
n-Hexadecane (C16)	**1.00**	S	n-Dotriacontane (C32)	0.0148	U
Norpristane (1650)	0.0161	U	n-Tritriacontane (C33)	0.0147	U
n-Heptadecane (C17)	0.0161	U	n-Tetratriacontane (C34)	0.0179	U
Pristane	0.0215	U	n-Pentatriacontane (C35)	0.0168	U
n-Octadecane (C18)	**1.01**	S	n-Hexatriacontane (C36)	**0.949**	S
Phytane	0.0112	U	n-Heptatriacontane (C37)	0.0227	U
n-Nonadecane (C19)	**0.922**	S	n-Octatriacontane (C38)	0.0205	U
n-Eicosane (C20)	**0.951**	S	n-Nonatriacontane (C39)	0.0244	U
n-Heneicosane (C21)	0.00895	U	n-Tetracontane (C40)	0.0244	U
n-Docosane (C22)	**0.965**	S			

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**13.2**	
Total Petroleum Hydrocarbons (C9-C44)	26.7	U
Total Resolved Hydrocarbons	26.7	U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	73	40-125
d50-Tetracosane	72	40-125

N/A - Not Applicable
U - The analyte was analyzed for but not detected at the sample specific level reported.
S - Spike compound.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28838.D
Signal(s) : FID2A.CH
Acq On : 10 Nov 2012 5:41 am
Operator : AC
Sample : SS110612LCSD05
Misc : 1X
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 09:57:29 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 15 12:44:50 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

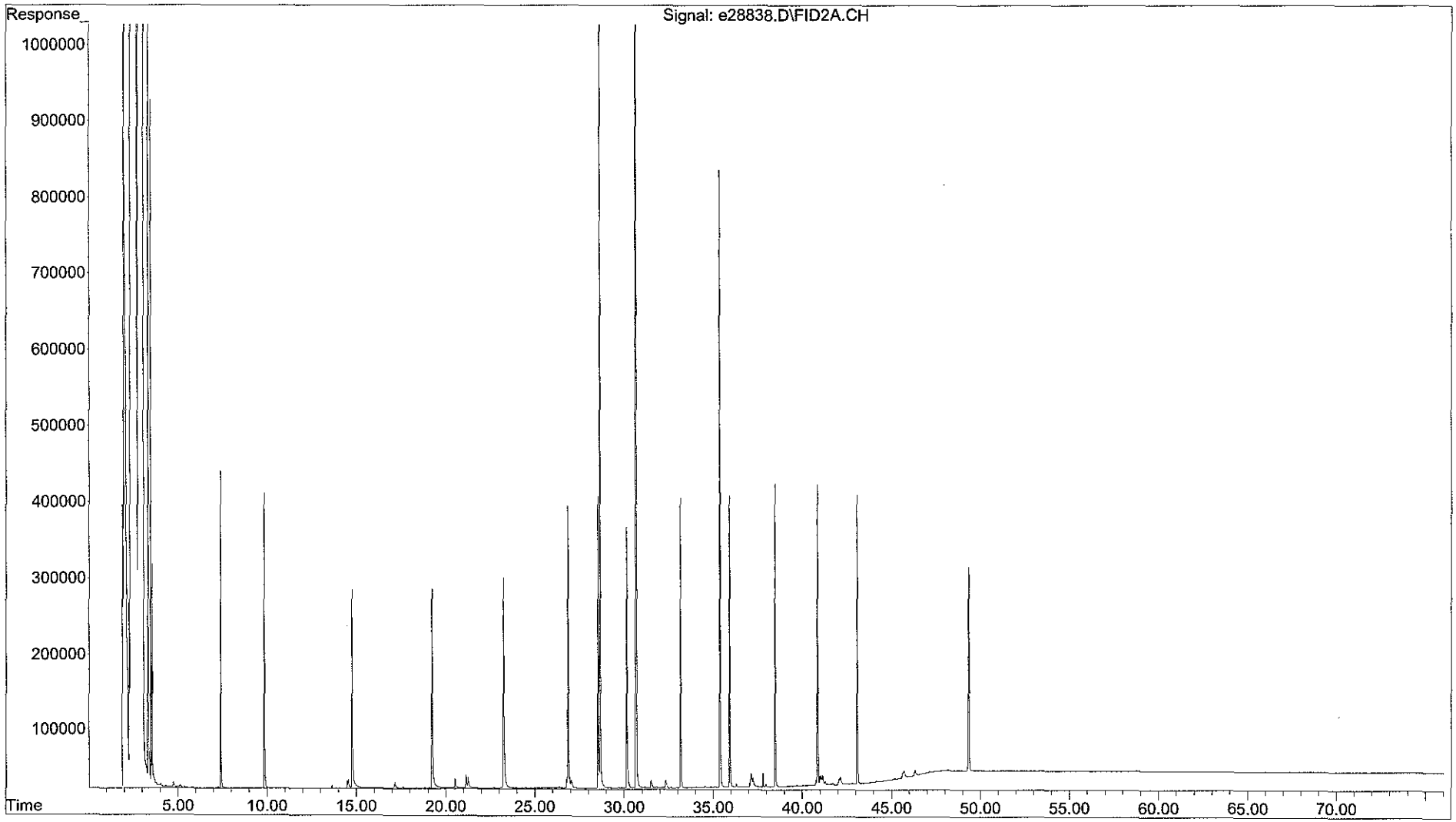
Blank Name : IB211091202R
Blank File : e28844.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.665	68852339	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.642	26657560	18.332 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	36.66%#
24) s	d50-Tetracosane	35.363	21098491	17.908 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	35.82%#
	Target Compounds			
3) t	n-Nonane (C9)	7.363	6544001	5.775 ug/mL M4
4) t	n-Decane (C10)	9.812	7592916	6.455 ug/mL M4
6) t	n-Dodecane (C12)	14.730	8074448	6.678 ug/mL M4
9) t	n-Tetradecane (C14)	19.211	8562076	6.978 ug/mL M4
12) t	n-Hexadecane (C16)	23.228	9298125	7.499 ug/mL M4
16) t	n-Octadecane (C18)	26.844	9551312	7.579 ug/mL M4
18) t	n-Nonadecane (C19)	28.526	8702312	6.917 ug/mL M4
20) t	n-Eicosane (C20)	30.134	9057335	7.130 ug/mL M4
22) t	n-Docosane (C22)	33.137	9251044	7.234 ug/mL M4
25) t	n-Tetracosane (C24)	35.902	9557964	7.486 ug/mL M4
27) t	n-Hexacosane (C26)	38.460	9580270	7.411 ug/mL M4
29) t	n-Octacosane (C28)	40.836	9620489	7.513 ug/mL M4
31) t	n-Triacontane (C30)	43.056	9409059	7.432 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.325	9291007	7.116 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.728	643679323	514.093 ug/mL M4
42) h	C9-C44 Total Petroleu BS	38.728	184227046	147.138 ug/mL M4
45) h	Total Resolved Hydroc...	38.728	136894179	109.334 ug/mL m
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28838.D
Operator : AC
Acquired : 10 Nov 2012 5:41 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : SS110612LCSD05
Misc Info : 1X
ALS Vial : 64



Form I
Cold Lake Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Cold Lake Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TS111312CL01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/12/12	100	0.10018	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**1900**		n-Tricosane (C23)	**213**	
n-Decane (C10)	**1000**		n-Tetracosane (C24)	**191**	
n-Undecane (C11)	**841**		n-Pentacosane (C25)	**250**	
n-Dodecane (C12)	**590**		n-Hexacosane (C26)	**154**	
n-Tridecane (C13)	**633**		n-Heptacosane (C27)	**143**	
2,6,10 Trimethyldodecane (1380)	**305**		n-Octacosane (C28)	**114**	
n-Tetradecane (C14)	**704**		n-Nonacosane (C29)	**120**	
2,6,10 Trimethyltridecane (1470)	**461**		n-Triacontane (C30)	**133**	
n-Pentadecane (C15)	**571**		n-Hentriacontane (C31)	**341**	
n-Hexadecane (C16)	**612**		n-Dotriacontane (C32)	**117**	
Norpristane (1650)	**226**		n-Tritriacontane (C33)	**76.3**	J
n-Heptadecane (C17)	**463**		n-Tetratriacontane (C34)	**196**	
Pristane	**443**		n-Pentatriacontane (C35)	**122**	
n-Octadecane (C18)	**401**		n-Hexatriacontane (C36)	**112**	
Phytane	**330**		n-Heptatriacontane (C37)	**71.9**	J
n-Nonadecane (C19)	**303**		n-Octatriacontane (C38)	**68.5**	J
n-Eicosane (C20)	**322**		n-Nonatriacontane (C39)	**35.5**	J
n-Heneicosane (C21)	**229**		n-Tetracontane (C40)	**42.2**	J
n-Docosane (C22)	**218**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**13000**
Total Petroleum Hydrocarbons (C9-C44)	**467000**
Total Resolved Hydrocarbons	**64600**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	40-125
d50-Tetracosane	94	40-125

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28914.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:44 pm
Operator : AC
Sample : TS111312CL01
Misc : WHAP16
ALS Vial : 99 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	65826060	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	71118073	51.154 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	102.31%
24) s	d50-Tetracosane	35.375	53029960	47.080 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	94.16%
	Target Compounds			
2) t	n-Octane (C8)	5.211	32587805	30.746 ug/mL M4
3) t	n-Nonane (C9)	7.359	20587631	19.003 ug/mL M4
4) t	n-Decane (C10)	9.808	11262429	10.014 ug/mL M4
5) t	n-Undecane (C11)	12.304	9576562	8.423 ug/mL M4
6) t	n-Dodecane (C12)	14.724	6828149	5.907 ug/mL M4
7) t	n-Tridecane (C13)	17.026	7366389	6.337 ug/mL M4
8) t	1380	18.704	3580328	3.052 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	8275895	7.055 ug/mL M4
10) t	1470	20.494	5428434	4.617 ug/mL M4
11) t	n-Pentadecane (C15)	21.264	6725409	5.720 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	7271259	6.134 ug/mL M4
13) t	1650	24.127	2669829	2.266 ug/mL M4
14) t	n-Heptadecane (C17)	25.075	5466206	4.640 ug/mL M4
15) t	Pristane	25.173	5337565	4.436 ug/mL M4
16) t	n-Octadecane (C18)	26.837	4834604	4.013 ug/mL M4
17) t	Phytane	27.000	3938903	3.305 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	3646196	3.031 ug/mL M4
20) t	n-Eicosane (C20)	30.126	3924339	3.231 ug/mL M4
21) t	n-Heneicosane (C21)	31.657	2797500	2.294 ug/mL M4
22) t	n-Docosane (C22)	33.128	2665808	2.180 ug/mL M4
23) t	n-Tricosane (C23)	34.539	2647949	2.133 ug/mL M4
25) t	n-Tetracosane (C24)	35.892	2334559	1.913 ug/mL M4
26) t	n-Pentacosane (C25)	37.195	3110581	2.501 ug/mL M4
27) t	n-Hexacosane (C26)	38.451	1903410	1.540 ug/mL M4
28) t	n-Heptacosane (C27)	39.659	1733325	1.430 ug/mL M4
29) t	n-Octacosane (C28)	40.828	1397060	1.141 ug/mL M4
30) t	n-Nonacosane (C29)	41.958	1466178	1.198 ug/mL M4
31) t	n-Triacontane (C30)	43.051	1610237	1.330 ug/mL M4
32) t	n-Hentriacontane (C31)	44.121	4170703	3.416 ug/mL M4
33) t	n-Dotriacontane (C32)	45.131	1429256	1.175 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	888465	0.764 ug/mL M4
35) t	n-tetratriacontane (C34)	47.050	2358831	1.966 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.137	1496801	1.226 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.288	1406017	1.126 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28914.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 11:44 pm
Operator : AC
Sample : TS111312CL01
Misc : WHAP16
ALS Vial : 99 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:56 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

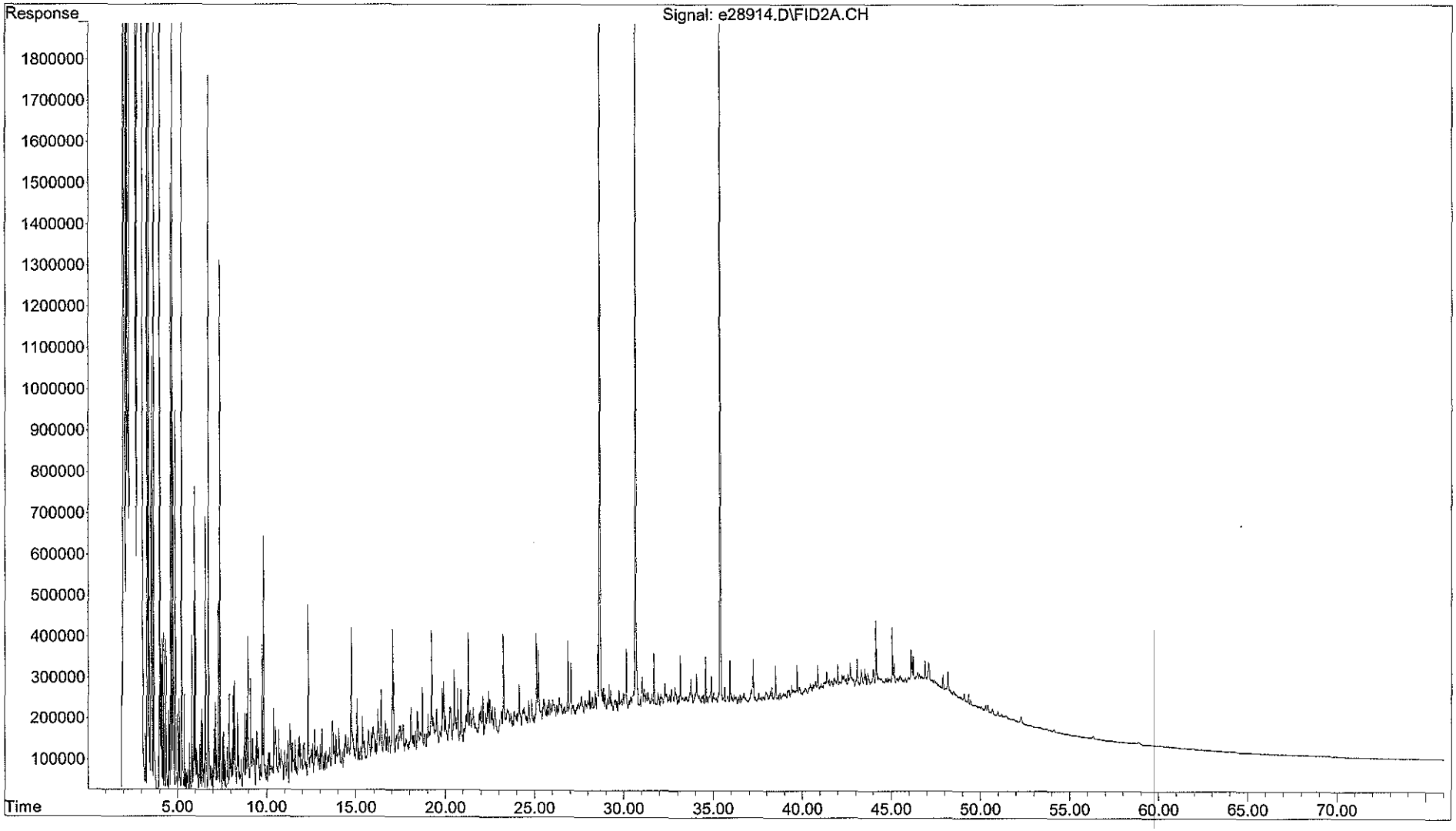
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.671	878384	0.720	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.270	832971	0.686	ug/mL	M4
40)	t	n-Nonatriacontane (C39)	54.095	409877	0.356	ug/mL	M4
41)	t	n-Tetracontane (C40)	56.286	486821	0.423	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	6637208111	5544.699	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	5595515221	4674.473	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	774204769	646.768	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28914.D
Operator : AC
Acquired : 12 Nov 2012 11:44 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312CL01
Misc Info : WHAP16
ALS Vial : 99



Form I
Western Canadian Select
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Western Canadian Select**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TS111312WCS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/12/12	100	0.10119	10	1	AC

Parameter	Result		Parameter	Result	
n-Nonane (C9)	**1600**		n-Tricosane (C23)	**207**	
n-Decane (C10)	**1000**		n-Tetracosane (C24)	**196**	
n-Undecane (C11)	**874**		n-Pentacosane (C25)	**224**	
n-Dodecane (C12)	**574**		n-Hexacosane (C26)	**155**	
n-Tridecane (C13)	**689**		n-Heptacosane (C27)	**127**	
2,6,10 Trimethyldodecane (1380)	**299**		n-Octacosane (C28)	**89.7**	J
n-Tetradecane (C14)	**688**		n-Nonacosane (C29)	**89.9**	J
2,6,10 Trimethyltridecane (1470)	**534**		n-Triacontane (C30)	**113**	
n-Pentadecane (C15)	**610**		n-Hentriacontane (C31)	**298**	
n-Hexadecane (C16)	**658**		n-Dotriacontane (C32)	**67.9**	J
Norpristane (1650)	**244**		n-Tritriacontane (C33)	**44.3**	J
n-Heptadecane (C17)	**455**		n-Tetratriacontane (C34)	**192**	
Pristane	**613**		n-Pentatriacontane (C35)	**93.8**	J
n-Octadecane (C18)	**397**		n-Hexatriacontane (C36)	**85.7**	J
Phytane	**355**		n-Heptatriacontane (C37)	**38.4**	J
n-Nonadecane (C19)	**306**		n-Octatriacontane (C38)	**82.8**	J
n-Eicosane (C20)	**310**		n-Nonatriacontane (C39)	98.8	U
n-Heneicosane (C21)	**225**		n-Tetracontane (C40)	98.8	U
n-Docosane (C22)	**208**				

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**12700**
Total Petroleum Hydrocarbons (C9-C44)	**464000**
Total Resolved Hydrocarbons	**67400**

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	97	40-125
d50-Tetracosane	95	40-125

N/A - Not Applicable
J - Estimated value, below quantitation limit.
U - The analyte was analyzed for but not detected at the sample specific level reported.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28912.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:15 pm
Operator : AC
Sample : TS111312WCS01
Misc : WHAP15
ALS Vial : 98 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:53 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

Sub List : SHC - SHC

11-19-12

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.666	69883728	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.654	71871575	48.694 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	97.39%
24) s	d50-Tetracosane	35.375	56901718	47.585 ug/mL M4
Spiked Amount	50.000 Range 50 - 130		Recovery =	95.17%
	Target Compounds			
2) t	n-Octane (C8)	5.206	27301688	24.263 ug/mL M4
3) t	n-Nonane (C9)	7.356	18673033	16.235 ug/mL M4
4) t	n-Decane (C10)	9.807	12082767	10.120 ug/mL M4
5) t	n-Undecane (C11)	12.304	10672327	8.842 ug/mL M4
6) t	n-Dodecane (C12)	14.722	7122246	5.804 ug/mL M4
7) t	n-Tridecane (C13)	17.025	8600410	6.969 ug/mL M4
8) t	1380	18.704	3767421	3.025 ug/mL M4
9) t	n-Tetradecane (C14)	19.204	8669720	6.961 ug/mL M4
10) t	1470	20.492	6744645	5.404 ug/mL M4
11) t	n-Pentadecane (C15)	21.265	7707900	6.175 ug/mL M4
12) t	n-Hexadecane (C16)	23.221	8378975	6.658 ug/mL M4
13) t	1650	24.130	3087847	2.469 ug/mL M4
14) t	n-Heptadecane (C17)	25.076	5760489	4.606 ug/mL M4
15) t	Pristane	25.174	7920762	6.201 ug/mL M4
16) t	n-Octadecane (C18)	26.839	5138781	4.017 ug/mL M4
17) t	Phytane	27.001	4539345	3.588 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	3948450	3.092 ug/mL M4
20) t	n-Eicosane (C20)	30.126	4047588	3.139 ug/mL M4
21) t	n-Heneicosane (C21)	31.658	2947227	2.277 ug/mL M4
22) t	n-Docosane (C22)	33.129	2736106	2.108 ug/mL M4
23) t	n-Tricosane (C23)	34.538	2756718	2.091 ug/mL M4
25) t	n-Tetracosane (C24)	35.893	2570359	1.983 ug/mL M4
26) t	n-Pentacosane (C25)	37.195	2989618	2.264 ug/mL M4
27) t	n-Hexacosane (C26)	38.452	2057263	1.568 ug/mL M4
28) t	n-Heptacosane (C27)	39.661	1656881	1.288 ug/mL M4
29) t	n-Octacosane (C28)	40.832	1179728	0.908 ug/mL M4
30) t	n-Nonacosane (C29)	41.961	1183107	0.910 ug/mL M4
31) t	n-Triacontane (C30)	43.058	1475563	1.148 ug/mL M4
32) t	n-Hentriacontane (C31)	44.119	3910023	3.016 ug/mL M4
33) t	n-Dotriacontane (C32)	45.132	887245	0.687 ug/mL M4
34) t	n-Tritriacontane (C33)	46.129	552842	0.448 ug/mL M4
35) t	n-tetratriacontane (C34)	47.049	2469637	1.939 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.136	1229457	0.949 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.268	1148441	0.867 ug/mL M4

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28912.D
Signal(s) : FID2A.CH
Acq On : 12 Nov 2012 10:15 pm
Operator : AC
Sample : TS111312WCS01
Misc : WHAP15
ALS Vial : 98 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 08:48:53 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 16 07:24:09 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091206R
Blank File : e28922.D

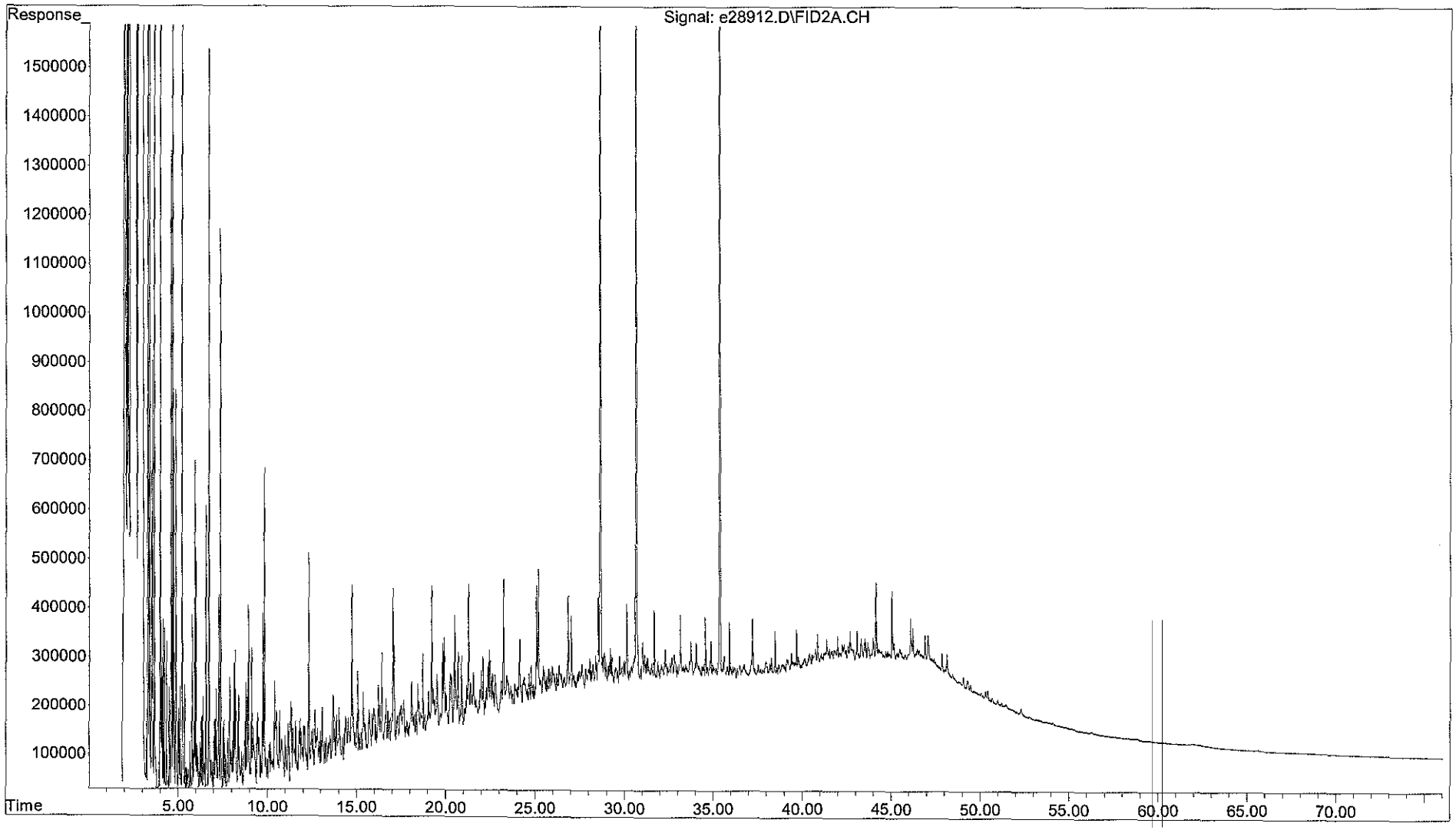
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units	
38)	t	n-Heptatriacontane (C37)	50.657	504384	0.389	ug/mL	M4
39)	t	n-Octatriacontane (C38)	52.279	1080989	0.838	ug/mL	M4
42)	h	C9-C44 Total Petroleu...	38.728	7008489108	5514.914	ug/mL	M4
42)	h	C9-C44 Total Petroleu BS	38.728	5966796218	4695.216	ug/mL	M4
45)	h	Total Resolved Hydroc...	38.728	866480449	681.825	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28912.D
Operator : AC
Acquired : 12 Nov 2012 10:15 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312WCS01
Misc Info : WHAP15
ALS Vial : 98



Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TS111312ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/09/12	100	0.10058	10	1	AC

Parameter	Result	Parameter	Result
n-Nonane (C9)	**7340**	n-Tricosane (C23)	**1940**
n-Decane (C10)	**5900**	n-Tetracosane (C24)	**1960**
n-Undecane (C11)	**5390**	n-Pentacosane (C25)	**1730**
n-Dodecane (C12)	**5000**	n-Hexacosane (C26)	**1530**
n-Tridecane (C13)	**4780**	n-Heptacosane (C27)	**1190**
2,6,10 Trimethyldodecane (1380)	**914**	n-Octacosane (C28)	**881**
n-Tetradecane (C14)	**4170**	n-Nonacosane (C29)	**776**
2,6,10 Trimethyltridecane (1470)	**1580**	n-Triacontane (C30)	**724**
n-Pentadecane (C15)	**4060**	n-Hentriacontane (C31)	**674**
n-Hexadecane (C16)	**3940**	n-Dotriacontane (C32)	**446**
Norpristane (1650)	**1240**	n-Tritriacontane (C33)	**371**
n-Heptadecane (C17)	**3540**	n-Tetratriacontane (C34)	**366**
Pristane	**2370**	n-Pentatriacontane (C35)	**333**
n-Octadecane (C18)	**3060**	n-Hexatriacontane (C36)	**219**
Phytane	**1410**	n-Heptatriacontane (C37)	**169**
n-Nonadecane (C19)	**2680**	n-Octatriacontane (C38)	**154**
n-Eicosane (C20)	**2570**	n-Nonatriacontane (C39)	**99.3** J
n-Heneicosane (C21)	**2280**	n-Tetracontane (C40)	**99.3** J
n-Docosane (C22)	**2220**		

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**78100**
Total Petroleum Hydrocarbons (C9-C44)	**627000**
Total Resolved Hydrocarbons	**197000**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28816.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 1:19 pm
Operator : AC
Sample : TS111312ANC01
Misc : 1X WHAP13
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:11:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.690	64252423	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.680	70802069	52.174 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	104.35%
24) s	d50-Tetracosane	35.400	58230087	52.963 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	105.93%
	Target Compounds			
2) t	n-Octane (C8)	5.231	105612147	102.082 ug/mL M4
3) t	n-Nonane (C9)	7.386	78036226	73.795 ug/mL M4
4) t	n-Decane (C10)	9.837	65194237	59.389 ug/mL M4
5) t	n-Undecane (C11)	12.336	60154601	54.206 ug/mL M4
6) t	n-Dodecane (C12)	14.756	56684456	50.237 ug/mL M4
7) t	n-Tridecane (C13)	17.059	54610876	48.132 ug/mL M4
8) t	1380	18.728	10528329	9.195 ug/mL M4
9) t	n-Tetradecane (C14)	19.239	48049969	41.963 ug/mL M4
10) t	1470	20.519	18178259	15.840 ug/mL M4
11) t	n-Pentadecane (C15)	21.301	46854027	40.828 ug/mL M4
12) t	n-Hexadecane (C16)	23.252	45801337	39.585 ug/mL M4
13) t	1650	24.154	14329063	12.462 ug/mL M4
14) t	n-Heptadecane (C17)	25.109	40902782	35.573 ug/mL M4
15) t	Pristane	25.206	27939411	23.788 ug/mL M4
16) t	n-Octadecane (C18)	26.873	36257328	30.830 ug/mL M4
17) t	Phytane	27.030	16542980	14.222 ug/mL M4
18) t	n-Nonadecane (C19)	28.556	31604938	26.920 ug/mL M4
20) t	n-Eicosane (C20)	30.159	30589125	25.804 ug/mL M4
21) t	n-Heneicosane (C21)	31.692	27320748	22.955 ug/mL M4
22) t	n-Docosane (C22)	33.163	26612353	22.300 ug/mL M4
23) t	n-Tricosane (C23)	34.574	23643581	19.508 ug/mL M4
25) t	n-Tetracosane (C24)	35.931	23473852	19.701 ug/mL M4
26) t	n-Pentacosane (C25)	37.231	21072792	17.356 ug/mL M4
27) t	n-Hexacosane (C26)	38.487	18557529	15.384 ug/mL M4
28) t	n-Heptacosane (C27)	39.697	14192088	11.996 ug/mL M4
29) t	n-Octacosane (C28)	40.862	10589890	8.862 ug/mL M4
30) t	n-Nonacosane (C29)	41.994	9318520	7.800 ug/mL M4
31) t	n-Triacontane (C30)	43.085	8607714	7.286 ug/mL M4
32) t	n-Hentriacontane (C31)	44.144	8081325	6.780 ug/mL M4
33) t	n-Dotriacontane (C32)	45.168	5333538	4.491 ug/mL M4
34) t	n-Tritriacontane (C33)	46.162	4228293	3.727 ug/mL M4
35) t	n-tetratriacontane (C34)	47.128	4306436	3.677 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.178	3990307	3.348 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.360	2678828	2.199 ug/mL M4

11-19-12

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\
Data File : e28816.D
Signal(s) : FID2A.CH
Acq On : 09 Nov 2012 1:19 pm
Operator : AC
Sample : TS111312ANC01
Misc : 1X WHAP13
ALS Vial : 53 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 15:11:36 2012
Quant Method : O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 12 09:02:37 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB211091201R
Blank File : e28820.D

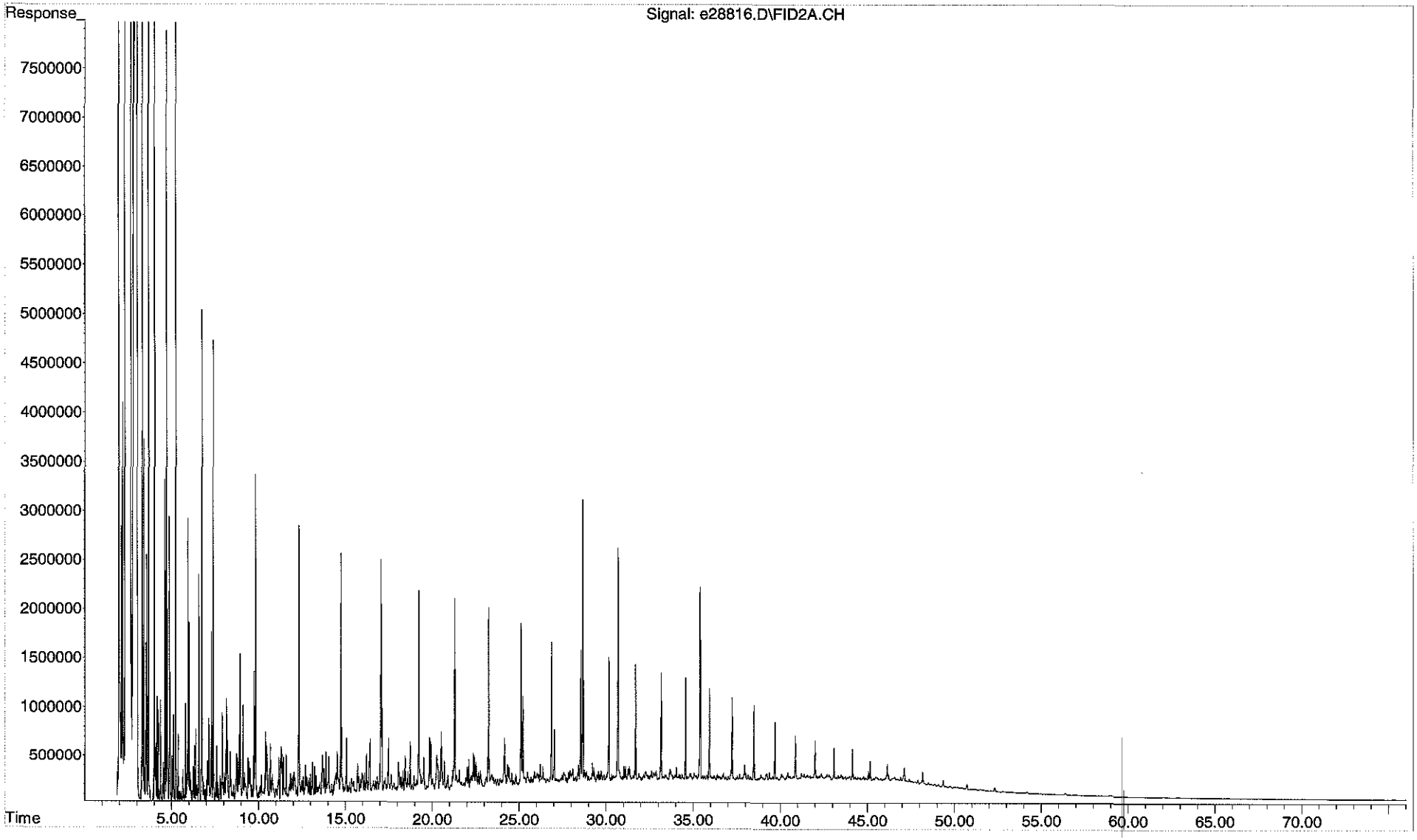
Sub List : SHC - SHC

	Compound	R.T.	Response	Conc	Units	
38) t	n-Heptatriacontane (C37)	50.732	2028207	1.703	ug/mL	M4
39) t	n-Octatriacontane (C38)	52.323	1836612	1.549	ug/mL	M4
40) t	n-Nonatriacontane (C39)	54.178	1121630	0.999	ug/mL	m
41) t	n-Tetracontane (C40)	56.381	1122632	0.999	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.728	8023993224	6867.386	ug/mL	M4
42) h	C9-C44 Total Petroleu BS	38.728	7363507858	6302.106	ug/mL	M4
45) h	Total Resolved Hydroc...	38.728	2316966904	1982.991	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\e28816.D
Operator : AC
Acquired : 09 Nov 2012 1:19 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TS111312ANC01
Misc Info : 1X WHAP13
ALS Vial : 53



Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **AECOM**
Project: **Enbridge Line 6B MP 608**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1210083**
Lab ID: **TW090712ANS01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	09/05/12	100	0.10058	10	1	AC

Parameter	Result	Parameter	Result
n-Nonane (C9)	**6790**	n-Tricosane (C23)	**1850**
n-Decane (C10)	**5470**	n-Tetracosane (C24)	**1710**
n-Undecane (C11)	**5000**	n-Pentacosane (C25)	**1630**
n-Dodecane (C12)	**4300**	n-Hexacosane (C26)	**1470**
n-Tridecane (C13)	**4300**	n-Heptacosane (C27)	**1100**
2,6,10 Trimethyldodecane (1380)	**914**	n-Octacosane (C28)	**782**
n-Tetradecane (C14)	**3750**	n-Nonacosane (C29)	**770**
2,6,10 Trimethyltridecane (1470)	**1520**	n-Triacontane (C30)	**655**
n-Pentadecane (C15)	**3830**	n-Hentriacontane (C31)	**493**
n-Hexadecane (C16)	**3530**	n-Dotriacontane (C32)	**441**
Norpristane (1650)	**1050**	n-Tritriacontane (C33)	**403**
n-Heptadecane (C17)	**3210**	n-Tetratriacontane (C34)	**378**
Pristane	**2150**	n-Pentatriacontane (C35)	**283**
n-Octadecane (C18)	**2850**	n-Hexatriacontane (C36)	**207**
Phytane	**1260**	n-Heptatriacontane (C37)	**172**
n-Nonadecane (C19)	**2410**	n-Octatriacontane (C38)	**136**
n-Eicosane (C20)	**2560**	n-Nonatriacontane (C39)	**104**
n-Heneicosane (C21)	**2120**	n-Tetracontane (C40)	**98.2** J
n-Docosane (C22)	**2070**		

Total Hydrocarbon Summary

Total Saturated Hydrocarbons	**71800**
Total Petroleum Hydrocarbons (C9-C44)	**590000**
Total Resolved Hydrocarbons	**196000**

N/A - Not Applicable
J - Estimated value, below quantitation limit.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

Sub List : SHC - SHC

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.032	67666055	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.018	69566380	48.677 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	97.35%
24) s	d50-Tetracosane	35.697	57141267	49.351 ug/mL M4
Spiked Amount	50.000 Range	50 - 130	Recovery =	98.70%
	Target Compounds			
2) t	n-Octane (C8)	5.422	102285134	93.879 ug/mL M4
3) t	n-Nonane (C9)	7.619	76013115	68.256 ug/mL M4
4) t	n-Decane (C10)	10.101	63613609	55.026 ug/mL M4
5) t	n-Undecane (C11)	12.611	58788004	50.302 ug/mL M4
6) t	n-Dodecane (C12)	15.036	51442150	43.291 ug/mL M4
7) t	n-Tridecane (C13)	17.344	51674013	43.246 ug/mL M4
8) t	1380	19.019	11081649	9.190 ug/mL M4
9) t	n-Tetradecane (C14)	19.527	45446037	37.687 ug/mL M4
10) t	1470	20.811	18437347	15.256 ug/mL M4
11) t	n-Pentadecane (C15)	21.591	46510985	38.484 ug/mL M4
12) t	n-Hexadecane (C16)	23.546	43300293	35.535 ug/mL M4
13) t	1650	24.454	12821499	10.588 ug/mL M4
14) t	n-Heptadecane (C17)	25.404	39092129	32.283 ug/mL M4
15) t	Pristane	25.504	26773773	21.646 ug/mL M4
16) t	n-Octadecane (C18)	27.170	35486858	28.652 ug/mL M4
17) t	Phytane	27.326	15485089	12.641 ug/mL M4
18) t	n-Nonadecane (C19)	28.855	30026103	24.285 ug/mL M4
20) t	n-Eicosane (C20)	30.459	32191313	25.786 ug/mL M4
21) t	n-Heneicosane (C21)	31.993	26761484	21.351 ug/mL M4
22) t	n-Docosane (C22)	33.463	26156955	20.812 ug/mL M4
23) t	n-Tricosane (C23)	34.874	23790002	18.639 ug/mL M4

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\
Data File : E27116.D
Signal(s) : FID2A.CH
Acq On : 05 Sep 2012 5:03 am
Operator : AC
Sample : TW090712ANS01
Misc : WHAP13
ALS Vial : 64 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Sep 07 14:39:30 2012
Quant Method : O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\HC2090412R.M
Quant Title : FID Forensics
QLast Update : Fri Sep 07 14:11:44 2012
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB209041203R
Blank File : E27112.D

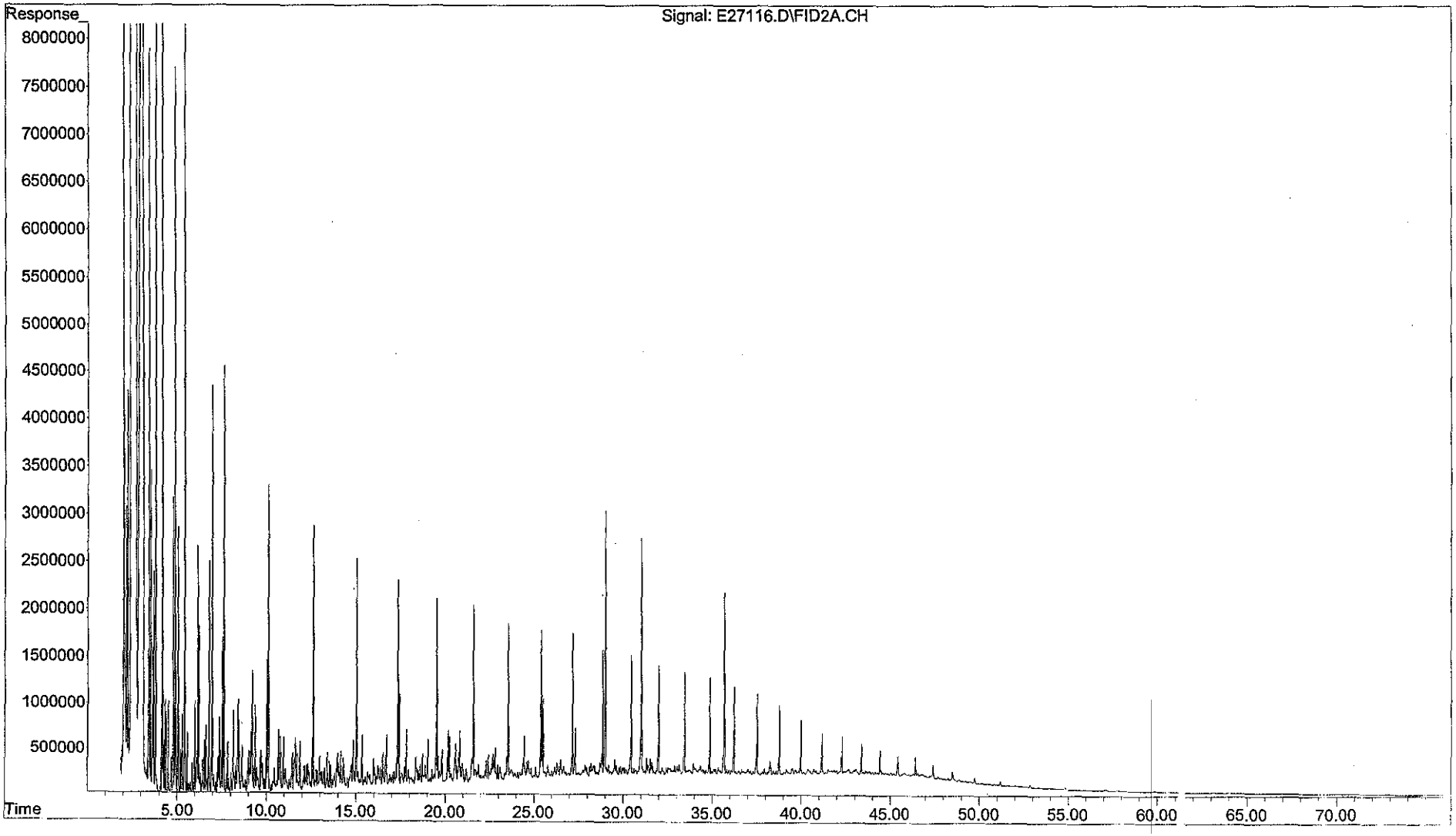
Sub List : SHC - SHC

		Compound	R.T.	Response	Conc	Units
25)	t	n-Tetracosane (C24)	36.229	21569823	17.190	ug/mL M4
26)	t	n-Pentacosane (C25)	37.530	21011766	16.433	ug/mL M4
27)	t	n-Hexacosane (C26)	38.784	18776288	14.780	ug/mL M4
28)	t	n-Heptacosane (C27)	39.993	13757353	11.042	ug/mL M4
29)	t	n-Octacosane (C28)	41.160	9894280	7.862	ug/mL M4
30)	t	n-Nonacosane (C29)	42.290	9748811	7.748	ug/mL M4
31)	t	n-Triacontane (C30)	43.376	8202260	6.592	ug/mL M4
32)	t	n-Hentriacontane (C31)	44.435	6227691	4.961	ug/mL M4
33)	t	n-Dotriacontane (C32)	45.452	5544934	4.433	ug/mL M4
34)	t	n-Tritriacontane (C33)	46.450	4844041	4.054	ug/mL M4
35)	t	n-tetratriacontane (C34)	47.431	4685802	3.799	ug/mL M4
36)	t	n-Pentatriacontane (C35)	48.521	3574400	2.848	ug/mL M4
37)	t	n-Hexatriacontane (C36)	49.764	2674892	2.085	ug/mL M4
38)	t	n-Heptatriacontane (C37)	51.193	2164492	1.726	ug/mL M4
39)	t	n-Octatriacontane (C38)	52.859	1707302	1.367	ug/mL M4
40)	t	n-Nonatriacontane (C39)	54.811	1232956	1.042	ug/mL M4
41)	t	n-Tetracontane (C40)	57.125	1168429	0.988	ug/mL M4
42)	h	C9-C44 Total Petroleu...	39.610	7428814548	6037.249	ug/mL M4
42)	h	C9-C44 Total Petroleu BS	39.610	7306360378	5937.733	ug/mLM4
45)	h	Total Resolved Hydroc...	39.151	2429958845	1974.779	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

File :O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\E27116.D
Operator : AC
Acquired : 05 Sep 2012 5:03 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample : TW090712ANS01
Misc Info : WHAP13
ALS Vial : 64



Alpha Woods Hole Lab
Batch Weight Report
10/05/2012

Lab ID	QC Type	PS1210004 - Pan Weight	PS1210004 - Wet Weight	PS1210004 - Dry Weight	PS1210004 - Dry Weight #2	PS1210004 - Dry Weight #3	Percent Solid
1210004-01	SAM 1210083-01	1.31	8.12	5.31	5.3		58.59
1210004-02	SAM 1210083-02	1.31	8.12	5.31	5.3		58.59
1210004-03	SAM 1210083-03	1.31	8.12	5.31	5.3		58.59
1210004-04	SAM 1210083-04	1.31	8.12	5.31	5.3		58.59
1210004-05	SAM 1210083-05	1.31	8.12	5.31	5.3		58.59
1210004-06	SAM 1210083-06	1.31	8.12	5.31	5.3		58.59
1210004-07	SAM 1210083-07	1.31	8.12	5.31	5.3		58.59
PSS100512B06	B	1.3	1.3	1.31	1.31		100.00

KML 11/16/12

Initial: 10/5/2012 12:32:03 PM wr
Weight #1: 10/9/2012 8:20:15 AM ctk
Weight #2: 10/10/2012 12:20:58 PM bls

3103261407
3133

Alpha Woods Hole Lab
Batch Prep Report

11/06/2012 1210083 - OP SHC

Lab ID	QC Type	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1210083-01	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.04	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-02	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-03	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.01	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-04	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.04	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-05	SAM	Shaker	CTK	11/6/2012	11/8/2012		15.05	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-06	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
1210083-07	SAM	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612B09	B	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCS05	LCS	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012
SS110612LCSD05	LCSD	Shaker	CTK	11/6/2012	11/8/2012		15	4	0.5	2	False	CTK	11/7/2012	KD Flask	0.1	KJD	11/8/2012

Alpha Woods Hole Lab
Batch Prep Report
11/06/2012 1210083 - OP SHC

Lab ID	Notes
1210083-01	1st Prep
1210083-02	1st Prep
1210083-03	1st Prep
1210083-04	1st Prep
1210083-05	1st Prep
1210083-06	1st Prep: Sample lost 1mL out of 4mL due to broken 4mL vial. Sample was graved at 3 mL CTK 11/7/12
1210083-07	1st Prep
SS110612B09	1st Prep
SS110612LCS05	1st Prep
SS110612LCSD05	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210083 - OP NEWFIE Analyst: CTK Witness: AMK

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1210083-01	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-02	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-03	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-04	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-05	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-06	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
1210083-07	SAM	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612B09	B	WHAQ79	100	µl	WHAQ65	100	µl			
SS110612LCS05	LCS	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl
SS110612LCSD05	LCSD	WHAQ79	100	µl	WHAQ65	100	µl	WHAQ 59	100	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ65	Biomarker Surrogate	5b(H) Cholane = 10 ug/mL	DCM	7787
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

Alpha Woods Hole Lab
Batch Prep Spike Report

11/06/2012 1210083 - OP SHC Analyst: CTK Witness: AMK

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1210083-01	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-02	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-03	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-04	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-05	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-06	SAM	WHAQ79	100	µl				WHAQ72	50	µl
1210083-07	SAM	WHAQ79	100	µl				WHAQ72	50	µl
SS110612B09	B	WHAQ79	100	µl				WHAQ72	50	µl
SS110612LCS05	LCS	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl
SS110612LCSD05	LCSD	WHAQ79	100	µl	WHAQ 59	100	µl	WHAQ72	50	µl

STD ID	TITLE	CONTENTS	SOLVENT	LOT
WHAQ 59	PAH/SHC LCS Spike Solution	Aromatic Hydrocarbon Std (for LCS) = 10 ug/mL MA EPH Aliphatic Hydrocarbon = 200 ug/mL	DCM	15768
WHAQ72	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene-d10, Chrysene-d12 = 5 ug/mL	DCM	L14S03
WHAQ79	Surrogate PAH/SHC Solution	Custom Deuterated PAH Surrogate = 10 ug/mL n-Tetracosane = 506.7 ug/mL OTP Stock Solution = 500 ug/mL	DCM	0000018797

ETR 1210083

Alpha Analytical

Analyst AMK
Date 11/07/2012

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	0.280	56.00	N/A	N/A	N/A	104%
1210083	1		4000	50	0.198	15.84	2000	7.92	2.00	
	2		4000	50	0.202	16.16	2000	8.08	2.00	
	3		4000	50	0.205	16.40	2000	8.20	2.00	
	4		4000	50	0.215	17.20	2000	8.60	2.00	
	5		4000	50	0.198	15.84	2000	7.92	2.00	
	6		4000	50	0.212	16.96	2000	8.48	2.00	
	7		4000	50	0.198	15.84	2000	7.92	2.00	

Note:
Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)
Gravimetric Standard = 5 mg/mL
LCS Acceptance Criteria: 95% - 105%

Verified by: AMK
Date: 11/20/12

ETR 1210083

Analyst

Date 11/07/2012

Alpha Analytical

- ☐ Pre-Alumina
- ☐ Post-Alumina
- ☑ Pre-Silica
- ☐ Oily Material Prep.
- ☐ Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	WHAQ75	Gravimetric Standard	10000	50	.280		N/A	N/A	N/A	0%
1210083	1		4000	50	.198					
11/20/12	2		4000	50	.202					
	3		4000	50	.205					
	4		4000	50	.215					
	5		4000	50	.198					
	6	AMK 11/7/12 ~~3000~~ 11/7/2012	~~4000~~ 4000	50	~~.138~~ .212	AMK 11/7/12				
	7		4000	50	.198					

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: AMK

Date: 11/7/12

Alpha Woods Hole Lab
Batch Weight Report
11/06/2012

Lab ID	QC Type	1210083 - Sample
1210083-01	SAM	15.04
1210083-02	SAM	15
1210083-03	SAM	15.01
1210083-04	SAM	15.04
1210083-05	SAM	15.05
1210083-06	SAM	15
1210083-07	SAM	15
SS110612B09	B	15
SS110612LCS05LCS	OP NEWFIE	15
SS110612LCS05LCS	OP SHC	15
SS110612LCS05LCS	OP Steranes/Triterpanes	
SS110612LCSD05LCSD	OP NEWFIE	15
SS110612LCSD05LCSD	OP SHC	15
SS110612LCSD05LCSD	OP Steranes/Triterpanes	

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210083 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210083-01	SAM	3660B	CTK	11/7/2012												True
1210083-02	SAM	3660B	CTK	11/7/2012												True
1210083-03	SAM	3660B	CTK	11/7/2012												True
1210083-04	SAM	3660B	CTK	11/7/2012												True
1210083-05	SAM	3660B	CTK	11/7/2012												True
1210083-06	SAM	3660B	CTK	11/7/2012												True
1210083-07	SAM	3660B	CTK	11/7/2012												True
SS110612B09	B	3660B	CTK	11/7/2012												True
SS110612LCS05	LCS	3660B	CTK	11/7/2012												True
SS110612LCSD05	LCSD	3660B	CTK	11/7/2012												True

Alpha Woods Hole Lab
Batch Clean Up Report
11/06/2012 1210083 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210083-01	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-02	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-03	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-04	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-05	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-06	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
1210083-07	SAM	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
SS110612B09	B	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
SS110612LCS05	LCS	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True
SS110612LCSD05	LCSD	3630	AMK	11/7/2012				KJD	11/8/2012		4	2	2		0.1	True

Alpha Woods Hole Lab
Batch Clean Up Report

11/06/2012 1210083 - OP SHC

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1210083-01	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-02	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-03	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-04	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-05	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-06	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
1210083-07	SAM	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612B09	B	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCS05	LCS	split	KJD	11/8/2012							0.9	0.45	2			True
SS110612LCSD05	LCSD	split	KJD	11/8/2012							0.9	0.45	2			True

Forensic Preparation Checklist

Batch ID: 1210083 **Client:** AECOM **Project:** Enbridge MPI

Test(s) Spiked for:
Choose from the following:
F1B, (POIB), POIH, POIHX, POITAS, (TPH+A)

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil Product • PUF • (Sediment) • Sheen Soil • Solid • SPMD • Tissue 1L Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:	11/6/12	CTK
1st Extraction:	11/6/12	CTK
2nd Extraction:	11/6/12	CTK
3rd Extraction:	11/7/12	WR/MH

Extraction HT:
9/2/12 0 13

Cleanup Methods:		Date/Initials:
No Cleanup Required		
Alumina Column (3610)		
Silica Column (3630)	X	11/7/12 AMK
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)	X	11/7/12 CTK
Water pH<2 verified		

	Date/Initials:	ID & Amount:
RIS Spike Analyst:	11/8/12 KJD	WHAQ 72
RIS Spike Witness:	11/8/12 BLS	50 µL

Prep Process Notes

Sample 6 lost ~~2~~ 1mL due to broken 4mL vial. CTK 11/7/12
11/7/12 CTK CTK 11/6/12 exactly out of 4mL CTK 11/7/12

Samples 1-7 spiked with 300uL WHAQ62. CTK 11/7/12
Sample 6 was graved @ 3mL's. CTK 11/7/12

REAGENT	LOT #
DCM	000015769
SODIUM SULFATE	000011407
SILICA GEL	RCBH9150V
ALUMINA	n/d

REAGENT	LOT #
COPPER	AWR110712B
GLASS WOOL	05112999

BATCH COMPLETE Analyst:	KJD	Date:	11/8/12
BATCH REVIEWED Analyst:	BLS	Date:	11/12/12

Analysis log File

Total Files Reported in Log : 30
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\SEPT12\SEP04.SEC\

9-7-12

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E27092.D	DCM	DCM	9/4/2012 9:08 am
2	E27094.D	IB209041201R	DCM	9/4/2012 10:36 am
3	E27095A.D	DCM	DCM	9/4/2012 12:13 pm
4	E27096.D	C209041201R	WHAQ26	9/4/2012 1:43 pm
5	E27098.D	IB209041202R	DCM	9/4/2012 3:14 pm
6	E27100.D	I209041201R	WHAO93	9/4/2012 4:46 pm
7	E27102.D	I209041202R	WHAP92	9/4/2012 6:18 pm
8	E27104.D	I209041203R	WHAQ26	9/4/2012 7:50 pm
9	E27106.D	I209041204R	WHAO95	9/4/2012 9:22 pm
10	E27108.D	I209041205R	WHAO96	9/4/2012 10:53 pm
11	E27110.D	I209041206R	WHAP58	9/5/2012 12:26 am
12	E27112.D	IB209041203R	DCM	9/5/2012 1:58 am
13	E27114.D	CQ209041201R	WHAQ27	9/5/2012 3:31 am
14	E27116.D	TW090712ANS01	WHAP13	9/5/2012 5:03 am
15	E27118.D	TW090712MC206	WHAP35	9/5/2012 6:36 am
16	E27120.D	DCM	DCM	9/5/2012 8:19 am
17	E27122.D		DCM	9/5/2012 9:48 am
18	E27124.D		DCM	9/5/2012 11:17 am
19	E27126.D		DCM	9/5/2012 12:46 pm
20	E27128.D		DCM	9/5/2012 2:16 pm
21	E27130.D		DCM	9/5/2012 3:45 pm
22	E27132.D		DCM	9/5/2012 5:15 pm
23	E27134.D		DCM	9/5/2012 6:44 pm
24	E27136.D			9/5/2012 8:13 pm
25	E27138.D			9/5/2012 9:41 pm
26	E27140.D			9/5/2012 11:09 pm
27	E27142.D			9/6/2012 12:36 am
28	E27144.D			9/6/2012 2:04 am
29	E27146.D			9/6/2012 3:31 am
30	E27148.D			9/6/2012 4:58 am

data files for method HC290412R.m

IB for ANS+MC252

ICV ✓ pass

ANS ✓ pass

MC252 ✓ pass

SeqLog 1.0.0.1 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 58
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
1	E28812.D	SPIKE CGECK	1X	11/9/2012 10:12 am
2	e28814.D	C211091201R	WHAQ67	11/9/2012 11:49 am
3	e28816.D	TS111312ANC01	1X WHAP13	11/9/2012 1:19 pm
4	e28818.D	DCM	DCM	11/9/2012 2:49 pm
5	e28820.D	IB211091201R	DCM	11/9/2012 4:19 pm
6	e28822.D	SS110612B07	1X	11/9/2012 5:49 pm
7	e28824.D	SS110612B08	1X	11/9/2012 7:18 pm
8	e28826.D	SS110612B09	1X	11/9/2012 8:48 pm
9	e28828.D	SS110612LCS03	1X	11/9/2012 10:17 pm
10	e28830.D	SS110612LCS04	1X	11/9/2012 11:46 pm
11	e28832.D	SS110612LCS05	1X	11/10/2012 1:15 am
12	e28834.D	SS110612LCSD03	1X	11/10/2012 2:44 am
13	e28836.D	SS110612LCSD04	1X	11/10/2012 4:13 am
14	e28838.D	SS110612LCSD05	1X	11/10/2012 5:41 am
15	e28840.D	C211091202R	WHAQ67	11/10/2012 7:10 am
16	e28842.D	DCM	DCM	11/10/2012 8:38 am
17	e28844.D	IB211091202R	DCM	11/10/2012 10:08 am
18	e28845a.D	dcm		11/10/2012 11:39 am
19	e28846.D	1210081-01	1X	11/10/2012 1:08 pm
20	e28848.D	1210081-02	1X	11/10/2012 2:38 pm
21	e28850.D	1210081-03	1X	11/10/2012 4:08 pm
22	e28852.D	1210081-04	1X	11/10/2012 5:38 pm
23	e28854.D	1210081-05	1X	11/10/2012 7:08 pm
24	e28856.D	1210081-06	1X	11/10/2012 8:37 pm
25	e28858.D	1210081-07	1X	11/10/2012 10:06 pm
26	e28860.D	C211091203R	WHAQ67	11/10/2012 11:35 pm
27	e28862.D	DCM	DCM	11/11/2012 1:04 am
28	e28864.D	IB211091203R	DCM	11/11/2012 2:34 am
29	e28866.D	1210082-01	1X	11/11/2012 4:03 am
30	e28868.D	1210082-02	1X	11/11/2012 5:33 am
31	e28870.D	1210082-03	1X	11/11/2012 7:02 am
32	e28872.D	1210082-04	1X	11/11/2012 8:32 am
33	e28874.D	1210082-05	1X	11/11/2012 10:02 am
34	e28876.D	1210082-06	1X	11/11/2012 11:31 am
35	e28878.D	1210082-07	1X	11/11/2012 1:02 pm
36	e28880.D	C211091204R	WHAQ67	11/11/2012 2:32 pm
37	e28882.D	DCM	DCM	11/11/2012 4:02 pm
38	e28884.D	IB211091204R	DCM	11/11/2012 5:32 pm
39	e28886.D	1210083-01	RA, INST STOPPED	11/11/2012 7:02 pm
40	e28888.D	1210083-02	RA, INST STOPPED	11/11/2012 8:39 pm
41	e28890.D	1210083-03	RA, FAILED IS	11/12/2012 4:22 am
42	e28892.D	1210083-04	1X	11/12/2012 5:50 am
43	e28893a.D	C211091205R	WHAQ67	11/12/2012 7:20 am
44	e28894.D	1210083-05	1X	11/12/2012 8:49 am
45	e28896.D	1210083-06	1X	11/12/2012 10:18 am
46	e28898.D	1210083-07	1X	11/12/2012 11:48 am
47	e28900.D	1210083-01	1X	11/12/2012 1:18 pm
48	e28902.D	1210083-02	1X	11/12/2012 2:48 pm
49	e28904.D	1210083-03	1X	11/12/2012 4:17 pm
50	e28906.D	C211091206R	WHAQ67	11/12/2012 5:47 pm
51	e28908.D	DCM	DCM	11/12/2012 7:16 pm
52	e28910.D	IB211091205R	DCM	11/12/2012 8:46 pm
53	e28912.D	TS111312WCS01	WHAP15	11/12/2012 10:15 pm
54	e28914.D	TS111312CL01	WHAP16	11/12/2012 11:44 pm

Printed: 11/19/12

METHOD: HC20904/12R.m
CCV = 50 ug/ml WHAQ67

SeqLog 1.0.0.1 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 58
Log Generated From Directory: O:\Forensics\Data\PAH2\2012\NOV12\NOV09.SEC\

No.	DATA FILE	SAMPLE NAME	MISC	DATE INJ'D
55	e28916.D	DCM	DCM	11/13/2012 1:14 am
56	e28918.D	C211091207R	WHAQ67	11/13/2012 2:43 am
57	e28920.D	DCM	DCM	11/13/2012 4:12 am
58	e28922.D	IB211091206R	DCM	11/13/2012 5:41 am

Chain of Custody Records

MANSFIELD CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA Job #: 1209034

Date Rec'd in Lab:

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193

Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: ENBRIDGE

Address: 333 KALAMAZOO AVE

MARSHALL , MI 49068

Phone: 616.970.9700

Fax:

Email: JOHN.BOHRMAN@ENBRIDGE.COM

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: MDLSed

Project Location: MARSHALL, MI

Project #: 60246209

Project Manager: DAVE BAREHAM

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information Data Deliverables

☐ FAX ☐ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client Info PO #: TASK# 9.04

Regulatory Requirements/Report Limits

State/Fed Program Criteria

Other Project Specific Requirements/Comments/Detection Limits:

Oil Topping-Range Finding-MDL Study'

☐ MS/MSD (at unit cost) will be omitted unless you check here

ANALYSIS

SAMPLE HANDLING

Filtration

☐ Done

☐ Not Needed

☐ Lab to do

Preservation

☐ Lab to do

(Please specify below)

mDL study

10-29-12

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	TOTAL # BOTTLES
1209034-01	SEKR0000R024S092112D004	09/21/12	1630	SE	ADM	8
-02	SEBC0000L012S092112D004	09/21/12	1455	SE	ADM	8
-03	SEKR3510R018S092112D004	09/21/12	1031	SE	ADM	8
-04	SEKR0000R024AS092112D004	09/21/12	1630	CORE	ADM	1

Container Type	G	G	G	G	G	G	G	G	-	-	-	-
Preservative	A	A	A	A	A	A	A	A	-	-	-	-

Relinquished By:	Date/Time	Received By:	Date/Time
	9.24.12/0850		9.24.12/0850
FedEx	9.24.12 0900	FedEx	
	9/25/12 1025		9/25/12 1025

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 101-09(I-NJ) (rev. 5-JAN-12)

ALPHA ANALYTICAL

Sample Delivery Group Form

Laboratory Job No: 1209034 Client: AECOM

Receipt Date/Time: 9/25/12 1025 SDG Reviewer: MF

1210081, 1210082, 1210083

Samples Delivered By:

[ ] Alpha Courier [ ] Client [ ] UPS [X] FedEx [ ] Other _____

Bill of Laden: [X] Yes [ ] Unavailable Tracking #: Attached

Chain of Custody: [ ] Present [ ] Absent: _____

Custody Seals: [ ] Absent [X] Present/Intact [ ] Present/Broken

Cooler/Sample Temperature:

Is Ice/Blue Ice present? [X] Yes [ ] No [ ] N/A _____

A = Cores
B = Jars

Temp taken from: Temp Blank: (a) 2° (b) MF (c) _____ (d) _____ (e) _____

IR Gun: (a) 2.3° (b) 2.7° (c) _____ (d) _____ (e) _____

IR Gun SN (circle one): 90512810 100311463

Was Temp: [X] 2-6 Celsius

[ ] <2 Celsius ... were samples frozen upon receipt? [ ] Yes [ ] No

[ ] >6 Celsius ... were samples delivered direct from site? [ ] Yes [ ] No

Containers Received: [X] Intact

[ ] Broken/Leaking Sample IDs: _____

Sample IDs: _____

All Containers Accounted For? [X] Yes

[ ] No: rec'd 2 cores - A1, A2 Not listed on COC

Extra Samples Received? [X] No

[ ] Yes: _____

Do Sample Labels and COC agree? [X] Yes

[ ] No: _____

Are Samples in Appropriate Containers? [X] Yes

[ ] No: _____

Are samples rec'd within holding time? [X] Yes

[ ] No: _____

* Please note: the analysis of pH will always be performed beyond the regulatory-required holding time of 15 min. from the time of collection.

pH of samples upon receipt: [X] N/A [ ] <2 [ ] >12 and/or [ ] _____

Are samples properly preserved? [ ] Yes [ ] No If No then.....

Initial pH= _____ preserved In-House with [ ] HCL [ ] H_2SO_4 [ ] HNO_3 [ ] NAOH <<Final pH = _____>>

Other Issues: _____

Chlorine Check: [ ] N/A [ ] Present [ ] Absent

VOA/VPH vials: [ ] Yes [X] No Preserved? [ ] Yes [ ] No If yes: [ ] HCL, [ ] _____

Aqueous: vials contain head space? [ ] No [ ] Yes: _____

Soils: MeOH covering soil? [ ] Yes [ ] No: _____

Reagent H_2O Preserved vials Frozen @ date/time: _____

Frozen by Client? [ ] No [ ] Yes @ date/time: _____

Was Client notified of any discrepancies listed above? [X] Yes [ ] No [ ] N/A

If Yes: Call Tracker # _____

FedEx Express **NEW Package US Airbill**

FedEx Tracking Number: 8762 5989 8873

Form ID No.: 0200

FedEx Retrieval Copy

From

Date: 9.24.12 Sender's FedEx Account Number: 2138-5929-3

Sender's Name: APRIL MODERT Phone: 517 2274710

Company: SUPERIOR ENVIRONMENTAL CORP

Address: 1680 Marquette Street Dept./Floor/Suite/Room:

City: Bay City State: MI ZIP: 48706-4178

Your Internal Billing Reference: BC3279. TASK 9.045

To

Recipient's Name: SUE O'NEIL Phone: 508 844 4117

Company: ALPHA WOODS HOLE LABS

Address: 320 FORBES BLVD Dept./Floor/Suite/Room:

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address: Use this line for the HOLD location address or for continuation of your shipping address.

City: MANSFIELD State: MA ZIP: 02048

01 ☐ HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

31 ☐ HOLD Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8762 5989 8873

2087

4 Express Package Service • To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

06 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01 ☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

49 ☐ NEW FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.

03 ☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging • Declared value limit $500.

06 ☐ FedEx Envelope* 02 ☐ FedEx Pak* 03 ☐ FedEx Box 04 ☐ FedEx Tube 01 ☒ Other

6 Special Handling and Delivery Signature Options

03 ☐ **SATURDAY DELIVERY**

☒ No Signature Required — Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.

34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods? One box must be checked.

☒ No 04 ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. 06 ☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

1 ☒ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

Total Packages: 1 Total Weight: ____ lbs. Credit Card Auth.: ____

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

612

Rev. Date 11/10 • Part #163136 • ©1994–2010 FedEx • PRINTED IN U.S.A. SRY

FedEx Express **NEW Package US Airbill**

FedEx Tracking Number: 8762 5989 8884

Form ID No.: 0200

FedEx Retrieval Copy

From

Date: 9.24.12 Sender's FedEx Account Number: 2138-5929-3

Sender's Name: APRIL MODERT Phone: 517 2274710

Company: SUPERIOR ENVIRONMENTAL CORP

Address: 1680 MARQUETTE STREET Dept./Floor/Suite/Room:

City: BAY CITY State: MI ZIP: 48706-4178

Your Internal Billing Reference: BC3279 TASK 9.045

To

Recipient's Name: SUE O'NEIL Phone: 5088444117

Company: ALPHA WOODS HOLE LABS

Address: 320 FORBES BLVD Dept./Floor/Suite/Room:

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address: Use this line for the HOLD location address or for continuation of your shipping address.

City: MANSFIELD State: MA ZIP: 02048

01 ☐ HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

31 ☐ HOLD Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8762 5989 8884

4 Express Package Service • To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

06 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01 ☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

49 ☐ NEW FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.

03 ☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging • Declared value limit $500.

06 ☐ FedEx Envelope* 02 ☐ FedEx Pak* 03 ☐ FedEx Box 04 ☐ FedEx Tube 01 ☒ Other

6 Special Handling and Delivery Signature Options

03 ☐ **SATURDAY DELIVERY**

☒ No Signature Required — Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.

34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods? One box must be checked.

☒ No 04 ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. 06 ☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

1 ☒ Sender Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

Total Packages: 1 Total Weight: ____ lbs. Credit Card Auth.: ____

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

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ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 9.24.12 Time: 0900
Name:
Company: PSEC

Seal Broken By:

Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

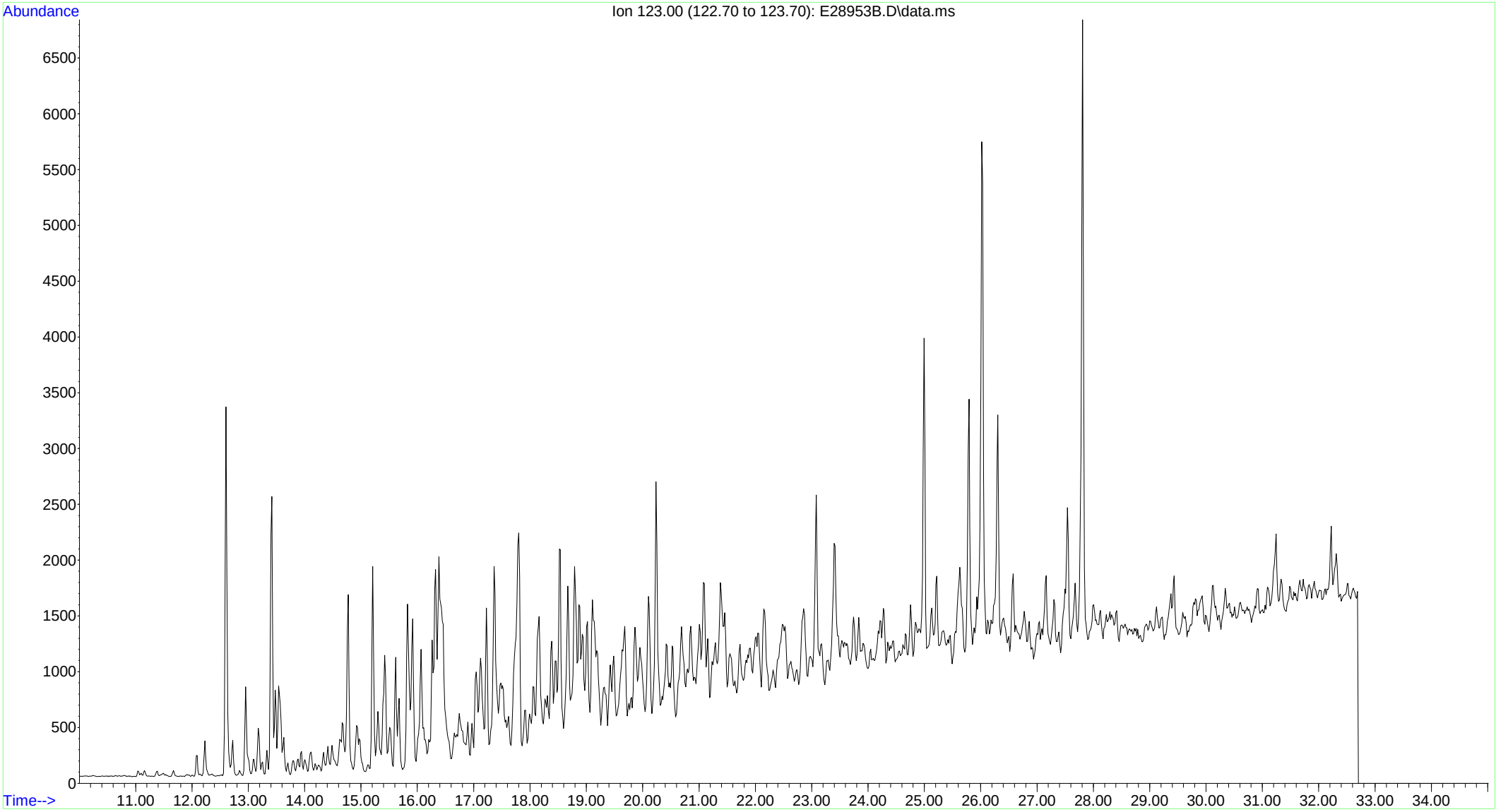
CUSTODY SEAL

Date: 9.24.12 Time: 0900
Name:
Company: PSEC

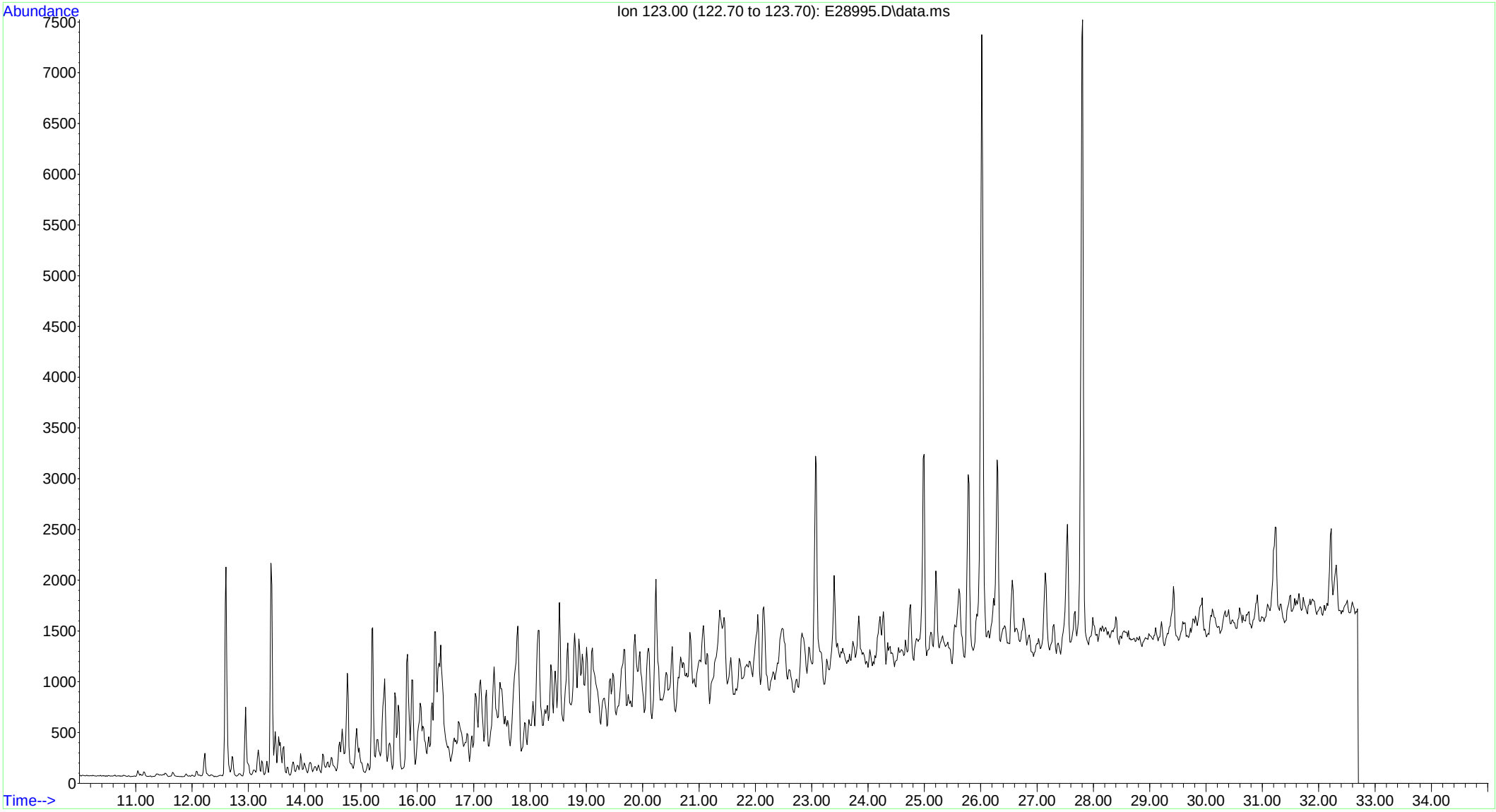
Seal Broken By:

Date:

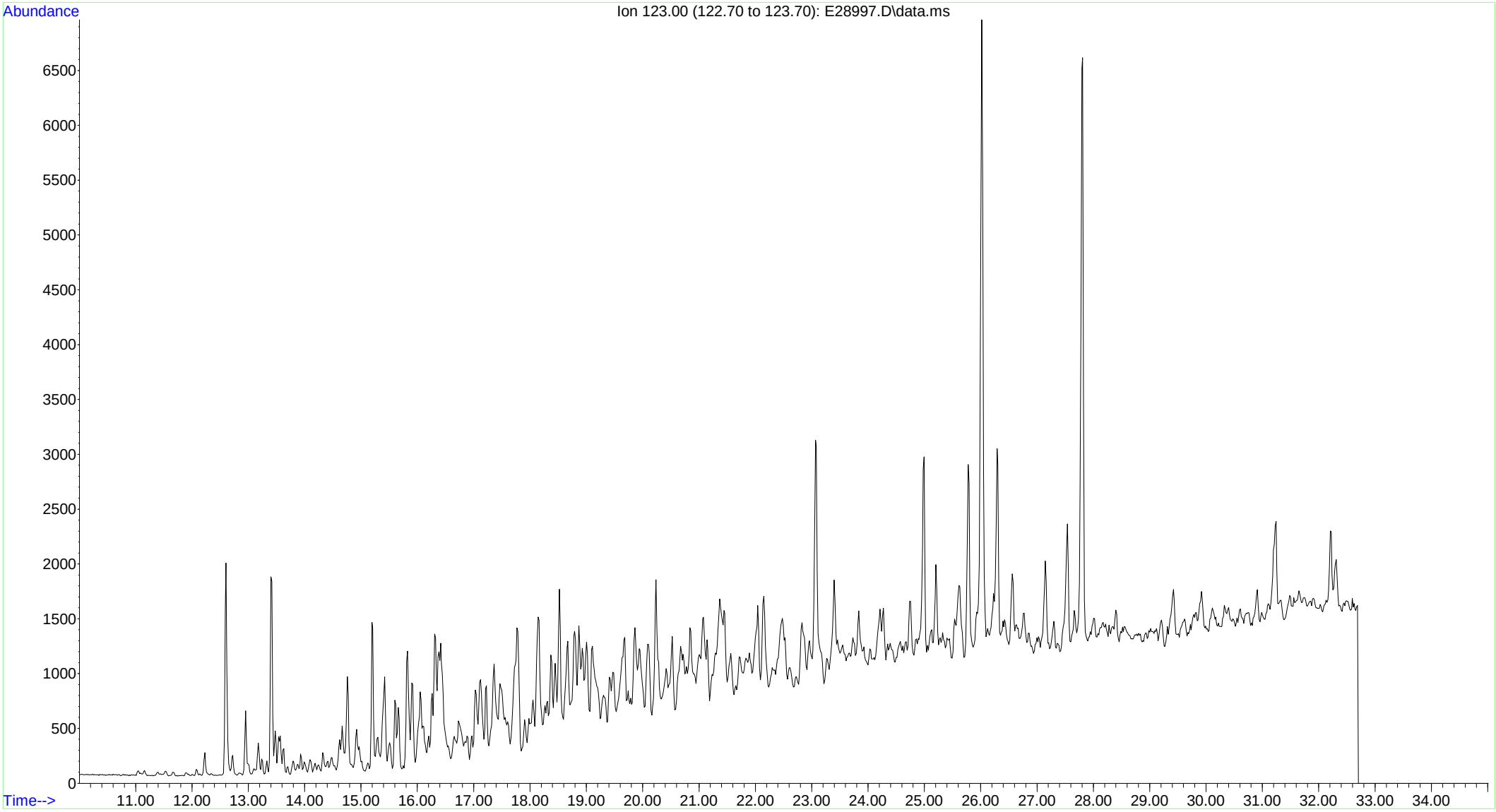
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28953B.D
Operator : AC
Acquired : 14 Nov 2012 9:16 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS111612ANC01
Misc Info : WHAQ46, 5.076
Vial Number: 25



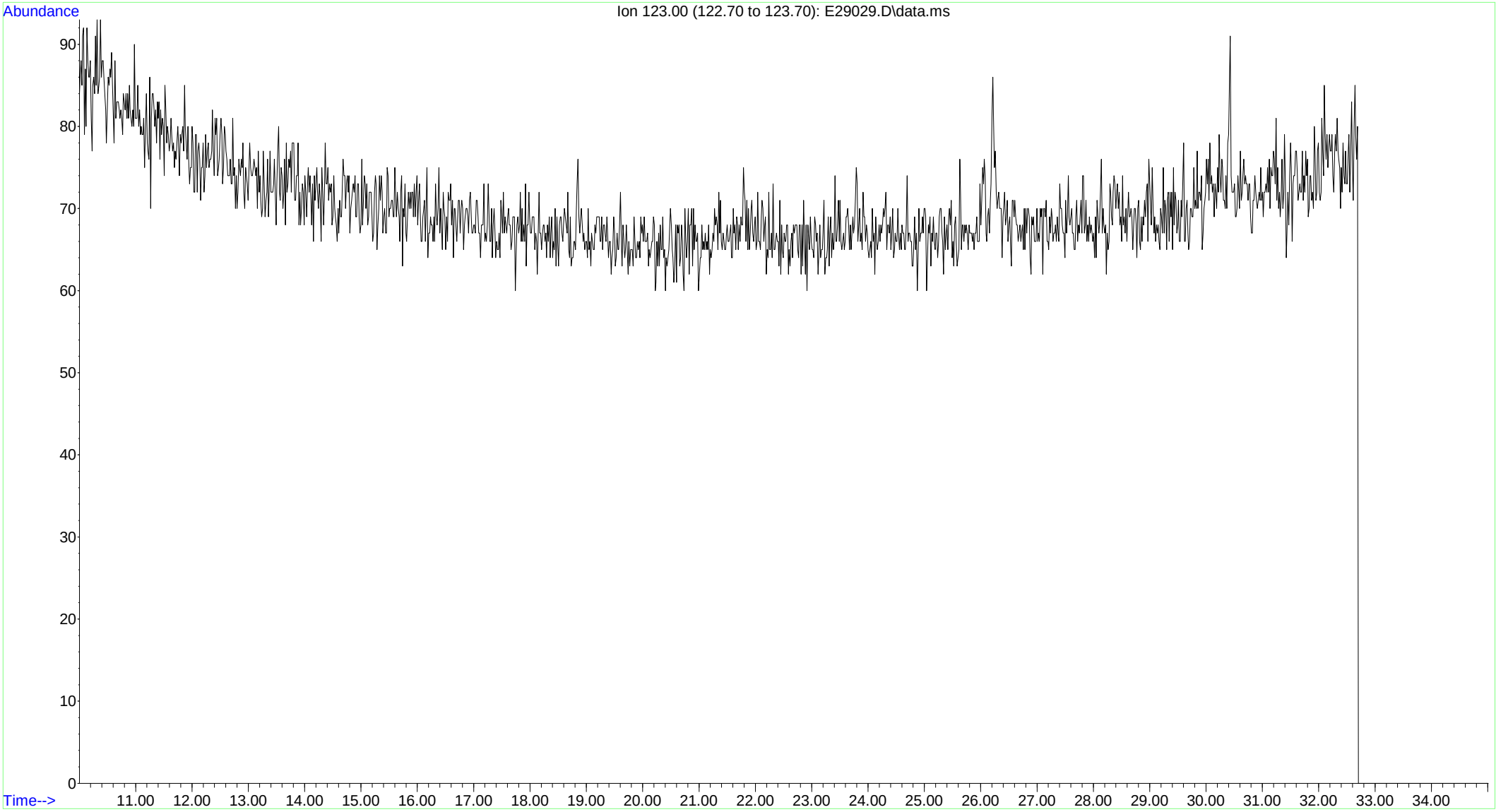
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28995.D
Operator : AC
Acquired : 15 Nov 2012 4:42 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS111612WCS01
Misc Info : WCS WHAQ73 5.036
Vial Number: 36



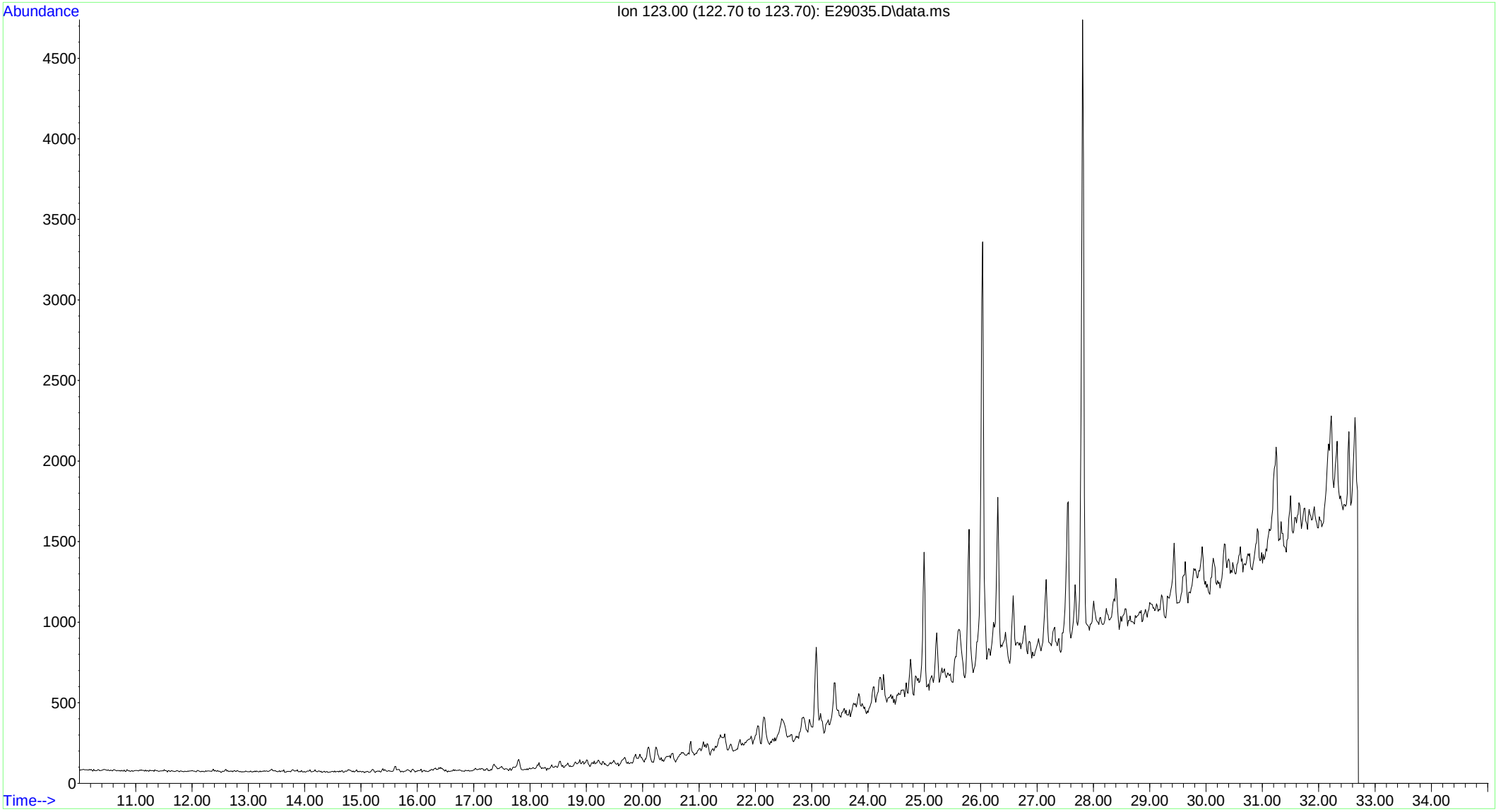
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E28997.D
Operator : AC
Acquired : 15 Nov 2012 6:10 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS111612CL01
Misc Info : CL WHAQ74 5.064
Vial Number: 37



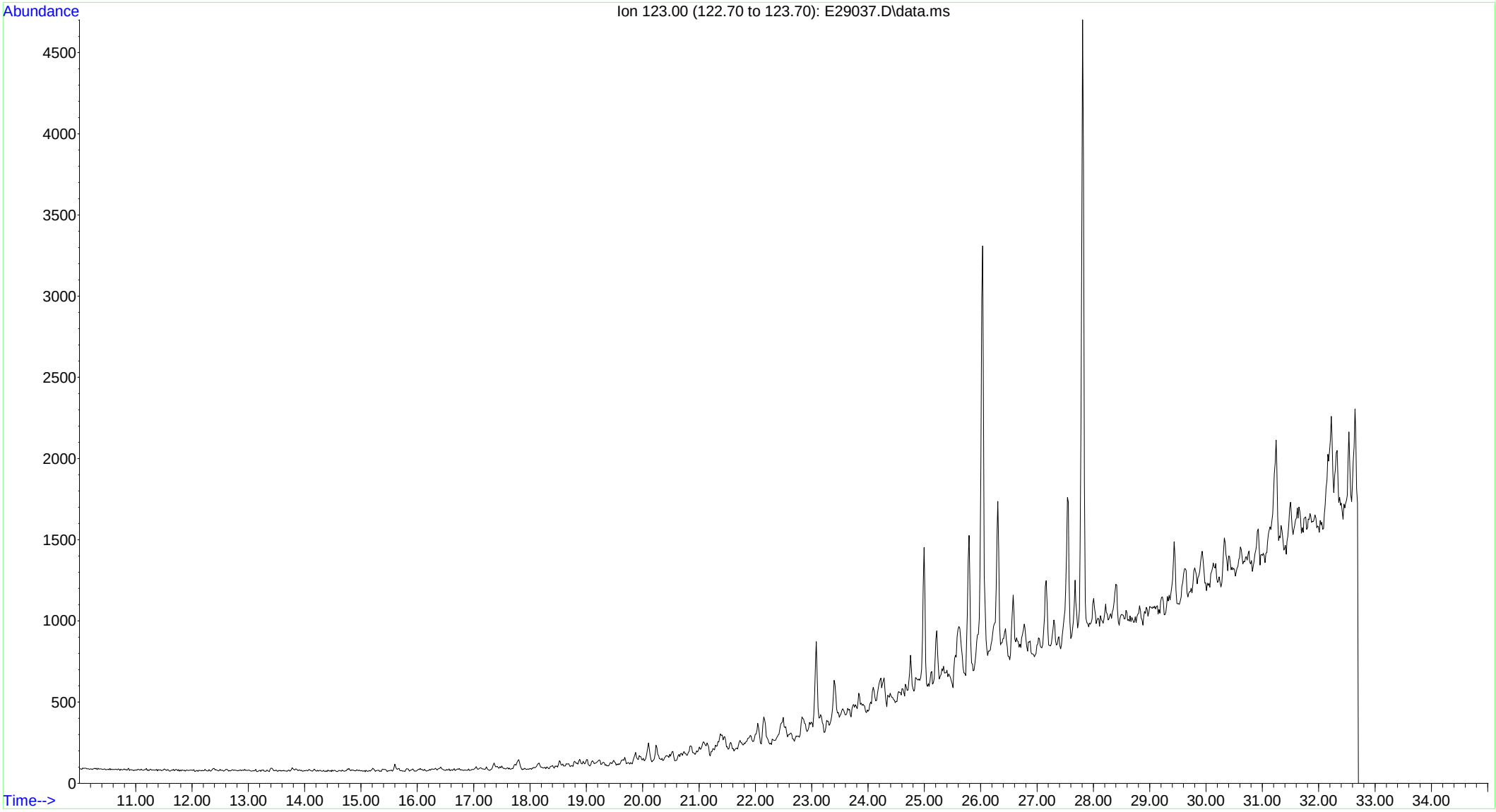
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29029.D
Operator : AC
Acquired : 17 Nov 2012 5:50 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: SS110612B09
Misc Info : 1X ETR1210083
Vial Number: 3



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29035.D
Operator : AC
Acquired : 17 Nov 2012 10:14 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-01
Misc Info : 1X
Vial Number: 6



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29037.D
Operator : AC
Acquired : 17 Nov 2012 11:42 am using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-02
Misc Info : 1X
Vial Number: 7



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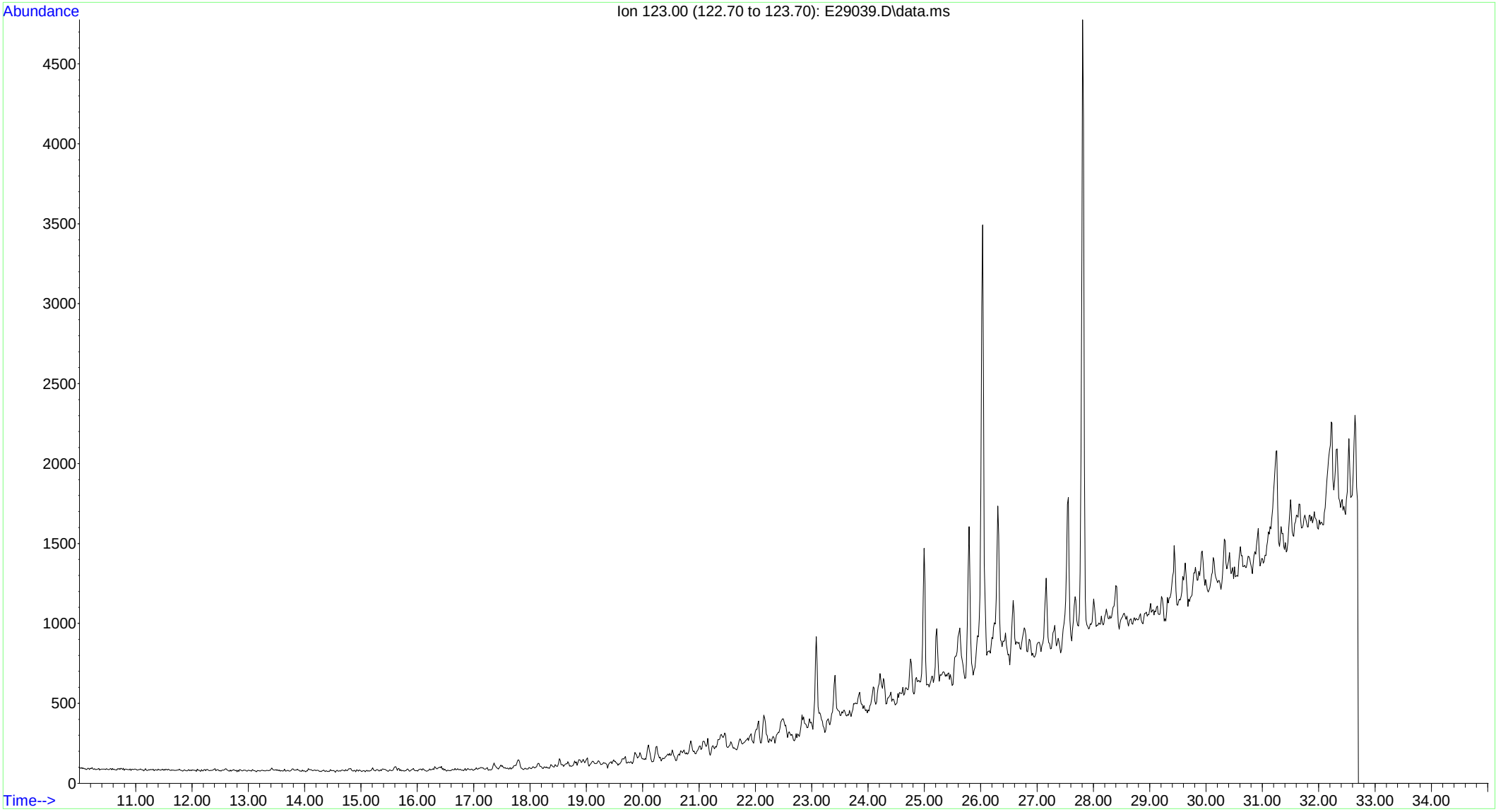
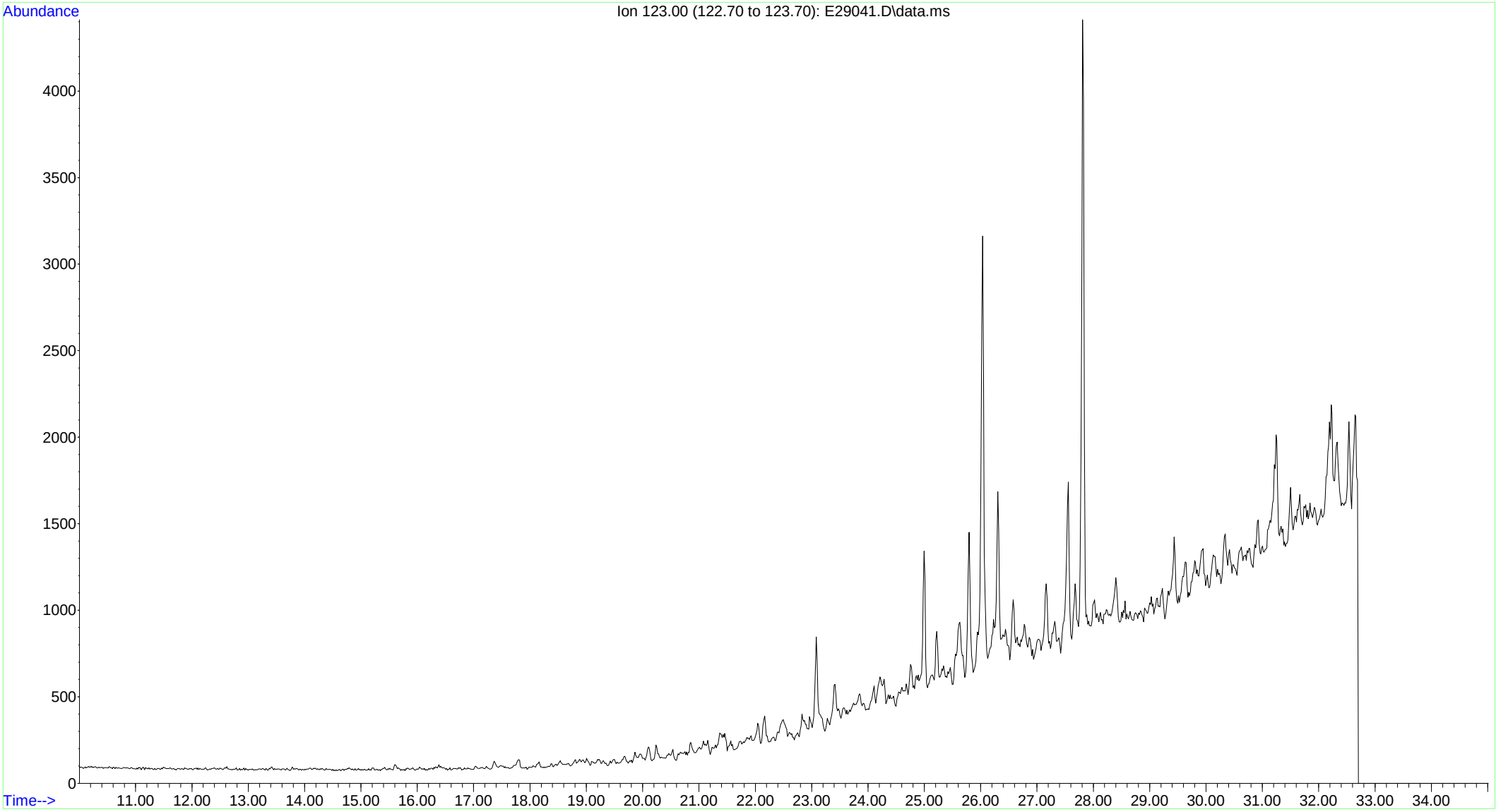
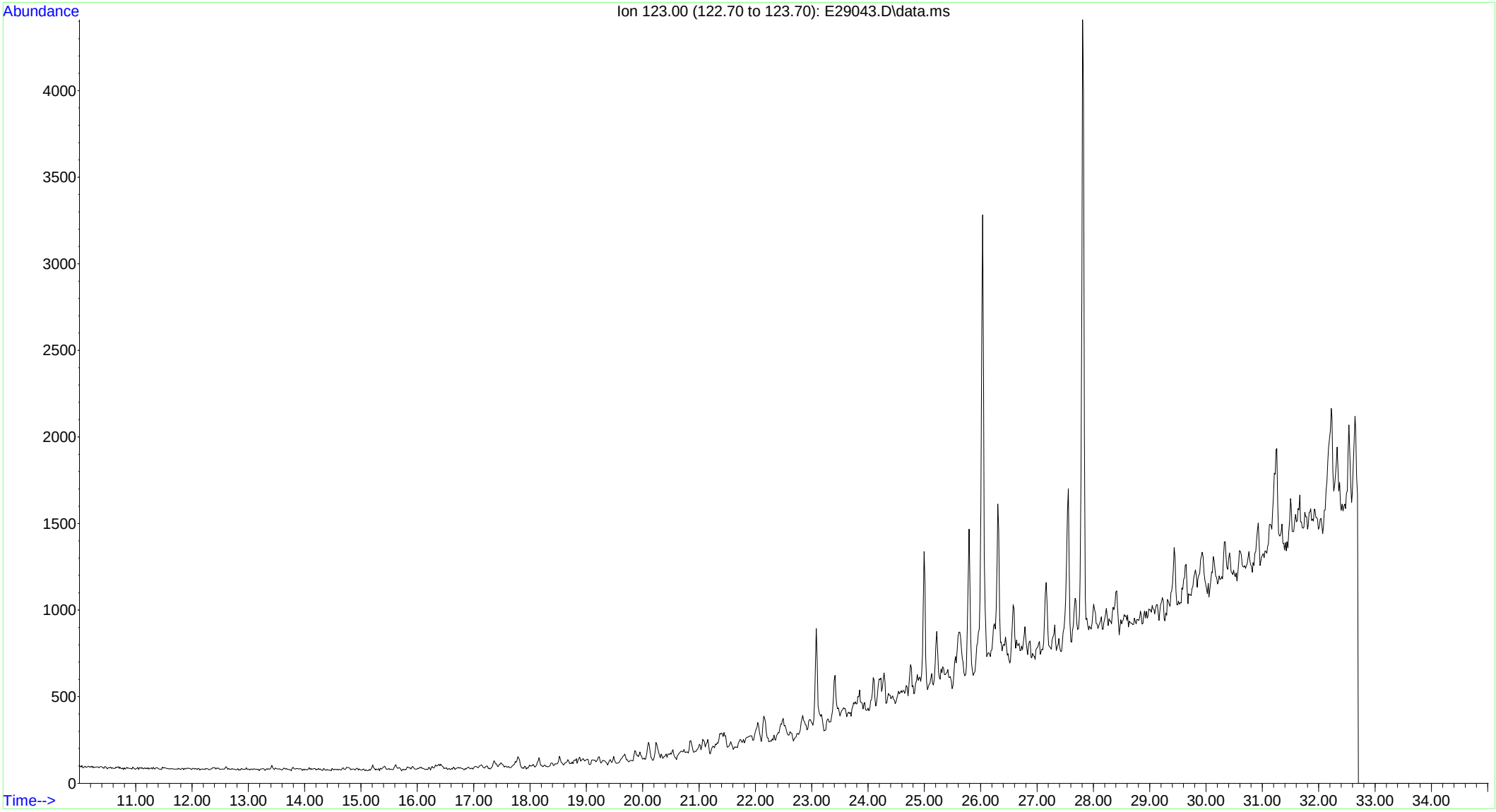
Operator : AC
Acquired : 17 Nov 2012 1:11 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-03
Misc Info : 1X
Vial Number: 8



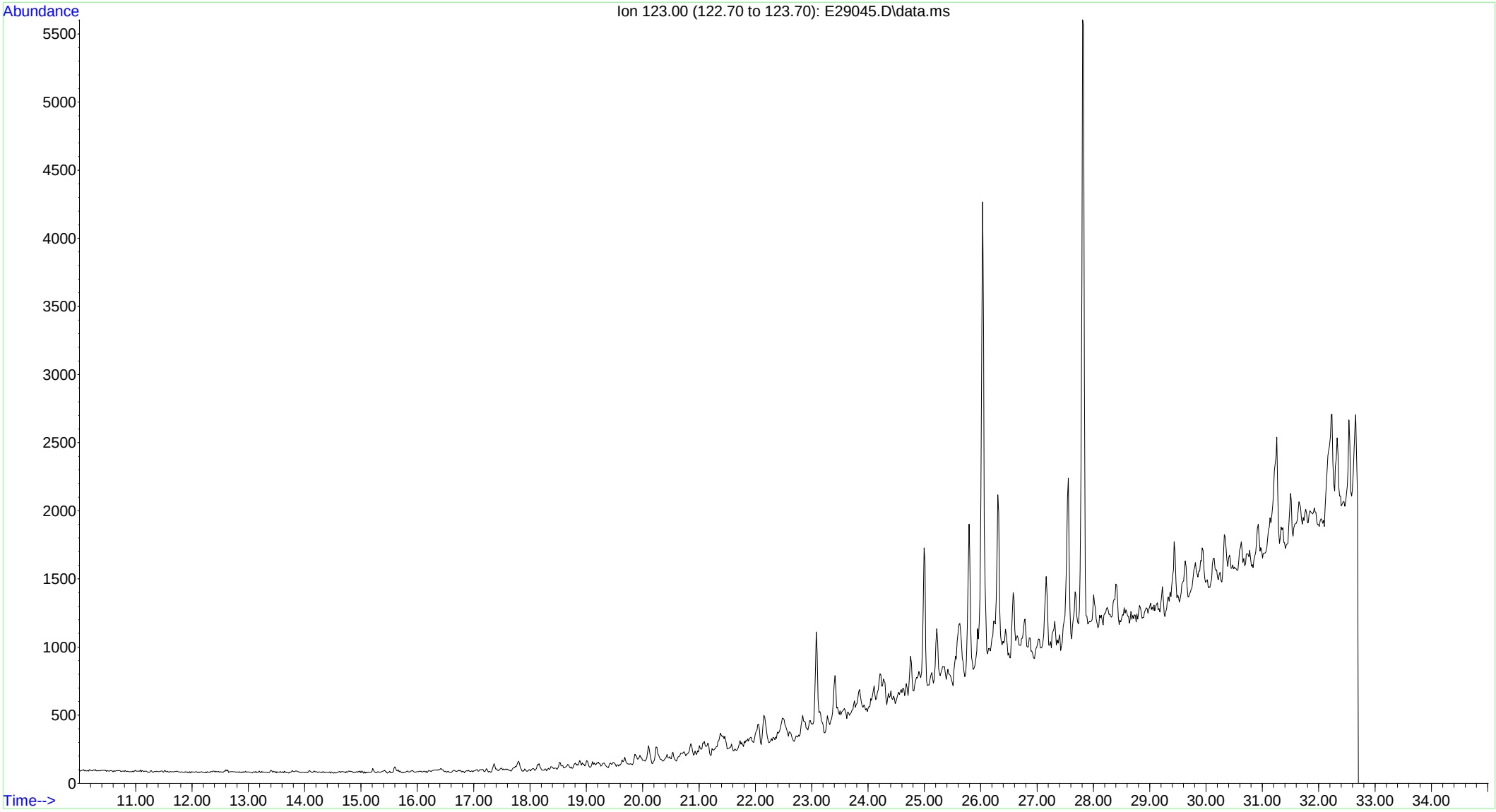
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29041.D
Operator : AC
Acquired : 17 Nov 2012 2:40 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-04
Misc Info : 1X
Vial Number: 9



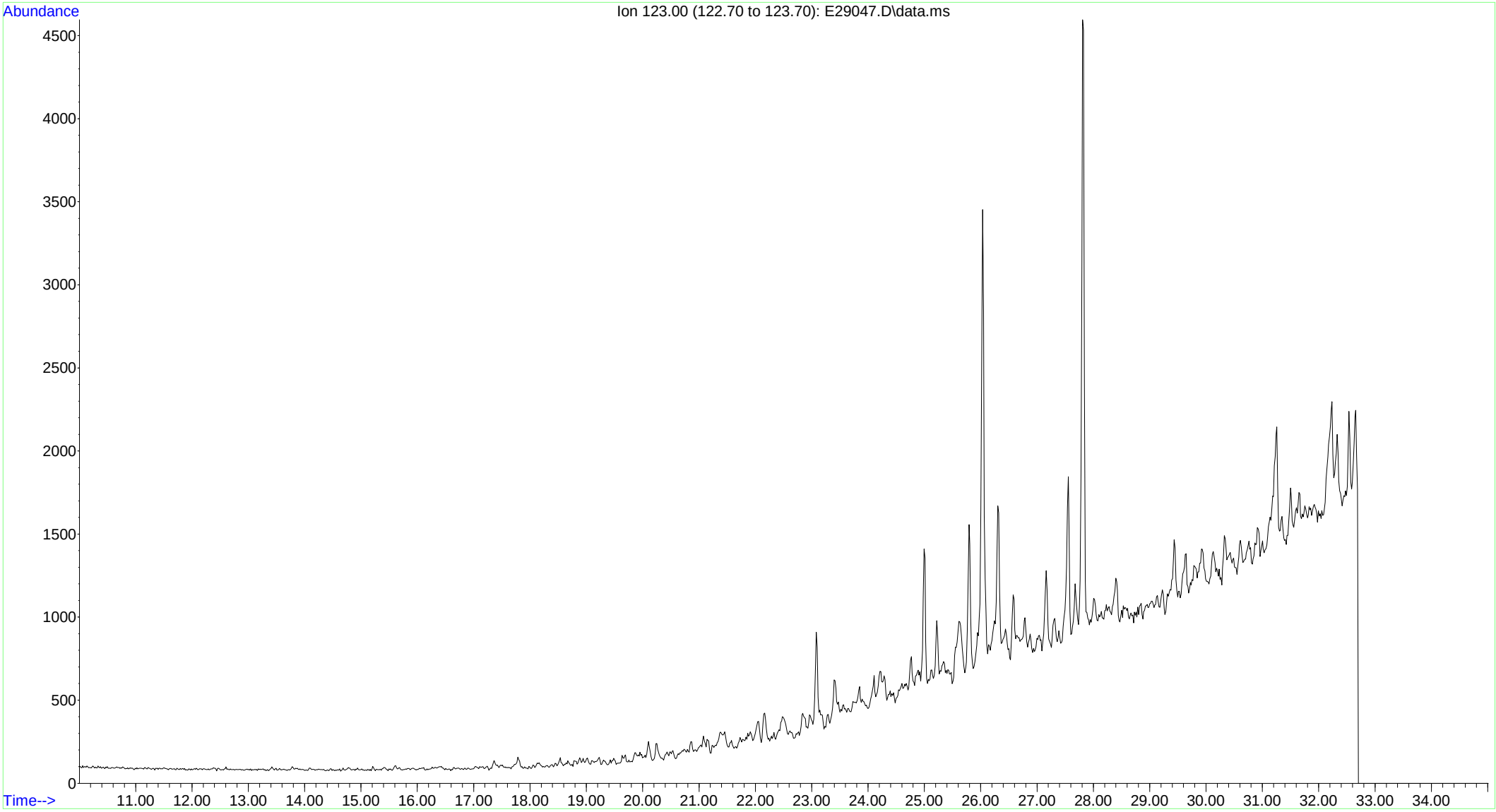
File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29043.D
Operator : AC
Acquired : 17 Nov 2012 4:09 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-05
Misc Info : 1X
Vial Number: 10



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29045.D
Operator : AC
Acquired : 17 Nov 2012 5:37 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-06
Misc Info : 1X
Vial Number: 11



File :O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\E29047.D
Operator : AC
Acquired : 17 Nov 2012 7:05 pm using AcqMethod FRNC2A.M
Instrument : PAH2
Sample Name: 1210083-07
Misc Info : 1X
Vial Number: 12



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24994M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	55363	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	80738	918.373	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 91.84%			
42) Phenanthrene-d10	32.085	188	87554	972.058	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.21%			
83) Benzo[b]fluoranthene-d12	46.645	264	115728	1017.579	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.76%			
88) Benzo[a]pyrene-d12	47.789	264	115547	1048.556	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.86%			
129) 5B(H)Cholane - Surr	43.347	217	23525	1078.150	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.82%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	44708	2236.194	ng/mL	100
4) cis-Decalin	17.091	138	2137	140.688	ng/mL	100
5) C1-Decalins	17.814	152	77413M5	3872.025	ng/mL	
6) C2-Decalins	19.154	166	72612m	3631.890	ng/mL	
7) C3-Decalins	21.623	180	41578m	2079.639	ng/mL	
8) C4-Decalins	25.010	194	44247M5	2213.136	ng/mL	
10) Naphthalene	19.304	128	291700	2967.006	ng/mL#	100
11) C1-Naphthalenes	21.999	142	619164M5	6297.783	ng/mL	
12) C2-Naphthalenes	24.844	156	774255m	7875.280	ng/mL	
13) C3-Naphthalenes	27.193	170	588218m	5983.018	ng/mL	
14) C4-Naphthalenes	29.963	184	345196M5	3511.137	ng/mL	
16) 2-Methylnaphthalene	21.999	142	364688	5824.053	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	254143	4176.935	ng/mL#	100
18) Benzothiophene	19.530	134	2230M3	27.437	ng/mL	
19) C1-Benzo(b)thiophenes	21.577	148	13032m	160.343	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	22864m	281.314	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49308m	606.675	ng/mL	
22) C4-Benzo(b)thiophenes	28.773	190	43322M5	533.025	ng/mL	
23) Biphenyl	23.881	154	57406M3	725.388	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	189324	3354.362	ng/mL#	100
25) Dibenzofuran	26.967	168	24057	274.576	ng/mL#	84
26) Acenaphthylene	25.597	152	3471M3	35.411	ng/mL	
27) Acenaphthene	26.320	153	4522M3	71.671	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	36242M3	686.324	ng/mL	
29) Fluorene	28.352	166	27831M3	395.497	ng/mL	
30) C1-Fluorenes	30.730	180	63133M5	897.162	ng/mL	
31) C2-Fluorenes	32.928	194	106713M5	1516.464	ng/mL	
32) C3-Fluorenes	34.780	208	106052M5	1507.070	ng/mL	
33) Dibenzothiophene	31.679	184	71705	742.544	ng/mL#	88
34) 4-Methyldibenzothiophene(	33.455	198	76022	787.248	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	56514	585.233	ng/mL#	100
36) 1-Methyldibenzothiophene(	34.223	198	24786	256.672	ng/mL#	100
37) OTP	33.877	198	7808M3	80.856	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	166611m	1725.346	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	227794M5	2358.928	ng/mL	
40) C3-Dibenzothiophenes	36.963	226	209778m	2172.363	ng/mL	
41) C4-Dibenzothiophenes	38.665	240	115055M5	1191.456	ng/mL	
43) Phenanthrene	32.176	178	111573	1135.648	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.148	192	52275	532.082	ng/mL	100
45) 2-Methylphenanthrene(2MP)	34.253	192	55603	565.956	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1976	20.113	ng/mL	92
47) 9/4-Methylphenanthrene(9M	34.600	192	81325	827.768	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	55944M3	569.427	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	250470M5	2549.415	ng/mL	

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
50)	C2-Phenanthrenes/Anthrace	36.421	206	284998M5	2900.859	ng/mL	
52)	C3-Phenanthrenes/Anthrace	38.273	220	209062M5	2127.943	ng/mL	
53)	C4-Phenanthrenes/Anthrace	40.471	234	84348M5	858.538	ng/mL	
56)	Carbazole	33.034	167	3161M2	36.168	ng/mL	
57)	1-Methylphenanthrene	34.690	192	54755M3	730.518	ng/mL	
58)	Fluoranthene	36.963	202	2424M3	22.341	ng/mL	
59)	Benzo(b)fluorene	39.508	216	2784M3	38.507	ng/mL	
60)	Pyrene	37.852	202	8320M3	75.445	ng/mL	
61)	C1-Fluoranthenes/Pyrenes	39.252	216	41317m	374.659	ng/mL	
62)	C2-Fluoranthenes/Pyrenes	41.074	230	68144M5	617.924	ng/mL	
63)	C3-Fluoranthenes/Pyrenes	43.106	244	84441M5	765.704	ng/mL	
64)	C4-Fluoranthenes/Pyrenes	44.461	258	76445M5	693.197	ng/mL	
66)	Naphthobenzothiophene	41.721	234	18944M3	174.170	ng/ml	
67)	Naphthobenzothiophene-2,1	41.721	234	18844M3	173.251	ng/mL	
68)	Naphthobenzothiophene-1,2	42.067	234	4387M6	40.334	ng/mL	
69)	Naphthobenzothiophene-2,3	42.369	234	2206M3	20.282	ng/mL	
70)	C1-Naphthobenzothiophenes	43.121	248	71342M5	655.915	ng/ml	
71)	C2-Naphthobenzothiophenes	45.139	262	101492M5	933.113	ng/ml	
72)	C3-Naphthobenzothiophenes	46.750	276	77926M5	716.448	ng/ml	
73)	C4-Naphthobenzothiophenes	47.805	290	55098M5	506.569	ng/mL	
75)	Benz[a]anthracene	42.655	228	1139M3	10.565	ng/mL	
77)	Chrysene/Triphenylene	42.790	228	22405M3	201.863	ng/mL	
78)	C1-Chrysenes	44.296	242	40335M5	363.407	ng/mL	
79)	C2-Chrysenes	47.006	256	61351M5	552.755	ng/mL	
80)	BBF-D12 Surr BKGD	46.645	256	3732	33.624	ng/mL	100
81)	C3-Chrysenes	49.024	270	70695M5	636.942	ng/mL	
82)	C4-Chrysenes	49.130	284	44151M5	397.788	ng/mL	
84)	Benzo[b]fluoranthene	46.720	252	3466M3	27.659	ng/mL	
87)	Benzo[e]pyrene	47.699	252	6116M3	49.985	ng/mL	
89)	Benzo[a]pyrene	47.880	252	1096M3	9.361	ng/mL	
90)	Perylene	48.181	252	2160M3	17.447	ng/mL	
91)	Indeno[1,2,3-cd]pyrene	52.549	276	632M3	4.587	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	52.579	278	659M3	4.492	ng/mL	
93)	Benzo[g,h,i]perylene	53.798	276	2734	18.402	ng/mL#	77
94)	Hopane (T19)	51.645	191	33249	800.231	ng/mL#	84
96)	C23 Tricyclic Terpane (T4	40.351	191	12477M2	300.294	ng/ml	
97)	C24 Tricyclic Terpane (T5	41.089	191	8030M3	193.265	ng/ml	
98)	C25 Tricyclic Terpane (T6	42.579	191	7444M3	179.161	ng/ml	
99)	C24 Tetracyclic Terpane (	43.889	191	2483M3	59.760	ng/ml	
100)	C26 Tricyclic Terpane-22S	43.648	191	2905M3	69.917	ng/ml	
101)	C26 Tricyclic Terpane-22R	43.739	191	2670M3	64.261	ng/ml	
102)	C28 Tricyclic Terpane-22S	46.043	191	2772M3	66.716	ng/ml	
103)	C28 Tricyclic Terpane-22R	46.208	191	3041M3	73.190	ng/ml	
104)	C29 Tricyclic Terpane-22S	46.735	191	3836	92.324	ng/ml	100
105)	C29 Tricyclic Terpane-22R	46.931	191	4396M3	105.802	ng/ml	
106)	18a-22,29,30-Trisnorneoho	47.985	191	6025	145.009	ng/ml	100
107)	C30 Tricyclic Terpane-22S	48.106	191	3655M3	87.968	ng/ml	
108)	C30 Tricyclic Terpane-22R	48.347	191	3018M3	72.637	ng/ml	
109)	17a(H)-22,29,30-Trisnorho	48.512	191	6658M3	160.244	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	49.672	191	1533	36.896	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	49.506	191	1593M4	38.340	ng/ml	
112)	30-Norhopane (T15)	50.320	191	19328	465.183	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	50.425	191	4835	116.368	ng/ml	100
114)	17a(H)-Diahopane (X)	50.546	191	2730M3	65.705	ng/ml	
115)	30-Normoretane (T17)	51.073	191	2128	51.216	ng/ml	100
117)	Moretane (T20)	52.308	191	3031M3	72.950	ng/ml	
118)	30-Homohopane-22S (T21)	53.362	191	13928	335.217	ng/ml	100
119)	30-Homohopane-22R (T22)	53.588	191	12032	289.584	ng/ml	100
120)	Gammacerane/C32-diahopane	54.115	191	2467M3	59.375	ng/mL	
121)	30,31-Bishomohopane-22S (	54.868	191	10409	250.522	ng/ml	100
122)	30,31-Bishomohopane-22R (	55.244	191	7380	177.621	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
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Operator : AC
Sample : SS111612ANC01
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QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
123) 30,31-Trishomohopane-22S	56.931	191	7813	188.042	ng/ml	100
124) 30,31-Trishomohopane-22R	57.518	191	5411	130.231	ng/ml	100
125) Tetrakishomohopane-22S (T	59.460	191	6144	147.873	ng/ml	100
126) Tetrakishomohopane-22R (T	60.334	191	4086	98.341	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	6600	158.848	ng/ml	100
128) Pentakishomohopane-22R (T	63.737	191	5017	120.748	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	5848M3	268.014	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.290	217	2922M3	133.915	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	3198M3	146.564	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	7405	339.371	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	8209M3	376.218	ng/ml	
135) Unknown Sterane (S18)	47.639	217	2180	99.909	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	358	16.407	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.046	217	3700M3	169.571	ng/ml	
138) 14a,17a-20R-Methylcholest	48.738	217	3776M3	173.054	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5663M3	259.535	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.958	217	4884M3	223.834	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	4962M3	227.408	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	4692M3	215.034	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	5446	249.590	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6112M3	280.113	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.311	218	7154M3	327.867	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	4482M3	205.410	ng/ml	
147) C26,20R- +C27,20S- triaro	49.040	231	27203	1246.712	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	17445	799.504	ng/mL	100
149) C27,20R-triaromatic stero	50.305	231	16412	752.161	ng/mL	100
150) C28,20R-triaromatic stero	51.464	231	13961M3	639.832	ng/mL	

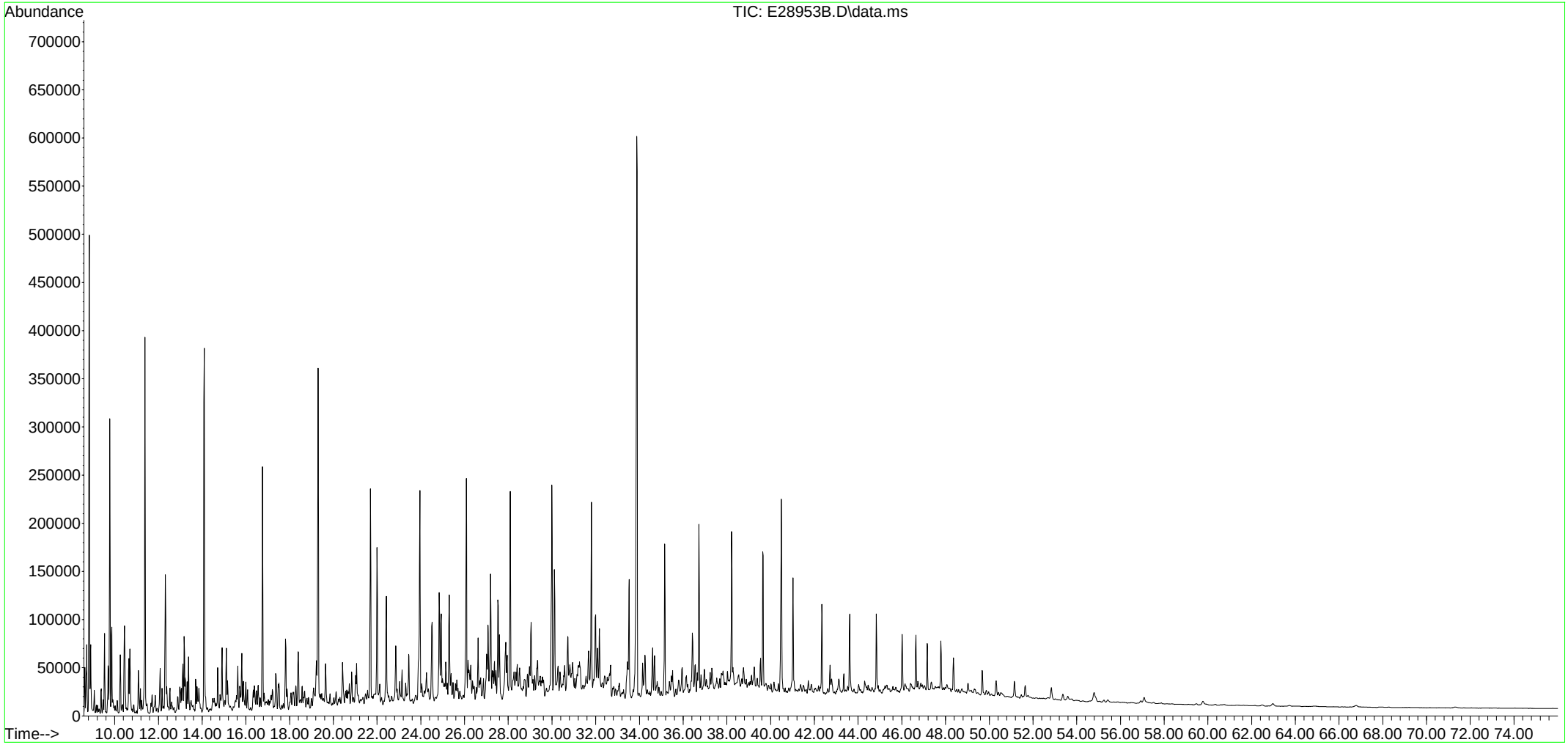
(#) = qualifier out of range (m) = manual integration (+) = signals summed

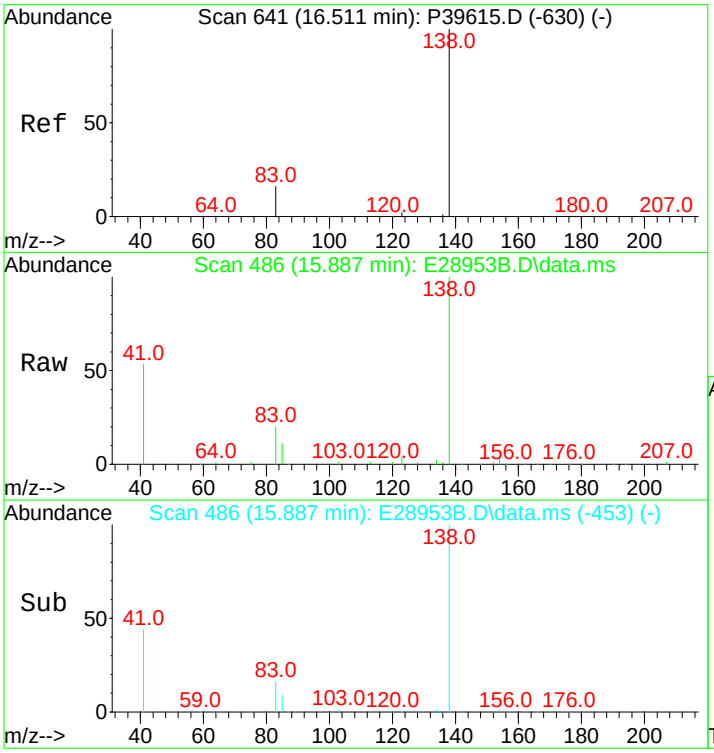
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28953B.D
Acq On : 14 Nov 2012 9:16 am
Operator : AC
Sample : SS111612ANC01
Misc : WHAQ46, 5.076
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Nov 16 13:09:26 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

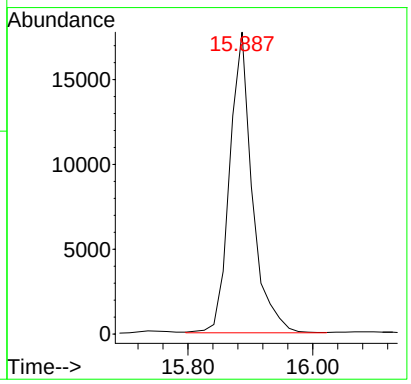
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

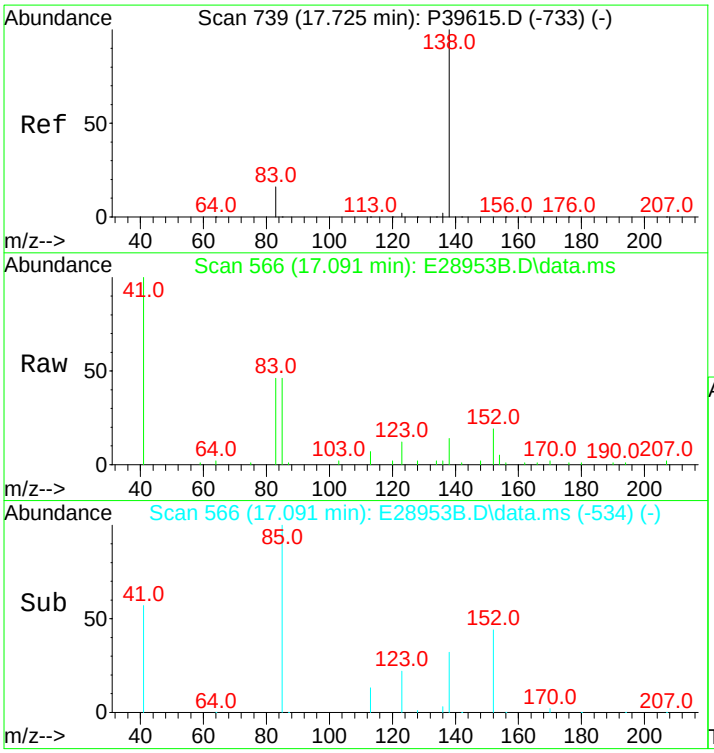




#3
trans-Decalin
Concen: 2236.19 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

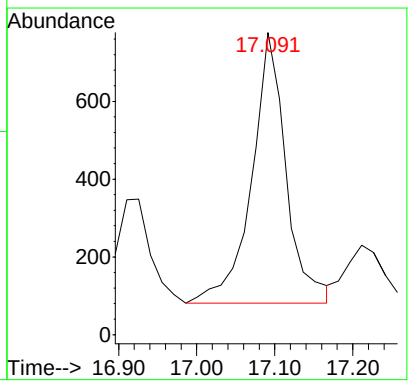
Tgt Ion:138 Resp: 44708

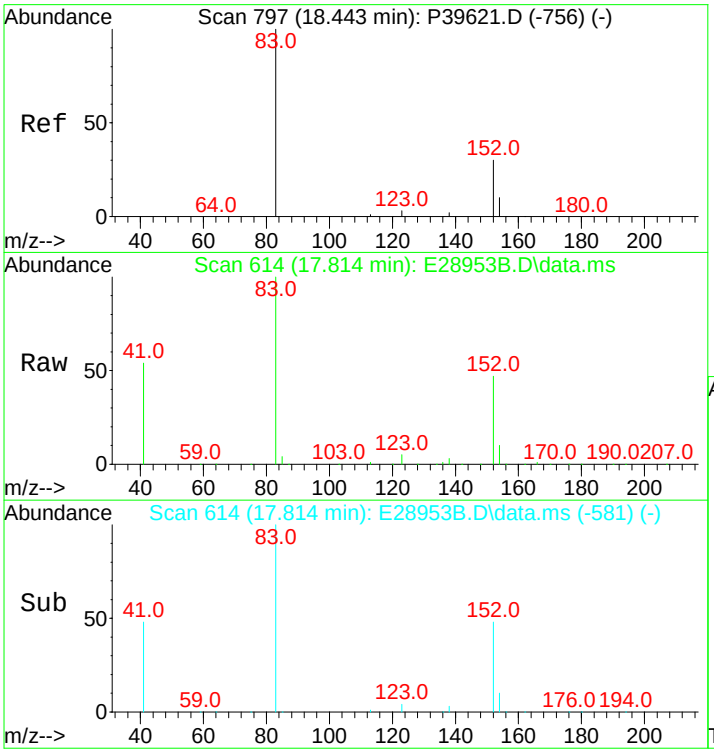




#4
cis-Decalin
Concen: 140.69 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

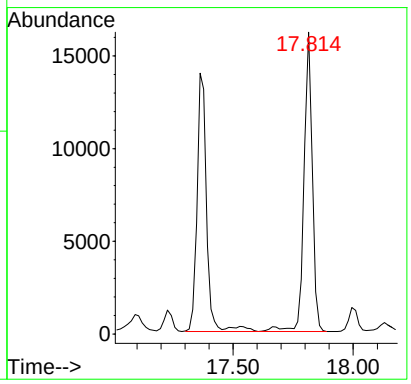
Tgt Ion:138 Resp: 2137

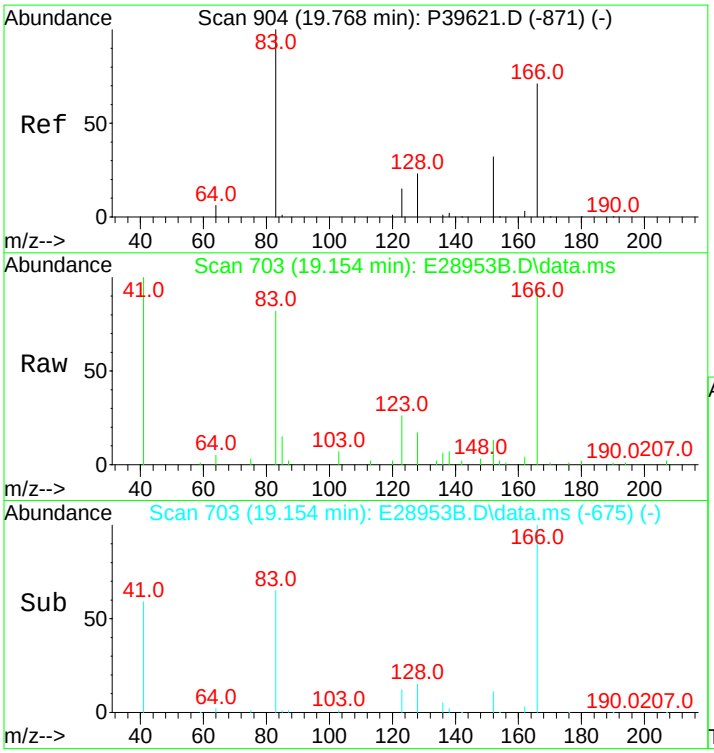




#5
C1-Decalins
Concen: 3872.03 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

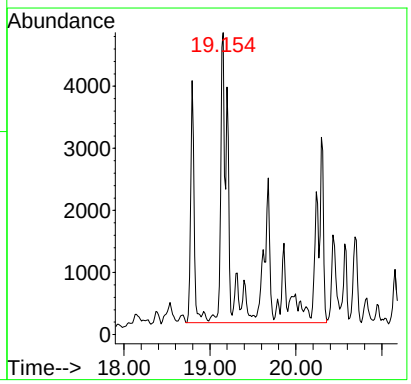
Tgt Ion:152 Resp: 77413

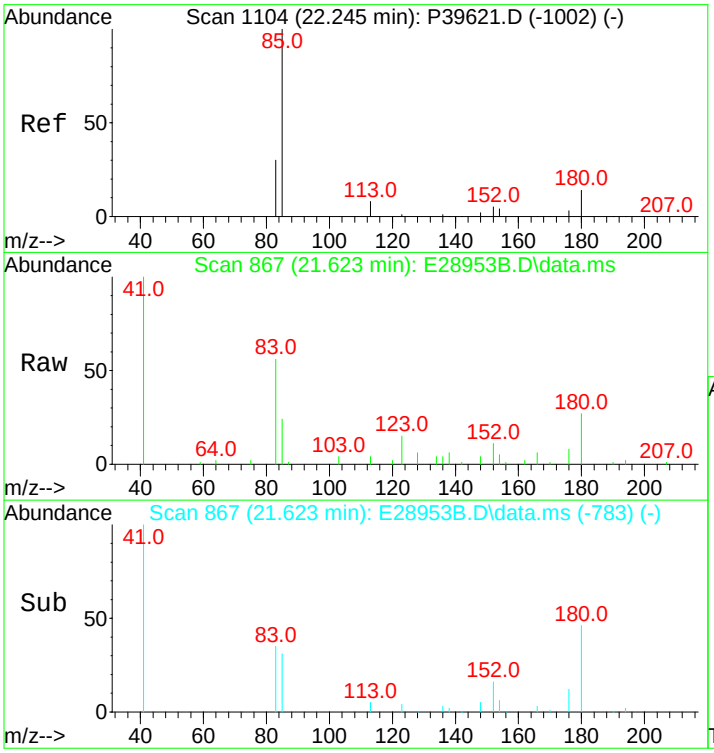




#6
C2-Decalins
Concen: 3631.89 ng/mL m
RT: 19.154 min Scan# 703
Delta R.T. -0.189 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

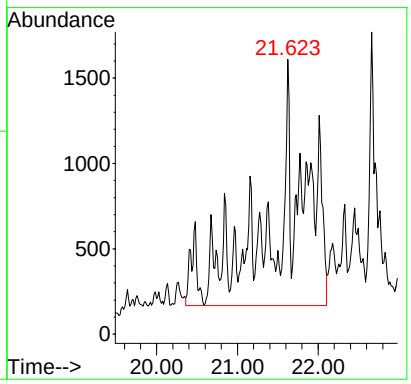
Tgt Ion:166 Resp: 72612

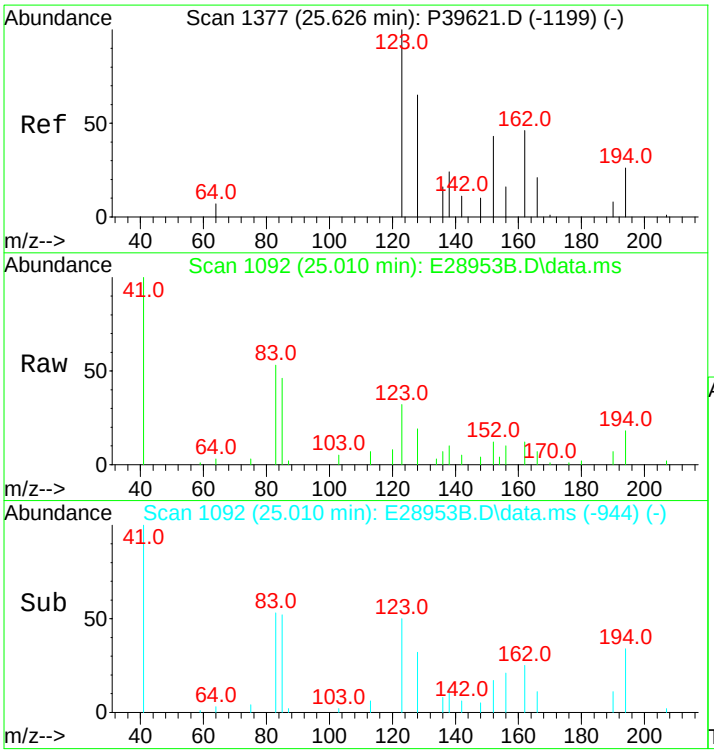




#7
C3-Decalins
Concen: 2079.64 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

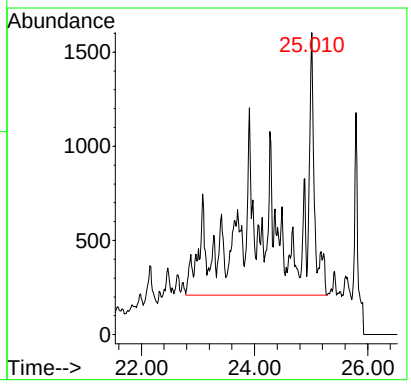
Tgt Ion:180 Resp: 41578

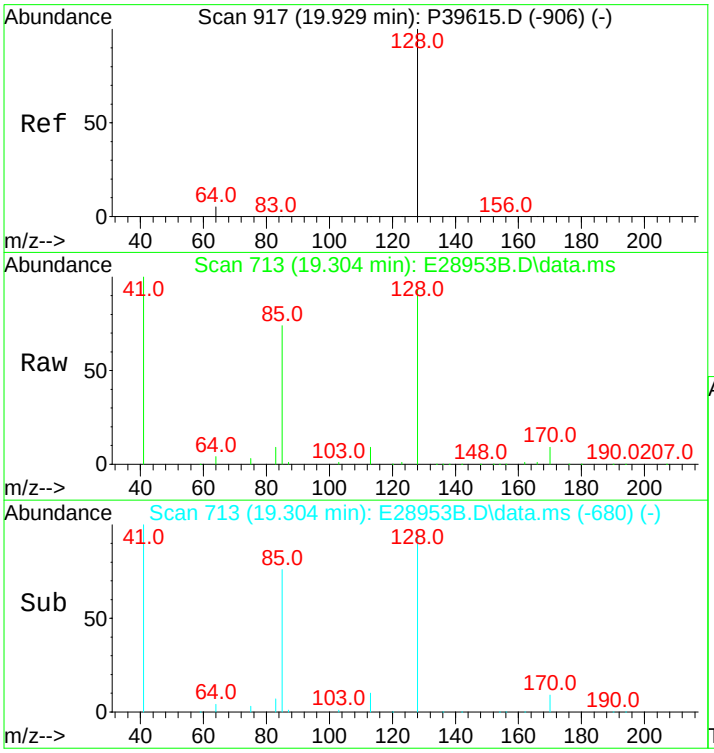




#8
C4-Decalins
Concen: 2213.14 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.046 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:194 Resp: 44247

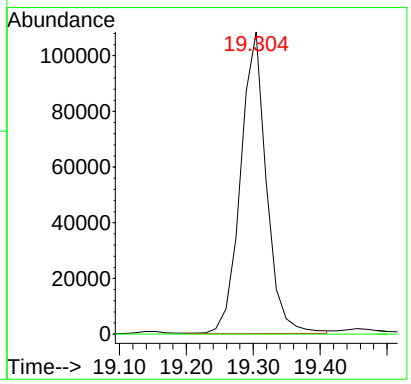


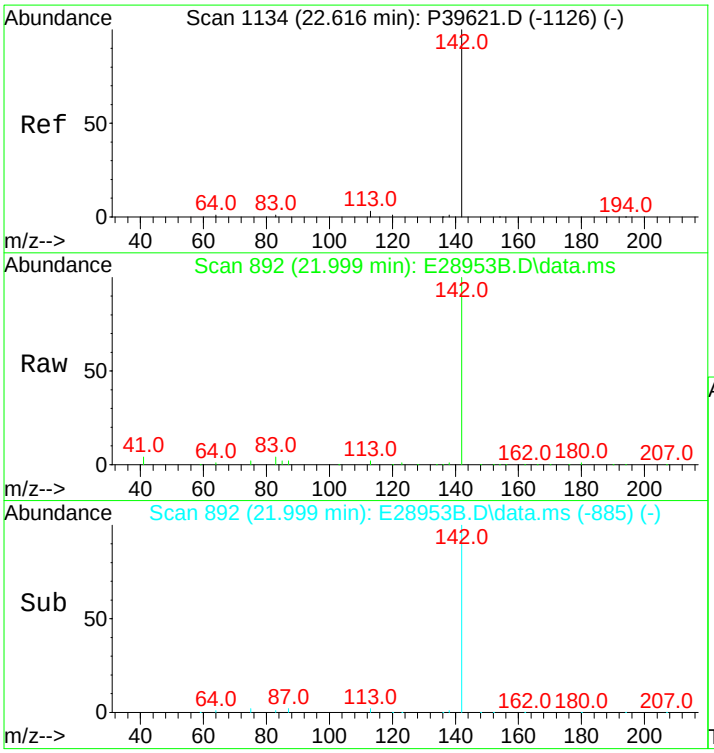


#10
Naphthalene
Concen: 2967.01 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:128 Resp: 291700

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

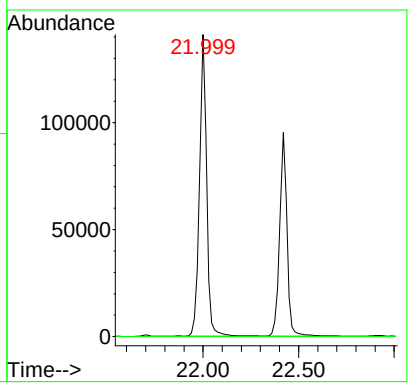


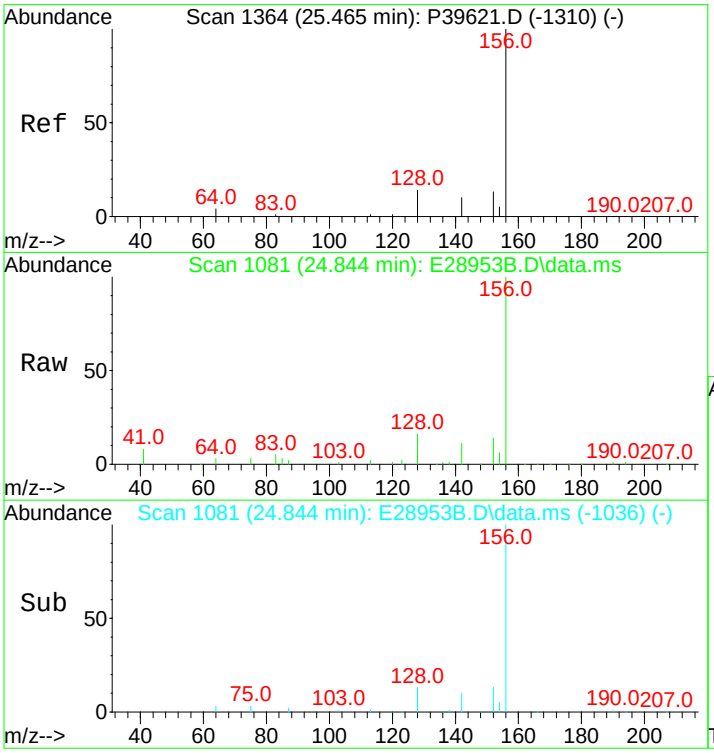


#11
C1-Naphthalenes
Concen: 6297.78 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:142 Resp: 619164

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

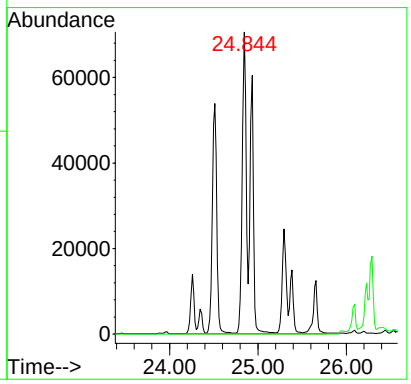


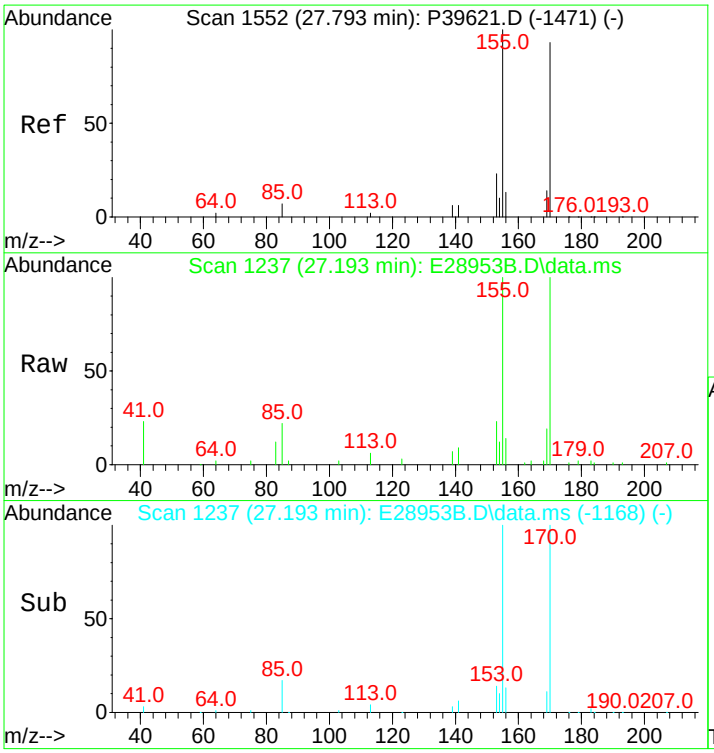


#12
C2-Naphthalenes
Concen: 7875.28 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:156 Resp: 774255

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

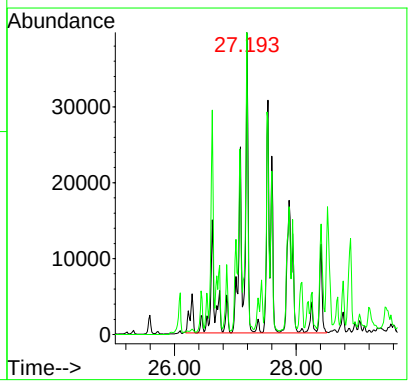


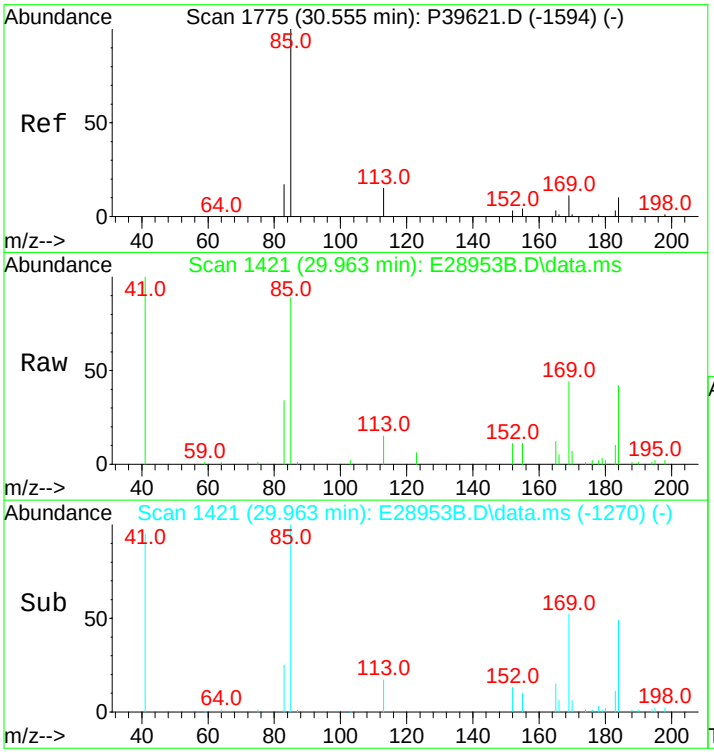


#13
C3-Naphthalenes
Concen: 5983.02 ng/mL m
RT: 27.193 min Scan# 1237
Delta R.T. 0.013 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:170 Resp: 588218

Ion	Ratio	Lower	Upper
170	100		
155	11.0	66.8	100.2#

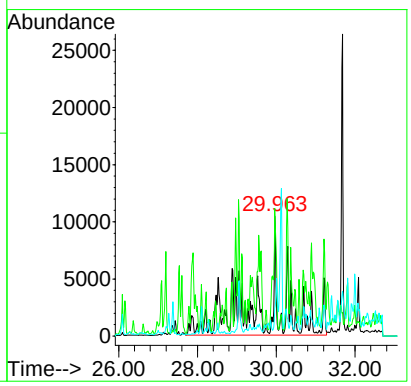


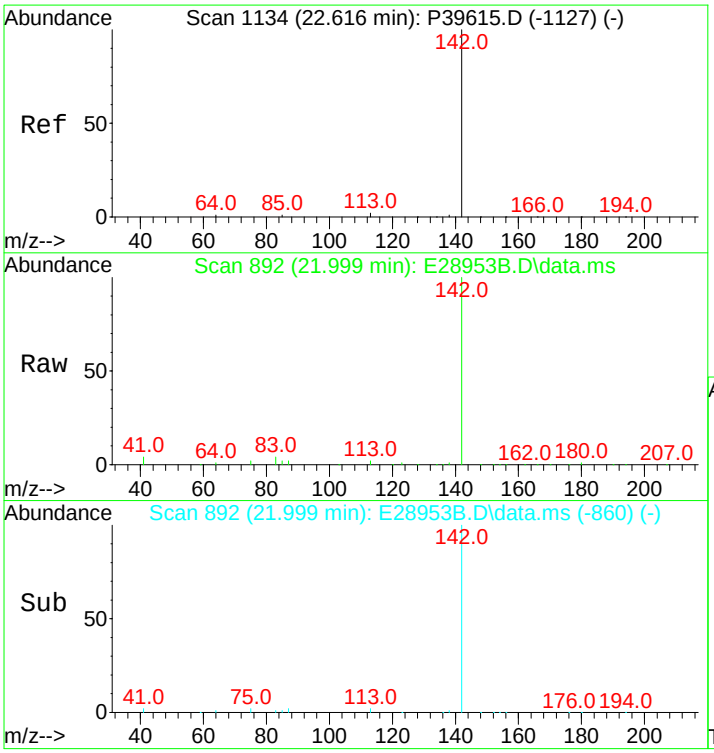


#14
C4-Naphthalenes
Concen: 3511.14 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.087 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:184 Resp: 345196

Ion	Ratio	Lower	Upper
184	100		
169	17.2	78.7	118.1#
183	0.0	26.7	40.1#

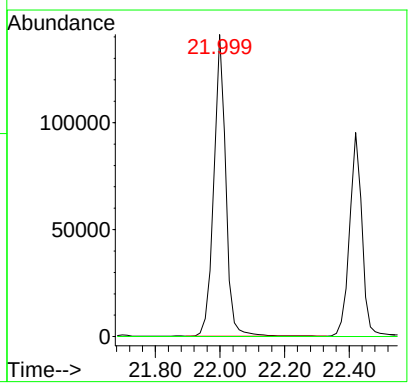


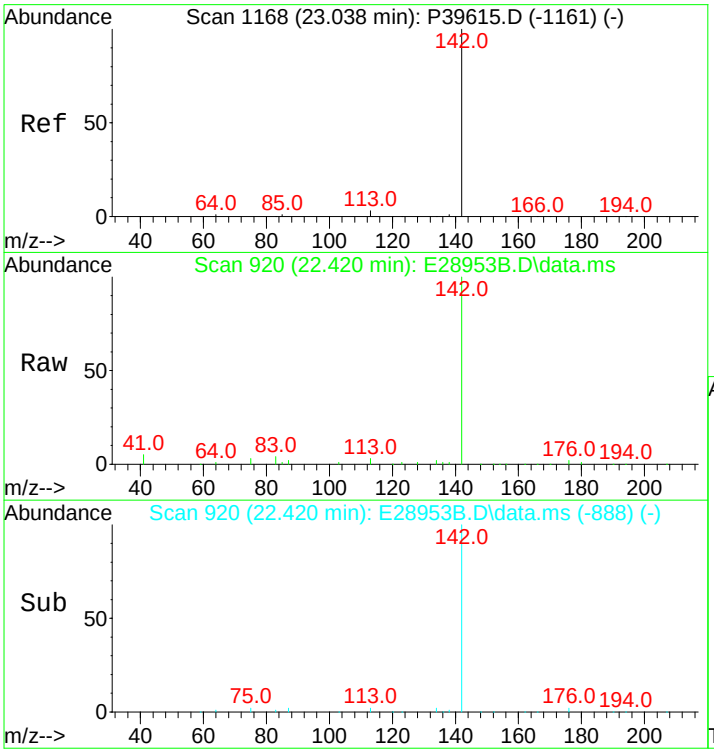


#16
2-Methylnaphthalene
Concen: 5824.05 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:142 Resp: 364688

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

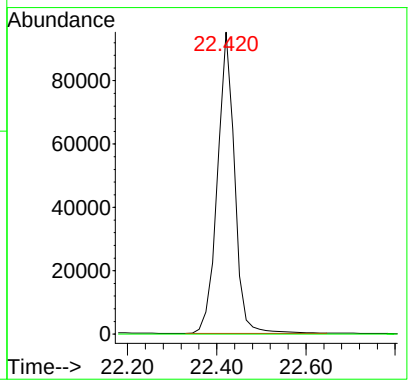


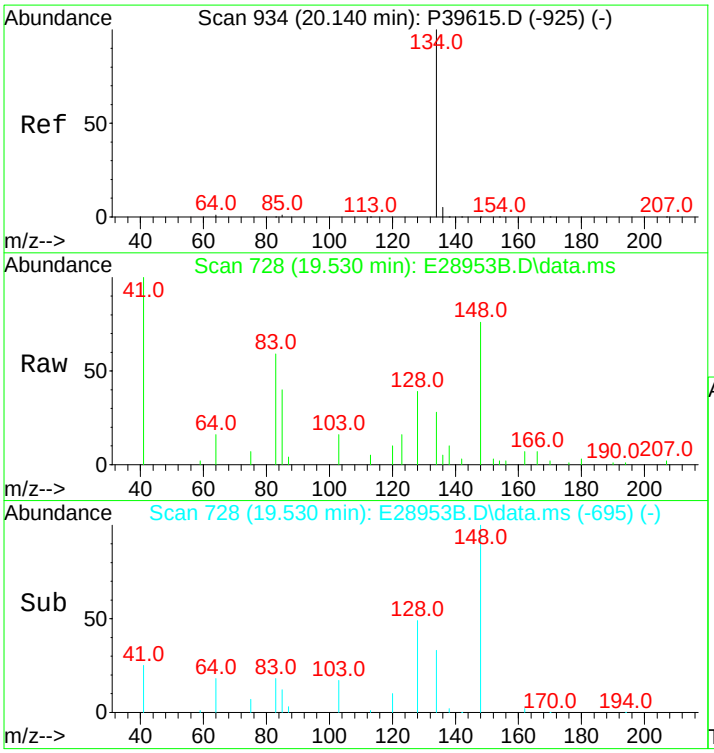


#17
1-Methylnaphthalene
Concen: 4176.93 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:142 Resp: 254143

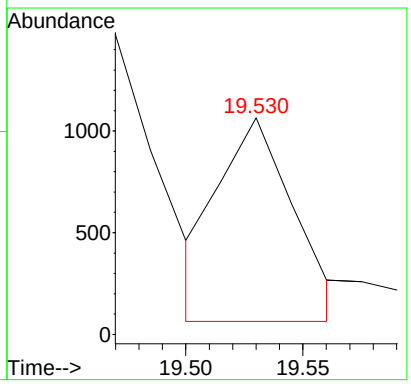
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

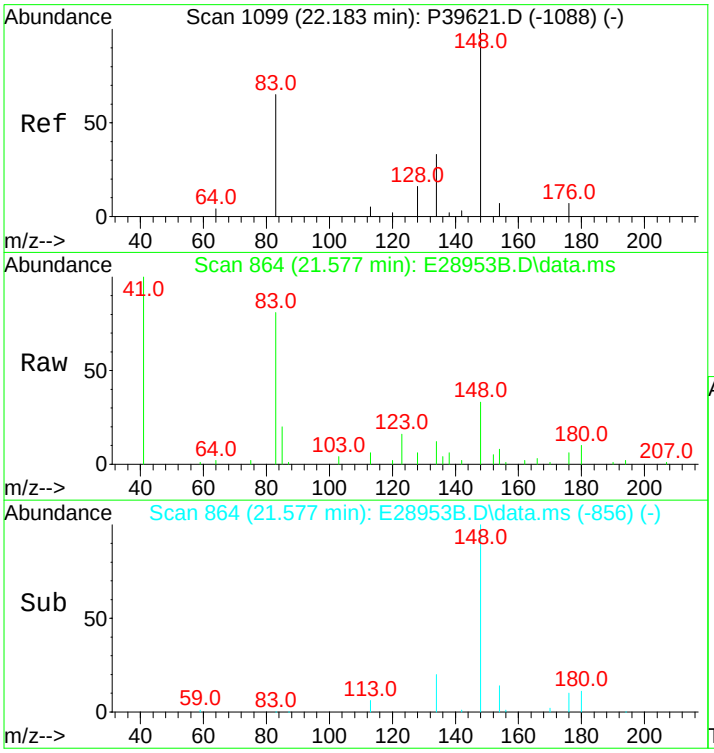




#18
Benzothiophene
Concen: 27.44 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

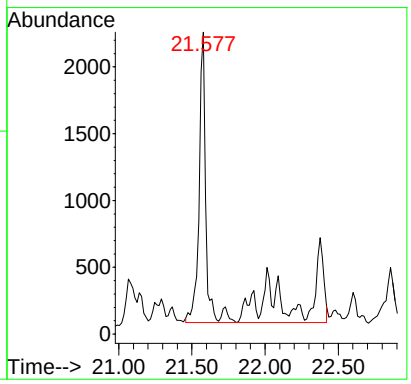
Tgt Ion:134 Resp: 2230

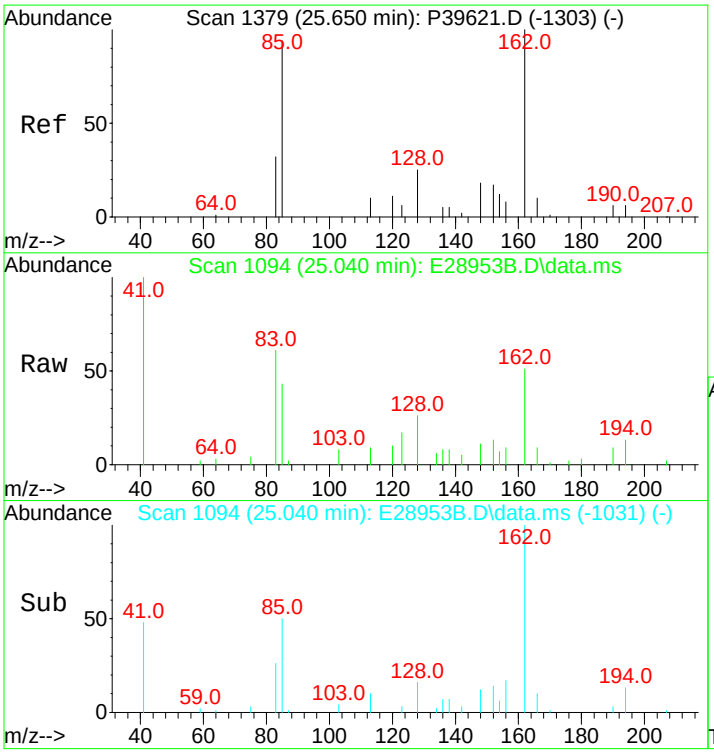




#19
C1-Benzo(b)thiophenes
Concen: 160.34 ng/mL m
RT: 21.577 min Scan# 864
Delta R.T. -0.123 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

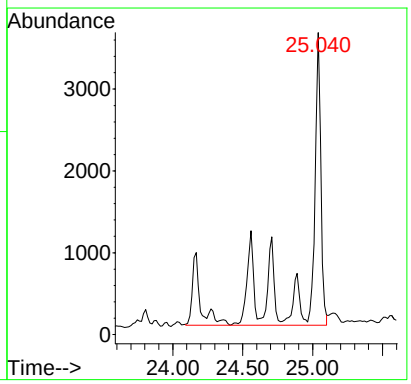
Tgt Ion:148 Resp: 13032

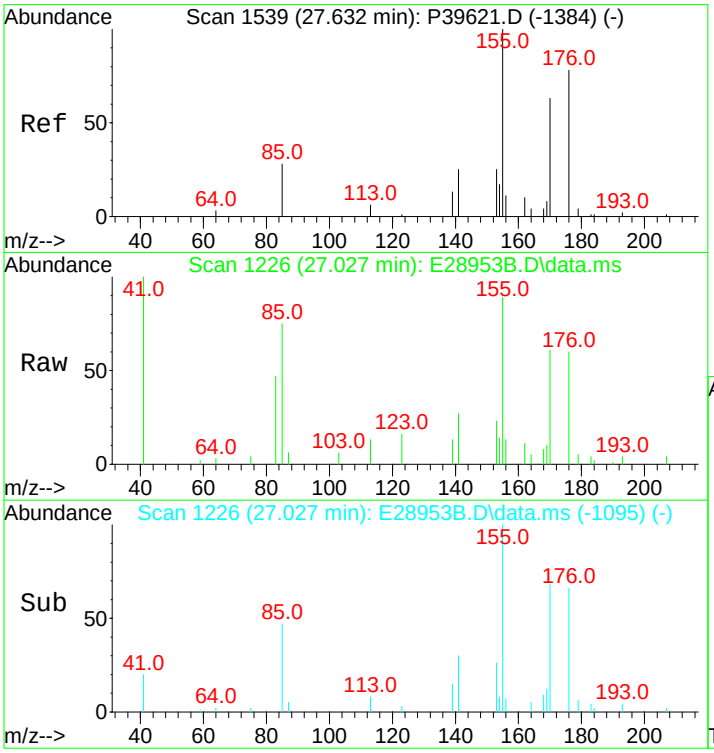




#20
C2-Benzo(b)thiophenes
Concen: 281.31 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

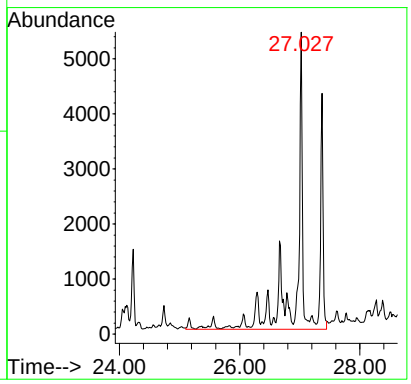
Tgt Ion:162 Resp: 22864

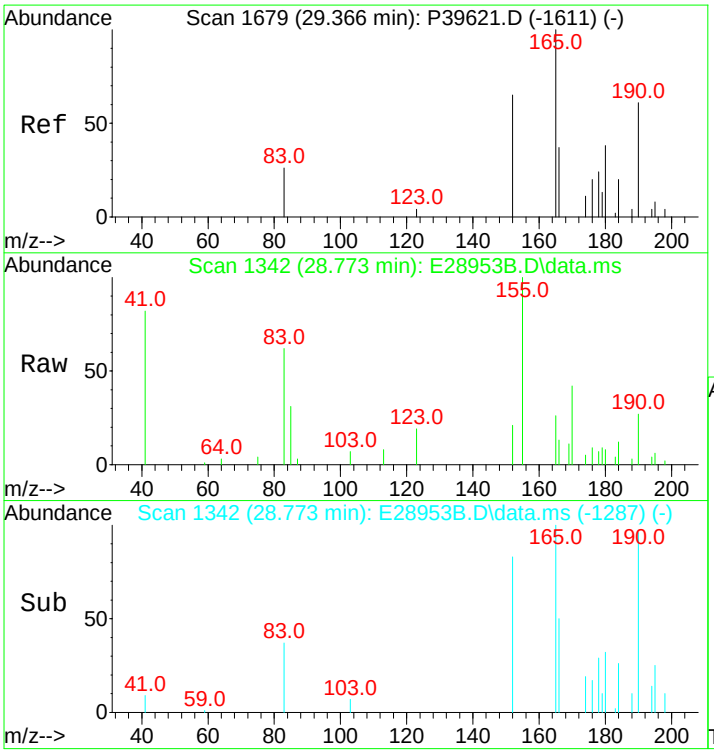




#21
C3-Benzo(b)thiophenes
Concen: 606.67 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

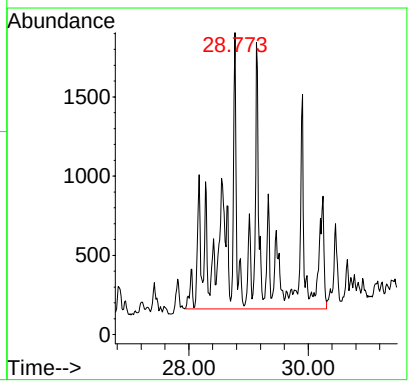
Tgt Ion:176 Resp: 49308

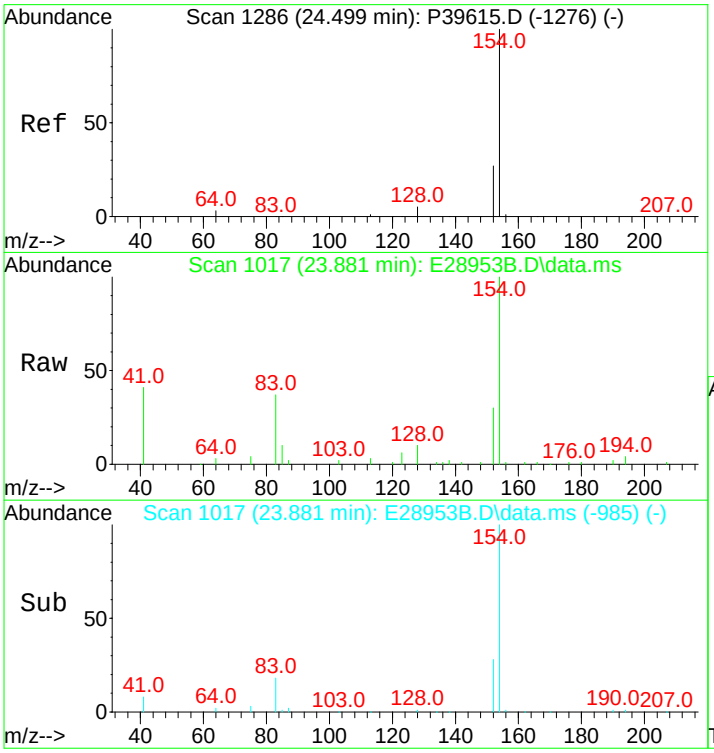




#22
C4-Benzo(b)thiophenes
Concen: 533.02 ng/mL m
RT: 28.773 min Scan# 1342
Delta R.T. -0.296 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:190 Resp: 43322

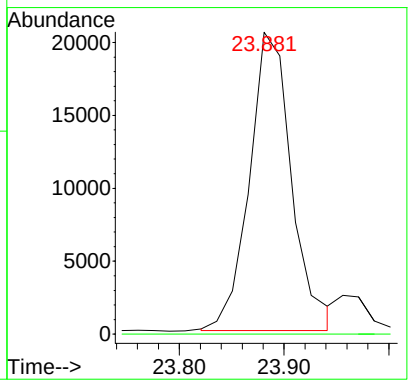


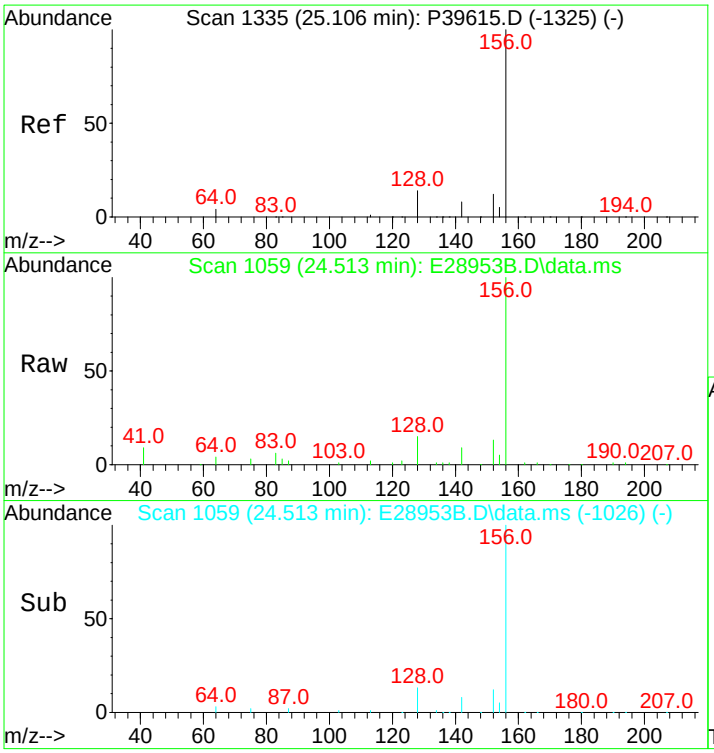


#23
Biphenyl
Concen: 725.39 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:154 Resp: 57406

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

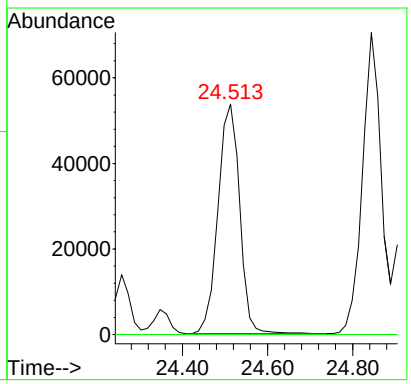


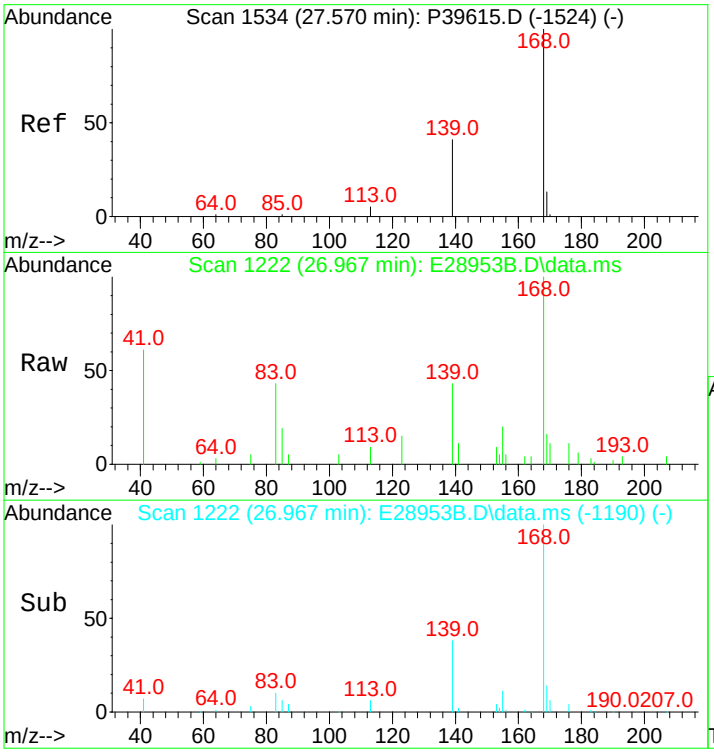


#24
2,6-Dimethylnaphthalene
Concen: 3354.36 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:156 Resp: 189324

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

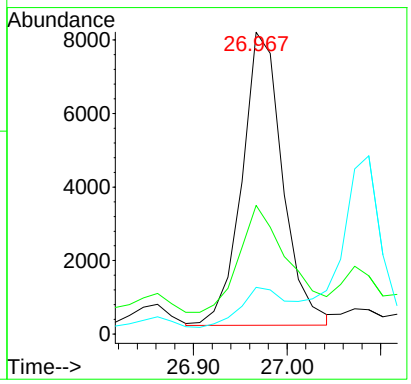


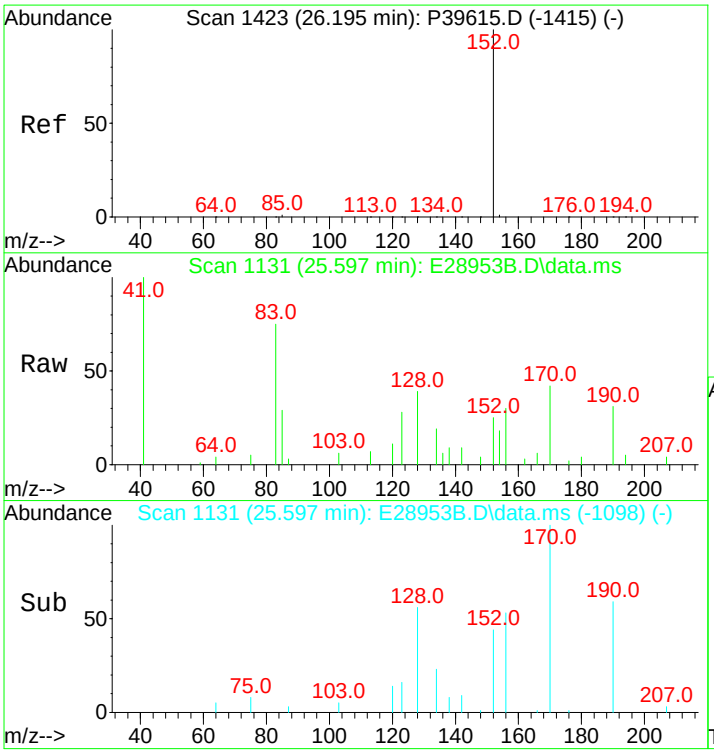


#25
Dibenzofuran
Concen: 274.58 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:168 Resp: 24057

Ion	Ratio	Lower	Upper
168	100		
139	43.2	26.0	39.0#
169	16.7	10.6	16.0#

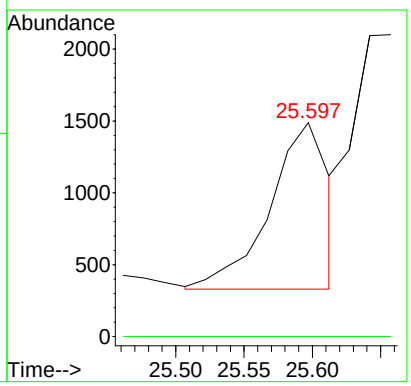


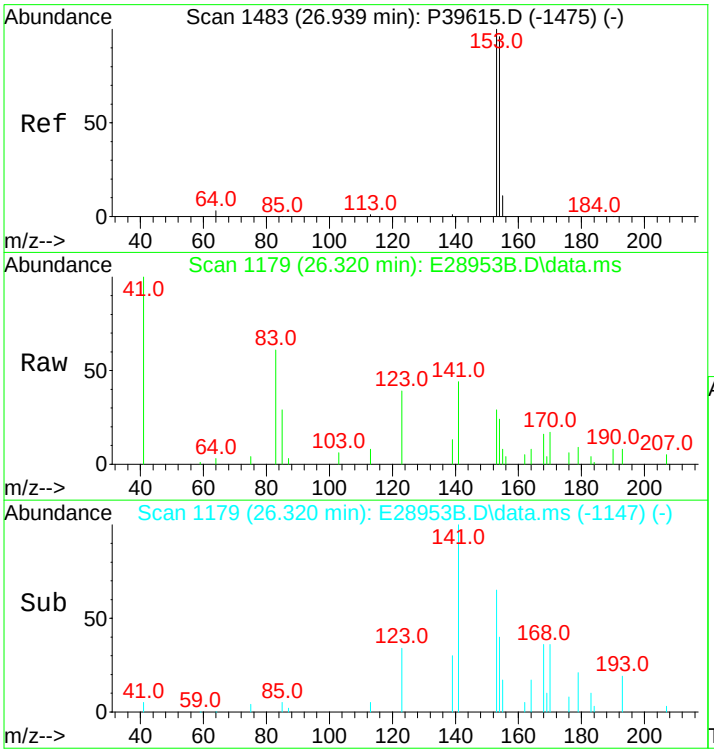


#26
Acenaphthylene
Concen: 35.41 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:152 Resp: 3471

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

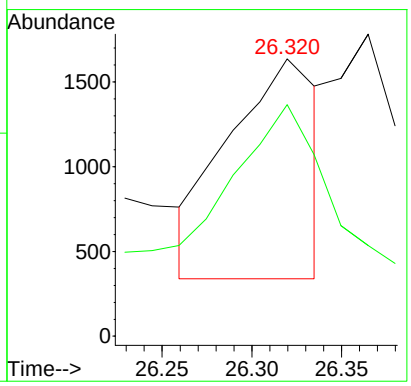


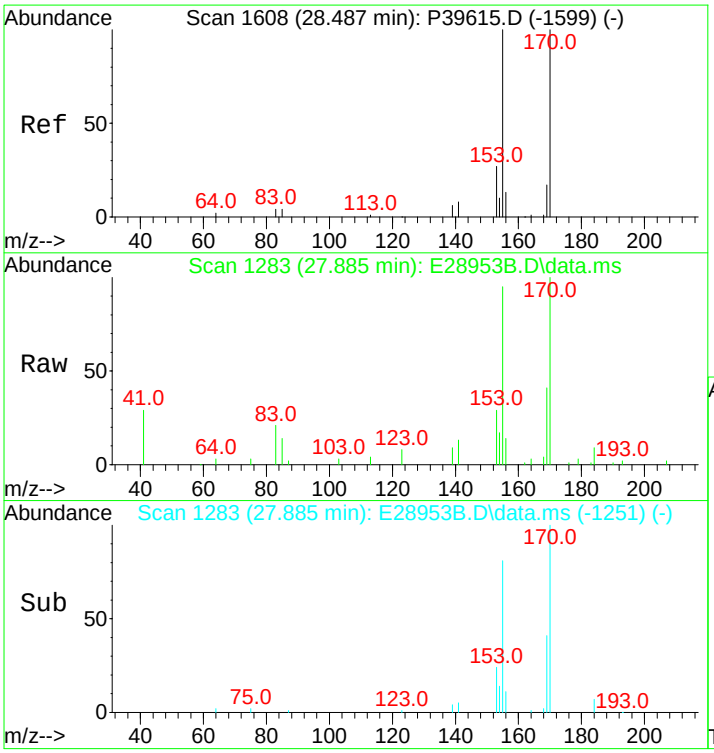


#27
Acenaphthene
Concen: 71.67 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:153 Resp: 4522

Ion	Ratio	Lower	Upper
153	100		
154	0.0	74.1	111.1#

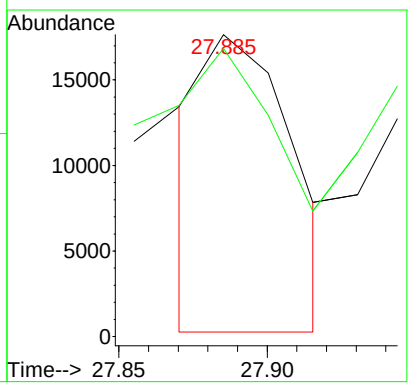


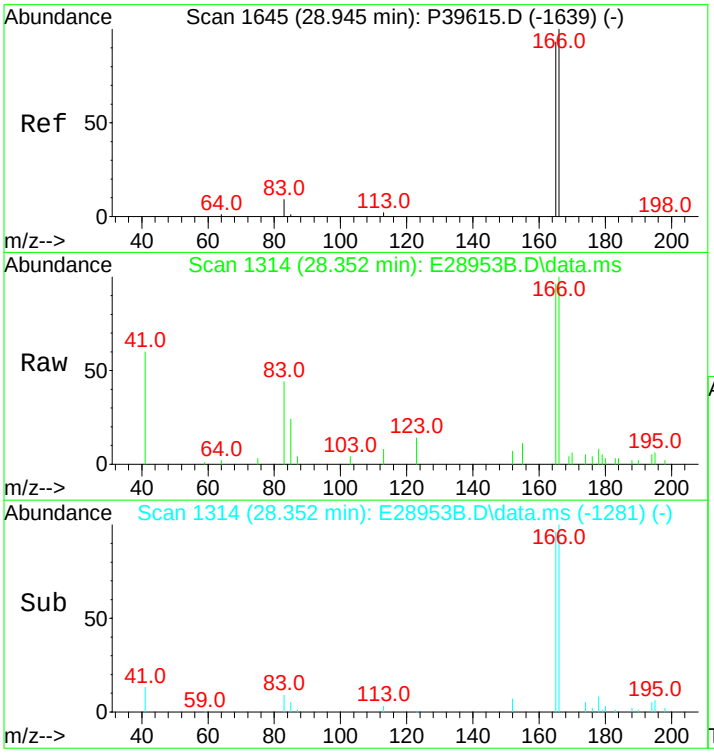


#28
2,3,5-Trimethylnaphthalene
Concen: 686.32 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:170 Resp: 36242

Ion	Ratio	Lower	Upper
170	100		
155	180.5	70.7	106.1#

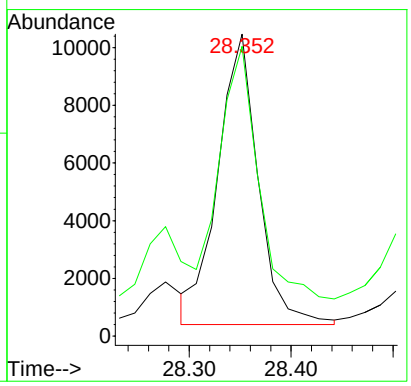


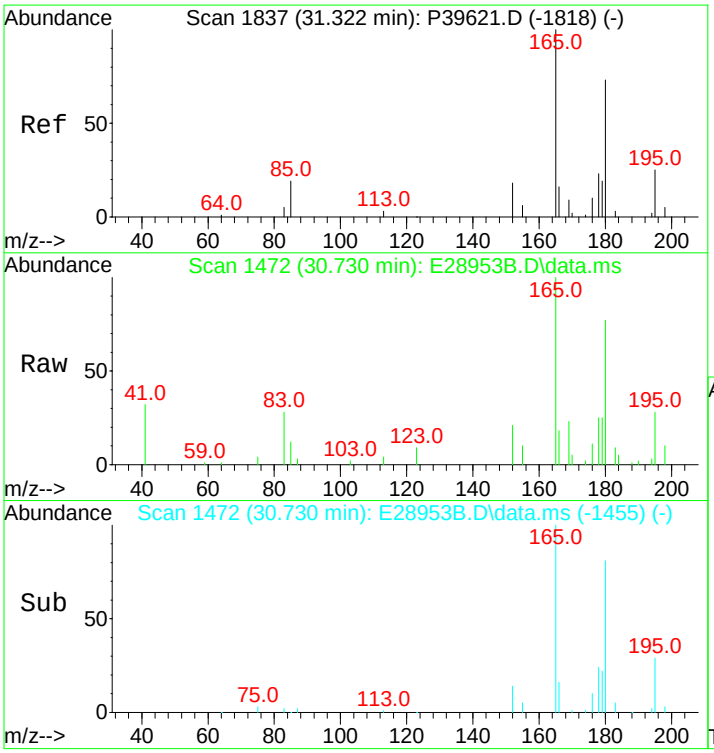


#29
Fluorene
Concen: 395.50 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:166 Resp: 27831

Ion	Ratio	Lower	Upper
166	100		
165	101.4	74.7	112.1

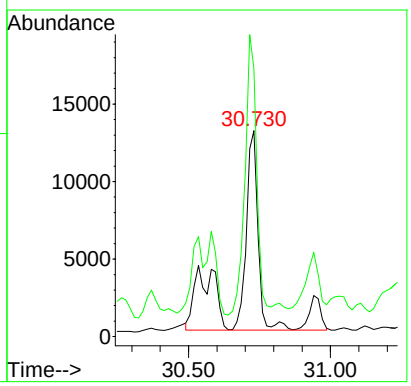


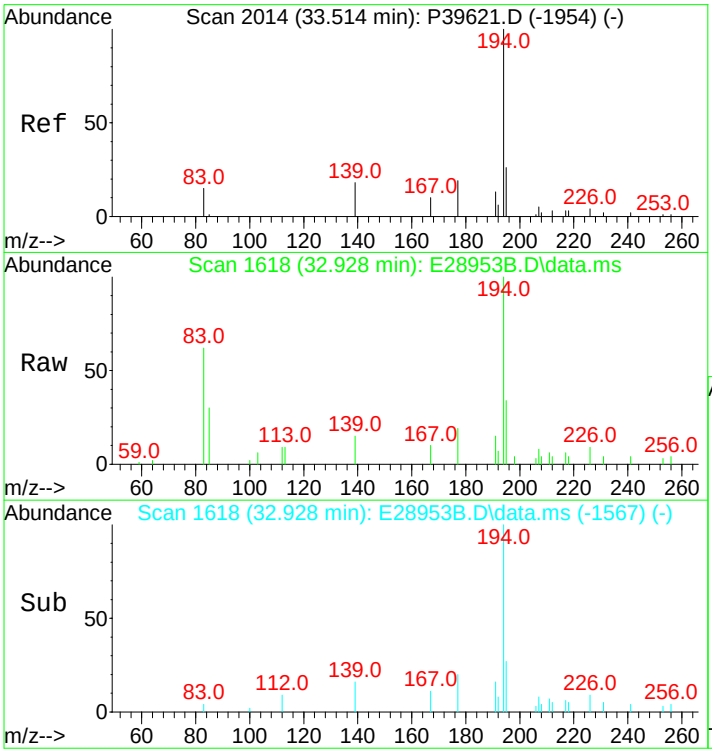


#30
C1-Fluorenes
Concen: 897.16 ng/mL m
RT: 30.730 min Scan# 1472
Delta R.T. 0.108 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:180 Resp: 63133

Ion	Ratio	Lower	Upper
180	100		
165	0.0	94.3	141.5#

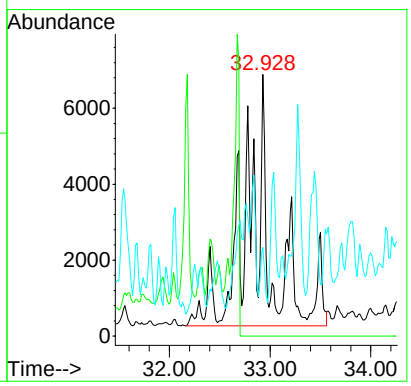


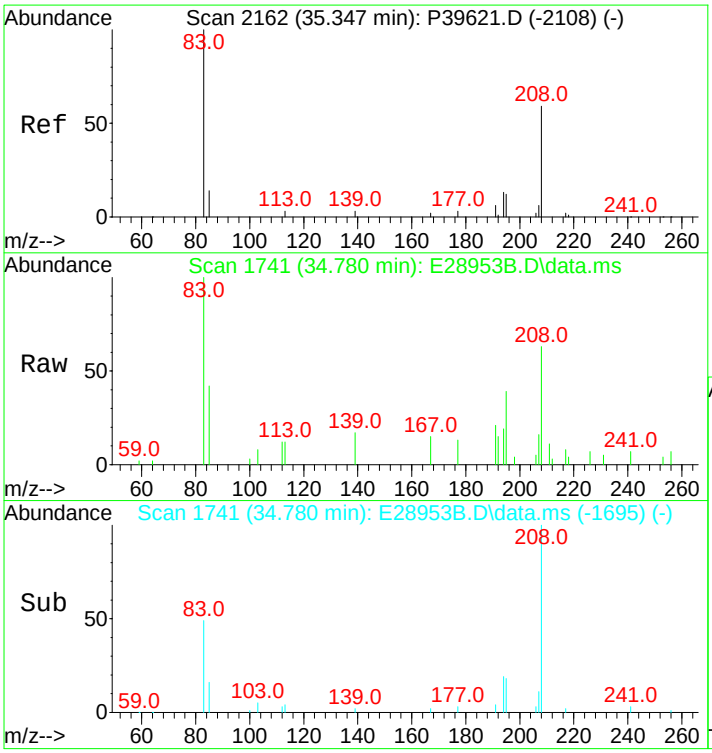


#31
C2-Fluorenes
Concen: 1516.46 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:194 Resp: 106713

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	6.7	27.0	40.4#

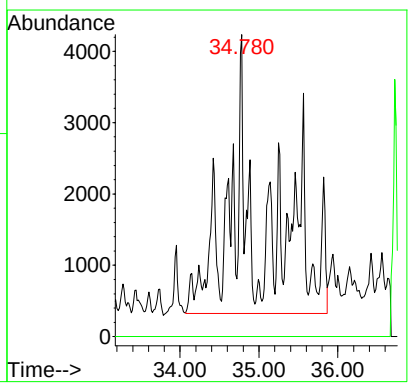


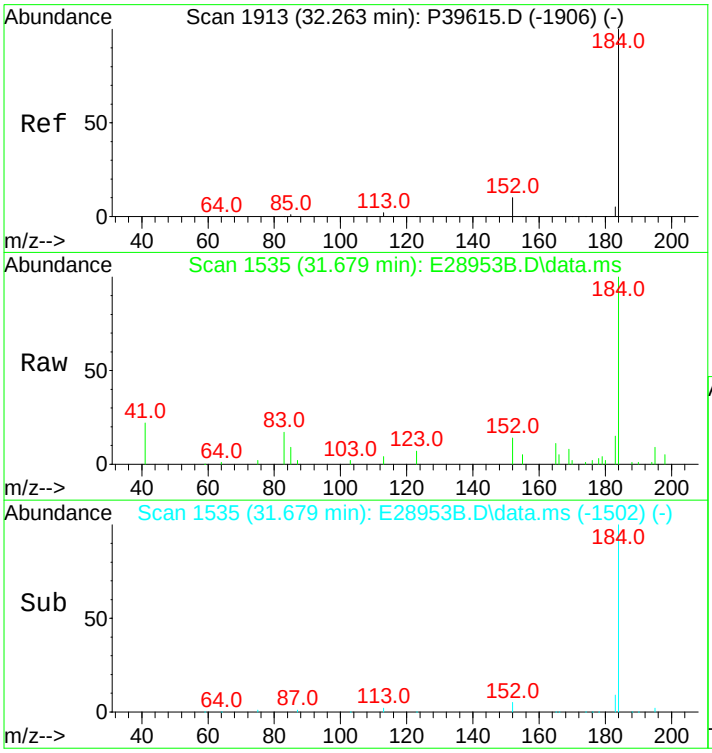


#32
C3-Fluorenes
Concen: 1507.07 ng/mL m
RT: 34.780 min Scan# 1741
Delta R.T. 0.231 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:208 Resp: 106052

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

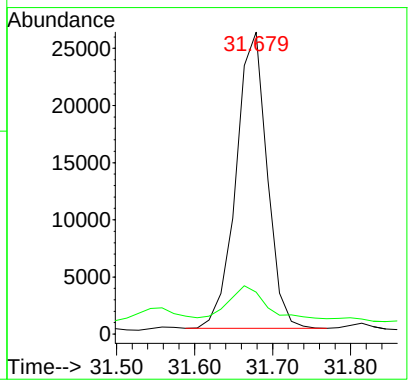


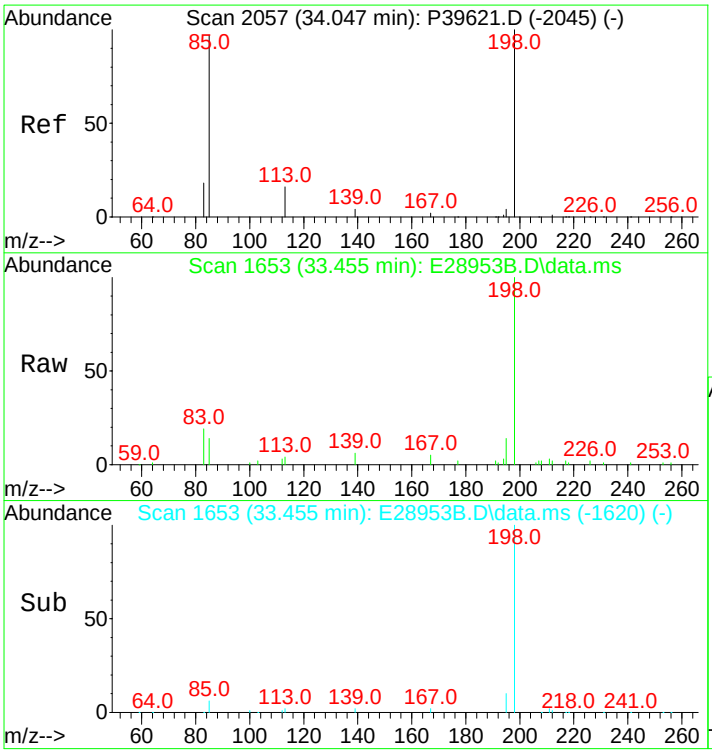


#33
Dibenzothiophene
Concen: 742.54 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:184 Resp: 71705

Ion	Ratio	Lower	Upper
184	100		
152	13.2	7.0	10.6#

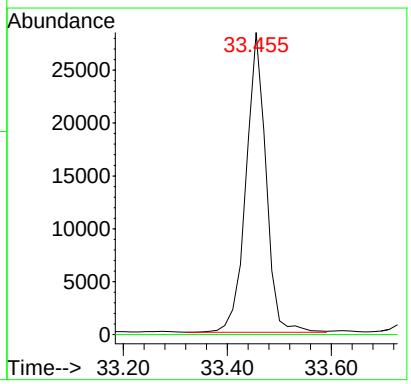


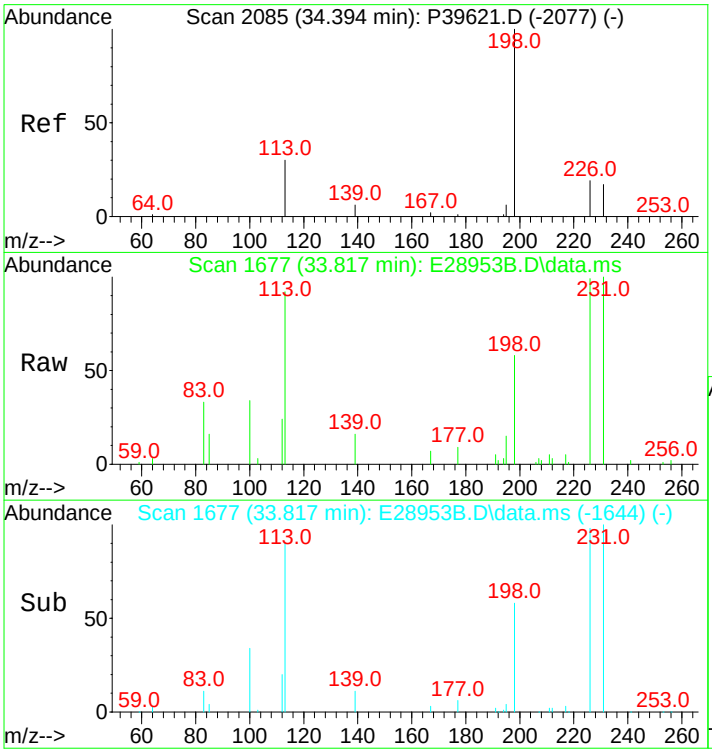


#34
4-Methyldibenzothiophene(4MDT)
Concen: 787.25 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 76022

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

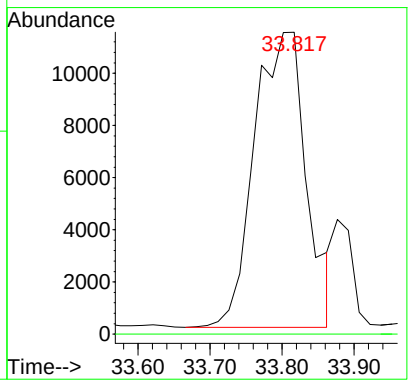


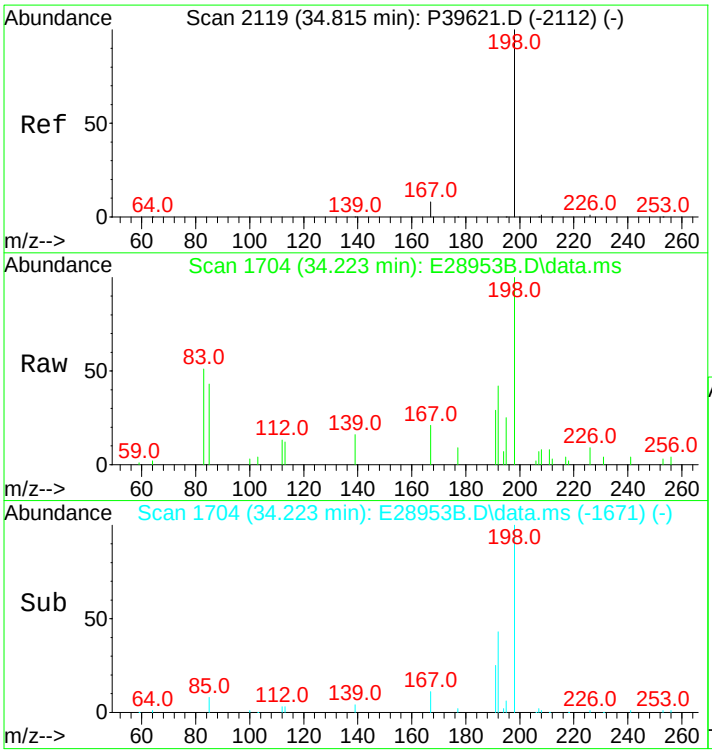


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 585.23 ng/mL
RT: 33.817 min Scan# 1677
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 56514

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

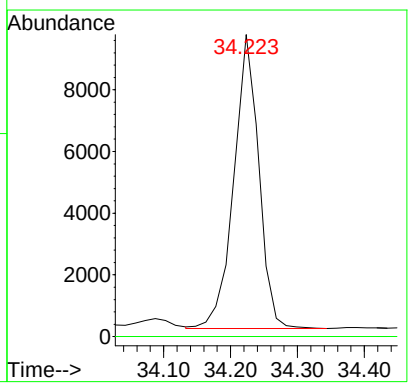


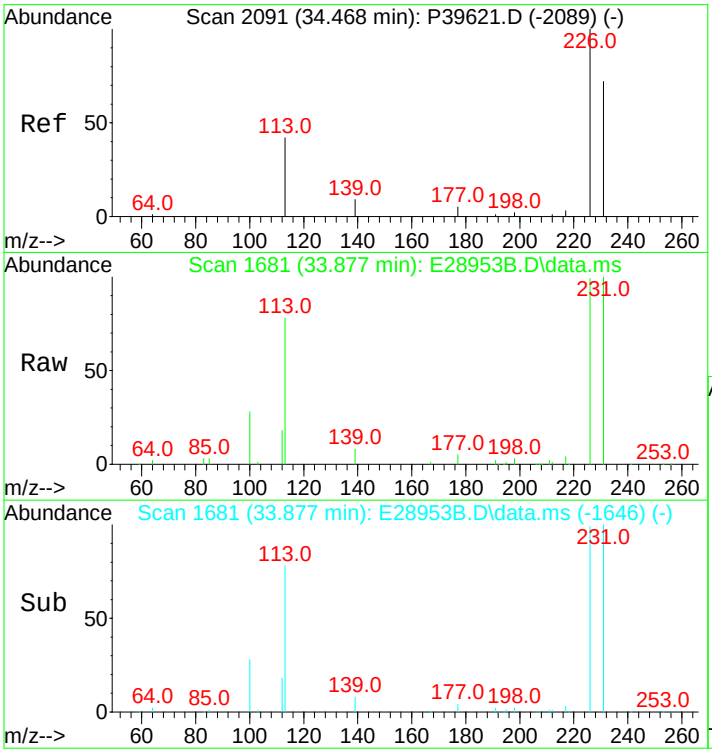


#36
1-Methyldibenzothiophene(1MDT)
Concen: 256.67 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 24786

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

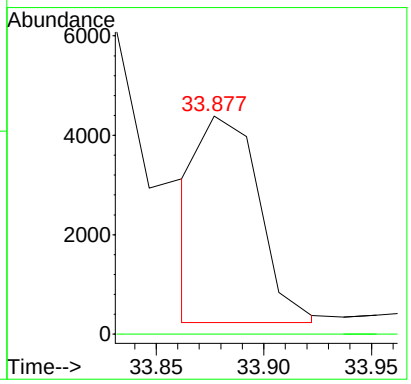


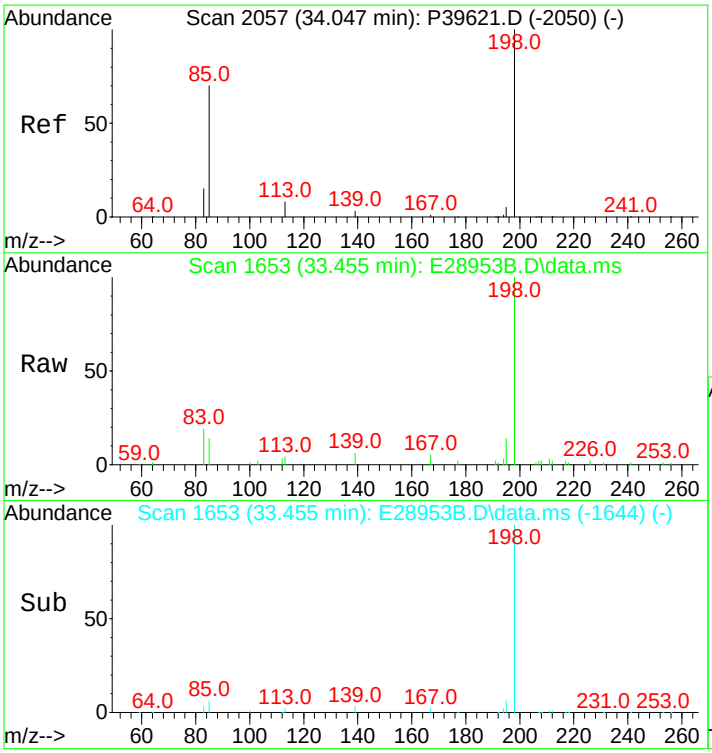


#37
OTP
Concen: 80.86 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 7808

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

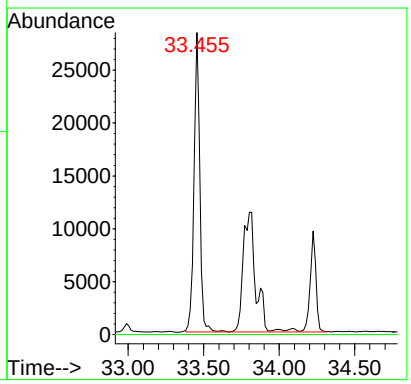


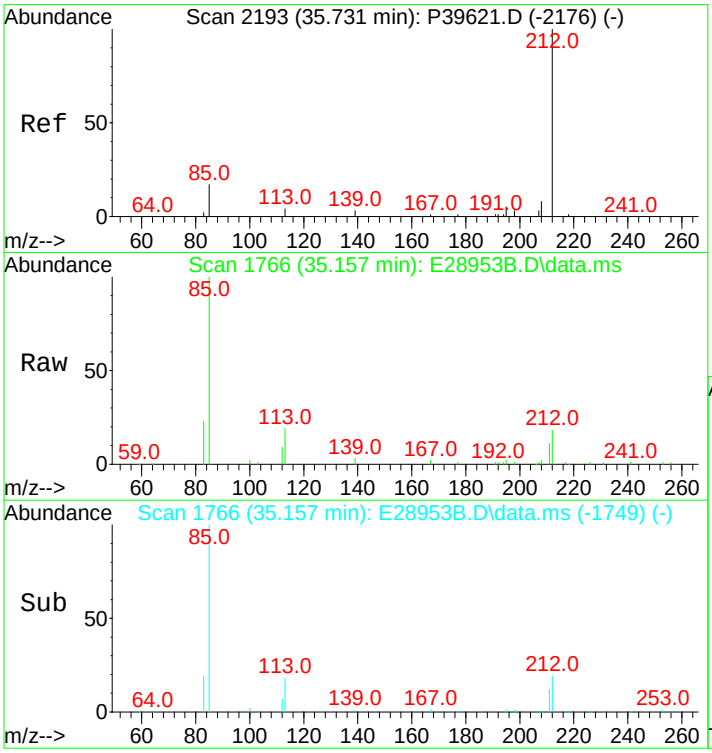


#38
C1-Dibenzothiophenes
Concen: 1725.35 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:198 Resp: 166611

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

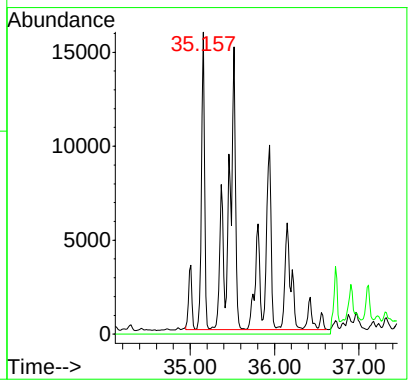


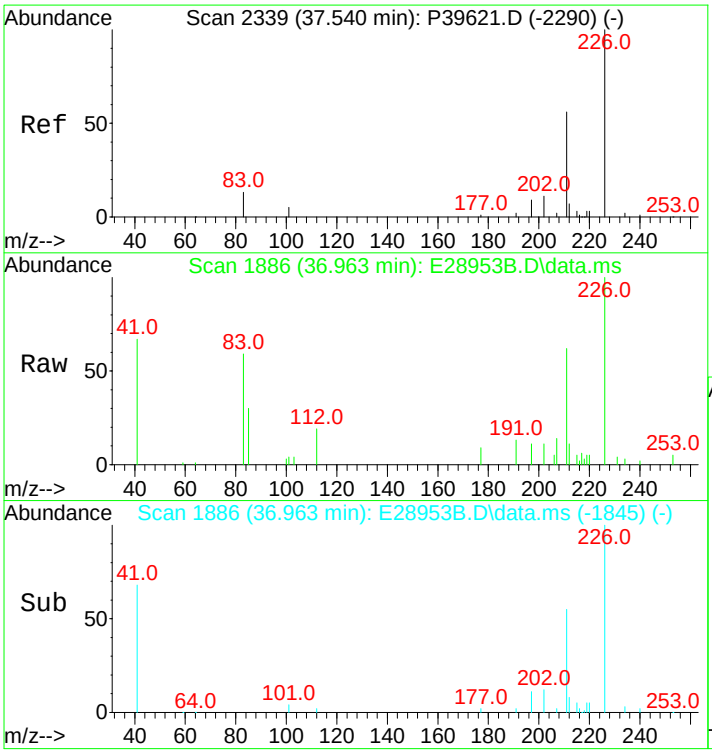


#39
C2-Dibenzothiophenes
Concen: 2358.93 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:212 Resp: 227794

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

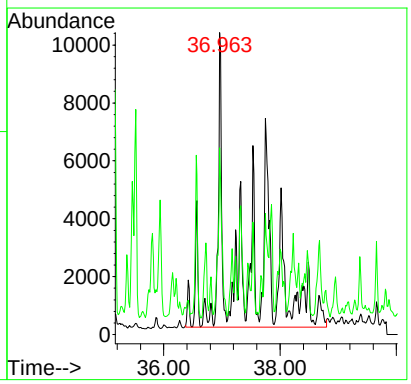


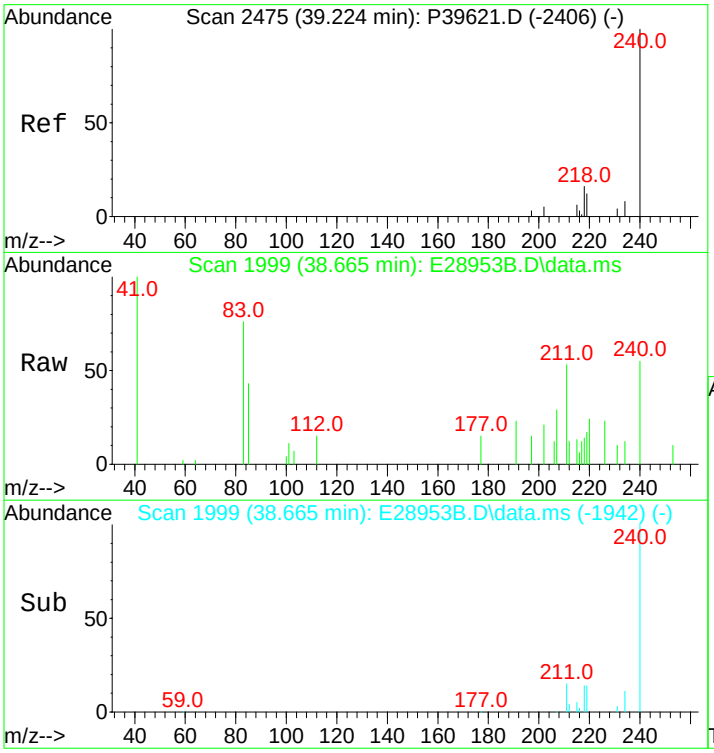


#40
C3-Dibenzothiophenes
Concen: 2172.36 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.275 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:226 Resp: 209778

Ion	Ratio	Lower	Upper
226	100		
211	4.1	44.1	66.1#

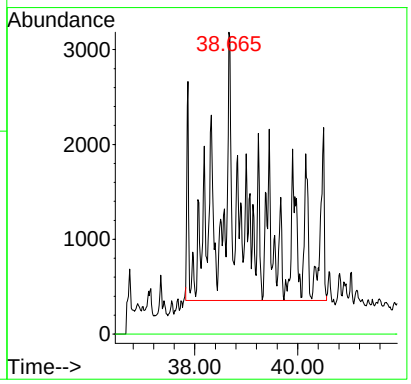


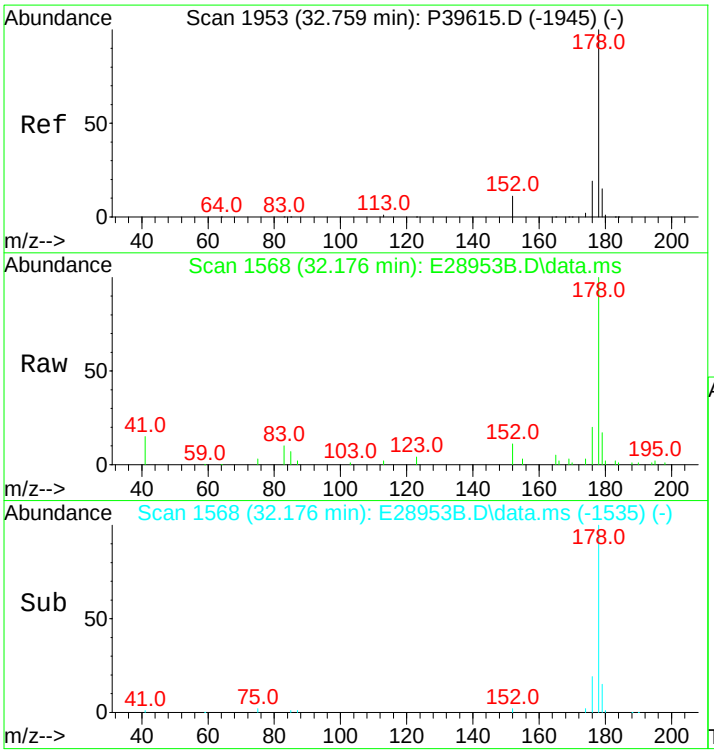


#41
C4-Dibenzothiophenes
Concen: 1191.46 ng/mL m
RT: 38.665 min Scan# 1999
Delta R.T. 0.320 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:240 Resp: 115055

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

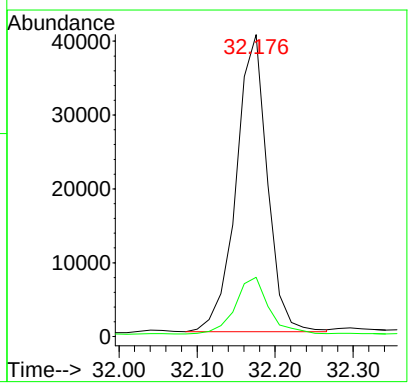


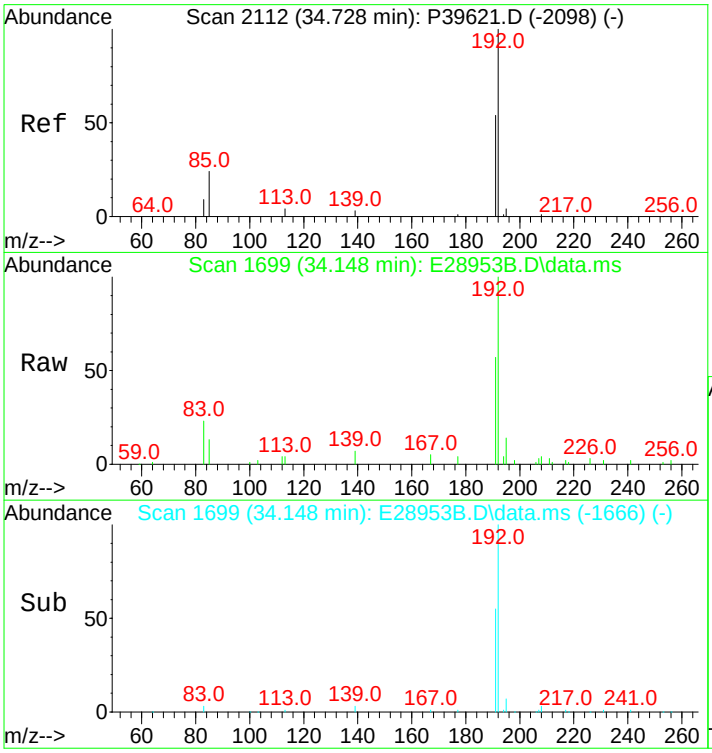


#43
Phenanthrene
Concen: 1135.65 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:178 Resp: 111573

Ion	Ratio	Lower	Upper
178	100		
176	20.6	15.0	22.4

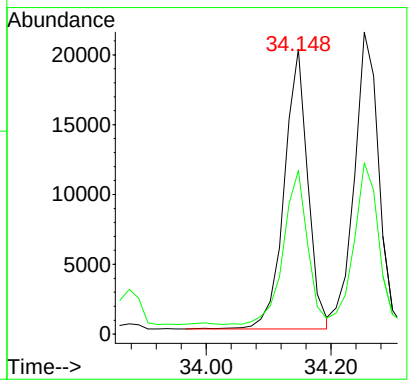


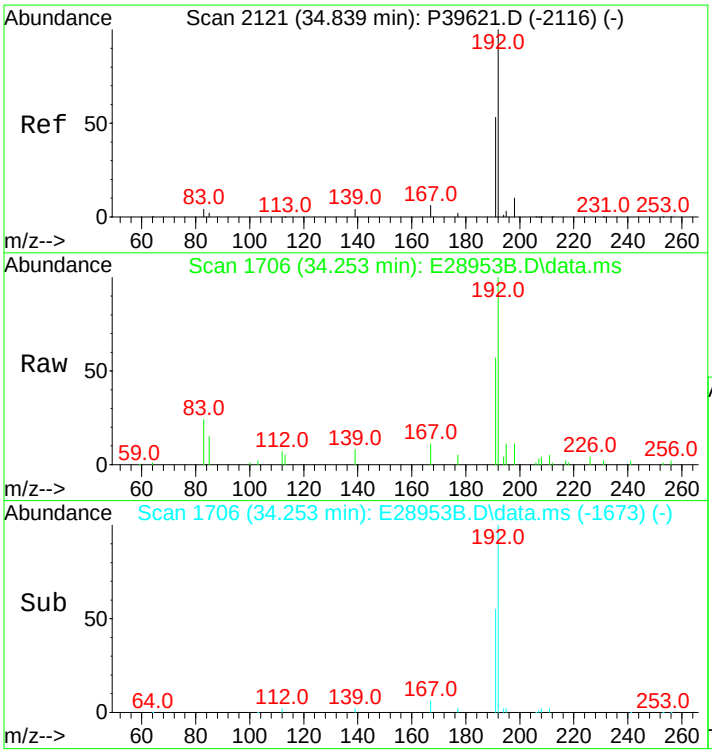


#44
3-Methylphenanthrene(3MP)
Concen: 532.08 ng/mL
RT: 34.148 min Scan# 1699
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 52275

Ion	Ratio	Lower	Upper
192	100		
191	57.2	45.9	68.9

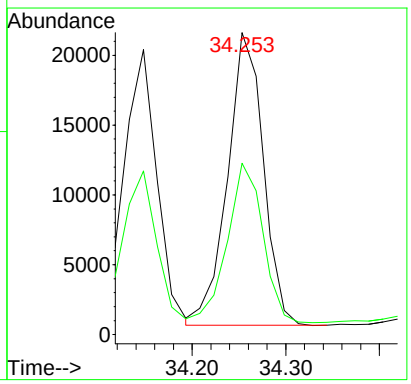


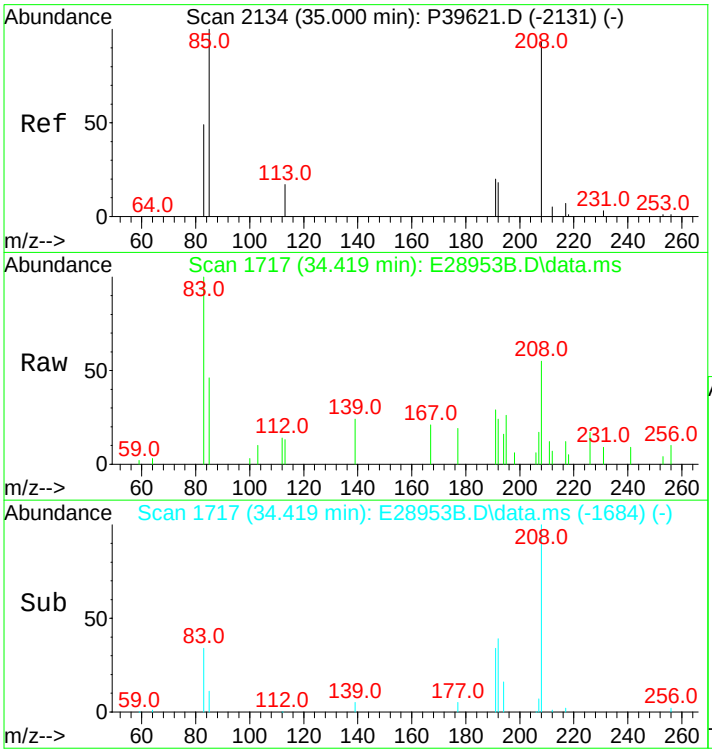


#45
2-Methylphenanthrene(2MP)
Concen: 565.96 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 55603

Ion	Ratio	Lower	Upper
192	100		
191	54.1	45.4	68.0

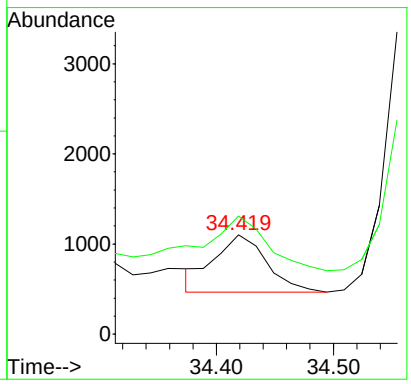


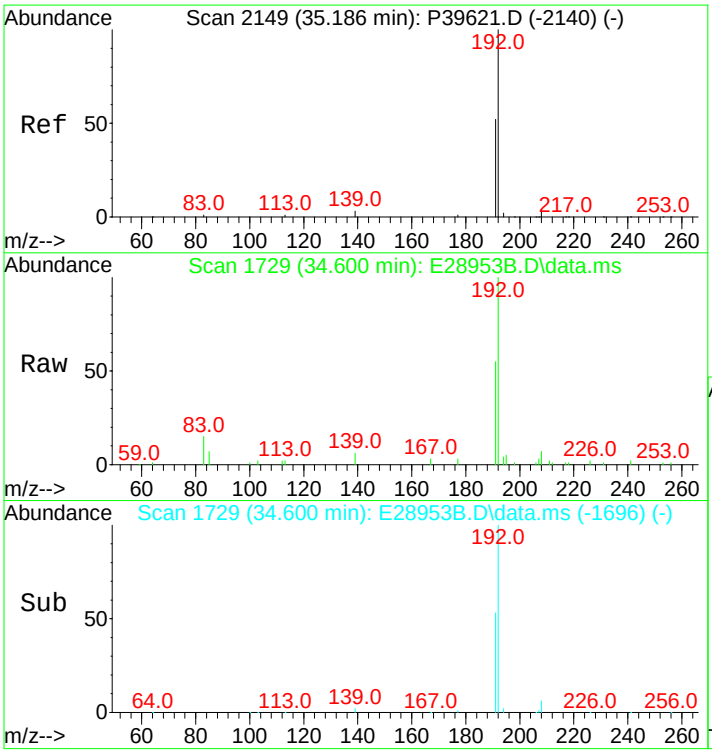


#46
2-Methylanthracene(2MA)
Concen: 20.11 ng/mL
RT: 34.419 min Scan# 1717
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 1976

Ion	Ratio	Lower	Upper
192	100		
191	128.1	95.4	143.0

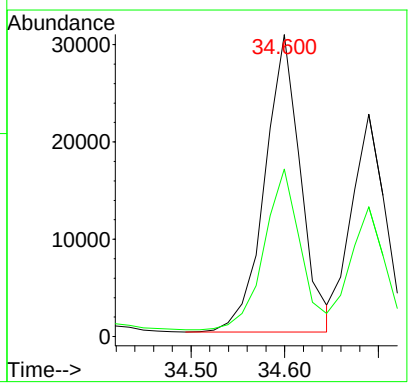


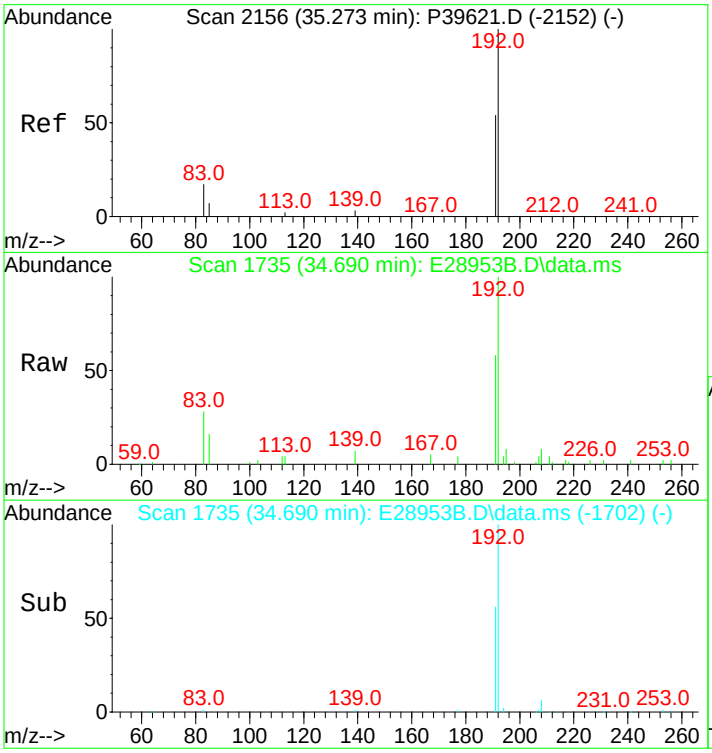


#47
9/4-Methylphenanthrene(9MP)
Concen: 827.77 ng/mL
RT: 34.600 min Scan# 1729
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 81325

Ion	Ratio	Lower	Upper
192	100		
191	54.8	44.3	66.5

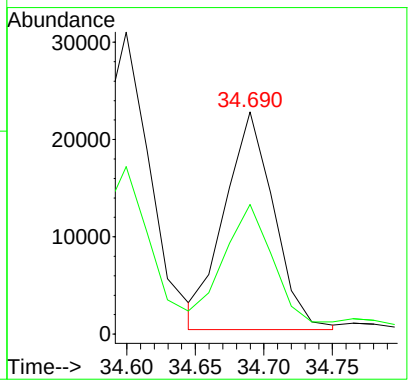


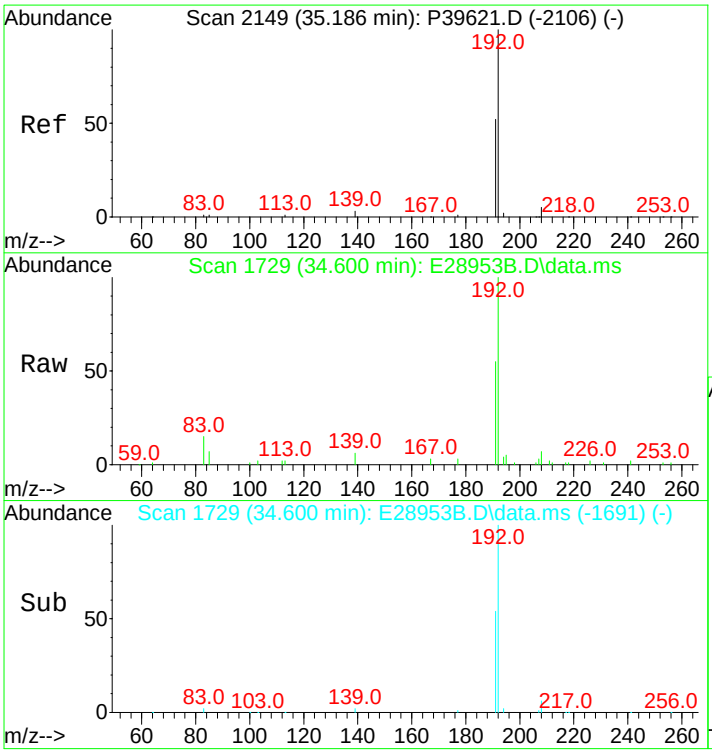


#48
1-Methylphenanthrene(1MP)
Concen: 569.43 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 55944

Ion	Ratio	Lower	Upper
192	100		
191	52.1	46.7	70.1

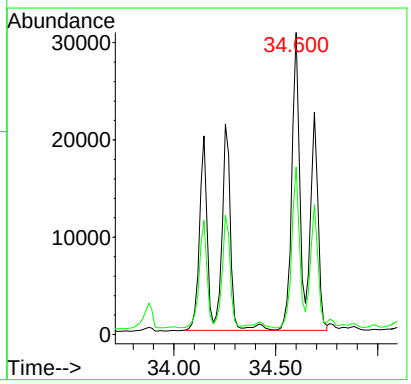


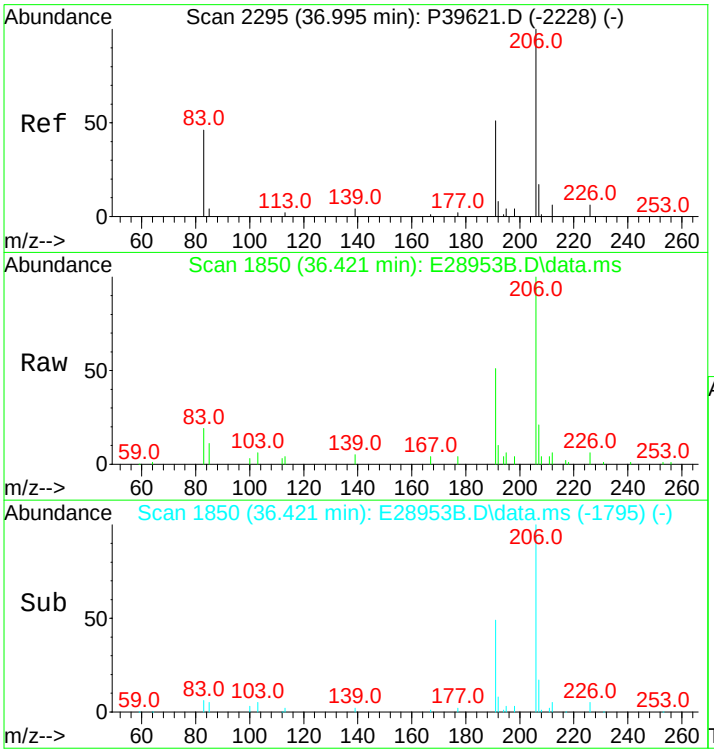


#49
C1-Phenanthrenes/Anthracenes
Concen: 2549.41 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.196 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 250470

Ion	Ratio	Lower	Upper
192	100		
191	12.0	44.0	66.0#

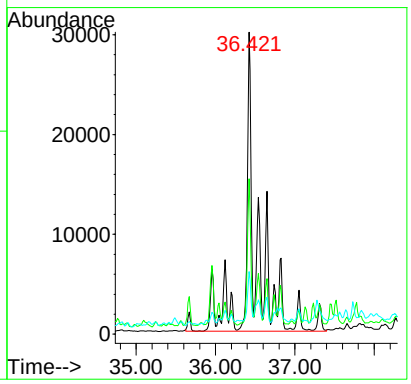


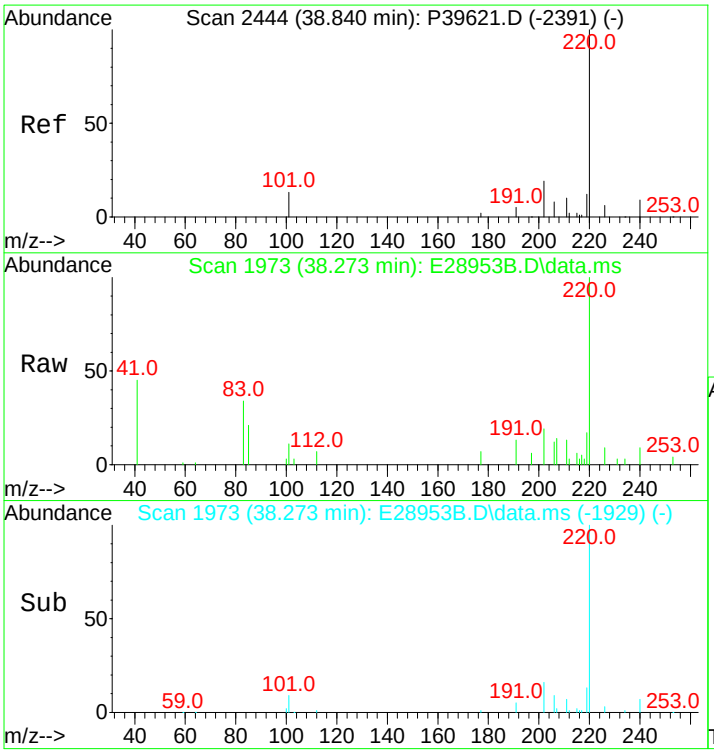


#50
C2-Phenanthrenes/Anthracenes
Concen: 2900.86 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:206 Resp: 284998

Ion	Ratio	Lower	Upper
206	100		
191	1.3	35.7	53.5#
207	0.6	16.5	24.7#

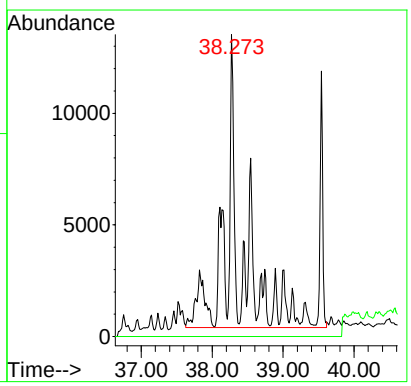


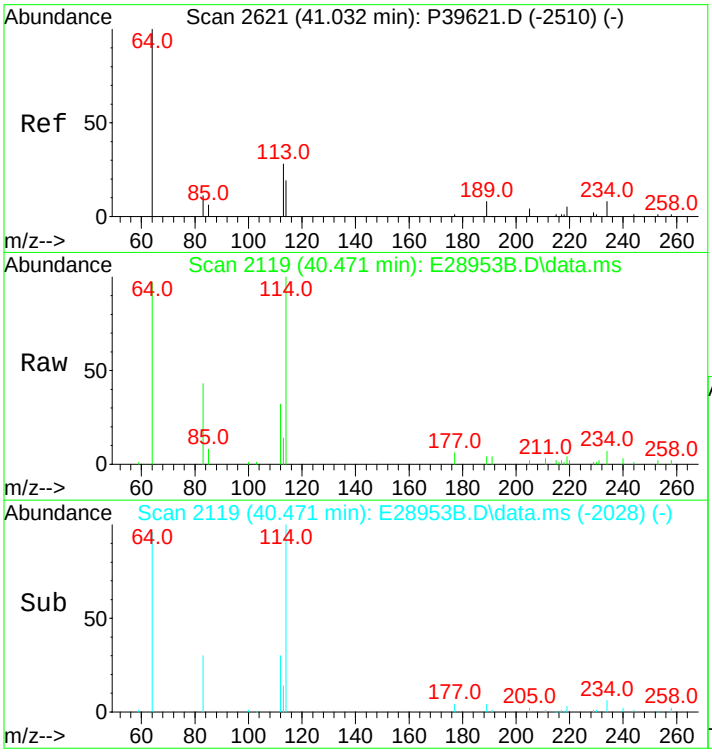


#52
C3-Phenanthrenes/Anthracenes
Concen: 2127.94 ng/mL m
RT: 38.273 min Scan# 1973
Delta R.T. 0.310 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:220 Resp: 209062

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

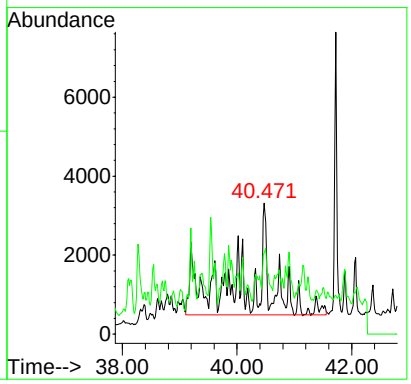


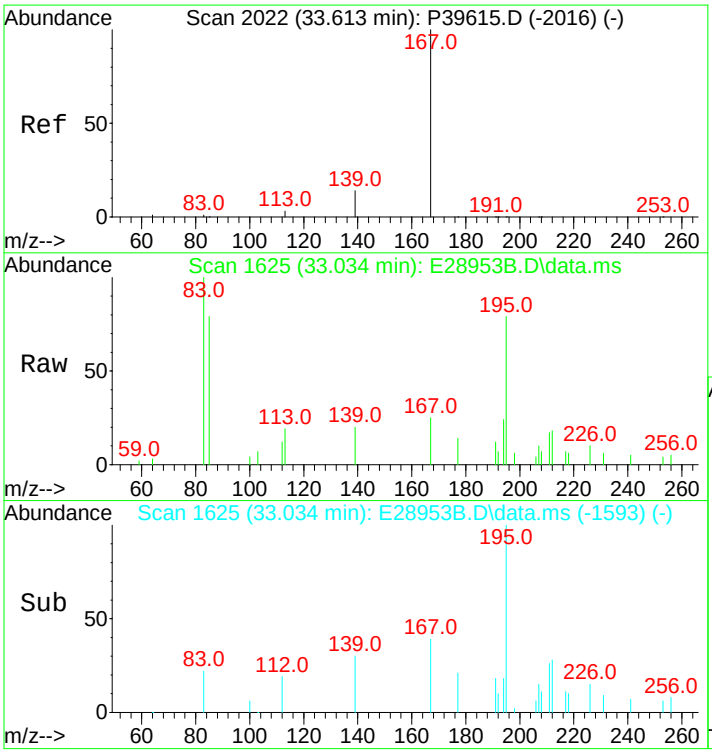


#53
C4-Phenanthrenes/Anthracenes
Concen: 858.54 ng/mL m
RT: 40.471 min Scan# 2119
Delta R.T. 0.384 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 84348

Ion	Ratio	Lower	Upper
234	100		
219	3.1	46.6	70.0#

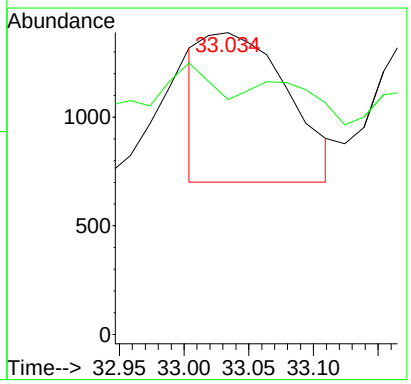


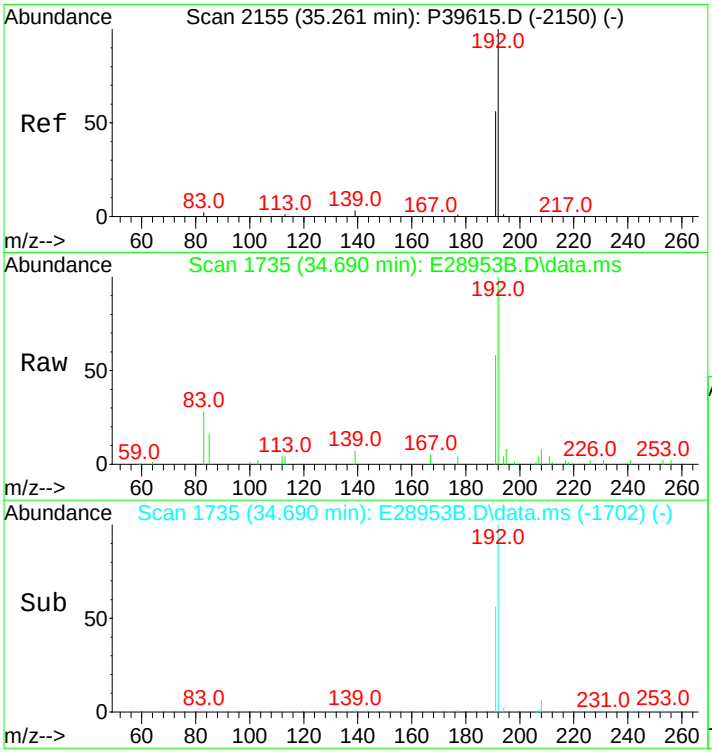


#56
Carbazole
Concen: 36.17 ng/mL m
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:167 Resp: 3161

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.1	15.1#

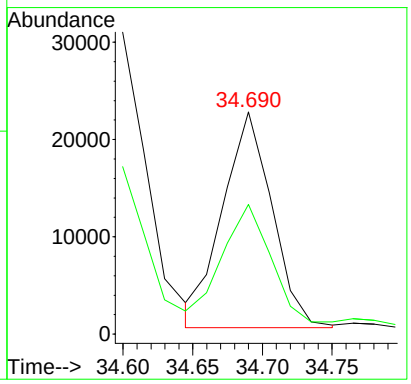


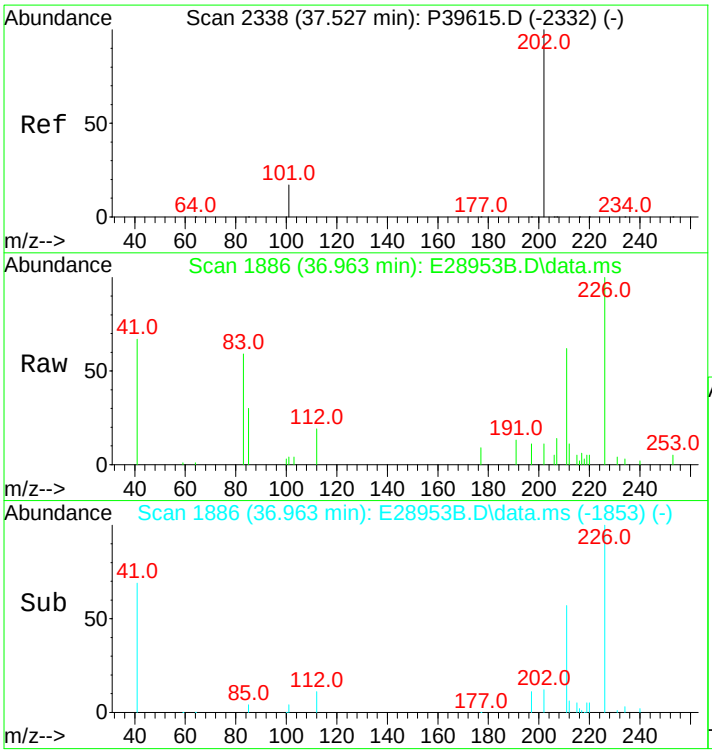


#57
1-Methylphenanthrene
Concen: 730.52 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:192 Resp: 54755

Ion	Ratio	Lower	Upper
192	100		
191	53.2	45.4	68.2

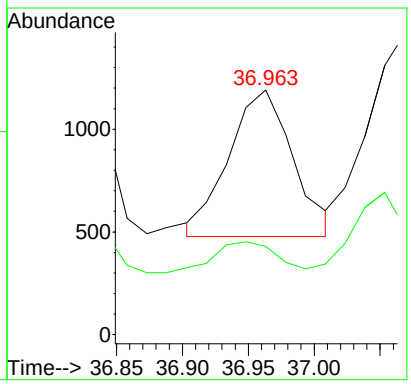


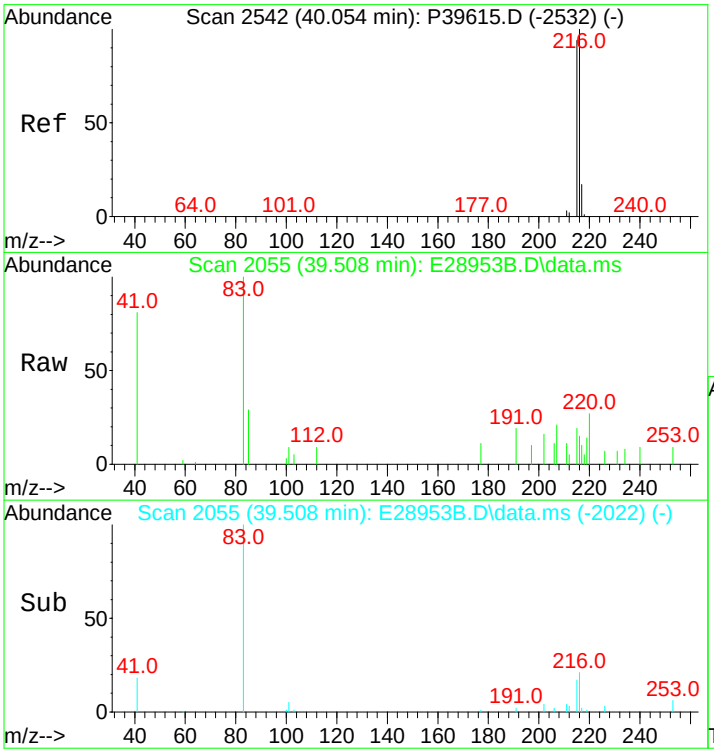


#58
Fluoranthene
Concen: 22.34 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:202 Resp: 2424

Ion	Ratio	Lower	Upper
202	100		
101	42.8	10.4	15.6#

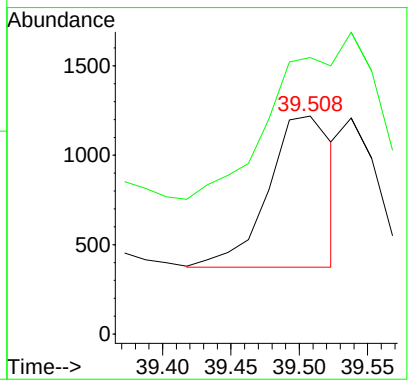


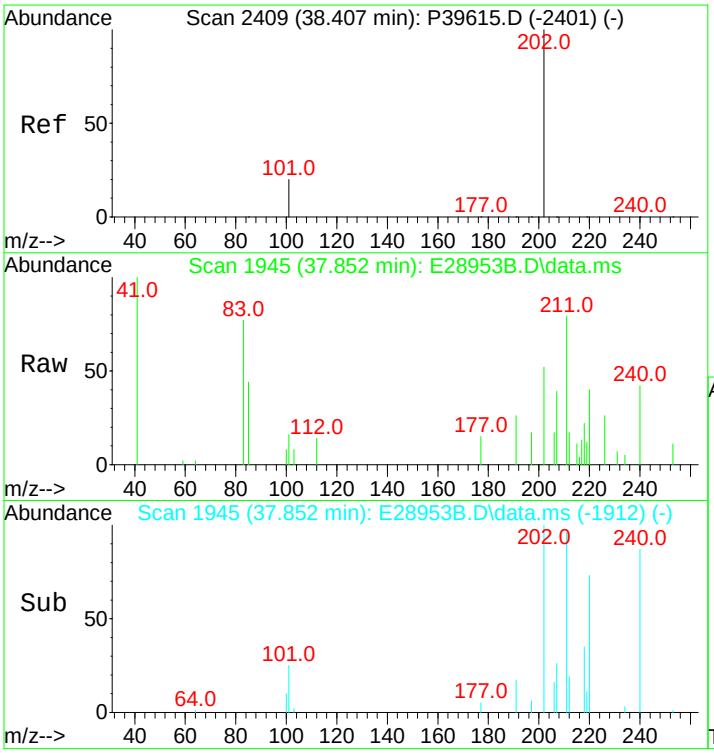


#59
Benzo(b)fluorene
Concen: 38.51 ng/mL m
RT: 39.508 min Scan# 2055
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:216 Resp: 2784

Ion	Ratio	Lower	Upper
216	100		
215	73.9	72.6	109.0

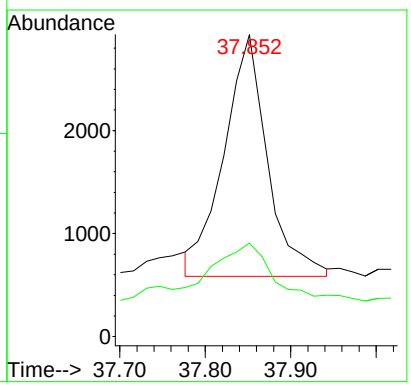


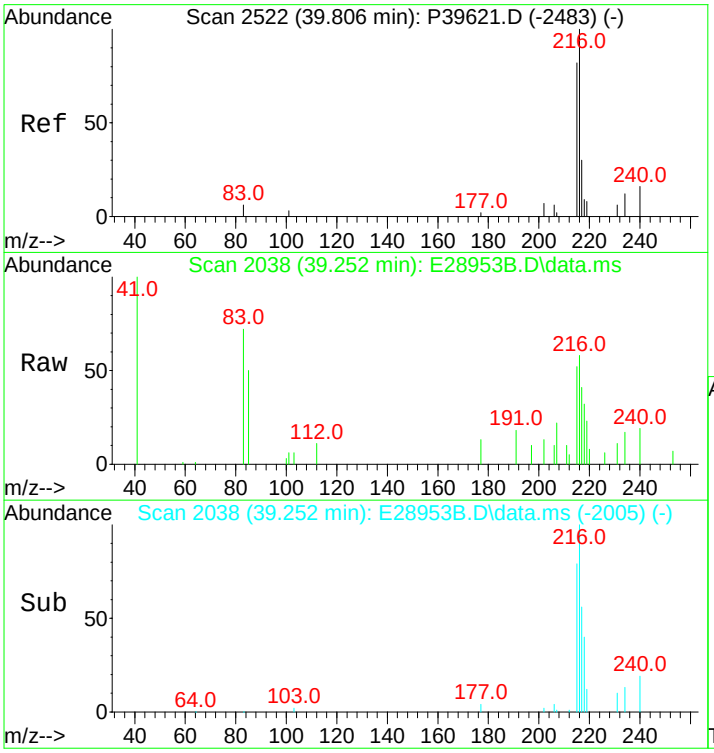


#60
Pyrene
Concen: 75.45 ng/mL m
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:202 Resp: 8320

Ion	Ratio	Lower	Upper
202	100		
101	33.8	11.0	16.4#

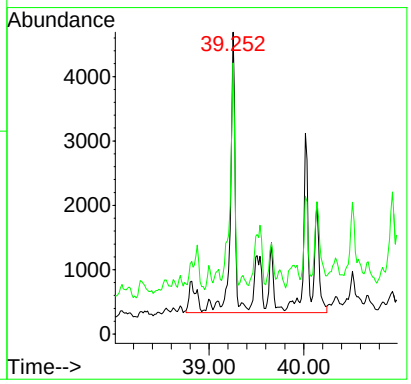


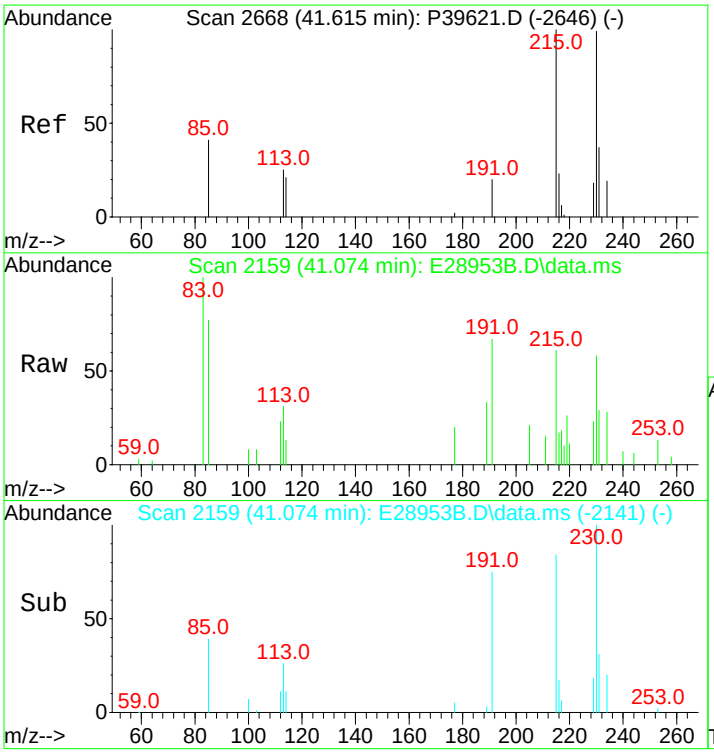


#61
C1-Fluoranthenes/Pyrenes
Concen: 374.66 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:216 Resp: 41317

Ion	Ratio	Lower	Upper
216	100		
215	28.7	73.4	110.2#

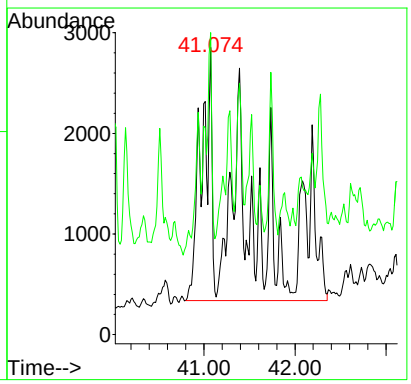


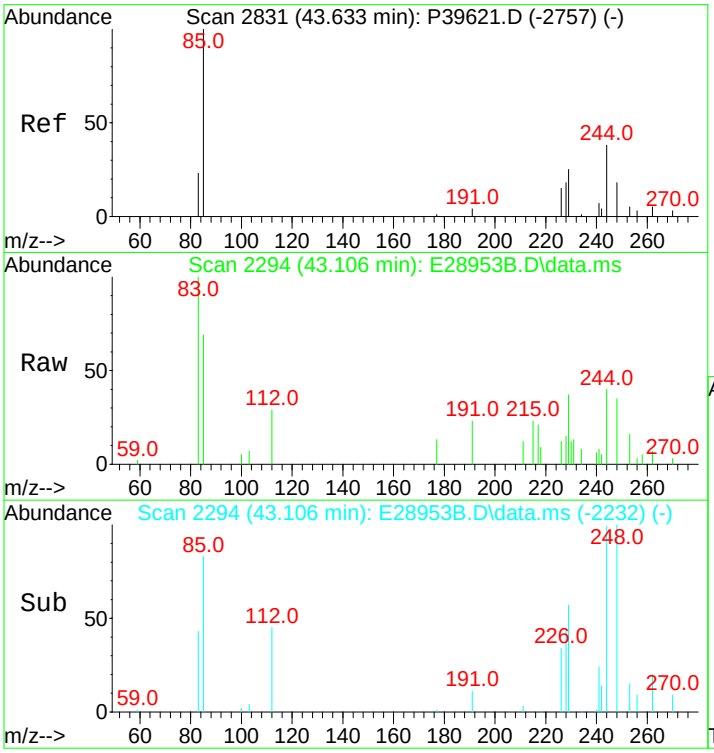


#62
C2-Fluoranthenes/Pyrenes
Concen: 617.92 ng/mL m
RT: 41.074 min Scan# 2159
Delta R.T. 0.194 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:230 Resp: 68144

Ion	Ratio	Lower	Upper
230	100		
215	7.0	93.8	140.8#

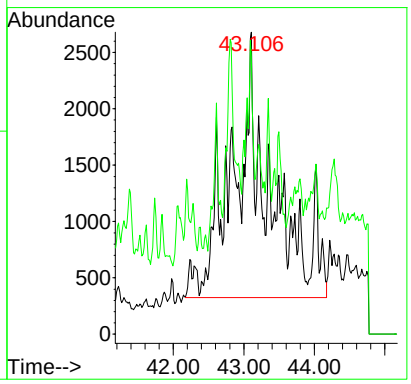


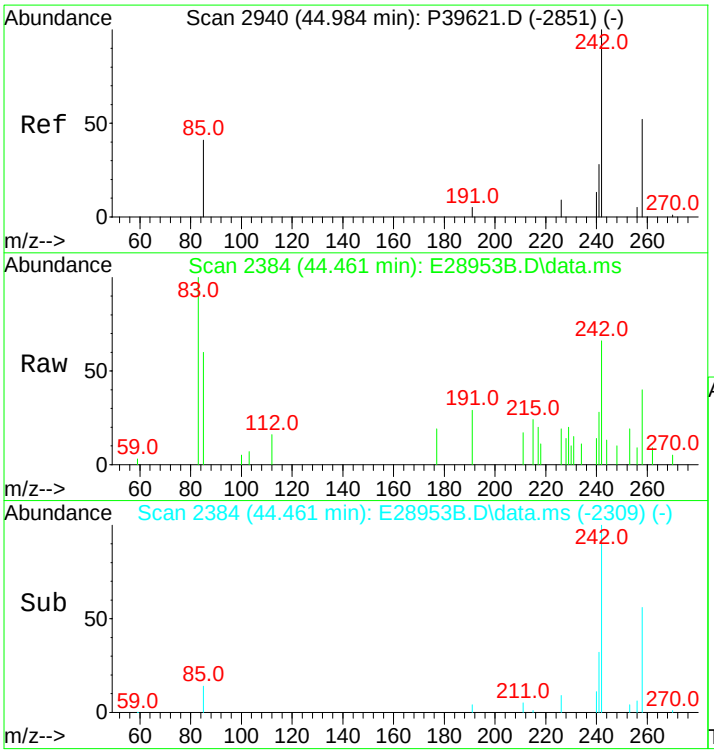


#63
C3-Fluoranthenes/Pyrenes
Concen: 765.70 ng/mL m
RT: 43.106 min Scan# 2294
Delta R.T. 0.455 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:244 Resp: 84441

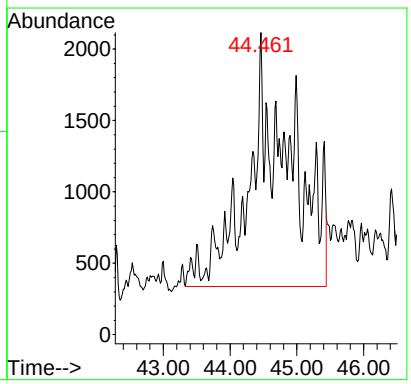
Ion	Ratio	Lower	Upper
244	100		
229	7.8	72.2	108.2#

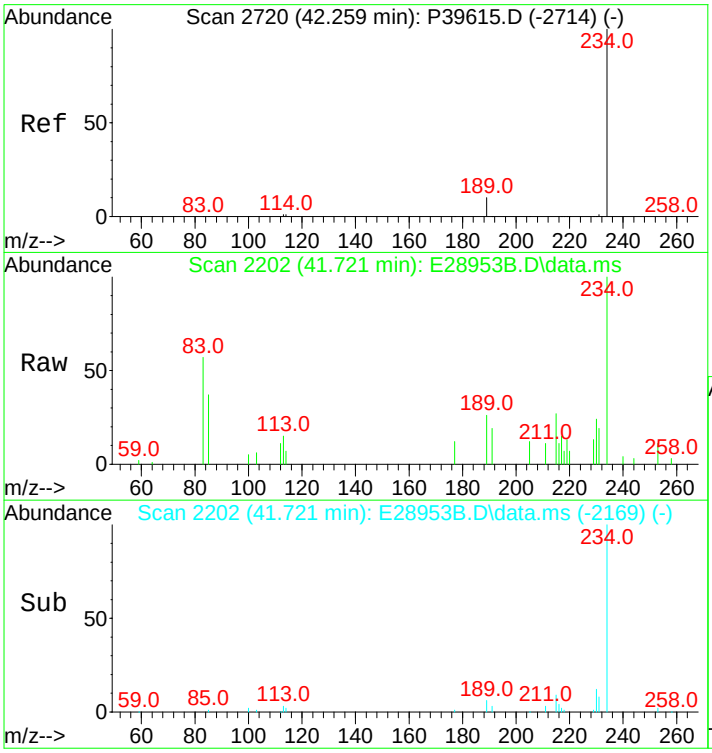




#64
C4-Fluoranthenes/Pyrenes
Concen: 693.20 ng/mL m
RT: 44.461 min Scan# 2384
Delta R.T. 0.491 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:258 Resp: 76445

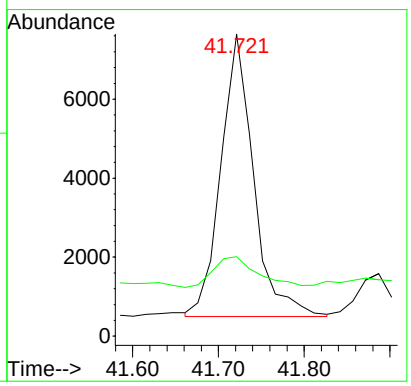


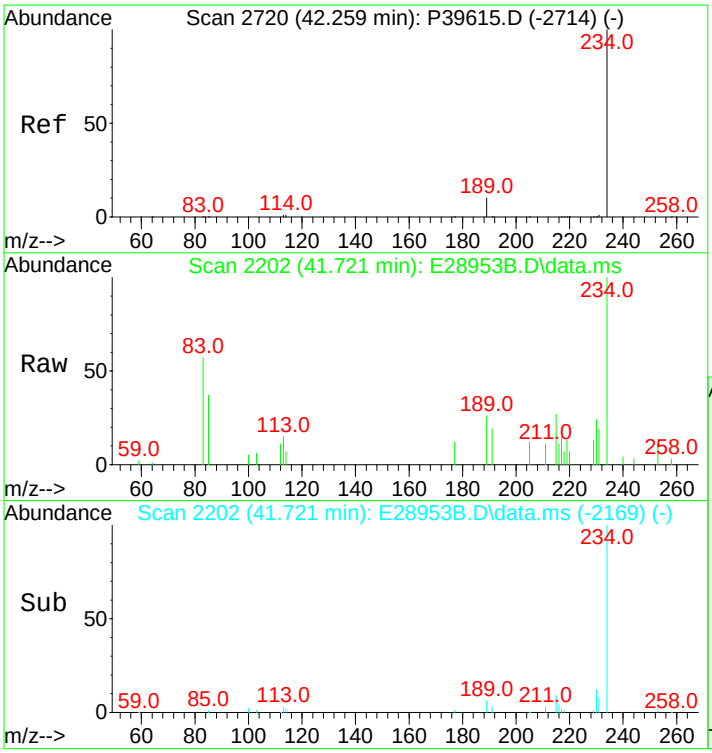


#66
Naphthobenzothiophene
Concen: 174.17 ng/ml m
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 18944

Ion	Ratio	Lower	Upper
234	100		
189	4.2	21.1	31.7#

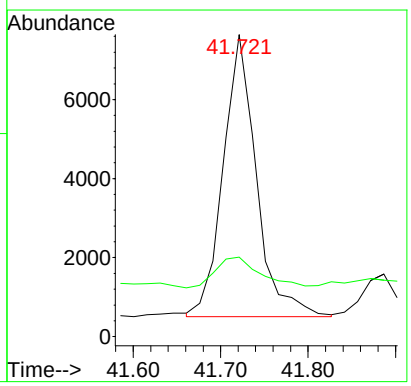


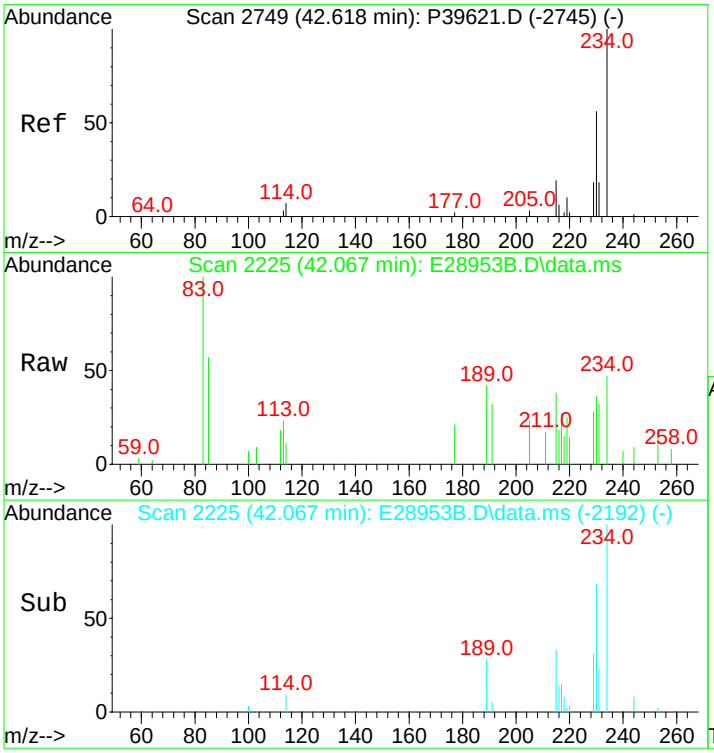


#67
Naphthobenzothiophene-2,1-D
Concen: 173.25 ng/mL m
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 18844

Ion	Ratio	Lower	Upper
234	100		
189	4.2	21.1	31.7#

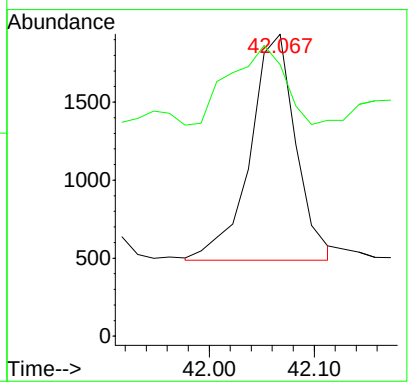


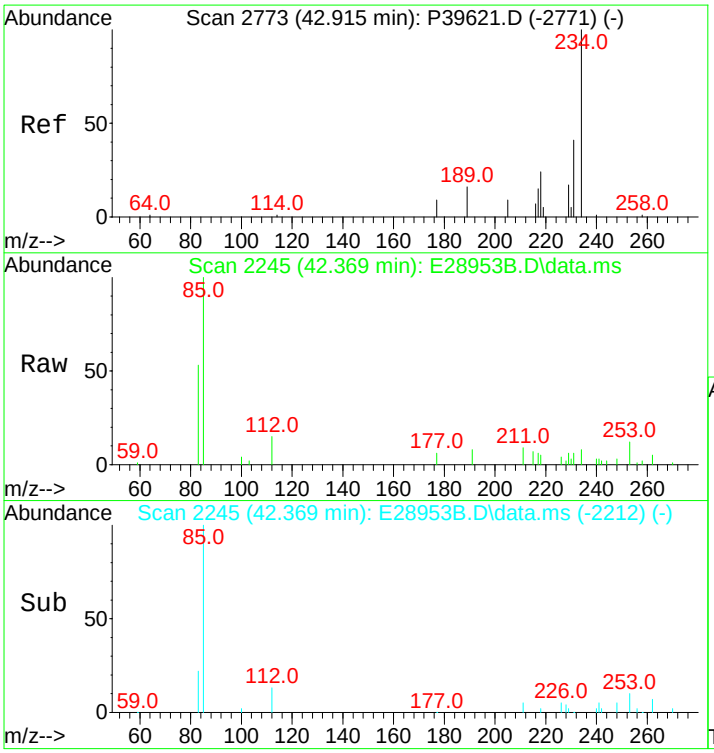


#68
Naphthobenzothiophene-1,2-D
Concen: 40.33 ng/mL m
RT: 42.067 min Scan# 2225
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 4387

Ion	Ratio	Lower	Upper
234	100		
189	40.9	71.9	107.9#

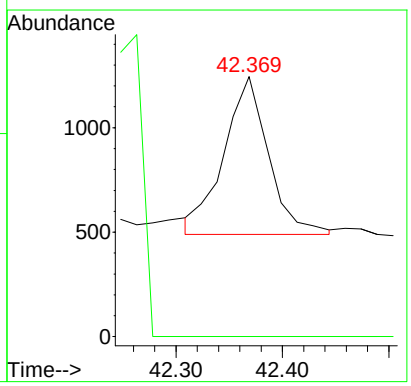


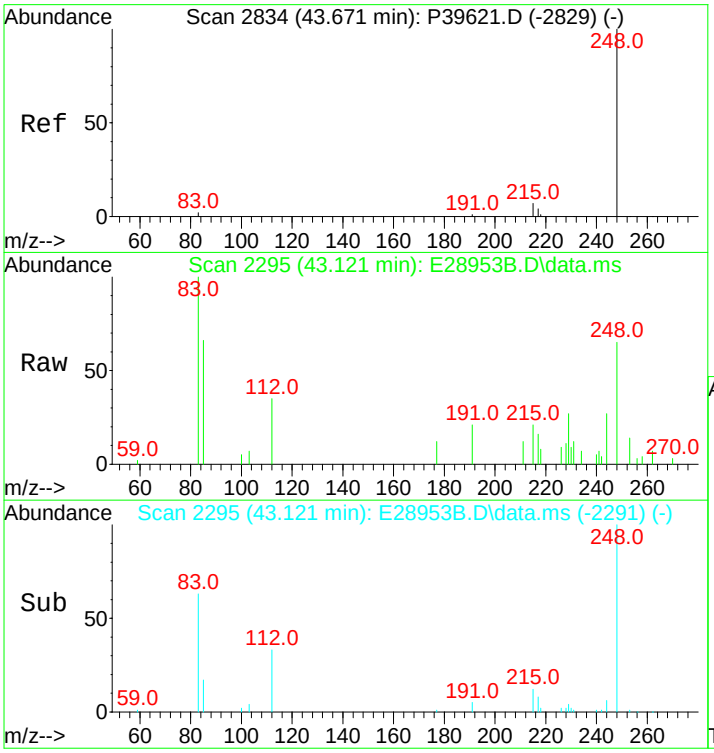


#69
Naphthobenzothiophene-2,3-D
Concen: 20.28 ng/mL m
RT: 42.369 min Scan# 2245
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:234 Resp: 2206

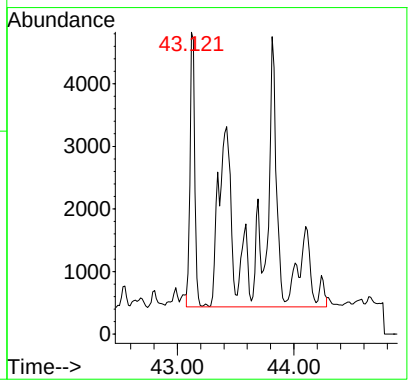
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

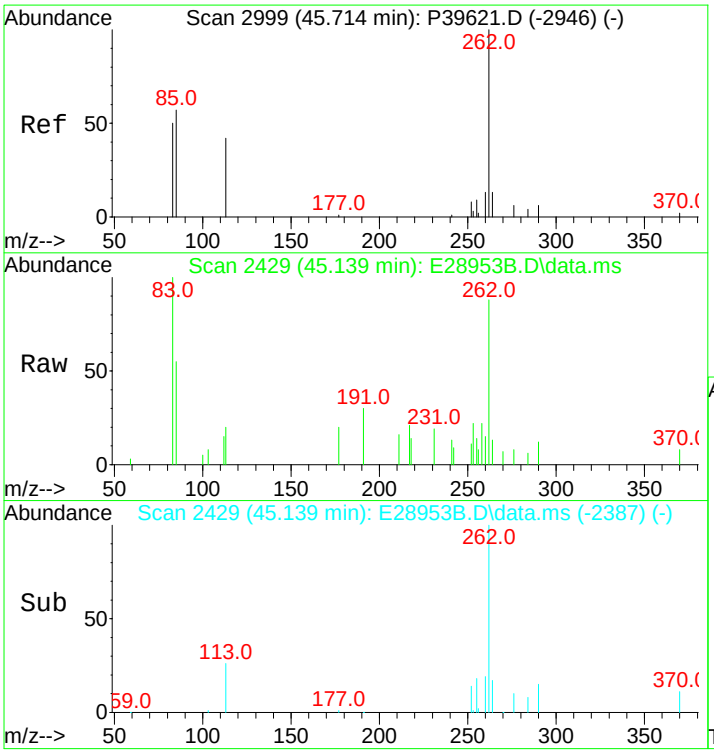




#70
C1-Naphthobenzothiophenes
Concen: 655.92 ng/ml m
RT: 43.121 min Scan# 2295
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

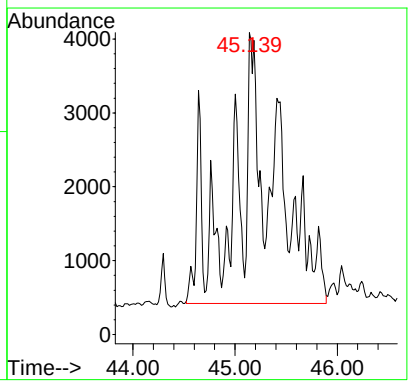
Tgt Ion:248 Resp: 71342

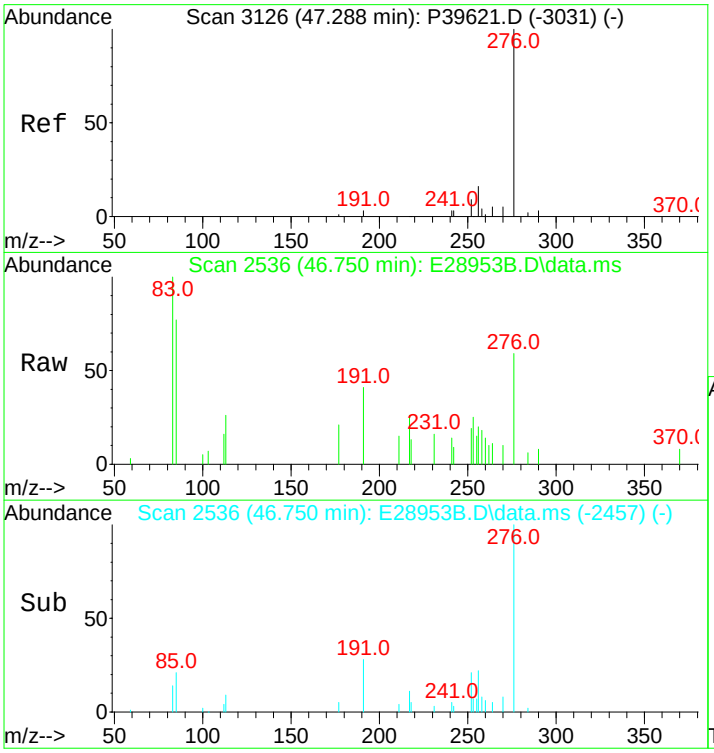




#71
C2-Naphthobenzothiophenes
Concen: 933.11 ng/ml m
RT: 45.139 min Scan# 2429
Delta R.T. 0.494 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

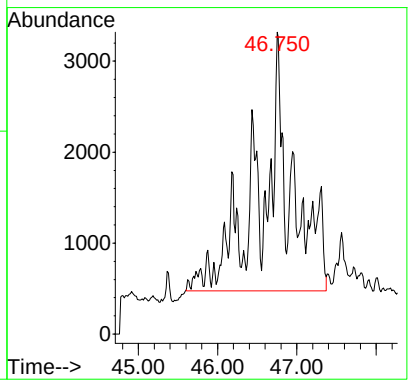
Tgt Ion:262 Resp: 101492

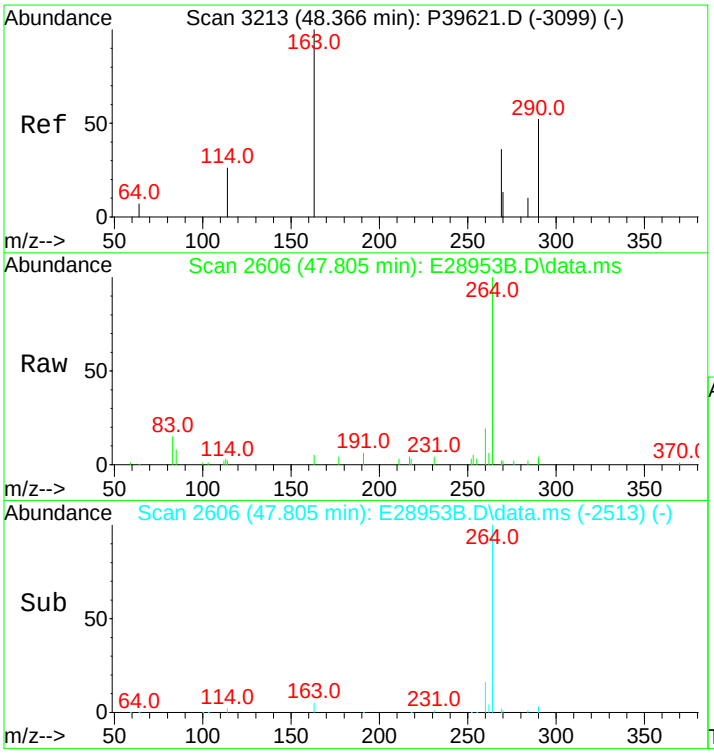




#72
C3-Naphthobenzothiophenes
Concen: 716.45 ng/ml m
RT: 46.750 min Scan# 2536
Delta R.T. 0.523 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

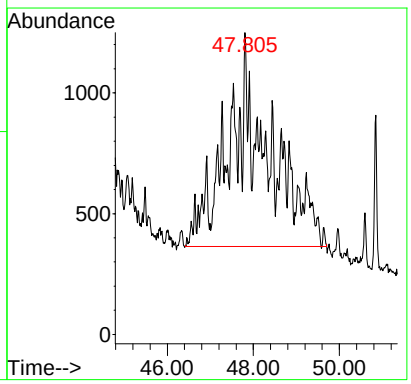
Tgt Ion:276 Resp: 77926

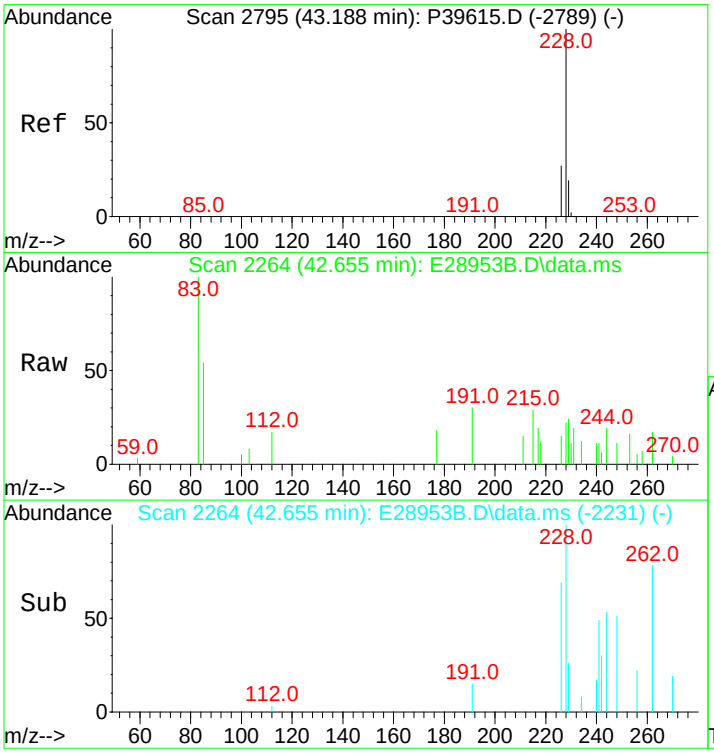




#73
C4-Naphthobenzothiophenes
Concen: 506.57 ng/mL m
RT: 47.805 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:290 Resp: 55098

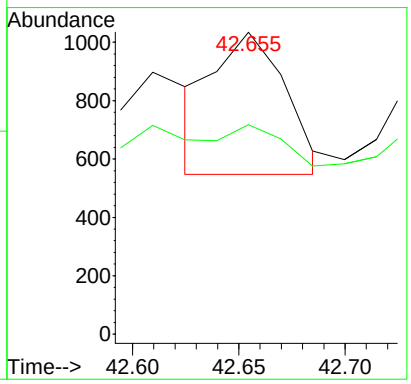


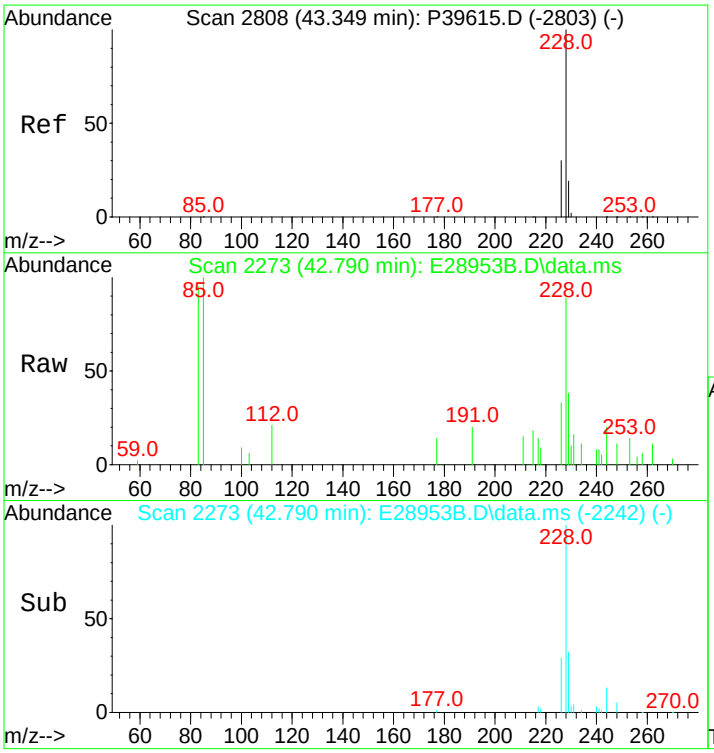


#75
Benz[a]anthracene
Concen: 10.56 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:228 Resp: 1139

Ion	Ratio	Lower	Upper
228	100		
226	588.3	20.7	31.1#

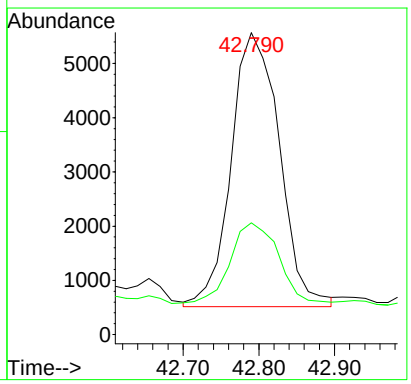


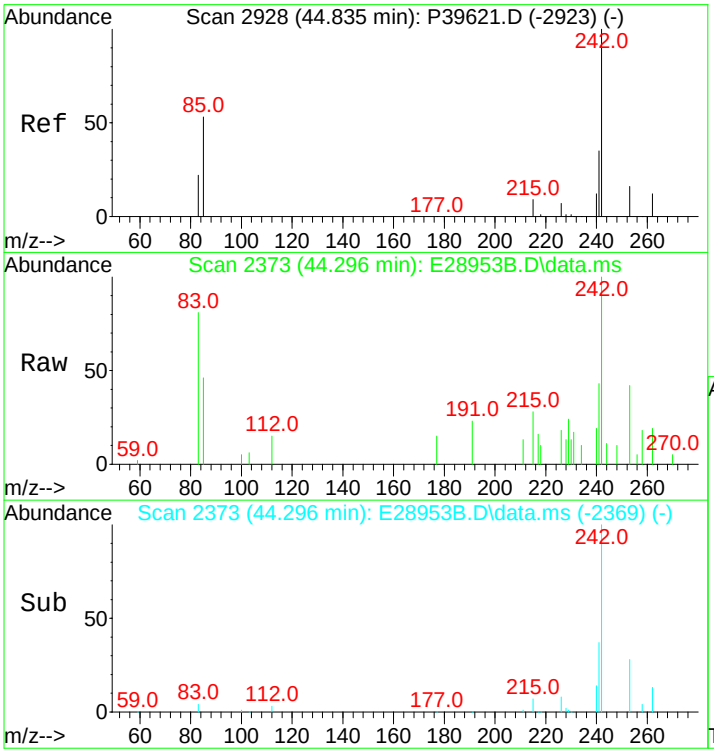


#77
Chrysene/Triphenylene
Concen: 201.86 ng/mL m
RT: 42.790 min Scan# 2273
Delta R.T. -0.030 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:228 Resp: 22405

Ion	Ratio	Lower	Upper
228	100		
226	30.0	22.6	34.0

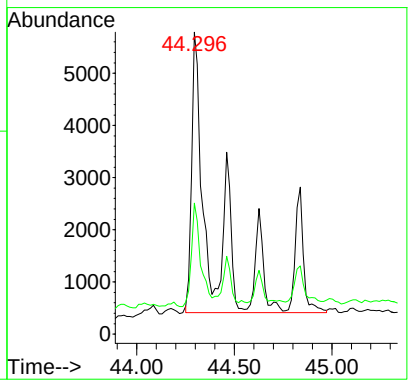


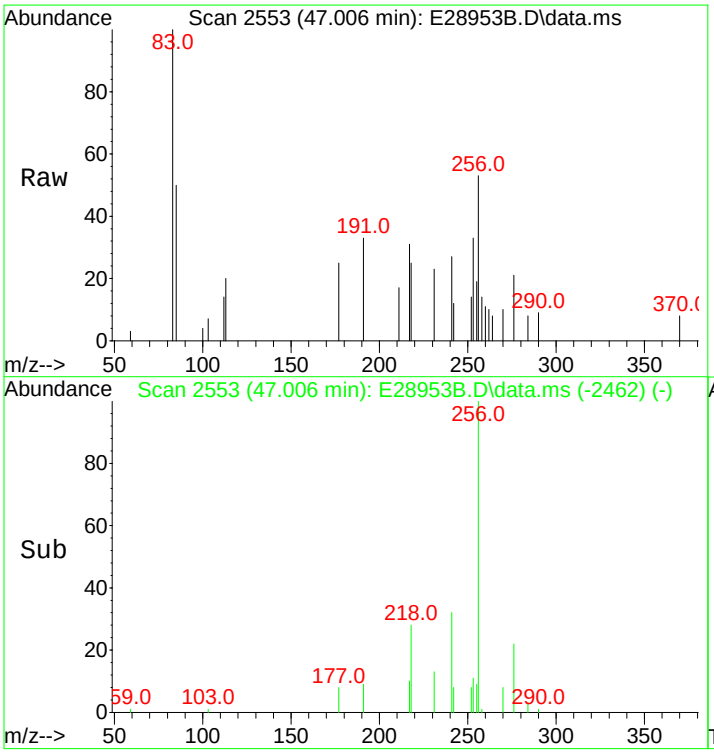


#78
C1-Chrysenes
Concen: 363.41 ng/mL m
RT: 44.296 min Scan# 2373
Delta R.T. 0.011 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:242 Resp: 40335

Ion	Ratio	Lower	Upper
242	100		
241	12.5	32.2	48.4#

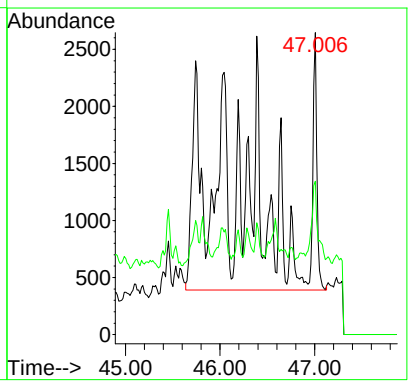


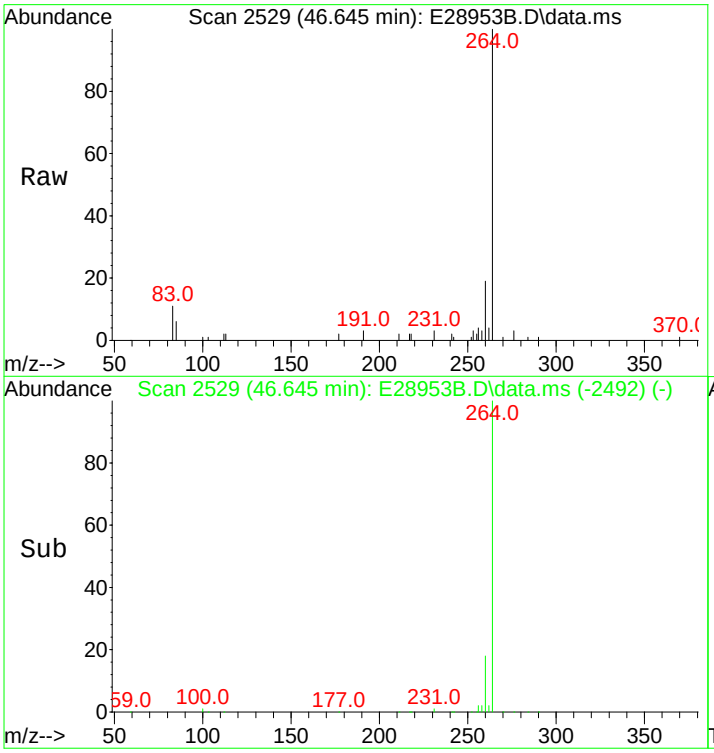


#79
C2-Chrysenes
Concen: 552.76 ng/mL m
RT: 47.006 min Scan# 2553
Delta R.T. 0.663 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:256 Resp: 61351

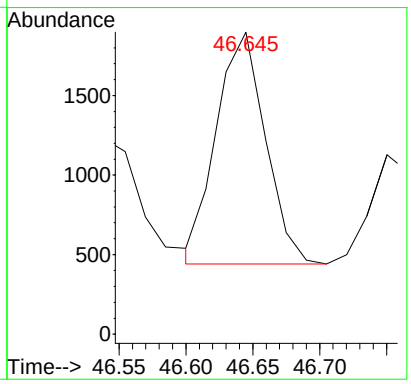
Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

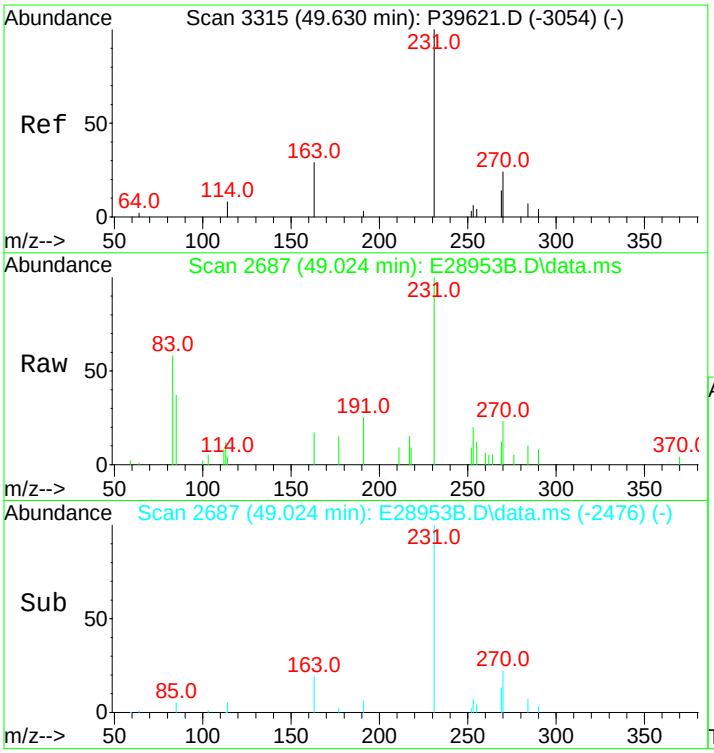




#80
BBF-D12 Surr BKGD
Concen: 33.62 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:256 Resp: 3732

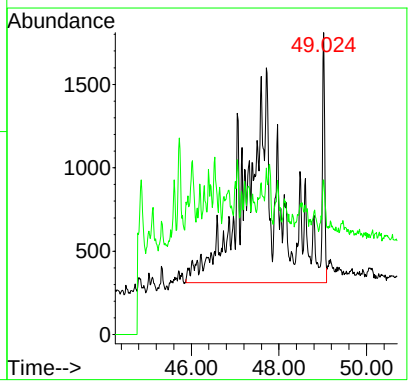


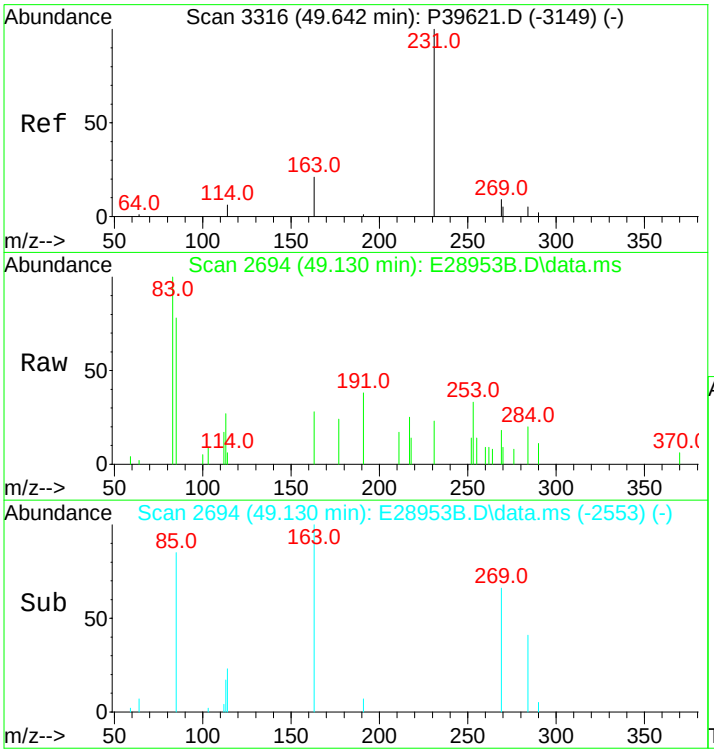


#81
C3-Chrysenes
Concen: 636.94 ng/mL m
RT: 49.024 min Scan# 2687
Delta R.T. -0.044 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:270 Resp: 70695

Ion	Ratio	Lower	Upper
270	100		
255	1.1	38.0	57.0#

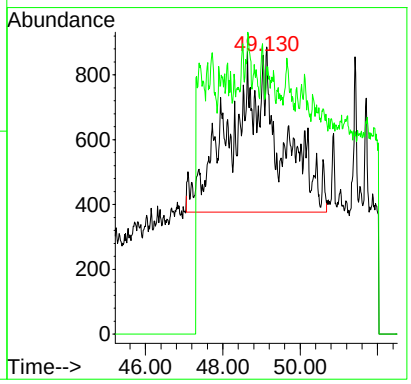


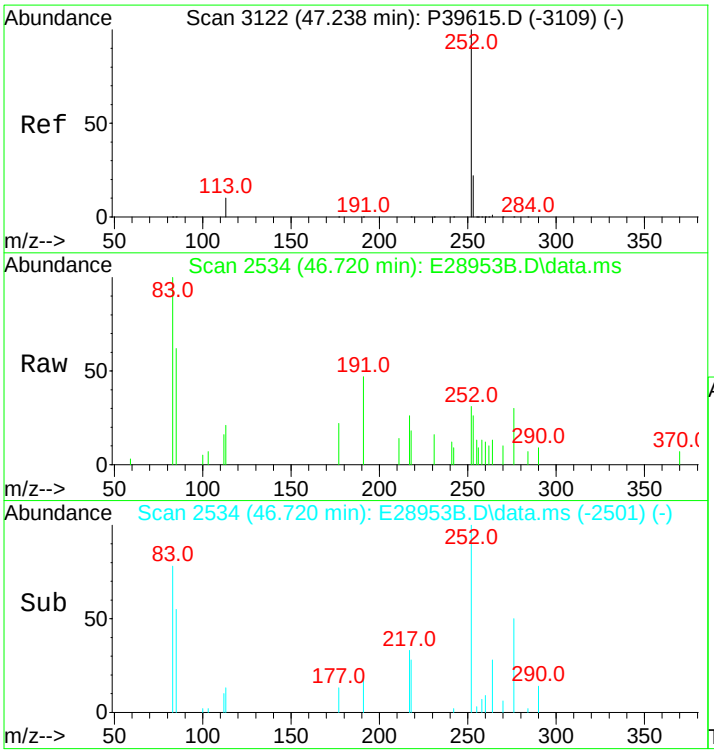


#82
C4-Chrysenes
Concen: 397.79 ng/mL m
RT: 49.130 min Scan# 2694
Delta R.T. -0.056 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:284 Resp: 44151

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

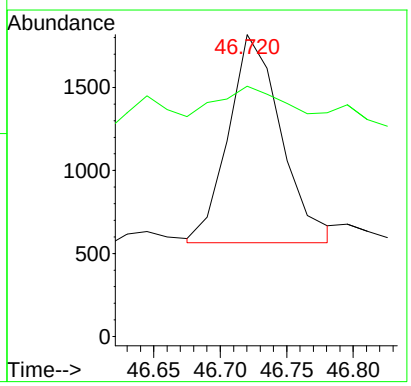


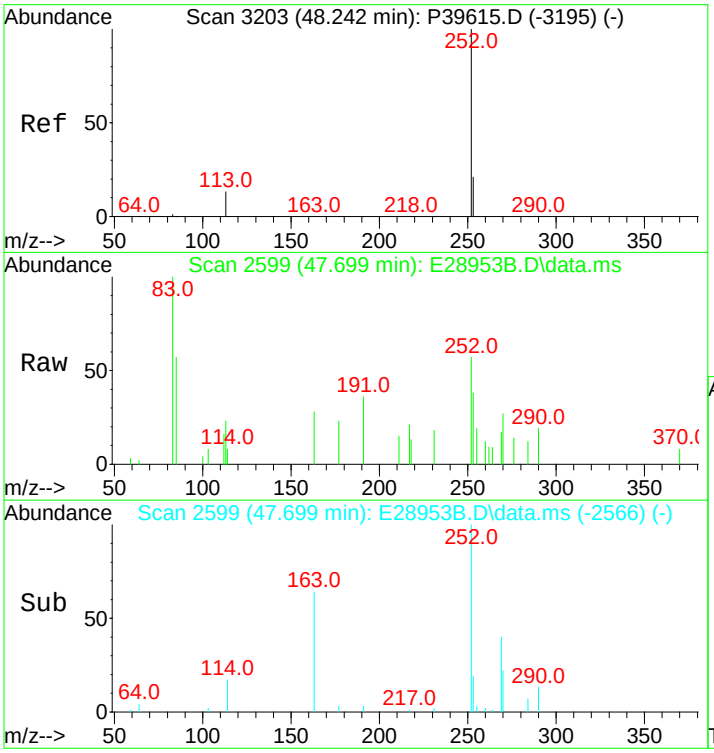


#84
Benzo[b]fluoranthene
Concen: 27.66 ng/mL m
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 3466

Ion	Ratio	Lower	Upper
252	100		
253	31.3	19.5	29.3#

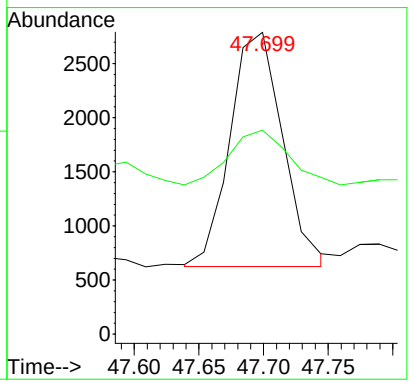


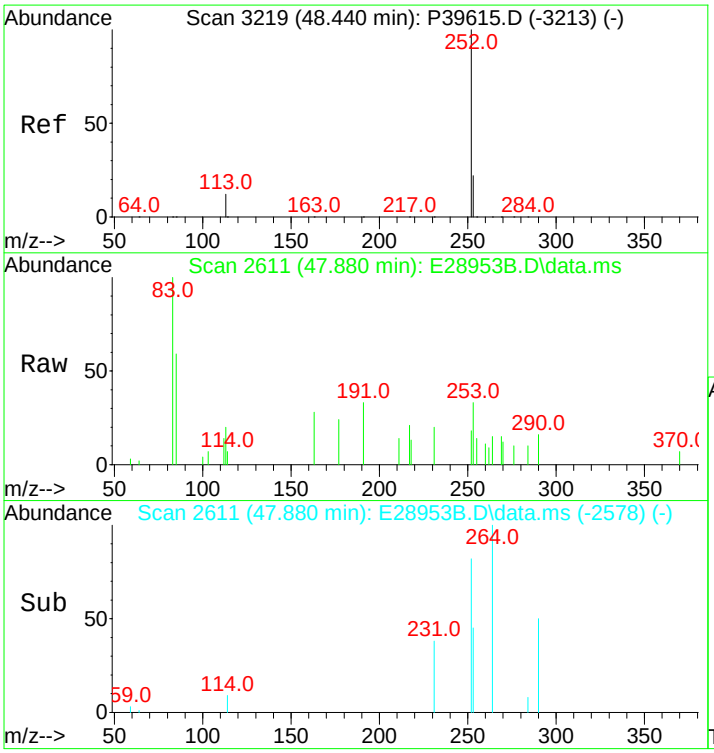


#87
Benzo[e]pyrene
Concen: 49.99 ng/mL m
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 6116

Ion	Ratio	Lower	Upper
252	100		
253	26.4	20.6	31.0

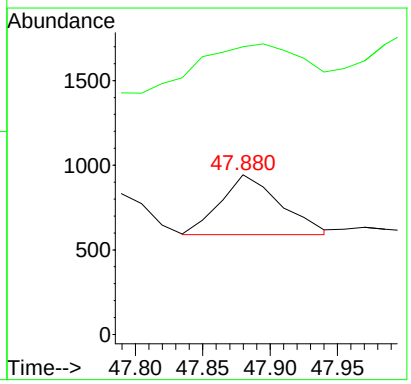


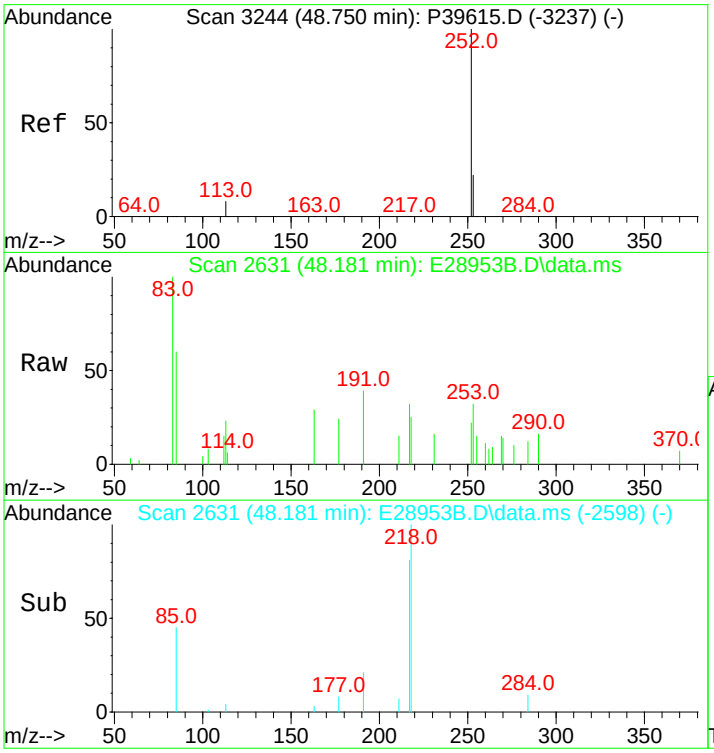


#89
Benzo[a]pyrene
Concen: 9.36 ng/mL m
RT: 47.880 min Scan# 2611
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 1096

Ion	Ratio	Lower	Upper
252	100		
253	153.0	20.8	31.2#

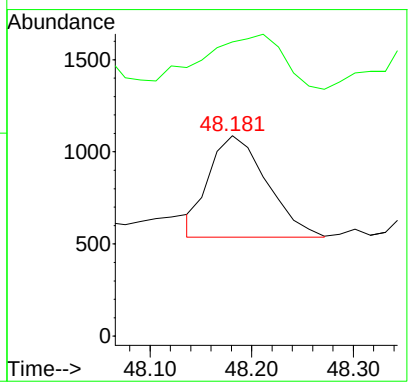


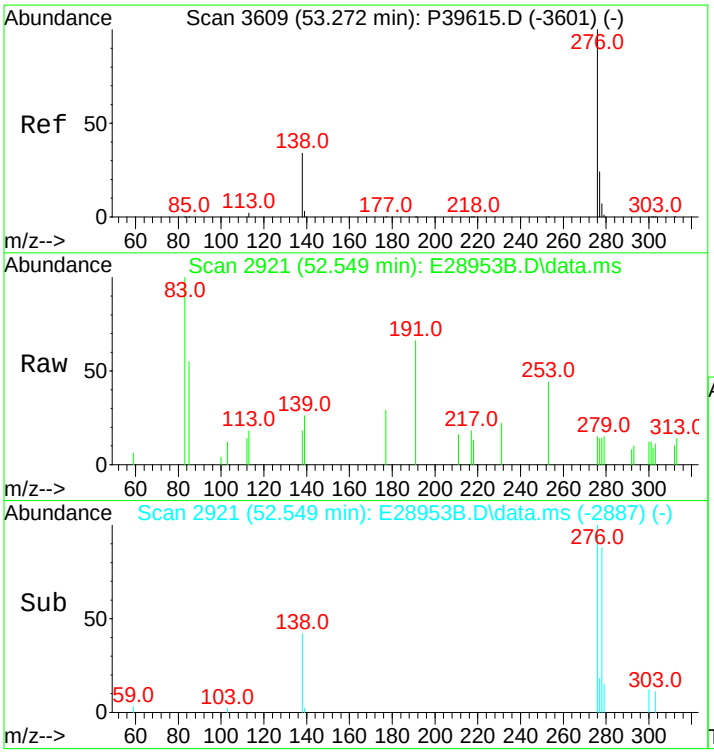


#90
Perylene
Concen: 17.45 ng/mL m
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:252 Resp: 2160

Ion	Ratio	Lower	Upper
252	100		
253	0.0	20.7	31.1#

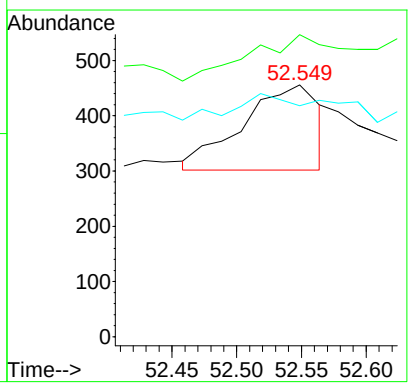


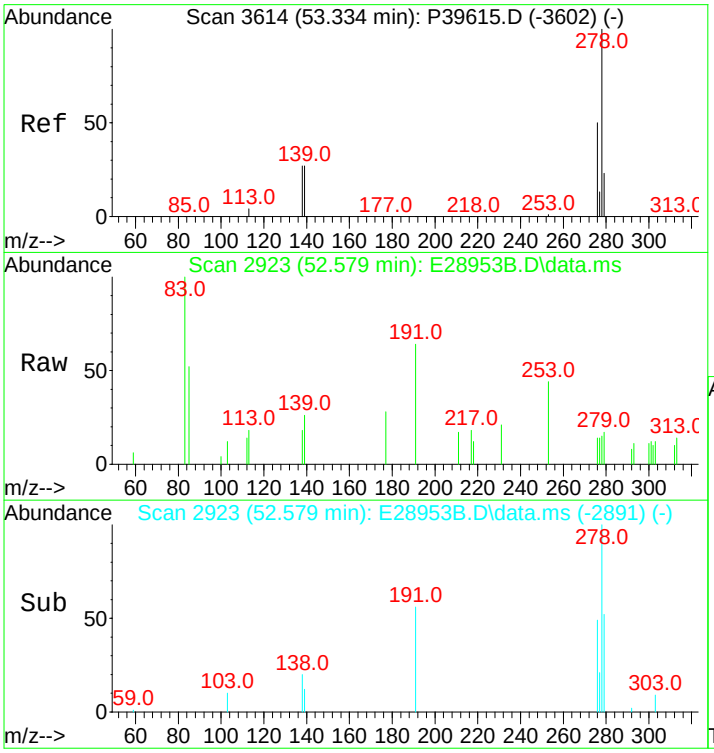


#91
Indeno[1,2,3-cd]pyrene
Concen: 4.59 ng/mL m
RT: 52.549 min Scan# 2921
Delta R.T. 0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:276 Resp: 632

Ion	Ratio	Lower	Upper
276	100		
138	67.6	16.3	24.5#
277	0.0	19.4	29.2#

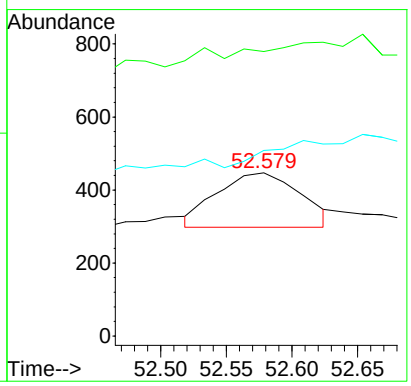


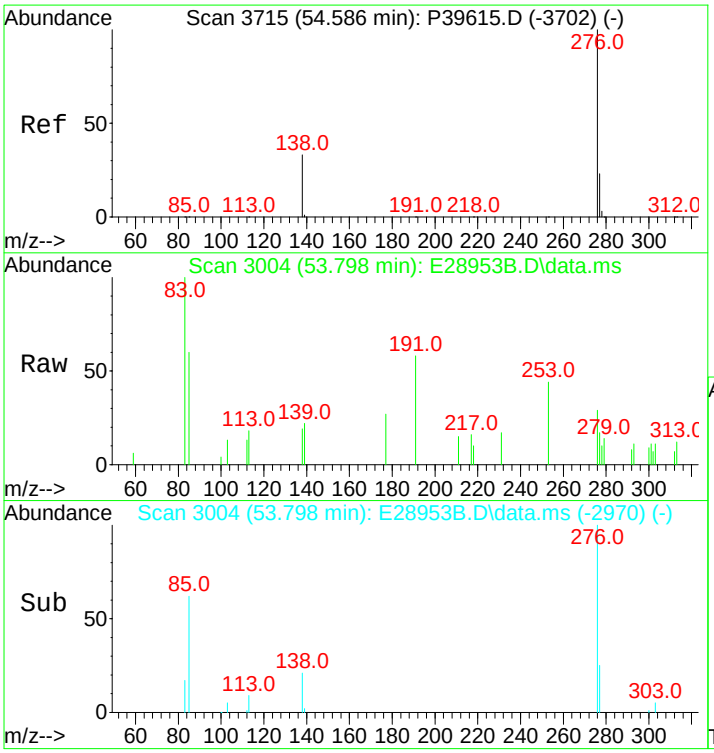


#92
Dibenz[ah]+[ac]anthracene
Concen: 4.49 ng/mL m
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:278 Resp: 659

Ion	Ratio	Lower	Upper
278	100		
139	0.0	11.6	17.4#
279	0.0	19.3	28.9#

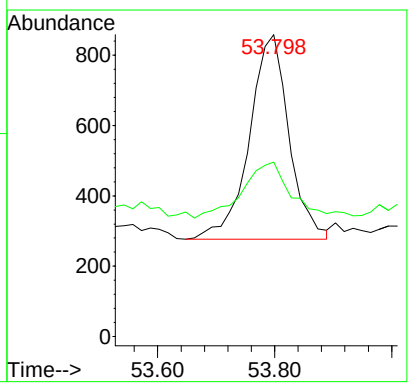


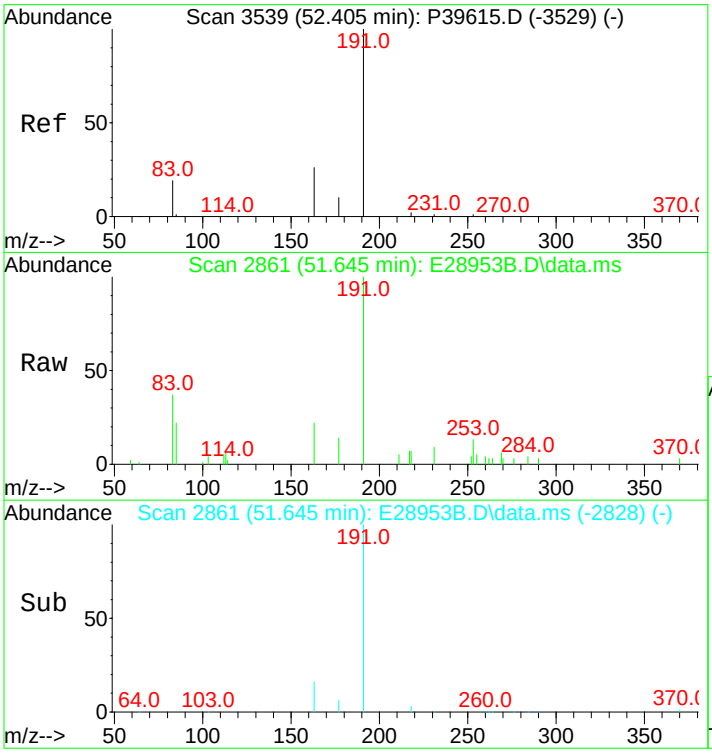


#93
Benzo[g,h,i]perylene
Concen: 18.40 ng/mL
RT: 53.798 min Scan# 3004
Delta R.T. 0.015 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:276 Resp: 2734

Ion	Ratio	Lower	Upper
276	100		
277	35.0	19.1	28.7#

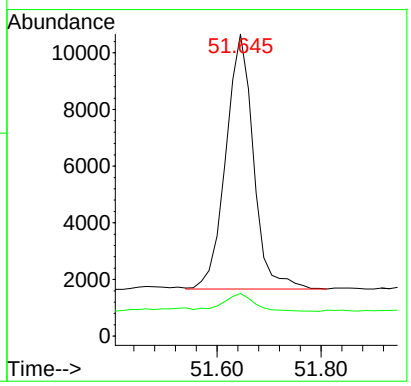


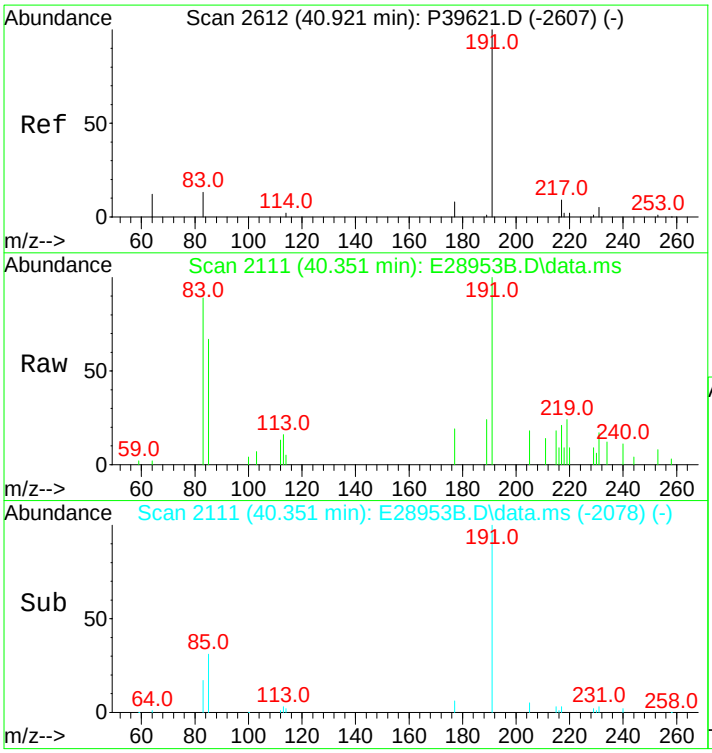


#94
Hopane (T19)
Concen: 800.23 ng/mL
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:191 Resp: 33249

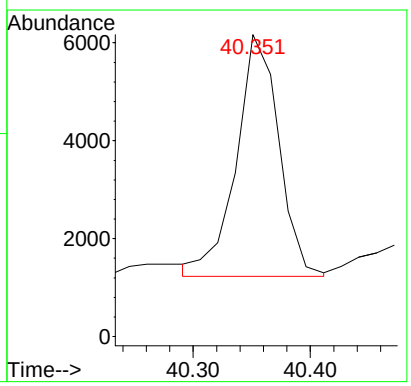
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.6	17.4#

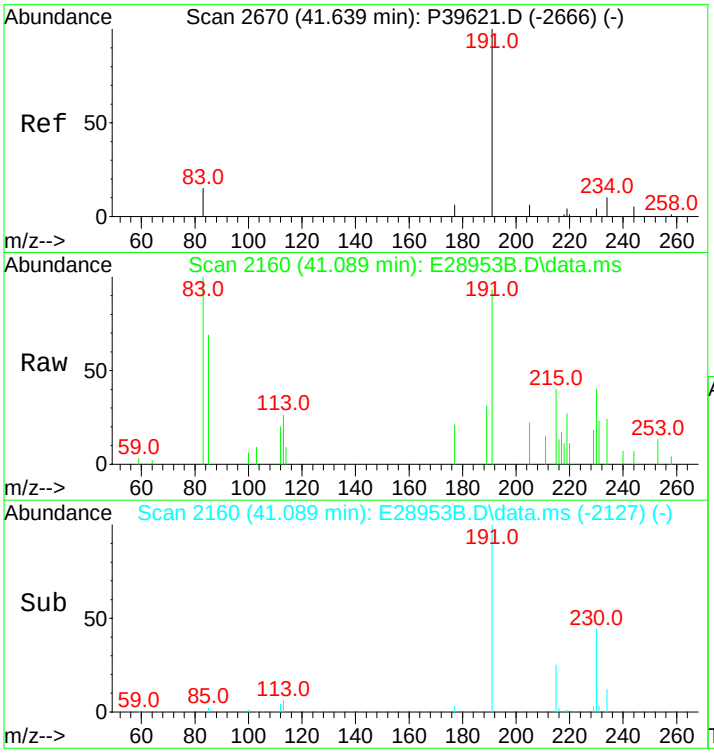




#96
C23 Tricyclic Terpane (T4)
Concen: 300.29 ng/ml m
RT: 40.351 min Scan# 2111
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

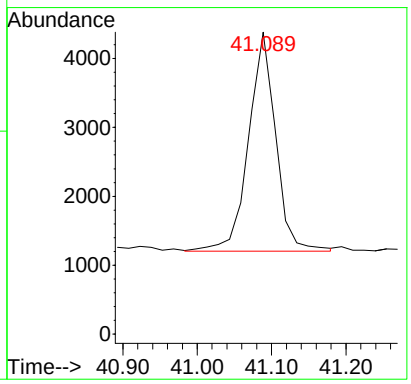
Tgt Ion:191 Resp: 12477

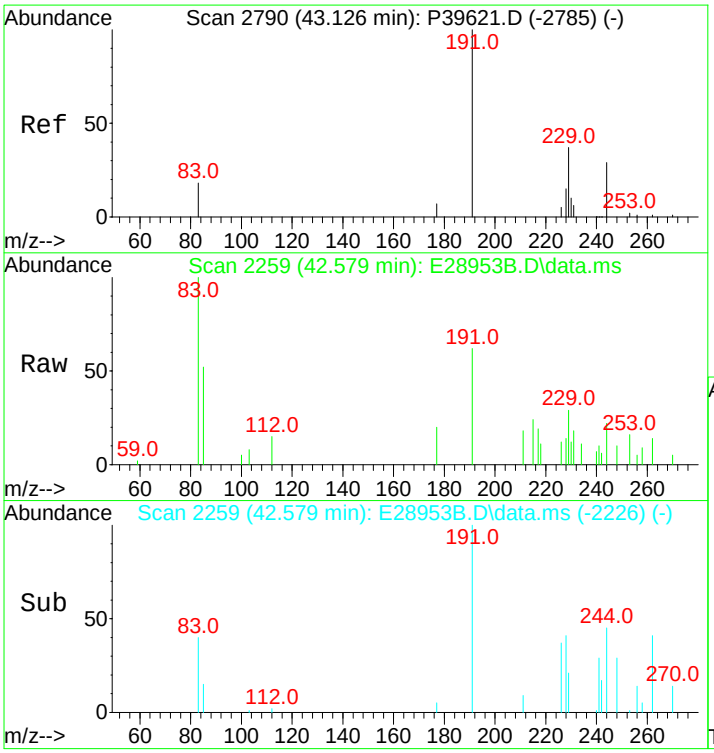




#97
C24 Tricyclic Terpane (T5)
Concen: 193.26 ng/ml m
RT: 41.089 min Scan# 2160
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

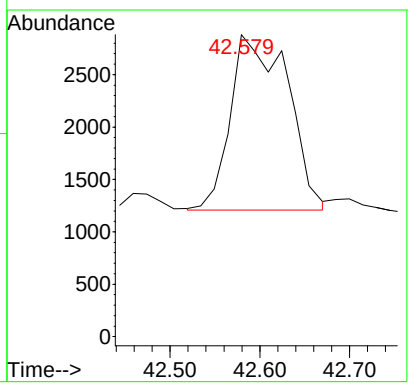
Tgt Ion:191 Resp: 8030

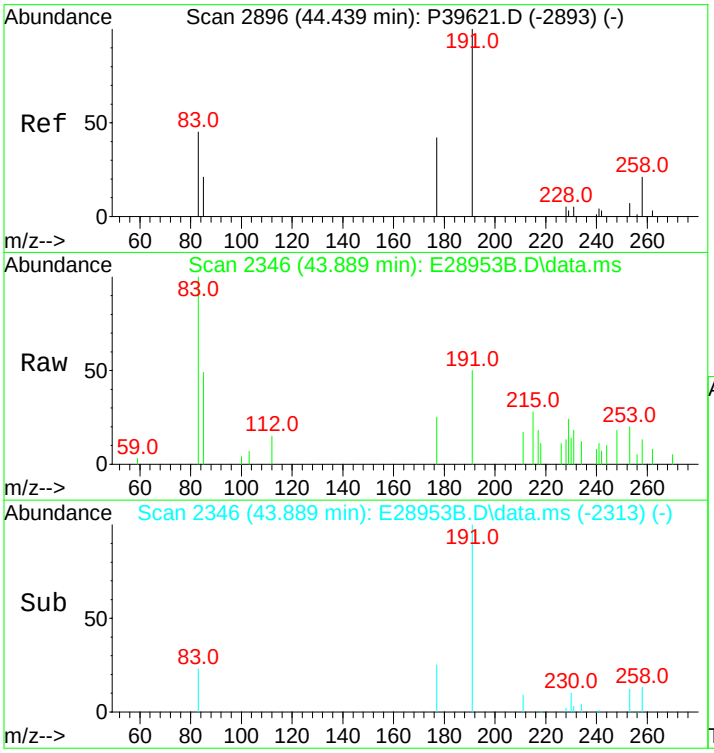




#98
C25 Tricyclic Terpane (T6)
Concen: 179.16 ng/ml m
RT: 42.579 min Scan# 2259
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

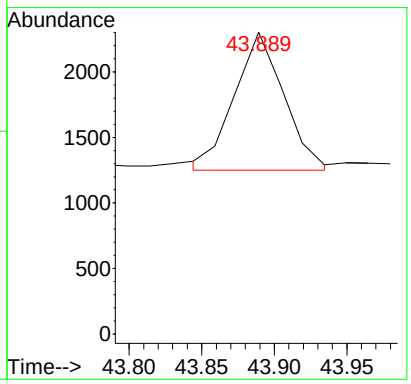
Tgt Ion:191 Resp: 7444

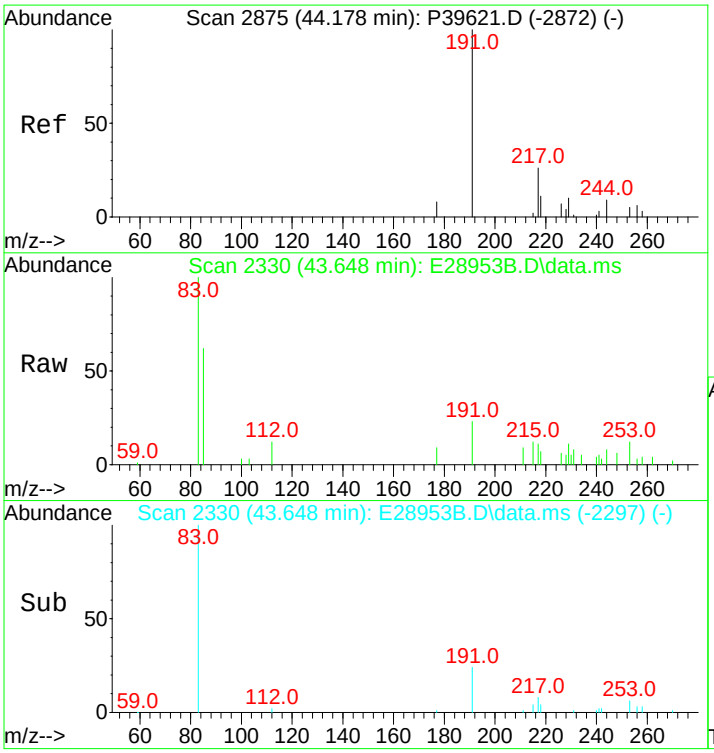




#99
C24 Tetracyclic Terpane (T6a)
Concen: 59.76 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

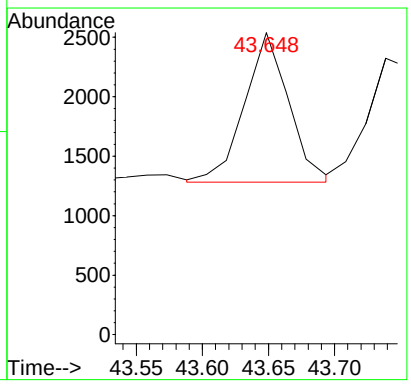
Tgt Ion:191 Resp: 2483

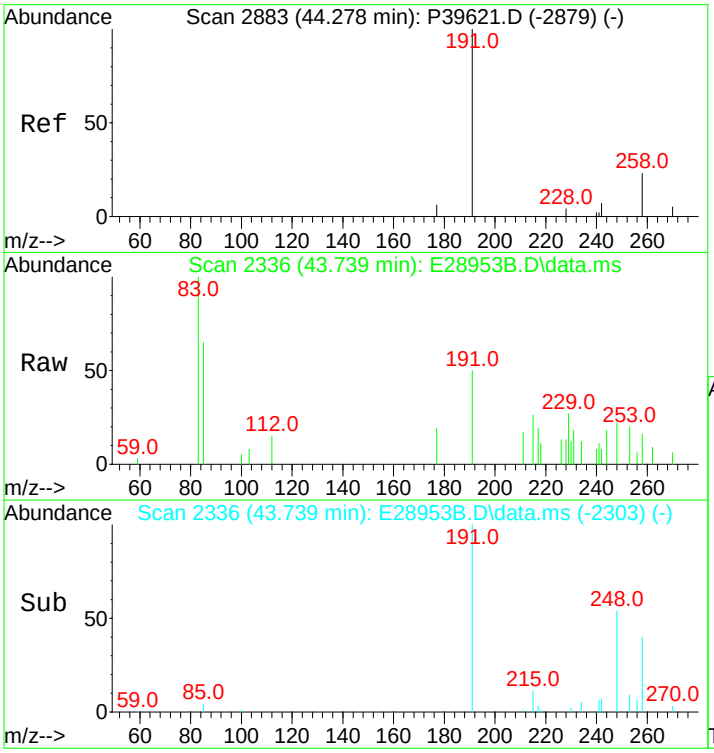




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 69.92 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

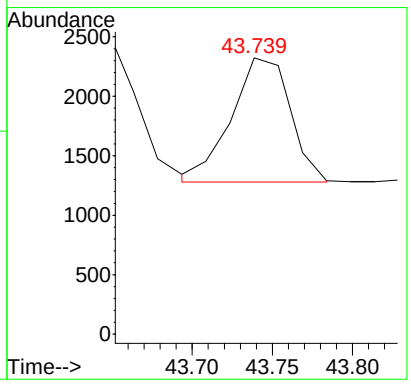
Tgt Ion:191 Resp: 2905

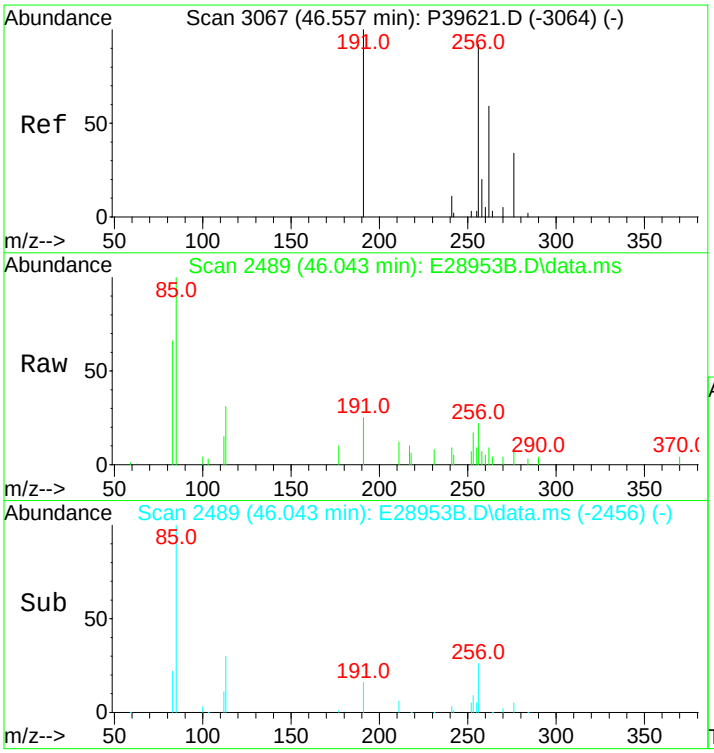




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 64.26 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

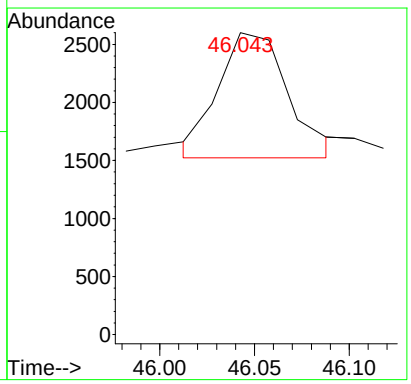
Tgt Ion:191 Resp: 2670

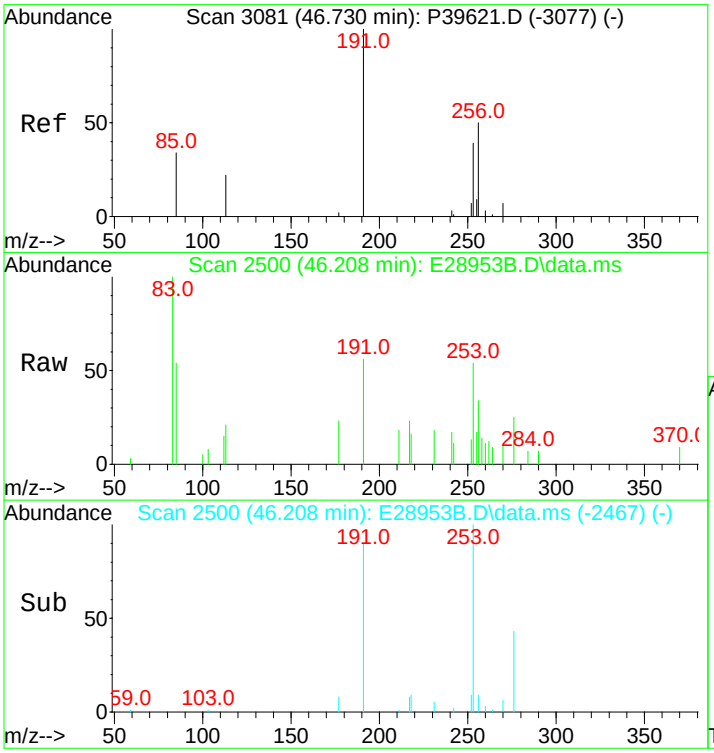




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 66.72 ng/ml m
RT: 46.043 min Scan# 2489
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

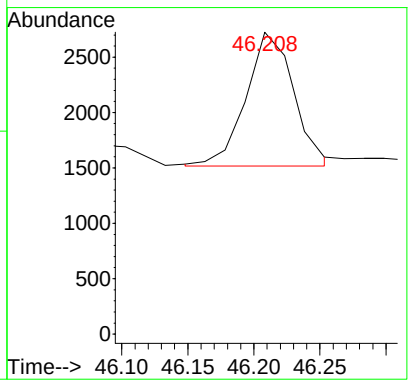
Tgt Ion:191 Resp: 2772

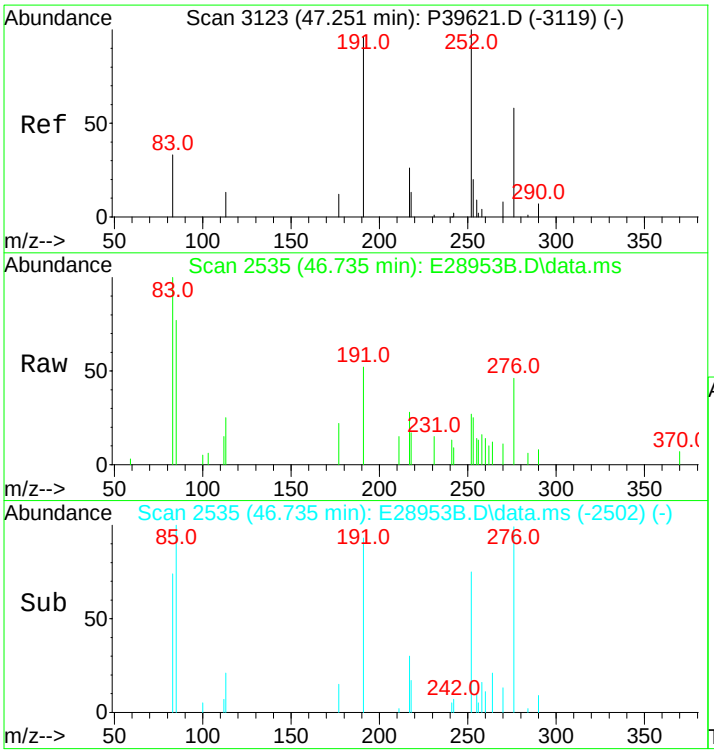




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 73.19 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

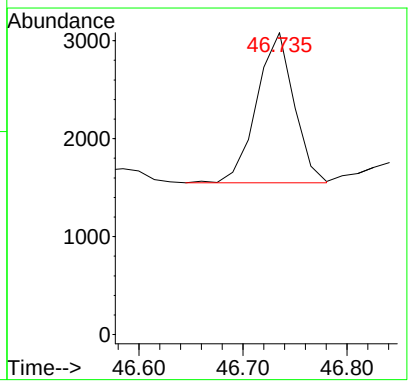
Tgt Ion:191 Resp: 3041

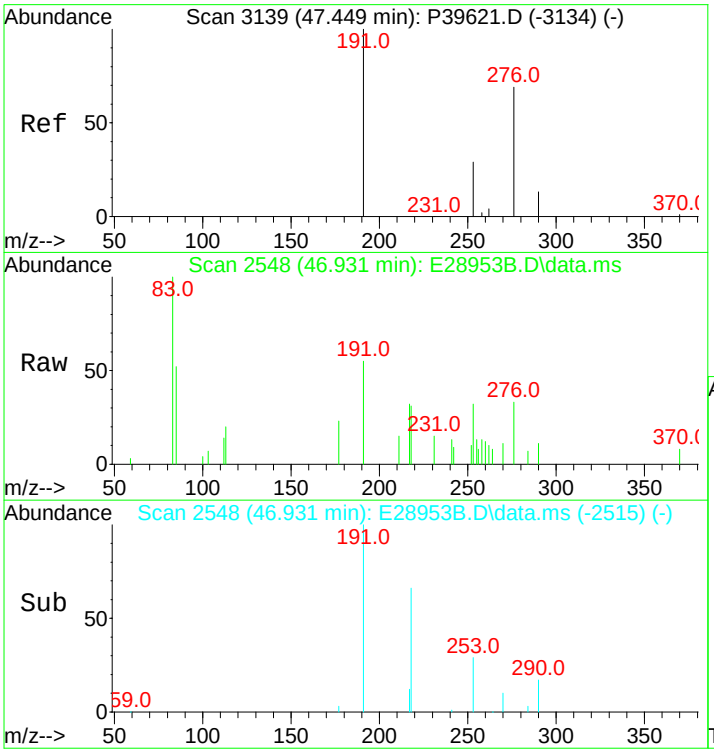




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 92.32 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

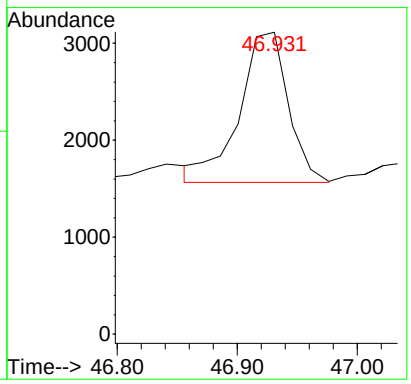
Tgt Ion:191 Resp: 3836

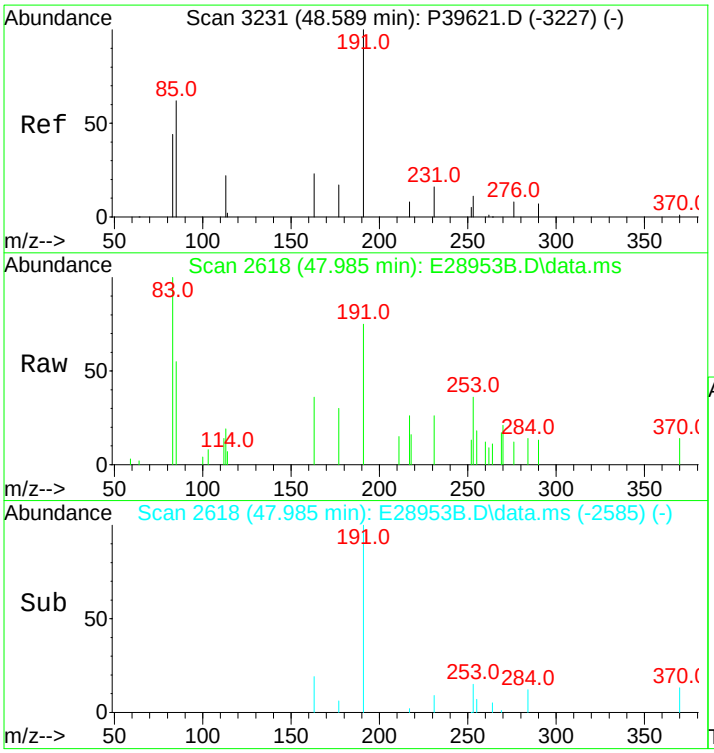




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 105.80 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

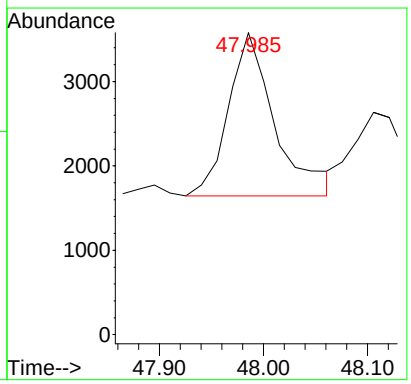
Tgt Ion:191 Resp: 4396

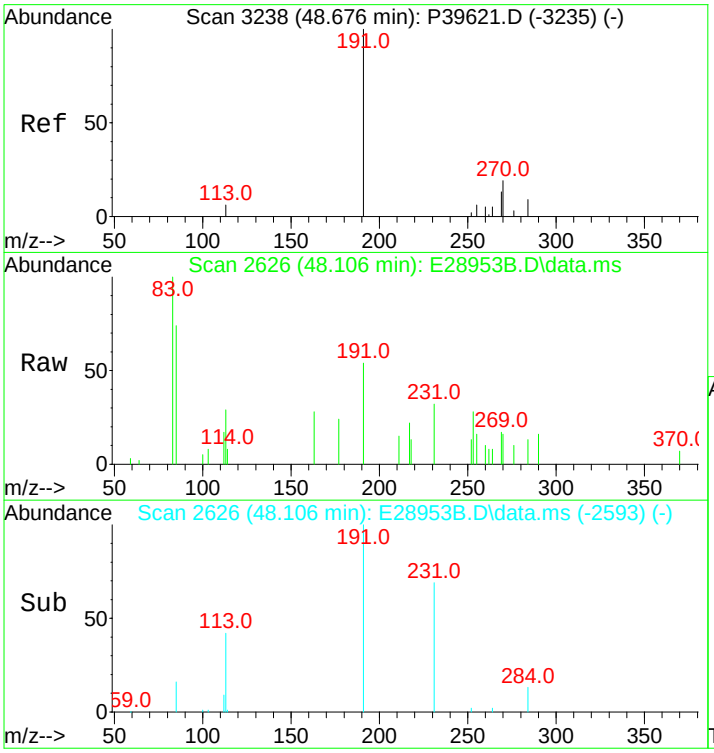




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 145.01 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

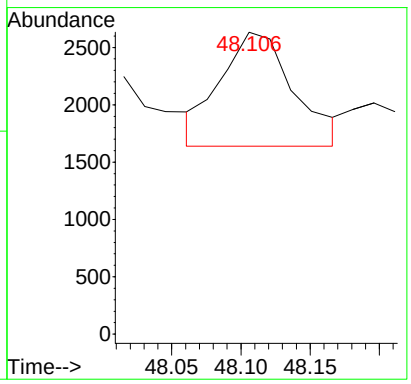
Tgt Ion:191 Resp: 6025

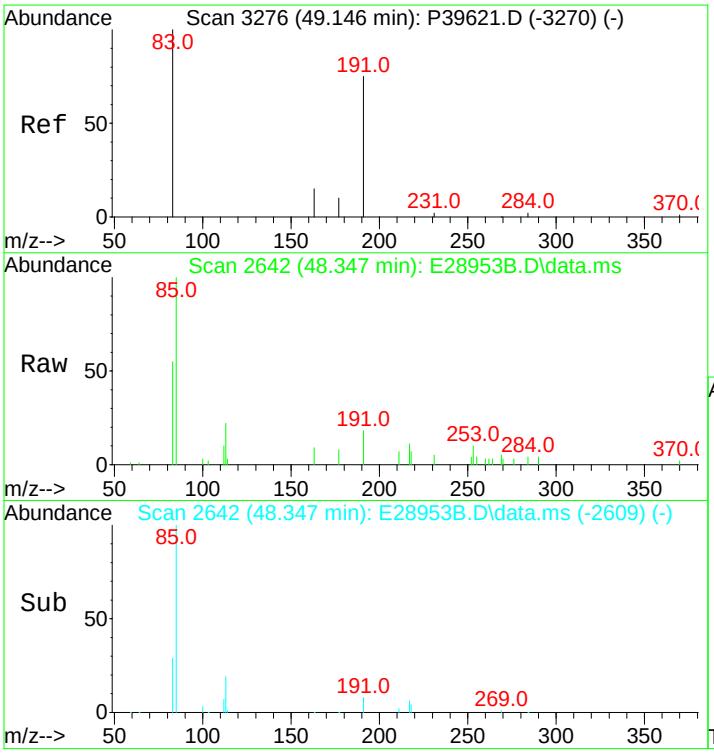




#107
C30 Tricyclic Terpane-22S
Concen: 87.97 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

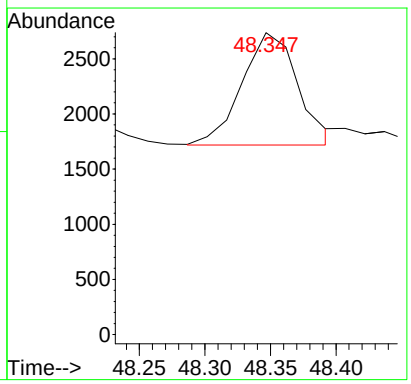
Tgt Ion:191 Resp: 3655

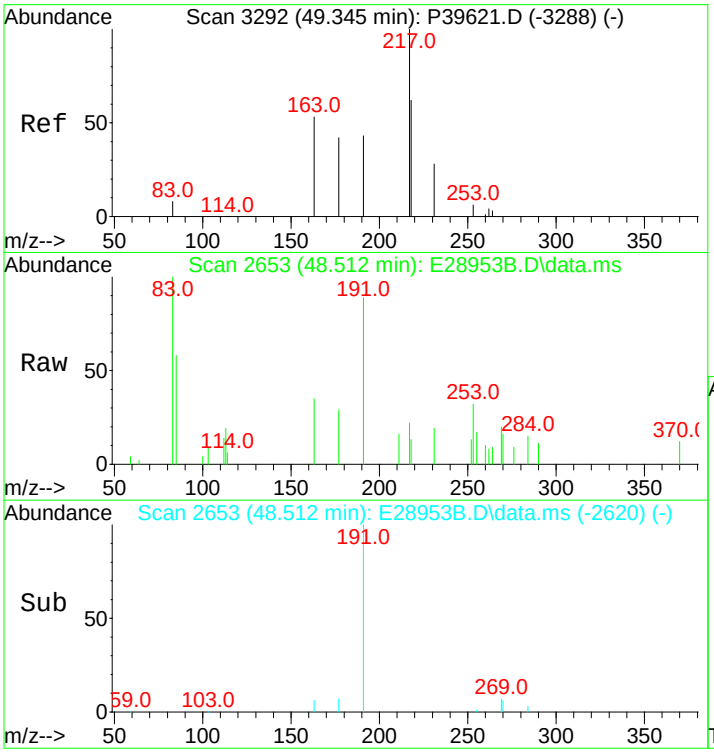




#108
C30 Tricyclic Terpane-22R
Concen: 72.64 ng/mL m
RT: 48.347 min Scan# 2642
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

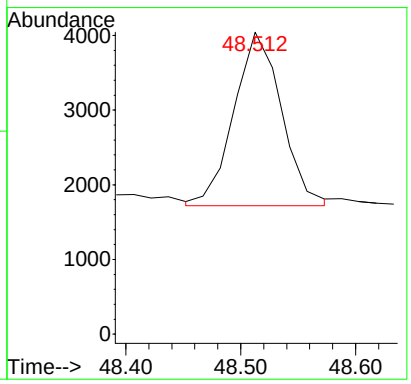
Tgt Ion:191 Resp: 3018

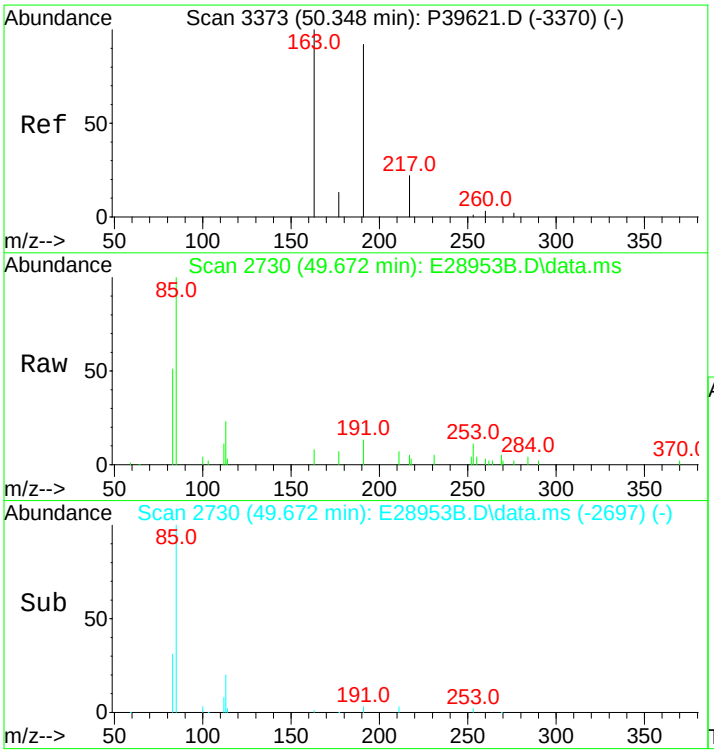




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 160.24 ng/ml m
RT: 48.512 min Scan# 2653
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

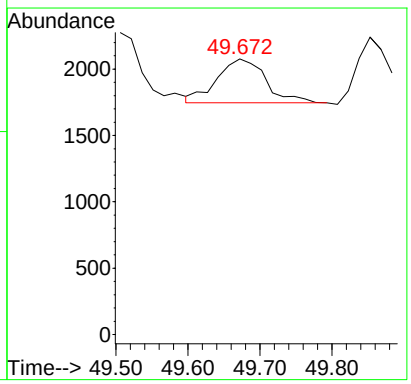
Tgt Ion:191 Resp: 6658

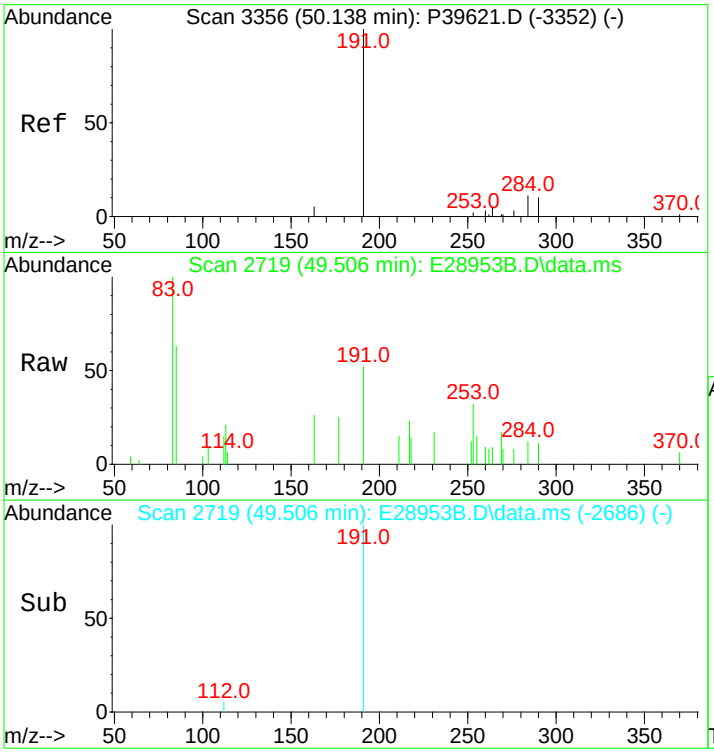




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 36.90 ng/ml
RT: 49.672 min Scan# 2730
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

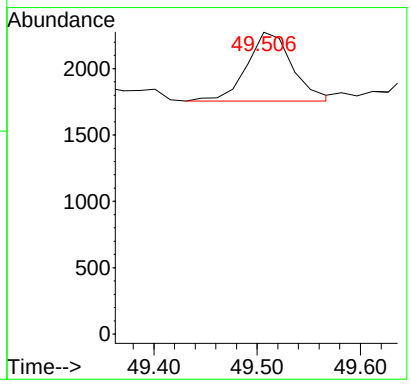
Tgt Ion:191 Resp: 1533

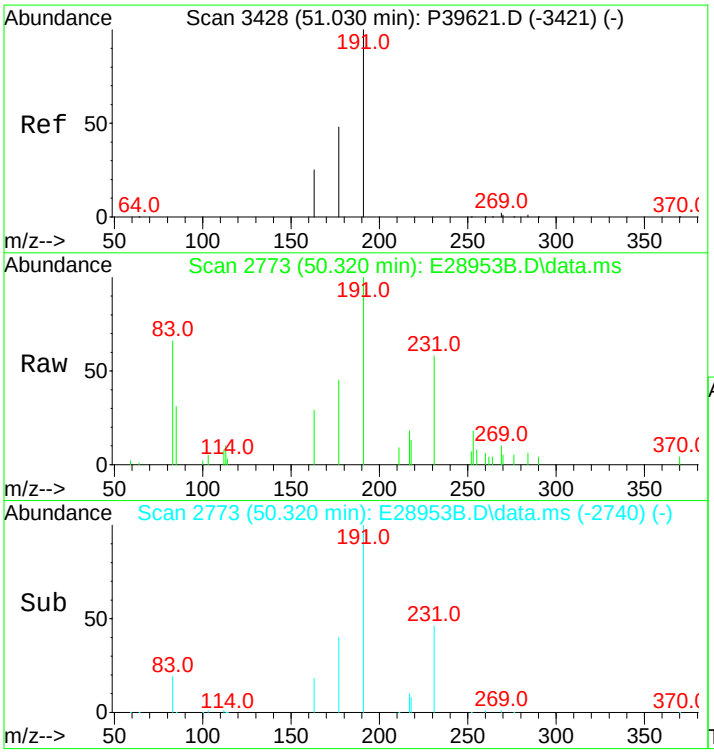




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 38.34 ng/ml m
RT: 49.506 min Scan# 2719
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

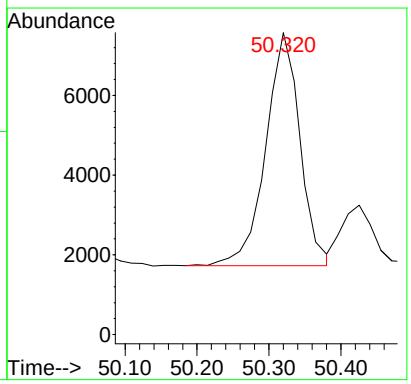
Tgt Ion:191 Resp: 1593

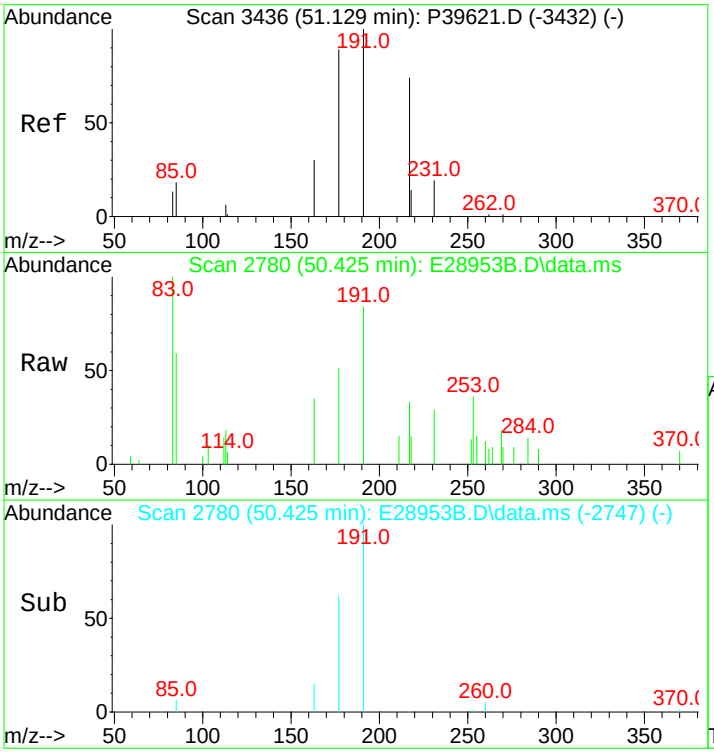




#112
30-Norhopane (T15)
Concen: 465.18 ng/ml
RT: 50.320 min Scan# 2773
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

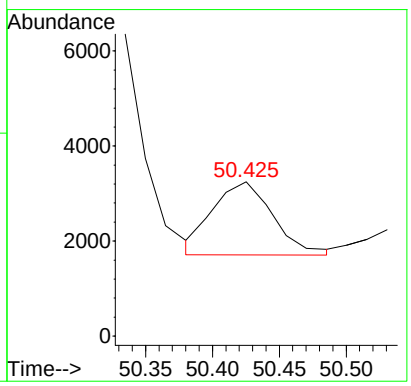
Tgt Ion:191 Resp: 19328

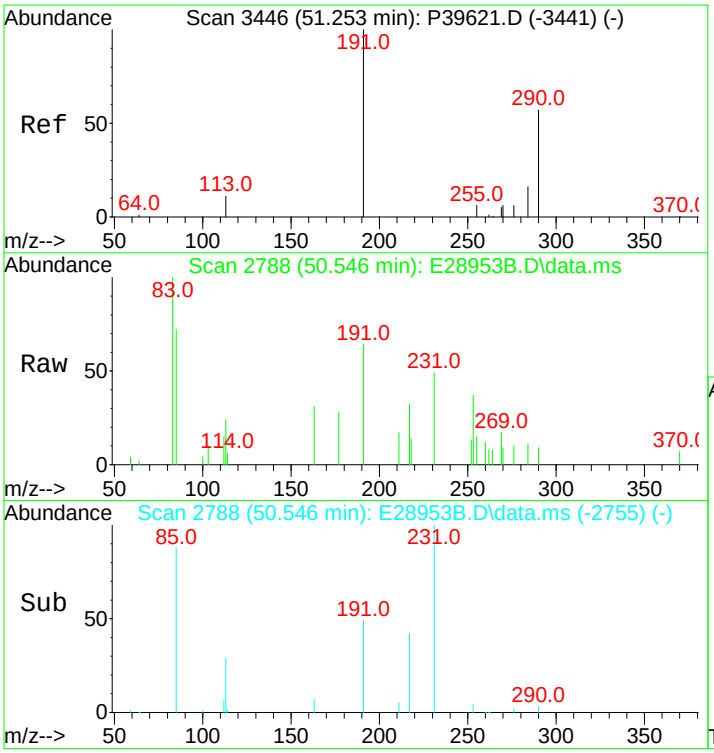




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 116.37 ng/ml
RT: 50.425 min Scan# 2780
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

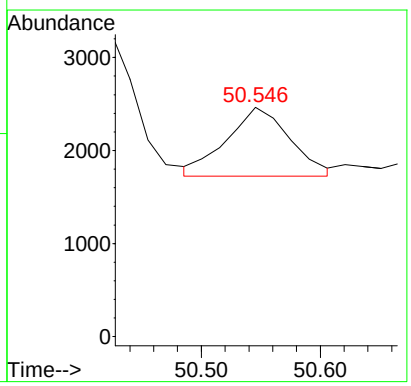
Tgt Ion:191 Resp: 4835

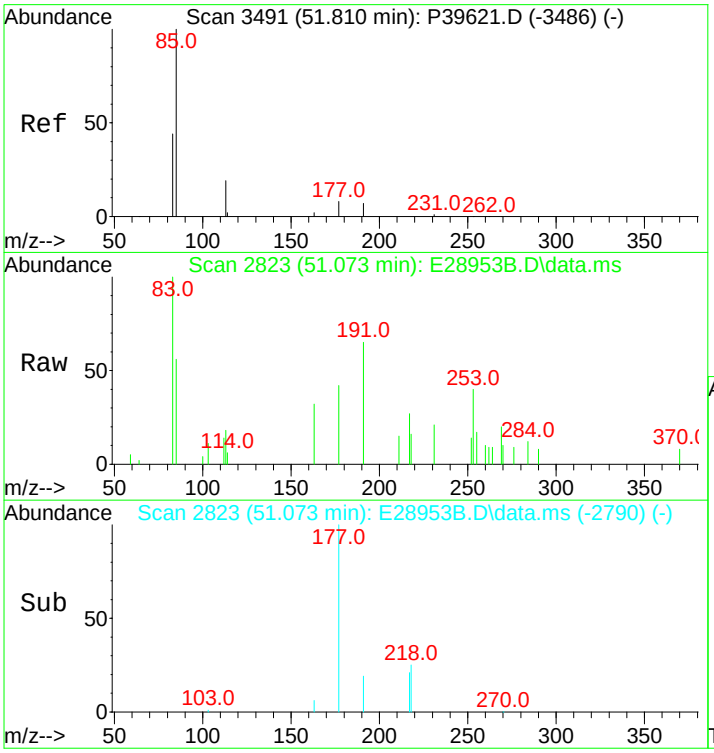




#114
17a(H)-Diahopane (X)
Concen: 65.71 ng/ml m
RT: 50.546 min Scan# 2788
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

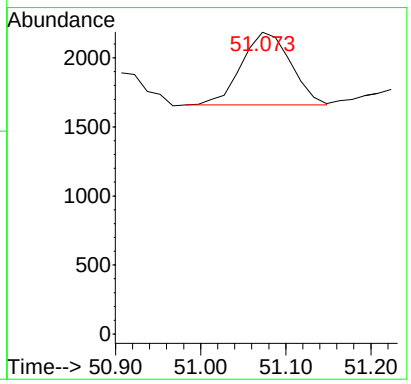
Tgt Ion:191 Resp: 2730

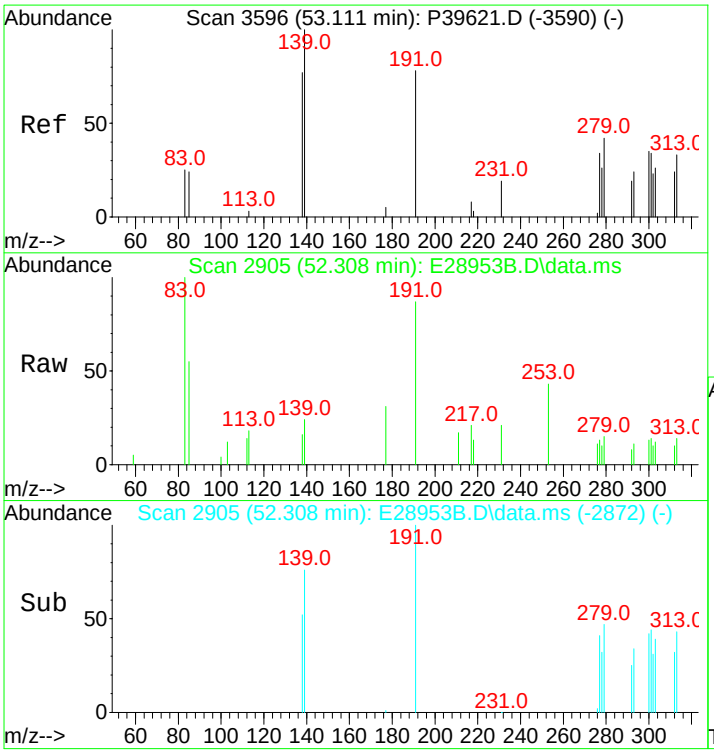




#115
30-Normoretane (T17)
Concen: 51.22 ng/ml
RT: 51.073 min Scan# 2823
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

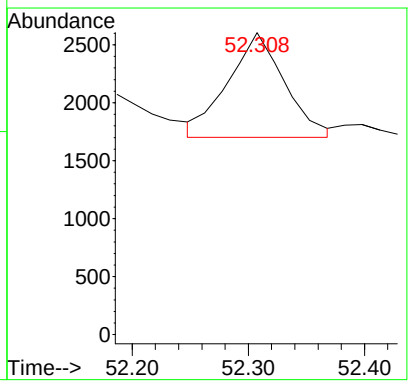
Tgt Ion:191 Resp: 2128

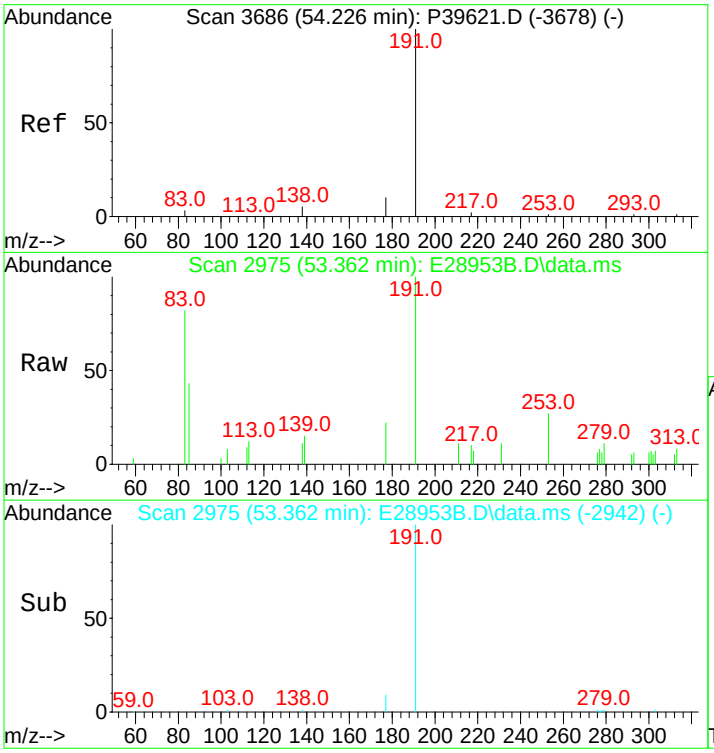




#117
Moretane (T20)
Concen: 72.95 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

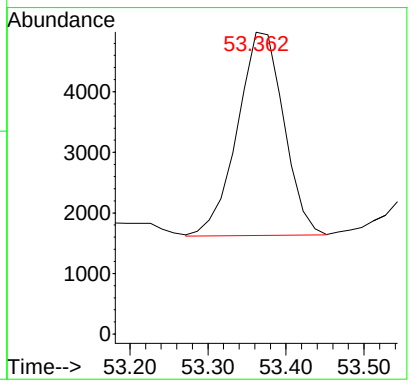
Tgt Ion:191 Resp: 3031

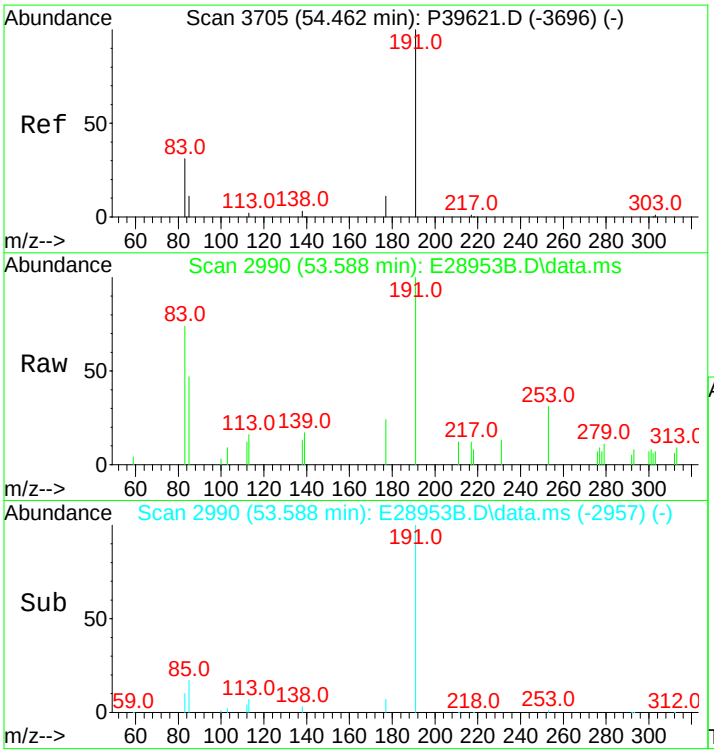




#118
30-Homohopane-22S (T21)
Concen: 335.22 ng/ml
RT: 53.362 min Scan# 2975
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

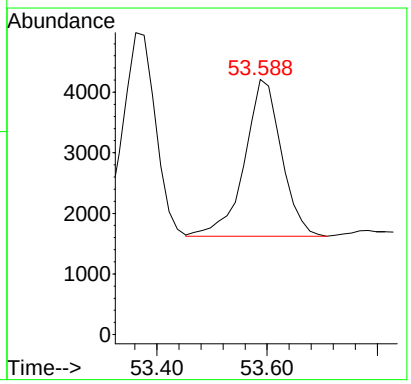
Tgt Ion:191 Resp: 13928

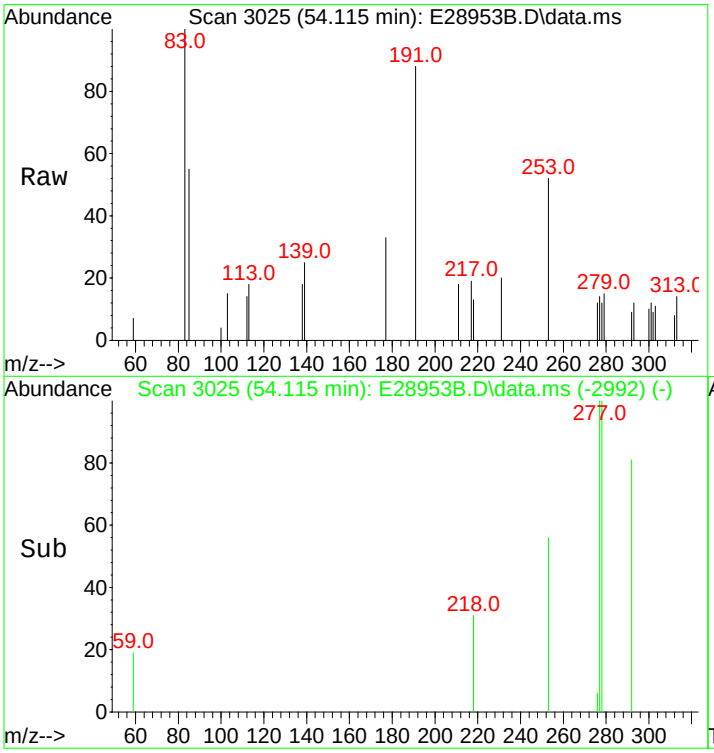




#119
30-Homohopane-22R (T22)
Concen: 289.58 ng/ml
RT: 53.588 min Scan# 2990
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

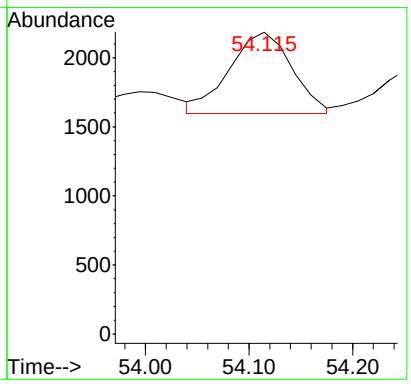
Tgt Ion:191 Resp: 12032

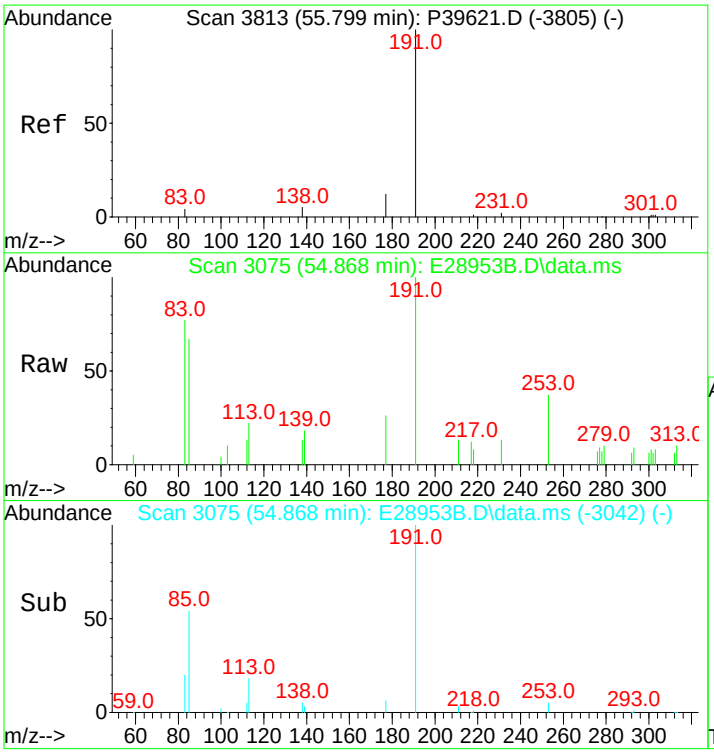




#120
Gammacerane/C32-diahopane
Concen: 59.38 ng/mL m
RT: 54.115 min Scan# 3025
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

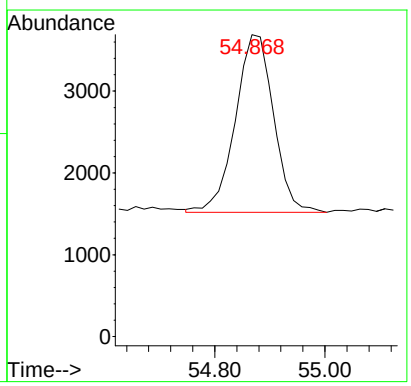
Tgt Ion:191 Resp: 2467

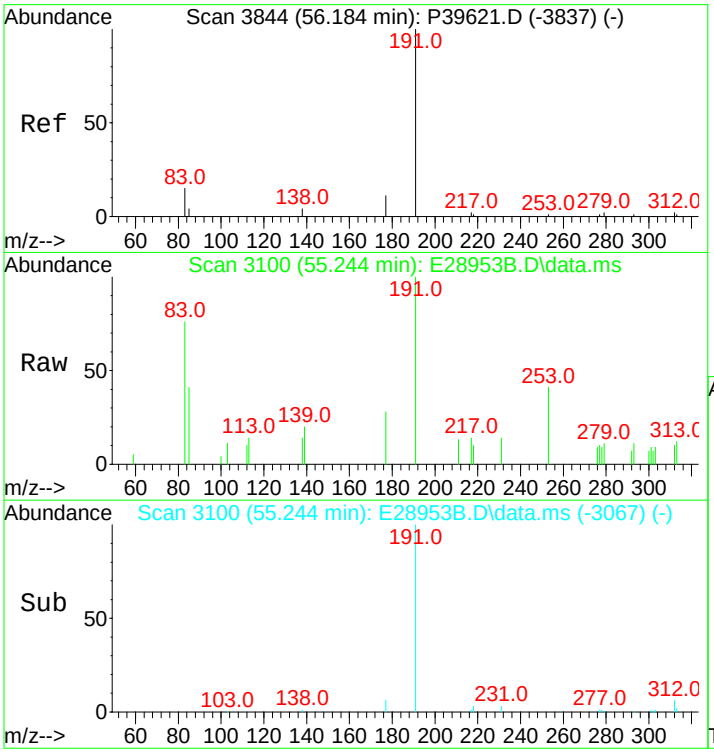




#121
30,31-Bishomohopane-22S (T26)
Concen: 250.52 ng/ml
RT: 54.868 min Scan# 3075
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

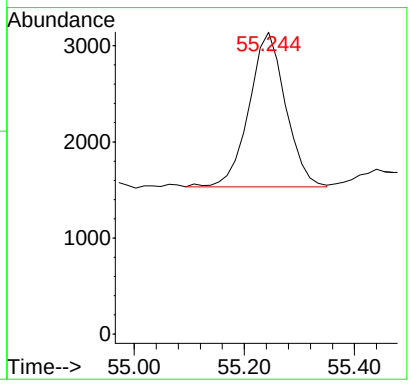
Tgt Ion:191 Resp: 10409

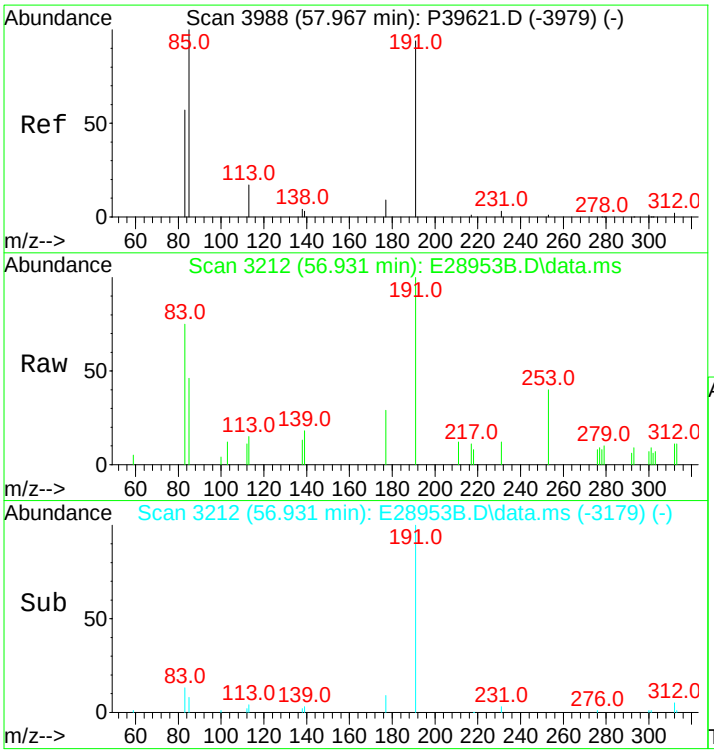




#122
30,31-Bishomohopane-22R (T27)
Concen: 177.62 ng/ml
RT: 55.244 min Scan# 3100
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

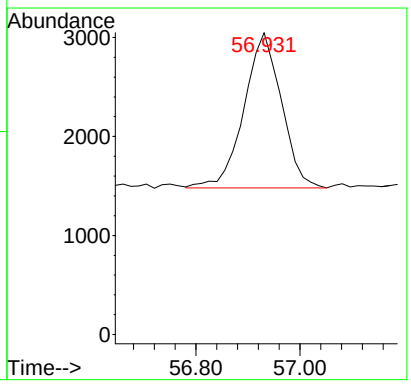
Tgt Ion:191 Resp: 7380

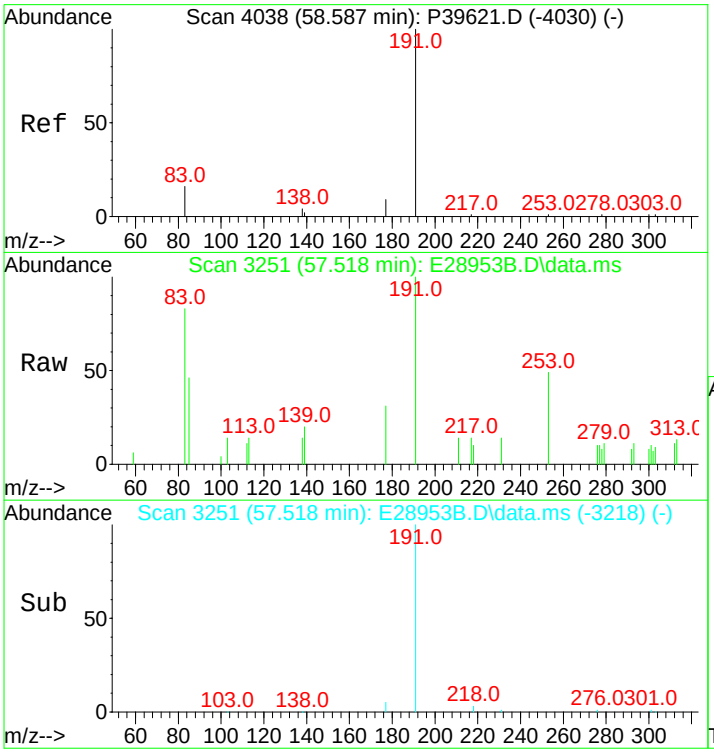




#123
30,31-Trishomohopane-22S (T30)
Concen: 188.04 ng/ml
RT: 56.931 min Scan# 3212
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

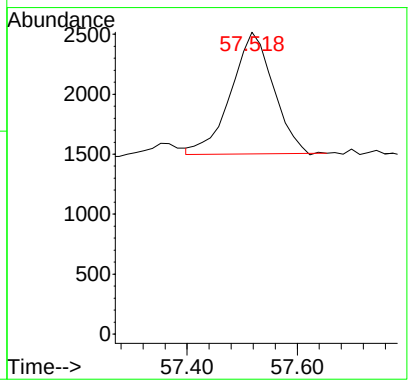
Tgt Ion:191 Resp: 7813

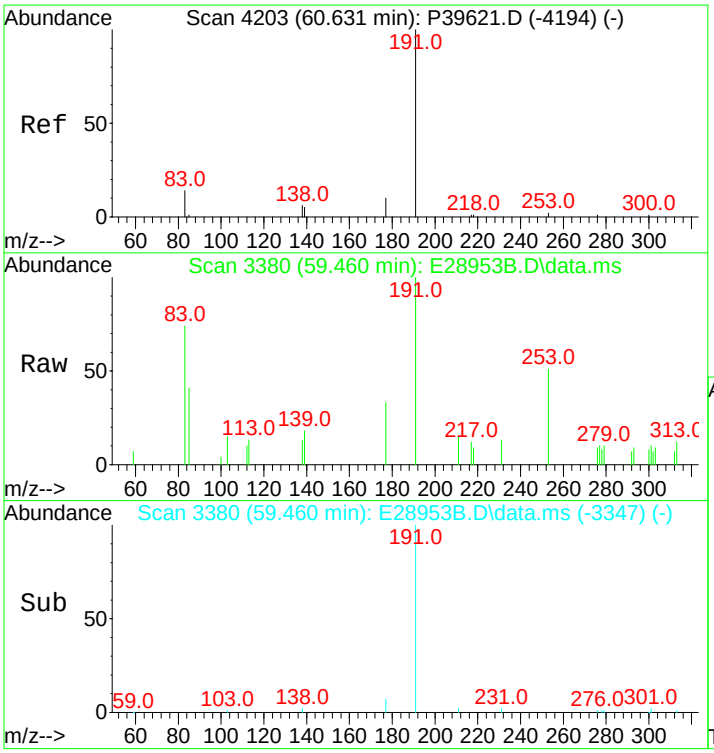




#124
30,31-Trishomohopane-22R (T31)
Concen: 130.23 ng/ml
RT: 57.518 min Scan# 3251
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

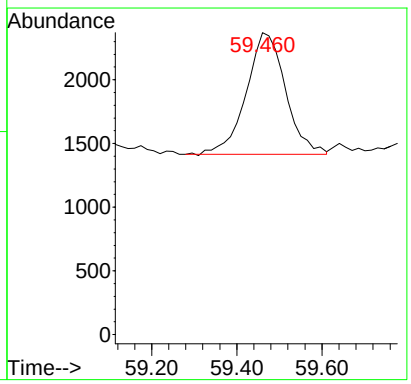
Tgt Ion:191 Resp: 5411

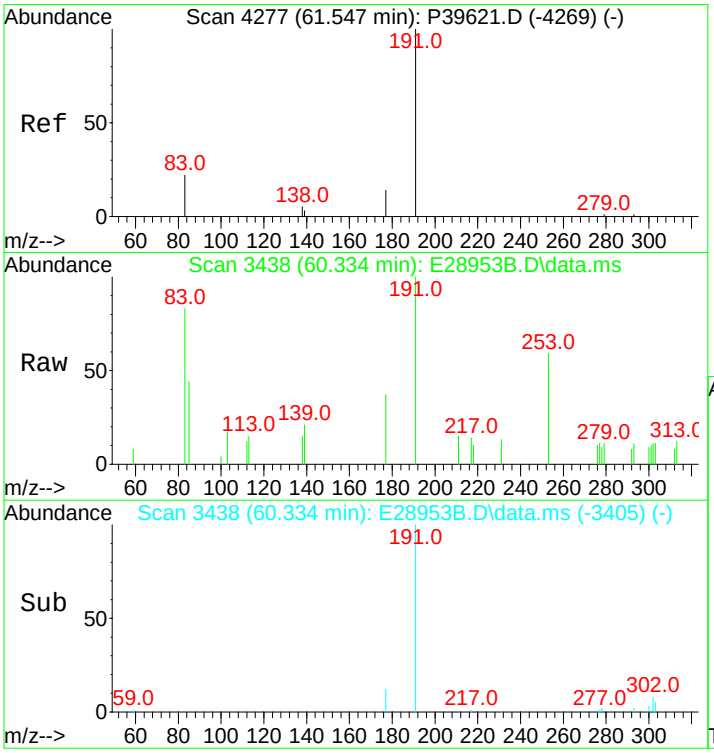




#125
Tetrakishomohopane-22S (T32)
Concen: 147.87 ng/ml
RT: 59.460 min Scan# 3380
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

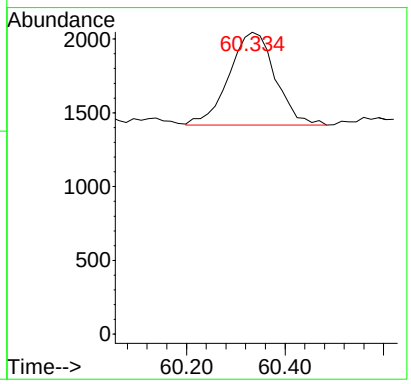
Tgt Ion:191 Resp: 6144

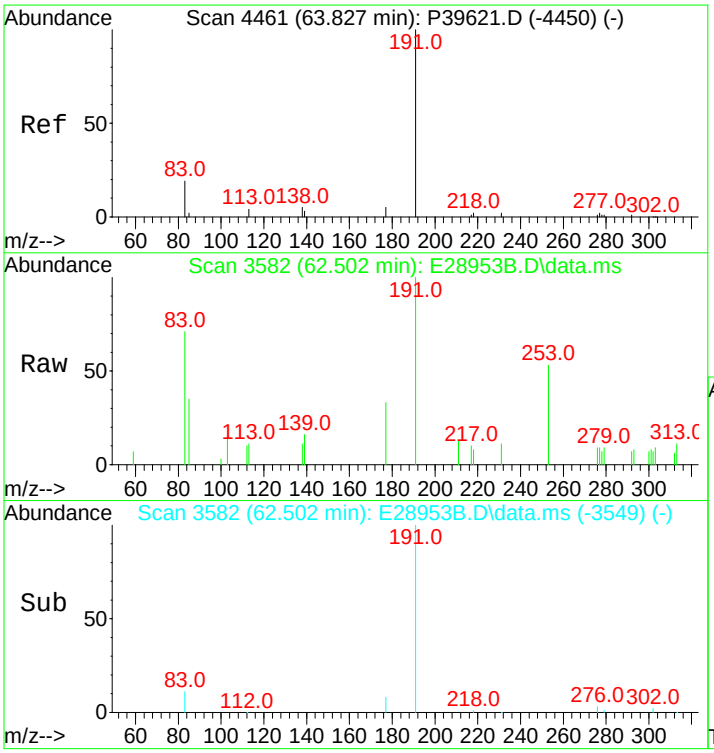




#126
Tetrakishomohopane-22R (T33)
Concen: 98.34 ng/ml
RT: 60.334 min Scan# 3438
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

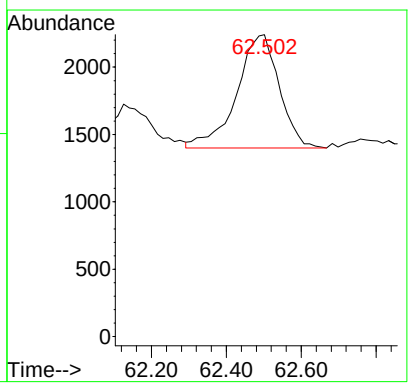
Tgt Ion:191 Resp: 4086

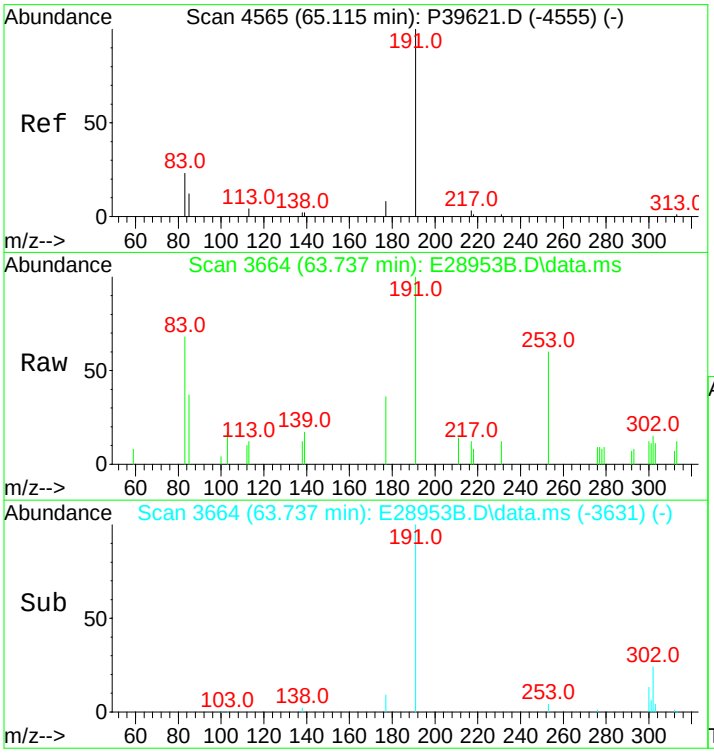




#127
Pentakishomohopane-22S (T34)
Concen: 158.85 ng/ml
RT: 62.502 min Scan# 3582
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

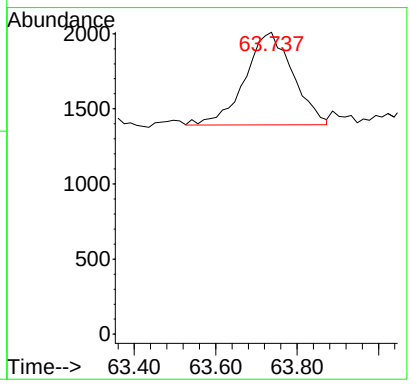
Tgt Ion:191 Resp: 6600

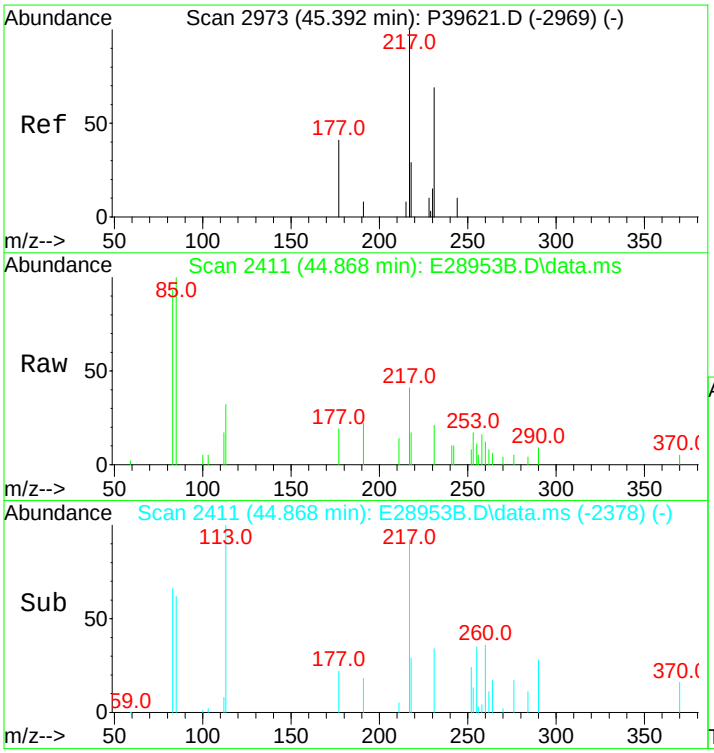




#128
Pentakishomohopane-22R (T35)
Concen: 120.75 ng/ml
RT: 63.737 min Scan# 3664
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

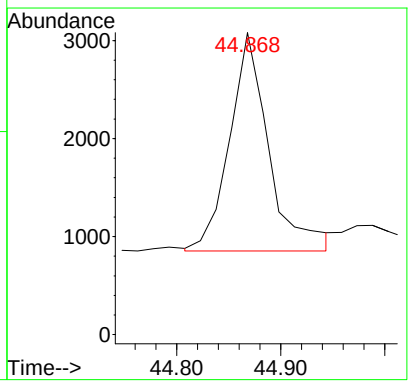
Tgt Ion:191 Resp: 5017

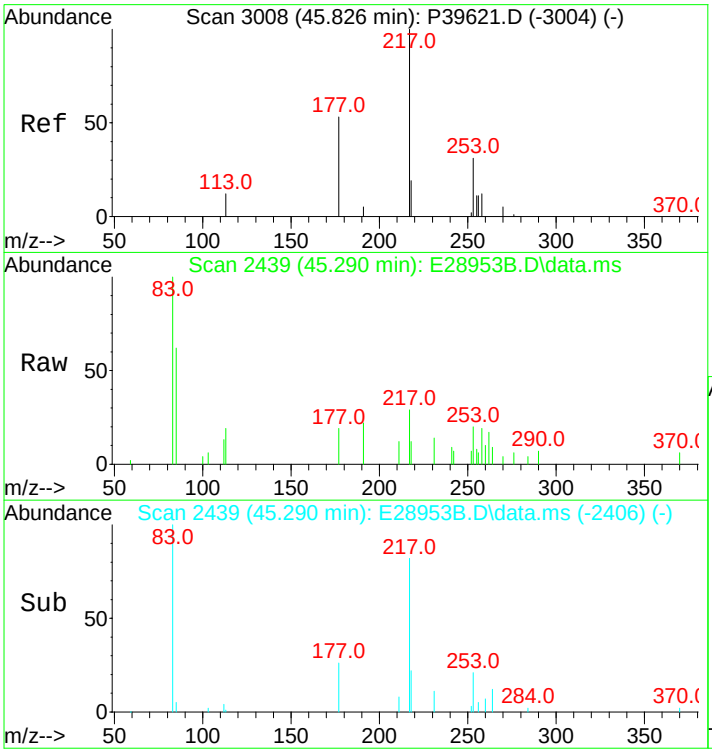




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 268.01 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

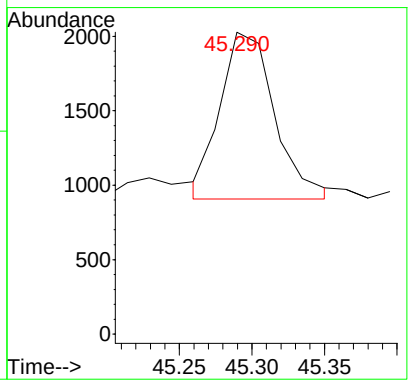
Tgt Ion:217 Resp: 5848

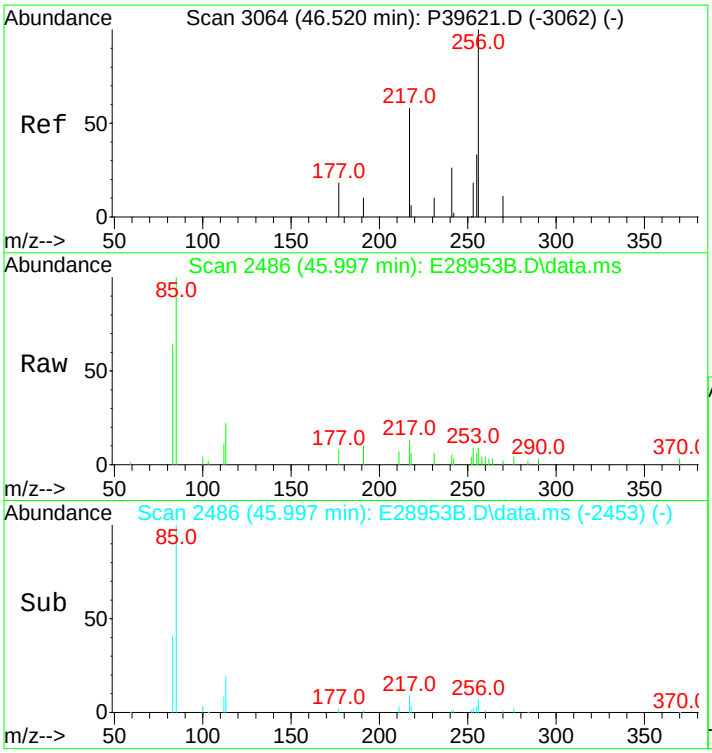




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 133.92 ng/ml m
RT: 45.290 min Scan# 2439
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

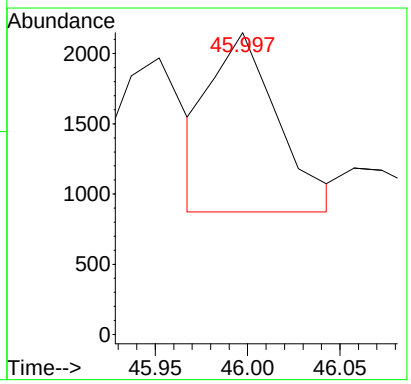
Tgt Ion:217 Resp: 2922

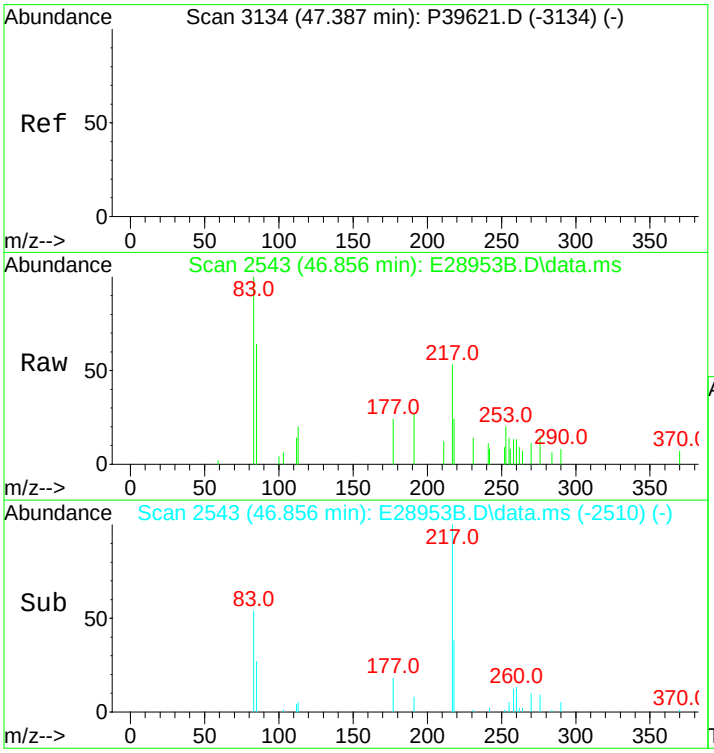




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 146.56 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

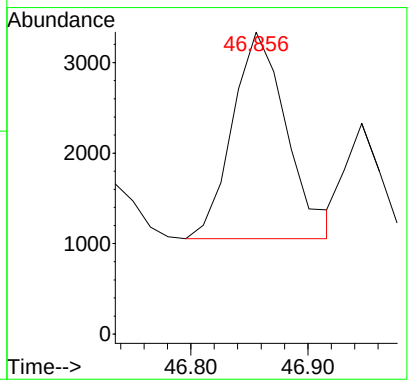
Tgt Ion:217 Resp: 3198

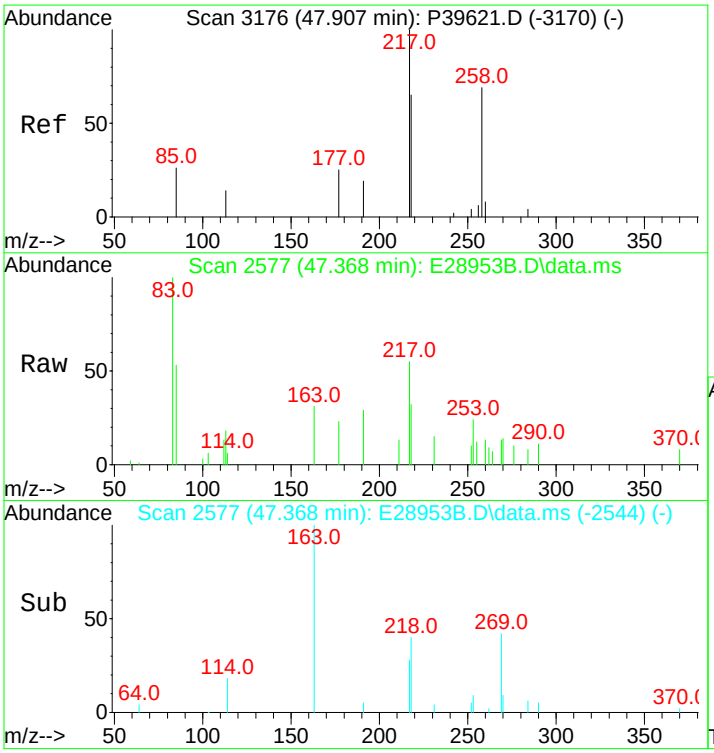




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 339.37 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

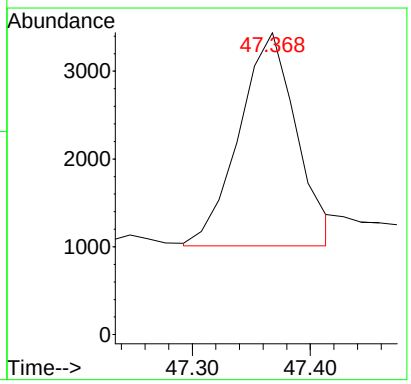
Tgt Ion:217 Resp: 7405

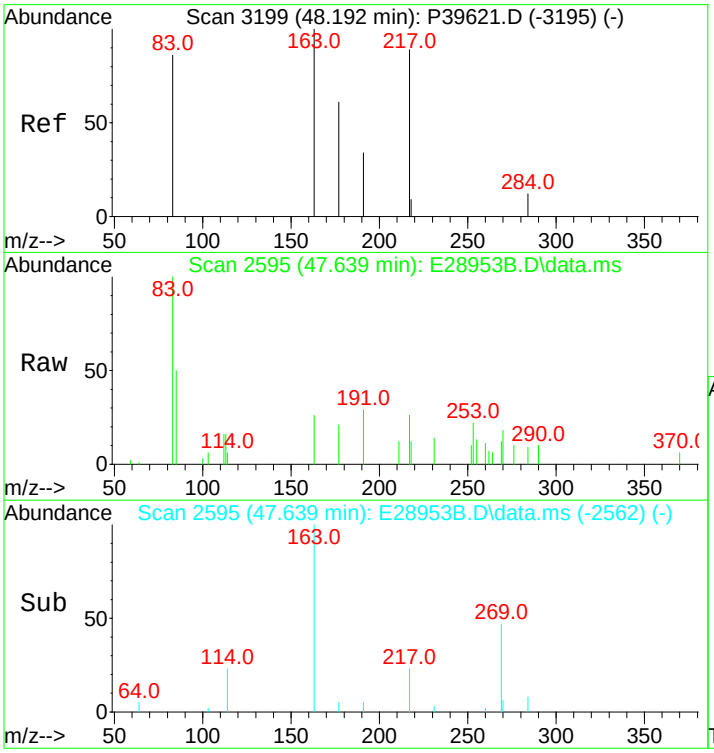




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 376.22 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

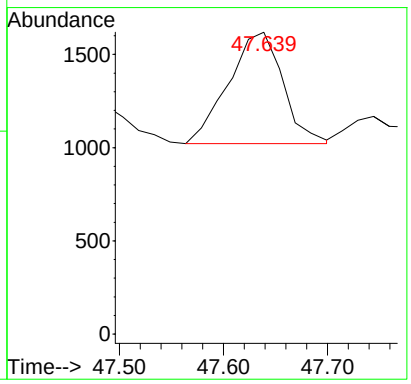
Tgt Ion:217 Resp: 8209

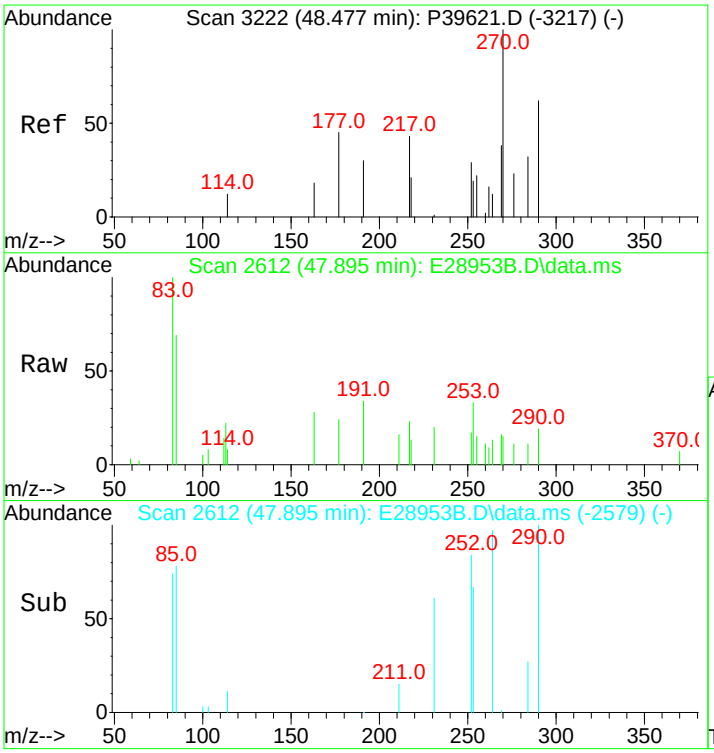




#135
Unknown Sterane (S18)
Concen: 99.91 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

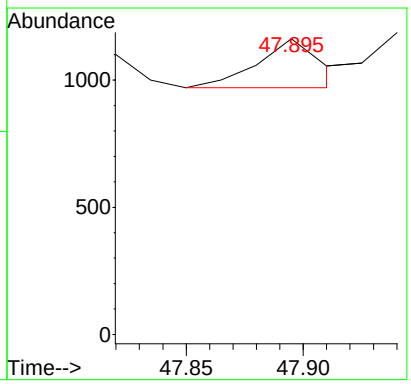
Tgt Ion:217 Resp: 2180

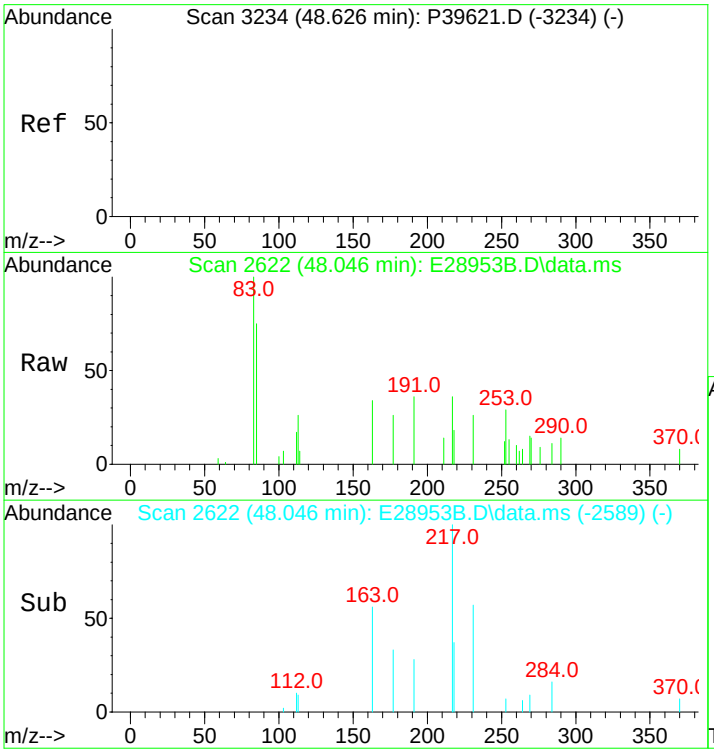




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 16.41 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

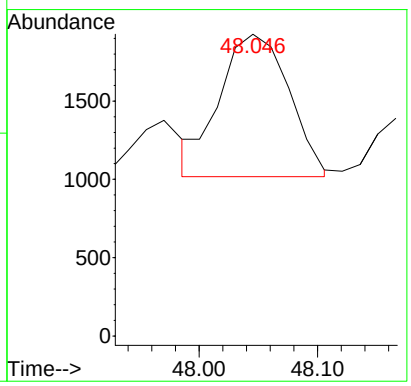
Tgt Ion:217 Resp: 358

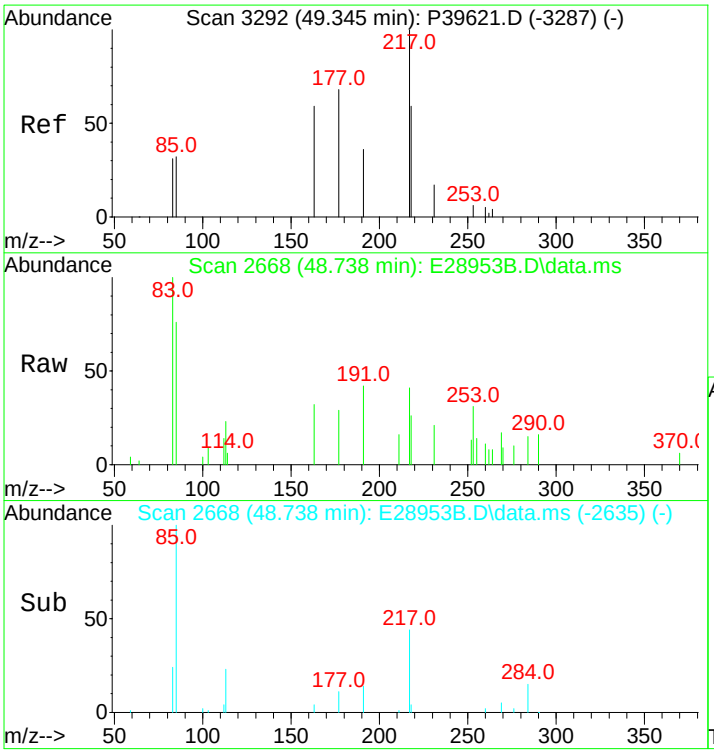




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 169.57 ng/ml m
RT: 48.046 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

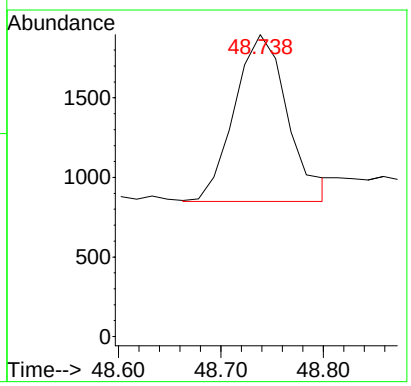
Tgt Ion:217 Resp: 3700

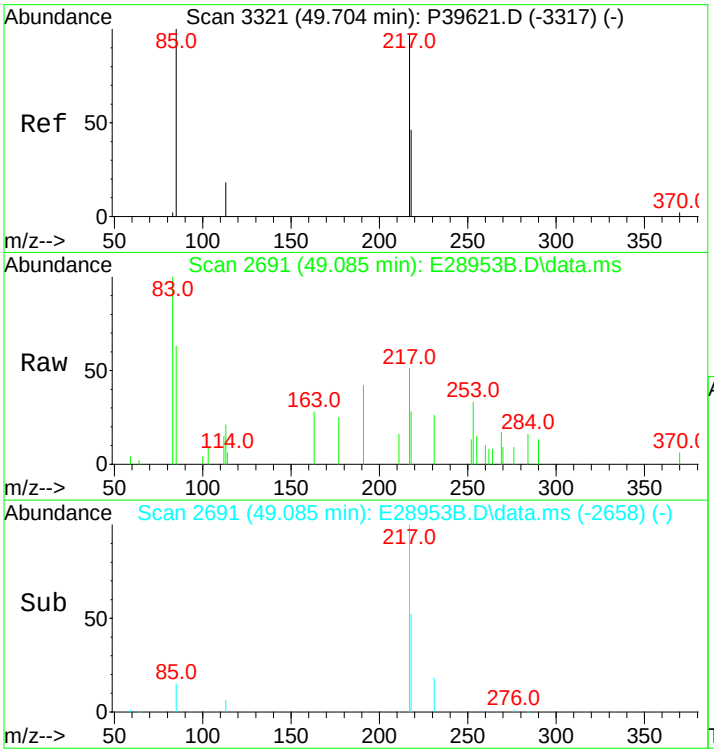




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 173.05 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

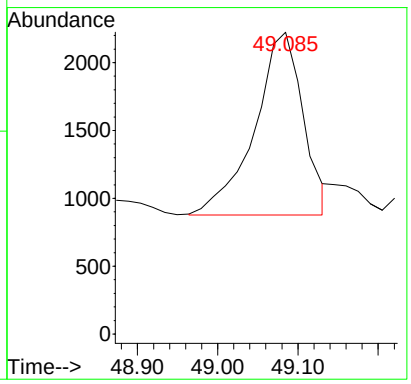
Tgt Ion:217 Resp: 3776

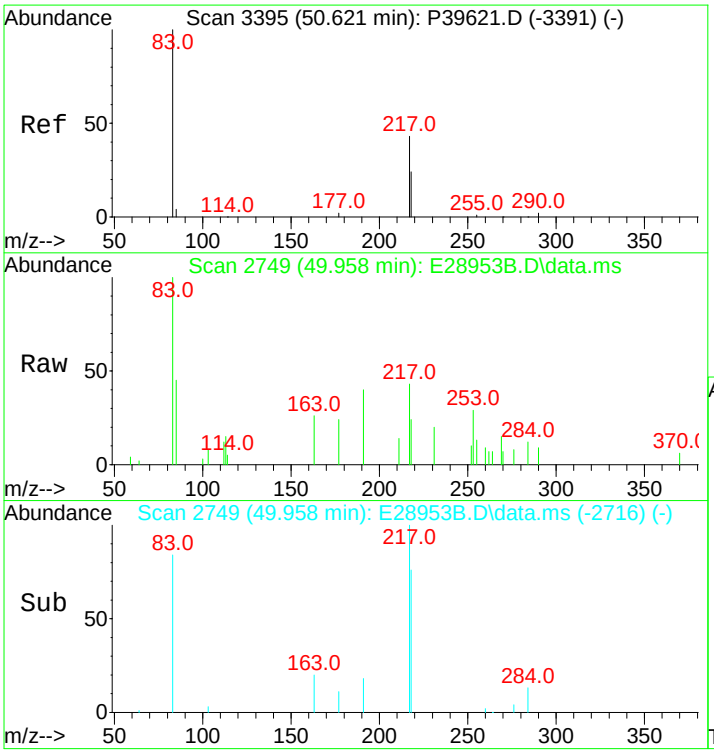




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 259.54 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

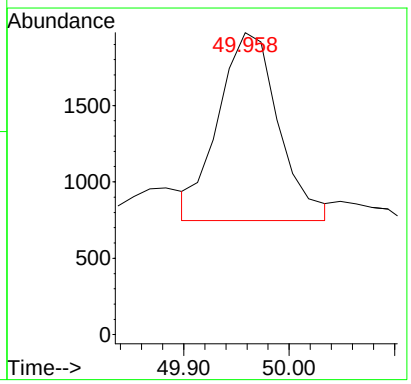
Tgt Ion:217 Resp: 5663

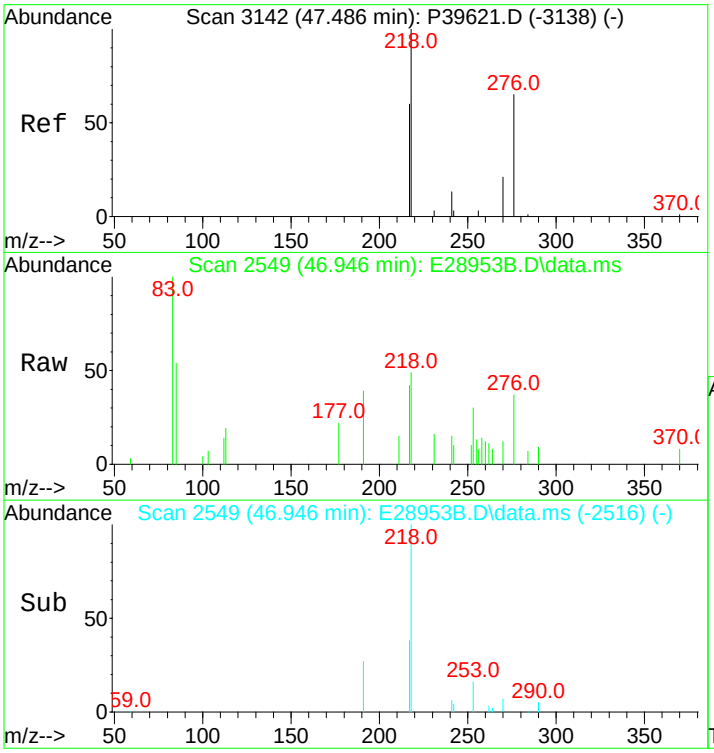




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 223.83 ng/ml m
RT: 49.958 min Scan# 2749
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

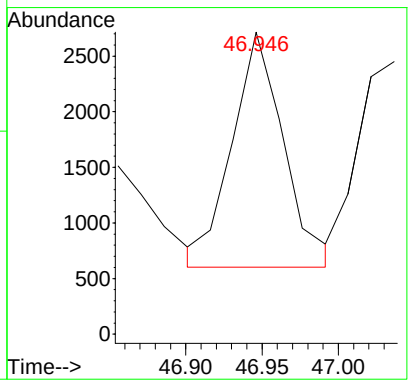
Tgt Ion:217 Resp: 4884

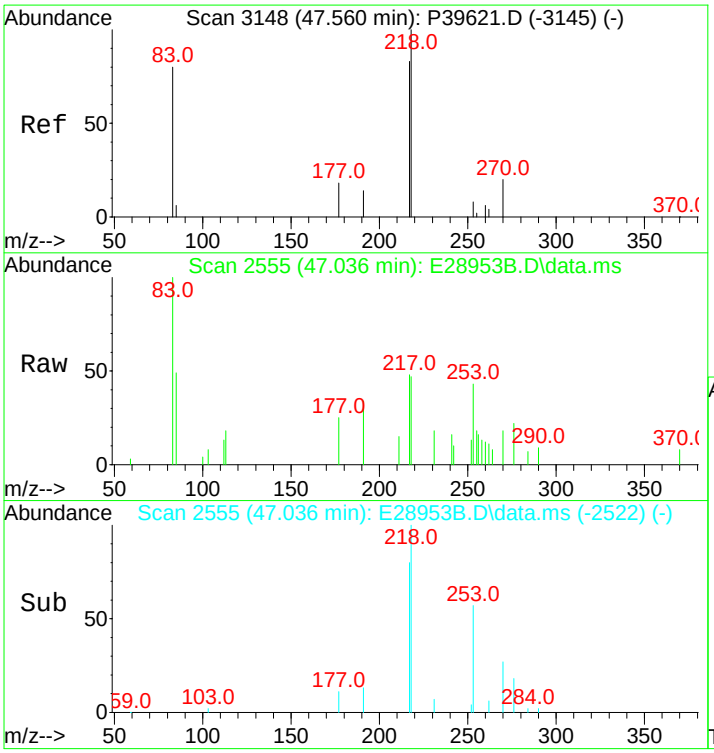




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 227.41 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

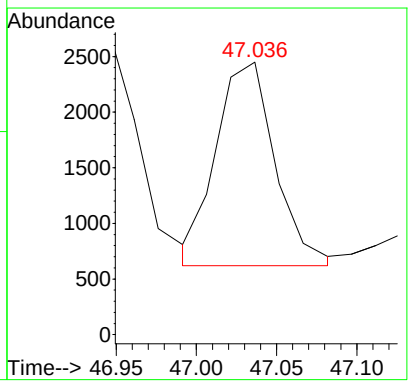
Tgt Ion:218 Resp: 4962

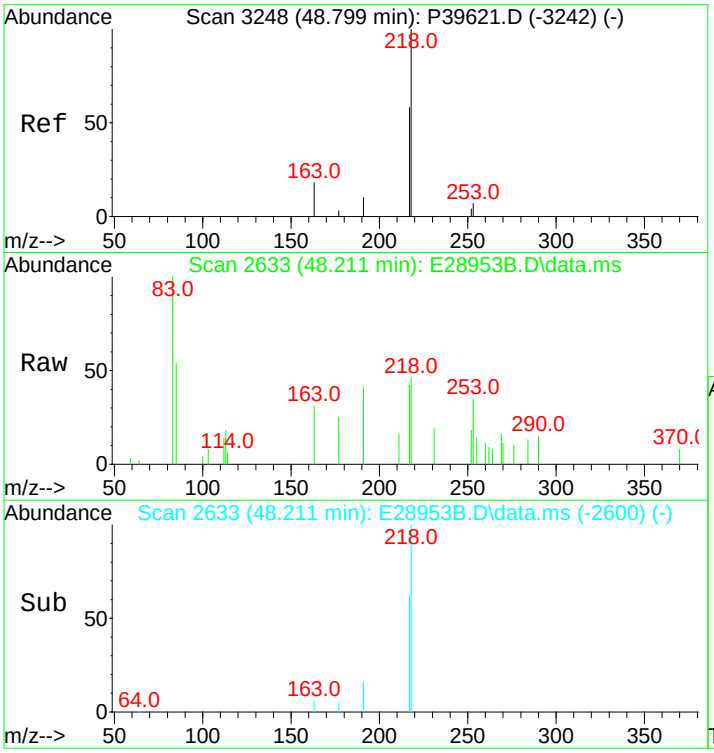




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 215.03 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

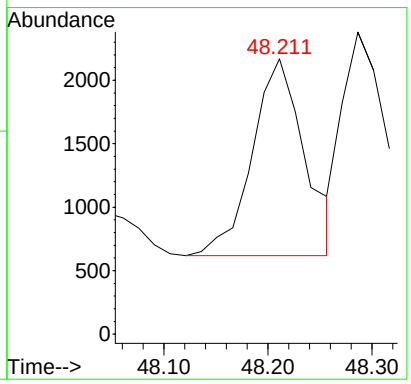
Tgt Ion:218 Resp: 4692

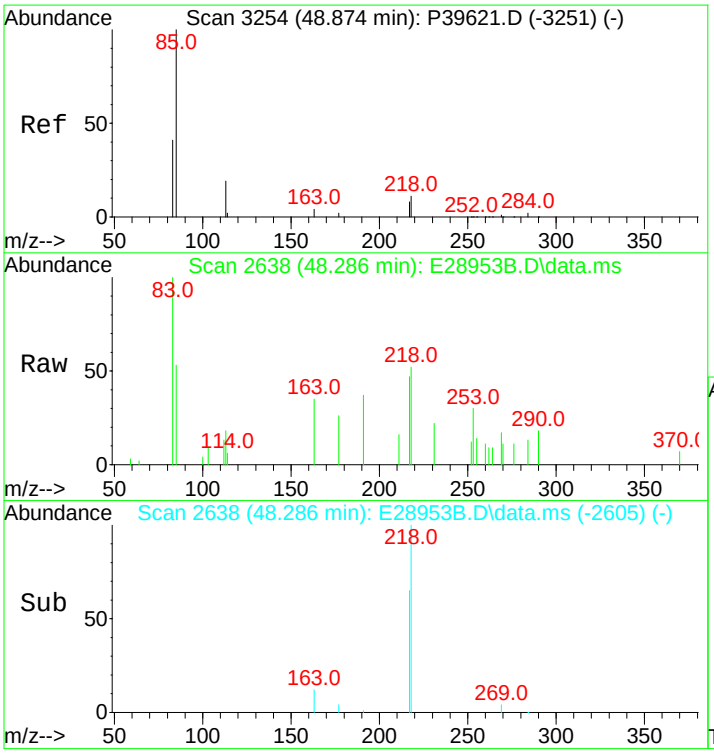




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 249.59 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

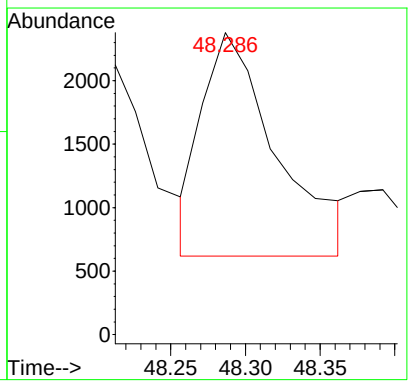
Tgt Ion:218 Resp: 5446

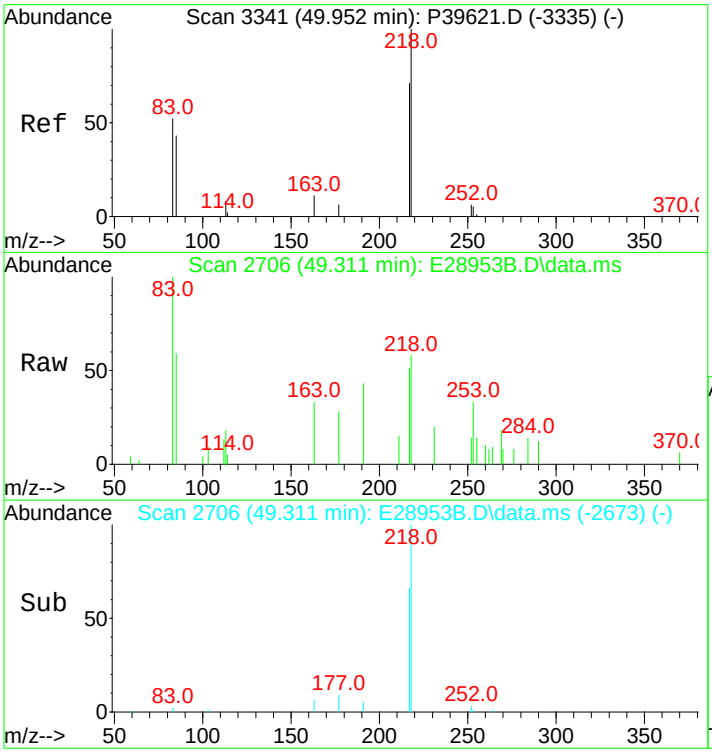




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 280.11 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

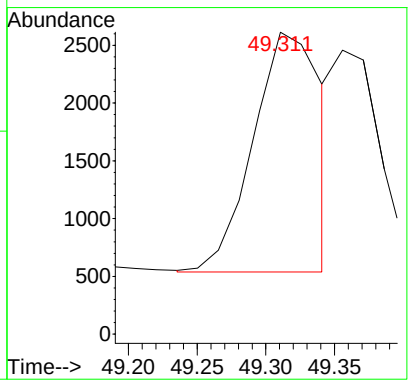
Tgt Ion:218 Resp: 6112

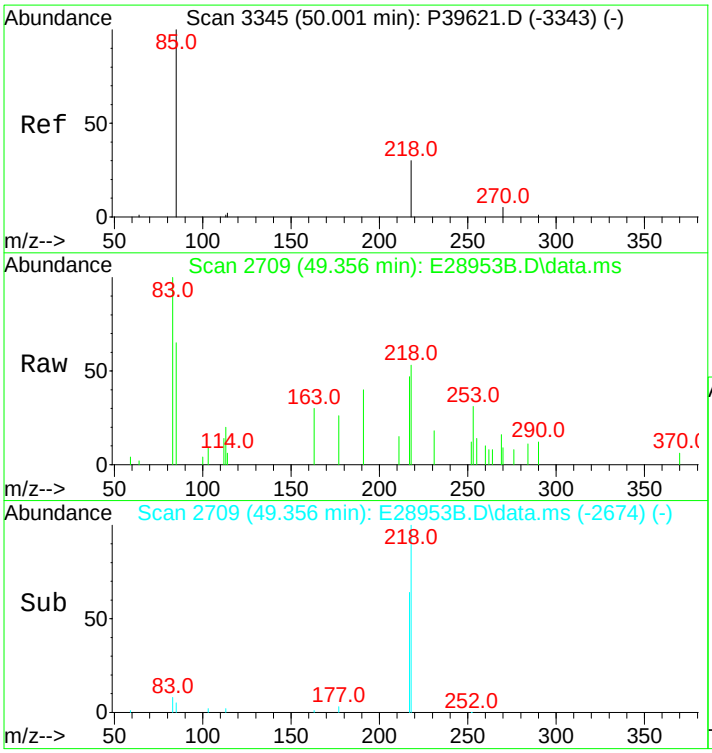




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 327.87 ng/ml m
RT: 49.311 min Scan# 2706
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

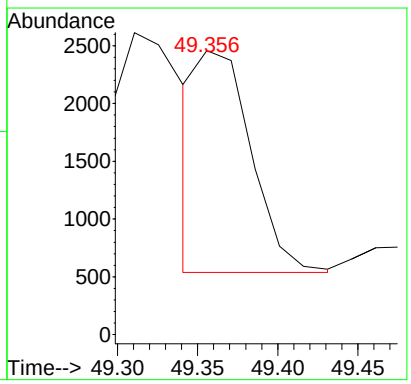
Tgt Ion:218 Resp: 7154

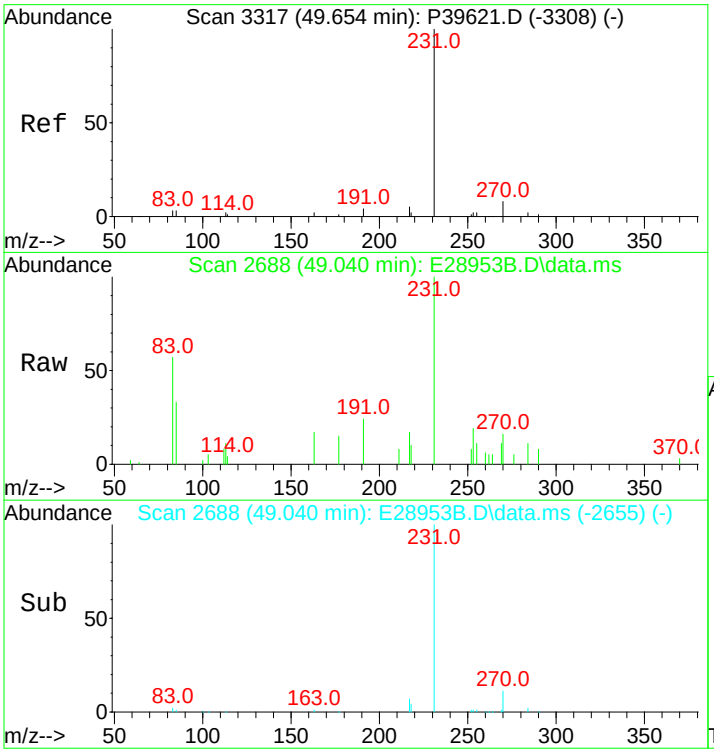




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 205.41 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

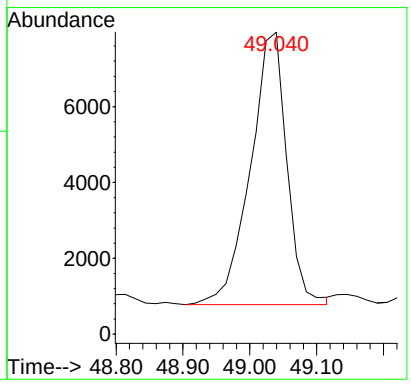
Tgt Ion:218 Resp: 4482

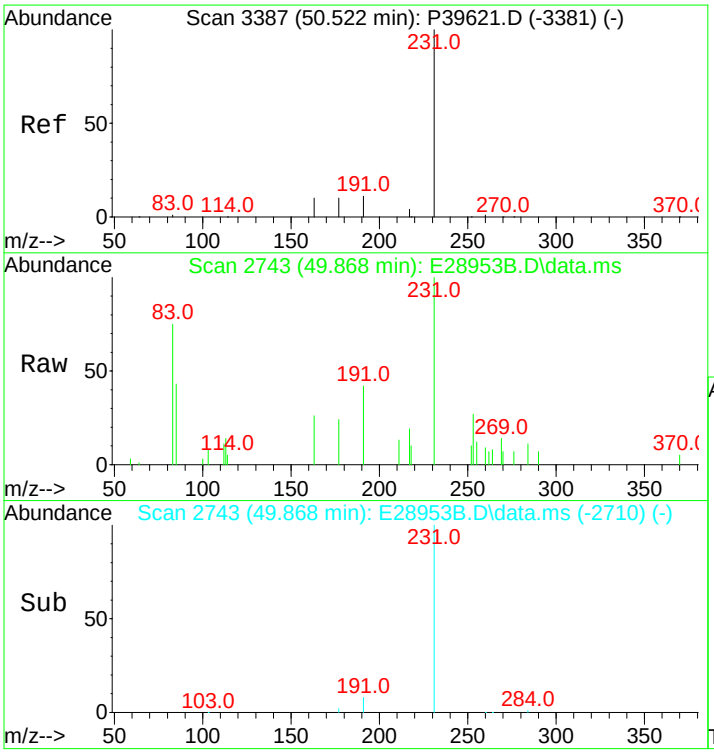




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1246.71 ng/mL
RT: 49.040 min Scan# 2688
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

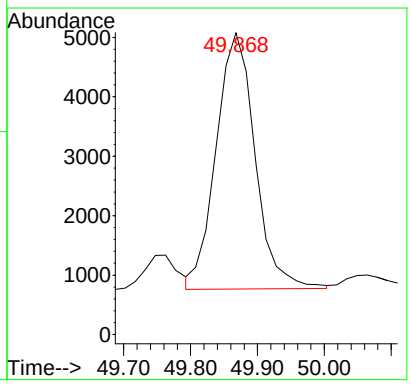
Tgt Ion:231 Resp: 27203

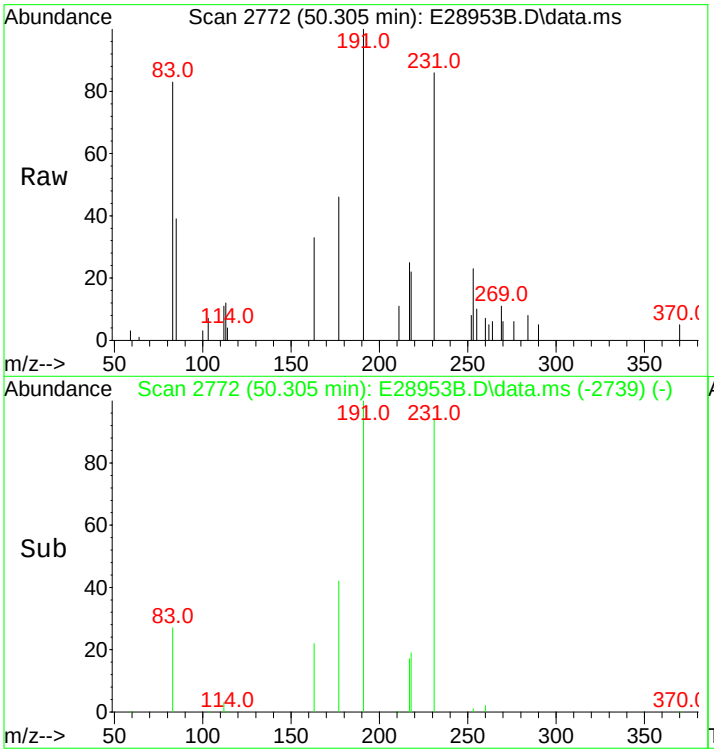


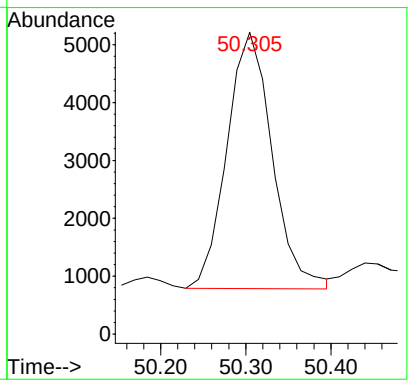


#148
C28,20S-triaromatic steroid
Concen: 799.50 ng/mL
RT: 49.868 min Scan# 2743
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:231 Resp: 17445

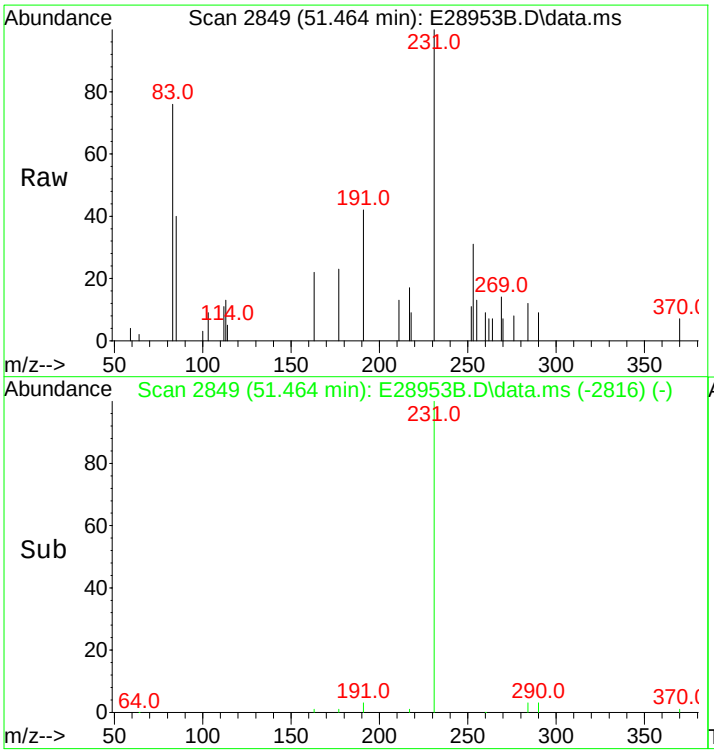


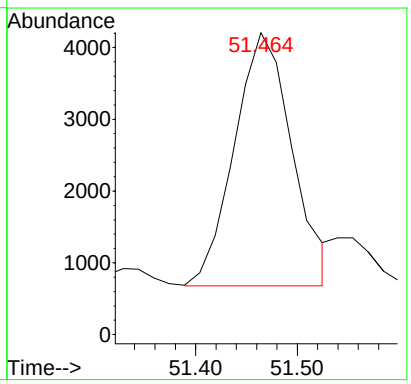




#149
C27,20R-triaromatic steroid
Concen: 752.16 ng/mL
RT: 50.305 min Scan# 2772
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:231 Resp: 16412





#150
C28,20R-triaromatic steroid
Concen: 639.83 ng/mL m
RT: 51.464 min Scan# 2849
Delta R.T. 0.000 min
Lab File: E28953B.D
Acq: 14 Nov 2012 9:16 am

Tgt Ion:231 Resp: 13961

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	21842M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	51901	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	75122	977.804	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.78%			
42) Phenanthrene-d10	32.085	188	83311	1058.430	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 105.84%			
83) Benzo[b]fluoranthene-d12	46.660	264	111635	1047.066	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.71%			
88) Benzo[a]pyrene-d12	47.804	264	110822	1072.760	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.28%			
129) 5B(H)Cholane - Surr	43.347	217	22186	1084.607	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.46%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	13052	747.041	ng/mL	100
4) cis-Decalin	17.091	138	1124	84.676	ng/mL	100
5) C1-Decalins	17.362	152	29663M5	1697.785	ng/mL	
6) C2-Decalins	18.792	166	42504m	2432.750	ng/mL	
7) C3-Decalins	21.622	180	33554m	1920.489	ng/mL	
8) C4-Decalins	24.995	194	37420M5	2141.763	ng/mL	
10) Naphthalene	19.304	128	31606	367.870	ng/mL#	100
11) C1-Naphthalenes	21.999	142	90373M5	1051.875	ng/mL	
12) C2-Naphthalenes	24.844	156	222589m	2590.771	ng/mL	
13) C3-Naphthalenes	27.193	170	265450m	3089.642	ng/mL	
14) C4-Naphthalenes	29.963	184	209560M5	2439.123	ng/mL	
16) 2-Methylnaphthalene	21.999	142	55769	1019.155	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	34727	653.116	ng/mL#	100
18) Benzothiophene	19.515	134	2602	36.634	ng/mL	100
19) C1-Benzo(b)thiophenes	21.562	148	13786M5	194.098	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	23346m	328.696	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	49201m	692.717	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	52800M5	743.389	ng/mL	
23) Biphenyl	23.881	154	5881M3	85.037	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	55634	1127.945	ng/mL#	100
25) Dibenzofuran	26.967	168	3329	43.479	ng/mL#	50
26) Acenaphthylene	25.597	152	1987	23.197	ng/mL#	100
27) Acenaphthene	26.320	153	3961M3	71.839	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	19874M3	430.671	ng/mL	
29) Fluorene	28.352	166	10777M3	175.249	ng/mL	
30) C1-Fluorenes	30.730	180	28376M5	461.434	ng/mL	
31) C2-Fluorenes	32.928	194	68351M5	1111.483	ng/mL	
32) C3-Fluorenes	34.780	208	76967m	1251.591	ng/mL	
33) Dibenzothiophene	31.679	184	27741	328.729	ng/mL#	65
34) 4-Methyldibenzothiophene(	33.455	198	37118	439.846	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	31892M3	377.918	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	19883	235.612	ng/mL#	100
37) OTP	33.877	198	8252M3	97.786	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	101204m	1199.260	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	92952m	1101.475	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	179953M5	2132.431	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	194163m	2300.818	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	133970M5	1587.535	ng/mL	
43) Phenanthrene	32.176	178	39318M3	457.952	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
44) 3-Methylphenanthrene(3MP)	34.148	192	22758	265.071	ng/mL	91
45) 2-Methylphenanthrene(2MP)	34.253	192	25392	295.750	ng/mL	96
46) 2-Methylanthracene(2MA)	34.419	192	1724M3	20.080	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.599	192	37285	434.272	ng/mL	98
48) 1-Methylphenanthrene(1MP)	34.690	192	21928M3	255.404	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.599	192	111975M5	1304.215	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	167293M5	1948.525	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	167293m	1948.525	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.538	220	155088M5	1806.369	ng/mL	
53) C4-Phenanthrenes/Anthrace	39.192	234	82125M5	956.541	ng/mL	
54) Retene	39.192	234	9360M3	338.791	ng/mL	
55) Anthracene	32.401	178	2120M3	28.568	ng/mL	
56) Carbazole	33.019	167	2417M3	31.646	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21795M3	332.742	ng/mL	
58) Fluoranthene	36.963	202	3417M3	36.039	ng/mL	
60) Pyrene	37.852	202	12034	124.871	ng/mL#	72
61) C1-Fluoranthenes/Pyrenes	39.252	216	42027m	436.093	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.736	230	61979M5	643.125	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	72727m	754.651	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.461	258	74298M5	770.953	ng/mL	
66) Naphthobenzothiophene	41.721	234	13161M3	138.463	ng/ml	
67) Naphthobenzothiophene-2,1	41.721	234	12820M3	134.876	ng/mL	
68) Naphthobenzothiophene-1,2	42.067	234	3370M3	35.455	ng/mL	
69) Naphthobenzothiophene-2,3	42.368	234	2267M3	23.850	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	64936M5	683.174	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	105816M5	1113.262	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	87977M5	925.582	ng/ml	
73) C4-Naphthobenzothiophenes	47.804	290	74820M5	787.161	ng/mL	
75) Benz[a]anthracene	42.655	228	2315M3	22.906	ng/mL	
77) Chrysene/Triphenylene	42.805	228	12114M3	116.424	ng/mL	
78) C1-Chrysenes	44.311	242	33434M5	321.324	ng/mL	
79) C2-Chrysenes	46.404	256	57755M5	555.066	ng/mL	
79) C2-Chrysenes BS	46.404	256	54167m	520.583	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3588M6	34.483	ng/mL	
81) C3-Chrysenes	47.729	270	72854M5	700.178	ng/mL	
82) C4-Chrysenes	49.130	284	47325M5	454.826	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	4119M3	35.063	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1239M3	10.251	ng/mL	
87) Benzo[e]pyrene	47.699	252	6166M3	53.755	ng/mL	
89) Benzo[a]pyrene	47.895	252	3378M3	30.777	ng/mL	
90) Perylene	48.196	252	7151	61.614	ng/mL#	74
91) Indeno[1,2,3-cd]pyrene	52.563	276	2214M3	17.140	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	1098M3	7.983	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	5879	42.211	ng/mL#	86
94) Hopane (T19)	51.645	191	48000M3	1232.316	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19756	507.201	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10718	275.166	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.579	191	9782M3	251.136	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3461M3	88.855	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3617M3	92.860	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3620M3	92.937	ng/ml	
102) C28 Tricyclic Terpane-22S	46.057	191	3973M3	102.000	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	4617M3	118.533	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5151	132.243	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5229M3	134.245	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5523	141.793	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.106	191	4143M3	106.364	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4289M3	110.113	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.512	191	12637	324.433	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8237M3	211.471	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.506	191	2402	61.667	ng/ml	100
112) 30-Norhopane (T15)	50.320	191	35007M3	898.744	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5508M3	141.408	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1793M3	46.032	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3674	94.324	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.479	191	401M3	10.295	ng/ml	
117) Moretane (T20)	52.308	191	3900M3	100.126	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	21315	547.225	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17506	449.436	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8063	207.003	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.882	191	14103	362.070	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10222	262.432	ng/ml	100
123) 30,31-Trishomohopane-22S	56.945	191	11269	289.312	ng/ml	100
124) 30,31-Trishomohopane-22R	57.533	191	7735	198.583	ng/ml	100
125) Tetrakishomohopane-22S (T	59.475	191	7464	191.625	ng/ml	100
126) Tetrakishomohopane-22R (T	60.349	191	5563	142.820	ng/ml	100
127) Pentakishomohopane-22S (T	62.517	191	9828	252.317	ng/ml	100
128) Pentakishomohopane-22R (T	63.752	191	6771M3	173.834	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.868	217	4167	203.712	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.289	217	1740M3	85.063	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1973M3	96.454	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6392	312.486	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7357	359.662	ng/ml	100
135) Unknown Sterane (S18)	47.639	217	1488	72.744	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	613	29.968	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2720	132.973	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2868M3	140.208	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5917M3	289.264	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5030M3	245.902	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5183M3	253.381	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	4969M3	242.919	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4326	211.485	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	5806M3	283.838	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7623M3	372.666	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.356	218	5312M3	259.688	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23942	1170.452	ng/mL	100
148) C28,20S-triaromatic stero	49.883	231	20094M3	982.335	ng/mL	
149) C27,20R-triaromatic stero	50.304	231	15473	756.428	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17191M3	840.416	ng/mL	

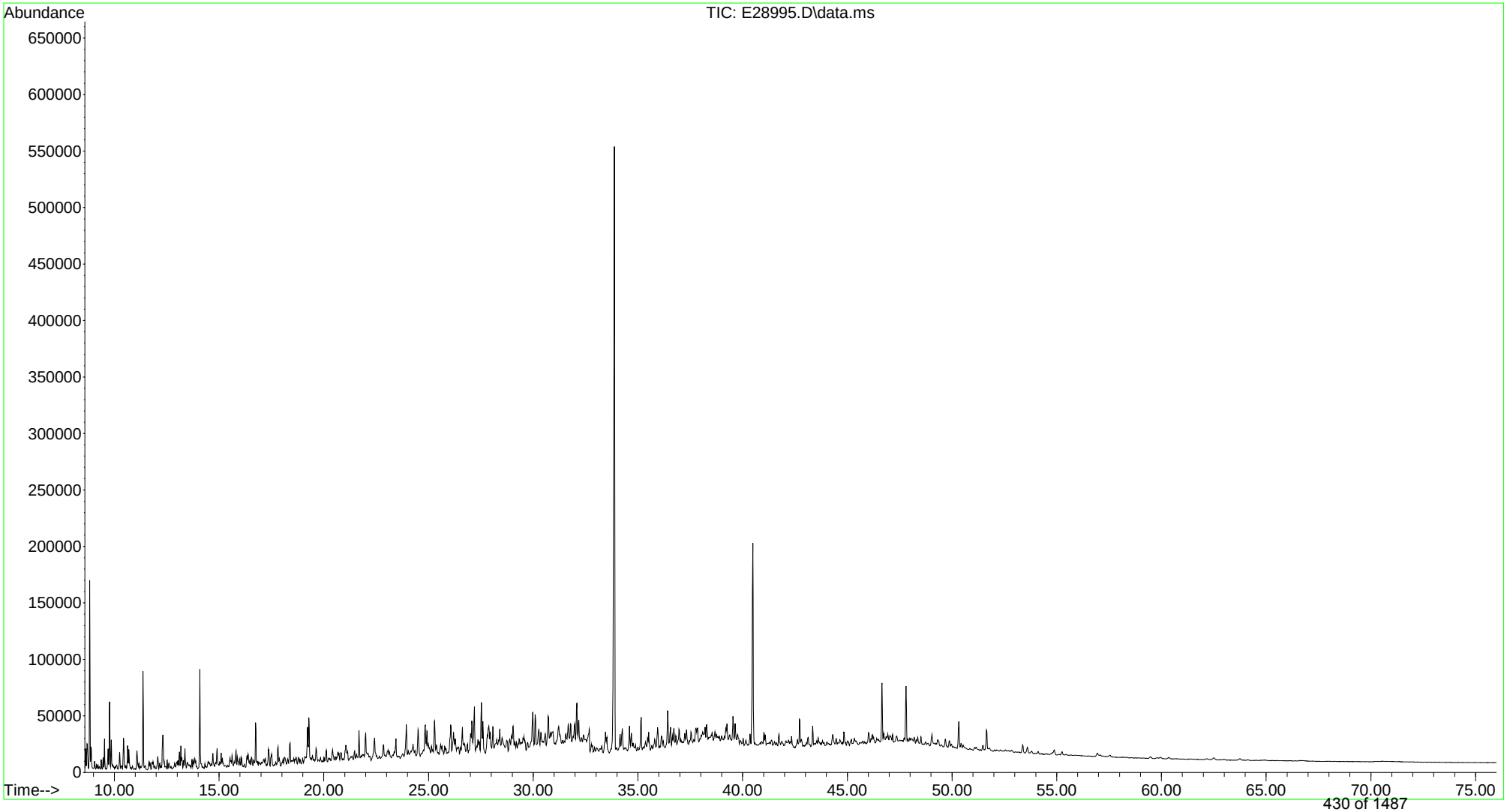
(#) = qualifier out of range (m) = manual integration (+) = signals summed

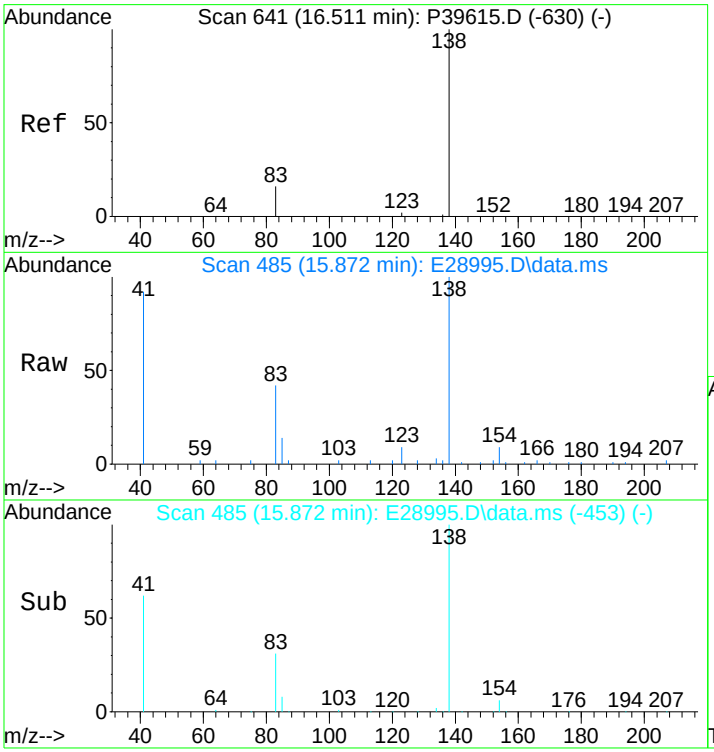
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28995.D
Acq On : 15 Nov 2012 4:42 pm
Operator : AC
Sample : SS111612WCS01
Misc : WCS WHAQ73 5.036
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Nov 16 13:53:27 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

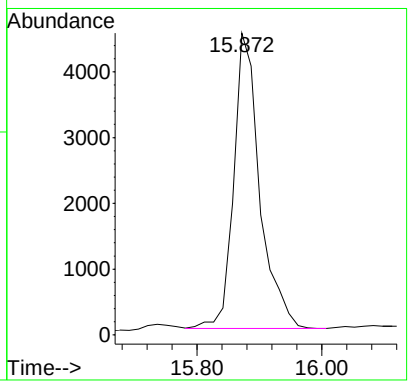
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

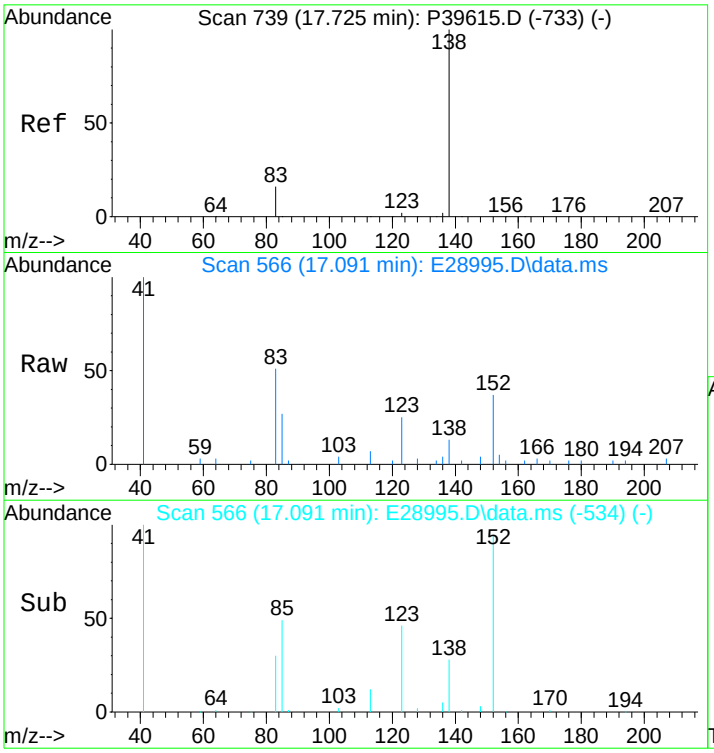




#3
trans-Decalin
Concen: 747.04 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

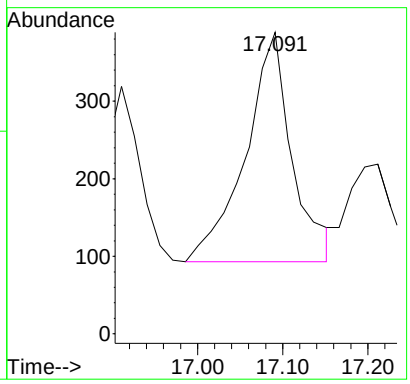
Tgt Ion:138 Resp: 13052

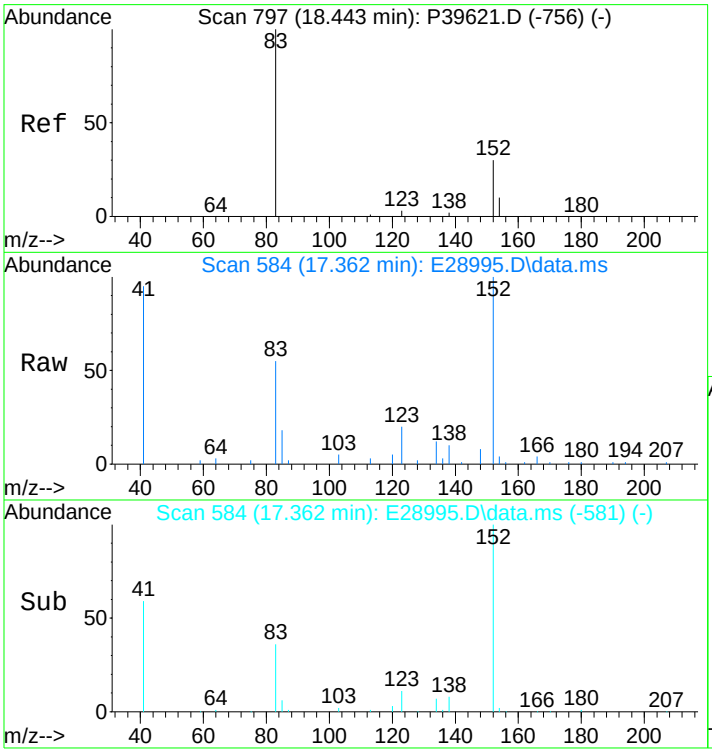




#4
cis-Decalin
Concen: 84.68 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

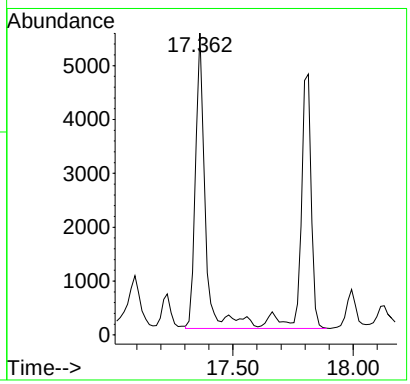
Tgt Ion:138 Resp: 1124

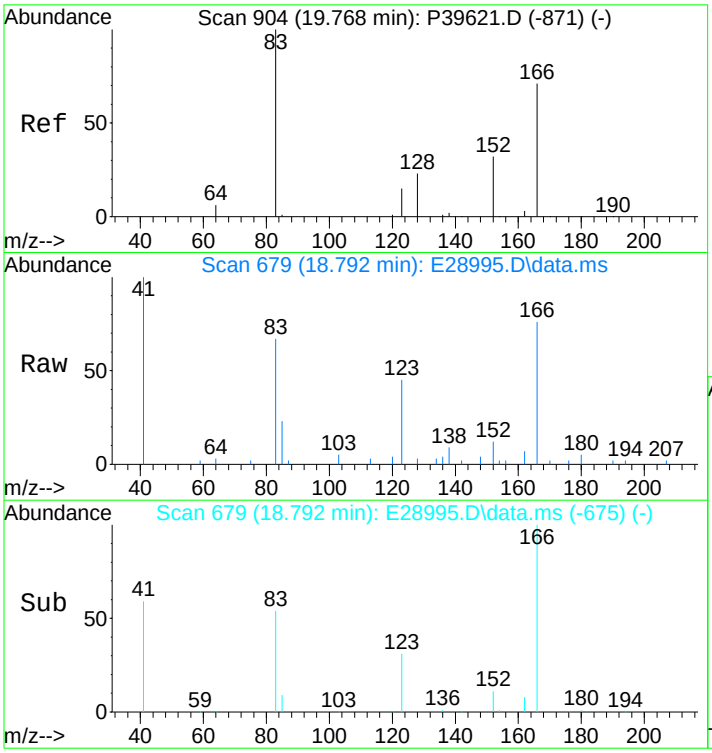




#5
C1-Decalins
Concen: 1697.78 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

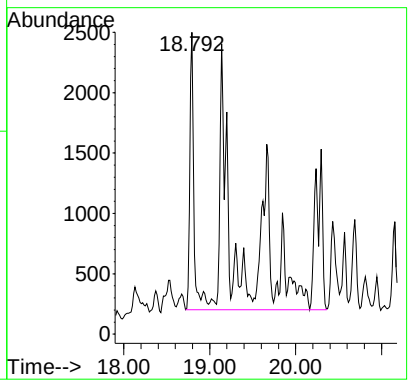
Tgt Ion:152 Resp: 29663

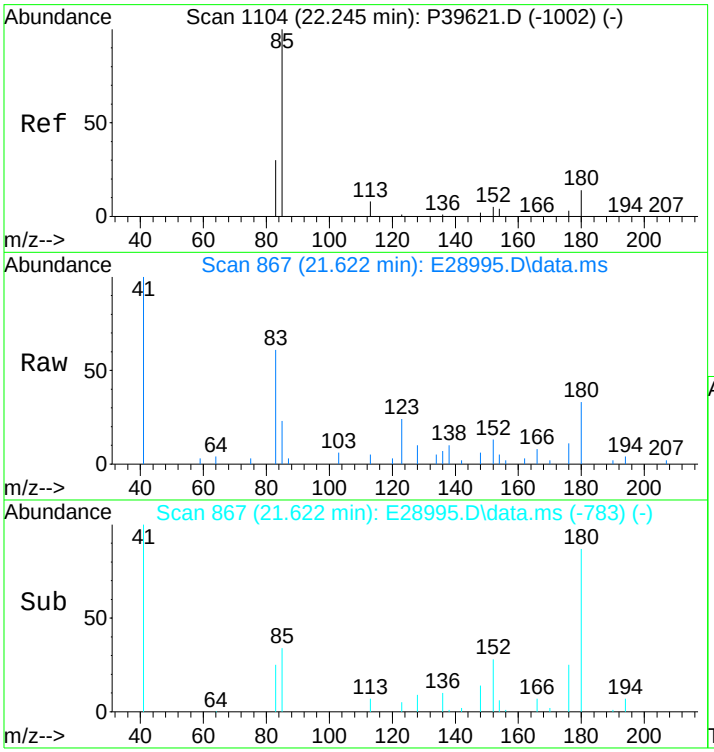




#6
C2-Decalins
Concen: 2432.75 ng/mL m
RT: 18.792 min Scan# 679
Delta R.T. -0.551 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

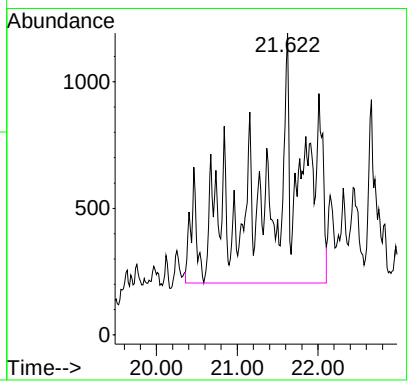
Tgt Ion:166 Resp: 42504

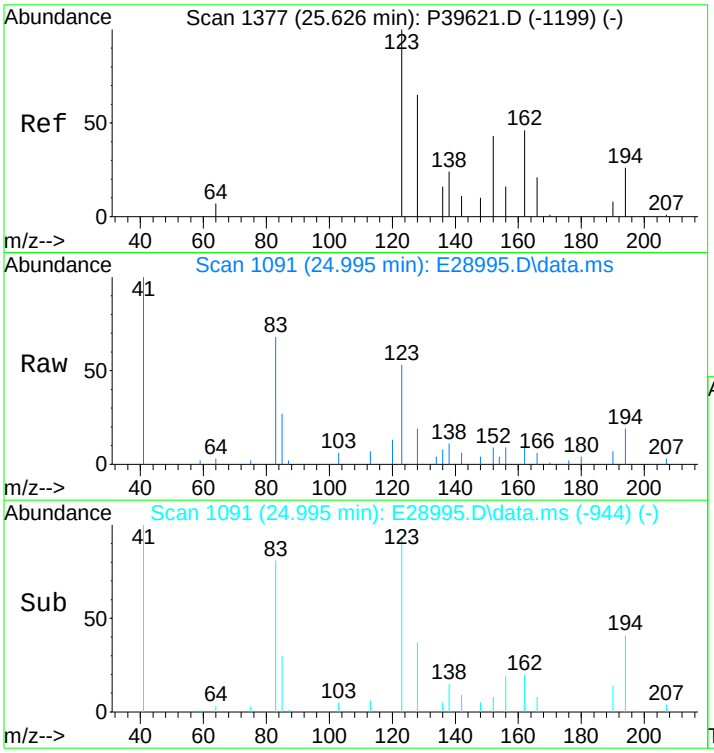




#7
C3-Decalins
Concen: 1920.49 ng/mL m
RT: 21.622 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

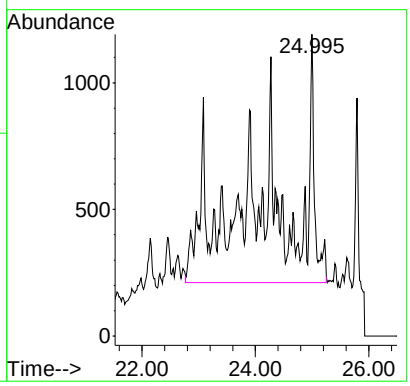
Tgt Ion:180 Resp: 33554

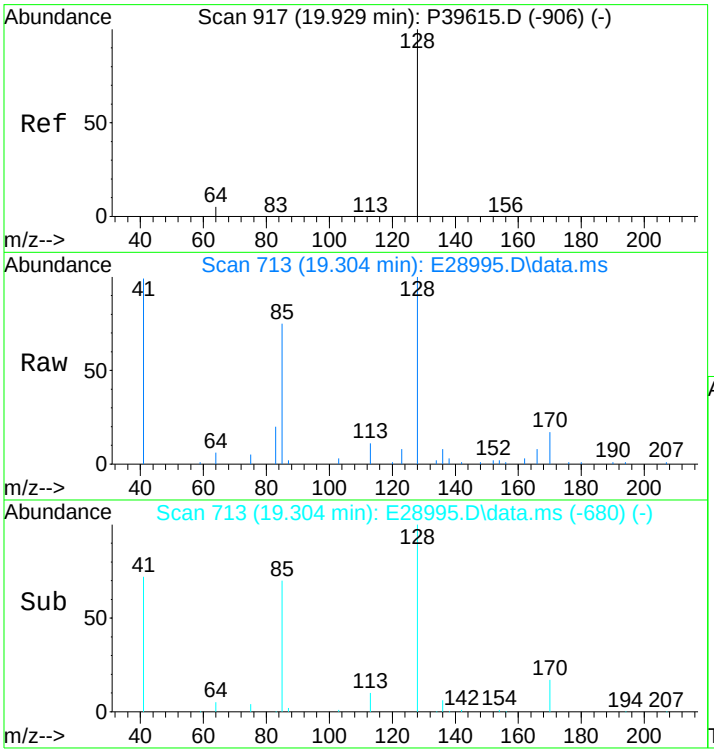




#8
C4-Decalins
Concen: 2141.76 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.061 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:194 Resp: 37420

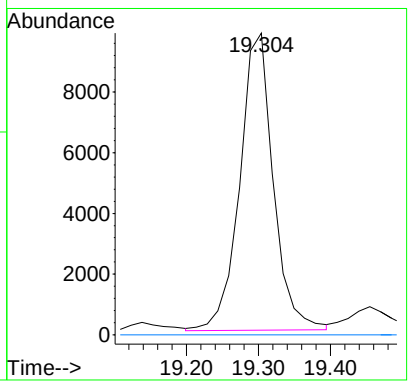


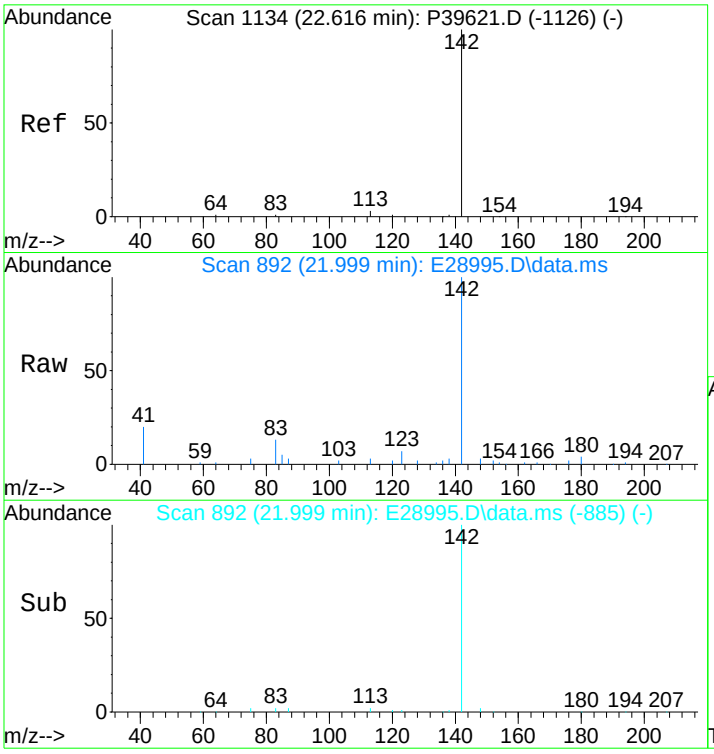


#10
Naphthalene
Concen: 367.87 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:128 Resp: 31606

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

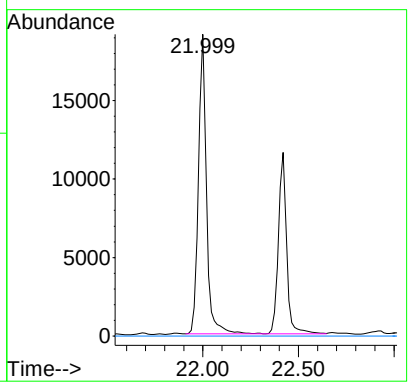


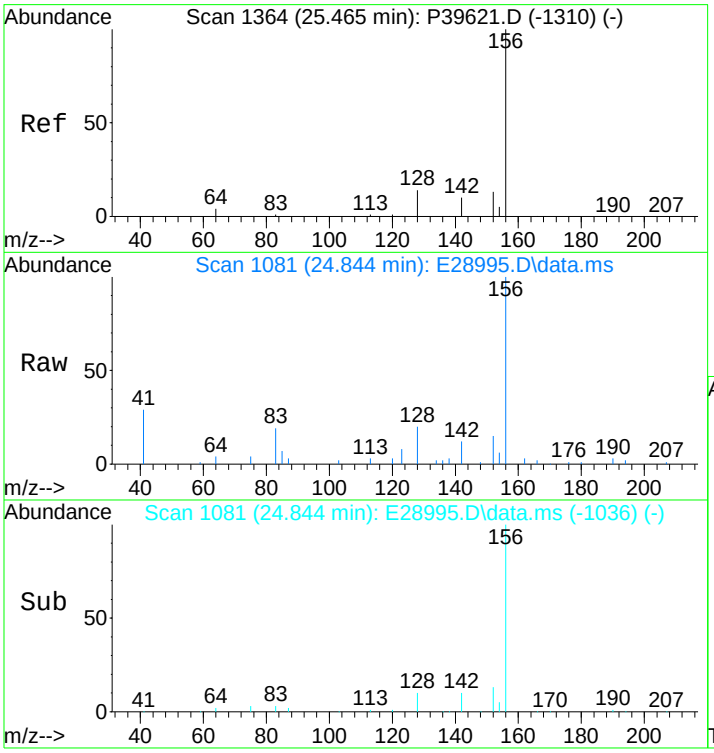


#11
C1-Naphthalenes
Concen: 1051.87 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:142 Resp: 90373

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

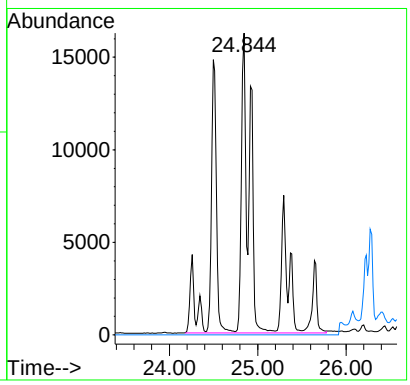


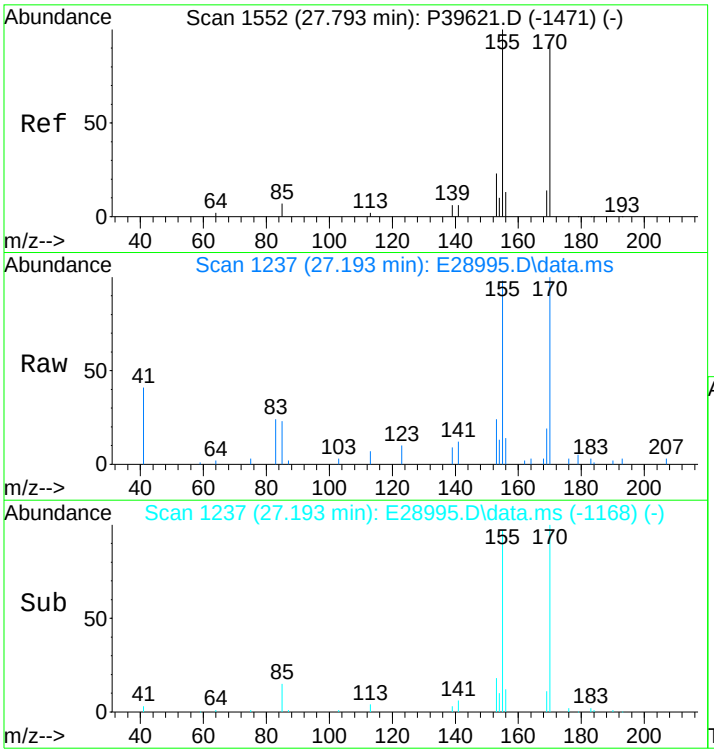


#12
C2-Naphthalenes
Concen: 2590.77 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:156 Resp: 222589

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

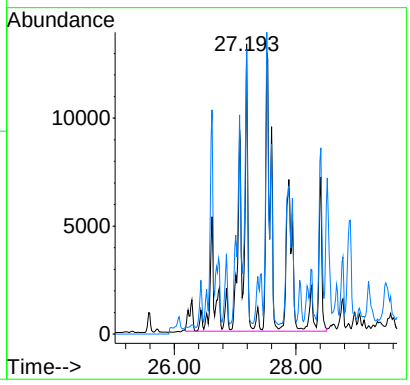


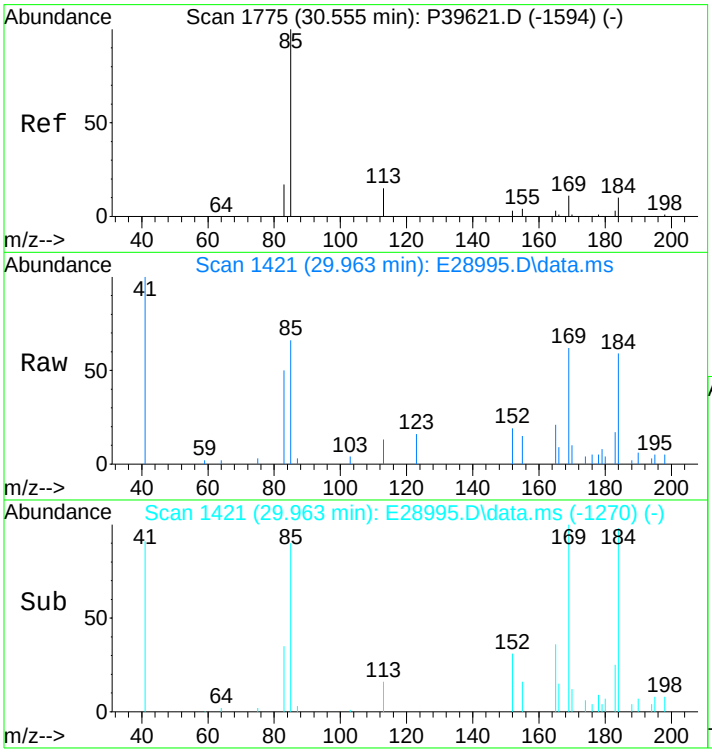


#13
C3-Naphthalenes
Concen: 3089.64 ng/mL m
RT: 27.193 min Scan# 1237
Delta R.T. 0.013 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:170 Resp: 265450

Ion	Ratio	Lower	Upper
170	100		
155	15.2	66.8	100.2#

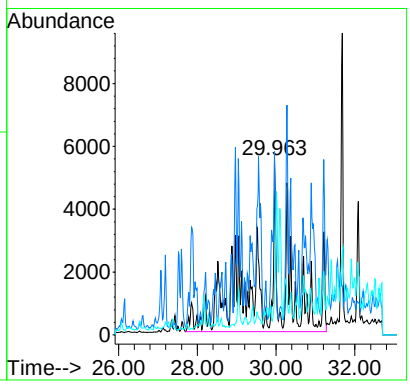


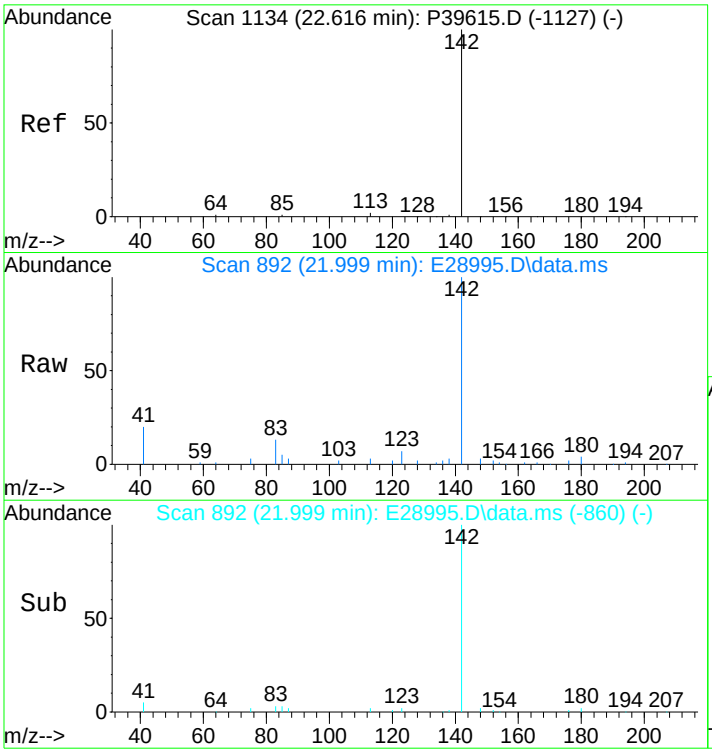


#14
C4-Naphthalenes
Concen: 2439.12 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:184 Resp: 209560

Ion	Ratio	Lower	Upper
184	100		
169	4.1	78.7	118.1#
183	1.3	26.7	40.1#

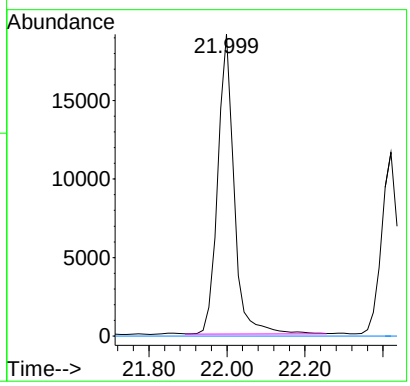


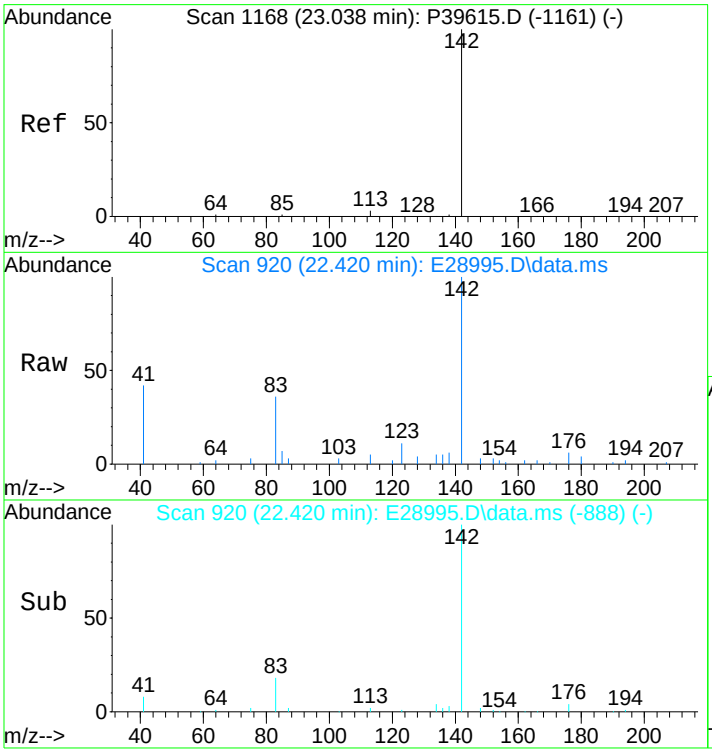


#16
2-Methylnaphthalene
Concen: 1019.15 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:142 Resp: 55769

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

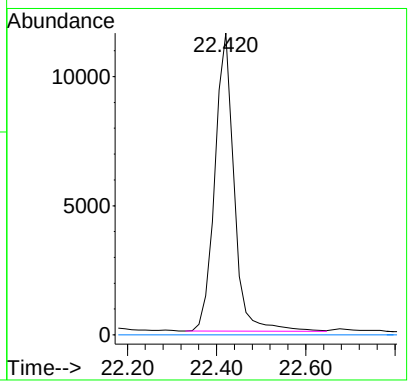


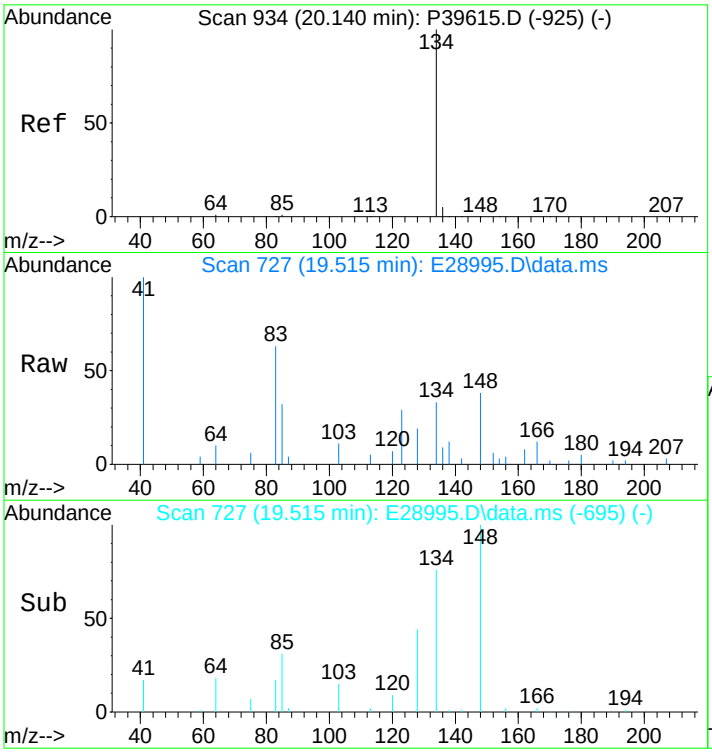


#17
1-Methylnaphthalene
Concen: 653.12 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:142 Resp: 34727

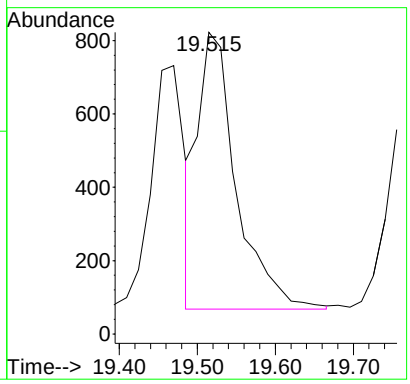
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

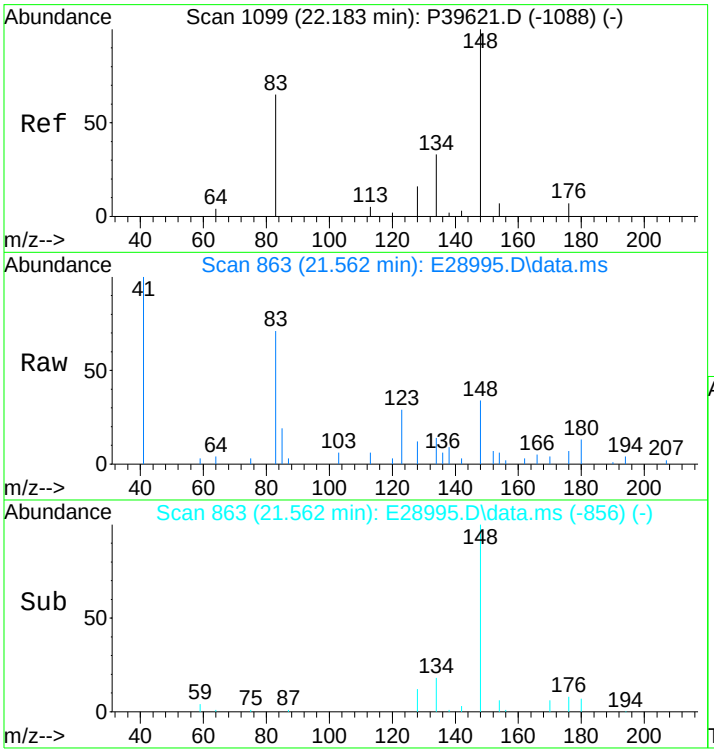




#18
Benzothiophene
Concen: 36.63 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

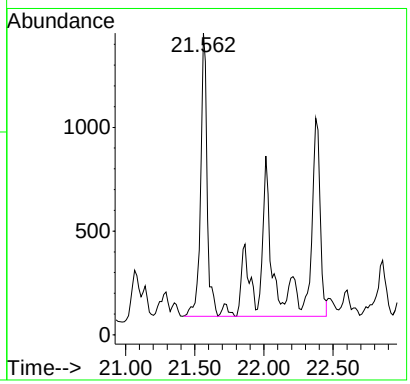
Tgt Ion:134 Resp: 2602

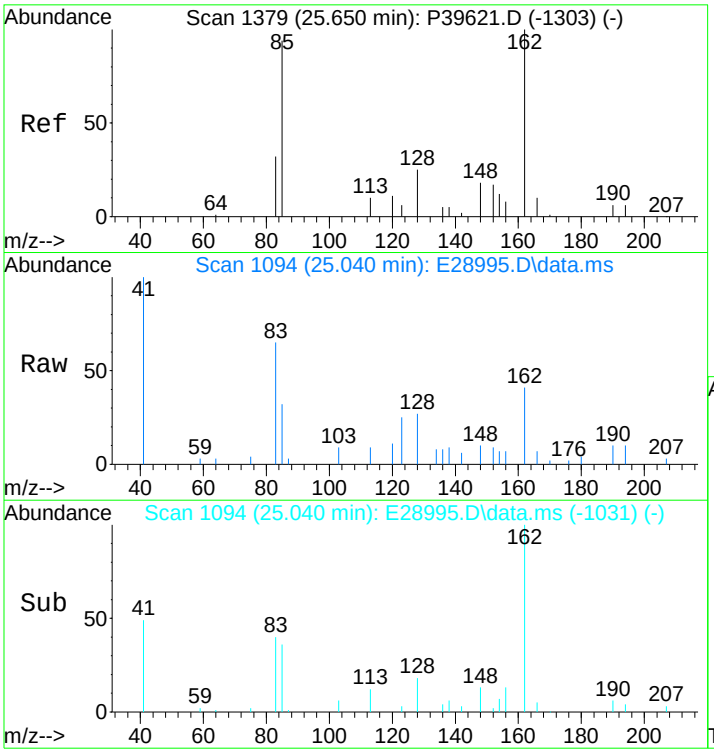




#19
C1-Benzo(b)thiophenes
Concen: 194.10 ng/mL m
RT: 21.562 min Scan# 863
Delta R.T. -0.139 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

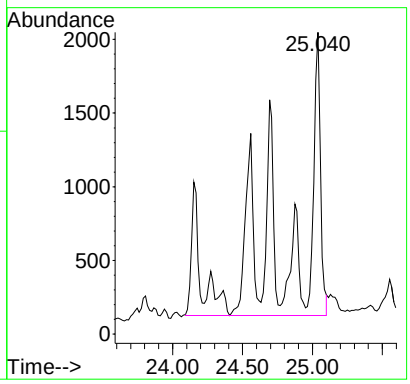
Tgt Ion:148 Resp: 13786

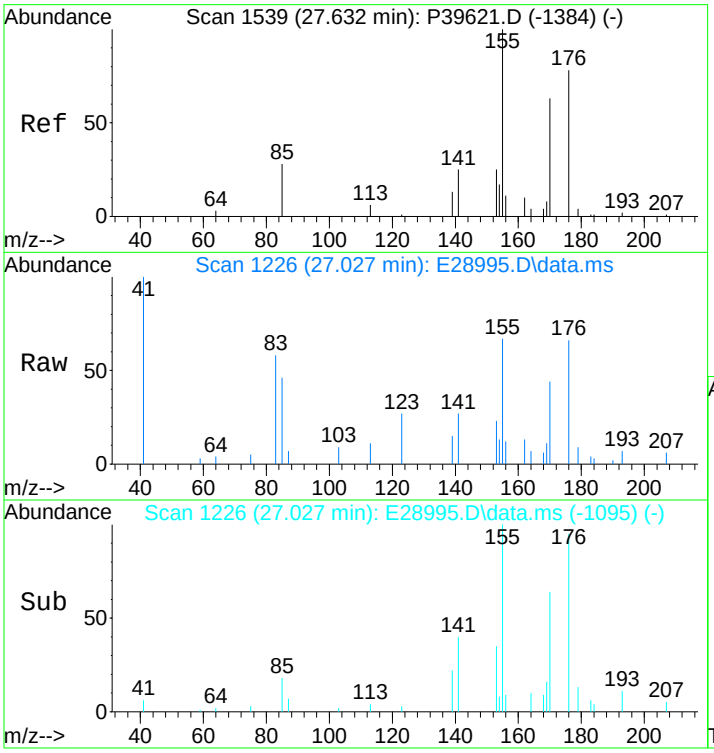




#20
C2-Benzo(b)thiophenes
Concen: 328.70 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

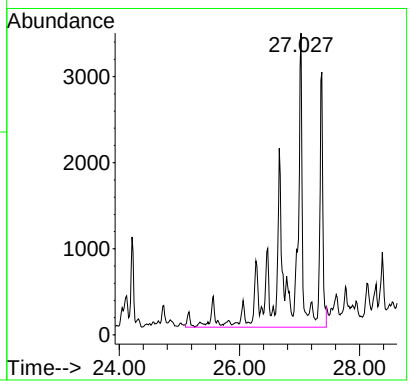
Tgt Ion:162 Resp: 23346

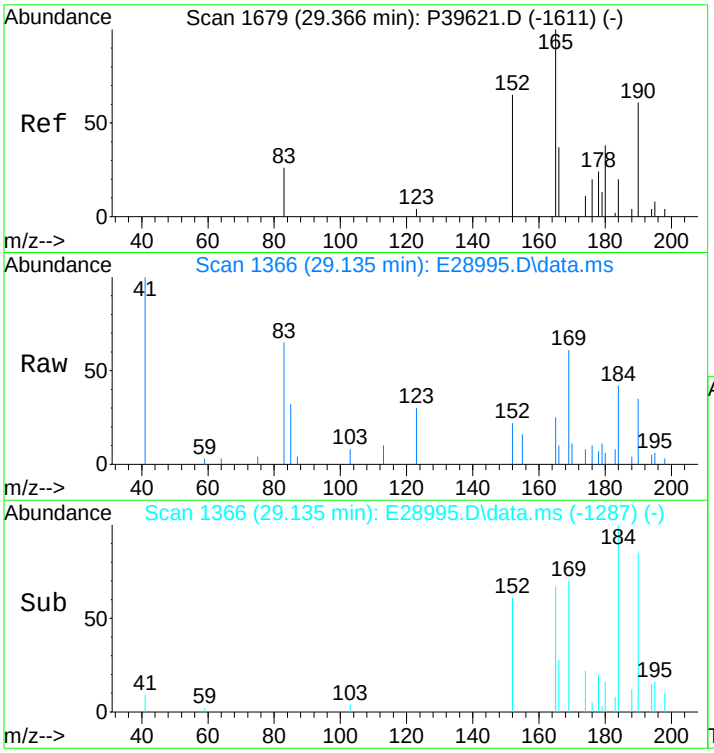




#21
C3-Benzo(b)thiophenes
Concen: 692.72 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

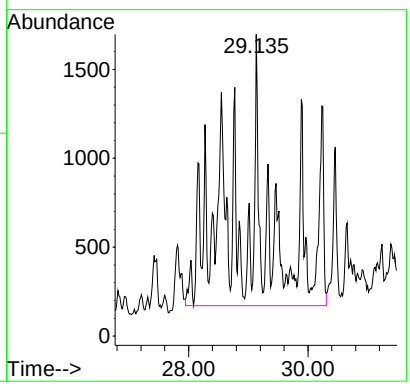
Tgt Ion:176 Resp: 49201

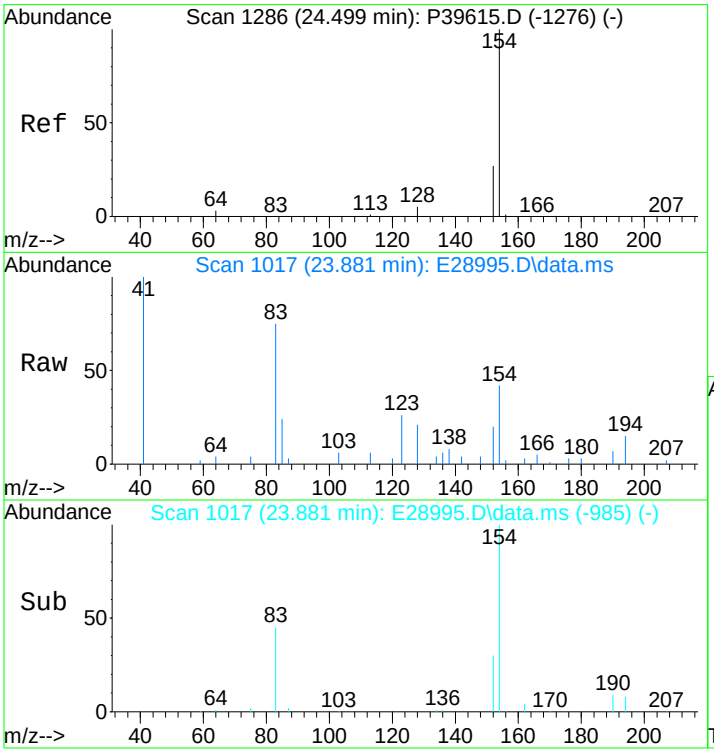




#22
C4-Benzo(b)thiophenes
Concen: 743.39 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:190 Resp: 52800

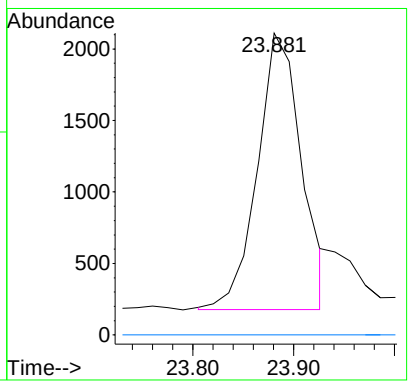


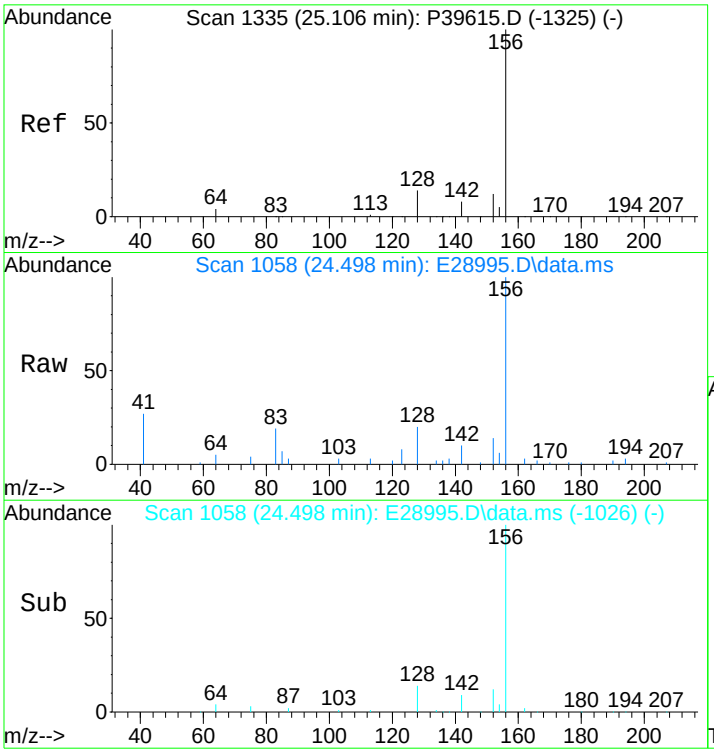


#23
Biphenyl
Concen: 85.04 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:154 Resp: 5881

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

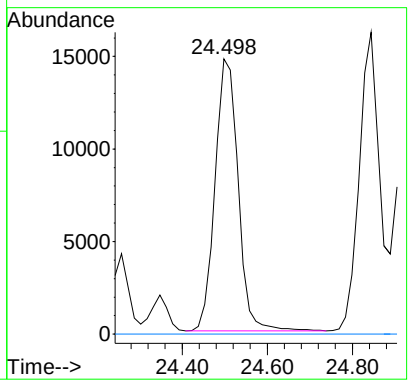


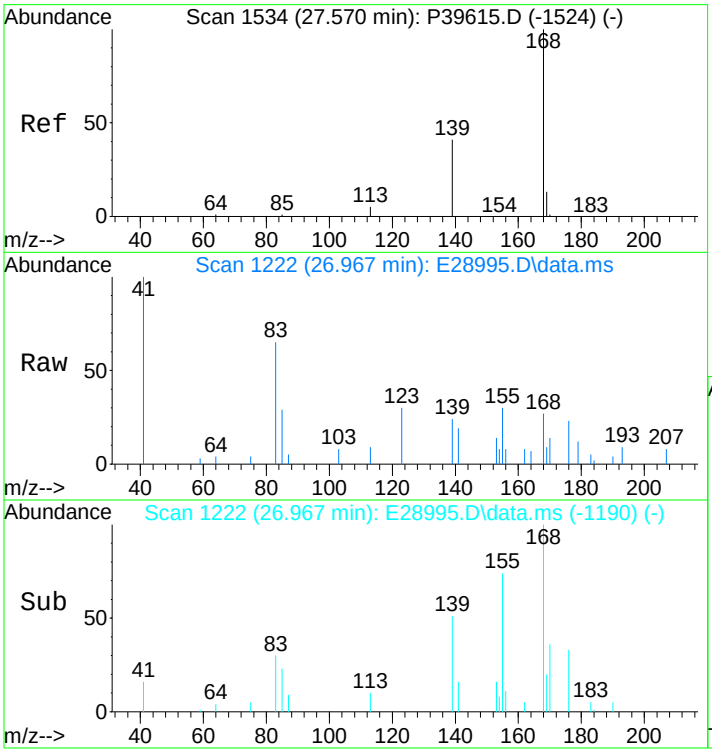


#24
2,6-Dimethylnaphthalene
Concen: 1127.95 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:156 Resp: 55634

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

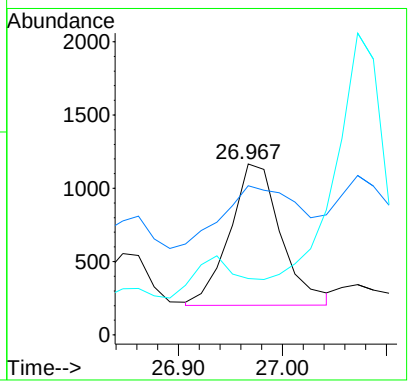


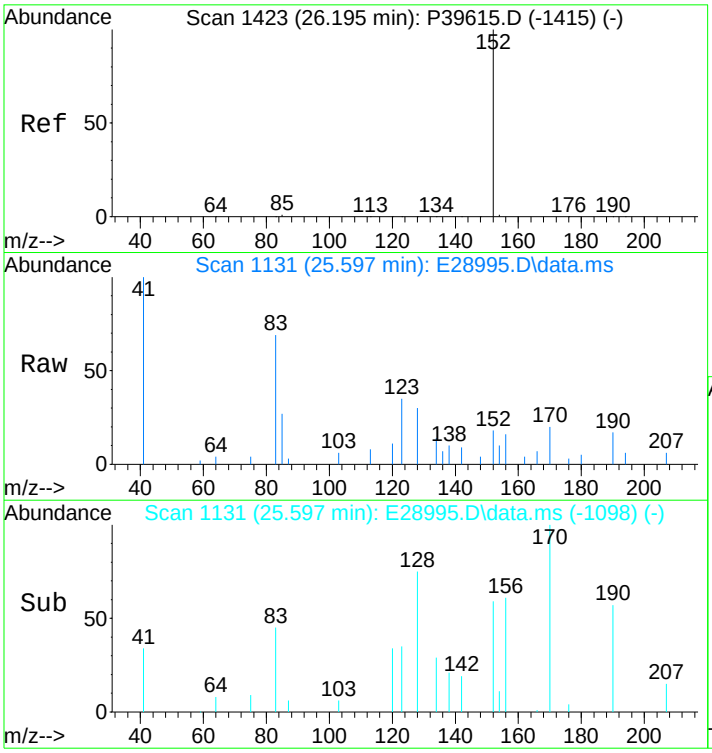


#25
Dibenzofuran
Concen: 43.48 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:168 Resp: 3329

Ion	Ratio	Lower	Upper
168	100		
139	64.1	26.0	39.0#
169	0.0	10.6	16.0#

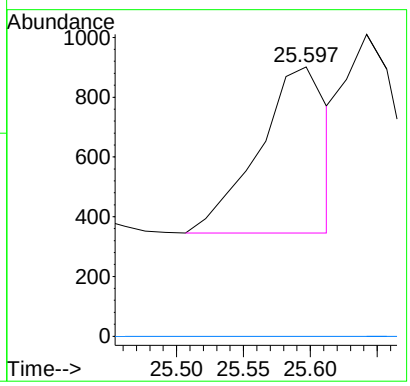


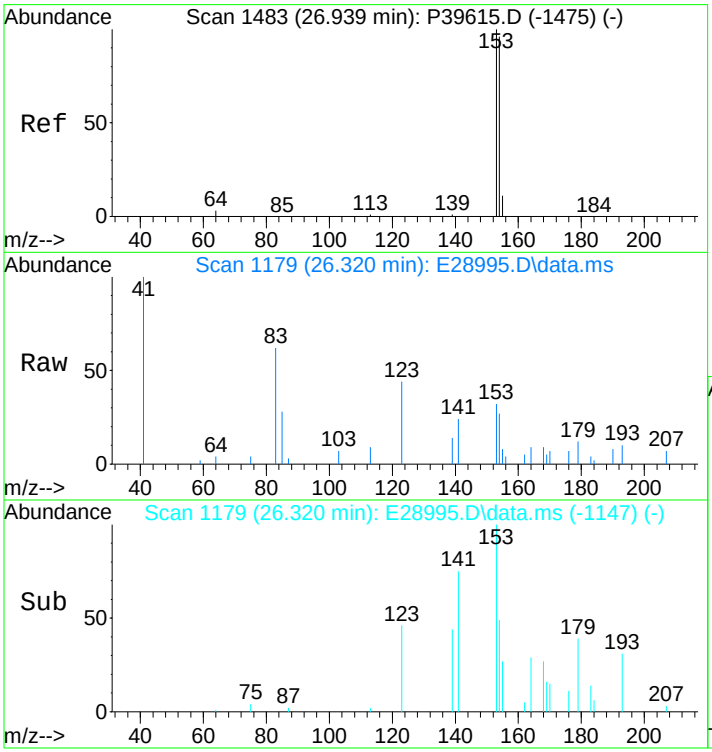


#26
Acenaphthylene
Concen: 23.20 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:152 Resp: 1987

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

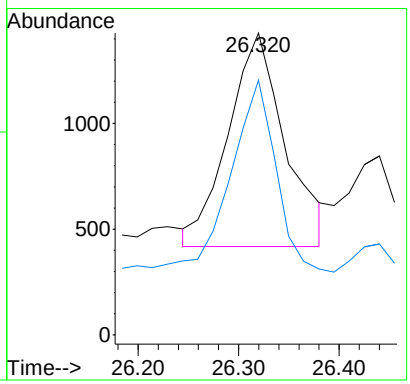


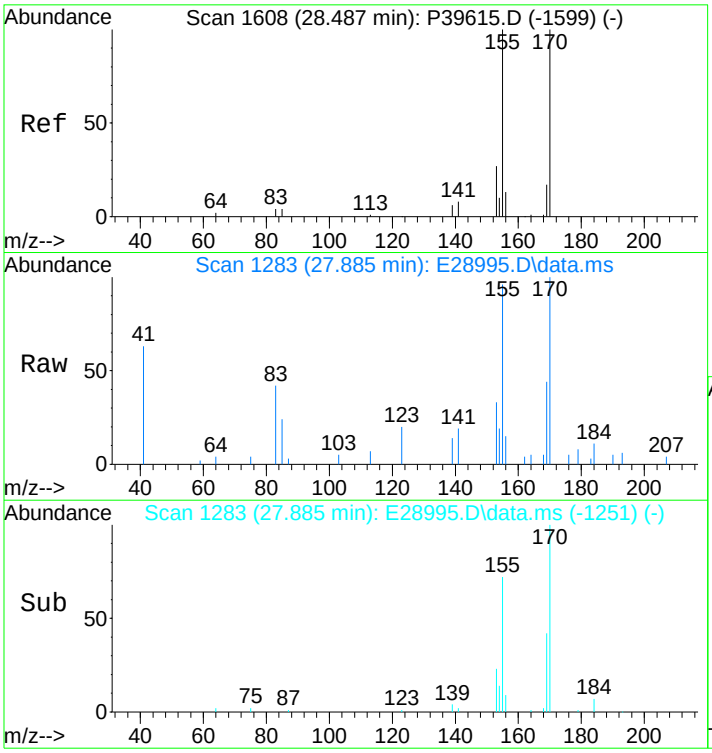


#27
Acenaphthene
Concen: 71.84 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:153 Resp: 3961

Ion	Ratio	Lower	Upper
153	100		
154	79.1	74.1	111.1

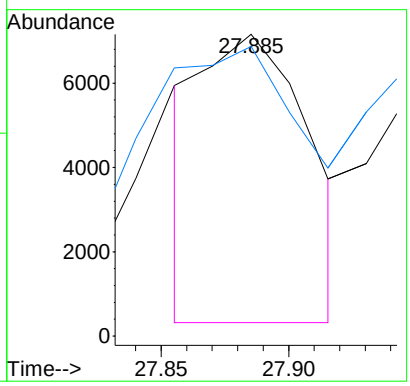


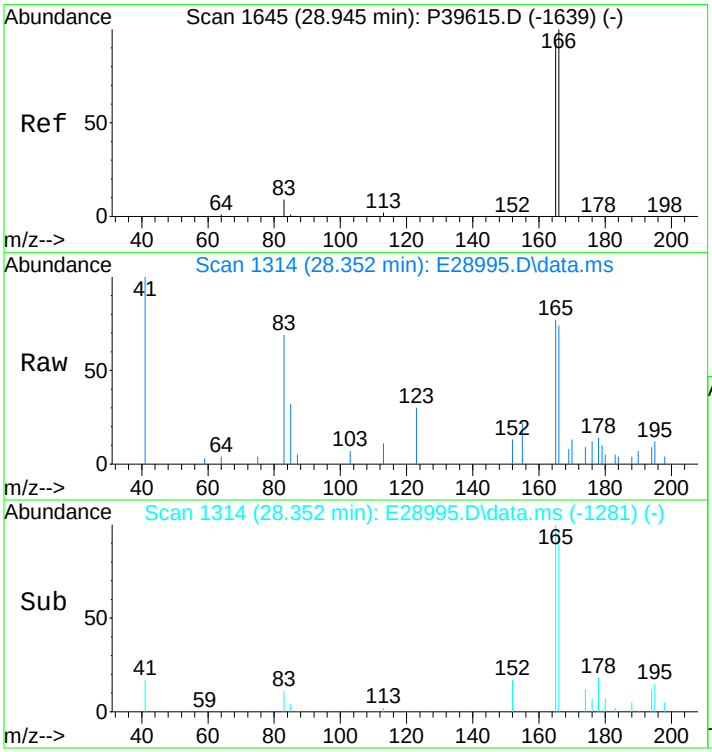


#28
2,3,5-Trimethylnaphthalene
Concen: 430.67 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:170 Resp: 19874

Ion	Ratio	Lower	Upper
170	100		
155	96.2	70.7	106.1

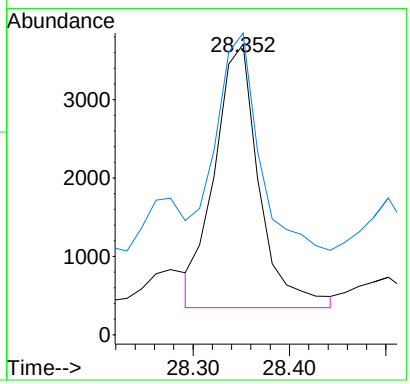


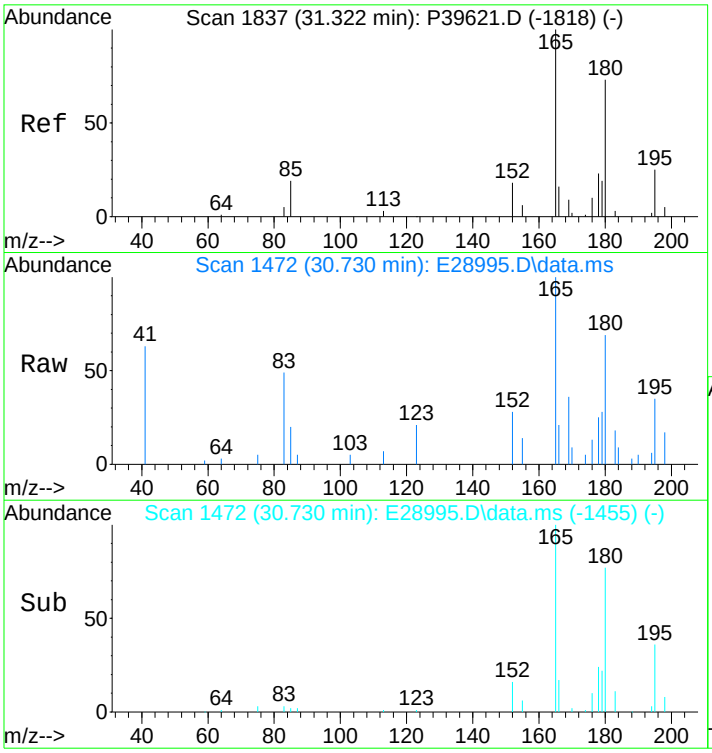


#29
Fluorene
Concen: 175.25 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:166 Resp: 10777

Ion	Ratio	Lower	Upper
166	100		
165	132.3	74.7	112.1#

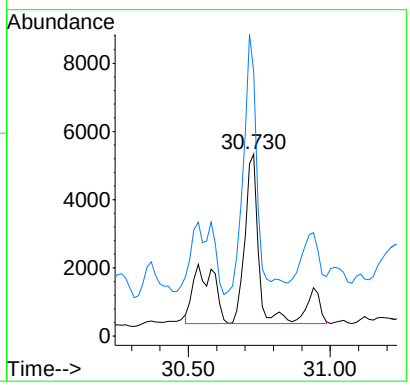


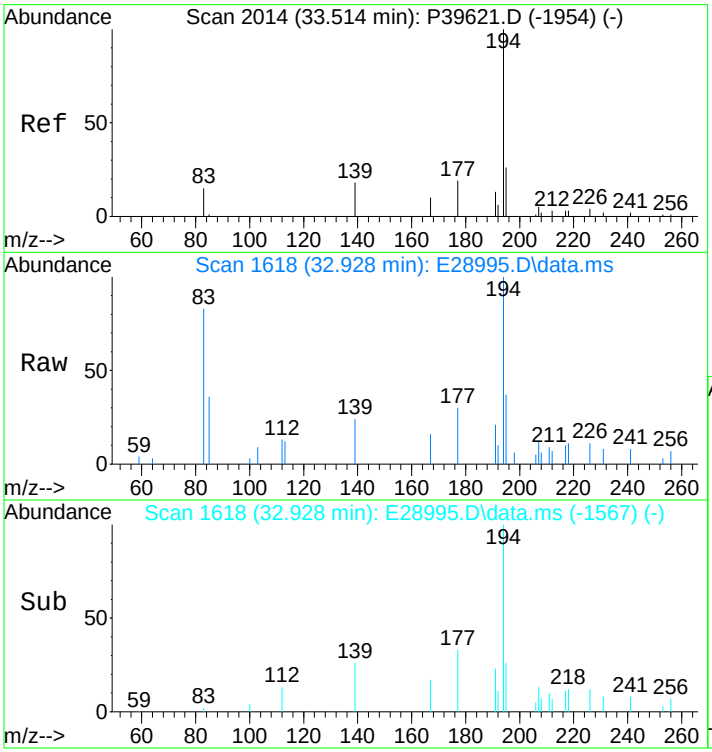


#30
C1-Fluorenes
Concen: 461.43 ng/mL m
RT: 30.730 min Scan# 1472
Delta R.T. 0.108 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:180 Resp: 28376

Ion	Ratio	Lower	Upper
180	100		
165	0.0	94.3	141.5#

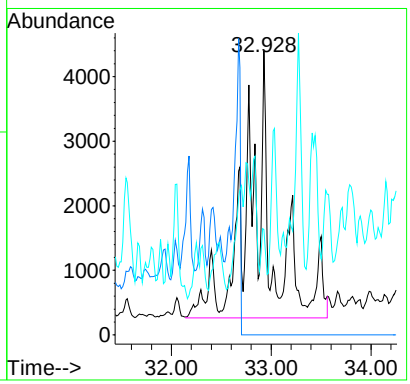


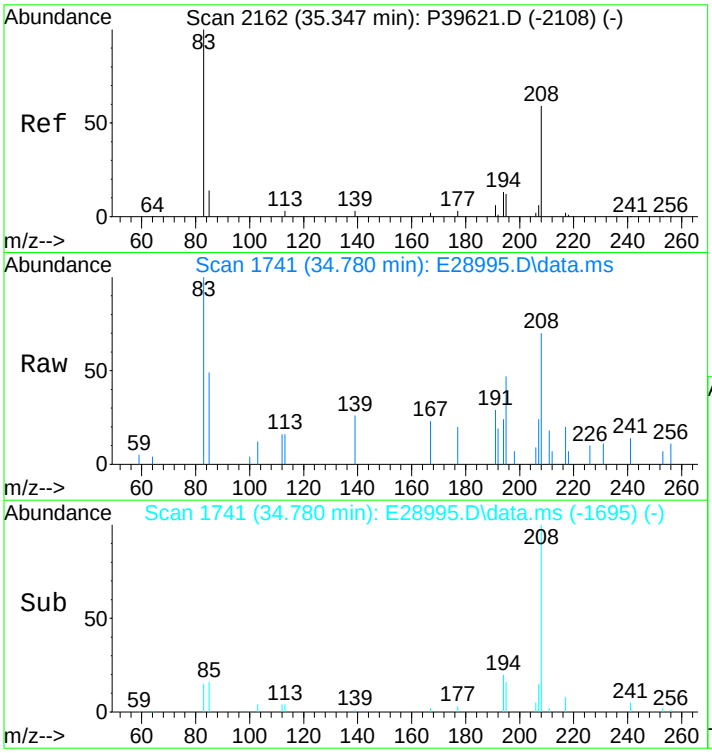


#31
C2-Fluorenes
Concen: 1111.48 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:194 Resp: 68351

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.0	40.4#

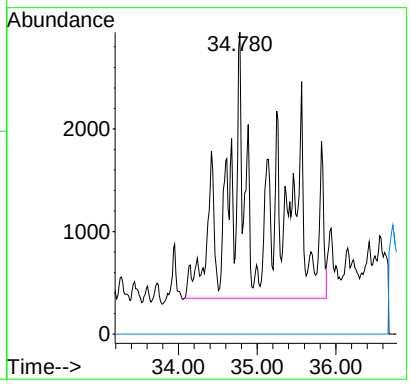


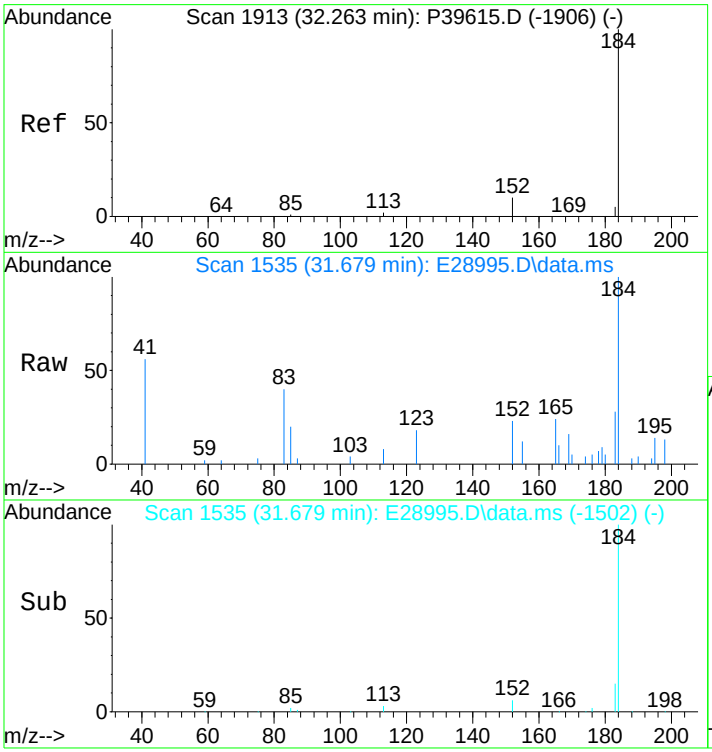


#32
C3-Fluorenes
Concen: 1251.59 ng/mL m
RT: 34.780 min Scan# 1741
Delta R.T. 0.231 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:208 Resp: 76967

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

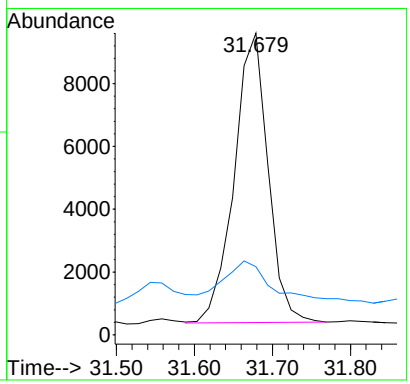


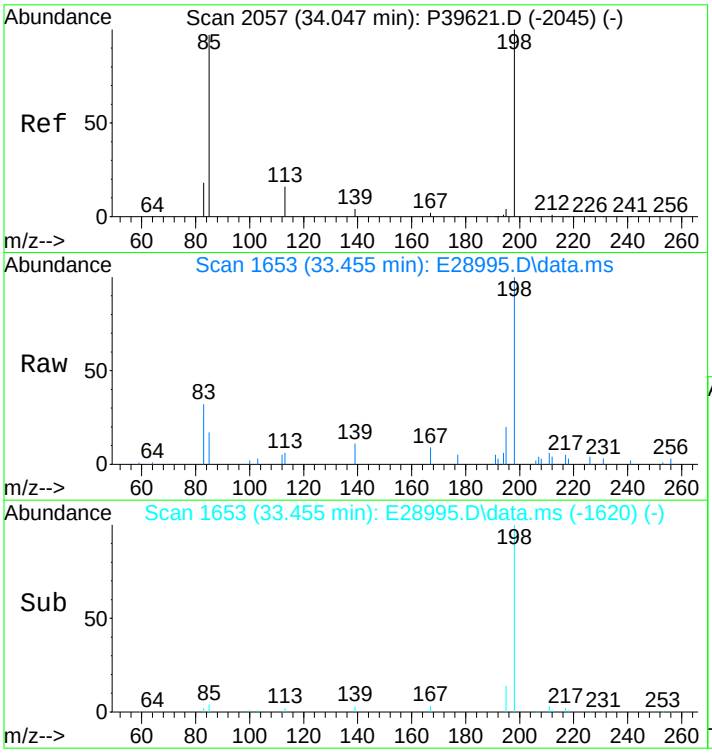


#33
Dibenzothiophene
Concen: 328.73 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:184 Resp: 27741

Ion	Ratio	Lower	Upper
184	100		
152	21.5	7.0	10.6#

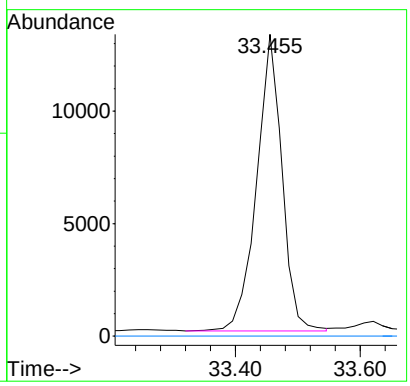


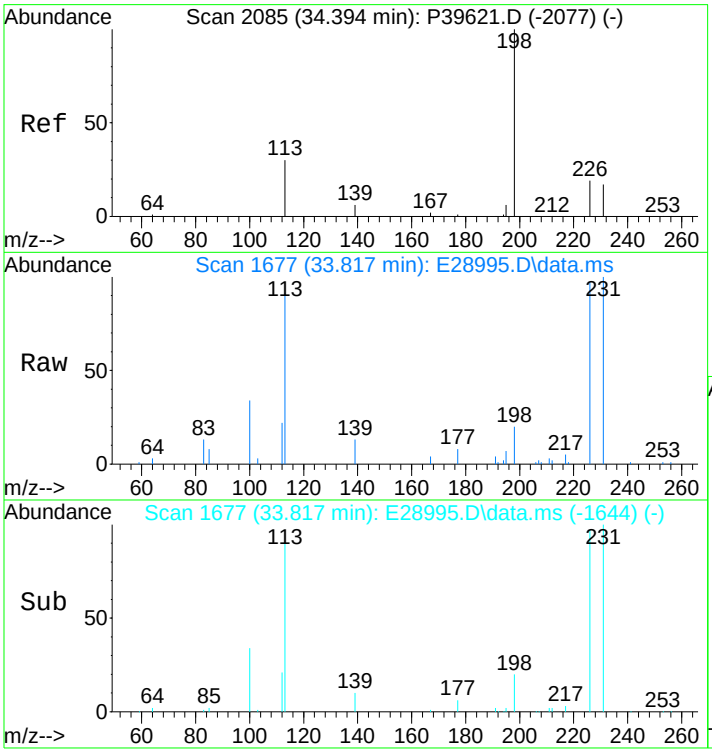


#34
4-Methyldibenzothiophene(4MDT)
Concen: 439.85 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 37118

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

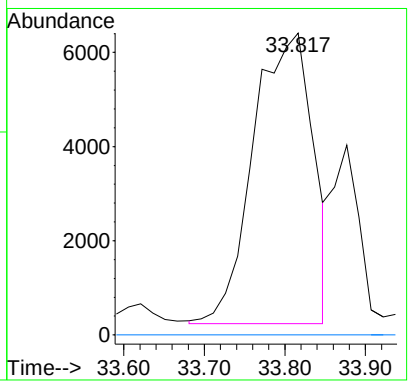


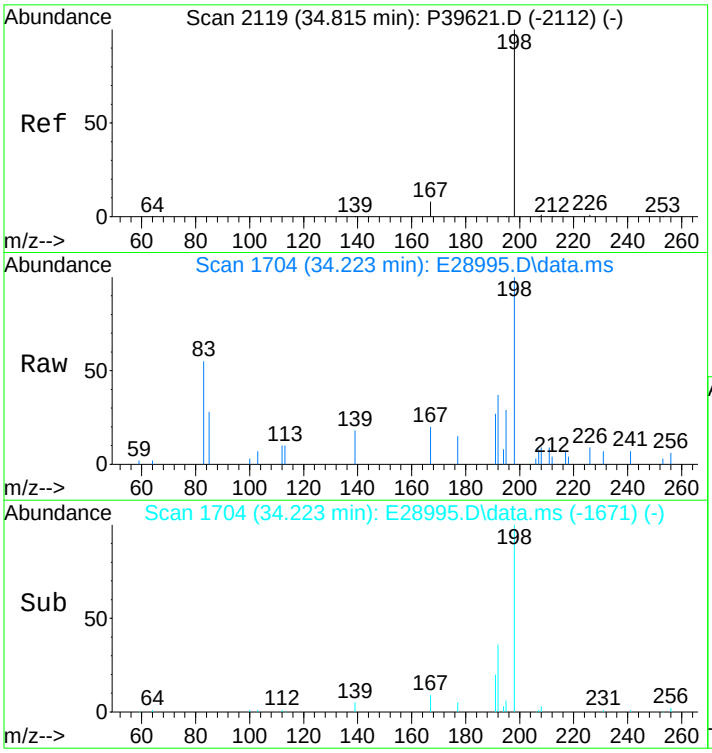


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 377.92 ng/mL m
RT: 33.817 min Scan# 1677
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 31892

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

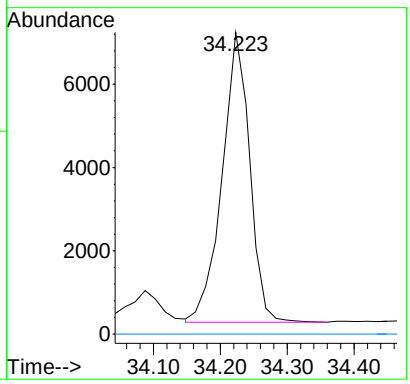


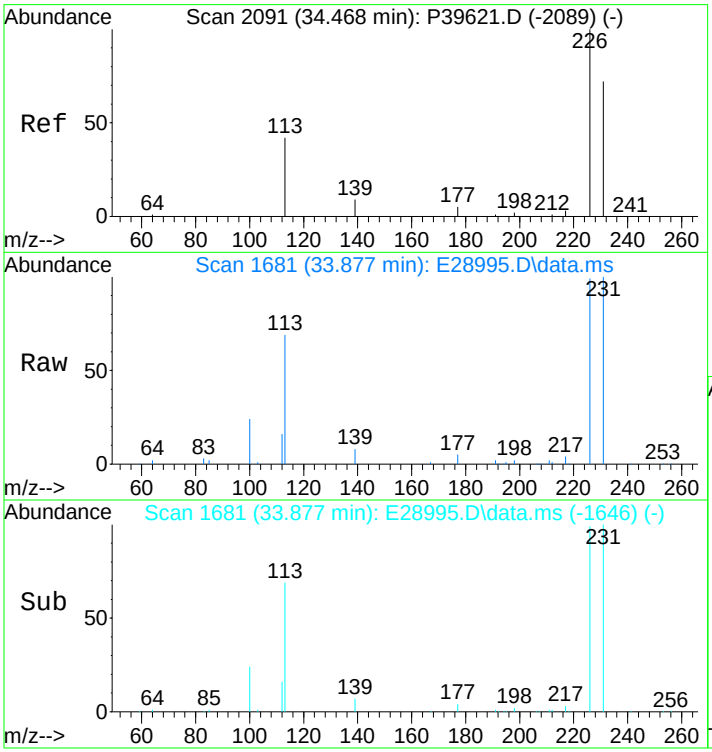


#36
1-Methyldibenzothiophene(1MDT)
Concen: 235.61 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 19883

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

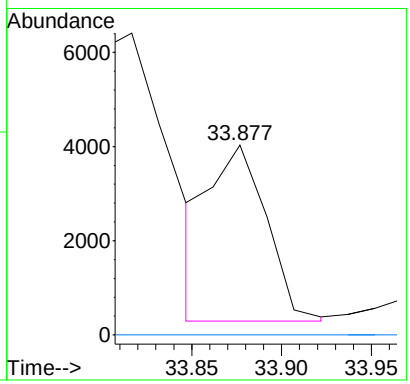


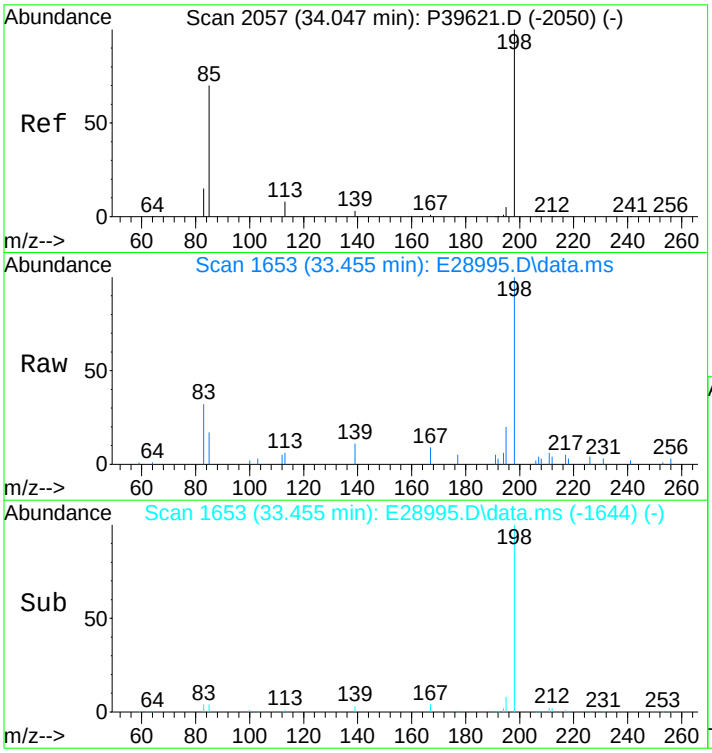


#37
OTP
Concen: 97.79 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 8252

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

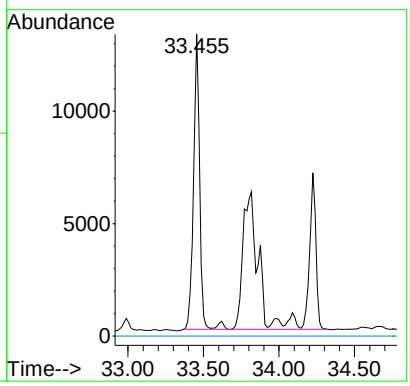


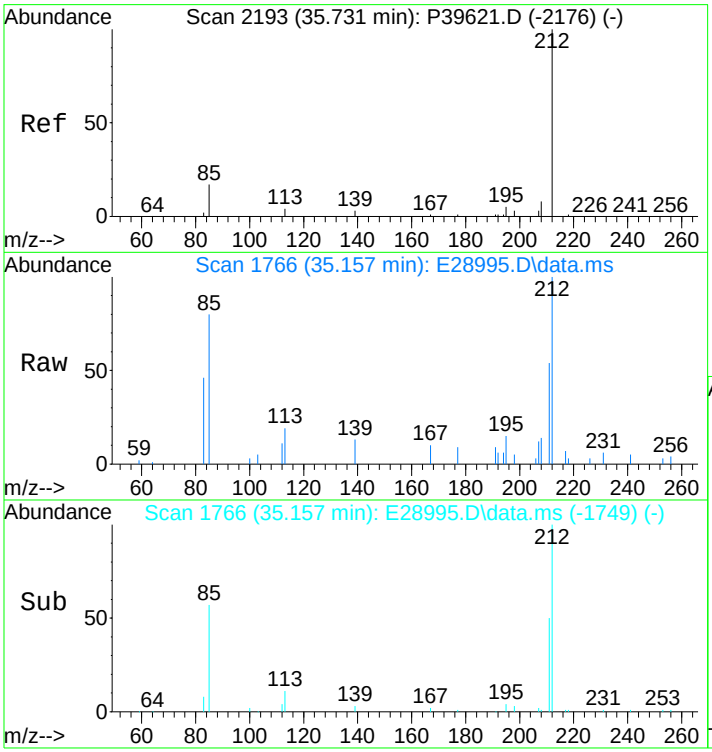


#38
C1-Dibenzothiophenes
Concen: 1199.26 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:198 Resp: 101204

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

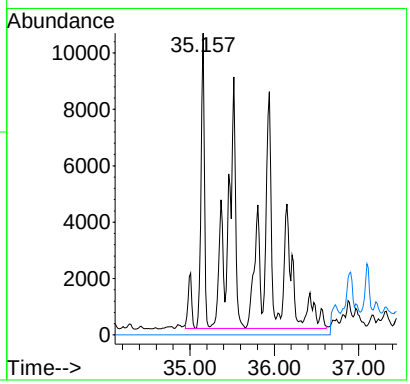


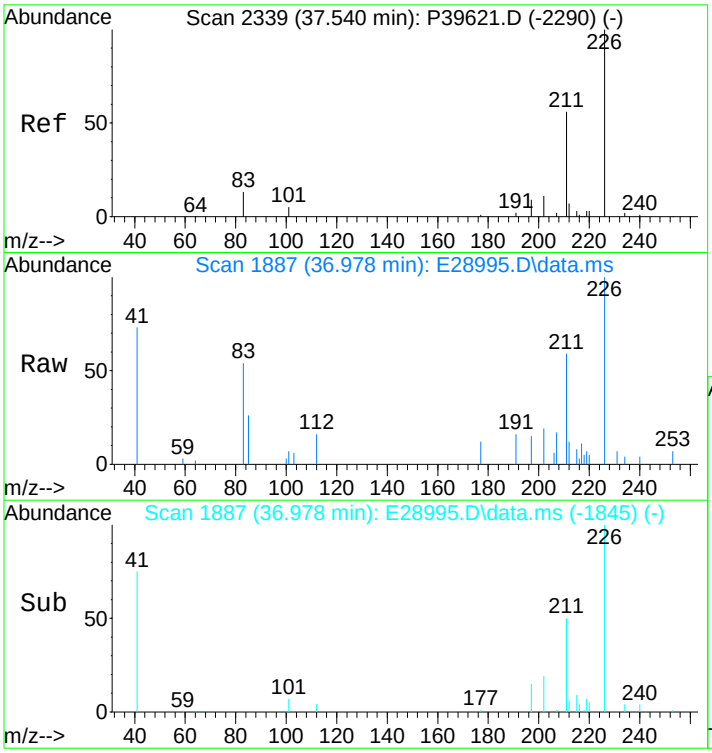


#39
C2-Dibenzothiophenes
Concen: 2132.43 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:212 Resp: 179953

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

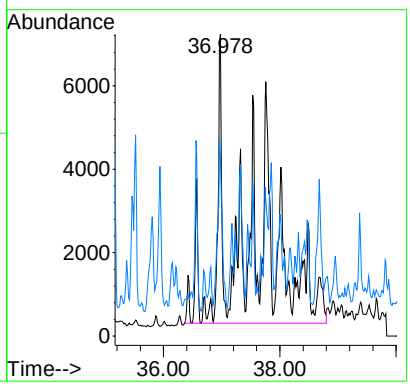


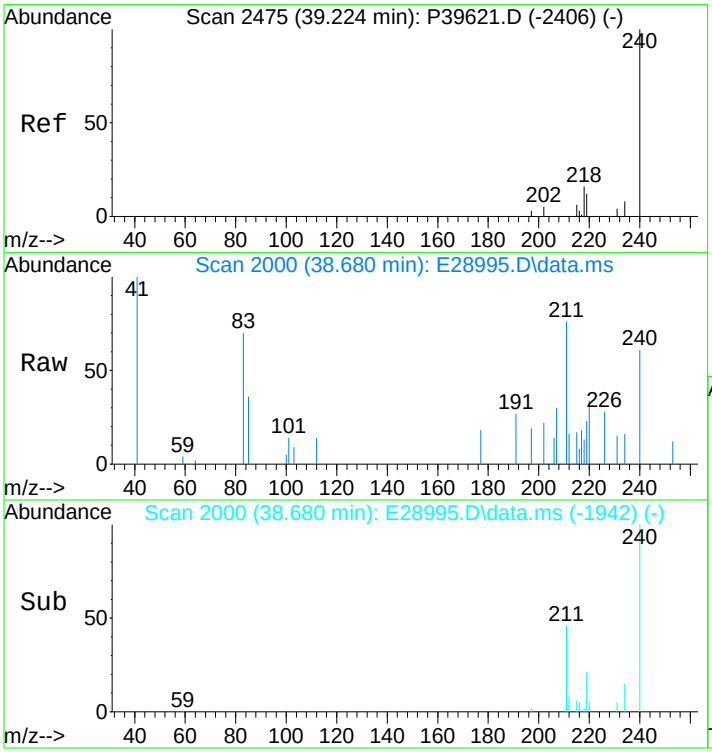


#40
C3-Dibenzothiophenes
Concen: 2300.82 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.290 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:226 Resp: 194163

Ion	Ratio	Lower	Upper
226	100		
211	1.7	44.1	66.1#

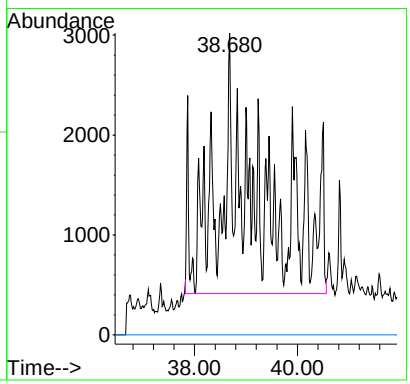


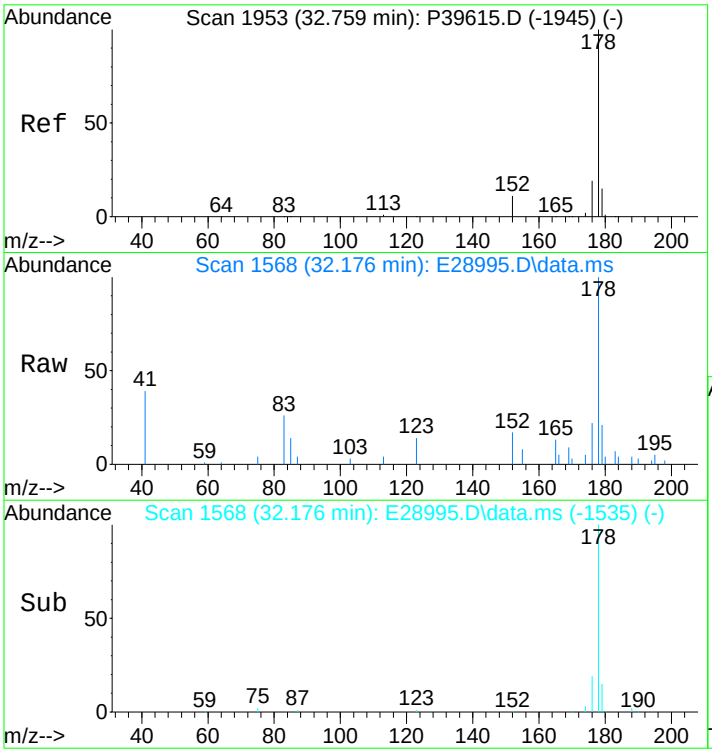


#41
C4-Dibenzothiophenes
Concen: 1587.54 ng/mL m
RT: 38.680 min Scan# 2000
Delta R.T. 0.335 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:240 Resp: 133970

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

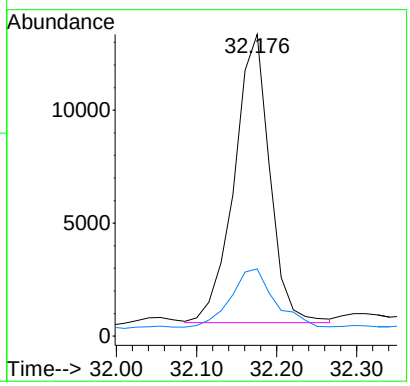


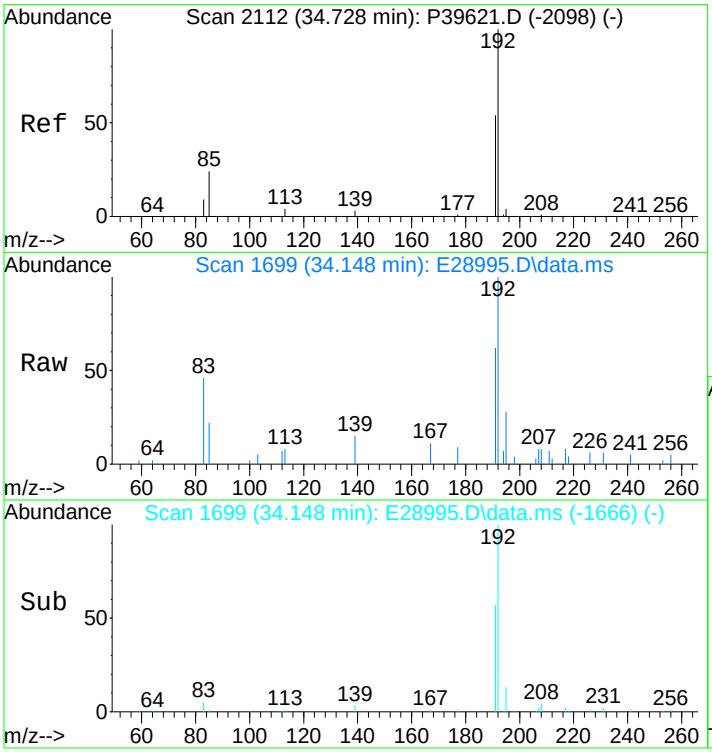


#43
Phenanthrene
Concen: 457.95 ng/mL m
RT: 32.176 min Scan# 1568
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:178 Resp: 39318

Ion	Ratio	Lower	Upper
178	100		
176	0.6	15.0	22.4#

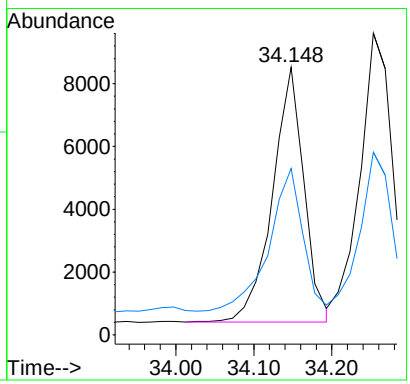


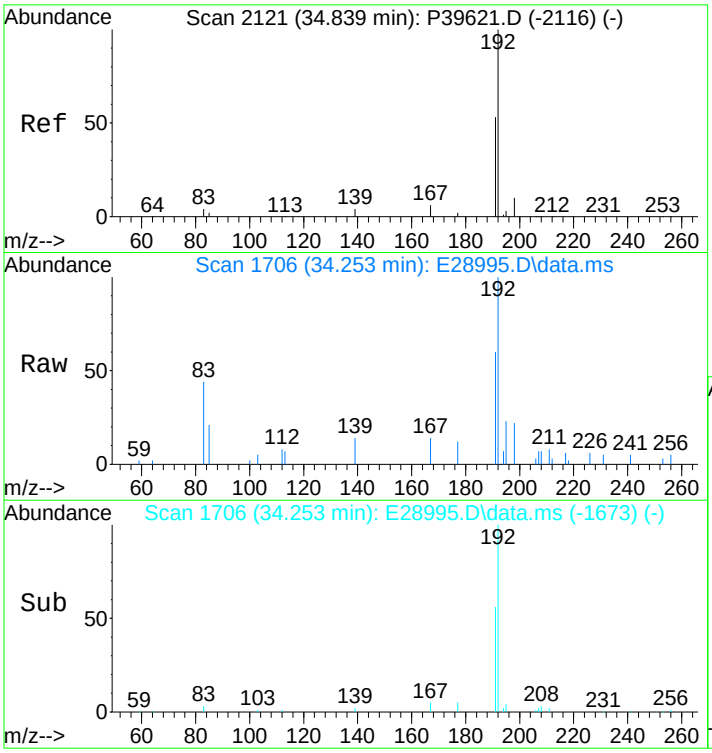


#44
3-Methylphenanthrene(3MP)
Concen: 265.07 ng/mL
RT: 34.148 min Scan# 1699
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 22758

Ion	Ratio	Lower	Upper
192	100		
191	63.7	45.9	68.9

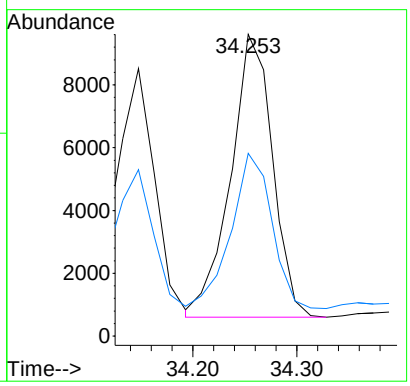


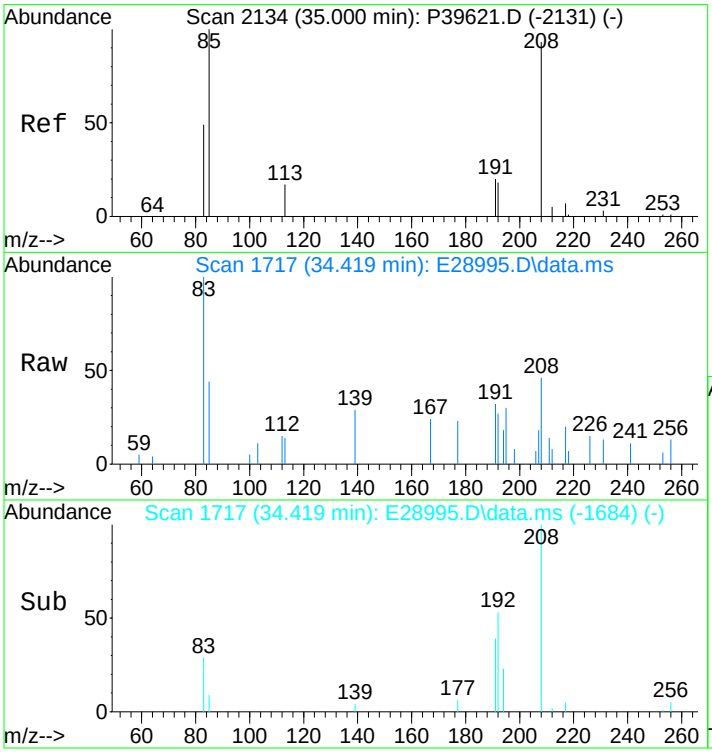


#45
2-Methylphenanthrene(2MP)
Concen: 295.75 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 25392

Ion	Ratio	Lower	Upper
192	100		
191	53.4	45.4	68.0

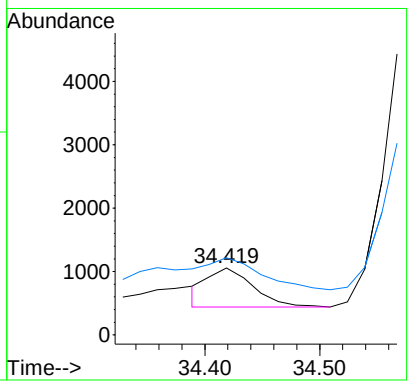


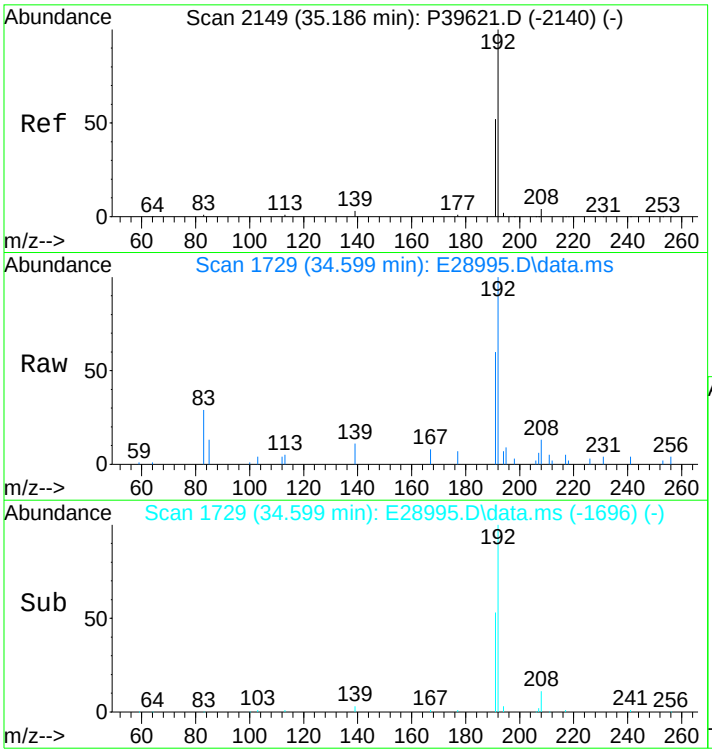


#46
2-Methylanthracene(2MA)
Concen: 20.08 ng/mL m
RT: 34.419 min Scan# 1717
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 1724

Ion	Ratio	Lower	Upper
192	100		
191	161.3	95.4	143.0#

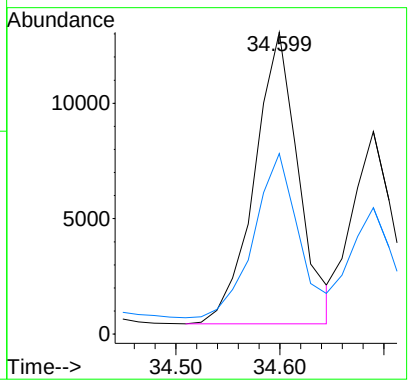


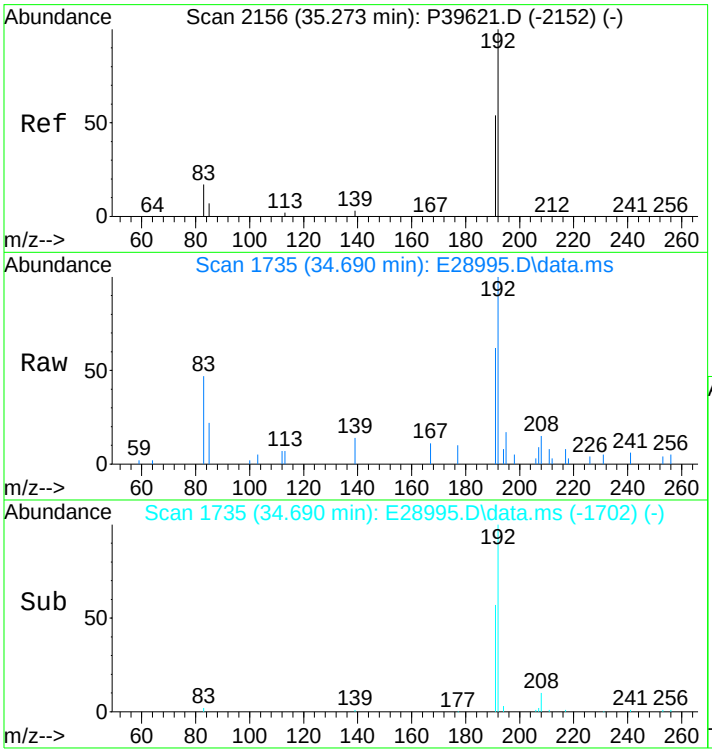


#47
9/4-Methylphenanthrene(9MP)
Concen: 434.27 ng/mL
RT: 34.599 min Scan# 1729
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 37285

Ion	Ratio	Lower	Upper
192	100		
191	57.0	44.3	66.5

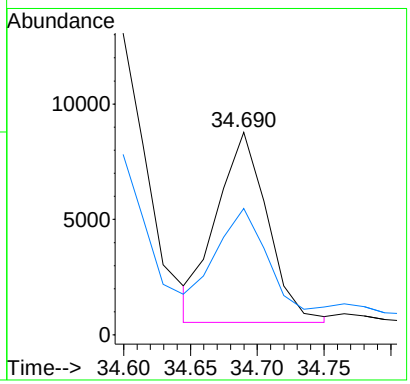


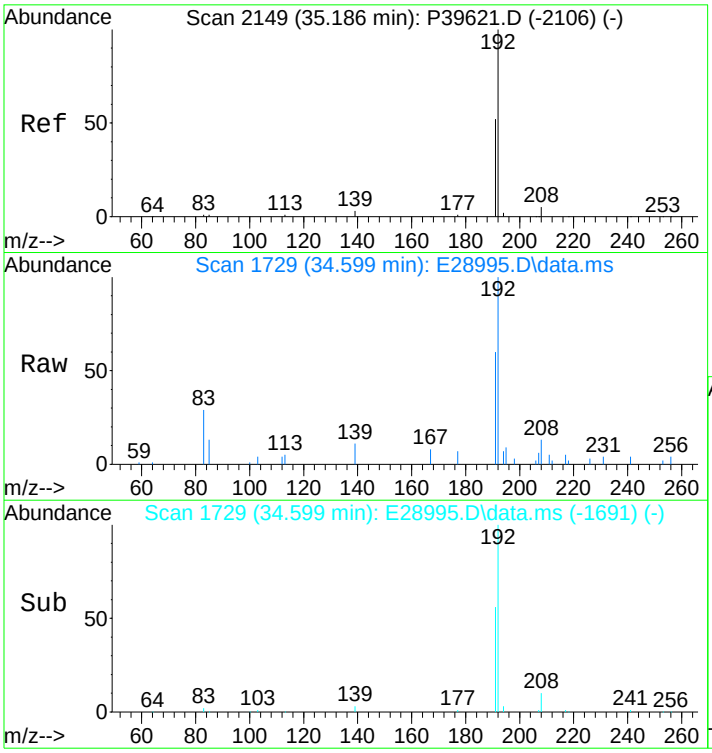


#48
1-Methylphenanthrene(1MP)
Concen: 255.40 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 21928

Ion	Ratio	Lower	Upper
192	100		
191	53.4	46.7	70.1

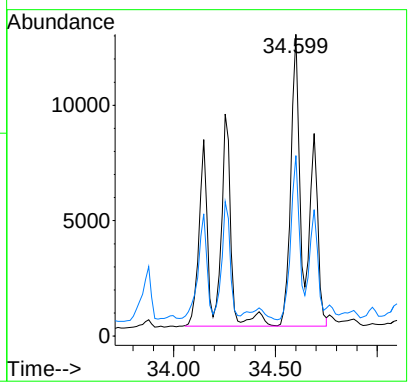


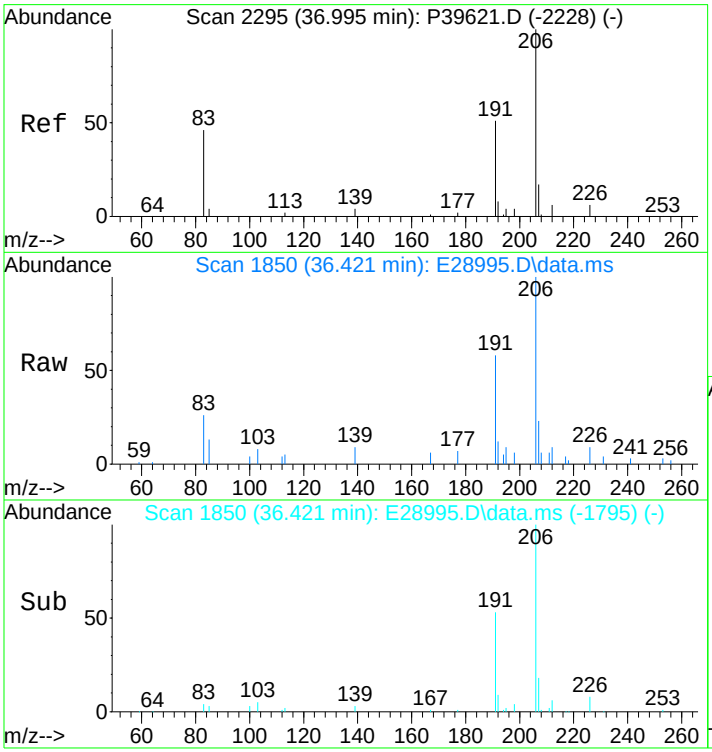


#49
C1-Phenanthrenes/Anthracenes
Concen: 1304.22 ng/mL m
RT: 34.599 min Scan# 1729
Delta R.T. 0.196 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 111975

Ion	Ratio	Lower	Upper
192	100		
191	12.1	44.0	66.0#

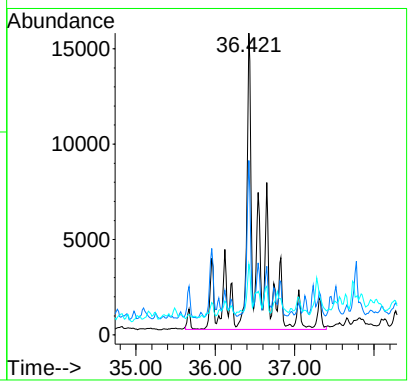


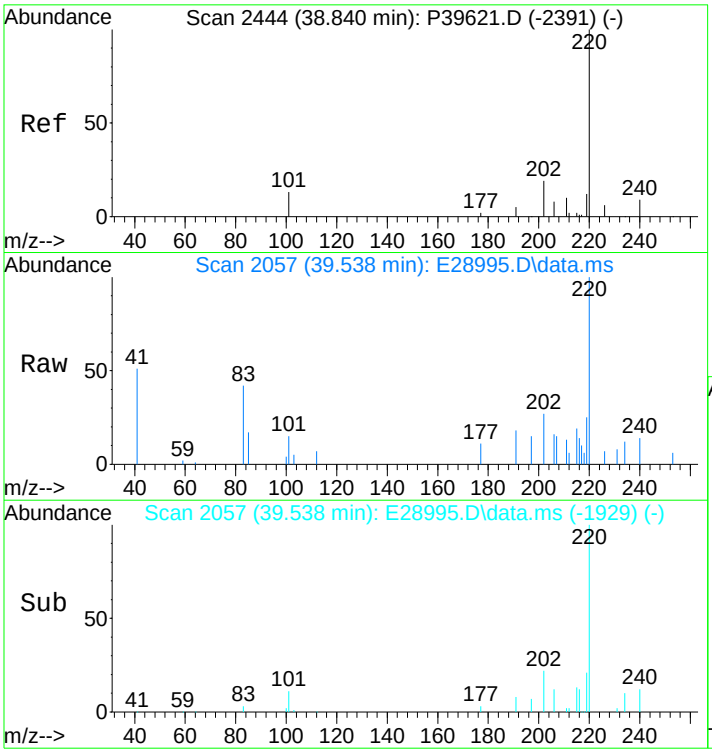


#50
C2-Phenanthrenes/Anthracenes
Concen: 1948.52 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:206 Resp: 167293

Ion	Ratio	Lower	Upper
206	100		
191	1.4	35.7	53.5#
207	0.9	16.5	24.7#

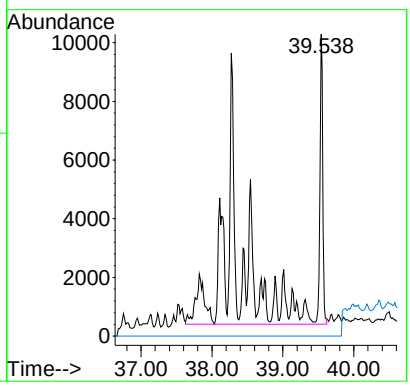


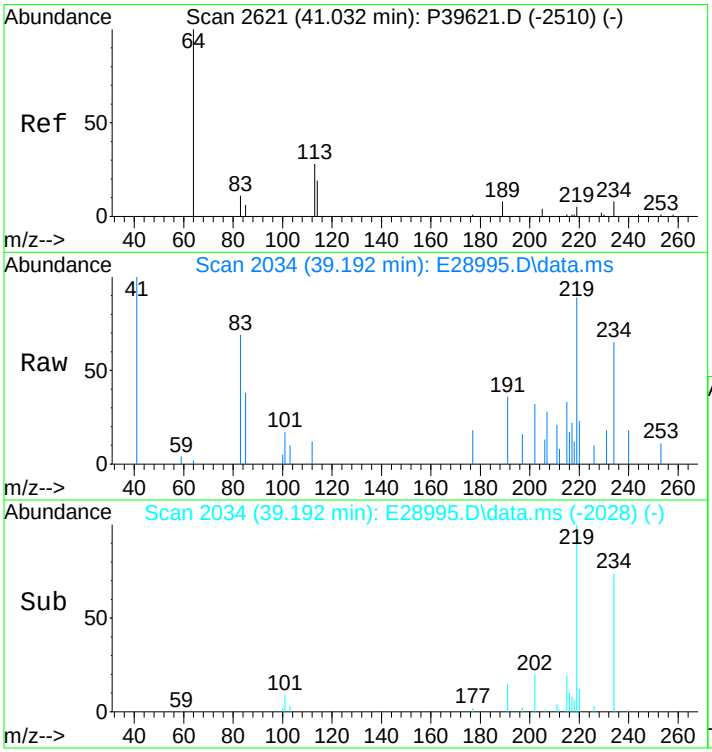


#52
C3-Phenanthrenes/Anthracenes
Concen: 1806.37 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 1.575 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:220 Resp: 155088

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

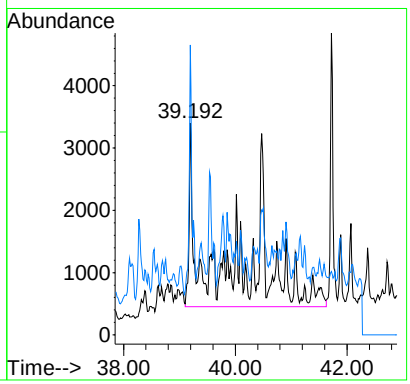


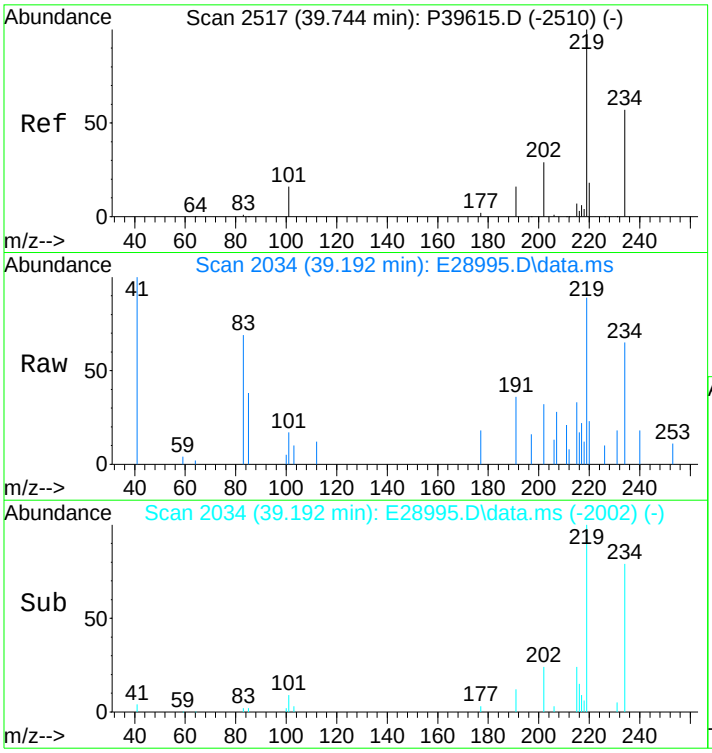


#53
C4-Phenanthrenes/Anthracenes
Concen: 956.54 ng/mL m
RT: 39.192 min Scan# 2034
Delta R.T. -0.896 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 82125

Ion	Ratio	Lower	Upper
234	100		
219	2.1	46.6	70.0#

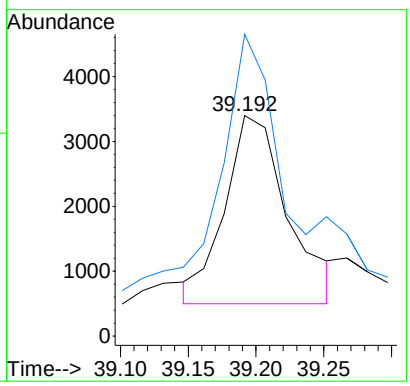


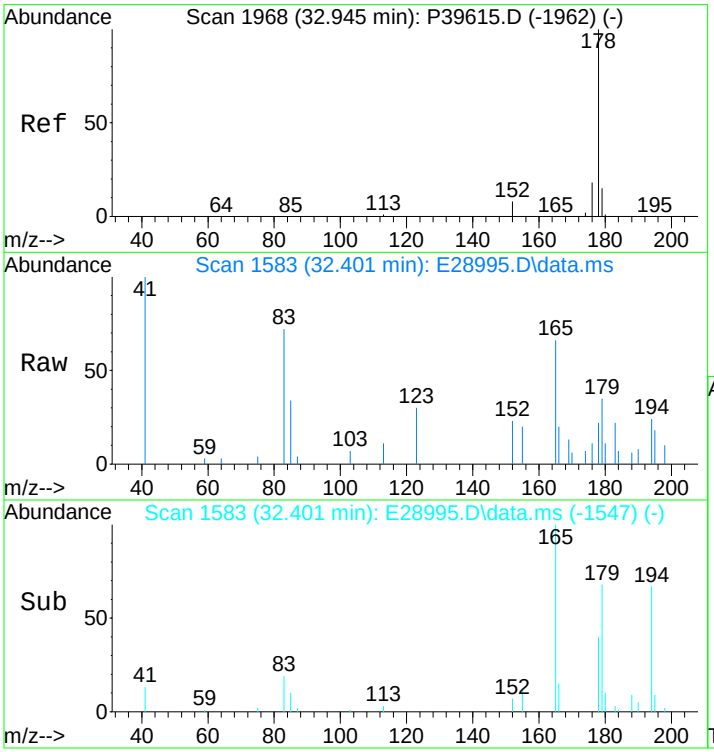


#54
Retene
Concen: 338.79 ng/mL m
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 9360

Ion	Ratio	Lower	Upper
234	100		
219	155.4	115.3	172.9

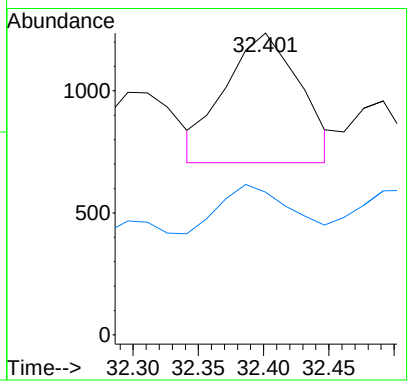


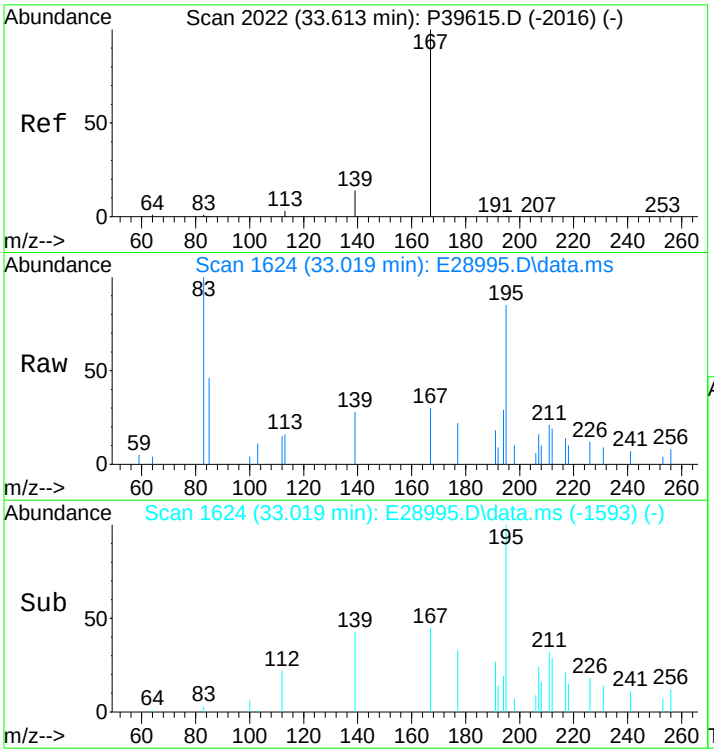


#55
Anthracene
Concen: 28.57 ng/mL m
RT: 32.401 min Scan# 1583
Delta R.T. 0.045 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:178 Resp: 2120

Ion	Ratio	Lower	Upper
178	100		
176	33.9	14.3	21.5#

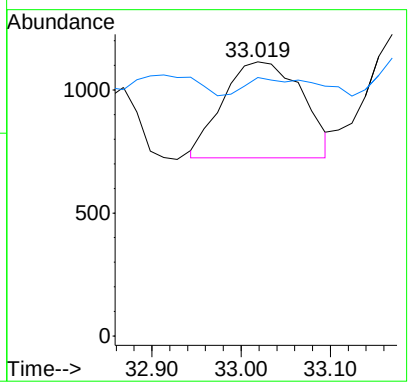


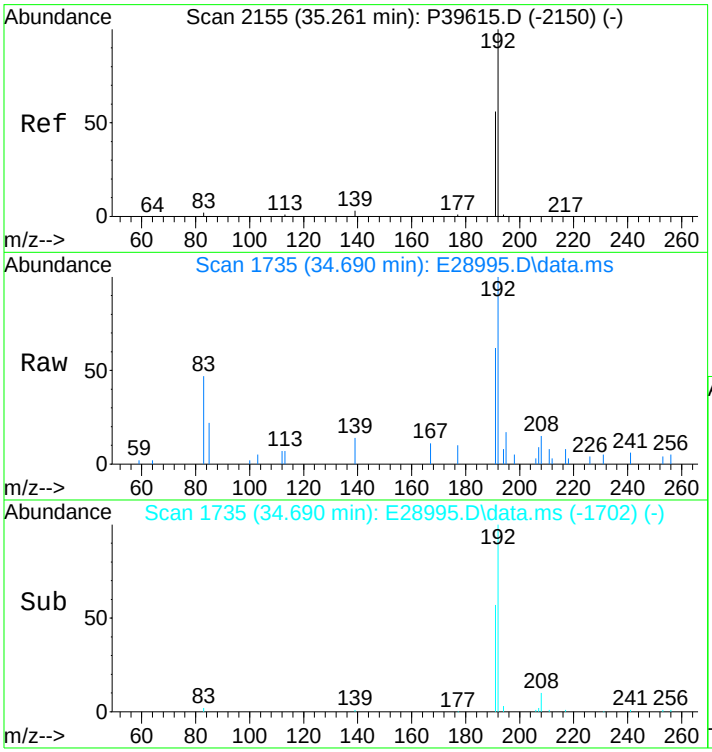


#56
Carbazole
Concen: 31.65 ng/mL m
RT: 33.019 min Scan# 1624
Delta R.T. -0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:167 Resp: 2417

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.1	15.1#

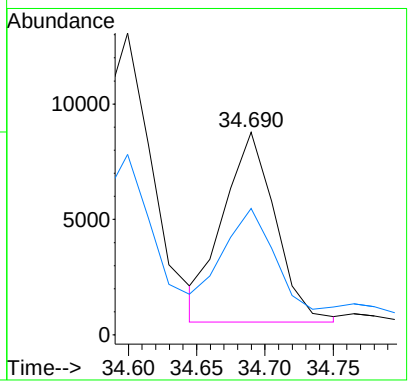


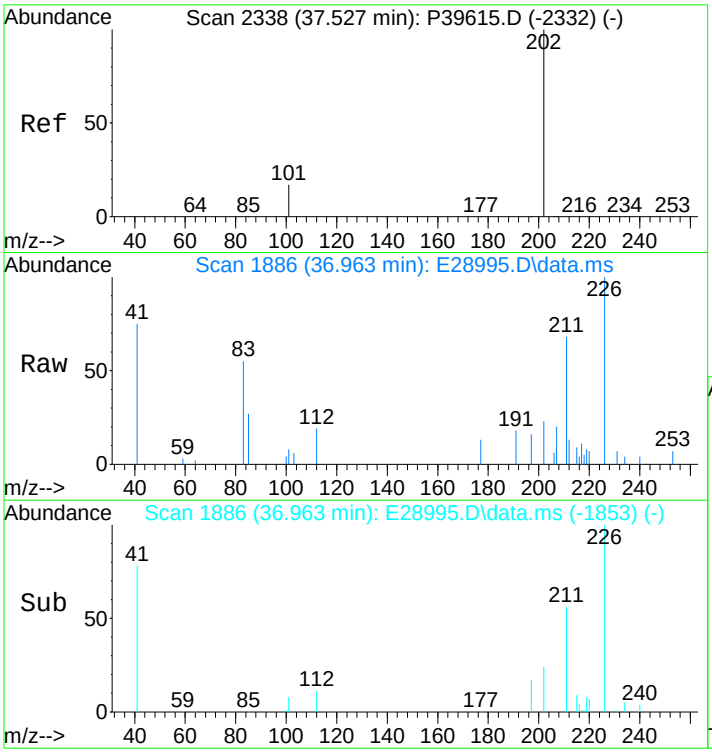


#57
1-Methylphenanthrene
Concen: 332.74 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:192 Resp: 21795

Ion	Ratio	Lower	Upper
192	100		
191	53.8	45.4	68.2

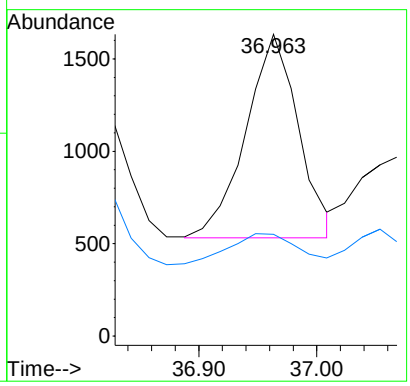


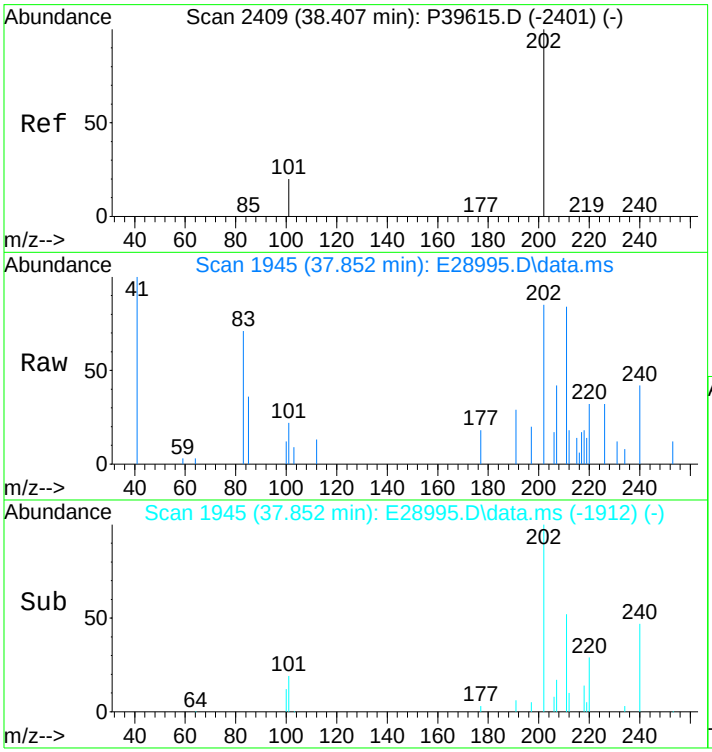


#58
Fluoranthene
Concen: 36.04 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:202 Resp: 3417

Ion	Ratio	Lower	Upper
202	100		
101	32.8	10.4	15.6#

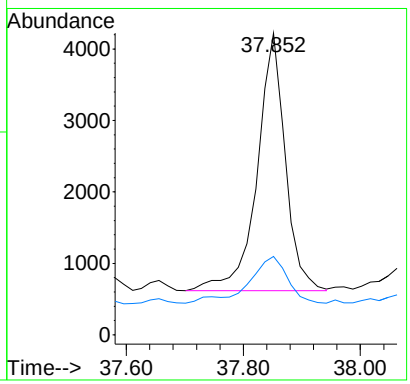


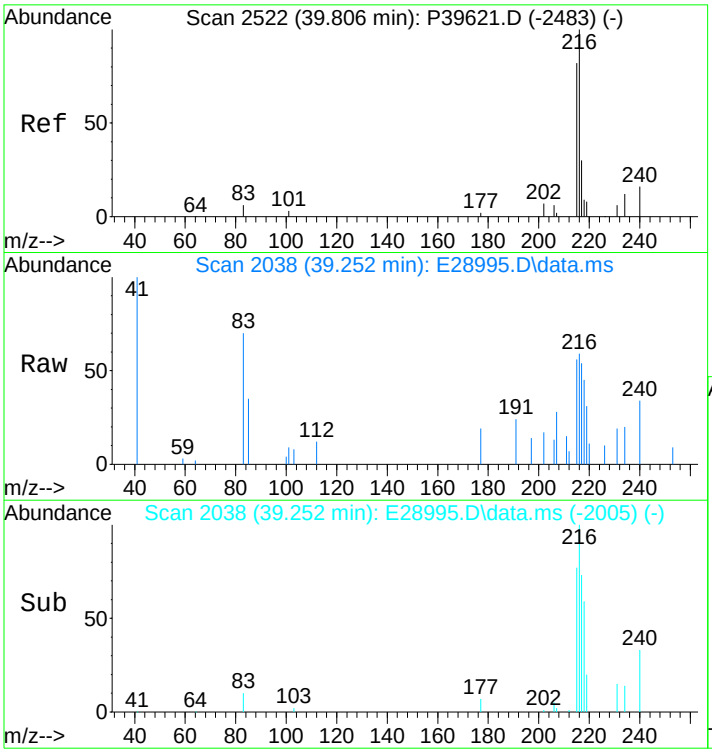


#60
Pyrene
Concen: 124.87 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:202 Resp: 12034

Ion	Ratio	Lower	Upper
202	100		
101	25.0	11.0	16.4#

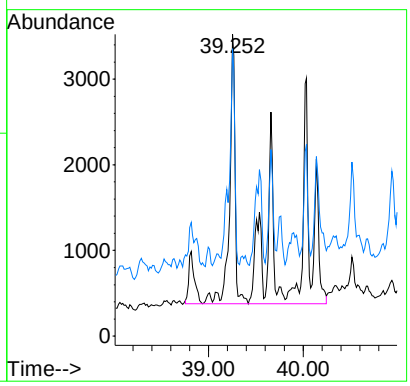


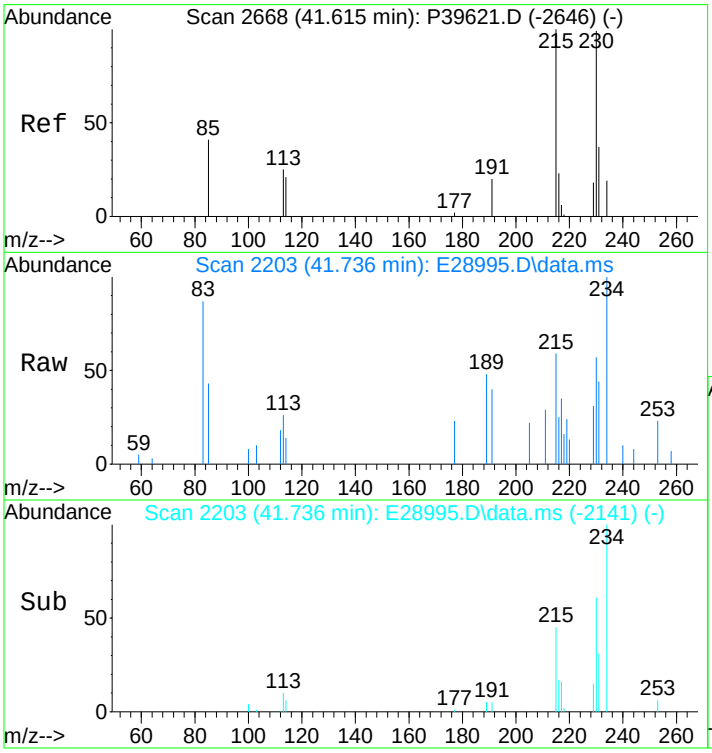


#61
C1-Fluoranthenes/Pyrenes
Concen: 436.09 ng/mL m
RT: 39.252 min Scan# 2038
Delta R.T. 0.337 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:216 Resp: 42027

Ion	Ratio	Lower	Upper
216	100		
215	5.6	73.4	110.2#

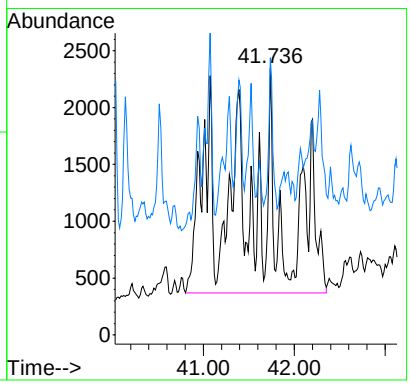


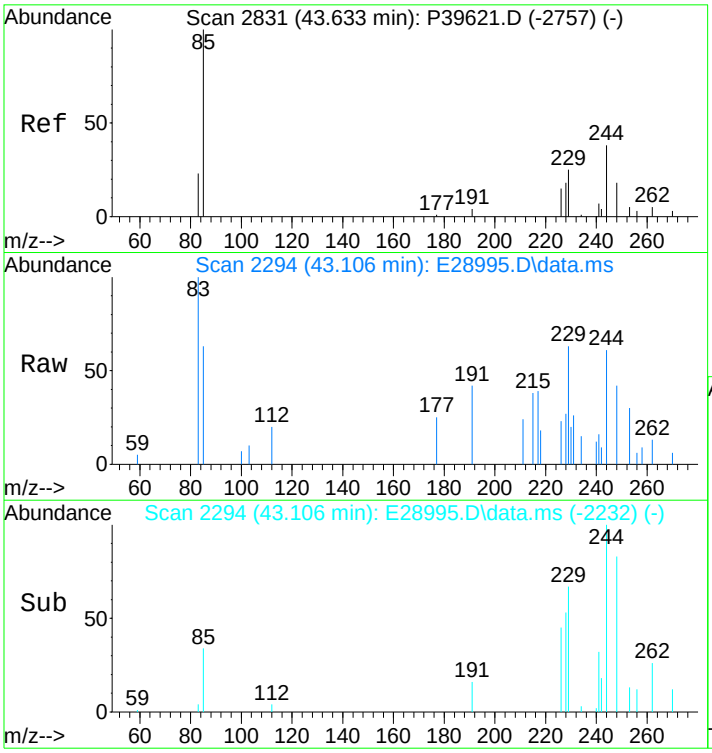


#62
C2-Fluoranthenes/Pyrenes
Concen: 643.12 ng/mL m
RT: 41.736 min Scan# 2203
Delta R.T. 0.856 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:230 Resp: 61979

Ion	Ratio	Lower	Upper
230	100		
215	9.8	93.8	140.8#

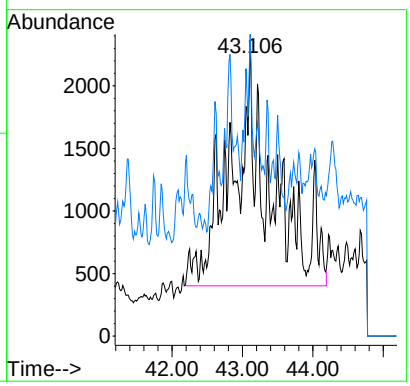


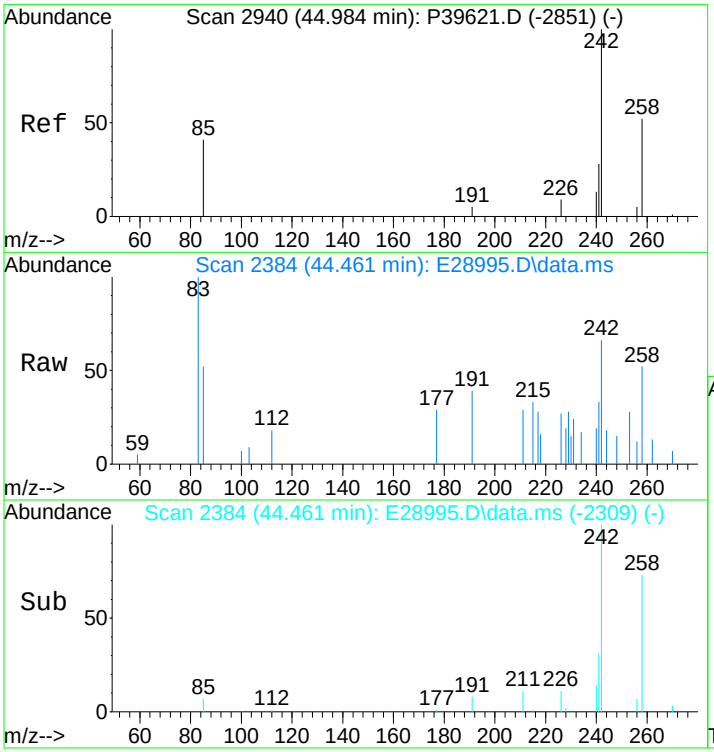


#63
C3-Fluoranthenes/Pyrenes
Concen: 754.65 ng/mL m
RT: 43.106 min Scan# 2294
Delta R.T. 0.455 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:244 Resp: 72727

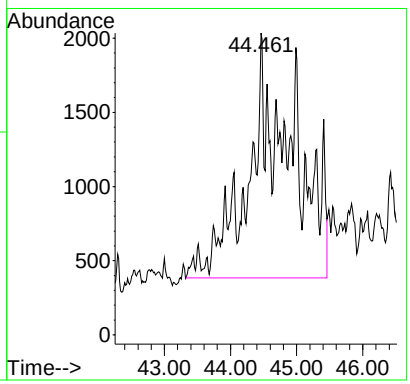
Ion	Ratio	Lower	Upper
244	100		
229	8.3	72.2	108.2#

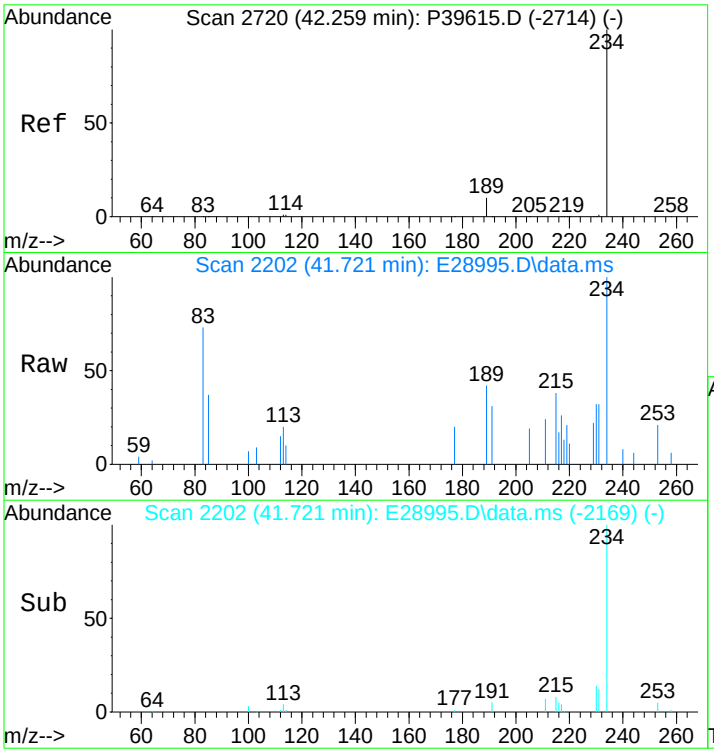




#64
C4-Fluoranthenes/Pyrenes
Concen: 770.95 ng/mL m
RT: 44.461 min Scan# 2384
Delta R.T. 0.491 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:258 Resp: 74298

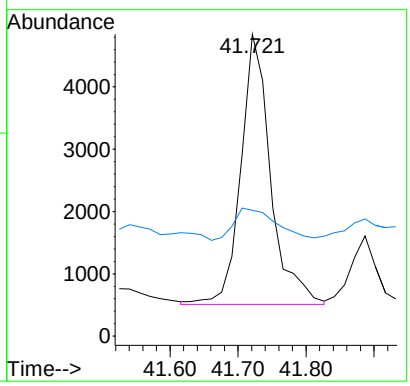


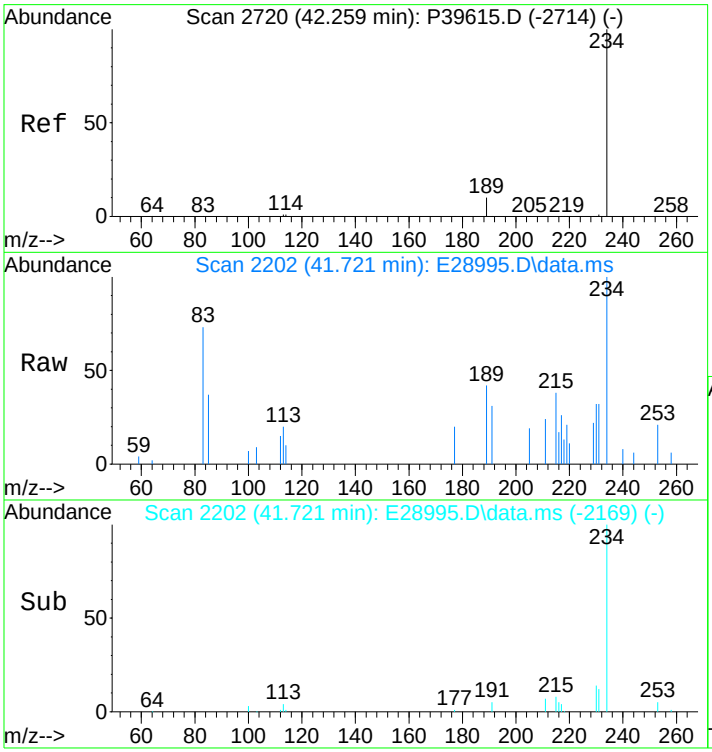


#66
Naphthobenzothiophene
Concen: 138.46 ng/ml m
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 13161

Ion	Ratio	Lower	Upper
234	100		
189	17.2	21.1	31.7#

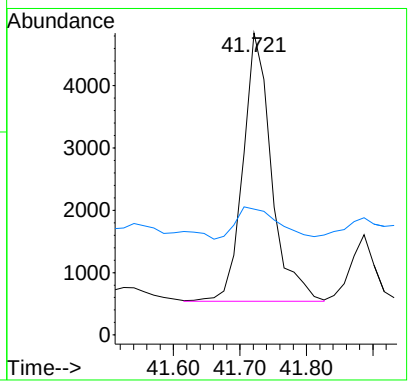


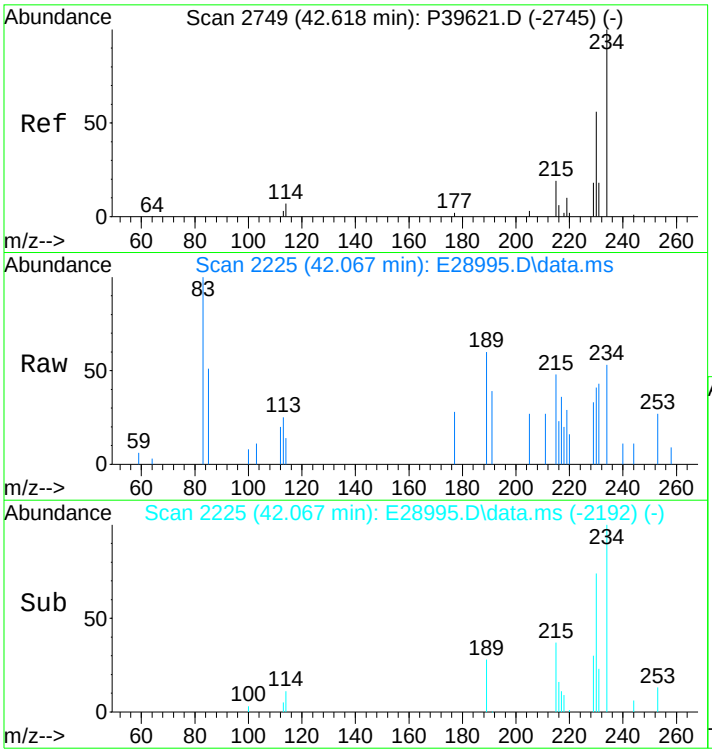


#67
Naphthobenzothiophene-2,1-D
Concen: 134.88 ng/mL m
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 12820

Ion	Ratio	Lower	Upper
234	100		
189	17.7	21.1	31.7#

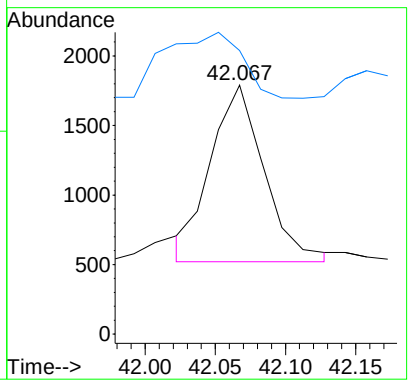


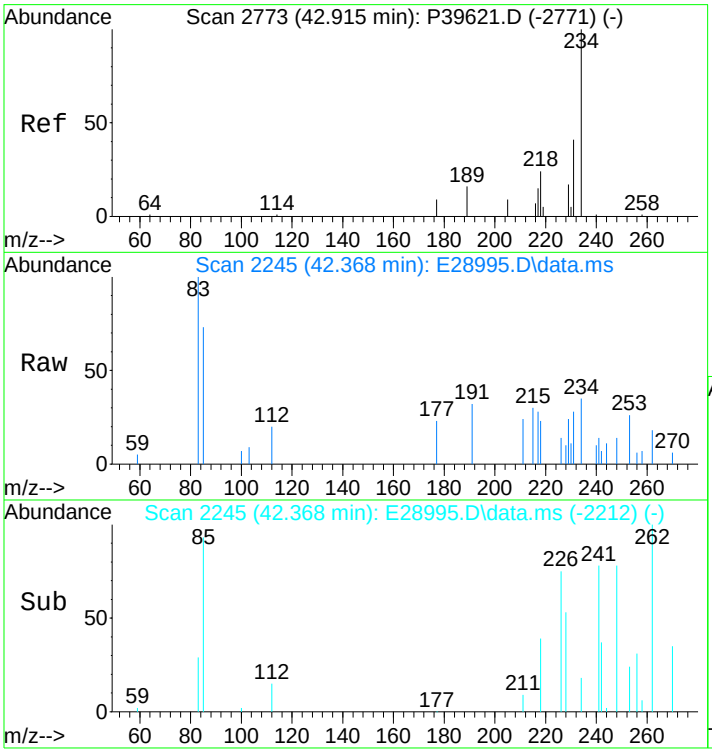


#68
Naphthobenzothiophene-1,2-D
Concen: 35.45 ng/mL m
RT: 42.067 min Scan# 2225
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 3370

Ion	Ratio	Lower	Upper
234	100		
189	53.6	71.9	107.9#

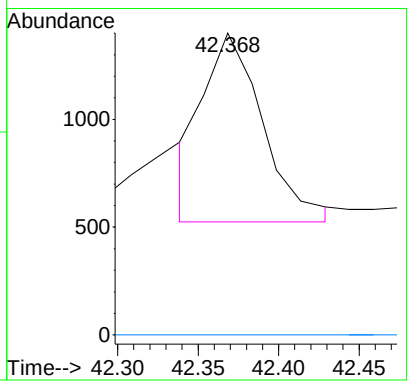


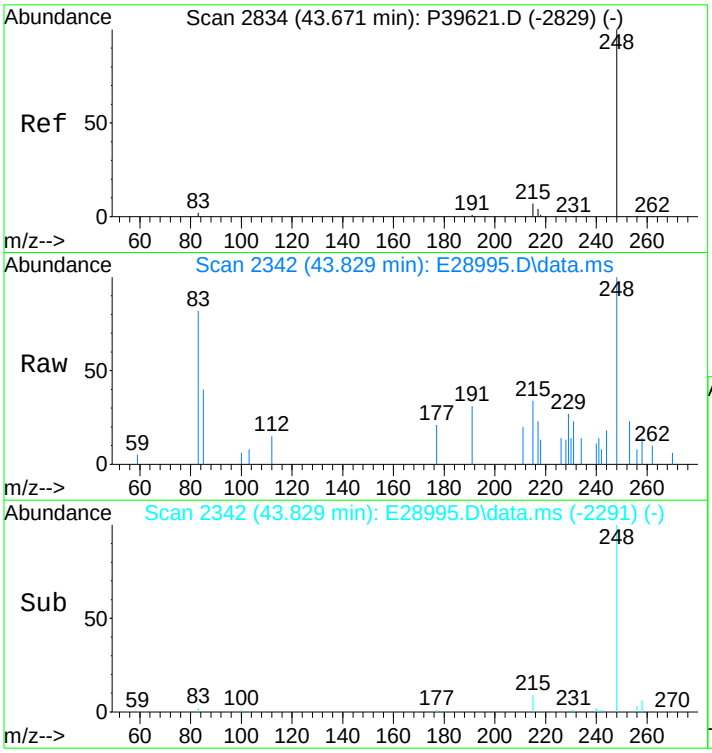


#69
Naphthobenzothiophene-2,3-D
Concen: 23.85 ng/mL m
RT: 42.368 min Scan# 2245
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:234 Resp: 2267

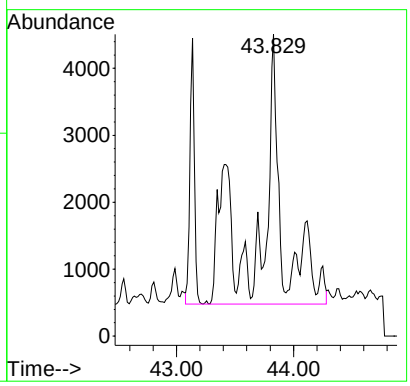
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

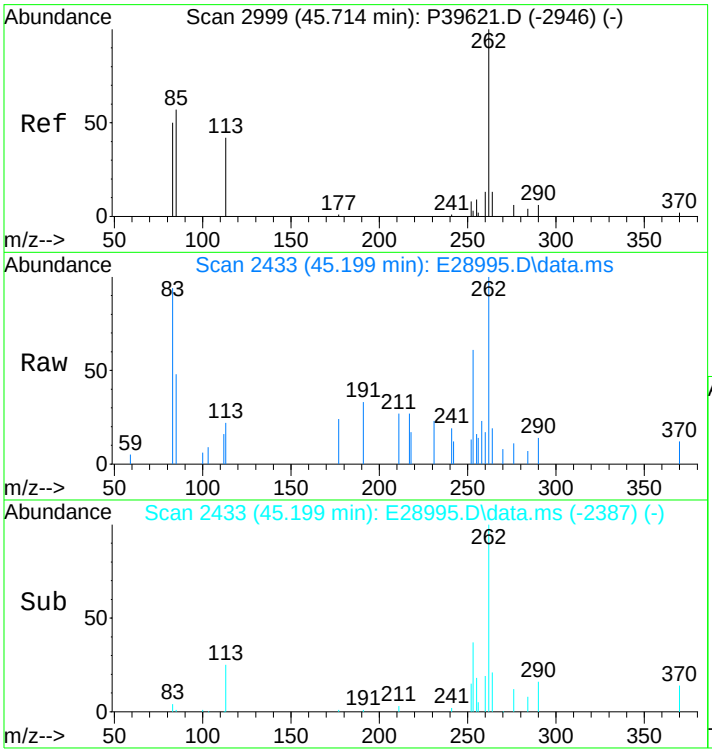




#70
C1-Naphthobenzothiophenes
Concen: 683.17 ng/ml m
RT: 43.829 min Scan# 2342
Delta R.T. 0.708 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

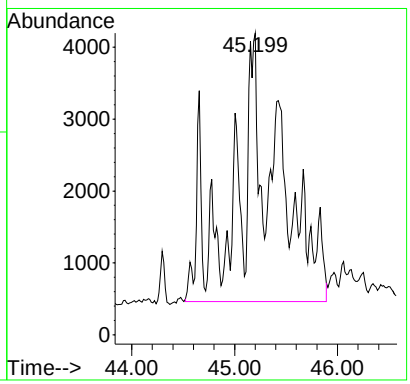
Tgt Ion:248 Resp: 64936

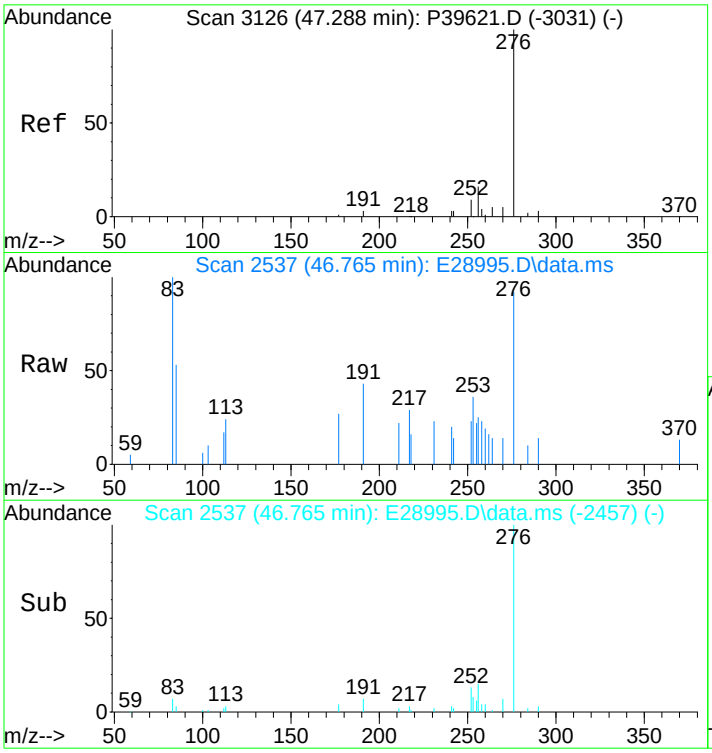




#71
C2-Naphthobenzothiophenes
Concen: 1113.26 ng/ml m
RT: 45.199 min Scan# 2433
Delta R.T. 0.554 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

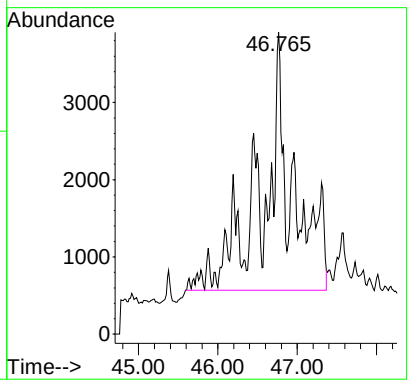
Tgt Ion:262 Resp: 105816

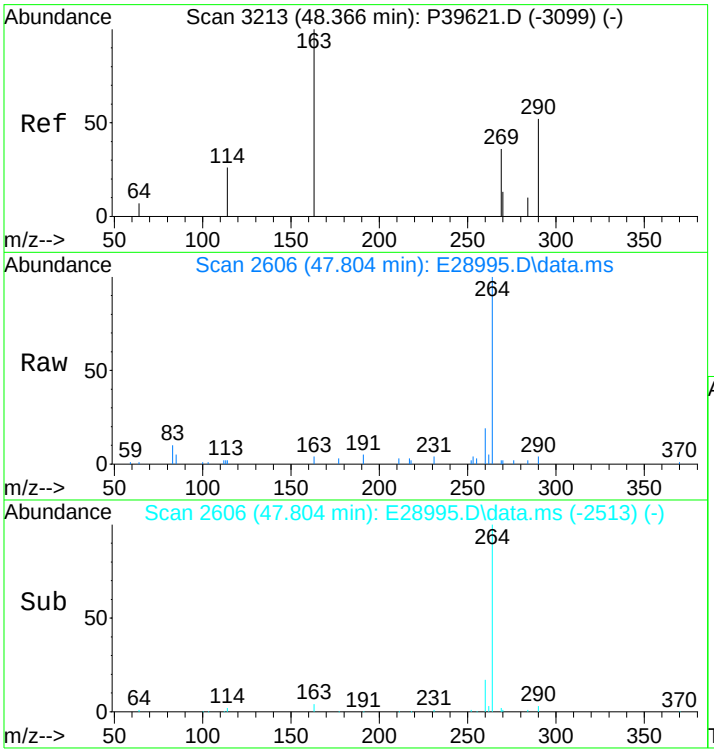




#72
C3-Naphthobenzothiophenes
Concen: 925.58 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

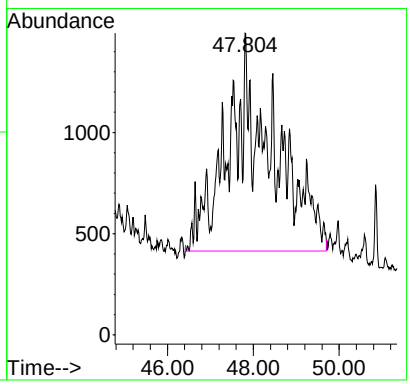
Tgt Ion:276 Resp: 87977

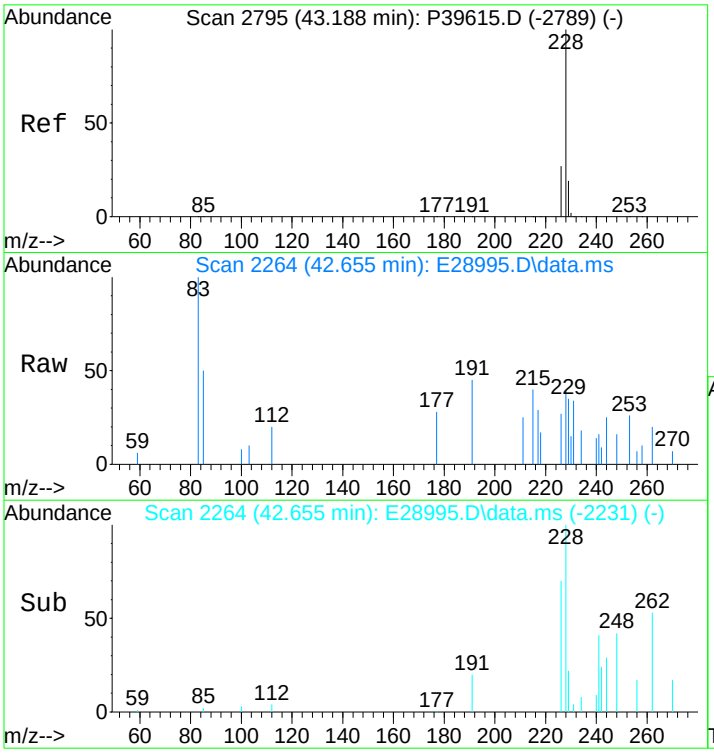




#73
C4-Naphthobenzothiophenes
Concen: 787.16 ng/mL m
RT: 47.804 min Scan# 2606
Delta R.T. 0.508 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:290 Resp: 74820

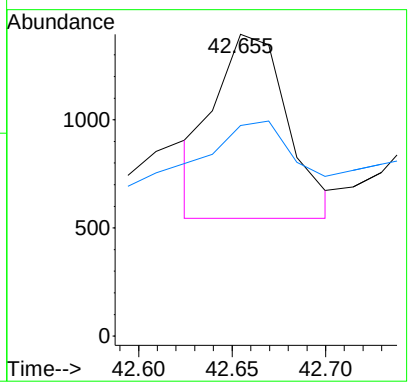


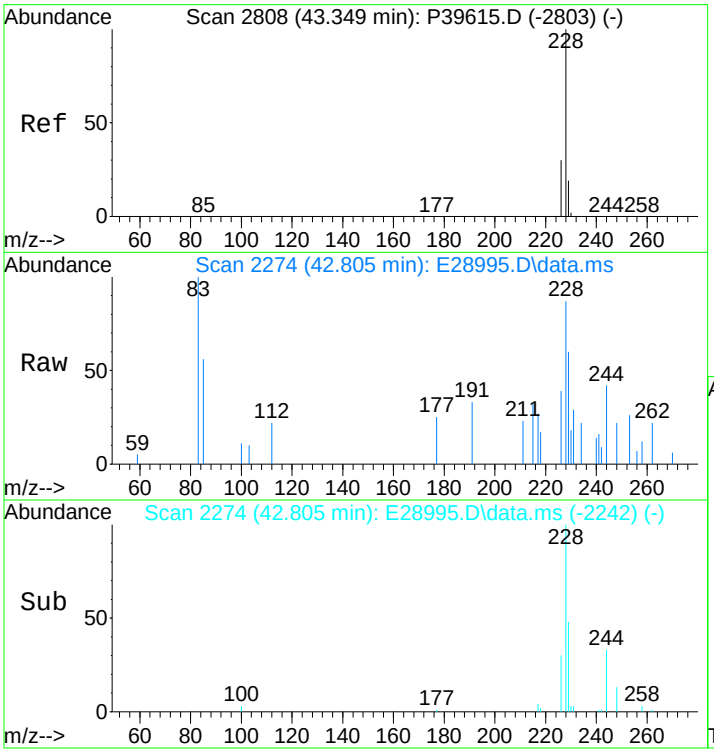


#75
Benz[a]anthracene
Concen: 22.91 ng/mL m
RT: 42.655 min Scan# 2264
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:228 Resp: 2315

Ion	Ratio	Lower	Upper
228	100		
226	54.0	20.7	31.1#

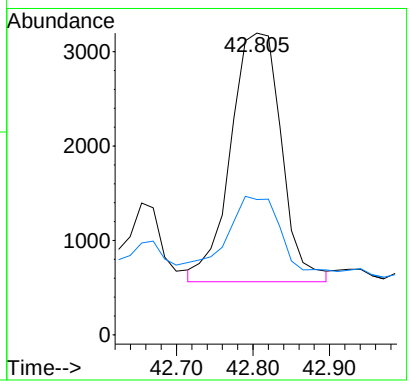


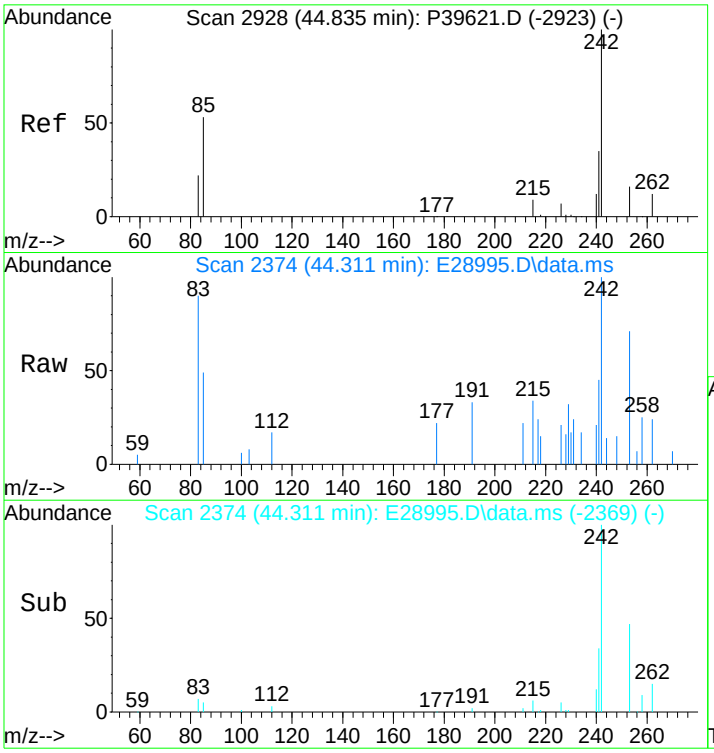


#77
Chrysene/Triphenylene
Concen: 116.42 ng/mL m
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:228 Resp: 12114

Ion	Ratio	Lower	Upper
228	100		
226	32.3	22.6	34.0

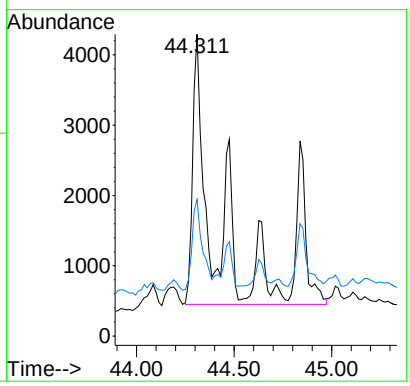


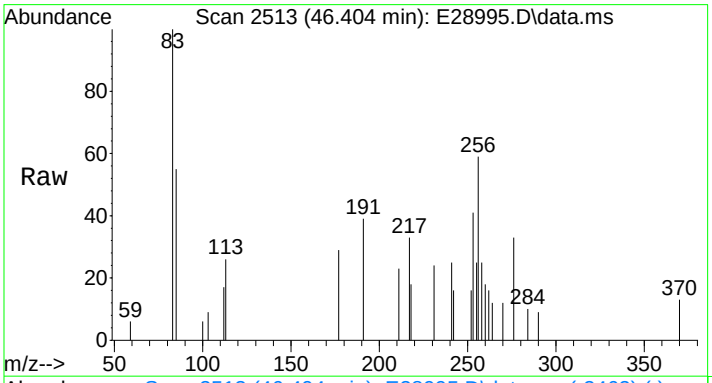


#78
C1-Chrysenes
Concen: 321.32 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:242 Resp: 33434

Ion	Ratio	Lower	Upper
242	100		
241	3.2	32.2	48.4#

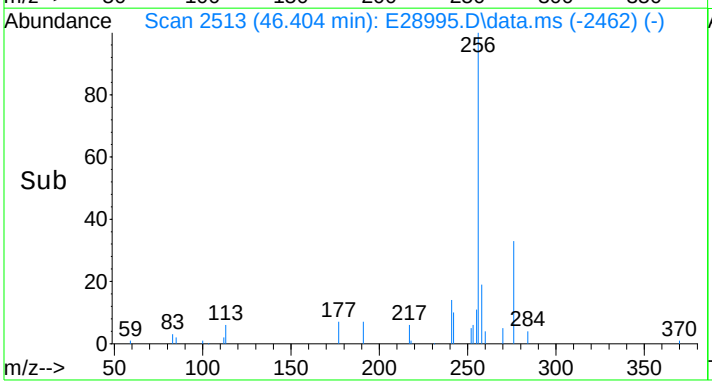


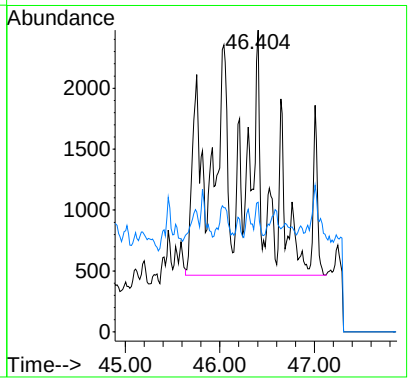


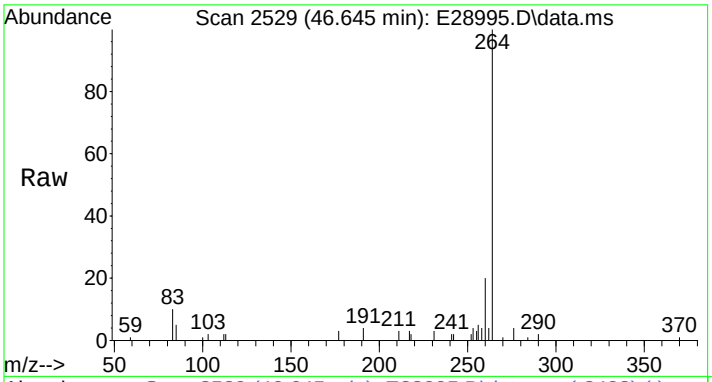
#79
C2-Chrysenes
Concen: 555.07 ng/mL m
RT: 46.404 min Scan# 2513
Delta R.T. 0.061 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:256 Resp: 57755

Ion	Ratio	Lower	Upper
256	100		
241	1.5	25.3	37.9#

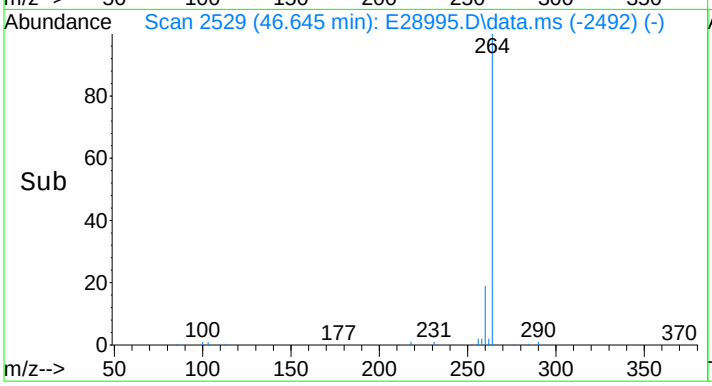


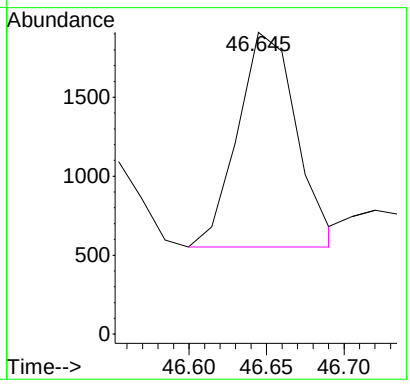


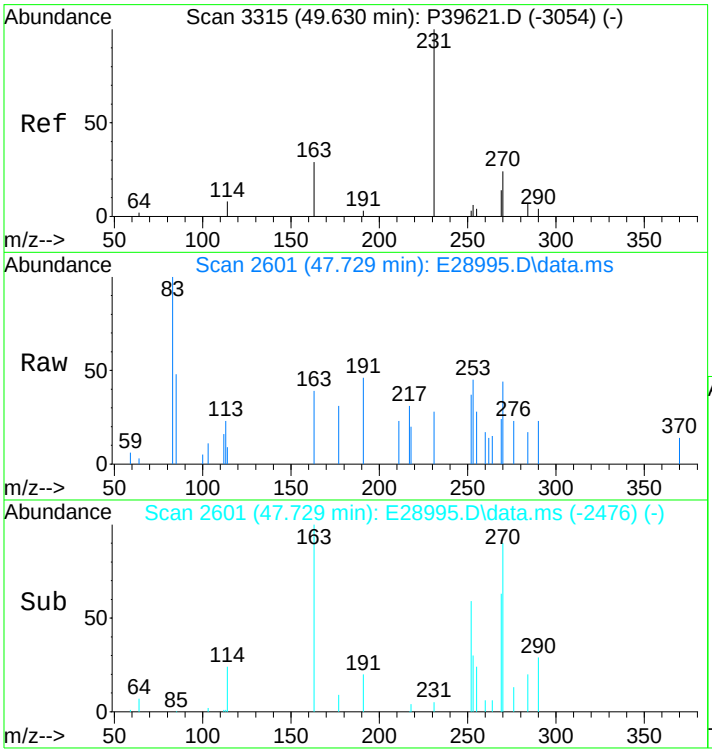


#80
BBF-D12 Surr BKGD
Concen: 34.48 ng/mL m
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:256 Resp: 3588



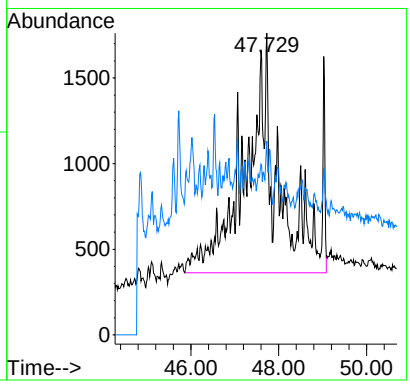


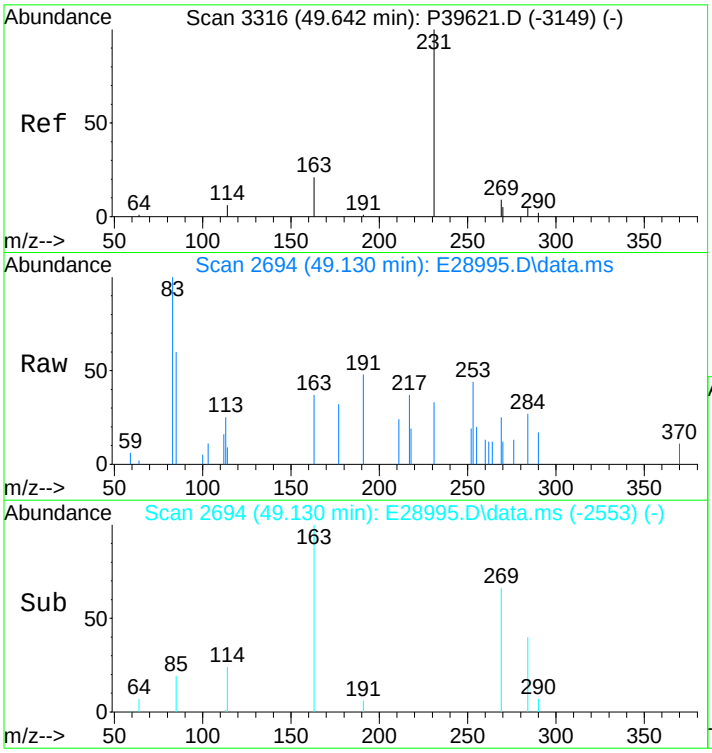


#81
C3-Chrysenes
Concen: 700.18 ng/mL m
RT: 47.729 min Scan# 2601
Delta R.T. -1.339 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:270 Resp: 72854

Ion	Ratio	Lower	Upper
270	100		
255	0.7	38.0	57.0#

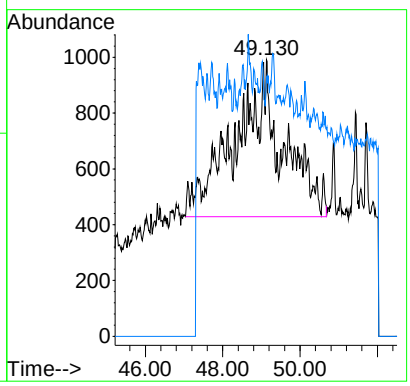


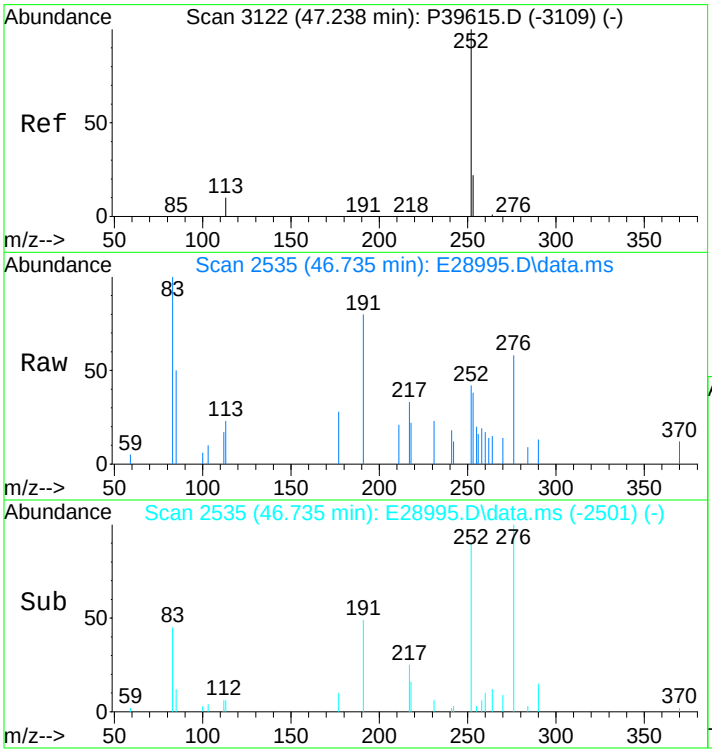


#82
C4-Chrysenes
Concen: 454.83 ng/mL m
RT: 49.130 min Scan# 2694
Delta R.T. -0.056 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:284 Resp: 47325

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

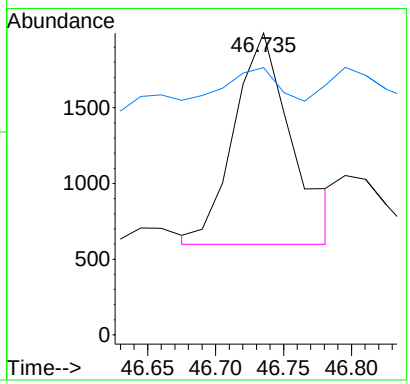


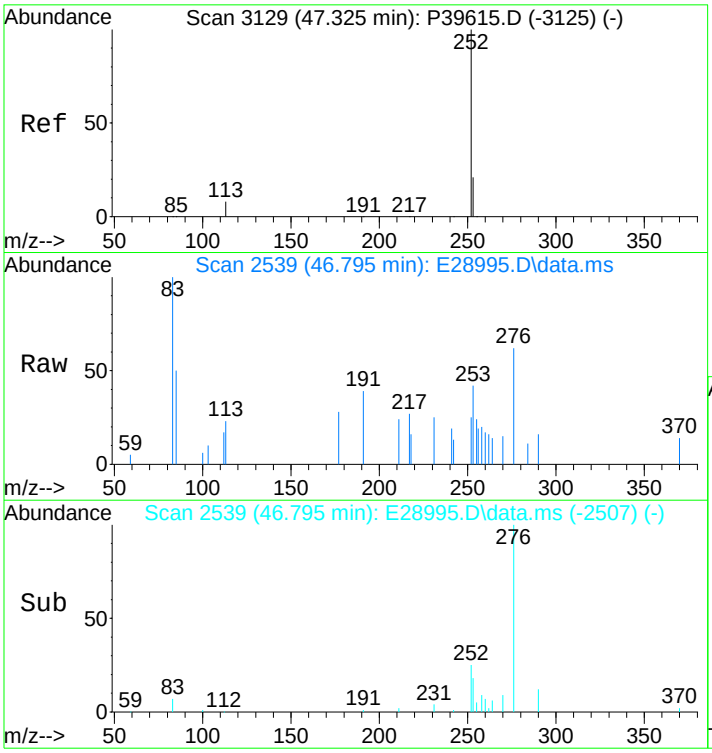


#84
Benzo[b]fluoranthene
Concen: 35.06 ng/mL m
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 4119

Ion	Ratio	Lower	Upper
252	100		
253	12.9	19.5	29.3#

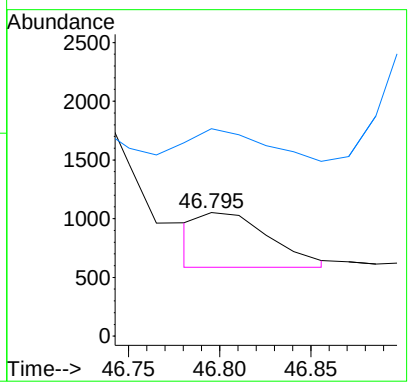


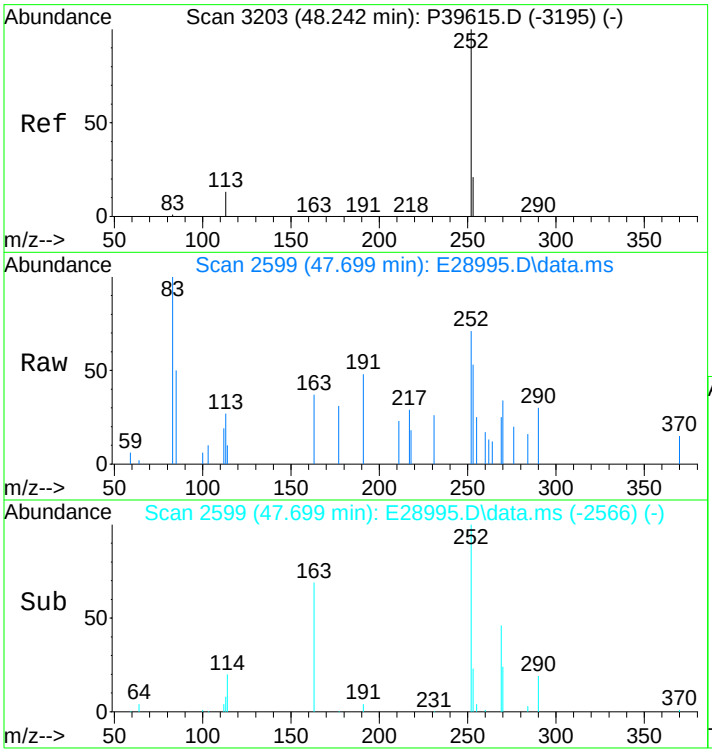


#85
Benzo[j]+[k]fluoranthene
Concen: 10.25 ng/mL m
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 1239

Ion	Ratio	Lower	Upper
252	100		
253	65.8	19.7	29.5#

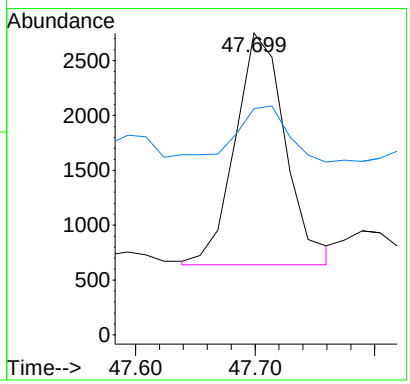


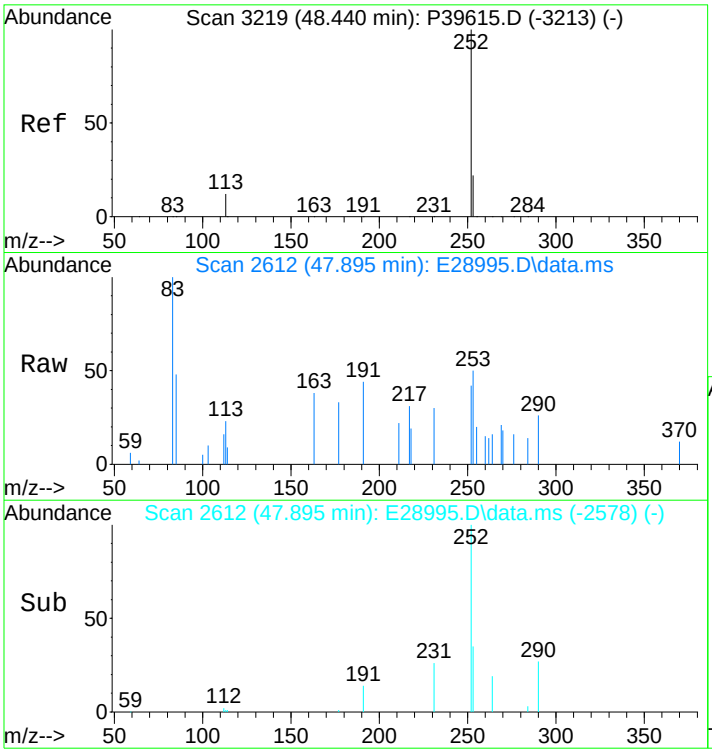


#87
Benzo[e]pyrene
Concen: 53.76 ng/mL m
RT: 47.699 min Scan# 2599
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 6166

Ion	Ratio	Lower	Upper
252	100		
253	30.4	20.6	31.0

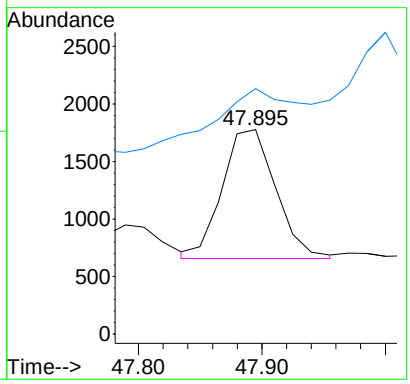


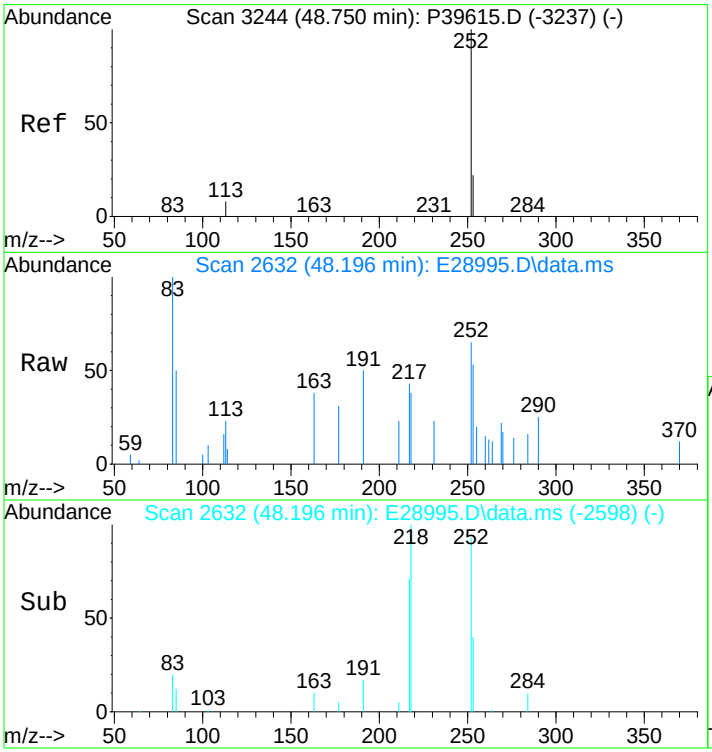


#89
Benzo[a]pyrene
Concen: 30.78 ng/mL m
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 3378

Ion	Ratio	Lower	Upper
252	100		
253	55.3	20.8	31.2#

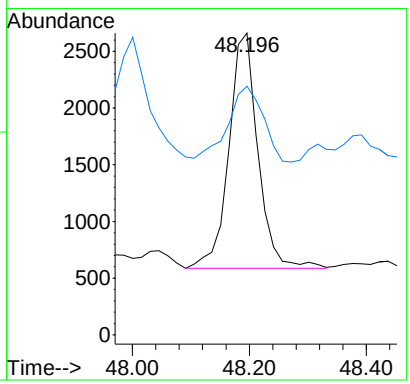


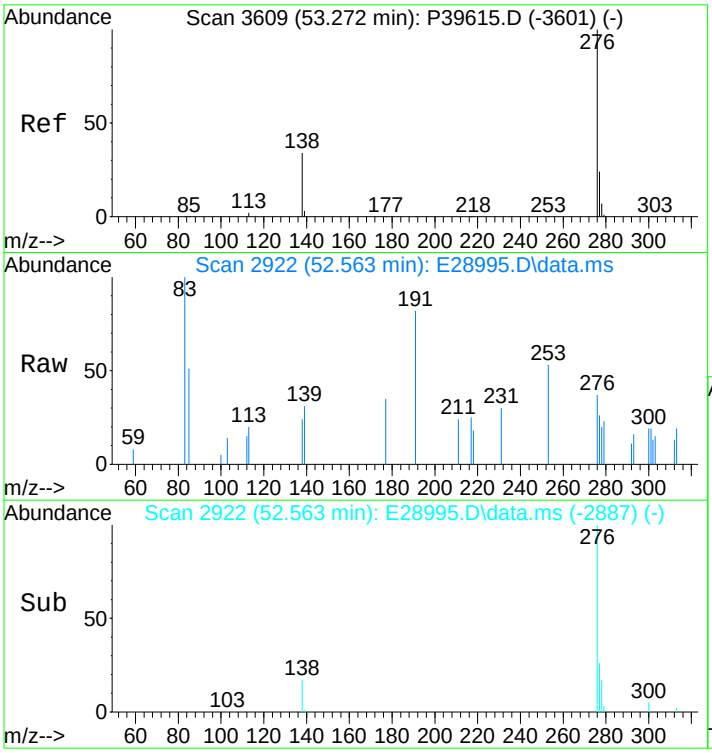


#90
Perylene
Concen: 61.61 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:252 Resp: 7151

Ion	Ratio	Lower	Upper
252	100		
253	39.0	20.7	31.1#

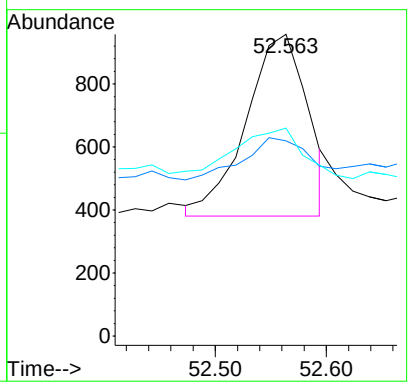


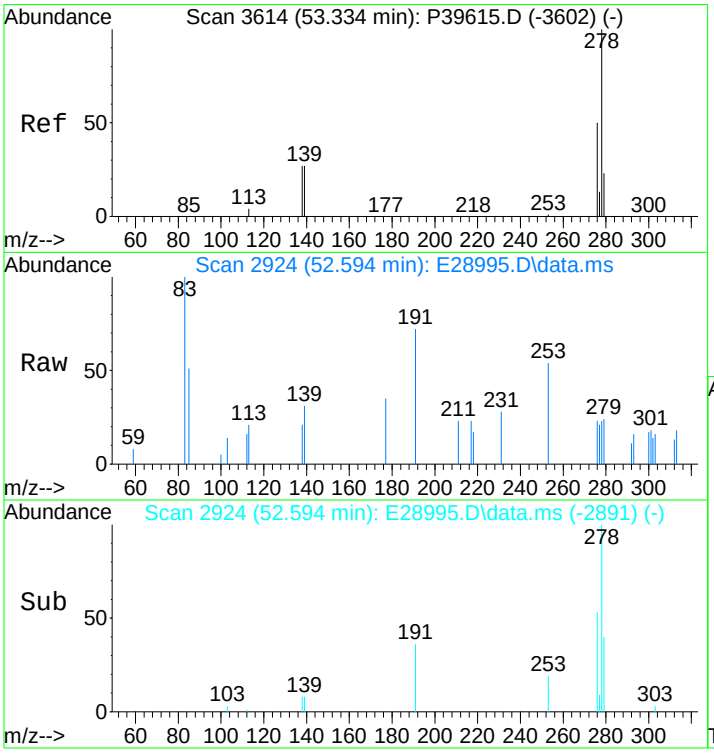


#91
Indeno[1,2,3-cd]pyrene
Concen: 17.14 ng/mL m
RT: 52.563 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:276 Resp: 2214

Ion	Ratio	Lower	Upper
276	100		
138	25.3	16.3	24.5#
277	31.3	19.4	29.2#

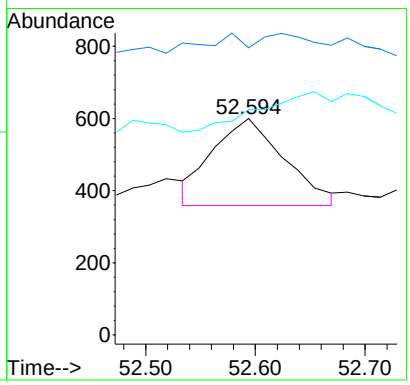


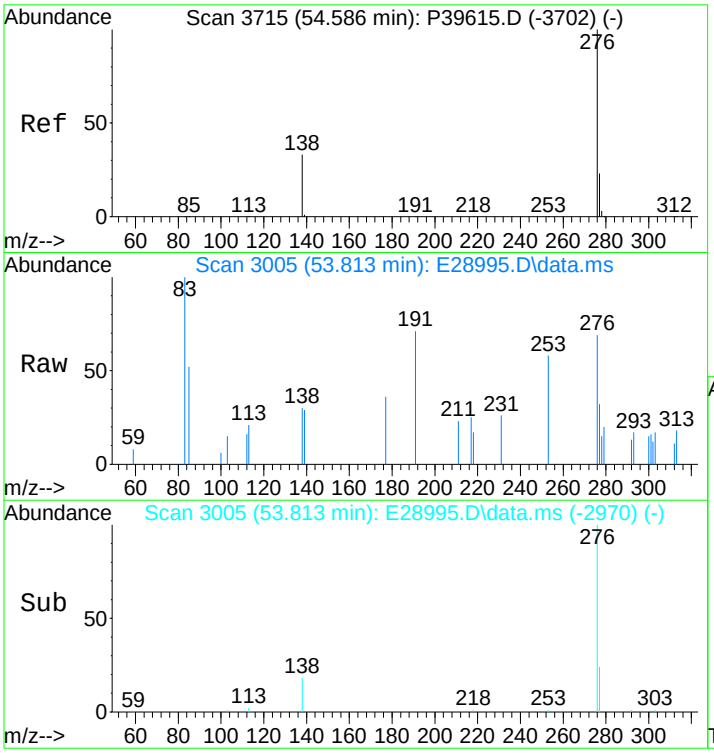


#92
Dibenz[ah]+[ac]anthracene
Concen: 7.98 ng/mL m
RT: 52.594 min Scan# 2924
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:278 Resp: 1098

Ion	Ratio	Lower	Upper
278	100		
139	11.8	11.6	17.4
279	0.0	19.3	28.9#

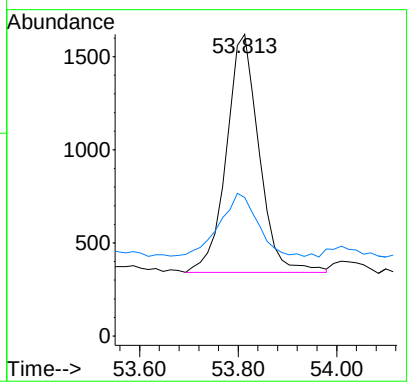


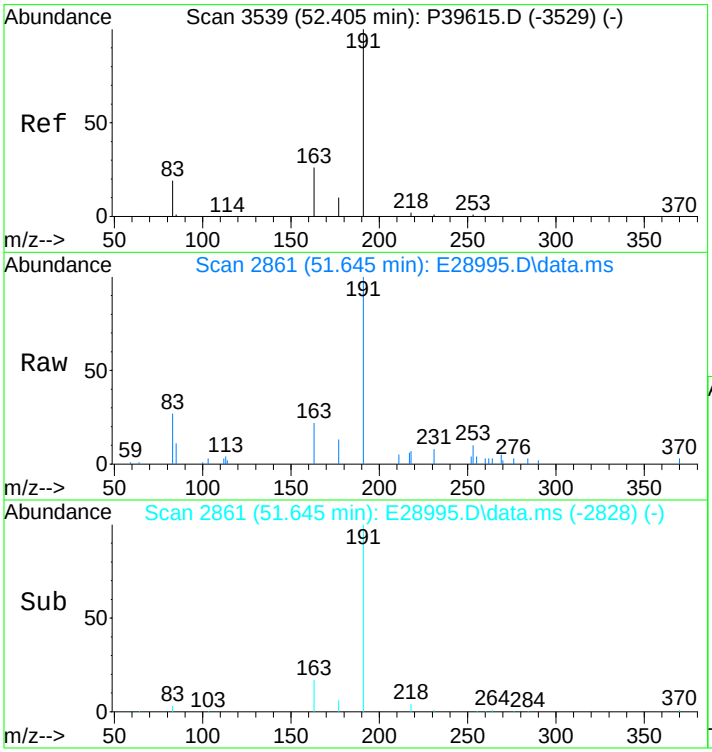


#93
Benzo[g,h,i]perylene
Concen: 42.21 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:276 Resp: 5879

Ion	Ratio	Lower	Upper
276	100		
277	31.0	19.1	28.7#

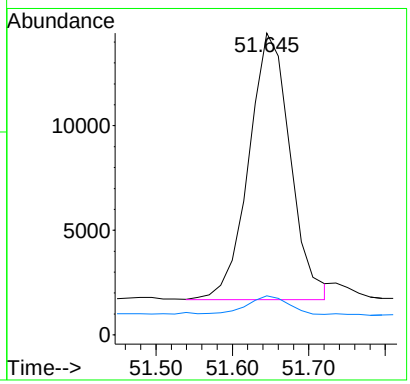


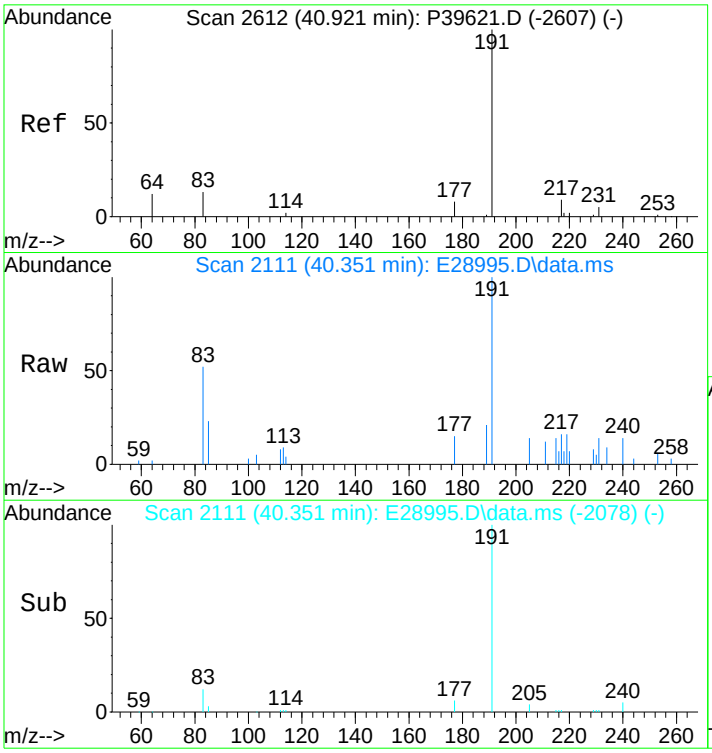


#94
Hopane (T19)
Concen: 1232.32 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:191 Resp: 48000

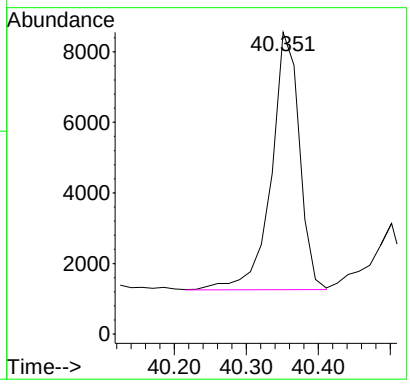
Ion	Ratio	Lower	Upper
191	100		
177	0.6	11.6	17.4#

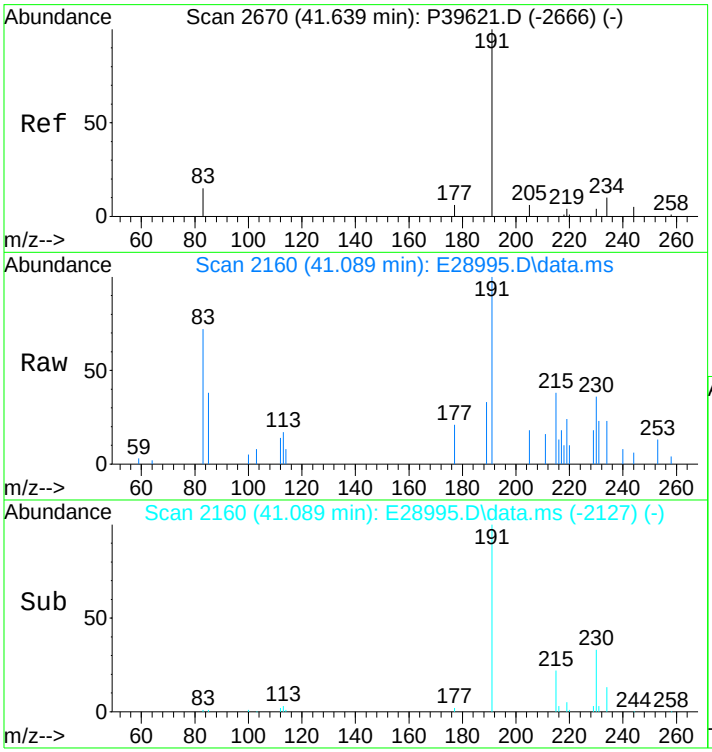




#96
C23 Tricyclic Terpane (T4)
Concen: 507.20 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

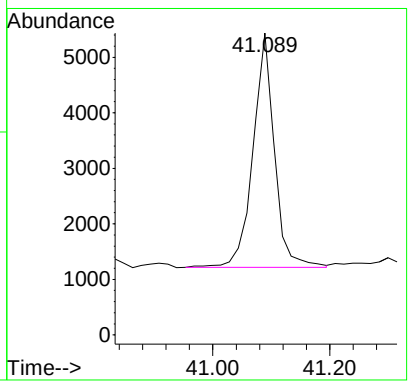
Tgt Ion:191 Resp: 19756

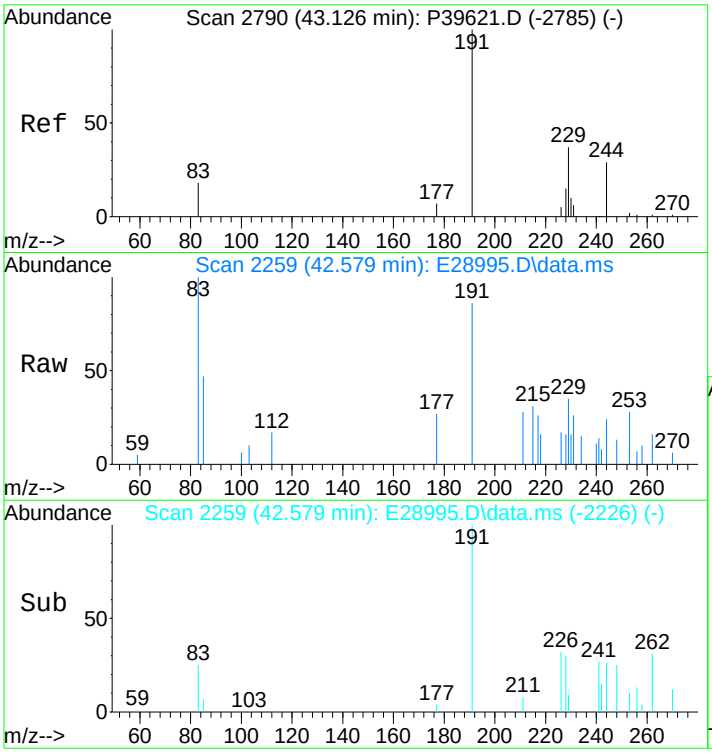




#97
C24 Tricyclic Terpane (T5)
Concen: 275.17 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

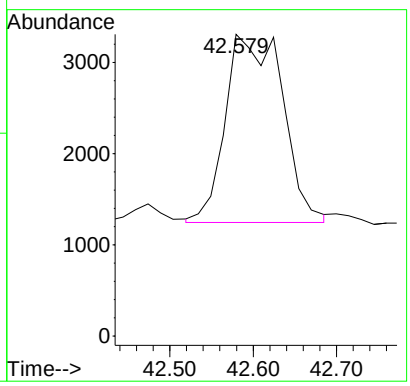
Tgt Ion:191 Resp: 10718

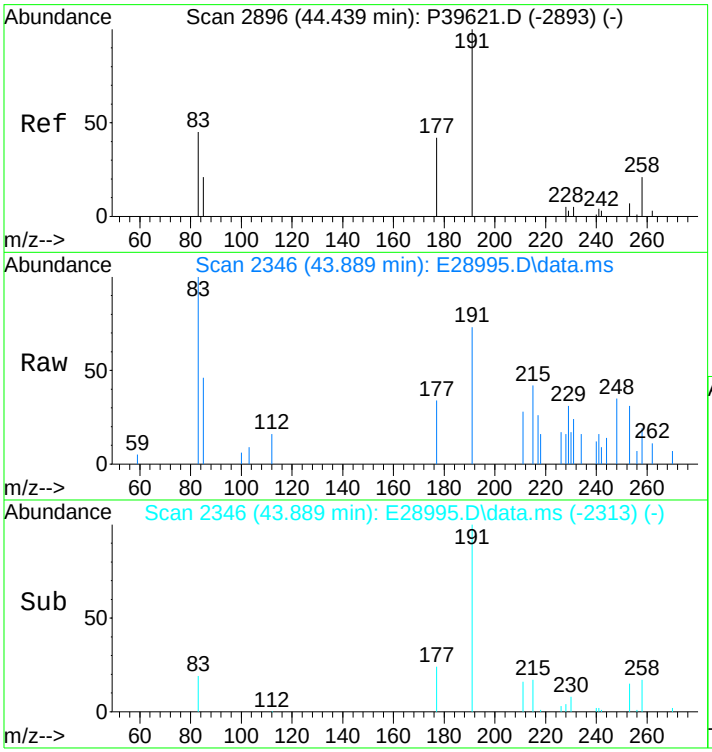




#98
C25 Tricyclic Terpane (T6)
Concen: 251.14 ng/ml m
RT: 42.579 min Scan# 2259
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

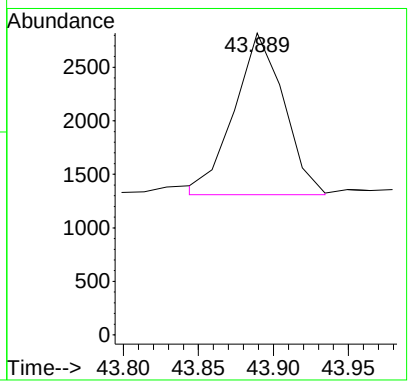
Tgt Ion:191 Resp: 9782

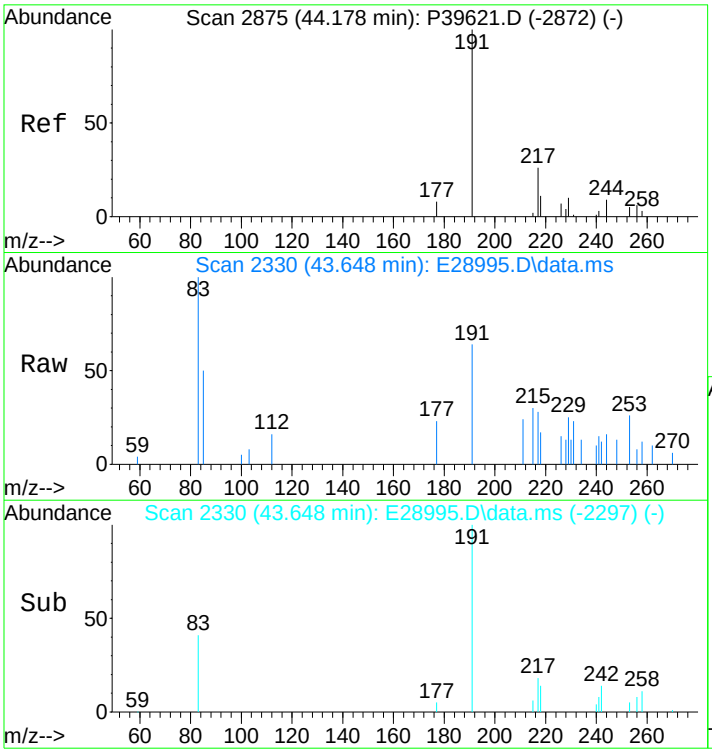




#99
C24 Tetracyclic Terpane (T6a)
Concen: 88.86 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

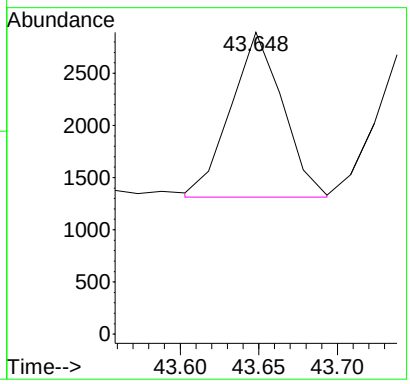
Tgt Ion:191 Resp: 3461

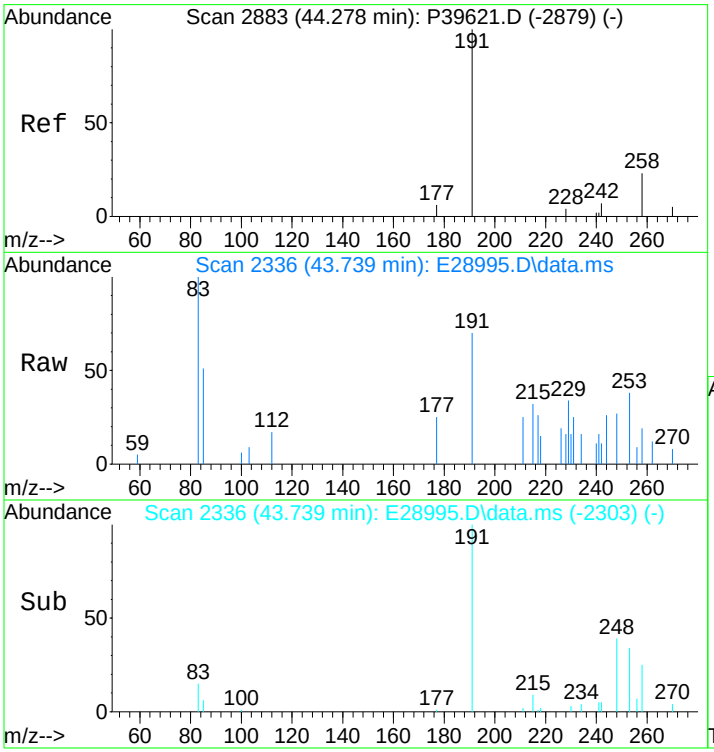




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 92.86 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

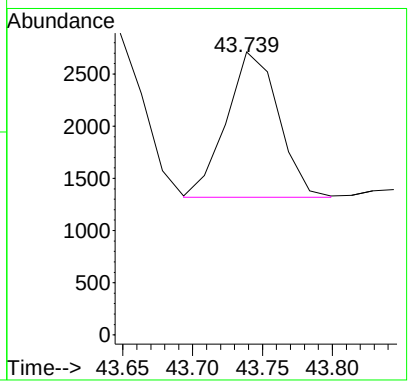
Tgt Ion:191 Resp: 3617

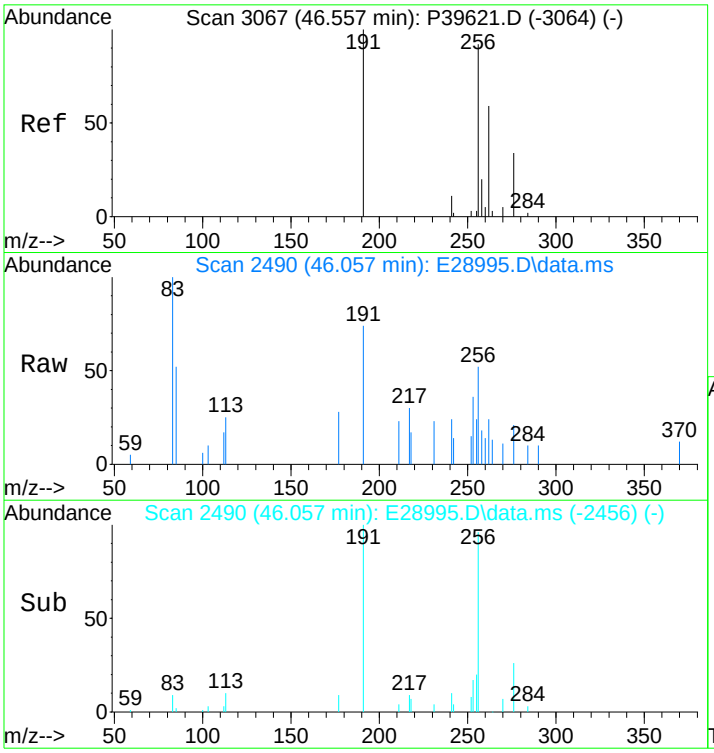




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 92.94 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

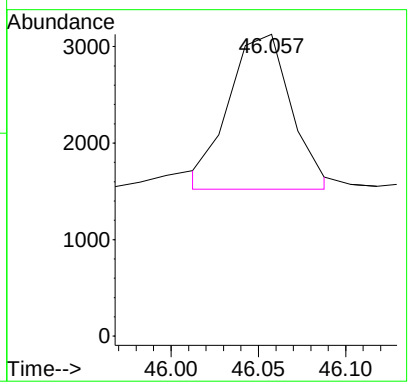
Tgt Ion:191 Resp: 3620

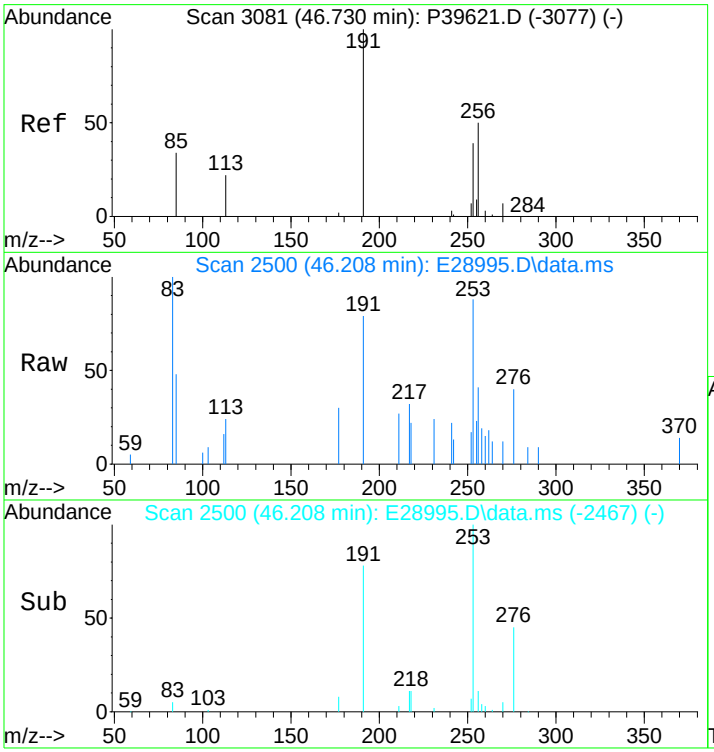




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 102.00 ng/ml m
RT: 46.057 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

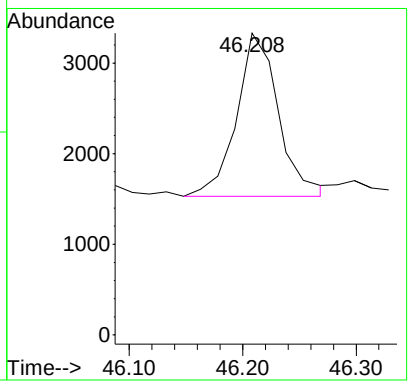
Tgt Ion:191 Resp: 3973

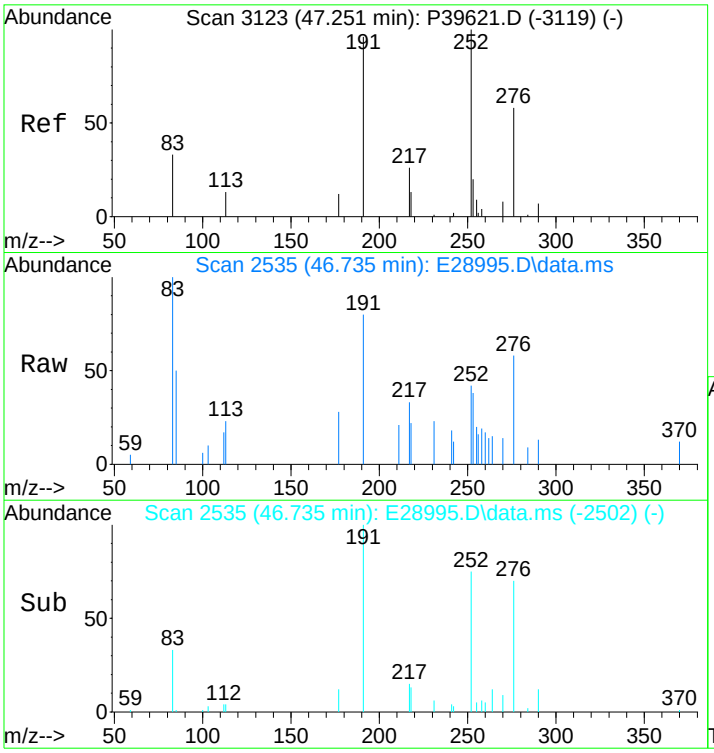




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 118.53 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

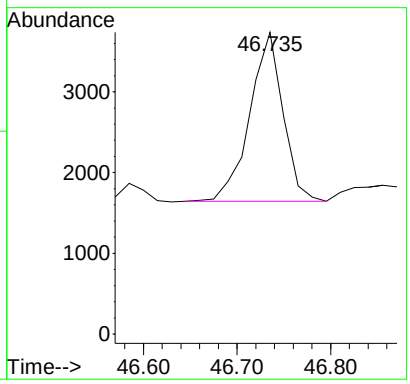
Tgt Ion:191 Resp: 4617

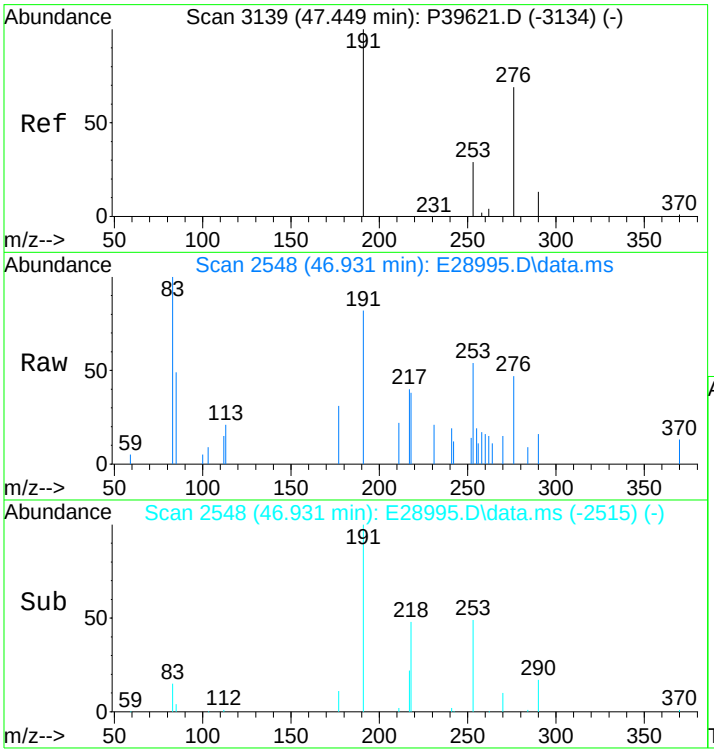




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 132.24 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

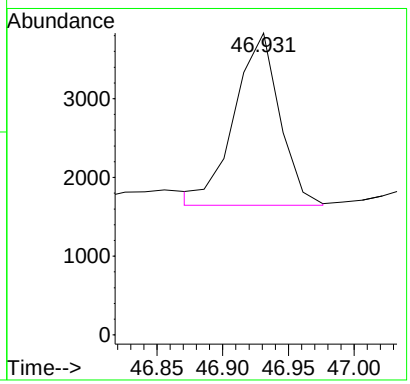
Tgt Ion:191 Resp: 5151

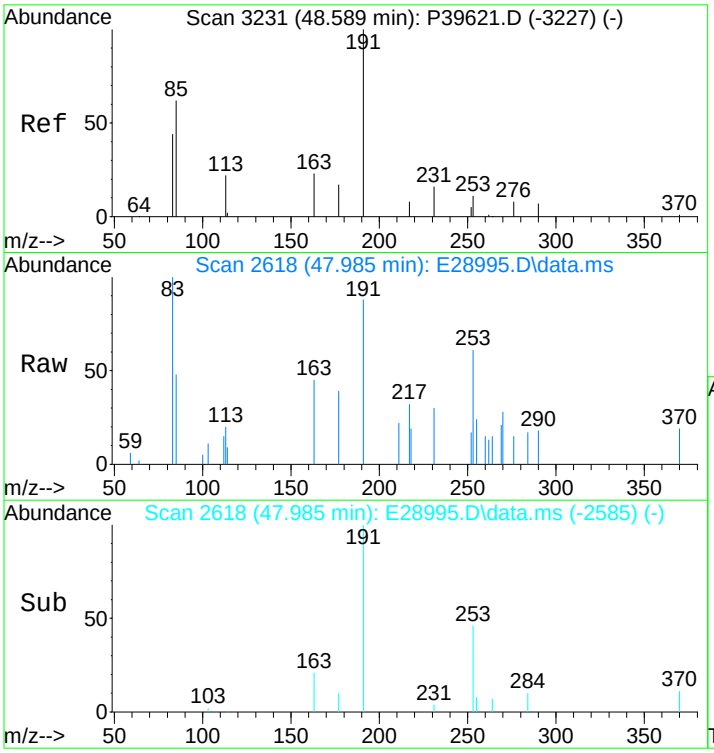




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 134.25 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

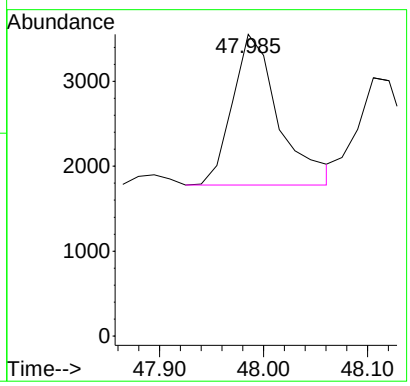
Tgt Ion:191 Resp: 5229

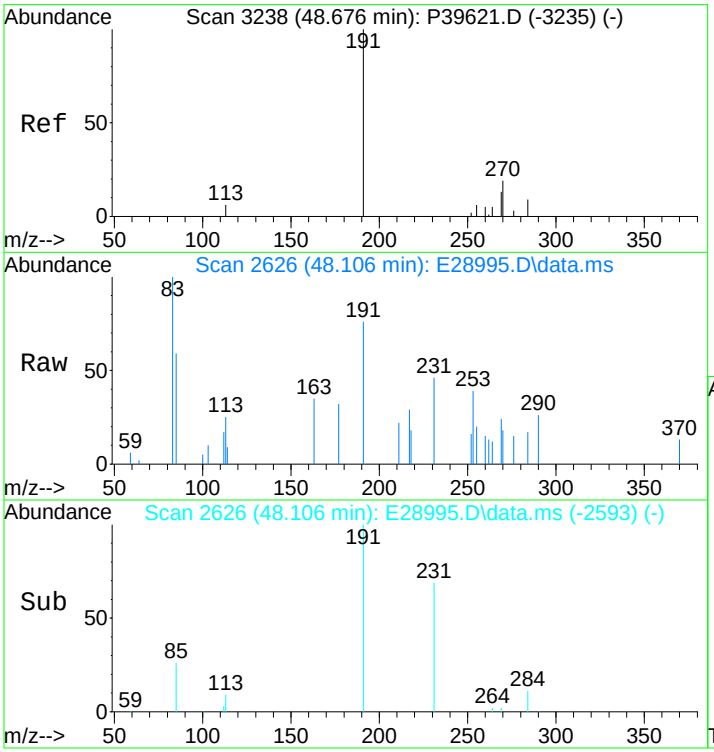




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 141.79 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

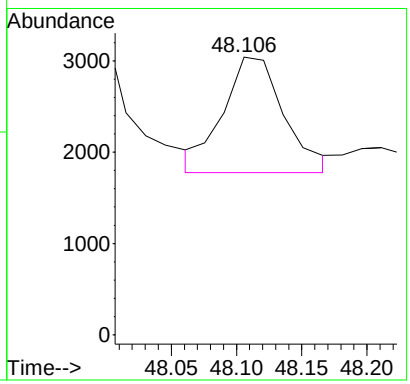
Tgt Ion:191 Resp: 5523

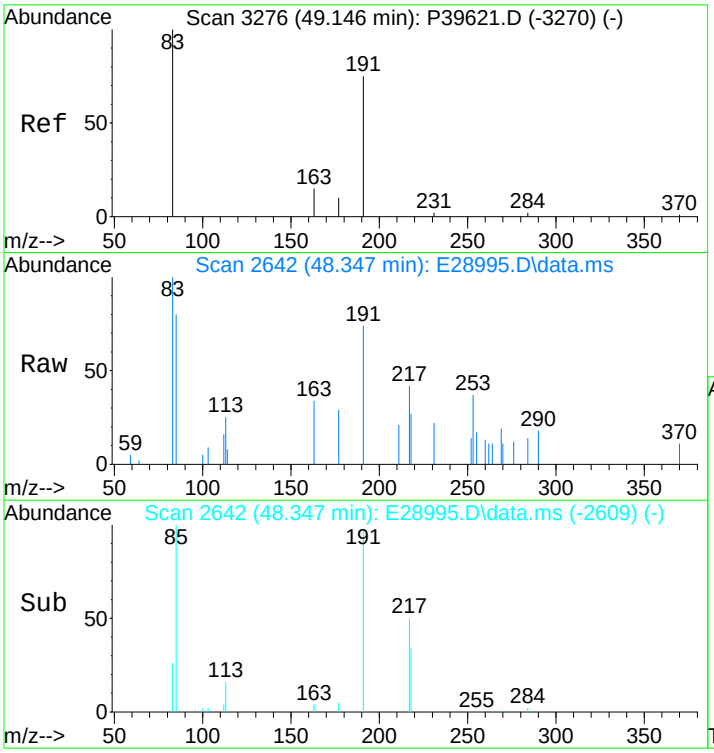




#107
C30 Tricyclic Terpane-22S
Concen: 106.36 ng/mL m
RT: 48.106 min Scan# 2626
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

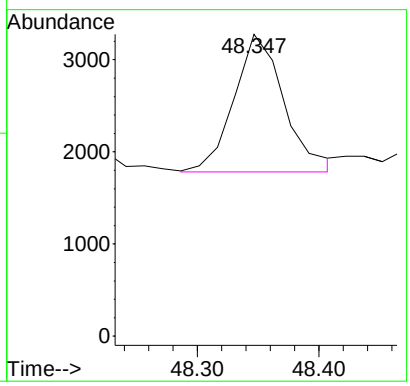
Tgt Ion:191 Resp: 4143

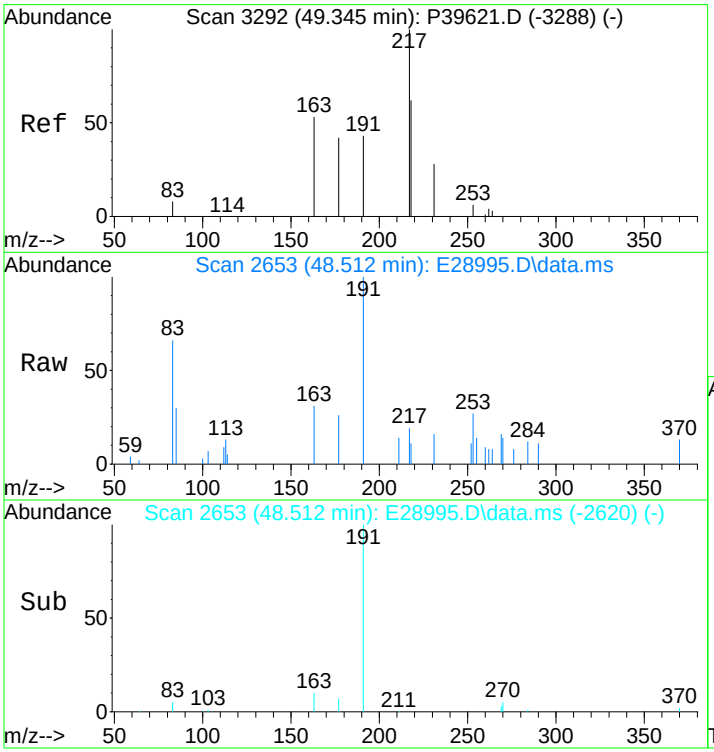




#108
C30 Tricyclic Terpane-22R
Concen: 110.11 ng/mL m
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

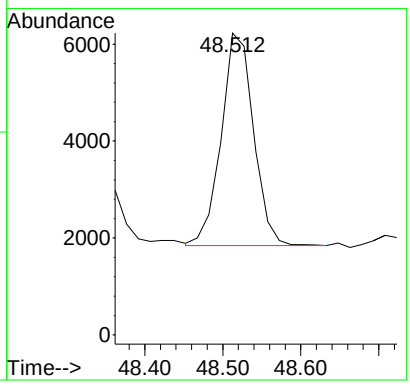
Tgt Ion:191 Resp: 4289

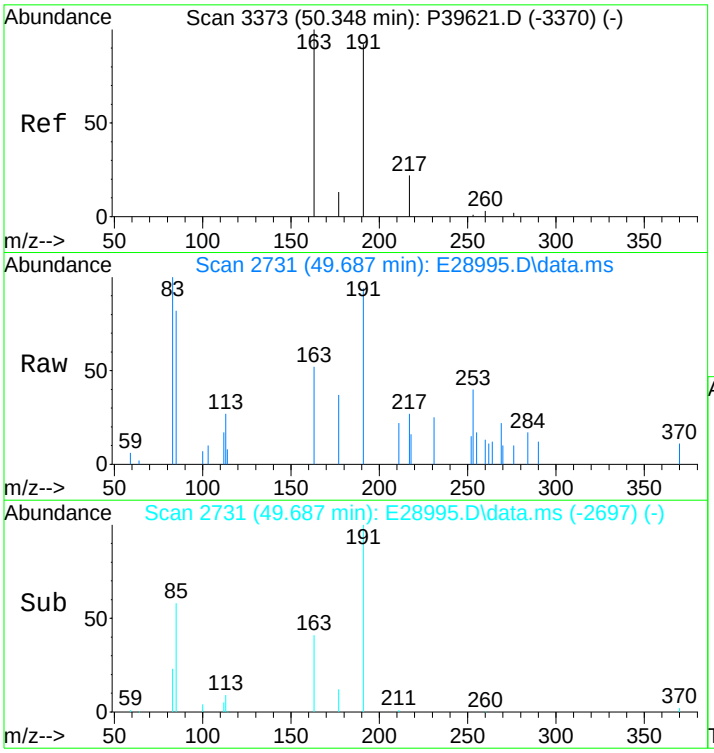




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 324.43 ng/ml
RT: 48.512 min Scan# 2653
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

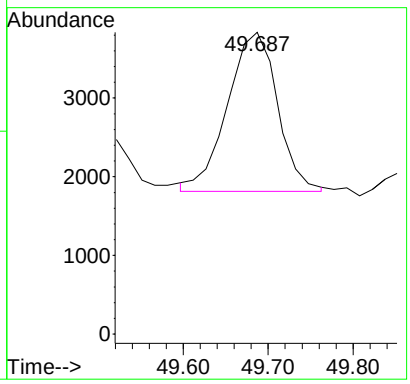
Tgt Ion:191 Resp: 12637

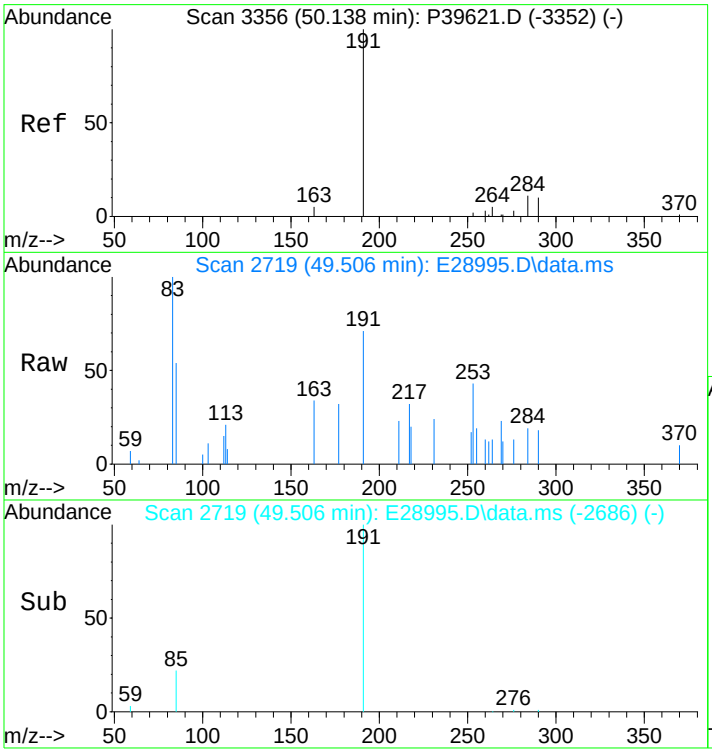




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 211.47 ng/ml m
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

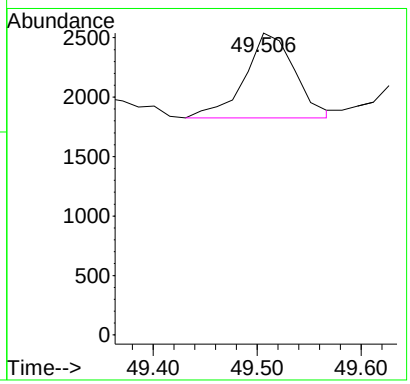
Tgt Ion:191 Resp: 8237

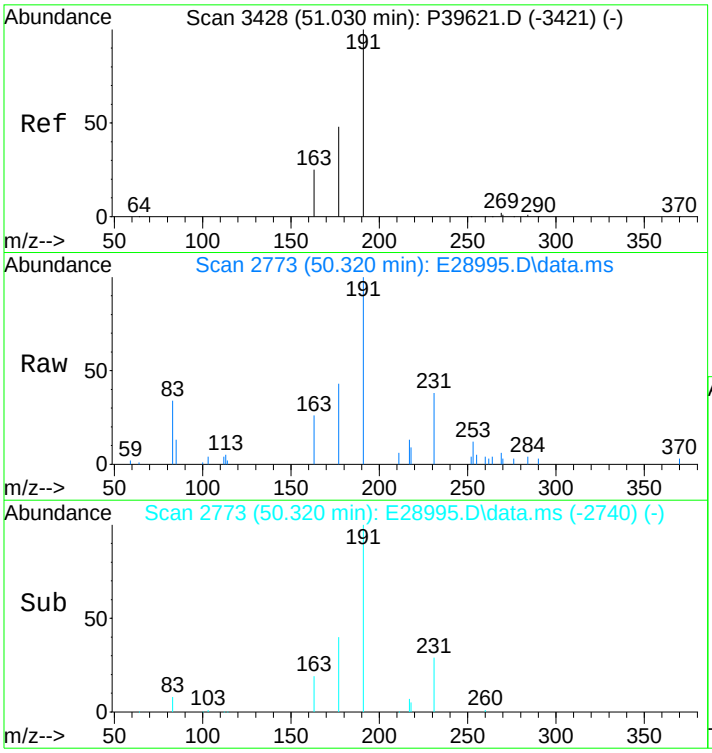




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 61.67 ng/ml
RT: 49.506 min Scan# 2719
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

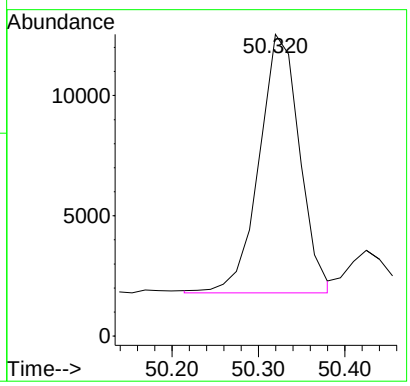
Tgt Ion:191 Resp: 2402

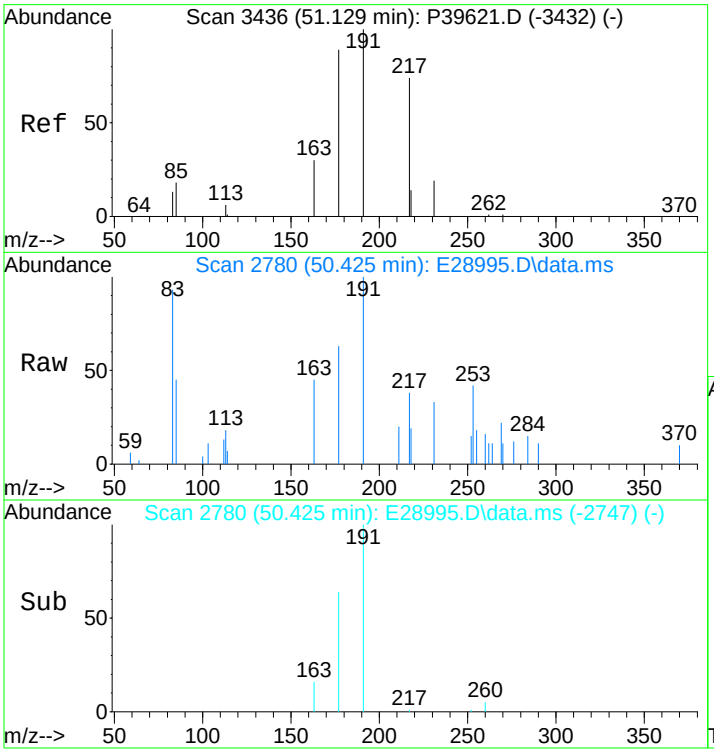




#112
30-Norhopane (T15)
Concen: 898.74 ng/ml m
RT: 50.320 min Scan# 2773
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

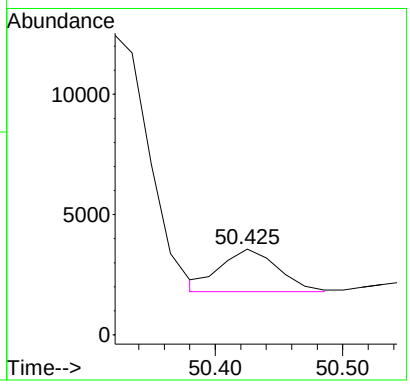
Tgt Ion:191 Resp: 35007

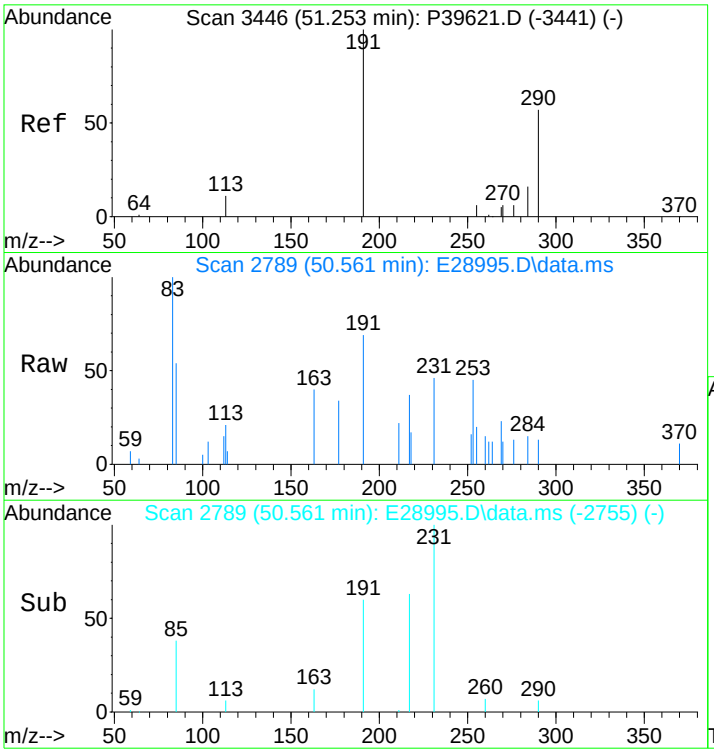




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 141.41 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

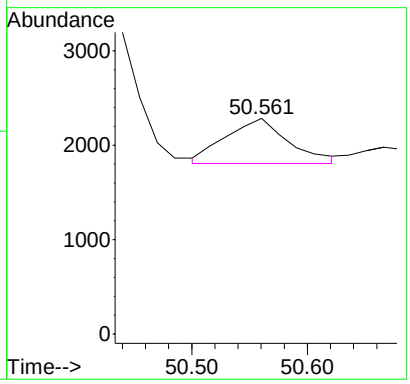
Tgt Ion:191 Resp: 5508

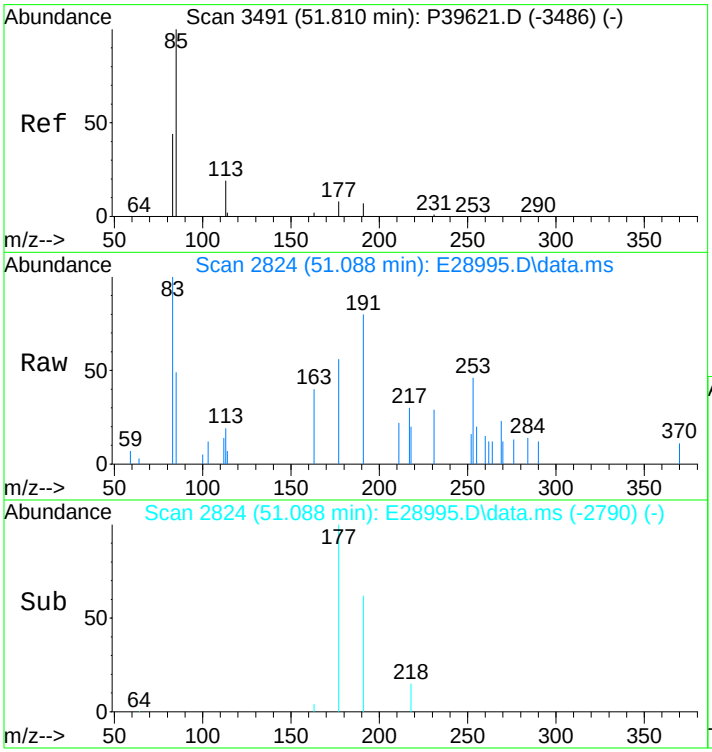




#114
17a(H)-Diahopane (X)
Concen: 46.03 ng/ml m
RT: 50.561 min Scan# 2789
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

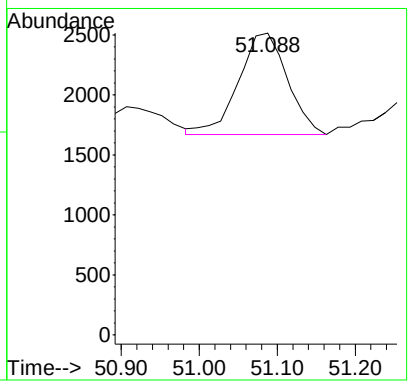
Tgt Ion:191 Resp: 1793

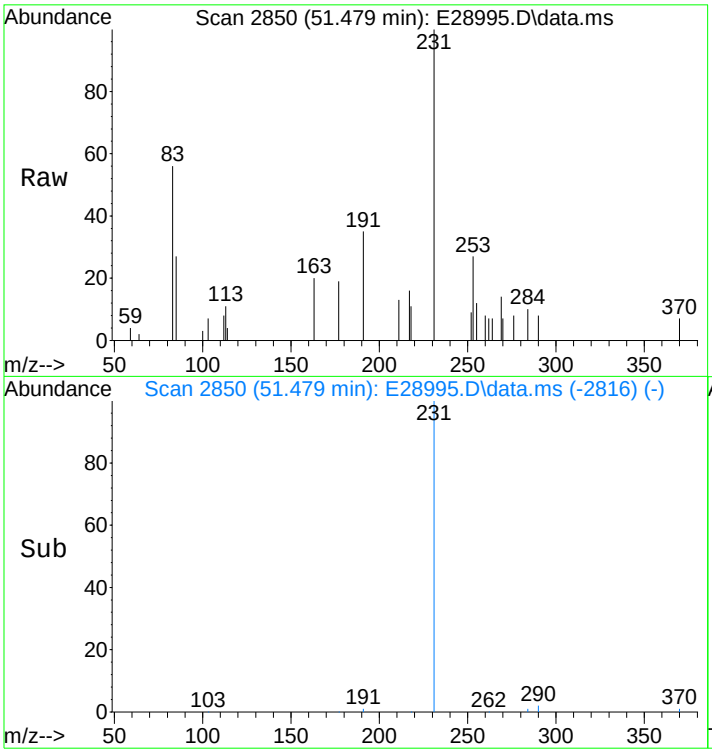




#115
30-Normoretane (T17)
Concen: 94.32 ng/ml
RT: 51.088 min Scan# 2824
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

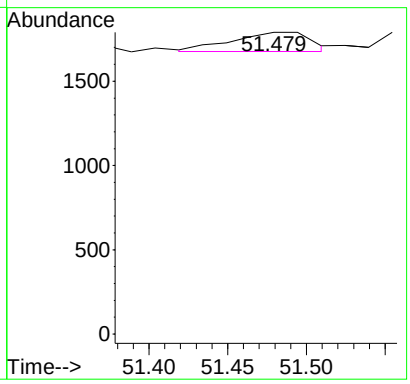
Tgt Ion:191 Resp: 3674

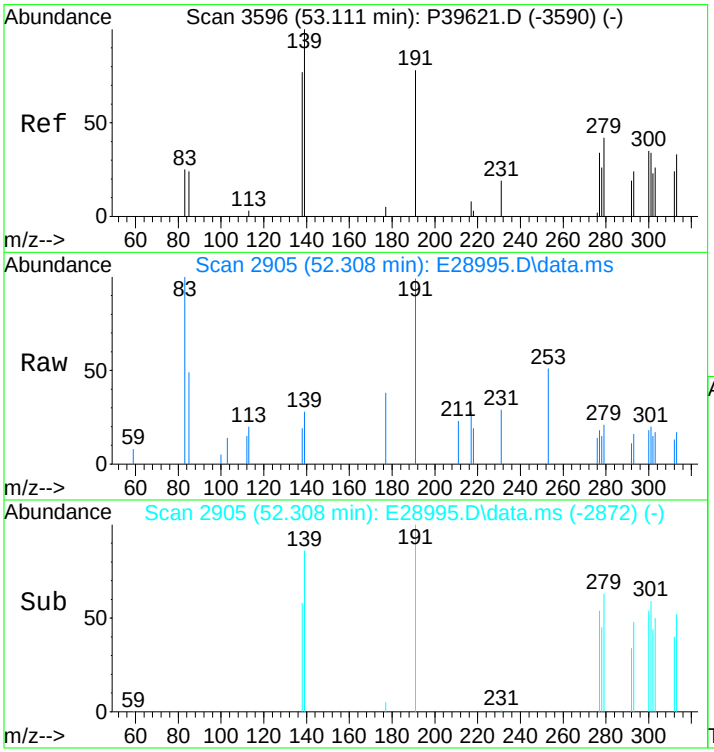




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 10.29 ng/ml m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

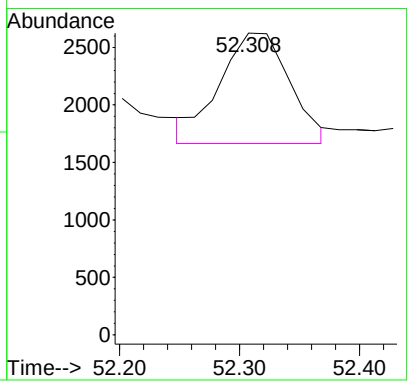
Tgt Ion:191 Resp: 401

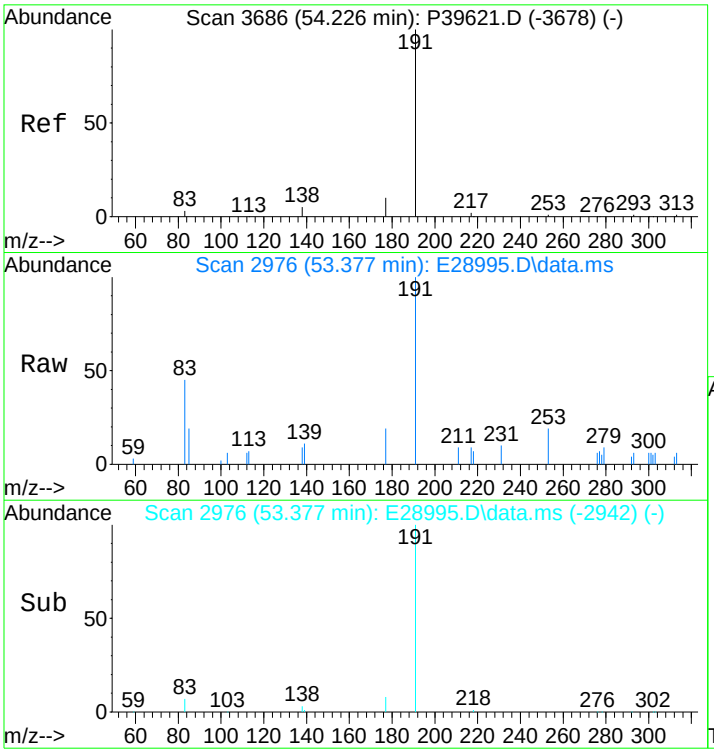




#117
Moretane (T20)
Concen: 100.13 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

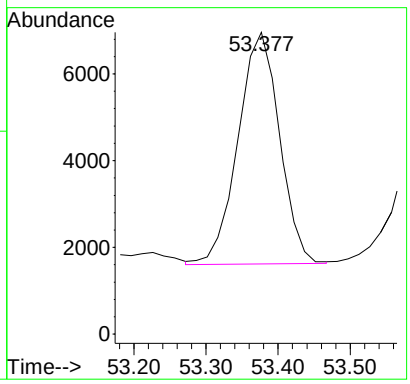
Tgt Ion:191 Resp: 3900

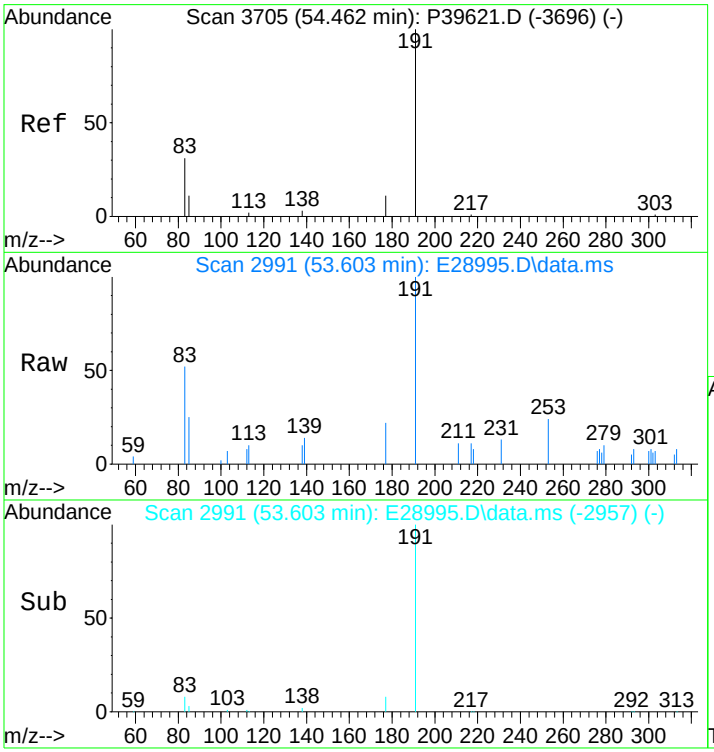




#118
30-Homohopane-22S (T21)
Concen: 547.23 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

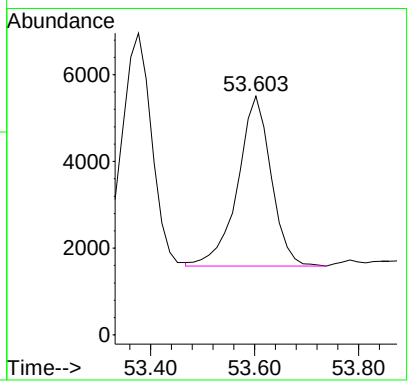
Tgt Ion:191 Resp: 21315

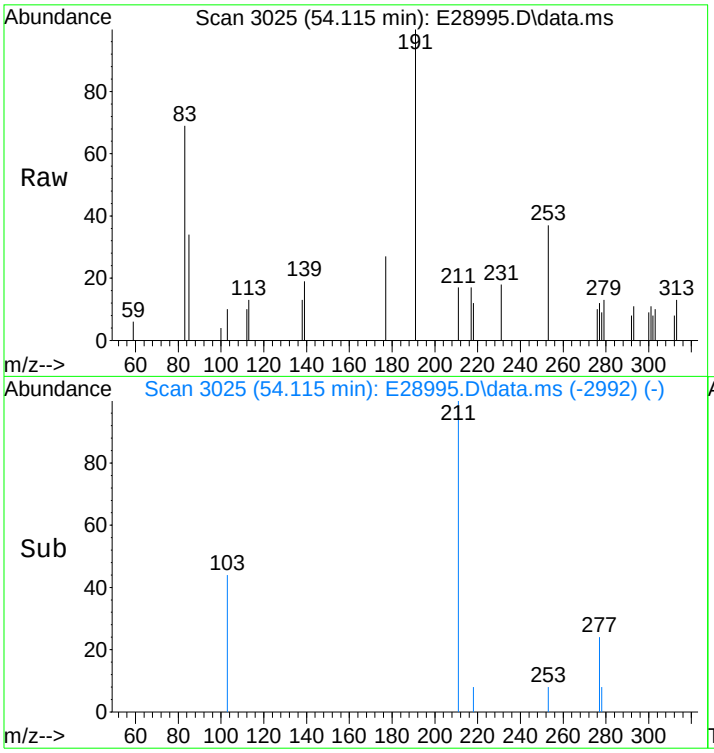




#119
30-Homohopane-22R (T22)
Concen: 449.44 ng/ml
RT: 53.603 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

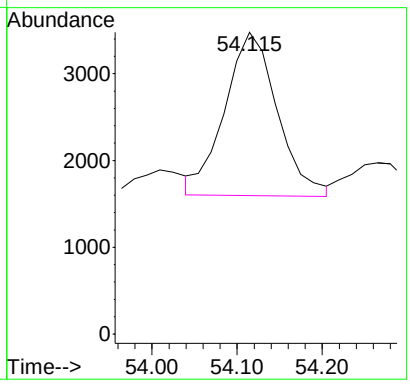
Tgt Ion:191 Resp: 17506

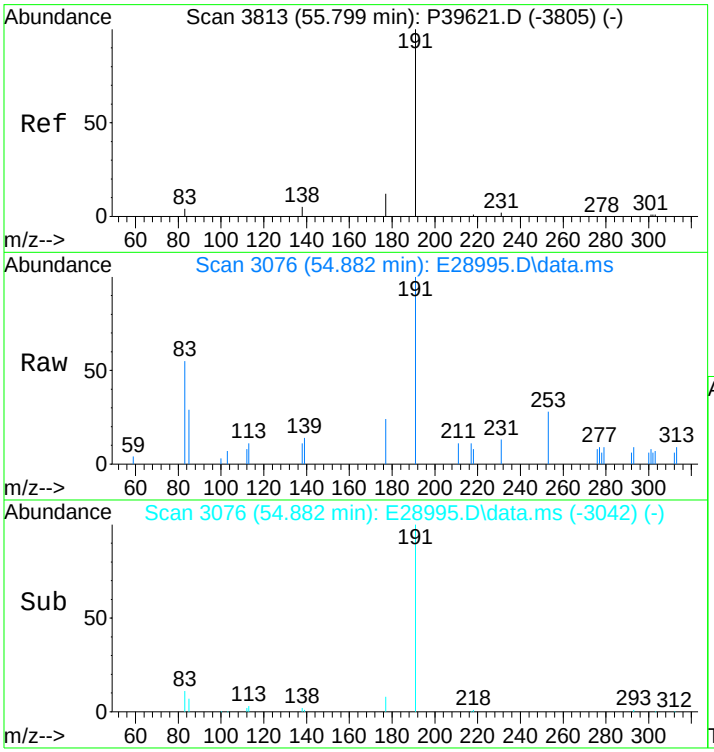




#120
Gammacerane/C32-diahopane
Concen: 207.00 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

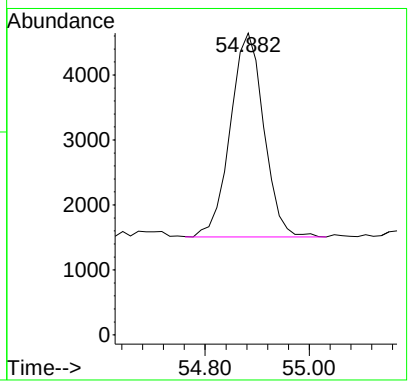
Tgt Ion:191 Resp: 8063

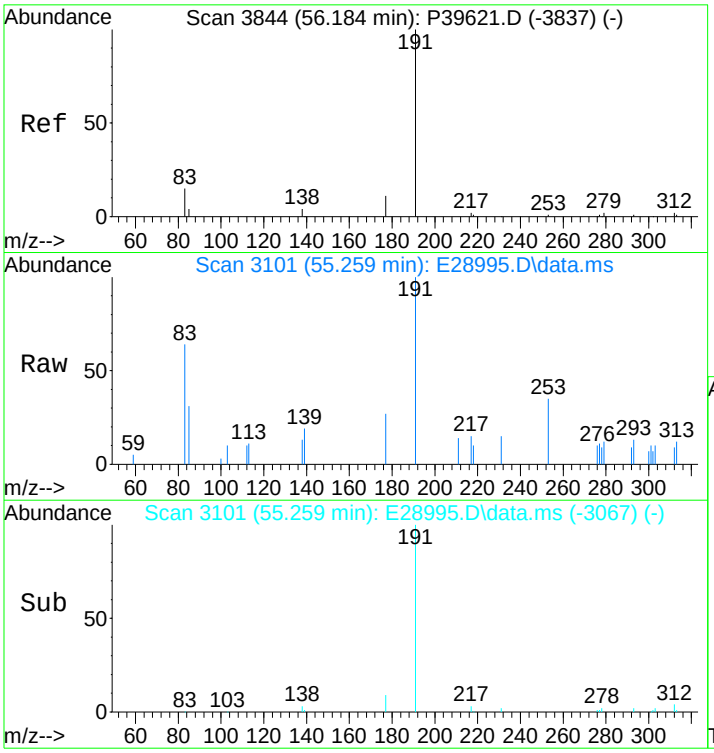




#121
30,31-Bishomohopane-22S (T26)
Concen: 362.07 ng/ml
RT: 54.882 min Scan# 3076
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

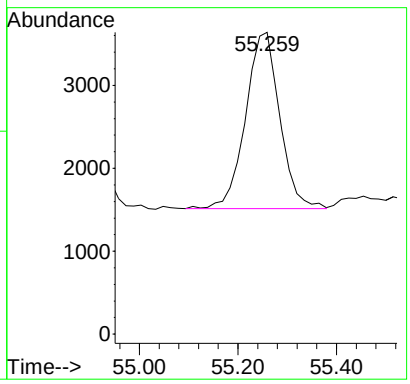
Tgt Ion:191 Resp: 14103

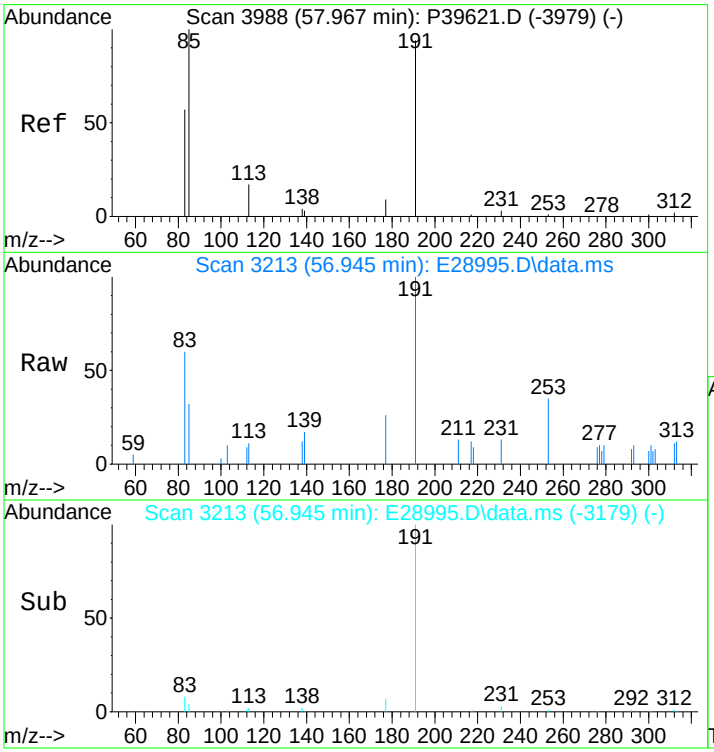




#122
30,31-Bishomohopane-22R (T27)
Concen: 262.43 ng/ml
RT: 55.259 min Scan# 3101
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

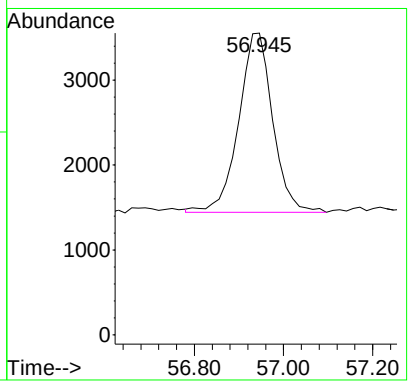
Tgt Ion:191 Resp: 10222

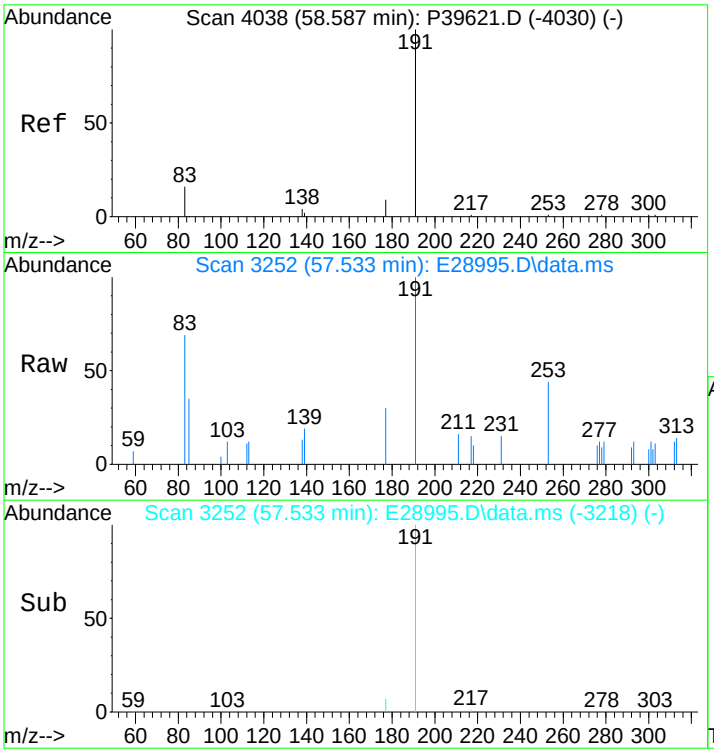




#123
30,31-Trishomohopane-22S (T30)
Concen: 289.31 ng/ml
RT: 56.945 min Scan# 3213
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

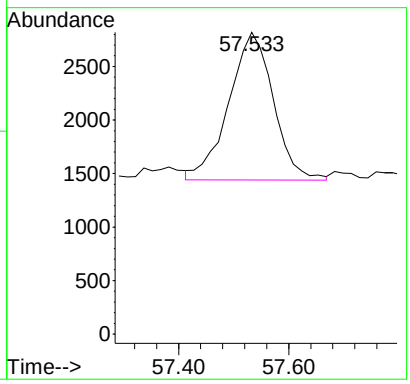
Tgt Ion:191 Resp: 11269

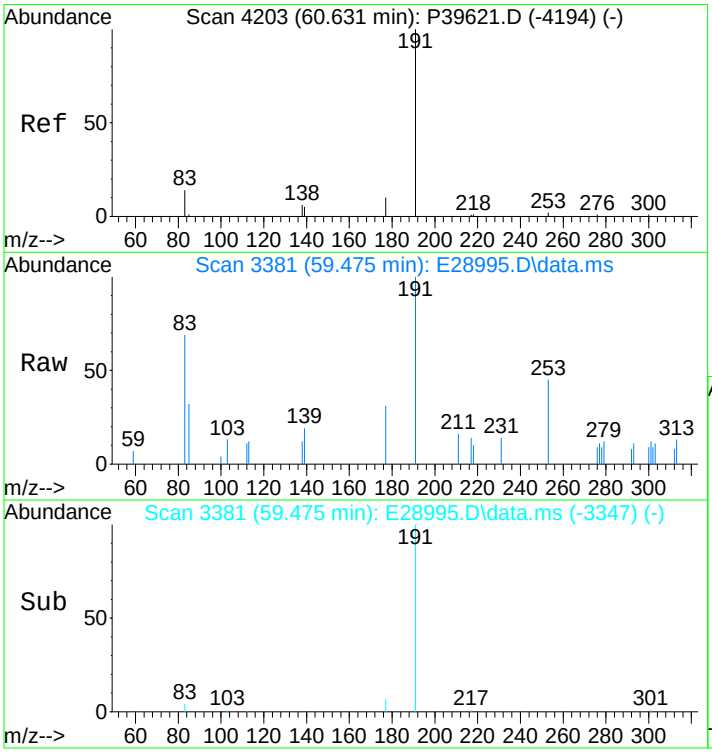




#124
30,31-Trishomohopane-22R (T31)
Concen: 198.58 ng/ml
RT: 57.533 min Scan# 3252
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

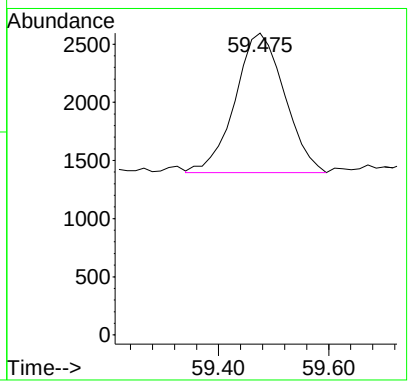
Tgt Ion:191 Resp: 7735

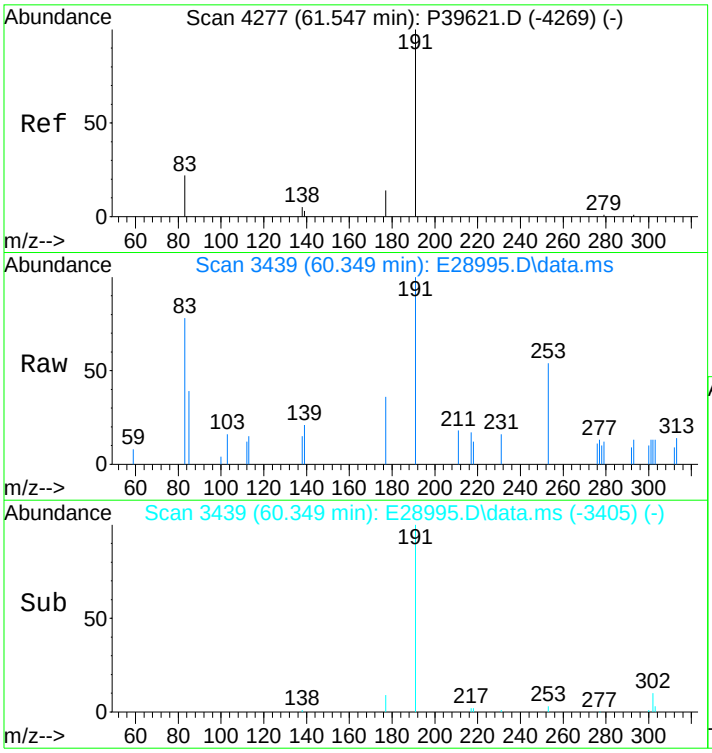




#125
Tetrakishomohopane-22S (T32)
Concen: 191.63 ng/ml
RT: 59.475 min Scan# 3381
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

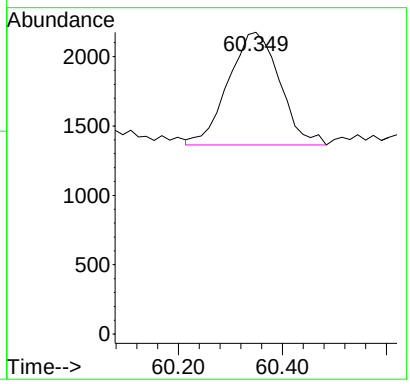
Tgt Ion:191 Resp: 7464

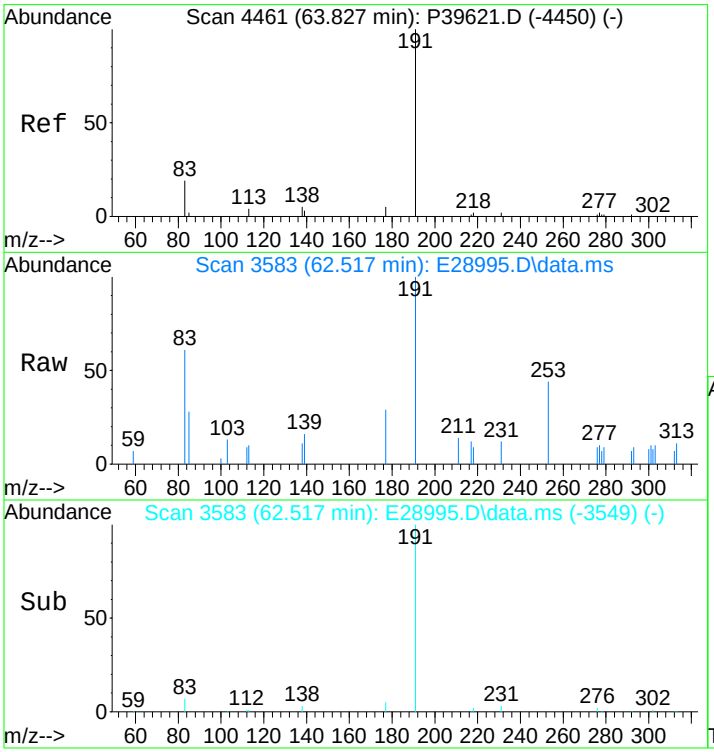




#126
Tetrakishomohopane-22R (T33)
Concen: 142.82 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

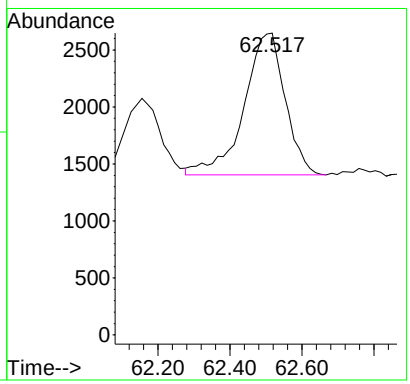
Tgt Ion:191 Resp: 5563

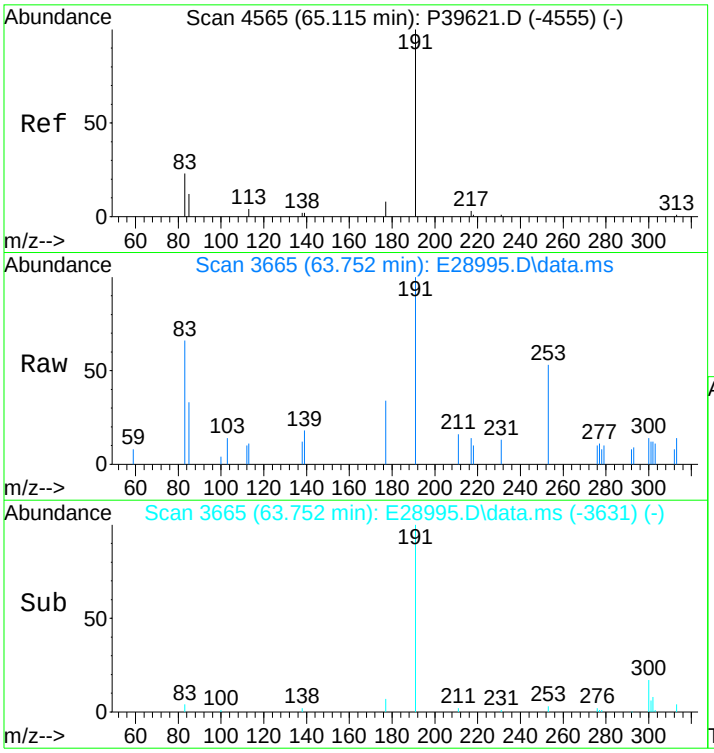




#127
Pentakishomohopane-22S (T34)
Concen: 252.32 ng/ml
RT: 62.517 min Scan# 3583
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

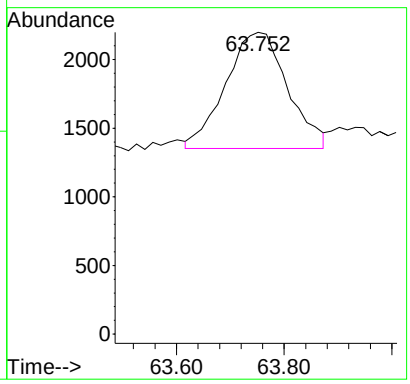
Tgt Ion:191 Resp: 9828

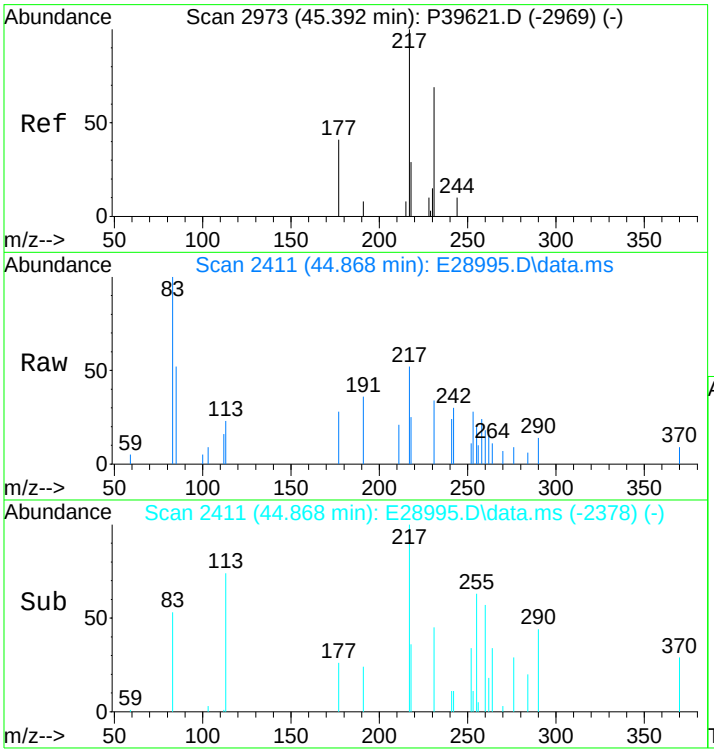




#128
Pentakishomohopane-22R (T35)
Concen: 173.83 ng/ml m
RT: 63.752 min Scan# 3665
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

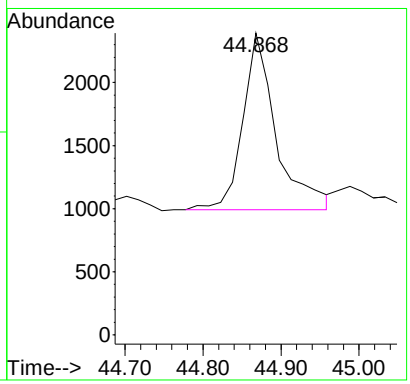
Tgt Ion:191 Resp: 6771

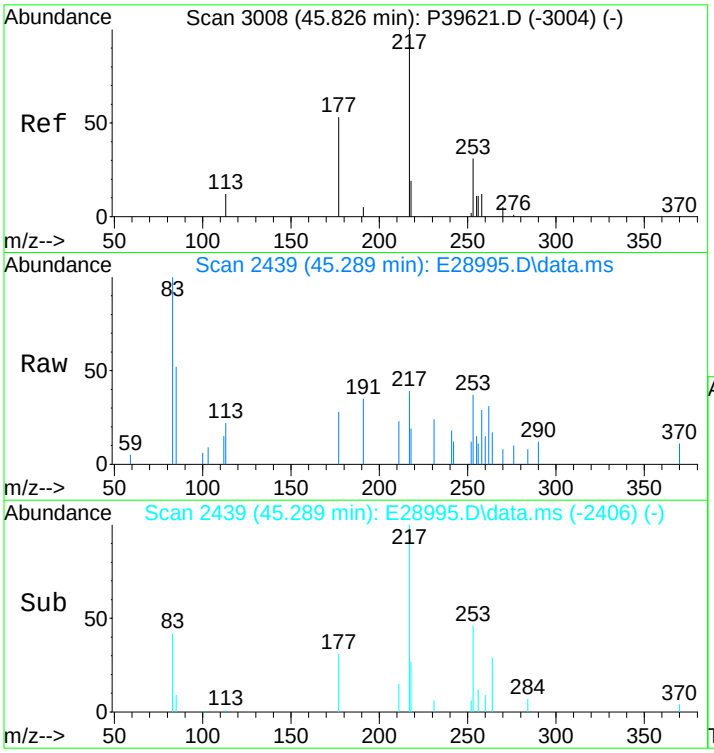




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 203.71 ng/ml
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

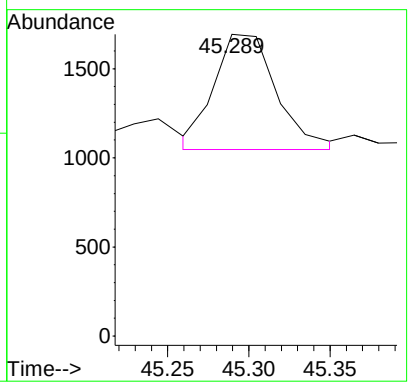
Tgt Ion:217 Resp: 4167

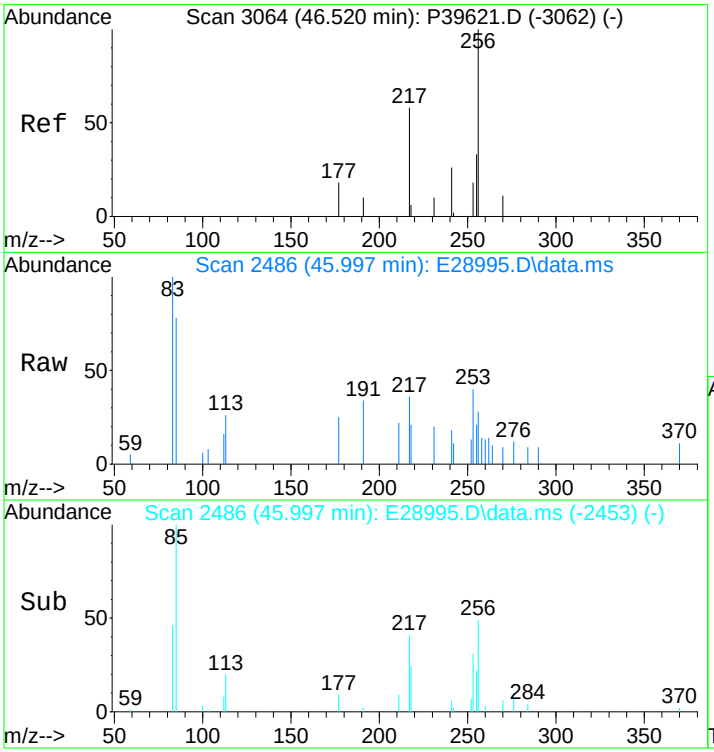




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 85.06 ng/ml m
RT: 45.289 min Scan# 2439
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

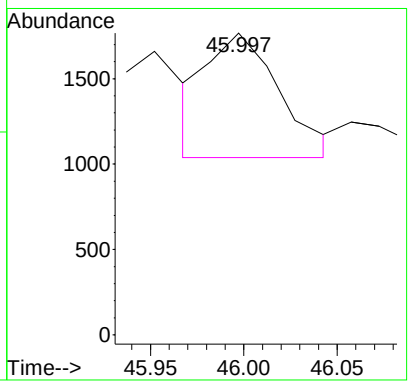
Tgt Ion:217 Resp: 1740

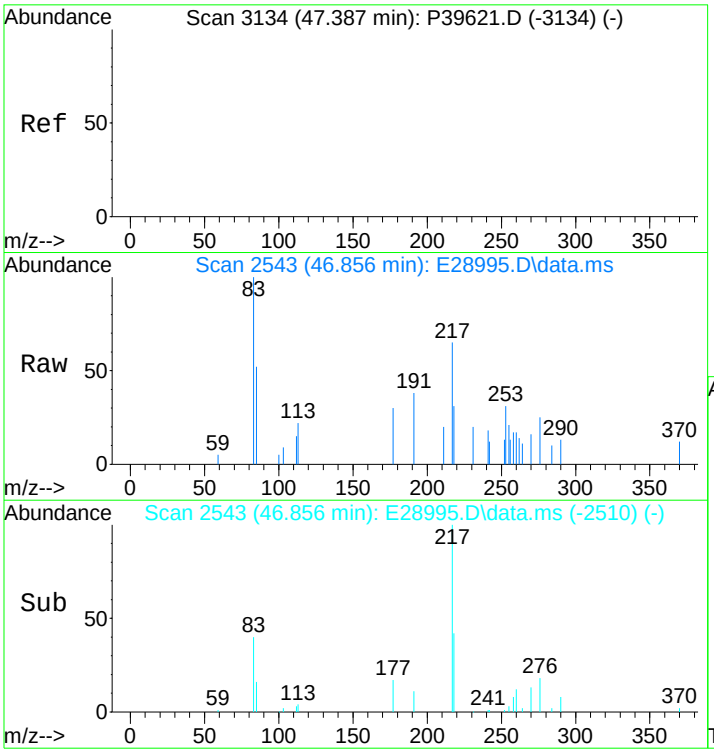




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 96.45 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

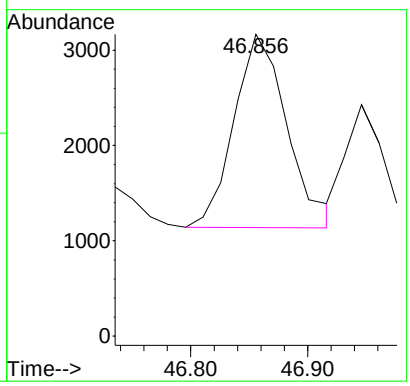
Tgt Ion:217 Resp: 1973

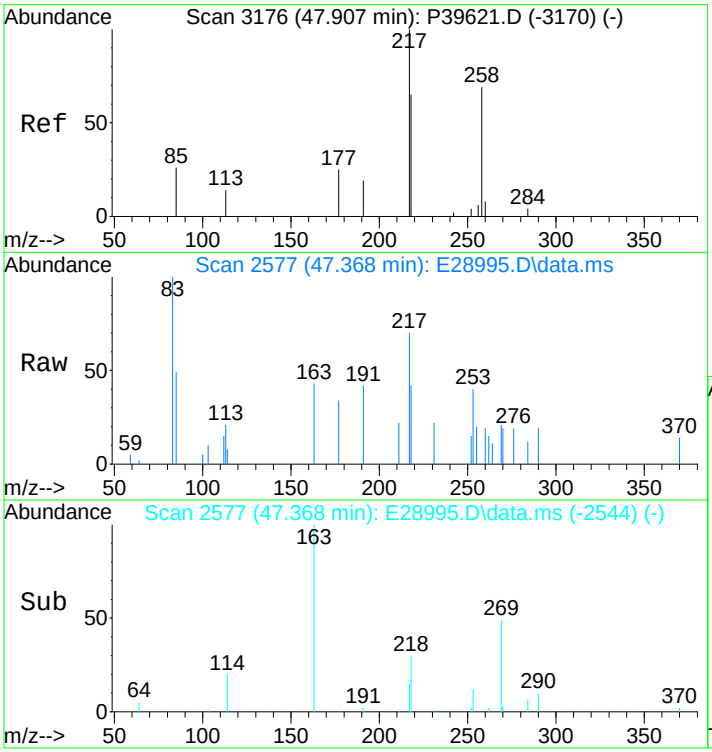




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 312.49 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

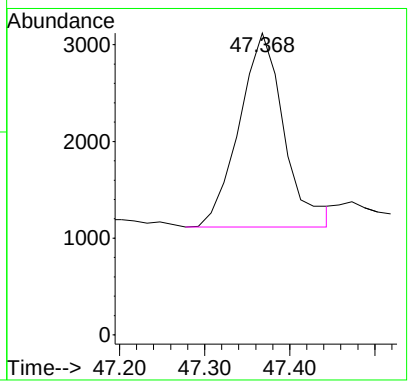
Tgt Ion:217 Resp: 6392

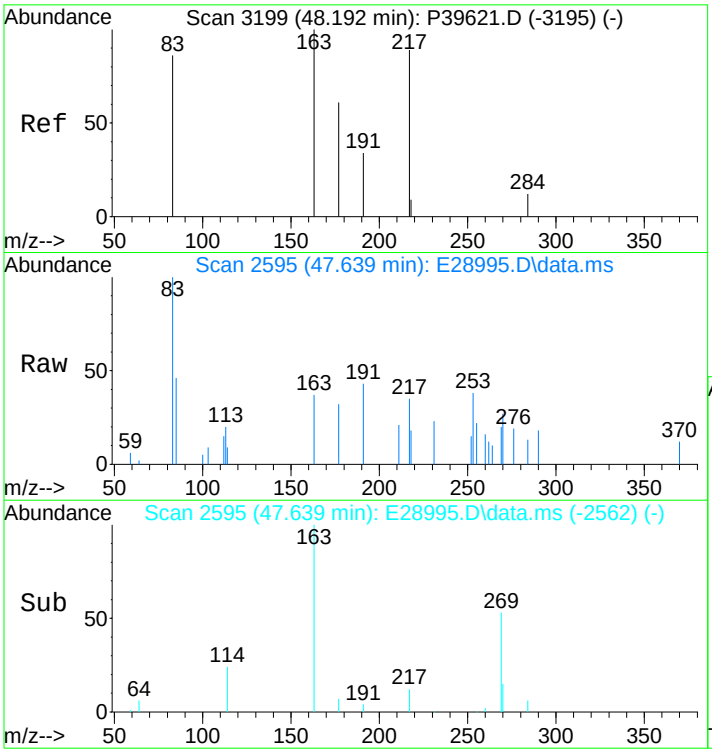




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 359.66 ng/ml
RT: 47.368 min Scan# 2577
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

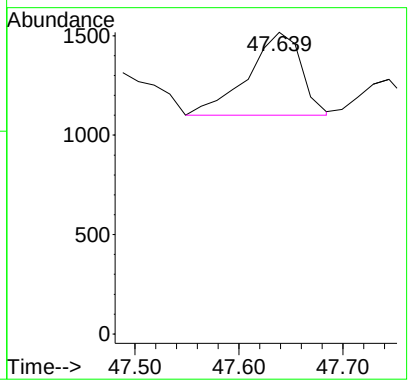
Tgt Ion:217 Resp: 7357

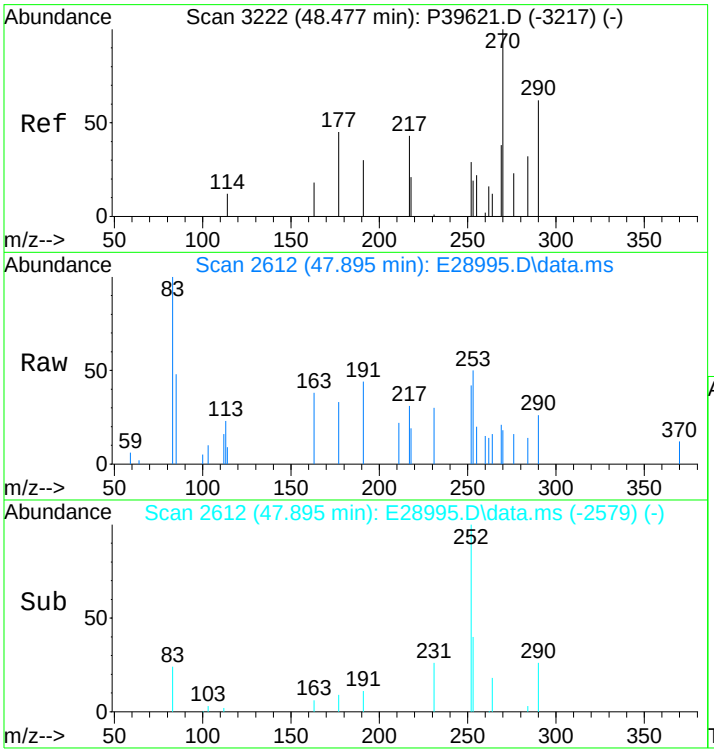




#135
Unknown Sterane (S18)
Concen: 72.74 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

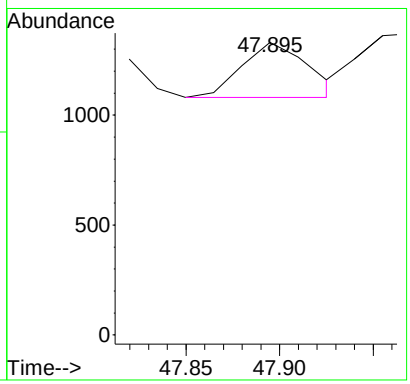
Tgt Ion:217 Resp: 1488

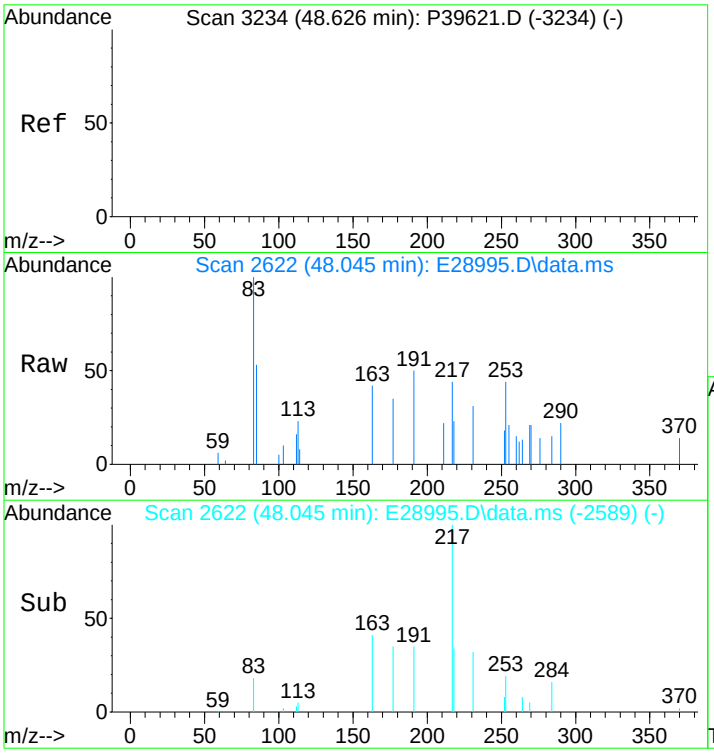




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 29.97 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

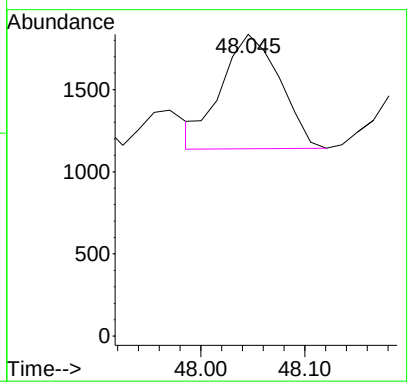
Tgt Ion:217 Resp: 613

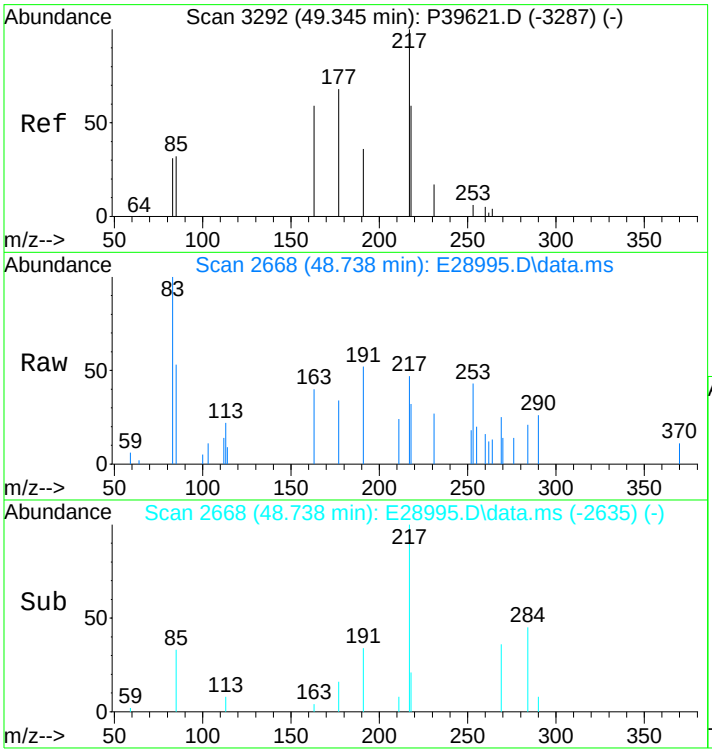




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 132.97 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

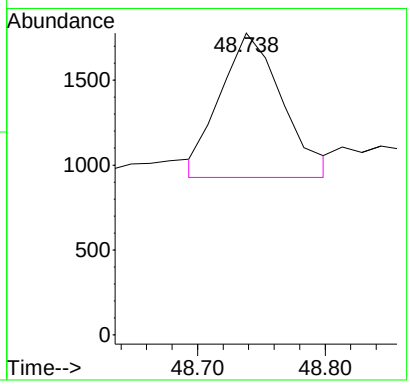
Tgt Ion:217 Resp: 2720

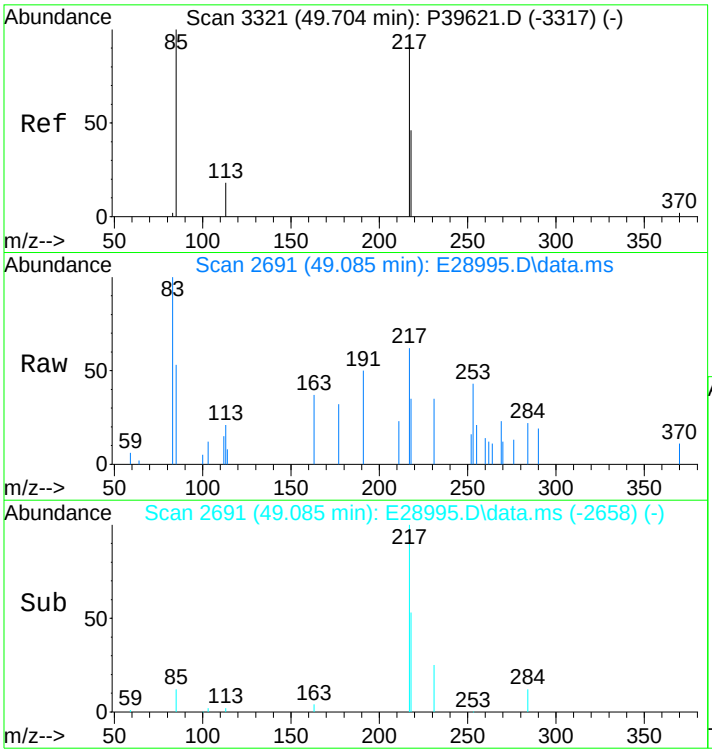




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 140.21 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

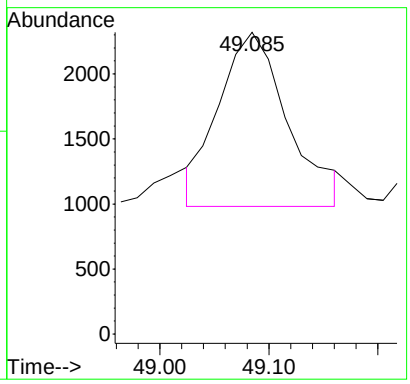
Tgt Ion:217 Resp: 2868

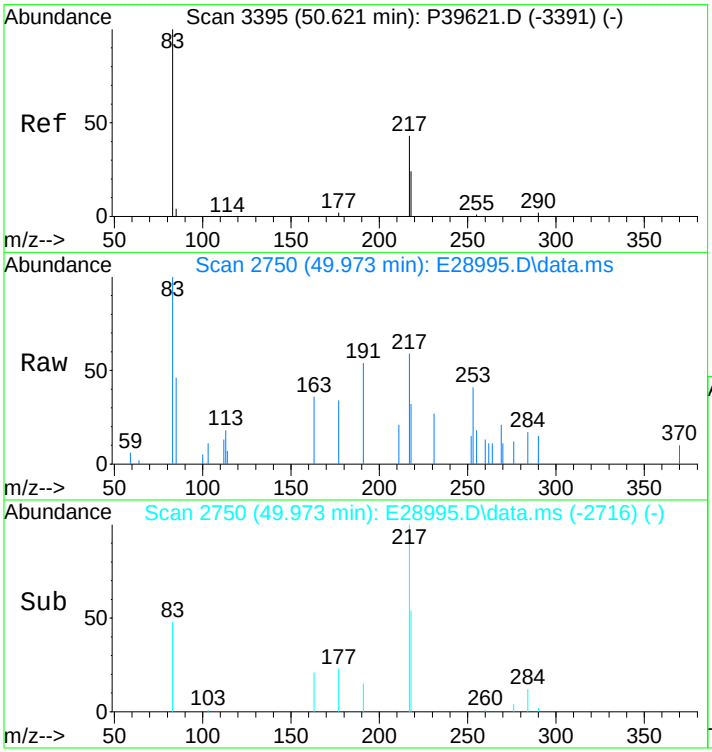




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 289.26 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

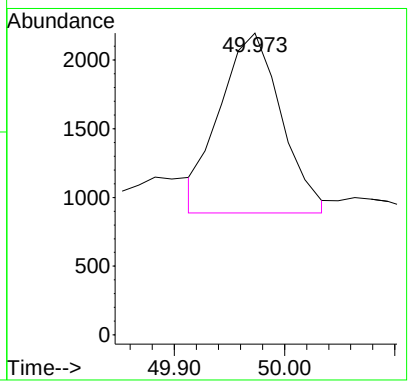
Tgt Ion:217 Resp: 5917

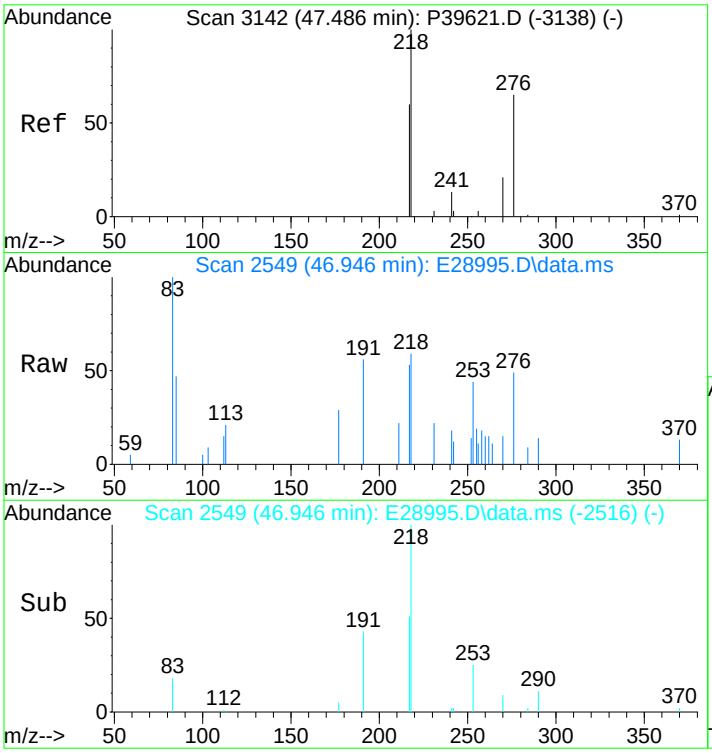




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 245.90 ng/ml m
RT: 49.973 min Scan# 2750
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

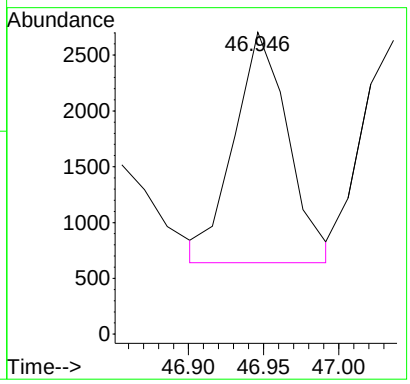
Tgt Ion:217 Resp: 5030

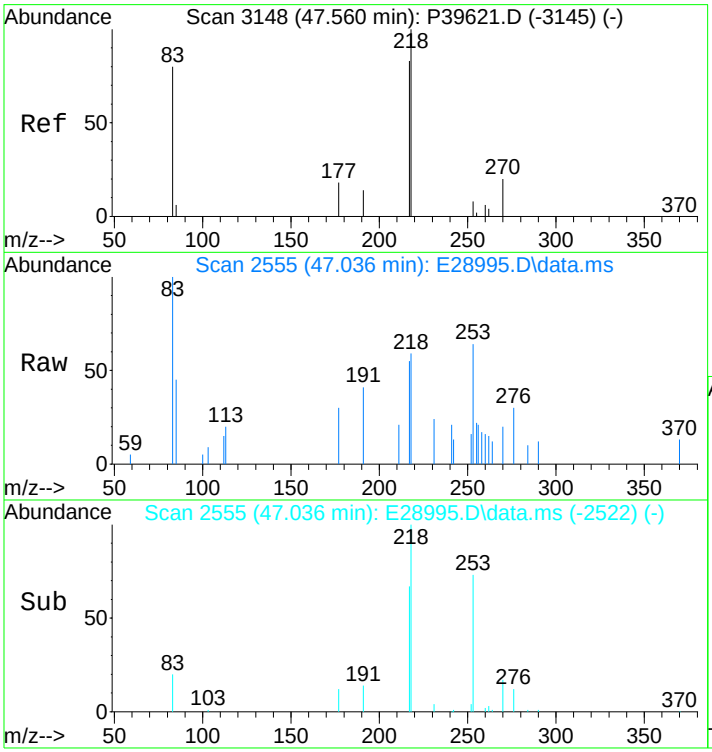




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 253.38 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

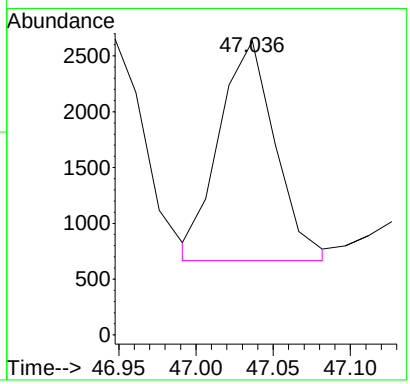
Tgt Ion:218 Resp: 5183

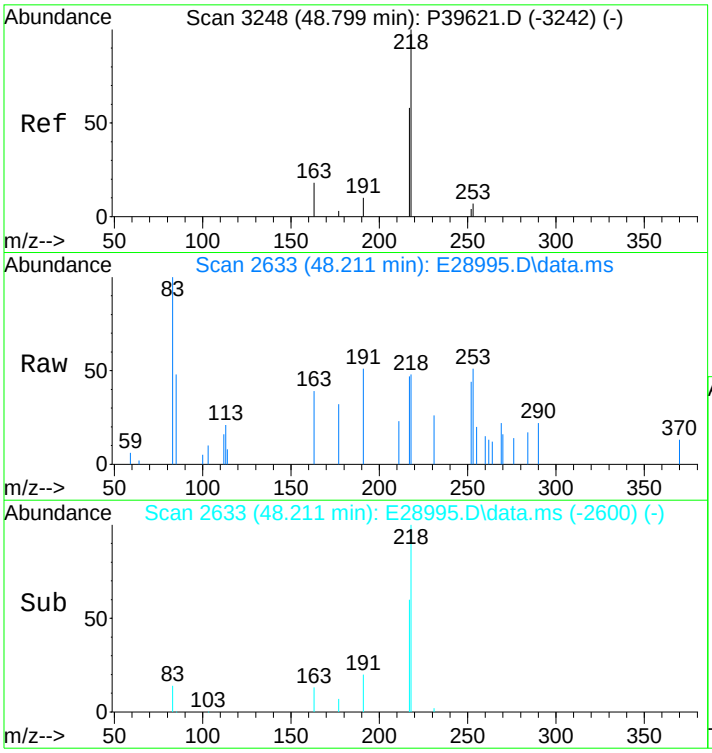




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 242.92 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

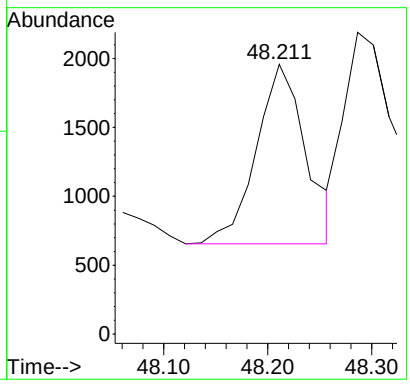
Tgt Ion:218 Resp: 4969

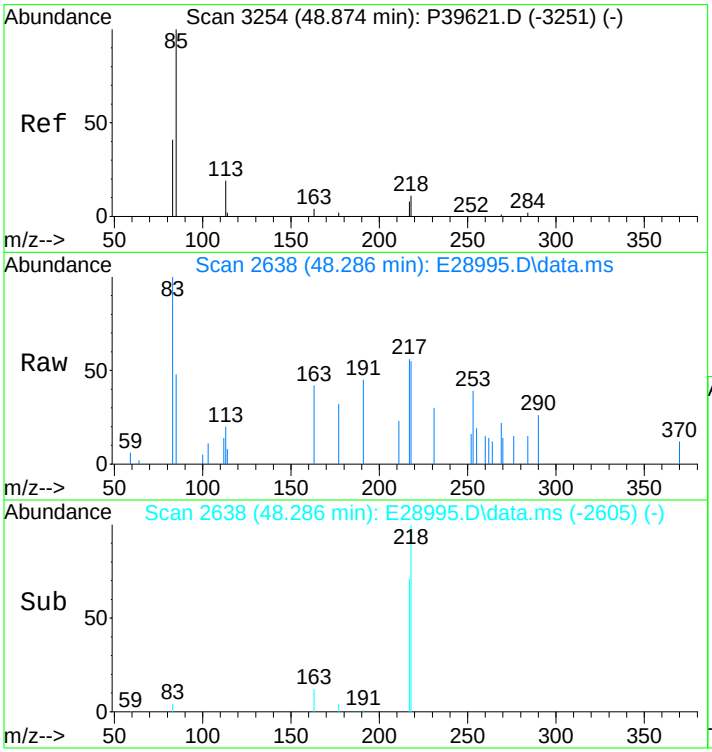




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 211.49 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

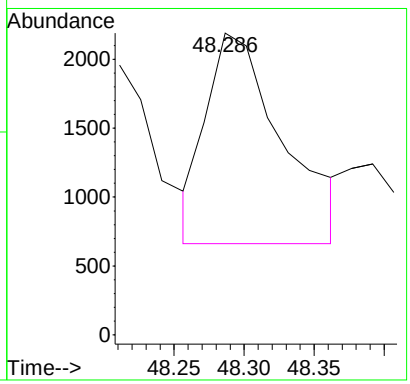
Tgt Ion:218 Resp: 4326

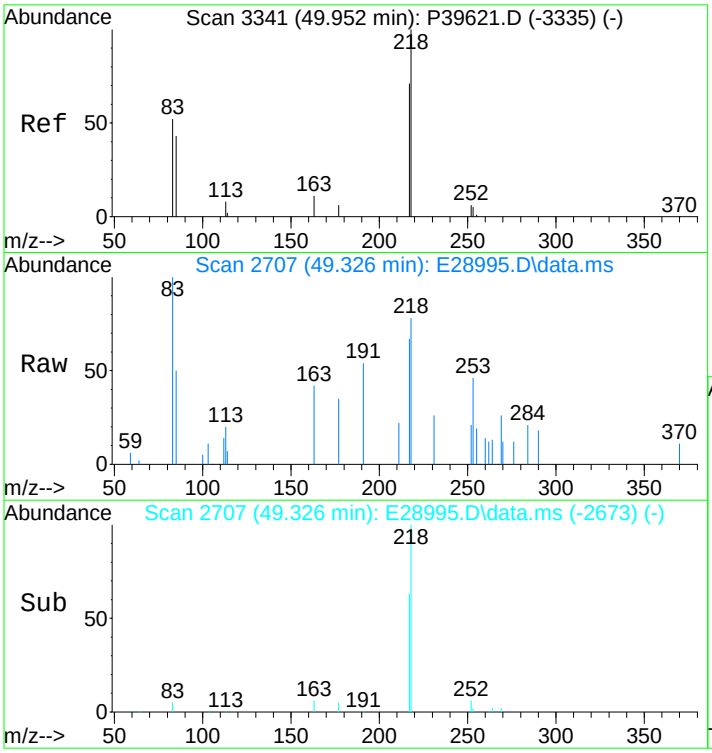




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 283.84 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

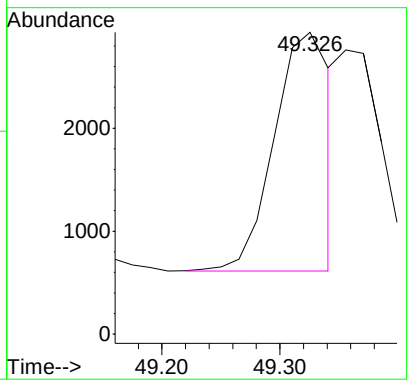
Tgt Ion:218 Resp: 5806

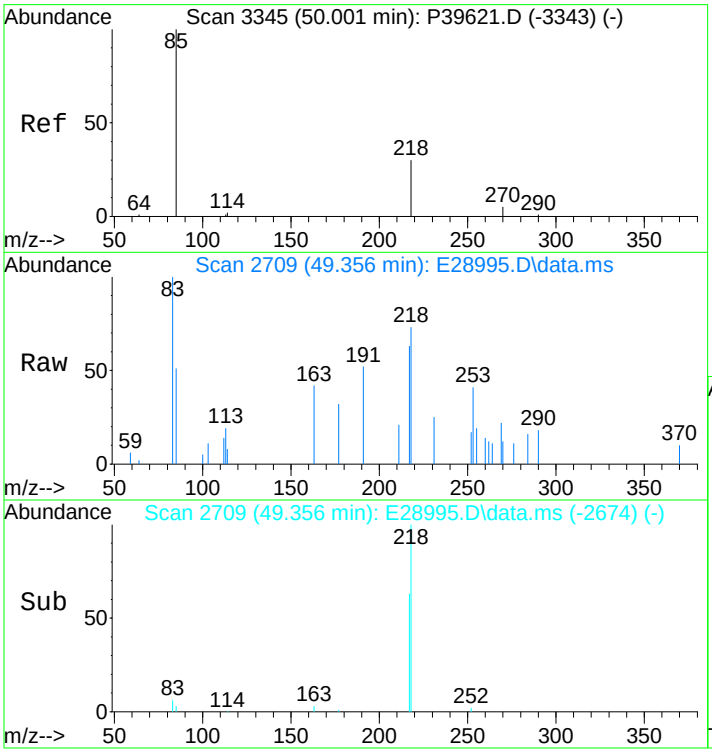




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 372.67 ng/ml m
RT: 49.326 min Scan# 2707
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

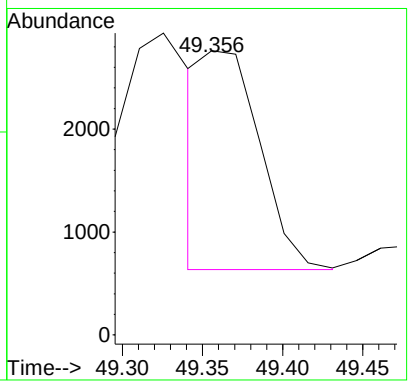
Tgt Ion:218 Resp: 7623

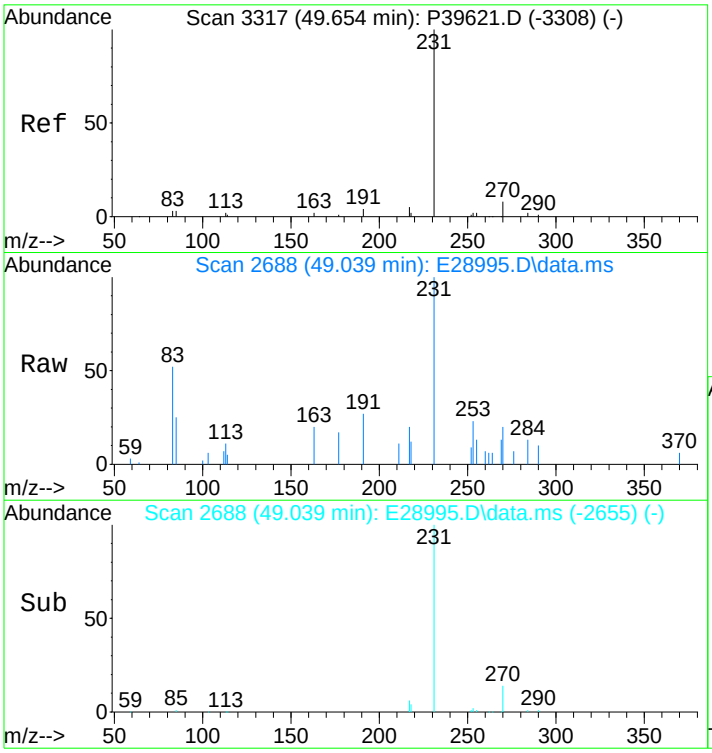




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 259.69 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. 0.030 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

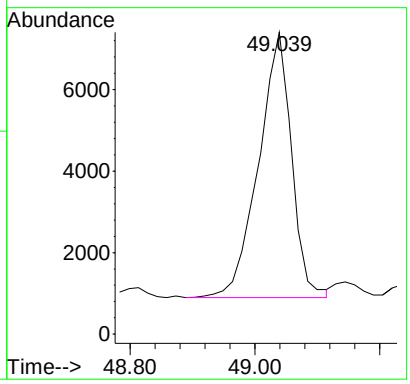
Tgt Ion:218 Resp: 5312

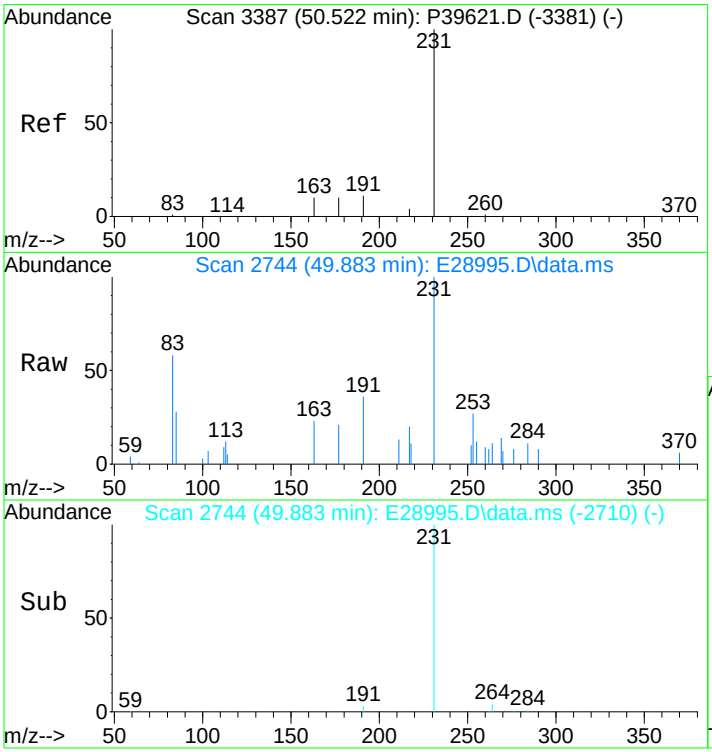




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1170.45 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

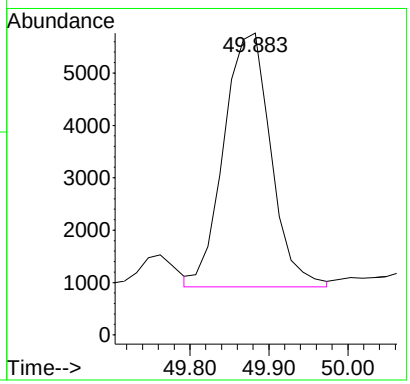
Tgt Ion:231 Resp: 23942

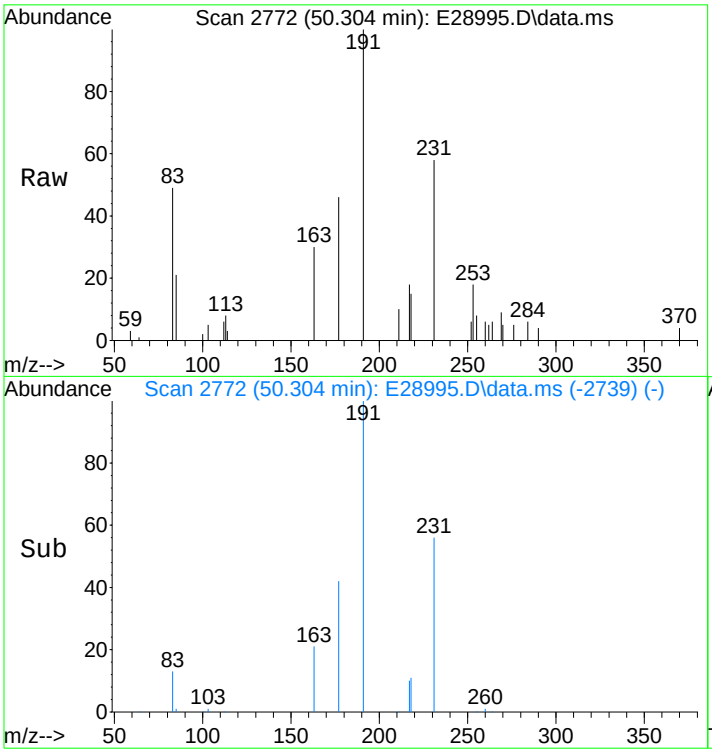




#148
C28,20S-triaromatic steroid
Concen: 982.34 ng/mL m
RT: 49.883 min Scan# 2744
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

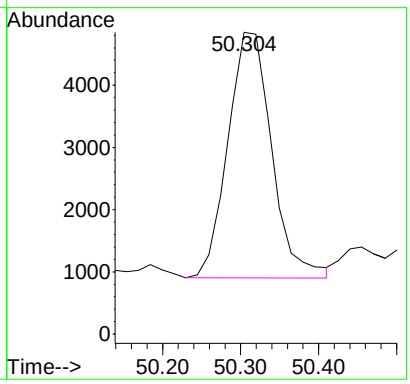
Tgt Ion:231 Resp: 20094

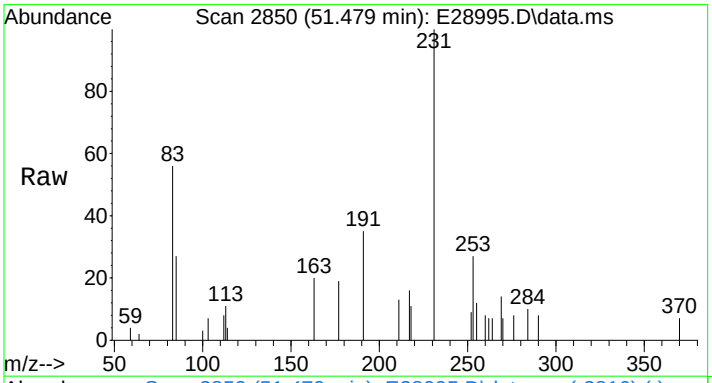




#149
C27,20R-triaromatic steroid
Concen: 756.43 ng/mL
RT: 50.304 min Scan# 2772
Delta R.T. -0.000 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

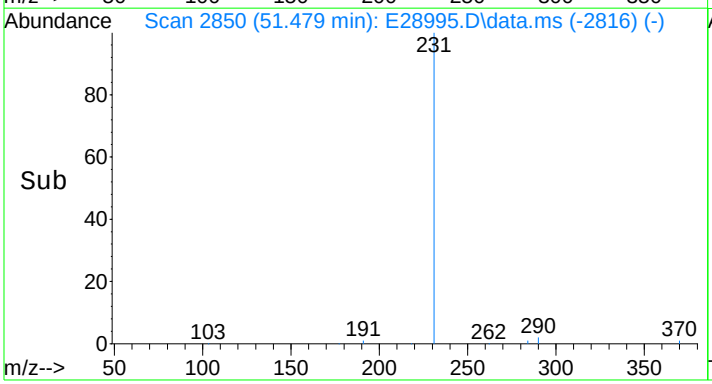
Tgt Ion:231 Resp: 15473

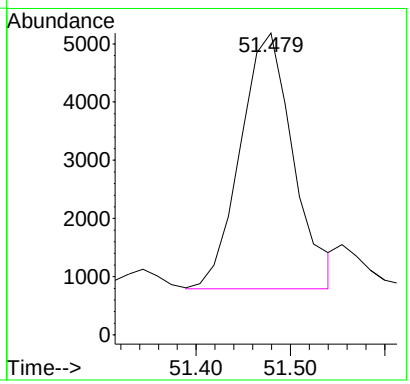




#150
C28,20R-triaromatic steroid
Concen: 840.42 ng/mL m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28995.D
Acq: 15 Nov 2012 4:42 pm

Tgt Ion:231 Resp: 17191





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22488M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.730	240	52371	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	75708	957.123	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.71%			
42) Phenanthrene-d10	32.085	188	83705	1032.886	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.29%			
83) Benzo[b]fluoranthene-d12	46.660	264	112882	1049.260	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.93%			
88) Benzo[a]pyrene-d12	47.805	264	108509	1040.944	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.09%			
129) 5B(H)Cholane - Surr	43.347	217	22224	1076.714	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.67%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	11487	638.581	ng/mL	100
4) cis-Decalin	17.091	138	961	70.317	ng/mL	100
5) C1-Decalins	17.362	152	27034M5	1502.863	ng/mL	
6) C2-Decalins	18.792	166	41962m	2332.735	ng/mL	
7) C3-Decalins	21.623	180	32282m	1794.608	ng/mL	
8) C4-Decalins	24.272	194	34396M5	1912.129	ng/mL	
10) Naphthalene	19.304	128	29886	337.858	ng/mL#	100
11) C1-Naphthalenes	21.999	142	84491M5	955.163	ng/mL	
12) C2-Naphthalenes	24.844	156	181124m	2047.590	ng/mL	
13) C3-Naphthalenes	27.539	170	227398m	2570.713	ng/mL	
14) C4-Naphthalenes	29.963	184	192482M5	2175.991	ng/mL	
16) 2-Methylnaphthalene	21.999	142	50808	901.822	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	33707	615.722	ng/mL#	100
18) Benzothiophene	19.515	134	3555M3	48.614	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	18443M5	252.206	ng/mL	
20) C2-Benzo(b)thiophenes	25.040	162	34386m	470.225	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	61203m	836.944	ng/mL	
22) C4-Benzo(b)thiophenes	29.135	190	65139M5	890.768	ng/mL	
23) Biphenyl	23.881	154	5778M3	81.148	ng/mL	
24) 2,6-Dimethylnaphthalene	24.498	156	44230	870.976	ng/mL#	100
25) Dibenzofuran	26.982	168	3377M4	42.839	ng/mL	
26) Acenaphthylene	25.597	152	1589M3	18.018	ng/mL	
27) Acenaphthene	26.320	153	3771M3	66.428	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.885	170	11977M3	252.087	ng/mL	
29) Fluorene	28.352	166	9231M3	145.797	ng/mL	
30) C1-Fluorenes	30.730	180	26347M5	416.132	ng/mL	
31) C2-Fluorenes	32.928	194	61879M5	977.334	ng/mL	
32) C3-Fluorenes	34.780	208	74460m	1176.041	ng/mL	
33) Dibenzothiophene	31.679	184	30776	354.217	ng/mL#	69
34) 4-Methyldibenzothiophene(	33.455	198	41863	481.823	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.817	198	35209M3	405.239	ng/mL	
36) 1-Methyldibenzothiophene(	34.223	198	22874	263.269	ng/mL#	100
37) OTP	33.877	198	8248M3	94.931	ng/mL	
38) C1-Dibenzothiophenes	33.455	198	115363m	1327.773	ng/mL	
38) C1-Dibenzothiophenes BS	33.455	198	107115m	1232.843	ng/mL	
39) C2-Dibenzothiophenes	35.157	212	202640M5	2332.290	ng/mL	
40) C3-Dibenzothiophenes	36.978	226	222481m	2560.651	ng/mL	
41) C4-Dibenzothiophenes	38.680	240	154353M5	1776.530	ng/mL	
43) Phenanthrene	32.176	178	37460M3	423.777	ng/mL	

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
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Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
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Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
44) 3-Methylphenanthrene(3MP)	34.148	192	21283M3	240.770	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.268	192	24068	272.276	ng/mL	93
46) 2-Methylanthracene(2MA)	34.419	192	2262M3	25.590	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.600	192	37627	425.666	ng/mL	99
48) 1-Methylphenanthrene(1MP)	34.690	192	21311M3	241.087	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.600	192	110226M5	1246.964	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.421	206	166742M5	1886.317	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.421	206	166742m	1886.317	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.553	220	159437M5	1803.677	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.471	234	73850M5	835.450	ng/mL	
55) Anthracene	32.386	178	2138M3	27.982	ng/mL	
56) Carbazole	33.034	167	2907M3	36.969	ng/mL	
57) 1-Methylphenanthrene	34.690	192	21431M3	317.786	ng/mL	
58) Fluoranthene	36.963	202	3019M3	30.926	ng/mL	
59) Benzo(b)fluorene	39.508	216	2540M3	39.048	ng/mL	
60) Pyrene	37.852	202	9821	98.980	ng/mL#	58
61) C1-Fluoranthenes/Pyrenes	39.267	216	37164m	374.554	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.074	230	57475M5	579.257	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.106	244	70060m	706.094	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.476	258	71175M5	717.331	ng/mL	
66) Naphthobenzothiophene	41.721	234	14696	150.171	ng/ml#	83
67) Naphthobenzothiophene-2,1	41.721	234	14696	150.171	ng/mL#	83
68) Naphthobenzothiophene-1,2	42.067	234	3816M3	38.994	ng/mL	
69) Naphthobenzothiophene-2,3	42.369	234	2452M3	25.056	ng/mL	
70) C1-Naphthobenzothiophenes	43.829	248	72458M5	740.413	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	115439M5	1179.614	ng/ml	
72) C3-Naphthobenzothiophenes	46.765	276	97784M5	999.206	ng/ml	
73) C4-Naphthobenzothiophenes	47.820	290	79999M5	817.470	ng/mL	
75) Benz[a]anthracene	42.670	228	1916M3	18.788	ng/mL	
77) Chrysene/Triphenylene	42.790	228	11966M3	113.970	ng/mL	
78) C1-Chrysenes	44.311	242	33088M5	315.145	ng/mL	
79) C2-Chrysenes	46.404	256	57413M5	546.827	ng/mL	
79) C2-Chrysenes BS	46.404	256	53727m	511.720	ng/mL	
80) BBF-D12 Surr BKGD	46.645	256	3686	35.107	ng/mL	100
81) C3-Chrysenes	49.039	270	63858M5	608.212	ng/mL	
82) C4-Chrysenes	49.145	284	42938M5	408.961	ng/mL	
84) Benzo[b]fluoranthene	46.735	252	3474M3	29.307	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.795	252	1089M3	8.930	ng/mL	
87) Benzo[e]pyrene	47.699	252	5445	47.044	ng/mL#	86
89) Benzo[a]pyrene	47.895	252	2983M3	26.934	ng/mL	
90) Perylene	48.196	252	6676	57.005	ng/mL#	65
91) Indeno[1,2,3-cd]pyrene	52.564	276	2135M3	16.380	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	861M3	6.204	ng/mL	
93) Benzo[g,h,i]perylene	53.813	276	4854	34.538	ng/mL#	80
94) Hopane (T19)	51.645	191	50509M3	1285.093	ng/mL	
96) C23 Tricyclic Terpane (T4	40.351	191	19859	505.270	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.089	191	10693	272.060	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.624	191	10049M3	255.675	ng/ml	
99) C24 Tetracyclic Terpane (	43.889	191	3791M3	96.454	ng/ml	
100) C26 Tricyclic Terpane-22S	43.648	191	3812M3	96.988	ng/ml	
101) C26 Tricyclic Terpane-22R	43.739	191	3647M3	92.790	ng/ml	
102) C28 Tricyclic Terpane-22S	46.058	191	4407M3	112.127	ng/ml	
103) C28 Tricyclic Terpane-22R	46.208	191	4541M3	115.536	ng/ml	
104) C29 Tricyclic Terpane-22S	46.735	191	5414	137.748	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.931	191	5133M3	130.598	ng/ml	
106) 18a-22,29,30-Trisnorneoho	47.985	191	5539	140.928	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.121	191	4416M3	112.356	ng/mL	
108) C30 Tricyclic Terpane-22R	48.347	191	4472M3	113.780	ng/mL	
109) 17a(H)-22,29,30-Trisnorho	48.527	191	13579	345.488	ng/ml	100
110) 17a/b,21b/a 28,30-Bisnorh	49.687	191	8803	223.973	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.521	191	2536	64.523	ng/ml	100
112) 30-Norhopane (T15)	50.335	191	37394M3	951.410	ng/ml	
113) 18a(H)-30-Norneohopane-C2	50.425	191	5112M3	130.064	ng/ml	
114) 17a(H)-Diahopane (X)	50.561	191	1765M3	44.907	ng/ml	
115) 30-Normoretane (T17)	51.088	191	3598	91.543	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.494	191	251	6.386	ng/ml	100
117) Moretane (T20)	52.308	191	4056M3	103.196	ng/ml	
118) 30-Homohopane-22S (T21)	53.377	191	22831	580.886	ng/ml	100
119) 30-Homohopane-22R (T22)	53.603	191	17916	455.834	ng/ml	100
120) Gammacerane/C32-diahopane	54.115	191	8524	216.875	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.883	191	14956	380.523	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.259	191	10789	274.503	ng/ml	100
123) 30,31-Trishomohopane-22S	56.946	191	11804	300.327	ng/ml	100
124) 30,31-Trishomohopane-22R	57.548	191	7741	196.953	ng/ml	100
125) Tetrakishomohopane-22S (T	59.490	191	7651M3	194.663	ng/ml	
126) Tetrakishomohopane-22R (T	60.349	191	5366	136.526	ng/ml	100
127) Pentakishomohopane-22S (T	62.502	191	10288	261.756	ng/ml	100
128) Pentakishomohopane-22R (T	63.767	191	6944	176.675	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.868	217	3728M3	180.615	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.305	217	1746M3	84.591	ng/ml	
132) 13b,17a-20S-Methyldiachol	45.997	217	1405M3	68.070	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.856	217	6470	313.460	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.368	217	7592M3	367.819	ng/ml	
135) Unknown Sterane (S18)	47.639	217	1270	61.529	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.895	217	823	39.873	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.045	217	2543	123.204	ng/ml	100
138) 14a,17a-20R-Methylcholest	48.738	217	2819M2	136.576	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.085	217	5989M3	290.157	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	49.973	217	5879M3	284.827	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.946	218	5640M3	273.248	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.036	218	5501M3	266.514	ng/ml	
143) 14b,17b-20R-Methylcholest	48.211	218	4708	228.094	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.286	218	6238M3	302.220	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.326	218	7915M3	383.468	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.371	218	6112M3	296.116	ng/ml	
147) C26,20R- +C27,20S- triaro	49.039	231	23951	1160.384	ng/mL	100
148) C28,20S-triaromatic stero	49.868	231	20900	1012.569	ng/mL	100
149) C27,20R-triaromatic stero	50.320	231	15762	763.641	ng/mL	100
150) C28,20R-triaromatic stero	51.479	231	17097M3	828.320	ng/mL	

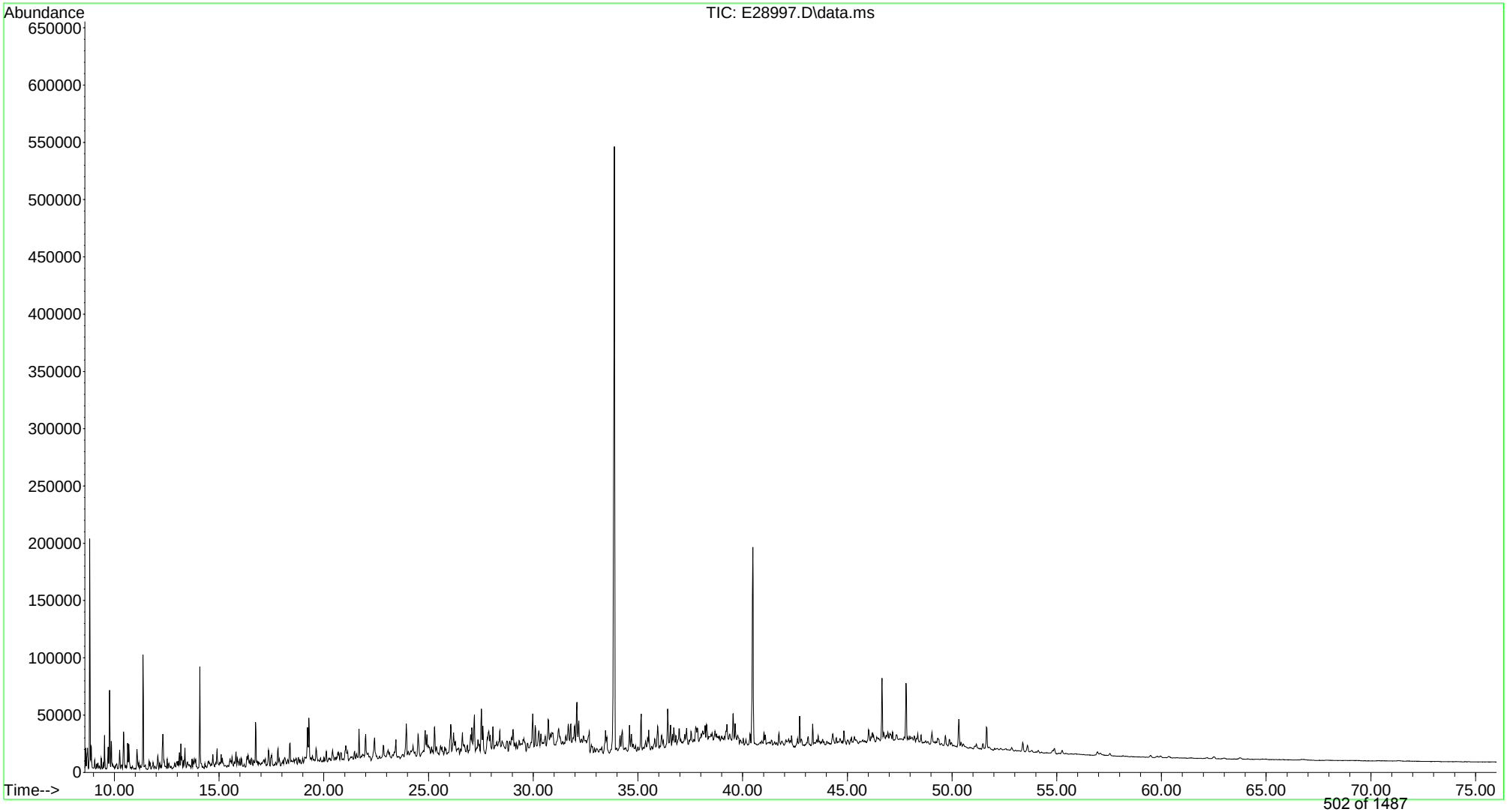
(#) = qualifier out of range (m) = manual integration (+) = signals summed

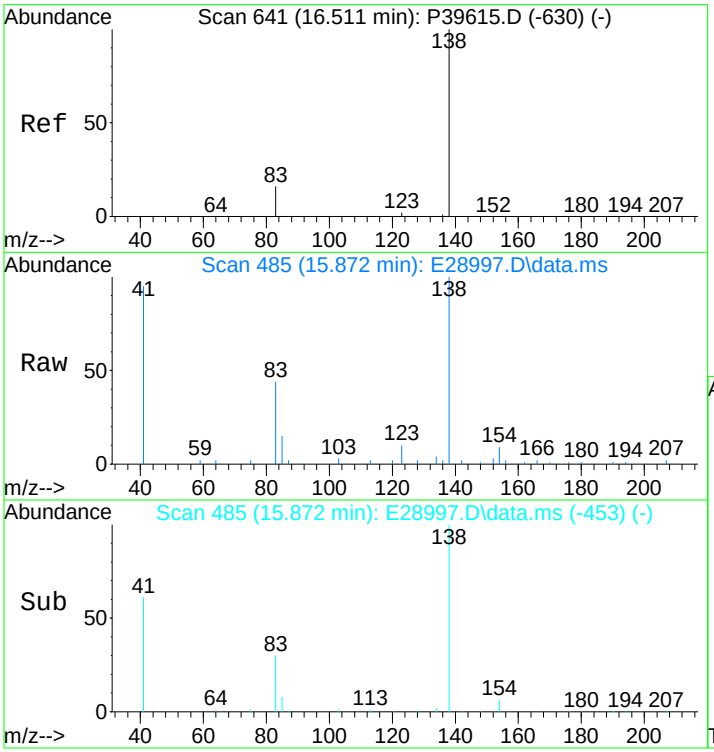
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E28997.D
Acq On : 15 Nov 2012 6:10 pm
Operator : AC
Sample : SS111612CL01
Misc : CL WHAQ74 5.064
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Nov 16 13:46:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

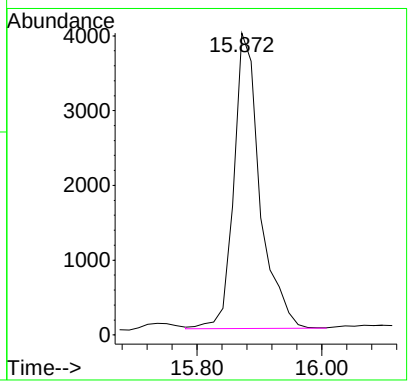
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

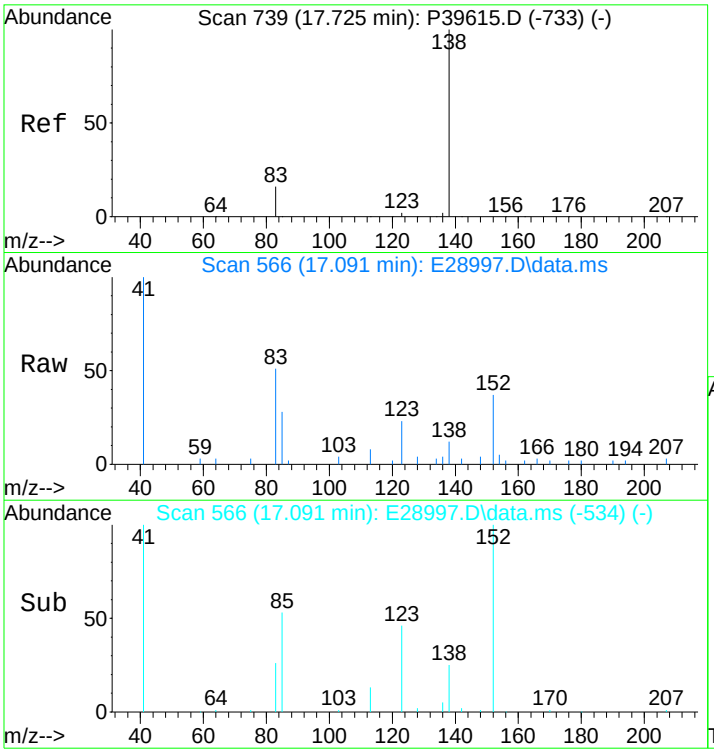




#3
trans-Decalin
Concen: 638.58 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

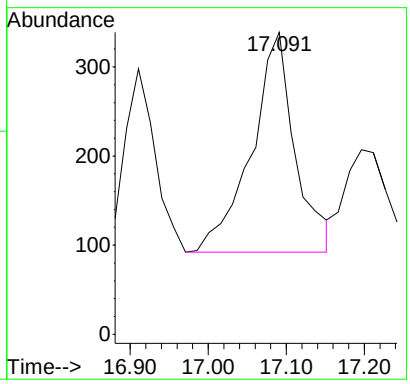
Tgt Ion:138 Resp: 11487

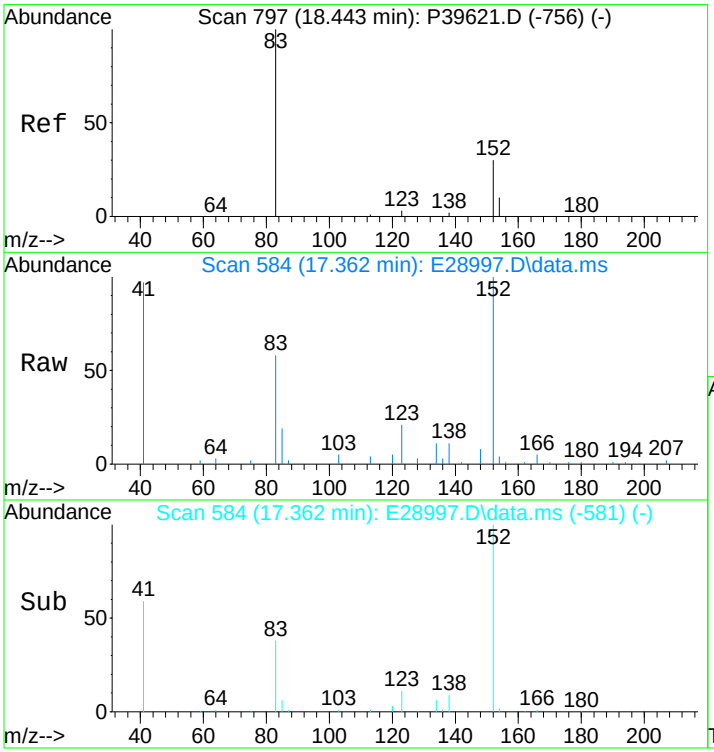




#4
cis-Decalin
Concen: 70.32 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

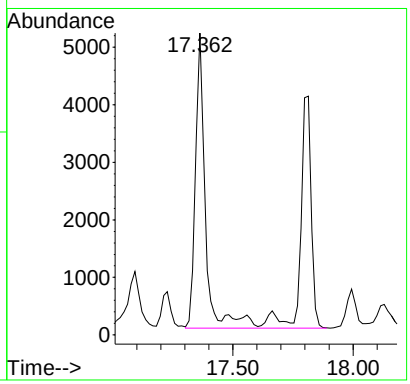
Tgt Ion:138 Resp: 961

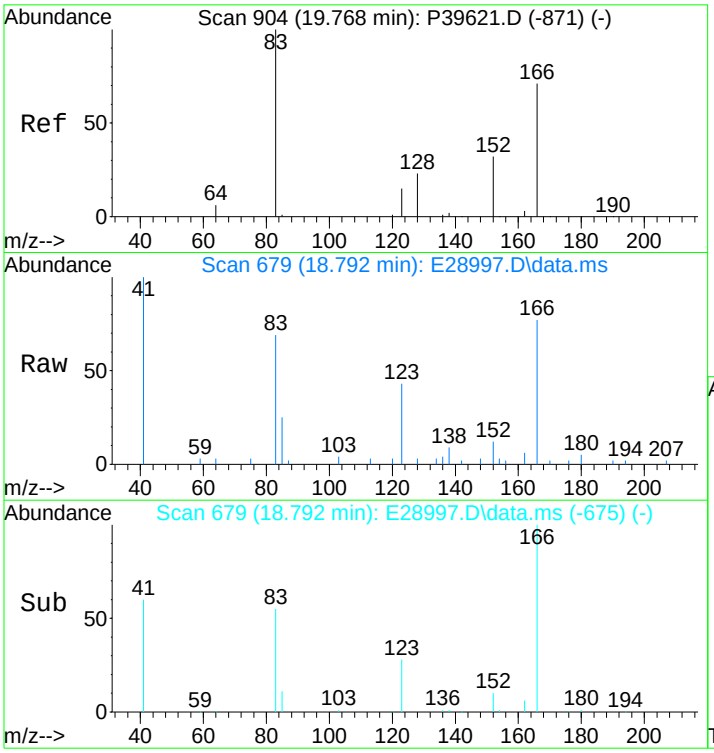




#5
C1-Decalins
Concen: 1502.86 ng/mL m
RT: 17.362 min Scan# 584
Delta R.T. -0.452 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

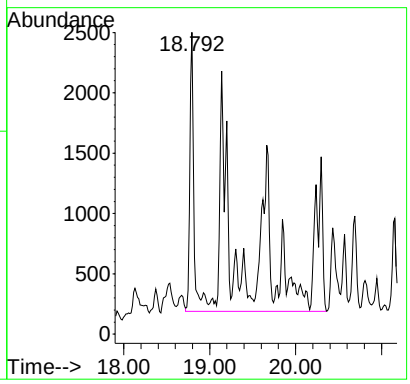
Tgt Ion:152 Resp: 27034

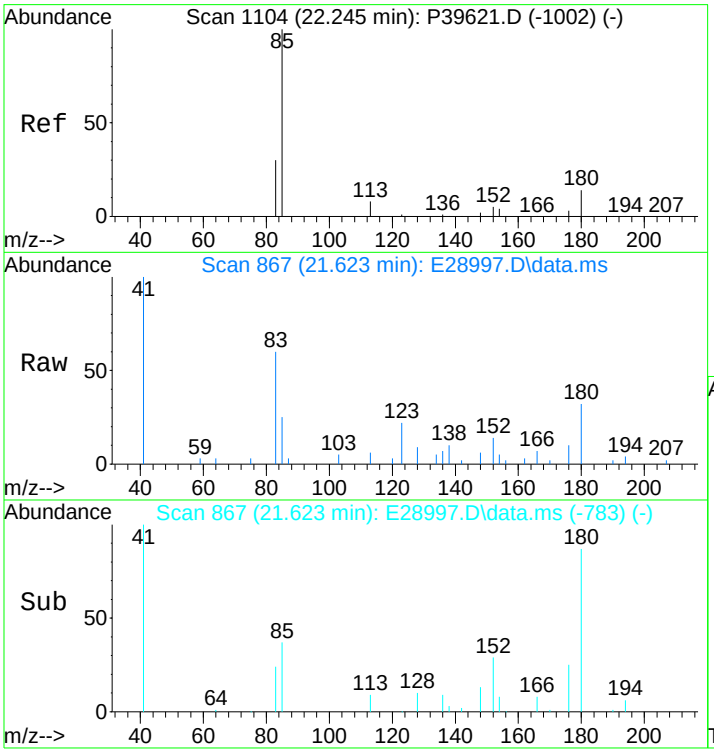




#6
C2-Decalins
Concen: 2332.73 ng/mL m
RT: 18.792 min Scan# 679
Delta R.T. -0.550 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

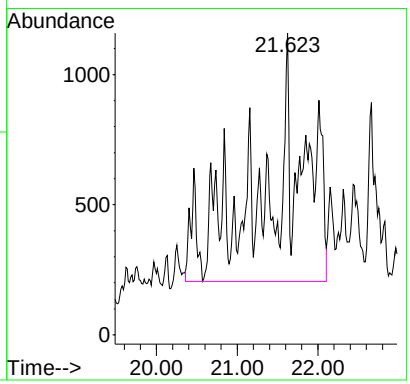
Tgt Ion:166 Resp: 41962

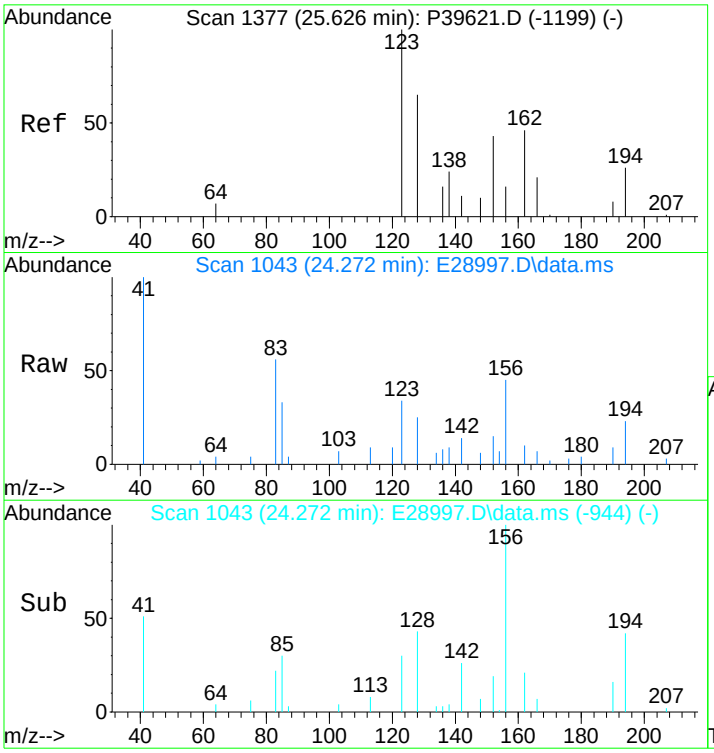




#7
C3-Decalins
Concen: 1794.61 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.123 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

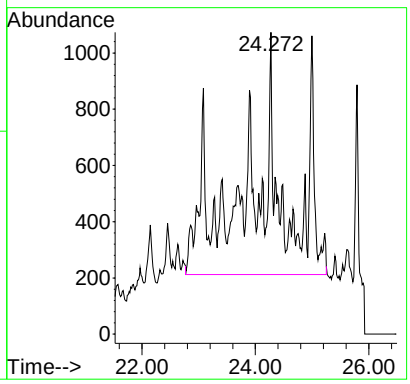
Tgt Ion:180 Resp: 32282

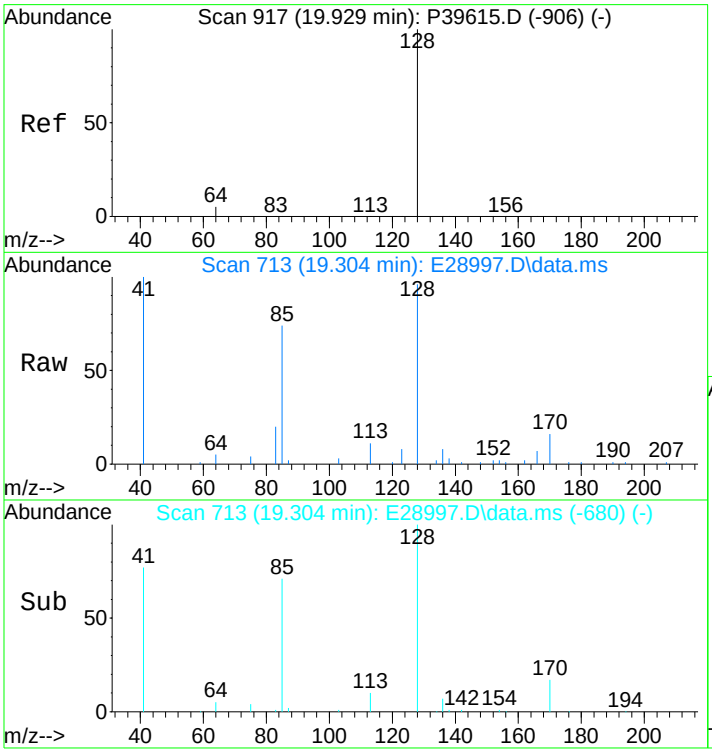




#8
C4-Decalins
Concen: 1912.13 ng/mL m
RT: 24.272 min Scan# 1043
Delta R.T. -0.783 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:194 Resp: 34396

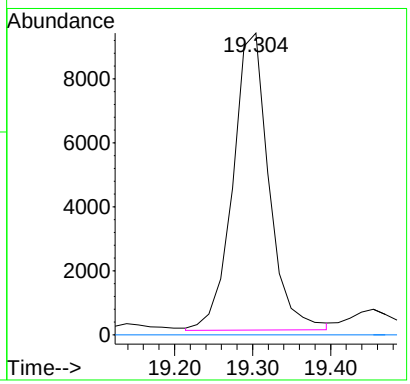


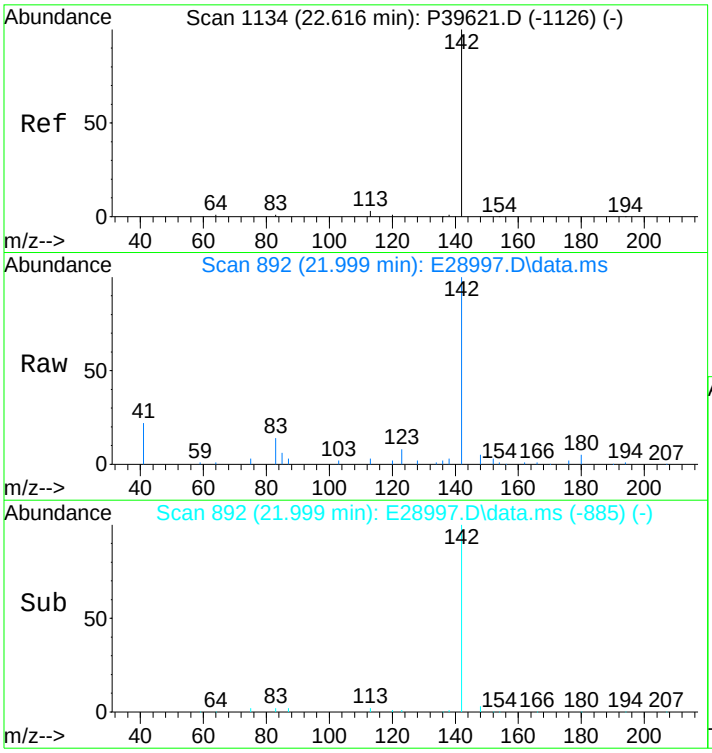


#10
Naphthalene
Concen: 337.86 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:128 Resp: 29886

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

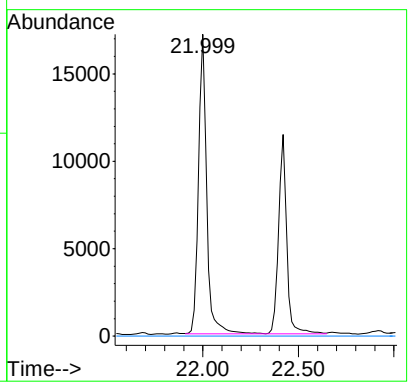


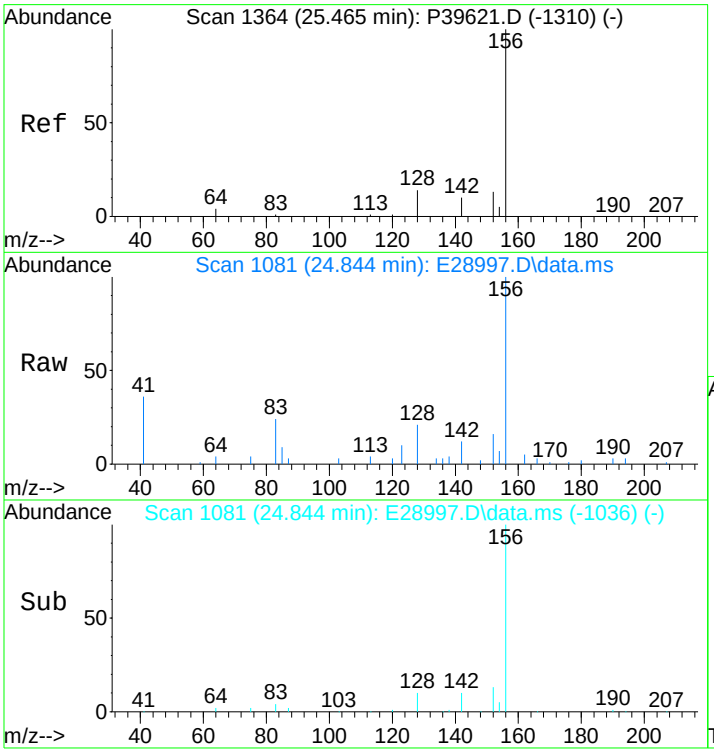


#11
C1-Naphthalenes
Concen: 955.16 ng/mL m
RT: 21.999 min Scan# 892
Delta R.T. -0.127 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:142 Resp: 84491

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

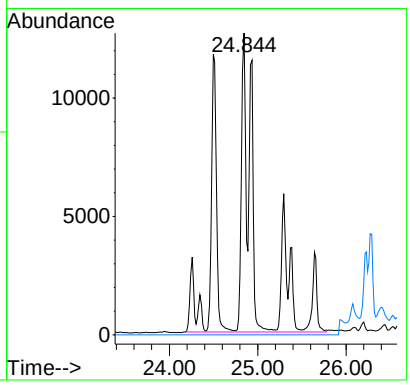


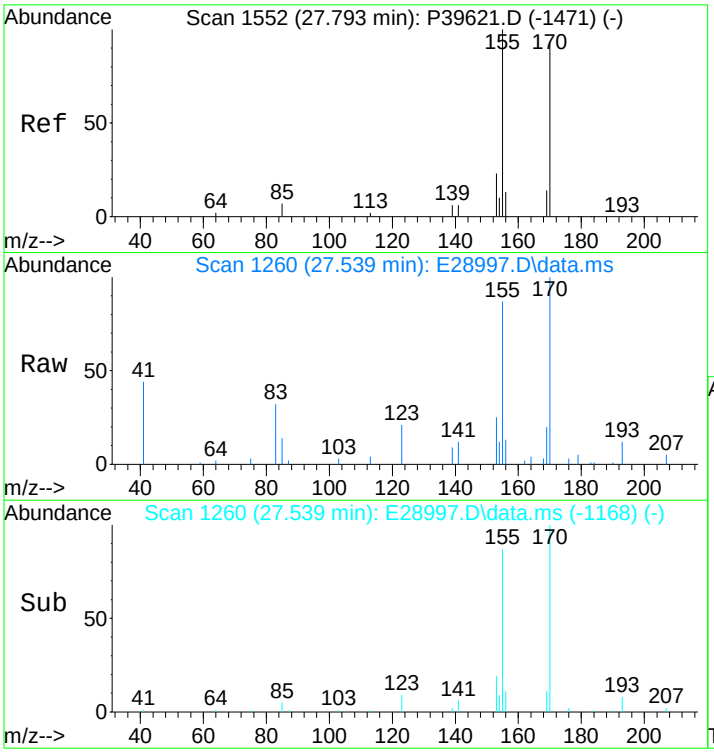


#12
C2-Naphthalenes
Concen: 2047.59 ng/mL m
RT: 24.844 min Scan# 1081
Delta R.T. -0.051 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:156 Resp: 181124

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

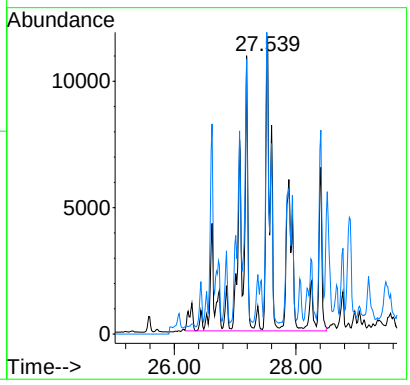


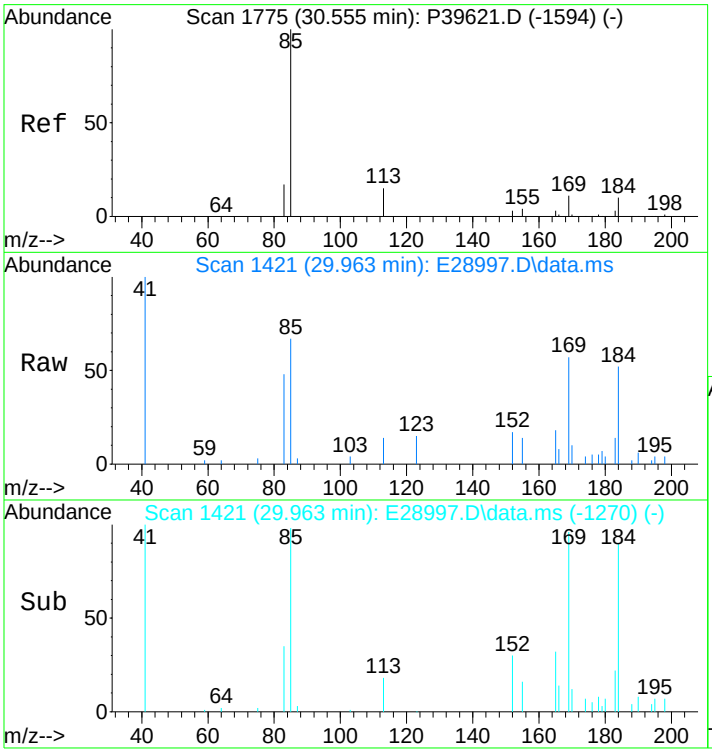


#13
C3-Naphthalenes
Concen: 2570.71 ng/mL m
RT: 27.539 min Scan# 1260
Delta R.T. 0.359 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:170 Resp: 227398

Ion	Ratio	Lower	Upper
170	100		
155	15.7	66.8	100.2#

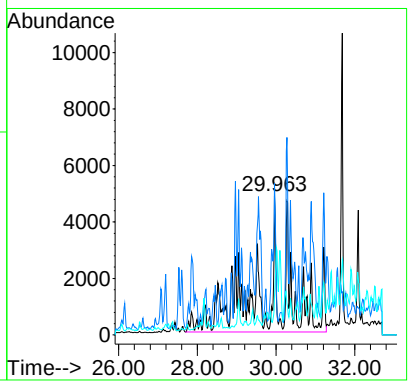


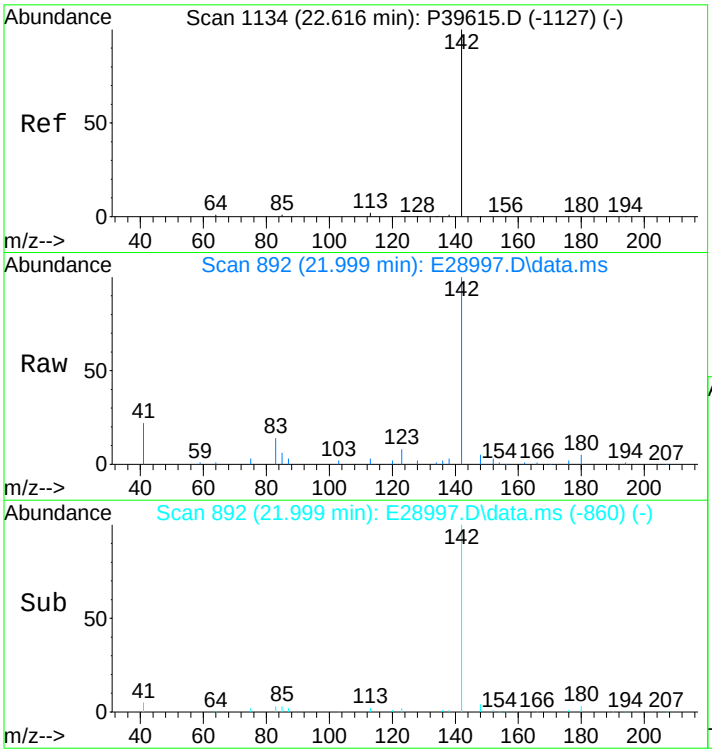


#14
C4-Naphthalenes
Concen: 2175.99 ng/mL m
RT: 29.963 min Scan# 1421
Delta R.T. 0.086 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:184 Resp: 192482

Ion	Ratio	Lower	Upper
184	100		
169	4.4	78.7	118.1#
183	1.3	26.7	40.1#

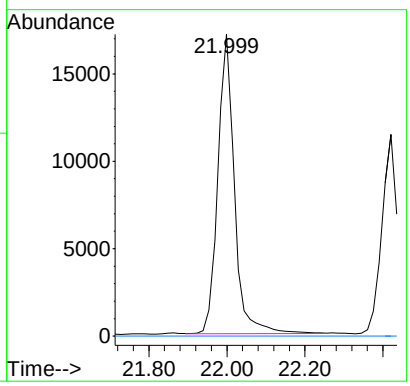


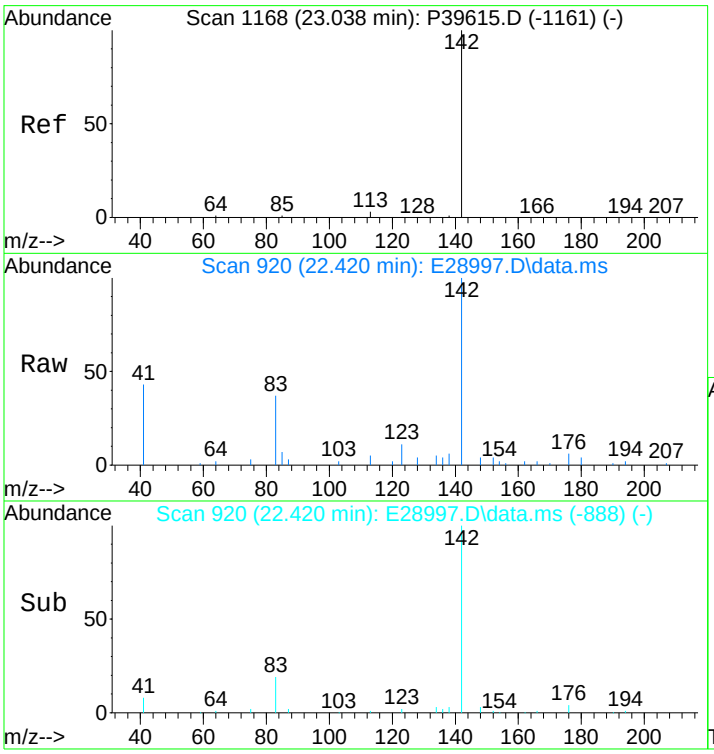


#16
2-Methylnaphthalene
Concen: 901.82 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:142 Resp: 50808

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

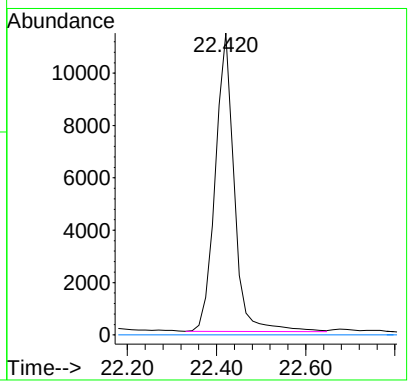


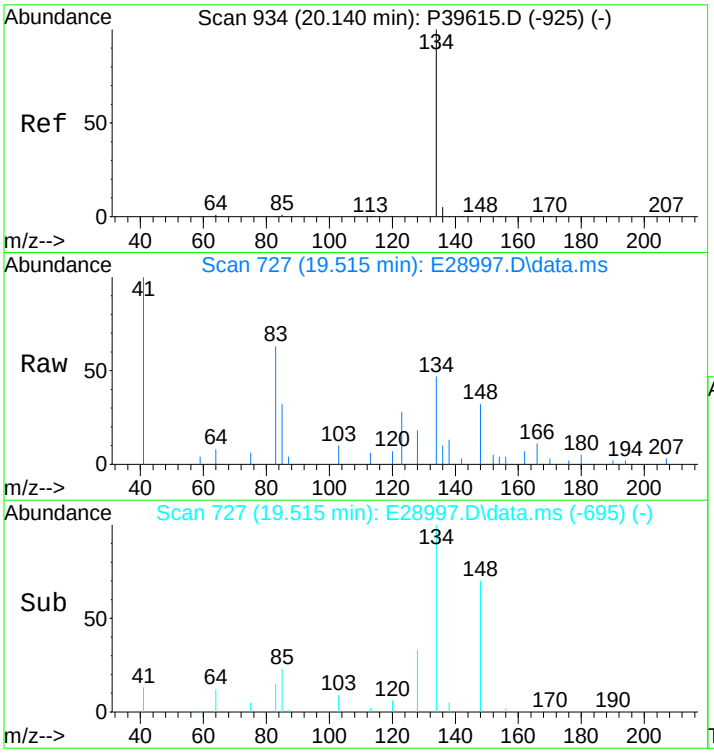


#17
1-Methylnaphthalene
Concen: 615.72 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:142 Resp: 33707

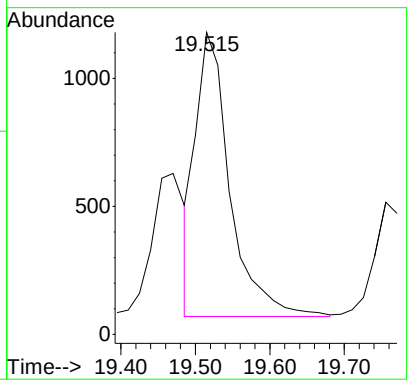
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

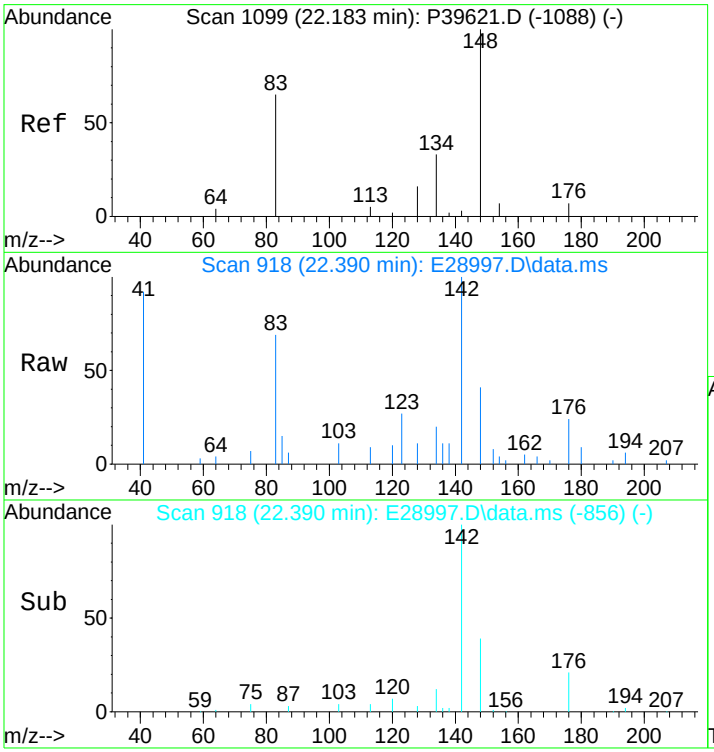




#18
Benzothiophene
Concen: 48.61 ng/mL m
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

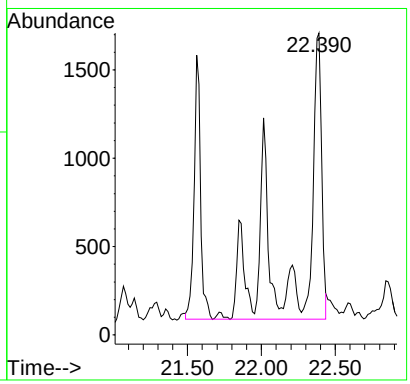
Tgt Ion:134 Resp: 3555

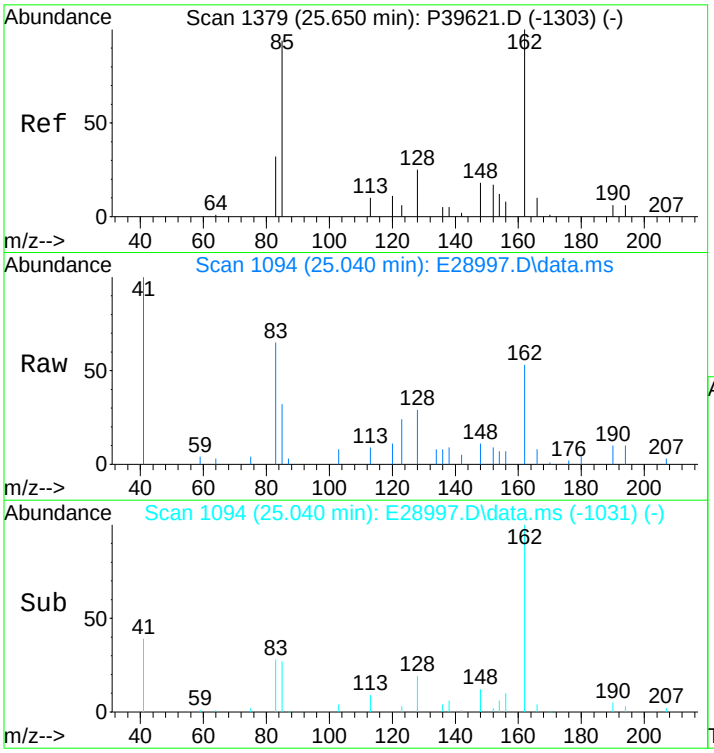




#19
C1-Benzo(b)thiophenes
Concen: 252.21 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.689 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

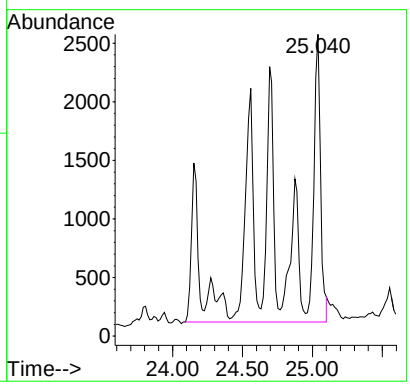
Tgt Ion:148 Resp: 18443

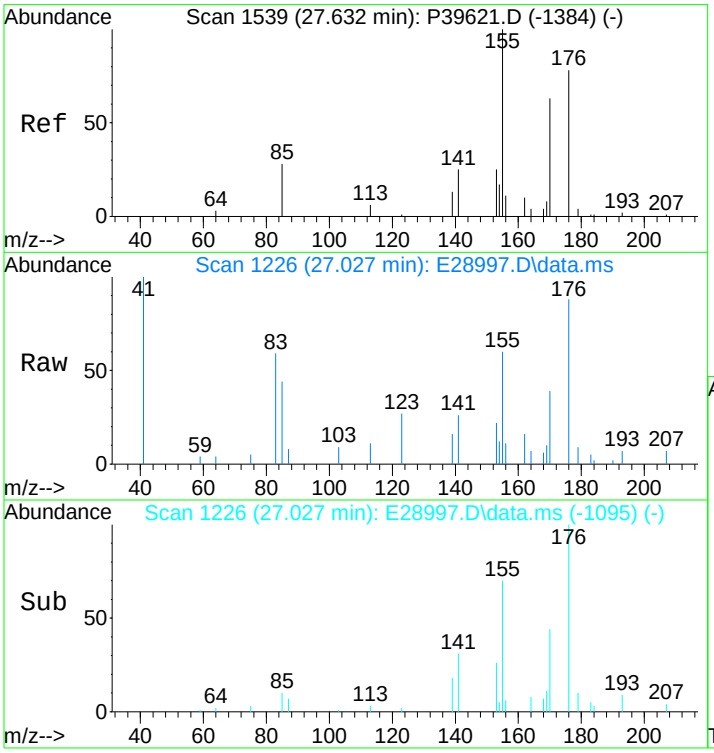




#20
C2-Benzo(b)thiophenes
Concen: 470.22 ng/mL m
RT: 25.040 min Scan# 1094
Delta R.T. -0.045 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

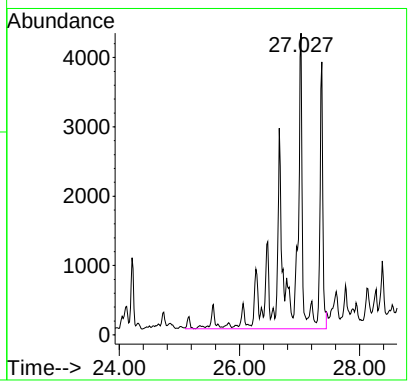
Tgt Ion:162 Resp: 34386

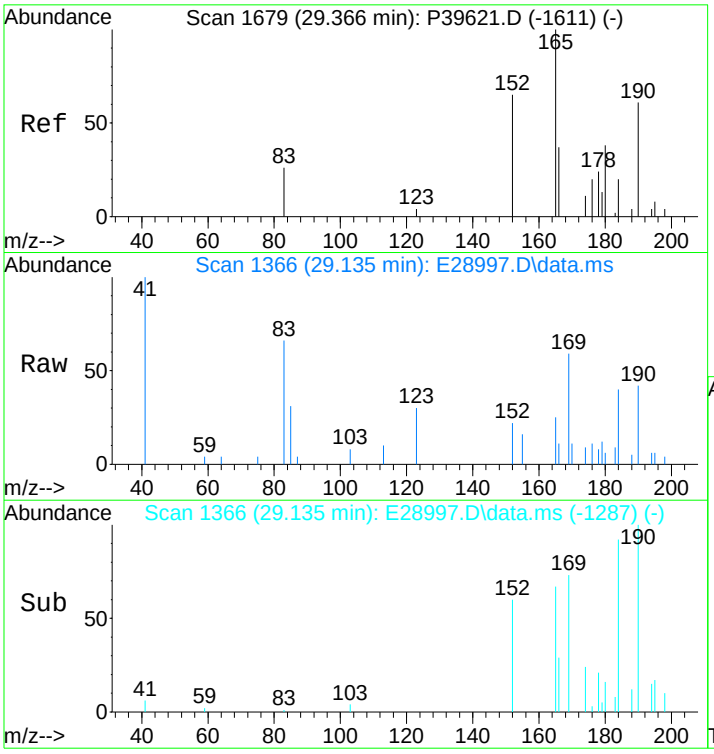




#21
C3-Benzo(b)thiophenes
Concen: 836.94 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. 0.008 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

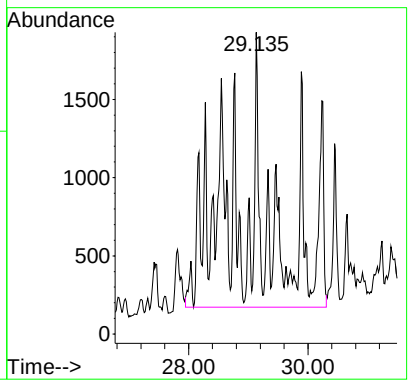
Tgt Ion:176 Resp: 61203

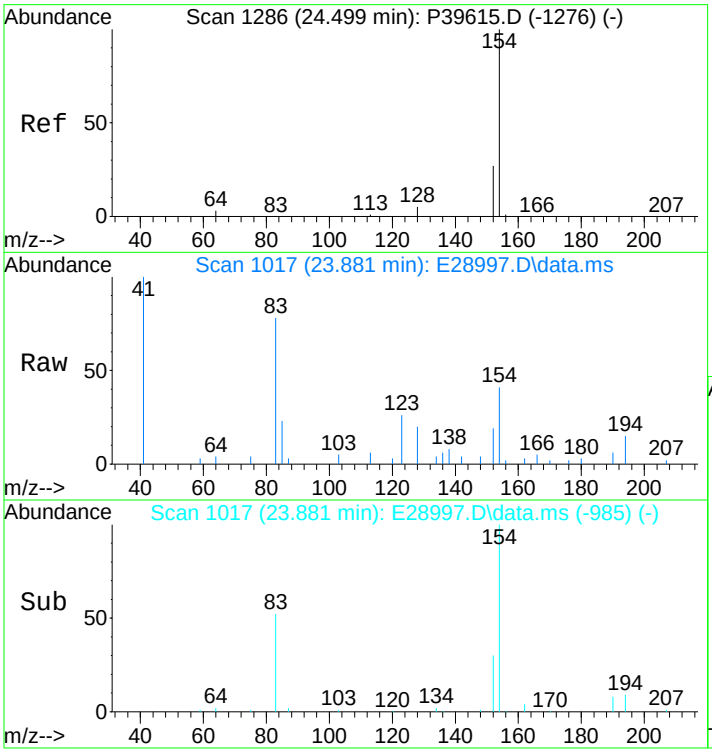




#22
C4-Benzo(b)thiophenes
Concen: 890.77 ng/mL m
RT: 29.135 min Scan# 1366
Delta R.T. 0.065 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:190 Resp: 65139

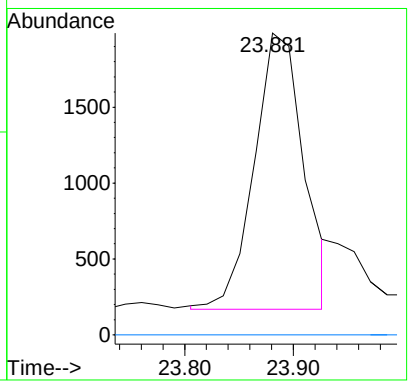


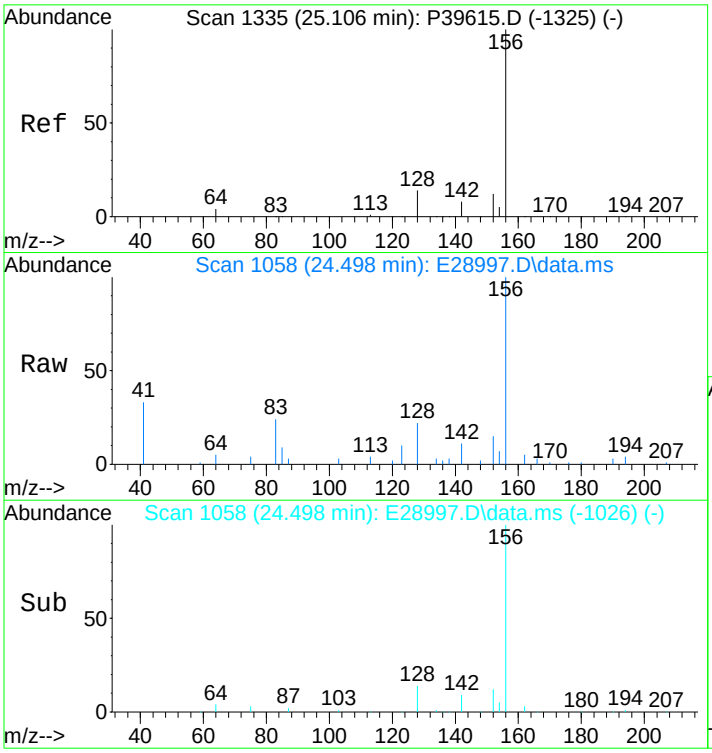


#23
Biphenyl
Concen: 81.15 ng/mL m
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:154 Resp: 5778

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

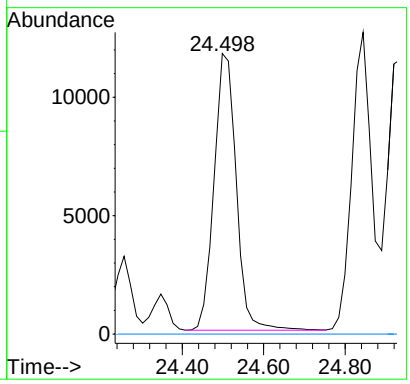


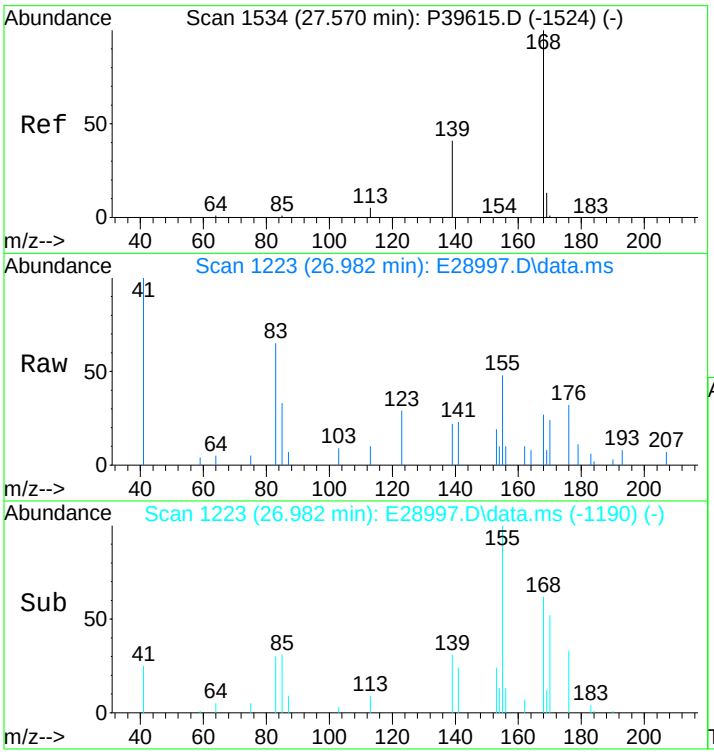


#24
2,6-Dimethylnaphthalene
Concen: 870.98 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:156 Resp: 44230

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

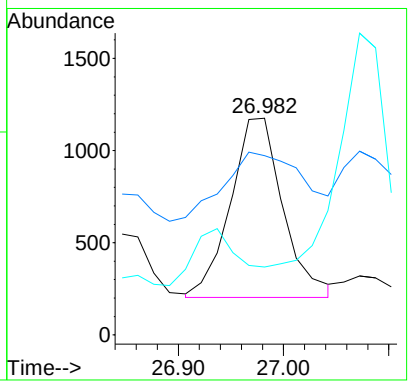


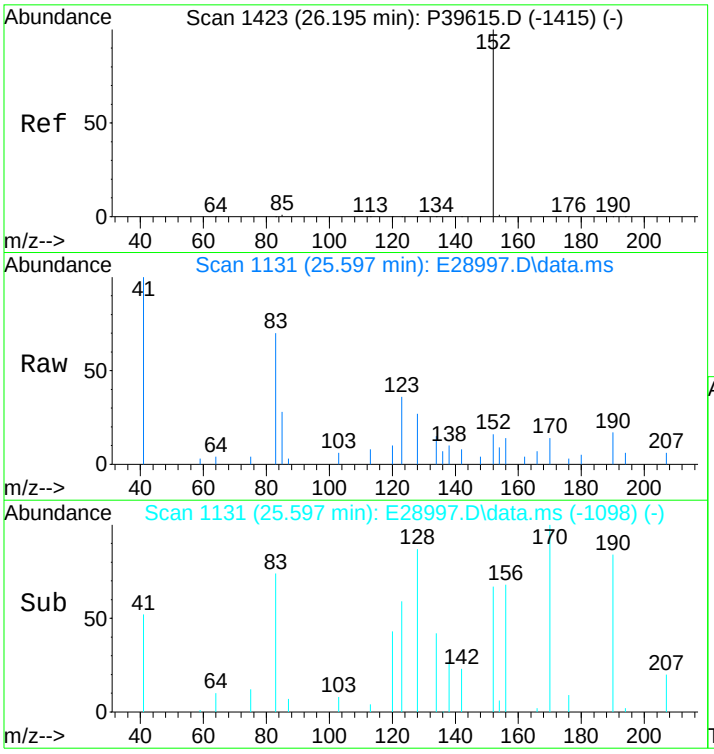


#25
Dibenzofuran
Concen: 42.84 ng/mL m
RT: 26.982 min Scan# 1223
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:168 Resp: 3377

Ion	Ratio	Lower	Upper
168	100		
139	58.5	26.0	39.0#
169	0.0	10.6	16.0#

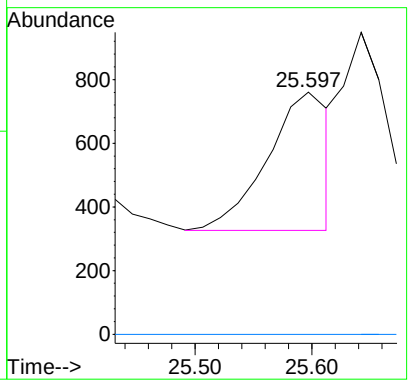


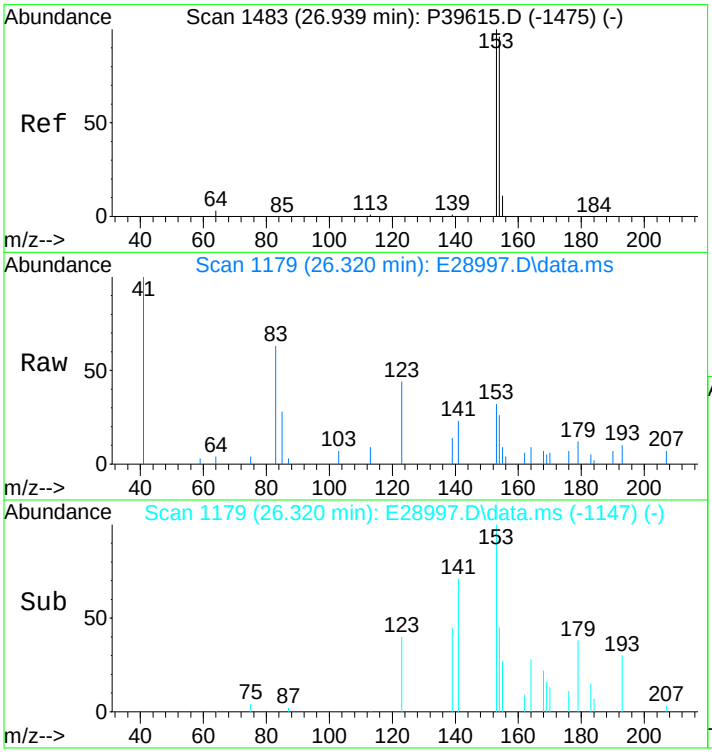


#26
Acenaphthylene
Concen: 18.02 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:152 Resp: 1589

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

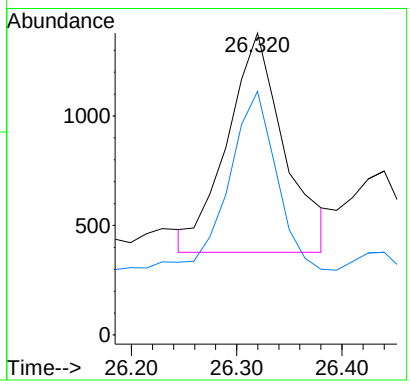


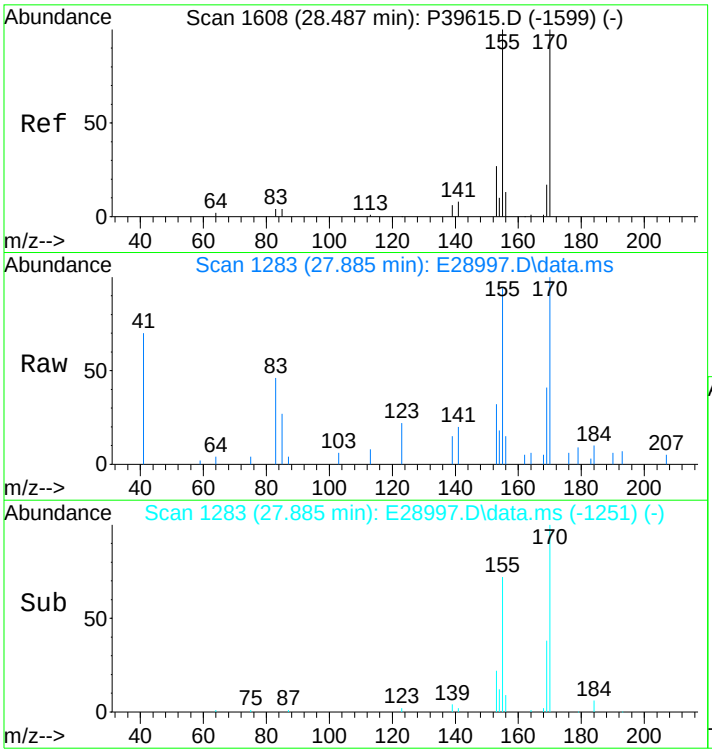


#27
Acenaphthene
Concen: 66.43 ng/mL m
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:153 Resp: 3771

Ion	Ratio	Lower	Upper
153	100		
154	79.9	74.1	111.1

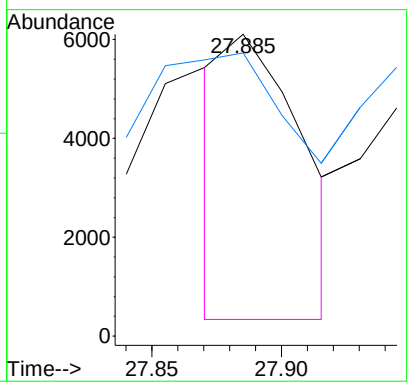


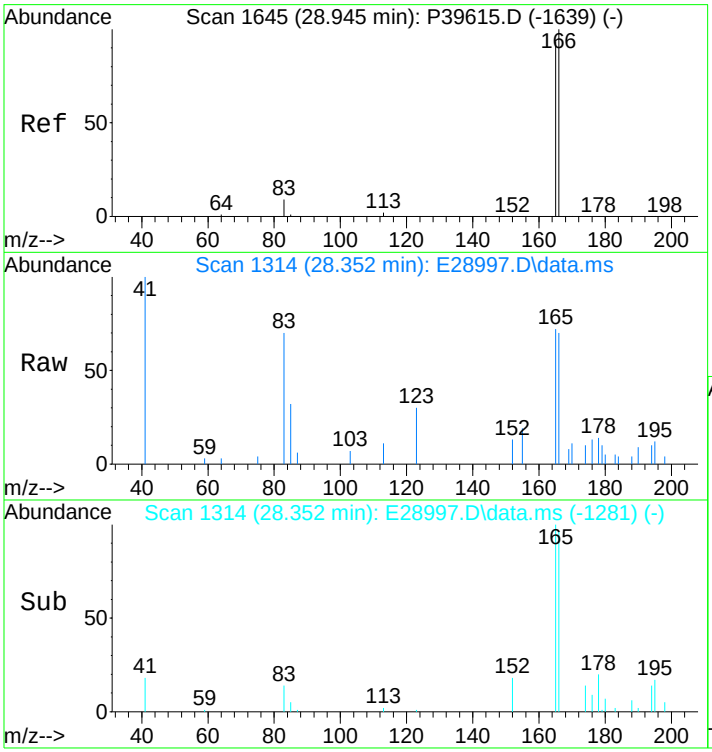


#28
2,3,5-Trimethylnaphthalene
Concen: 252.09 ng/mL m
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:170 Resp: 11977

Ion	Ratio	Lower	Upper
170	100		
155	139.2	70.7	106.1#

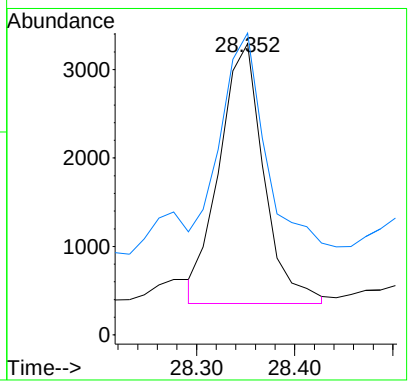


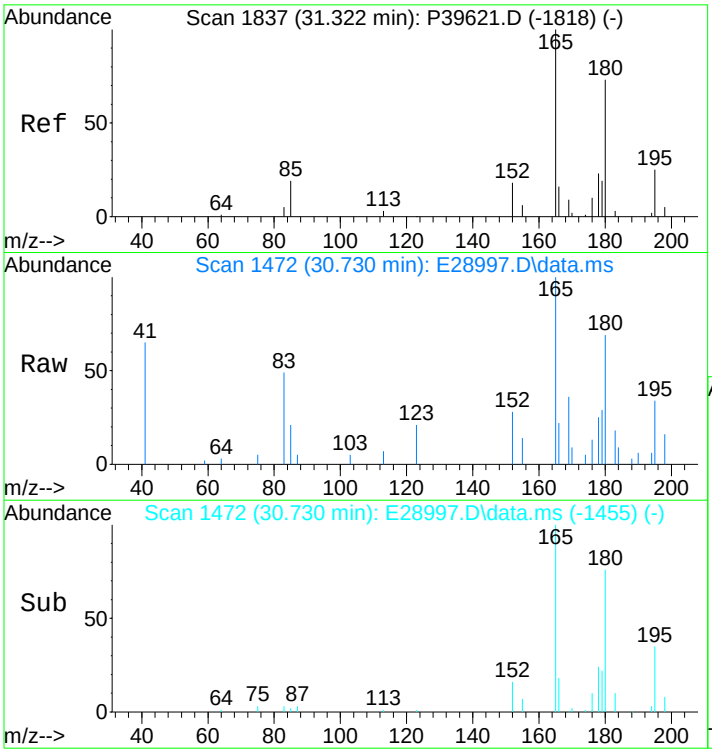


#29
Fluorene
Concen: 145.80 ng/mL m
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:166 Resp: 9231

Ion	Ratio	Lower	Upper
166	100		
165	176.7	74.7	112.1#

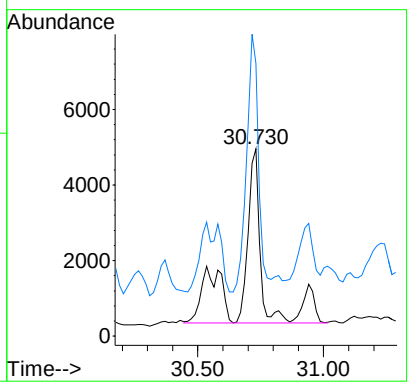


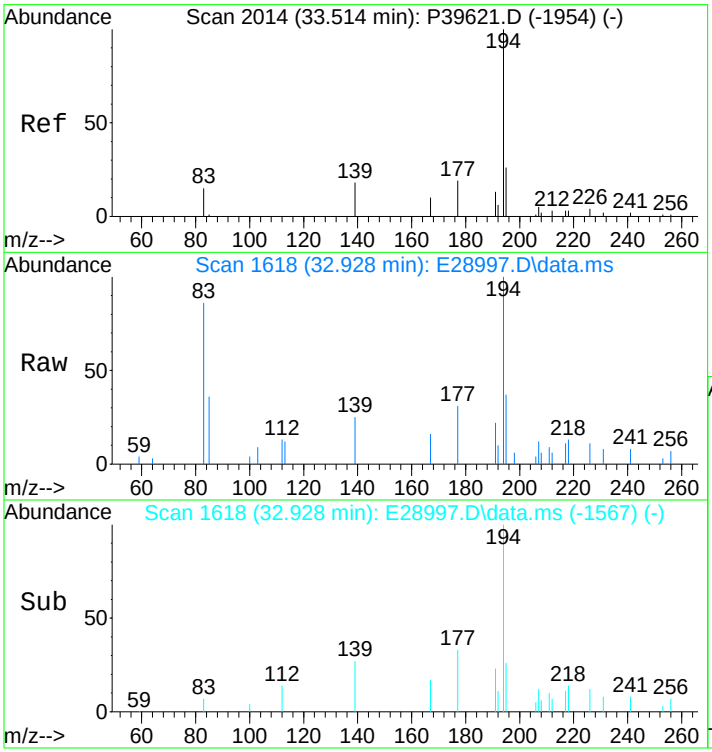


#30
C1-Fluorenes
Concen: 416.13 ng/mL m
RT: 30.730 min Scan# 1472
Delta R.T. 0.108 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:180 Resp: 26347

Ion	Ratio	Lower	Upper
180	100		
165	32.5	94.3	141.5#

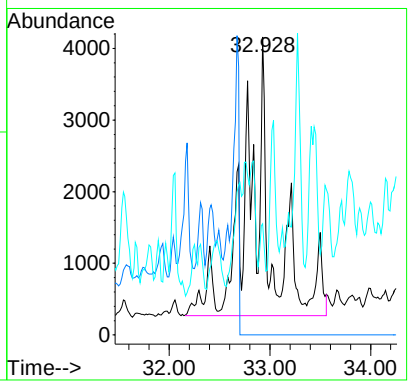


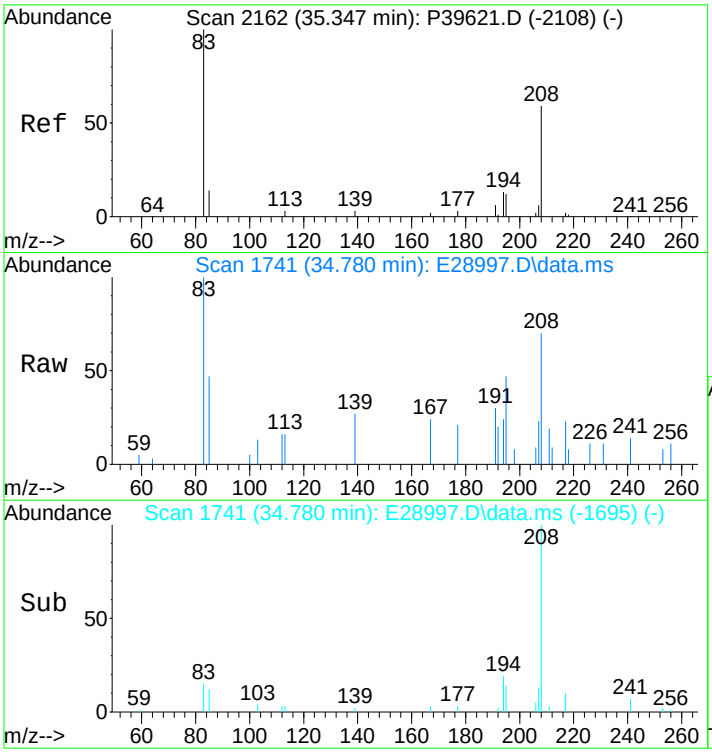


#31
C2-Fluorenes
Concen: 977.33 ng/mL m
RT: 32.928 min Scan# 1618
Delta R.T. 0.167 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:194 Resp: 61879

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	1.9	27.0	40.4#

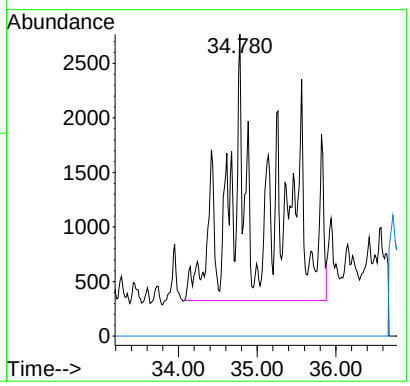


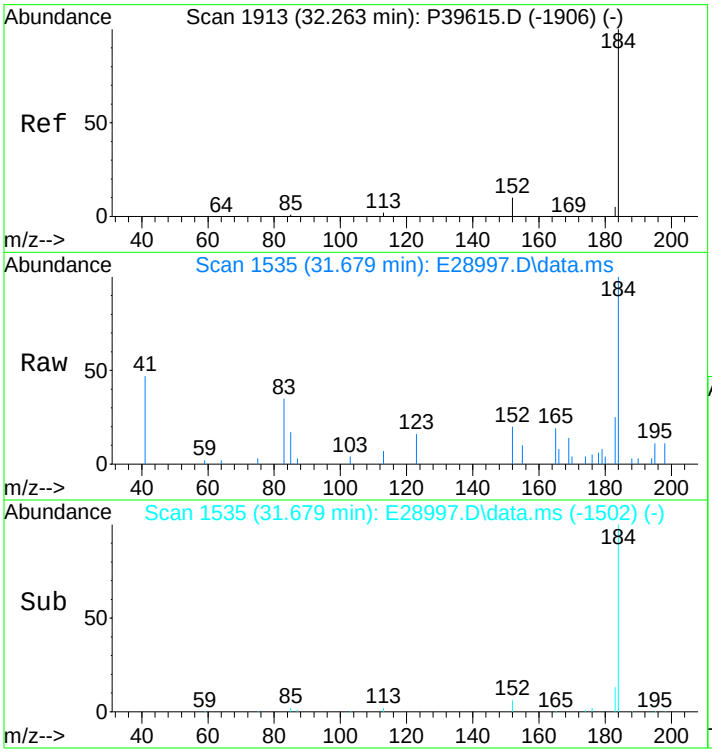


#32
C3-Fluorenes
Concen: 1176.04 ng/mL m
RT: 34.780 min Scan# 1741
Delta R.T. 0.231 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:208 Resp: 74460

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

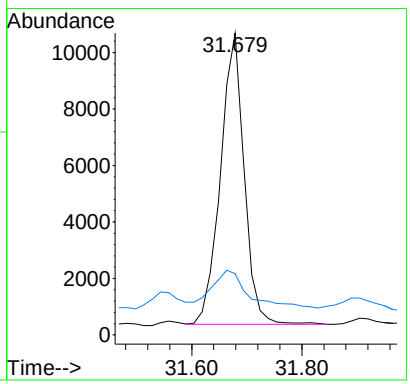


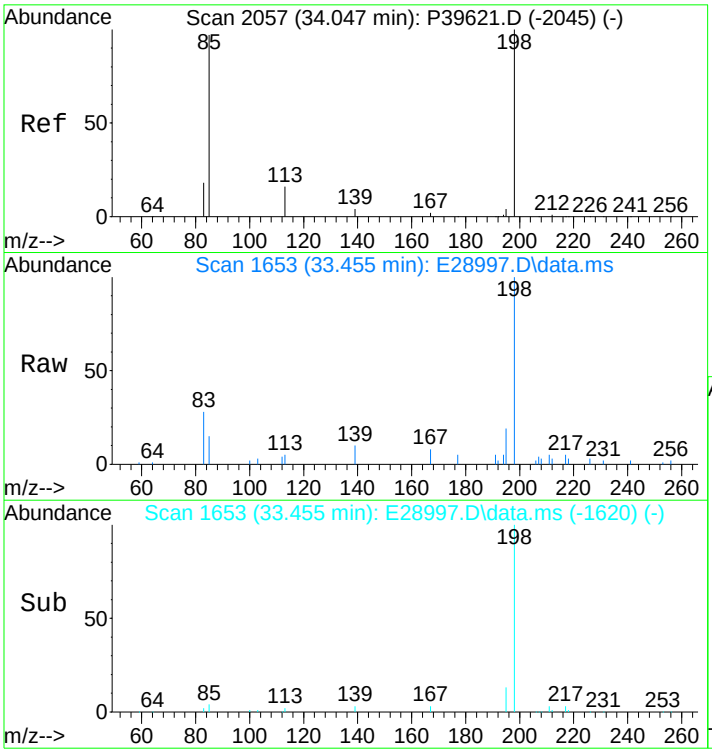


#33
Dibenzothiophene
Concen: 354.22 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:184 Resp: 30776

Ion	Ratio	Lower	Upper
184	100		
152	20.1	7.0	10.6#

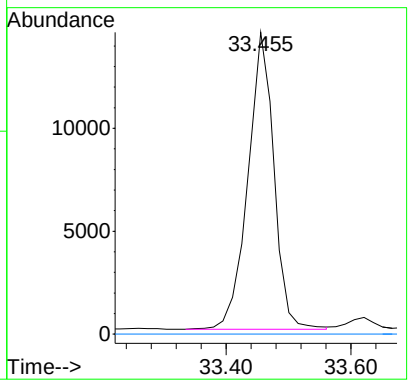


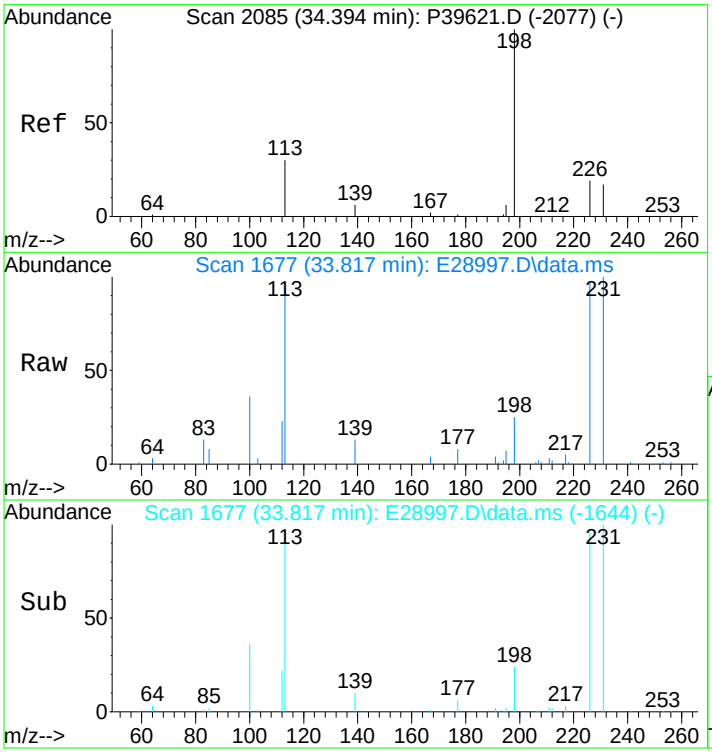


#34
4-Methyldibenzothiophene(4MDT)
Concen: 481.82 ng/mL
RT: 33.455 min Scan# 1653
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 41863

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

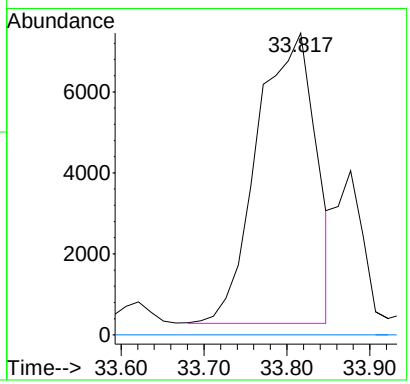


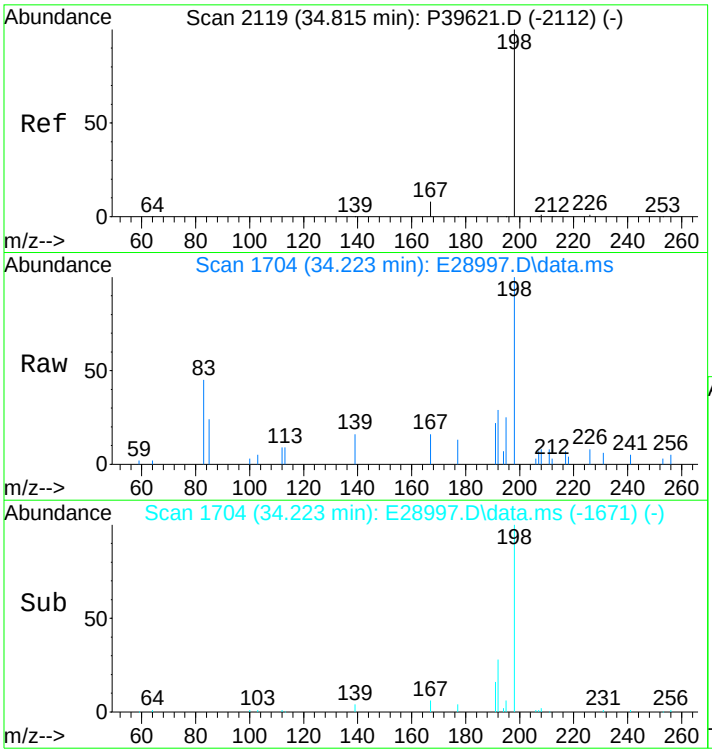


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 405.24 ng/mL m
RT: 33.817 min Scan# 1677
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 35209

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

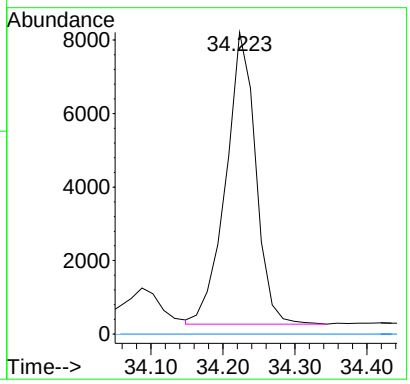


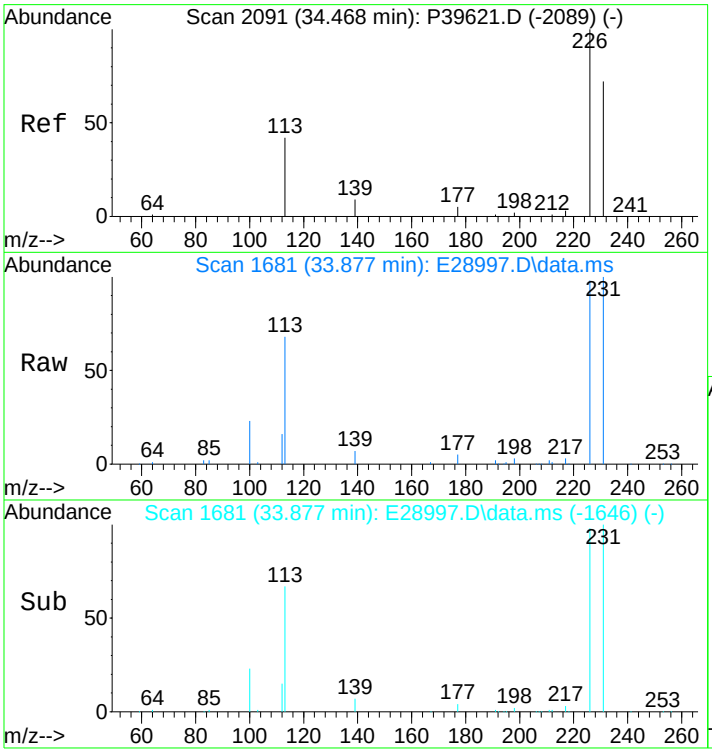


#36
1-Methyldibenzothiophene(1MDT)
Concen: 263.27 ng/mL
RT: 34.223 min Scan# 1704
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 22874

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

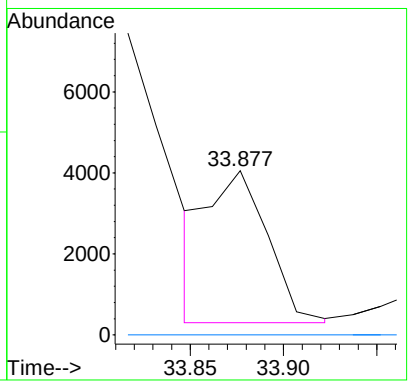


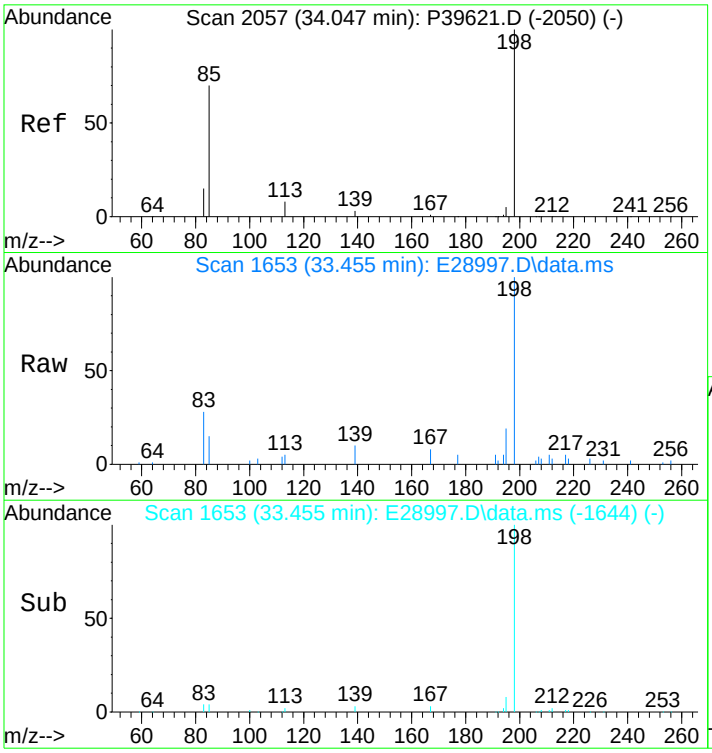


#37
OTP
Concen: 94.93 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 8248

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

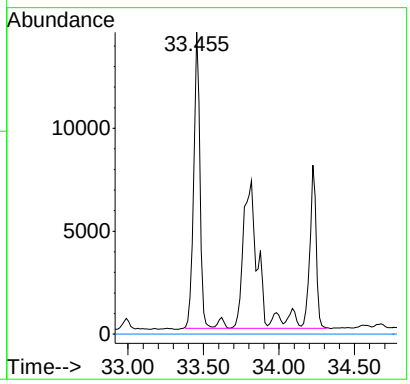


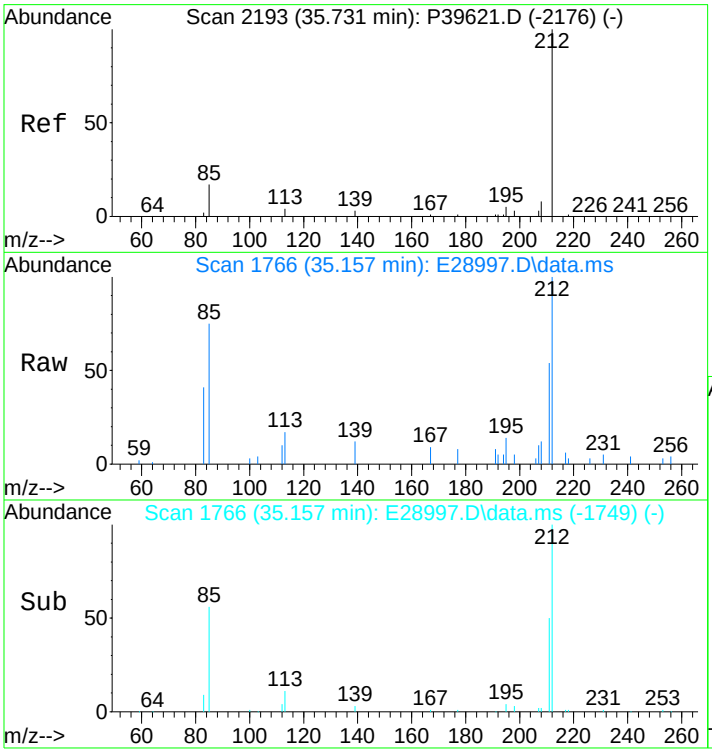


#38
C1-Dibenzothiophenes
Concen: 1327.77 ng/mL m
RT: 33.455 min Scan# 1653
Delta R.T. 0.062 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:198 Resp: 115363

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

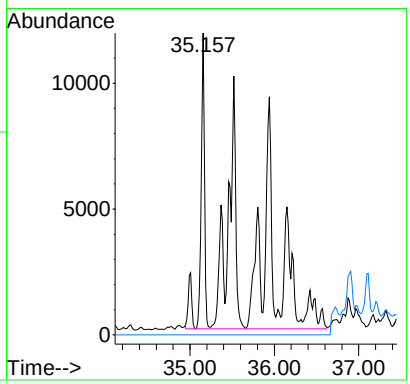


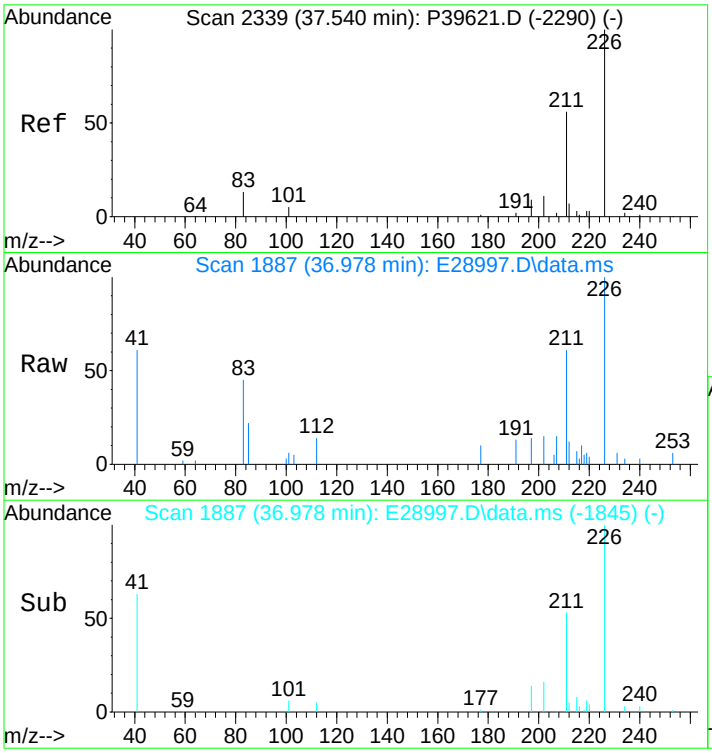


#39
C2-Dibenzothiophenes
Concen: 2332.29 ng/mL m
RT: 35.157 min Scan# 1766
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:212 Resp: 202640

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

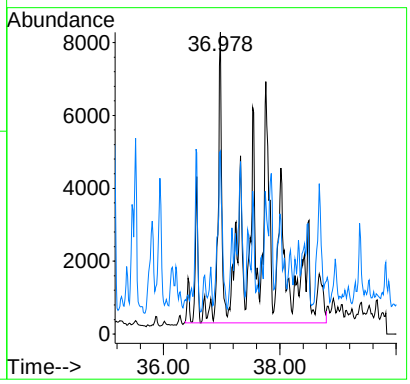


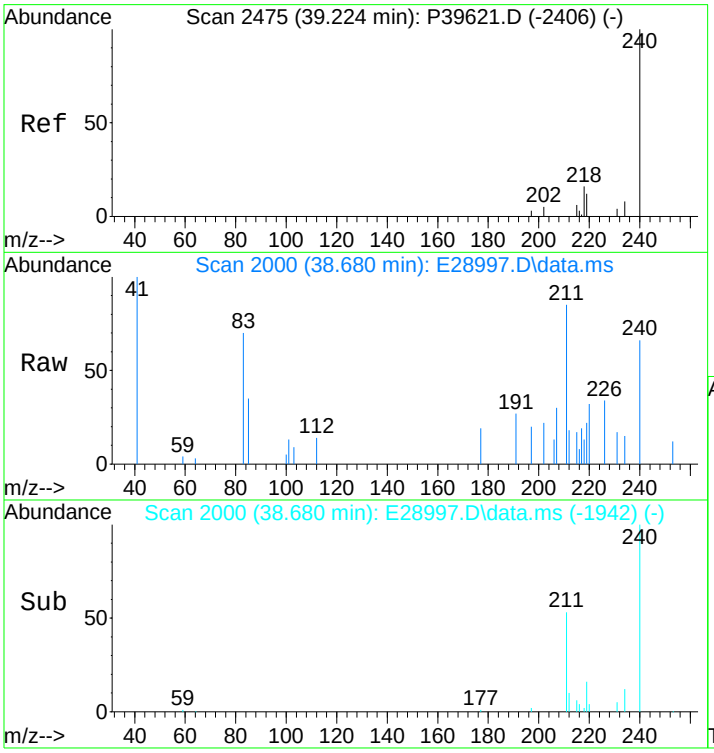


#40
C3-Dibenzothiophenes
Concen: 2560.65 ng/mL m
RT: 36.978 min Scan# 1887
Delta R.T. 0.290 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:226 Resp: 222481

Ion	Ratio	Lower	Upper
226	100		
211	1.6	44.1	66.1#

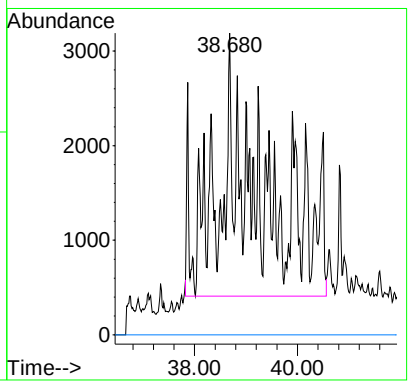


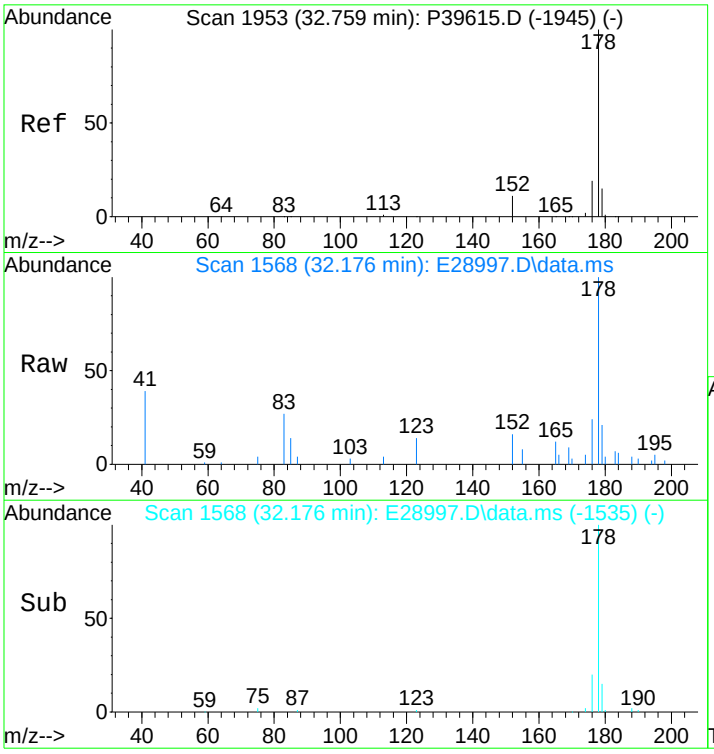


#41
C4-Dibenzothiophenes
Concen: 1776.53 ng/mL m
RT: 38.680 min Scan# 2000
Delta R.T. 0.335 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:240 Resp: 154353

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

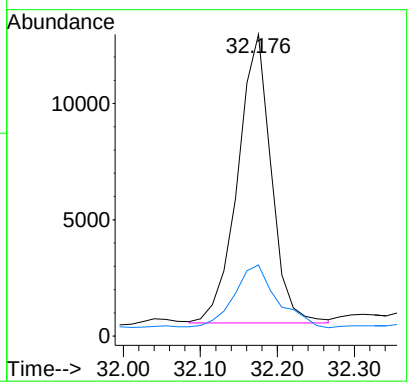


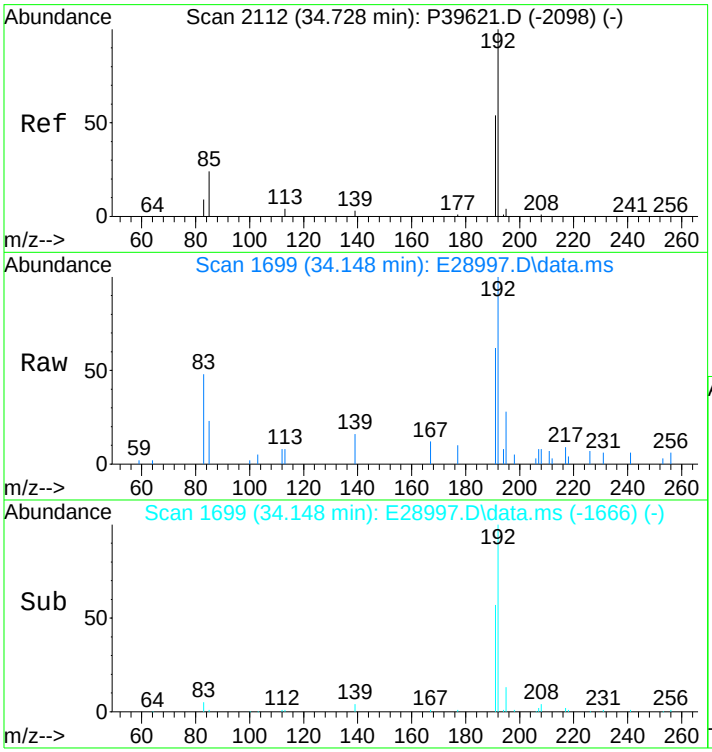


#43
Phenanthrene
Concen: 423.78 ng/mL m
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:178 Resp: 37460

Ion	Ratio	Lower	Upper
178	100		
176	0.4	15.0	22.4#

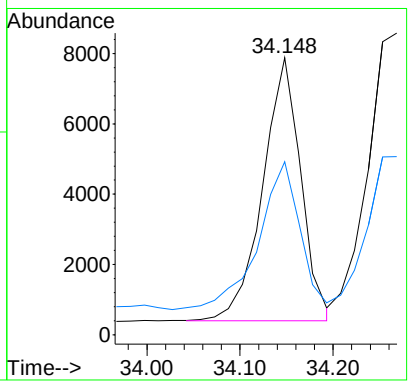


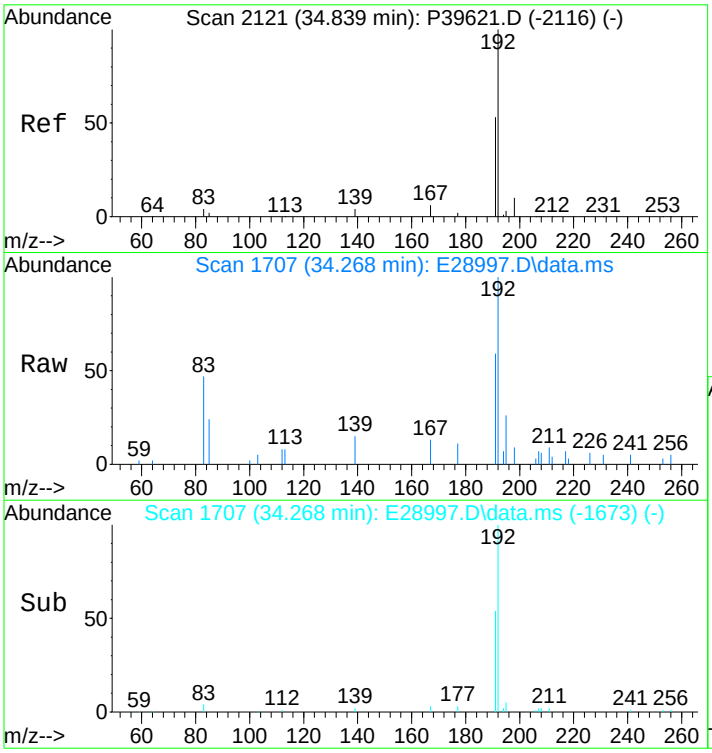


#44
3-Methylphenanthrene(3MP)
Concen: 240.77 ng/mL m
RT: 34.148 min Scan# 1699
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 21283

Ion	Ratio	Lower	Upper
192	100		
191	64.4	45.9	68.9

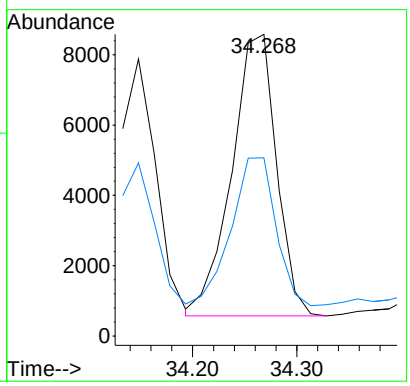


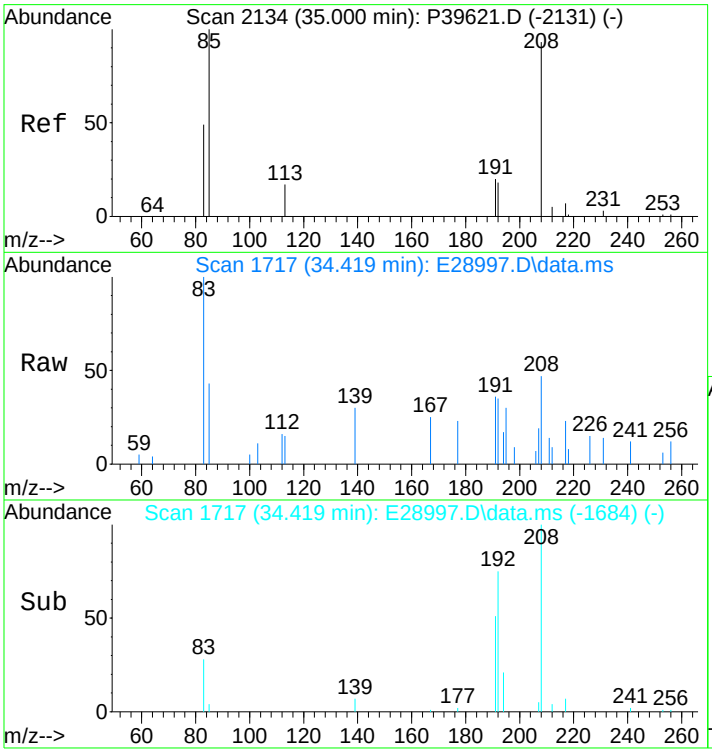


#45
2-Methylphenanthrene(2MP)
Concen: 272.28 ng/mL
RT: 34.268 min Scan# 1707
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 24068

Ion	Ratio	Lower	Upper
192	100		
191	51.5	45.4	68.0

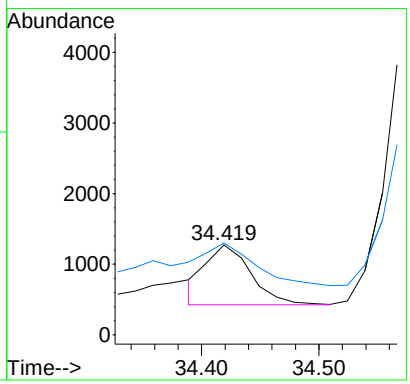


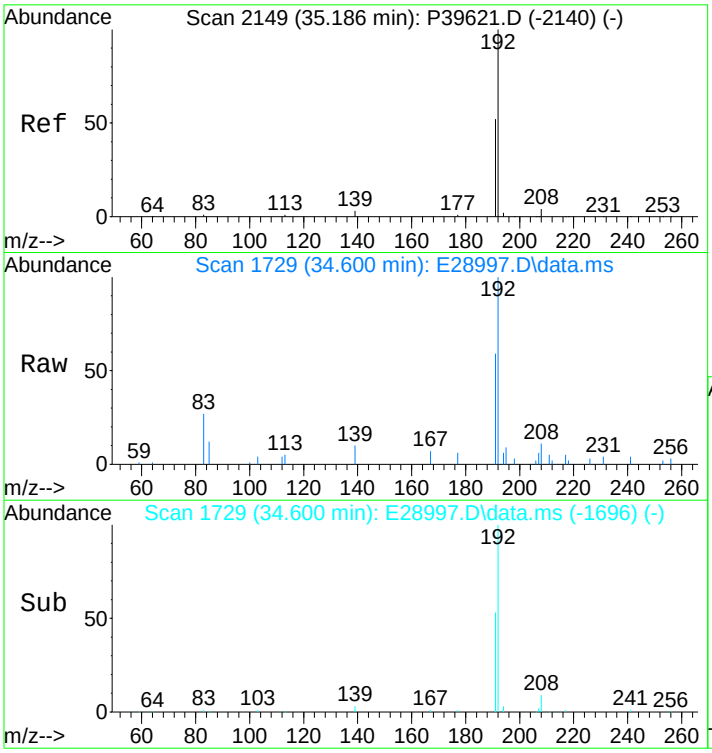


#46
2-Methylanthracene(2MA)
Concen: 25.59 ng/mL m
RT: 34.419 min Scan# 1717
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 2262

Ion	Ratio	Lower	Upper
192	100		
191	128.0	95.4	143.0

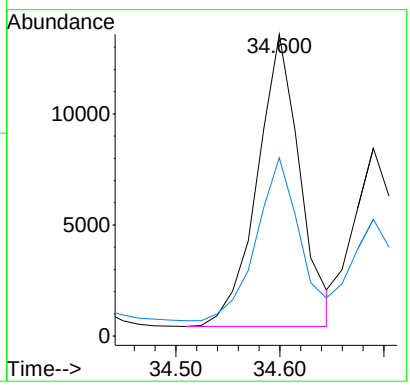


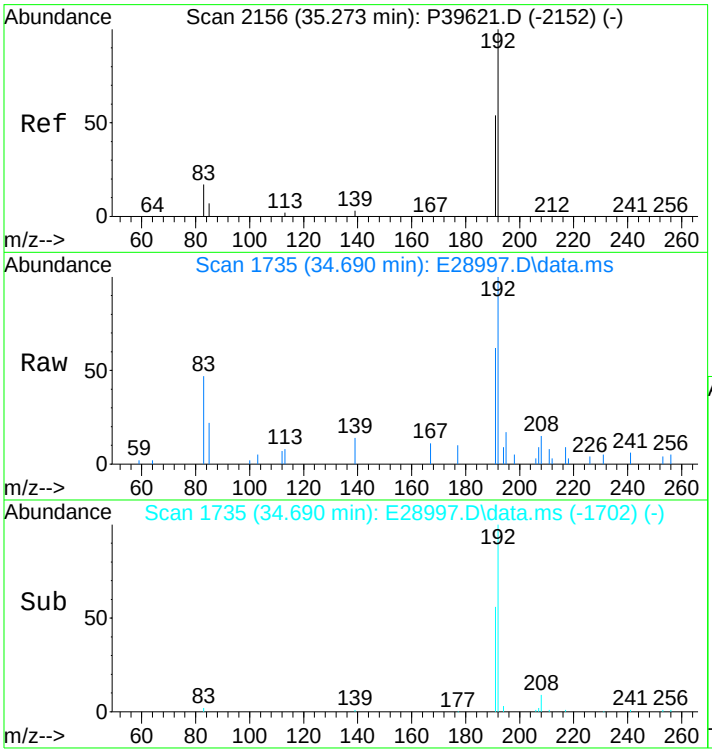


#47
9/4-Methylphenanthrene(9MP)
Concen: 425.67 ng/mL
RT: 34.600 min Scan# 1729
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 37627

Ion	Ratio	Lower	Upper
192	100		
191	56.3	44.3	66.5

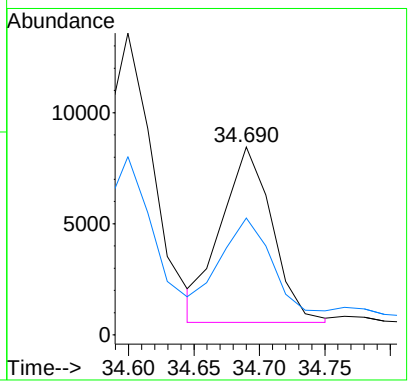


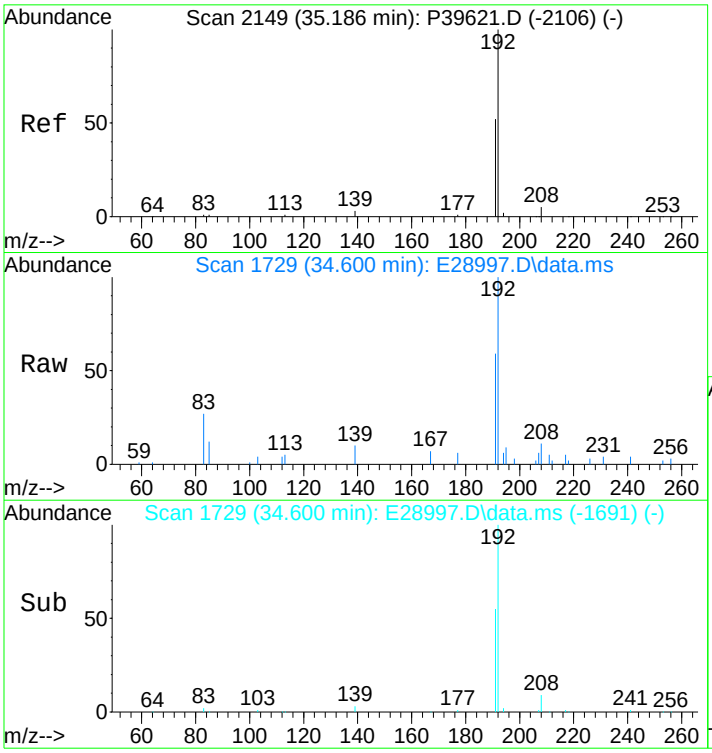


#48
1-Methylphenanthrene(1MP)
Concen: 241.09 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 21311

Ion	Ratio	Lower	Upper
192	100		
191	53.1	46.7	70.1

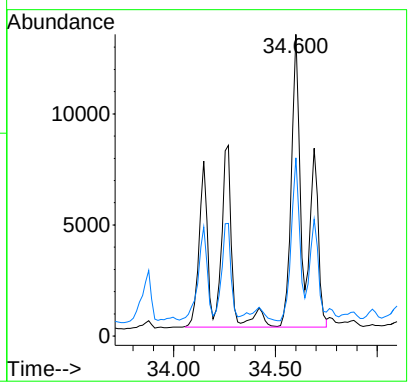


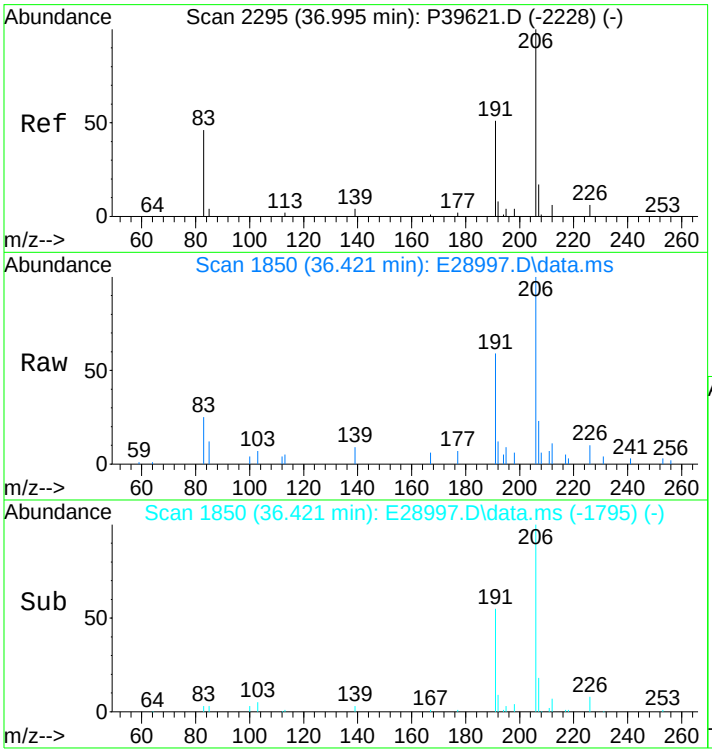


#49
C1-Phenanthrenes/Anthracenes
Concen: 1246.96 ng/mL m
RT: 34.600 min Scan# 1729
Delta R.T. 0.196 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 110226

Ion	Ratio	Lower	Upper
192	100		
191	11.2	44.0	66.0#

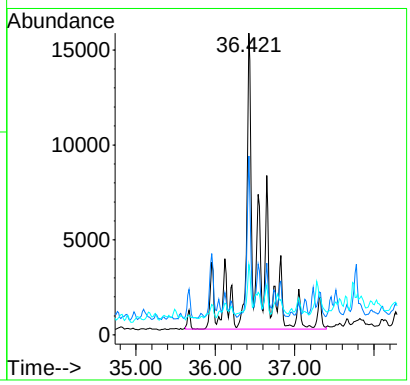


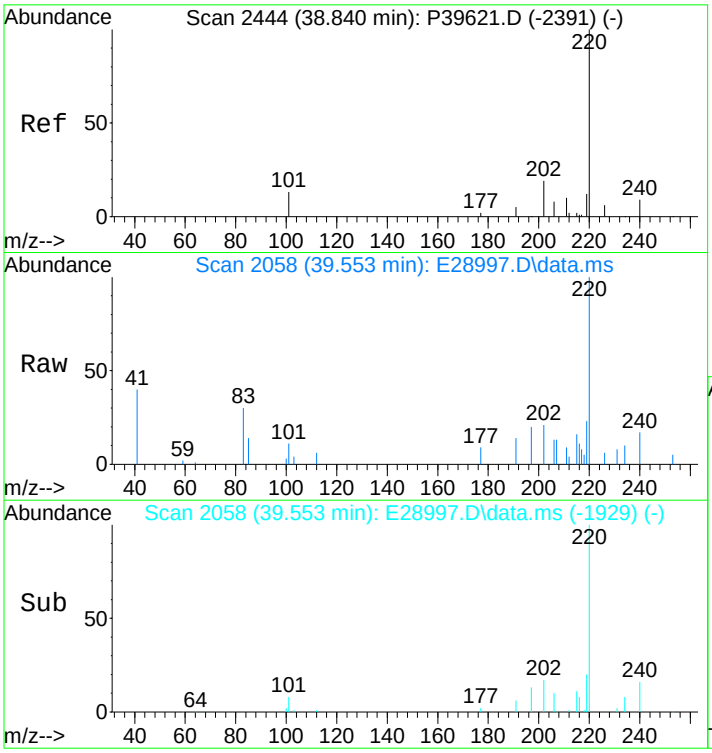


#50
C2-Phenanthrenes/Anthracenes
Concen: 1886.32 ng/mL m
RT: 36.421 min Scan# 1850
Delta R.T. 0.260 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:206 Resp: 166742

Ion	Ratio	Lower	Upper
206	100		
191	16.0	35.7	53.5#
207	5.6	16.5	24.7#

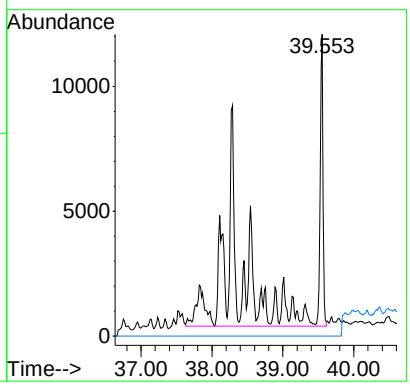


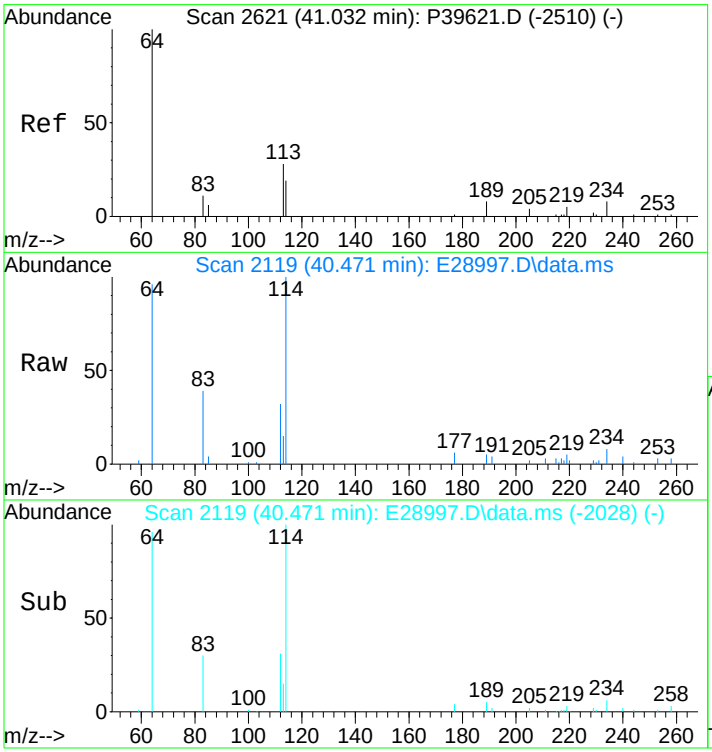


#52
C3-Phenanthrenes/Anthracenes
Concen: 1803.68 ng/mL m
RT: 39.553 min Scan# 2058
Delta R.T. 1.590 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:220 Resp: 159437

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

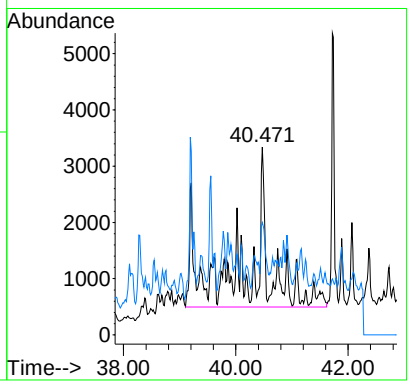


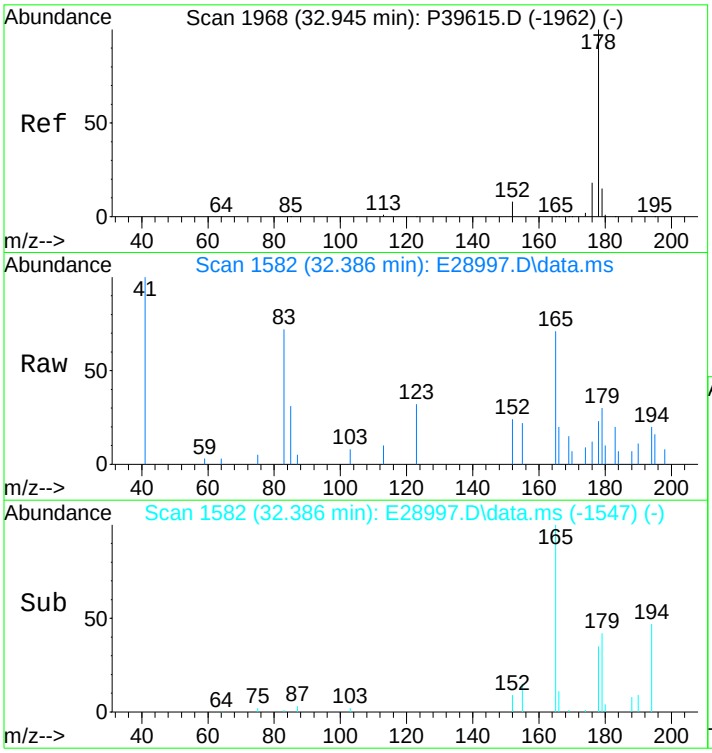


#53
C4-Phenanthrenes/Anthracenes
Concen: 835.45 ng/mL m
RT: 40.471 min Scan# 2119
Delta R.T. 0.384 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 73850

Ion	Ratio	Lower	Upper
234	100		
219	2.1	46.6	70.0#

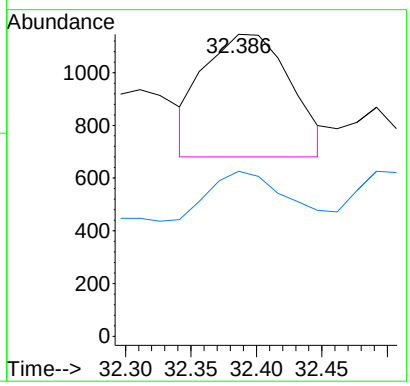


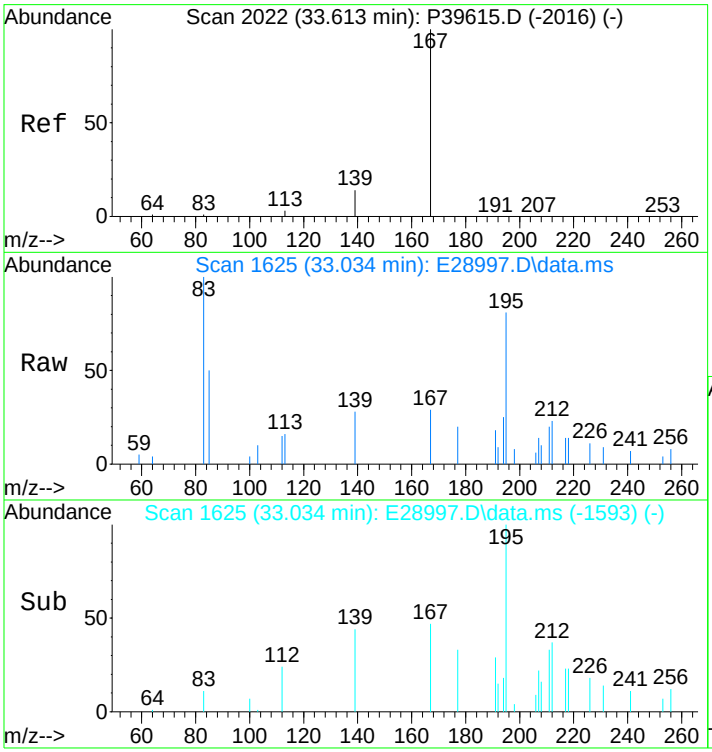


#55
Anthracene
Concen: 27.98 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:178 Resp: 2138

Ion	Ratio	Lower	Upper
178	100		
176	0.0	14.3	21.5#

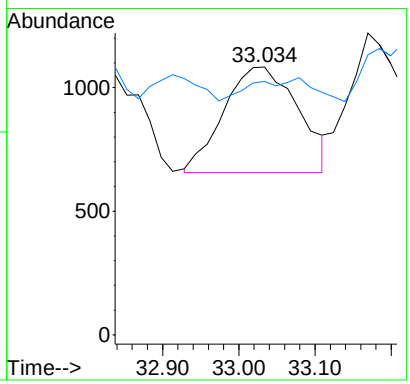


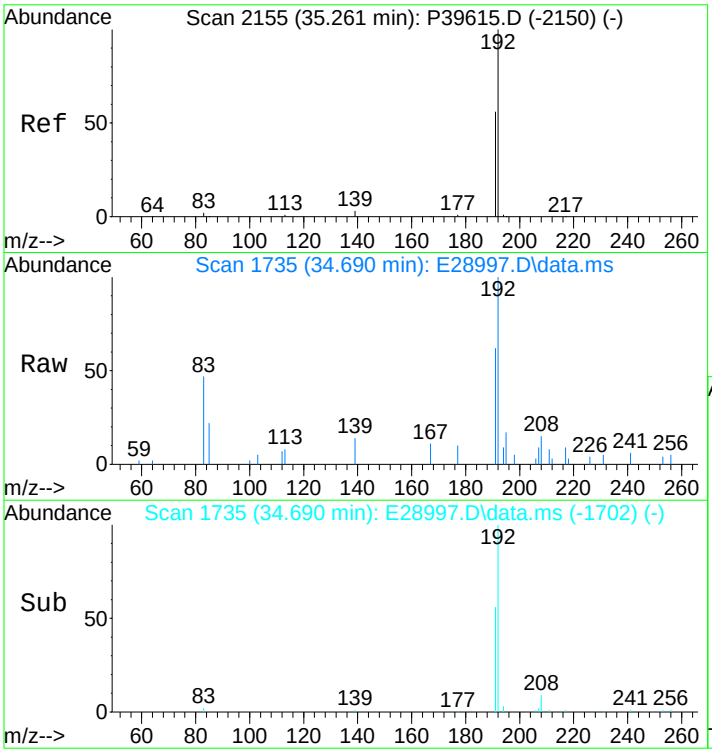


#56
Carbazole
Concen: 36.97 ng/mL m
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:167 Resp: 2907

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.1	15.1#

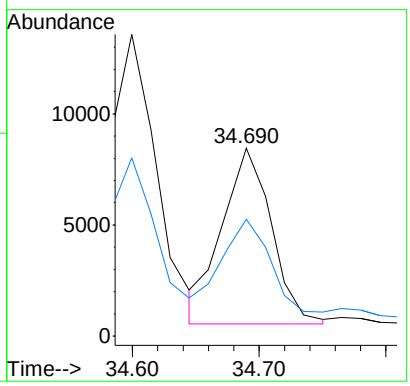


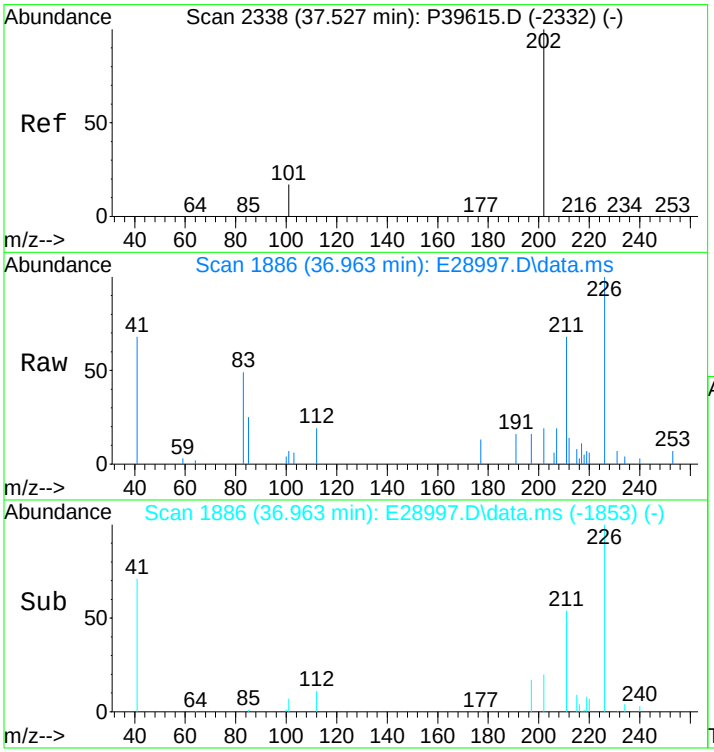


#57
1-Methylphenanthrene
Concen: 317.79 ng/mL m
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:192 Resp: 21431

Ion	Ratio	Lower	Upper
192	100		
191	52.8	45.4	68.2

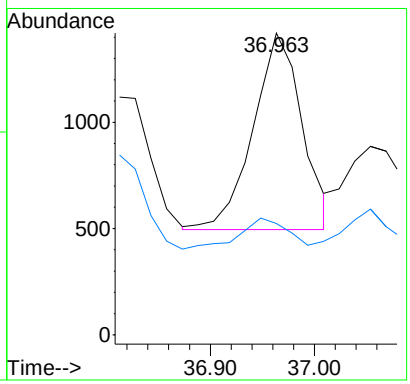


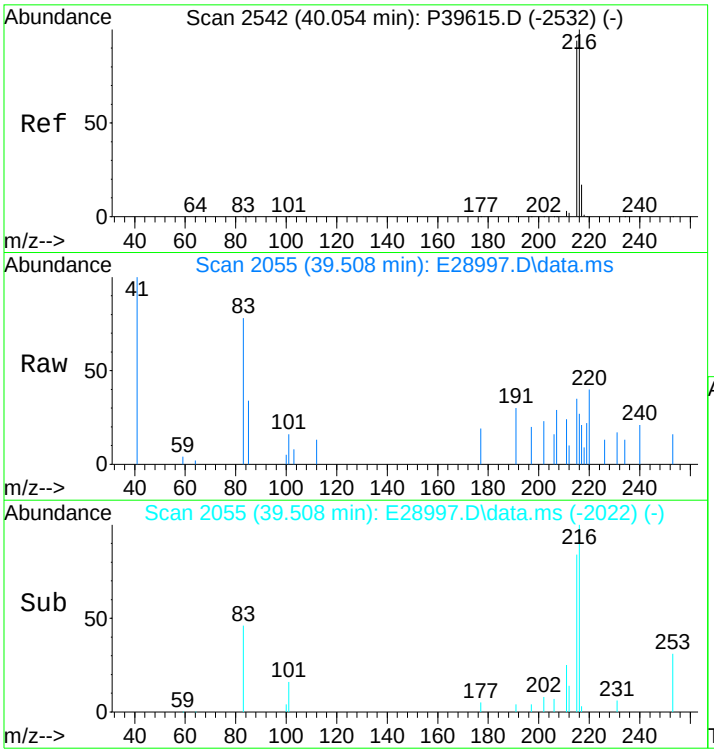


#58
Fluoranthene
Concen: 30.93 ng/mL m
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:202 Resp: 3019

Ion	Ratio	Lower	Upper
202	100		
101	29.6	10.4	15.6#

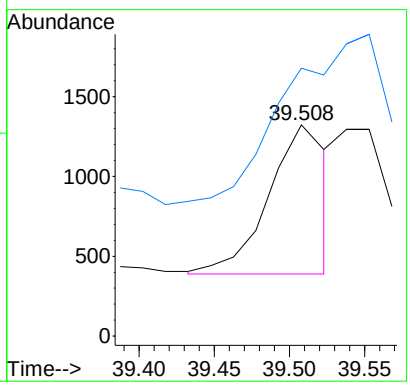


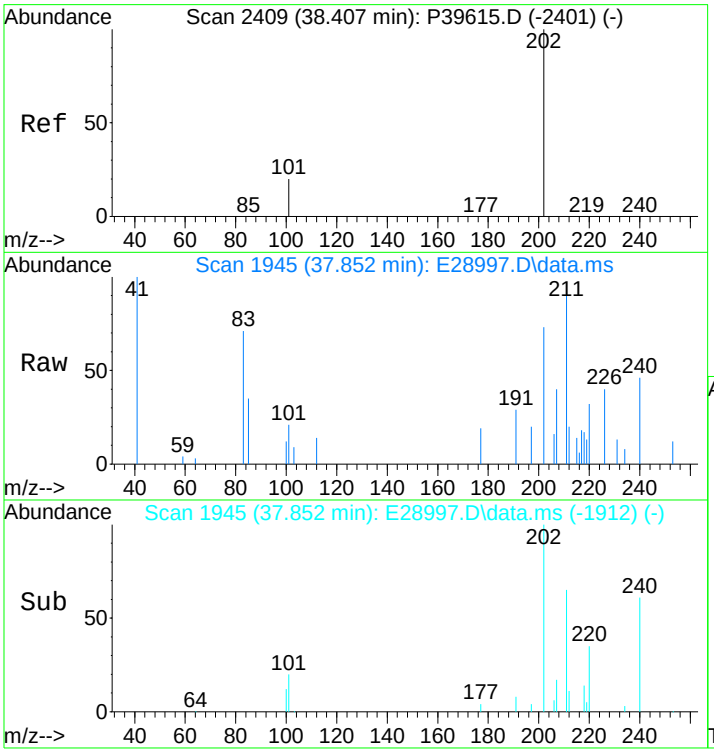


#59
Benzo(b)fluorene
Concen: 39.05 ng/mL m
RT: 39.508 min Scan# 2055
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:216 Resp: 2540

Ion	Ratio	Lower	Upper
216	100		
215	125.6	72.6	109.0#

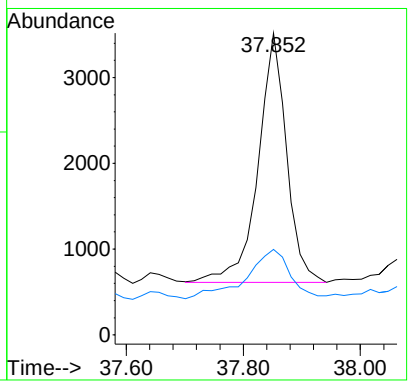


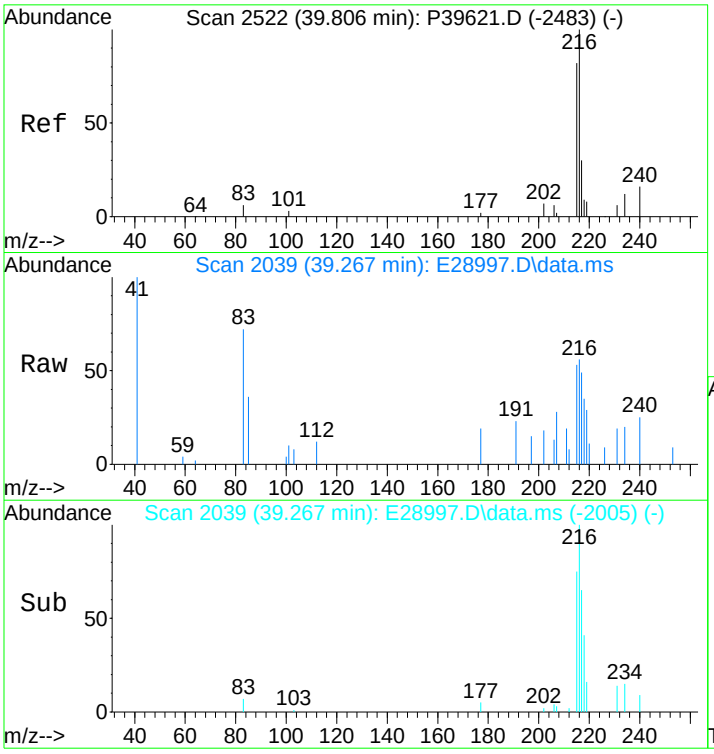


#60
Pyrene
Concen: 98.98 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:202 Resp: 9821

Ion	Ratio	Lower	Upper
202	100		
101	30.8	11.0	16.4#

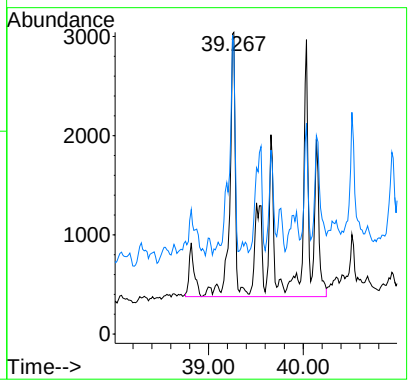


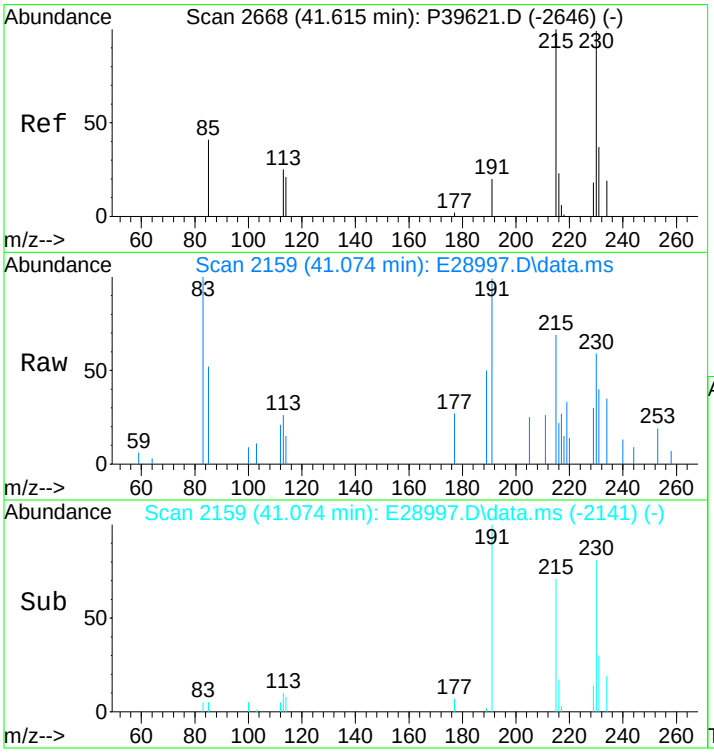


#61
C1-Fluoranthenes/Pyrenes
Concen: 374.55 ng/mL m
RT: 39.267 min Scan# 2039
Delta R.T. 0.352 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:216 Resp: 37164

Ion	Ratio	Lower	Upper
216	100		
215	23.8	73.4	110.2#

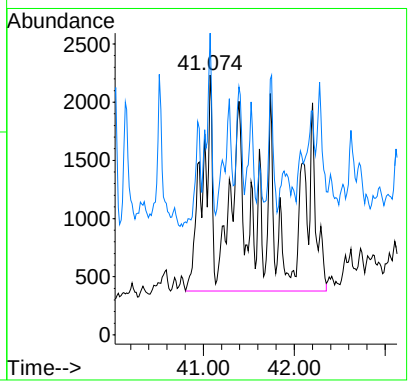


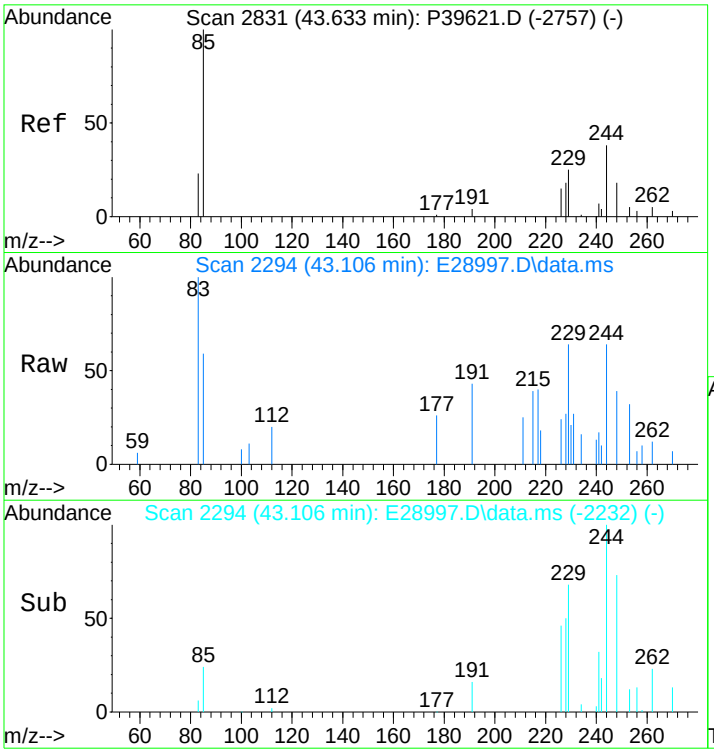


#62
C2-Fluoranthenes/Pyrenes
Concen: 579.26 ng/mL m
RT: 41.074 min Scan# 2159
Delta R.T. 0.194 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:230 Resp: 57475

Ion	Ratio	Lower	Upper
230	100		
215	10.2	93.8	140.8#

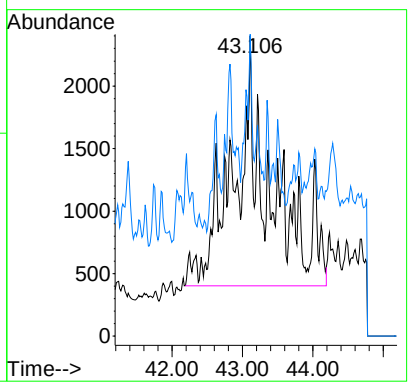


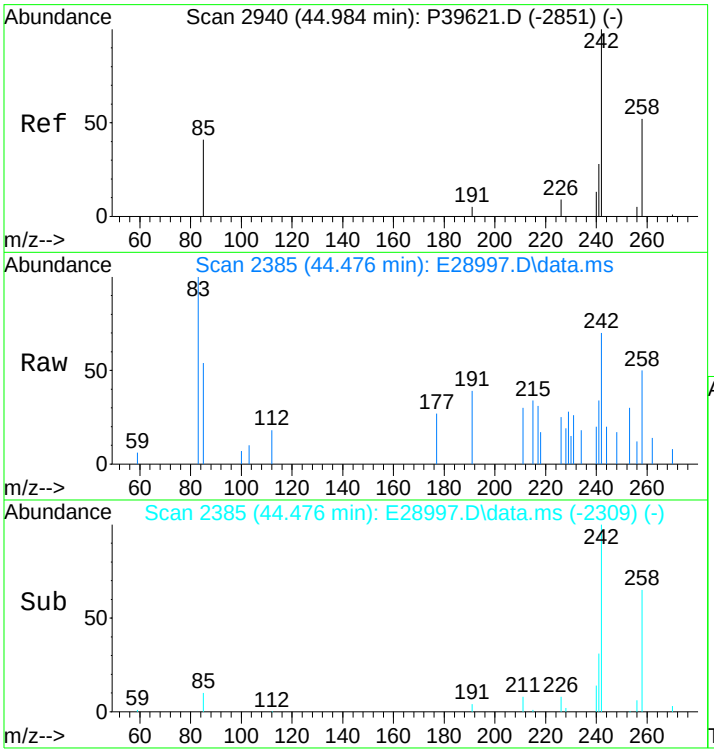


#63
C3-Fluoranthenes/Pyrenes
Concen: 706.09 ng/mL m
RT: 43.106 min Scan# 2294
Delta R.T. 0.455 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:244 Resp: 70060

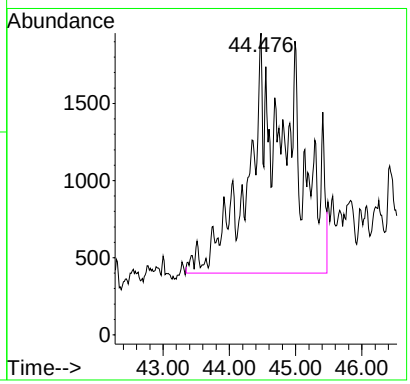
Ion	Ratio	Lower	Upper
244	100		
229	8.0	72.2	108.2#

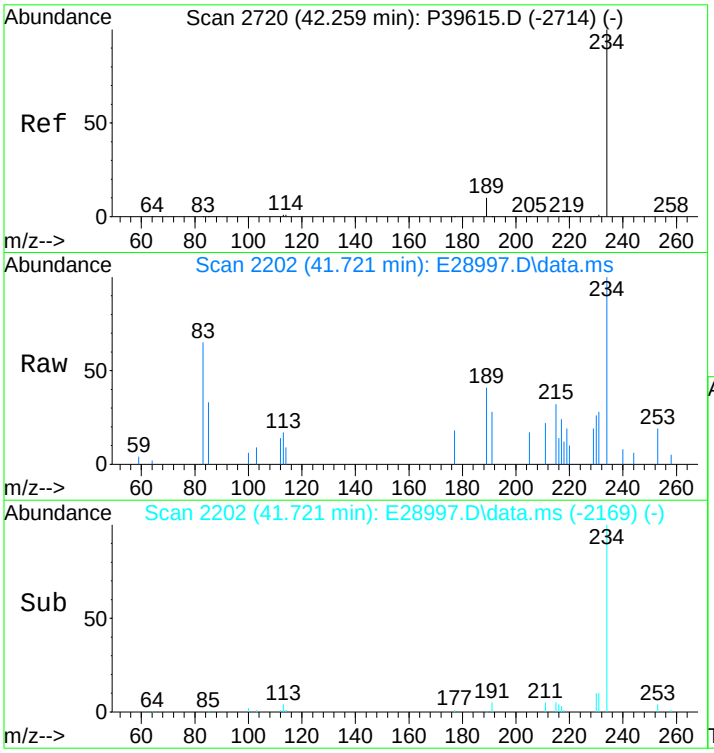




#64
C4-Fluoranthenes/Pyrenes
Concen: 717.33 ng/mL m
RT: 44.476 min Scan# 2385
Delta R.T. 0.506 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:258 Resp: 71175

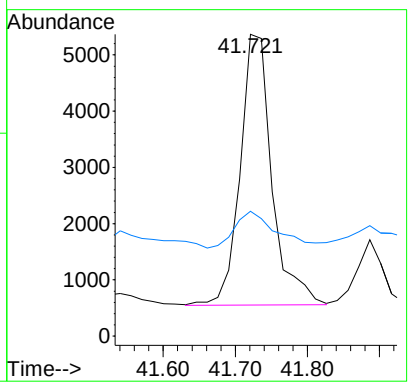


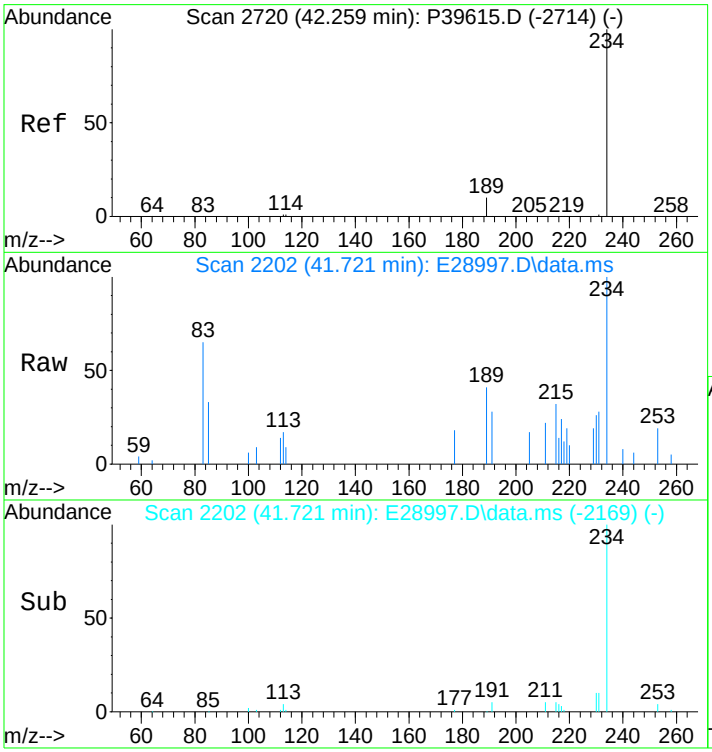


#66
Naphthobenzothiophene
Concen: 150.17 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 14696

Ion	Ratio	Lower	Upper
234	100		
189	17.6	21.1	31.7#

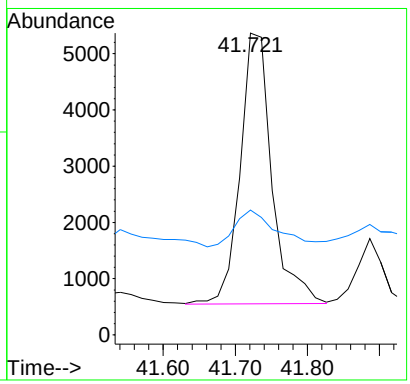


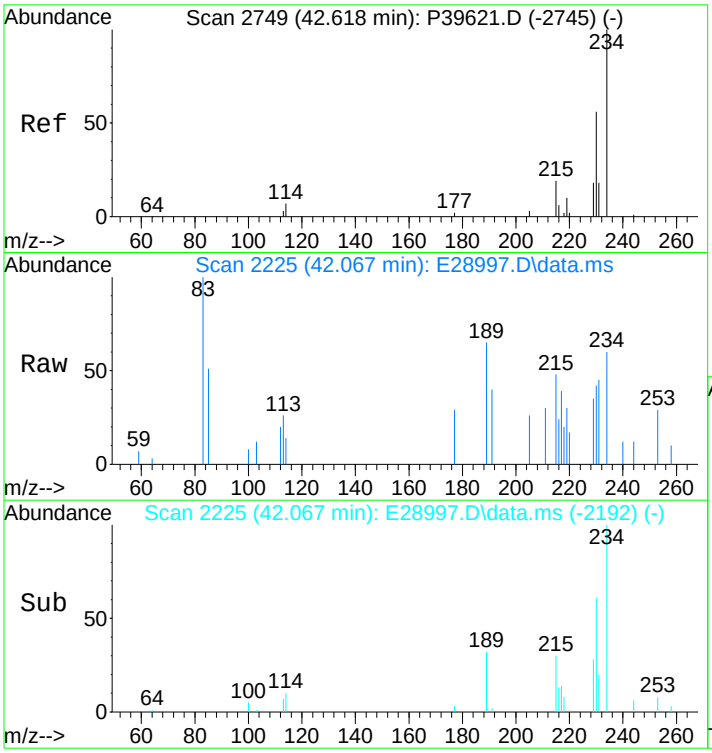


#67
Naphthobenzothiophene-2,1-D
Concen: 150.17 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 14696

Ion	Ratio	Lower	Upper
234	100		
189	17.6	21.1	31.7#

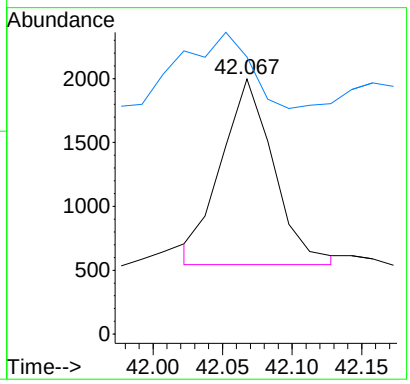


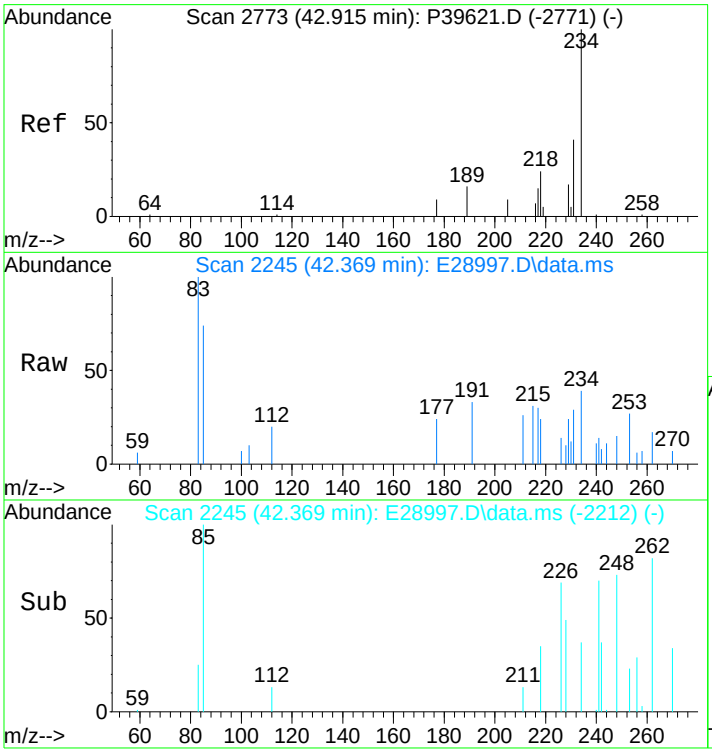


#68
Naphthobenzothiophene-1,2-D
Concen: 38.99 ng/mL m
RT: 42.067 min Scan# 2225
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 3816

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

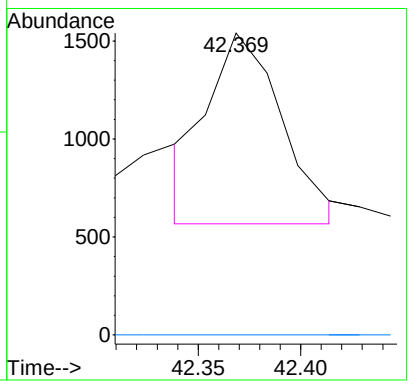


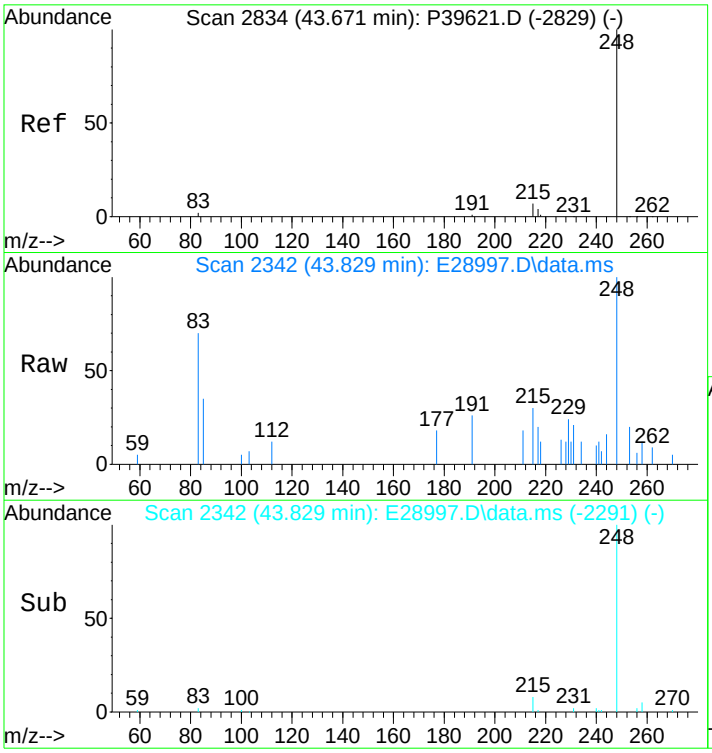


#69
Naphthobenzothiophene-2,3-D
Concen: 25.06 ng/mL m
RT: 42.369 min Scan# 2245
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:234 Resp: 2452

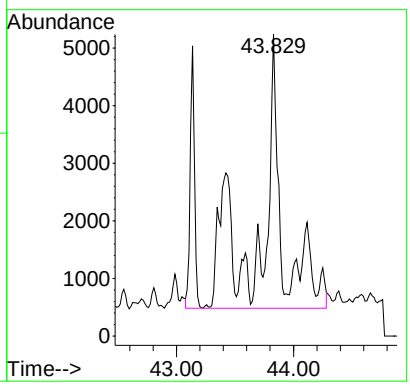
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

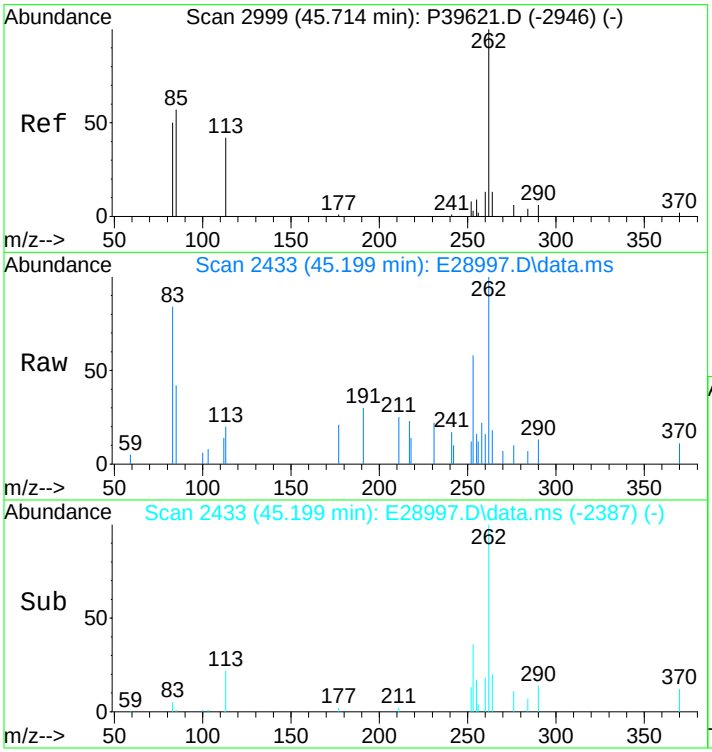




#70
C1-Naphthobenzothiophenes
Concen: 740.41 ng/ml m
RT: 43.829 min Scan# 2342
Delta R.T. 0.708 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

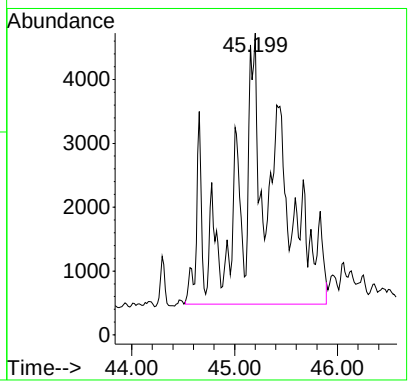
Tgt Ion:248 Resp: 72458

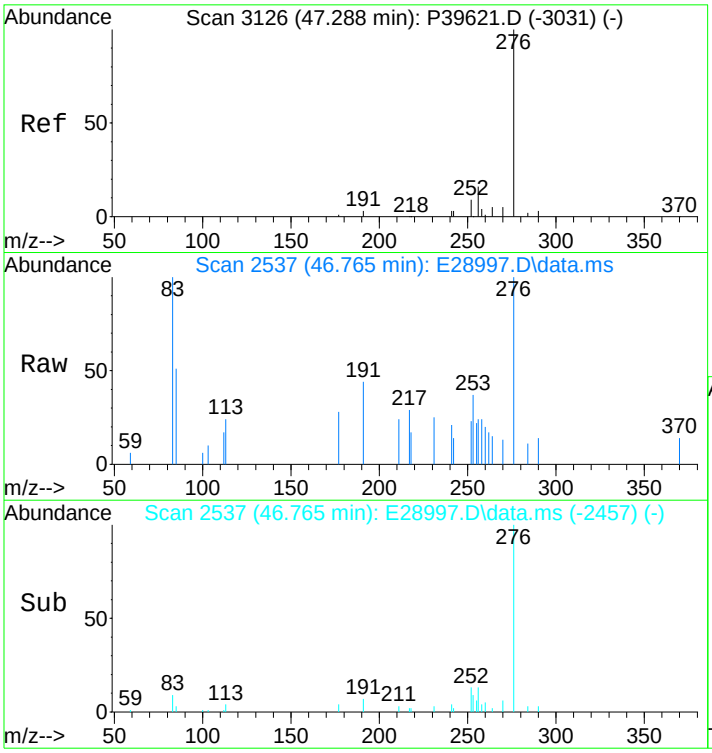




#71
C2-Naphthobenzothiophenes
Concen: 1179.61 ng/ml m
RT: 45.199 min Scan# 2433
Delta R.T. 0.554 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

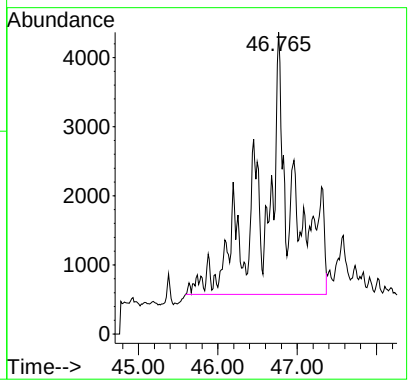
Tgt Ion:262 Resp: 115439

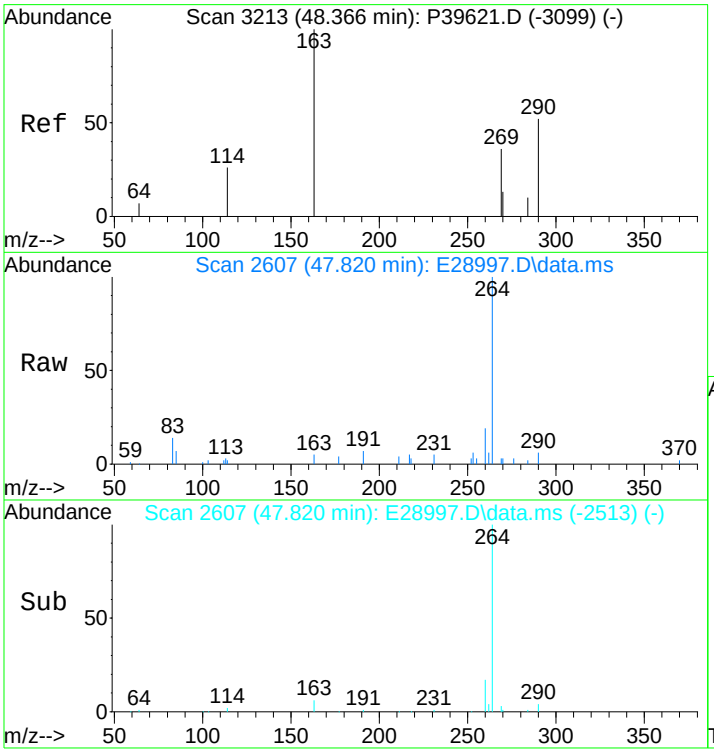




#72
C3-Naphthobenzothiophenes
Concen: 999.21 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. 0.538 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

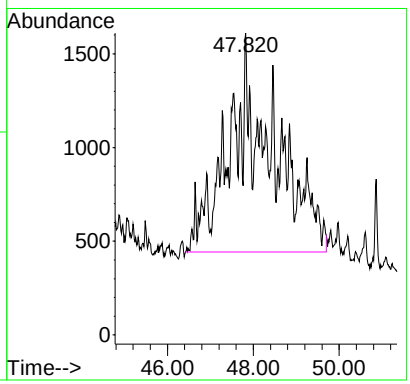
Tgt Ion:276 Resp: 97784

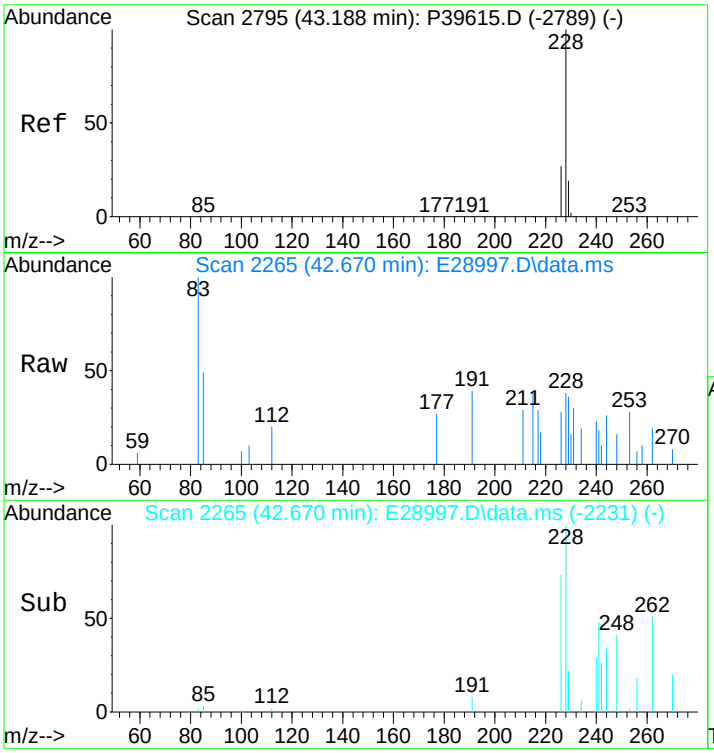




#73
C4-Naphthobenzothiophenes
Concen: 817.47 ng/mL m
RT: 47.820 min Scan# 2607
Delta R.T. 0.523 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:290 Resp: 79999

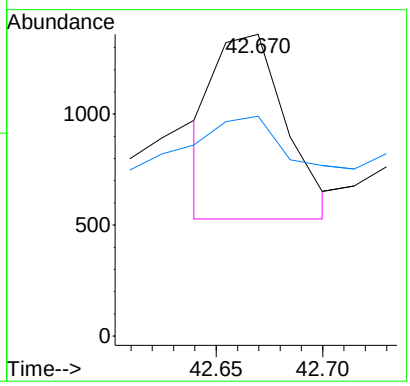


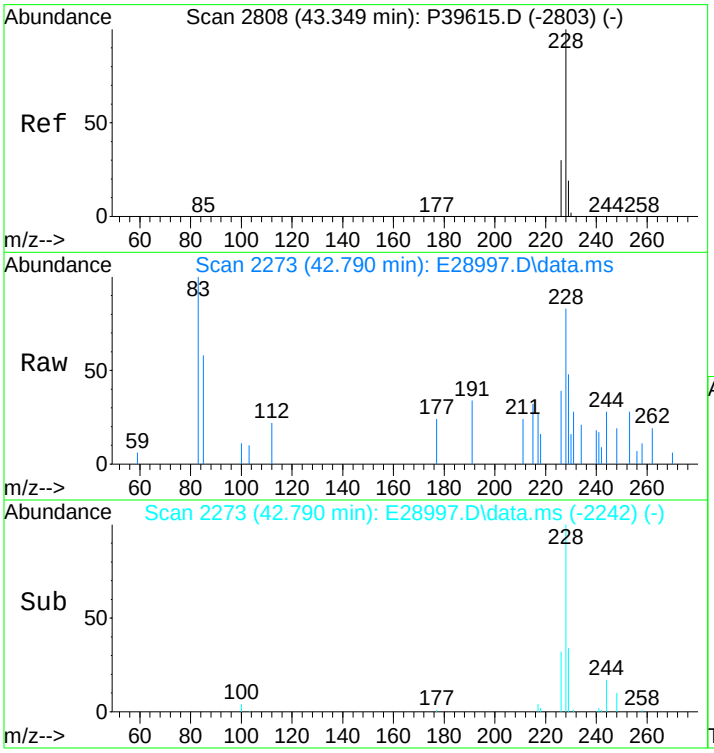


#75
Benz[a]anthracene
Concen: 18.79 ng/mL m
RT: 42.670 min Scan# 2265
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:228 Resp: 1916

Ion	Ratio	Lower	Upper
228	100		
226	88.5	20.7	31.1#

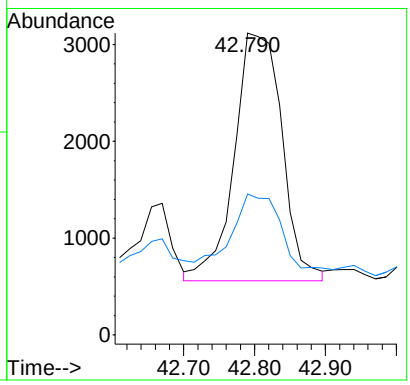


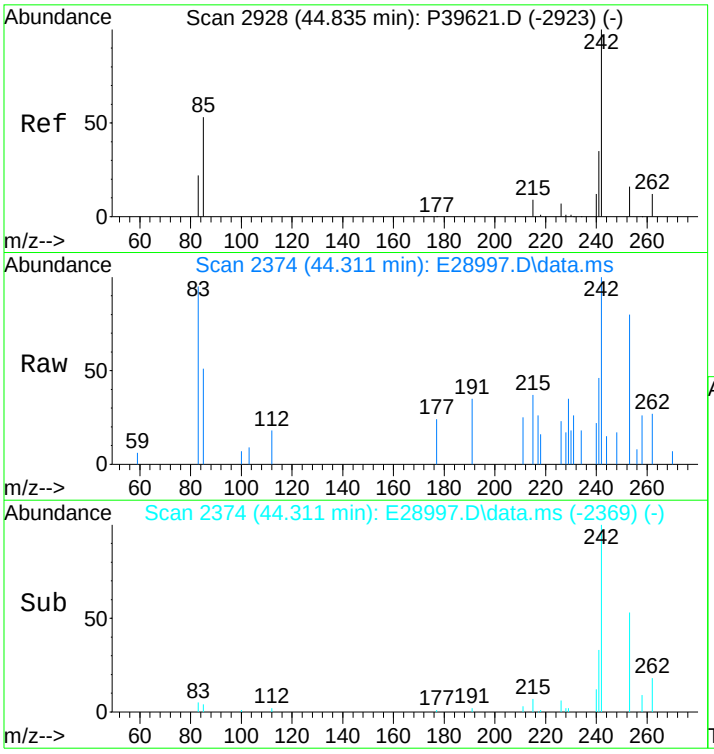


#77
Chrysene/Triphenylene
Concen: 113.97 ng/mL m
RT: 42.790 min Scan# 2273
Delta R.T. -0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:228 Resp: 11966

Ion	Ratio	Lower	Upper
228	100		
226	36.2	22.6	34.0#

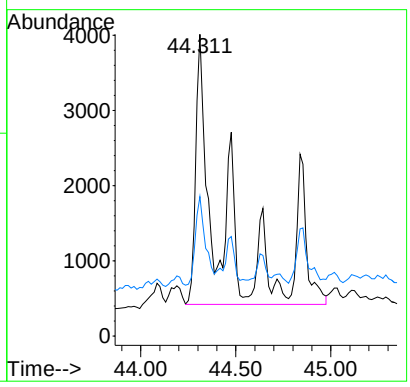


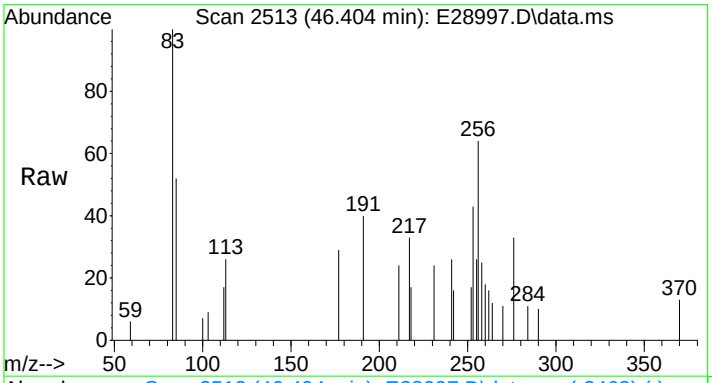


#78
C1-Chrysenes
Concen: 315.15 ng/mL m
RT: 44.311 min Scan# 2374
Delta R.T. 0.026 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:242 Resp: 33088

Ion	Ratio	Lower	Upper
242	100		
241	8.7	32.2	48.4#

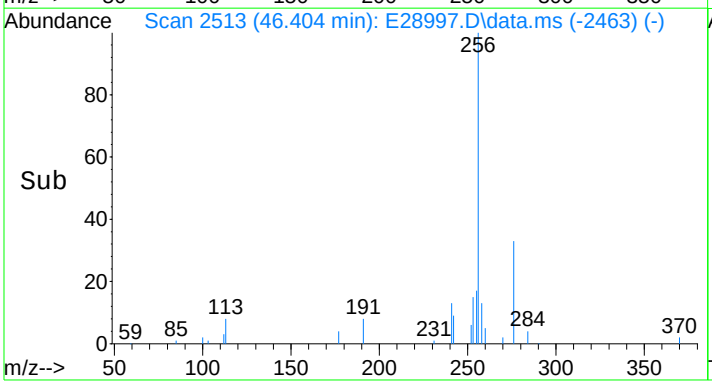


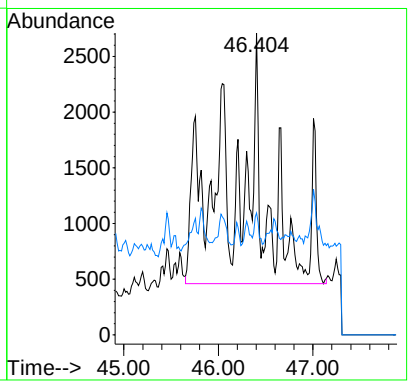


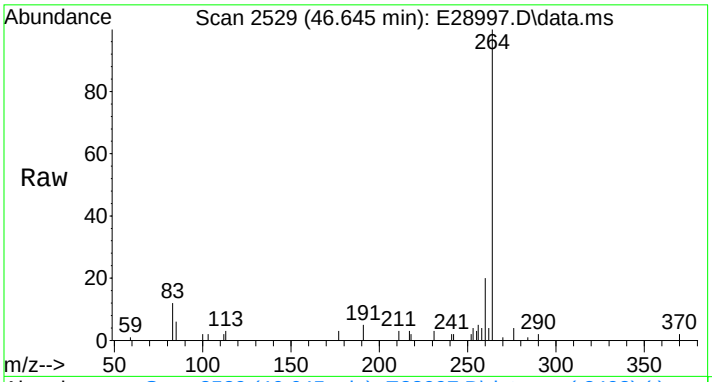
#79
C2-Chrysenes
Concen: 546.83 ng/mL m
RT: 46.404 min Scan# 2513
Delta R.T. 0.061 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:256 Resp: 57413

Ion	Ratio	Lower	Upper
256	100		
241	1.5	25.3	37.9#

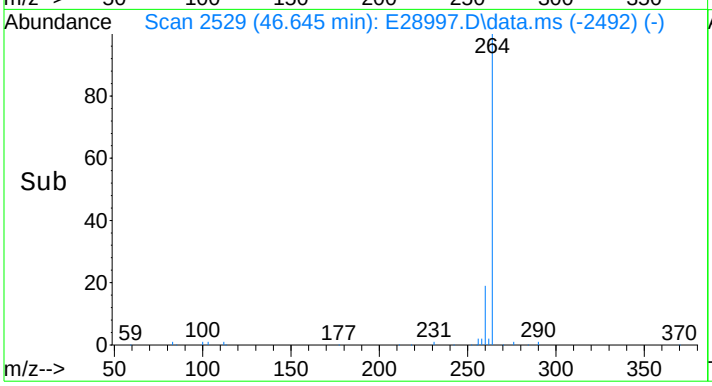


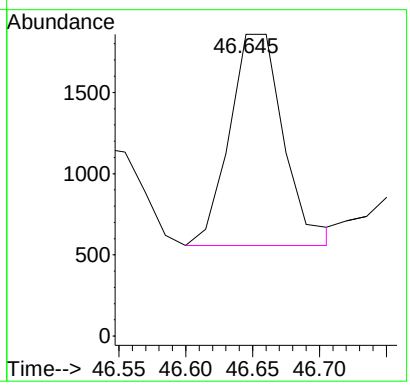


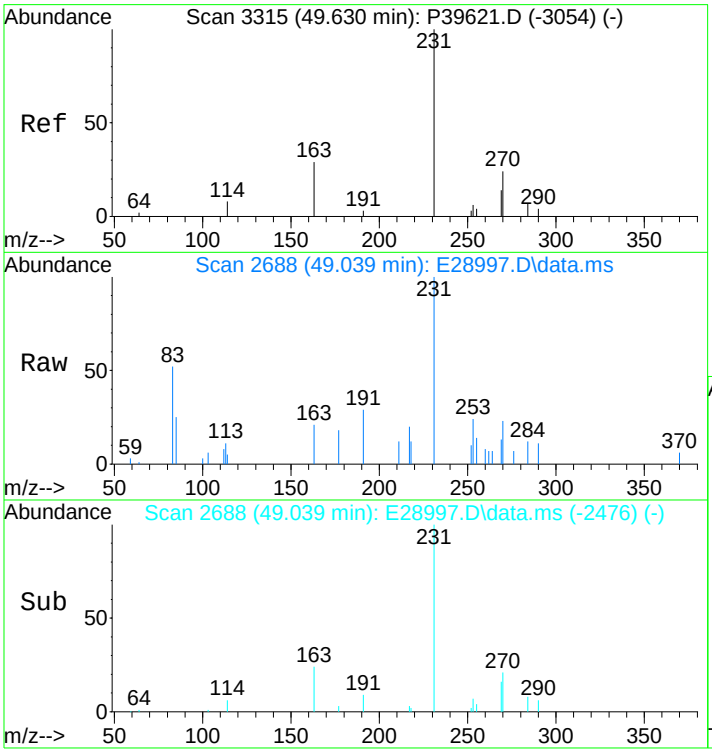


#80
BBF-D12 Surr BKGD
Concen: 35.11 ng/mL
RT: 46.645 min Scan# 2529
Delta R.T. 0.050 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:256 Resp: 3686



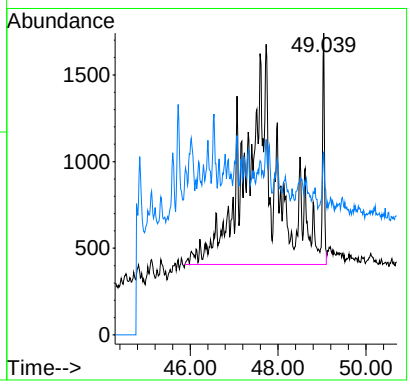


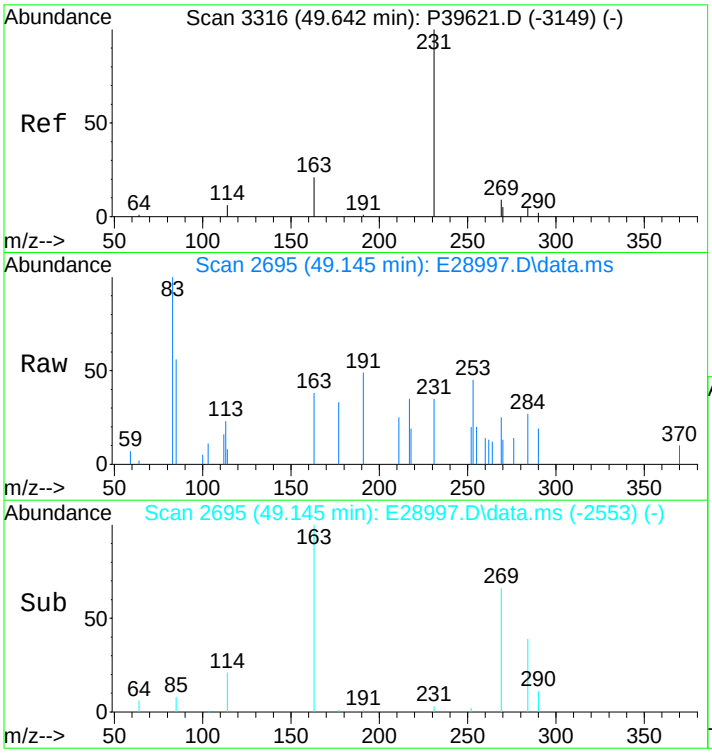


#81
C3-Chrysenes
Concen: 608.21 ng/mL m
RT: 49.039 min Scan# 2688
Delta R.T. -0.029 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:270 Resp: 63858

Ion	Ratio	Lower	Upper
270	100		
255	1.6	38.0	57.0#

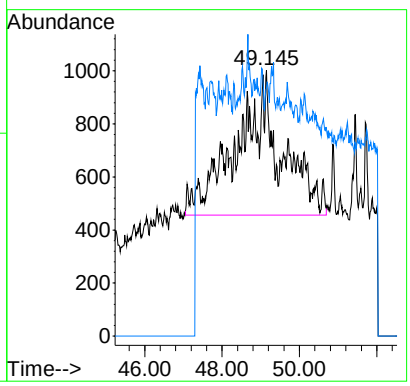


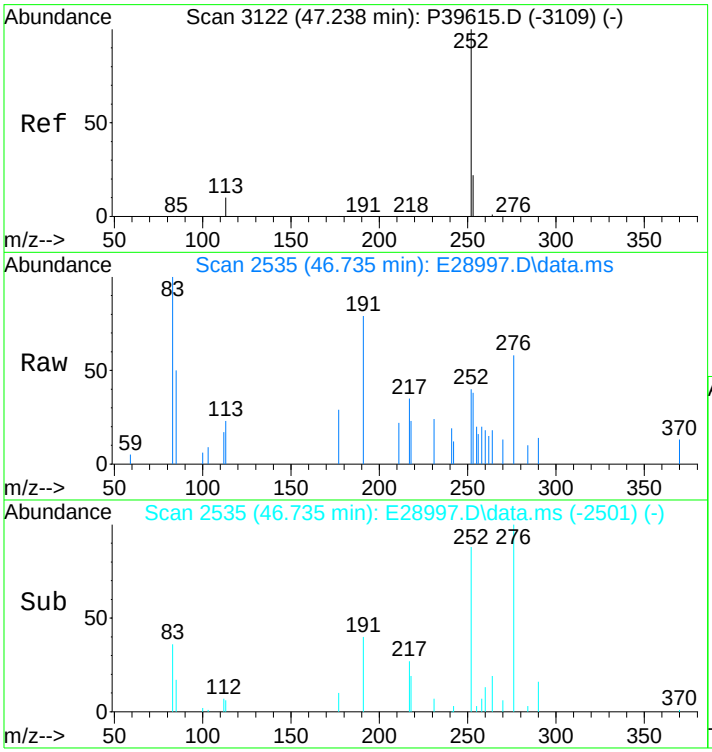


#82
C4-Chrysenes
Concen: 408.96 ng/mL m
RT: 49.145 min Scan# 2695
Delta R.T. -0.041 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:284 Resp: 42938

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

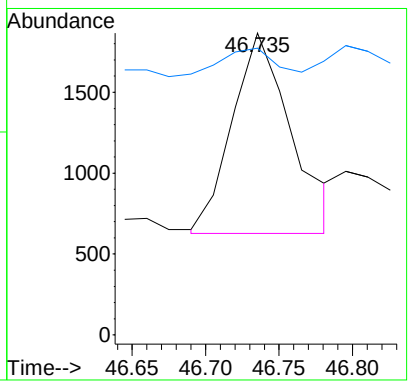


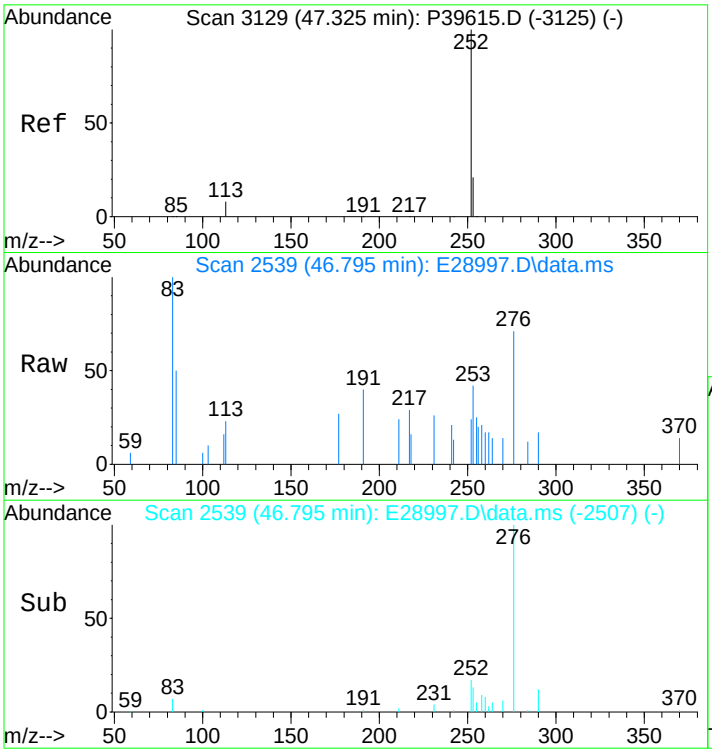


#84
Benzo[b]fluoranthene
Concen: 29.31 ng/mL m
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 3474

Ion	Ratio	Lower	Upper
252	100		
253	13.1	19.5	29.3#

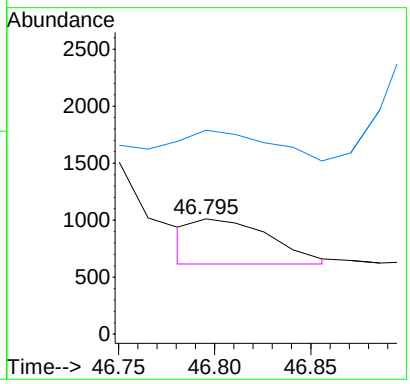


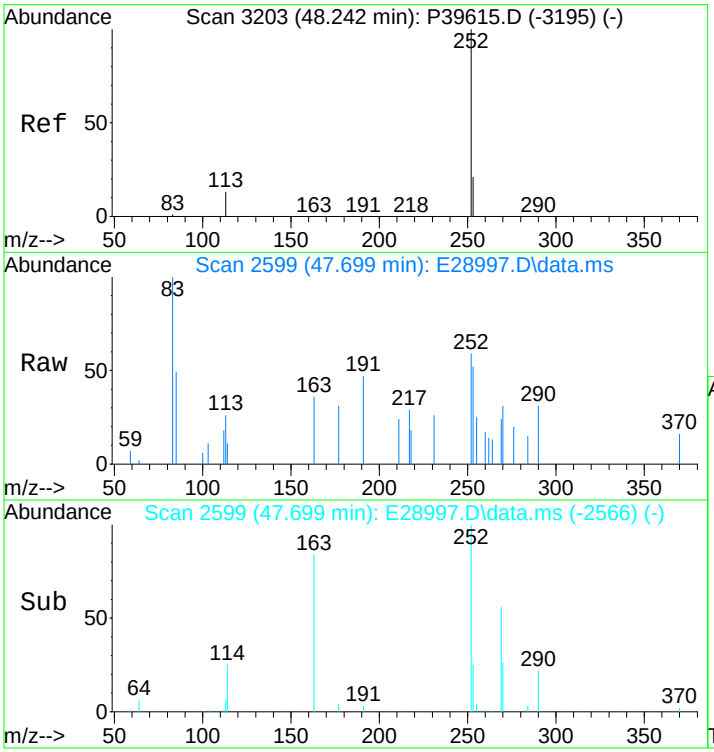


#85
Benzo[j]+[k]fluoranthene
Concen: 8.93 ng/mL m
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 1089

Ion	Ratio	Lower	Upper
252	100		
253	459.2	19.7	29.5#

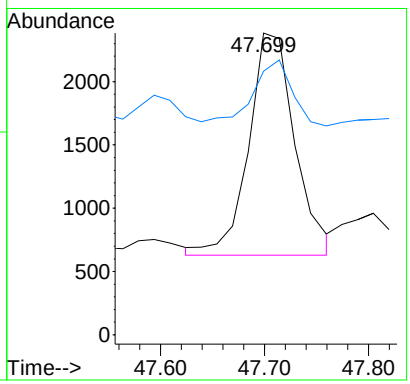


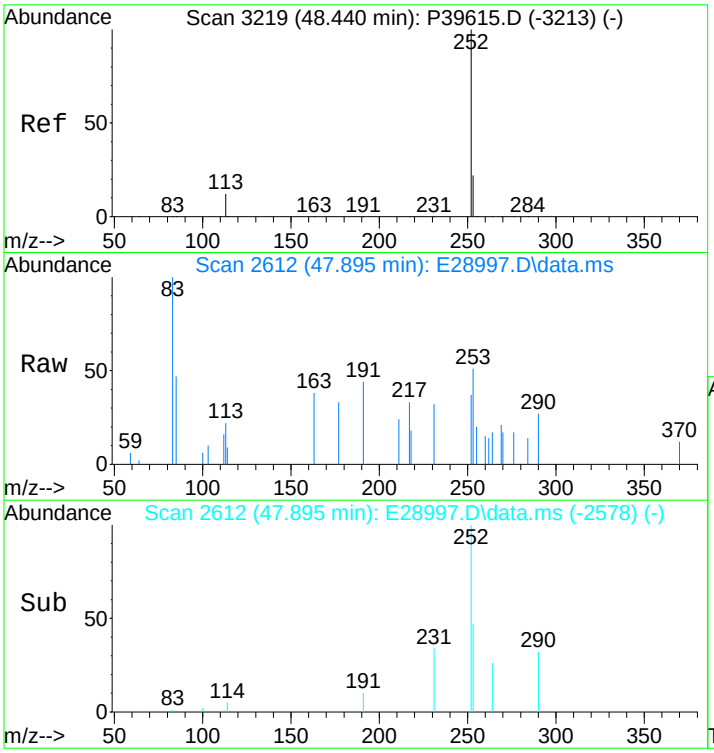


#87
Benzo[e]pyrene
Concen: 47.04 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 5445

Ion	Ratio	Lower	Upper
252	100		
253	32.7	20.6	31.0#

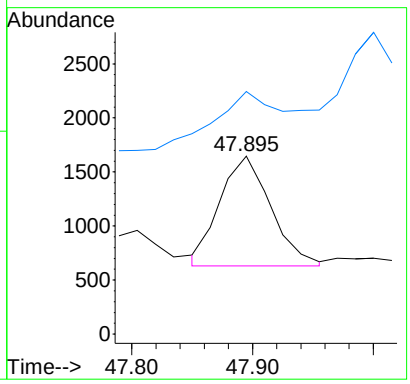


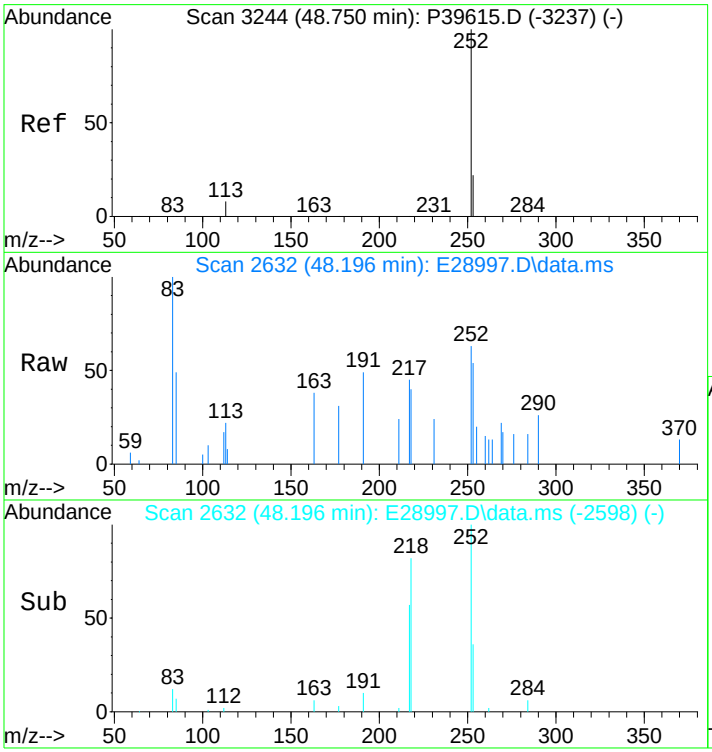


#89
Benzo[a]pyrene
Concen: 26.93 ng/mL m
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 2983

Ion	Ratio	Lower	Upper
252	100		
253	51.7	20.8	31.2#

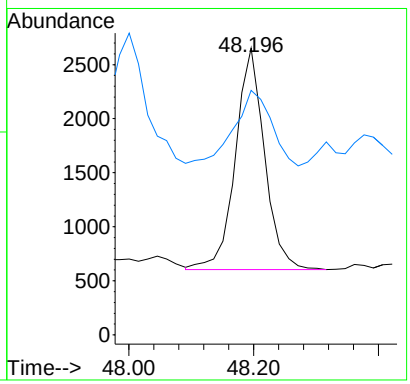


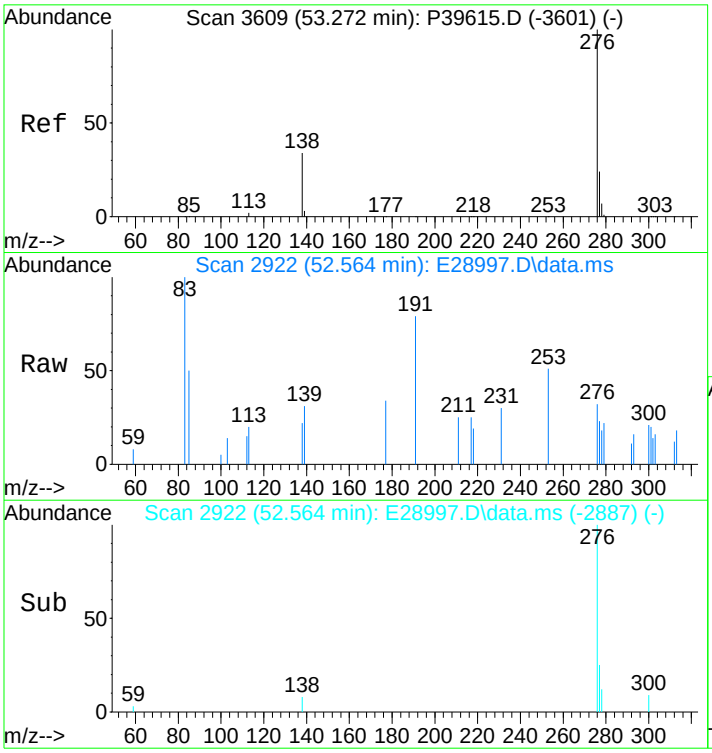


#90
Perylene
Concen: 57.00 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:252 Resp: 6676

Ion	Ratio	Lower	Upper
252	100		
253	43.7	20.7	31.1#

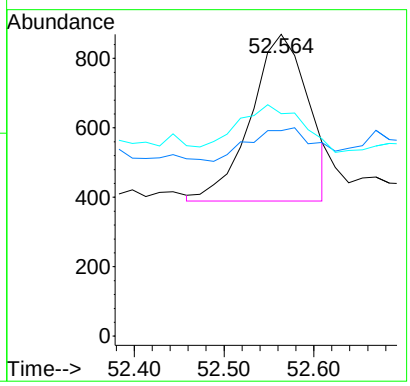


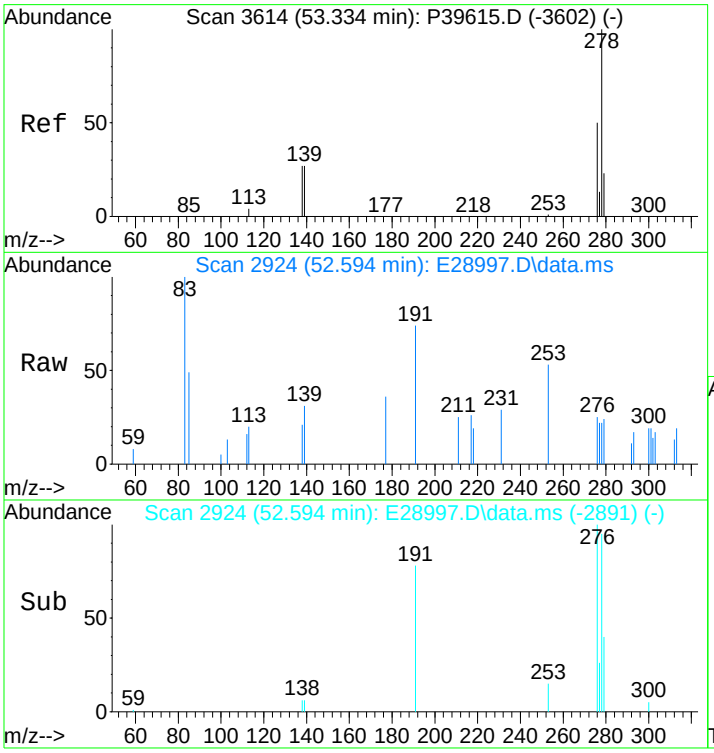


#91
Indeno[1,2,3-cd]pyrene
Concen: 16.38 ng/mL m
RT: 52.564 min Scan# 2922
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:276 Resp: 2135

Ion	Ratio	Lower	Upper
276	100		
138	23.4	16.3	24.5
277	0.0	19.4	29.2#

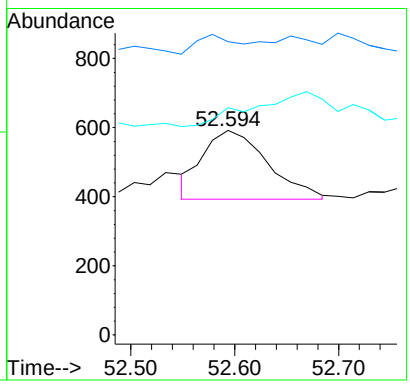


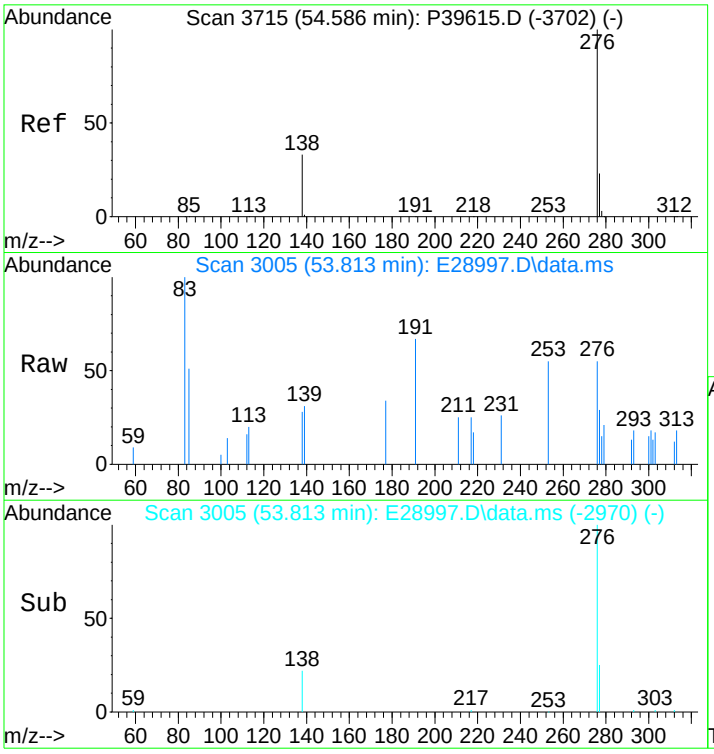


#92
Dibenz[ah]+[ac]anthracene
Concen: 6.20 ng/mL m
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:278 Resp: 861

Ion	Ratio	Lower	Upper
278	100		
139	17.2	11.6	17.4
279	0.0	19.3	28.9#

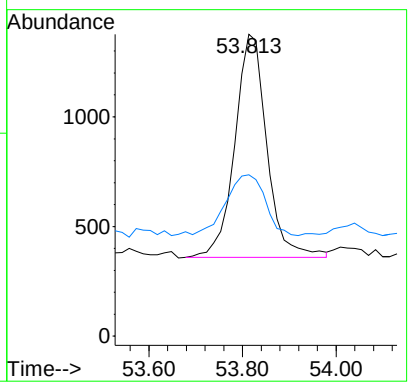


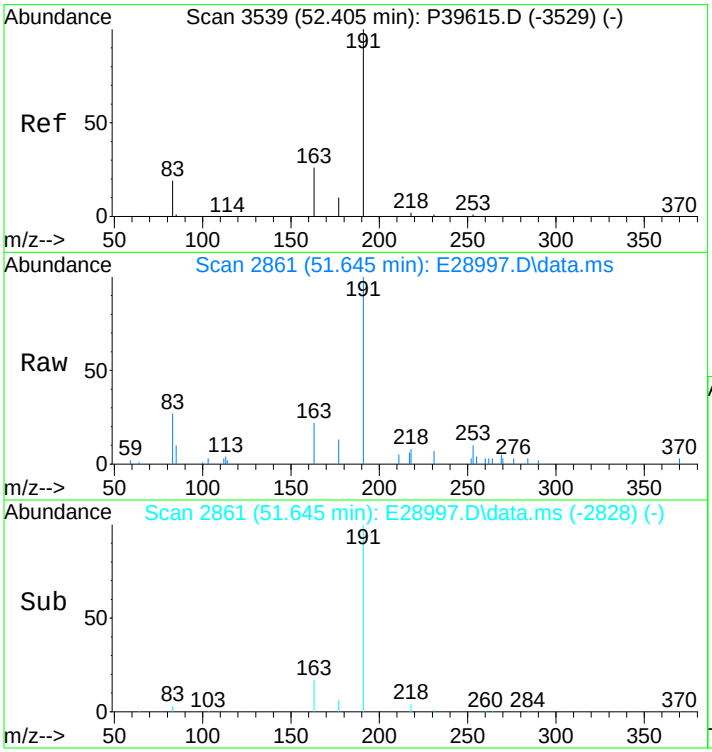


#93
Benzo[g,h,i]perylene
Concen: 34.54 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:276 Resp: 4854

Ion	Ratio	Lower	Upper
276	100		
277	33.7	19.1	28.7#

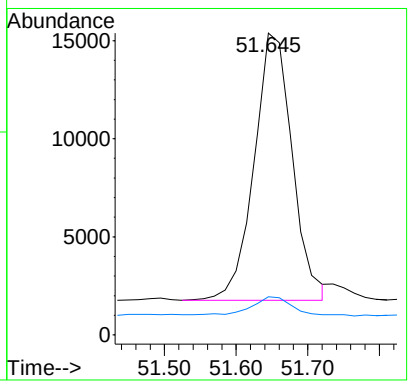


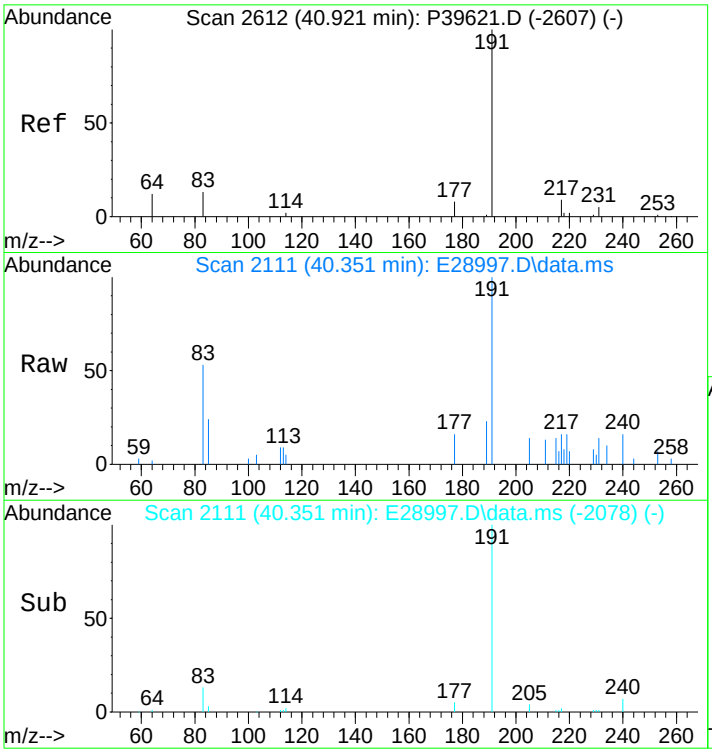


#94
Hopane (T19)
Concen: 1285.09 ng/mL m
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:191 Resp: 50509

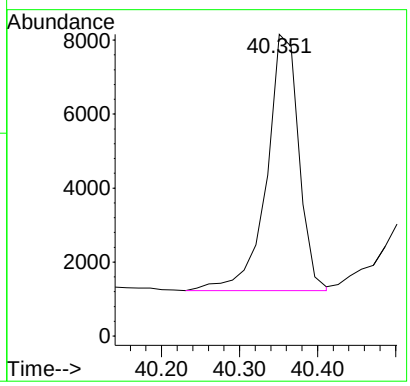
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.6	17.4#

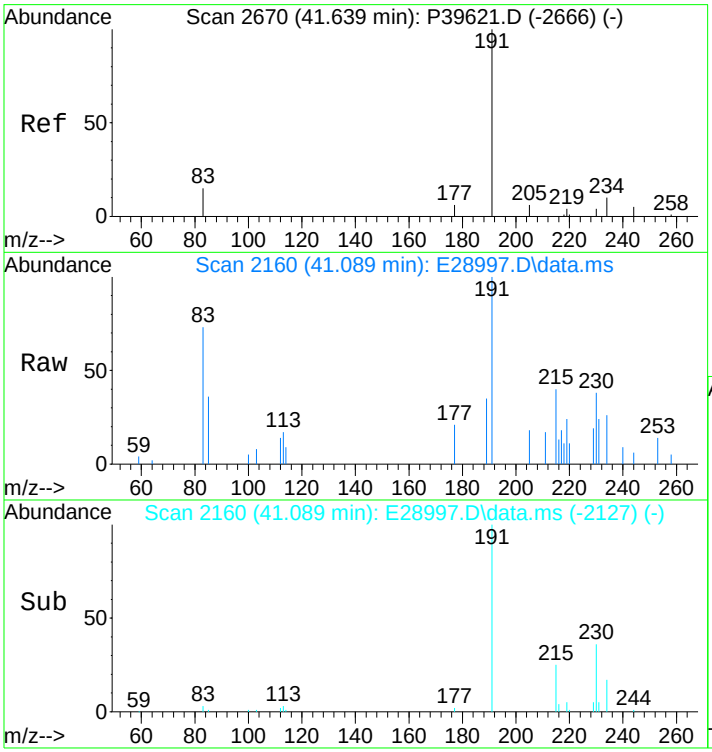




#96
C23 Tricyclic Terpane (T4)
Concen: 505.27 ng/ml
RT: 40.351 min Scan# 2111
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

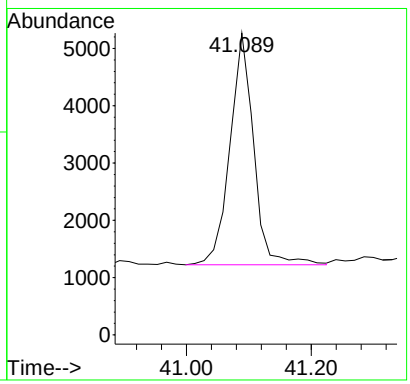
Tgt Ion:191 Resp: 19859

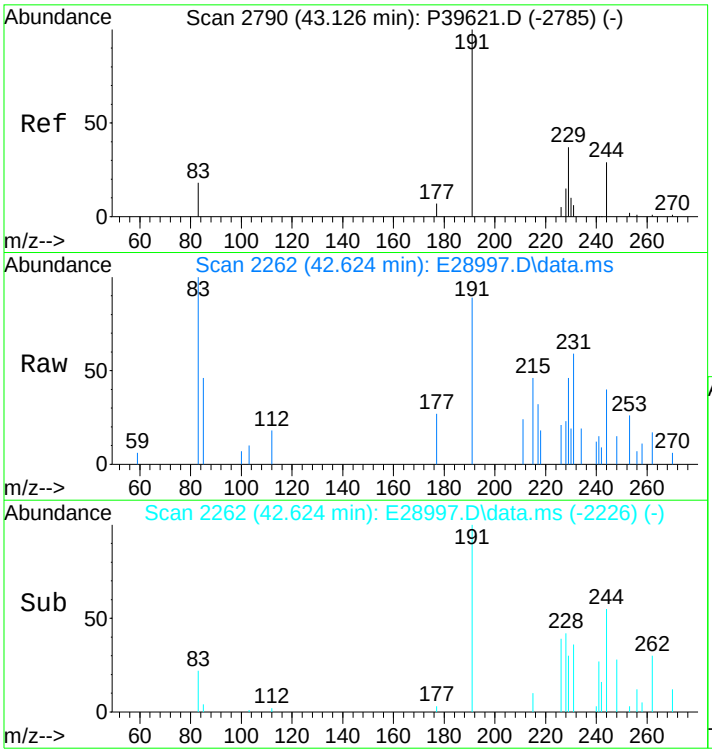




#97
C24 Tricyclic Terpane (T5)
Concen: 272.06 ng/ml
RT: 41.089 min Scan# 2160
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

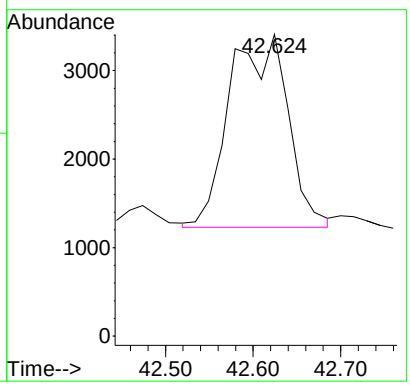
Tgt Ion:191 Resp: 10693

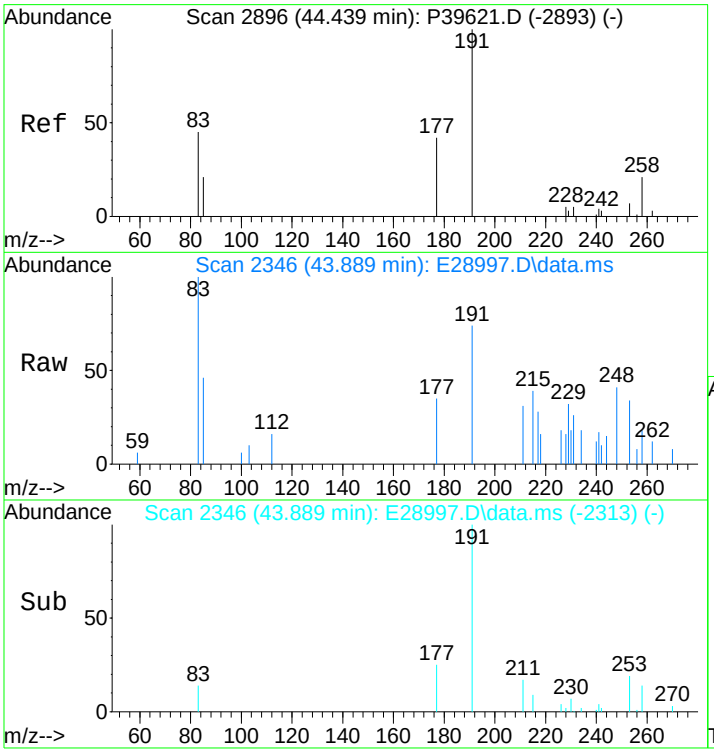




#98
C25 Tricyclic Terpane (T6)
Concen: 255.68 ng/ml m
RT: 42.624 min Scan# 2262
Delta R.T. 0.045 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

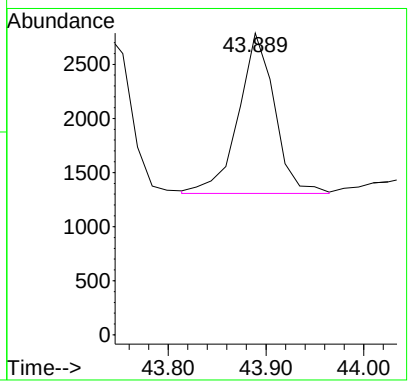
Tgt Ion:191 Resp: 10049

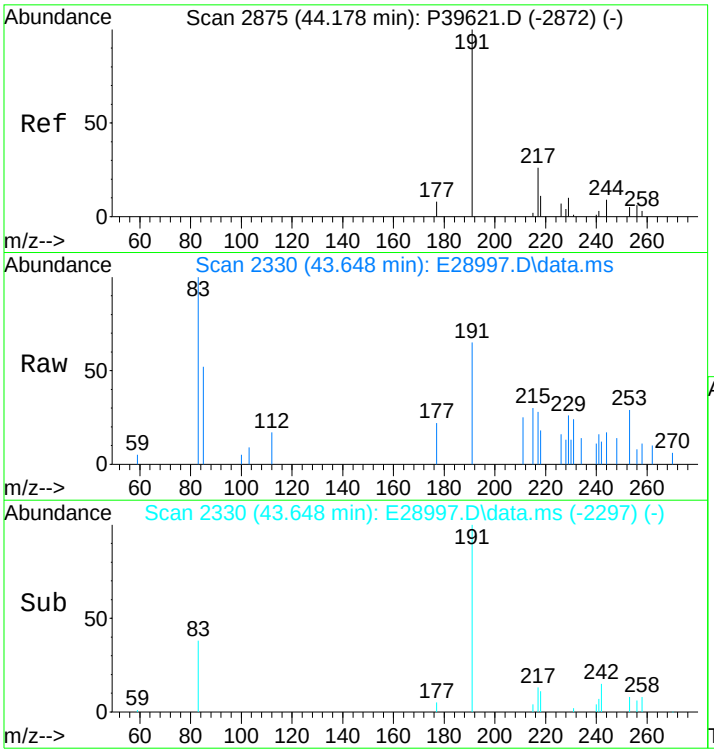




#99
C24 Tetracyclic Terpane (T6a)
Concen: 96.45 ng/ml m
RT: 43.889 min Scan# 2346
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

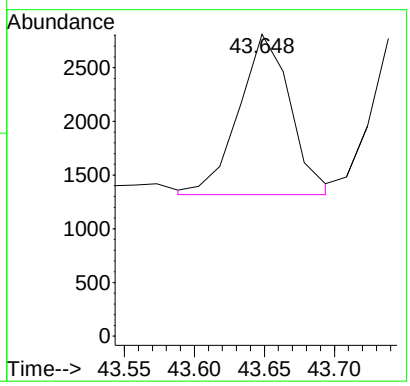
Tgt Ion:191 Resp: 3791

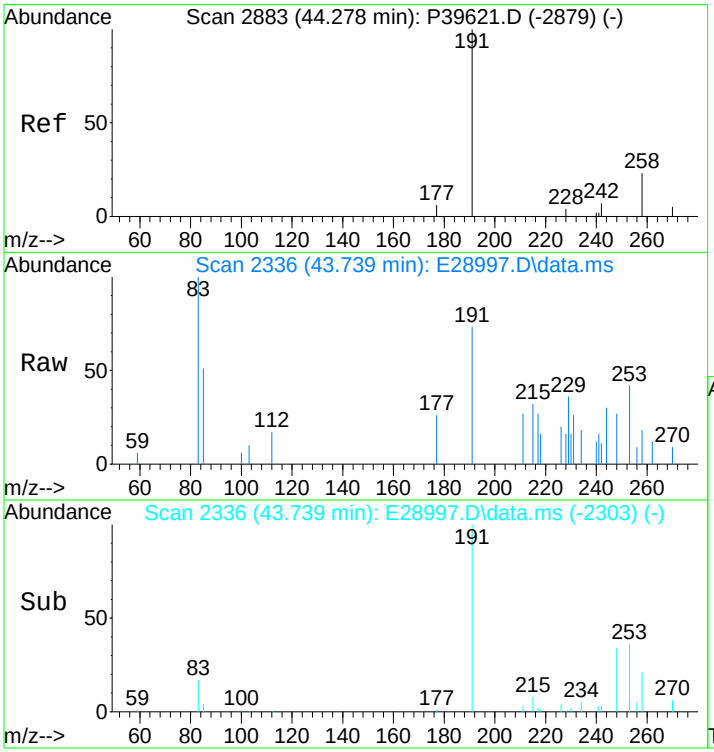




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 96.99 ng/ml m
RT: 43.648 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

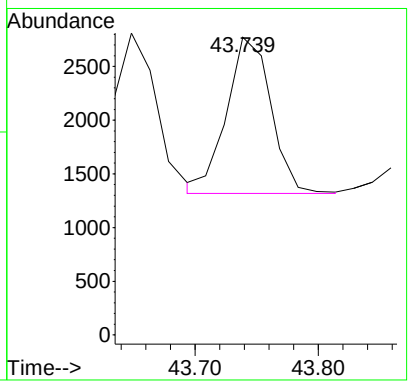
Tgt Ion:191 Resp: 3812

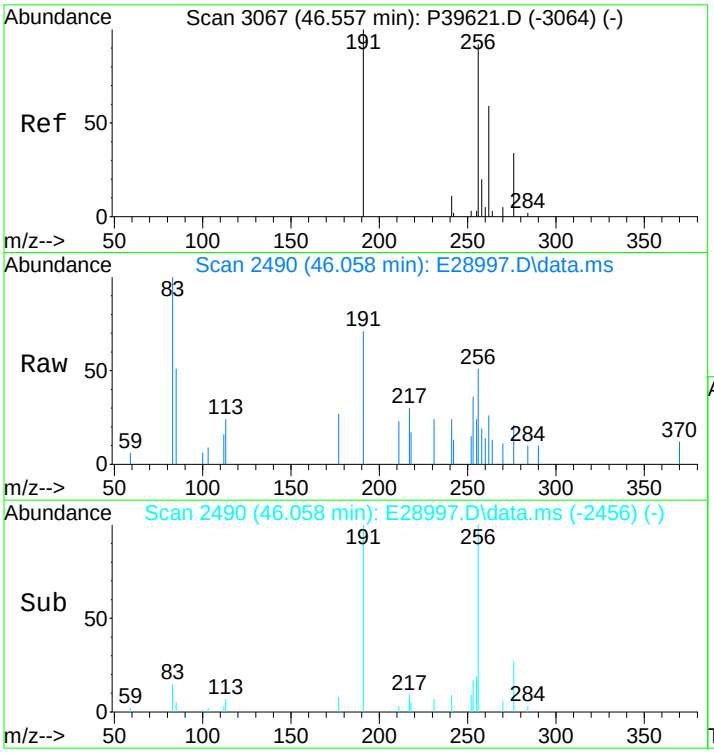




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 92.79 ng/ml m
RT: 43.739 min Scan# 2336
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

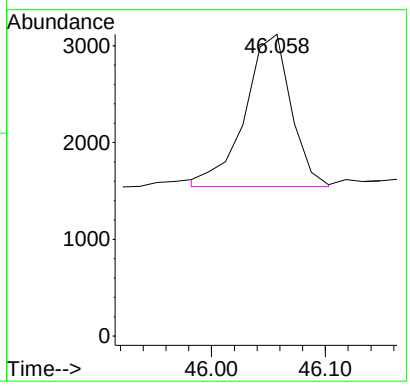
Tgt Ion:191 Resp: 3647

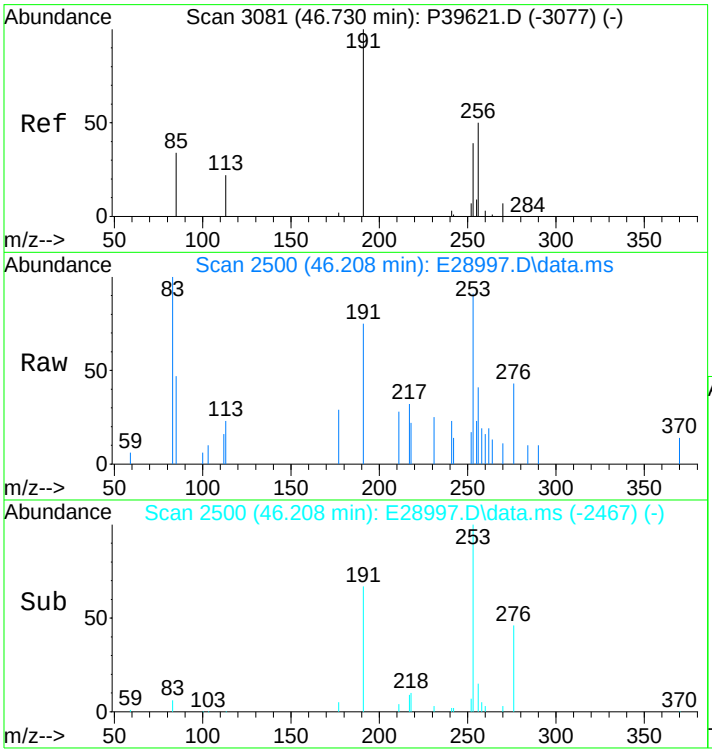




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 112.13 ng/ml m
RT: 46.058 min Scan# 2490
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

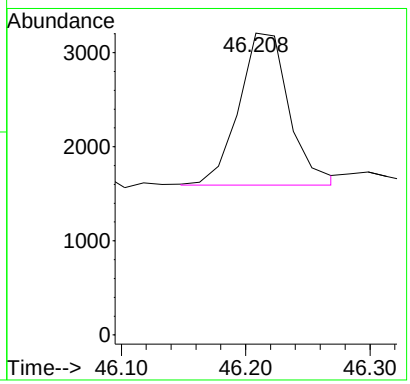
Tgt Ion:191 Resp: 4407

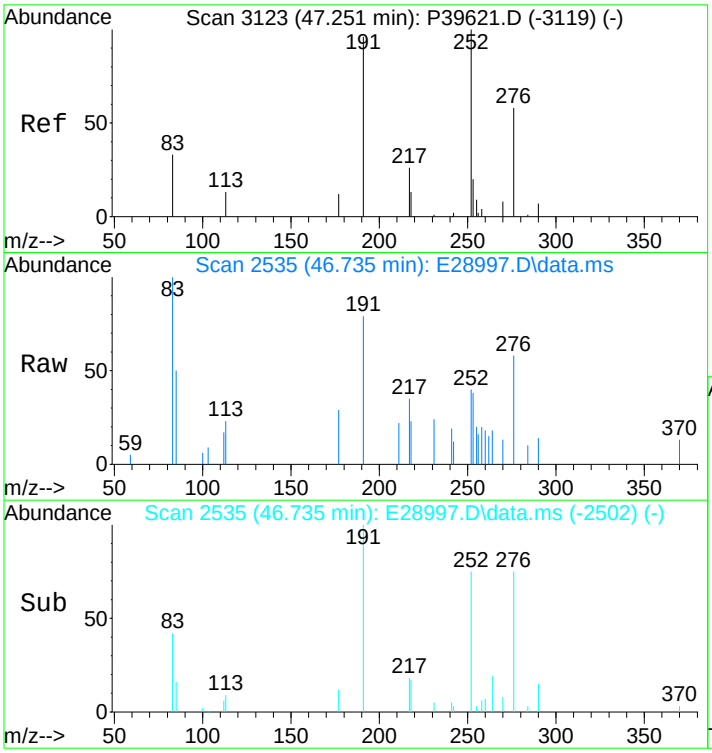




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 115.54 ng/ml m
RT: 46.208 min Scan# 2500
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

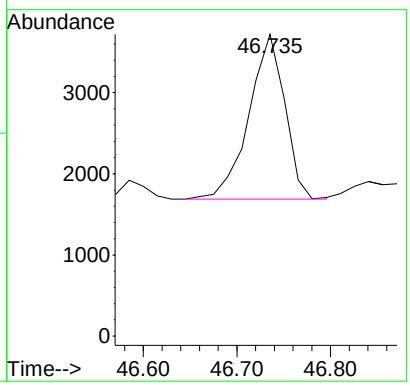
Tgt Ion:191 Resp: 4541

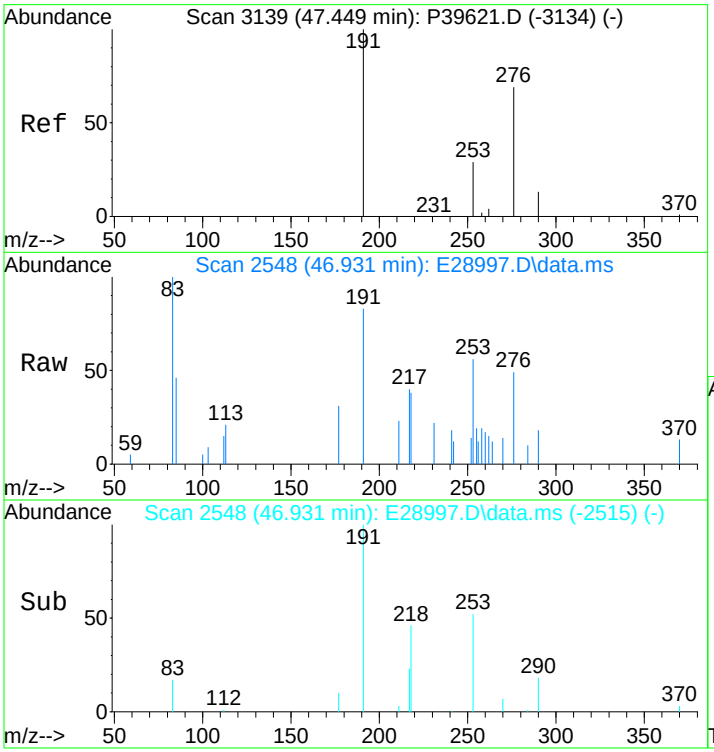




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 137.75 ng/ml
RT: 46.735 min Scan# 2535
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

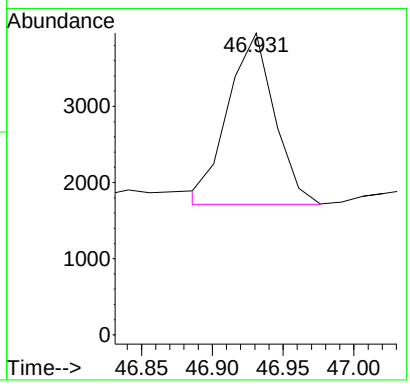
Tgt Ion:191 Resp: 5414

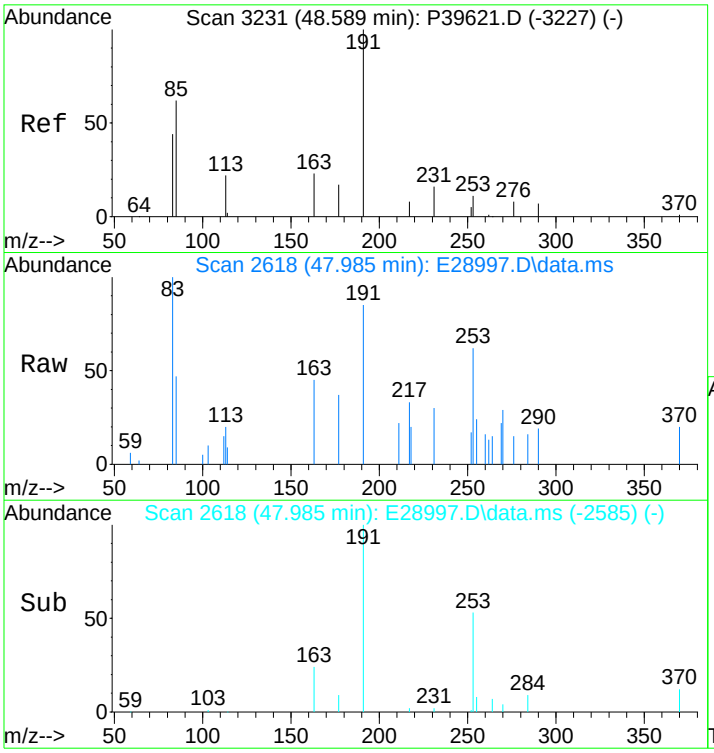




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 130.60 ng/ml m
RT: 46.931 min Scan# 2548
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

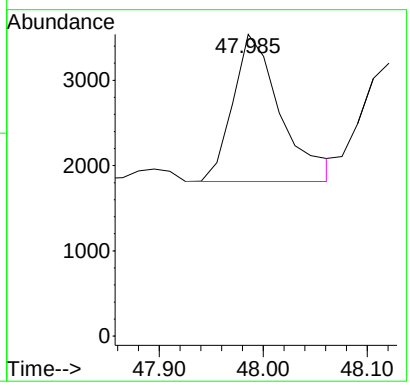
Tgt Ion:191 Resp: 5133

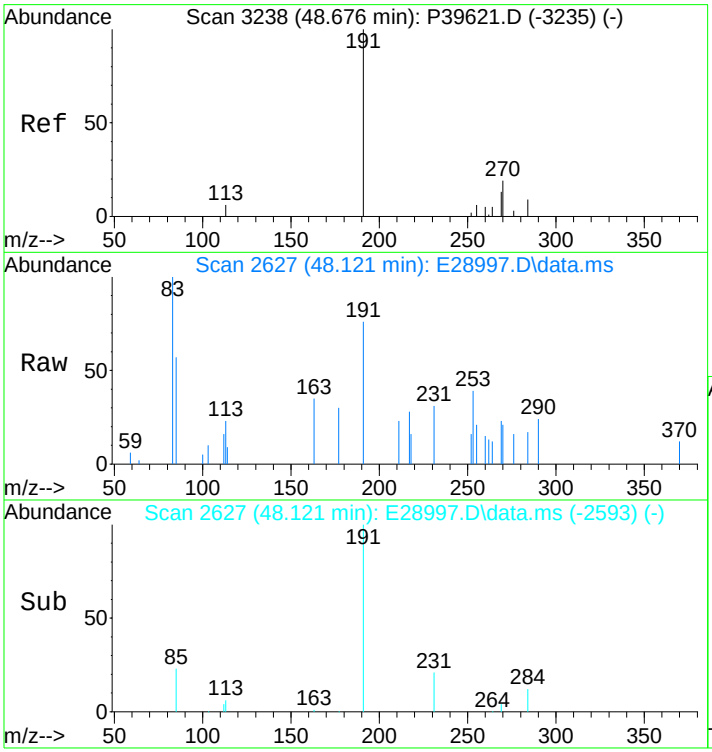




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 140.93 ng/ml
RT: 47.985 min Scan# 2618
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

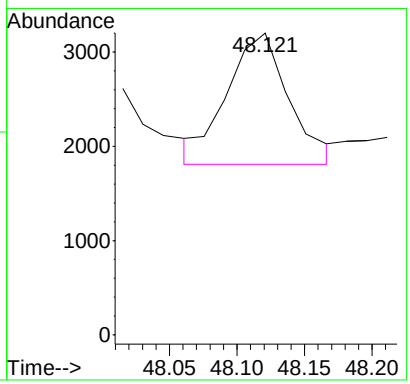
Tgt Ion:191 Resp: 5539

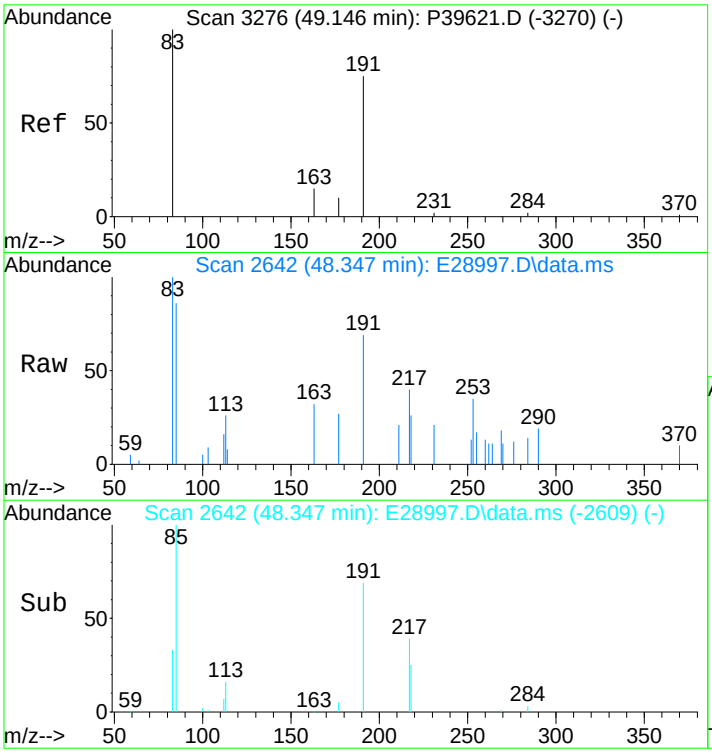




#107
C30 Tricyclic Terpane-22S
Concen: 112.36 ng/mL m
RT: 48.121 min Scan# 2627
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

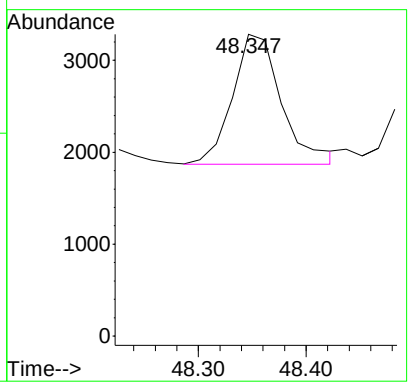
Tgt Ion:191 Resp: 4416

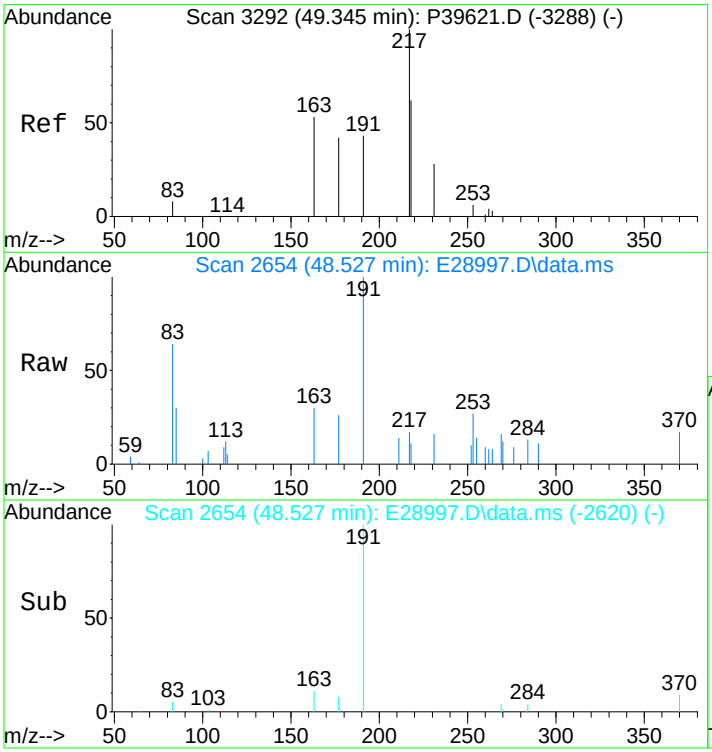




#108
C30 Tricyclic Terpane-22R
Concen: 113.78 ng/mL m
RT: 48.347 min Scan# 2642
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

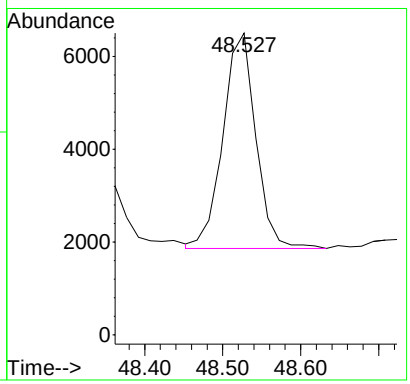
Tgt Ion:191 Resp: 4472

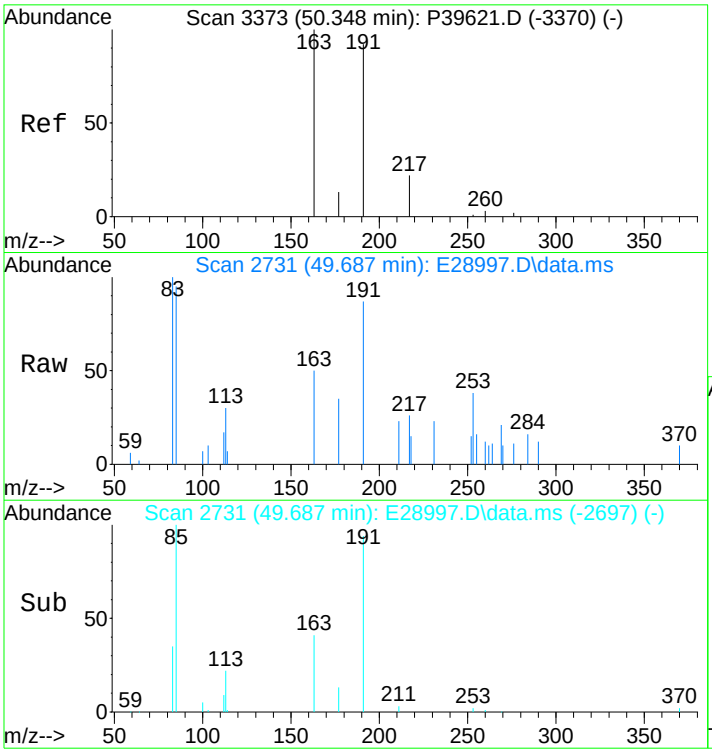




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 345.49 ng/ml
RT: 48.527 min Scan# 2654
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

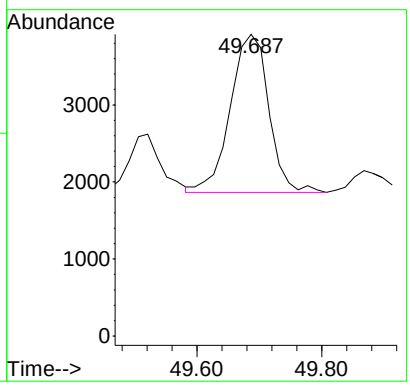
Tgt Ion:191 Resp: 13579

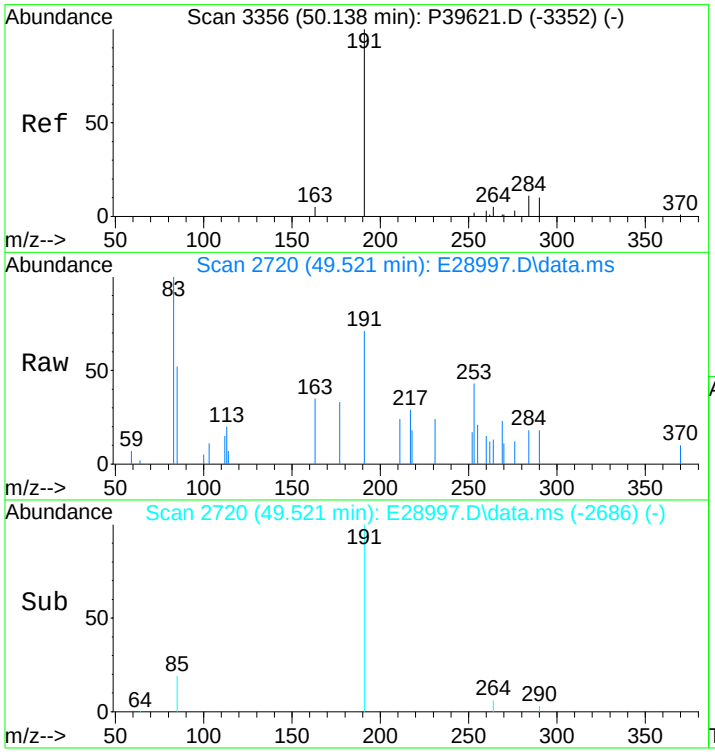




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 223.97 ng/ml
RT: 49.687 min Scan# 2731
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

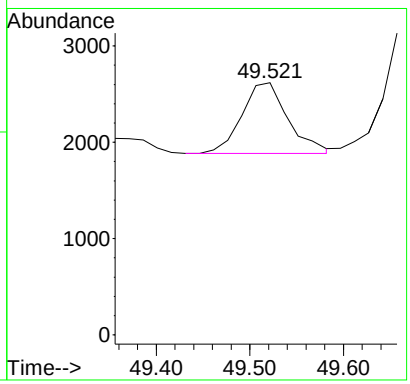
Tgt Ion:191 Resp: 8803

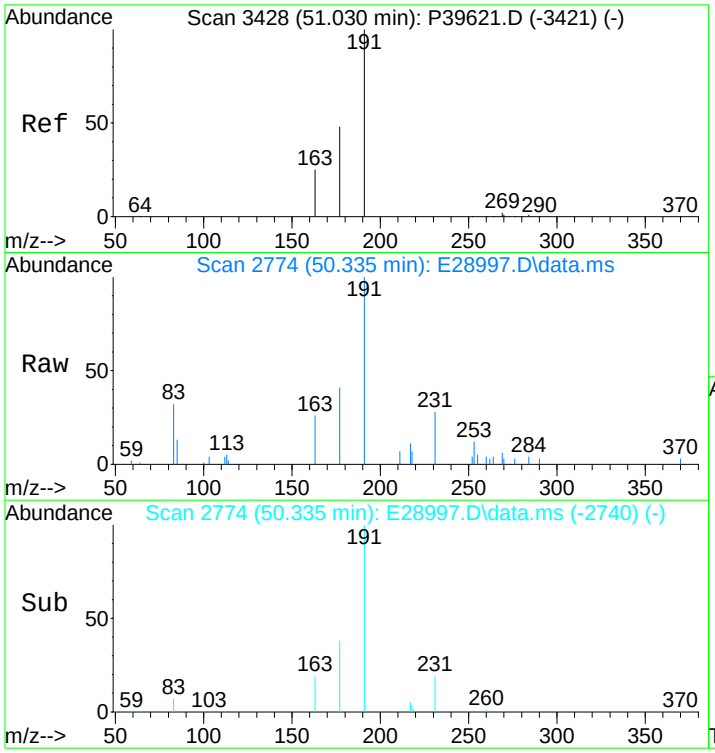




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 64.52 ng/ml
RT: 49.521 min Scan# 2720
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

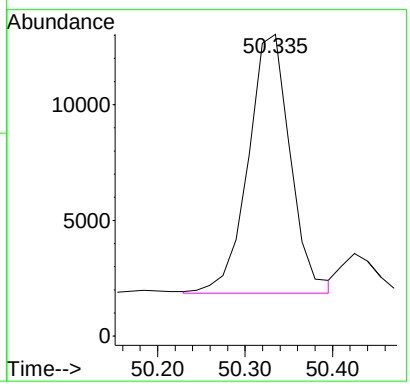
Tgt Ion:191 Resp: 2536

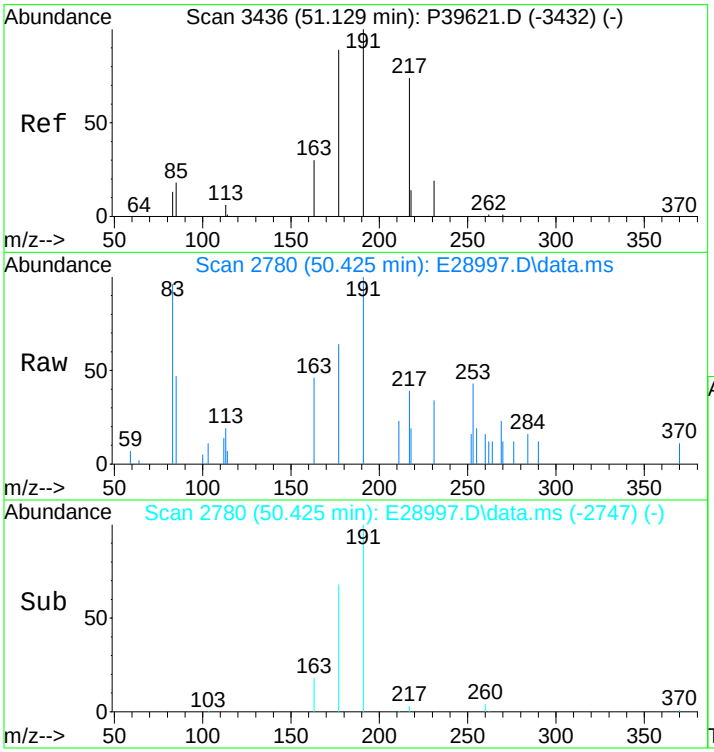




#112
30-Norhopane (T15)
Concen: 951.41 ng/ml m
RT: 50.335 min Scan# 2774
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

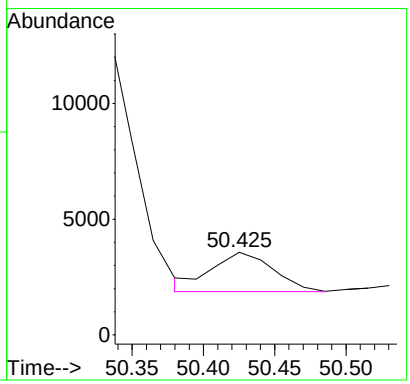
Tgt Ion:191 Resp: 37394

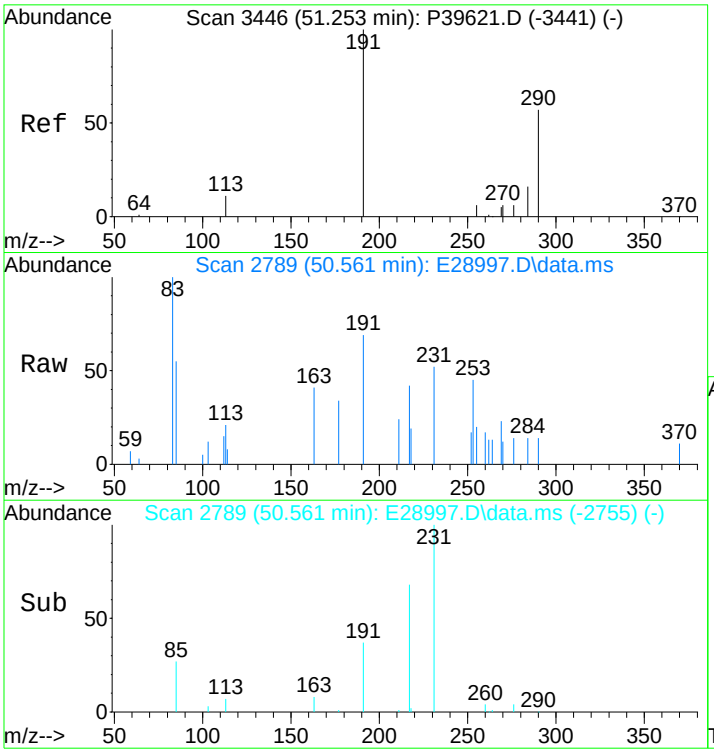




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 130.06 ng/ml m
RT: 50.425 min Scan# 2780
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

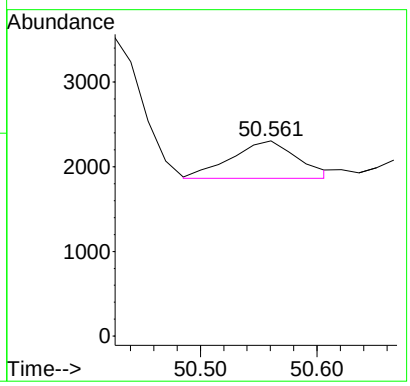
Tgt Ion:191 Resp: 5112

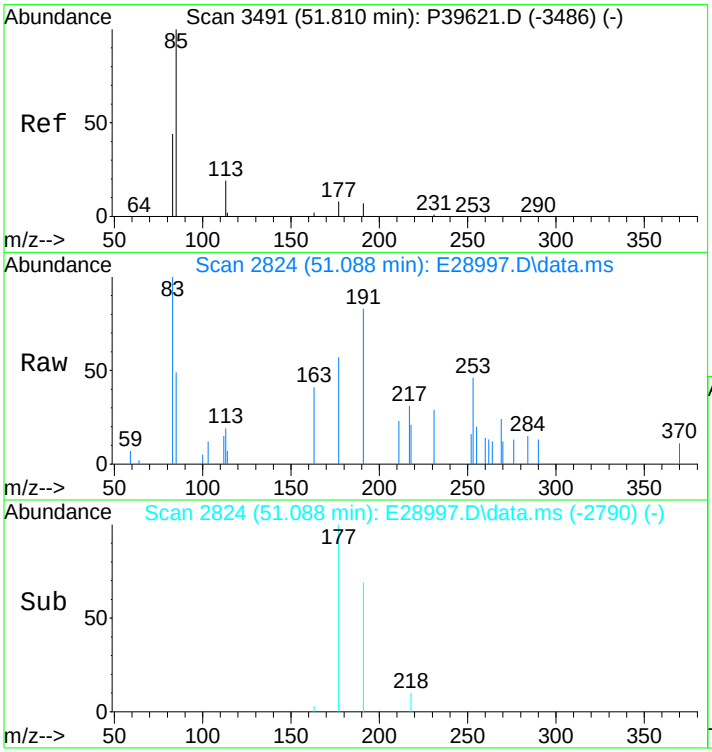




#114
17a(H)-Diahopane (X)
Concen: 44.91 ng/ml m
RT: 50.561 min Scan# 2789
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

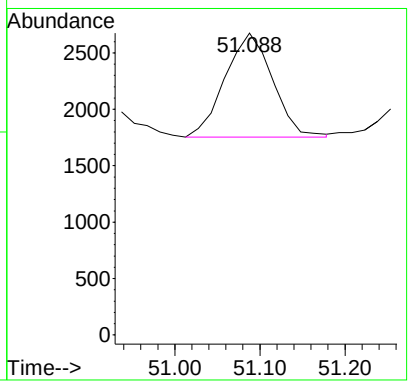
Tgt Ion:191 Resp: 1765

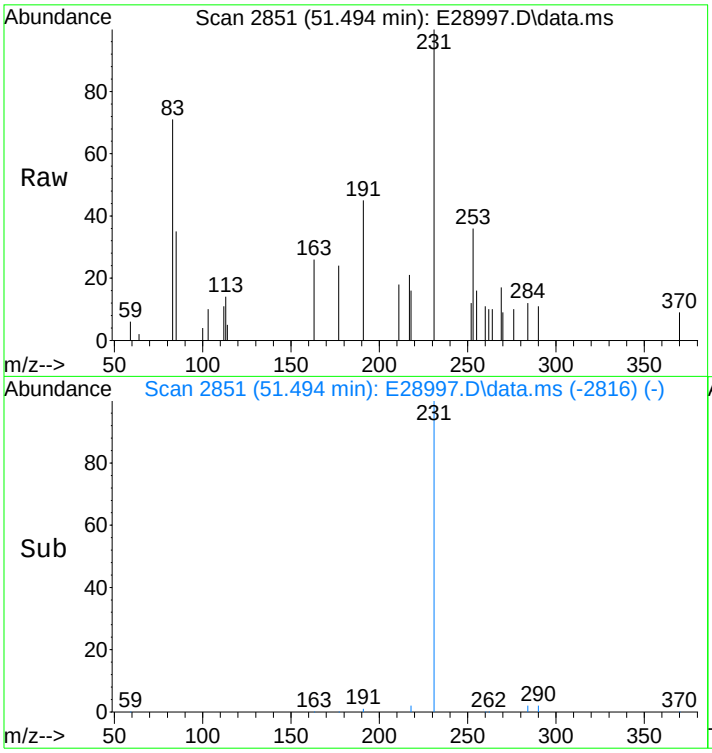




#115
30-Normoretane (T17)
Concen: 91.54 ng/ml
RT: 51.088 min Scan# 2824
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

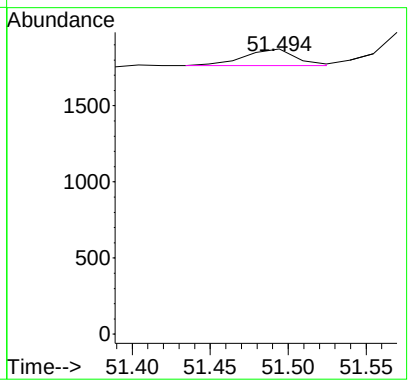
Tgt Ion:191 Resp: 3598

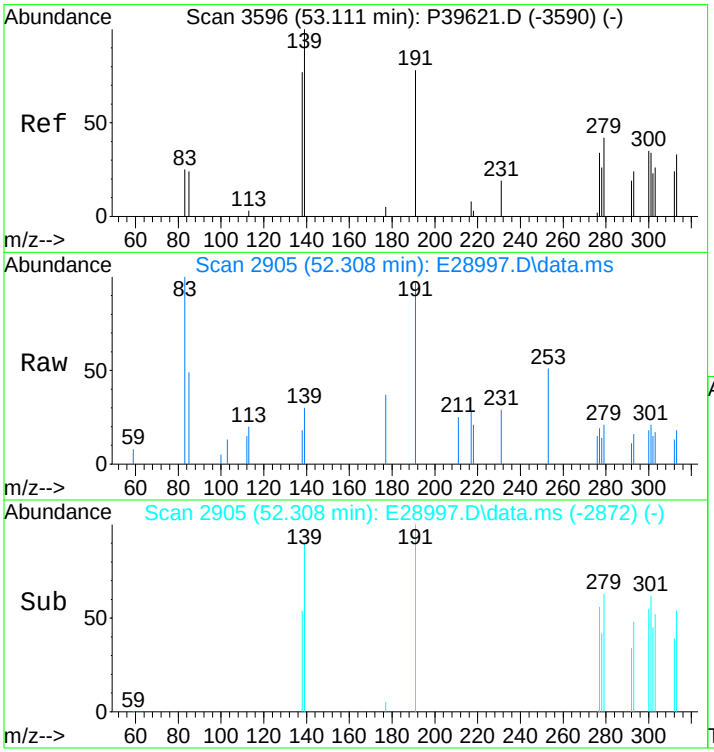




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 6.39 ng/ml
RT: 51.494 min Scan# 2851
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

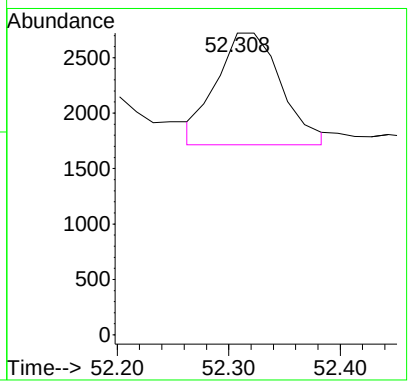
Tgt Ion:191 Resp: 251

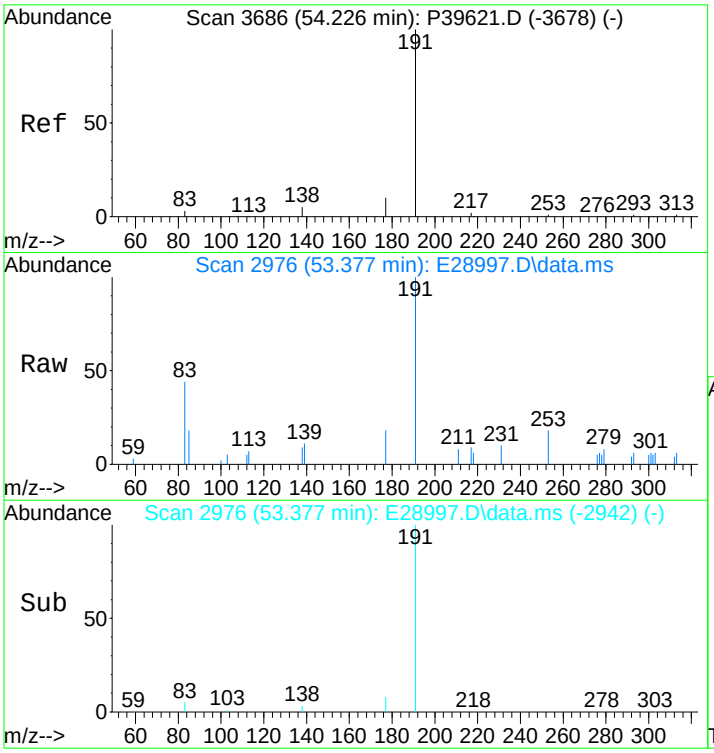




#117
Moretane (T20)
Concen: 103.20 ng/ml m
RT: 52.308 min Scan# 2905
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

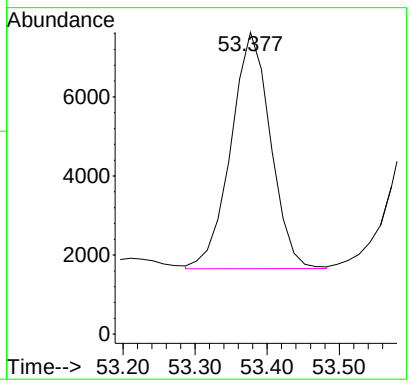
Tgt Ion:191 Resp: 4056

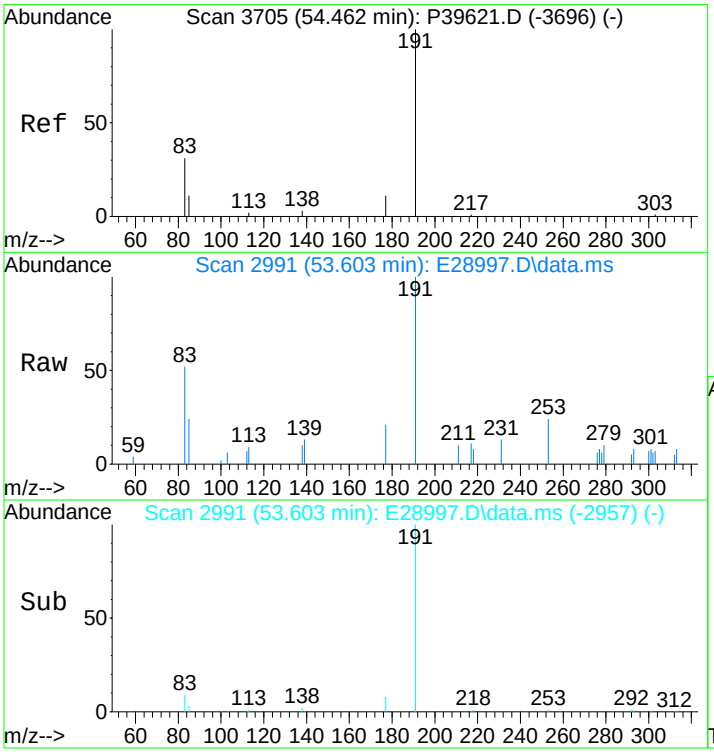




#118
30-Homohopane-22S (T21)
Concen: 580.89 ng/ml
RT: 53.377 min Scan# 2976
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

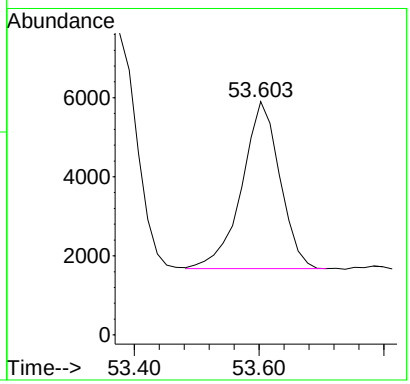
Tgt Ion:191 Resp: 22831

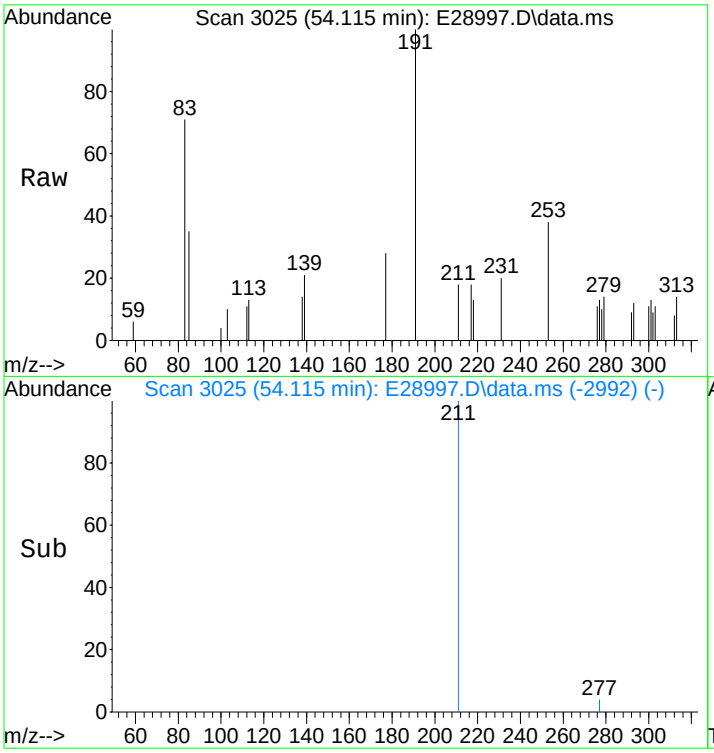




#119
30-Homohopane-22R (T22)
Concen: 455.83 ng/ml
RT: 53.603 min Scan# 2991
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

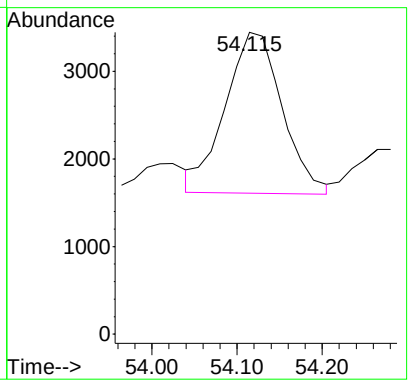
Tgt Ion:191 Resp: 17916

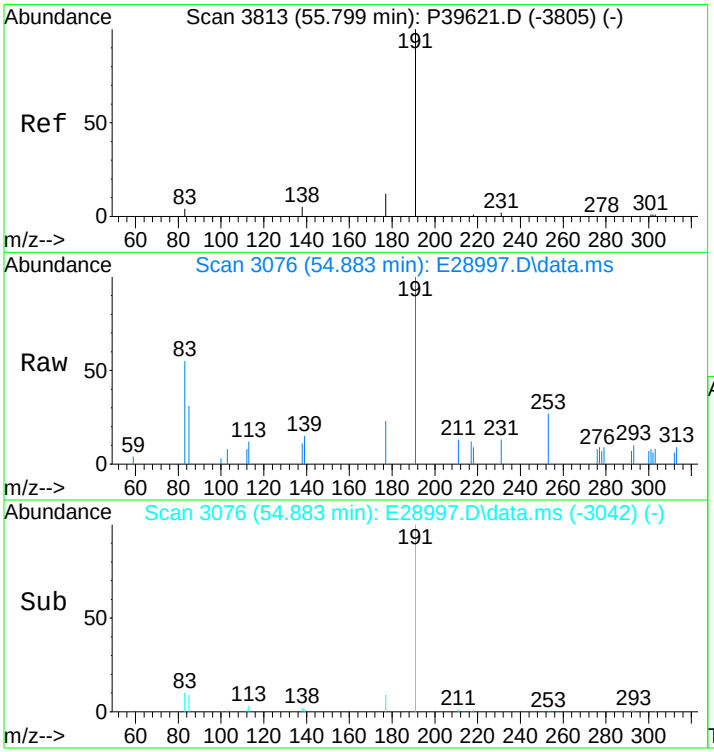




#120
Gammacerane/C32-diahopane
Concen: 216.87 ng/mL
RT: 54.115 min Scan# 3025
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

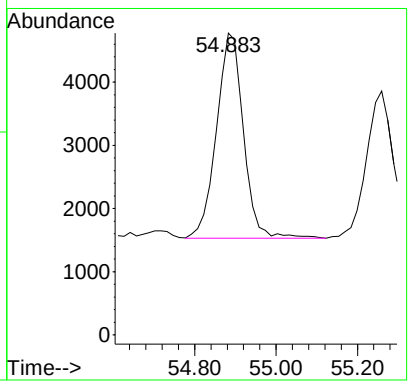
Tgt Ion:191 Resp: 8524

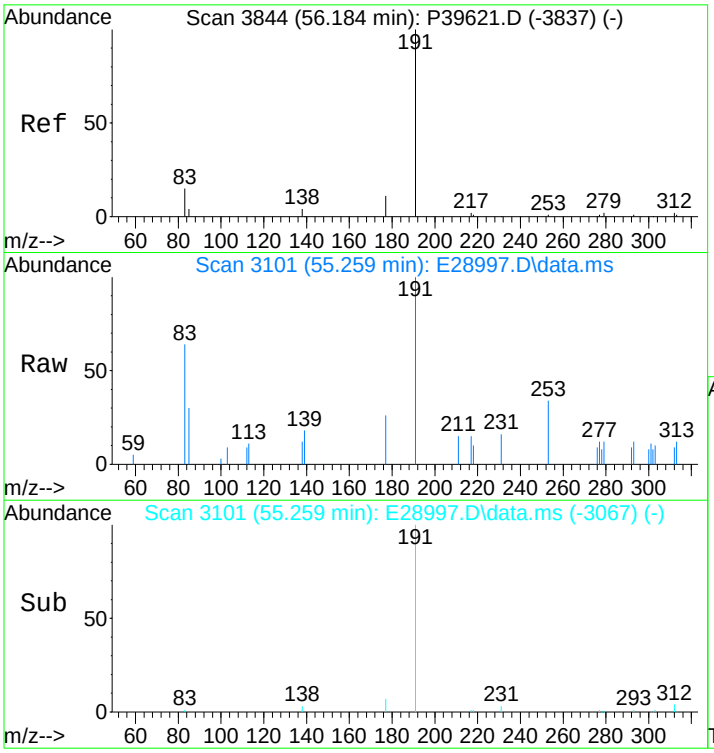




#121
30,31-Bishomohopane-22S (T26)
Concen: 380.52 ng/ml
RT: 54.883 min Scan# 3076
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

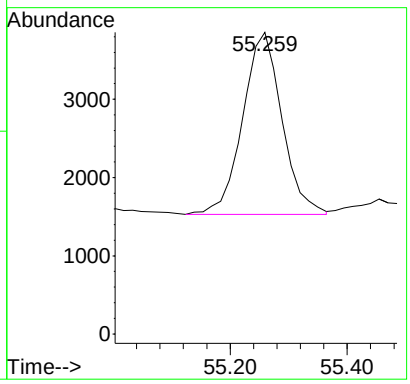
Tgt Ion:191 Resp: 14956

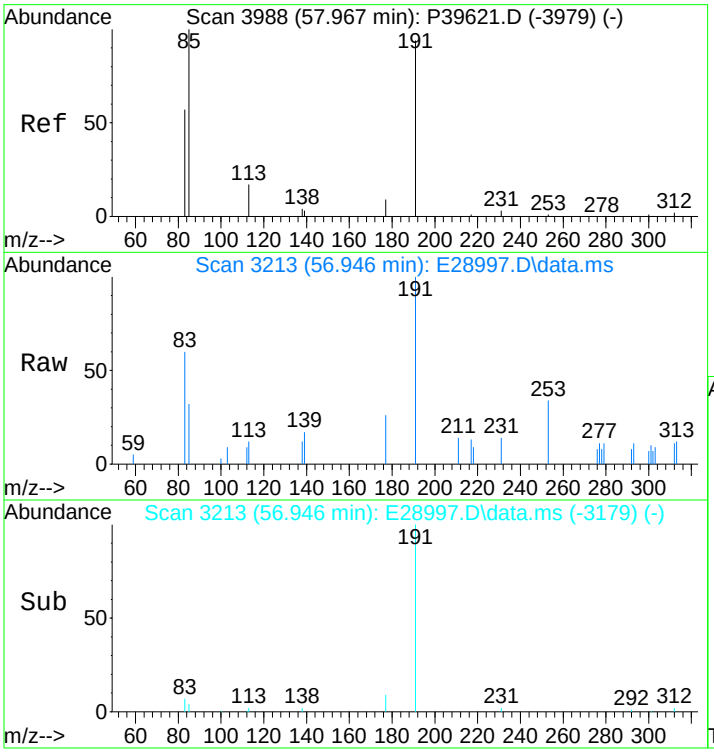




#122
30,31-Bishomohopane-22R (T27)
Concen: 274.50 ng/ml
RT: 55.259 min Scan# 3101
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

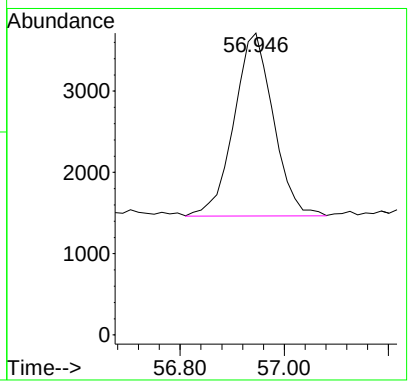
Tgt Ion:191 Resp: 10789

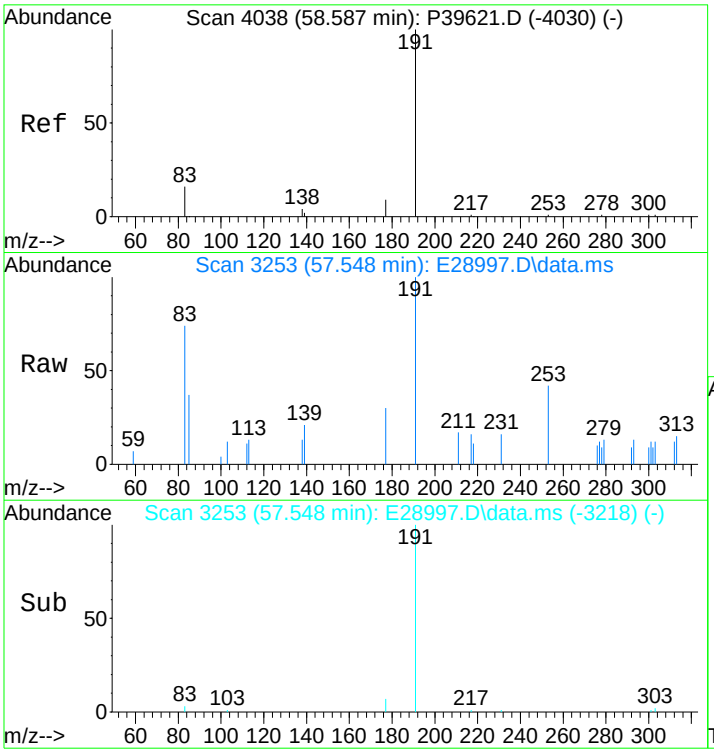




#123
30,31-Trishomohopane-22S (T30)
Concen: 300.33 ng/ml
RT: 56.946 min Scan# 3213
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

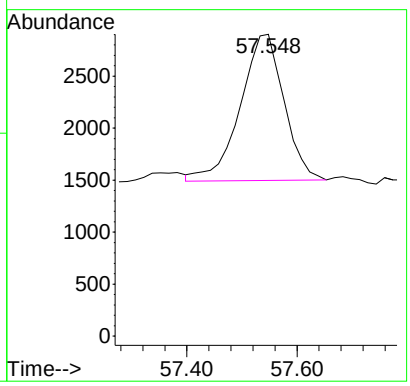
Tgt Ion:191 Resp: 11804

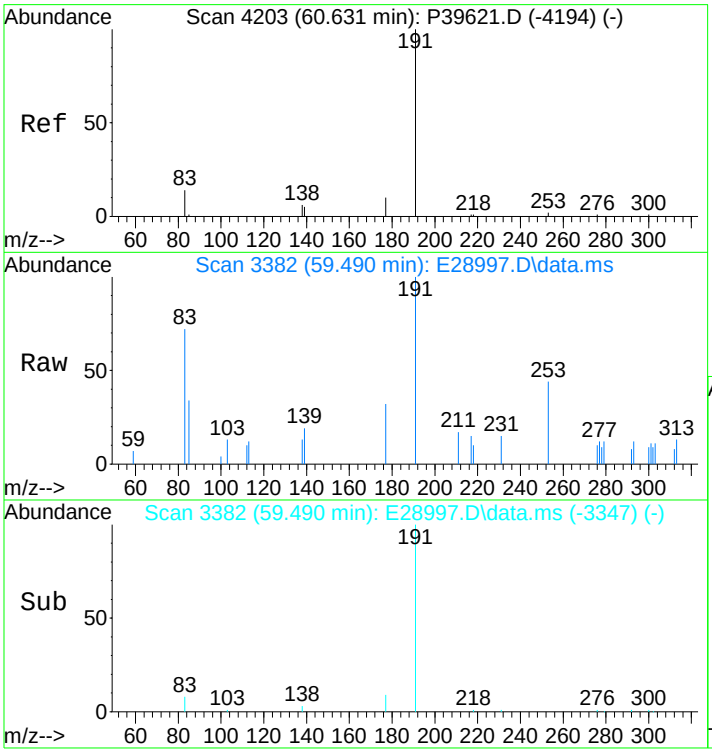




#124
30,31-Trishomohopane-22R (T31)
Concen: 196.95 ng/ml
RT: 57.548 min Scan# 3253
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

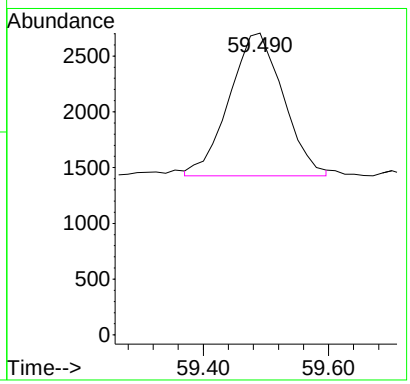
Tgt Ion:191 Resp: 7741

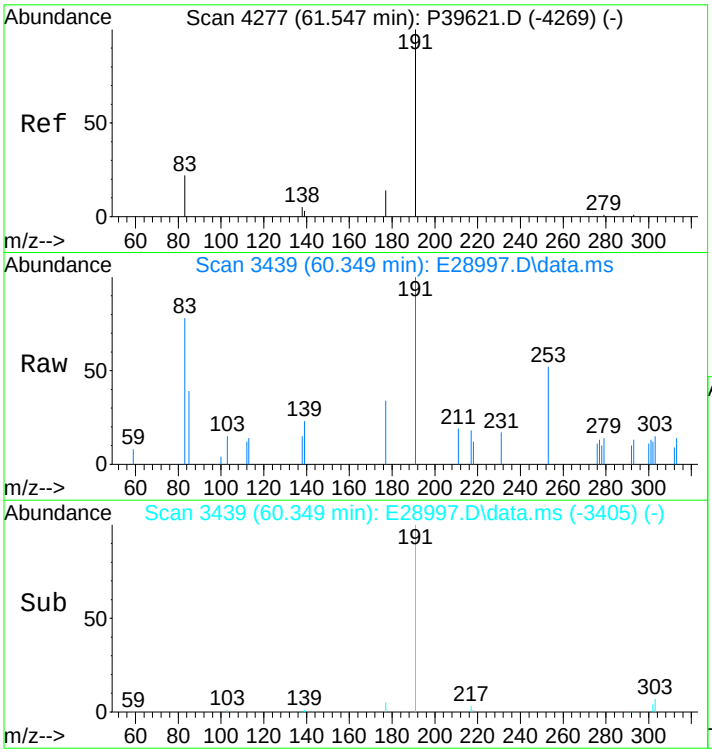




#125
Tetrakishomohopane-22S (T32)
Concen: 194.66 ng/ml m
RT: 59.490 min Scan# 3382
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

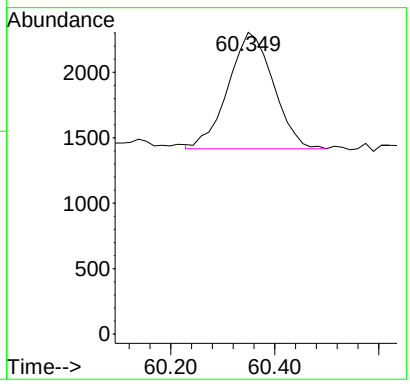
Tgt Ion:191 Resp: 7651

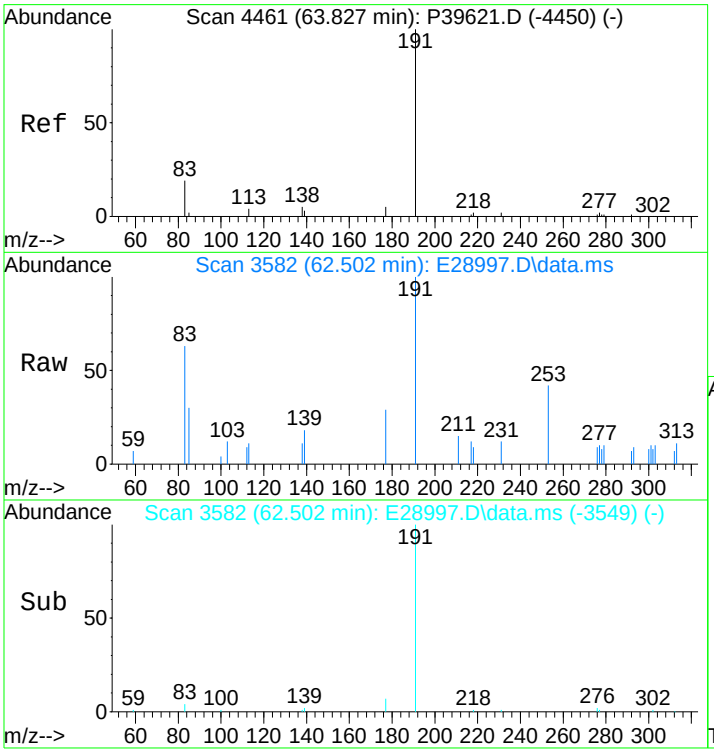




#126
Tetrakishomohopane-22R (T33)
Concen: 136.53 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

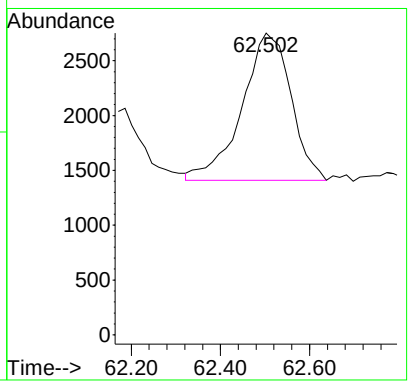
Tgt Ion:191 Resp: 5366

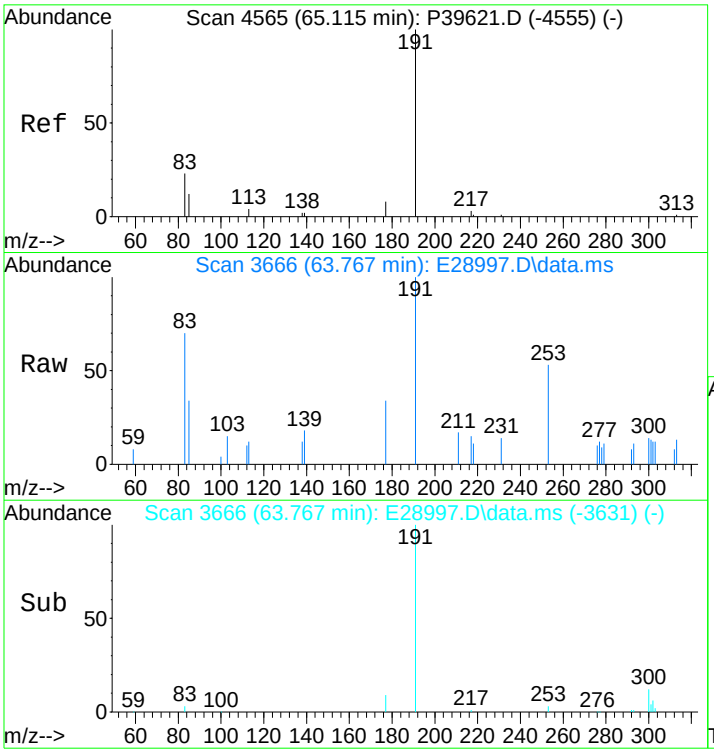




#127
Pentakishomohopane-22S (T34)
Concen: 261.76 ng/ml
RT: 62.502 min Scan# 3582
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

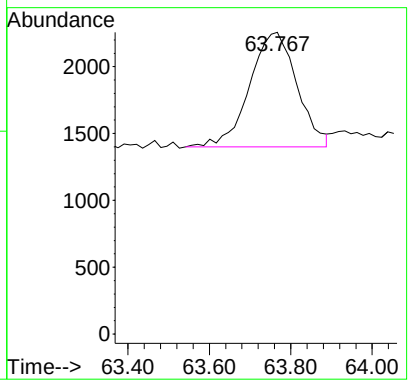
Tgt Ion:191 Resp: 10288

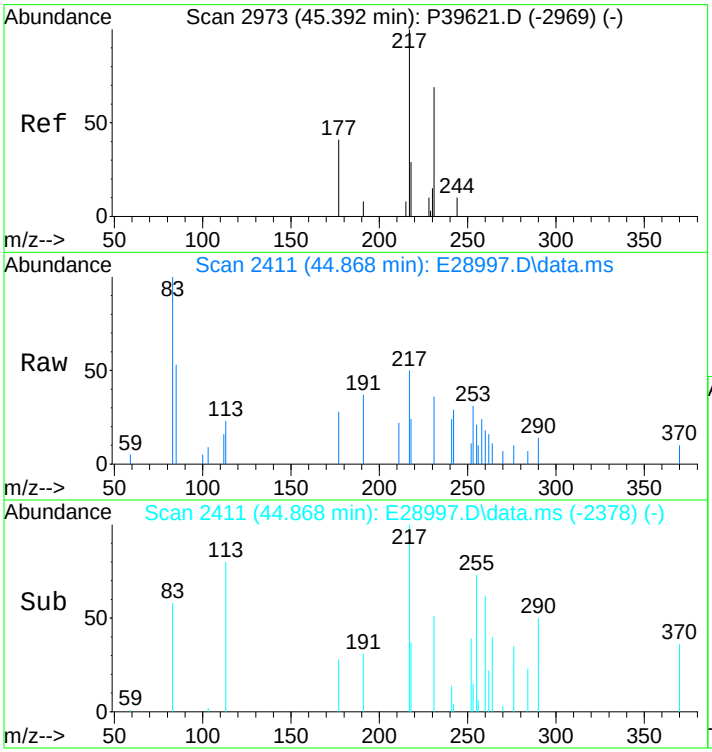




#128
Pentakishomohopane-22R (T35)
Concen: 176.68 ng/ml
RT: 63.767 min Scan# 3666
Delta R.T. 0.030 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

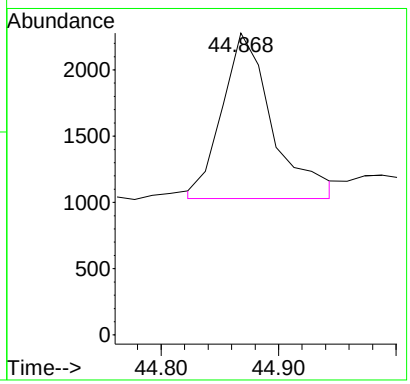
Tgt Ion:191 Resp: 6944

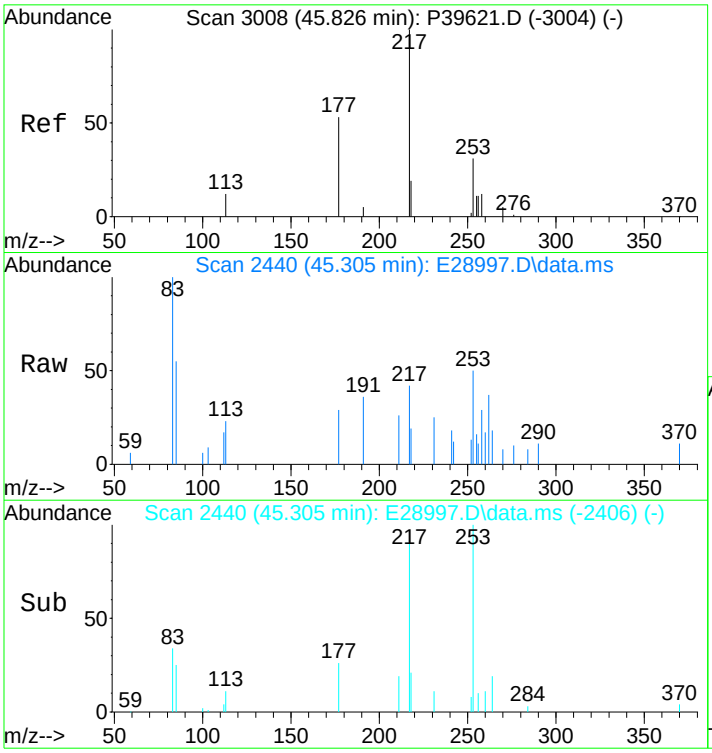




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 180.62 ng/ml m
RT: 44.868 min Scan# 2411
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

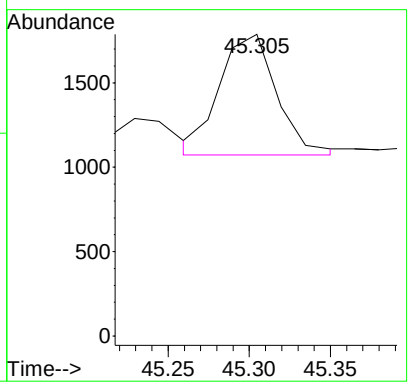
Tgt Ion:217 Resp: 3728

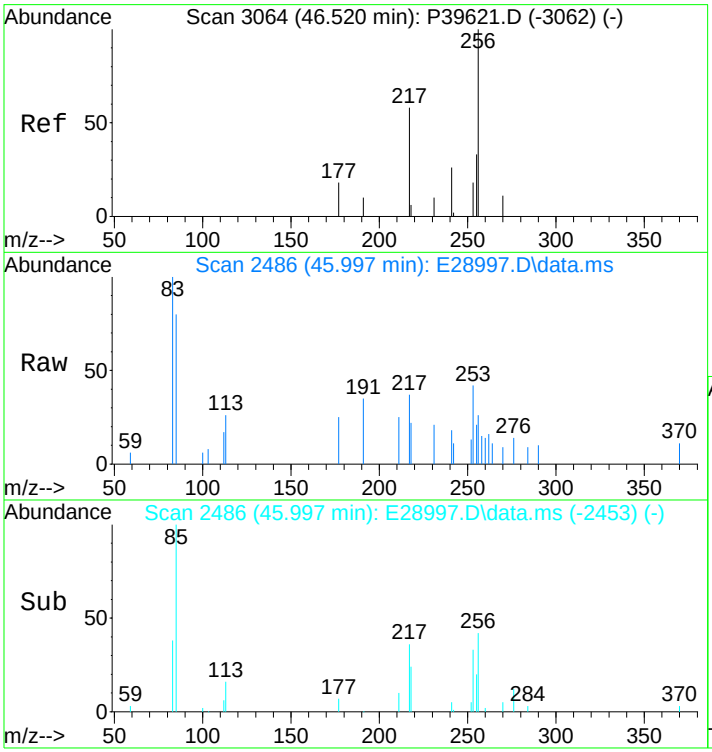




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 84.59 ng/ml m
RT: 45.305 min Scan# 2440
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

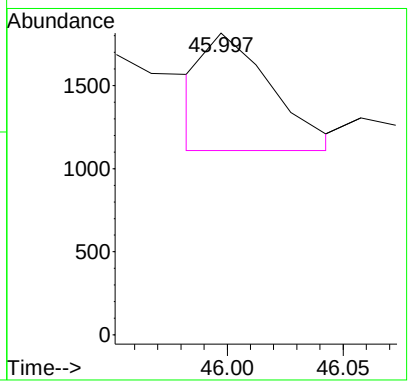
Tgt Ion:217 Resp: 1746

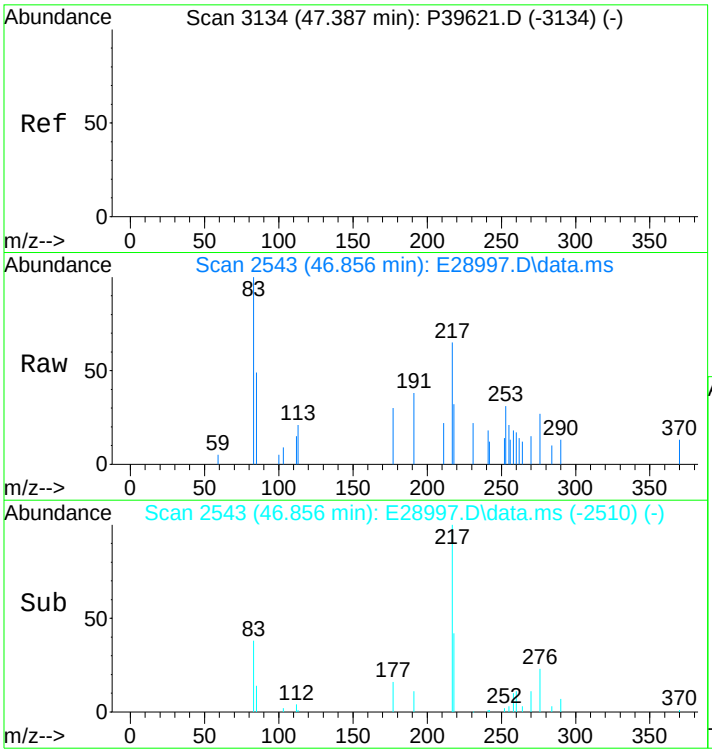




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 68.07 ng/ml m
RT: 45.997 min Scan# 2486
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

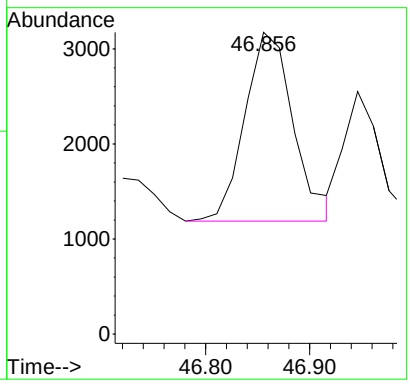
Tgt Ion:217 Resp: 1405

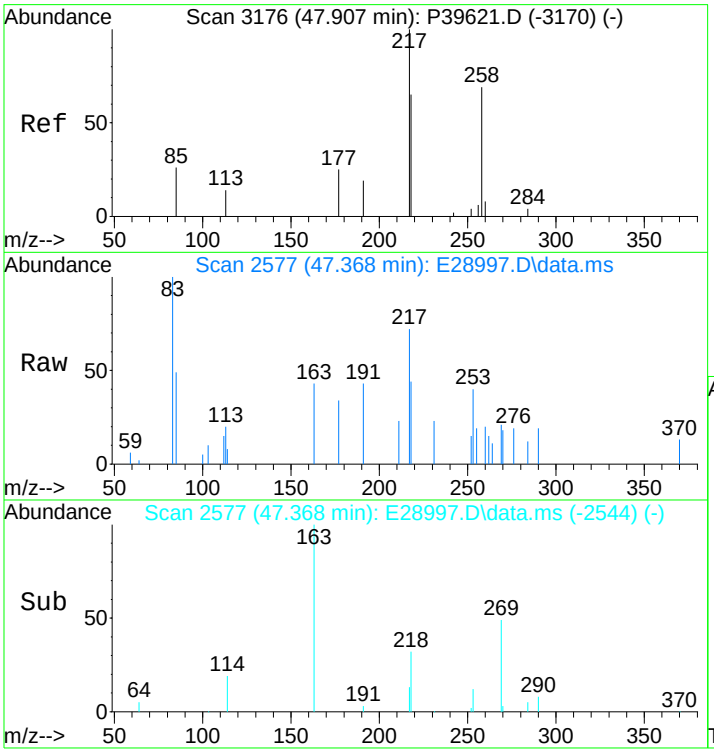




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 313.46 ng/ml
RT: 46.856 min Scan# 2543
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

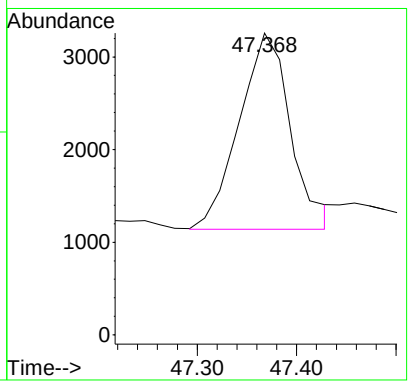
Tgt Ion:217 Resp: 6470

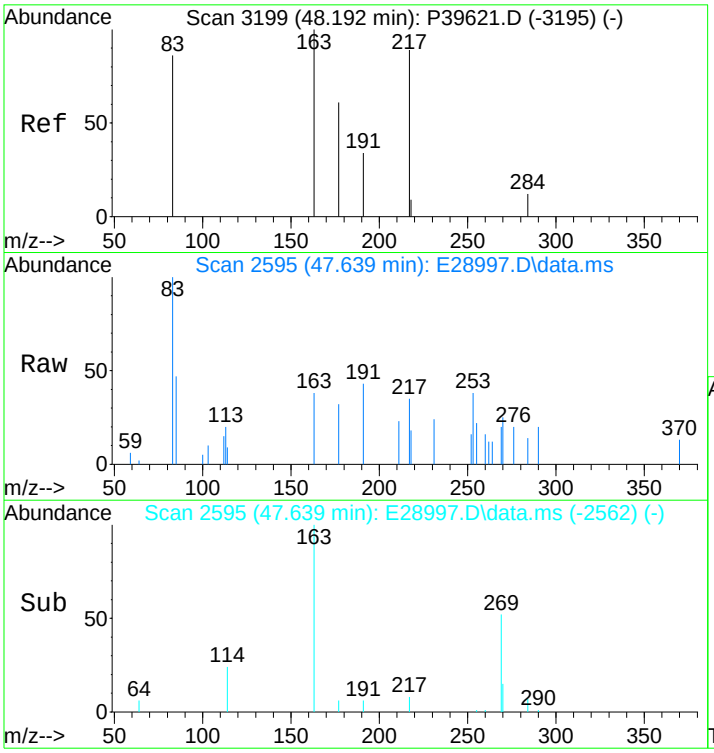




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 367.82 ng/ml m
RT: 47.368 min Scan# 2577
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

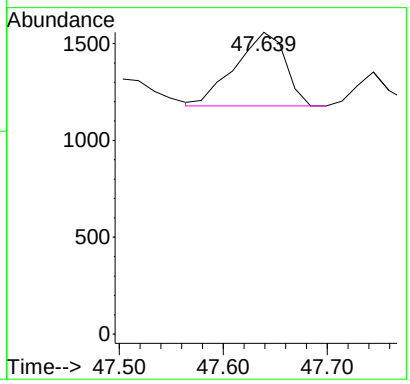
Tgt Ion:217 Resp: 7592

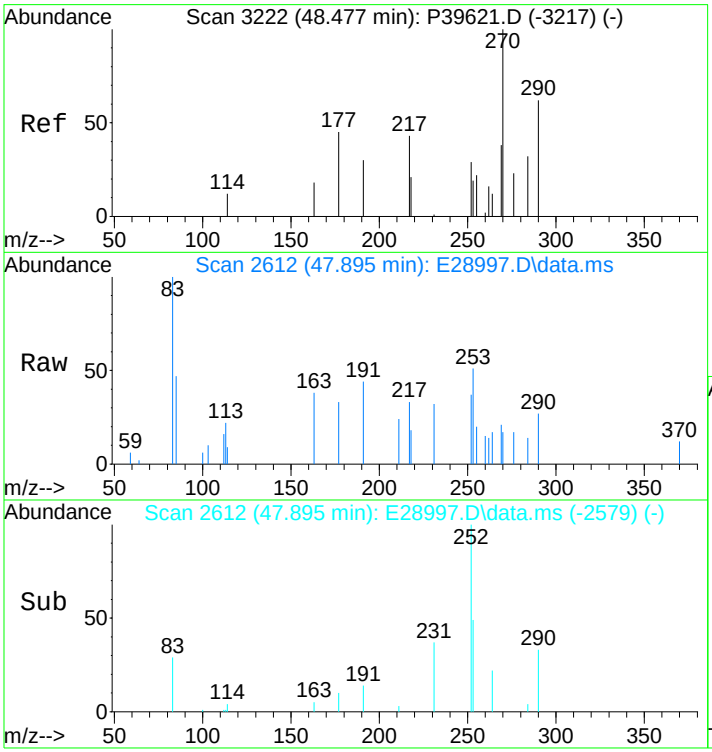




#135
Unknown Sterane (S18)
Concen: 61.53 ng/ml
RT: 47.639 min Scan# 2595
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

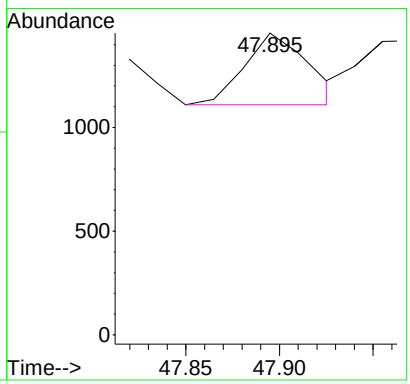
Tgt Ion:217 Resp: 1270

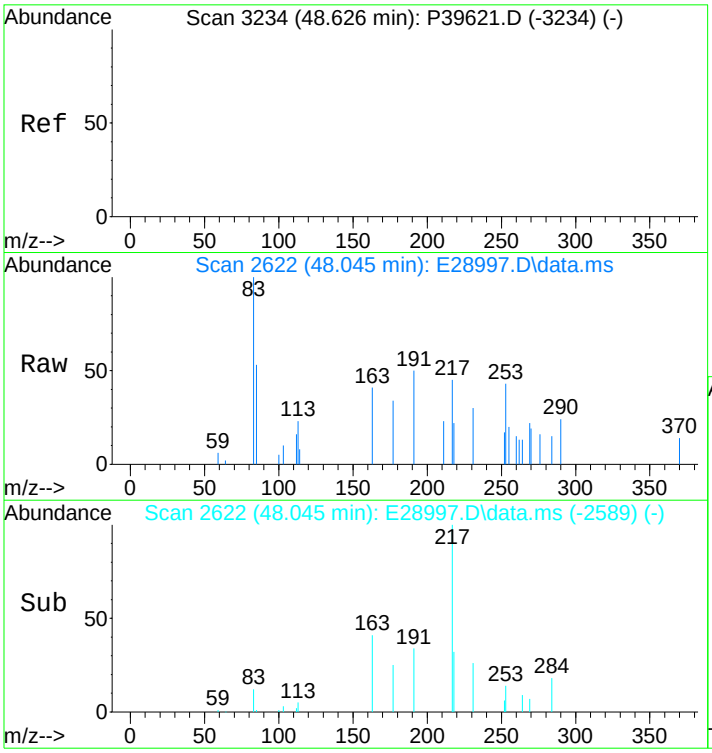




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 39.87 ng/ml
RT: 47.895 min Scan# 2612
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

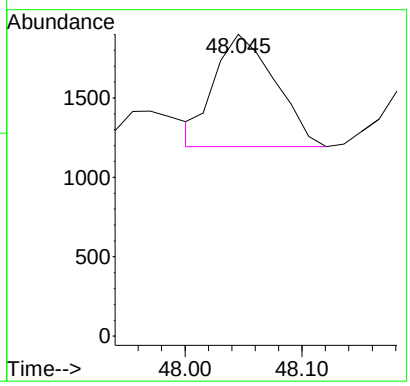
Tgt Ion:217 Resp: 823

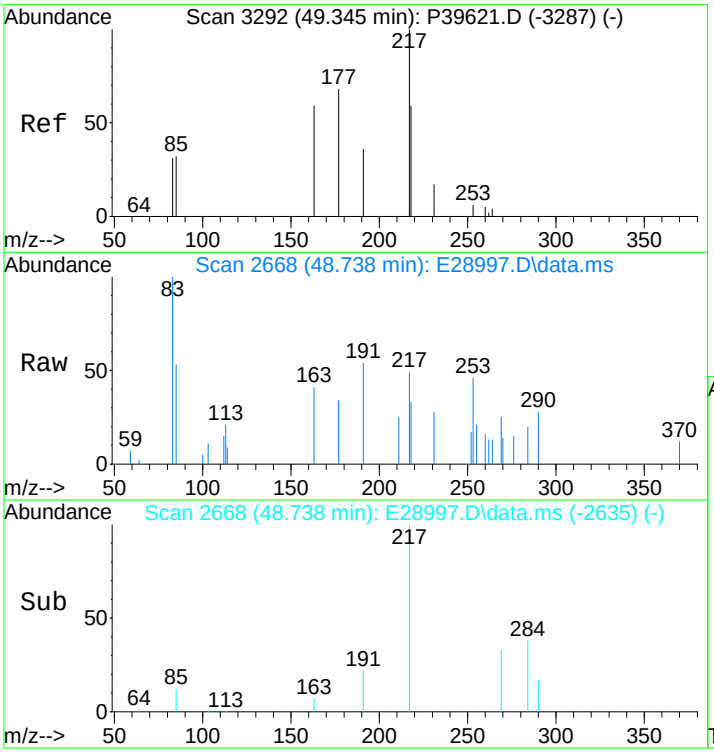




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 123.20 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

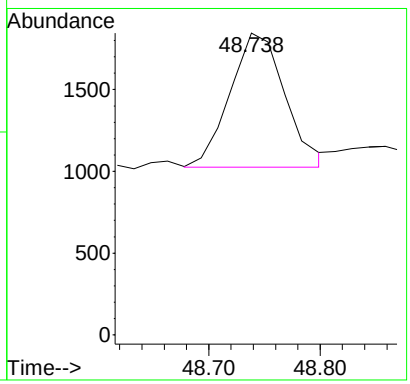
Tgt Ion:217 Resp: 2543

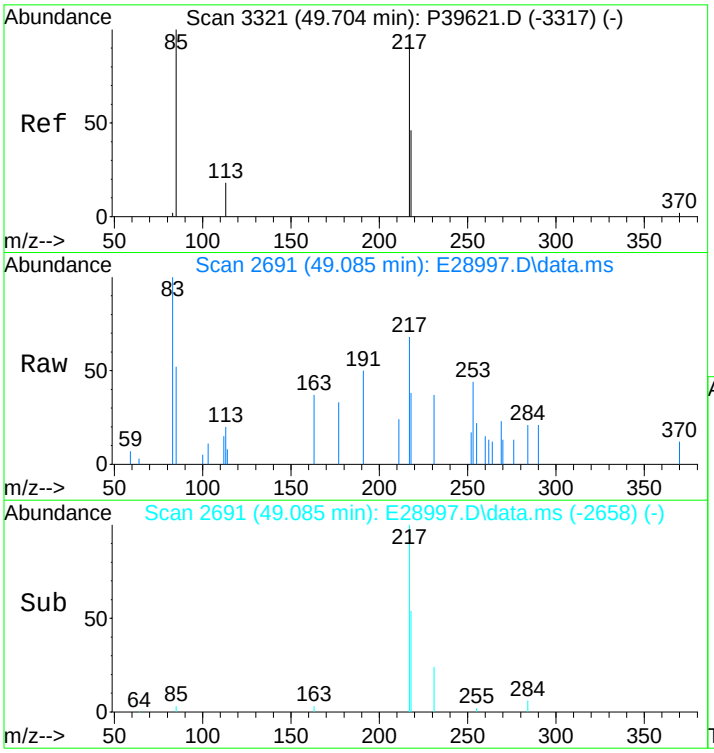




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 136.58 ng/ml m
RT: 48.738 min Scan# 2668
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

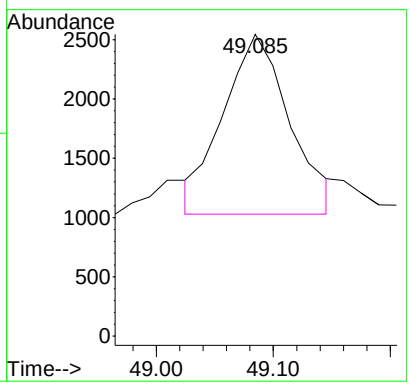
Tgt Ion:217 Resp: 2819

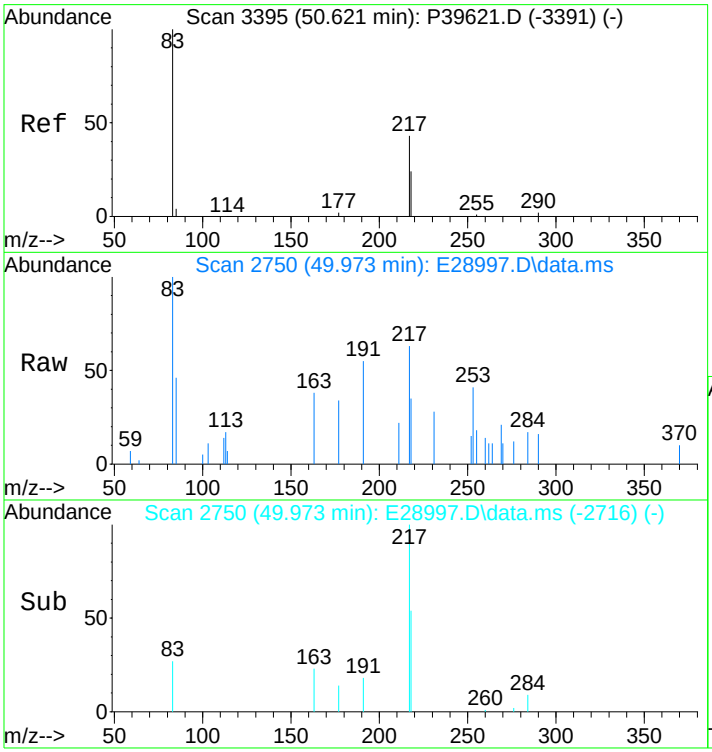




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 290.16 ng/ml m
RT: 49.085 min Scan# 2691
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

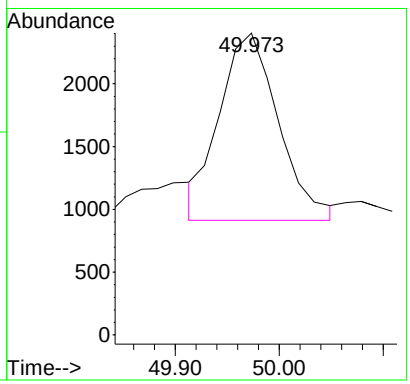
Tgt Ion:217 Resp: 5989

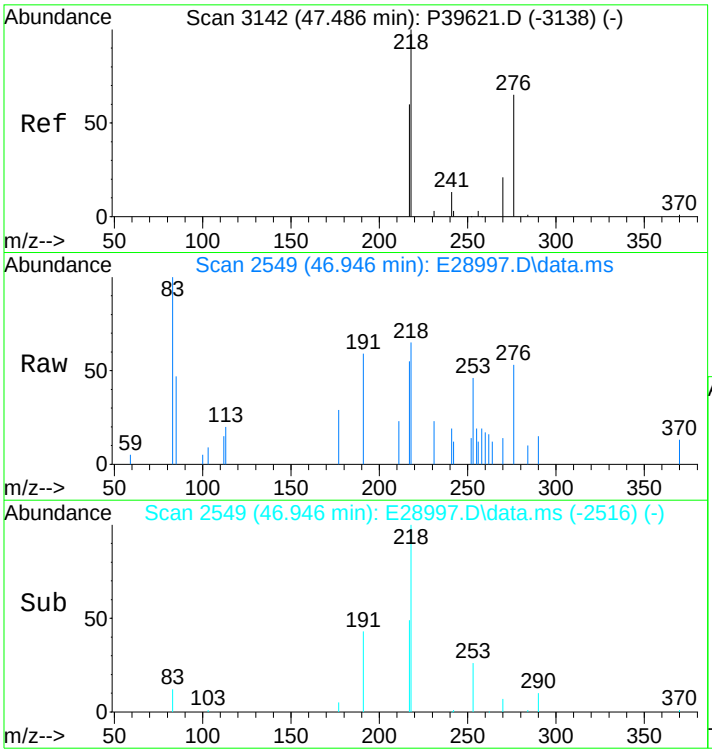




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 284.83 ng/ml m
RT: 49.973 min Scan# 2750
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

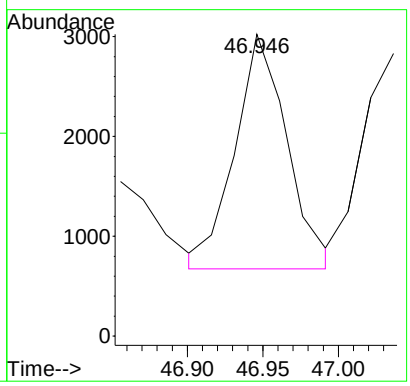
Tgt Ion:217 Resp: 5879

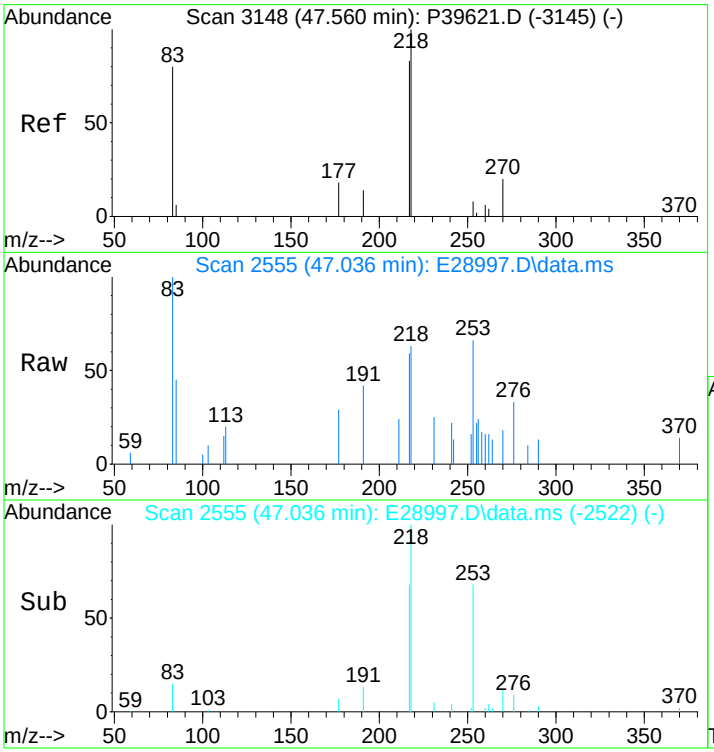




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 273.25 ng/ml m
RT: 46.946 min Scan# 2549
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

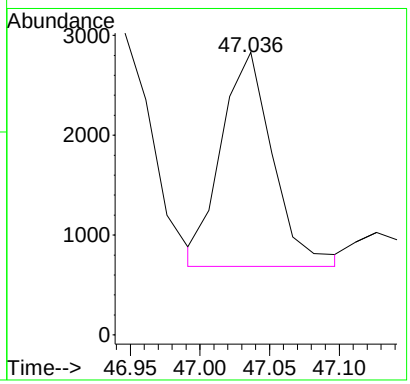
Tgt Ion:218 Resp: 5640

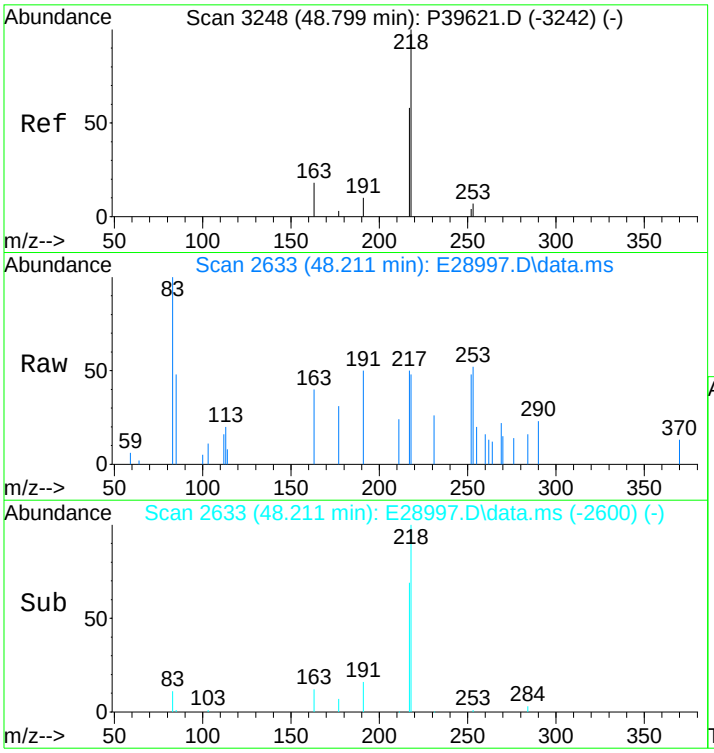




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 266.51 ng/ml m
RT: 47.036 min Scan# 2555
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

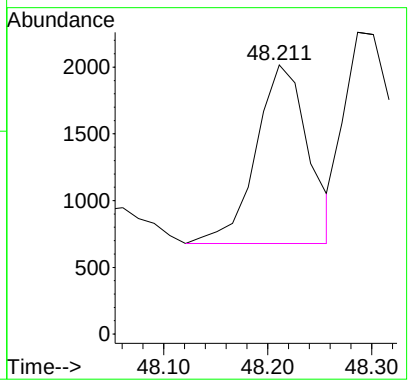
Tgt Ion:218 Resp: 5501

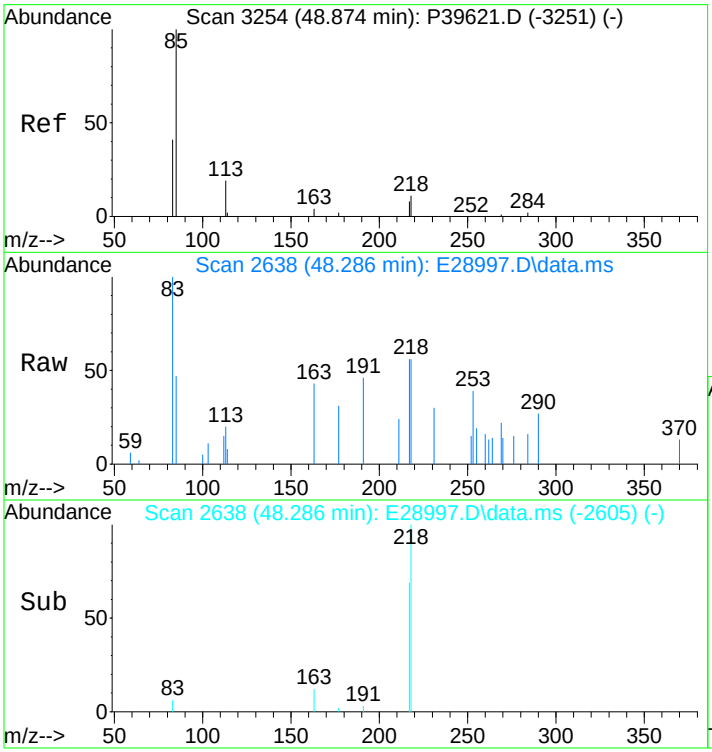




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 228.09 ng/ml
RT: 48.211 min Scan# 2633
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

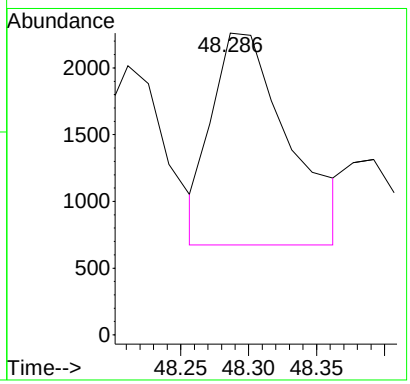
Tgt Ion:218 Resp: 4708

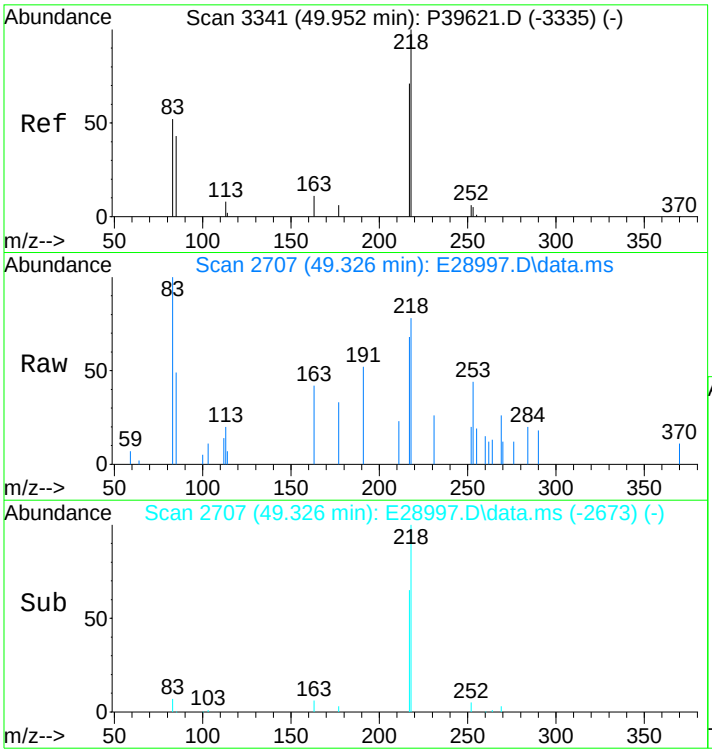




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 302.22 ng/ml m
RT: 48.286 min Scan# 2638
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

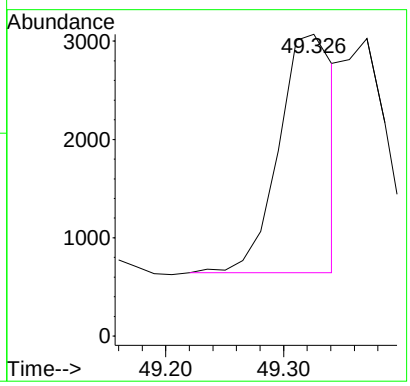
Tgt Ion:218 Resp: 6238

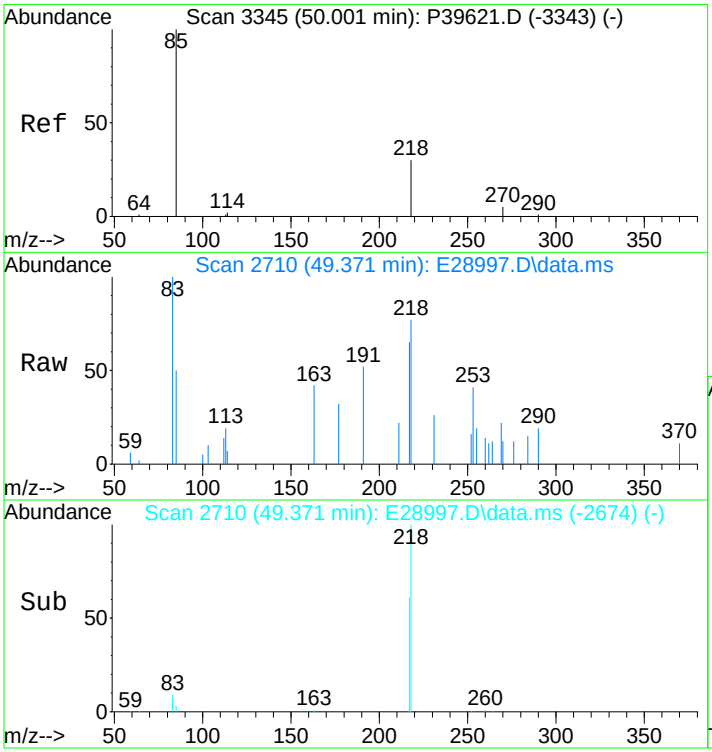




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 383.47 ng/ml m
RT: 49.326 min Scan# 2707
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

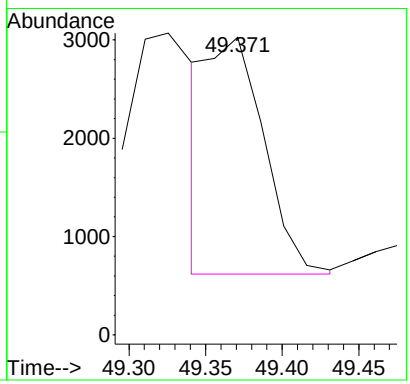
Tgt Ion:218 Resp: 7915

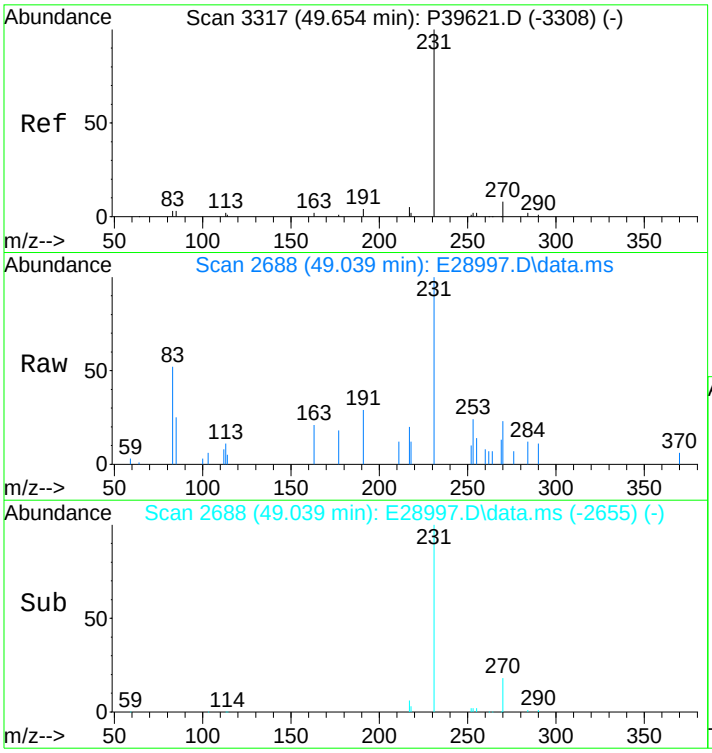




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 296.12 ng/ml m
RT: 49.371 min Scan# 2710
Delta R.T. 0.045 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

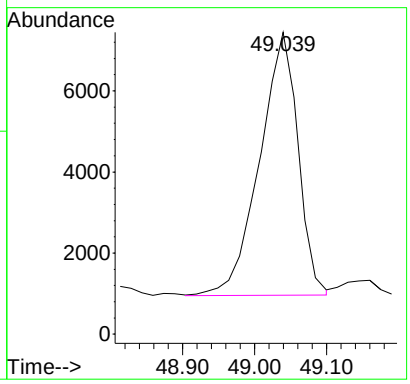
Tgt Ion:218 Resp: 6112

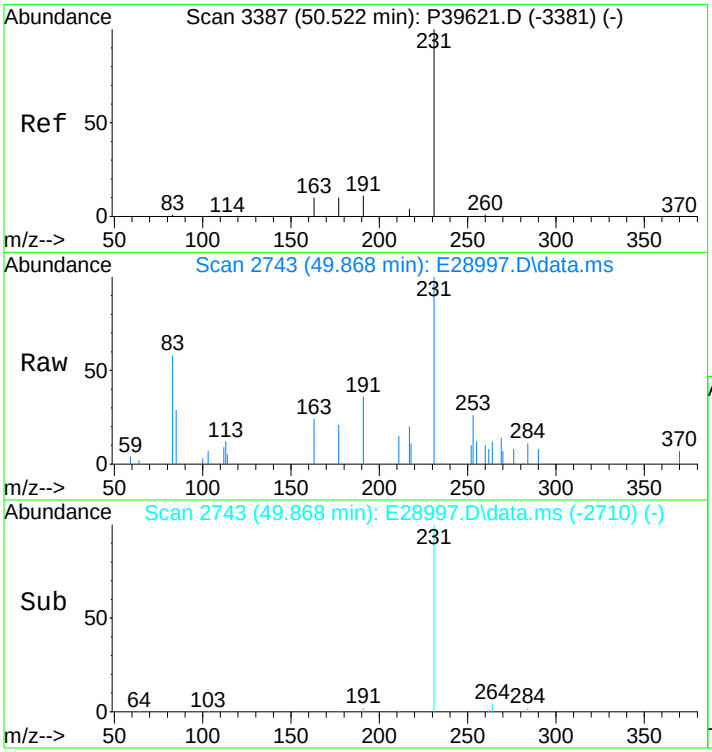




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1160.38 ng/mL
RT: 49.039 min Scan# 2688
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

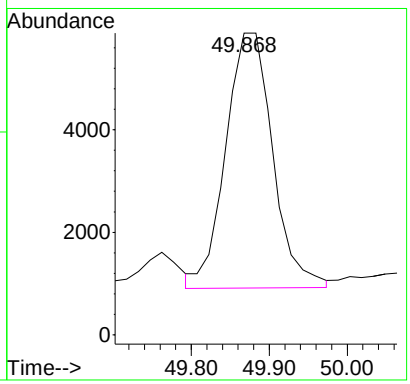
Tgt Ion:231 Resp: 23951

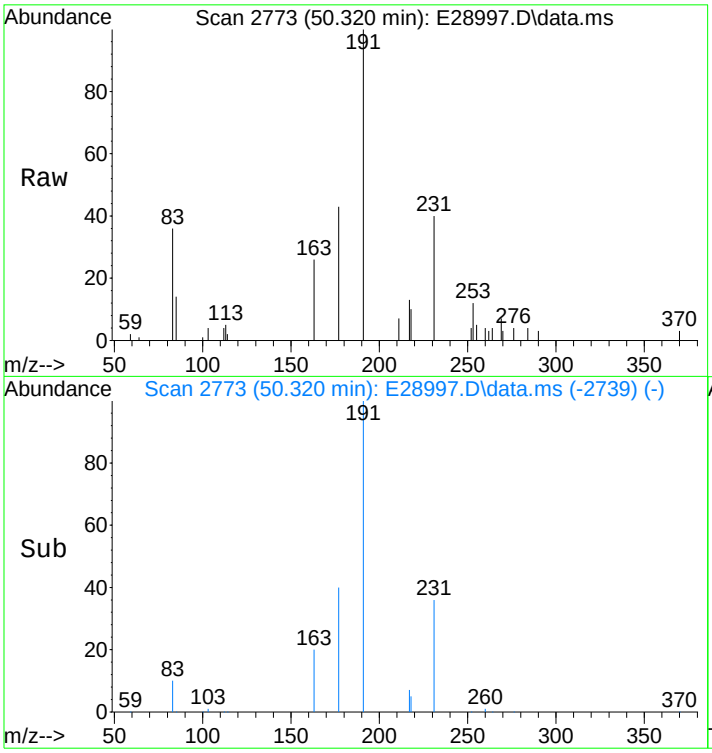




#148
C28,20S-triaromatic steroid
Concen: 1012.57 ng/mL
RT: 49.868 min Scan# 2743
Delta R.T. -0.000 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

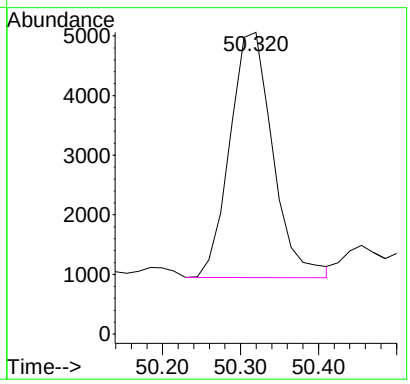
Tgt Ion:231 Resp: 20900

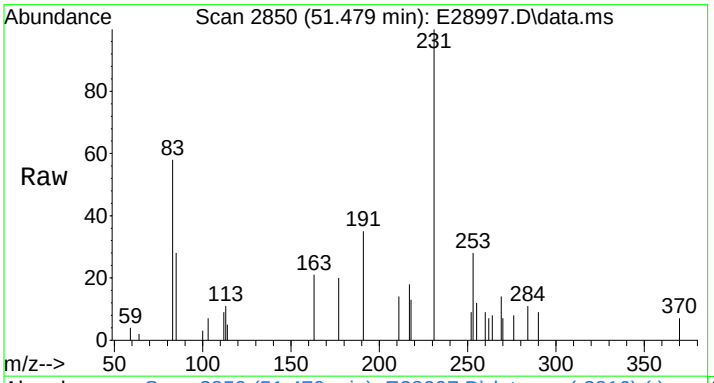




#149
C27,20R-triaromatic steroid
Concen: 763.64 ng/mL
RT: 50.320 min Scan# 2773
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

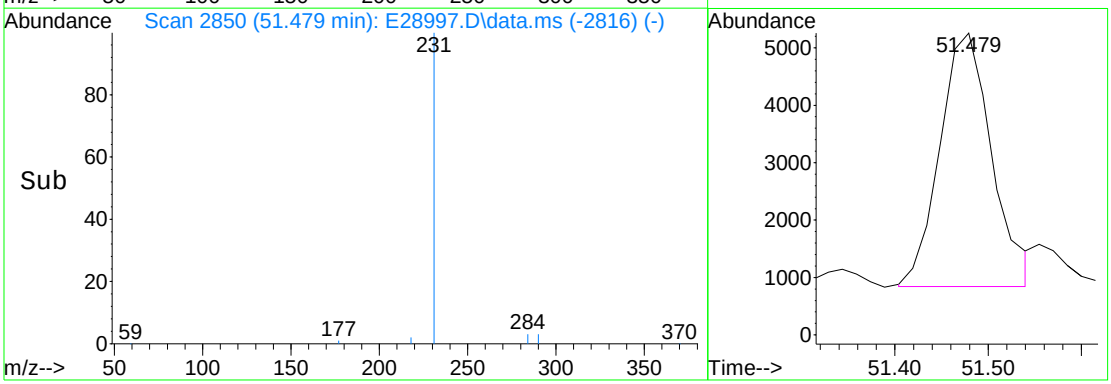
Tgt Ion:231 Resp: 15762





#150
C28,20R-triaromatic steroid
Concen: 828.32 ng/mL m
RT: 51.479 min Scan# 2850
Delta R.T. 0.015 min
Lab File: E28997.D
Acq: 15 Nov 2012 6:10 pm

Tgt Ion:231 Resp: 17097



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29029.D
Acq On : 17 Nov 2012 5:50 am
Operator : AC
Sample : SS110612B09
Misc : 1X ETR1210083
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 19 09:45:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	35406	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	79653	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	51089	410.230	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.02%#			
42) Phenanthrene-d10	32.115	188	57599	451.430	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.14%#			
83) Benzo[b]fluoranthene-d12	46.690	264	76992	470.536	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.05%#			
88) Benzo[a]pyrene-d12	47.850	264	73150	461.386	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.14%#			
129) 5B(H)Cholane - Surr	43.362	217	15107	481.222	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.12%#			
Target Compounds						Qvalue
10) Naphthalene	19.319	128	83M3	0.596	ng/mL	
26) Acenaphthylene	25.612	152	60M4	0.432	ng/mL	
29) Fluorene	28.397	166	79M2	0.793	ng/mL	
33) Dibenzothiophene	31.709	184	116M3	0.848	ng/mL	
34) 4-Methyldibenzothiophene(	33.500	198	139M3	1.016	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	183	1.338	ng/mL#	100
37) OTP	33.877	198	8302	60.690	ng/mL#	100
38) C1-Dibenzothiophenes	33.877	198	8880M5	64.915	ng/mL	
38) C1-Dibenzothiophenes BS	33.877	198	578m	4.225	ng/mL	
39) C2-Dibenzothiophenes	36.180	212	970M5	7.091	ng/mL	
43) Phenanthrene	32.206	178	177	1.272	ng/mL#	59
44) 3-Methylphenanthrene(3MP)	34.178	192	97M4	0.697	ng/mL	
45) 2-Methylphenanthrene(2MP)	34.298	192	99M3	0.711	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.630	192	89M2	0.639	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.720	192	85M3	0.611	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.630	192	474M5	3.406	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.180	206	7471M5	53.681	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.180	206	1305m	9.377	ng/mL	
51) 5AA IS BKGD	36.180	206	6166	44.304	ng/mL	100
52) C3-Phenanthrenes/Anthrace	38.318	220	1367M5	9.822	ng/mL	
57) 1-Methylphenanthrene	34.720	192	85M3	0.801	ng/mL	
58) Fluoranthene	36.993	202	80M3	0.521	ng/mL	
60) Pyrene	37.897	202	178	1.139	ng/mL#	65
61) C1-Fluoranthenes/Pyrenes	40.065	216	1110M5	7.105	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.766	230	1153M5	7.381	ng/mL	
75) Benz[a]anthracene	42.700	228	51M3	0.329	ng/mL	
77) Chrysene/Triphenylene	42.835	228	73M3	0.457	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	86M3	0.477	ng/mL	
85) Benzo[j]+[k]fluoranthene	46.841	252	61M3	0.329	ng/mL	
87) Benzo[e]pyrene	47.744	252	240	1.363	ng/mL#	51
89) Benzo[a]pyrene	47.925	252	258	1.532	ng/mL#	71
91) Indeno[1,2,3-cd]pyrene	52.654	276	244M4	1.231	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	265M3	1.240	ng/mL	
147) C26,20R- +C27,20S- triaro	49.054	231	273M3	8.696	ng/mL	
148) C28,20S-triaromatic stero	49.868	231	161	5.129	ng/mL	100
149) C27,20R-triaromatic stero	50.335	231	153M3	4.874	ng/mL	

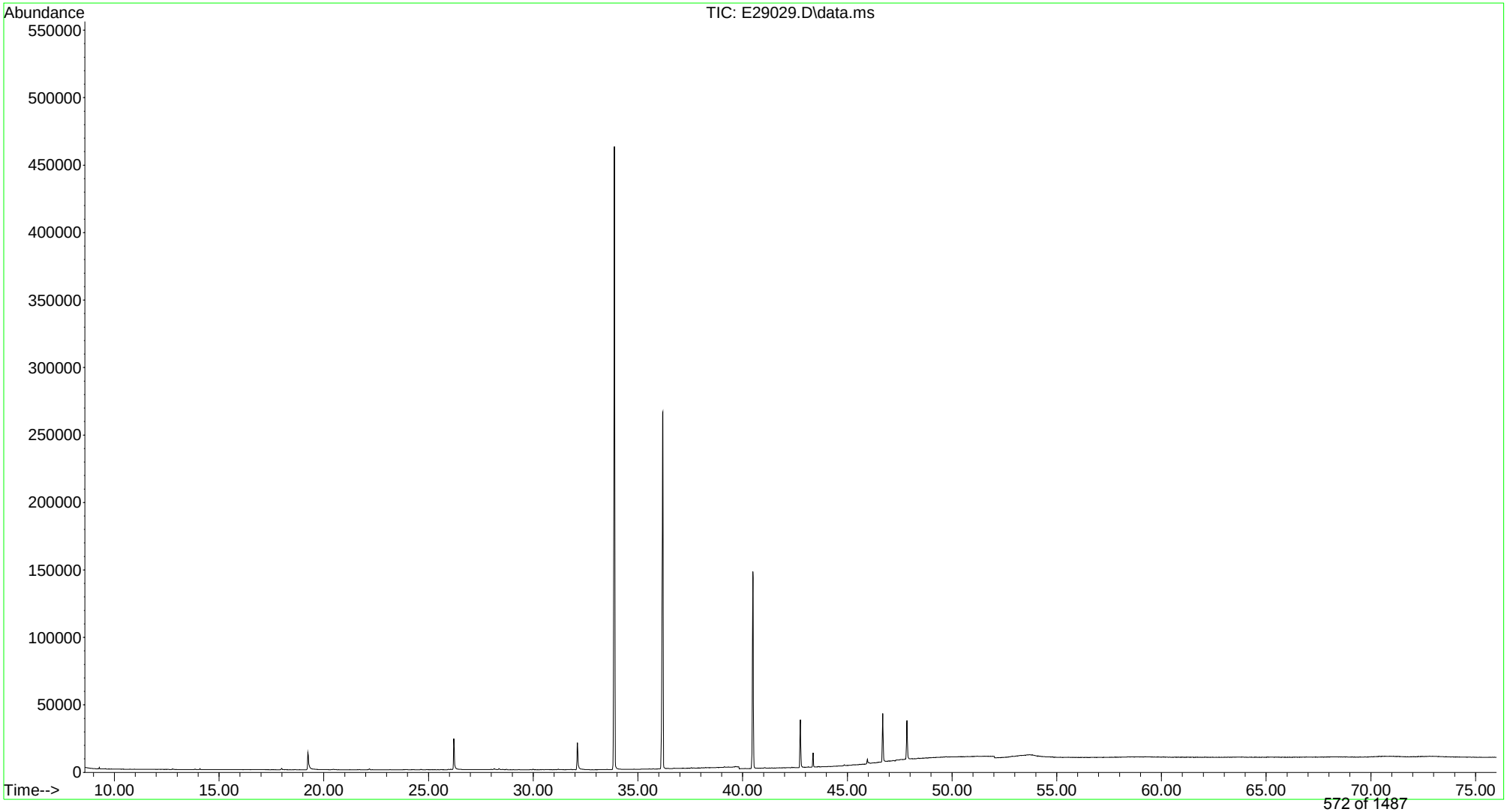
(#) = qualifier out of range (m) = manual integration (+) = signals summed

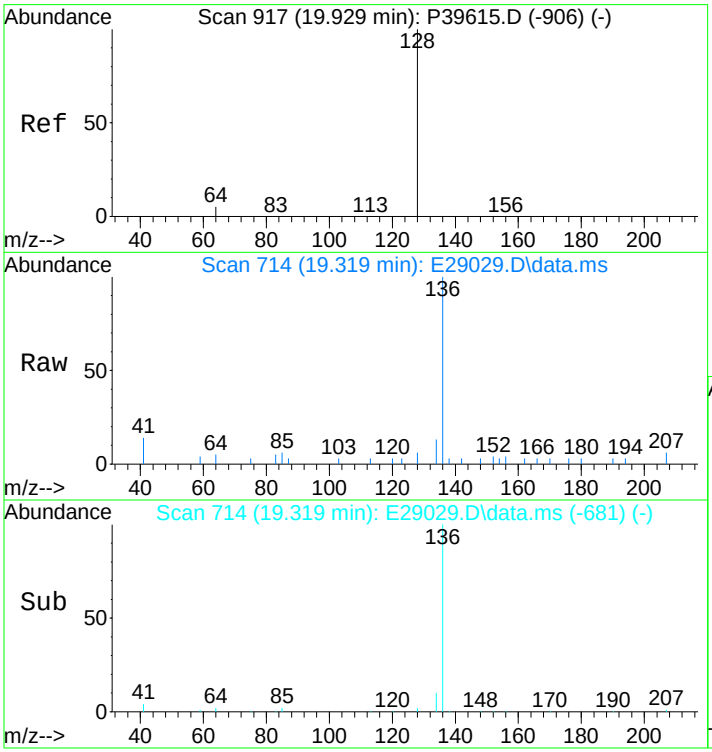
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29029.D
Acq On : 17 Nov 2012 5:50 am
Operator : AC
Sample : SS110612B09
Misc : 1X ETR1210083
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 19 09:45:18 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

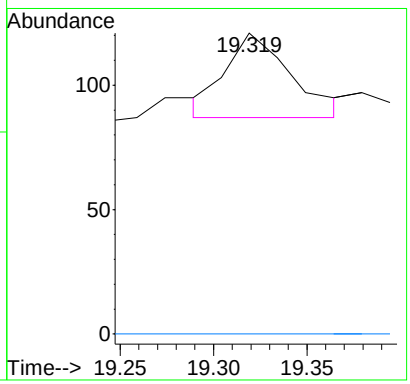


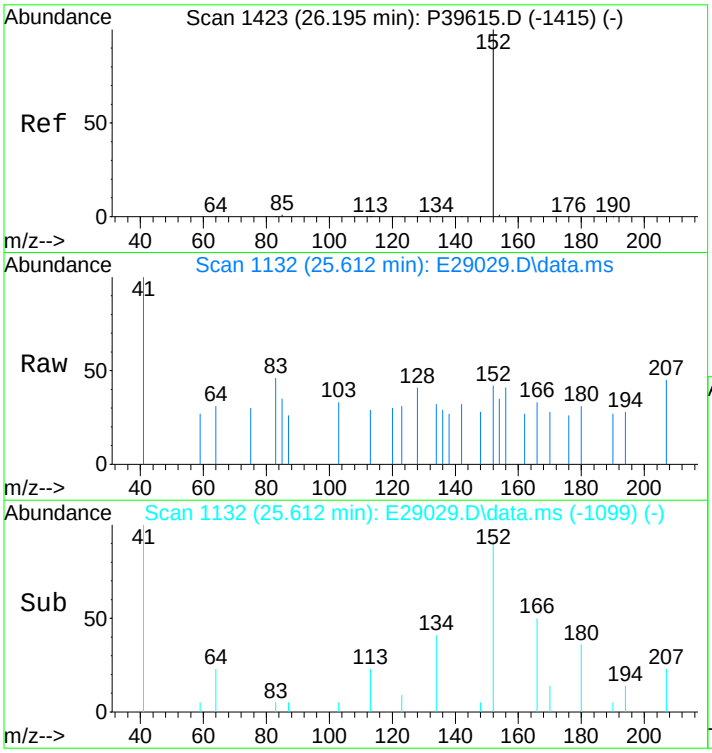


#10
Naphthalene
Concen: 0.60 ng/mL m
RT: 19.319 min Scan# 714
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:128 Resp: 83

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

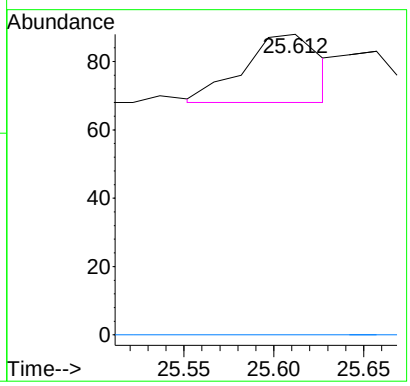


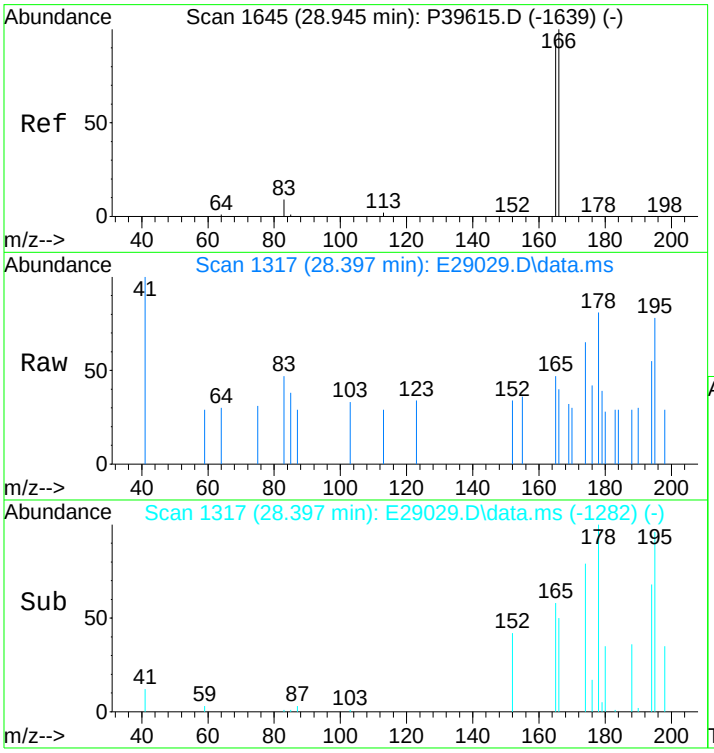


#26
Acenaphthylene
Concen: 0.43 ng/mL m
RT: 25.612 min Scan# 1132
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:152 Resp: 60

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

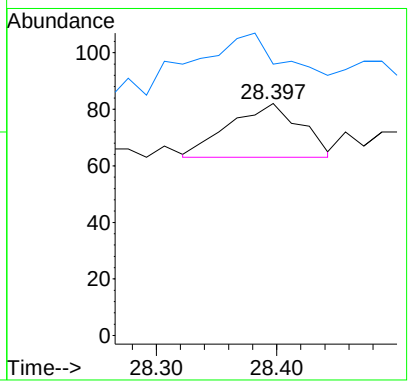


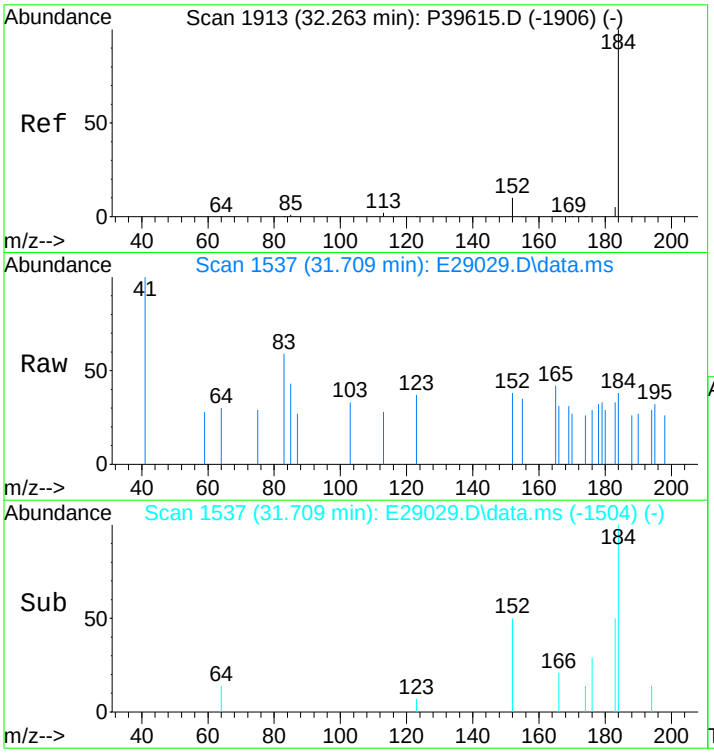


#29
Fluorene
Concen: 0.79 ng/mL m
RT: 28.397 min Scan# 1317
Delta R.T. 0.030 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:166 Resp: 79

Ion	Ratio	Lower	Upper
166	100		
165	0.0	74.4	111.6#

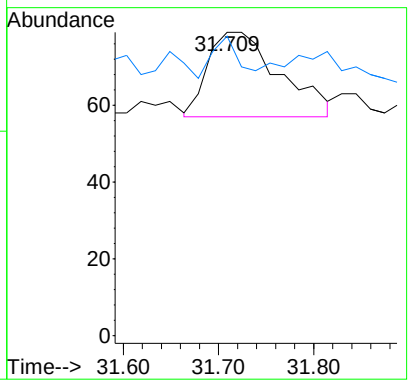


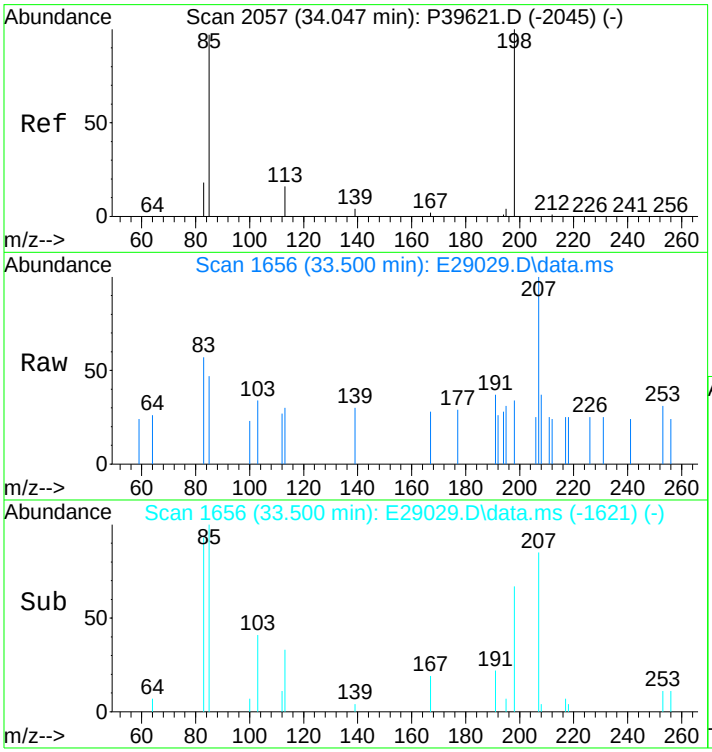


#33
Dibenzothiophene
Concen: 0.85 ng/mL m
RT: 31.709 min Scan# 1537
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:184 Resp: 116

Ion	Ratio	Lower	Upper
184	100		
152	0.0	6.0	9.0#

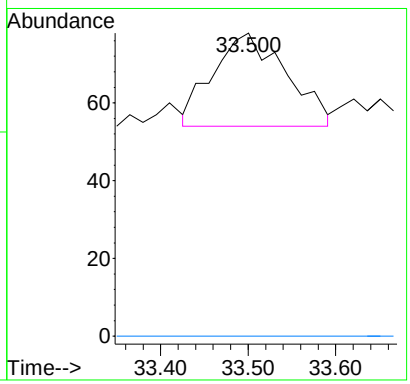


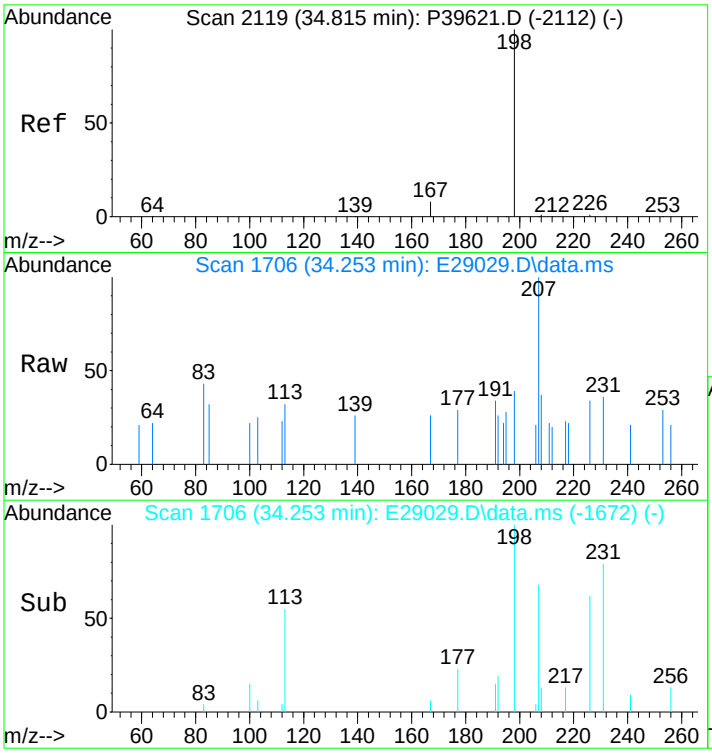


#34
4-Methyldibenzothiophene(4MDT)
Concen: 1.02 ng/mL m
RT: 33.500 min Scan# 1656
Delta R.T. 0.026 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:198 Resp: 139

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

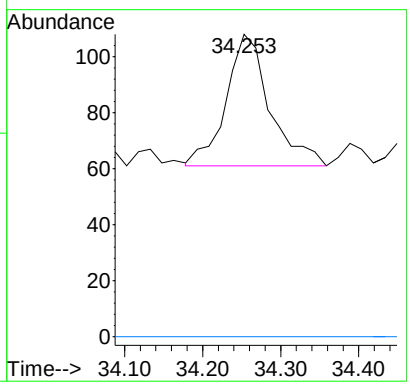


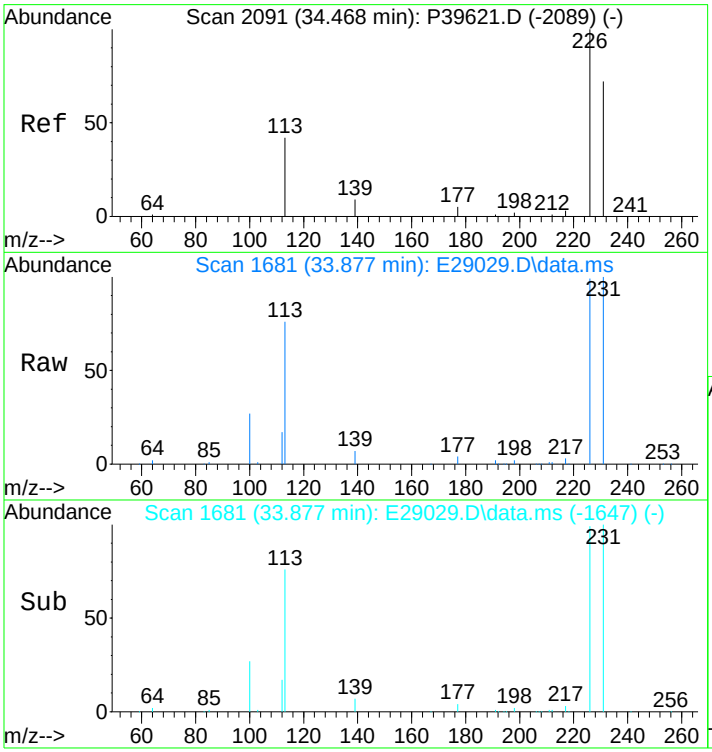


#36
1-Methyldibenzothiophene(1MDT)
Concen: 1.34 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.010 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:198 Resp: 183

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

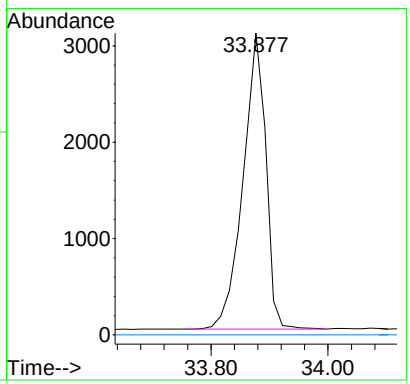


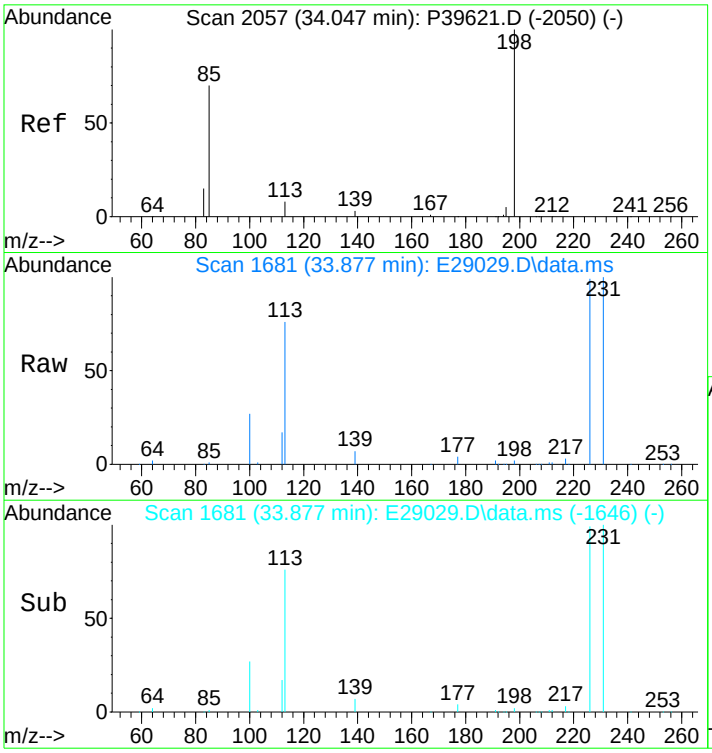


#37
OTP
Concen: 60.69 ng/mL
RT: 33.877 min Scan# 1681
Delta R.T. -0.019 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:198 Resp: 8302

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

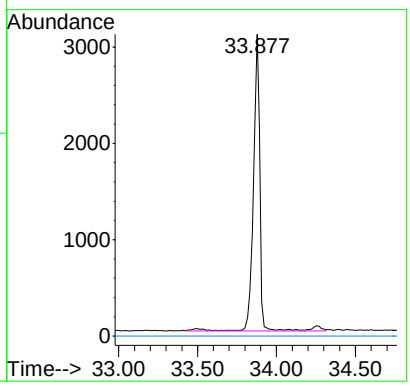


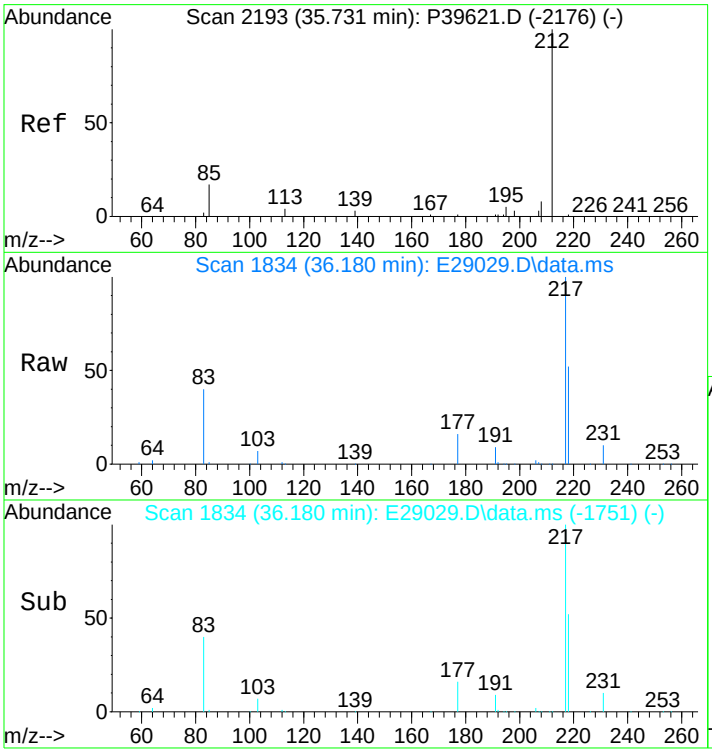


#38
C1-Dibenzothiophenes
Concen: 64.91 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. 0.464 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:198 Resp: 8880

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

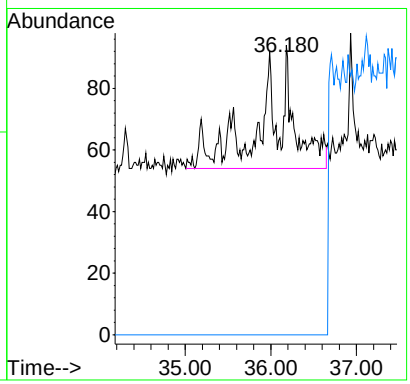


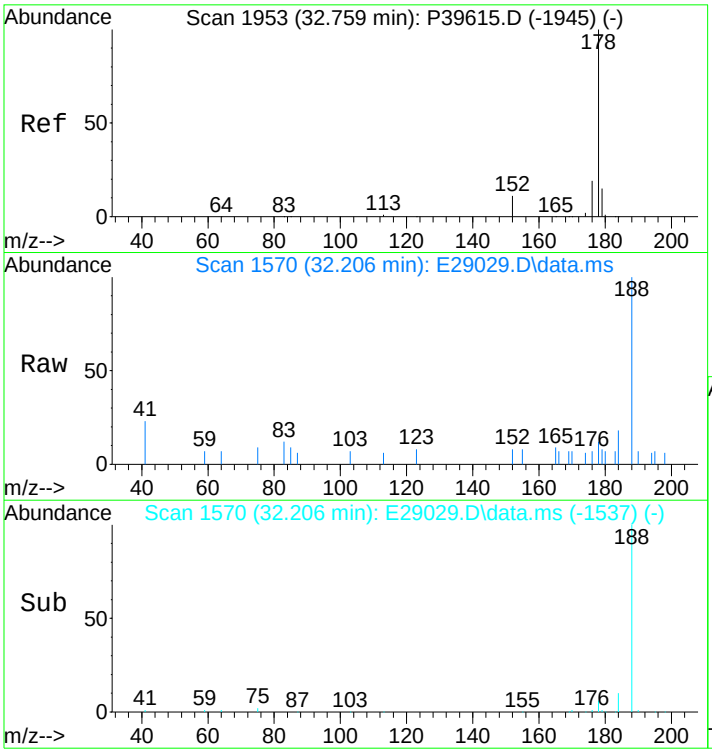


#39
C2-Dibenzothiophenes
Concen: 7.09 ng/mL m
RT: 36.180 min Scan# 1834
Delta R.T. 1.004 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:212 Resp: 970

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

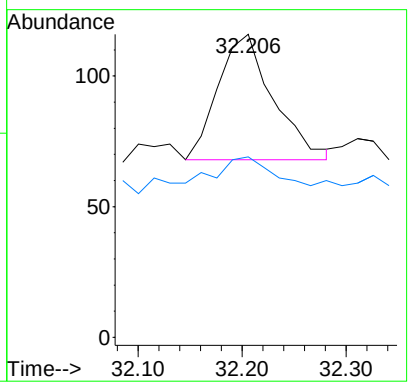


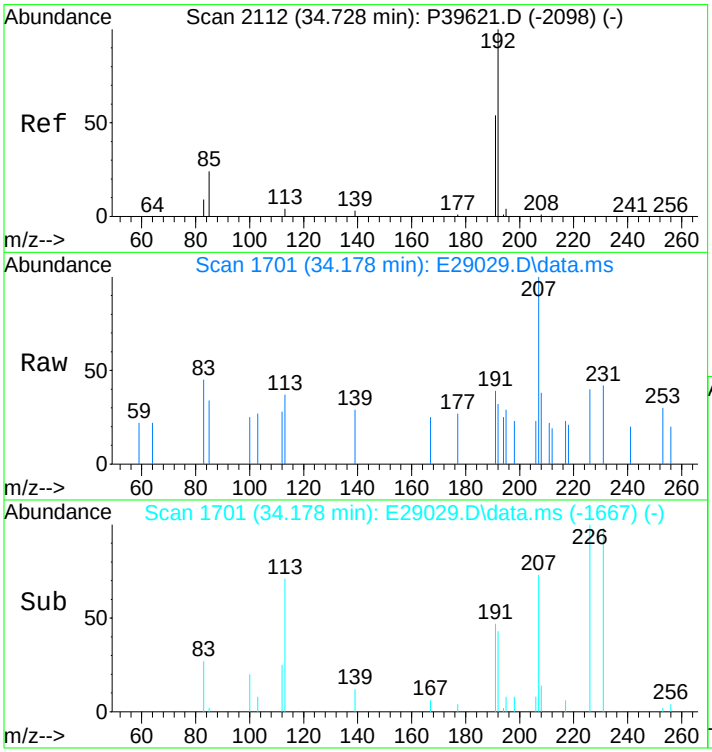


#43
Phenanthrene
Concen: 1.27 ng/mL
RT: 32.206 min Scan# 1570
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:178 Resp: 177

Ion	Ratio	Lower	Upper
178	100		
176	0.0	14.6	21.8#

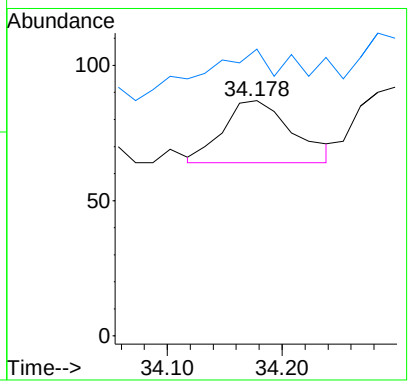


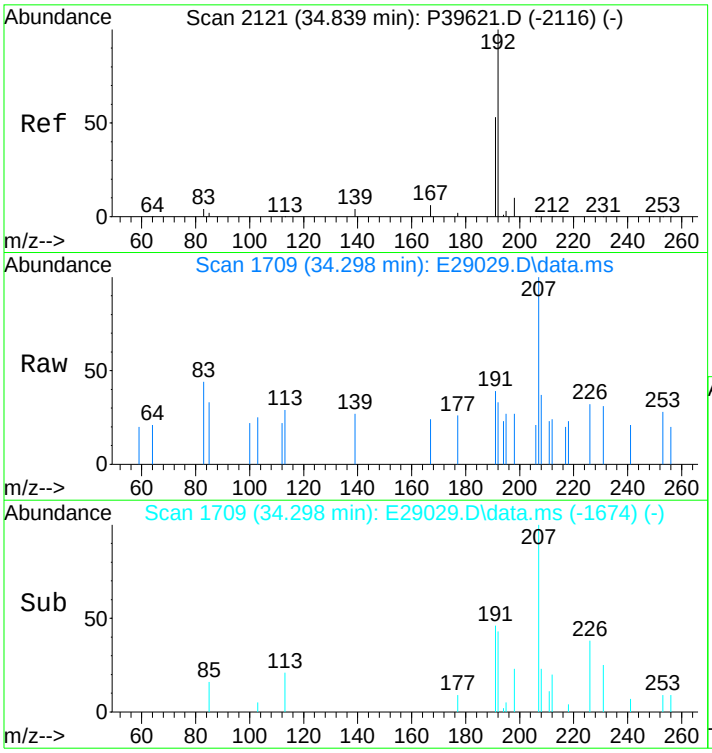


#44
3-Methylphenanthrene(3MP)
Concen: 0.70 ng/mL m
RT: 34.178 min Scan# 1701
Delta R.T. 0.011 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:192 Resp: 97

Ion	Ratio	Lower	Upper
192	100		
191	0.0	45.9	68.9#

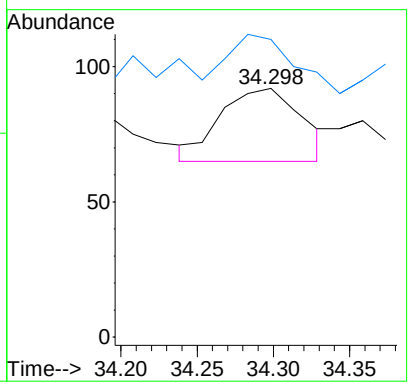


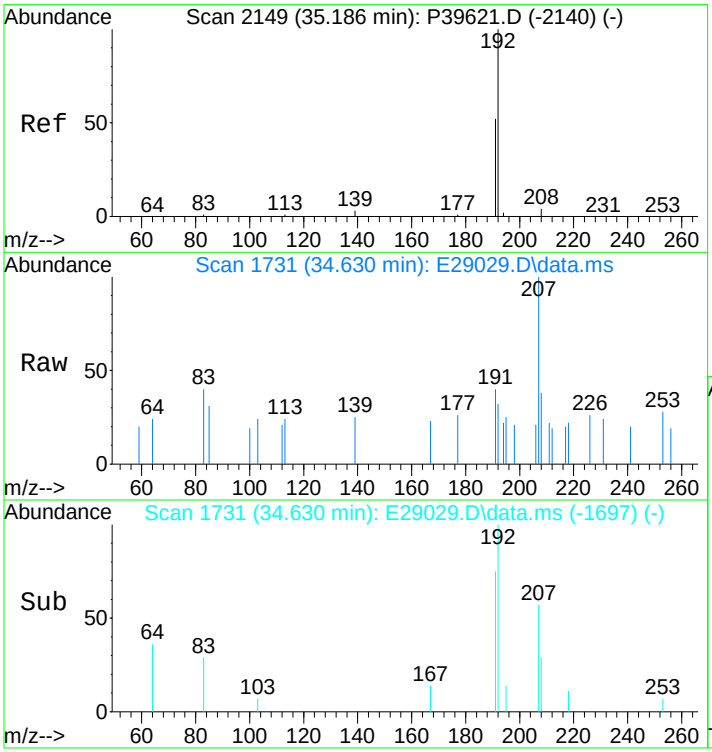


#45
2-Methylphenanthrene(2MP)
Concen: 0.71 ng/mL m
RT: 34.298 min Scan# 1709
Delta R.T. 0.026 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:192 Resp: 99

Ion	Ratio	Lower	Upper
192	100		
191	0.0	45.4	68.0#

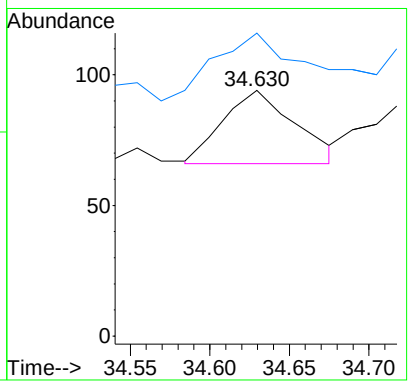


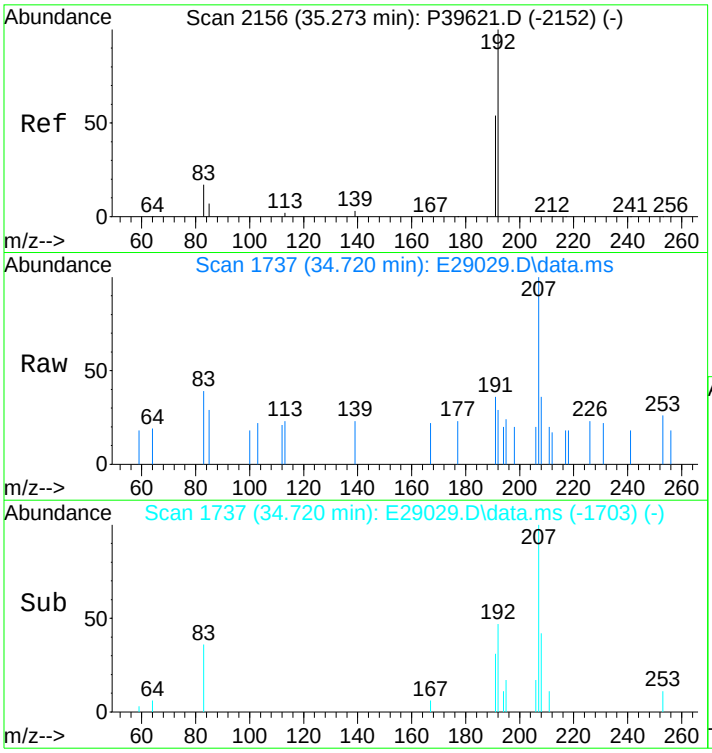


#47
9/4-Methylphenanthrene(9MP)
Concen: 0.64 ng/mL m
RT: 34.630 min Scan# 1731
Delta R.T. 0.010 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:192 Resp: 89

Ion	Ratio	Lower	Upper
192	100		
191	0.0	44.3	66.5#

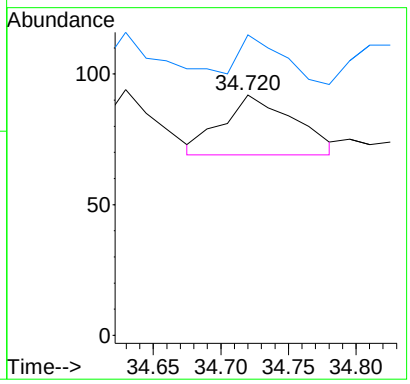


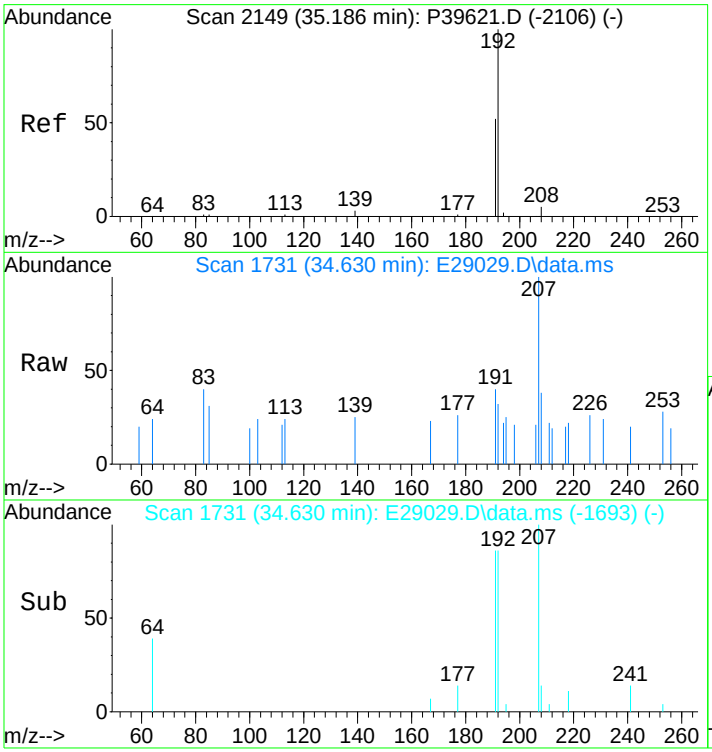


#48
1-Methylphenanthrene(1MP)
Concen: 0.61 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.010 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:192 Resp: 85

Ion	Ratio	Lower	Upper
192	100		
191	0.0	46.7	70.1#

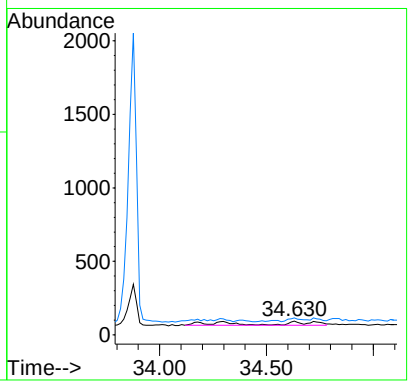


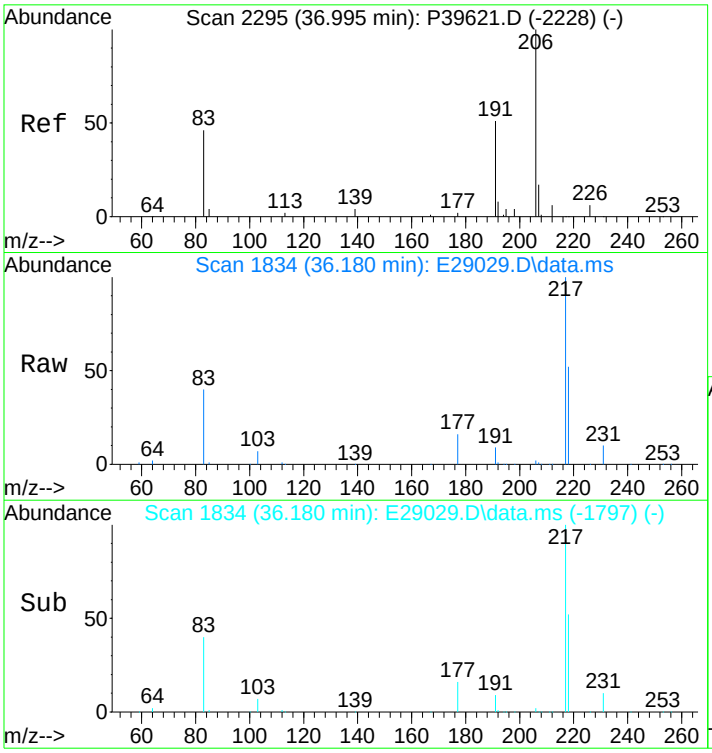


#49
C1-Phenanthrenes/Anthracenes
Concen: 3.41 ng/mL m
RT: 34.630 min Scan# 1731
Delta R.T. 0.207 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:192 Resp: 474

Ion	Ratio	Lower	Upper
192	100		
191	0.0	44.0	66.0#

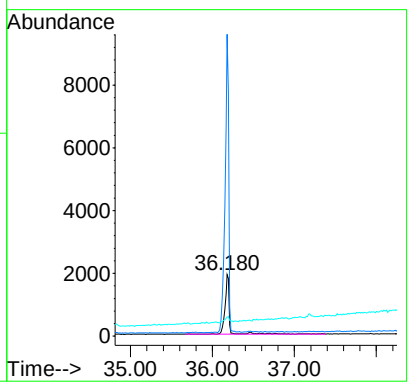


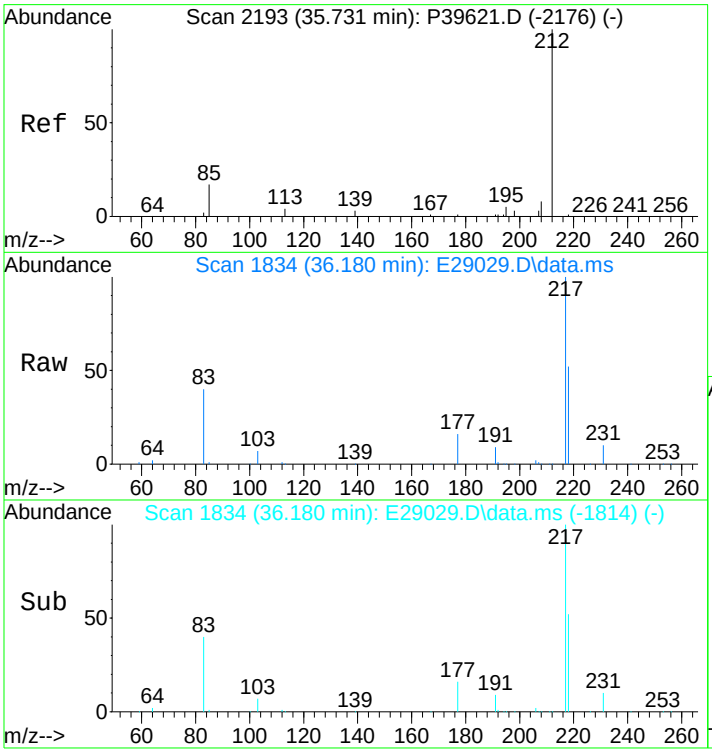


#50
C2-Phenanthrenes/Anthracenes
Concen: 53.68 ng/mL m
RT: 36.180 min Scan# 1834
Delta R.T. -0.001 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:206 Resp: 7471

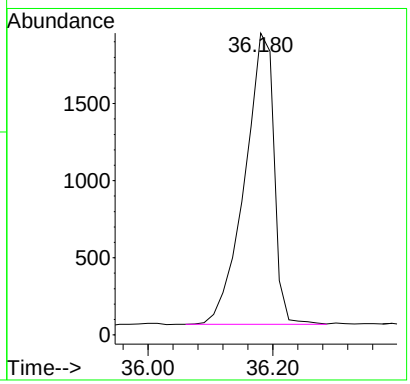
Ion	Ratio	Lower	Upper
206	100		
191	396.0	35.7	53.5#
207	13.1	16.5	24.7#

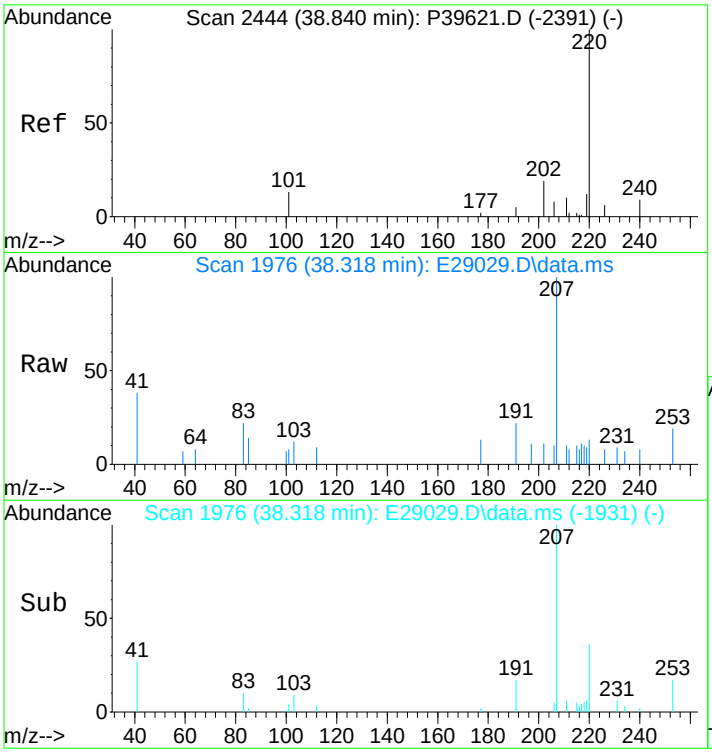




#51
5AA IS BKGD
Concen: 44.30 ng/mL
RT: 36.180 min Scan# 1834
Delta R.T. 0.039 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:206 Resp: 6166

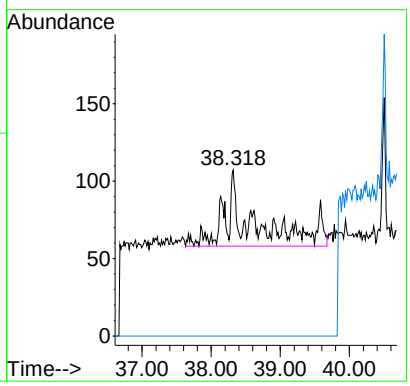


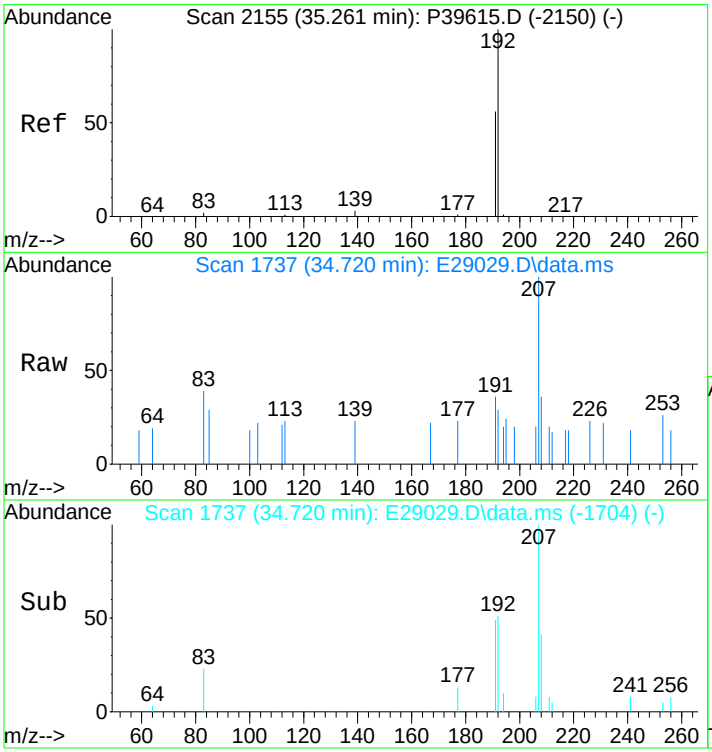


#52
C3-Phenanthrenes/Anthracenes
Concen: 9.82 ng/mL m
RT: 38.318 min Scan# 1976
Delta R.T. 0.334 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:220 Resp: 1367

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

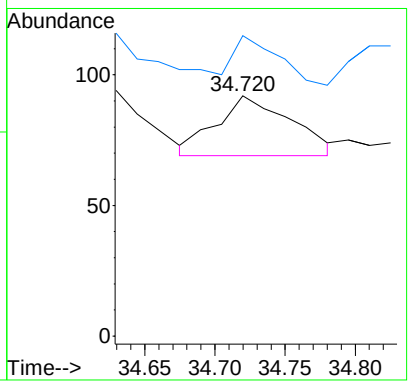


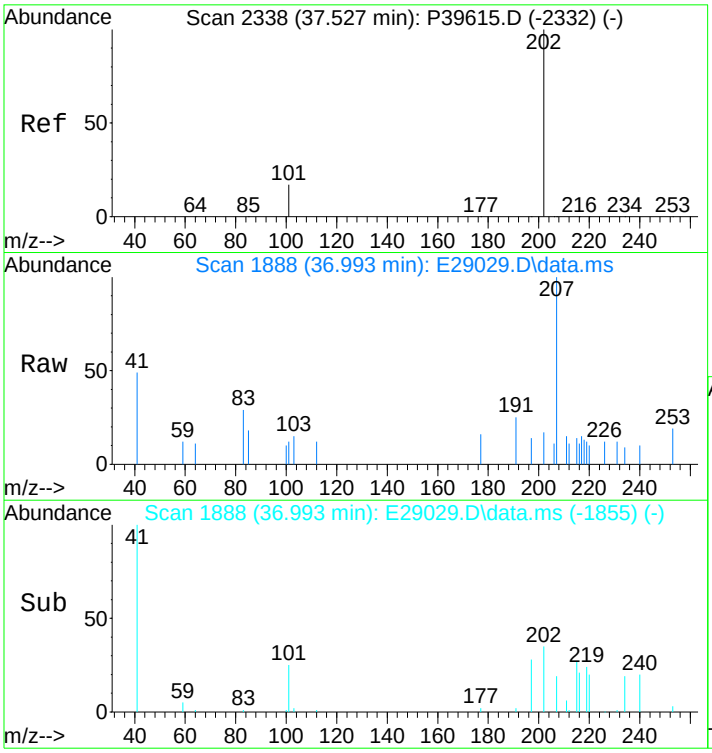


#57
1-Methylphenanthrene
Concen: 0.80 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:192 Resp: 85

Ion	Ratio	Lower	Upper
192	100		
191	0.0	44.4	66.6#

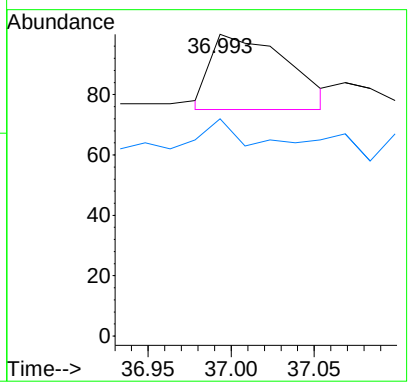


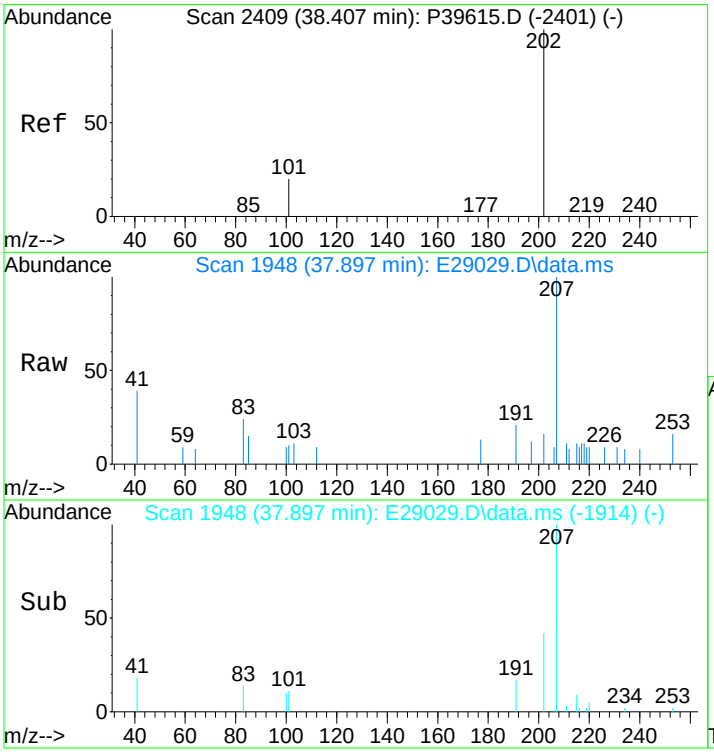


#58
Fluoranthene
Concen: 0.52 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:202 Resp: 80

Ion	Ratio	Lower	Upper
202	100		
101	295.0	10.5	15.7#

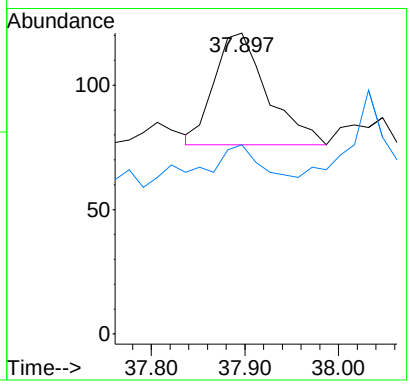


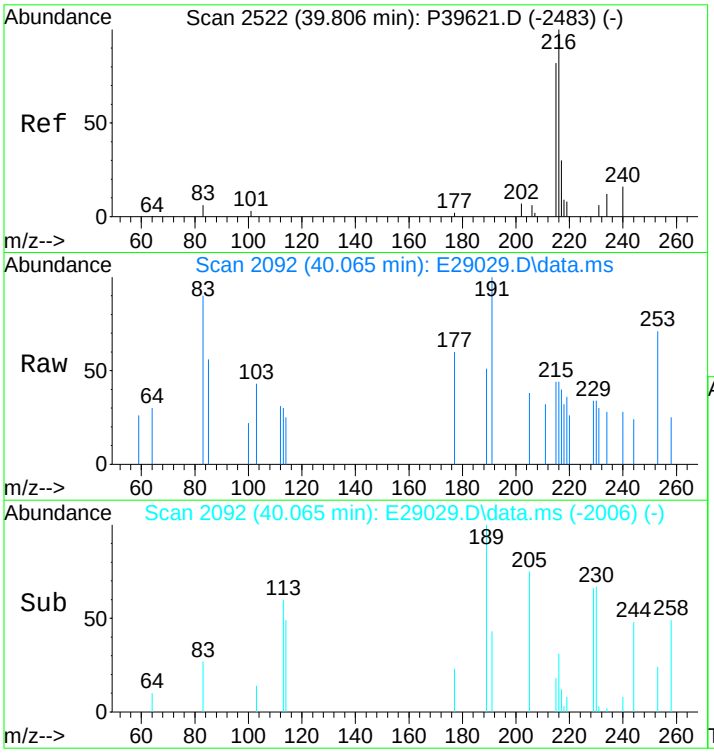


#60
Pyrene
Concen: 1.14 ng/mL
RT: 37.897 min Scan# 1948
Delta R.T. 0.015 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:202 Resp: 178

Ion	Ratio	Lower	Upper
202	100		
101	0.0	11.5	17.3#

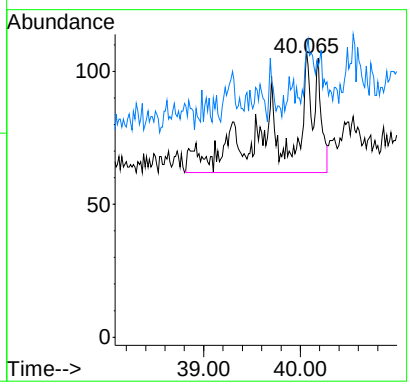


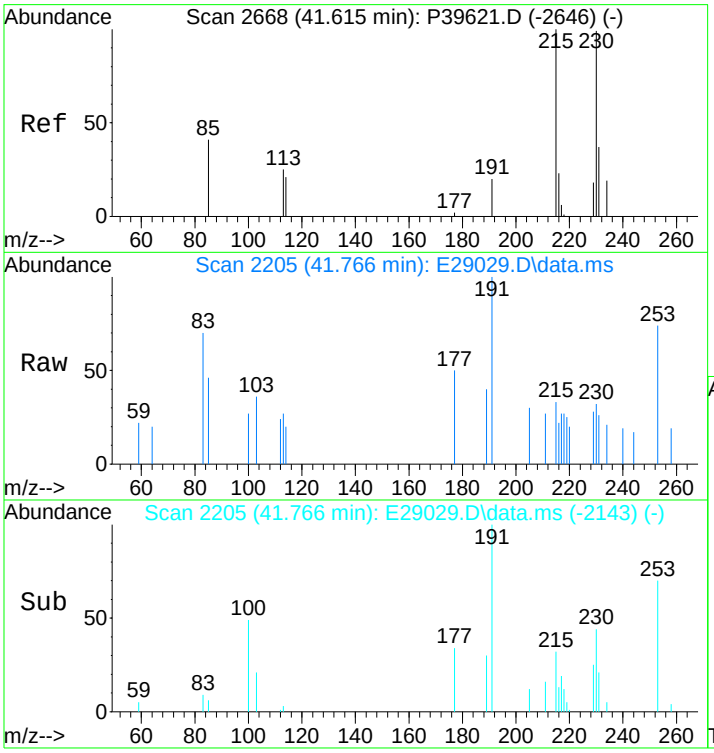


#61
C1-Fluoranthenes/Pyrenes
Concen: 7.11 ng/mL m
RT: 40.065 min Scan# 2092
Delta R.T. 1.127 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:216 Resp: 1110

Ion	Ratio	Lower	Upper
216	100		
215	10.4	73.4	110.2#

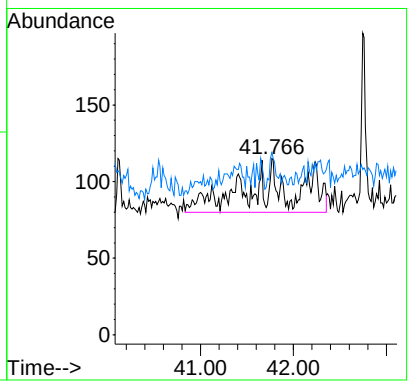


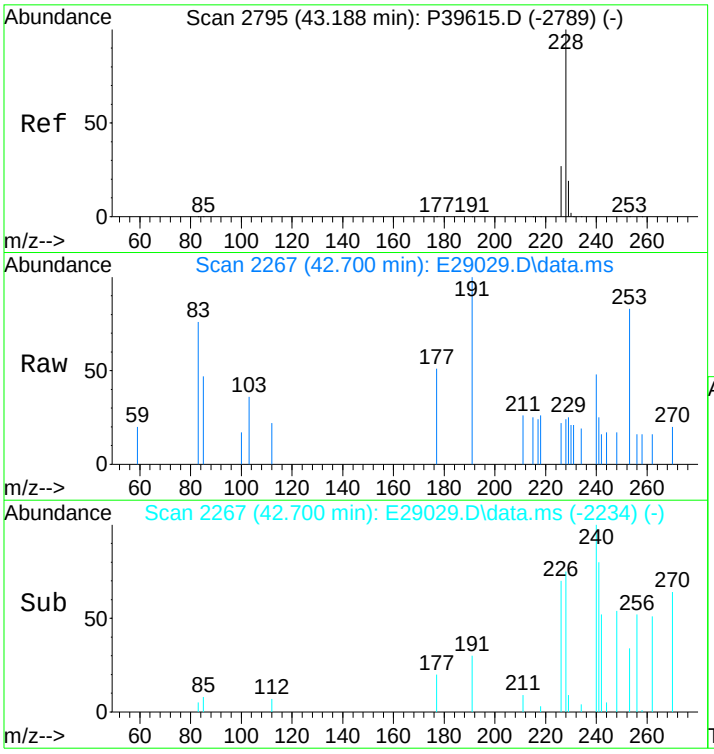


#62
C2-Fluoranthenes/Pyrenes
Concen: 7.38 ng/mL m
RT: 41.766 min Scan# 2205
Delta R.T. 0.863 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:230 Resp: 1153

Ion	Ratio	Lower	Upper
230	100		
215	0.0	93.8	140.8#

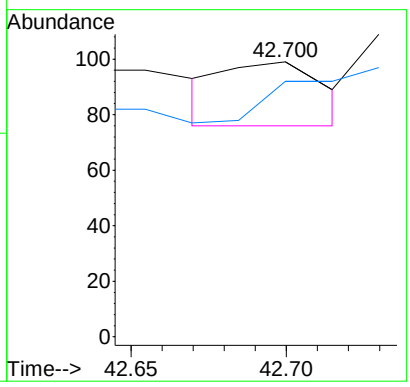


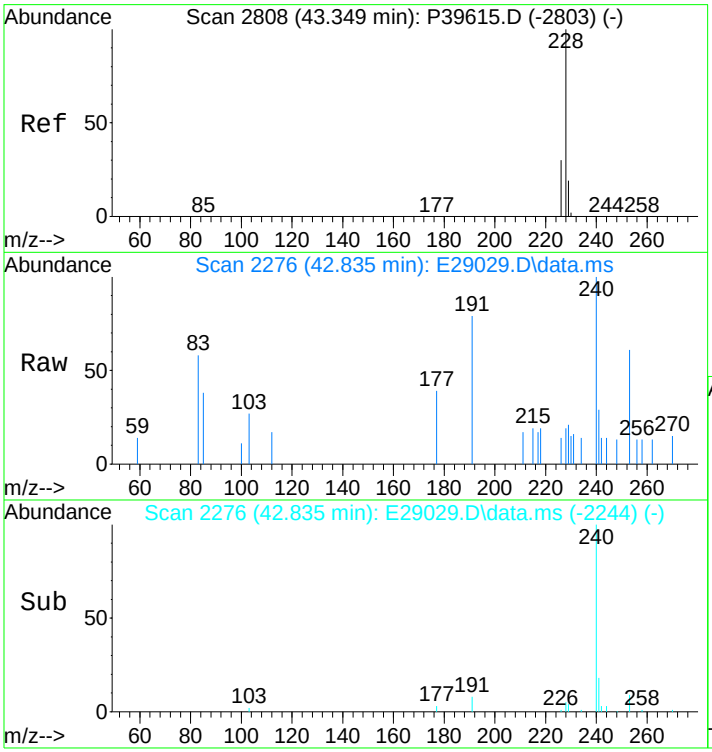


#75
Benz[a]anthracene
Concen: 0.33 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:228 Resp: 51

Ion	Ratio	Lower	Upper
228	100		
226	0.0	20.2	30.4#

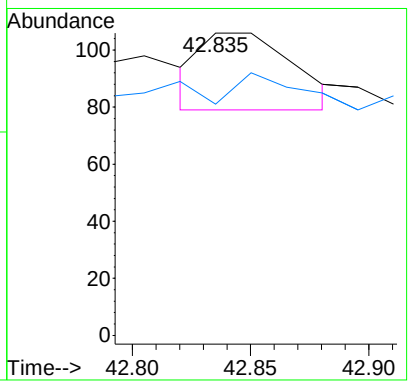


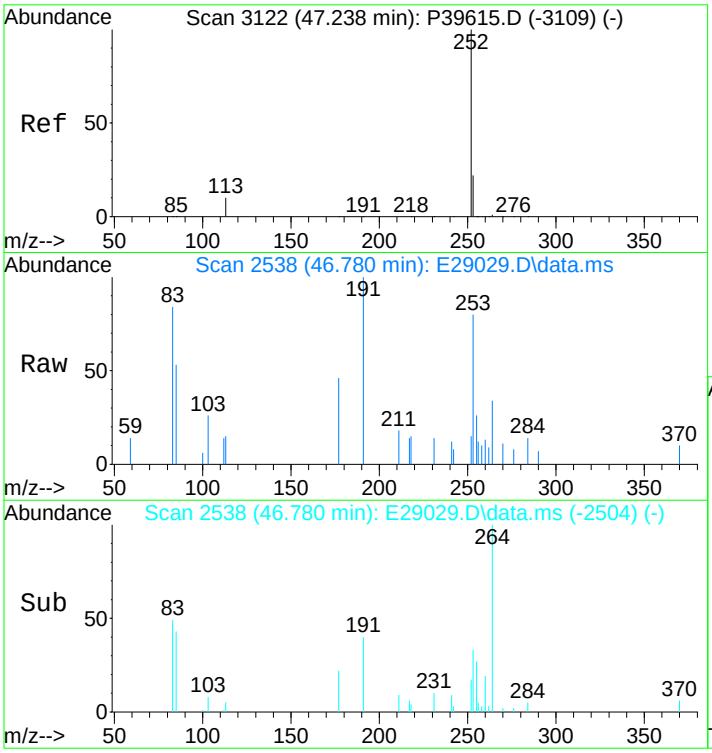


#77
Chrysene/Triphenylene
Concen: 0.46 ng/mL m
RT: 42.835 min Scan# 2276
Delta R.T. -0.015 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:228 Resp: 73

Ion	Ratio	Lower	Upper
228	100		
226	0.0	22.5	33.7#

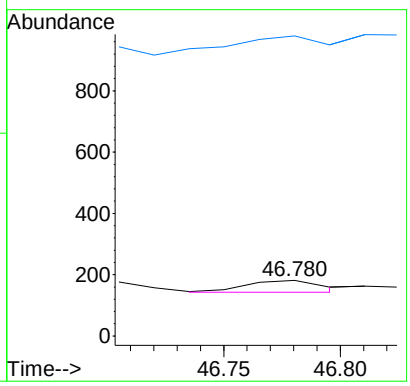


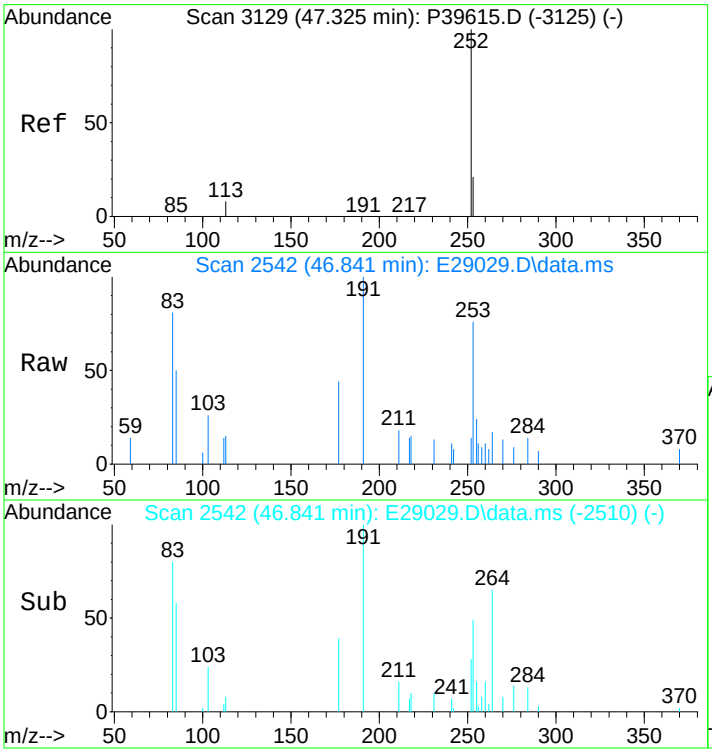


#84
Benzo[b]fluoranthene
Concen: 0.48 ng/mL m
RT: 46.780 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:252 Resp: 86

Ion	Ratio	Lower	Upper
252	100		
253	203.5	19.2	28.8#

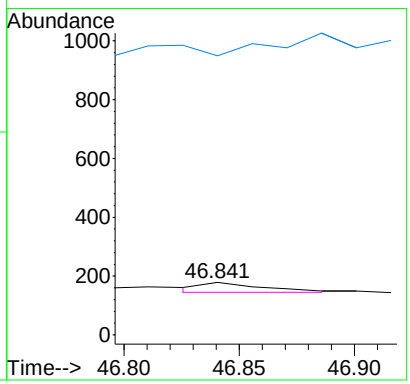


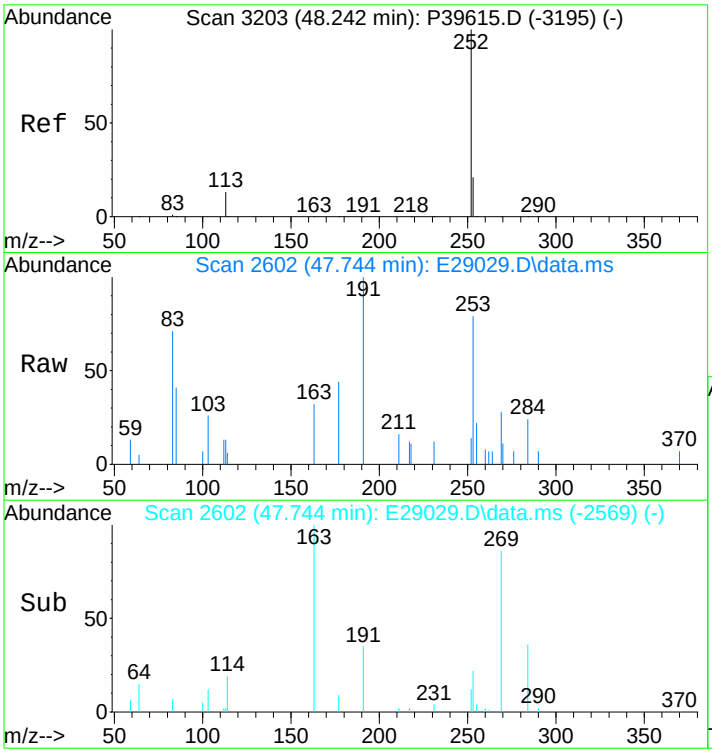


#85
Benzo[j]+[k]fluoranthene
Concen: 0.33 ng/mL m
RT: 46.841 min Scan# 2542
Delta R.T. -0.015 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:252 Resp: 61

Ion	Ratio	Lower	Upper
252	100		
253	286.9	19.3	28.9#

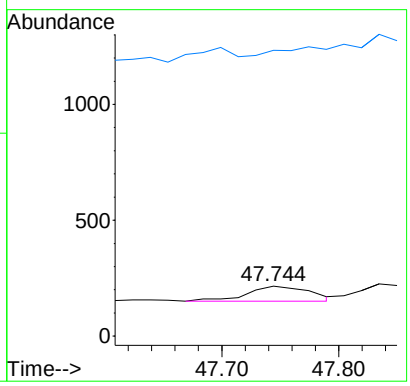


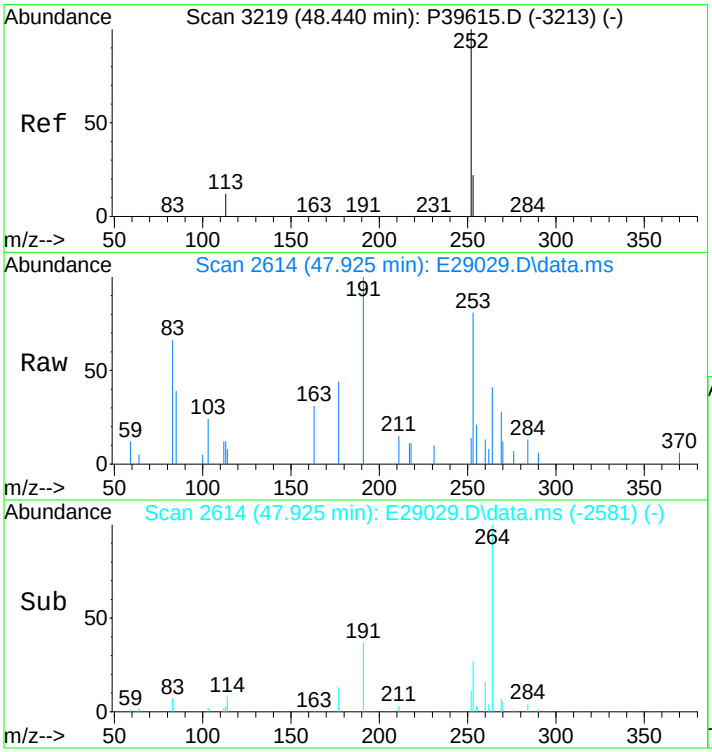


#87
Benzo[e]pyrene
Concen: 1.36 ng/mL
RT: 47.744 min Scan# 2602
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:252 Resp: 240

Ion	Ratio	Lower	Upper
252	100		
253	0.0	19.4	29.0#

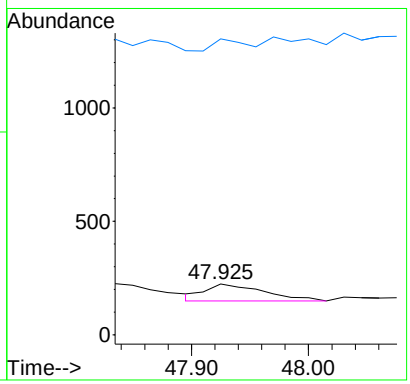


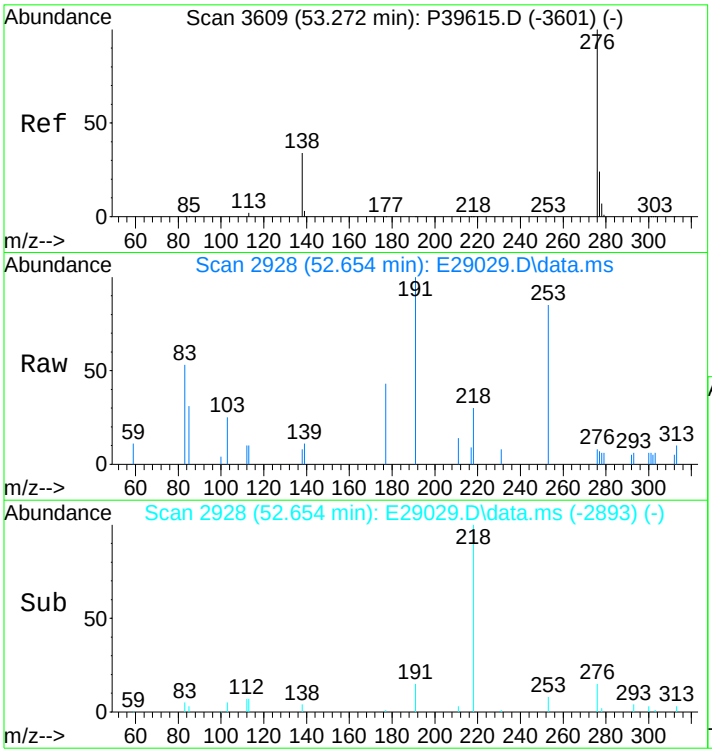


#89
Benzo[a]pyrene
Concen: 1.53 ng/mL
RT: 47.925 min Scan# 2614
Delta R.T. 0.000 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:252 Resp: 258

Ion	Ratio	Lower	Upper
252	100		
253	39.1	19.6	29.4#

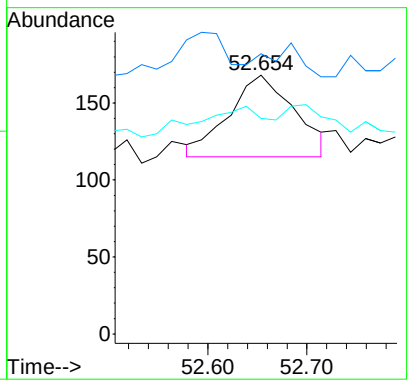


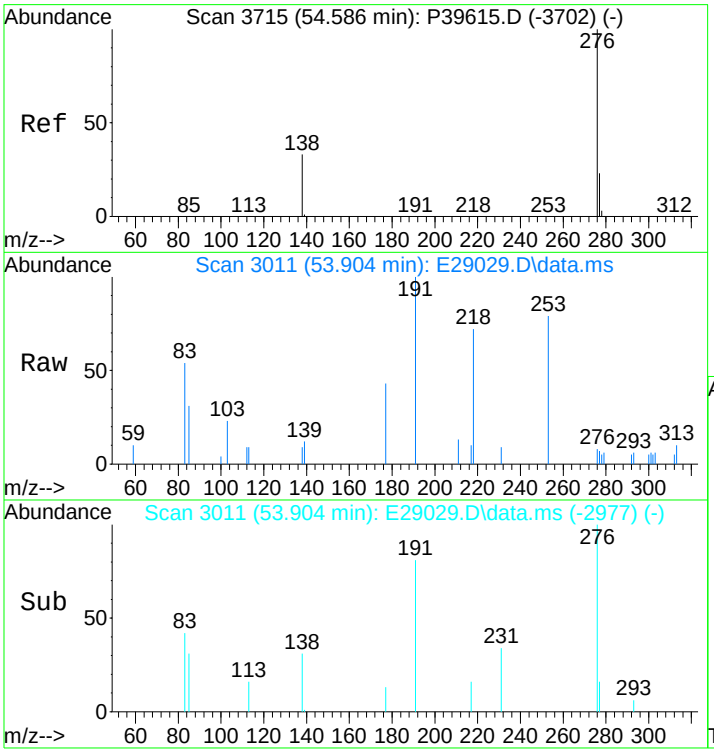


#91
Indeno[1,2,3-cd]pyrene
Concen: 1.23 ng/mL m
RT: 52.654 min Scan# 2928
Delta R.T. 0.030 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:276 Resp: 244

Ion	Ratio	Lower	Upper
276	100		
138	0.0	17.8	26.8#
277	0.0	20.0	30.0#

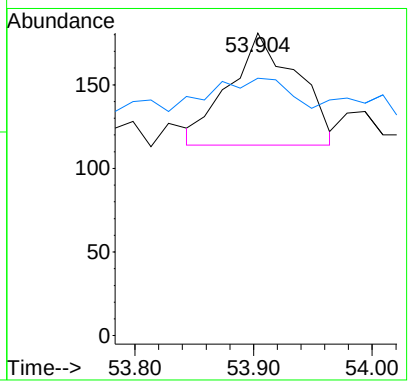


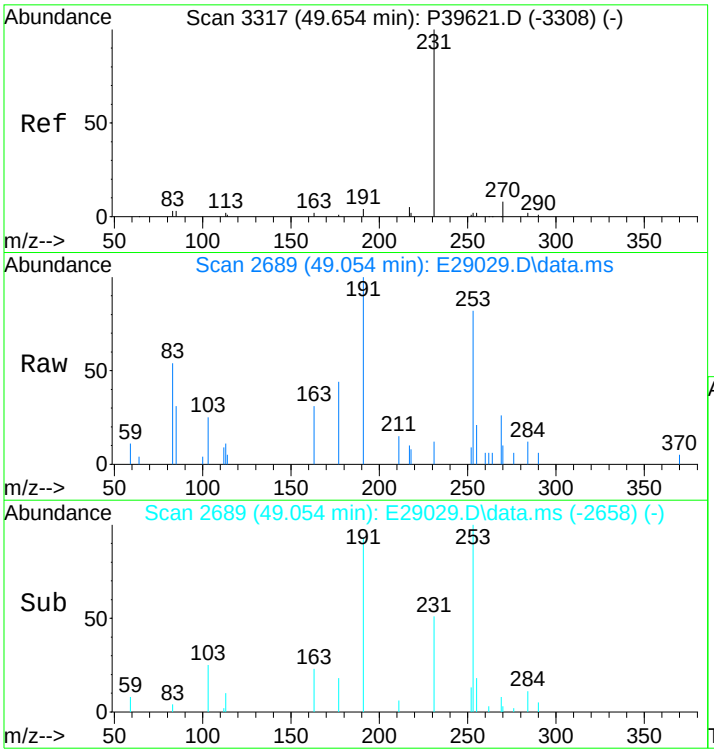


#93
Benzo[g,h,i]perylene
Concen: 1.24 ng/mL m
RT: 53.904 min Scan# 3011
Delta R.T. 0.015 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:276 Resp: 265

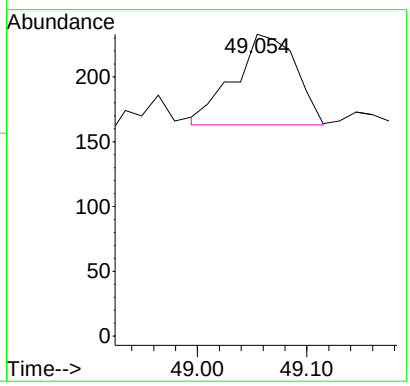
Ion	Ratio	Lower	Upper
276	100		
277	0.0	19.4	29.2#

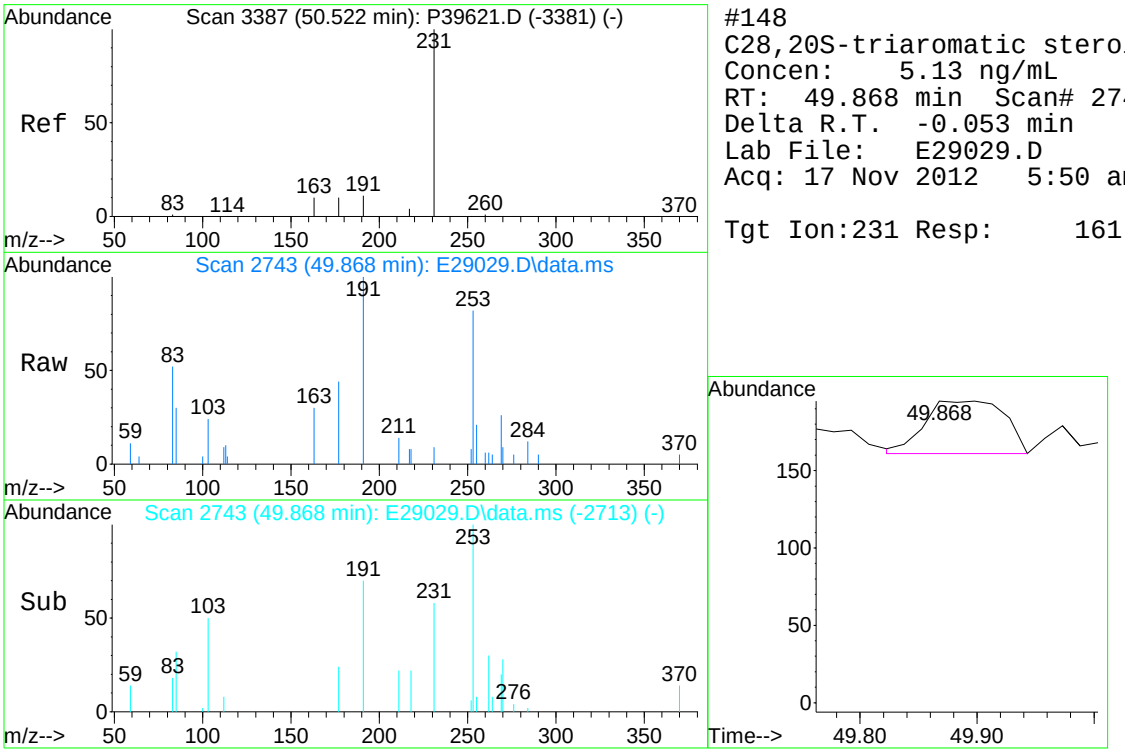




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 8.70 ng/mL m
RT: 49.054 min Scan# 2689
Delta R.T. -0.037 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

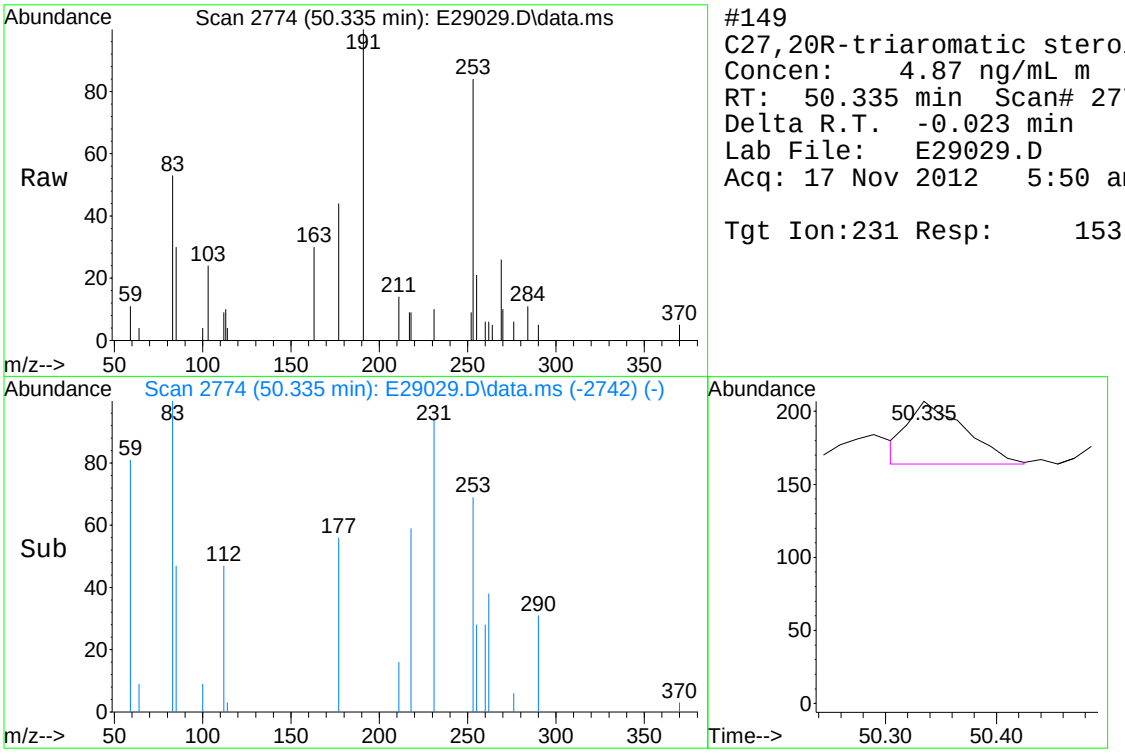
Tgt Ion:231 Resp: 273





#148
C28,20S-triaromatic steroid
Concen: 5.13 ng/mL
RT: 49.868 min Scan# 2743
Delta R.T. -0.053 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:231 Resp: 161



#149
C27,20R-triaromatic steroid
Concen: 4.87 ng/mL m
RT: 50.335 min Scan# 2774
Delta R.T. -0.023 min
Lab File: E29029.D
Acq: 17 Nov 2012 5:50 am

Tgt Ion:231 Resp: 153

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29031.D
Acq On : 17 Nov 2012 7:18 am
Operator : AC
Sample : SS110612LCS05
Misc : 1X ETR1210083
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 19 09:55:22 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	36962M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.745	240	83224	500.000	ng/mL	-0.01
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	55782	429.057	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.91%#			
42) Phenanthrene-d10	32.100	188	58821	441.600	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.16%#			
83) Benzo[b]fluoranthene-d12	46.690	264	77019	450.504	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.05%#			
88) Benzo[a]pyrene-d12	47.835	264	74320	448.652	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.87%#			
129) 5B(H)Cholane - Surr	43.362	217	15013	457.707	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.77%#			
Target Compounds						Qvalue
10) Naphthalene	19.319	128	66062	454.375	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	42481	458.753	ng/mL#	100
26) Acenaphthylene	25.597	152	66833M3	461.061	ng/mL	
27) Acenaphthene	26.335	153	41441	444.141	ng/mL	99
29) Fluorene	28.367	166	47633M4	457.723	ng/mL	
43) Phenanthrene	32.191	178	65518	450.947	ng/mL	100
55) Anthracene	32.387	178	63724M3	507.431	ng/mL	
58) Fluoranthene	36.994	202	77358	482.130	ng/mL	99
60) Pyrene	37.882	202	80160	491.525	ng/mL	99
75) Benz[a]anthracene	42.685	228	77336	477.198	ng/mL	100
77) Chrysene/Triphenylene	42.850	228	75811	454.375	ng/mL	100
84) Benzo[b]fluoranthene	46.766	252	94219	500.177	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	89287	460.714	ng/mL	96
89) Benzo[a]pyrene	47.925	252	87402	496.609	ng/mL	96
91) Indeno[1,2,3-cd]pyrene	52.624	276	113503M3	547.988	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.654	278	105333	477.602	ng/mL	98
93) Benzo[g,h,i]perylene	53.874	276	101424	454.136	ng/mL	99

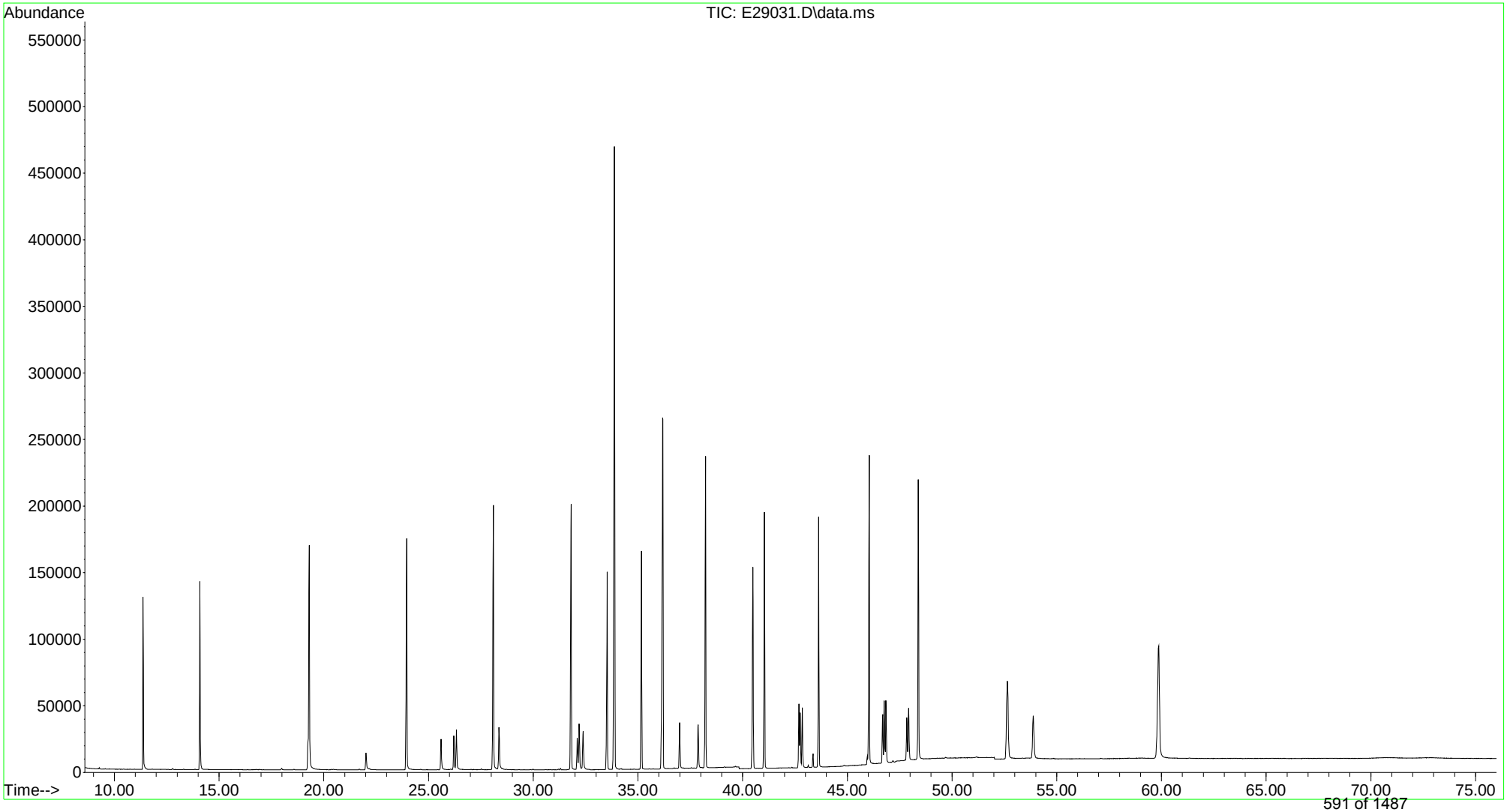
(#) = qualifier out of range (m) = manual integration (+) = signals summed

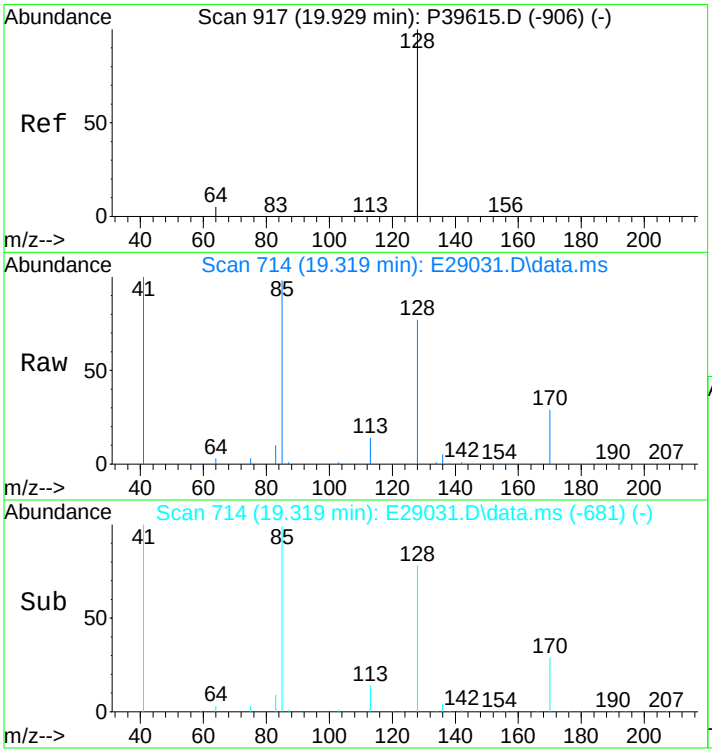
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29031.D
Acq On : 17 Nov 2012 7:18 am
Operator : AC
Sample : SS110612LCS05
Misc : 1X ETR1210083
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 19 09:55:22 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

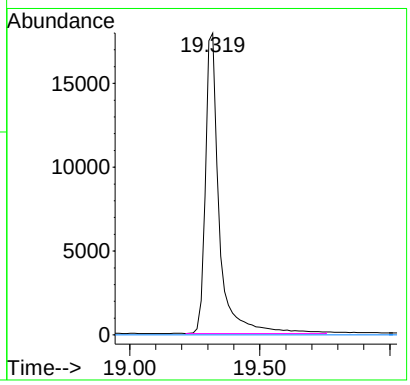


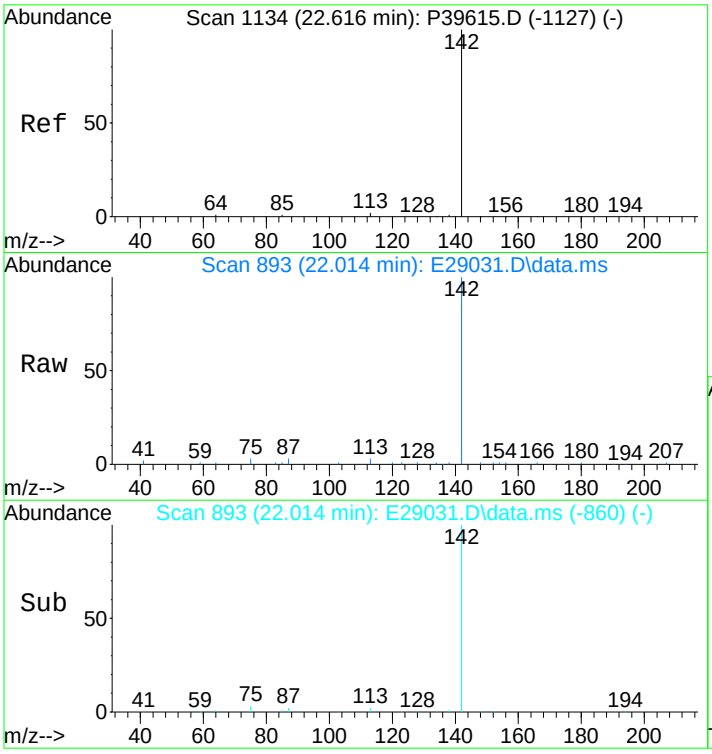


#10
Naphthalene
Concen: 454.37 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:128 Resp: 66062

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

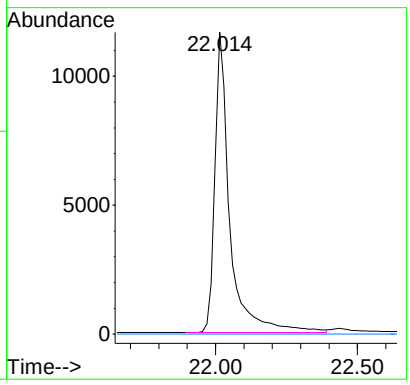


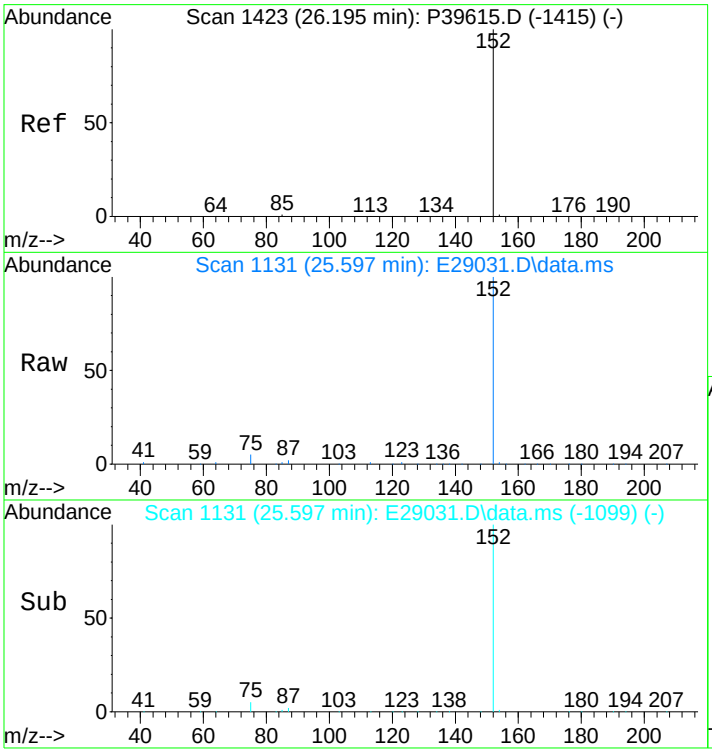


#16
2-Methylnaphthalene
Concen: 458.75 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:142 Resp: 42481

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

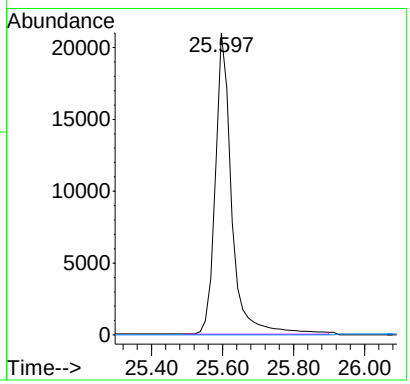


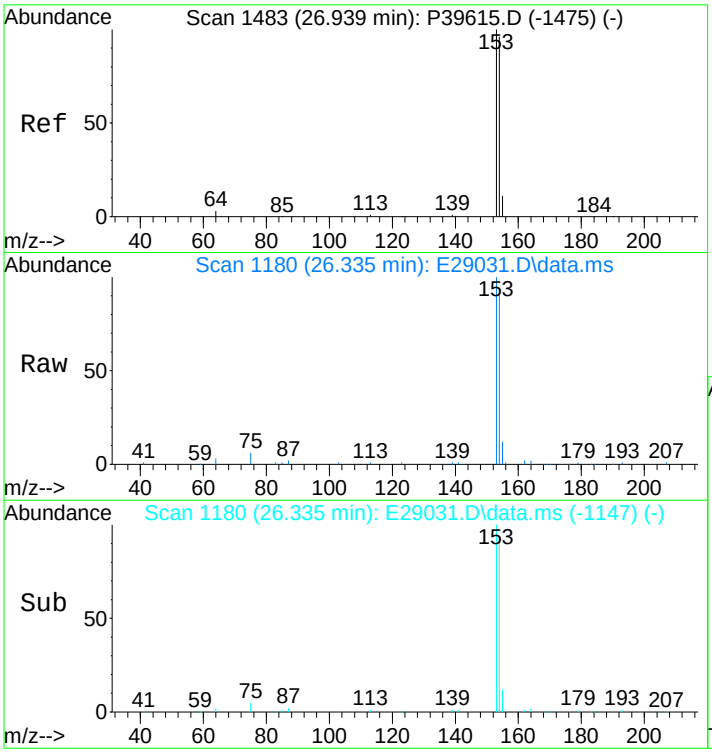


#26
Acenaphthylene
Concen: 461.06 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:152 Resp: 66833

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

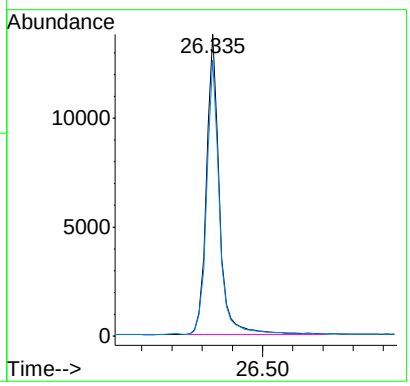


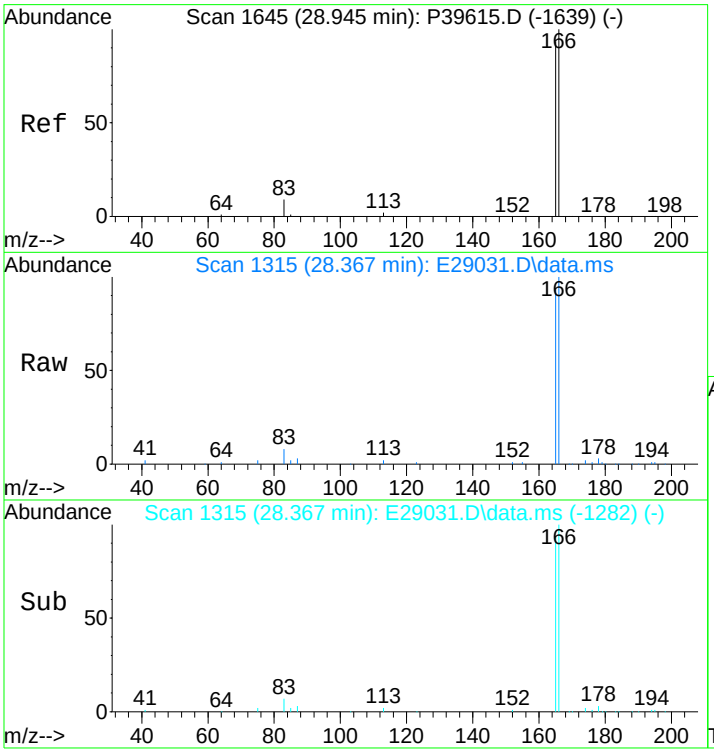


#27
Acenaphthene
Concen: 444.14 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:153 Resp: 41441

Ion	Ratio	Lower	Upper
153	100		
154	90.7	73.0	109.4

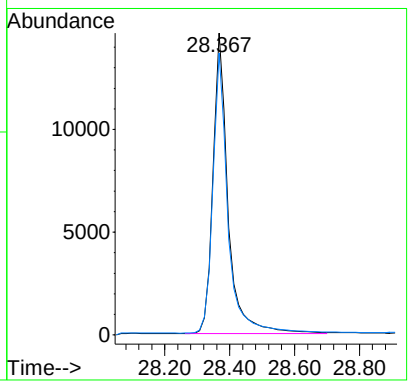


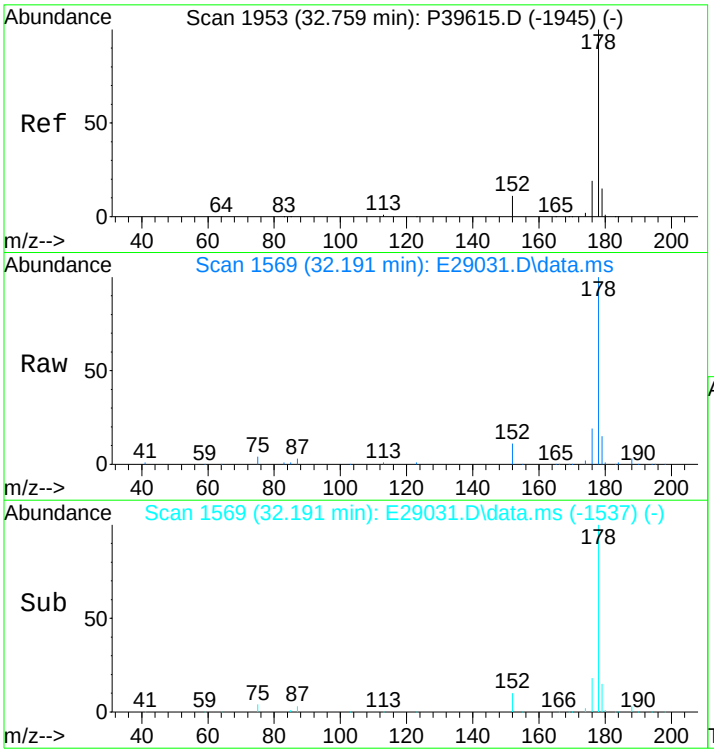


#29
Fluorene
Concen: 457.72 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:166 Resp: 47633

Ion	Ratio	Lower	Upper
166	100		
165	93.0	74.4	111.6

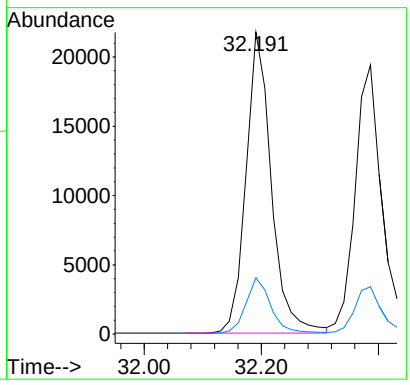


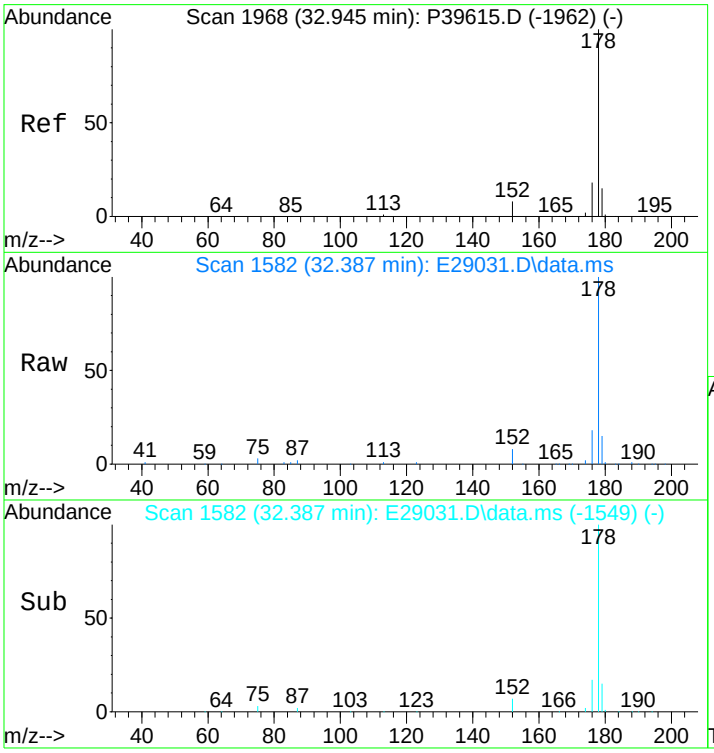


#43
Phenanthrene
Concen: 450.95 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:178 Resp: 65518

Ion	Ratio	Lower	Upper
178	100		
176	18.2	14.6	21.8

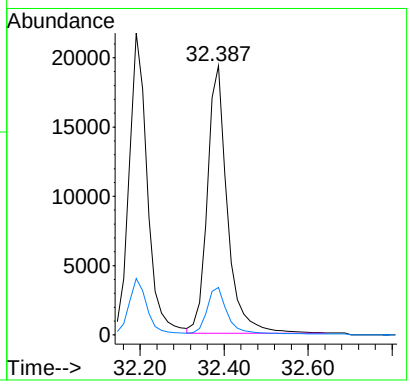


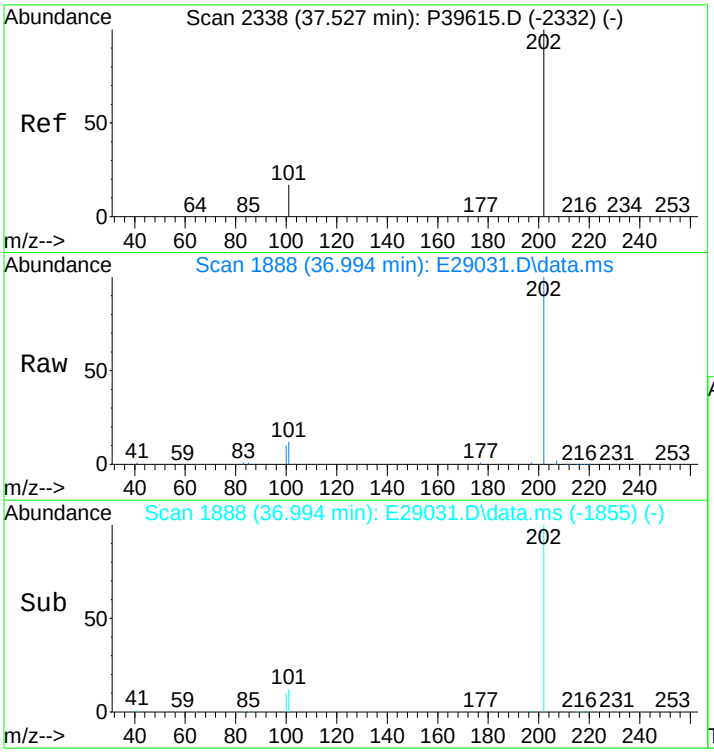


#55
Anthracene
Concen: 507.43 ng/mL m
RT: 32.387 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:178 Resp: 63724

Ion	Ratio	Lower	Upper
178	100		
176	20.0	14.2	21.2

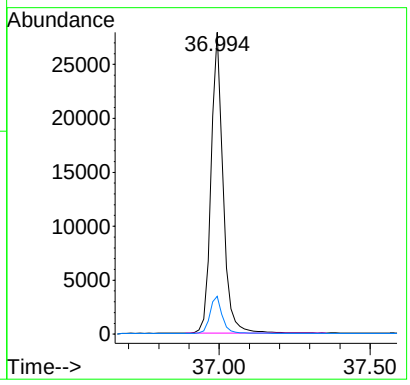


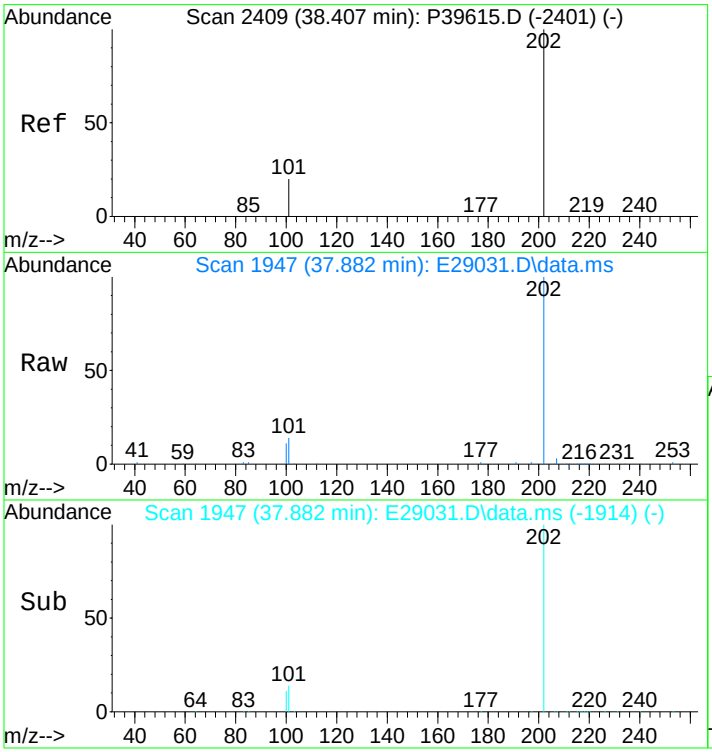


#58
Fluoranthene
Concen: 482.13 ng/mL
RT: 36.994 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:202 Resp: 77358

Ion	Ratio	Lower	Upper
202	100		
101	12.7	10.5	15.7

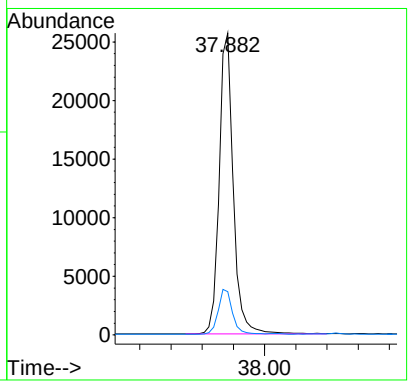


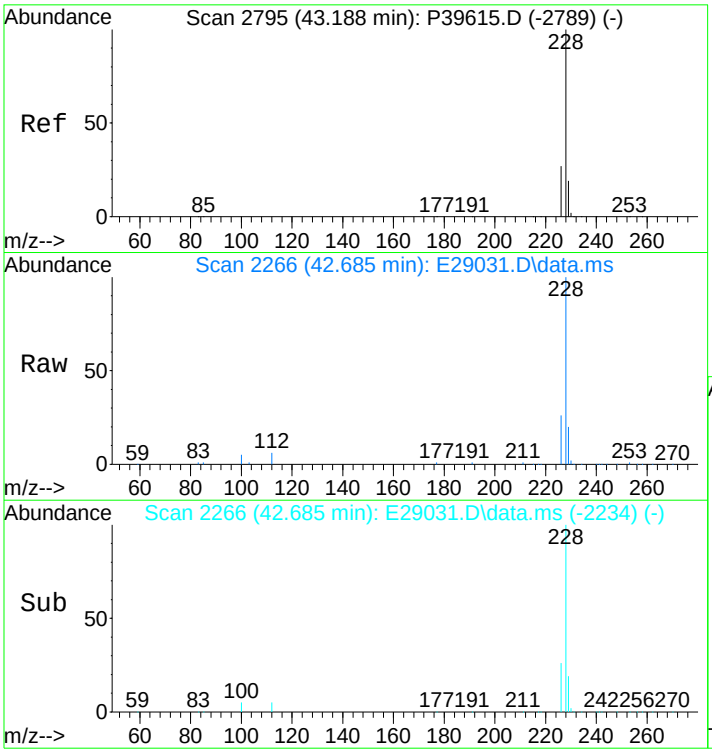


#60
Pyrene
Concen: 491.52 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:202 Resp: 80160

Ion	Ratio	Lower	Upper
202	100		
101	15.0	11.5	17.3

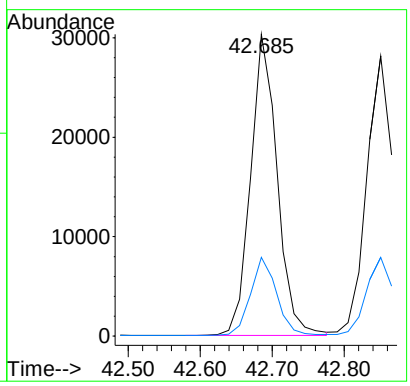


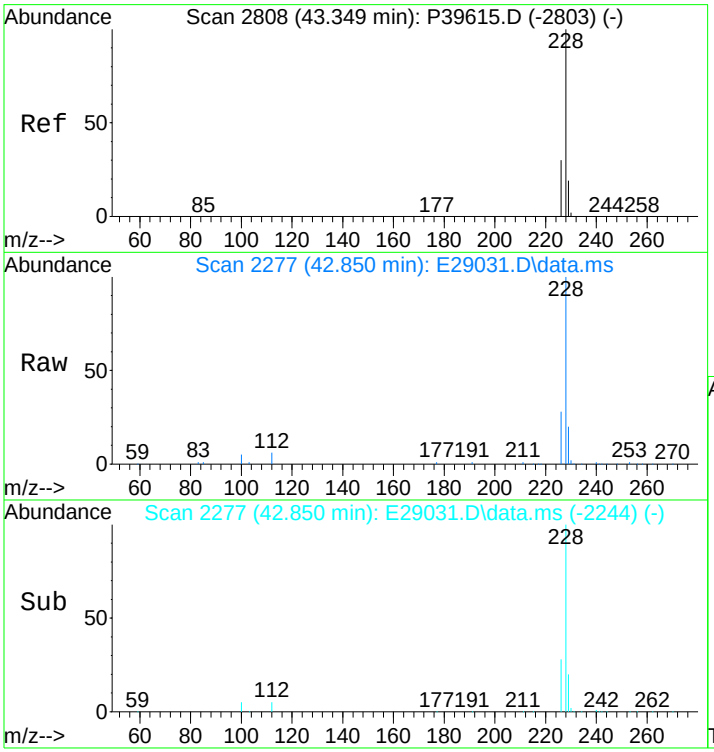


#75
Benz[a]anthracene
Concen: 477.20 ng/mL
RT: 42.685 min Scan# 2266
Delta R.T. -0.015 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:228 Resp: 77336

Ion	Ratio	Lower	Upper
228	100		
226	25.5	20.2	30.4

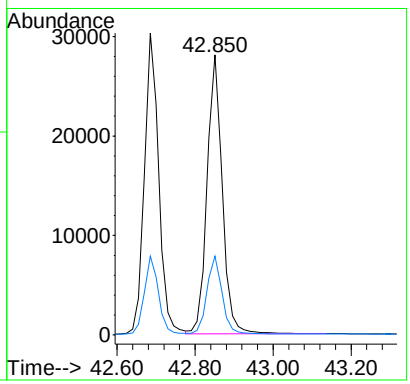


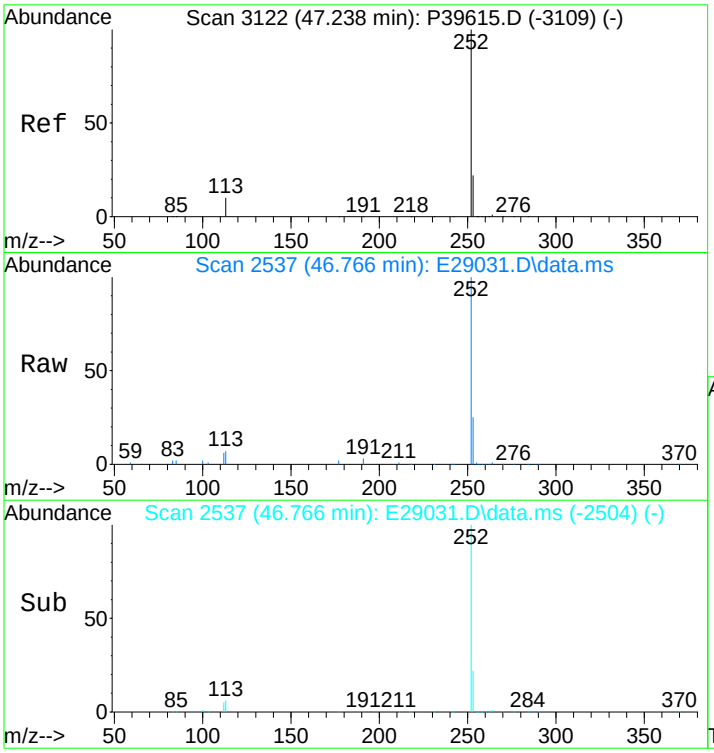


#77
Chrysene/Triphenylene
Concen: 454.38 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:228 Resp: 75811

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.5	33.7

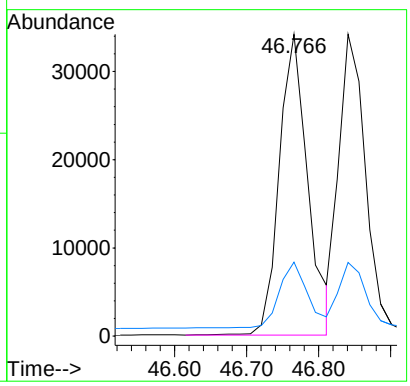


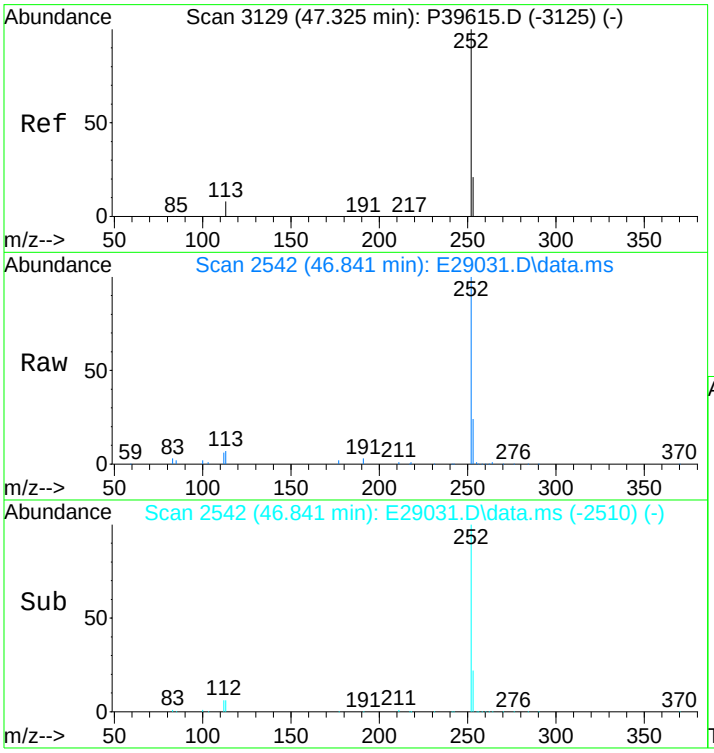


#84
Benzo[b]fluoranthene
Concen: 500.18 ng/mL
RT: 46.766 min Scan# 2537
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:252 Resp: 94219

Ion	Ratio	Lower	Upper
252	100		
253	22.6	19.2	28.8

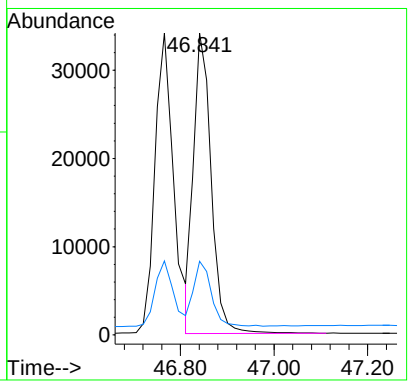


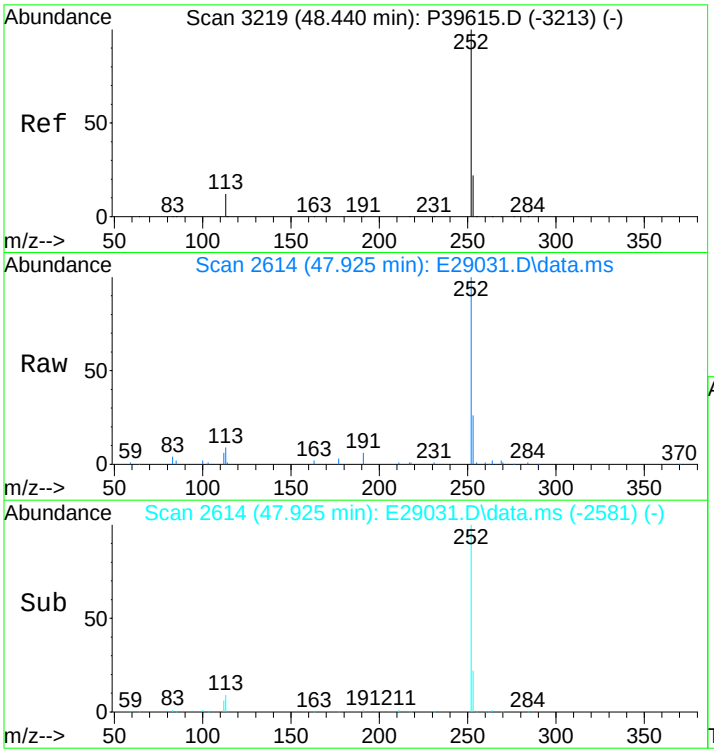


#85
Benzo[j]+[k]fluoranthene
Concen: 460.71 ng/mL
RT: 46.841 min Scan# 2542
Delta R.T. -0.015 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:252 Resp: 89287

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.3	28.9

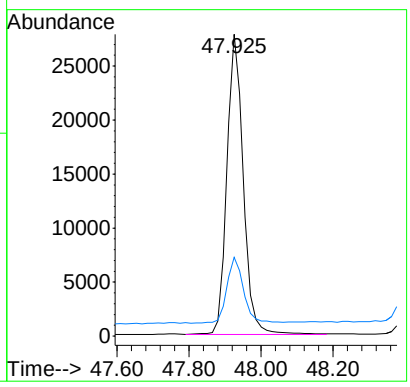


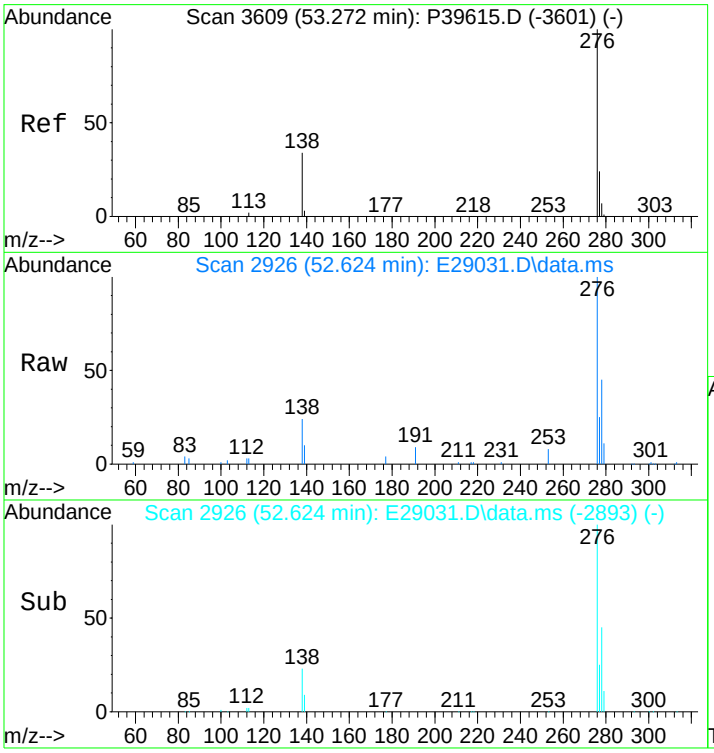


#89
Benzo[a]pyrene
Concen: 496.61 ng/mL
RT: 47.925 min Scan# 2614
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:252 Resp: 87402

Ion	Ratio	Lower	Upper
252	100		
253	22.6	19.6	29.4

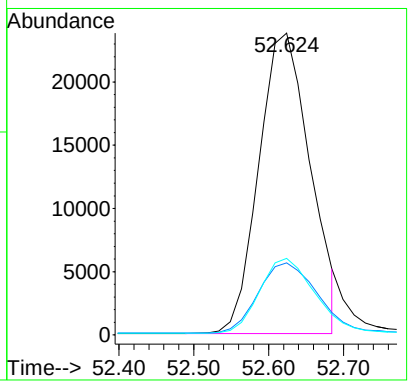


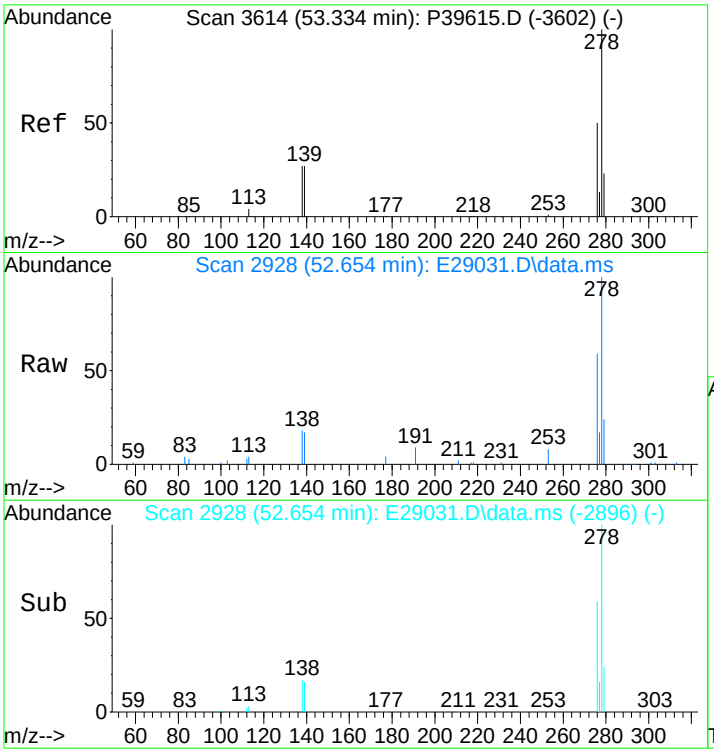


#91
Indeno[1,2,3-cd]pyrene
Concen: 547.99 ng/mL m
RT: 52.624 min Scan# 2926
Delta R.T. 0.000 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:276 Resp: 113503

Ion	Ratio	Lower	Upper
276	100		
138	27.2	17.8	26.8#
277	27.2	20.0	30.0

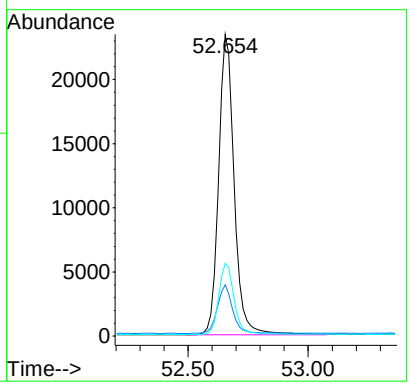


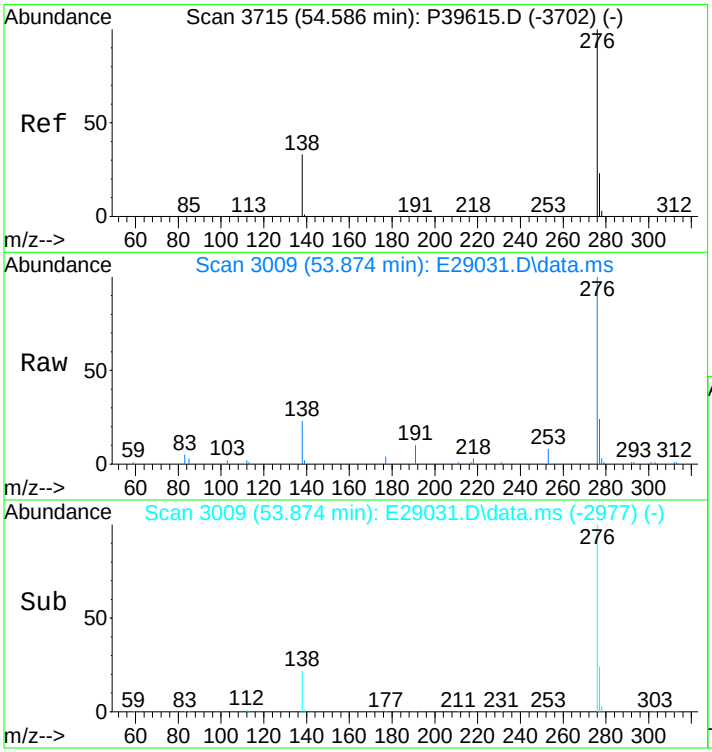


#92
Dibenz[ah]+[ac]anthracene
Concen: 477.60 ng/mL
RT: 52.654 min Scan# 2928
Delta R.T. -0.015 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:278 Resp: 105333

Ion	Ratio	Lower	Upper
278	100		
139	15.8	13.0	19.4
279	23.2	19.4	29.2

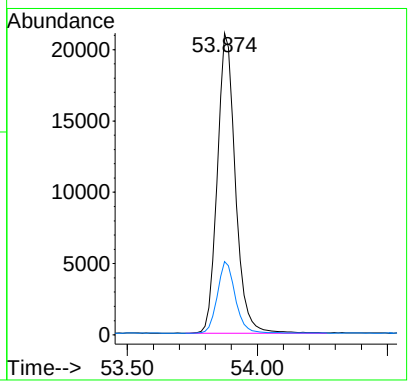




#93
Benzo[g,h,i]perylene
Concen: 454.14 ng/mL
RT: 53.874 min Scan# 3009
Delta R.T. -0.015 min
Lab File: E29031.D
Acq: 17 Nov 2012 7:18 am

Tgt Ion:276 Resp: 101424

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.4	29.2



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29033.D
Acq On : 17 Nov 2012 8:46 am
Operator : AC
Sample : SS110612LCSD05
Misc : 1X ETR1210083
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 19 09:56:36 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	35691	500.000	ng/mL	0.00
74) Chrysene-d12	42.745	240	77805	500.000	ng/mL	-0.01
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	42624	339.525	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 33.95%#			
42) Phenanthrene-d10	32.100	188	45804	356.120	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.61%#			
83) Benzo[b]fluoranthene-d12	46.690	264	59135	369.987	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 37.00%#			
88) Benzo[a]pyrene-d12	47.835	264	56115	362.346	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.23%#			
129) 5B(H)Cholane - Surr	43.362	217	11669	380.536	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 38.05%#			
Target Compounds						Qvalue
10) Naphthalene	19.319	128	52593	374.617	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	33281	372.201	ng/mL#	100
26) Acenaphthylene	25.597	152	51988M3	371.422	ng/mL	
27) Acenaphthene	26.335	153	33014	366.425	ng/mL	98
29) Fluorene	28.367	166	37466	372.846	ng/mL	99
43) Phenanthrene	32.191	178	50929	363.017	ng/mL	100
55) Anthracene	32.386	178	50174M3	413.761	ng/mL	
58) Fluoranthene	36.993	202	59745	385.618	ng/mL	100
60) Pyrene	37.882	202	61797	392.421	ng/mL	99
75) Benz[a]anthracene	42.685	228	59807	394.739	ng/mL	100
77) Chrysene/Triphenylene	42.850	228	58734	376.542	ng/mL	100
84) Benzo[b]fluoranthene	46.765	252	71803	407.726	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.841	252	68770	379.562	ng/mL	96
89) Benzo[a]pyrene	47.925	252	66428	403.725	ng/mL	98
91) Indeno[1,2,3-cd]pyrene	52.624	276	85697M3	442.558	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.654	278	80270	389.311	ng/mL	98
93) Benzo[g,h,i]perylene	53.874	276	77664	371.969	ng/mL	99

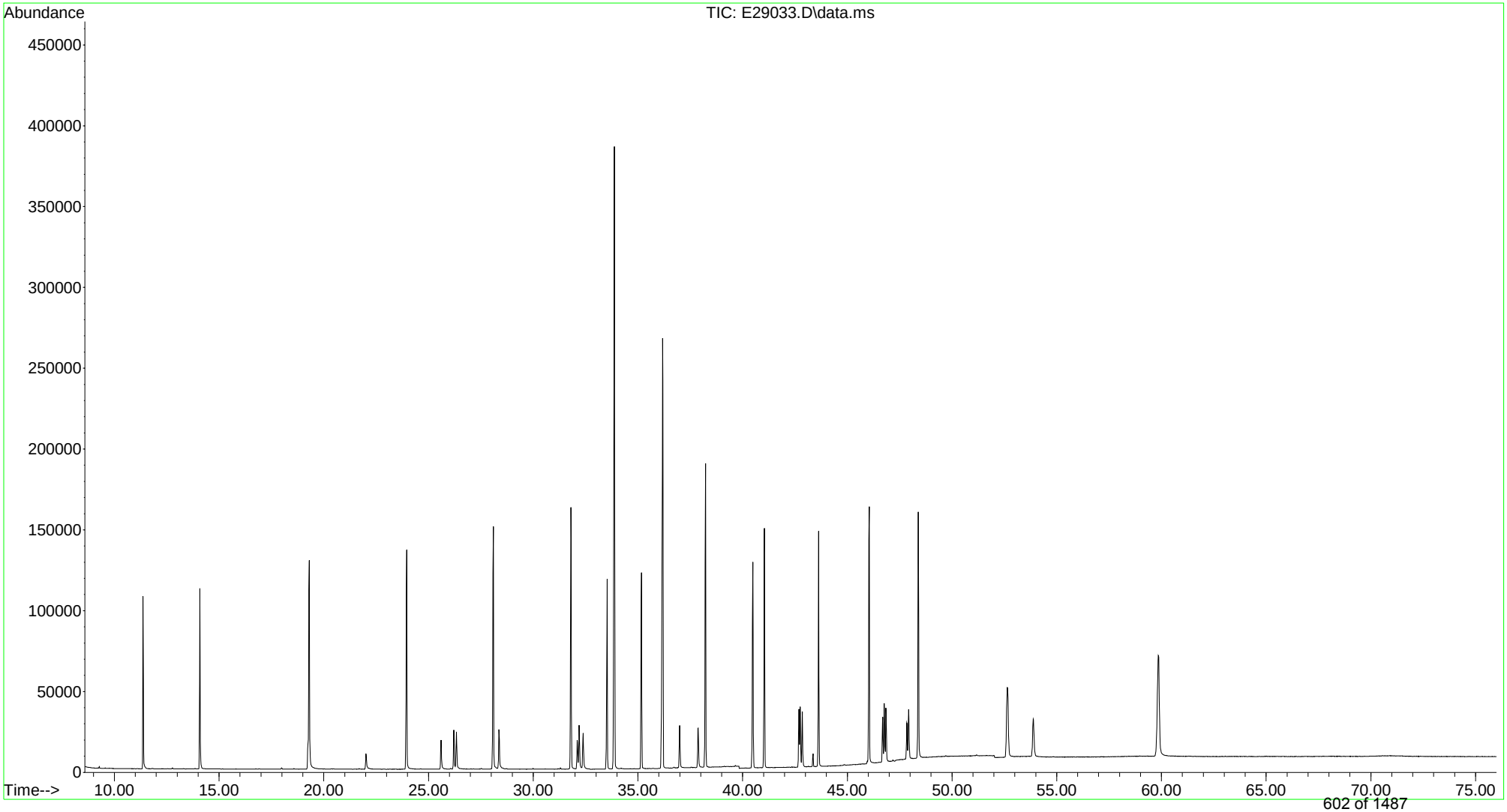
(#) = qualifier out of range (m) = manual integration (+) = signals summed

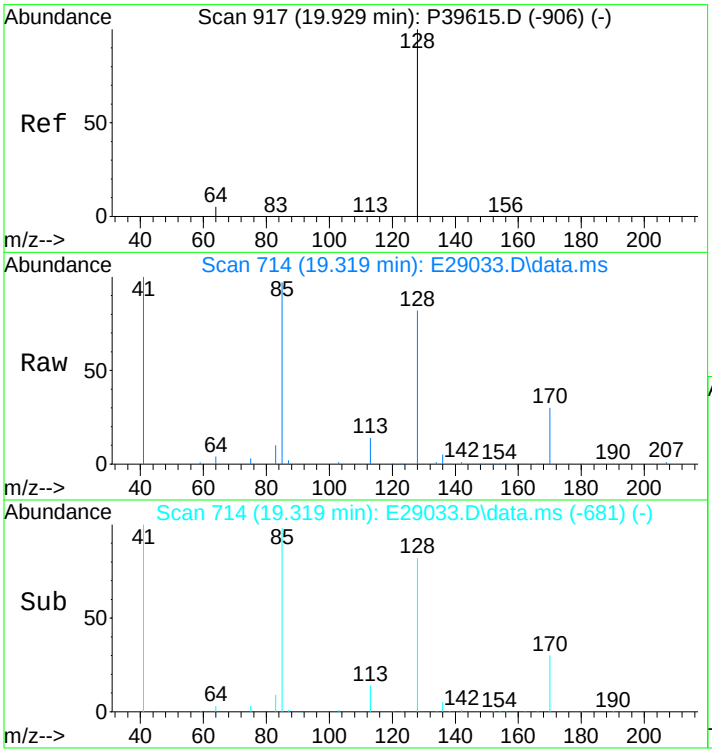
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29033.D
Acq On : 17 Nov 2012 8:46 am
Operator : AC
Sample : SS110612LCSD05
Misc : 1X ETR1210083
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 19 09:56:36 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:49:46 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

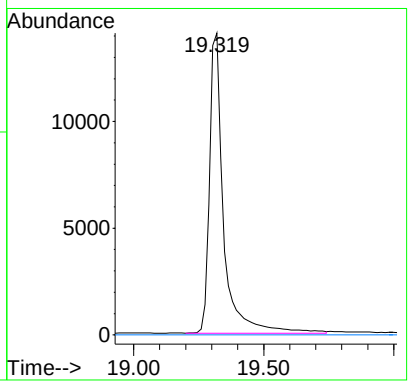


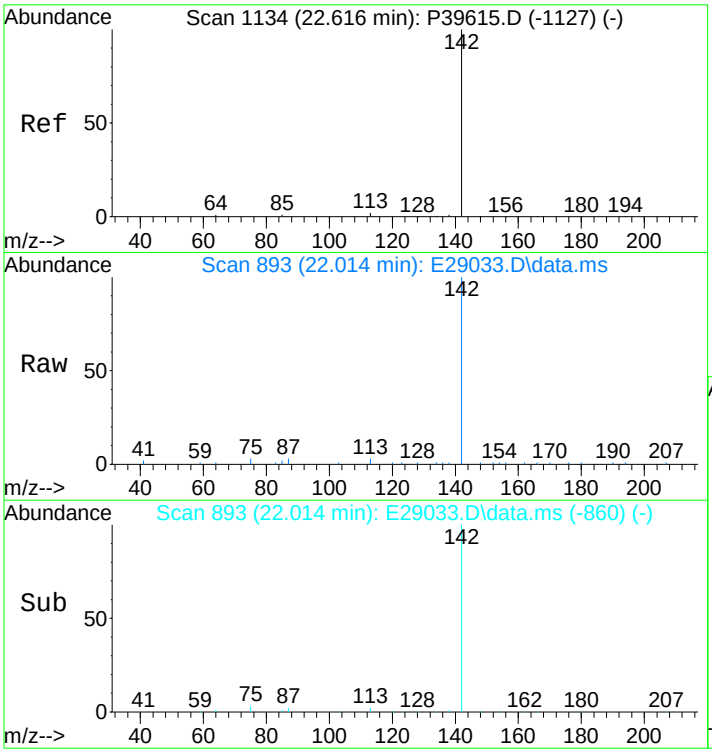


#10
Naphthalene
Concen: 374.62 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:128 Resp: 52593

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

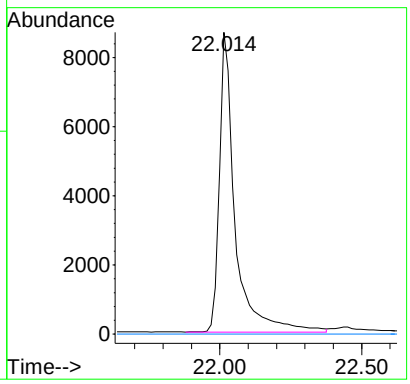


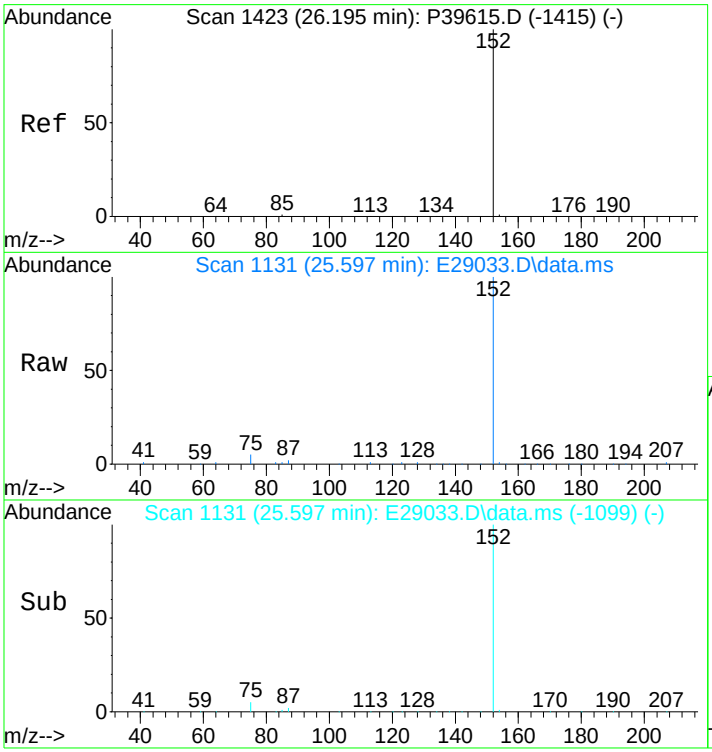


#16
2-Methylnaphthalene
Concen: 372.20 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:142 Resp: 33281

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

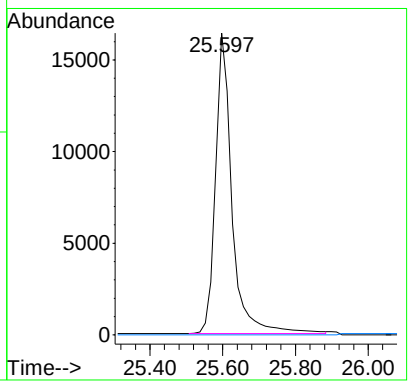


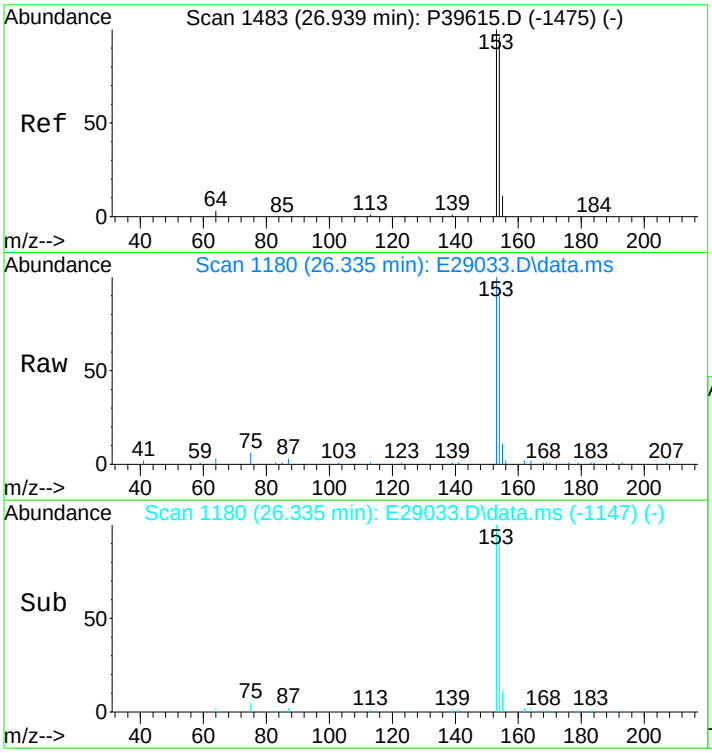


#26
Acenaphthylene
Concen: 371.42 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:152 Resp: 51988

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

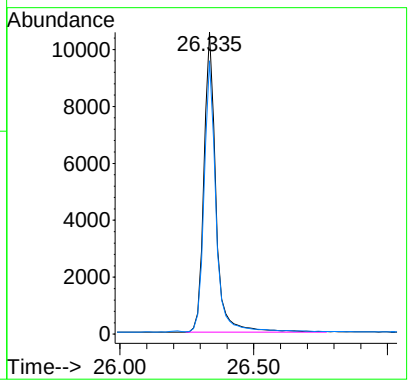


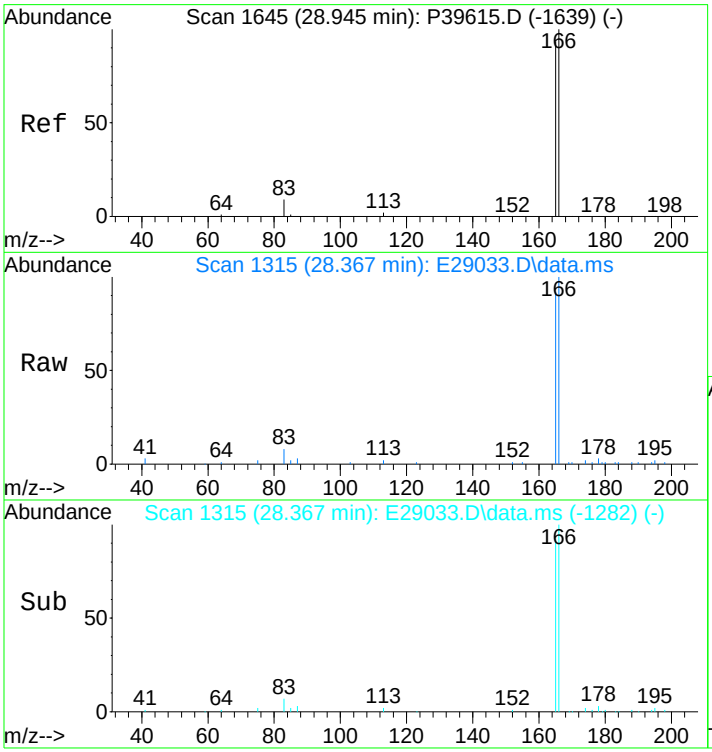


#27
Acenaphthene
Concen: 366.43 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:153 Resp: 33014

Ion	Ratio	Lower	Upper
153	100		
154	89.2	73.0	109.4

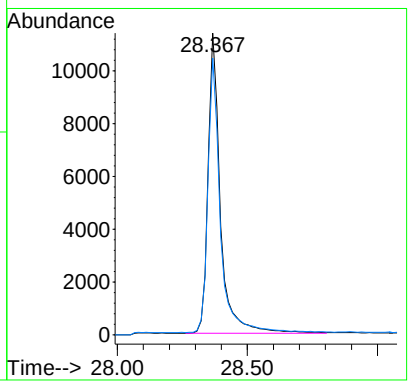


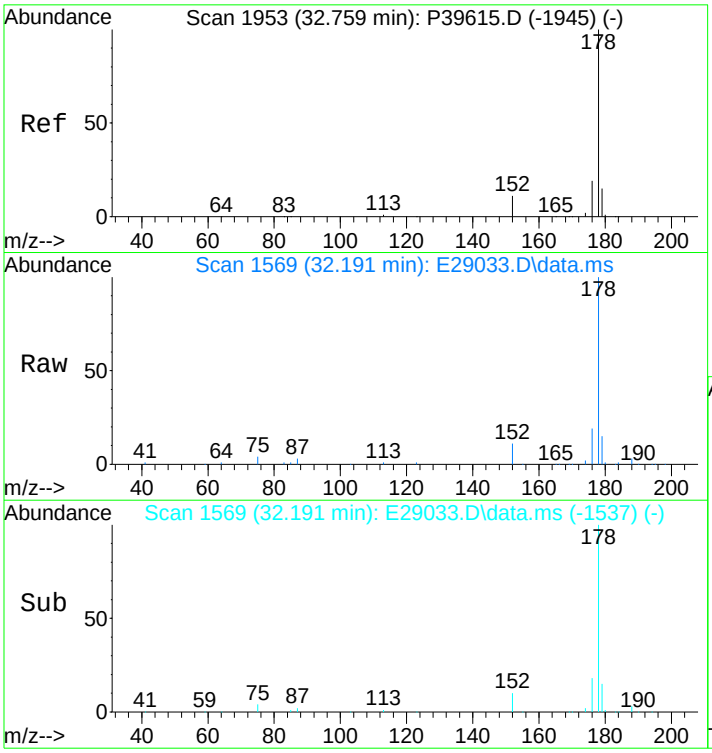


#29
Fluorene
Concen: 372.85 ng/mL
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:166 Resp: 37466

Ion	Ratio	Lower	Upper
166	100		
165	91.7	74.4	111.6

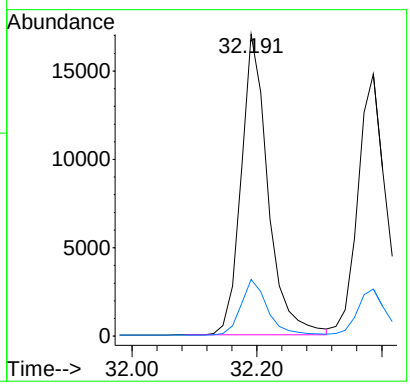


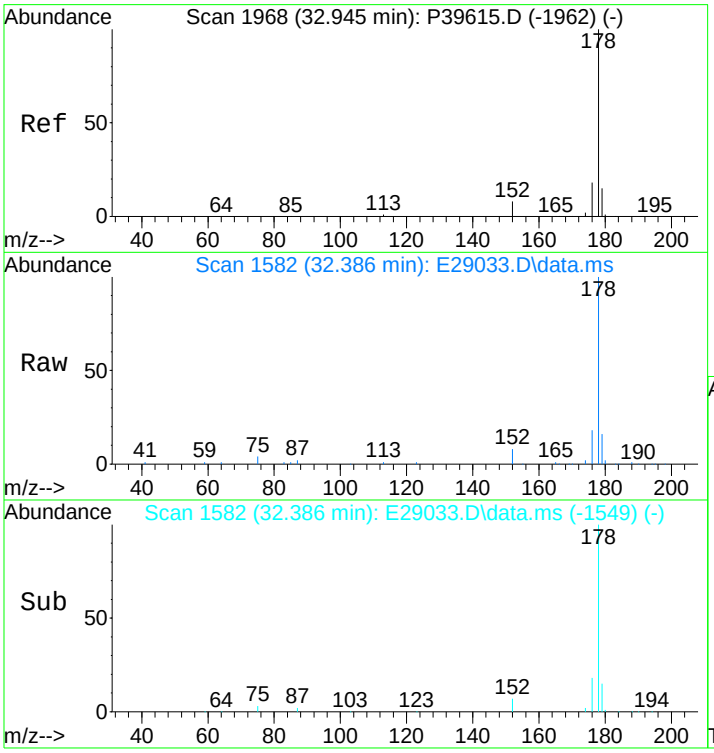


#43
Phenanthrene
Concen: 363.02 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:178 Resp: 50929

Ion	Ratio	Lower	Upper
178	100		
176	18.3	14.6	21.8

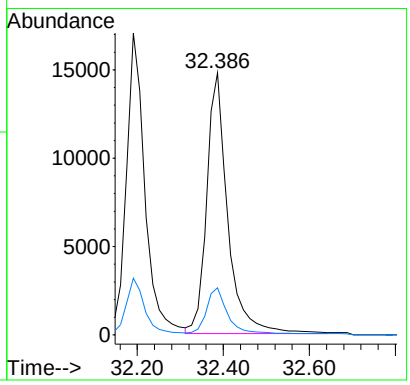


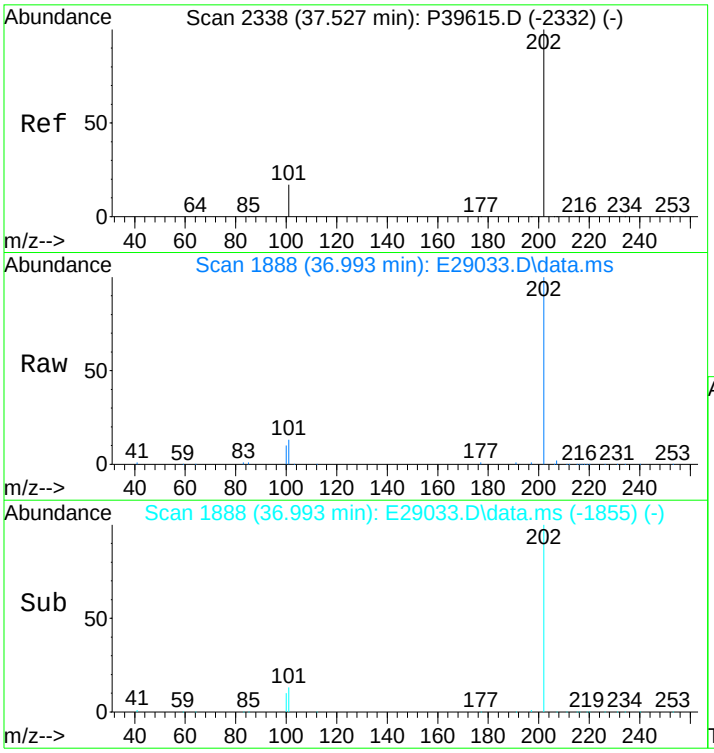


#55
Anthracene
Concen: 413.76 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:178 Resp: 50174

Ion	Ratio	Lower	Upper
178	100		
176	20.4	14.2	21.2

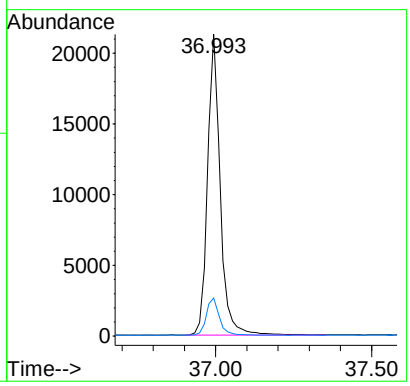


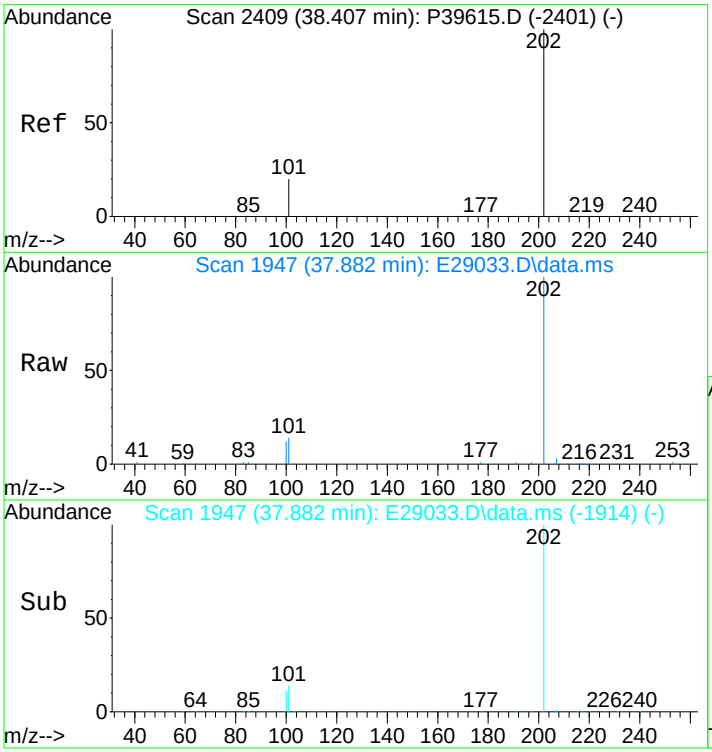


#58
Fluoranthene
Concen: 385.62 ng/mL
RT: 36.993 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:202 Resp: 59745

Ion	Ratio	Lower	Upper
202	100		
101	12.9	10.5	15.7

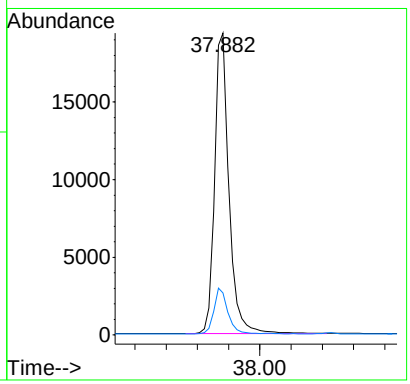


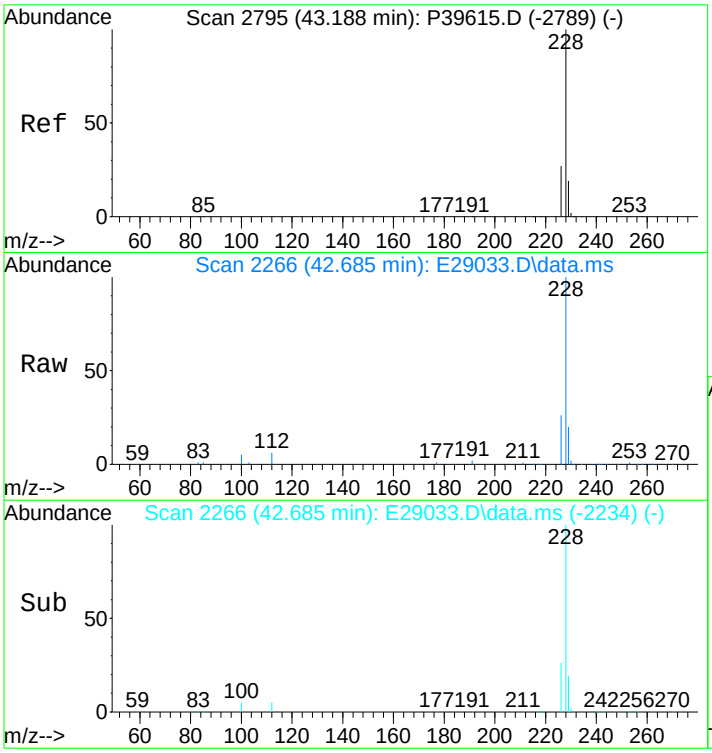


#60
Pyrene
Concen: 392.42 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:202 Resp: 61797

Ion	Ratio	Lower	Upper
202	100		
101	14.9	11.5	17.3

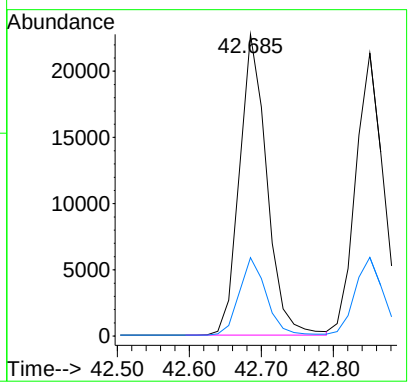


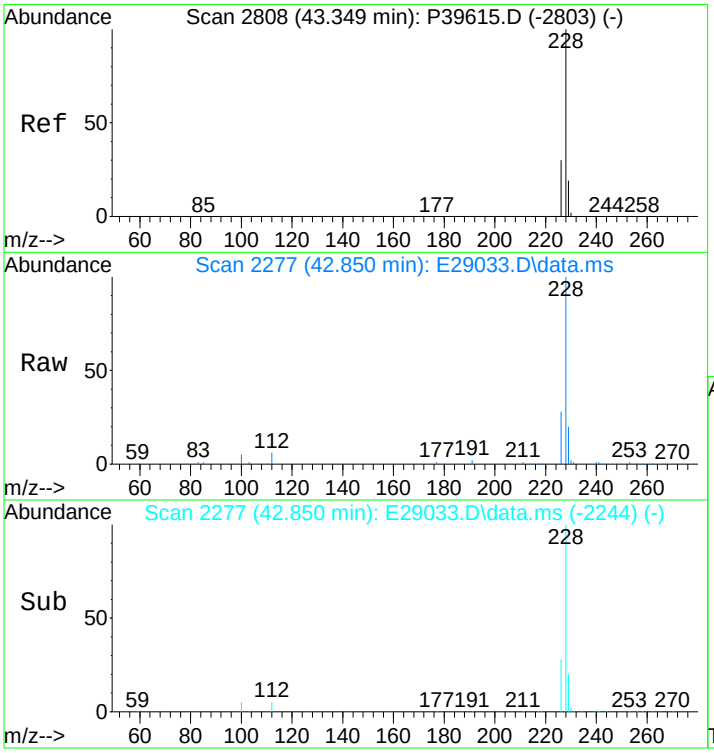


#75
Benz[a]anthracene
Concen: 394.74 ng/mL
RT: 42.685 min Scan# 2266
Delta R.T. -0.015 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:228 Resp: 59807

Ion	Ratio	Lower	Upper
228	100		
226	25.4	20.2	30.4

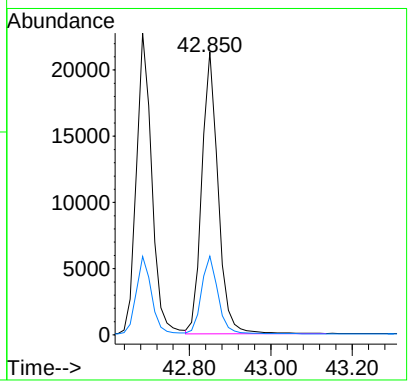


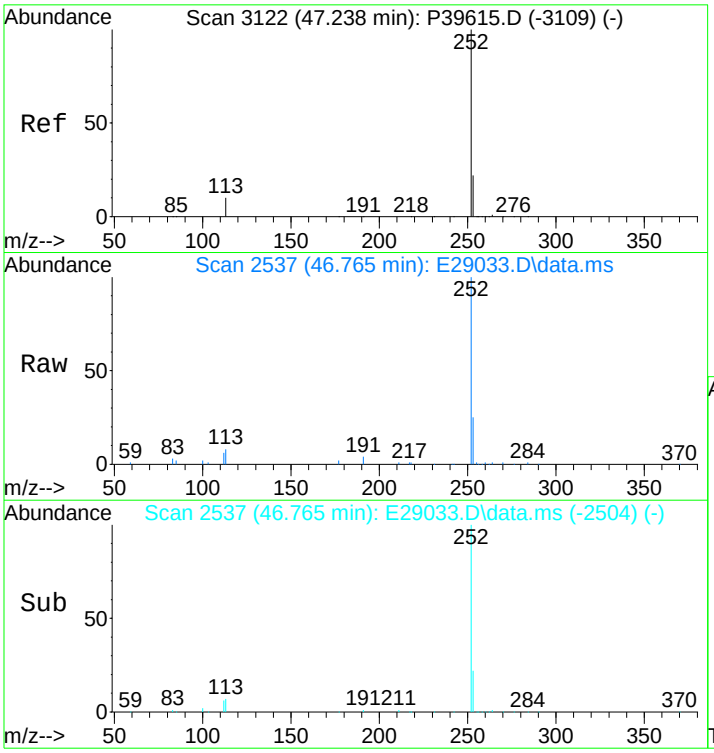


#77
Chrysene/Triphenylene
Concen: 376.54 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:228 Resp: 58734

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.5	33.7

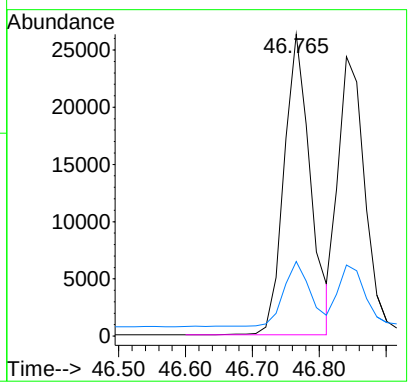


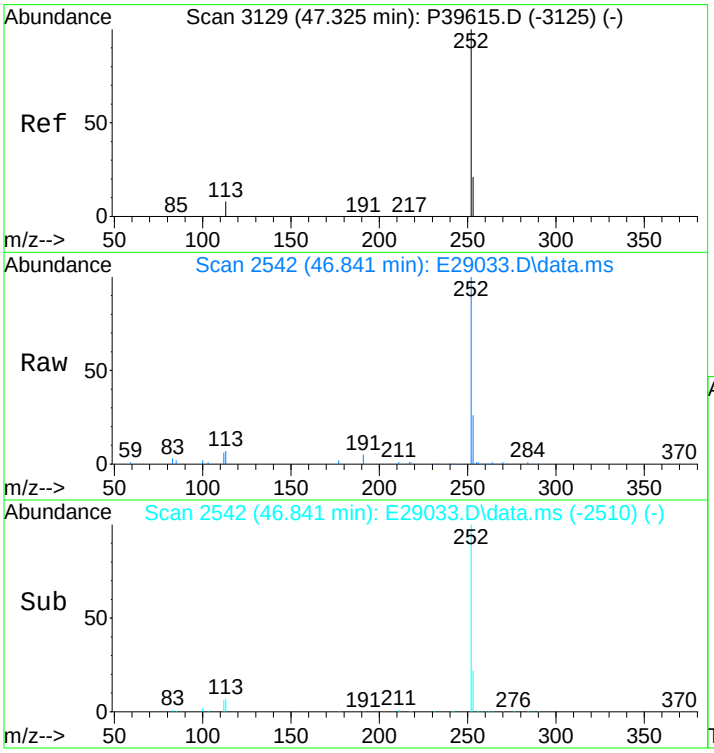


#84
Benzo[b]fluoranthene
Concen: 407.73 ng/mL
RT: 46.765 min Scan# 2537
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:252 Resp: 71803

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.2	28.8

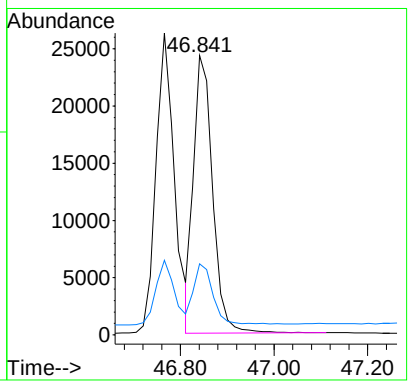


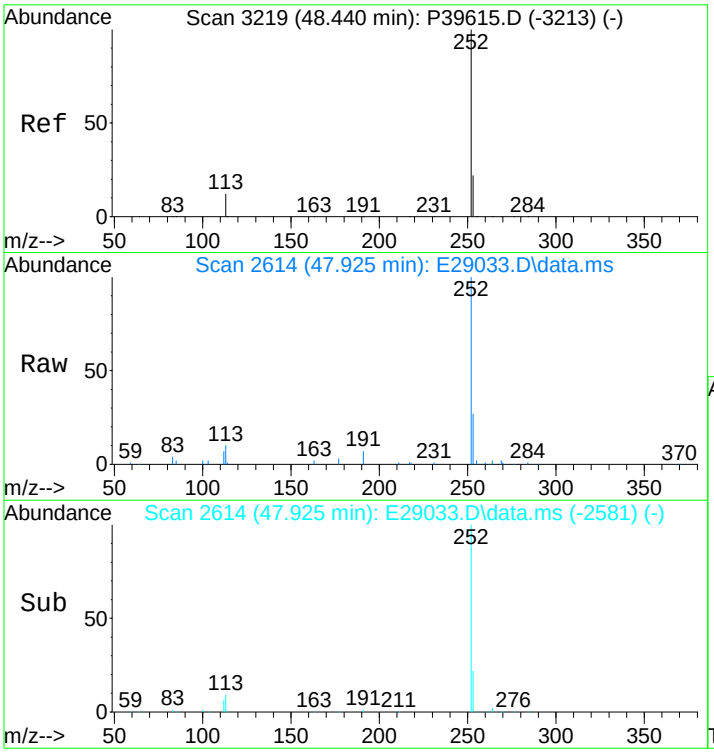


#85
Benzo[j]+[k]fluoranthene
Concen: 379.56 ng/mL
RT: 46.841 min Scan# 2542
Delta R.T. -0.015 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:252 Resp: 68770

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.3	28.9

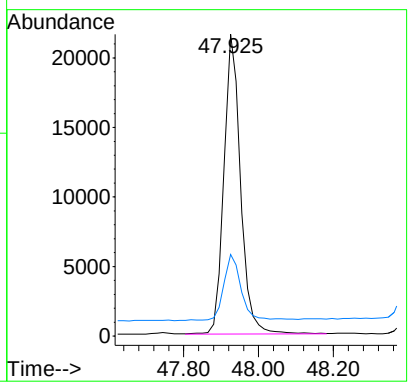


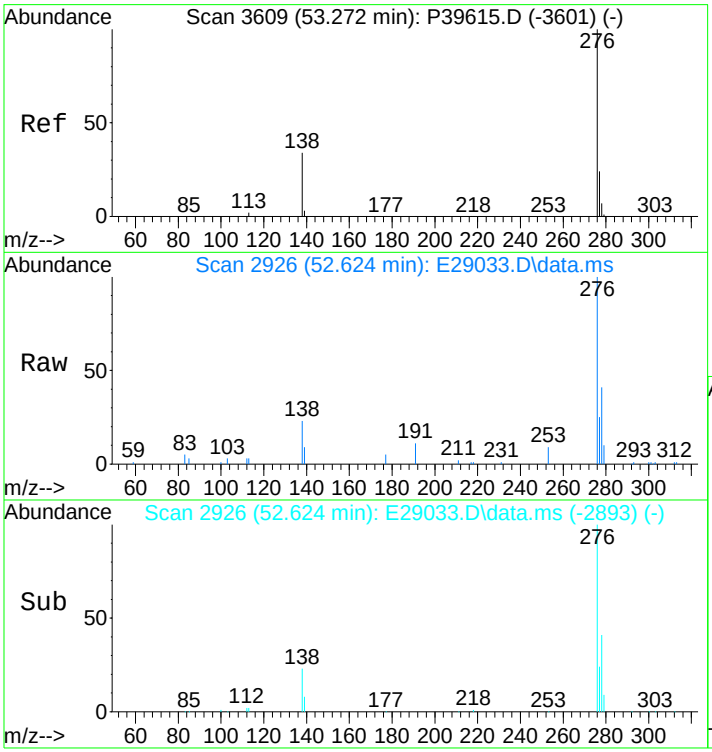


#89
Benzo[a]pyrene
Concen: 403.72 ng/mL
RT: 47.925 min Scan# 2614
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:252 Resp: 66428

Ion	Ratio	Lower	Upper
252	100		
253	23.4	19.6	29.4

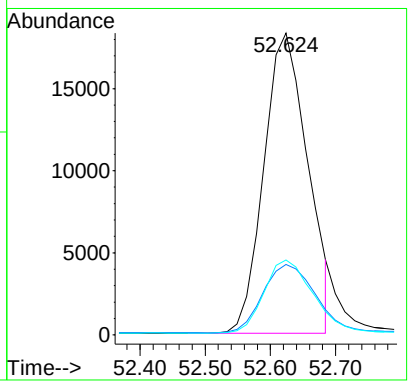


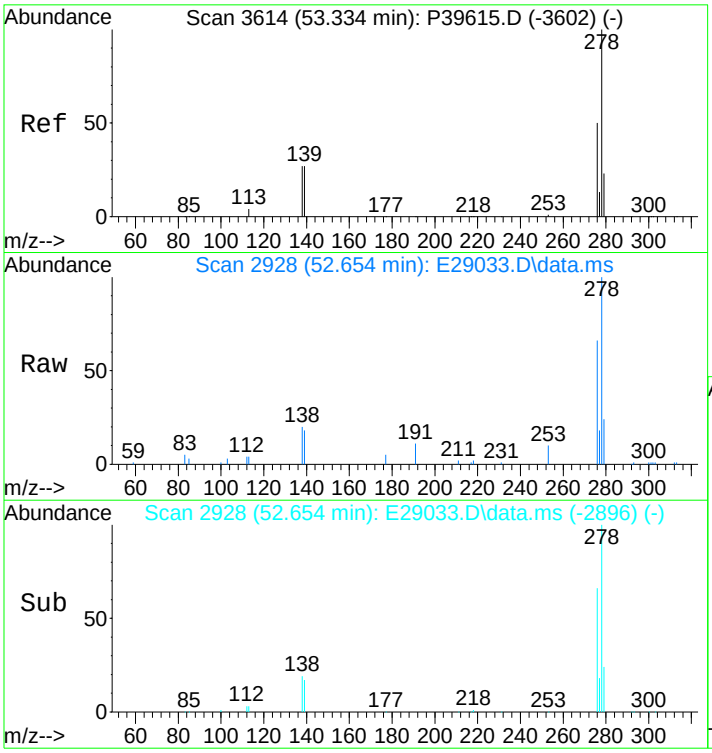


#91
Indeno[1,2,3-cd]pyrene
Concen: 442.56 ng/mL m
RT: 52.624 min Scan# 2926
Delta R.T. 0.000 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:276 Resp: 85697

Ion	Ratio	Lower	Upper
276	100		
138	27.8	17.8	26.8#
277	27.7	20.0	30.0

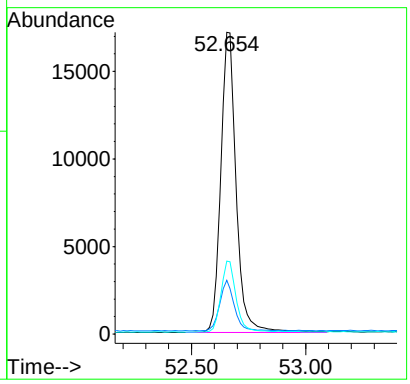


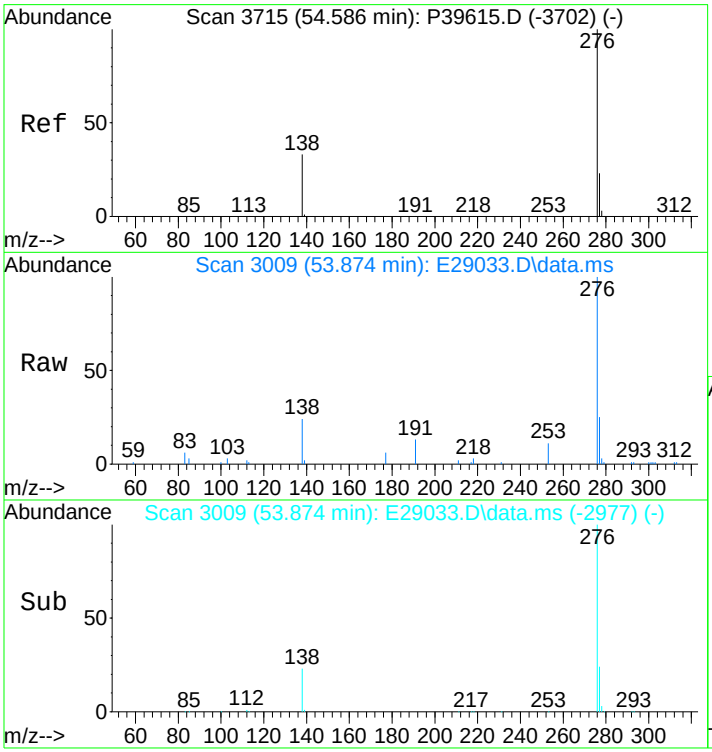


#92
Dibenz[ah]+[ac]anthracene
Concen: 389.31 ng/mL
RT: 52.654 min Scan# 2928
Delta R.T. -0.015 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:278 Resp: 80270

Ion	Ratio	Lower	Upper
278	100		
139	16.0	13.0	19.4
279	23.1	19.4	29.2

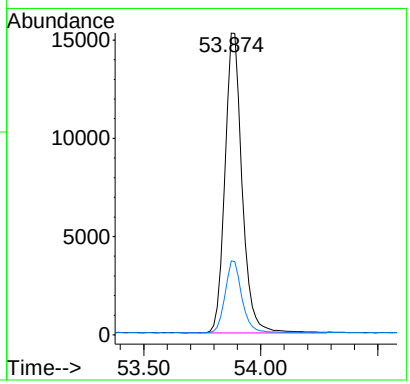




#93
Benzo[g,h,i]perylene
Concen: 371.97 ng/mL
RT: 53.874 min Scan# 3009
Delta R.T. -0.015 min
Lab File: E29033.D
Acq: 17 Nov 2012 8:46 am

Tgt Ion:276 Resp: 77664

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.4	29.2



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	39752M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	97491	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	49234	352.114	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.21%#			
42) Phenanthrene-d10	32.100	188	63533	443.499	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.35%#			
83) Benzo[b]fluoranthene-d12	46.690	264	88011	439.462	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.95%#			
88) Benzo[a]pyrene-d12	47.850	264	77463	399.192	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.92%#			
129) 5B(H)Cholane - Surr	43.362	217	18379	478.329	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.83%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	239	7.516	ng/mL	100
5) C1-Decalins	17.814	152	817M5	25.693	ng/mL	
6) C2-Decalins	18.792	166	3010M5	94.660	ng/mL	
7) C3-Decalins	21.623	180	5346M5	168.124	ng/mL	
8) C4-Decalins	24.995	194	12173M5	382.824	ng/mL	
10) Naphthalene	19.304	128	19433	124.279	ng/mL#	100
11) C1-Naphthalenes	22.014	142	24651M5	157.650	ng/mL	
12) C2-Naphthalenes	24.859	156	79488M5	508.347	ng/mL	
13) C3-Naphthalenes	27.539	170	134715M5	861.539	ng/mL	
14) C4-Naphthalenes	29.978	184	126971M5	812.014	ng/mL	
16) 2-Methylnaphthalene	22.014	142	14487	145.465	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	10236	105.776	ng/mL#	100
18) Benzothiophene	19.530	134	685M3	5.299	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	3334M5	25.792	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	11651M5	90.132	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	30266M5	234.137	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	38446M5	297.418	ng/mL	
23) Biphenyl	23.896	154	4774	37.929	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	17890	199.293	ng/mL#	100
25) Dibenzofuran	26.982	168	11266	80.848	ng/mL	93
26) Acenaphthylene	25.597	152	56497	362.401	ng/mL#	100
27) Acenaphthene	26.335	153	9936	99.014	ng/mL	91
28) 2,3,5-Trimethylnaphthalen	27.900	170	10088M3	120.115	ng/mL	
29) Fluorene	28.367	166	19605M3	175.169	ng/mL	
30) C1-Fluorenes	30.746	180	23639M5	211.213	ng/mL	
31) C2-Fluorenes	32.943	194	54581M5	487.678	ng/mL	
32) C3-Fluorenes	34.795	208	75642M5	675.856	ng/mL	
33) Dibenzothiophene	31.694	184	33791	220.014	ng/mL#	73
34) 4-Methyldibenzothiophene(	33.470	198	34567	225.067	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	31026M3	202.011	ng/mL	
36) 1-Methyldibenzothiophene(	34.238	198	16482	107.315	ng/mL#	100
37) OTP	33.862	198	5128M3	33.389	ng/mL	
38) C1-Dibenzothiophenes	33.470	198	94041M5	612.303	ng/mL	
38) C1-Dibenzothiophenes BS	33.470	198	88913m	578.915	ng/mL	
39) C2-Dibenzothiophenes	35.172	212	183888M5	1197.299	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	214271M5	1395.123	ng/mL	
41) C4-Dibenzothiophenes	38.695	240	147336M5	959.308	ng/mL	
43) Phenanthrene	32.191	178	303894	1944.839	ng/mL	99
44) 3-Methylphenanthrene(3MP)	34.163	192	50362	322.303	ng/mL	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	60163	385.027	ng/mL	95
46) 2-Methylanthracene(2MA)	34.434	192	20102M3	128.647	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.615	192	67374	431.175	ng/mL	87
48) 1-Methylphenanthrene(1MP)	34.705	192	43982M3	281.473	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.615	192	247870M5	1586.301	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	288154M5	1844.108	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	288154m	1844.108	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	216020M5	1382.469	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	109007M5	697.615	ng/mL	
55) Anthracene	32.371	178	65874M3	487.736	ng/mL	
56) Carbazole	33.064	167	25168	181.063	ng/mL	95
57) 1-Methylphenanthrene	34.705	192	44213M3	370.880	ng/mL	
58) Fluoranthene	36.993	202	844552M3	4894.199	ng/mL	
59) Benzo(b)fluorene	39.523	216	78556M3	683.173	ng/mL	
60) Pyrene	37.882	202	841418	4797.289	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	599097M5	3415.712	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	317810M5	1811.973	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	191093M5	1089.504	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	168700M5	961.832	ng/mL	
66) Naphthobenzothiophene	41.751	234	103765	599.833	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.751	234	103765	599.833	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.098	234	22047	127.447	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	31292M3	180.889	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	176011M5	1017.464	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	192727M5	1114.094	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	146123M5	844.691	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	110345M5	637.870	ng/mL	
75) Benz[a]anthracene	42.685	228	495075M3	2607.784	ng/mL	
77) Chrysene/Triphenylene	42.850	228	603962	3090.124	ng/mL	99
78) C1-Chrysenes	44.341	242	352994M5	1806.066	ng/mL	
79) C2-Chrysenes	46.073	256	226064M5	1156.639	ng/mL	
79) C2-Chrysenes BS	46.073	256	223235m	1142.164	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	2829	14.474	ng/mL	100
81) C3-Chrysenes	47.639	270	170418M5	871.930	ng/mL	
82) C4-Chrysenes	49.100	284	101735M5	520.519	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	678996	3077.063	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	540778	2382.025	ng/mL	94
86) Benzo[a]fluoranthene	47.157	252	139239M3	613.321	ng/mL	
87) Benzo[e]pyrene	47.759	252	498966M4	2315.798	ng/mL	
89) Benzo[a]pyrene	47.940	252	656082	3182.259	ng/mL	96
90) Perylene	48.241	252	219241	1005.642	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.639	276	544335M3	2243.436	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	136586M4	528.679	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	563333	2153.251	ng/mL	100
94) Hopane (T19)	51.690	191	111527	1524.306	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	23615M3	322.760	ng/ml	
97) C24 Tricyclic Terpane (T5	41.104	191	14017M3	191.579	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	19499	266.504	ng/ml	100
99) C24 Tetracyclic Terpane (	43.919	191	7295M3	99.705	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6664M3	91.081	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5831	79.696	ng/ml	100
102) C28 Tricyclic Terpane-22S	46.073	191	6586	90.015	ng/ml	100
103) C28 Tricyclic Terpane-22R	46.238	191	8194M3	111.992	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	8099	110.694	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	8335	113.919	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	16162	220.896	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.151	191	6914M3	94.498	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10920	149.250	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	27021M3	369.312	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	11369	155.387	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	12432	169.916	ng/ml	100
112) 30-Norhopane (T15)	50.365	191	78247	1069.448	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	20664M3	282.427	ng/ml	
114) 17a(H)-Diahopane (X)	50.591	191	6287M3	85.928	ng/ml	
115) 30-Normoretane (T17)	51.118	191	11577	158.230	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.509	191	5922	80.940	ng/ml	100
117) Moretane (T20)	52.368	191	18174M3	248.395	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	40268M3	550.367	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	36758	502.394	ng/ml	100
120) Gammacerane/C32-diahopane	54.175	191	14375	196.472	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.898	191G	81071	1108.046	ng/ml	100
122) 30,31-Bishomohopane-22R (	55.319	191	25657	350.670	ng/ml	100
123) 30,31-Trishomohopane-22S	57.006	191	27992	382.583	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	12976	177.351	ng/ml	100
125) Tetrakishomohopane-22S (T	59.581	191	23614M3	322.747	ng/ml	
126) Tetrakishomohopane-22R (T	60.364	191G	52224	713.777	ng/ml	100
127) Pentakishomohopane-22S (T	62.592	191	14453M3	197.538	ng/ml	
128) Pentakishomohopane-22R (T	63.842	191	10252	140.120	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8252M3	214.765	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4572M3	118.990	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	4354M3	113.316	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16661	433.616	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16470	428.645	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3329	86.640	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	865	22.512	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	7319M3	190.483	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6579M3	171.224	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.115	217	11201M3	291.515	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.003	217	11459M3	298.230	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9034M3	235.117	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	8868M3	230.797	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9276	241.416	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13325M3	346.794	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	20784M3	540.921	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	10443M3	271.788	ng/ml	
147) C26,20R- +C27,20S- triaro	49.070	231	31192M3	811.798	ng/mL	
148) C28,20S-triaromatic stero	49.913	231	26778	696.920	ng/mL	100
149) C27,20R-triaromatic stero	50.350	231	19203M4	499.774	ng/mL	
150) C28,20R-triaromatic stero	51.525	231	22662M3	589.797	ng/mL	

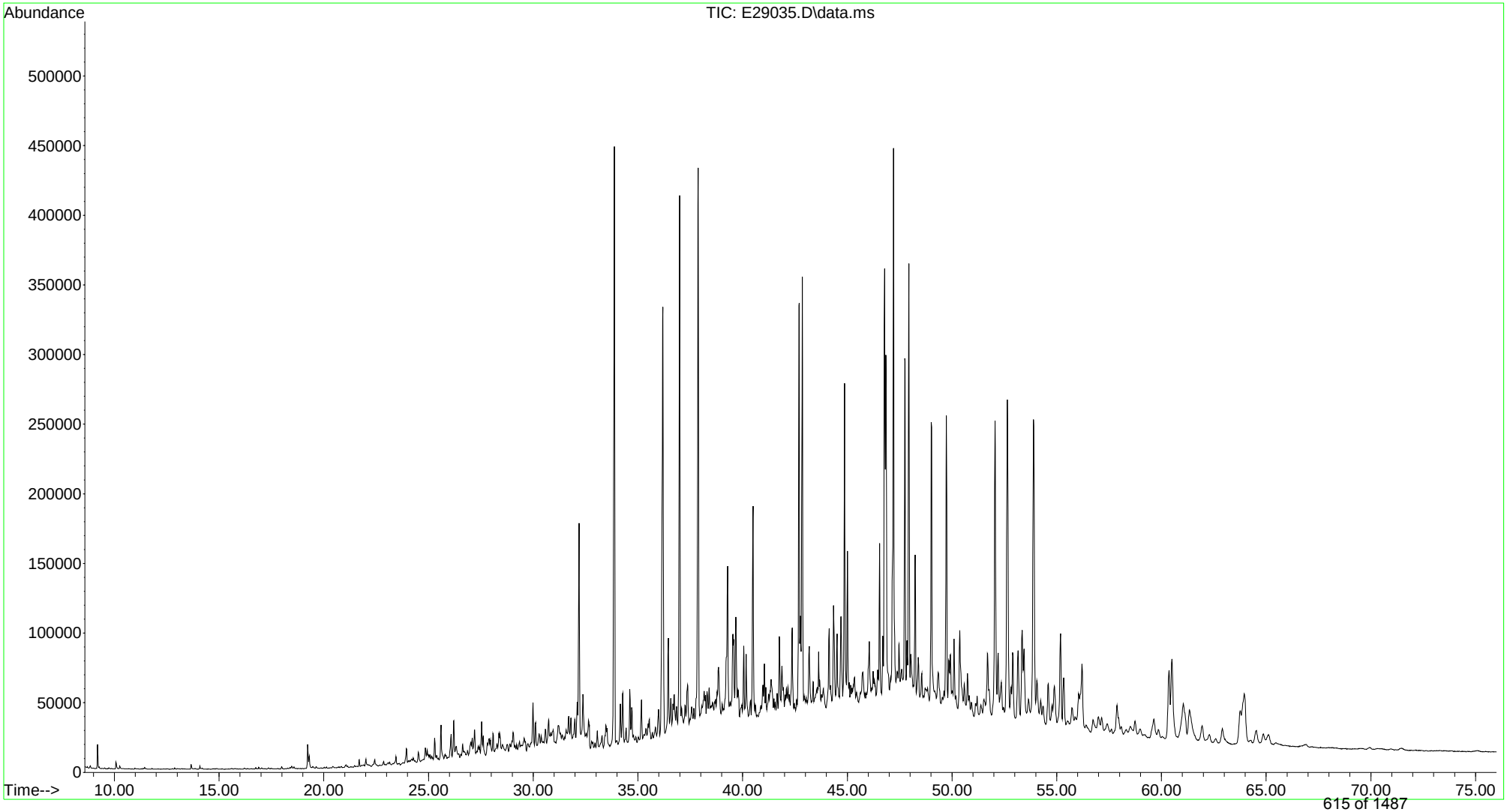
(#) = qualifier out of range (m) = manual integration (+) = signals summed

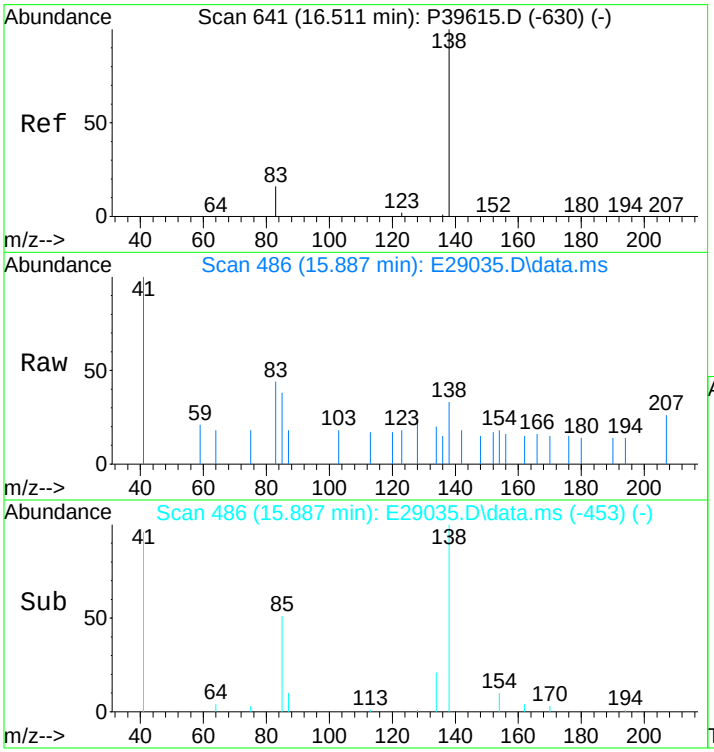
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29035.D
Acq On : 17 Nov 2012 10:14 am
Operator : AC
Sample : 1210083-01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 19 10:16:15 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

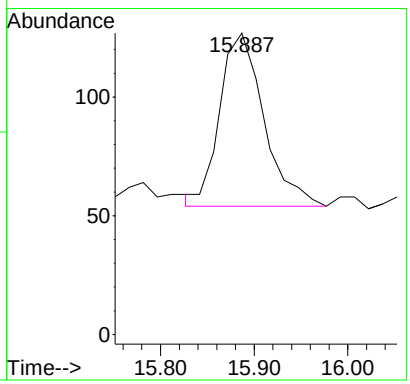
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

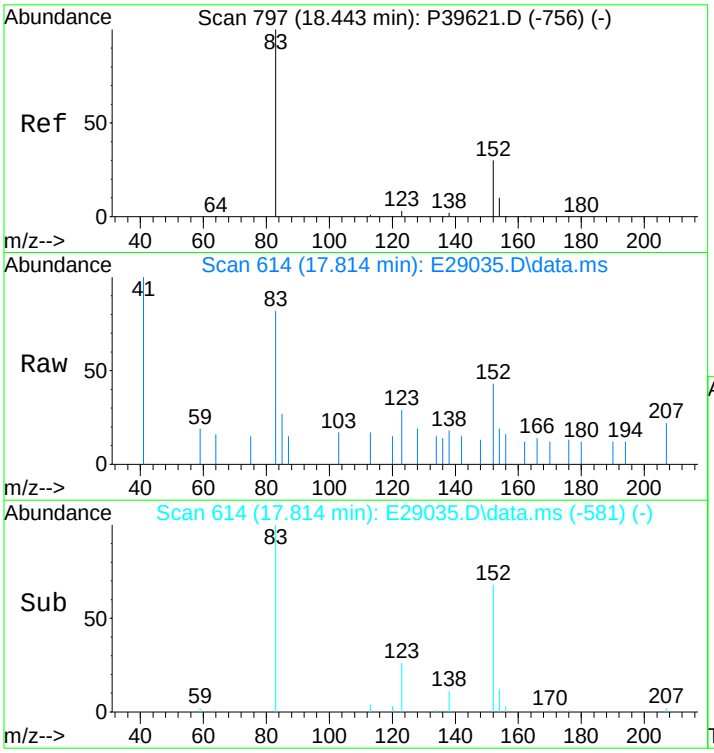




#3
trans-Decalin
Concen: 7.52 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

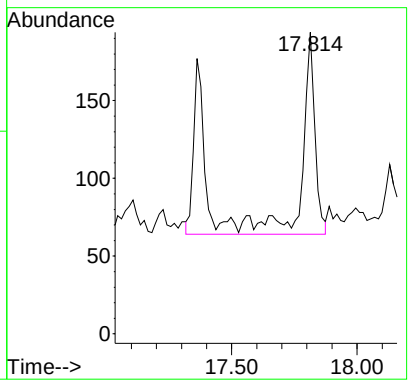
Tgt Ion:138 Resp: 239

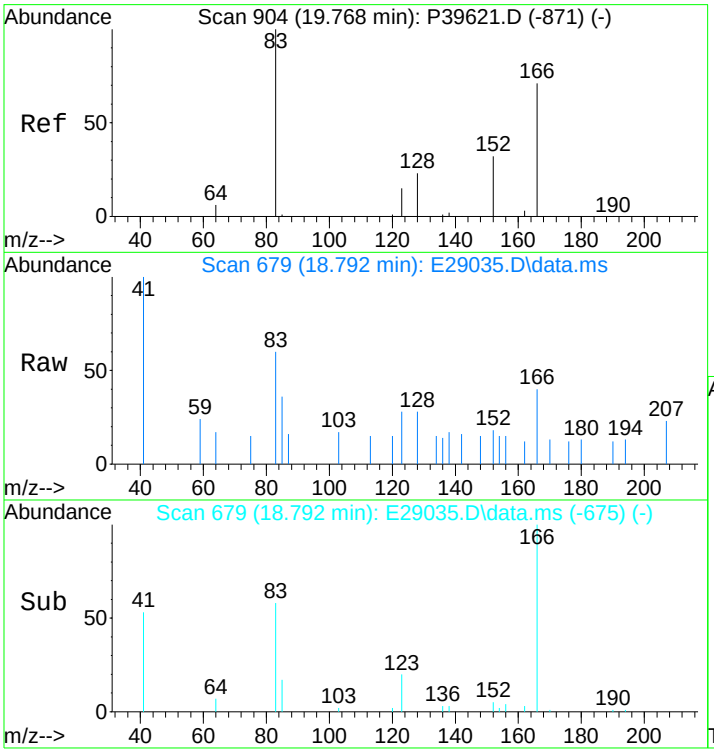




#5
C1-Decalins
Concen: 25.69 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

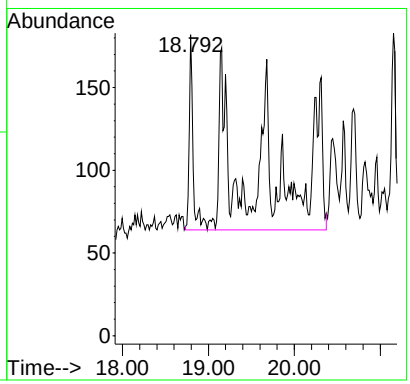
Tgt Ion:152 Resp: 817

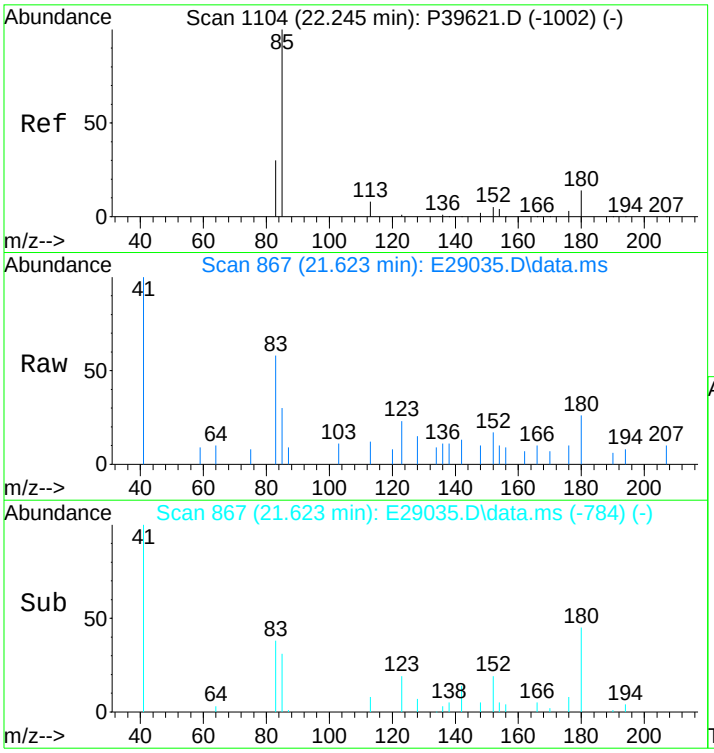




#6
C2-Decalins
Concen: 94.66 ng/mL m
RT: 18.792 min Scan# 679
Delta R.T. -0.561 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

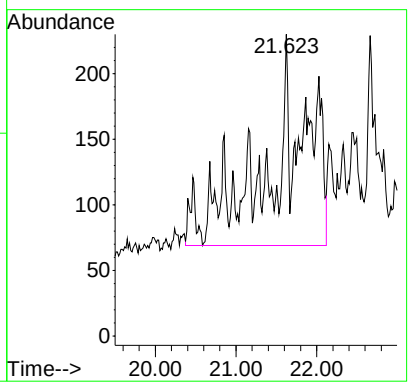
Tgt Ion:166 Resp: 3010

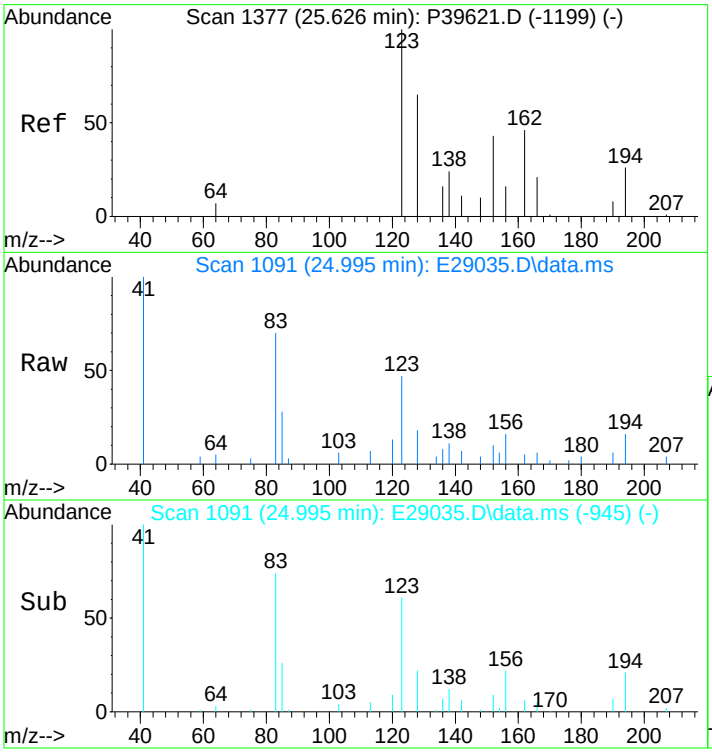




#7
C3-Decalins
Concen: 168.12 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.135 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

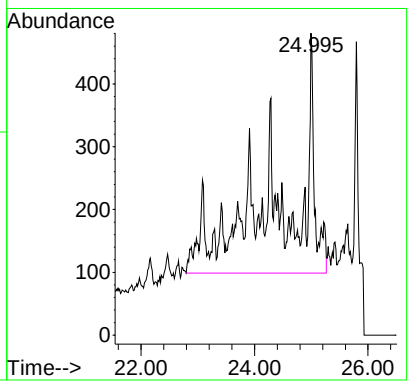
Tgt Ion:180 Resp: 5346

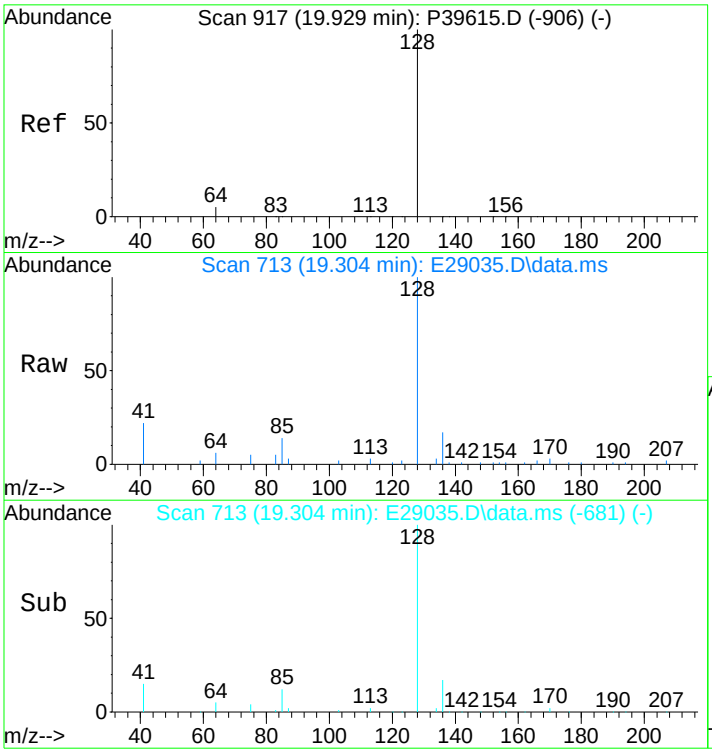




#8
C4-Decalins
Concen: 382.82 ng/mL m
RT: 24.995 min Scan# 1091
Delta R.T. -0.075 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:194 Resp: 12173

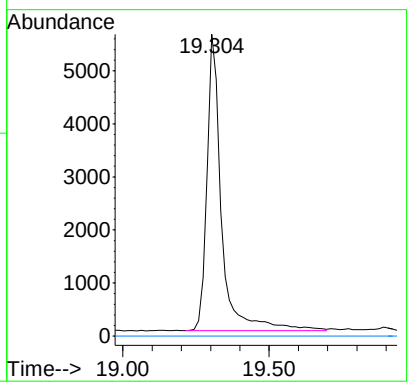


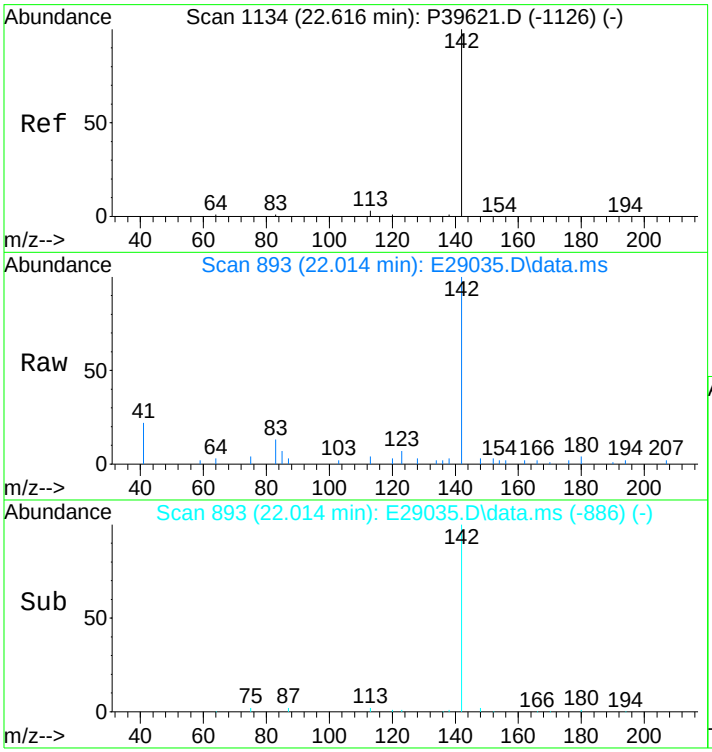


#10
Naphthalene
Concen: 124.28 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:128 Resp: 19433

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

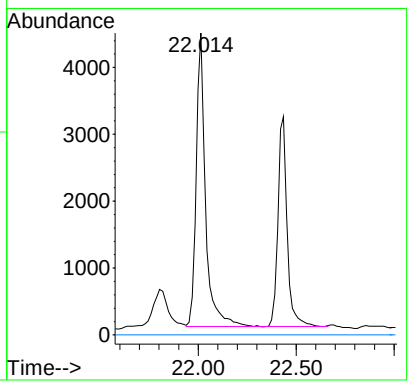


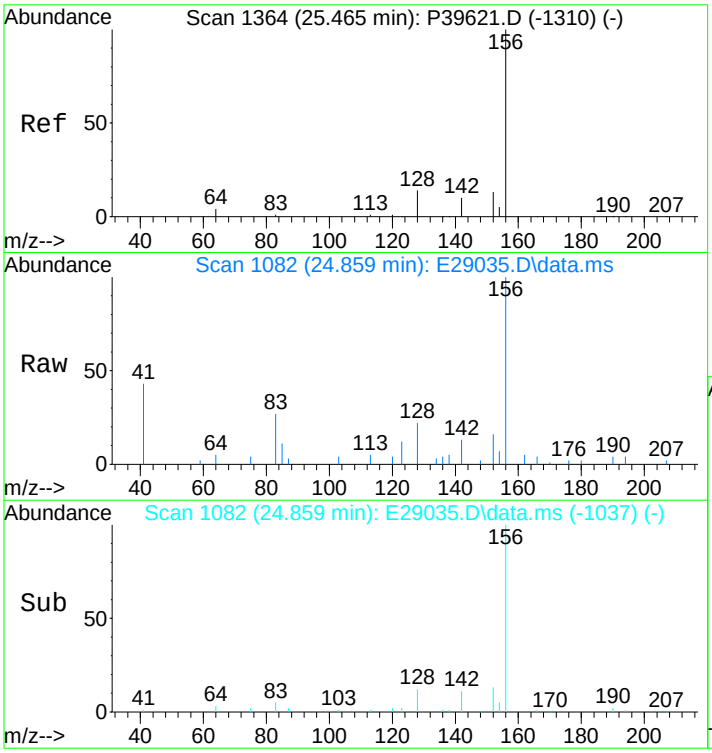


#11
C1-Naphthalenes
Concen: 157.65 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:142 Resp: 24651

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

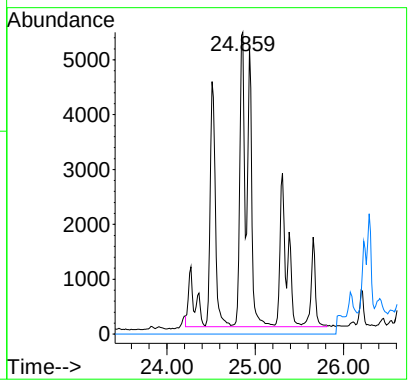


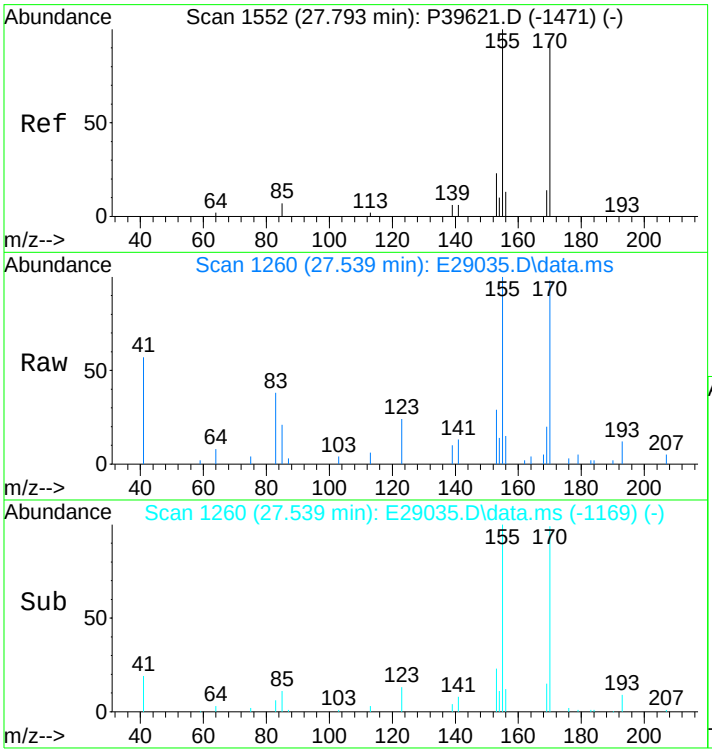


#12
C2-Naphthalenes
Concen: 508.35 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:156 Resp: 79488

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

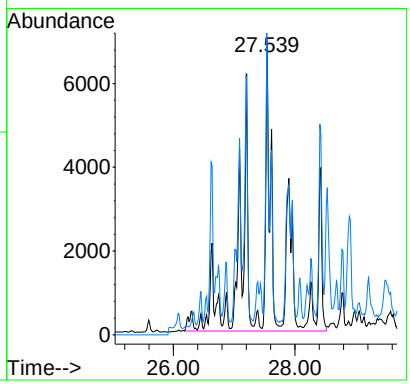


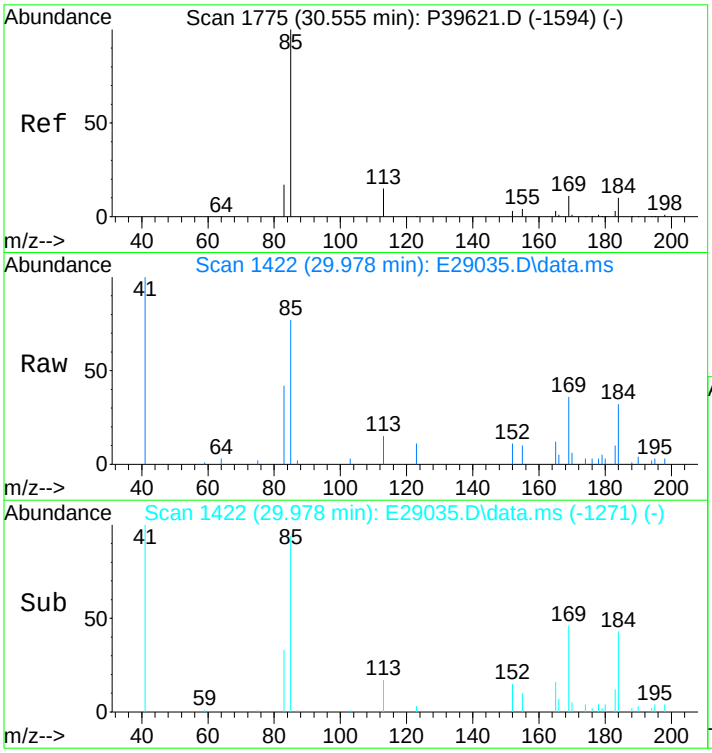


#13
C3-Naphthalenes
Concen: 861.54 ng/mL m
RT: 27.539 min Scan# 1260
Delta R.T. 0.343 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:170 Resp: 134715

Ion	Ratio	Lower	Upper
170	100		
155	15.4	66.8	100.2#

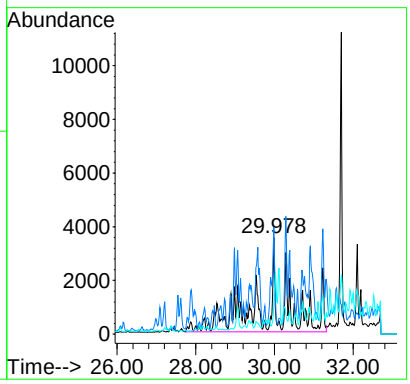


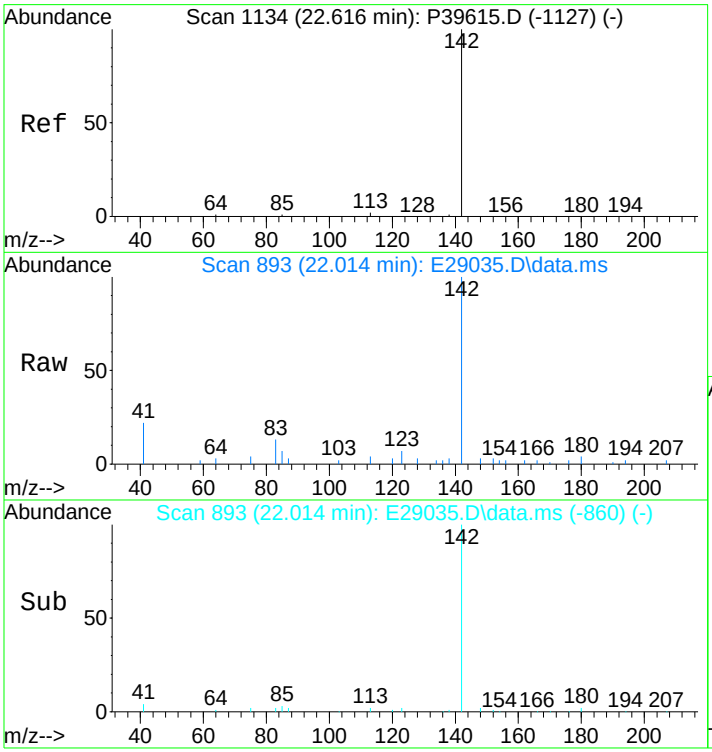


#14
C4-Naphthalenes
Concen: 812.01 ng/mL m
RT: 29.978 min Scan# 1422
Delta R.T. 0.085 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:184 Resp: 126971

Ion	Ratio	Lower	Upper
184	100		
169	4.2	78.7	118.1#
183	1.2	26.7	40.1#

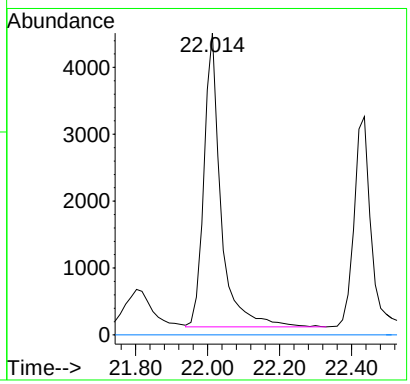


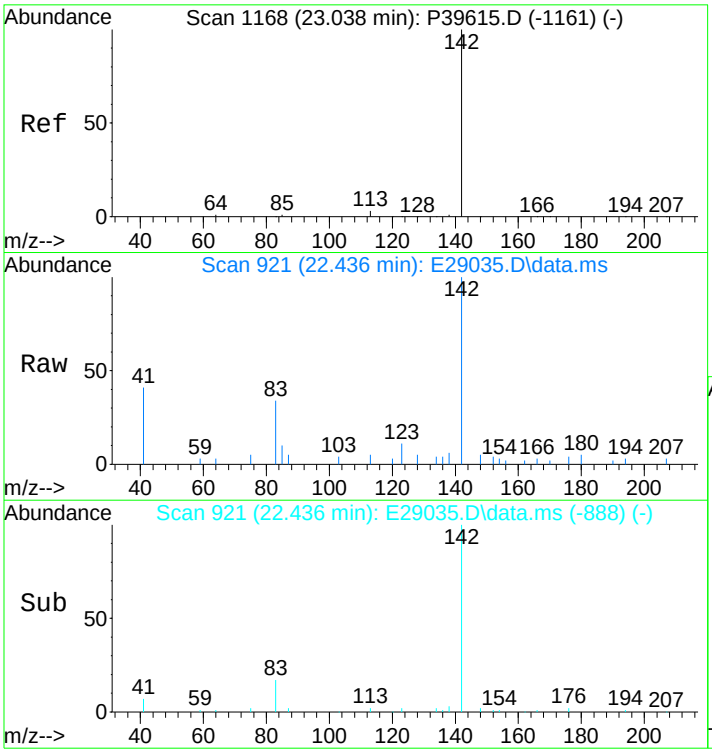


#16
2-Methylnaphthalene
Concen: 145.47 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:142 Resp: 14487

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

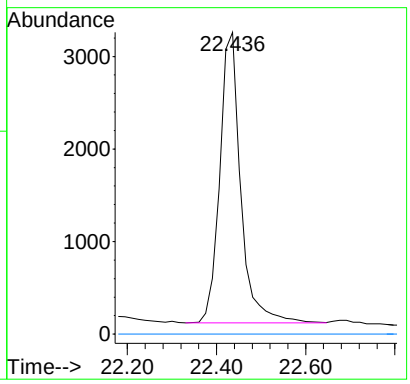


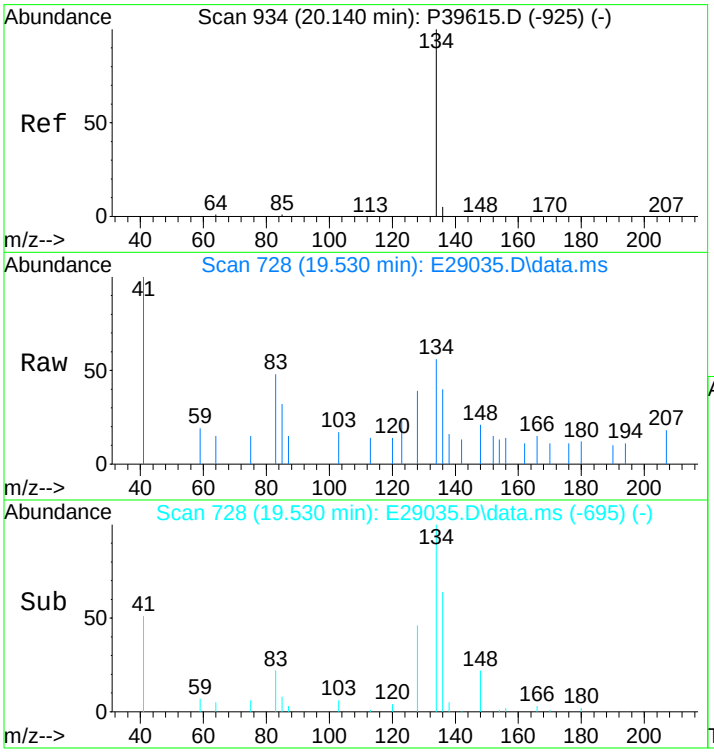


#17
1-Methylnaphthalene
Concen: 105.78 ng/mL
RT: 22.436 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:142 Resp: 10236

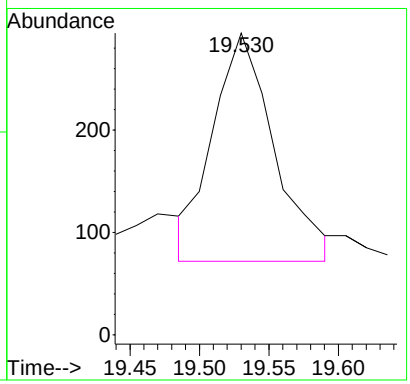
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

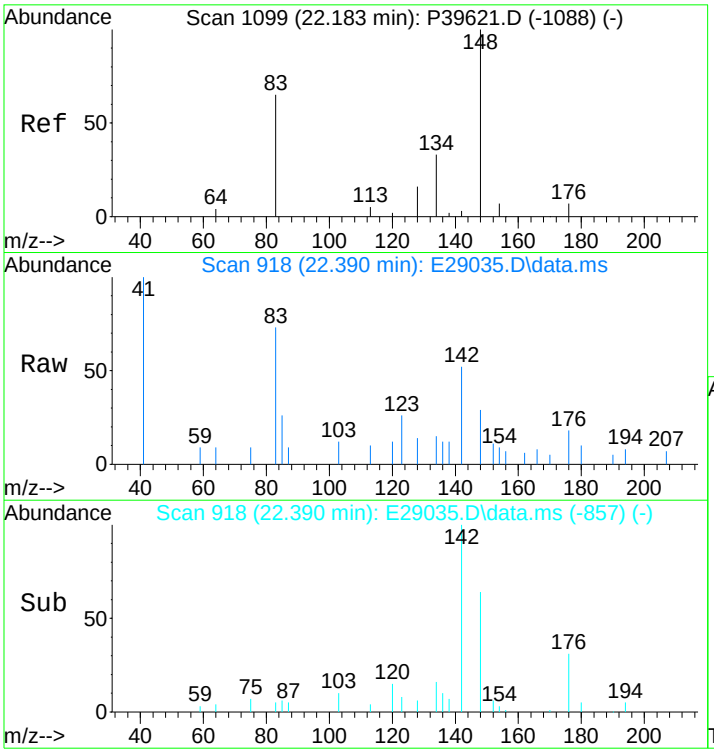




#18
Benzothiophene
Concen: 5.30 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

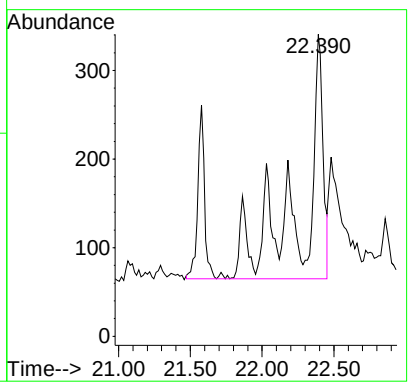
Tgt Ion:134 Resp: 685

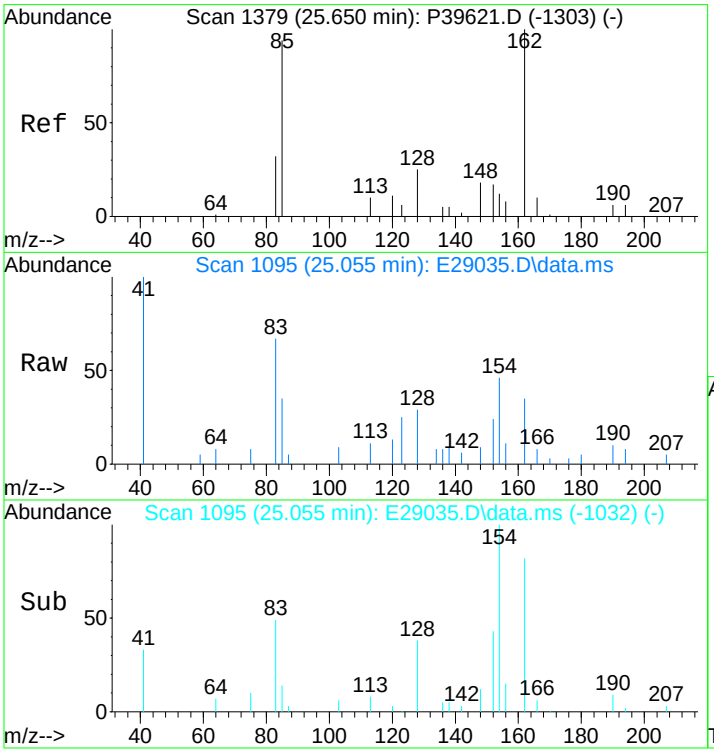




#19
C1-Benzo(b)thiophenes
Concen: 25.79 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.677 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

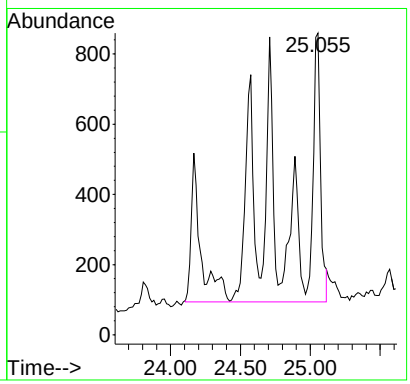
Tgt Ion:148 Resp: 3334

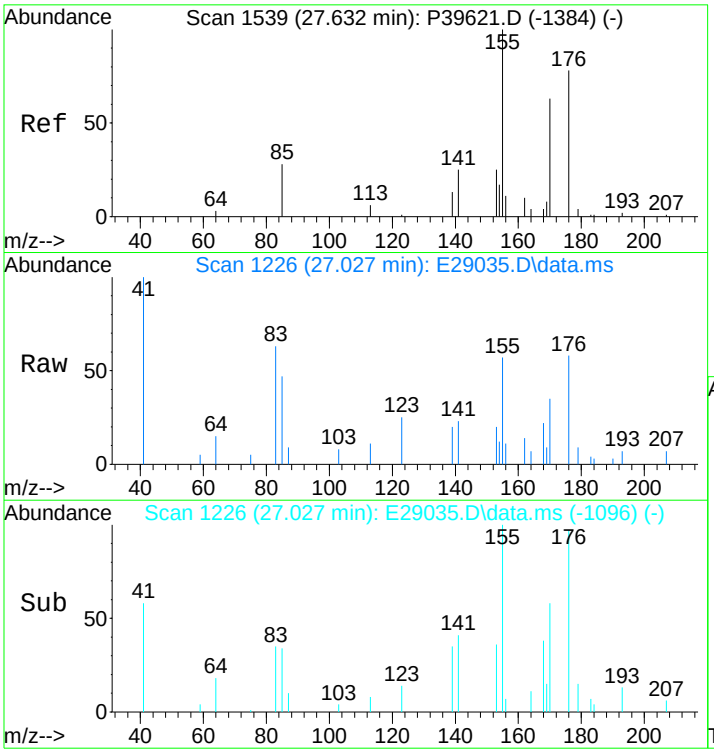




#20
C2-Benzo(b)thiophenes
Concen: 90.13 ng/mL m
RT: 25.055 min Scan# 1095
Delta R.T. -0.044 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

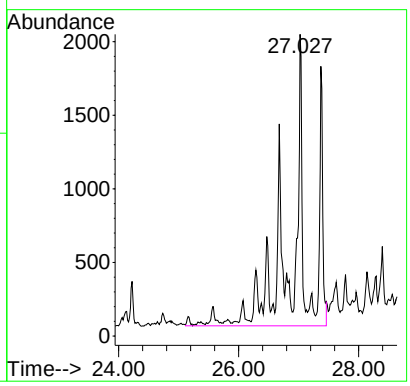
Tgt Ion:162 Resp: 11651

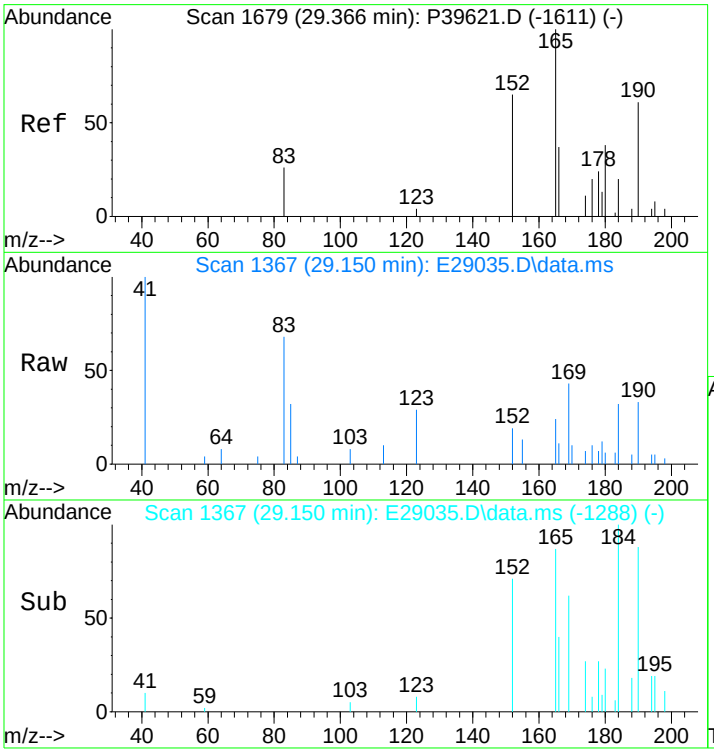




#21
C3-Benzo(b)thiophenes
Concen: 234.14 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. -0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

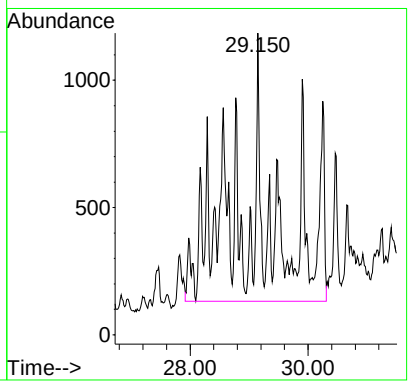
Tgt Ion:176 Resp: 30266

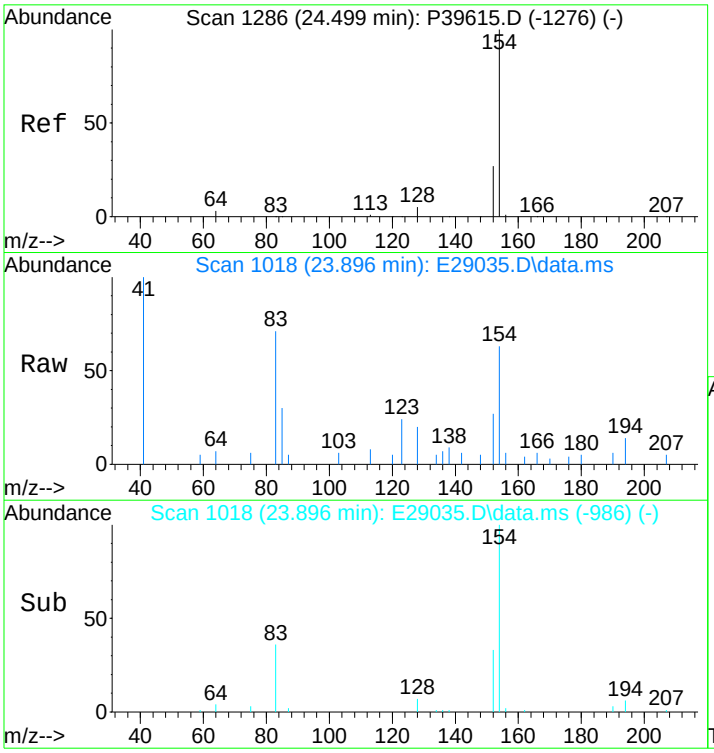




#22
C4-Benzo(b)thiophenes
Concen: 297.42 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:190 Resp: 38446

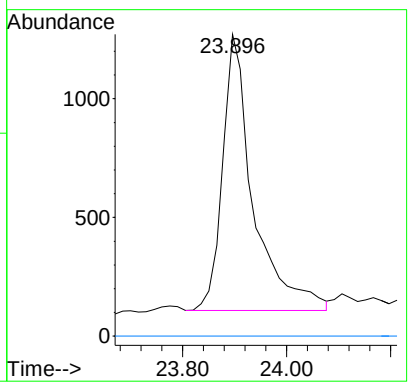


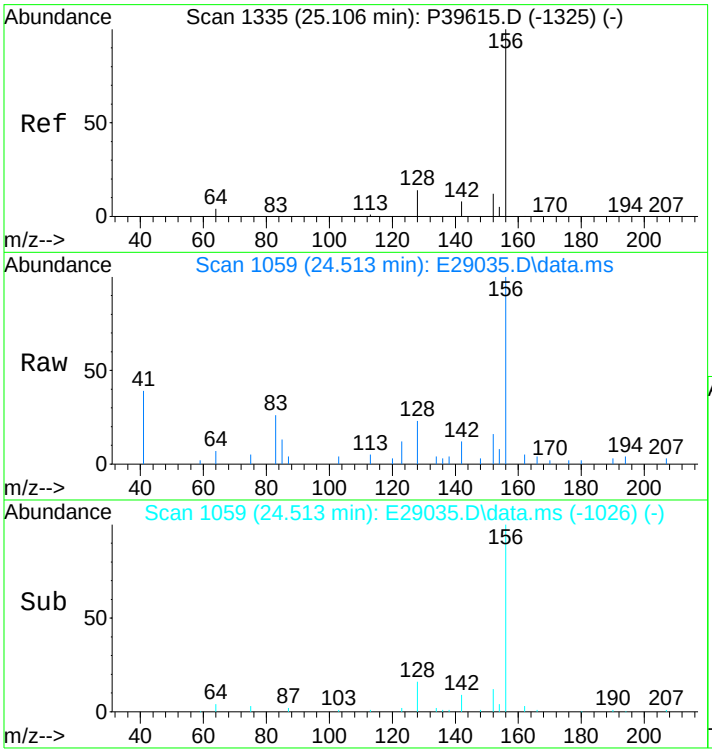


#23
Biphenyl
Concen: 37.93 ng/mL
RT: 23.896 min Scan# 1018
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:154 Resp: 4774

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

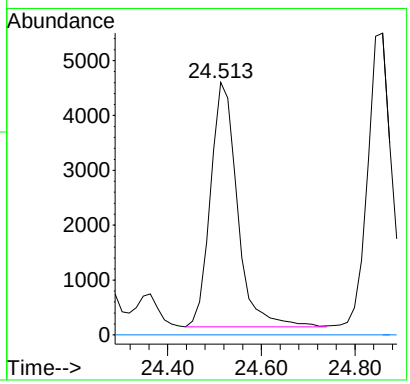


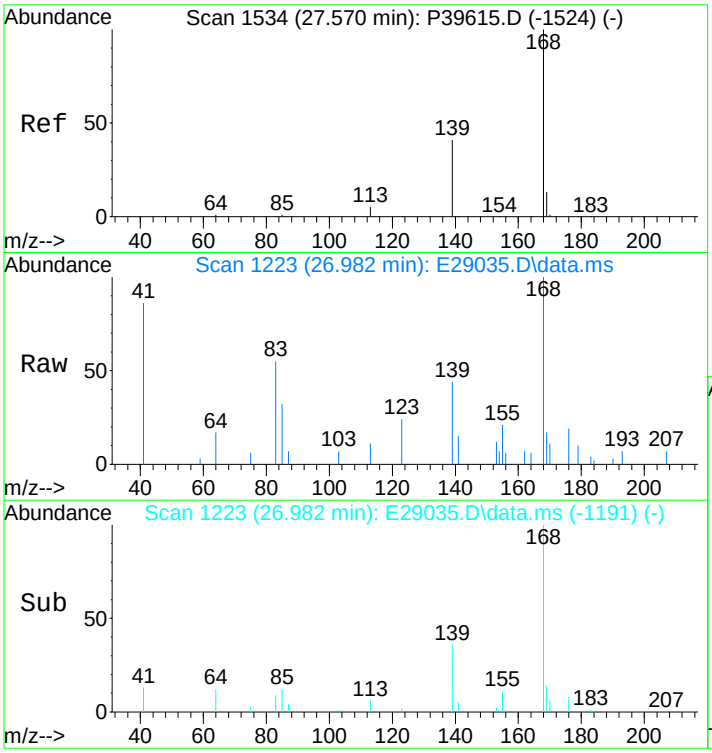


#24
2,6-Dimethylnaphthalene
Concen: 199.29 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:156 Resp: 17890

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

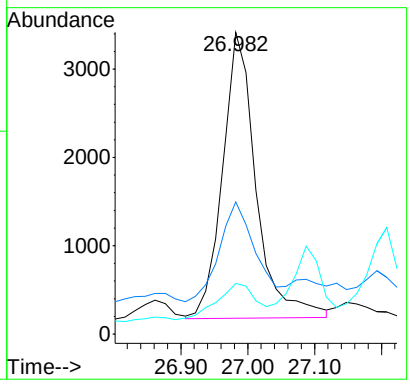


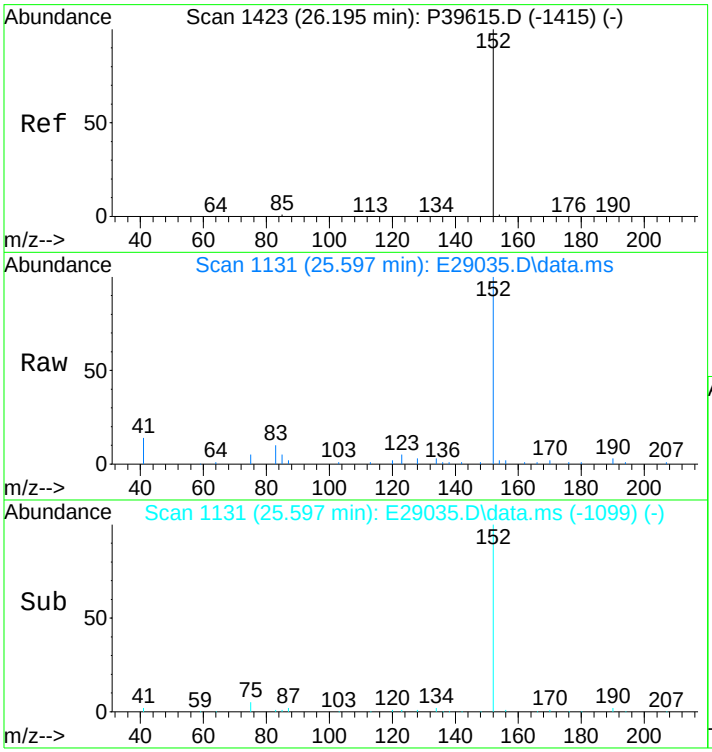


#25
Dibenzofuran
Concen: 80.85 ng/mL
RT: 26.982 min Scan# 1223
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:168 Resp: 11266

Ion	Ratio	Lower	Upper
168	100		
139	38.1	26.9	40.3
169	15.9	10.7	16.1

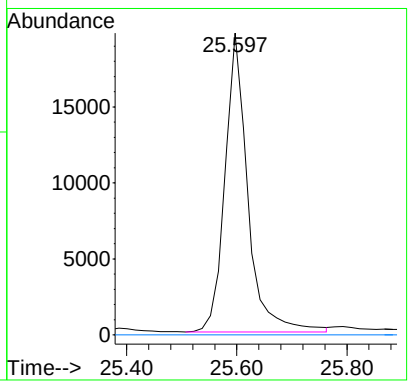


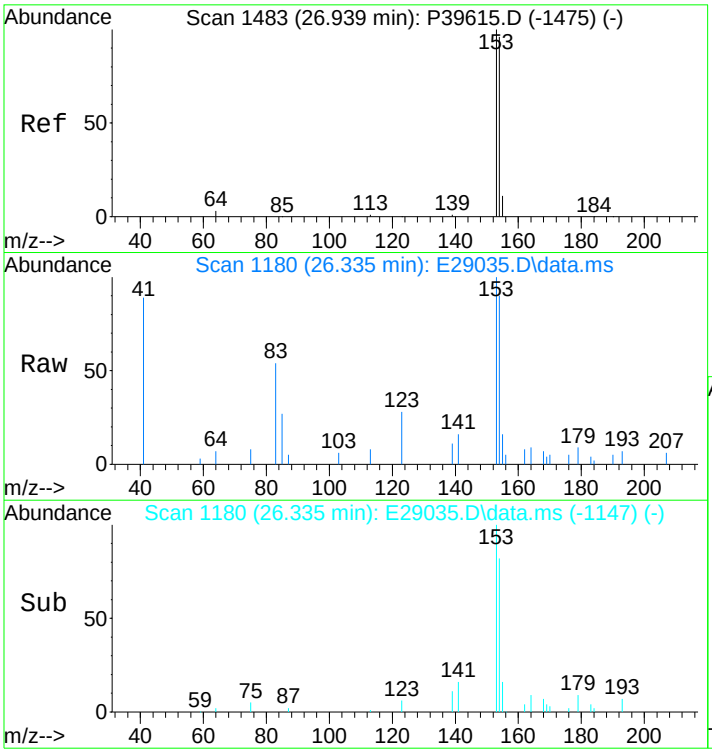


#26
Acenaphthylene
Concen: 362.40 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:152 Resp: 56497

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

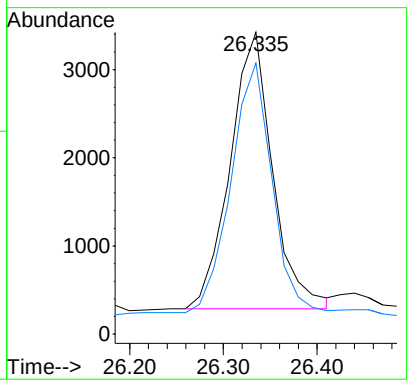


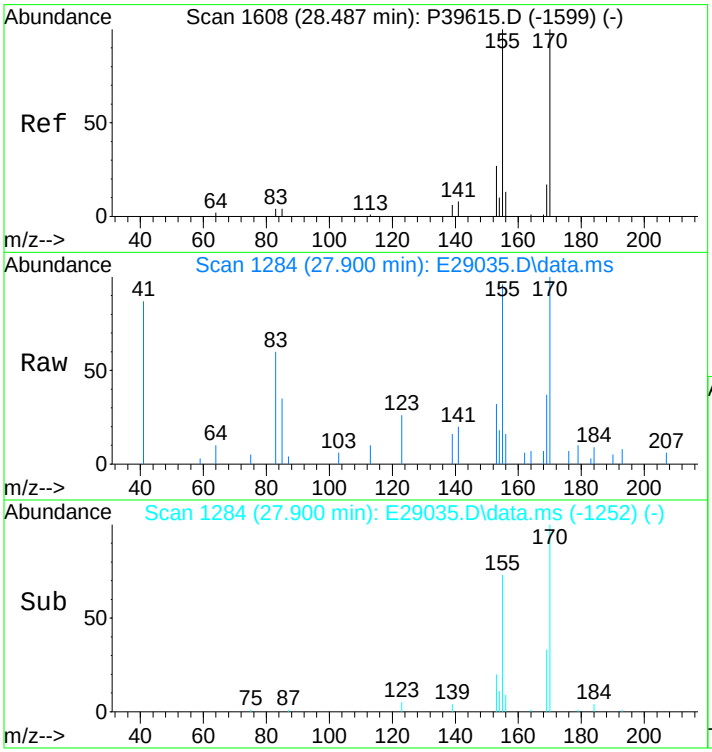


#27
Acenaphthene
Concen: 99.01 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:153 Resp: 9936

Ion	Ratio	Lower	Upper
153	100		
154	99.5	73.0	109.4

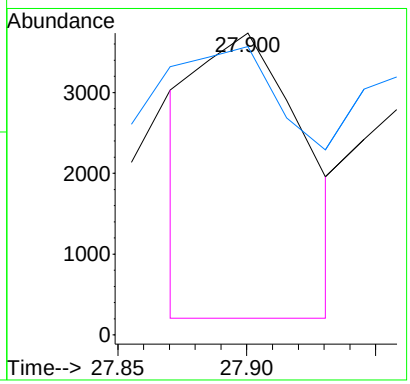


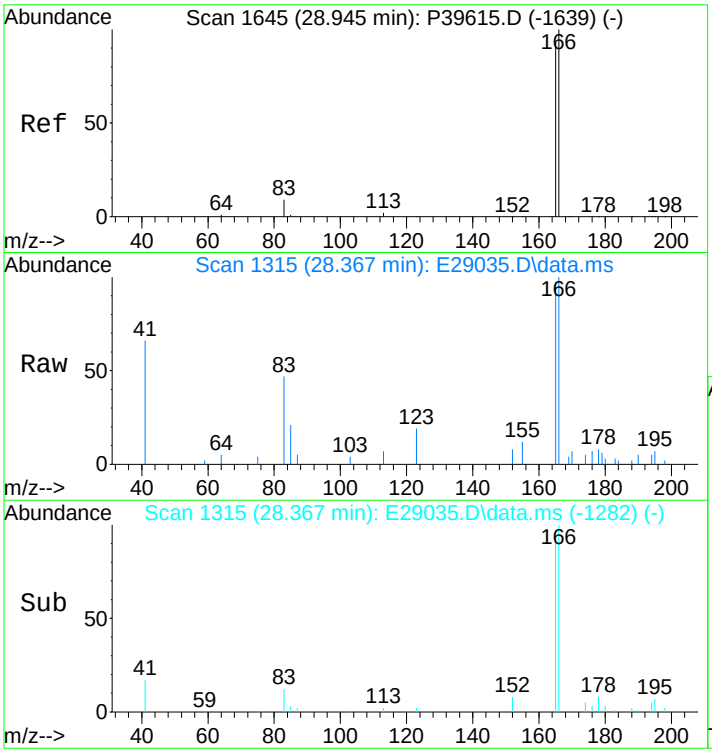


#28
2,3,5-Trimethylnaphthalene
Concen: 120.12 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:170 Resp: 10088

Ion	Ratio	Lower	Upper
170	100		
155	160.9	69.8	104.6#

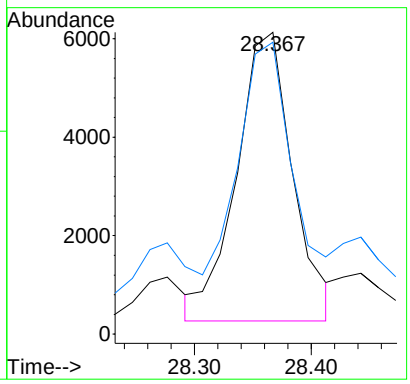


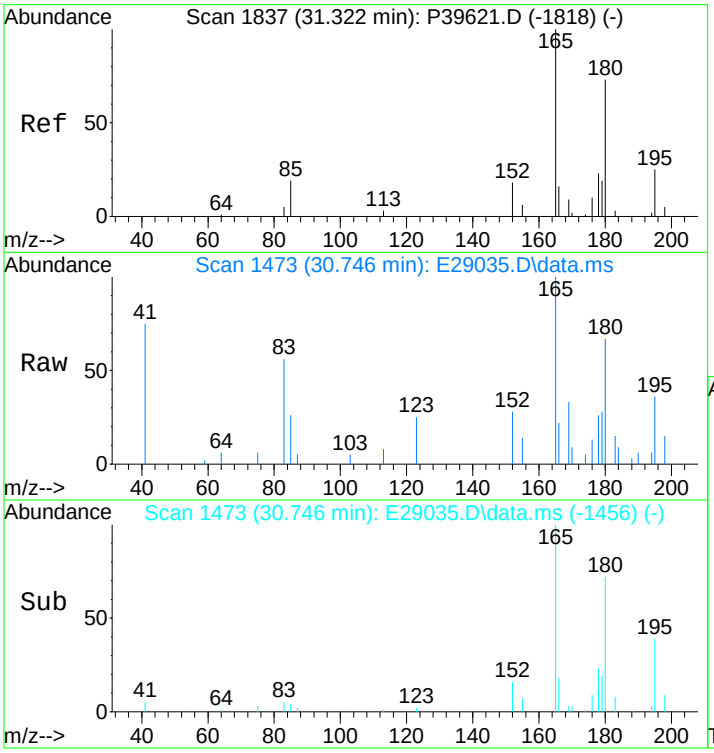


#29
Fluorene
Concen: 175.17 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:166 Resp: 19605

Ion	Ratio	Lower	Upper
166	100		
165	71.8	74.4	111.6#

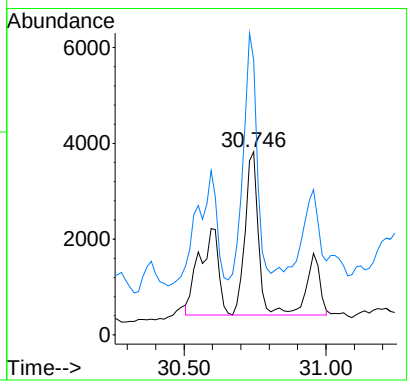


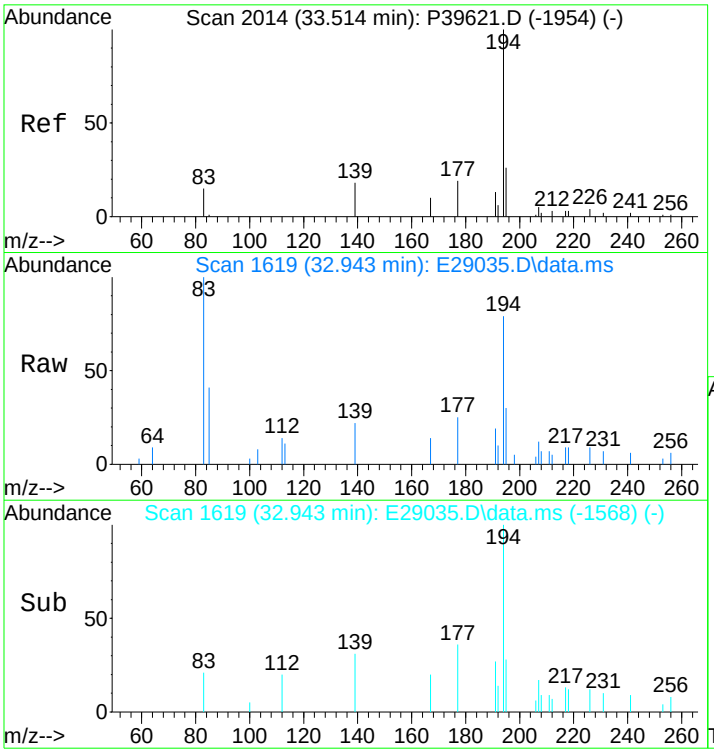


#30
C1-Fluorenes
Concen: 211.21 ng/mL m
RT: 30.746 min Scan# 1473
Delta R.T. 0.106 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:180 Resp: 23639

Ion	Ratio	Lower	Upper
180	100		
165	39.5	94.3	141.5#

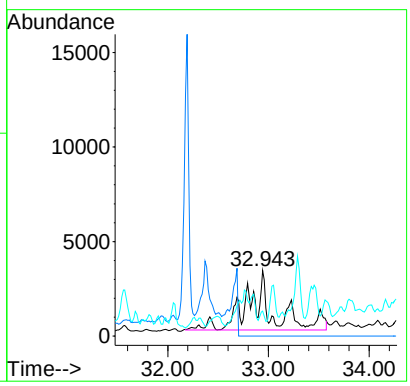


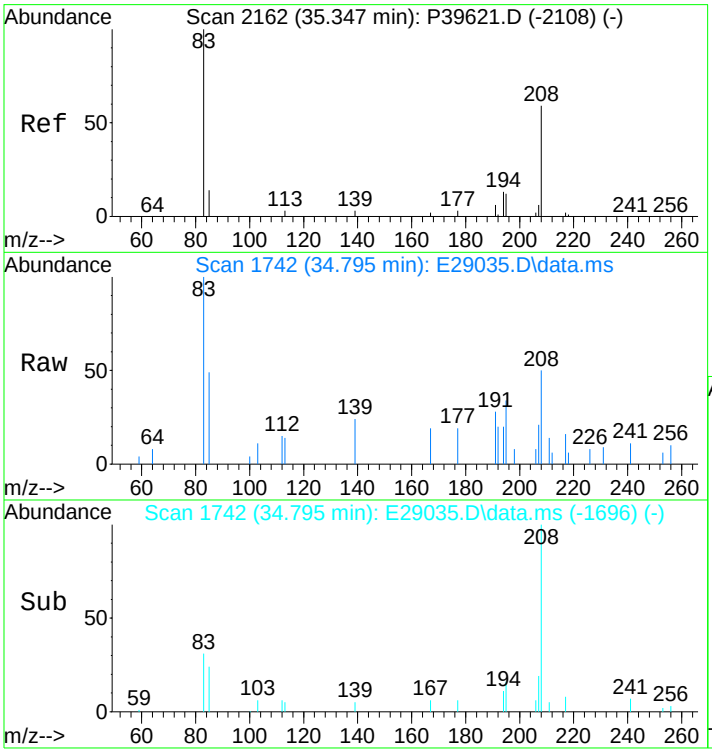


#31
C2-Fluorenes
Concen: 487.68 ng/mL m
RT: 32.943 min Scan# 1619
Delta R.T. 0.163 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:194 Resp: 54581

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.0	40.4#

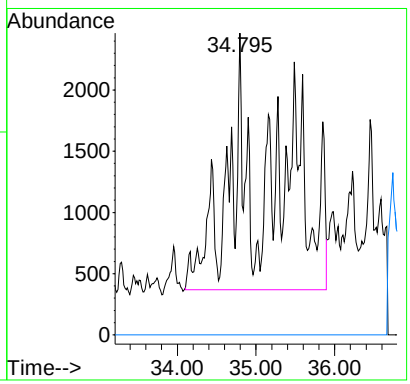


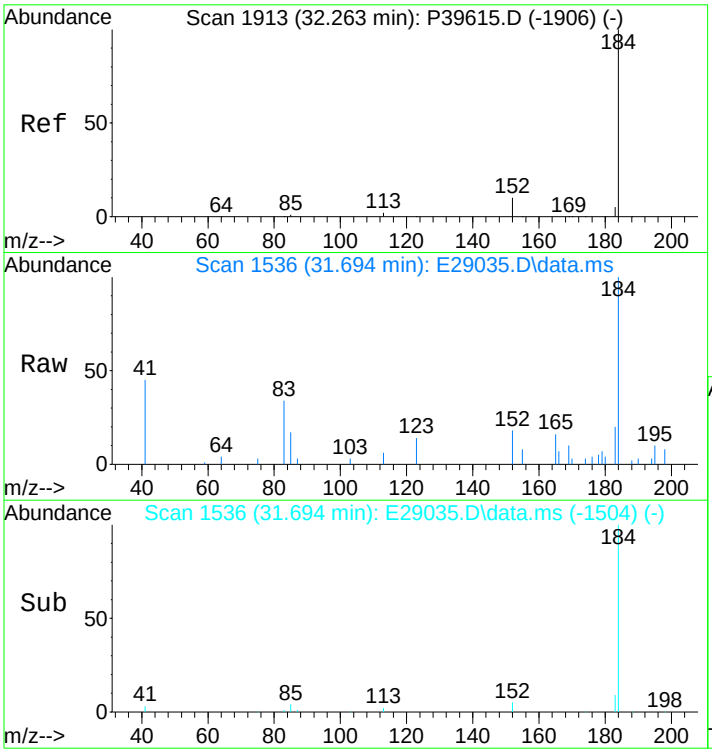


#32
C3-Fluorenes
Concen: 675.86 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.226 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:208 Resp: 75642

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

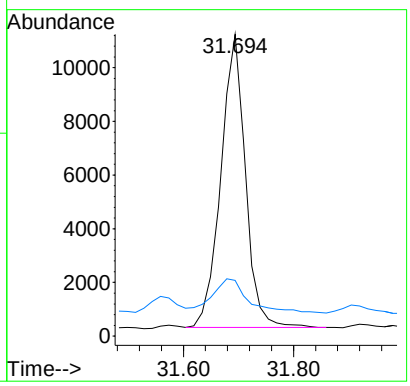


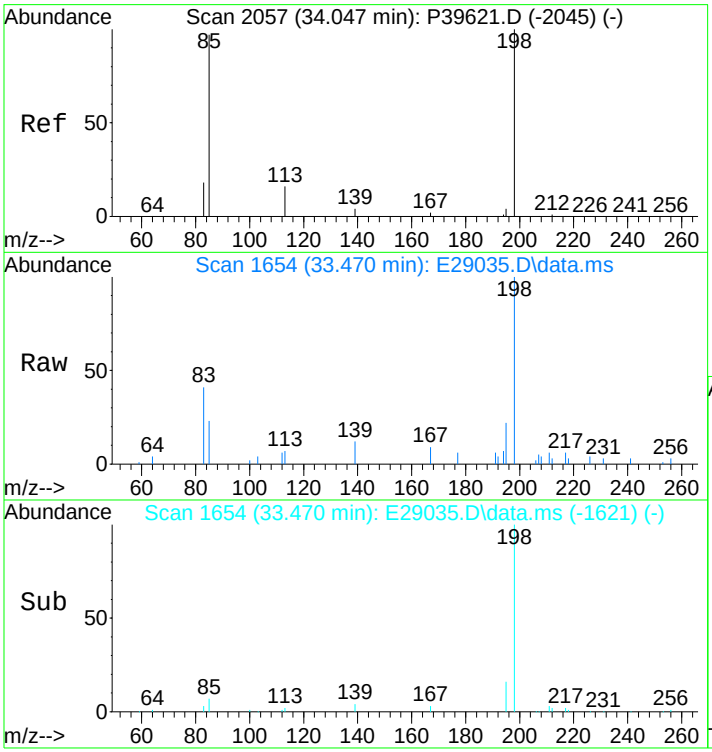


#33
Dibenzothiophene
Concen: 220.01 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:184 Resp: 33791

Ion	Ratio	Lower	Upper
184	100		
152	16.9	6.0	9.0#

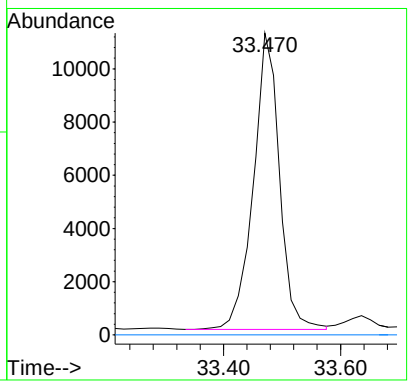


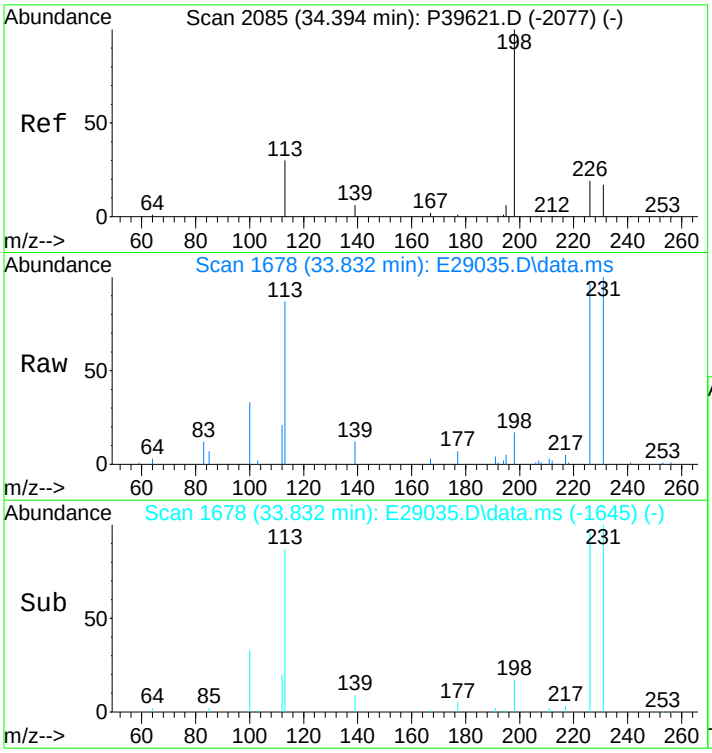


#34
4-Methyldibenzothiophene(4MDT)
Concen: 225.07 ng/mL
RT: 33.470 min Scan# 1654
Delta R.T. -0.004 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:198 Resp: 34567

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

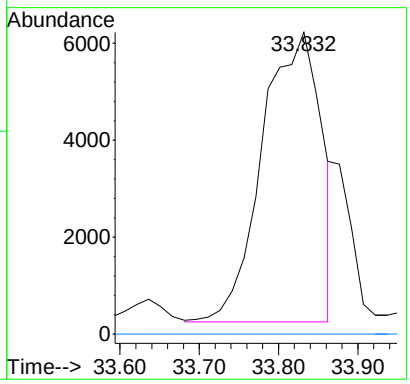


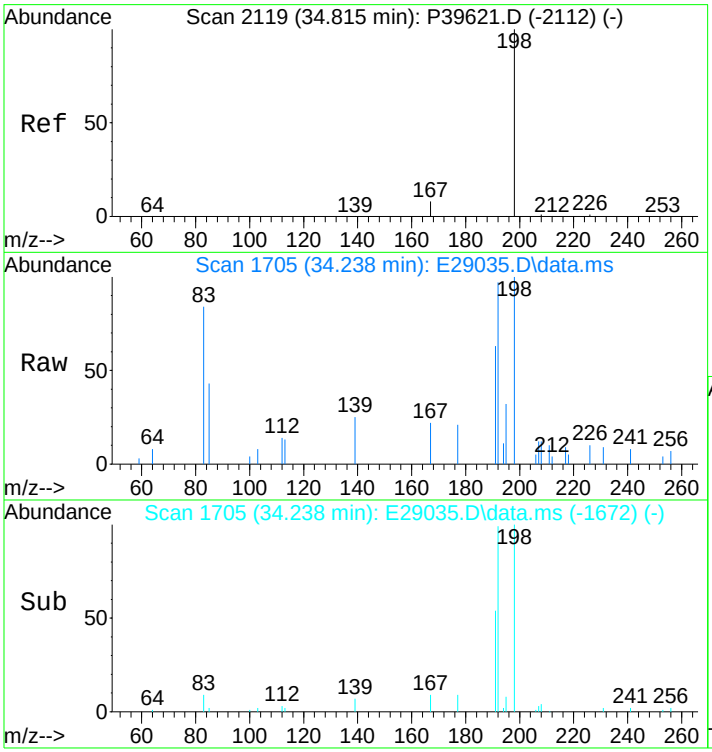


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 202.01 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. -0.004 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:198 Resp: 31026

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

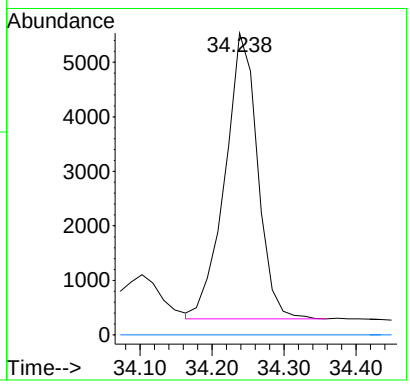


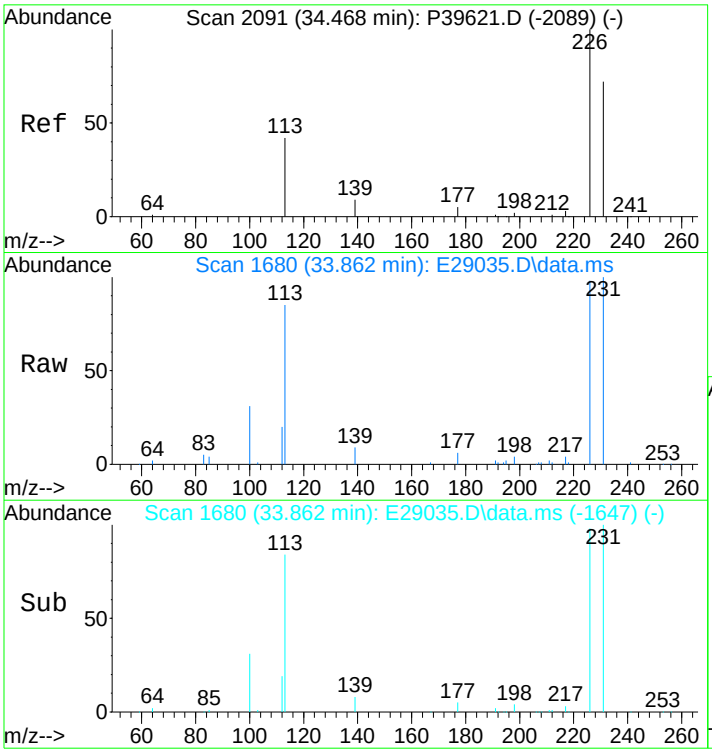


#36
1-Methyldibenzothiophene(1MDT)
Concen: 107.31 ng/mL
RT: 34.238 min Scan# 1705
Delta R.T. -0.004 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:198 Resp: 16482

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

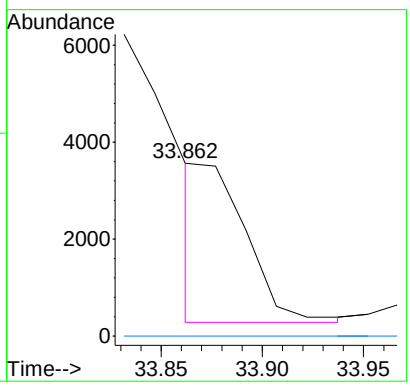


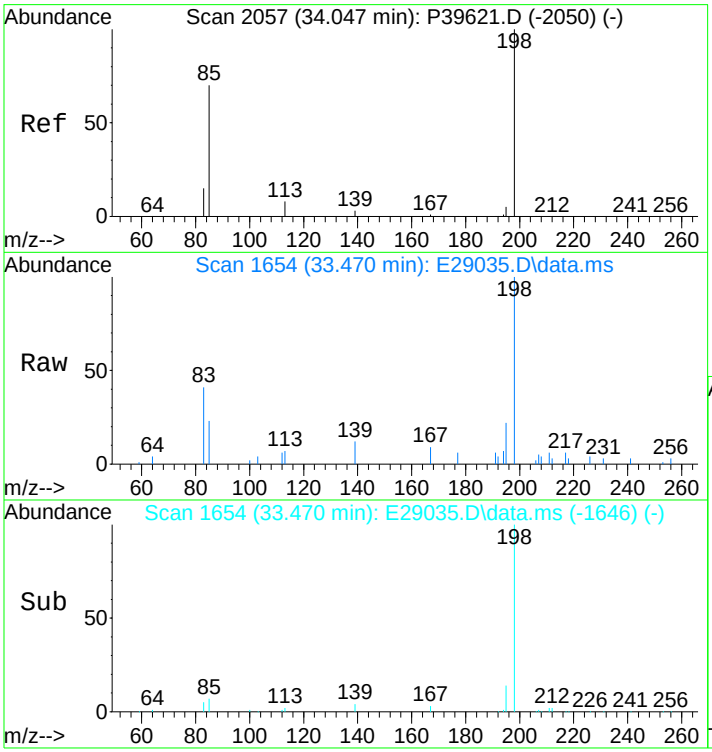


#37
OTP
Concen: 33.39 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.034 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:198 Resp: 5128

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

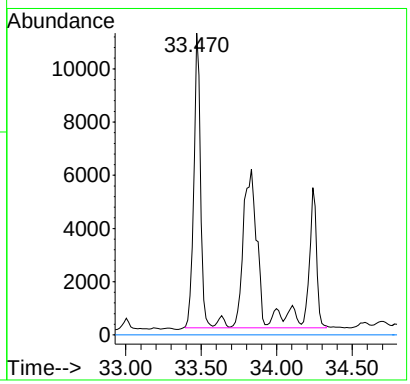


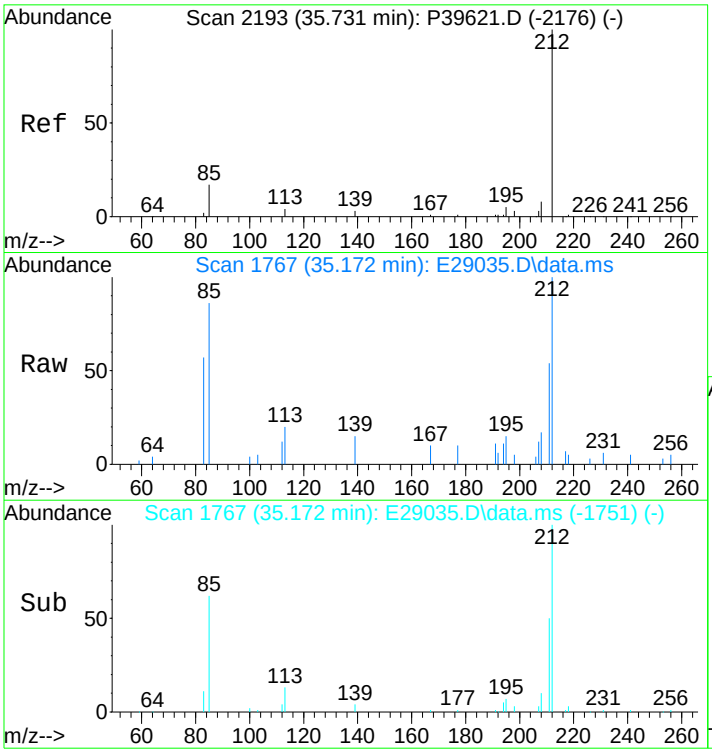


#38
C1-Dibenzothiophenes
Concen: 612.30 ng/mL m
RT: 33.470 min Scan# 1654
Delta R.T. 0.058 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:198 Resp: 94041

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

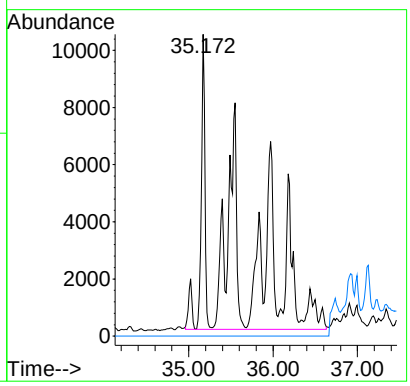


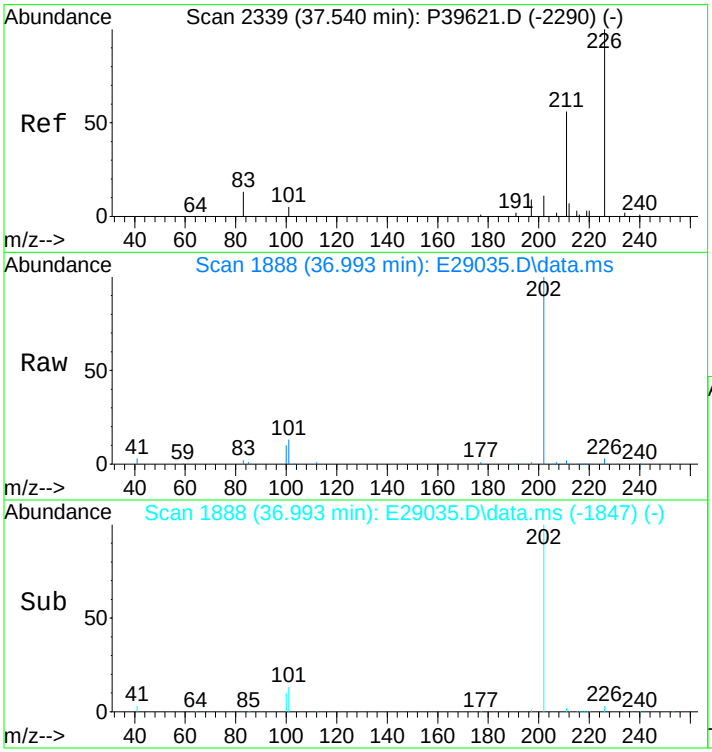


#39
C2-Dibenzothiophenes
Concen: 1197.30 ng/mL m
RT: 35.172 min Scan# 1767
Delta R.T. -0.005 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:212 Resp: 183888

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

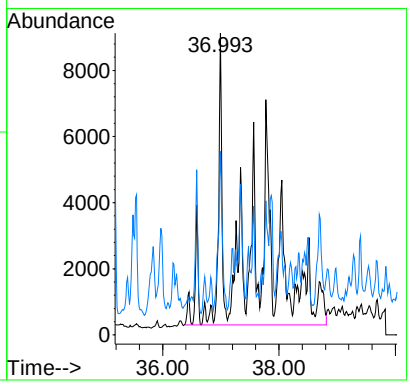


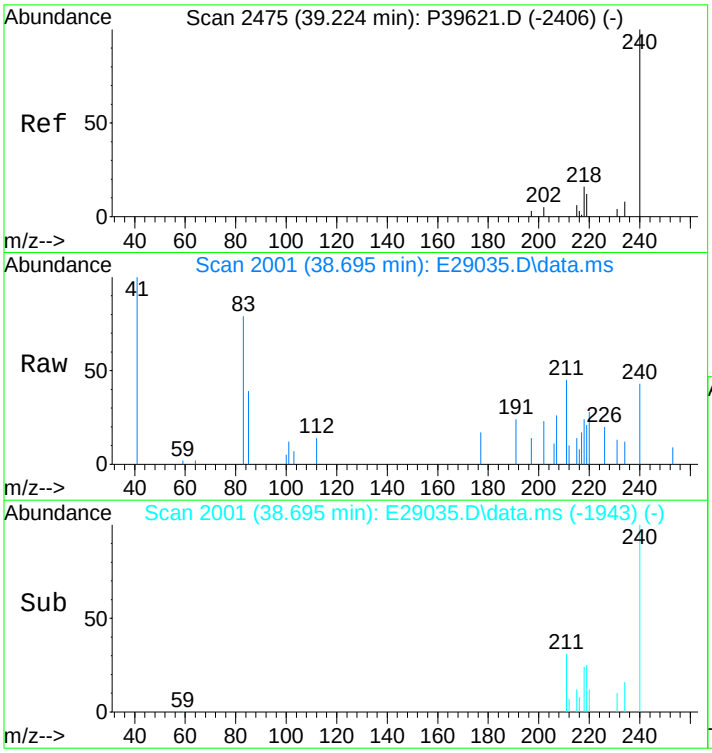


#40
C3-Dibenzothiophenes
Concen: 1395.12 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.284 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:226 Resp: 214271

Ion	Ratio	Lower	Upper
226	100		
211	1.7	44.1	66.1#

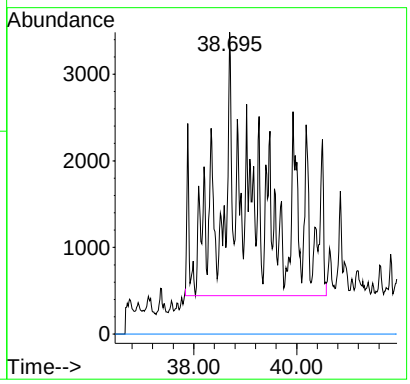


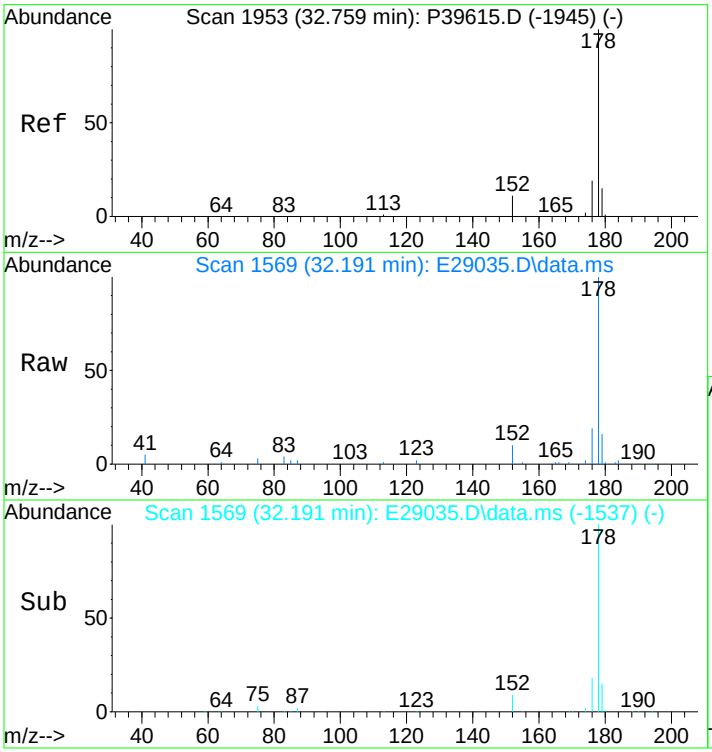


#41
C4-Dibenzothiophenes
Concen: 959.31 ng/mL m
RT: 38.695 min Scan# 2001
Delta R.T. 0.329 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:240 Resp: 147336

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

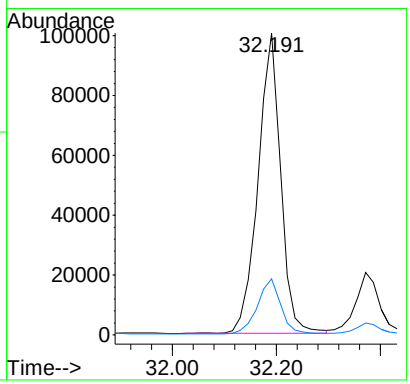


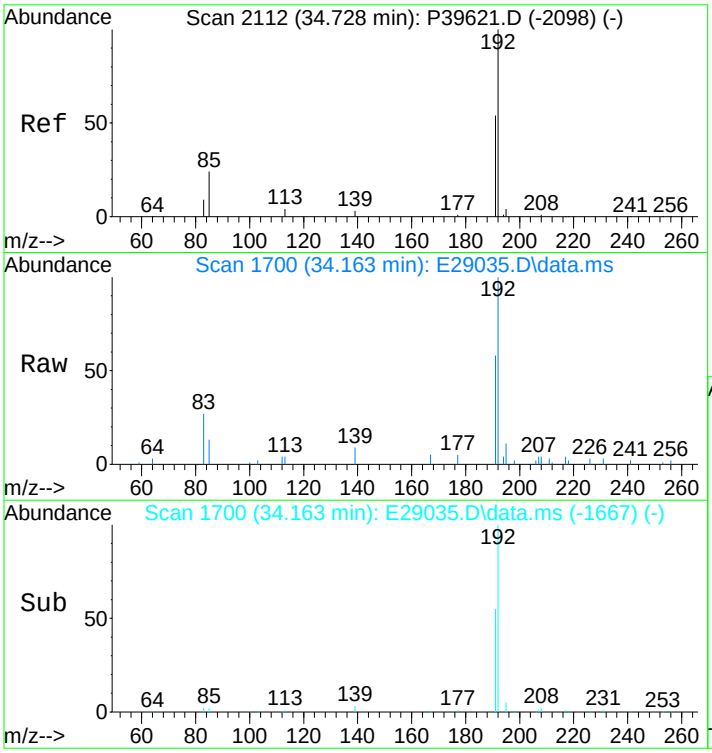


#43
Phenanthrene
Concen: 1944.84 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:178 Resp: 303894

Ion	Ratio	Lower	Upper
178	100		
176	18.9	14.6	21.8

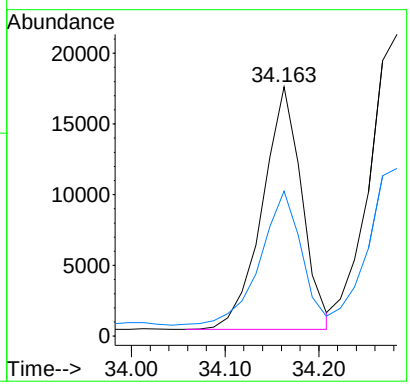


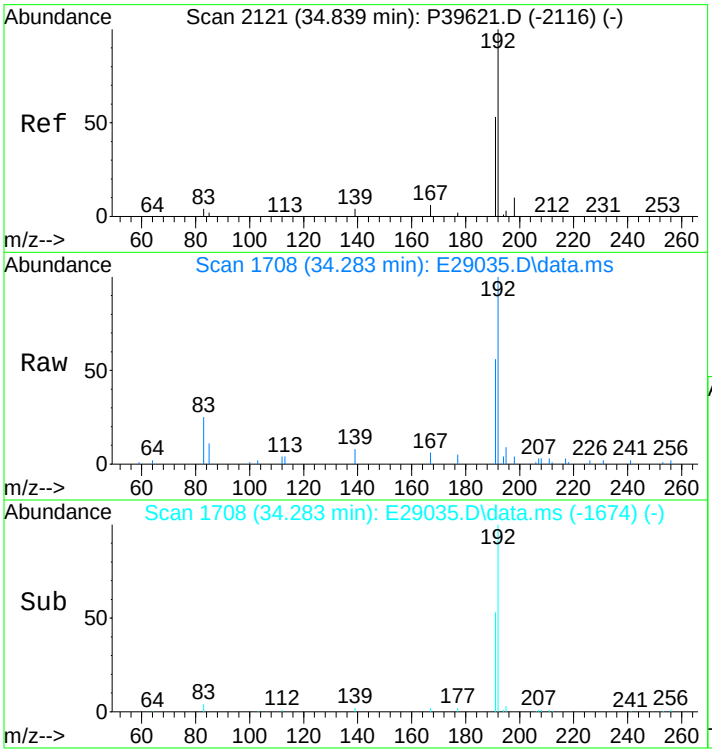


#44
3-Methylphenanthrene(3MP)
Concen: 322.30 ng/mL
RT: 34.163 min Scan# 1700
Delta R.T. -0.004 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 50362

Ion	Ratio	Lower	Upper
192	100		
191	57.6	45.9	68.9

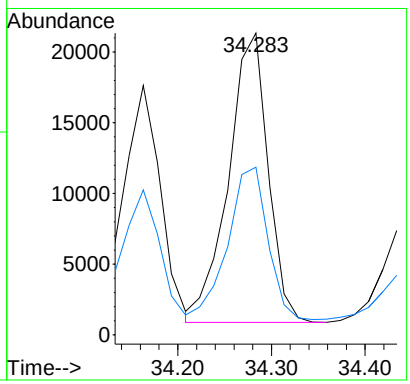


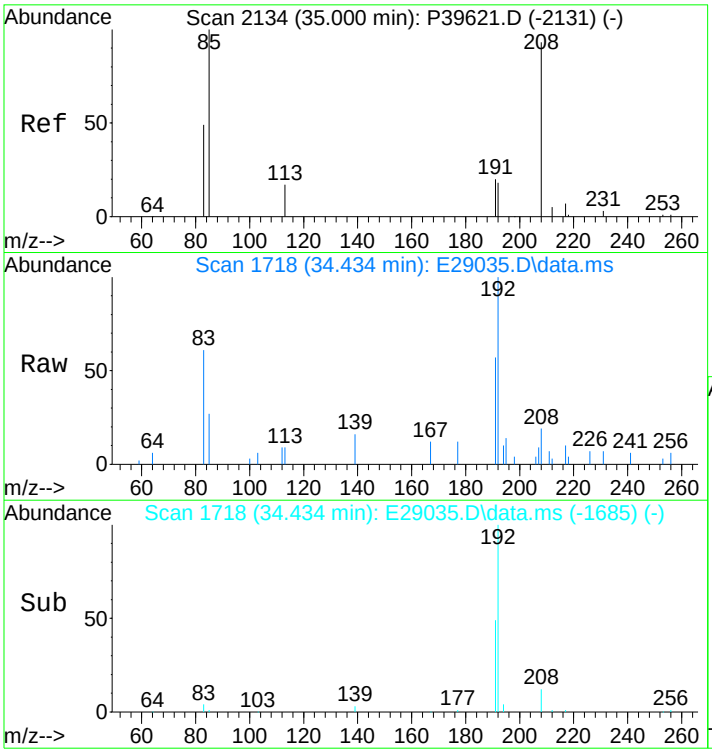


#45
2-Methylphenanthrene(2MP)
Concen: 385.03 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.011 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 60163

Ion	Ratio	Lower	Upper
192	100		
191	53.1	45.4	68.0

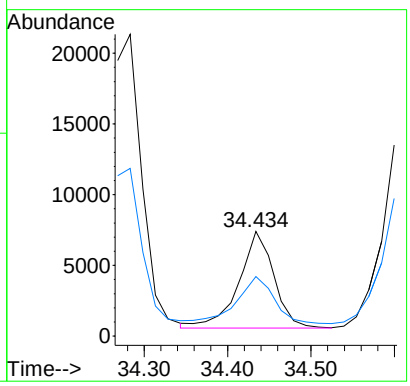


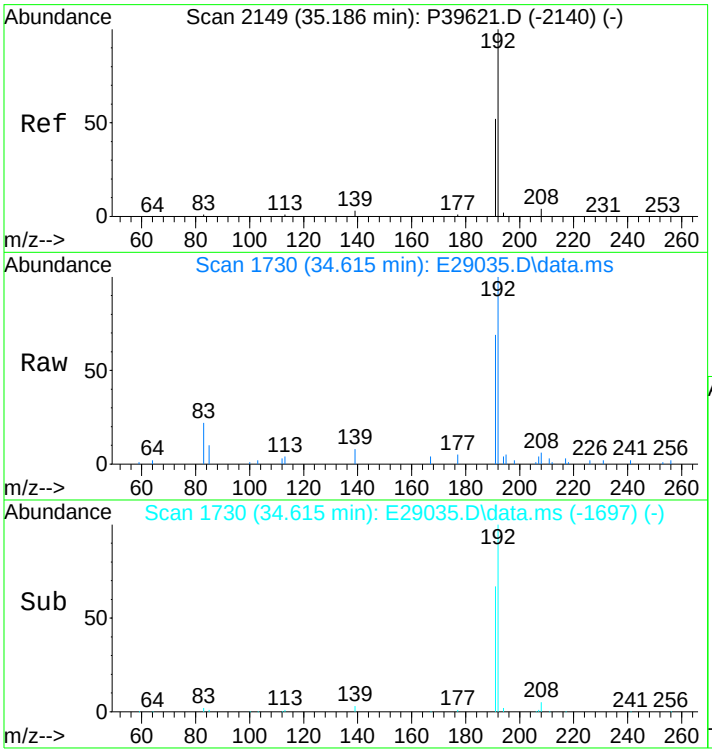


#46
2-Methylanthracene(2MA)
Concen: 128.65 ng/mL m
RT: 34.434 min Scan# 1718
Delta R.T. -0.005 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 20102

Ion	Ratio	Lower	Upper
192	100		
191	2.3	95.4	143.0#

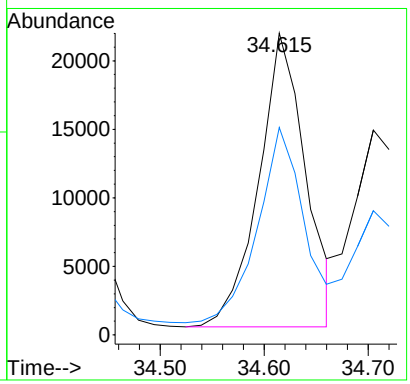


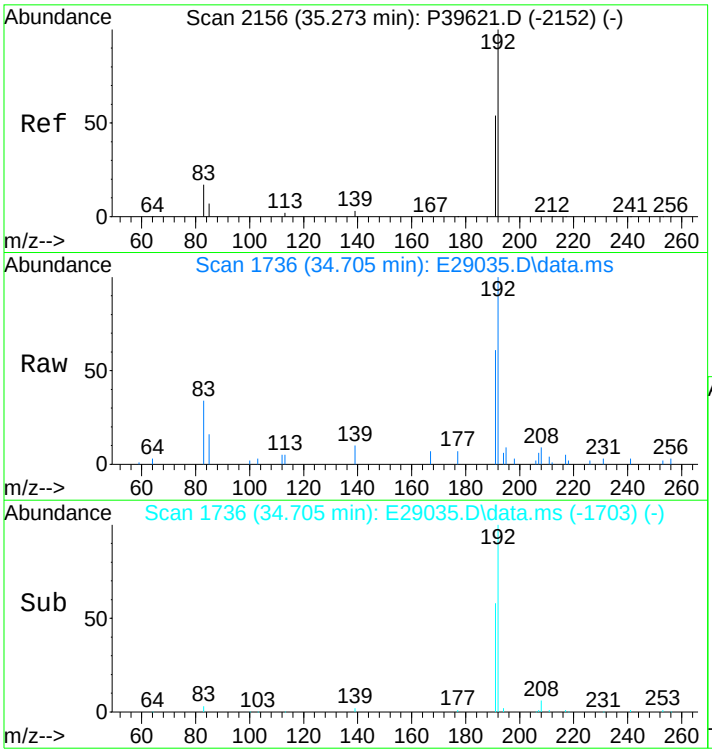


#47
9/4-Methylphenanthrene(9MP)
Concen: 431.18 ng/mL
RT: 34.615 min Scan# 1730
Delta R.T. -0.005 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 67374

Ion	Ratio	Lower	Upper
192	100		
191	65.2	44.3	66.5

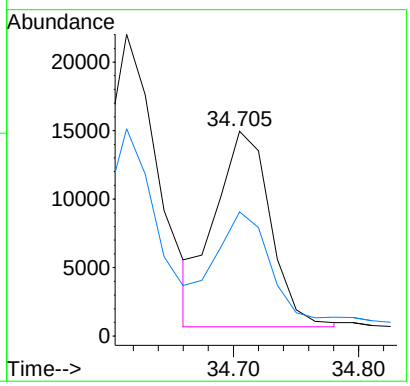


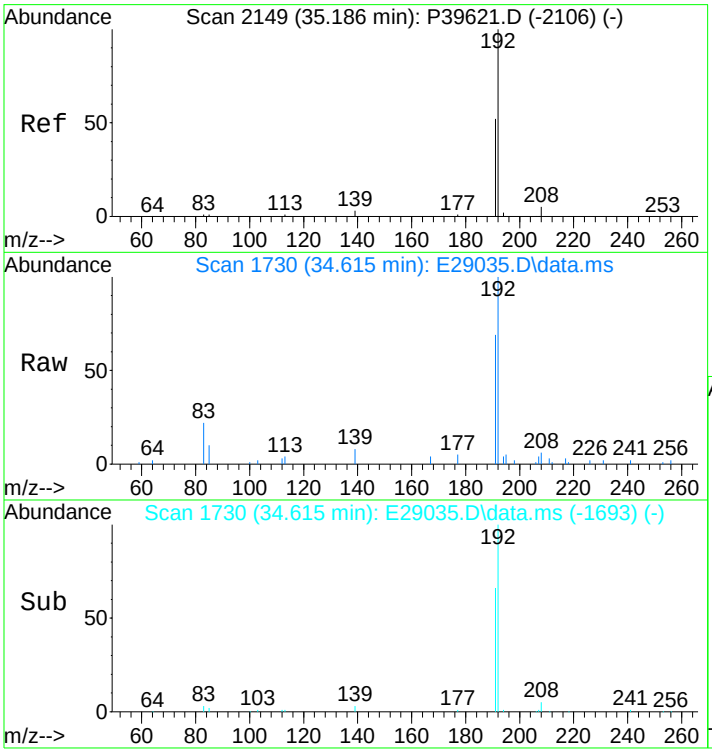


#48
1-Methylphenanthrene(1MP)
Concen: 281.47 ng/mL m
RT: 34.705 min Scan# 1736
Delta R.T. -0.005 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 43982

Ion	Ratio	Lower	Upper
192	100		
191	57.6	46.7	70.1

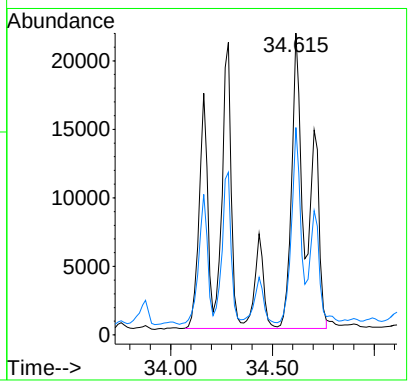


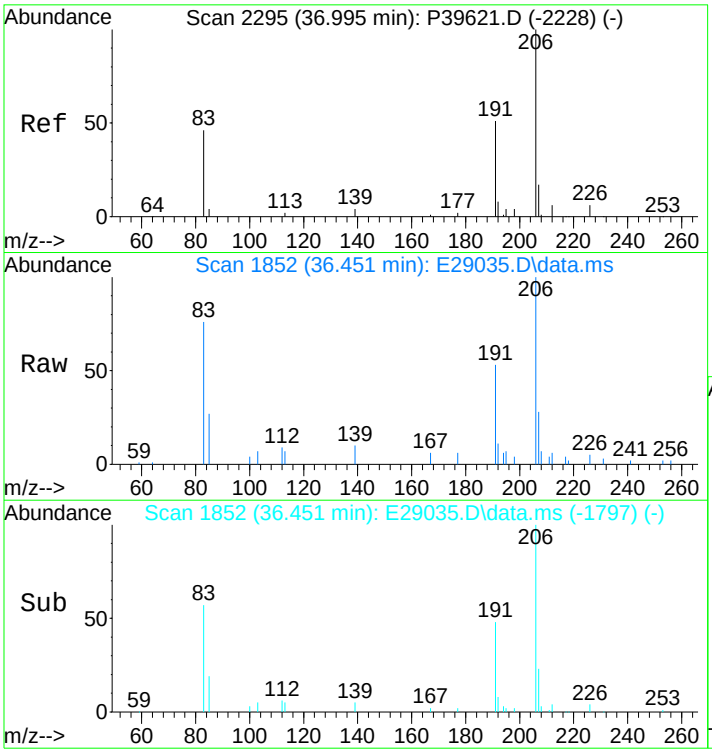


#49
C1-Phenanthrenes/Anthracenes
Concen: 1586.30 ng/mL m
RT: 34.615 min Scan# 1730
Delta R.T. 0.192 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 247870

Ion	Ratio	Lower	Upper
192	100		
191	4.2	44.0	66.0#

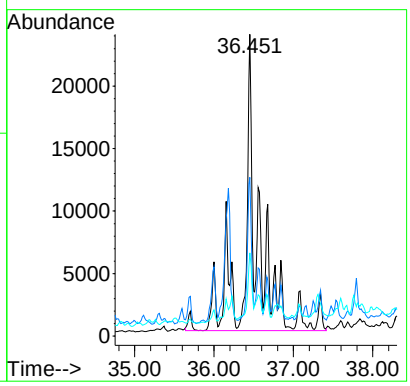


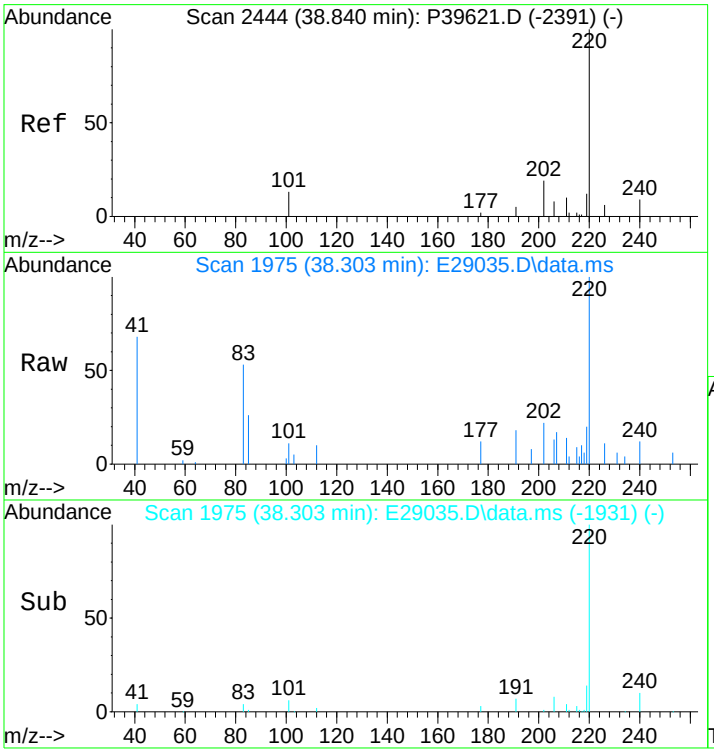


#50
C2-Phenanthrenes/Anthracenes
Concen: 1844.11 ng/mL m
RT: 36.451 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:206 Resp: 288154

Ion	Ratio	Lower	Upper
206	100		
191	14.5	35.7	53.5#
207	6.8	16.5	24.7#

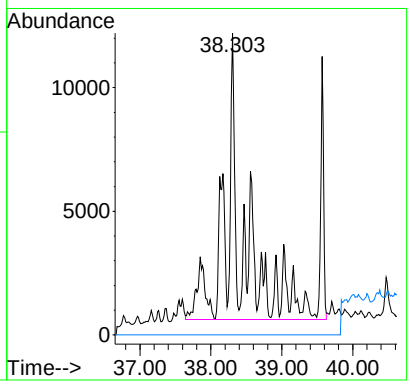


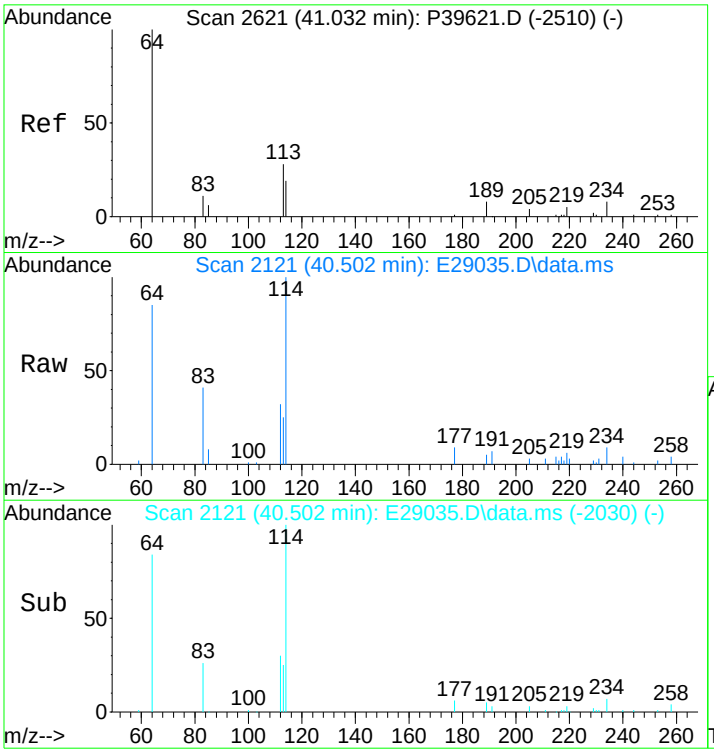


#52
C3-Phenanthrenes/Anthracenes
Concen: 1382.47 ng/mL m
RT: 38.303 min Scan# 1975
Delta R.T. 0.319 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:220 Resp: 216020

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

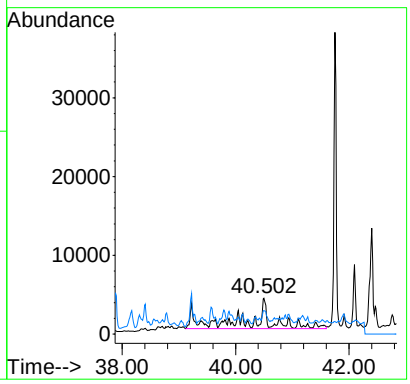


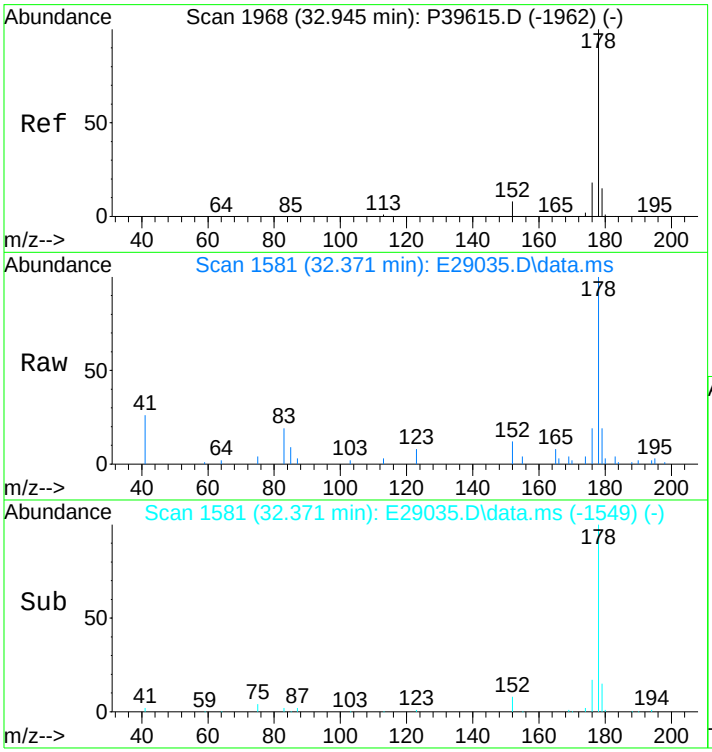


#53
C4-Phenanthrenes/Anthracenes
Concen: 697.62 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:234 Resp: 109007

Ion	Ratio	Lower	Upper
234	100		
219	0.9	46.6	70.0#

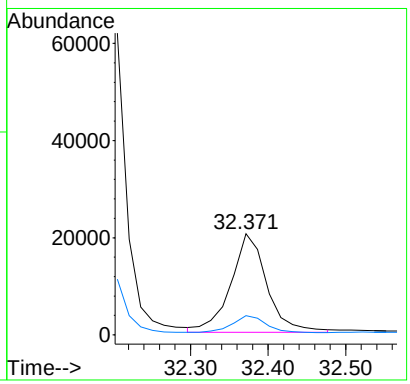


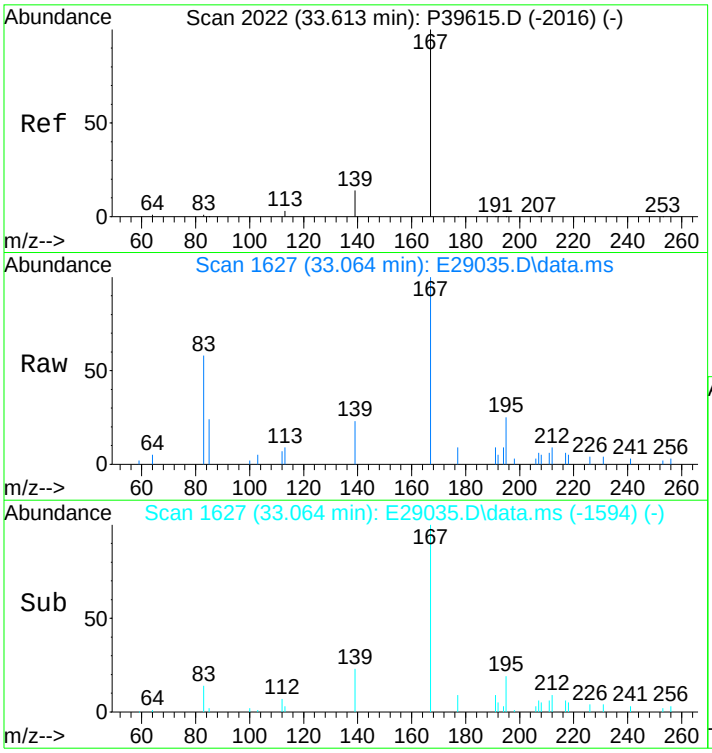


#55
Anthracene
Concen: 487.74 ng/mL m
RT: 32.371 min Scan# 1581
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:178 Resp: 65874

Ion	Ratio	Lower	Upper
178	100		
176	16.5	14.2	21.2

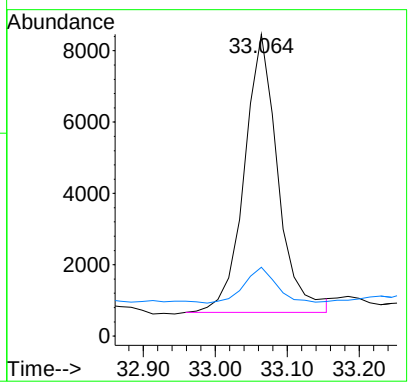


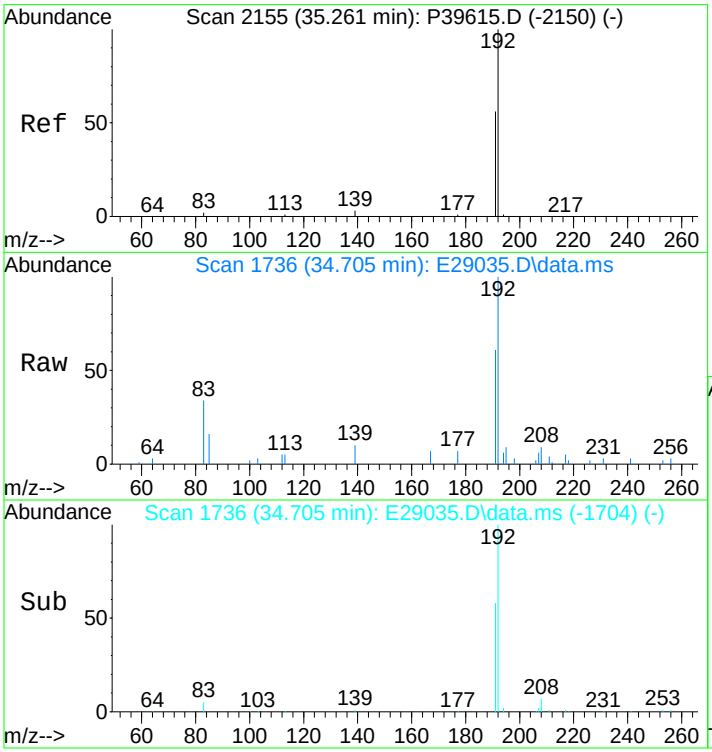


#56
Carbazole
Concen: 181.06 ng/mL
RT: 33.064 min Scan# 1627
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:167 Resp: 25168

Ion	Ratio	Lower	Upper
167	100		
139	11.3	10.6	15.8

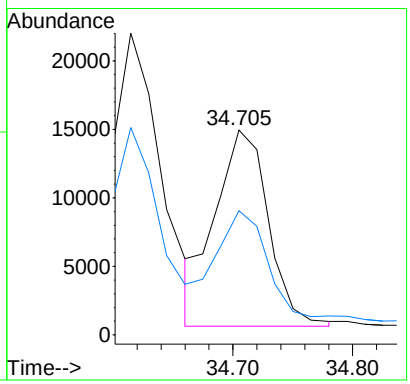


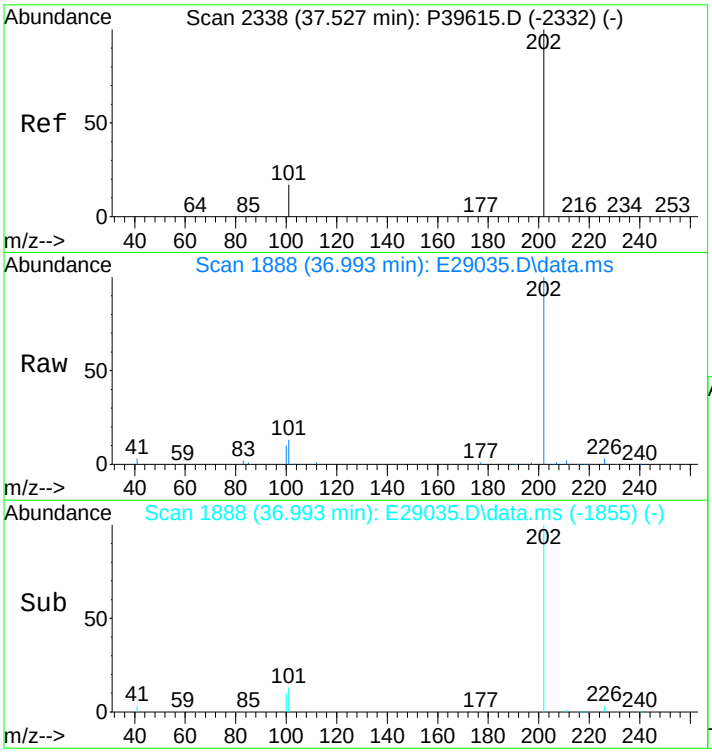


#57
1-Methylphenanthrene
Concen: 370.88 ng/mL m
RT: 34.705 min Scan# 1736
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:192 Resp: 44213

Ion	Ratio	Lower	Upper
192	100		
191	57.3	44.4	66.6

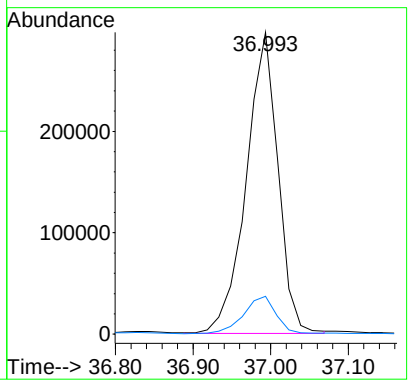


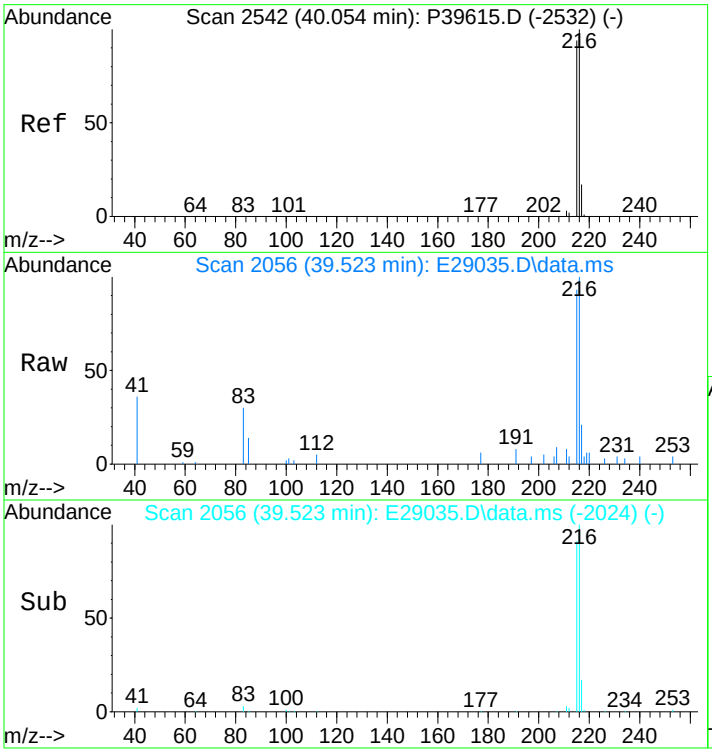


#58
Fluoranthene
Concen: 4894.20 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:202 Resp: 844552

Ion	Ratio	Lower	Upper
202	100		
101	13.3	10.5	15.7

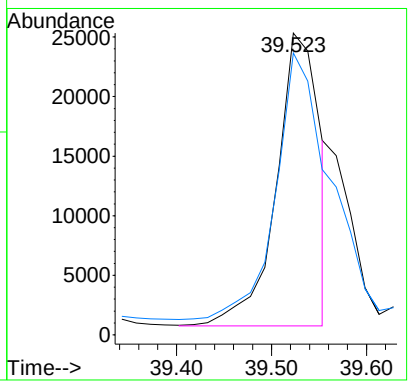


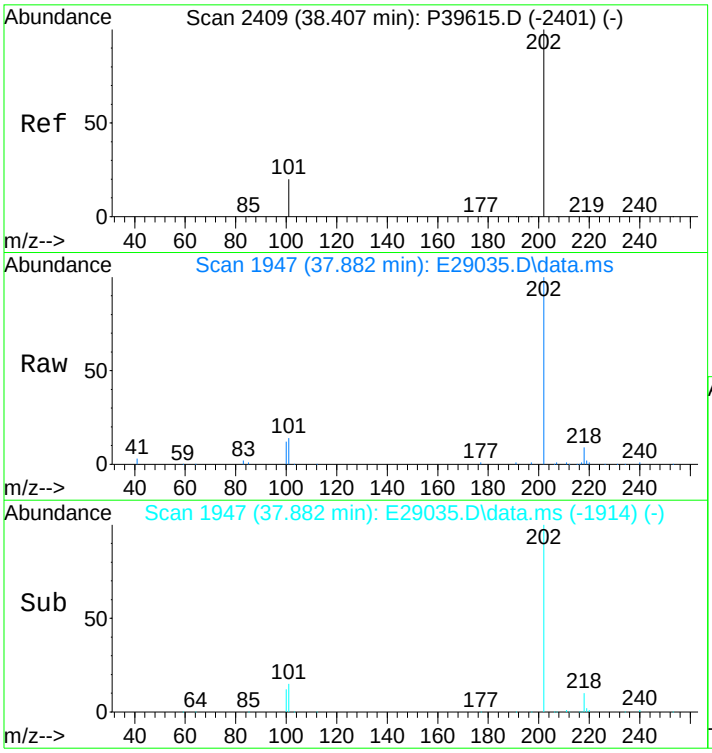


#59
Benzo(b)fluorene
Concen: 683.17 ng/mL m
RT: 39.523 min Scan# 2056
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:216 Resp: 78556

Ion	Ratio	Lower	Upper
216	100		
215	113.6	73.0	109.6#

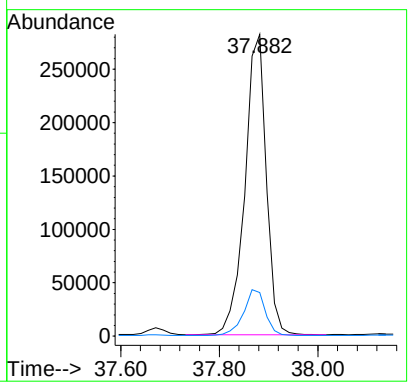


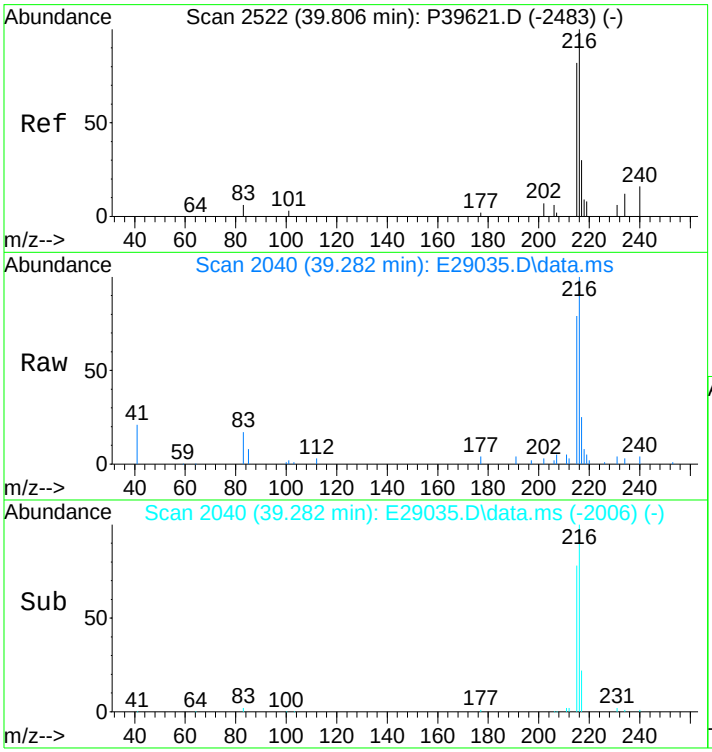


#60
Pyrene
Concen: 4797.29 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:202 Resp: 841418

Ion	Ratio	Lower	Upper
202	100		
101	15.7	11.5	17.3

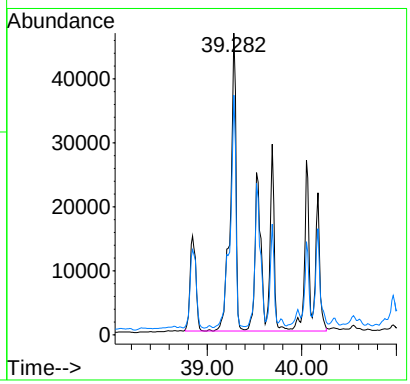


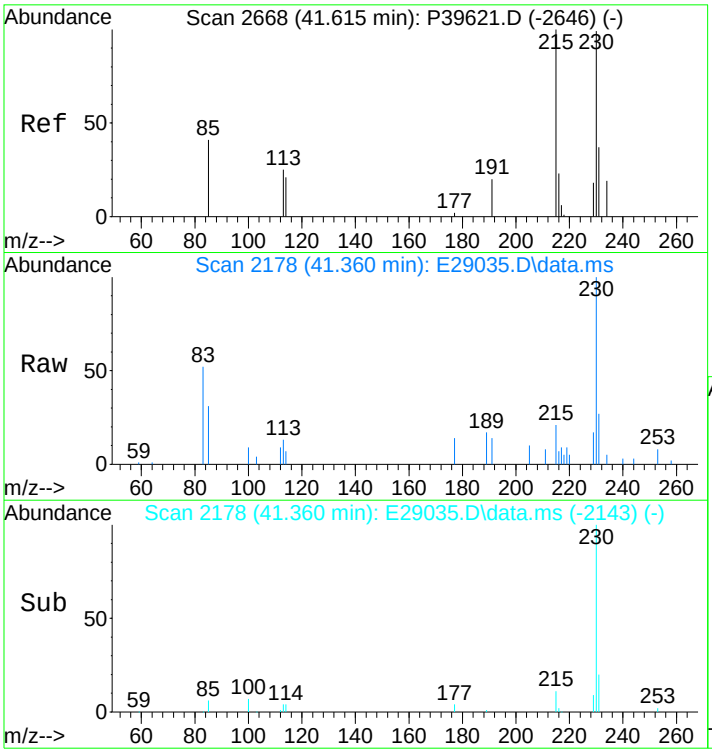


#61
C1-Fluoranthenes/Pyrenes
Concen: 3415.71 ng/mL m
RT: 39.282 min Scan# 2040
Delta R.T. 0.345 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:216 Resp: 599097

Ion	Ratio	Lower	Upper
216	100		
215	8.9	73.4	110.2#

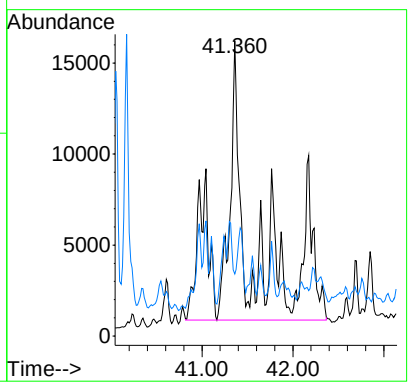


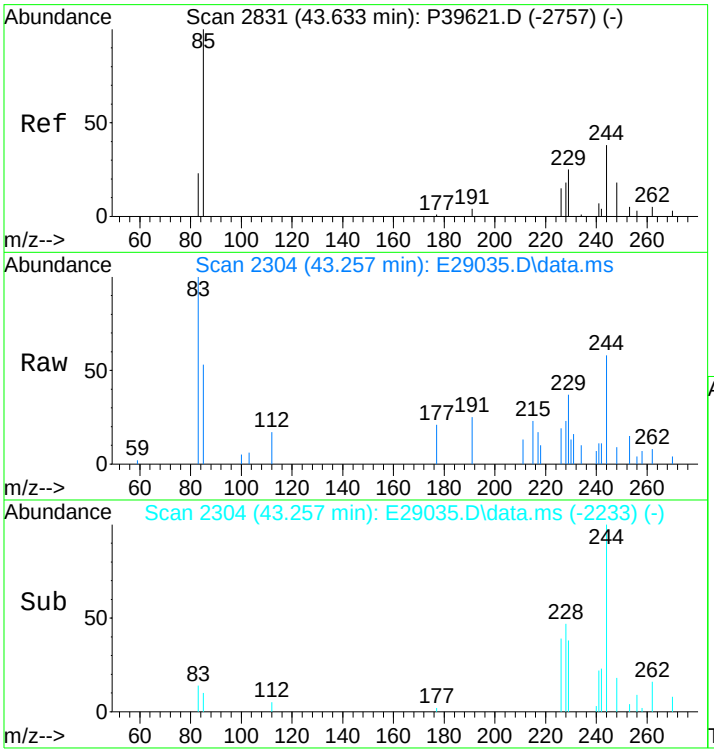


#62
C2-Fluoranthenes/Pyrenes
Concen: 1811.97 ng/mL m
RT: 41.360 min Scan# 2178
Delta R.T. 0.457 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:230 Resp: 317810

Ion	Ratio	Lower	Upper
230	100		
215	4.0	93.8	140.8#

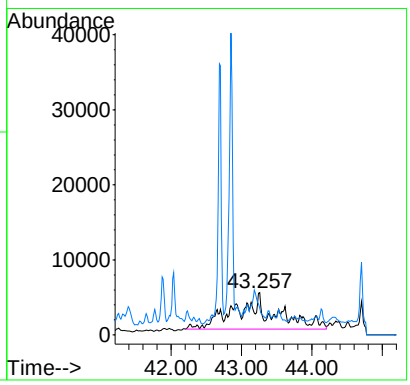


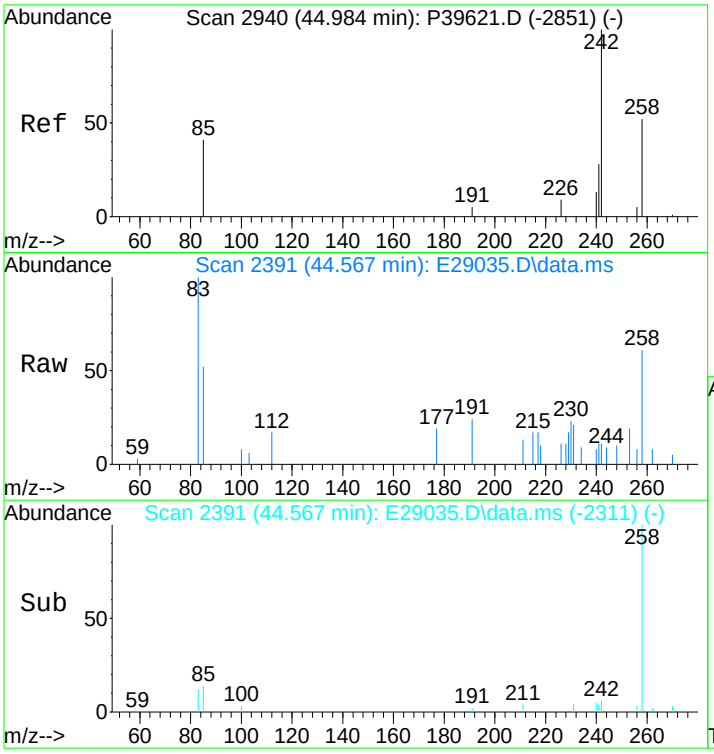


#63
C3-Fluoranthenes/Pyrenes
Concen: 1089.50 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:244 Resp: 191093

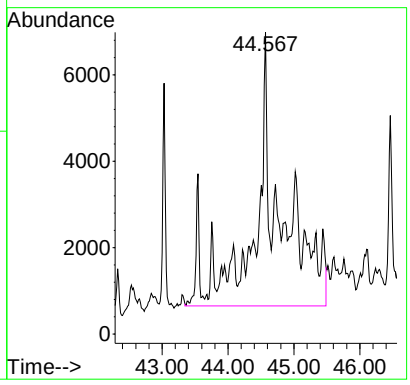
Ion	Ratio	Lower	Upper
244	100		
229	4.0	72.2	108.2#

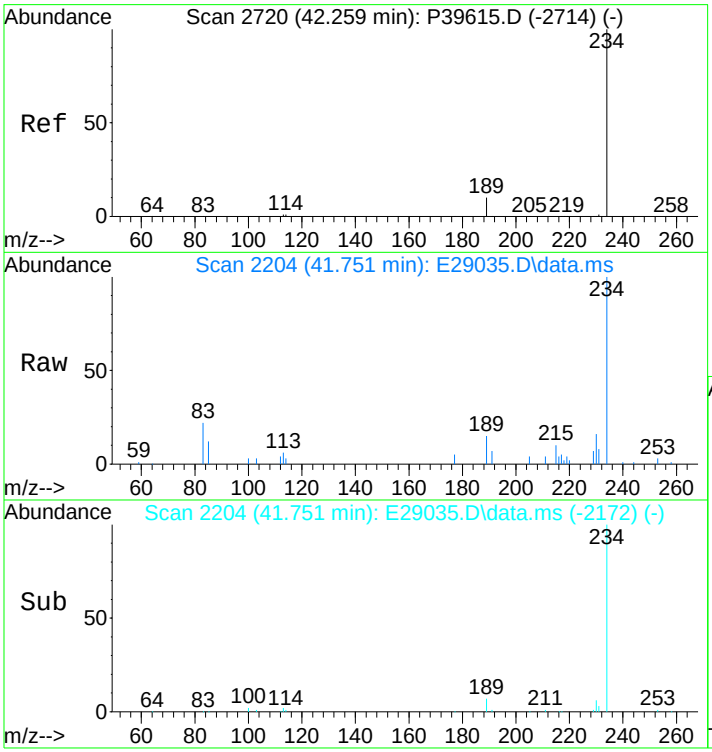




#64
C4-Fluoranthenes/Pyrenes
Concen: 961.83 ng/mL m
RT: 44.567 min Scan# 2391
Delta R.T. 0.571 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:258 Resp: 168700

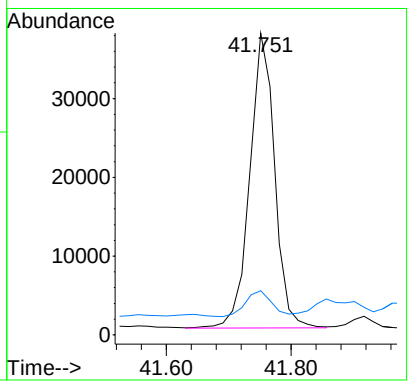


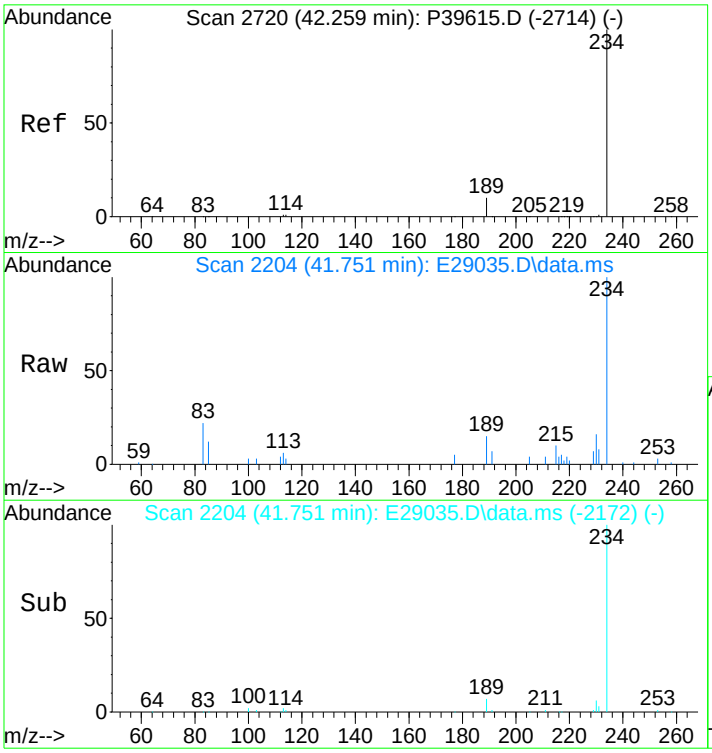


#66
Naphthobenzothiophene
Concen: 599.83 ng/ml
RT: 41.751 min Scan# 2204
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:234 Resp: 103765

Ion	Ratio	Lower	Upper
234	100		
189	9.2	5.4	8.2#

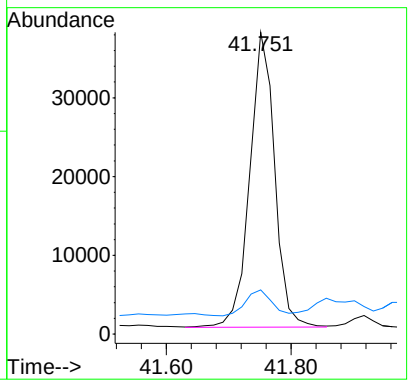


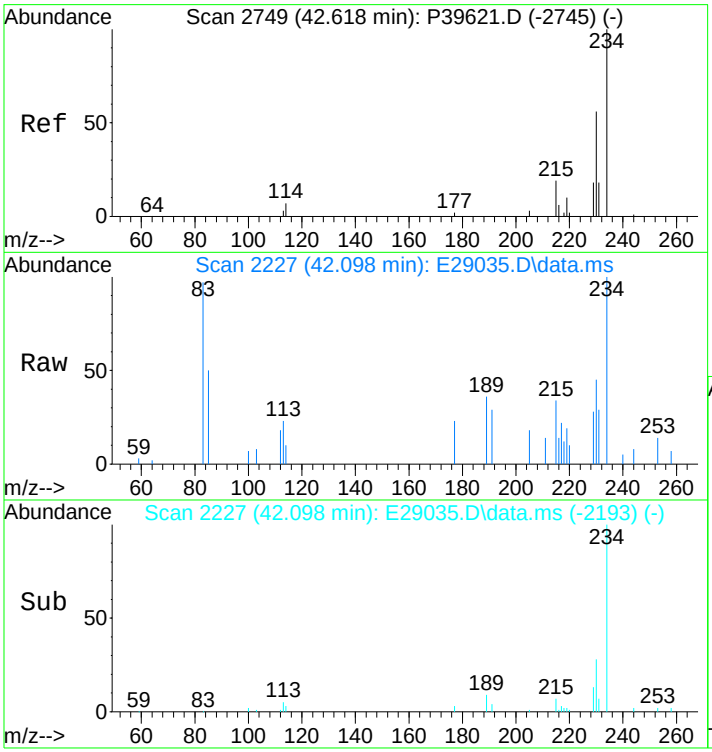


#67
Naphthobenzothiophene-2,1-D
Concen: 599.83 ng/mL
RT: 41.751 min Scan# 2204
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:234 Resp: 103765

Ion	Ratio	Lower	Upper
234	100		
189	9.2	5.4	8.2#

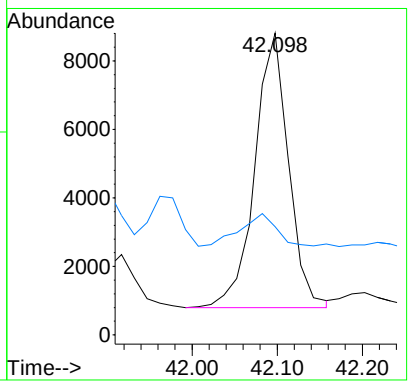


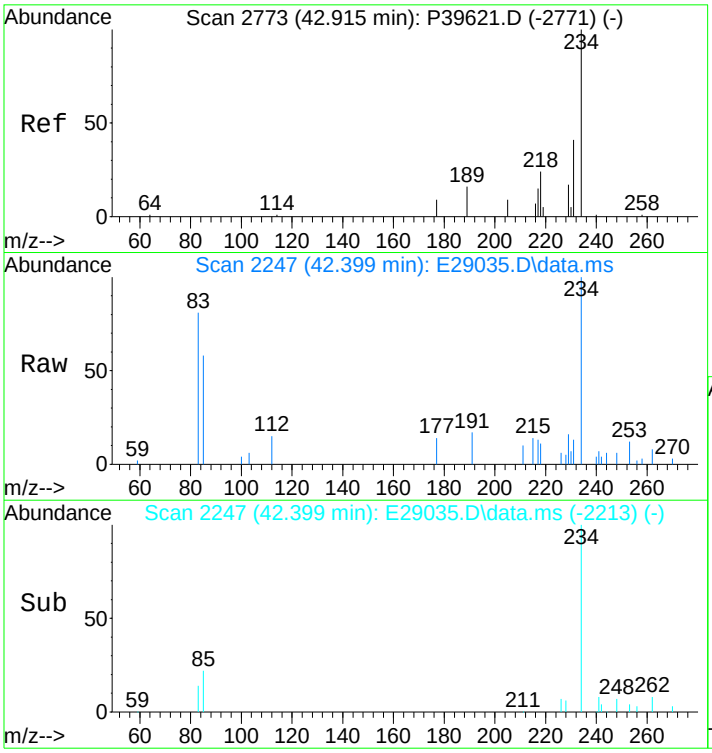


#68
Naphthobenzothiophene-1,2-D
Concen: 127.45 ng/mL
RT: 42.098 min Scan# 2227
Delta R.T. 0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:234 Resp: 22047

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

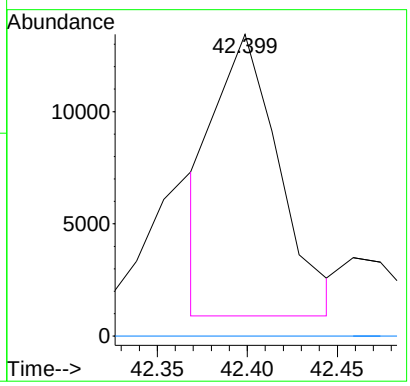


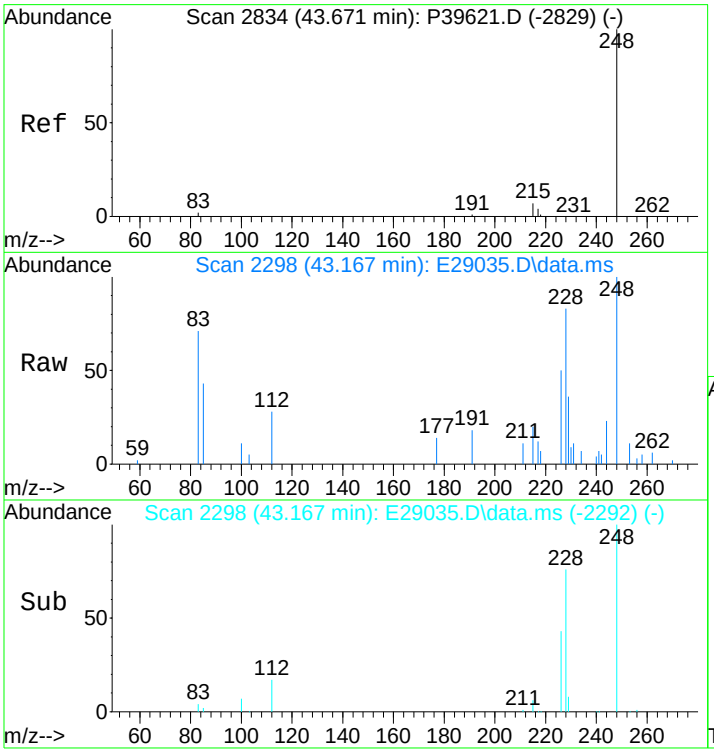


#69
Naphthobenzothiophene-2,3-D
Concen: 180.89 ng/mL m
RT: 42.399 min Scan# 2247
Delta R.T. 0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:234 Resp: 31292

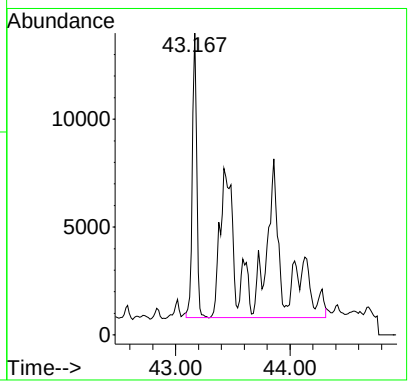
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

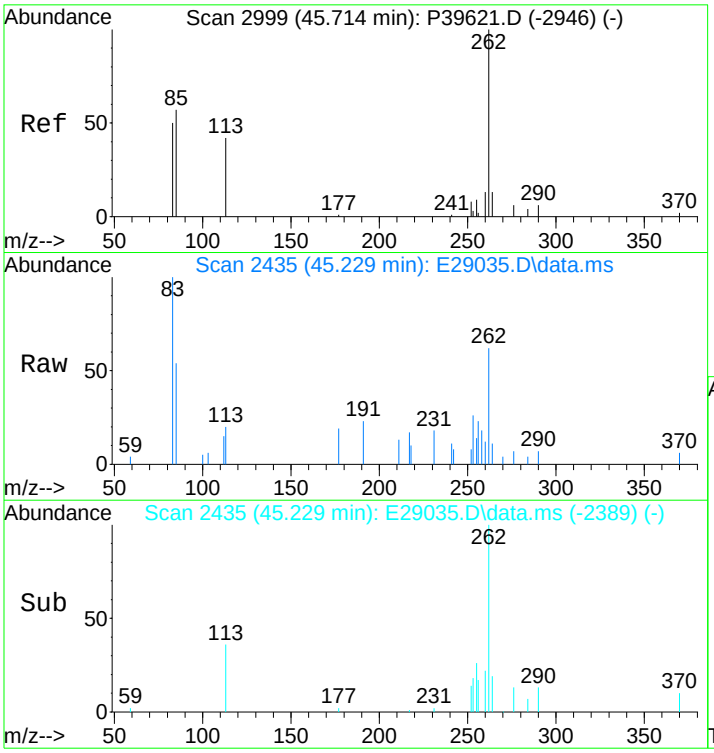




#70
C1-Naphthobenzothiophenes
Concen: 1017.46 ng/ml m
RT: 43.167 min Scan# 2298
Delta R.T. 0.021 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

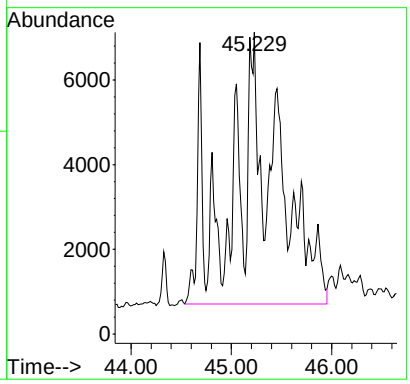
Tgt Ion:248 Resp: 176011

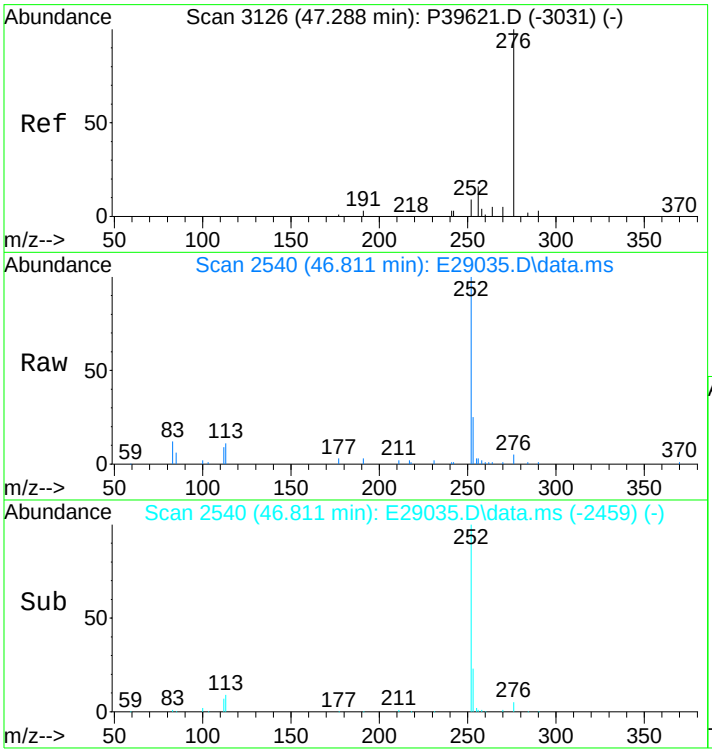




#71
C2-Naphthobenzothiophenes
Concen: 1114.09 ng/ml m
RT: 45.229 min Scan# 2435
Delta R.T. 0.559 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

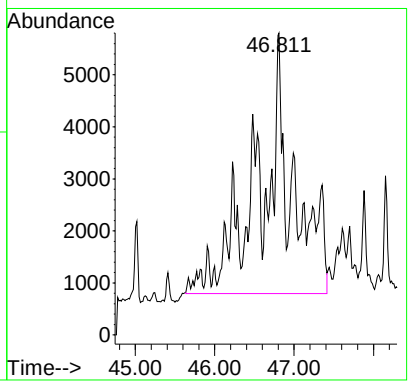
Tgt Ion:262 Resp: 192727

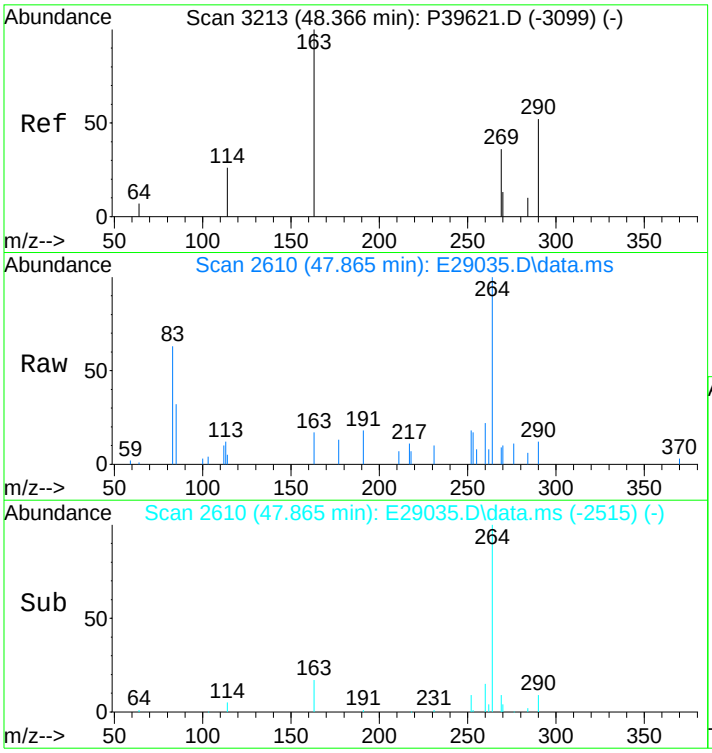




#72
C3-Naphthobenzothiophenes
Concen: 844.69 ng/ml m
RT: 46.811 min Scan# 2540
Delta R.T. 0.557 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

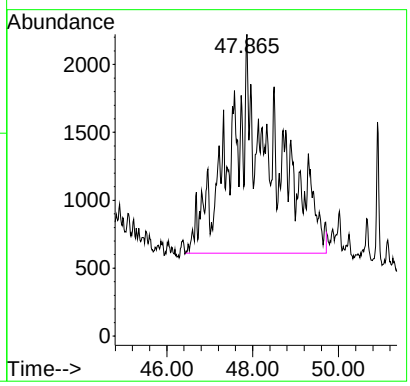
Tgt Ion:276 Resp: 146123

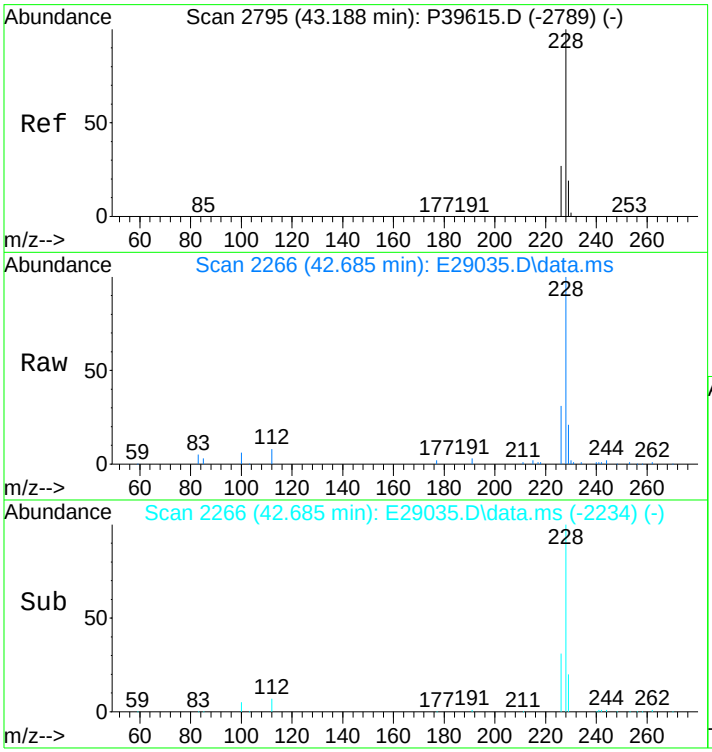




#73
C4-Naphthobenzothiophenes
Concen: 637.87 ng/mL m
RT: 47.865 min Scan# 2610
Delta R.T. 0.541 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:290 Resp: 110345

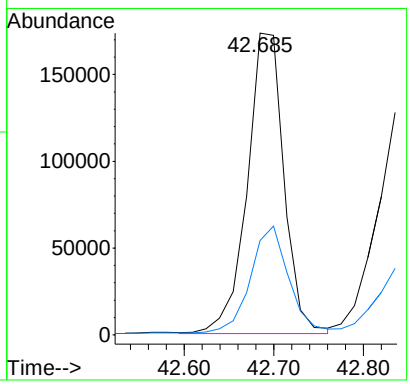


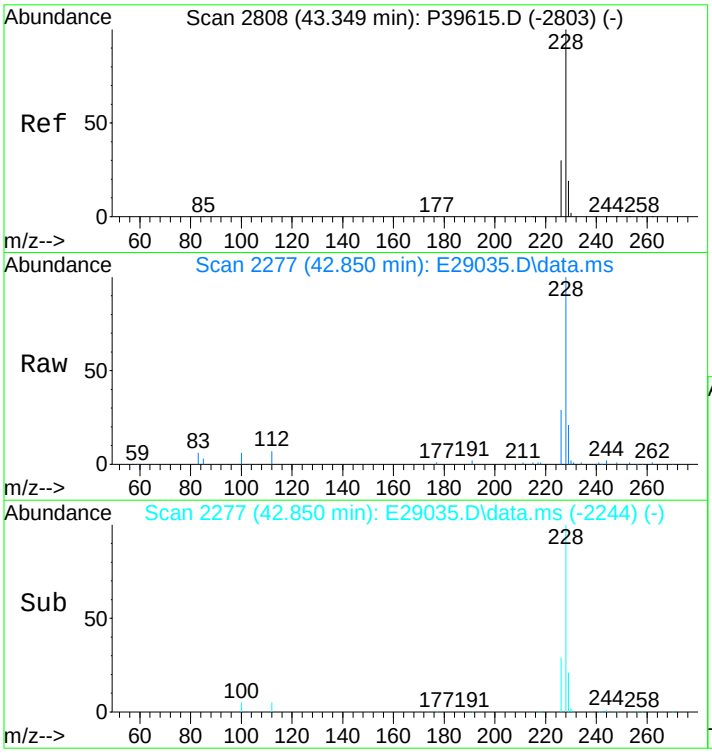


#75
Benz[a]anthracene
Concen: 2607.78 ng/mL m
RT: 42.685 min Scan# 2266
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:228 Resp: 495075

Ion	Ratio	Lower	Upper
228	100		
226	34.4	20.2	30.4#

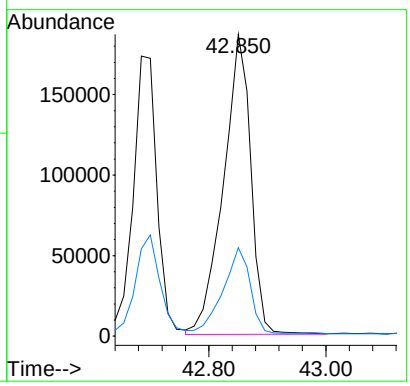


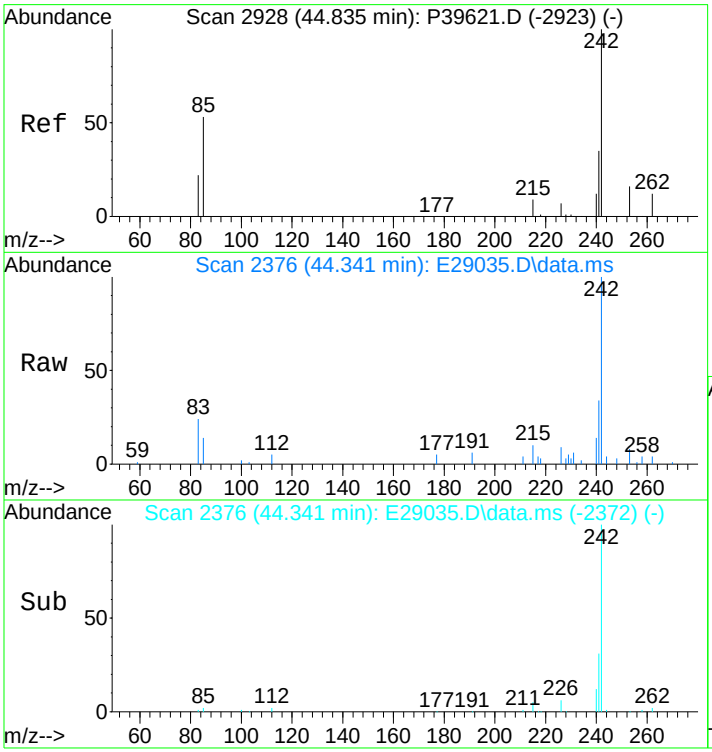


#77
Chrysene/Triphenylene
Concen: 3090.12 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:228 Resp: 603962

Ion	Ratio	Lower	Upper
228	100		
226	28.8	22.5	33.7

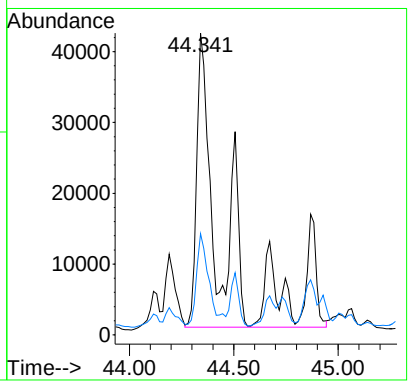


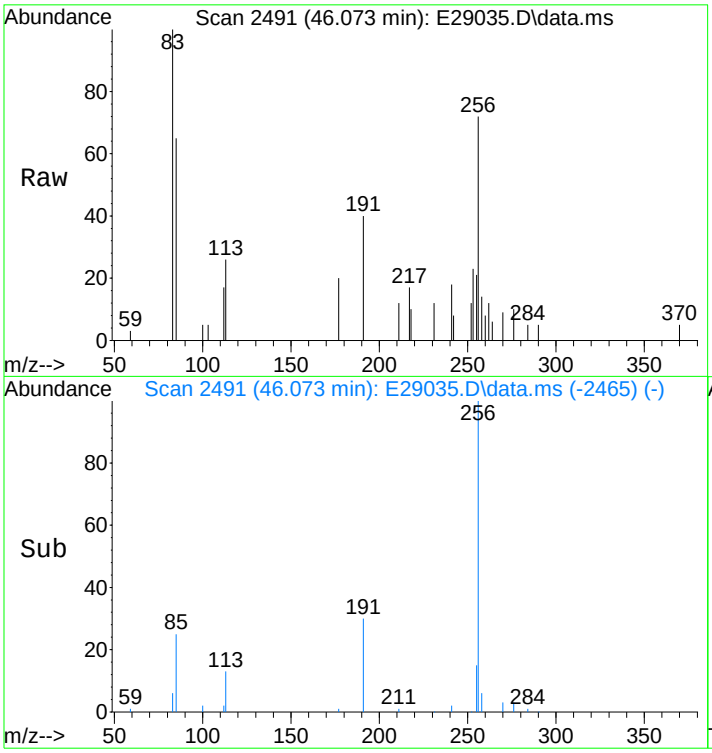


#78
C1-Chrysenes
Concen: 1806.07 ng/mL m
RT: 44.341 min Scan# 2376
Delta R.T. 0.010 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:242 Resp: 352994

Ion	Ratio	Lower	Upper
242	100		
241	4.2	32.2	48.4#

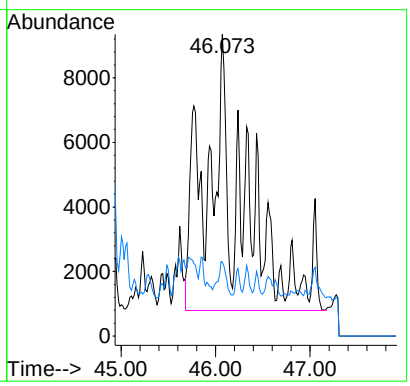


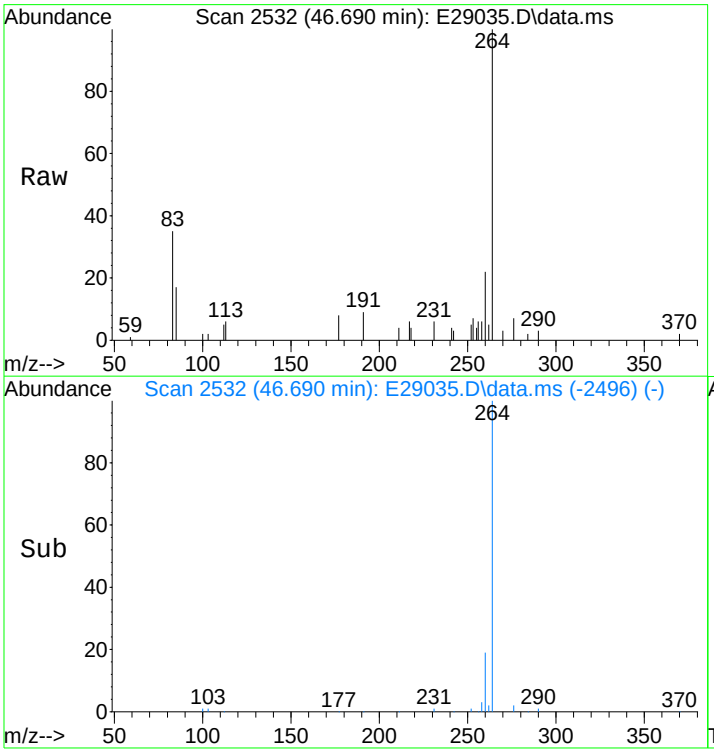


#79
C2-Chrysenes
Concen: 1156.64 ng/mL m
RT: 46.073 min Scan# 2491
Delta R.T. -0.319 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:256 Resp: 226064

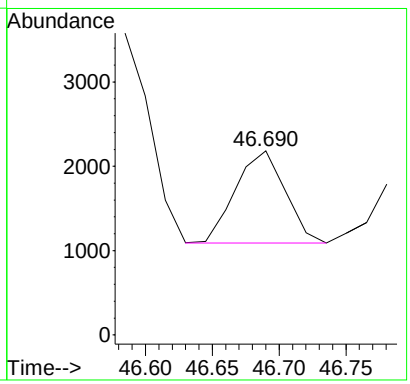
Ion	Ratio	Lower	Upper
256	100		
241	1.1	25.3	37.9#

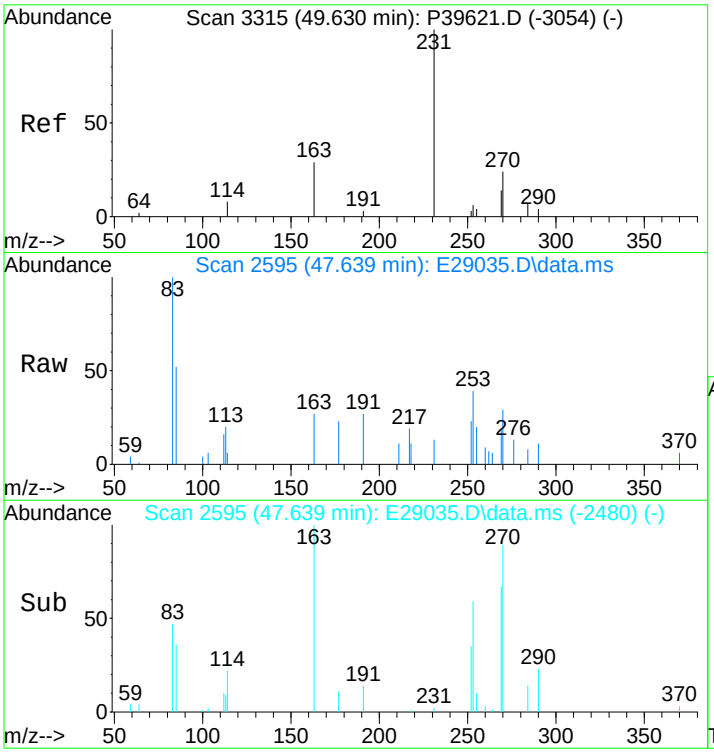




#80
BBF-D12 Surr BKGD
Concen: 14.47 ng/mL
RT: 46.690 min Scan# 2532
Delta R.T. 0.046 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:256 Resp: 2829

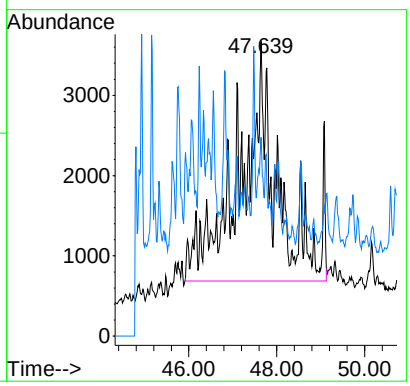


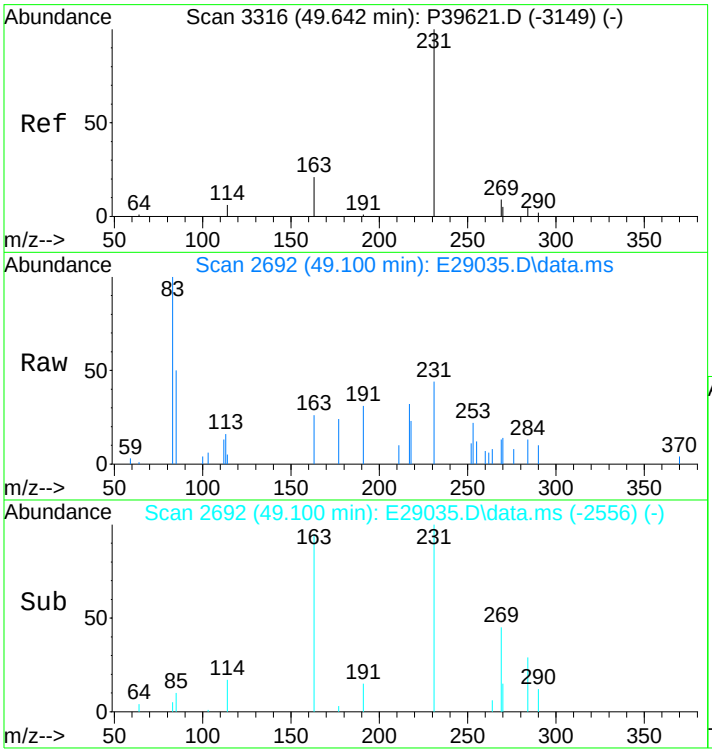


#81
C3-Chrysenes
Concen: 871.93 ng/mL m
RT: 47.639 min Scan# 2595
Delta R.T. -1.481 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:270 Resp: 170418

Ion	Ratio	Lower	Upper
270	100		
255	0.0	38.0	57.0#

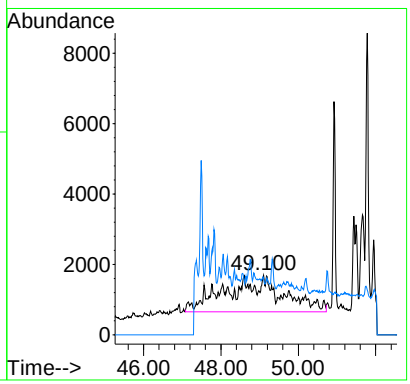


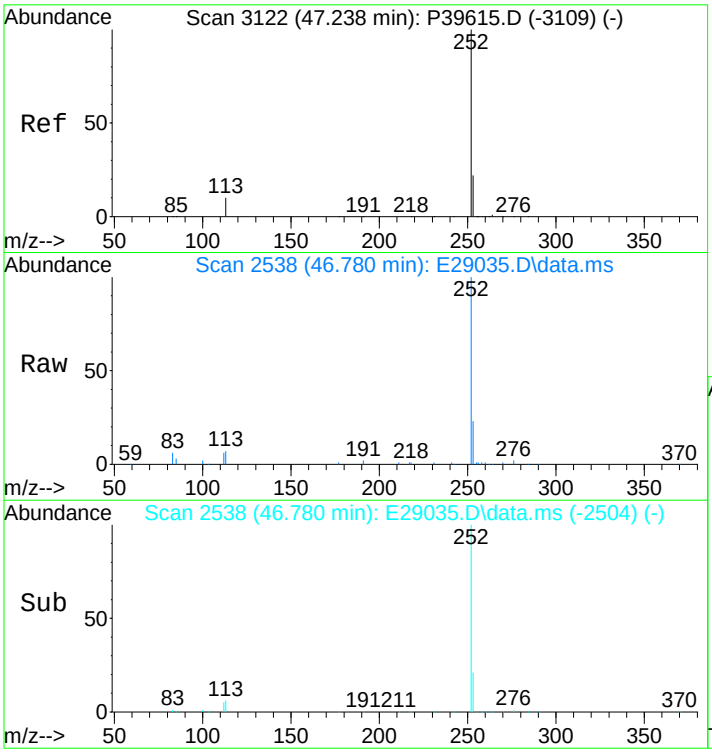


#82
C4-Chrysenes
Concen: 520.52 ng/mL m
RT: 49.100 min Scan# 2692
Delta R.T. -0.138 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:284 Resp: 101735

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

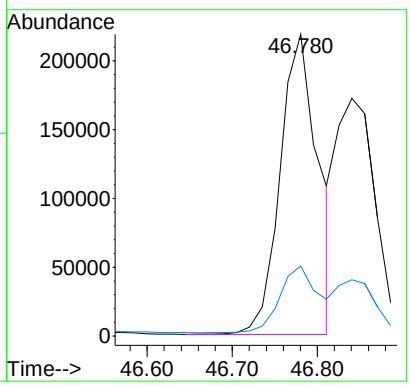


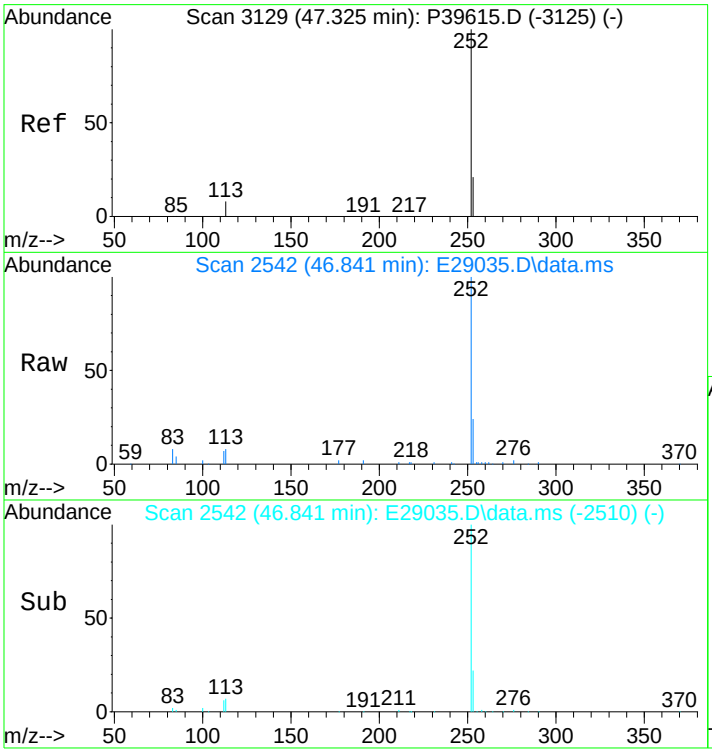


#84
Benzo[b]fluoranthene
Concen: 3077.06 ng/mL
RT: 46.780 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:252 Resp: 678996

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.2	28.8

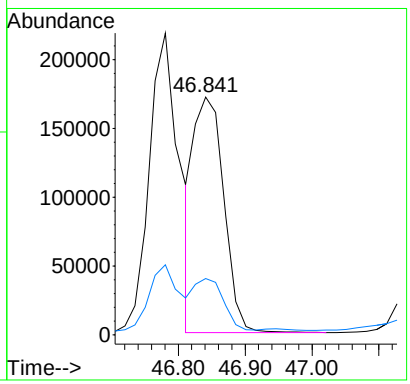


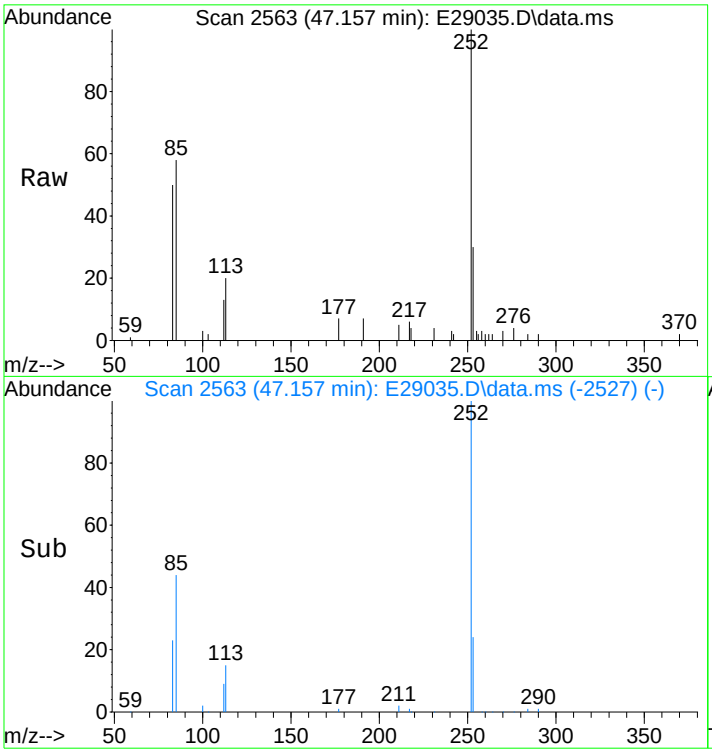


#85
Benzo[j]+[k]fluoranthene
Concen: 2382.02 ng/mL
RT: 46.841 min Scan# 2542
Delta R.T. -0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:252 Resp: 540778

Ion	Ratio	Lower	Upper
252	100		
253	21.2	19.3	28.9

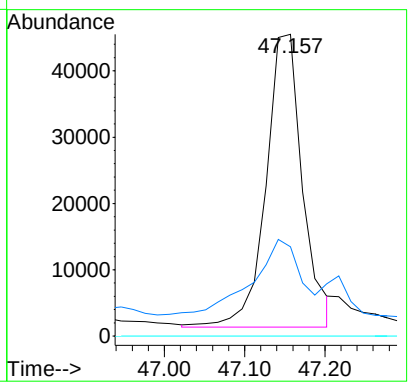


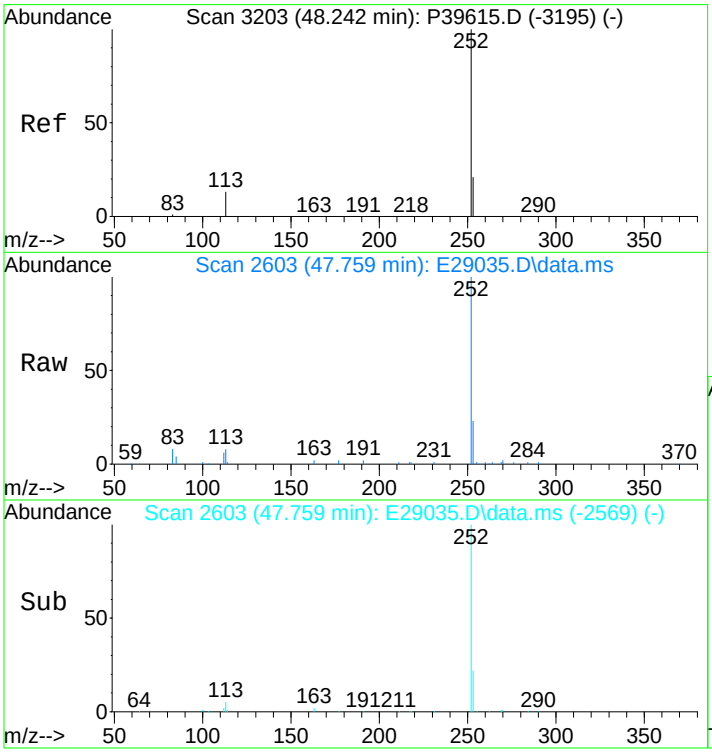


#86
Benzo[a]fluoranthene
Concen: 613.32 ng/mL m
RT: 47.157 min Scan# 2563
Delta R.T. 0.035 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:252 Resp: 139239

Ion	Ratio	Lower	Upper
252	100		
253	33.8	456.0	684.0#
125	0.0	0.0	0.0

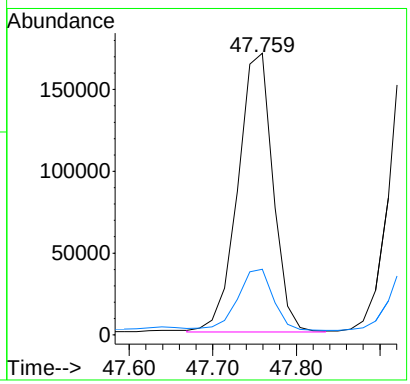


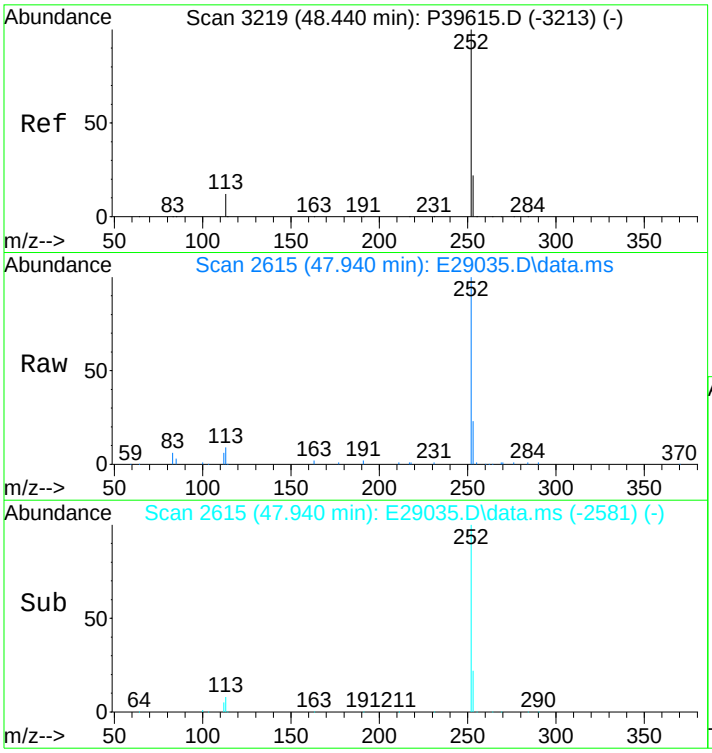


#87
Benzo[e]pyrene
Concen: 2315.80 ng/mL m
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:252 Resp: 498966

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.4	29.0

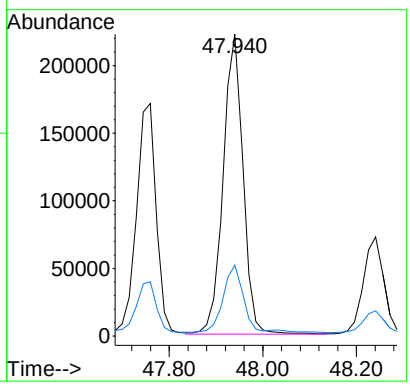


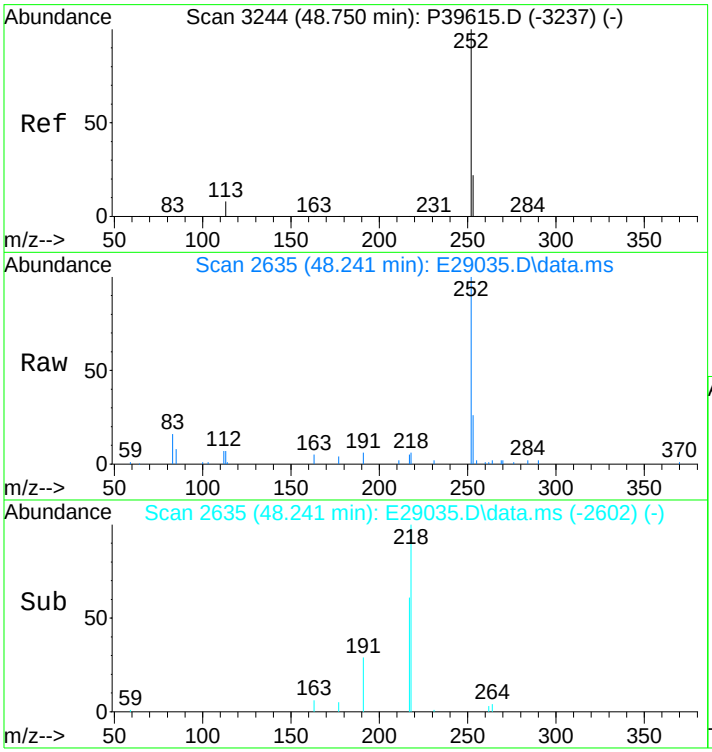


#89
Benzo[a]pyrene
Concen: 3182.26 ng/mL
RT: 47.940 min Scan# 2615
Delta R.T. 0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:252 Resp: 656082

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.6	29.4

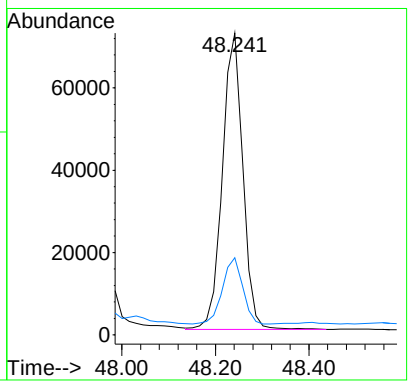


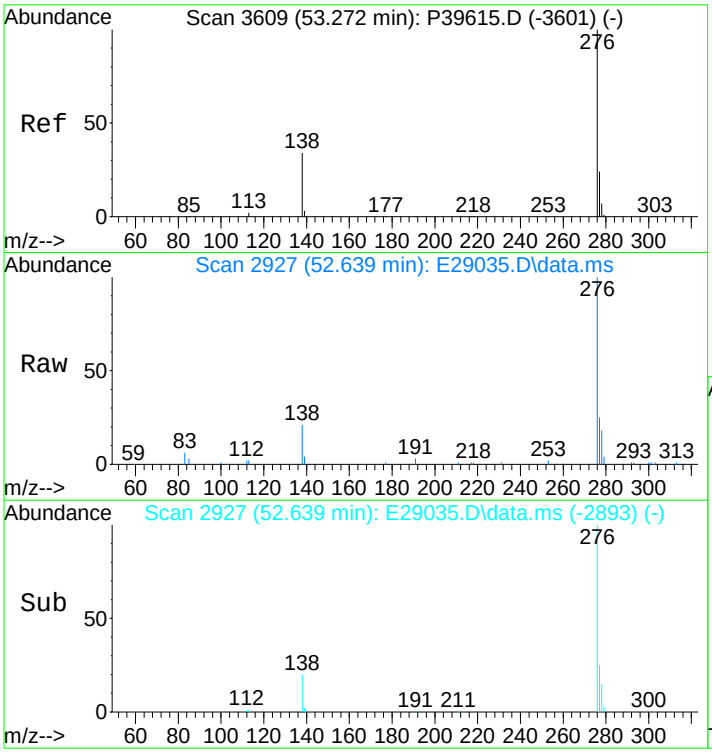


#90
Perylene
Concen: 1005.64 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:252 Resp: 219241

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.9	29.9

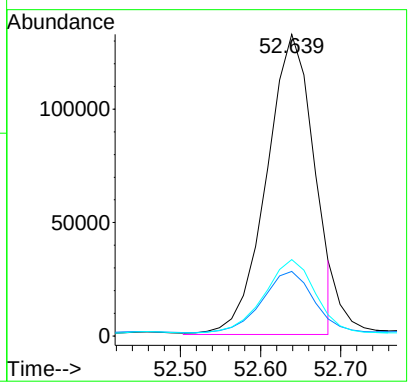


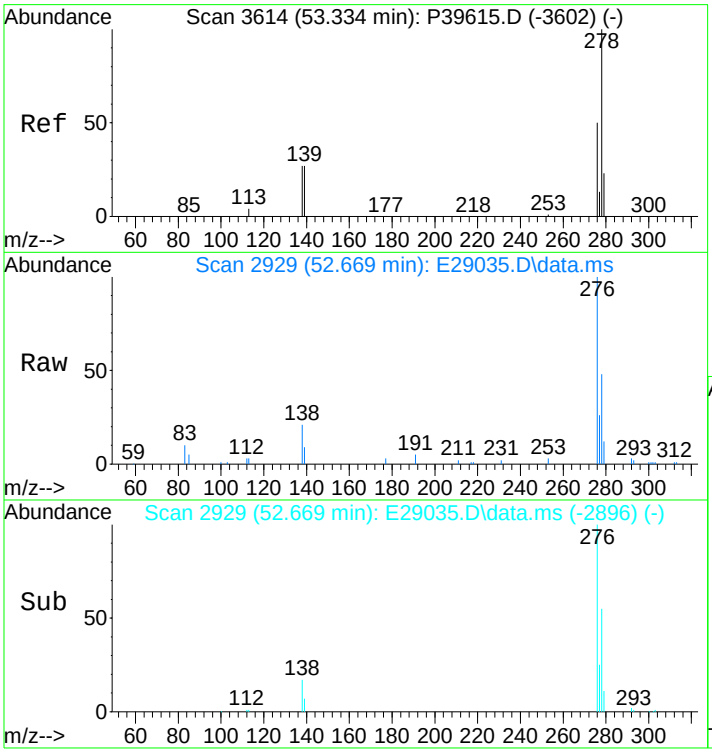


#91
Indeno[1,2,3-cd]pyrene
Concen: 2243.44 ng/mL m
RT: 52.639 min Scan# 2927
Delta R.T. 0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:276 Resp: 544335

Ion	Ratio	Lower	Upper
276	100		
138	22.3	17.8	26.8
277	27.1	20.0	30.0

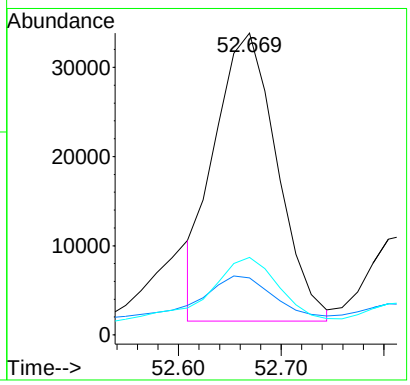


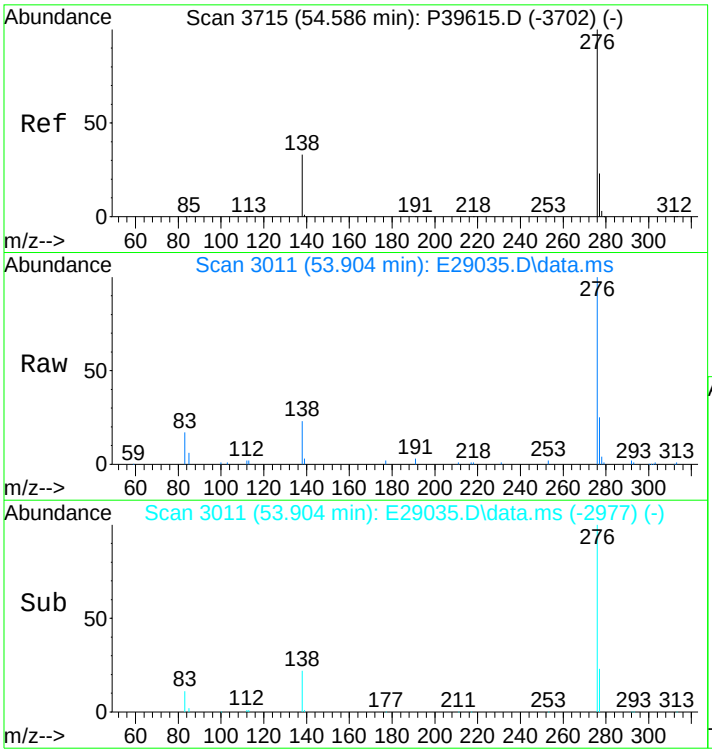


#92
Dibenz[ah]+[ac]anthracene
Concen: 528.68 ng/mL m
RT: 52.669 min Scan# 2929
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:278 Resp: 136586

Ion	Ratio	Lower	Upper
278	100		
139	17.2	13.0	19.4
279	27.6	19.4	29.2

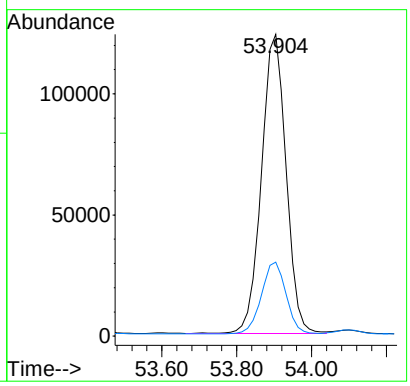


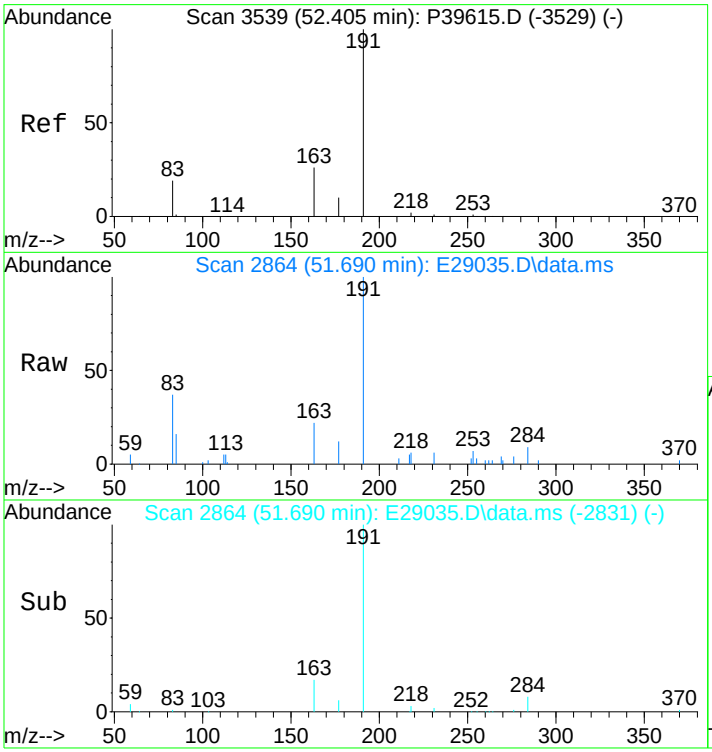


#93
Benzo[g,h,i]perylene
Concen: 2153.25 ng/mL
RT: 53.904 min Scan# 3011
Delta R.T. 0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:276 Resp: 563333

Ion	Ratio	Lower	Upper
276	100		
277	24.1	19.4	29.2

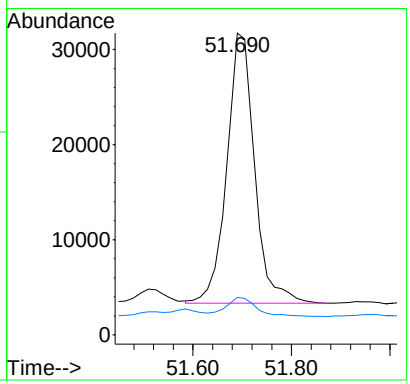


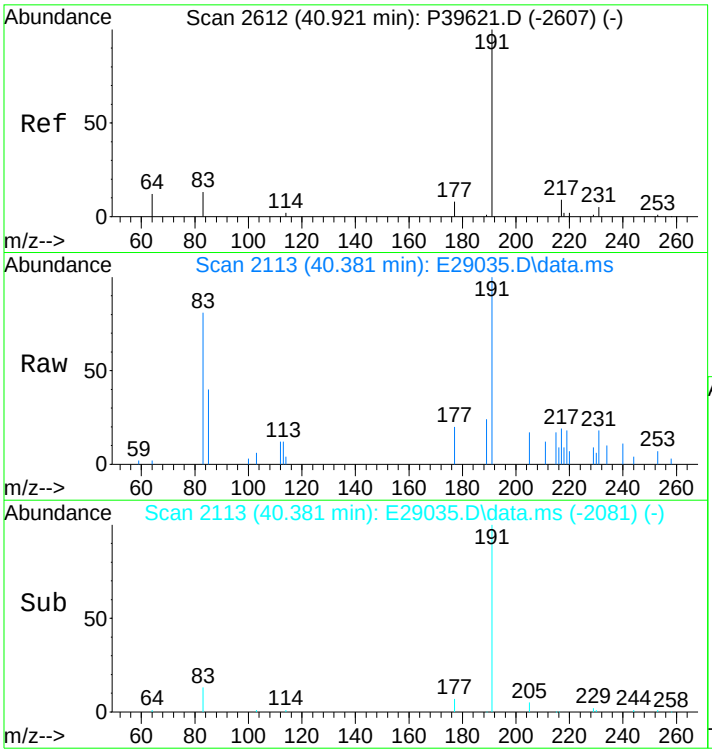


#94
Hopane (T19)
Concen: 1524.31 ng/mL
RT: 51.690 min Scan# 2864
Delta R.T. 0.000 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:191 Resp: 111527

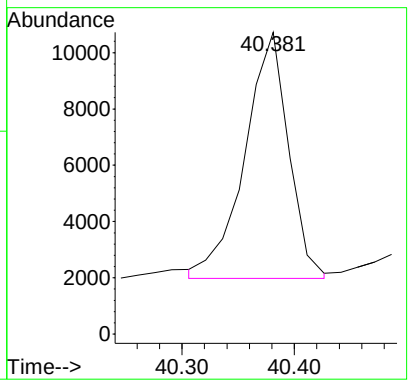
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.3	16.9#

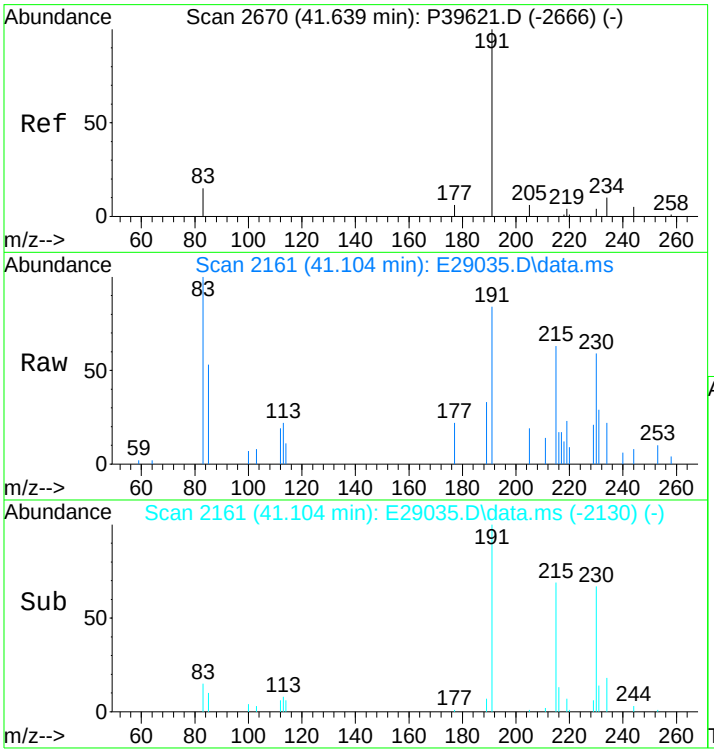




#96
C23 Tricyclic Terpane (T4)
Concen: 322.76 ng/ml m
RT: 40.381 min Scan# 2113
Delta R.T. -0.012 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

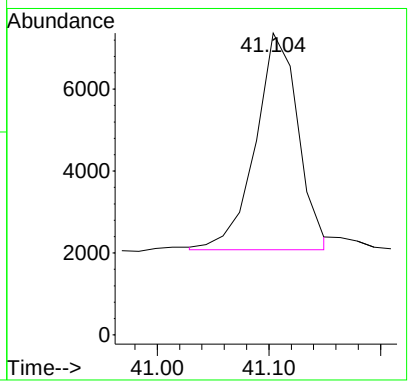
Tgt Ion:191 Resp: 23615

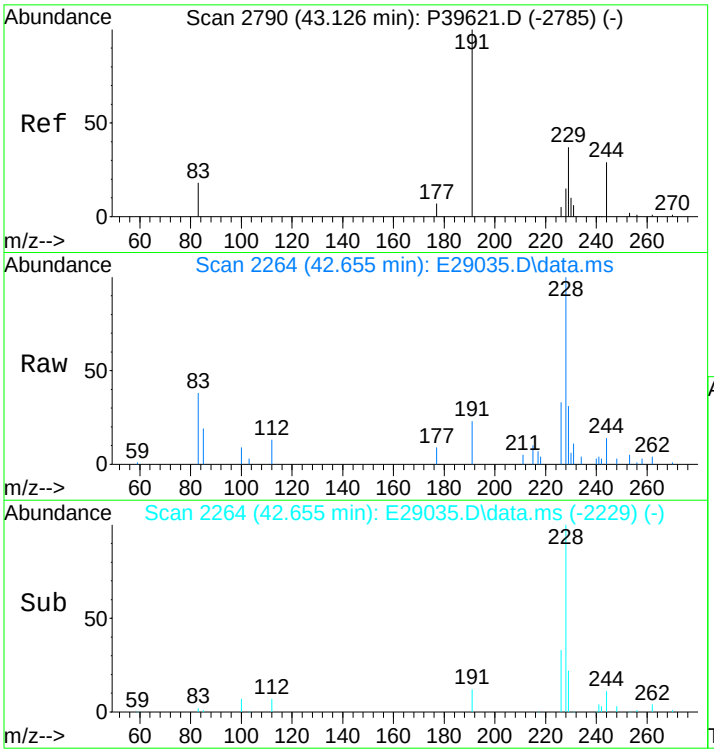




#97
C24 Tricyclic Terpane (T5)
Concen: 191.58 ng/ml m
RT: 41.104 min Scan# 2161
Delta R.T. -0.028 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

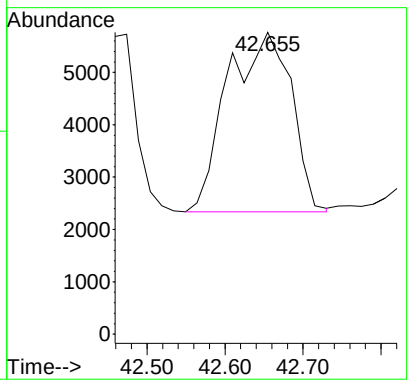
Tgt Ion:191 Resp: 14017

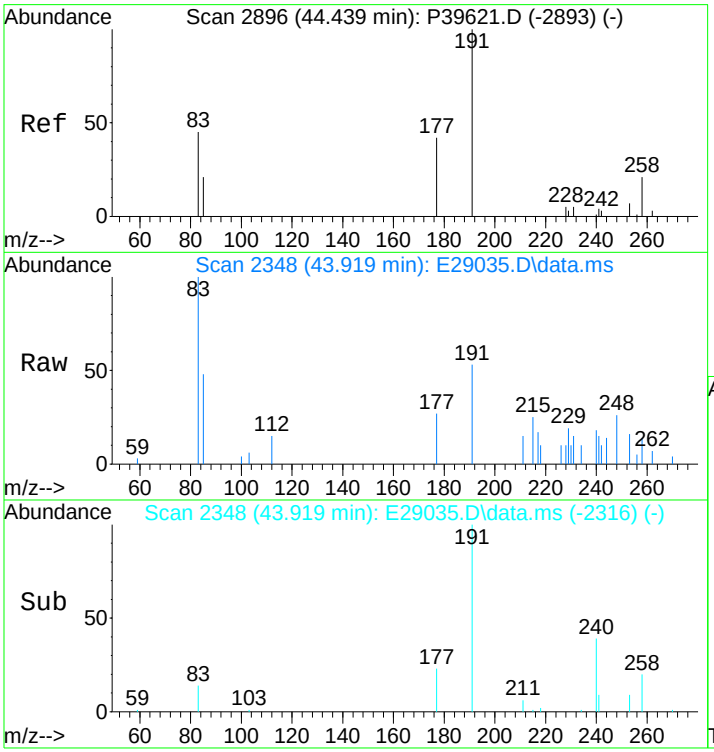




#98
C25 Tricyclic Terpane (T6)
Concen: 266.50 ng/ml
RT: 42.655 min Scan# 2264
Delta R.T. 0.030 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

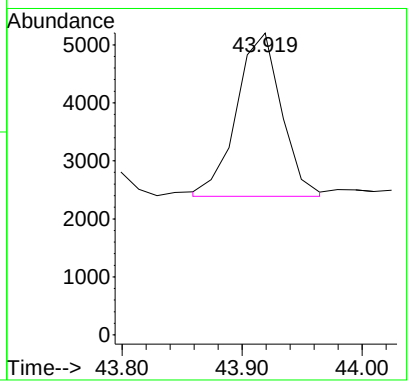
Tgt Ion:191 Resp: 19499

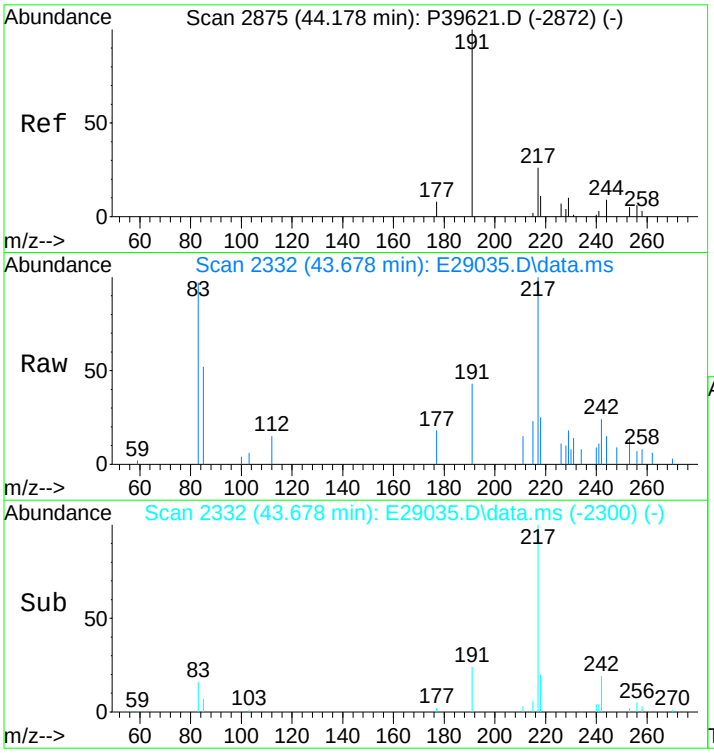




#99
C24 Tetracyclic Terpane (T6a)
Concen: 99.71 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

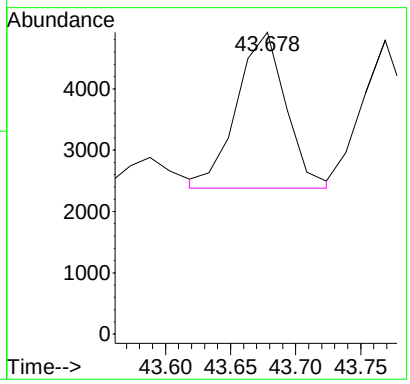
Tgt Ion:191 Resp: 7295

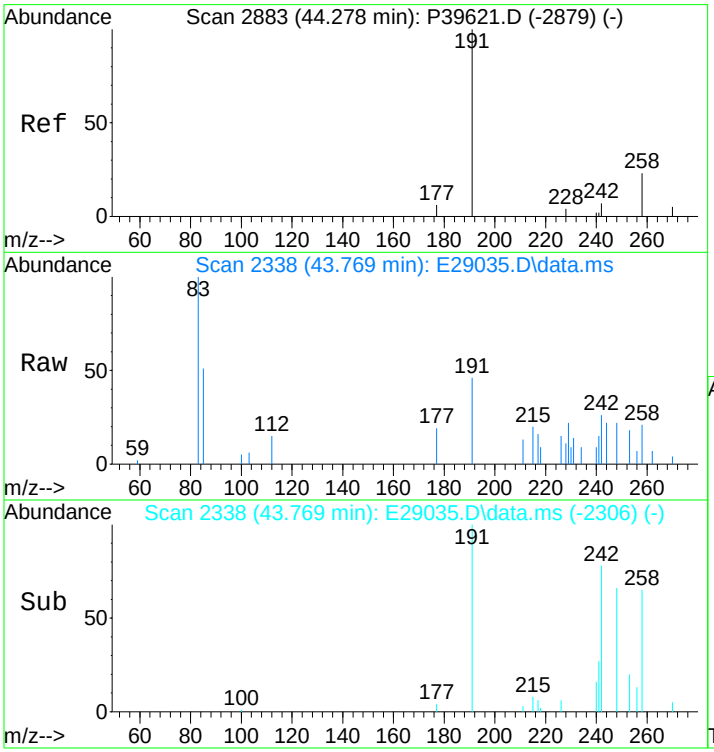




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 91.08 ng/ml m
RT: 43.678 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

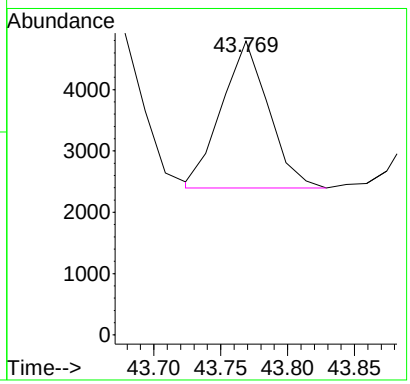
Tgt Ion:191 Resp: 6664

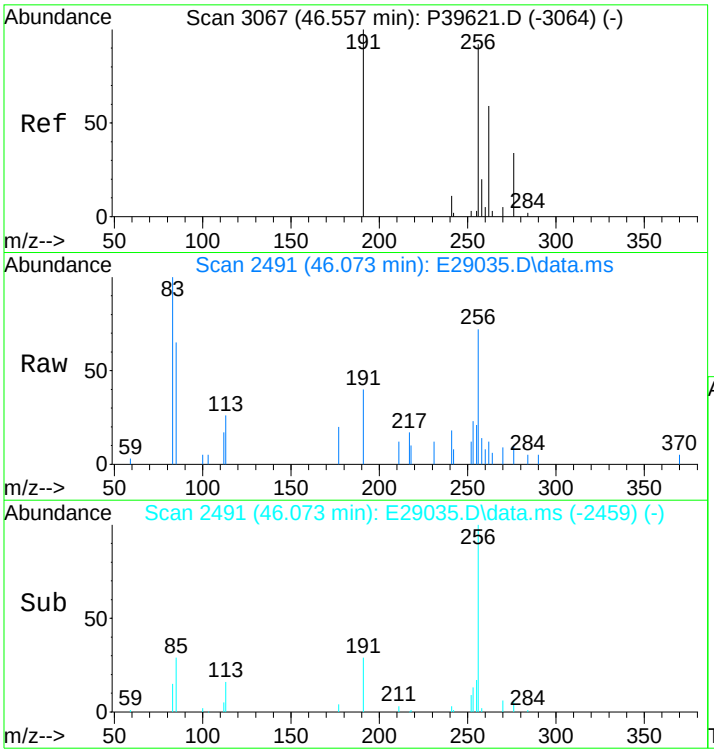




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 79.70 ng/ml
RT: 43.769 min Scan# 2338
Delta R.T. -0.016 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

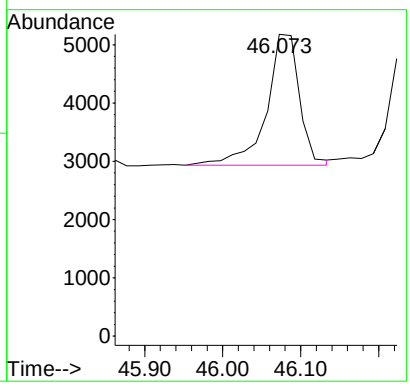
Tgt Ion:191 Resp: 5831

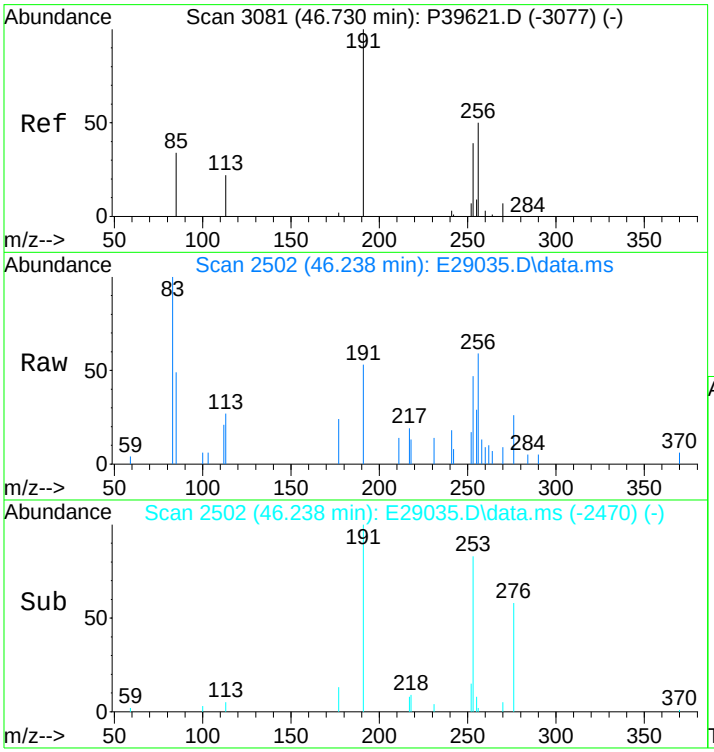




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 90.01 ng/ml
RT: 46.073 min Scan# 2491
Delta R.T. -0.018 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

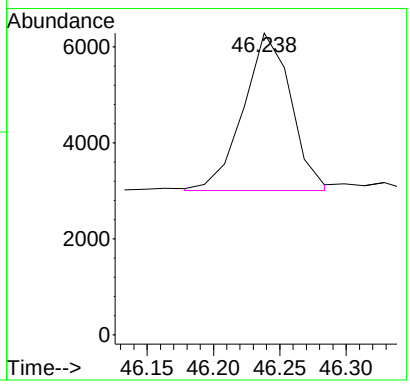
Tgt Ion:191 Resp: 6586

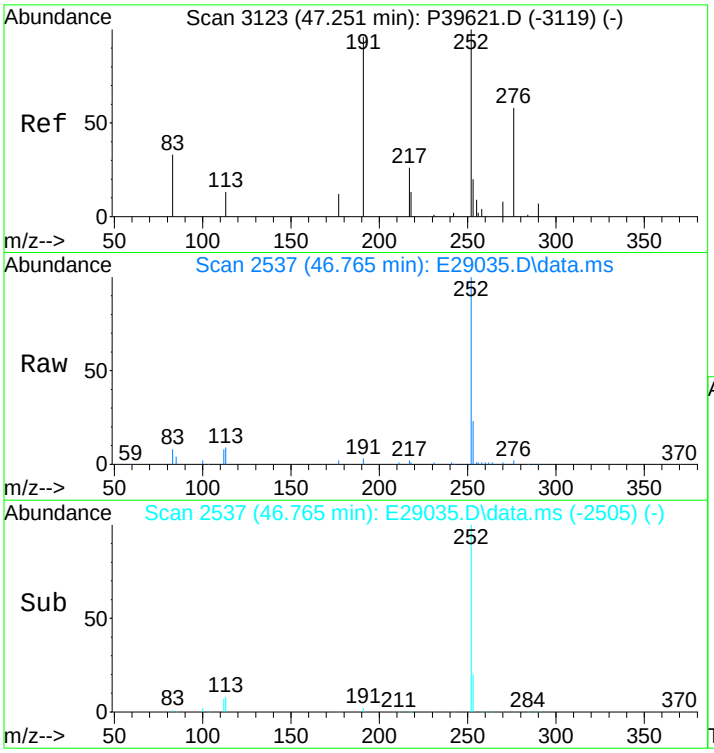




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 111.99 ng/ml m
RT: 46.238 min Scan# 2502
Delta R.T. -0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

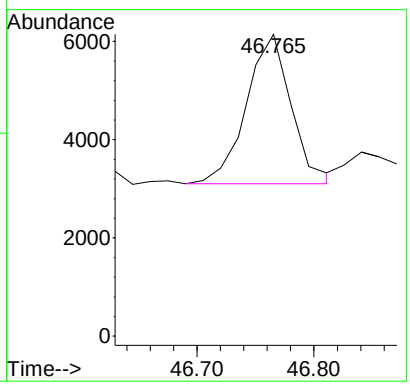
Tgt Ion:191 Resp: 8194

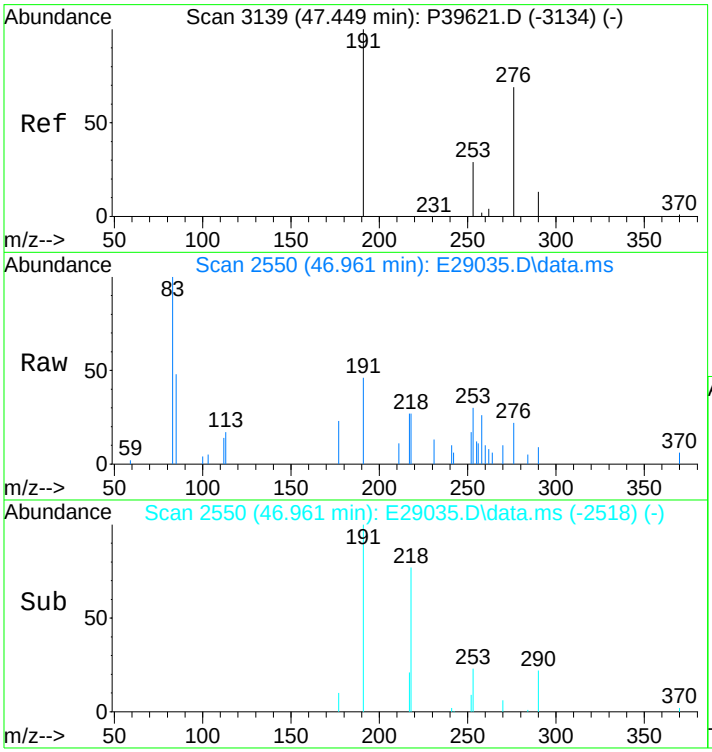




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 110.69 ng/ml
RT: 46.765 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

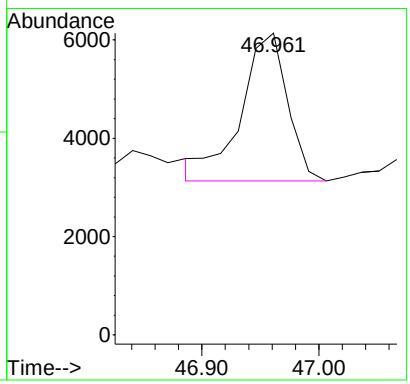
Tgt Ion:191 Resp: 8099

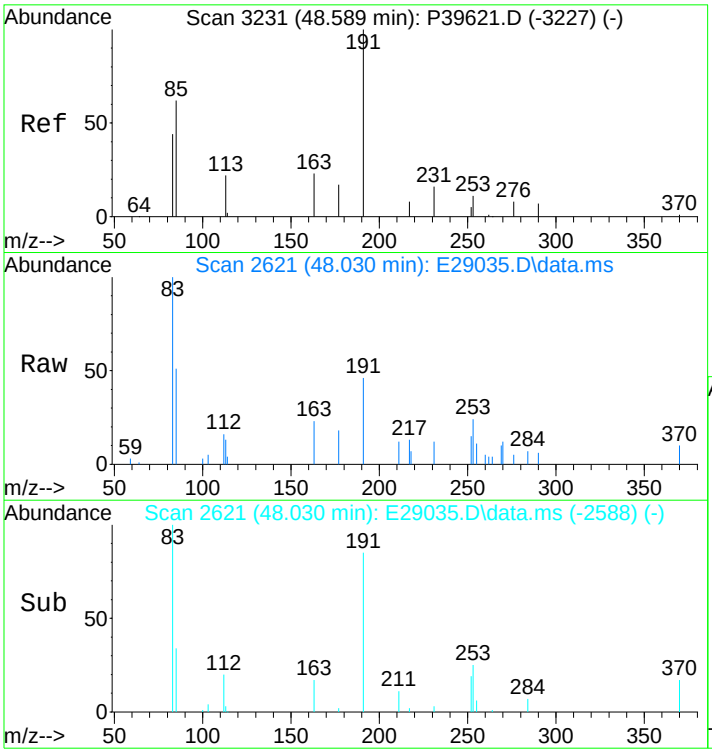




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 113.92 ng/ml
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

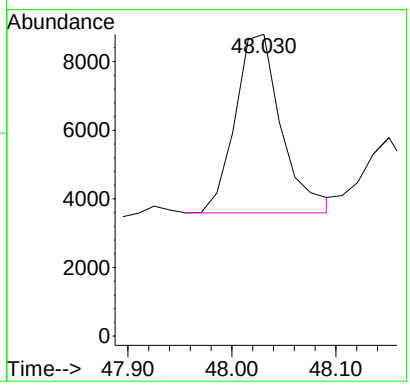
Tgt Ion:191 Resp: 8335

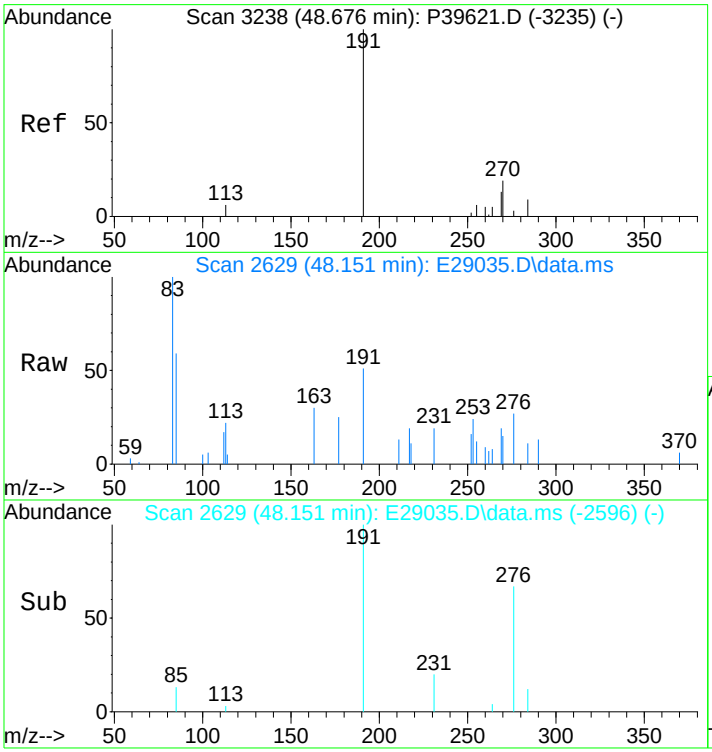




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 220.90 ng/ml
RT: 48.030 min Scan# 2621
Delta R.T. -0.005 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

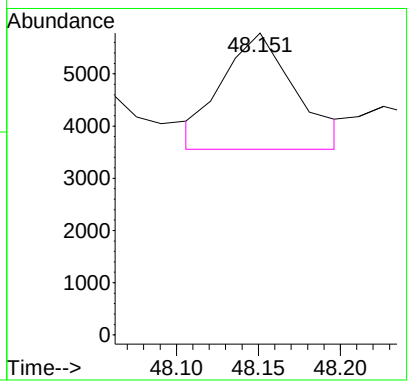
Tgt Ion:191 Resp: 16162

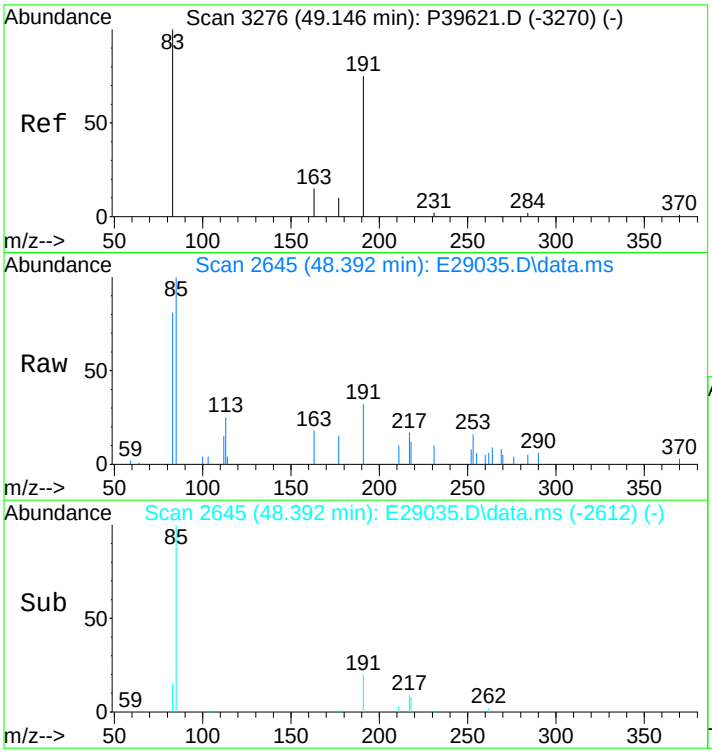




#107
C30 Tricyclic Terpane-22S
Concen: 94.50 ng/mL m
RT: 48.151 min Scan# 2629
Delta R.T. -0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

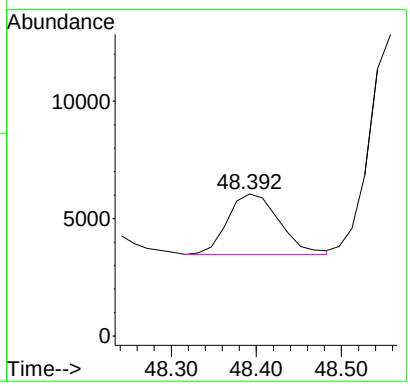
Tgt Ion:191 Resp: 6914

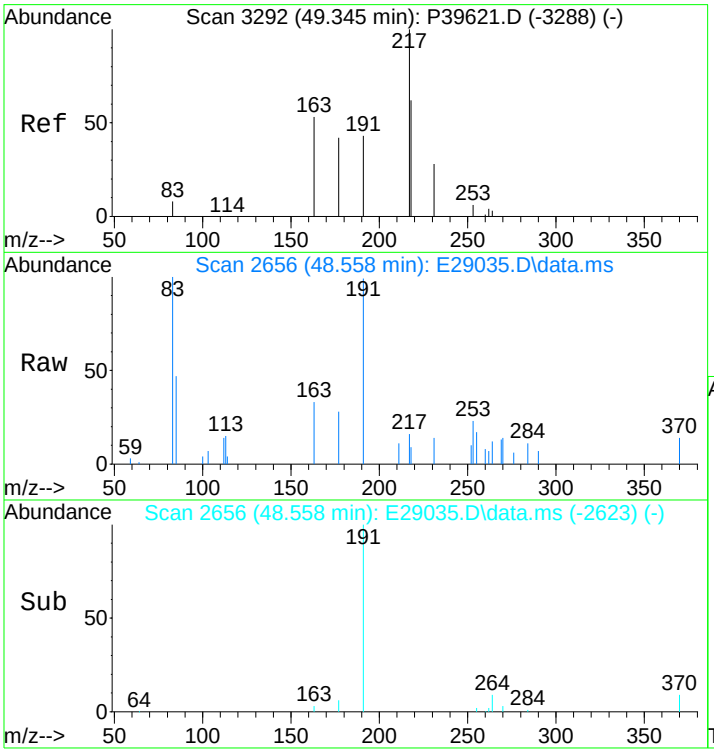




#108
C30 Tricyclic Terpane-22R
Concen: 149.25 ng/mL
RT: 48.392 min Scan# 2645
Delta R.T. -0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

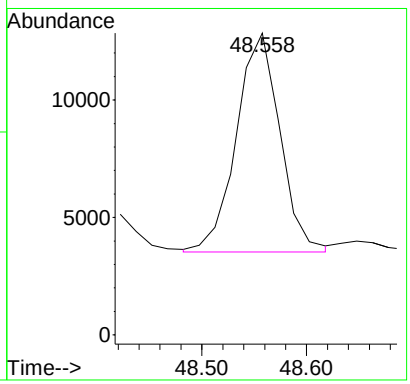
Tgt Ion:191 Resp: 10920

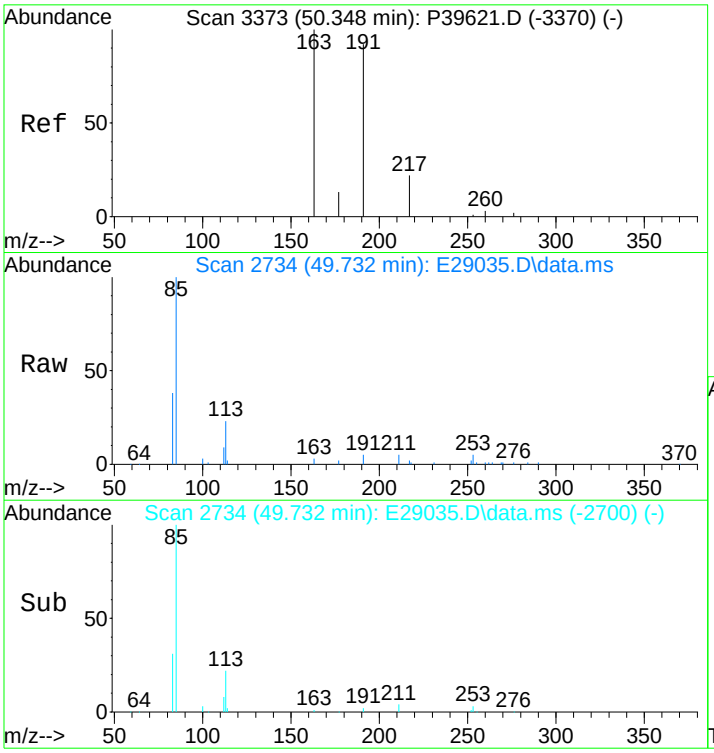




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 369.31 ng/ml m
RT: 48.558 min Scan# 2656
Delta R.T. -0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

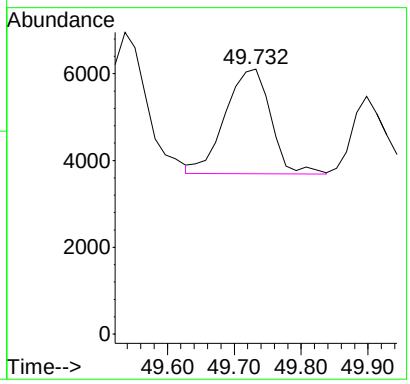
Tgt Ion:191 Resp: 27021

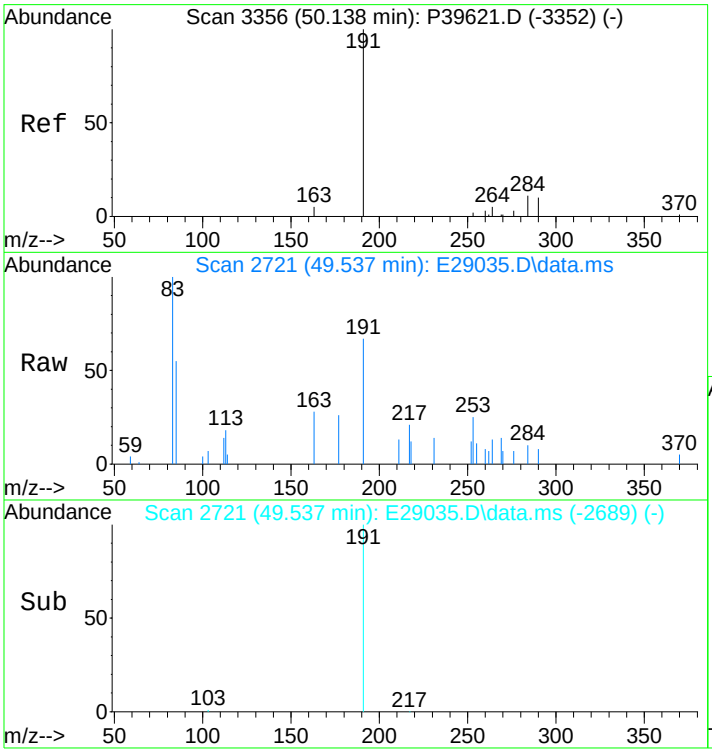




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 155.39 ng/ml
RT: 49.732 min Scan# 2734
Delta R.T. 0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

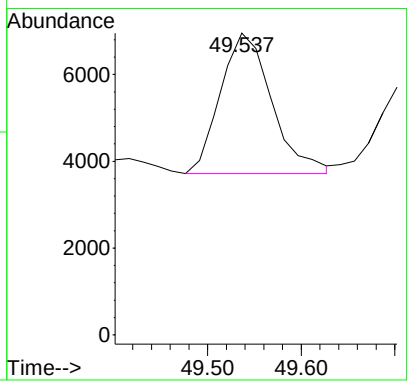
Tgt Ion:191 Resp: 11369

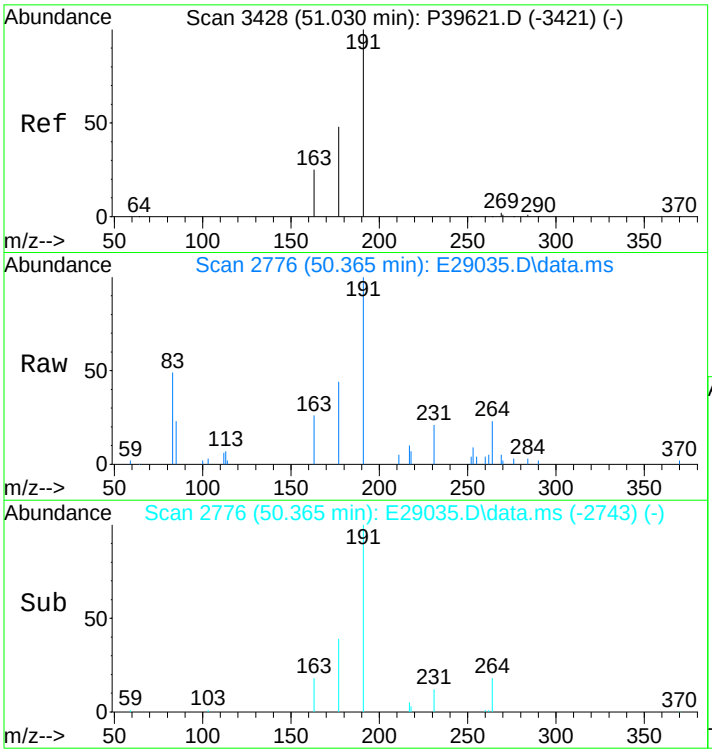




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 169.92 ng/ml
RT: 49.537 min Scan# 2721
Delta R.T. -0.022 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

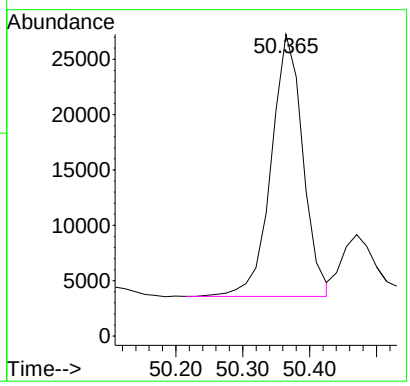
Tgt Ion:191 Resp: 12432

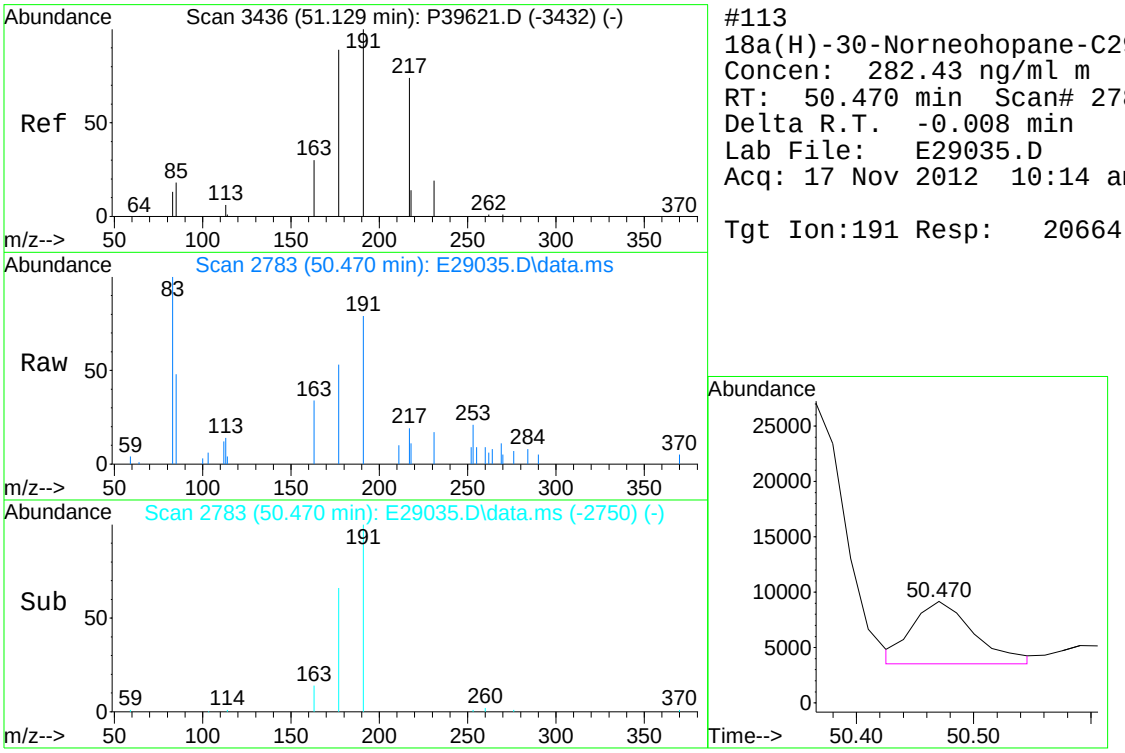




#112
30-Norhopane (T15)
Concen: 1069.45 ng/ml
RT: 50.365 min Scan# 2776
Delta R.T. -0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

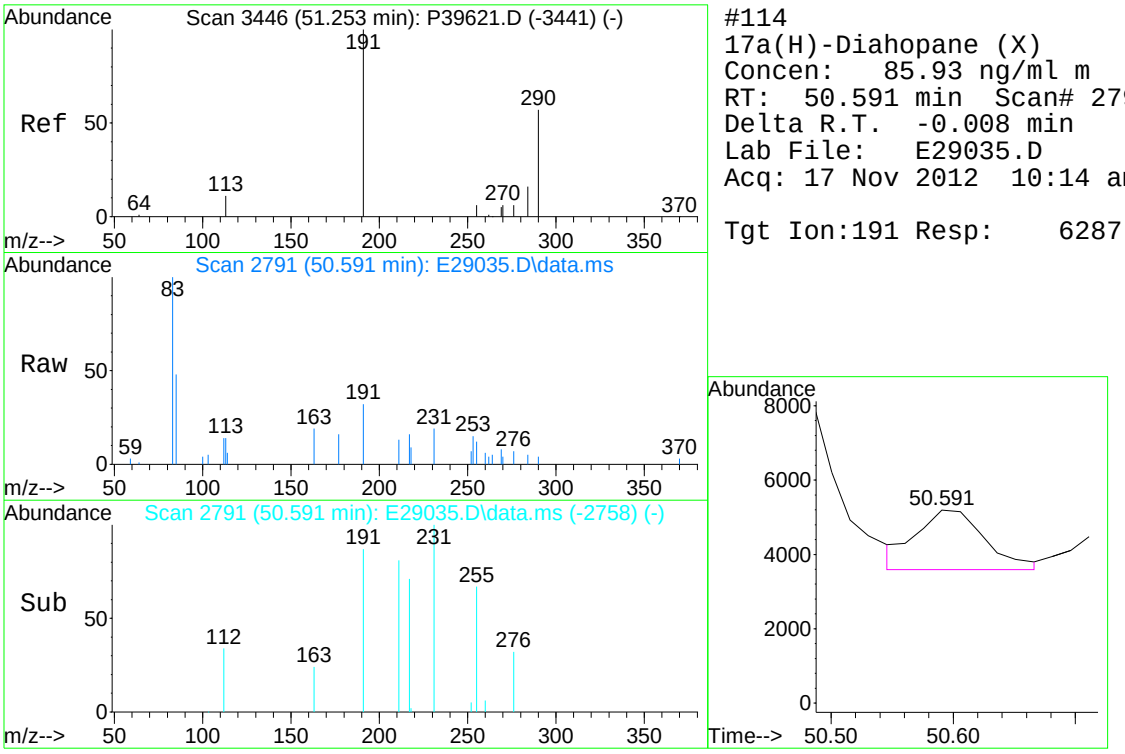
Tgt Ion:191 Resp: 78247





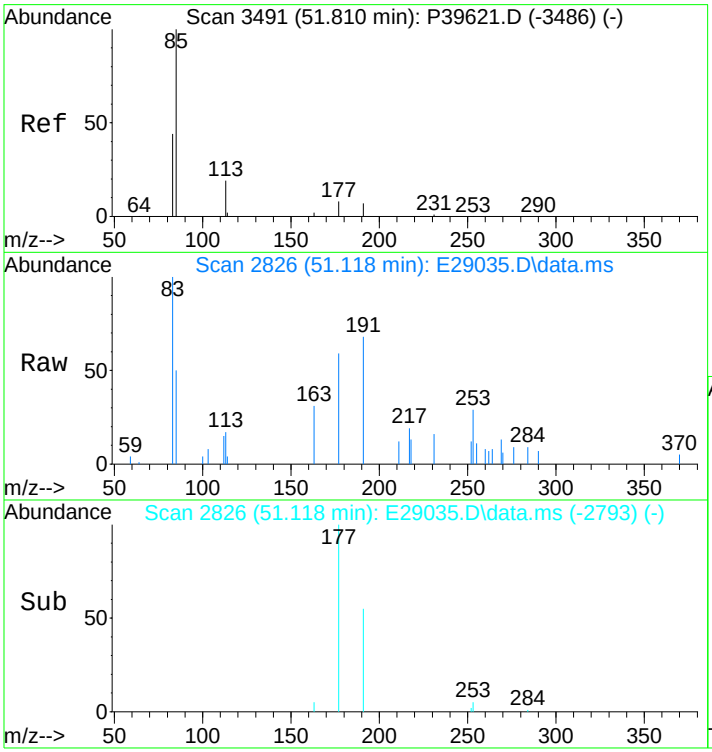
#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 282.43 ng/ml m
RT: 50.470 min Scan# 2783
Delta R.T. -0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:191 Resp: 20664



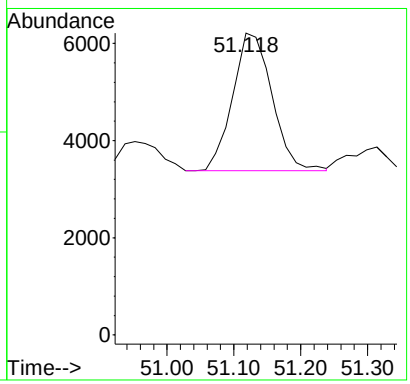
#114
17a(H)-Diahopane (X)
Concen: 85.93 ng/ml m
RT: 50.591 min Scan# 2791
Delta R.T. -0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

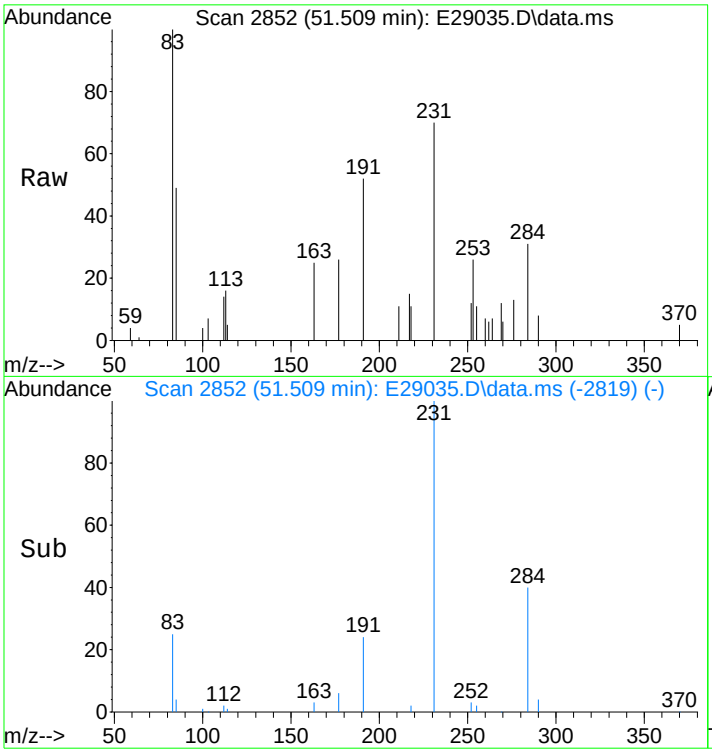
Tgt Ion:191 Resp: 6287



#115
30-Normoretane (T17)
Concen: 158.23 ng/ml
RT: 51.118 min Scan# 2826
Delta R.T. -0.009 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

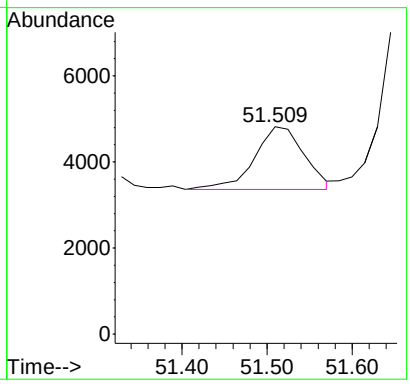
Tgt Ion:191 Resp: 11577

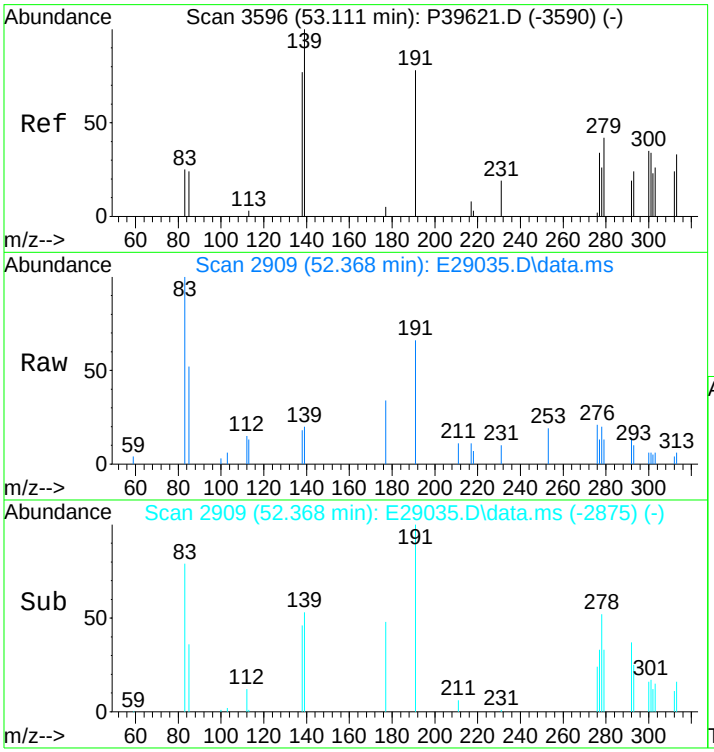




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 80.94 ng/ml
RT: 51.509 min Scan# 2852
Delta R.T. -0.009 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

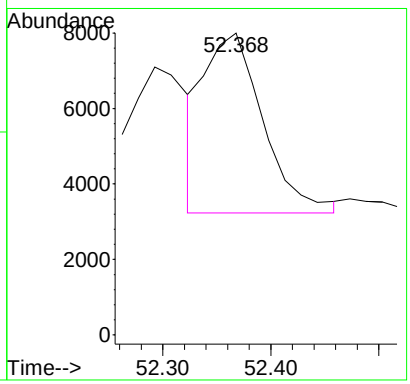
Tgt Ion:191 Resp: 5922

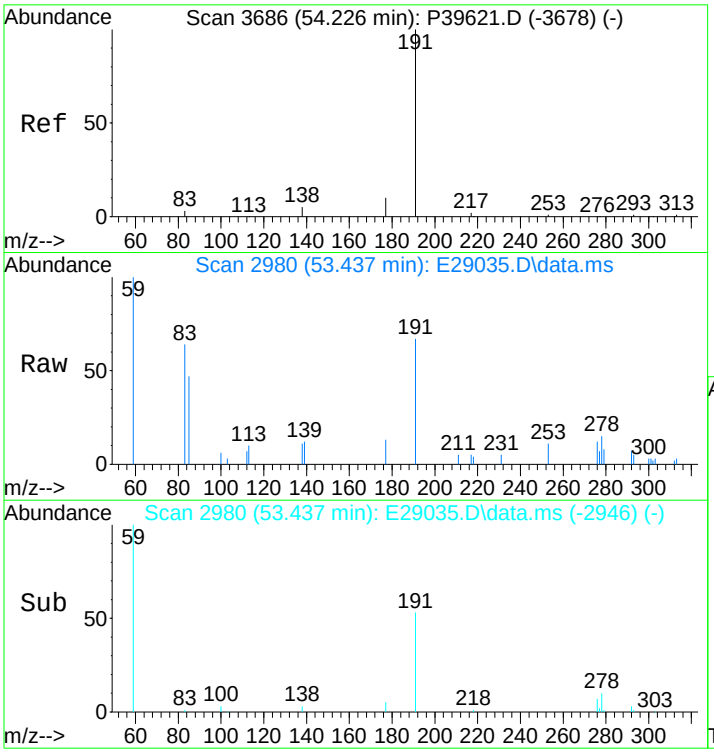




#117
Moretane (T20)
Concen: 248.39 ng/ml m
RT: 52.368 min Scan# 2909
Delta R.T. 0.005 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

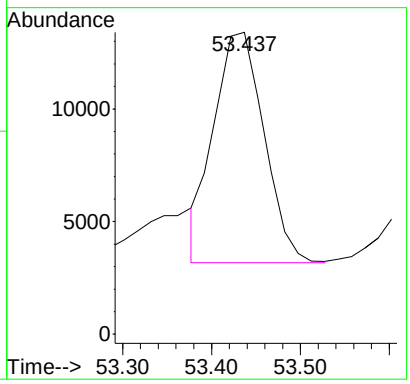
Tgt Ion:191 Resp: 18174

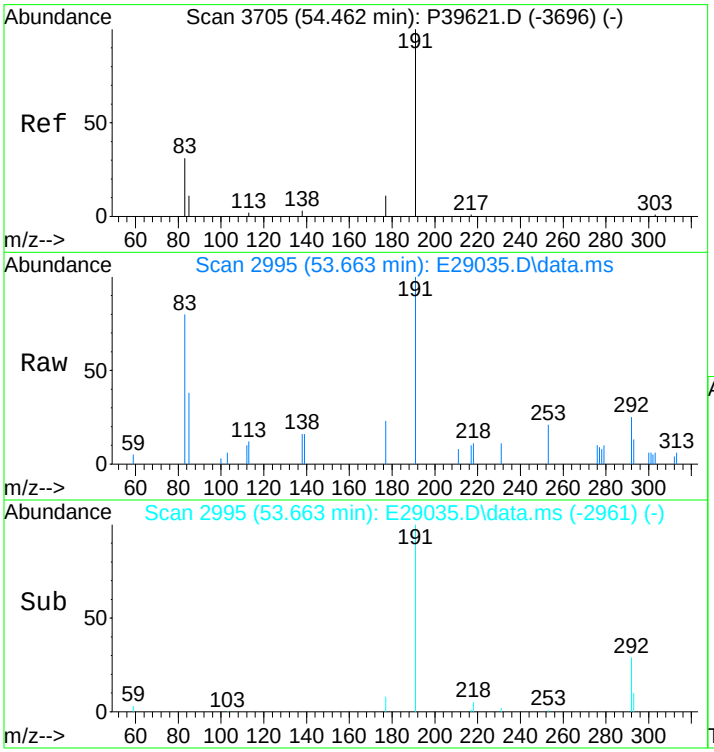




#118
30-Homohopane-22S (T21)
Concen: 550.37 ng/ml m
RT: 53.437 min Scan# 2980
Delta R.T. 0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

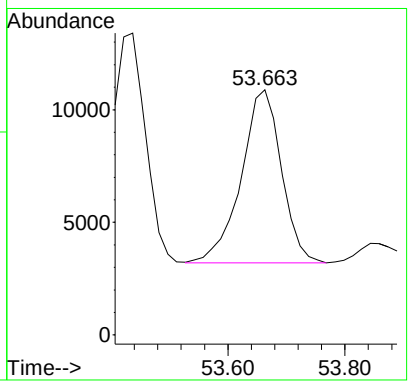
Tgt Ion:191 Resp: 40268

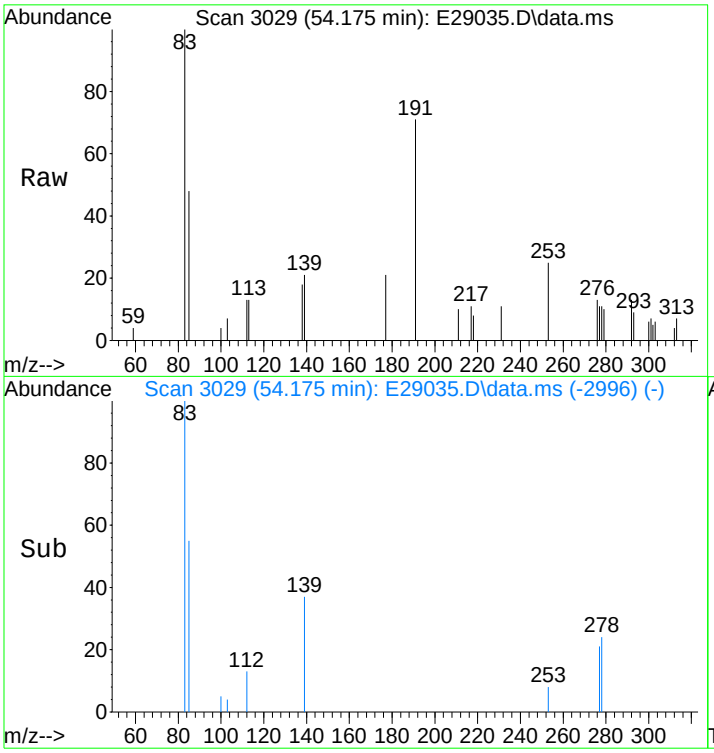




#119
30-Homohopane-22R (T22)
Concen: 502.39 ng/ml
RT: 53.663 min Scan# 2995
Delta R.T. 0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

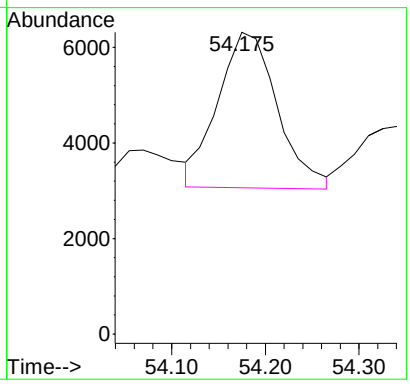
Tgt Ion:191 Resp: 36758

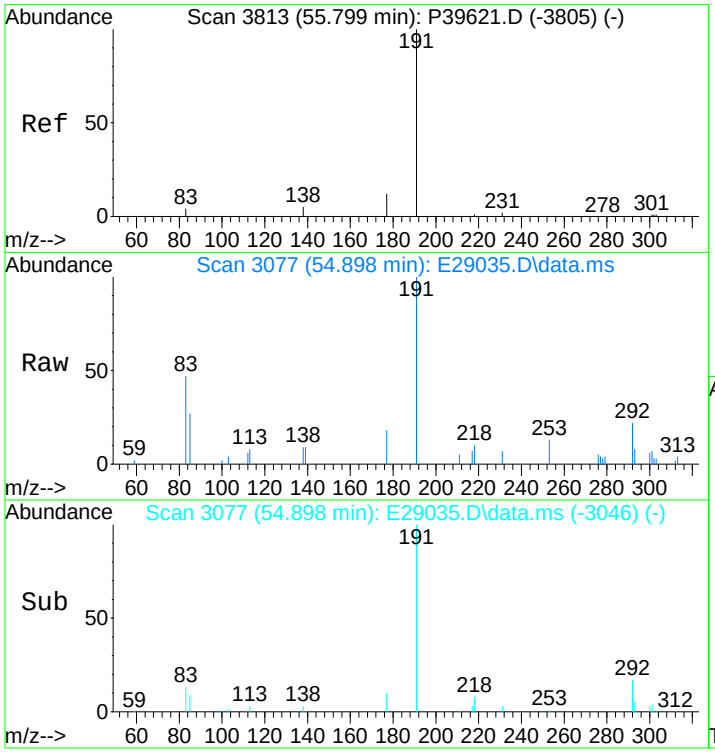




#120
Gammacerane/C32-diahopane
Concen: 196.47 ng/mL
RT: 54.175 min Scan# 3029
Delta R.T. 0.003 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

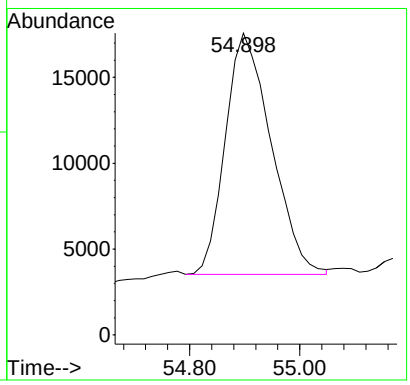
Tgt Ion:191 Resp: 14375

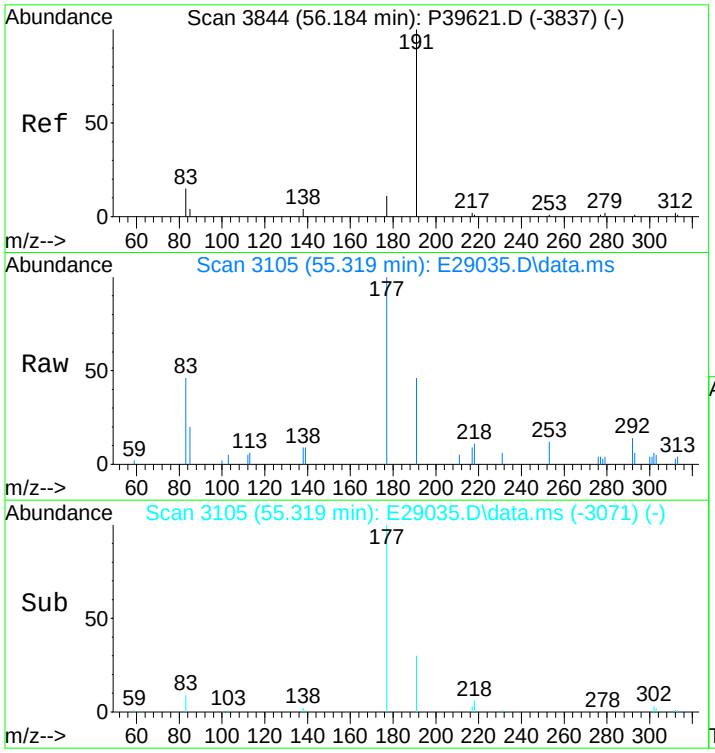




#121
30,31-Bishomohopane-22S (T26)
Concen: 1108.05 ng/ml
RT: 54.898 min Scan# 3077
Delta R.T. -0.028 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

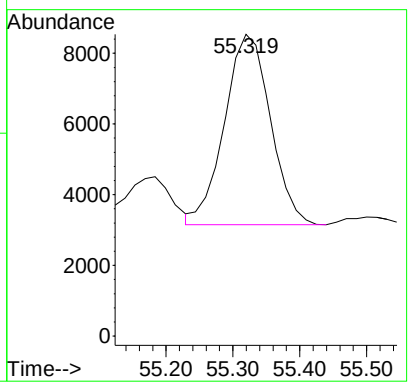
Tgt Ion:191 Resp: 81071

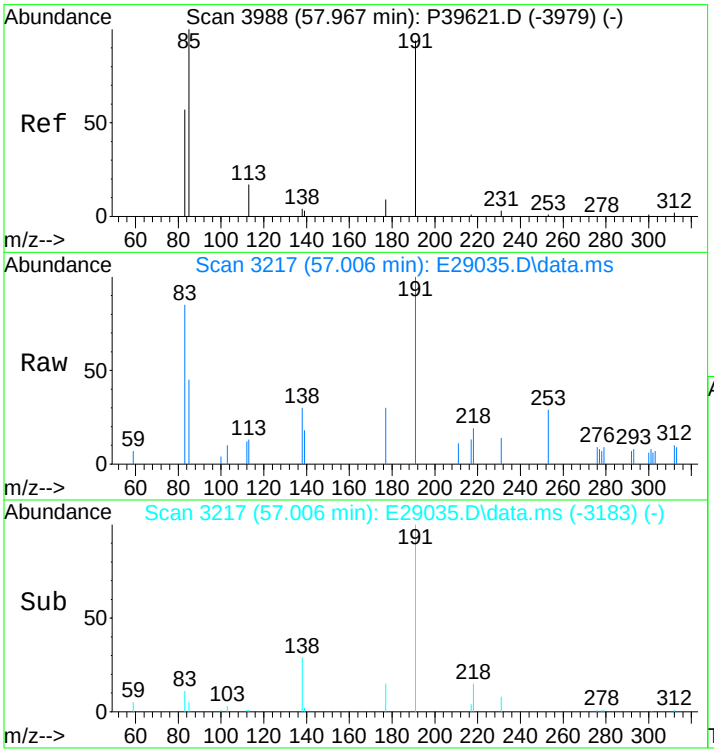




#122
30,31-Bishomohopane-22R (T27)
Concen: 350.67 ng/ml
RT: 55.319 min Scan# 3105
Delta R.T. 0.017 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

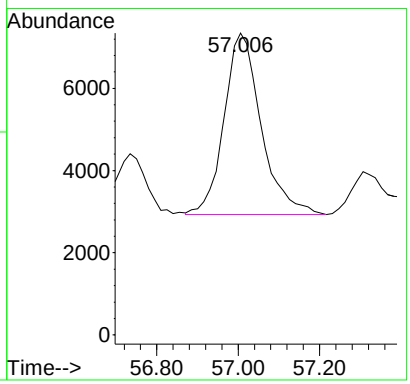
Tgt Ion:191 Resp: 25657

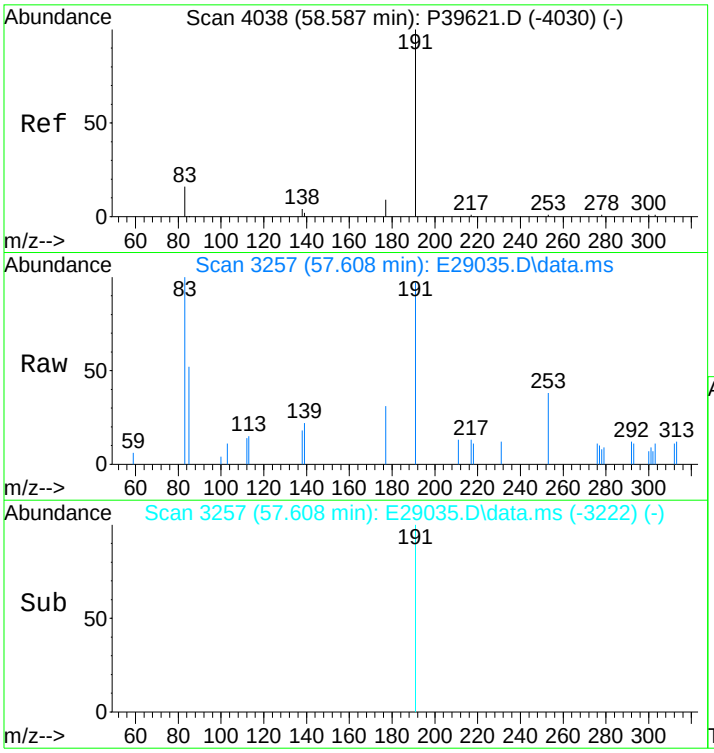




#123
30,31-Trishomohopane-22S (T30)
Concen: 382.58 ng/ml
RT: 57.006 min Scan# 3217
Delta R.T. 0.015 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

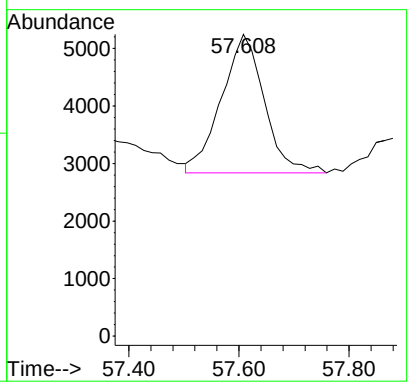
Tgt Ion:191 Resp: 27992

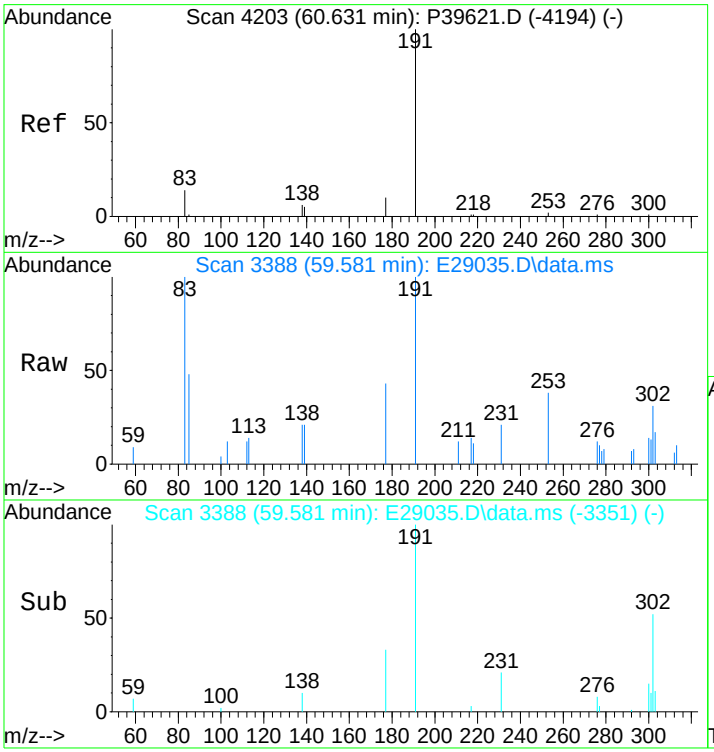




#124
30,31-Trishomohopane-22R (T31)
Concen: 177.35 ng/ml
RT: 57.608 min Scan# 3257
Delta R.T. 0.030 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

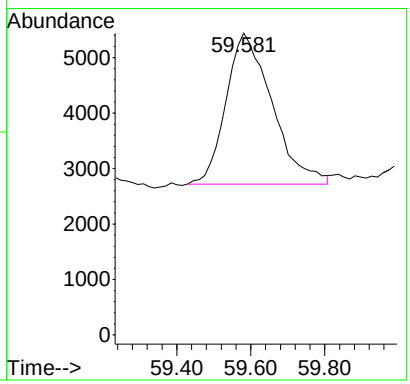
Tgt Ion:191 Resp: 12976

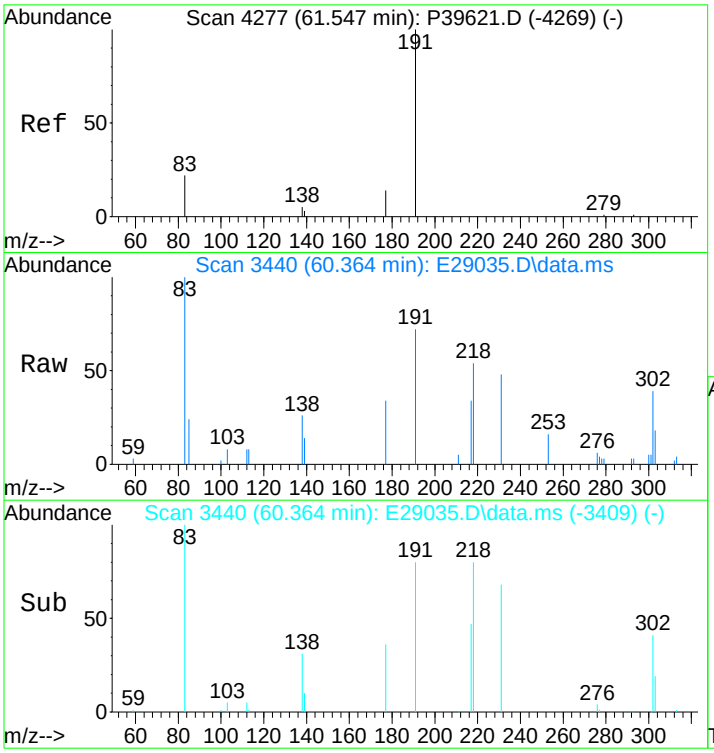




#125
Tetrakishomohopane-22S (T32)
Concen: 322.75 ng/ml m
RT: 59.581 min Scan# 3388
Delta R.T. 0.058 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

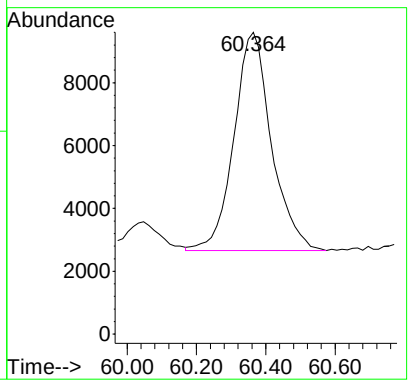
Tgt Ion:191 Resp: 23614

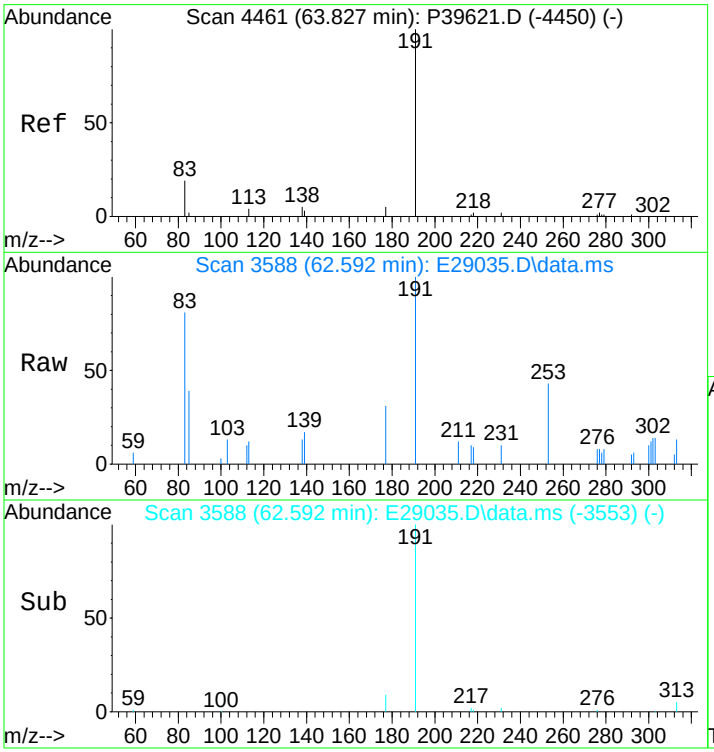




#126
Tetrakishomohopane-22R (T33)
Concen: 713.78 ng/ml
RT: 60.364 min Scan# 3440
Delta R.T. -0.034 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

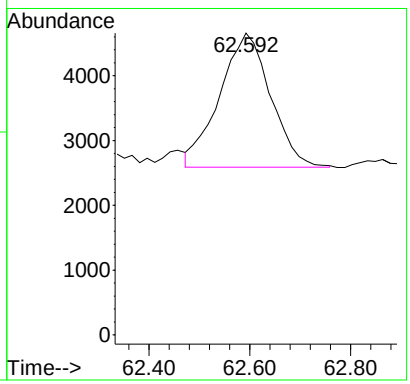
Tgt Ion:191 Resp: 52224

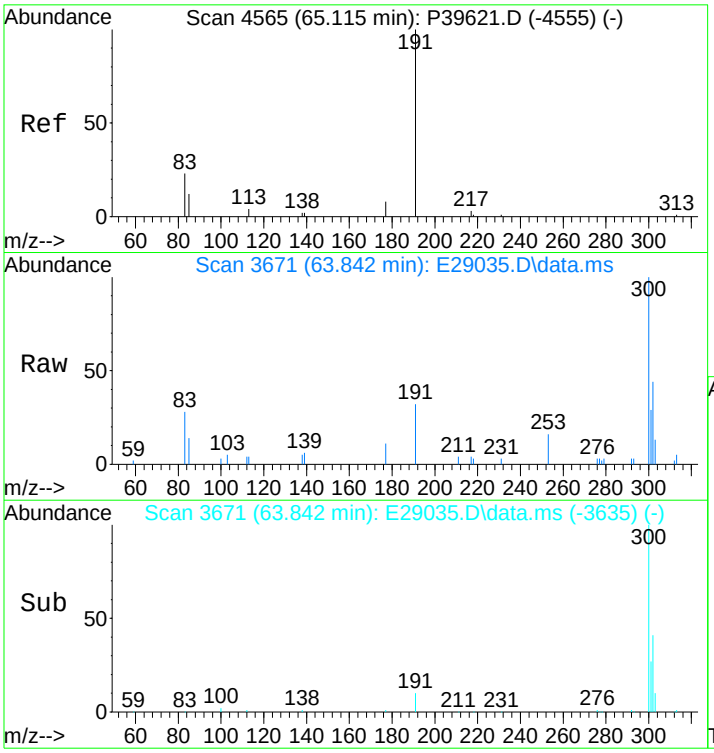




#127
Pentakishomohopane-22S (T34)
Concen: 197.54 ng/ml m
RT: 62.592 min Scan# 3588
Delta R.T. 0.024 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

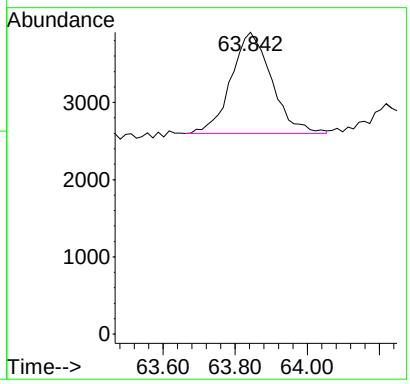
Tgt Ion:191 Resp: 14453

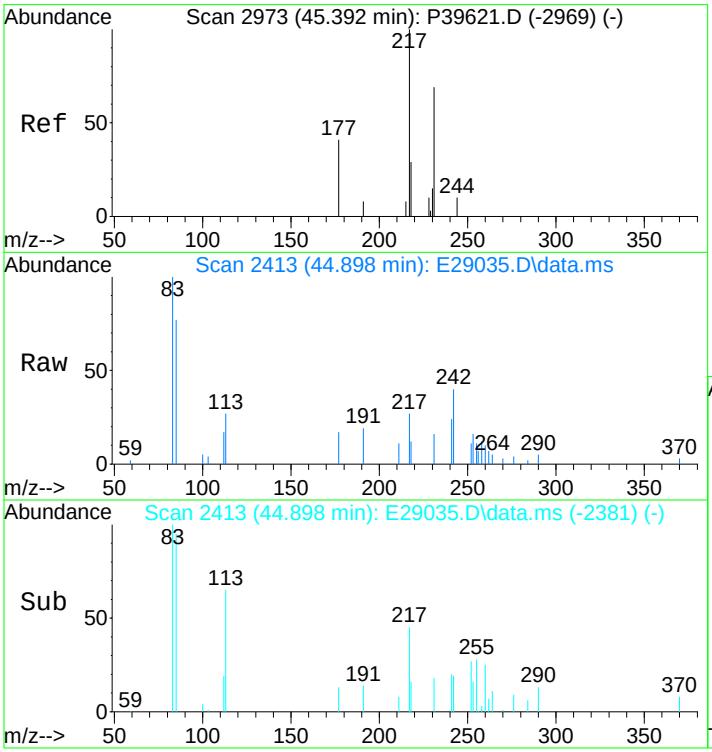




#128
Pentakishomohopane-22R (T35)
Concen: 140.12 ng/ml
RT: 63.842 min Scan# 3671
Delta R.T. 0.038 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

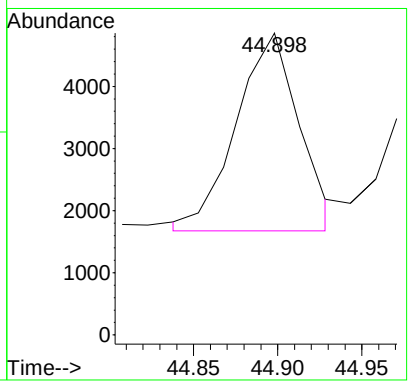
Tgt Ion:191 Resp: 10252

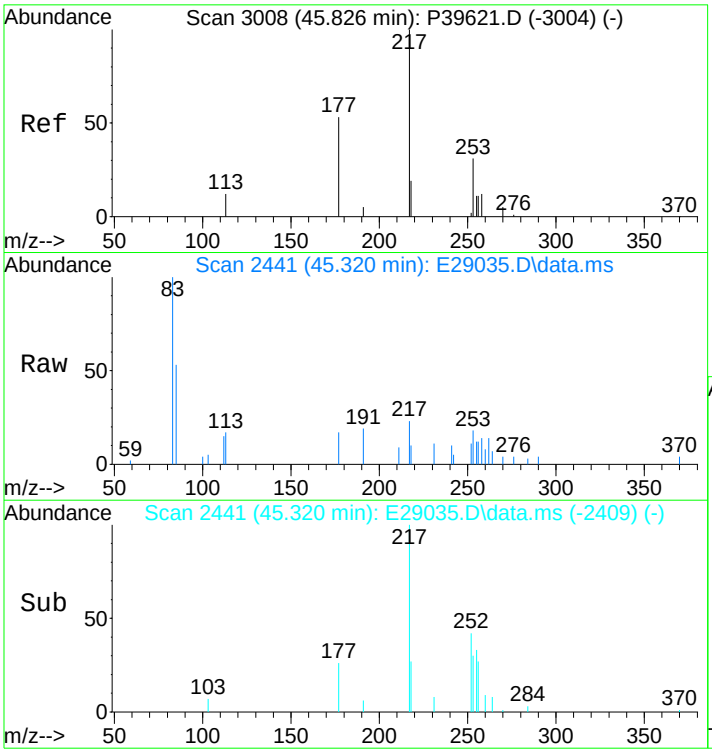




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 214.77 ng/ml m
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

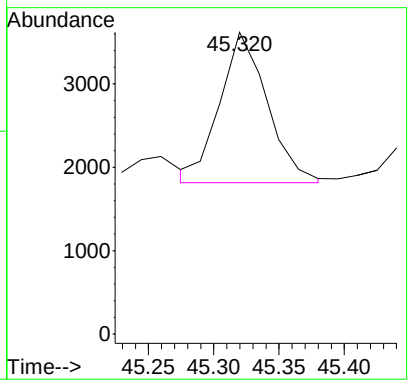
Tgt Ion:217 Resp: 8252

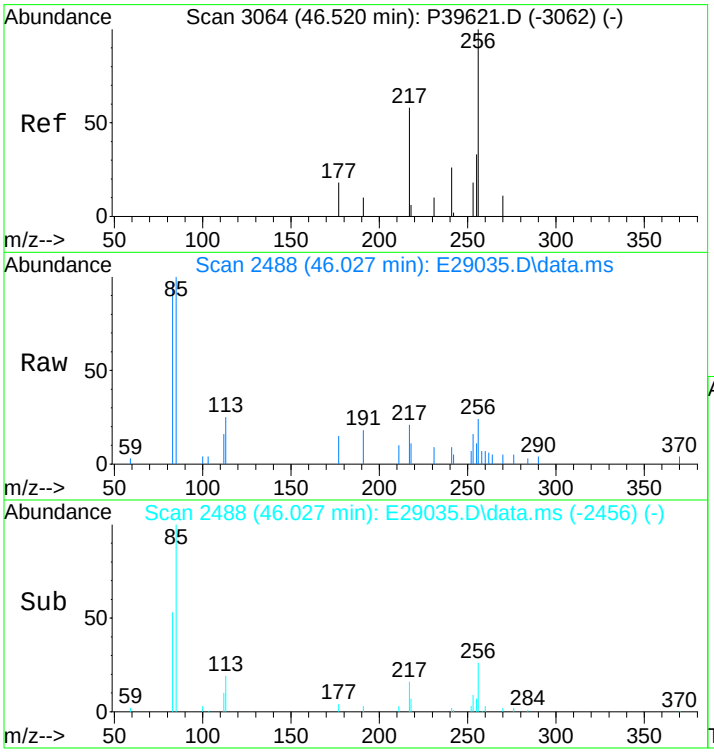




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 118.99 ng/ml m
RT: 45.320 min Scan# 2441
Delta R.T. -0.018 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

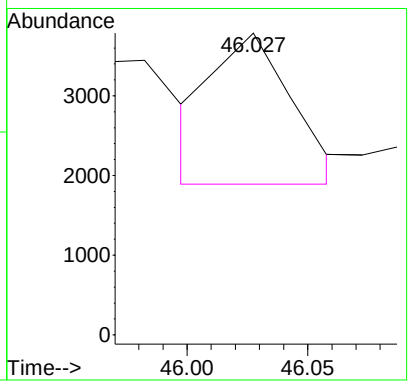
Tgt Ion:217 Resp: 4572

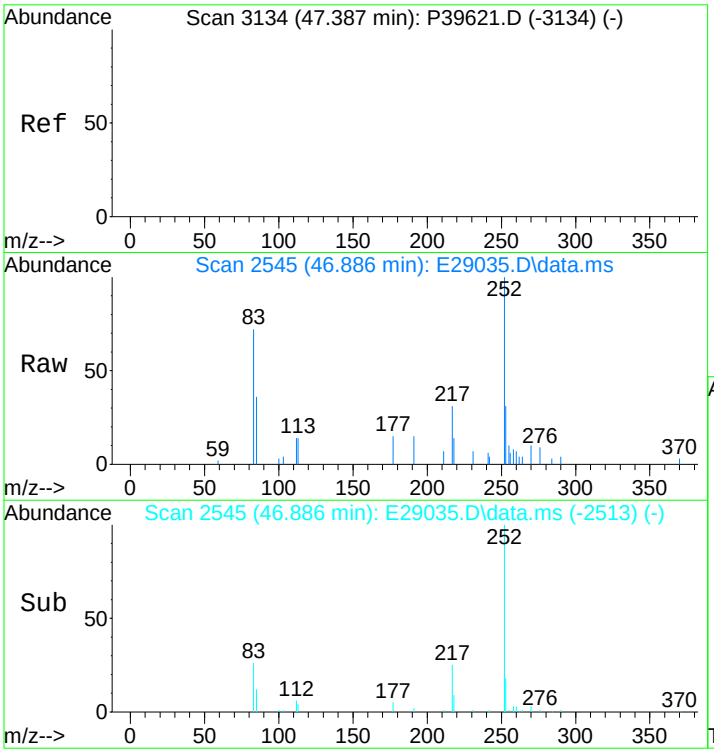




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 113.32 ng/ml m
RT: 46.027 min Scan# 2488
Delta R.T. -0.018 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

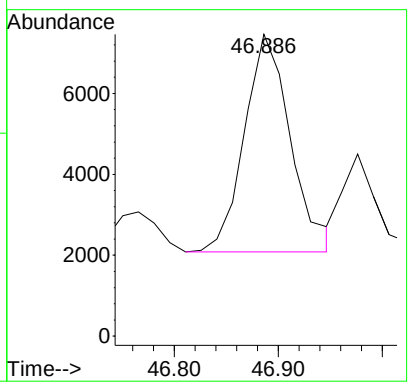
Tgt Ion:217 Resp: 4354

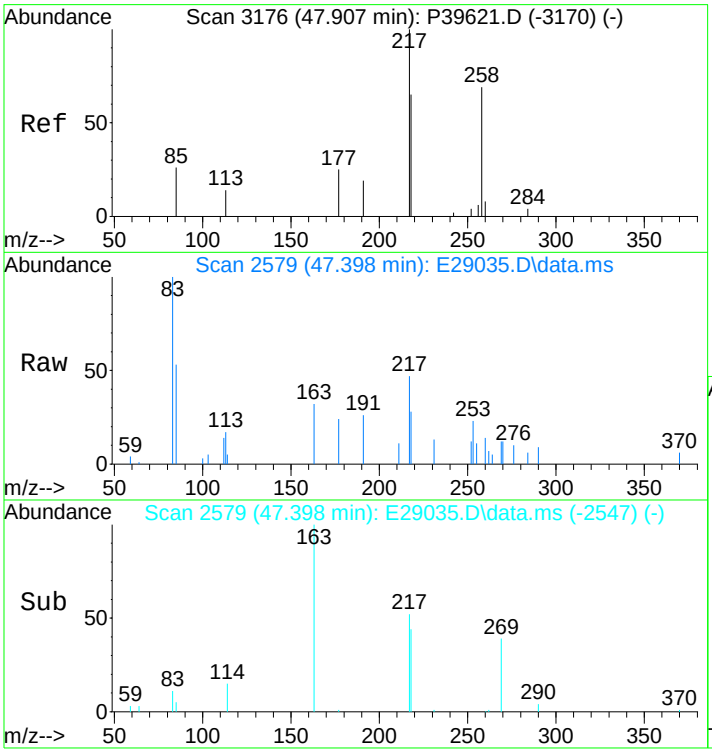




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 433.62 ng/ml
RT: 46.886 min Scan# 2545
Delta R.T. -0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

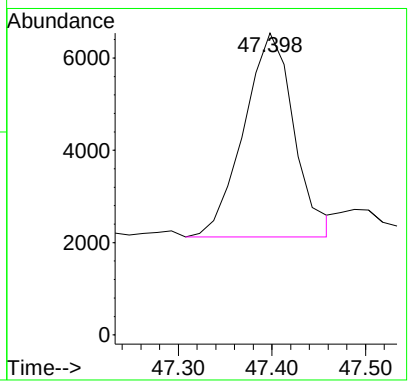
Tgt Ion:217 Resp: 16661

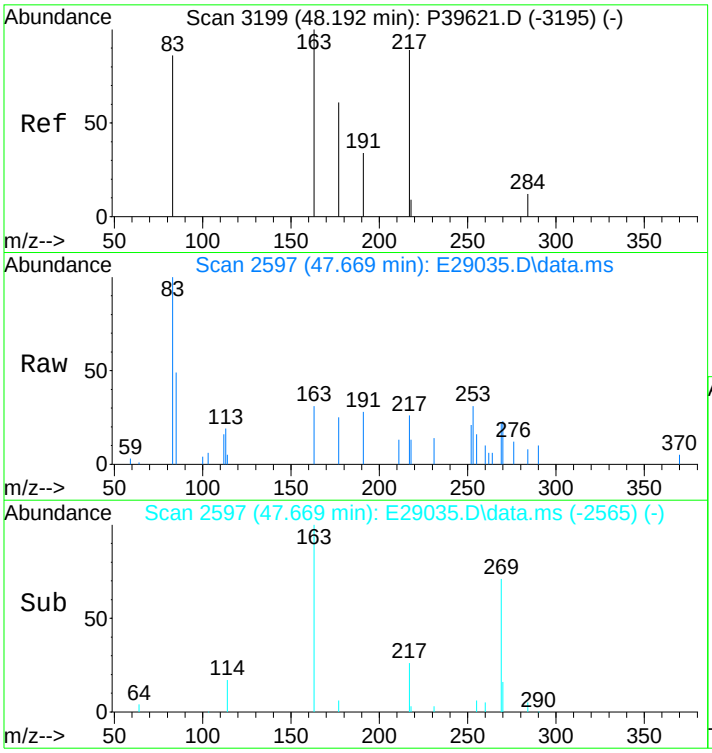




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 428.65 ng/ml
RT: 47.398 min Scan# 2579
Delta R.T. -0.020 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

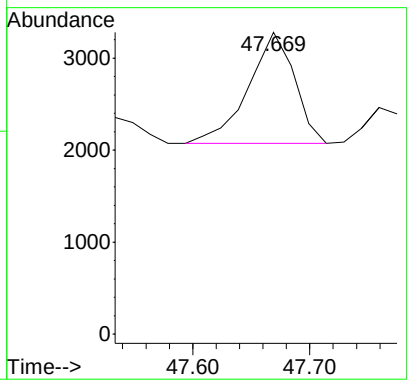
Tgt Ion:217 Resp: 16470

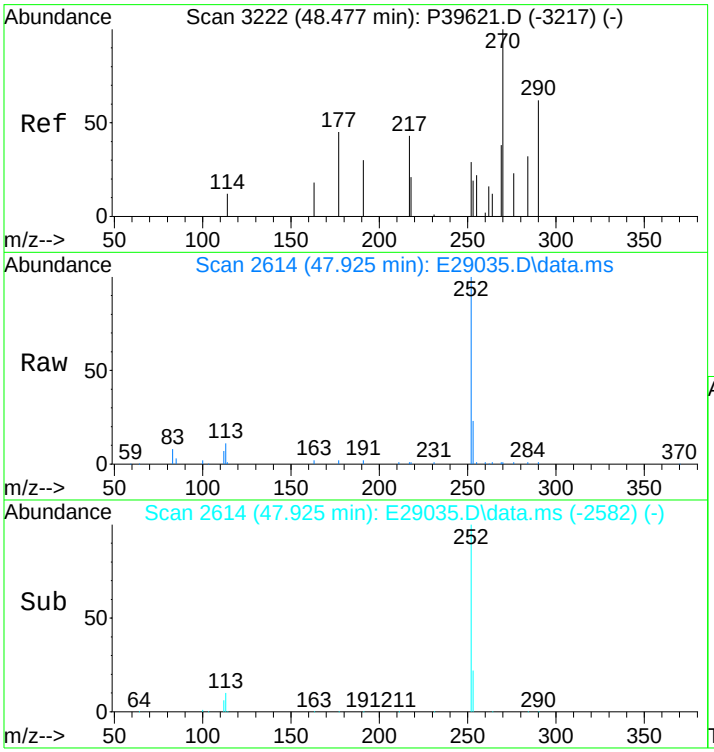




#135
Unknown Sterane (S18)
Concen: 86.64 ng/ml
RT: 47.669 min Scan# 2597
Delta R.T. -0.020 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

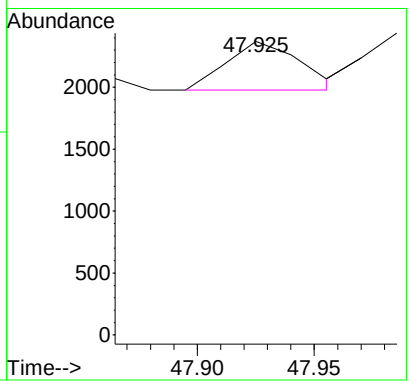
Tgt Ion:217 Resp: 3329

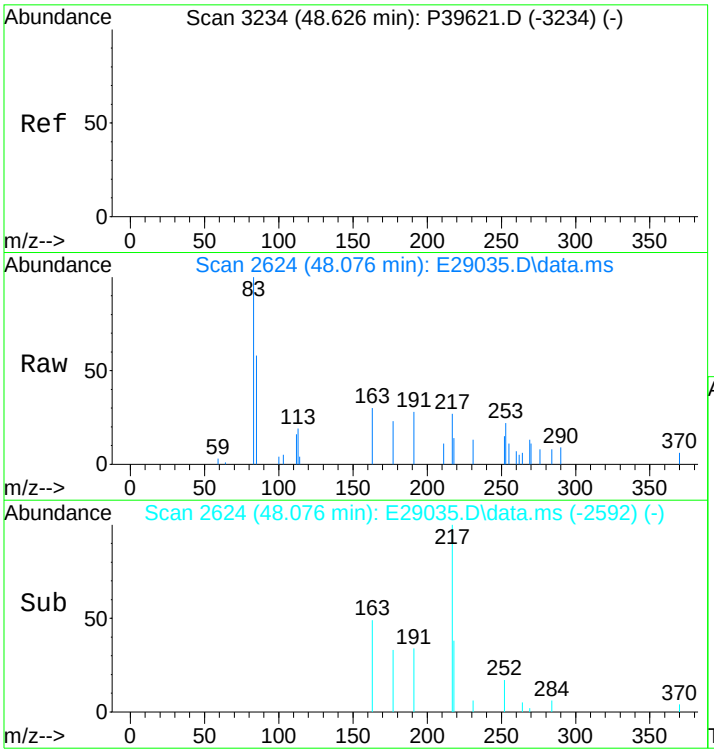




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 22.51 ng/ml
RT: 47.925 min Scan# 2614
Delta R.T. -0.020 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

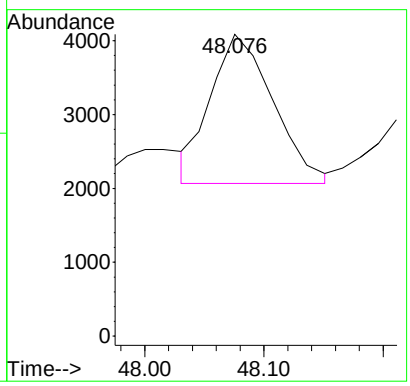
Tgt Ion:217 Resp: 865

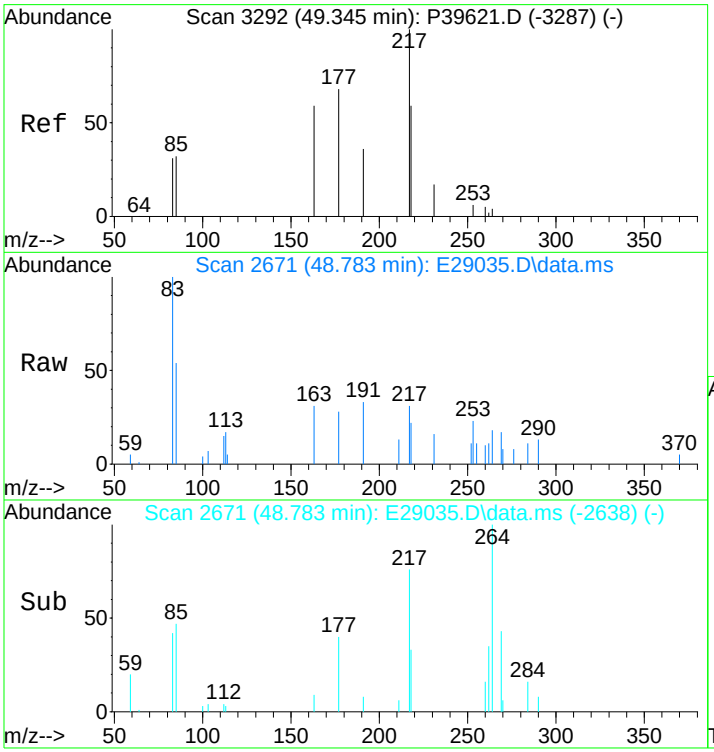




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 190.48 ng/ml m
RT: 48.076 min Scan# 2624
Delta R.T. -0.021 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

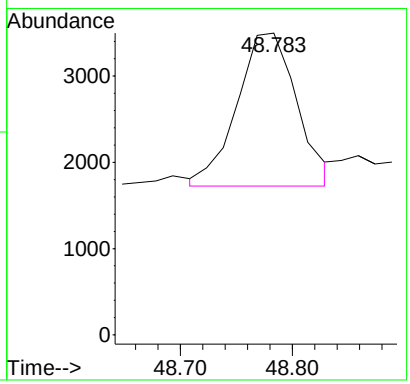
Tgt Ion:217 Resp: 7319

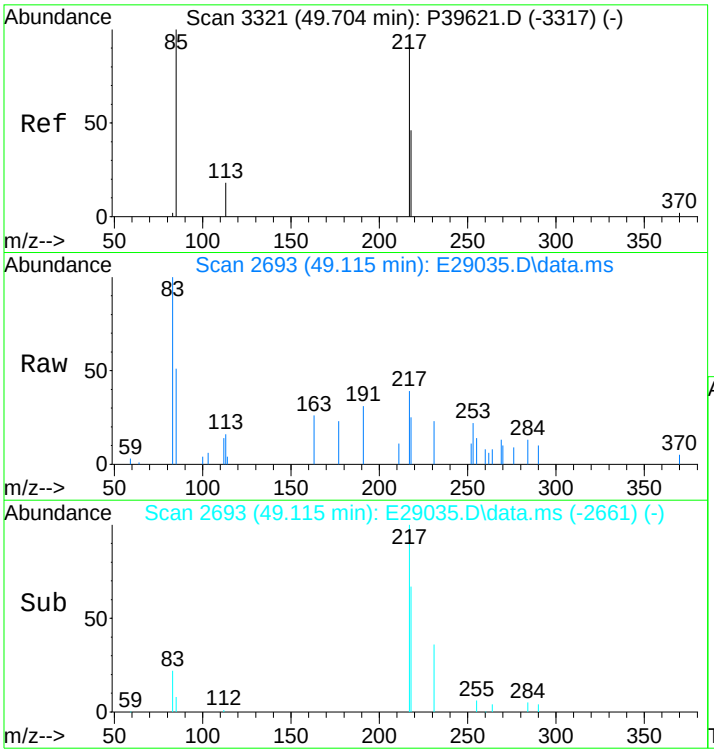




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 171.22 ng/ml m
RT: 48.783 min Scan# 2671
Delta R.T. -0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

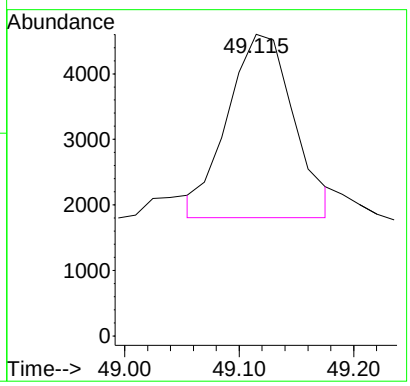
Tgt Ion:217 Resp: 6579

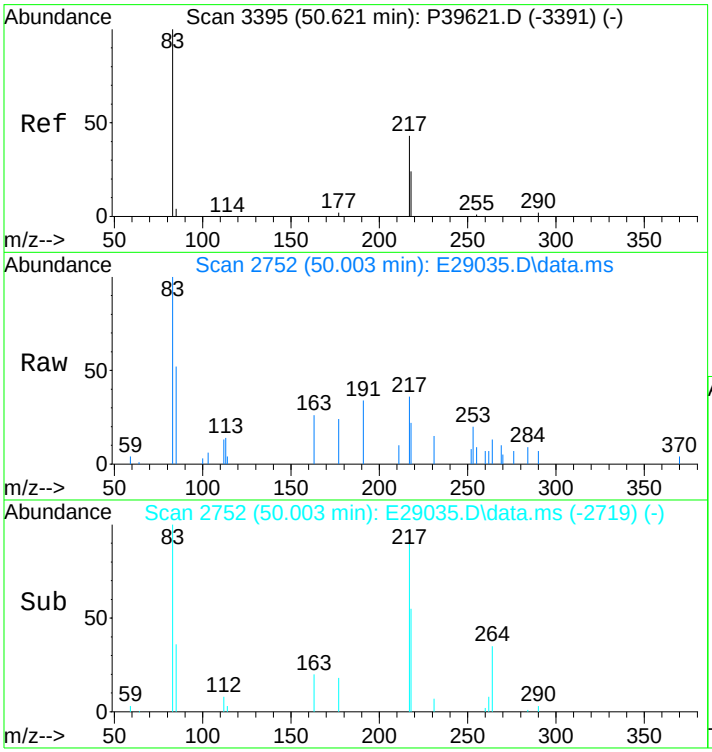




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 291.52 ng/ml m
RT: 49.115 min Scan# 2693
Delta R.T. -0.022 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

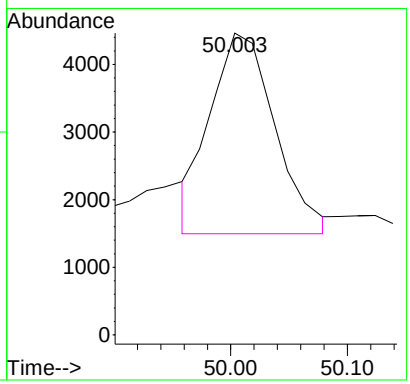
Tgt Ion:217 Resp: 11201

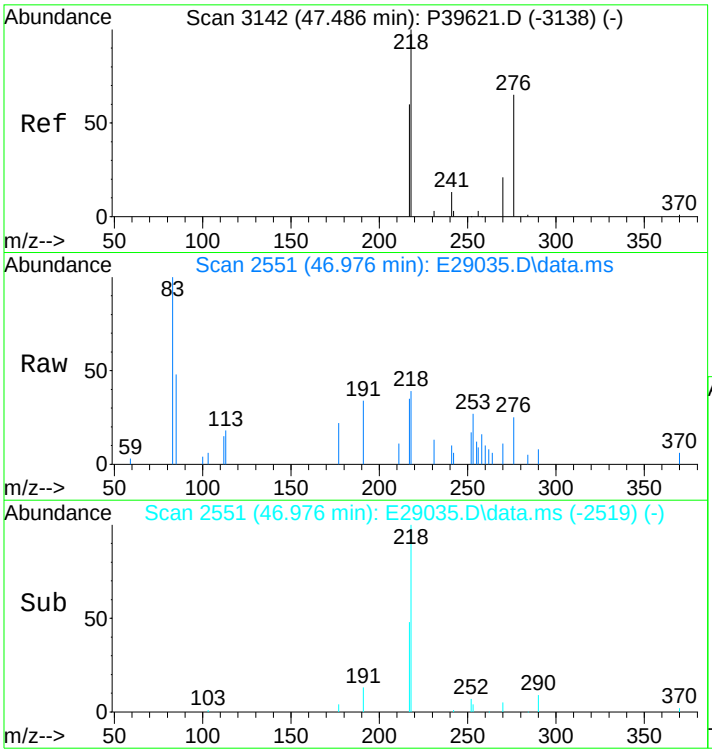




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 298.23 ng/ml m
RT: 50.003 min Scan# 2752
Delta R.T. -0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

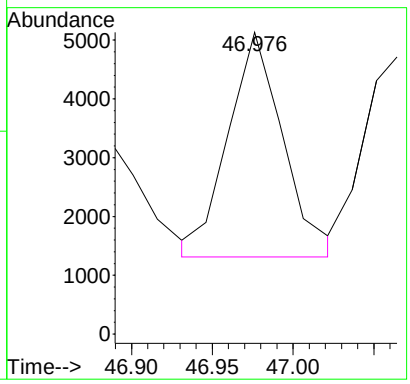
Tgt Ion:217 Resp: 11459

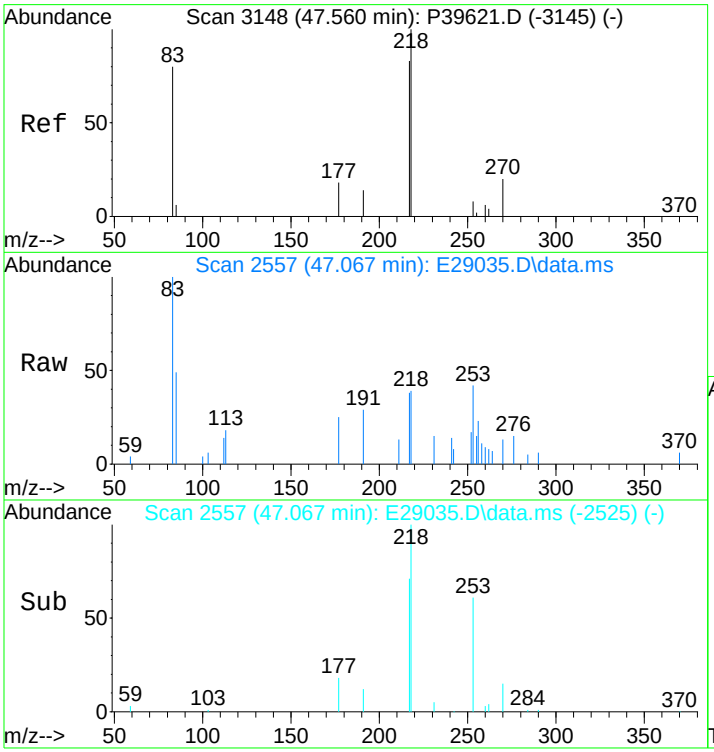




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 235.12 ng/ml m
RT: 46.976 min Scan# 2551
Delta R.T. -0.019 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

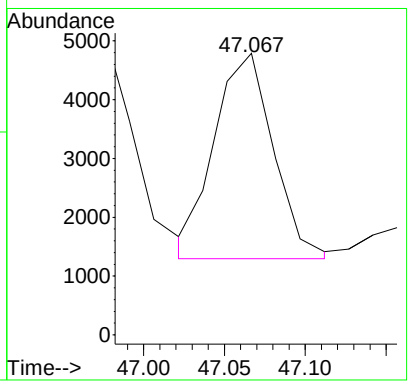
Tgt Ion:218 Resp: 9034

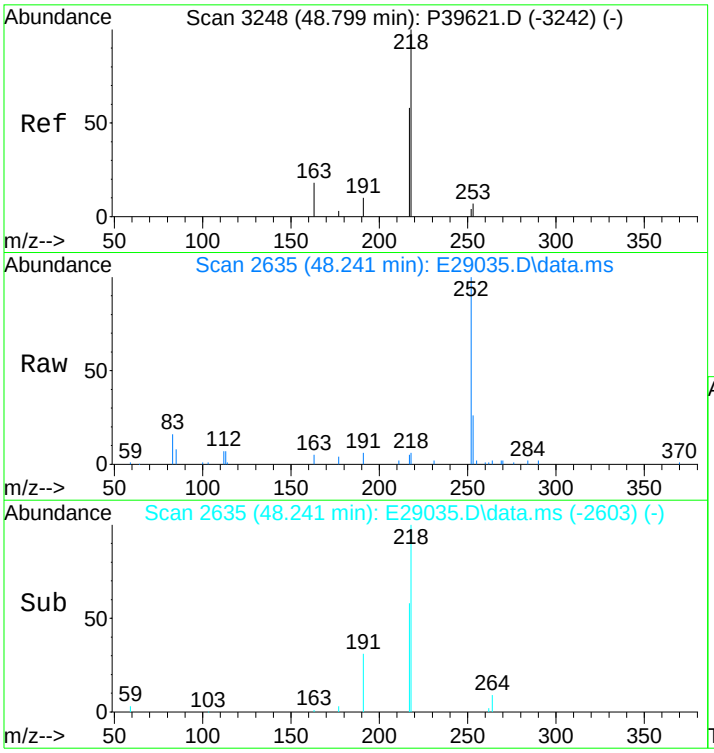




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 230.80 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.020 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

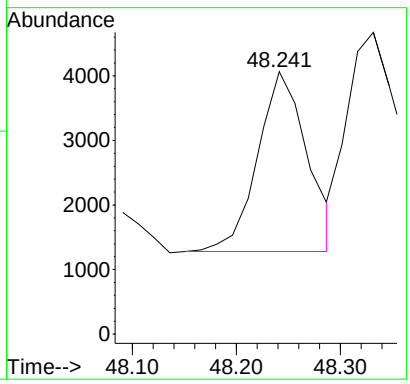
Tgt Ion:218 Resp: 8868

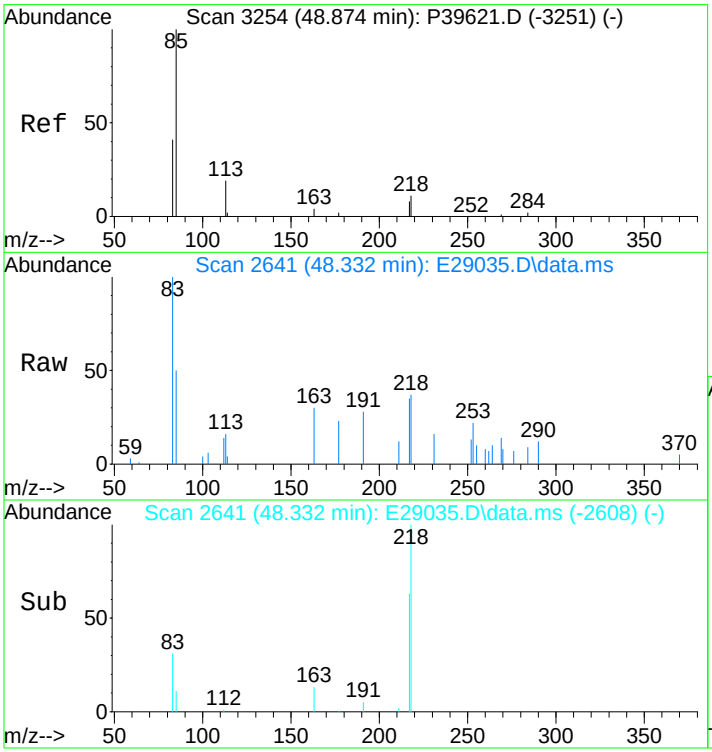




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 241.42 ng/ml
RT: 48.241 min Scan# 2635
Delta R.T. -0.021 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

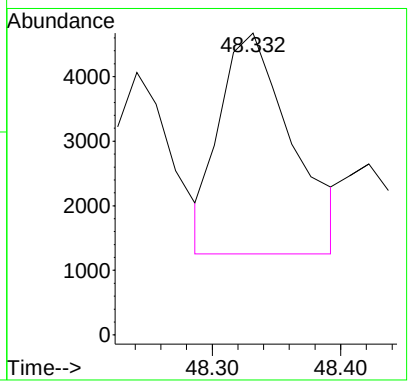
Tgt Ion:218 Resp: 9276

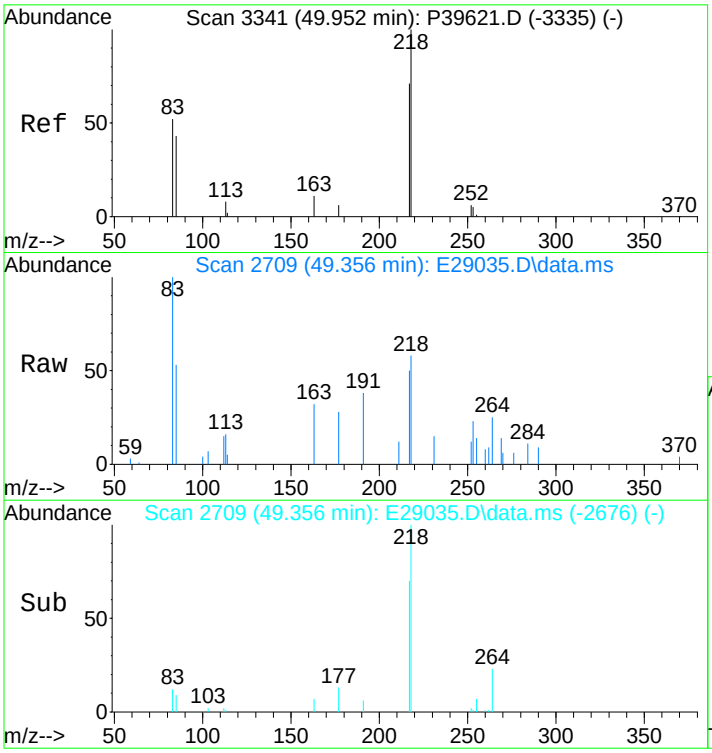




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 346.79 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

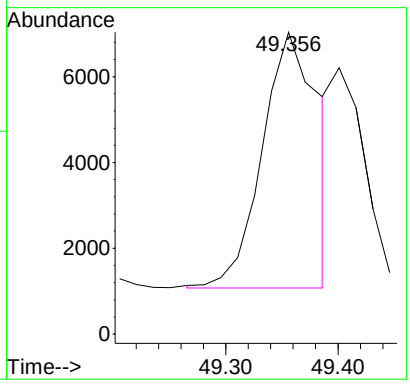
Tgt Ion:218 Resp: 13325

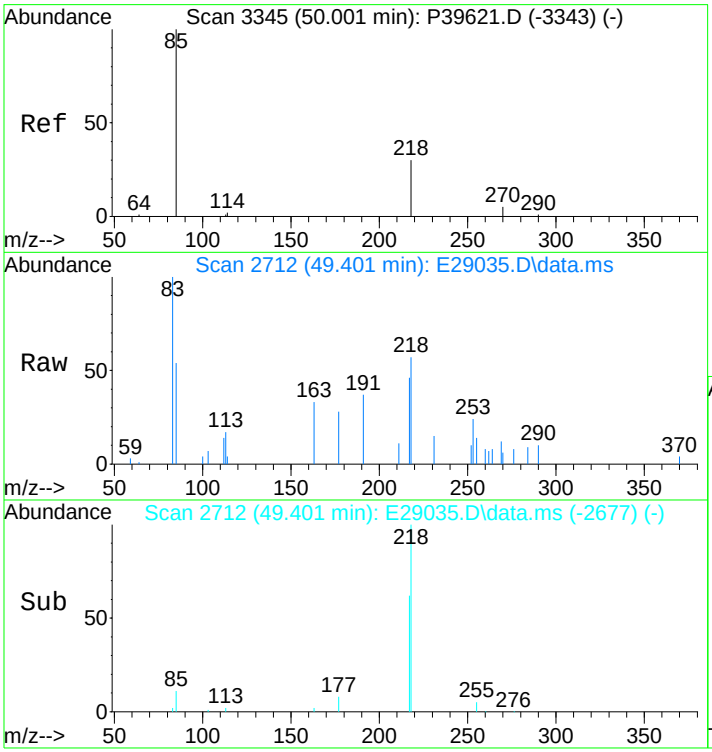




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 540.92 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. -0.007 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

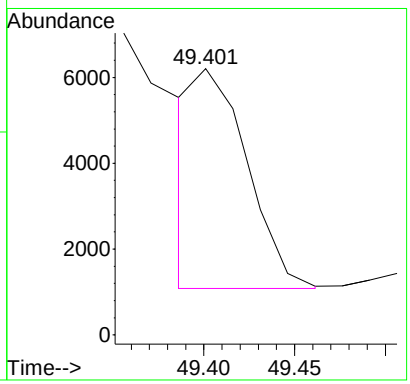
Tgt Ion:218 Resp: 20784

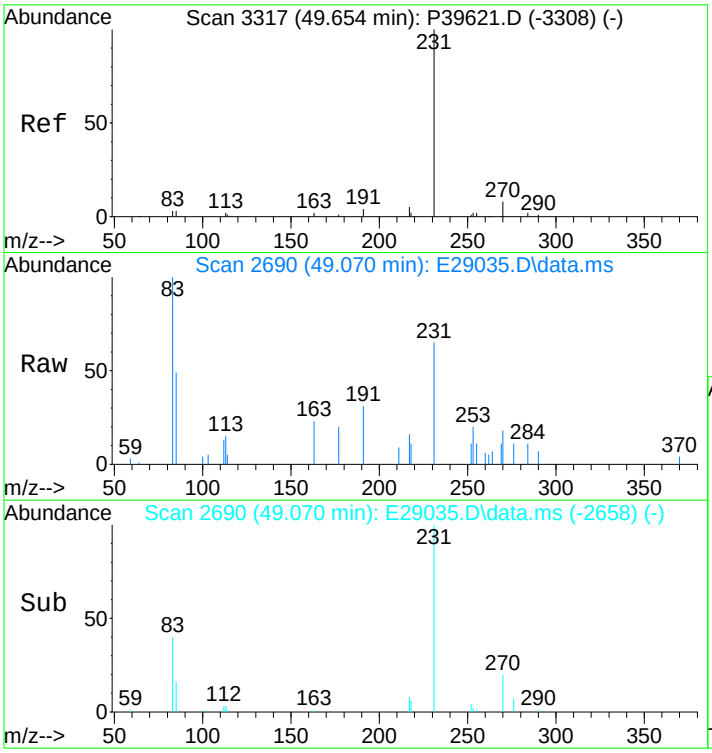




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 271.79 ng/ml m
RT: 49.401 min Scan# 2712
Delta R.T. 0.023 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

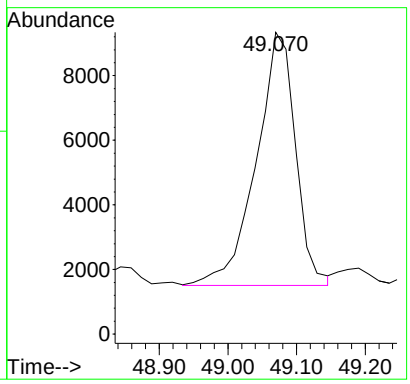
Tgt Ion:218 Resp: 10443

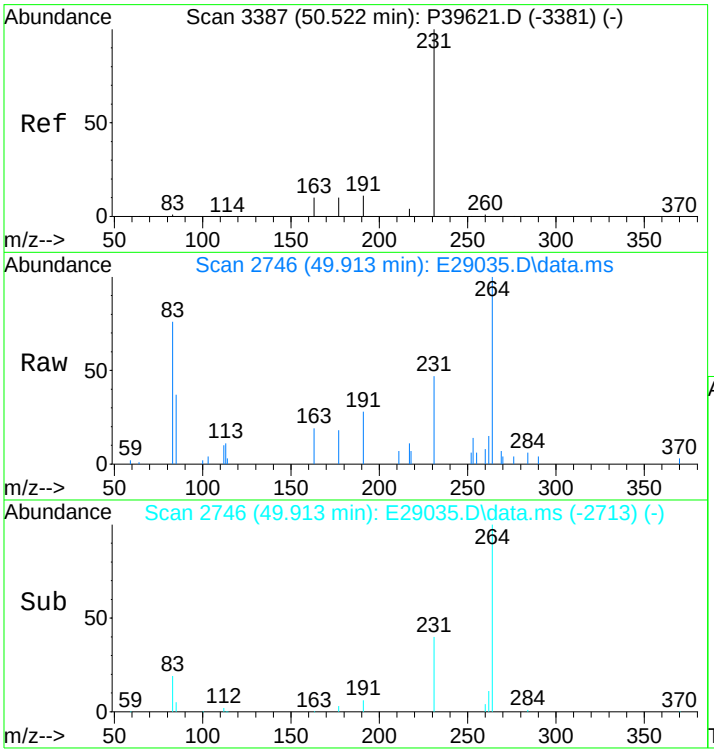




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 811.80 ng/mL m
RT: 49.070 min Scan# 2690
Delta R.T. -0.022 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

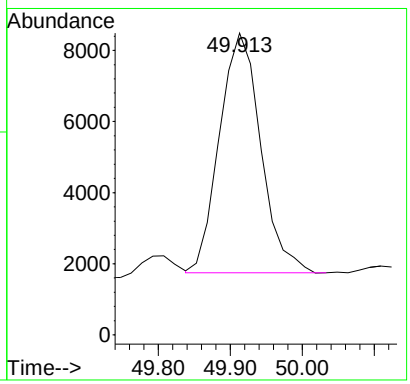
Tgt Ion:231 Resp: 31192

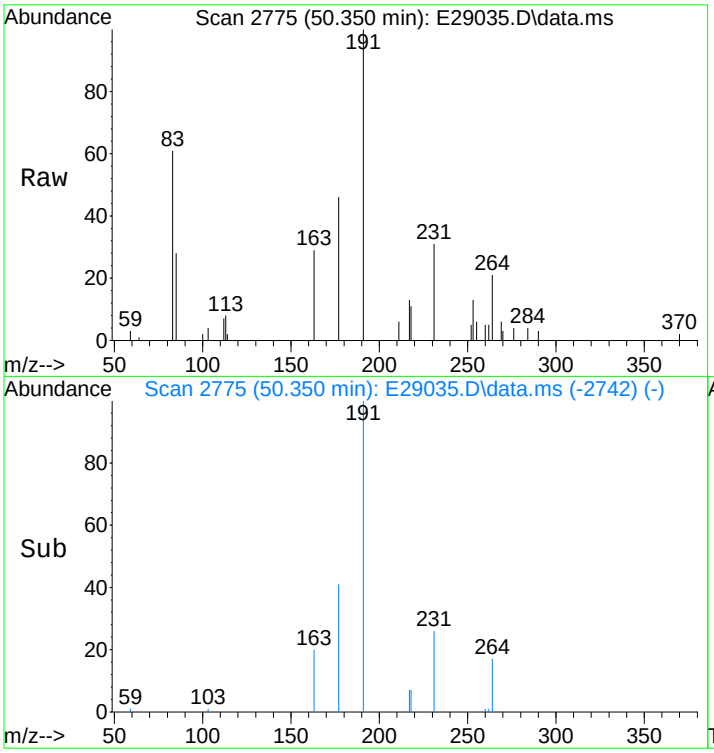




#148
C28,20S-triaromatic steroid
Concen: 696.92 ng/mL
RT: 49.913 min Scan# 2746
Delta R.T. -0.007 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

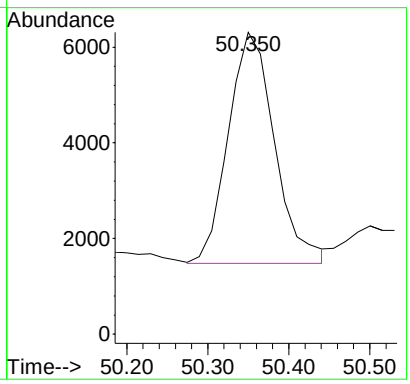
Tgt Ion:231 Resp: 26778

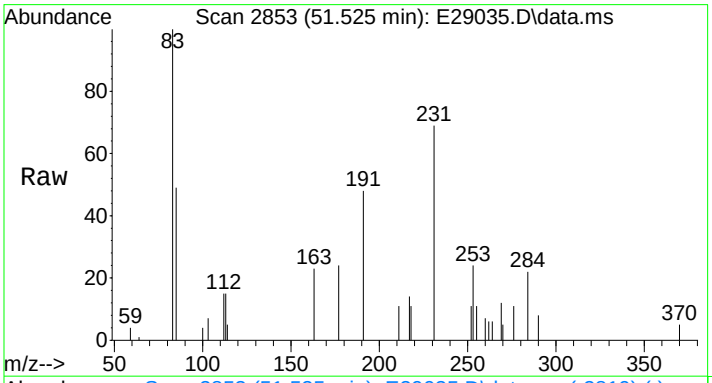




#149
C27,20R-triaromatic steroid
Concen: 499.77 ng/mL m
RT: 50.350 min Scan# 2775
Delta R.T. -0.008 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

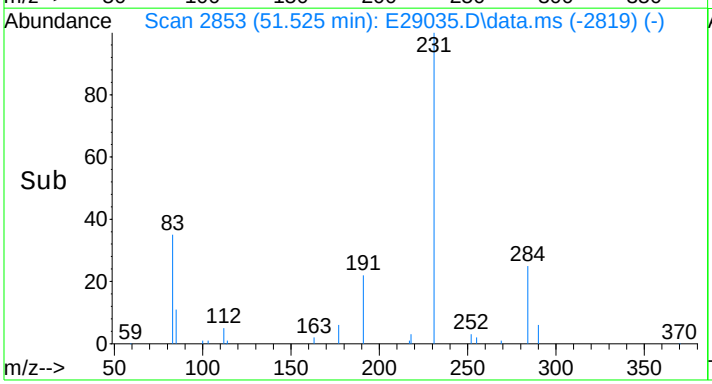
Tgt Ion:231 Resp: 19203

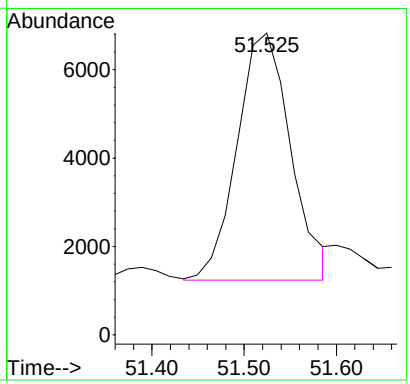




#150
C28,20R-triaromatic steroid
Concen: 589.80 ng/mL m
RT: 51.525 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29035.D
Acq: 17 Nov 2012 10:14 am

Tgt Ion:231 Resp: 22662





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	40349M3	500.000	ng/mL	-0.01
74) Chrysene-d12	42.760	240	98217	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	49180	346.523	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 34.65%#			
42) Phenanthrene-d10	32.100	188	64994	446.985	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.70%#			
83) Benzo[b]fluoranthene-d12	46.690	264	90756	449.819	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.98%#			
88) Benzo[a]pyrene-d12	47.850	264	80383	411.178	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.12%#			
129) 5B(H)Cholane - Surr	43.362	217	18687	482.750	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.27%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	239	7.405	ng/mL	100
5) C1-Decalins	17.814	152	782M5	24.229	ng/mL	
6) C2-Decalins	19.139	166	2828M5	87.621	ng/mL	
7) C3-Decalins	21.623	180	5246M5	162.538	ng/mL	
8) C4-Decalins	25.010	194	12514M5	387.725	ng/mL	
10) Naphthalene	19.304	128	15588	98.214	ng/mL#	100
11) C1-Naphthalenes	22.014	142	23635M5	148.916	ng/mL	
12) C2-Naphthalenes	24.859	156	76294M5	480.701	ng/mL	
13) C3-Naphthalenes	27.539	170	132767M5	836.518	ng/mL	
14) C4-Naphthalenes	29.978	184	128976M5	812.632	ng/mL	
16) 2-Methylnaphthalene	22.014	142	13591	134.449	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	10194	103.783	ng/mL#	100
18) Benzothiophene	19.530	134	560M3	4.268	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	3297M5	25.128	ng/mL	
20) C2-Benzo(b)thiophenes	24.709	162	12366M5	94.248	ng/mL	
21) C3-Benzo(b)thiophenes	27.027	176	30498M5	232.441	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	38432M5	292.910	ng/mL	
23) Biphenyl	23.896	154	4103M3	32.116	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	17464	191.669	ng/mL#	100
25) Dibenzofuran	26.982	168	9716M3	68.693	ng/mL	
26) Acenaphthylene	25.597	152	47944	302.988	ng/mL#	100
27) Acenaphthene	26.335	153	8222	80.722	ng/mL	96
28) 2,3,5-Trimethylnaphthalen	27.900	170	9910M3	116.250	ng/mL	
29) Fluorene	28.367	166	16617M3	146.275	ng/mL	
30) C1-Fluorenes	30.746	180	23553M5	207.331	ng/mL	
31) C2-Fluorenes	32.943	194	54456M5	479.362	ng/mL	
32) C3-Fluorenes	34.795	208	74356M5	654.536	ng/mL	
33) Dibenzothiophene	31.694	184	31345	201.068	ng/mL#	67
34) 4-Methyldibenzothiophene(	33.470	198	32886	210.953	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	30212M3	193.801	ng/mL	
36) 1-Methyldibenzothiophene(	34.238	198	16414	105.291	ng/mL#	100
37) OTP	33.862	198	4914M3	31.522	ng/mL	
38) C1-Dibenzothiophenes	33.470	198	93424M5	599.286	ng/mL	
38) C1-Dibenzothiophenes BS	33.470	198	88510m	567.764	ng/mL	
39) C2-Dibenzothiophenes	35.172	212	176475M5	1132.032	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	208148M5	1335.204	ng/mL	
41) C4-Dibenzothiophenes	38.695	240	151492M5	971.774	ng/mL	
43) Phenanthrene	32.191	178	271011	1708.735	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.163	192	47841	301.639	ng/mL	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	57083	359.911	ng/mL	96
46) 2-Methylanthracene(2MA)	34.434	192	18187	114.670	ng/mL#	40
47) 9/4-Methylphenanthrene(9M	34.615	192	61678	388.882	ng/mL	85
48) 1-Methylphenanthrene(1MP)	34.705	192	40752M3	256.943	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	232659M5	1466.924	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	268332M5	1691.844	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	268332m	1691.844	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	205881M5	1298.088	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	112098M5	706.782	ng/mL	
55) Anthracene	32.371	178	61570M3	449.124	ng/mL	
56) Carbazole	33.064	167	21372	151.479	ng/mL	97
57) 1-Methylphenanthrene	34.705	192	41133M3	339.939	ng/mL	
58) Fluoranthene	36.993	202	837577	4781.963	ng/mL	100
59) Benzo(b)fluorene	39.538	216	73888M3	633.070	ng/mL	
60) Pyrene	37.882	202	798955	4487.791	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	554127M5	3112.573	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	296055M5	1662.963	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	177307M5	995.947	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	158360M5	889.520	ng/mL	
66) Naphthobenzothiophene	41.751	234	92584	527.280	ng/ml#	94
67) Naphthobenzothiophene-2,1	41.751	234	92584	527.280	ng/mL#	94
68) Naphthobenzothiophene-1,2	42.098	234	20786	118.379	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	28945M3	164.846	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	154838M5	881.826	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	173544M5	988.360	ng/ml	
72) C3-Naphthobenzothiophenes	46.796	276	149550M5	851.710	ng/ml	
73) C4-Naphthobenzothiophenes	47.850	290	112444M5	640.386	ng/mL	
75) Benz[a]anthracene	42.700	228	469360M3	2454.056	ng/mL	
77) Chrysene/Triphenylene	42.850	228	556293	2825.191	ng/mL	98
78) C1-Chrysenes	44.341	242	302735M5	1537.471	ng/mL	
79) C2-Chrysenes	46.073	256	203916M5	1035.608	ng/mL	
79) C2-Chrysenes BS	46.073	256	200901m	1020.296	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	3015	15.312	ng/mL	100
81) C3-Chrysenes	47.639	270	160523M5	815.232	ng/mL	
82) C4-Chrysenes	49.190	284	90324M5	458.720	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	627538	2822.846	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	513778	2246.366	ng/mL	94
86) Benzo[a]fluoranthene	47.157	252	123184M3	538.591	ng/mL	
87) Benzo[e]pyrene	47.759	252	451285M4	2079.019	ng/mL	
89) Benzo[a]pyrene	47.940	252	589043	2835.974	ng/mL	96
90) Perylene	48.241	252	209780	955.133	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.639	276	502245M3	2054.665	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	126086M3	484.430	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	500623	1899.407	ng/mL	100
94) Hopane (T19)	51.705	191	109901	1490.979	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	22560M3	306.062	ng/ml	
97) C24 Tricyclic Terpane (T5	41.104	191	14162M3	192.130	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	19117M3	259.352	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	7629M3	103.499	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6979M3	94.681	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5748M3	77.981	ng/ml	
102) C28 Tricyclic Terpane-22S	46.073	191	5551M3	75.308	ng/ml	
103) C28 Tricyclic Terpane-22R	46.238	191	8623	116.985	ng/ml	100
104) C29 Tricyclic Terpane-22S	46.765	191	7836	106.308	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	8022M3	108.831	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.030	191	16414	222.682	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
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Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.151	191	7781M3	105.561	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10715	145.366	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	26729M3	362.621	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10939	148.405	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	13670	185.455	ng/ml	100
112) 30-Norhopane (T15)	50.365	191	76309	1035.251	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	21003M3	284.939	ng/ml	
114) 17a(H)-Diahopane (X)	50.591	191	6492M3	88.074	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11273	152.936	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.509	191	6100	82.756	ng/ml	100
117) Moretane (T20)	52.368	191	15913M3	215.885	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	40092M3	543.911	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	36973	501.597	ng/ml	100
120) Gammacerane/C32-diahopane	54.175	191	14441	195.915	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.913	191G	87694M3	1189.707	ng/ml	
122) 30,31-Bishomohopane-22R (	55.319	191	23777	322.572	ng/ml	100
123) 30,31-Trishomohopane-22S	57.006	191	28387M3	385.114	ng/ml	
124) 30,31-Trishomohopane-22R	57.608	191	12347	167.506	ng/ml	100
125) Tetrakishomohopane-22S (T	59.581	191	25880	351.103	ng/ml	100
126) Tetrakishomohopane-22R (T	60.364	191G	45261	614.036	ng/ml	100
127) Pentakishomohopane-22S (T	62.592	191	15266	207.107	ng/ml	100
128) Pentakishomohopane-22R (T	63.842	191	10217	138.610	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8509M3	219.817	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4567M3	117.981	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.028	217	4811M3	124.285	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16761	432.994	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16806	434.157	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3325	85.896	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	855	22.088	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	7985M3	206.280	ng/ml	
138) 14a,17a-20R-Methylcholest	48.768	217	6328M3	163.474	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.115	217	11558M3	298.583	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.003	217	12104M3	312.688	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9482M3	244.953	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	9592M3	247.794	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9686	250.223	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13833M3	357.354	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	20643M3	533.280	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	10950M3	282.876	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	29475	761.441	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	29713	767.589	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	19154	494.814	ng/mL	100
150) C28,20R-triaromatic stero	51.525	231	22056M3	569.783	ng/mL	

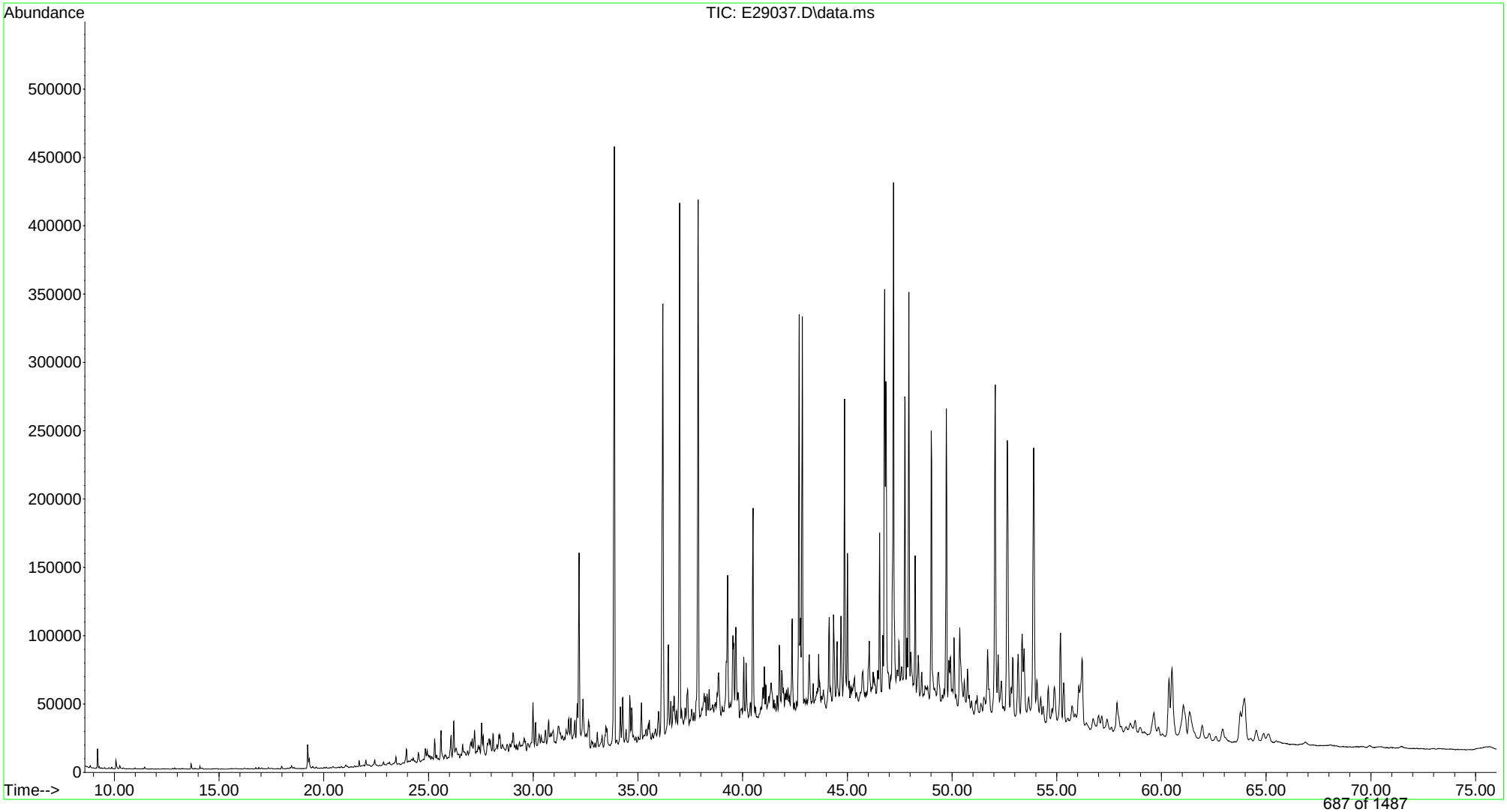
(#) = qualifier out of range (m) = manual integration (+) = signals summed

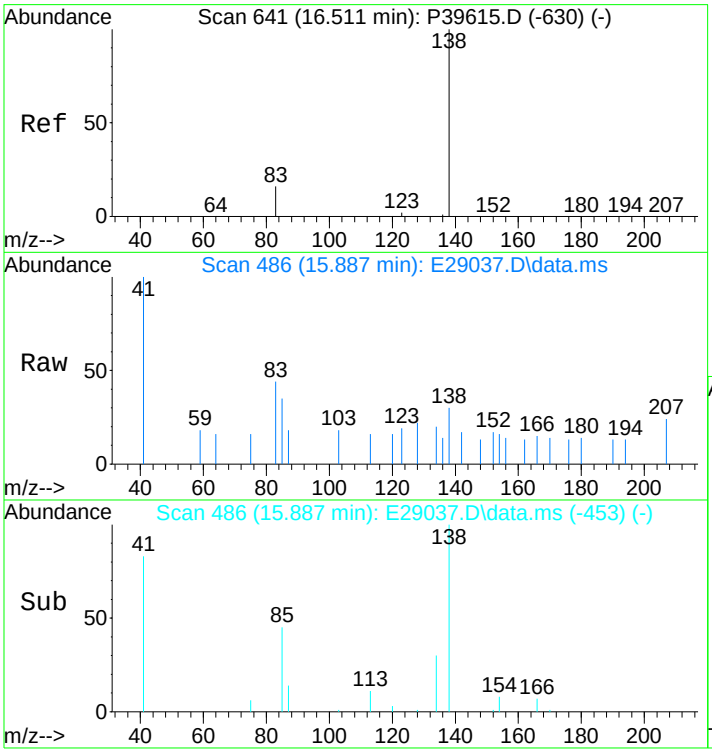
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29037.D
Acq On : 17 Nov 2012 11:42 am
Operator : AC
Sample : 1210083-02
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 19 10:18:31 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

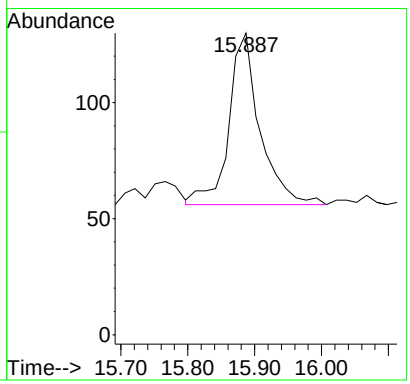
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

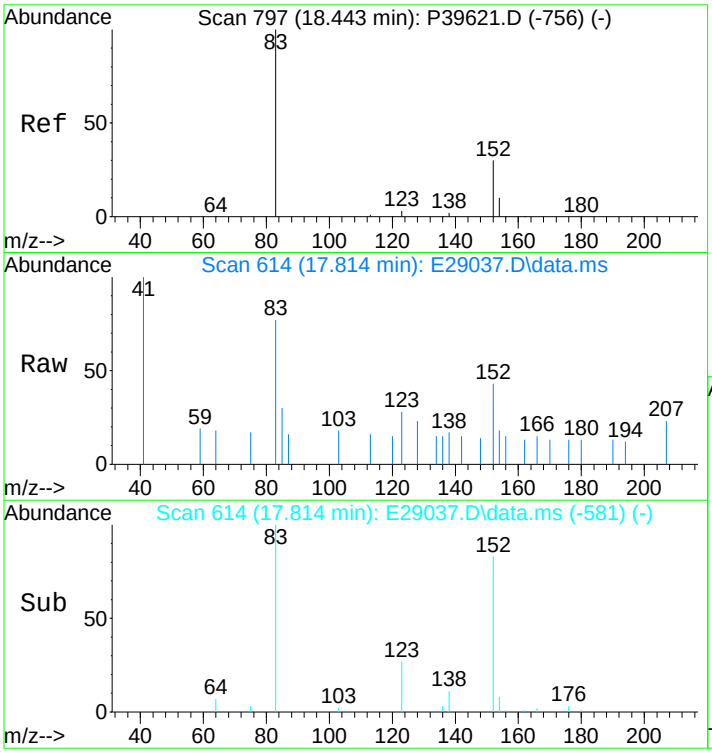




#3
trans-Decalin
Concen: 7.41 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

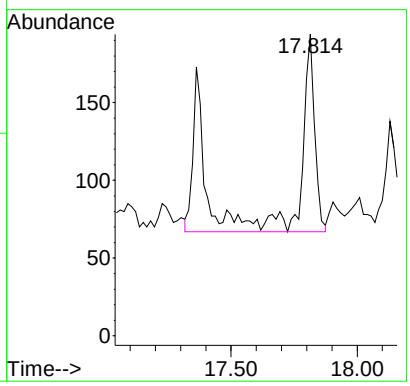
Tgt Ion:138 Resp: 239

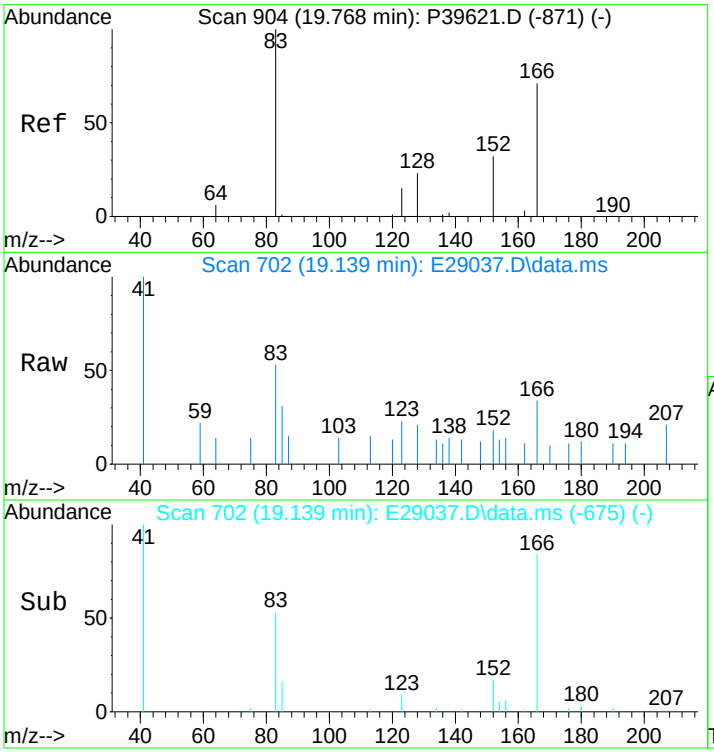




#5
C1-Decalins
Concen: 24.23 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

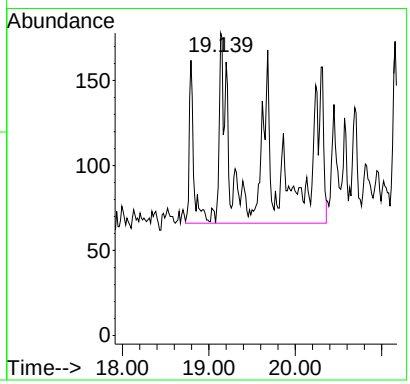
Tgt Ion:152 Resp: 782

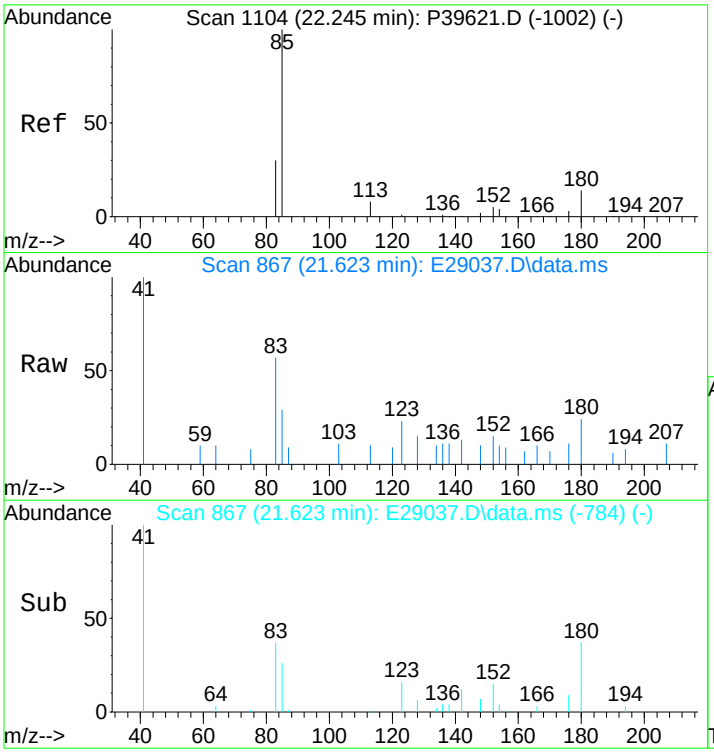




#6
C2-Decalins
Concen: 87.62 ng/mL m
RT: 19.139 min Scan# 702
Delta R.T. -0.215 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

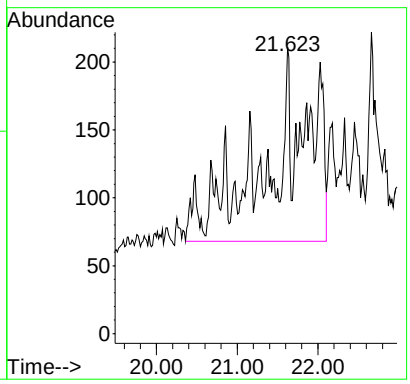
Tgt Ion:166 Resp: 2828

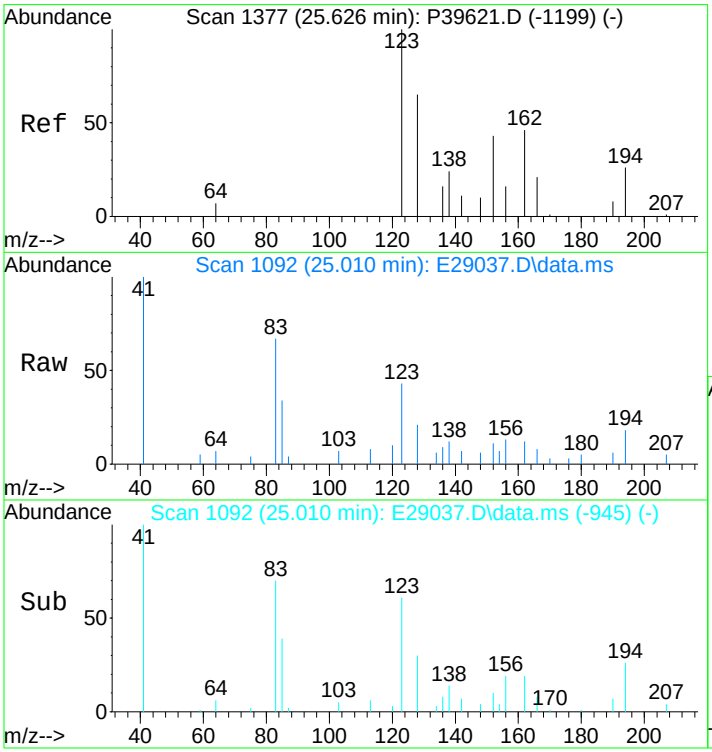




#7
C3-Decalins
Concen: 162.54 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.135 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

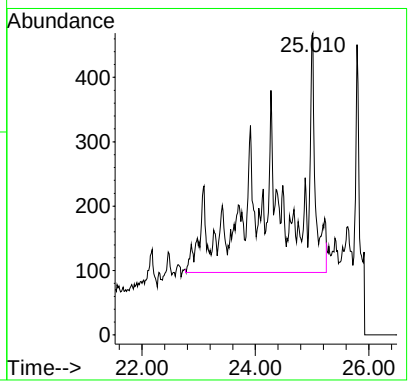
Tgt Ion:180 Resp: 5246

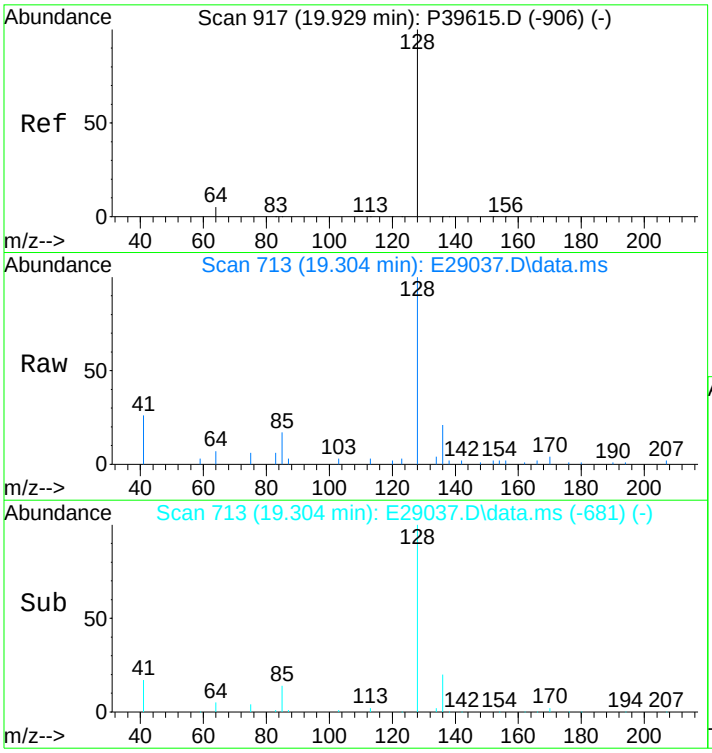




#8
C4-Decalins
Concen: 387.72 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.060 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:194 Resp: 12514

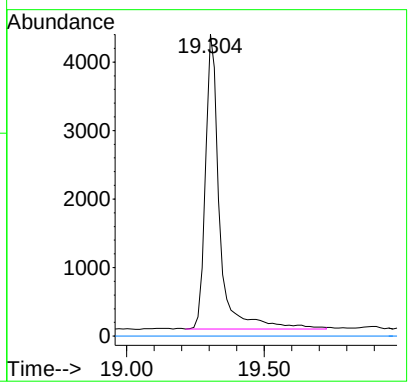


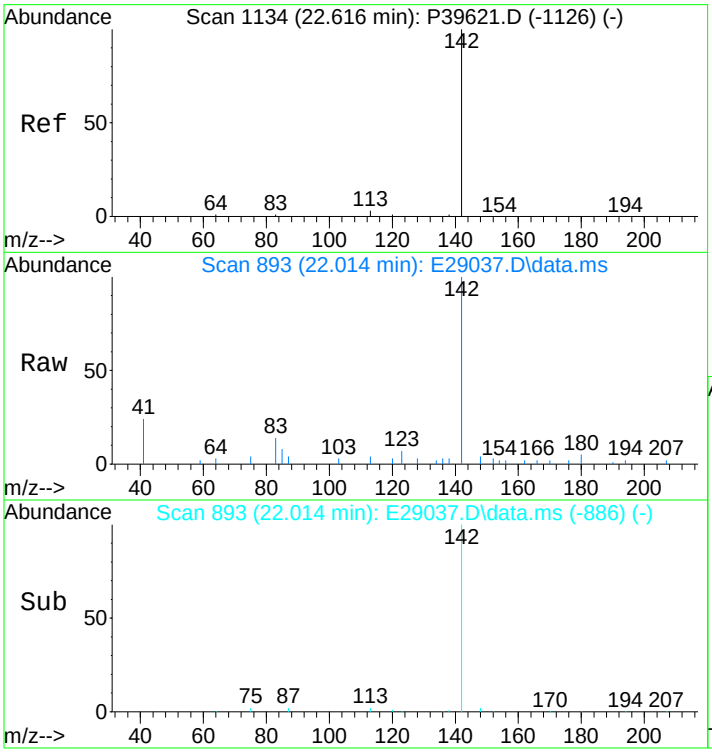


#10
Naphthalene
Concen: 98.21 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:128 Resp: 15588

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

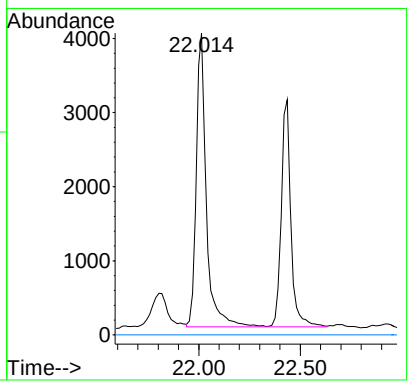


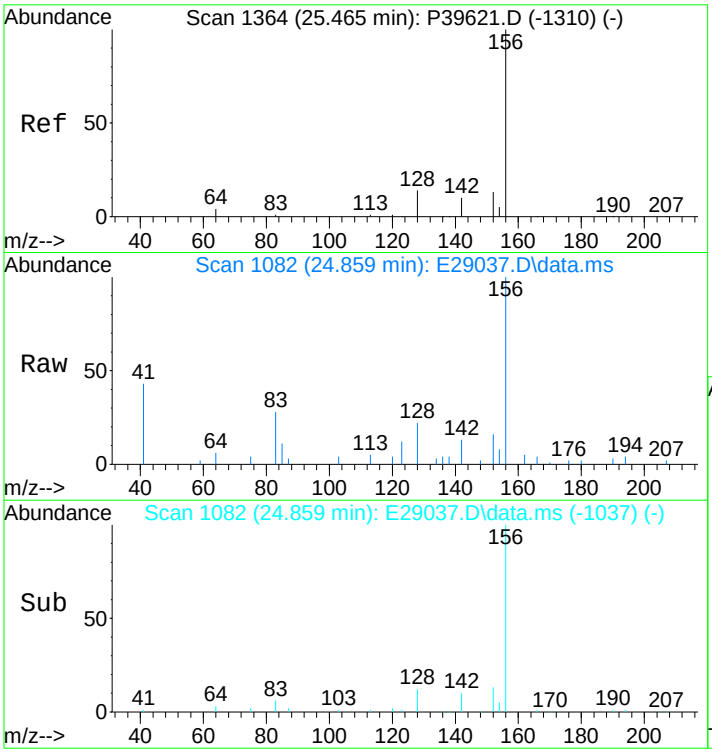


#11
C1-Naphthalenes
Concen: 148.92 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:142 Resp: 23635

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

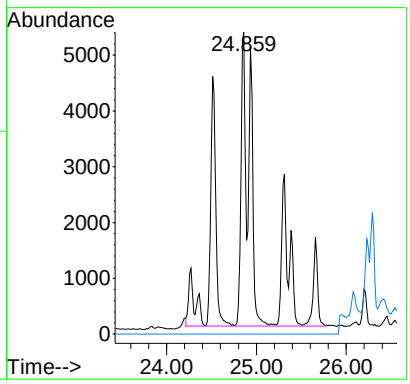


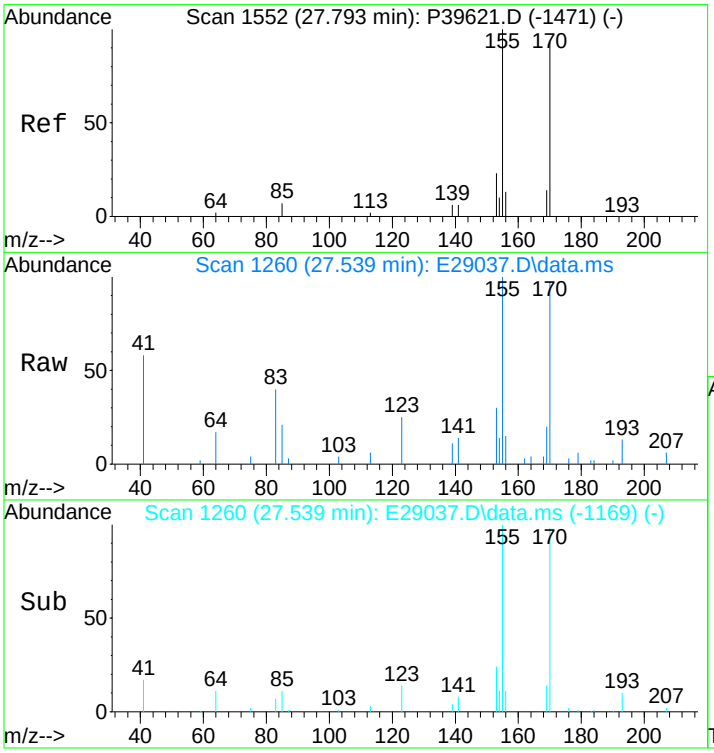


#12
C2-Naphthalenes
Concen: 480.70 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:156 Resp: 76294

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

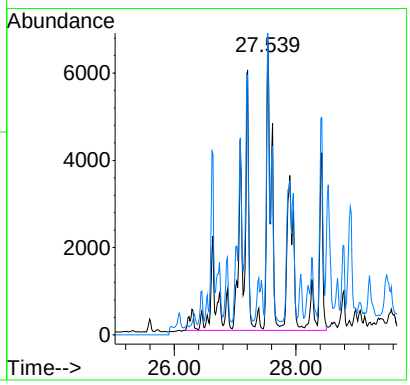


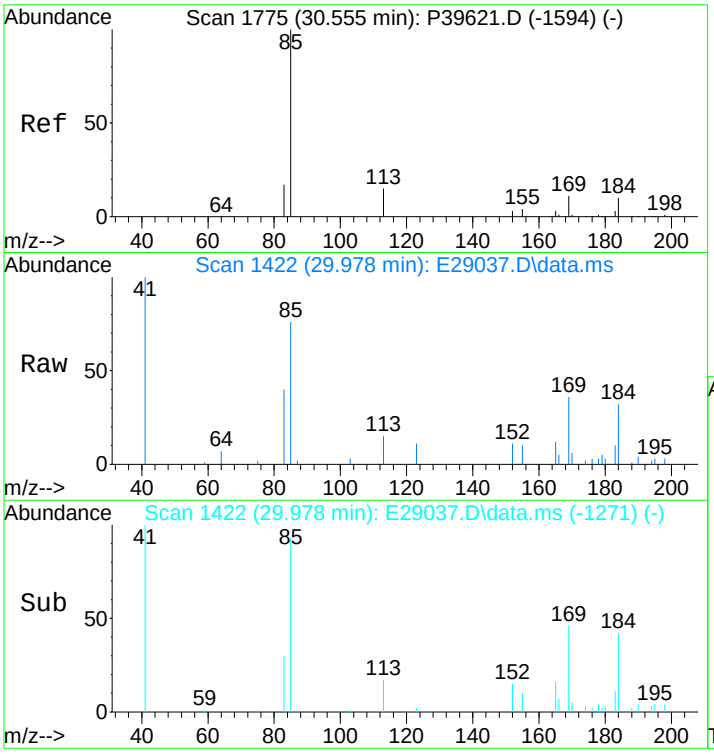


#13
C3-Naphthalenes
Concen: 836.52 ng/mL m
RT: 27.539 min Scan# 1260
Delta R.T. 0.344 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:170 Resp: 132767

Ion	Ratio	Lower	Upper
170	100		
155	15.9	66.8	100.2#

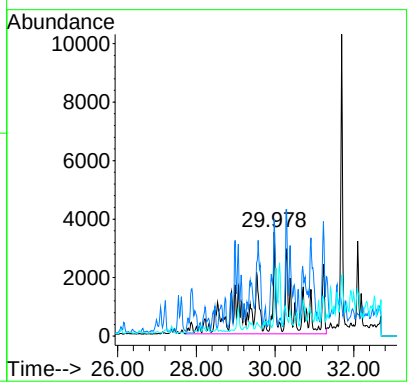


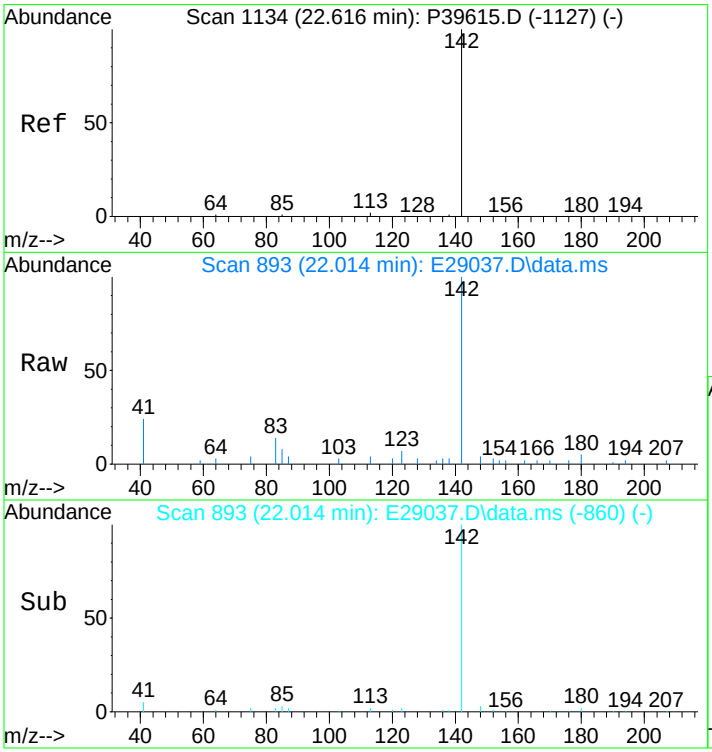


#14
C4-Naphthalenes
Concen: 812.63 ng/mL m
RT: 29.978 min Scan# 1422
Delta R.T. 0.085 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:184 Resp: 128976

Ion	Ratio	Lower	Upper
184	100		
169	10.3	78.7	118.1#
183	0.0	26.7	40.1#

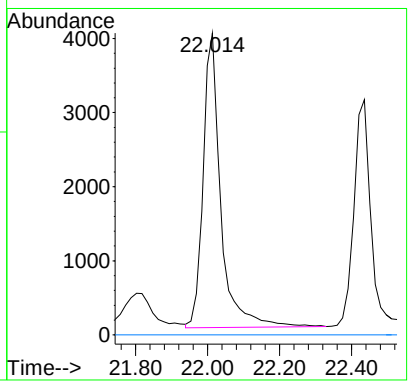


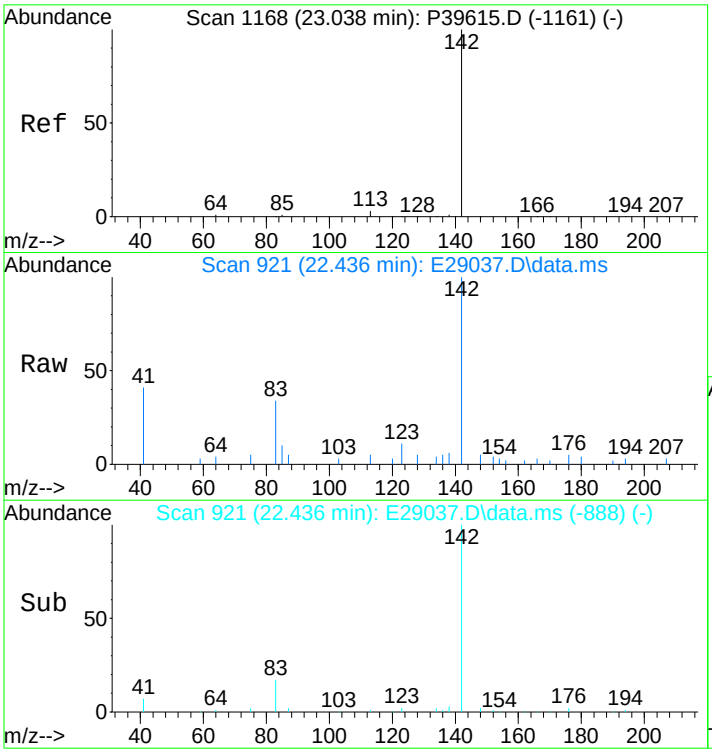


#16
2-Methylnaphthalene
Concen: 134.45 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:142 Resp: 13591

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

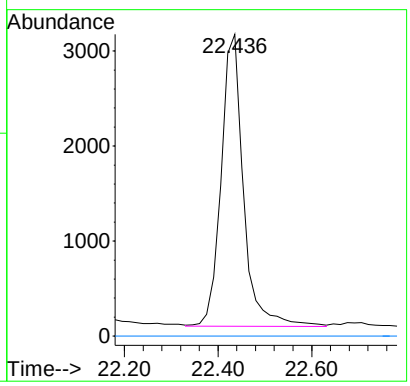


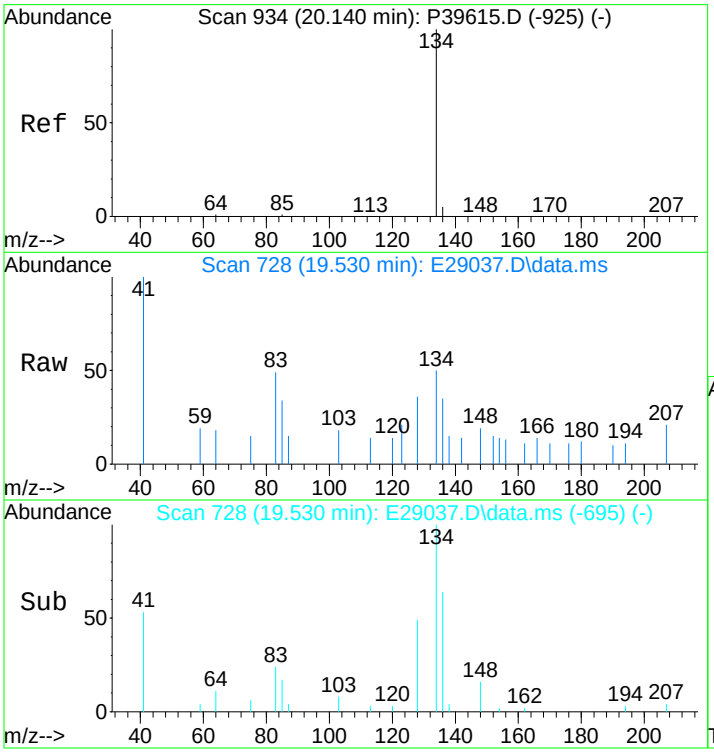


#17
1-Methylnaphthalene
Concen: 103.78 ng/mL
RT: 22.436 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:142 Resp: 10194

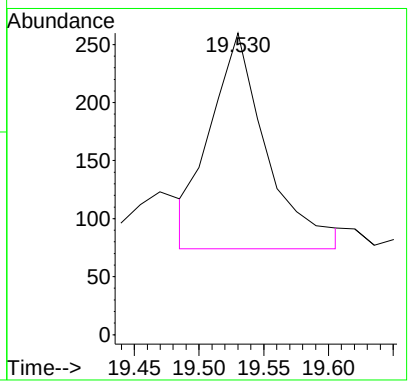
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

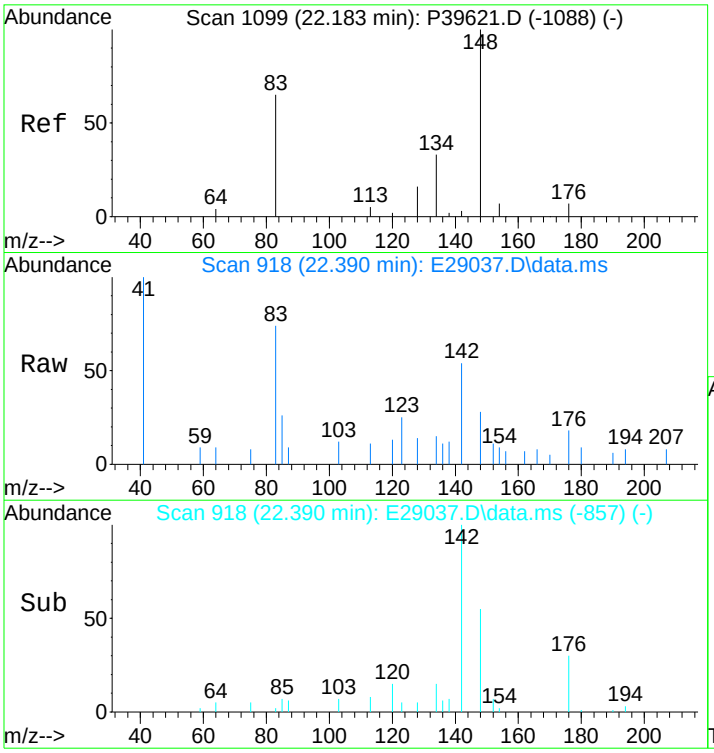




#18
Benzothiophene
Concen: 4.27 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

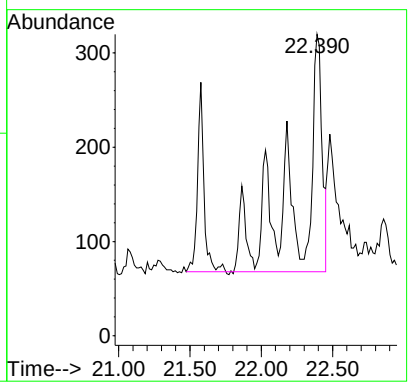
Tgt Ion:134 Resp: 560

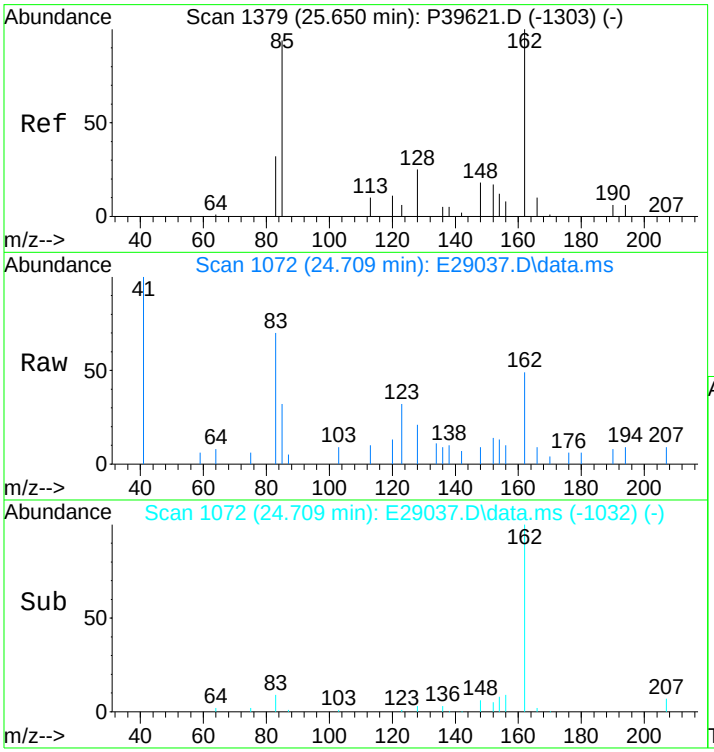




#19
C1-Benzo(b)thiophenes
Concen: 25.13 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.677 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

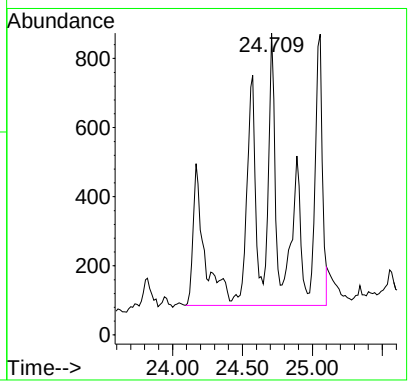
Tgt Ion:148 Resp: 3297

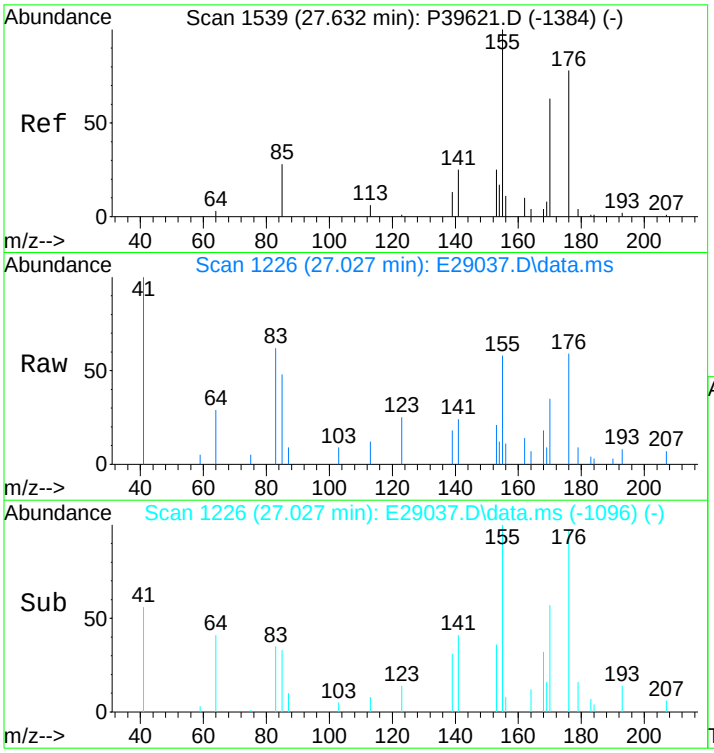




#20
C2-Benzo(b)thiophenes
Concen: 94.25 ng/mL m
RT: 24.709 min Scan# 1072
Delta R.T. -0.391 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

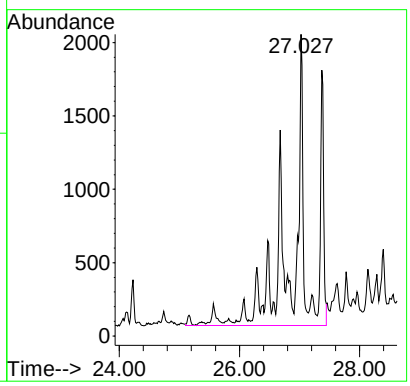
Tgt Ion:162 Resp: 12366

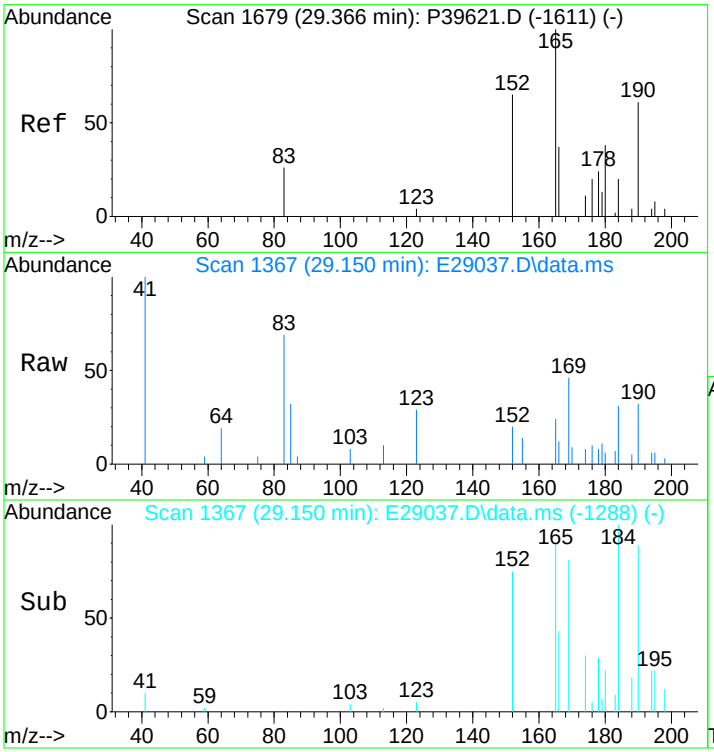




#21
C3-Benzo(b)thiophenes
Concen: 232.44 ng/mL m
RT: 27.027 min Scan# 1226
Delta R.T. -0.008 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

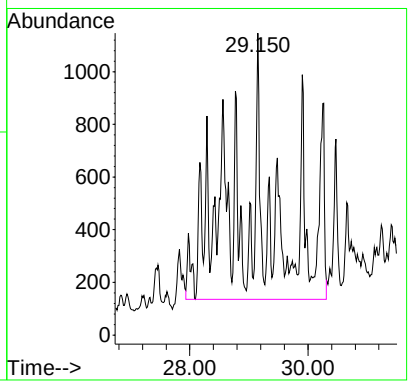
Tgt Ion:176 Resp: 30498

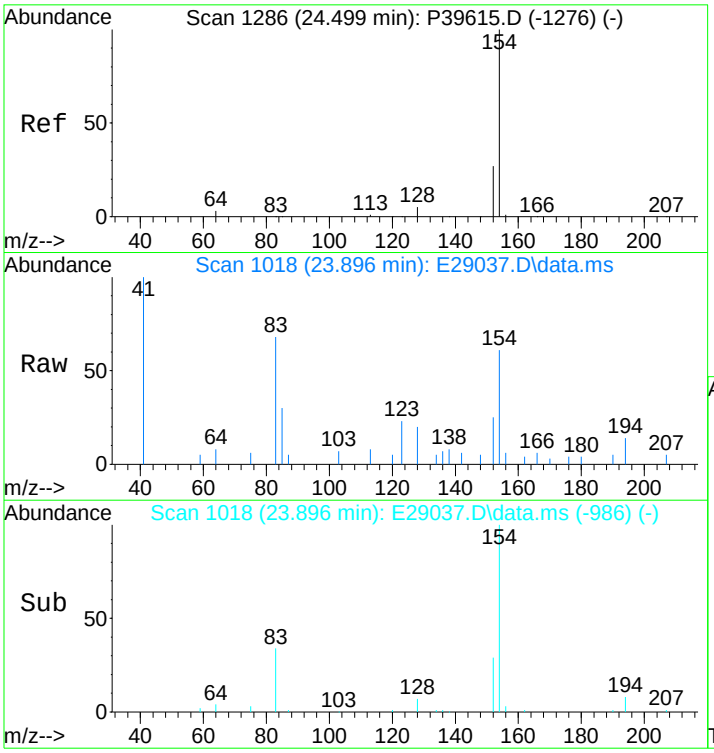




#22
C4-Benzo(b)thiophenes
Concen: 292.91 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:190 Resp: 38432

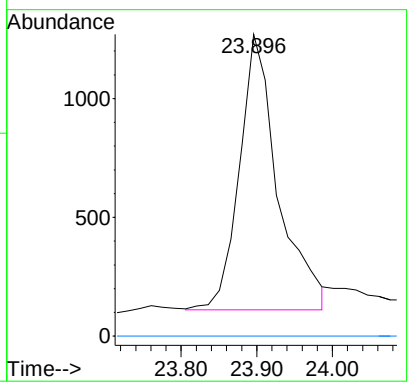


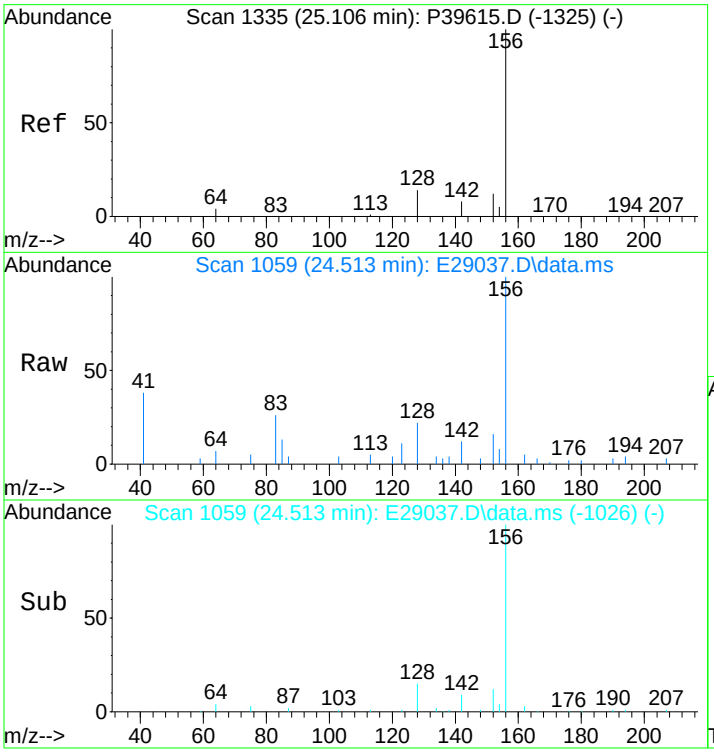


#23
Biphenyl
Concen: 32.12 ng/mL m
RT: 23.896 min Scan# 1018
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:154 Resp: 4103

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

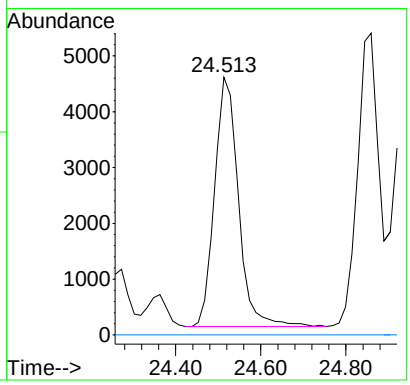


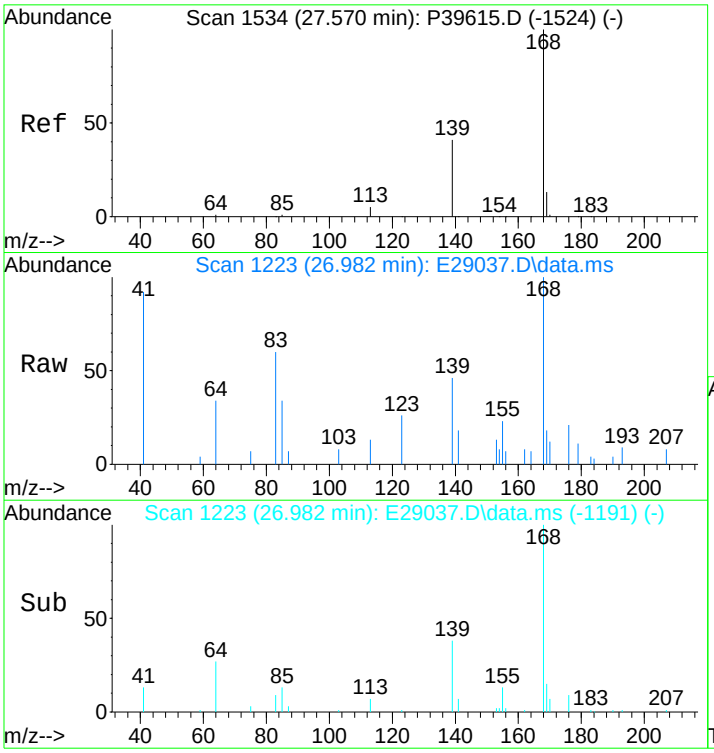


#24
2,6-Dimethylnaphthalene
Concen: 191.67 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:156 Resp: 17464

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

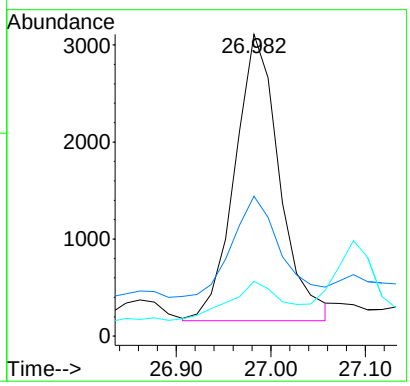


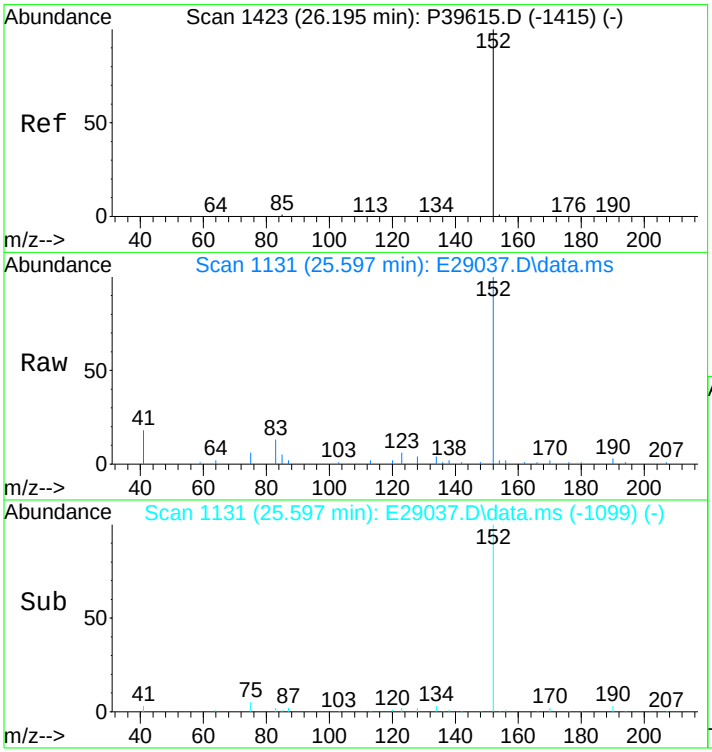


#25
Dibenzofuran
Concen: 68.69 ng/mL m
RT: 26.982 min Scan# 1223
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:168 Resp: 9716

Ion	Ratio	Lower	Upper
168	100		
139	39.8	26.9	40.3
169	18.0	10.7	16.1#

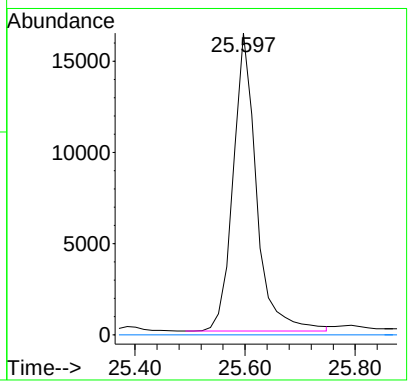


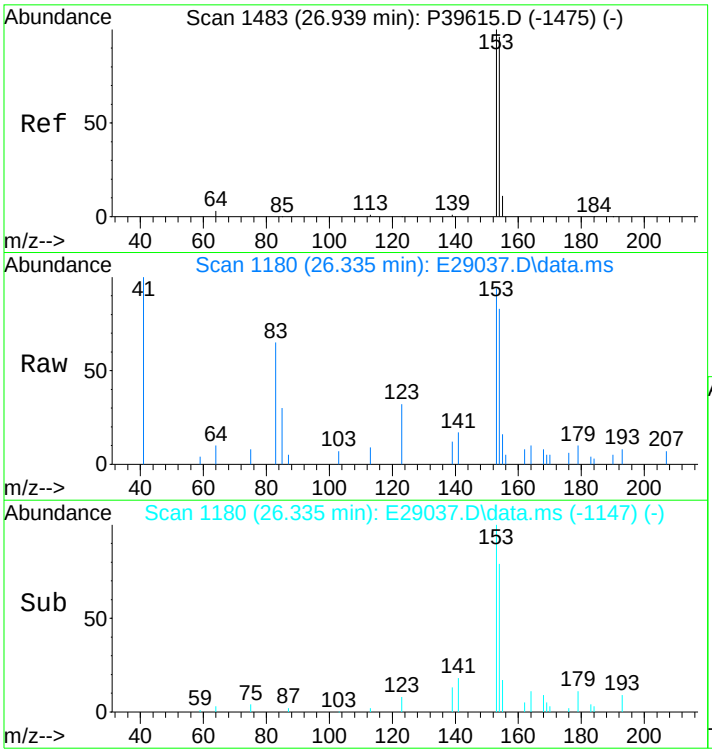


#26
Acenaphthylene
Concen: 302.99 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:152 Resp: 47944

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

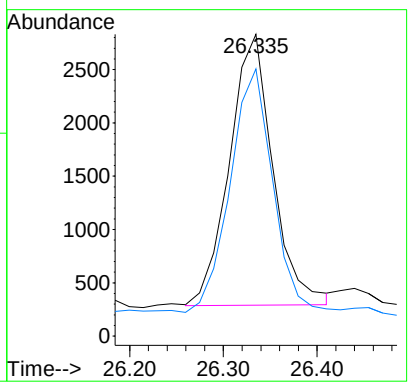


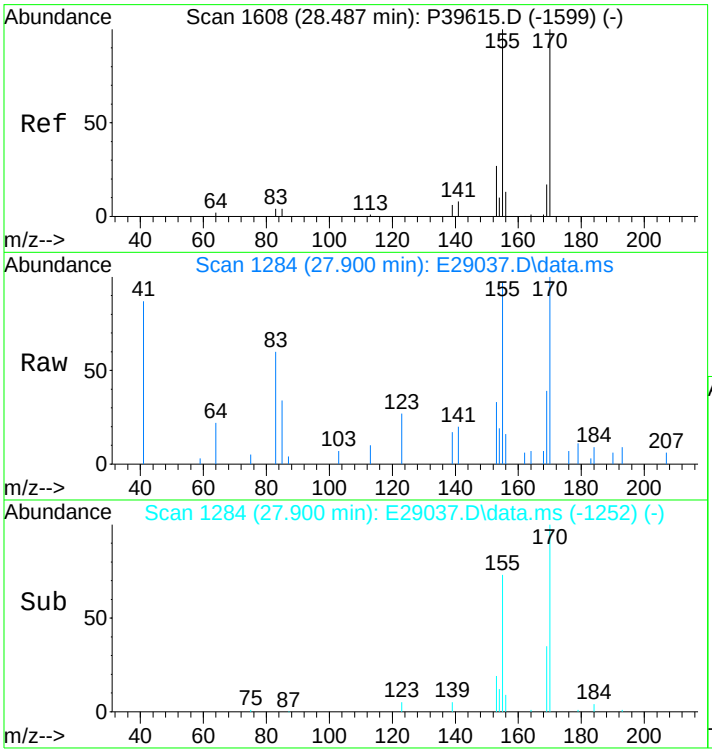


#27
Acenaphthene
Concen: 80.72 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:153 Resp: 8222

Ion	Ratio	Lower	Upper
153	100		
154	87.2	73.0	109.4

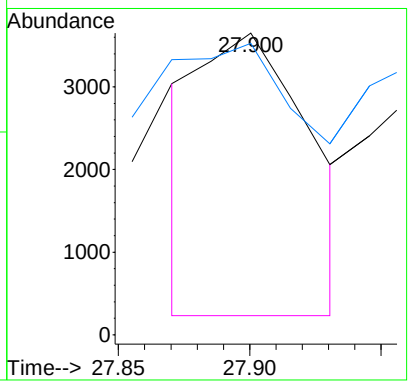


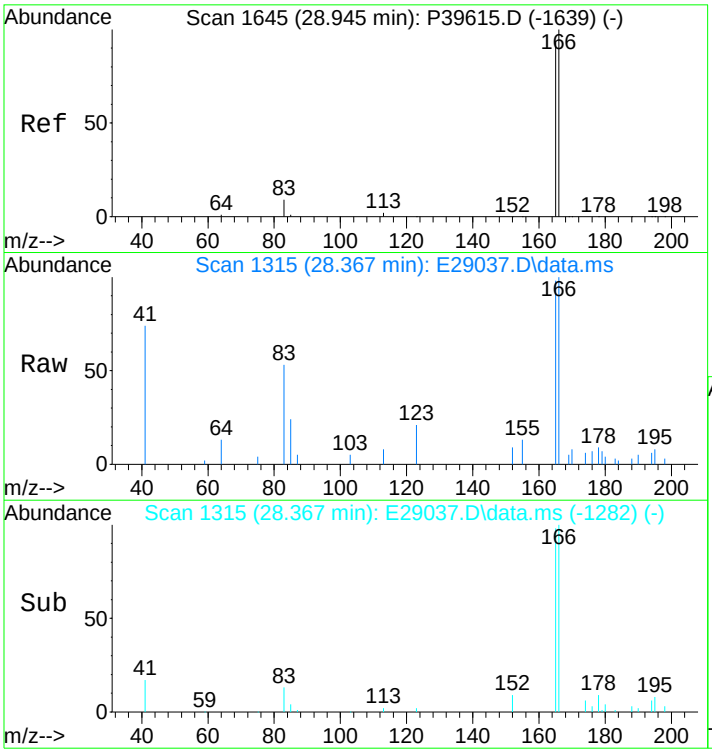


#28
2,3,5-Trimethylnaphthalene
Concen: 116.25 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:170 Resp: 9910

Ion	Ratio	Lower	Upper
170	100		
155	162.7	69.8	104.6#

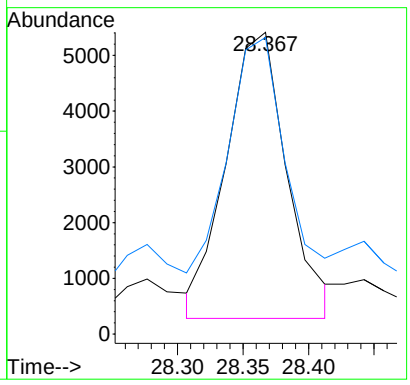


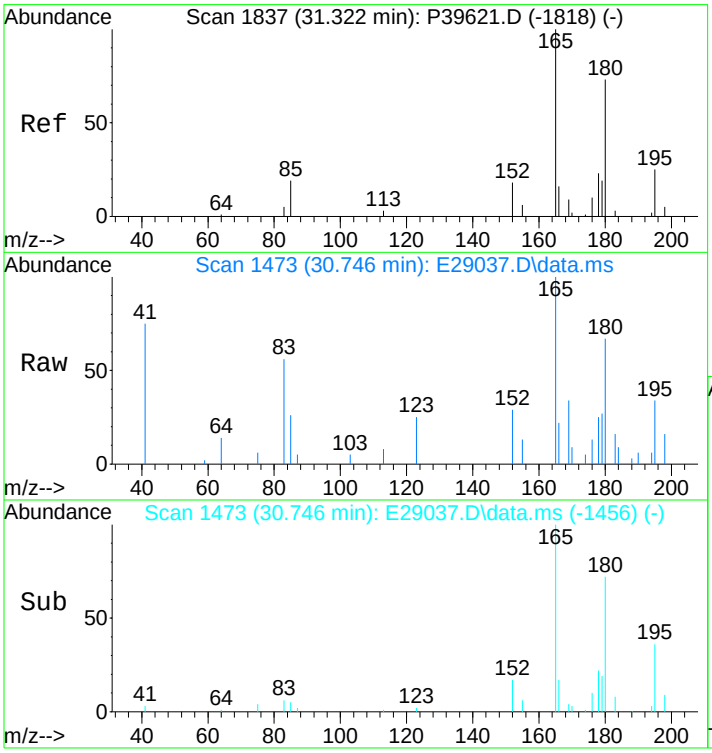


#29
Fluorene
Concen: 146.28 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:166 Resp: 16617

Ion	Ratio	Lower	Upper
166	100		
165	75.8	74.4	111.6

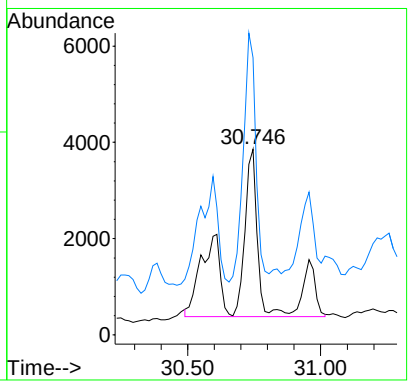


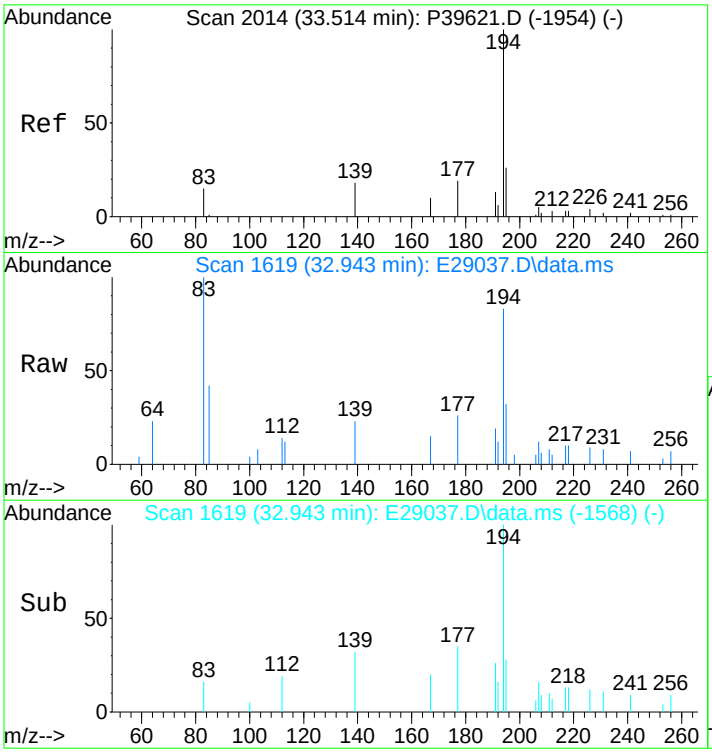


#30
C1-Fluorenes
Concen: 207.33 ng/mL m
RT: 30.746 min Scan# 1473
Delta R.T. 0.106 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:180 Resp: 23553

Ion	Ratio	Lower	Upper
180	100		
165	41.1	94.3	141.5#

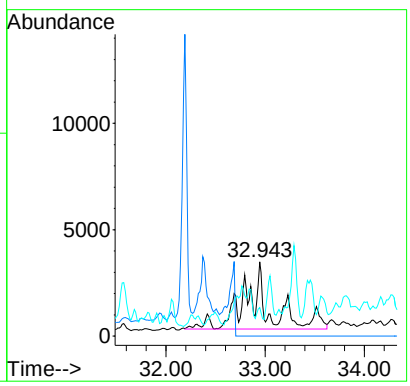


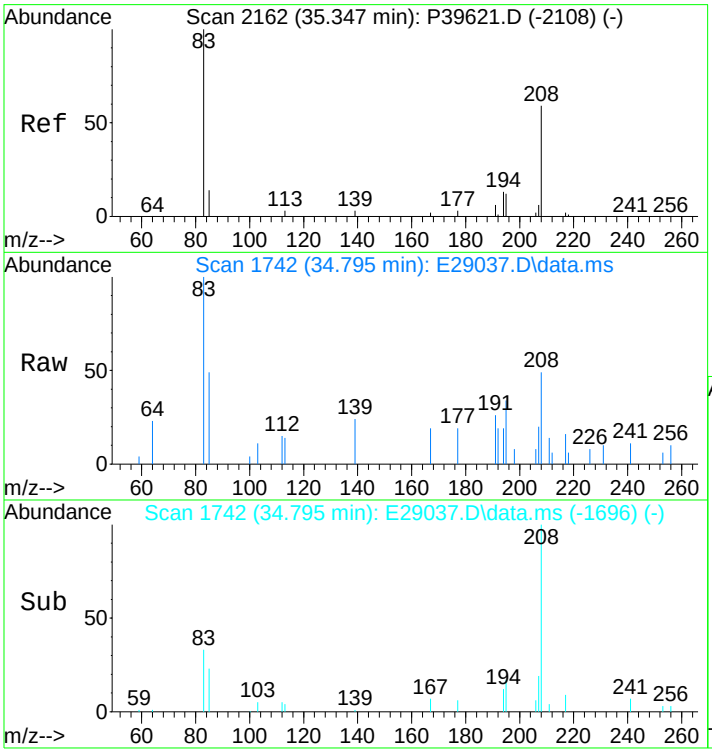


#31
C2-Fluorenes
Concen: 479.36 ng/mL m
RT: 32.943 min Scan# 1619
Delta R.T. 0.163 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:194 Resp: 54456

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	0.0	27.0	40.4#

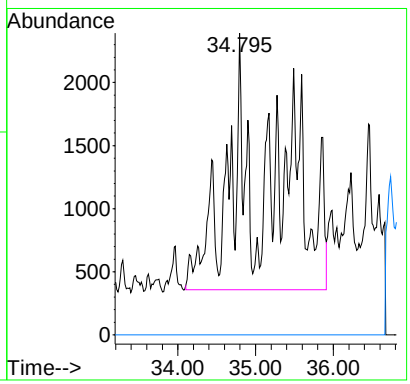


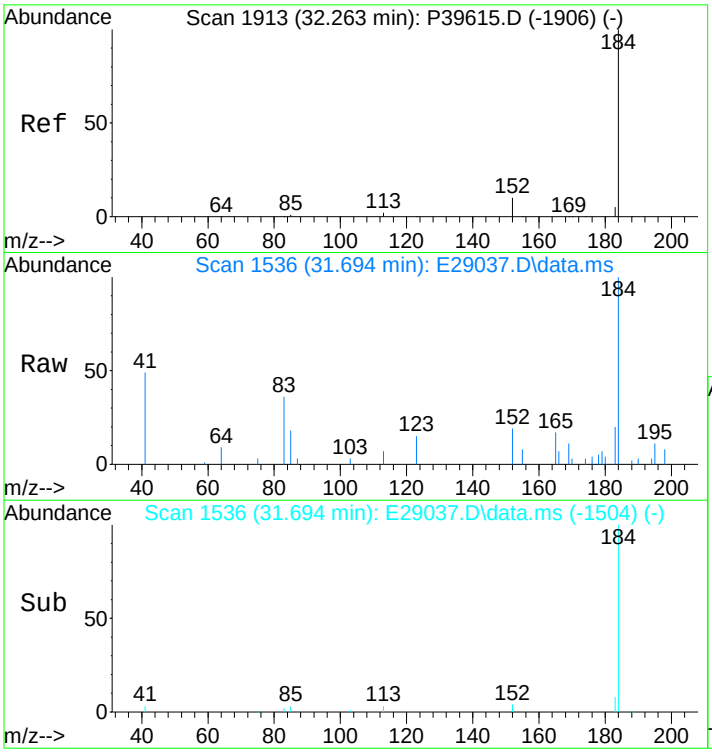


#32
C3-Fluorenes
Concen: 654.54 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.227 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:208 Resp: 74356

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

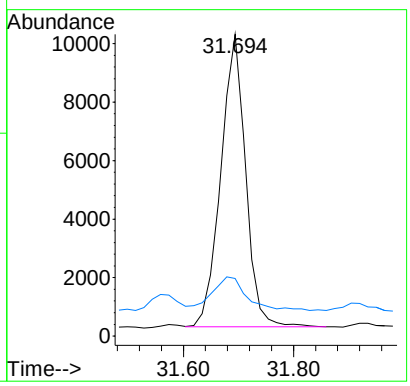


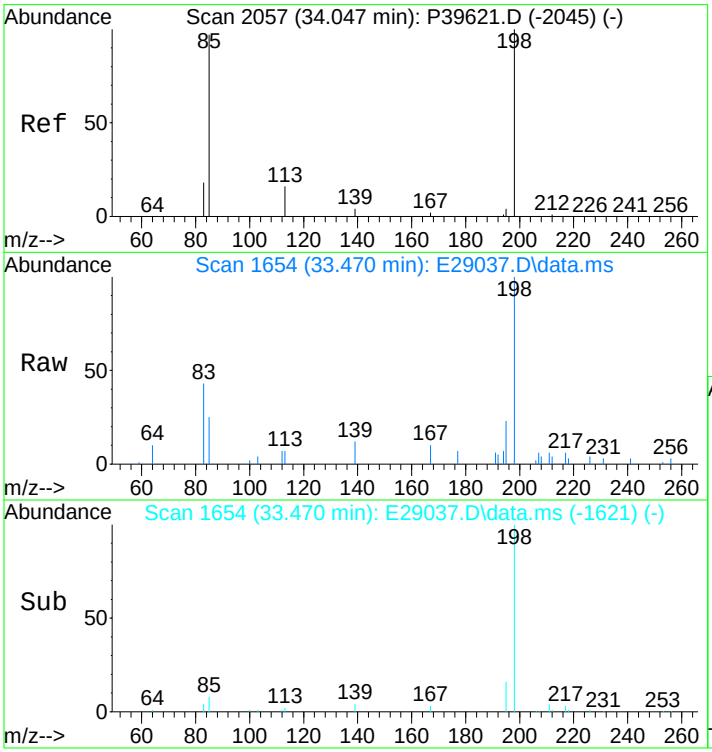


#33
Dibenzothiophene
Concen: 201.07 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:184 Resp: 31345

Ion	Ratio	Lower	Upper
184	100		
152	19.1	6.0	9.0#

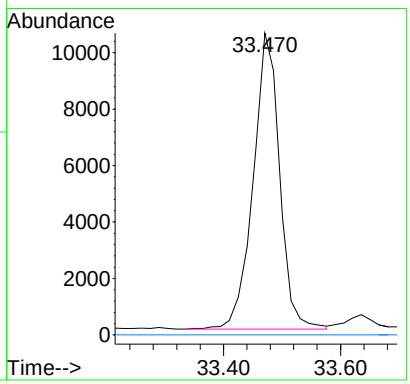


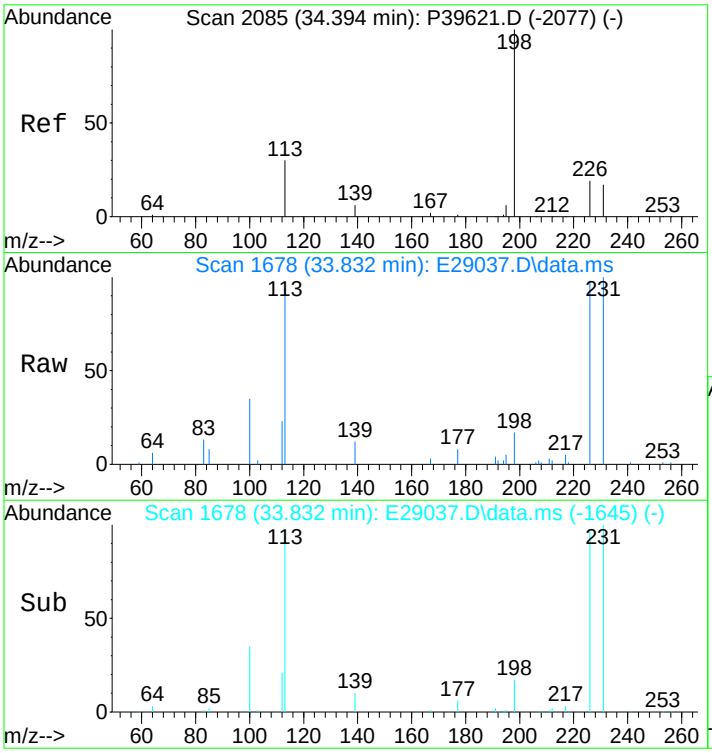


#34
4-Methyldibenzothiophene(4MDT)
Concen: 210.95 ng/mL
RT: 33.470 min Scan# 1654
Delta R.T. -0.004 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:198 Resp: 32886

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

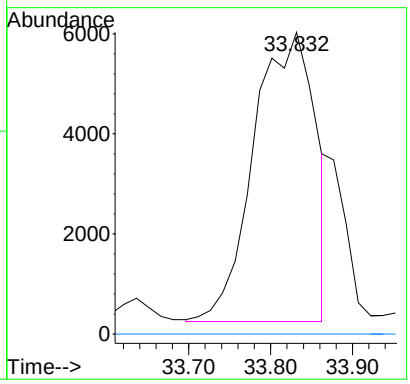


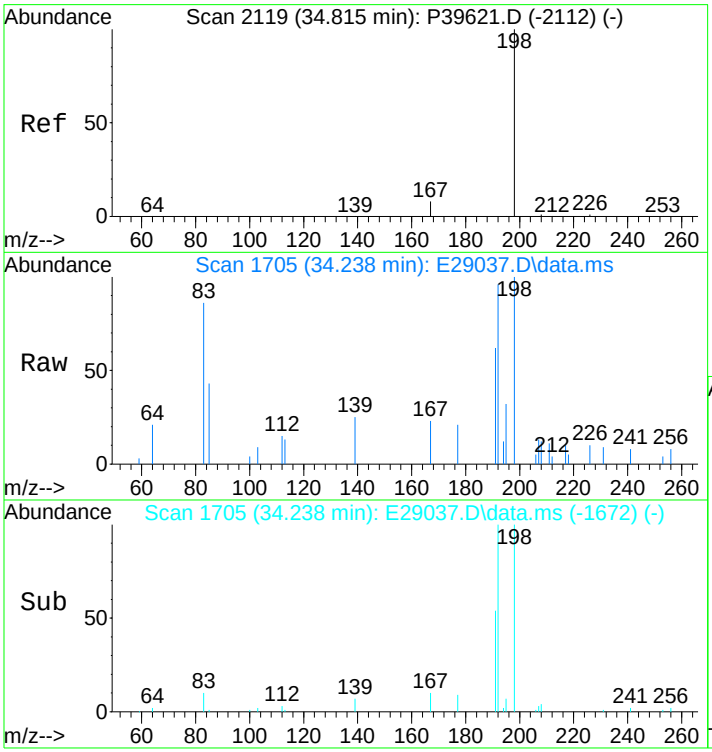


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 193.80 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. -0.004 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:198 Resp: 30212

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

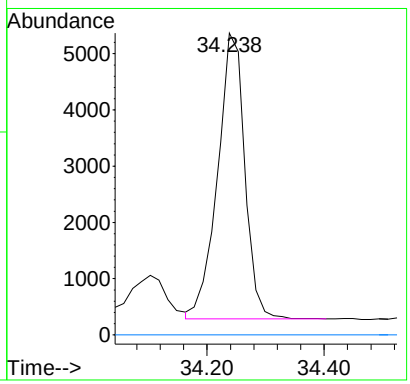


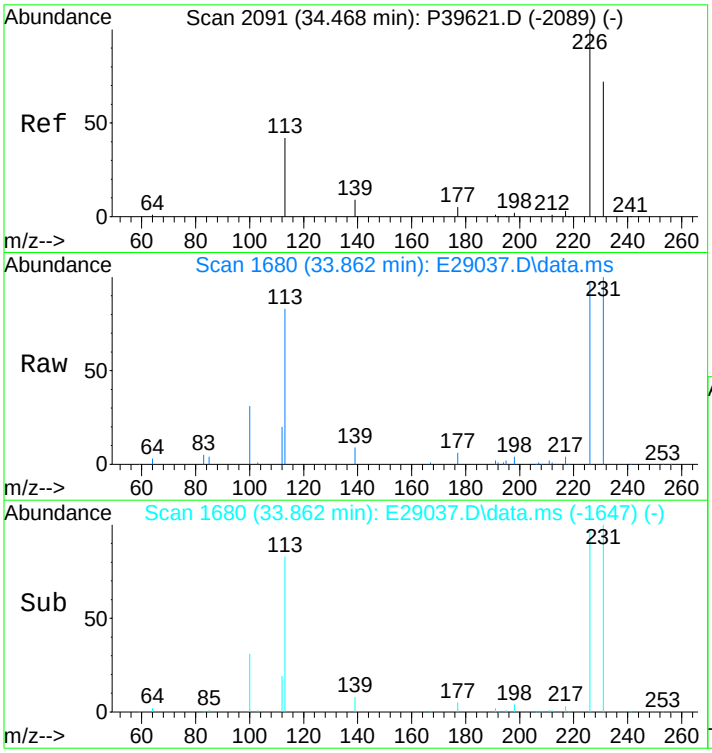


#36
1-Methyldibenzothiophene(1MDT)
Concen: 105.29 ng/mL
RT: 34.238 min Scan# 1705
Delta R.T. -0.004 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:198 Resp: 16414

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

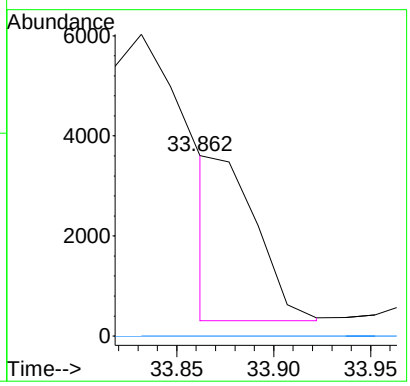


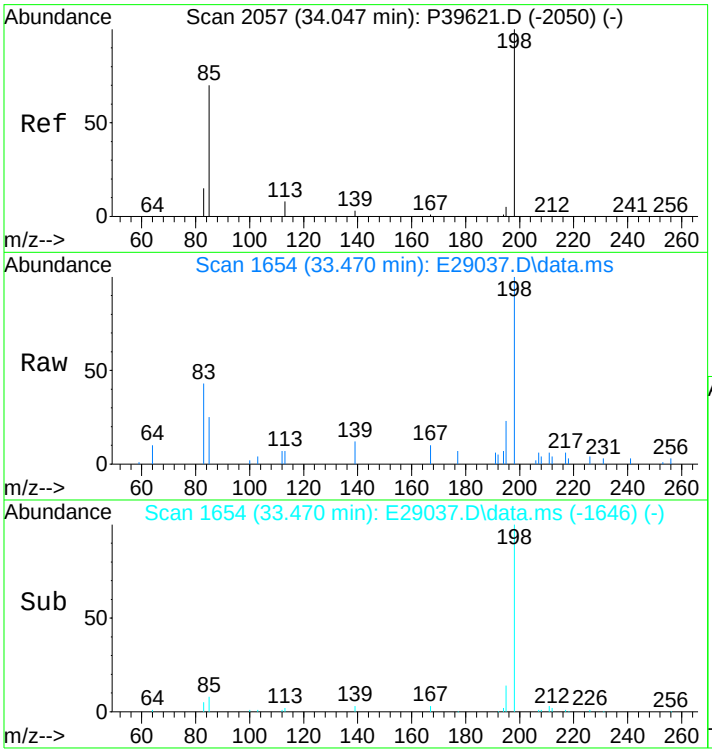


#37
OTP
Concen: 31.52 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.034 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:198 Resp: 4914

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

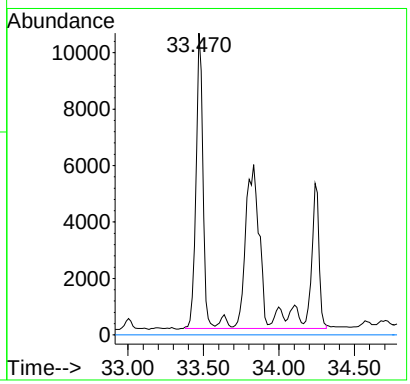


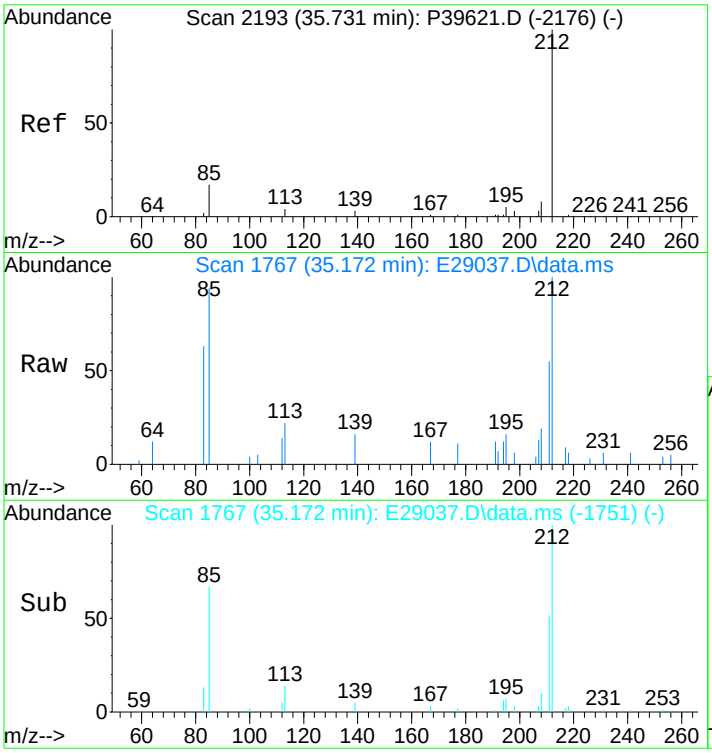


#38
C1-Dibenzothiophenes
Concen: 599.29 ng/mL m
RT: 33.470 min Scan# 1654
Delta R.T. 0.058 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:198 Resp: 93424

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

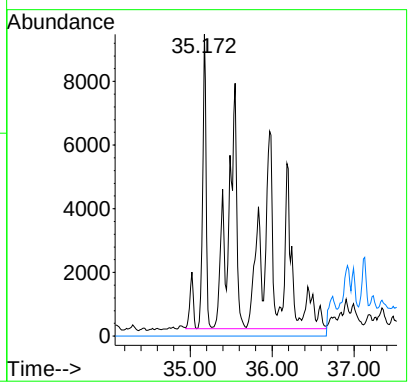


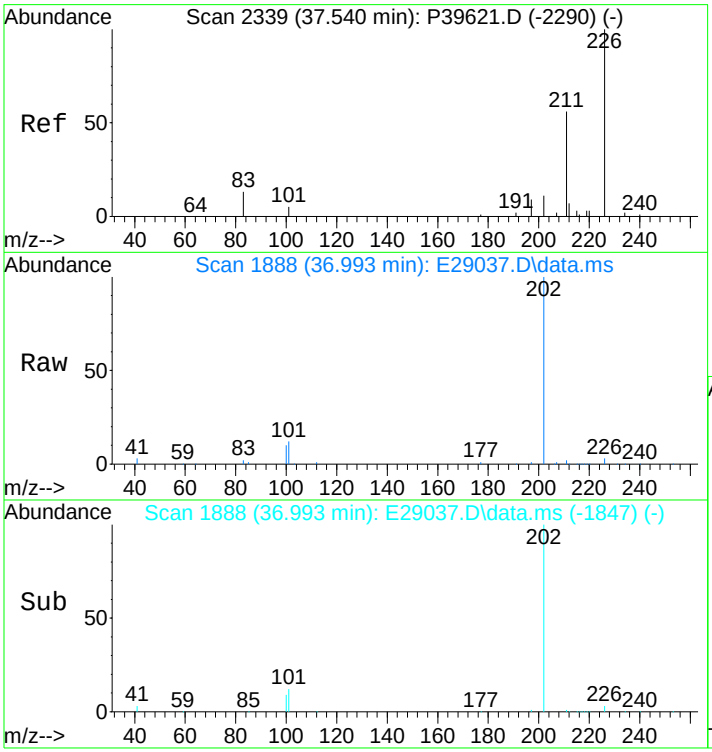


#39
C2-Dibenzothiophenes
Concen: 1132.03 ng/mL m
RT: 35.172 min Scan# 1767
Delta R.T. -0.005 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:212 Resp: 176475

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

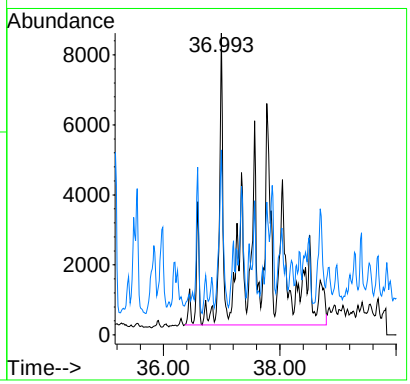


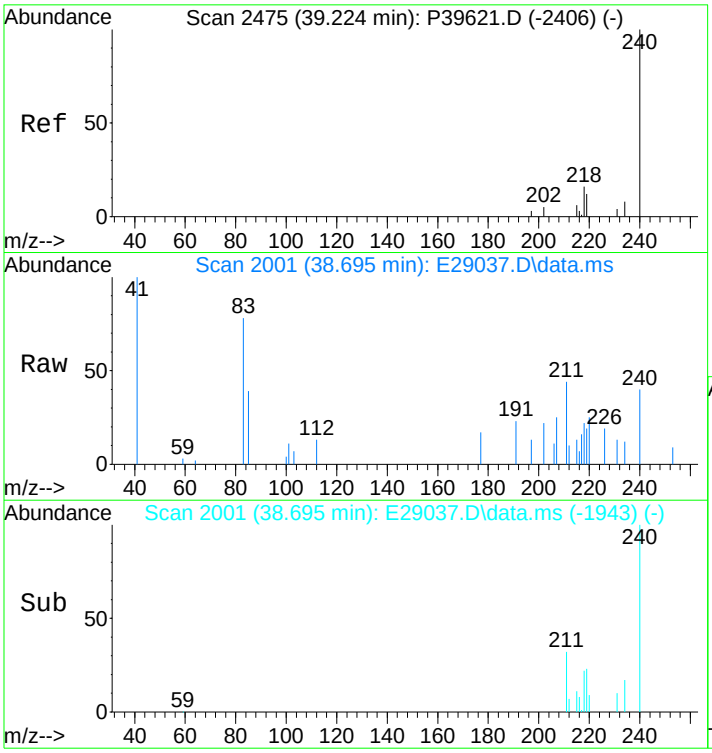


#40
C3-Dibenzothiophenes
Concen: 1335.20 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.284 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:226 Resp: 208148

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

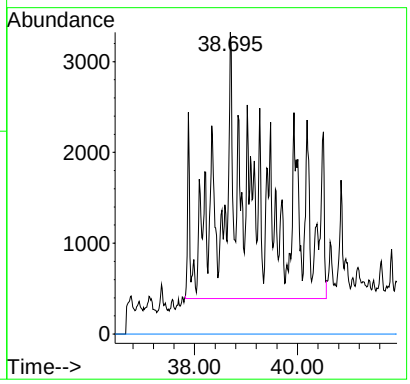


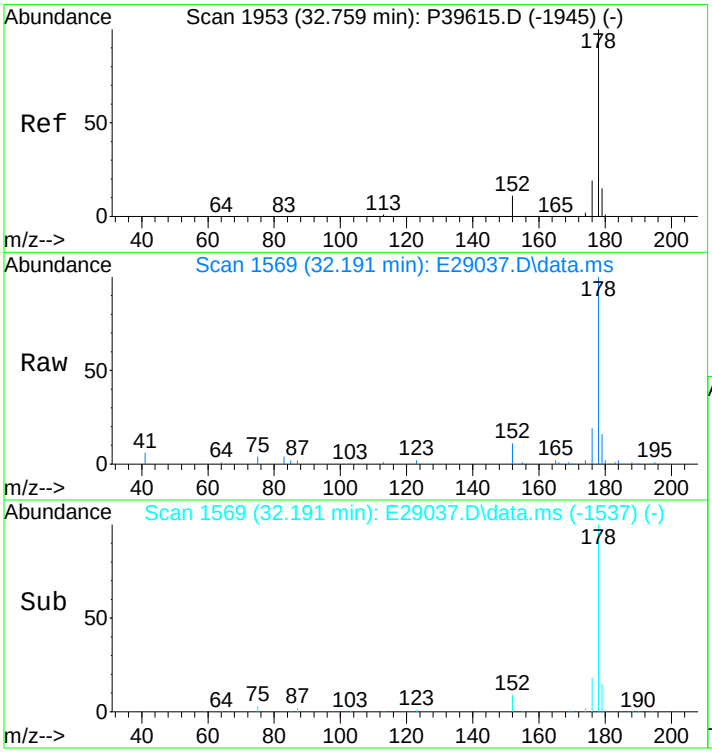


#41
C4-Dibenzothiophenes
Concen: 971.77 ng/mL m
RT: 38.695 min Scan# 2001
Delta R.T. 0.329 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:240 Resp: 151492

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

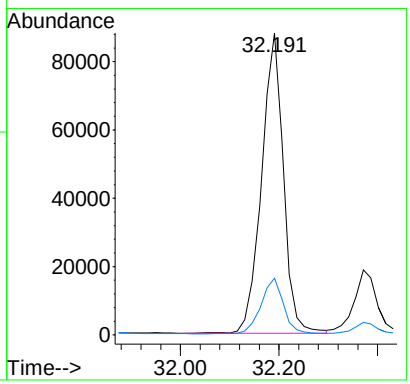


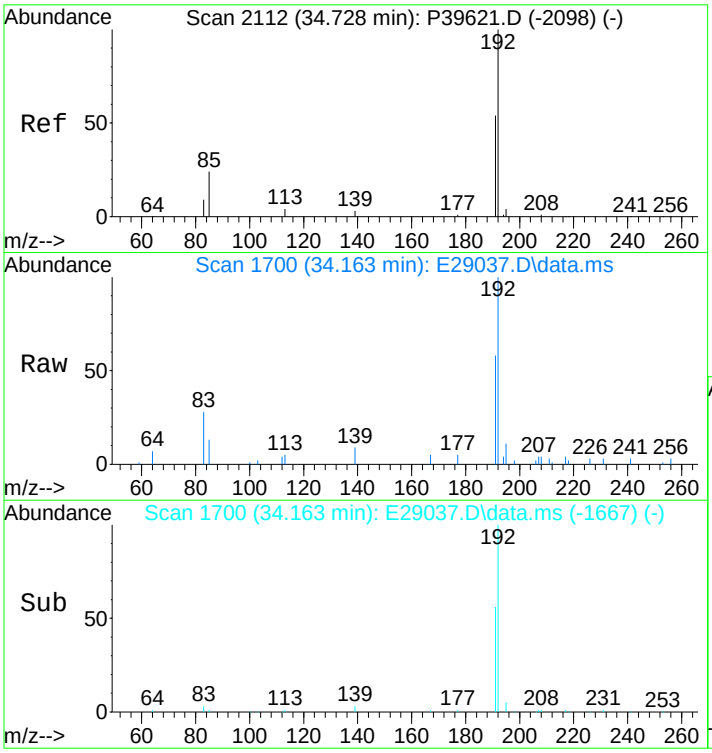


#43
Phenanthrene
Concen: 1708.73 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:178 Resp: 271011

Ion	Ratio	Lower	Upper
178	100		
176	18.9	14.6	21.8

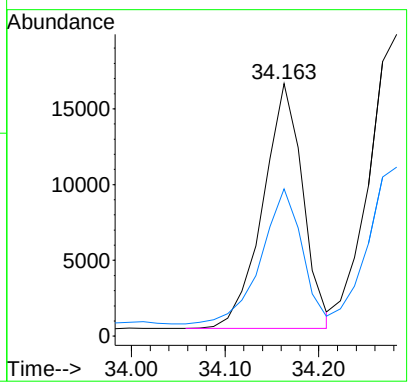


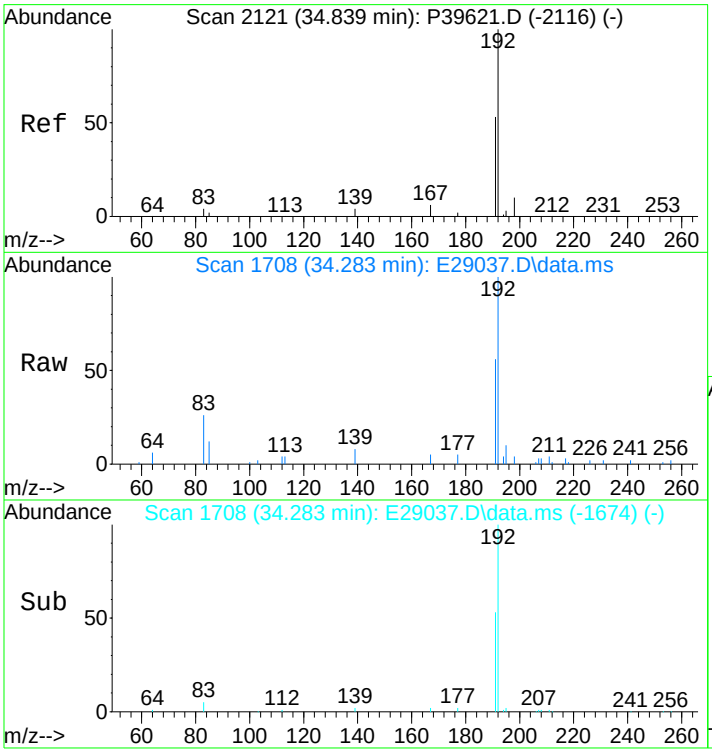


#44
3-Methylphenanthrene(3MP)
Concen: 301.64 ng/mL
RT: 34.163 min Scan# 1700
Delta R.T. -0.004 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 47841

Ion	Ratio	Lower	Upper
192	100		
191	57.3	45.9	68.9

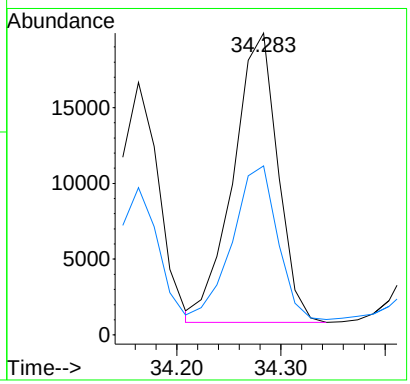


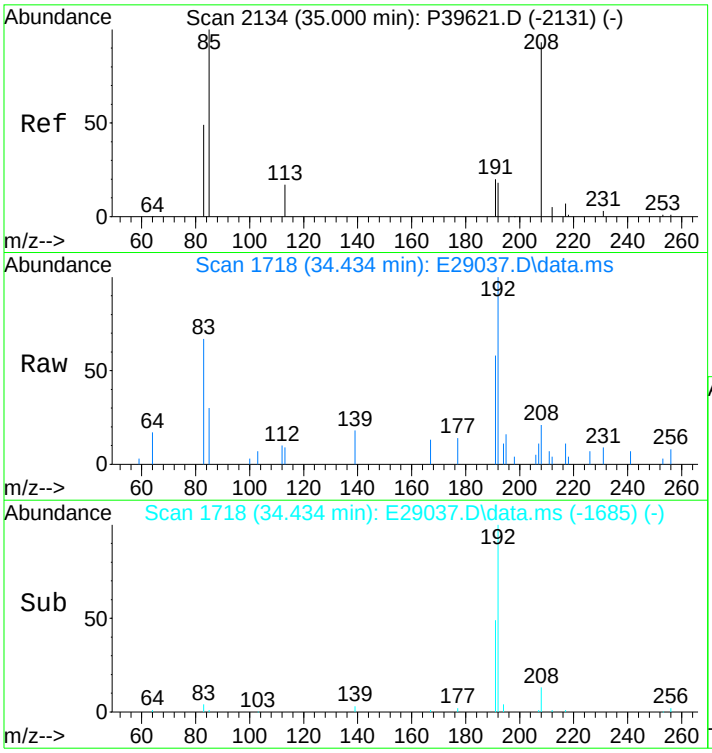


#45
2-Methylphenanthrene(2MP)
Concen: 359.91 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.011 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 57083

Ion	Ratio	Lower	Upper
192	100		
191	53.6	45.4	68.0

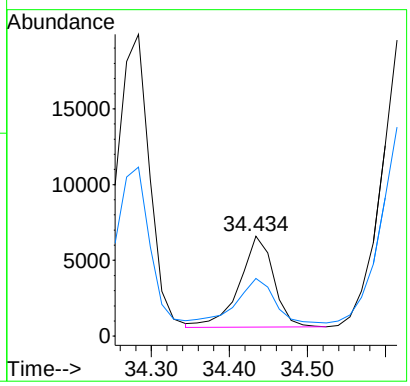


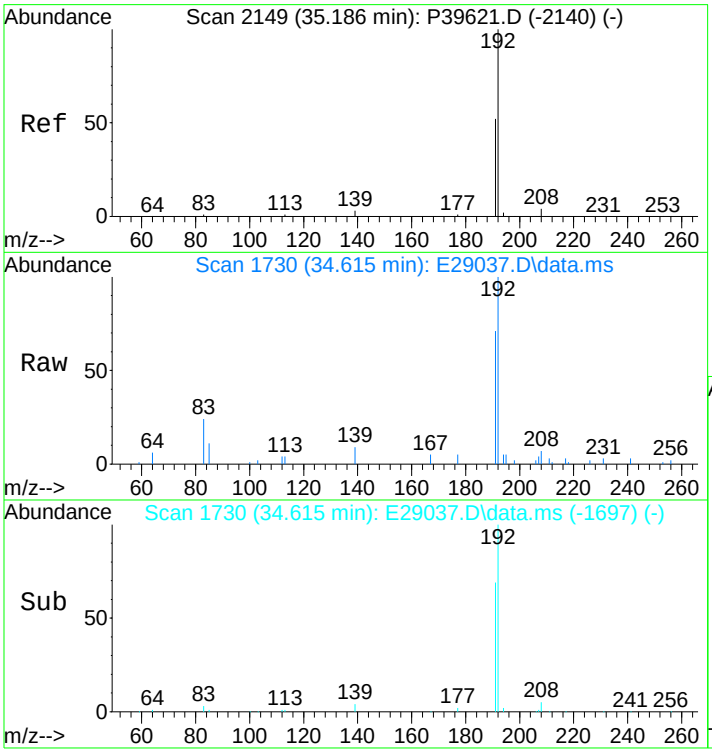


#46
2-Methylanthracene(2MA)
Concen: 114.67 ng/mL
RT: 34.434 min Scan# 1718
Delta R.T. -0.005 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 18187

Ion	Ratio	Lower	Upper
192	100		
191	52.9	95.4	143.0#

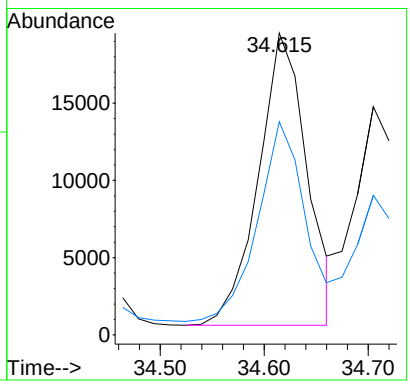


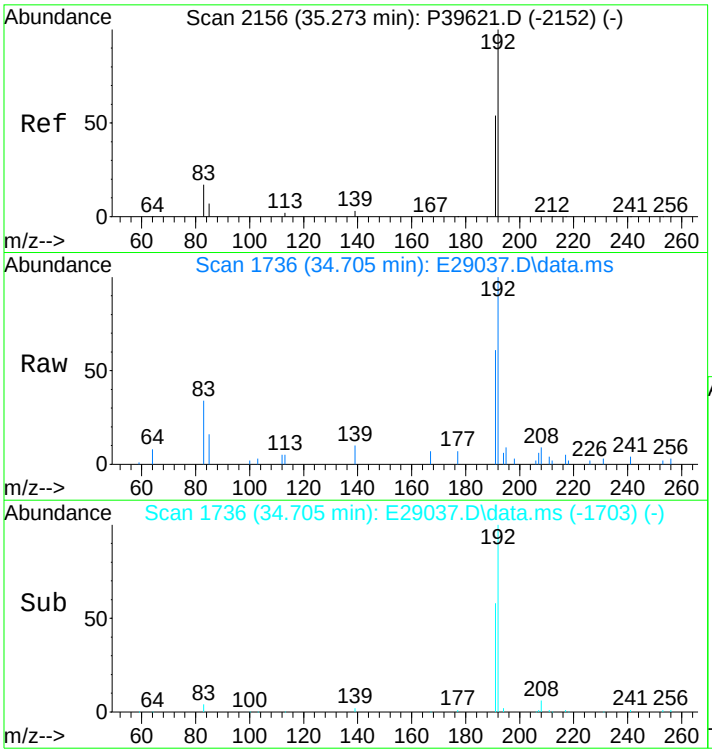


#47
9/4-Methylphenanthrene(9MP)
Concen: 388.88 ng/mL
RT: 34.615 min Scan# 1730
Delta R.T. -0.005 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 61678

Ion	Ratio	Lower	Upper
192	100		
191	66.2	44.3	66.5

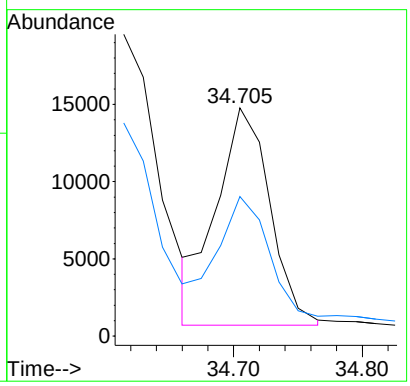


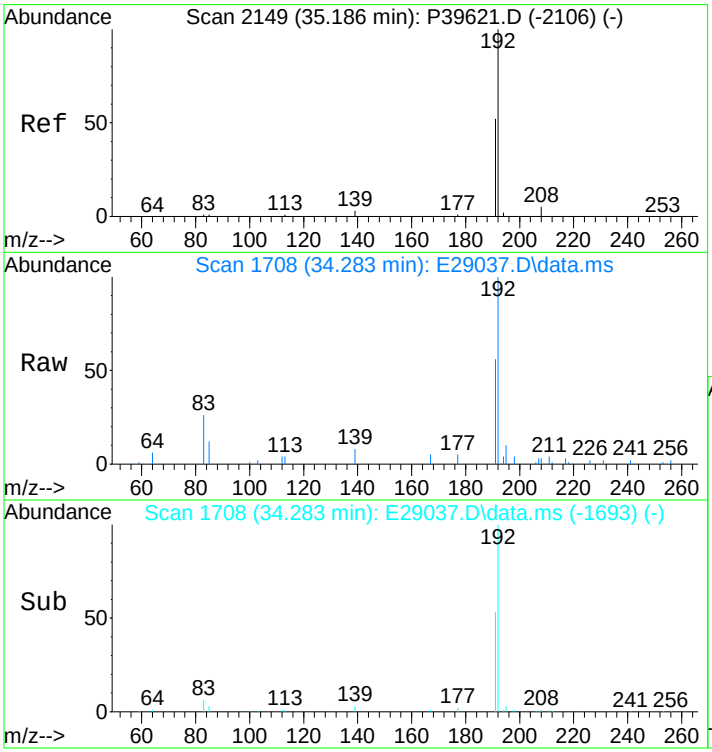


#48
1-Methylphenanthrene(1MP)
Concen: 256.94 ng/mL m
RT: 34.705 min Scan# 1736
Delta R.T. -0.005 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 40752

Ion	Ratio	Lower	Upper
192	100		
191	57.4	46.7	70.1

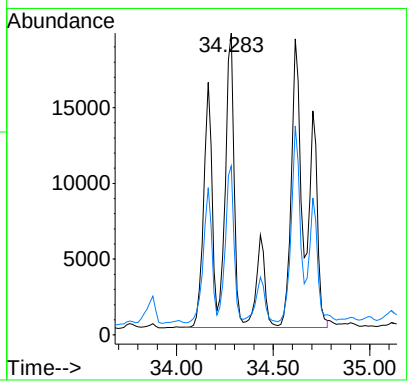


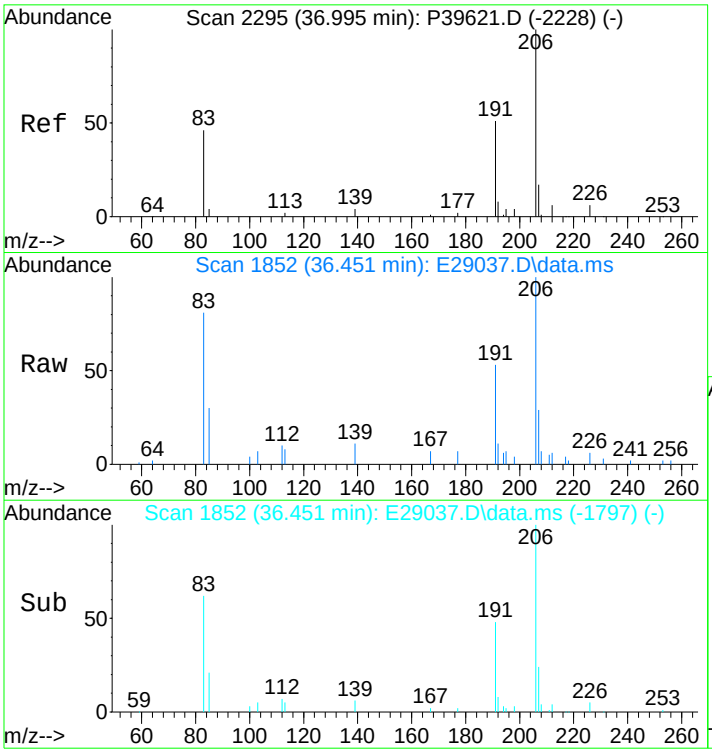


#49
C1-Phenanthrenes/Anthracenes
Concen: 1466.92 ng/mL m
RT: 34.283 min Scan# 1708
Delta R.T. -0.139 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 232659

Ion	Ratio	Lower	Upper
192	100		
191	4.1	44.0	66.0#

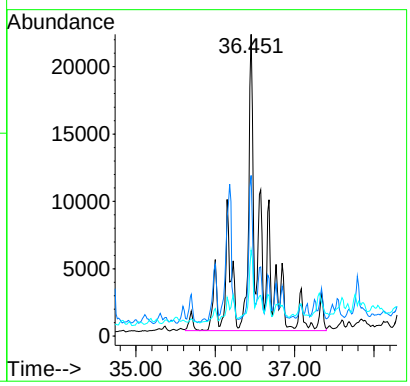


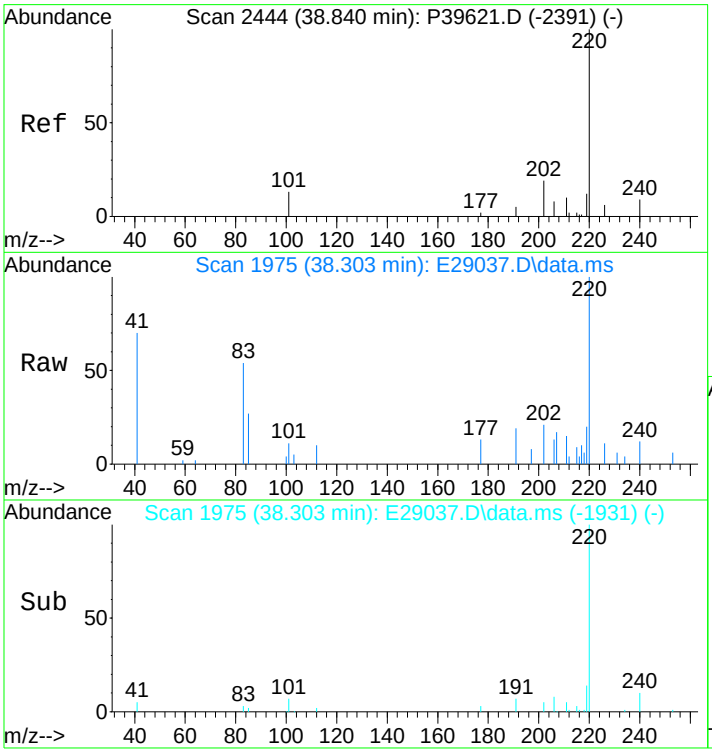


#50
C2-Phenanthrenes/Anthracenes
Concen: 1691.84 ng/mL m
RT: 36.451 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:206 Resp: 268332

Ion	Ratio	Lower	Upper
206	100		
191	14.2	35.7	53.5#
207	6.7	16.5	24.7#

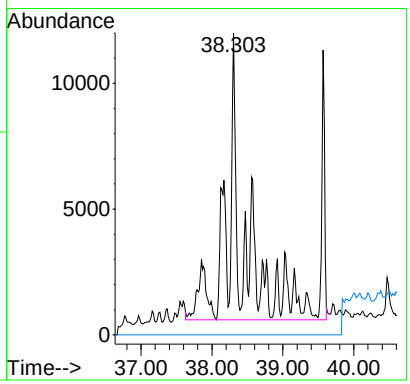


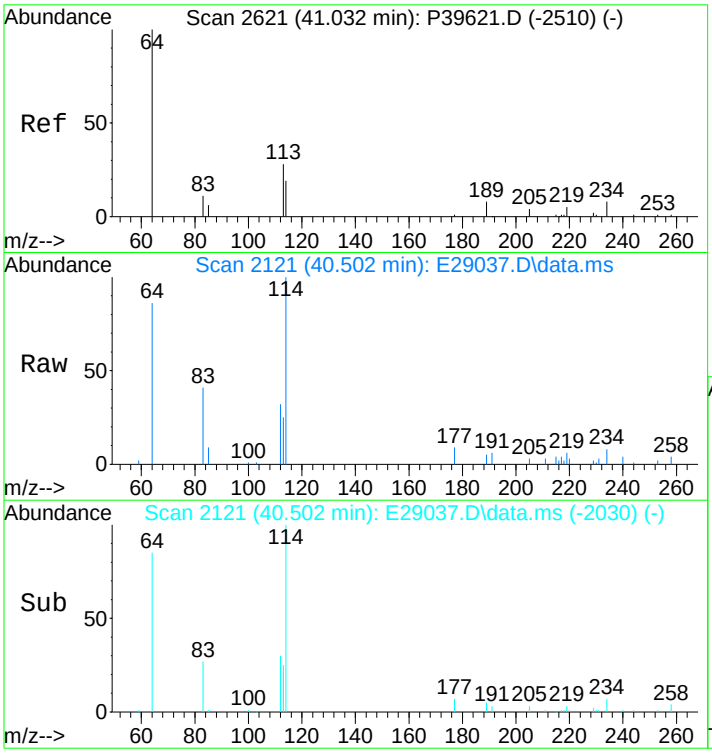


#52
C3-Phenanthrenes/Anthracenes
Concen: 1298.09 ng/mL m
RT: 38.303 min Scan# 1975
Delta R.T. 0.319 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:220 Resp: 205881

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

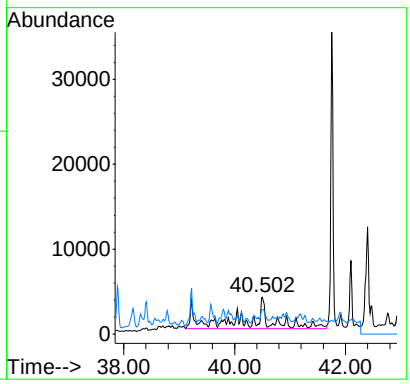


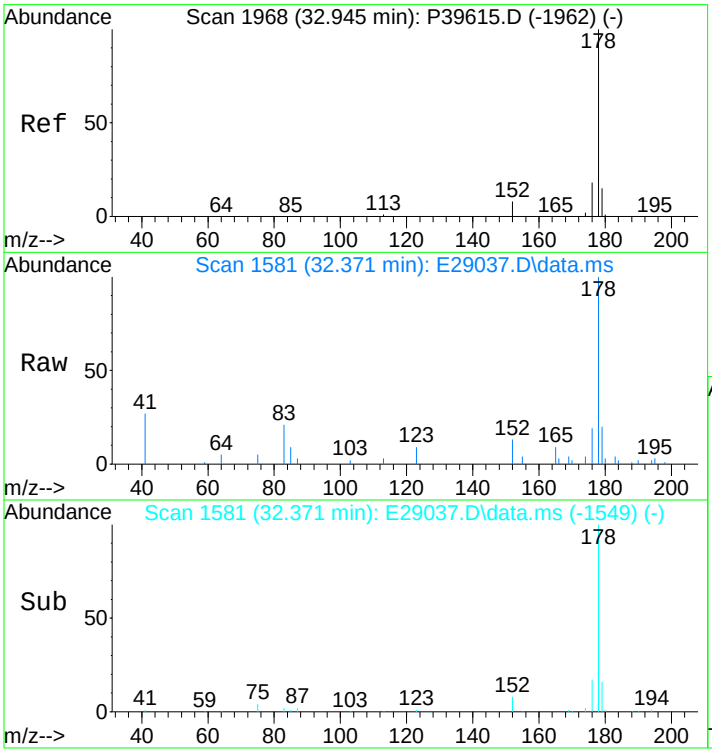


#53
C4-Phenanthrenes/Anthracenes
Concen: 706.78 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:234 Resp: 112098

Ion	Ratio	Lower	Upper
234	100		
219	2.7	46.6	70.0#

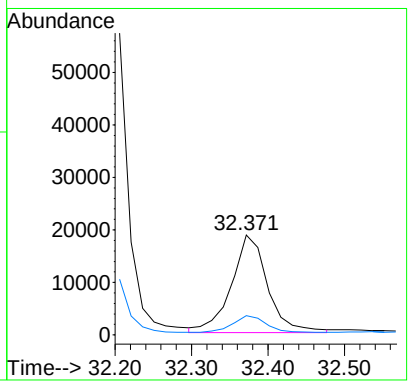


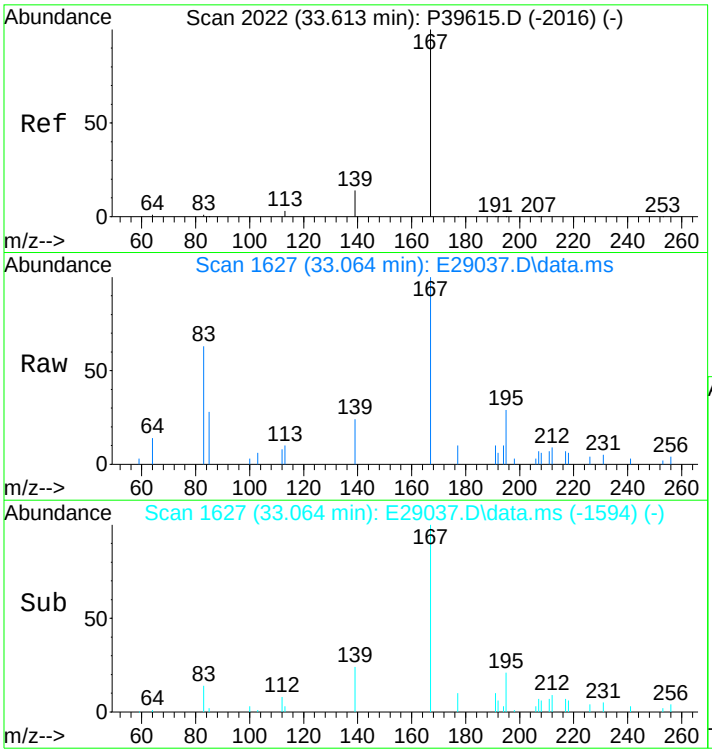


#55
Anthracene
Concen: 449.12 ng/mL m
RT: 32.371 min Scan# 1581
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:178 Resp: 61570

Ion	Ratio	Lower	Upper
178	100		
176	16.1	14.2	21.2

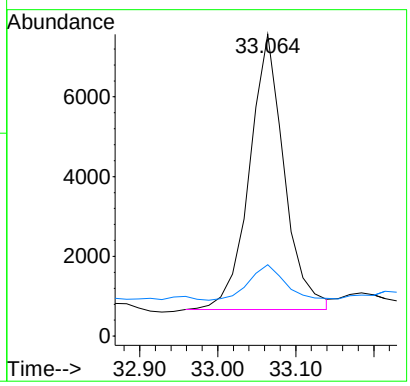


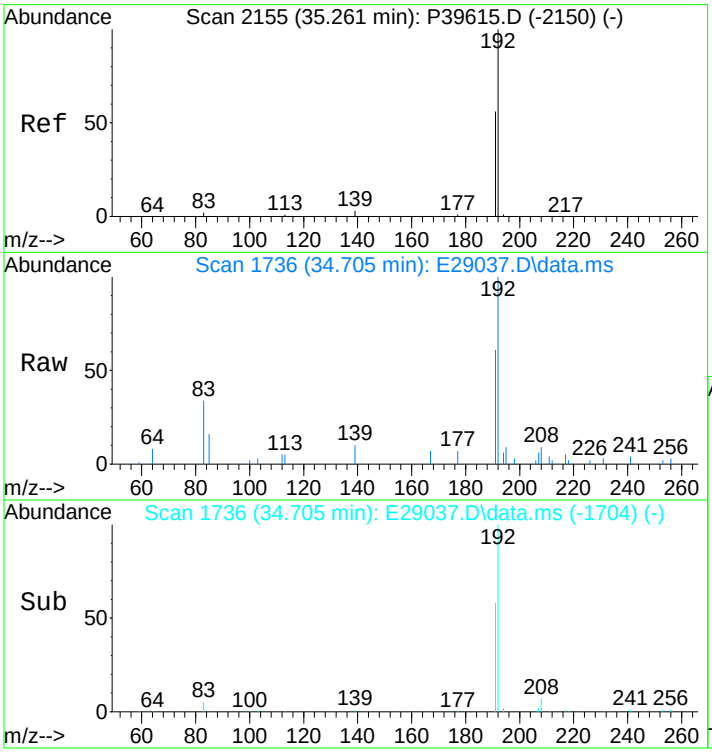


#56
Carbazole
Concen: 151.48 ng/mL
RT: 33.064 min Scan# 1627
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:167 Resp: 21372

Ion	Ratio	Lower	Upper
167	100		
139	12.1	10.6	15.8

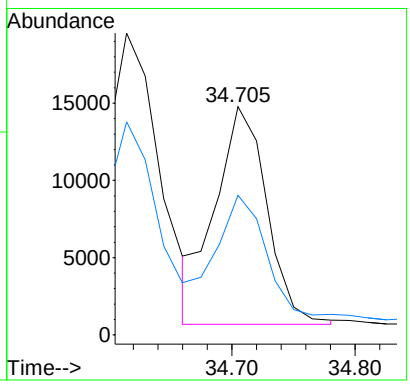


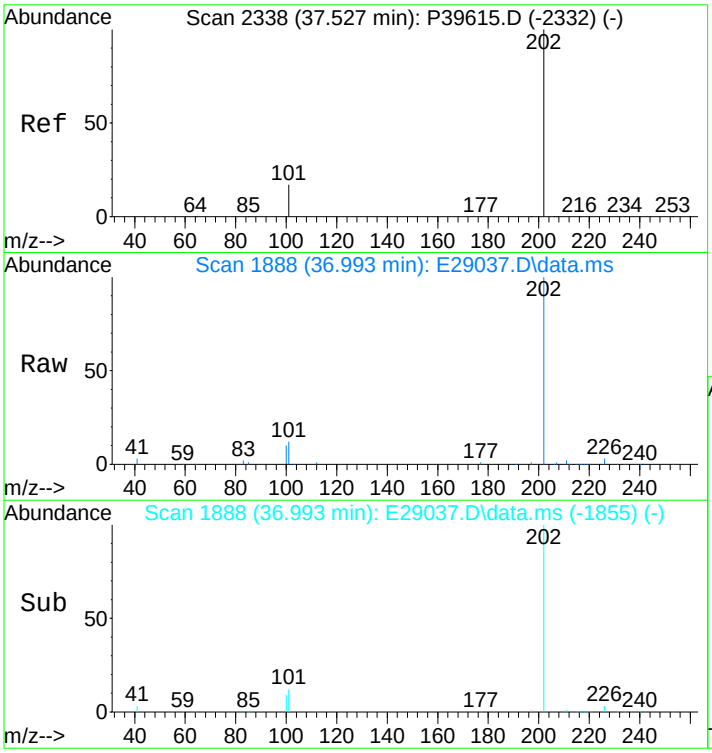


#57
1-Methylphenanthrene
Concen: 339.94 ng/mL m
RT: 34.705 min Scan# 1736
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:192 Resp: 41133

Ion	Ratio	Lower	Upper
192	100		
191	56.9	44.4	66.6

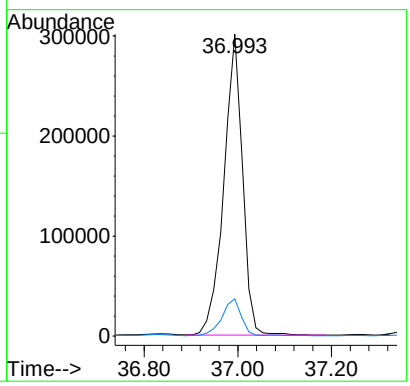


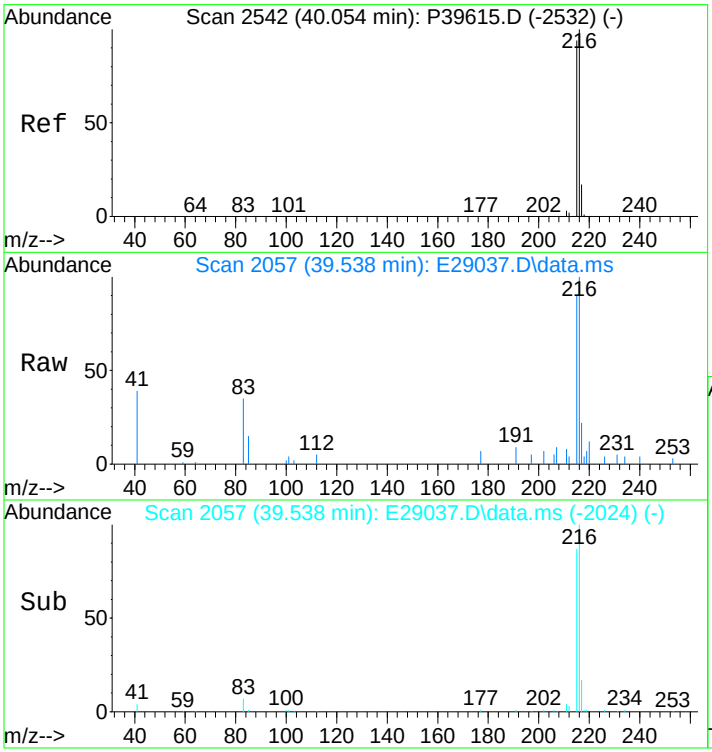


#58
Fluoranthene
Concen: 4781.96 ng/mL
RT: 36.993 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:202 Resp: 837577

Ion	Ratio	Lower	Upper
202	100		
101	13.0	10.5	15.7

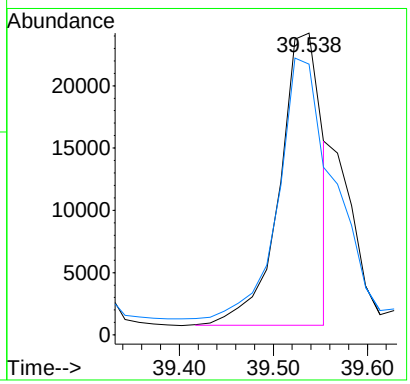


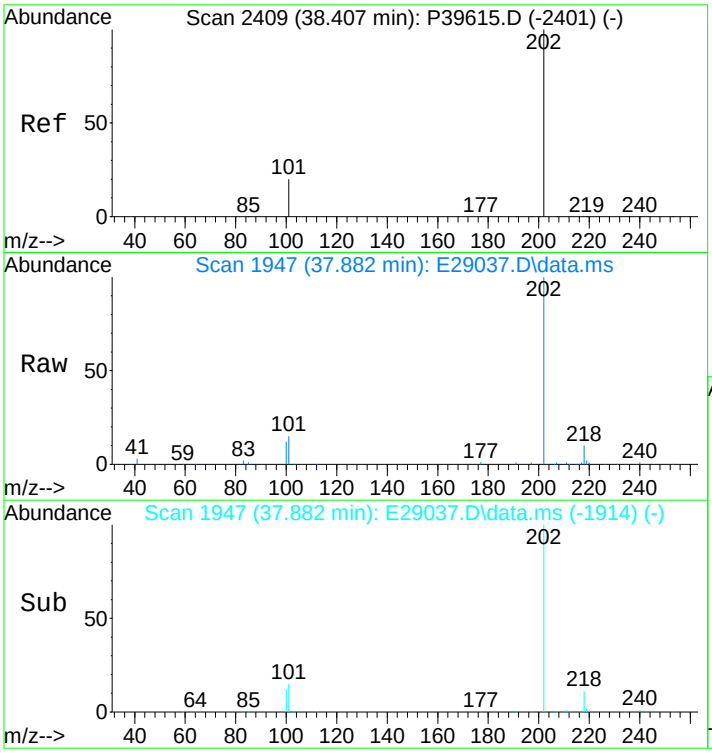


#59
Benzo(b)fluorene
Concen: 633.07 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:216 Resp: 73888

Ion	Ratio	Lower	Upper
216	100		
215	115.9	73.0	109.6#

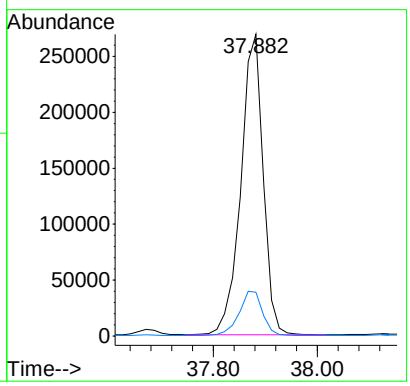


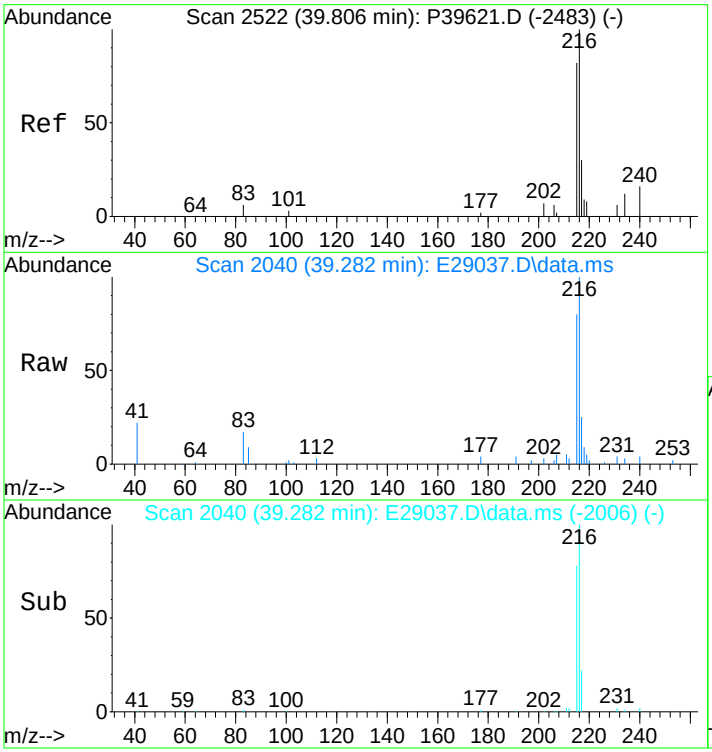


#60
Pyrene
Concen: 4487.79 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:202 Resp: 798955

Ion	Ratio	Lower	Upper
202	100		
101	15.6	11.5	17.3

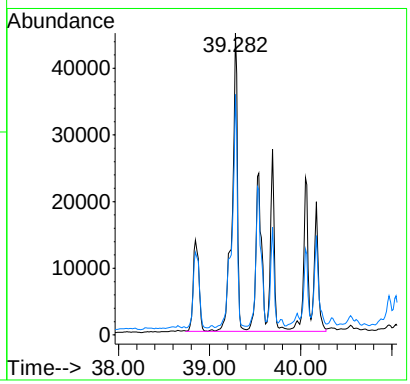


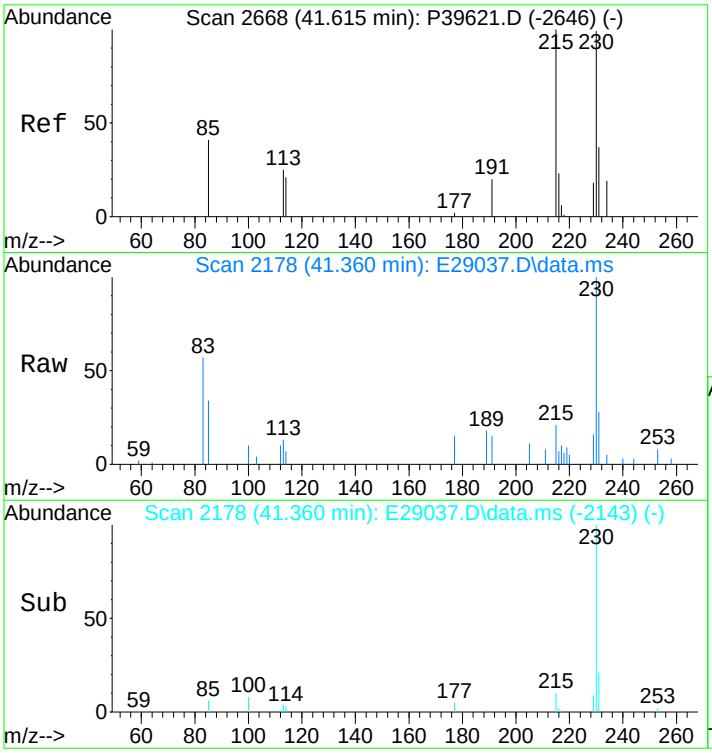


#61
C1-Fluoranthenes/Pyrenes
Concen: 3112.57 ng/mL m
RT: 39.282 min Scan# 2040
Delta R.T. 0.345 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:216 Resp: 554127

Ion	Ratio	Lower	Upper
216	100		
215	9.2	73.4	110.2#

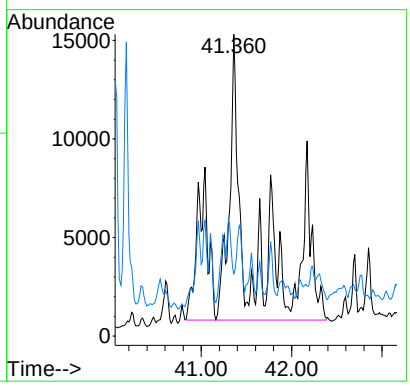


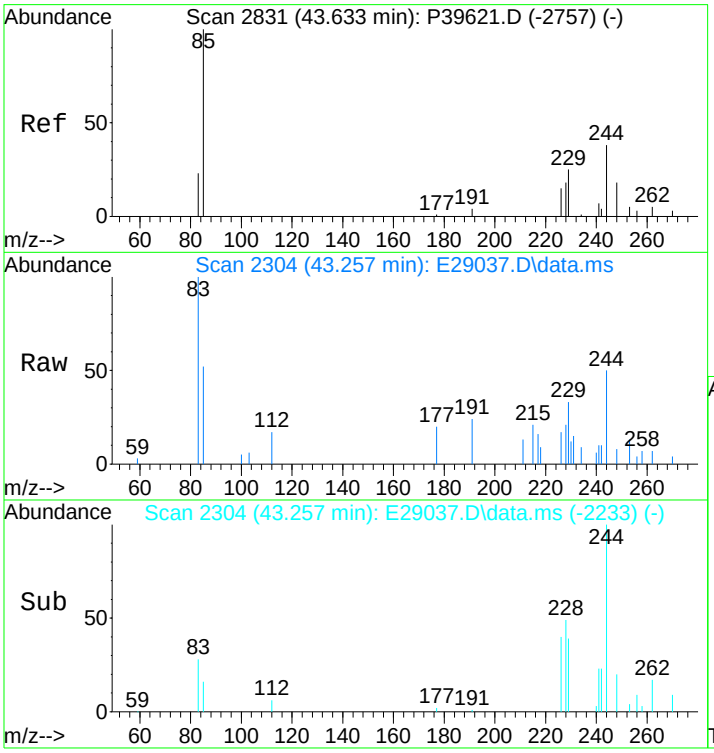


#62
C2-Fluoranthenes/Pyrenes
Concen: 1662.96 ng/mL m
RT: 41.360 min Scan# 2178
Delta R.T. 0.457 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:230 Resp: 296055

Ion	Ratio	Lower	Upper
230	100		
215	2.9	93.8	140.8#

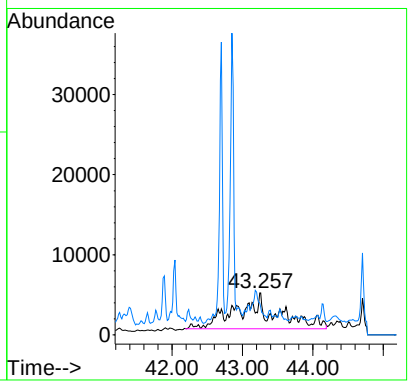


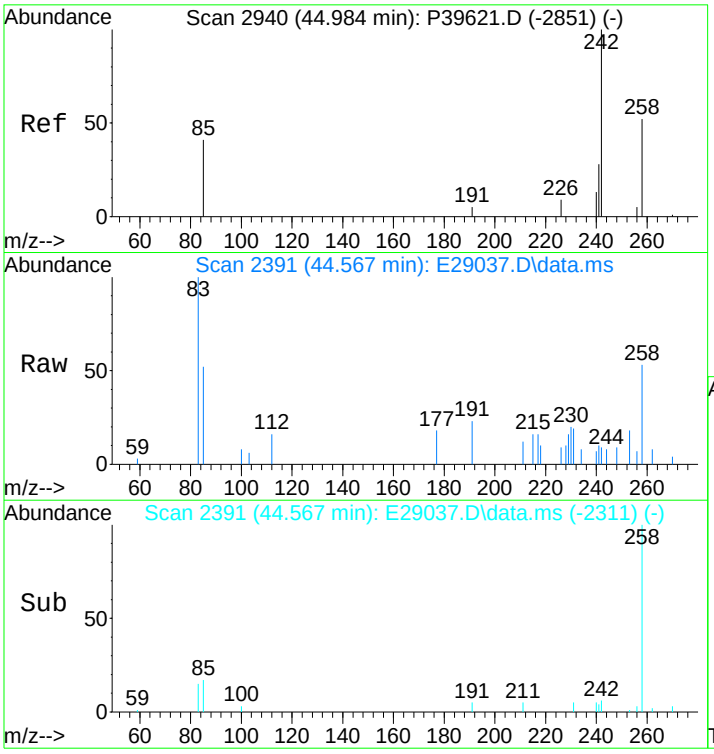


#63
C3-Fluoranthenes/Pyrenes
Concen: 995.95 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:244 Resp: 177307

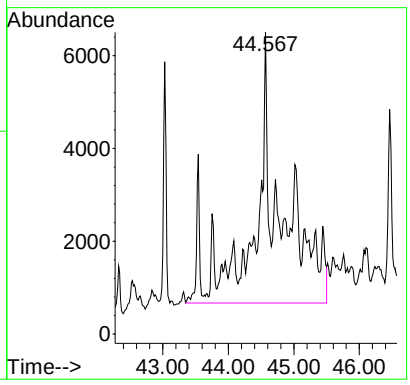
Ion	Ratio	Lower	Upper
244	100		
229	3.8	72.2	108.2#

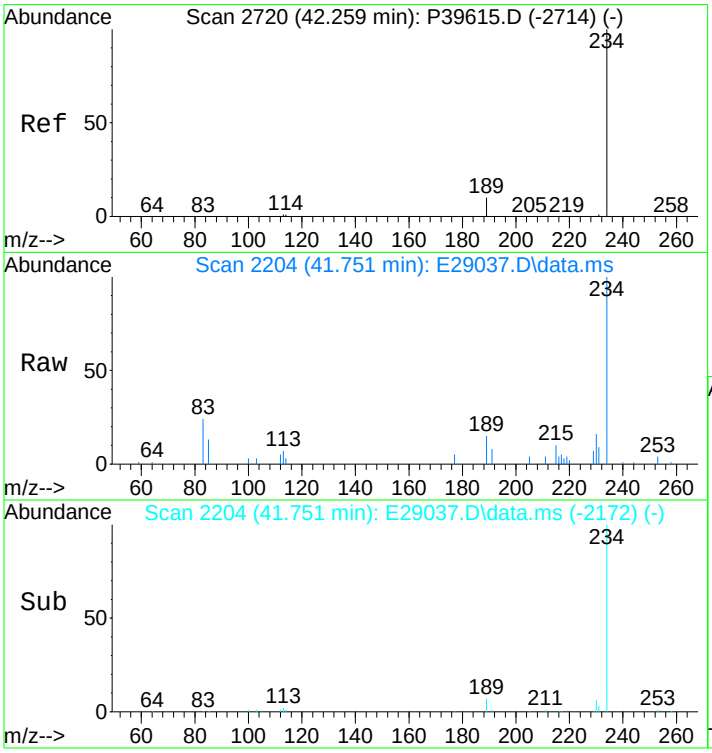




#64
C4-Fluoranthenes/Pyrenes
Concen: 889.52 ng/mL m
RT: 44.567 min Scan# 2391
Delta R.T. 0.571 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:258 Resp: 158360

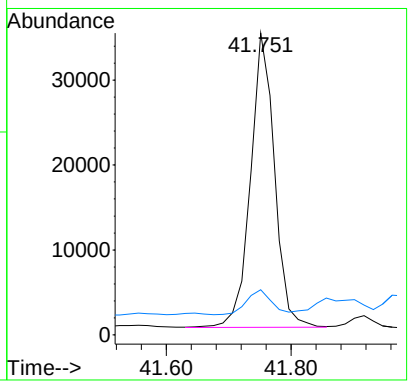


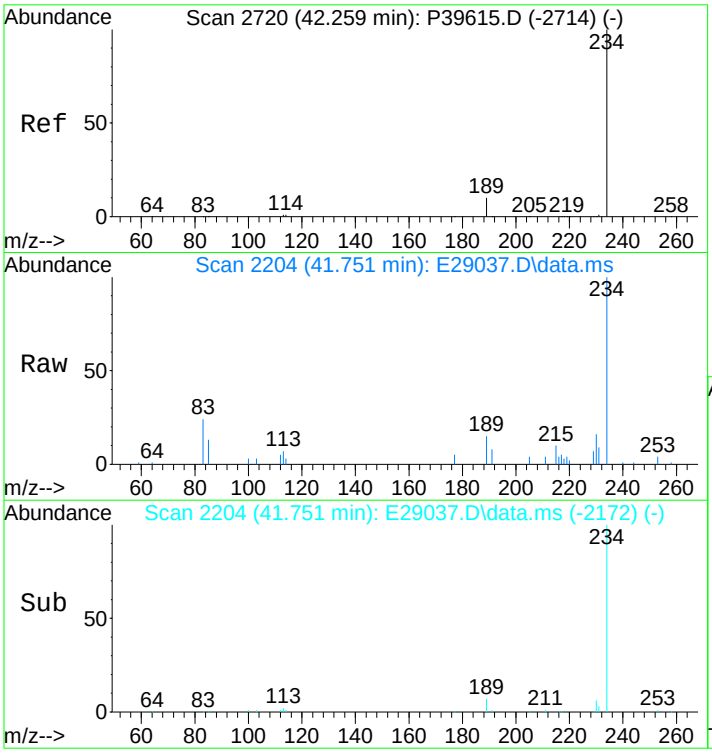


#66
Naphthobenzothiophene
Concen: 527.28 ng/ml
RT: 41.751 min Scan# 2204
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:234 Resp: 92584

Ion	Ratio	Lower	Upper
234	100		
189	8.7	5.4	8.2#

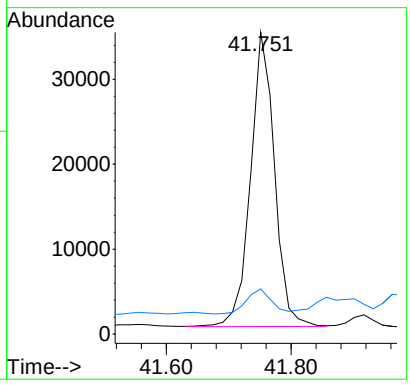


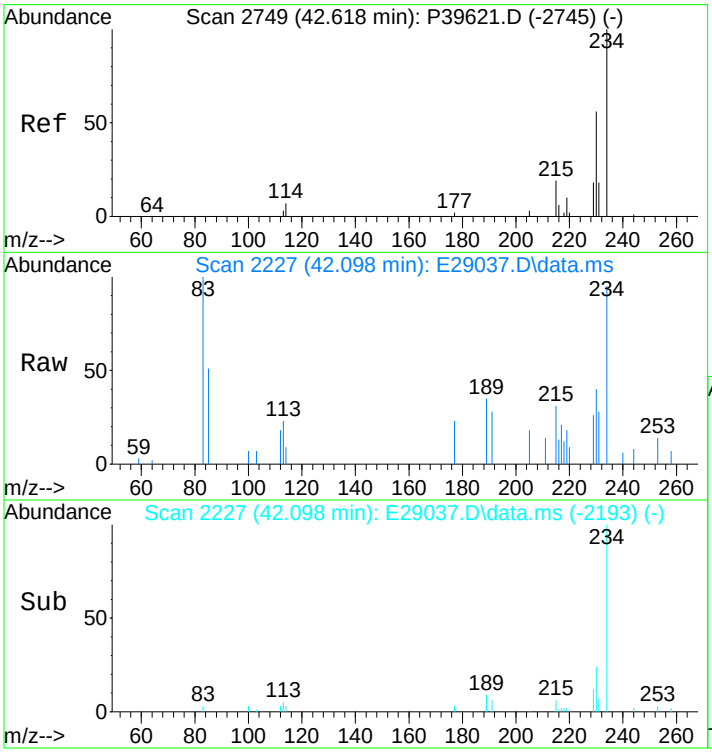


#67
Naphthobenzothiophene-2,1-D
Concen: 527.28 ng/mL
RT: 41.751 min Scan# 2204
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:234 Resp: 92584

Ion	Ratio	Lower	Upper
234	100		
189	8.7	5.4	8.2#

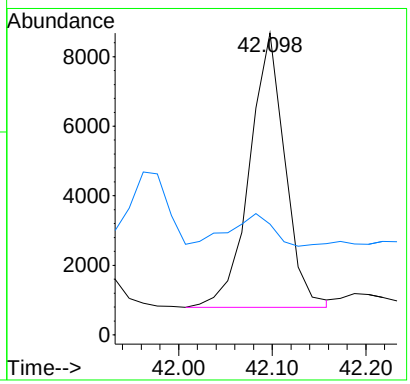


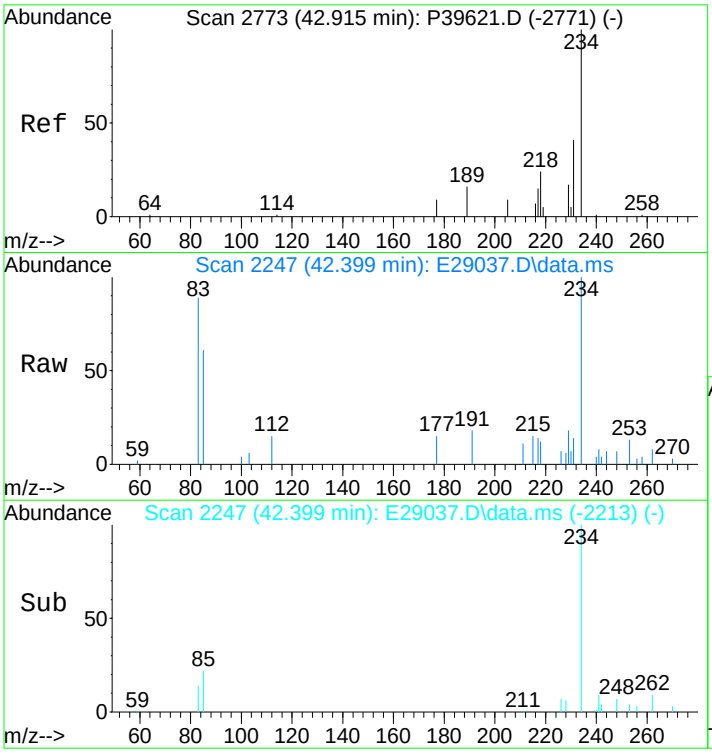


#68
Naphthobenzothiophene-1,2-D
Concen: 118.38 ng/mL
RT: 42.098 min Scan# 2227
Delta R.T. 0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:234 Resp: 20786

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

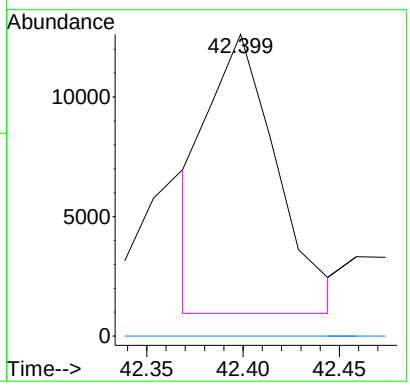


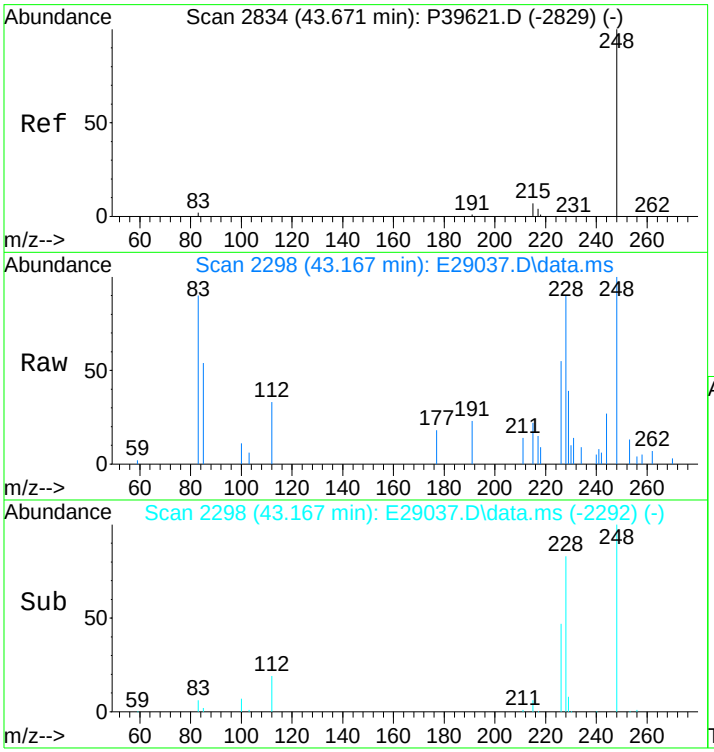


#69
Naphthobenzothiophene-2,3-D
Concen: 164.85 ng/mL m
RT: 42.399 min Scan# 2247
Delta R.T. 0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:234 Resp: 28945

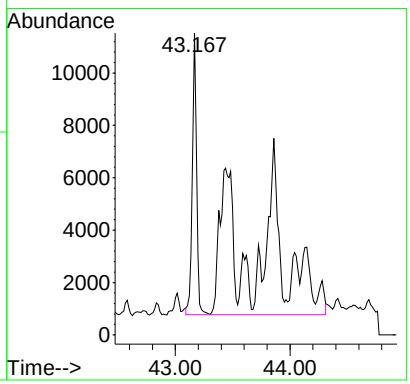
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

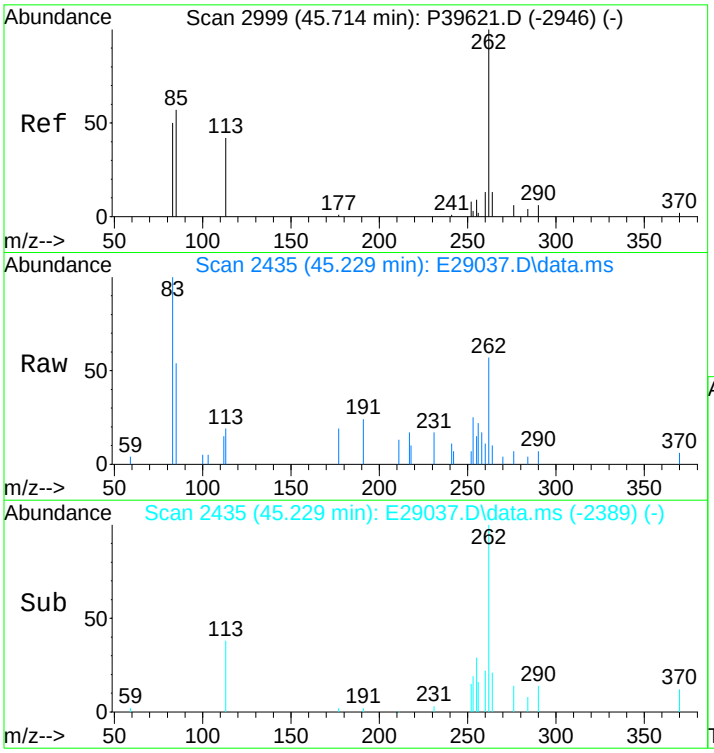




#70
C1-Naphthobenzothiophenes
Concen: 881.83 ng/ml m
RT: 43.167 min Scan# 2298
Delta R.T. 0.021 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

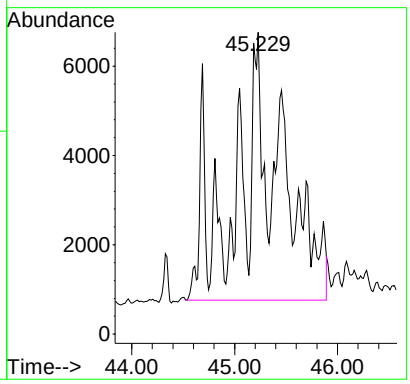
Tgt Ion:248 Resp: 154838

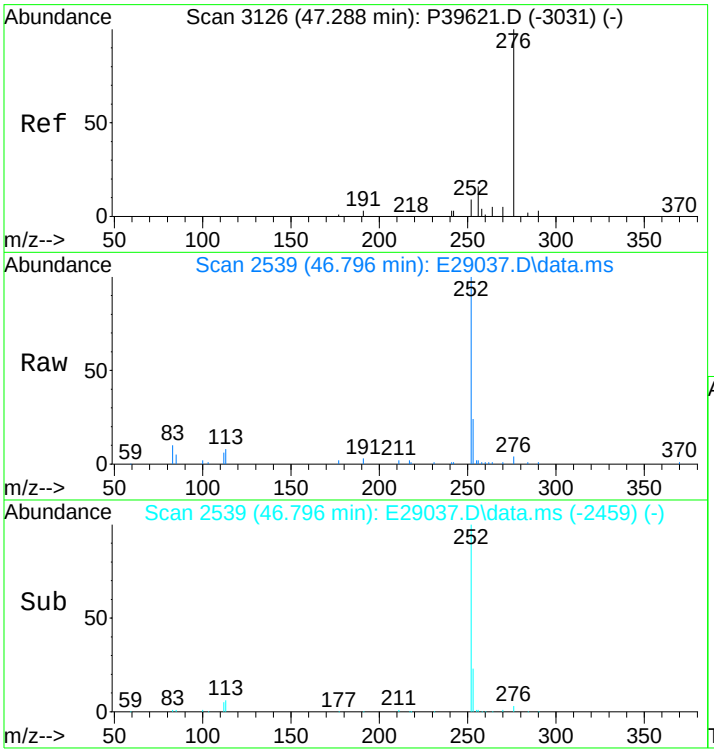




#71
C2-Naphthobenzothiophenes
Concen: 988.36 ng/ml m
RT: 45.229 min Scan# 2435
Delta R.T. 0.559 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

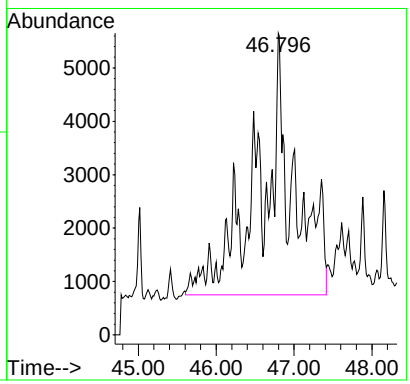
Tgt Ion:262 Resp: 173544

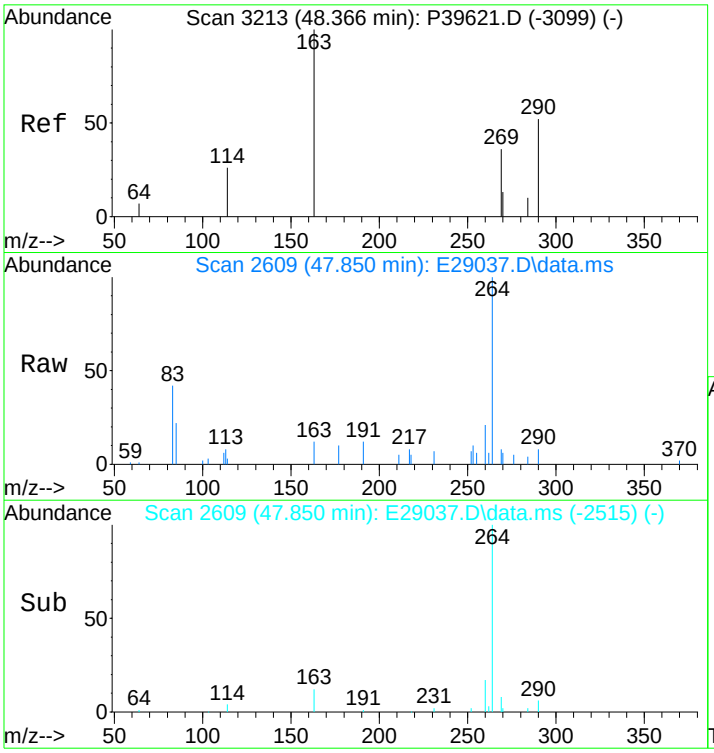




#72
C3-Naphthobenzothiophenes
Concen: 851.71 ng/ml m
RT: 46.796 min Scan# 2539
Delta R.T. 0.542 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

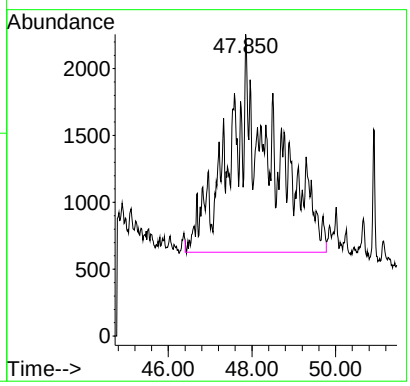
Tgt Ion:276 Resp: 149550

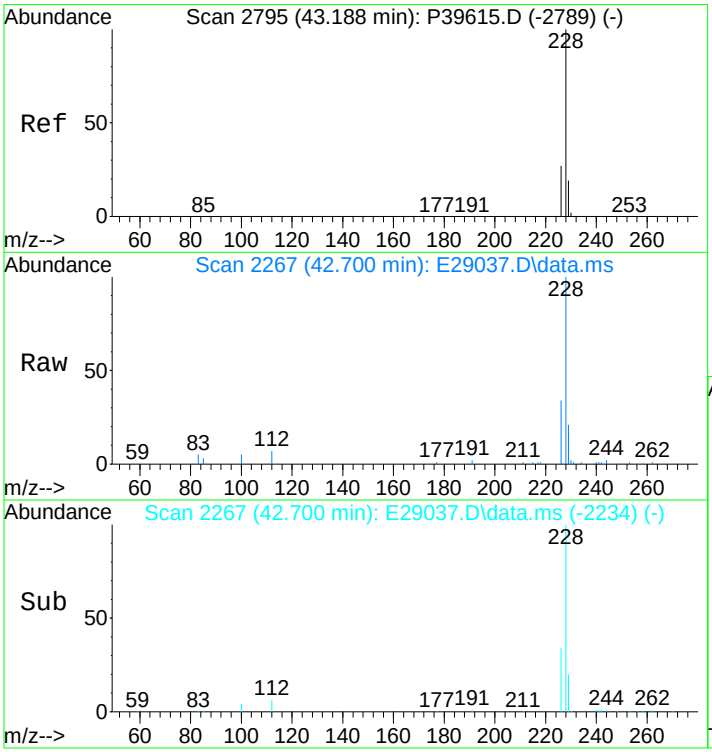




#73
C4-Naphthobenzothiophenes
Concen: 640.39 ng/mL m
RT: 47.850 min Scan# 2609
Delta R.T. 0.526 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:290 Resp: 112444

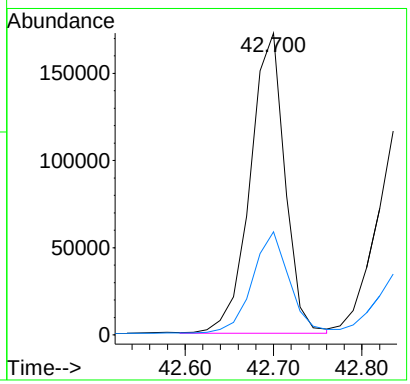


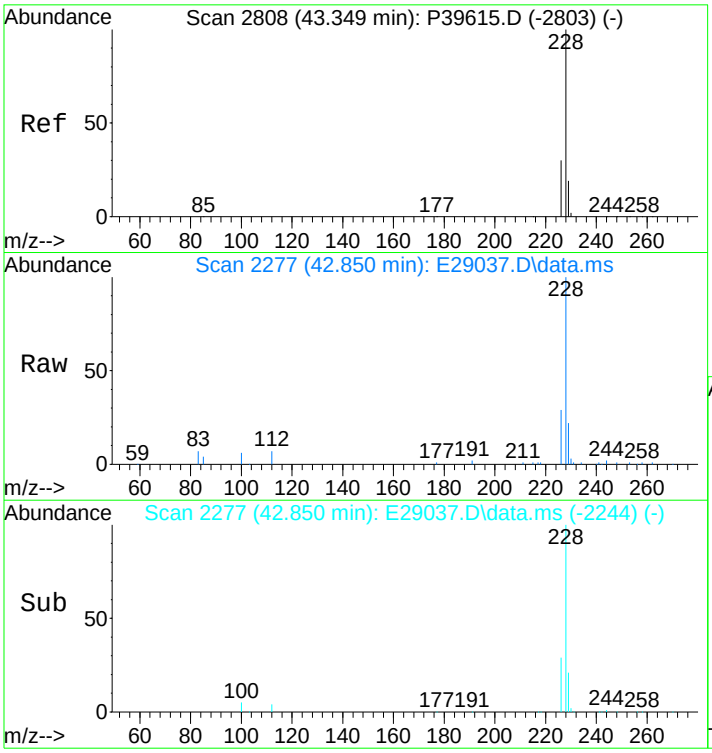


#75
Benz[a]anthracene
Concen: 2454.06 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:228 Resp: 469360

Ion	Ratio	Lower	Upper
228	100		
226	33.5	20.2	30.4#

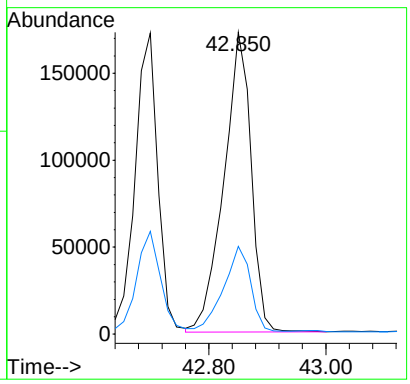


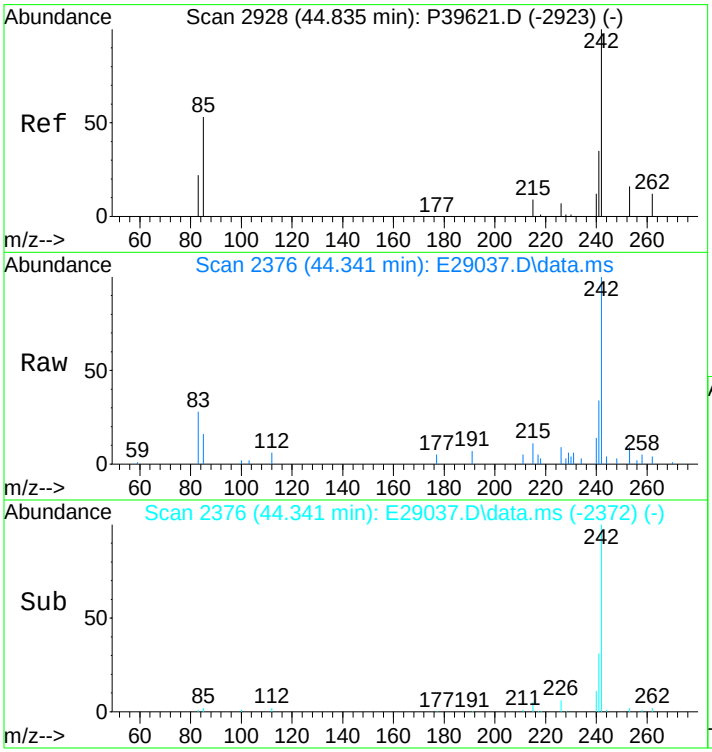


#77
Chrysene/Triphenylene
Concen: 2825.19 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:228 Resp: 556293

Ion	Ratio	Lower	Upper
228	100		
226	28.9	22.5	33.7

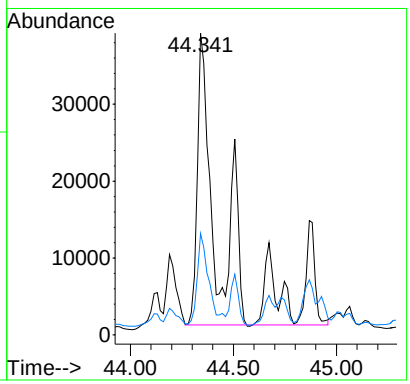


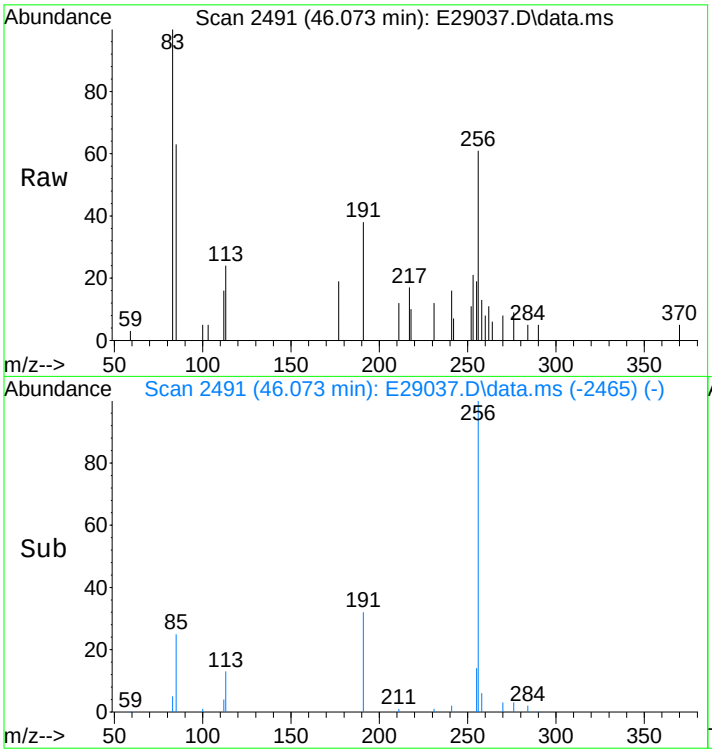


#78
C1-Chrysenes
Concen: 1537.47 ng/mL m
RT: 44.341 min Scan# 2376
Delta R.T. 0.010 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:242 Resp: 302735

Ion	Ratio	Lower	Upper
242	100		
241	4.3	32.2	48.4#

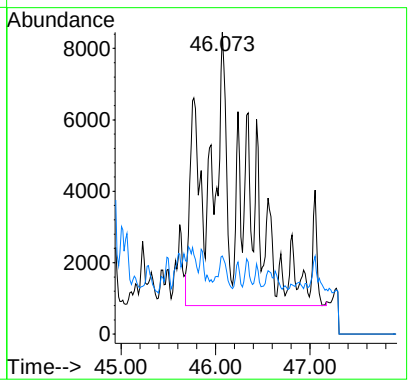


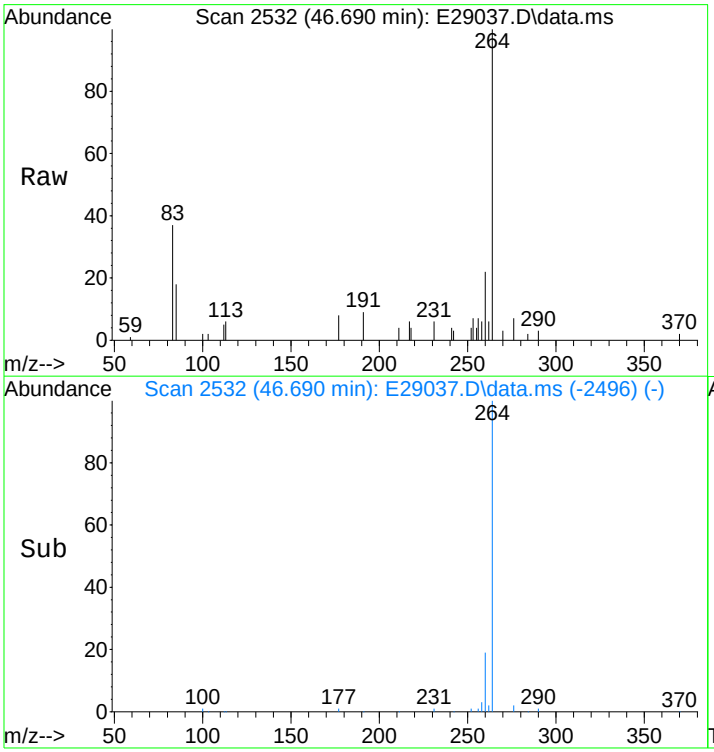


#79
C2-Chrysenes
Concen: 1035.61 ng/mL m
RT: 46.073 min Scan# 2491
Delta R.T. -0.319 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:256 Resp: 203916

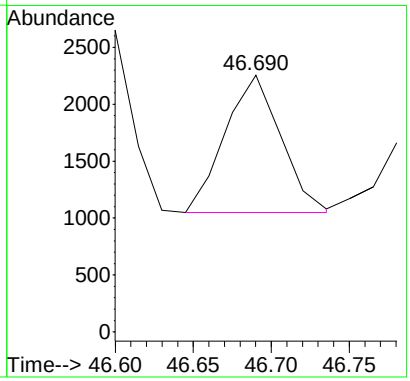
Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

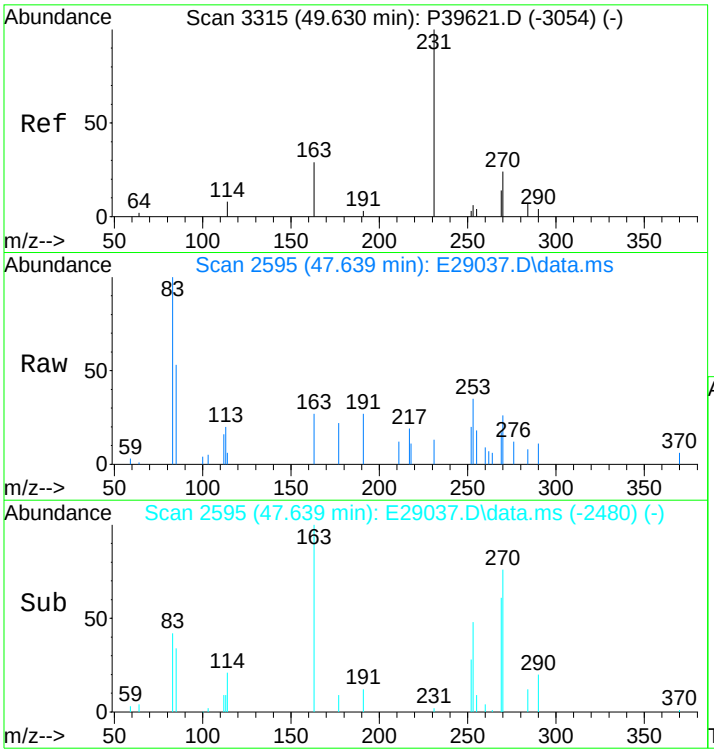




#80
BBF-D12 Surr BKGD
Concen: 15.31 ng/mL
RT: 46.690 min Scan# 2532
Delta R.T. 0.046 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:256 Resp: 3015

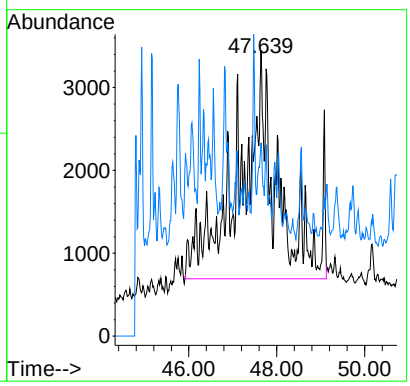


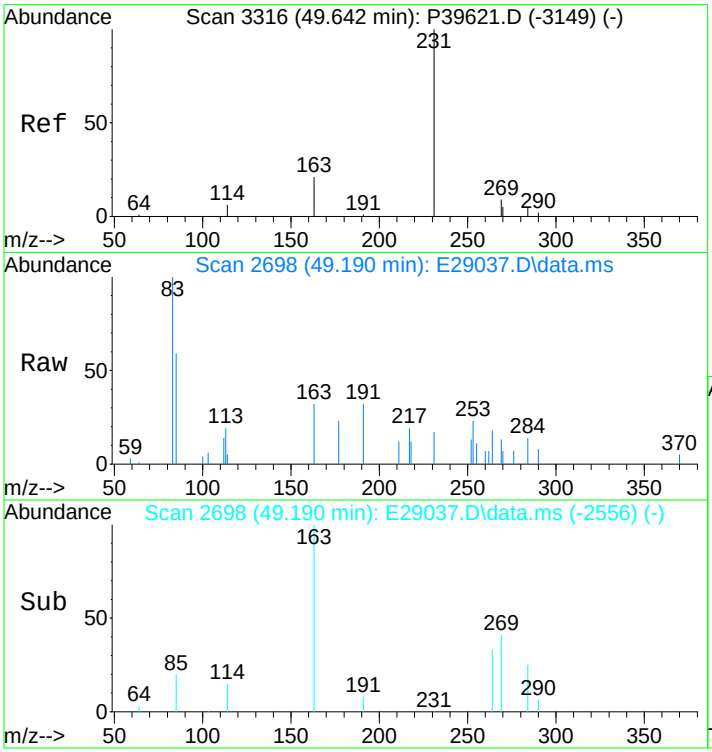


#81
C3-Chrysenes
Concen: 815.23 ng/mL m
RT: 47.639 min Scan# 2595
Delta R.T. -1.481 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:270 Resp: 160523

Ion	Ratio	Lower	Upper
270	100		
255	1.0	38.0	57.0#

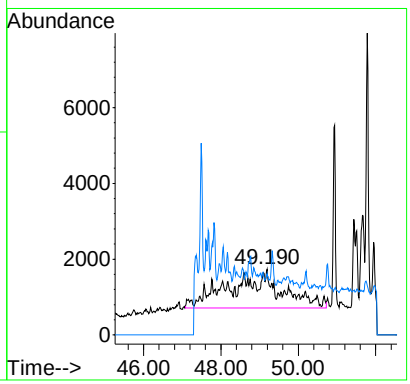


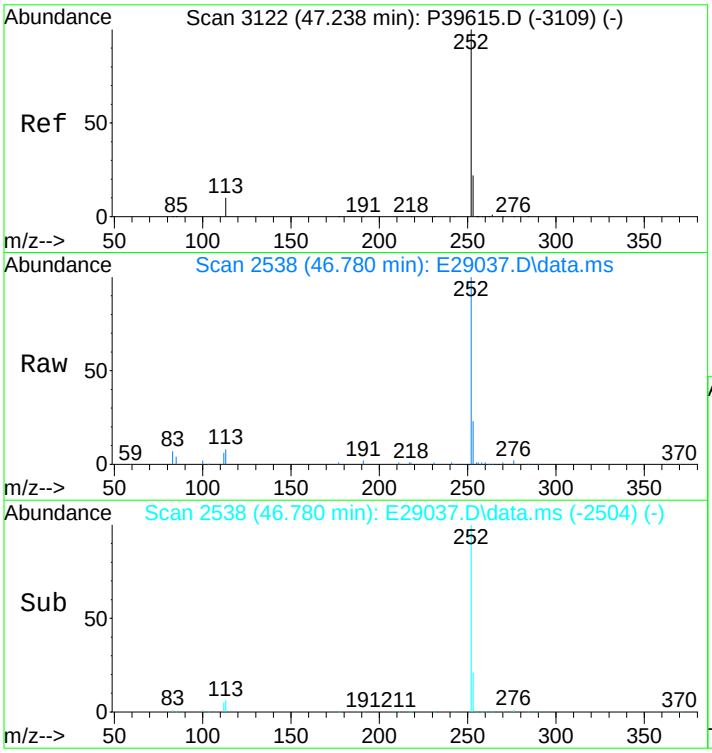


#82
C4-Chrysenes
Concen: 458.72 ng/mL m
RT: 49.190 min Scan# 2698
Delta R.T. -0.048 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:284 Resp: 90324

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

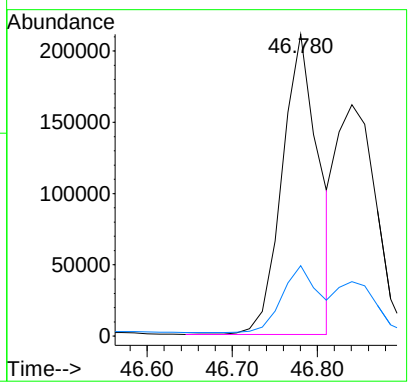


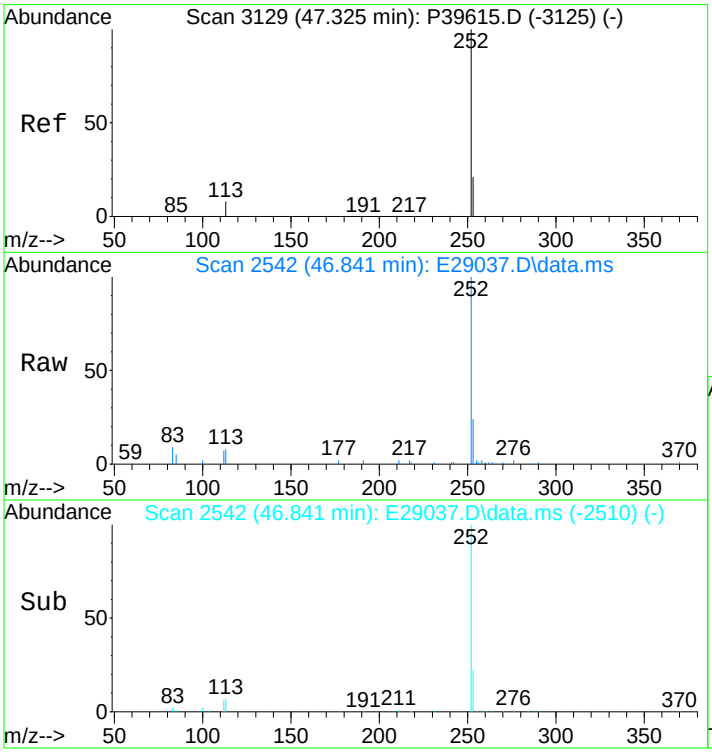


#84
Benzo[b]fluoranthene
Concen: 2822.85 ng/mL
RT: 46.780 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:252 Resp: 627538

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.2	28.8

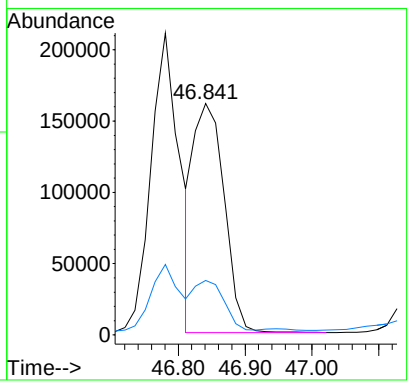


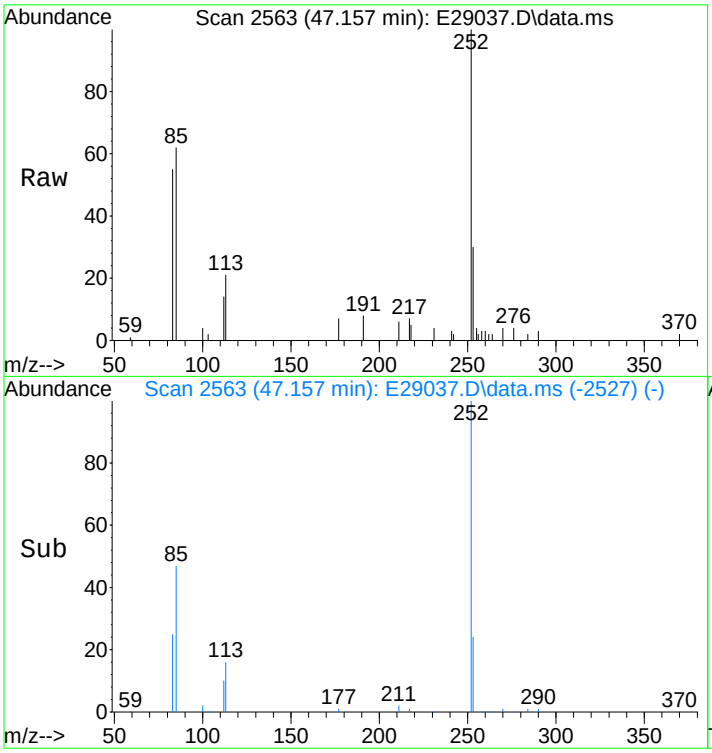


#85
Benzo[j]+[k]fluoranthene
Concen: 2246.37 ng/mL
RT: 46.841 min Scan# 2542
Delta R.T. -0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:252 Resp: 513778

Ion	Ratio	Lower	Upper
252	100		
253	21.2	19.3	28.9

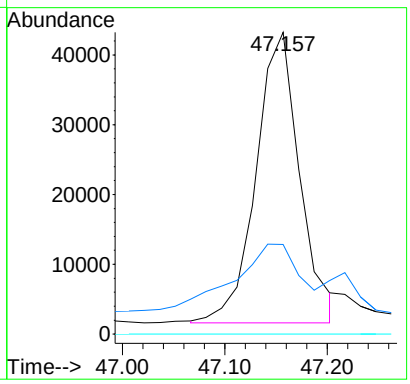


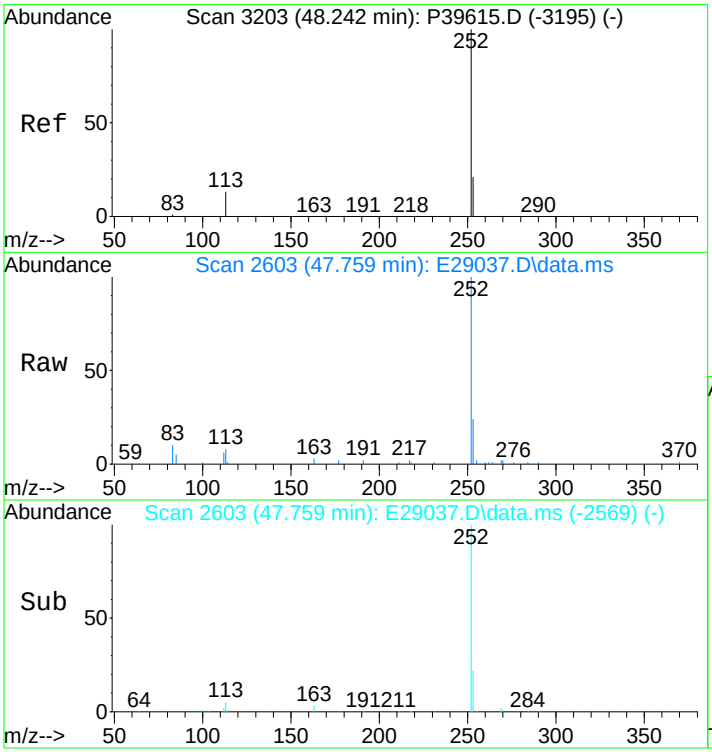


#86
Benzo[a]fluoranthene
Concen: 538.59 ng/mL m
RT: 47.157 min Scan# 2563
Delta R.T. 0.035 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:252 Resp: 123184

Ion	Ratio	Lower	Upper
252	100		
253	34.8	456.0	684.0#
125	0.0	0.0	0.0

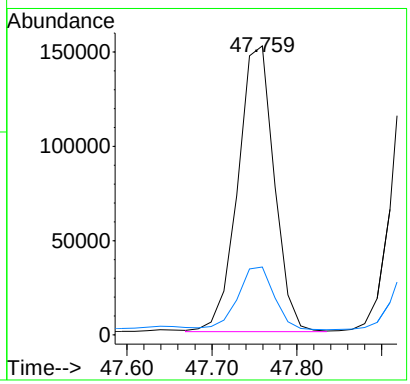


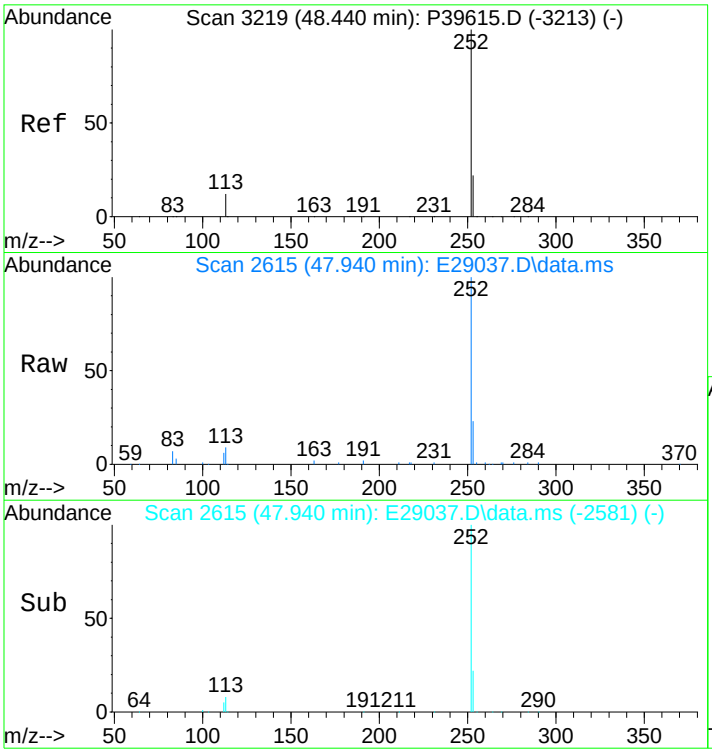


#87
Benzo[e]pyrene
Concen: 2079.02 ng/mL m
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:252 Resp: 451285

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.4	29.0

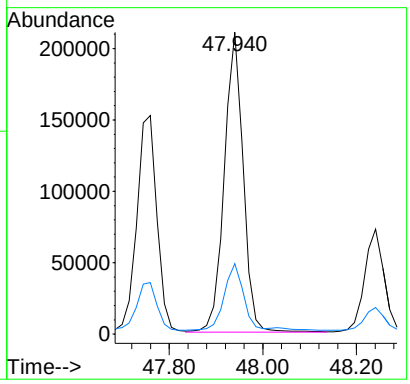


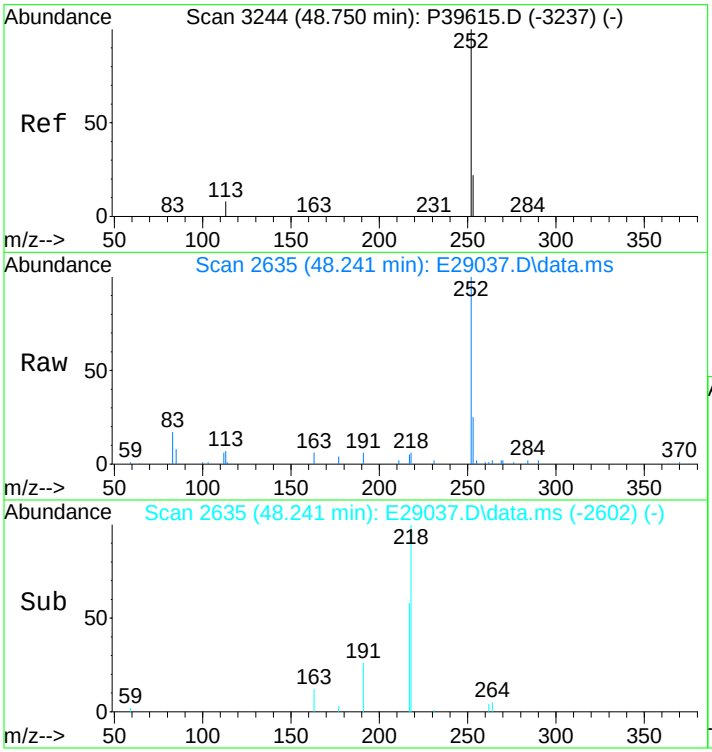


#89
Benzo[a]pyrene
Concen: 2835.97 ng/mL
RT: 47.940 min Scan# 2615
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:252 Resp: 589043

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.6	29.4

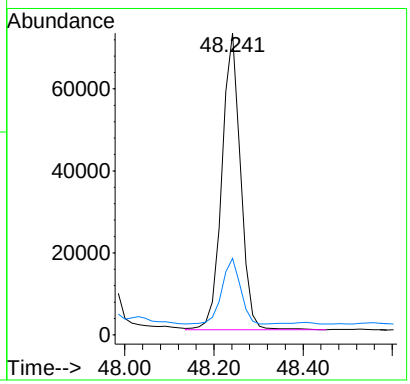


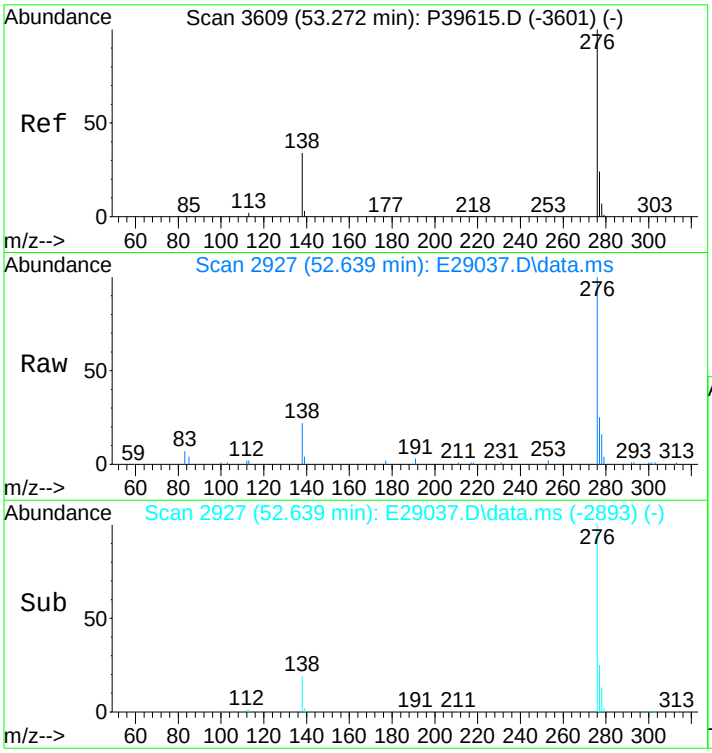


#90
Perylene
Concen: 955.13 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:252 Resp: 209780

Ion	Ratio	Lower	Upper
252	100		
253	22.1	19.9	29.9

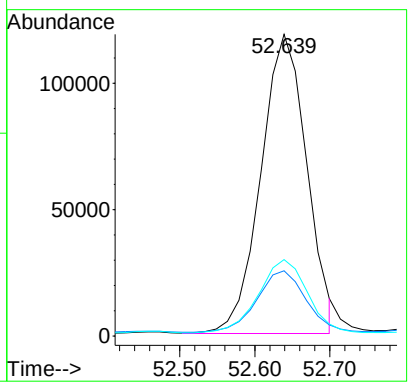


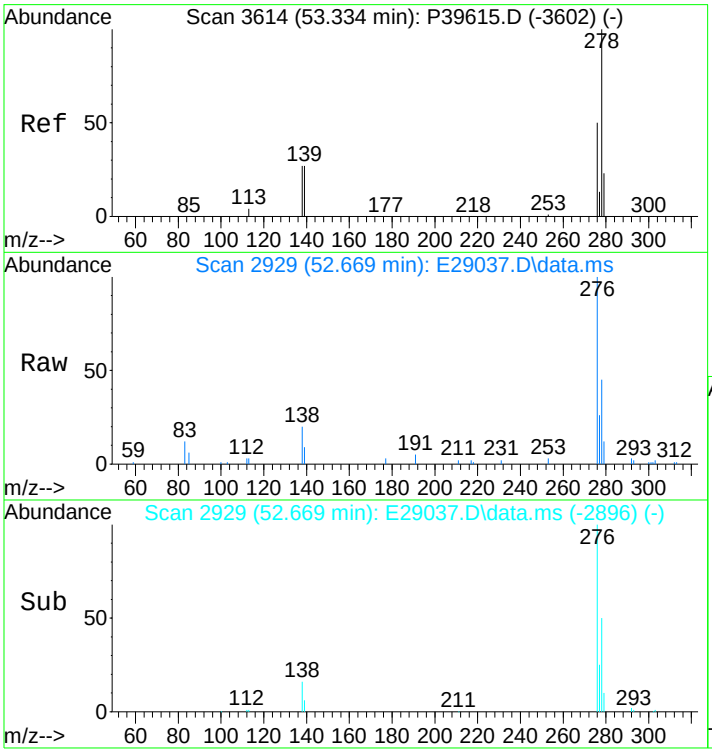


#91
Indeno[1,2,3-cd]pyrene
Concen: 2054.66 ng/mL m
RT: 52.639 min Scan# 2927
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:276 Resp: 502245

Ion	Ratio	Lower	Upper
276	100		
138	21.8	17.8	26.8
277	26.6	20.0	30.0

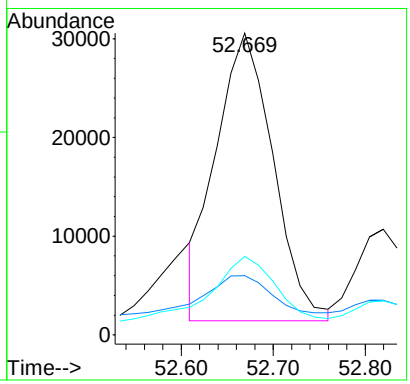


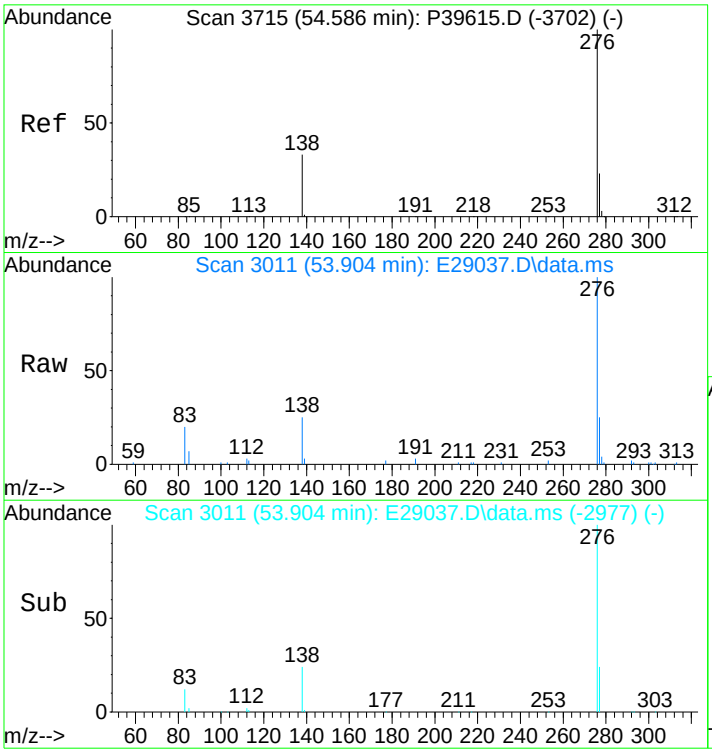


#92
Dibenz[ah]+[ac]anthracene
Concen: 484.43 ng/mL m
RT: 52.669 min Scan# 2929
Delta R.T. 0.000 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:278 Resp: 126086

Ion	Ratio	Lower	Upper
278	100		
139	16.8	13.0	19.4
279	27.1	19.4	29.2

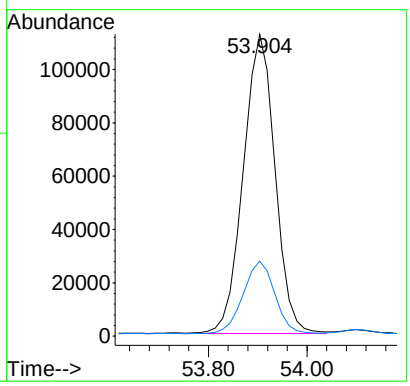


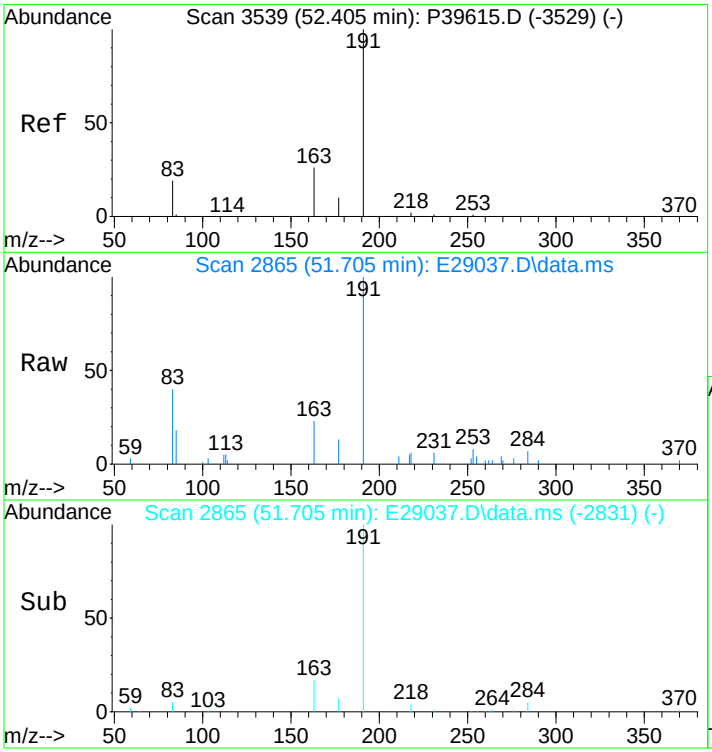


#93
Benzo[g,h,i]perylene
Concen: 1899.41 ng/mL
RT: 53.904 min Scan# 3011
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:276 Resp: 500623

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.4	29.2

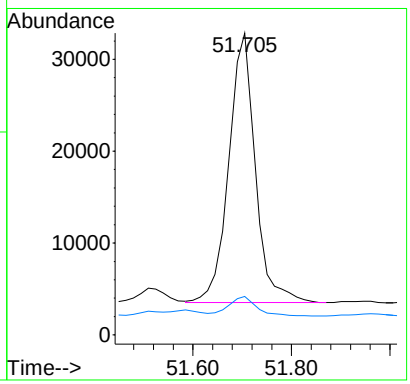


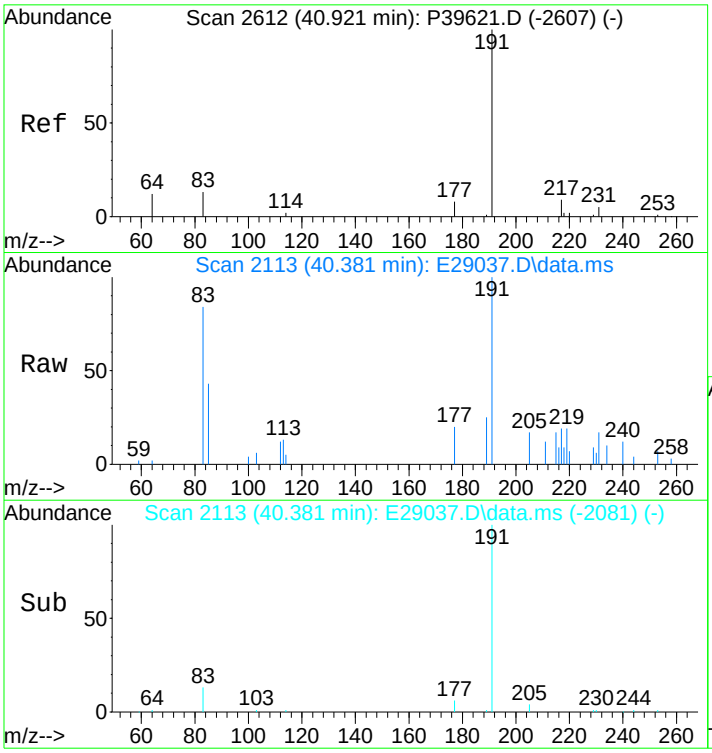


#94
Hopane (T19)
Concen: 1490.98 ng/mL
RT: 51.705 min Scan# 2865
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:191 Resp: 109901

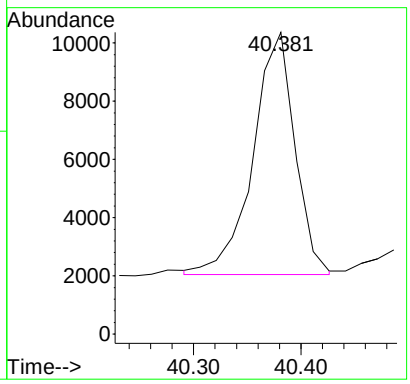
Ion	Ratio	Lower	Upper
191	100		
177	7.8	11.3	16.9#

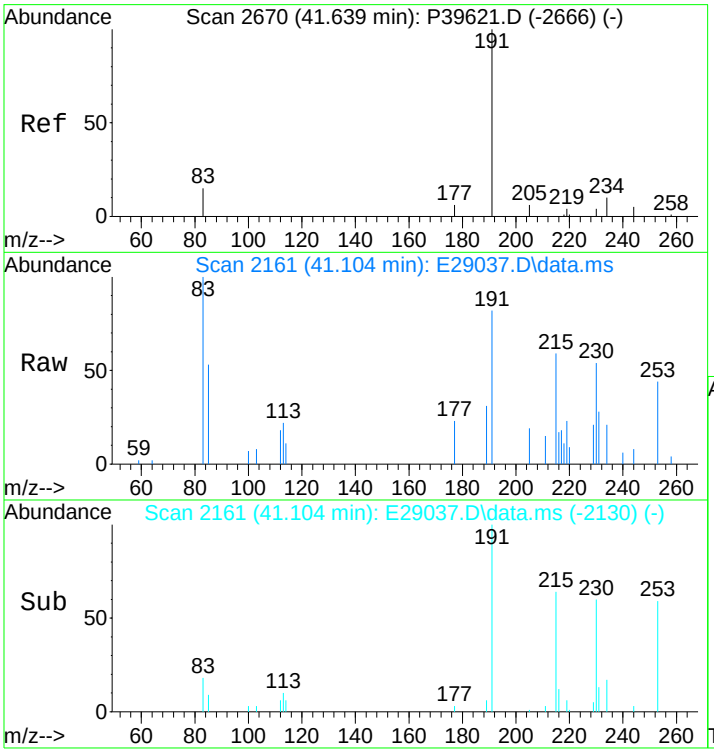




#96
C23 Tricyclic Terpane (T4)
Concen: 306.06 ng/ml m
RT: 40.381 min Scan# 2113
Delta R.T. -0.012 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

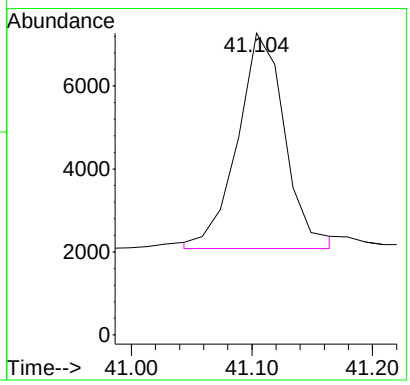
Tgt Ion:191 Resp: 22560

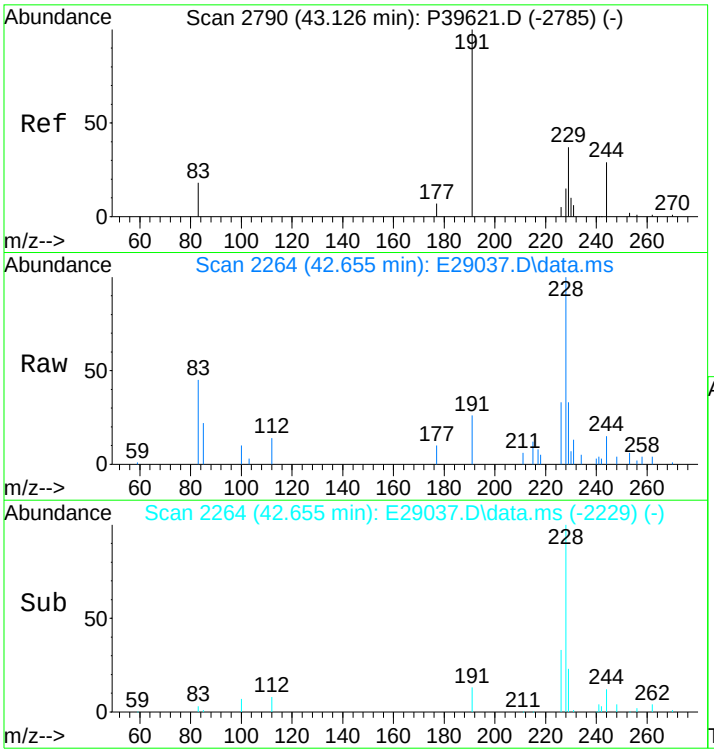




#97
C24 Tricyclic Terpane (T5)
Concen: 192.13 ng/ml m
RT: 41.104 min Scan# 2161
Delta R.T. -0.028 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

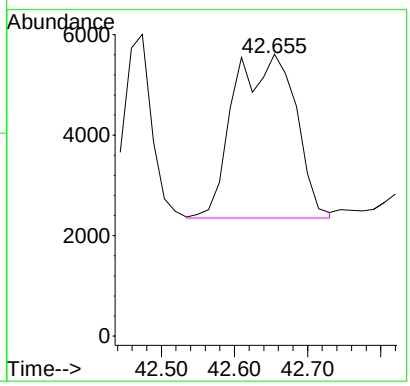
Tgt Ion:191 Resp: 14162

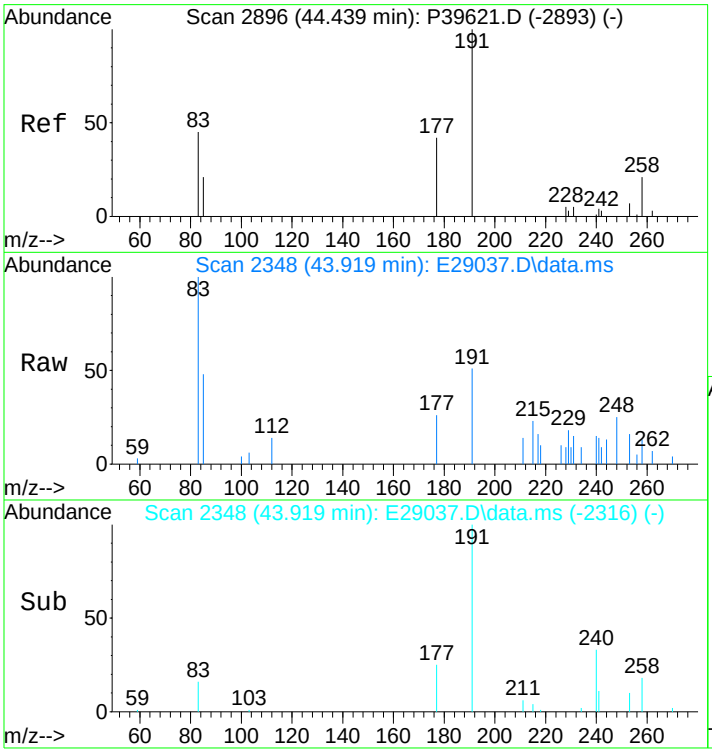




#98
C25 Tricyclic Terpane (T6)
Concen: 259.35 ng/ml m
RT: 42.655 min Scan# 2264
Delta R.T. 0.030 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

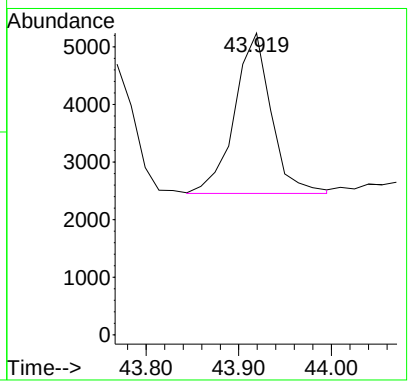
Tgt Ion:191 Resp: 19117

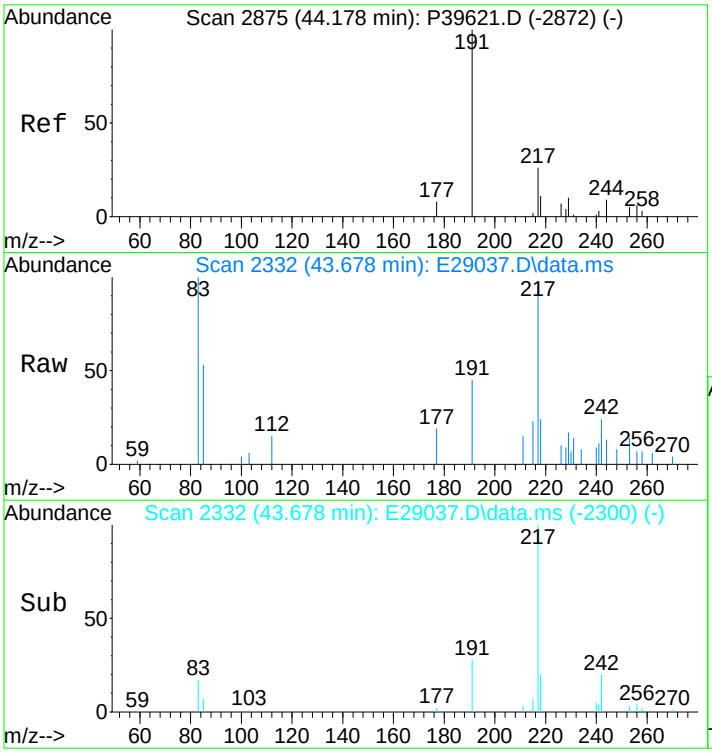




#99
C24 Tetracyclic Terpane (T6a)
Concen: 103.50 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

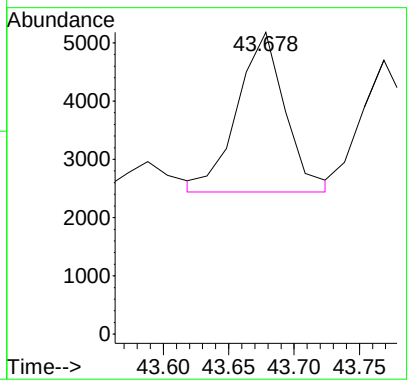
Tgt Ion:191 Resp: 7629

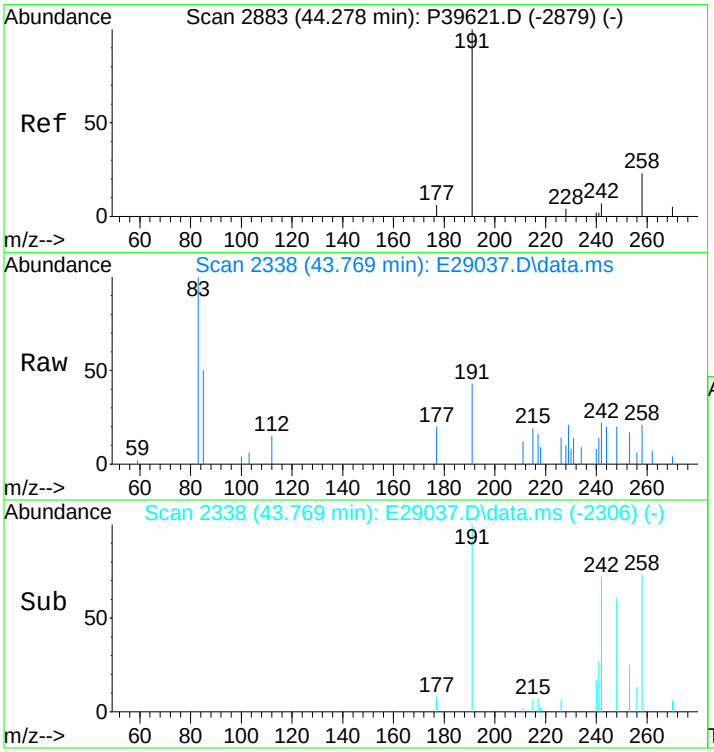




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 94.68 ng/ml m
RT: 43.678 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

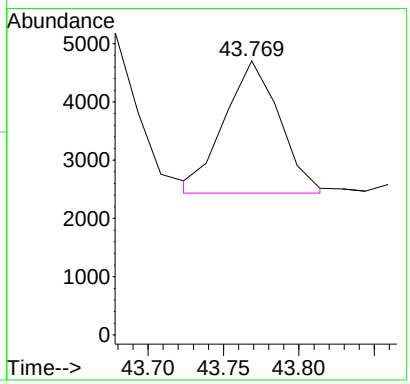
Tgt Ion:191 Resp: 6979

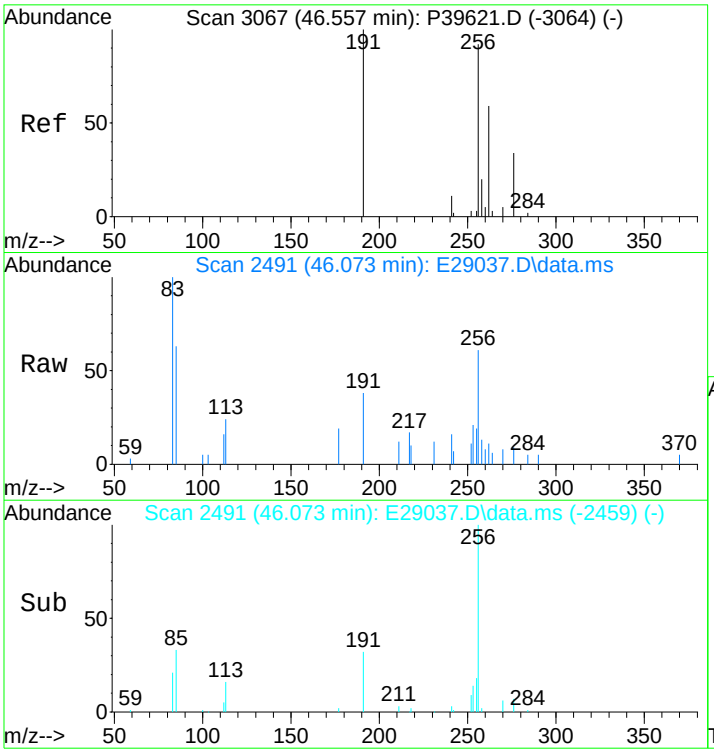




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 77.98 ng/ml m
RT: 43.769 min Scan# 2338
Delta R.T. -0.016 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

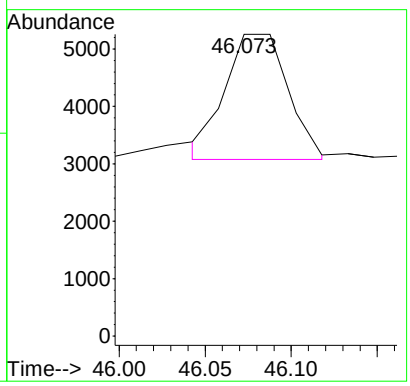
Tgt Ion:191 Resp: 5748

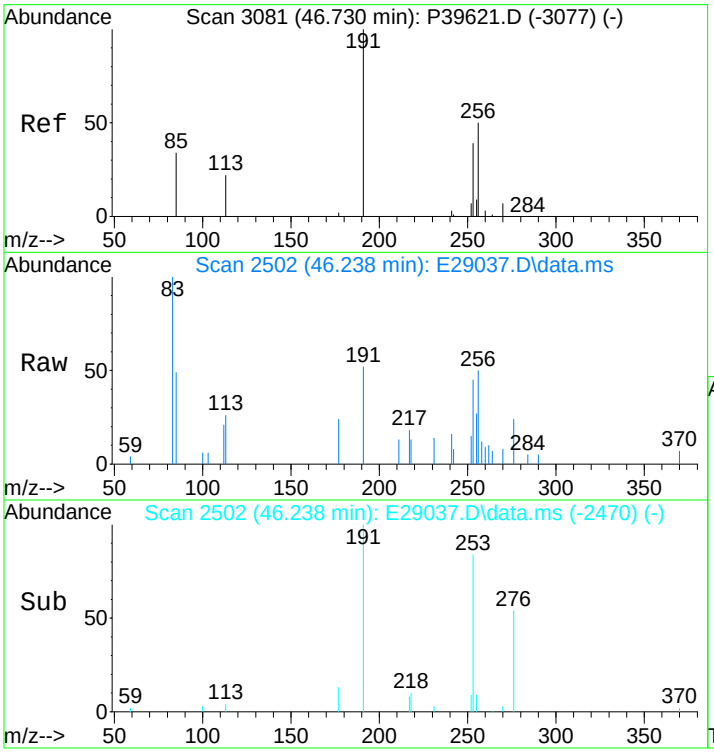




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 75.31 ng/ml m
RT: 46.073 min Scan# 2491
Delta R.T. -0.018 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

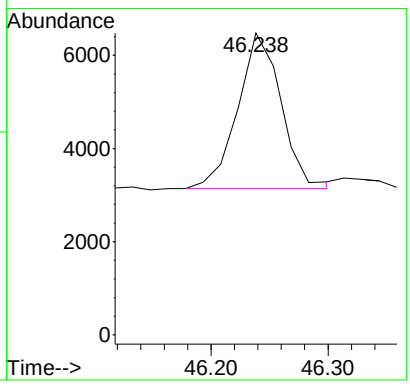
Tgt Ion:191 Resp: 5551

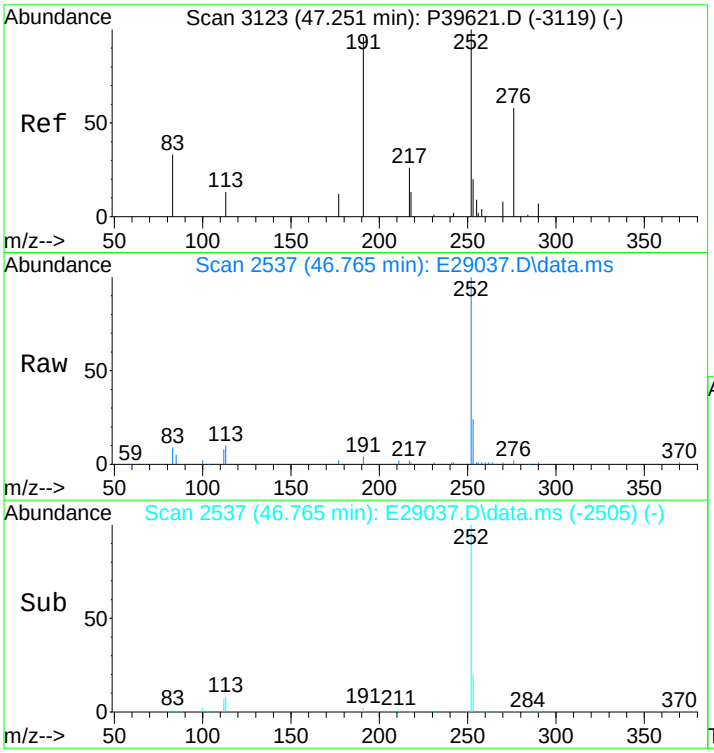




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 116.98 ng/ml
RT: 46.238 min Scan# 2502
Delta R.T. -0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

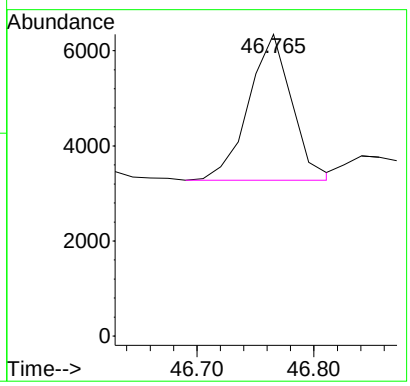
Tgt Ion:191 Resp: 8623

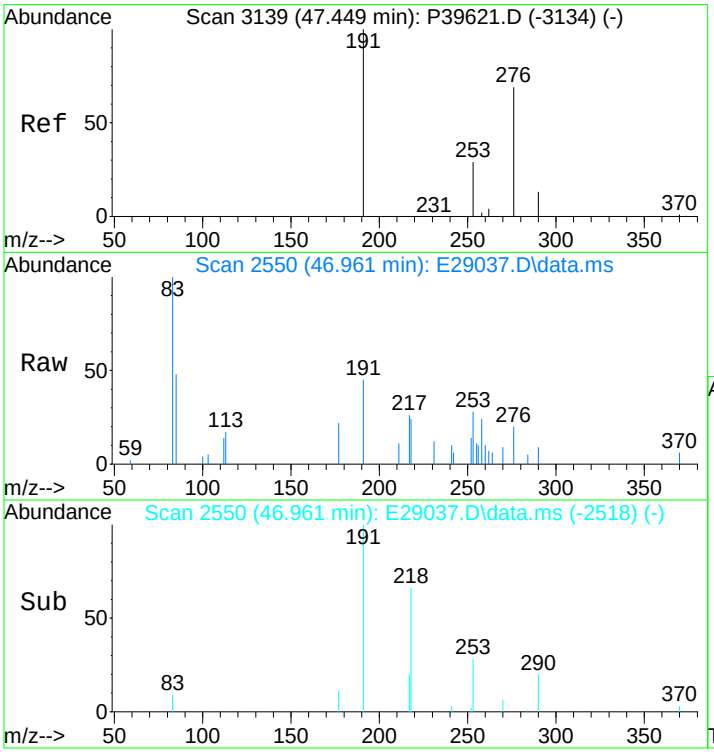




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 106.31 ng/ml
RT: 46.765 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

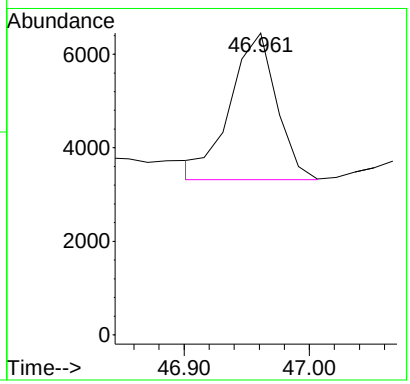
Tgt Ion:191 Resp: 7836

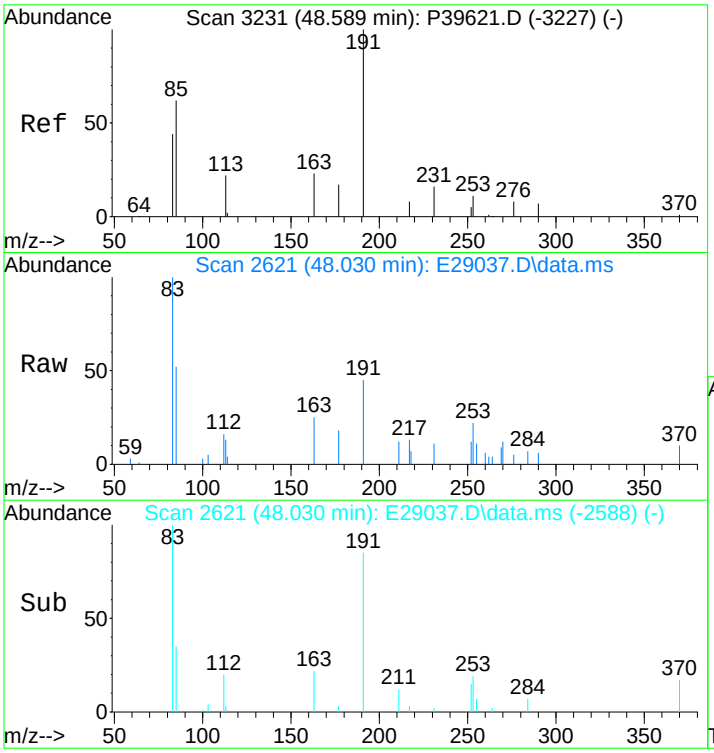




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 108.83 ng/ml m
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

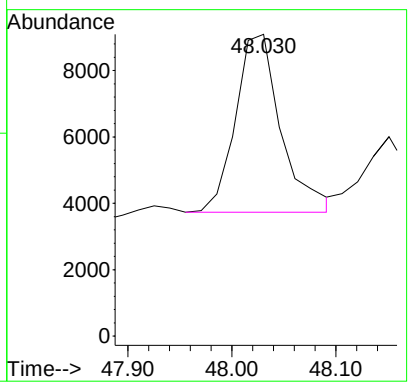
Tgt Ion:191 Resp: 8022

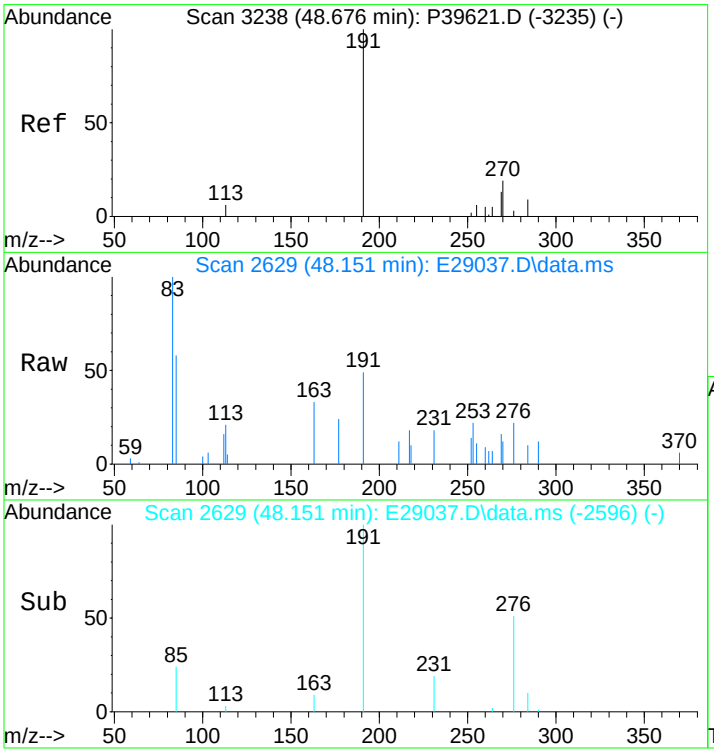




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 222.68 ng/ml
RT: 48.030 min Scan# 2621
Delta R.T. -0.005 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

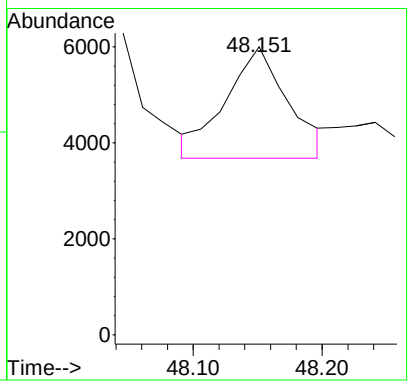
Tgt Ion:191 Resp: 16414

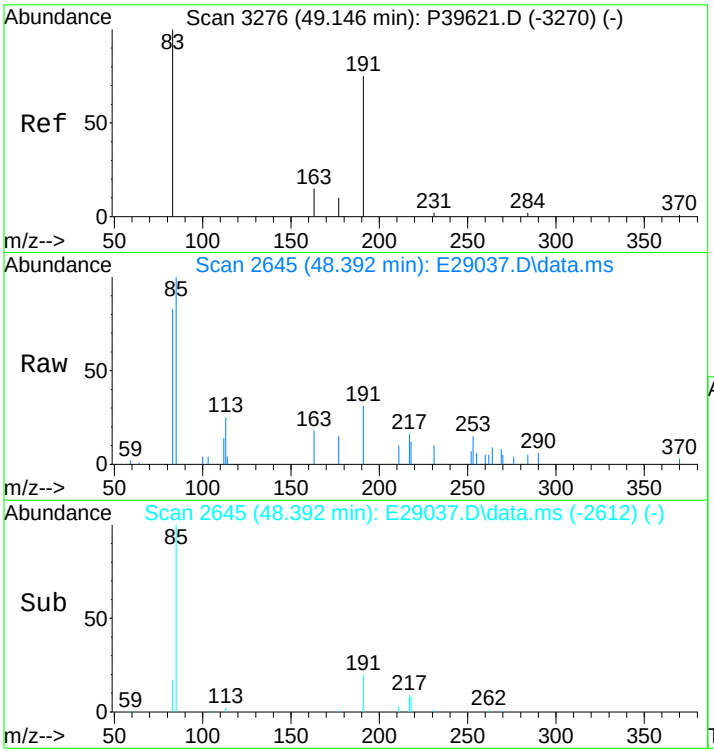




#107
C30 Tricyclic Terpane-22S
Concen: 105.56 ng/mL m
RT: 48.151 min Scan# 2629
Delta R.T. -0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

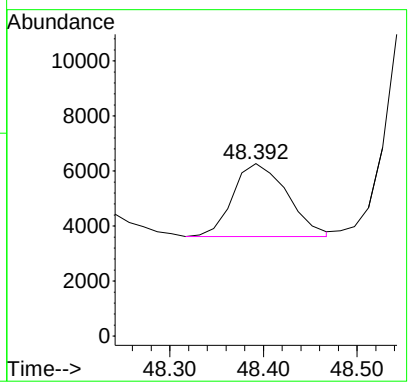
Tgt Ion:191 Resp: 7781

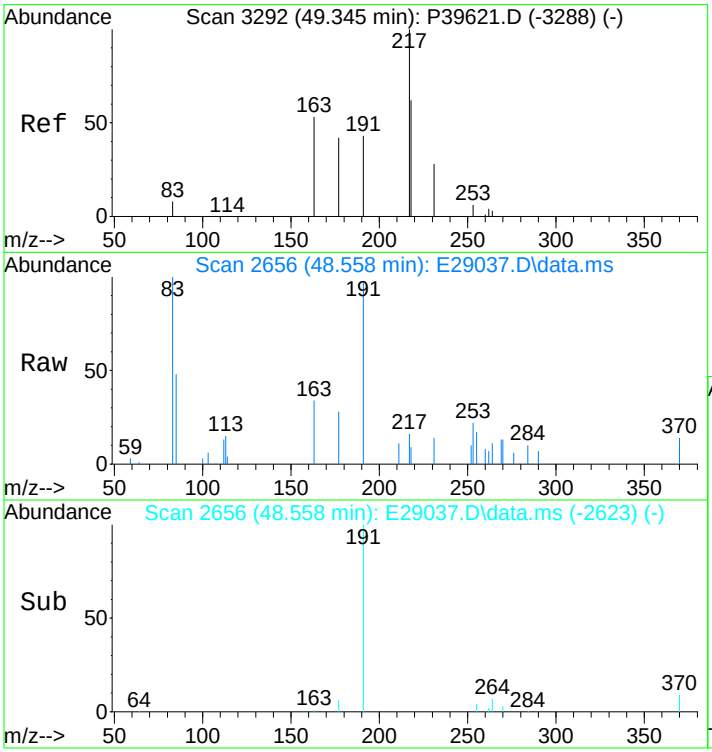




#108
C30 Tricyclic Terpane-22R
Concen: 145.37 ng/mL
RT: 48.392 min Scan# 2645
Delta R.T. -0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

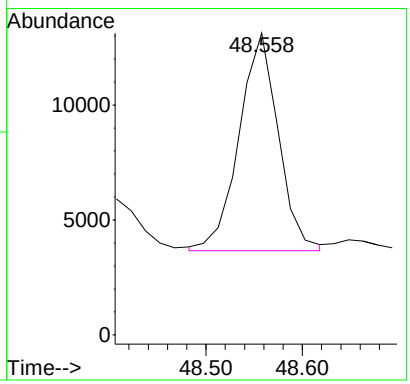
Tgt Ion:191 Resp: 10715

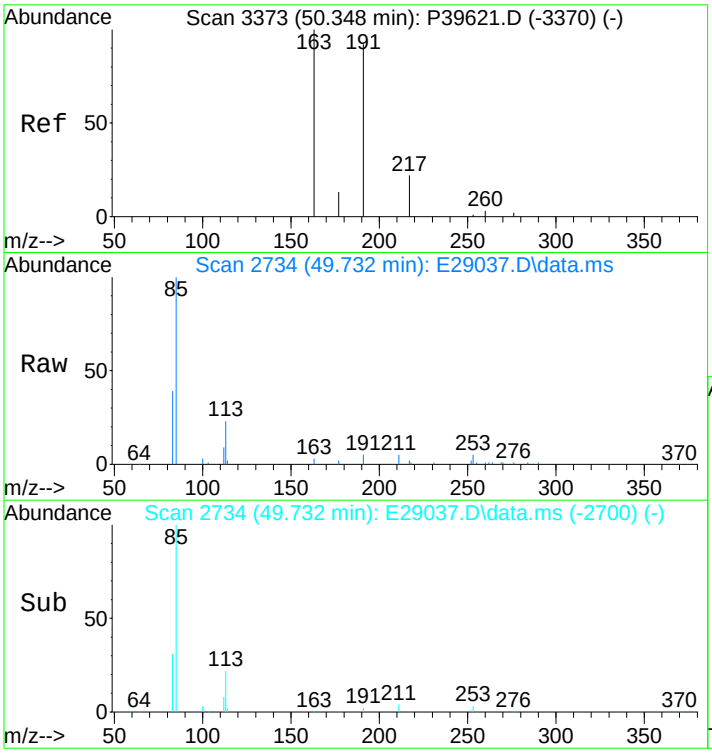




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 362.62 ng/ml m
RT: 48.558 min Scan# 2656
Delta R.T. -0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

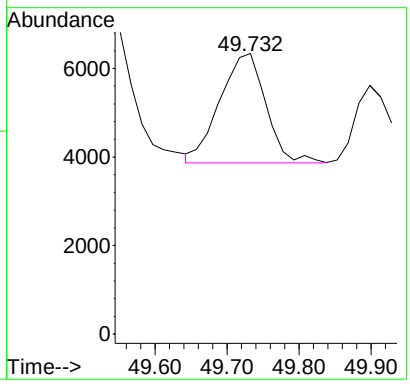
Tgt Ion:191 Resp: 26729

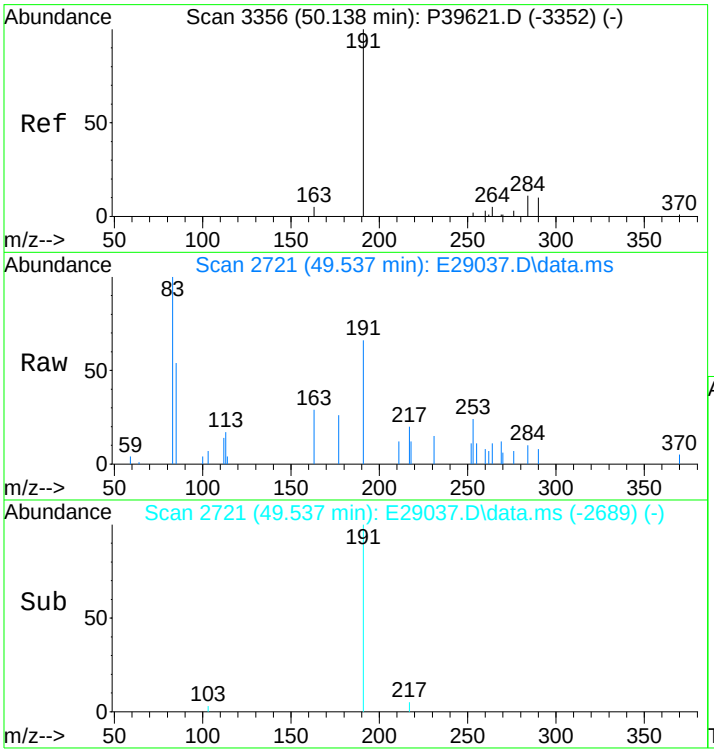




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 148.40 ng/ml
RT: 49.732 min Scan# 2734
Delta R.T. 0.008 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

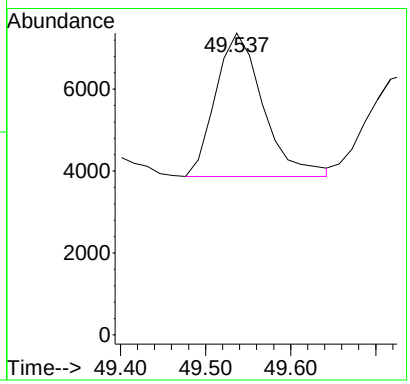
Tgt Ion:191 Resp: 10939

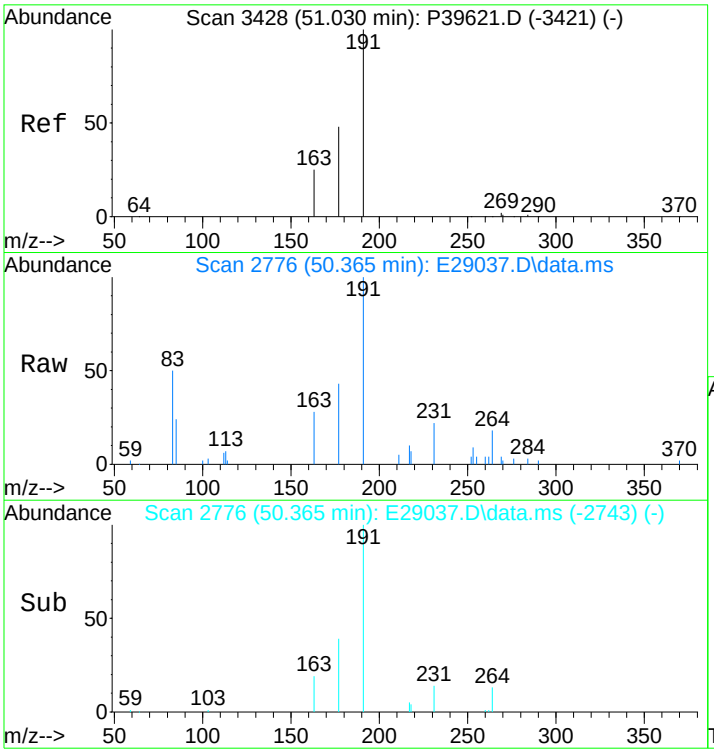




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 185.45 ng/ml
RT: 49.537 min Scan# 2721
Delta R.T. -0.022 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

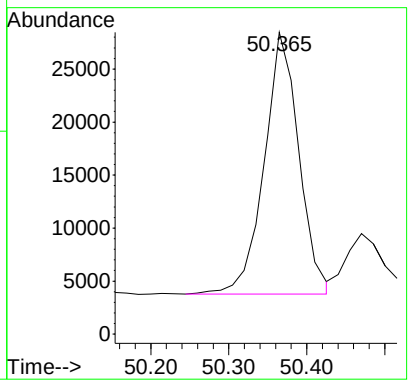
Tgt Ion:191 Resp: 13670

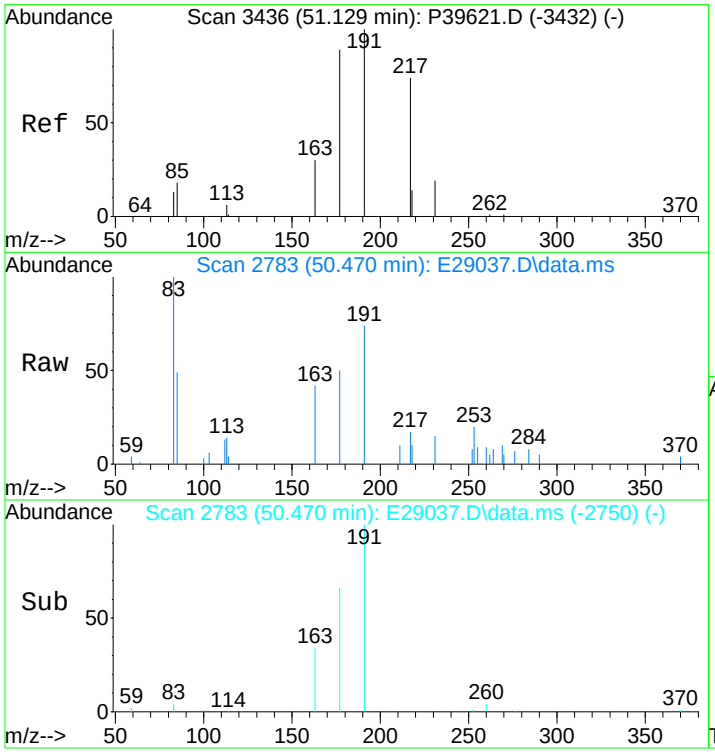




#112
30-Norhopane (T15)
Concen: 1035.25 ng/ml
RT: 50.365 min Scan# 2776
Delta R.T. -0.008 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

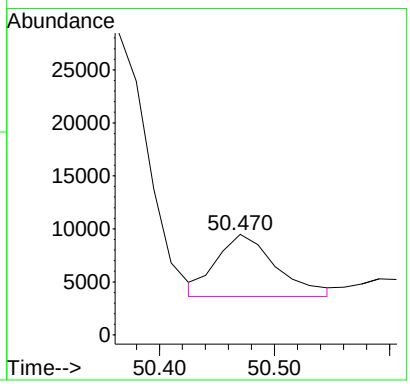
Tgt Ion:191 Resp: 76309

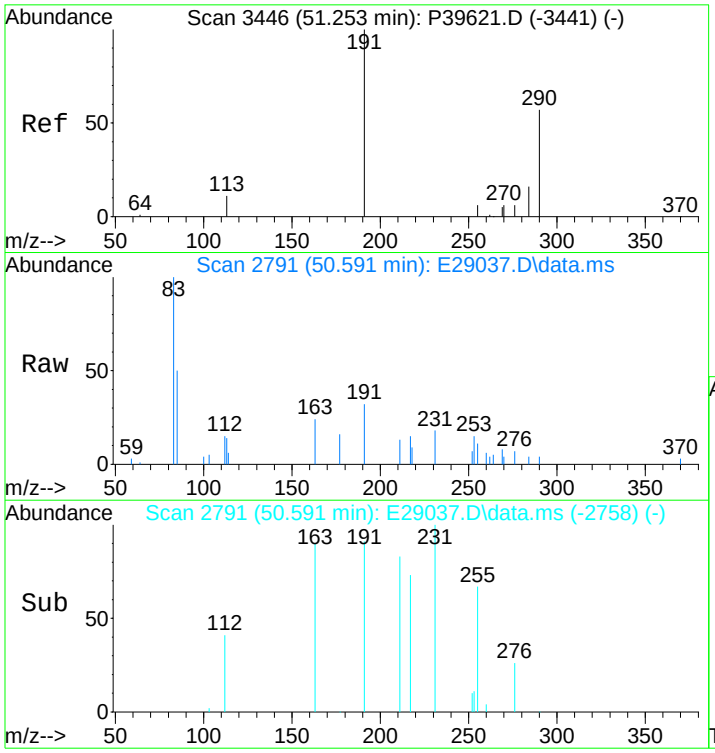




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 284.94 ng/ml m
RT: 50.470 min Scan# 2783
Delta R.T. -0.008 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

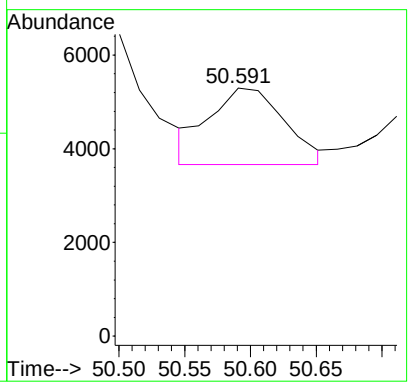
Tgt Ion:191 Resp: 21003

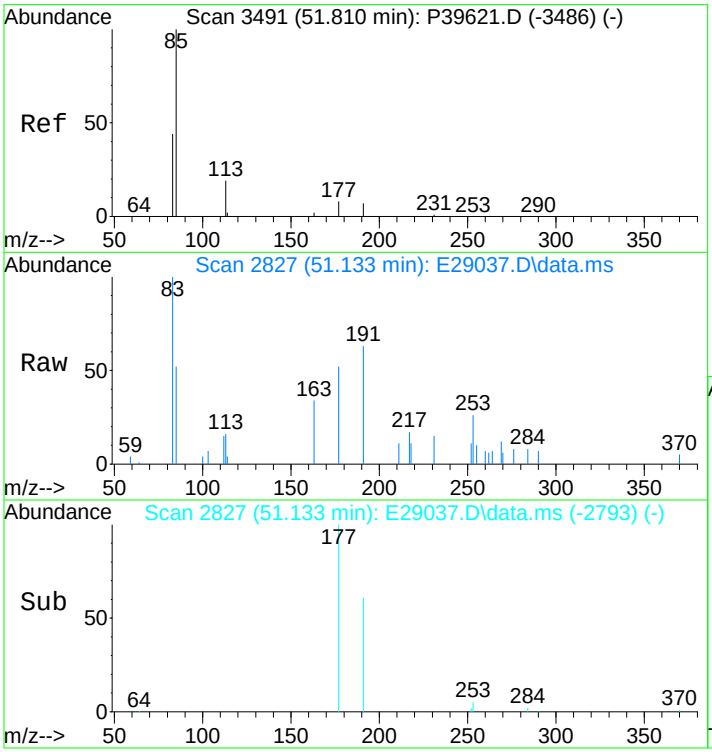




#114
17a(H)-Diahopane (X)
Concen: 88.07 ng/ml m
RT: 50.591 min Scan# 2791
Delta R.T. -0.008 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

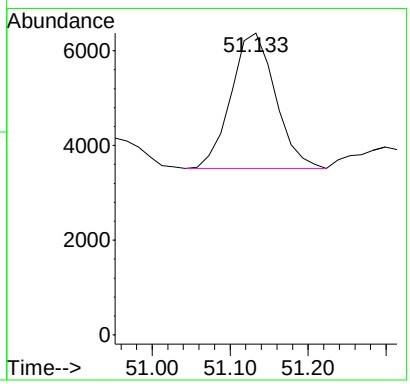
Tgt Ion:191 Resp: 6492

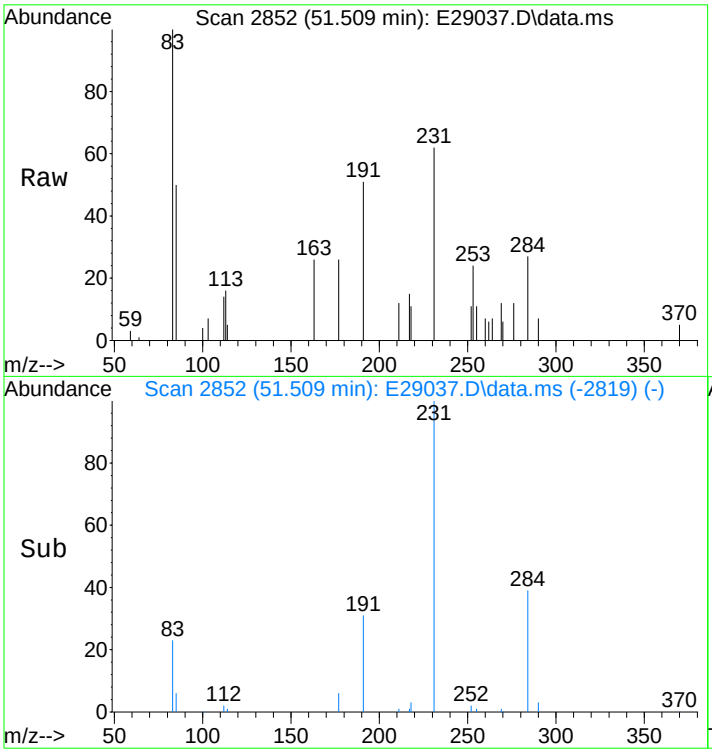




#115
30-Normoretane (T17)
Concen: 152.94 ng/ml
RT: 51.133 min Scan# 2827
Delta R.T. 0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

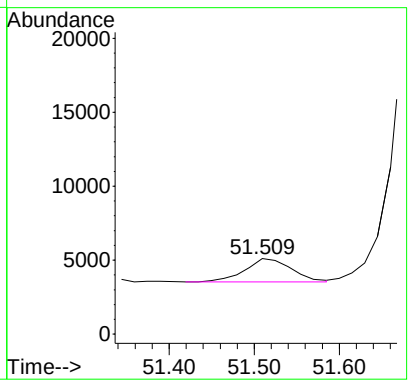
Tgt Ion:191 Resp: 11273

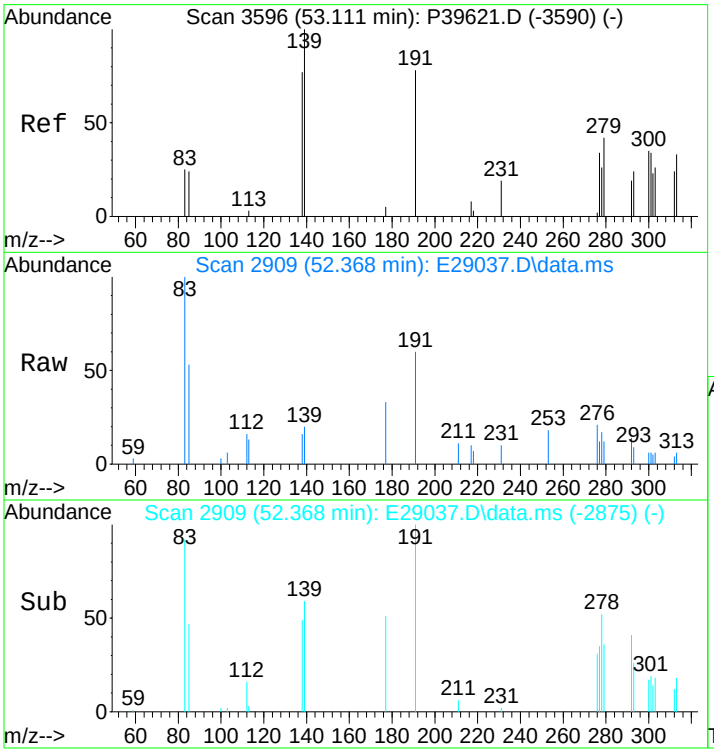




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 82.76 ng/ml
RT: 51.509 min Scan# 2852
Delta R.T. -0.009 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

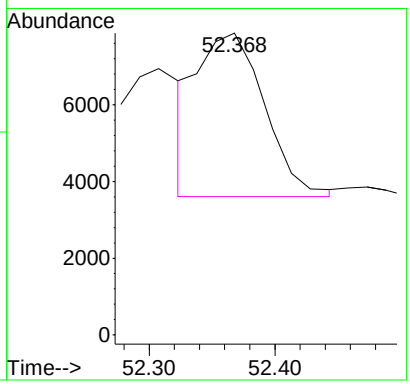
Tgt Ion:191 Resp: 6100

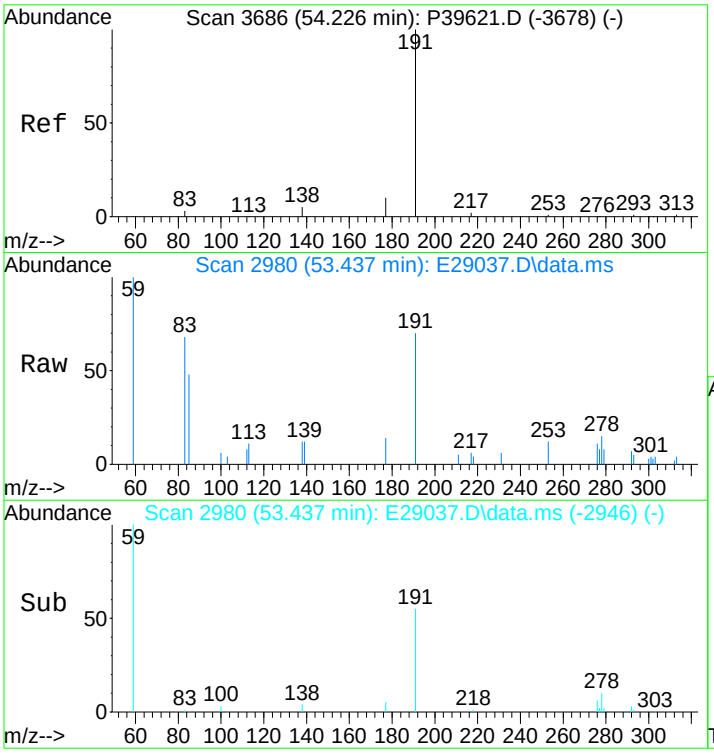




#117
Moretane (T20)
Concen: 215.88 ng/ml m
RT: 52.368 min Scan# 2909
Delta R.T. 0.005 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

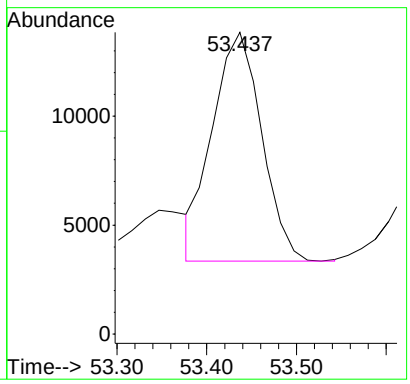
Tgt Ion:191 Resp: 15913

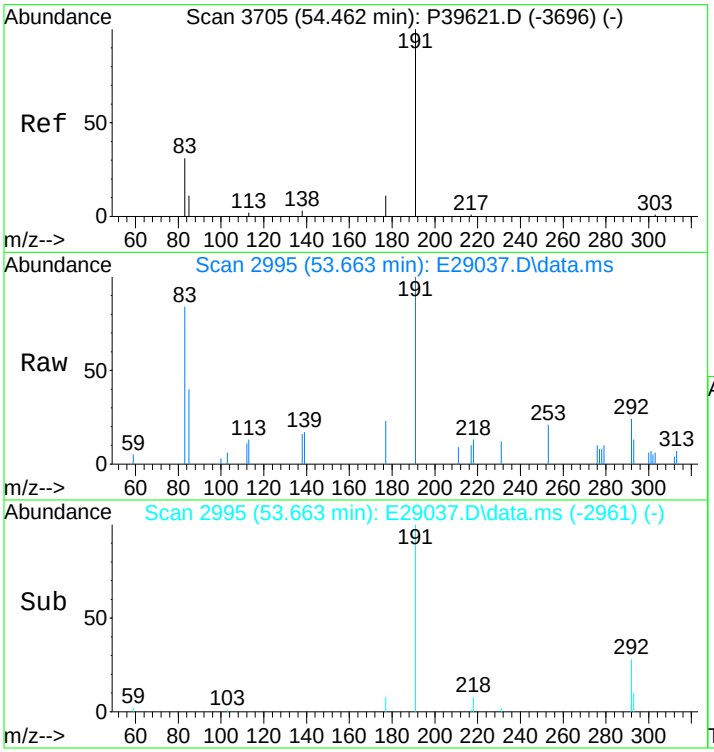




#118
30-Homohopane-22S (T21)
Concen: 543.91 ng/ml m
RT: 53.437 min Scan# 2980
Delta R.T. 0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

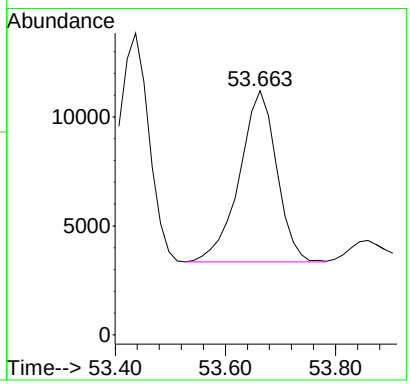
Tgt Ion:191 Resp: 40092

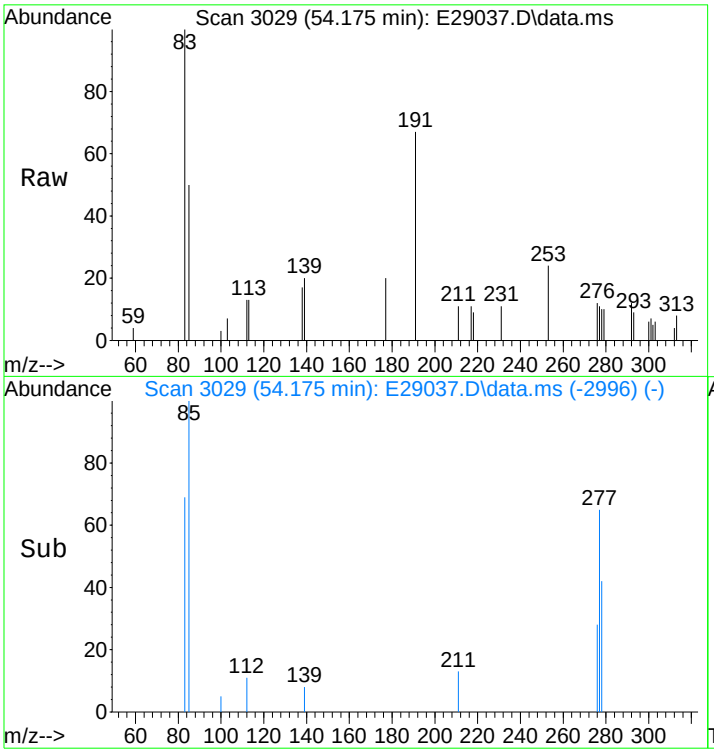




#119
30-Homohopane-22R (T22)
Concen: 501.60 ng/ml
RT: 53.663 min Scan# 2995
Delta R.T. 0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

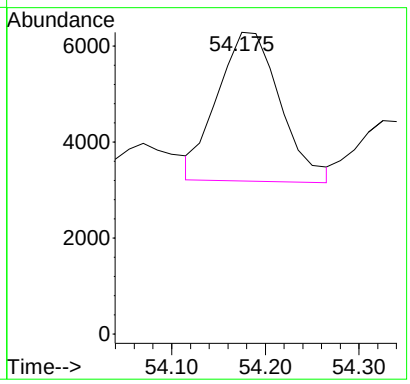
Tgt Ion:191 Resp: 36973

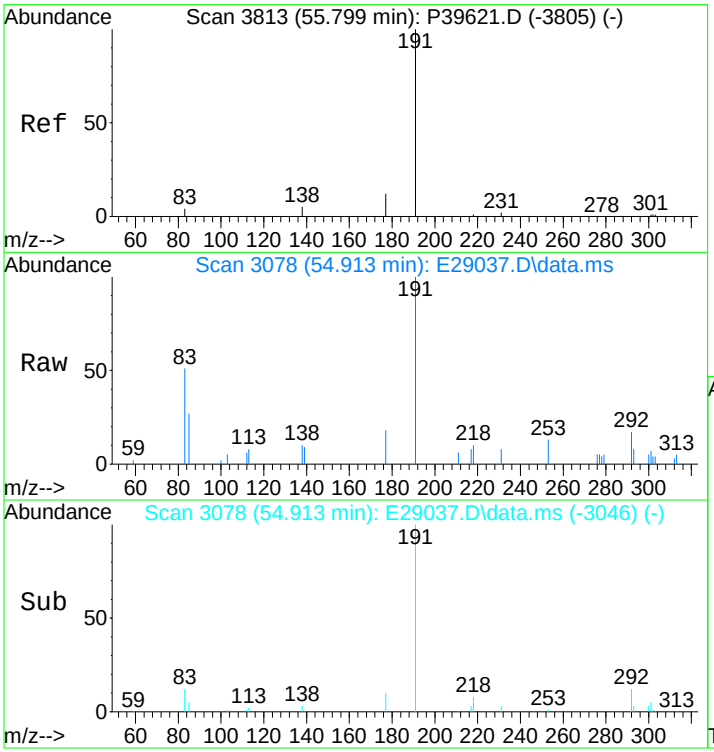




#120
Gammacerane/C32-diahopane
Concen: 195.91 ng/mL
RT: 54.175 min Scan# 3029
Delta R.T. 0.003 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

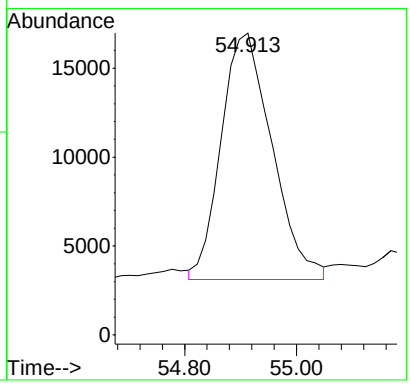
Tgt Ion:191 Resp: 14441

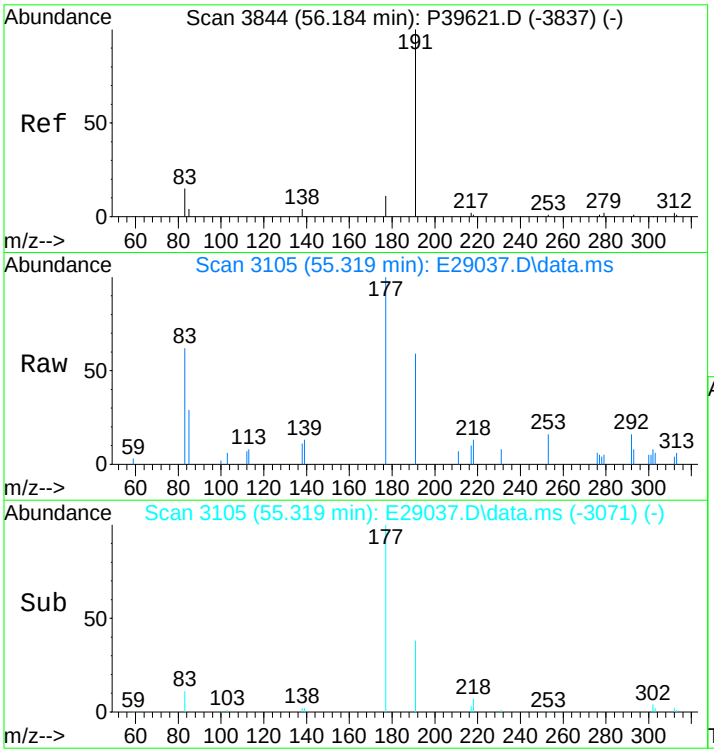




#121
30,31-Bishomohopane-22S (T26)
Concen: 1189.71 ng/ml m
RT: 54.913 min Scan# 3078
Delta R.T. -0.013 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

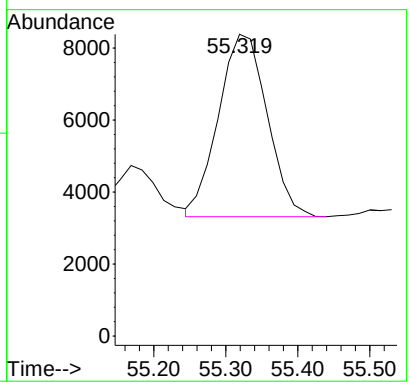
Tgt Ion:191 Resp: 87694

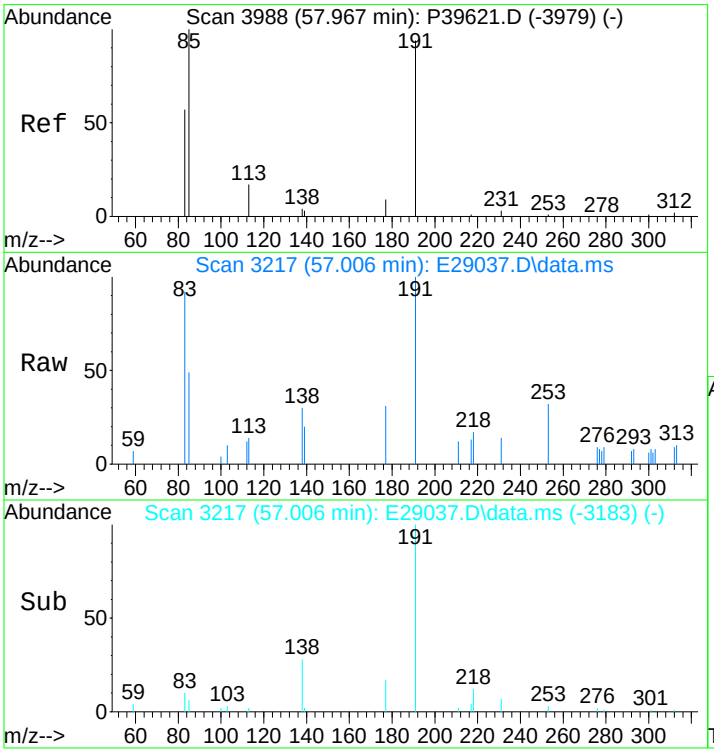




#122
30,31-Bishomohopane-22R (T27)
Concen: 322.57 ng/ml
RT: 55.319 min Scan# 3105
Delta R.T. 0.017 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

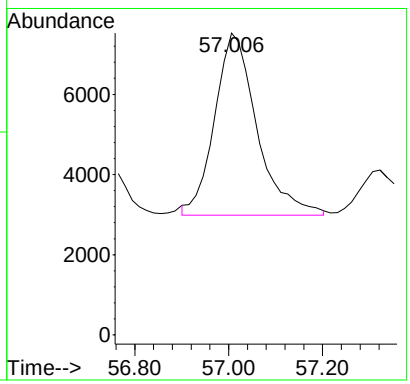
Tgt Ion:191 Resp: 23777

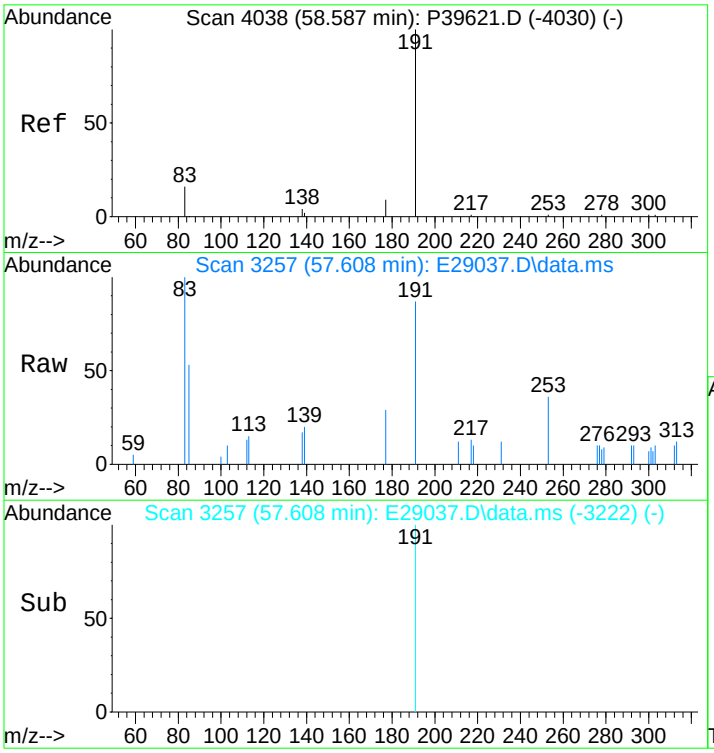




#123
30,31-Trishomohopane-22S (T30)
Concen: 385.11 ng/ml m
RT: 57.006 min Scan# 3217
Delta R.T. 0.015 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

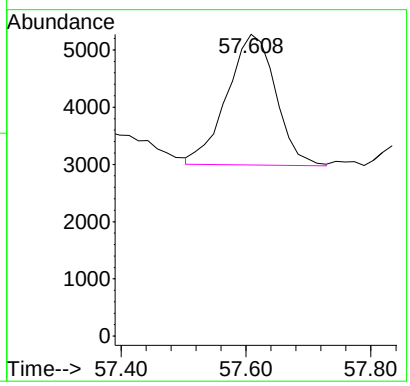
Tgt Ion:191 Resp: 28387

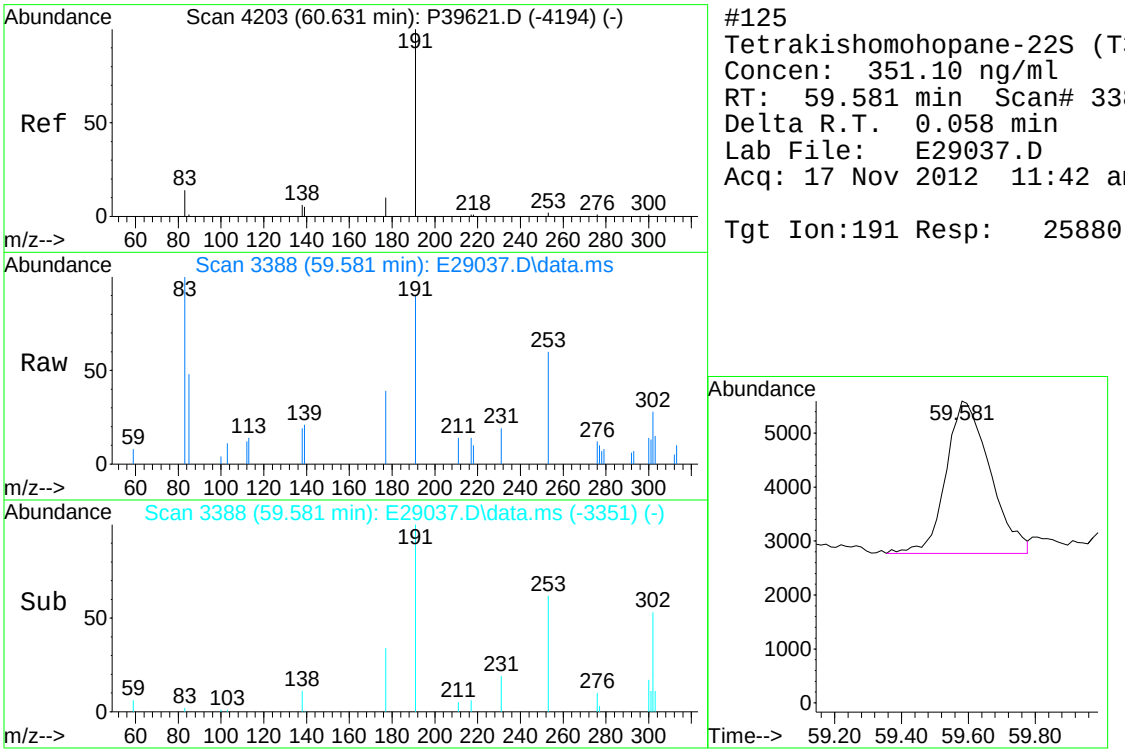




#124
30,31-Trishomohopane-22R (T31)
Concen: 167.51 ng/ml
RT: 57.608 min Scan# 3257
Delta R.T. 0.030 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

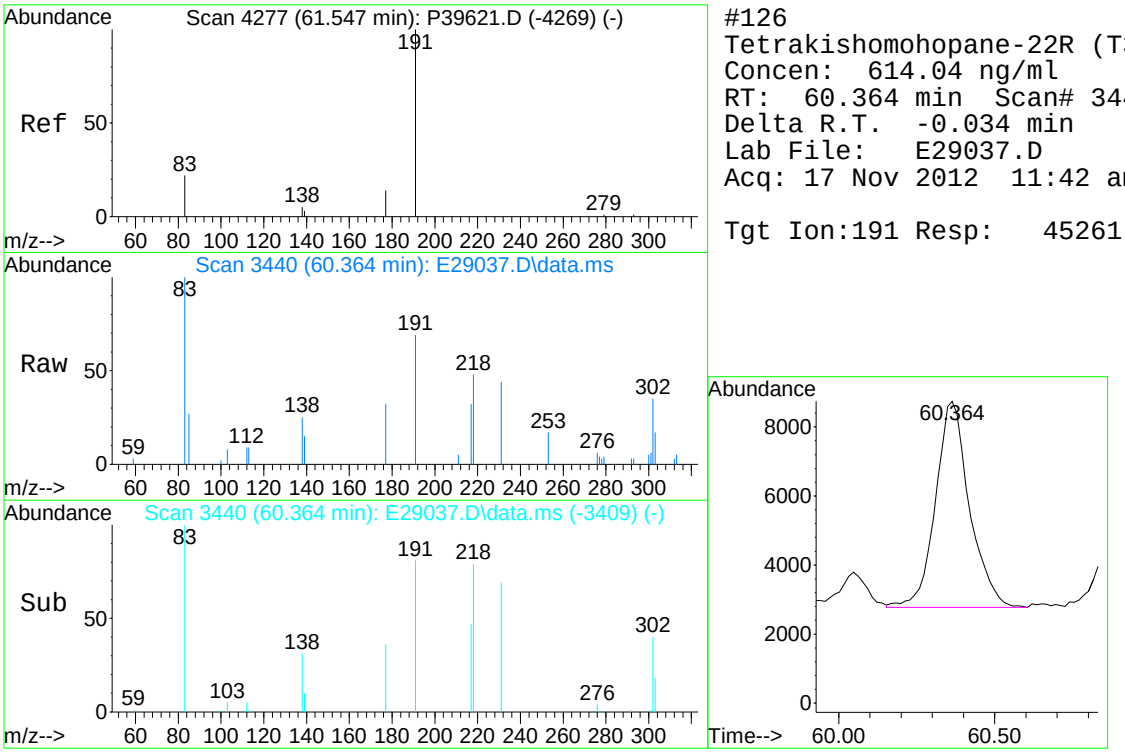
Tgt Ion:191 Resp: 12347





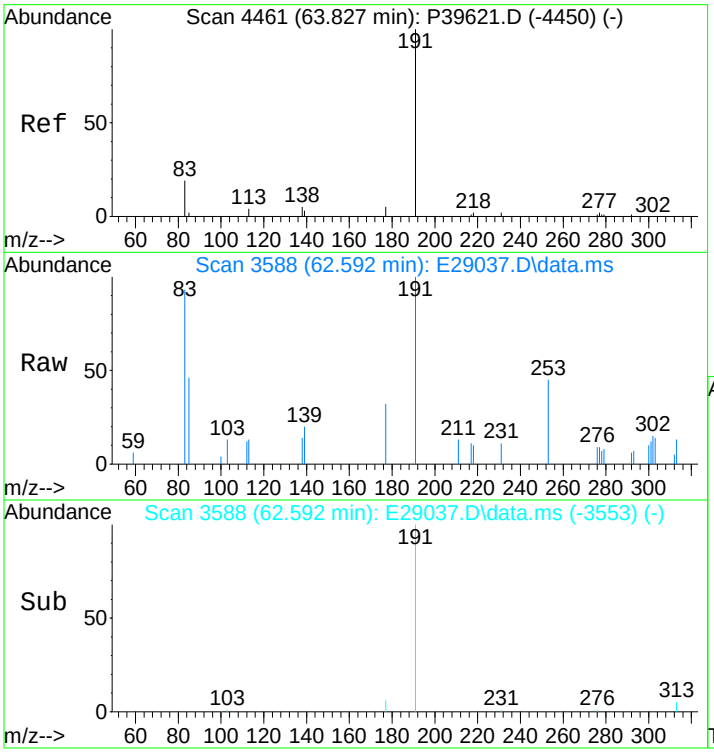
#125
Tetrakishomohopane-22S (T32)
Concen: 351.10 ng/ml
RT: 59.581 min Scan# 3388
Delta R.T. 0.058 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:191 Resp: 25880



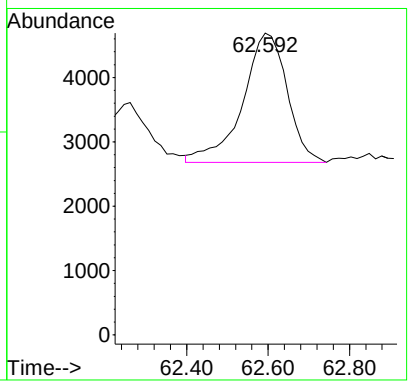
#126
Tetrakishomohopane-22R (T33)
Concen: 614.04 ng/ml
RT: 60.364 min Scan# 3440
Delta R.T. -0.034 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

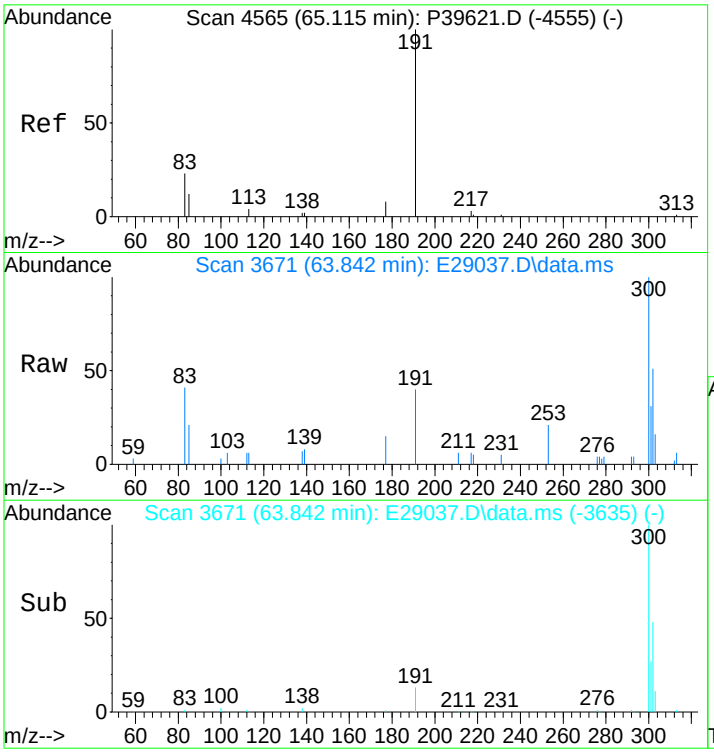
Tgt Ion:191 Resp: 45261



#127
Pentakishomohopane-22S (T34)
Concen: 207.11 ng/ml
RT: 62.592 min Scan# 3588
Delta R.T. 0.024 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

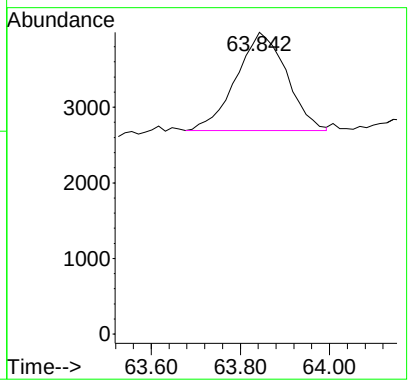
Tgt Ion:191 Resp: 15266

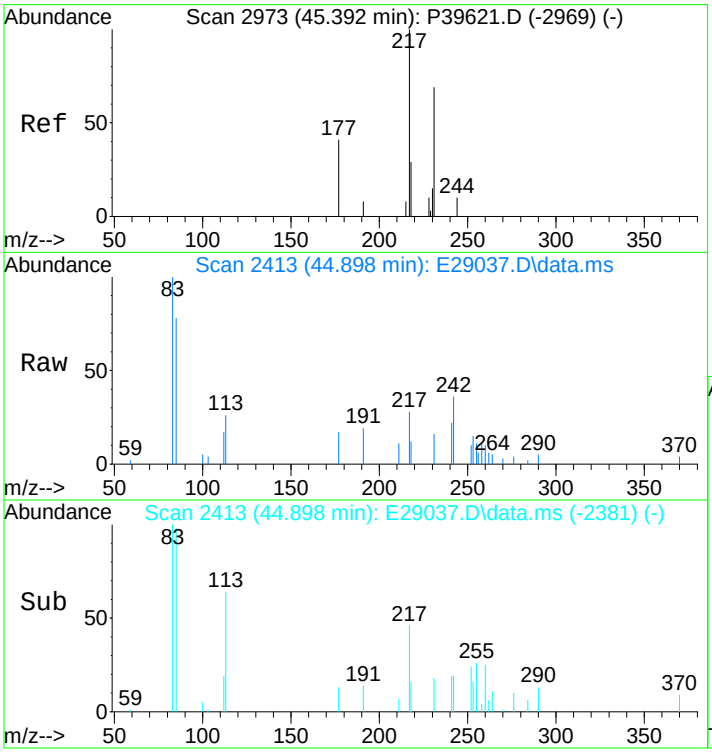




#128
Pentakishomohopane-22R (T35)
Concen: 138.61 ng/ml
RT: 63.842 min Scan# 3671
Delta R.T. 0.038 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

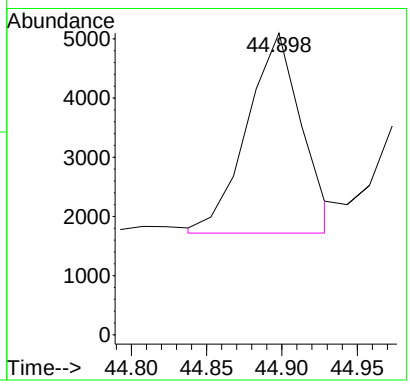
Tgt Ion:191 Resp: 10217

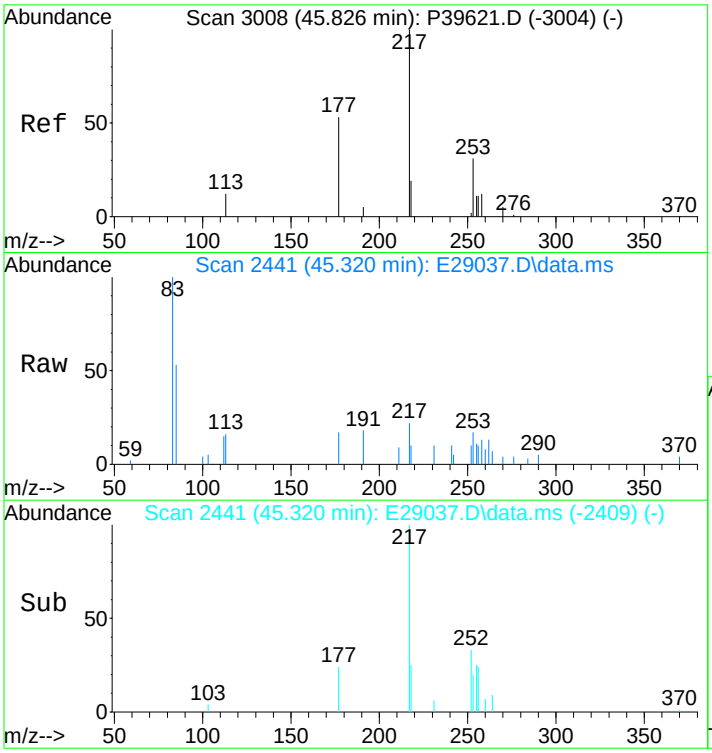




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 219.82 ng/ml m
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

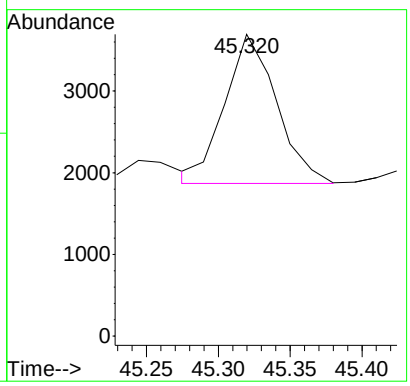
Tgt Ion:217 Resp: 8509

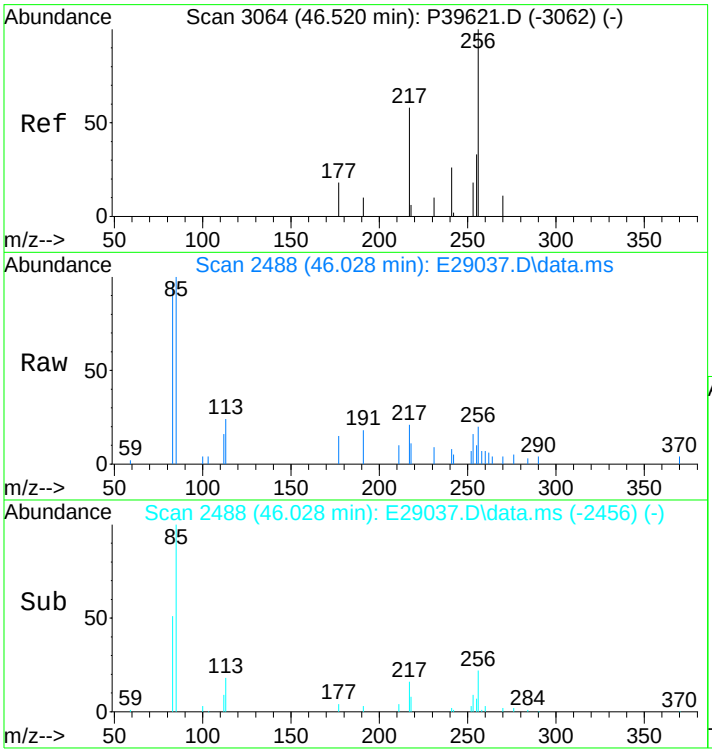




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 117.98 ng/ml m
RT: 45.320 min Scan# 2441
Delta R.T. -0.018 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

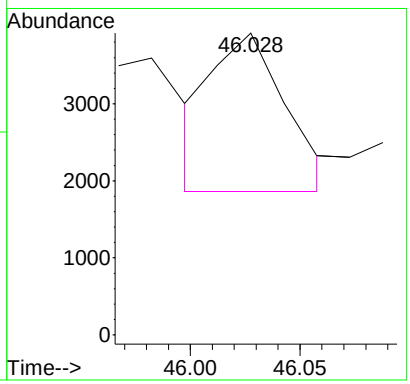
Tgt Ion:217 Resp: 4567

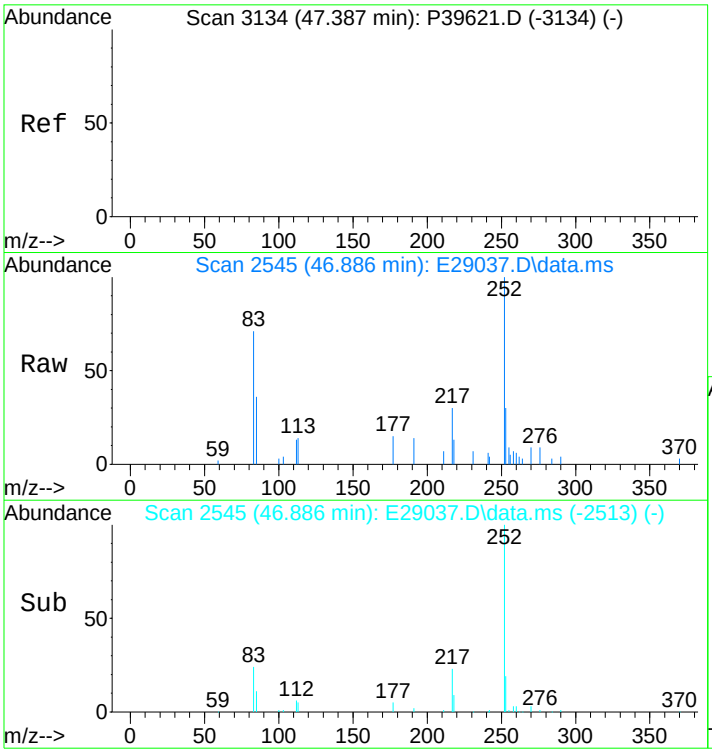




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 124.28 ng/ml m
RT: 46.028 min Scan# 2488
Delta R.T. -0.018 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

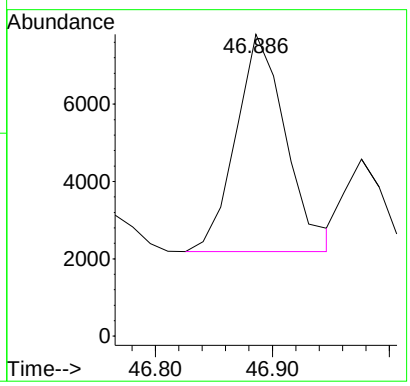
Tgt Ion:217 Resp: 4811

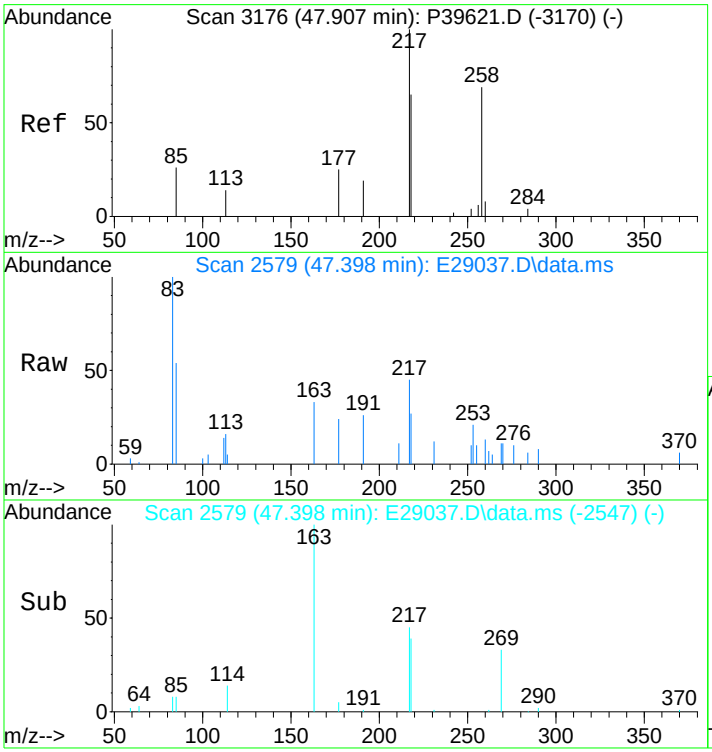




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 432.99 ng/ml
RT: 46.886 min Scan# 2545
Delta R.T. -0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

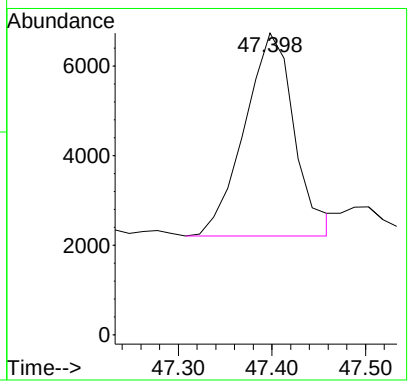
Tgt Ion:217 Resp: 16761

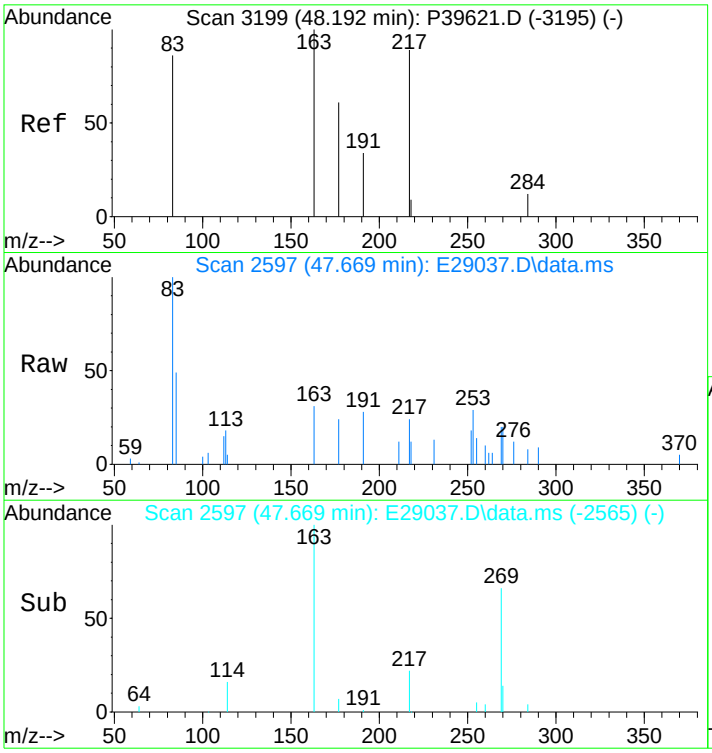




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 434.16 ng/ml
RT: 47.398 min Scan# 2579
Delta R.T. -0.020 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

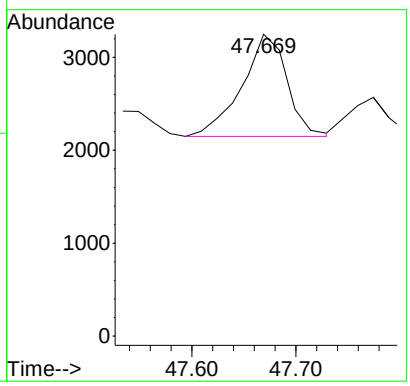
Tgt Ion:217 Resp: 16806

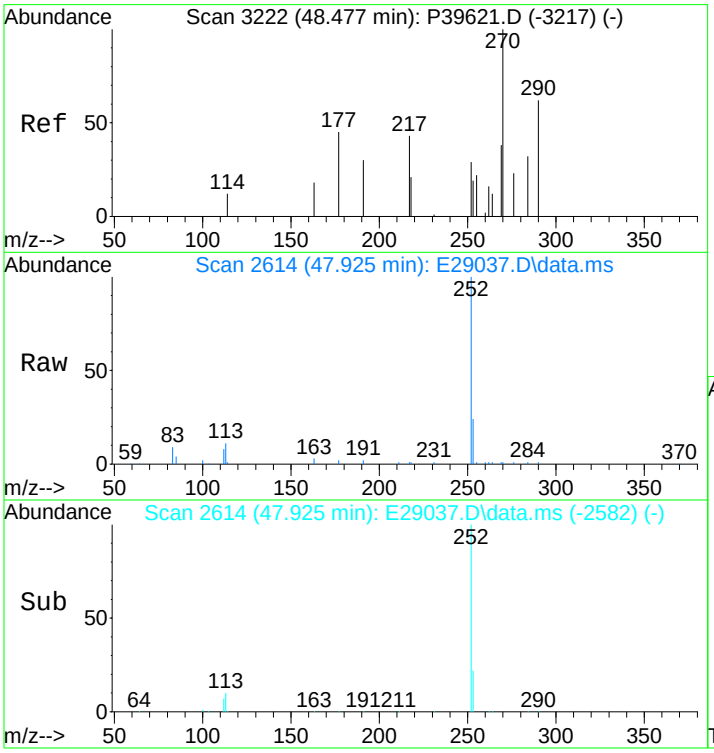




#135
Unknown Sterane (S18)
Concen: 85.90 ng/ml
RT: 47.669 min Scan# 2597
Delta R.T. -0.020 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

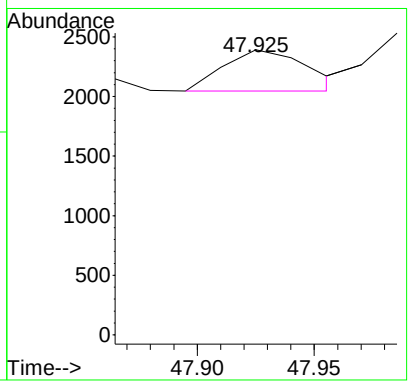
Tgt Ion:217 Resp: 3325

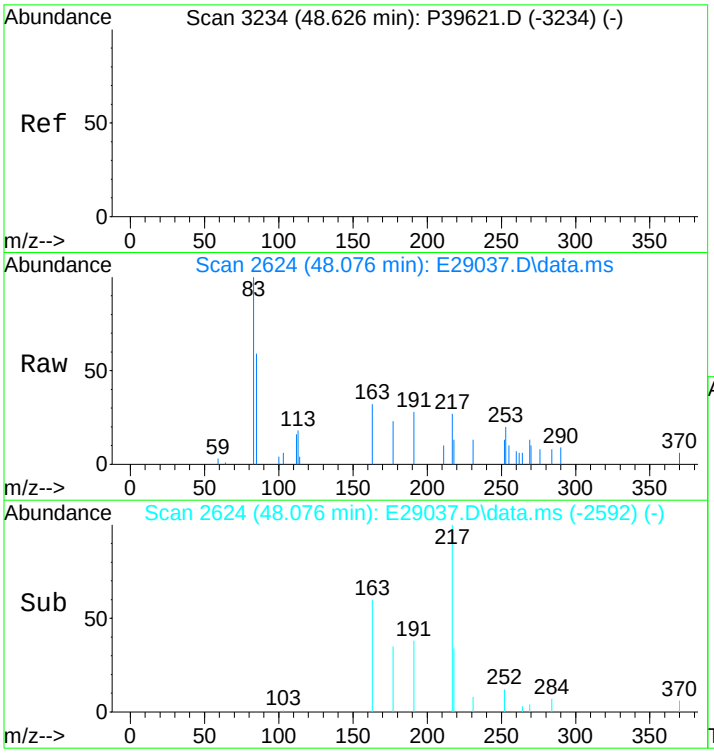




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 22.09 ng/ml
RT: 47.925 min Scan# 2614
Delta R.T. -0.020 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

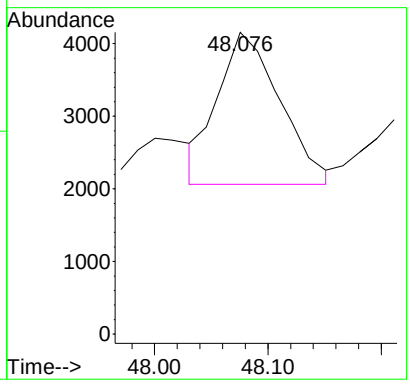
Tgt Ion:217 Resp: 855

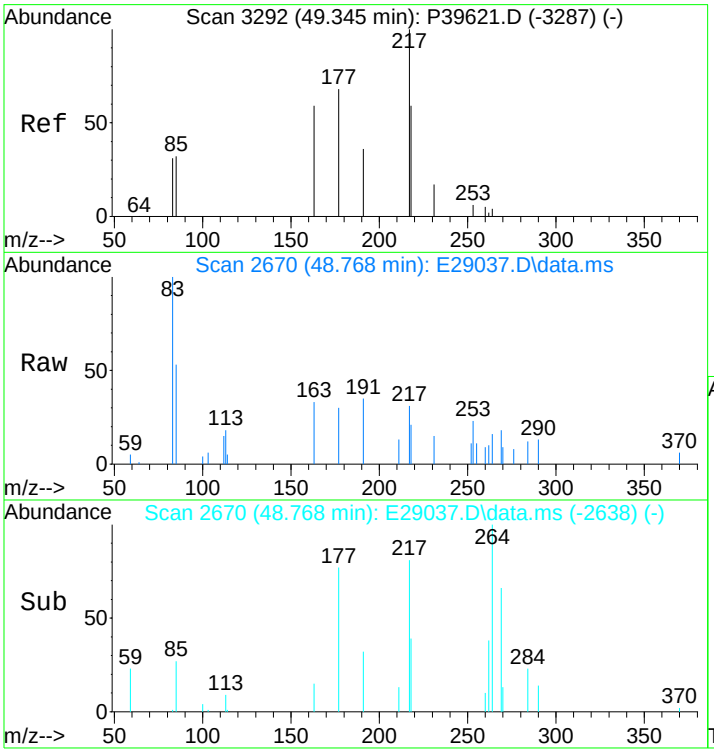




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 206.28 ng/ml m
RT: 48.076 min Scan# 2624
Delta R.T. -0.021 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

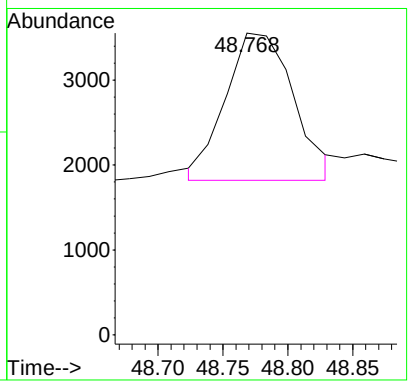
Tgt Ion:217 Resp: 7985

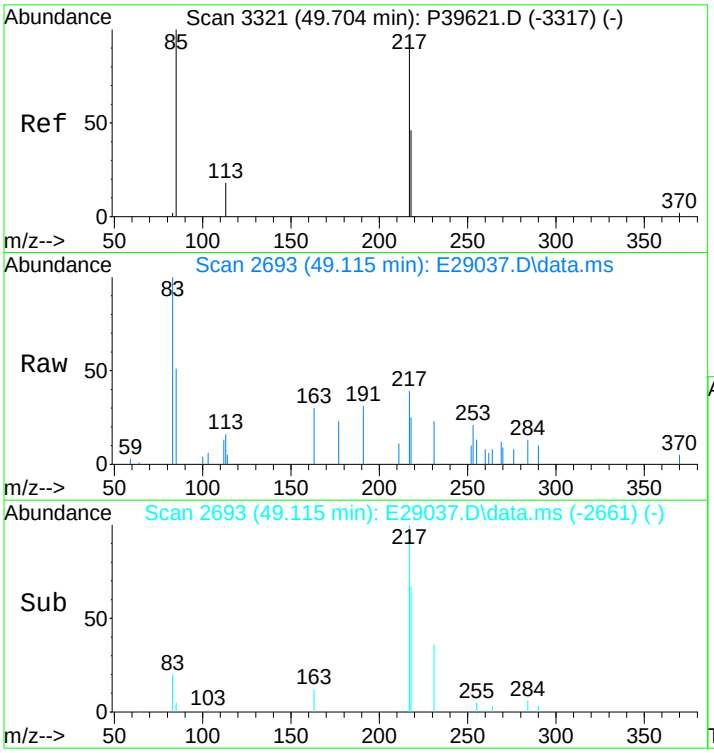




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 163.47 ng/ml m
RT: 48.768 min Scan# 2670
Delta R.T. -0.021 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

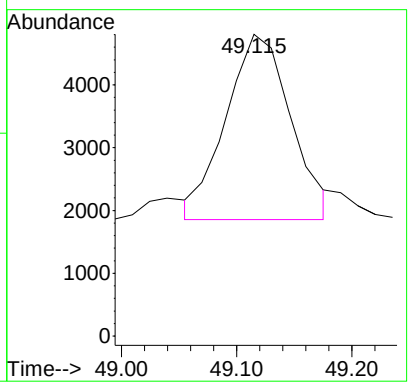
Tgt Ion:217 Resp: 6328

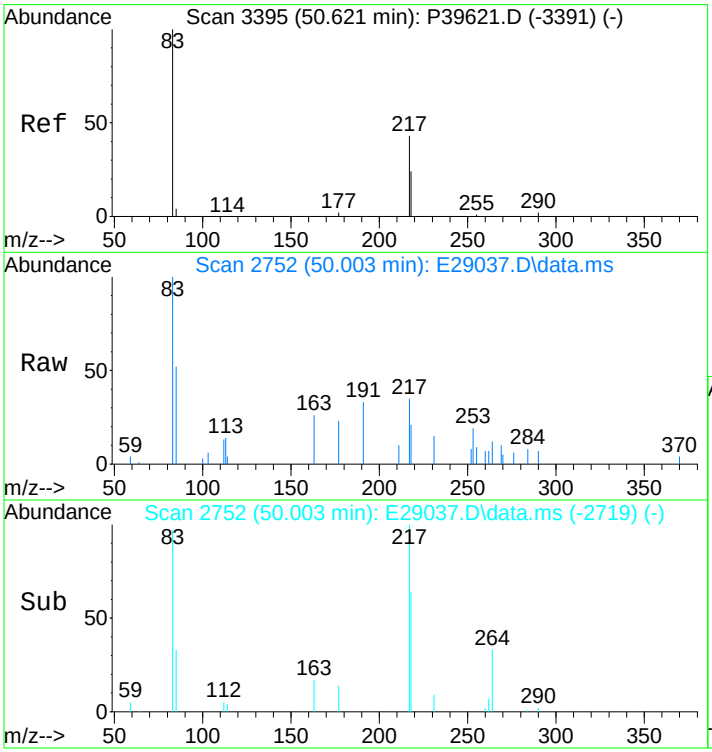




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 298.58 ng/ml m
RT: 49.115 min Scan# 2693
Delta R.T. -0.022 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

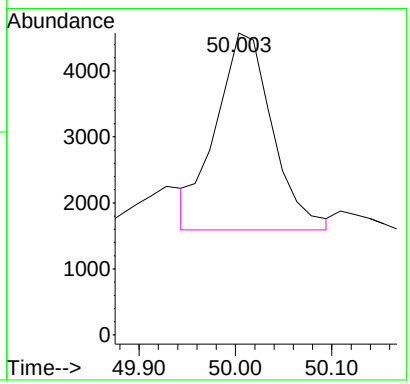
Tgt Ion:217 Resp: 11558

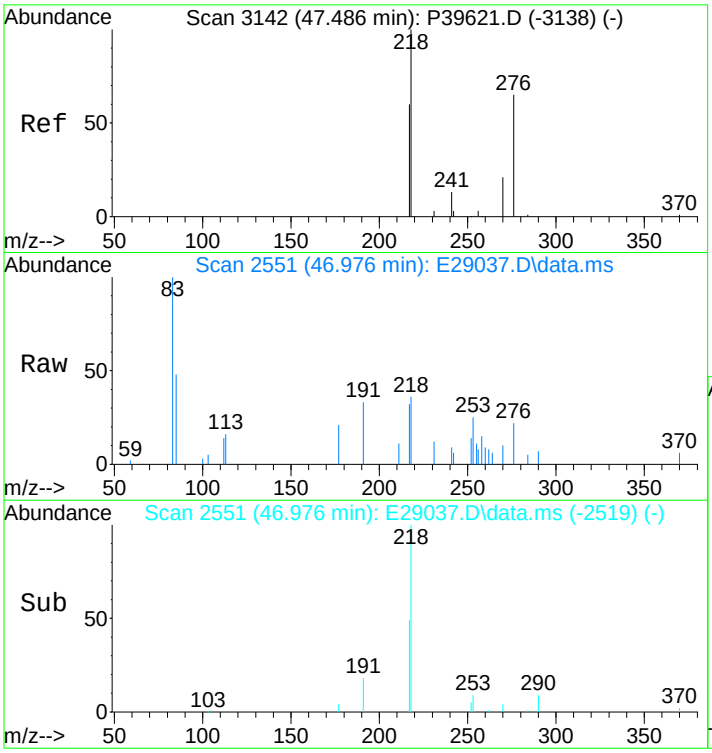




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 312.69 ng/ml m
RT: 50.003 min Scan# 2752
Delta R.T. -0.008 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

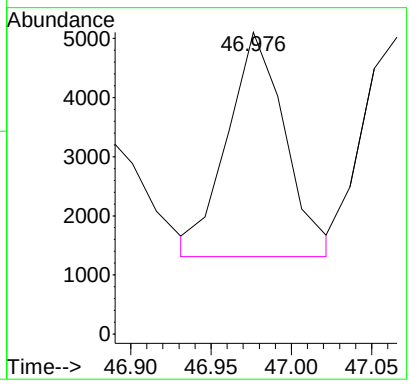
Tgt Ion:217 Resp: 12104

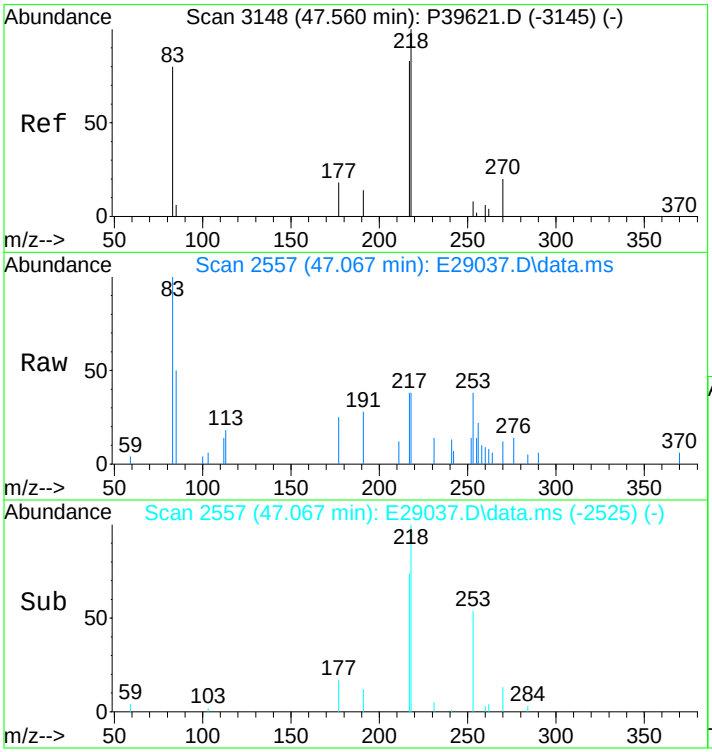




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 244.95 ng/ml m
RT: 46.976 min Scan# 2551
Delta R.T. -0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

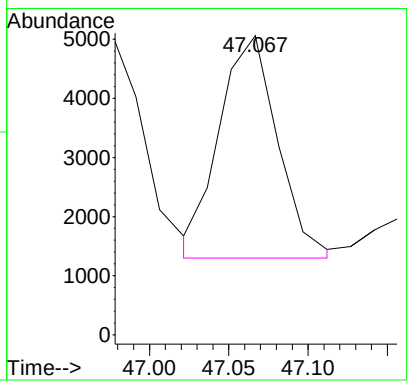
Tgt Ion:218 Resp: 9482

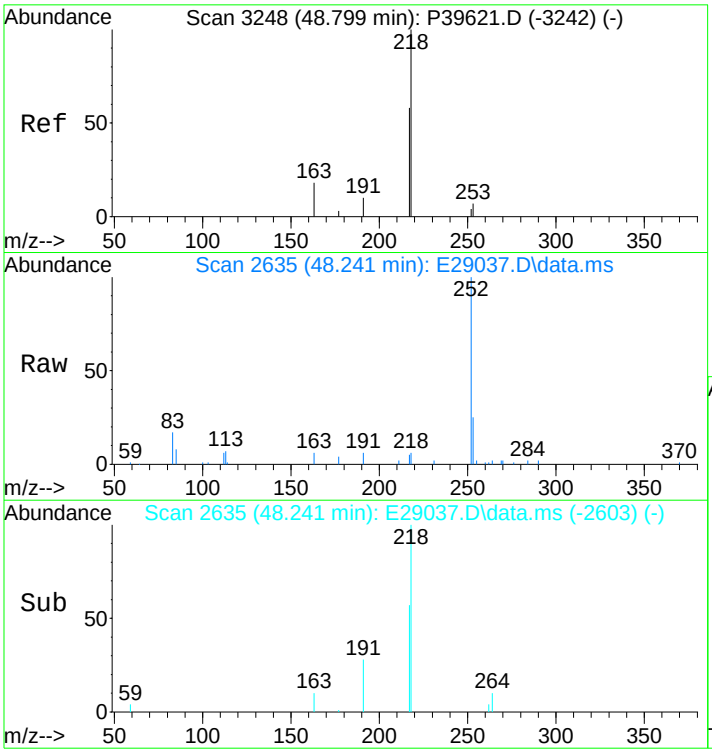




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 247.79 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.019 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

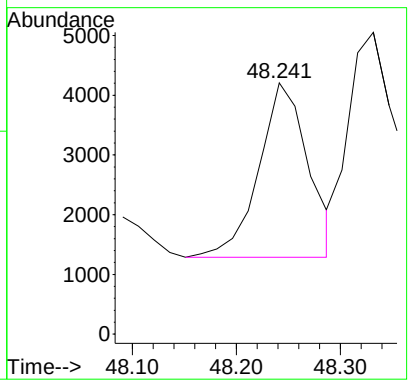
Tgt Ion:218 Resp: 9592

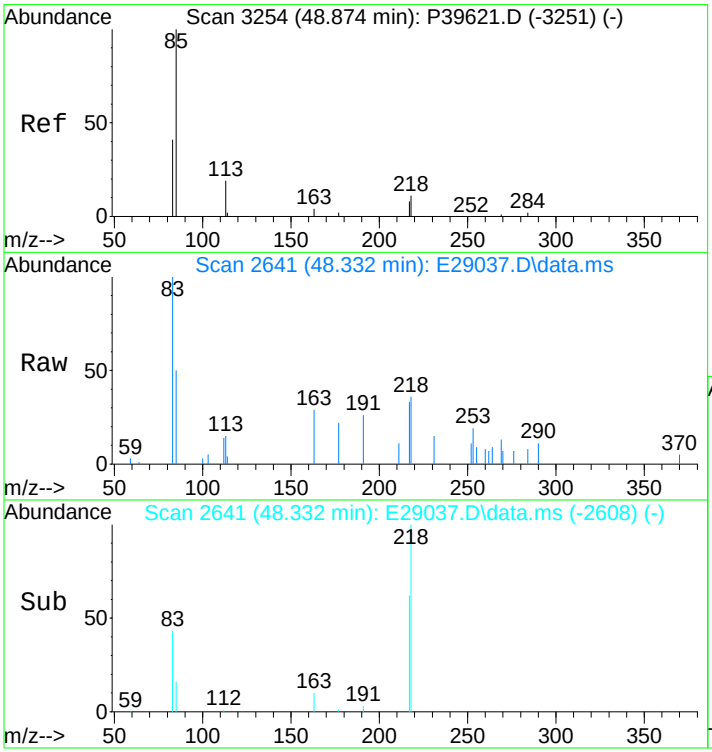




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 250.22 ng/ml
RT: 48.241 min Scan# 2635
Delta R.T. -0.021 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

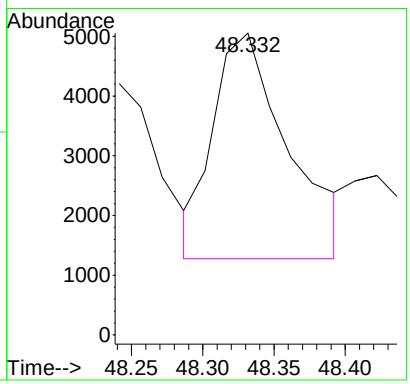
Tgt Ion:218 Resp: 9686

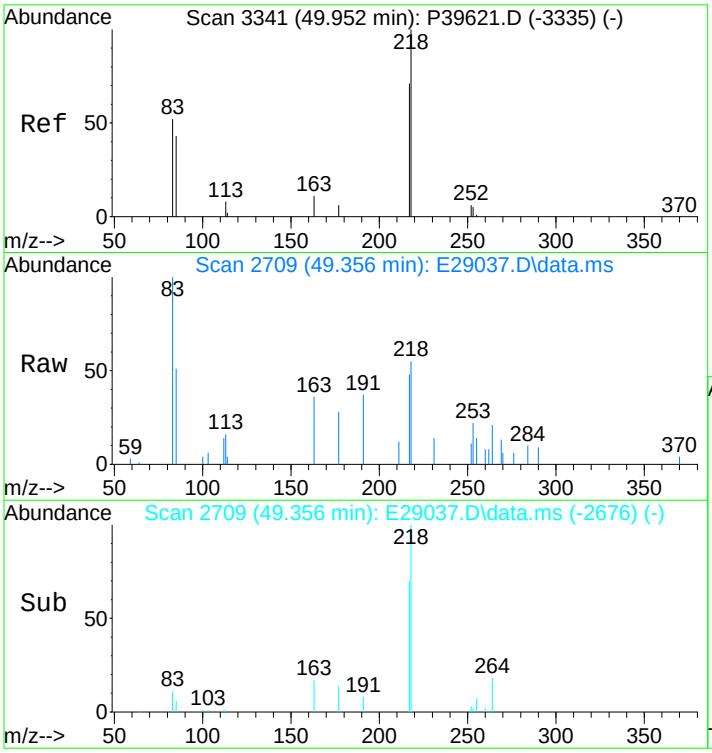




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 357.35 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

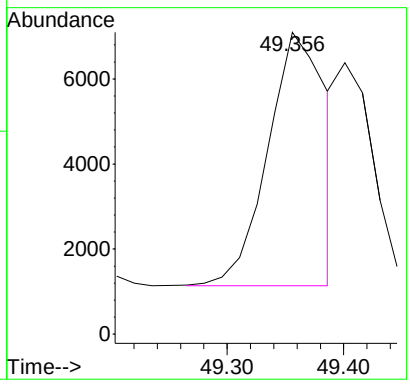
Tgt Ion:218 Resp: 13833

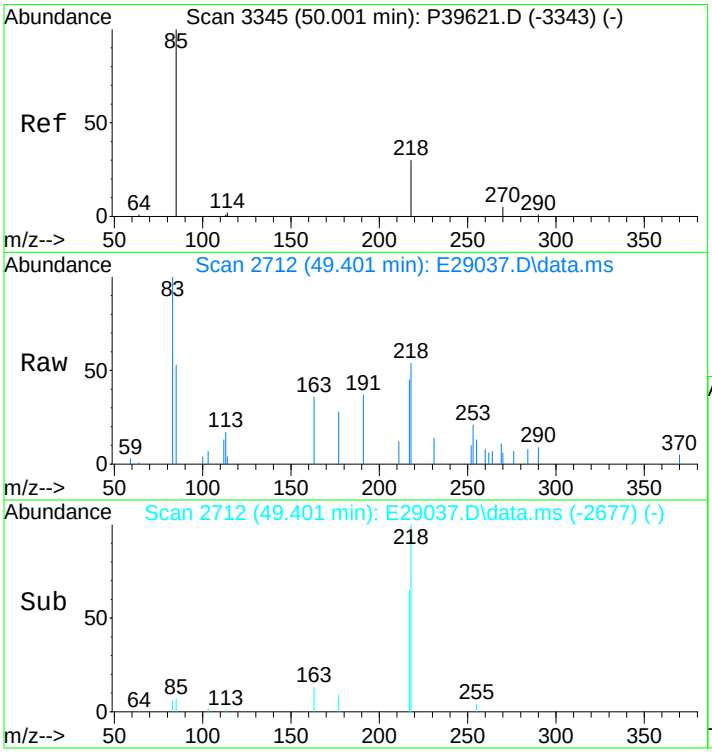




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 533.28 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. -0.007 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

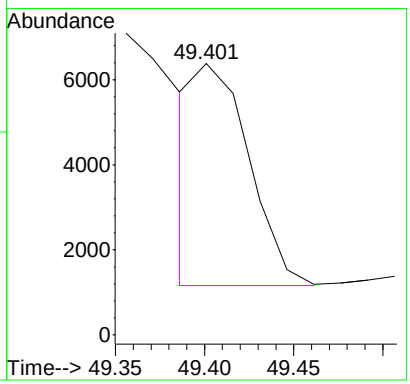
Tgt Ion:218 Resp: 20643

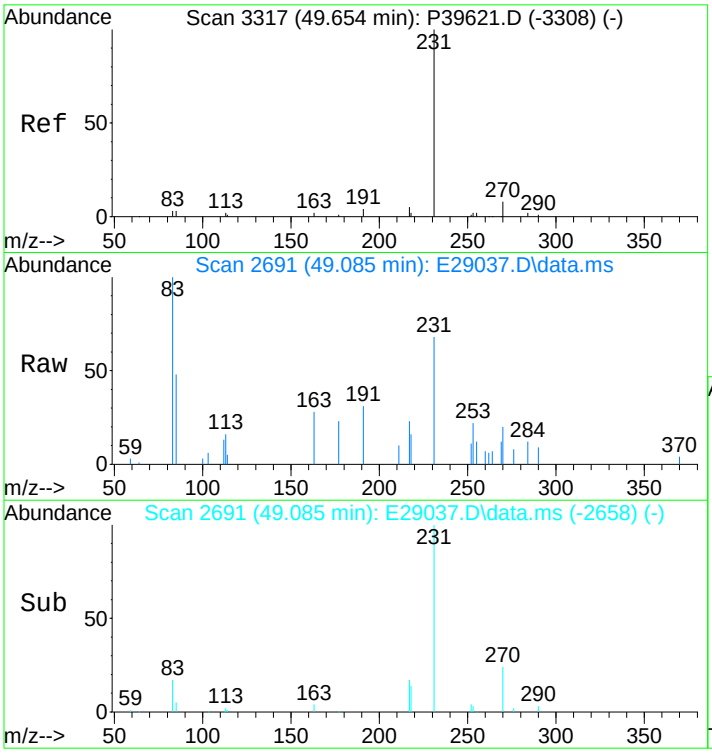




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 282.88 ng/ml m
RT: 49.401 min Scan# 2712
Delta R.T. 0.023 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

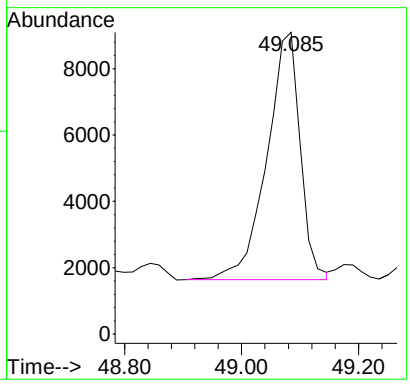
Tgt Ion:218 Resp: 10950

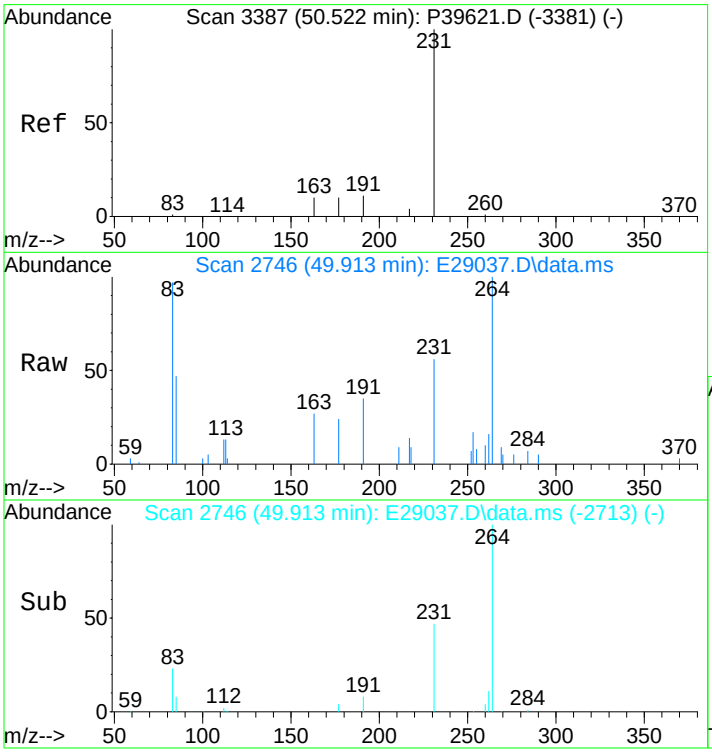




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 761.44 ng/mL
RT: 49.085 min Scan# 2691
Delta R.T. -0.007 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

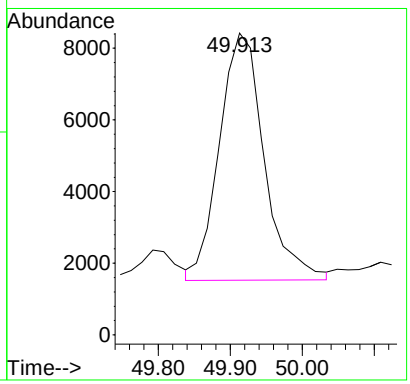
Tgt Ion:231 Resp: 29475

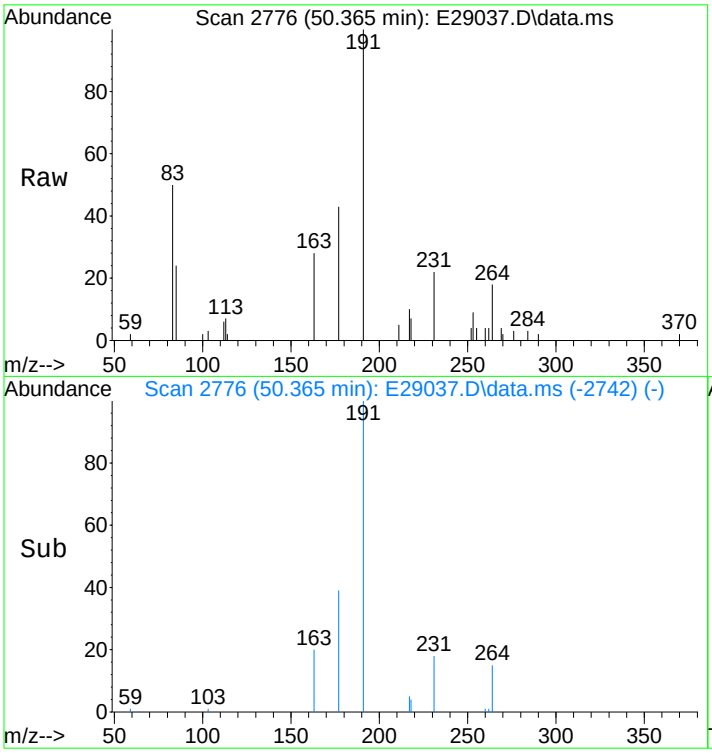




#148
C28,20S-triaromatic steroid
Concen: 767.59 ng/mL
RT: 49.913 min Scan# 2746
Delta R.T. -0.007 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

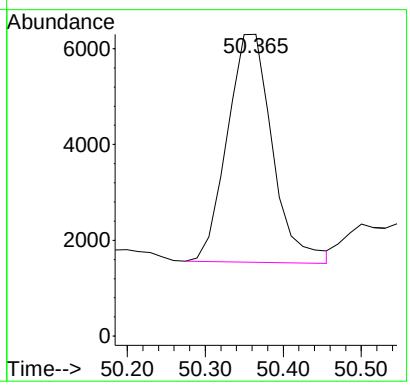
Tgt Ion:231 Resp: 29713

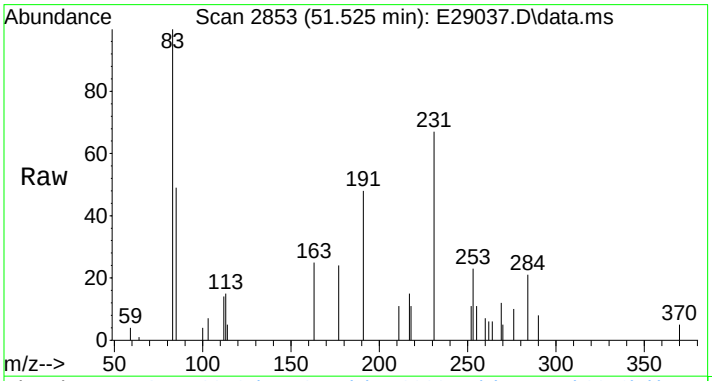




#149
C27,20R-triaromatic steroid
Concen: 494.81 ng/mL
RT: 50.365 min Scan# 2776
Delta R.T. 0.007 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

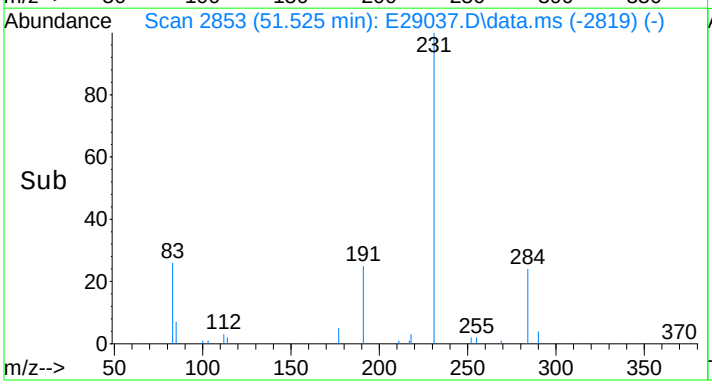
Tgt Ion:231 Resp: 19154

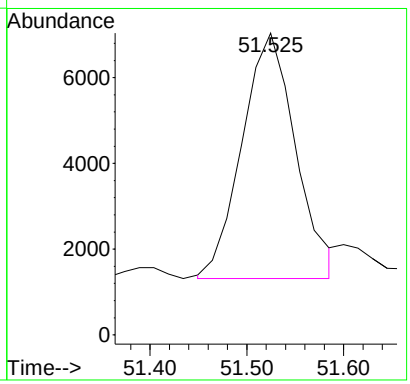




#150
C28,20R-triaromatic steroid
Concen: 569.78 ng/mL m
RT: 51.525 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29037.D
Acq: 17 Nov 2012 11:42 am

Tgt Ion:231 Resp: 22056





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	38910M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	96149	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	49282	360.084	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.01%#			
42) Phenanthrene-d10	32.100	188	63866	455.471	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.55%#			
83) Benzo[b]fluoranthene-d12	46.690	264	89725	454.274	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.43%#			
88) Benzo[a]pyrene-d12	47.850	264	80732	421.845	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.18%#			
129) 5B(H)Cholane - Surr	43.377	217	18337	483.897	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.39%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	248	7.968	ng/mL	100
5) C1-Decalins	17.814	152	839M5	26.956	ng/mL	
6) C2-Decalins	19.139	166	3097M5	99.504	ng/mL	
7) C3-Decalins	21.622	180	5530M5	177.674	ng/mL	
8) C4-Decalins	25.010	194	13200M5	424.104	ng/mL	
10) Naphthalene	19.304	128	16559	108.191	ng/mL#	100
11) C1-Naphthalenes	22.014	142	24520M5	160.205	ng/mL	
12) C2-Naphthalenes	24.859	156	76971M5	502.902	ng/mL	
13) C3-Naphthalenes	27.539	170	131442M5	858.797	ng/mL	
14) C4-Naphthalenes	29.978	184	126474M5	826.338	ng/mL	
16) 2-Methylnaphthalene	22.014	142	14156	145.218	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	10593	111.834	ng/mL#	100
18) Benzothiophene	19.530	134	569M3	4.497	ng/mL	
19) C1-Benzo(b)thiophenes	22.405	148	3301M5	26.089	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	12566M5	99.314	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	30682M5	242.492	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	37967M5	300.068	ng/mL	
23) Biphenyl	23.896	154	3743M4	30.381	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	17690	201.329	ng/mL#	100
25) Dibenzofuran	26.982	168	10904M3	79.943	ng/mL	
26) Acenaphthylene	25.597	152	39245	257.185	ng/mL#	100
27) Acenaphthene	26.335	153	8145	82.923	ng/mL	97
28) 2,3,5-Trimethylnaphthalen	27.900	170	7525M3	91.537	ng/mL	
29) Fluorene	28.367	166	17809M3	162.566	ng/mL	
30) C1-Fluorenes	30.745	180	22422M5	204.674	ng/mL	
31) C2-Fluorenes	32.943	194	53255M5	486.127	ng/mL	
32) C3-Fluorenes	34.795	208	71530M5	652.946	ng/mL	
33) Dibenzothiophene	31.694	184	31398	208.857	ng/mL#	76
34) 4-Methyldibenzothiophene(	33.485	198	32545	216.487	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	28543M3	189.866	ng/mL	
36) 1-Methyldibenzothiophene(	34.238	198	16305	108.460	ng/mL#	100
37) OTP	33.862	198	5343M3	35.541	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	88949M5	591.682	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	83606m	556.140	ng/mL	
39) C2-Dibenzothiophenes	35.172	212	171482M5	1140.685	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	211257M5	1405.265	ng/mL	
41) C4-Dibenzothiophenes	38.695	240	146930M5	977.367	ng/mL	
43) Phenanthrene	32.191	178	260594	1703.820	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.163	192	42057	274.978	ng/mL	100

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	49536	323.877	ng/mL	95
46) 2-Methylanthracene(2MA)	34.434	192	14901M3	97.426	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.615	192	58211	380.596	ng/mL	91
48) 1-Methylphenanthrene(1MP)	34.705	192	33584M3	219.579	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	204822M5	1339.171	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	247209M5	1616.306	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	247209m	1616.306	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	208194M5	1361.218	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	110968M5	725.533	ng/mL	
55) Anthracene	32.371	178	53994M3	408.426	ng/mL	
56) Carbazole	33.064	167	21892	160.903	ng/mL	100
57) 1-Methylphenanthrene	34.705	192	33676M3	288.604	ng/mL	
58) Fluoranthene	36.993	202	726217M3	4299.514	ng/mL	
59) Benzo(b)fluorene	39.538	216	57477M3	510.674	ng/mL	
60) Pyrene	37.882	202	696927	4059.468	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	462739M5	2695.367	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	266572M5	1552.732	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	174696M5	1017.571	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	157983M5	920.221	ng/mL	
66) Naphthobenzothiophene	41.751	234	84061	496.446	ng/ml#	92
67) Naphthobenzothiophene-2,1	41.751	234	84061	496.446	ng/mL#	92
68) Naphthobenzothiophene-1,2	42.097	234	18203	107.503	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	25368M3	149.818	ng/mL	
70) C1-Naphthobenzothiophenes	43.166	248	144717M5	854.666	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	178391M5	1053.537	ng/ml	
72) C3-Naphthobenzothiophenes	46.810	276	147202M5	869.342	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	113289M5	669.060	ng/mL	
75) Benz[a]anthracene	42.700	228	382421M3	2042.500	ng/mL	
77) Chrysene/Triphenylene	42.850	228	483474	2508.183	ng/mL	99
78) C1-Chrysenes	44.341	242	276071M5	1432.211	ng/mL	
79) C2-Chrysenes	46.073	256	189338M5	982.254	ng/mL	
79) C2-Chrysenes BS	46.073	256	186267m	966.322	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	3071	15.932	ng/mL	100
81) C3-Chrysenes	47.639	270	167729M5	870.150	ng/mL	
82) C4-Chrysenes	49.190	284	87572M5	454.309	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	543658	2498.129	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.841	252	464775M3	2075.820	ng/mL	
86) Benzo[a]fluoranthene	47.157	252	106399M3	475.209	ng/mL	
87) Benzo[e]pyrene	47.759	252	400764M4	1885.984	ng/mL	
89) Benzo[a]pyrene	47.940	252	515681	2536.169	ng/mL	96
90) Perylene	48.241	252	192573	895.647	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.639	276	451266M3	1885.818	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	110861M4	435.095	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	452893	1755.273	ng/mL	100
94) Hopane (T19)	51.705	191	111915	1550.959	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	25083	347.609	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.104	191	14252M3	197.509	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	20697	286.827	ng/ml	100
99) C24 Tetracyclic Terpane (	43.919	191	7528M3	104.326	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6968M3	96.565	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5991	83.025	ng/ml	100
102) C28 Tricyclic Terpane-22S	46.088	191	6425M3	89.040	ng/ml	
103) C28 Tricyclic Terpane-22R	46.238	191	9281M3	128.619	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	8310	115.163	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	8495	117.727	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	16819	233.084	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
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Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.151	191	7757M3	107.499	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10417	144.363	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.557	191	27630M3	382.907	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10764M3	149.171	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.536	191	14025	194.364	ng/ml	100
112) 30-Norhopane (T15)	50.365	191	77614	1075.603	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	20800	288.254	ng/ml	100
114) 17a(H)-Diahopane (X)	50.606	191	6696M3	92.796	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11730	162.559	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.524	191	6033	83.607	ng/ml	100
117) Moretane (T20)	52.368	191	17910M3	248.203	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	41463M3	574.609	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	36825	510.334	ng/ml	100
120) Gammacerane/C32-diahopane	54.190	191	13684M3	189.638	ng/mL	
121) 30,31-Bishomohopane-22S (	54.913	191G	87548M2	1213.272	ng/ml	
122) 30,31-Bishomohopane-22R (	55.319	191	24717	342.537	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	29281	405.787	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	13028M3	180.547	ng/ml	
125) Tetrakishomohopane-22S (T	59.596	191	23630M3	327.473	ng/ml	
126) Tetrakishomohopane-22R (T	60.364	191G	44256	613.316	ng/ml	100
127) Pentakishomohopane-22S (T	62.607	191	15776	218.630	ng/ml	100
128) Pentakishomohopane-22R (T	63.857	191	10912	151.222	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8814	232.593	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.320	217	4490M3	118.487	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	5018M3	132.420	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	16979	448.060	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16582	437.584	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3499	92.335	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.925	217	942	24.859	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	8063M3	212.775	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6801M3	179.472	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	11453M3	302.234	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	12024M3	317.302	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	9733M3	256.845	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	9936M3	262.202	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9657	254.839	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13767M3	363.298	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	21169M3	558.630	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	11226M3	296.244	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	31373	827.905	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	31350	827.298	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	20121	530.975	ng/mL	100
150) C28,20R-triaromatic stero	51.524	231	23165M3	611.303	ng/mL	

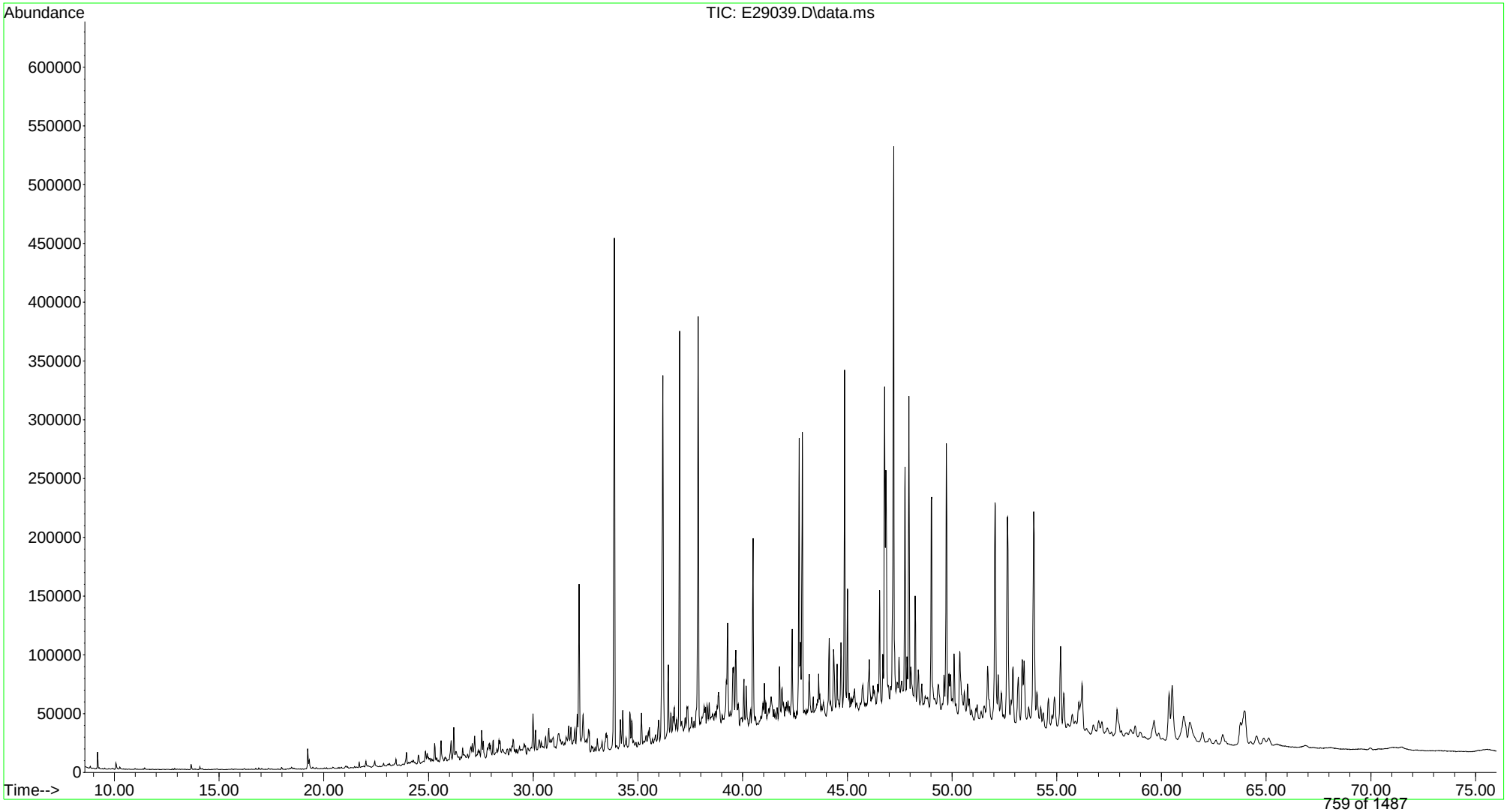
(#) = qualifier out of range (m) = manual integration (+) = signals summed

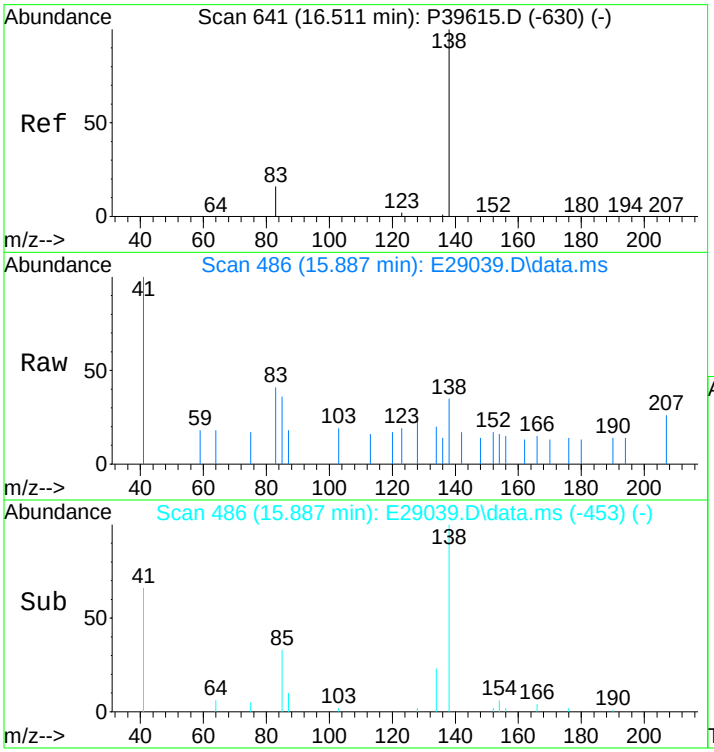
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29039.D
Acq On : 17 Nov 2012 1:11 pm
Operator : AC
Sample : 1210083-03
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 19 10:35:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

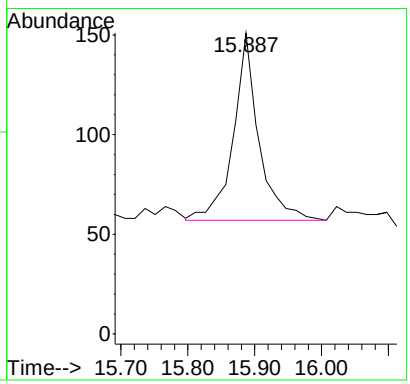
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

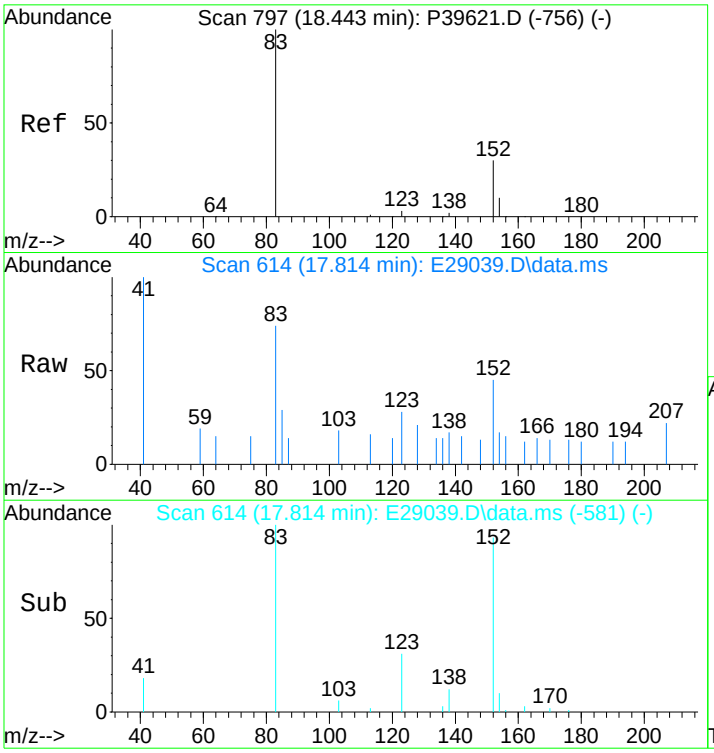




#3
trans-Decalin
Concen: 7.97 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

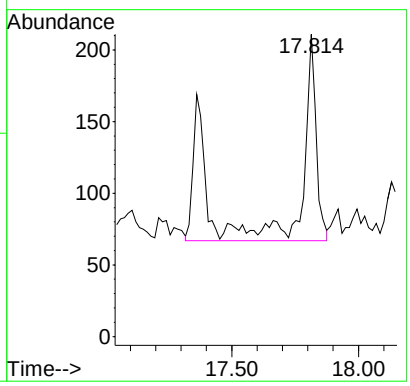
Tgt Ion:138 Resp: 248

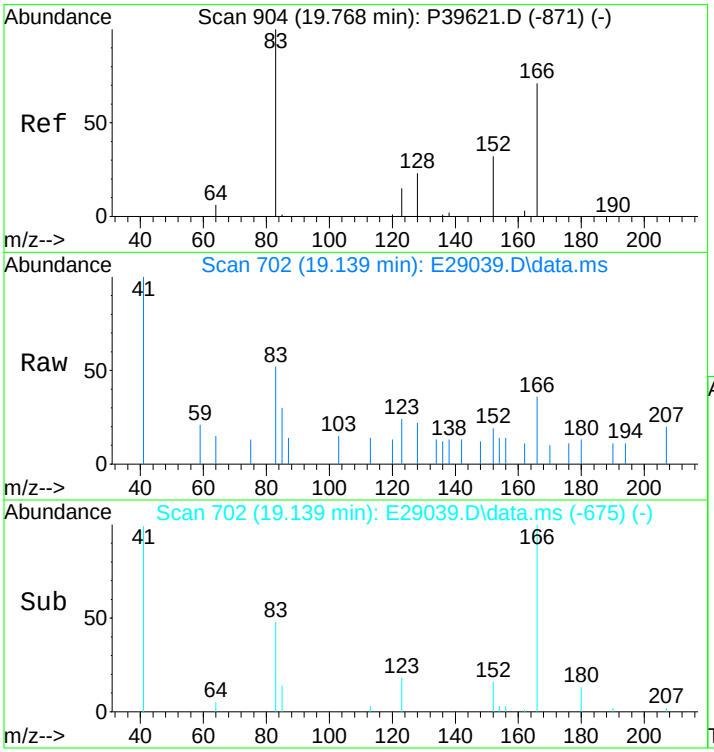




#5
C1-Decalins
Concen: 26.96 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

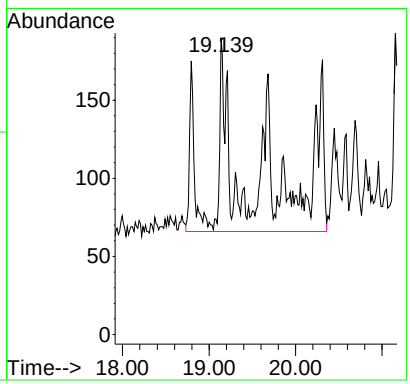
Tgt Ion:152 Resp: 839

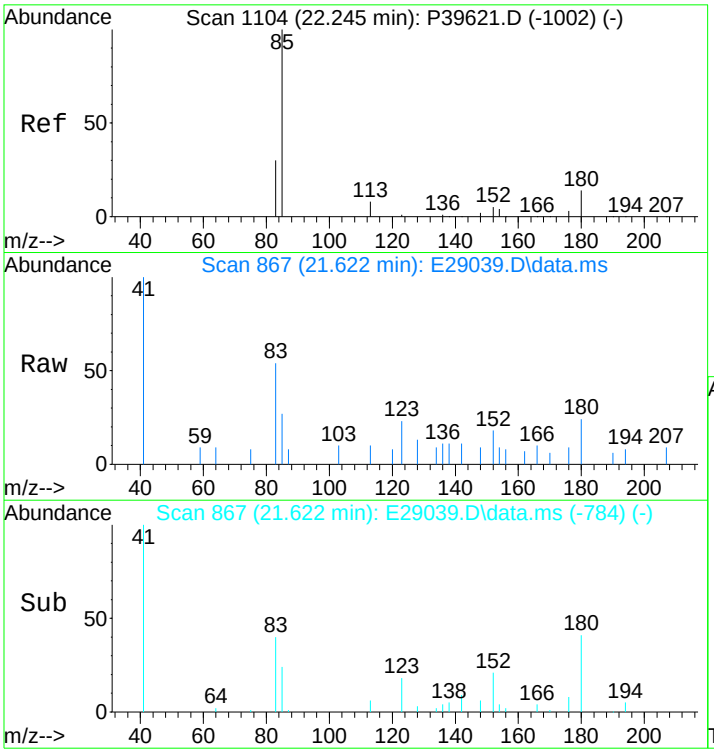




#6
C2-Decalins
Concen: 99.50 ng/mL m
RT: 19.139 min Scan# 702
Delta R.T. -0.215 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

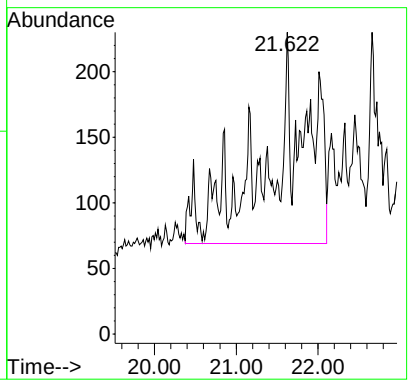
Tgt Ion:166 Resp: 3097

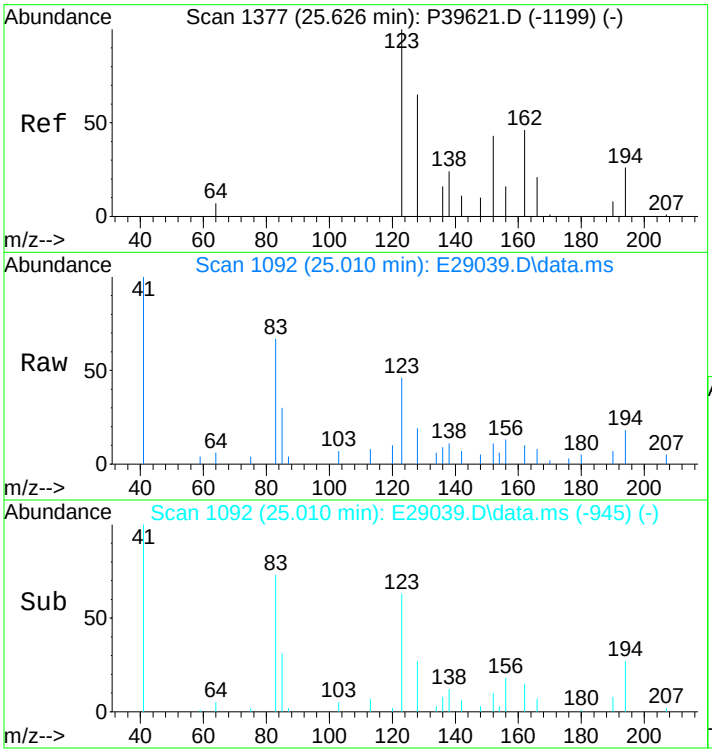




#7
C3-Decalins
Concen: 177.67 ng/mL m
RT: 21.622 min Scan# 867
Delta R.T. -0.135 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

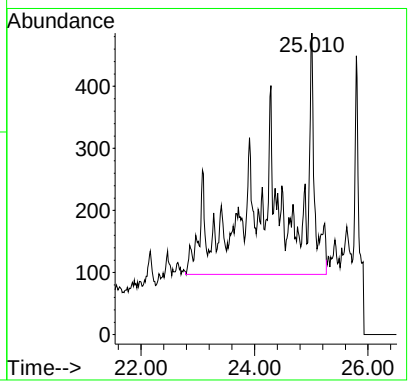
Tgt Ion:180 Resp: 5530

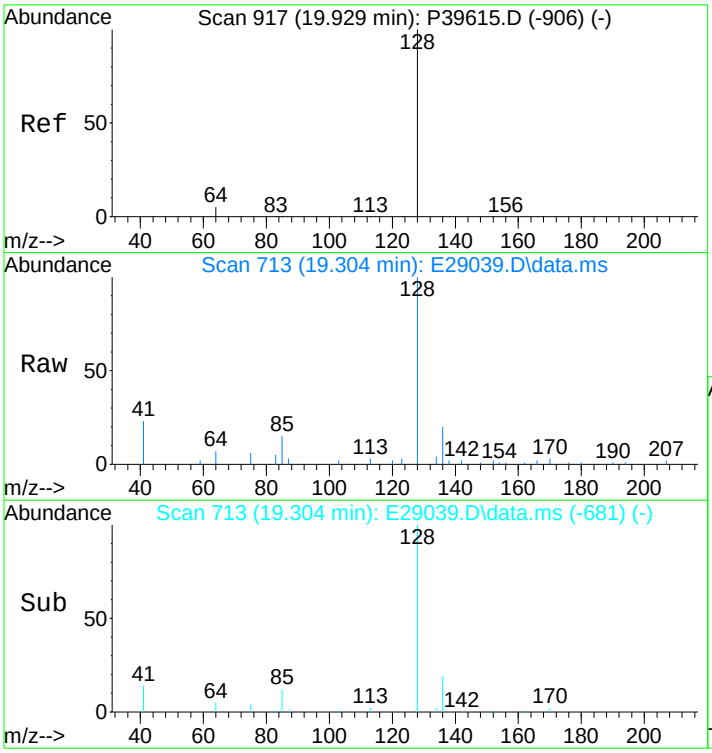




#8
C4-Decalins
Concen: 424.10 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.060 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:194 Resp: 13200

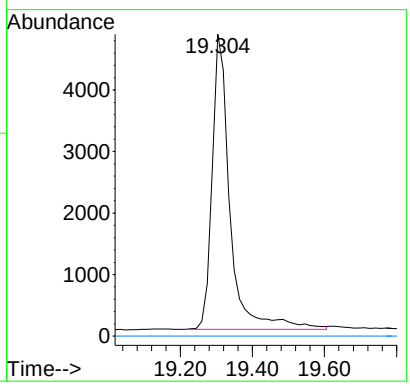


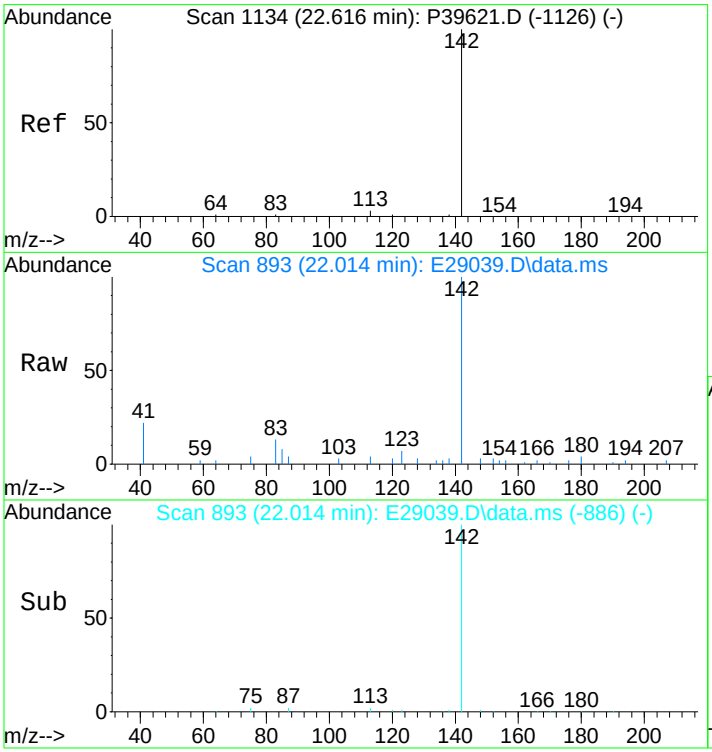


#10
Naphthalene
Concen: 108.19 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:128 Resp: 16559

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

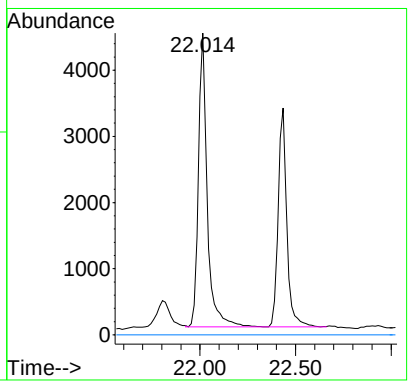


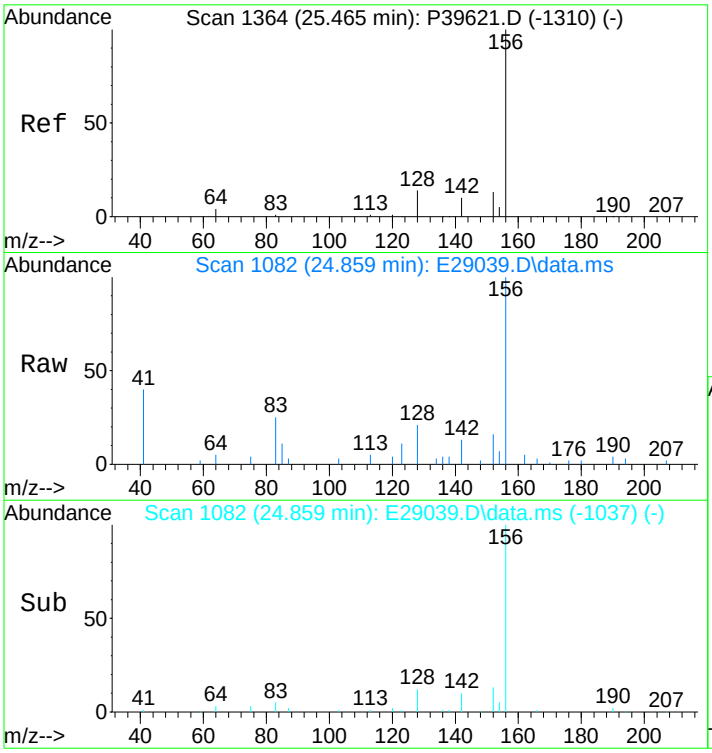


#11
C1-Naphthalenes
Concen: 160.21 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:142 Resp: 24520

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

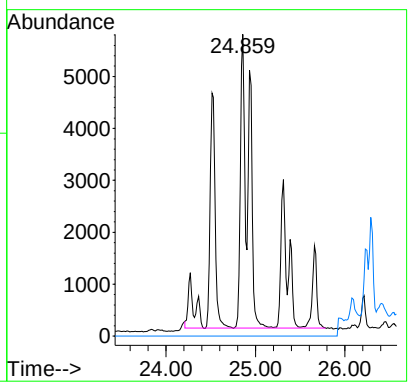


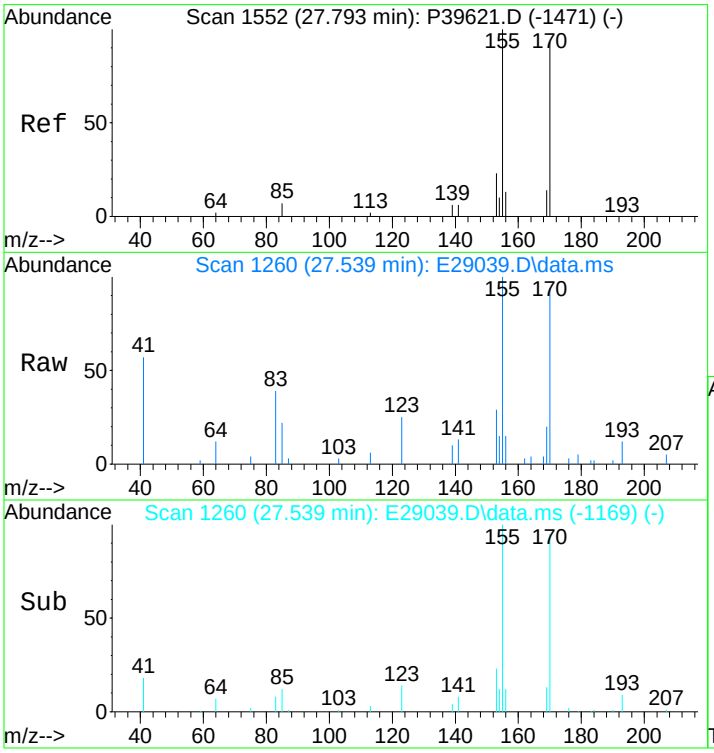


#12
C2-Naphthalenes
Concen: 502.90 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:156 Resp: 76971

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

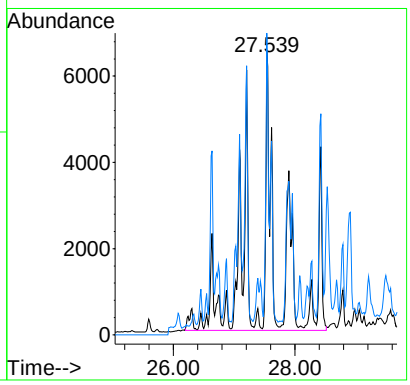


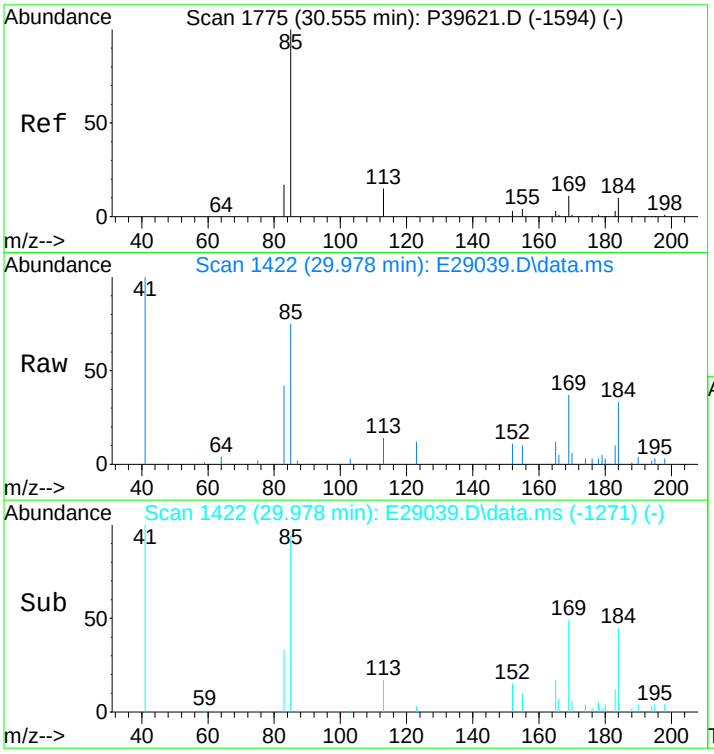


#13
C3-Naphthalenes
Concen: 858.80 ng/mL m
RT: 27.539 min Scan# 1260
Delta R.T. 0.343 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:170 Resp: 131442

Ion	Ratio	Lower	Upper
170	100		
155	16.1	66.8	100.2#

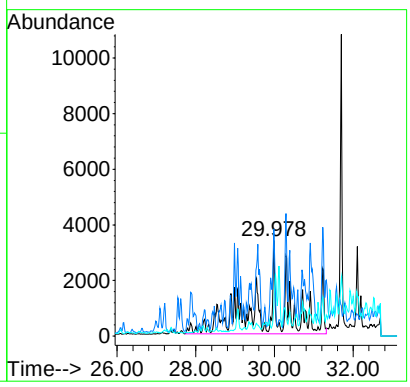


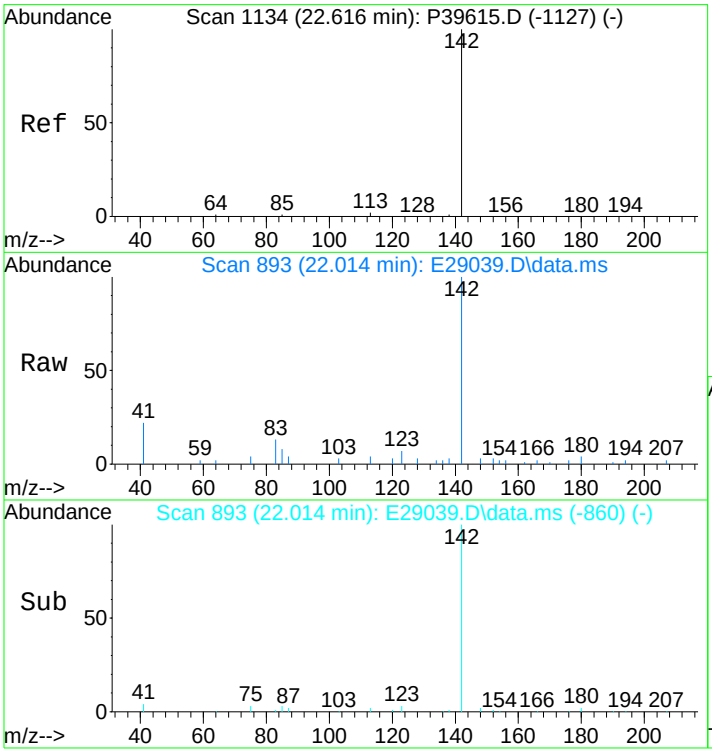


#14
C4-Naphthalenes
Concen: 826.34 ng/mL m
RT: 29.978 min Scan# 1422
Delta R.T. 0.084 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:184 Resp: 126474

Ion	Ratio	Lower	Upper
184	100		
169	10.4	78.7	118.1#
183	0.0	26.7	40.1#

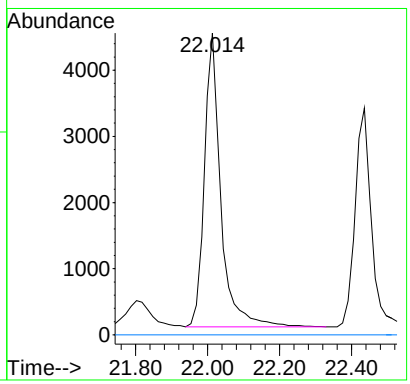


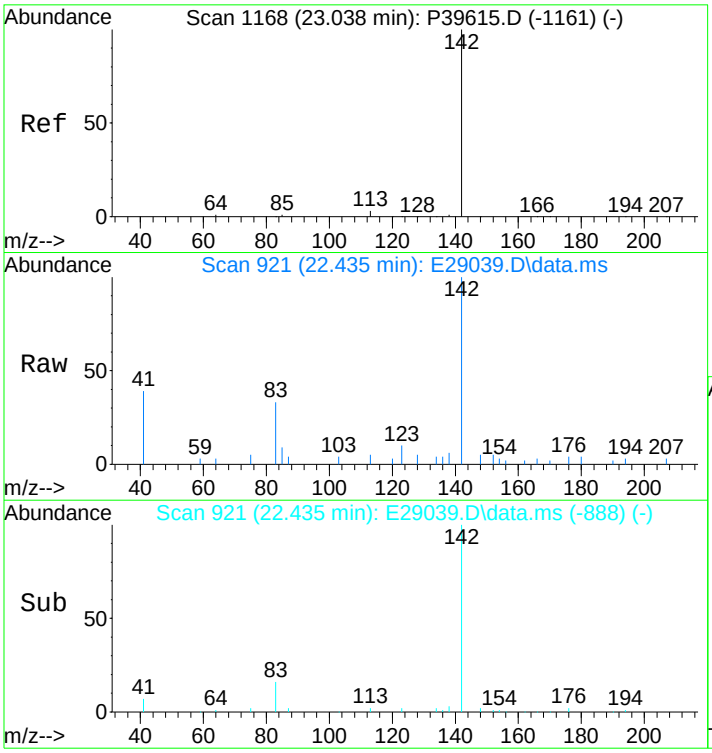


#16
2-Methylnaphthalene
Concen: 145.22 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:142 Resp: 14156

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

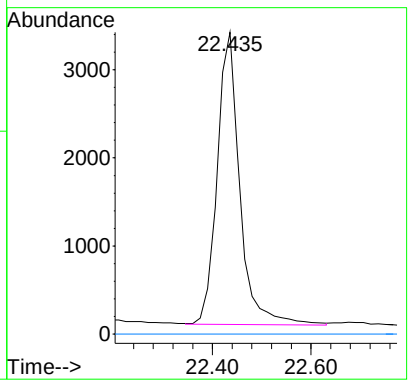


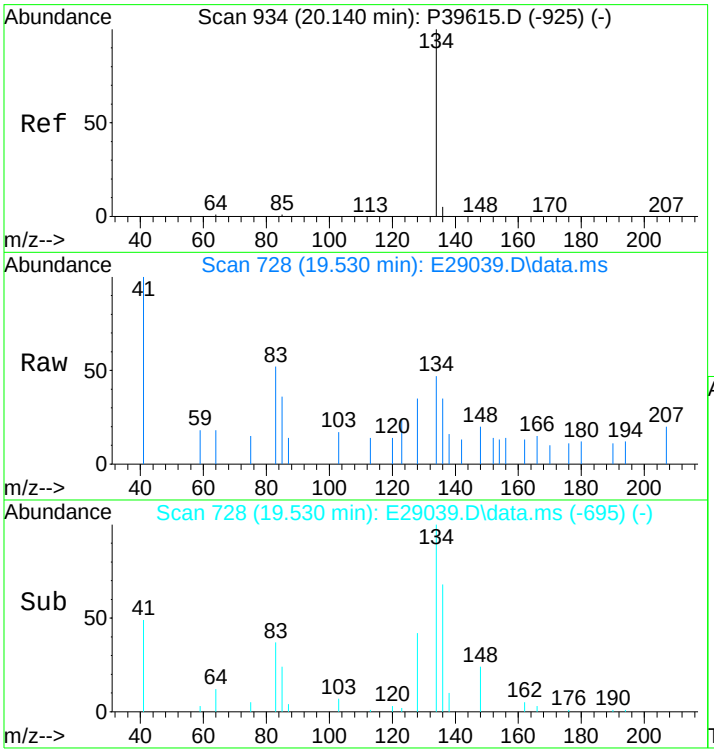


#17
1-Methylnaphthalene
Concen: 111.83 ng/mL
RT: 22.435 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:142 Resp: 10593

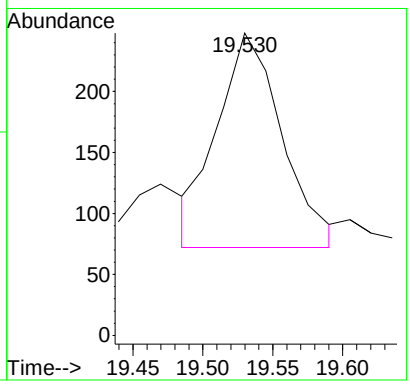
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

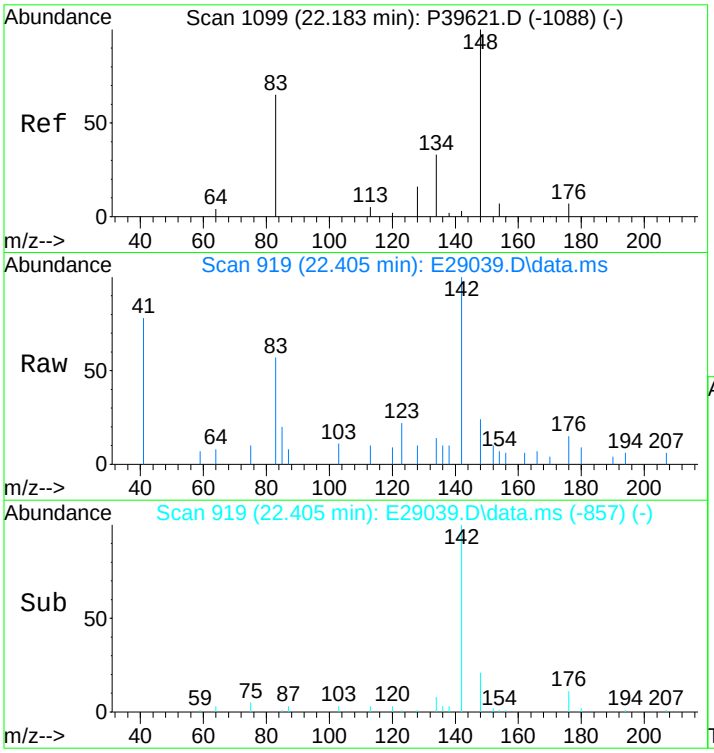




#18
Benzothiophene
Concen: 4.50 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

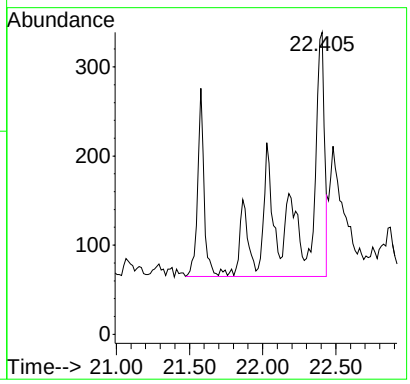
Tgt Ion:134 Resp: 569

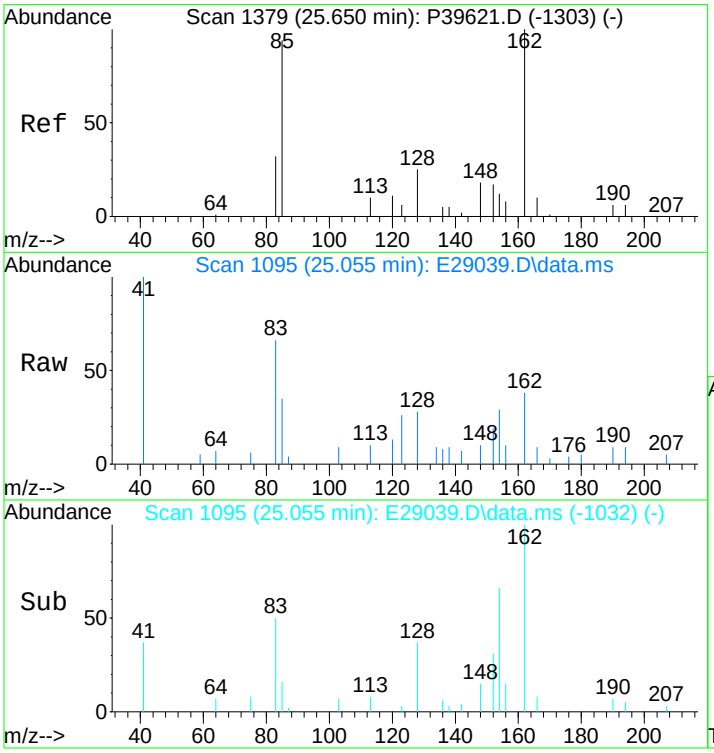




#19
C1-Benzo(b)thiophenes
Concen: 26.09 ng/mL m
RT: 22.405 min Scan# 919
Delta R.T. 0.692 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

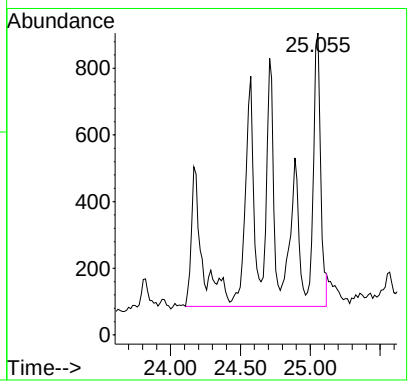
Tgt Ion:148 Resp: 3301

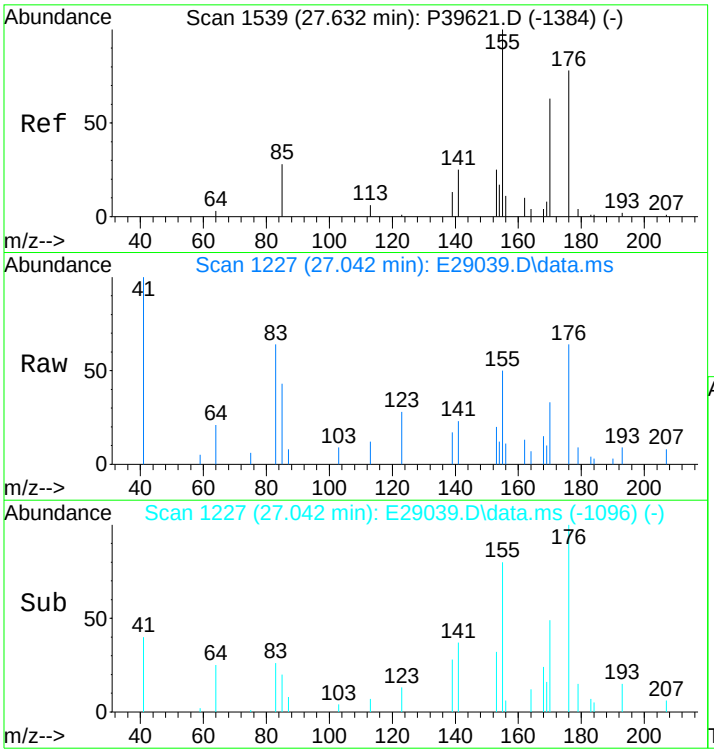




#20
C2-Benzo(b)thiophenes
Concen: 99.31 ng/mL m
RT: 25.055 min Scan# 1095
Delta R.T. -0.045 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

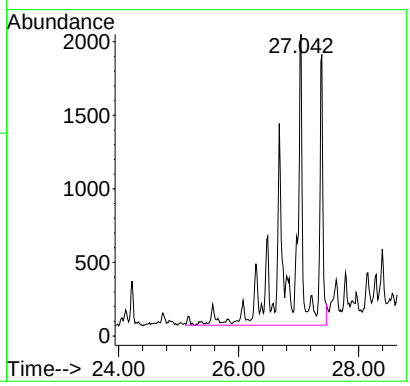
Tgt Ion:162 Resp: 12566

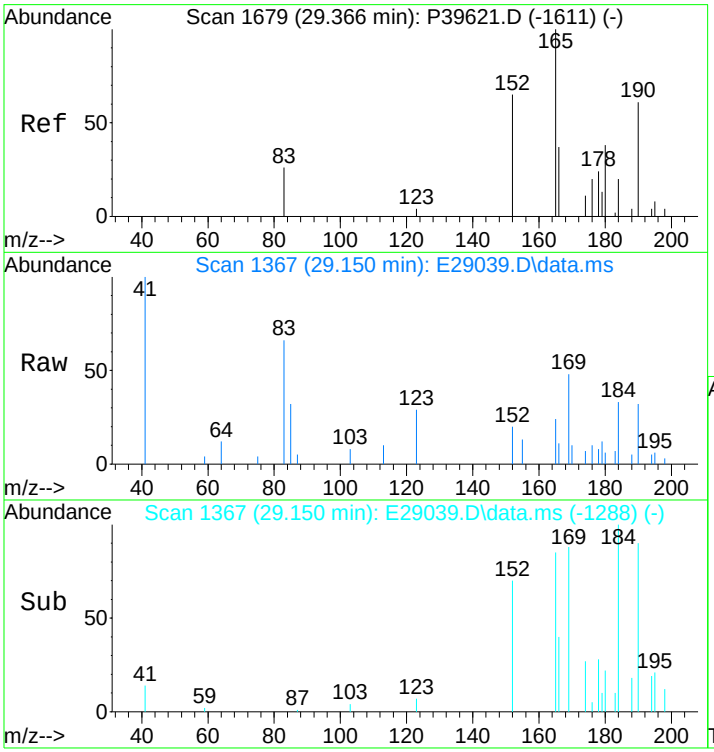




#21
C3-Benzo(b)thiophenes
Concen: 242.49 ng/mL m
RT: 27.042 min Scan# 1227
Delta R.T. 0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

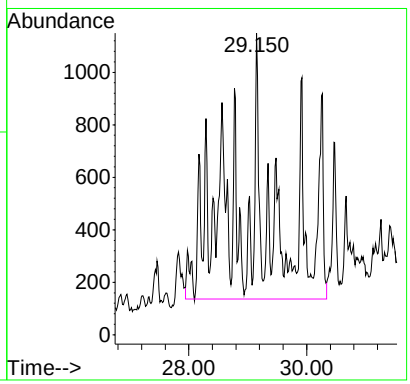
Tgt Ion:176 Resp: 30682

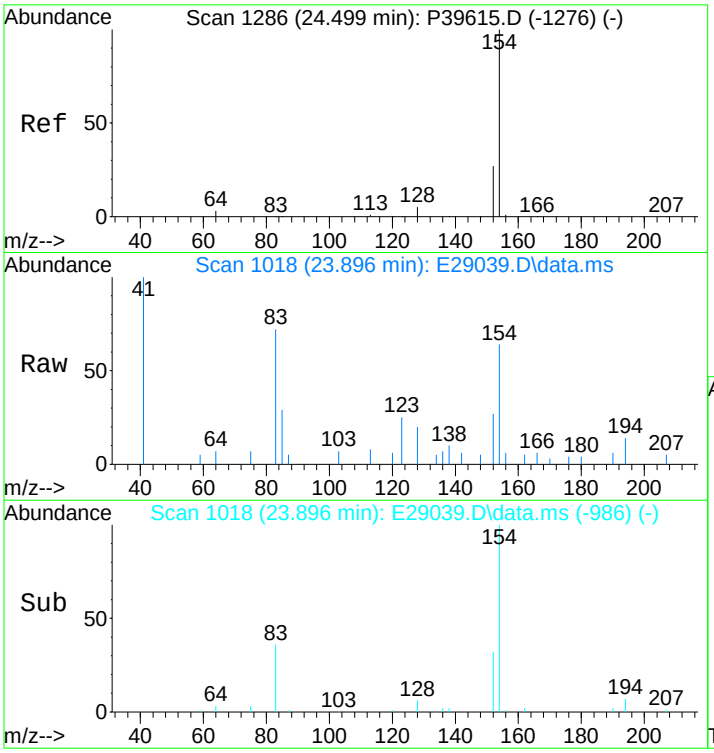




#22
C4-Benzo(b)thiophenes
Concen: 300.07 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:190 Resp: 37967

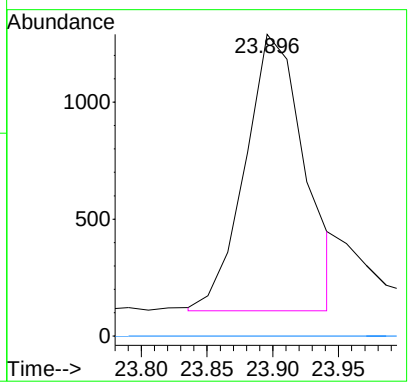


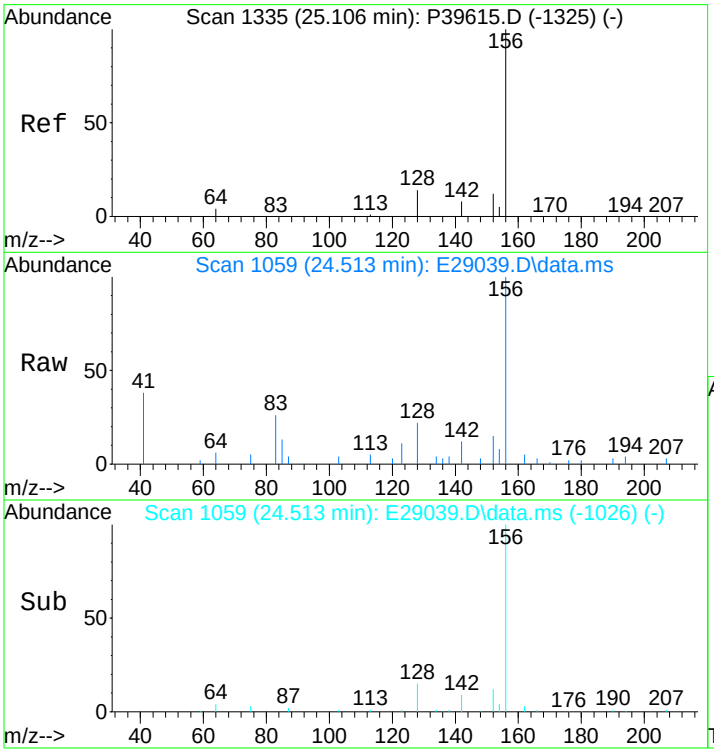


#23
Biphenyl
Concen: 30.38 ng/mL m
RT: 23.896 min Scan# 1018
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:154 Resp: 3743

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

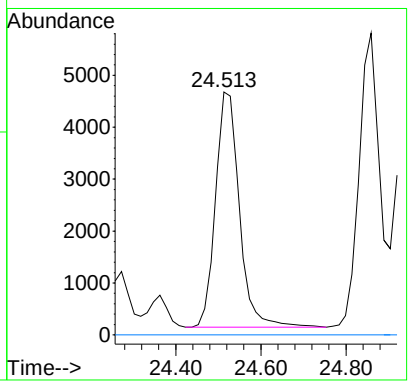


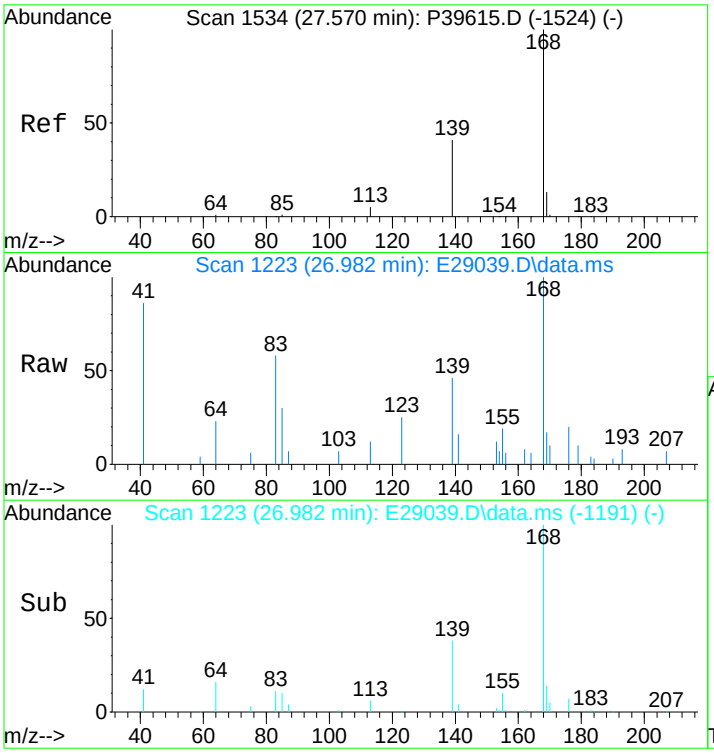


#24
2,6-Dimethylnaphthalene
Concen: 201.33 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:156 Resp: 17690

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

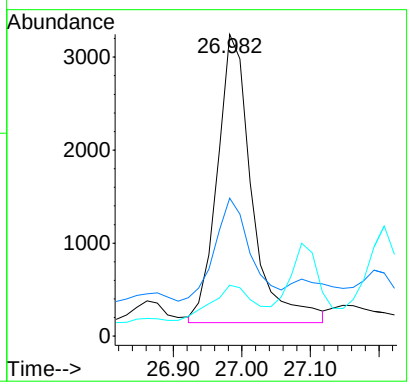


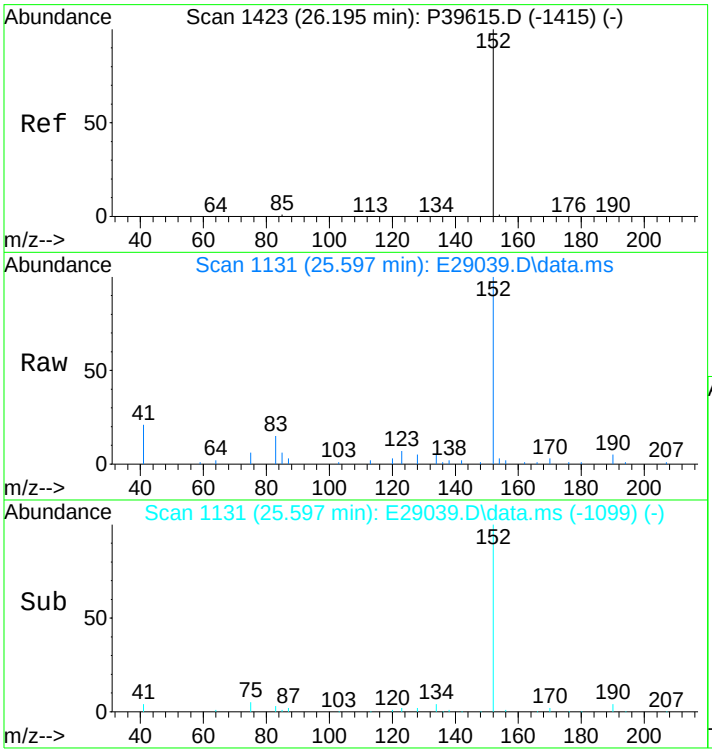


#25
Dibenzofuran
Concen: 79.94 ng/mL m
RT: 26.982 min Scan# 1223
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:168 Resp: 10904

Ion	Ratio	Lower	Upper
168	100		
139	2.9	26.9	40.3#
169	1.2	10.7	16.1#

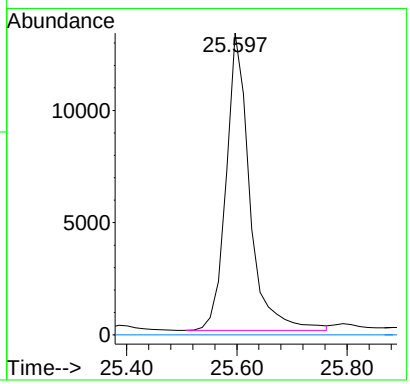


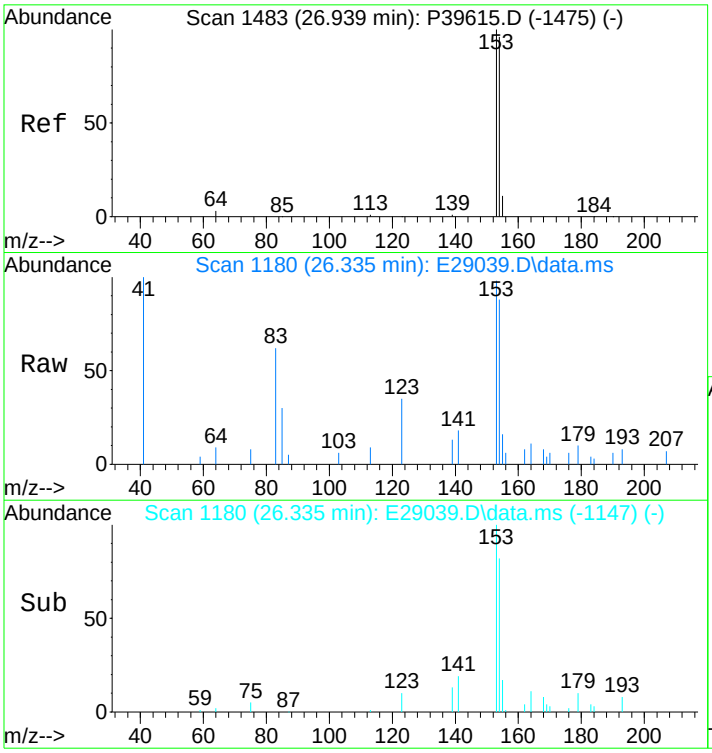


#26
Acenaphthylene
Concen: 257.19 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:152 Resp: 39245

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

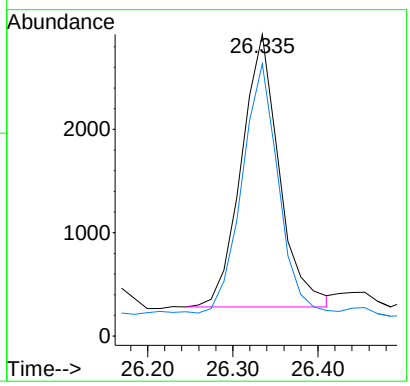


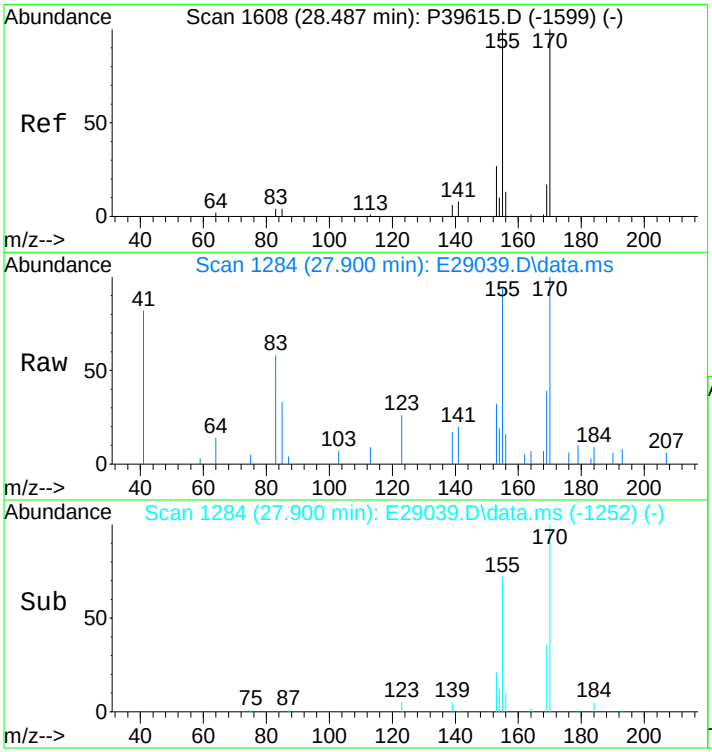


#27
Acenaphthene
Concen: 82.92 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:153 Resp: 8145

Ion	Ratio	Lower	Upper
153	100		
154	88.6	73.0	109.4

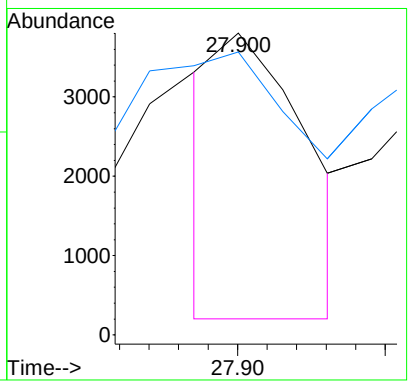


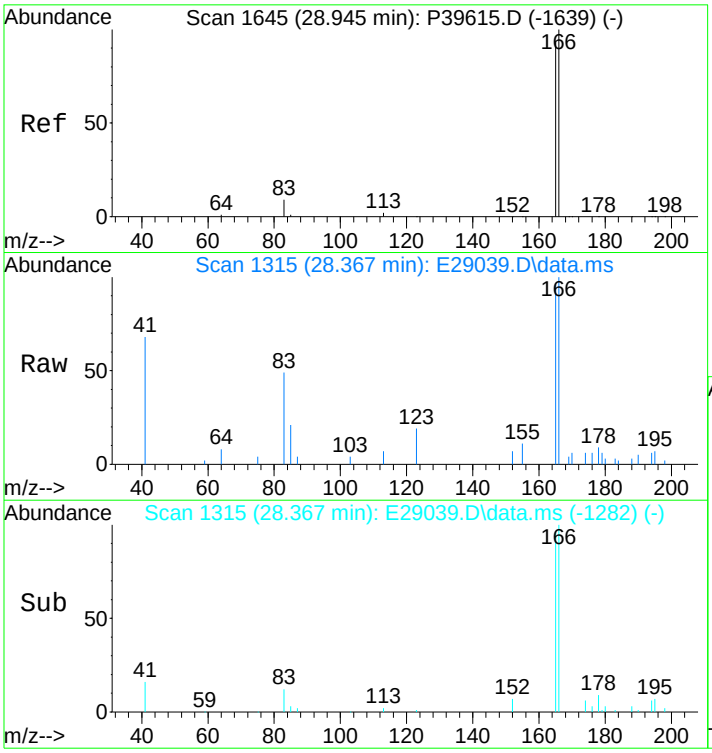


#28
2,3,5-Trimethylnaphthalene
Concen: 91.54 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:170 Resp: 7525

Ion	Ratio	Lower	Upper
170	100		
155	136.8	69.8	104.6#

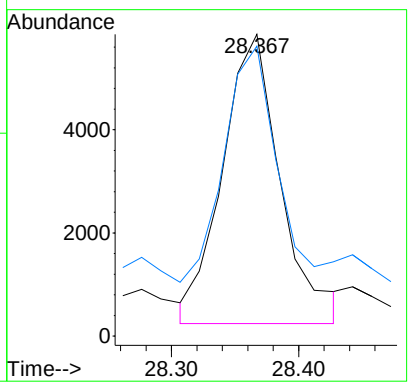


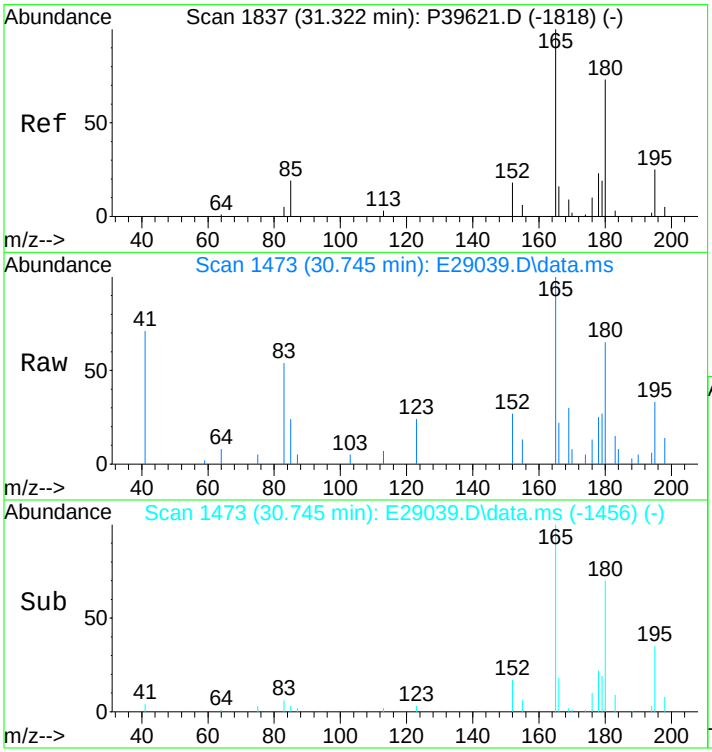


#29
Fluorene
Concen: 162.57 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:166 Resp: 17809

Ion	Ratio	Lower	Upper
166	100		
165	117.9	74.4	111.6#

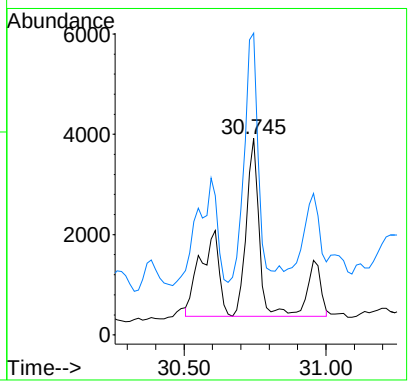


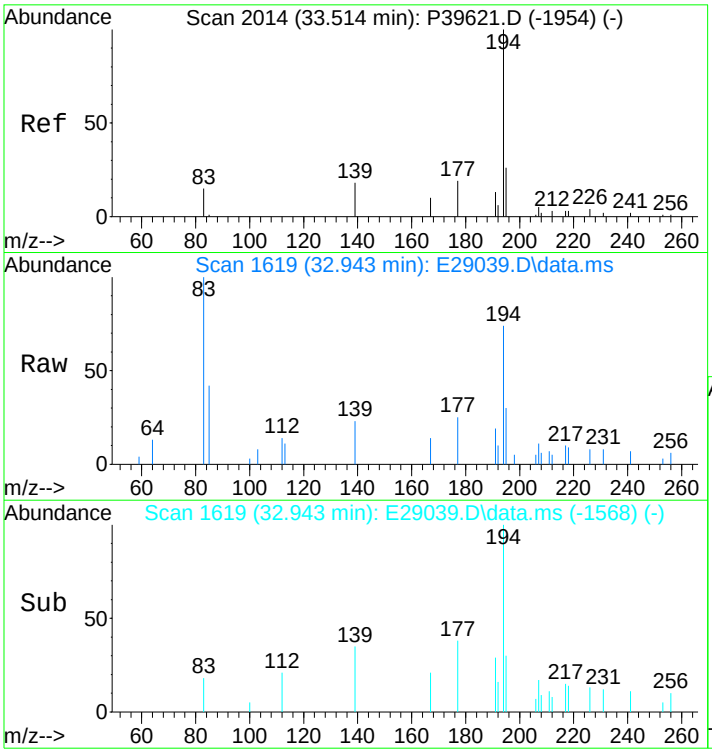


#30
C1-Fluorenes
Concen: 204.67 ng/mL m
RT: 30.745 min Scan# 1473
Delta R.T. 0.105 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:180 Resp: 22422

Ion	Ratio	Lower	Upper
180	100		
165	39.4	94.3	141.5#

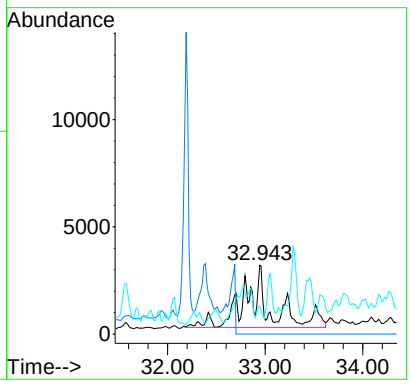


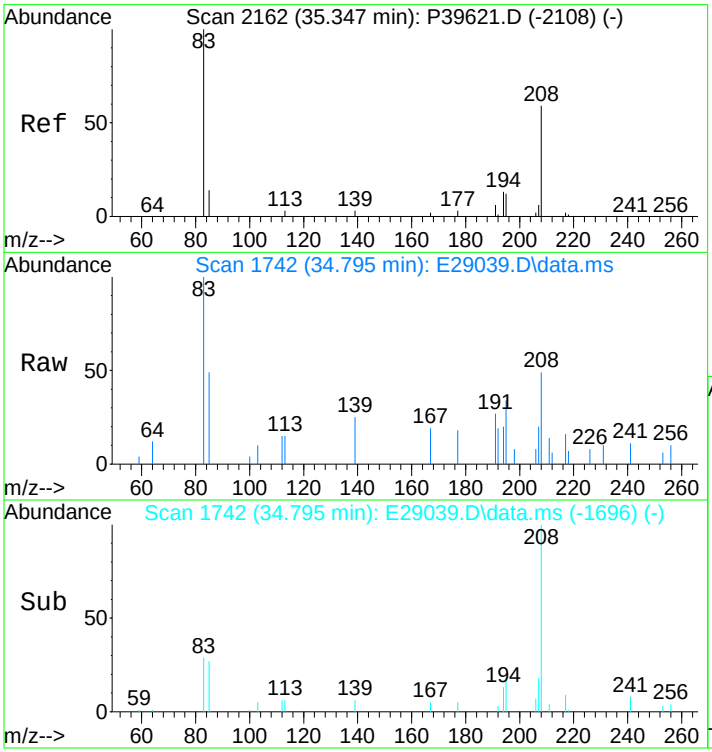


#31
C2-Fluorenes
Concen: 486.13 ng/mL m
RT: 32.943 min Scan# 1619
Delta R.T. 0.163 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:194 Resp: 53255

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	23.6	27.0	40.4#

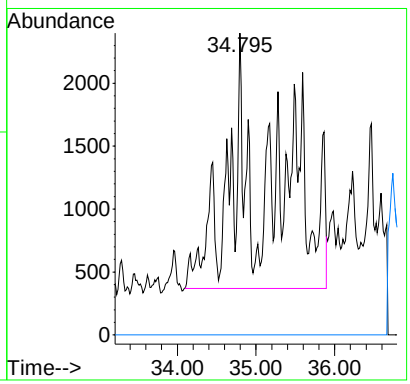


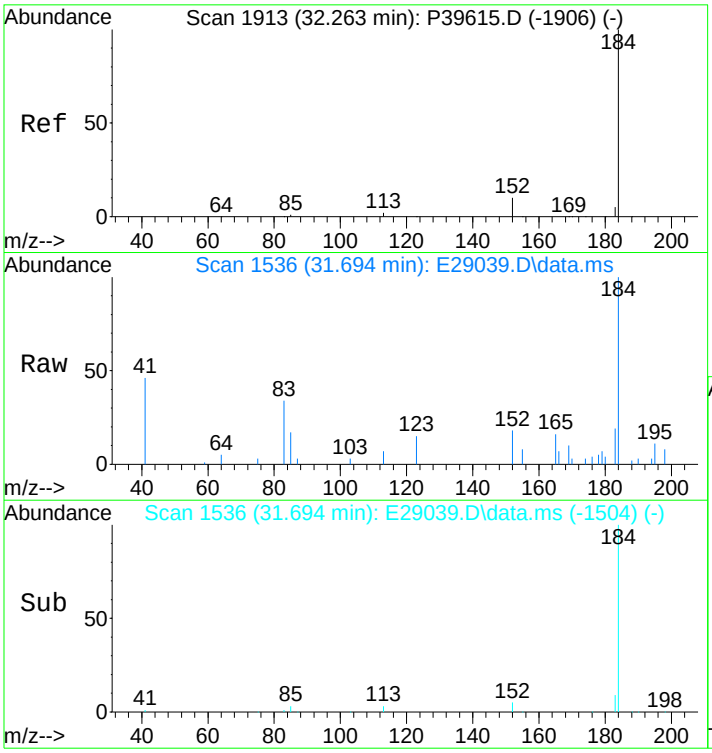


#32
C3-Fluorenes
Concen: 652.95 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.226 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:208 Resp: 71530

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

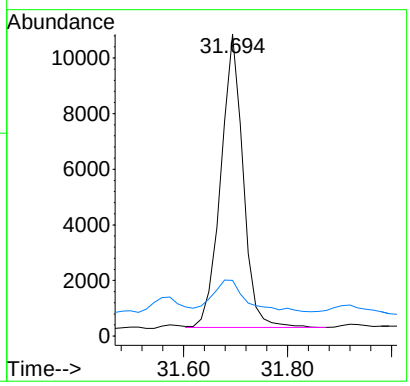


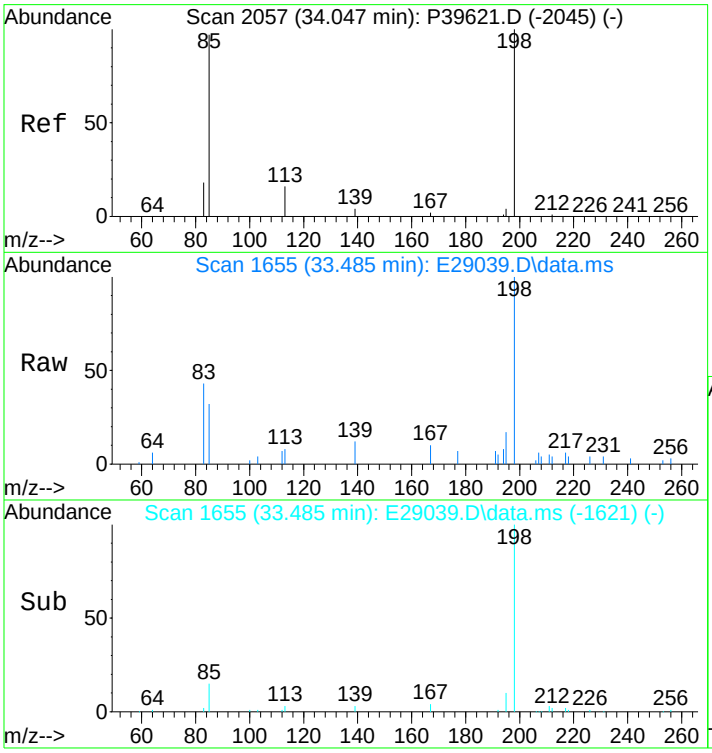


#33
Dibenzothiophene
Concen: 208.86 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:184 Resp: 31398

Ion	Ratio	Lower	Upper
184	100		
152	15.7	6.0	9.0#

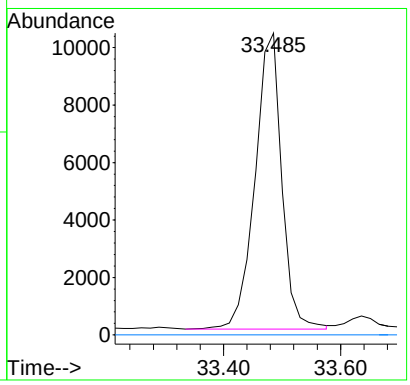


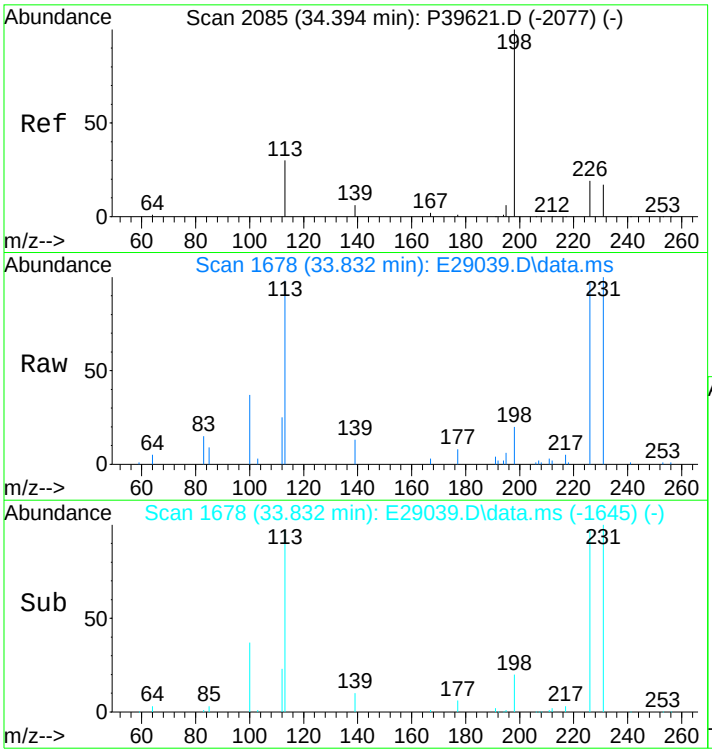


#34
4-Methyldibenzothiophene(4MDT)
Concen: 216.49 ng/mL
RT: 33.485 min Scan# 1655
Delta R.T. 0.011 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:198 Resp: 32545

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

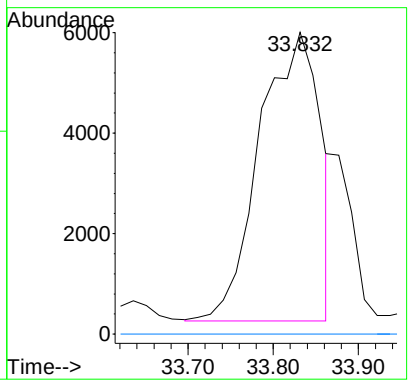


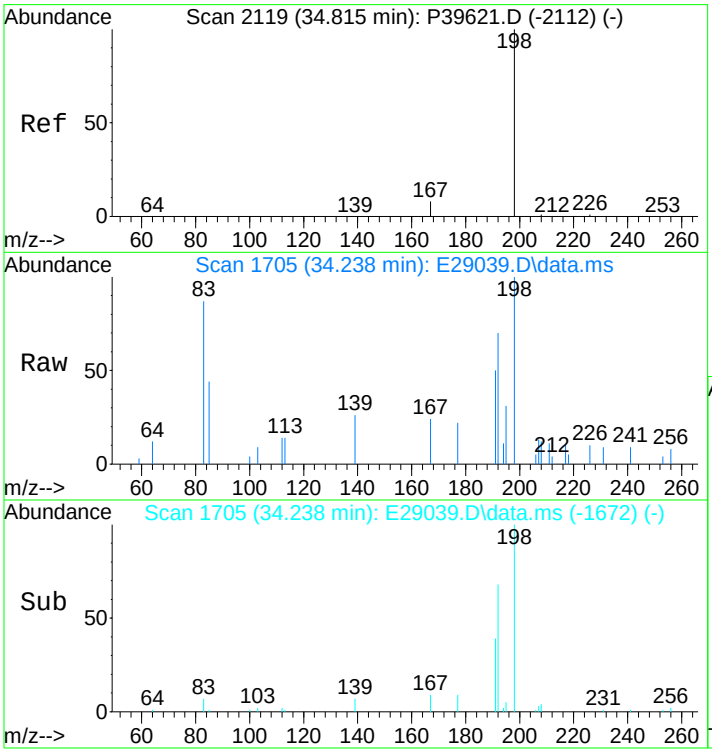


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 189.87 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. -0.004 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:198 Resp: 28543

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

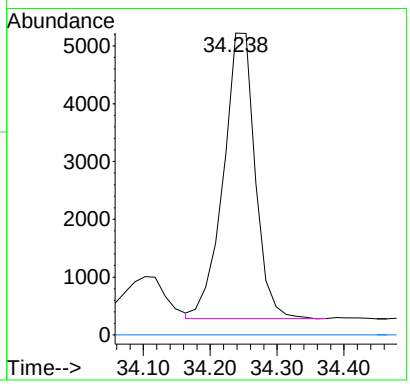


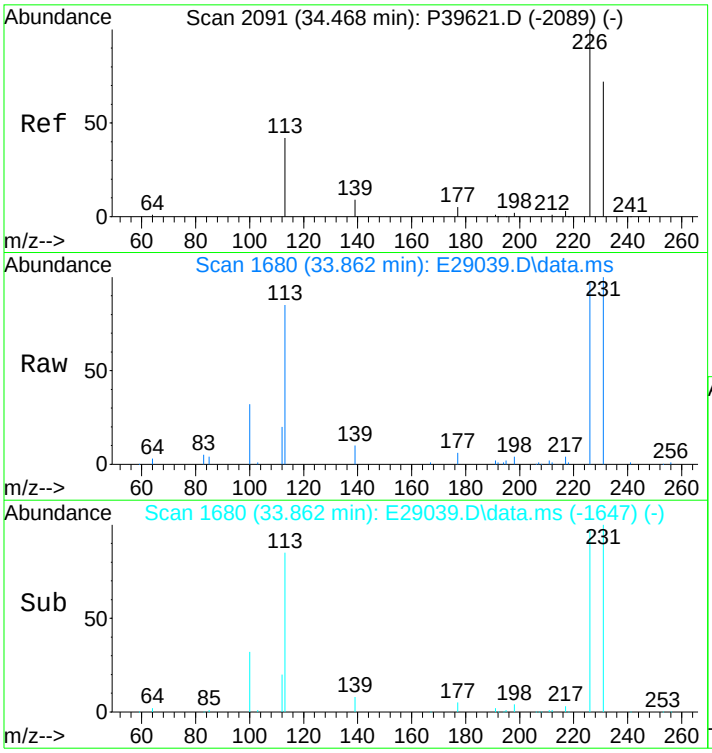


#36
1-Methyldibenzothiophene(1MDT)
Concen: 108.46 ng/mL
RT: 34.238 min Scan# 1705
Delta R.T. -0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:198 Resp: 16305

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

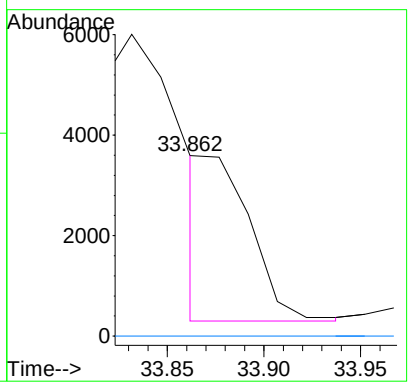


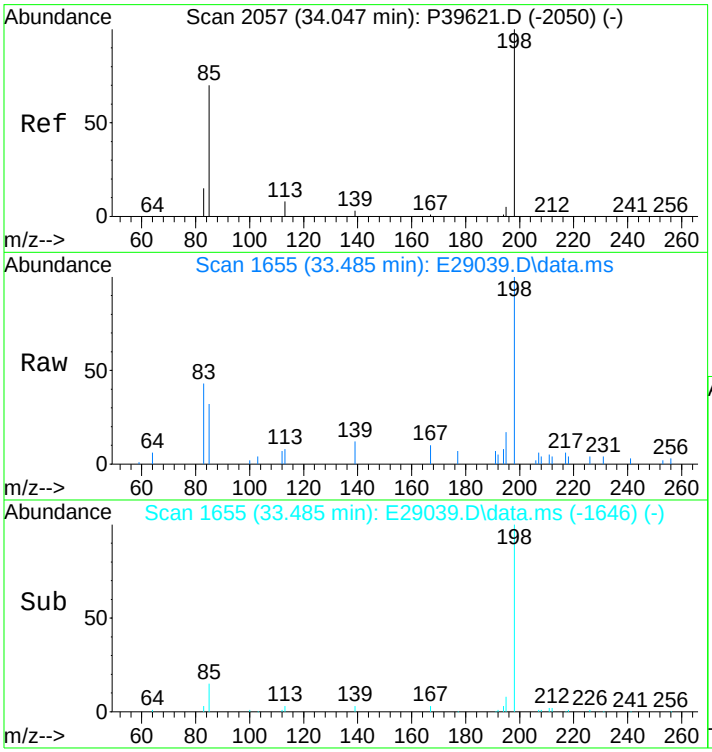


#37
OTP
Concen: 35.54 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.034 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:198 Resp: 5343

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

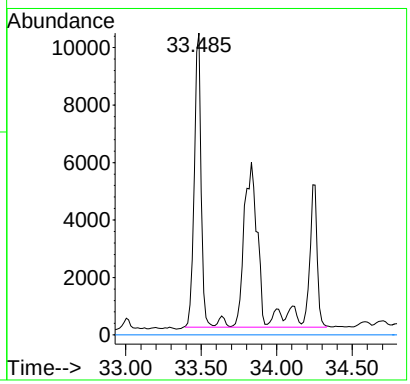


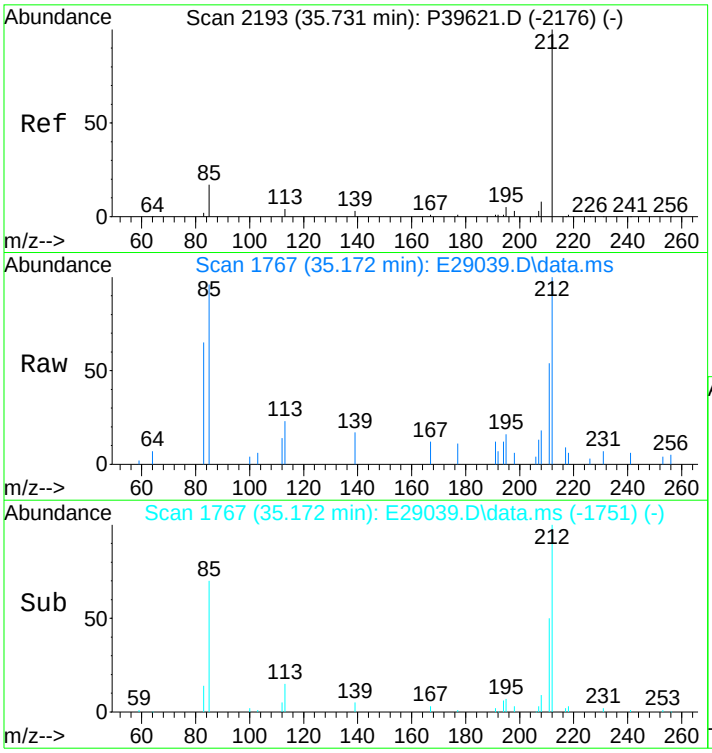


#38
C1-Dibenzothiophenes
Concen: 591.68 ng/mL m
RT: 33.485 min Scan# 1655
Delta R.T. 0.073 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:198 Resp: 88949

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

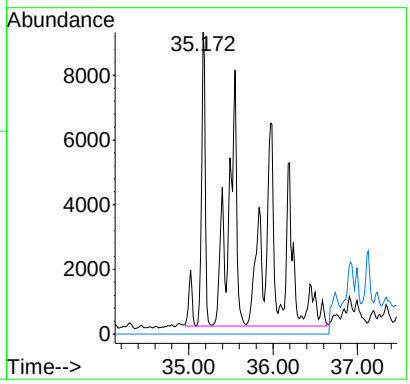


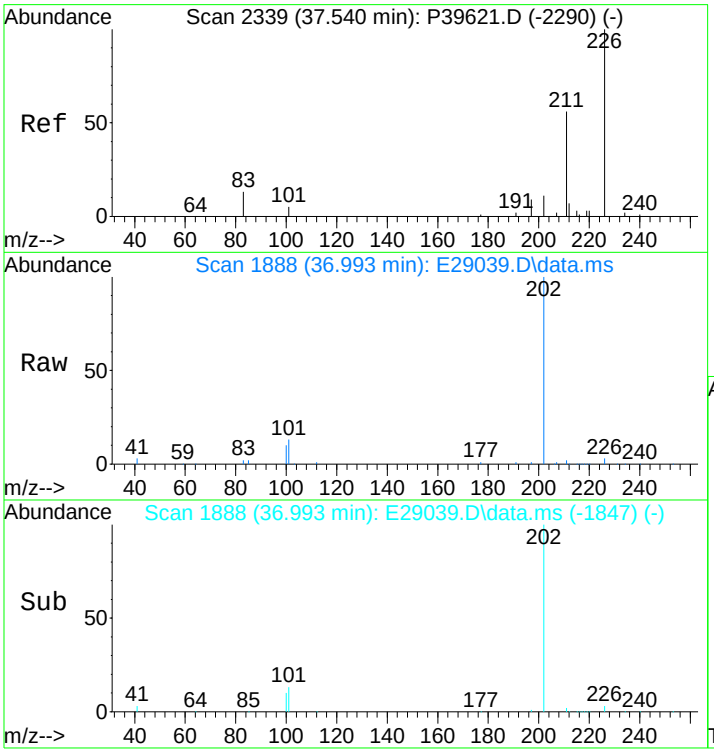


#39
C2-Dibenzothiophenes
Concen: 1140.68 ng/mL m
RT: 35.172 min Scan# 1767
Delta R.T. -0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:212 Resp: 171482

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

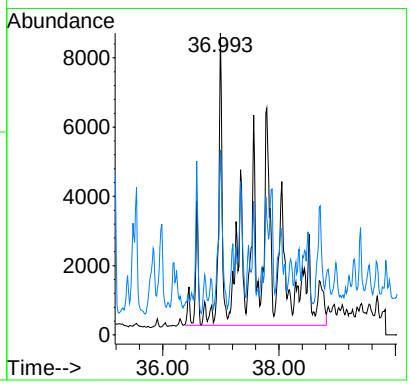


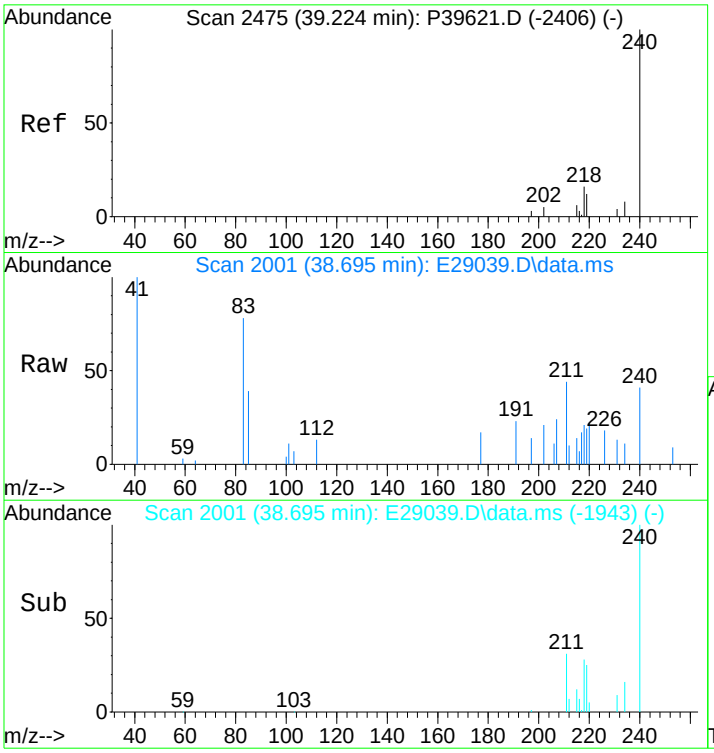


#40
C3-Dibenzothiophenes
Concen: 1405.26 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.284 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:226 Resp: 211257

Ion	Ratio	Lower	Upper
226	100		
211	1.9	44.1	66.1#

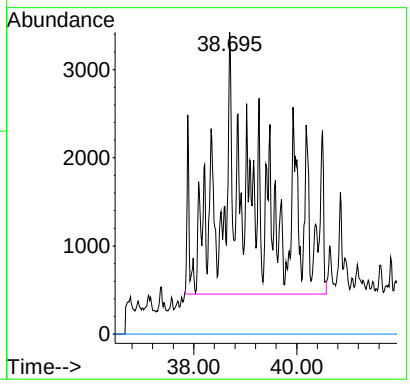


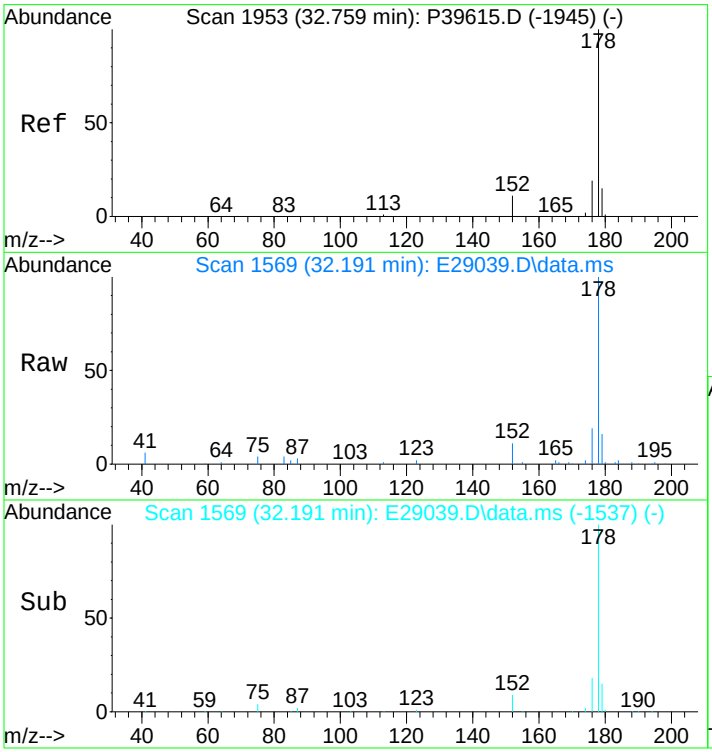


#41
C4-Dibenzothiophenes
Concen: 977.37 ng/mL m
RT: 38.695 min Scan# 2001
Delta R.T. 0.328 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:240 Resp: 146930

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

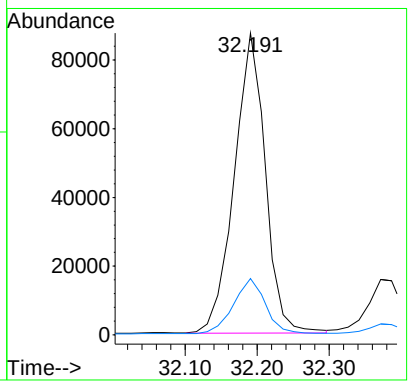


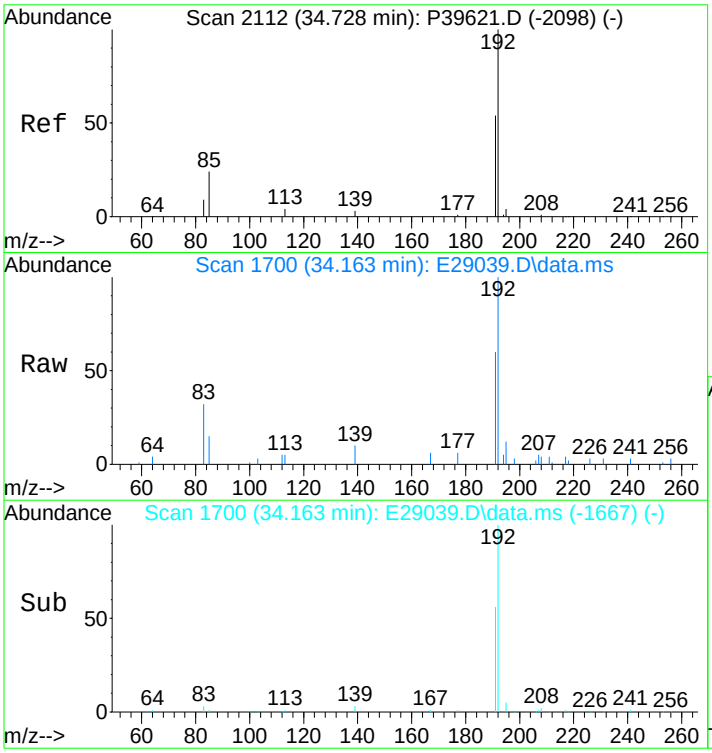


#43
Phenanthrene
Concen: 1703.82 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:178 Resp: 260594

Ion	Ratio	Lower	Upper
178	100		
176	19.0	14.6	21.8

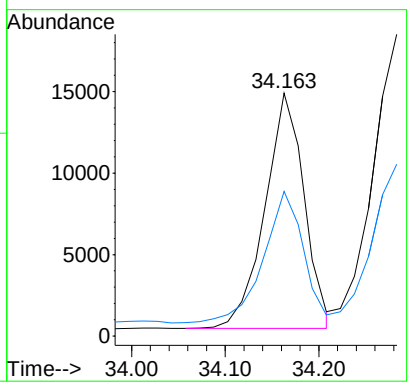


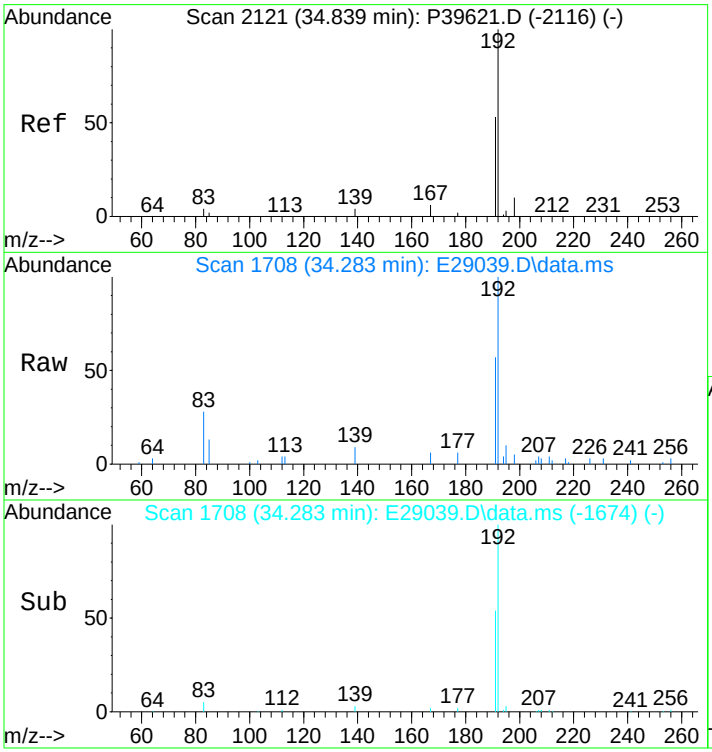


#44
3-Methylphenanthrene(3MP)
Concen: 274.98 ng/mL
RT: 34.163 min Scan# 1700
Delta R.T. -0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 42057

Ion	Ratio	Lower	Upper
192	100		
191	57.7	45.9	68.9

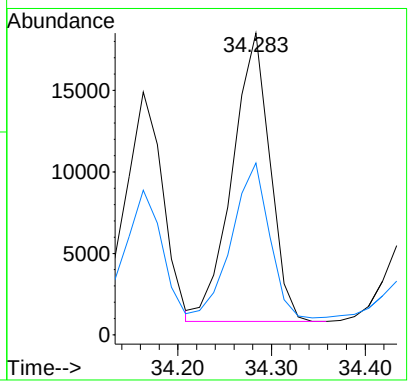


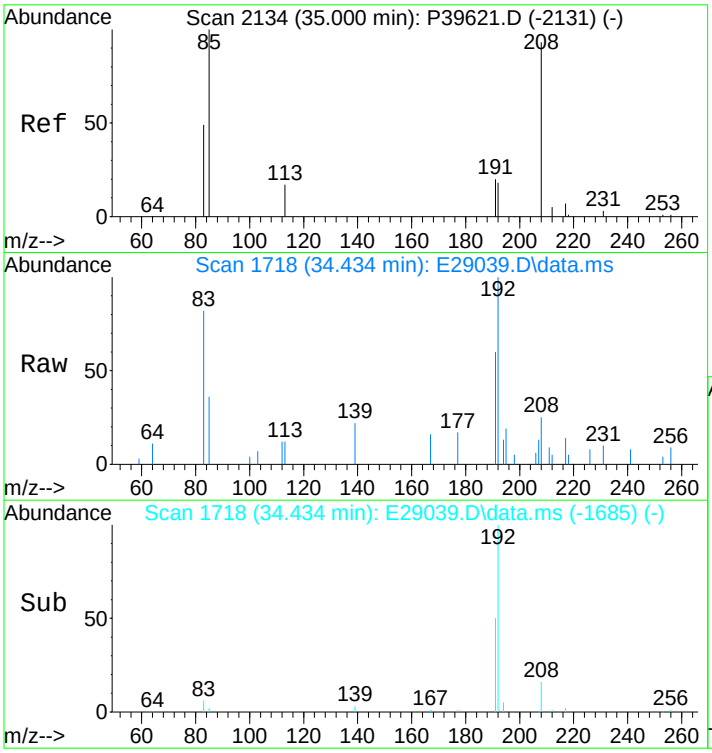


#45
2-Methylphenanthrene(2MP)
Concen: 323.88 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.010 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 49536

Ion	Ratio	Lower	Upper
192	100		
191	53.2	45.4	68.0

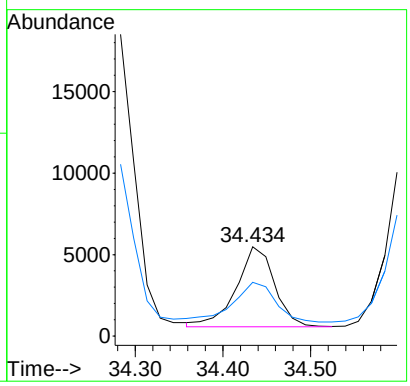


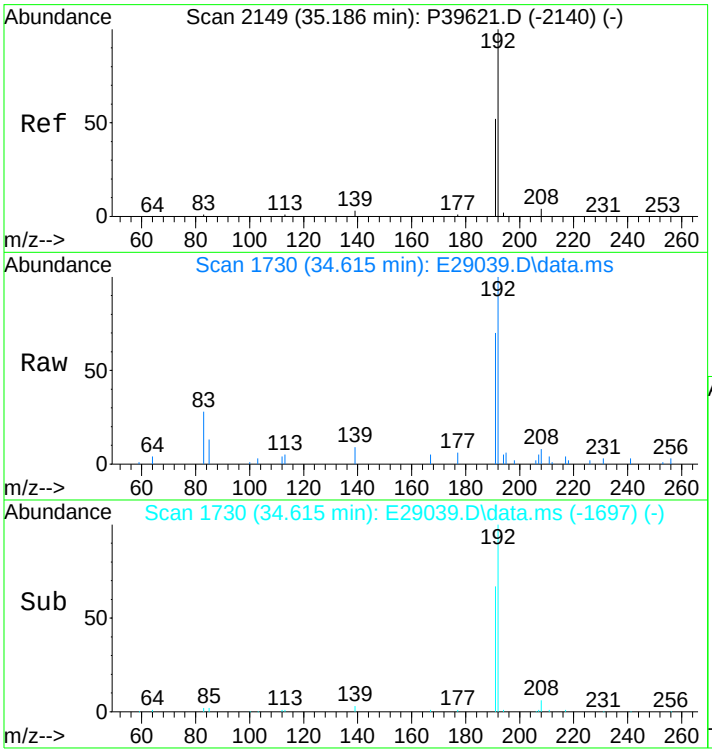


#46
2-Methylanthracene(2MA)
Concen: 97.43 ng/mL m
RT: 34.434 min Scan# 1718
Delta R.T. -0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 14901

Ion	Ratio	Lower	Upper
192	100		
191	2.4	95.4	143.0#

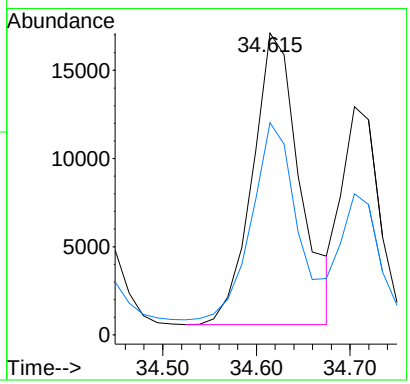


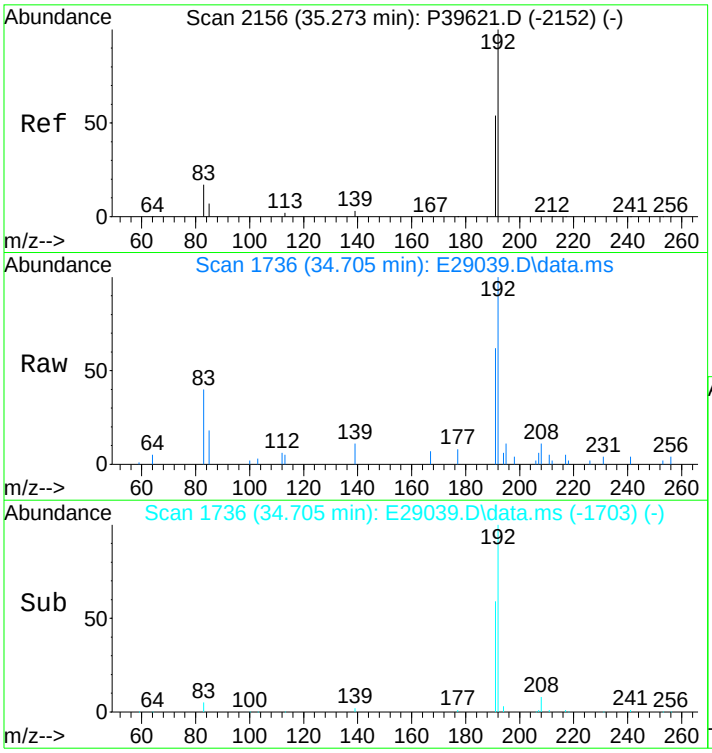


#47
9/4-Methylphenanthrene(9MP)
Concen: 380.60 ng/mL
RT: 34.615 min Scan# 1730
Delta R.T. -0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 58211

Ion	Ratio	Lower	Upper
192	100		
191	62.0	44.3	66.5

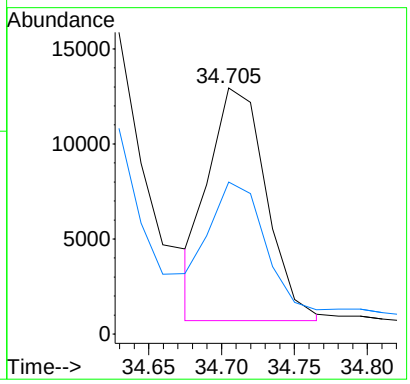


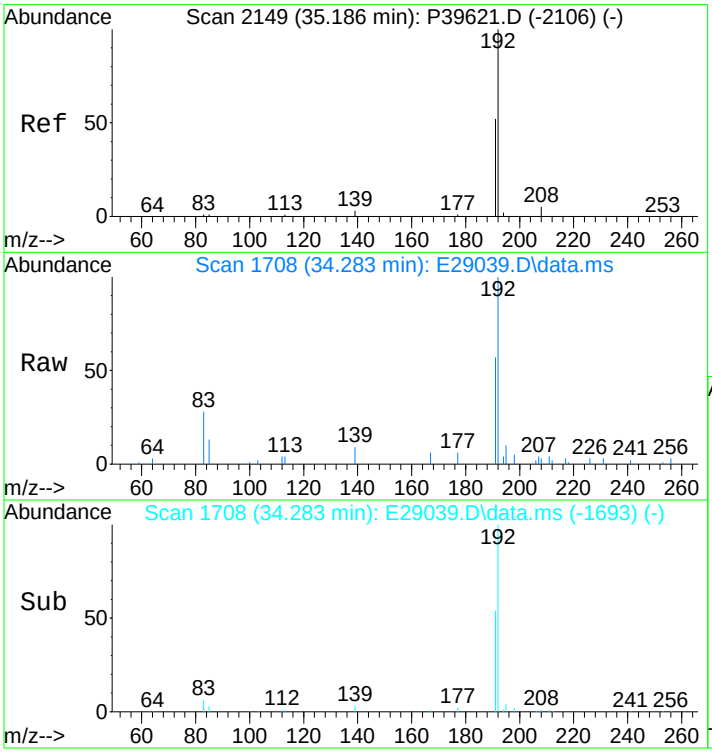


#48
1-Methylphenanthrene(1MP)
Concen: 219.58 ng/mL m
RT: 34.705 min Scan# 1736
Delta R.T. -0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 33584

Ion	Ratio	Lower	Upper
192	100		
191	64.5	46.7	70.1

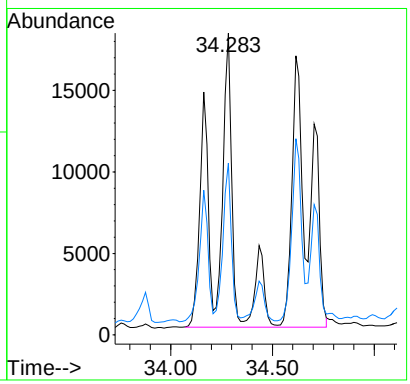


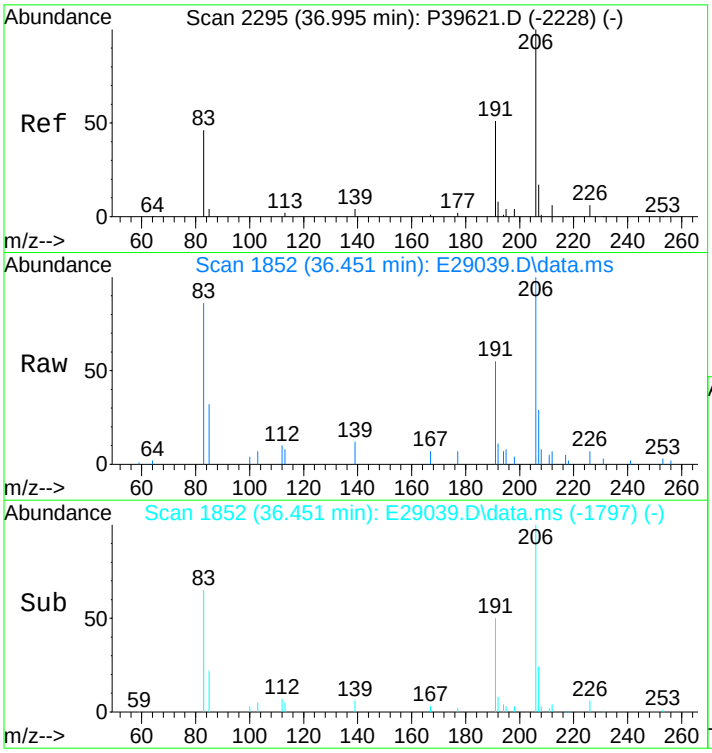


#49
C1-Phenanthrenes/Anthracenes
Concen: 1339.17 ng/mL m
RT: 34.283 min Scan# 1708
Delta R.T. -0.140 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 204822

Ion	Ratio	Lower	Upper
192	100		
191	4.1	44.0	66.0#

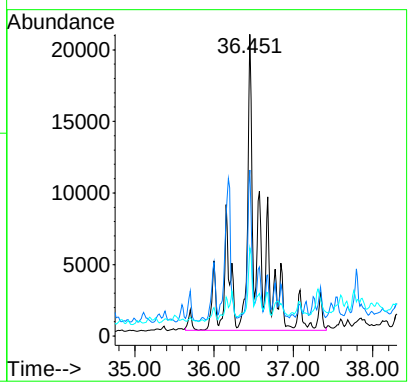


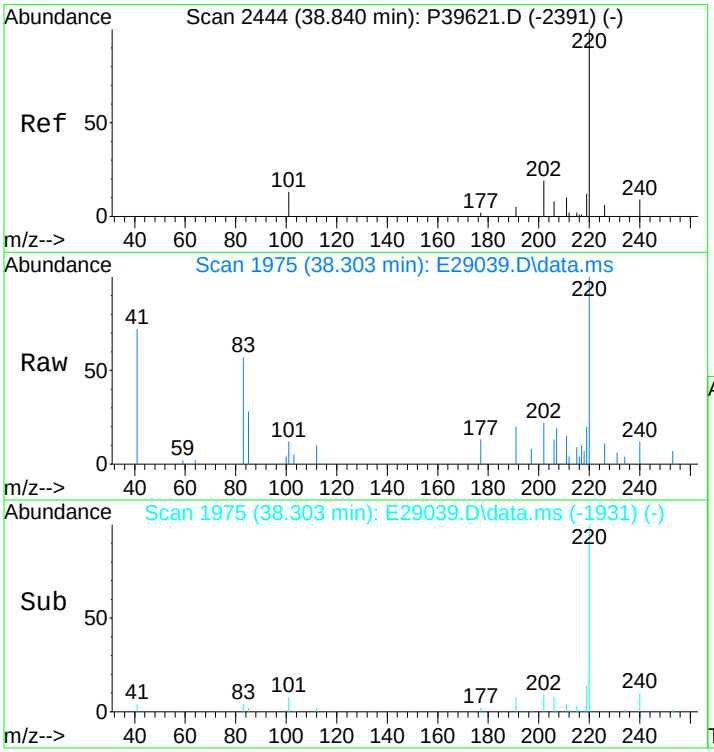


#50
C2-Phenanthrenes/Anthracenes
Concen: 1616.31 ng/mL m
RT: 36.451 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:206 Resp: 247209

Ion	Ratio	Lower	Upper
206	100		
191	14.6	35.7	53.5#
207	7.2	16.5	24.7#

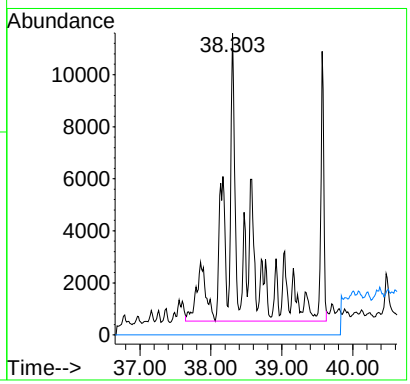


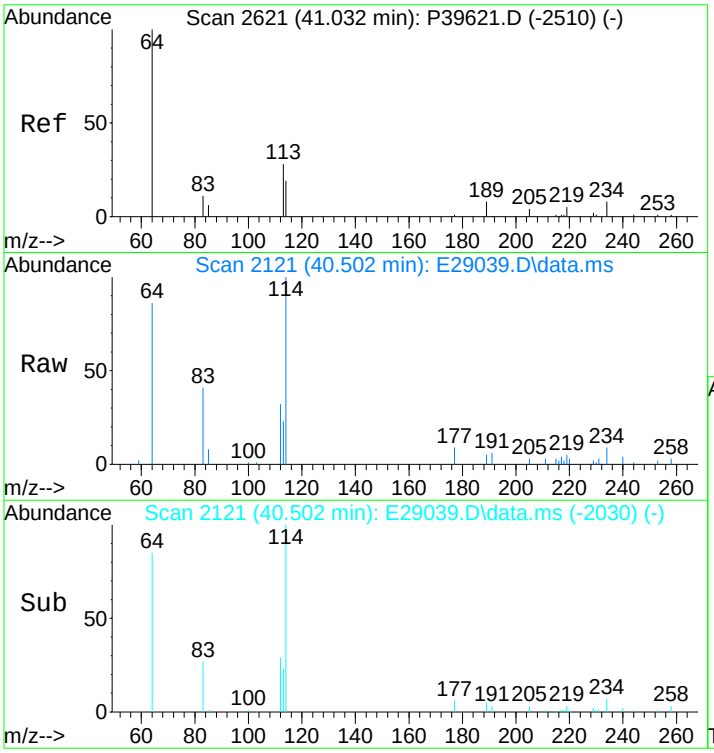


#52
C3-Phenanthrenes/Anthracenes
Concen: 1361.22 ng/mL m
RT: 38.303 min Scan# 1975
Delta R.T. 0.319 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:220 Resp: 208194

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

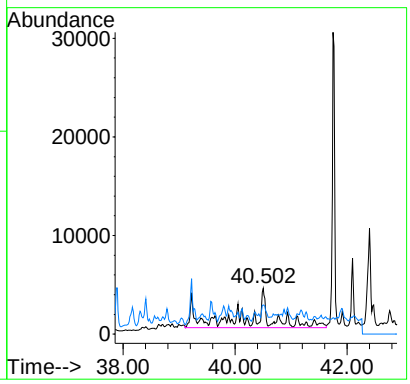


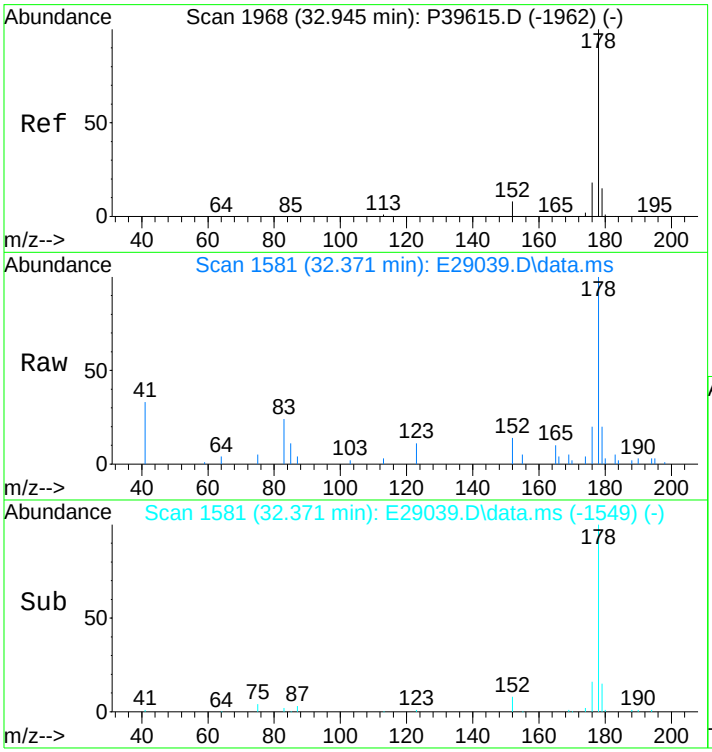


#53
C4-Phenanthrenes/Anthracenes
Concen: 725.53 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:234 Resp: 110968

Ion	Ratio	Lower	Upper
234	100		
219	0.8	46.6	70.0#

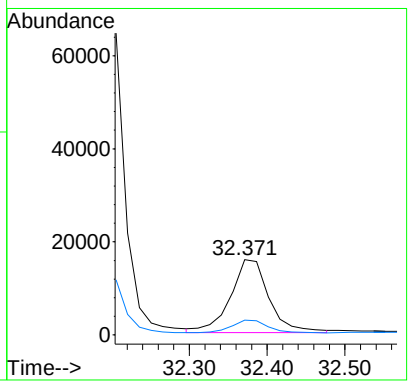


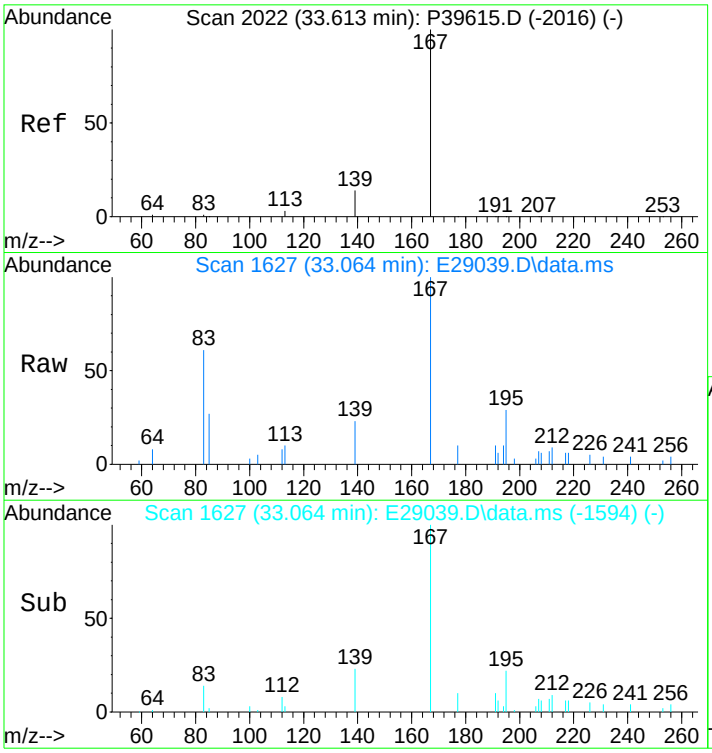


#55
Anthracene
Concen: 408.43 ng/mL m
RT: 32.371 min Scan# 1581
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:178 Resp: 53994

Ion	Ratio	Lower	Upper
178	100		
176	16.5	14.2	21.2

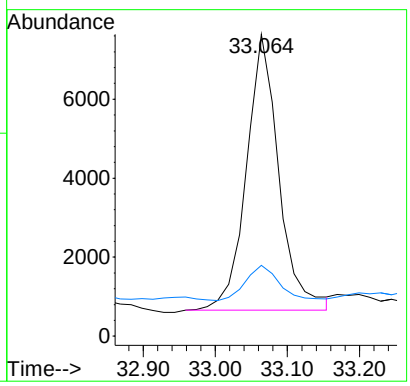


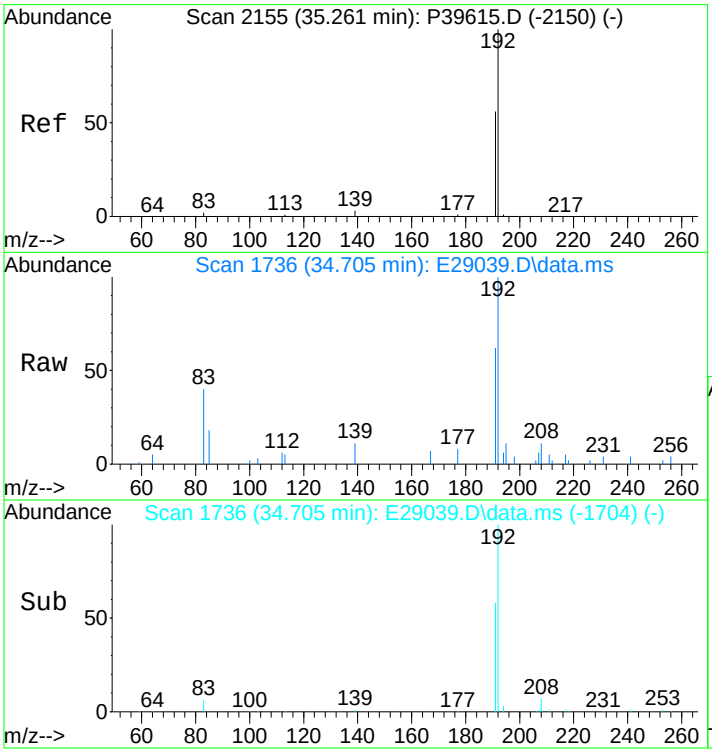


#56
Carbazole
Concen: 160.90 ng/mL
RT: 33.064 min Scan# 1627
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:167 Resp: 21892

Ion	Ratio	Lower	Upper
167	100		
139	13.3	10.6	15.8

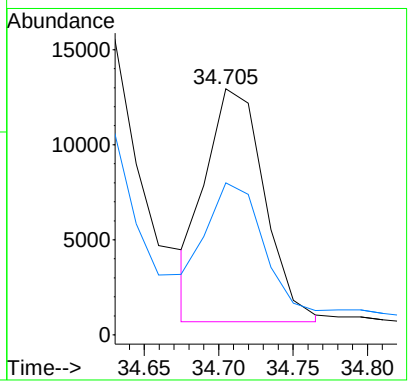


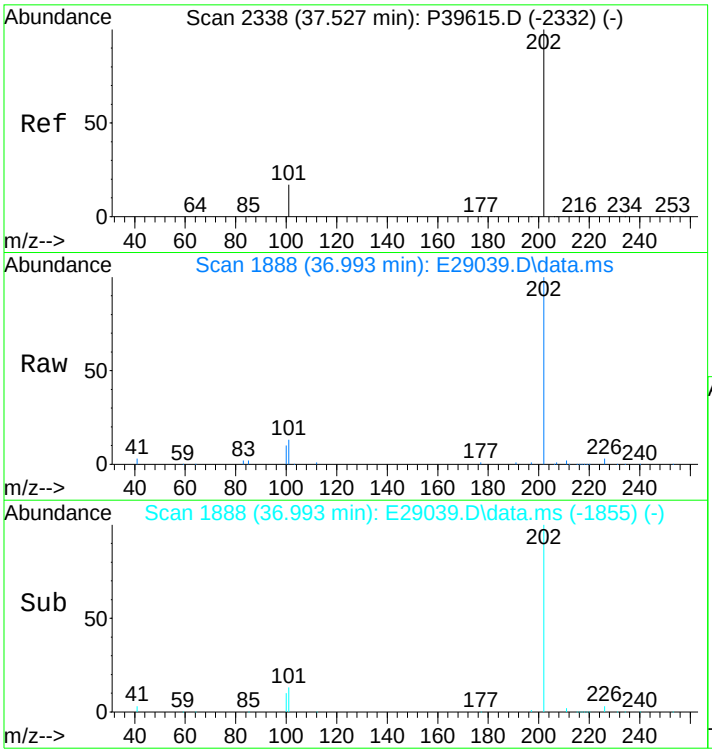


#57
1-Methylphenanthrene
Concen: 288.60 ng/mL m
RT: 34.705 min Scan# 1736
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:192 Resp: 33676

Ion	Ratio	Lower	Upper
192	100		
191	64.3	44.4	66.6

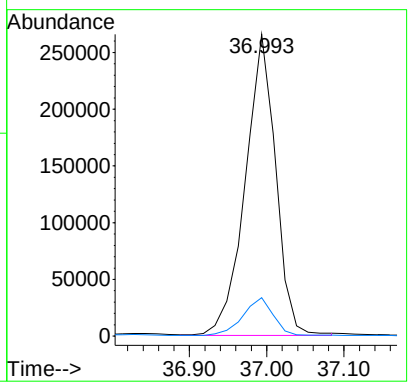


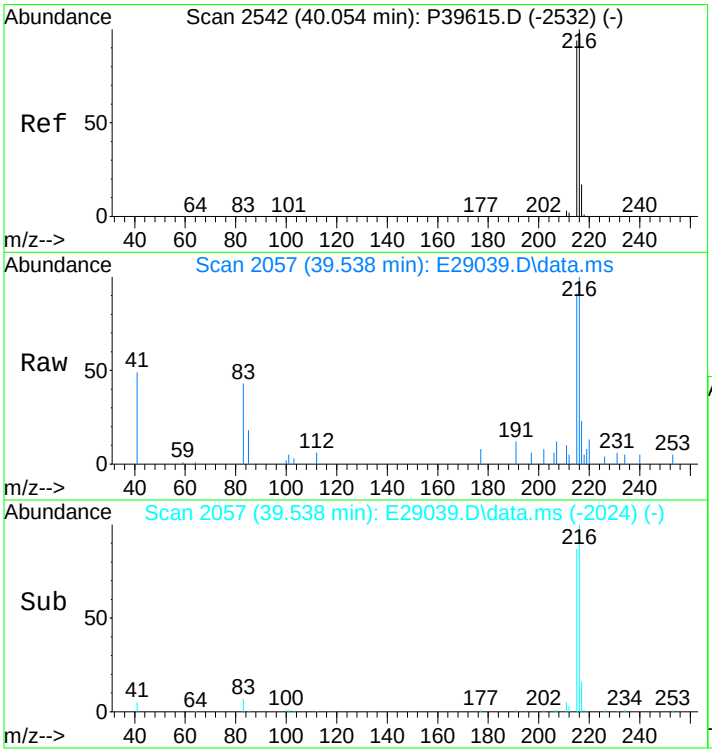


#58
Fluoranthene
Concen: 4299.51 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:202 Resp: 726217

Ion	Ratio	Lower	Upper
202	100		
101	13.2	10.5	15.7

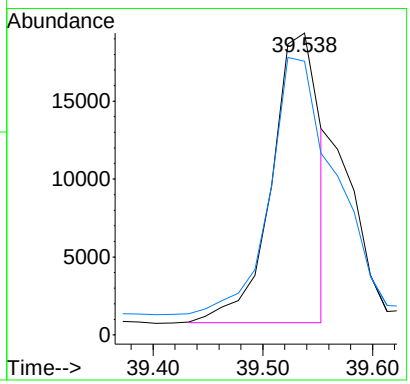


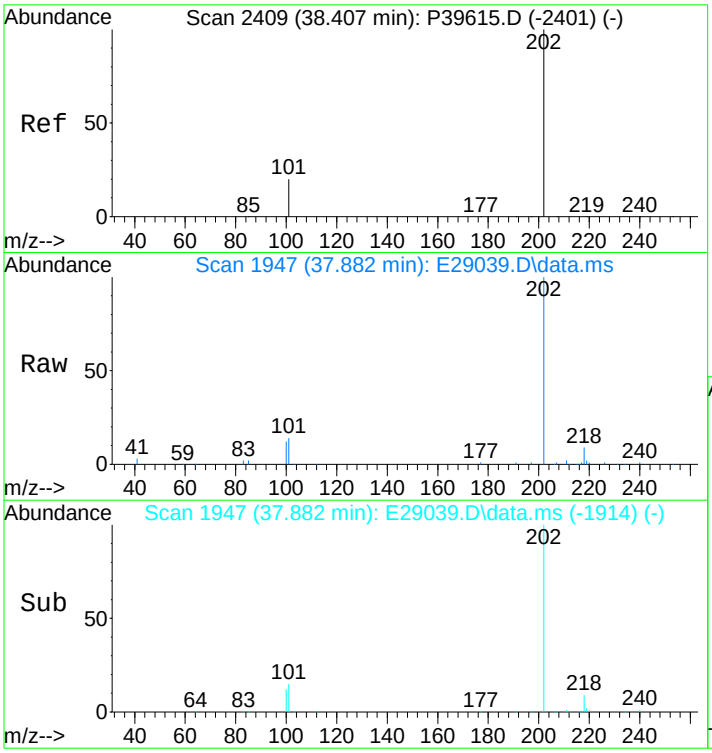


#59
Benzo(b)fluorene
Concen: 510.67 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:216 Resp: 57477

Ion	Ratio	Lower	Upper
216	100		
215	119.8	73.0	109.6#

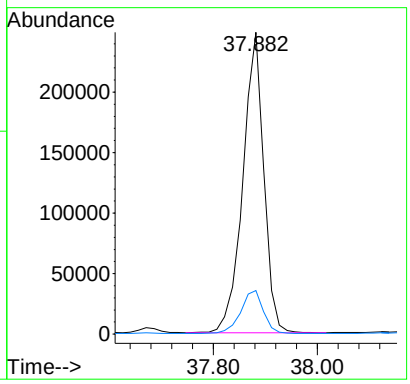


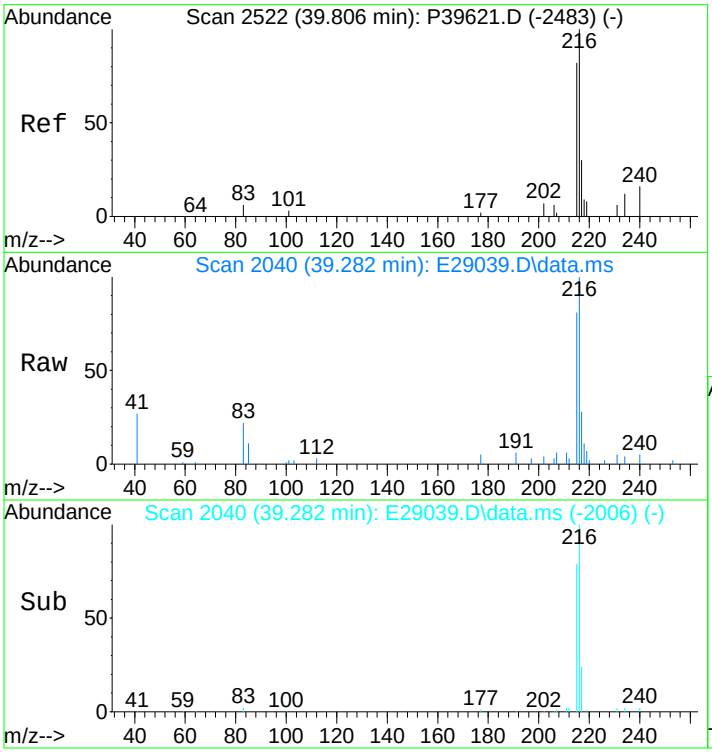


#60
Pyrene
Concen: 4059.47 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:202 Resp: 696927

Ion	Ratio	Lower	Upper
202	100		
101	15.7	11.5	17.3

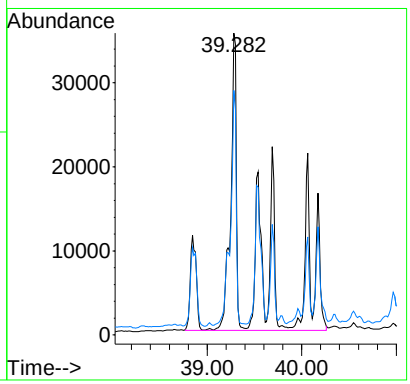


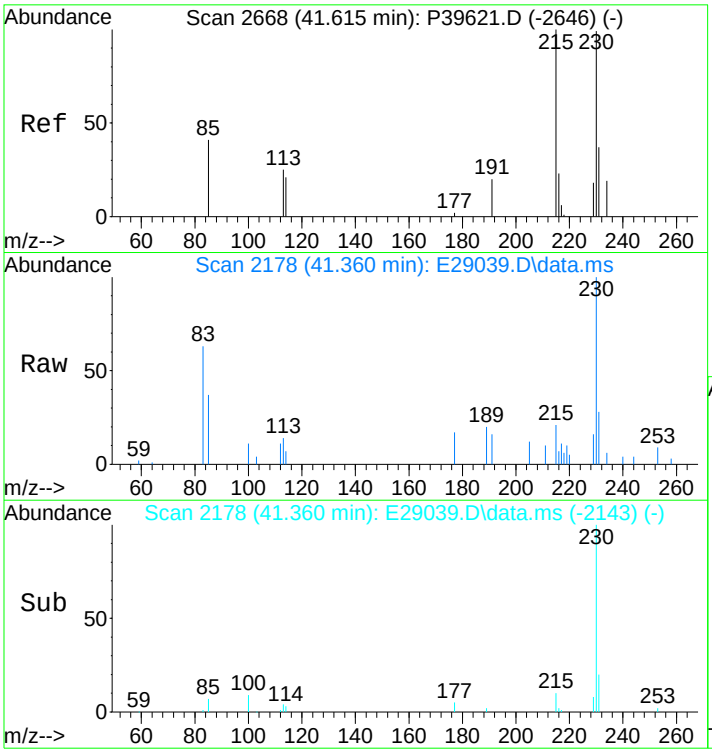


#61
C1-Fluoranthenes/Pyrenes
Concen: 2695.37 ng/mL m
RT: 39.282 min Scan# 2040
Delta R.T. 0.344 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:216 Resp: 462739

Ion	Ratio	Lower	Upper
216	100		
215	9.1	73.4	110.2#

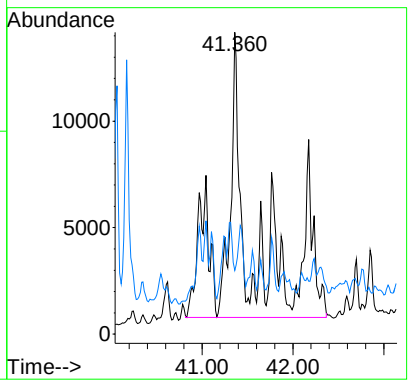


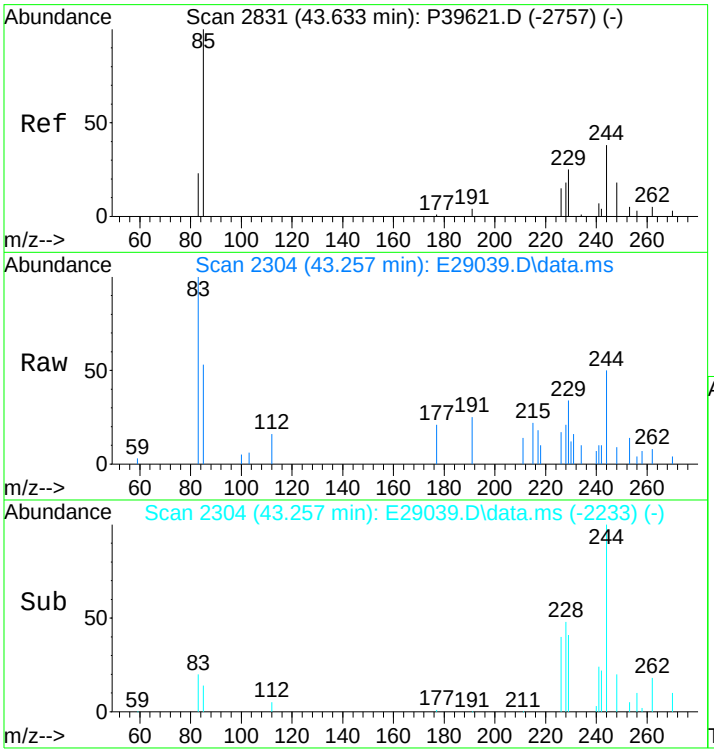


#62
C2-Fluoranthenes/Pyrenes
Concen: 1552.73 ng/mL m
RT: 41.360 min Scan# 2178
Delta R.T. 0.456 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:230 Resp: 266572

Ion	Ratio	Lower	Upper
230	100		
215	3.1	93.8	140.8#

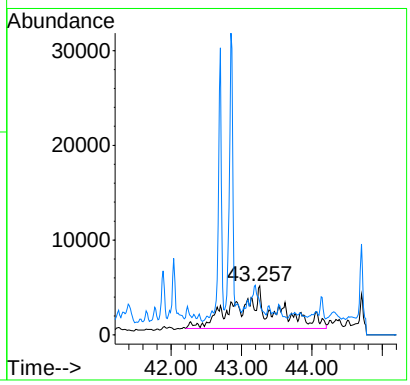


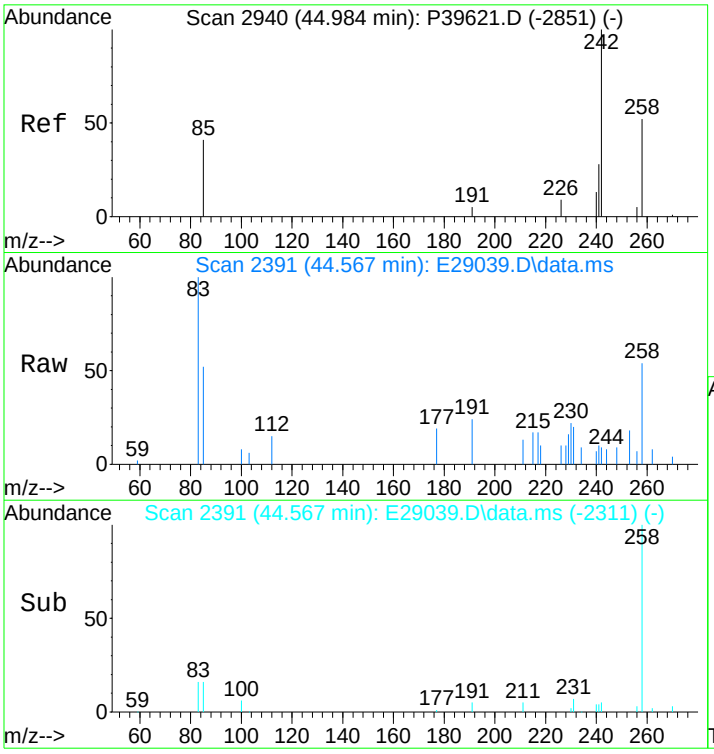


#63
C3-Fluoranthenes/Pyrenes
Concen: 1017.57 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:244 Resp: 174696

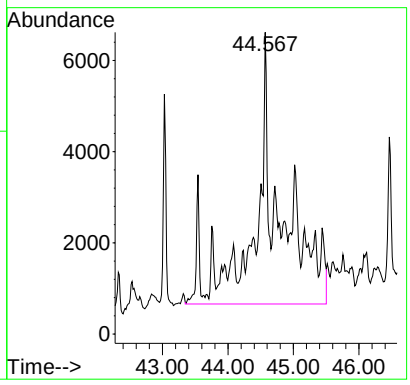
Ion	Ratio	Lower	Upper
244	100		
229	4.1	72.2	108.2#

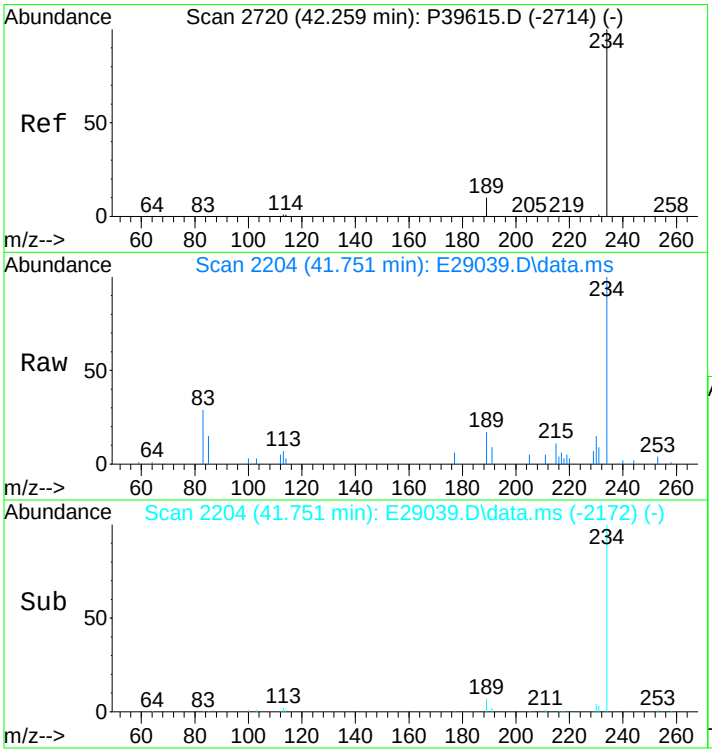




#64
C4-Fluoranthenes/Pyrenes
Concen: 920.22 ng/mL m
RT: 44.567 min Scan# 2391
Delta R.T. 0.571 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:258 Resp: 157983

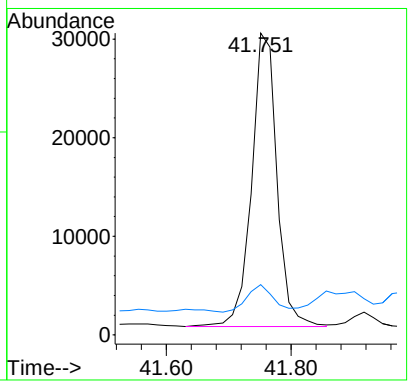


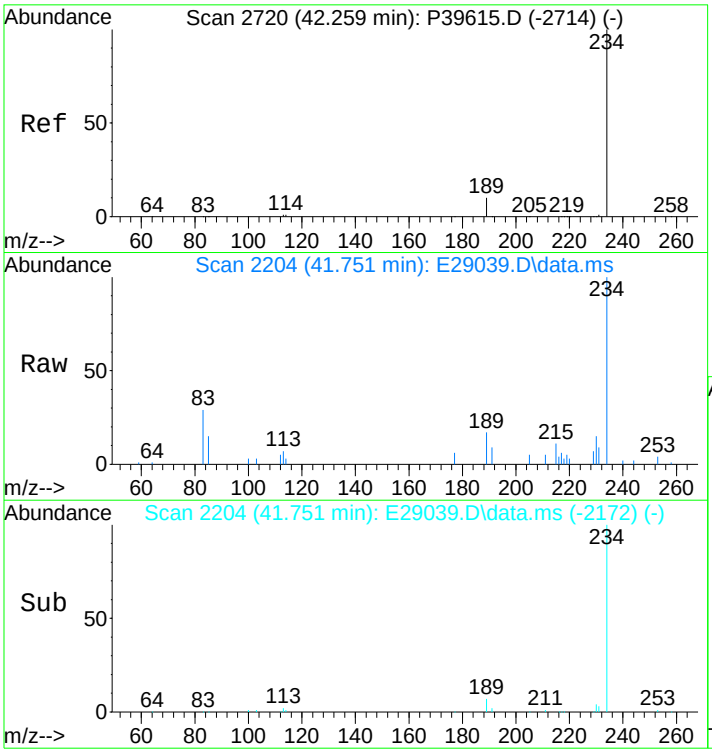


#66
Naphthobenzothiophene
Concen: 496.45 ng/ml
RT: 41.751 min Scan# 2204
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:234 Resp: 84061

Ion	Ratio	Lower	Upper
234	100		
189	9.5	5.4	8.2#

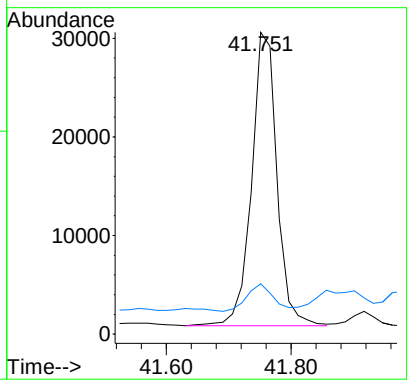


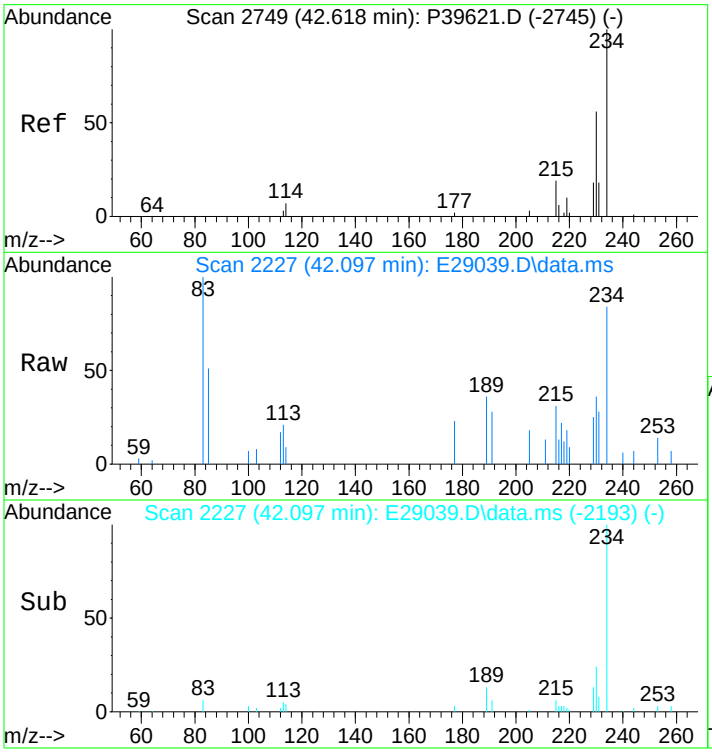


#67
Naphthobenzothiophene-2,1-D
Concen: 496.45 ng/mL
RT: 41.751 min Scan# 2204
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:234 Resp: 84061

Ion	Ratio	Lower	Upper
234	100		
189	9.5	5.4	8.2#

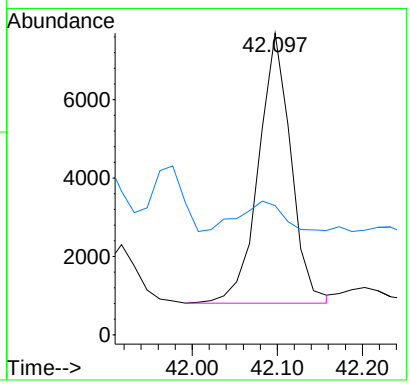


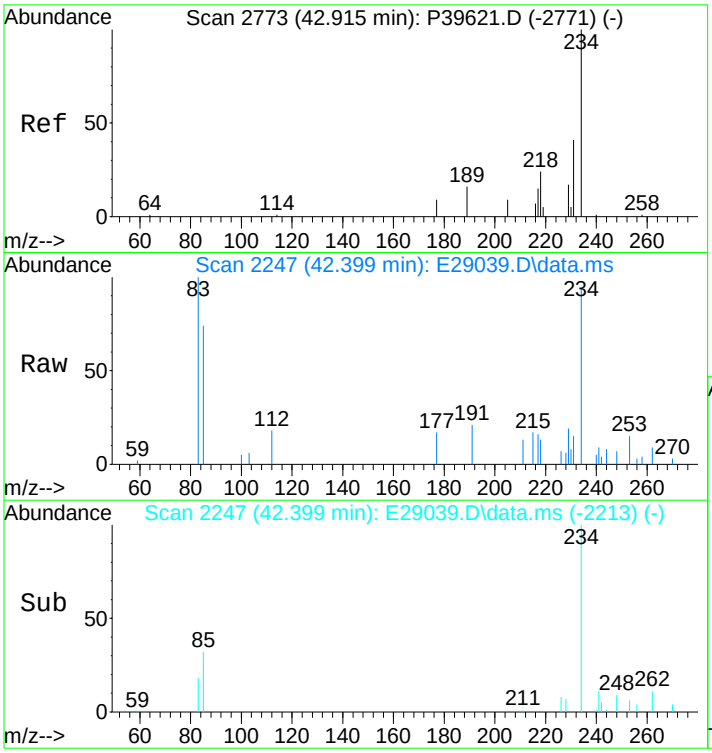


#68
Naphthobenzothiophene-1,2-D
Concen: 107.50 ng/mL
RT: 42.097 min Scan# 2227
Delta R.T. 0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:234 Resp: 18203

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

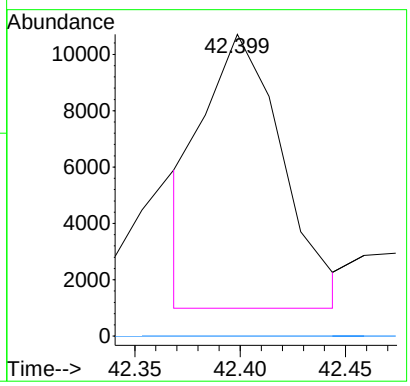


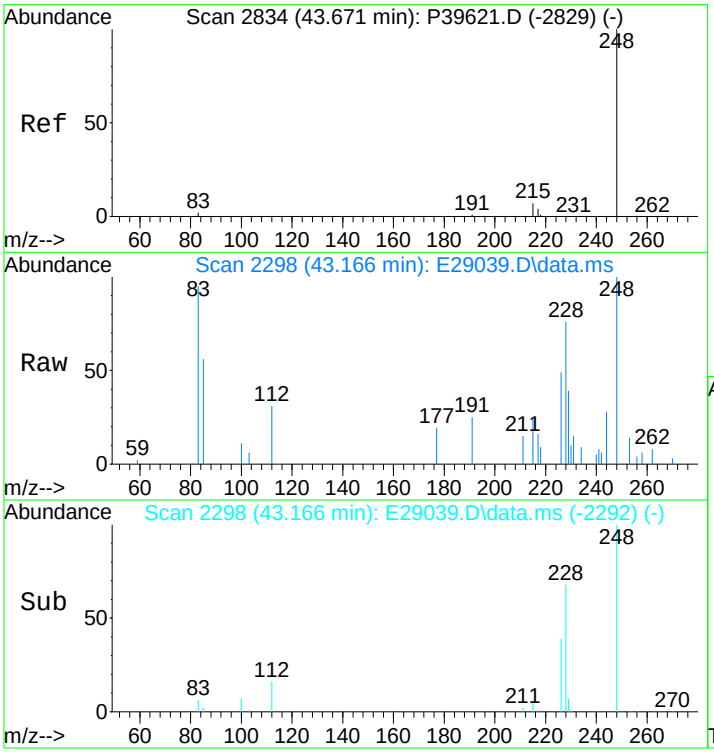


#69
Naphthobenzothiophene-2,3-D
Concen: 149.82 ng/mL m
RT: 42.399 min Scan# 2247
Delta R.T. 0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:234 Resp: 25368

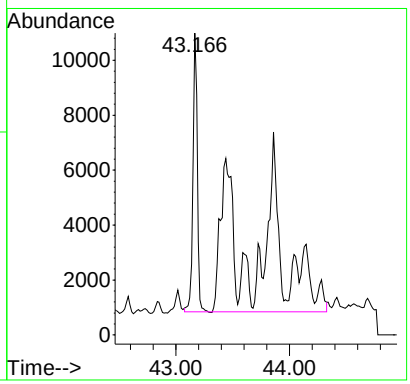
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

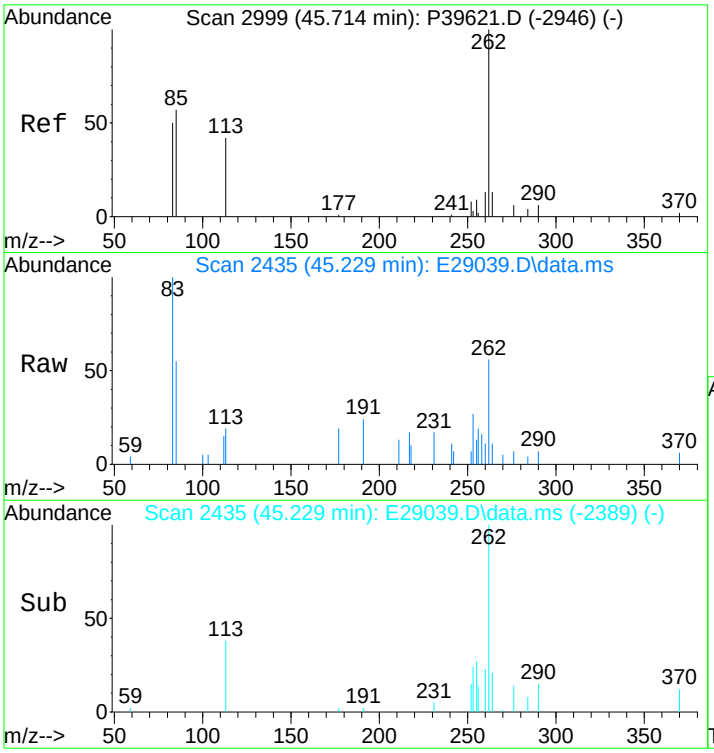




#70
C1-Naphthobenzothiophenes
Concen: 854.67 ng/ml m
RT: 43.166 min Scan# 2298
Delta R.T. 0.020 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

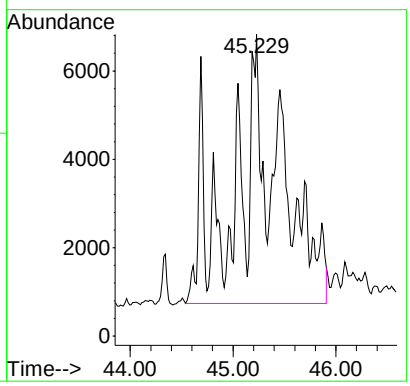
Tgt Ion:248 Resp: 144717

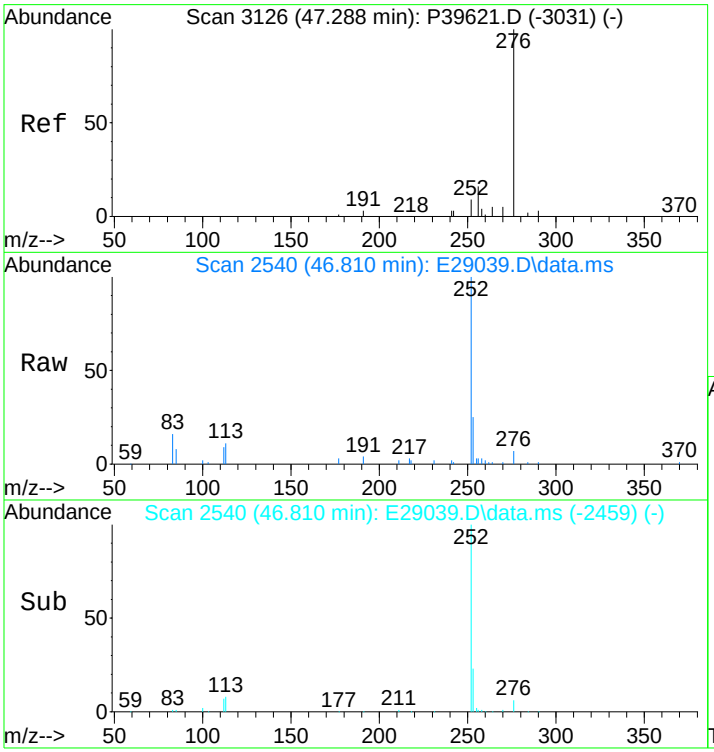




#71
C2-Naphthobenzothiophenes
Concen: 1053.54 ng/ml m
RT: 45.229 min Scan# 2435
Delta R.T. 0.559 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

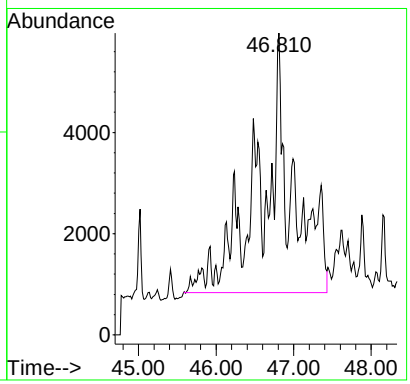
Tgt Ion:262 Resp: 178391

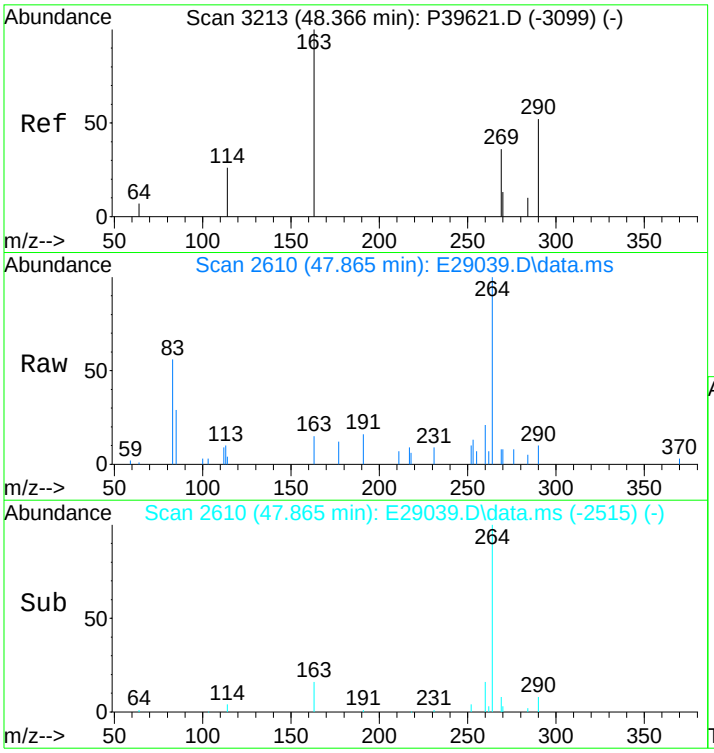




#72
C3-Naphthobenzothiophenes
Concen: 869.34 ng/ml m
RT: 46.810 min Scan# 2540
Delta R.T. 0.557 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

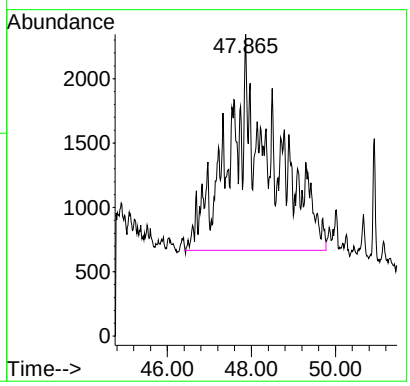
Tgt Ion:276 Resp: 147202

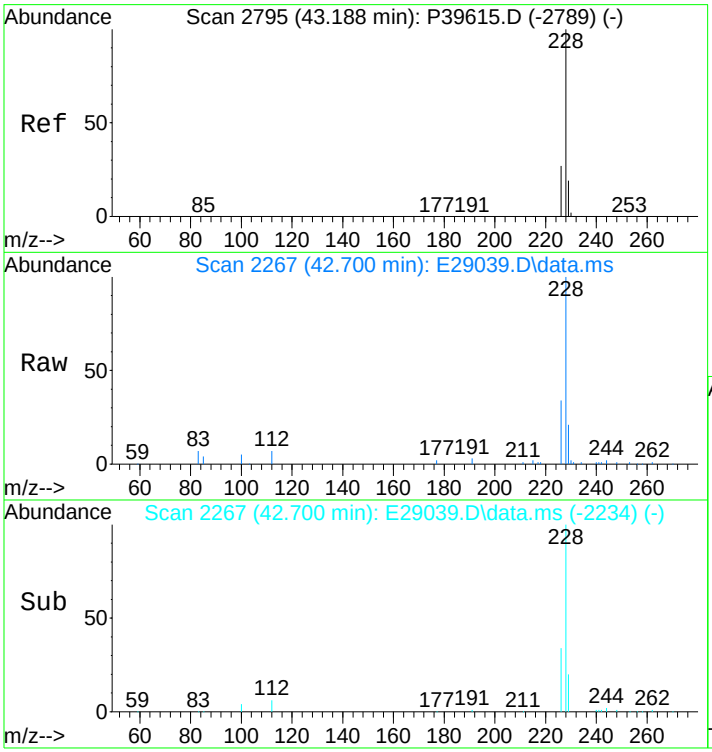




#73
C4-Naphthobenzothiophenes
Concen: 669.06 ng/mL m
RT: 47.865 min Scan# 2610
Delta R.T. 0.541 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:290 Resp: 113289

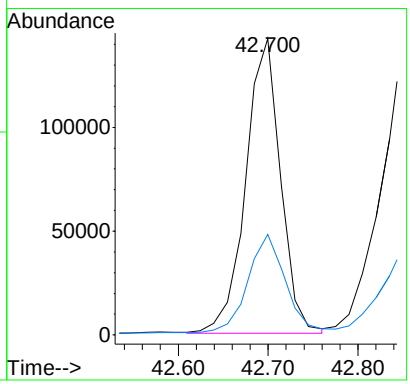


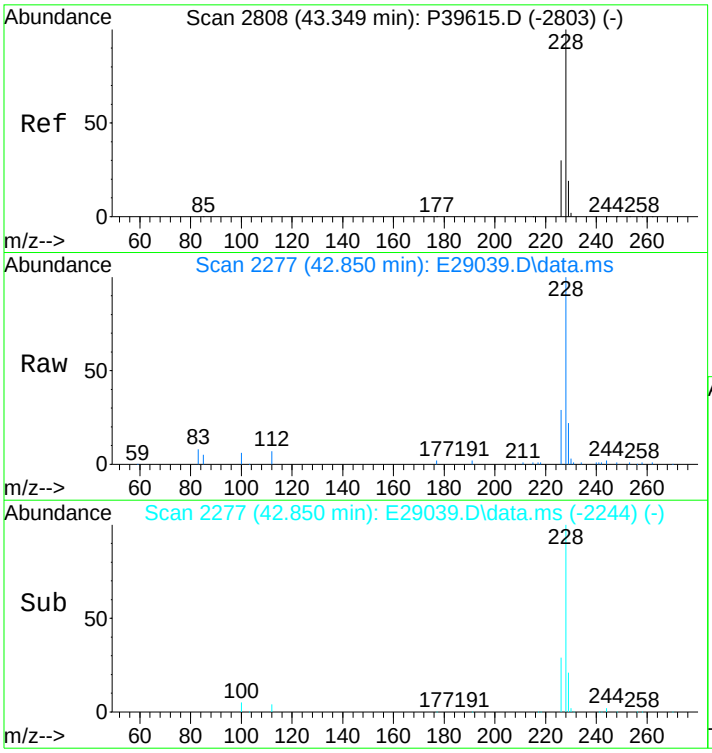


#75
Benz[a]anthracene
Concen: 2042.50 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:228 Resp: 382421

Ion	Ratio	Lower	Upper
228	100		
226	35.5	20.2	30.4#

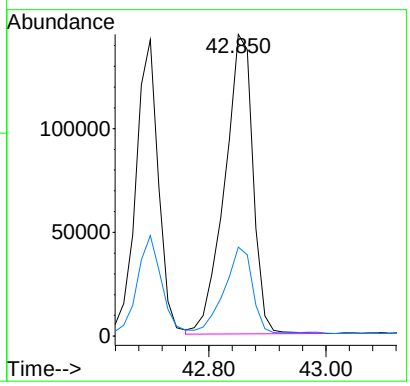


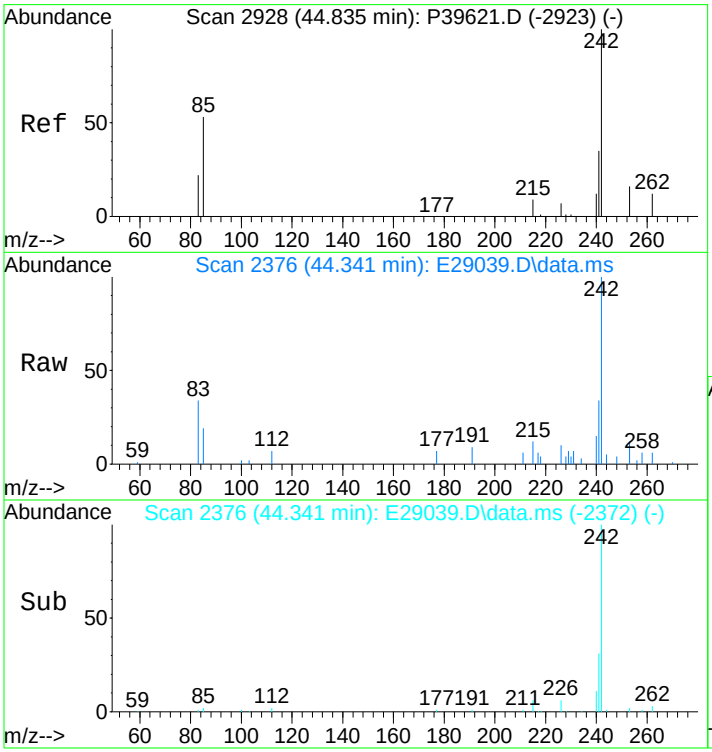


#77
Chrysene/Triphenylene
Concen: 2508.18 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:228 Resp: 483474

Ion	Ratio	Lower	Upper
228	100		
226	28.6	22.5	33.7

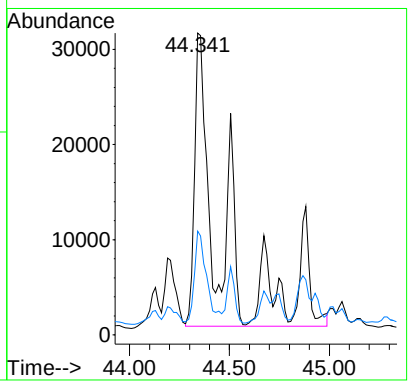


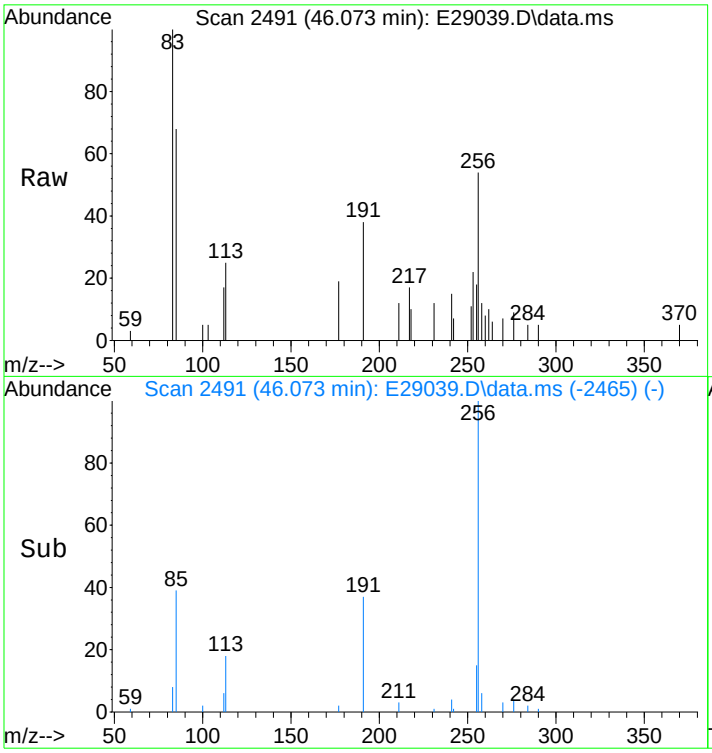


#78
C1-Chrysenes
Concen: 1432.21 ng/mL m
RT: 44.341 min Scan# 2376
Delta R.T. 0.010 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:242 Resp: 276071

Ion	Ratio	Lower	Upper
242	100		
241	4.0	32.2	48.4#

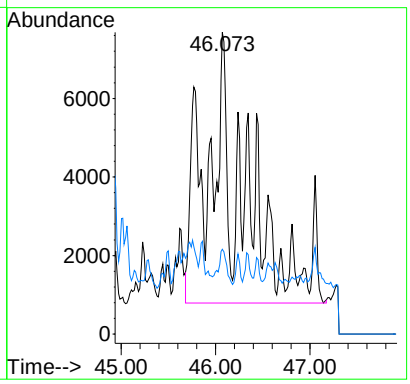


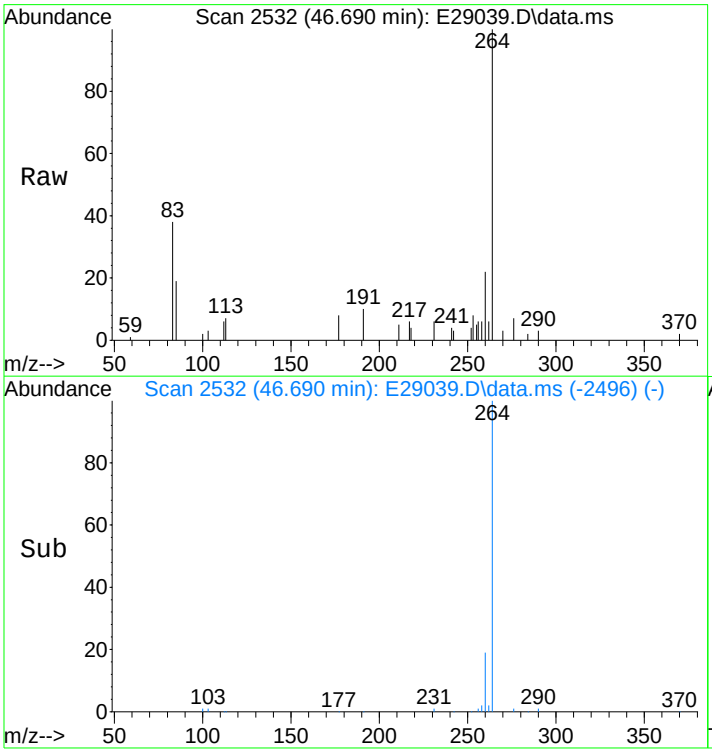


#79
C2-Chrysenes
Concen: 982.25 ng/mL m
RT: 46.073 min Scan# 2491
Delta R.T. -0.319 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:256 Resp: 189338

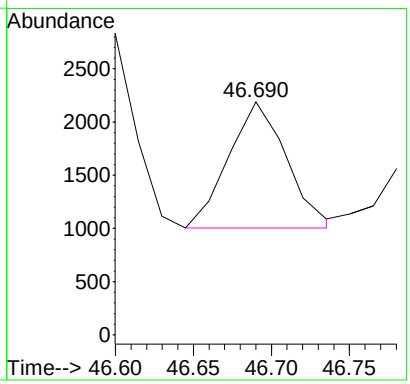
Ion	Ratio	Lower	Upper
256	100		
241	1.3	25.3	37.9#

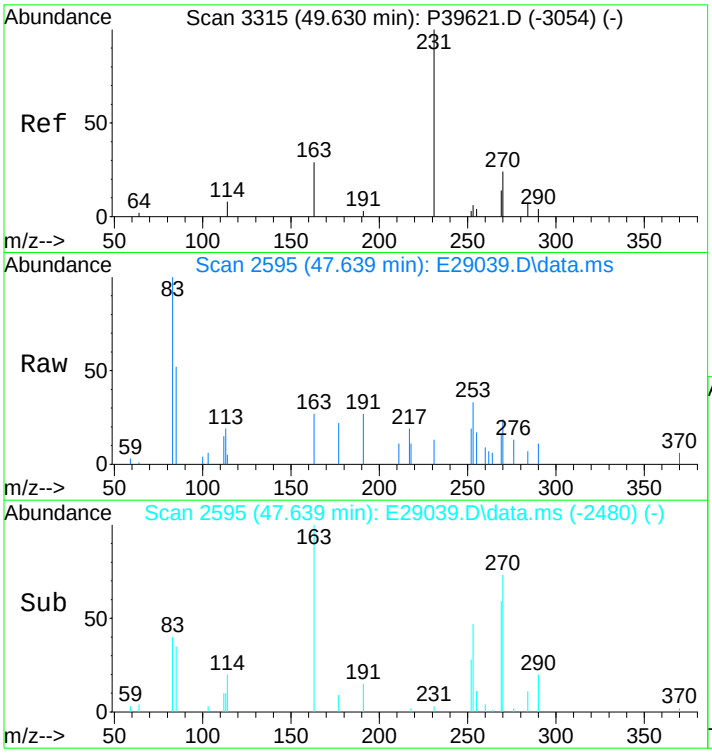




#80
BBF-D12 Surr BKGD
Concen: 15.93 ng/mL
RT: 46.690 min Scan# 2532
Delta R.T. 0.046 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:256 Resp: 3071

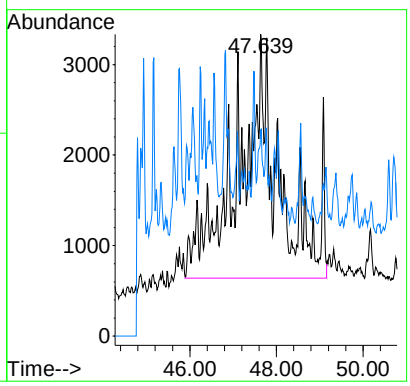


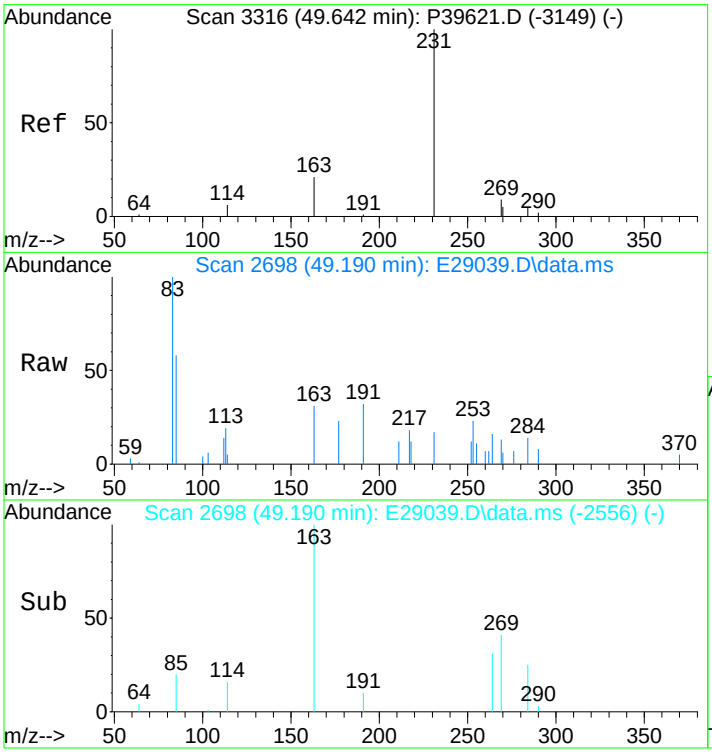


#81
C3-Chrysenes
Concen: 870.15 ng/mL m
RT: 47.639 min Scan# 2595
Delta R.T. -1.481 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:270 Resp: 167729

Ion	Ratio	Lower	Upper
270	100		
255	1.9	38.0	57.0#

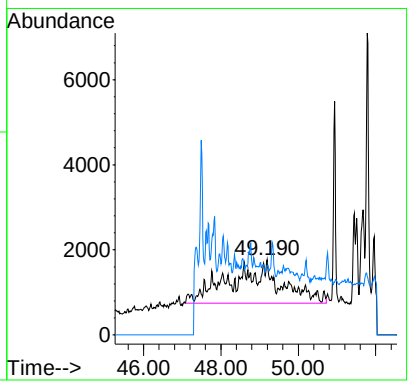


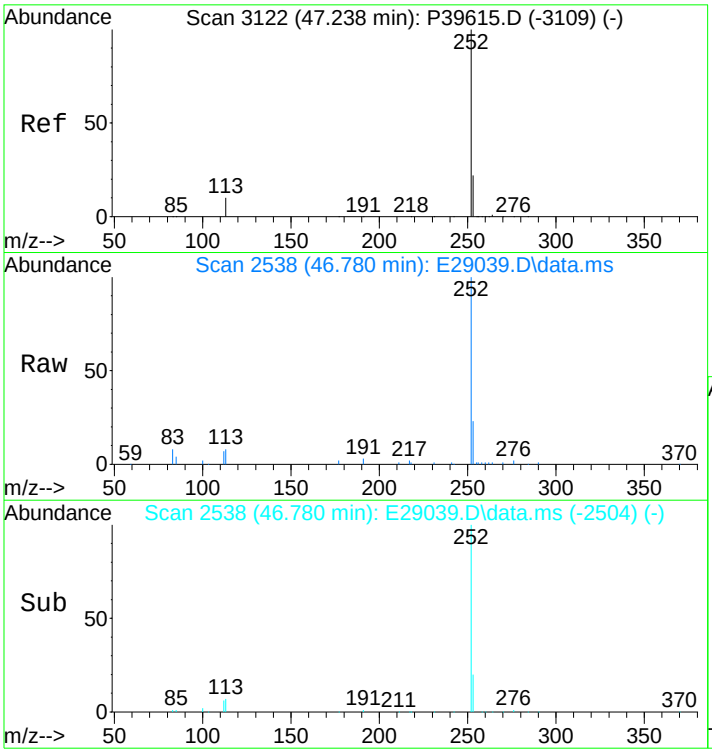


#82
C4-Chrysenes
Concen: 454.31 ng/mL m
RT: 49.190 min Scan# 2698
Delta R.T. -0.048 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:284 Resp: 87572

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

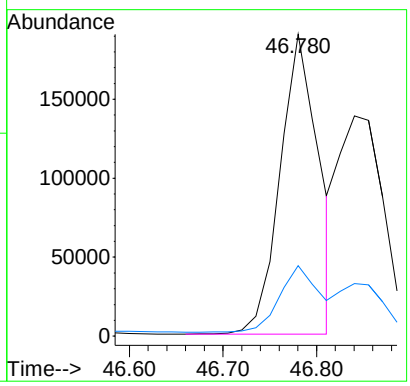


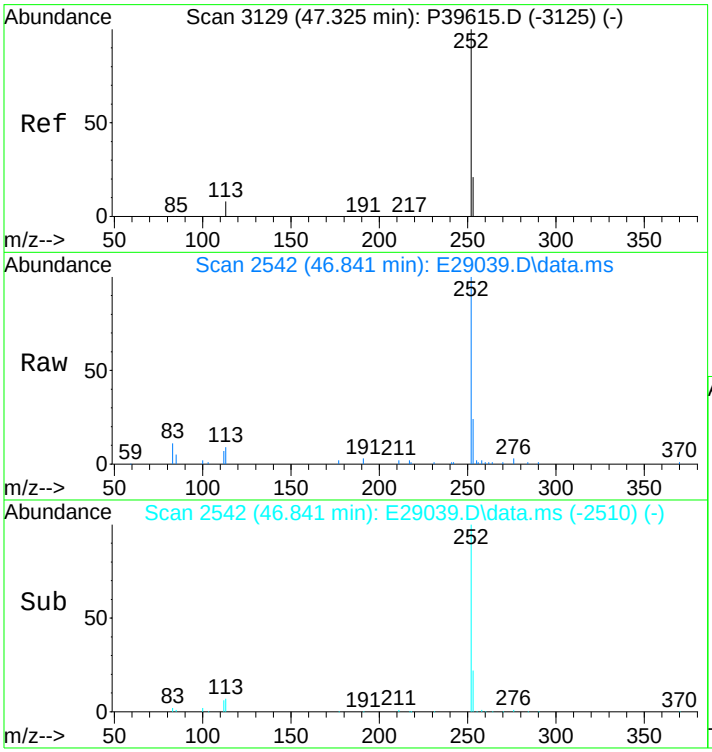


#84
Benzo[b]fluoranthene
Concen: 2498.13 ng/mL
RT: 46.780 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:252 Resp: 543658

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.2	28.8

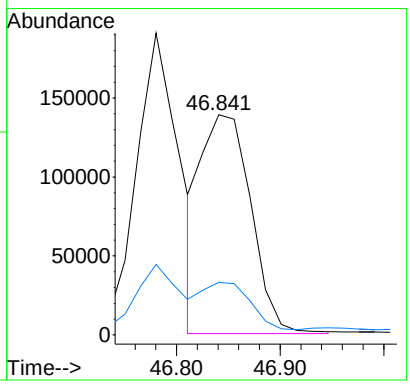


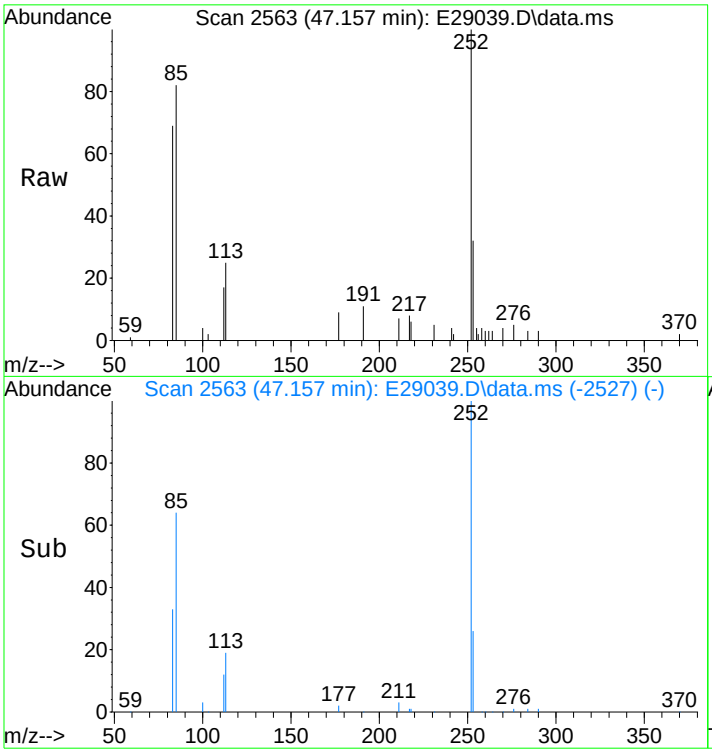


#85
Benzo[j]+[k]fluoranthene
Concen: 2075.82 ng/mL m
RT: 46.841 min Scan# 2542
Delta R.T. -0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:252 Resp: 464775

Ion	Ratio	Lower	Upper
252	100		
253	26.3	19.3	28.9

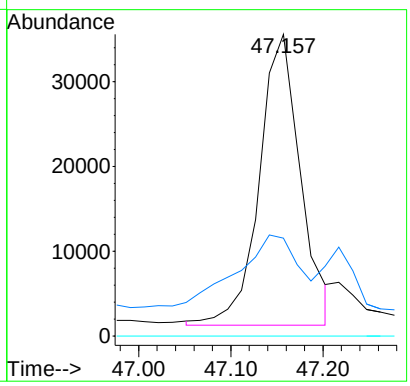


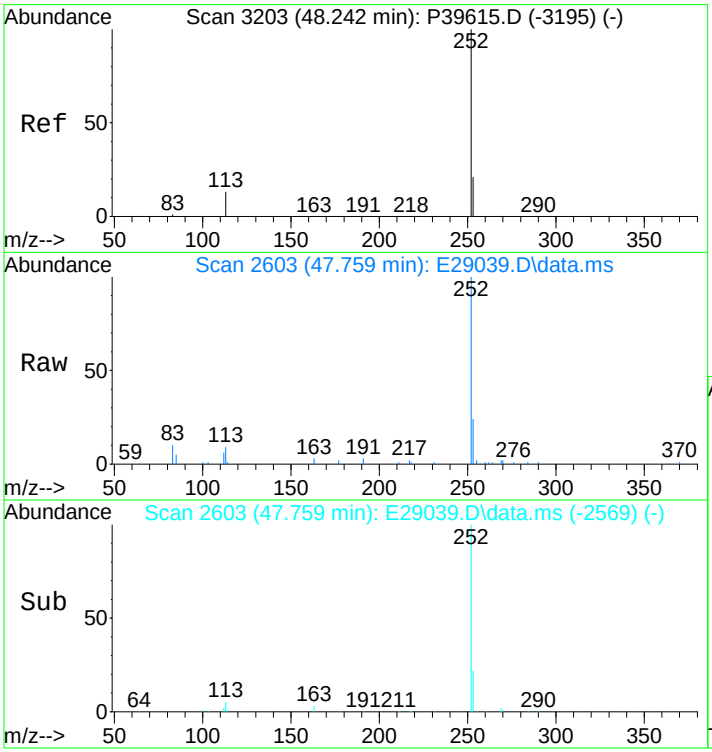


#86
Benzo[a]fluoranthene
Concen: 475.21 ng/mL m
RT: 47.157 min Scan# 2563
Delta R.T. 0.035 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:252 Resp: 106399

Ion	Ratio	Lower	Upper
252	100		
253	39.5	456.0	684.0#
125	0.0	0.0	0.0

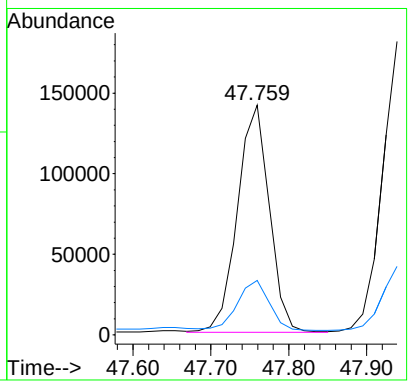


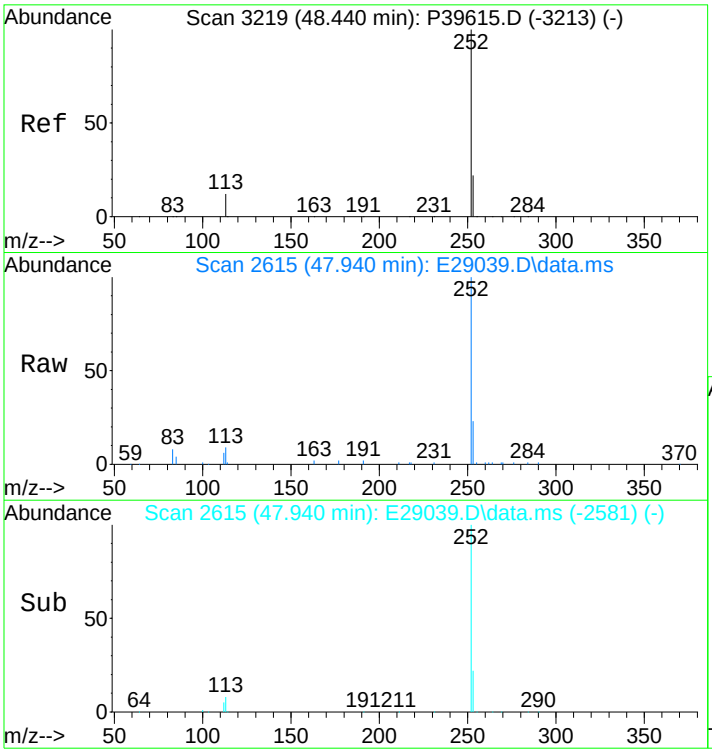


#87
Benzo[e]pyrene
Concen: 1885.98 ng/mL m
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:252 Resp: 400764

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.4	29.0

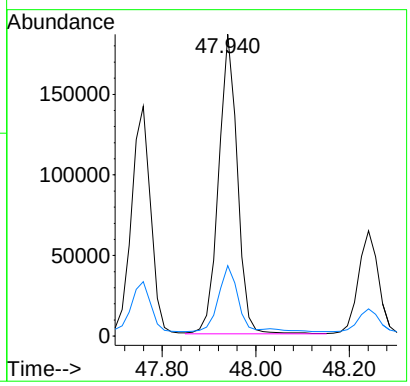


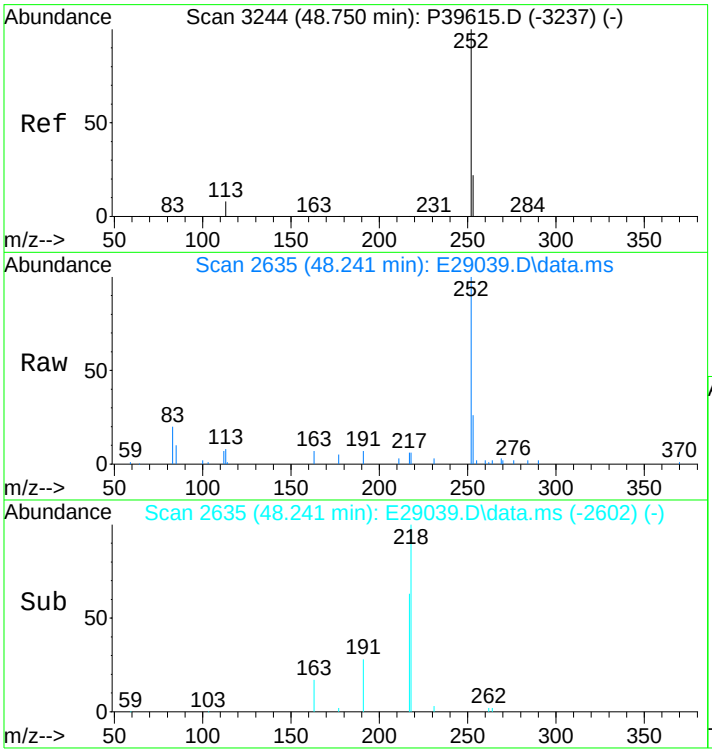


#89
Benzo[a]pyrene
Concen: 2536.17 ng/mL
RT: 47.940 min Scan# 2615
Delta R.T. 0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:252 Resp: 515681

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.6	29.4

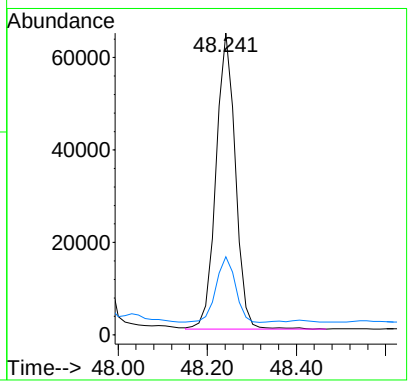


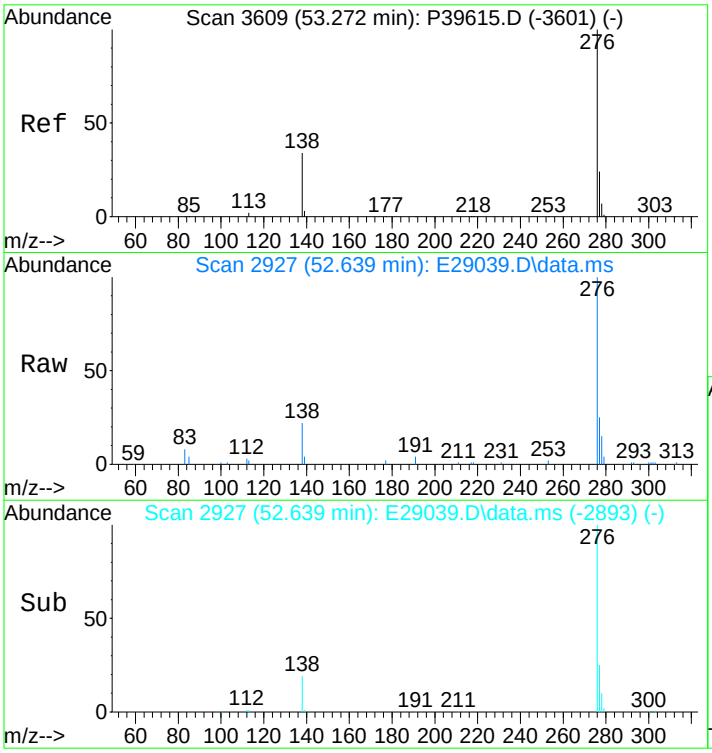


#90
Perylene
Concen: 895.65 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:252 Resp: 192573

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.9	29.9

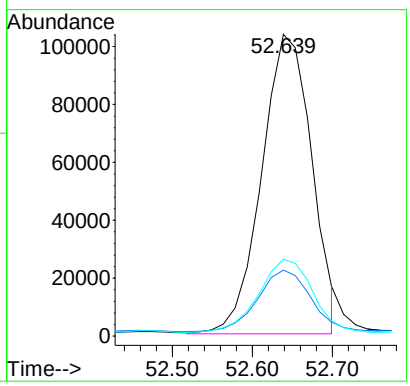


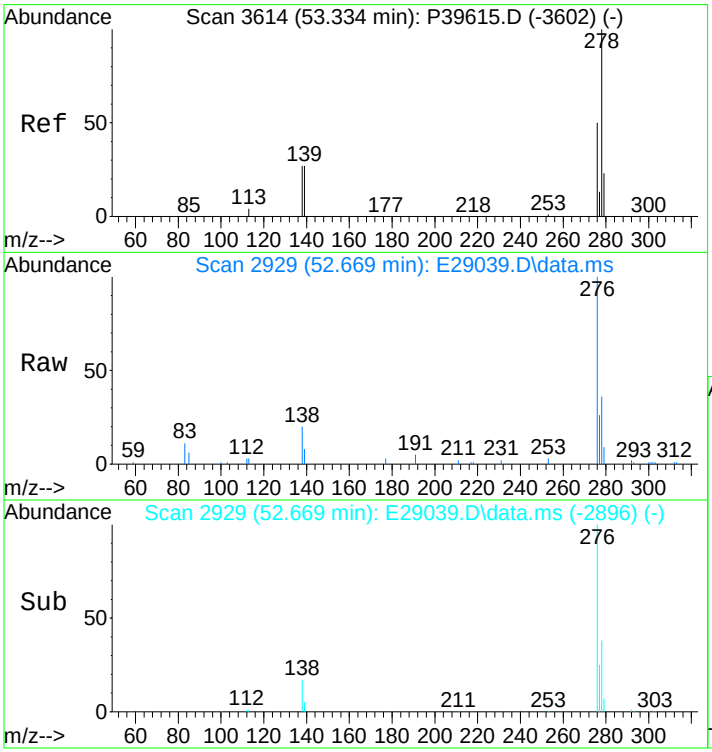


#91
Indeno[1,2,3-cd]pyrene
Concen: 1885.82 ng/mL m
RT: 52.639 min Scan# 2927
Delta R.T. 0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:276 Resp: 451266

Ion	Ratio	Lower	Upper
276	100		
138	21.8	17.8	26.8
277	26.7	20.0	30.0

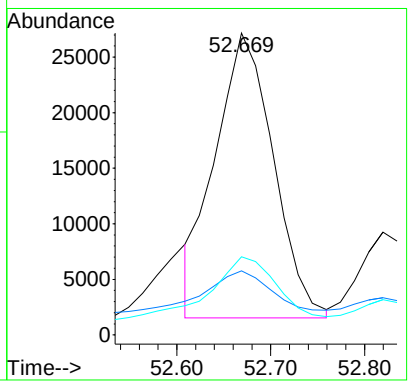


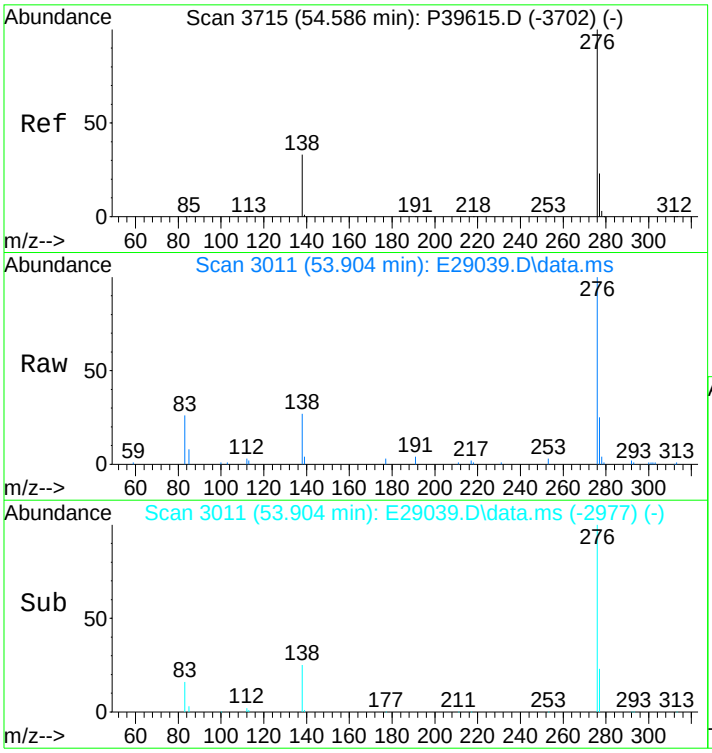


#92
Dibenz[ah]+[ac]anthracene
Concen: 435.10 ng/mL m
RT: 52.669 min Scan# 2929
Delta R.T. 0.000 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:278 Resp: 110861

Ion	Ratio	Lower	Upper
278	100		
139	17.5	13.0	19.4
279	26.9	19.4	29.2

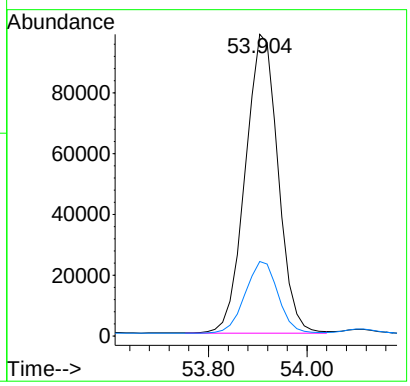


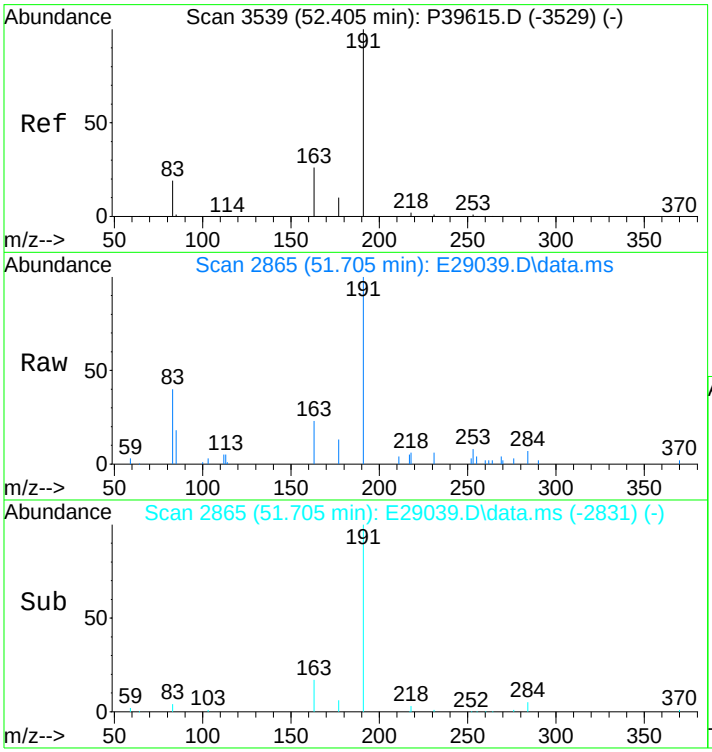


#93
Benzo[g,h,i]perylene
Concen: 1755.27 ng/mL
RT: 53.904 min Scan# 3011
Delta R.T. 0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:276 Resp: 452893

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.4	29.2

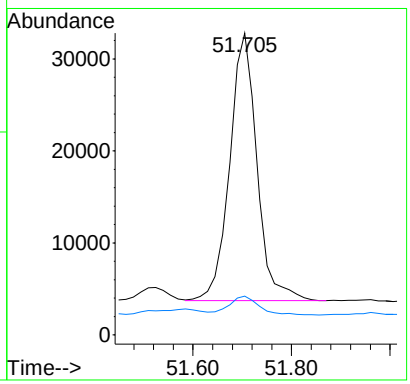


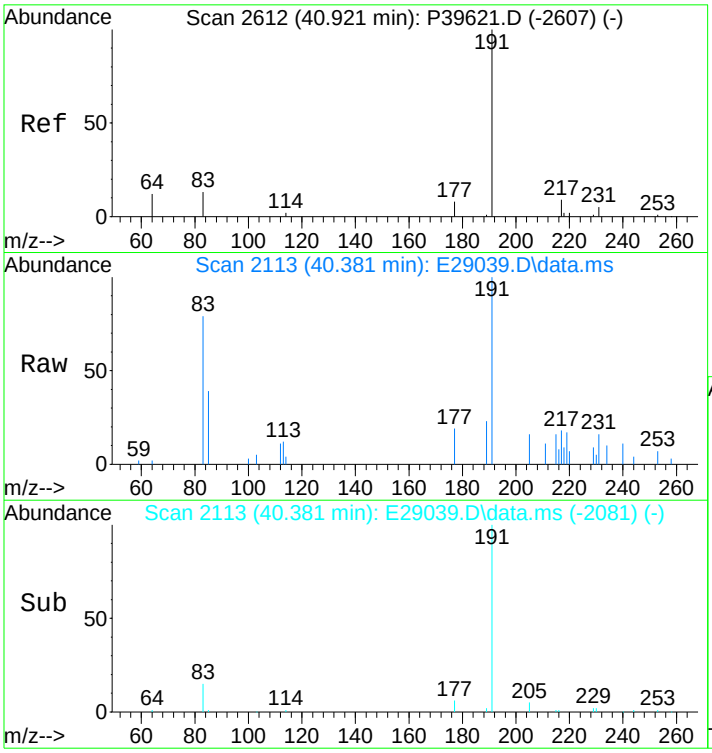


#94
Hopane (T19)
Concen: 1550.96 ng/mL
RT: 51.705 min Scan# 2865
Delta R.T. 0.015 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:191 Resp: 111915

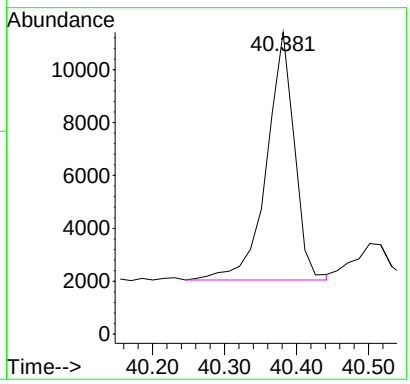
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.3	16.9#

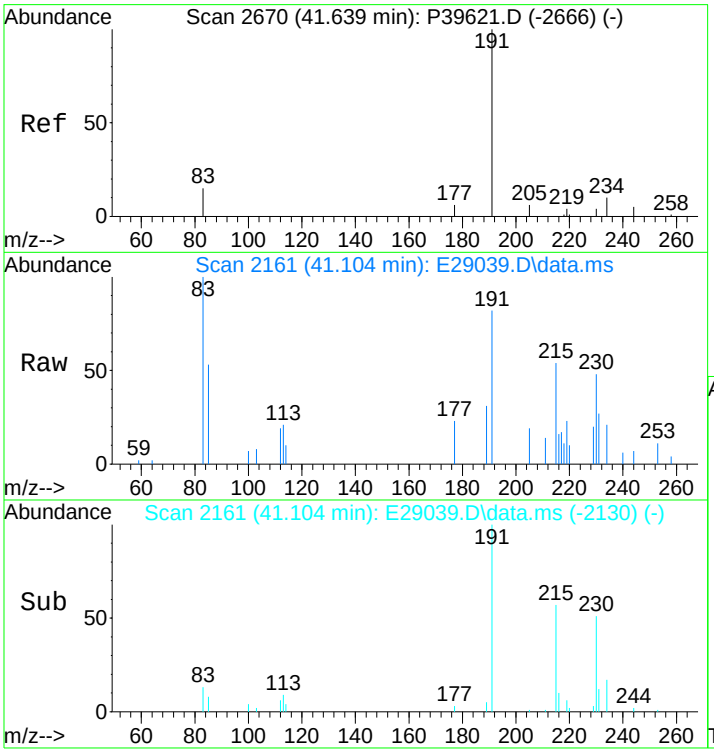




#96
C23 Tricyclic Terpane (T4)
Concen: 347.61 ng/ml
RT: 40.381 min Scan# 2113
Delta R.T. -0.013 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

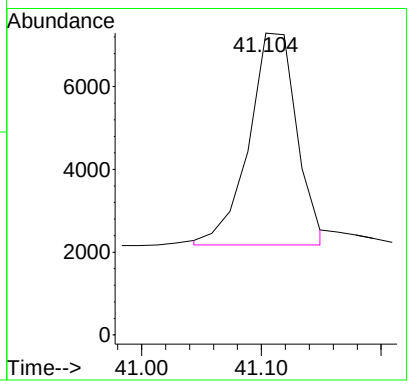
Tgt Ion:191 Resp: 25083

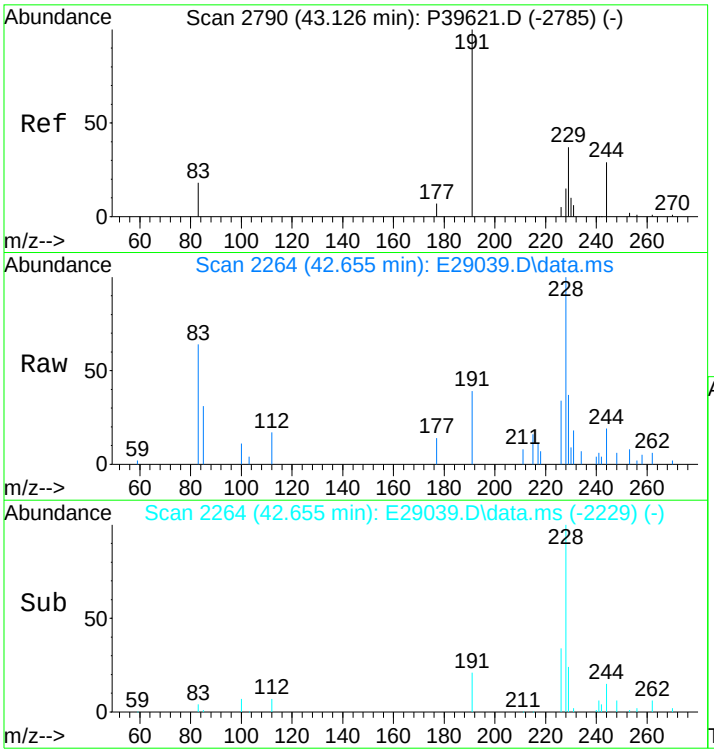




#97
C24 Tricyclic Terpane (T5)
Concen: 197.51 ng/ml m
RT: 41.104 min Scan# 2161
Delta R.T. -0.028 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

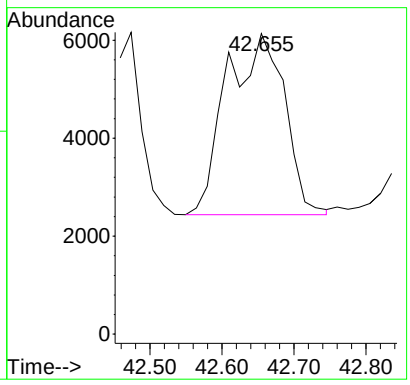
Tgt Ion:191 Resp: 14252

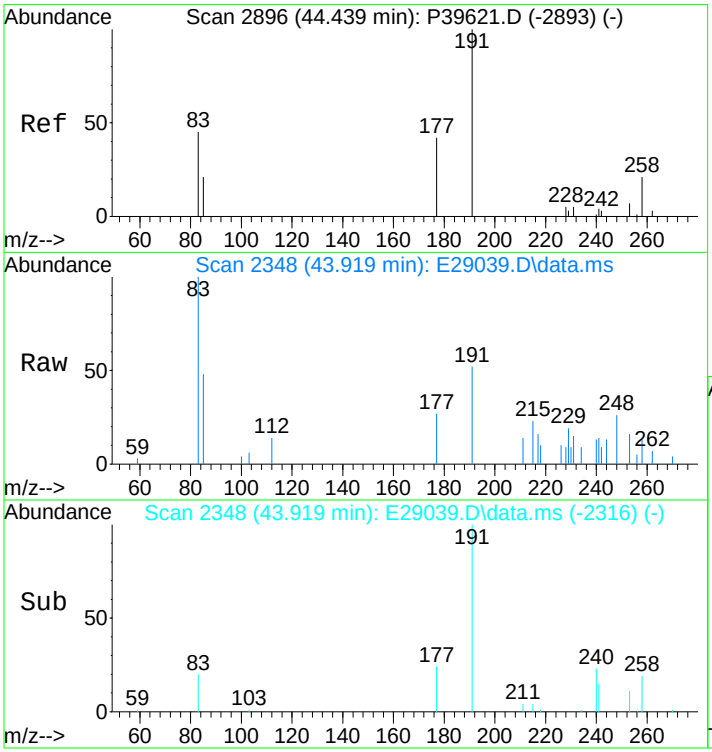




#98
C25 Tricyclic Terpane (T6)
Concen: 286.83 ng/ml
RT: 42.655 min Scan# 2264
Delta R.T. 0.030 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

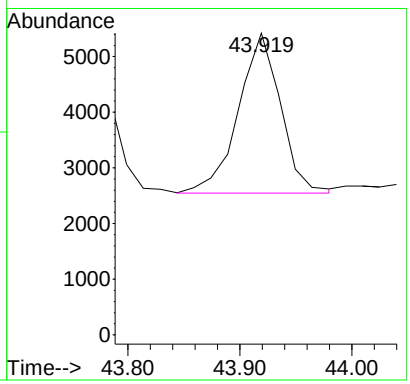
Tgt Ion:191 Resp: 20697

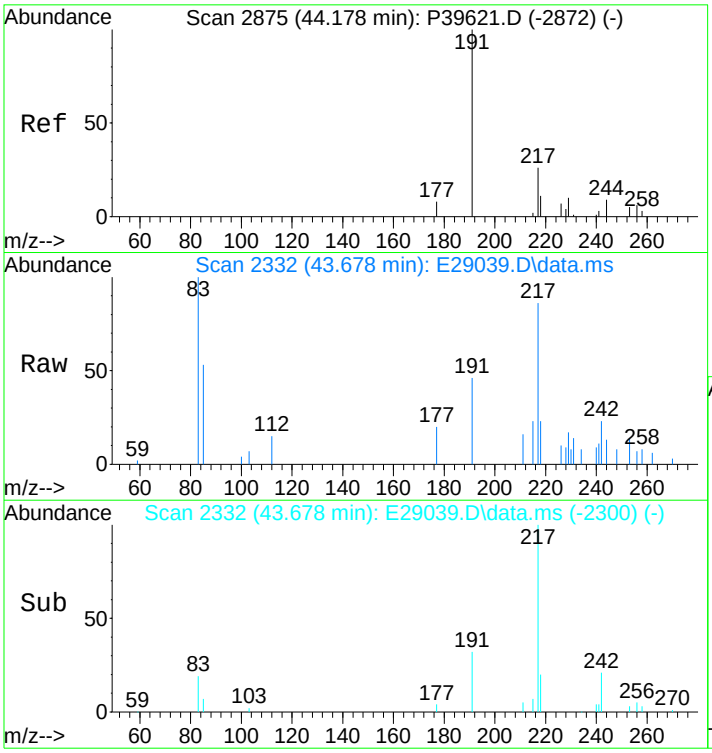




#99
C24 Tetracyclic Terpane (T6a)
Concen: 104.33 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

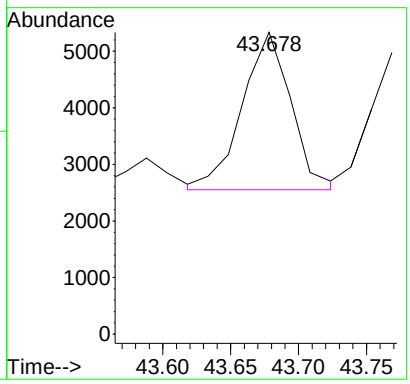
Tgt Ion:191 Resp: 7528

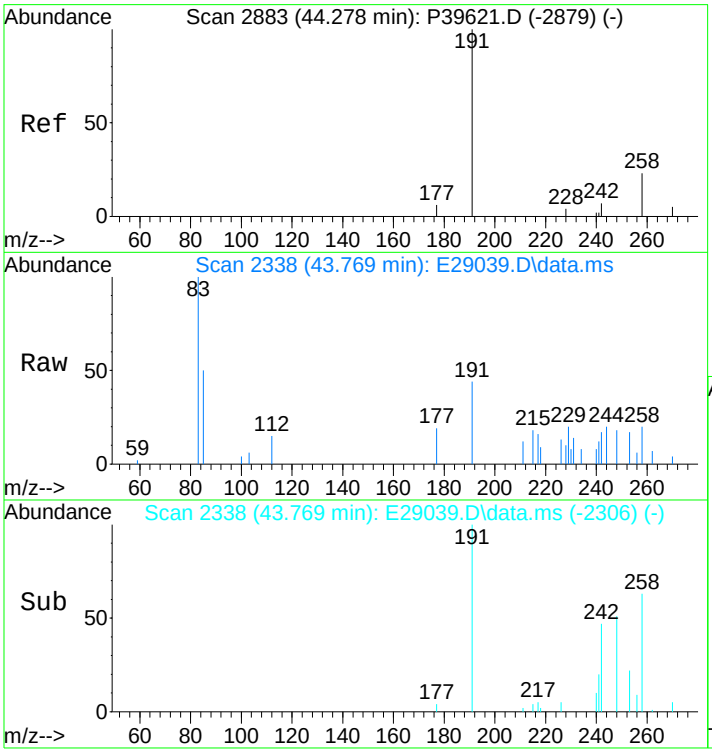




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 96.57 ng/ml m
RT: 43.678 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

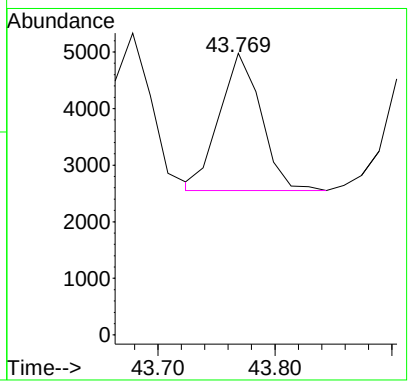
Tgt Ion:191 Resp: 6968

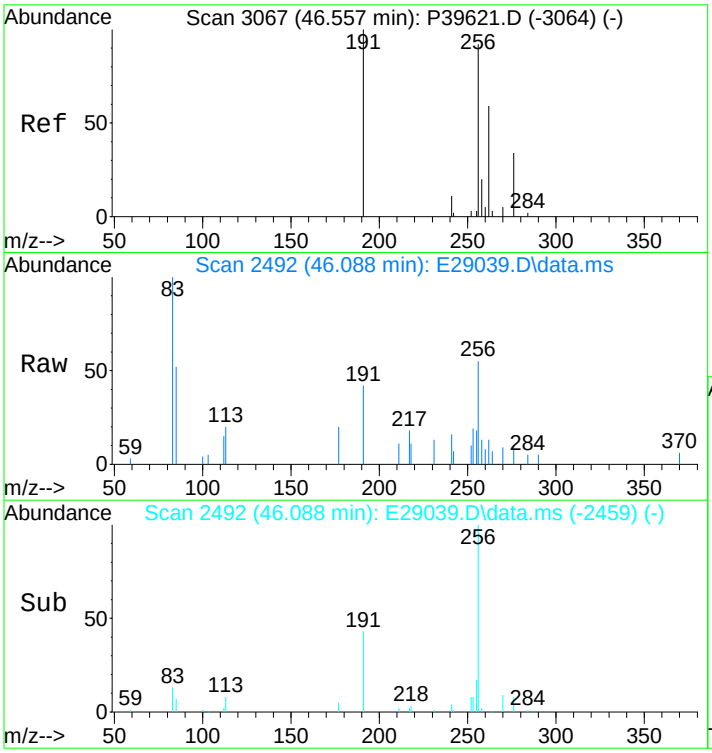




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 83.03 ng/ml
RT: 43.769 min Scan# 2338
Delta R.T. -0.016 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

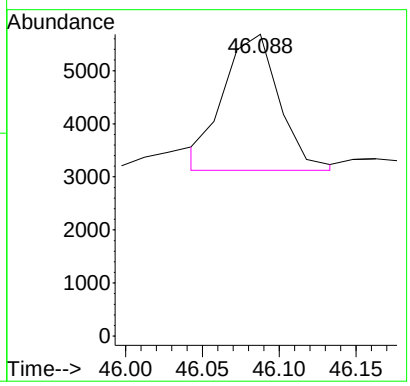
Tgt Ion:191 Resp: 5991

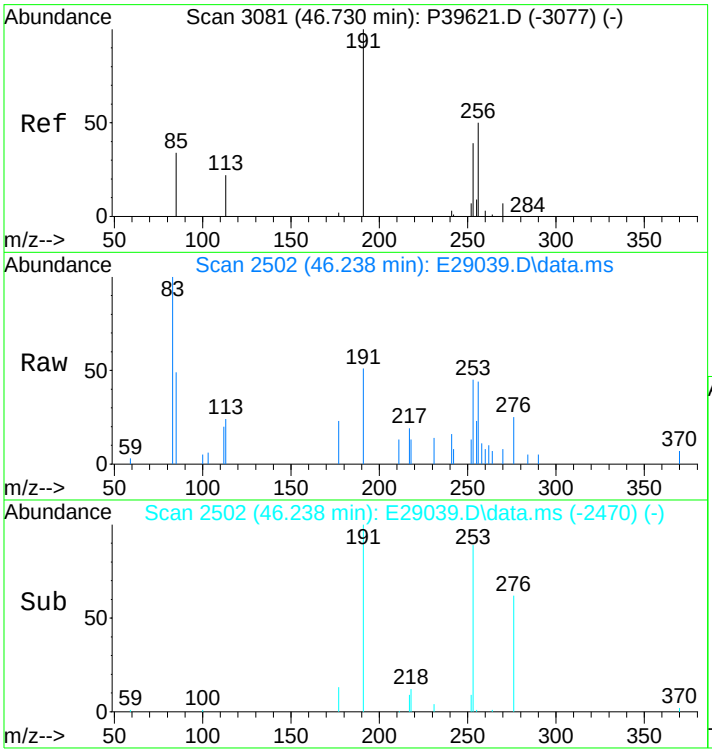




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 89.04 ng/ml m
RT: 46.088 min Scan# 2492
Delta R.T. -0.003 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

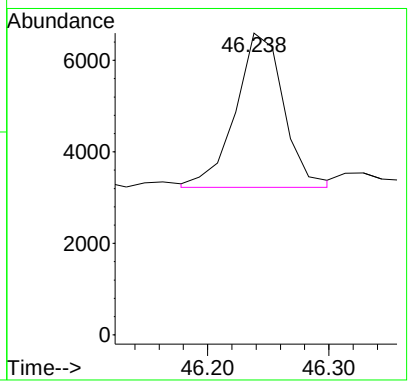
Tgt Ion:191 Resp: 6425

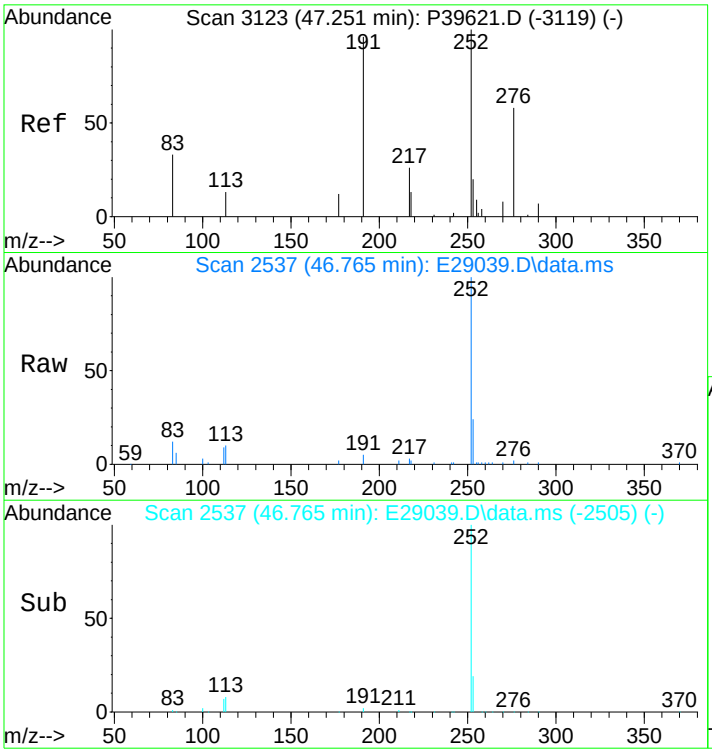




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 128.62 ng/ml m
RT: 46.238 min Scan# 2502
Delta R.T. -0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

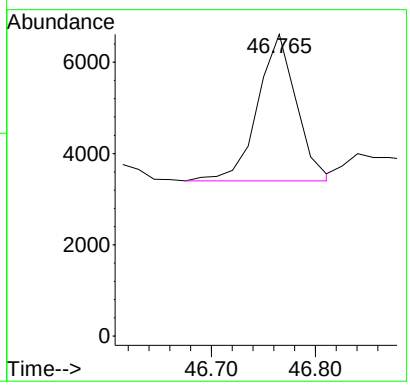
Tgt Ion:191 Resp: 9281

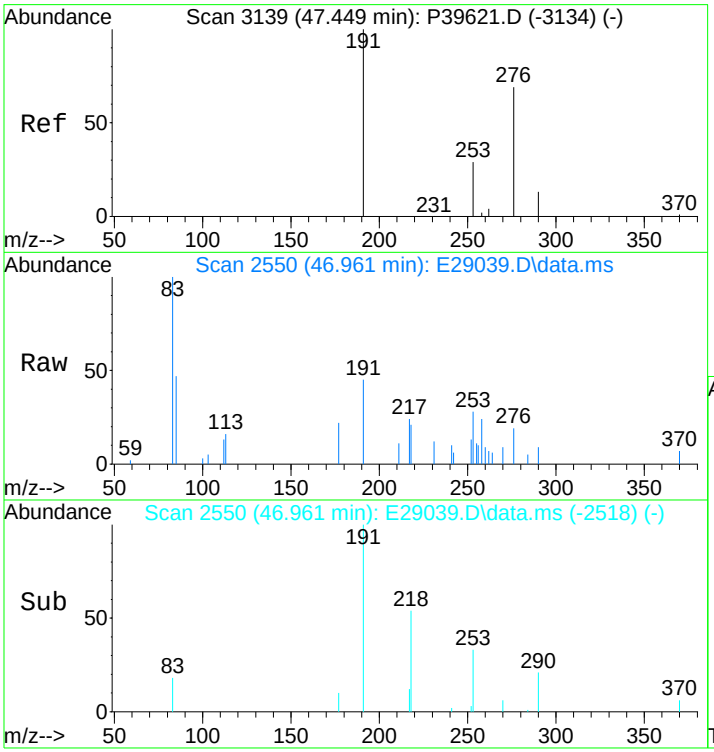




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 115.16 ng/ml
RT: 46.765 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

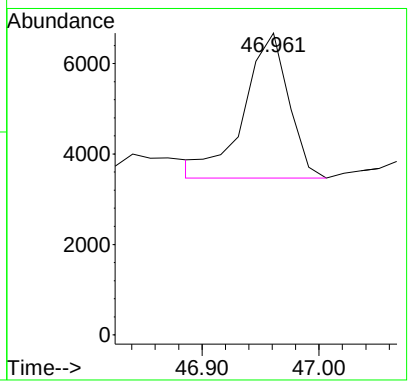
Tgt Ion:191 Resp: 8310

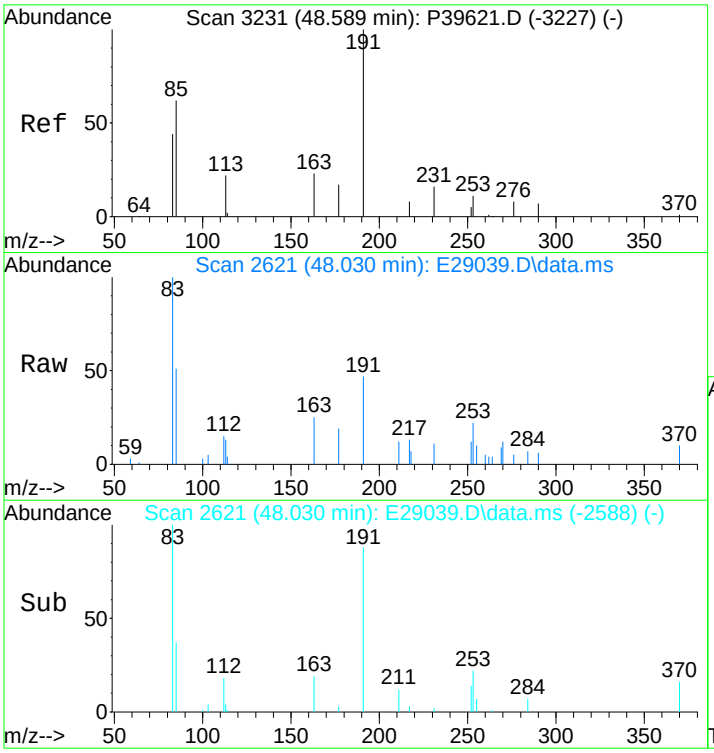




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 117.73 ng/ml
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

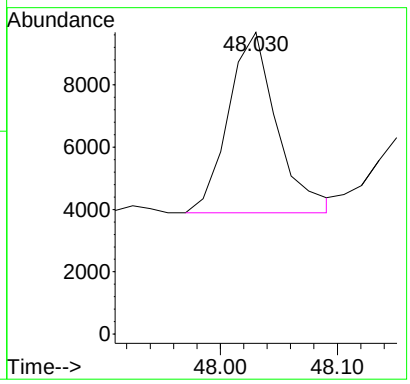
Tgt Ion:191 Resp: 8495

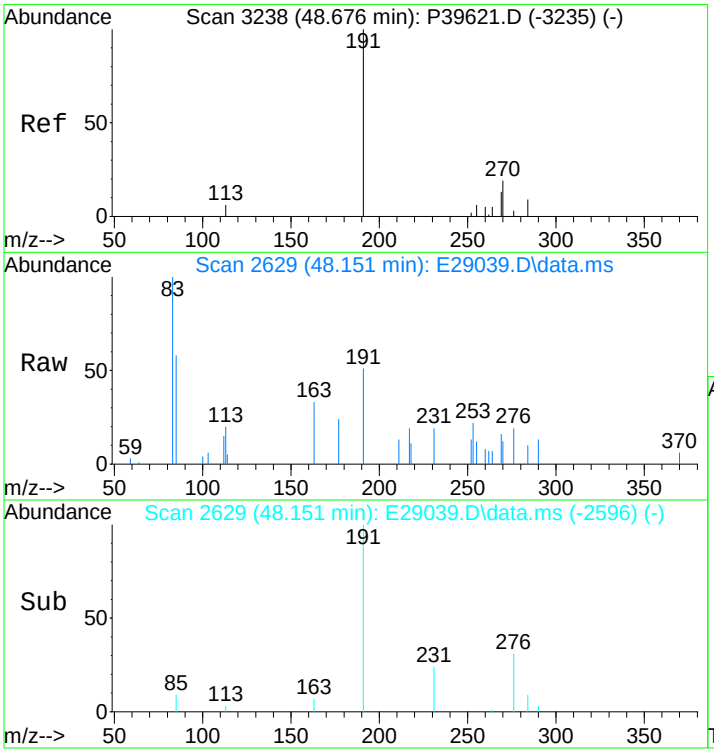




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 233.08 ng/ml
RT: 48.030 min Scan# 2621
Delta R.T. -0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

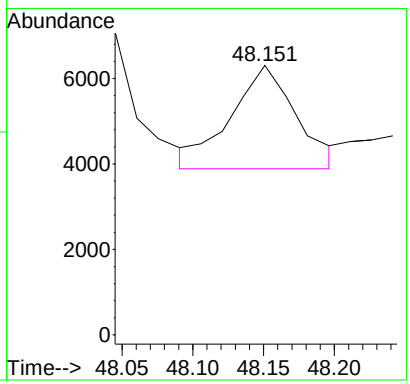
Tgt Ion:191 Resp: 16819

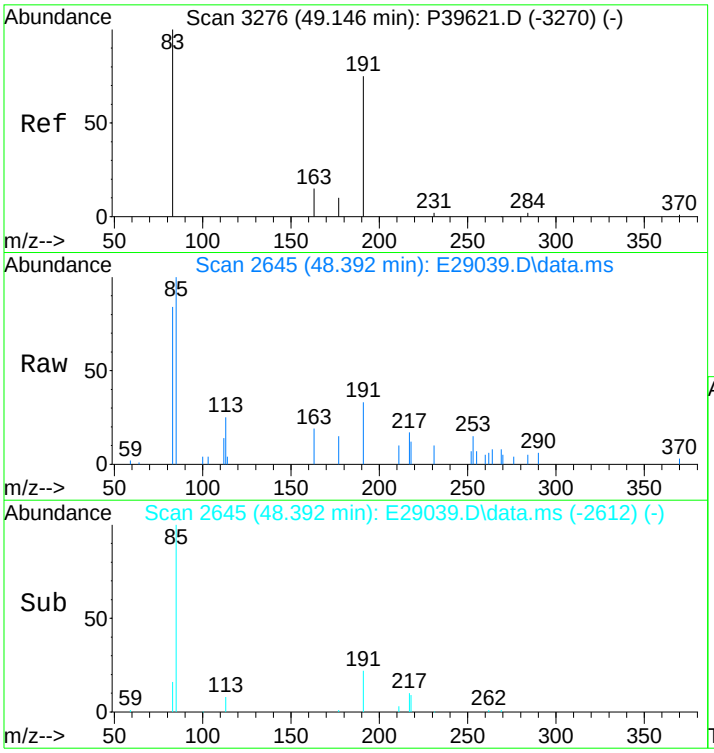




#107
C30 Tricyclic Terpane-22S
Concen: 107.50 ng/mL m
RT: 48.151 min Scan# 2629
Delta R.T. -0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

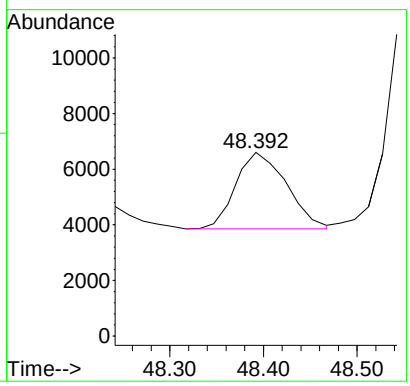
Tgt Ion:191 Resp: 7757

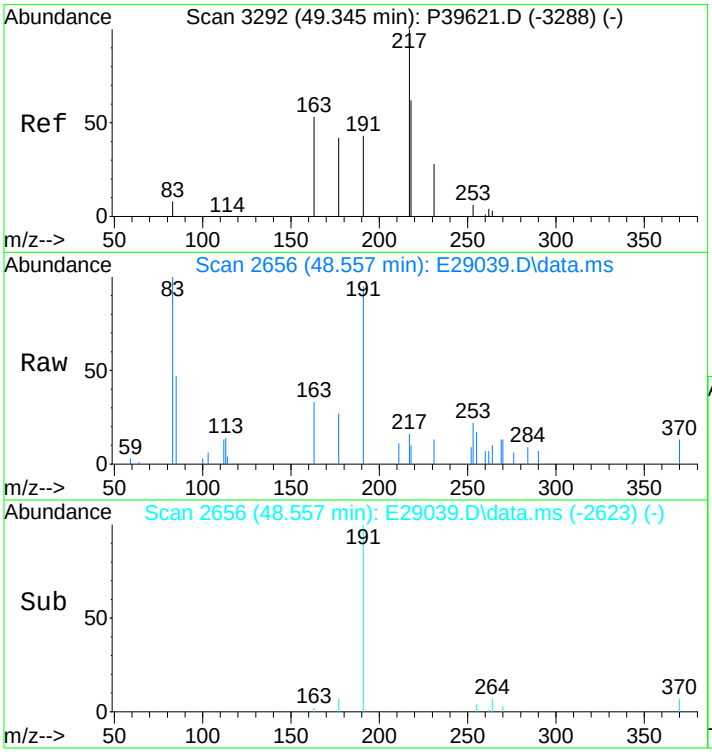




#108
C30 Tricyclic Terpane-22R
Concen: 144.36 ng/mL
RT: 48.392 min Scan# 2645
Delta R.T. -0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

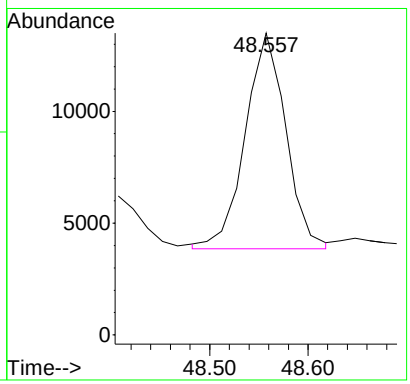
Tgt Ion:191 Resp: 10417

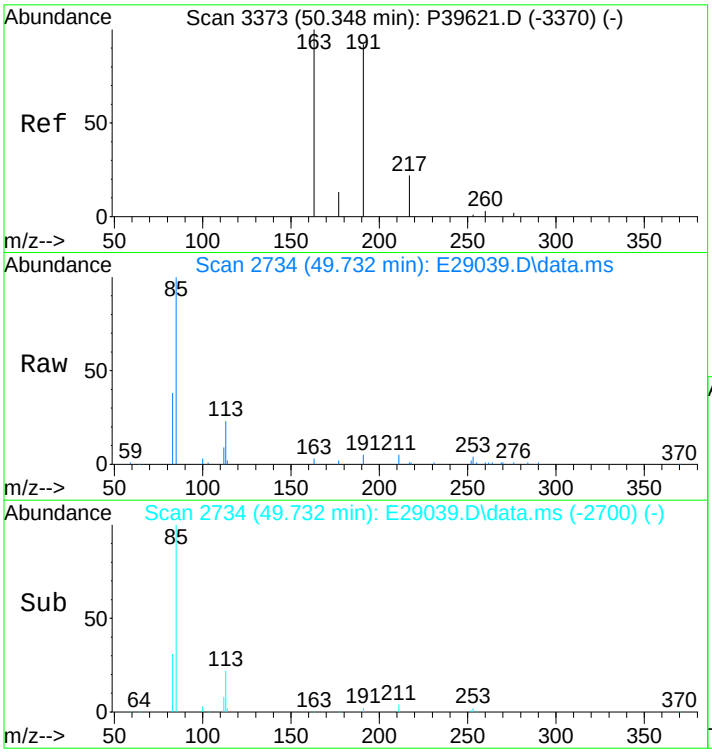




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 382.91 ng/ml m
RT: 48.557 min Scan# 2656
Delta R.T. -0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

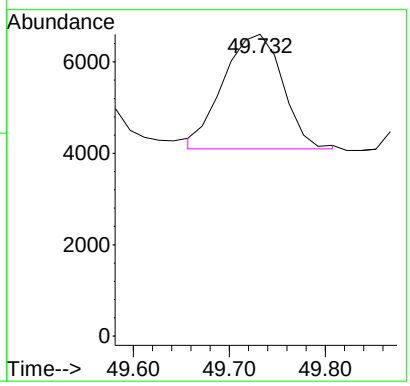
Tgt Ion:191 Resp: 27630

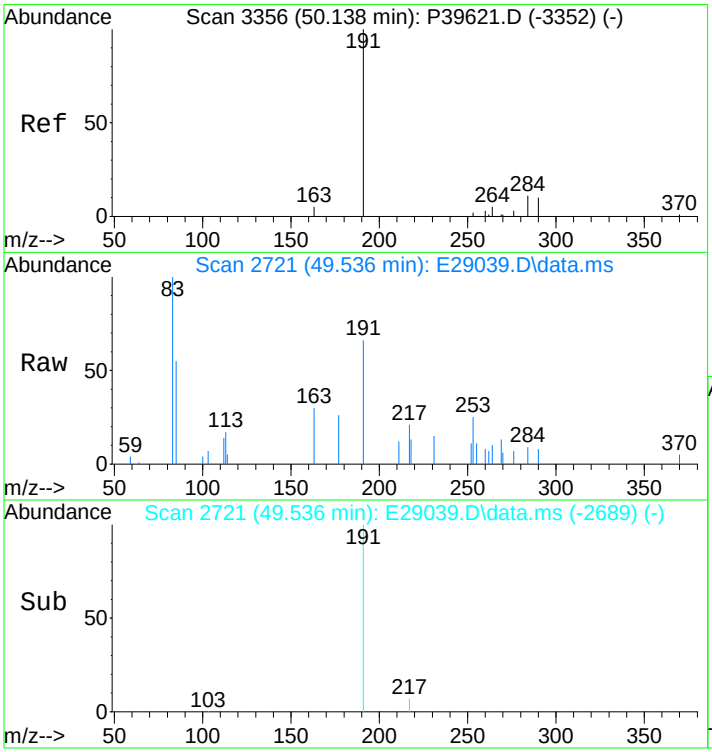




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 149.17 ng/ml m
RT: 49.732 min Scan# 2734
Delta R.T. 0.008 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

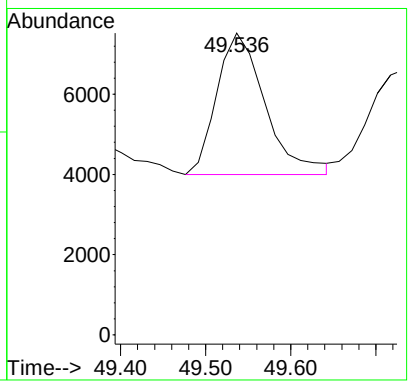
Tgt Ion:191 Resp: 10764

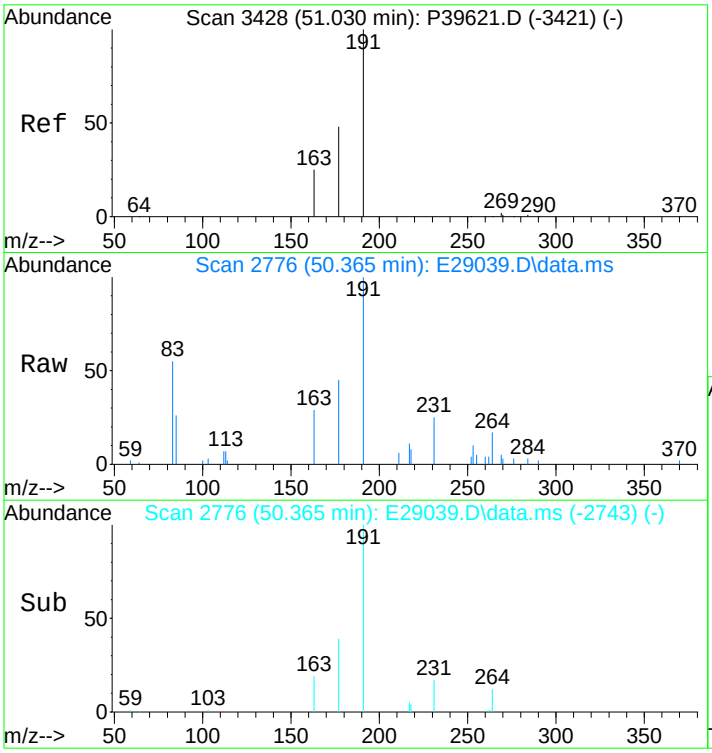




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 194.36 ng/ml
RT: 49.536 min Scan# 2721
Delta R.T. -0.022 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

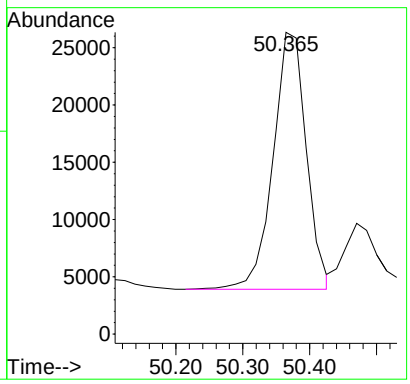
Tgt Ion:191 Resp: 14025

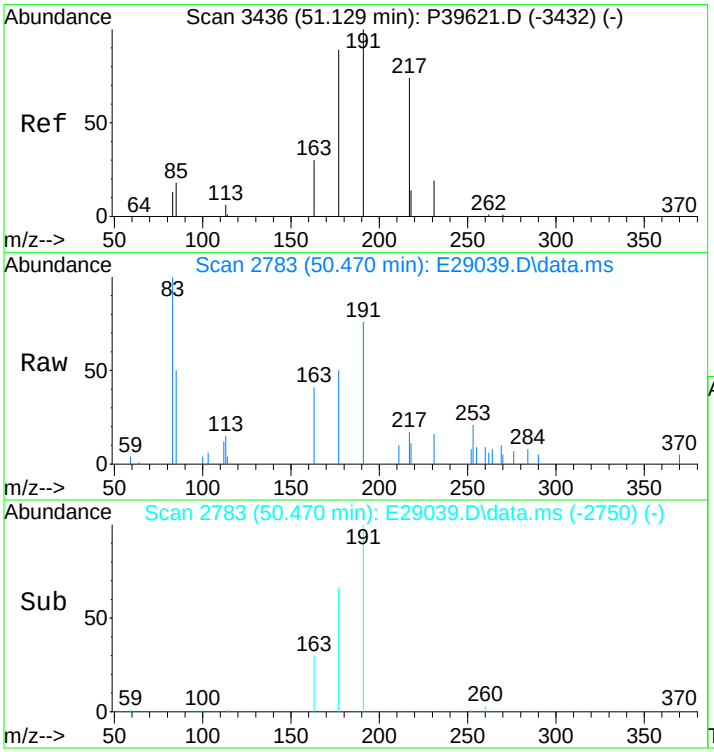




#112
30-Norhopane (T15)
Concen: 1075.60 ng/ml
RT: 50.365 min Scan# 2776
Delta R.T. -0.008 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

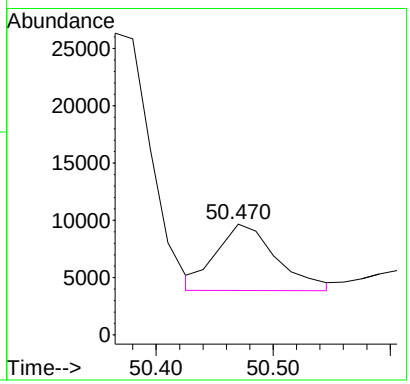
Tgt Ion:191 Resp: 77614

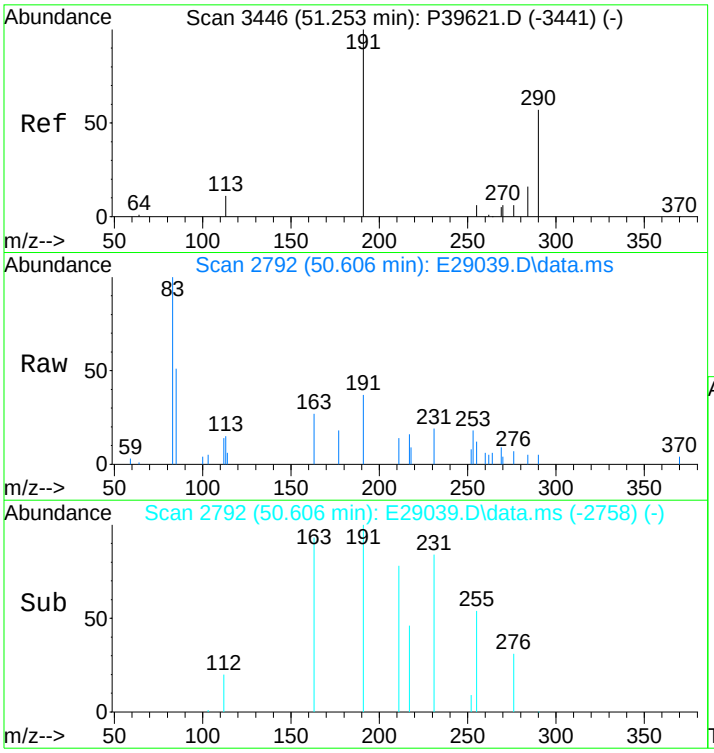




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 288.25 ng/ml
RT: 50.470 min Scan# 2783
Delta R.T. -0.008 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

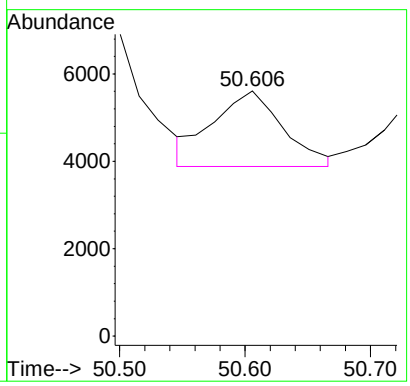
Tgt Ion:191 Resp: 20800

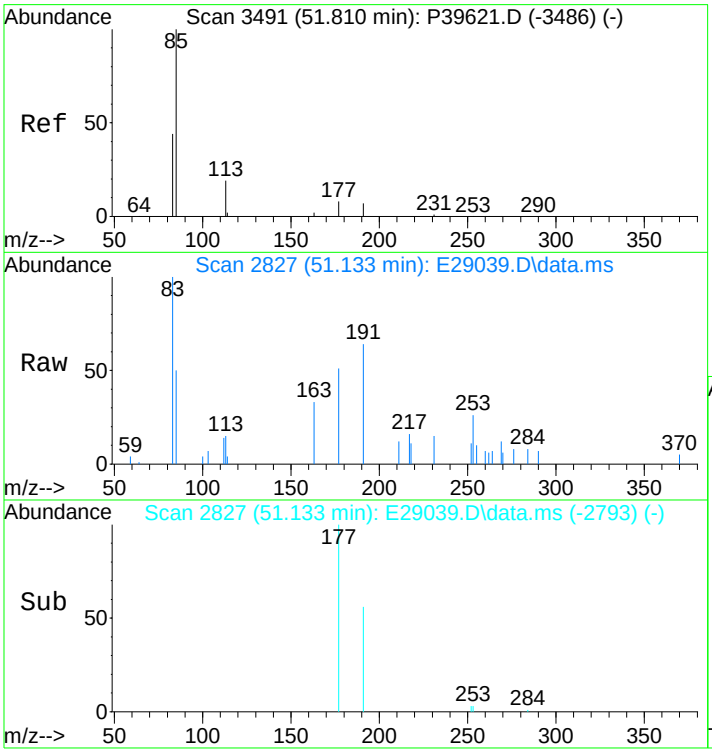




#114
17a(H)-Diahopane (X)
Concen: 92.80 ng/ml m
RT: 50.606 min Scan# 2792
Delta R.T. 0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

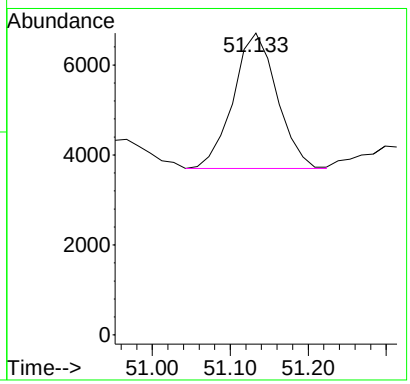
Tgt Ion:191 Resp: 6696

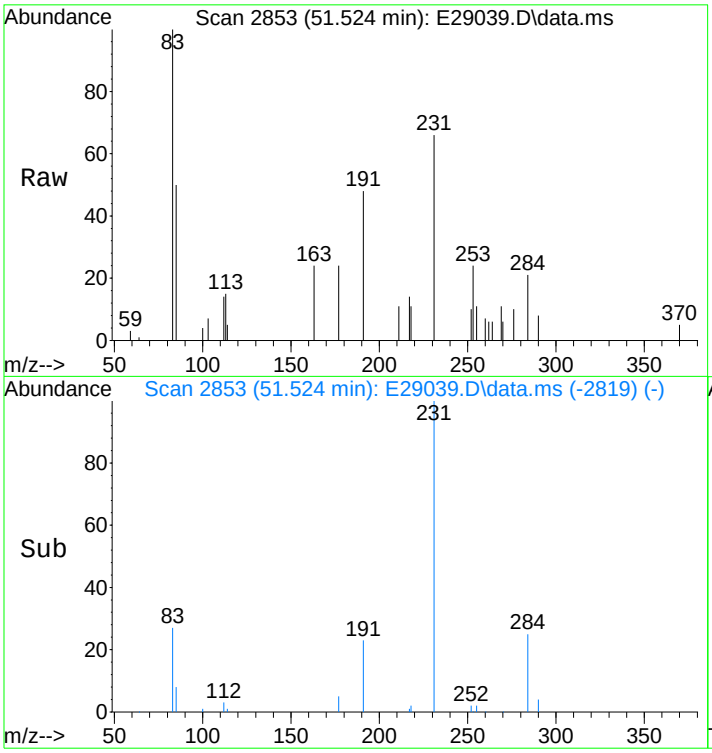




#115
30-Normoretane (T17)
Concen: 162.56 ng/ml
RT: 51.133 min Scan# 2827
Delta R.T. 0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

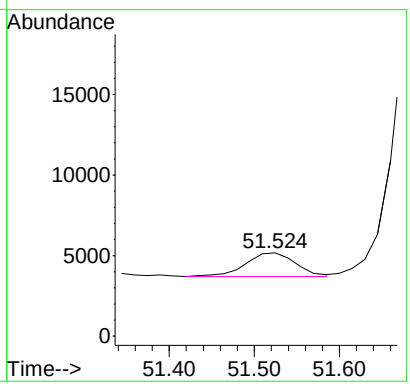
Tgt Ion:191 Resp: 11730

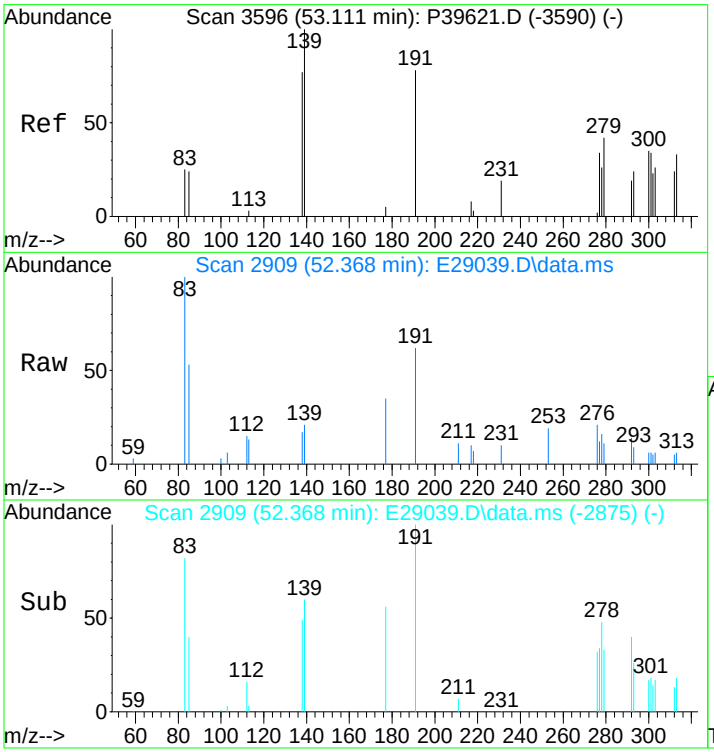




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 83.61 ng/ml
RT: 51.524 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

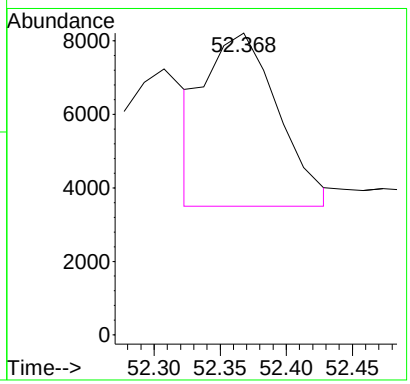
Tgt Ion:191 Resp: 6033

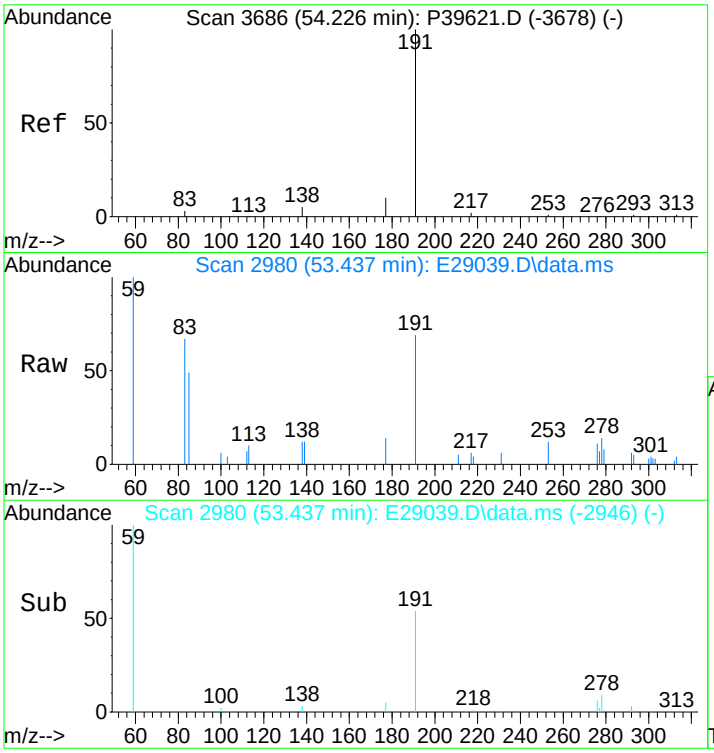




#117
Moretane (T20)
Concen: 248.20 ng/ml m
RT: 52.368 min Scan# 2909
Delta R.T. 0.005 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

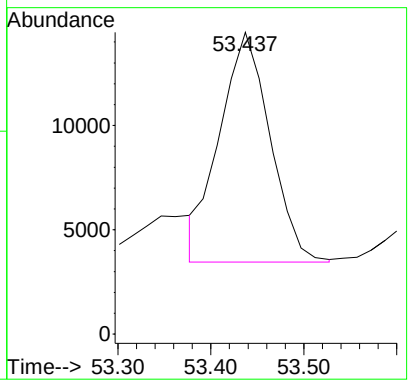
Tgt Ion:191 Resp: 17910

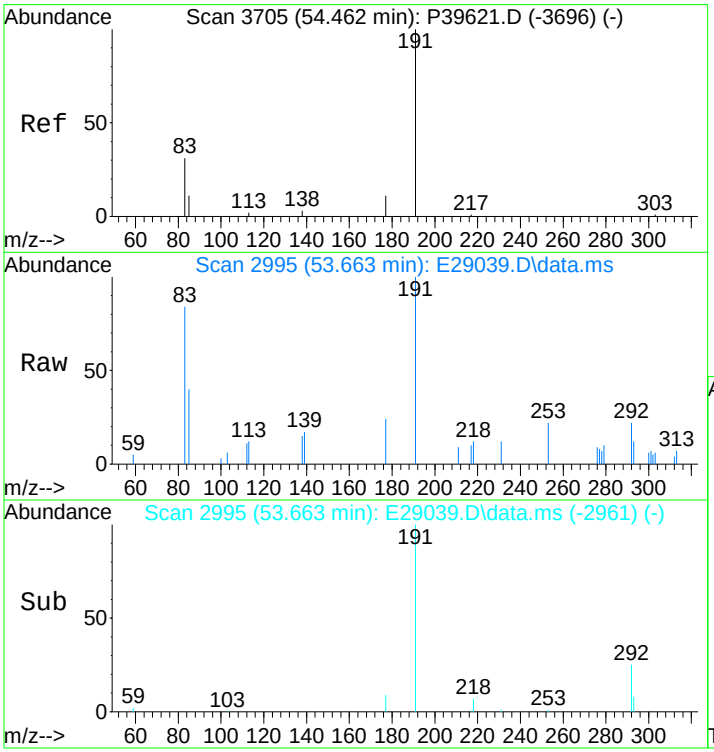




#118
30-Homohopane-22S (T21)
Concen: 574.61 ng/ml m
RT: 53.437 min Scan# 2980
Delta R.T. 0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

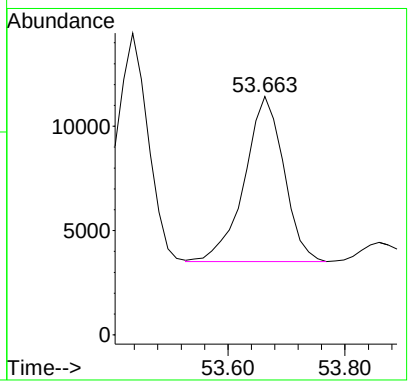
Tgt Ion:191 Resp: 41463

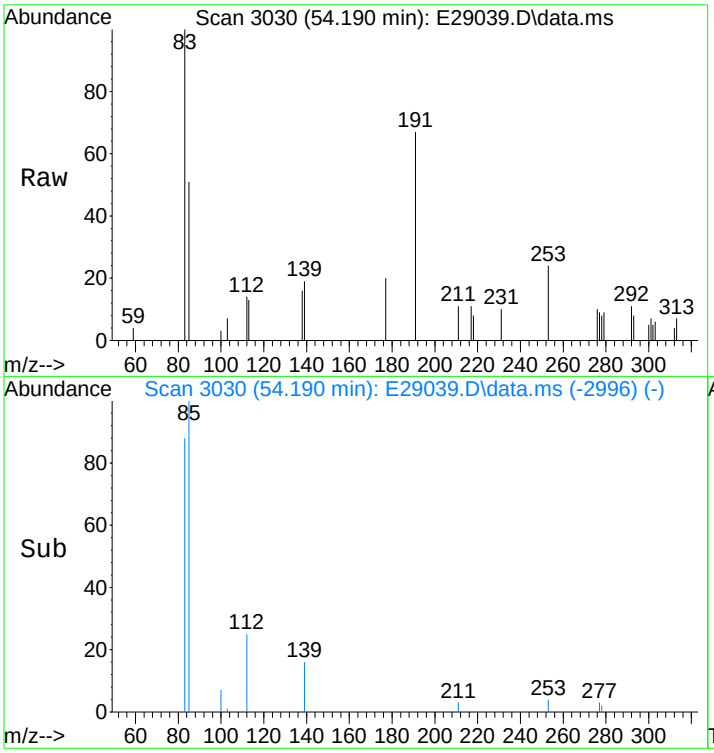




#119
30-Homohopane-22R (T22)
Concen: 510.33 ng/ml
RT: 53.663 min Scan# 2995
Delta R.T. 0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

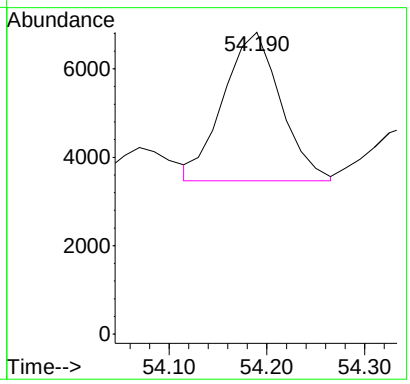
Tgt Ion:191 Resp: 36825

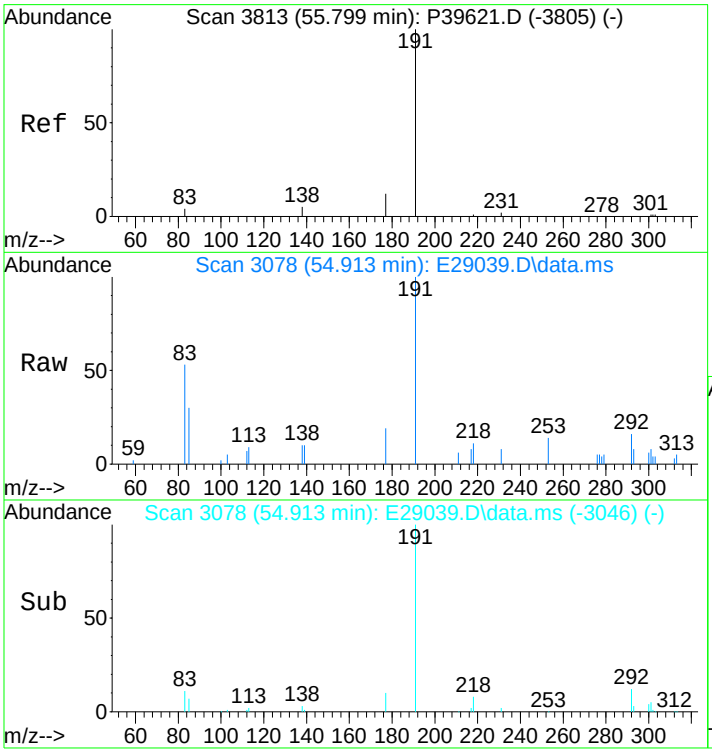




#120
Gammacerane/C32-diahopane
Concen: 189.64 ng/mL m
RT: 54.190 min Scan# 3030
Delta R.T. 0.018 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

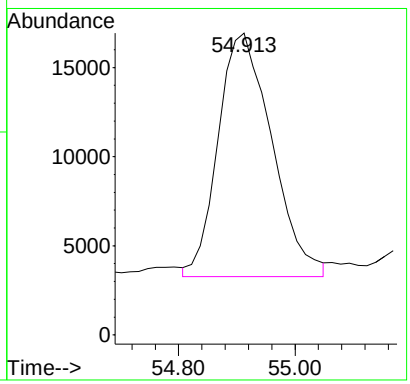
Tgt Ion:191 Resp: 13684

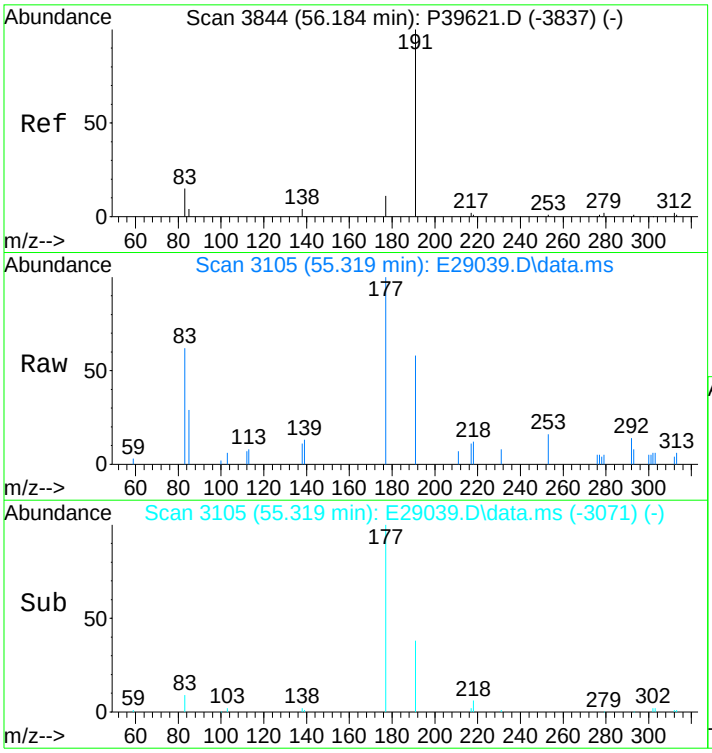




#121
30,31-Bishomohopane-22S (T26)
Concen: 1213.27 ng/ml m
RT: 54.913 min Scan# 3078
Delta R.T. -0.013 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

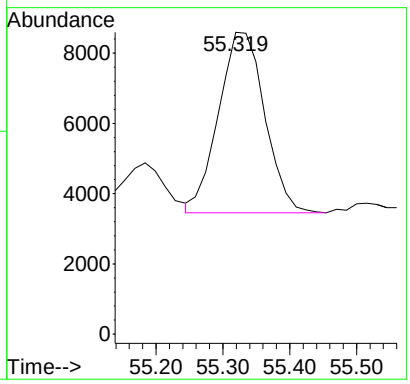
Tgt Ion:191 Resp: 87548

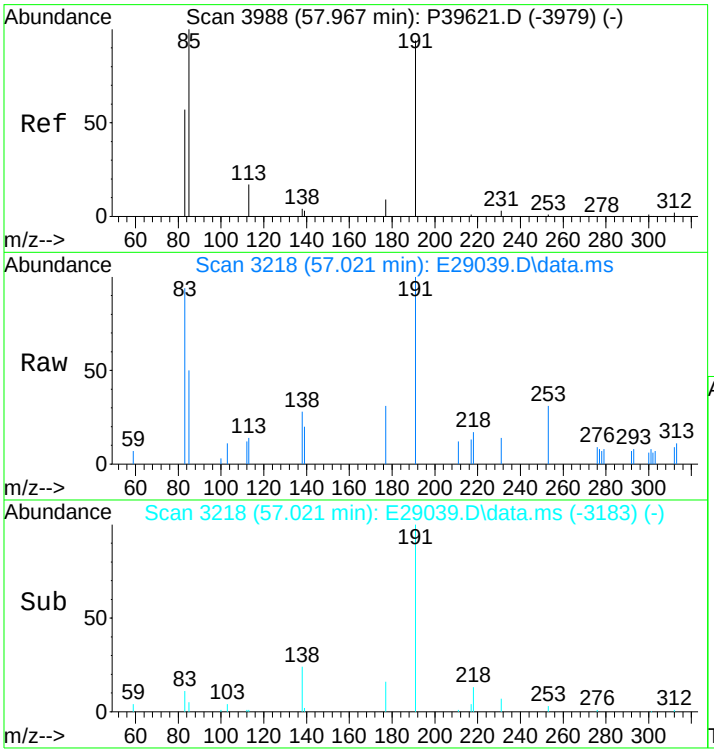




#122
30,31-Bishomohopane-22R (T27)
Concen: 342.54 ng/ml
RT: 55.319 min Scan# 3105
Delta R.T. 0.017 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

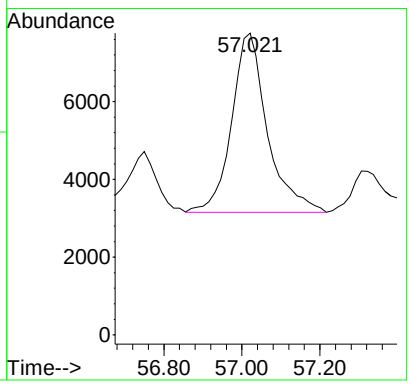
Tgt Ion:191 Resp: 24717

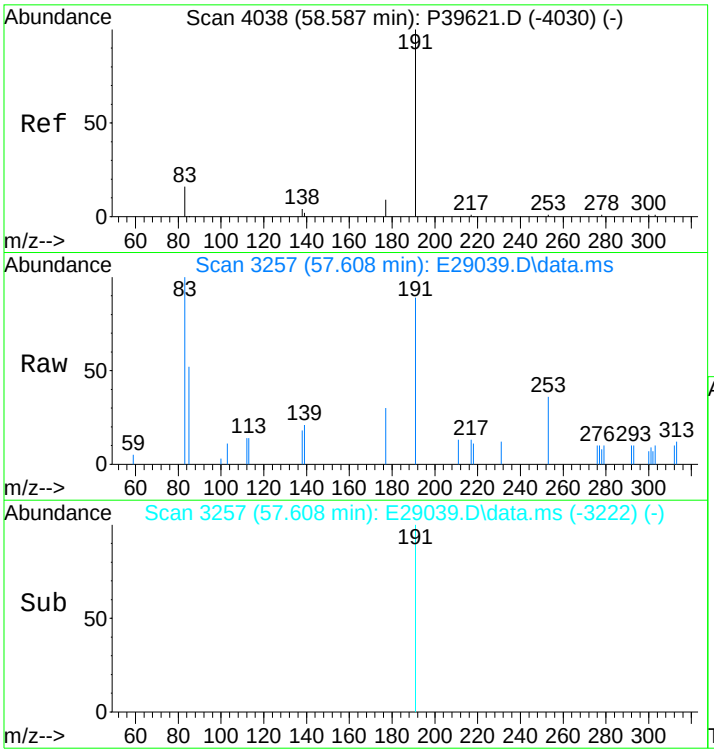




#123
30,31-Trishomohopane-22S (T30)
Concen: 405.79 ng/ml
RT: 57.021 min Scan# 3218
Delta R.T. 0.030 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

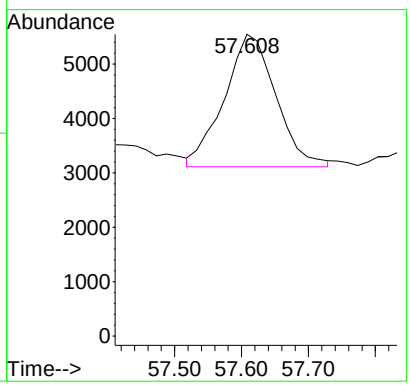
Tgt Ion:191 Resp: 29281

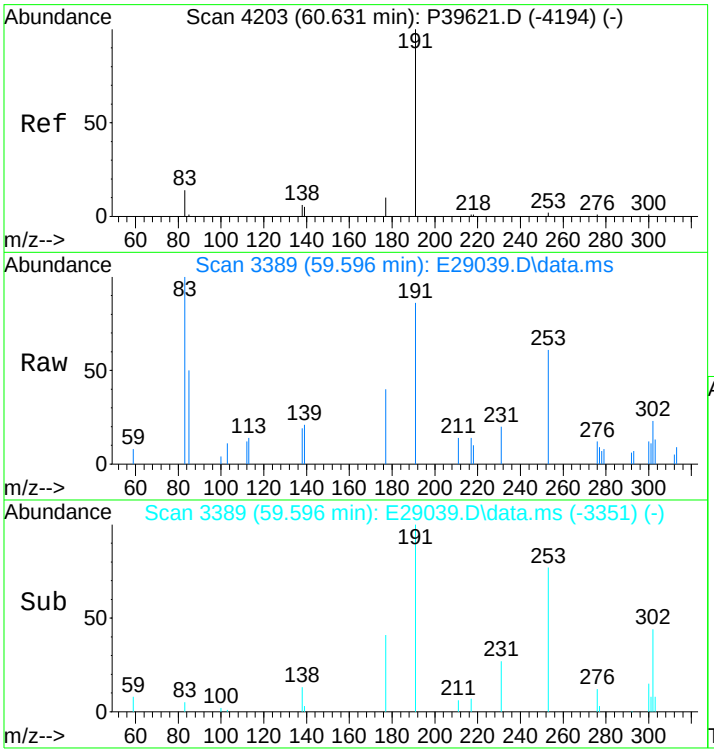




#124
30,31-Trishomohopane-22R (T31)
Concen: 180.55 ng/ml m
RT: 57.608 min Scan# 3257
Delta R.T. 0.030 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

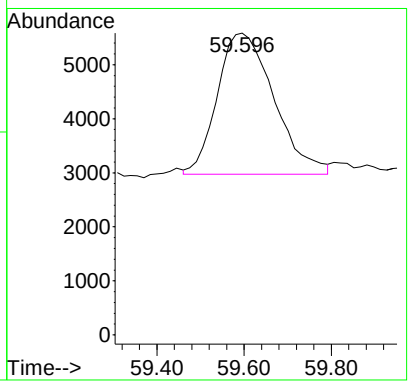
Tgt Ion:191 Resp: 13028

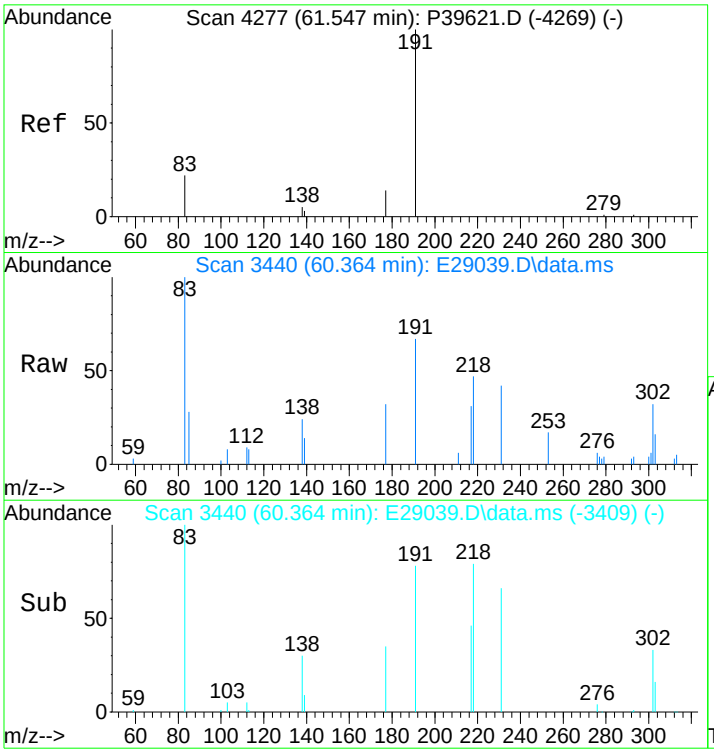




#125
Tetrakishomohopane-22S (T32)
Concen: 327.47 ng/ml m
RT: 59.596 min Scan# 3389
Delta R.T. 0.073 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

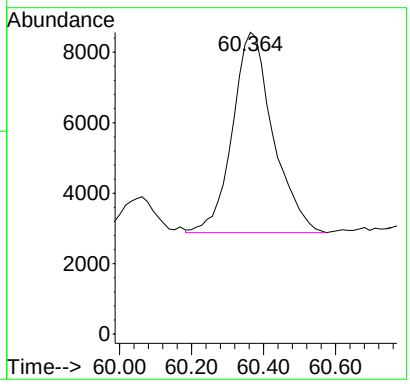
Tgt Ion:191 Resp: 23630

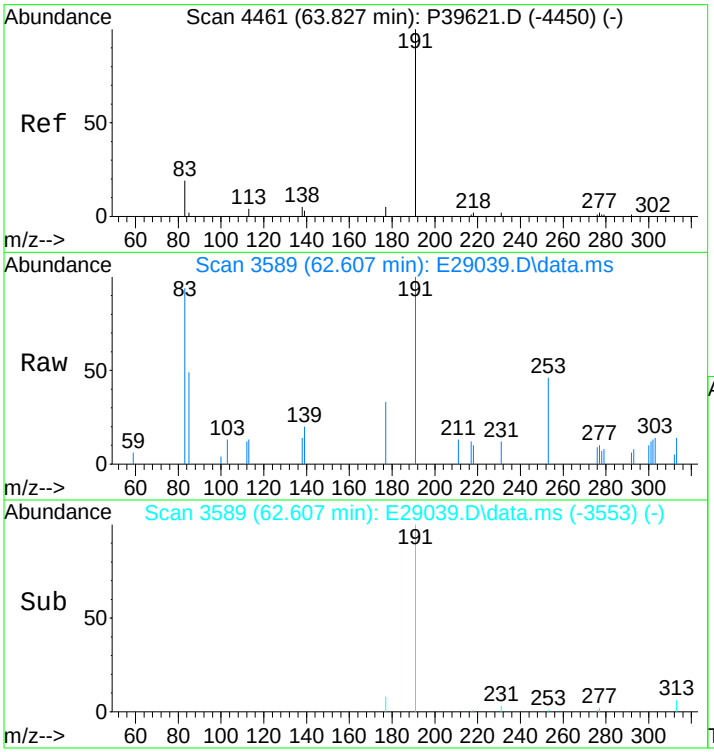




#126
Tetrakishomohopane-22R (T33)
Concen: 613.32 ng/ml
RT: 60.364 min Scan# 3440
Delta R.T. -0.034 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

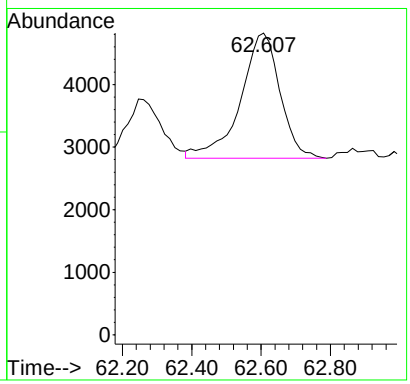
Tgt Ion:191 Resp: 44256

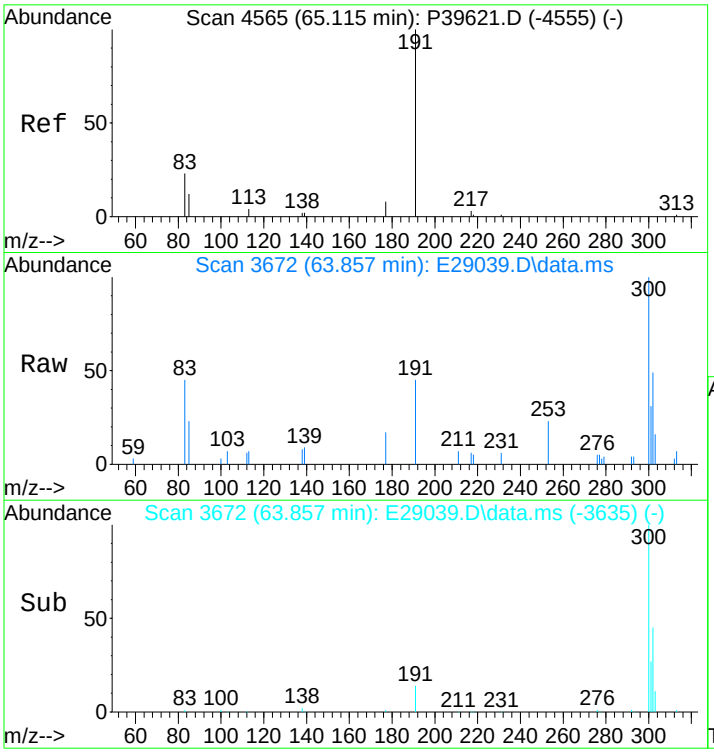




#127
Pentakishomohopane-22S (T34)
Concen: 218.63 ng/ml
RT: 62.607 min Scan# 3589
Delta R.T. 0.039 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

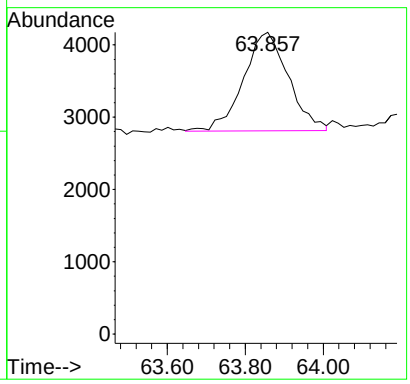
Tgt Ion:191 Resp: 15776

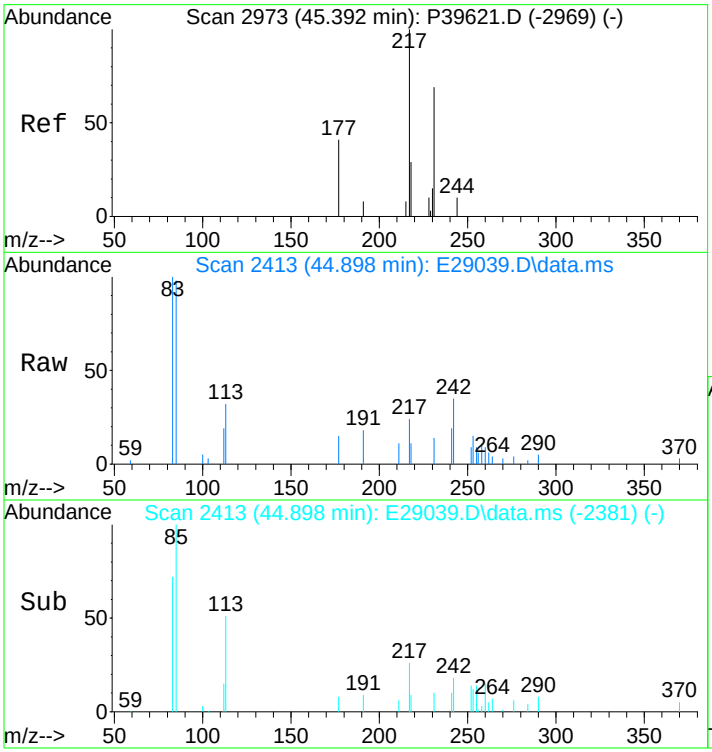




#128
Pentakishomohopane-22R (T35)
Concen: 151.22 ng/ml
RT: 63.857 min Scan# 3672
Delta R.T. 0.053 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

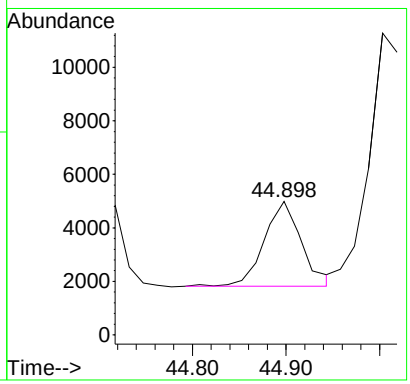
Tgt Ion:191 Resp: 10912

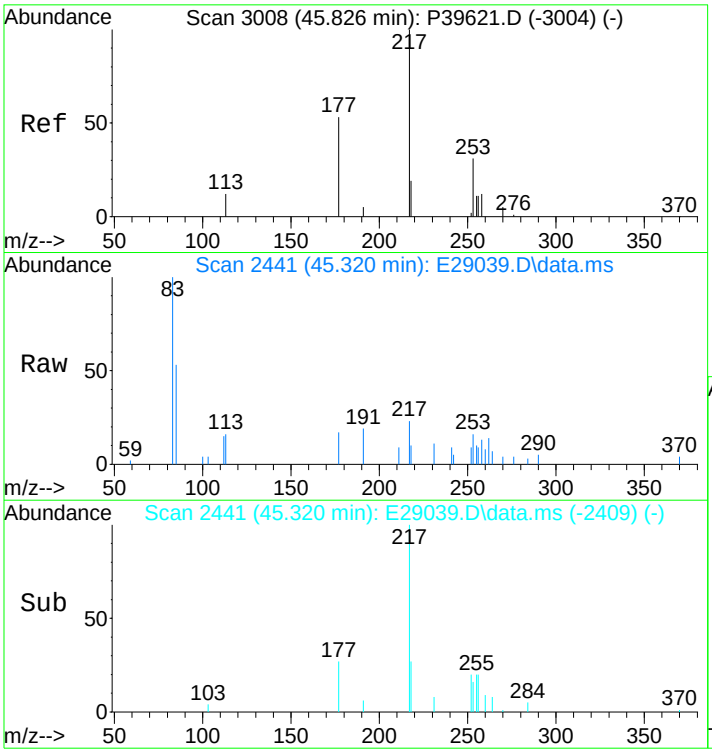




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 232.59 ng/ml
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

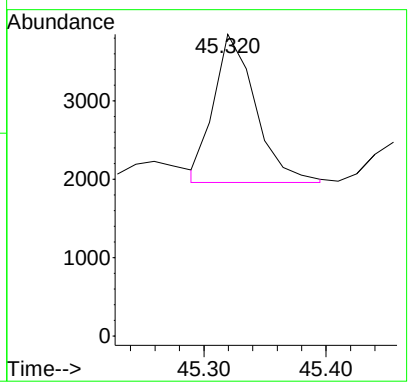
Tgt Ion:217 Resp: 8814

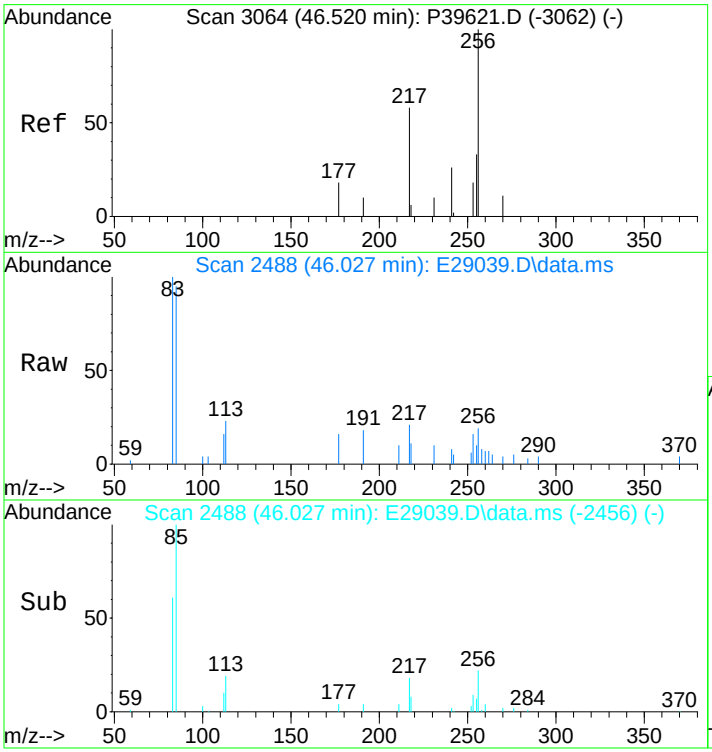




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 118.49 ng/ml m
RT: 45.320 min Scan# 2441
Delta R.T. -0.018 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

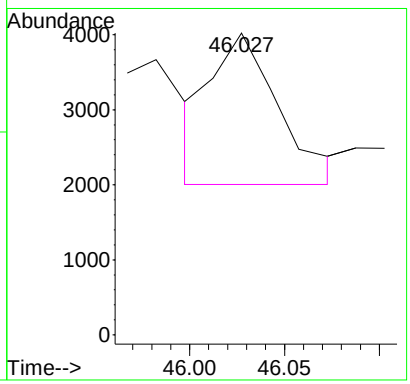
Tgt Ion:217 Resp: 4490

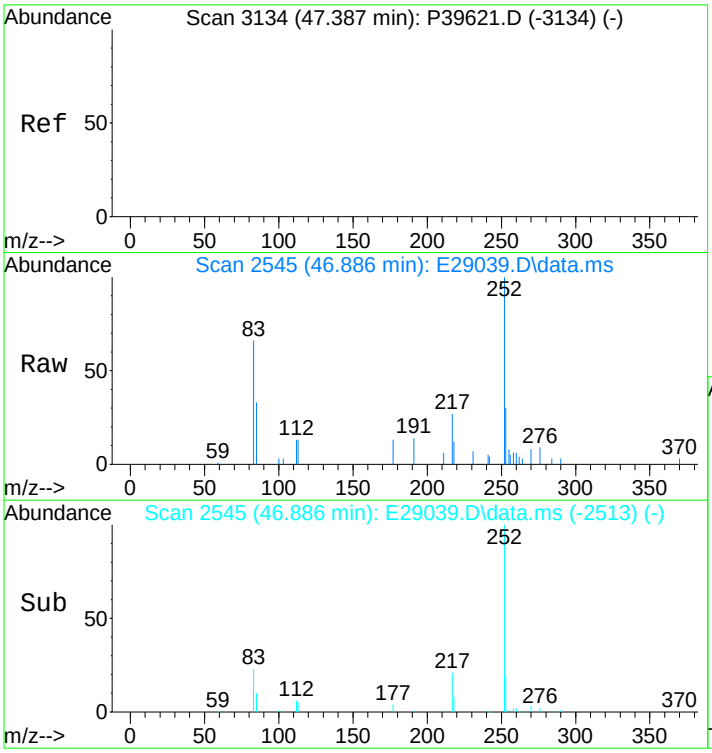




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 132.42 ng/ml m
RT: 46.027 min Scan# 2488
Delta R.T. -0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

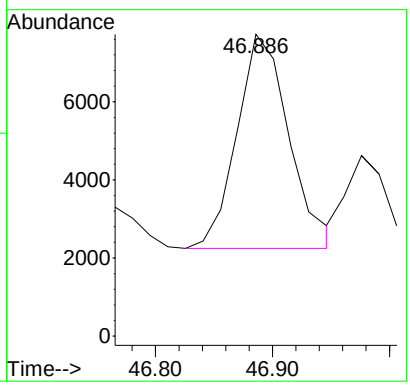
Tgt Ion:217 Resp: 5018

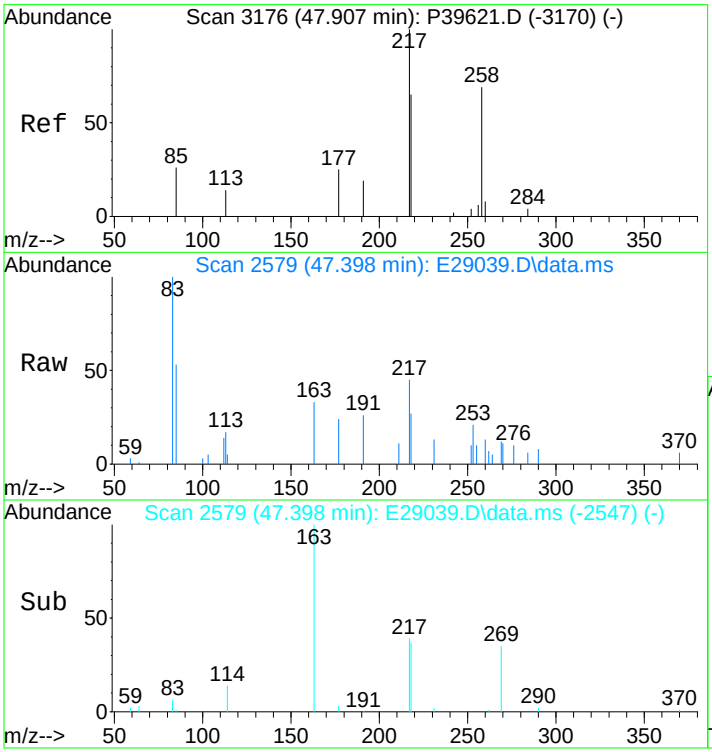




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 448.06 ng/ml
RT: 46.886 min Scan# 2545
Delta R.T. -0.019 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

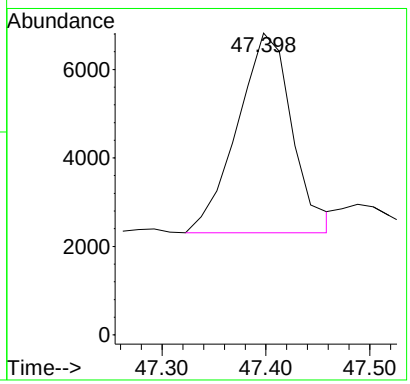
Tgt Ion:217 Resp: 16979

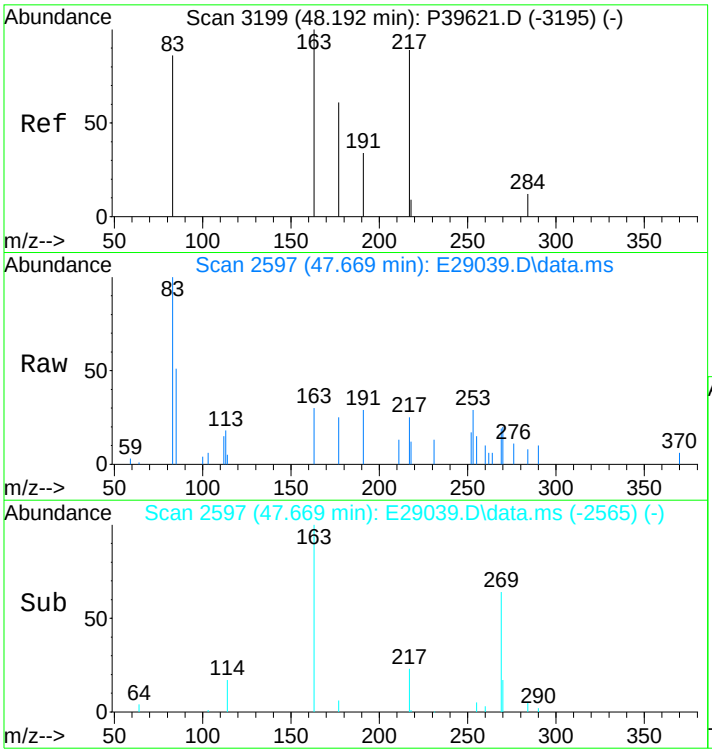




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 437.58 ng/ml
RT: 47.398 min Scan# 2579
Delta R.T. -0.020 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

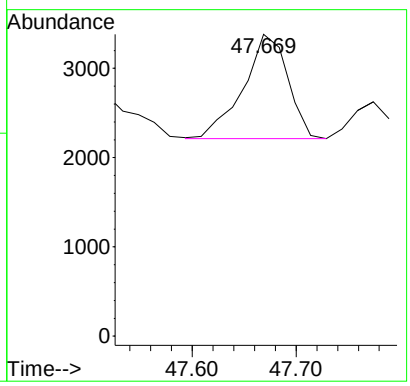
Tgt Ion:217 Resp: 16582

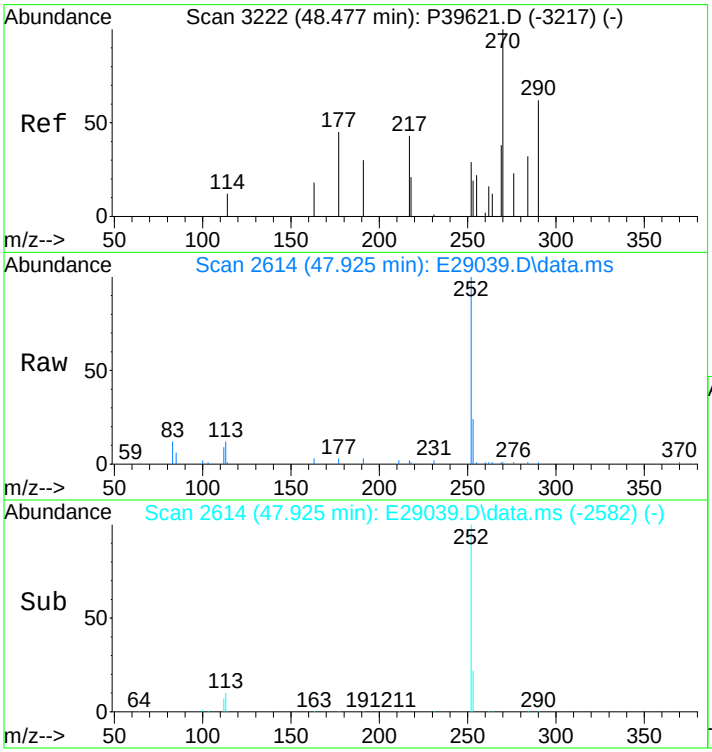




#135
Unknown Sterane (S18)
Concen: 92.34 ng/ml
RT: 47.669 min Scan# 2597
Delta R.T. -0.020 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

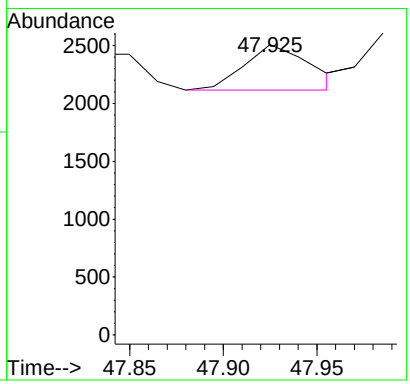
Tgt Ion:217 Resp: 3499

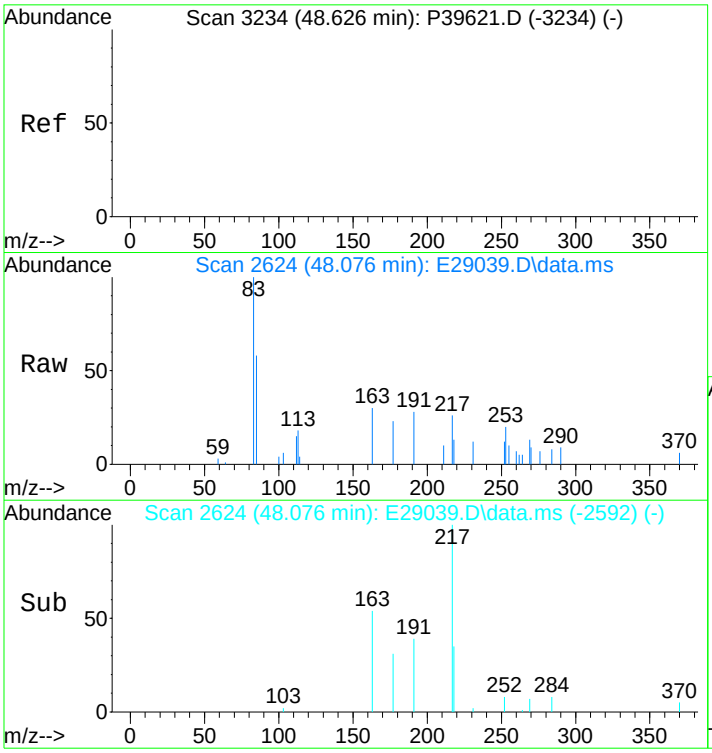




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 24.86 ng/ml
RT: 47.925 min Scan# 2614
Delta R.T. -0.020 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

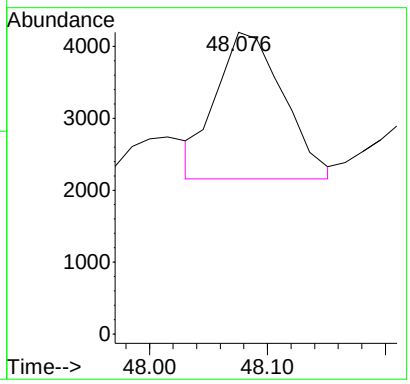
Tgt Ion:217 Resp: 942

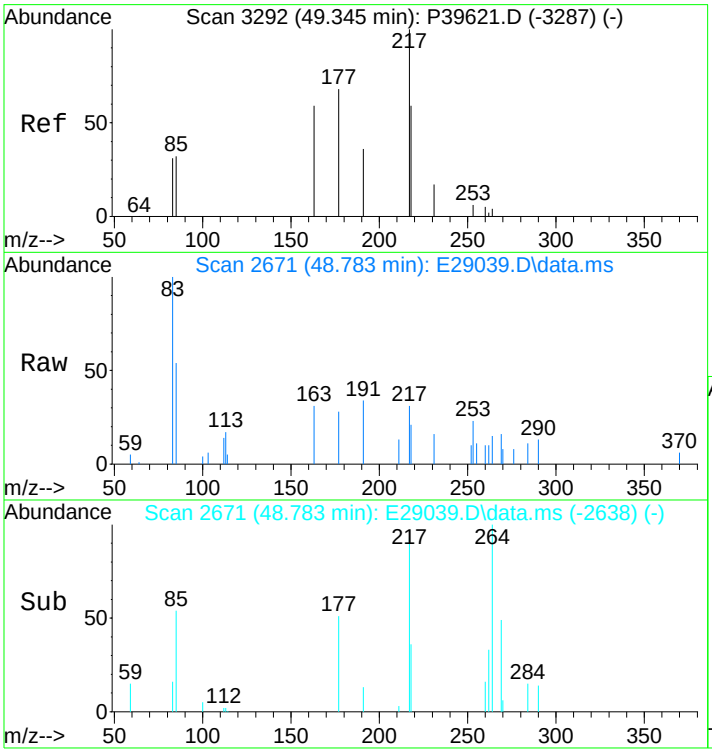




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 212.78 ng/ml m
RT: 48.076 min Scan# 2624
Delta R.T. -0.021 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

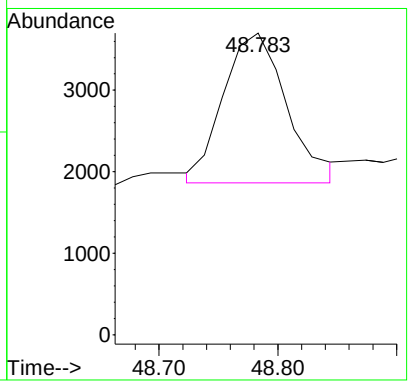
Tgt Ion:217 Resp: 8063

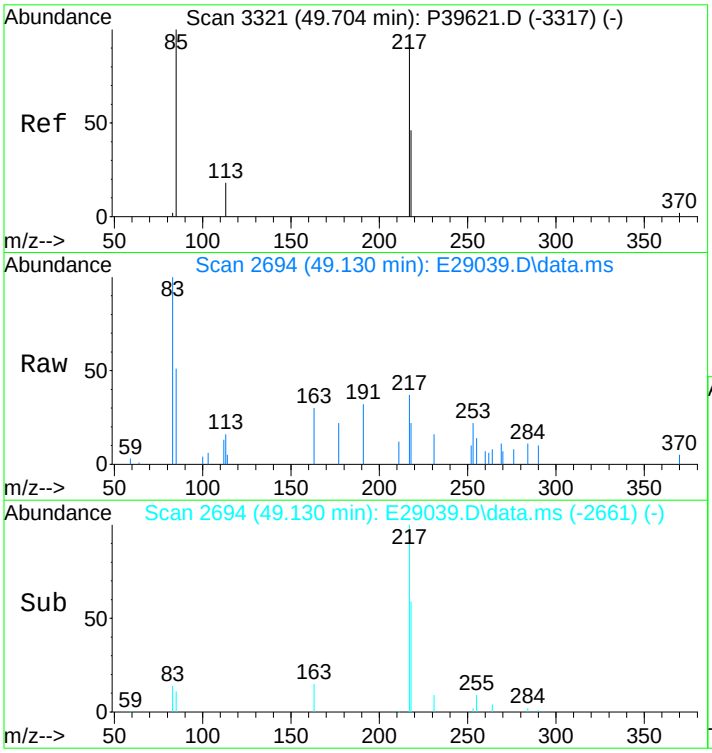




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 179.47 ng/ml m
RT: 48.783 min Scan# 2671
Delta R.T. -0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

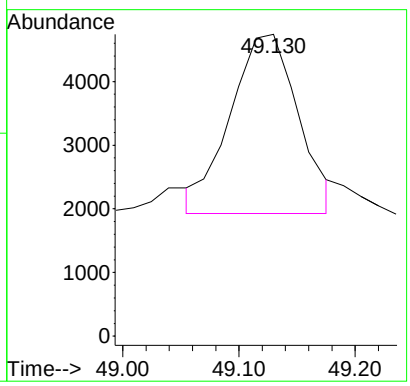
Tgt Ion:217 Resp: 6801

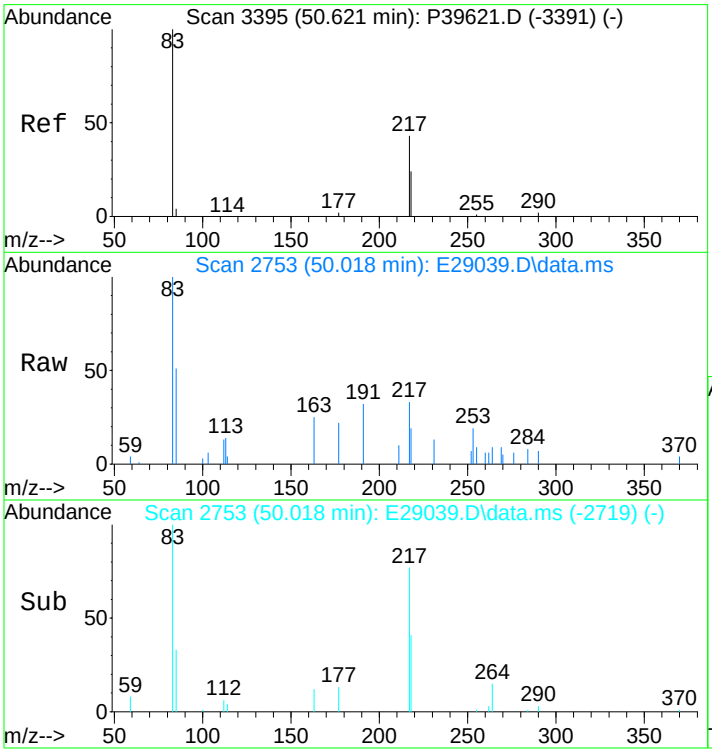




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 302.23 ng/ml m
RT: 49.130 min Scan# 2694
Delta R.T. -0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

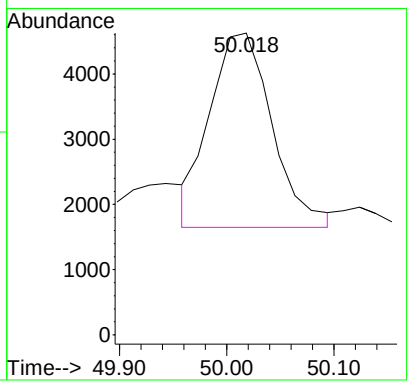
Tgt Ion:217 Resp: 11453

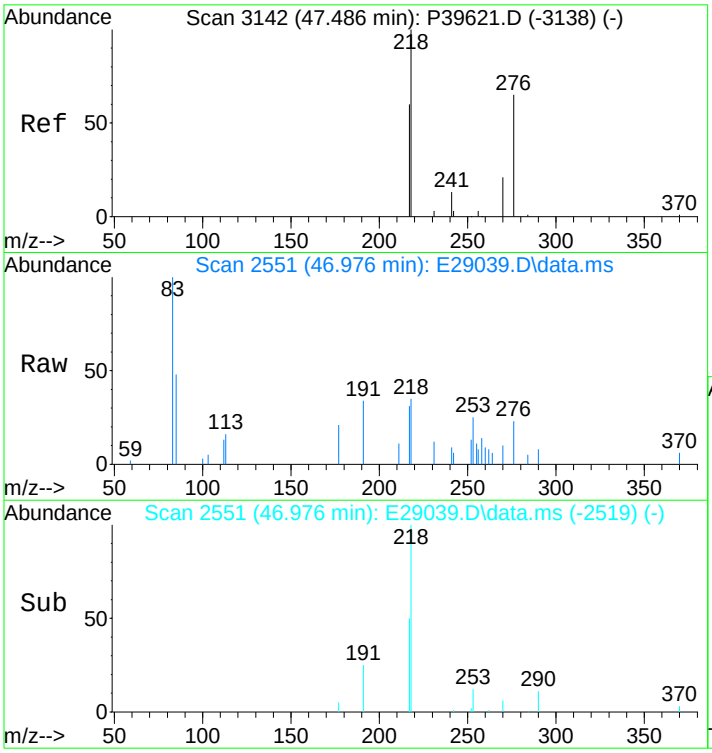




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 317.30 ng/ml m
RT: 50.018 min Scan# 2753
Delta R.T. 0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

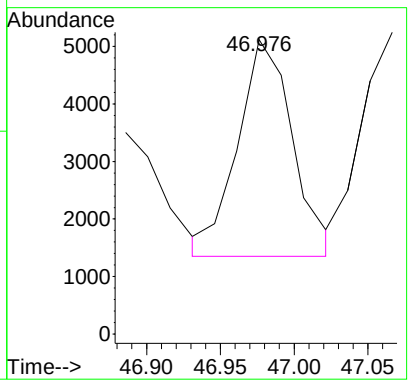
Tgt Ion:217 Resp: 12024

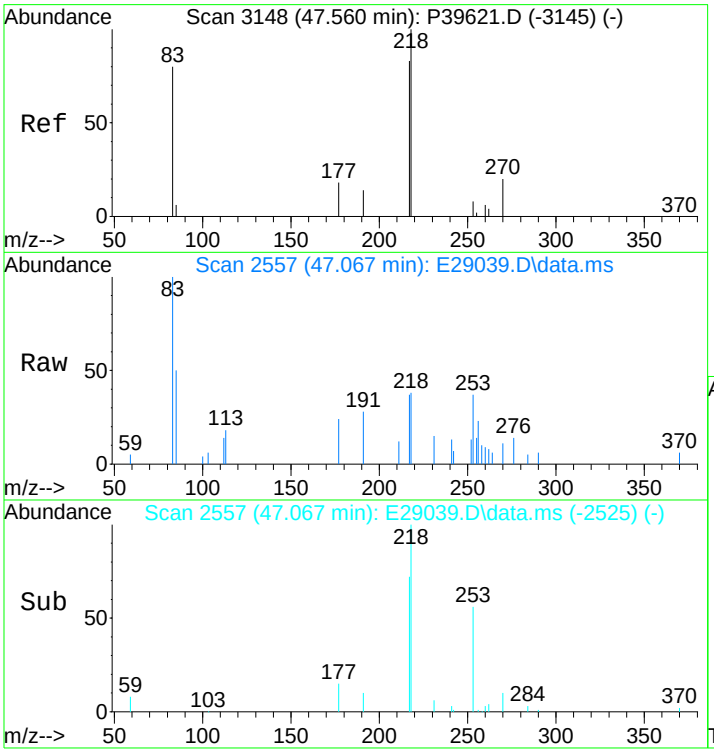




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 256.84 ng/ml m
RT: 46.976 min Scan# 2551
Delta R.T. -0.020 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

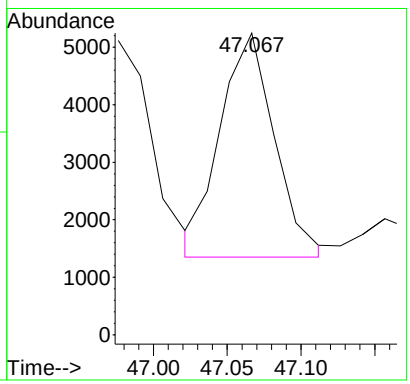
Tgt Ion:218 Resp: 9733

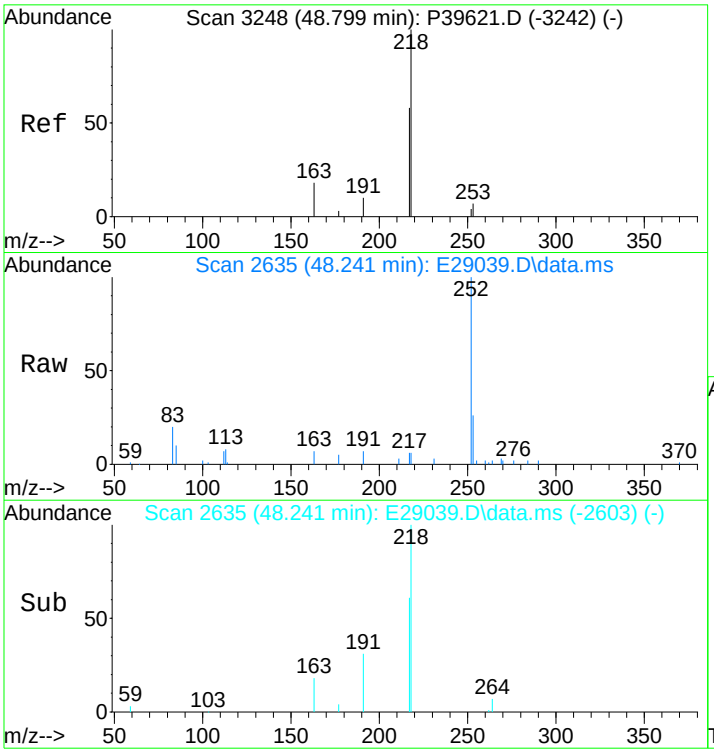




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 262.20 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.020 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

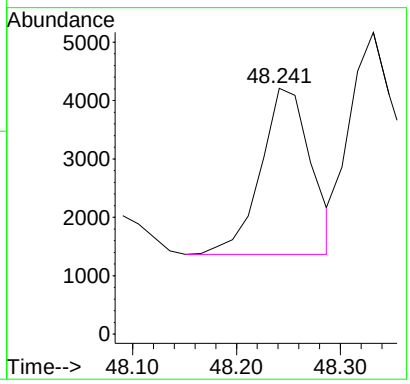
Tgt Ion:218 Resp: 9936

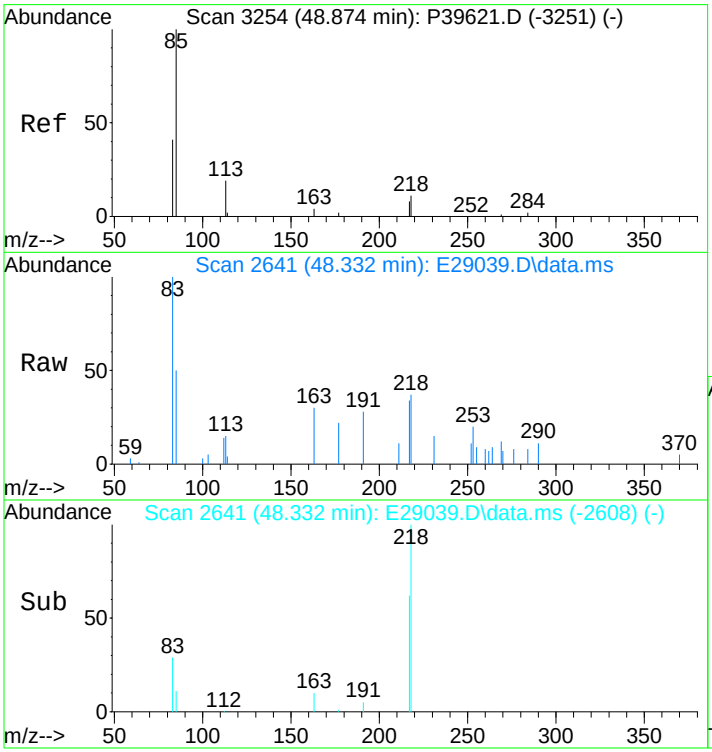




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 254.84 ng/ml
RT: 48.241 min Scan# 2635
Delta R.T. -0.021 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

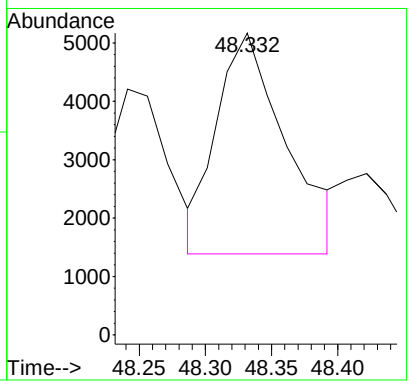
Tgt Ion:218 Resp: 9657

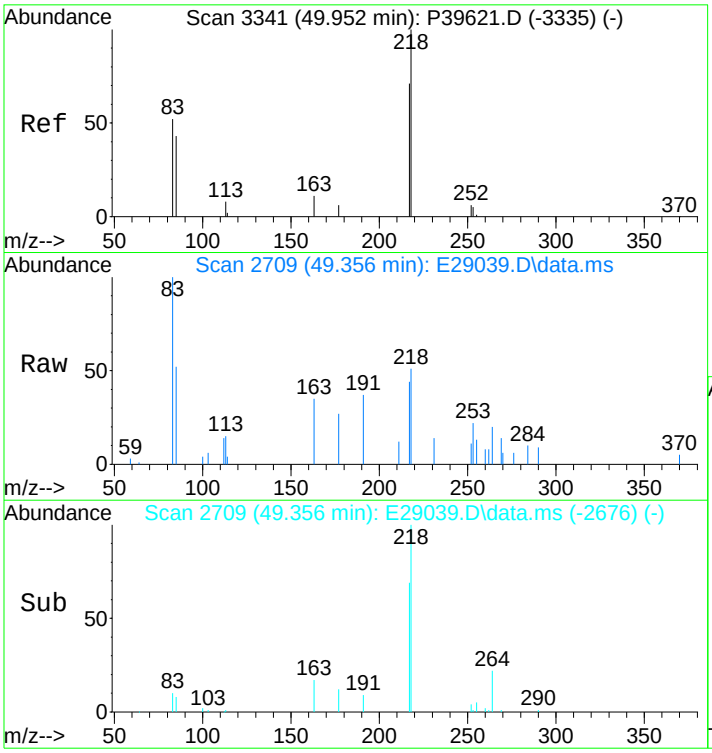




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 363.30 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

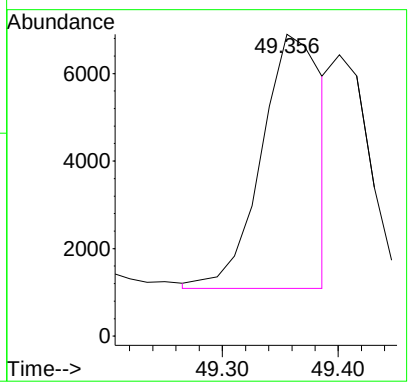
Tgt Ion:218 Resp: 13767

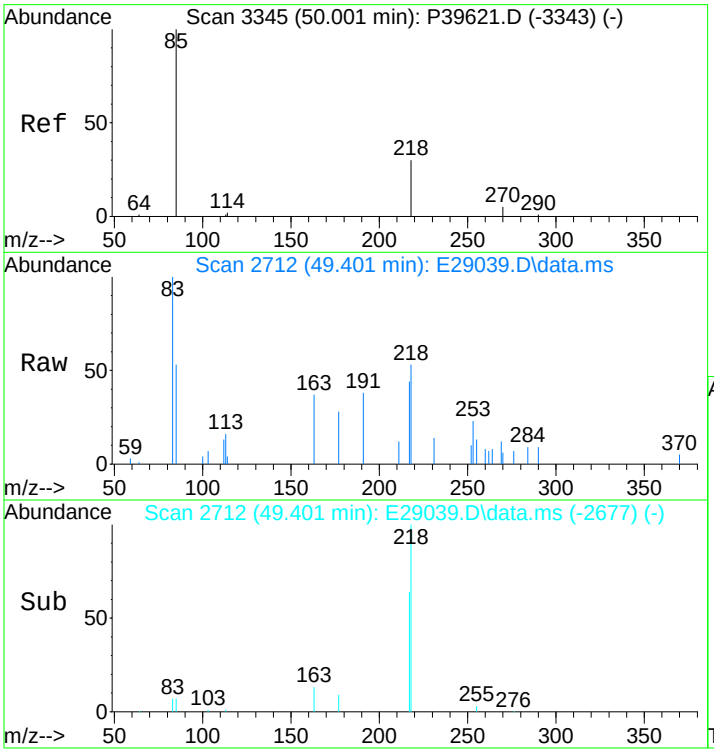




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 558.63 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. -0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

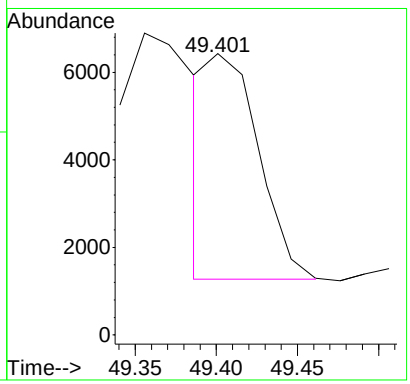
Tgt Ion:218 Resp: 21169

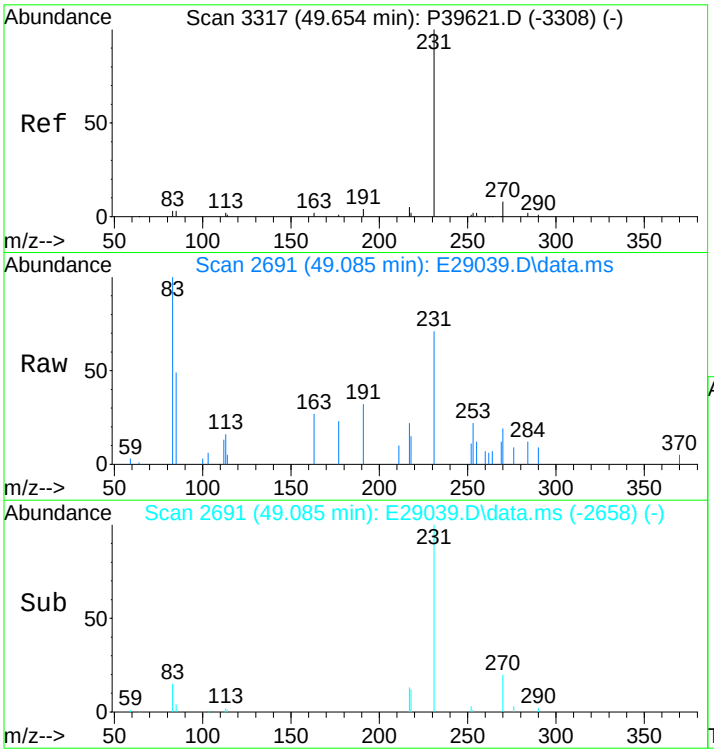




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 296.24 ng/ml m
RT: 49.401 min Scan# 2712
Delta R.T. 0.023 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

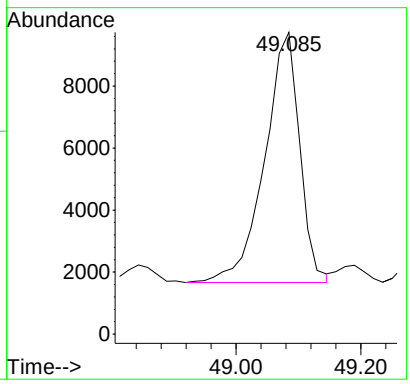
Tgt Ion:218 Resp: 11226

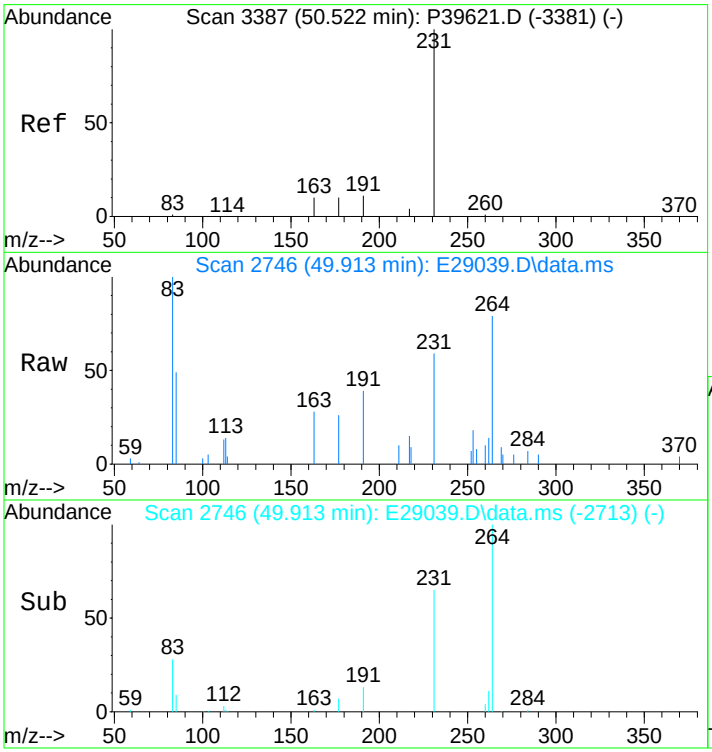




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 827.90 ng/mL
RT: 49.085 min Scan# 2691
Delta R.T. -0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

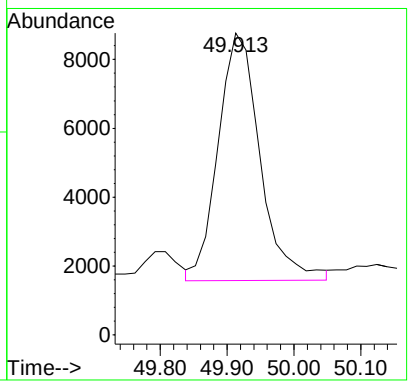
Tgt Ion:231 Resp: 31373

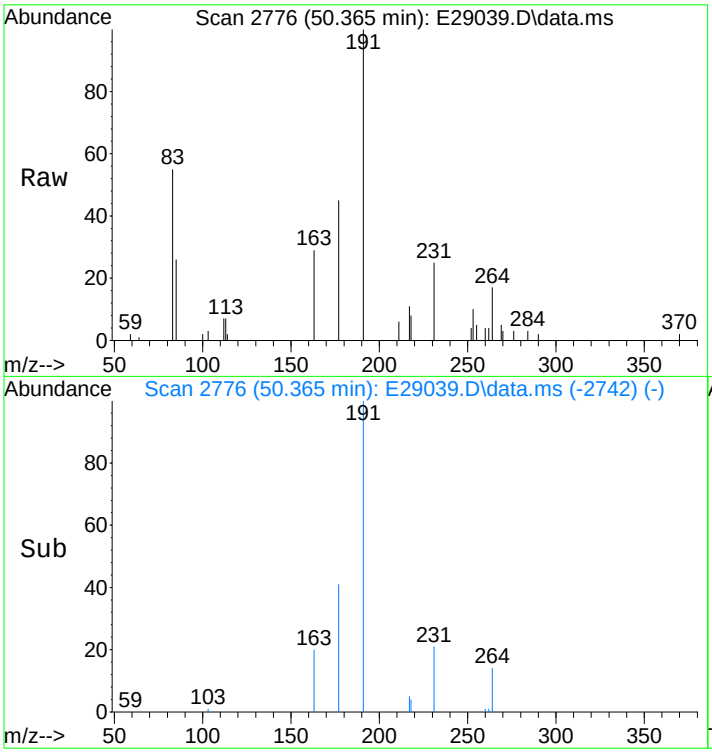




#148
C28,20S-triaromatic steroid
Concen: 827.30 ng/mL
RT: 49.913 min Scan# 2746
Delta R.T. -0.008 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

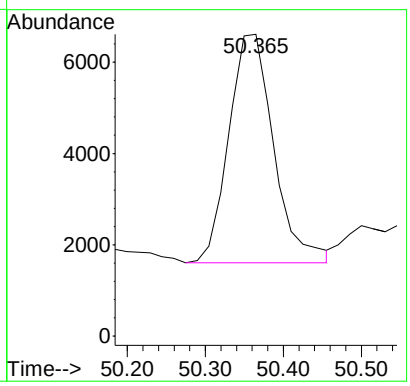
Tgt Ion:231 Resp: 31350

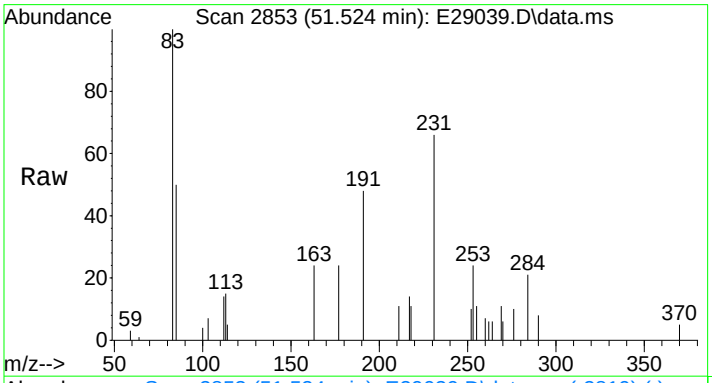




#149
C27,20R-triaromatic steroid
Concen: 530.97 ng/mL
RT: 50.365 min Scan# 2776
Delta R.T. 0.007 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

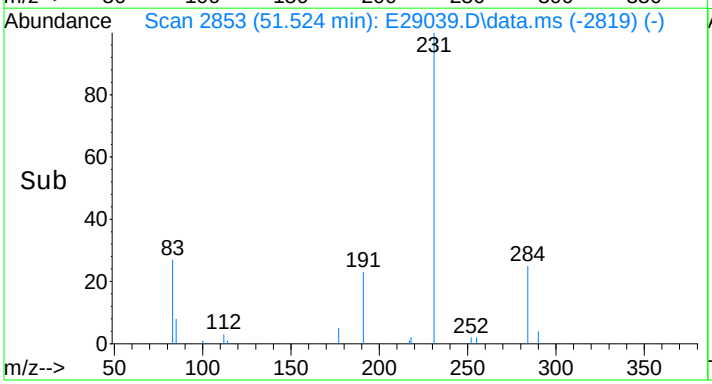
Tgt Ion:231 Resp: 20121

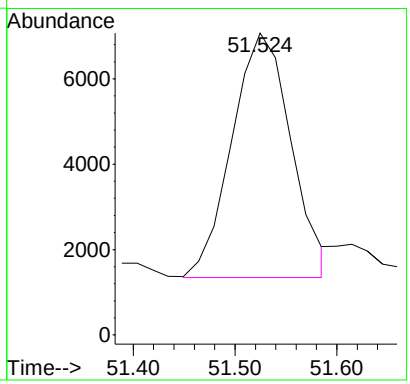




#150
C28,20R-triaromatic steroid
Concen: 611.30 ng/mL m
RT: 51.524 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29039.D
Acq: 17 Nov 2012 1:11 pm

Tgt Ion:231 Resp: 23165





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	38708	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	95114	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	47585	349.499	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 34.95%#			
42) Phenanthrene-d10	32.100	188	61631	441.825	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.18%#			
83) Benzo[b]fluoranthene-d12	46.705	264	85641	438.315	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.83%#			
88) Benzo[a]pyrene-d12	47.850	264	75200	397.215	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.72%#			
129) 5B(H)Cholane - Surr	43.377	217	17401	464.193	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.42%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	224M3	7.234	ng/mL	
5) C1-Decalins	17.814	152	696M5	22.479	ng/mL	
6) C2-Decalins	19.139	166	2659M5	85.877	ng/mL	
7) C3-Decalins	21.623	180	5020M5	162.130	ng/mL	
8) C4-Decalins	25.010	194	11548M5	372.963	ng/mL	
10) Naphthalene	19.304	128	21271	139.703	ng/mL#	100
11) C1-Naphthalenes	22.014	142	26498M5	174.032	ng/mL	
12) C2-Naphthalenes	24.859	156	76760M5	504.141	ng/mL	
13) C3-Naphthalenes	27.554	170	127686M5	838.611	ng/mL	
14) C4-Naphthalenes	29.978	184	121290M5	796.603	ng/mL	
16) 2-Methylnaphthalene	22.014	142	15218	156.927	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	11364	120.600	ng/mL#	100
18) Benzothiophene	19.530	134	618M3	4.910	ng/mL	
19) C1-Benzo(b)thiophenes	22.406	148	3232M5	25.677	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	11597M5	92.134	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	29941M5	237.870	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	36709M5	291.639	ng/mL	
23) Biphenyl	23.896	154	4028M4	32.865	ng/mL	
24) 2,6-Dimethylnaphthalene	24.528	156	17552	200.801	ng/mL#	100
25) Dibenzofuran	26.982	168	13412	98.844	ng/mL#	93
26) Acenaphthylene	25.597	152	32579	214.615	ng/mL#	100
27) Acenaphthene	26.335	153	13685M3	140.052	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.900	170	7560M3	92.443	ng/mL	
29) Fluorene	28.367	166	22675M3	208.064	ng/mL	
30) C1-Fluorenes	30.746	180	22234M5	204.017	ng/mL	
31) C2-Fluorenes	32.959	194	49880M5	457.695	ng/mL	
32) C3-Fluorenes	34.795	208	70913M5	650.692	ng/mL	
33) Dibenzothiophene	31.694	184	32773	219.141	ng/mL#	77
34) 4-Methyldibenzothiophene(	33.486	198	32029	214.166	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	27987M3	187.139	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	16007	107.033	ng/mL#	100
37) OTP	33.862	198	5301M3	35.446	ng/mL	
38) C1-Dibenzothiophenes	33.486	198	87872M5	587.568	ng/mL	
38) C1-Dibenzothiophenes BS	33.486	198	82571m	552.122	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	162180M5	1084.438	ng/mL	
40) C3-Dibenzothiophenes	36.994	226	192285M5	1285.739	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	137145M5	917.038	ng/mL	
43) Phenanthrene	32.191	178	302367	1987.258	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.163	192	45307	297.773	ng/mL	99

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	52175	342.912	ng/mL	96
46) 2-Methylanthracene(2MA)	34.434	192	14531	95.503	ng/mL#	42
47) 9/4-Methylphenanthrene(9M	34.630	192	59632	391.922	ng/mL	85
48) 1-Methylphenanthrene(1MP)	34.720	192	36288M3	238.497	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	214227M5	1407.972	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.452	206	235566M5	1548.219	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.452	206	235566m	1548.219	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	187163M5	1230.098	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	102239M5	671.949	ng/mL	
55) Anthracene	32.387	178	58259M3	442.988	ng/mL	
56) Carbazole	33.064	167	27063	199.947	ng/mL	96
57) 1-Methylphenanthrene	34.720	192	36123M3	311.190	ng/mL	
58) Fluoranthene	36.994	202	756731	4503.550	ng/mL	100
59) Benzo(b)fluorene	39.538	216	57270M3	511.490	ng/mL	
60) Pyrene	37.882	202	722866	4232.531	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.282	216	457844M5	2680.772	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	244464M5	1431.388	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	156575M5	916.779	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	143131M5	838.062	ng/mL	
66) Naphthobenzothiophene	41.766	234	81543	484.088	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	81543	484.088	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.098	234	18019	106.972	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	20342M3	120.762	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	137039M5	813.545	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	157932M5	937.579	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	131542M5	780.912	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	110997M5	658.944	ng/mL	
75) Benz[a]anthracene	42.700	228	389534M3	2103.129	ng/mL	
77) Chrysene/Triphenylene	42.865	228	483239	2534.244	ng/mL	99
78) C1-Chrysenes	44.356	242	256746M5	1346.450	ng/mL	
79) C2-Chrysenes	46.073	256	171197M5	897.806	ng/mL	
79) C2-Chrysenes BS	46.073	256	168380m	883.033	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	2817	14.773	ng/mL	100
81) C3-Chrysenes	47.639	270	155047M5	813.111	ng/mL	
82) C4-Chrysenes	49.190	284	81008M5	424.829	ng/mL	
84) Benzo[b]fluoranthene	46.781	252	523116	2429.894	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	465825M3	2103.149	ng/mL	
86) Benzo[a]fluoranthene	47.157	252	98688M3	445.566	ng/mL	
87) Benzo[e]pyrene	47.759	252	394829M4	1878.273	ng/mL	
89) Benzo[a]pyrene	47.940	252	498765	2479.667	ng/mL	96
90) Perylene	48.241	252	182744	859.181	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.654	276	434158M3	1834.068	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	109598M3	434.819	ng/mL	
93) Benzo[g,h,i]perylene	53.904	276	441287	1728.903	ng/mL	100
94) Hopane (T19)	51.705	191	100860M3	1412.964	ng/mL	
96) C23 Tricyclic Terpane (T4	40.381	191	22927	321.188	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.119	191	14187M3	198.748	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	21016	294.417	ng/ml	100
99) C24 Tetracyclic Terpane (	43.919	191	7119M3	99.731	ng/ml	
100) C26 Tricyclic Terpane-22S	43.679	191	6263M3	87.739	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5565M3	77.961	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	5923M3	82.976	ng/ml	
103) C28 Tricyclic Terpane-22R	46.253	191	7275M3	101.917	ng/ml	
104) C29 Tricyclic Terpane-22S	46.766	191	7438	104.200	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	7534M3	105.545	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.031	191	15779	221.051	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107)	C30 Tricyclic Terpane-22S	48.151	191	7309M3	102.393	ng/mL	
108)	C30 Tricyclic Terpane-22R	48.392	191	10871	152.294	ng/mL	100
109)	17a(H)-22,29,30-Trisnorho	48.558	191	26443M3	370.444	ng/ml	
110)	17a/b,21b/a 28,30-Bisnorh	49.732	191	10283	144.056	ng/ml	100
111)	17a(H),21b(H)-25-Norhopan	49.537	191	11965	167.620	ng/ml	100
112)	30-Norhopane (T15)	50.380	191	72454	1015.020	ng/ml	100
113)	18a(H)-30-Norneohopane-C2	50.470	191	20232M3	283.433	ng/ml	
114)	17a(H)-Diahopane (X)	50.606	191	5879M3	82.360	ng/ml	
115)	30-Normoretane (T17)	51.133	191	10929	153.106	ng/ml	100
116)	18a(H)&18b(H)-Oleananes (	51.525	191	5209M3	72.974	ng/ml	
117)	Moretane (T20)	52.368	191	15390M3	215.601	ng/ml	
118)	30-Homohopane-22S (T21)	53.437	191	38507M3	539.451	ng/ml	
119)	30-Homohopane-22R (T22)	53.663	191	34253	479.856	ng/ml	100
120)	Gammacerane/C32-diahopane	54.190	191	13881M3	194.461	ng/mL	
121)	30,31-Bishomohopane-22S (	54.898	191G	80643M3	1129.741	ng/ml	
122)	30,31-Bishomohopane-22R (	55.319	191	21086	295.397	ng/ml	100
123)	30,31-Trishomohopane-22S	57.021	191	27024	378.584	ng/ml	100
124)	30,31-Trishomohopane-22R	57.608	191	11957	167.508	ng/ml	100
125)	Tetrakishomohopane-22S (T	59.581	191	19606	274.664	ng/ml	100
126)	Tetrakishomohopane-22R (T	60.349	191G	28039	392.803	ng/ml	100
127)	Pentakishomohopane-22S (T	62.608	191	14383M3	201.494	ng/ml	
128)	Pentakishomohopane-22R (T	63.857	191	10258	143.706	ng/ml	100
130)	13b(H),17a(H)-20S-Diachol	44.898	217	8491M3	226.508	ng/ml	
131)	13b(H),17a(H)-20R-Diachol	45.320	217	4337M3	115.695	ng/ml	
132)	13b,17a-20S-Methyldiachol	46.028	217	4955M3	132.181	ng/ml	
133)	14a,17a-20S-Chol/13b,17a-	46.886	217	16033	427.700	ng/ml	100
134)	14a,17a-20R-Chol/13b,17a-	47.398	217	16260	433.756	ng/ml	100
135)	Unknown Sterane (S18)	47.669	217	3077	82.083	ng/ml	100
136)	13a,17b-20S-Ethyldiachole	47.925	217	920	24.542	ng/ml	100
137)	14a,17a-20S-Methylcholest	48.076	217	6339M3	169.101	ng/ml	
138)	14a,17a-20R-Methylcholest	48.784	217	5880M3	156.856	ng/ml	
139)	14a(H),17a(H)-20S-Ethylch	49.130	217	10462M3	279.087	ng/ml	
140)	14a(H),17a(H)-20R-Ethylch	50.019	217	11096M3	296.000	ng/ml	
141)	14b(H),17b(H)-20R-Cholest	46.976	218	9163M3	244.434	ng/ml	
142)	14b(H),17b(H)-20S-Cholest	47.067	218	8961M3	239.046	ng/ml	
143)	14b,17b-20R-Methylcholest	48.256	218	8896	237.312	ng/ml	100
144)	14b,17b-20S-Methylcholest	48.332	218	12982M3	346.311	ng/ml	
145)	14b(H),17b(H)-20R-Ethylch	49.371	218	18870M3	503.381	ng/ml	
146)	14b(H),17b(H)-20S-Ethylch	49.401	218	11579M3	308.884	ng/ml	
147)	C26,20R- +C27,20S- triaro	49.085	231	27993	746.748	ng/mL	100
148)	C28,20S-triaromatic stero	49.913	231	28552	761.660	ng/mL	100
149)	C27,20R-triaromatic stero	50.365	231	18381	490.336	ng/mL	100
150)	C28,20R-triaromatic stero	51.525	231	21036M3	561.161	ng/mL	

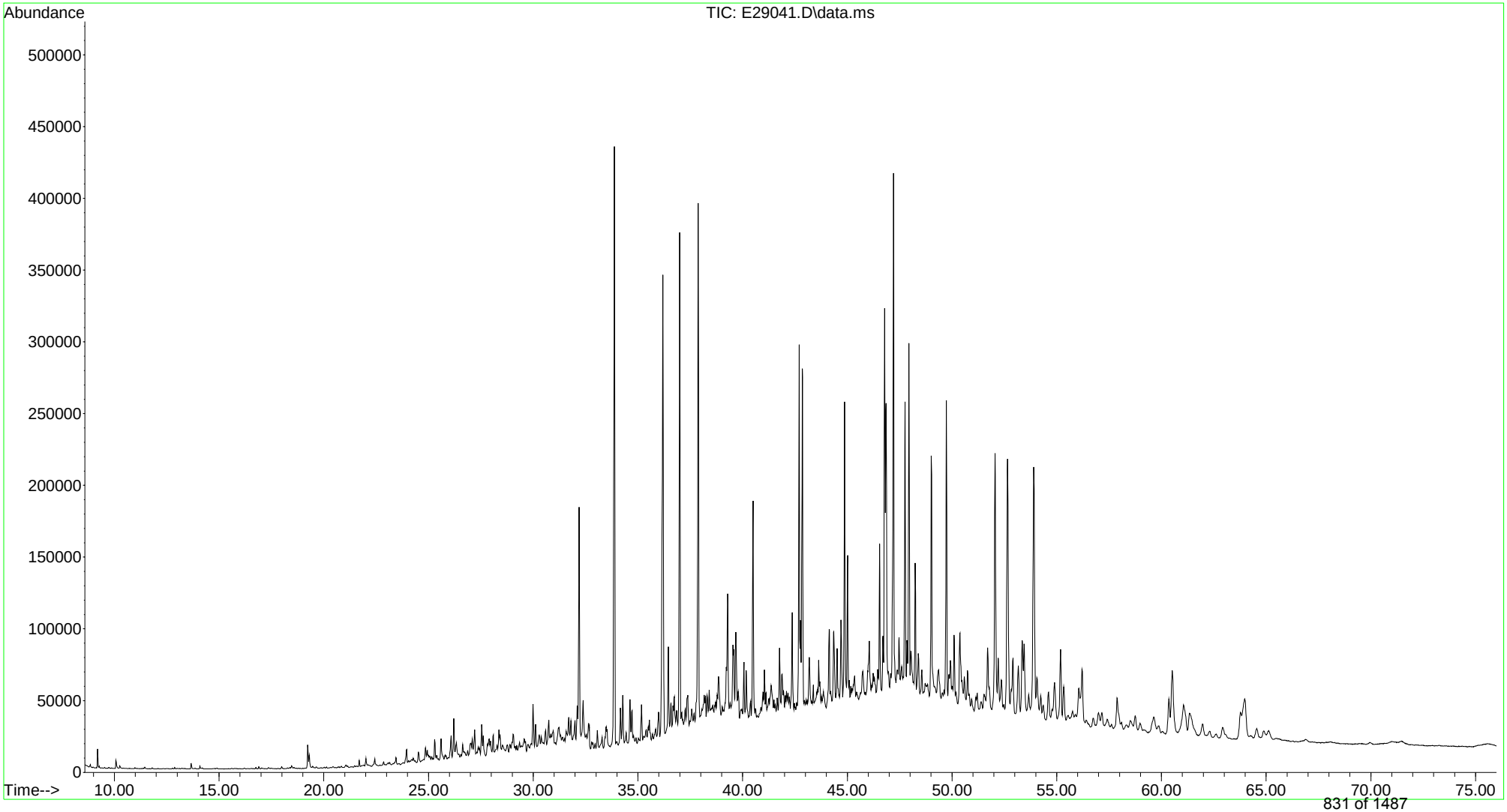
(#) = qualifier out of range (m) = manual integration (+) = signals summed

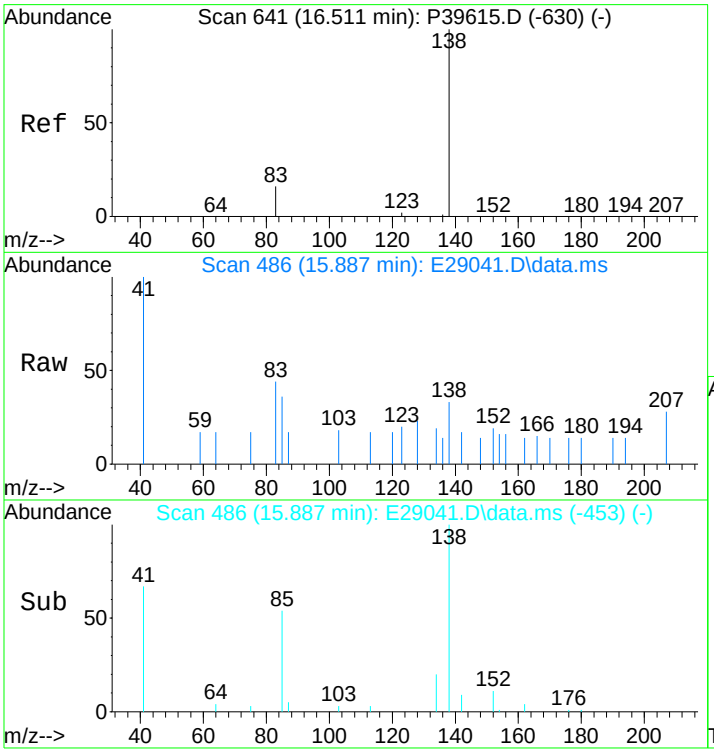
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29041.D
Acq On : 17 Nov 2012 2:40 pm
Operator : AC
Sample : 1210083-04
Misc : 1X
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 19 10:22:57 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

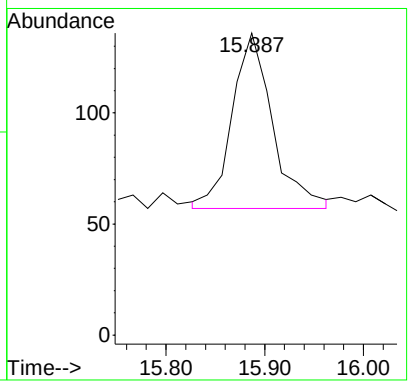
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

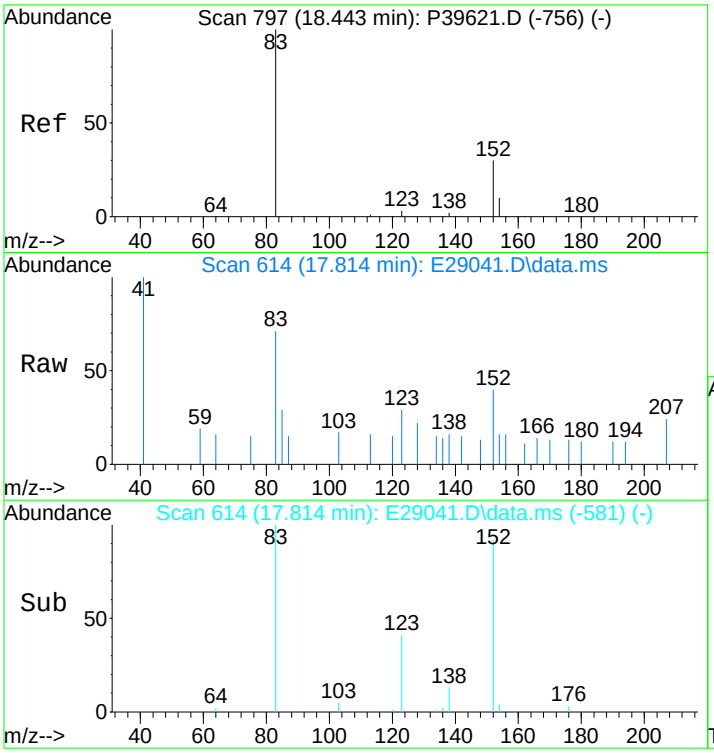




#3
trans-Decalin
Concen: 7.23 ng/mL m
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

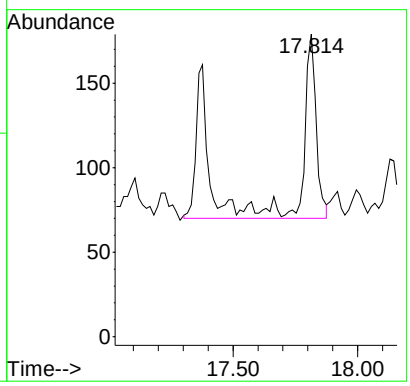
Tgt Ion:138 Resp: 224

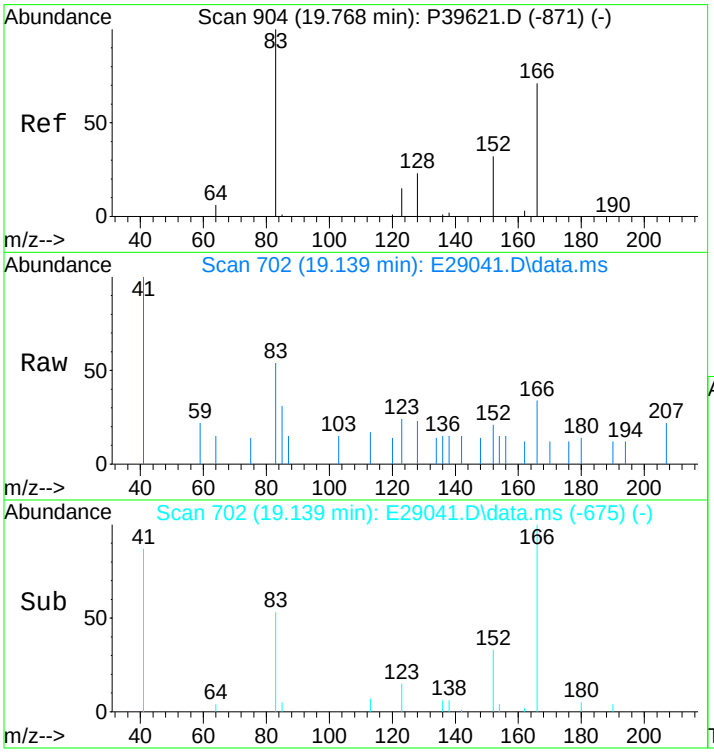




#5
C1-Decalins
Concen: 22.48 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

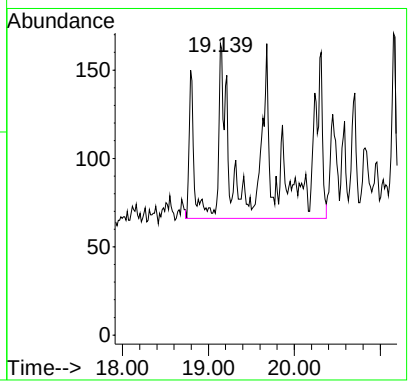
Tgt Ion:152 Resp: 696

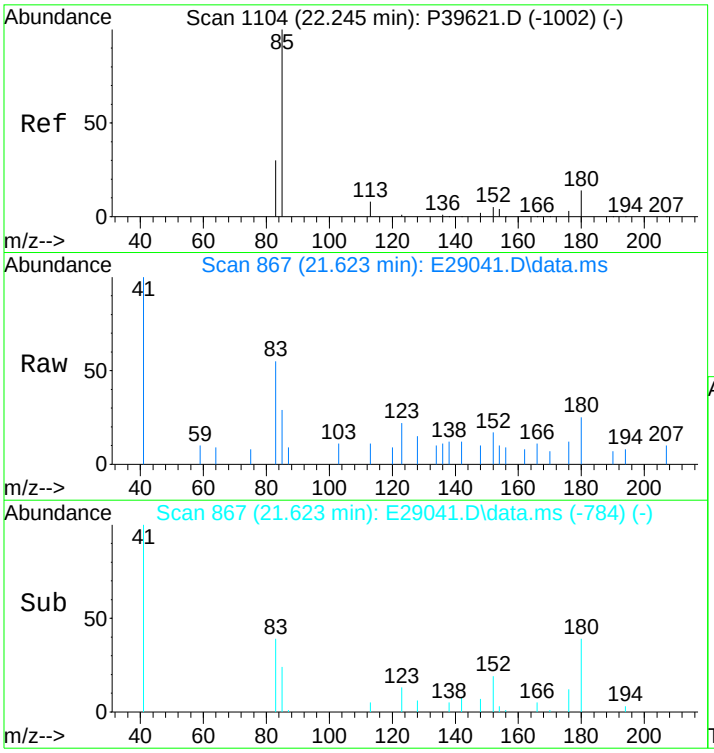




#6
C2-Decalins
Concen: 85.88 ng/mL m
RT: 19.139 min Scan# 702
Delta R.T. -0.215 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

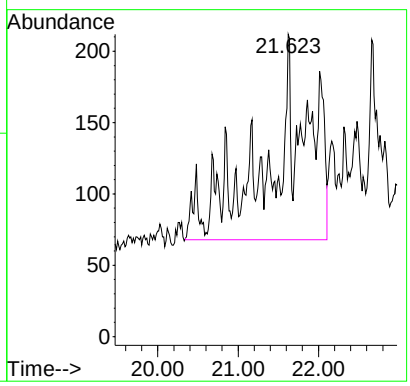
Tgt Ion:166 Resp: 2659

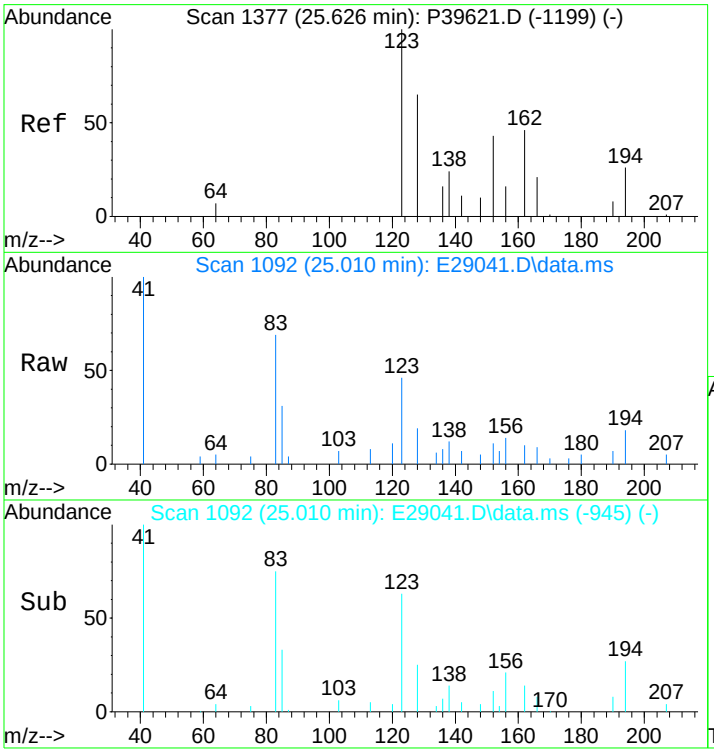




#7
C3-Decalins
Concen: 162.13 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.135 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

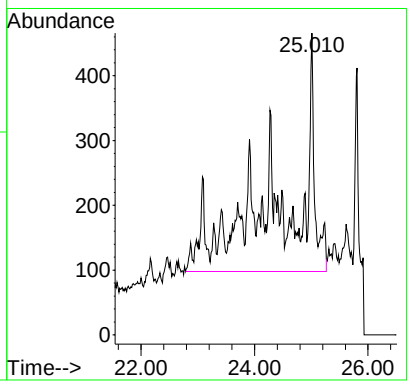
Tgt Ion:180 Resp: 5020

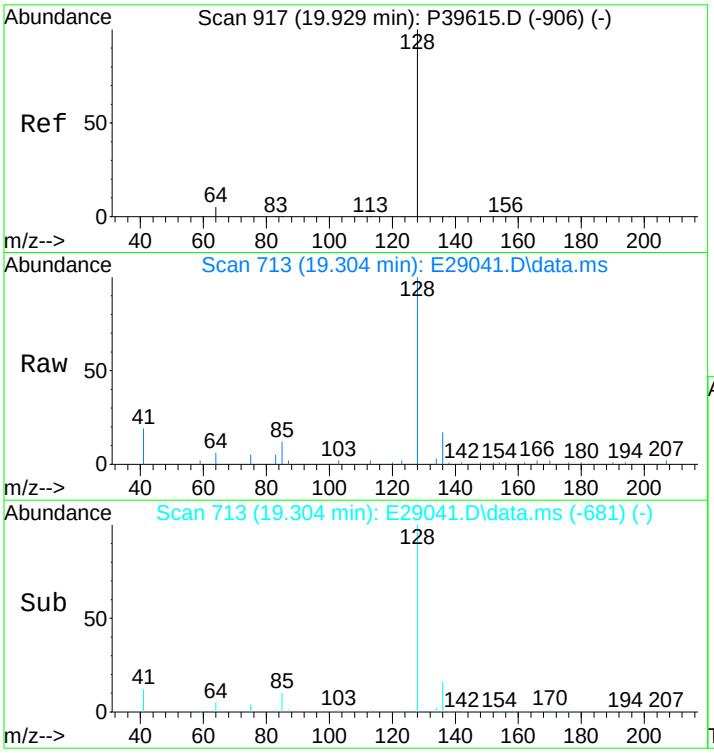




#8
C4-Decalins
Concen: 372.96 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.060 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:194 Resp: 11548

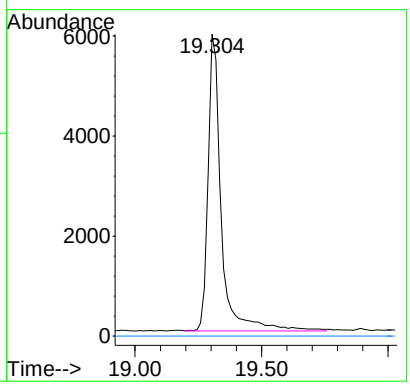


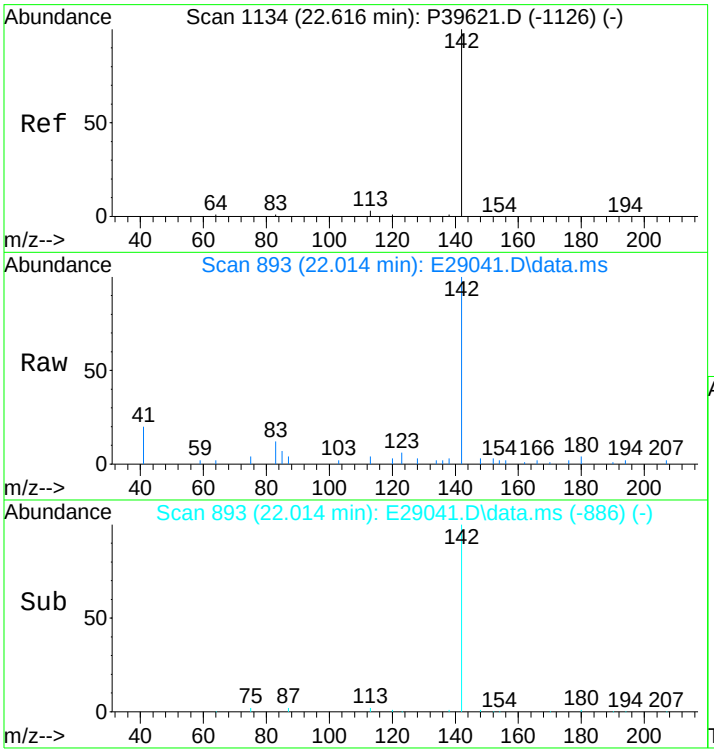


#10
Naphthalene
Concen: 139.70 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:128 Resp: 21271

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

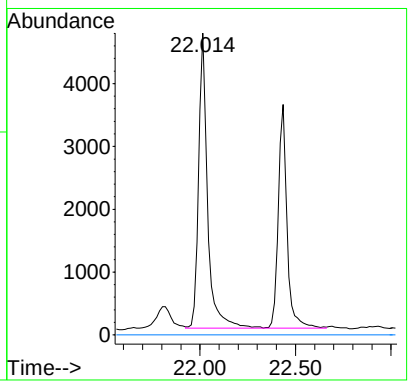


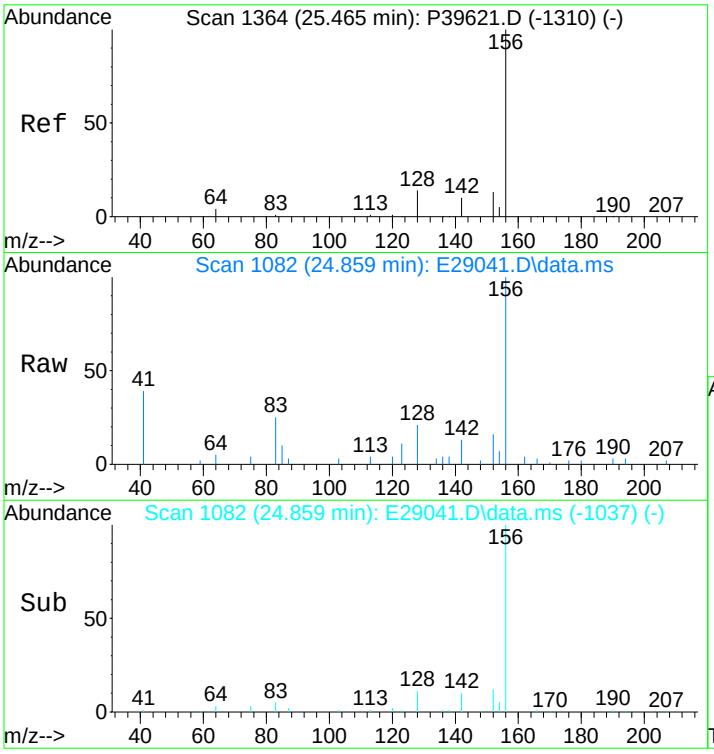


#11
C1-Naphthalenes
Concen: 174.03 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:142 Resp: 26498

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

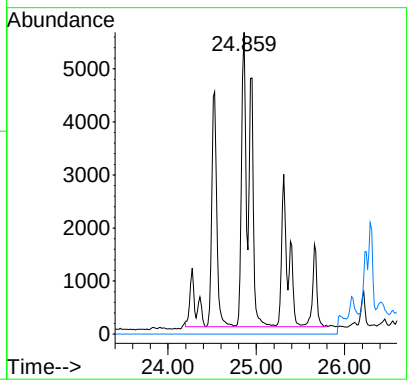


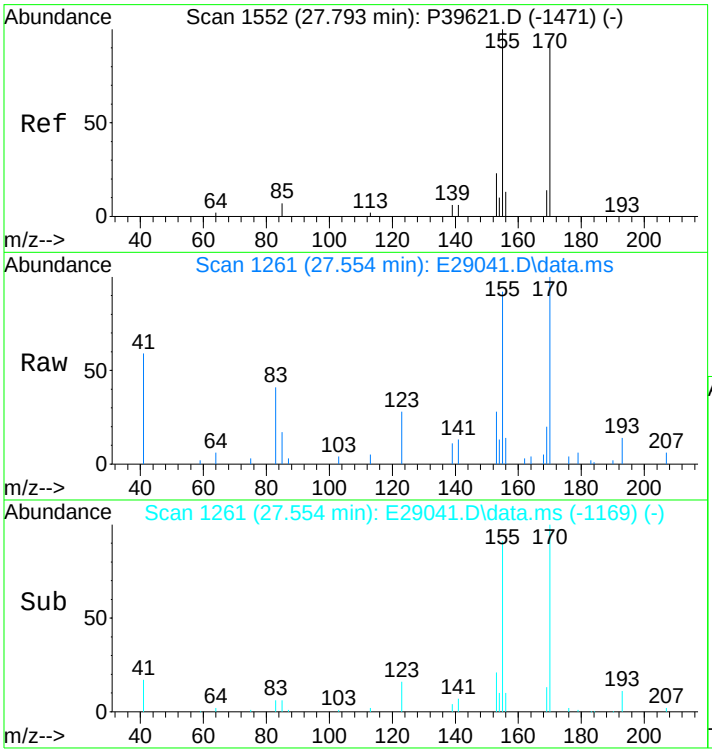


#12
C2-Naphthalenes
Concen: 504.14 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:156 Resp: 76760

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

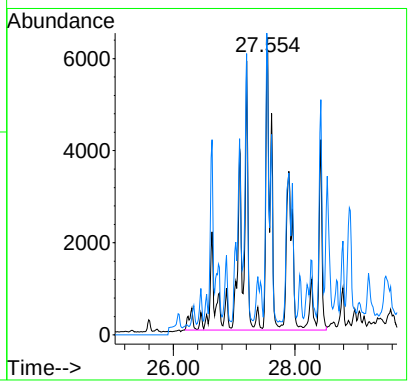


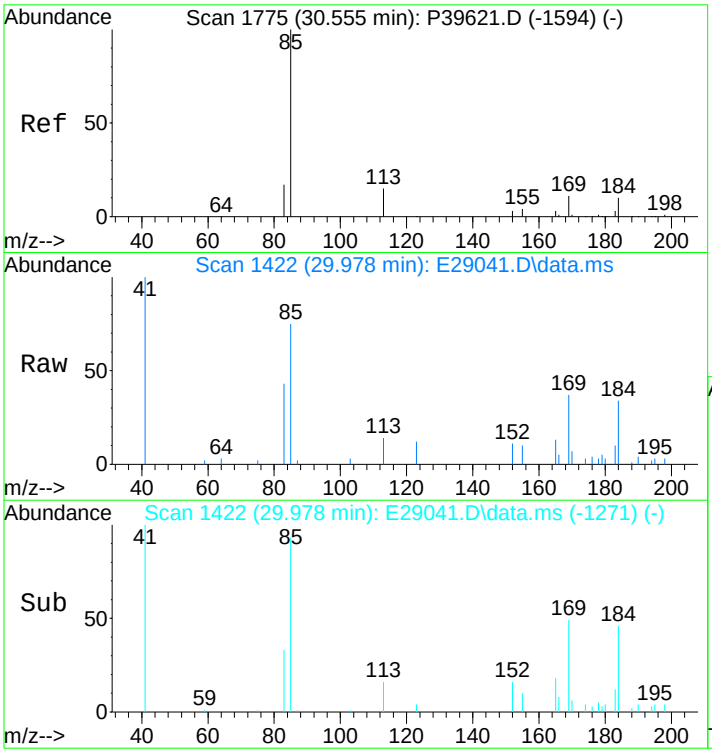


#13
C3-Naphthalenes
Concen: 838.61 ng/mL m
RT: 27.554 min Scan# 1261
Delta R.T. 0.359 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:170 Resp: 127686

Ion	Ratio	Lower	Upper
170	100		
155	7.9	66.8	100.2#

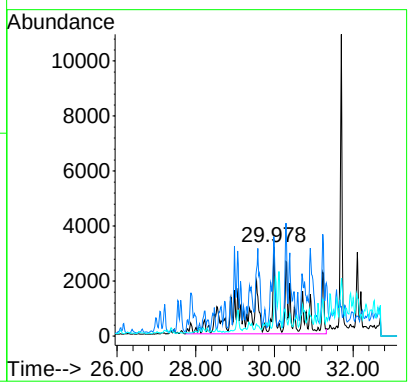


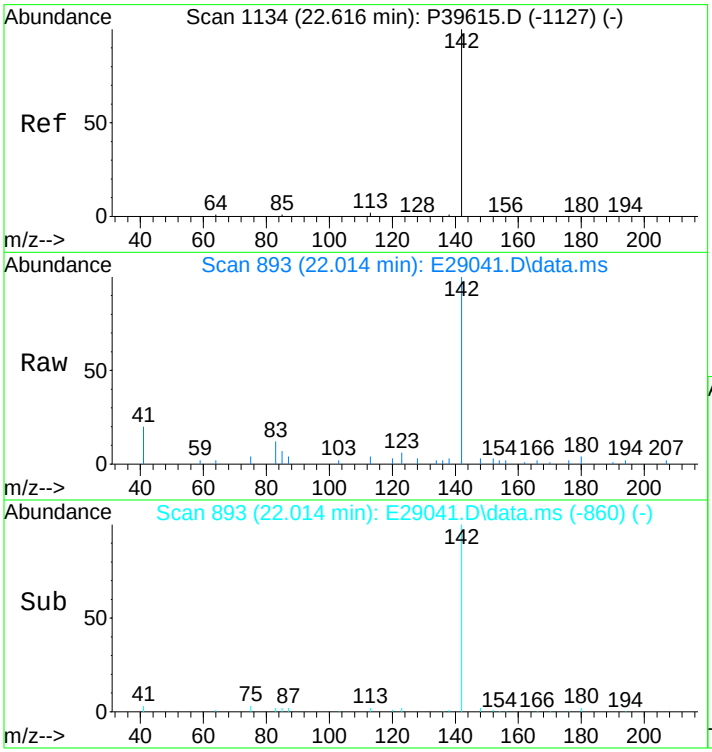


#14
C4-Naphthalenes
Concen: 796.60 ng/mL m
RT: 29.978 min Scan# 1422
Delta R.T. 0.085 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:184 Resp: 121290

Ion	Ratio	Lower	Upper
184	100		
169	4.5	78.7	118.1#
183	1.3	26.7	40.1#

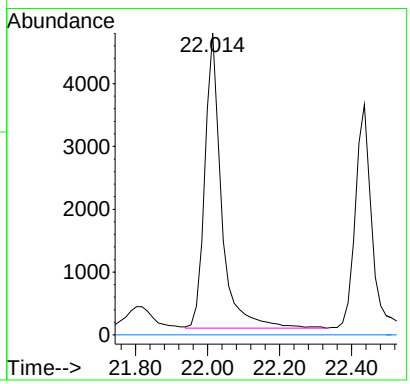


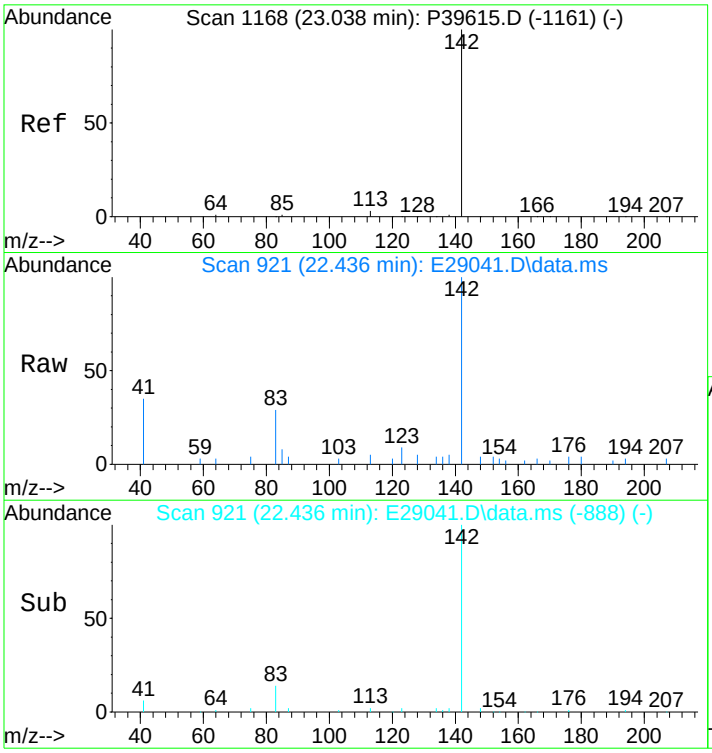


#16
2-Methylnaphthalene
Concen: 156.93 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:142 Resp: 15218

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

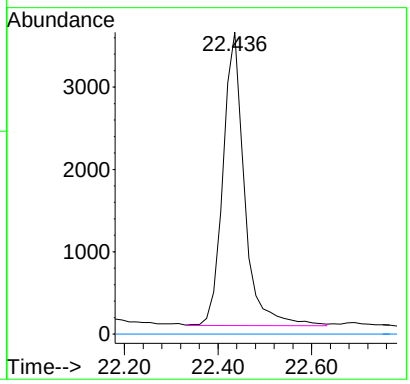


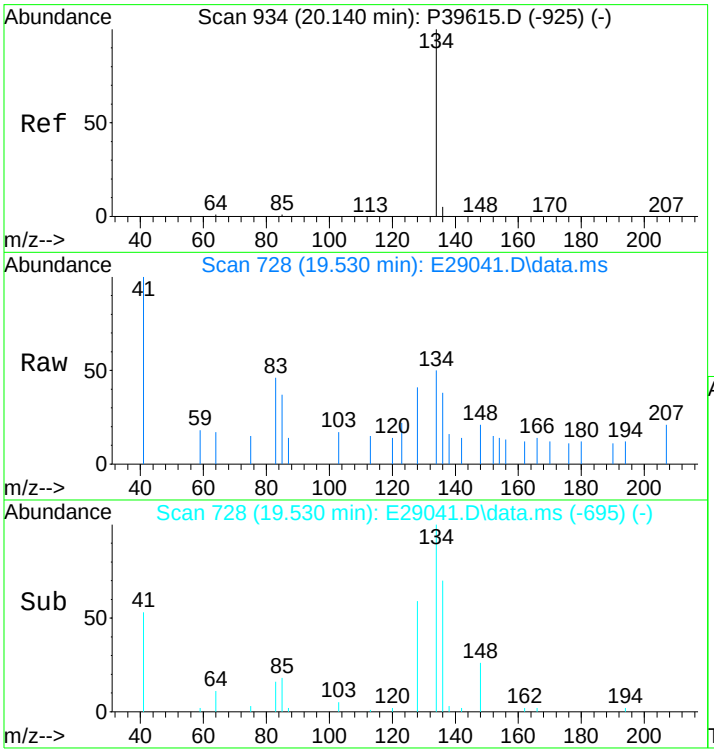


#17
1-Methylnaphthalene
Concen: 120.60 ng/mL
RT: 22.436 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:142 Resp: 11364

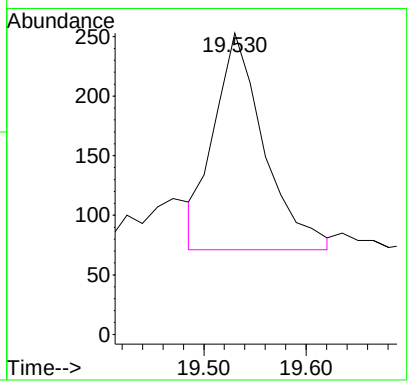
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

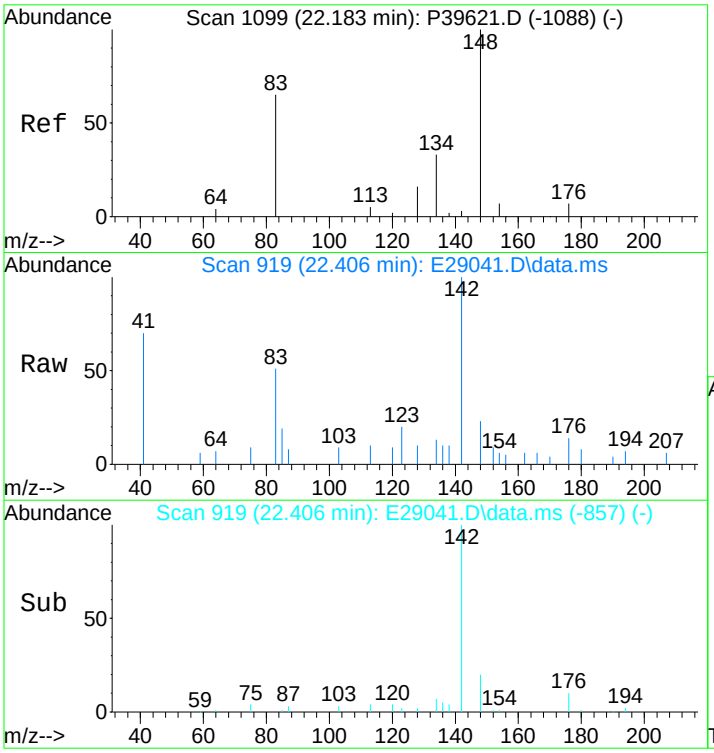




#18
Benzothiophene
Concen: 4.91 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

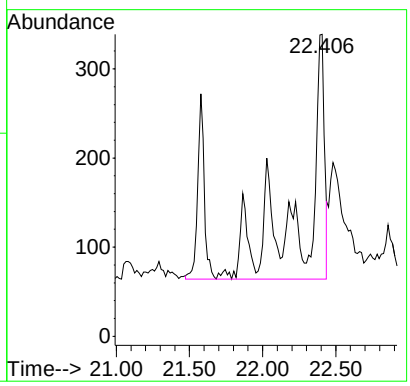
Tgt Ion:134 Resp: 618

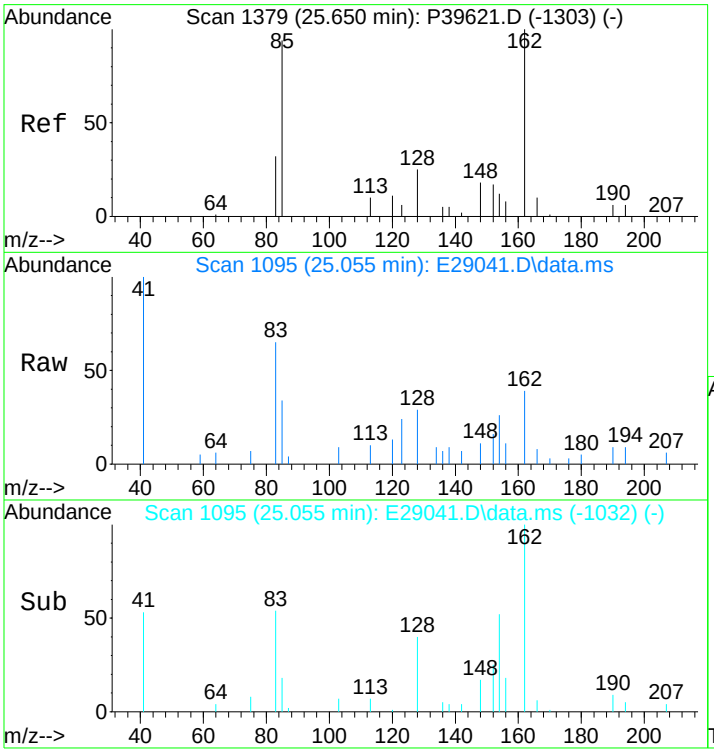




#19
C1-Benzo(b)thiophenes
Concen: 25.68 ng/mL m
RT: 22.406 min Scan# 919
Delta R.T. 0.692 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

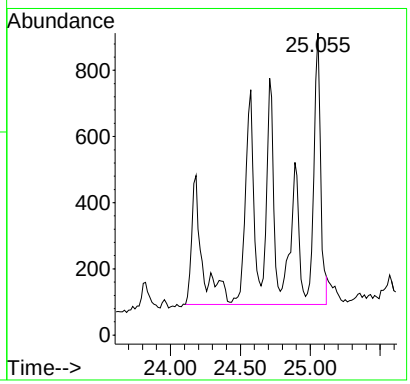
Tgt Ion:148 Resp: 3232

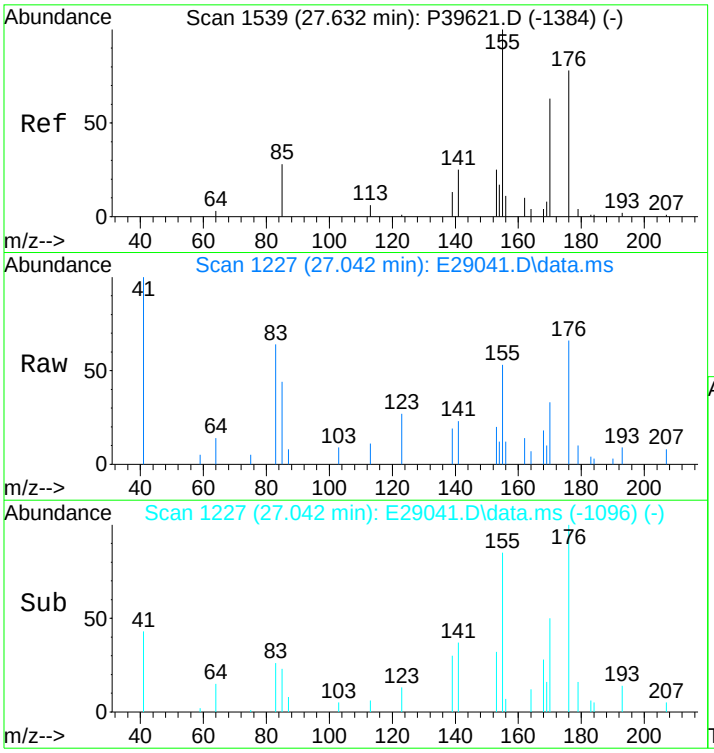




#20
C2-Benzo(b)thiophenes
Concen: 92.13 ng/mL m
RT: 25.055 min Scan# 1095
Delta R.T. -0.044 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

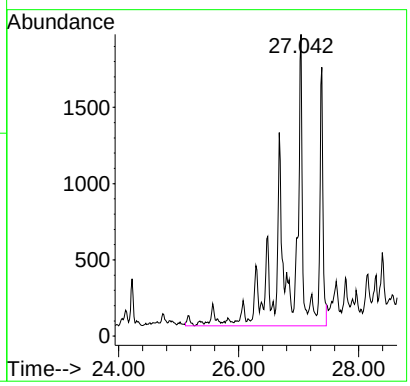
Tgt Ion:162 Resp: 11597

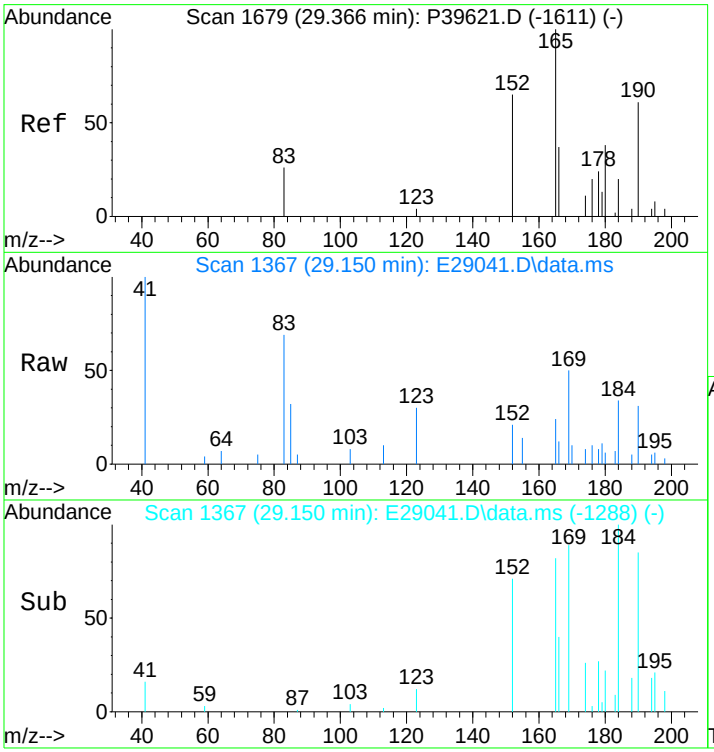




#21
C3-Benzo(b)thiophenes
Concen: 237.87 ng/mL m
RT: 27.042 min Scan# 1227
Delta R.T. 0.008 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

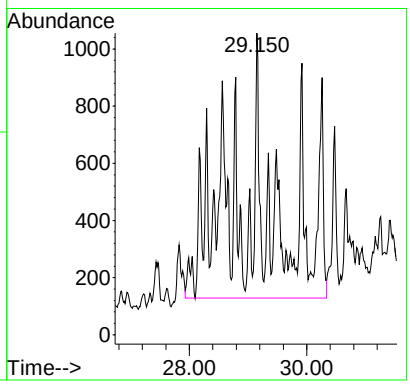
Tgt Ion:176 Resp: 29941

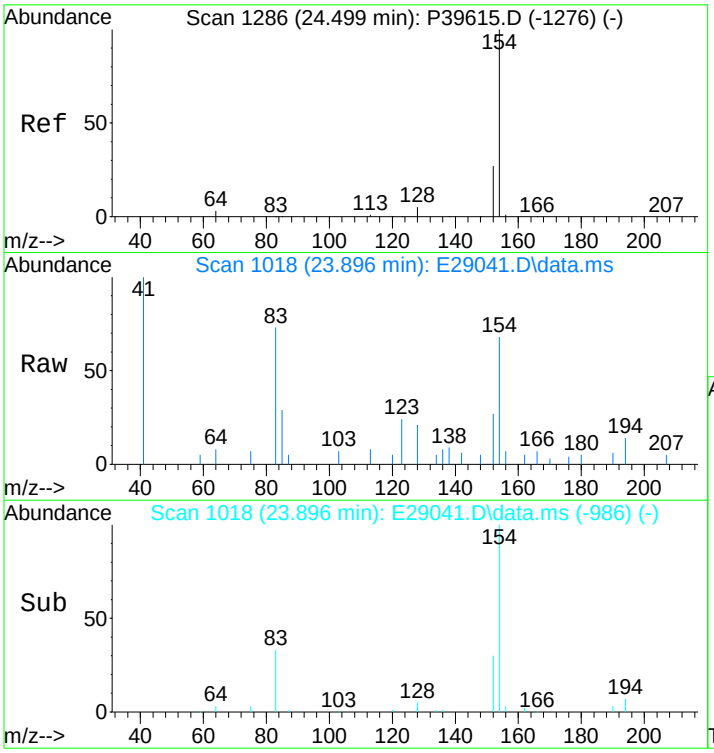




#22
C4-Benzo(b)thiophenes
Concen: 291.64 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:190 Resp: 36709

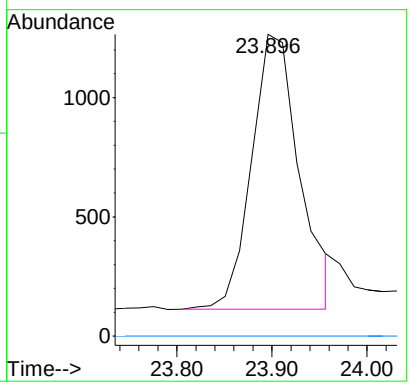


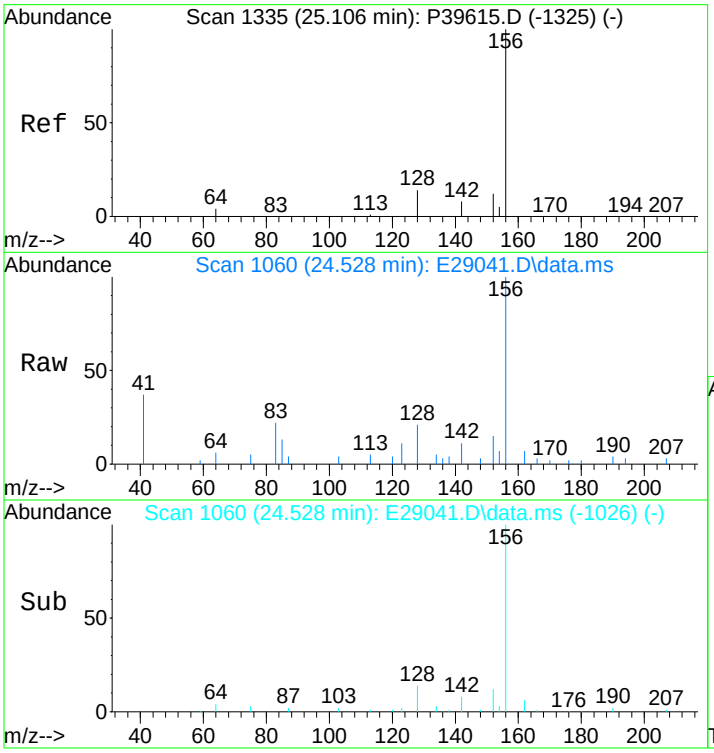


#23
Biphenyl
Concen: 32.87 ng/mL m
RT: 23.896 min Scan# 1018
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:154 Resp: 4028

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

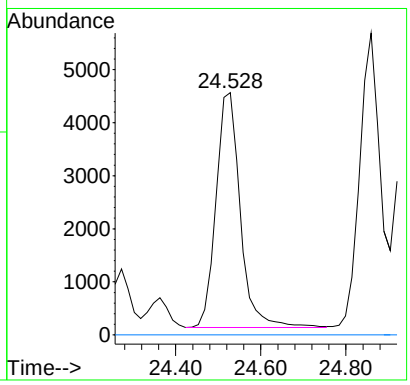


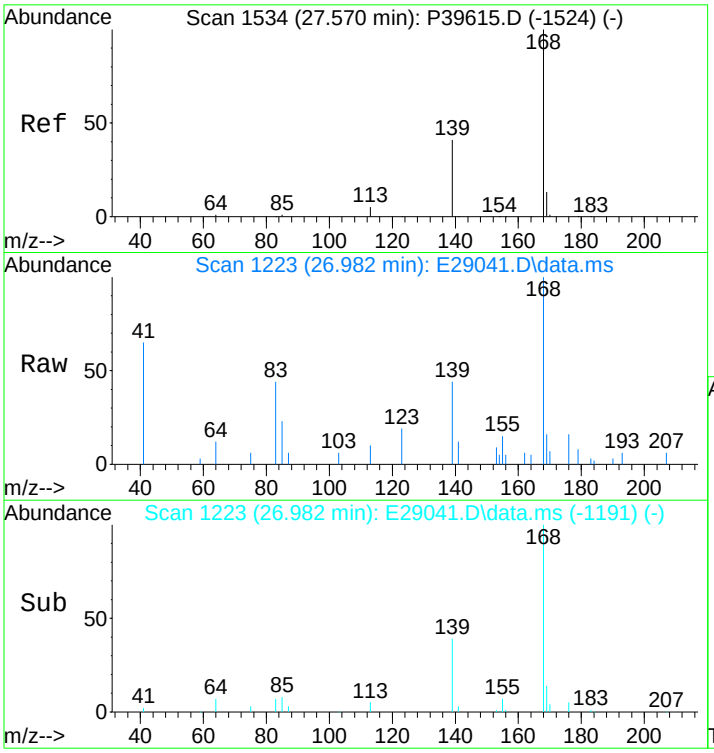


#24
2,6-Dimethylnaphthalene
Concen: 200.80 ng/mL
RT: 24.528 min Scan# 1060
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:156 Resp: 17552

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

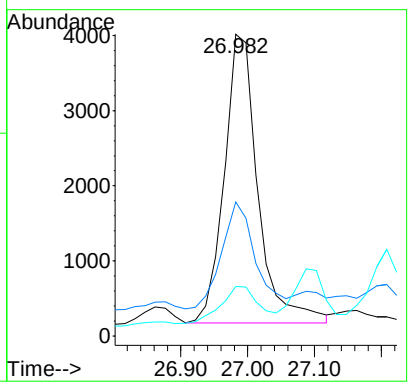


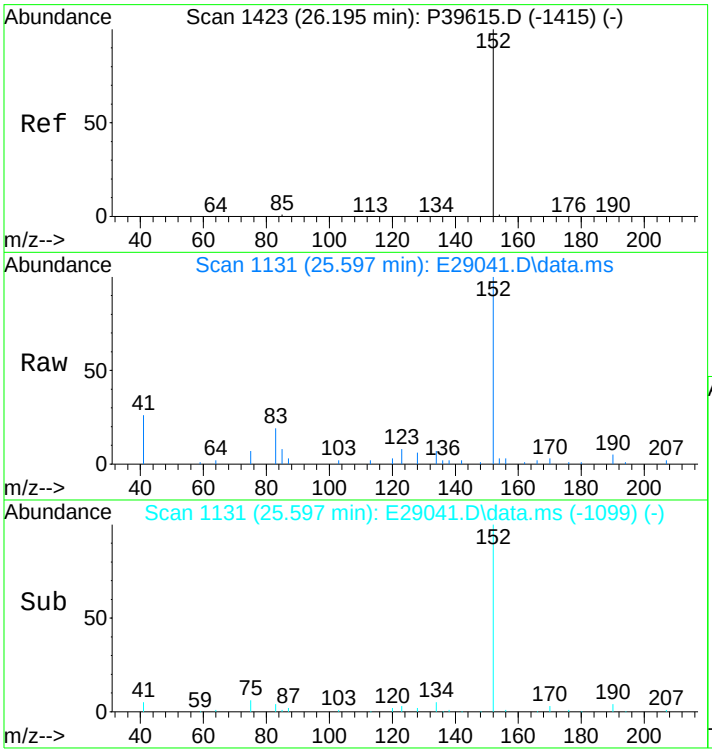


#25
Dibenzofuran
Concen: 98.84 ng/mL
RT: 26.982 min Scan# 1223
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:168 Resp: 13412

Ion	Ratio	Lower	Upper
168	100		
139	37.1	26.9	40.3
169	16.7	10.7	16.1#

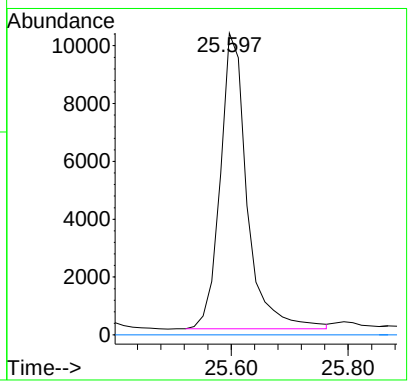


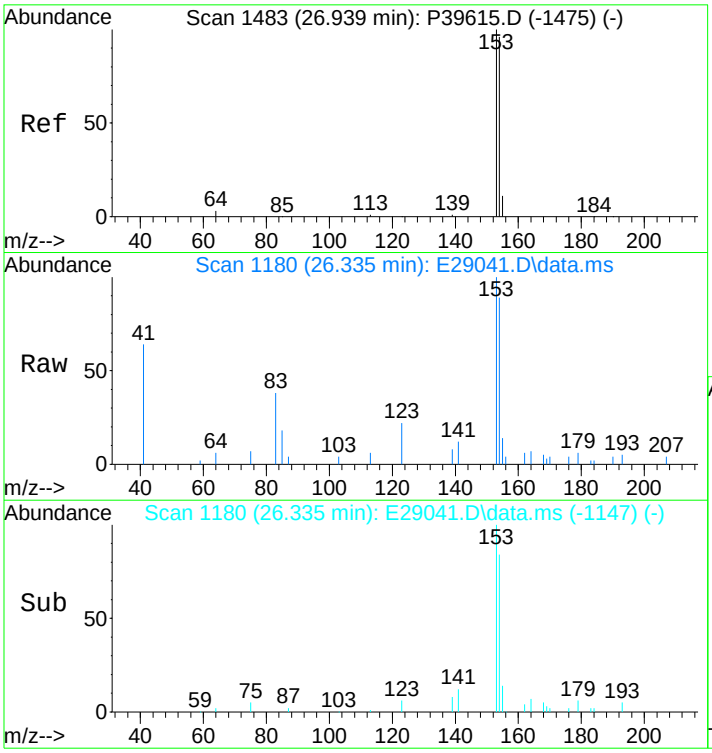


#26
Acenaphthylene
Concen: 214.62 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:152 Resp: 32579

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

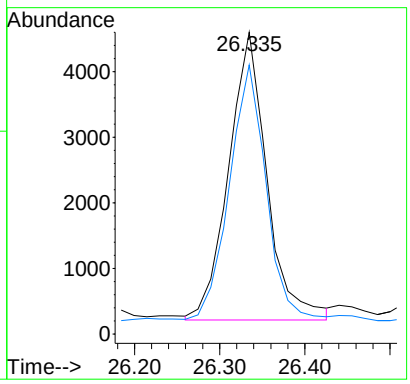


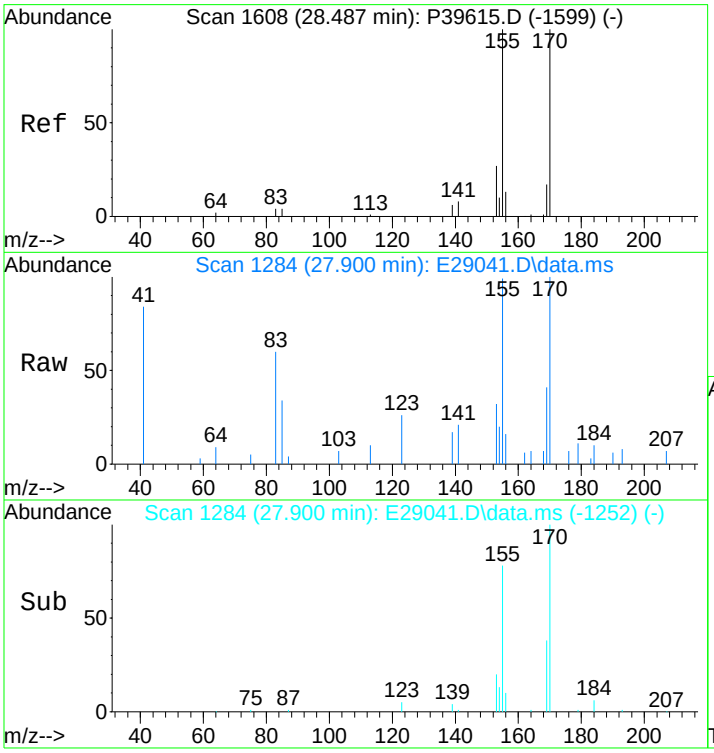


#27
Acenaphthene
Concen: 140.05 ng/mL m
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:153 Resp: 13685

Ion	Ratio	Lower	Upper
153	100		
154	83.5	73.0	109.4

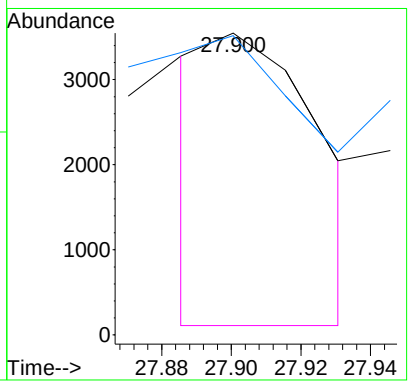


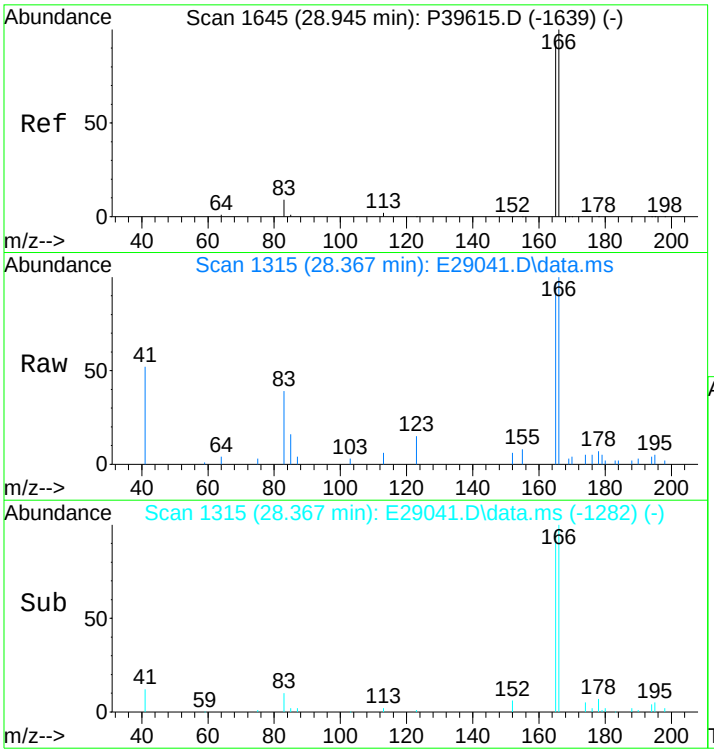


#28
2,3,5-Trimethylnaphthalene
Concen: 92.44 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:170 Resp: 7560

Ion	Ratio	Lower	Upper
170	100		
155	132.6	69.8	104.6#

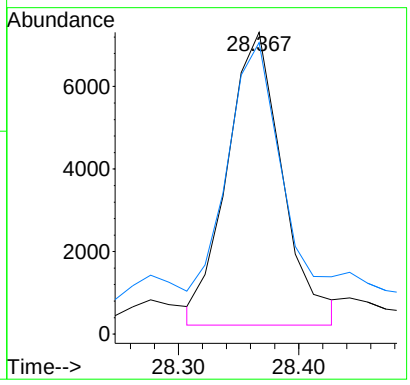


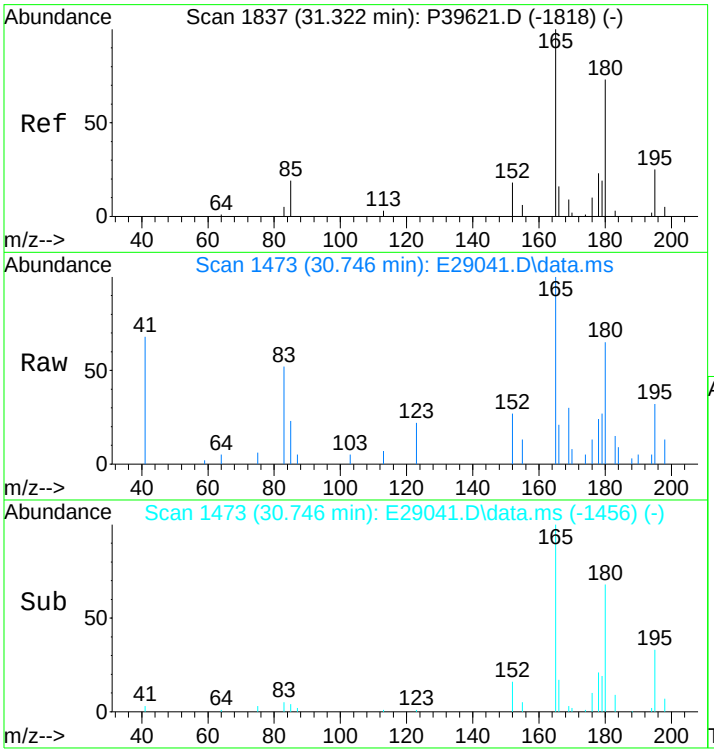


#29
Fluorene
Concen: 208.06 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:166 Resp: 22675

Ion	Ratio	Lower	Upper
166	100		
165	112.3	74.4	111.6#

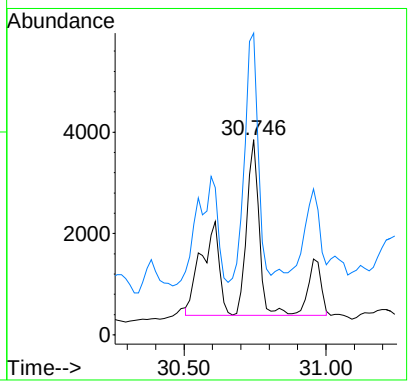


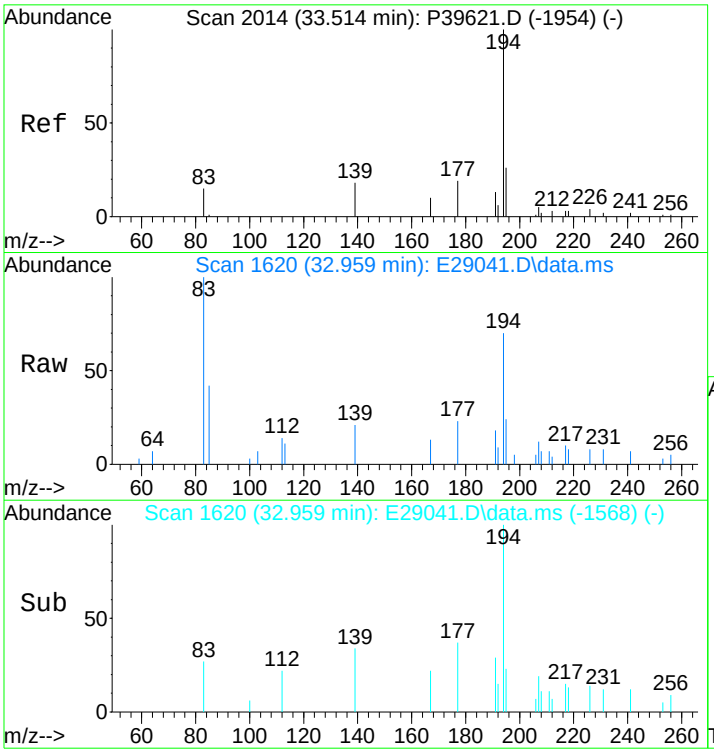


#30
C1-Fluorenes
Concen: 204.02 ng/mL m
RT: 30.746 min Scan# 1473
Delta R.T. 0.106 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:180 Resp: 22234

Ion	Ratio	Lower	Upper
180	100		
165	41.8	94.3	141.5#

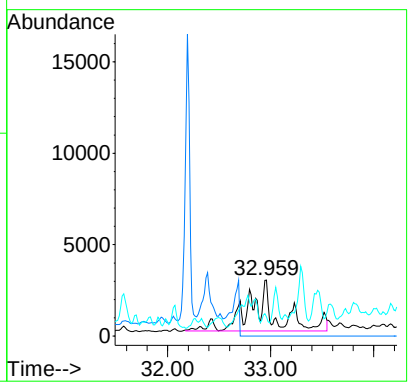


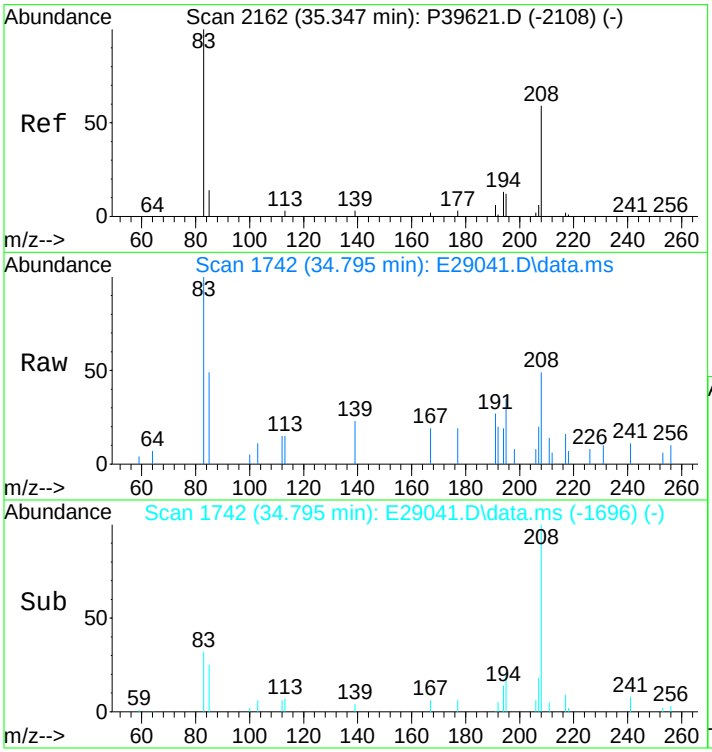


#31
C2-Fluorenes
Concen: 457.69 ng/mL m
RT: 32.959 min Scan# 1620
Delta R.T. 0.178 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:194 Resp: 49880

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	24.8	27.0	40.4#

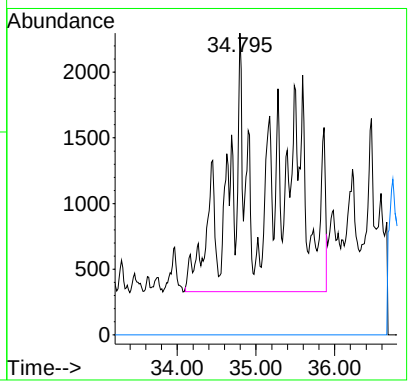


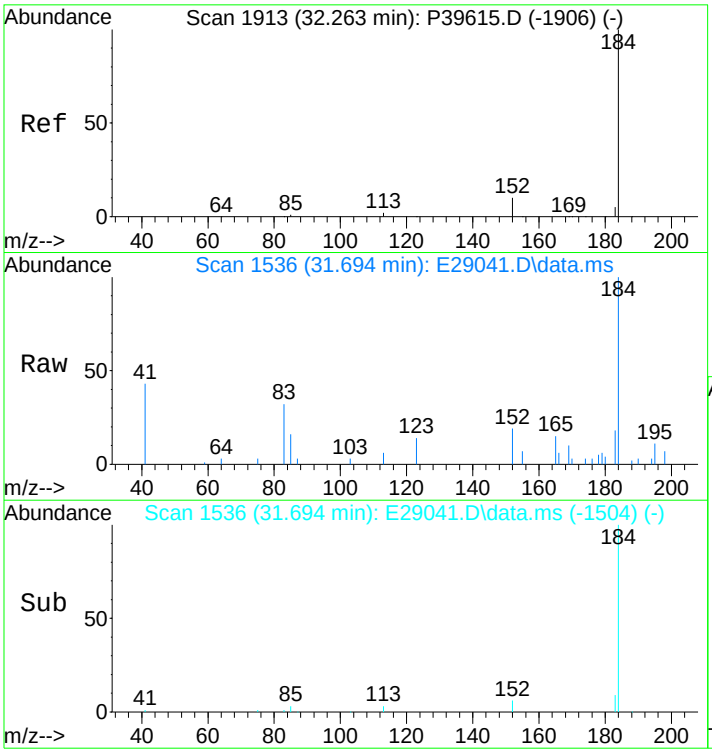


#32
C3-Fluorenes
Concen: 650.69 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.227 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:208 Resp: 70913

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

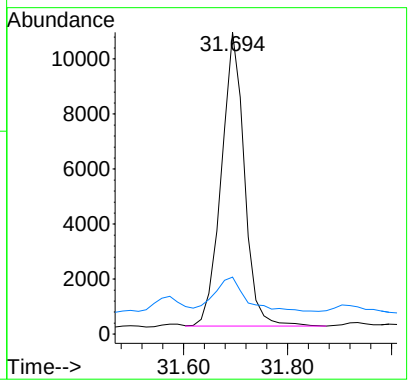


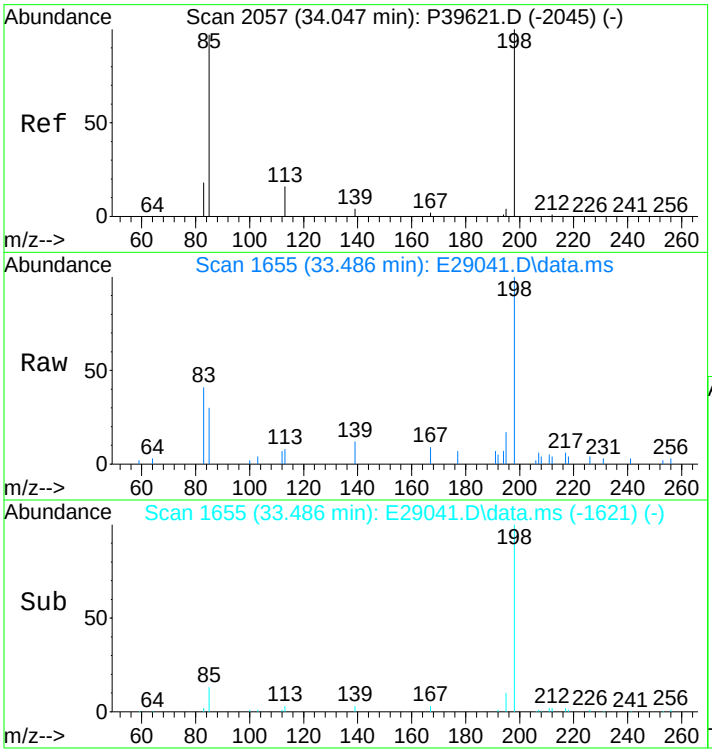


#33
Dibenzothiophene
Concen: 219.14 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:184 Resp: 32773

Ion	Ratio	Lower	Upper
184	100		
152	15.6	6.0	9.0#

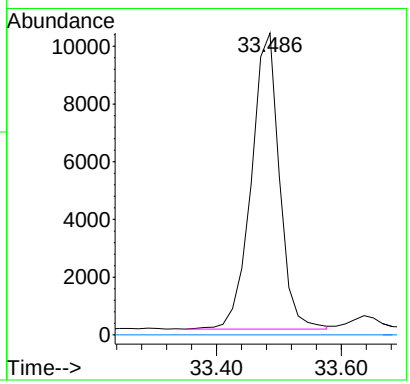


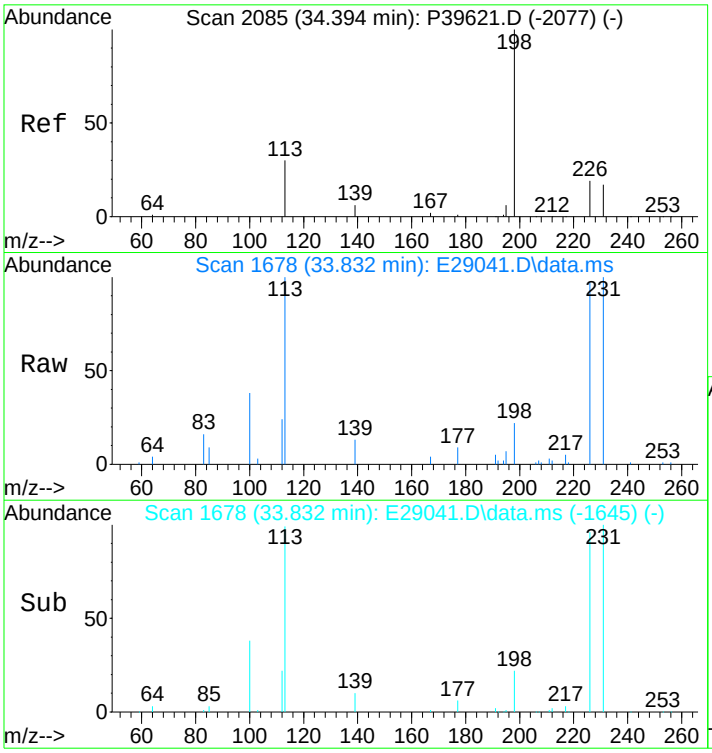


#34
4-Methyldibenzothiophene(4MDT)
Concen: 214.17 ng/mL
RT: 33.486 min Scan# 1655
Delta R.T. 0.011 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:198 Resp: 32029

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

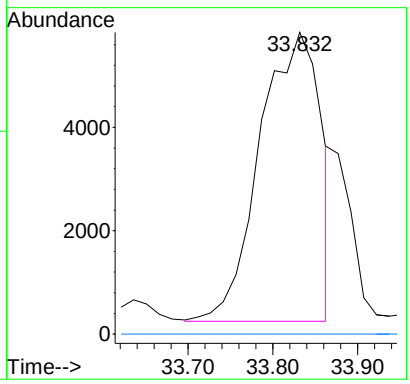


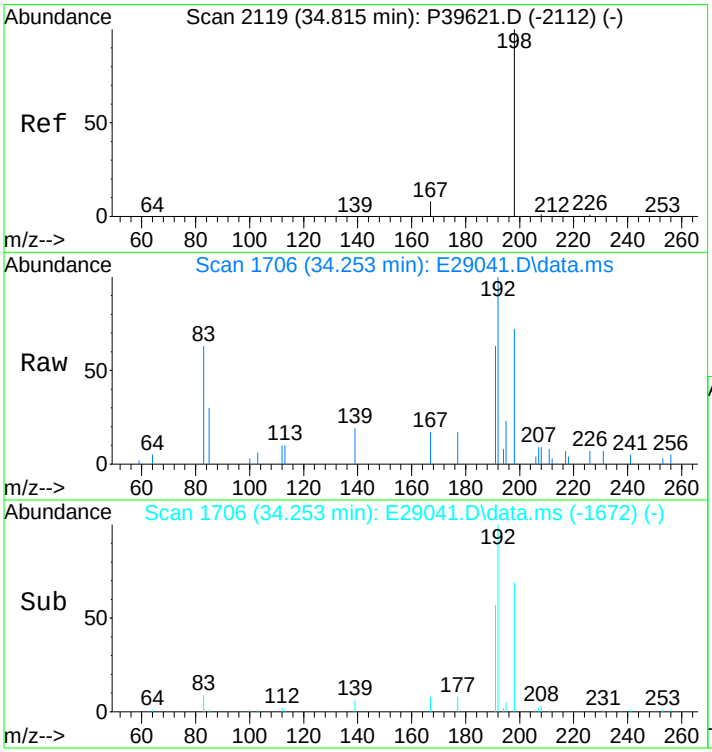


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 187.14 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. -0.004 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:198 Resp: 27987

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

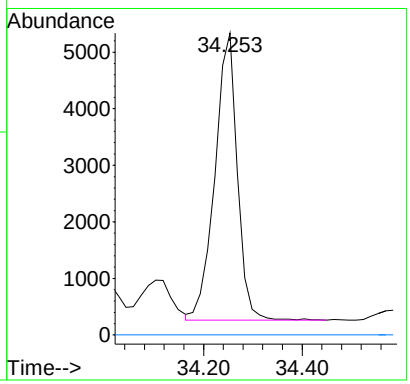


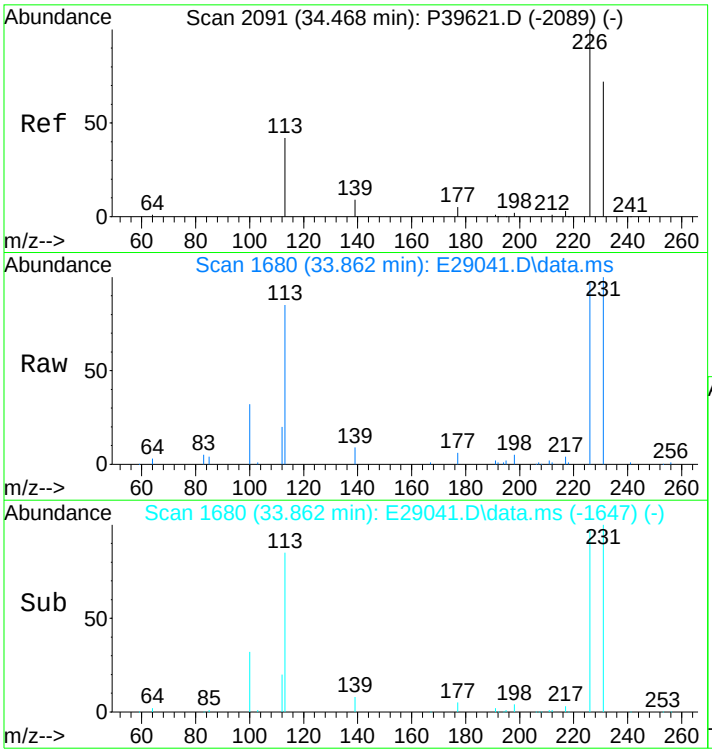


#36
1-Methyldibenzothiophene(1MDT)
Concen: 107.03 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.011 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:198 Resp: 16007

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

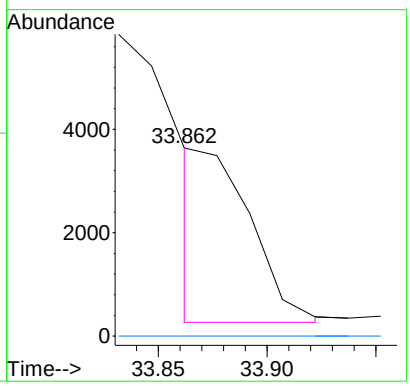


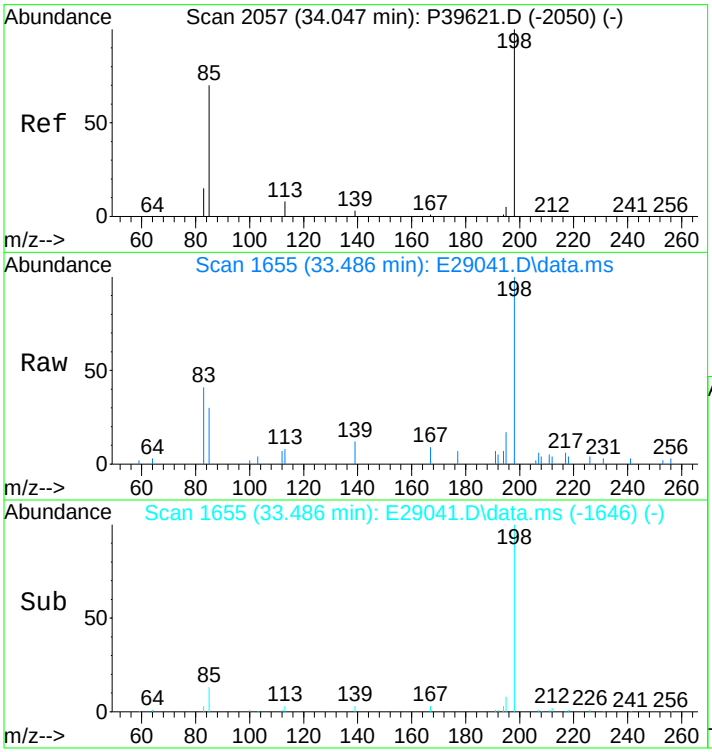


#37
OTP
Concen: 35.45 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.034 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:198 Resp: 5301

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

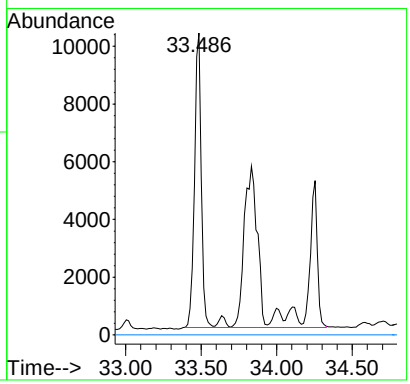


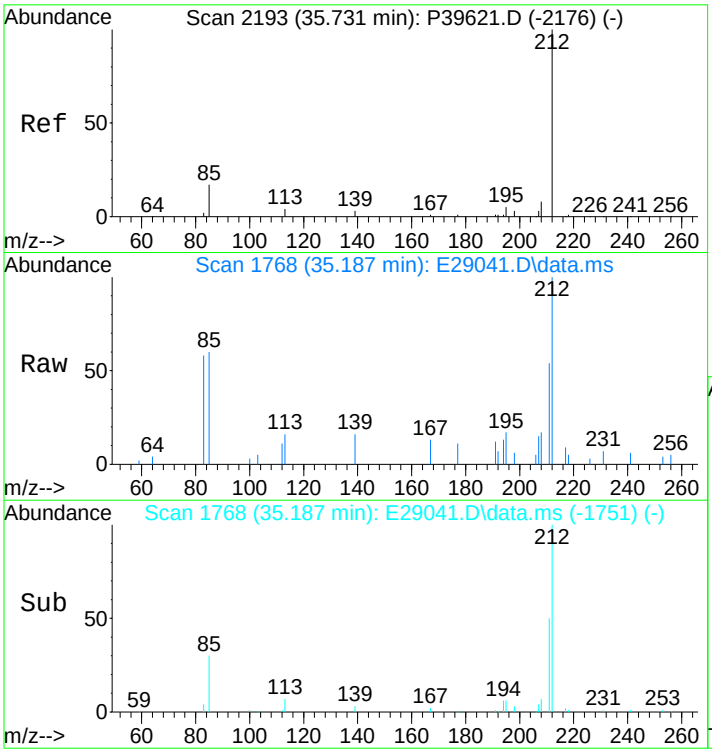


#38
C1-Dibenzothiophenes
Concen: 587.57 ng/mL m
RT: 33.486 min Scan# 1655
Delta R.T. 0.073 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:198 Resp: 87872

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

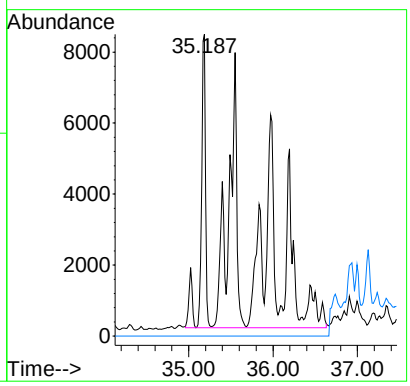


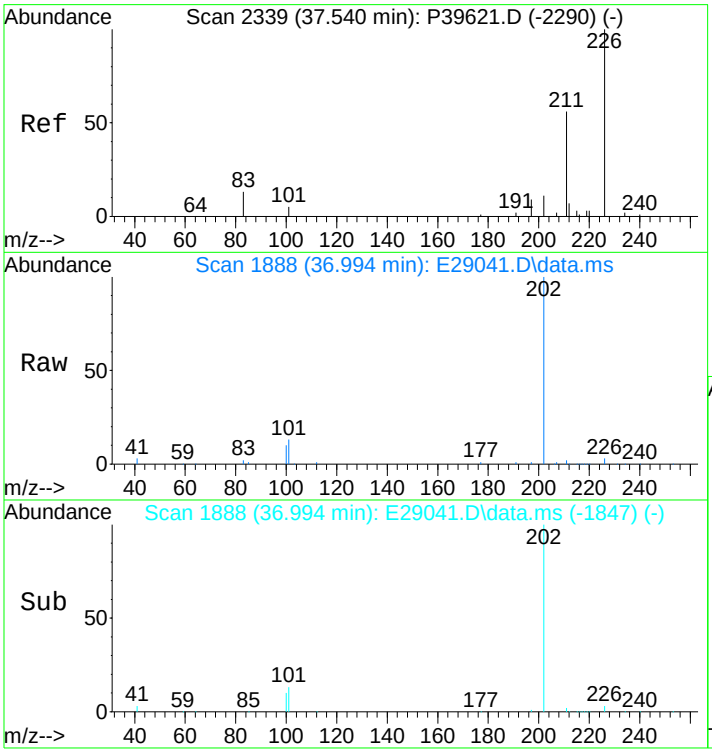


#39
C2-Dibenzothiophenes
Concen: 1084.44 ng/mL m
RT: 35.187 min Scan# 1768
Delta R.T. 0.010 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:212 Resp: 162180

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

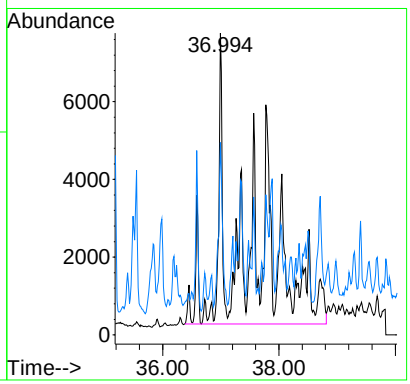


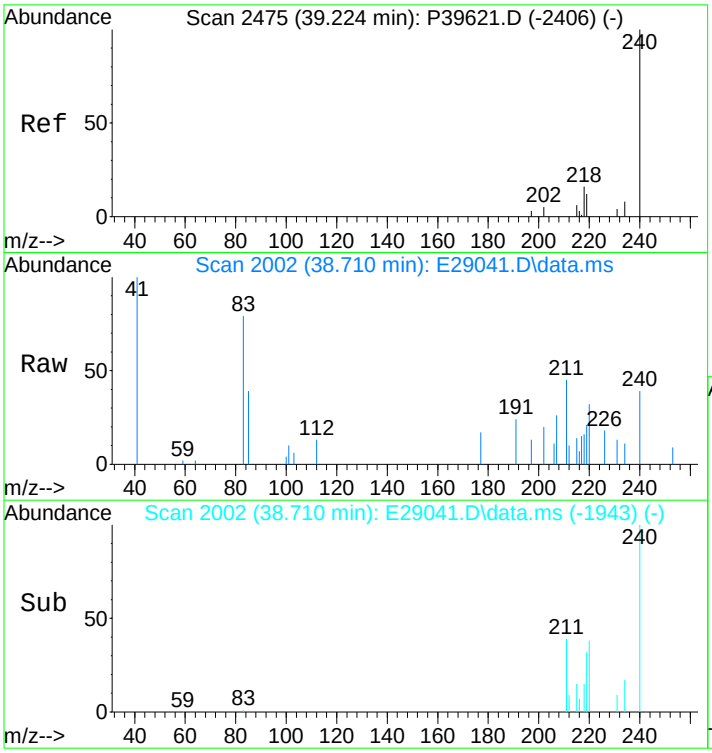


#40
C3-Dibenzothiophenes
Concen: 1285.74 ng/mL m
RT: 36.994 min Scan# 1888
Delta R.T. 0.284 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:226 Resp: 192285

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

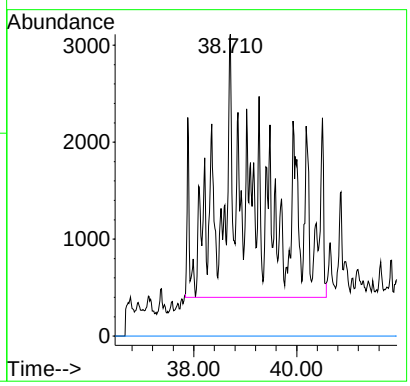


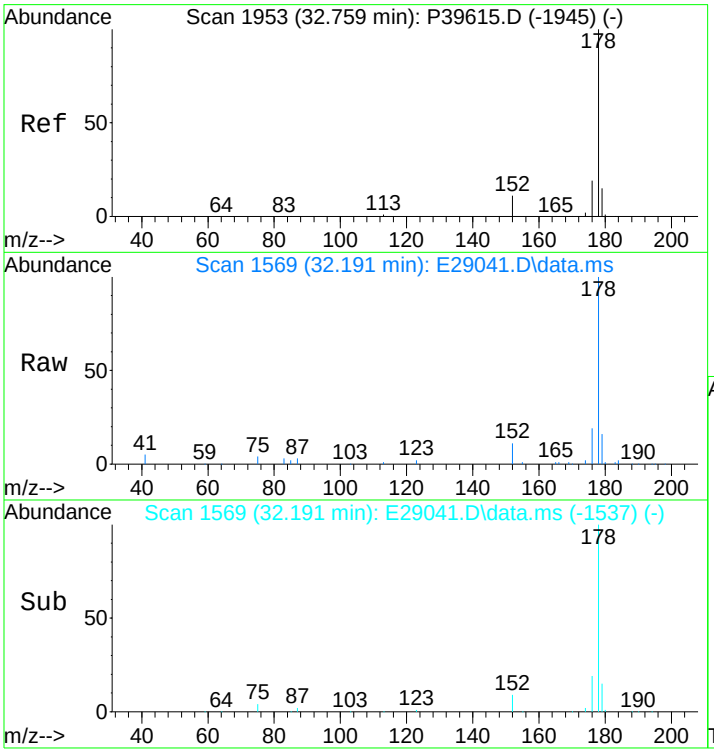


#41
C4-Dibenzothiophenes
Concen: 917.04 ng/mL m
RT: 38.710 min Scan# 2002
Delta R.T. 0.344 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:240 Resp: 137145

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

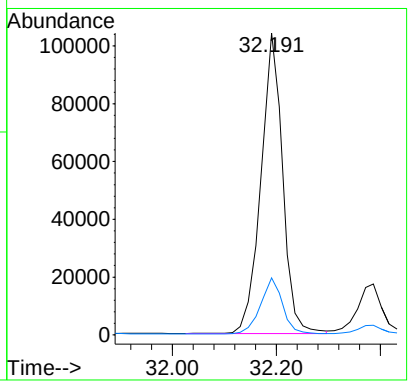


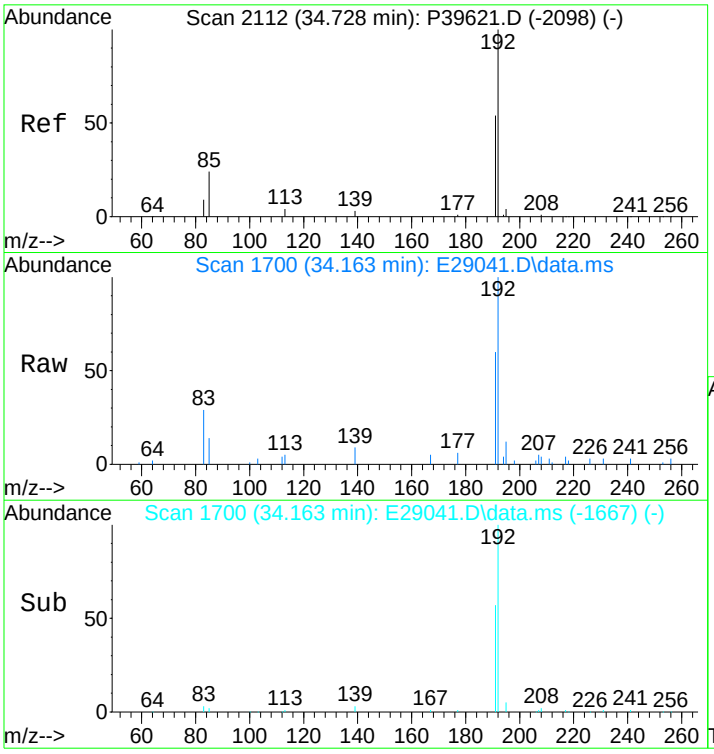


#43
Phenanthrene
Concen: 1987.26 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:178 Resp: 302367

Ion	Ratio	Lower	Upper
178	100		
176	19.0	14.6	21.8

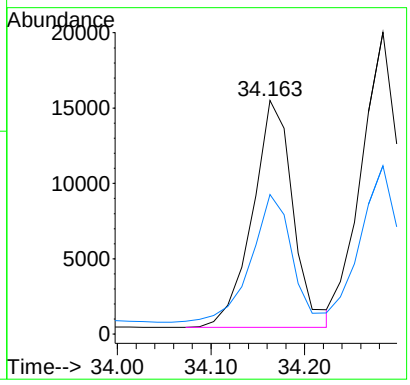


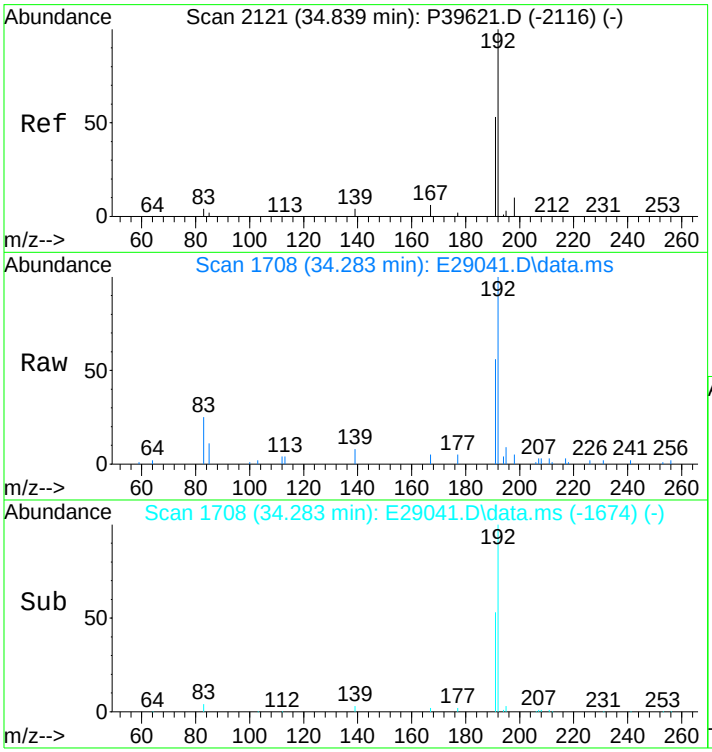


#44
3-Methylphenanthrene(3MP)
Concen: 297.77 ng/mL
RT: 34.163 min Scan# 1700
Delta R.T. -0.004 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 45307

Ion	Ratio	Lower	Upper
192	100		
191	57.0	45.9	68.9

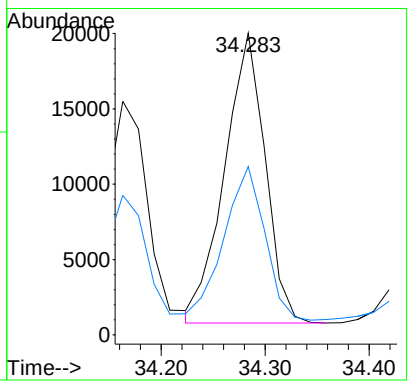


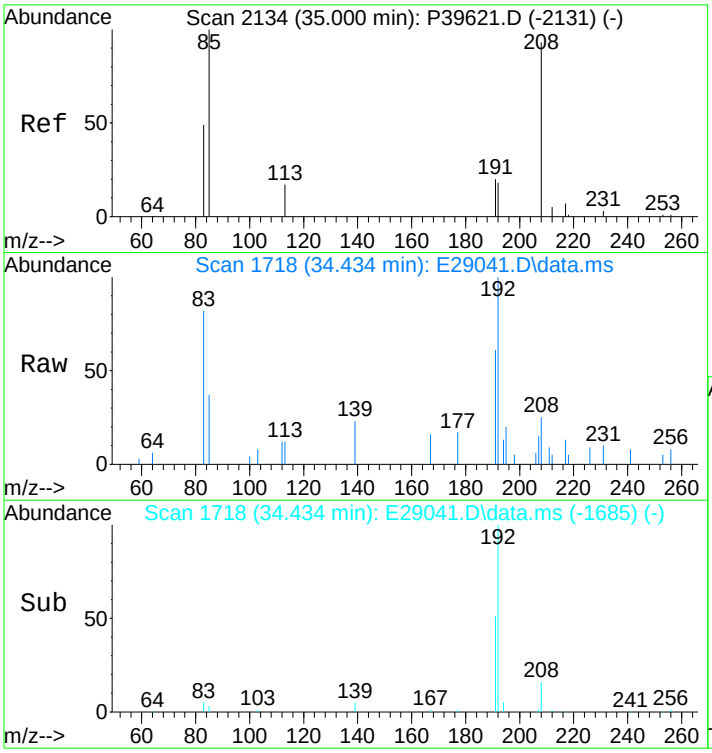


#45
2-Methylphenanthrene(2MP)
Concen: 342.91 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.011 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 52175

Ion	Ratio	Lower	Upper
192	100		
191	54.0	45.4	68.0

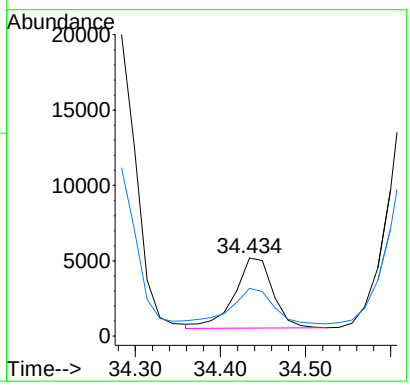


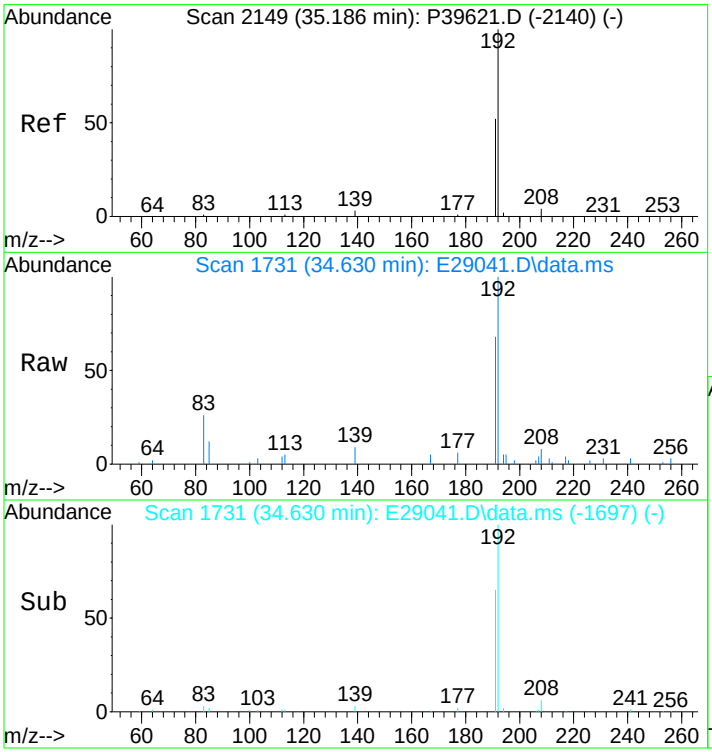


#46
2-Methylanthracene(2MA)
Concen: 95.50 ng/mL
RT: 34.434 min Scan# 1718
Delta R.T. -0.004 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 14531

Ion	Ratio	Lower	Upper
192	100		
191	55.2	95.4	143.0#

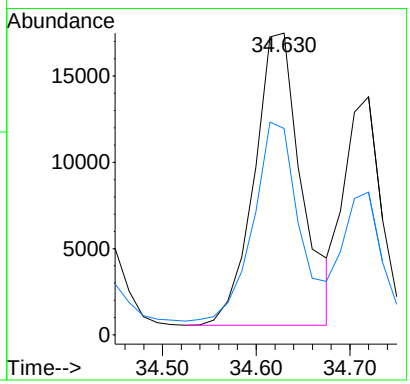


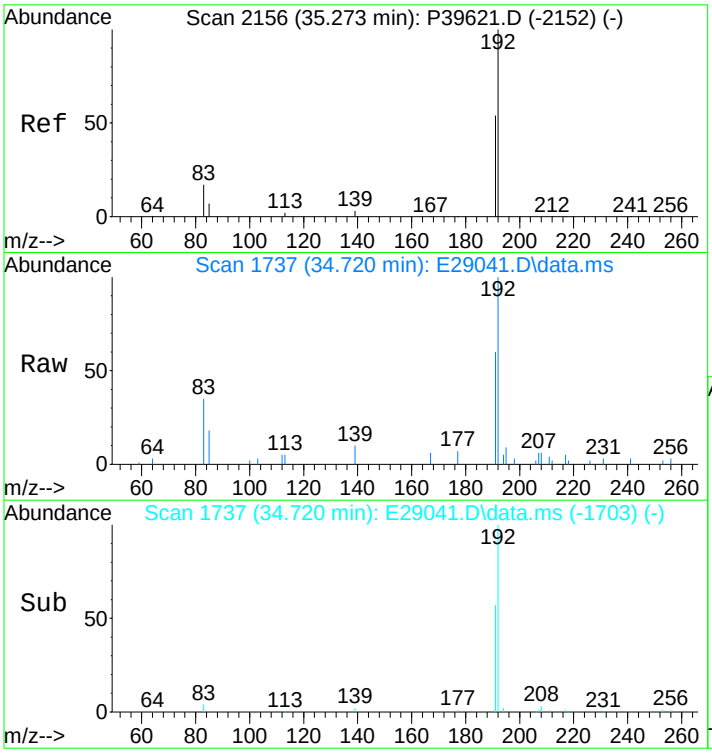


#47
9/4-Methylphenanthrene(9MP)
Concen: 391.92 ng/mL
RT: 34.630 min Scan# 1731
Delta R.T. 0.010 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 59632

Ion	Ratio	Lower	Upper
192	100		
191	66.2	44.3	66.5

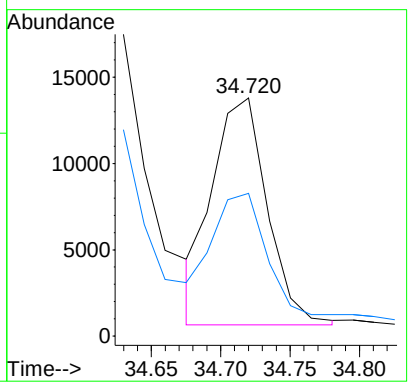


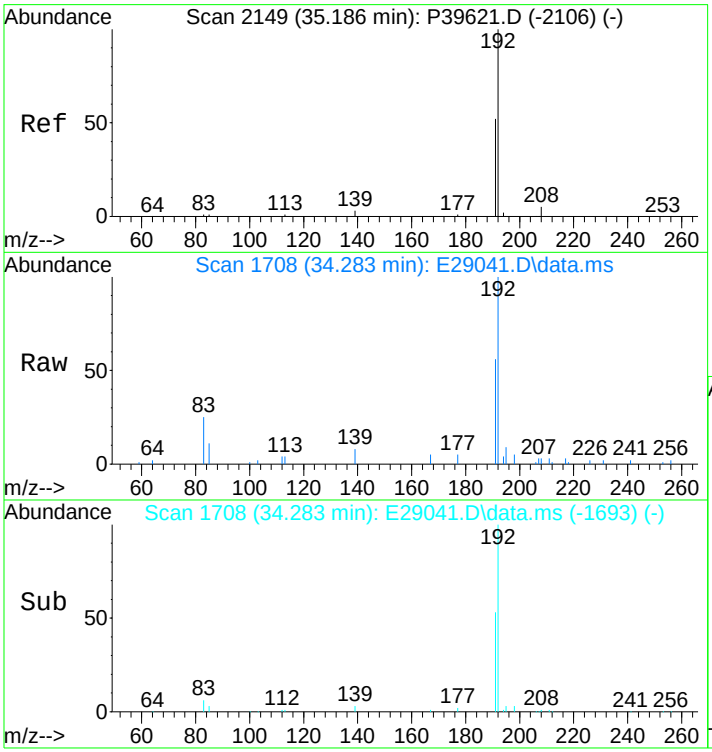


#48
1-Methylphenanthrene(1MP)
Concen: 238.50 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.010 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 36288

Ion	Ratio	Lower	Upper
192	100		
191	57.5	46.7	70.1

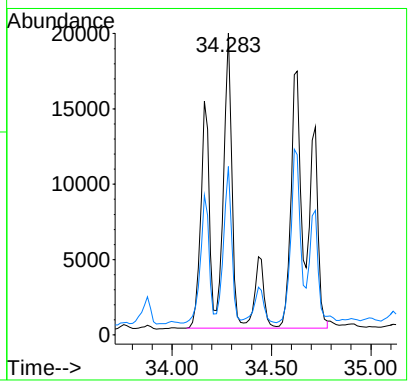


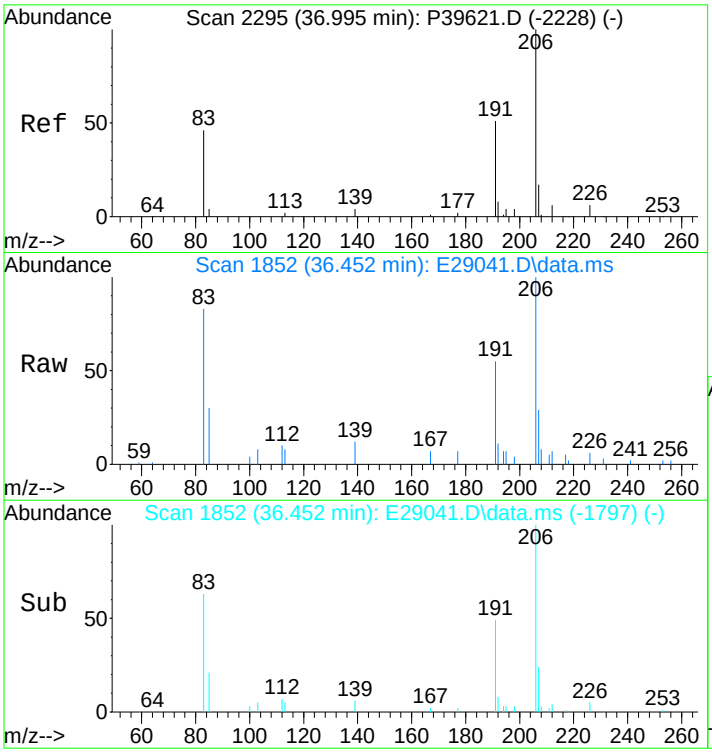


#49
C1-Phenanthrenes/Anthracenes
Concen: 1407.97 ng/mL m
RT: 34.283 min Scan# 1708
Delta R.T. -0.139 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 214227

Ion	Ratio	Lower	Upper
192	100		
191	3.8	44.0	66.0#

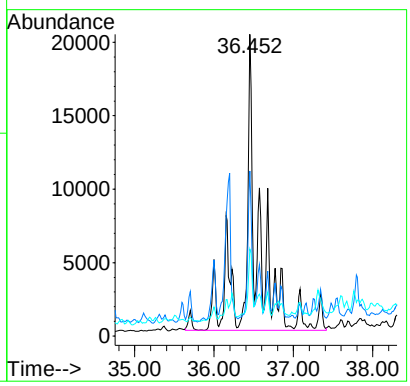


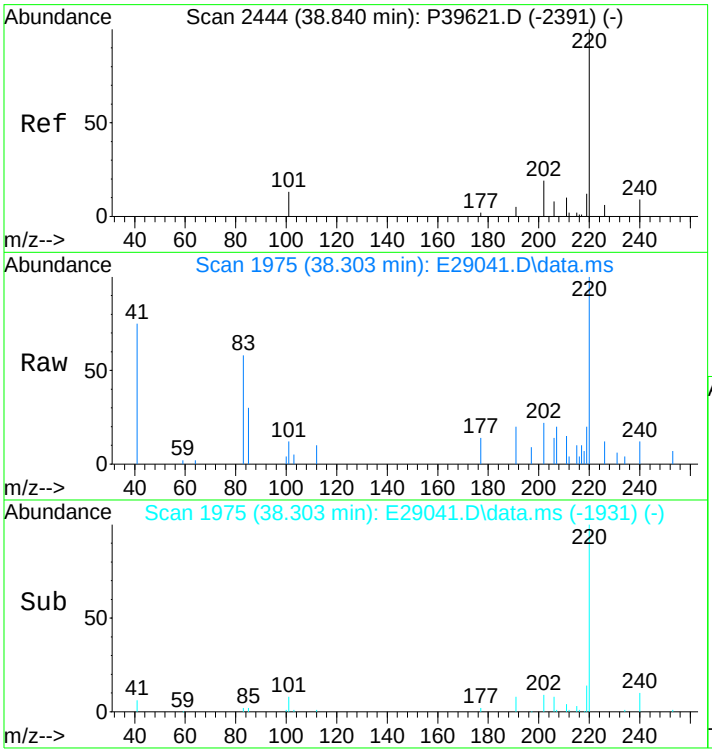


#50
C2-Phenanthrenes/Anthracenes
Concen: 1548.22 ng/mL m
RT: 36.452 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:206 Resp: 235566

Ion	Ratio	Lower	Upper
206	100		
191	0.0	35.7	53.5#
207	2.0	16.5	24.7#

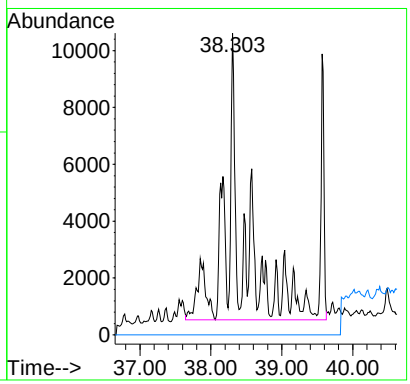


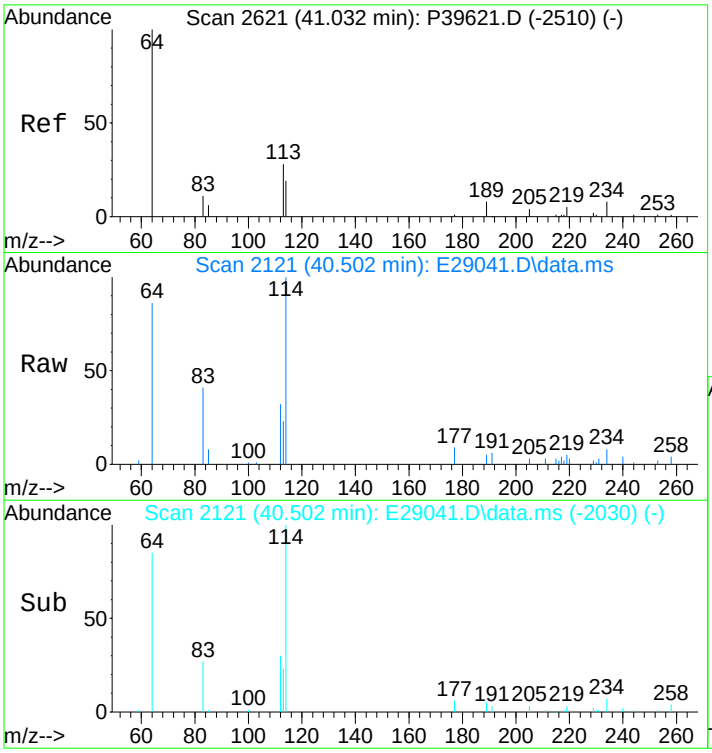


#52
C3-Phenanthrenes/Anthracenes
Concen: 1230.10 ng/mL m
RT: 38.303 min Scan# 1975
Delta R.T. 0.319 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:220 Resp: 187163

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

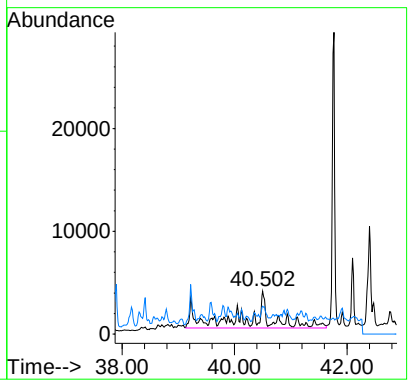


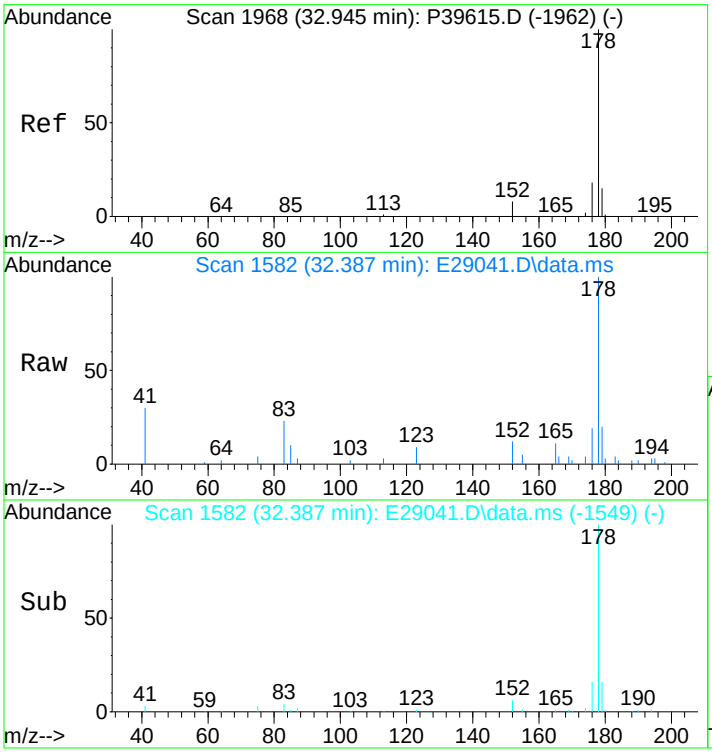


#53
C4-Phenanthrenes/Anthracenes
Concen: 671.95 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:234 Resp: 102239

Ion	Ratio	Lower	Upper
234	100		
219	0.9	46.6	70.0#

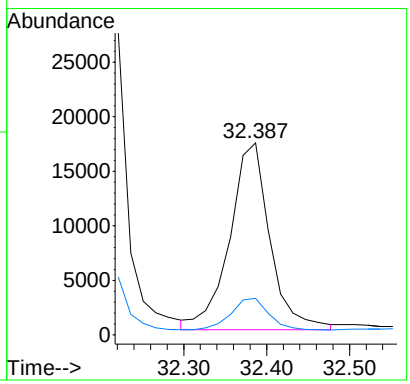


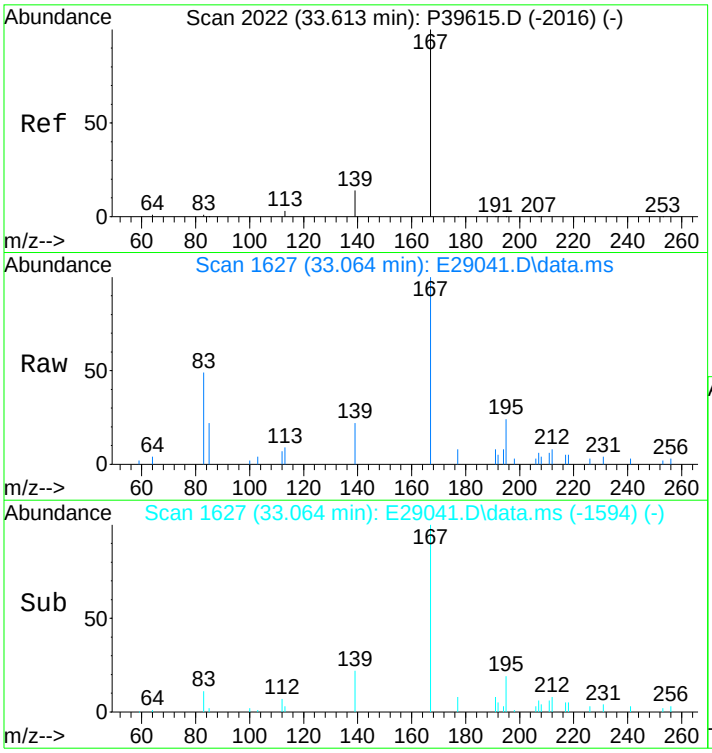


#55
Anthracene
Concen: 442.99 ng/mL m
RT: 32.387 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:178 Resp: 58259

Ion	Ratio	Lower	Upper
178	100		
176	16.4	14.2	21.2

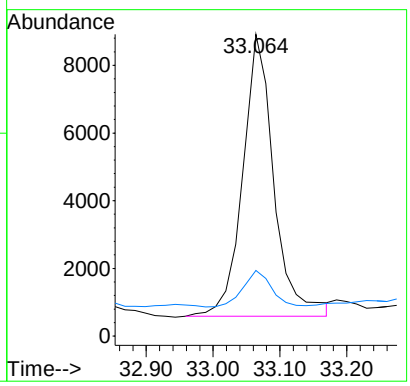


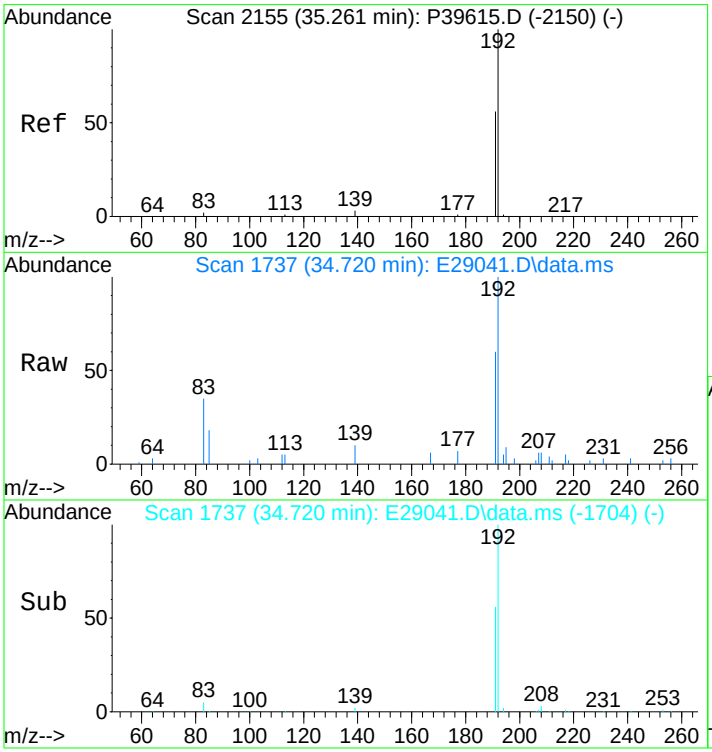


#56
Carbazole
Concen: 199.95 ng/mL
RT: 33.064 min Scan# 1627
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:167 Resp: 27063

Ion	Ratio	Lower	Upper
167	100		
139	11.5	10.6	15.8

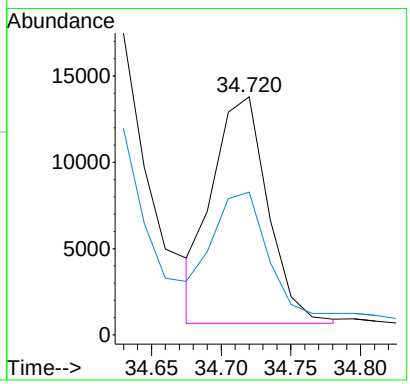


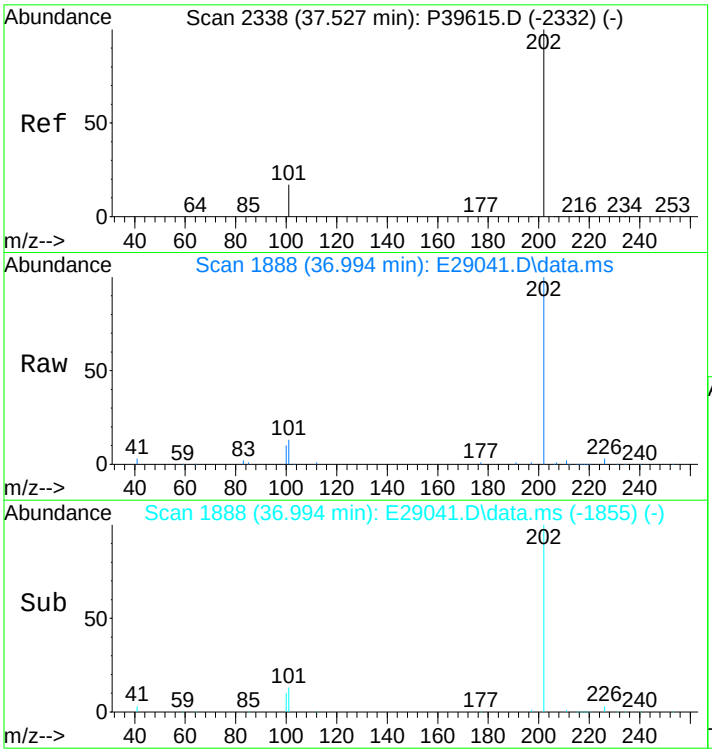


#57
1-Methylphenanthrene
Concen: 311.19 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:192 Resp: 36123

Ion	Ratio	Lower	Upper
192	100		
191	57.8	44.4	66.6

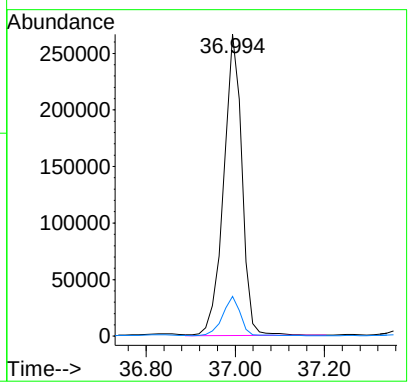


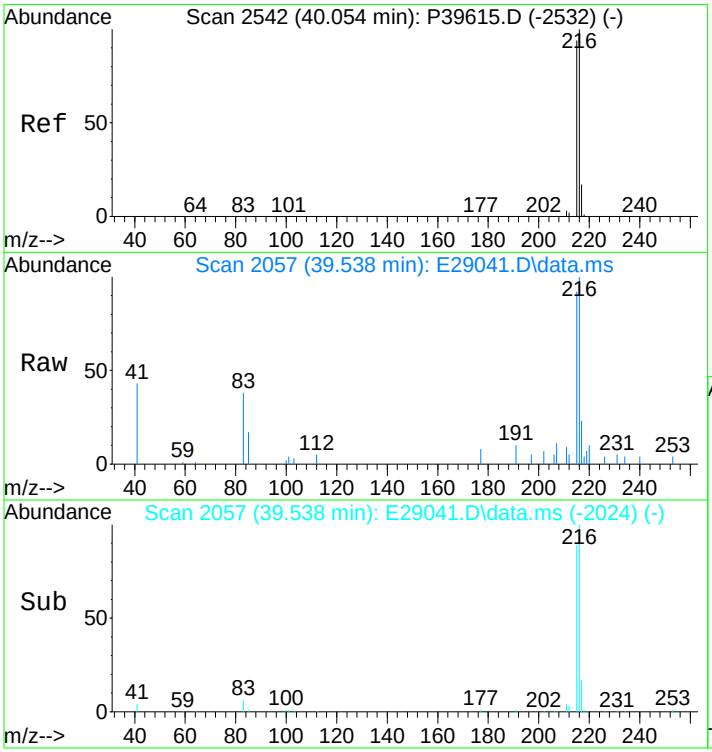


#58
Fluoranthene
Concen: 4503.55 ng/mL
RT: 36.994 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:202 Resp: 756731

Ion	Ratio	Lower	Upper
202	100		
101	13.1	10.5	15.7

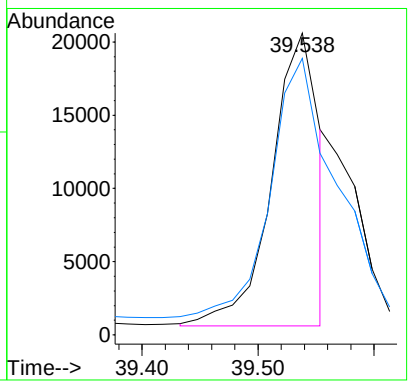


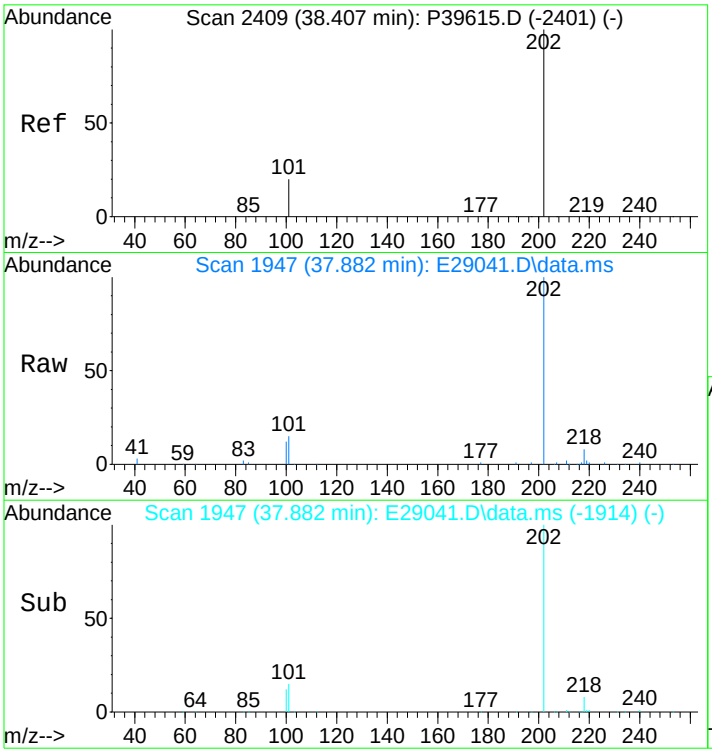


#59
Benzo(b)fluorene
Concen: 511.49 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:216 Resp: 57270

Ion	Ratio	Lower	Upper
216	100		
215	121.2	73.0	109.6#

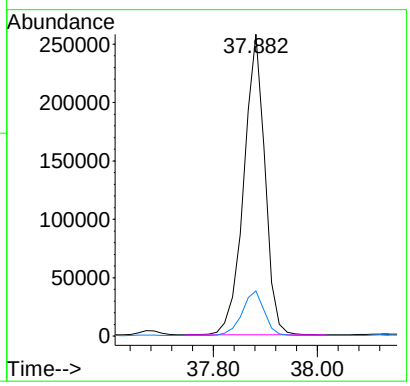


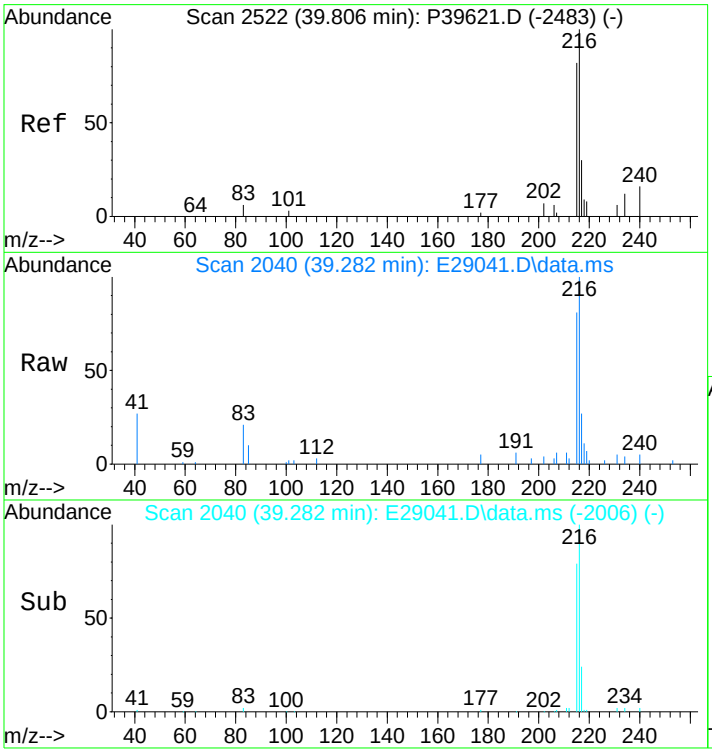


#60
Pyrene
Concen: 4232.53 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:202 Resp: 722866

Ion	Ratio	Lower	Upper
202	100		
101	15.8	11.5	17.3

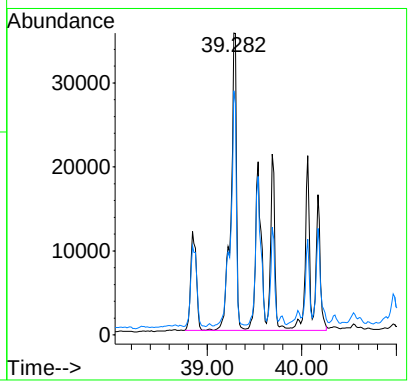


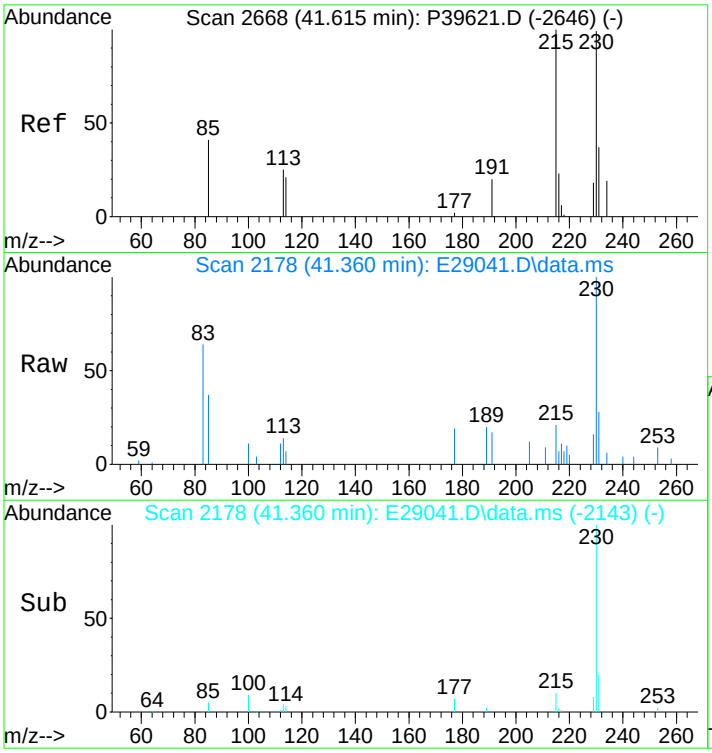


#61
C1-Fluoranthenes/Pyrenes
Concen: 2680.77 ng/mL m
RT: 39.282 min Scan# 2040
Delta R.T. 0.345 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:216 Resp: 457844

Ion	Ratio	Lower	Upper
216	100		
215	9.1	73.4	110.2#

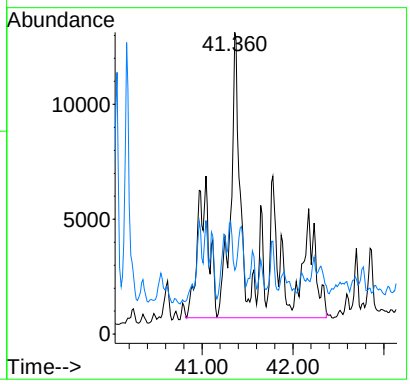


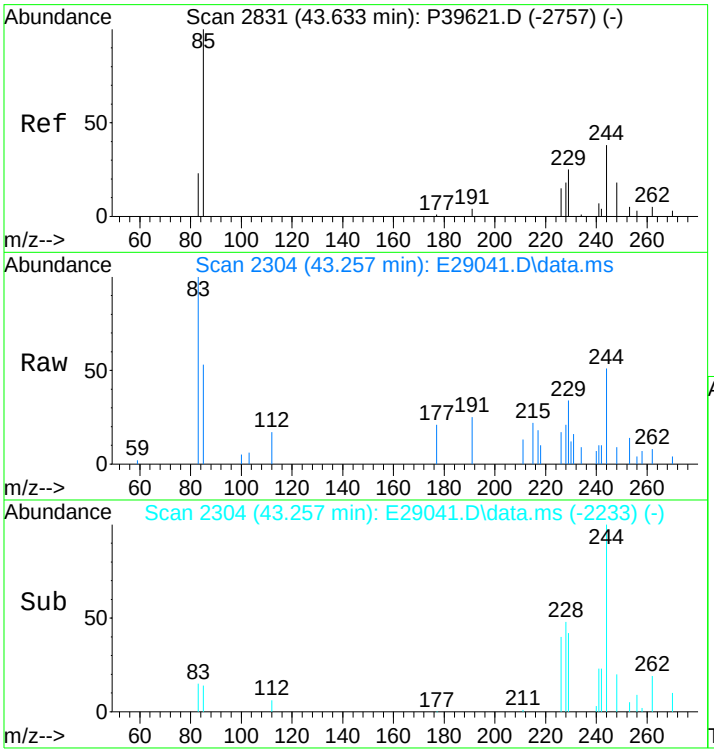


#62
C2-Fluoranthenes/Pyrenes
Concen: 1431.39 ng/mL m
RT: 41.360 min Scan# 2178
Delta R.T. 0.457 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:230 Resp: 244464

Ion	Ratio	Lower	Upper
230	100		
215	3.3	93.8	140.8#

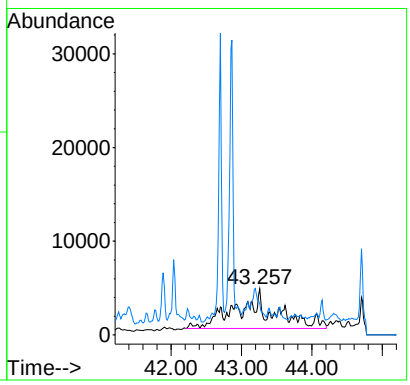


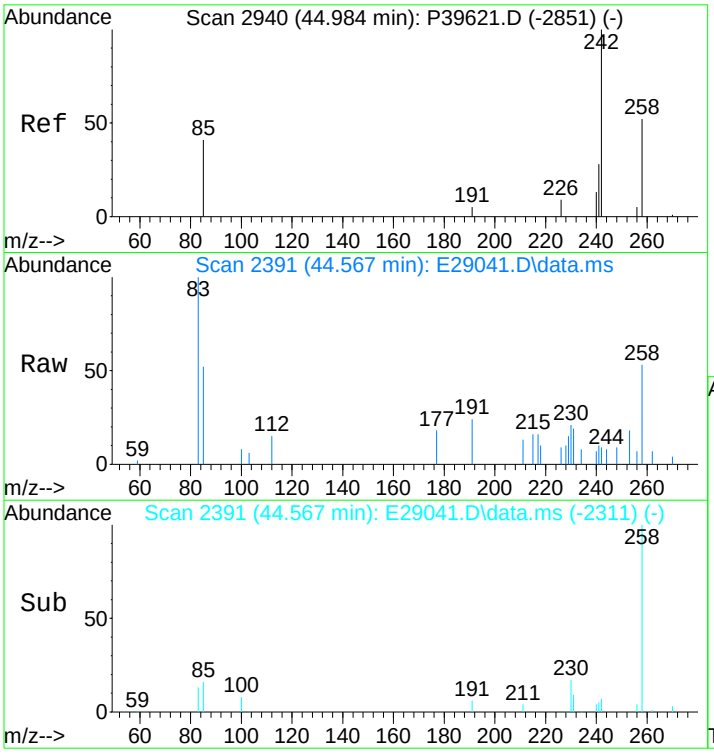


#63
C3-Fluoranthenes/Pyrenes
Concen: 916.78 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:244 Resp: 156575

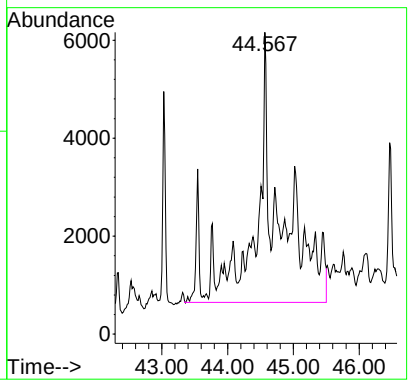
Ion	Ratio	Lower	Upper
244	100		
229	2.9	72.2	108.2#

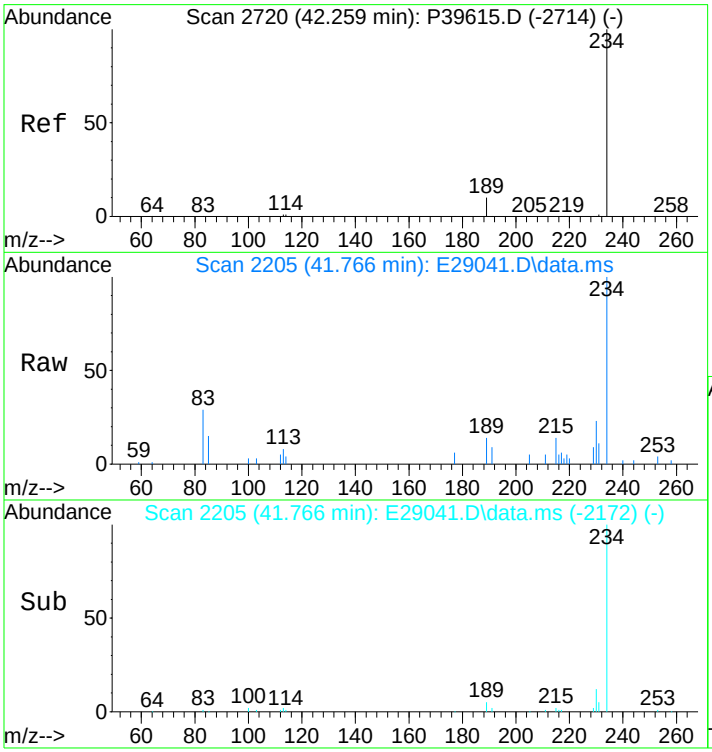




#64
C4-Fluoranthenes/Pyrenes
Concen: 838.06 ng/mL m
RT: 44.567 min Scan# 2391
Delta R.T. 0.571 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:258 Resp: 143131

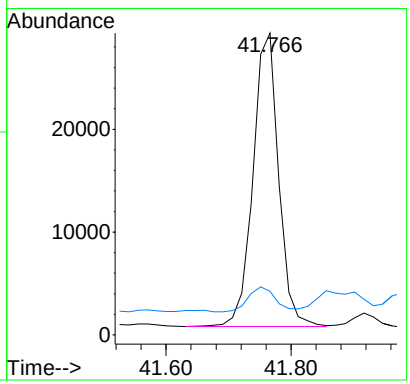


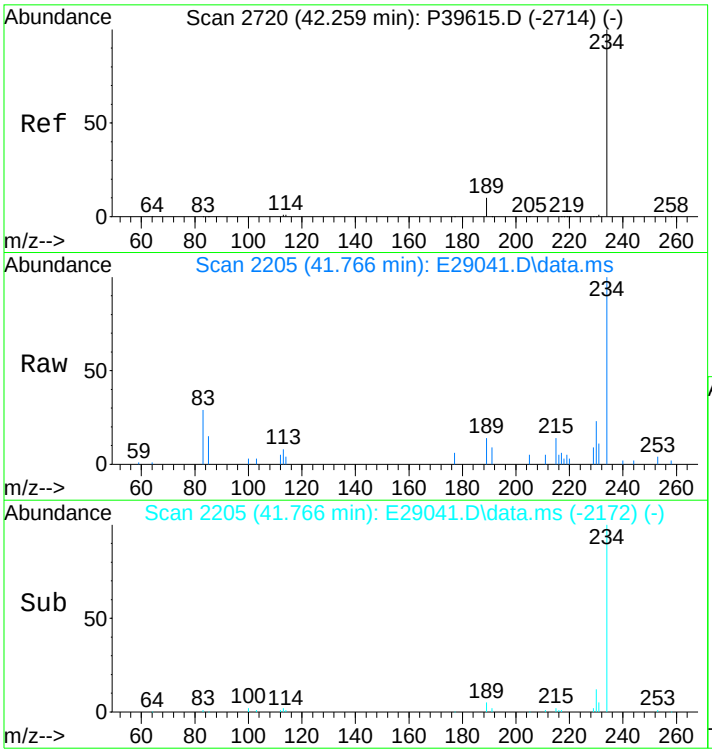


#66
Naphthobenzothiophene
Concen: 484.09 ng/ml
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:234 Resp: 81543

Ion	Ratio	Lower	Upper
234	100		
189	9.3	5.4	8.2#

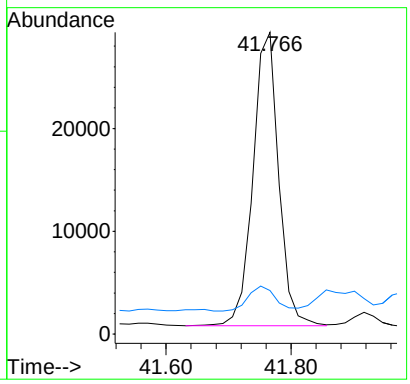


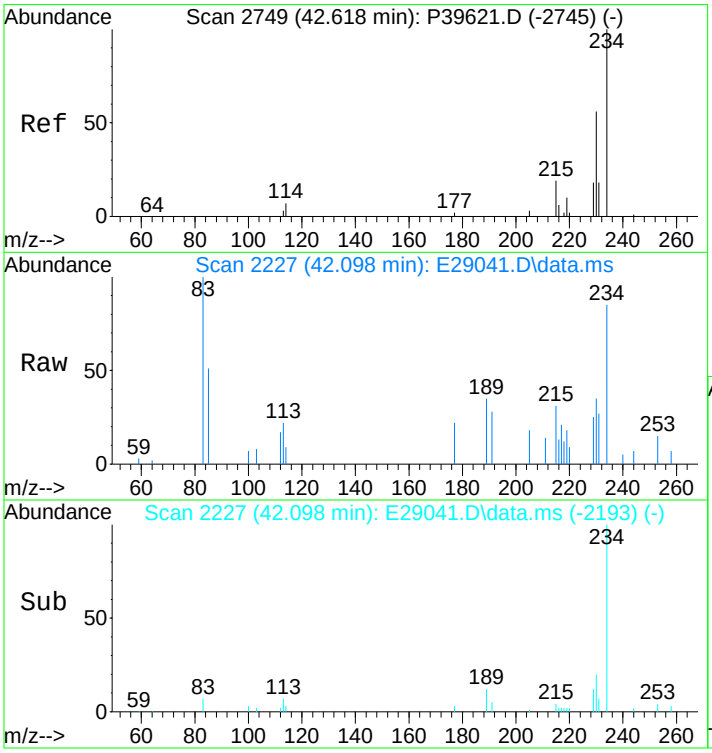


#67
Naphthobenzothiophene-2,1-D
Concen: 484.09 ng/mL
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:234 Resp: 81543

Ion	Ratio	Lower	Upper
234	100		
189	9.3	5.4	8.2#

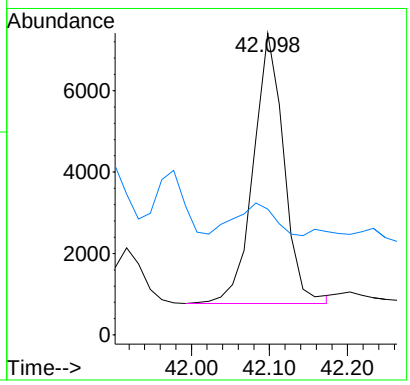


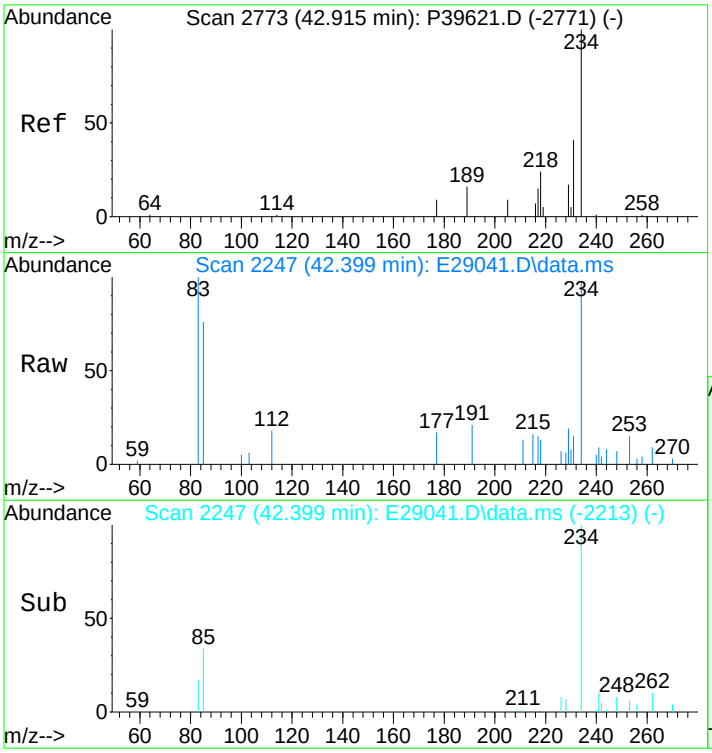


#68
Naphthobenzothiophene-1,2-D
Concen: 106.97 ng/mL
RT: 42.098 min Scan# 2227
Delta R.T. 0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:234 Resp: 18019

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

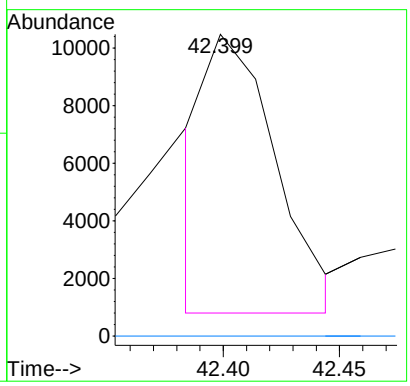


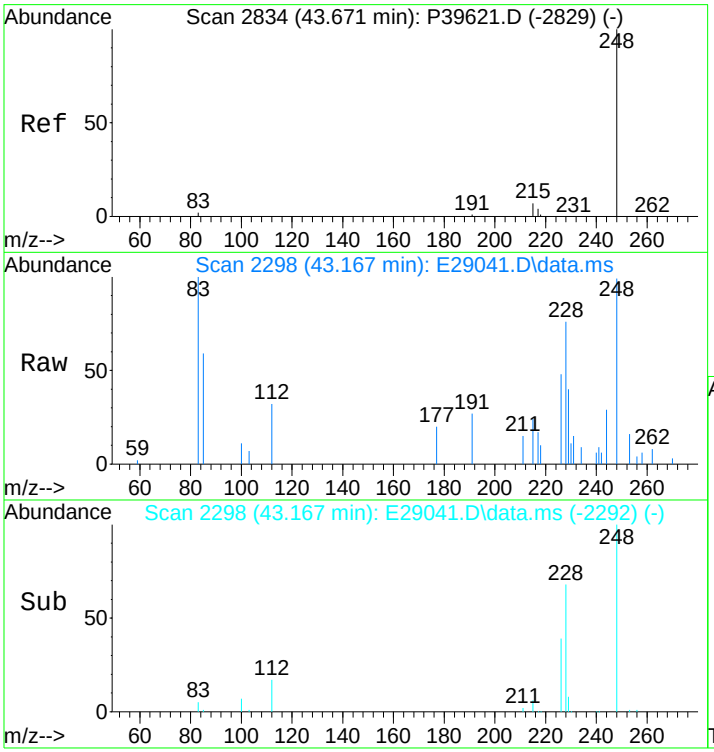


#69
Naphthobenzothiophene-2,3-D
Concen: 120.76 ng/mL m
RT: 42.399 min Scan# 2247
Delta R.T. 0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:234 Resp: 20342

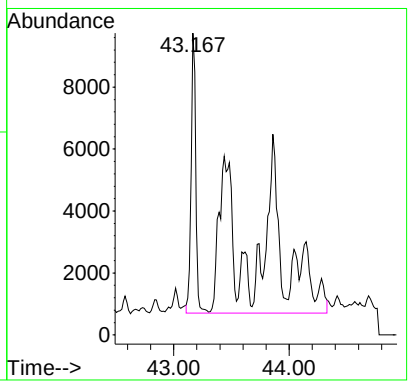
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

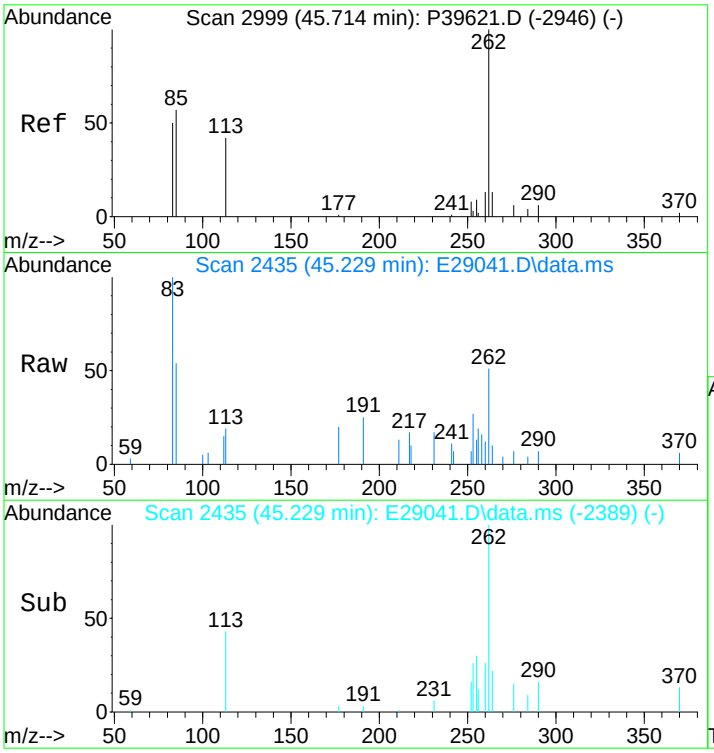




#70
C1-Naphthobenzothiophenes
Concen: 813.55 ng/ml m
RT: 43.167 min Scan# 2298
Delta R.T. 0.021 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

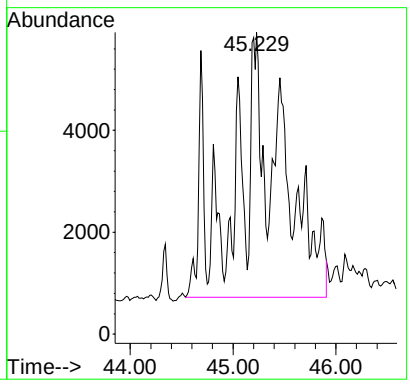
Tgt Ion:248 Resp: 137039

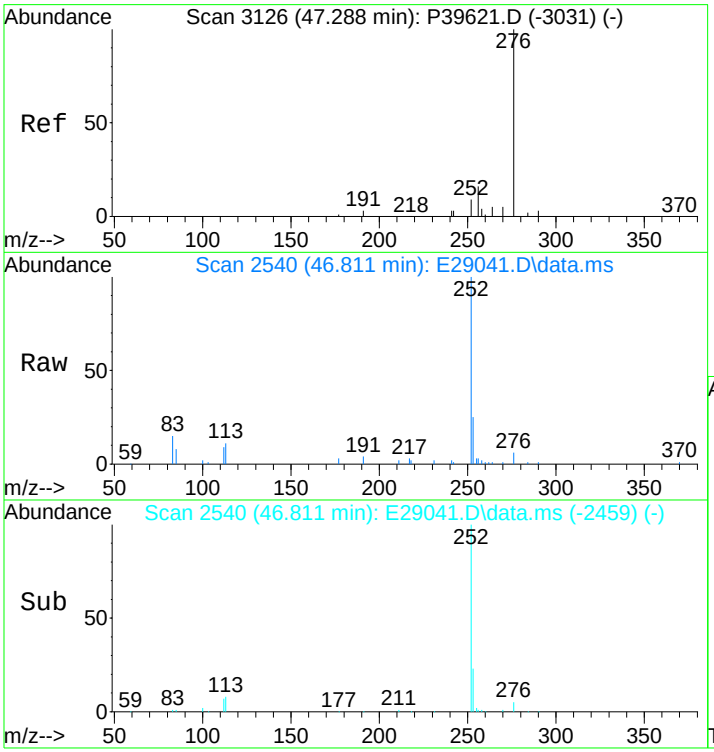




#71
C2-Naphthobenzothiophenes
Concen: 937.58 ng/ml m
RT: 45.229 min Scan# 2435
Delta R.T. 0.559 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

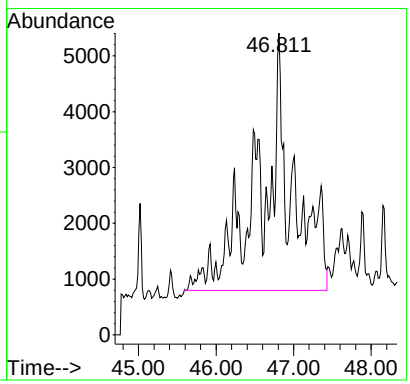
Tgt Ion:262 Resp: 157932

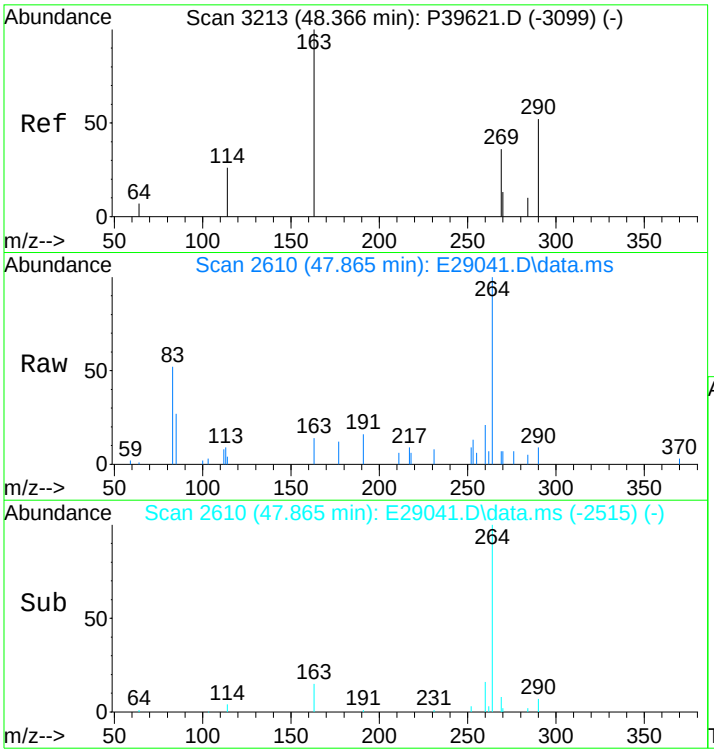




#72
C3-Naphthobenzothiophenes
Concen: 780.91 ng/ml m
RT: 46.811 min Scan# 2540
Delta R.T. 0.557 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

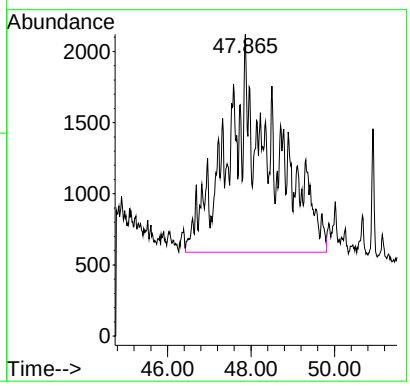
Tgt Ion:276 Resp: 131542

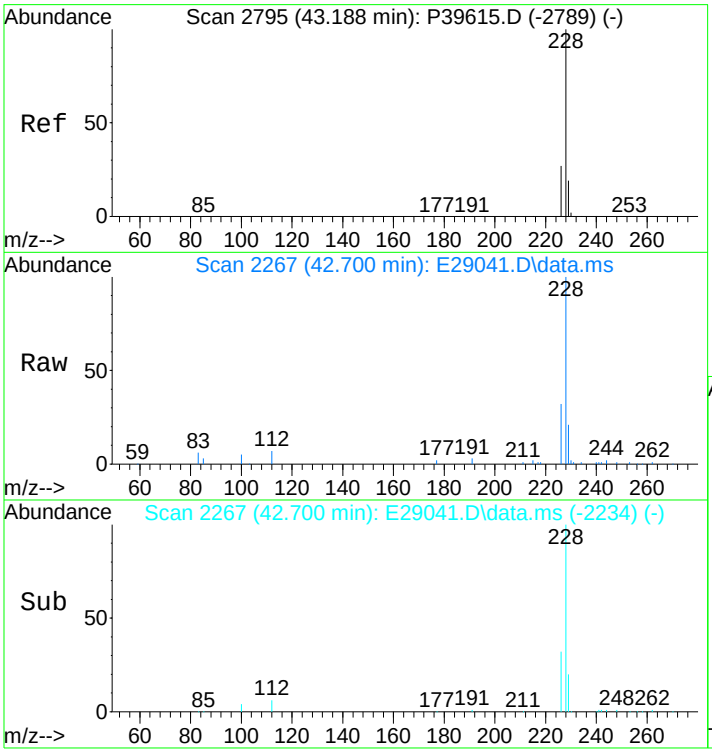




#73
C4-Naphthobenzothiophenes
Concen: 658.94 ng/mL m
RT: 47.865 min Scan# 2610
Delta R.T. 0.541 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:290 Resp: 110997

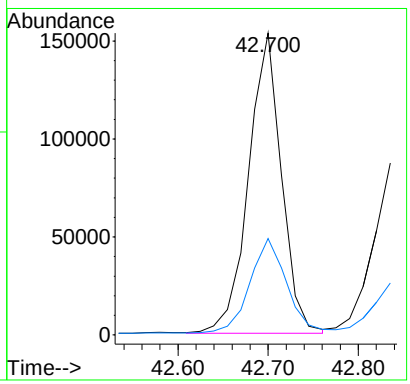


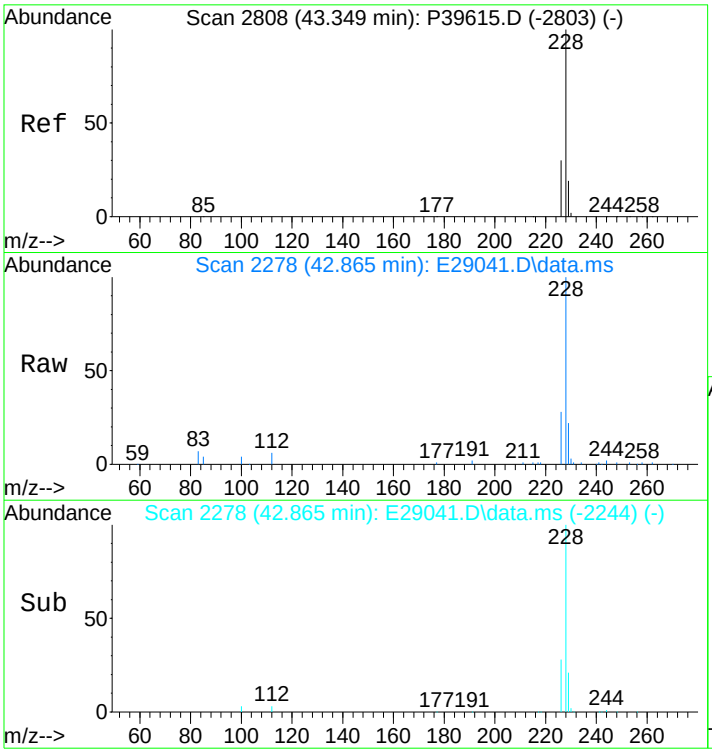


#75
Benz[a]anthracene
Concen: 2103.13 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:228 Resp: 389534

Ion	Ratio	Lower	Upper
228	100		
226	34.8	20.2	30.4#

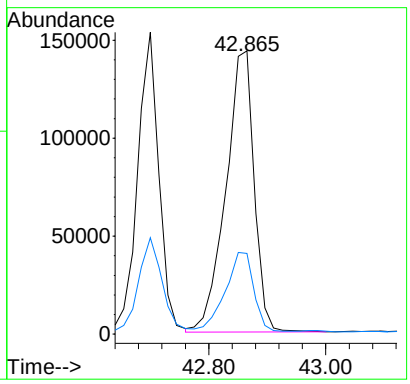


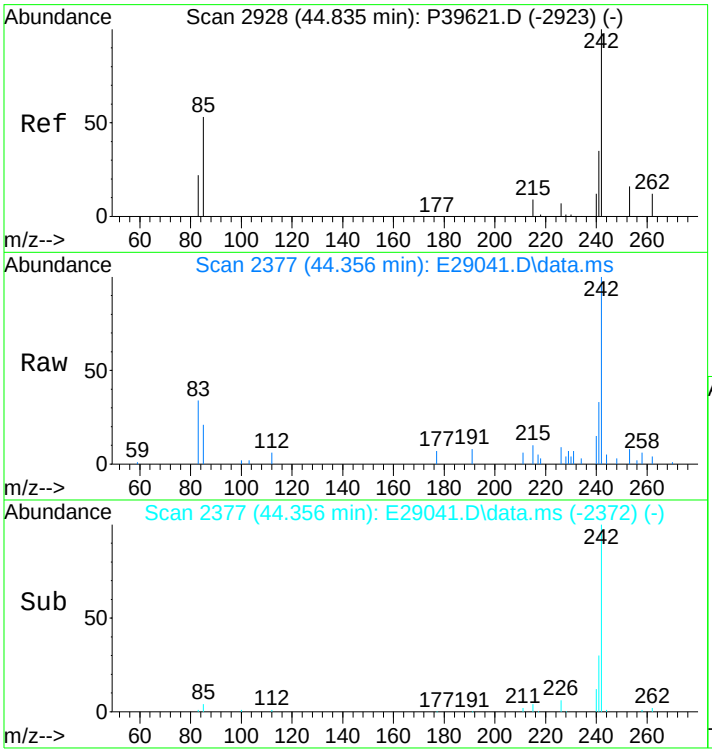


#77
Chrysene/Triphenylene
Concen: 2534.24 ng/mL
RT: 42.865 min Scan# 2278
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:228 Resp: 483239

Ion	Ratio	Lower	Upper
228	100		
226	28.5	22.5	33.7

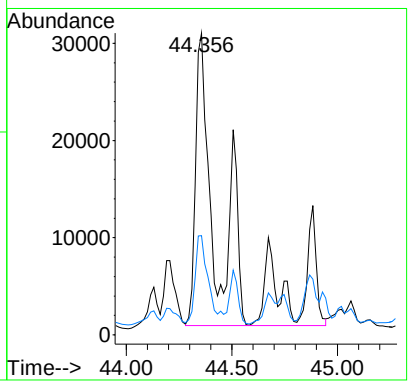


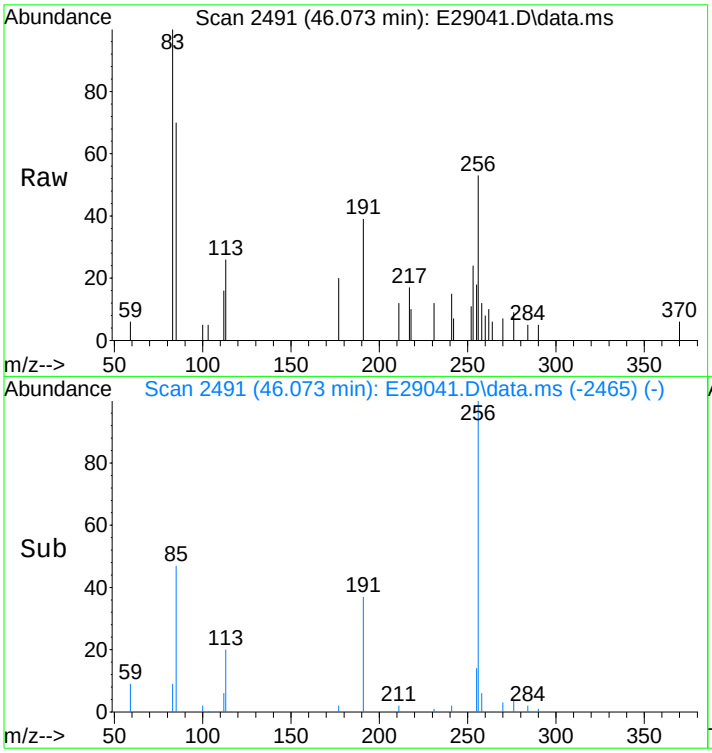


#78
C1-Chrysenes
Concen: 1346.45 ng/mL m
RT: 44.356 min Scan# 2377
Delta R.T. 0.025 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:242 Resp: 256746

Ion	Ratio	Lower	Upper
242	100		
241	4.9	32.2	48.4#

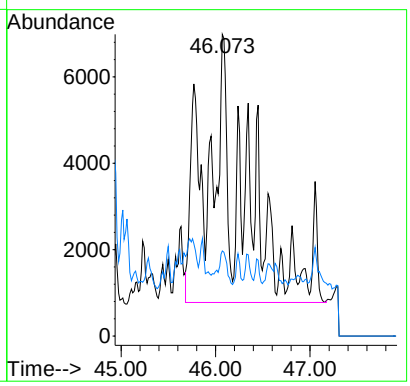


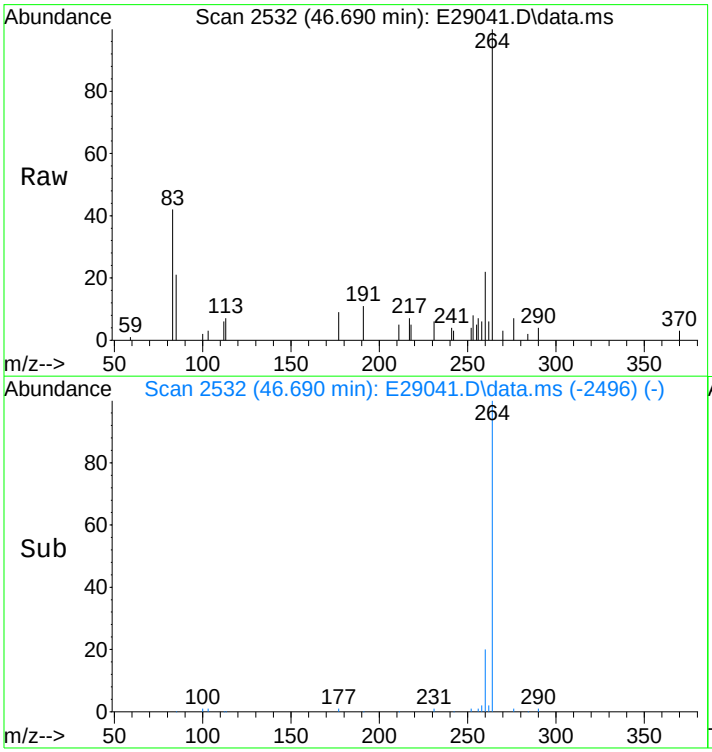


#79
C2-Chrysenes
Concen: 897.81 ng/mL m
RT: 46.073 min Scan# 2491
Delta R.T. -0.319 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:256 Resp: 171197

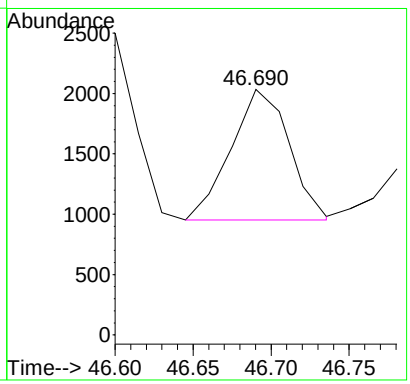
Ion	Ratio	Lower	Upper
256	100		
241	1.4	25.3	37.9#

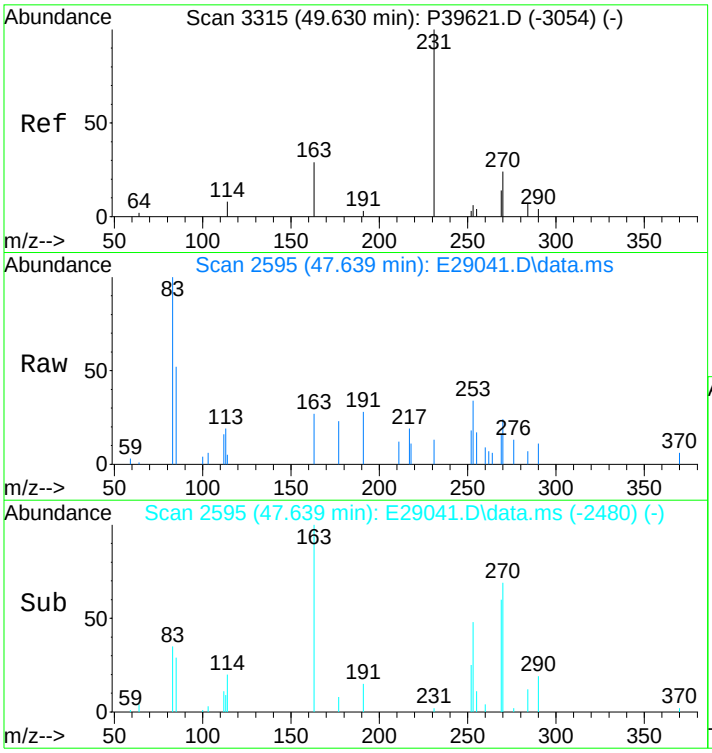




#80
BBF-D12 Surr BKGD
Concen: 14.77 ng/mL
RT: 46.690 min Scan# 2532
Delta R.T. 0.046 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:256 Resp: 2817

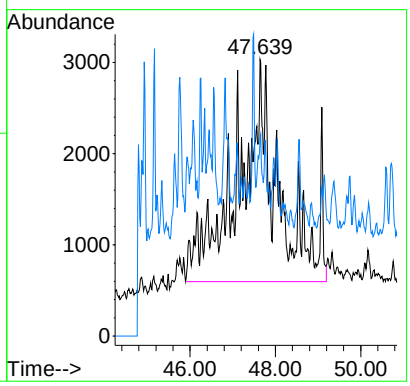


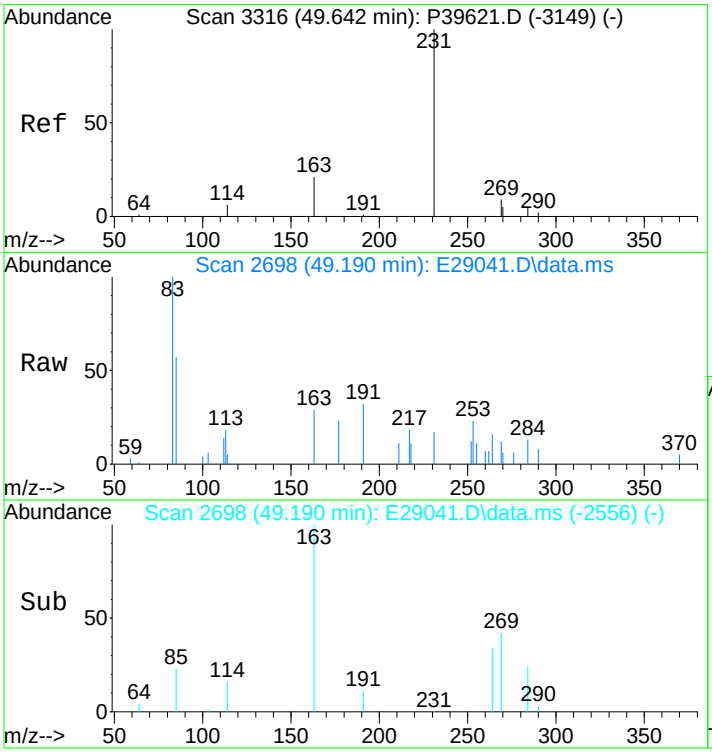


#81
C3-Chrysenes
Concen: 813.11 ng/mL m
RT: 47.639 min Scan# 2595
Delta R.T. -1.481 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:270 Resp: 155047

Ion	Ratio	Lower	Upper
270	100		
255	1.0	38.0	57.0#

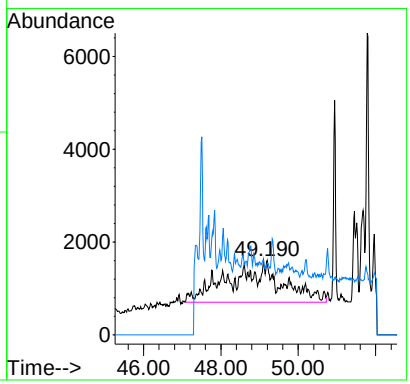


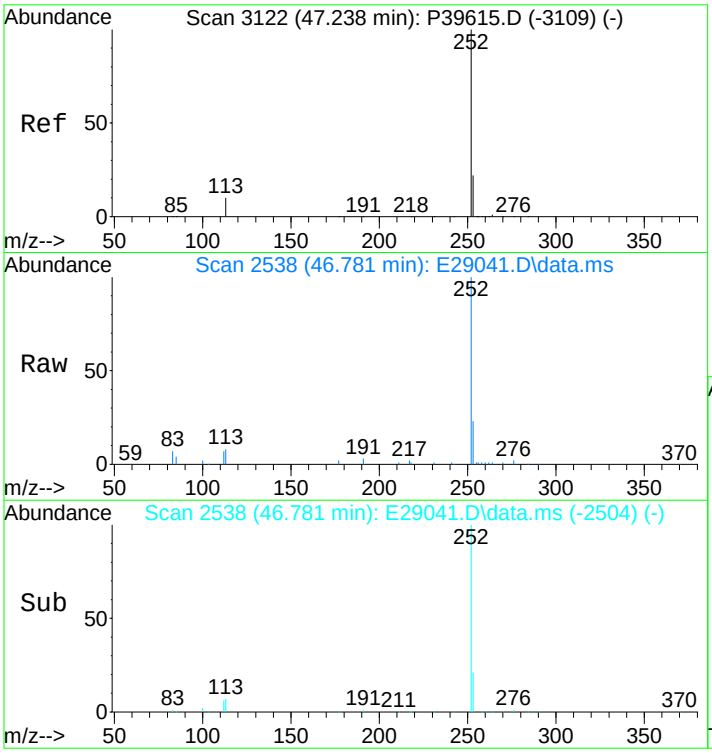


#82
C4-Chrysenes
Concen: 424.83 ng/mL m
RT: 49.190 min Scan# 2698
Delta R.T. -0.048 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:284 Resp: 81008

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

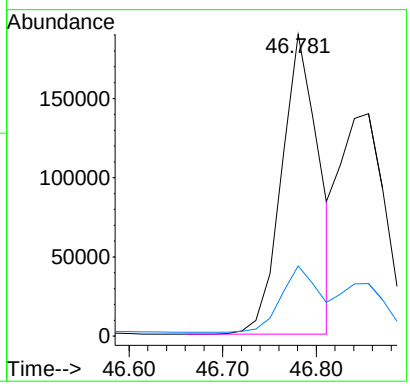


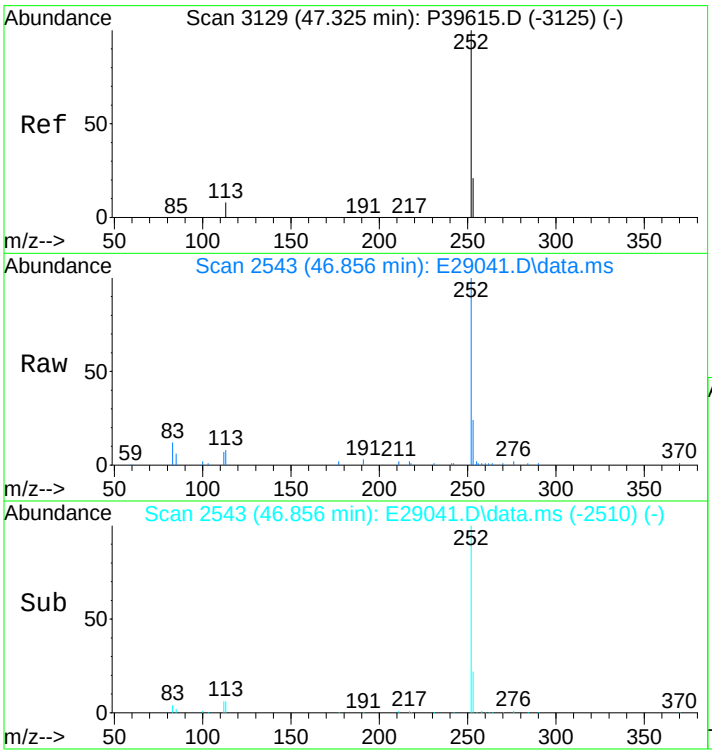


#84
Benzo[b]fluoranthene
Concen: 2429.89 ng/mL
RT: 46.781 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:252 Resp: 523116

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.2	28.8

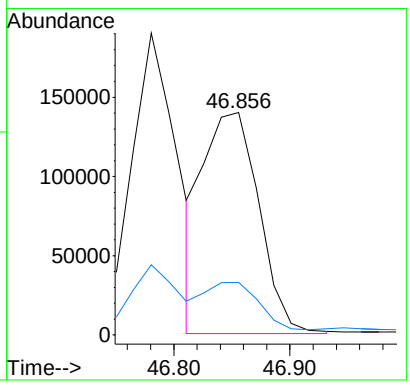


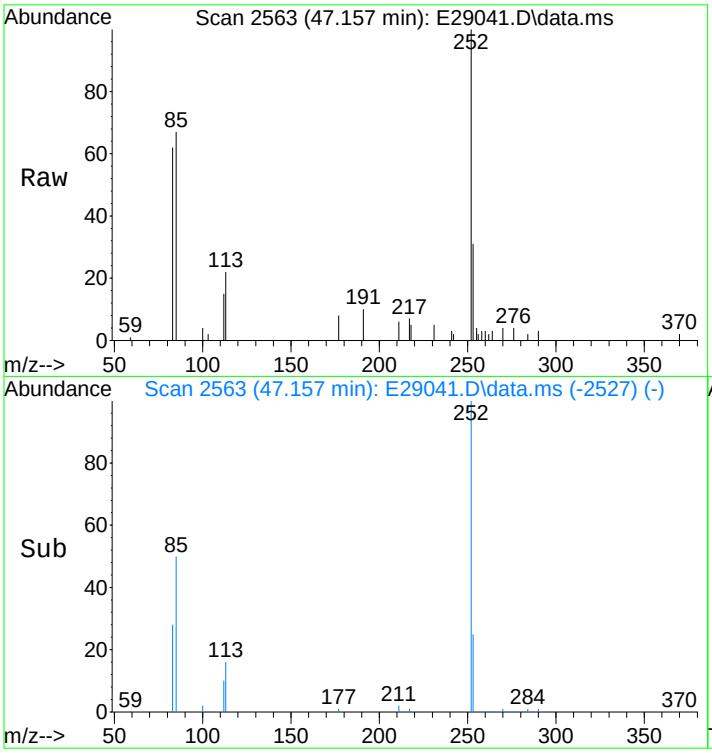


#85
Benzo[j]+[k]fluoranthene
Concen: 2103.15 ng/mL m
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:252 Resp: 465825

Ion	Ratio	Lower	Upper
252	100		
253	16.6	19.3	28.9#

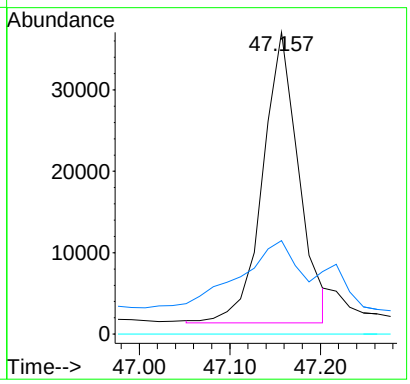


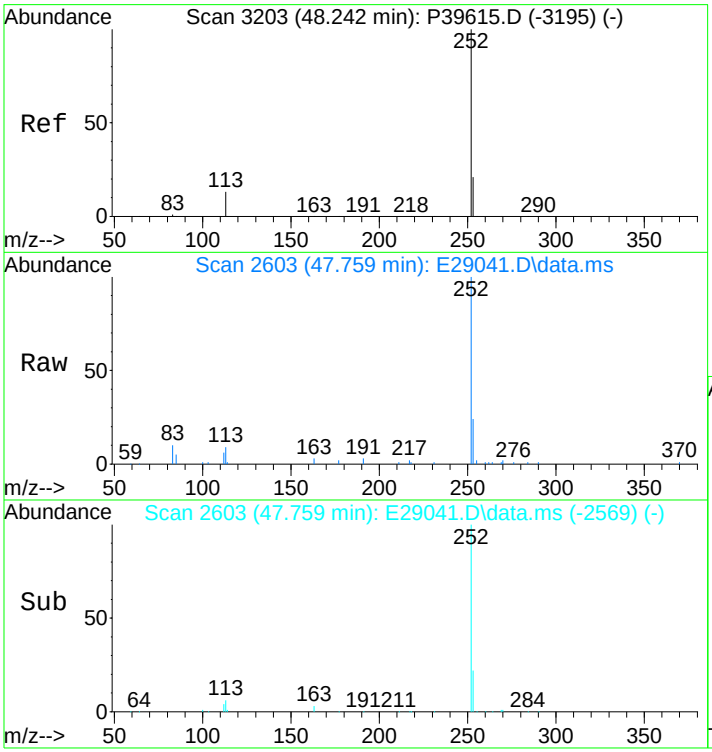


#86
Benzo[a]fluoranthene
Concen: 445.57 ng/mL m
RT: 47.157 min Scan# 2563
Delta R.T. 0.035 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:252 Resp: 98688

Ion	Ratio	Lower	Upper
252	100		
253	37.2	456.0	684.0#
125	0.0	0.0	0.0

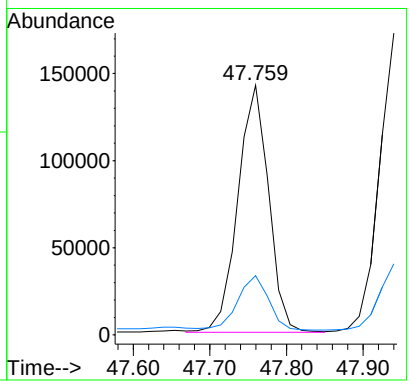


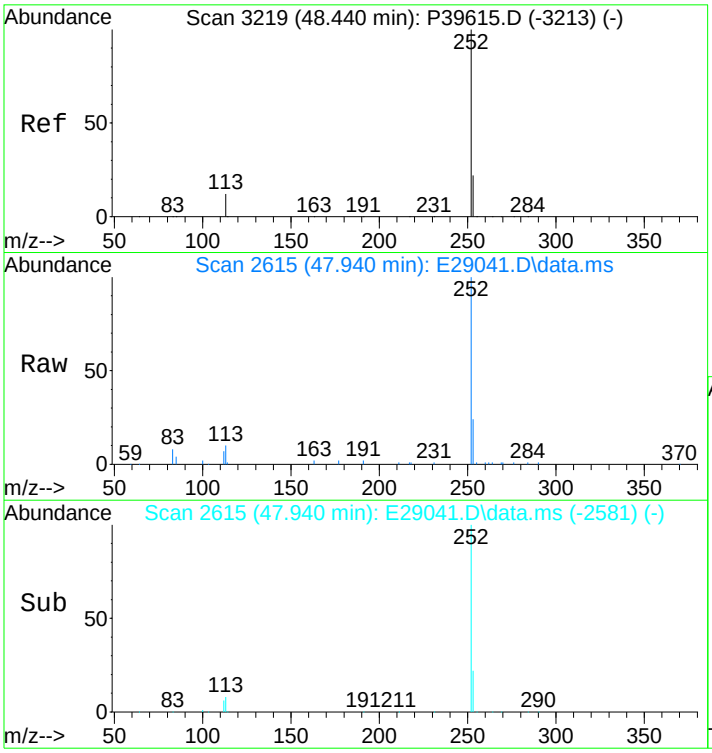


#87
Benzo[e]pyrene
Concen: 1878.27 ng/mL m
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:252 Resp: 394829

Ion	Ratio	Lower	Upper
252	100		
253	22.1	19.4	29.0

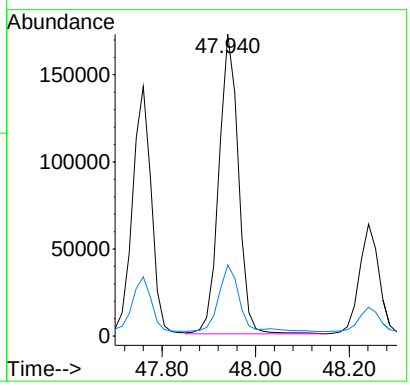


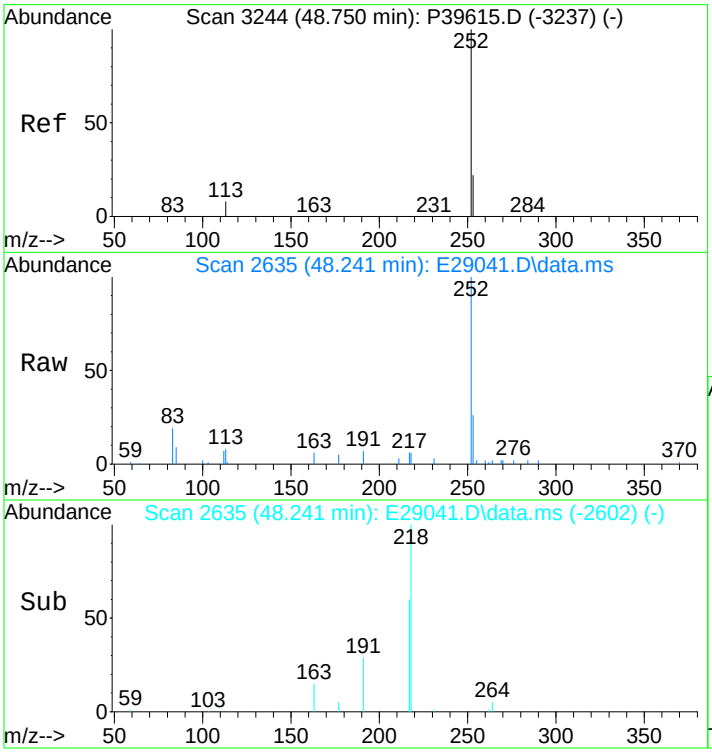


#89
Benzo[a]pyrene
Concen: 2479.67 ng/mL
RT: 47.940 min Scan# 2615
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:252 Resp: 498765

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.6	29.4

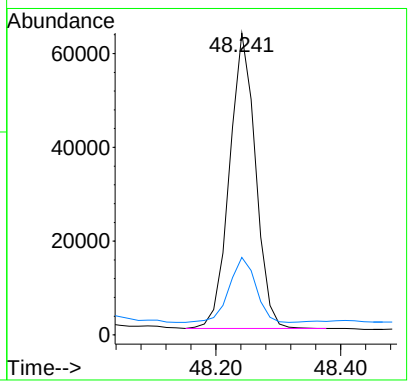


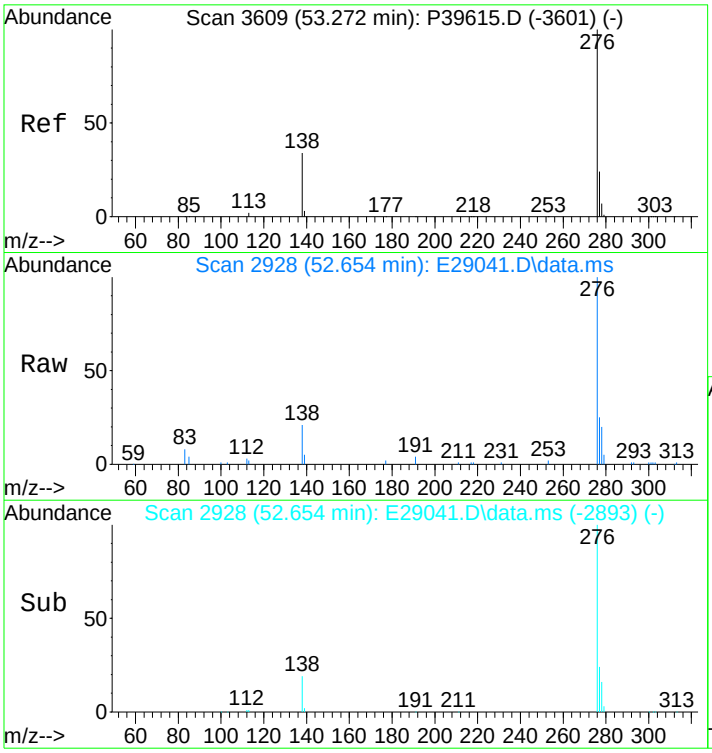


#90
Perylene
Concen: 859.18 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:252 Resp: 182744

Ion	Ratio	Lower	Upper
252	100		
253	22.6	19.9	29.9

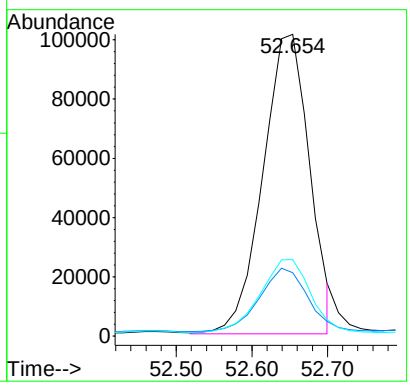


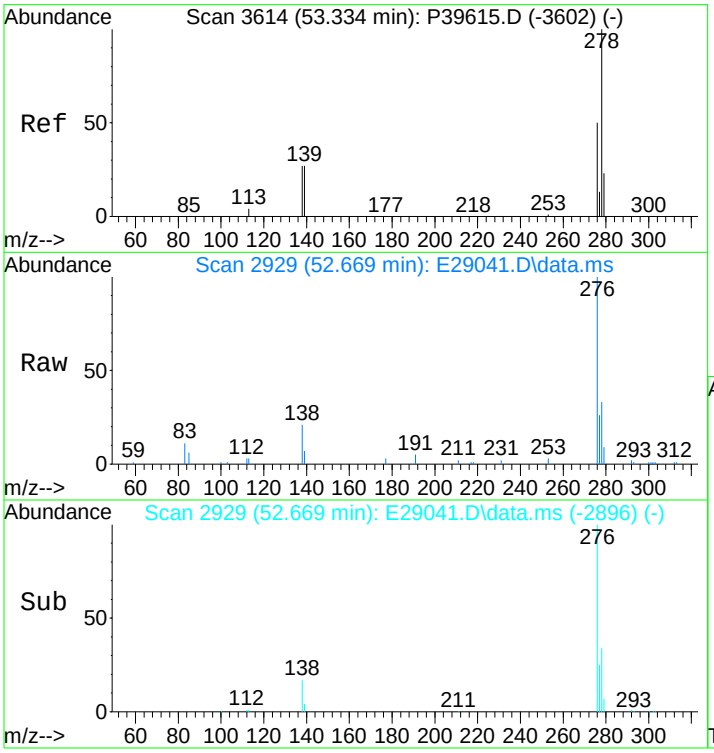


#91
Indeno[1,2,3-cd]pyrene
Concen: 1834.07 ng/mL m
RT: 52.654 min Scan# 2928
Delta R.T. 0.030 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:276 Resp: 434158

Ion	Ratio	Lower	Upper
276	100		
138	22.2	17.8	26.8
277	26.9	20.0	30.0

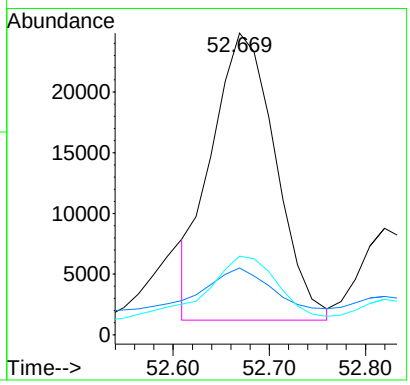


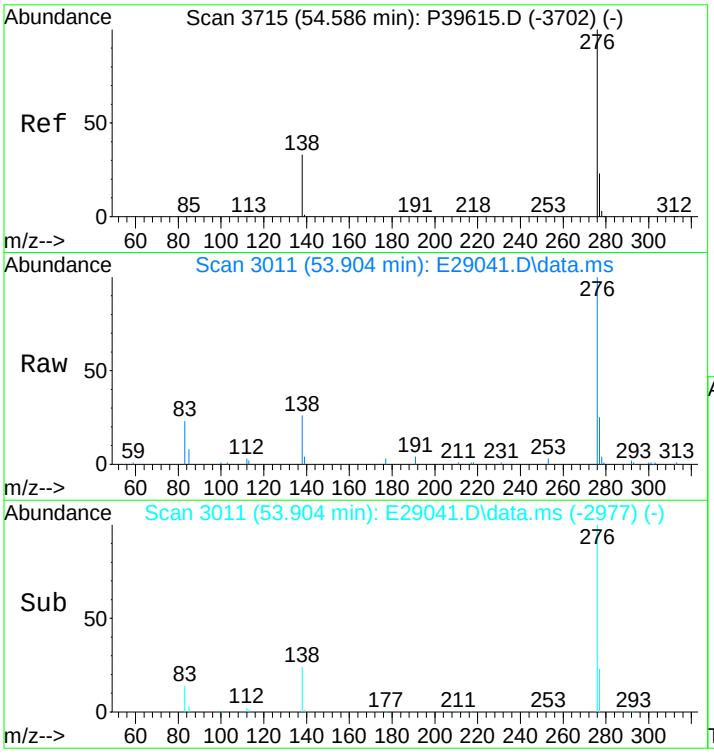


#92
Dibenz[ah]+[ac]anthracene
Concen: 434.82 ng/mL m
RT: 52.669 min Scan# 2929
Delta R.T. 0.000 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:278 Resp: 109598

Ion	Ratio	Lower	Upper
278	100		
139	16.4	13.0	19.4
279	26.0	19.4	29.2

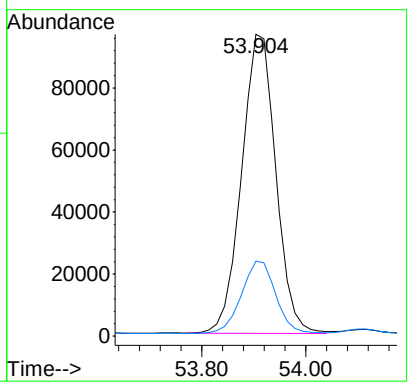


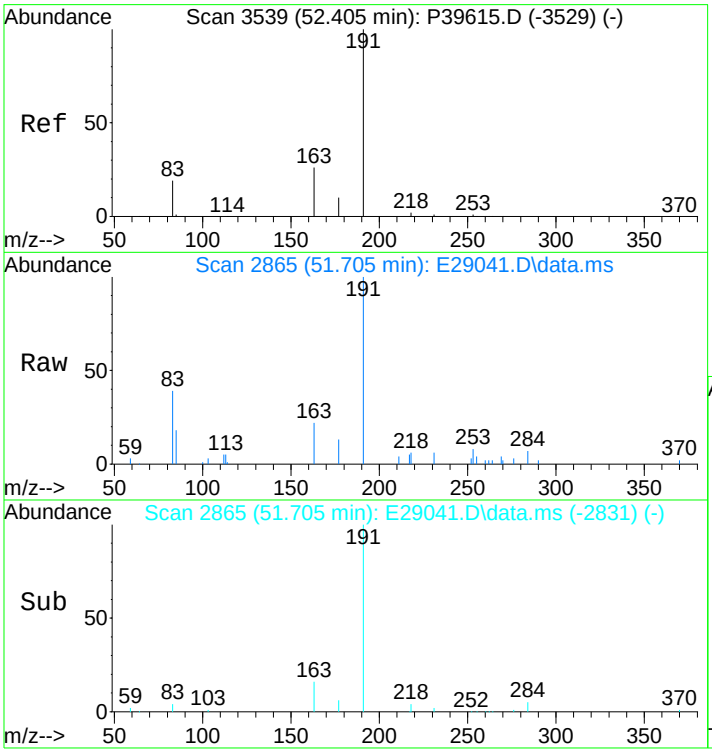


#93
Benzo[g,h,i]perylene
Concen: 1728.90 ng/mL
RT: 53.904 min Scan# 3011
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:276 Resp: 441287

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.4	29.2

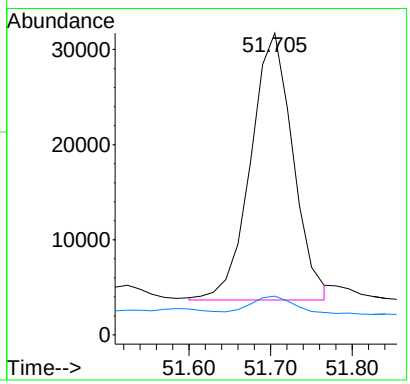


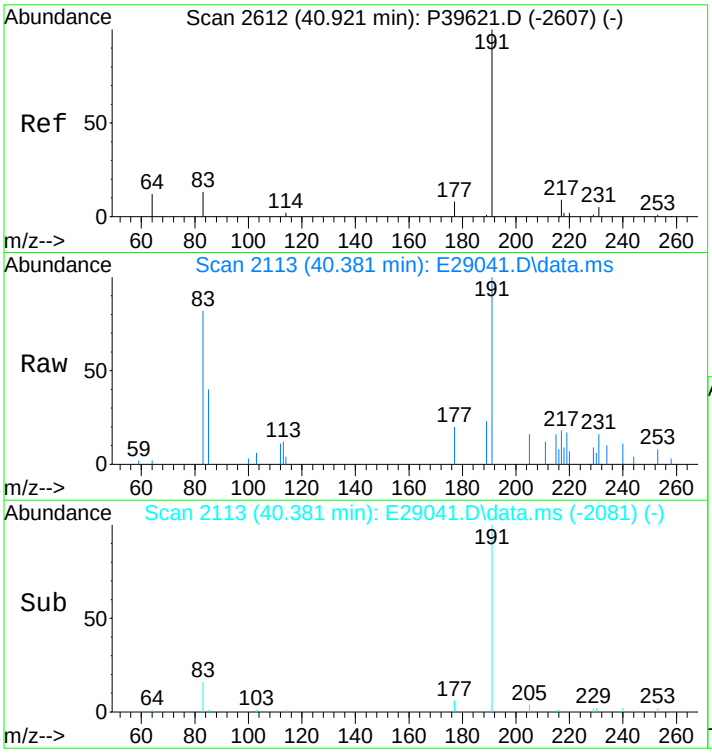


#94
Hopane (T19)
Concen: 1412.96 ng/mL m
RT: 51.705 min Scan# 2865
Delta R.T. 0.015 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:191 Resp: 100860

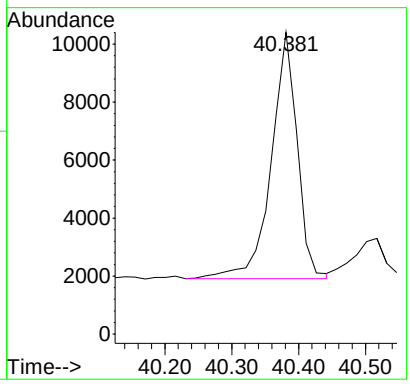
Ion	Ratio	Lower	Upper
191	100		
177	8.1	11.3	16.9#

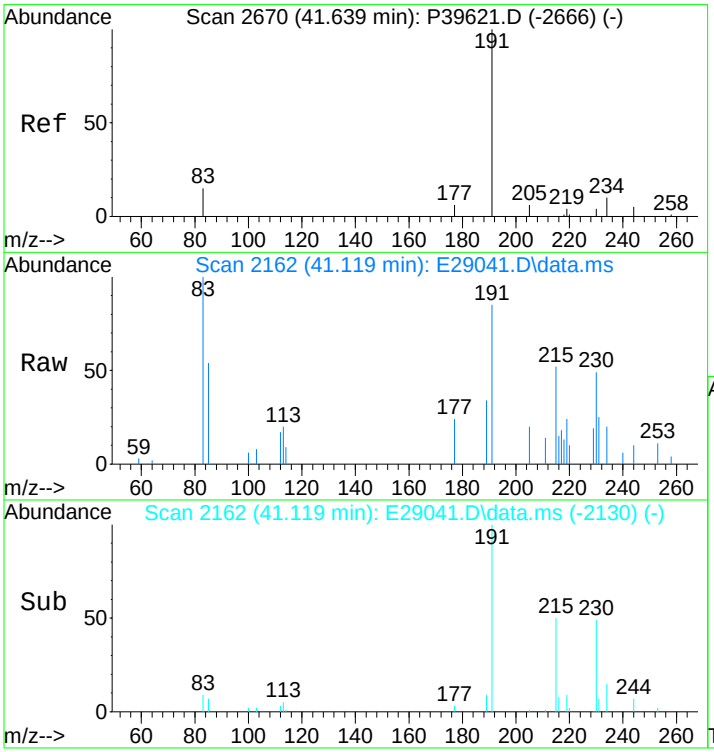




#96
C23 Tricyclic Terpane (T4)
Concen: 321.19 ng/ml
RT: 40.381 min Scan# 2113
Delta R.T. -0.012 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

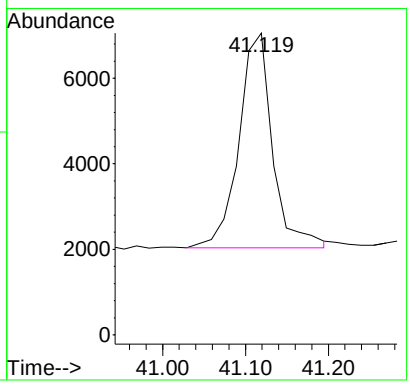
Tgt Ion:191 Resp: 22927

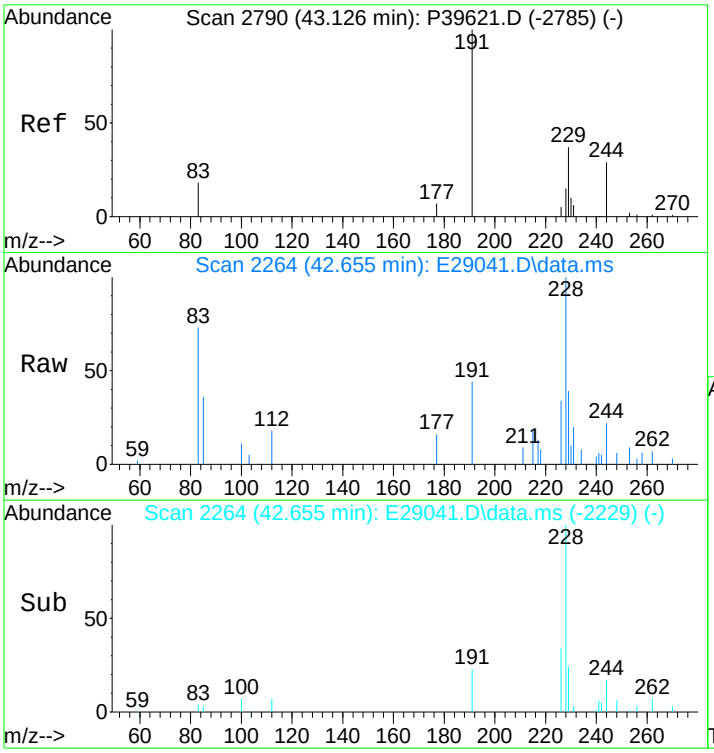




#97
C24 Tricyclic Terpane (T5)
Concen: 198.75 ng/ml m
RT: 41.119 min Scan# 2162
Delta R.T. -0.013 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

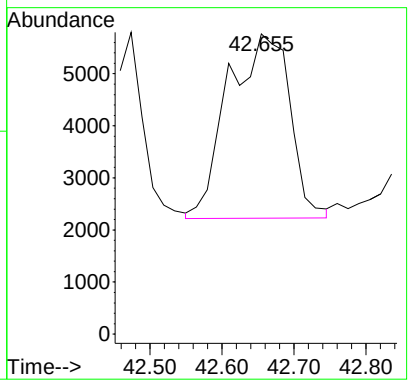
Tgt Ion:191 Resp: 14187

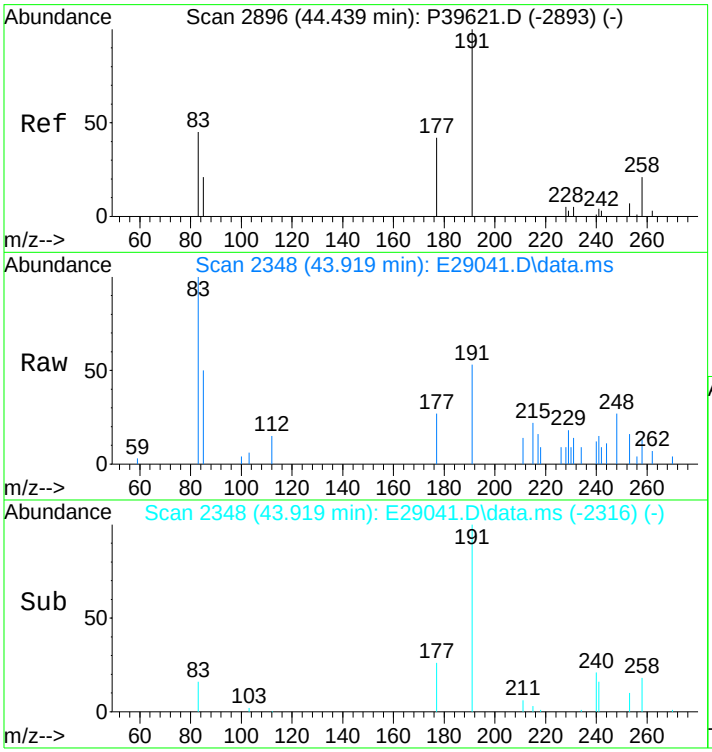




#98
C25 Tricyclic Terpane (T6)
Concen: 294.42 ng/ml
RT: 42.655 min Scan# 2264
Delta R.T. 0.030 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

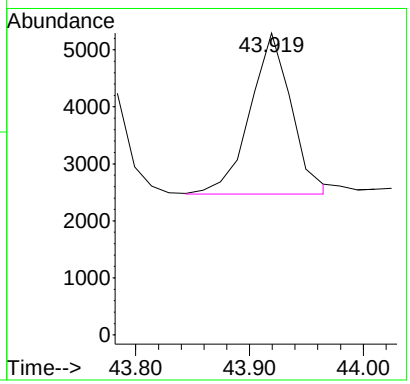
Tgt Ion:191 Resp: 21016

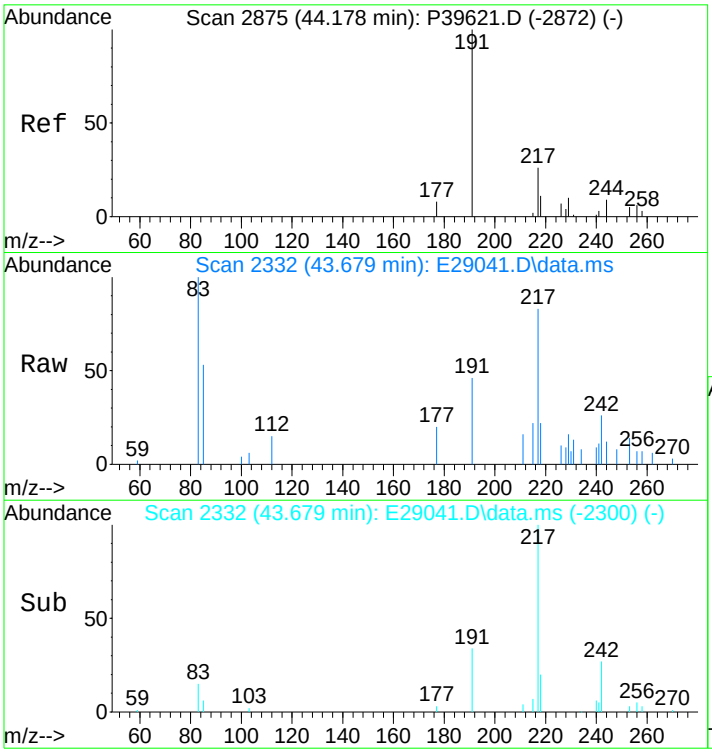




#99
C24 Tetracyclic Terpane (T6a)
Concen: 99.73 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

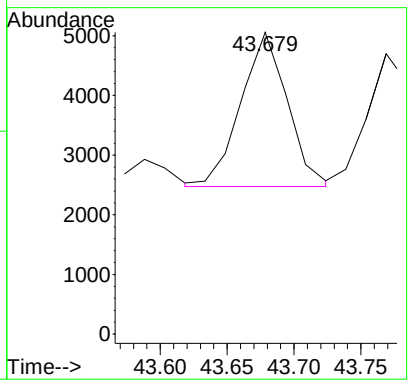
Tgt Ion:191 Resp: 7119

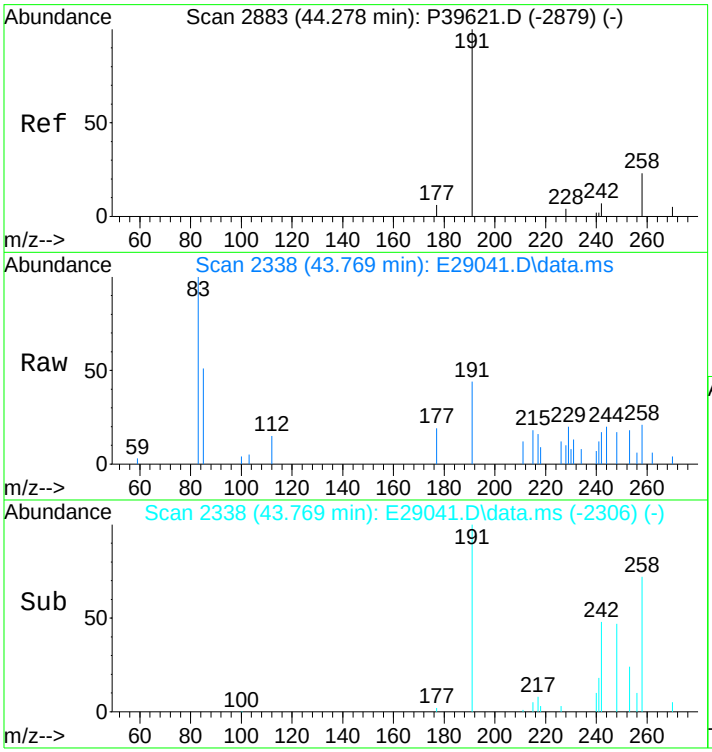




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 87.74 ng/ml m
RT: 43.679 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

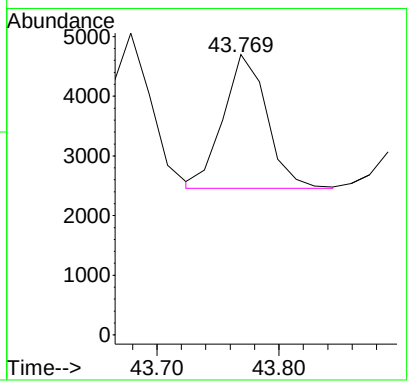
Tgt Ion:191 Resp: 6263

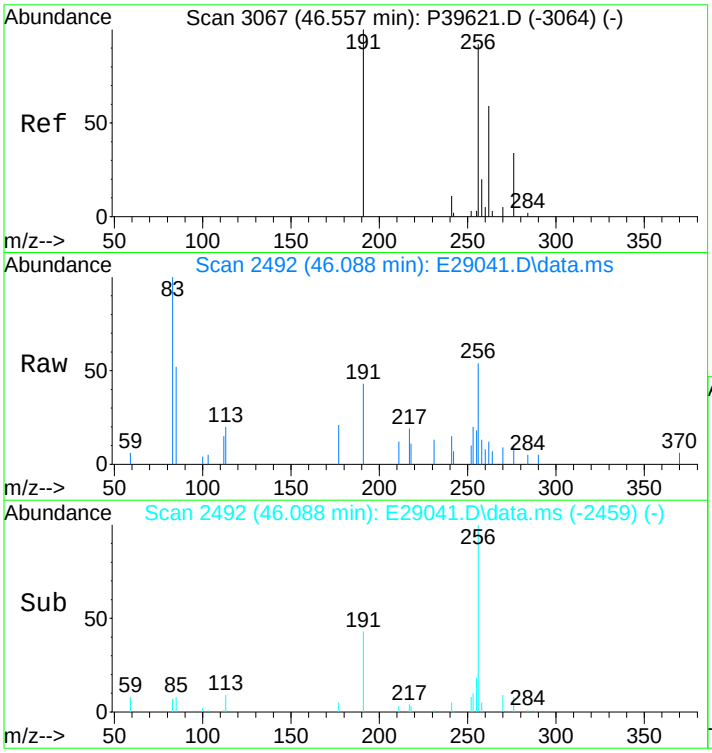




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 77.96 ng/ml m
RT: 43.769 min Scan# 2338
Delta R.T. -0.016 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

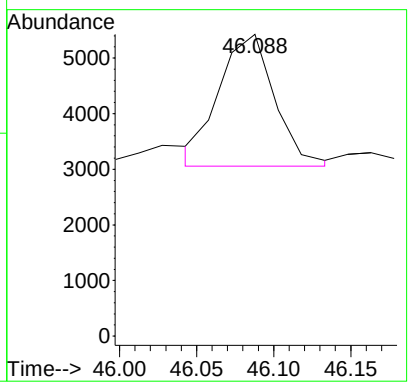
Tgt Ion:191 Resp: 5565

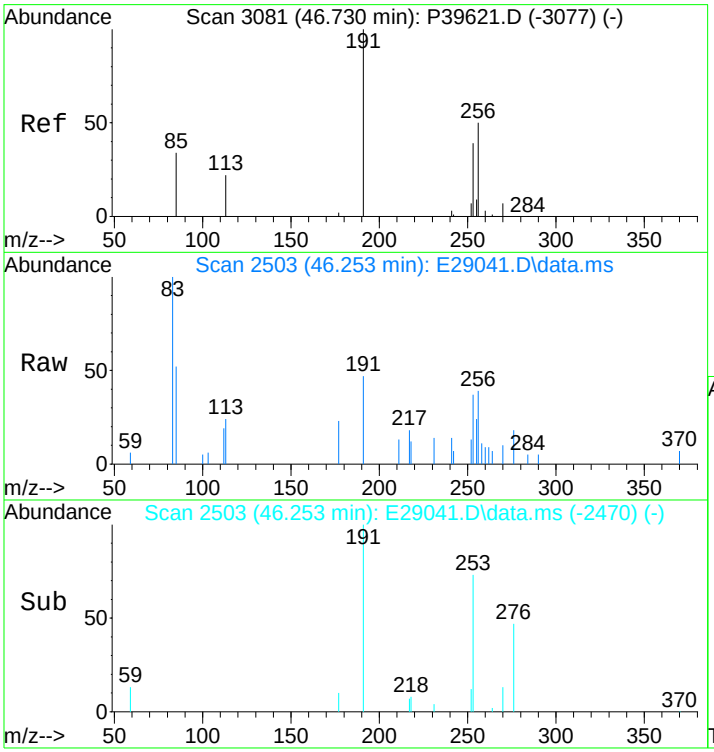




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 82.98 ng/ml m
RT: 46.088 min Scan# 2492
Delta R.T. -0.003 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

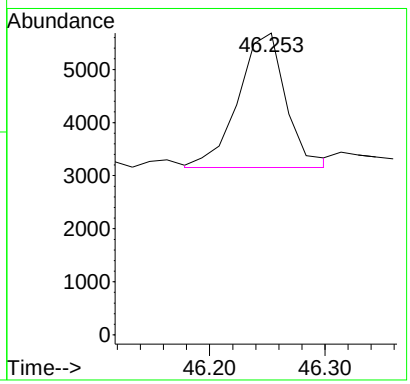
Tgt Ion:191 Resp: 5923

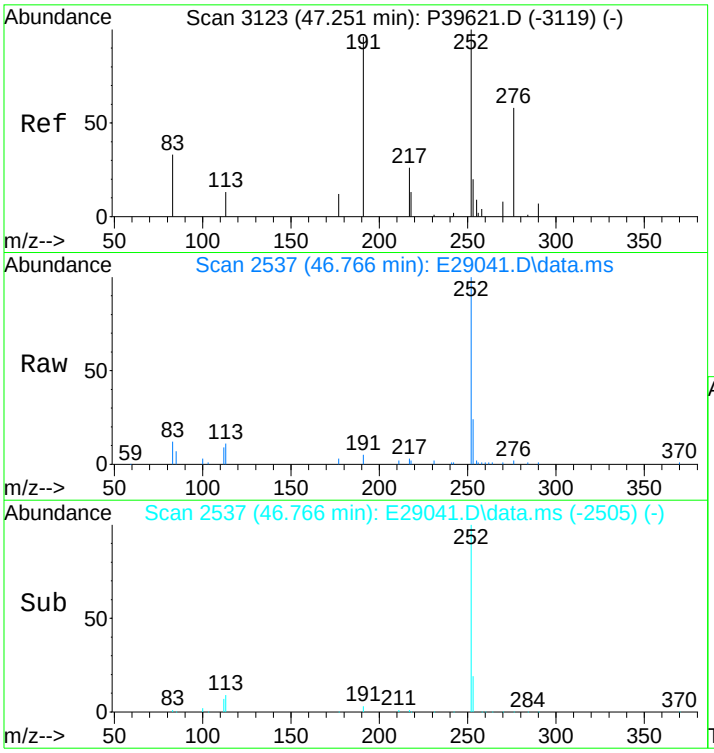




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 101.92 ng/ml m
RT: 46.253 min Scan# 2503
Delta R.T. -0.003 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

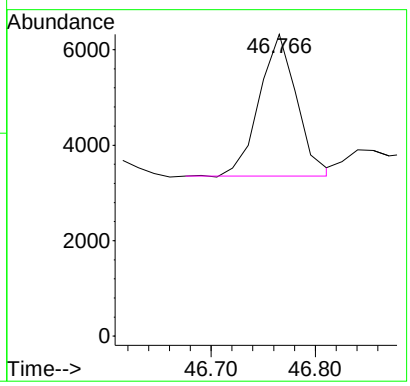
Tgt Ion:191 Resp: 7275

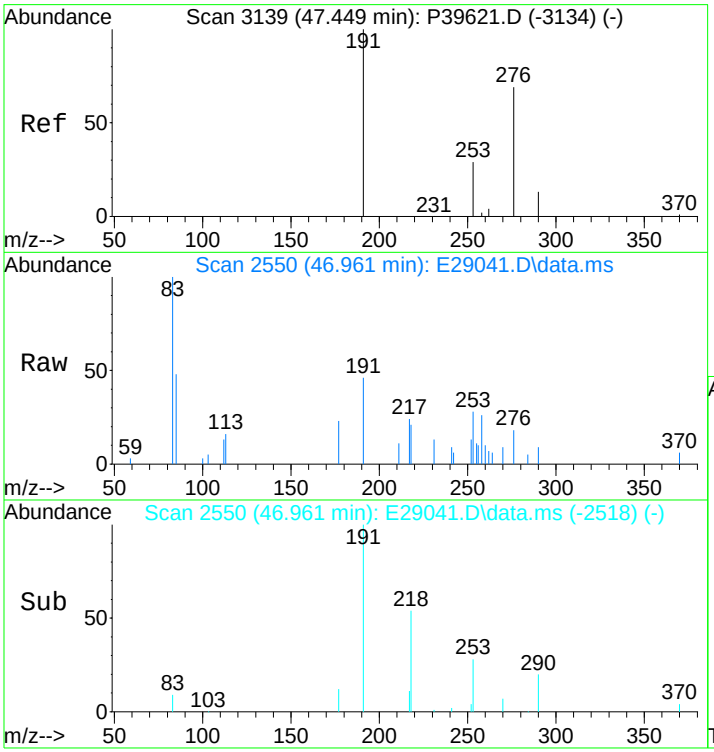




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 104.20 ng/ml
RT: 46.766 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

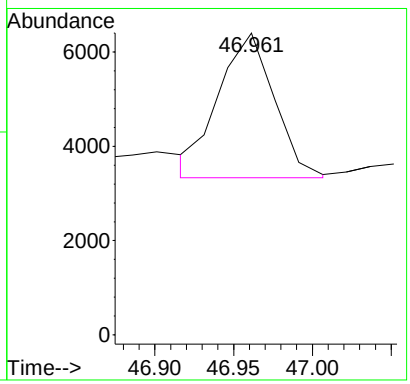
Tgt Ion:191 Resp: 7438

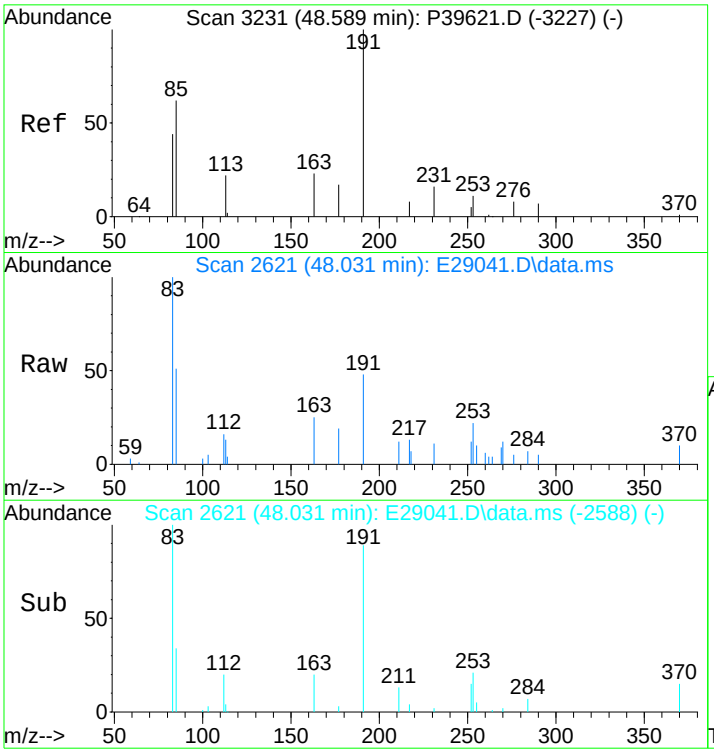




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 105.55 ng/ml m
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

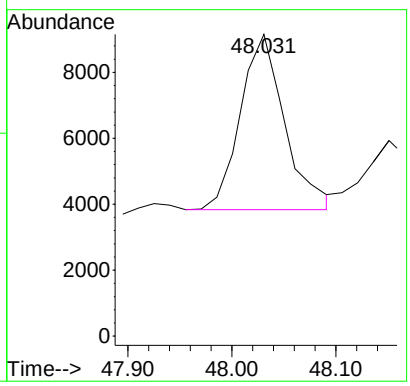
Tgt Ion:191 Resp: 7534

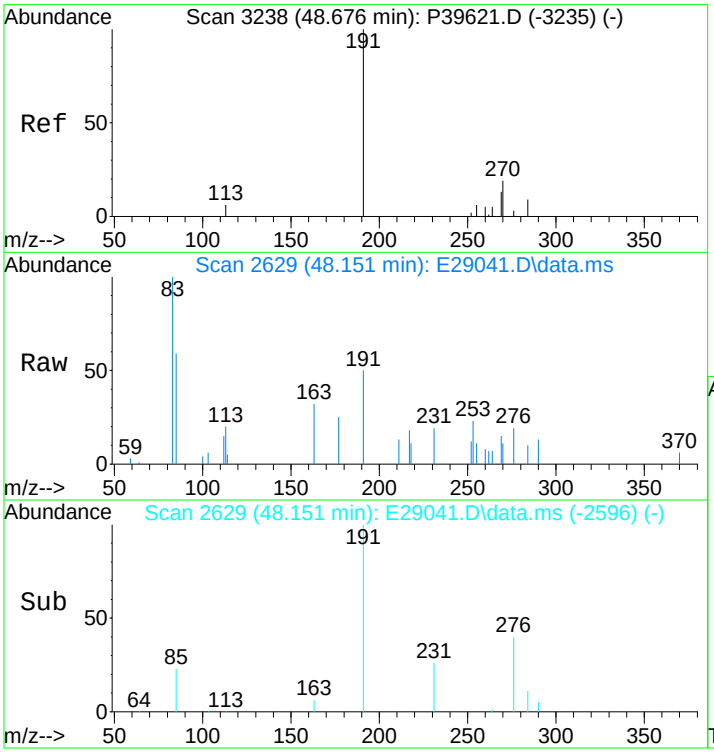




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 221.05 ng/ml
RT: 48.031 min Scan# 2621
Delta R.T. -0.005 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

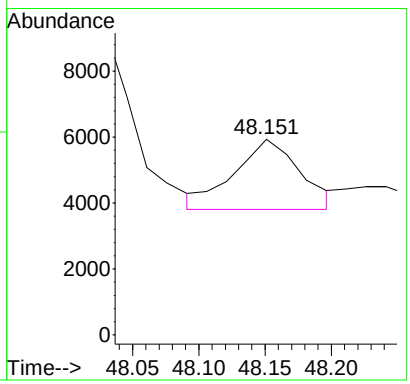
Tgt Ion:191 Resp: 15779

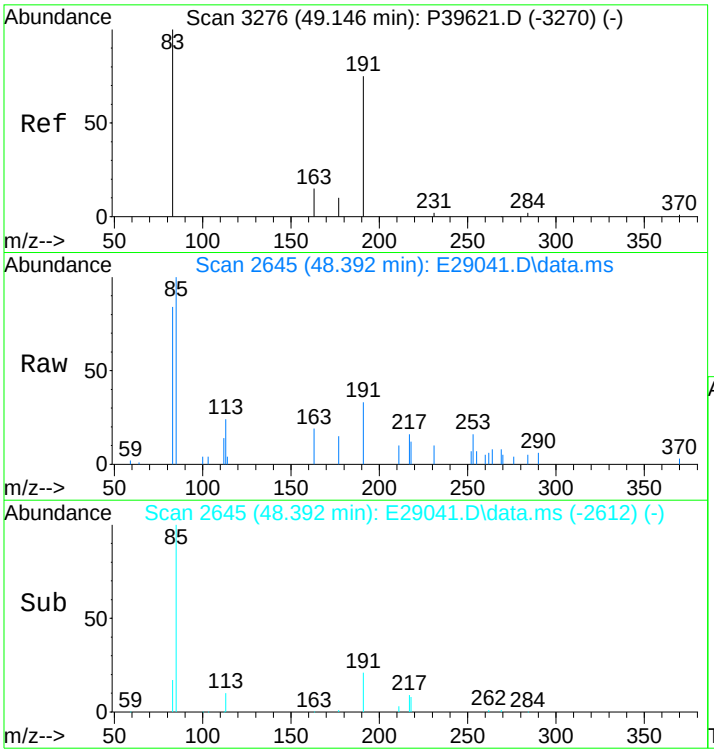




#107
C30 Tricyclic Terpane-22S
Concen: 102.39 ng/mL m
RT: 48.151 min Scan# 2629
Delta R.T. -0.005 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

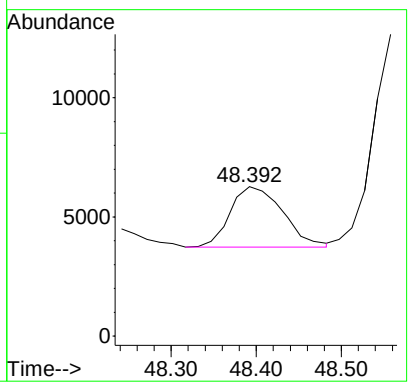
Tgt Ion:191 Resp: 7309

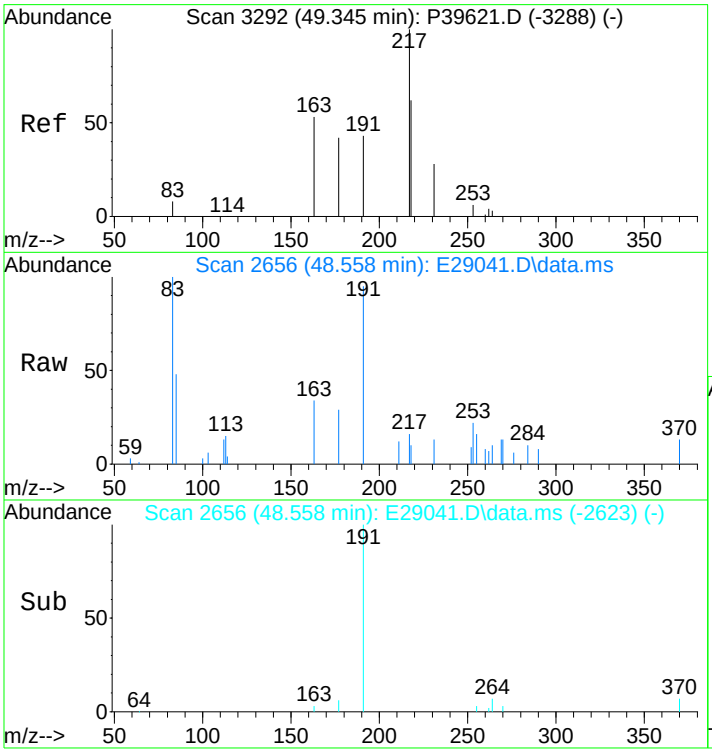




#108
C30 Tricyclic Terpane-22R
Concen: 152.29 ng/mL
RT: 48.392 min Scan# 2645
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

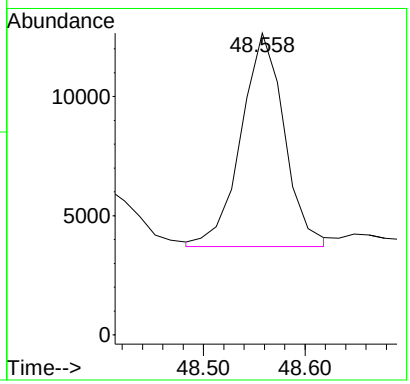
Tgt Ion:191 Resp: 10871

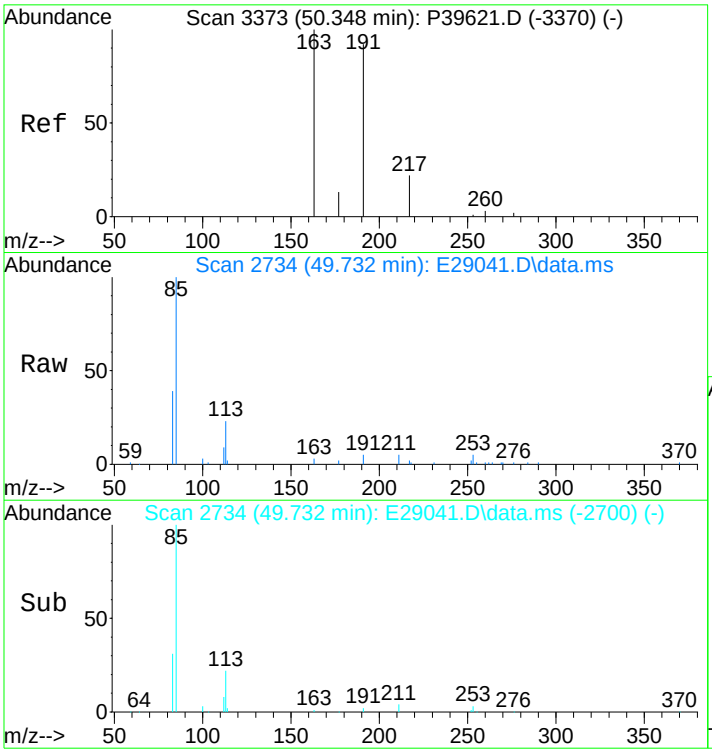




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 370.44 ng/ml m
RT: 48.558 min Scan# 2656
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

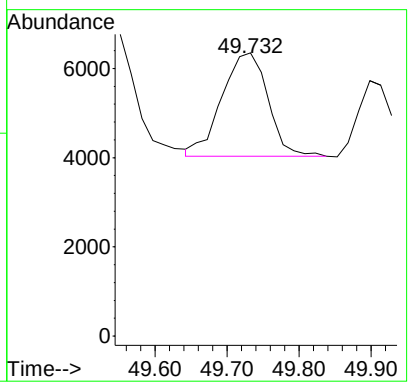
Tgt Ion:191 Resp: 26443

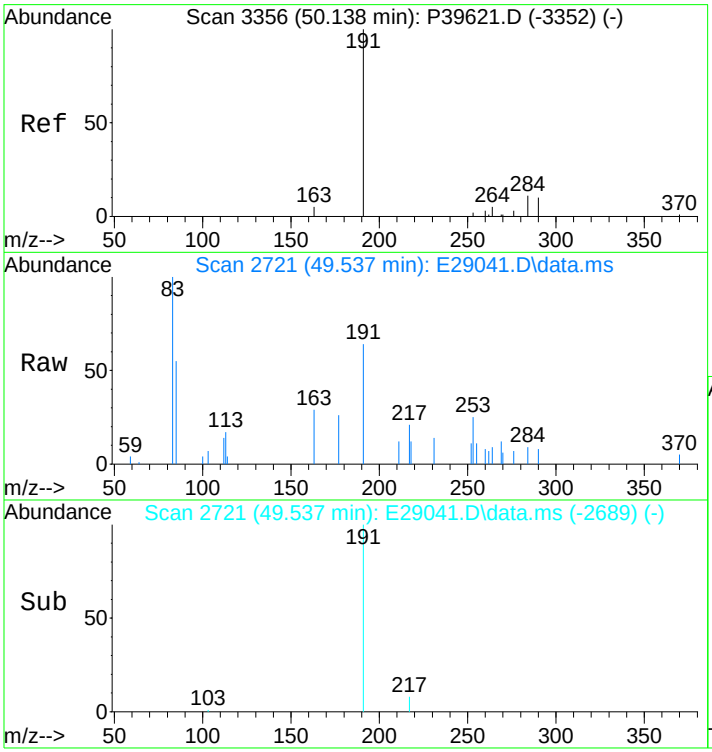




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 144.06 ng/ml
RT: 49.732 min Scan# 2734
Delta R.T. 0.008 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

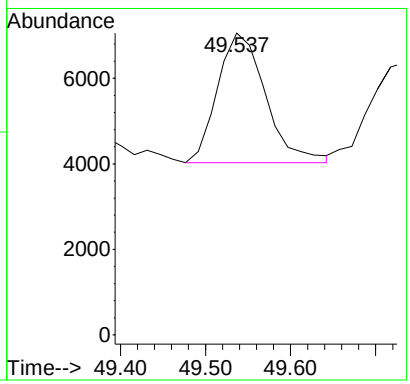
Tgt Ion:191 Resp: 10283

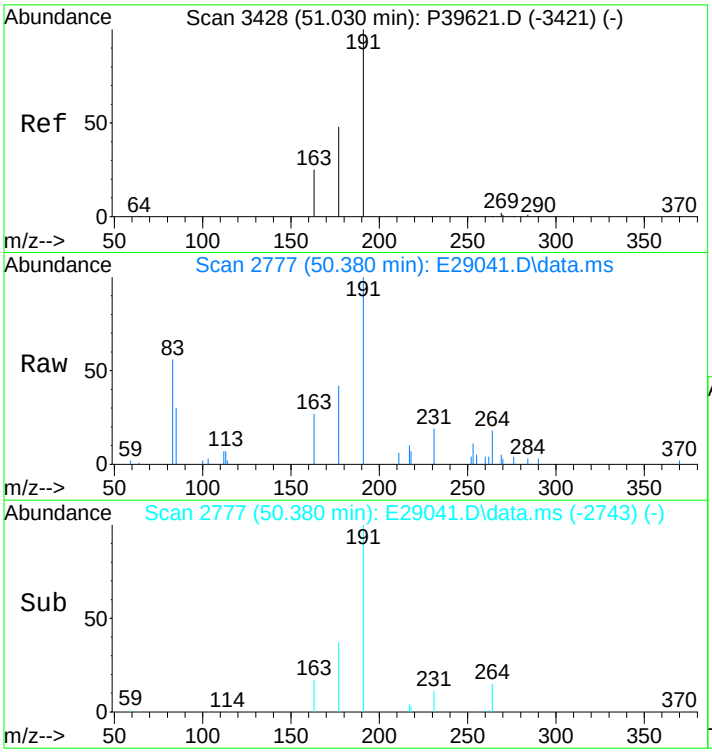




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 167.62 ng/ml
RT: 49.537 min Scan# 2721
Delta R.T. -0.022 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

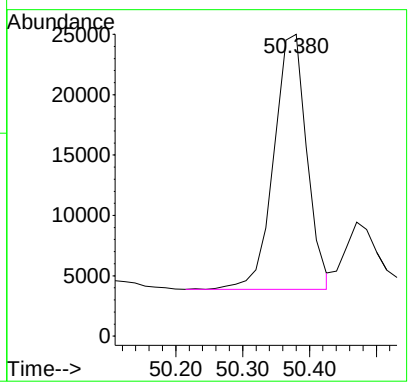
Tgt Ion:191 Resp: 11965

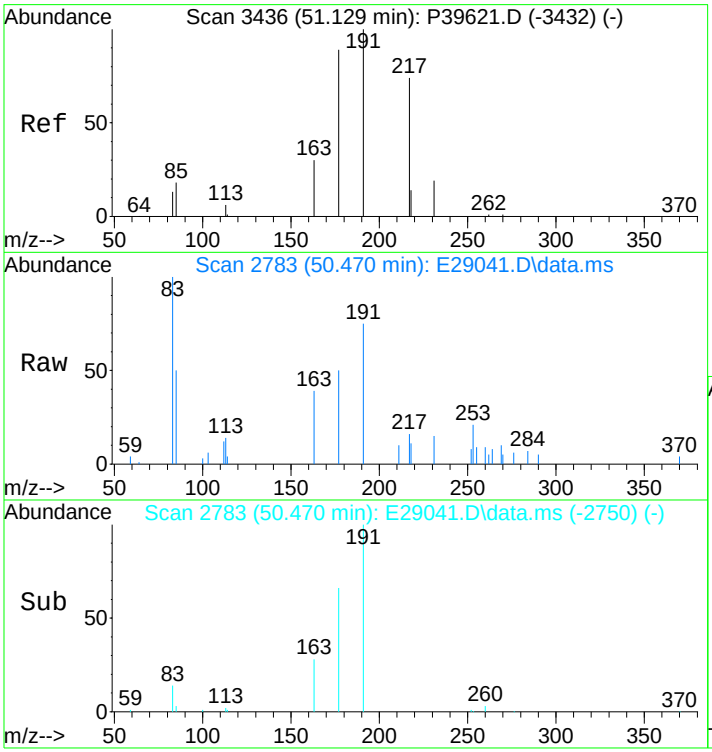




#112
30-Norhopane (T15)
Concen: 1015.02 ng/ml
RT: 50.380 min Scan# 2777
Delta R.T. 0.007 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

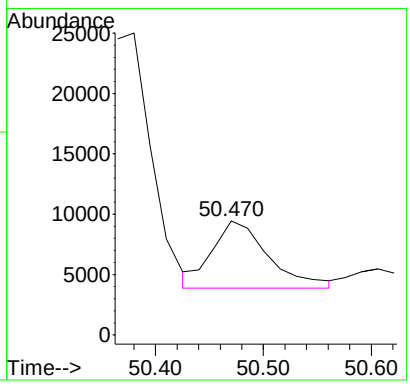
Tgt Ion:191 Resp: 72454

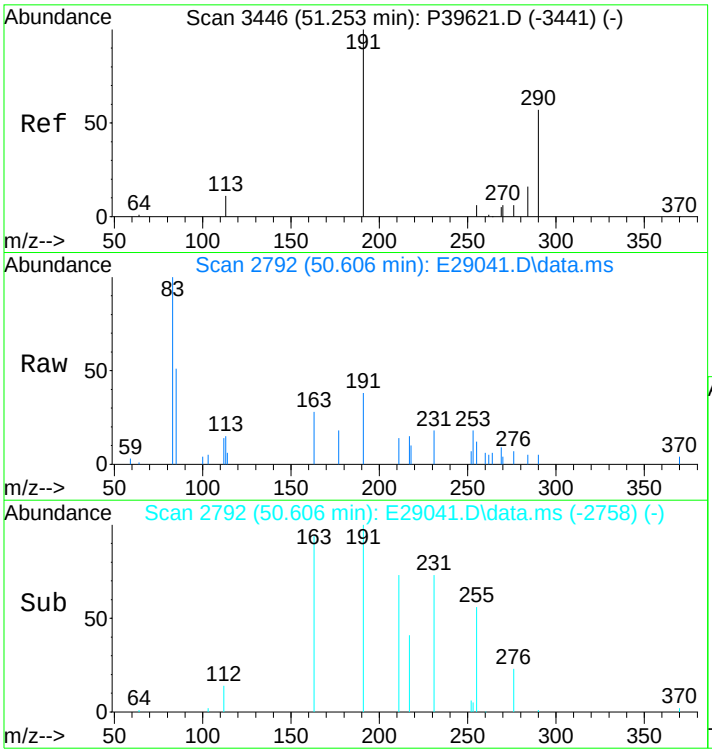




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 283.43 ng/ml m
RT: 50.470 min Scan# 2783
Delta R.T. -0.008 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

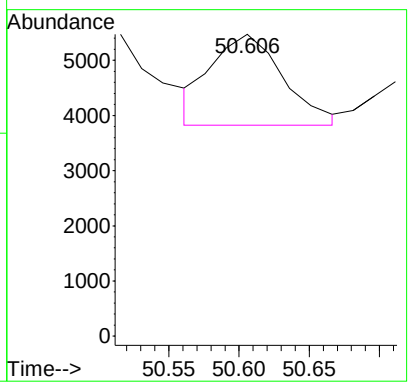
Tgt Ion:191 Resp: 20232

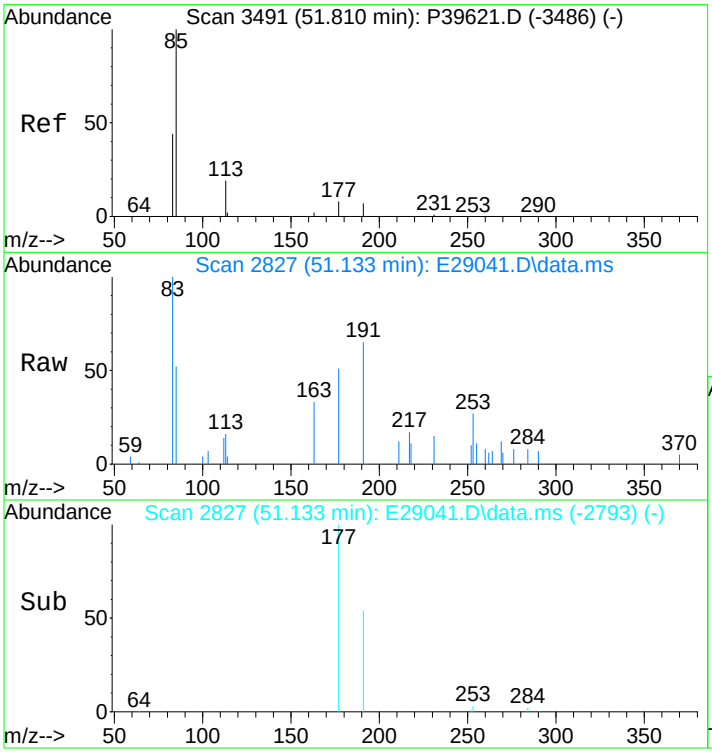




#114
17a(H)-Diahopane (X)
Concen: 82.36 ng/ml m
RT: 50.606 min Scan# 2792
Delta R.T. 0.007 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

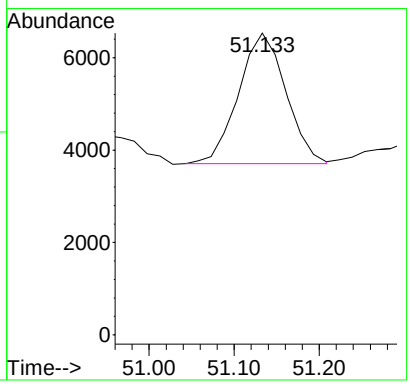
Tgt Ion:191 Resp: 5879

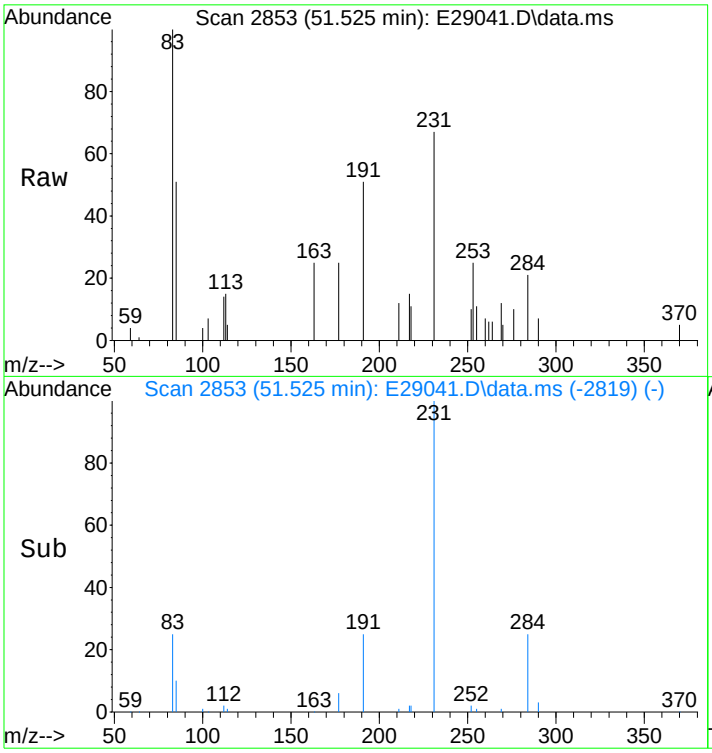




#115
30-Normoretane (T17)
Concen: 153.11 ng/ml
RT: 51.133 min Scan# 2827
Delta R.T. 0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

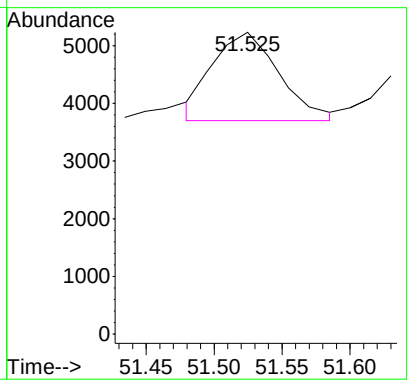
Tgt Ion:191 Resp: 10929

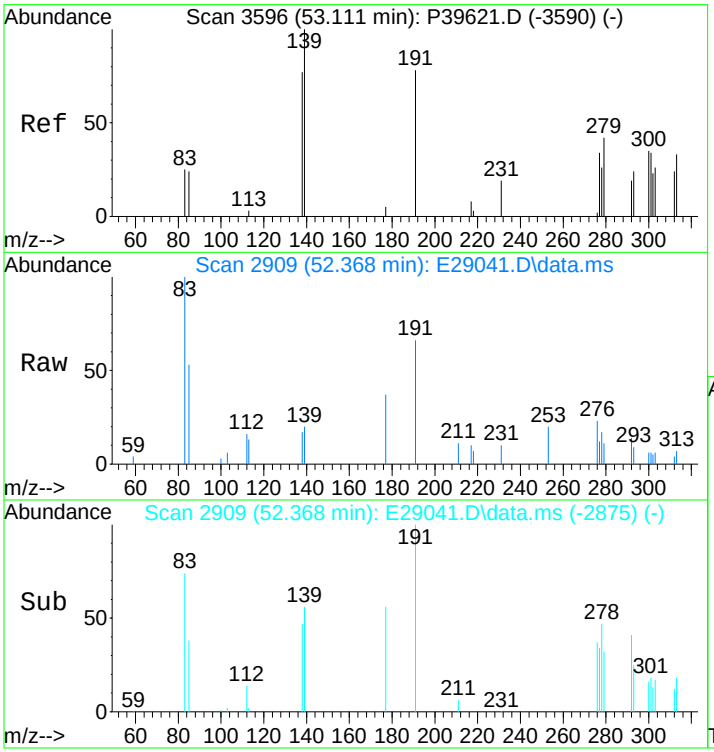




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 72.97 ng/ml m
RT: 51.525 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

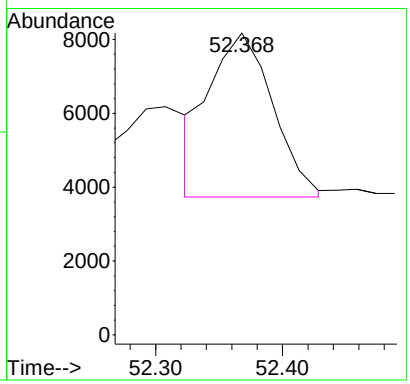
Tgt Ion:191 Resp: 5209

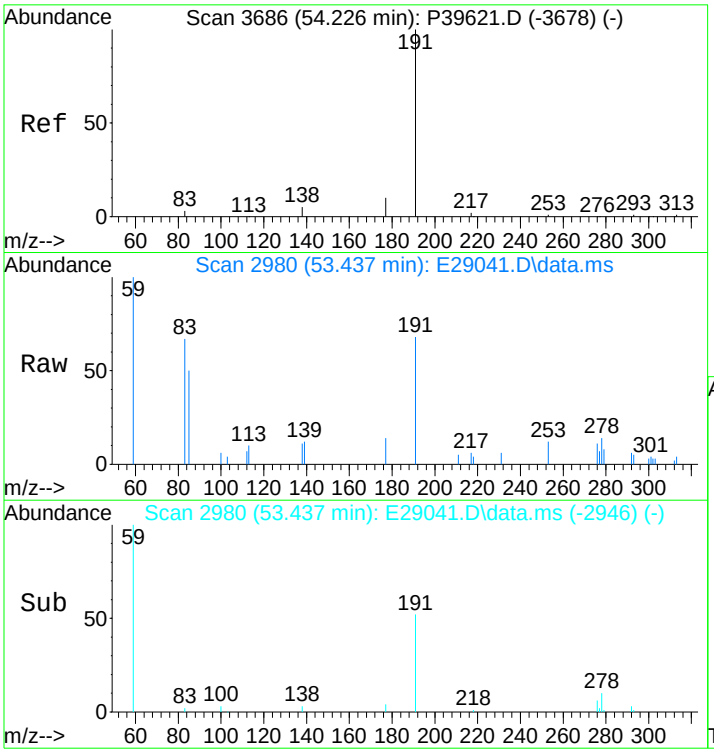




#117
Moretane (T20)
Concen: 215.60 ng/ml m
RT: 52.368 min Scan# 2909
Delta R.T. 0.005 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

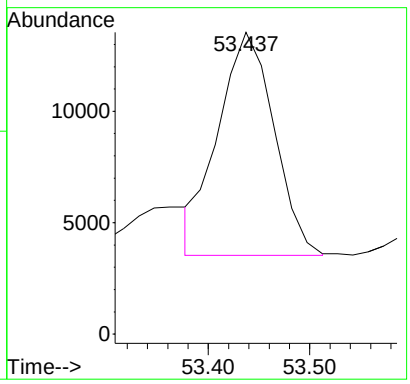
Tgt Ion:191 Resp: 15390

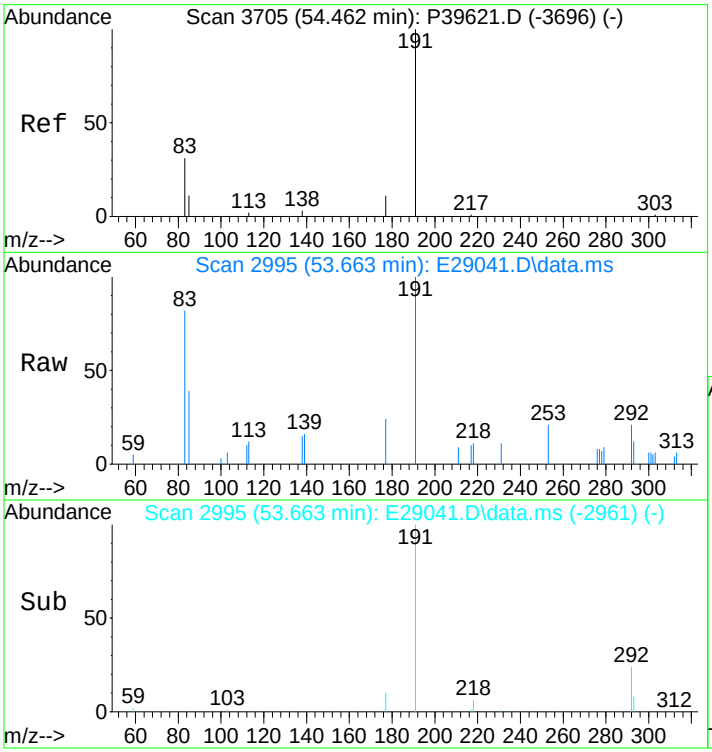




#118
30-Homohopane-22S (T21)
Concen: 539.45 ng/ml m
RT: 53.437 min Scan# 2980
Delta R.T. 0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

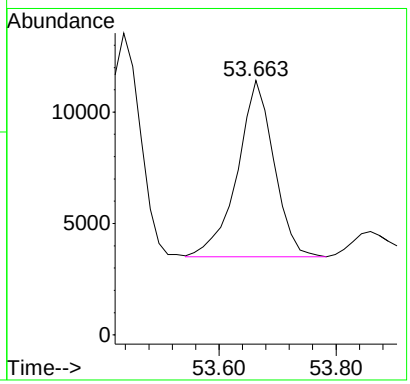
Tgt Ion:191 Resp: 38507

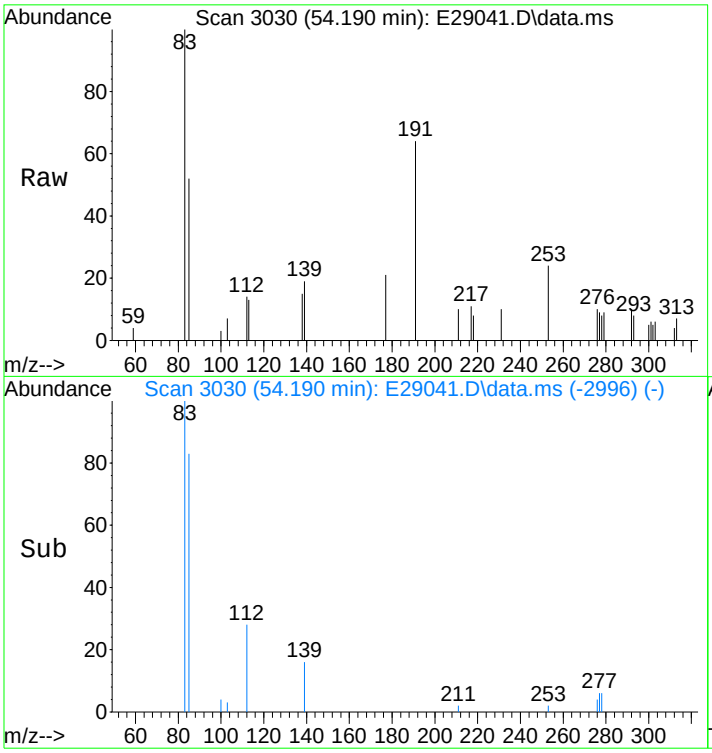




#119
30-Homohopane-22R (T22)
Concen: 479.86 ng/ml
RT: 53.663 min Scan# 2995
Delta R.T. 0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

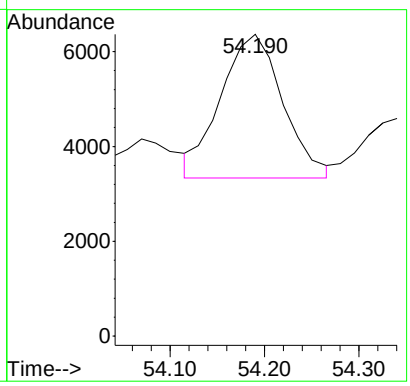
Tgt Ion:191 Resp: 34253

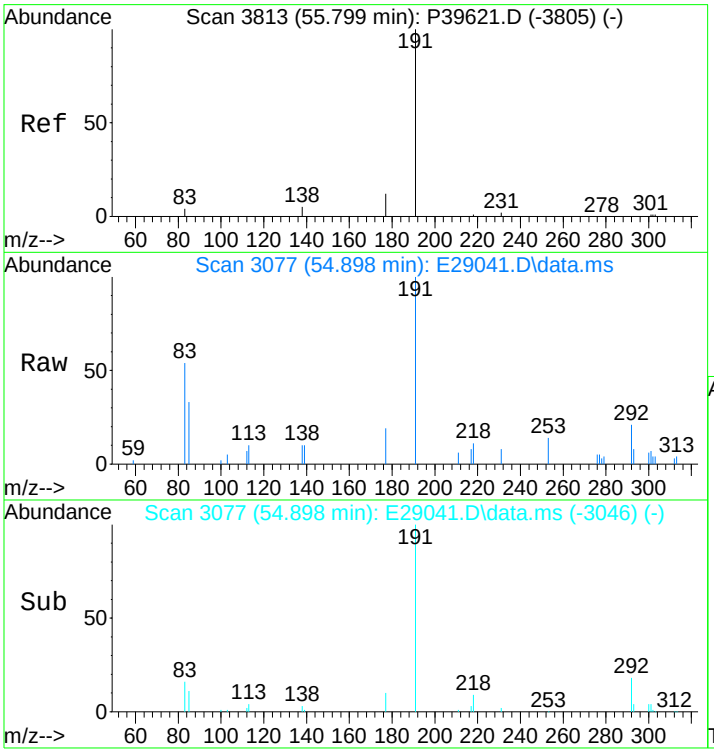




#120
Gammacerane/C32-diahopane
Concen: 194.46 ng/mL m
RT: 54.190 min Scan# 3030
Delta R.T. 0.018 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

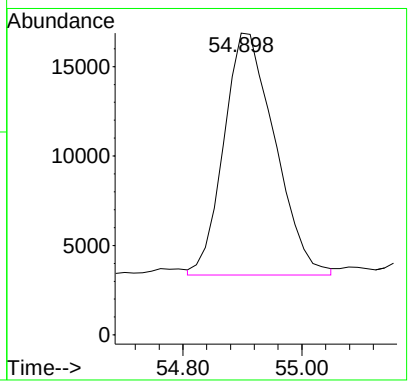
Tgt Ion:191 Resp: 13881

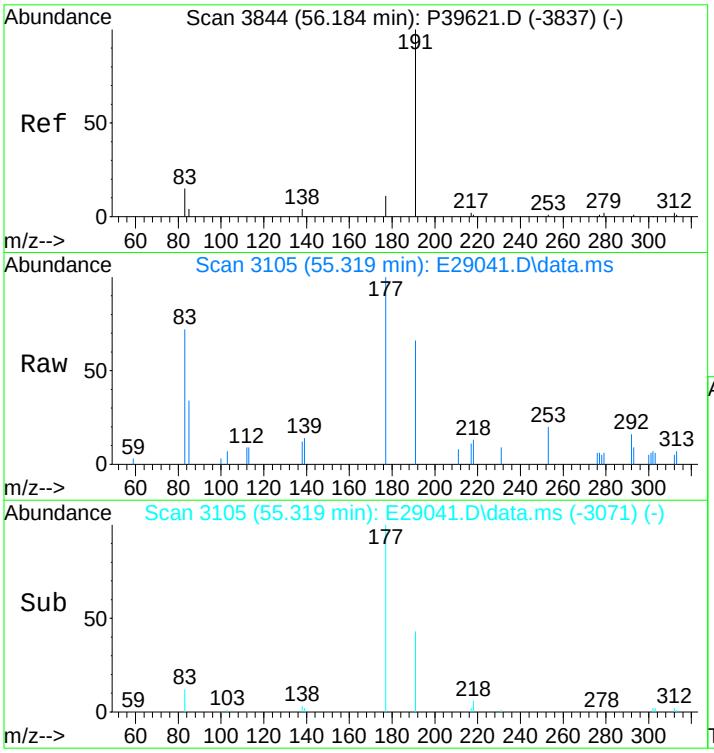




#121
30,31-Bishomohopane-22S (T26)
Concen: 1129.74 ng/ml m
RT: 54.898 min Scan# 3077
Delta R.T. -0.028 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

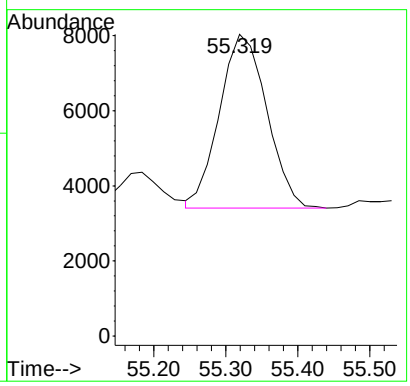
Tgt Ion:191 Resp: 80643

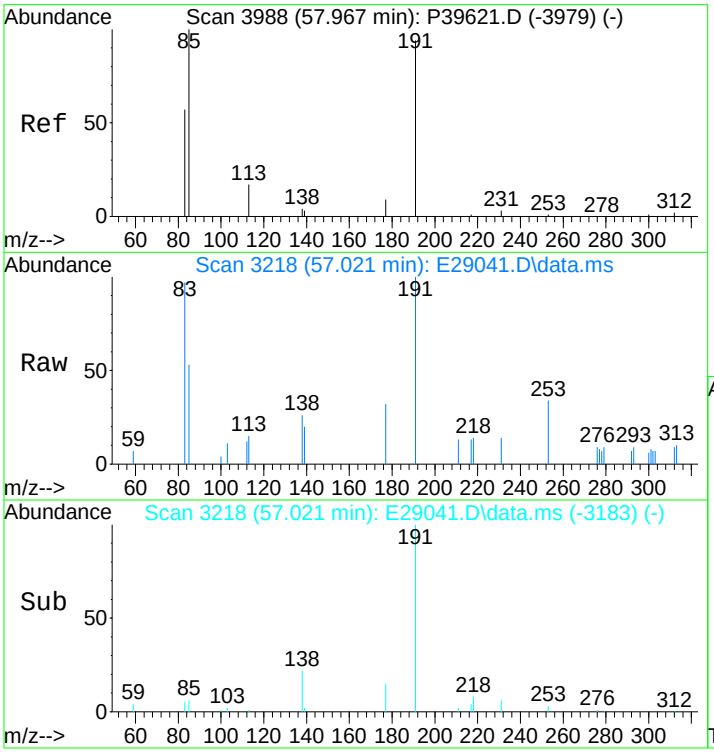




#122
30,31-Bishomohopane-22R (T27)
Concen: 295.40 ng/ml
RT: 55.319 min Scan# 3105
Delta R.T. 0.017 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

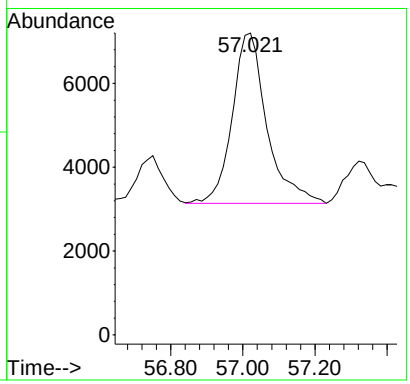
Tgt Ion:191 Resp: 21086

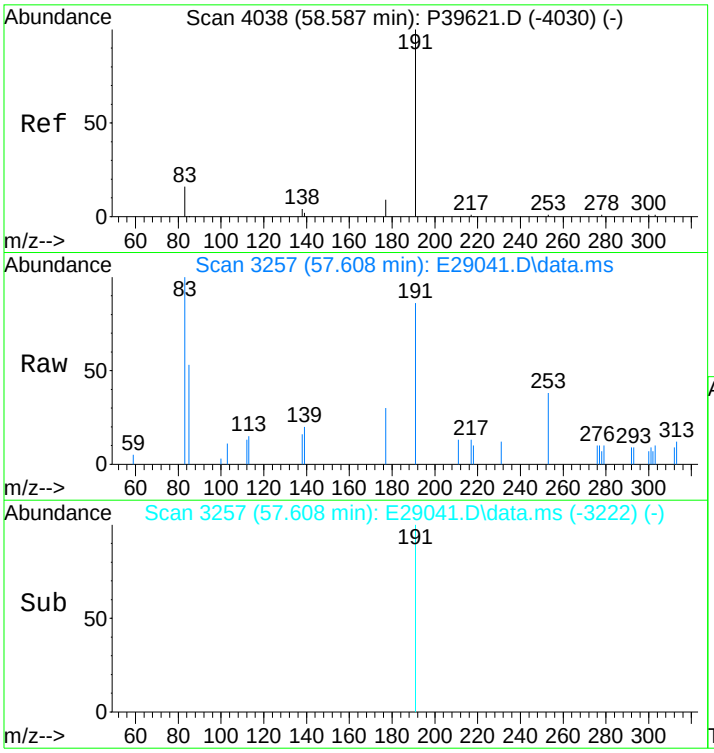




#123
30,31-Trishomohopane-22S (T30)
Concen: 378.58 ng/ml
RT: 57.021 min Scan# 3218
Delta R.T. 0.030 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

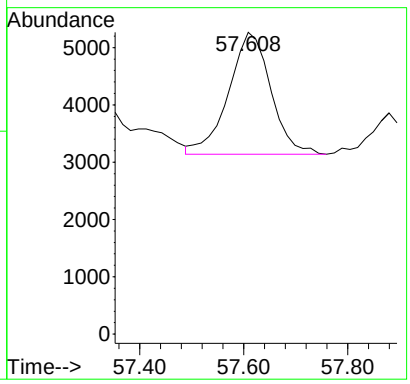
Tgt Ion:191 Resp: 27024

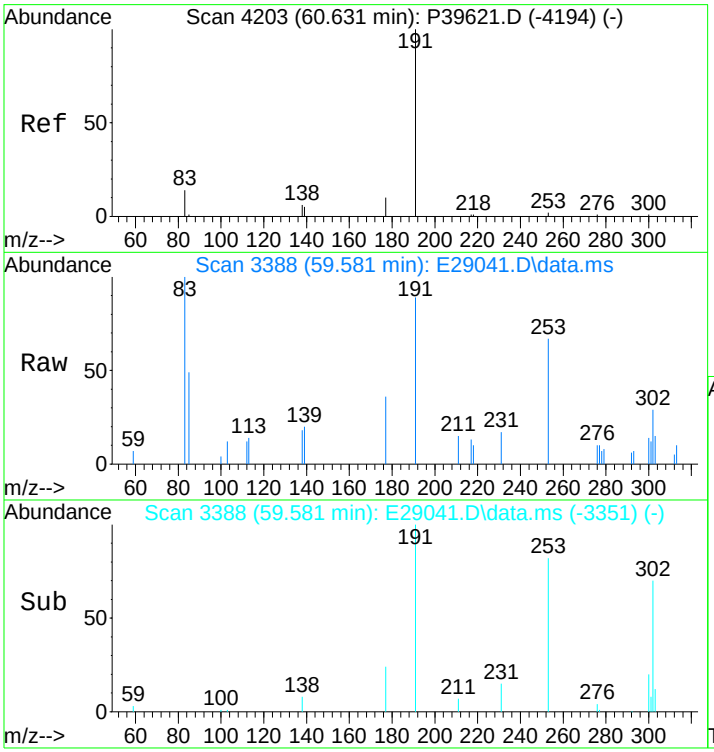




#124
30,31-Trishomohopane-22R (T31)
Concen: 167.51 ng/ml
RT: 57.608 min Scan# 3257
Delta R.T. 0.030 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

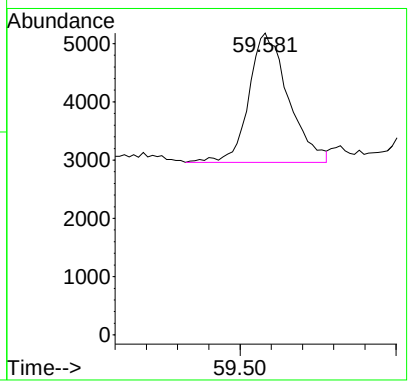
Tgt Ion:191 Resp: 11957

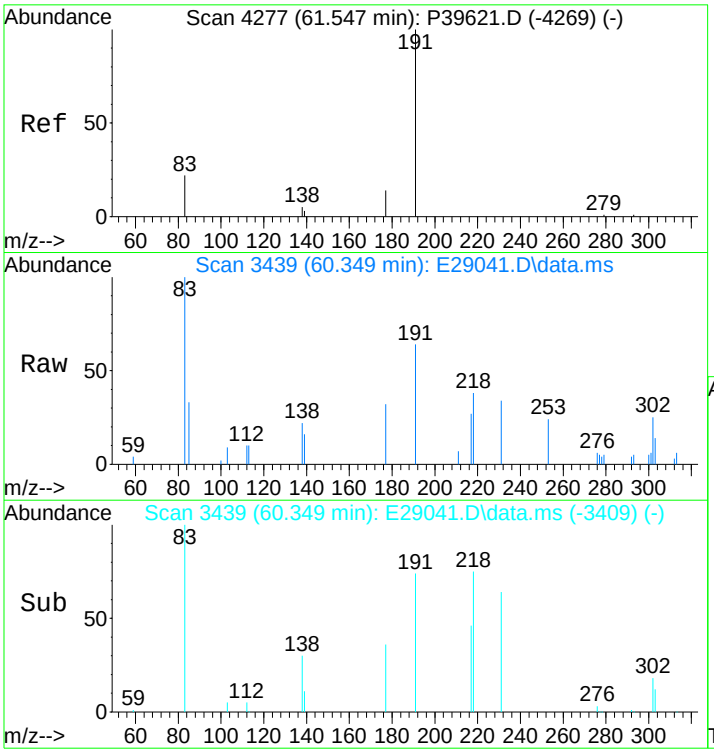




#125
Tetrakishomohopane-22S (T32)
Concen: 274.66 ng/ml
RT: 59.581 min Scan# 3388
Delta R.T. 0.058 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

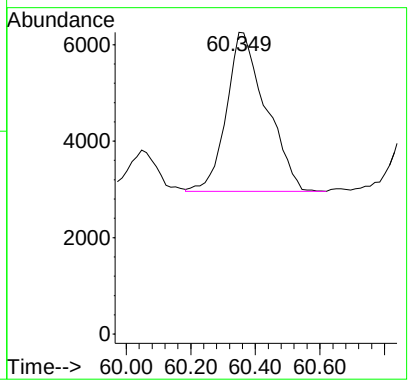
Tgt Ion:191 Resp: 19606

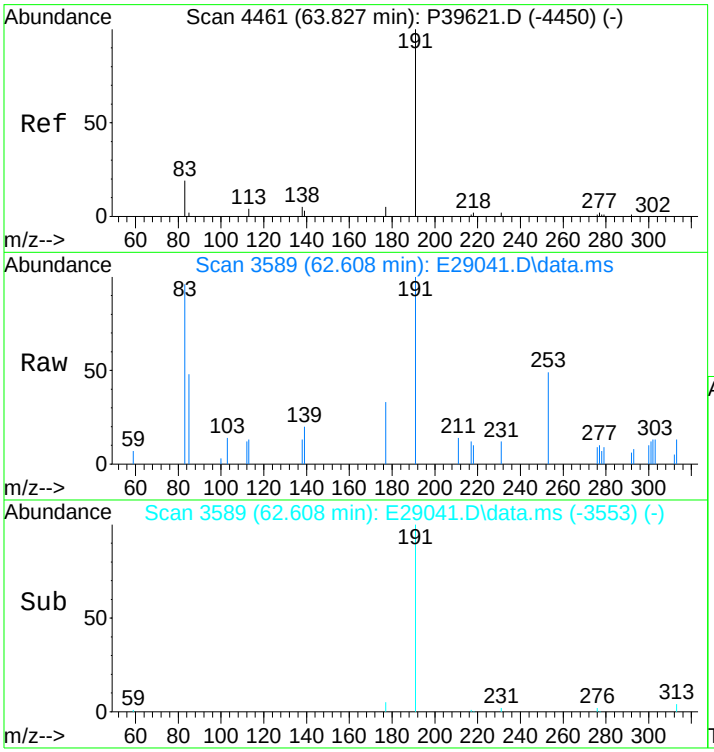




#126
Tetrakishomohopane-22R (T33)
Concen: 392.80 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. -0.048 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

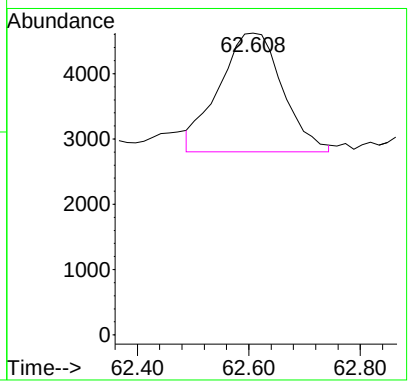
Tgt Ion:191 Resp: 28039

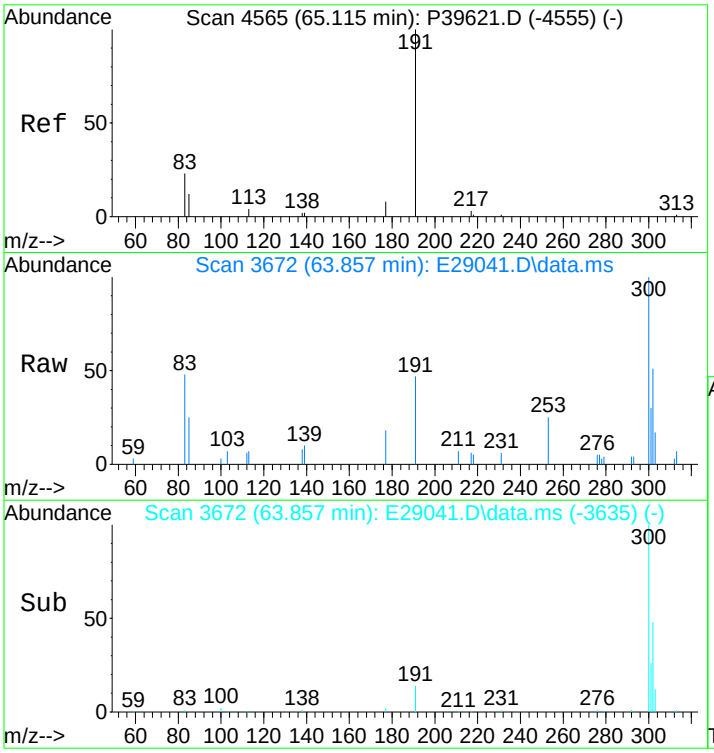




#127
Pentakishomohopane-22S (T34)
Concen: 201.49 ng/ml m
RT: 62.608 min Scan# 3589
Delta R.T. 0.040 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

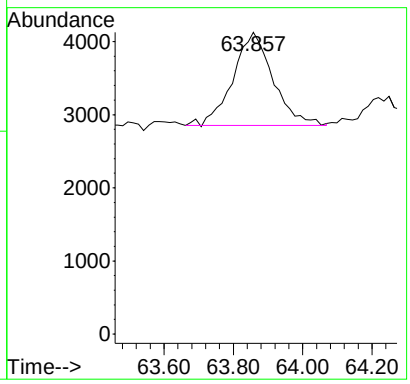
Tgt Ion:191 Resp: 14383

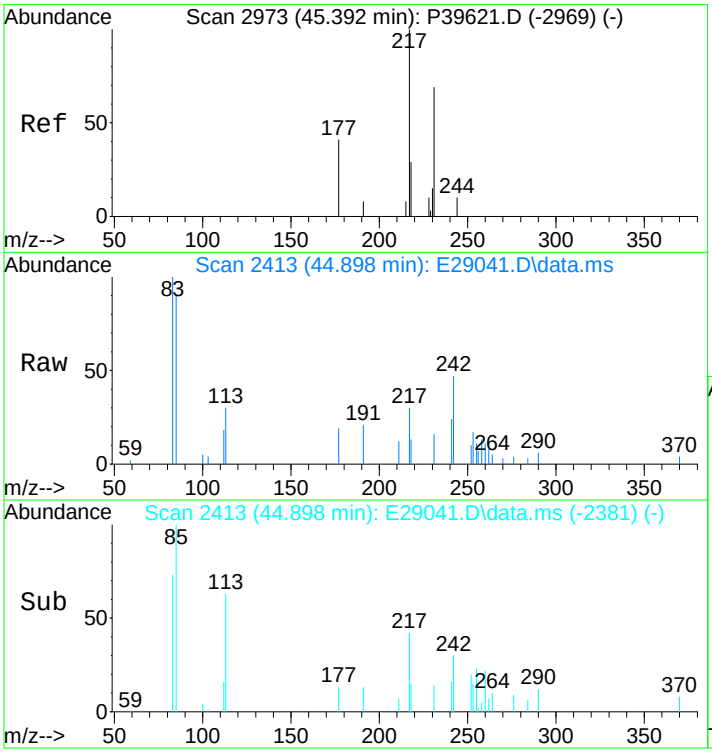




#128
Pentakishomohopane-22R (T35)
Concen: 143.71 ng/ml
RT: 63.857 min Scan# 3672
Delta R.T. 0.053 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

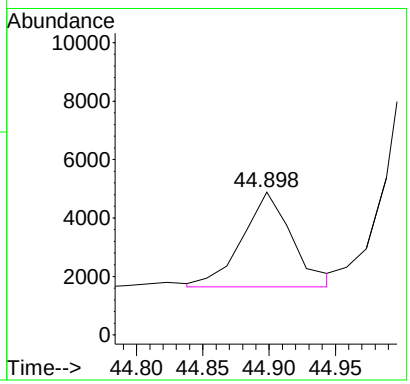
Tgt Ion:191 Resp: 10258

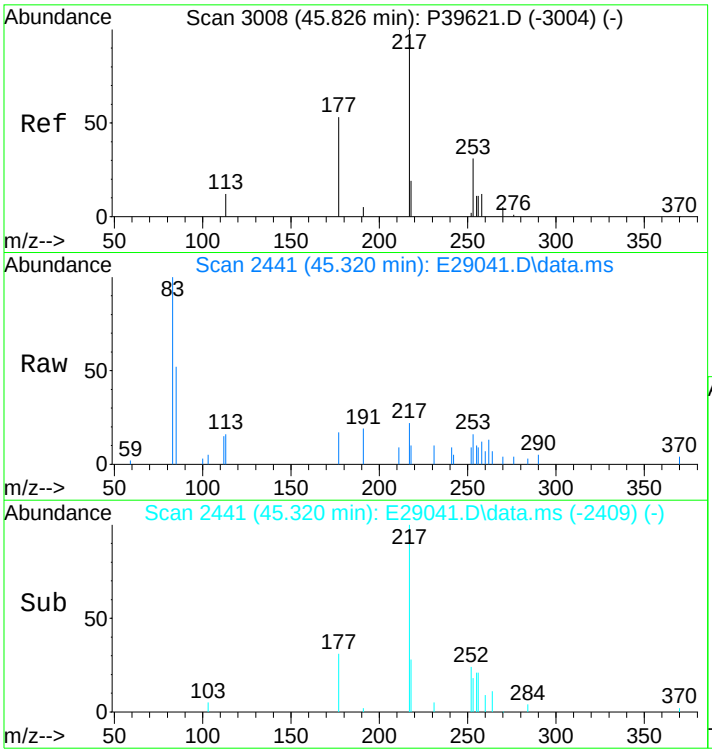




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 226.51 ng/ml m
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

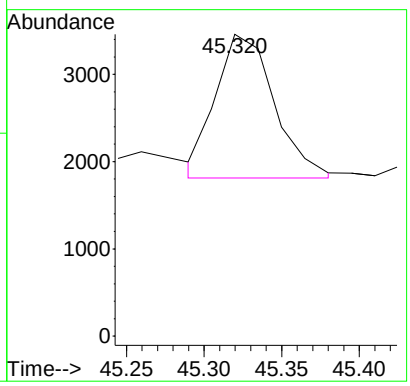
Tgt Ion:217 Resp: 8491

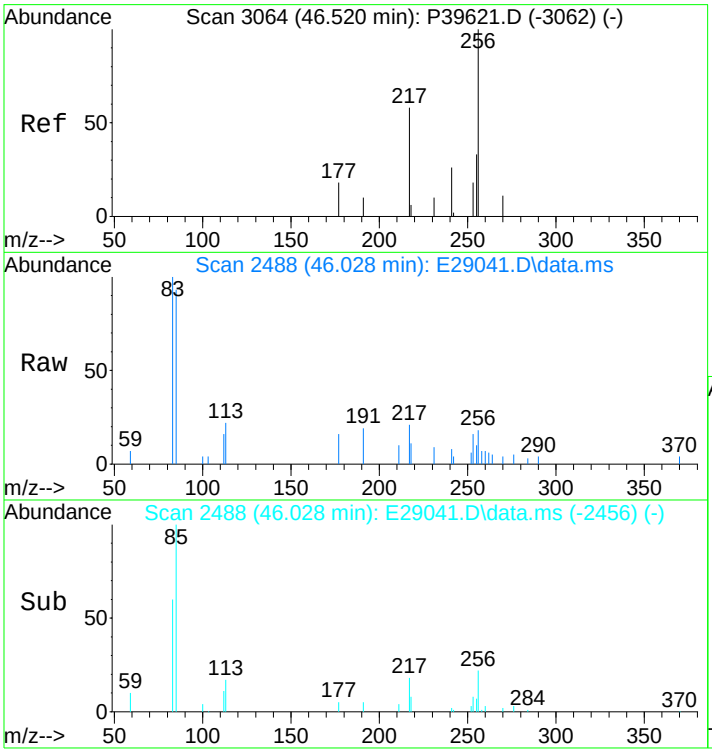




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 115.69 ng/ml m
RT: 45.320 min Scan# 2441
Delta R.T. -0.018 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

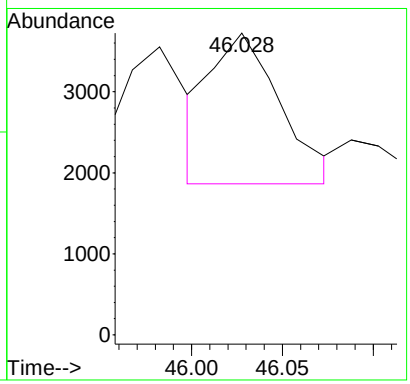
Tgt Ion:217 Resp: 4337

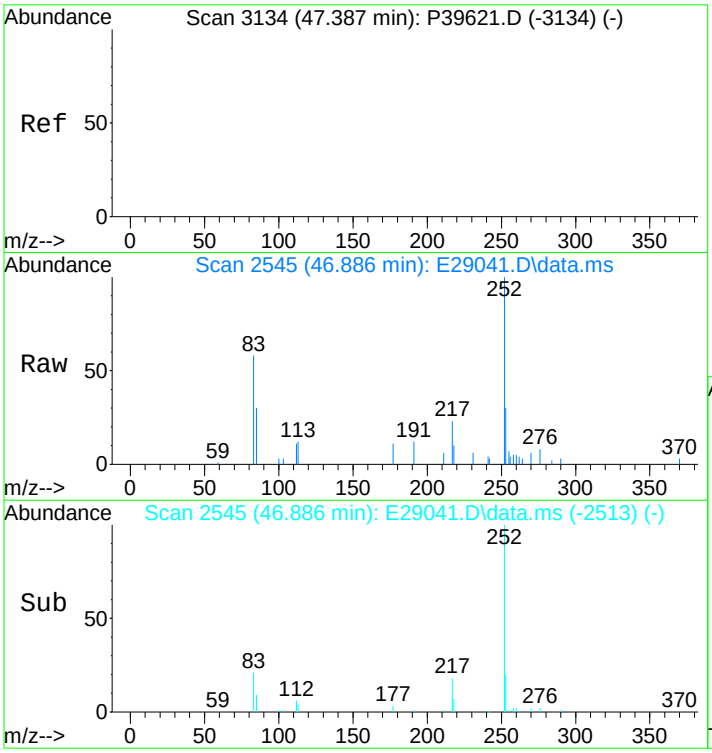




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 132.18 ng/ml m
RT: 46.028 min Scan# 2488
Delta R.T. -0.018 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

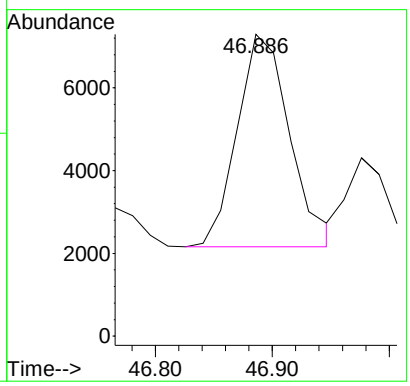
Tgt Ion:217 Resp: 4955

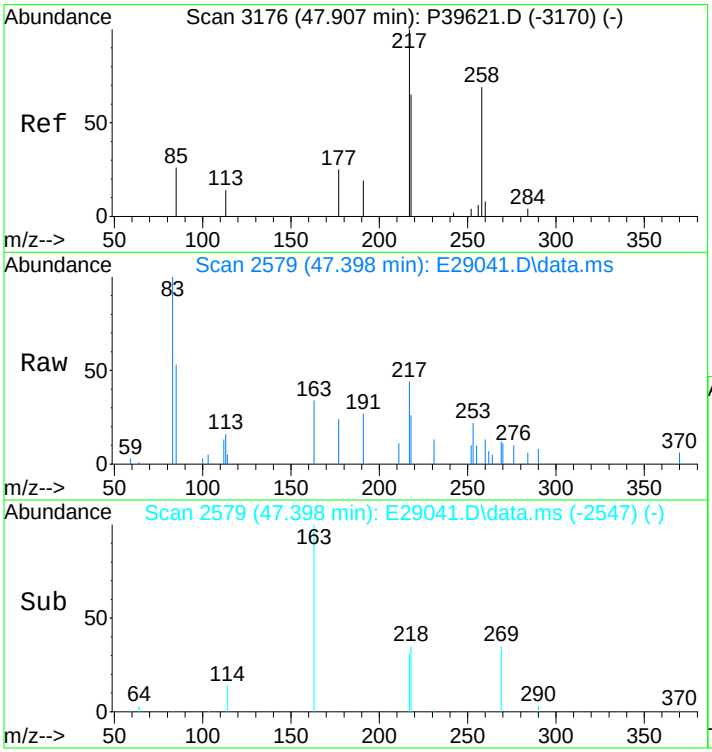




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 427.70 ng/ml
RT: 46.886 min Scan# 2545
Delta R.T. -0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

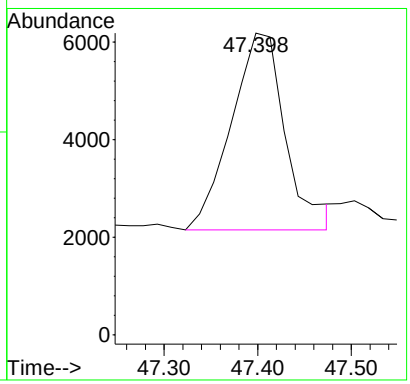
Tgt Ion:217 Resp: 16033

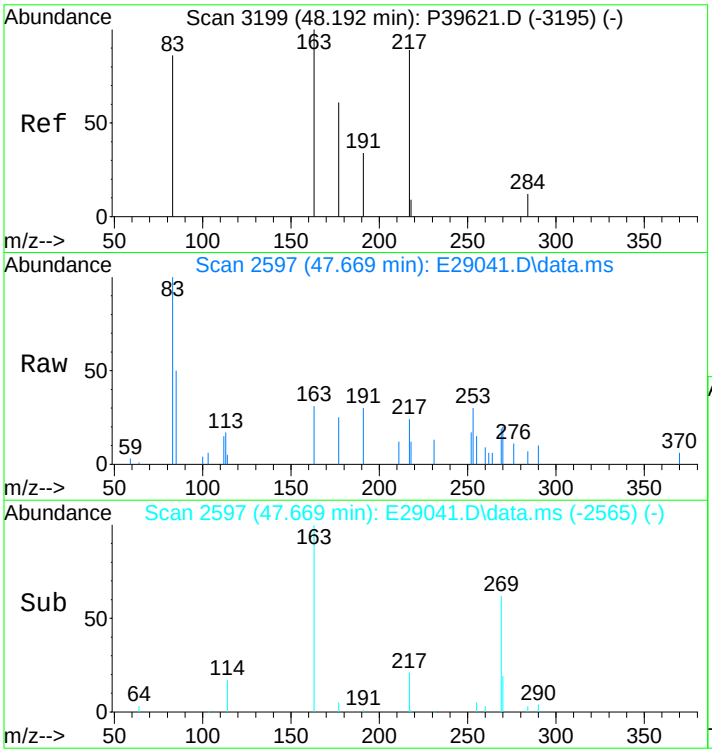




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 433.76 ng/ml
RT: 47.398 min Scan# 2579
Delta R.T. -0.020 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

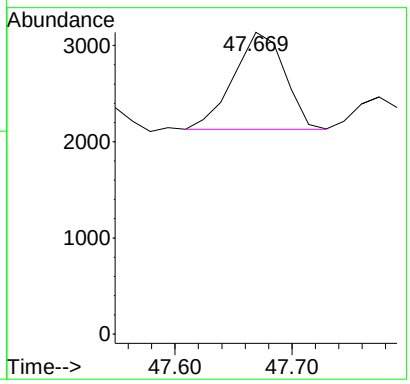
Tgt Ion:217 Resp: 16260

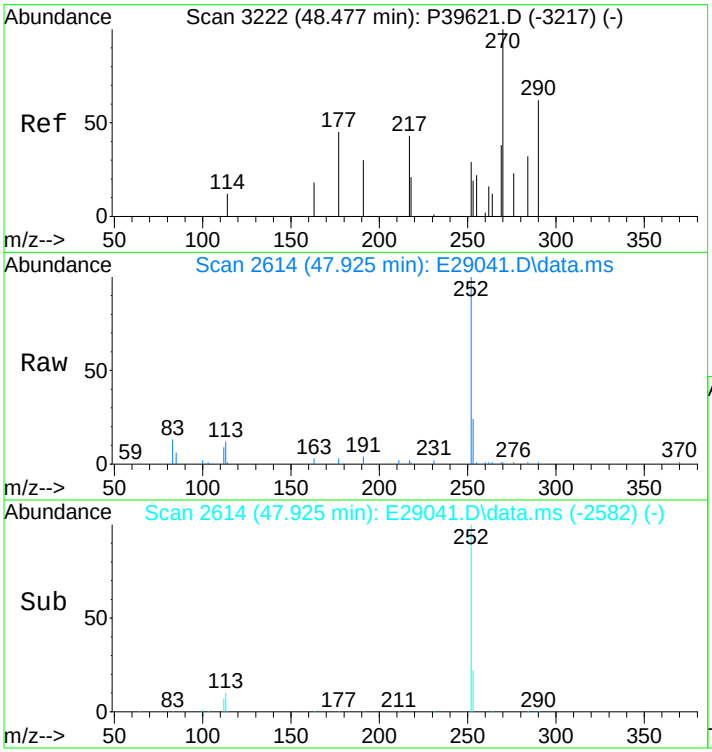




#135
Unknown Sterane (S18)
Concen: 82.08 ng/ml
RT: 47.669 min Scan# 2597
Delta R.T. -0.020 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

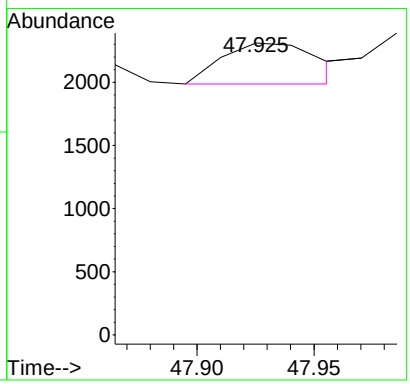
Tgt Ion:217 Resp: 3077

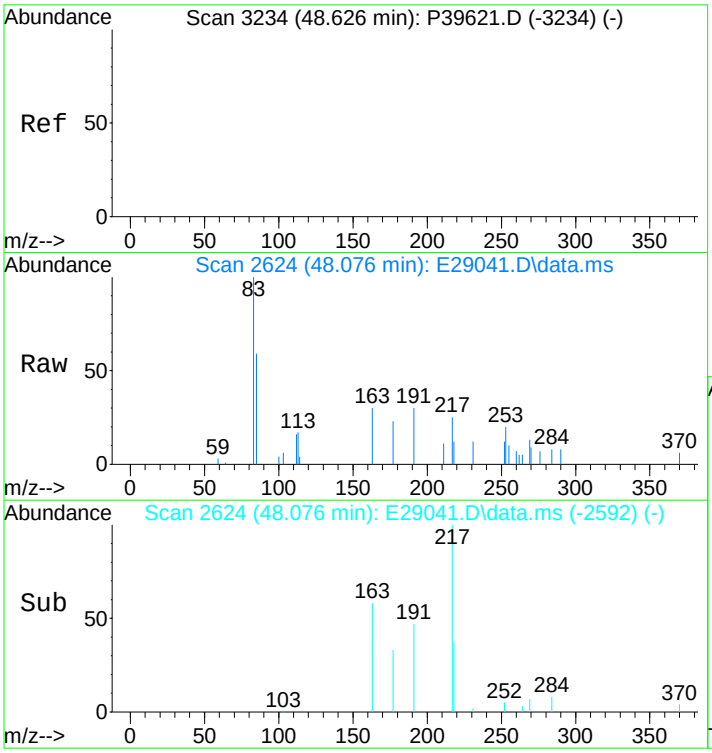




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 24.54 ng/ml
RT: 47.925 min Scan# 2614
Delta R.T. -0.020 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

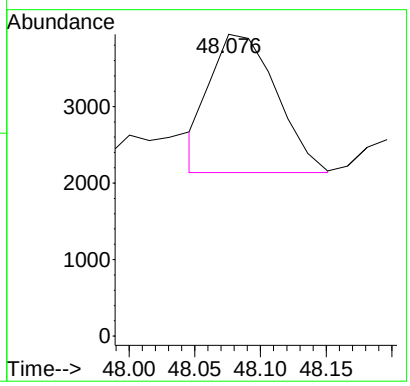
Tgt Ion:217 Resp: 920

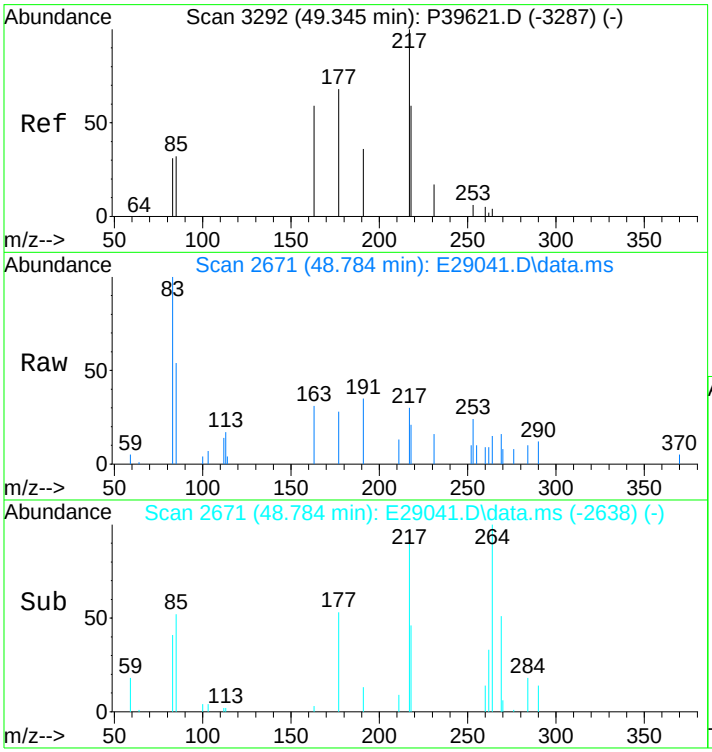




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 169.10 ng/ml m
RT: 48.076 min Scan# 2624
Delta R.T. -0.020 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

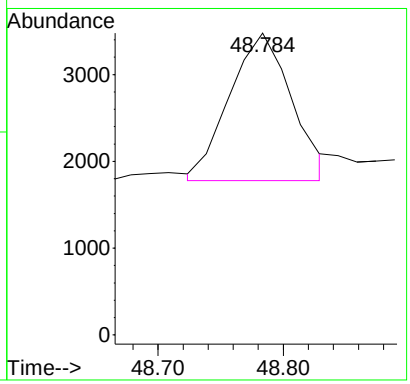
Tgt Ion:217 Resp: 6339

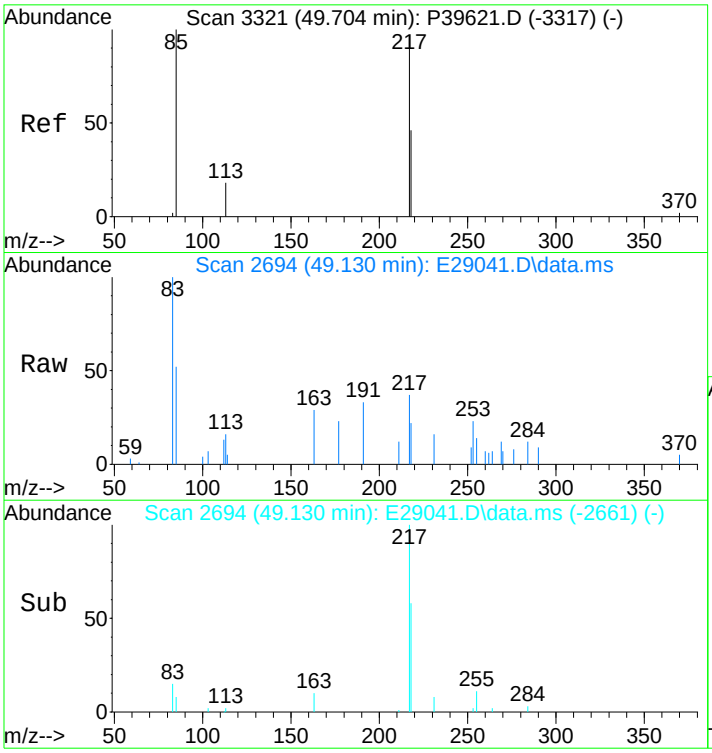




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 156.86 ng/ml m
RT: 48.784 min Scan# 2671
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

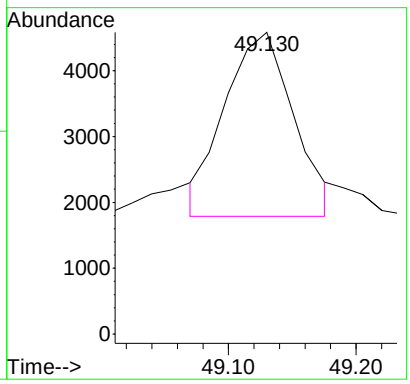
Tgt Ion:217 Resp: 5880

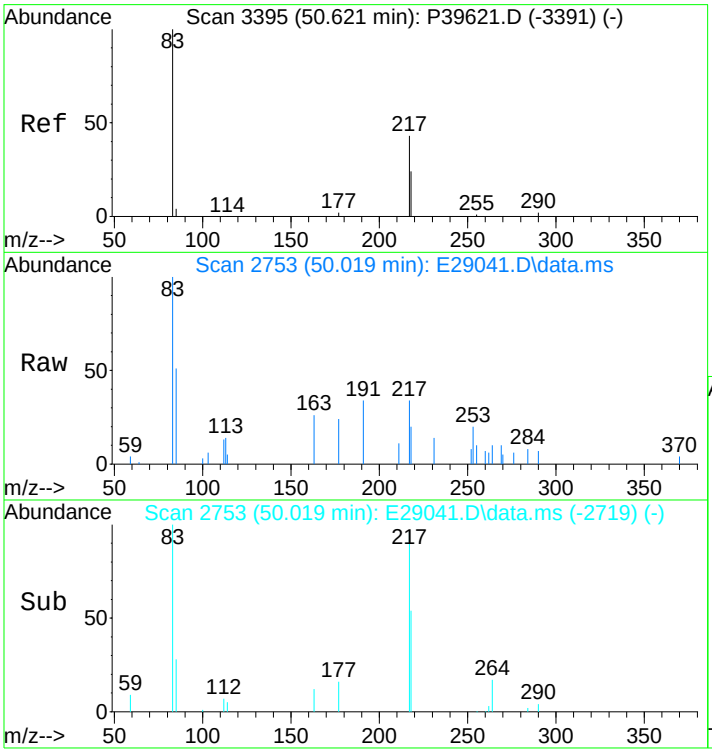




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 279.09 ng/ml m
RT: 49.130 min Scan# 2694
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

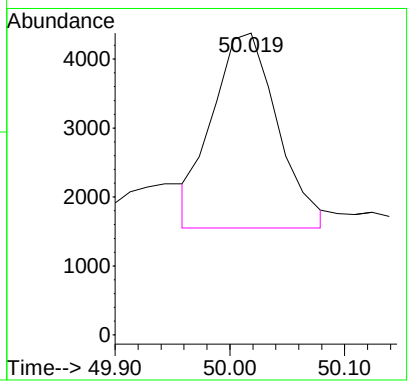
Tgt Ion:217 Resp: 10462

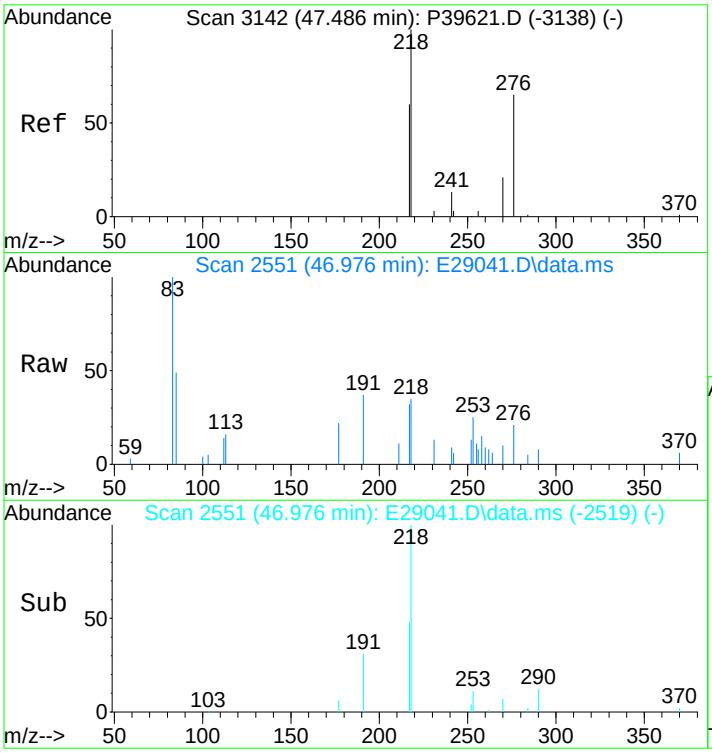




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 296.00 ng/ml m
RT: 50.019 min Scan# 2753
Delta R.T. 0.008 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

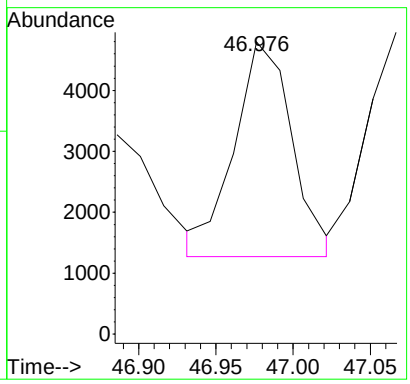
Tgt Ion:217 Resp: 11096

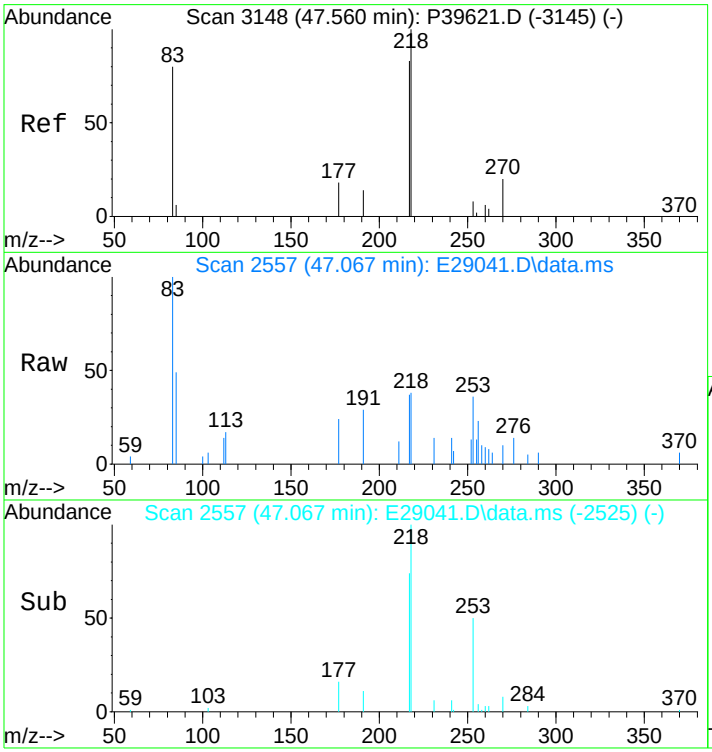




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 244.43 ng/ml m
RT: 46.976 min Scan# 2551
Delta R.T. -0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

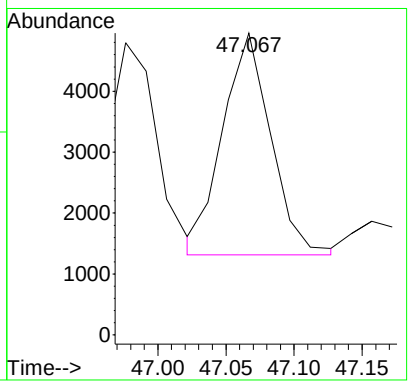
Tgt Ion:218 Resp: 9163

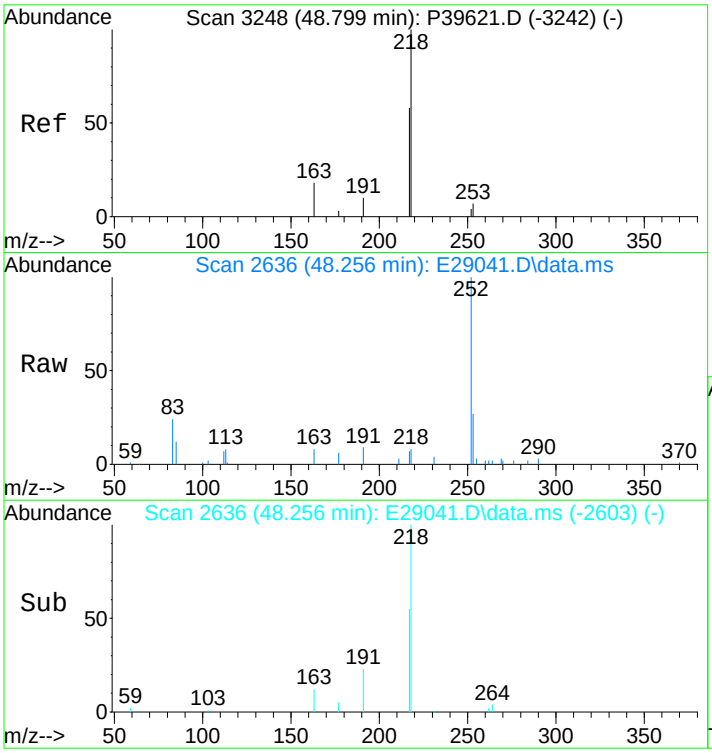




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 239.05 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.019 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

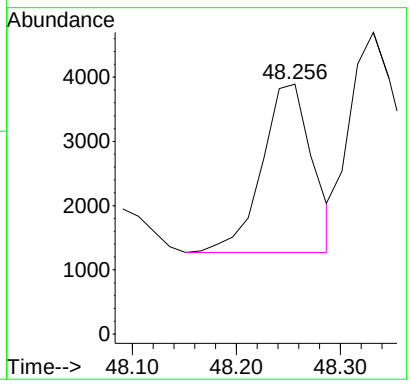
Tgt Ion:218 Resp: 8961

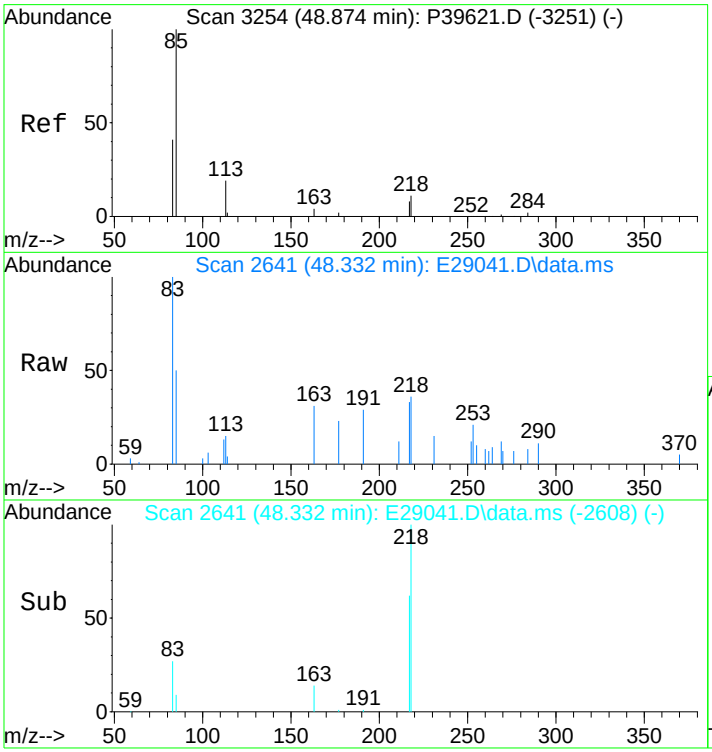




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 237.31 ng/ml
RT: 48.256 min Scan# 2636
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

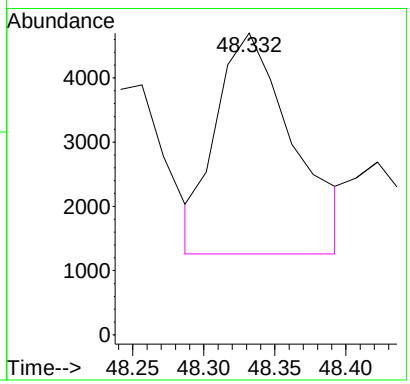
Tgt Ion:218 Resp: 8896

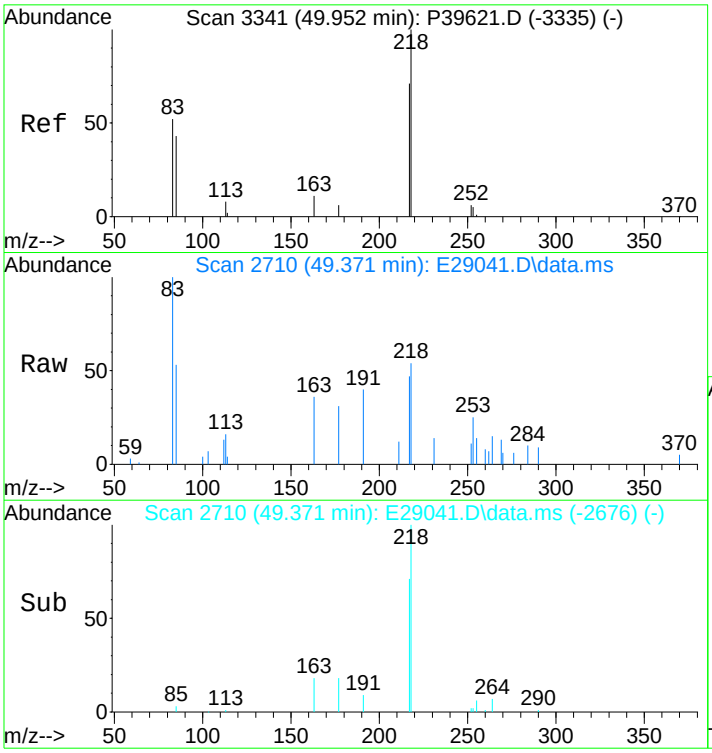




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 346.31 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

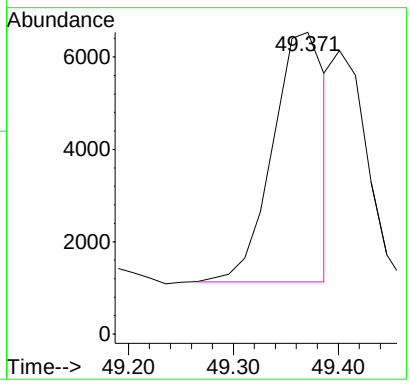
Tgt Ion:218 Resp: 12982

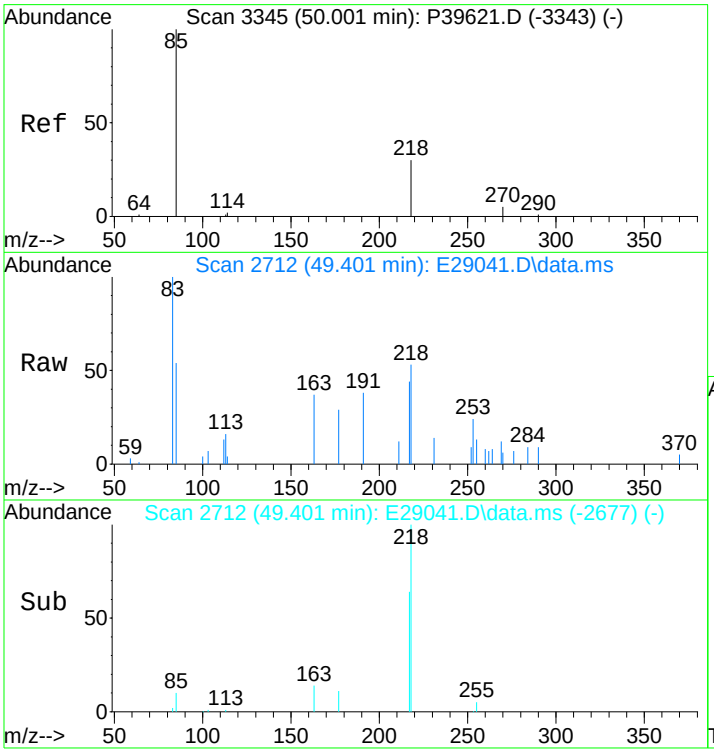




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 503.38 ng/ml m
RT: 49.371 min Scan# 2710
Delta R.T. 0.008 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

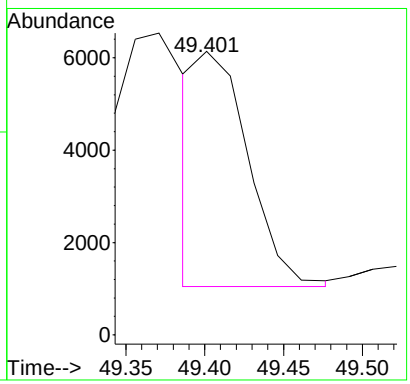
Tgt Ion:218 Resp: 18870

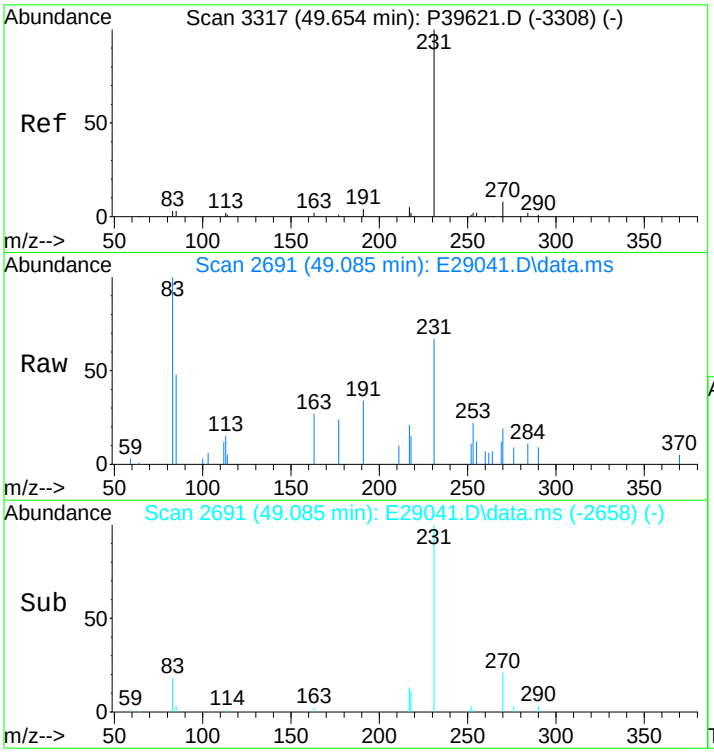




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 308.88 ng/ml m
RT: 49.401 min Scan# 2712
Delta R.T. 0.023 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

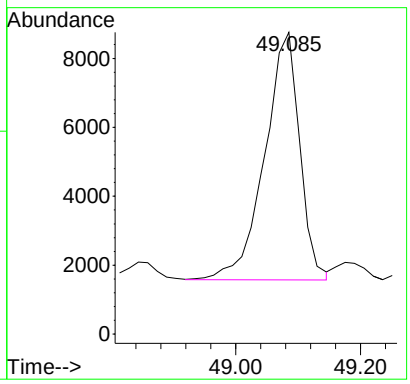
Tgt Ion:218 Resp: 11579

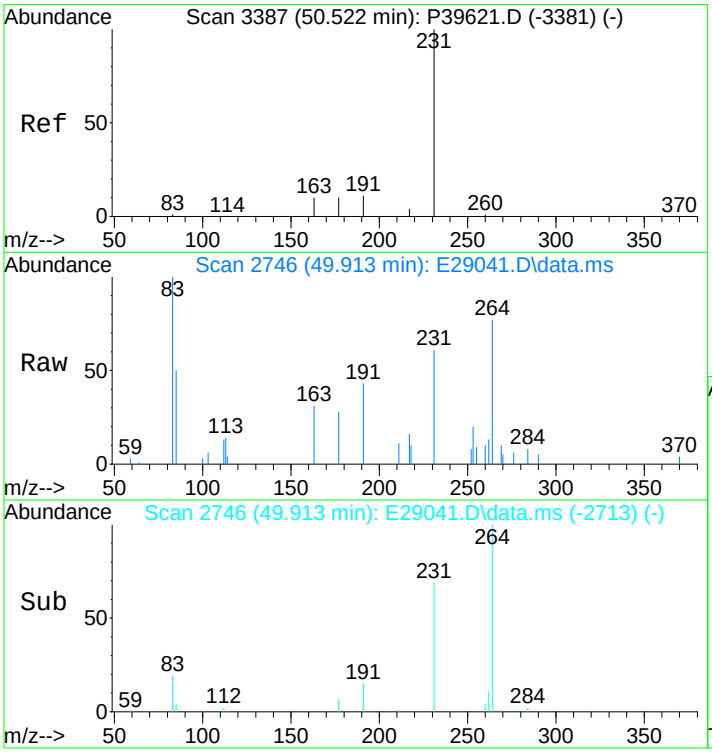




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 746.75 ng/mL
RT: 49.085 min Scan# 2691
Delta R.T. -0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

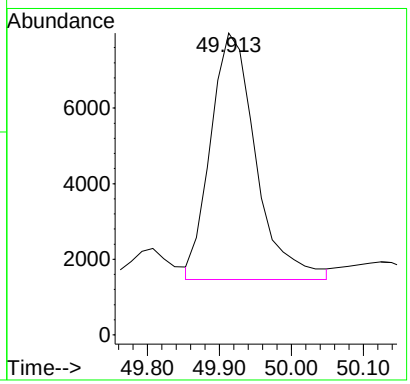
Tgt Ion:231 Resp: 27993

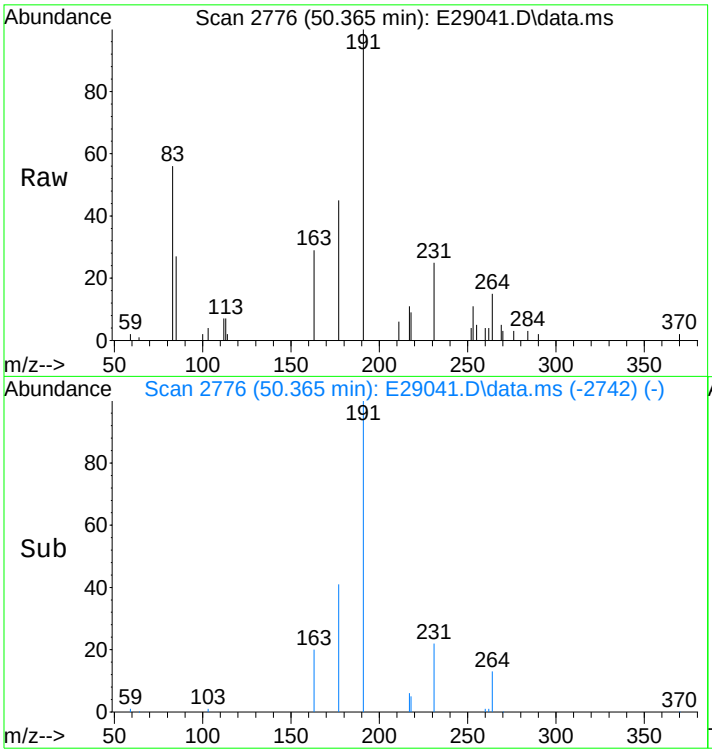




#148
C28,20S-triaromatic steroid
Concen: 761.66 ng/mL
RT: 49.913 min Scan# 2746
Delta R.T. -0.007 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

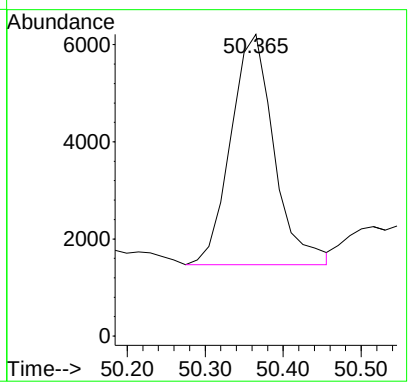
Tgt Ion:231 Resp: 28552

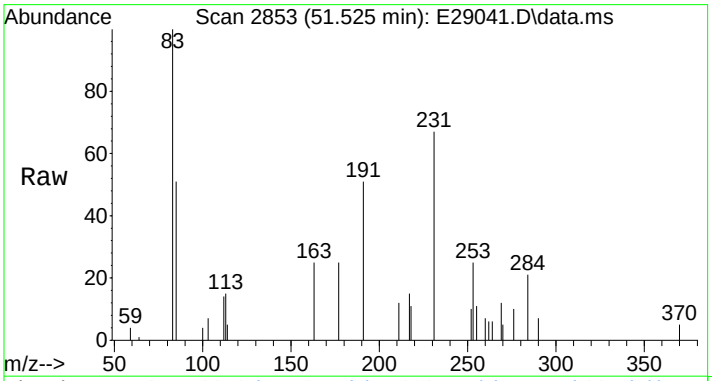




#149
C27,20R-triaromatic steroid
Concen: 490.34 ng/mL
RT: 50.365 min Scan# 2776
Delta R.T. 0.007 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

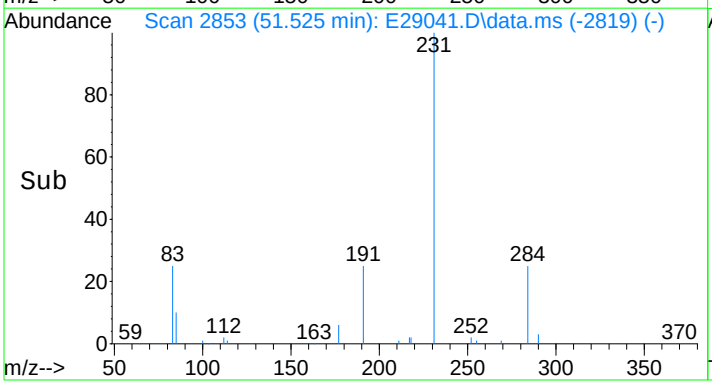
Tgt Ion:231 Resp: 18381

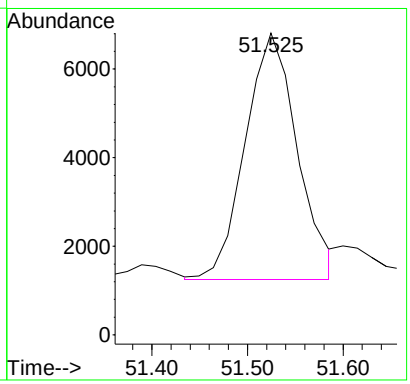




#150
C28,20R-triaromatic steroid
Concen: 561.16 ng/mL m
RT: 51.525 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29041.D
Acq: 17 Nov 2012 2:40 pm

Tgt Ion:231 Resp: 21036





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	37581M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	92294	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	44044	333.193	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 33.32%#			
42) Phenanthrene-d10	32.100	188	57067	421.375	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.14%#			
83) Benzo[b]fluoranthene-d12	46.705	264	80517	424.682	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.47%#			
88) Benzo[a]pyrene-d12	47.850	264	71279	388.008	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 38.80%#			
129) 5B(H)Cholane - Surr	43.377	217	16801	461.882	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.19%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	317M3	10.545	ng/mL	
5) C1-Decalins	17.814	152	883M5	29.373	ng/mL	
6) C2-Decalins	19.681	166	2956M5	98.332	ng/mL	
7) C3-Decalins	21.623	180	4893M5	162.767	ng/mL	
8) C4-Decalins	25.010	194	12028M5	400.115	ng/mL	
10) Naphthalene	19.304	128	17133	115.900	ng/mL#	100
11) C1-Naphthalenes	22.014	142	25188M5	170.390	ng/mL	
12) C2-Naphthalenes	24.859	156	74655M5	505.020	ng/mL	
13) C3-Naphthalenes	27.554	170	138503M5	936.933	ng/mL	
14) C4-Naphthalenes	29.993	184	127680M5	863.719	ng/mL	
16) 2-Methylnaphthalene	22.014	142	14384	152.775	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	10761M4	117.625	ng/mL	
18) Benzothiophene	19.530	134	592M3	4.844	ng/mL	
19) C1-Benzo(b)thiophenes	22.405	148	3158M5	25.842	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	11763M5	96.255	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	28960M5	236.976	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	34139M5	279.355	ng/mL	
23) Biphenyl	23.896	154	3671M4	30.851	ng/mL	
24) 2,6-Dimethylnaphthalene	24.513	156	16754	197.420	ng/mL#	100
25) Dibenzofuran	26.982	168	11416M4	86.657	ng/mL	
26) Acenaphthylene	25.597	152	37335	253.321	ng/mL#	100
27) Acenaphthene	26.335	153	12044	126.955	ng/mL	95
28) 2,3,5-Trimethylnaphthalen	27.900	170	8626M3	108.641	ng/mL	
29) Fluorene	28.367	166	21377M3	202.036	ng/mL	
30) C1-Fluorenes	30.746	180	32942M5	311.338	ng/mL	
31) C2-Fluorenes	32.958	194	57282M5	541.378	ng/mL	
32) C3-Fluorenes	34.795	208	76131M5	719.521	ng/mL	
33) Dibenzothiophene	31.694	184	37112	255.596	ng/mL#	78
34) 4-Methyldibenzothiophene(	33.485	198	32405	223.178	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.832	198	28400M3	195.595	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	15918	109.630	ng/mL#	100
37) OTP	33.862	198	4902M3	33.761	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	88971M5	612.757	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	84069m	578.996	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	165578M5	1140.361	ng/mL	
40) C3-Dibenzothiophenes	36.993	226	203723M5	1403.072	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	144058M5	992.150	ng/mL	
43) Phenanthrene	32.191	178	296182	2004.984	ng/mL	99
44) 3-Methylphenanthrene(3MP)	34.163	192	51362	347.692	ng/mL	99

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	57159	386.934	ng/mL	96
46) 2-Methylanthracene(2MA)	34.449	192	18737	126.839	ng/mL#	40
47) 9/4-Methylphenanthrene(9M	34.615	192	69307M3	469.169	ng/mL	
48) 1-Methylphenanthrene(1MP)	34.720	192	40960M3	277.276	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	243113M5	1645.737	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	263192M5	1781.660	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	263192m	1781.660	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.303	220	207455M5	1404.353	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	109482M5	741.131	ng/mL	
55) Anthracene	32.386	178	64308M3	503.647	ng/mL	
56) Carbazole	33.064	167	25933	197.344	ng/mL	98
57) 1-Methylphenanthrene	34.720	192	41302M3	366.476	ng/mL	
58) Fluoranthene	36.993	202	812204M4	4978.643	ng/mL	
59) Benzo(b)fluorene	39.538	216	68886M3	633.685	ng/mL	
60) Pyrene	37.882	202	817743	4931.642	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.297	216	538054M5	3244.895	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.360	230	302773M5	1825.963	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	181878M5	1096.869	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.567	258	157682M5	950.948	ng/mL	
66) Naphthobenzothiophene	41.766	234	87653	535.965	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	87653	535.965	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.098	234	19717	120.562	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.399	234	22803M3	139.432	ng/mL	
70) C1-Naphthobenzothiophenes	43.167	248	147858M5	904.096	ng/ml	
71) C2-Naphthobenzothiophenes	45.229	262	170322M5	1041.455	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	149301M5	912.920	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	110083M5	673.116	ng/mL	
75) Benz[a]anthracene	42.700	228	441568M3	2456.910	ng/mL	
77) Chrysene/Triphenylene	42.865	228	536507	2899.565	ng/mL	99
78) C1-Chrysenes	44.356	242	295350M5	1596.226	ng/mL	
79) C2-Chrysenes	46.073	256	193645M5	1046.559	ng/mL	
79) C2-Chrysenes BS	46.073	256	191006m	1032.296	ng/mL	
80) BBF-D12 Surr BKGD	46.690	256	2639	14.263	ng/mL	100
81) C3-Chrysenes	47.654	270	173571M5	938.068	ng/mL	
82) C4-Chrysenes	49.190	284	91559M5	494.833	ng/mL	
84) Benzo[b]fluoranthene	46.780	252	560919	2685.100	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	519452M3	2416.928	ng/mL	
86) Benzo[a]fluoranthene	47.157	252	114146M3	531.103	ng/mL	
87) Benzo[e]pyrene	47.759	252	431565M4	2115.763	ng/mL	
89) Benzo[a]pyrene	47.940	252	556660	2852.059	ng/mL	96
90) Perylene	48.241	252	204992	993.230	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.654	276	471074M3	2050.821	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.684	278	121671M4	497.467	ng/mL	
93) Benzo[g,h,i]perylene	53.919	276	480852	1941.475	ng/mL	100
94) Hopane (T19)	51.705	191	108018	1559.478	ng/mL#	83
96) C23 Tricyclic Terpane (T4	40.381	191	22963M4	331.522	ng/ml	
97) C24 Tricyclic Terpane (T5	41.119	191	14521M3	209.643	ng/ml	
98) C25 Tricyclic Terpane (T6	42.655	191	18664M3	269.456	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	7055M3	101.854	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6335M3	91.460	ng/ml	
101) C26 Tricyclic Terpane-22R	43.769	191	5670M3	81.859	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	5932M3	85.642	ng/ml	
103) C28 Tricyclic Terpane-22R	46.253	191	8227M3	118.775	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	7619	109.997	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	7295M3	105.319	ng/ml	
106) 18a-22,29,30-Trisnorneoho	48.030	191	15691M3	226.534	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.151	191	7039M3	101.624	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	10503	151.634	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.558	191	26987M3	389.617	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	11494	165.941	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.537	191	11834M4	170.850	ng/ml	
112) 30-Norhopane (T15)	50.380	191	74393	1074.027	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.470	191	19079M3	275.447	ng/ml	
114) 17a(H)-Diahopane (X)	50.606	191	6172M3	89.106	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11319	163.415	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.525	191	5878	84.862	ng/ml	100
117) Moretane (T20)	52.368	191	16491M3	238.084	ng/ml	
118) 30-Homohopane-22S (T21)	53.437	191	39981M3	577.214	ng/ml	
119) 30-Homohopane-22R (T22)	53.663	191	35949	519.003	ng/ml	100
120) Gammacerane/C32-diahopane	54.190	191	13808M3	199.349	ng/mL	
121) 30,31-Bishomohopane-22S (	54.913	191G	80134M3	1156.911	ng/ml	
122) 30,31-Bishomohopane-22R (	55.334	191	23865	344.544	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	26563	383.496	ng/ml	100
124) 30,31-Trishomohopane-22R	57.608	191	12330	178.011	ng/ml	100
125) Tetrakishomohopane-22S (T	59.596	191	23019M3	332.330	ng/ml	
126) Tetrakishomohopane-22R (T	60.379	191G	64158	926.262	ng/ml	100
127) Pentakishomohopane-22S (T	62.608	191	15033	217.035	ng/ml	100
128) Pentakishomohopane-22R (T	63.857	191	9032	130.397	ng/ml	100
130) 13b(H),17a(H)-20S-Diachol	44.898	217	7828M3	215.202	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.320	217	3988M3	109.635	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	4916M3	135.147	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.886	217	15945	438.349	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.398	217	16115	443.023	ng/ml	100
135) Unknown Sterane (S18)	47.669	217	3552	97.649	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.940	217	719	19.766	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.076	217	7464M3	205.195	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6932M3	190.570	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	10514M3	289.044	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	11235M3	308.865	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.976	218	8674M3	238.460	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	8975M3	246.735	ng/ml	
143) 14b,17b-20R-Methylcholest	48.241	218	9222	253.525	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	13252M3	364.315	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.356	218	19140M3	526.184	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.401	218	11970M3	329.071	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	30057	826.307	ng/mL	100
148) C28,20S-triaromatic stero	49.913	231	29402M3	808.300	ng/mL	
149) C27,20R-triaromatic stero	50.365	231	19413M3	533.689	ng/mL	
150) C28,20R-triaromatic stero	51.525	231	23165M3	636.836	ng/mL	

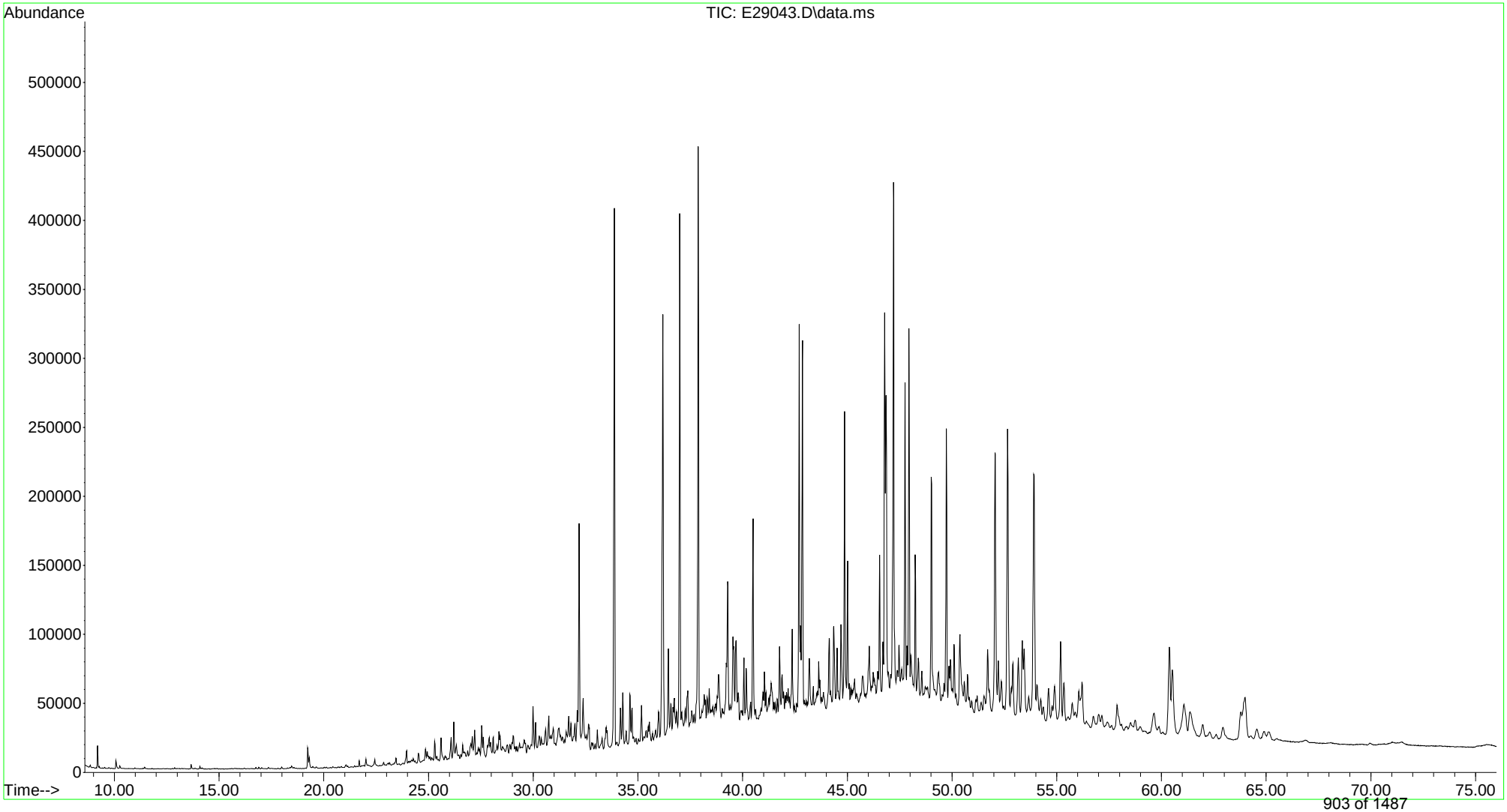
(#) = qualifier out of range (m) = manual integration (+) = signals summed

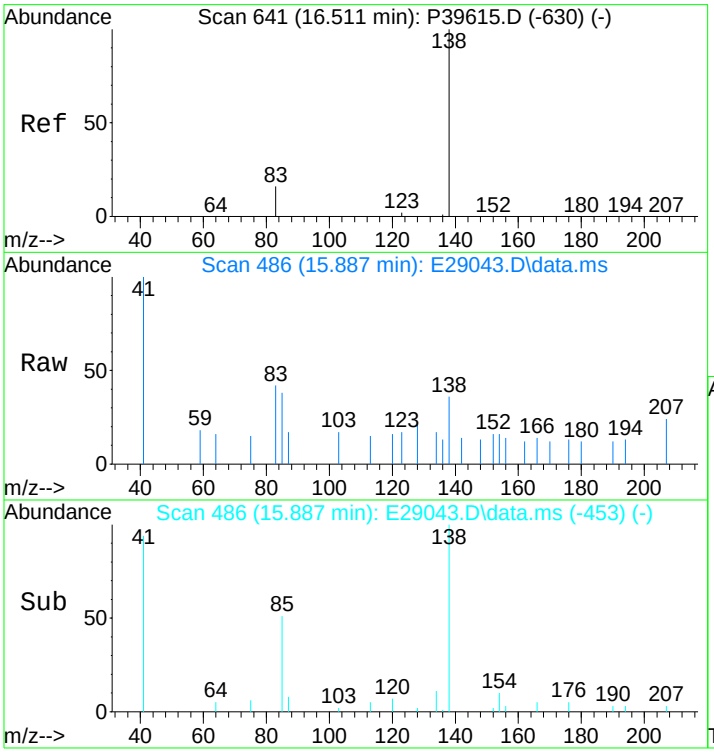
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29043.D
Acq On : 17 Nov 2012 4:09 pm
Operator : AC
Sample : 1210083-05
Misc : 1X
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 19 10:07:48 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

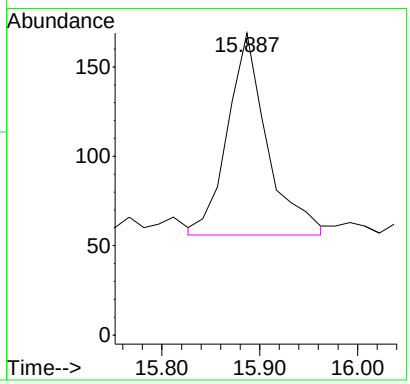
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

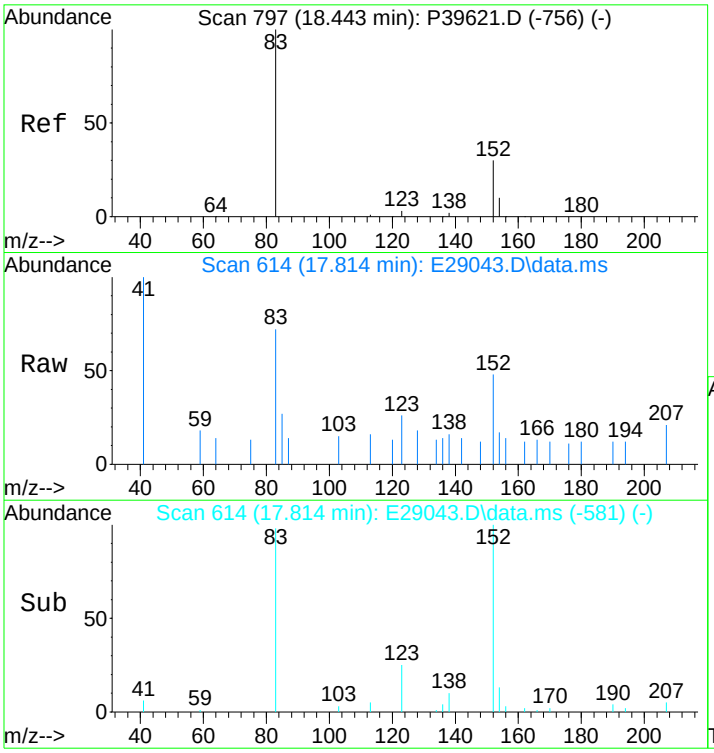




#3
trans-Decalin
Concen: 10.55 ng/mL m
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

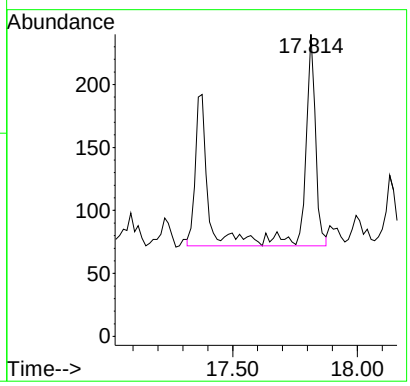
Tgt Ion:138 Resp: 317

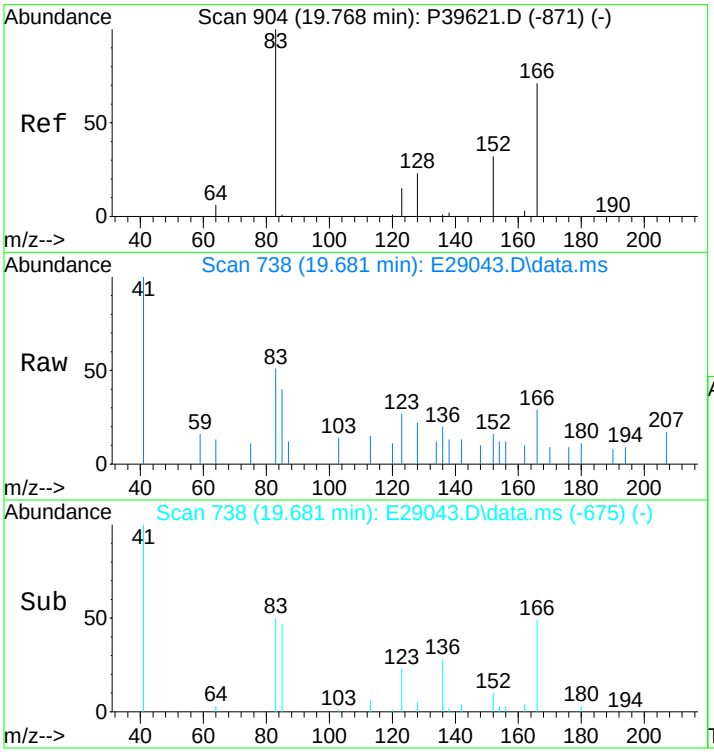




#5
C1-Decalins
Concen: 29.37 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

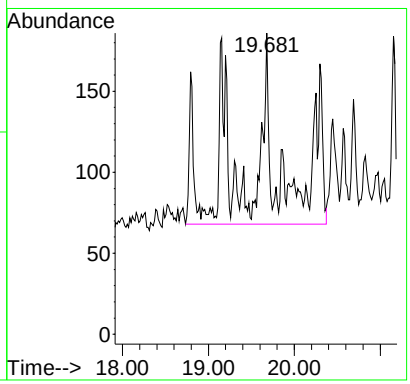
Tgt Ion:152 Resp: 883

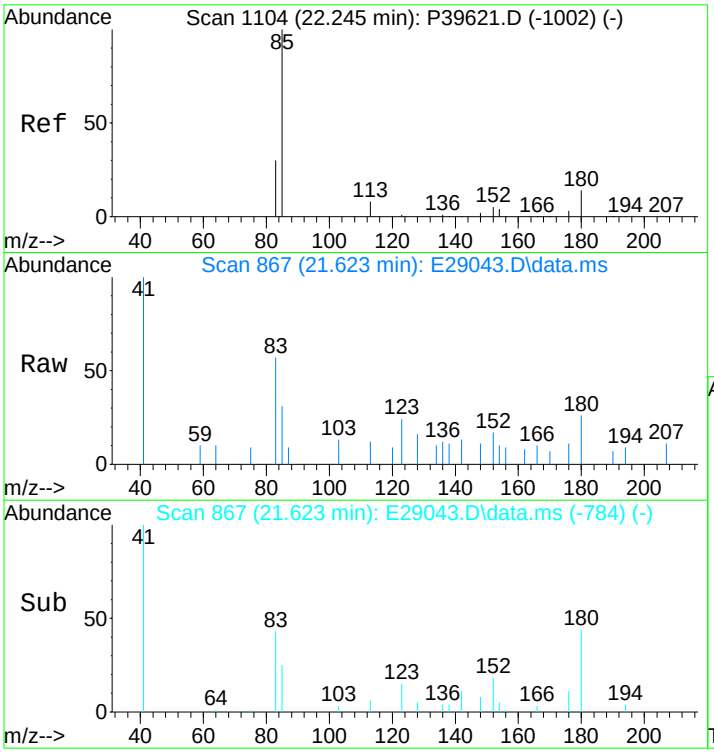




#6
C2-Decalins
Concen: 98.33 ng/mL m
RT: 19.681 min Scan# 738
Delta R.T. 0.327 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

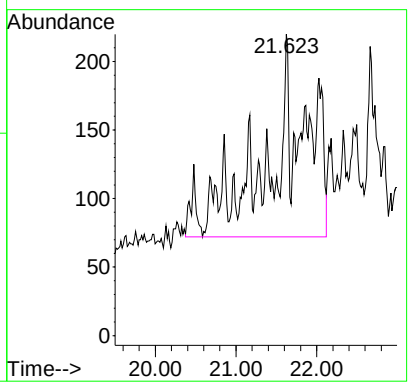
Tgt Ion:166 Resp: 2956

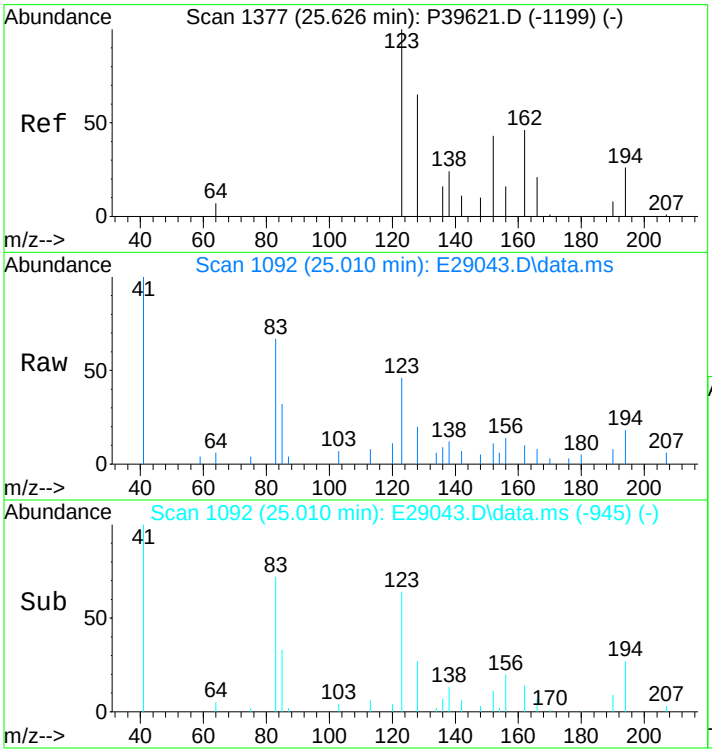




#7
C3-Decalins
Concen: 162.77 ng/mL m
RT: 21.623 min Scan# 867
Delta R.T. -0.135 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

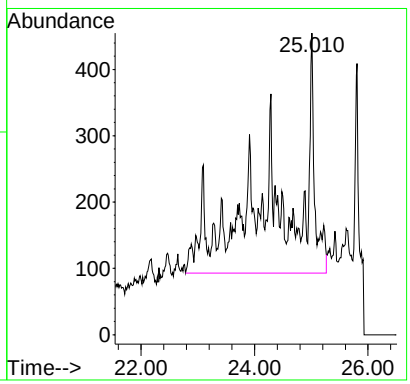
Tgt Ion:180 Resp: 4893

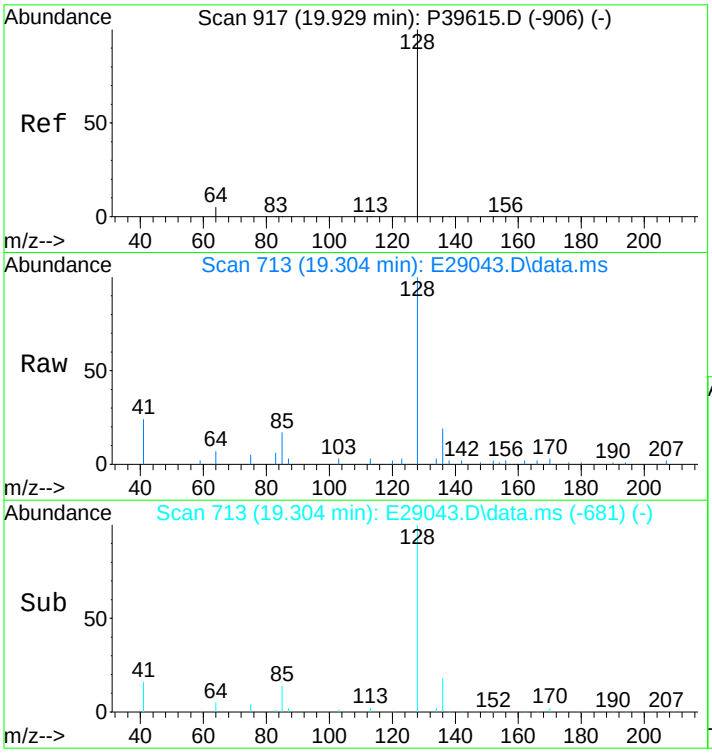




#8
C4-Decalins
Concen: 400.12 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.060 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:194 Resp: 12028

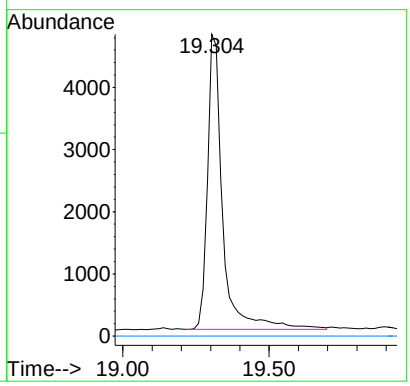


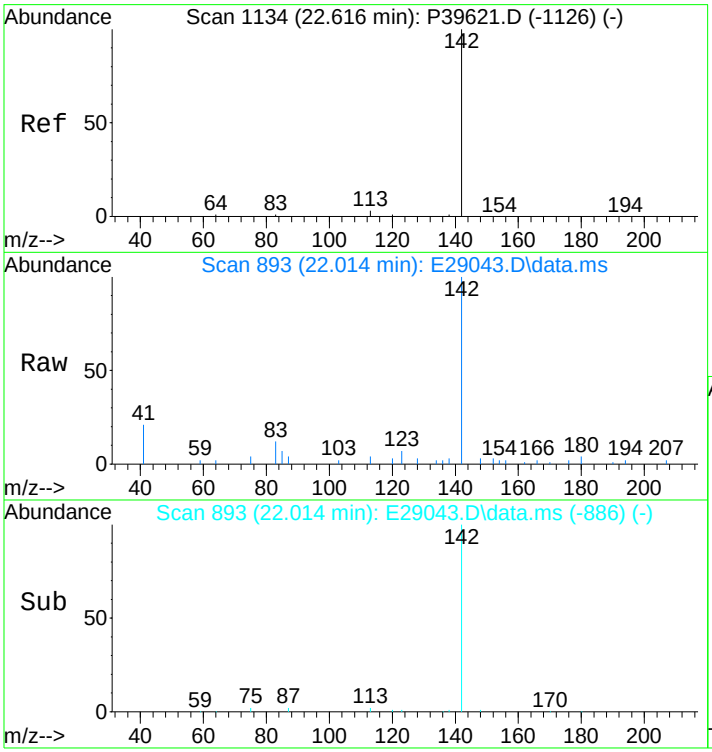


#10
Naphthalene
Concen: 115.90 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:128 Resp: 17133

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

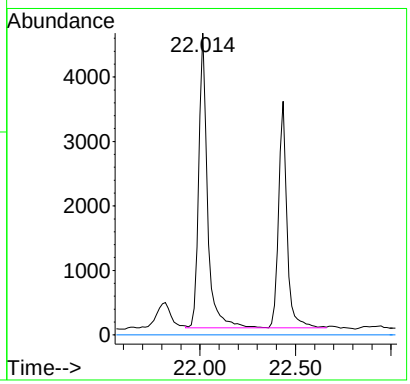


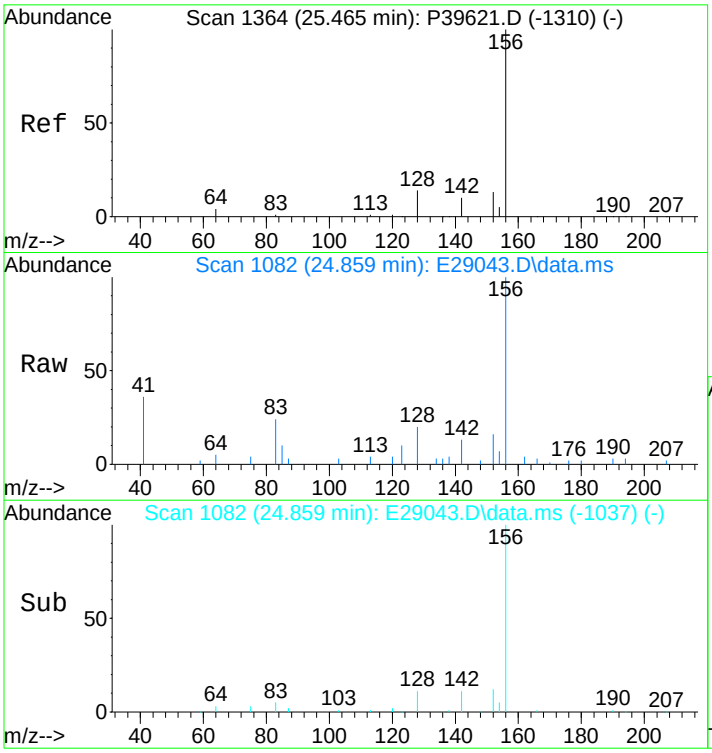


#11
C1-Naphthalenes
Concen: 170.39 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:142 Resp: 25188

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

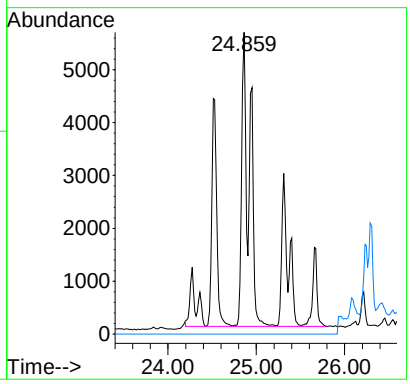


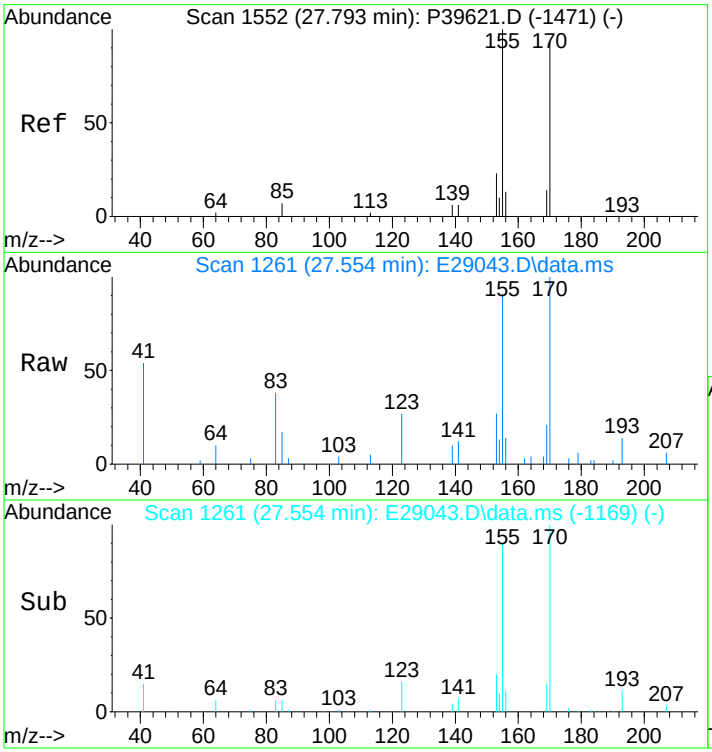


#12
C2-Naphthalenes
Concen: 505.02 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:156 Resp: 74655

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

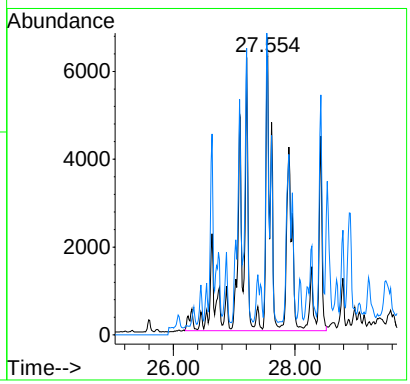


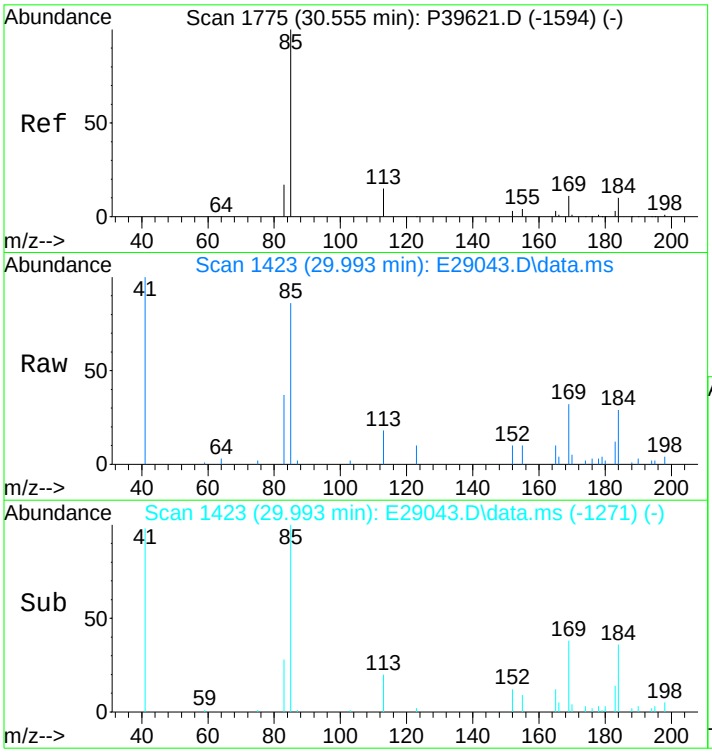


#13
C3-Naphthalenes
Concen: 936.93 ng/mL m
RT: 27.554 min Scan# 1261
Delta R.T. 0.359 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:170 Resp: 138503

Ion	Ratio	Lower	Upper
170	100		
155	14.3	66.8	100.2#

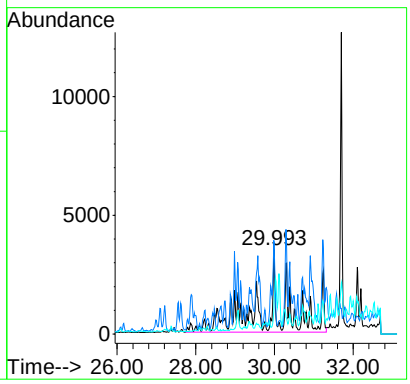


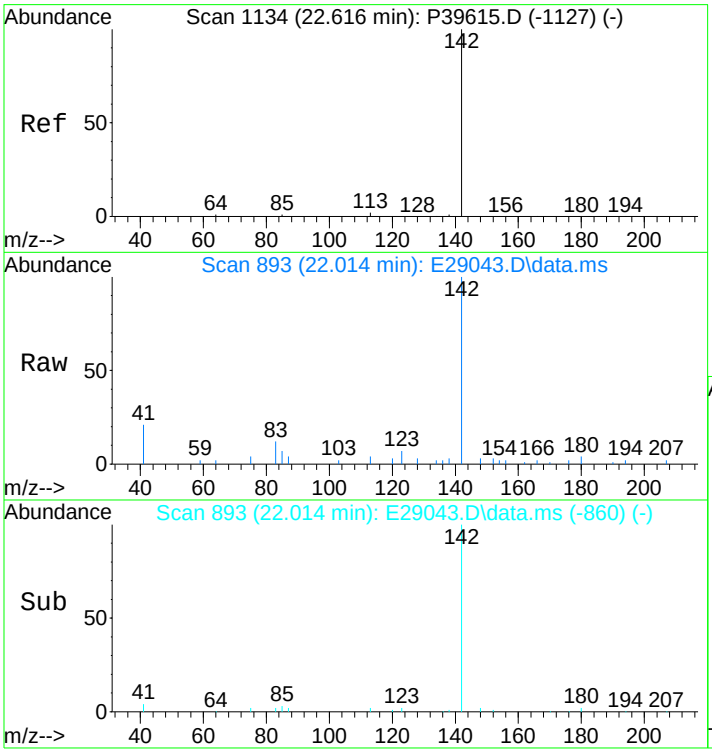


#14
C4-Naphthalenes
Concen: 863.72 ng/mL m
RT: 29.993 min Scan# 1423
Delta R.T. 0.100 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:184 Resp: 127680

Ion	Ratio	Lower	Upper
184	100		
169	4.4	78.7	118.1#
183	1.2	26.7	40.1#

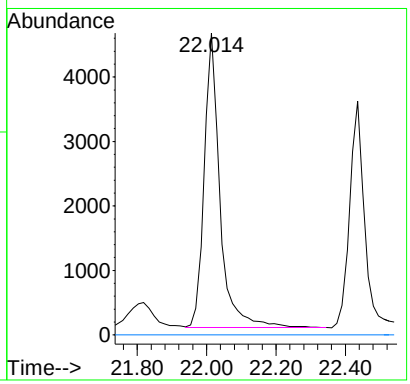


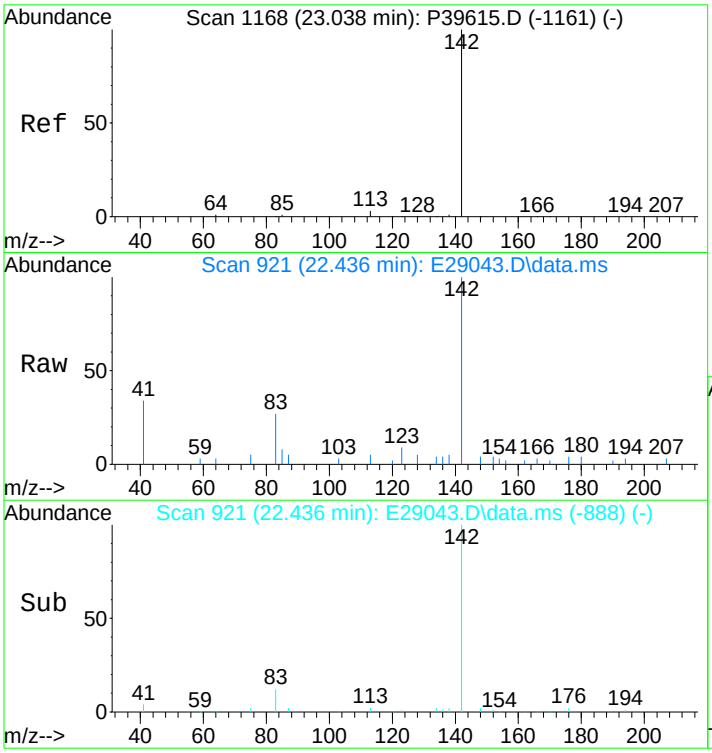


#16
2-Methylnaphthalene
Concen: 152.77 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:142 Resp: 14384

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

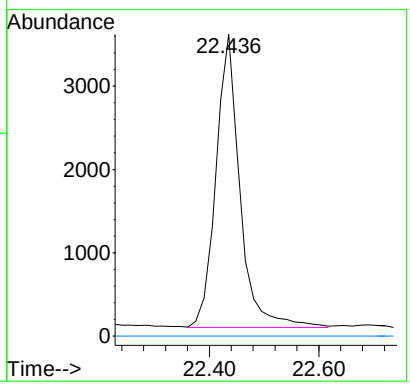


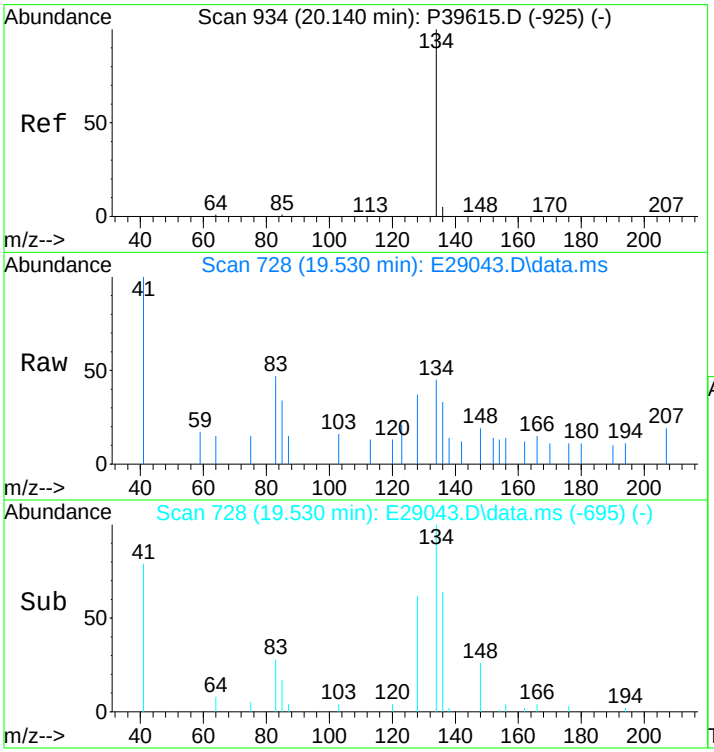


#17
1-Methylnaphthalene
Concen: 117.62 ng/mL m
RT: 22.436 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:142 Resp: 10761

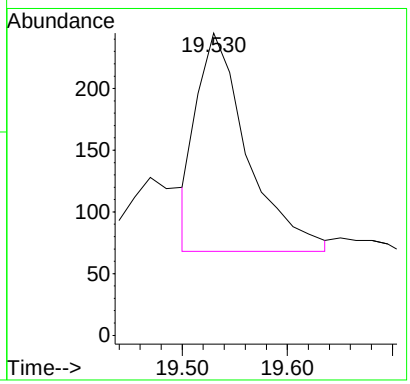
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

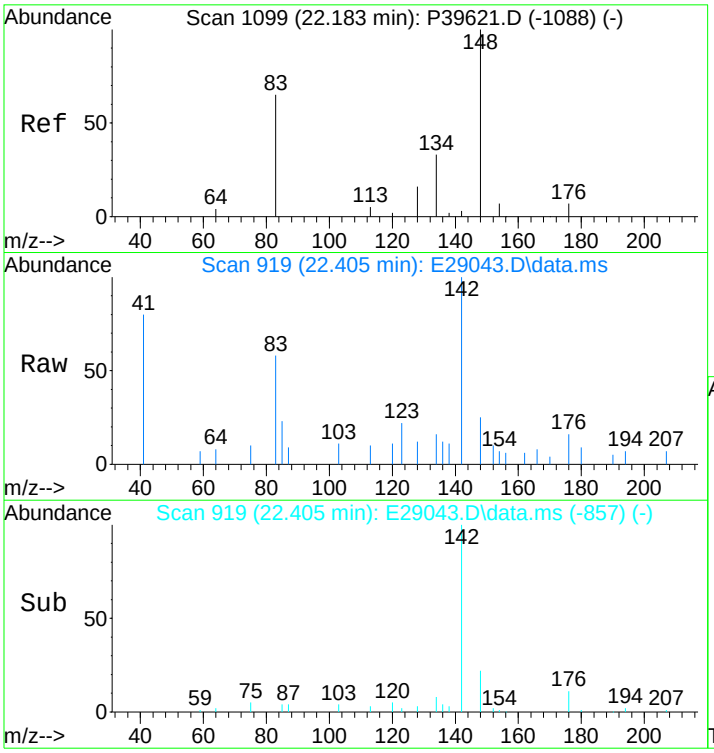




#18
Benzothiophene
Concen: 4.84 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

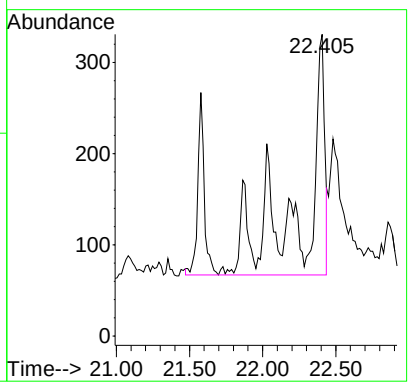
Tgt Ion:134 Resp: 592

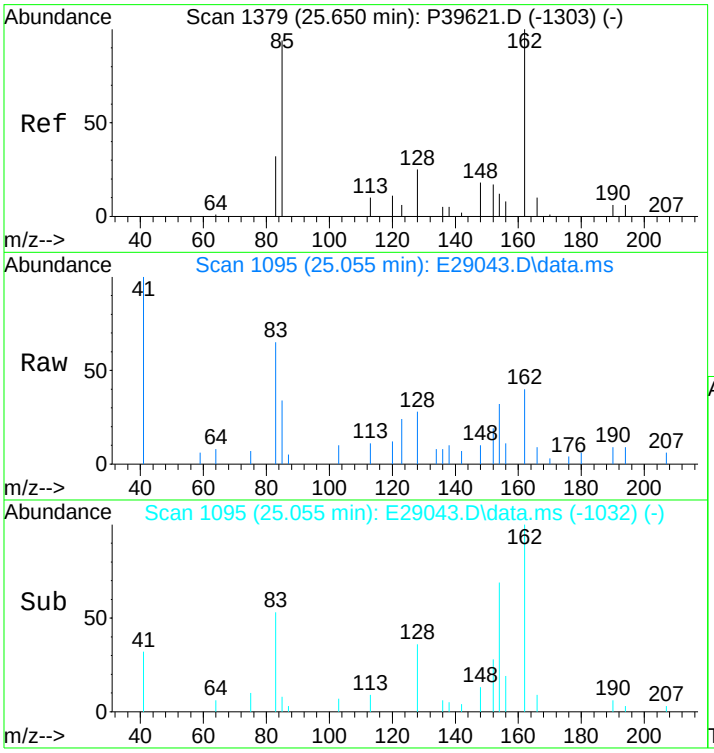




#19
C1-Benzo(b)thiophenes
Concen: 25.84 ng/mL m
RT: 22.405 min Scan# 919
Delta R.T. 0.692 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

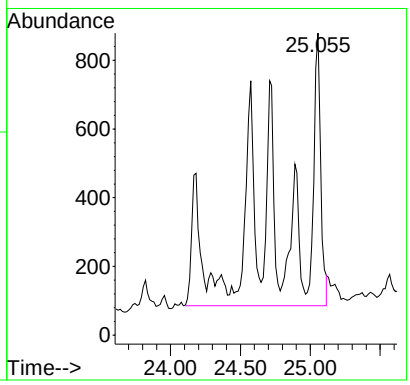
Tgt Ion:148 Resp: 3158

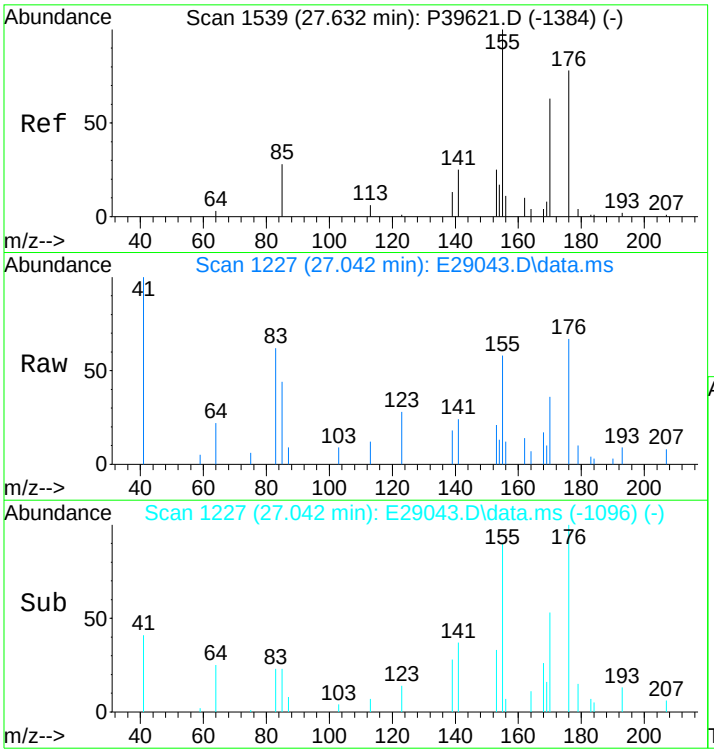




#20
C2-Benzo(b)thiophenes
Concen: 96.26 ng/mL m
RT: 25.055 min Scan# 1095
Delta R.T. -0.044 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

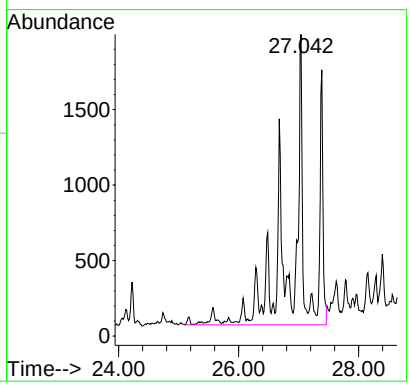
Tgt Ion:162 Resp: 11763

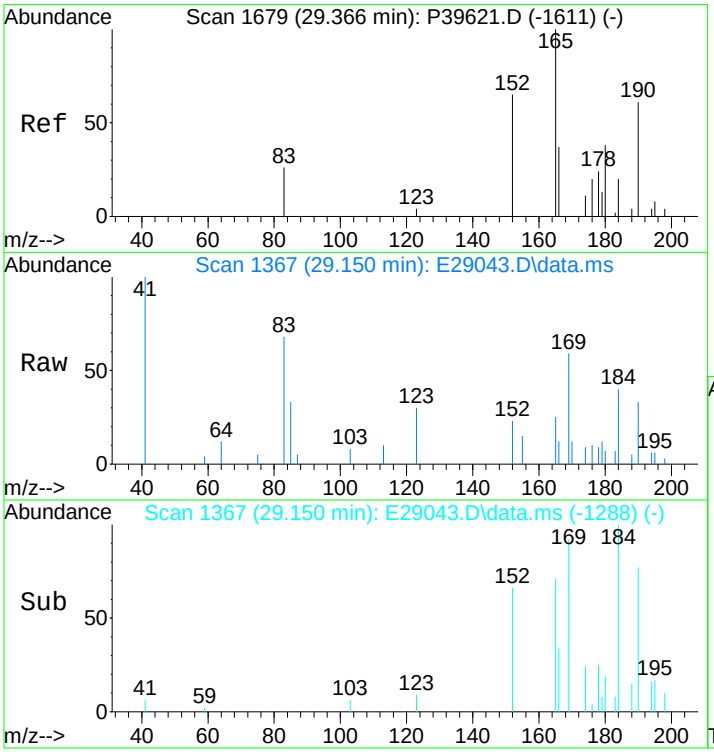




#21
C3-Benzo(b)thiophenes
Concen: 236.98 ng/mL m
RT: 27.042 min Scan# 1227
Delta R.T. 0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

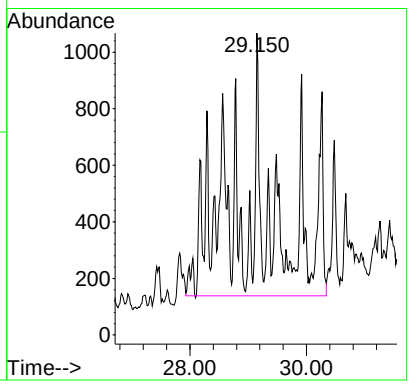
Tgt Ion:176 Resp: 28960

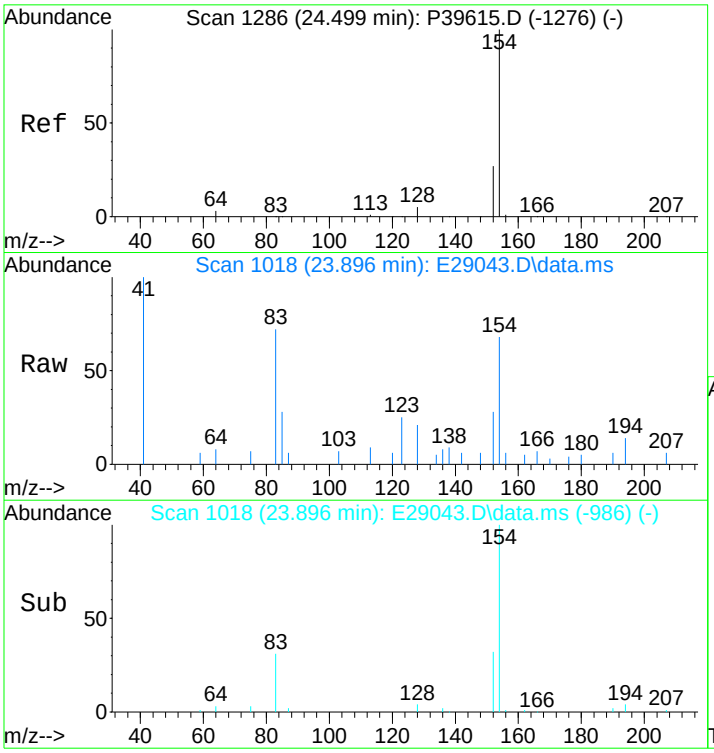




#22
C4-Benzo(b)thiophenes
Concen: 279.36 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:190 Resp: 34139

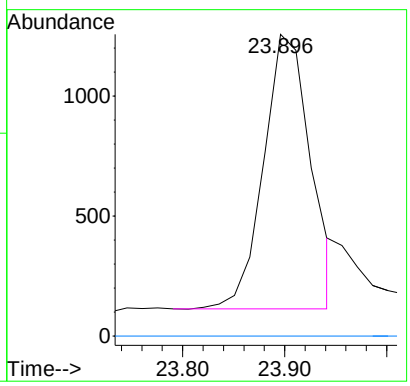


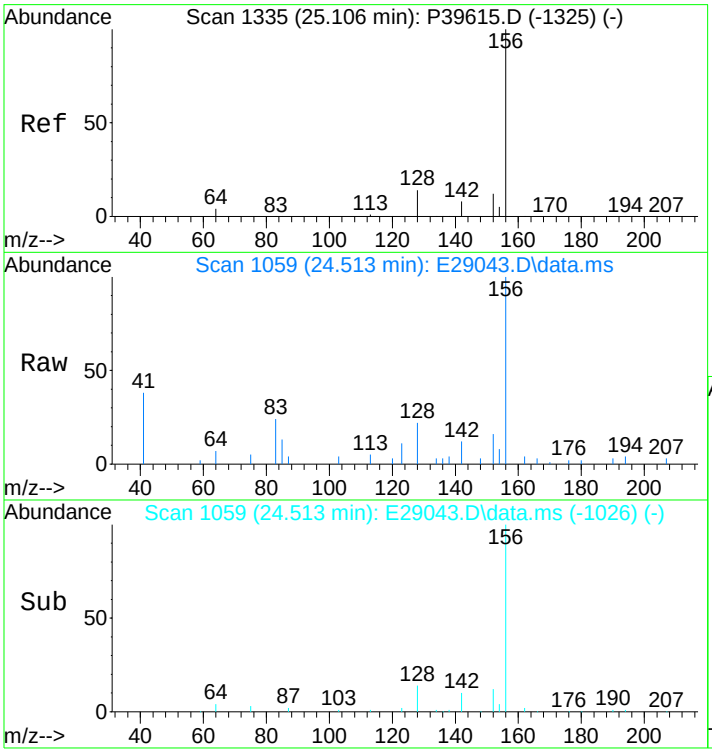


#23
Biphenyl
Concen: 30.85 ng/mL m
RT: 23.896 min Scan# 1018
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:154 Resp: 3671

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

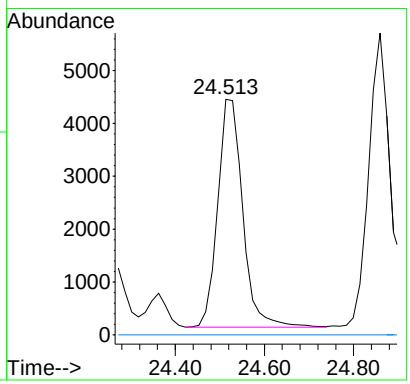


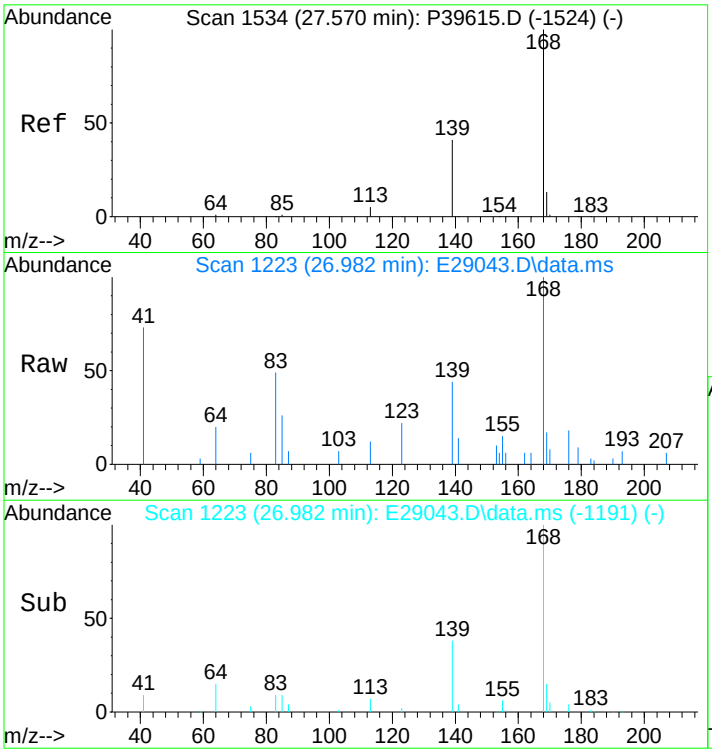


#24
2,6-Dimethylnaphthalene
Concen: 197.42 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:156 Resp: 16754

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

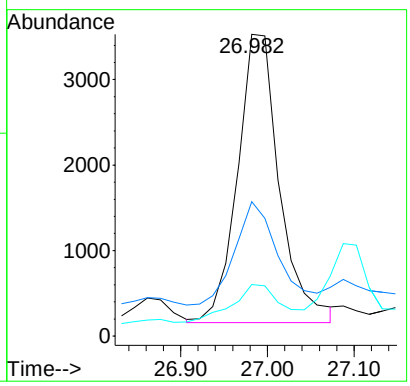


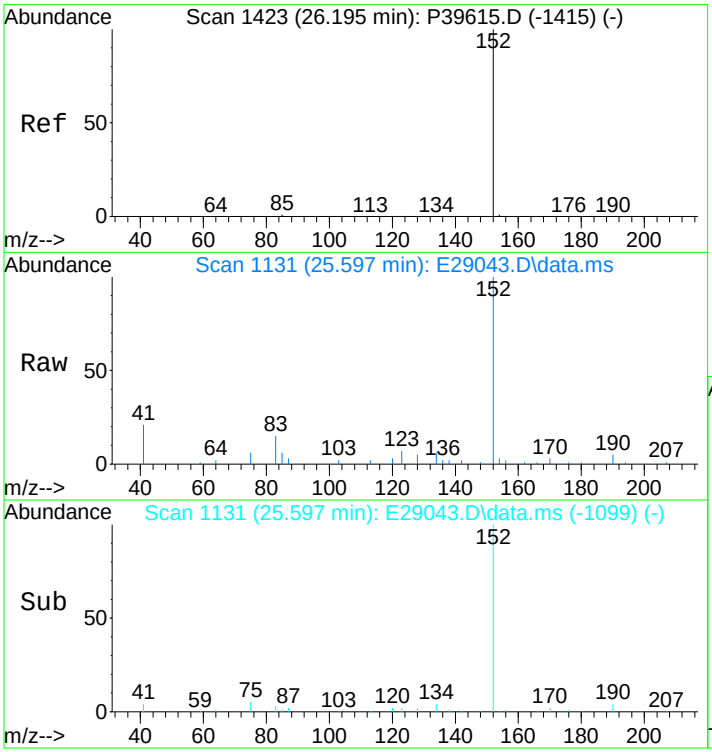


#25
Dibenzofuran
Concen: 86.66 ng/mL m
RT: 26.982 min Scan# 1223
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:168 Resp: 11416

Ion	Ratio	Lower	Upper
168	100		
139	36.8	26.9	40.3
169	17.2	10.7	16.1#

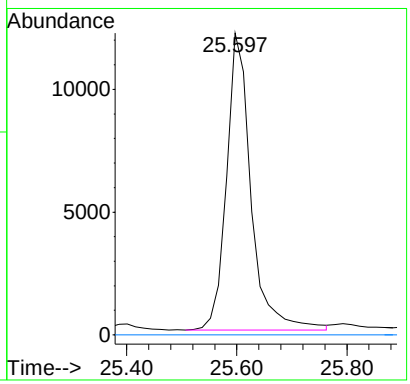


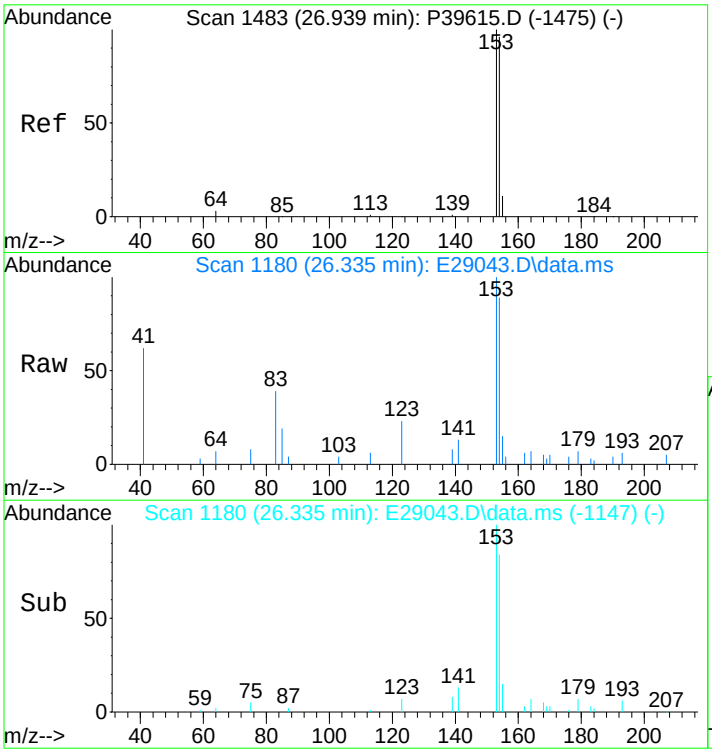


#26
Acenaphthylene
Concen: 253.32 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:152 Resp: 37335

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

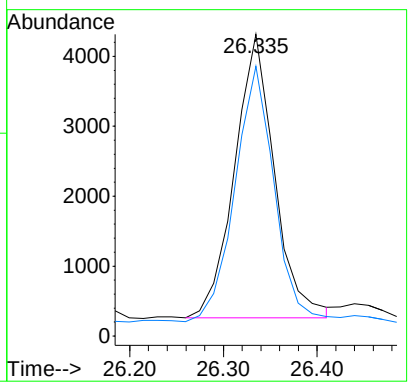


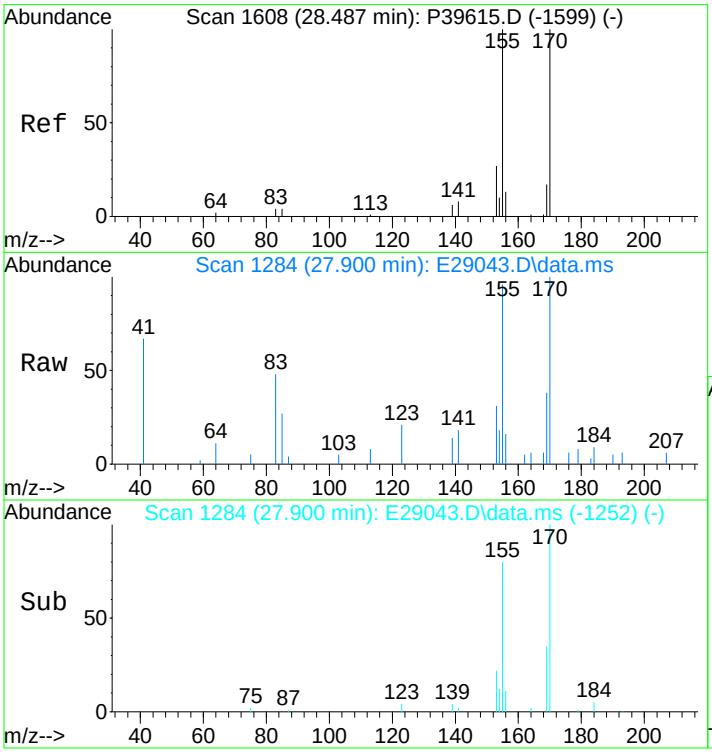


#27
Acenaphthene
Concen: 126.95 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:153 Resp: 12044

Ion	Ratio	Lower	Upper
153	100		
154	95.7	73.0	109.4

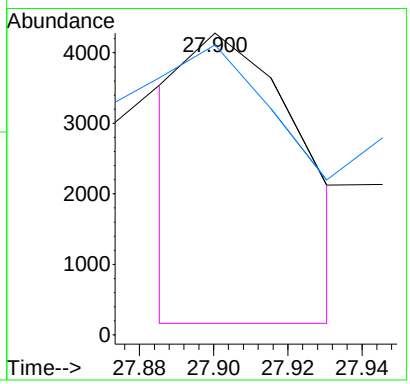


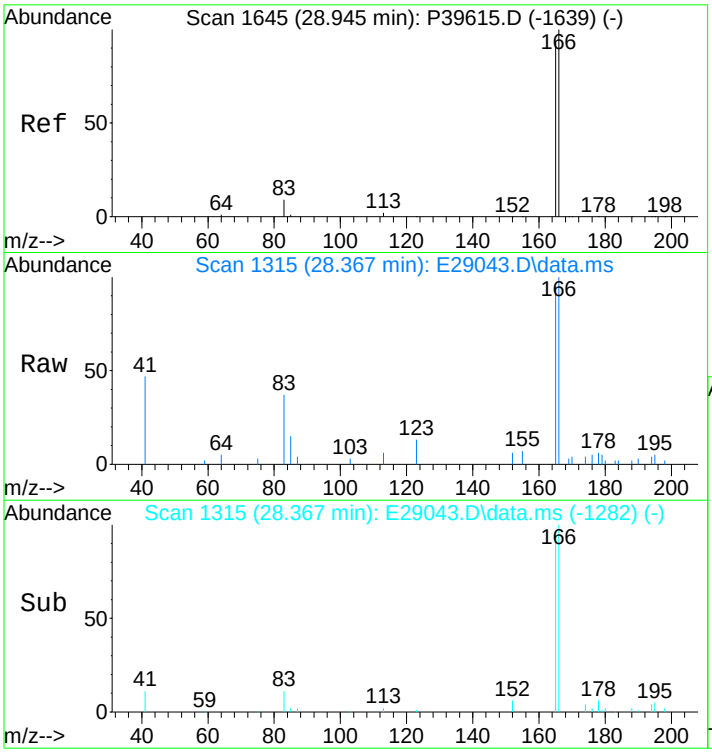


#28
2,3,5-Trimethylnaphthalene
Concen: 108.64 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:170 Resp: 8626

Ion	Ratio	Lower	Upper
170	100		
155	190.3	69.8	104.6#

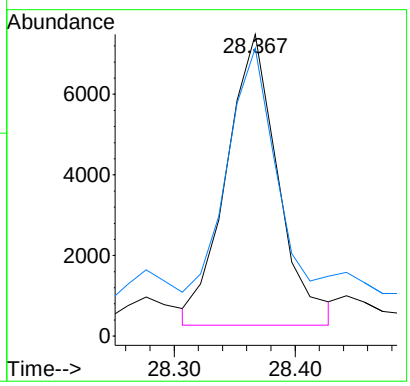


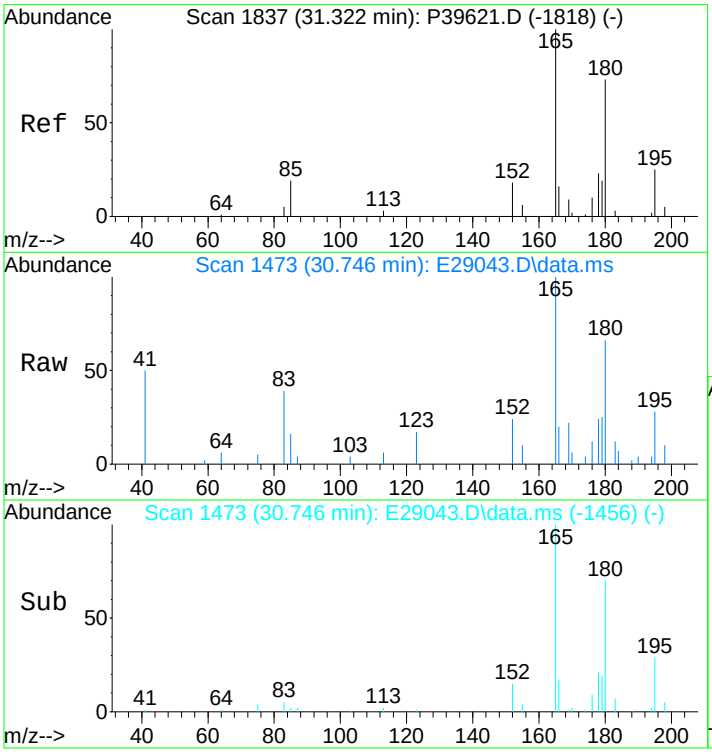


#29
Fluorene
Concen: 202.04 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:166 Resp: 21377

Ion	Ratio	Lower	Upper
166	100		
165	114.9	74.4	111.6#

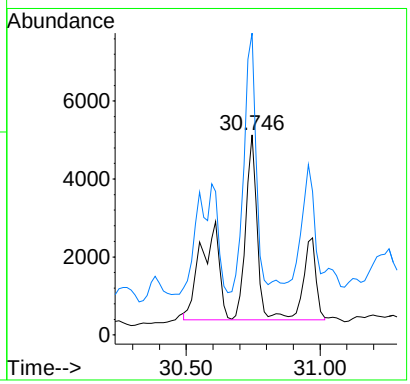


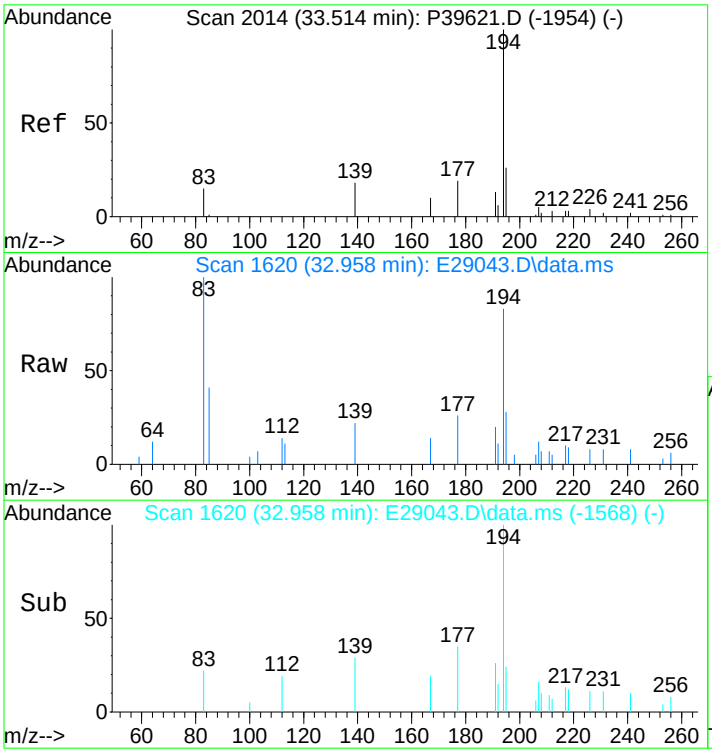


#30
C1-Fluorenes
Concen: 311.34 ng/mL m
RT: 30.746 min Scan# 1473
Delta R.T. 0.106 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:180 Resp: 32942

Ion	Ratio	Lower	Upper
180	100		
165	0.0	94.3	141.5#

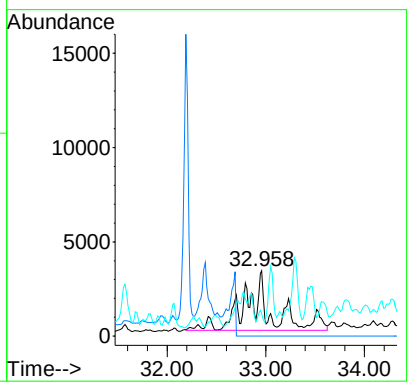


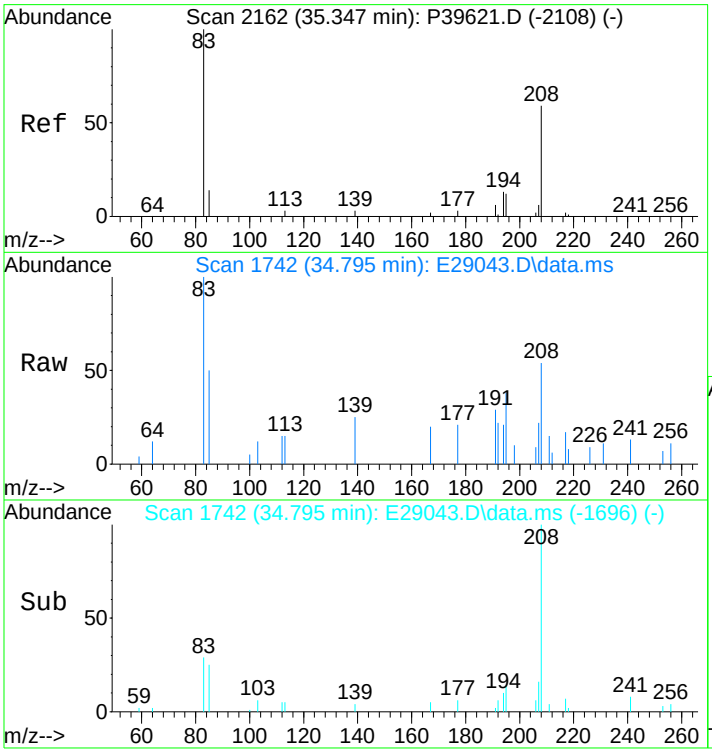


#31
C2-Fluorenes
Concen: 541.38 ng/mL m
RT: 32.958 min Scan# 1620
Delta R.T. 0.178 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:194 Resp: 57282

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	23.0	27.0	40.4#

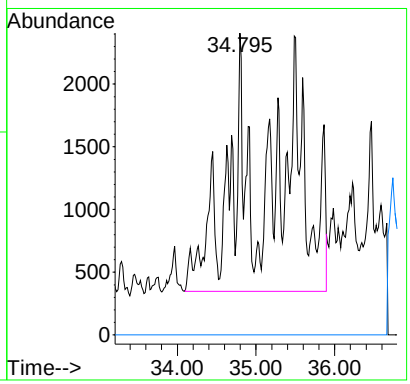


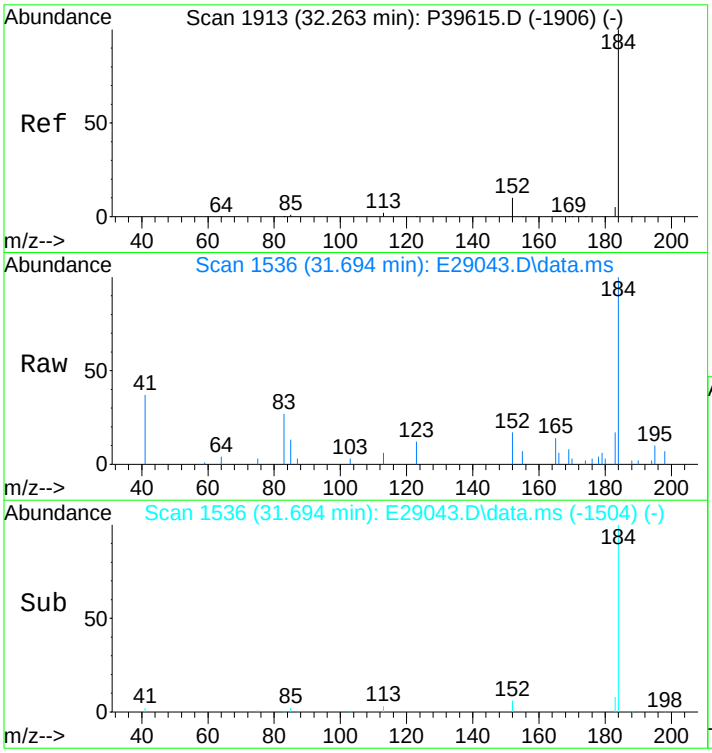


#32
C3-Fluorenes
Concen: 719.52 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.226 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:208 Resp: 76131

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

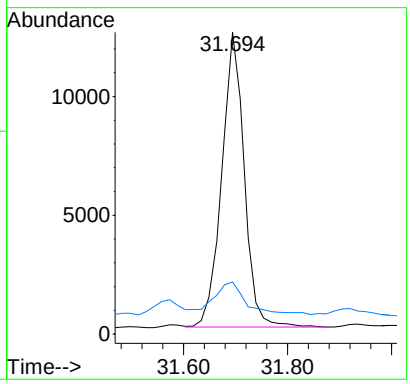


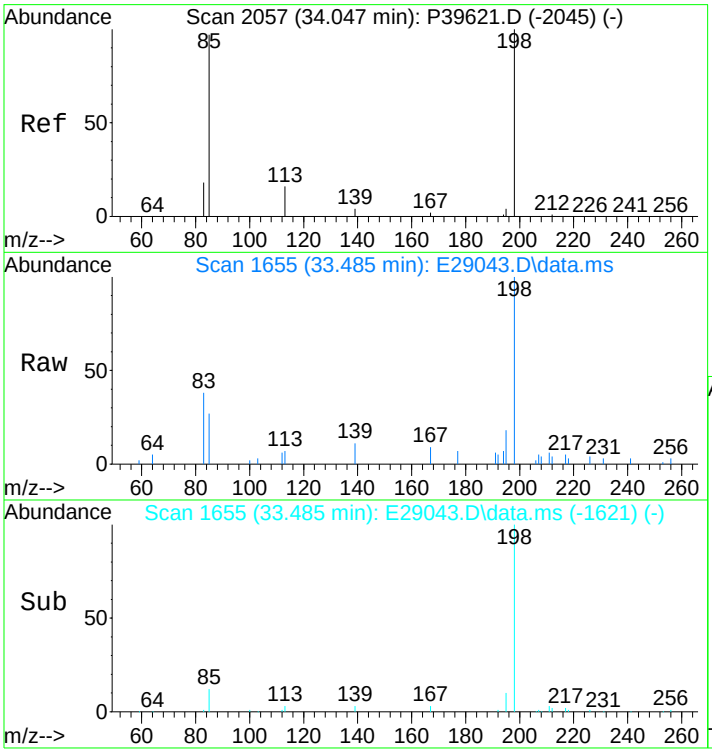


#33
Dibenzothiophene
Concen: 255.60 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:184 Resp: 37112

Ion	Ratio	Lower	Upper
184	100		
152	15.2	6.0	9.0#

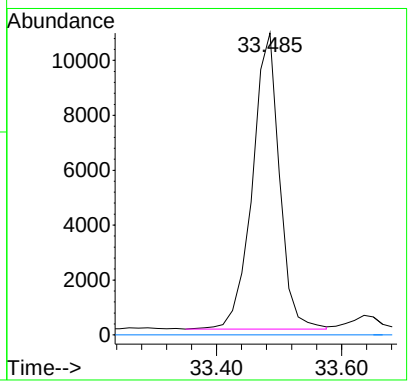


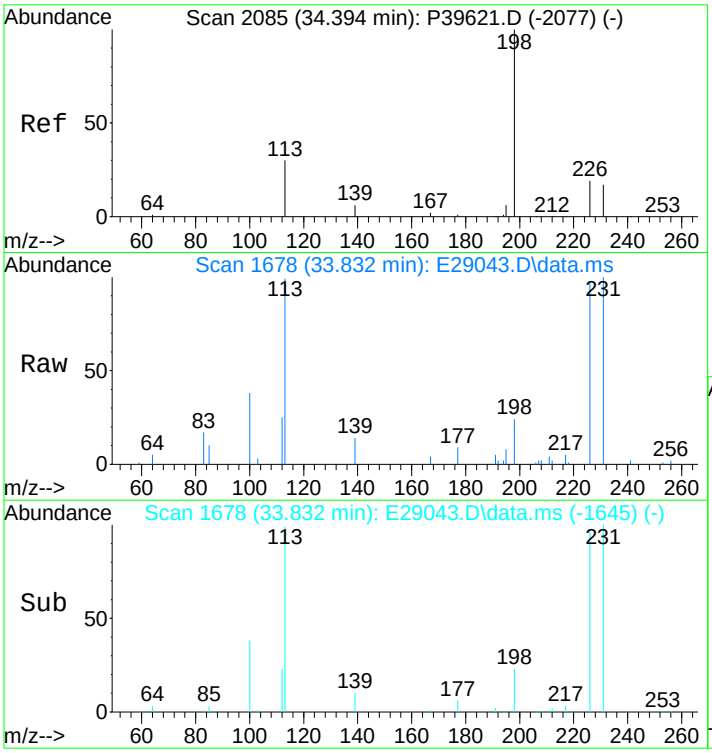


#34
4-Methyldibenzothiophene(4MDT)
Concen: 223.18 ng/mL
RT: 33.485 min Scan# 1655
Delta R.T. 0.011 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:198 Resp: 32405

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

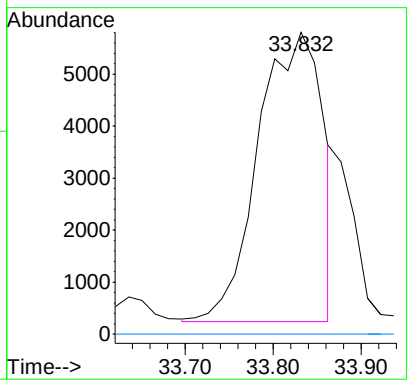


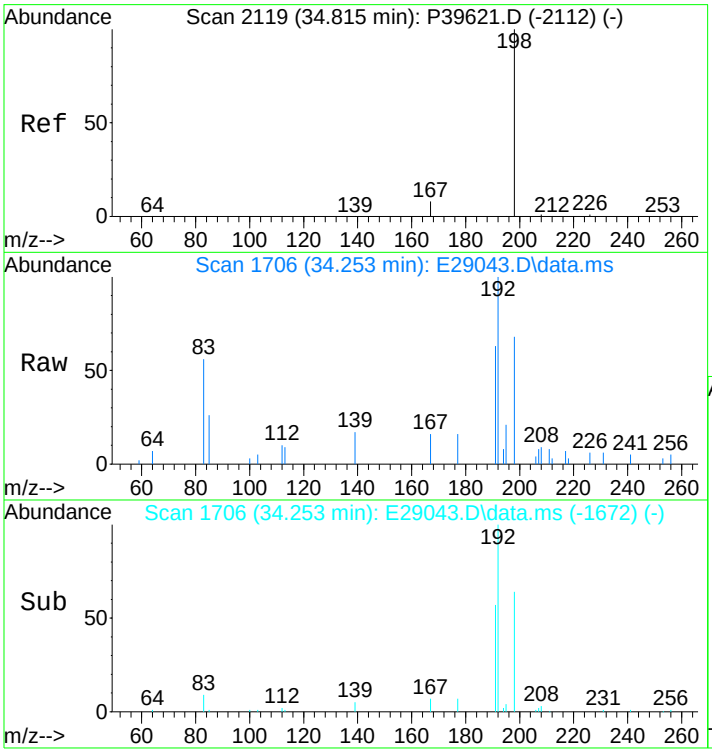


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 195.60 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. -0.004 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:198 Resp: 28400

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

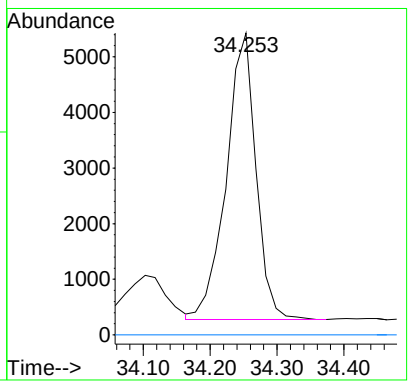


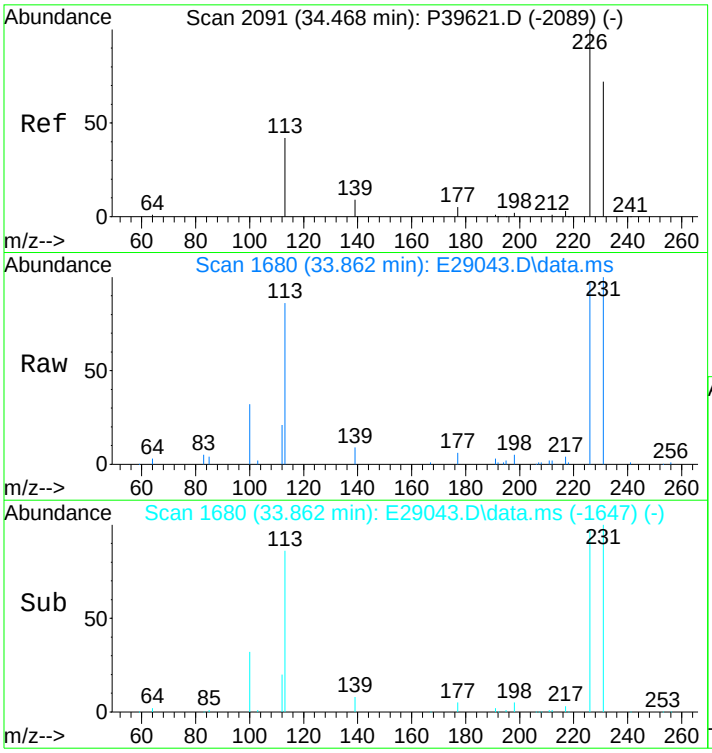


#36
1-Methyldibenzothiophene(1MDT)
Concen: 109.63 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.011 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:198 Resp: 15918

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

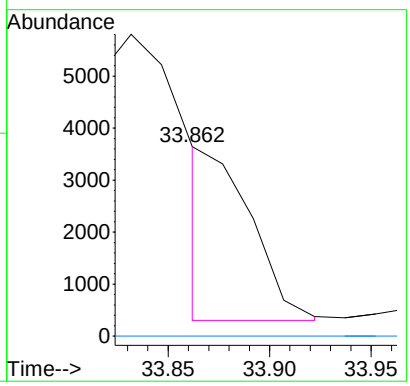


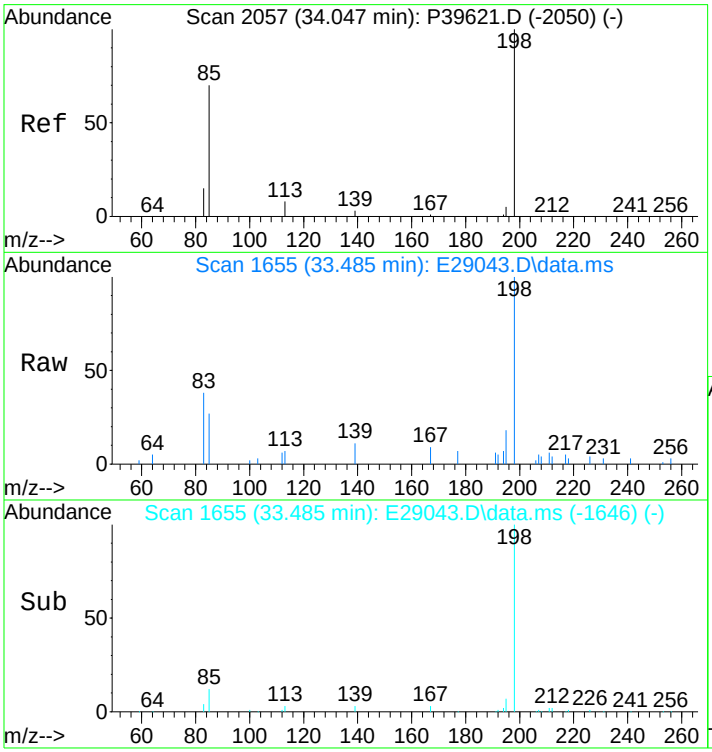


#37
OTP
Concen: 33.76 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.034 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:198 Resp: 4902

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

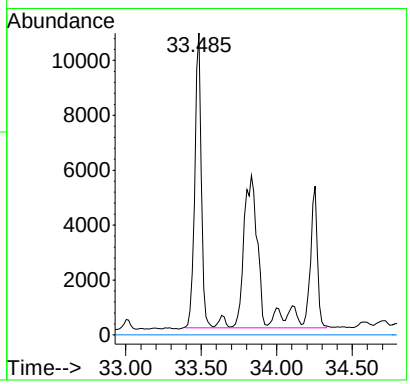


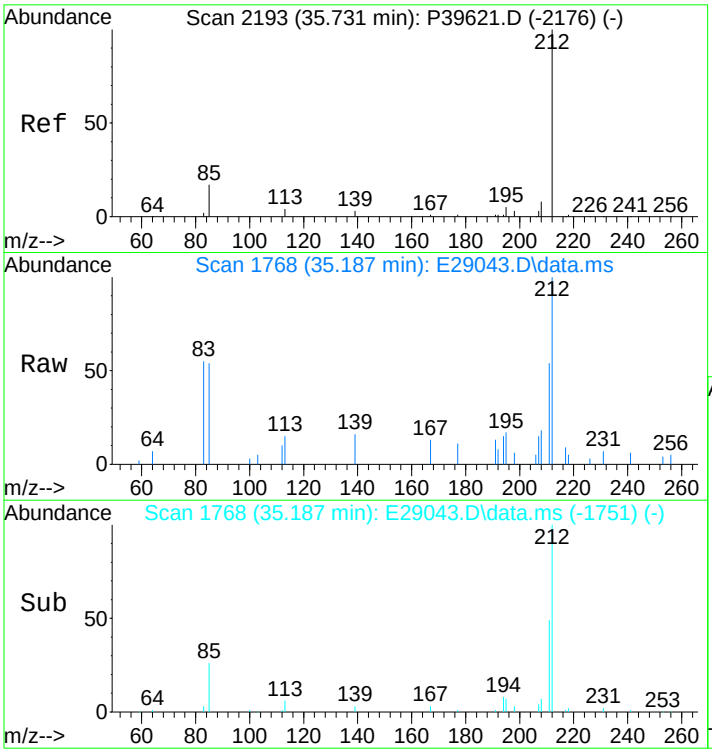


#38
C1-Dibenzothiophenes
Concen: 612.76 ng/mL m
RT: 33.485 min Scan# 1655
Delta R.T. 0.073 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:198 Resp: 88971

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

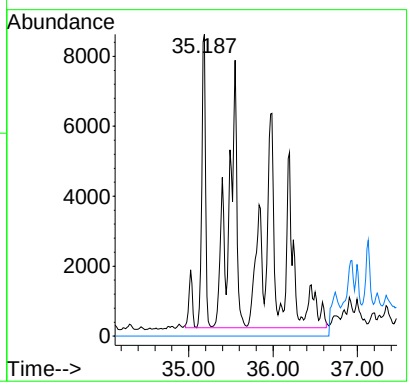


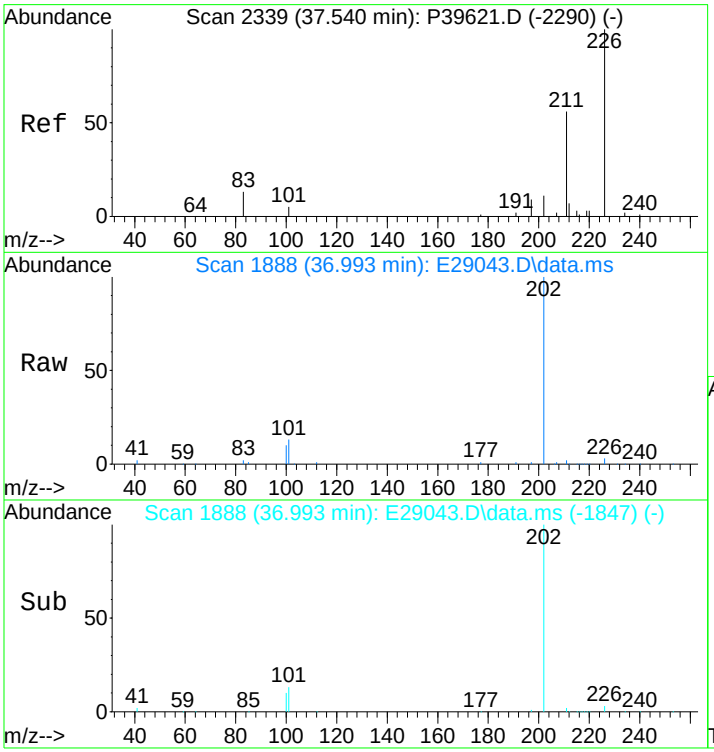


#39
C2-Dibenzothiophenes
Concen: 1140.36 ng/mL m
RT: 35.187 min Scan# 1768
Delta R.T. 0.010 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:212 Resp: 165578

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

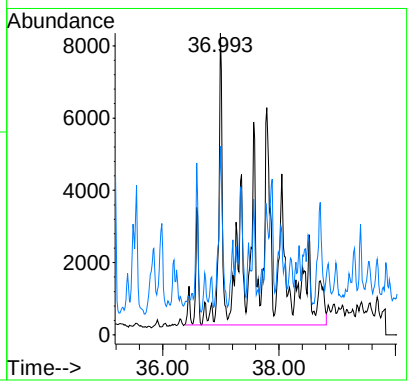


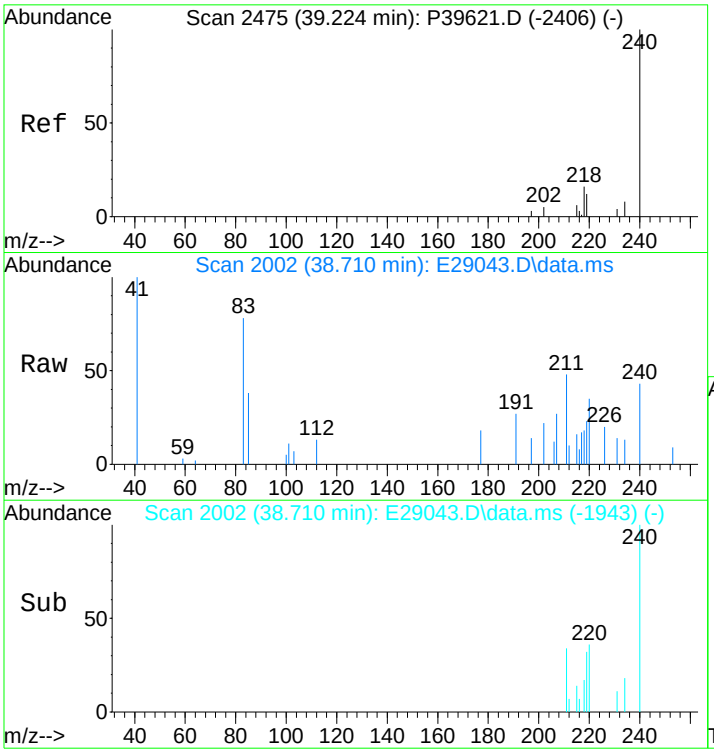


#40
C3-Dibenzothiophenes
Concen: 1403.07 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.284 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:226 Resp: 203723

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

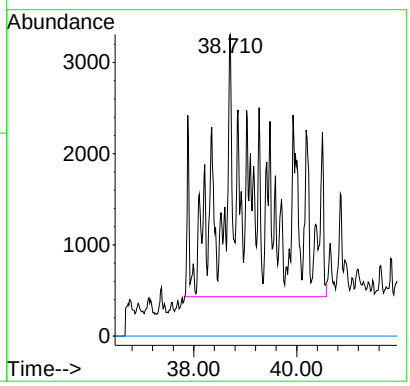


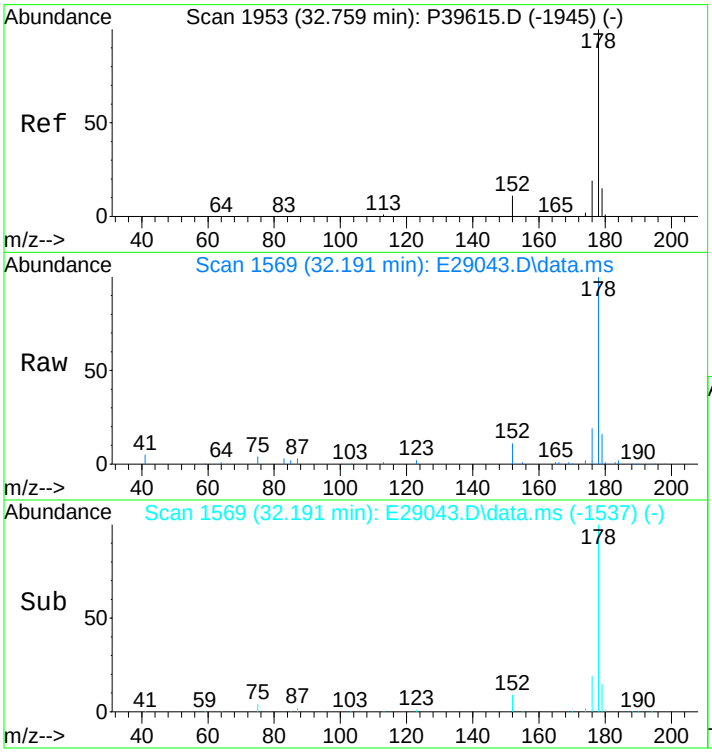


#41
C4-Dibenzothiophenes
Concen: 992.15 ng/mL m
RT: 38.710 min Scan# 2002
Delta R.T. 0.344 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:240 Resp: 144058

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

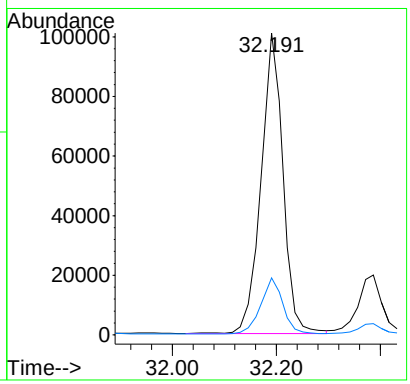


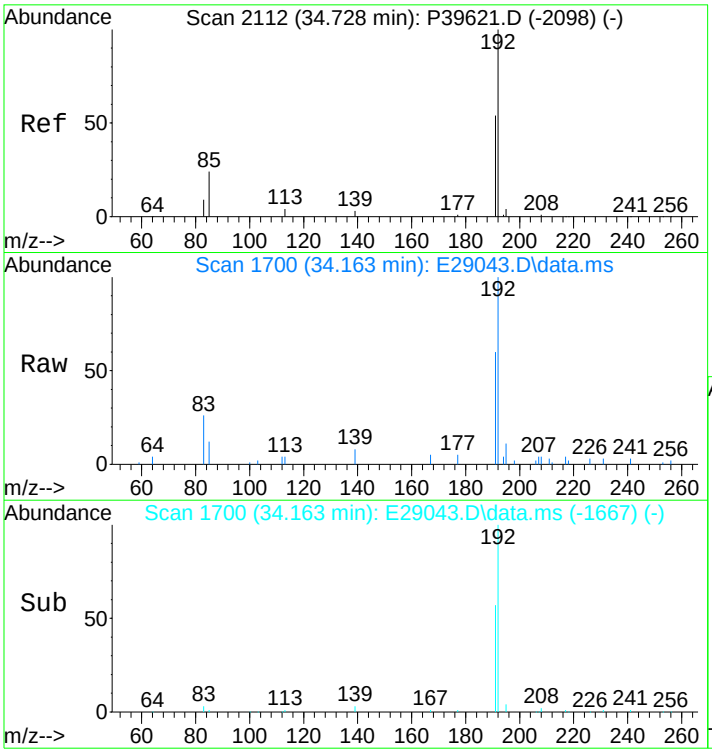


#43
Phenanthrene
Concen: 2004.98 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:178 Resp: 296182

Ion	Ratio	Lower	Upper
178	100		
176	18.8	14.6	21.8

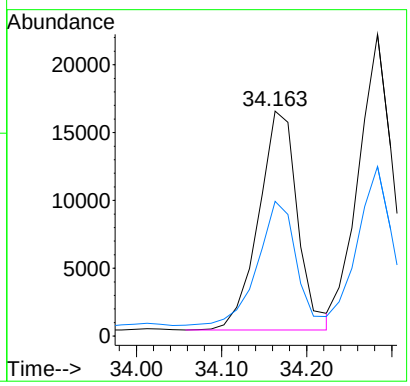


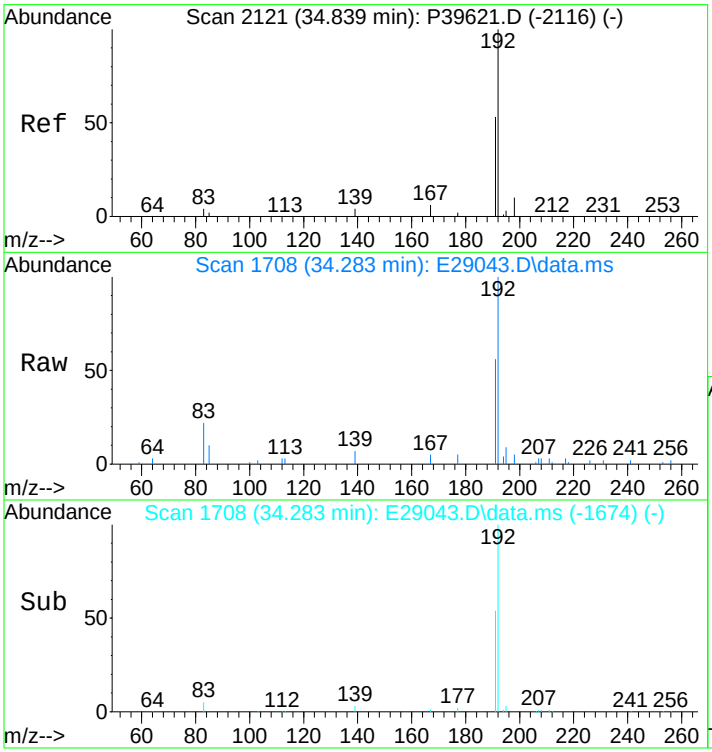


#44
3-Methylphenanthrene(3MP)
Concen: 347.69 ng/mL
RT: 34.163 min Scan# 1700
Delta R.T. -0.004 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 51362

Ion	Ratio	Lower	Upper
192	100		
191	56.6	45.9	68.9

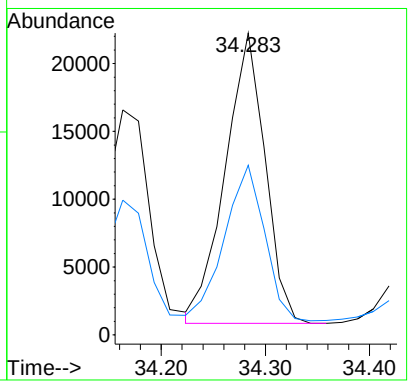


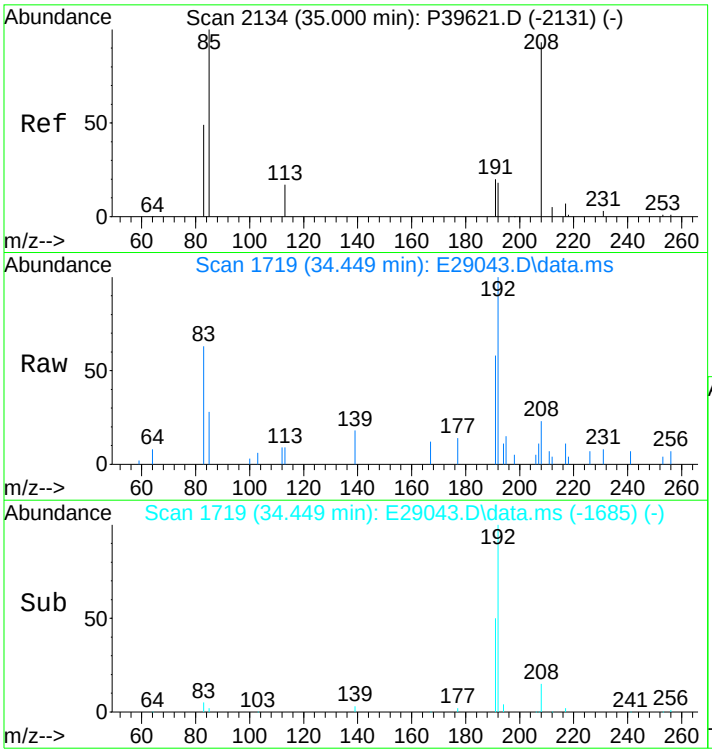


#45
2-Methylphenanthrene(2MP)
Concen: 386.93 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.011 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 57159

Ion	Ratio	Lower	Upper
192	100		
191	53.8	45.4	68.0

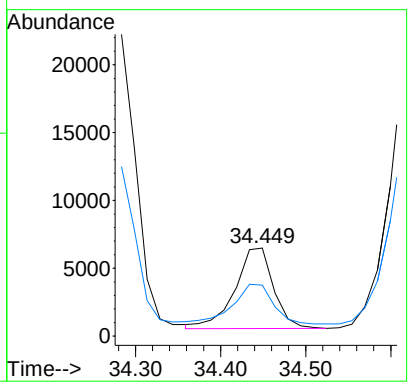


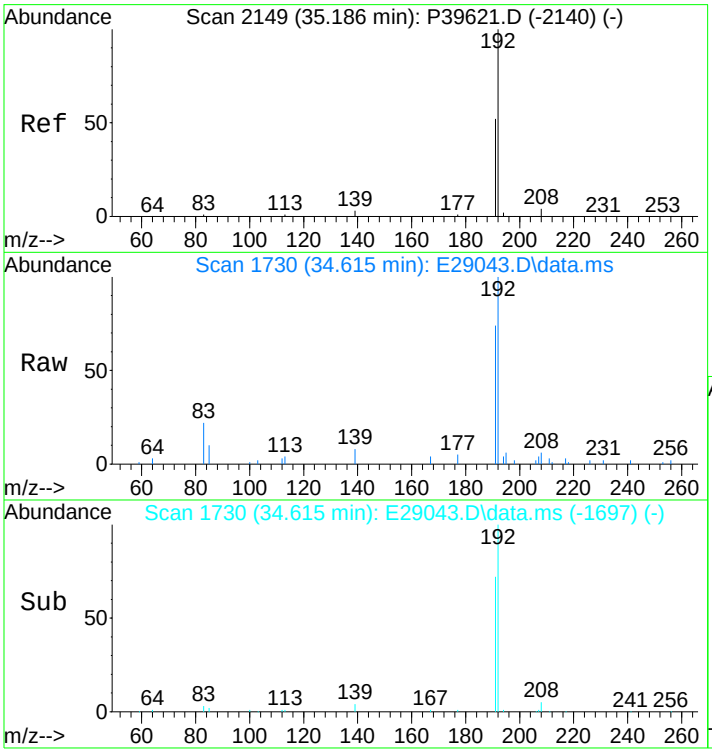


#46
2-Methylanthracene(2MA)
Concen: 126.84 ng/mL
RT: 34.449 min Scan# 1719
Delta R.T. 0.010 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 18737

Ion	Ratio	Lower	Upper
192	100		
191	52.3	95.4	143.0#

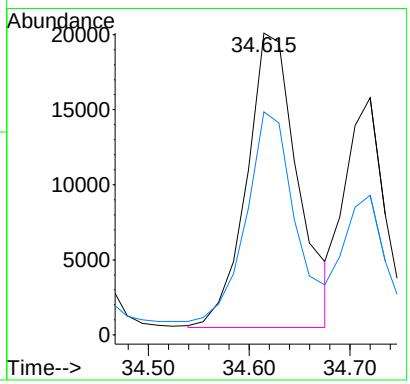


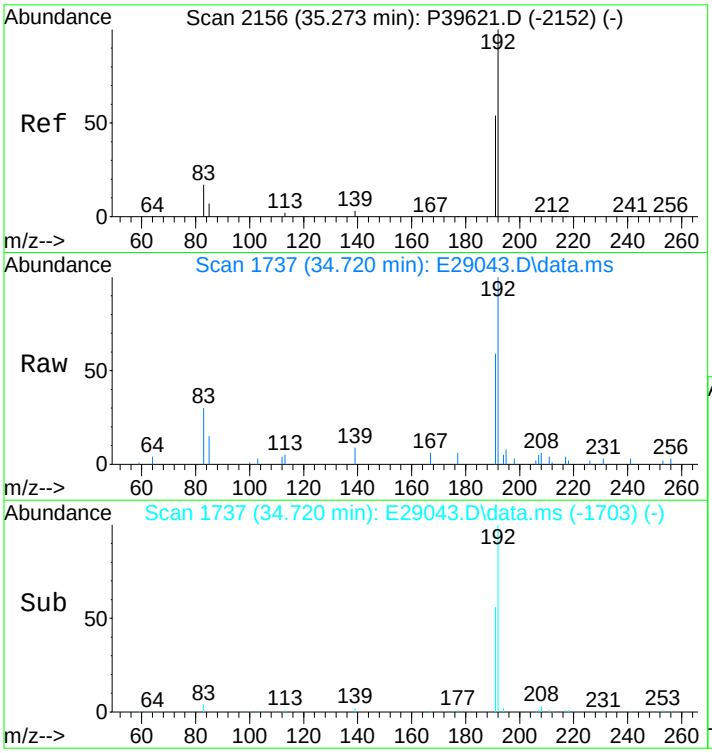


#47
9/4-Methylphenanthrene(9MP)
Concen: 469.17 ng/mL m
RT: 34.615 min Scan# 1730
Delta R.T. -0.005 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 69307

Ion	Ratio	Lower	Upper
192	100		
191	34.1	44.3	66.5#

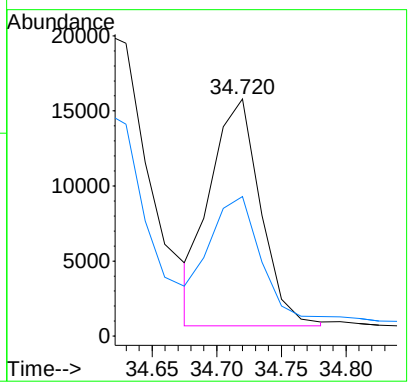


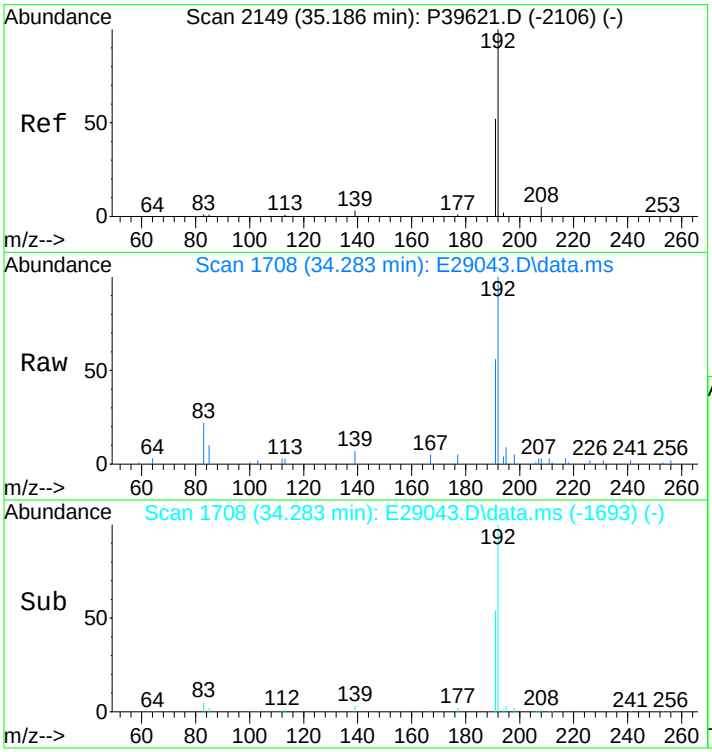


#48
1-Methylphenanthrene(1MP)
Concen: 277.28 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.010 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 40960

Ion	Ratio	Lower	Upper
192	100		
191	57.7	46.7	70.1

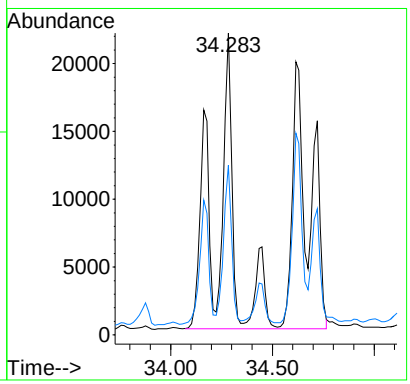


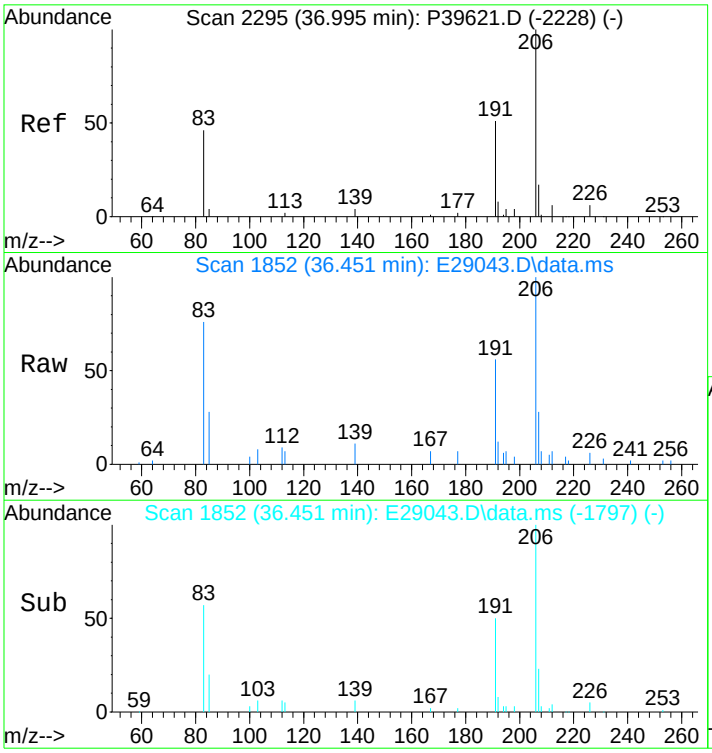


#49
C1-Phenanthrenes/Anthracenes
Concen: 1645.74 ng/mL m
RT: 34.283 min Scan# 1708
Delta R.T. -0.139 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 243113

Ion	Ratio	Lower	Upper
192	100		
191	4.0	44.0	66.0#

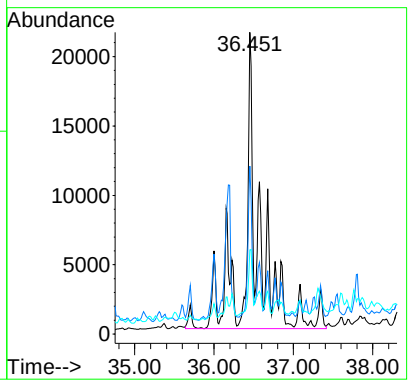


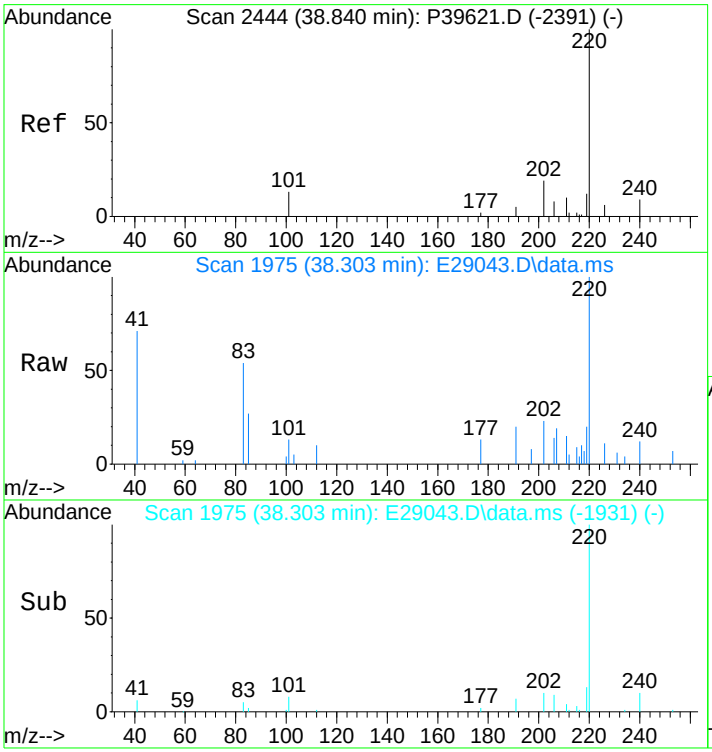


#50
C2-Phenanthrenes/Anthracenes
Concen: 1781.66 ng/mL m
RT: 36.451 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:206 Resp: 263192

Ion	Ratio	Lower	Upper
206	100		
191	14.2	35.7	53.5#
207	6.7	16.5	24.7#

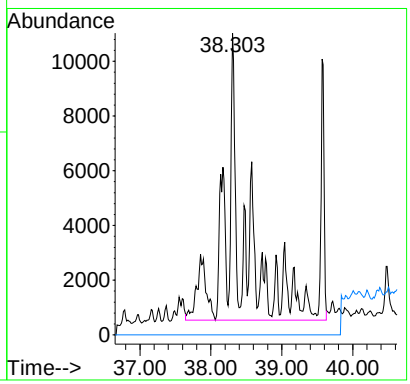


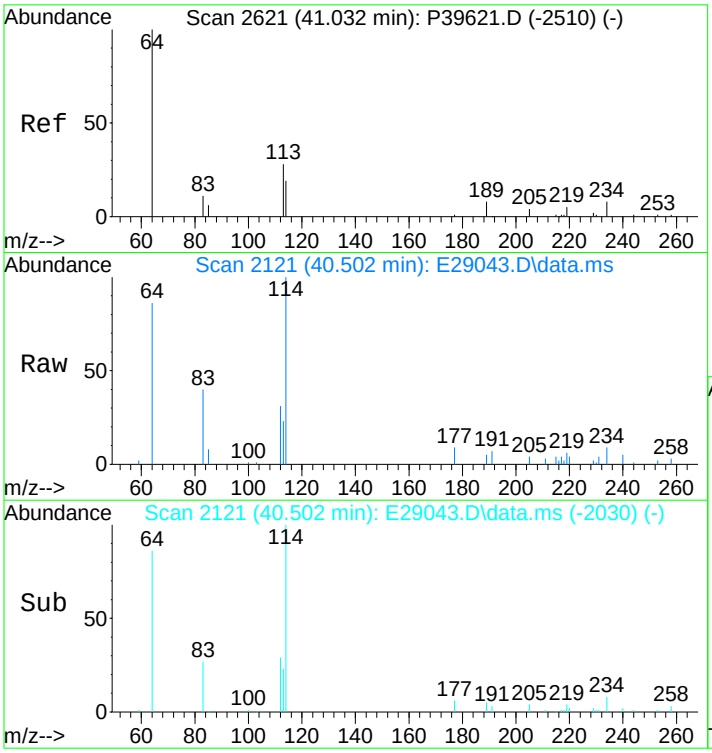


#52
C3-Phenanthrenes/Anthracenes
Concen: 1404.35 ng/mL m
RT: 38.303 min Scan# 1975
Delta R.T. 0.319 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:220 Resp: 207455

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

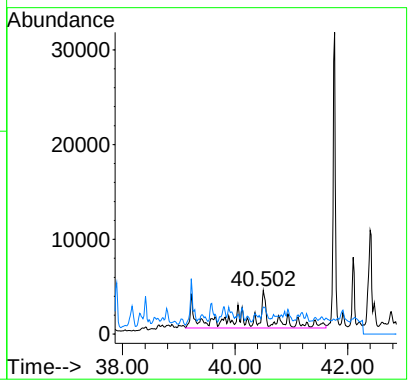


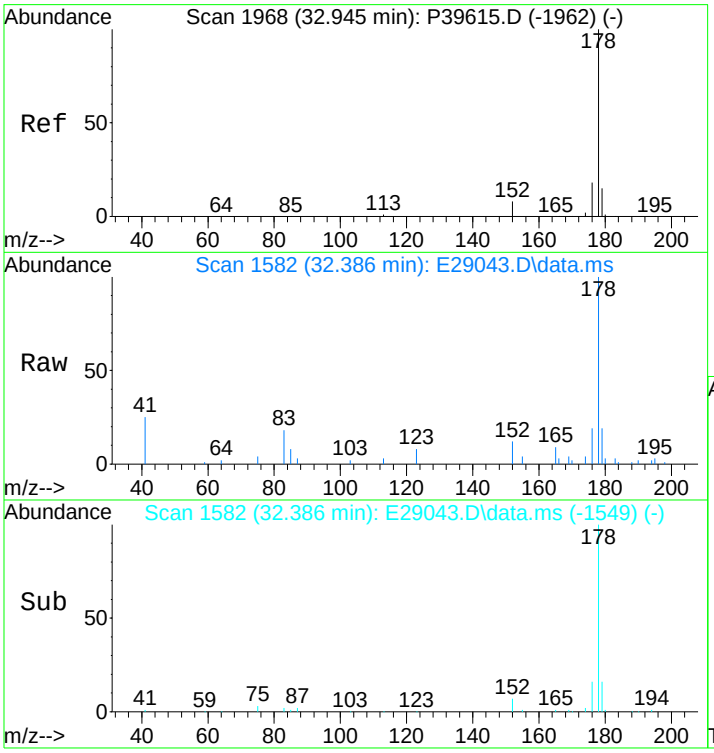


#53
C4-Phenanthrenes/Anthracenes
Concen: 741.13 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:234 Resp: 109482

Ion	Ratio	Lower	Upper
234	100		
219	1.0	46.6	70.0#

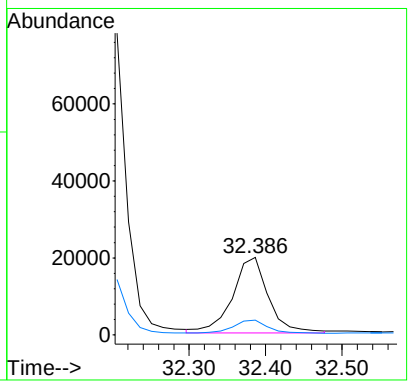


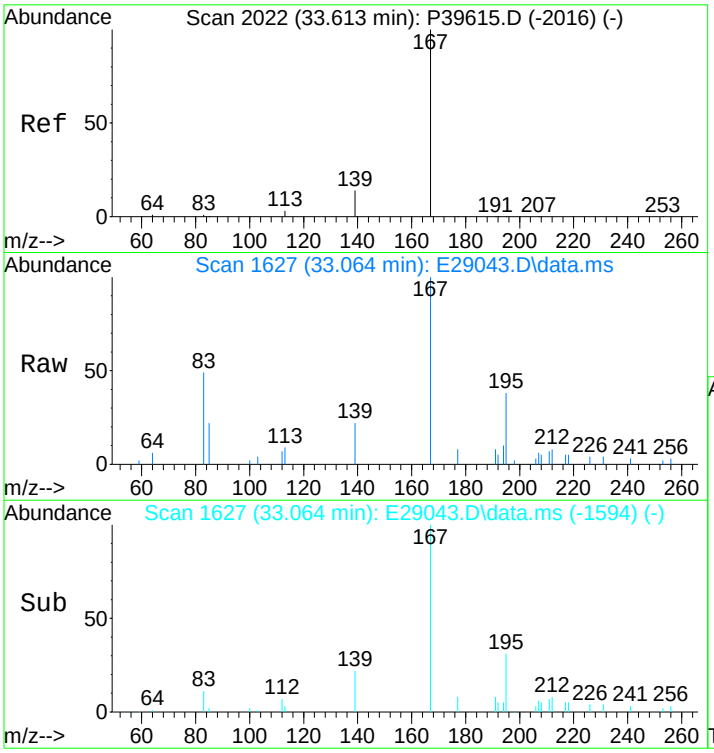


#55
Anthracene
Concen: 503.65 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:178 Resp: 64308

Ion	Ratio	Lower	Upper
178	100		
176	16.4	14.2	21.2

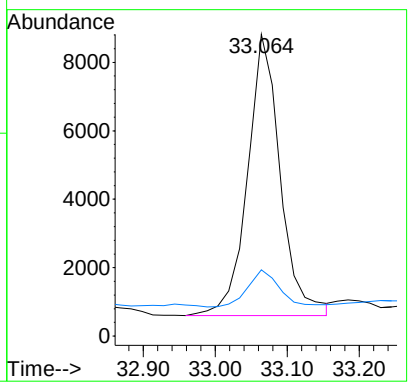


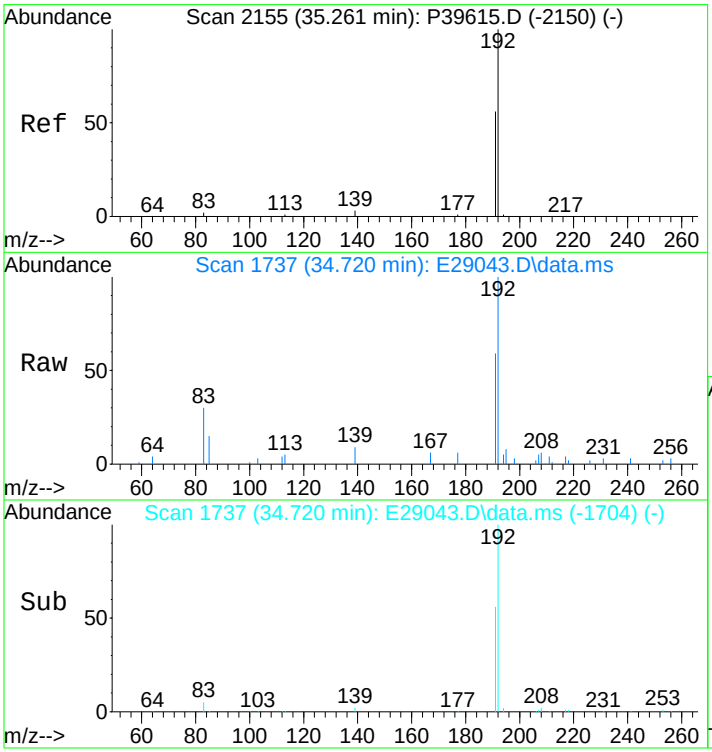


#56
Carbazole
Concen: 197.34 ng/mL
RT: 33.064 min Scan# 1627
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:167 Resp: 25933

Ion	Ratio	Lower	Upper
167	100		
139	12.5	10.6	15.8

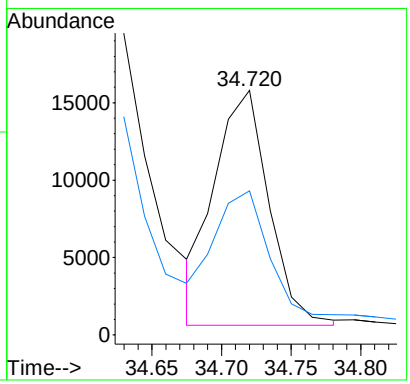


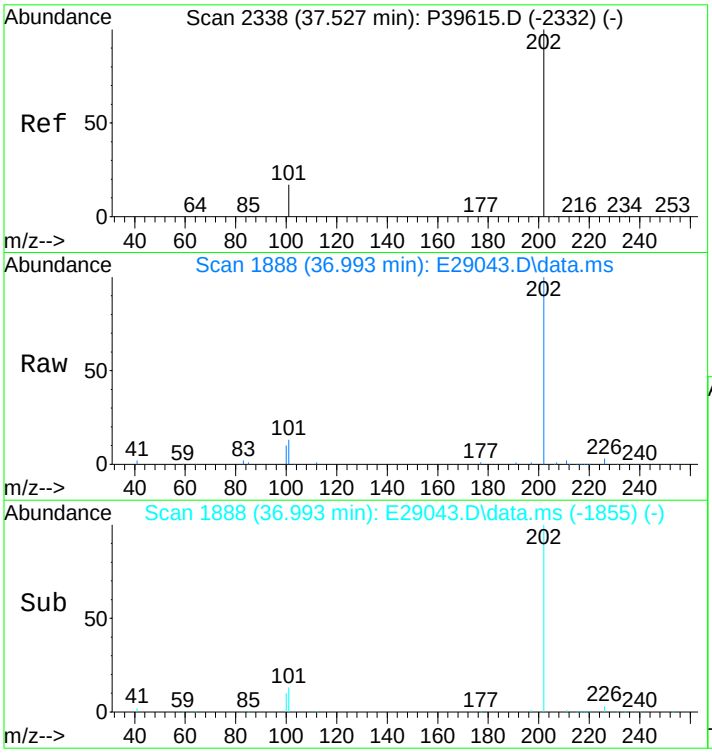


#57
1-Methylphenanthrene
Concen: 366.48 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:192 Resp: 41302

Ion	Ratio	Lower	Upper
192	100		
191	57.3	44.4	66.6

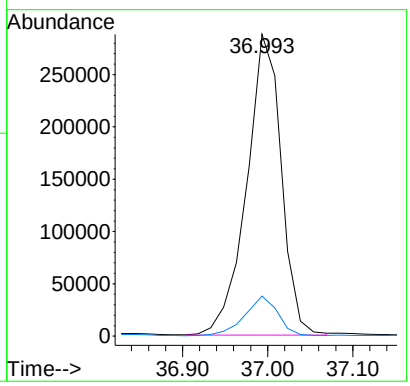


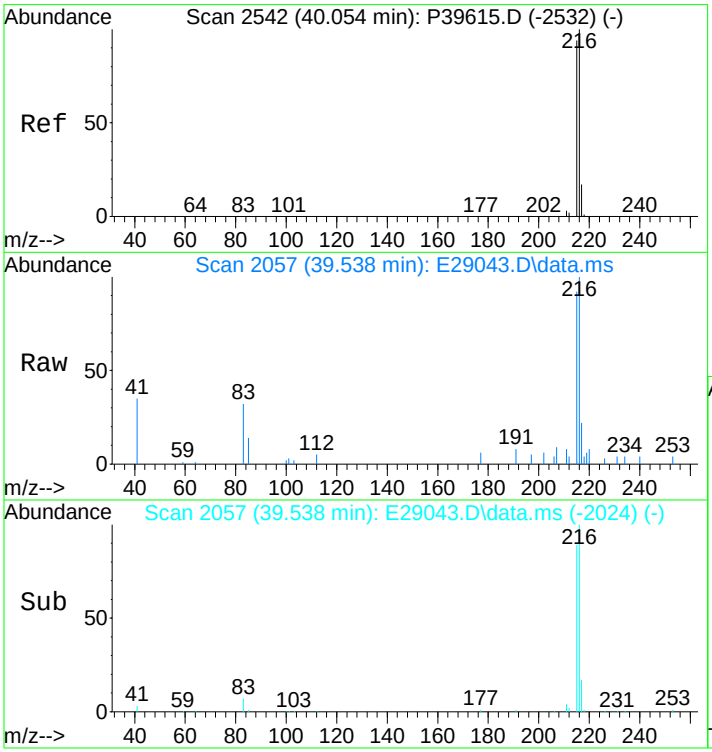


#58
Fluoranthene
Concen: 4978.64 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:202 Resp: 812204

Ion	Ratio	Lower	Upper
202	100		
101	13.2	10.5	15.7

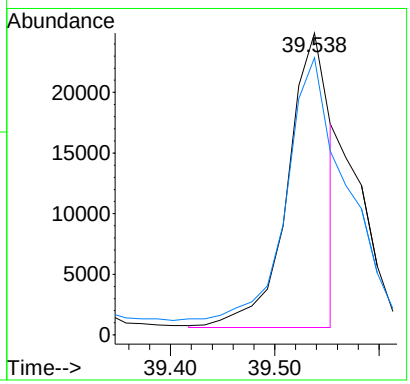


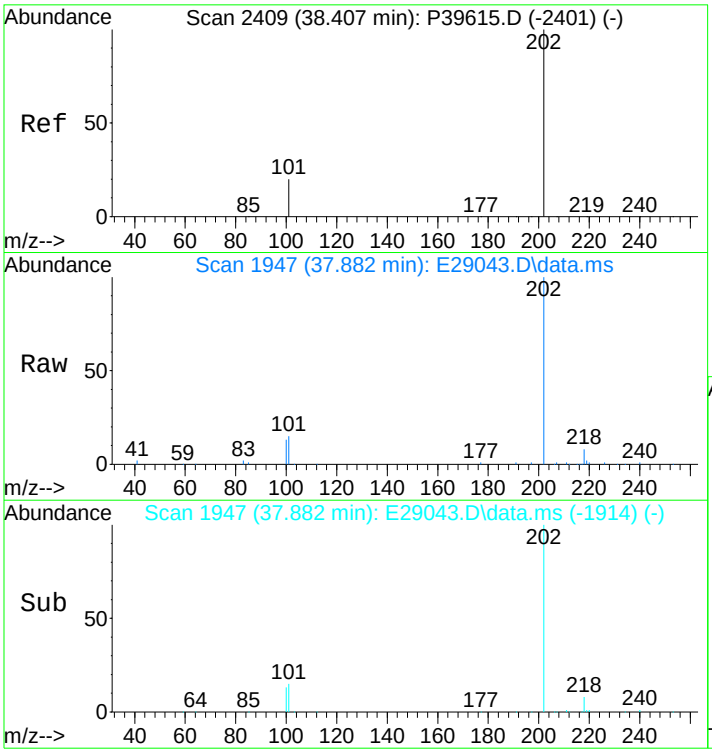


#59
Benzo(b)fluorene
Concen: 633.68 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:216 Resp: 68886

Ion	Ratio	Lower	Upper
216	100		
215	122.8	73.0	109.6#

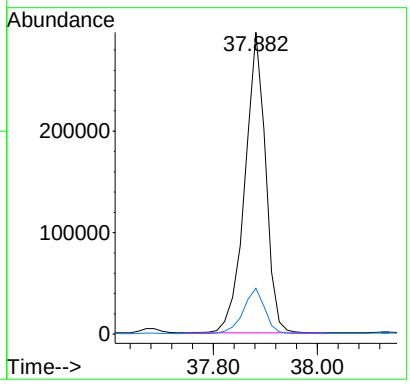


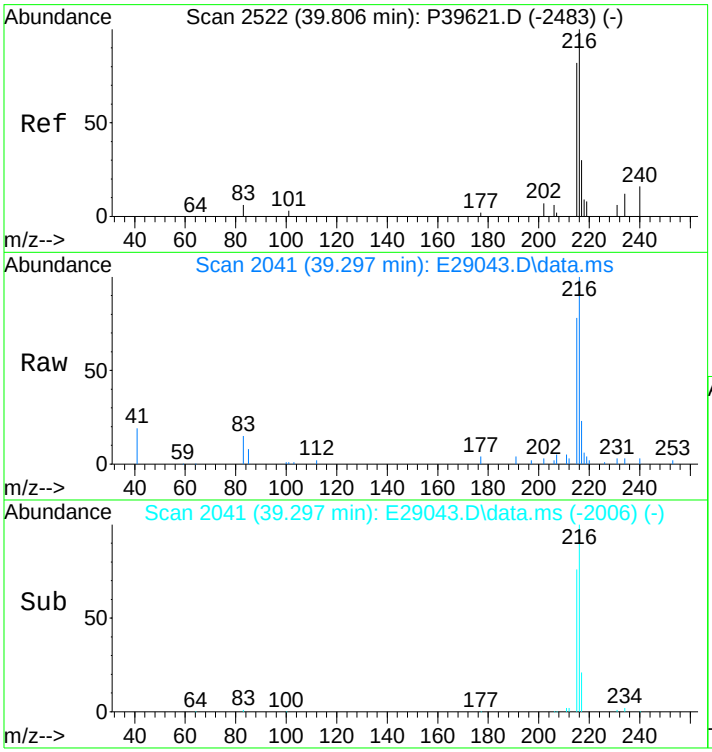


#60
Pyrene
Concen: 4931.64 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:202 Resp: 817743

Ion	Ratio	Lower	Upper
202	100		
101	15.7	11.5	17.3

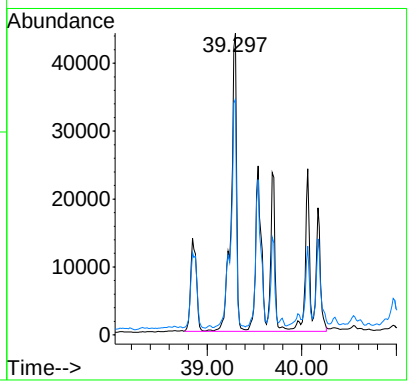


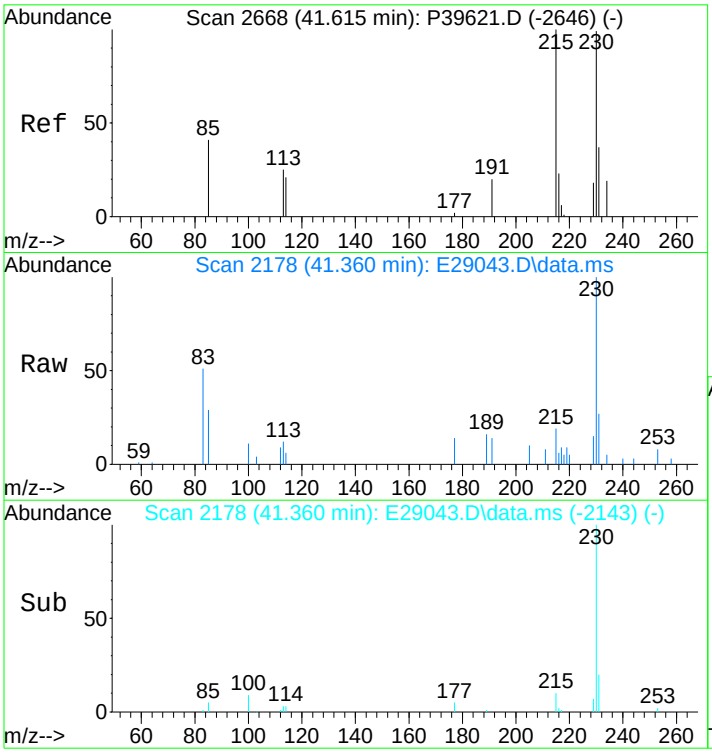


#61
C1-Fluoranthenes/Pyrenes
Concen: 3244.89 ng/mL m
RT: 39.297 min Scan# 2041
Delta R.T. 0.360 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:216 Resp: 538054

Ion	Ratio	Lower	Upper
216	100		
215	9.2	73.4	110.2#

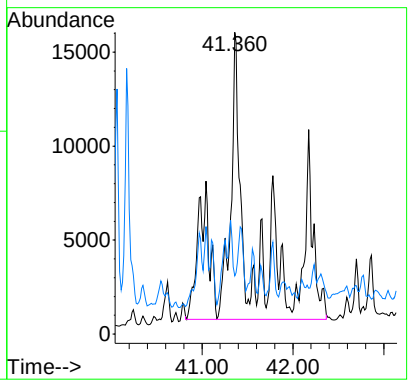


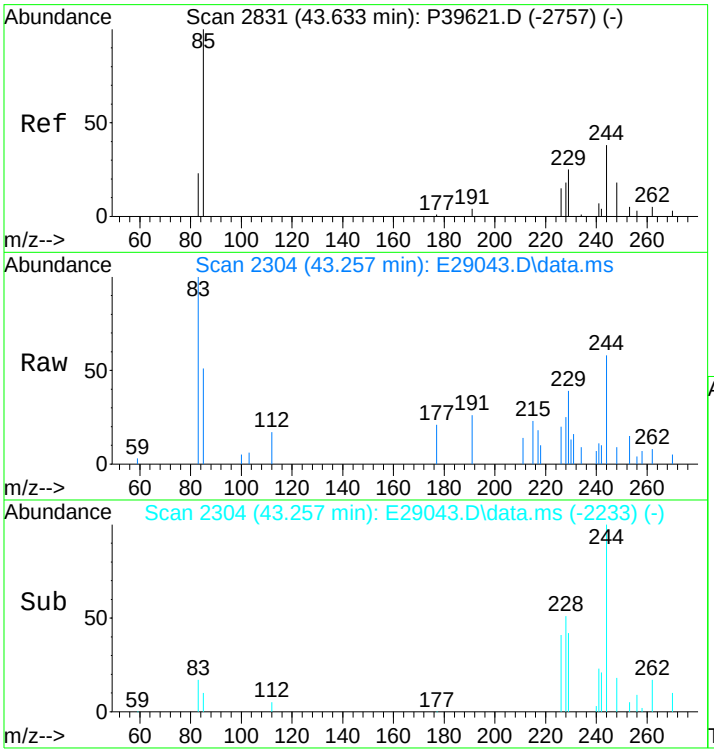


#62
C2-Fluoranthenes/Pyrenes
Concen: 1825.96 ng/mL m
RT: 41.360 min Scan# 2178
Delta R.T. 0.457 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:230 Resp: 302773

Ion	Ratio	Lower	Upper
230	100		
215	3.2	93.8	140.8#

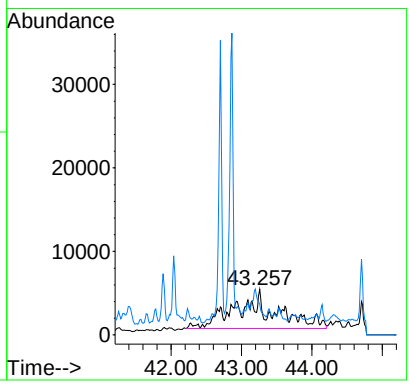


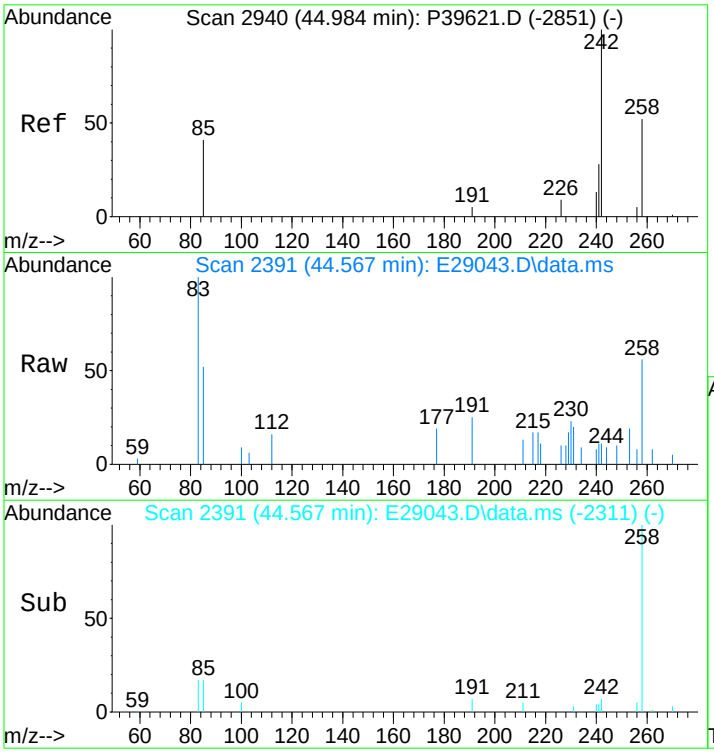


#63
C3-Fluoranthenes/Pyrenes
Concen: 1096.87 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:244 Resp: 181878

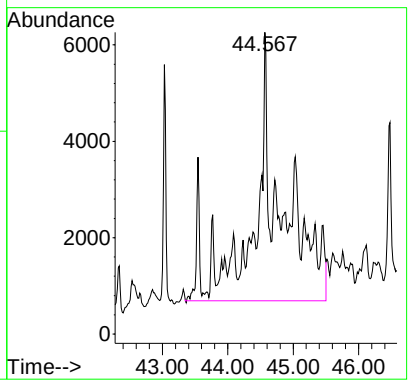
Ion	Ratio	Lower	Upper
244	100		
229	4.5	72.2	108.2#

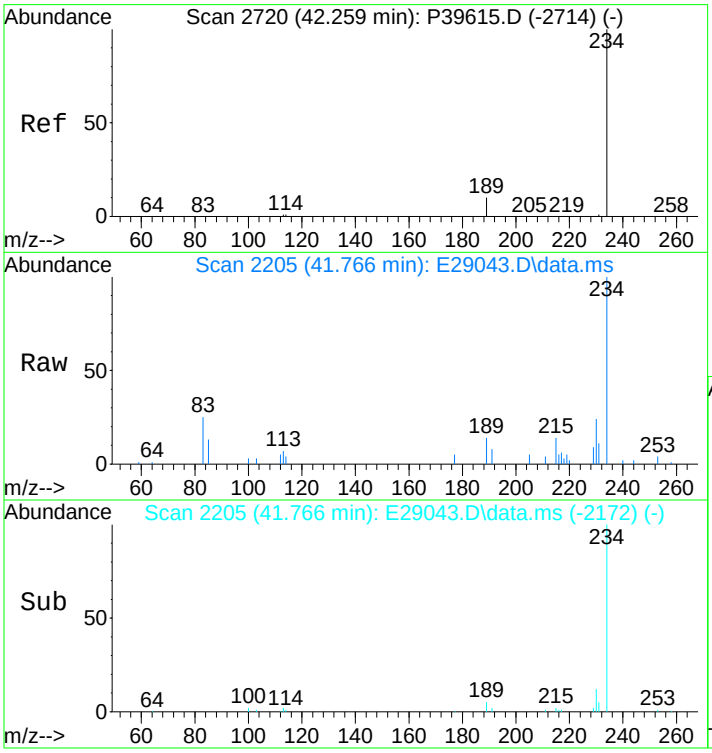




#64
C4-Fluoranthenes/Pyrenes
Concen: 950.95 ng/mL m
RT: 44.567 min Scan# 2391
Delta R.T. 0.571 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:258 Resp: 157682

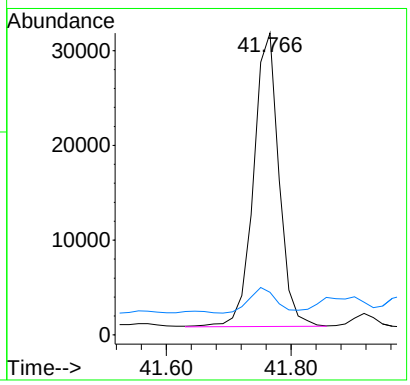


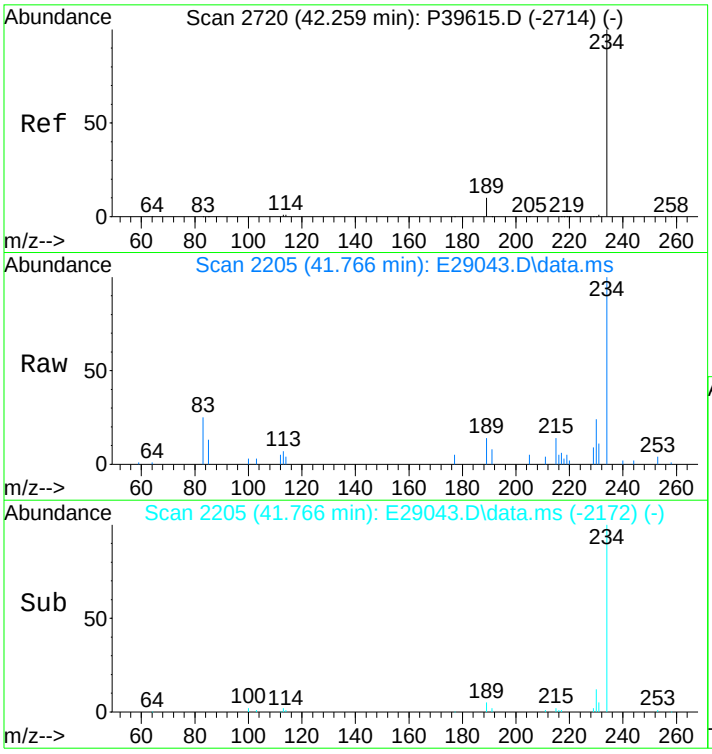


#66
Naphthobenzothiophene
Concen: 535.97 ng/ml
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:234 Resp: 87653

Ion	Ratio	Lower	Upper
234	100		
189	9.2	5.4	8.2#

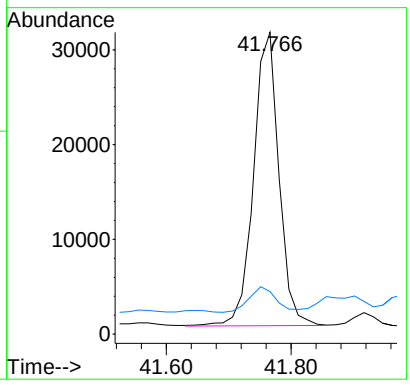


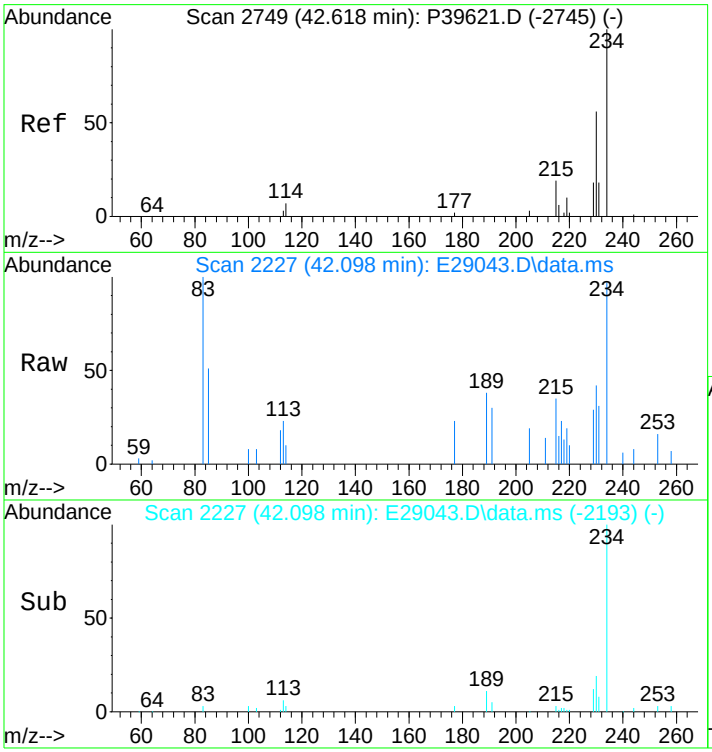


#67
Naphthobenzothiophene-2,1-D
Concen: 535.97 ng/mL
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:234 Resp: 87653

Ion	Ratio	Lower	Upper
234	100		
189	9.2	5.4	8.2#

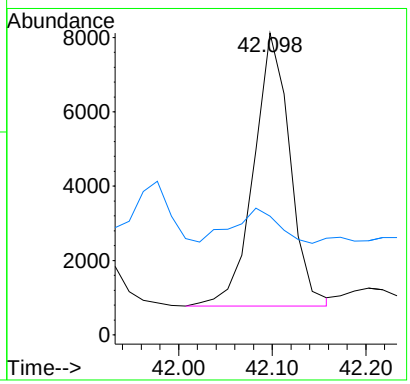


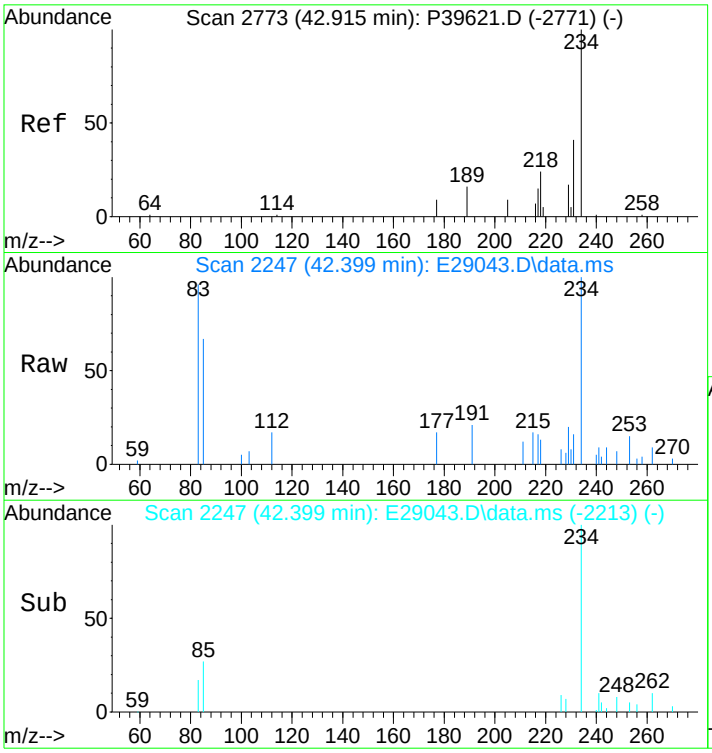


#68
Naphthobenzothiophene-1,2-D
Concen: 120.56 ng/mL
RT: 42.098 min Scan# 2227
Delta R.T. 0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:234 Resp: 19717

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

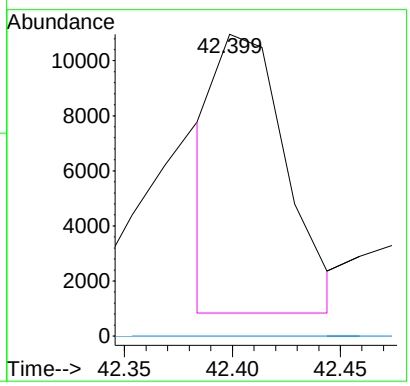


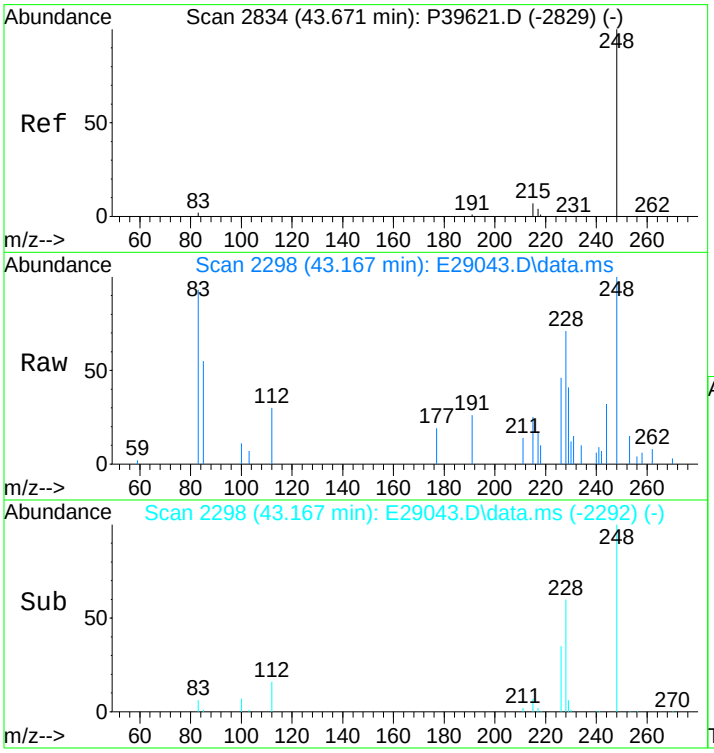


#69
Naphthobenzothiophene-2,3-D
Concen: 139.43 ng/mL m
RT: 42.399 min Scan# 2247
Delta R.T. 0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:234 Resp: 22803

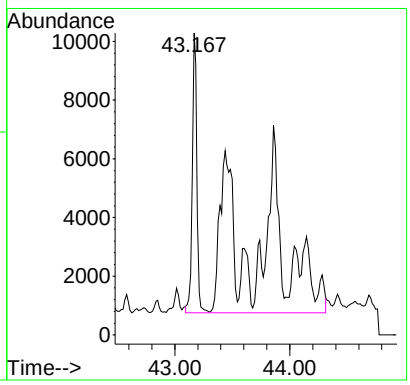
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

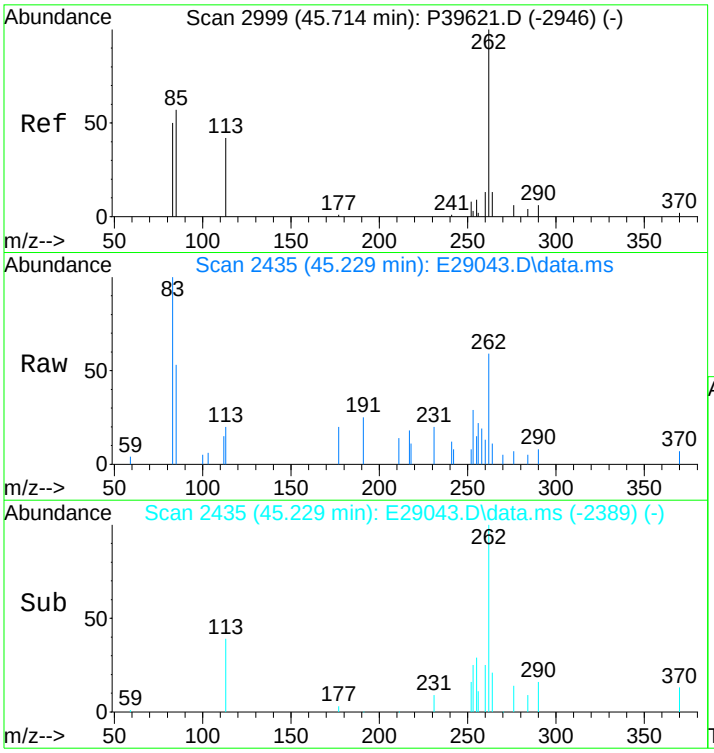




#70
C1-Naphthobenzothiophenes
Concen: 904.10 ng/ml m
RT: 43.167 min Scan# 2298
Delta R.T. 0.021 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

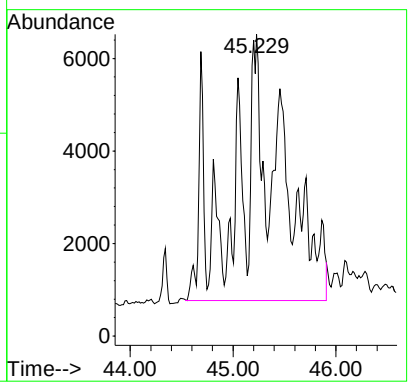
Tgt Ion:248 Resp: 147858

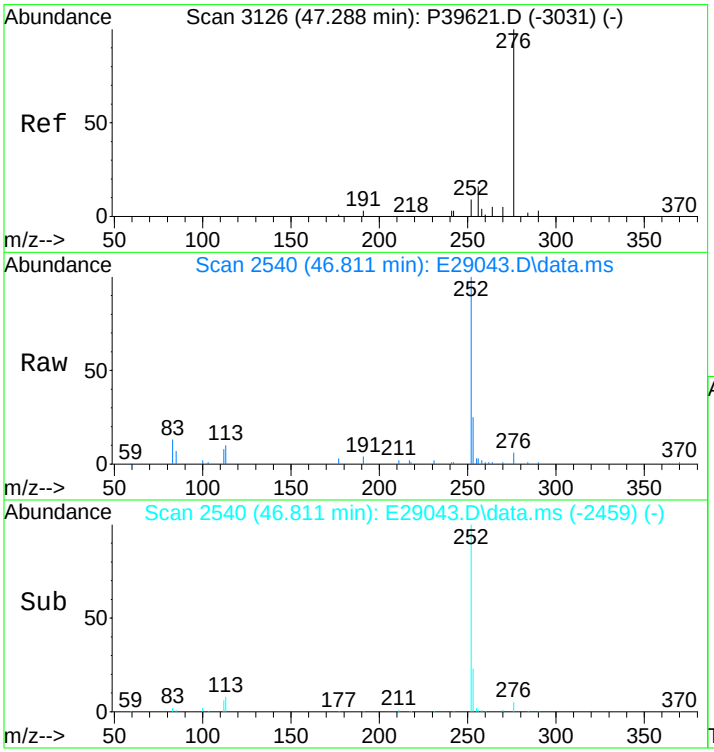




#71
C2-Naphthobenzothiophenes
Concen: 1041.46 ng/ml m
RT: 45.229 min Scan# 2435
Delta R.T. 0.559 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

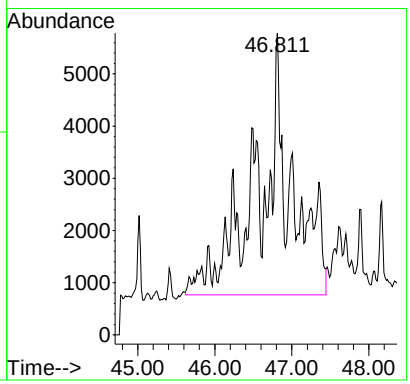
Tgt Ion:262 Resp: 170322

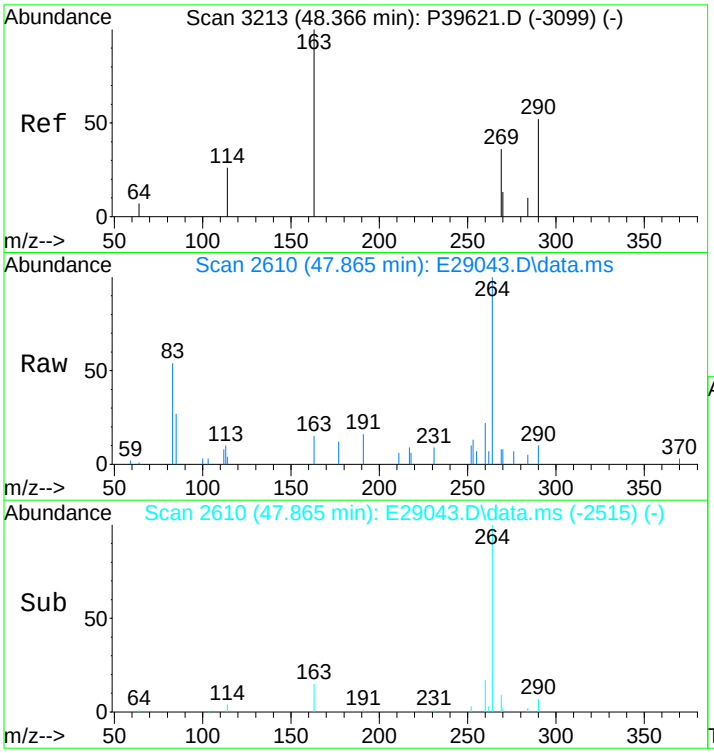




#72
C3-Naphthobenzothiophenes
Concen: 912.92 ng/ml m
RT: 46.811 min Scan# 2540
Delta R.T. 0.557 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

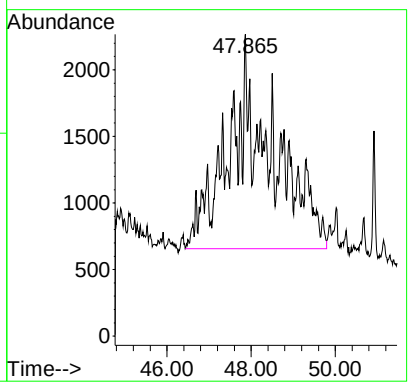
Tgt Ion:276 Resp: 149301

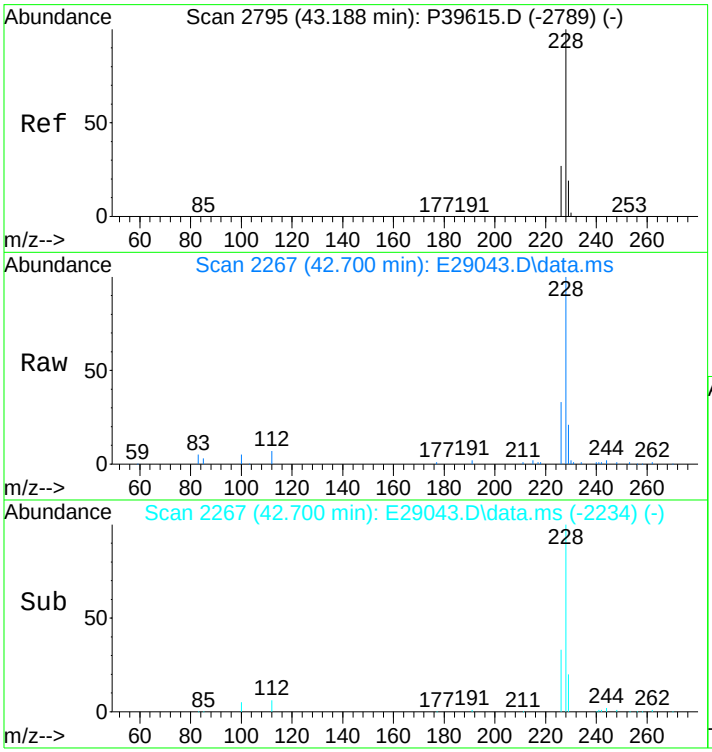




#73
C4-Naphthobenzothiophenes
Concen: 673.12 ng/mL m
RT: 47.865 min Scan# 2610
Delta R.T. 0.541 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:290 Resp: 110083

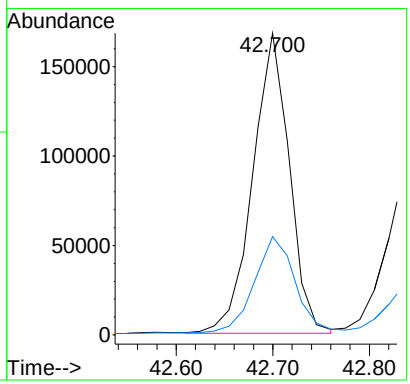


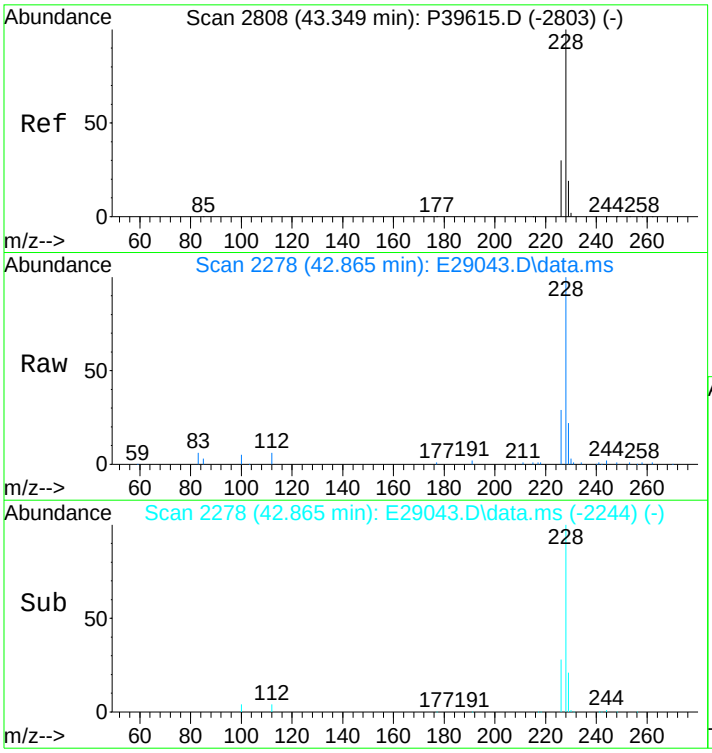


#75
Benz[a]anthracene
Concen: 2456.91 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:228 Resp: 441568

Ion	Ratio	Lower	Upper
228	100		
226	34.1	20.2	30.4#

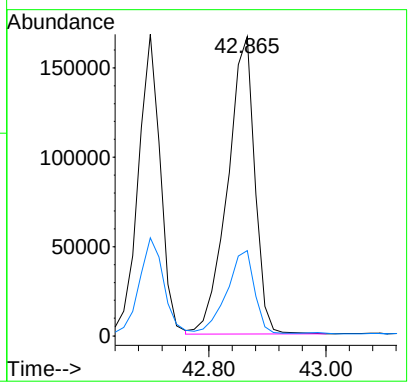


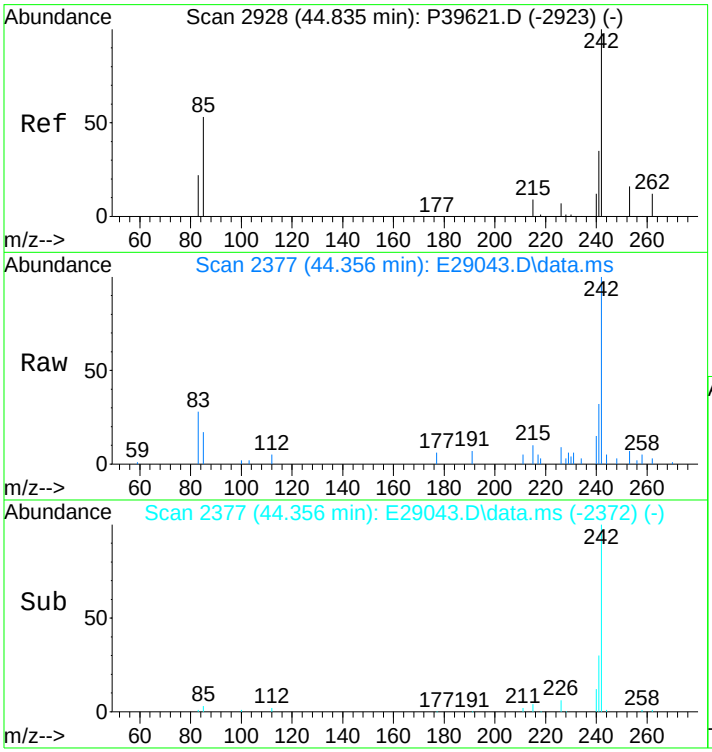


#77
Chrysene/Triphenylene
Concen: 2899.56 ng/mL
RT: 42.865 min Scan# 2278
Delta R.T. 0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:228 Resp: 536507

Ion	Ratio	Lower	Upper
228	100		
226	28.7	22.5	33.7

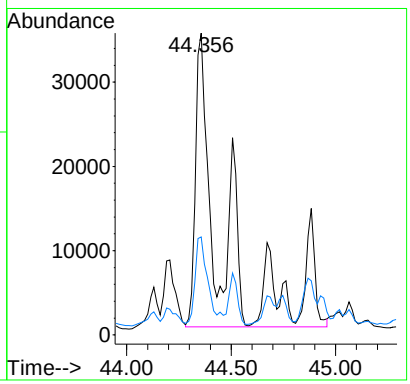


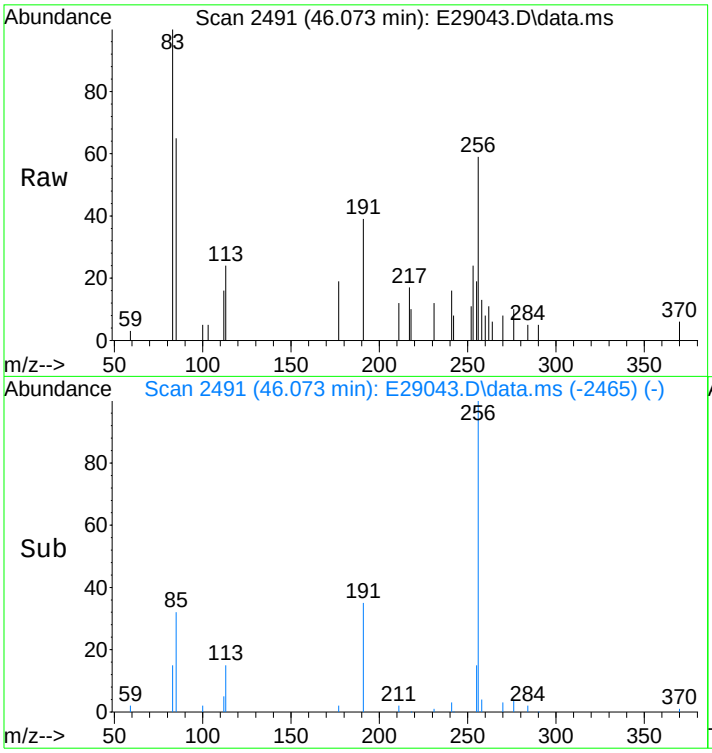


#78
C1-Chrysenes
Concen: 1596.23 ng/mL m
RT: 44.356 min Scan# 2377
Delta R.T. 0.025 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:242 Resp: 295350

Ion	Ratio	Lower	Upper
242	100		
241	4.5	32.2	48.4#

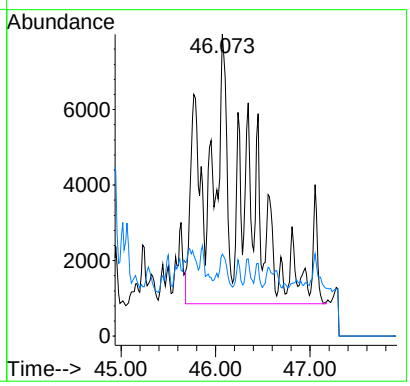


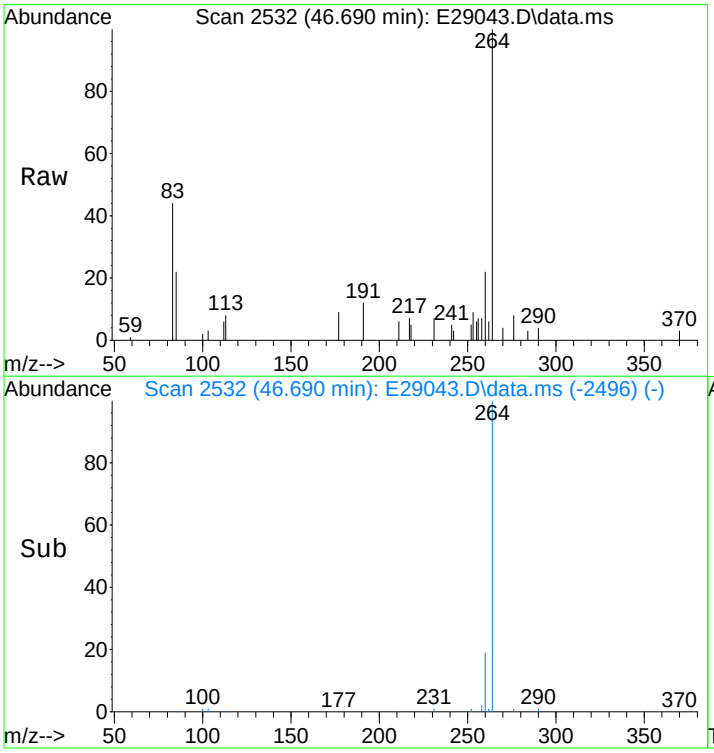


#79
C2-Chrysenes
Concen: 1046.56 ng/mL m
RT: 46.073 min Scan# 2491
Delta R.T. -0.319 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:256 Resp: 193645

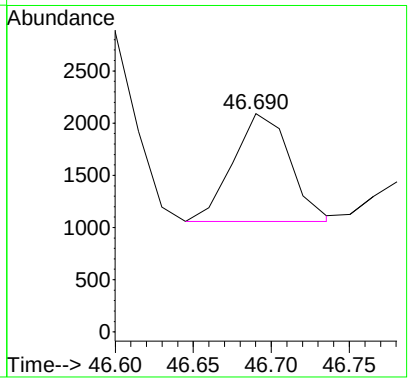
Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

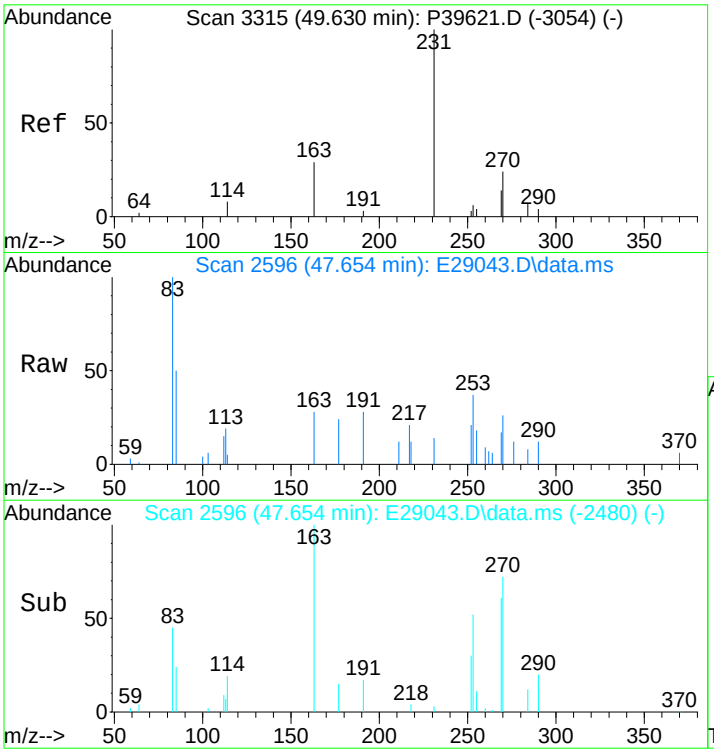




#80
BBF-D12 Surr BKGD
Concen: 14.26 ng/mL
RT: 46.690 min Scan# 2532
Delta R.T. 0.046 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:256 Resp: 2639

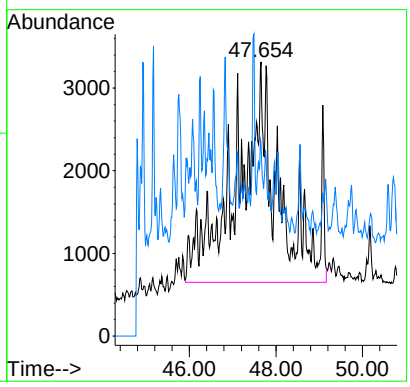


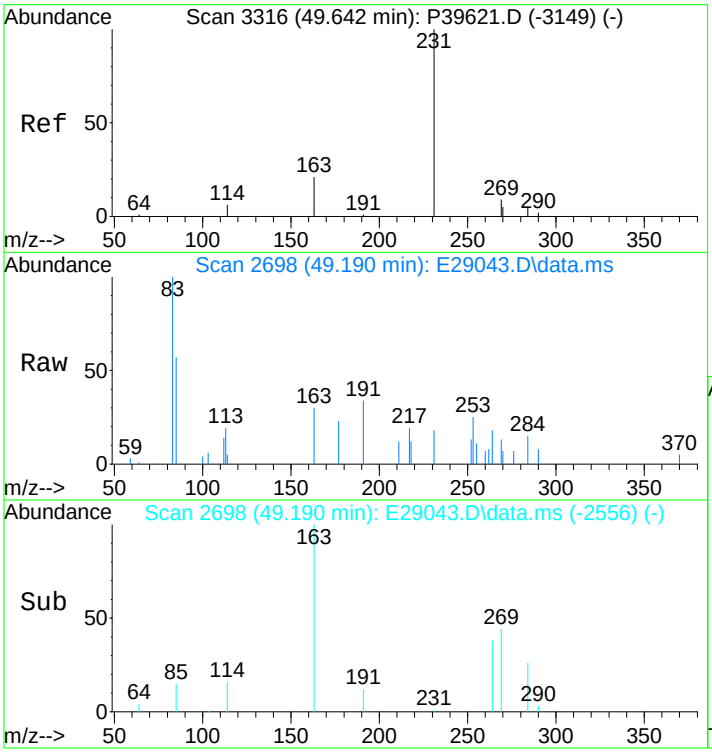


#81
C3-Chrysenes
Concen: 938.07 ng/mL m
RT: 47.654 min Scan# 2596
Delta R.T. -1.466 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:270 Resp: 173571

Ion	Ratio	Lower	Upper
270	100		
255	1.8	38.0	57.0#

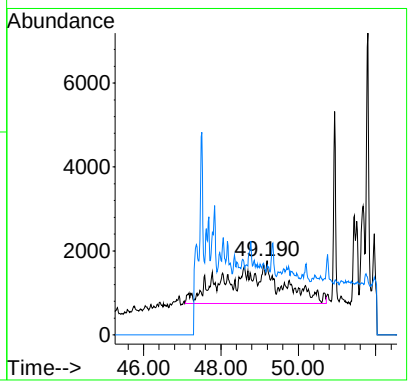


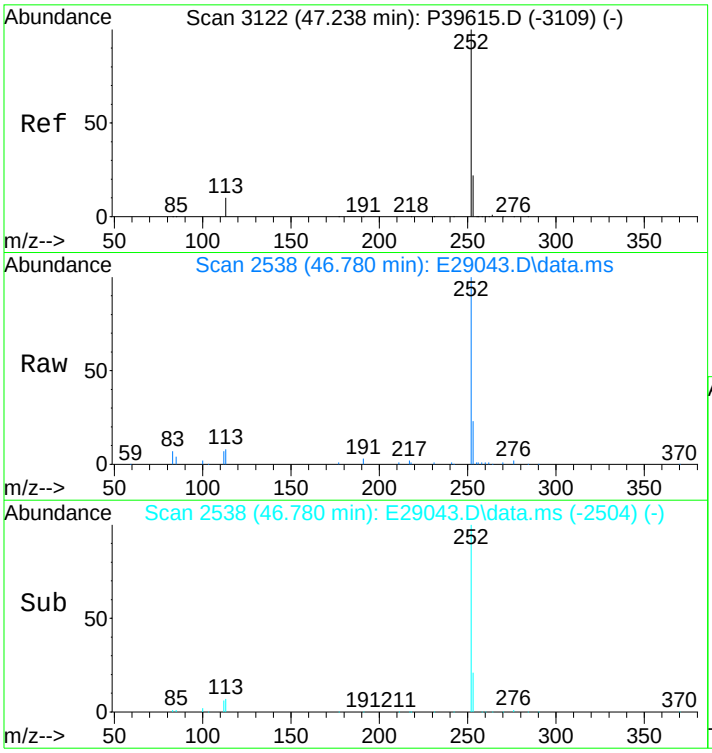


#82
C4-Chrysenes
Concen: 494.83 ng/mL m
RT: 49.190 min Scan# 2698
Delta R.T. -0.048 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:284 Resp: 91559

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

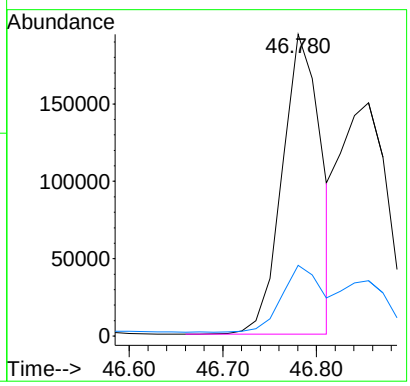


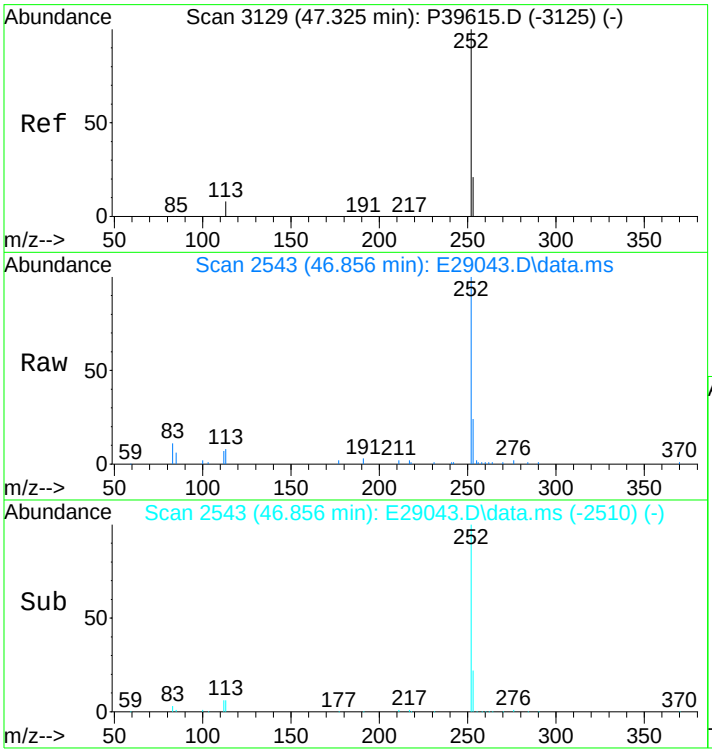


#84
Benzo[b]fluoranthene
Concen: 2685.10 ng/mL
RT: 46.780 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:252 Resp: 560919

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.2	28.8

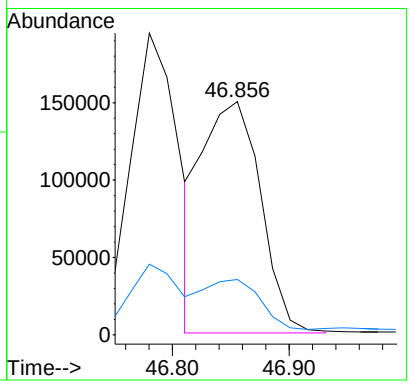


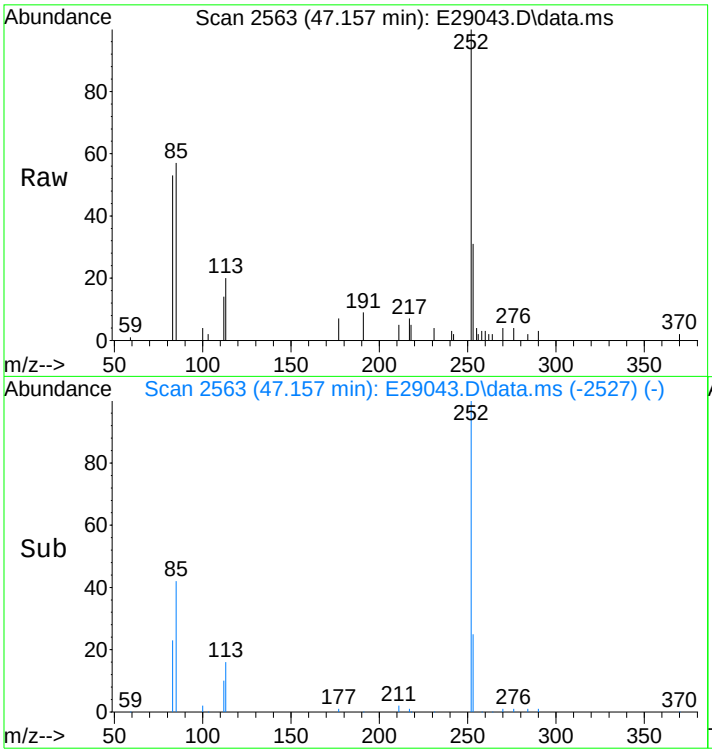


#85
Benzo[j]+[k]fluoranthene
Concen: 2416.93 ng/mL m
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:252 Resp: 519452

Ion	Ratio	Lower	Upper
252	100		
253	17.4	19.3	28.9#

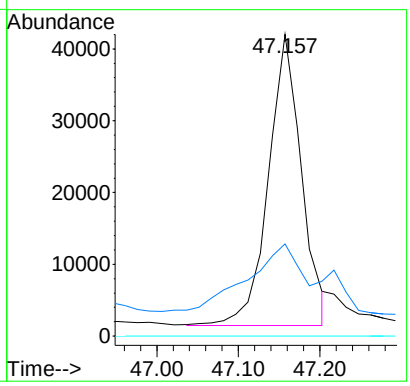


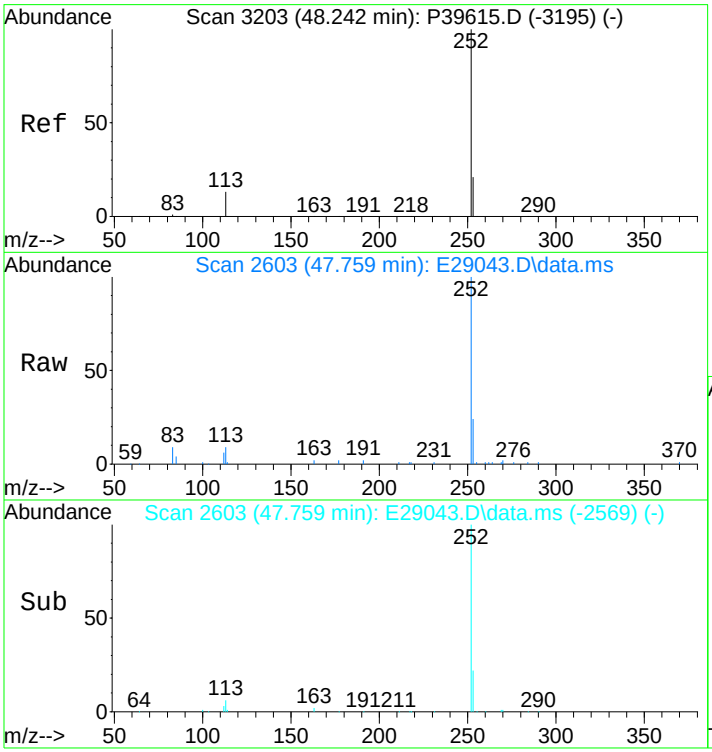


#86
Benzo[a]fluoranthene
Concen: 531.10 ng/mL m
RT: 47.157 min Scan# 2563
Delta R.T. 0.035 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:252 Resp: 114146

Ion	Ratio	Lower	Upper
252	100		
253	56.2	456.0	684.0#
125	0.0	0.0	0.0

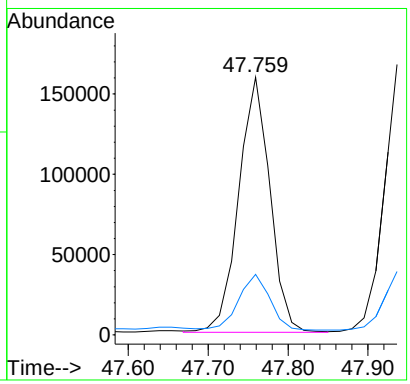


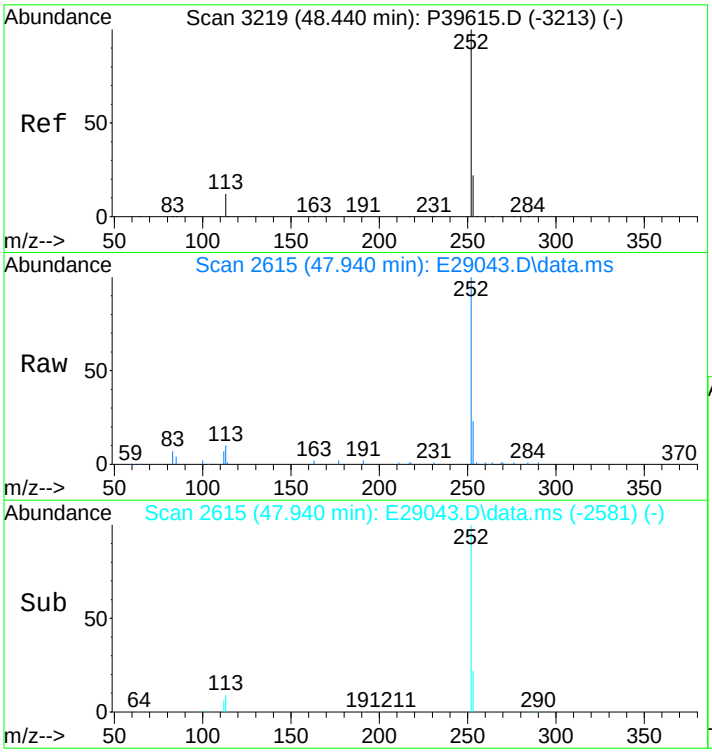


#87
Benzo[e]pyrene
Concen: 2115.76 ng/mL m
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:252 Resp: 431565

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.4	29.0

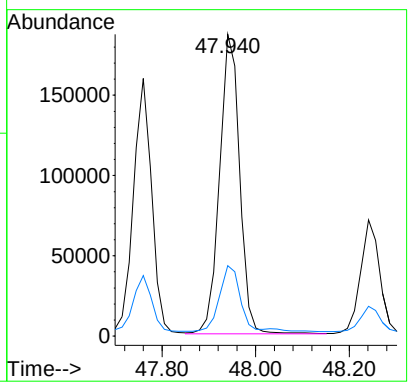


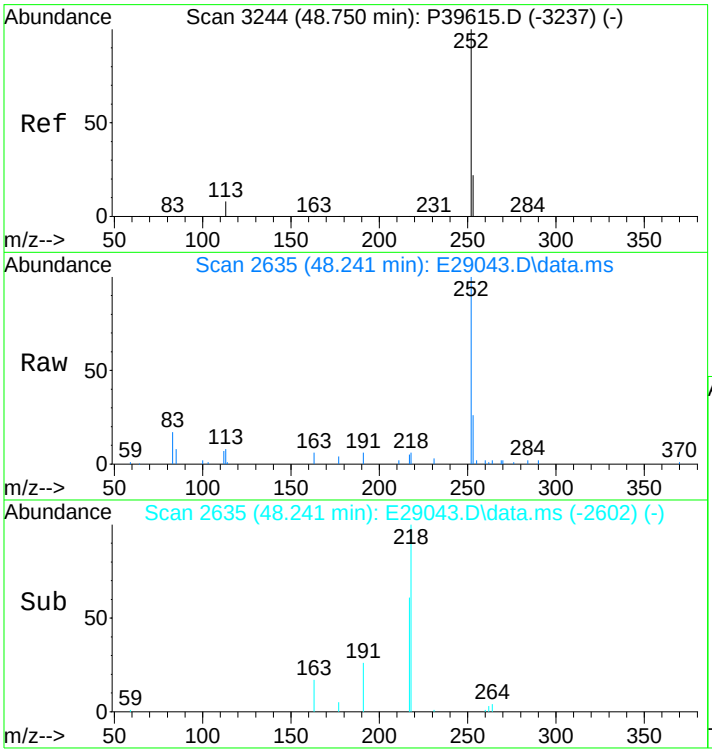


#89
Benzo[a]pyrene
Concen: 2852.06 ng/mL
RT: 47.940 min Scan# 2615
Delta R.T. 0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:252 Resp: 556660

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.6	29.4

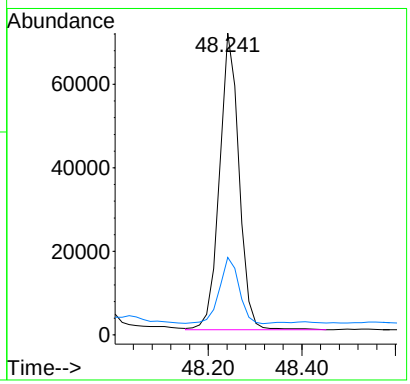


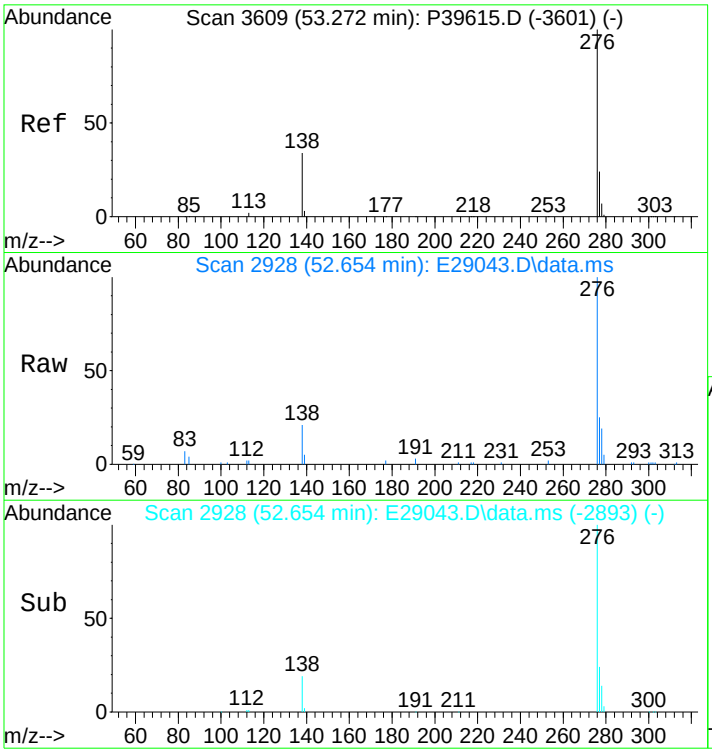


#90
Perylene
Concen: 993.23 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.000 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:252 Resp: 204992

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.9	29.9

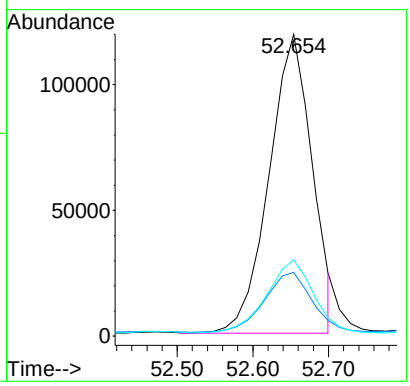


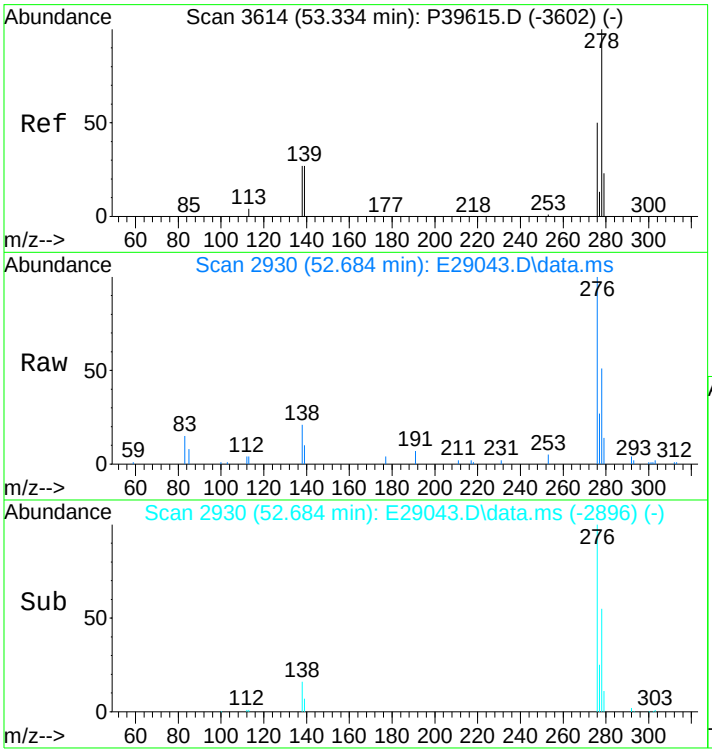


#91
Indeno[1,2,3-cd]pyrene
Concen: 2050.82 ng/mL m
RT: 52.654 min Scan# 2928
Delta R.T. 0.030 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:276 Resp: 471074

Ion	Ratio	Lower	Upper
276	100		
138	22.3	17.8	26.8
277	27.0	20.0	30.0

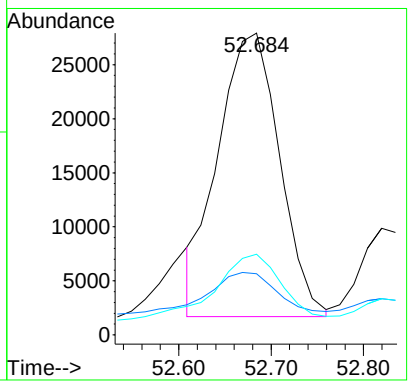


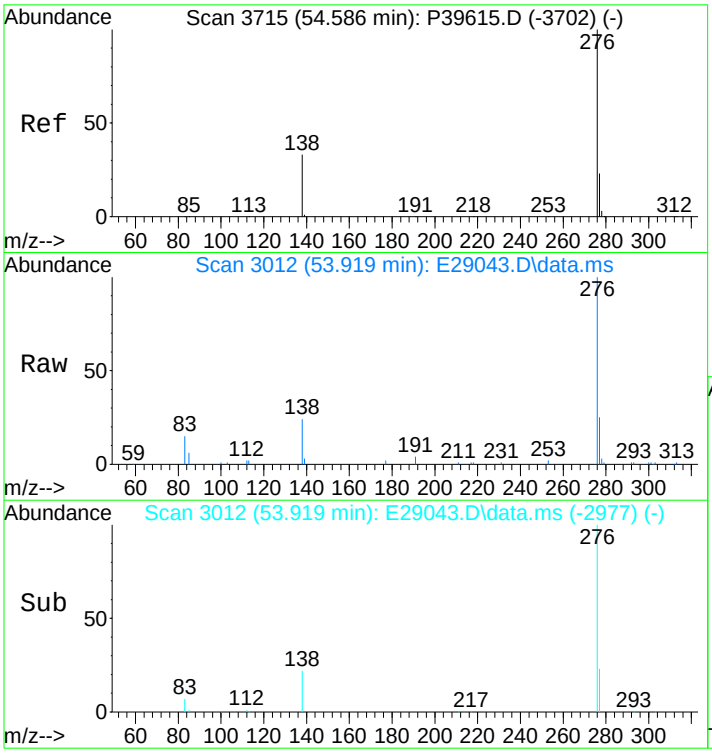


#92
Dibenz[ah]+[ac]anthracene
Concen: 497.47 ng/mL m
RT: 52.684 min Scan# 2930
Delta R.T. 0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:278 Resp: 121671

Ion	Ratio	Lower	Upper
278	100		
139	0.0	13.0	19.4#
279	0.0	19.4	29.2#

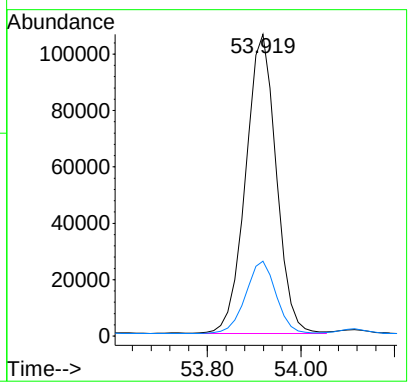


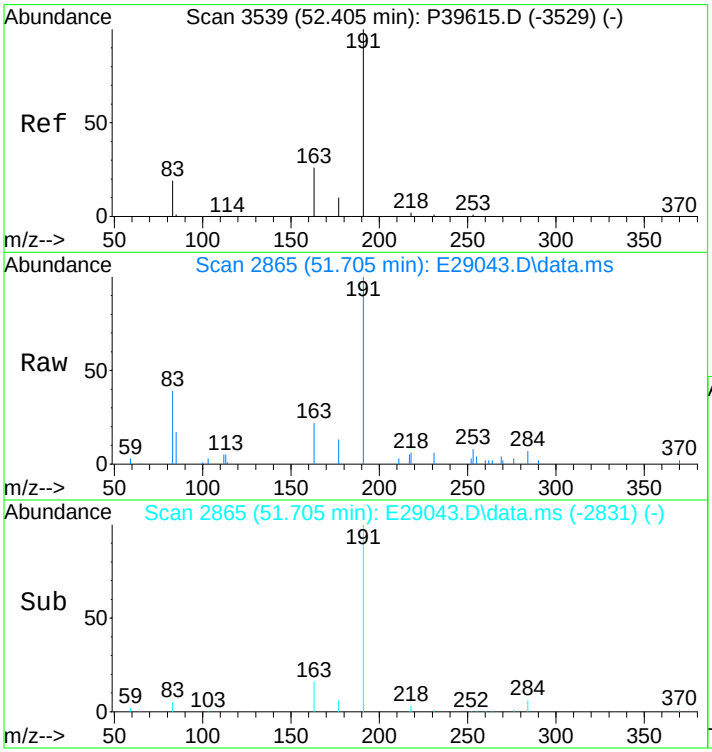


#93
Benzo[g,h,i]perylene
Concen: 1941.48 ng/mL
RT: 53.919 min Scan# 3012
Delta R.T. 0.030 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:276 Resp: 480852

Ion	Ratio	Lower	Upper
276	100		
277	24.3	19.4	29.2

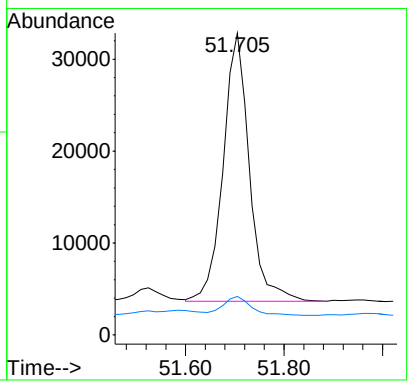


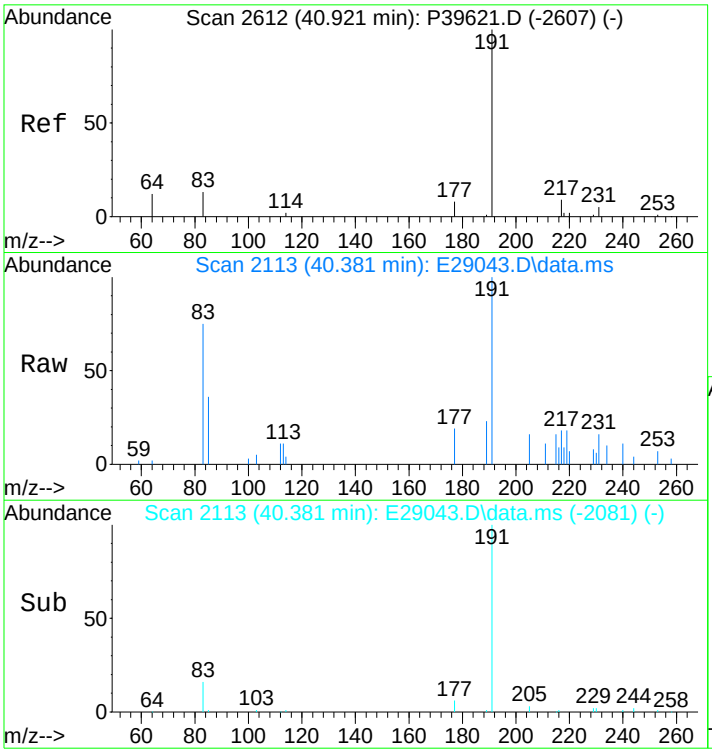


#94
Hopane (T19)
Concen: 1559.48 ng/mL
RT: 51.705 min Scan# 2865
Delta R.T. 0.015 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:191 Resp: 108018

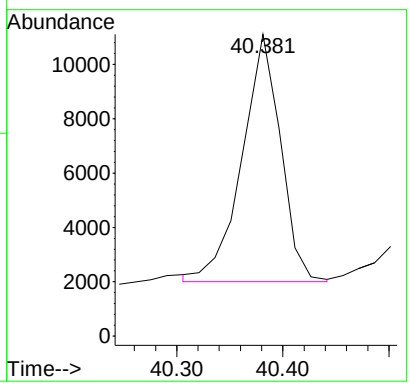
Ion	Ratio	Lower	Upper
191	100		
177	7.4	11.3	16.9#

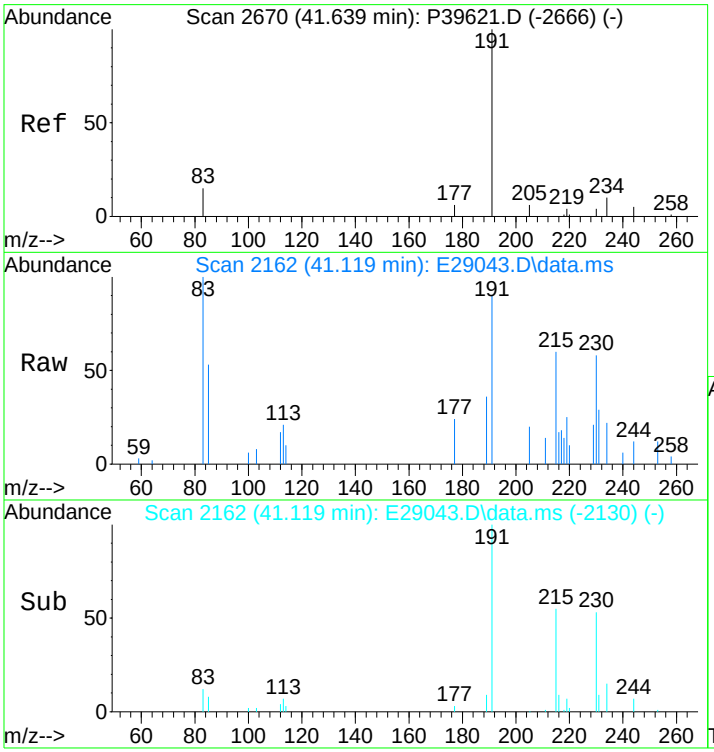




#96
C23 Tricyclic Terpane (T4)
Concen: 331.52 ng/ml m
RT: 40.381 min Scan# 2113
Delta R.T. -0.012 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

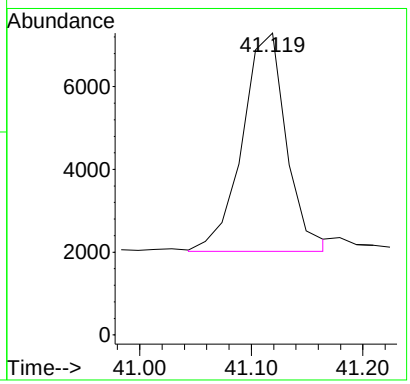
Tgt Ion:191 Resp: 22963

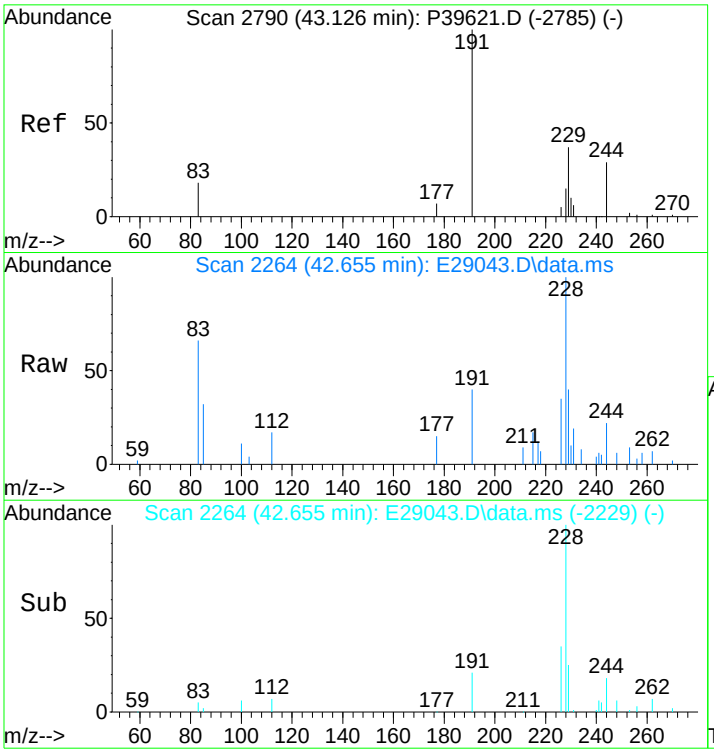




#97
C24 Tricyclic Terpane (T5)
Concen: 209.64 ng/ml m
RT: 41.119 min Scan# 2162
Delta R.T. -0.013 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

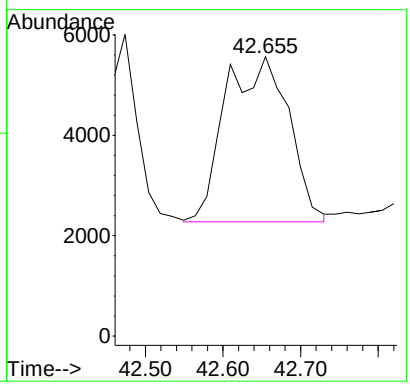
Tgt Ion:191 Resp: 14521

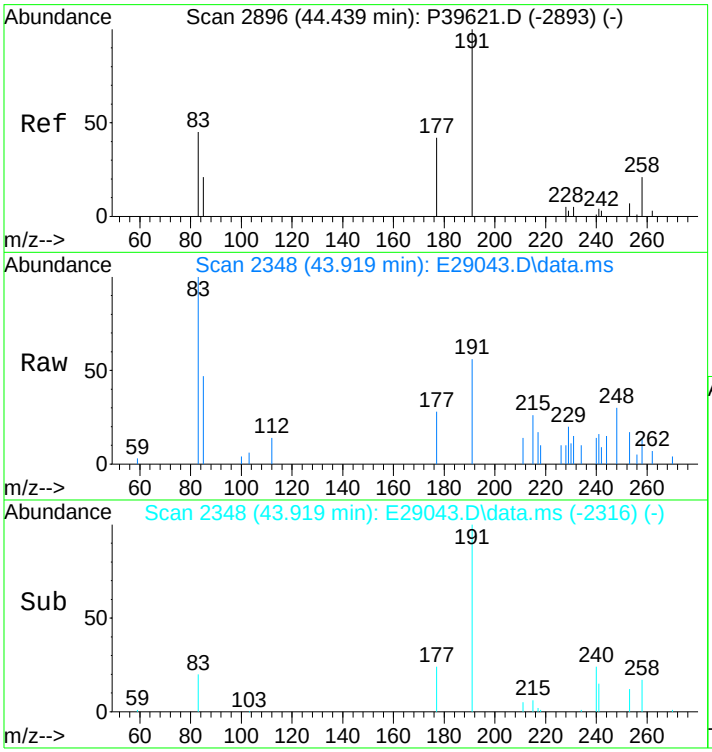




#98
C25 Tricyclic Terpane (T6)
Concen: 269.46 ng/ml m
RT: 42.655 min Scan# 2264
Delta R.T. 0.030 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

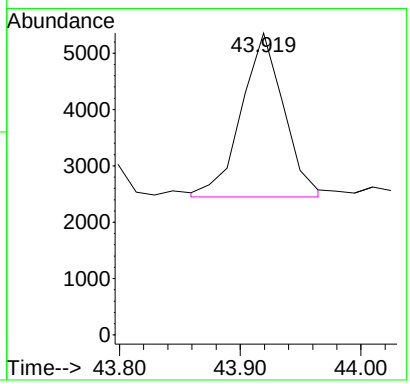
Tgt Ion:191 Resp: 18664

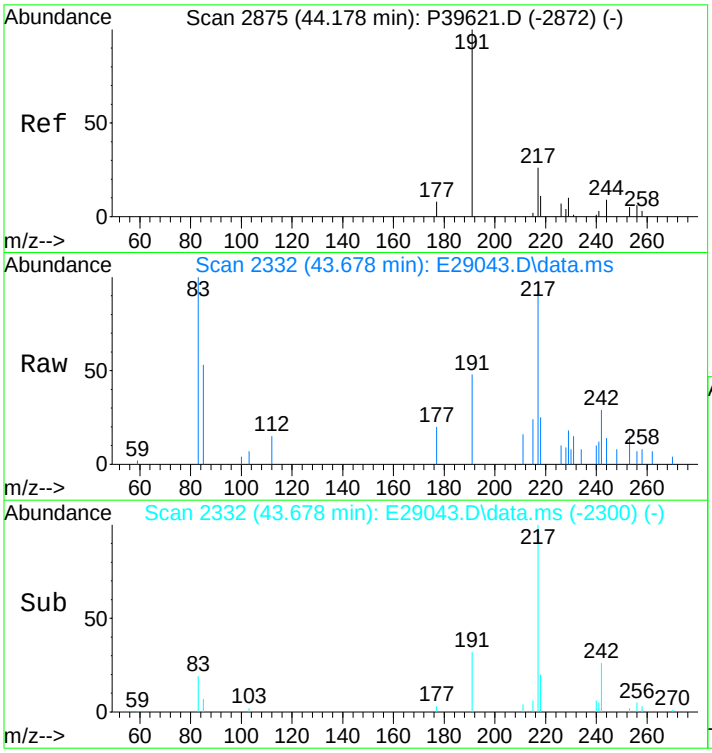




#99
C24 Tetracyclic Terpane (T6a)
Concen: 101.85 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

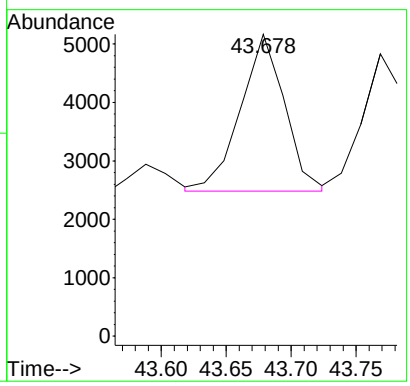
Tgt Ion:191 Resp: 7055

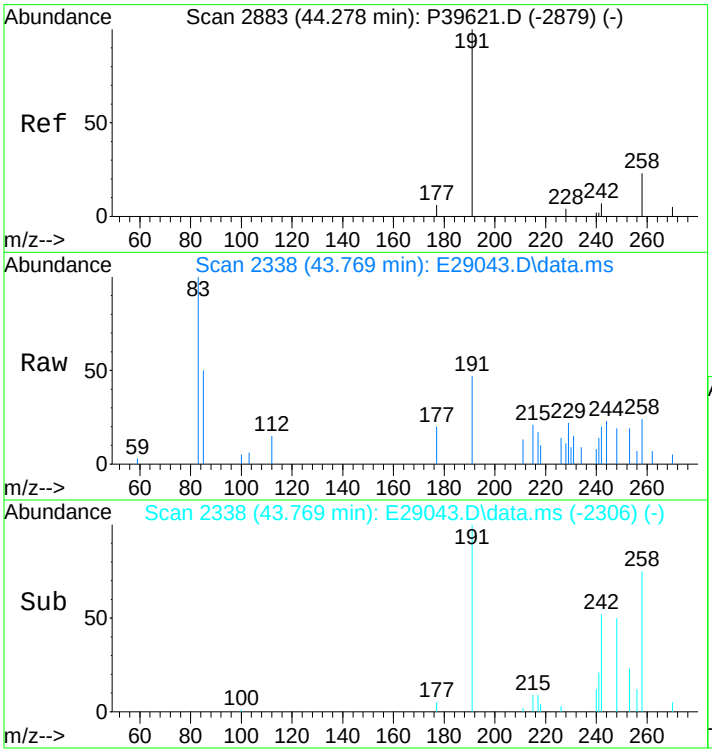




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 91.46 ng/ml m
RT: 43.678 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

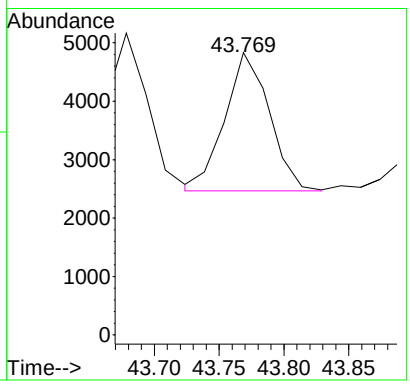
Tgt Ion:191 Resp: 6335

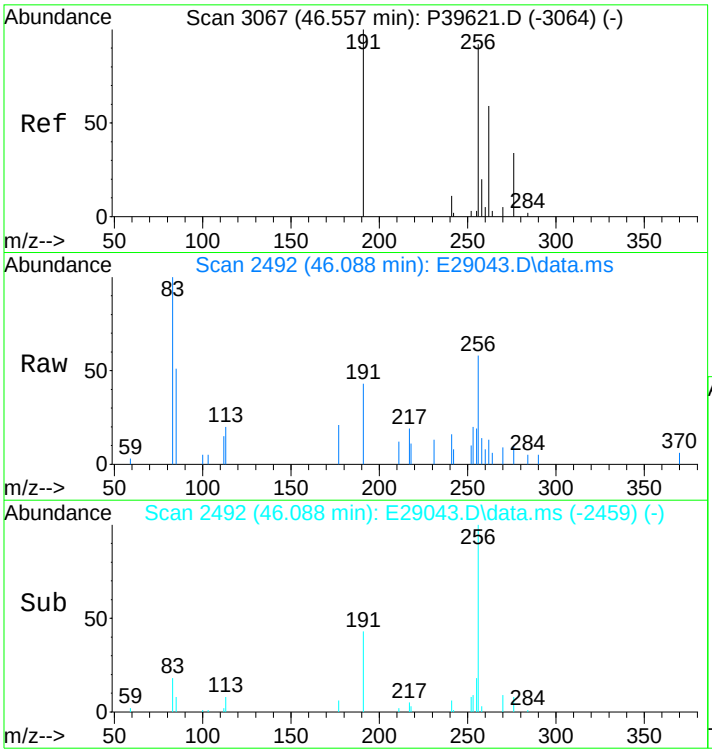




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 81.86 ng/ml m
RT: 43.769 min Scan# 2338
Delta R.T. -0.016 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

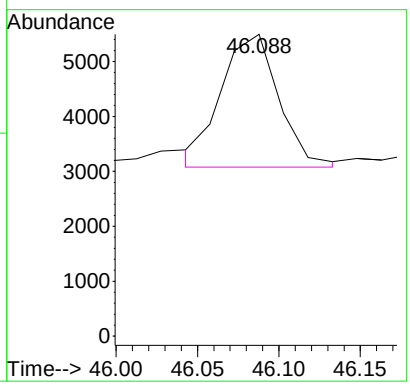
Tgt Ion:191 Resp: 5670

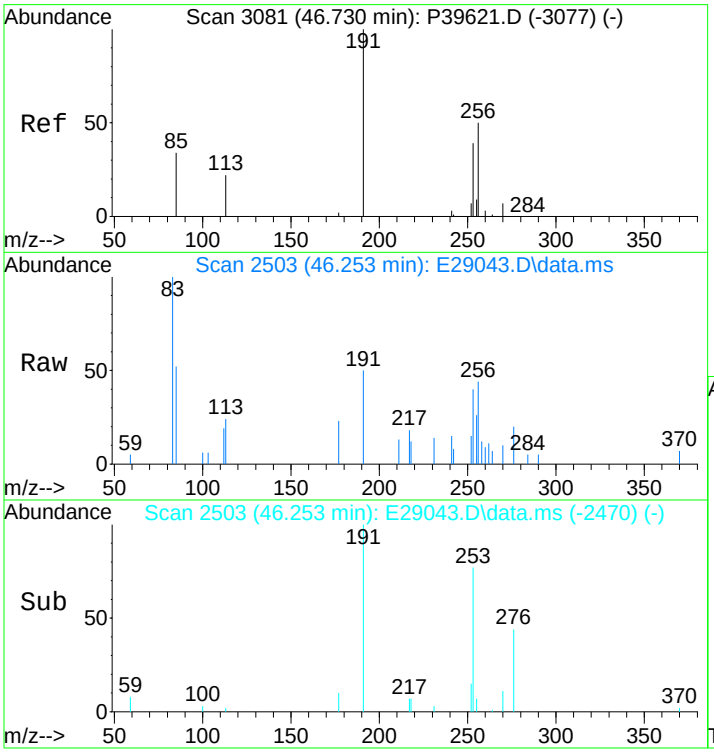




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 85.64 ng/ml m
RT: 46.088 min Scan# 2492
Delta R.T. -0.003 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

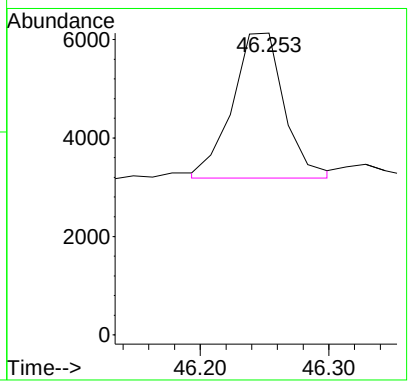
Tgt Ion:191 Resp: 5932

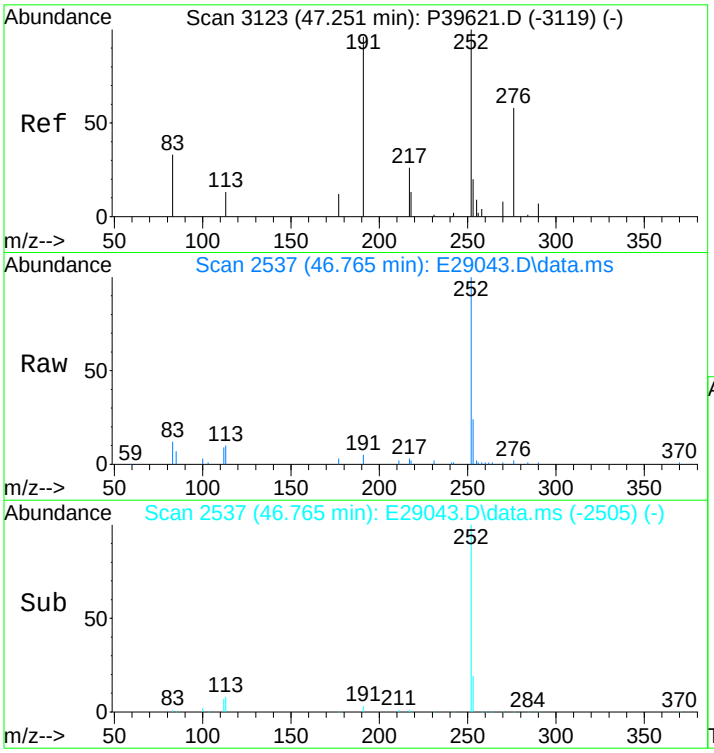




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 118.77 ng/ml m
RT: 46.253 min Scan# 2503
Delta R.T. -0.004 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

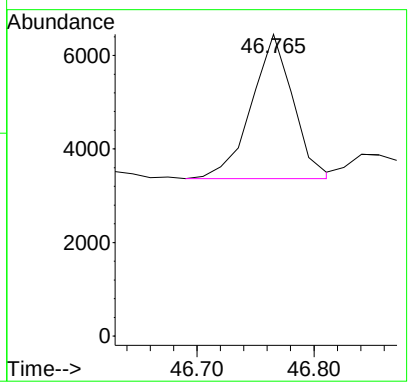
Tgt Ion:191 Resp: 8227

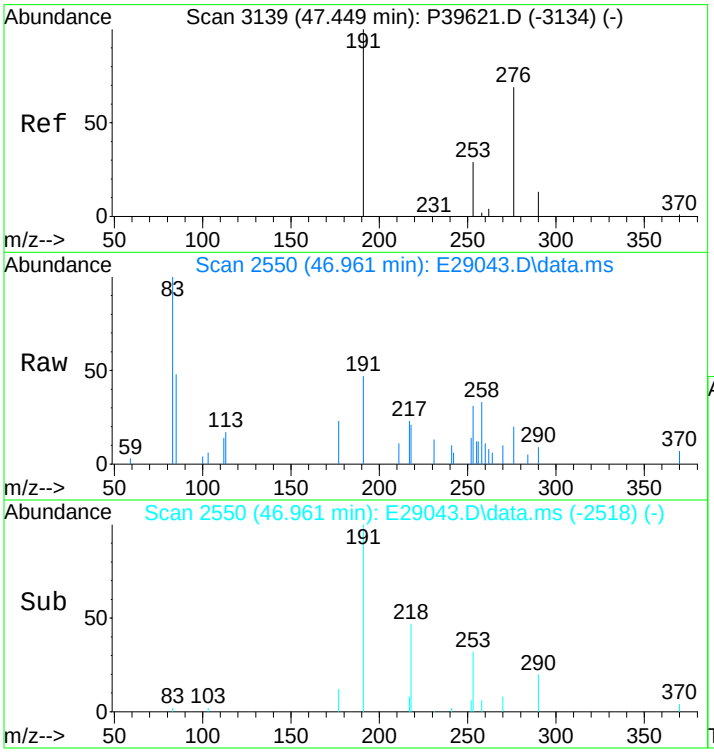




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 110.00 ng/ml
RT: 46.765 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

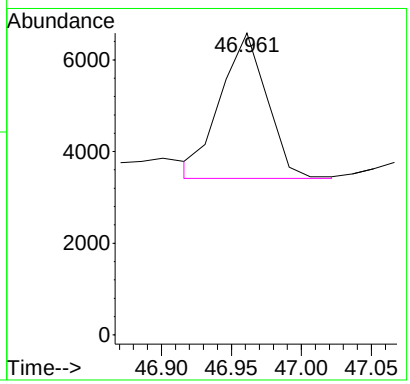
Tgt Ion:191 Resp: 7619

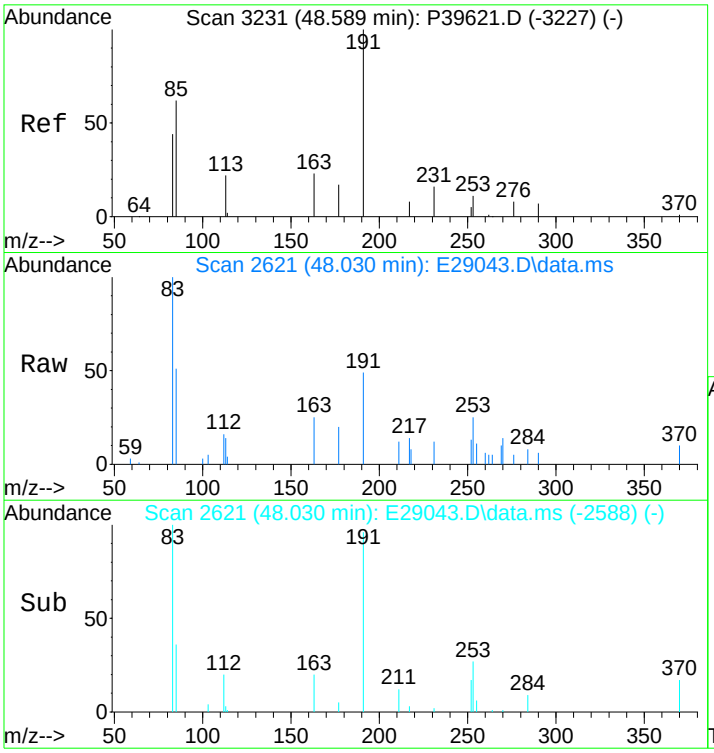




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 105.32 ng/ml m
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

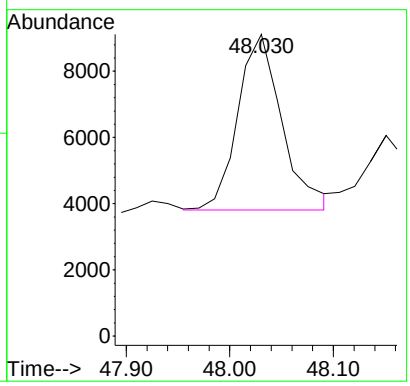
Tgt Ion:191 Resp: 7295

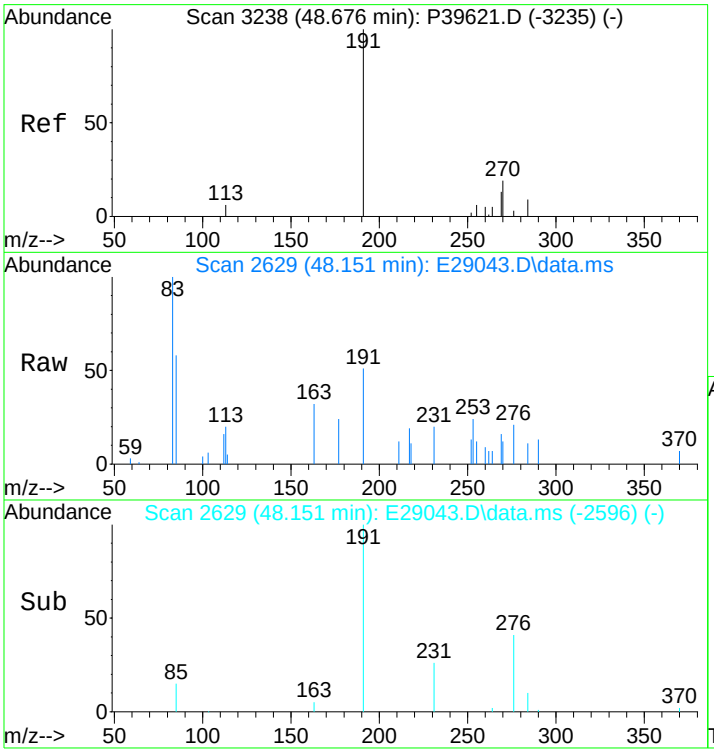




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 226.53 ng/ml m
RT: 48.030 min Scan# 2621
Delta R.T. -0.005 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

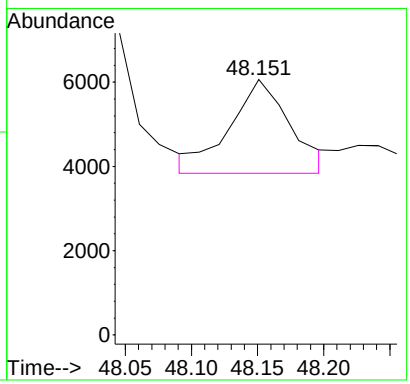
Tgt Ion:191 Resp: 15691

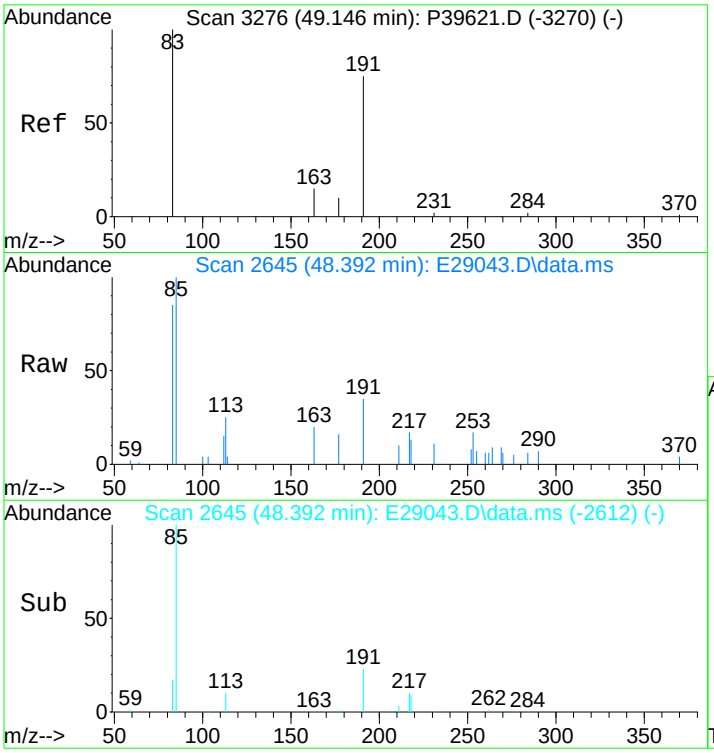




#107
C30 Tricyclic Terpane-22S
Concen: 101.62 ng/mL m
RT: 48.151 min Scan# 2629
Delta R.T. -0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

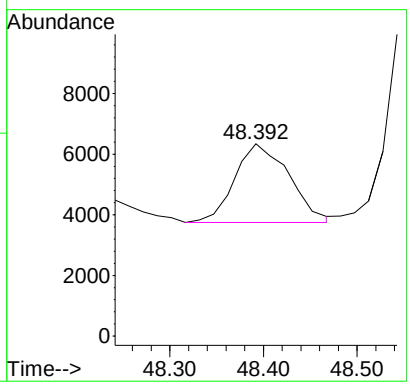
Tgt Ion:191 Resp: 7039

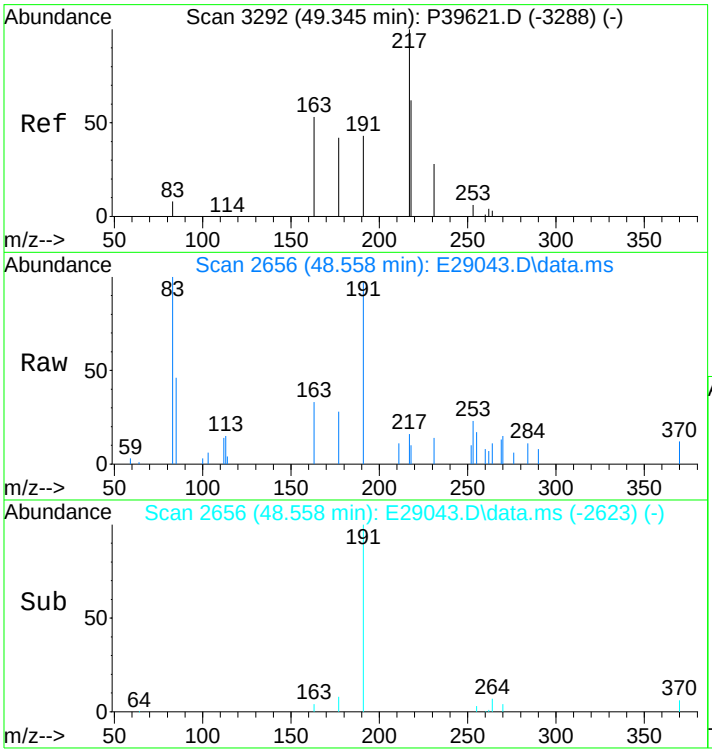




#108
C30 Tricyclic Terpane-22R
Concen: 151.63 ng/mL
RT: 48.392 min Scan# 2645
Delta R.T. -0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

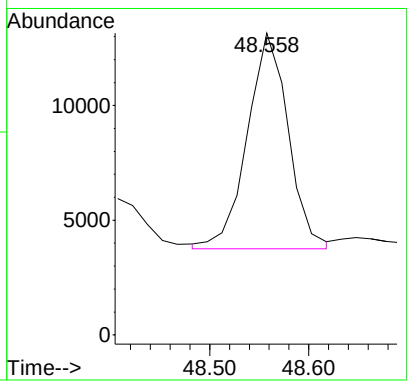
Tgt Ion:191 Resp: 10503

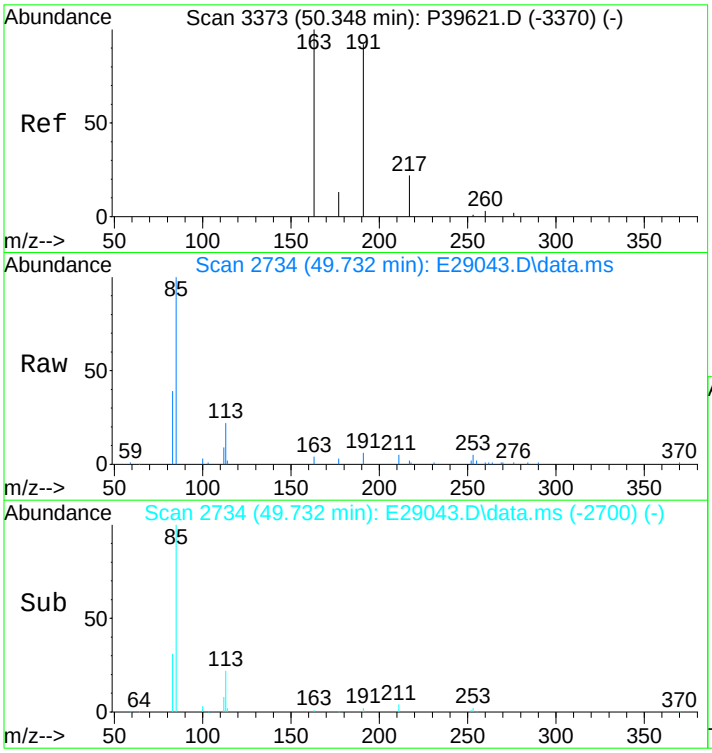




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 389.62 ng/ml m
RT: 48.558 min Scan# 2656
Delta R.T. -0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

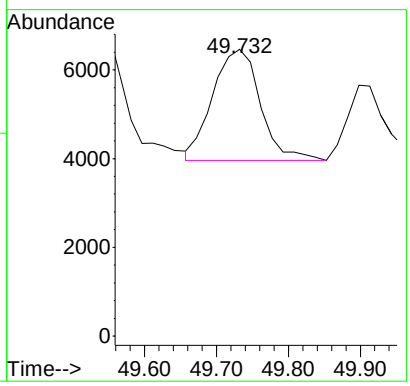
Tgt Ion:191 Resp: 26987

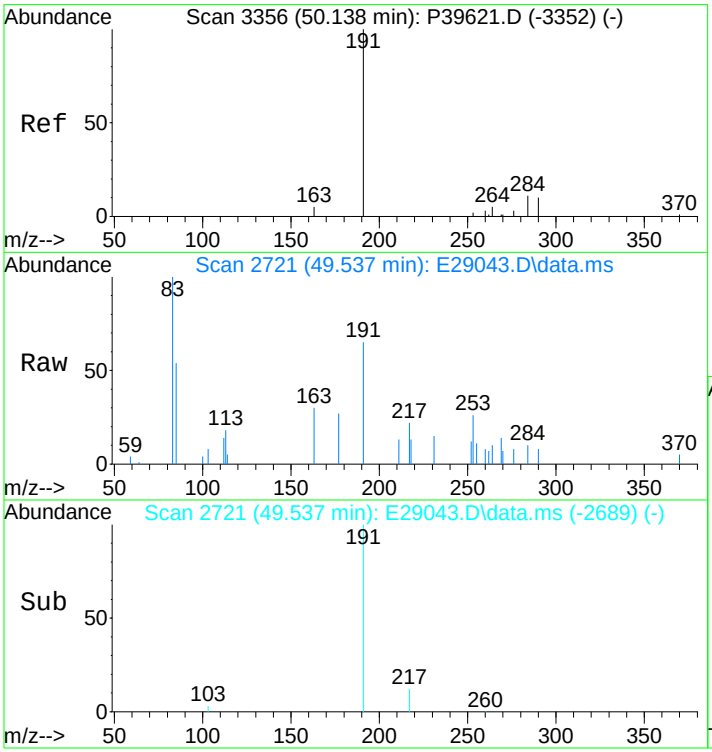




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 165.94 ng/ml
RT: 49.732 min Scan# 2734
Delta R.T. 0.008 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

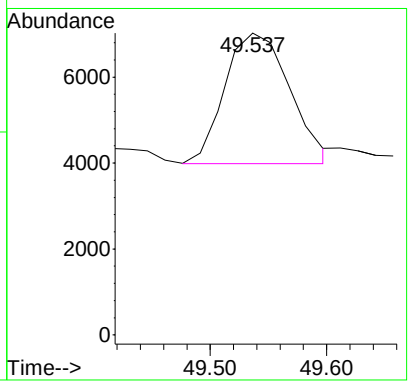
Tgt Ion:191 Resp: 11494

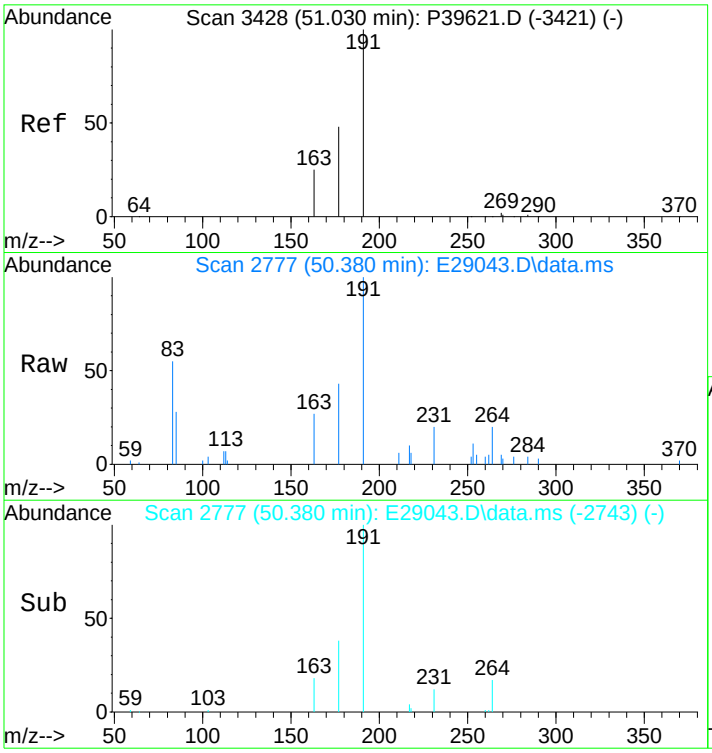




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 170.85 ng/ml m
RT: 49.537 min Scan# 2721
Delta R.T. -0.022 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

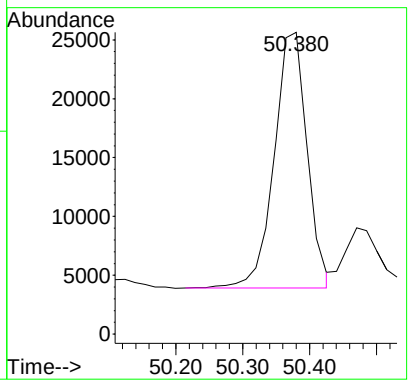
Tgt Ion:191 Resp: 11834

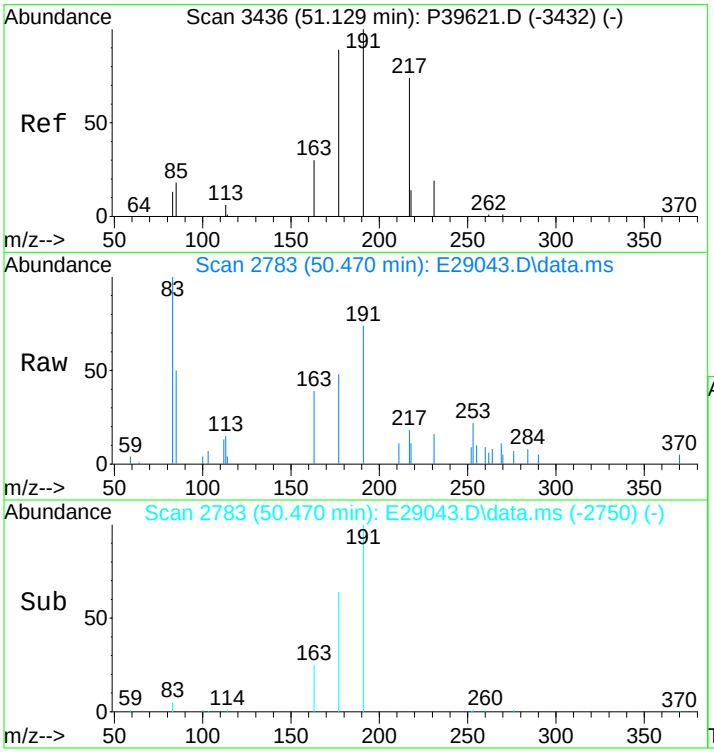




#112
30-Norhopane (T15)
Concen: 1074.03 ng/ml
RT: 50.380 min Scan# 2777
Delta R.T. 0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

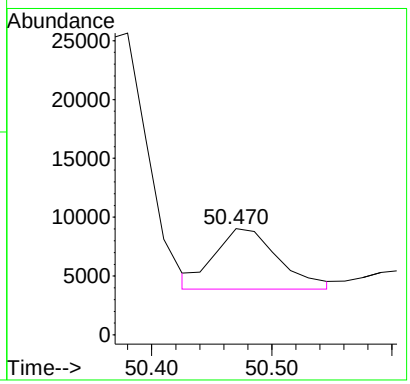
Tgt Ion:191 Resp: 74393

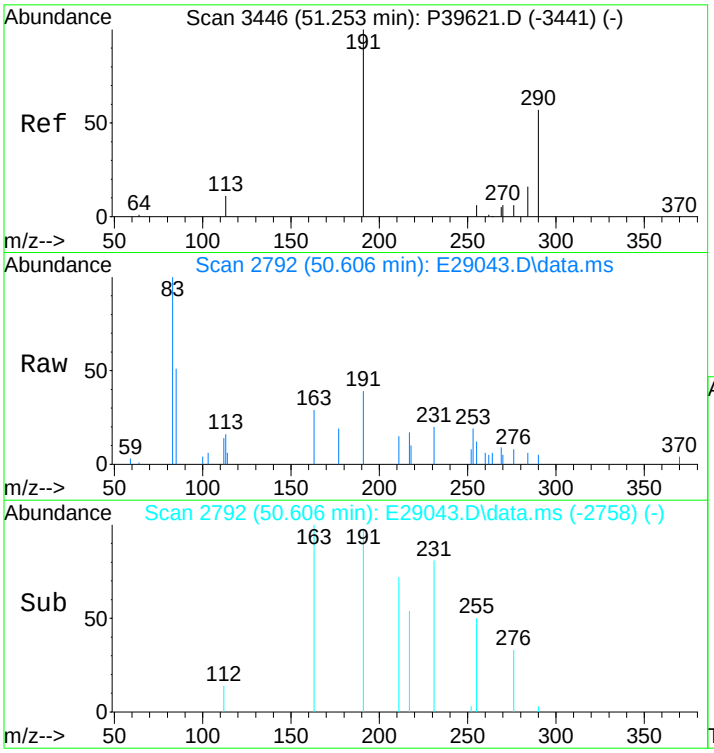




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 275.45 ng/ml m
RT: 50.470 min Scan# 2783
Delta R.T. -0.008 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

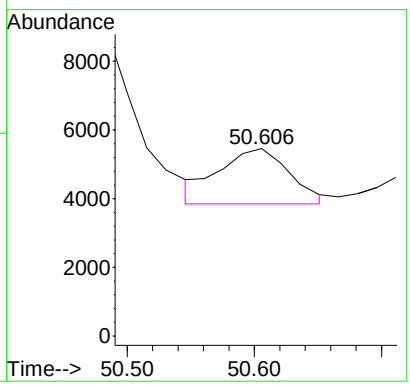
Tgt Ion:191 Resp: 19079

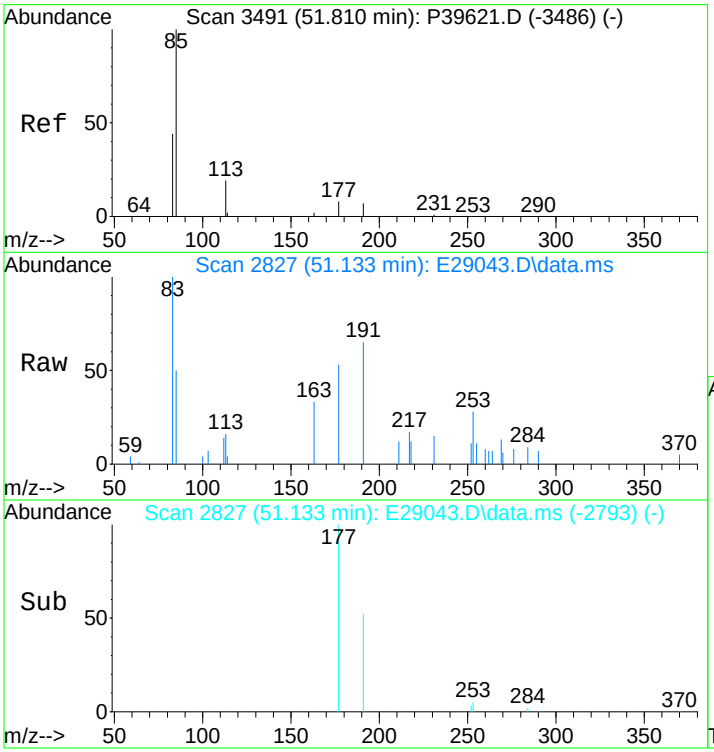




#114
17a(H)-Diahopane (X)
Concen: 89.11 ng/ml m
RT: 50.606 min Scan# 2792
Delta R.T. 0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

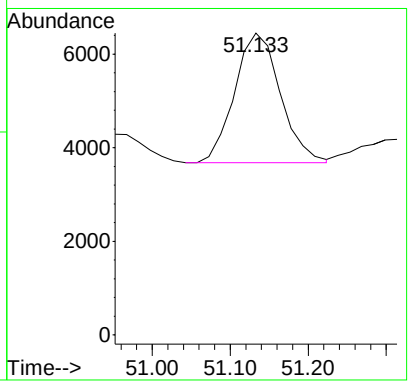
Tgt Ion:191 Resp: 6172

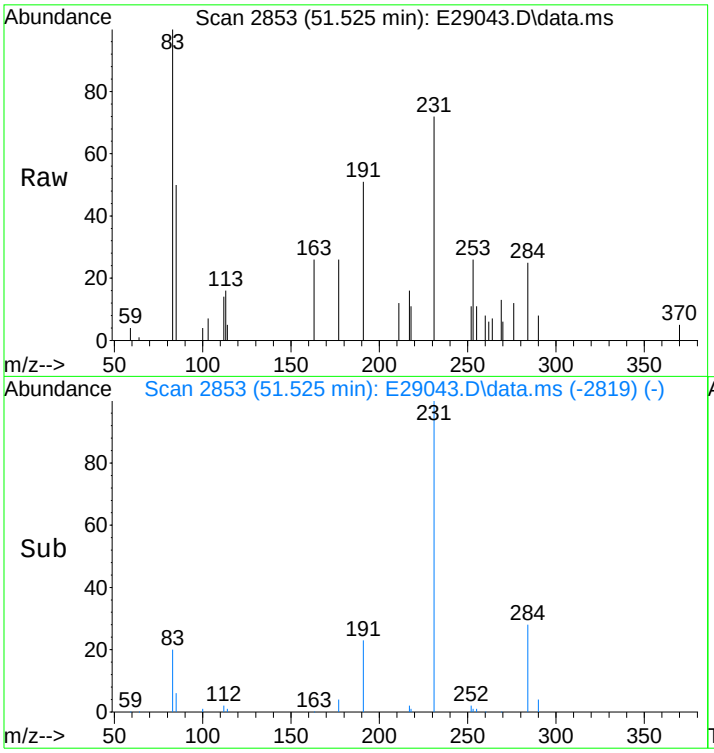




#115
30-Normoretane (T17)
Concen: 163.41 ng/ml
RT: 51.133 min Scan# 2827
Delta R.T. 0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

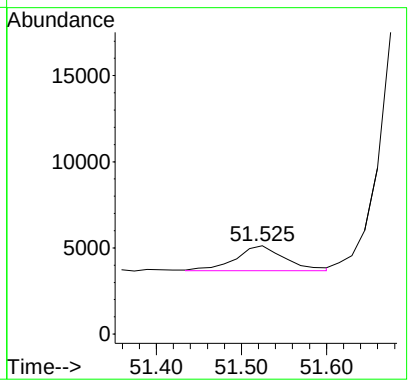
Tgt Ion:191 Resp: 11319

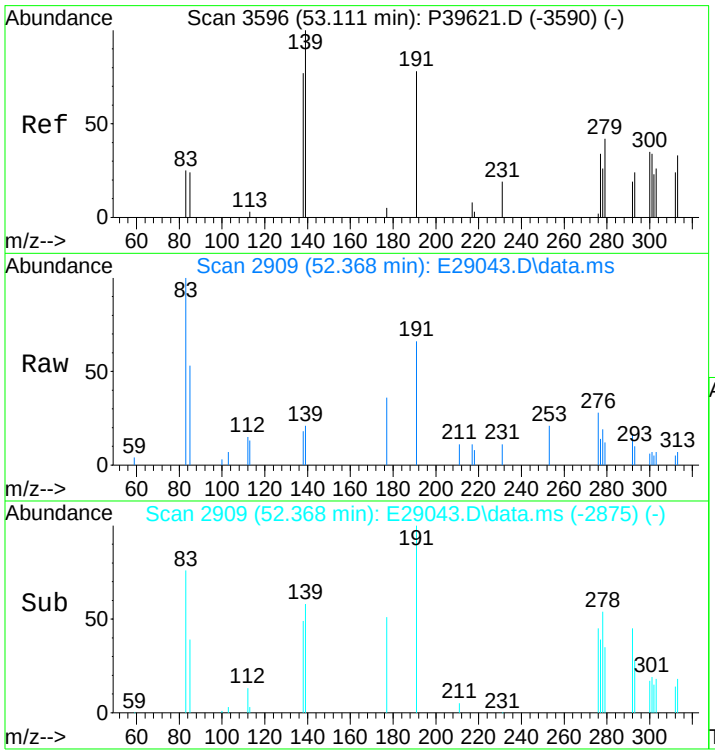




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 84.86 ng/ml
RT: 51.525 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

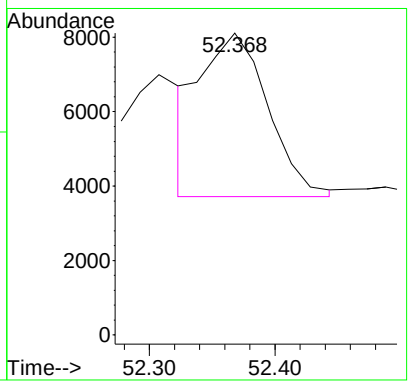
Tgt Ion:191 Resp: 5878

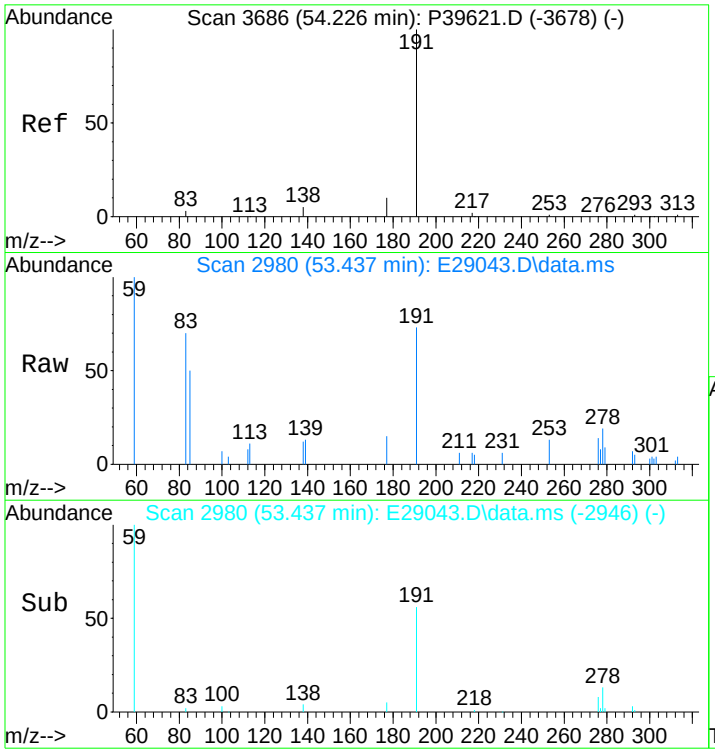




#117
Moretane (T20)
Concen: 238.08 ng/ml m
RT: 52.368 min Scan# 2909
Delta R.T. 0.005 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

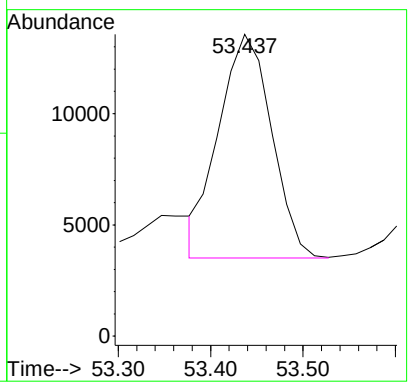
Tgt Ion:191 Resp: 16491

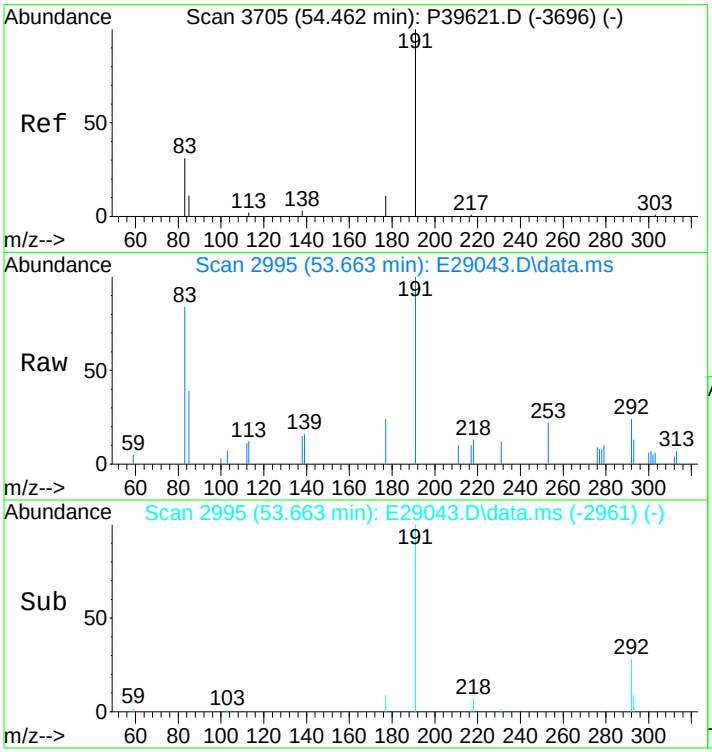




#118
30-Homohopane-22S (T21)
Concen: 577.21 ng/ml m
RT: 53.437 min Scan# 2980
Delta R.T. 0.019 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

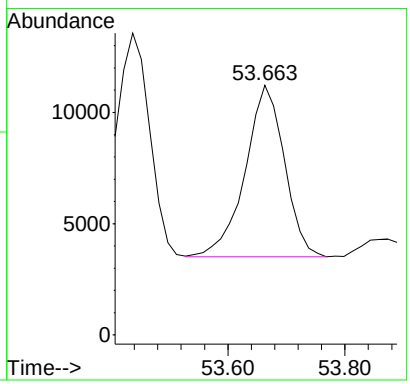
Tgt Ion:191 Resp: 39981

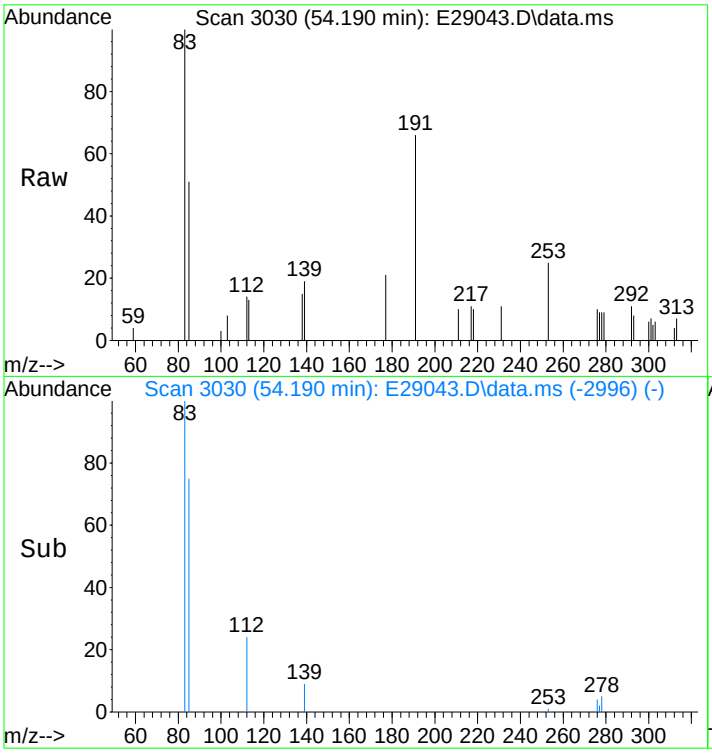




#119
30-Homohopane-22R (T22)
Concen: 519.00 ng/ml
RT: 53.663 min Scan# 2995
Delta R.T. 0.019 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

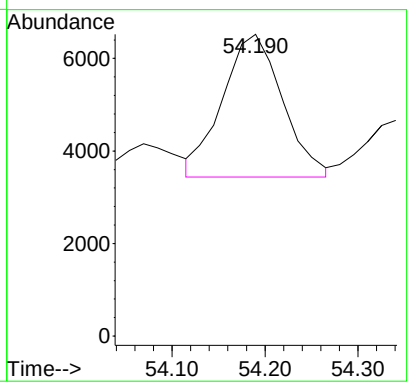
Tgt Ion:191 Resp: 35949

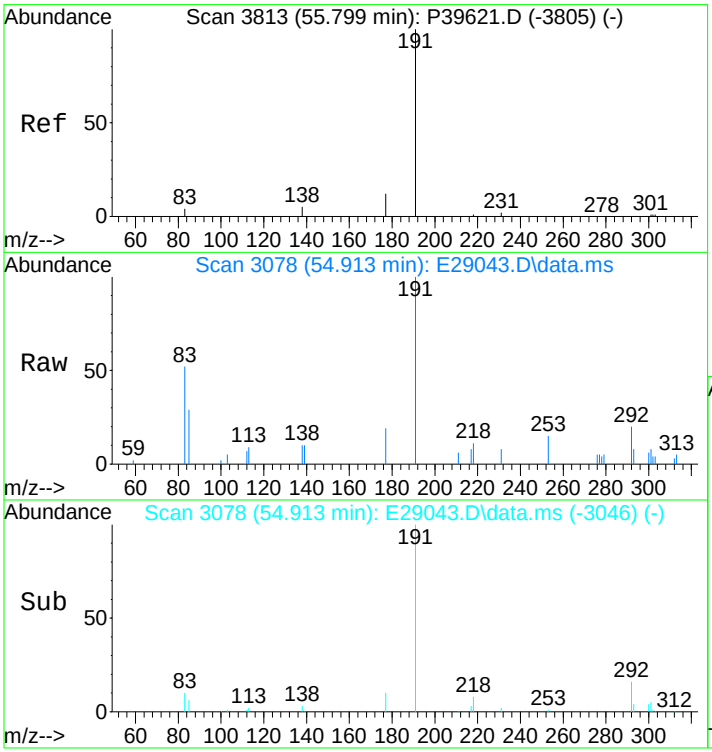




#120
Gammacerane/C32-diahopane
Concen: 199.35 ng/mL m
RT: 54.190 min Scan# 3030
Delta R.T. 0.018 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

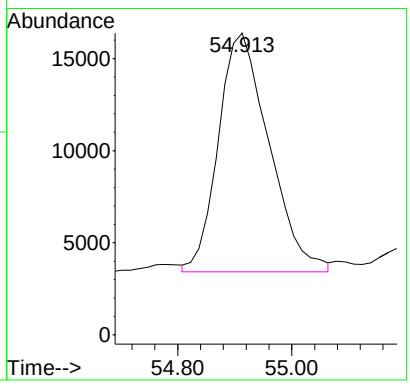
Tgt Ion:191 Resp: 13808

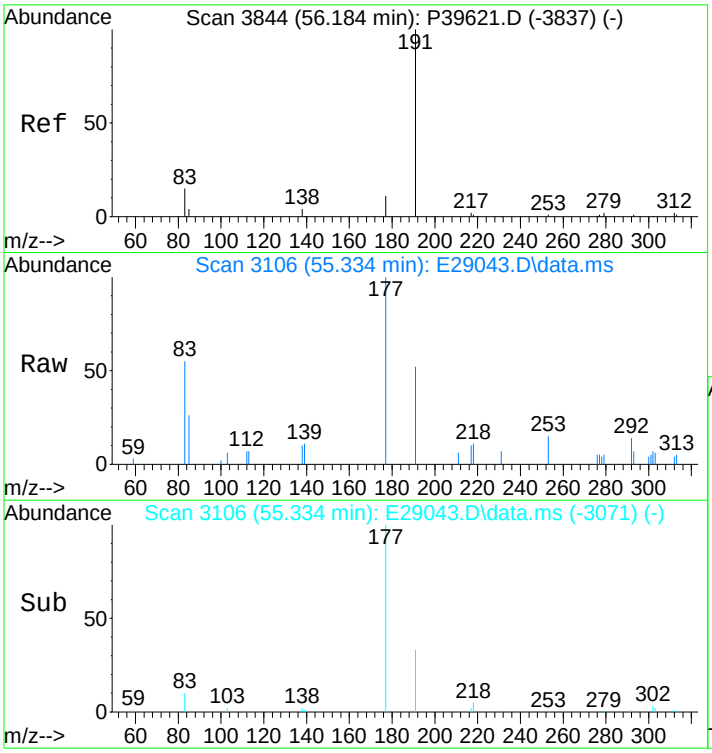




#121
30,31-Bishomohopane-22S (T26)
Concen: 1156.91 ng/ml m
RT: 54.913 min Scan# 3078
Delta R.T. -0.013 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

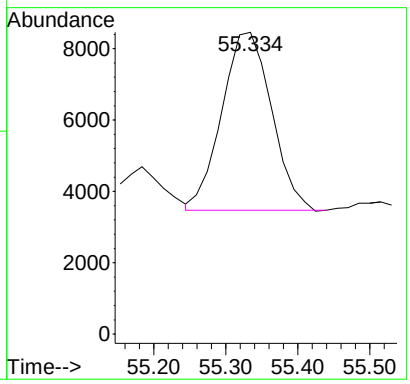
Tgt Ion:191 Resp: 80134

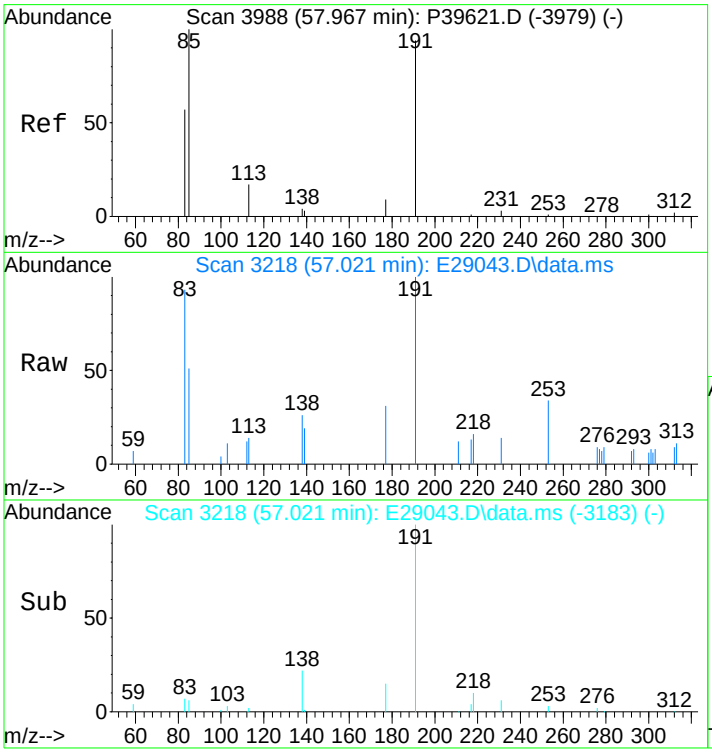




#122
30,31-Bishomohopane-22R (T27)
Concen: 344.54 ng/ml
RT: 55.334 min Scan# 3106
Delta R.T. 0.032 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

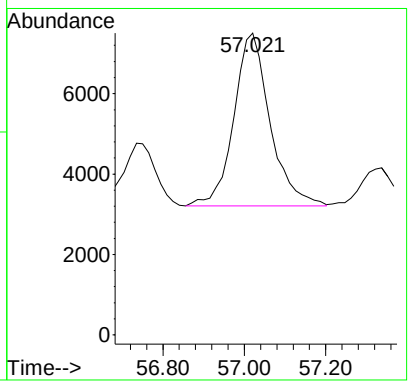
Tgt Ion:191 Resp: 23865

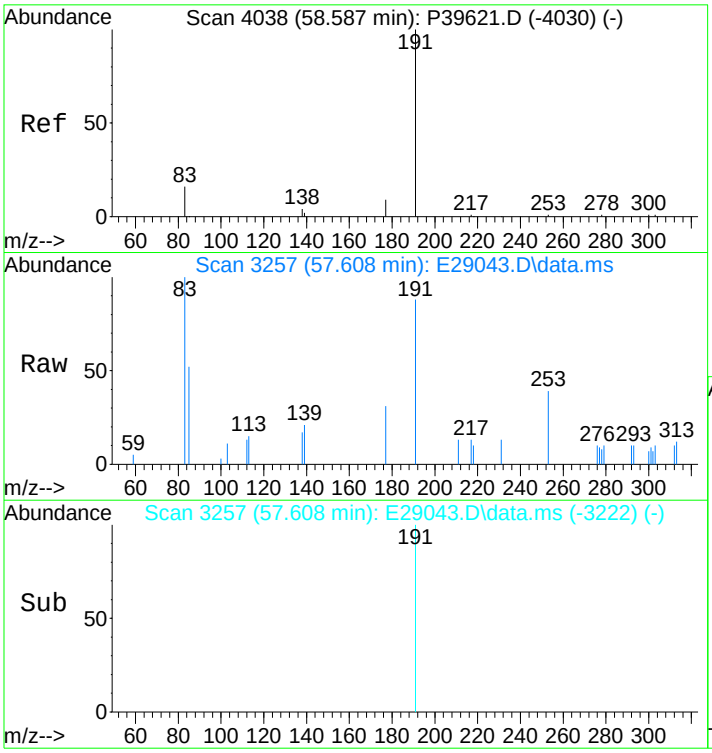




#123
30,31-Trishomohopane-22S (T30)
Concen: 383.50 ng/ml
RT: 57.021 min Scan# 3218
Delta R.T. 0.030 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

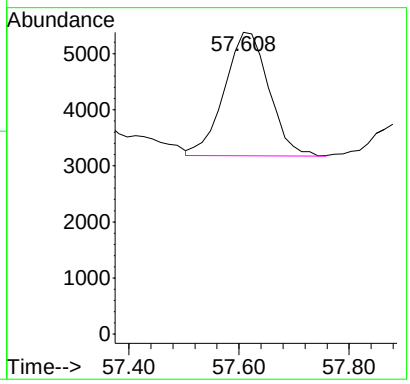
Tgt Ion:191 Resp: 26563

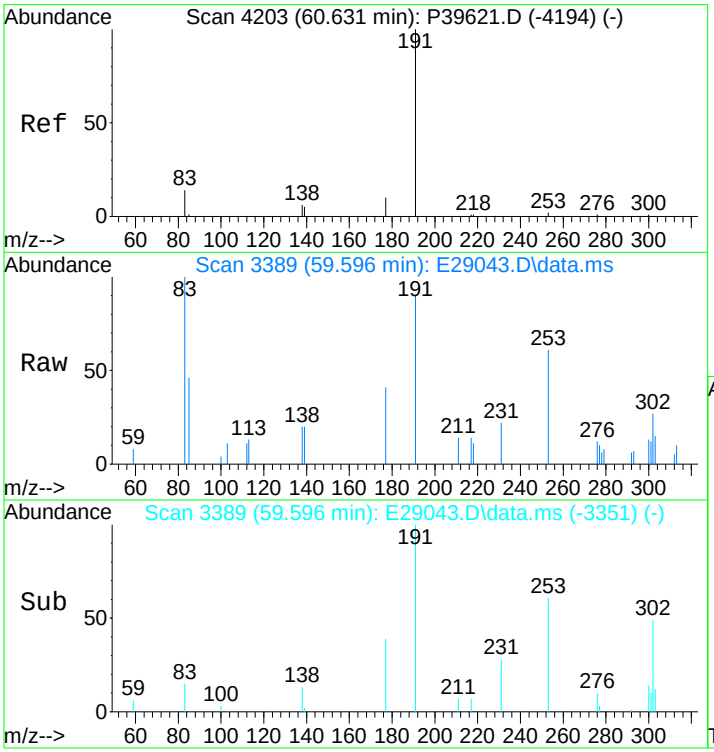




#124
30,31-Trishomohopane-22R (T31)
Concen: 178.01 ng/ml
RT: 57.608 min Scan# 3257
Delta R.T. 0.030 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

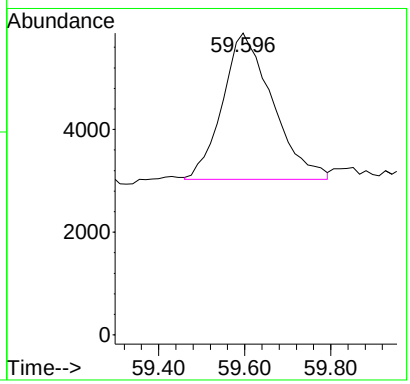
Tgt Ion:191 Resp: 12330

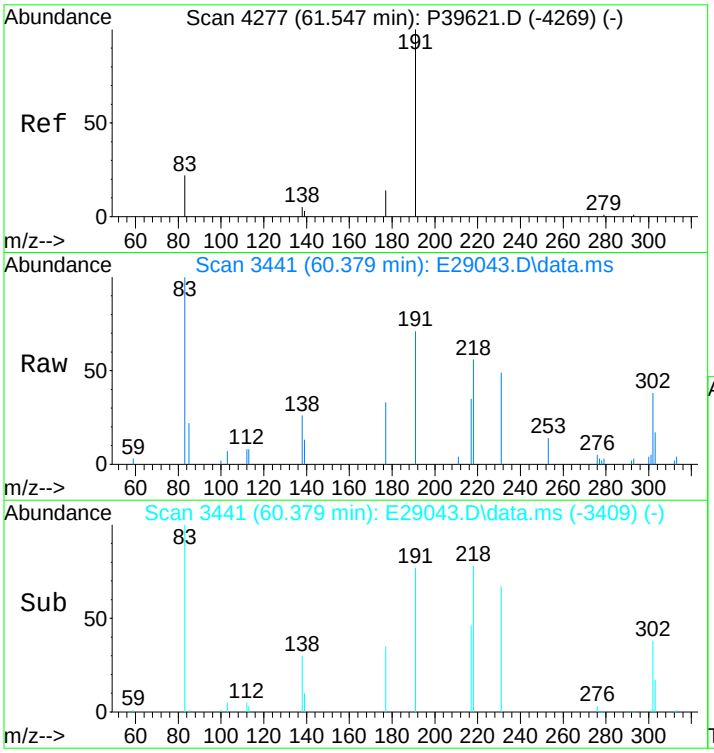




#125
Tetrakishomohopane-22S (T32)
Concen: 332.33 ng/ml m
RT: 59.596 min Scan# 3389
Delta R.T. 0.073 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

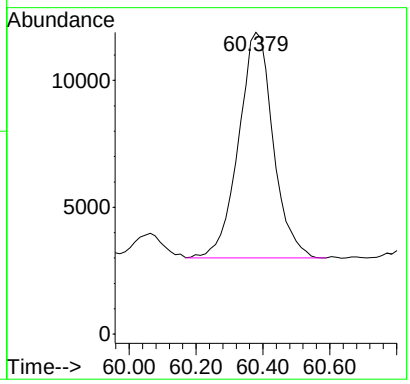
Tgt Ion:191 Resp: 23019

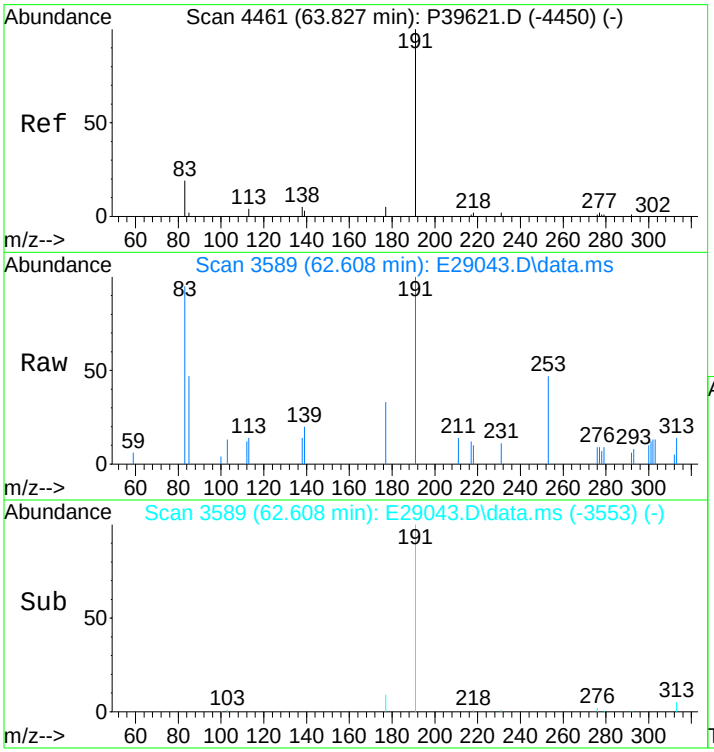




#126
Tetrakishomohopane-22R (T33)
Concen: 926.26 ng/ml
RT: 60.379 min Scan# 3441
Delta R.T. -0.018 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

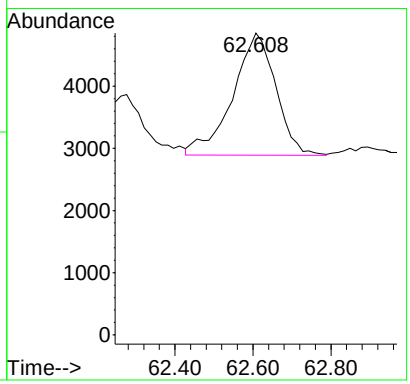
Tgt Ion:191 Resp: 64158

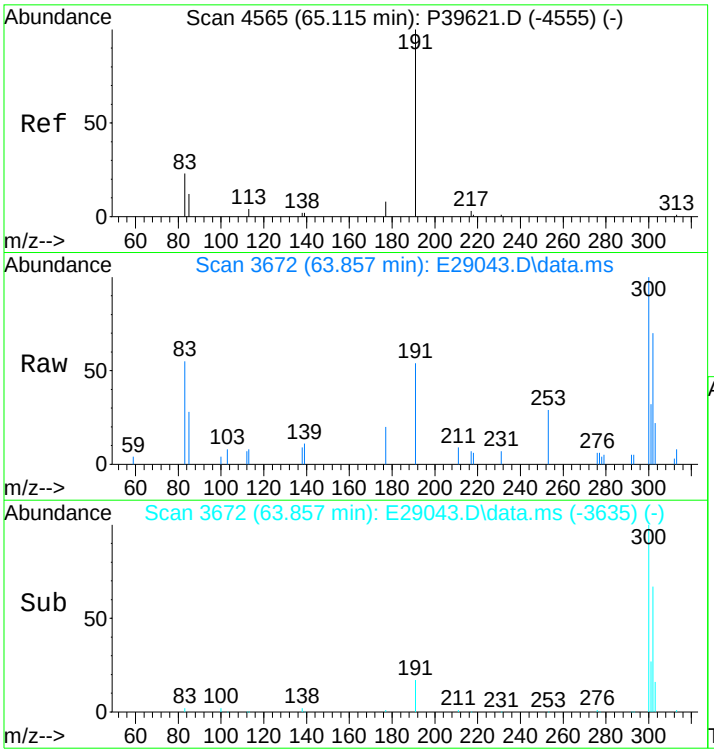




#127
Pentakishomohopane-22S (T34)
Concen: 217.03 ng/ml
RT: 62.608 min Scan# 3589
Delta R.T. 0.039 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

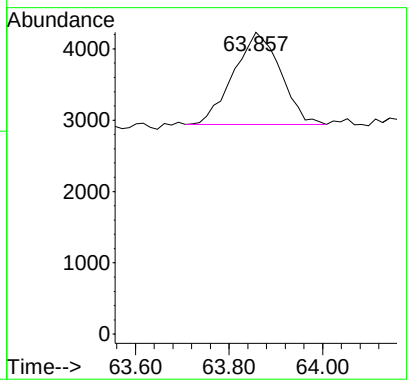
Tgt Ion:191 Resp: 15033

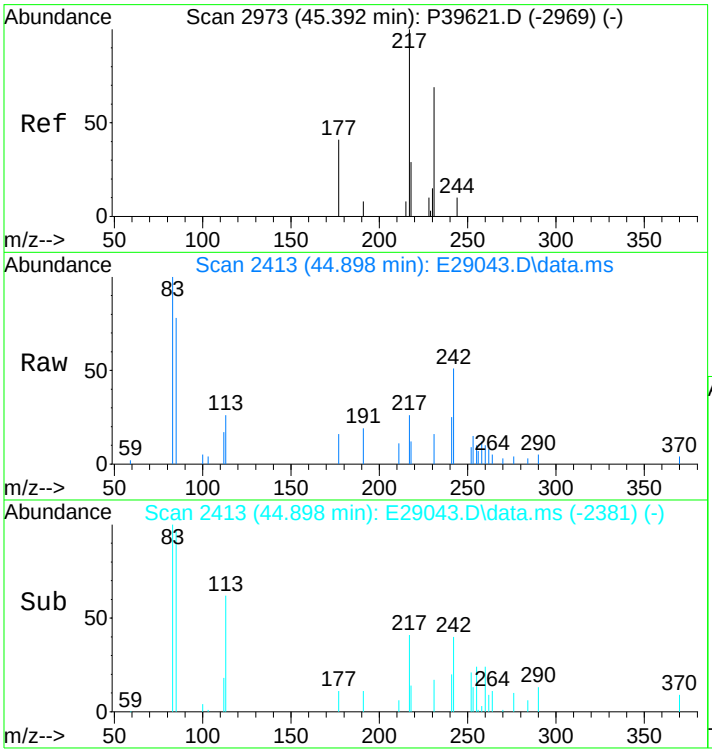




#128
Pentakishomohopane-22R (T35)
Concen: 130.40 ng/ml
RT: 63.857 min Scan# 3672
Delta R.T. 0.053 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

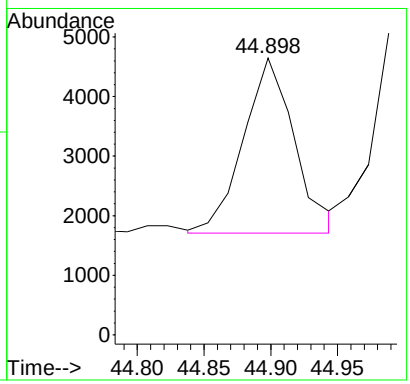
Tgt Ion:191 Resp: 9032

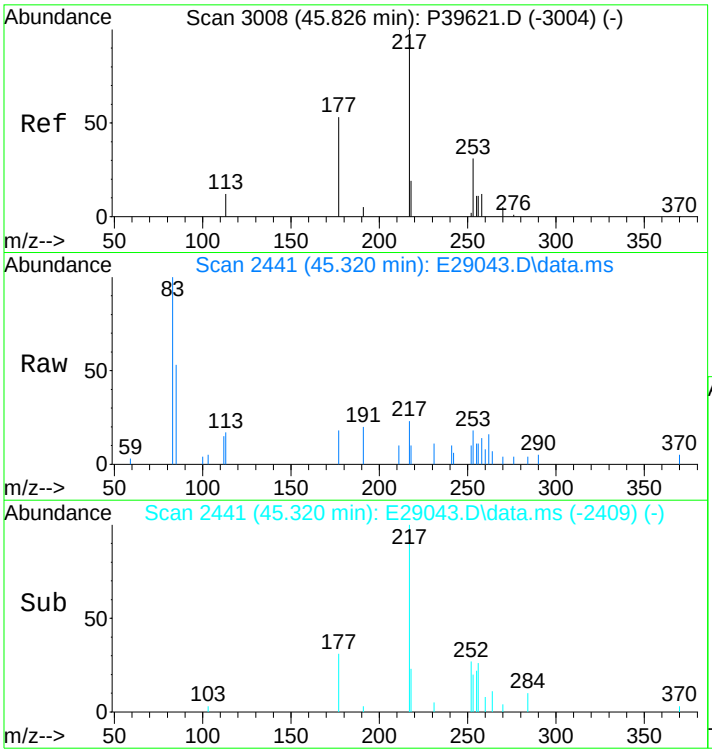




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 215.20 ng/ml m
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

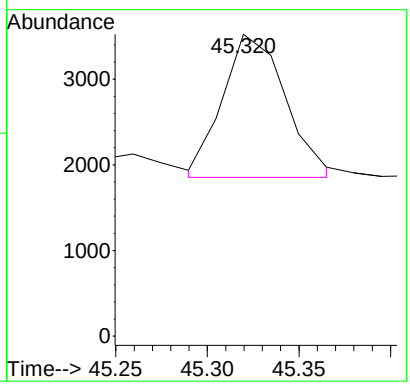
Tgt Ion:217 Resp: 7828

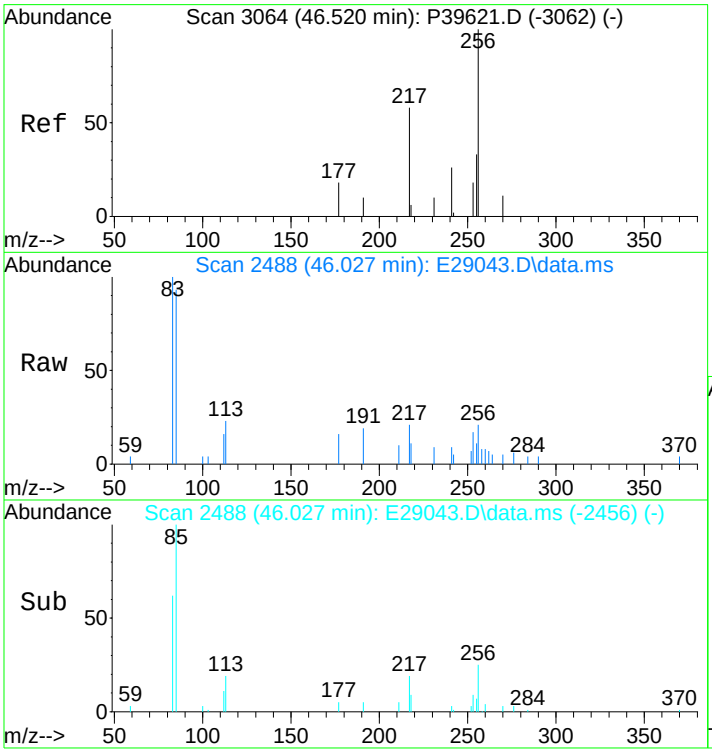




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 109.64 ng/ml m
RT: 45.320 min Scan# 2441
Delta R.T. -0.018 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

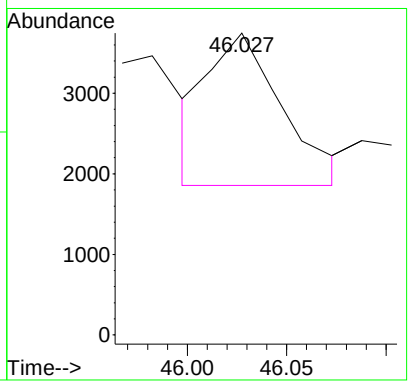
Tgt Ion:217 Resp: 3988

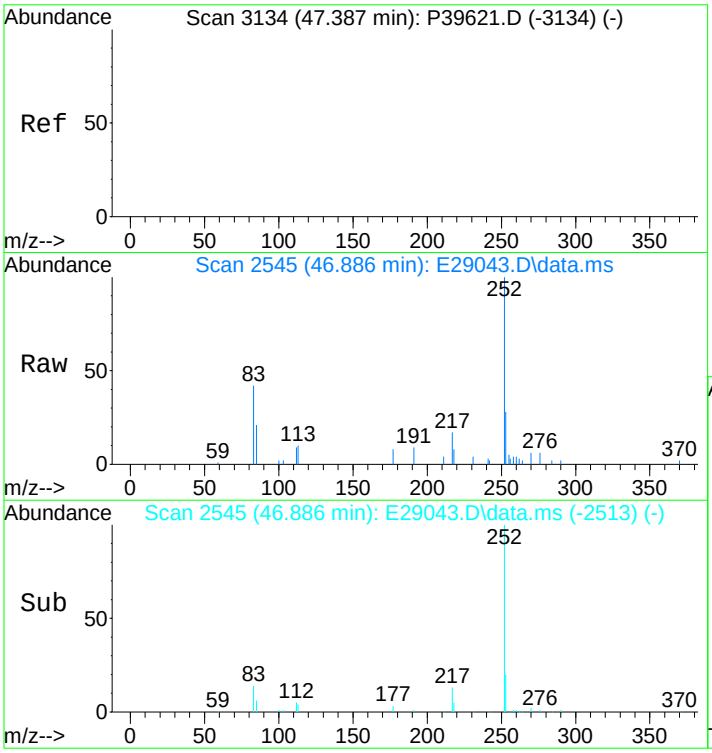




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 135.15 ng/ml m
RT: 46.027 min Scan# 2488
Delta R.T. -0.018 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

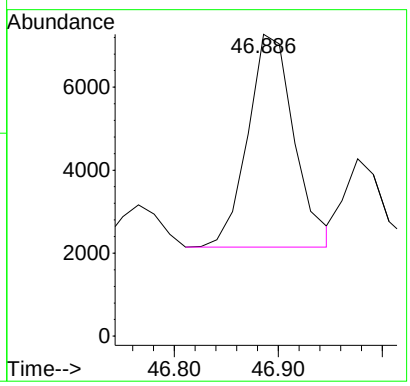
Tgt Ion:217 Resp: 4916

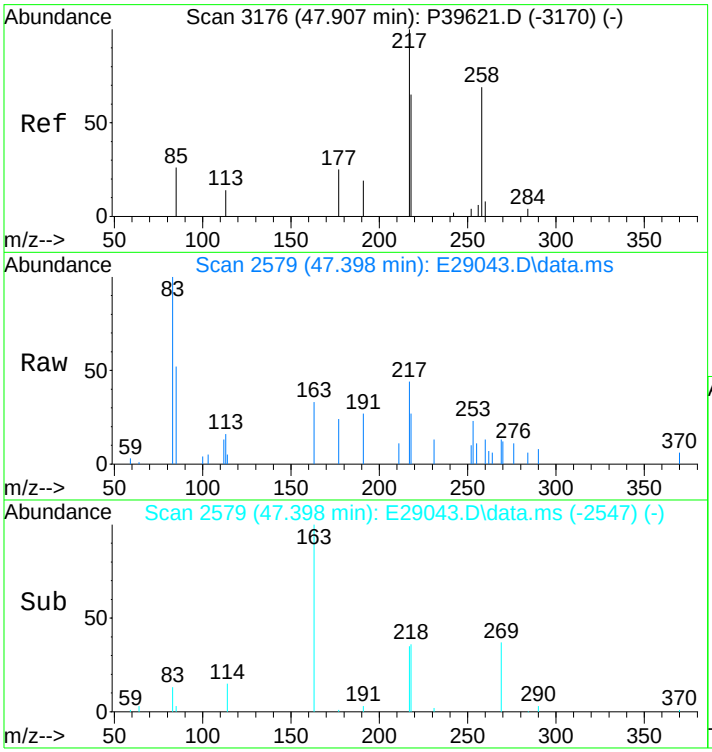




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 438.35 ng/ml
RT: 46.886 min Scan# 2545
Delta R.T. -0.019 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

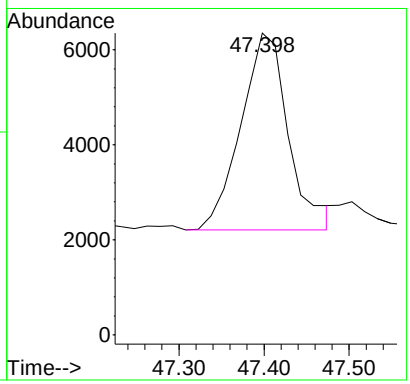
Tgt Ion:217 Resp: 15945

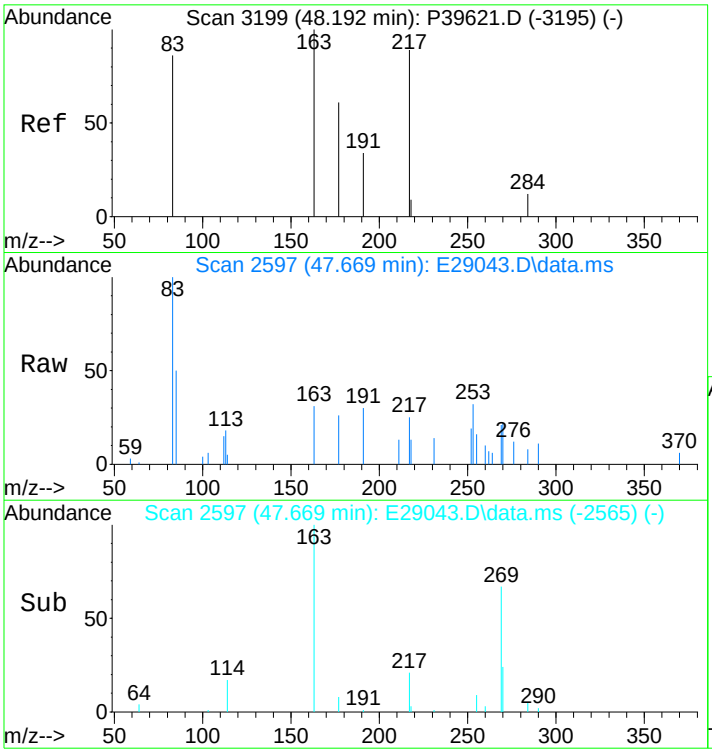




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 443.02 ng/ml
RT: 47.398 min Scan# 2579
Delta R.T. -0.020 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

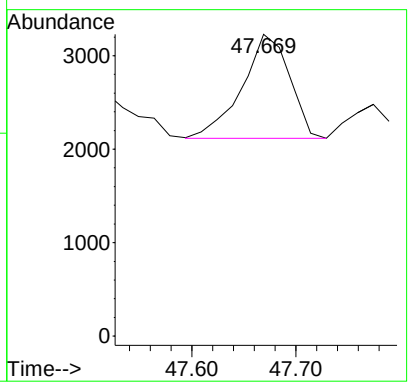
Tgt Ion:217 Resp: 16115

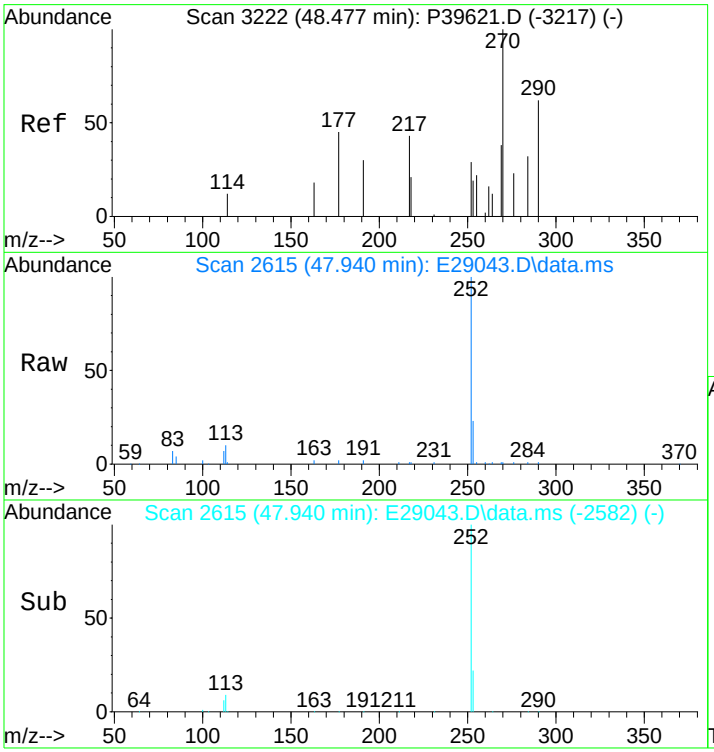




#135
Unknown Sterane (S18)
Concen: 97.65 ng/ml
RT: 47.669 min Scan# 2597
Delta R.T. -0.020 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

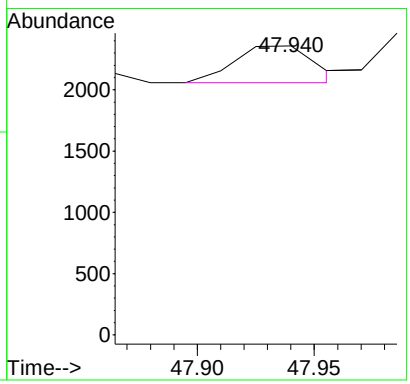
Tgt Ion:217 Resp: 3552

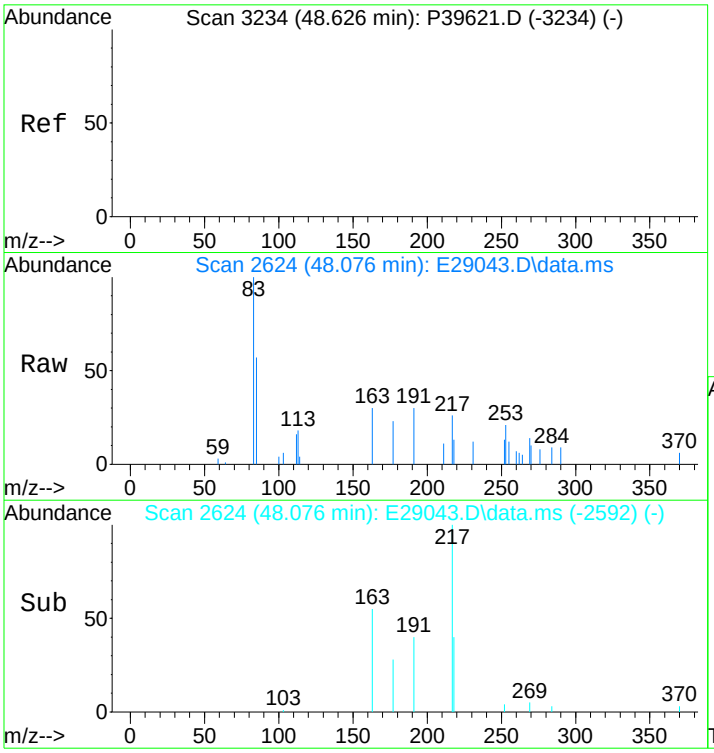




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 19.77 ng/ml
RT: 47.940 min Scan# 2615
Delta R.T. -0.005 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

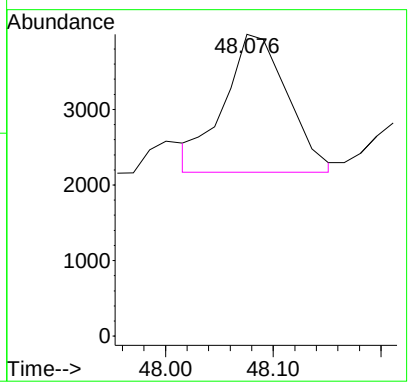
Tgt Ion:217 Resp: 719

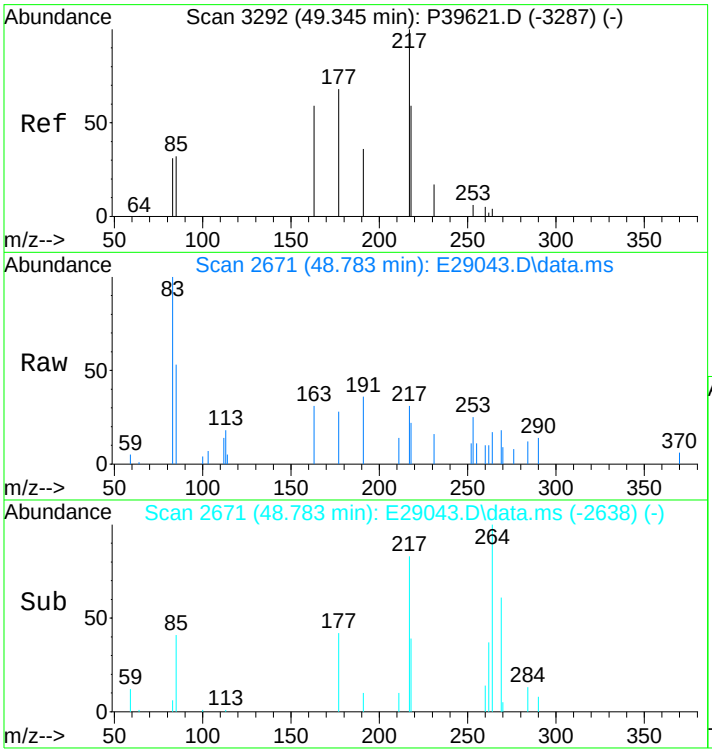




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 205.20 ng/ml m
RT: 48.076 min Scan# 2624
Delta R.T. -0.021 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

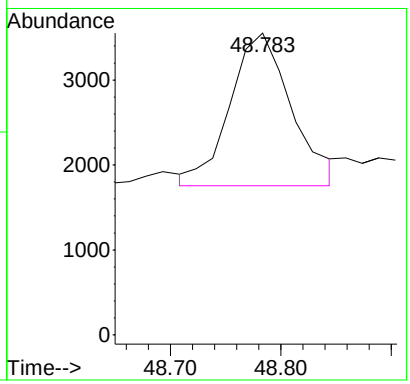
Tgt Ion:217 Resp: 7464

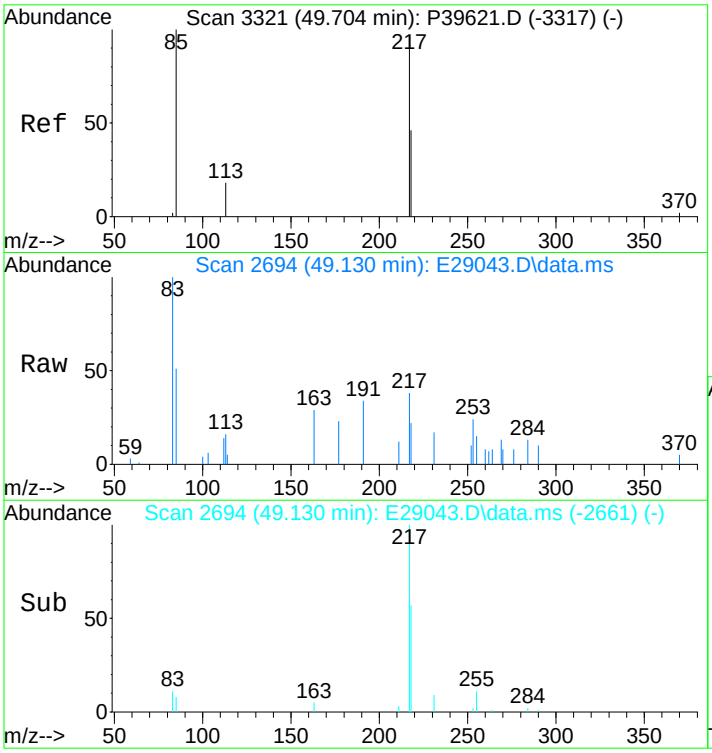




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 190.57 ng/ml m
RT: 48.783 min Scan# 2671
Delta R.T. -0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

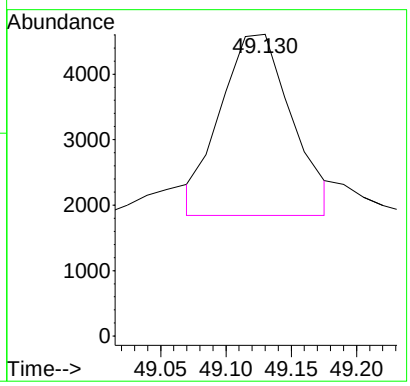
Tgt Ion:217 Resp: 6932

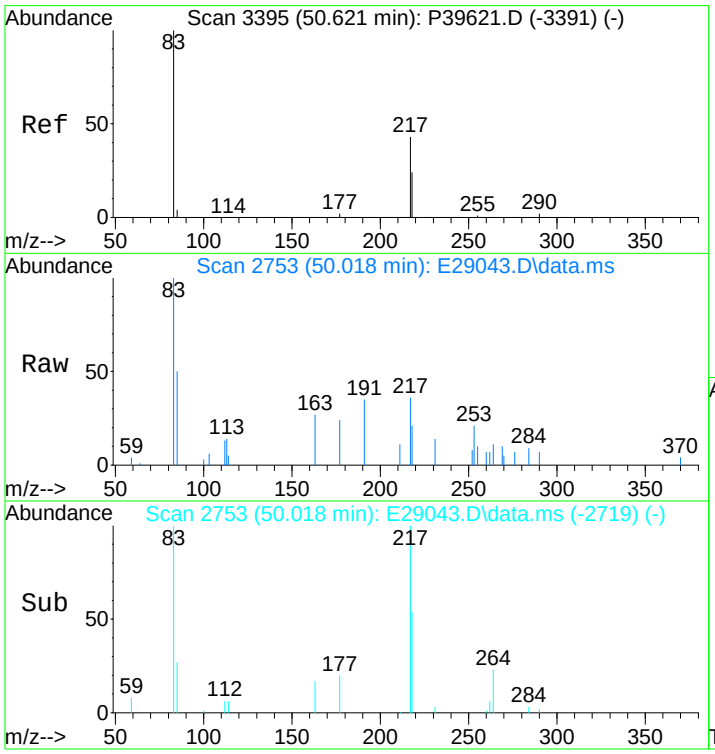




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 289.04 ng/ml m
RT: 49.130 min Scan# 2694
Delta R.T. -0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

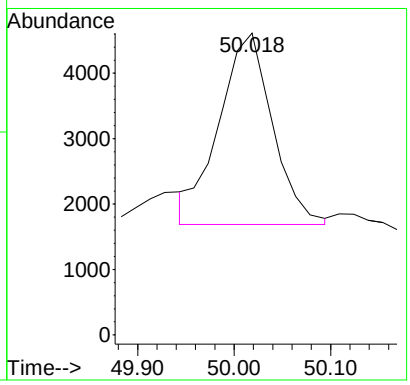
Tgt Ion:217 Resp: 10514

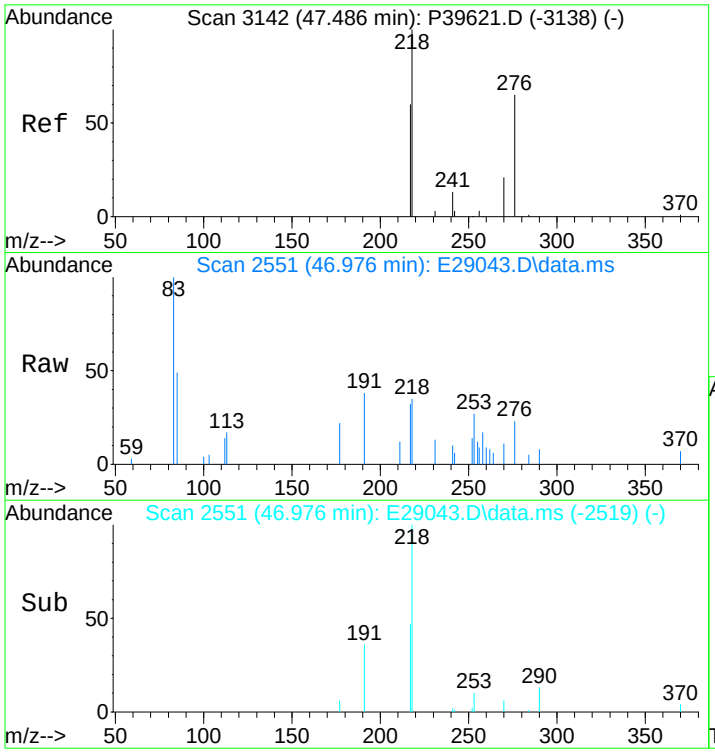




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 308.86 ng/ml m
RT: 50.018 min Scan# 2753
Delta R.T. 0.008 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

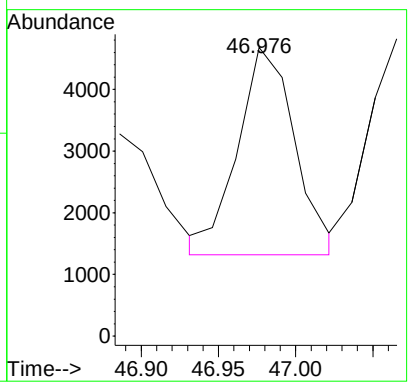
Tgt Ion:217 Resp: 11235

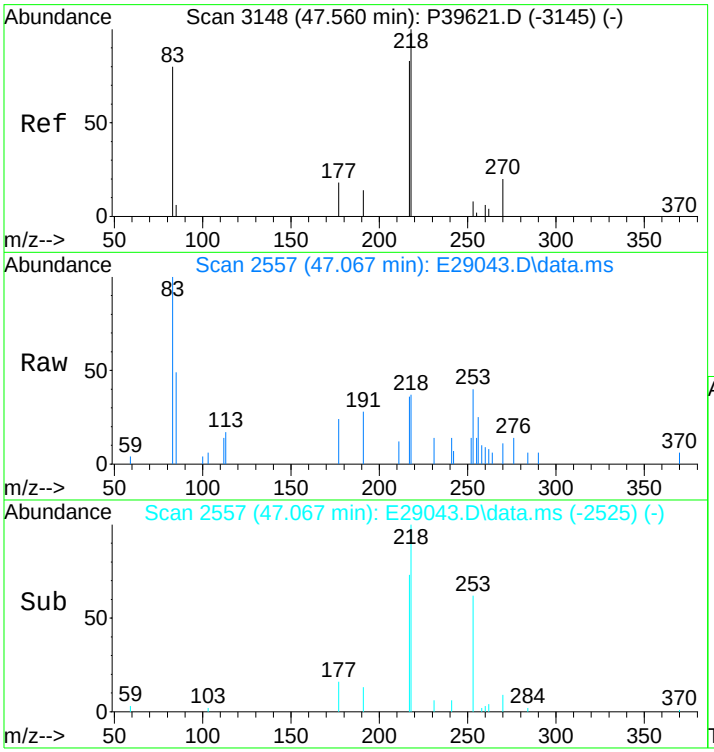




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 238.46 ng/ml m
RT: 46.976 min Scan# 2551
Delta R.T. -0.019 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

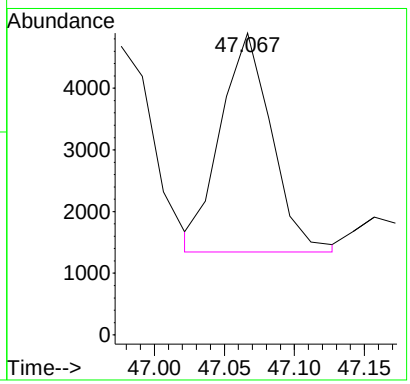
Tgt Ion:218 Resp: 8674

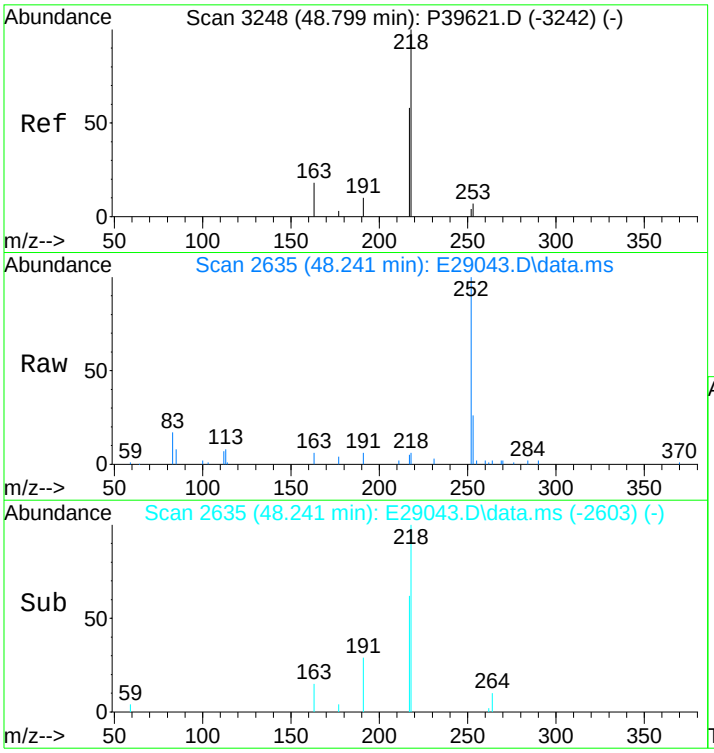




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 246.73 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.020 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

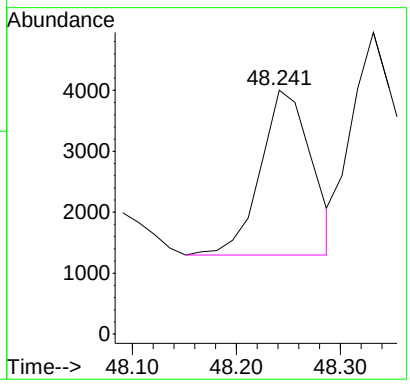
Tgt Ion:218 Resp: 8975

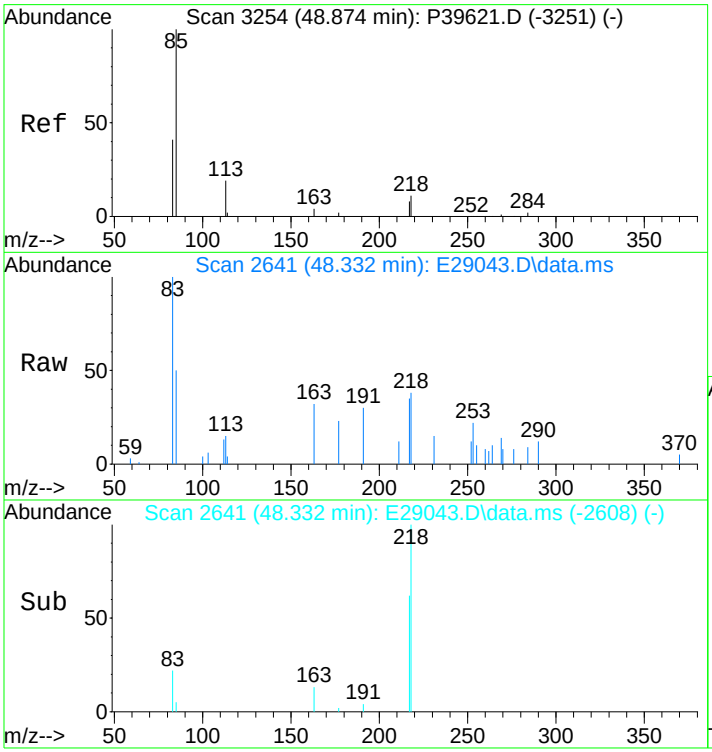




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 253.52 ng/ml
RT: 48.241 min Scan# 2635
Delta R.T. -0.021 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

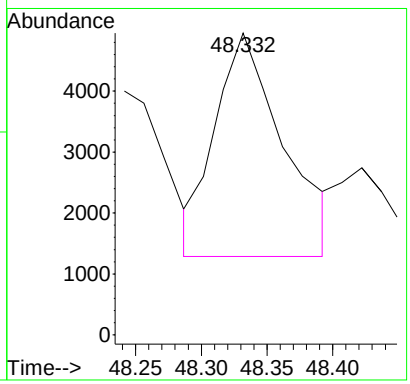
Tgt Ion:218 Resp: 9222

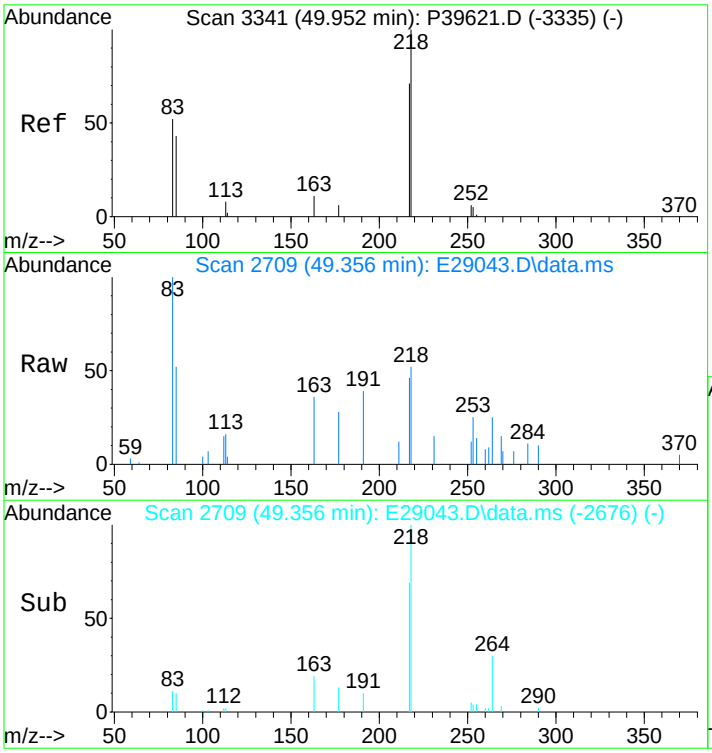




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 364.31 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

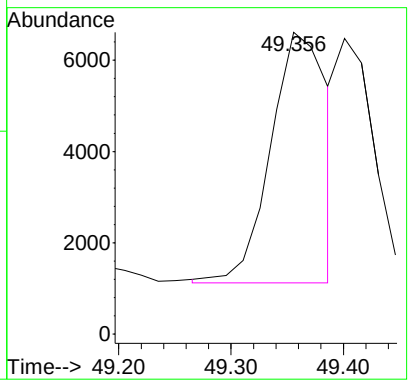
Tgt Ion:218 Resp: 13252

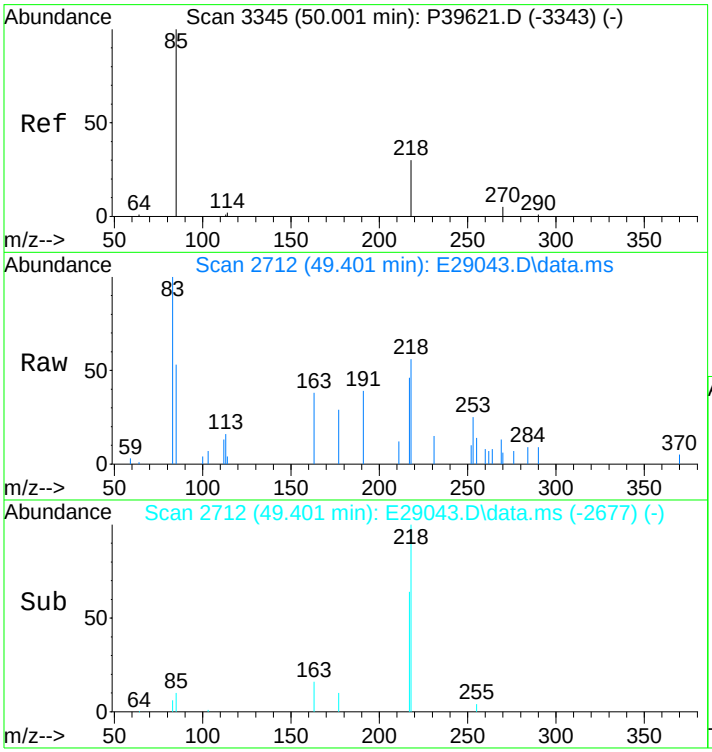




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 526.18 ng/ml m
RT: 49.356 min Scan# 2709
Delta R.T. -0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

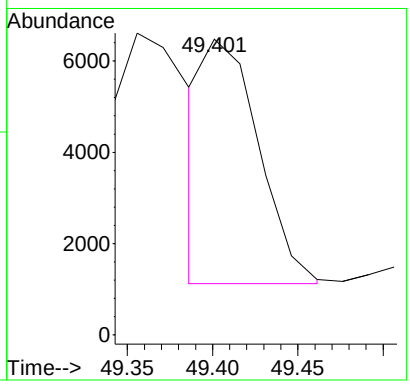
Tgt Ion:218 Resp: 19140

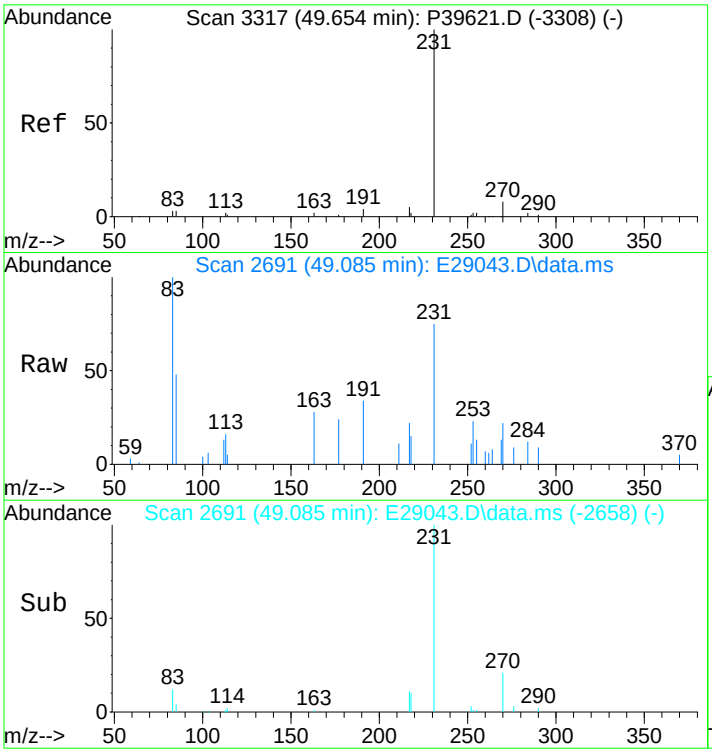




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 329.07 ng/ml m
RT: 49.401 min Scan# 2712
Delta R.T. 0.023 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

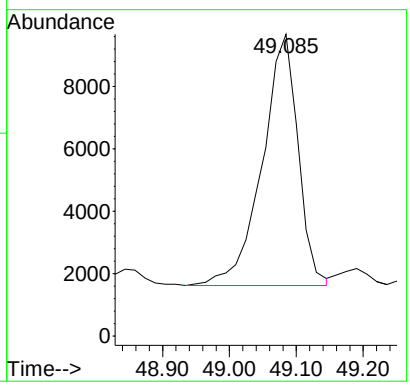
Tgt Ion:218 Resp: 11970

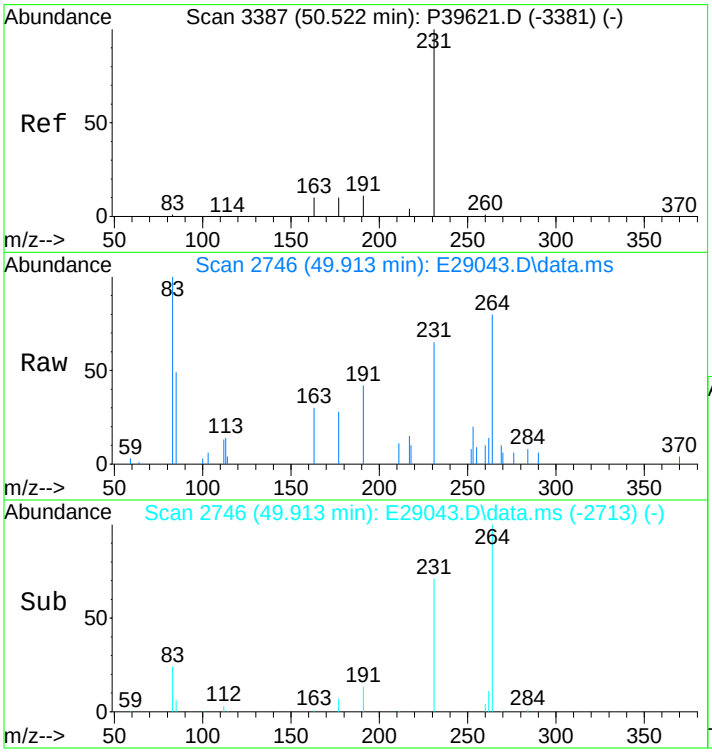




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 826.31 ng/mL
RT: 49.085 min Scan# 2691
Delta R.T. -0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

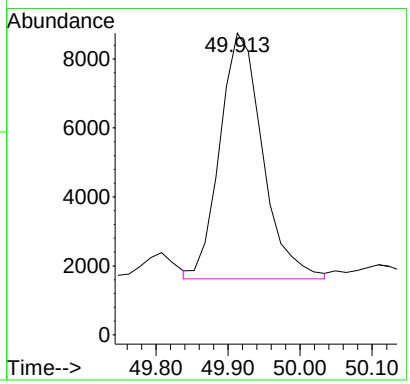
Tgt Ion:231 Resp: 30057

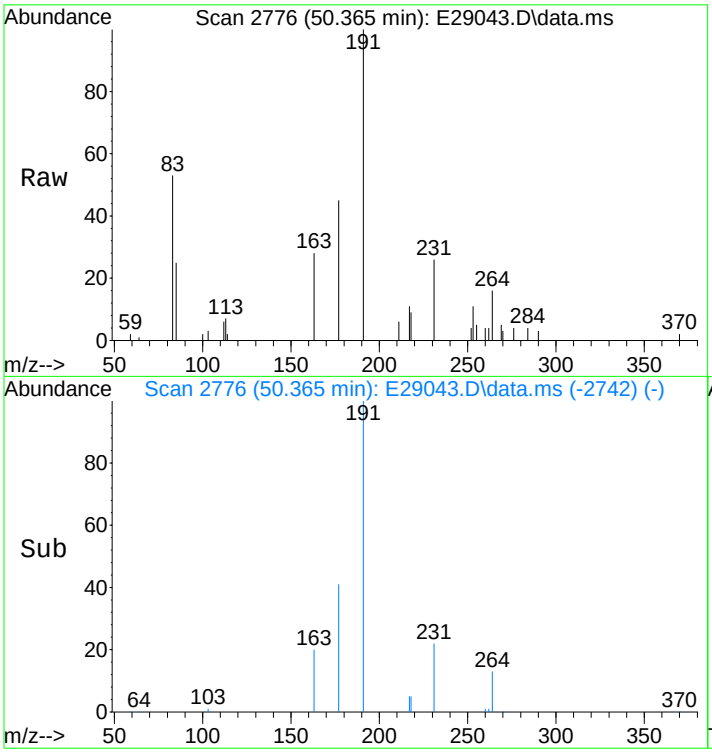




#148
C28,20S-triaromatic steroid
Concen: 808.30 ng/mL m
RT: 49.913 min Scan# 2746
Delta R.T. -0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

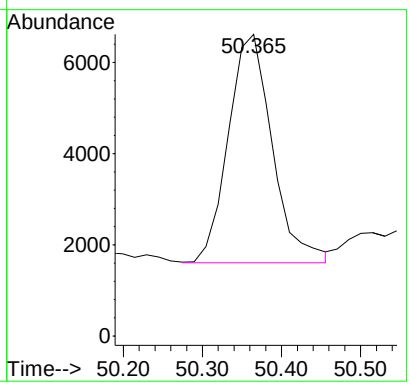
Tgt Ion:231 Resp: 29402

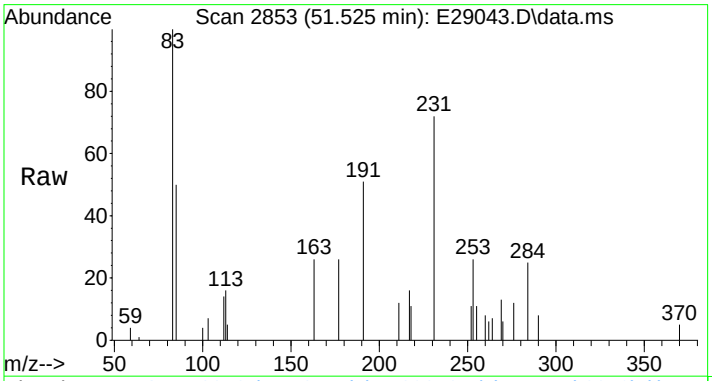




#149
C27,20R-triaromatic steroid
Concen: 533.69 ng/mL m
RT: 50.365 min Scan# 2776
Delta R.T. 0.007 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

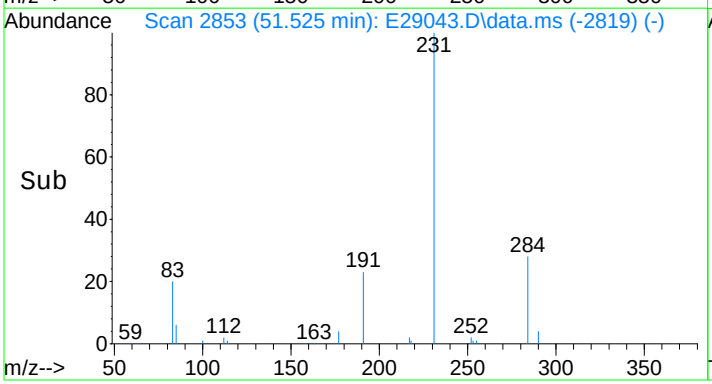
Tgt Ion:231 Resp: 19413

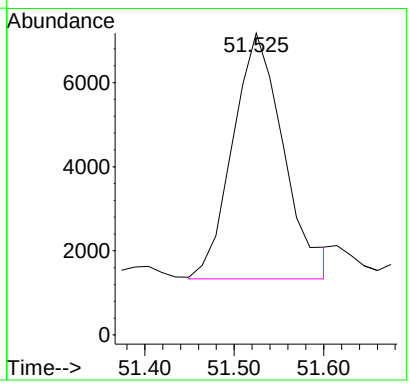




#150
C28,20R-triaromatic steroid
Concen: 636.84 ng/mL m
RT: 51.525 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29043.D
Acq: 17 Nov 2012 4:09 pm

Tgt Ion:231 Resp: 23165





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29045.D
Acq On : 17 Nov 2012 5:37 pm
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 19 10:24:47 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	43317M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	107331	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	59518	390.631	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 39.06%#			
42) Phenanthrene-d10	32.100	188	77998	499.663	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.97%#			
83) Benzo[b]fluoranthene-d12	46.705	264	109666	497.389	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.74%#			
88) Benzo[a]pyrene-d12	47.865	264	98791	462.429	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.24%#			
129) 5B(H)Cholane - Surr	43.377	217	22888	541.068	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.11%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	286	8.254	ng/mL	100
5) C1-Decalins	17.814	152	901M5	26.003	ng/mL	
6) C2-Decalins	19.139	166	3450M5	99.568	ng/mL	
7) C3-Decalins	21.638	180	6037M5	174.230	ng/mL	
8) C4-Decalins	25.010	194	15766M5	455.012	ng/mL	
10) Naphthalene	19.304	128	23339	136.975	ng/mL#	100
11) C1-Naphthalenes	22.014	142	31384M5	184.191	ng/mL	
12) C2-Naphthalenes	24.859	156	94595M5	555.172	ng/mL	
13) C3-Naphthalenes	27.554	170	163428M5	959.149	ng/mL	
14) C4-Naphthalenes	29.993	184	155439M5	912.262	ng/mL	
16) 2-Methylnaphthalene	22.014	142	18368	169.256	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	13107	124.297	ng/mL#	100
18) Benzothiophene	19.530	134	782M3	5.552	ng/mL	
19) C1-Benzo(b)thiophenes	22.390	148	4234M5	30.058	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	15146M5	107.526	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	36194M5	256.952	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	46488M5	330.033	ng/mL	
23) Biphenyl	23.896	154	4712M4	34.355	ng/mL	
24) 2,6-Dimethylnaphthalene	24.528	156	21611	220.931	ng/mL#	100
25) Dibenzofuran	26.982	168	13008	85.666	ng/mL#	93
26) Acenaphthylene	25.597	152	55331	325.712	ng/mL#	100
27) Acenaphthene	26.335	153	10980	100.413	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.900	170	13039M3	142.475	ng/mL	
29) Fluorene	28.367	166	22945M3	188.140	ng/mL	
30) C1-Fluorenes	30.745	180	30099M5	246.799	ng/mL	
31) C2-Fluorenes	32.958	194	66186M5	542.698	ng/mL	
32) C3-Fluorenes	34.810	208	92119M5	755.338	ng/mL	
33) Dibenzothiophene	31.694	184	40050	239.305	ng/mL#	77
34) 4-Methyldibenzothiophene(	33.485	198	41381	247.258	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.847	198	38853M3	232.153	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	20384	121.798	ng/mL#	100
37) OTP	33.877	198	4436M3	26.506	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	114658M5	685.100	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	110222m	658.595	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	214392M5	1281.027	ng/mL	
40) C3-Dibenzothiophenes	37.008	226	255824M5	1528.590	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	183411M5	1095.911	ng/mL	
43) Phenanthrene	32.191	178	363905	2137.225	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.178	192	63946	375.557	ng/mL	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29045.D
Acq On : 17 Nov 2012 5:37 pm
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 19 10:24:47 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	74432	437.141	ng/mL	96
46) 2-Methylanthracene(2MA)	34.449	192	24435M3	143.507	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.630	192	87195	512.099	ng/mL	86
48) 1-Methylphenanthrene(1MP)	34.720	192	53598M3	314.783	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.630	192	309937M5	1820.269	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	326759M5	1919.065	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	326759m	1919.065	ng/mL	
52) C3-Phenanthrenes/Anthrace	39.583	220	251583M5	1477.554	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	134377M5	789.200	ng/mL	
55) Anthracene	32.386	178	83482M3	567.236	ng/mL	
56) Carbazole	33.064	167	28014M3	184.951	ng/mL	
57) 1-Methylphenanthrene	34.720	192	53718M3	413.527	ng/mL	
58) Fluoranthene	37.008	202	1020486	5427.038	ng/mL	100
59) Benzo(b)fluorene	39.538	216	94987M3	758.082	ng/mL	
60) Pyrene	37.882	202	1002979	5247.791	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.297	216	675681M5	3535.301	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.375	230	343503M5	1797.278	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	212961M5	1114.255	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.582	258	190056M5	994.412	ng/mL	
66) Naphthobenzothiophene	41.766	234	109441	580.577	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	109441	580.577	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.113	234	24480	129.865	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.414	234	29973M3	159.005	ng/mL	
70) C1-Naphthobenzothiophenes	43.182	248	183990M5	976.055	ng/ml	
71) C2-Naphthobenzothiophenes	45.199	262	214824M5	1139.627	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	183201M5	971.869	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	138509M5	734.781	ng/mL	
75) Benz[a]anthracene	42.700	228	547047M3	2617.366	ng/mL	
77) Chrysene/Triphenylene	42.865	228	664702	3089.105	ng/mL	99
78) C1-Chrysenes	44.356	242	363656M5	1690.038	ng/mL	
79) C2-Chrysenes	46.088	256	242969M5	1129.163	ng/mL	
79) C2-Chrysenes BS	46.088	256	239157m	1111.447	ng/mL	
80) BBF-D12 Surr BKGD	46.705	256	3812	17.716	ng/mL	100
81) C3-Chrysenes	47.654	270	207866M5	966.027	ng/mL	
82) C4-Chrysenes	49.190	284	107828M5	501.115	ng/mL	
84) Benzo[b]fluoranthene	46.795	252	760681	3131.203	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	600653	2403.202	ng/mL	96
86) Benzo[a]fluoranthene	47.172	252	152126M3	608.653	ng/mL	
87) Benzo[e]pyrene	47.774	252	550134M4	2319.196	ng/mL	
89) Benzo[a]pyrene	47.955	252	715220	3151.058	ng/mL	98
90) Perylene	48.256	252	251521	1047.937	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.669	276	598903M3	2242.040	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.699	278	152330M4	535.563	ng/mL	
93) Benzo[g,h,i]perylene	53.934	276	610518	2119.665	ng/mL	100
94) Hopane (T19)	51.720	191	140171	1740.162	ng/mL#	84
96) C23 Tricyclic Terpane (T4	40.381	191	30114	373.852	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.119	191	18363M3	227.969	ng/ml	
98) C25 Tricyclic Terpane (T6	42.670	191	24837M3	308.341	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	9003M3	111.768	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	7824M3	97.132	ng/ml	
101) C26 Tricyclic Terpane-22R	43.784	191	7368M3	91.471	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	7656M3	95.046	ng/ml	
103) C28 Tricyclic Terpane-22R	46.253	191	10198M3	126.604	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	10263	127.411	ng/ml	100
105) C29 Tricyclic Terpane-22R	46.961	191	10100	125.387	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	22073M3	274.027	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29045.D
Acq On : 17 Nov 2012 5:37 pm
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 19 10:24:47 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.166	191	10368M3	128.714	ng/mL	
108) C30 Tricyclic Terpane-22R	48.407	191	12940	160.644	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.573	191	34160M3	424.082	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.747	191	14814M3	183.909	ng/ml	
111) 17a(H),21b(H)-25-Norhopan	49.552	191	16011	198.770	ng/ml	100
112) 30-Norhopane (T15)	50.380	191	96932	1203.369	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.485	191	25669	318.669	ng/ml	100
114) 17a(H)-Diahopane (X)	50.606	191	7240M3	89.881	ng/ml	
115) 30-Normoretane (T17)	51.148	191	14537	180.471	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.524	191	7674	95.269	ng/ml	100
117) Moretane (T20)	52.383	191	20430M3	253.630	ng/ml	
118) 30-Homohopane-22S (T21)	53.452	191	50418M3	625.918	ng/ml	
119) 30-Homohopane-22R (T22)	53.678	191	44889	557.277	ng/ml	100
120) Gammacerane/C32-diahopane	54.205	191	16884M3	209.608	ng/mL	
121) 30,31-Bishomohopane-22S (	54.928	191G	106038M3	1316.416	ng/ml	
122) 30,31-Bishomohopane-22R (	55.334	191	29278	363.474	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	33358	414.125	ng/ml	100
124) 30,31-Trishomohopane-22R	57.638	191	15629	194.027	ng/ml	100
125) Tetrakishomohopane-22S (T	59.611	191	26562	329.756	ng/ml	100
126) Tetrakishomohopane-22R (T	60.394	191G	43414	538.966	ng/ml	100
127) Pentakishomohopane-22S (T	62.623	191	19095	237.056	ng/ml	100
128) Pentakishomohopane-22R (T	63.887	191	13445M3	166.914	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.898	217	9888M3	233.750	ng/ml	
131) 13b(H),17a(H)-20R-Diachol	45.335	217	5243	123.943	ng/ml	100
132) 13b,17a-20S-Methyldiachol	46.027	217	4953M3	117.088	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.901	217	20615	487.335	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.413	217	21461	507.334	ng/ml	100
135) Unknown Sterane (S18)	47.684	217	3847	90.942	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.940	217	1262	29.833	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.091	217	8920M3	210.867	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	7891M3	186.542	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	14245M3	336.749	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	14970M3	353.888	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.991	218	11003M3	260.109	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	11793M3	278.784	ng/ml	
143) 14b,17b-20R-Methylcholest	48.256	218	12476	294.930	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	15841M3	374.478	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.371	218	22094M3	522.298	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.416	218	18142M3	428.873	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	38708	915.050	ng/mL	100
148) C28,20S-triaromatic stero	49.928	231	38025	898.904	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	23978	566.835	ng/mL	100
150) C28,20R-triaromatic stero	51.539	231	27937M3	660.425	ng/mL	

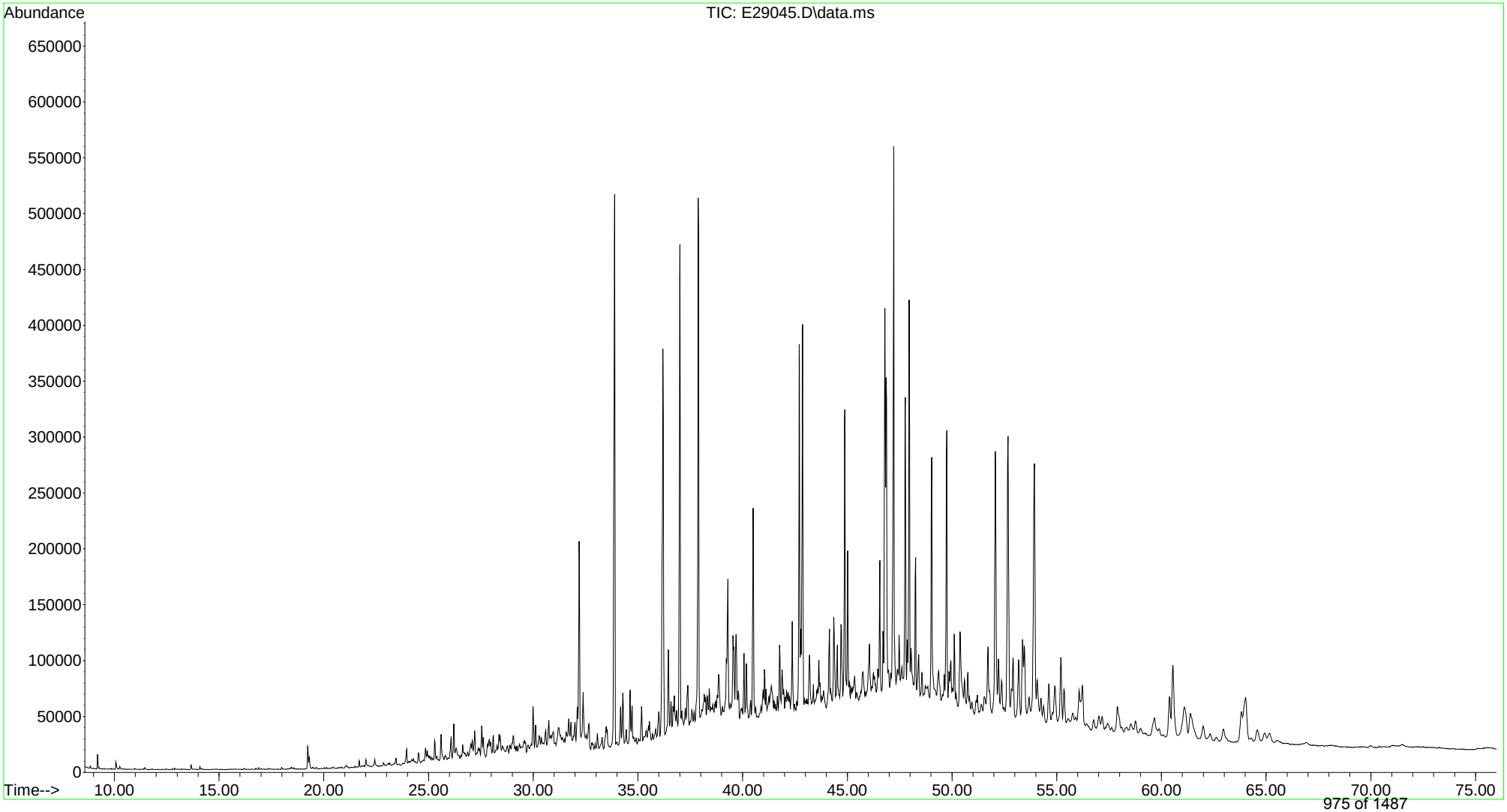
(#) = qualifier out of range (m) = manual integration (+) = signals summed

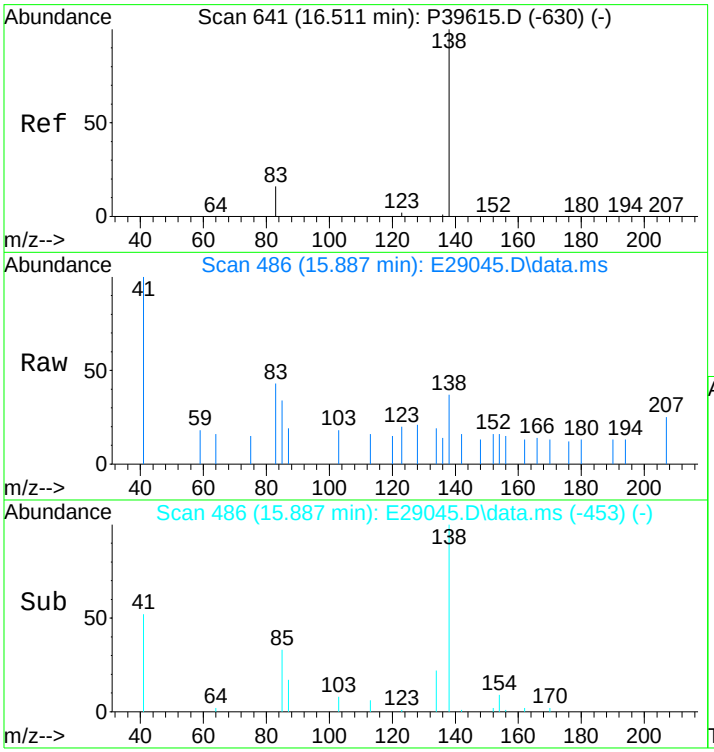
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29045.D
Acq On : 17 Nov 2012 5:37 pm
Operator : AC
Sample : 1210083-06
Misc : 1X
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 19 10:24:47 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

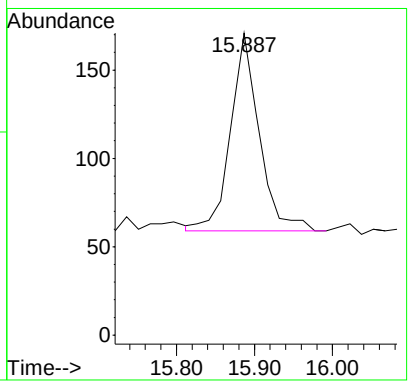
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

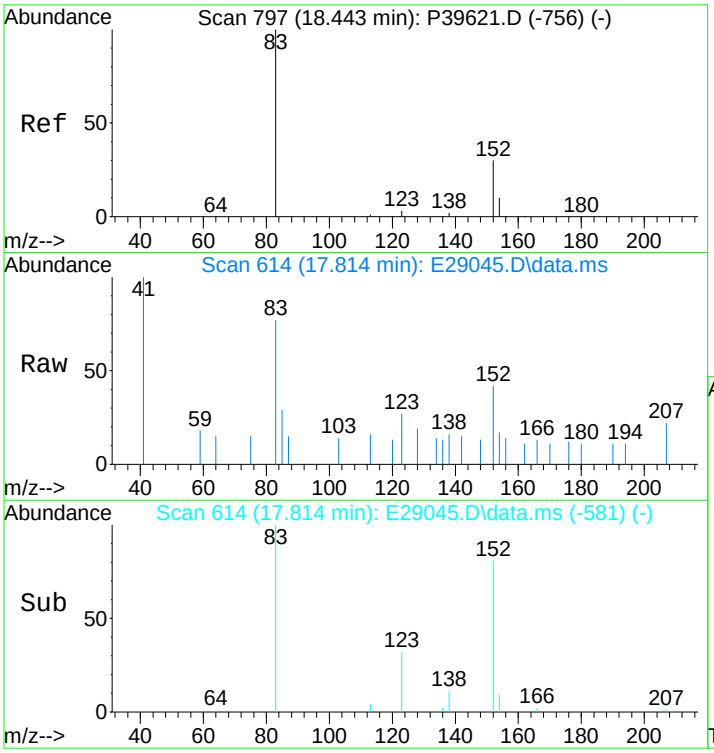




#3
trans-Decalin
Concen: 8.25 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

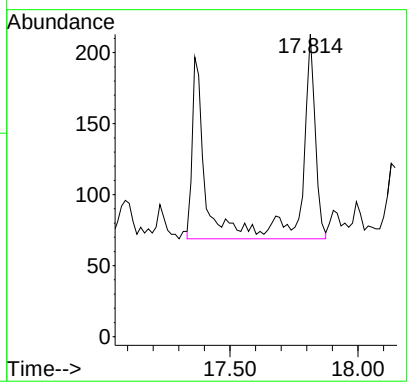
Tgt Ion:138 Resp: 286

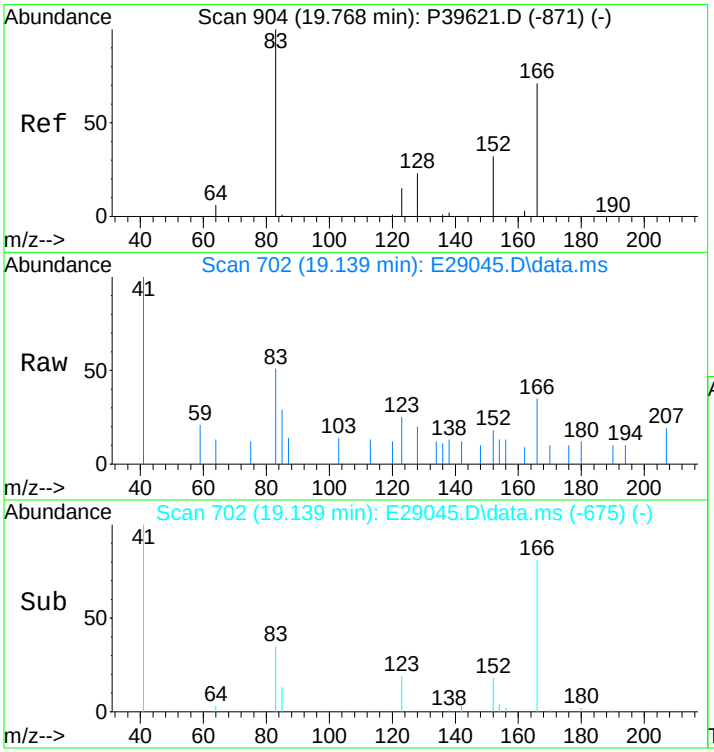




#5
C1-Decalins
Concen: 26.00 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

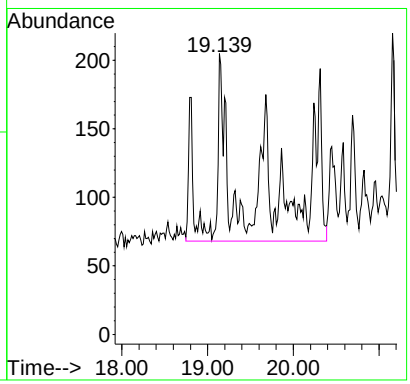
Tgt Ion:152 Resp: 901

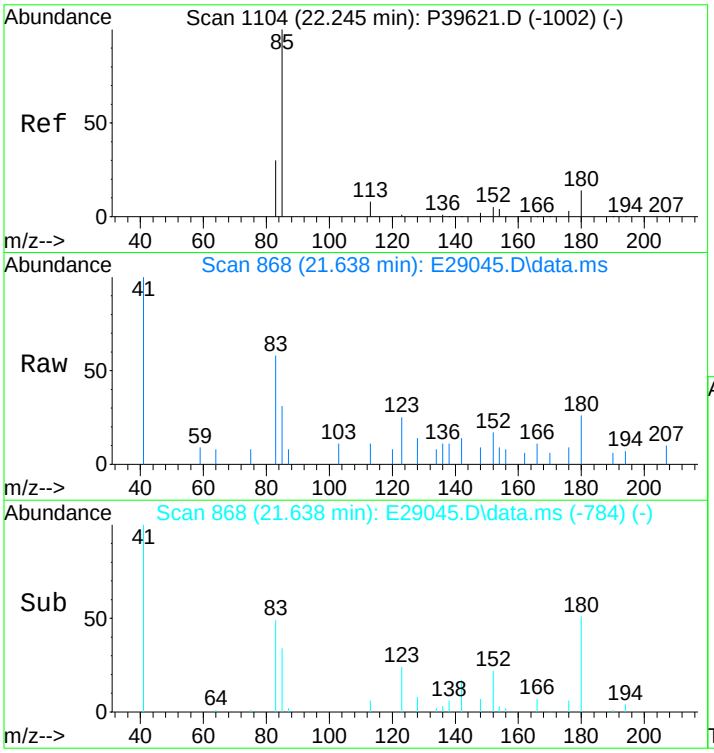




#6
C2-Decalins
Concen: 99.57 ng/mL m
RT: 19.139 min Scan# 702
Delta R.T. -0.215 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

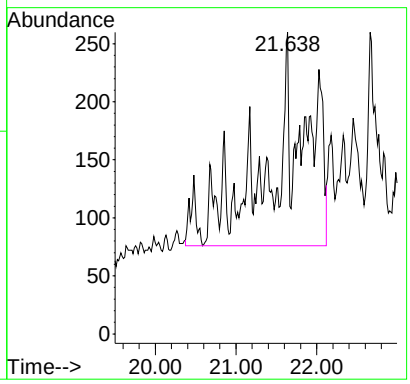
Tgt Ion:166 Resp: 3450

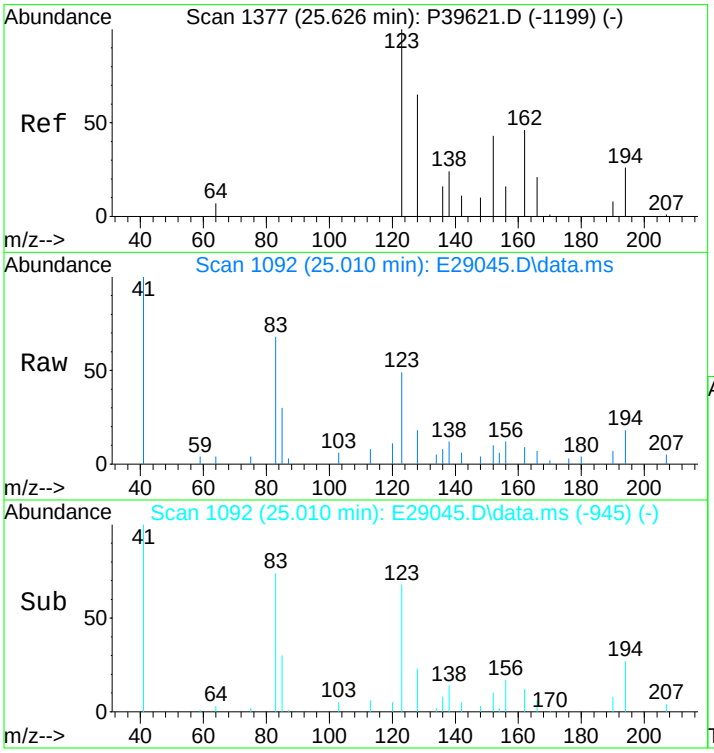




#7
C3-Decalins
Concen: 174.23 ng/mL m
RT: 21.638 min Scan# 868
Delta R.T. -0.120 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

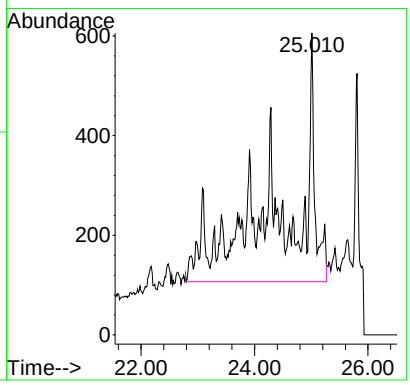
Tgt Ion:180 Resp: 6037

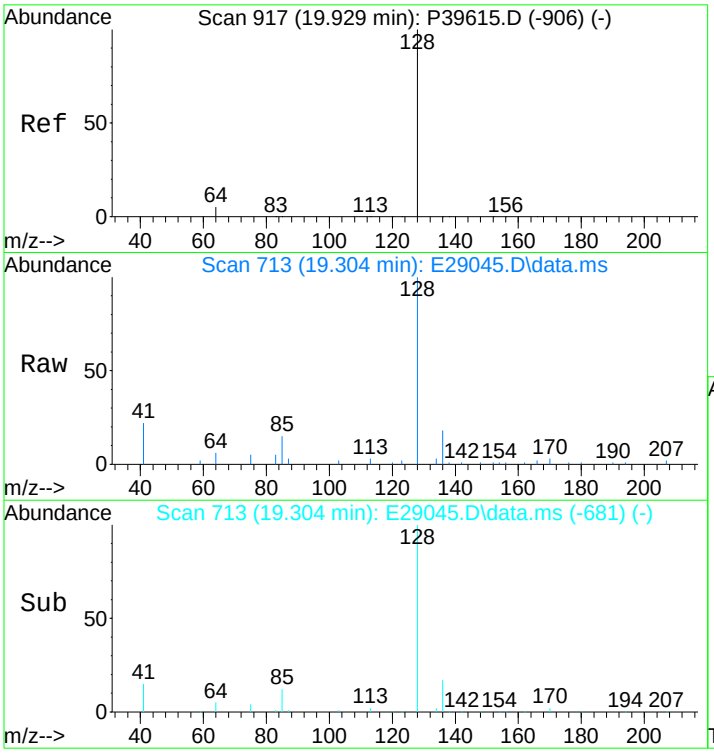




#8
C4-Decalins
Concen: 455.01 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.060 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:194 Resp: 15766

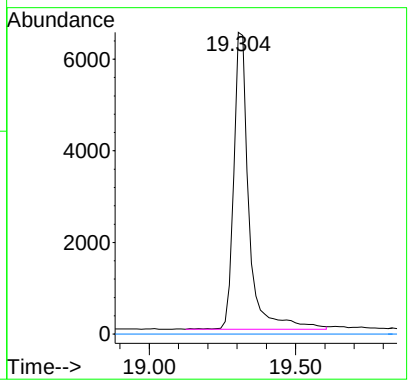


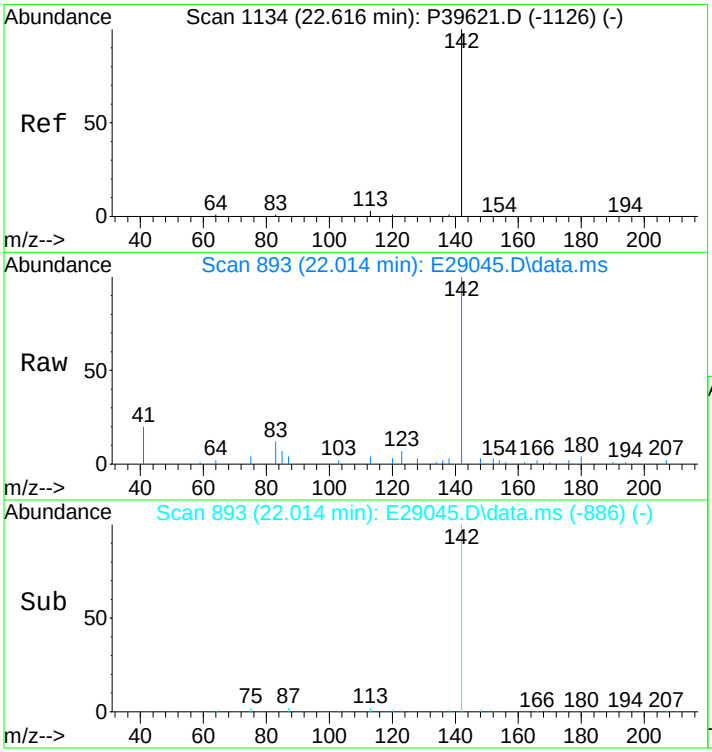


#10
Naphthalene
Concen: 136.98 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:128 Resp: 23339

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

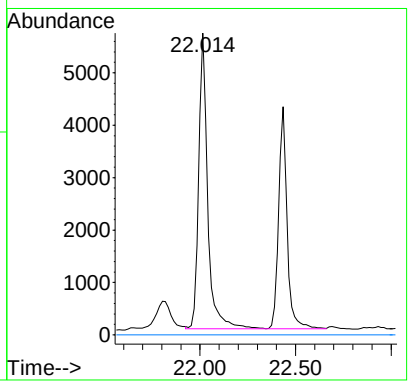


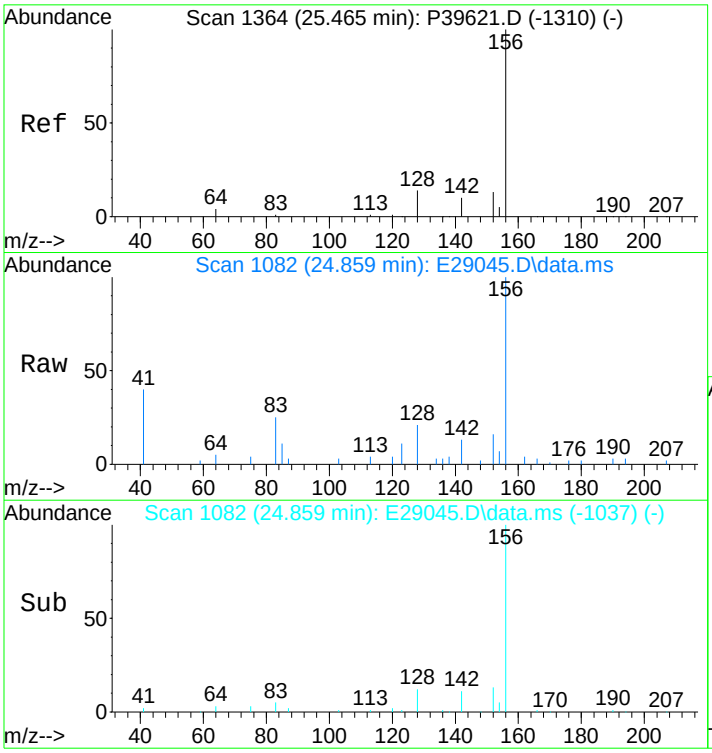


#11
C1-Naphthalenes
Concen: 184.19 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:142 Resp: 31384

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

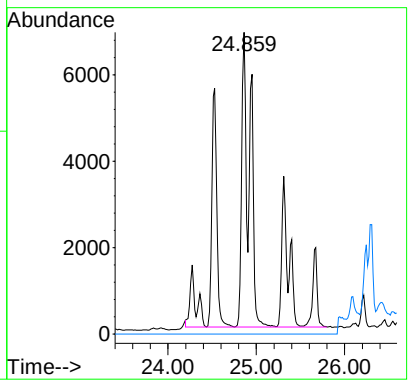


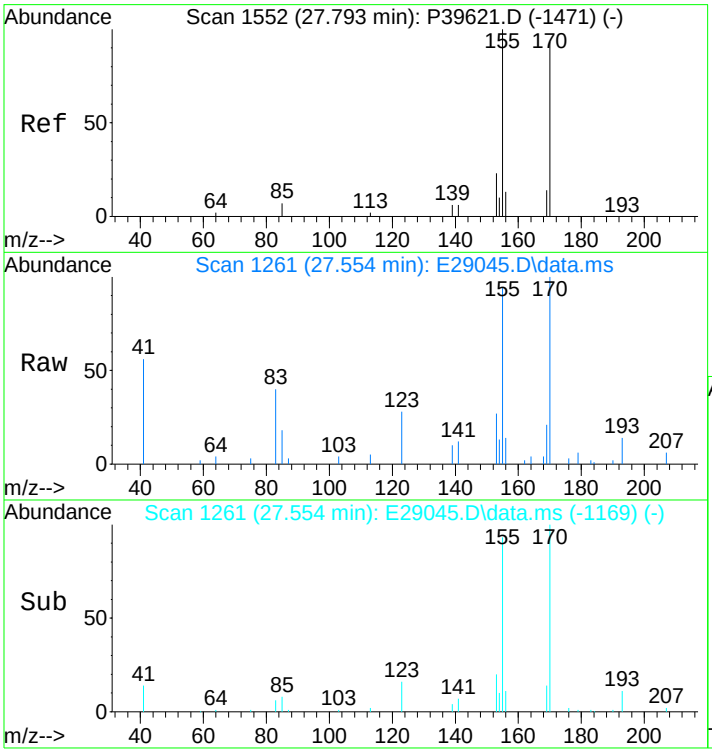


#12
C2-Naphthalenes
Concen: 555.17 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:156 Resp: 94595

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

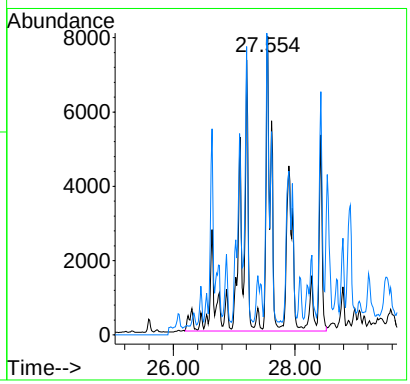


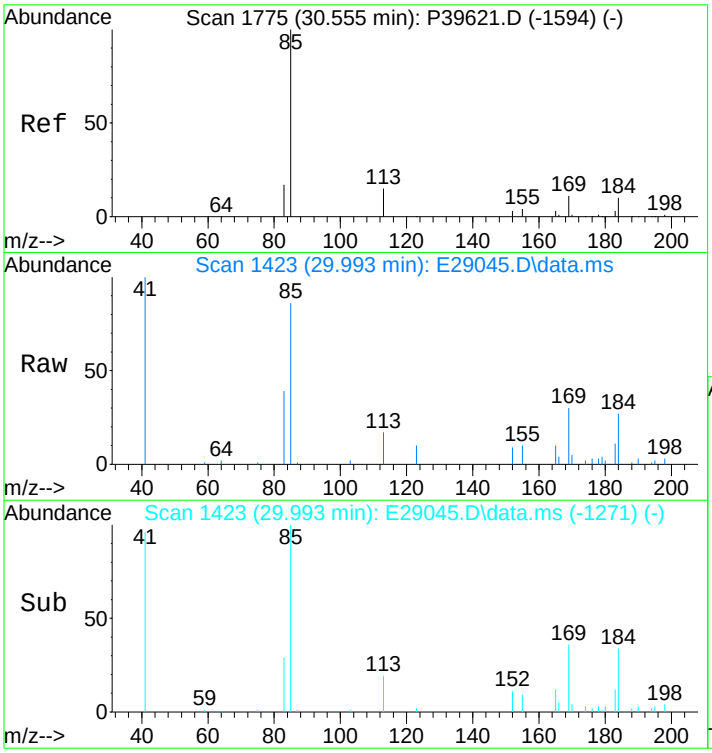


#13
C3-Naphthalenes
Concen: 959.15 ng/mL m
RT: 27.554 min Scan# 1261
Delta R.T. 0.358 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:170 Resp: 163428

Ion	Ratio	Lower	Upper
170	100		
155	8.1	66.8	100.2#

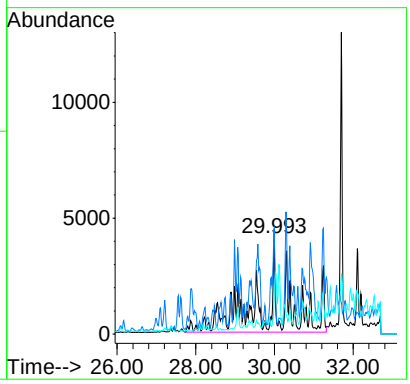


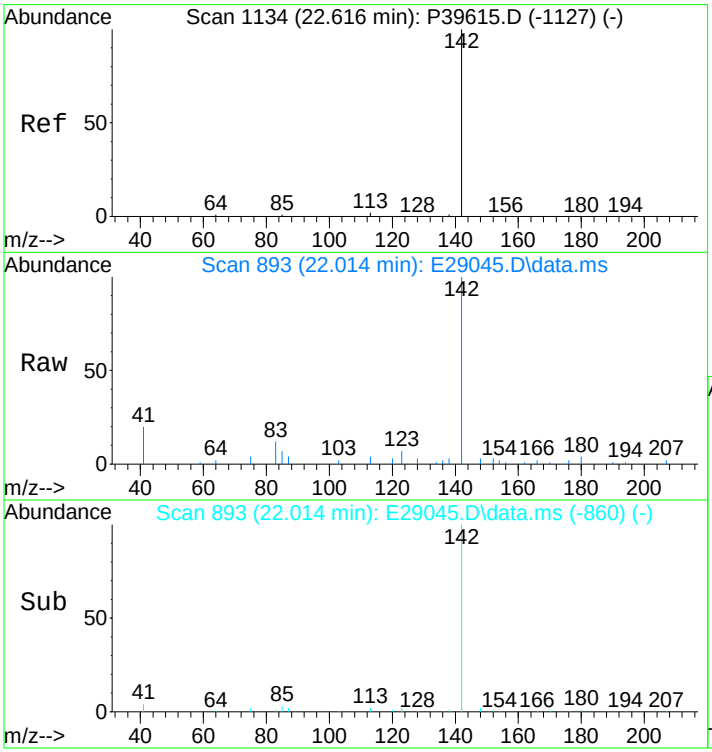


#14
C4-Naphthalenes
Concen: 912.26 ng/mL m
RT: 29.993 min Scan# 1423
Delta R.T. 0.099 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:184 Resp: 155439

Ion	Ratio	Lower	Upper
184	100		
169	15.9	78.7	118.1#
183	0.0	26.7	40.1#

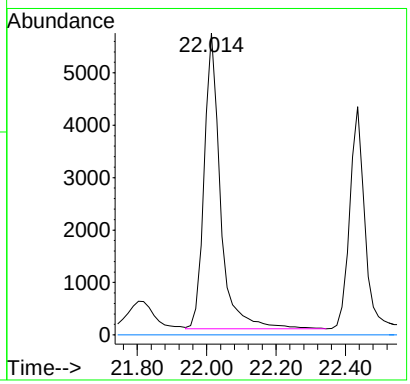


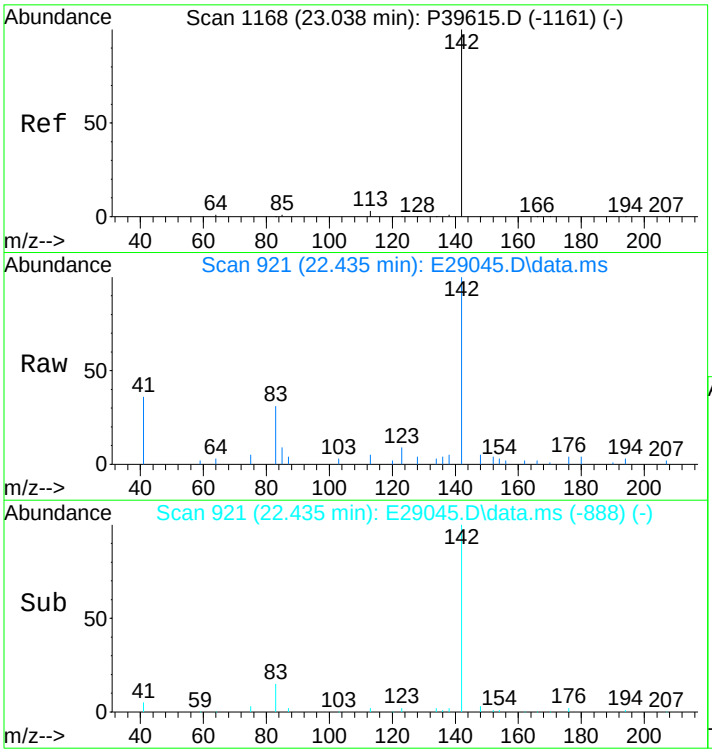


#16
2-Methylnaphthalene
Concen: 169.26 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:142 Resp: 18368

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

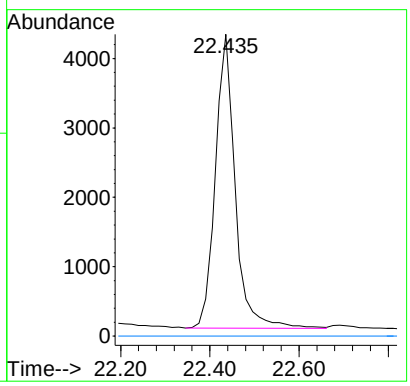


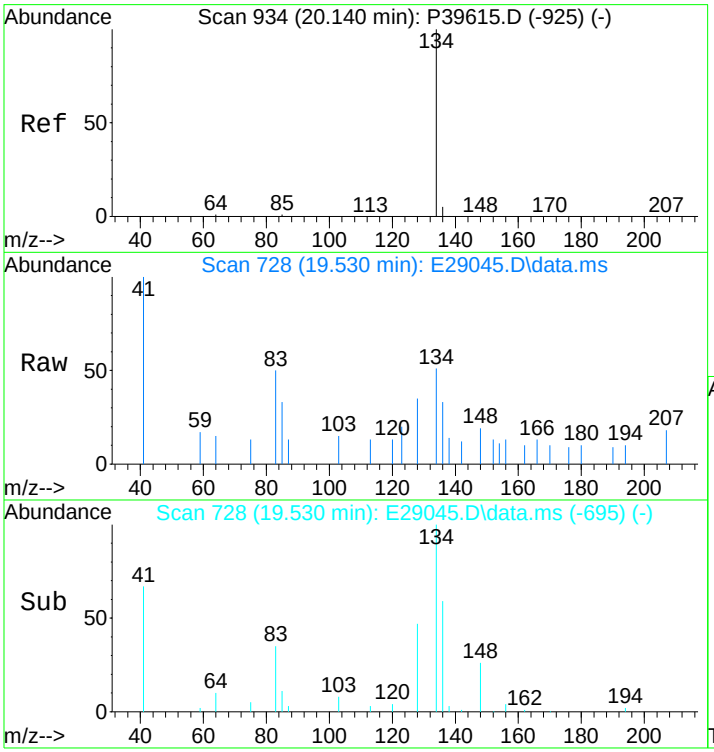


#17
1-Methylnaphthalene
Concen: 124.30 ng/mL
RT: 22.435 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:142 Resp: 13107

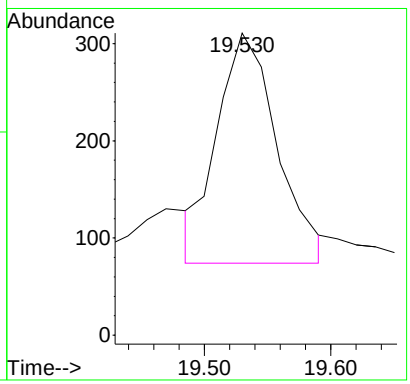
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

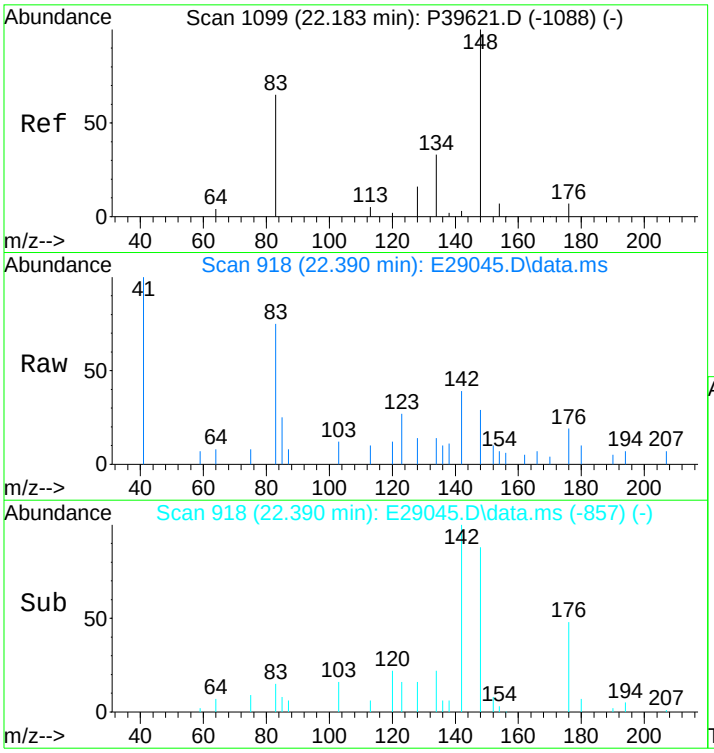




#18
Benzothiophene
Concen: 5.55 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

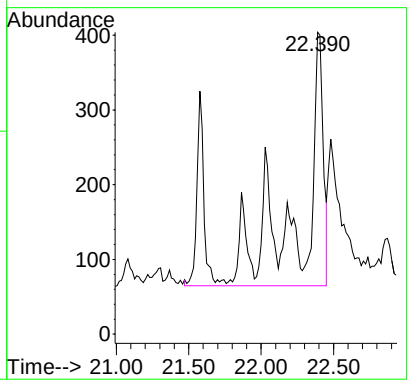
Tgt Ion:134 Resp: 782

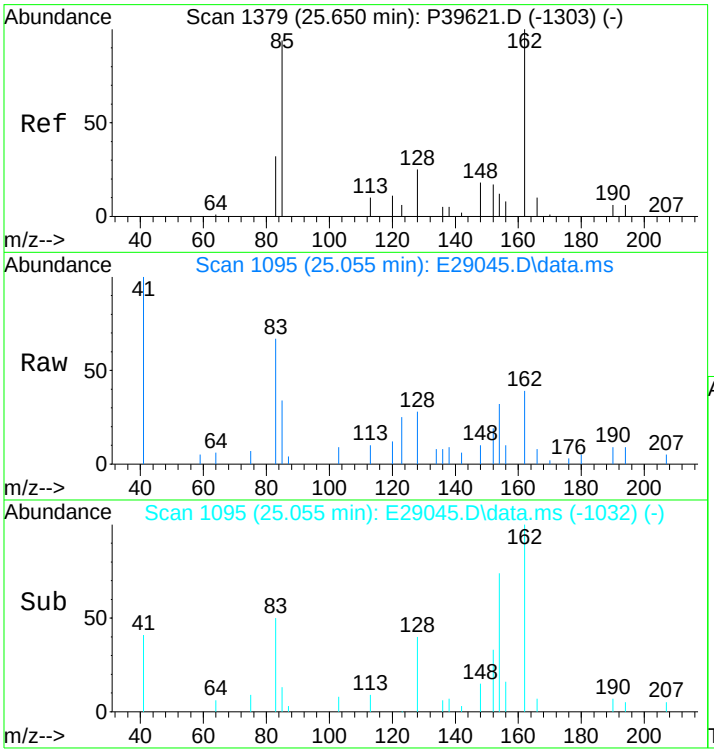




#19
C1-Benzo(b)thiophenes
Concen: 30.06 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. 0.677 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

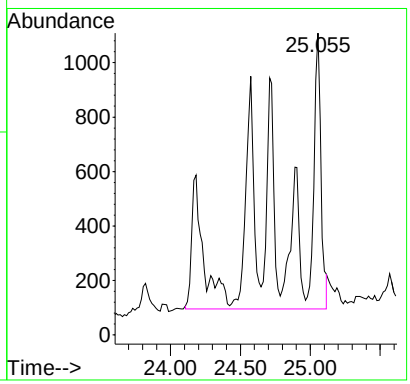
Tgt Ion:148 Resp: 4234

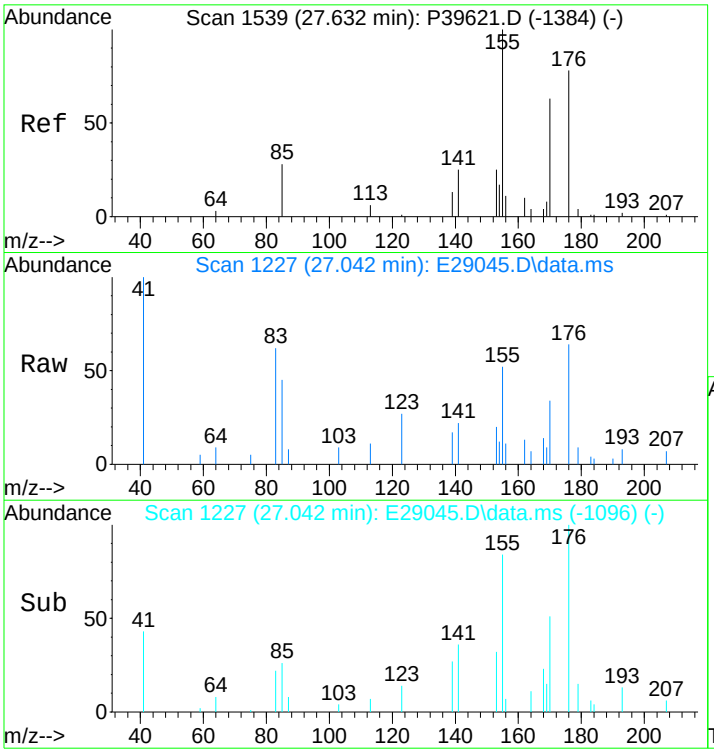




#20
C2-Benzo(b)thiophenes
Concen: 107.53 ng/mL m
RT: 25.055 min Scan# 1095
Delta R.T. -0.045 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

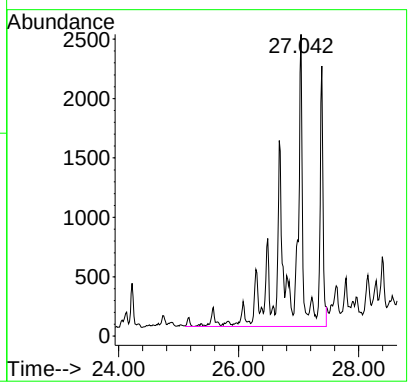
Tgt Ion:162 Resp: 15146

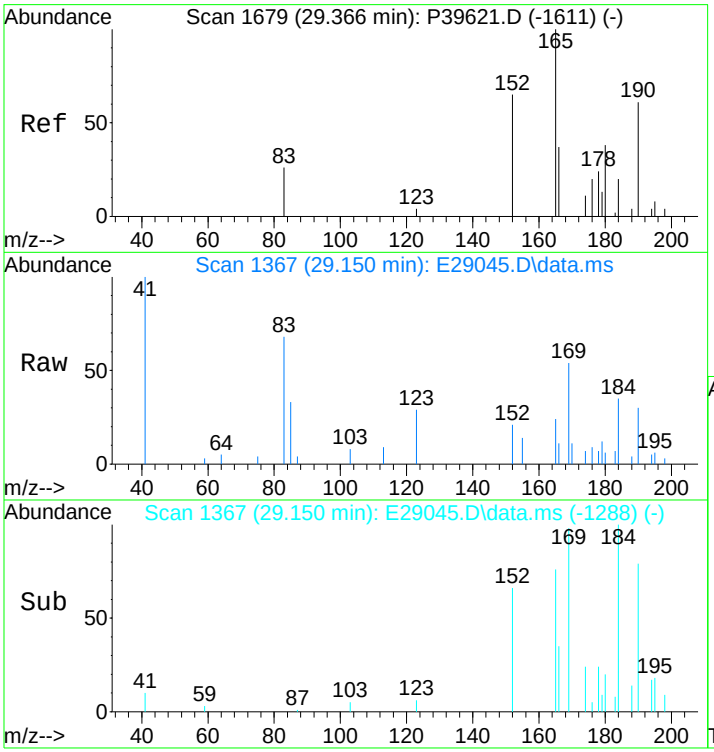




#21
C3-Benzo(b)thiophenes
Concen: 256.95 ng/mL m
RT: 27.042 min Scan# 1227
Delta R.T. 0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

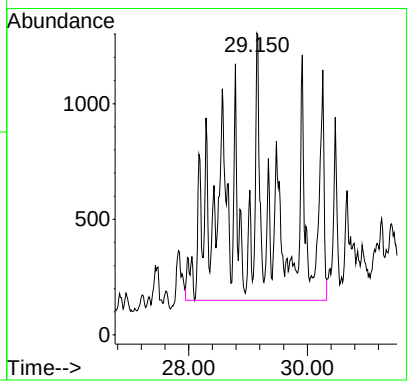
Tgt Ion:176 Resp: 36194

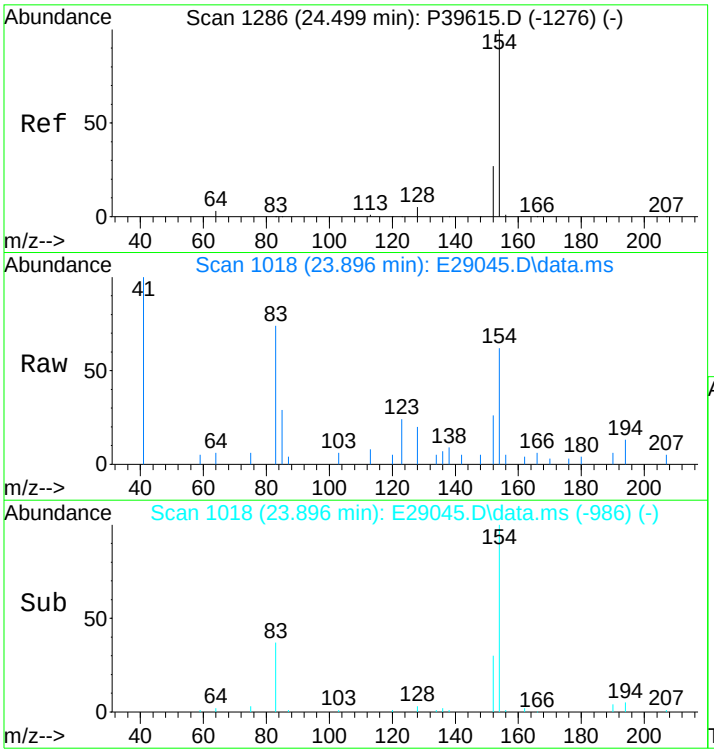




#22
C4-Benzo(b)thiophenes
Concen: 330.03 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:190 Resp: 46488

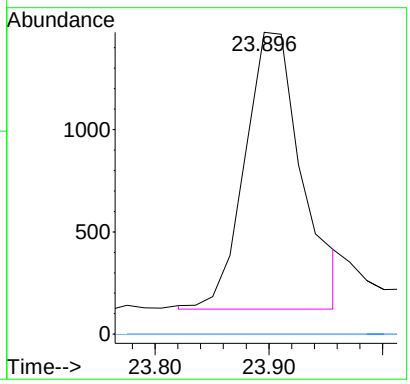


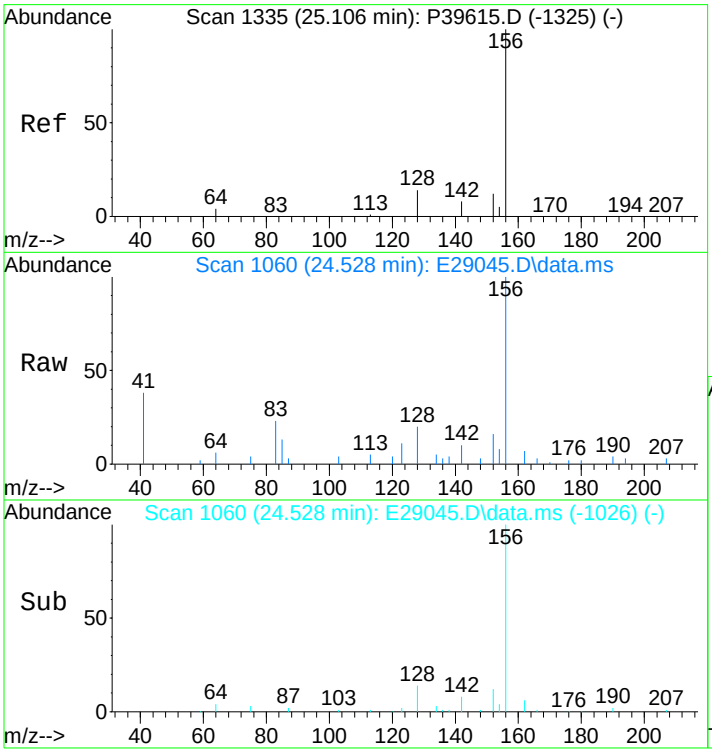


#23
Biphenyl
Concen: 34.36 ng/mL m
RT: 23.896 min Scan# 1018
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:154 Resp: 4712

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

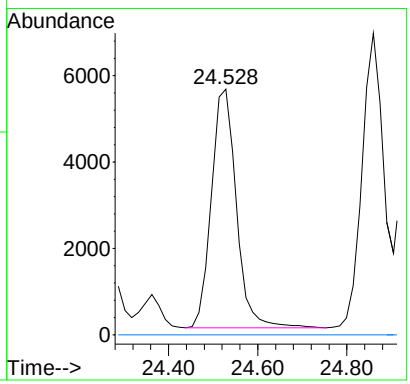


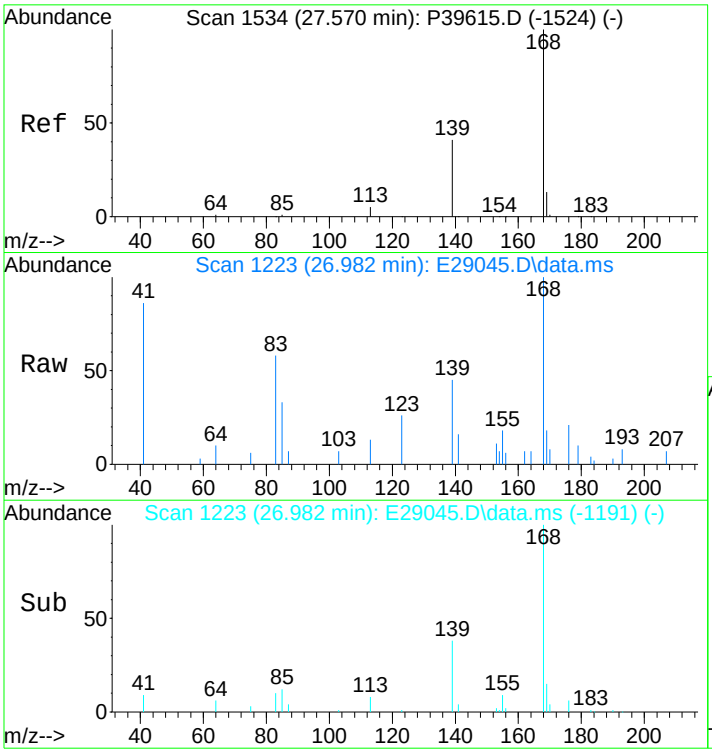


#24
2,6-Dimethylnaphthalene
Concen: 220.93 ng/mL
RT: 24.528 min Scan# 1060
Delta R.T. 0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:156 Resp: 21611

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

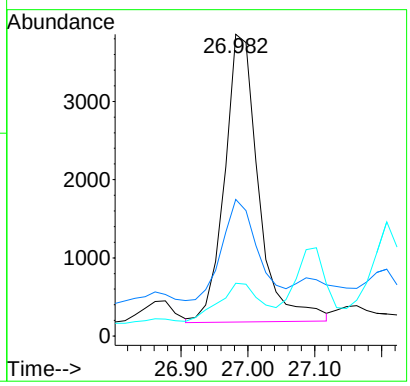


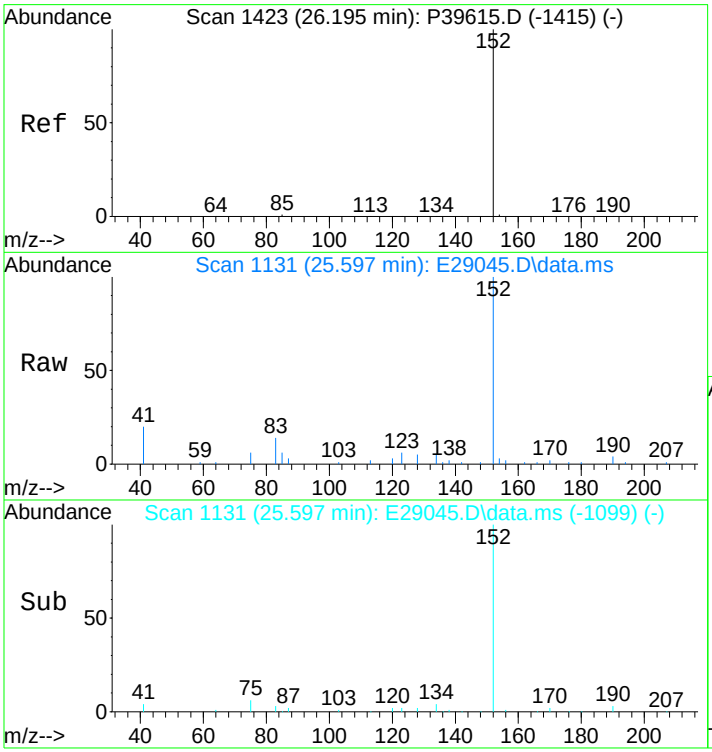


#25
Dibenzofuran
Concen: 85.67 ng/mL
RT: 26.982 min Scan# 1223
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:168 Resp: 13008

Ion	Ratio	Lower	Upper
168	100		
139	36.5	26.9	40.3
169	17.9	10.7	16.1#

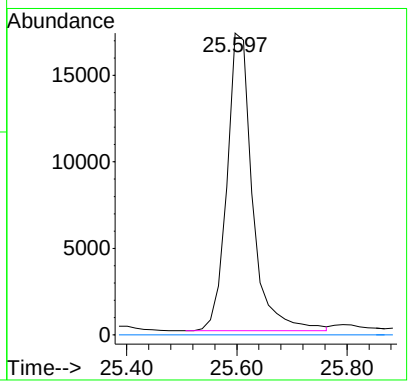


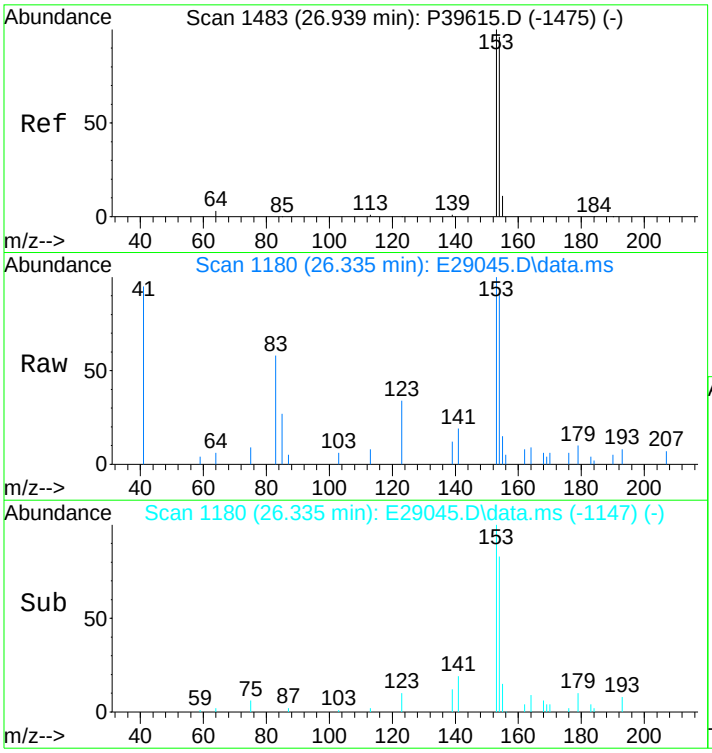


#26
Acenaphthylene
Concen: 325.71 ng/mL
RT: 25.597 min Scan# 1131
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:152 Resp: 55331

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

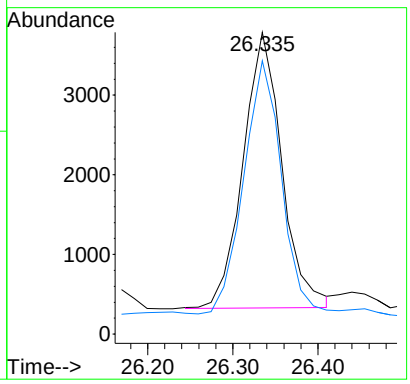


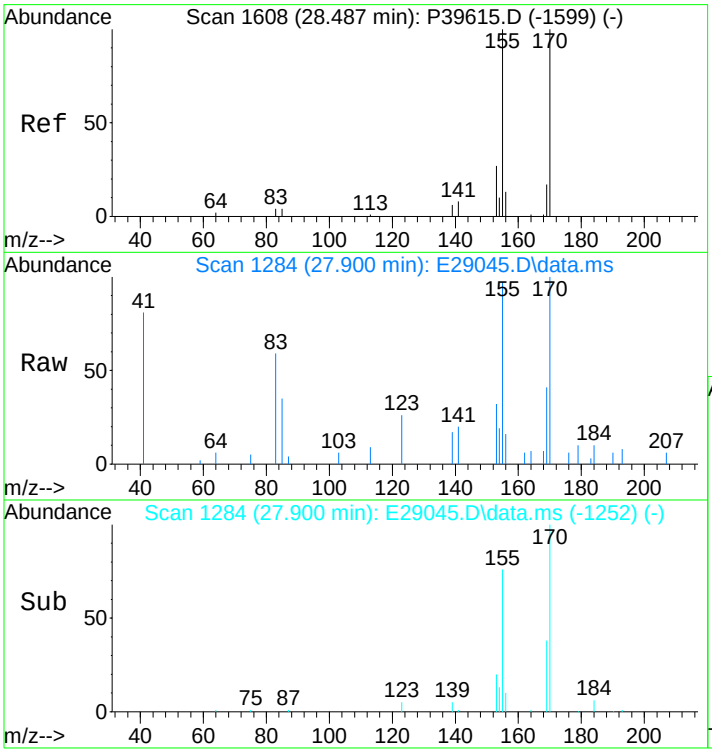


#27
Acenaphthene
Concen: 100.41 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:153 Resp: 10980

Ion	Ratio	Lower	Upper
153	100		
154	89.2	73.0	109.4

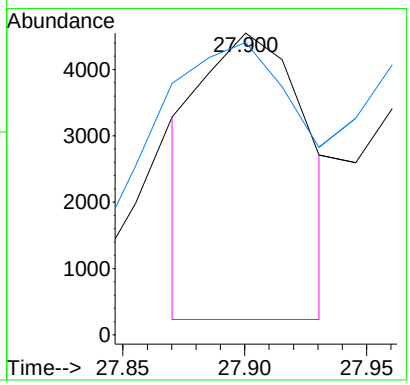


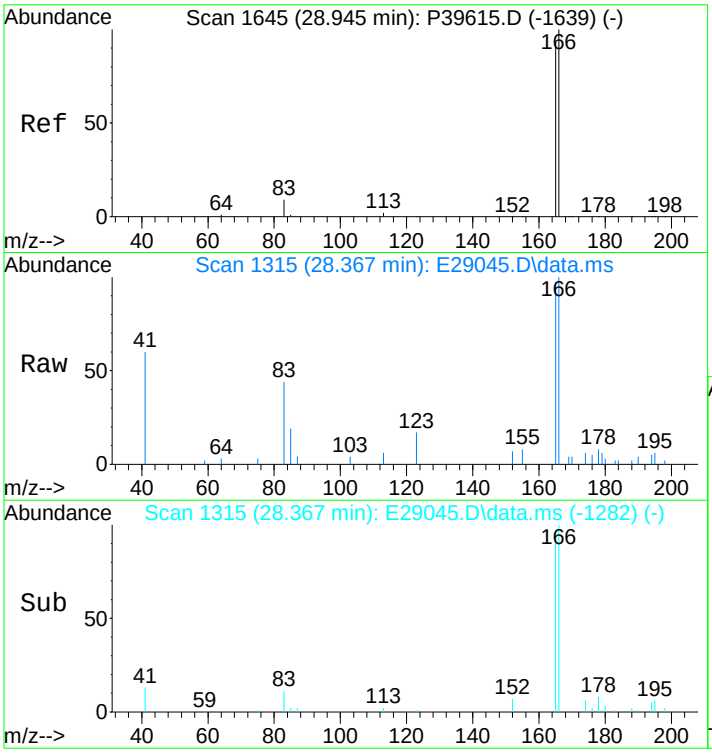


#28
2,3,5-Trimethylnaphthalene
Concen: 142.47 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:170 Resp: 13039

Ion	Ratio	Lower	Upper
170	100		
155	145.4	69.8	104.6#

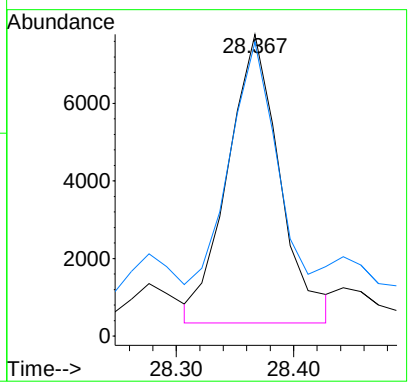


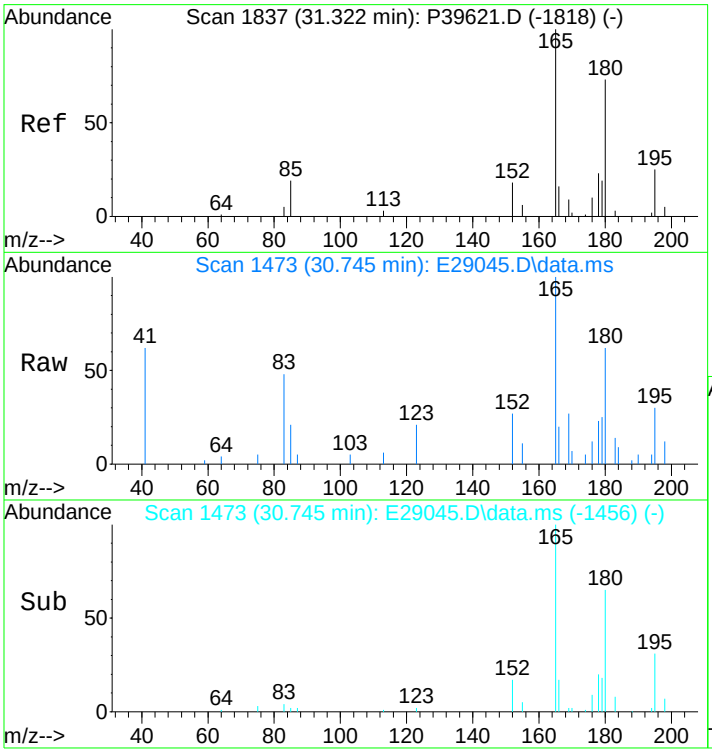


#29
Fluorene
Concen: 188.14 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:166 Resp: 22945

Ion	Ratio	Lower	Upper
166	100		
165	75.6	74.4	111.6

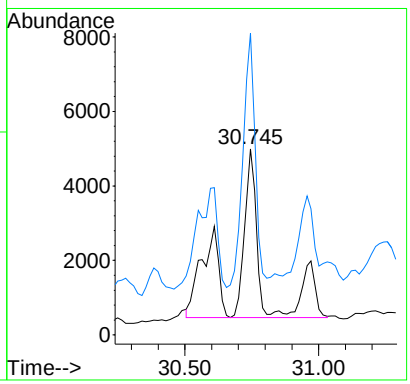


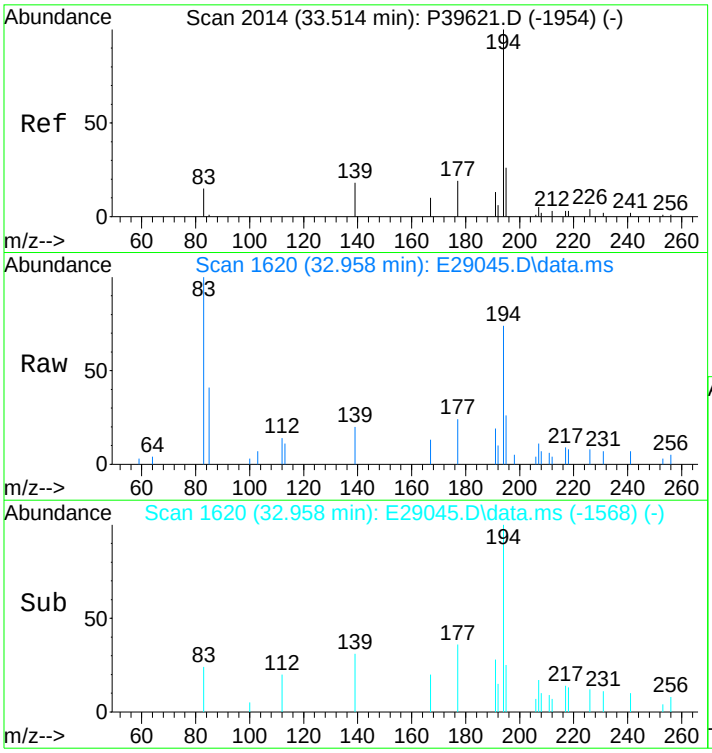


#30
C1-Fluorenes
Concen: 246.80 ng/mL m
RT: 30.745 min Scan# 1473
Delta R.T. 0.105 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:180 Resp: 30099

Ion	Ratio	Lower	Upper
180	100		
165	41.9	94.3	141.5#

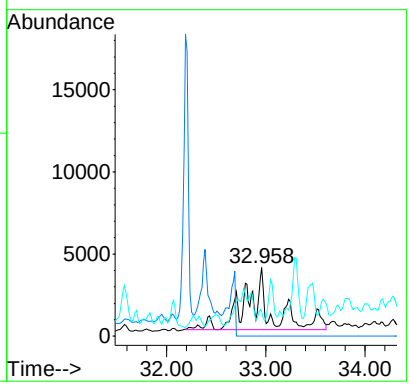


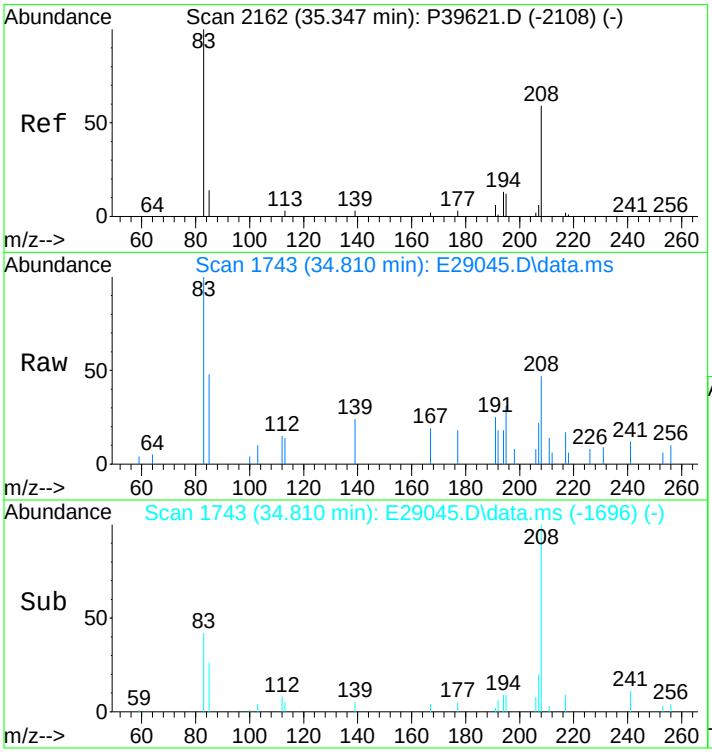


#31
C2-Fluorenes
Concen: 542.70 ng/mL m
RT: 32.958 min Scan# 1620
Delta R.T. 0.178 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:194 Resp: 66186

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	26.3	27.0	40.4#

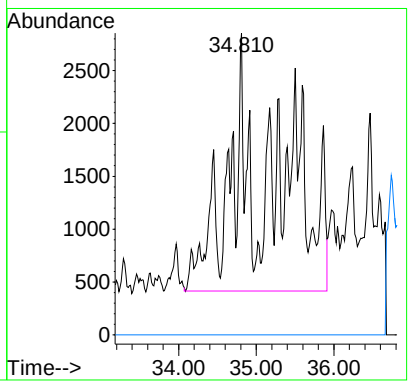


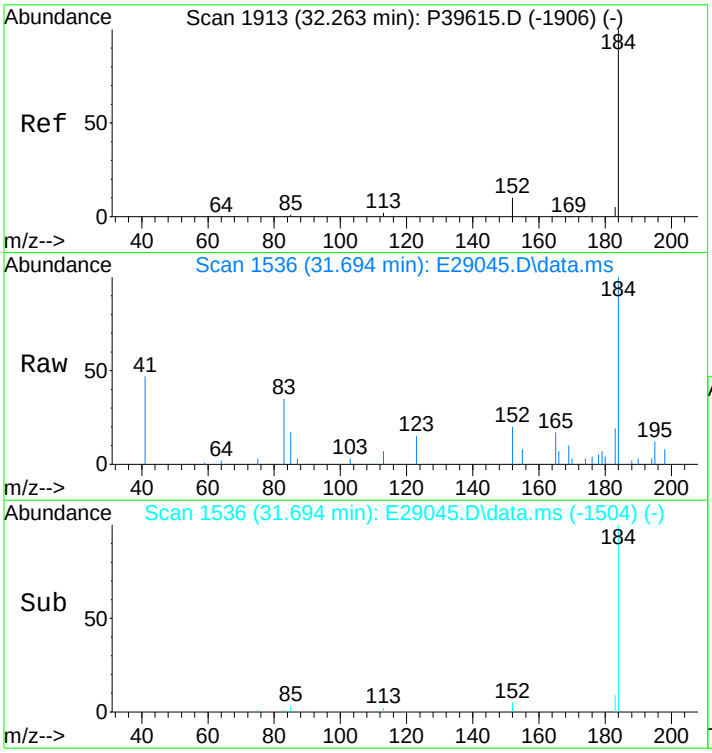


#32
C3-Fluorenes
Concen: 755.34 ng/mL m
RT: 34.810 min Scan# 1743
Delta R.T. 0.241 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:208 Resp: 92119

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

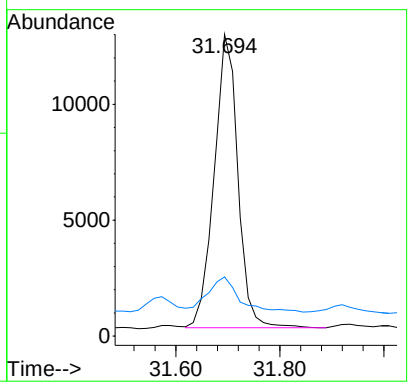


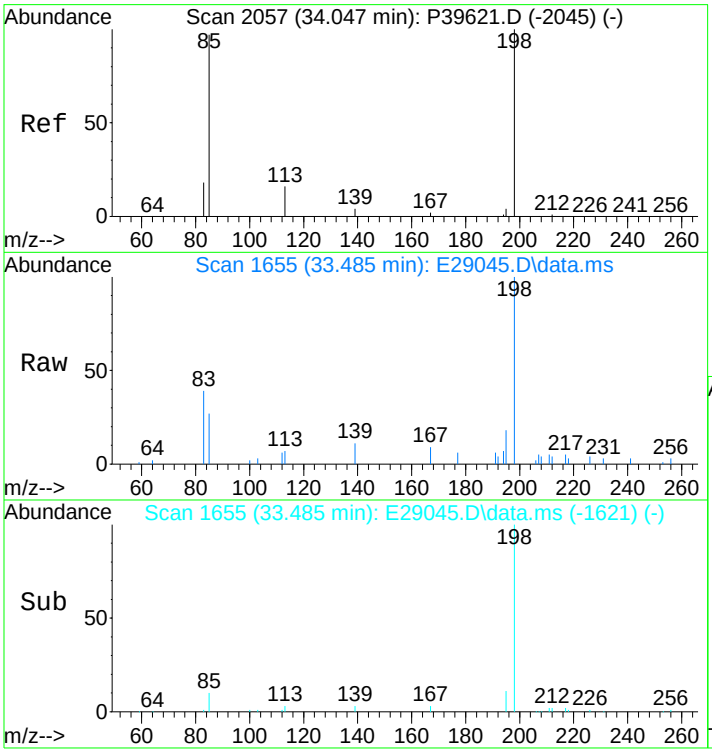


#33
Dibenzothiophene
Concen: 239.31 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:184 Resp: 40050

Ion	Ratio	Lower	Upper
184	100		
152	15.6	6.0	9.0#

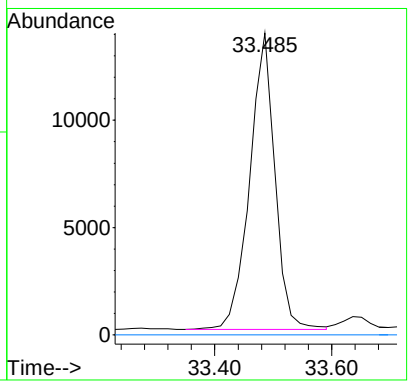


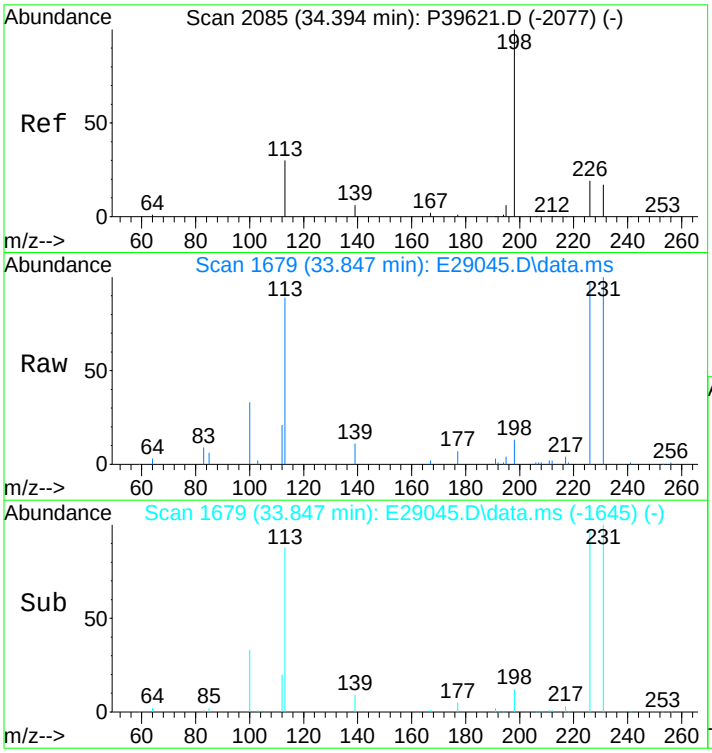


#34
4-Methyldibenzothiophene(4MDT)
Concen: 247.26 ng/mL
RT: 33.485 min Scan# 1655
Delta R.T. 0.011 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:198 Resp: 41381

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

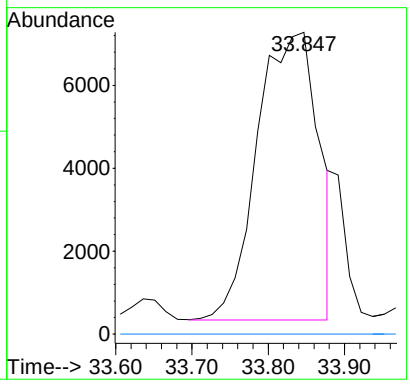


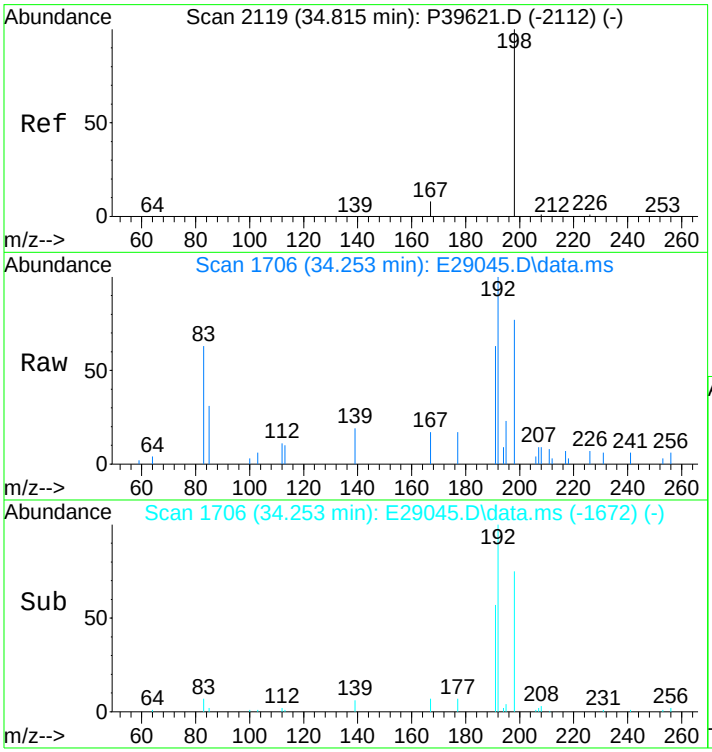


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 232.15 ng/mL m
RT: 33.847 min Scan# 1679
Delta R.T. 0.011 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:198 Resp: 38853

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

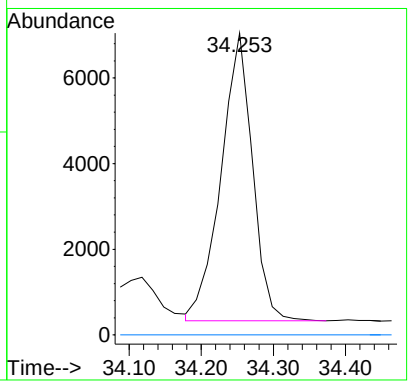


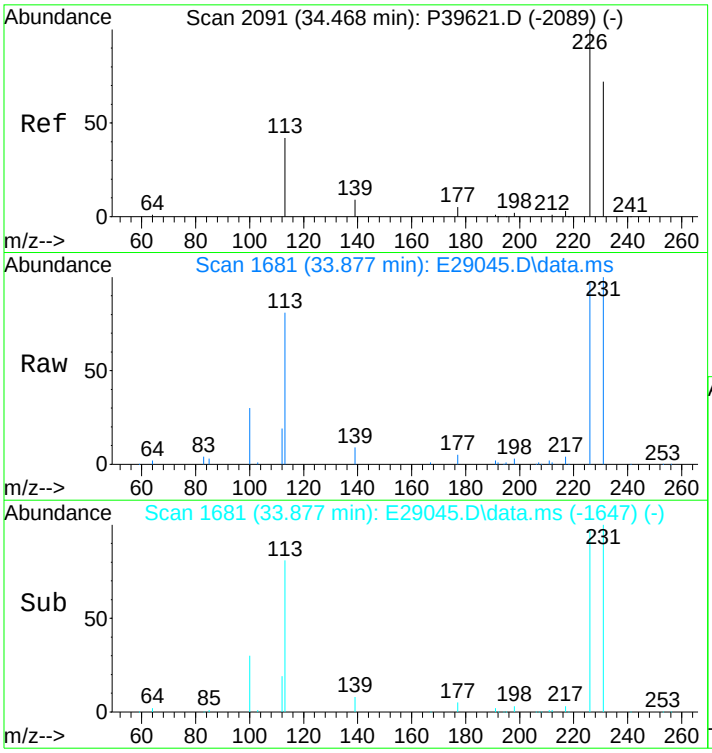


#36
1-Methyldibenzothiophene(1MDT)
Concen: 121.80 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.011 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:198 Resp: 20384

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

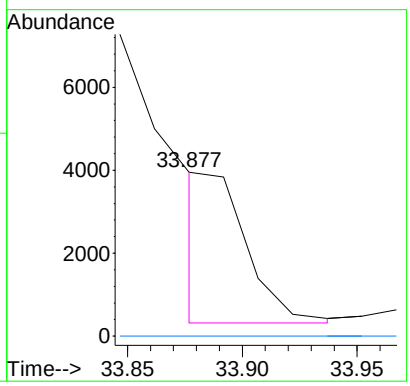


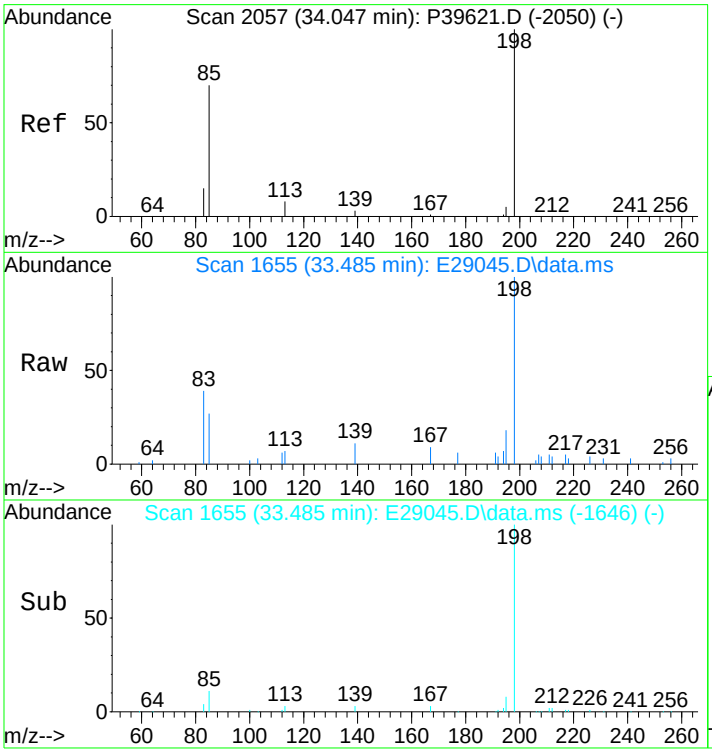


#37
OTP
Concen: 26.51 ng/mL m
RT: 33.877 min Scan# 1681
Delta R.T. -0.019 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:198 Resp: 4436

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

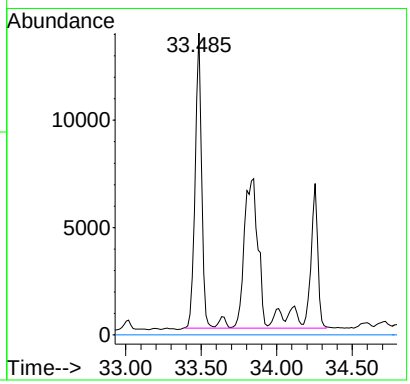


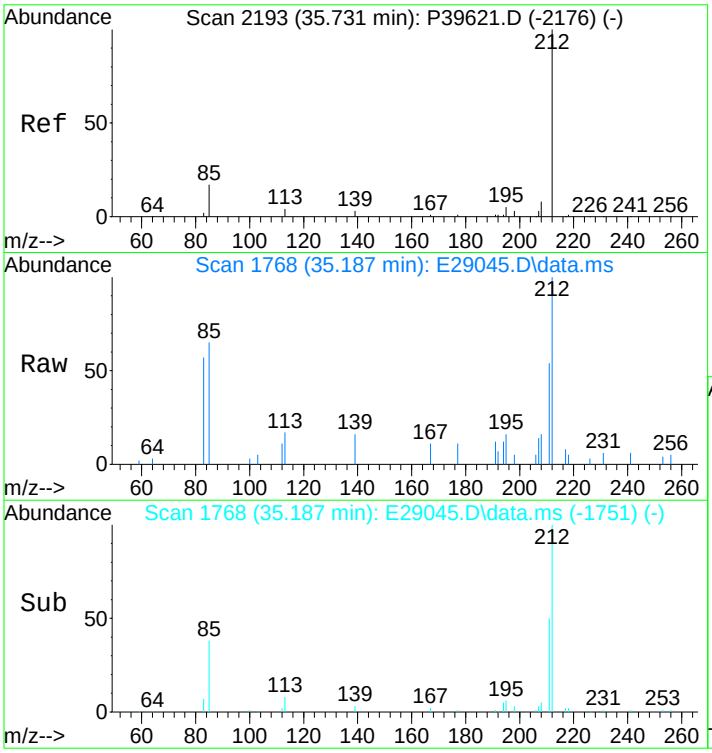


#38
C1-Dibenzothiophenes
Concen: 685.10 ng/mL m
RT: 33.485 min Scan# 1655
Delta R.T. 0.073 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:198 Resp: 114658

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

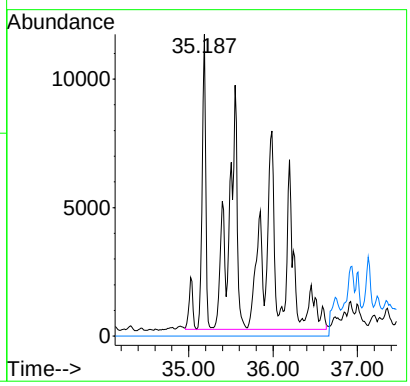


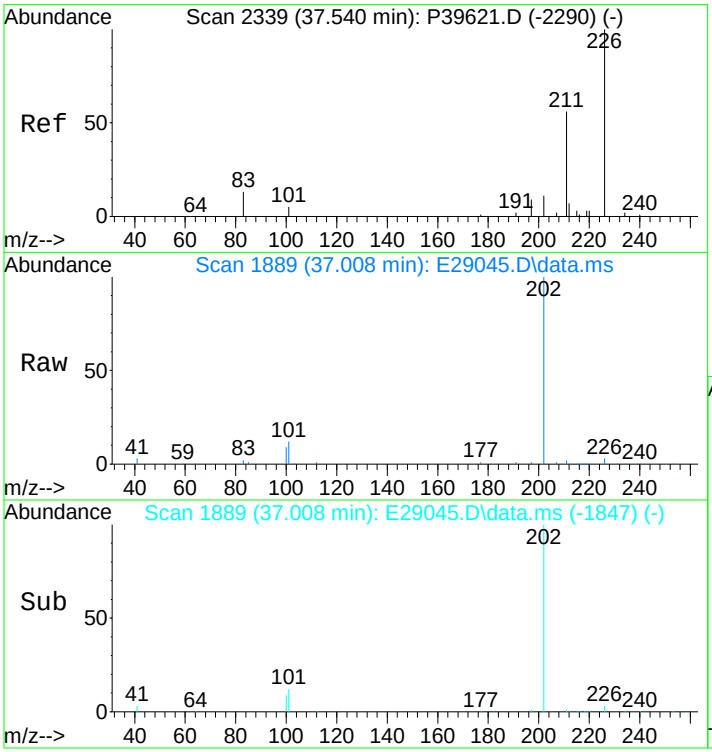


#39
C2-Dibenzothiophenes
Concen: 1281.03 ng/mL m
RT: 35.187 min Scan# 1768
Delta R.T. 0.010 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:212 Resp: 214392

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

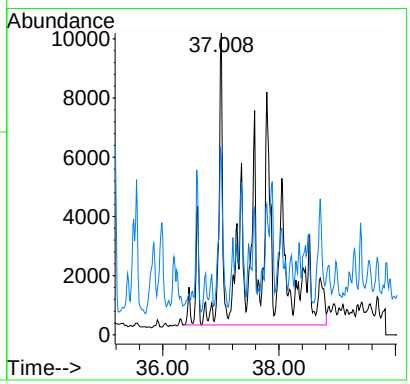


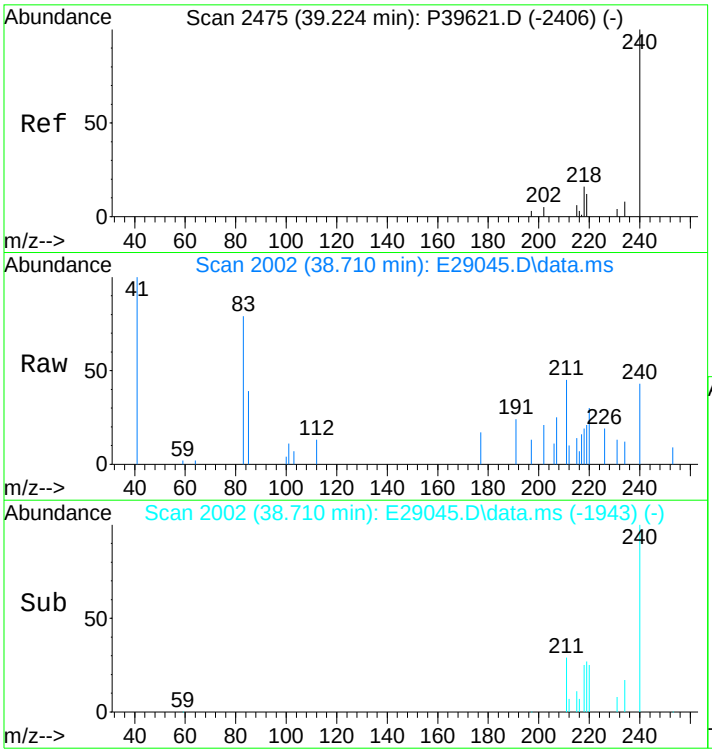


#40
C3-Dibenzothiophenes
Concen: 1528.59 ng/mL m
RT: 37.008 min Scan# 1889
Delta R.T. 0.299 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:226 Resp: 255824

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

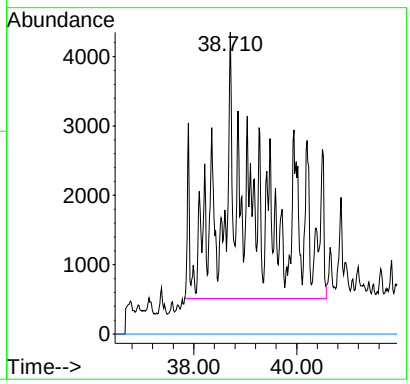


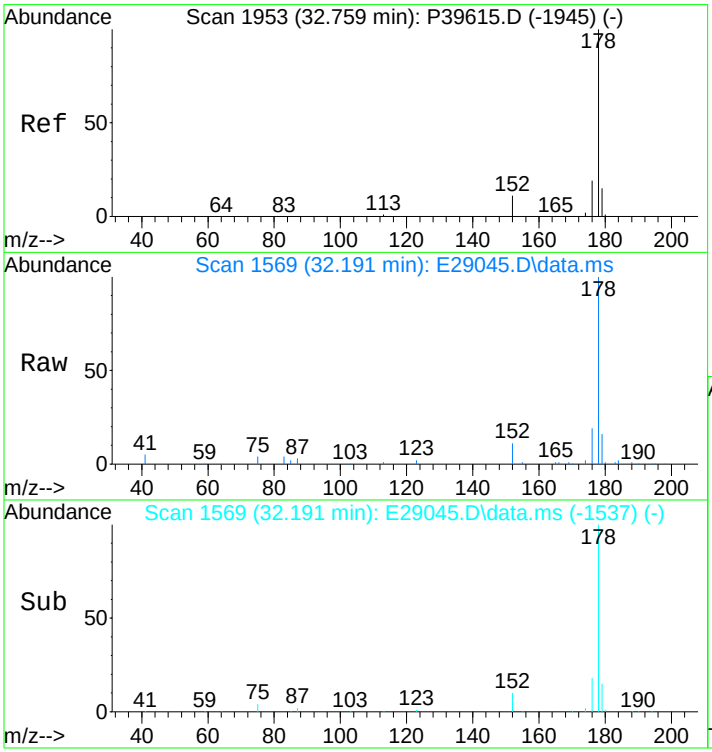


#41
C4-Dibenzothiophenes
Concen: 1095.91 ng/mL m
RT: 38.710 min Scan# 2002
Delta R.T. 0.343 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:240 Resp: 183411

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

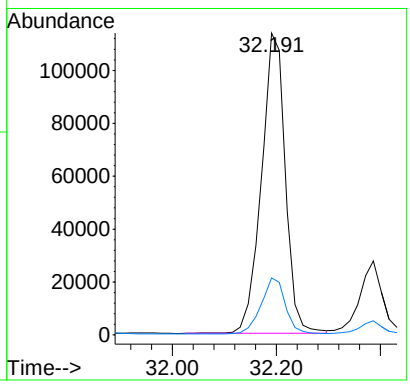


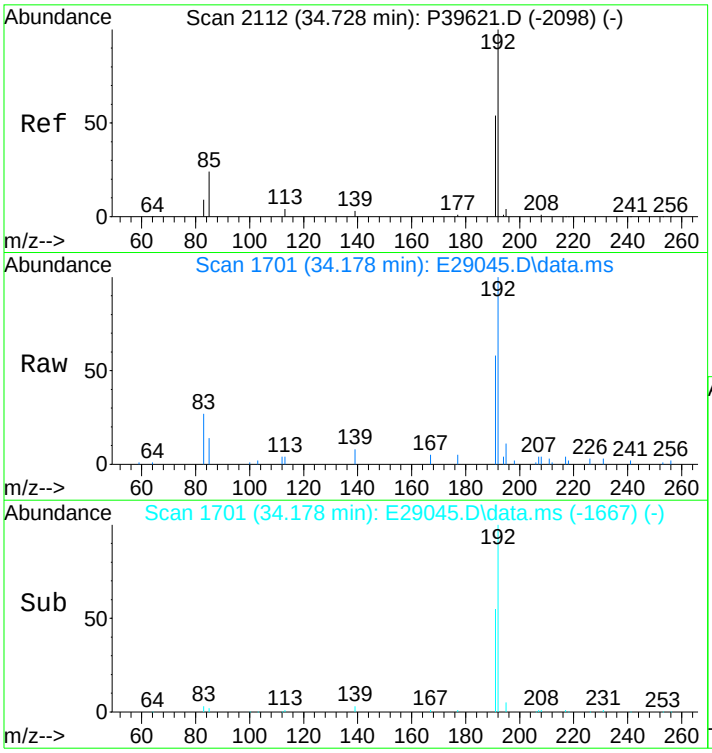


#43
Phenanthrene
Concen: 2137.22 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:178 Resp: 363905

Ion	Ratio	Lower	Upper
178	100		
176	18.9	14.6	21.8

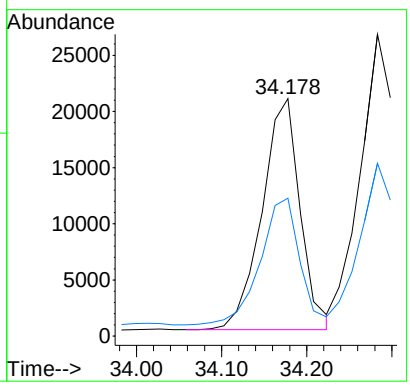


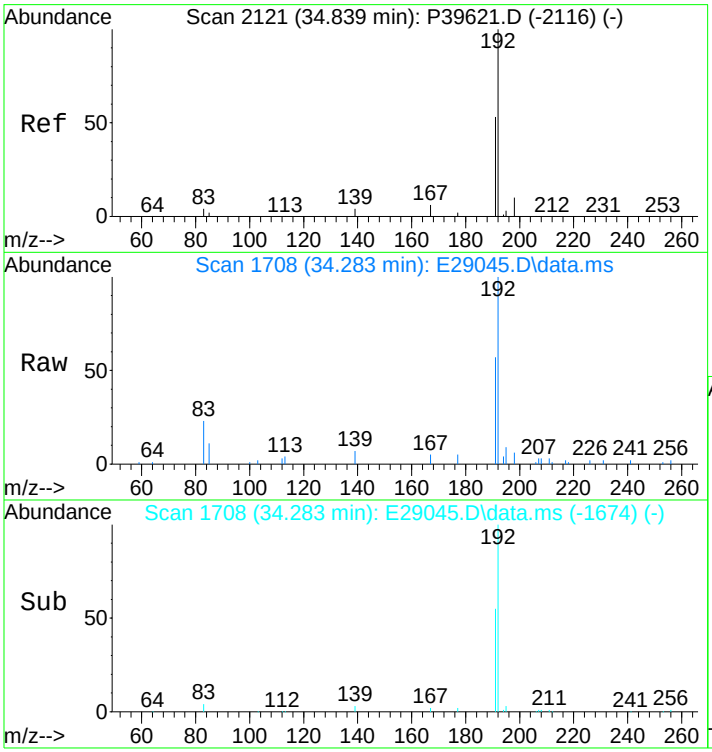


#44
3-Methylphenanthrene(3MP)
Concen: 375.56 ng/mL
RT: 34.178 min Scan# 1701
Delta R.T. 0.011 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 63946

Ion	Ratio	Lower	Upper
192	100		
191	57.7	45.9	68.9

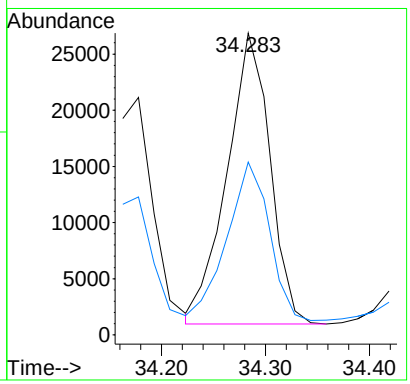


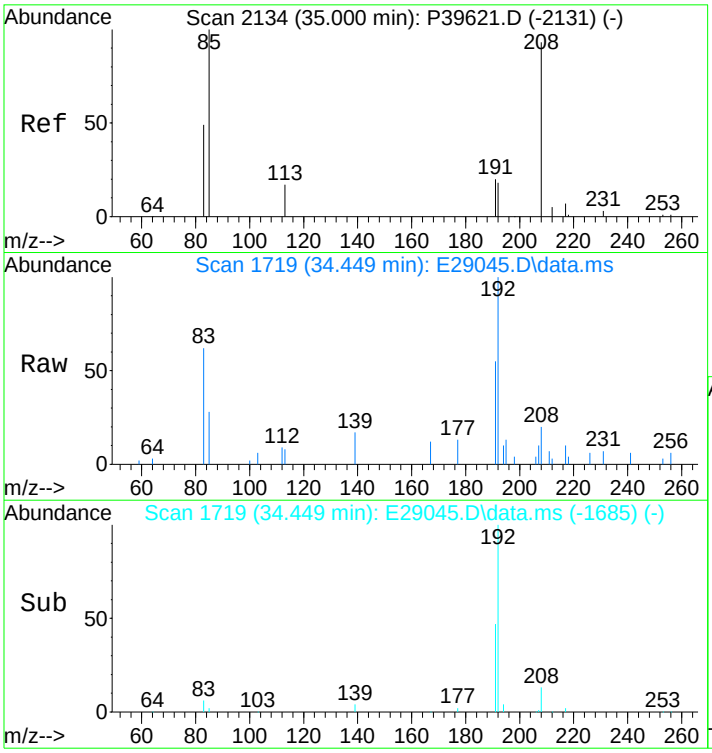


#45
2-Methylphenanthrene(2MP)
Concen: 437.14 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.011 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 74432

Ion	Ratio	Lower	Upper
192	100		
191	53.4	45.4	68.0

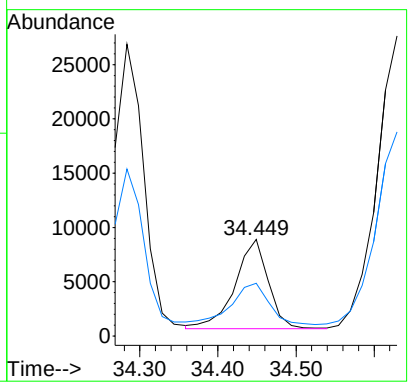


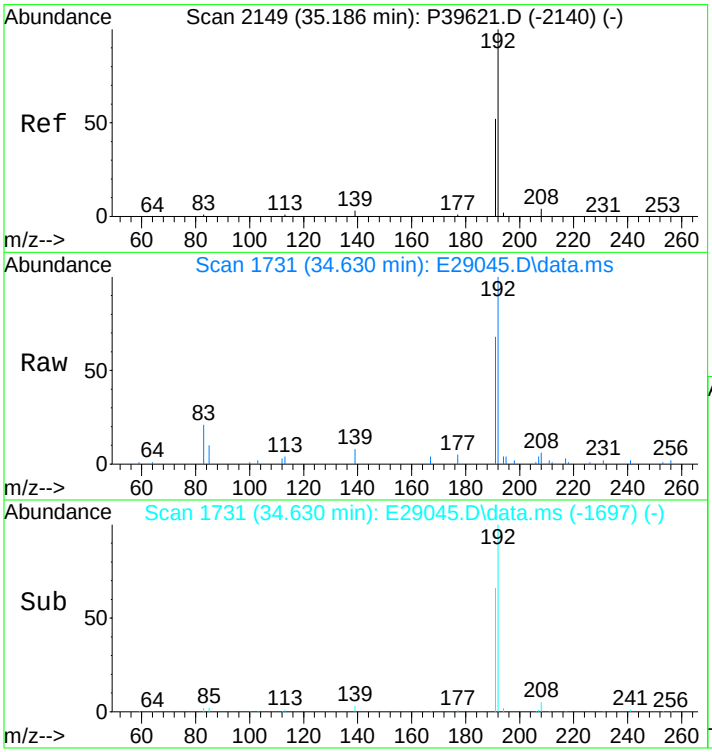


#46
2-Methylanthracene(2MA)
Concen: 143.51 ng/mL m
RT: 34.449 min Scan# 1719
Delta R.T. 0.010 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 24435

Ion	Ratio	Lower	Upper
192	100		
191	1.7	95.4	143.0#

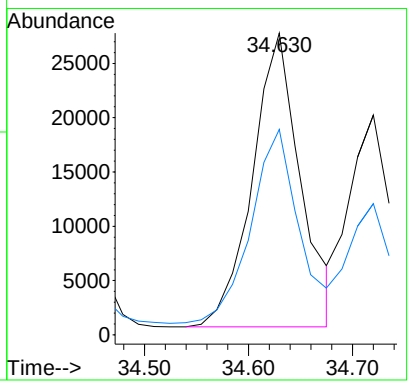


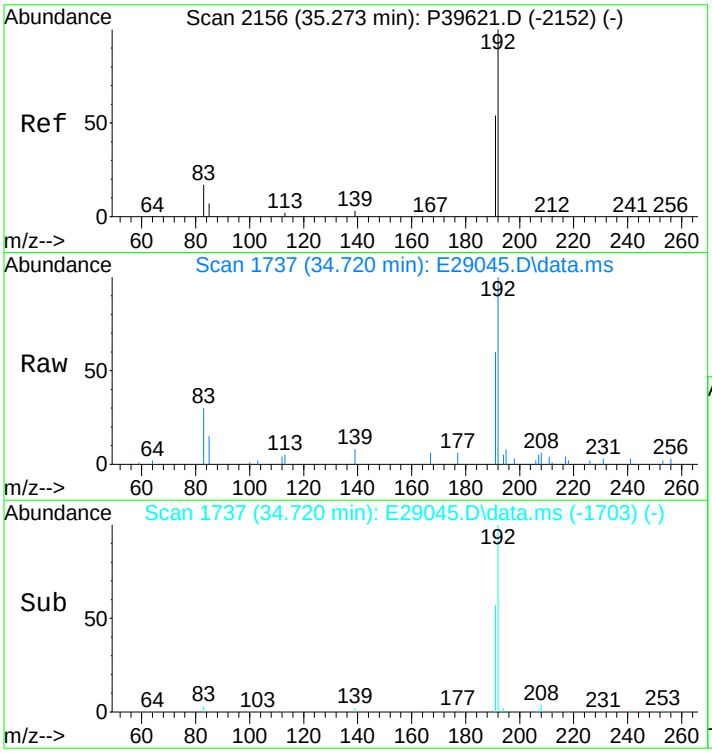


#47
9/4-Methylphenanthrene(9MP)
Concen: 512.10 ng/mL
RT: 34.630 min Scan# 1731
Delta R.T. 0.010 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 87195

Ion	Ratio	Lower	Upper
192	100		
191	65.8	44.3	66.5

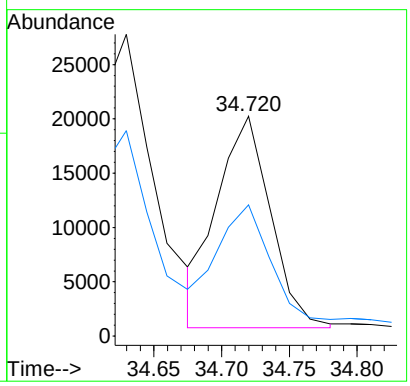


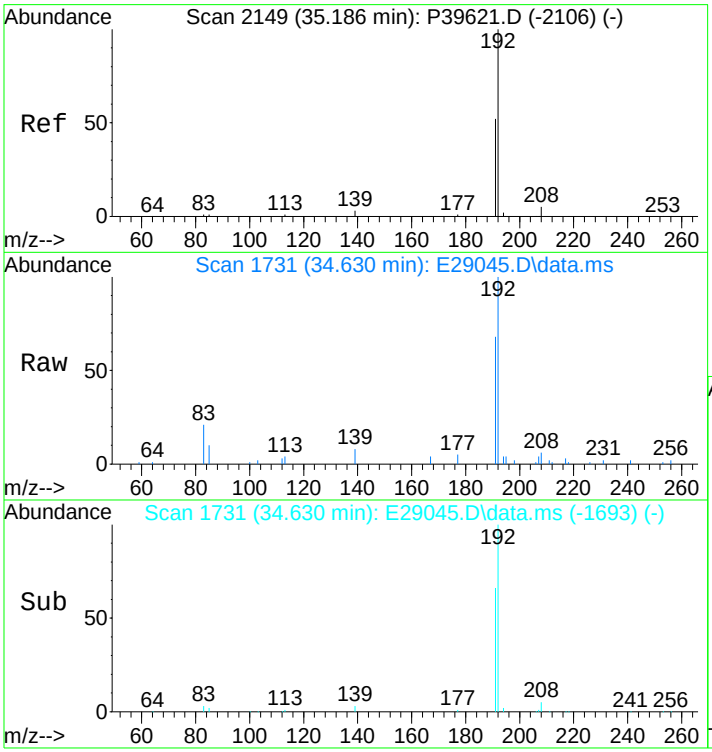


#48
1-Methylphenanthrene(1MP)
Concen: 314.78 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.010 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 53598

Ion	Ratio	Lower	Upper
192	100		
191	57.3	46.7	70.1

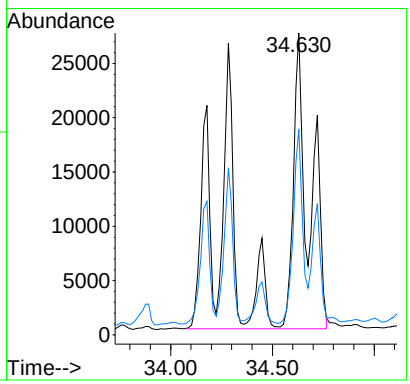


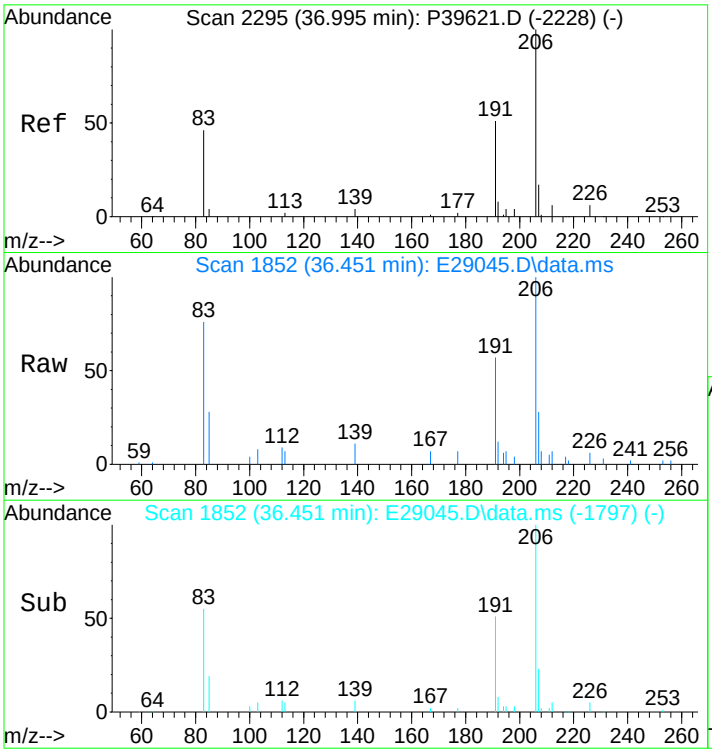


#49
C1-Phenanthrenes/Anthracenes
Concen: 1820.27 ng/mL m
RT: 34.630 min Scan# 1731
Delta R.T. 0.207 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 309937

Ion	Ratio	Lower	Upper
192	100		
191	4.1	44.0	66.0#

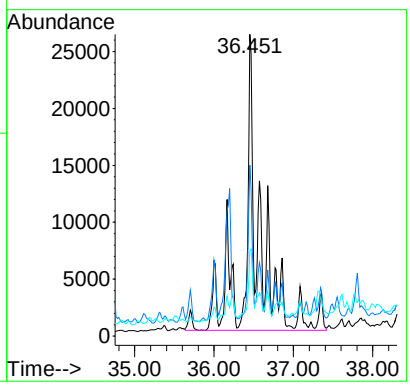


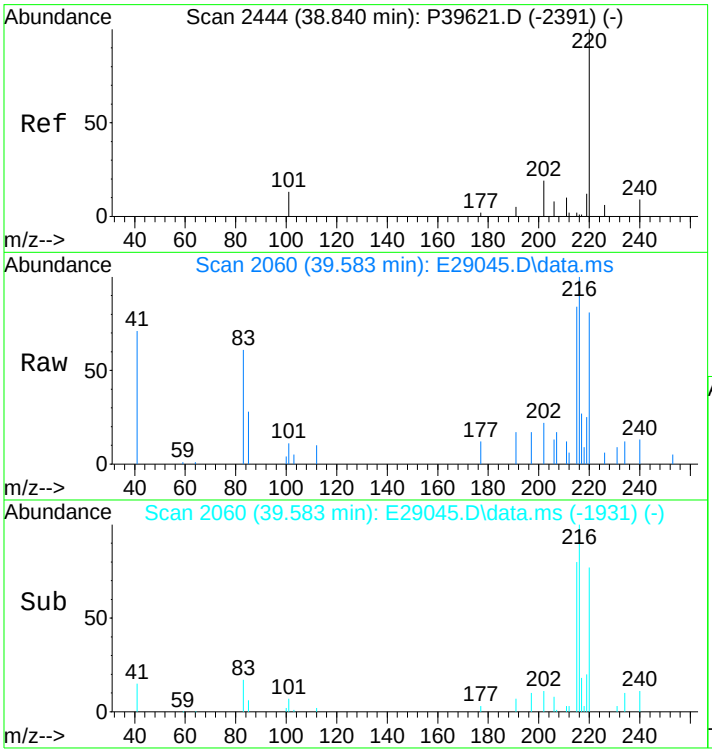


#50
C2-Phenanthrenes/Anthracenes
Concen: 1919.07 ng/mL m
RT: 36.451 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:206 Resp: 326759

Ion	Ratio	Lower	Upper
206	100		
191	14.4	35.7	53.5#
207	7.0	16.5	24.7#

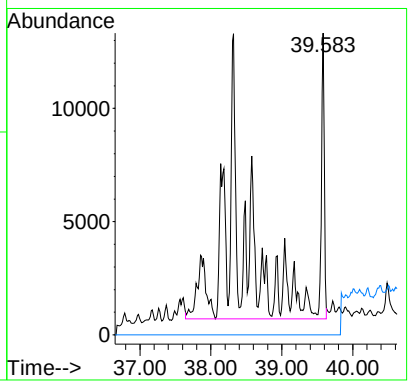


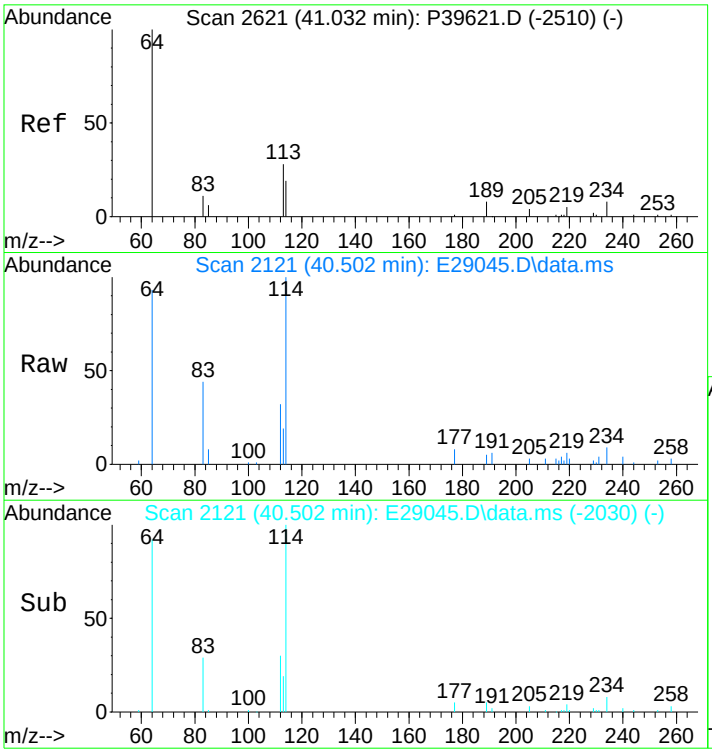


#52
C3-Phenanthrenes/Anthracenes
Concen: 1477.55 ng/mL m
RT: 39.583 min Scan# 2060
Delta R.T. 1.598 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:220 Resp: 251583

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

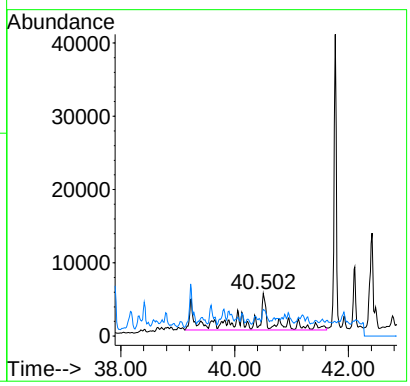


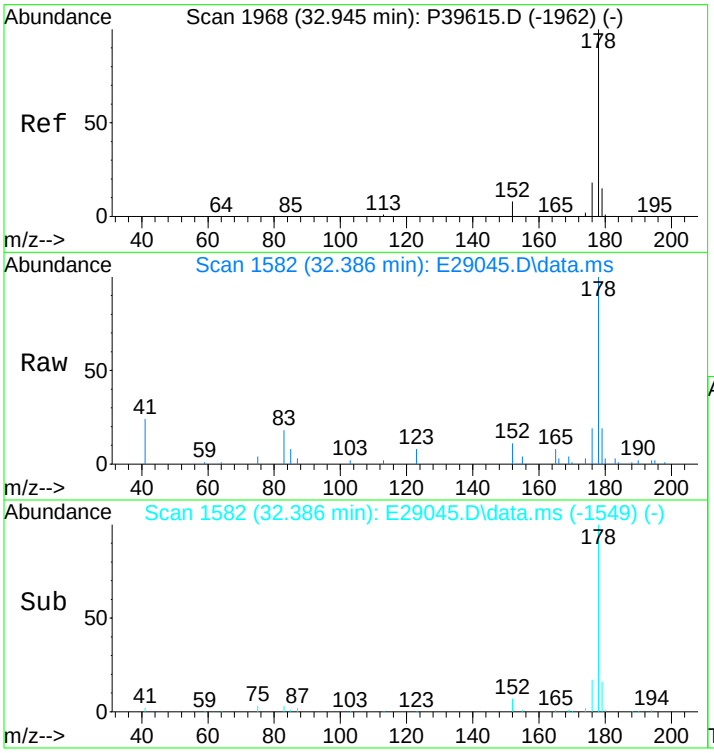


#53
C4-Phenanthrenes/Anthracenes
Concen: 789.20 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:234 Resp: 134377

Ion	Ratio	Lower	Upper
234	100		
219	2.2	46.6	70.0#

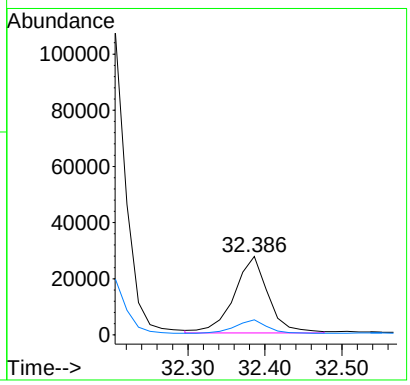


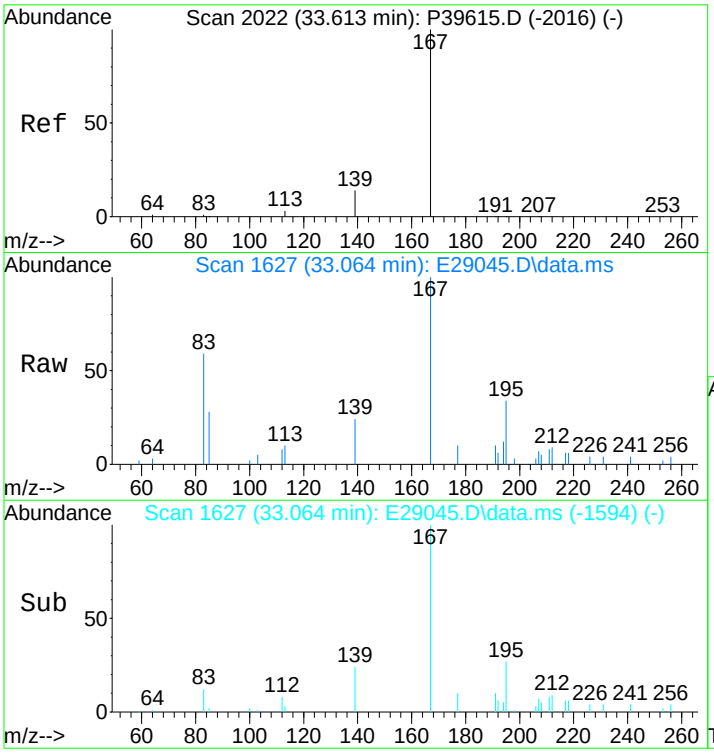


#55
Anthracene
Concen: 567.24 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:178 Resp: 83482

Ion	Ratio	Lower	Upper
178	100		
176	16.9	14.2	21.2

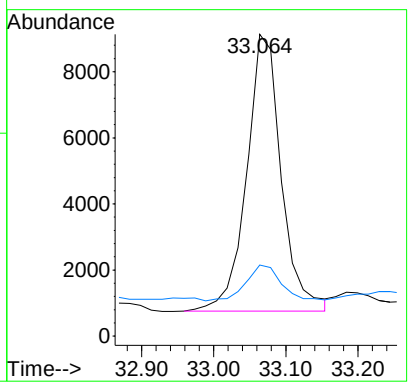


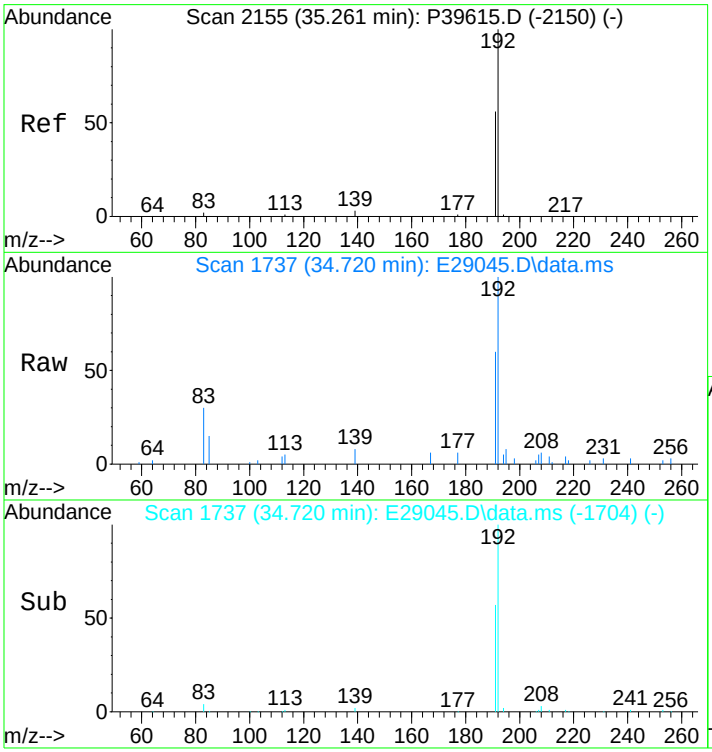


#56
Carbazole
Concen: 184.95 ng/mL m
RT: 33.064 min Scan# 1627
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:167 Resp: 28014

Ion	Ratio	Lower	Upper
167	100		
139	11.8	10.6	15.8

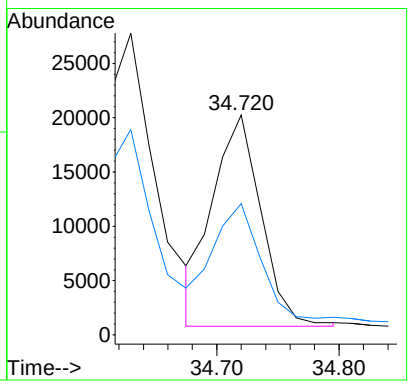


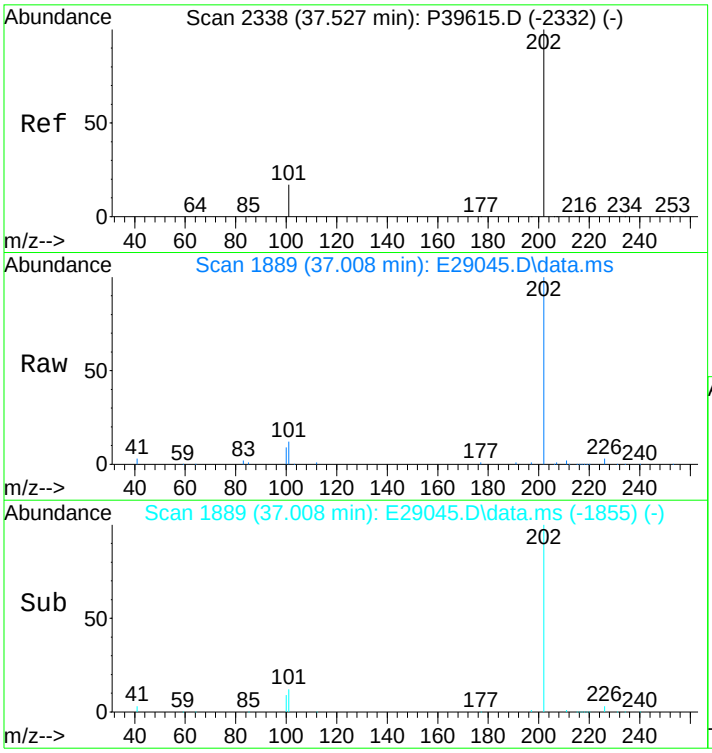


#57
1-Methylphenanthrene
Concen: 413.53 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:192 Resp: 53718

Ion	Ratio	Lower	Upper
192	100		
191	57.2	44.4	66.6

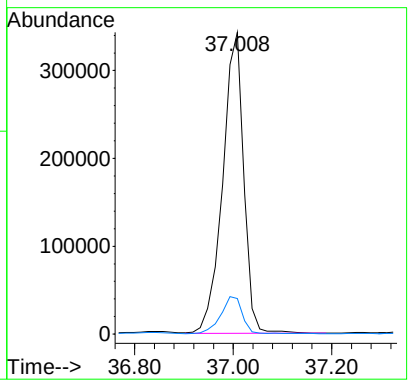


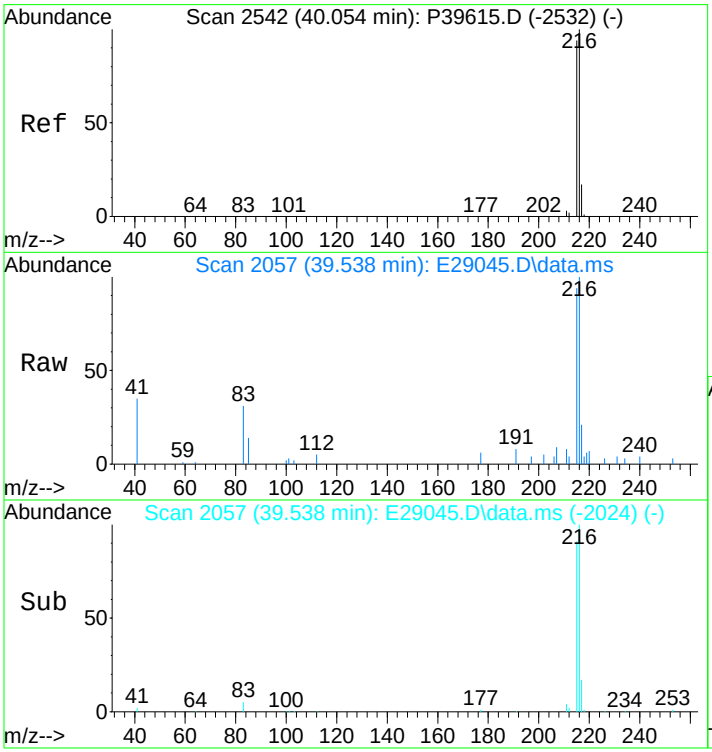


#58
Fluoranthene
Concen: 5427.04 ng/mL
RT: 37.008 min Scan# 1889
Delta R.T. 0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:202 Resp: 1020486

Ion	Ratio	Lower	Upper
202	100		
101	13.0	10.5	15.7

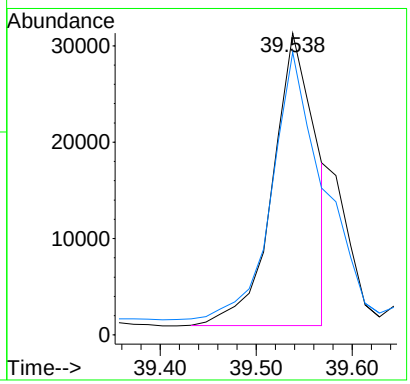


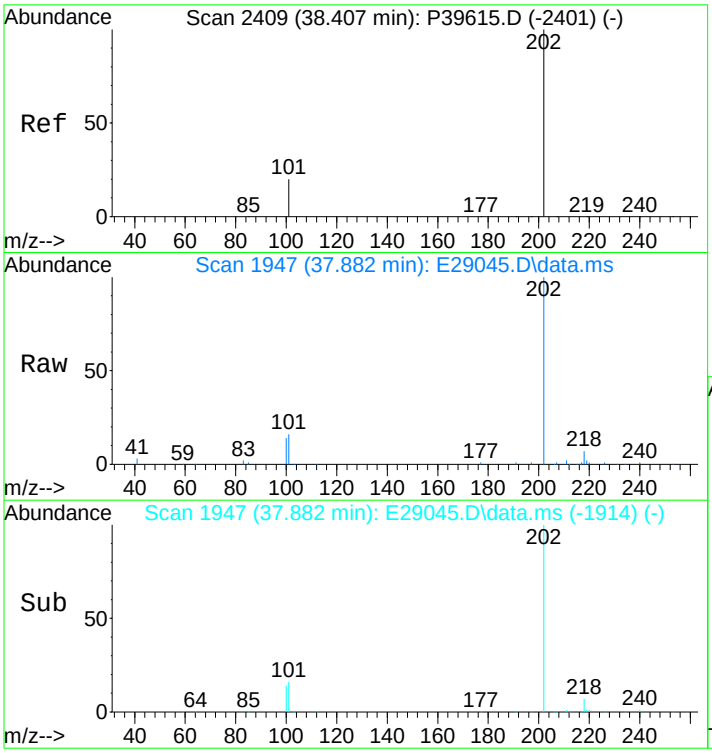


#59
Benzo(b)fluorene
Concen: 758.08 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:216 Resp: 94987

Ion	Ratio	Lower	Upper
216	100		
215	109.6	73.0	109.6

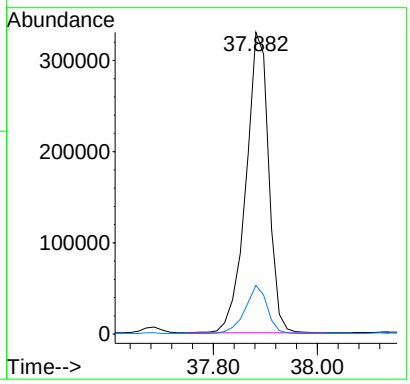


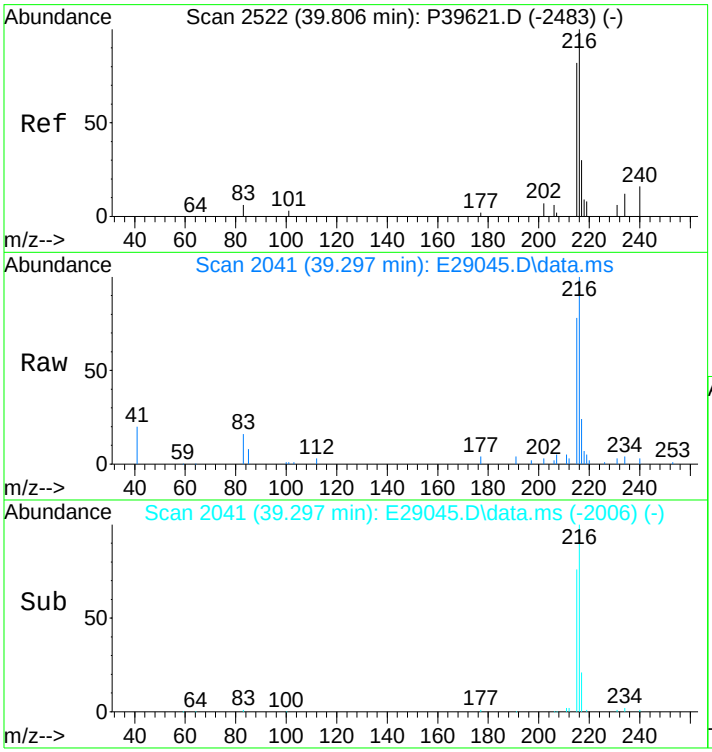


#60
Pyrene
Concen: 5247.79 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:202 Resp: 1002979

Ion	Ratio	Lower	Upper
202	100		
101	15.7	11.5	17.3

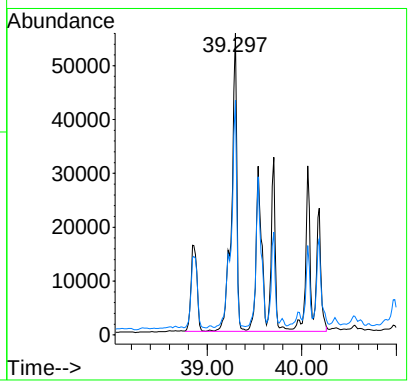


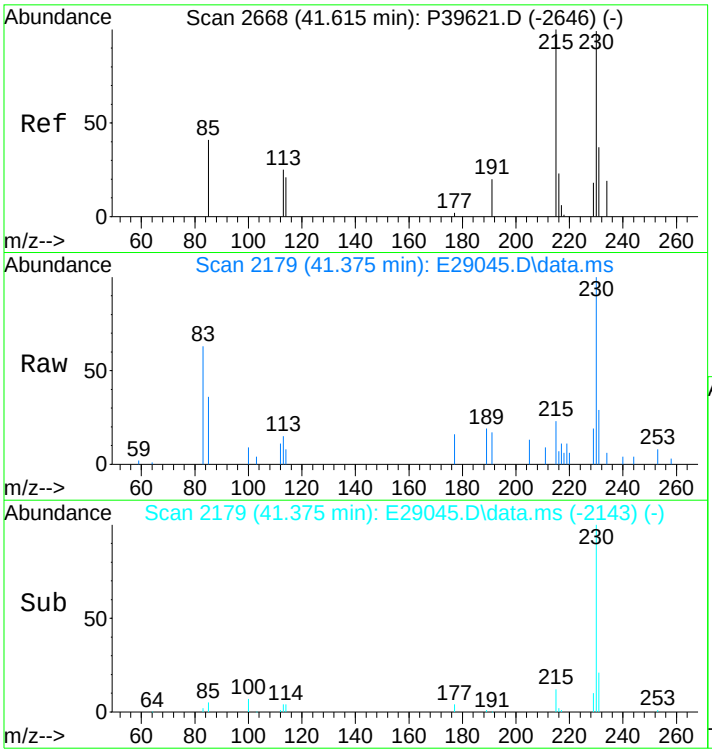


#61
C1-Fluoranthenes/Pyrenes
Concen: 3535.30 ng/mL m
RT: 39.297 min Scan# 2041
Delta R.T. 0.360 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:216 Resp: 675681

Ion	Ratio	Lower	Upper
216	100		
215	8.9	73.4	110.2#

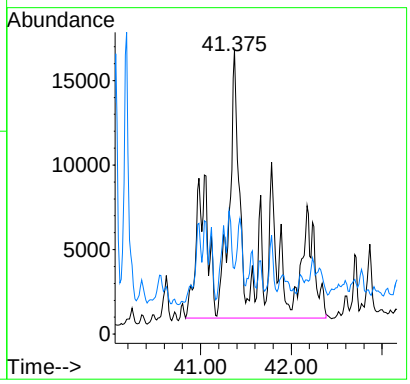


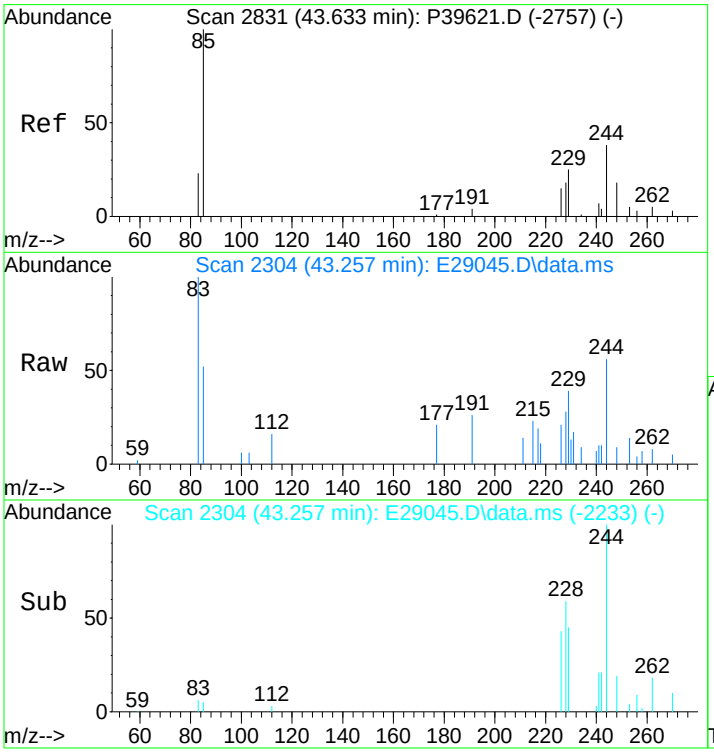


#62
C2-Fluoranthenes/Pyrenes
Concen: 1797.28 ng/mL m
RT: 41.375 min Scan# 2179
Delta R.T. 0.472 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:230 Resp: 343503

Ion	Ratio	Lower	Upper
230	100		
215	2.0	93.8	140.8#

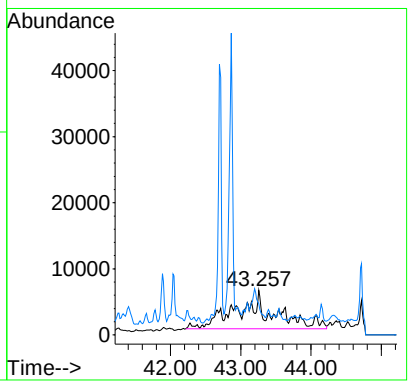


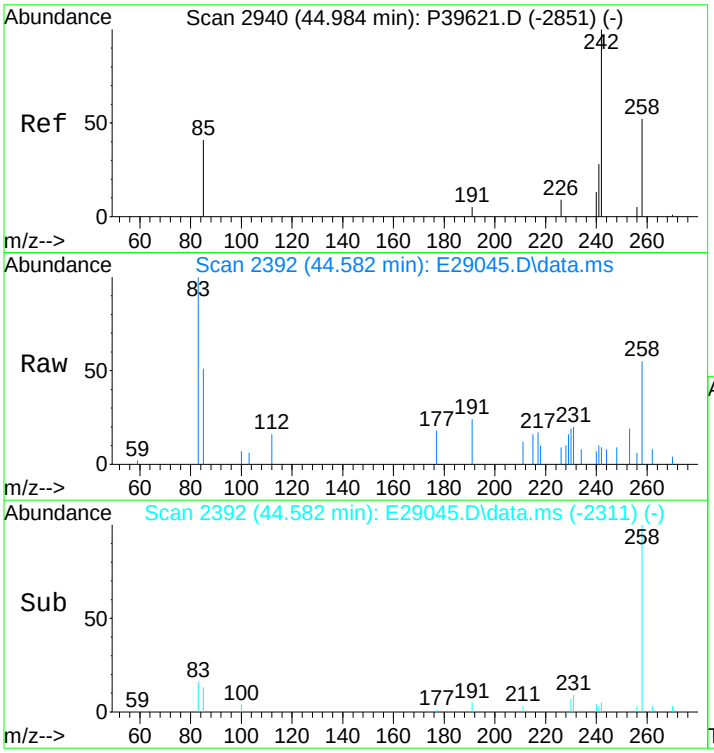


#63
C3-Fluoranthenes/Pyrenes
Concen: 1114.26 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:244 Resp: 212961

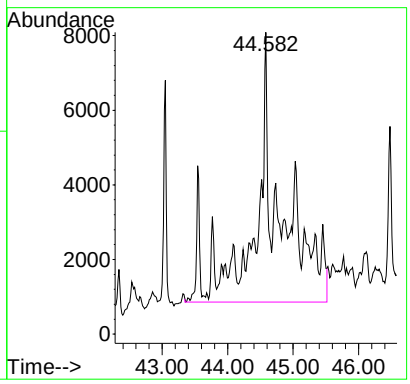
Ion	Ratio	Lower	Upper
244	100		
229	4.5	72.2	108.2#

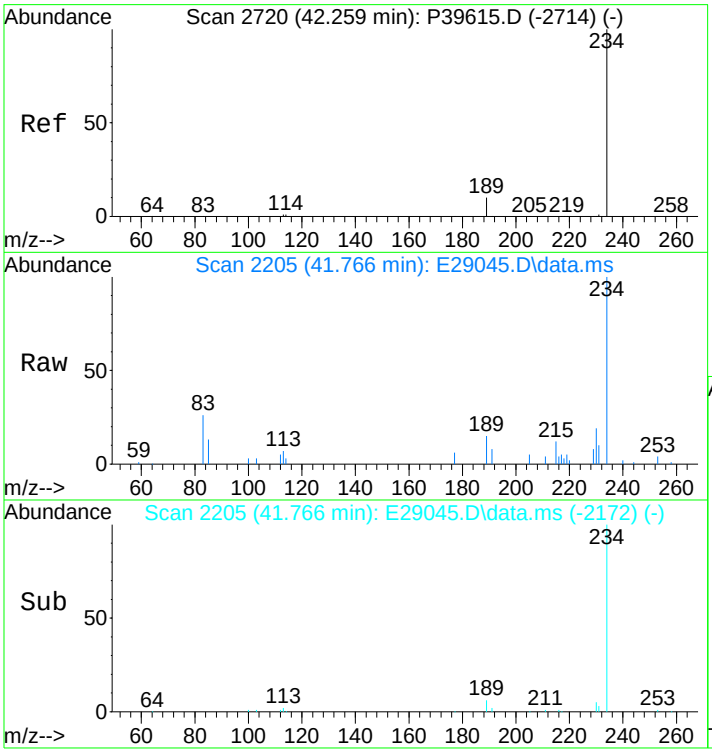




#64
C4-Fluoranthenes/Pyrenes
Concen: 994.41 ng/mL m
RT: 44.582 min Scan# 2392
Delta R.T. 0.586 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:258 Resp: 190056

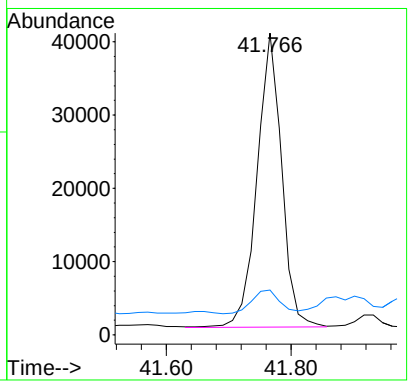


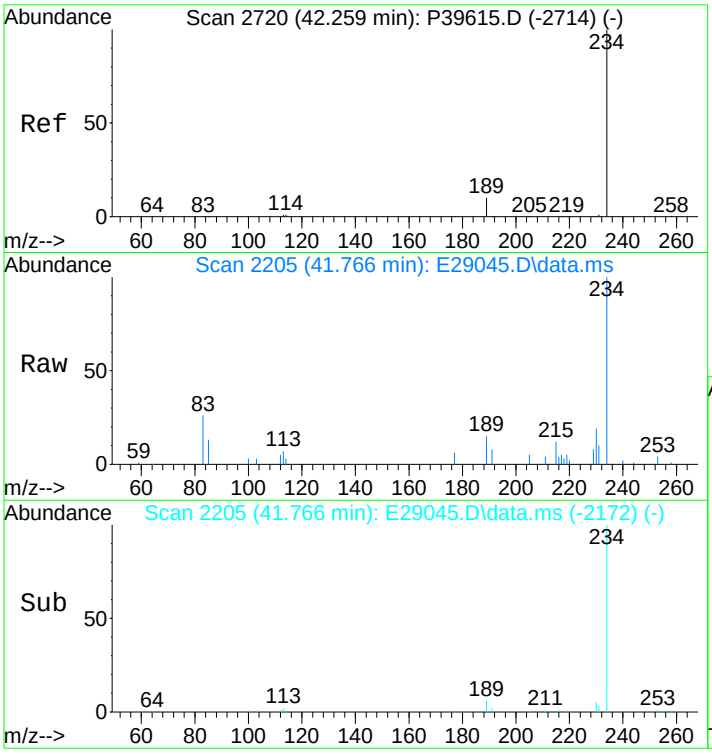


#66
Naphthobenzothiophene
Concen: 580.58 ng/ml
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:234 Resp: 109441

Ion	Ratio	Lower	Upper
234	100		
189	9.3	5.4	8.2#

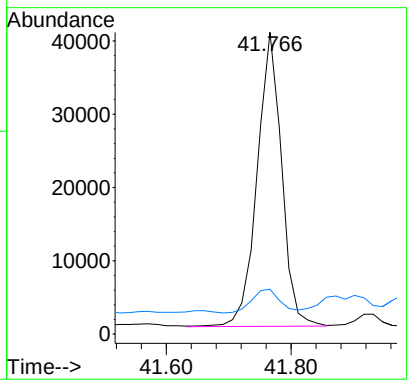


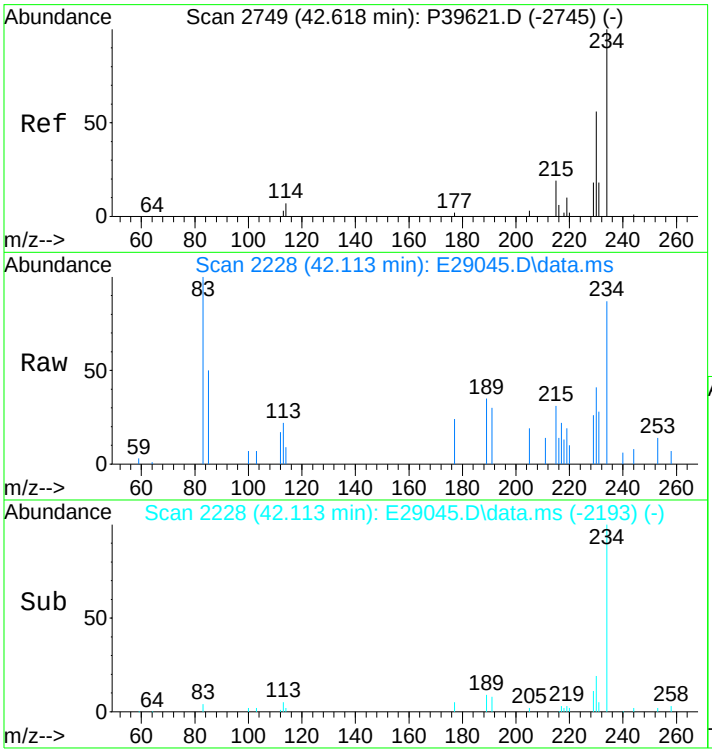


#67
Naphthobenzothiophene-2,1-D
Concen: 580.58 ng/mL
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:234 Resp: 109441

Ion	Ratio	Lower	Upper
234	100		
189	9.3	5.4	8.2#

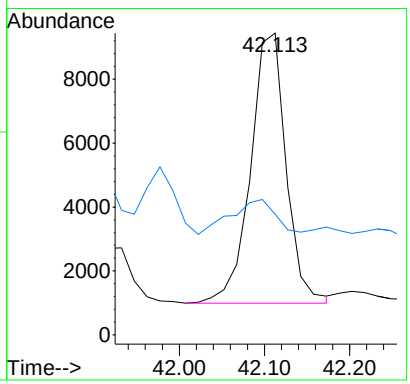


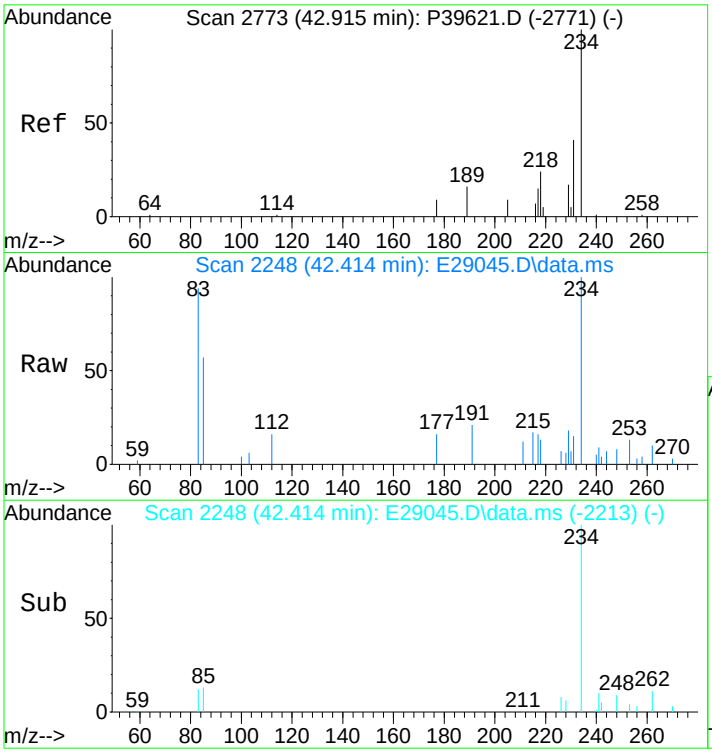


#68
Naphthobenzothiophene-1,2-D
Concen: 129.86 ng/mL
RT: 42.113 min Scan# 2228
Delta R.T. 0.021 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:234 Resp: 24480

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

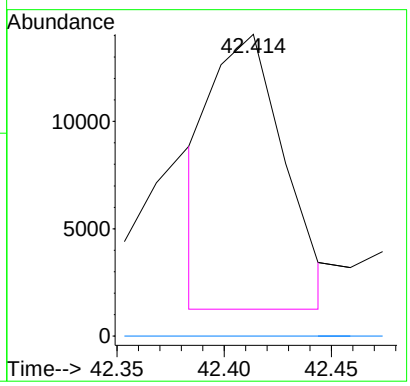


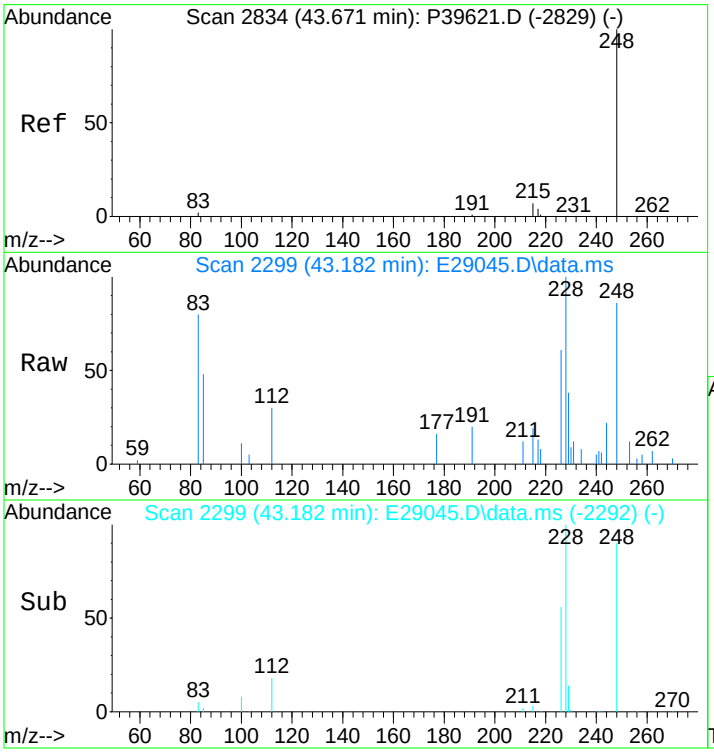


#69
Naphthobenzothiophene-2,3-D
Concen: 159.00 ng/mL m
RT: 42.414 min Scan# 2248
Delta R.T. 0.021 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:234 Resp: 29973

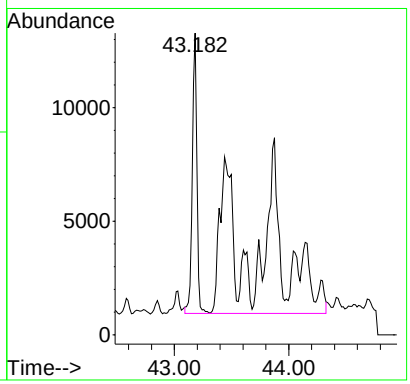
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

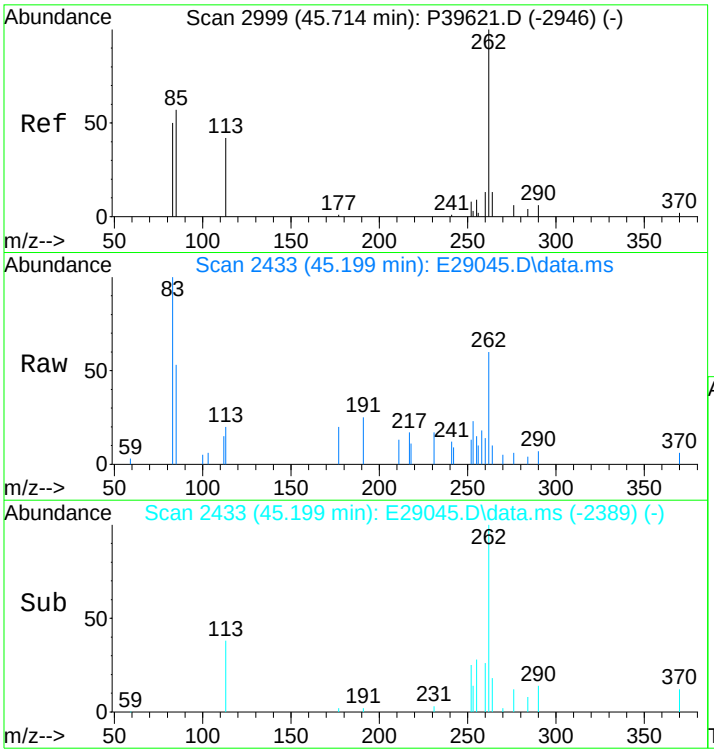




#70
C1-Naphthobenzothiophenes
Concen: 976.05 ng/ml m
RT: 43.182 min Scan# 2299
Delta R.T. 0.036 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

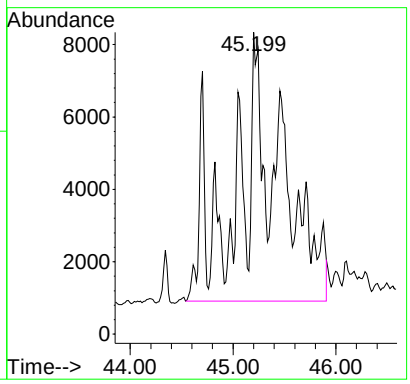
Tgt Ion:248 Resp: 183990

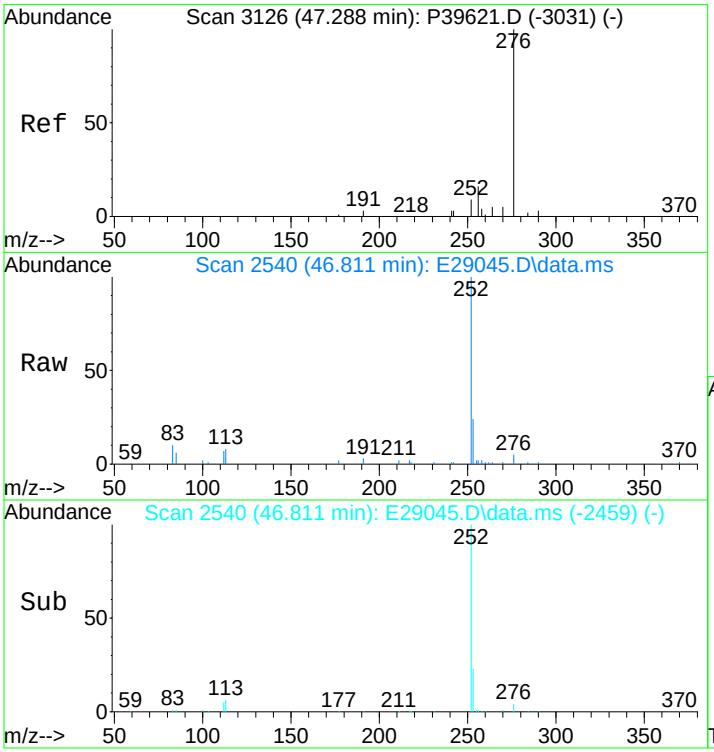




#71
C2-Naphthobenzothiophenes
Concen: 1139.63 ng/ml m
RT: 45.199 min Scan# 2433
Delta R.T. 0.529 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

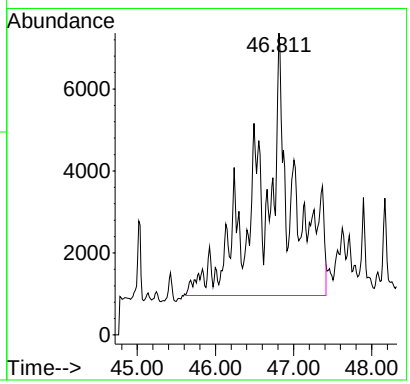
Tgt Ion:262 Resp: 214824

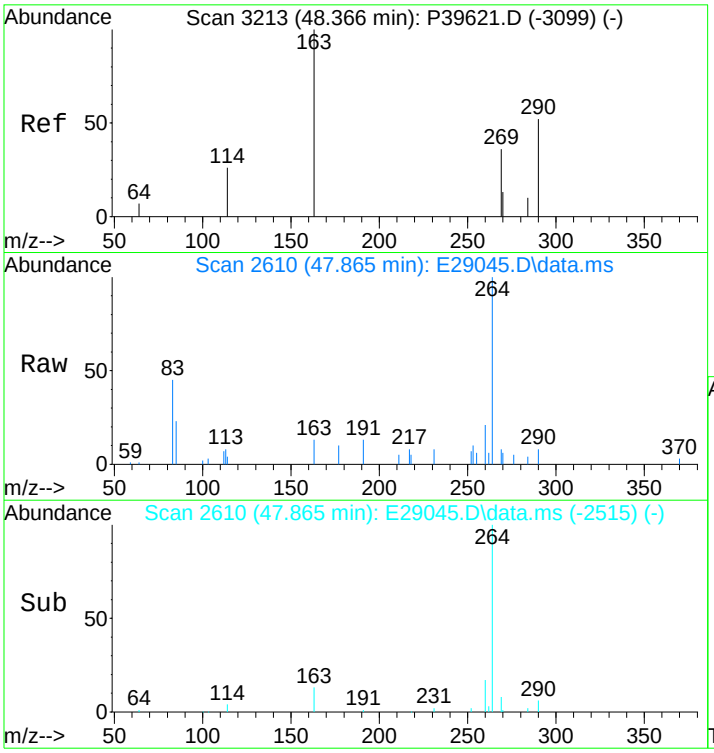




#72
C3-Naphthobenzothiophenes
Concen: 971.87 ng/ml m
RT: 46.811 min Scan# 2540
Delta R.T. 0.557 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

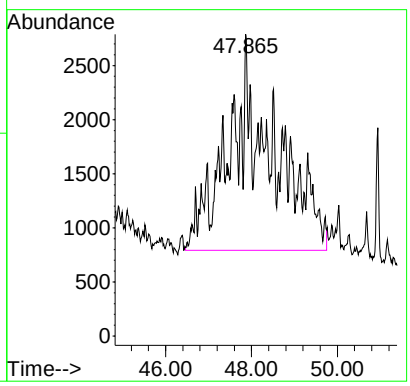
Tgt Ion:276 Resp: 183201

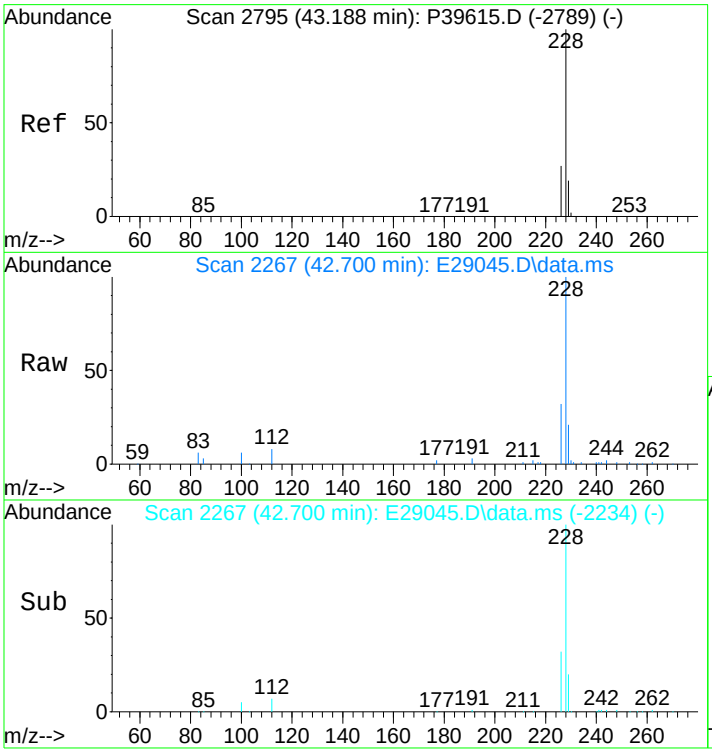




#73
C4-Naphthobenzothiophenes
Concen: 734.78 ng/mL m
RT: 47.865 min Scan# 2610
Delta R.T. 0.541 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:290 Resp: 138509

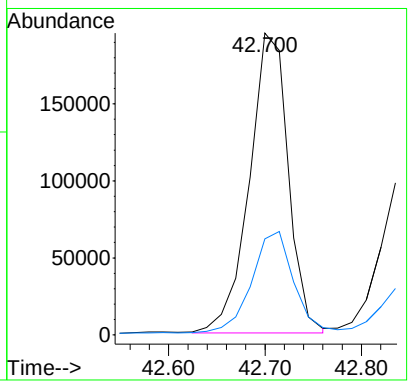


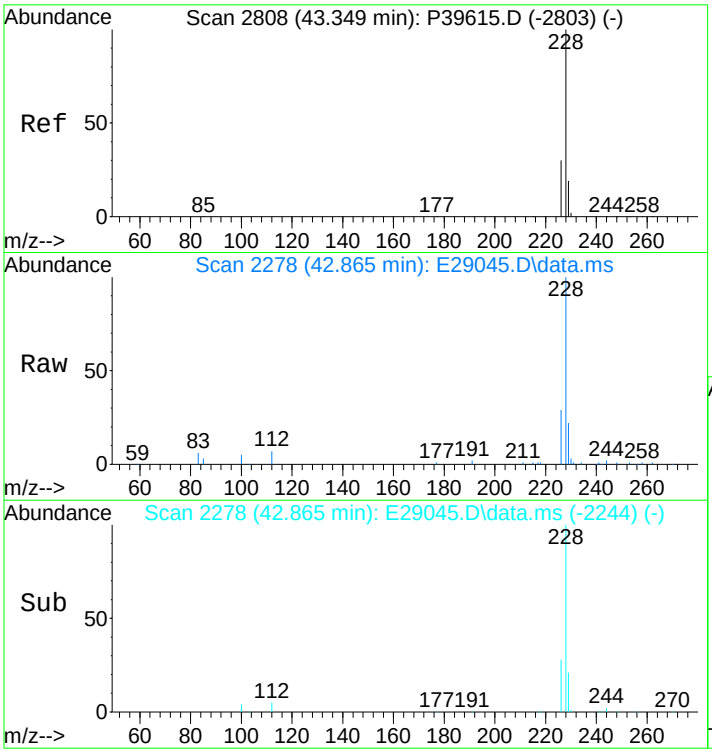


#75
Benz[a]anthracene
Concen: 2617.37 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:228 Resp: 547047

Ion	Ratio	Lower	Upper
228	100		
226	34.1	20.2	30.4#

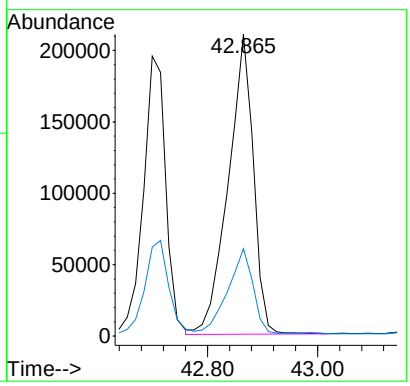


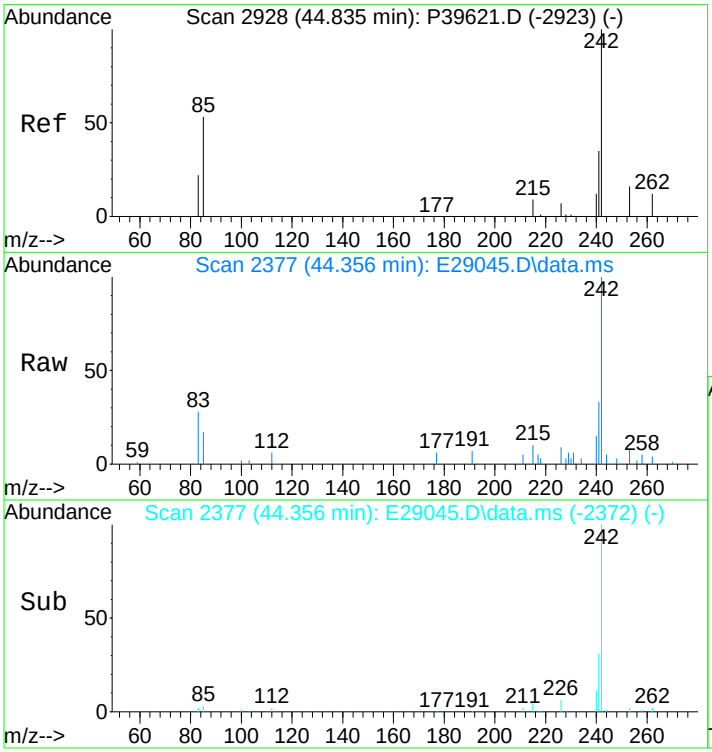


#77
Chrysene/Triphenylene
Concen: 3089.10 ng/mL
RT: 42.865 min Scan# 2278
Delta R.T. 0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:228 Resp: 664702

Ion	Ratio	Lower	Upper
228	100		
226	28.8	22.5	33.7

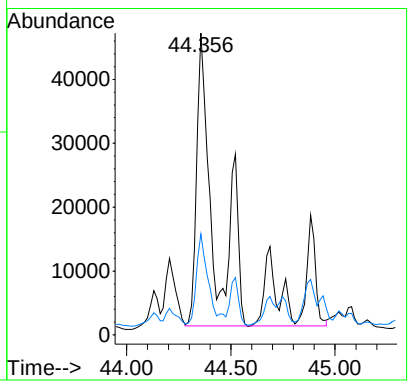


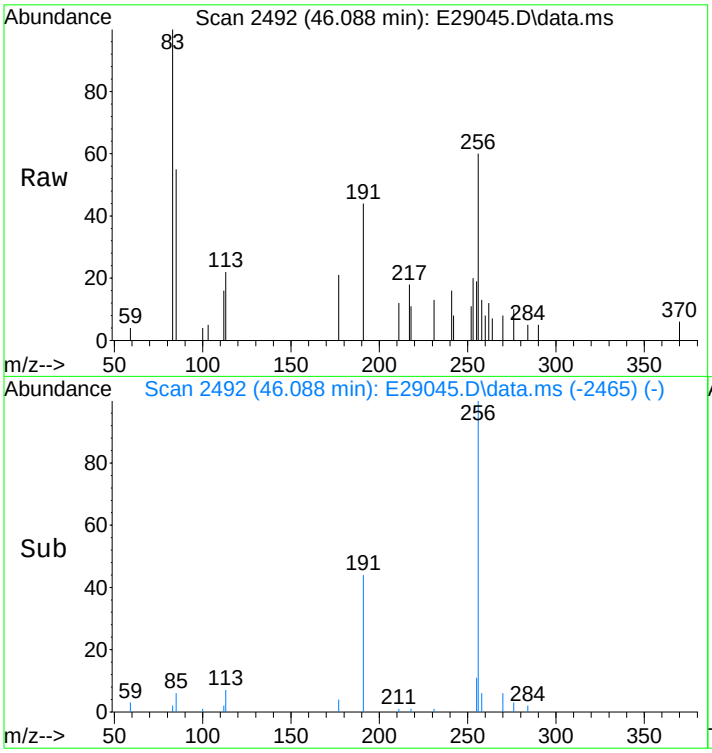


#78
C1-Chrysenes
Concen: 1690.04 ng/mL m
RT: 44.356 min Scan# 2377
Delta R.T. 0.025 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:242 Resp: 363656

Ion	Ratio	Lower	Upper
242	100		
241	4.6	32.2	48.4#

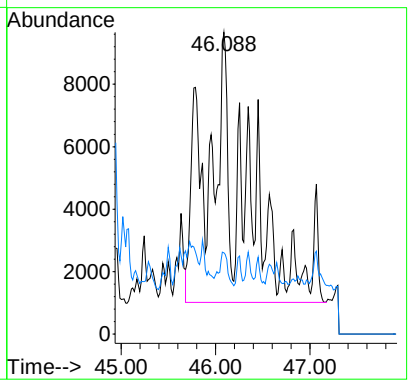


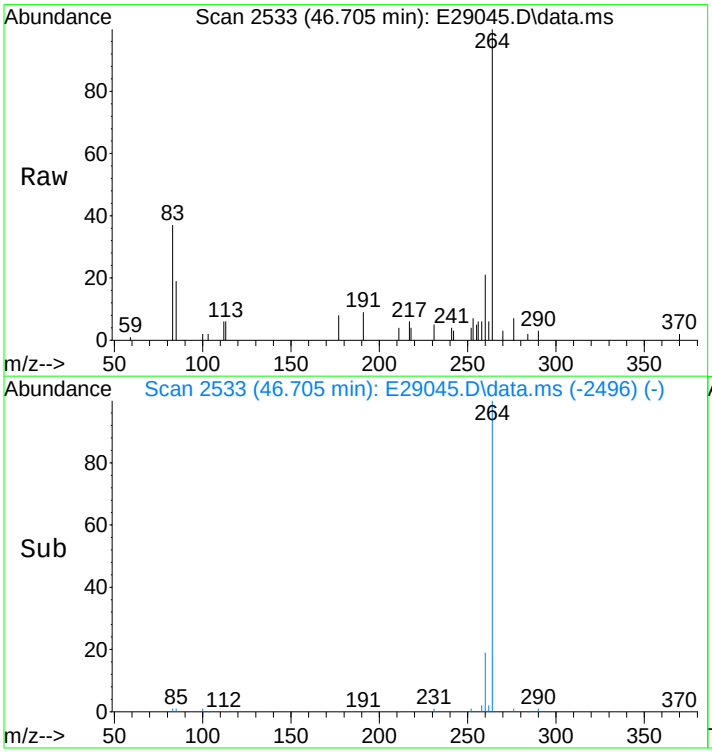


#79
C2-Chrysenes
Concen: 1129.16 ng/mL m
RT: 46.088 min Scan# 2492
Delta R.T. -0.304 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:256 Resp: 242969

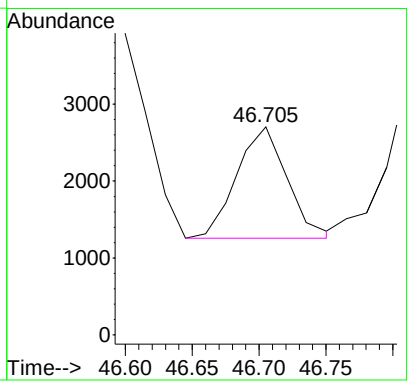
Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

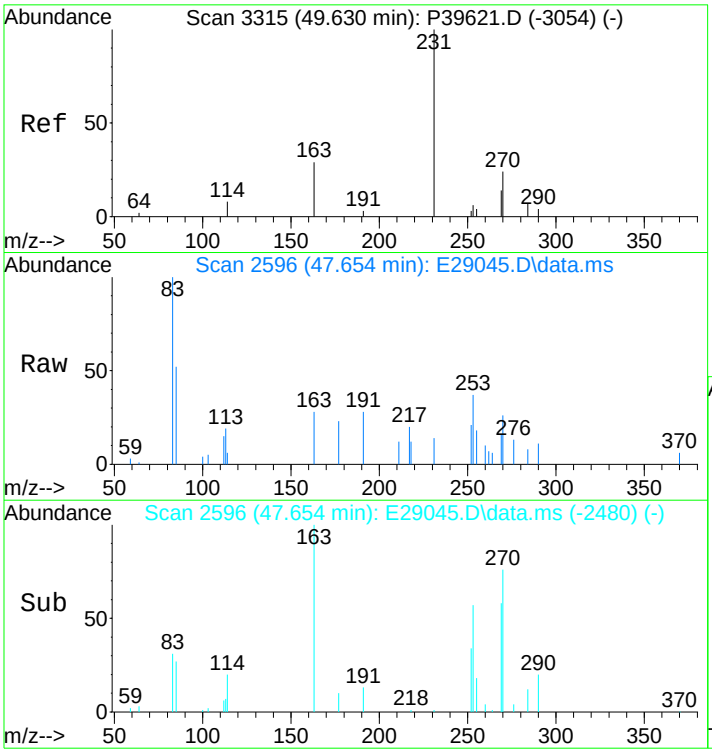




#80
BBF-D12 Surr BKGD
Concen: 17.72 ng/mL
RT: 46.705 min Scan# 2533
Delta R.T. 0.061 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:256 Resp: 3812

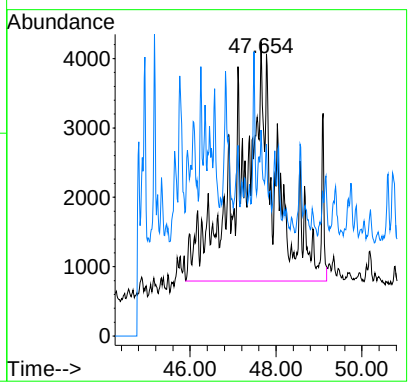


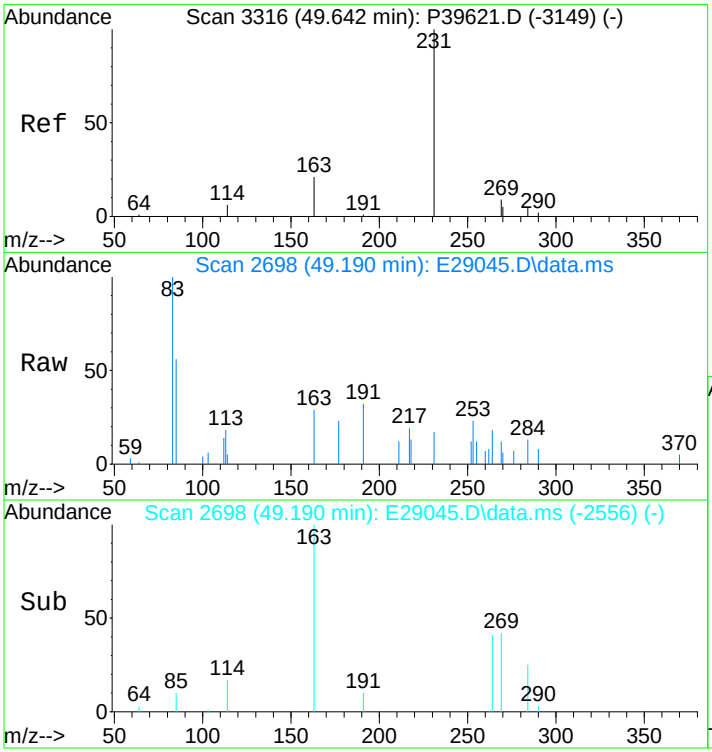


#81
C3-Chrysenes
Concen: 966.03 ng/mL m
RT: 47.654 min Scan# 2596
Delta R.T. -1.466 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:270 Resp: 207866

Ion	Ratio	Lower	Upper
270	100		
255	0.8	38.0	57.0#

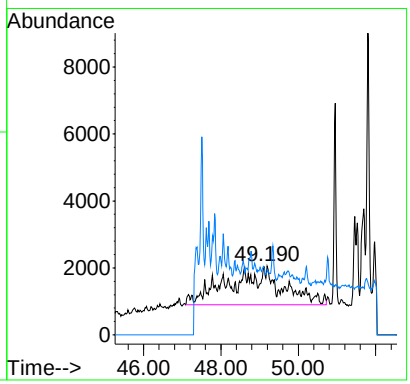


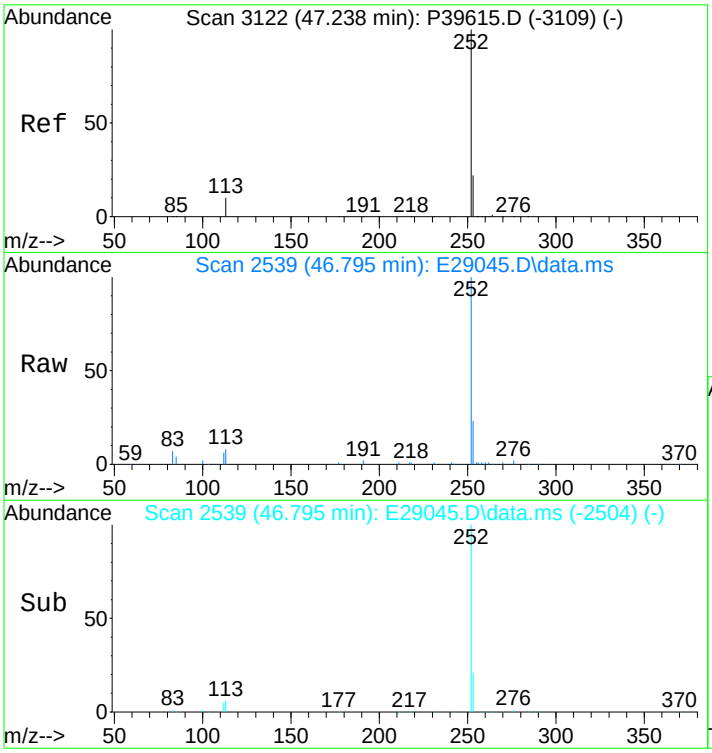


#82
C4-Chrysenes
Concen: 501.11 ng/mL m
RT: 49.190 min Scan# 2698
Delta R.T. -0.048 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:284 Resp: 107828

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

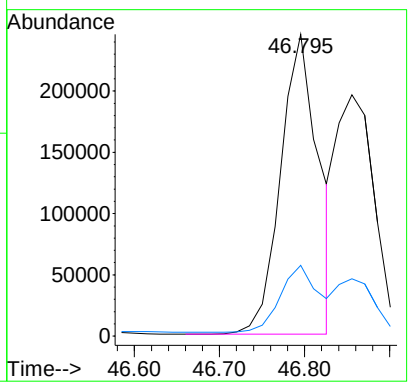


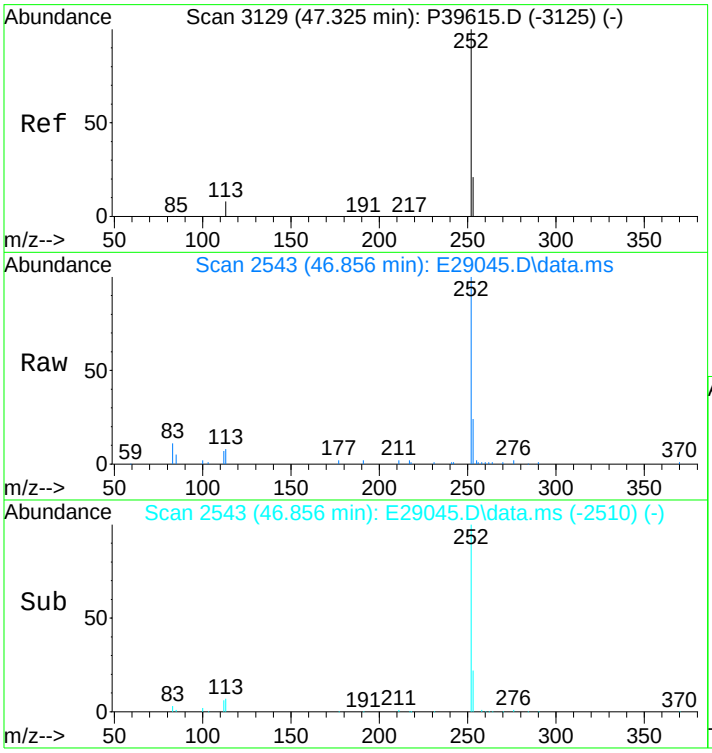


#84
Benzo[b]fluoranthene
Concen: 3131.20 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. 0.030 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:252 Resp: 760681

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.2	28.8

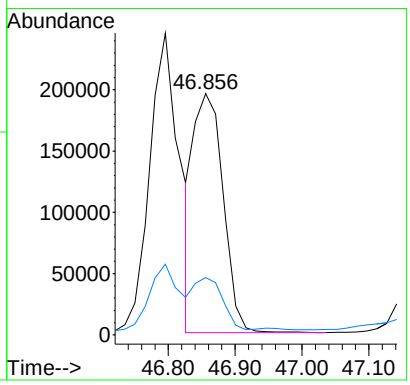


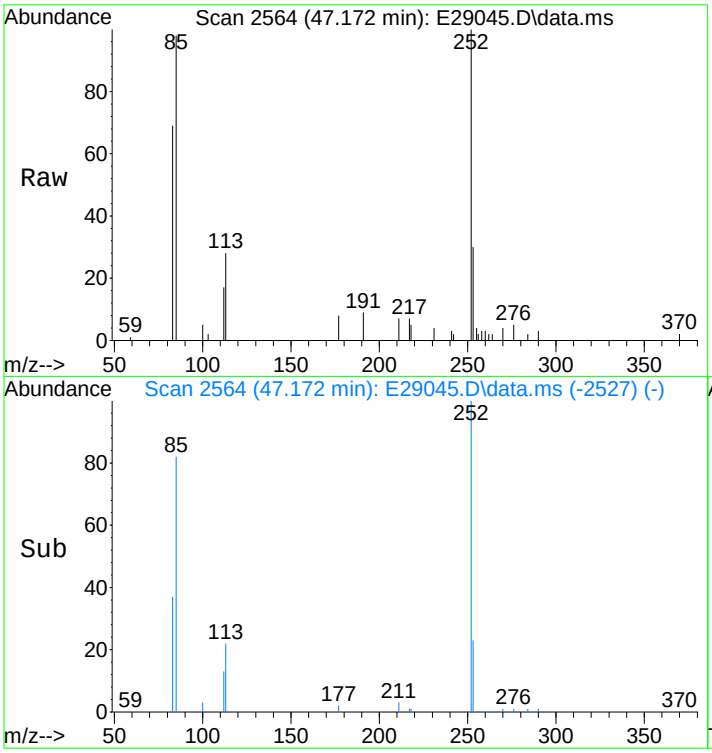


#85
Benzo[j]+[k]fluoranthene
Concen: 2403.20 ng/mL
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:252 Resp: 600653

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.3	28.9

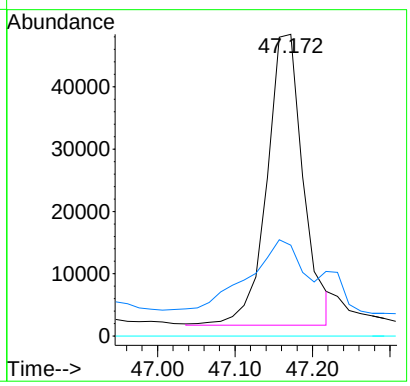


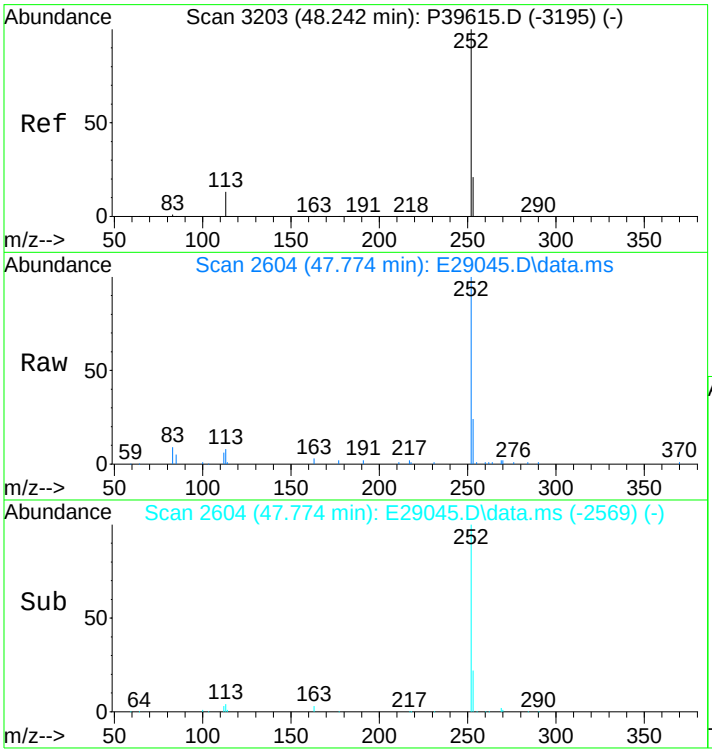


#86
Benzo[a]fluoranthene
Concen: 608.65 ng/mL m
RT: 47.172 min Scan# 2564
Delta R.T. 0.050 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:252 Resp: 152126

Ion	Ratio	Lower	Upper
252	100		
253	51.8	456.0	684.0#
125	0.0	0.0	0.0

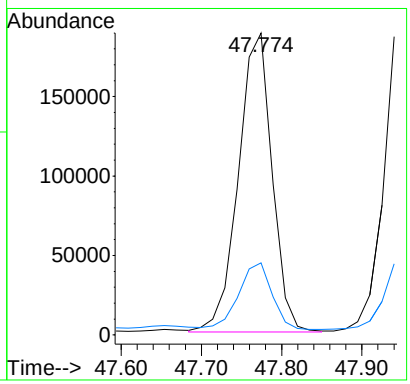


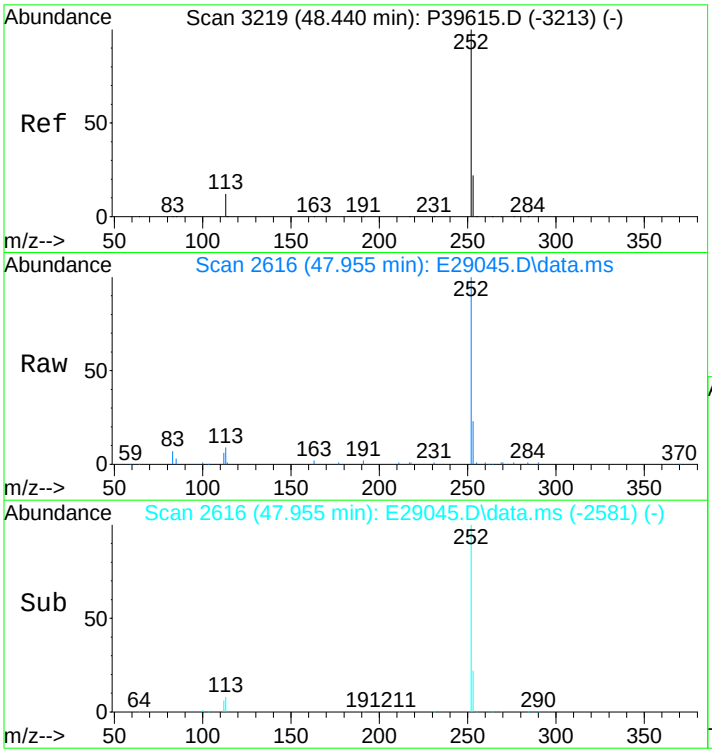


#87
Benzo[e]pyrene
Concen: 2319.20 ng/mL m
RT: 47.774 min Scan# 2604
Delta R.T. 0.030 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:252 Resp: 550134

Ion	Ratio	Lower	Upper
252	100		
253	22.2	19.4	29.0

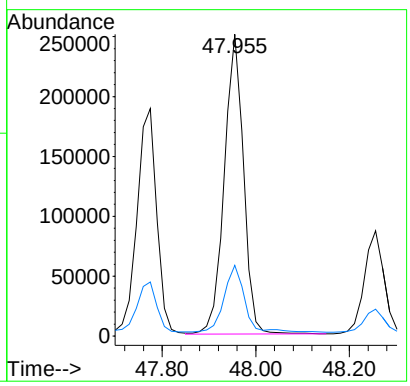


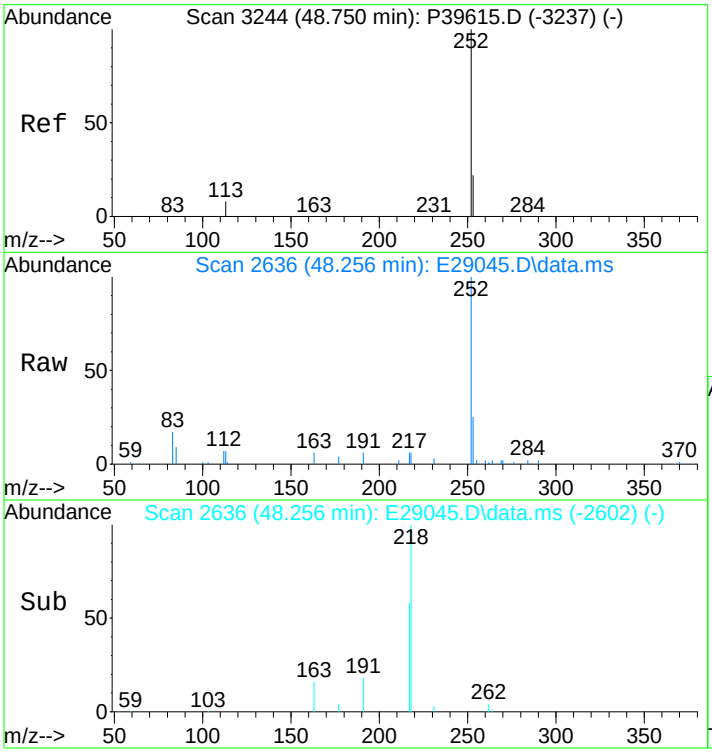


#89
Benzo[a]pyrene
Concen: 3151.06 ng/mL
RT: 47.955 min Scan# 2616
Delta R.T. 0.030 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:252 Resp: 715220

Ion	Ratio	Lower	Upper
252	100		
253	23.6	19.6	29.4

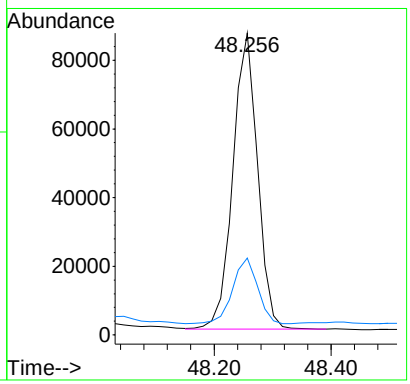


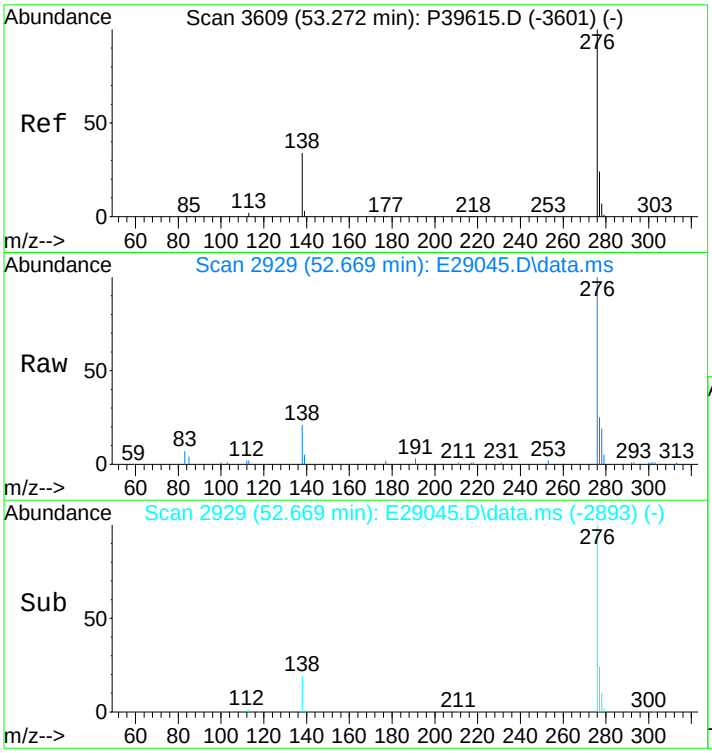


#90
Perylene
Concen: 1047.94 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. 0.015 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:252 Resp: 251521

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.9	29.9

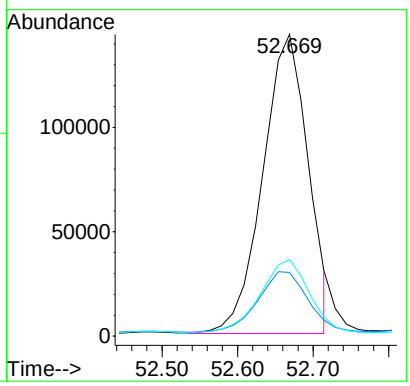


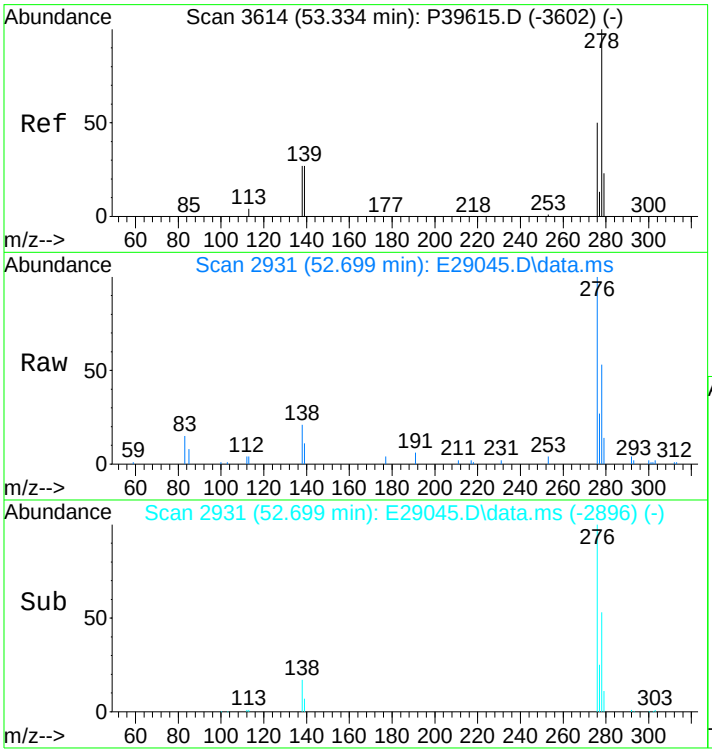


#91
Indeno[1,2,3-cd]pyrene
Concen: 2242.04 ng/mL m
RT: 52.669 min Scan# 2929
Delta R.T. 0.045 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:276 Resp: 598903

Ion	Ratio	Lower	Upper
276	100		
138	22.4	17.8	26.8
277	27.1	20.0	30.0

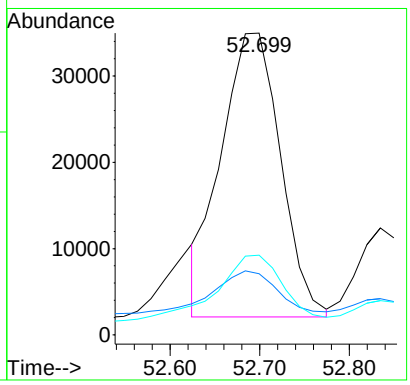


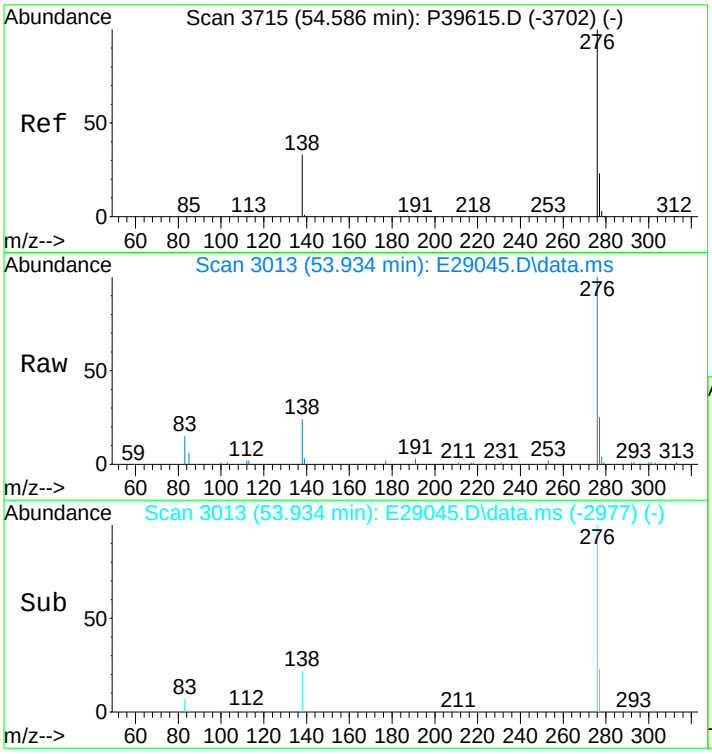


#92
Dibenz[ah]+[ac]anthracene
Concen: 535.56 ng/mL m
RT: 52.699 min Scan# 2931
Delta R.T. 0.030 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:278 Resp: 152330

Ion	Ratio	Lower	Upper
278	100		
139	16.6	13.0	19.4
279	26.7	19.4	29.2

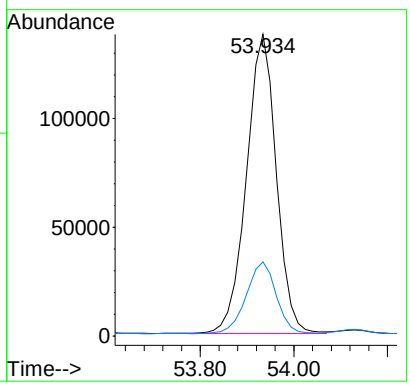


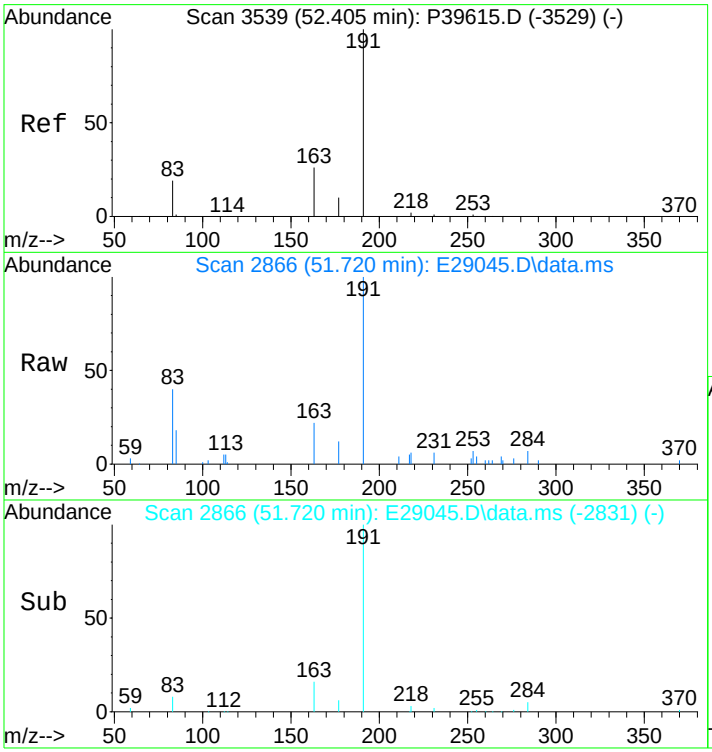


#93
Benzo[g,h,i]perylene
Concen: 2119.67 ng/mL
RT: 53.934 min Scan# 3013
Delta R.T. 0.045 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:276 Resp: 610518

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.4	29.2

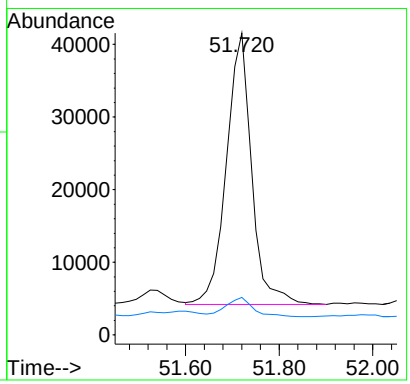


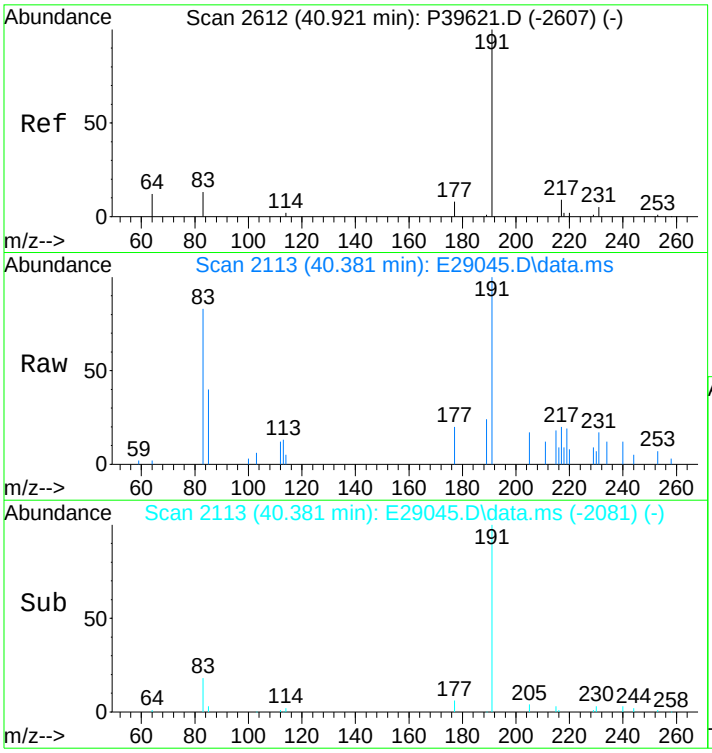


#94
Hopane (T19)
Concen: 1740.16 ng/mL
RT: 51.720 min Scan# 2866
Delta R.T. 0.030 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:191 Resp: 140171

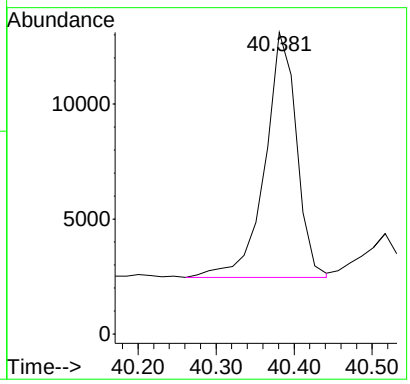
Ion	Ratio	Lower	Upper
191	100		
177	7.5	11.3	16.9#

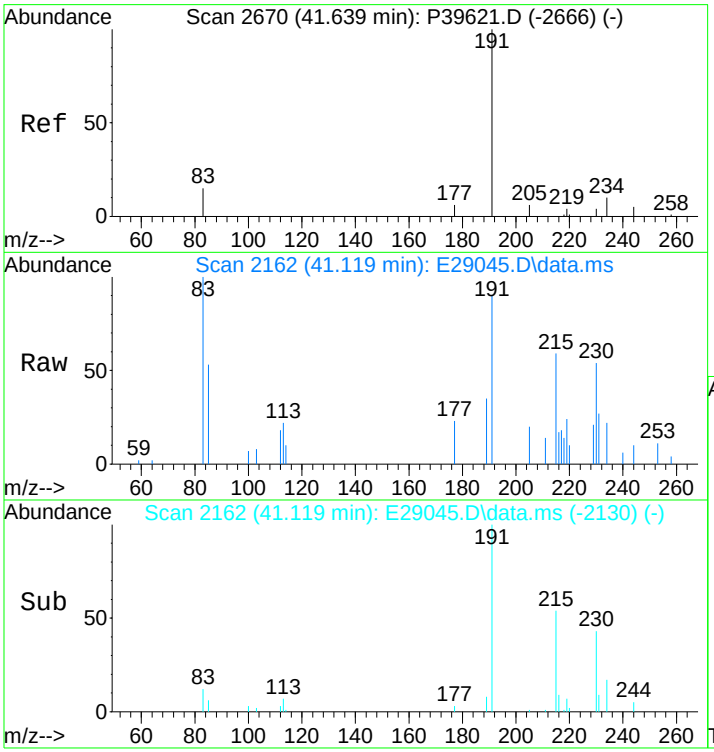




#96
C23 Tricyclic Terpane (T4)
Concen: 373.85 ng/ml
RT: 40.381 min Scan# 2113
Delta R.T. -0.013 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

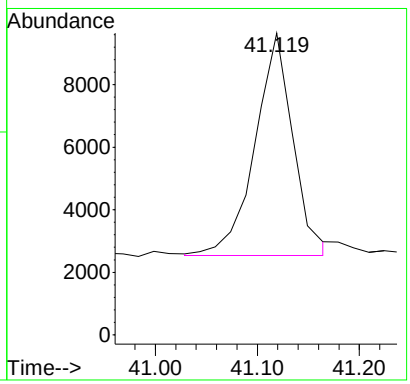
Tgt Ion:191 Resp: 30114

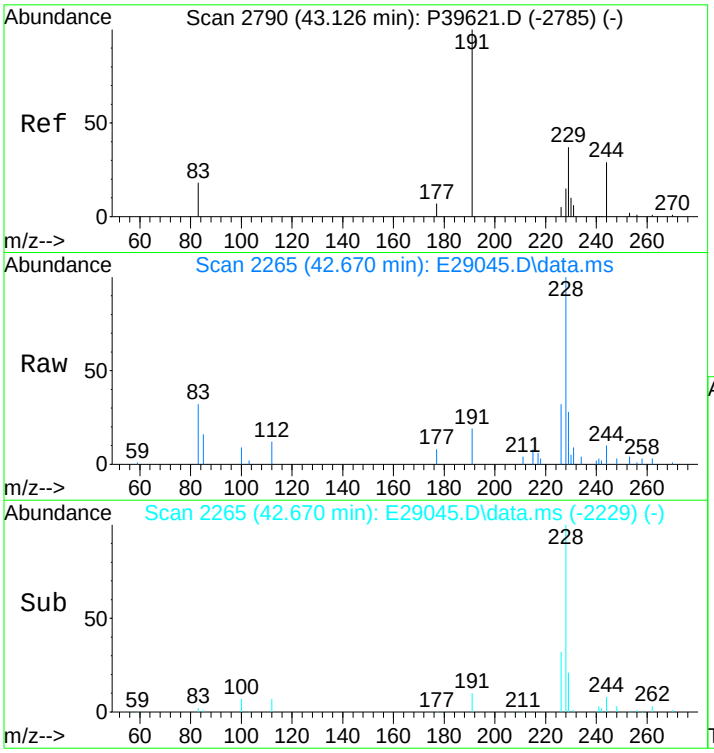




#97
C24 Tricyclic Terpane (T5)
Concen: 227.97 ng/ml m
RT: 41.119 min Scan# 2162
Delta R.T. -0.013 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

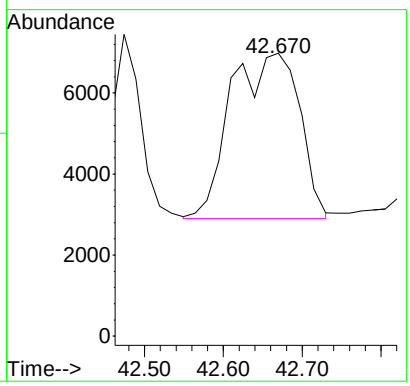
Tgt Ion:191 Resp: 18363

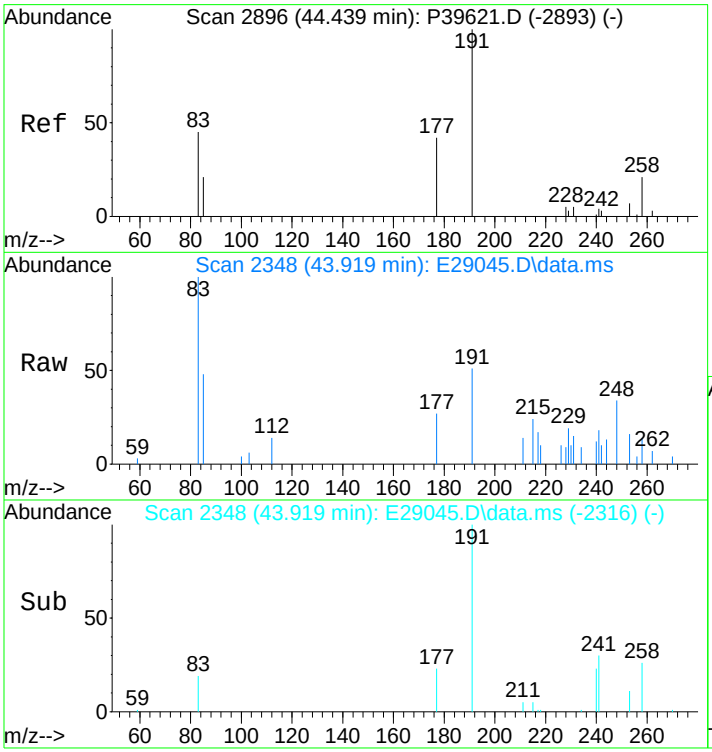




#98
C25 Tricyclic Terpane (T6)
Concen: 308.34 ng/ml m
RT: 42.670 min Scan# 2265
Delta R.T. 0.045 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

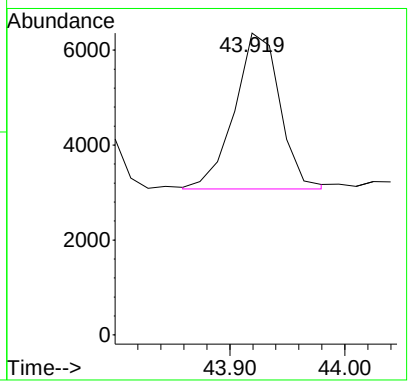
Tgt Ion:191 Resp: 24837

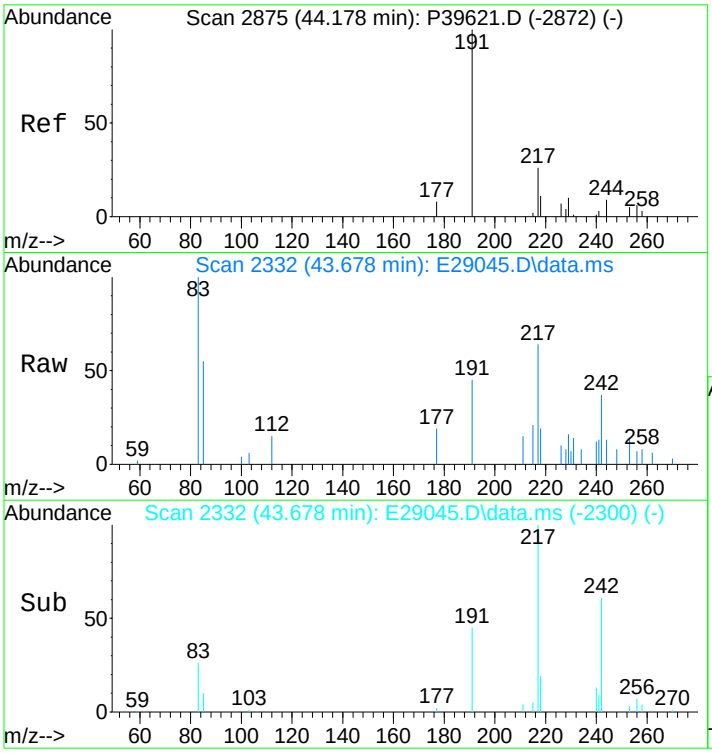




#99
C24 Tetracyclic Terpane (T6a)
Concen: 111.77 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

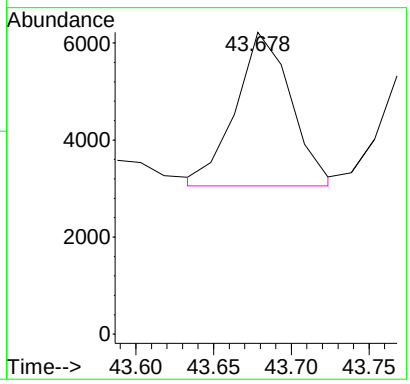
Tgt Ion:191 Resp: 9003

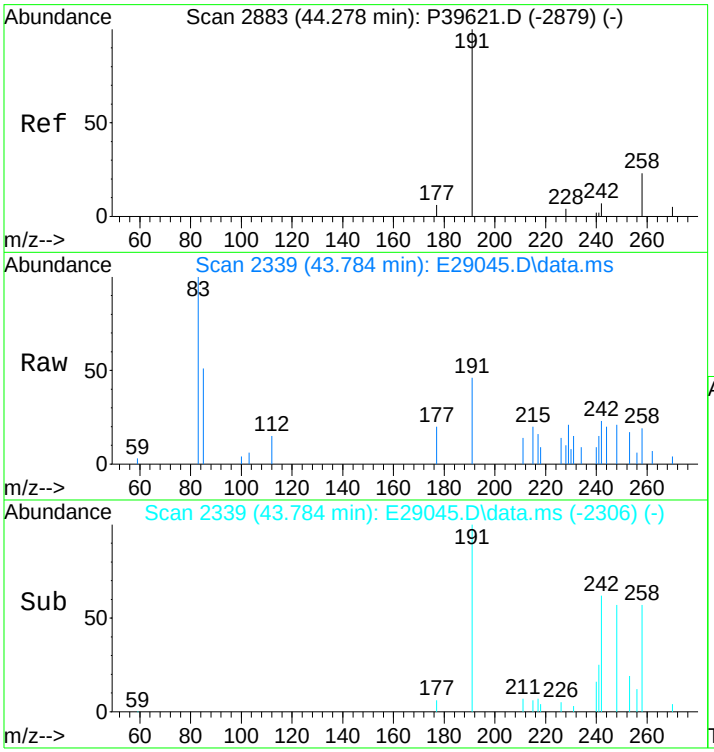




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 97.13 ng/ml m
RT: 43.678 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

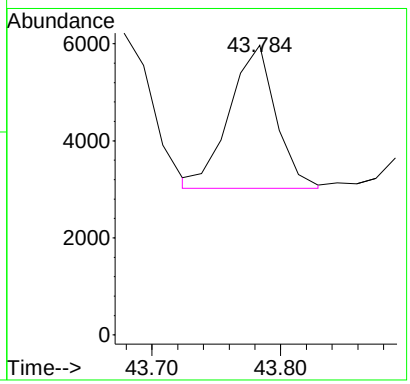
Tgt Ion:191 Resp: 7824

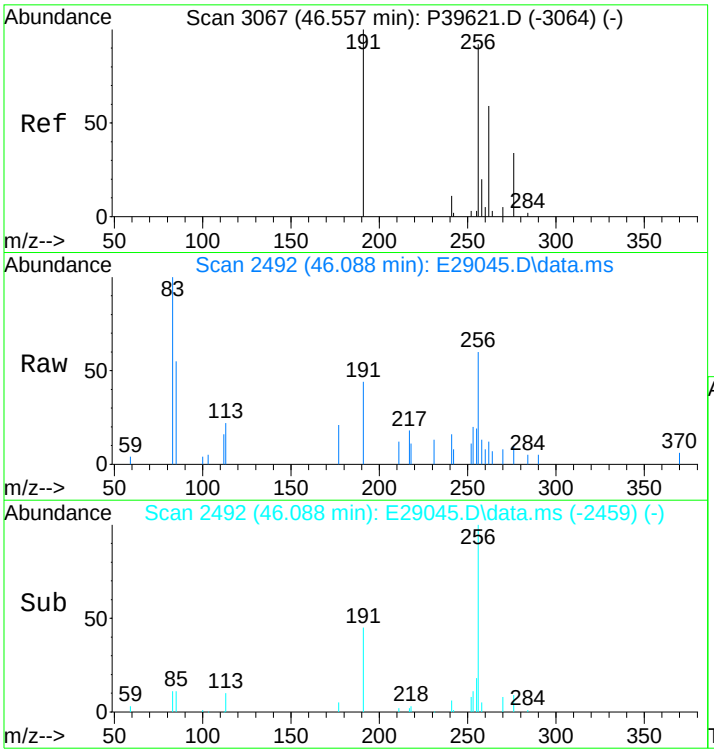




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 91.47 ng/ml m
RT: 43.784 min Scan# 2339
Delta R.T. -0.001 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

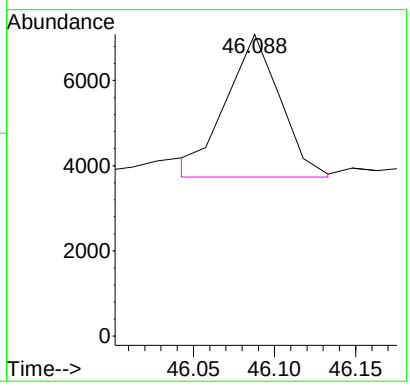
Tgt Ion:191 Resp: 7368

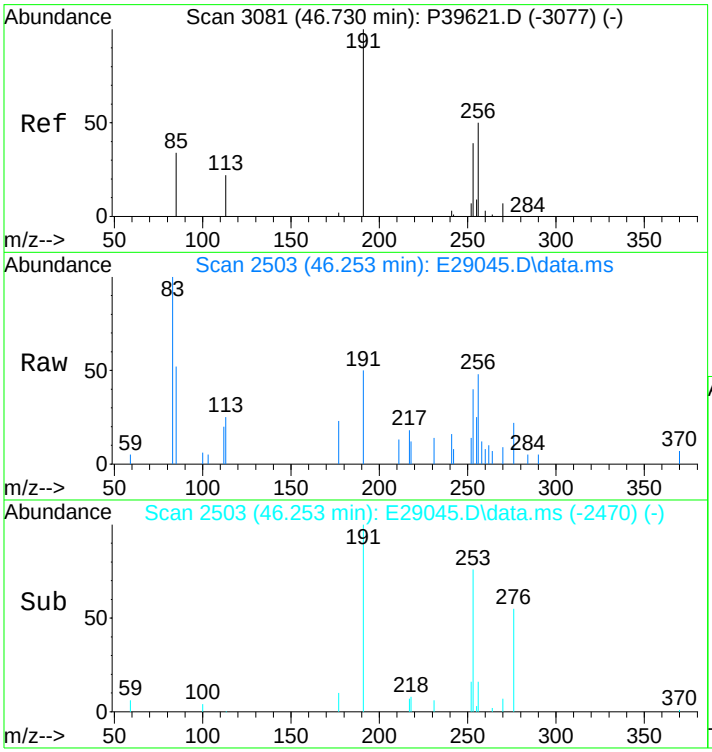




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 95.05 ng/ml m
RT: 46.088 min Scan# 2492
Delta R.T. -0.003 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

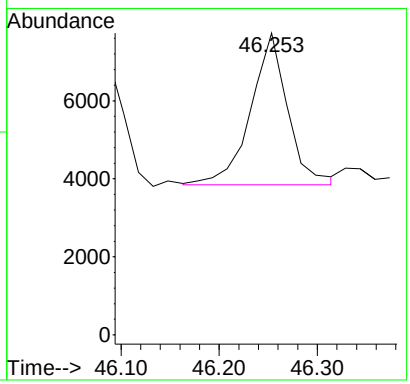
Tgt Ion:191 Resp: 7656

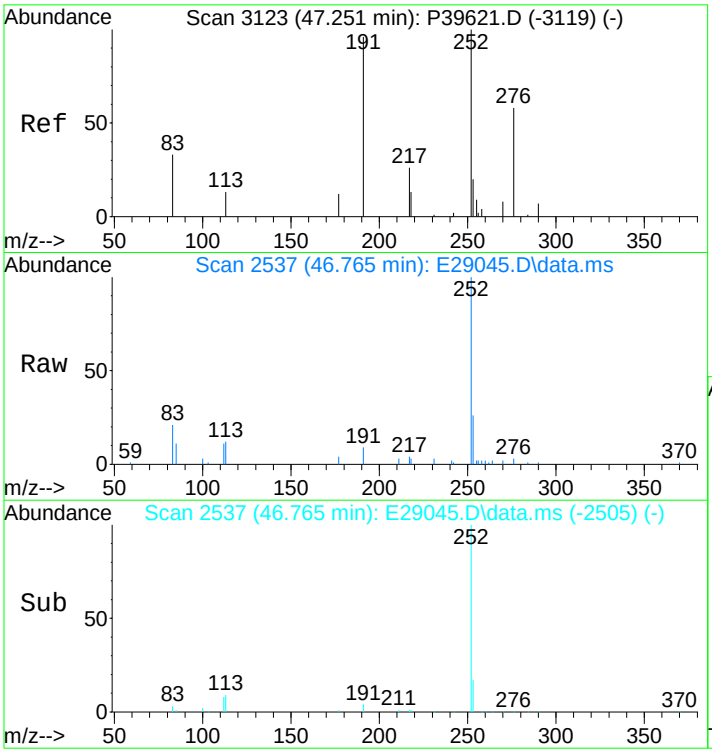




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 126.60 ng/ml m
RT: 46.253 min Scan# 2503
Delta R.T. -0.004 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

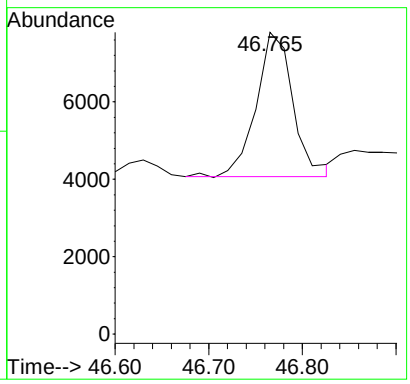
Tgt Ion:191 Resp: 10198

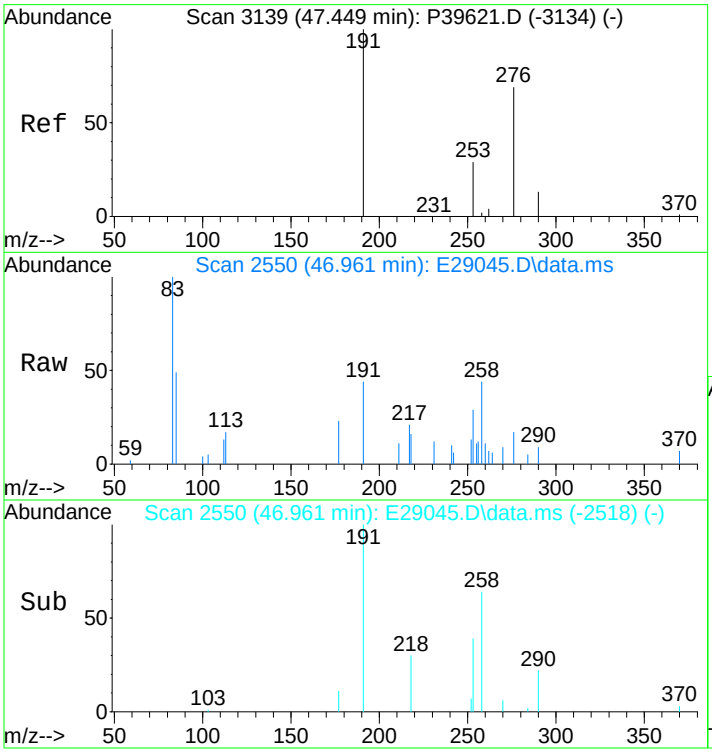




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 127.41 ng/ml
RT: 46.765 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

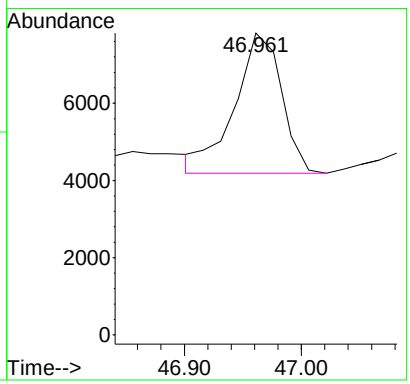
Tgt Ion:191 Resp: 10263

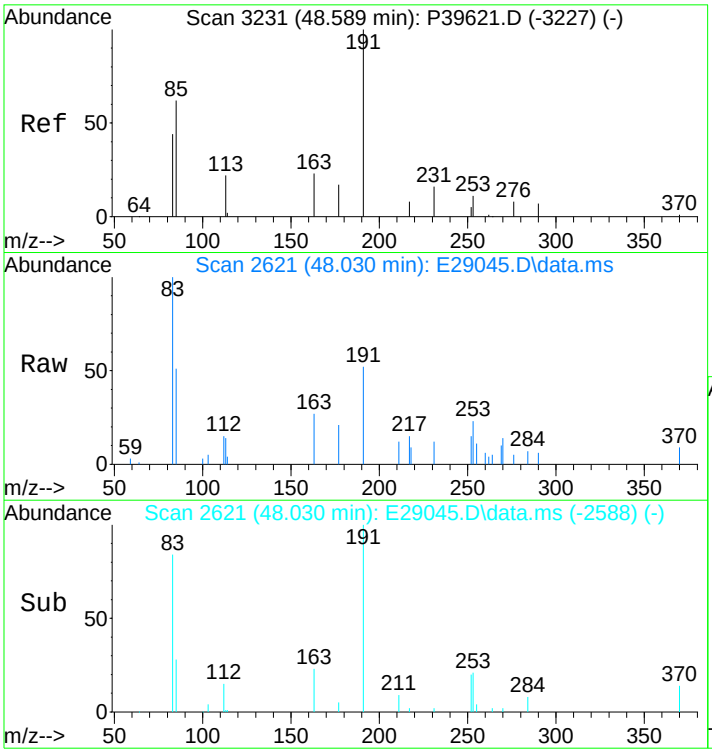




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 125.39 ng/ml
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

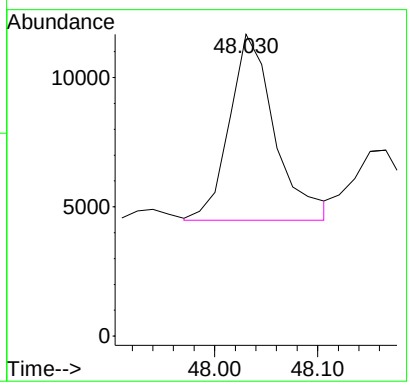
Tgt Ion:191 Resp: 10100

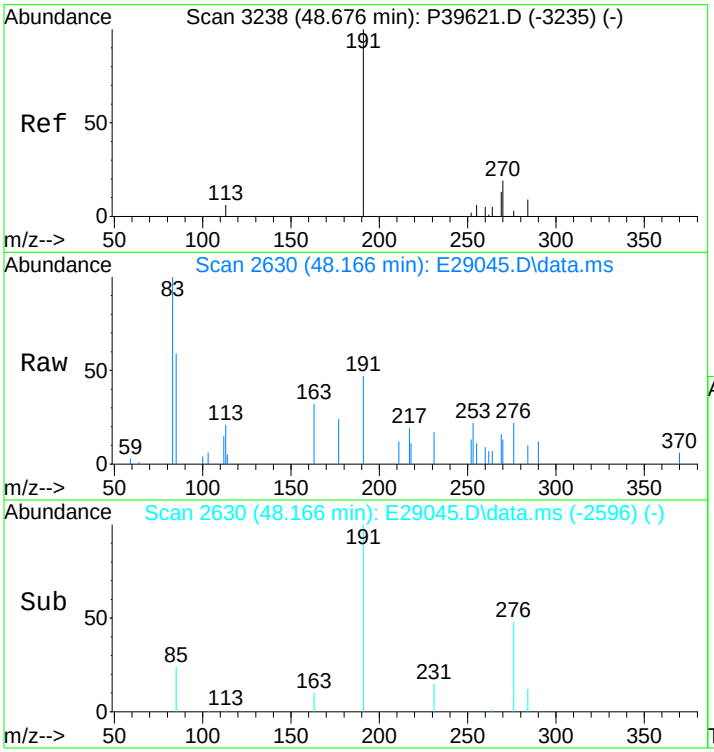




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 274.03 ng/ml m
RT: 48.030 min Scan# 2621
Delta R.T. -0.006 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

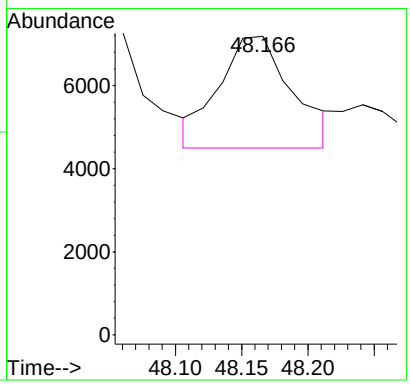
Tgt Ion:191 Resp: 22073

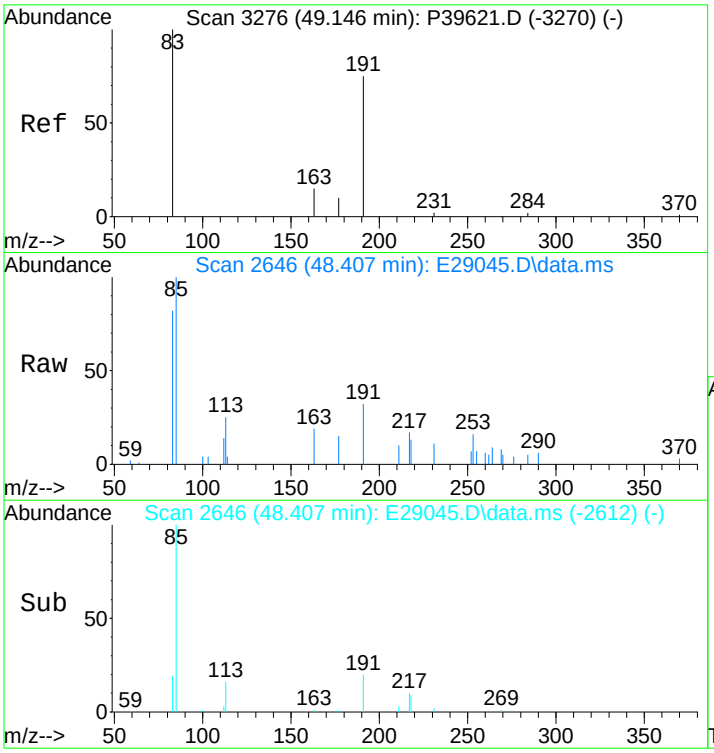




#107
C30 Tricyclic Terpane-22S
Concen: 128.71 ng/mL m
RT: 48.166 min Scan# 2630
Delta R.T. 0.009 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

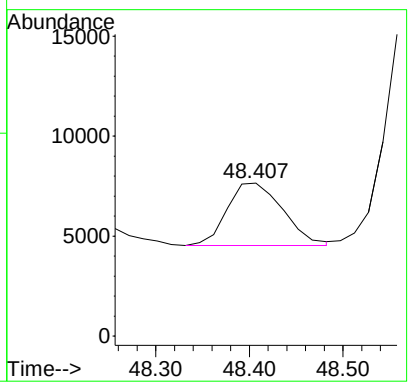
Tgt Ion:191 Resp: 10368

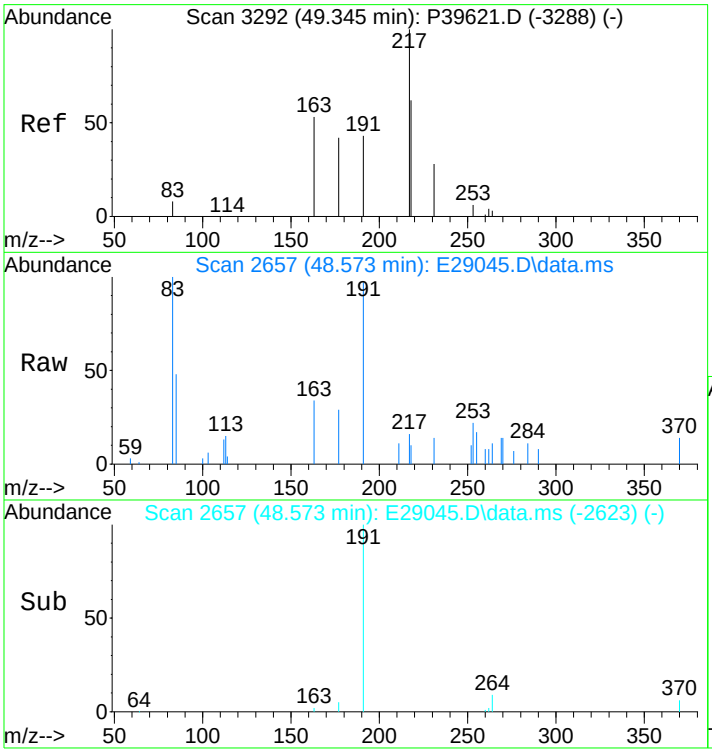




#108
C30 Tricyclic Terpane-22R
Concen: 160.64 ng/mL
RT: 48.407 min Scan# 2646
Delta R.T. 0.009 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

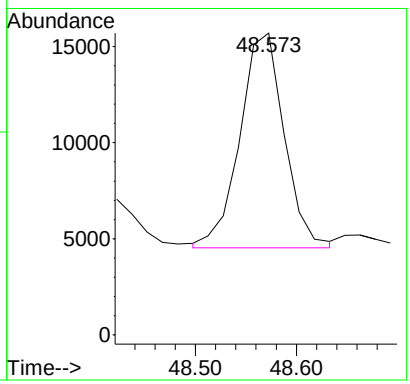
Tgt Ion:191 Resp: 12940

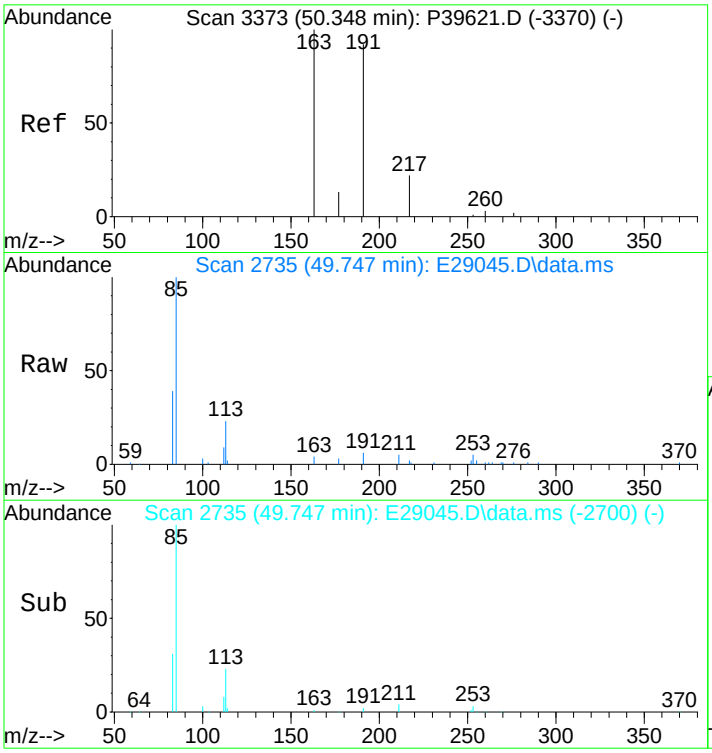




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 424.08 ng/ml m
RT: 48.573 min Scan# 2657
Delta R.T. 0.009 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

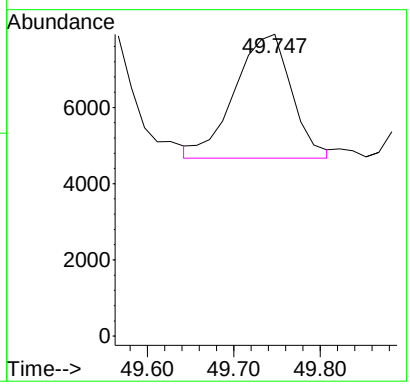
Tgt Ion:191 Resp: 34160

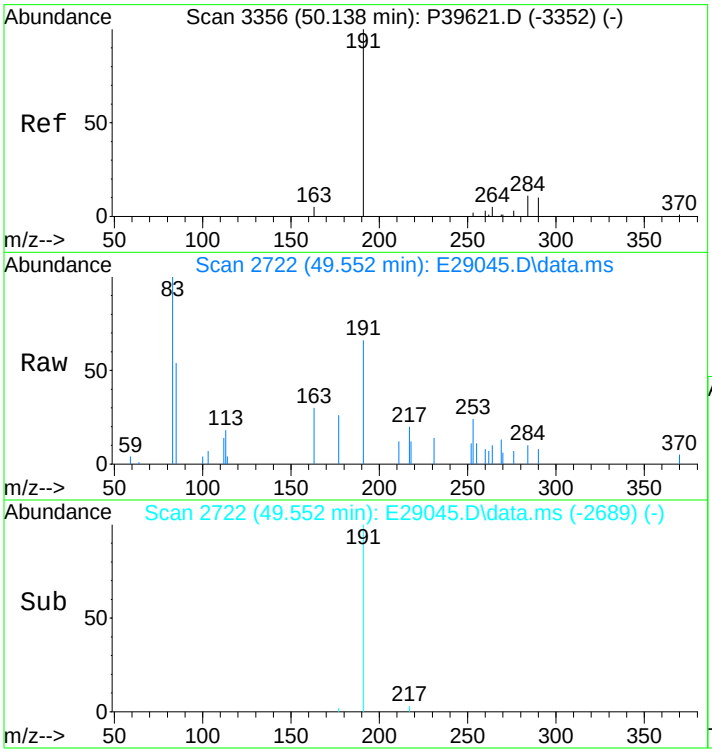




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 183.91 ng/ml m
RT: 49.747 min Scan# 2735
Delta R.T. 0.023 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

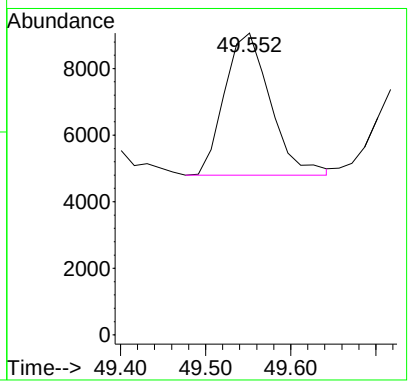
Tgt Ion:191 Resp: 14814

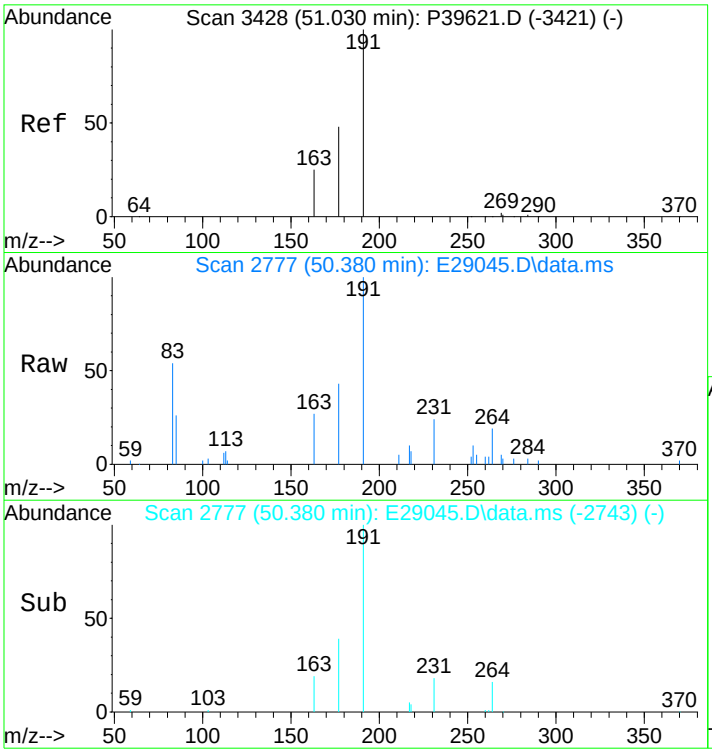




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 198.77 ng/ml
RT: 49.552 min Scan# 2722
Delta R.T. -0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

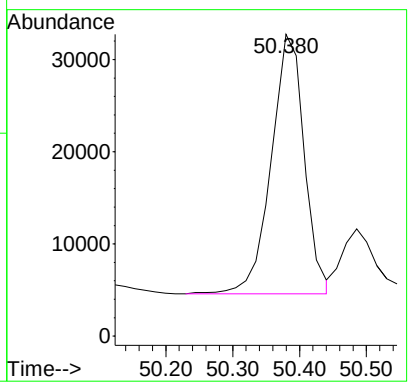
Tgt Ion:191 Resp: 16011

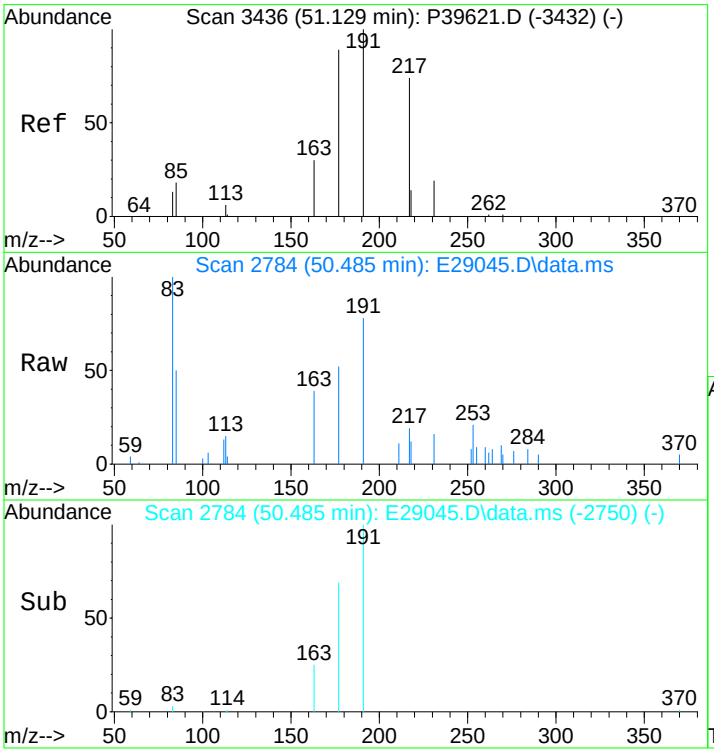




#112
30-Norhopane (T15)
Concen: 1203.37 ng/ml
RT: 50.380 min Scan# 2777
Delta R.T. 0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

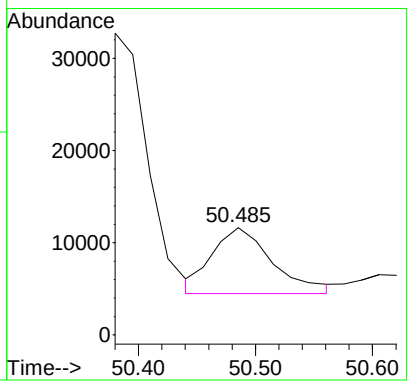
Tgt Ion:191 Resp: 96932

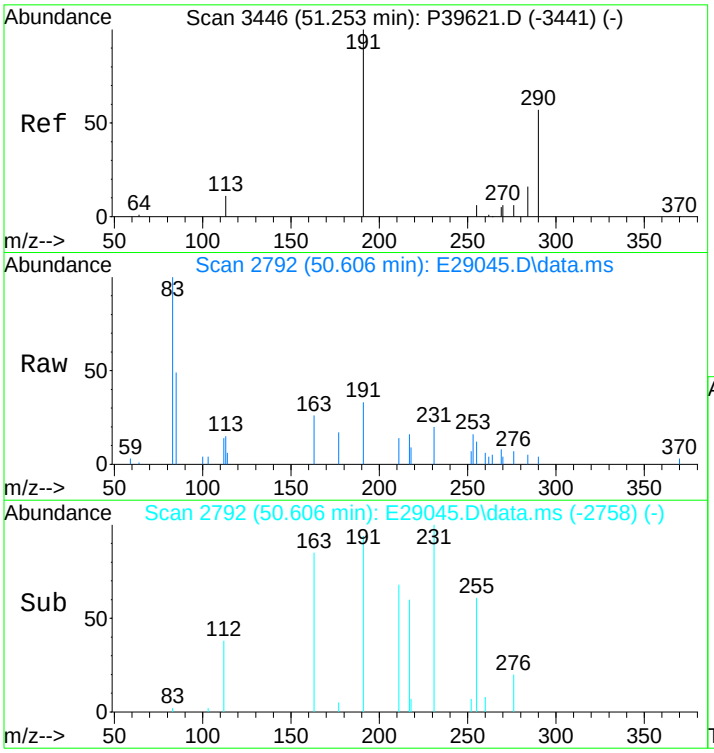




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 318.67 ng/ml
RT: 50.485 min Scan# 2784
Delta R.T. 0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

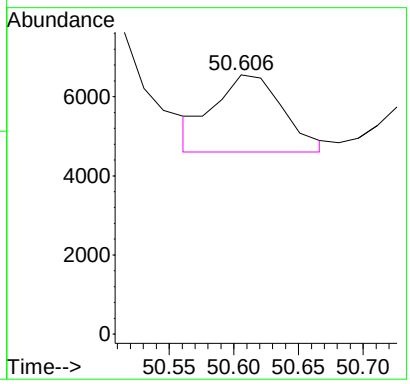
Tgt Ion:191 Resp: 25669

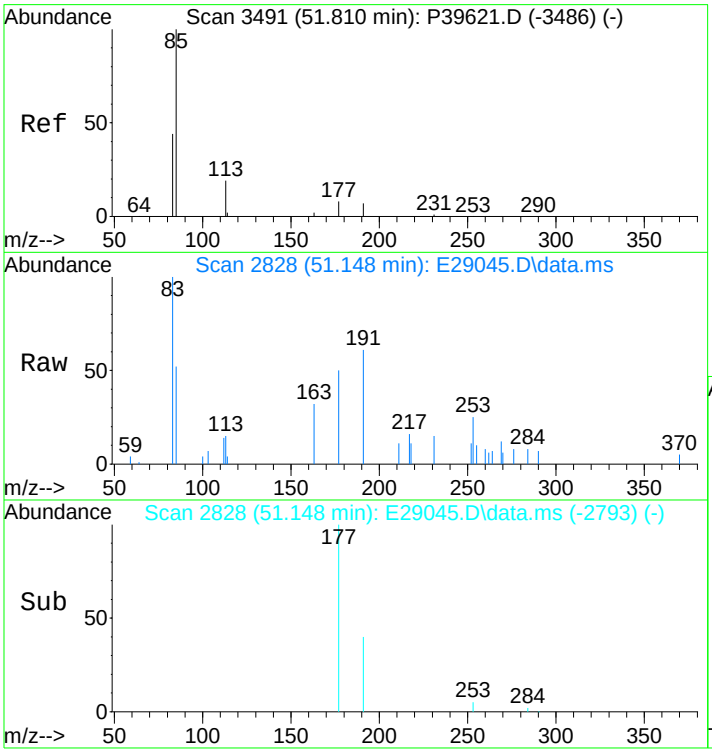




#114
17a(H)-Diahopane (X)
Concen: 89.88 ng/ml m
RT: 50.606 min Scan# 2792
Delta R.T. 0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

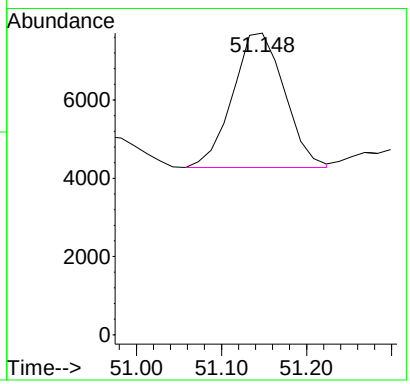
Tgt Ion:191 Resp: 7240

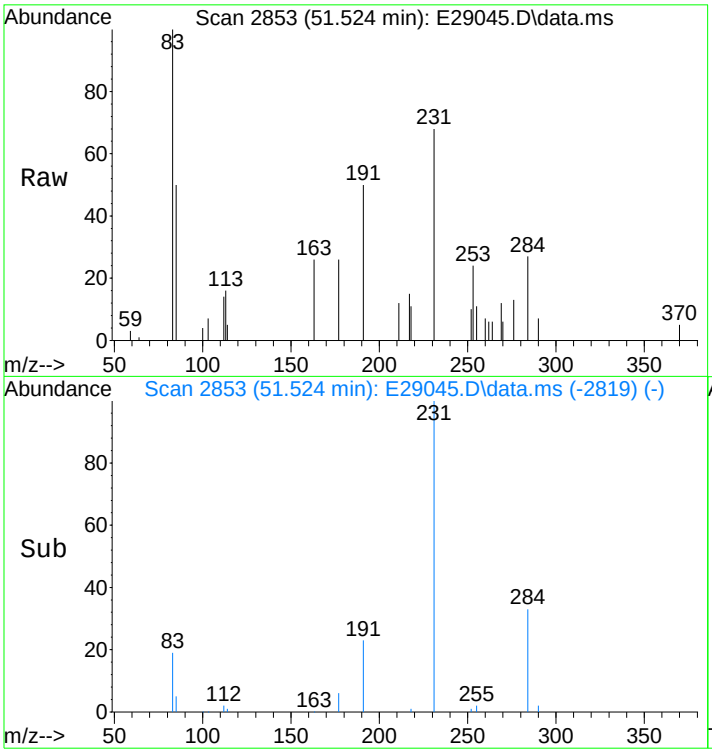




#115
30-Normoretane (T17)
Concen: 180.47 ng/ml
RT: 51.148 min Scan# 2828
Delta R.T. 0.021 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

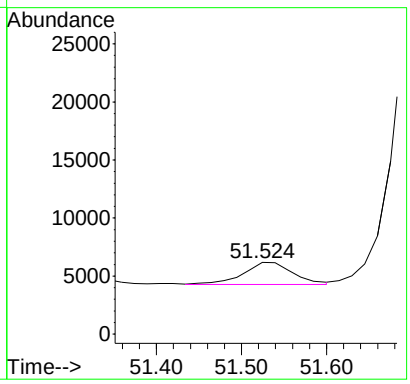
Tgt Ion:191 Resp: 14537

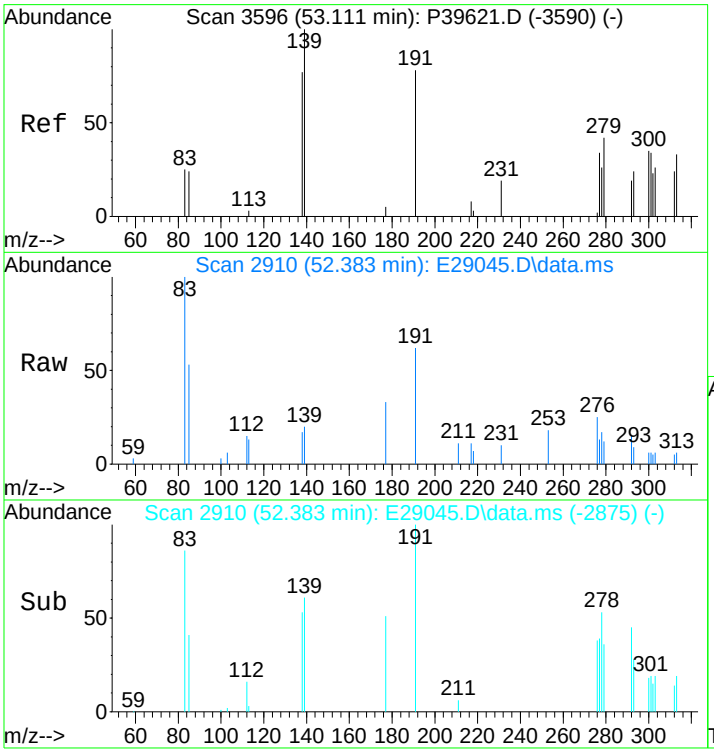




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 95.27 ng/ml
RT: 51.524 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

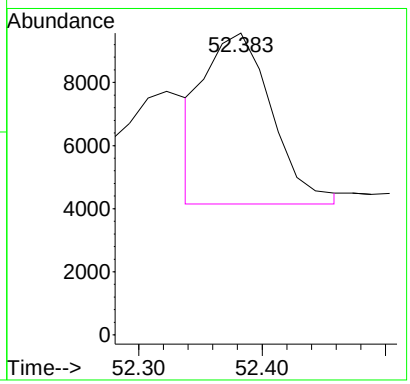
Tgt Ion:191 Resp: 7674

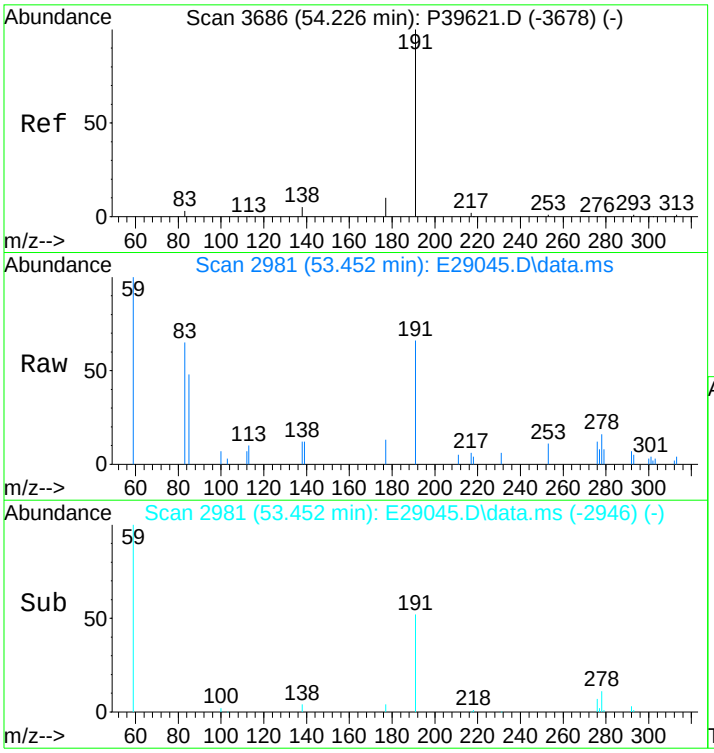




#117
Moretane (T20)
Concen: 253.63 ng/ml m
RT: 52.383 min Scan# 2910
Delta R.T. 0.020 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

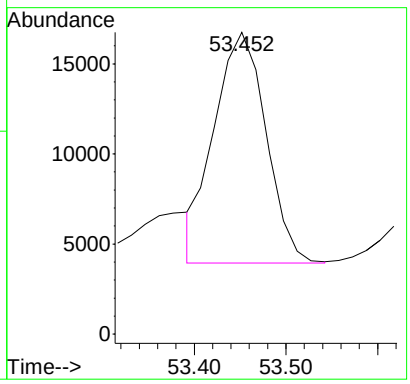
Tgt Ion:191 Resp: 20430

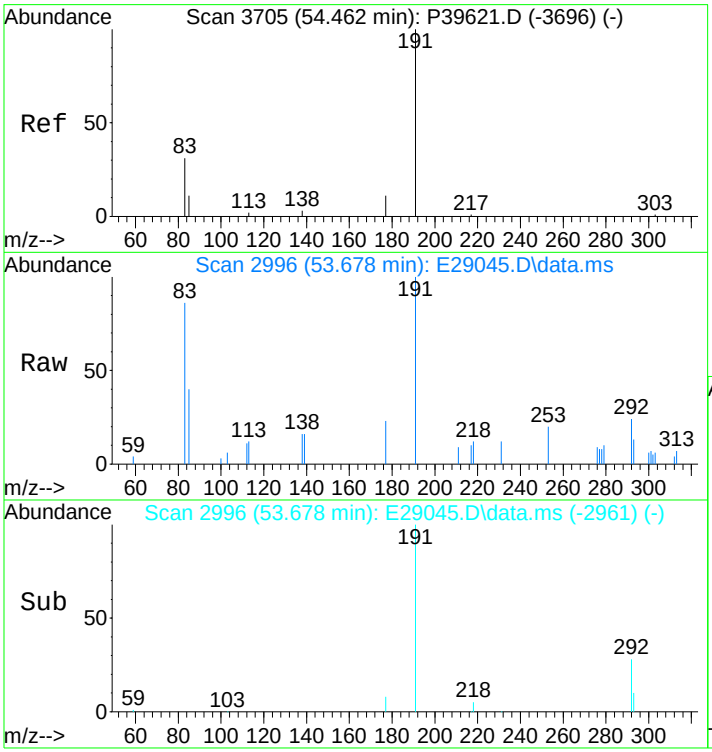




#118
30-Homohopane-22S (T21)
Concen: 625.92 ng/ml m
RT: 53.452 min Scan# 2981
Delta R.T. 0.034 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

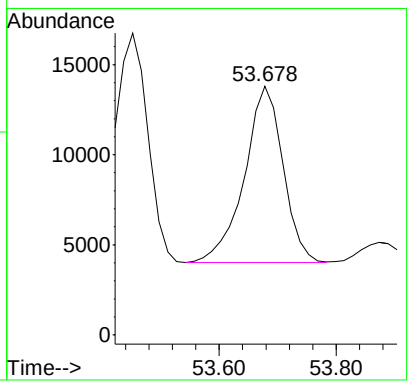
Tgt Ion:191 Resp: 50418

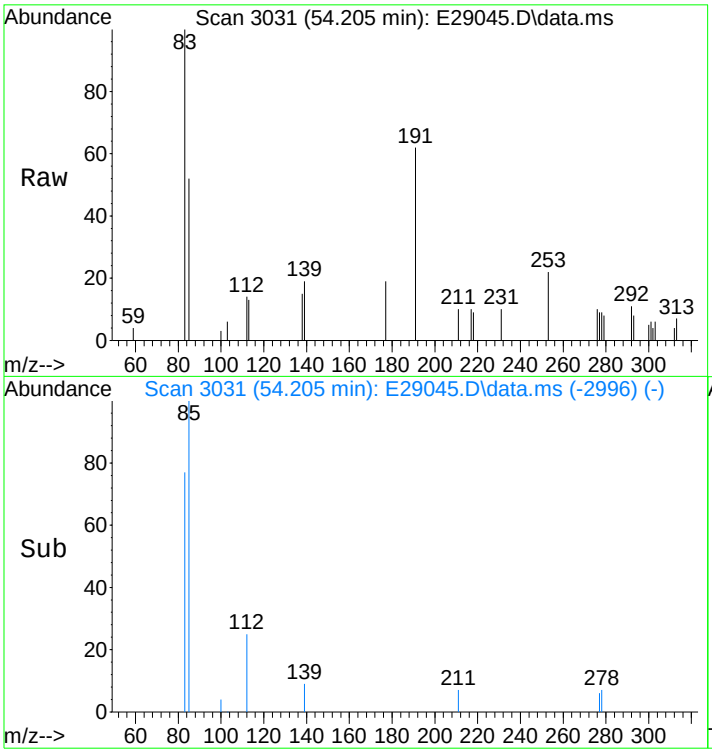




#119
30-Homohopane-22R (T22)
Concen: 557.28 ng/ml
RT: 53.678 min Scan# 2996
Delta R.T. 0.034 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

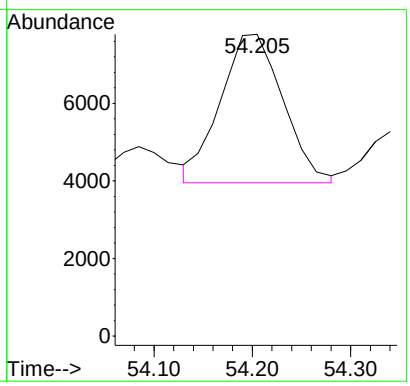
Tgt Ion:191 Resp: 44889

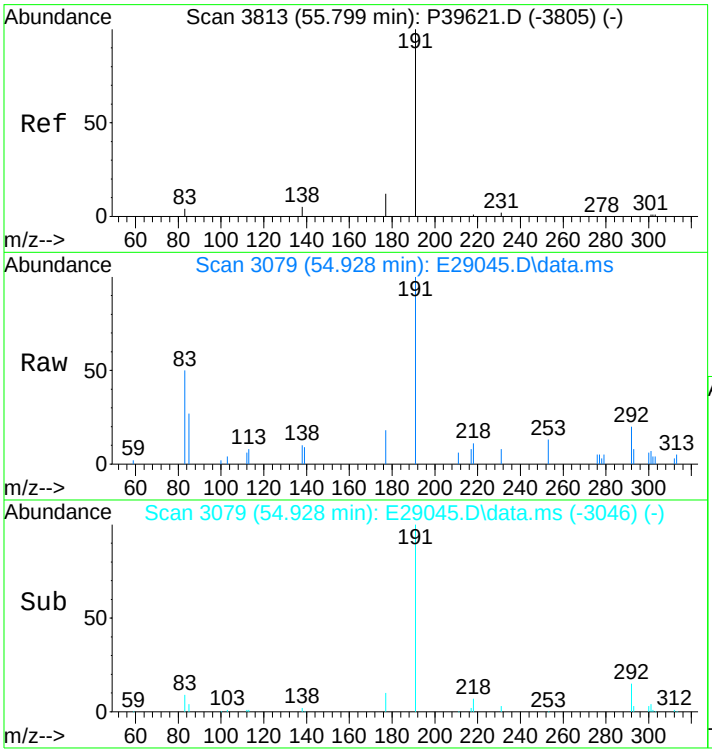




#120
Gammacerane/C32-diahopane
Concen: 209.61 ng/mL m
RT: 54.205 min Scan# 3031
Delta R.T. 0.033 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

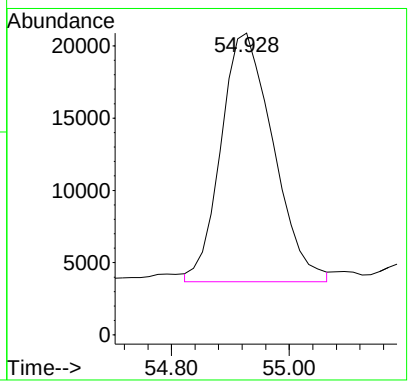
Tgt Ion:191 Resp: 16884

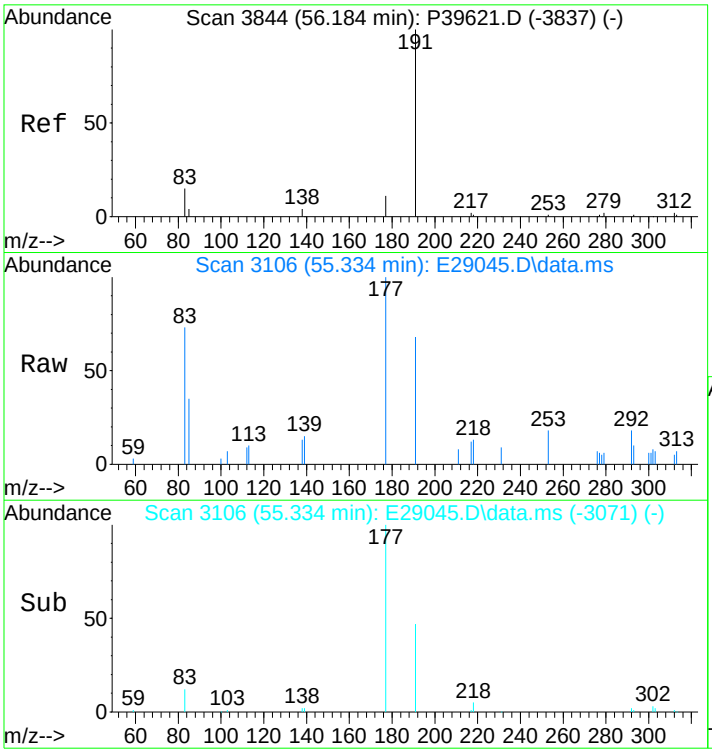




#121
30,31-Bishomohopane-22S (T26)
Concen: 1316.42 ng/ml m
RT: 54.928 min Scan# 3079
Delta R.T. 0.002 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

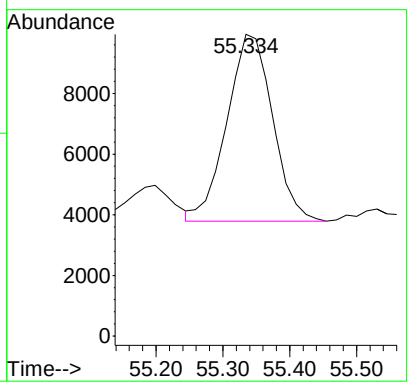
Tgt Ion:191 Resp: 106038

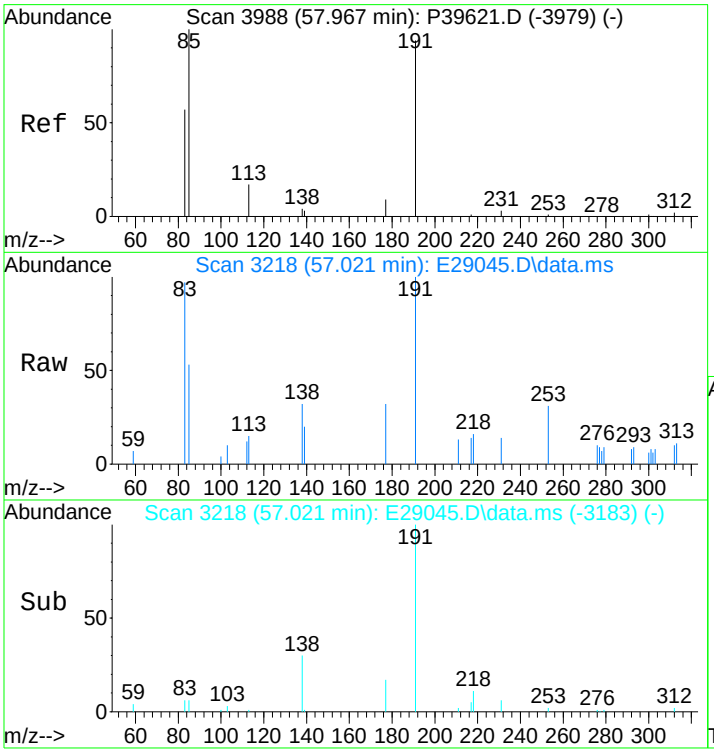




#122
30,31-Bishomohopane-22R (T27)
Concen: 363.47 ng/ml
RT: 55.334 min Scan# 3106
Delta R.T. 0.032 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

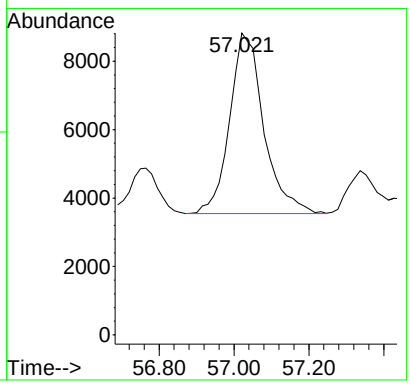
Tgt Ion:191 Resp: 29278

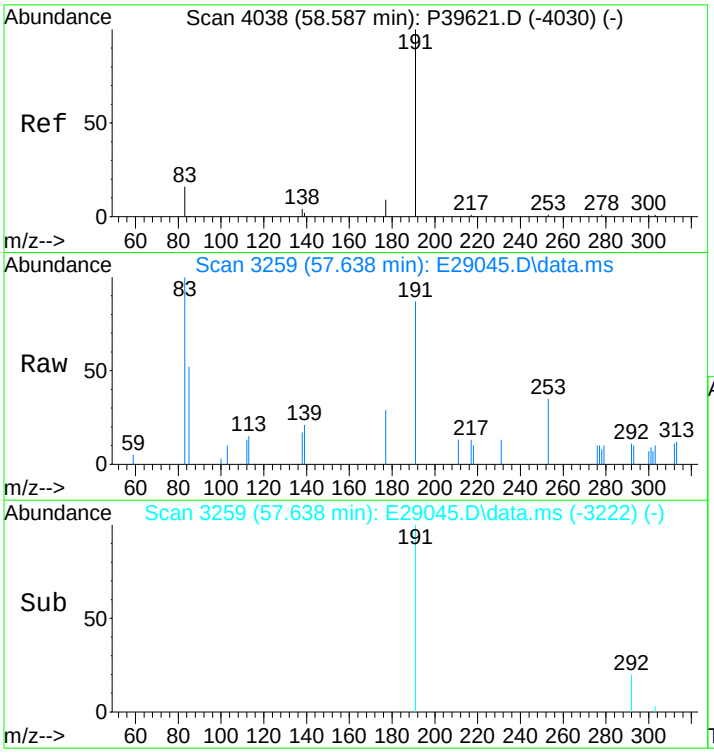




#123
30,31-Trishomohopane-22S (T30)
Concen: 414.13 ng/ml
RT: 57.021 min Scan# 3218
Delta R.T. 0.030 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

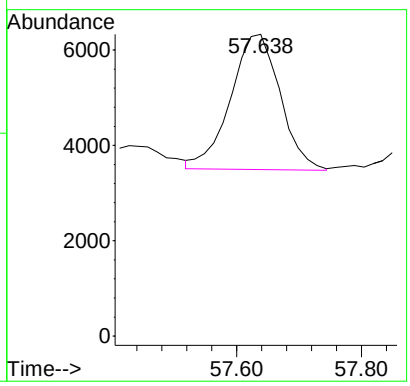
Tgt Ion:191 Resp: 33358

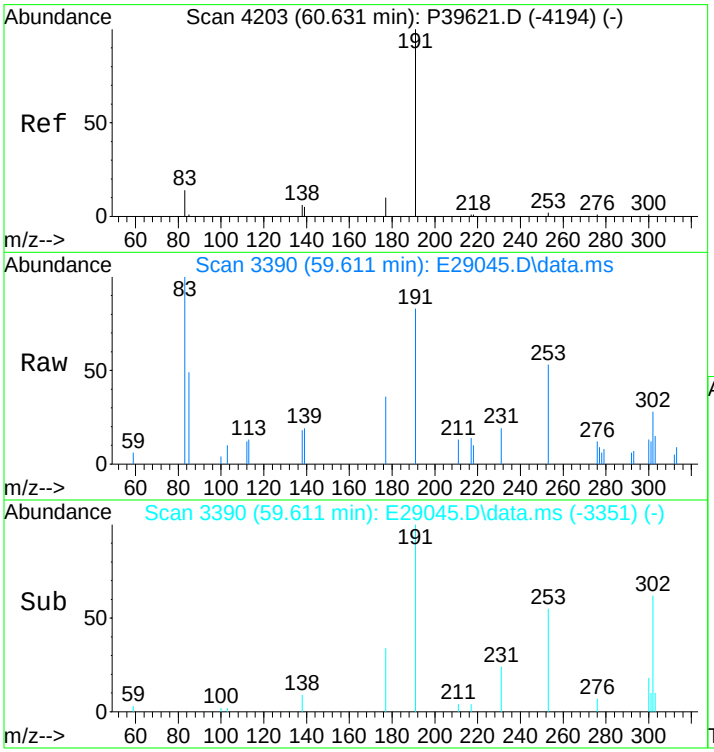




#124
30,31-Trishomohopane-22R (T31)
Concen: 194.03 ng/ml
RT: 57.638 min Scan# 3259
Delta R.T. 0.060 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

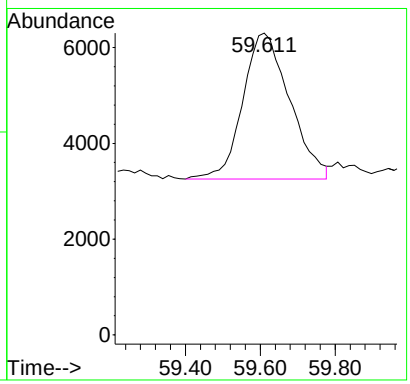
Tgt Ion:191 Resp: 15629

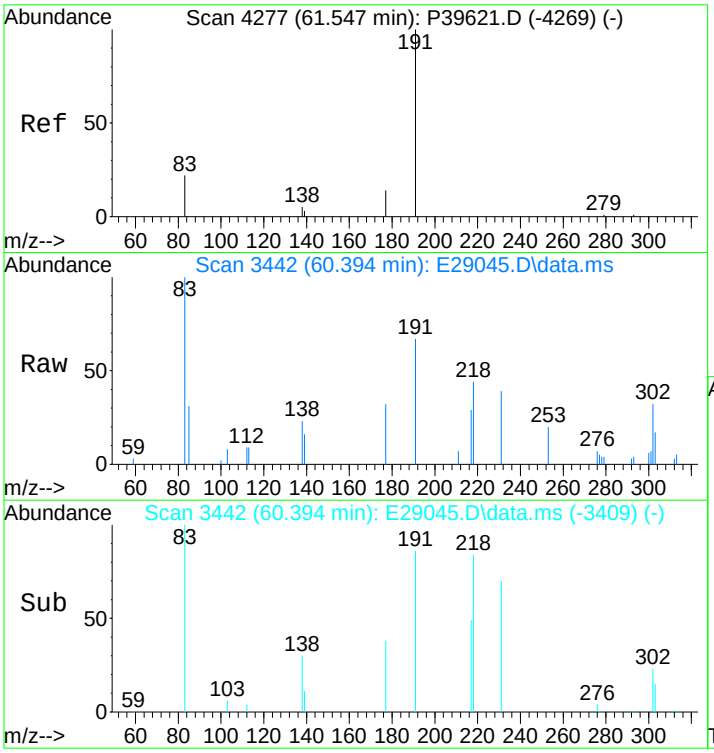




#125
Tetrakishomohopane-22S (T32)
Concen: 329.76 ng/ml
RT: 59.611 min Scan# 3390
Delta R.T. 0.088 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

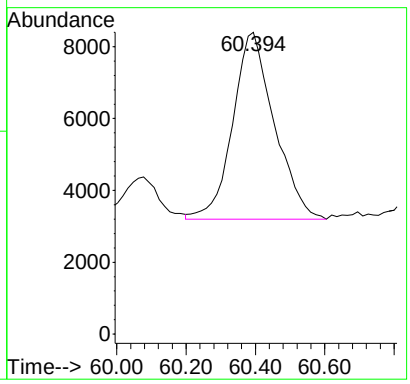
Tgt Ion:191 Resp: 26562

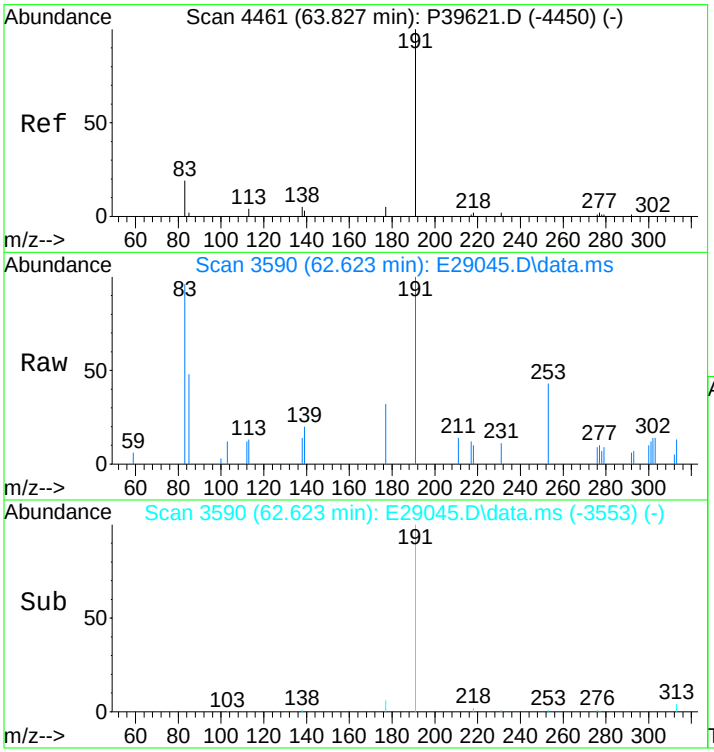




#126
Tetrakishomohopane-22R (T33)
Concen: 538.97 ng/ml
RT: 60.394 min Scan# 3442
Delta R.T. -0.003 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

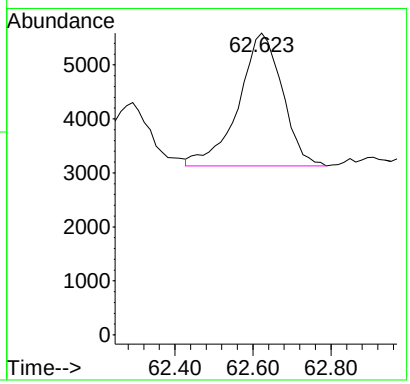
Tgt Ion:191 Resp: 43414

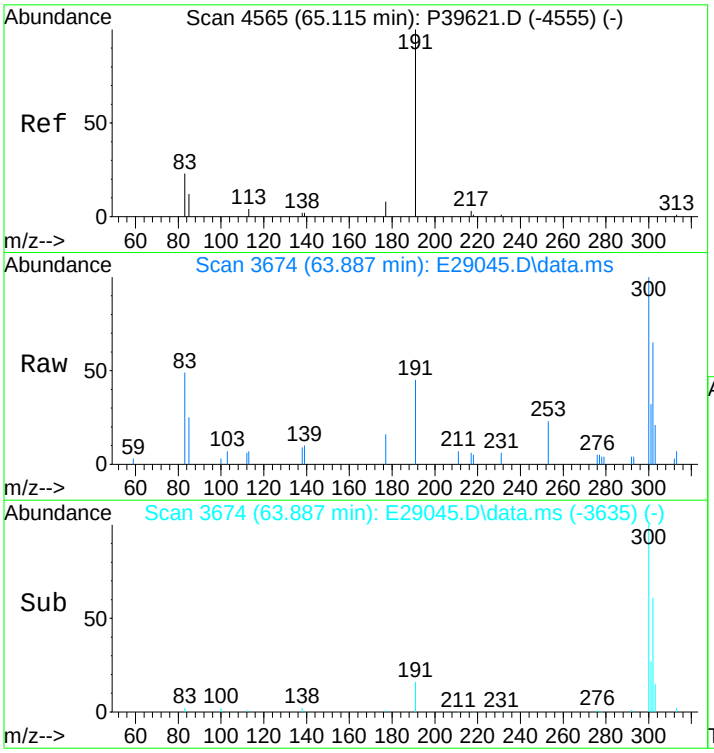




#127
Pentakishomohopane-22S (T34)
Concen: 237.06 ng/ml
RT: 62.623 min Scan# 3590
Delta R.T. 0.054 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

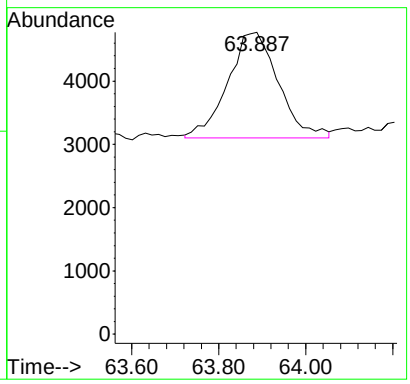
Tgt Ion:191 Resp: 19095

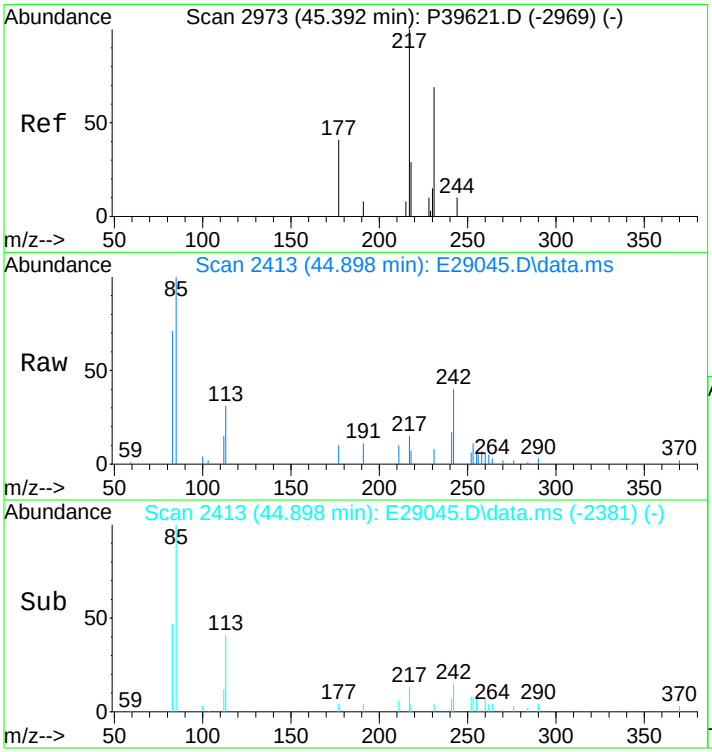




#128
Pentakishomohopane-22R (T35)
Concen: 166.91 ng/ml m
RT: 63.887 min Scan# 3674
Delta R.T. 0.083 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

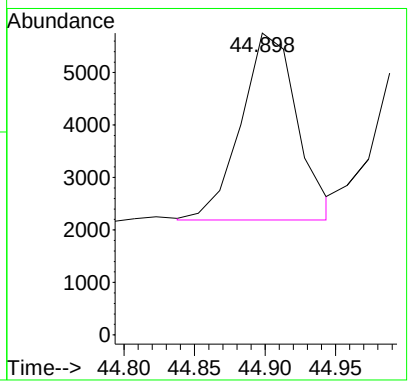
Tgt Ion:191 Resp: 13445

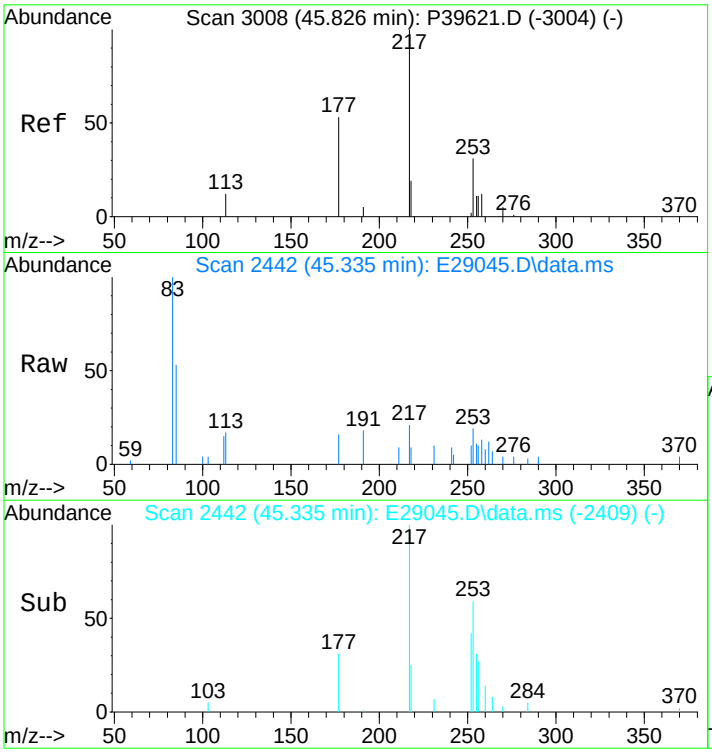




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 233.75 ng/ml m
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

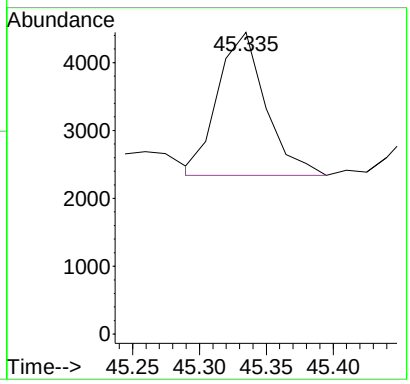
Tgt Ion:217 Resp: 9888

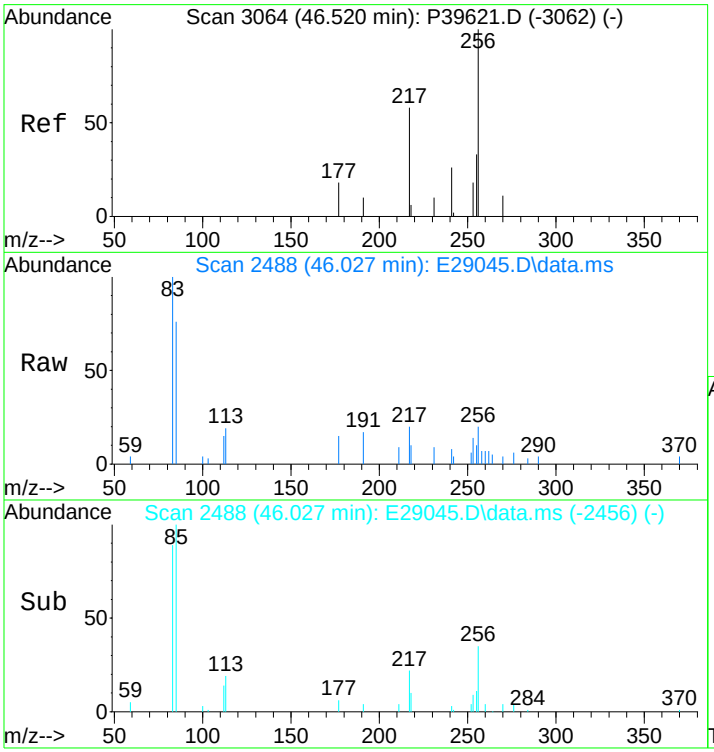




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 123.94 ng/ml
RT: 45.335 min Scan# 2442
Delta R.T. -0.003 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

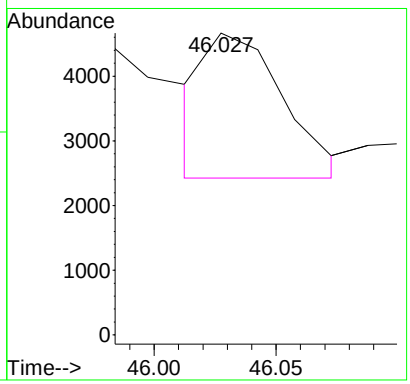
Tgt Ion:217 Resp: 5243

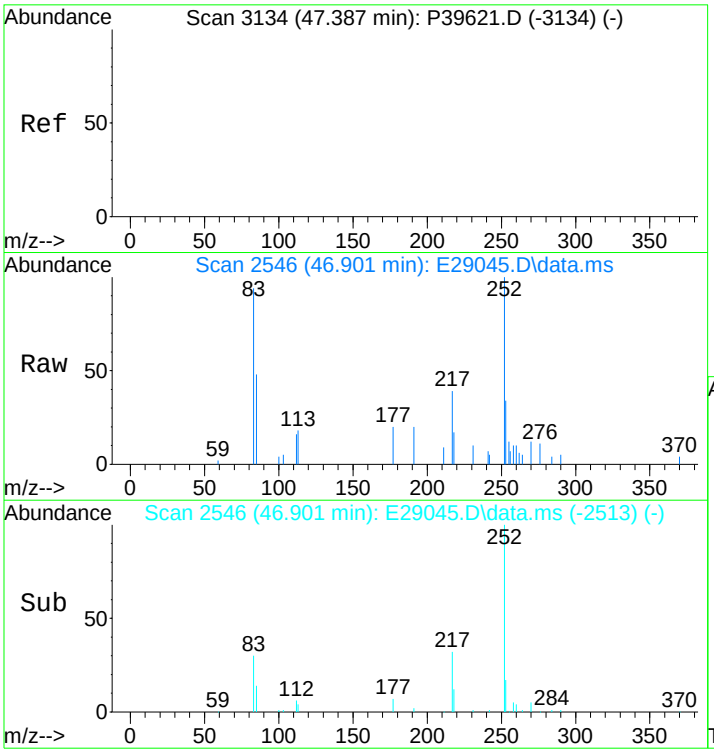




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 117.09 ng/ml m
RT: 46.027 min Scan# 2488
Delta R.T. -0.018 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

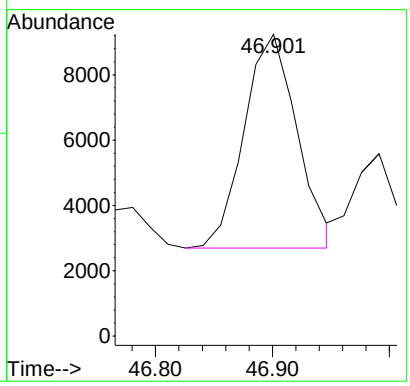
Tgt Ion:217 Resp: 4953

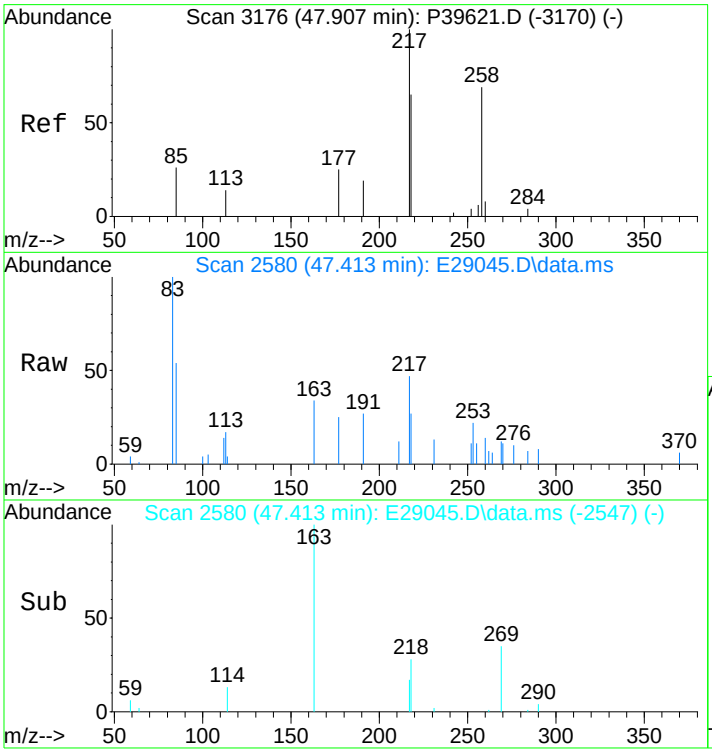




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 487.33 ng/ml
RT: 46.901 min Scan# 2546
Delta R.T. -0.004 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

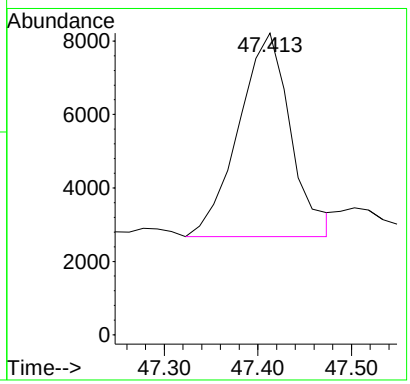
Tgt Ion:217 Resp: 20615

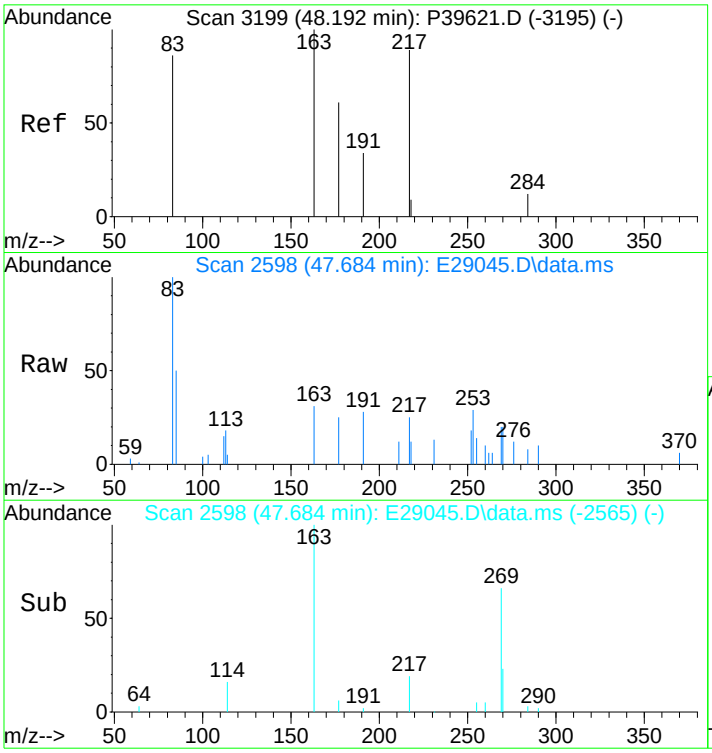




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 507.33 ng/ml
RT: 47.413 min Scan# 2580
Delta R.T. -0.005 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

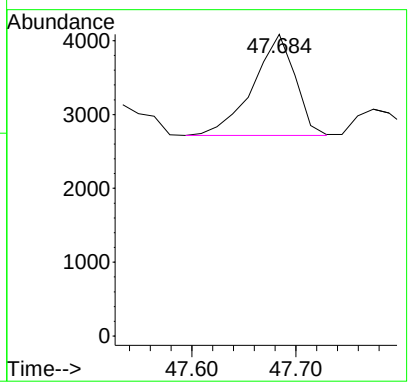
Tgt Ion:217 Resp: 21461

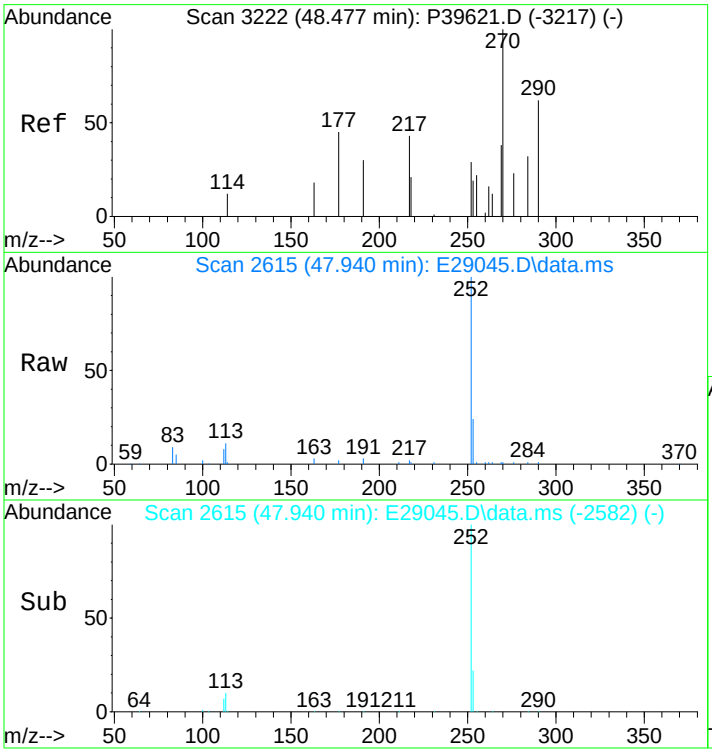




#135
Unknown Sterane (S18)
Concen: 90.94 ng/ml
RT: 47.684 min Scan# 2598
Delta R.T. -0.005 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

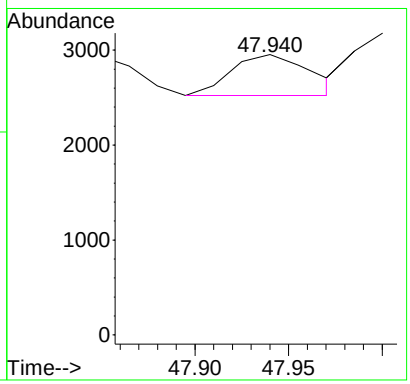
Tgt Ion:217 Resp: 3847

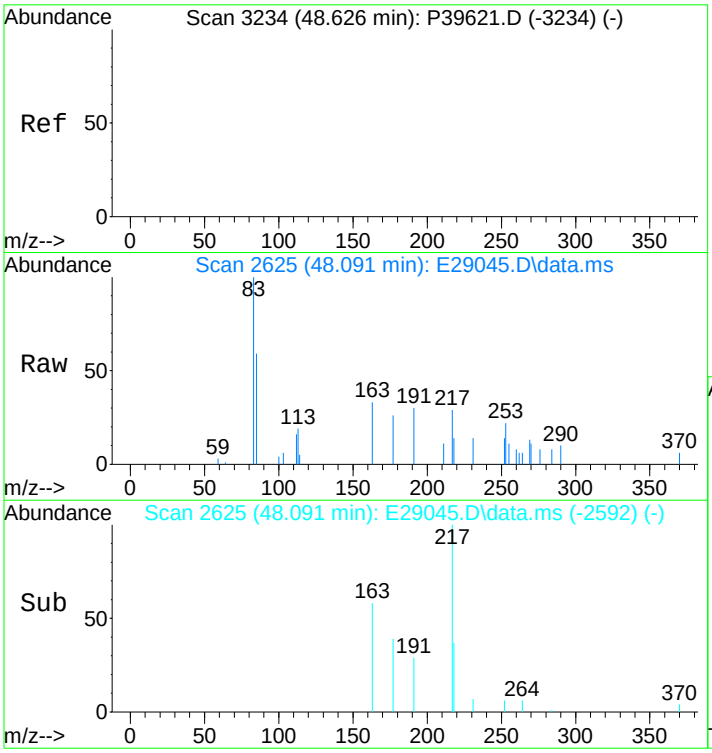




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 29.83 ng/ml
RT: 47.940 min Scan# 2615
Delta R.T. -0.005 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

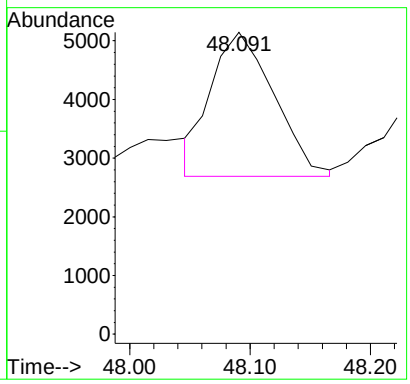
Tgt Ion:217 Resp: 1262

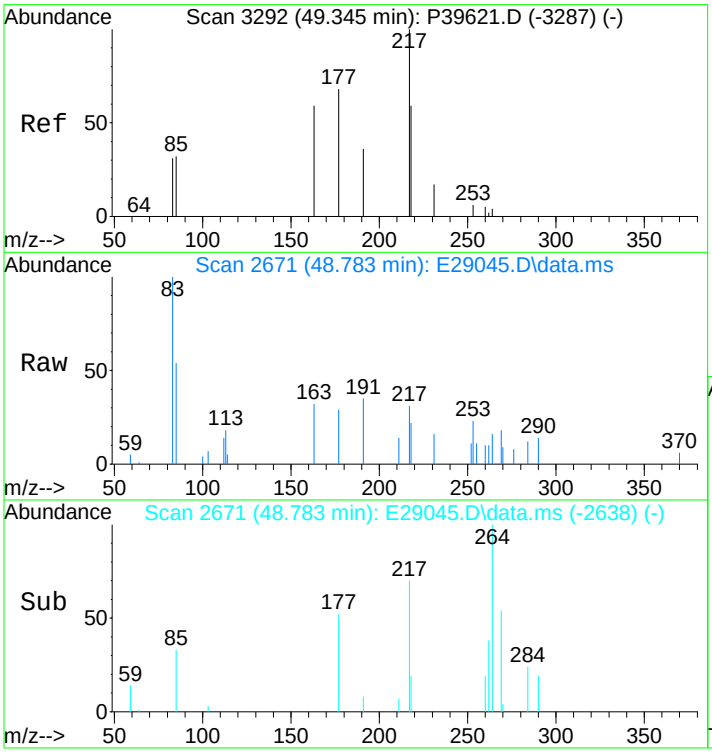




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 210.87 ng/ml m
RT: 48.091 min Scan# 2625
Delta R.T. -0.006 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

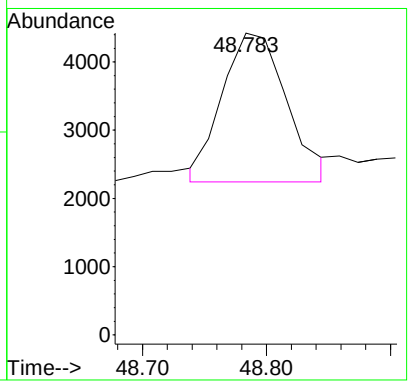
Tgt Ion:217 Resp: 8920

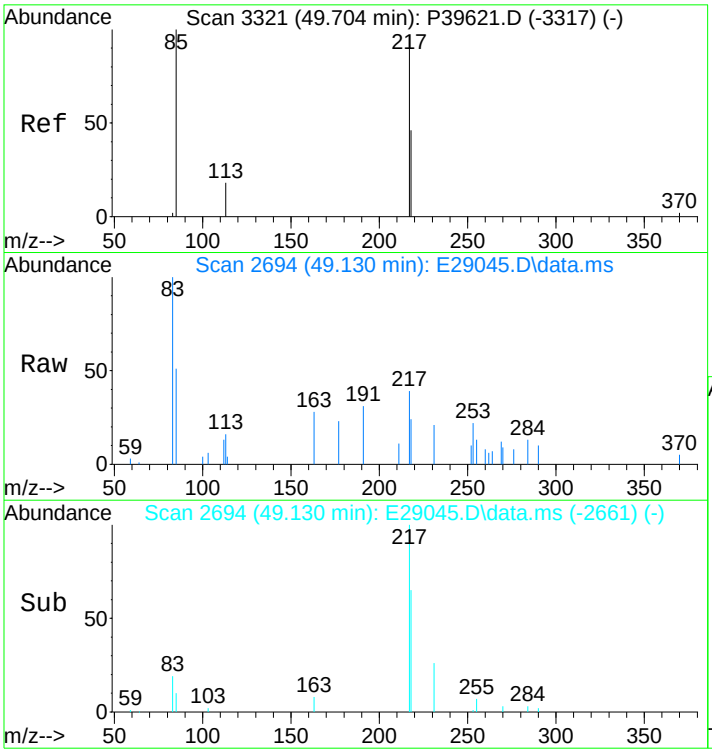




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 186.54 ng/ml m
RT: 48.783 min Scan# 2671
Delta R.T. -0.006 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

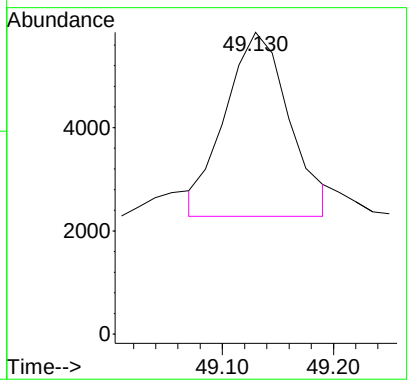
Tgt Ion:217 Resp: 7891

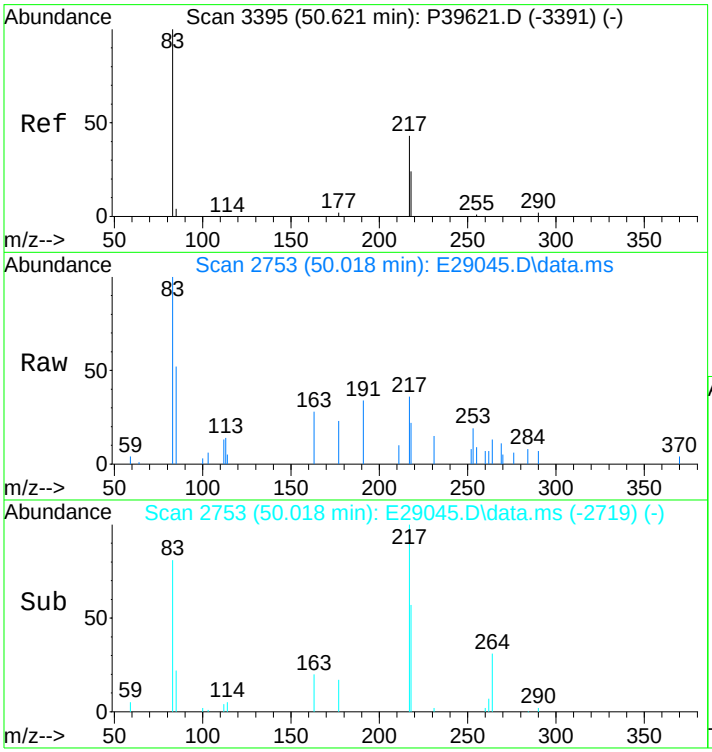




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 336.75 ng/ml m
RT: 49.130 min Scan# 2694
Delta R.T. -0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

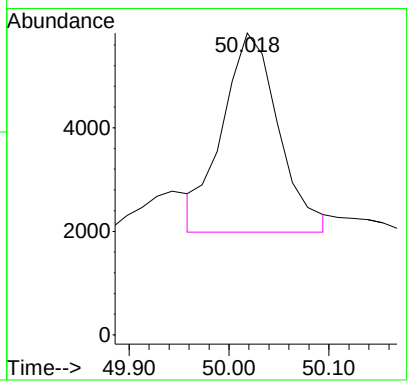
Tgt Ion:217 Resp: 14245

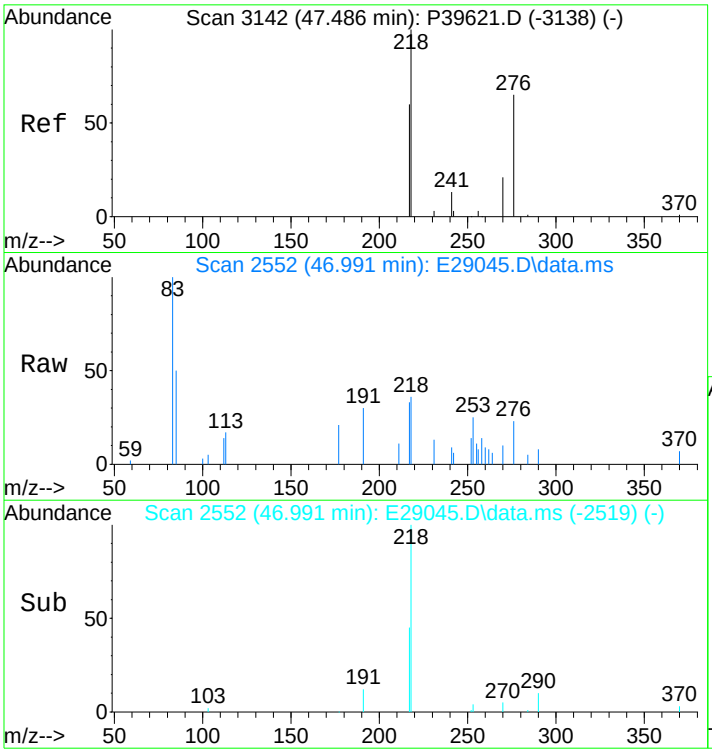




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 353.89 ng/ml m
RT: 50.018 min Scan# 2753
Delta R.T. 0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

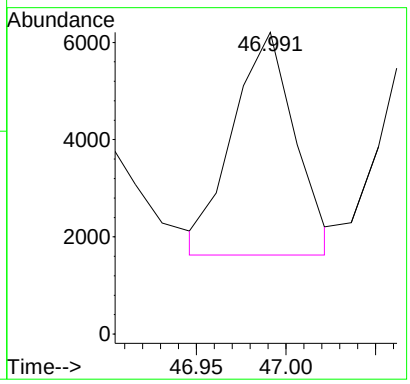
Tgt Ion:217 Resp: 14970

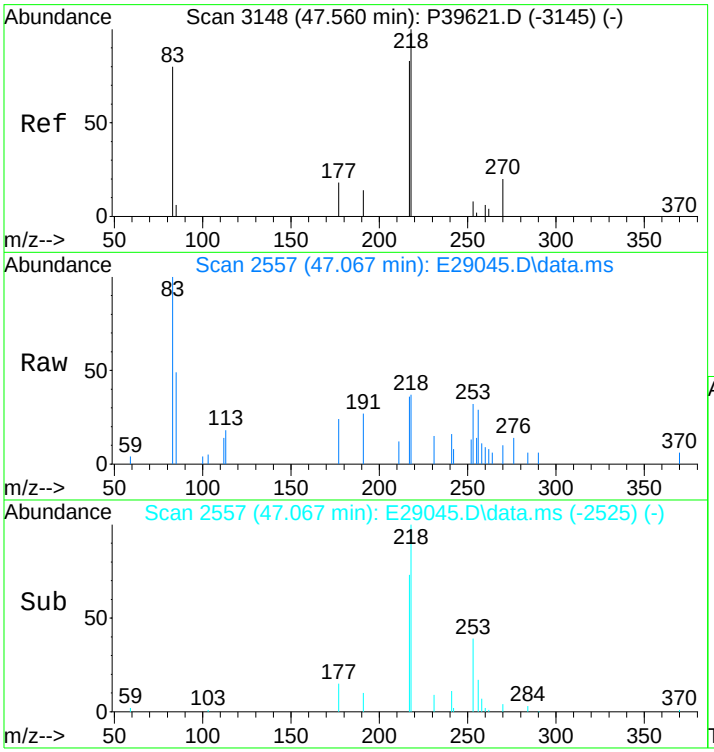




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 260.11 ng/ml m
RT: 46.991 min Scan# 2552
Delta R.T. -0.004 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

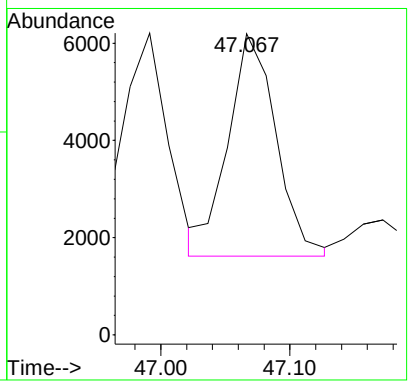
Tgt Ion:218 Resp: 11003

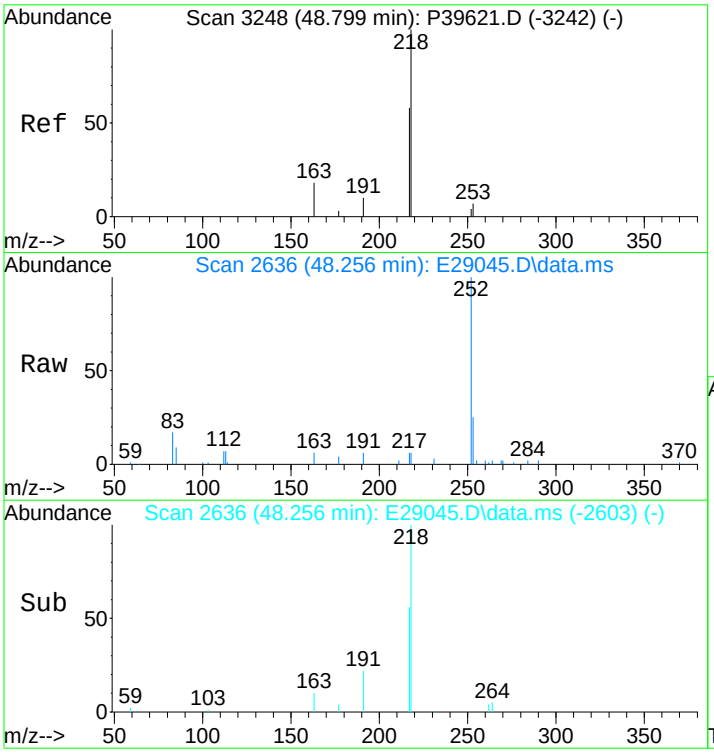




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 278.78 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.020 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

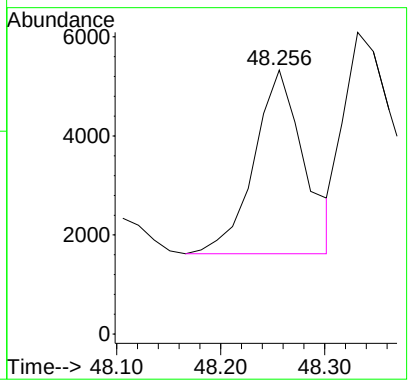
Tgt Ion:218 Resp: 11793

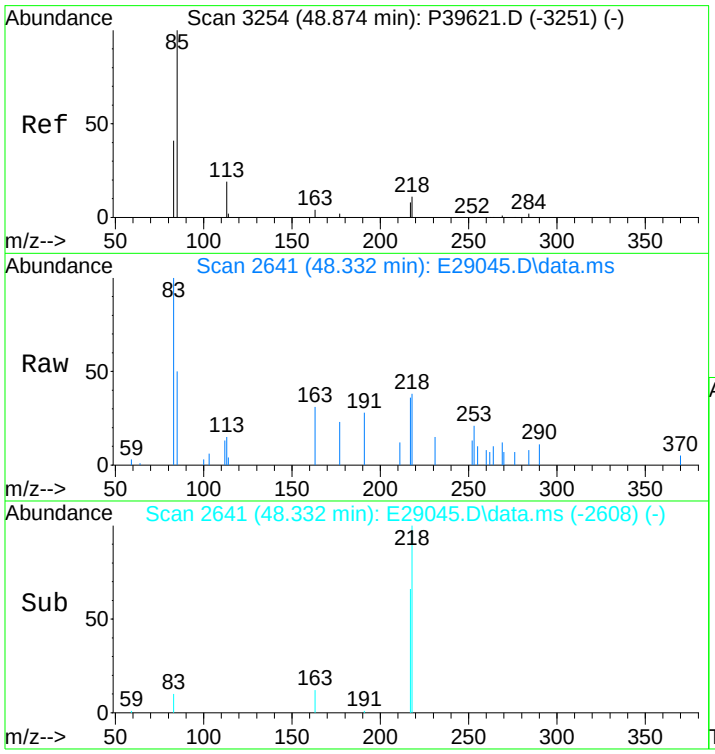




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 294.93 ng/ml
RT: 48.256 min Scan# 2636
Delta R.T. -0.006 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

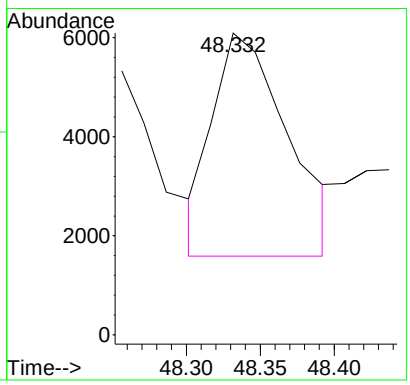
Tgt Ion:218 Resp: 12476

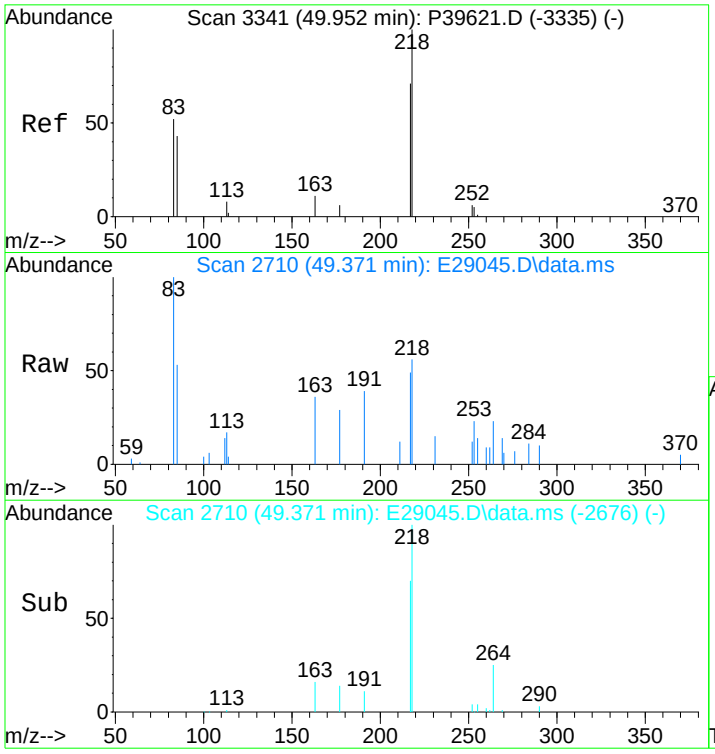




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 374.48 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

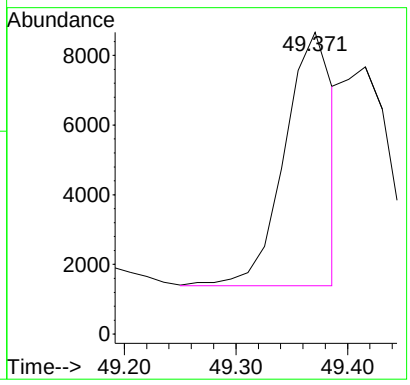
Tgt Ion:218 Resp: 15841

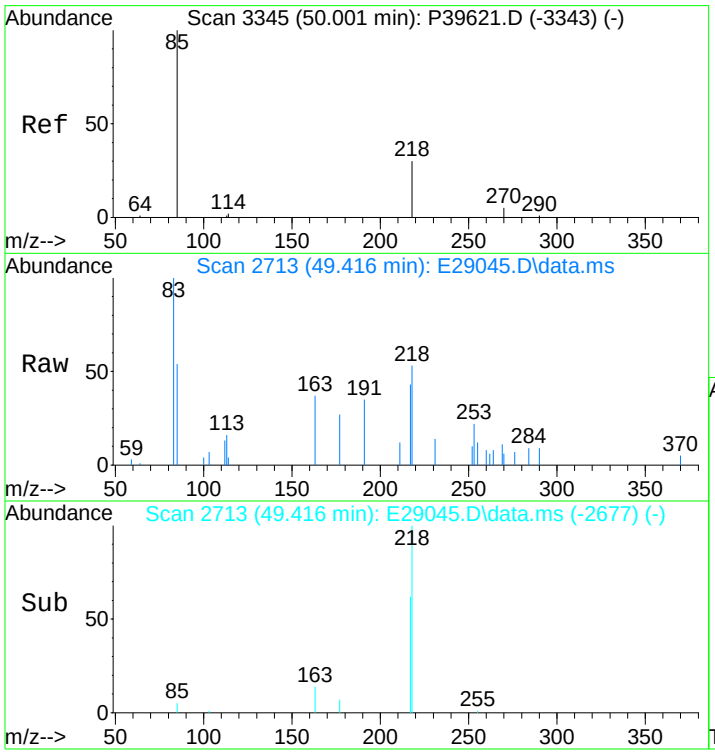




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 522.30 ng/ml m
RT: 49.371 min Scan# 2710
Delta R.T. 0.008 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

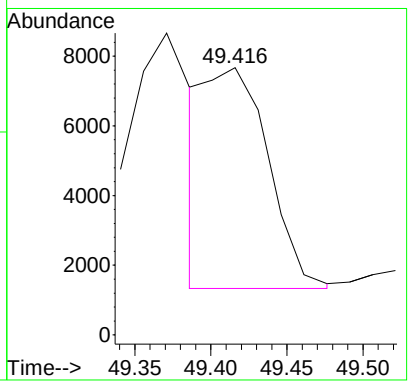
Tgt Ion:218 Resp: 22094

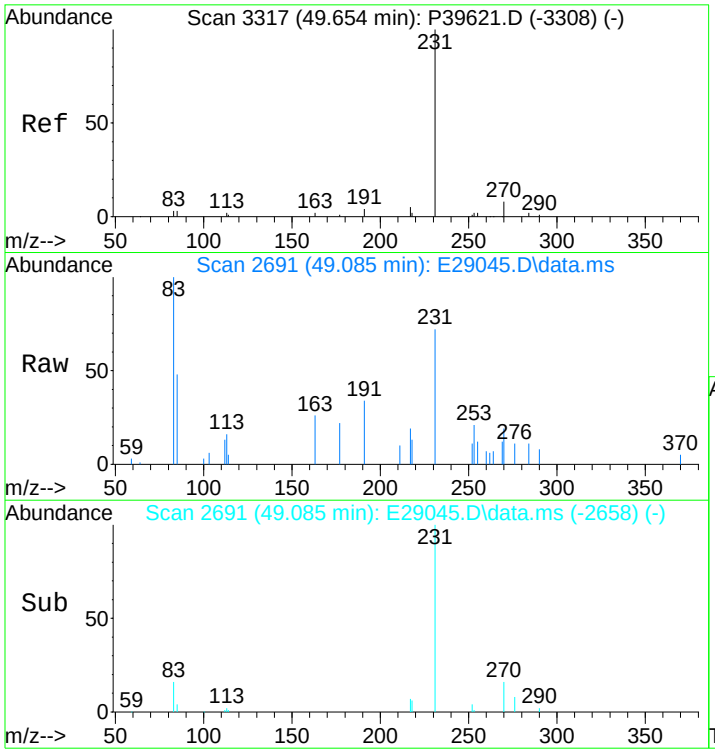




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 428.87 ng/ml m
RT: 49.416 min Scan# 2713
Delta R.T. 0.038 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

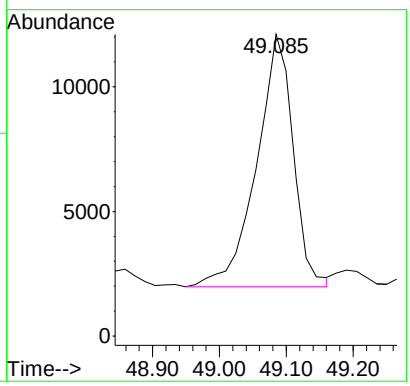
Tgt Ion:218 Resp: 18142

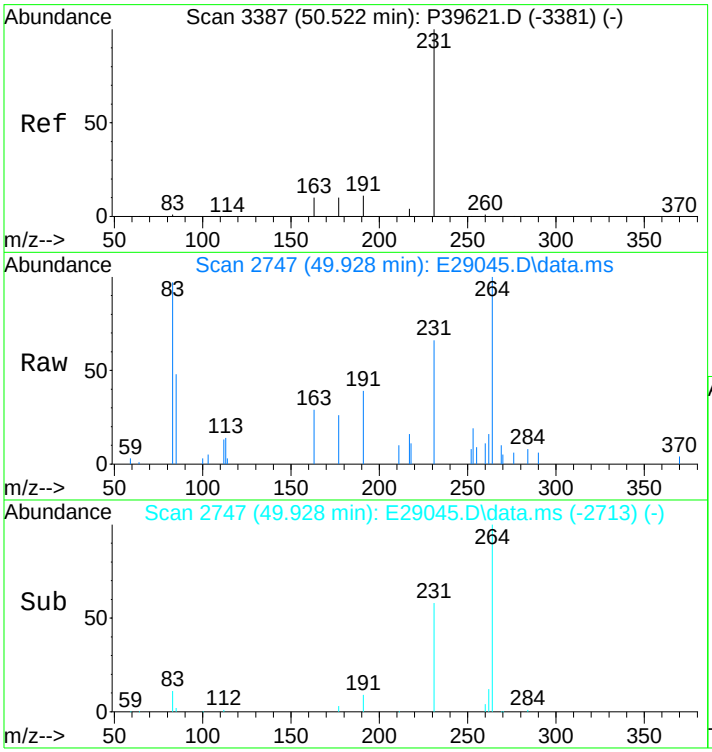




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 915.05 ng/mL
RT: 49.085 min Scan# 2691
Delta R.T. -0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

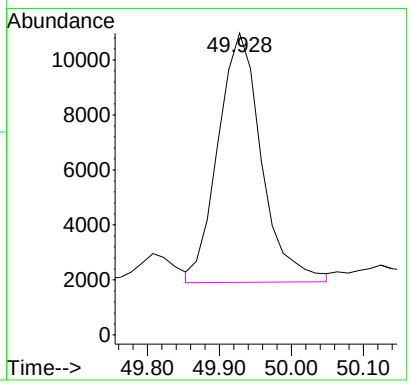
Tgt Ion:231 Resp: 38708

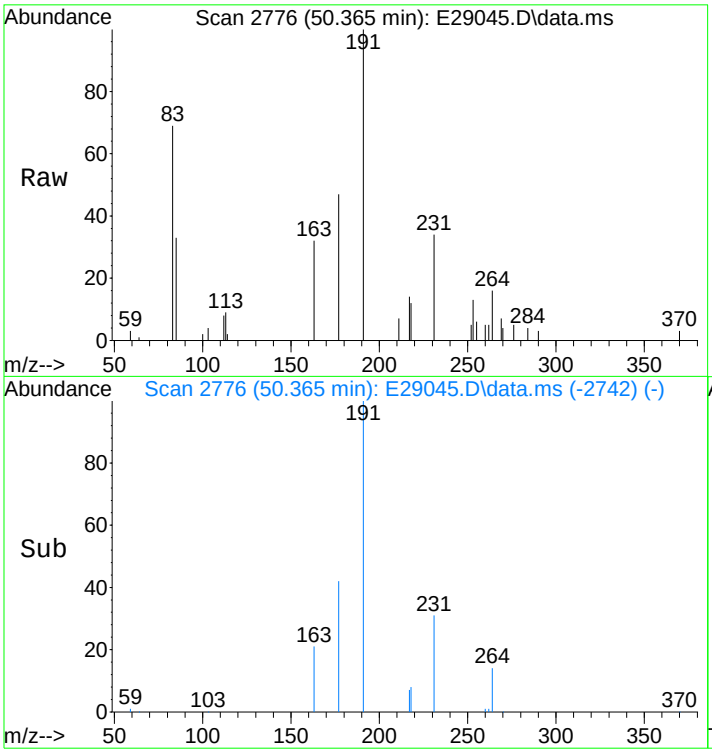




#148
C28,20S-triaromatic steroid
Concen: 898.90 ng/mL
RT: 49.928 min Scan# 2747
Delta R.T. 0.008 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

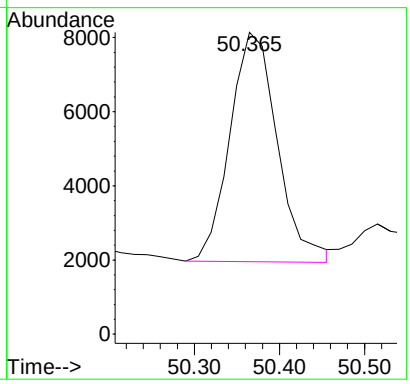
Tgt Ion:231 Resp: 38025

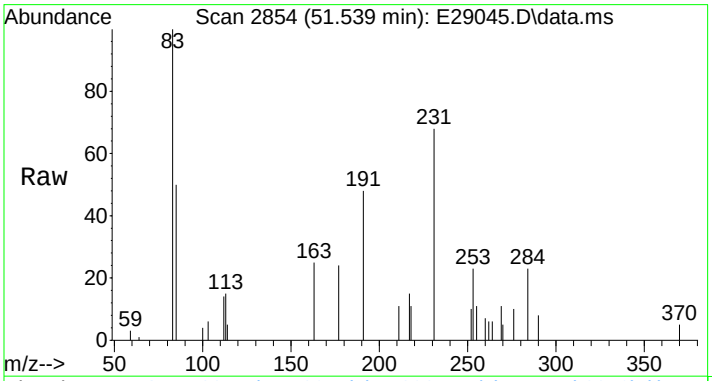




#149
C27,20R-triaromatic steroid
Concen: 566.84 ng/mL
RT: 50.365 min Scan# 2776
Delta R.T. 0.007 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

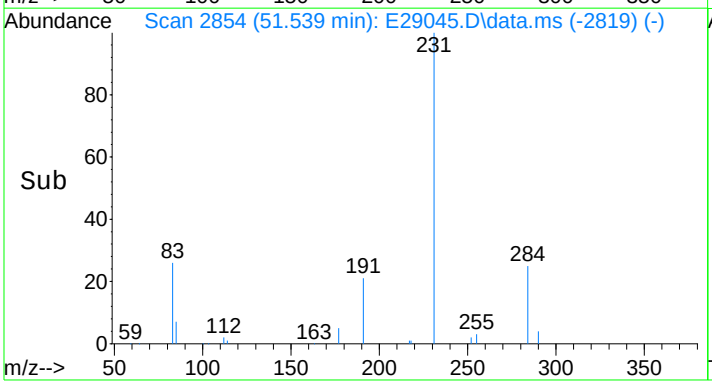
Tgt Ion:231 Resp: 23978

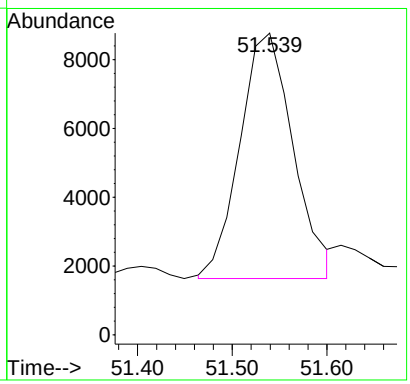




#150
C28,20R-triaromatic steroid
Concen: 660.43 ng/mL m
RT: 51.539 min Scan# 2854
Delta R.T. 0.021 min
Lab File: E29045.D
Acq: 17 Nov 2012 5:37 pm

Tgt Ion:231 Resp: 27937





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	39090	500.000	ng/mL	0.00
74) Chrysene-d12	42.775	240	96027	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	50455	366.957	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 36.70%#			
42) Phenanthrene-d10	32.115	188	63908	453.672	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.37%#			
83) Benzo[b]fluoranthene-d12	46.705	264	89229	452.337	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.23%#			
88) Benzo[a]pyrene-d12	47.865	264	79063	413.649	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.36%#			
129) 5B(H)Cholane - Surr	43.377	217	18739	495.133	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.51%#			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	283	9.051	ng/mL	100
5) C1-Decalins	17.814	152	821M5	26.257	ng/mL	
6) C2-Decalins	19.154	166	2754M5	88.076	ng/mL	
7) C3-Decalins	21.638	180	5163M5	165.119	ng/mL	
8) C4-Decalins	25.010	194	12244M5	391.577	ng/mL	
10) Naphthalene	19.319	128	20528	133.505	ng/mL#	100
11) C1-Naphthalenes	22.014	142	27445M5	178.491	ng/mL	
12) C2-Naphthalenes	24.859	156	79748M5	518.647	ng/mL	
13) C3-Naphthalenes	27.554	170	138734M5	902.267	ng/mL	
14) C4-Naphthalenes	29.993	184	130459M5	848.450	ng/mL	
16) 2-Methylnaphthalene	22.014	142	16061	164.001	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	11569	121.575	ng/mL#	100
18) Benzothiophene	19.530	134	755M3	5.940	ng/mL	
19) C1-Benzo(b)thiophenes	22.405	148	3233M5	25.434	ng/mL	
20) C2-Benzo(b)thiophenes	25.055	162	12604M5	99.156	ng/mL	
21) C3-Benzo(b)thiophenes	27.042	176	30681M5	241.367	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	37609M5	295.870	ng/mL	
23) Biphenyl	23.911	154	4574	36.956	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.528	156	18080	204.820	ng/mL#	100
25) Dibenzofuran	26.997	168	10749M4	78.444	ng/mL	
26) Acenaphthylene	25.612	152	45062	293.946	ng/mL#	100
27) Acenaphthene	26.335	153	8632M3	87.477	ng/mL	
28) 2,3,5-Trimethylnaphthalen	27.900	170	9977M3	120.806	ng/mL	
29) Fluorene	28.367	166	17437M3	158.437	ng/mL	
30) C1-Fluorenes	30.745	180	25224M5	229.192	ng/mL	
31) C2-Fluorenes	32.958	194	57516M5	522.605	ng/mL	
32) C3-Fluorenes	34.810	208	76281M5	693.108	ng/mL	
33) Dibenzothiophene	31.694	184	32357	214.245	ng/mL#	74
34) 4-Methyldibenzothiophene(	33.485	198	34836	230.659	ng/mL#	100
35) 2/3-Methyldibenzothiophen	33.847	198	29642M3	196.268	ng/mL	
36) 1-Methyldibenzothiophene(	34.253	198	16626	110.086	ng/mL#	100
37) OTP	33.862	198	5734M3	37.966	ng/mL	
38) C1-Dibenzothiophenes	33.485	198	94555M5	626.076	ng/mL	
38) C1-Dibenzothiophenes BS	33.485	198	88821m	588.110	ng/mL	
39) C2-Dibenzothiophenes	35.187	212	175479M5	1161.897	ng/mL	
40) C3-Dibenzothiophenes	37.008	226	210546M5	1394.086	ng/mL	
41) C4-Dibenzothiophenes	38.710	240	149374M5	989.048	ng/mL	
43) Phenanthrene	32.191	178	273686	1781.179	ng/mL	98
44) 3-Methylphenanthrene(3MP)	34.178	192	53523	348.334	ng/mL	100

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.283	192	62834	408.931	ng/mL	95
46) 2-Methylanthracene(2MA)	34.449	192	20604M3	134.093	ng/mL	
47) 9/4-Methylphenanthrene(9M	34.630	192	72379	471.051	ng/mL	86
48) 1-Methylphenanthrene(1MP)	34.720	192	45356M3	295.182	ng/mL	
49) C1-Phenanthrenes/Anthrace	34.283	192	261390M5	1701.155	ng/mL	
50) C2-Phenanthrenes/Anthrace	36.451	206	280289M5	1824.152	ng/mL	
50) C2-Phenanthrenes/Anthr BS	36.451	206	280289m	1824.152	ng/mL	
52) C3-Phenanthrenes/Anthrace	38.318	220	213953M5	1392.430	ng/mL	
53) C4-Phenanthrenes/Anthrace	40.502	234	114268M5	743.669	ng/mL	
55) Anthracene	32.386	178	62286M3	468.980	ng/mL	
56) Carbazole	33.079	167	20547	150.322	ng/mL	100
57) 1-Methylphenanthrene	34.720	192	45561M3	388.661	ng/mL	
58) Fluoranthene	37.008	202	873880M3	5149.918	ng/mL	
59) Benzo(b)fluorene	39.538	216	86517M3	765.150	ng/mL	
60) Pyrene	37.882	202	865309	5017.052	ng/mL	97
61) C1-Fluoranthenes/Pyrenes	39.297	216	592408M5	3434.775	ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.375	230	294946M5	1710.094	ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.257	244	180060M5	1043.986	ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.582	258	159502M5	924.791	ng/mL	
66) Naphthobenzothiophene	41.766	234	92838	545.756	ng/ml#	93
67) Naphthobenzothiophene-2,1	41.766	234	92838	545.756	ng/mL#	93
68) Naphthobenzothiophene-1,2	42.113	234	20970	123.274	ng/mL#	5
69) Naphthobenzothiophene-2,3	42.414	234	28612M3	168.198	ng/mL	
70) C1-Naphthobenzothiophenes	43.182	248	149075M5	876.350	ng/ml	
71) C2-Naphthobenzothiophenes	45.244	262	175996M5	1034.607	ng/ml	
72) C3-Naphthobenzothiophenes	46.811	276	143950M5	846.222	ng/ml	
73) C4-Naphthobenzothiophenes	47.865	290	113256M5	665.785	ng/mL	
75) Benz[a]anthracene	42.700	228	481544M3	2575.181	ng/mL	
77) Chrysene/Triphenylene	42.865	228	569040	2955.836	ng/mL	99
78) C1-Chrysenes	44.356	242	306722M5	1593.244	ng/mL	
79) C2-Chrysenes	46.088	256	201460M5	1046.469	ng/mL	
79) C2-Chrysenes BS	46.088	256	198566m	1031.436	ng/mL	
80) BBF-D12 Surr BKGD	46.705	256	2894	15.033	ng/mL	100
81) C3-Chrysenes	47.654	270	167982M5	872.570	ng/mL	
82) C4-Chrysenes	49.205	284	85928M5	446.347	ng/mL	
84) Benzo[b]fluoranthene	46.795	252	654908	3013.150	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	513847	2297.906	ng/mL	96
86) Benzo[a]fluoranthene	47.172	252	133819M3	598.434	ng/mL	
87) Benzo[e]pyrene	47.759	252	463199M4	2182.571	ng/mL	
89) Benzo[a]pyrene	47.955	252	602261	2965.741	ng/mL	98
90) Perylene	48.256	252	207168	964.752	ng/mL	95
91) Indeno[1,2,3-cd]pyrene	52.669	276	501314M3	2097.628	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.684	278	129859M3	510.304	ng/mL	
93) Benzo[g,h,i]perylene	53.934	276	507787	1970.526	ng/mL	100
94) Hopane (T19)	51.705	191	111262	1543.868	ng/mL#	85
96) C23 Tricyclic Terpane (T4	40.381	191	24728	343.125	ng/ml	100
97) C24 Tricyclic Terpane (T5	41.119	191	15223	211.234	ng/ml	100
98) C25 Tricyclic Terpane (T6	42.655	191	20131M3	279.337	ng/ml	
99) C24 Tetracyclic Terpane (	43.919	191	7097M3	98.478	ng/ml	
100) C26 Tricyclic Terpane-22S	43.678	191	6560M3	91.026	ng/ml	
101) C26 Tricyclic Terpane-22R	43.784	191	6073M3	84.269	ng/ml	
102) C28 Tricyclic Terpane-22S	46.088	191	7046M3	97.770	ng/ml	
103) C28 Tricyclic Terpane-22R	46.253	191	8301M3	115.184	ng/ml	
104) C29 Tricyclic Terpane-22S	46.765	191	8295M3	115.101	ng/ml	
105) C29 Tricyclic Terpane-22R	46.961	191	8151	113.103	ng/ml	100
106) 18a-22,29,30-Trisnorneoho	48.030	191	17012	236.058	ng/ml	100

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
107) C30 Tricyclic Terpane-22S	48.166	191	7733M3	107.303	ng/mL	
108) C30 Tricyclic Terpane-22R	48.392	191	11122	154.329	ng/mL	100
109) 17a(H)-22,29,30-Trisnorho	48.573	191	27574M3	382.616	ng/ml	
110) 17a/b,21b/a 28,30-Bisnorh	49.732	191	10846	150.499	ng/ml	100
111) 17a(H),21b(H)-25-Norhopan	49.536	191	14130	196.067	ng/ml	100
112) 30-Norhopane (T15)	50.380	191	78268	1086.044	ng/ml	100
113) 18a(H)-30-Norneohopane-C2	50.485	191	20679	286.941	ng/ml	100
114) 17a(H)-Diahopane (X)	50.621	191	6010M3	83.395	ng/ml	
115) 30-Normoretane (T17)	51.133	191	11406	158.269	ng/ml	100
116) 18a(H)&18b(H)-Oleananes (	51.524	191	6466	89.722	ng/ml	100
117) Moretane (T20)	52.383	191	16044M3	222.626	ng/ml	
118) 30-Homohopane-22S (T21)	53.452	191	42119M3	584.442	ng/ml	
119) 30-Homohopane-22R (T22)	53.678	191	36794	510.552	ng/ml	100
120) Gammacerane/C32-diahopane	54.205	191	14865	206.266	ng/mL	100
121) 30,31-Bishomohopane-22S (	54.913	191G	87011M3	1207.362	ng/ml	
122) 30,31-Bishomohopane-22R (	55.334	191	23826	330.609	ng/ml	100
123) 30,31-Trishomohopane-22S	57.021	191	27427	380.576	ng/ml	100
124) 30,31-Trishomohopane-22R	57.623	191	12803	177.654	ng/ml	100
125) Tetrakishomohopane-22S (T	59.596	191	22202	308.074	ng/ml	100
126) Tetrakishomohopane-22R (T	60.394	191G	34222	474.863	ng/ml	100
127) Pentakishomohopane-22S (T	62.622	191	15180M3	210.637	ng/ml	
128) Pentakishomohopane-22R (T	63.872	191	10624M3	147.418	ng/ml	
130) 13b(H),17a(H)-20S-Diachol	44.898	217	8987	237.460	ng/ml	100
131) 13b(H),17a(H)-20R-Diachol	45.335	217	4870M3	128.678	ng/ml	
132) 13b,17a-20S-Methyldiachol	46.027	217	4377M3	115.652	ng/ml	
133) 14a,17a-20S-Chol/13b,17a-	46.901	217	17117	452.276	ng/ml	100
134) 14a,17a-20R-Chol/13b,17a-	47.413	217	17281	456.609	ng/ml	100
135) Unknown Sterane (S18)	47.684	217	3407	90.022	ng/ml	100
136) 13a,17b-20S-Ethyldiachole	47.940	217	909	24.018	ng/ml	100
137) 14a,17a-20S-Methylcholest	48.091	217	7345M3	194.074	ng/ml	
138) 14a,17a-20R-Methylcholest	48.783	217	6746M3	178.247	ng/ml	
139) 14a(H),17a(H)-20S-Ethylch	49.130	217	11836M3	312.738	ng/ml	
140) 14a(H),17a(H)-20R-Ethylch	50.018	217	11978M3	316.490	ng/ml	
141) 14b(H),17b(H)-20R-Cholest	46.991	218	9562M3	252.653	ng/ml	
142) 14b(H),17b(H)-20S-Cholest	47.067	218	9900M3	261.584	ng/ml	
143) 14b,17b-20R-Methylcholest	48.256	218	10084	266.446	ng/ml	100
144) 14b,17b-20S-Methylcholest	48.332	218	14497M3	383.049	ng/ml	
145) 14b(H),17b(H)-20R-Ethylch	49.371	218	18380M3	485.648	ng/ml	
146) 14b(H),17b(H)-20S-Ethylch	49.416	218	13949M3	368.569	ng/ml	
147) C26,20R- +C27,20S- triaro	49.085	231	30890	816.194	ng/mL	100
148) C28,20S-triaromatic stero	49.928	231	28021	740.388	ng/mL	100
149) C27,20R-triaromatic stero	50.365	231	20111M3	531.385	ng/mL	
150) C28,20R-triaromatic stero	51.539	231	22994M3	607.561	ng/mL	

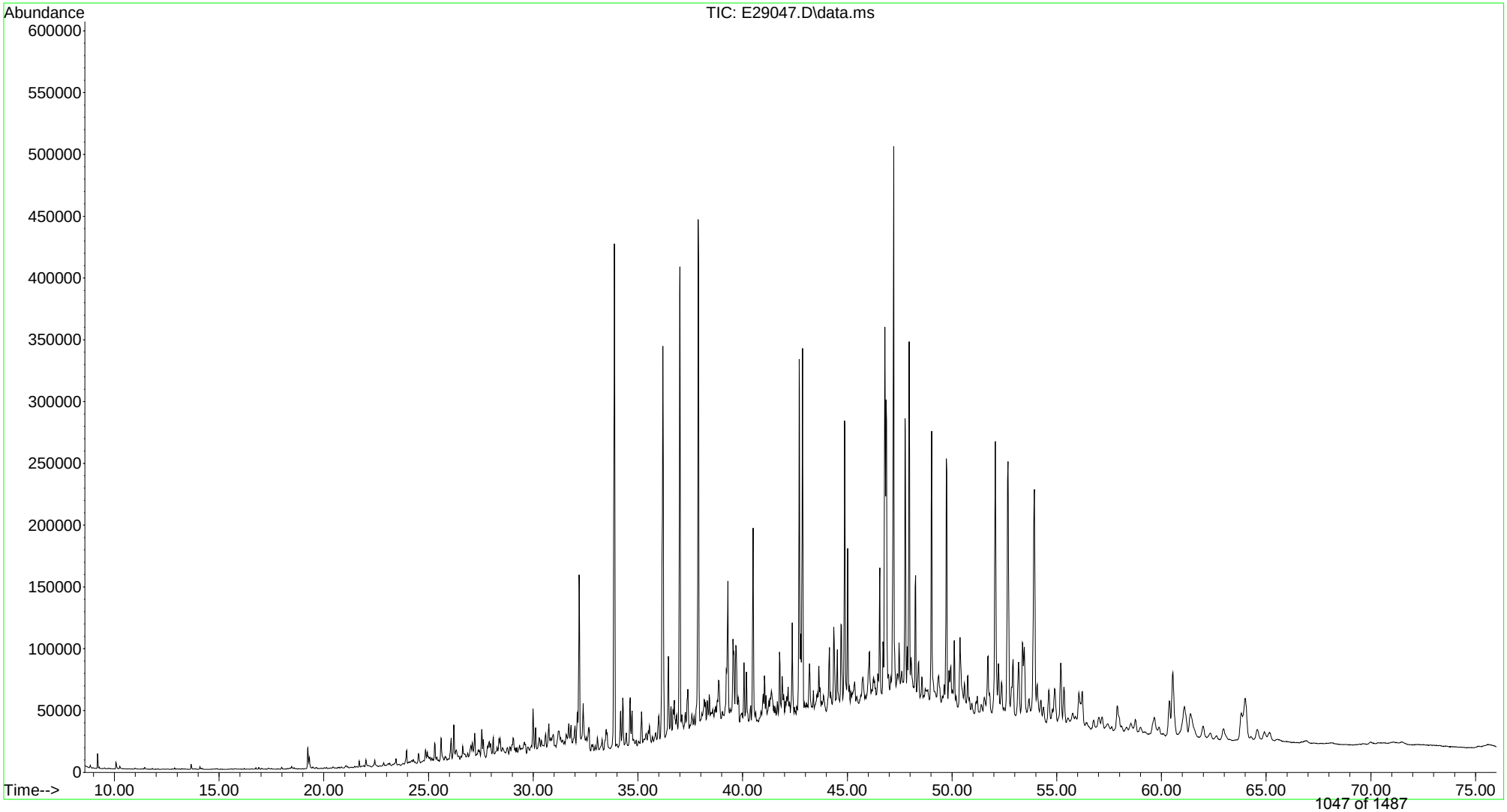
(#) = qualifier out of range (m) = manual integration (+) = signals summed

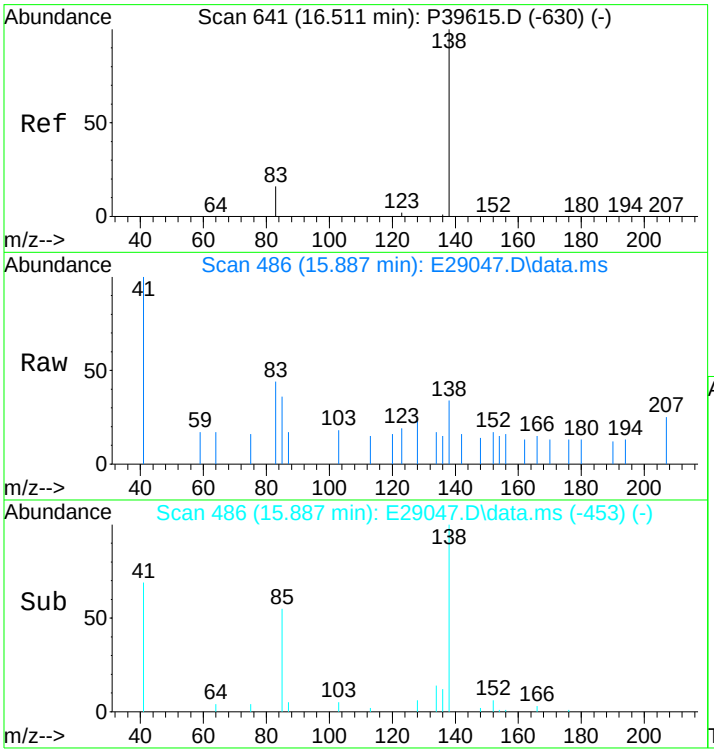
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29047.D
Acq On : 17 Nov 2012 7:05 pm
Operator : AC
Sample : 1210083-07
Misc : 1X
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 19 10:27:39 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

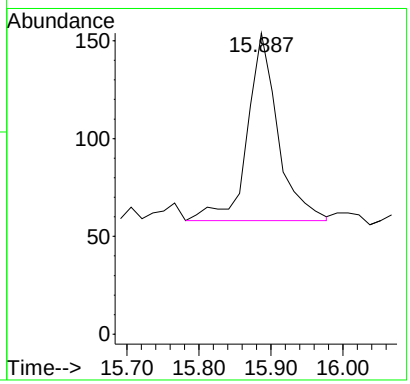
Sub List : PIOB_ALTNEW_REV2 - PIOB+5 SURROGATES

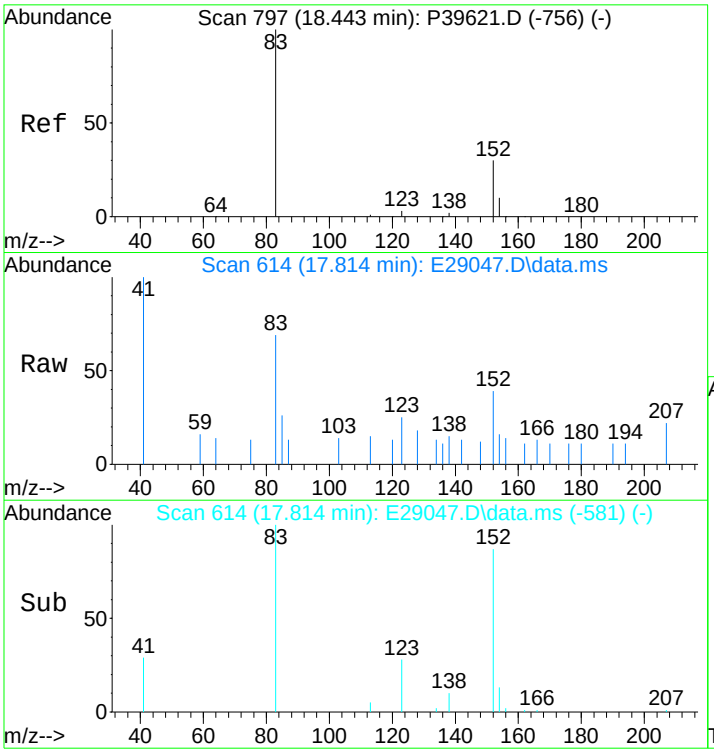




#3
trans-Decalin
Concen: 9.05 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

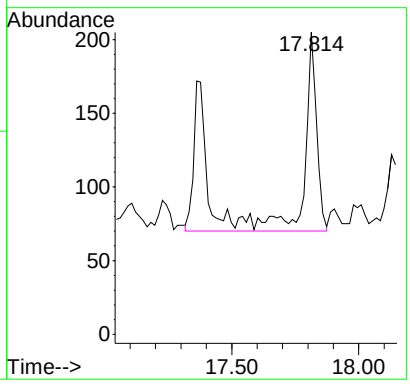
Tgt Ion:138 Resp: 283

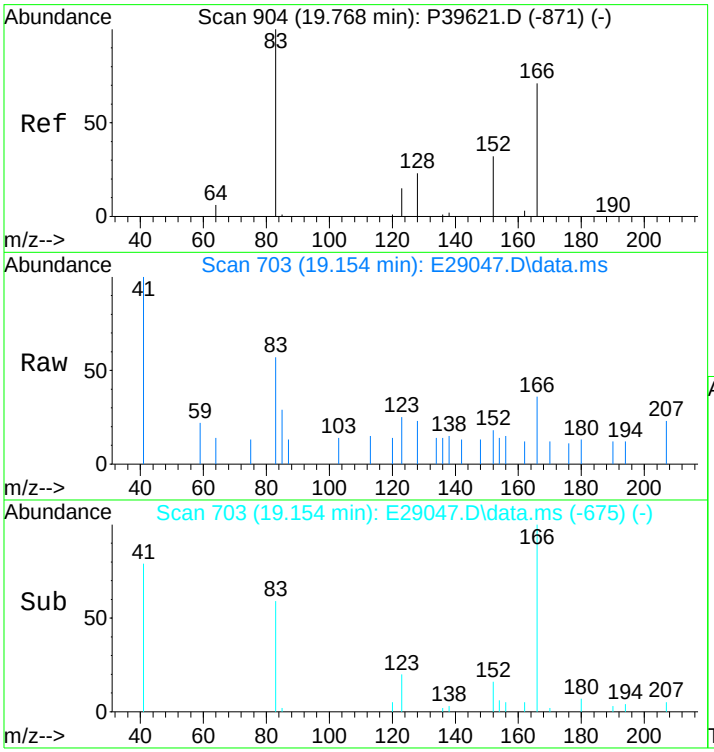




#5
C1-Decalins
Concen: 26.26 ng/mL m
RT: 17.814 min Scan# 614
Delta R.T. -0.010 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

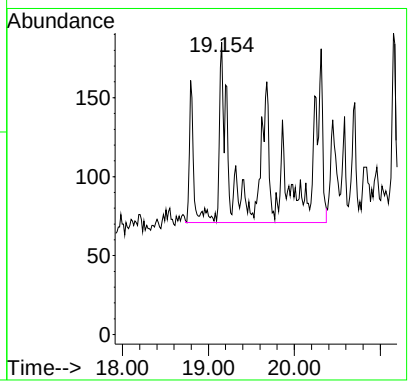
Tgt Ion:152 Resp: 821

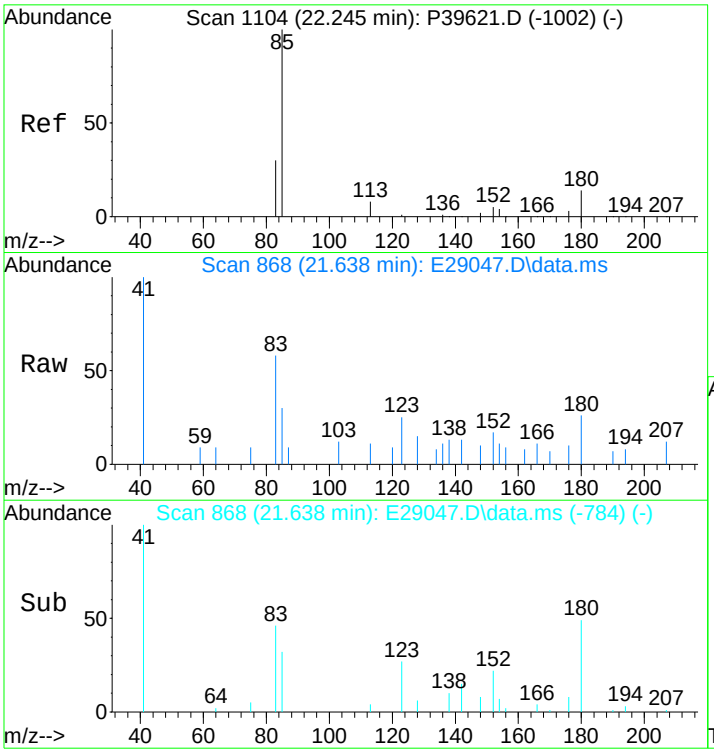




#6
C2-Decalins
Concen: 88.08 ng/mL m
RT: 19.154 min Scan# 703
Delta R.T. -0.200 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

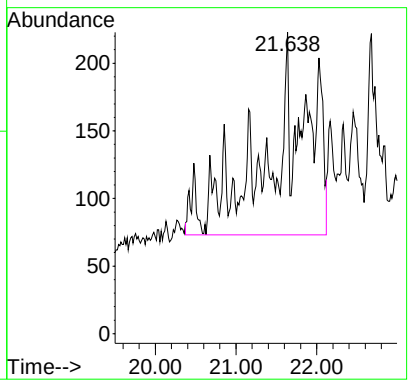
Tgt Ion:166 Resp: 2754

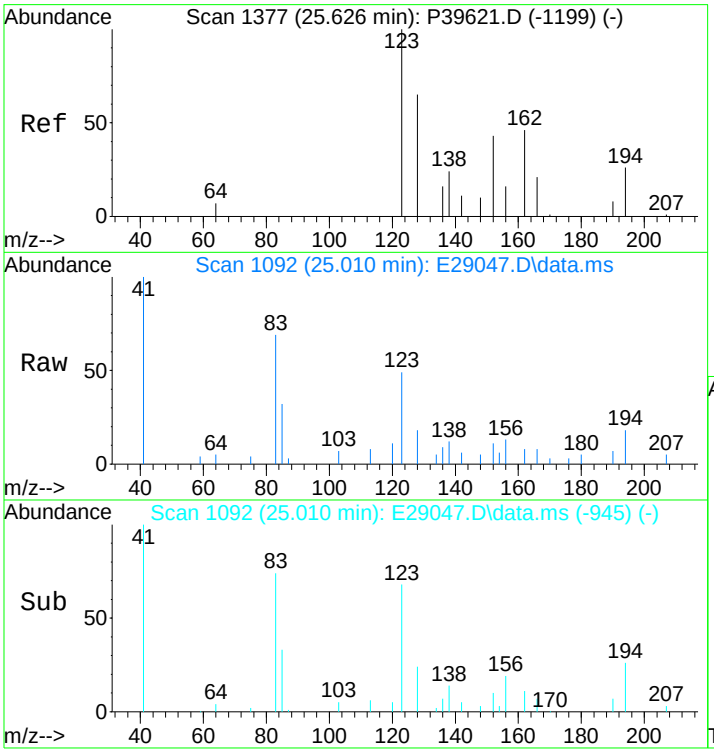




#7
C3-Decalins
Concen: 165.12 ng/mL m
RT: 21.638 min Scan# 868
Delta R.T. -0.120 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

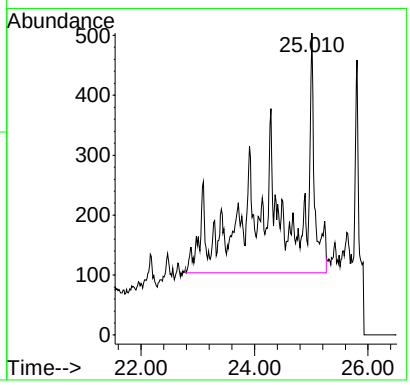
Tgt Ion:180 Resp: 5163

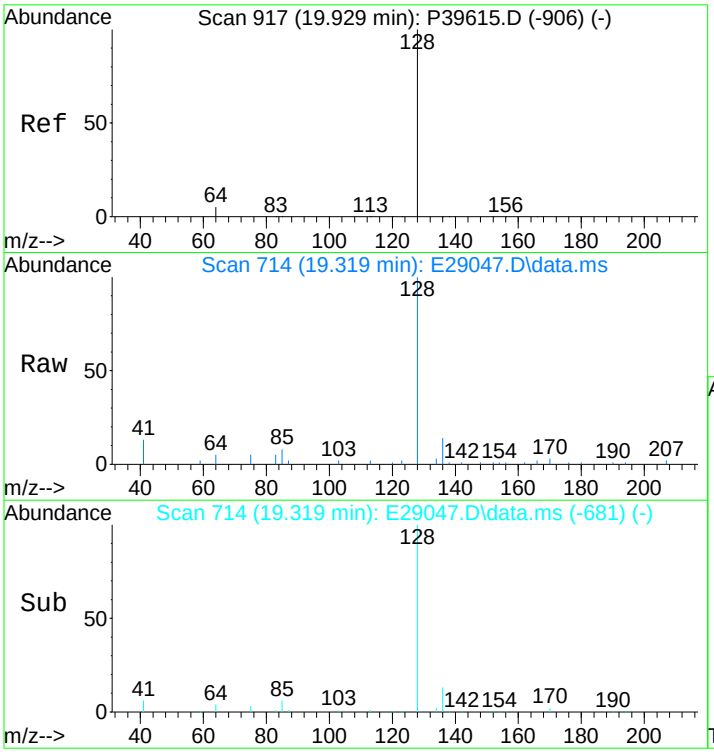




#8
C4-Decalins
Concen: 391.58 ng/mL m
RT: 25.010 min Scan# 1092
Delta R.T. -0.060 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:194 Resp: 12244

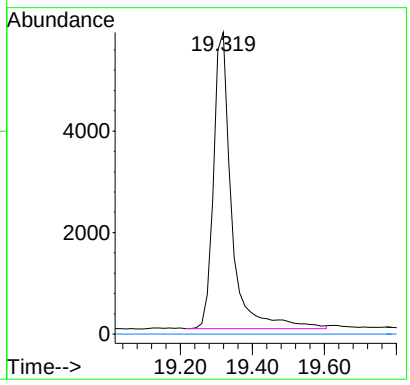


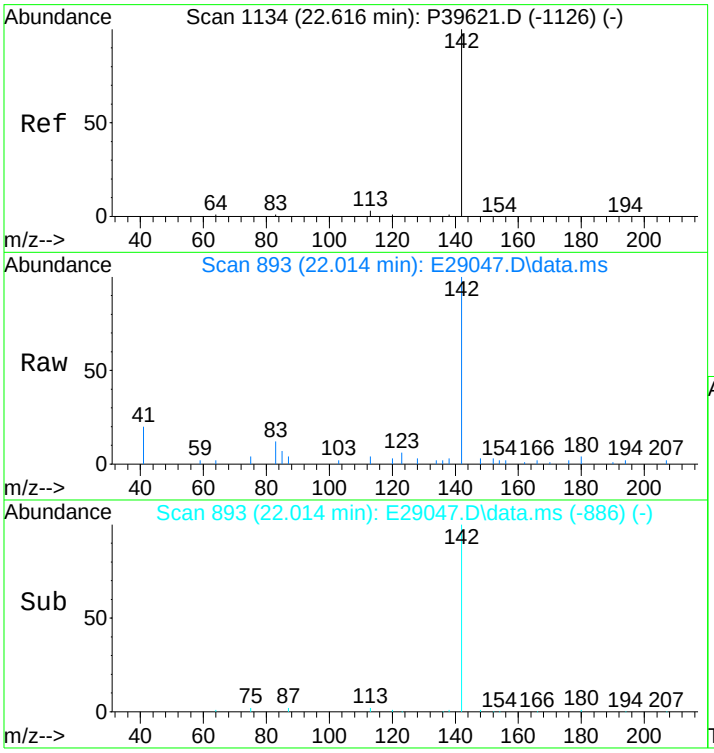


#10
Naphthalene
Concen: 133.51 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:128 Resp: 20528

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

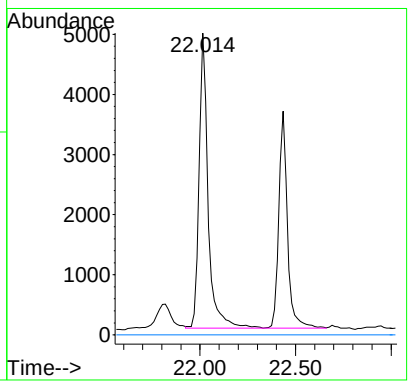


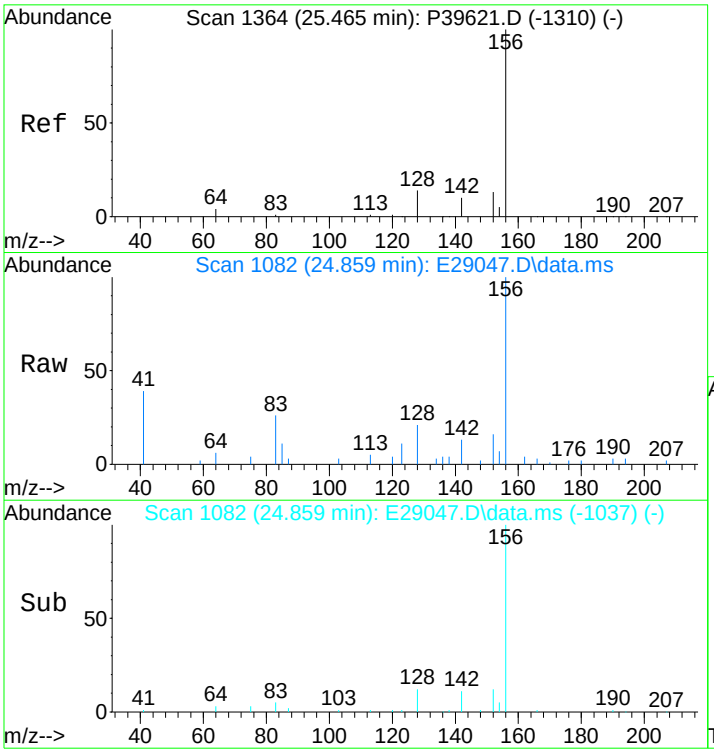


#11
C1-Naphthalenes
Concen: 178.49 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.124 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:142 Resp: 27445

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

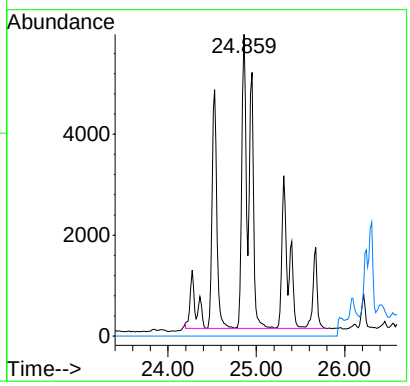


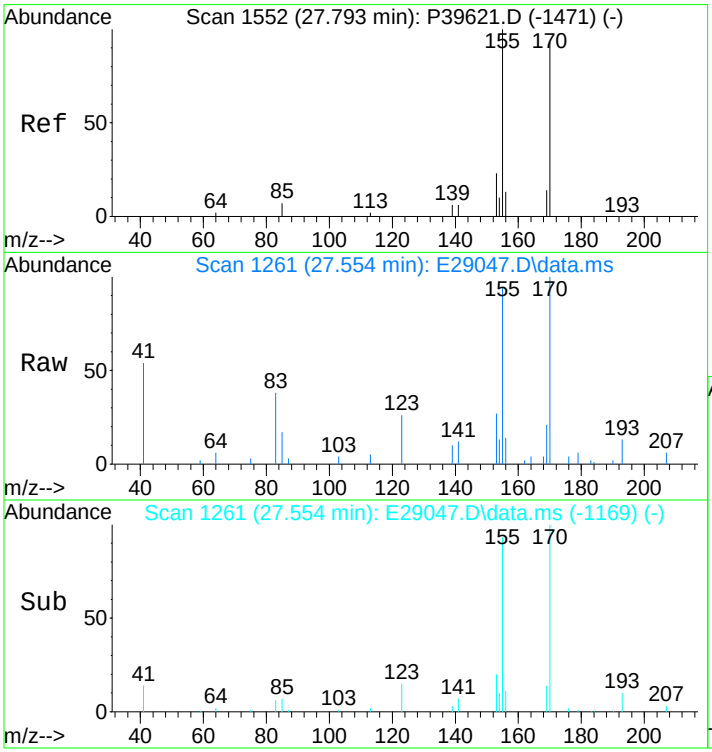


#12
C2-Naphthalenes
Concen: 518.65 ng/mL m
RT: 24.859 min Scan# 1082
Delta R.T. -0.050 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:156 Resp: 79748

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

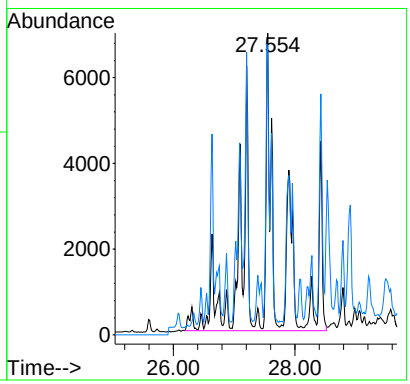


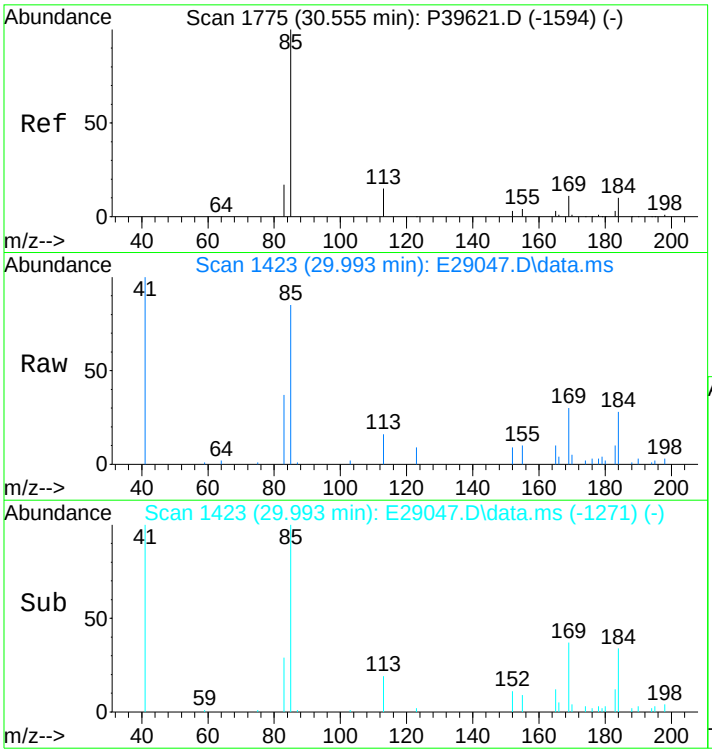


#13
C3-Naphthalenes
Concen: 902.27 ng/mL m
RT: 27.554 min Scan# 1261
Delta R.T. 0.358 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:170 Resp: 138734

Ion	Ratio	Lower	Upper
170	100		
155	15.1	66.8	100.2#

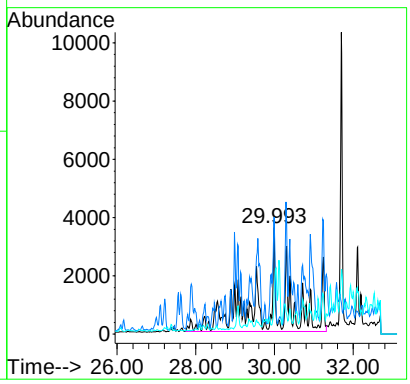


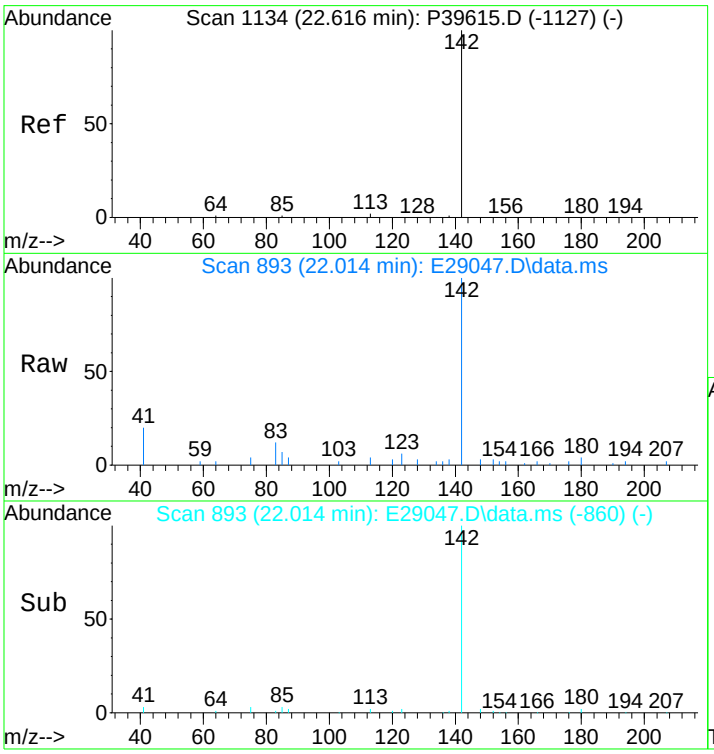


#14
C4-Naphthalenes
Concen: 848.45 ng/mL m
RT: 29.993 min Scan# 1423
Delta R.T. 0.099 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:184 Resp: 130459

Ion	Ratio	Lower	Upper
184	100		
169	4.5	78.7	118.1#
183	1.2	26.7	40.1#

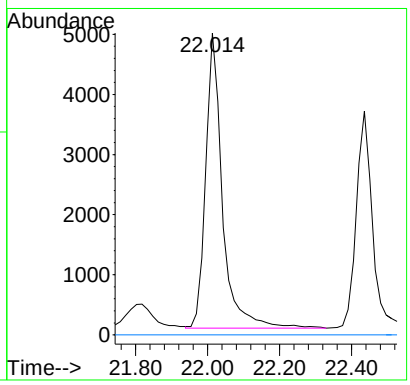


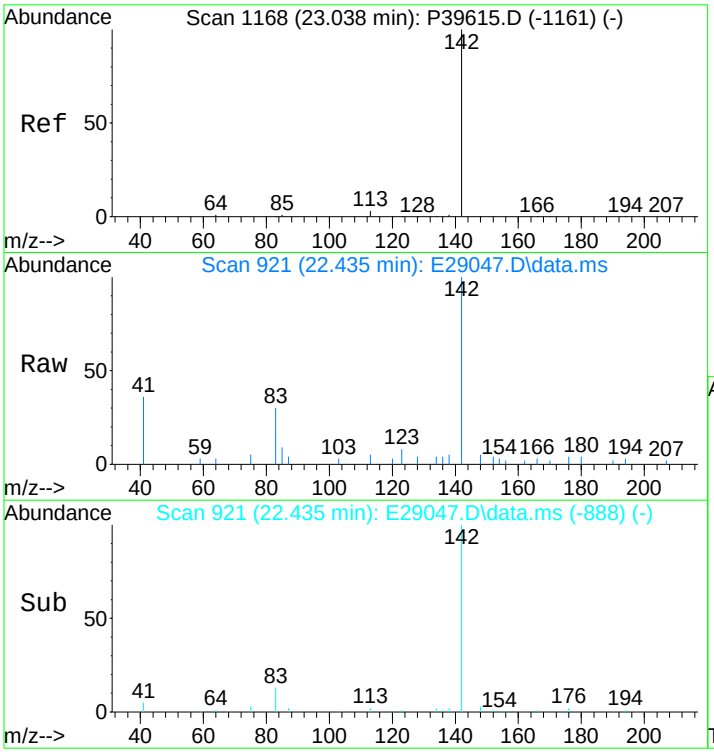


#16
2-Methylnaphthalene
Concen: 164.00 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:142 Resp: 16061

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

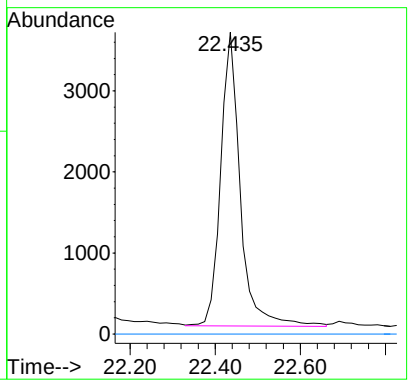


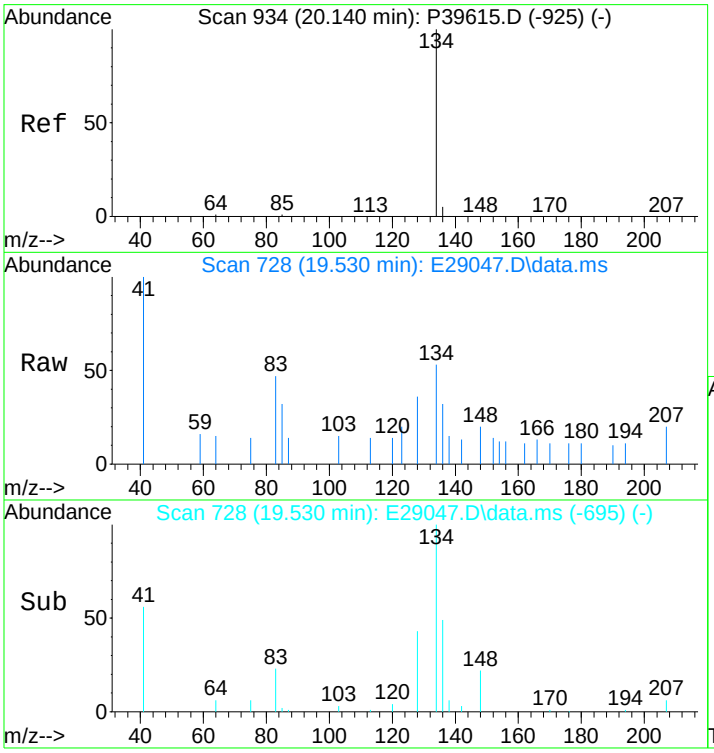


#17
1-Methylnaphthalene
Concen: 121.58 ng/mL
RT: 22.435 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:142 Resp: 11569

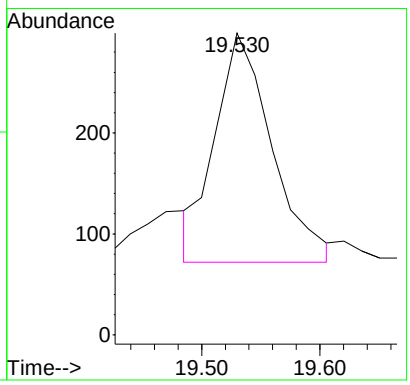
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

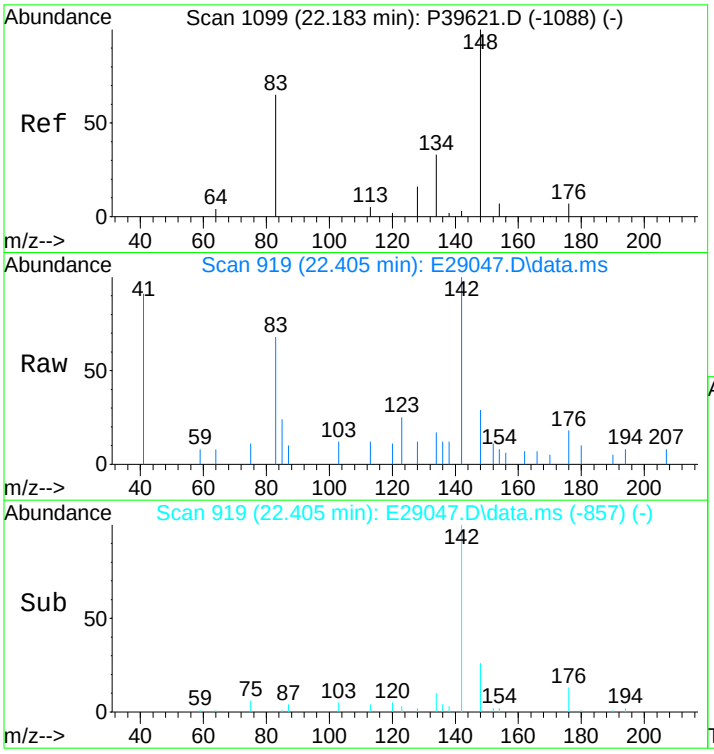




#18
Benzothiophene
Concen: 5.94 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

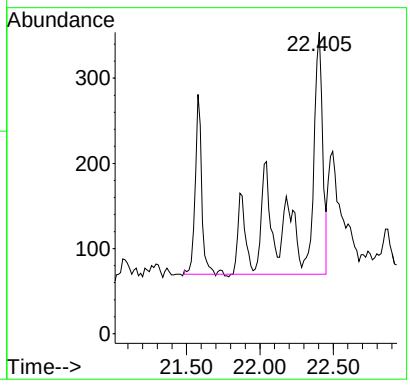
Tgt Ion:134 Resp: 755

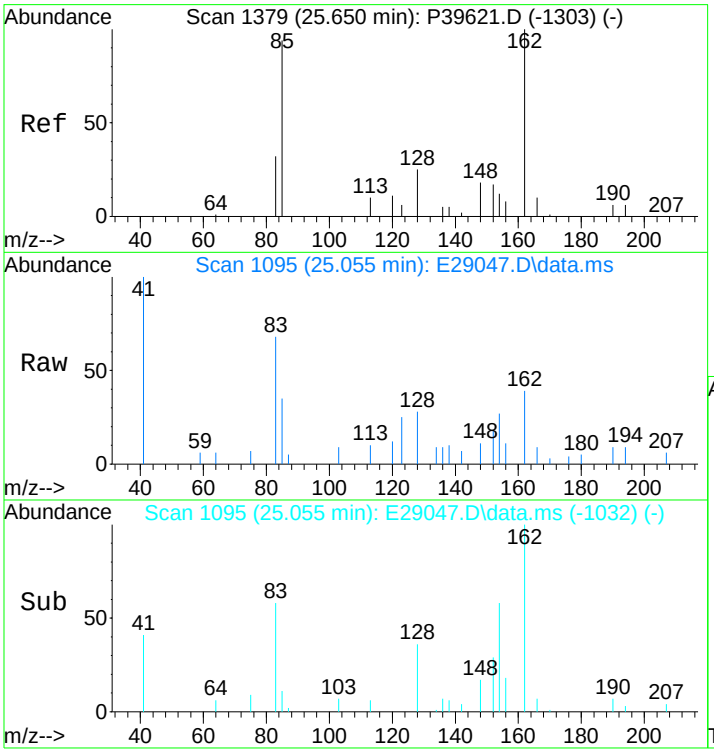




#19
C1-Benzo(b)thiophenes
Concen: 25.43 ng/mL m
RT: 22.405 min Scan# 919
Delta R.T. 0.692 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

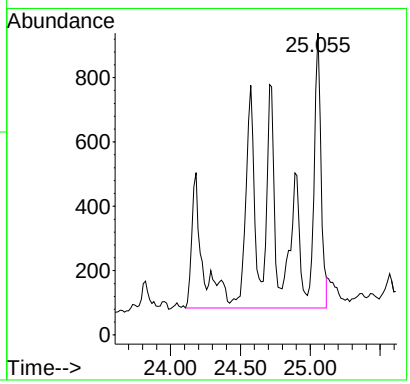
Tgt Ion:148 Resp: 3233

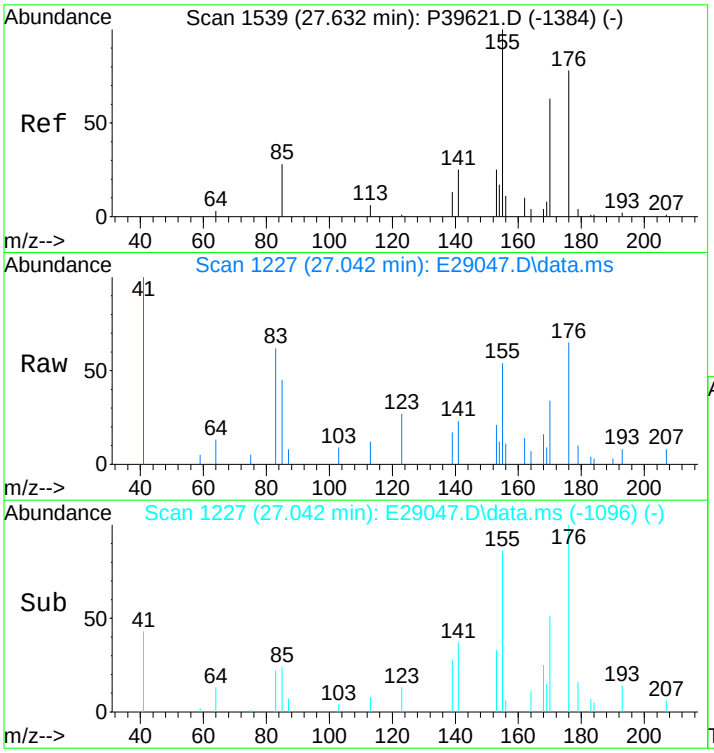




#20
C2-Benzo(b)thiophenes
Concen: 99.16 ng/mL m
RT: 25.055 min Scan# 1095
Delta R.T. -0.045 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

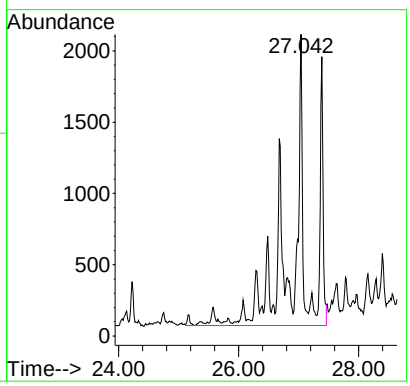
Tgt Ion:162 Resp: 12604

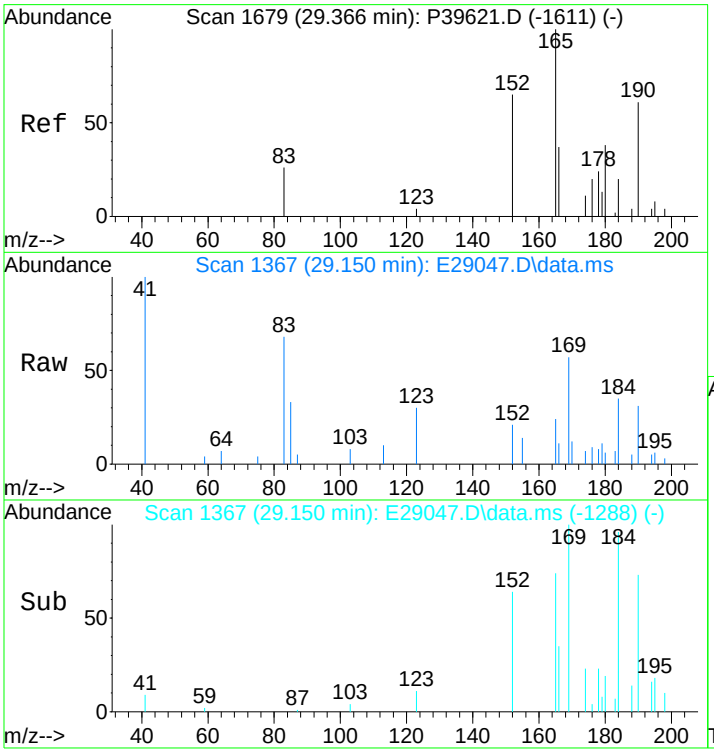




#21
C3-Benzo(b)thiophenes
Concen: 241.37 ng/mL m
RT: 27.042 min Scan# 1227
Delta R.T. 0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

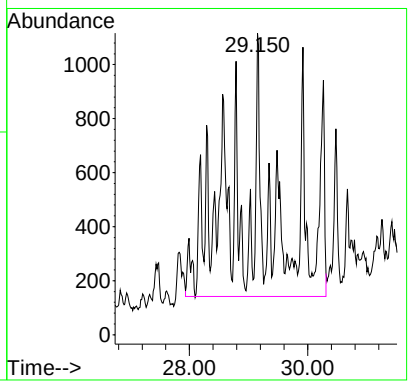
Tgt Ion:176 Resp: 30681

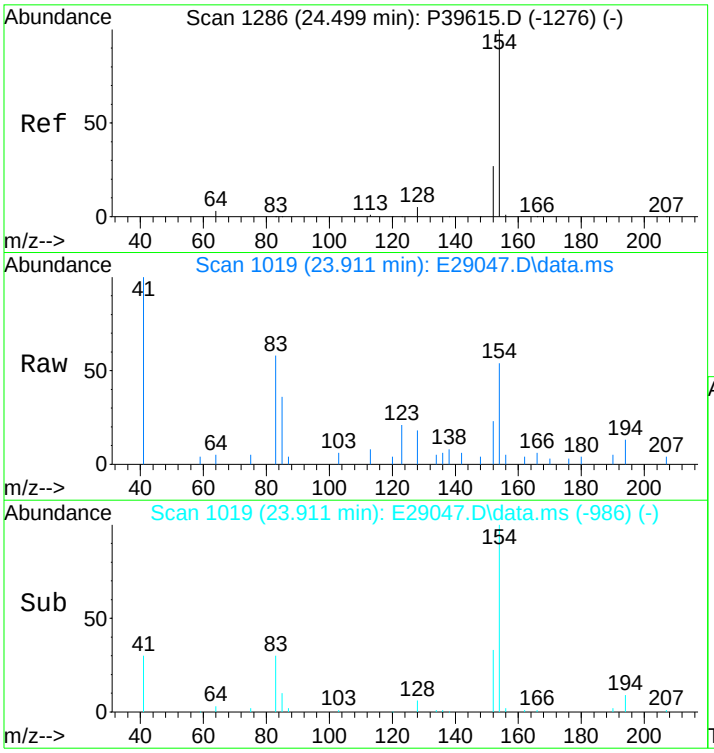




#22
C4-Benzo(b)thiophenes
Concen: 295.87 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. 0.063 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:190 Resp: 37609

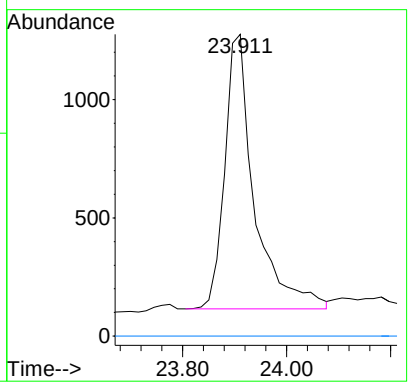


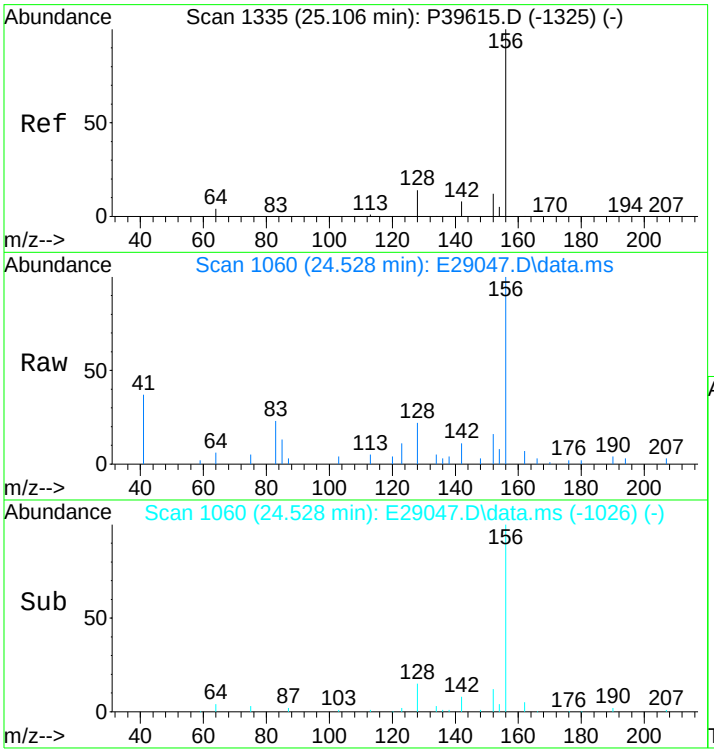


#23
Biphenyl
Concen: 36.96 ng/mL
RT: 23.911 min Scan# 1019
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:154 Resp: 4574

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

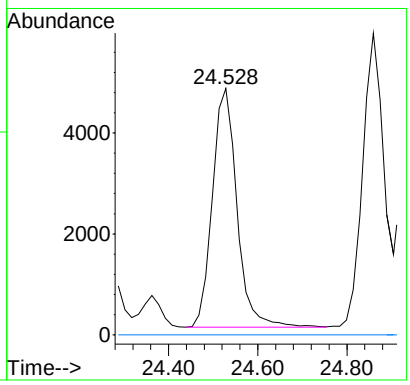


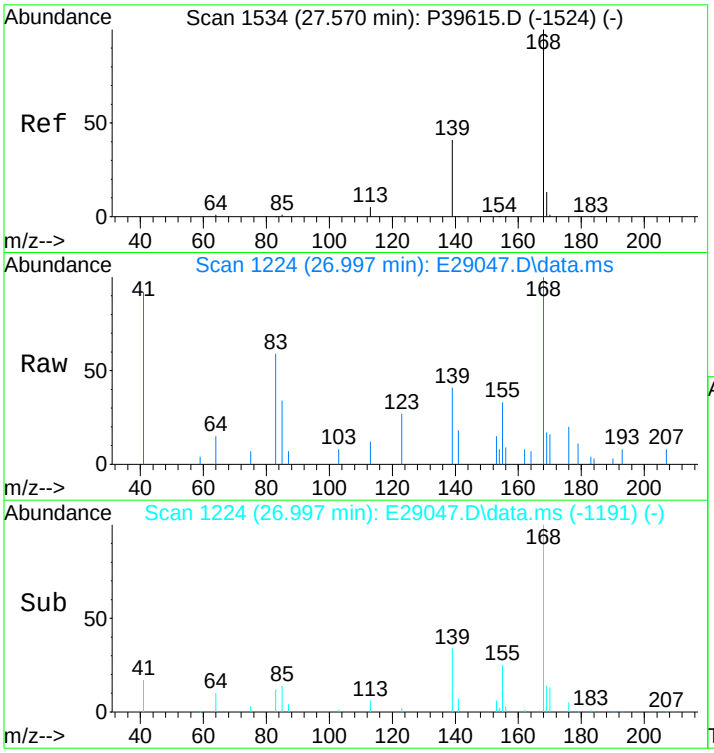


#24
2,6-Dimethylnaphthalene
Concen: 204.82 ng/mL
RT: 24.528 min Scan# 1060
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:156 Resp: 18080

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

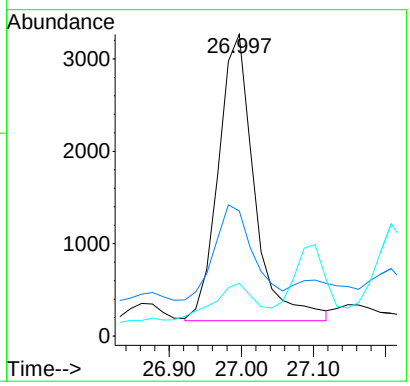


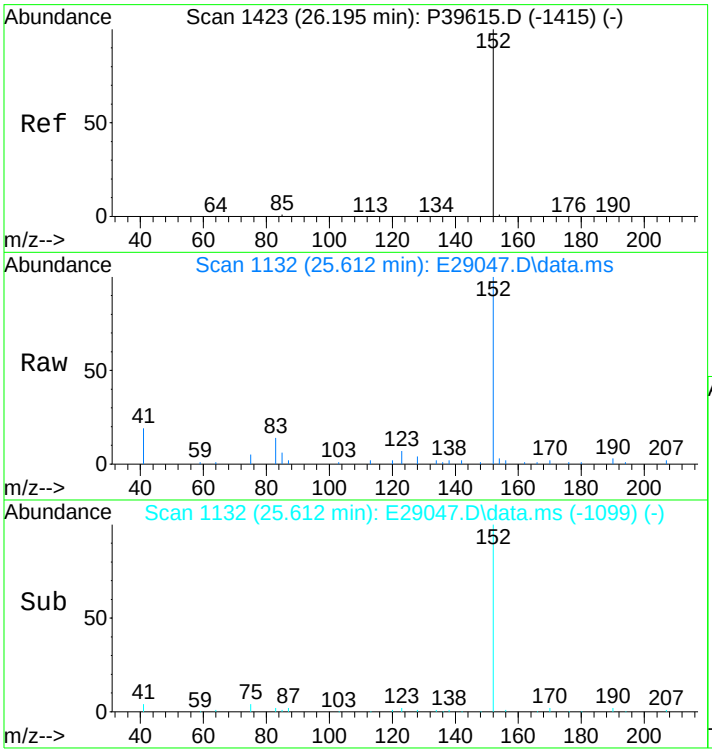


#25
Dibenzofuran
Concen: 78.44 ng/mL m
RT: 26.997 min Scan# 1224
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:168 Resp: 10749

Ion	Ratio	Lower	Upper
168	100		
139	35.3	26.9	40.3
169	17.9	10.7	16.1#

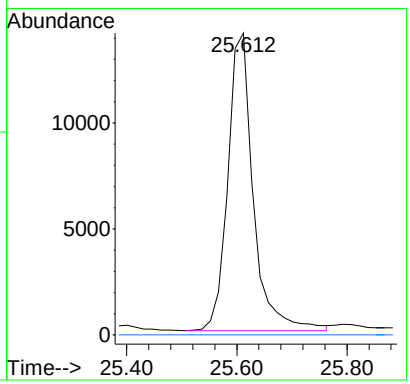


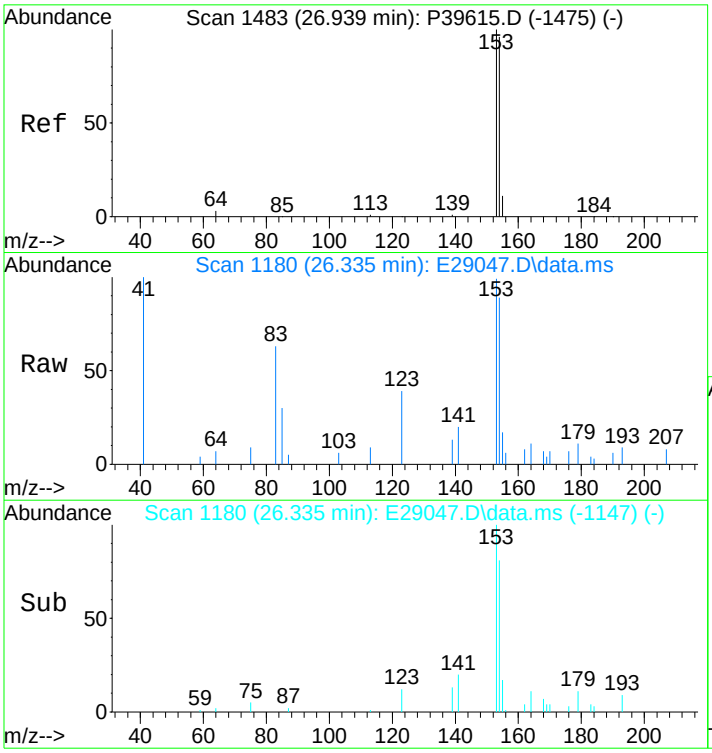


#26
Acenaphthylene
Concen: 293.95 ng/mL
RT: 25.612 min Scan# 1132
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:152 Resp: 45062

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

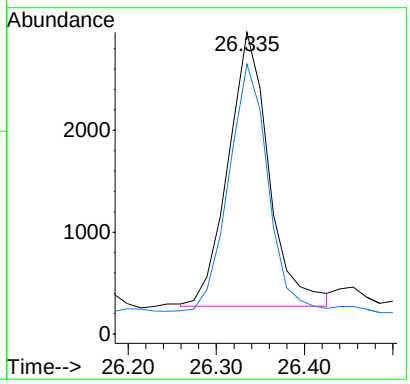


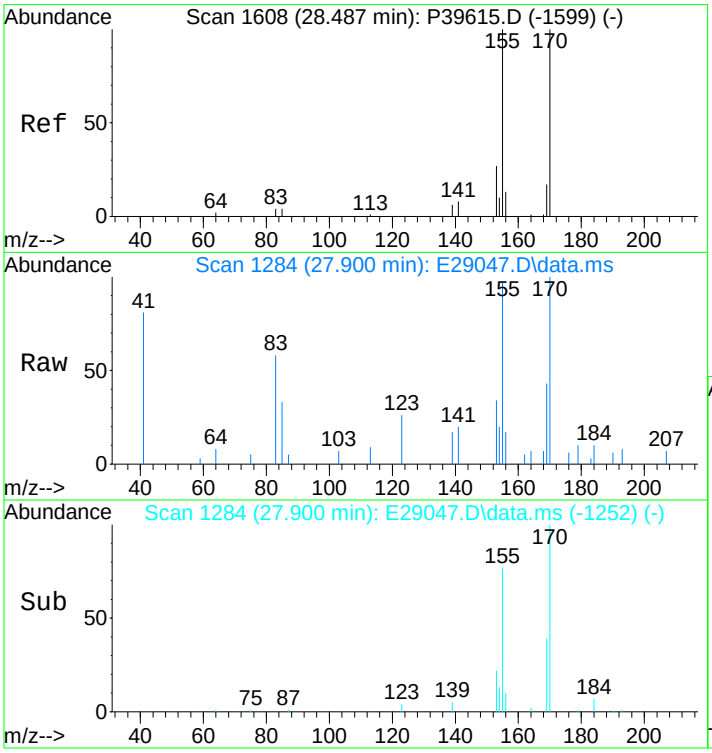


#27
Acenaphthene
Concen: 87.48 ng/mL m
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:153 Resp: 8632

Ion	Ratio	Lower	Upper
153	100		
154	87.0	73.0	109.4

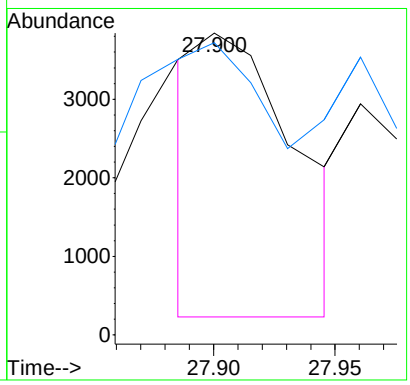


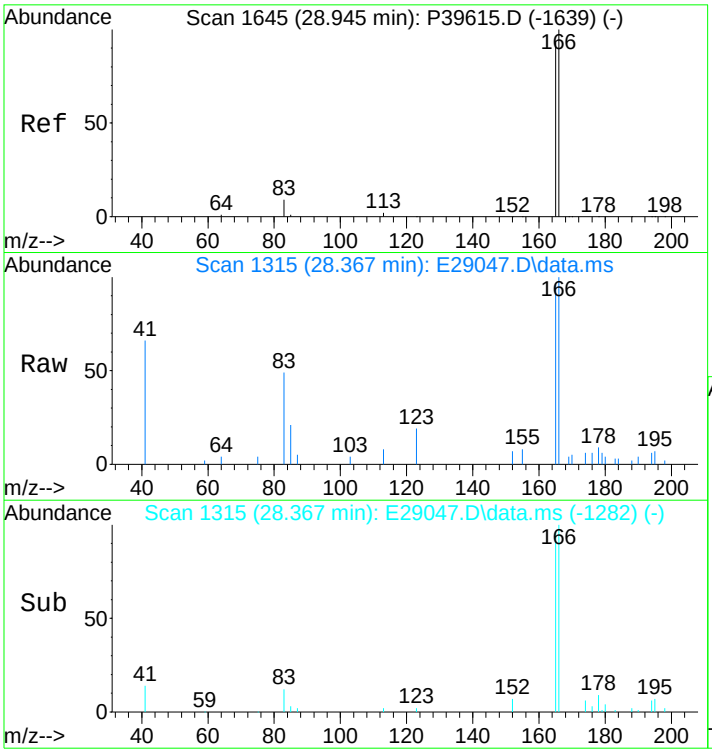


#28
2,3,5-Trimethylnaphthalene
Concen: 120.81 ng/mL m
RT: 27.900 min Scan# 1284
Delta R.T. -0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:170 Resp: 9977

Ion	Ratio	Lower	Upper
170	100		
155	160.1	69.8	104.6#

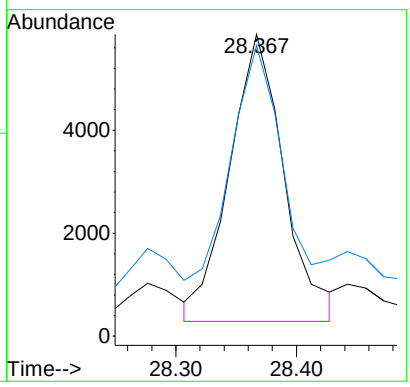


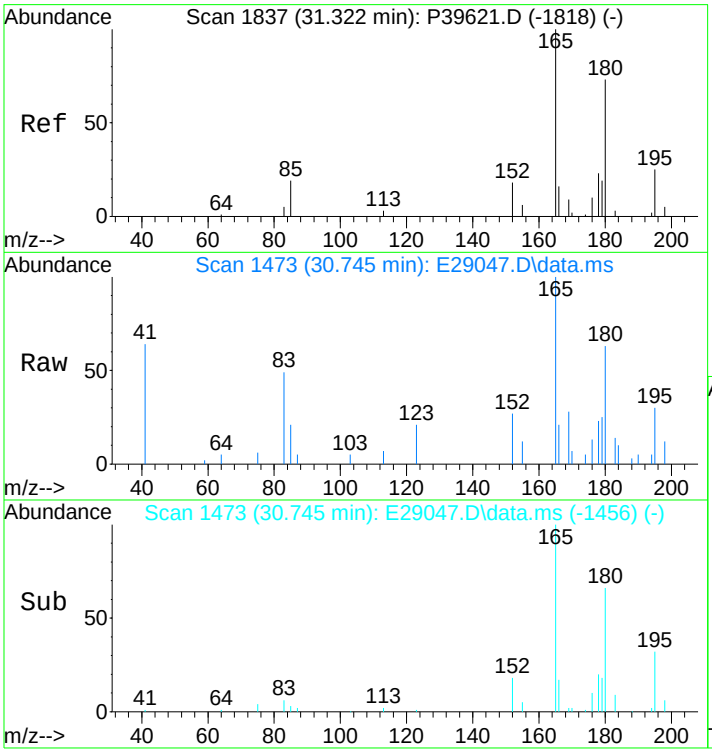


#29
Fluorene
Concen: 158.44 ng/mL m
RT: 28.367 min Scan# 1315
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:166 Resp: 17437

Ion	Ratio	Lower	Upper
166	100		
165	75.1	74.4	111.6

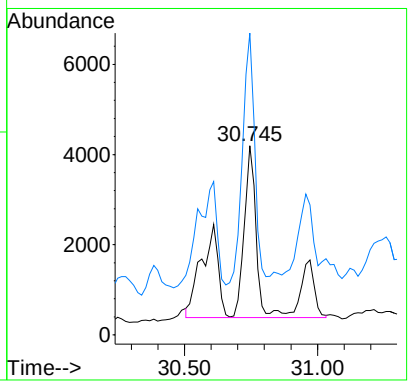


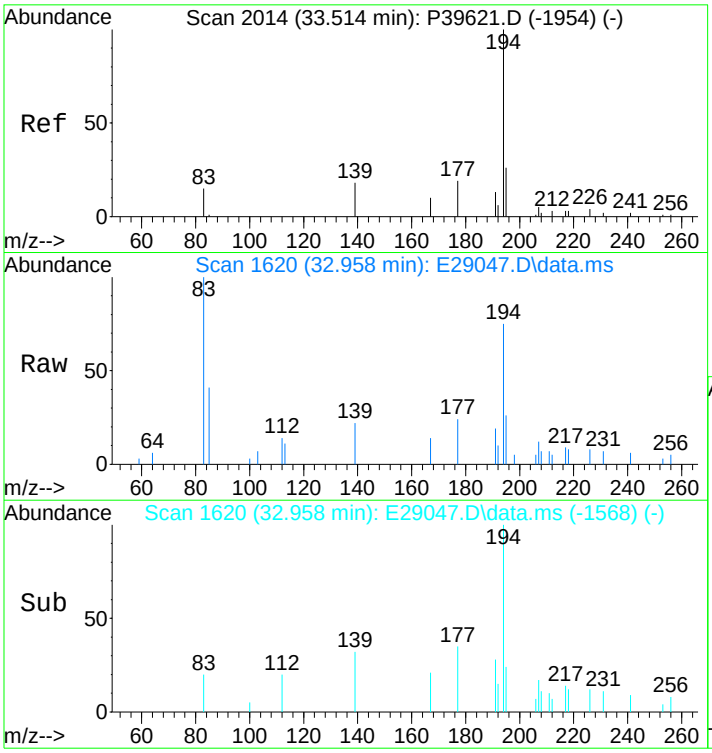


#30
C1-Fluorenes
Concen: 229.19 ng/mL m
RT: 30.745 min Scan# 1473
Delta R.T. 0.105 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:180 Resp: 25224

Ion	Ratio	Lower	Upper
180	100		
165	40.5	94.3	141.5#

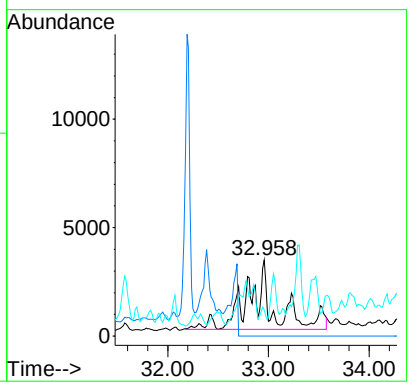


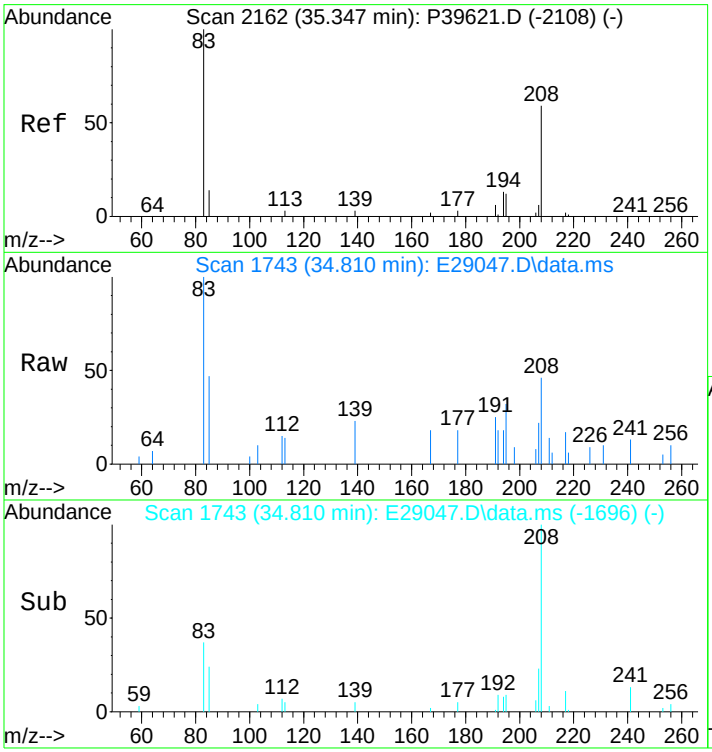


#31
C2-Fluorenes
Concen: 522.60 ng/mL m
RT: 32.958 min Scan# 1620
Delta R.T. 0.178 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:194 Resp: 57516

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	23.4	27.0	40.4#

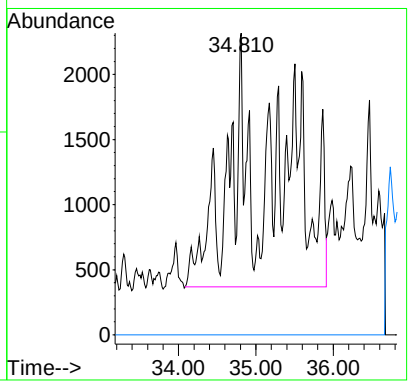


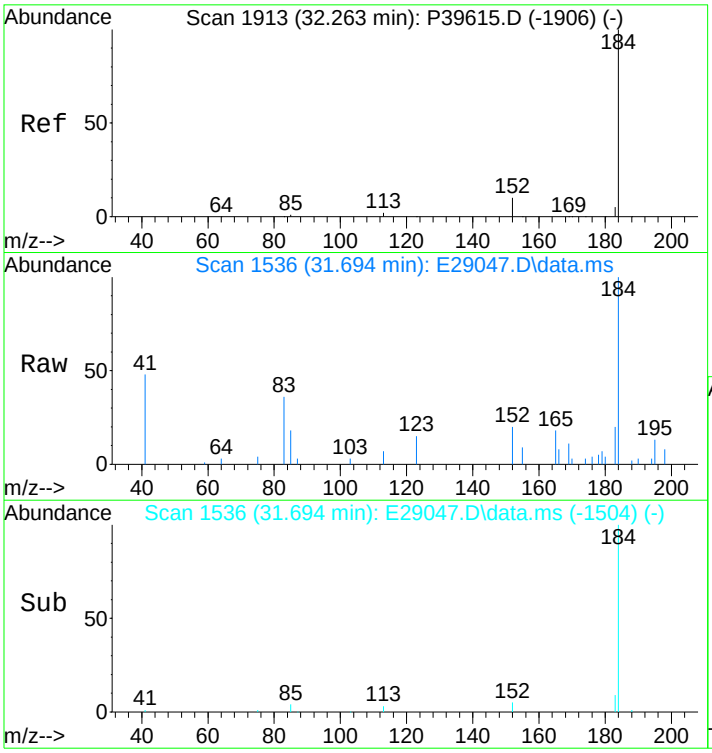


#32
C3-Fluorenes
Concen: 693.11 ng/mL m
RT: 34.810 min Scan# 1743
Delta R.T. 0.241 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:208 Resp: 76281

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

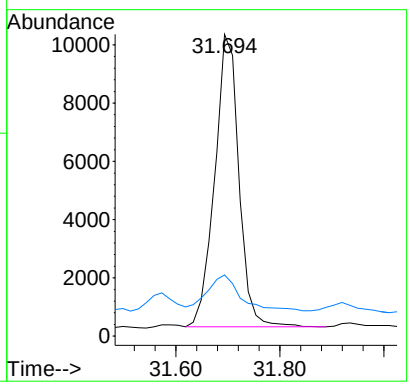


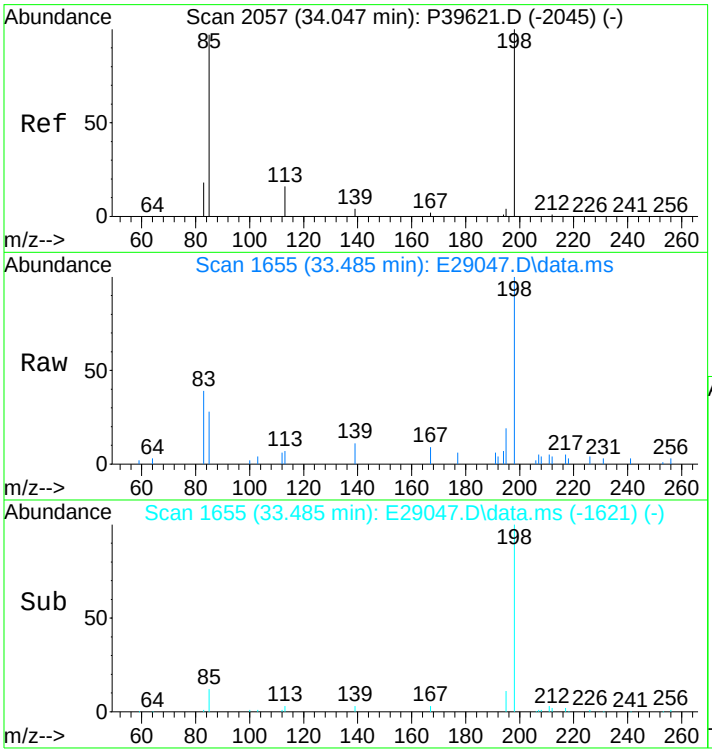


#33
Dibenzothiophene
Concen: 214.25 ng/mL
RT: 31.694 min Scan# 1536
Delta R.T. -0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:184 Resp: 32357

Ion	Ratio	Lower	Upper
184	100		
152	16.6	6.0	9.0#

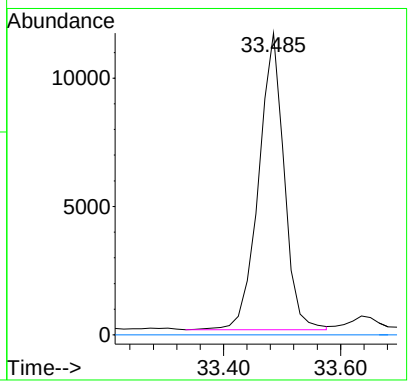


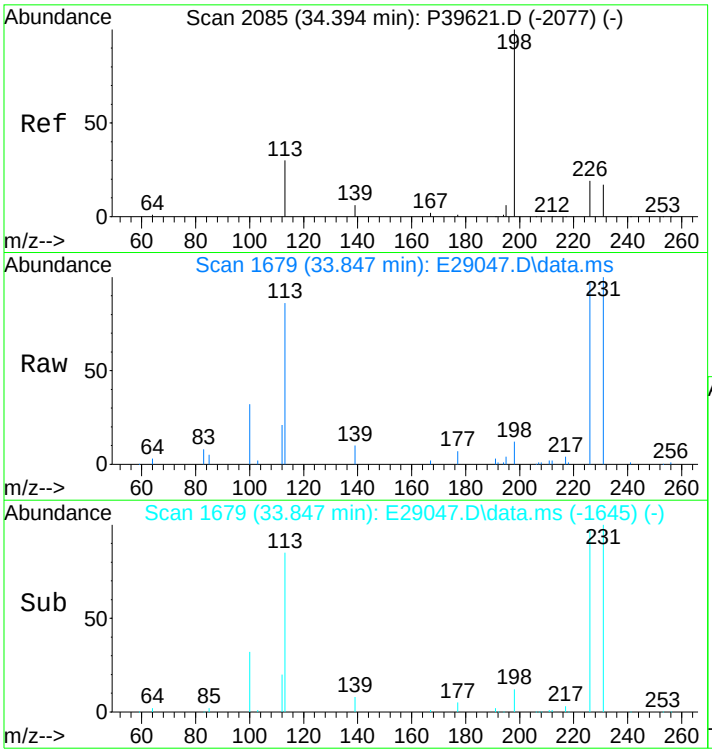


#34
4-Methyldibenzothiophene(4MDT)
Concen: 230.66 ng/mL
RT: 33.485 min Scan# 1655
Delta R.T. 0.011 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:198 Resp: 34836

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

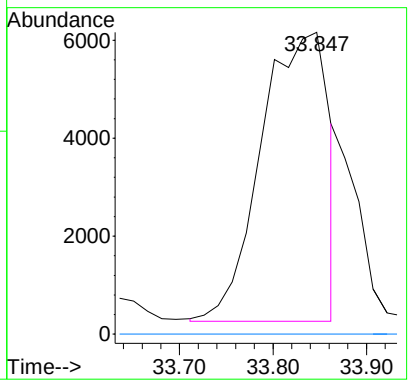


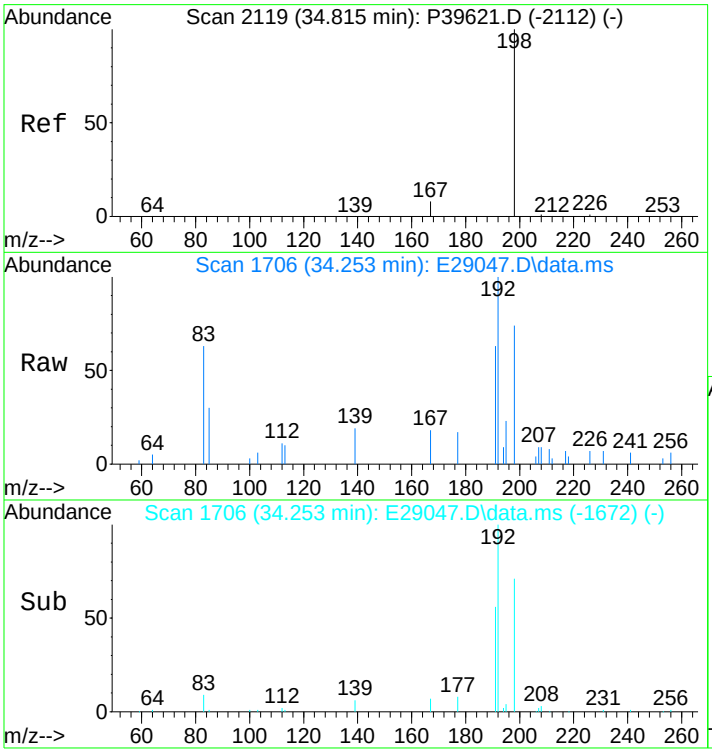


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 196.27 ng/mL m
RT: 33.847 min Scan# 1679
Delta R.T. 0.011 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:198 Resp: 29642

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

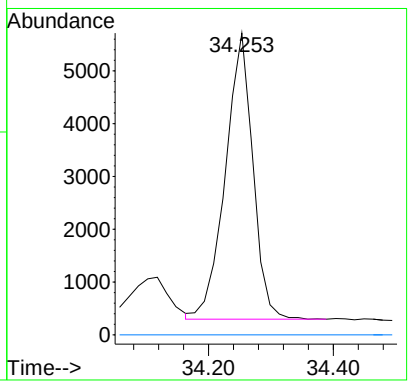


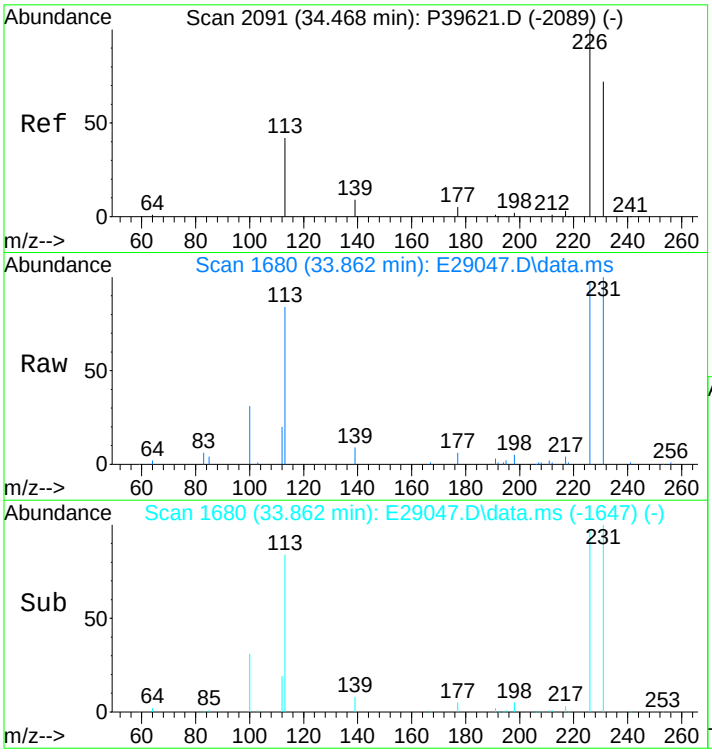


#36
1-Methyldibenzothiophene(1MDT)
Concen: 110.09 ng/mL
RT: 34.253 min Scan# 1706
Delta R.T. 0.011 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:198 Resp: 16626

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

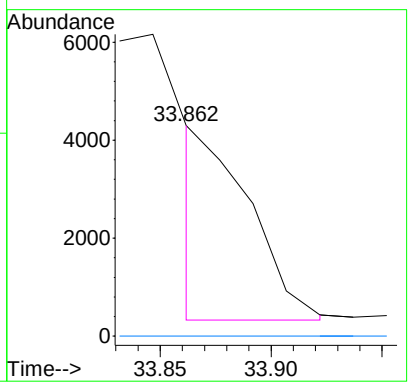


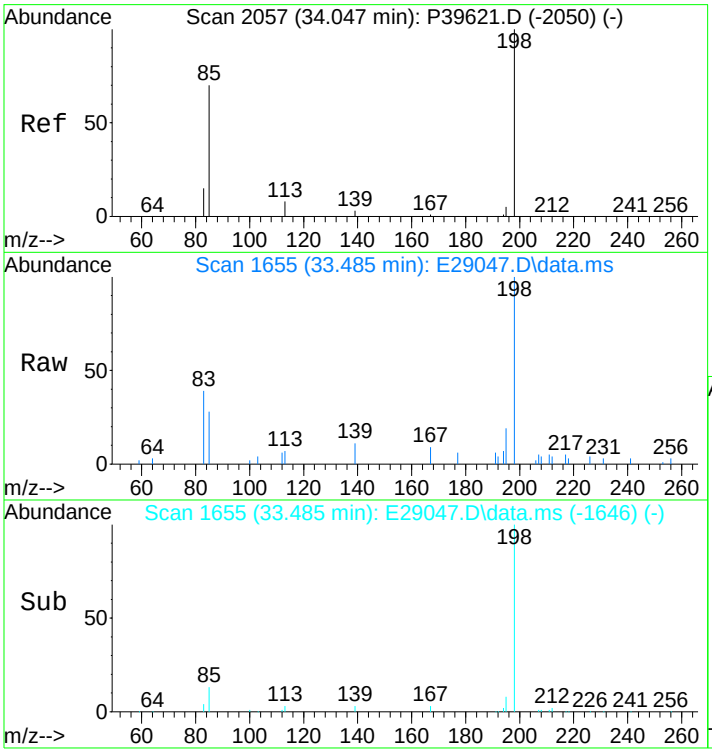


#37
OTP
Concen: 37.97 ng/mL m
RT: 33.862 min Scan# 1680
Delta R.T. -0.034 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:198 Resp: 5734

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

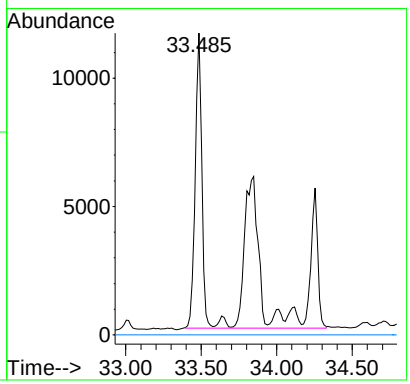


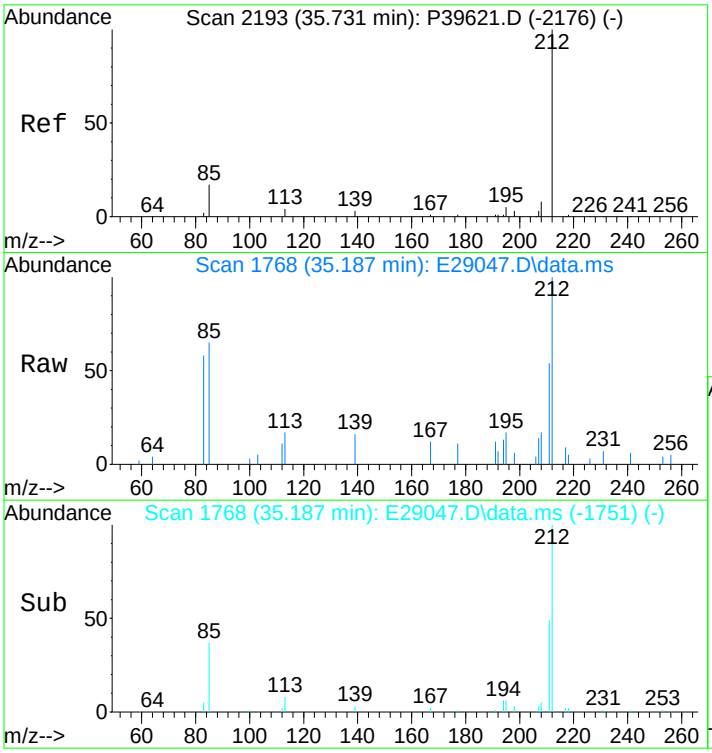


#38
C1-Dibenzothiophenes
Concen: 626.08 ng/mL m
RT: 33.485 min Scan# 1655
Delta R.T. 0.073 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:198 Resp: 94555

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

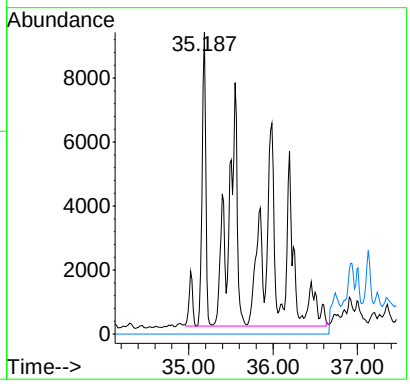


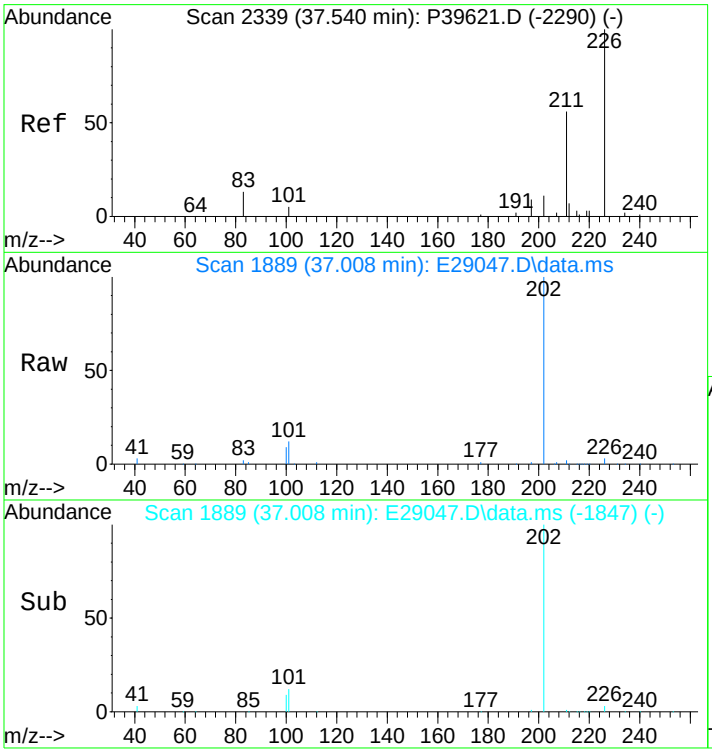


#39
C2-Dibenzothiophenes
Concen: 1161.90 ng/mL m
RT: 35.187 min Scan# 1768
Delta R.T. 0.010 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:212 Resp: 175479

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

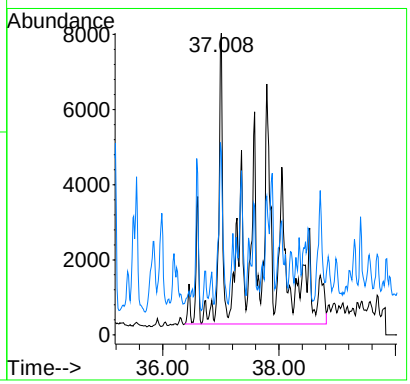


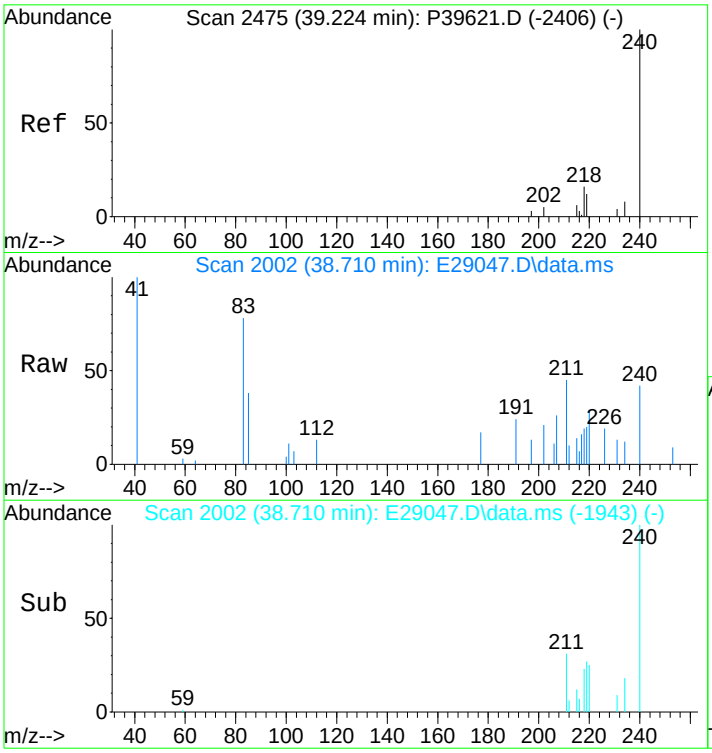


#40
C3-Dibenzothiophenes
Concen: 1394.09 ng/mL m
RT: 37.008 min Scan# 1889
Delta R.T. 0.299 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:226 Resp: 210546

Ion	Ratio	Lower	Upper
226	100		
211	1.8	44.1	66.1#

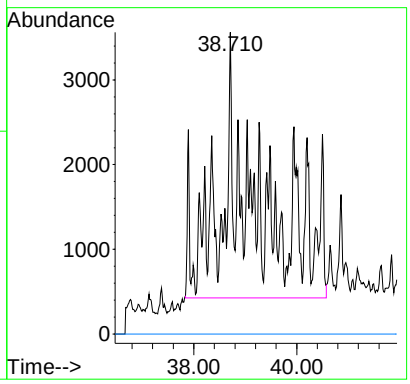


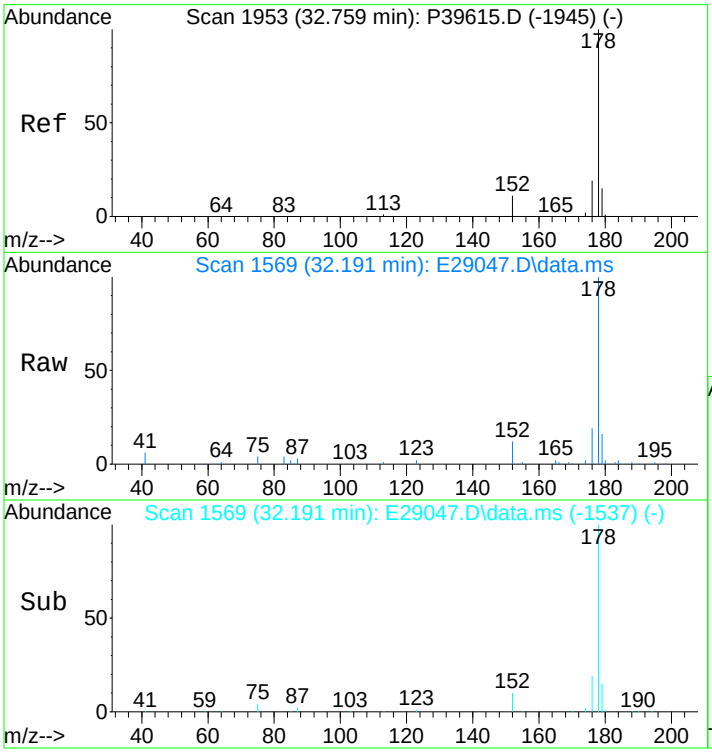


#41
C4-Dibenzothiophenes
Concen: 989.05 ng/mL m
RT: 38.710 min Scan# 2002
Delta R.T. 0.343 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:240 Resp: 149374

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

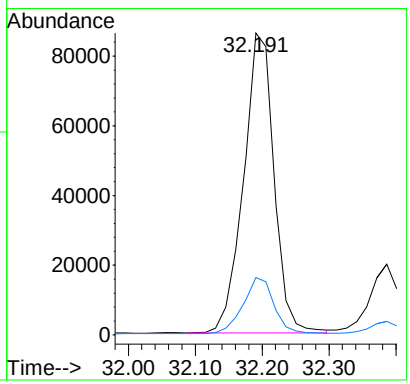


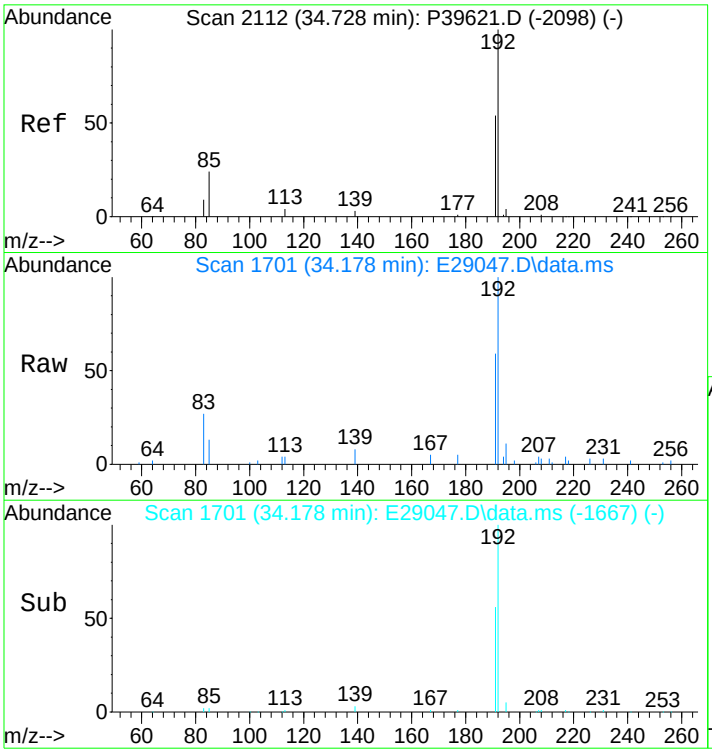


#43
Phenanthrene
Concen: 1781.18 ng/mL
RT: 32.191 min Scan# 1569
Delta R.T. -0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:178 Resp: 273686

Ion	Ratio	Lower	Upper
178	100		
176	19.0	14.6	21.8

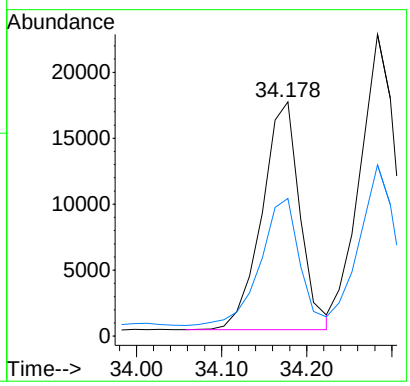


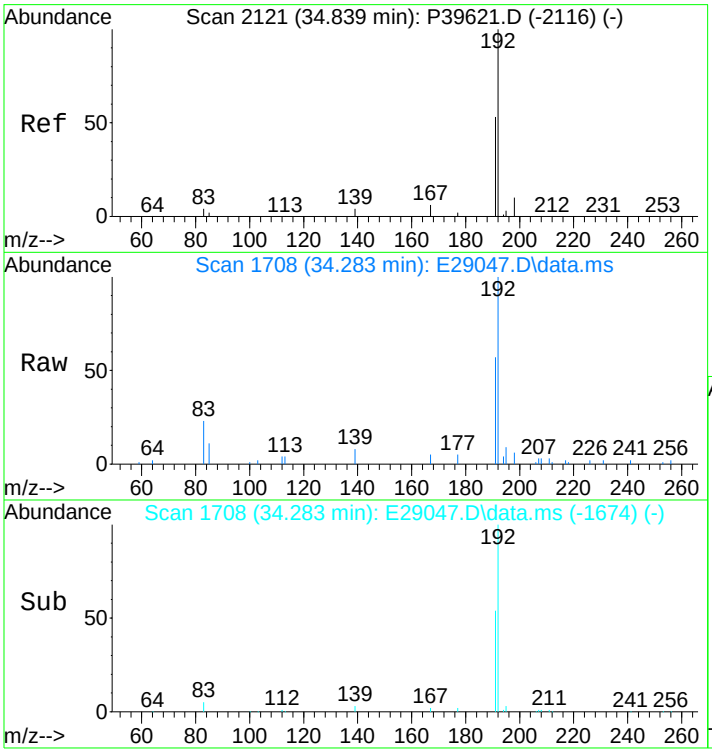


#44
3-Methylphenanthrene(3MP)
Concen: 348.33 ng/mL
RT: 34.178 min Scan# 1701
Delta R.T. 0.011 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 53523

Ion	Ratio	Lower	Upper
192	100		
191	57.7	45.9	68.9

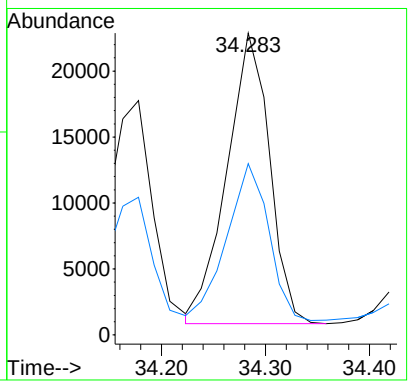


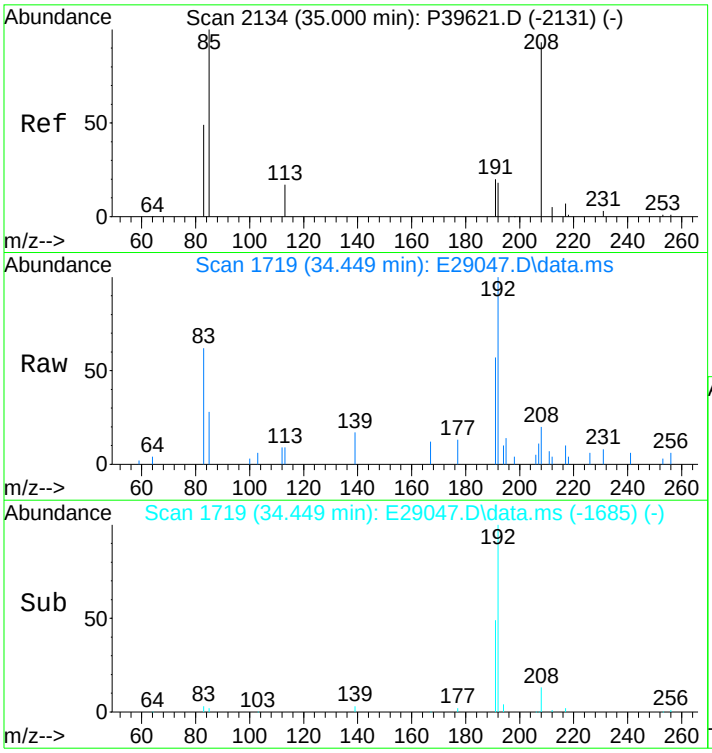


#45
2-Methylphenanthrene(2MP)
Concen: 408.93 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.011 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 62834

Ion	Ratio	Lower	Upper
192	100		
191	52.7	45.4	68.0

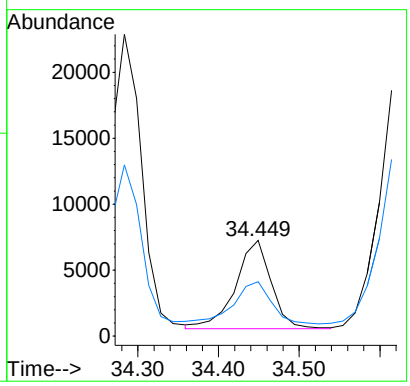


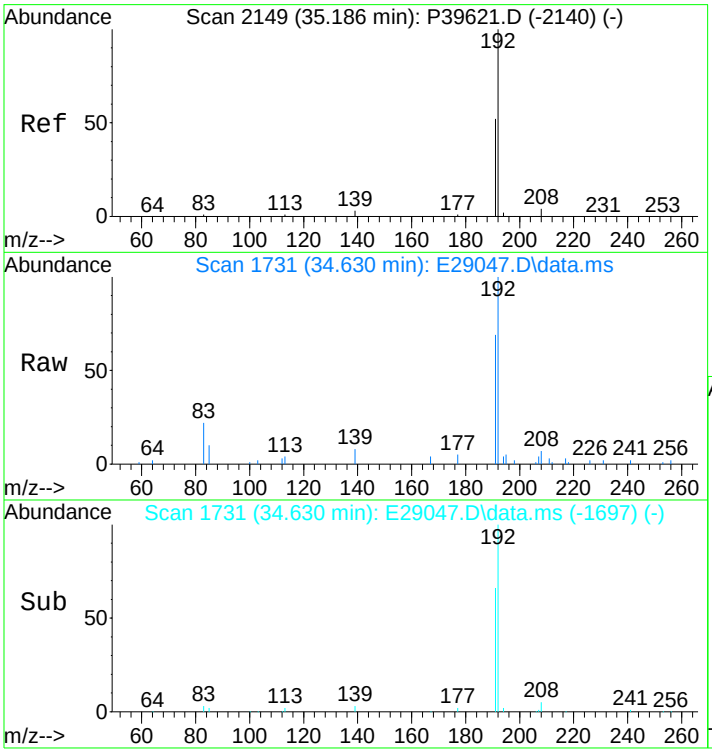


#46
2-Methylanthracene(2MA)
Concen: 134.09 ng/mL m
RT: 34.449 min Scan# 1719
Delta R.T. 0.010 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 20604

Ion	Ratio	Lower	Upper
192	100		
191	50.5	95.4	143.0#

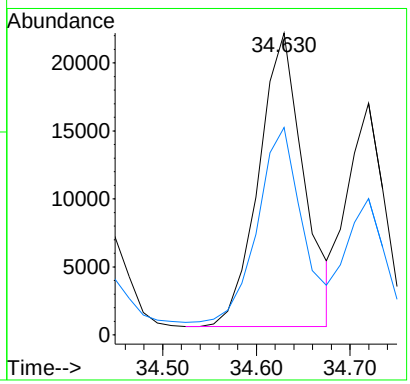


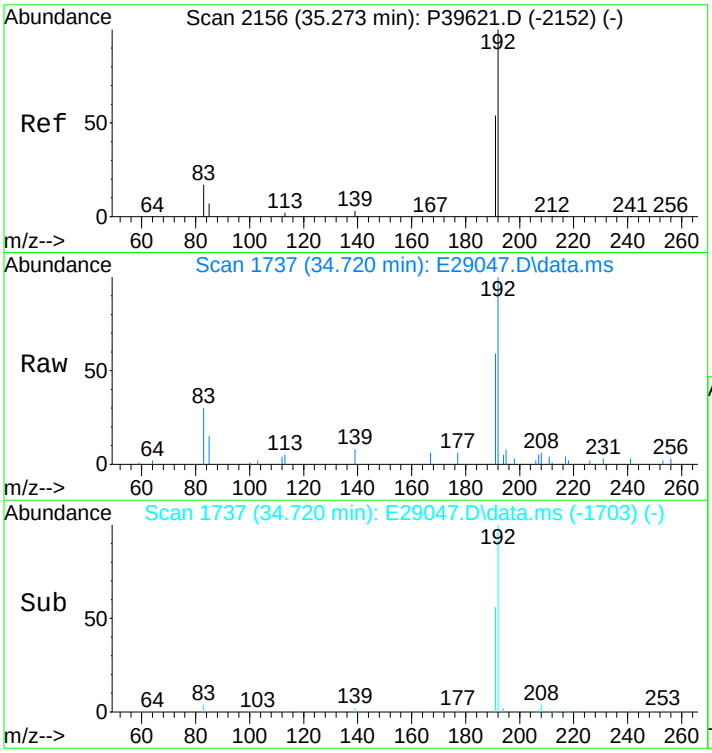


#47
9/4-Methylphenanthrene(9MP)
Concen: 471.05 ng/mL
RT: 34.630 min Scan# 1731
Delta R.T. 0.010 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 72379

Ion	Ratio	Lower	Upper
192	100		
191	65.7	44.3	66.5

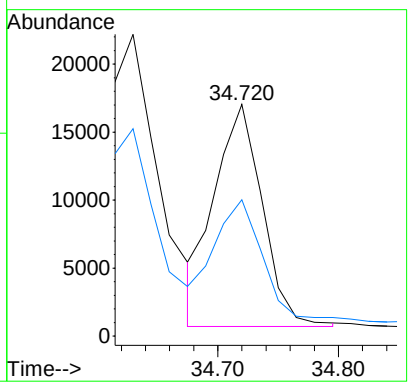


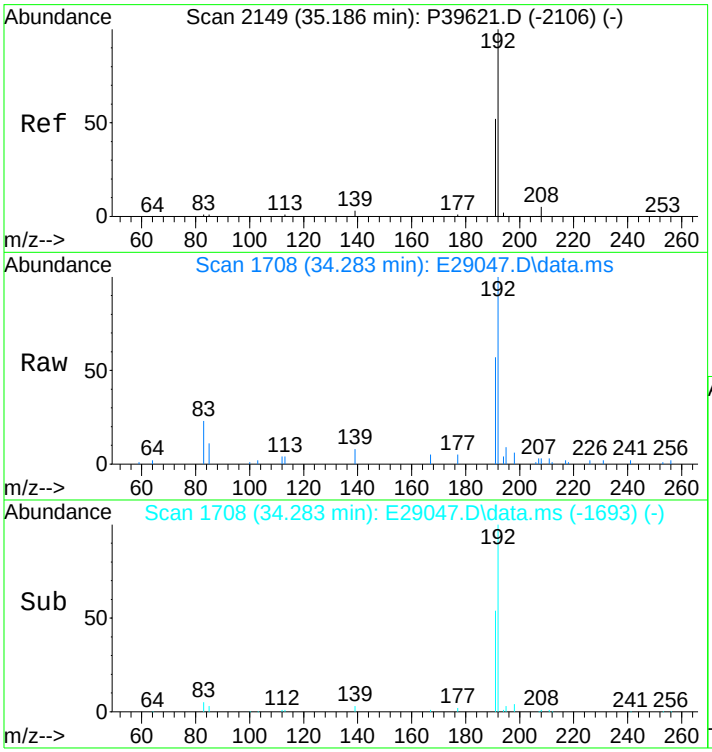


#48
1-Methylphenanthrene(1MP)
Concen: 295.18 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.010 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 45356

Ion	Ratio	Lower	Upper
192	100		
191	57.0	46.7	70.1

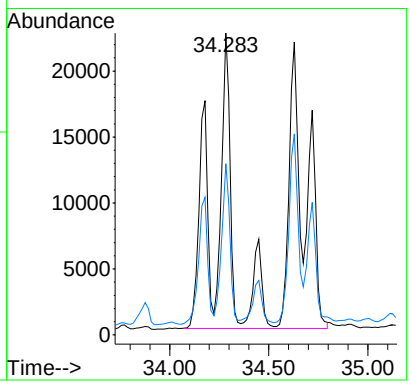


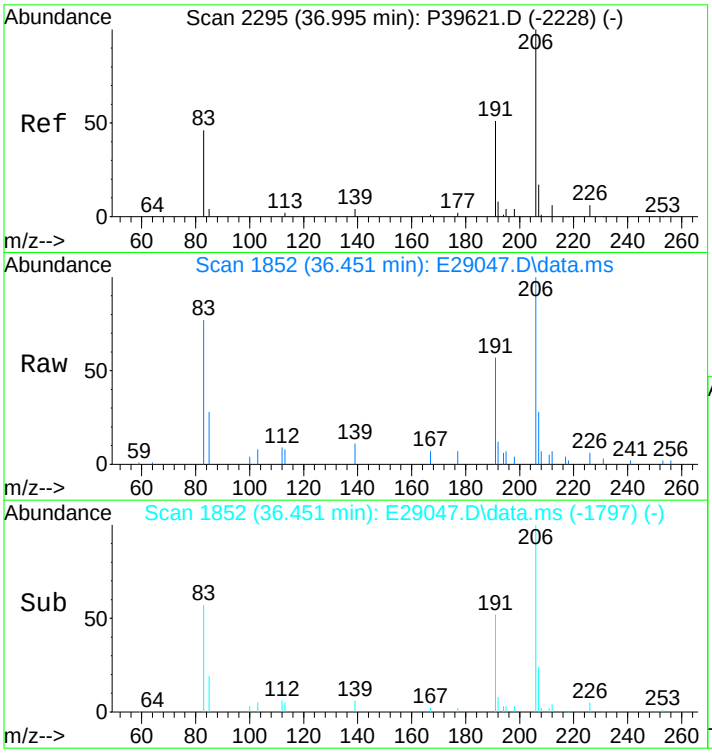


#49
C1-Phenanthrenes/Anthracenes
Concen: 1701.15 ng/mL m
RT: 34.283 min Scan# 1708
Delta R.T. -0.139 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 261390

Ion	Ratio	Lower	Upper
192	100		
191	4.0	44.0	66.0#

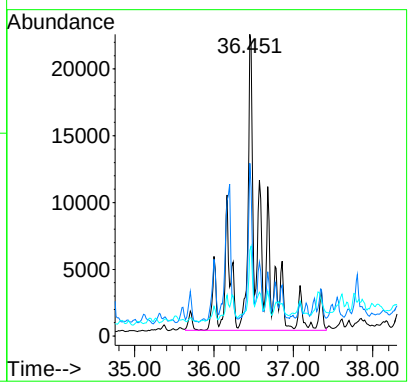


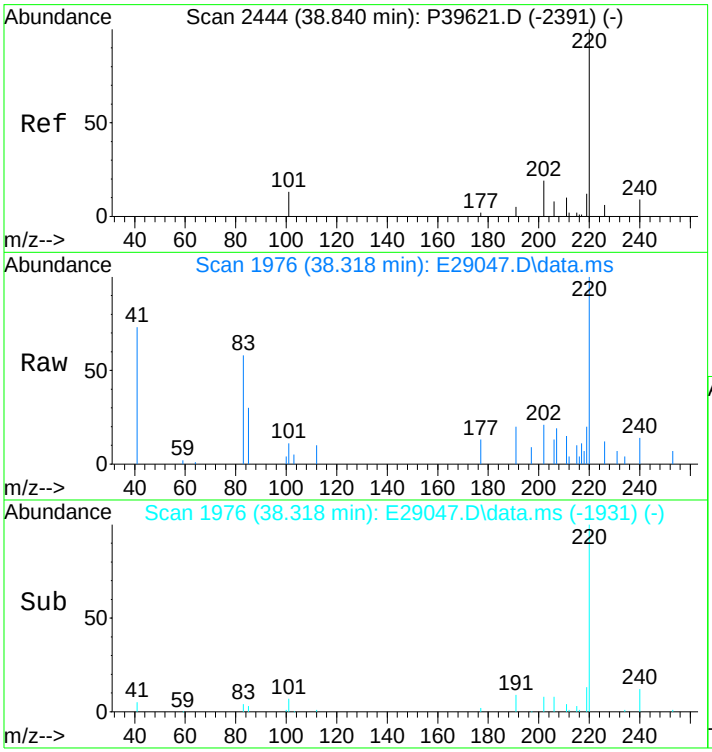


#50
C2-Phenanthrenes/Anthracenes
Concen: 1824.15 ng/mL m
RT: 36.451 min Scan# 1852
Delta R.T. 0.270 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:206 Resp: 280289

Ion	Ratio	Lower	Upper
206	100		
191	14.4	35.7	53.5#
207	7.0	16.5	24.7#

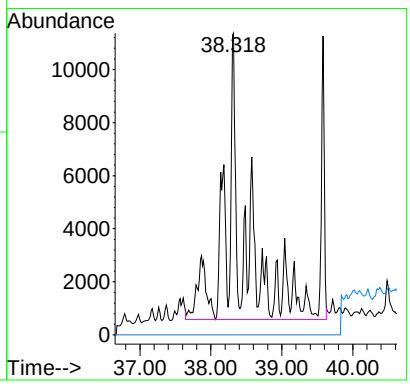


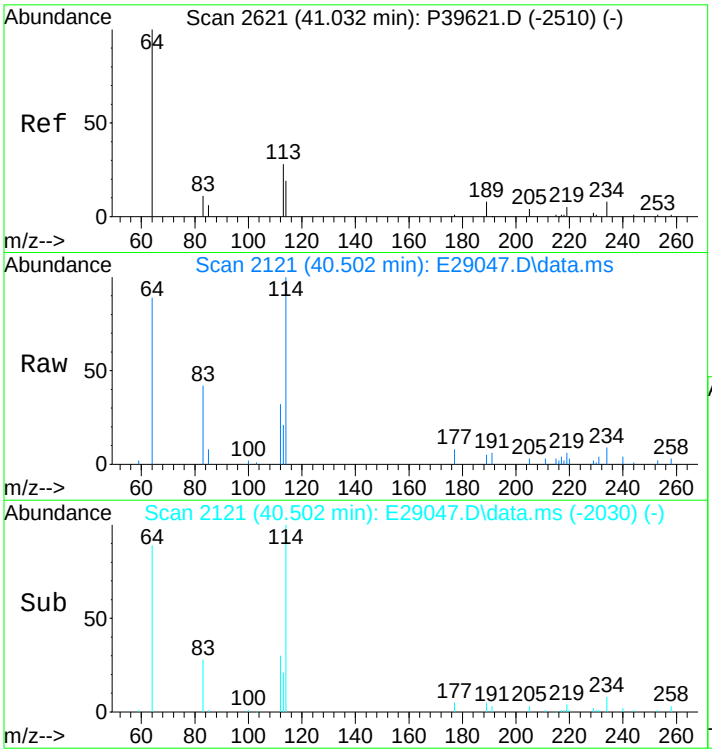


#52
C3-Phenanthrenes/Anthracenes
Concen: 1392.43 ng/mL m
RT: 38.318 min Scan# 1976
Delta R.T. 0.334 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:220 Resp: 213953

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

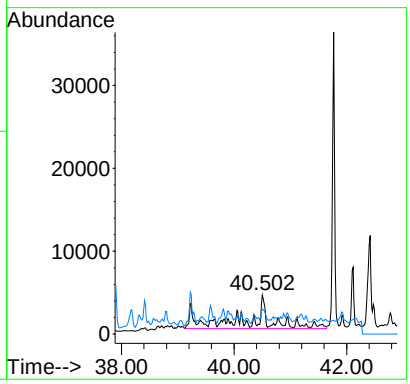


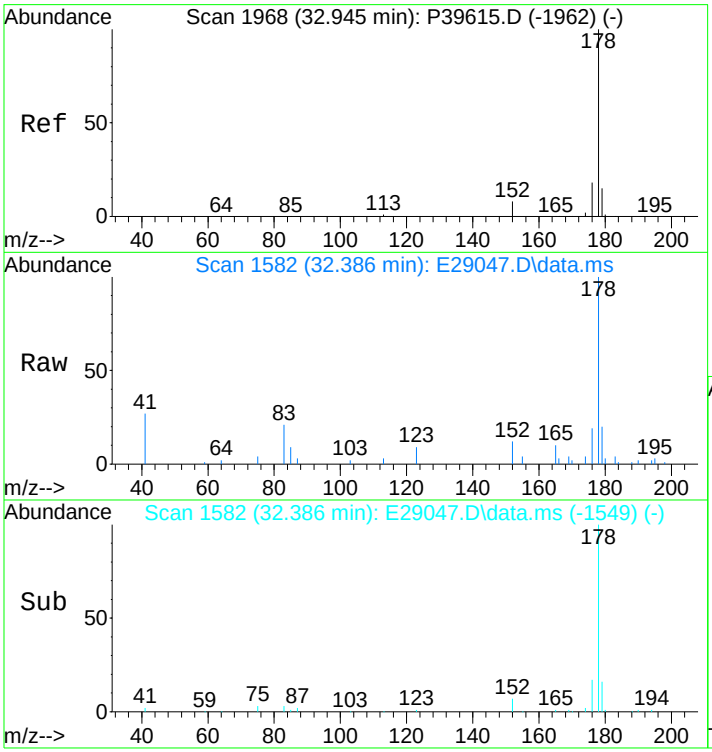


#53
C4-Phenanthrenes/Anthracenes
Concen: 743.67 ng/mL m
RT: 40.502 min Scan# 2121
Delta R.T. 0.391 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:234 Resp: 114268

Ion	Ratio	Lower	Upper
234	100		
219	2.2	46.6	70.0#

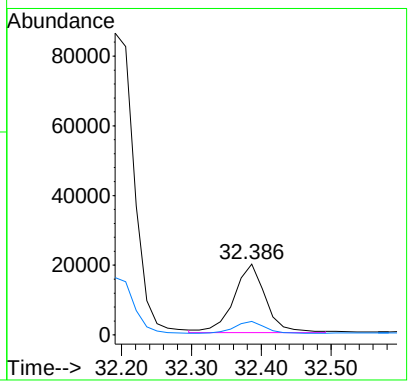


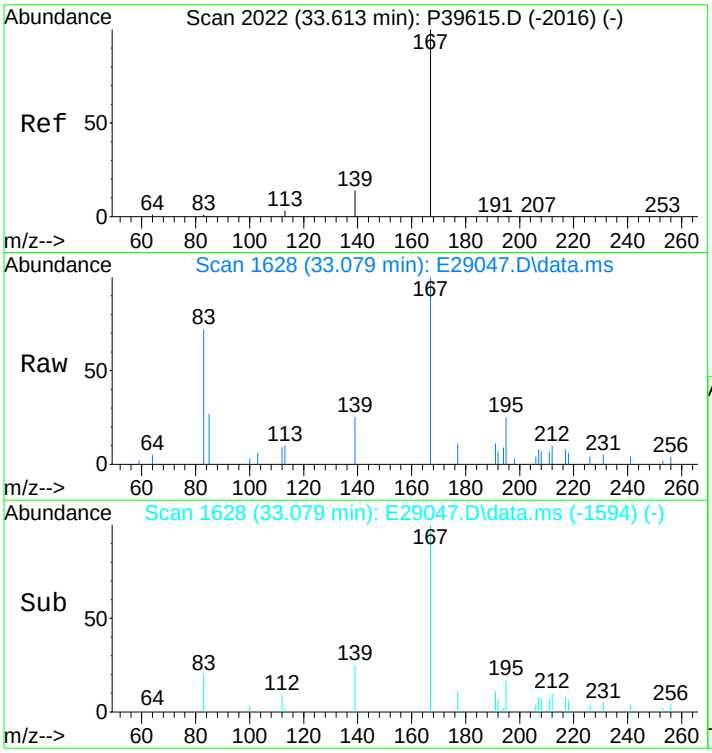


#55
Anthracene
Concen: 468.98 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:178 Resp: 62286

Ion	Ratio	Lower	Upper
178	100		
176	16.7	14.2	21.2

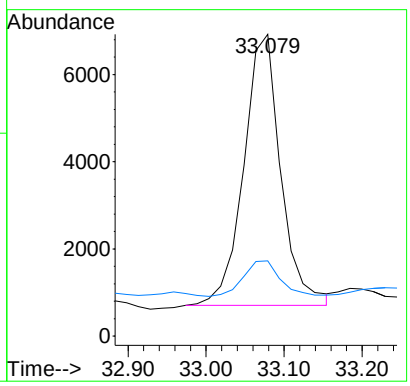


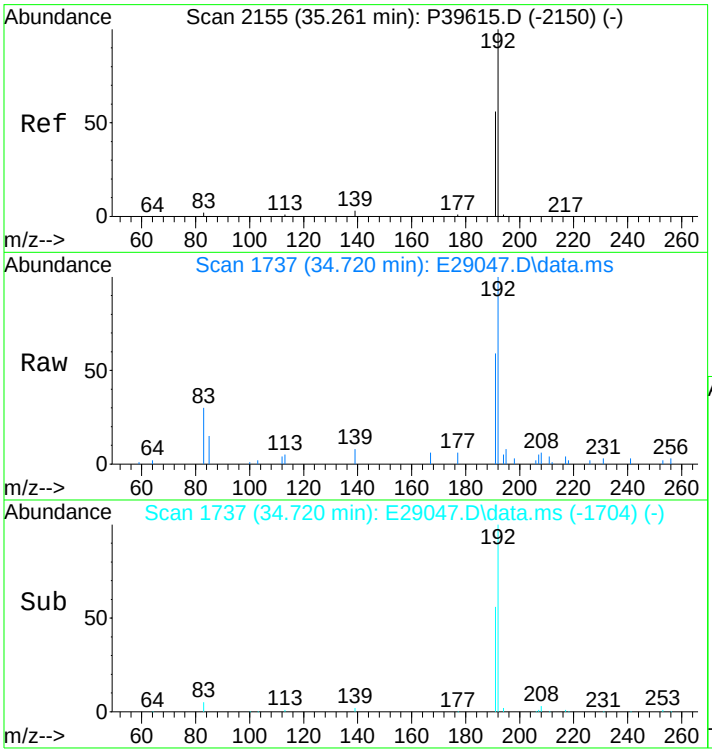


#56
Carbazole
Concen: 150.32 ng/mL
RT: 33.079 min Scan# 1628
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:167 Resp: 20547

Ion	Ratio	Lower	Upper
167	100		
139	13.1	10.6	15.8

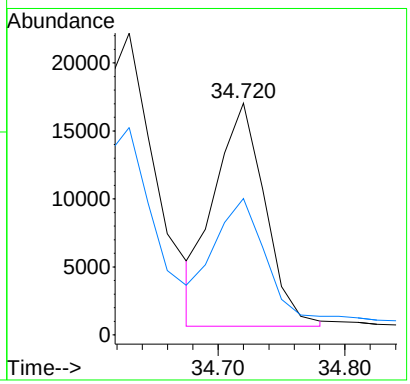


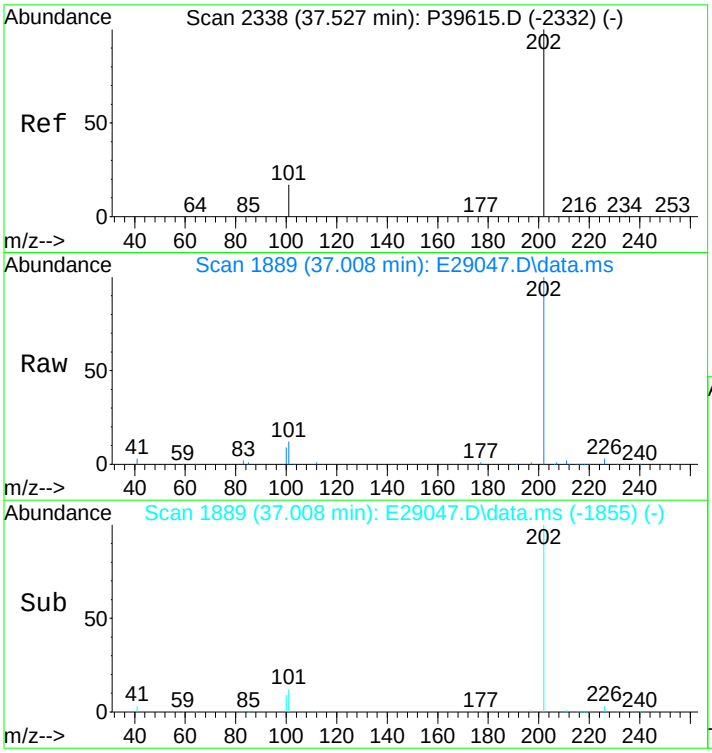


#57
1-Methylphenanthrene
Concen: 388.66 ng/mL m
RT: 34.720 min Scan# 1737
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:192 Resp: 45561

Ion	Ratio	Lower	Upper
192	100		
191	56.7	44.4	66.6

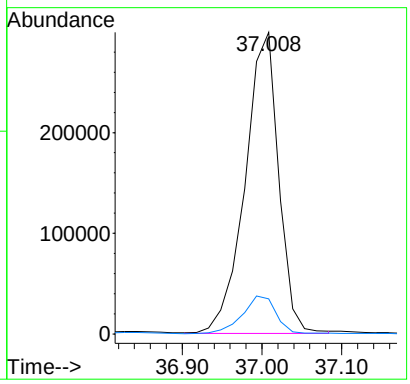


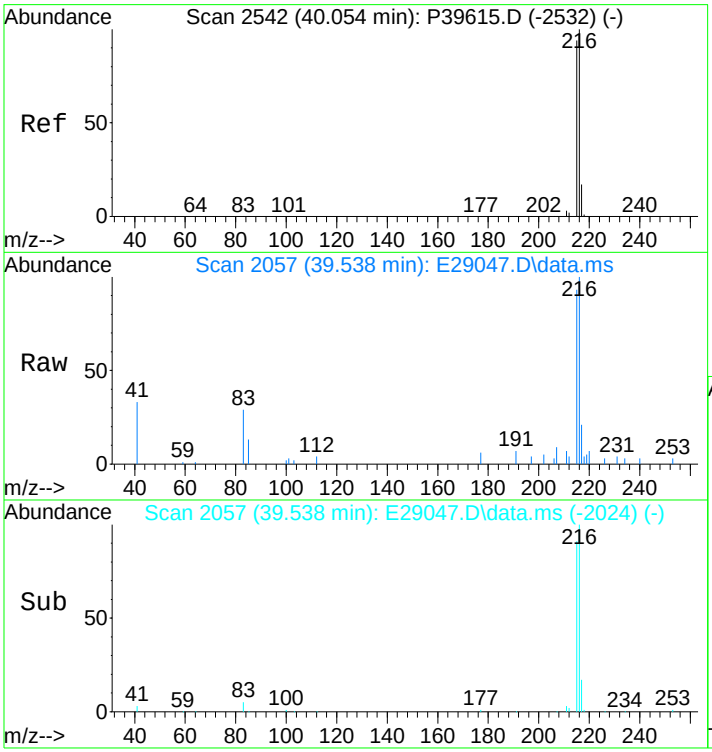


#58
Fluoranthene
Concen: 5149.92 ng/mL m
RT: 37.008 min Scan# 1889
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:202 Resp: 873880

Ion	Ratio	Lower	Upper
202	100		
101	13.1	10.5	15.7

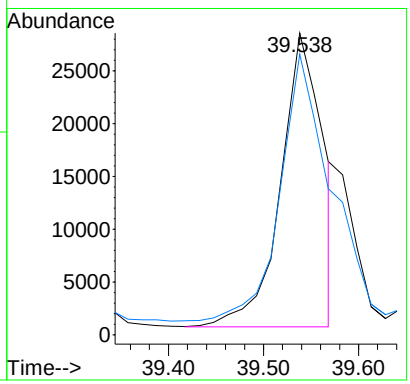


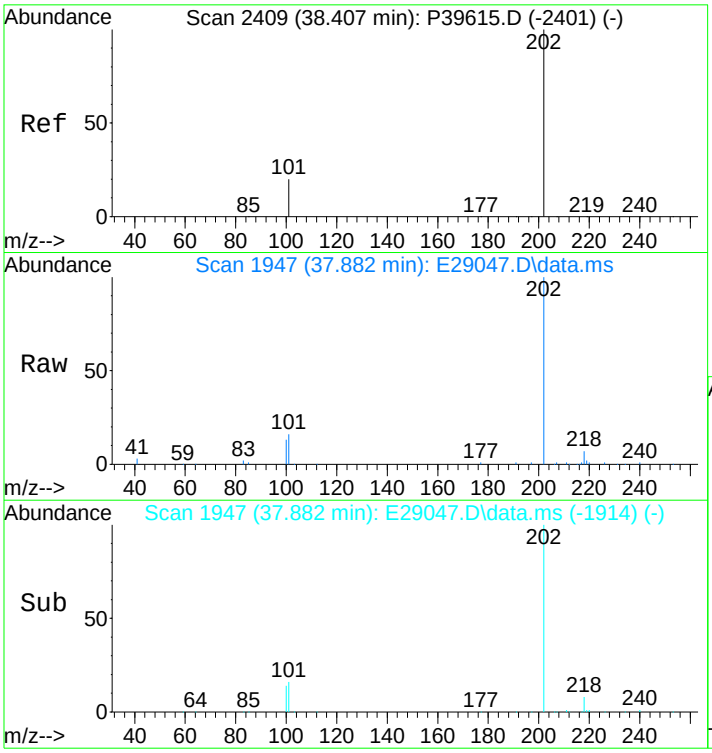


#59
Benzo(b)fluorene
Concen: 765.15 ng/mL m
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:216 Resp: 86517

Ion	Ratio	Lower	Upper
216	100		
215	109.2	73.0	109.6

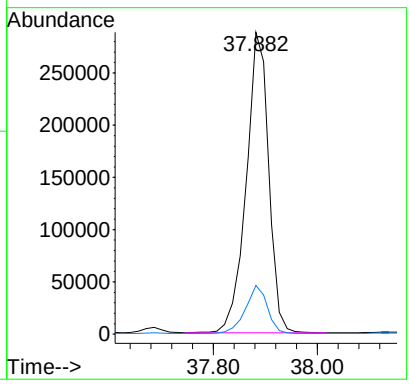


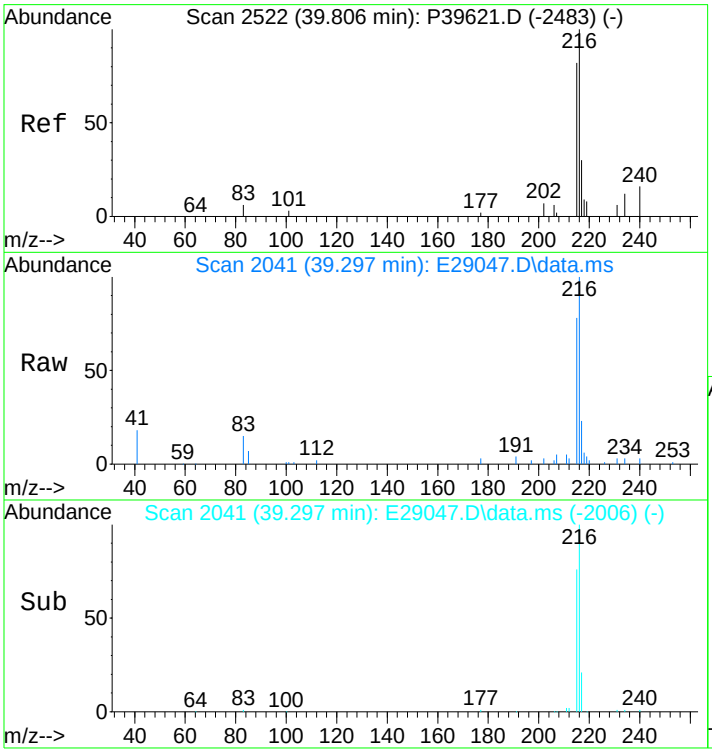


#60
Pyrene
Concen: 5017.05 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:202 Resp: 865309

Ion	Ratio	Lower	Upper
202	100		
101	15.7	11.5	17.3

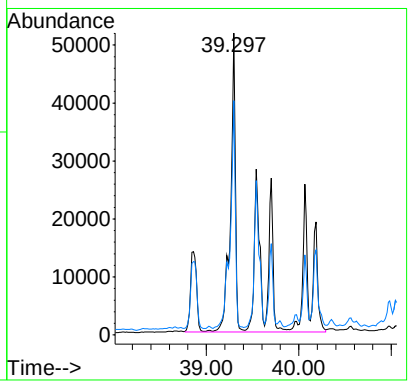


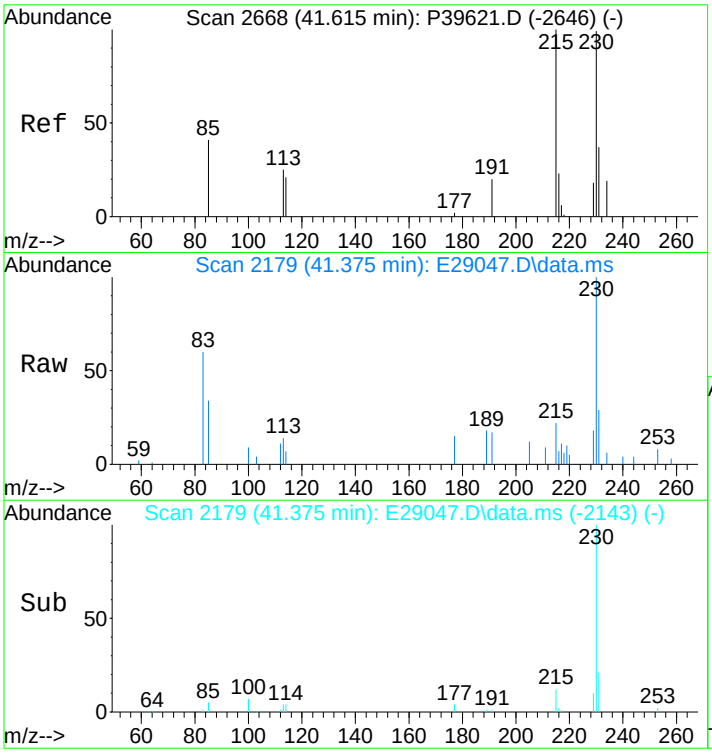


#61
C1-Fluoranthenes/Pyrenes
Concen: 3434.78 ng/mL m
RT: 39.297 min Scan# 2041
Delta R.T. 0.360 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:216 Resp: 592408

Ion	Ratio	Lower	Upper
216	100		
215	9.0	73.4	110.2#

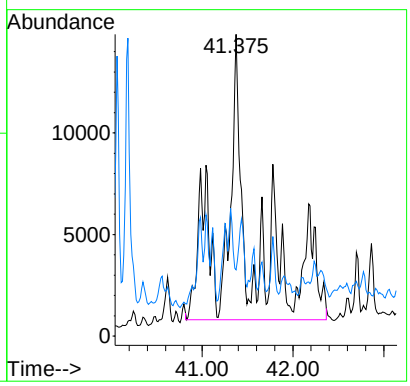


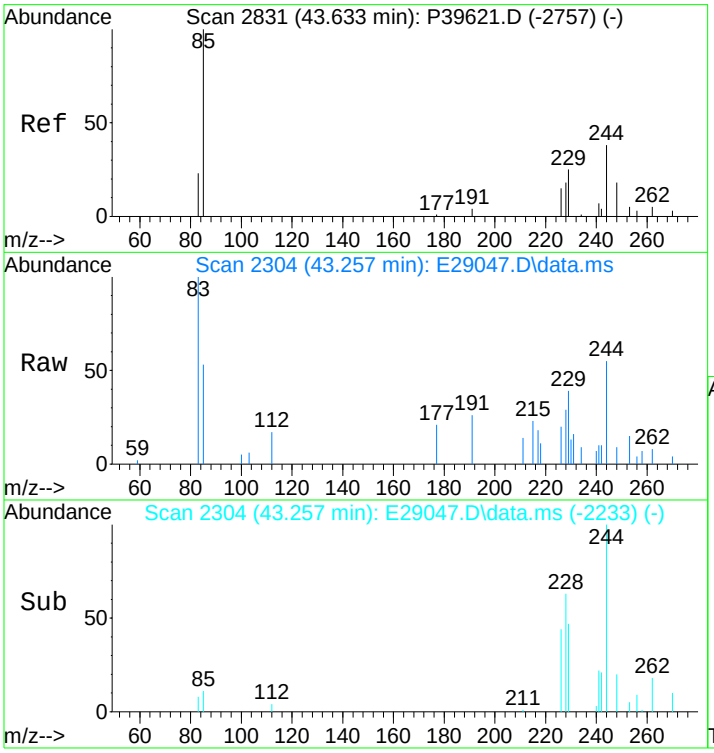


#62
C2-Fluoranthenes/Pyrenes
Concen: 1710.09 ng/mL m
RT: 41.375 min Scan# 2179
Delta R.T. 0.472 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:230 Resp: 294946

Ion	Ratio	Lower	Upper
230	100		
215	1.9	93.8	140.8#

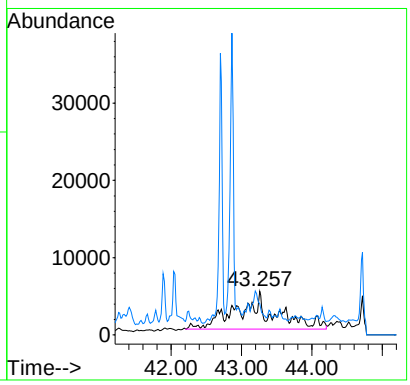


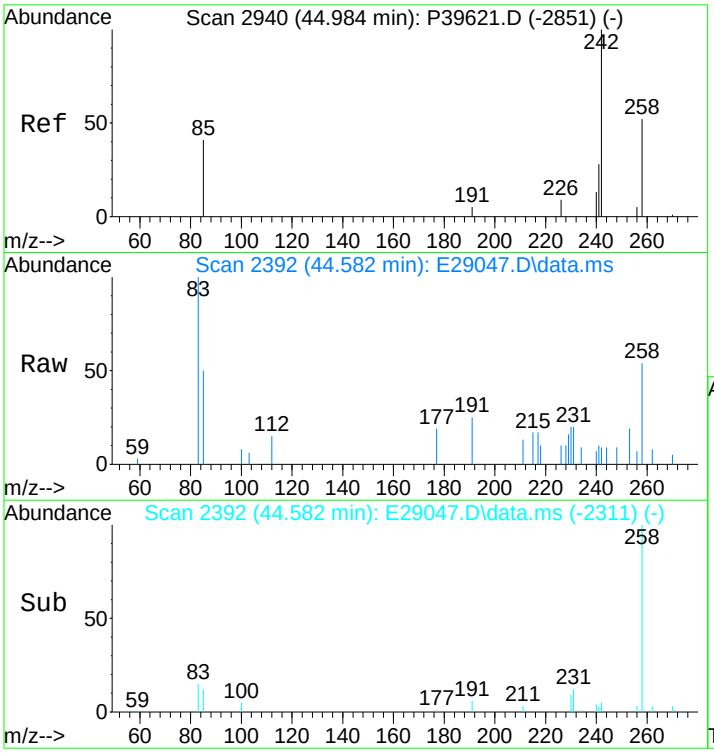


#63
C3-Fluoranthenes/Pyrenes
Concen: 1043.99 ng/mL m
RT: 43.257 min Scan# 2304
Delta R.T. 0.581 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:244 Resp: 180060

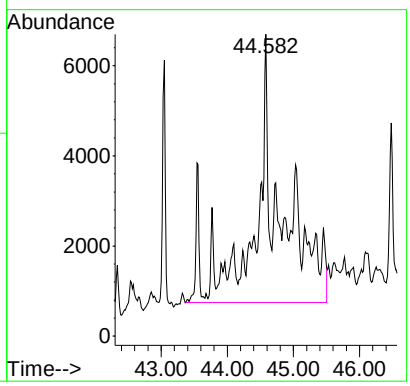
Ion	Ratio	Lower	Upper
244	100		
229	4.5	72.2	108.2#

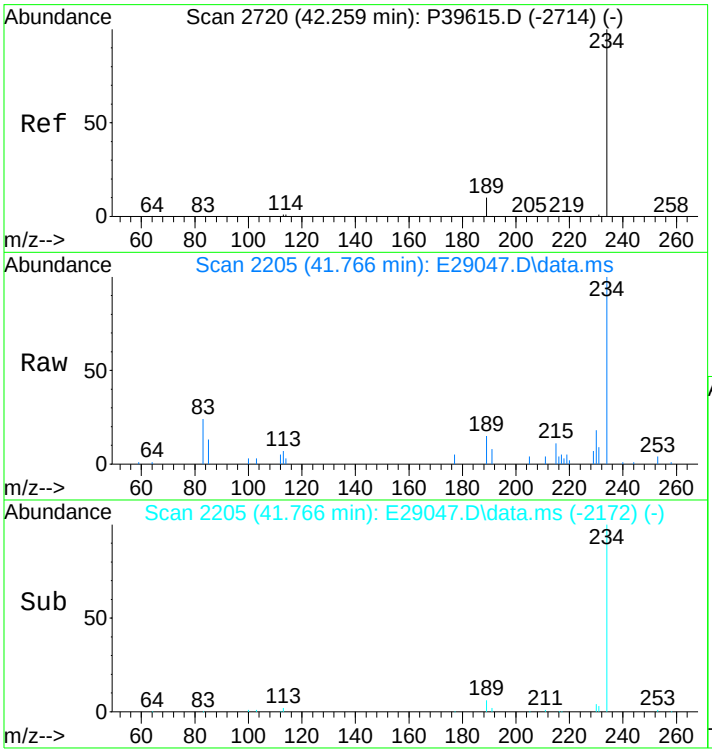




#64
C4-Fluoranthenes/Pyrenes
Concen: 924.79 ng/mL m
RT: 44.582 min Scan# 2392
Delta R.T. 0.586 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:258 Resp: 159502

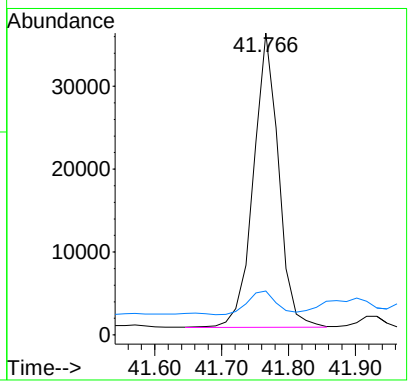


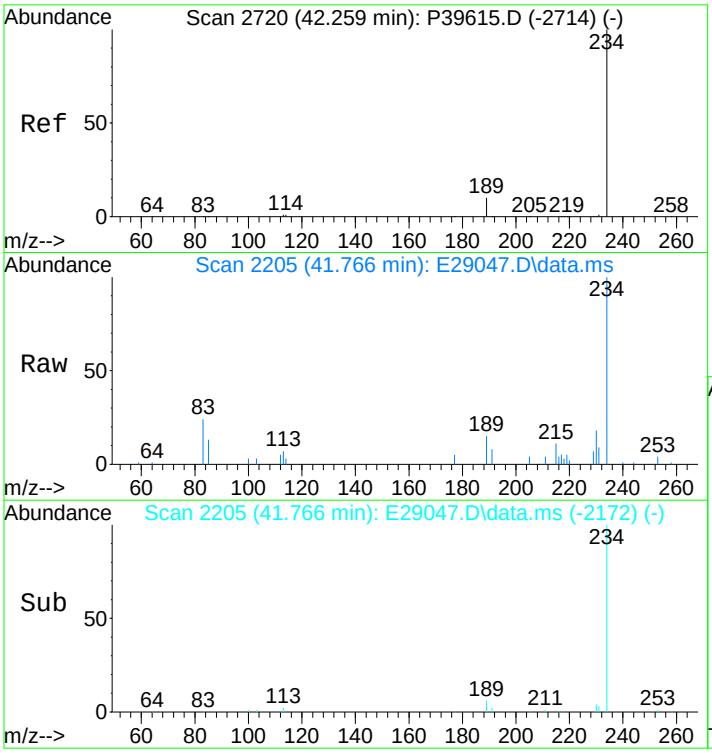


#66
Naphthobenzothiophene
Concen: 545.76 ng/ml
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:234 Resp: 92838

Ion	Ratio	Lower	Upper
234	100		
189	9.3	5.4	8.2#

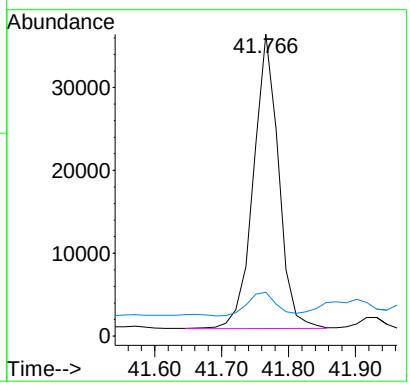


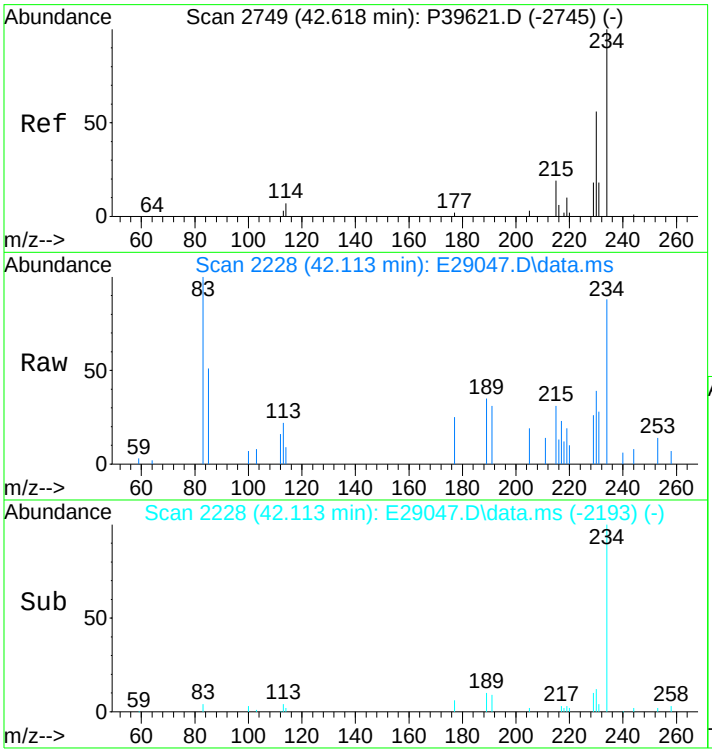


#67
Naphthobenzothiophene-2,1-D
Concen: 545.76 ng/mL
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:234 Resp: 92838

Ion	Ratio	Lower	Upper
234	100		
189	9.3	5.4	8.2#

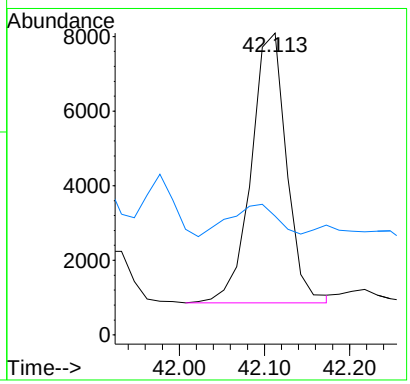


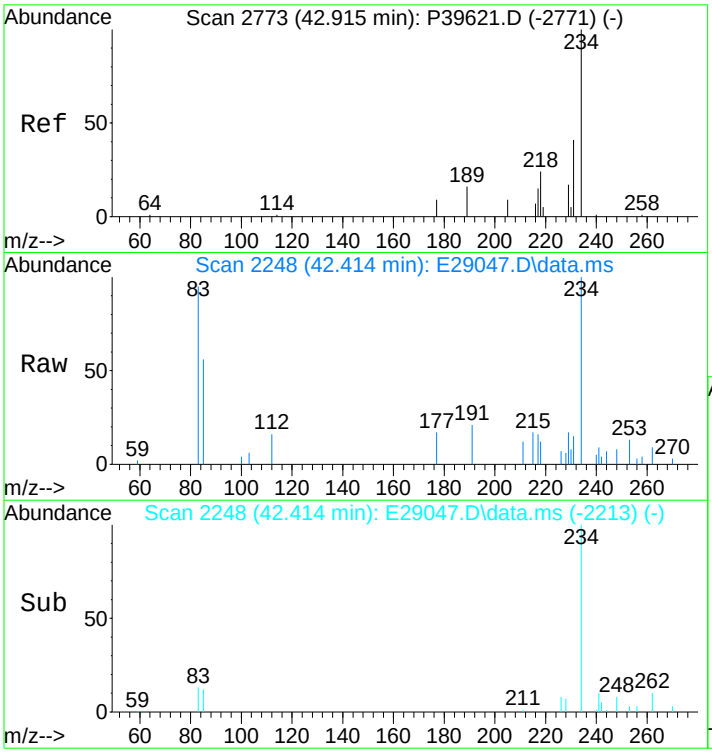


#68
Naphthobenzothiophene-1,2-D
Concen: 123.27 ng/mL
RT: 42.113 min Scan# 2228
Delta R.T. 0.021 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:234 Resp: 20970

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.9	107.9#

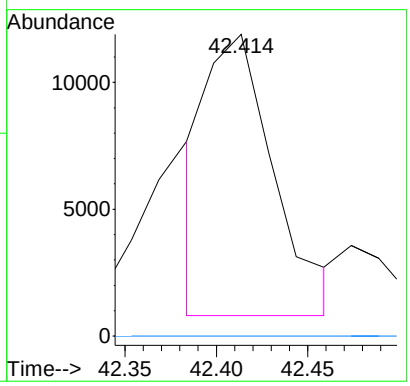


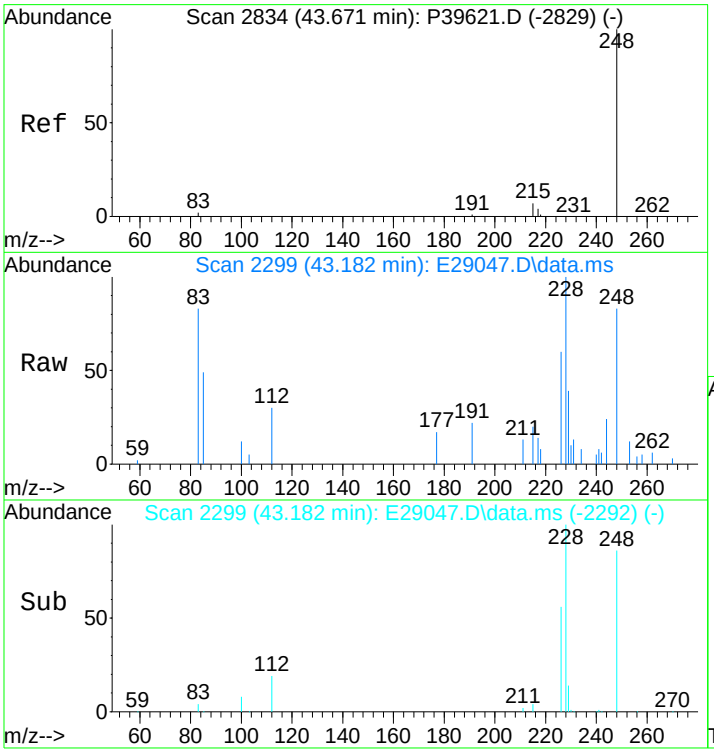


#69
Naphthobenzothiophene-2,3-D
Concen: 168.20 ng/mL m
RT: 42.414 min Scan# 2248
Delta R.T. 0.021 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:234 Resp: 28612

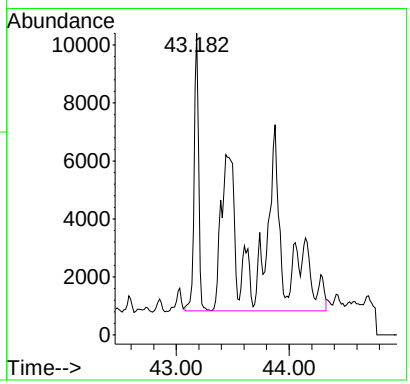
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

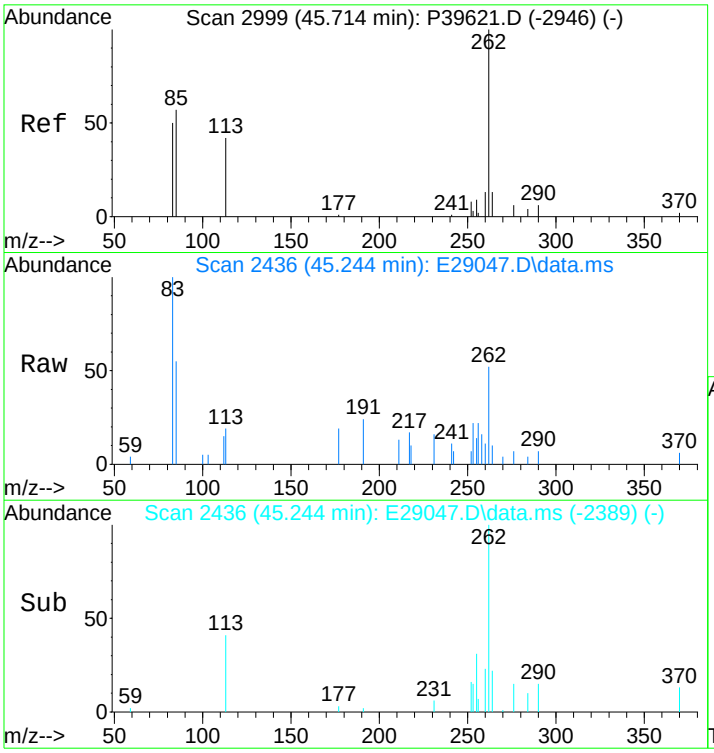




#70
C1-Naphthobenzothiophenes
Concen: 876.35 ng/ml m
RT: 43.182 min Scan# 2299
Delta R.T. 0.036 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

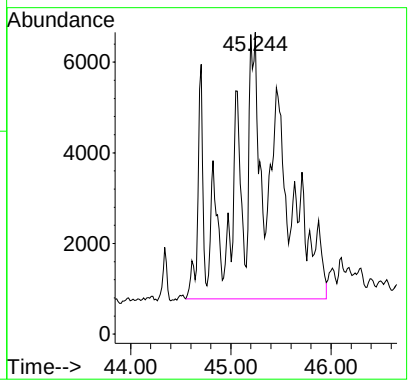
Tgt Ion:248 Resp: 149075

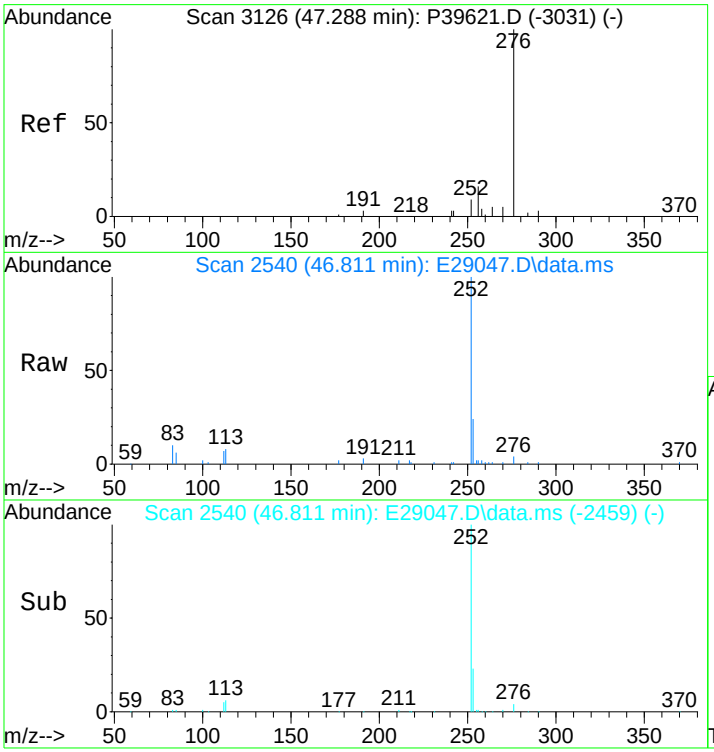




#71
C2-Naphthobenzothiophenes
Concen: 1034.61 ng/ml m
RT: 45.244 min Scan# 2436
Delta R.T. 0.574 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

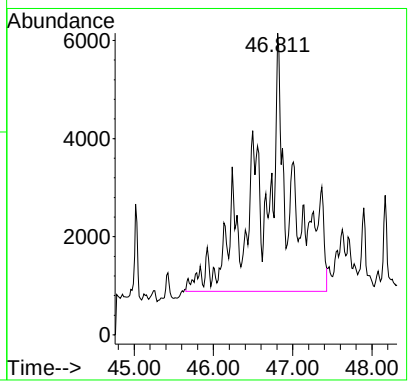
Tgt Ion:262 Resp: 175996

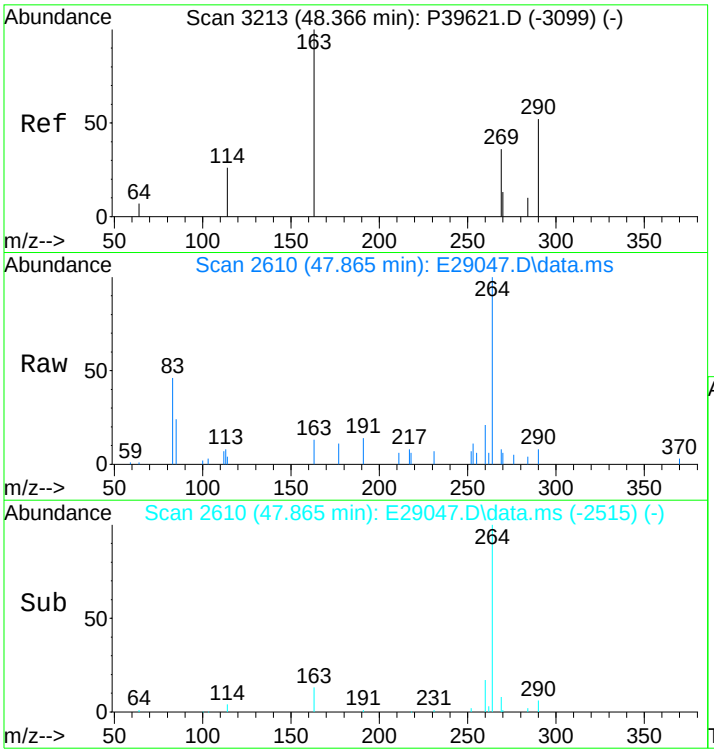




#72
C3-Naphthobenzothiophenes
Concen: 846.22 ng/ml m
RT: 46.811 min Scan# 2540
Delta R.T. 0.557 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

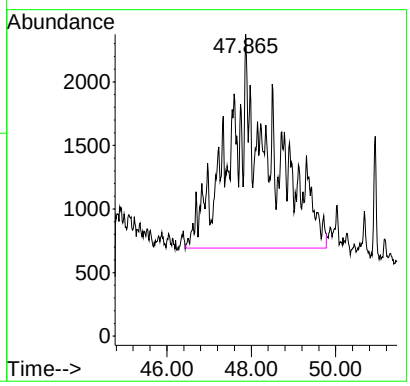
Tgt Ion:276 Resp: 143950

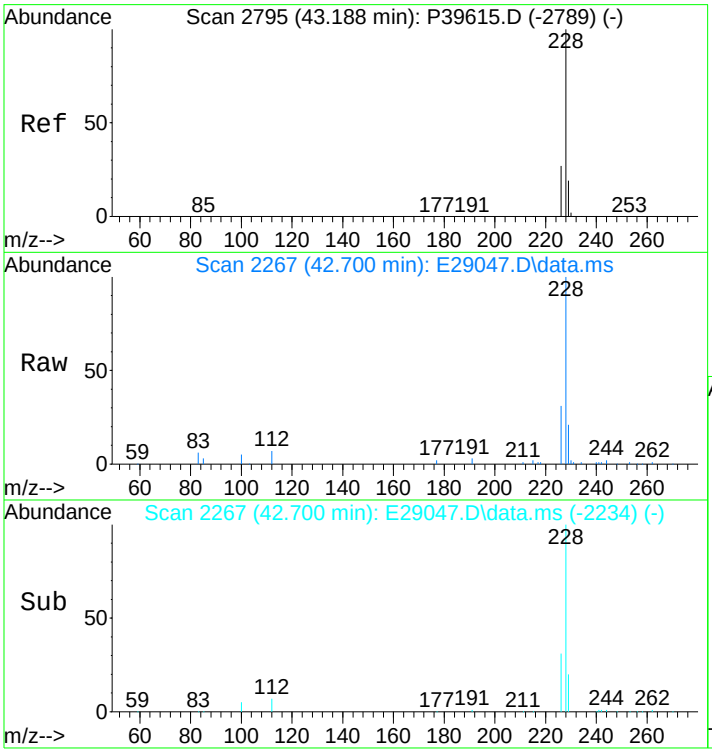




#73
C4-Naphthobenzothiophenes
Concen: 665.78 ng/mL m
RT: 47.865 min Scan# 2610
Delta R.T. 0.541 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:290 Resp: 113256

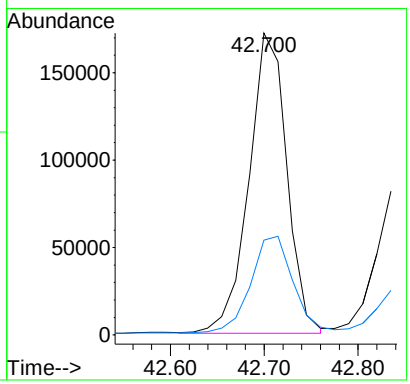


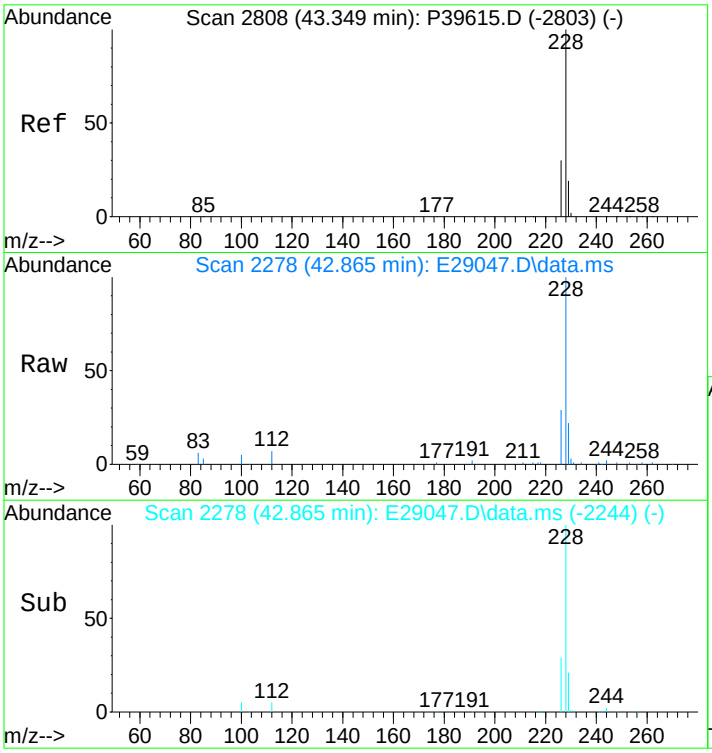


#75
Benz[a]anthracene
Concen: 2575.18 ng/mL m
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:228 Resp: 481544

Ion	Ratio	Lower	Upper
228	100		
226	33.4	20.2	30.4#

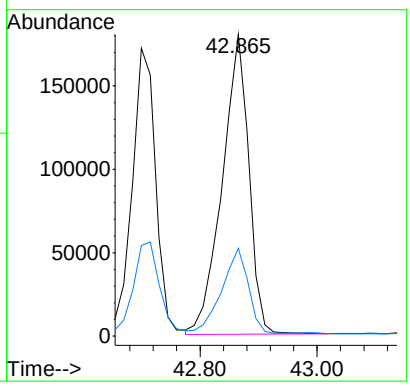


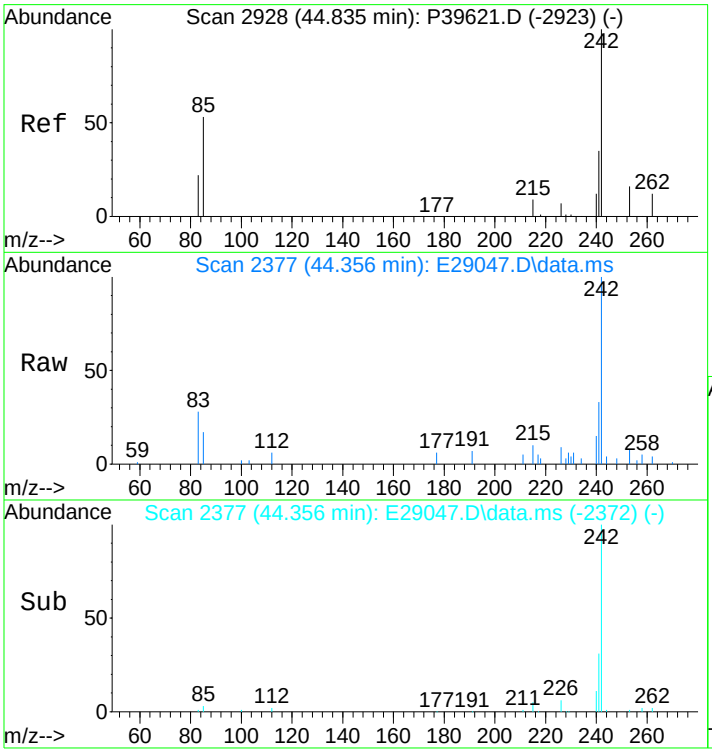


#77
Chrysene/Triphenylene
Concen: 2955.84 ng/mL
RT: 42.865 min Scan# 2278
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:228 Resp: 569040

Ion	Ratio	Lower	Upper
228	100		
226	28.8	22.5	33.7

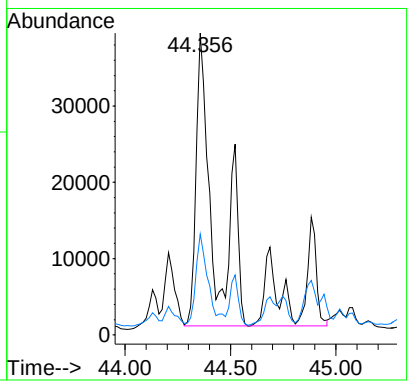


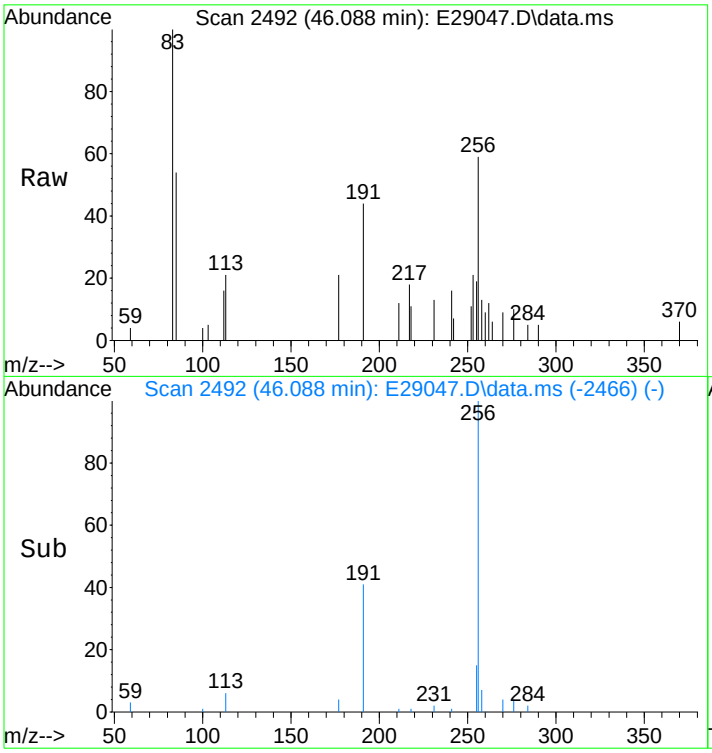


#78
C1-Chrysenes
Concen: 1593.24 ng/mL m
RT: 44.356 min Scan# 2377
Delta R.T. 0.025 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:242 Resp: 306722

Ion	Ratio	Lower	Upper
242	100		
241	4.6	32.2	48.4#

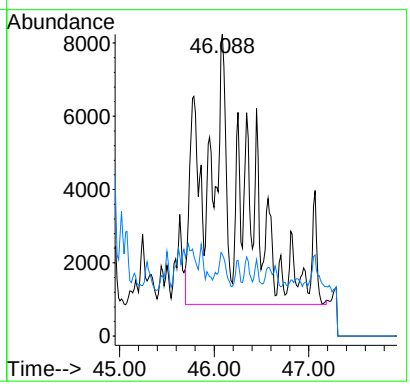


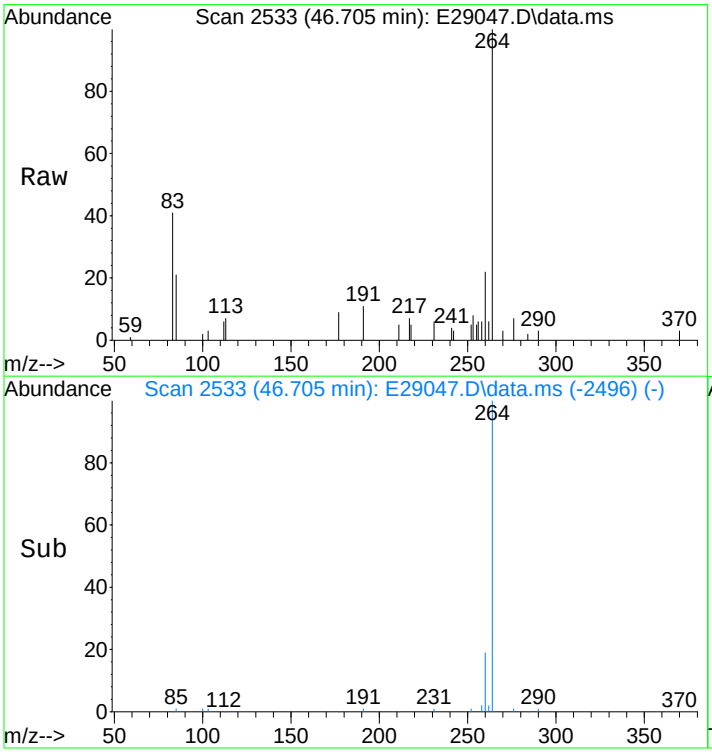


#79
C2-Chrysenes
Concen: 1046.47 ng/mL m
RT: 46.088 min Scan# 2492
Delta R.T. -0.304 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:256 Resp: 201460

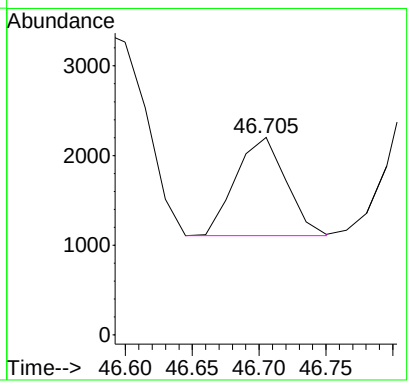
Ion	Ratio	Lower	Upper
256	100		
241	1.4	25.3	37.9#

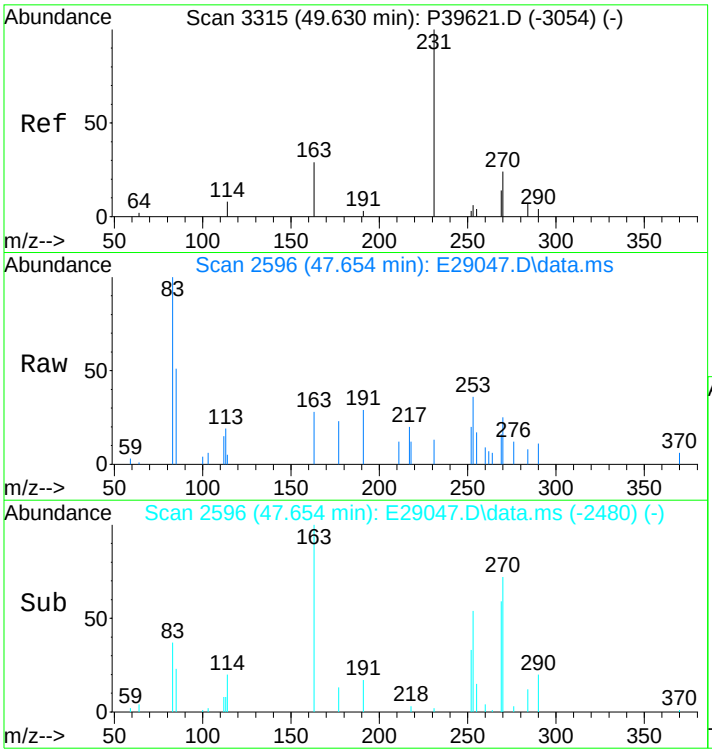




#80
BBF-D12 Surr BKGD
Concen: 15.03 ng/mL
RT: 46.705 min Scan# 2533
Delta R.T. 0.061 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:256 Resp: 2894

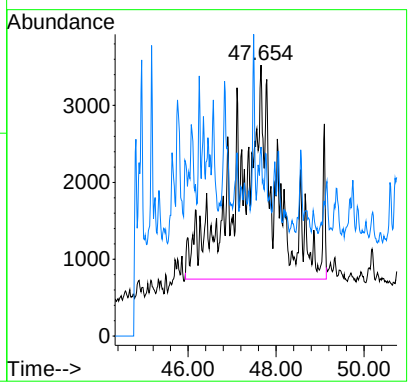


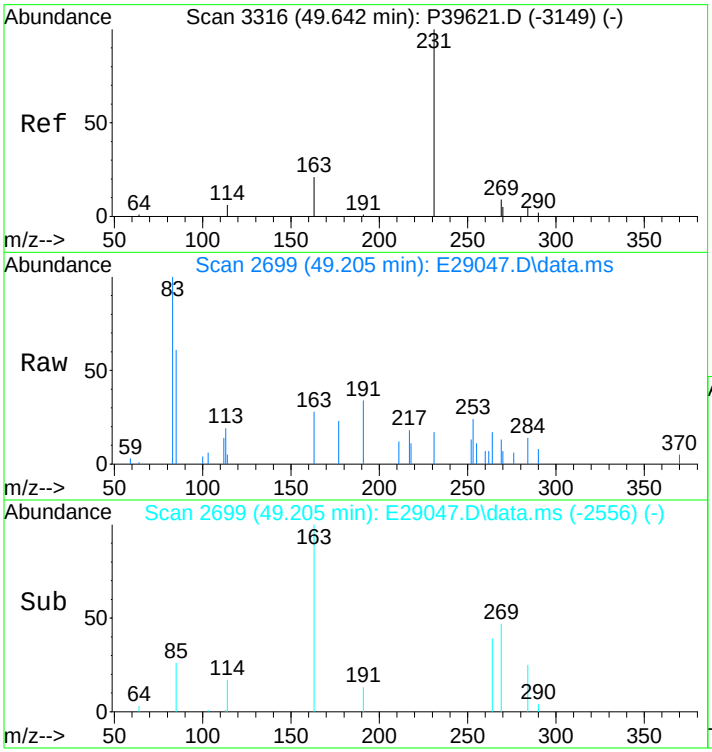


#81
C3-Chrysenes
Concen: 872.57 ng/mL m
RT: 47.654 min Scan# 2596
Delta R.T. -1.466 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:270 Resp: 167982

Ion	Ratio	Lower	Upper
270	100		
255	2.1	38.0	57.0#

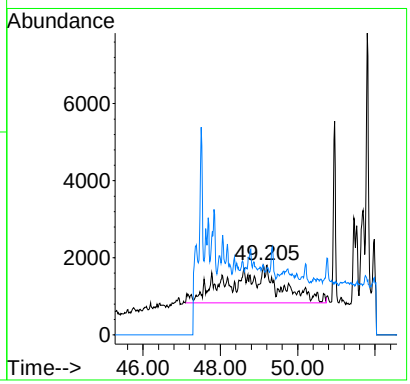


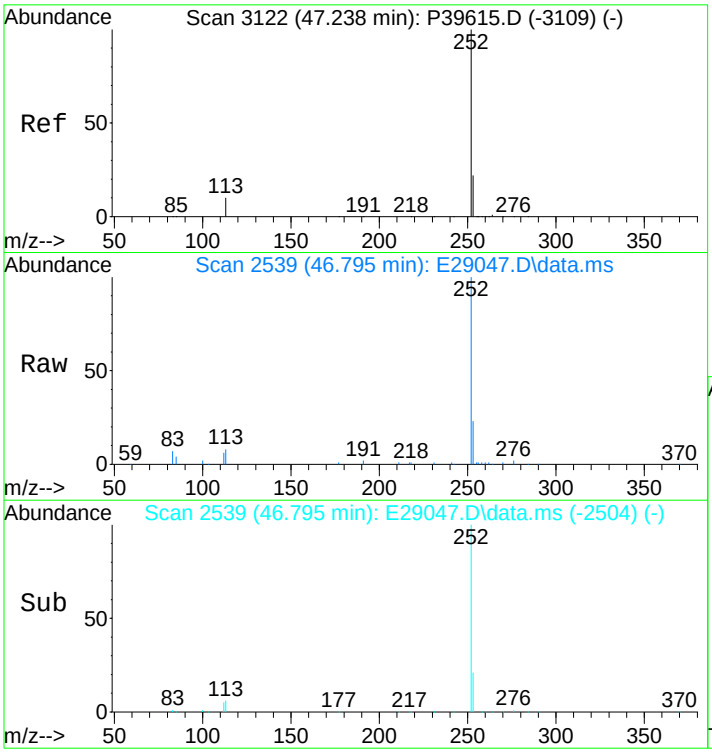


#82
C4-Chrysenes
Concen: 446.35 ng/mL m
RT: 49.205 min Scan# 2699
Delta R.T. -0.033 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:284 Resp: 85928

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

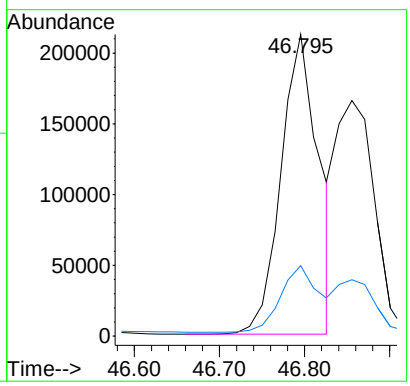


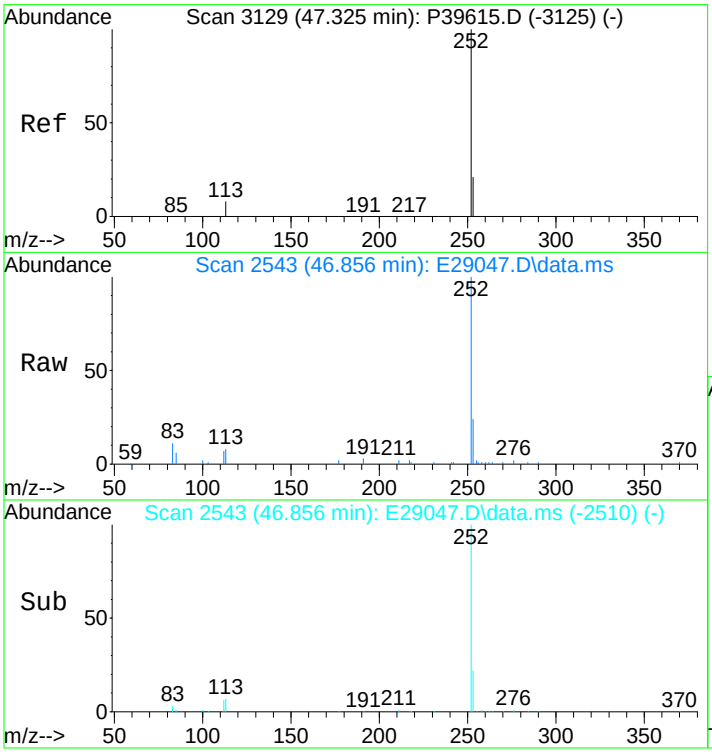


#84
Benzo[b]fluoranthene
Concen: 3013.15 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. 0.030 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:252 Resp: 654908

Ion	Ratio	Lower	Upper
252	100		
253	22.5	19.2	28.8

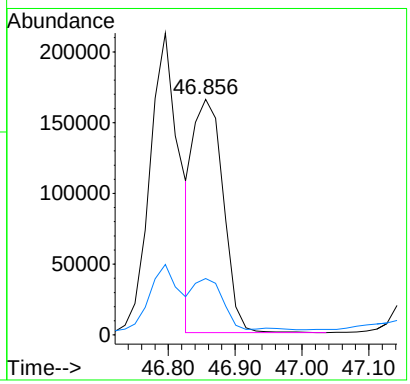


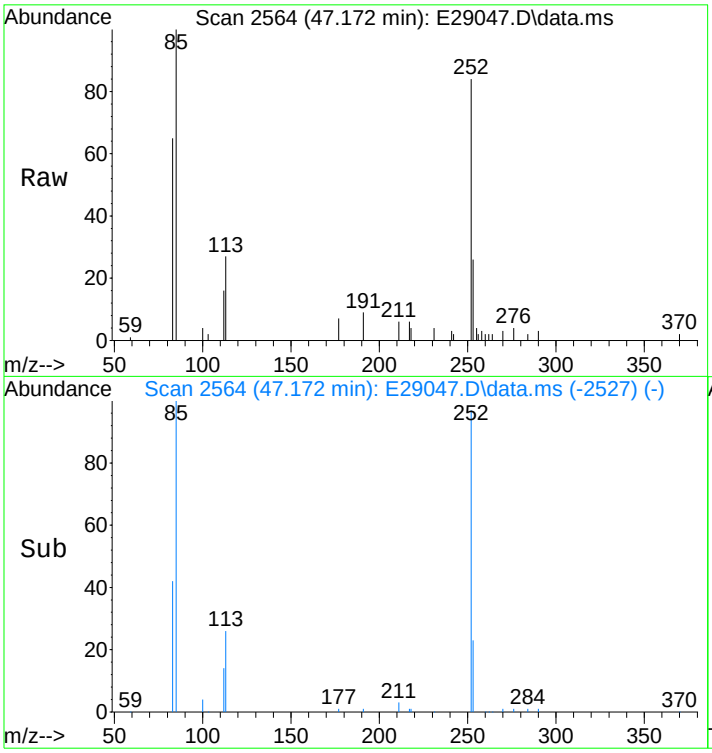


#85
Benzo[j]+[k]fluoranthene
Concen: 2297.91 ng/mL
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:252 Resp: 513847

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.3	28.9

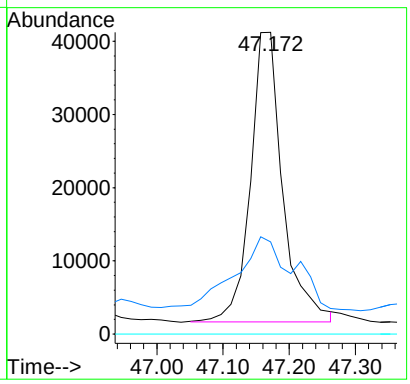


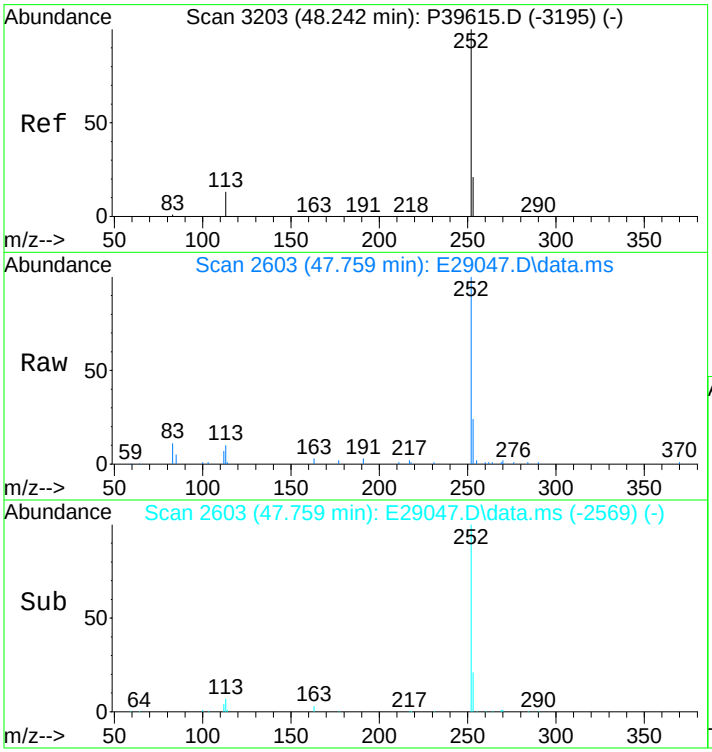


#86
Benzo[a]fluoranthene
Concen: 598.43 ng/mL m
RT: 47.172 min Scan# 2564
Delta R.T. 0.050 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:252 Resp: 133819

Ion	Ratio	Lower	Upper
252	100		
253	50.7	456.0	684.0#
125	0.0	0.0	0.0

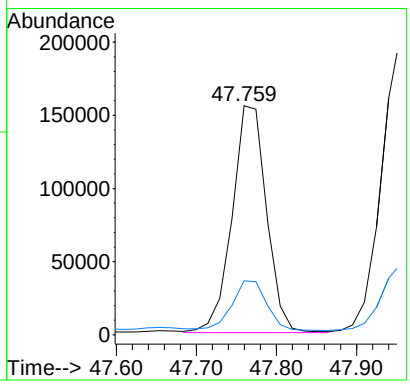


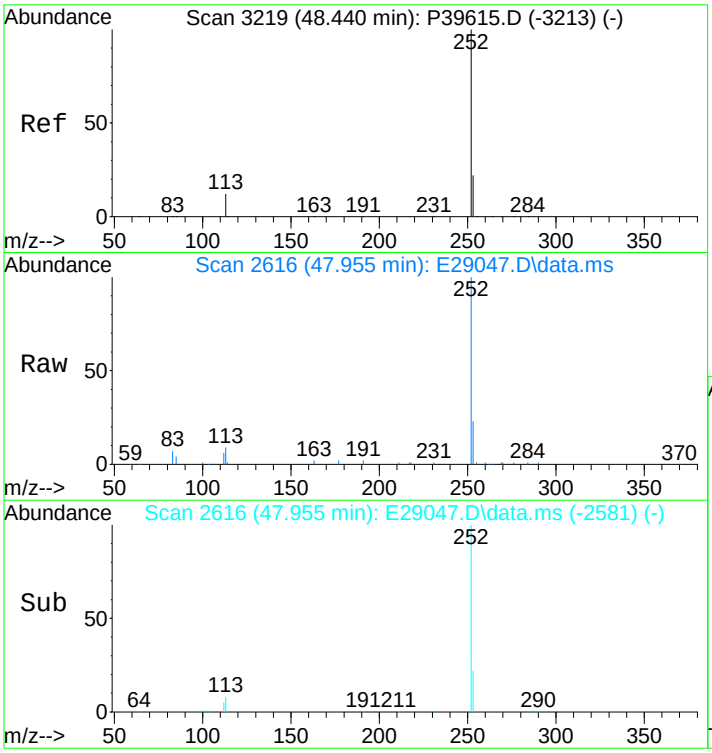


#87
Benzo[e]pyrene
Concen: 2182.57 ng/mL m
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:252 Resp: 463199

Ion	Ratio	Lower	Upper
252	100		
253	22.1	19.4	29.0

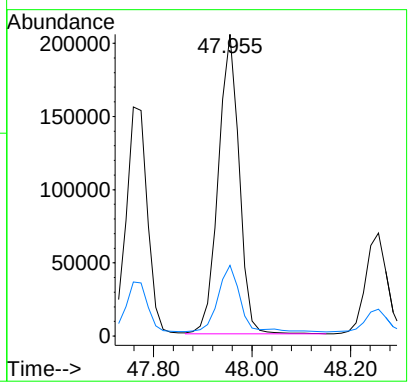


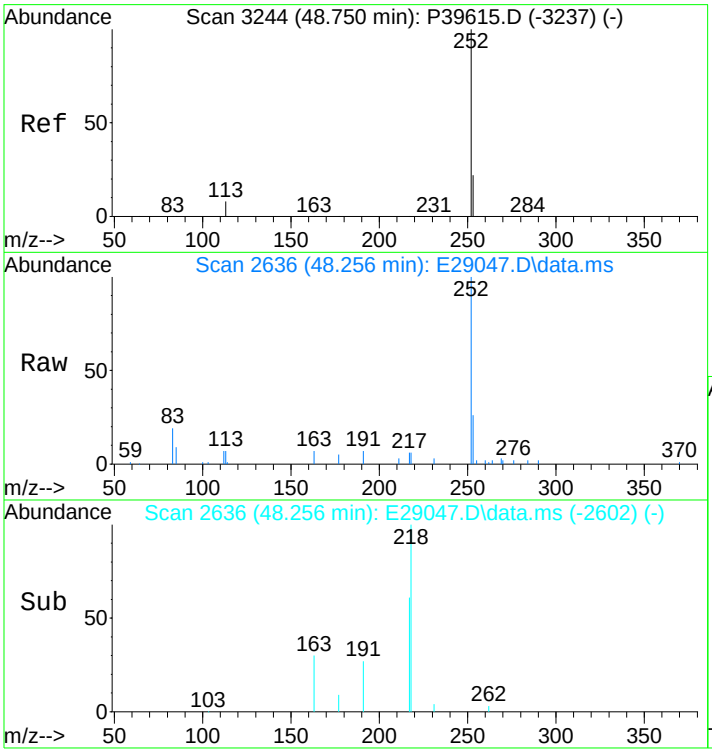


#89
Benzo[a]pyrene
Concen: 2965.74 ng/mL
RT: 47.955 min Scan# 2616
Delta R.T. 0.030 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:252 Resp: 602261

Ion	Ratio	Lower	Upper
252	100		
253	23.5	19.6	29.4

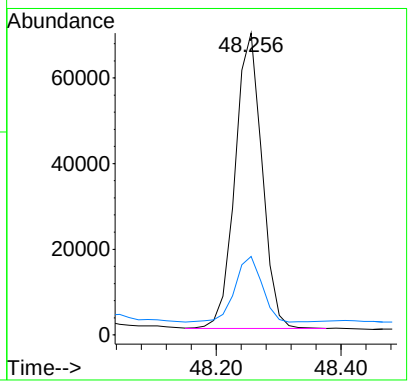


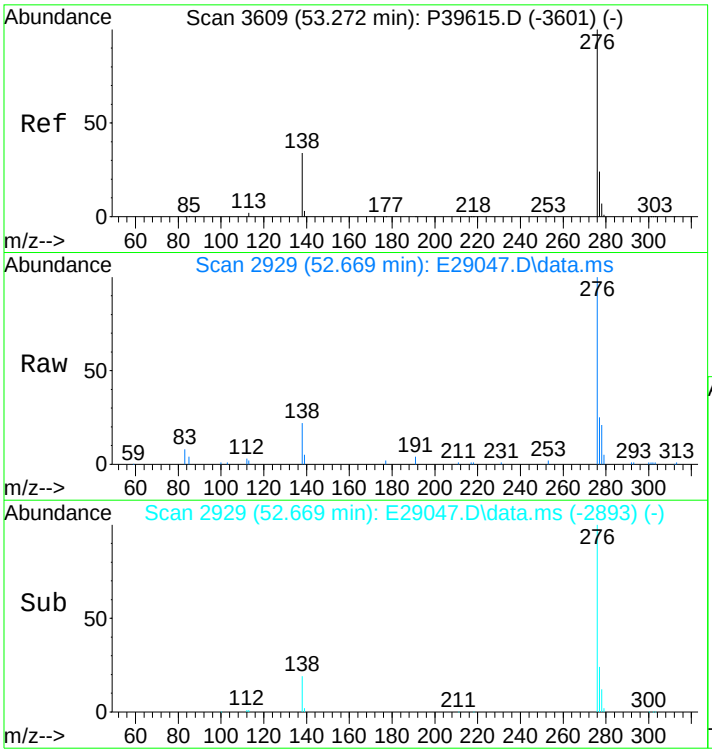


#90
Perylene
Concen: 964.75 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:252 Resp: 207168

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.9	29.9

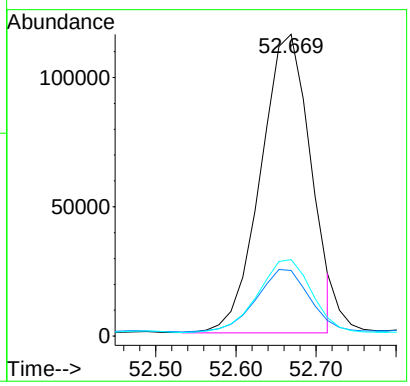


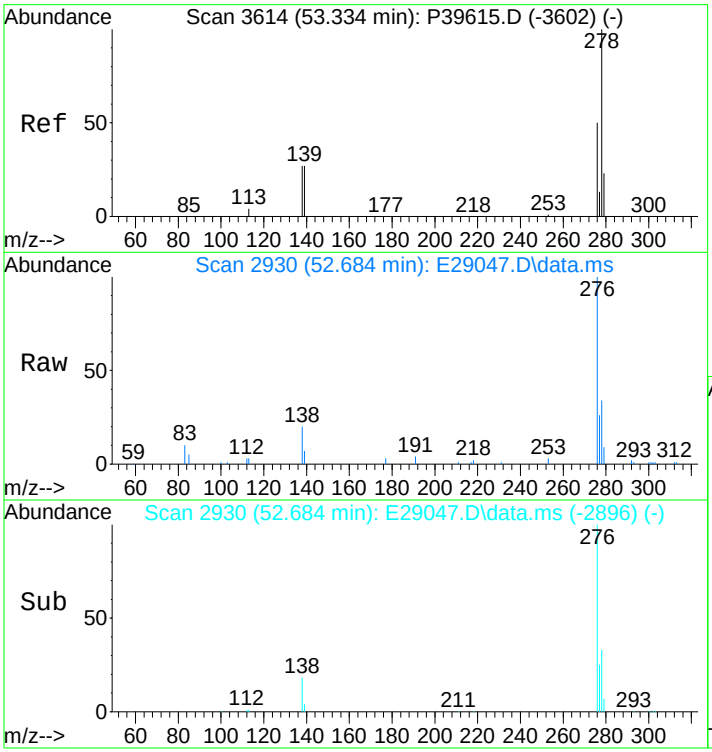


#91
Indeno[1,2,3-cd]pyrene
Concen: 2097.63 ng/mL m
RT: 52.669 min Scan# 2929
Delta R.T. 0.045 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:276 Resp: 501314

Ion	Ratio	Lower	Upper
276	100		
138	22.6	17.8	26.8
277	27.1	20.0	30.0

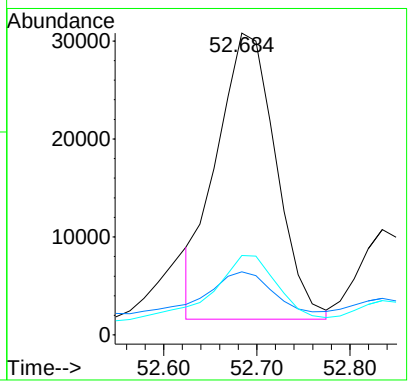


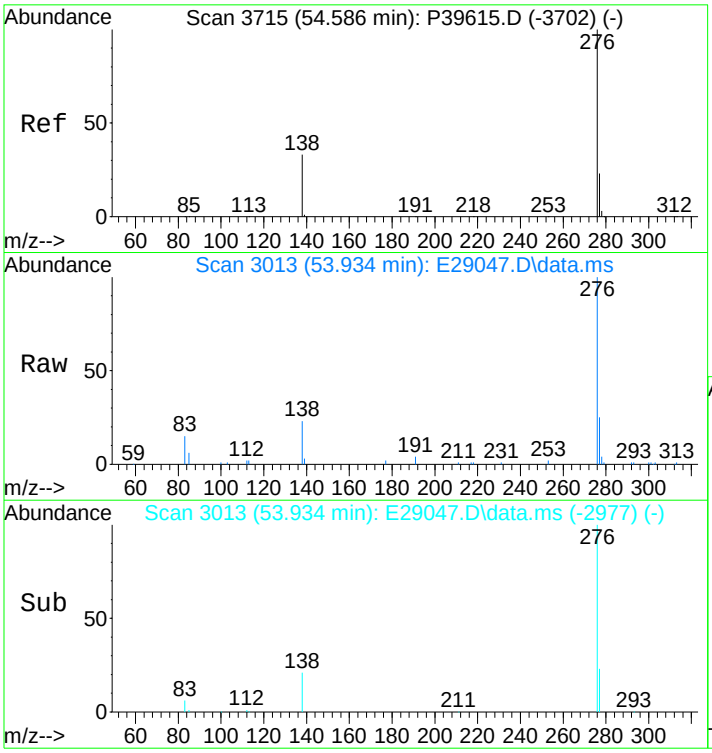


#92
Dibenz[ah]+[ac]anthracene
Concen: 510.30 ng/mL m
RT: 52.684 min Scan# 2930
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:278 Resp: 129859

Ion	Ratio	Lower	Upper
278	100		
139	17.0	13.0	19.4
279	26.2	19.4	29.2

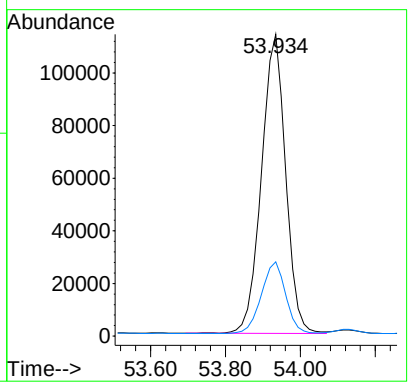


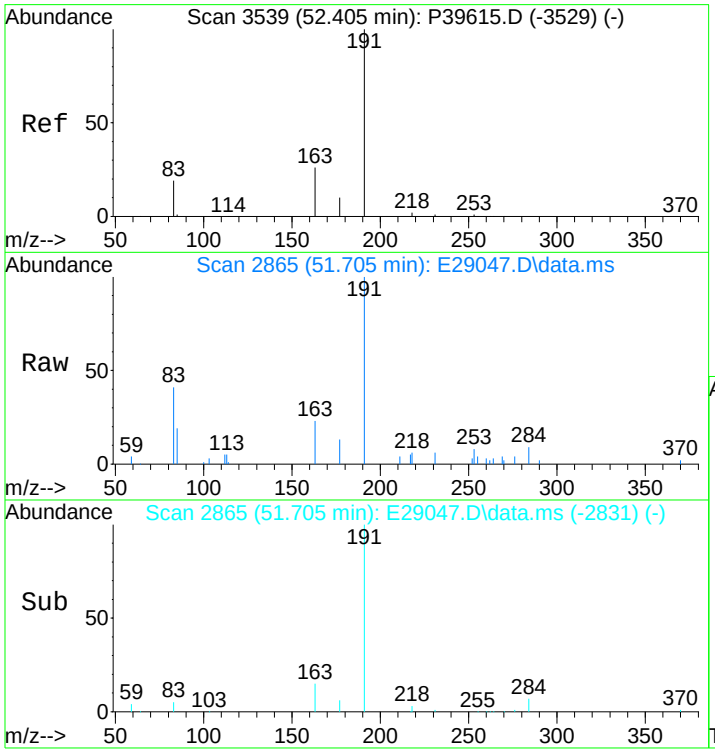


#93
Benzo[g,h,i]perylene
Concen: 1970.53 ng/mL
RT: 53.934 min Scan# 3013
Delta R.T. 0.045 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:276 Resp: 507787

Ion	Ratio	Lower	Upper
276	100		
277	24.4	19.4	29.2

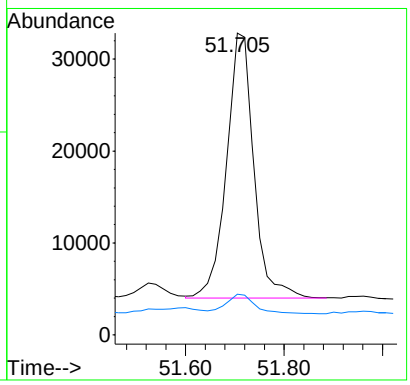


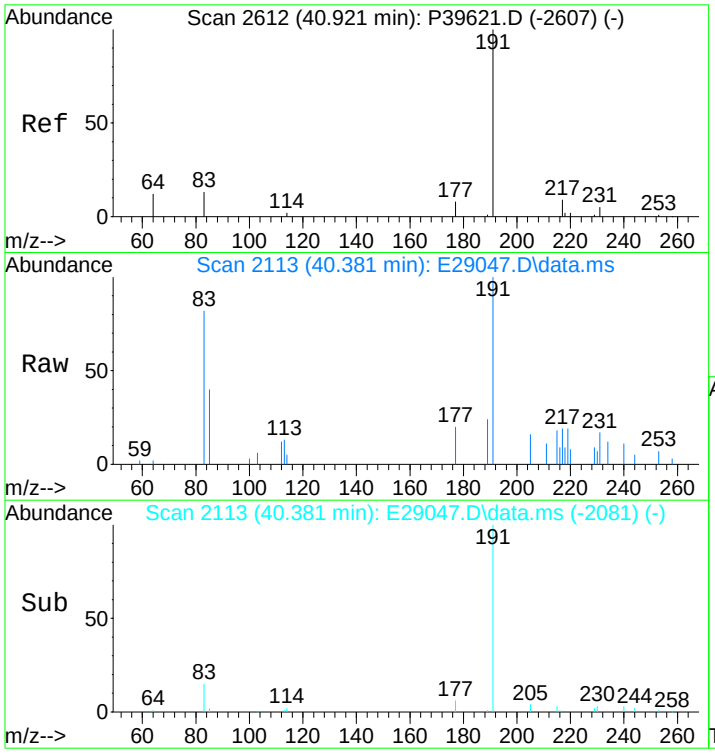


#94
Hopane (T19)
Concen: 1543.87 ng/mL
RT: 51.705 min Scan# 2865
Delta R.T. 0.015 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:191 Resp: 111262

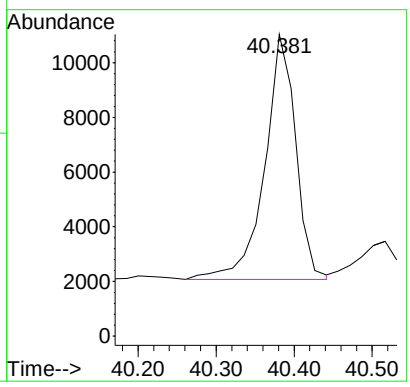
Ion	Ratio	Lower	Upper
191	100		
177	7.9	11.3	16.9#

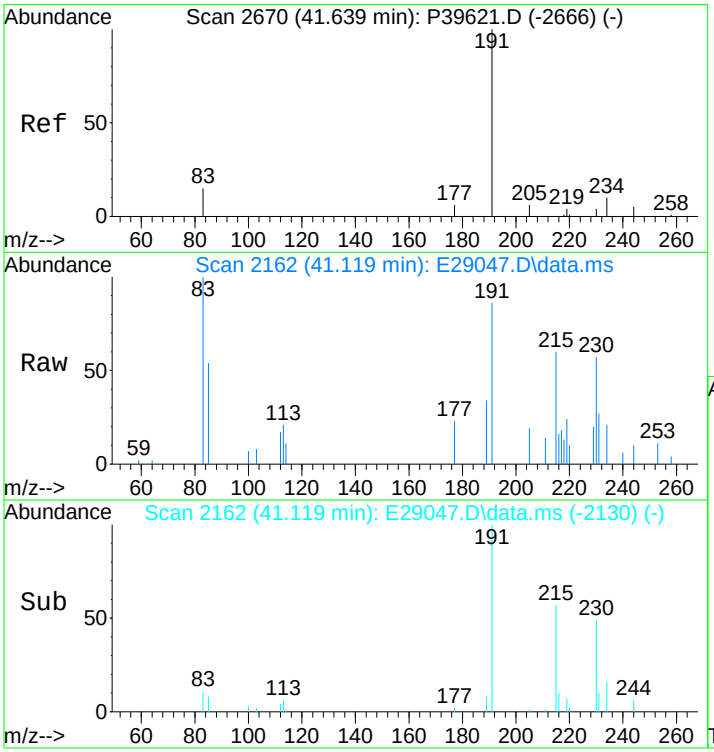




#96
C23 Tricyclic Terpane (T4)
Concen: 343.12 ng/ml
RT: 40.381 min Scan# 2113
Delta R.T. -0.013 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

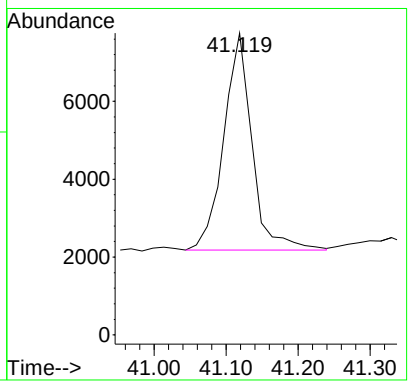
Tgt Ion:191 Resp: 24728

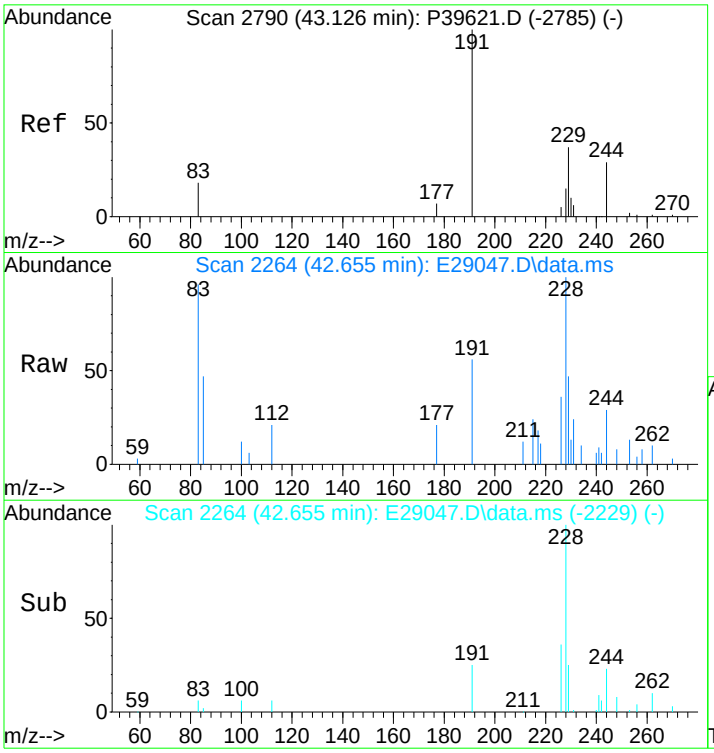




#97
C24 Tricyclic Terpane (T5)
Concen: 211.23 ng/ml
RT: 41.119 min Scan# 2162
Delta R.T. -0.013 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

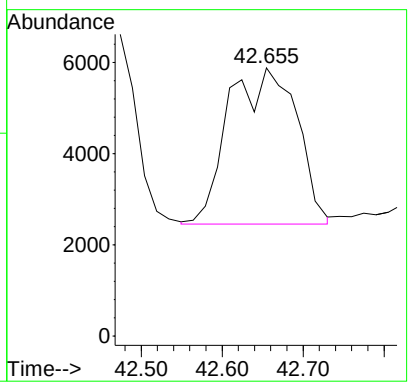
Tgt Ion:191 Resp: 15223

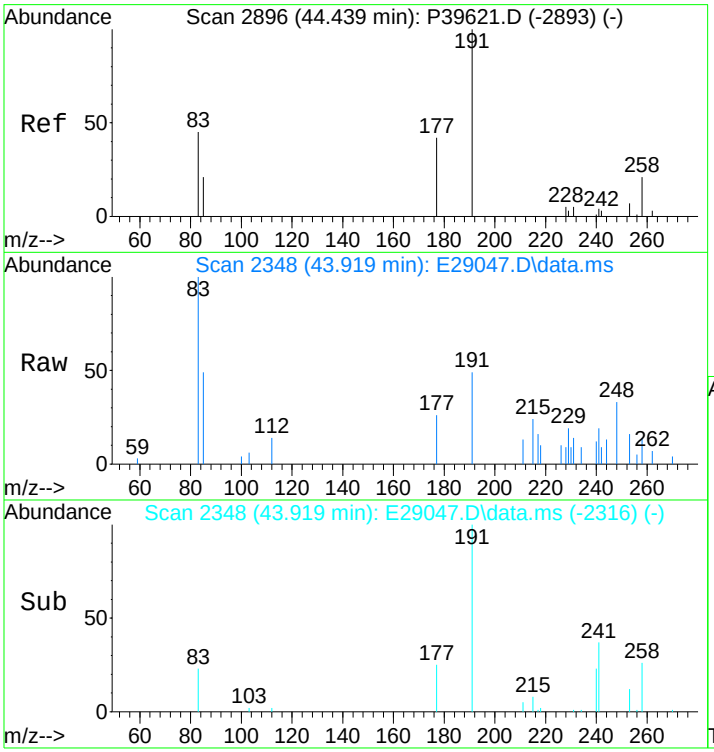




#98
C25 Tricyclic Terpane (T6)
Concen: 279.34 ng/ml m
RT: 42.655 min Scan# 2264
Delta R.T. 0.030 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

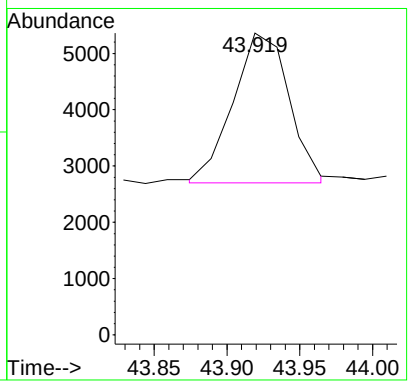
Tgt Ion:191 Resp: 20131

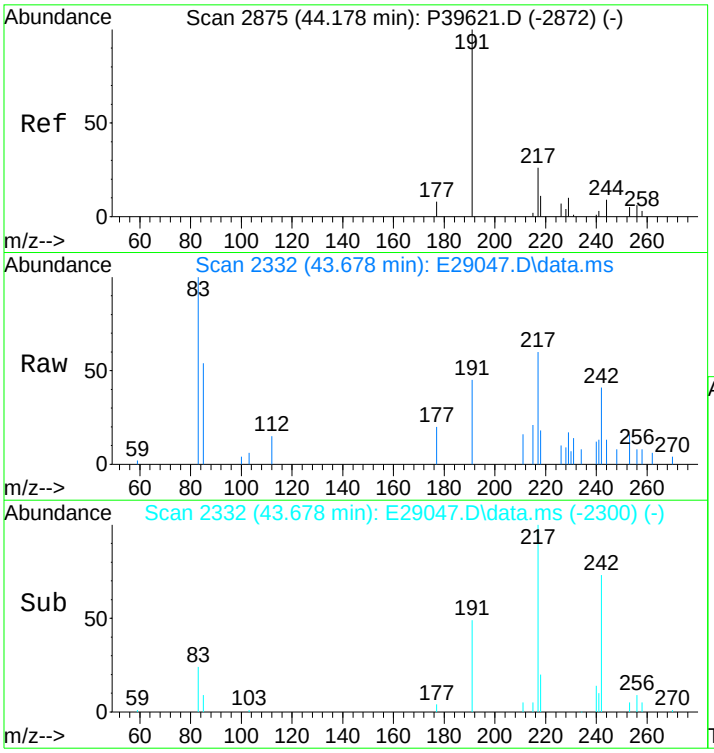




#99
C24 Tetracyclic Terpane (T6a)
Concen: 98.48 ng/ml m
RT: 43.919 min Scan# 2348
Delta R.T. -0.016 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

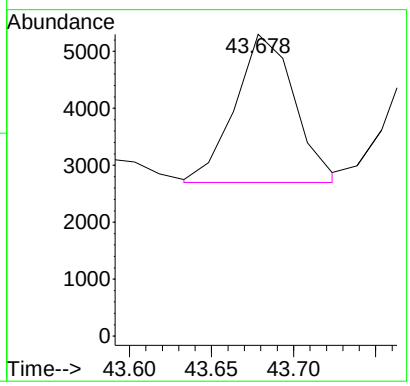
Tgt Ion:191 Resp: 7097

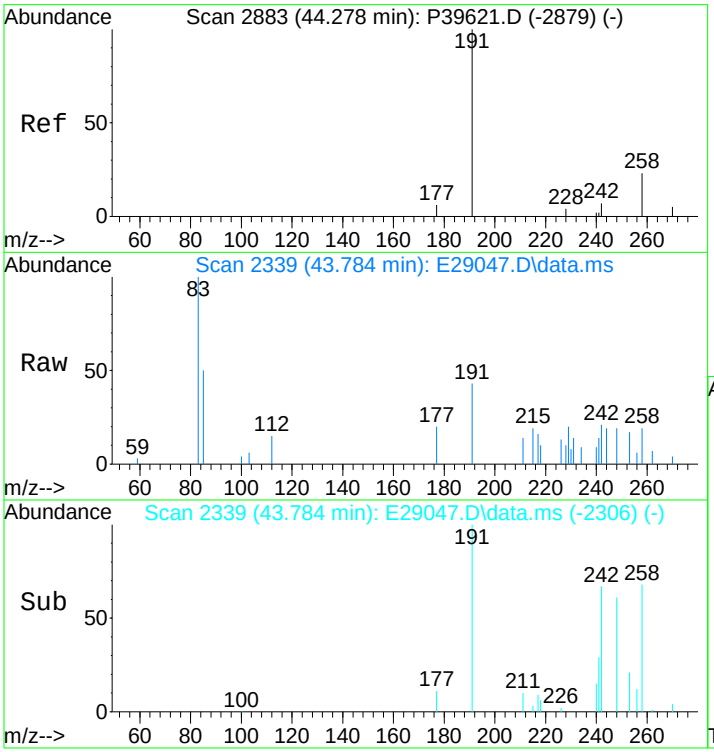




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 91.03 ng/ml m
RT: 43.678 min Scan# 2332
Delta R.T. -0.016 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

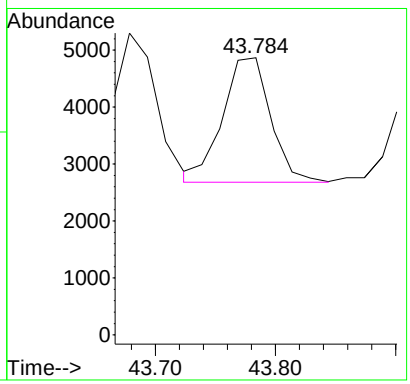
Tgt Ion:191 Resp: 6560

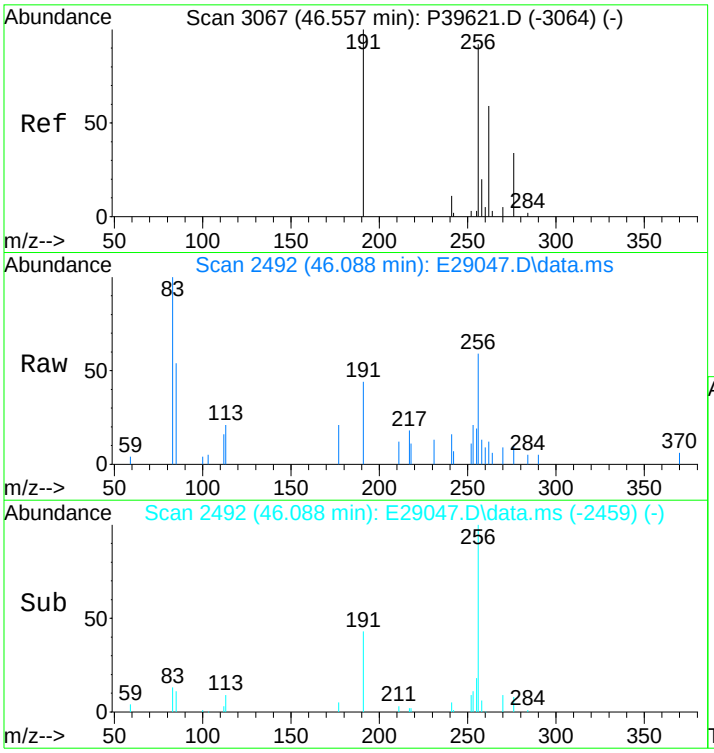




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 84.27 ng/ml m
RT: 43.784 min Scan# 2339
Delta R.T. -0.001 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

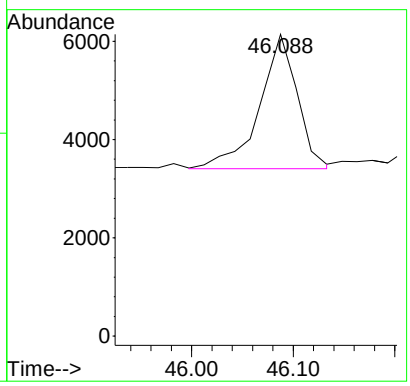
Tgt Ion:191 Resp: 6073

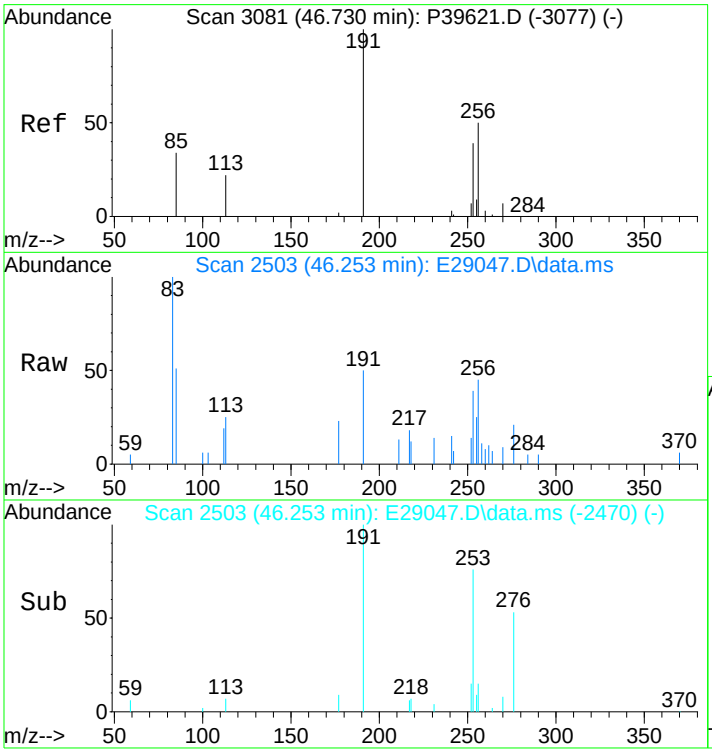




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 97.77 ng/ml m
RT: 46.088 min Scan# 2492
Delta R.T. -0.003 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

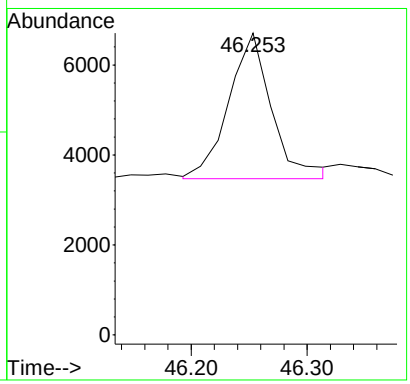
Tgt Ion:191 Resp: 7046

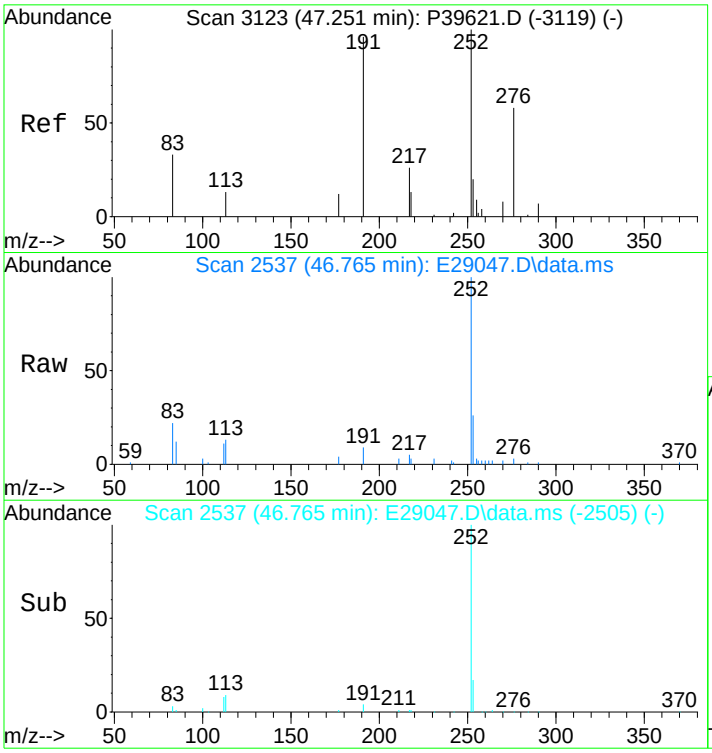




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 115.18 ng/ml m
RT: 46.253 min Scan# 2503
Delta R.T. -0.004 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

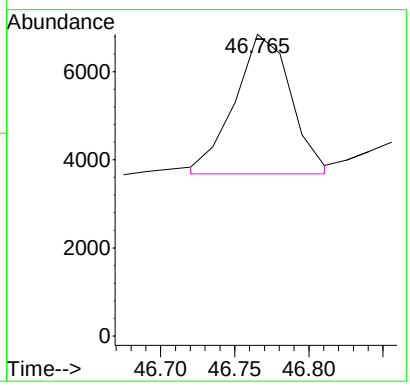
Tgt Ion:191 Resp: 8301

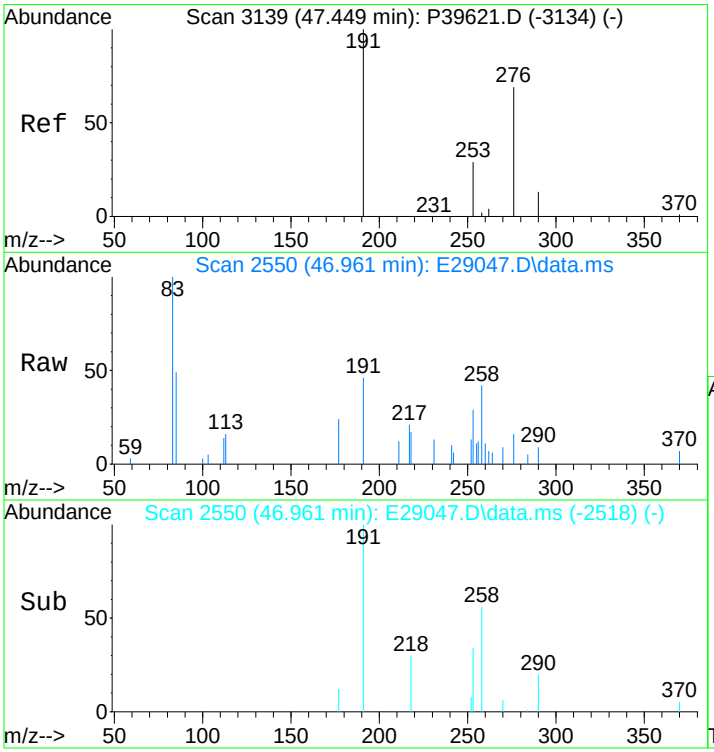




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 115.10 ng/ml m
RT: 46.765 min Scan# 2537
Delta R.T. -0.019 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

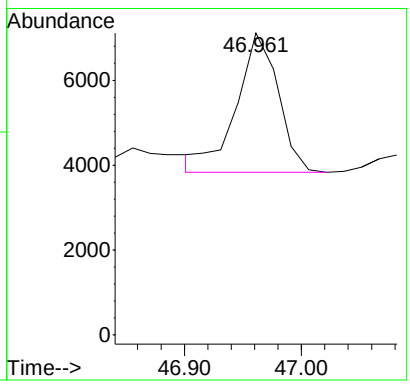
Tgt Ion:191 Resp: 8295

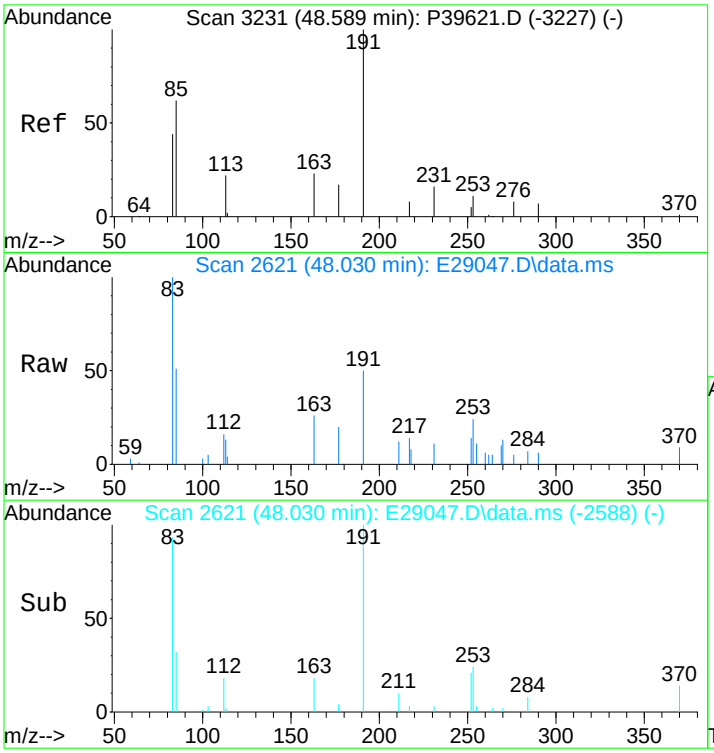




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 113.10 ng/ml
RT: 46.961 min Scan# 2550
Delta R.T. -0.019 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

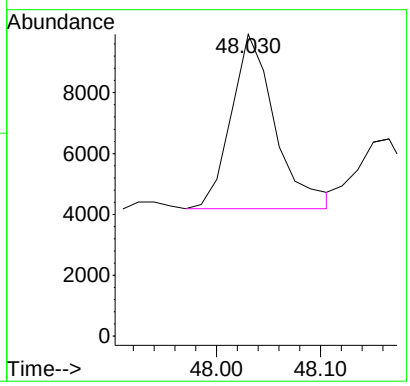
Tgt Ion:191 Resp: 8151

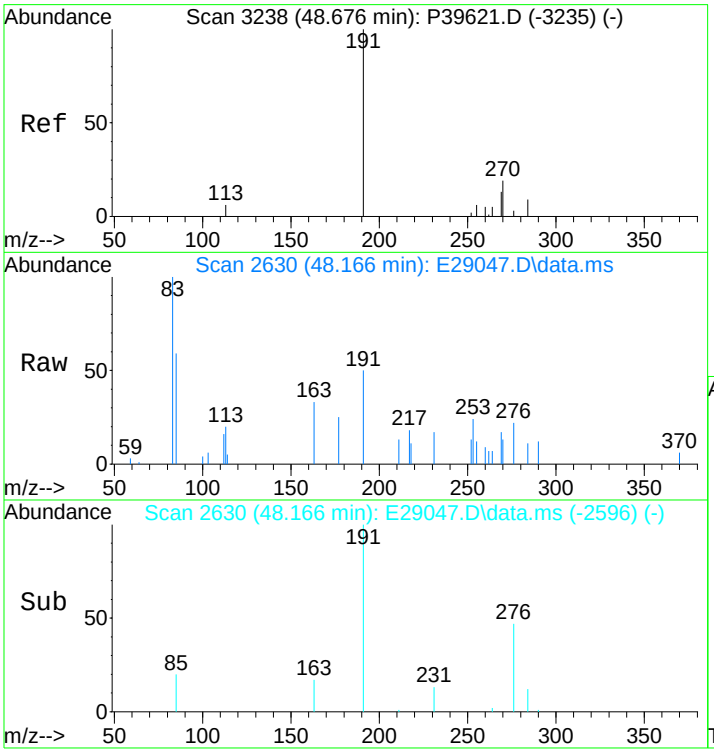




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 236.06 ng/ml
RT: 48.030 min Scan# 2621
Delta R.T. -0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

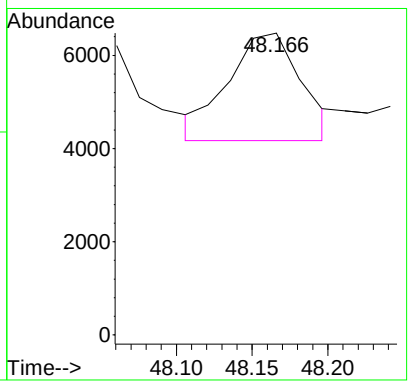
Tgt Ion:191 Resp: 17012

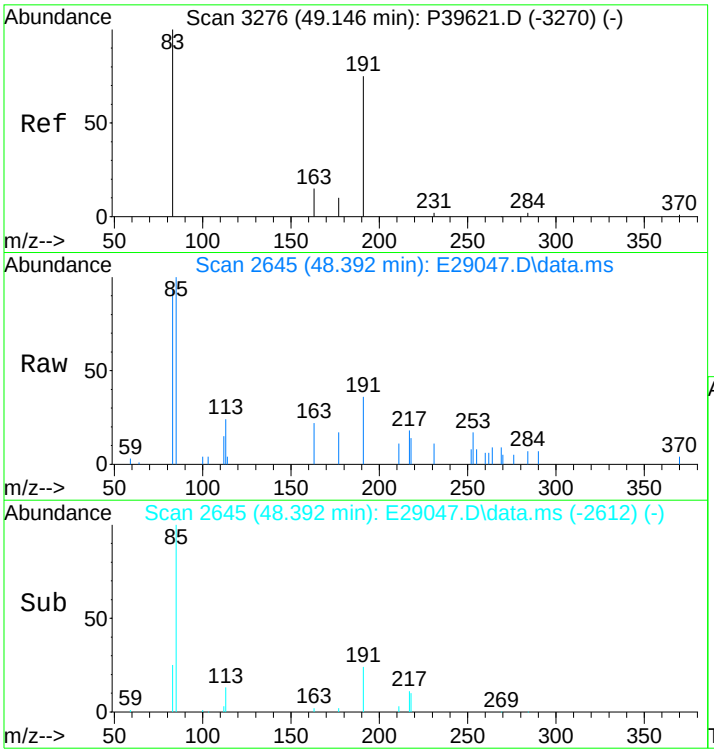




#107
C30 Tricyclic Terpane-22S
Concen: 107.30 ng/mL m
RT: 48.166 min Scan# 2630
Delta R.T. 0.009 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

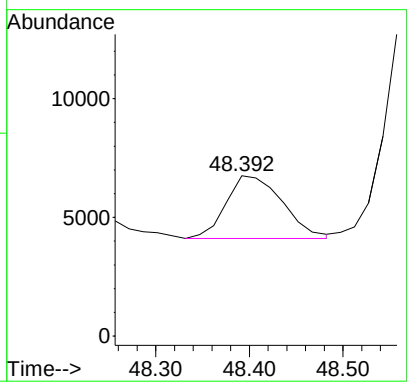
Tgt Ion:191 Resp: 7733

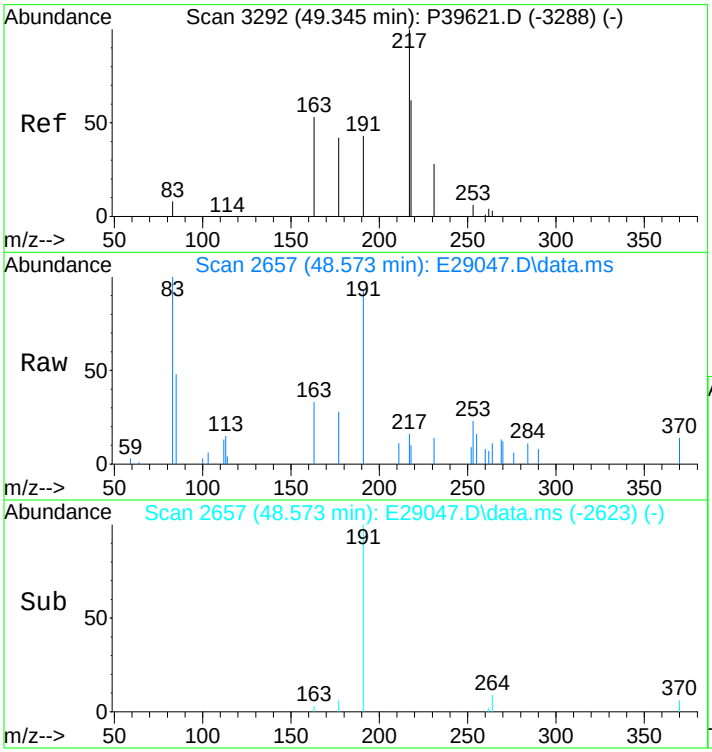




#108
C30 Tricyclic Terpane-22R
Concen: 154.33 ng/mL
RT: 48.392 min Scan# 2645
Delta R.T. -0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

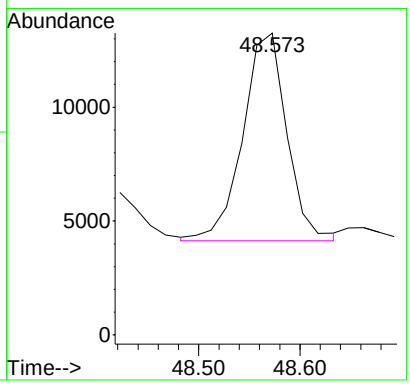
Tgt Ion:191 Resp: 11122

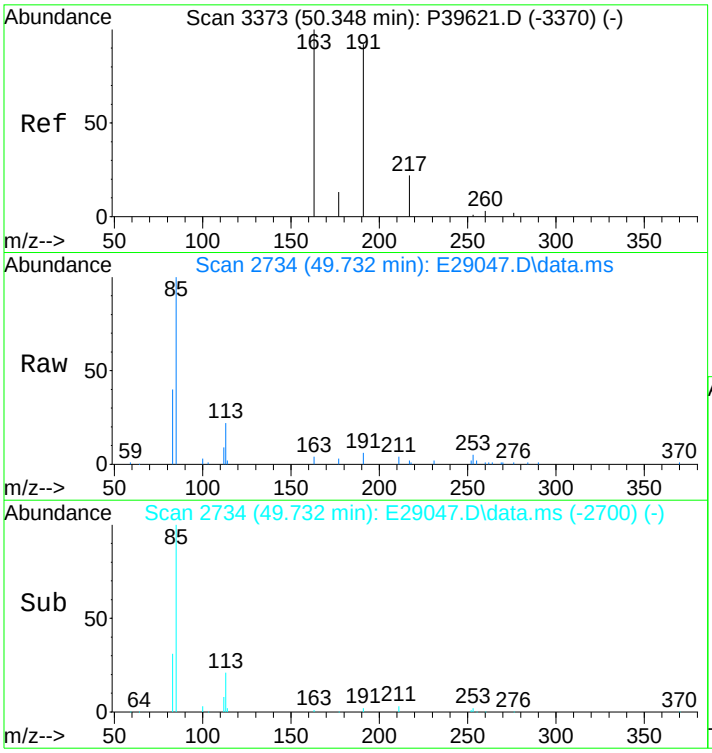




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 382.62 ng/ml m
RT: 48.573 min Scan# 2657
Delta R.T. 0.009 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

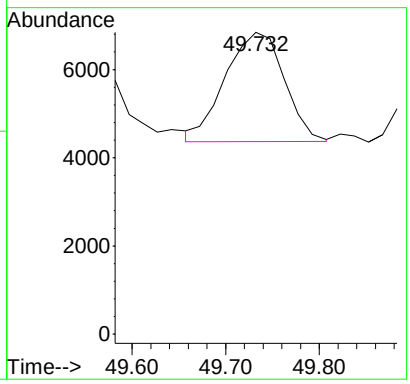
Tgt Ion:191 Resp: 27574

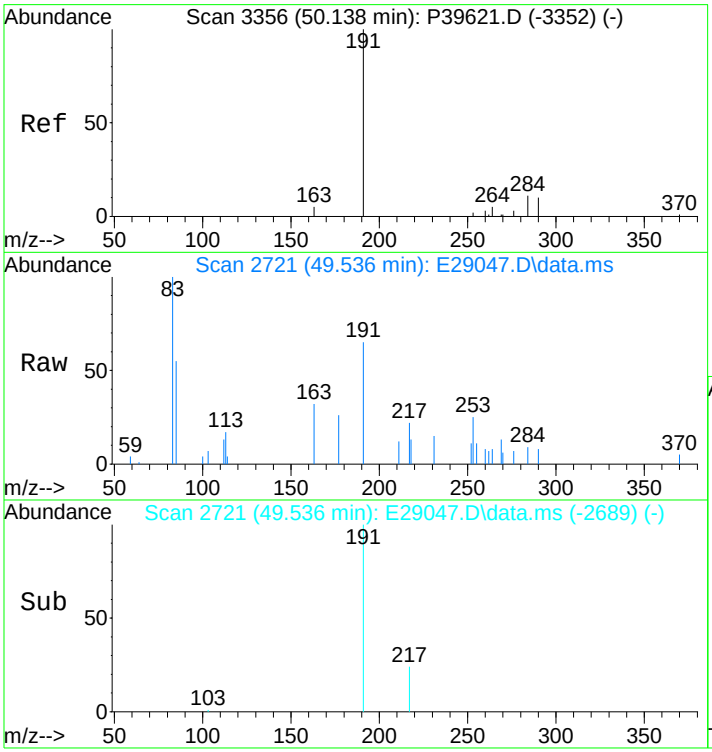




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 150.50 ng/ml
RT: 49.732 min Scan# 2734
Delta R.T. 0.008 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

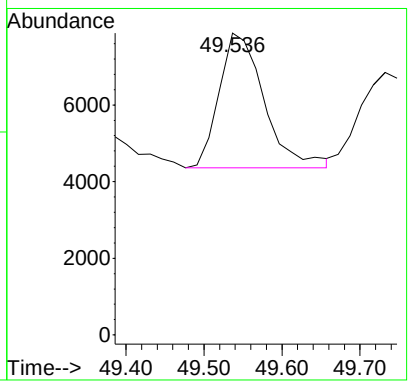
Tgt Ion:191 Resp: 10846

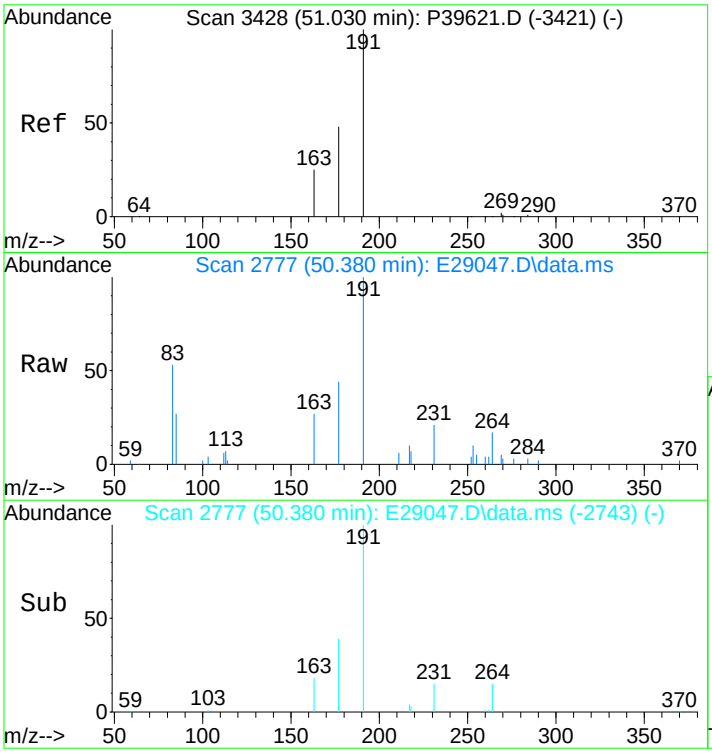




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 196.07 ng/ml
RT: 49.536 min Scan# 2721
Delta R.T. -0.022 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

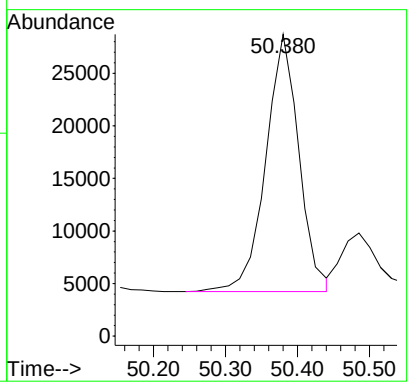
Tgt Ion:191 Resp: 14130

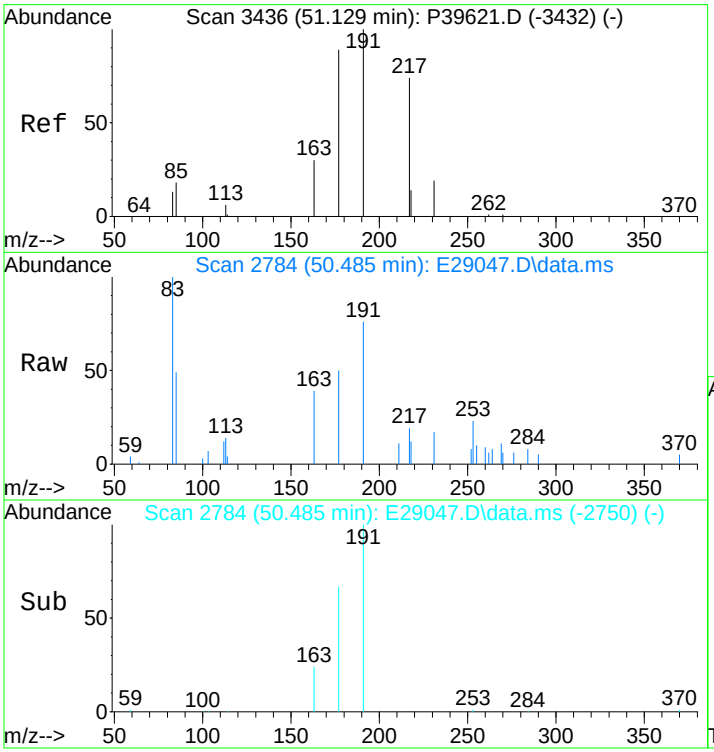




#112
30-Norhopane (T15)
Concen: 1086.04 ng/ml
RT: 50.380 min Scan# 2777
Delta R.T. 0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

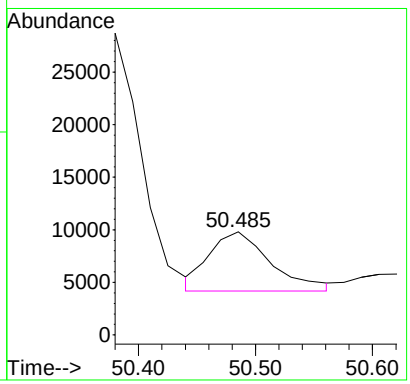
Tgt Ion:191 Resp: 78268

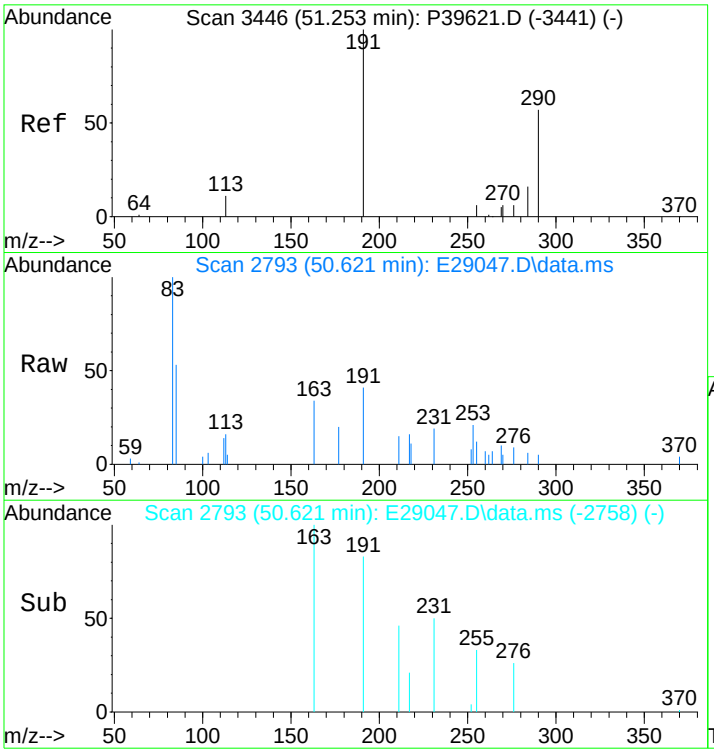




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 286.94 ng/ml
RT: 50.485 min Scan# 2784
Delta R.T. 0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

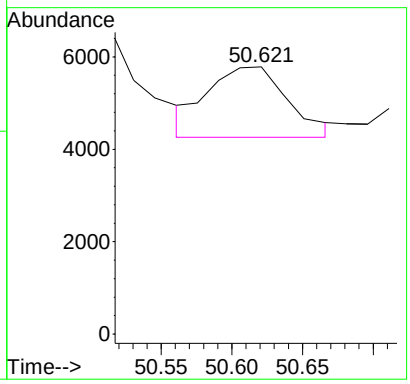
Tgt Ion:191 Resp: 20679

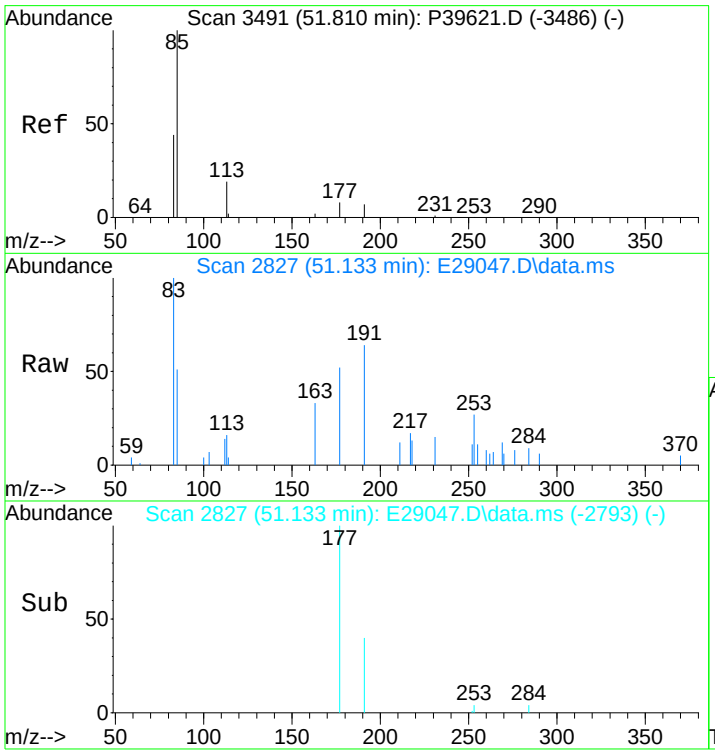




#114
17a(H)-Diahopane (X)
Concen: 83.39 ng/ml m
RT: 50.621 min Scan# 2793
Delta R.T. 0.022 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

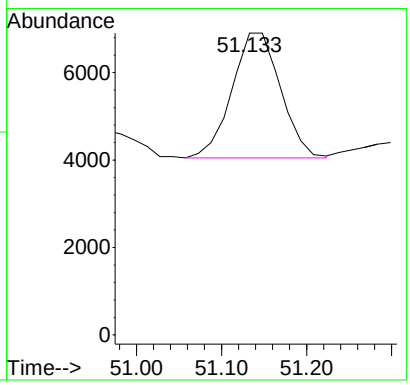
Tgt Ion:191 Resp: 6010

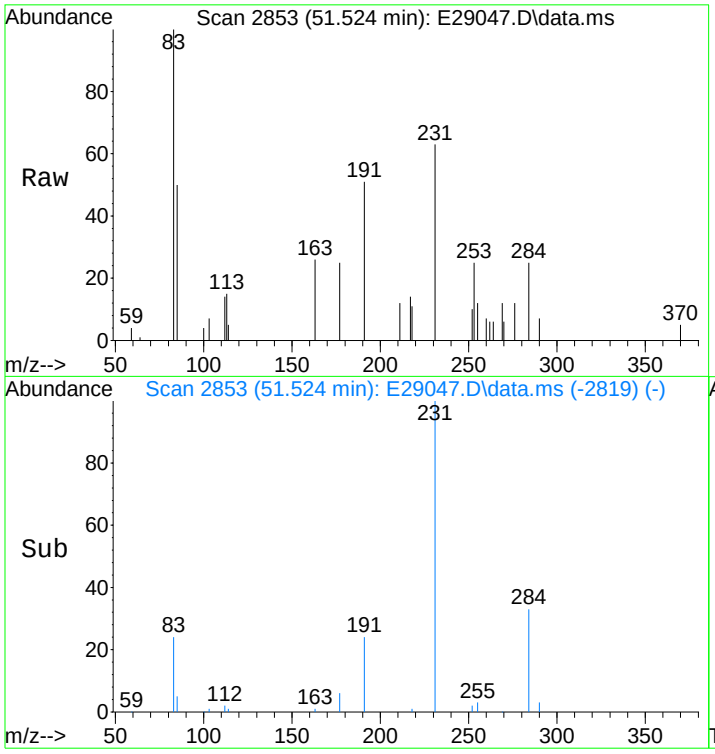




#115
30-Normoretane (T17)
Concen: 158.27 ng/ml
RT: 51.133 min Scan# 2827
Delta R.T. 0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

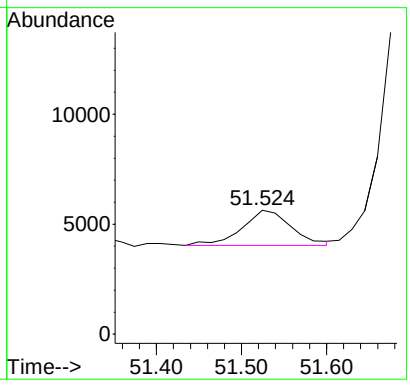
Tgt Ion:191 Resp: 11406

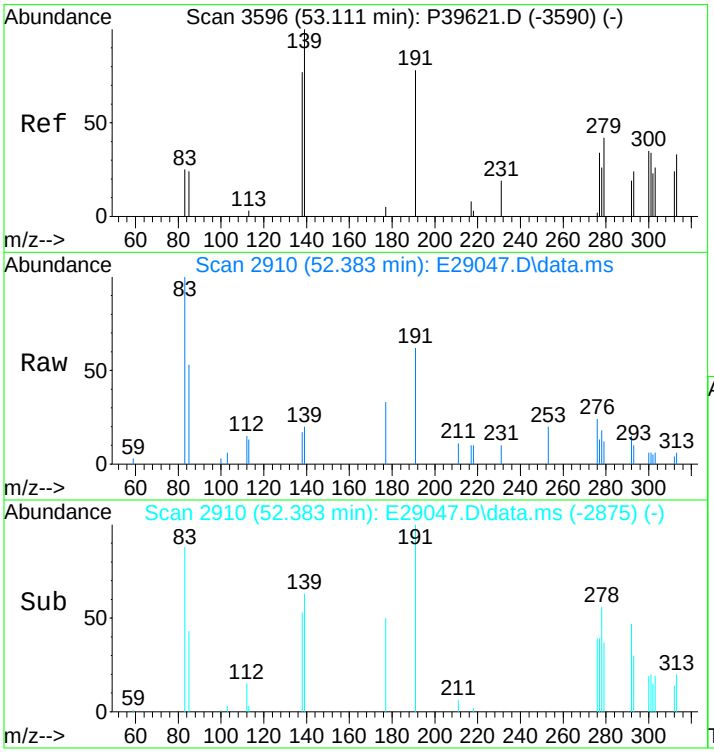




#116
18a(H)&18b(H)-Oleananes (T18)
Concen: 89.72 ng/ml
RT: 51.524 min Scan# 2853
Delta R.T. 0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

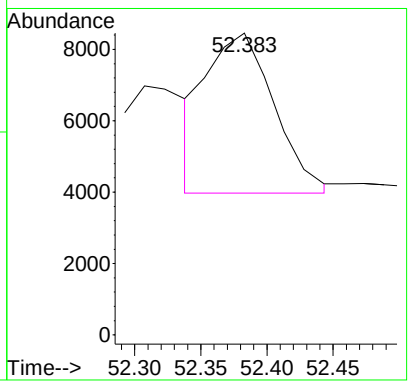
Tgt Ion:191 Resp: 6466

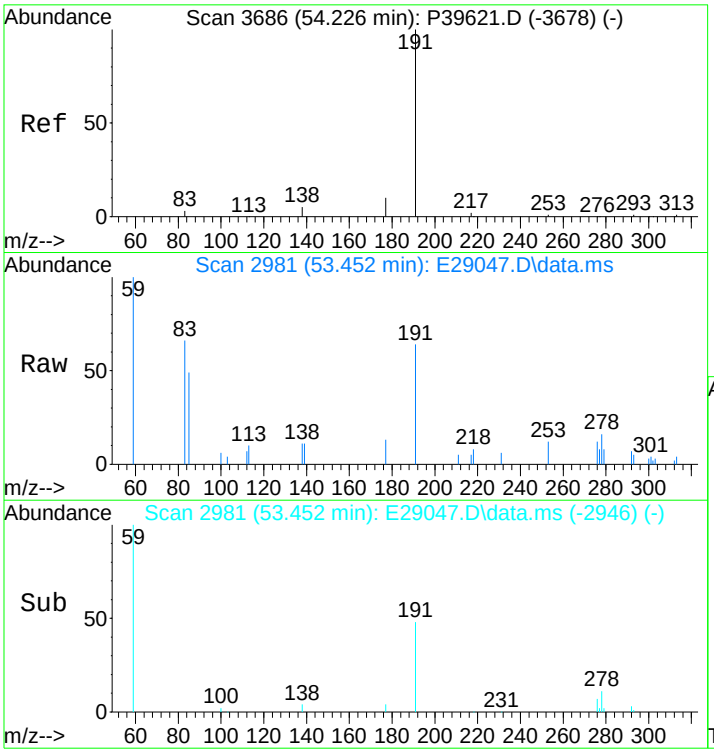




#117
Moretane (T20)
Concen: 222.63 ng/ml m
RT: 52.383 min Scan# 2910
Delta R.T. 0.020 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

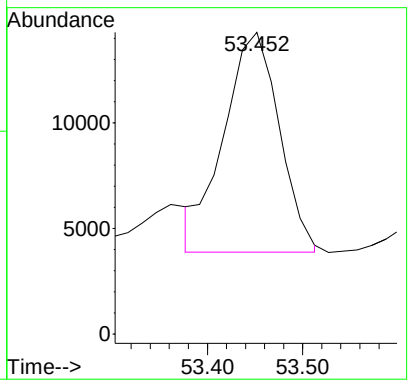
Tgt Ion:191 Resp: 16044

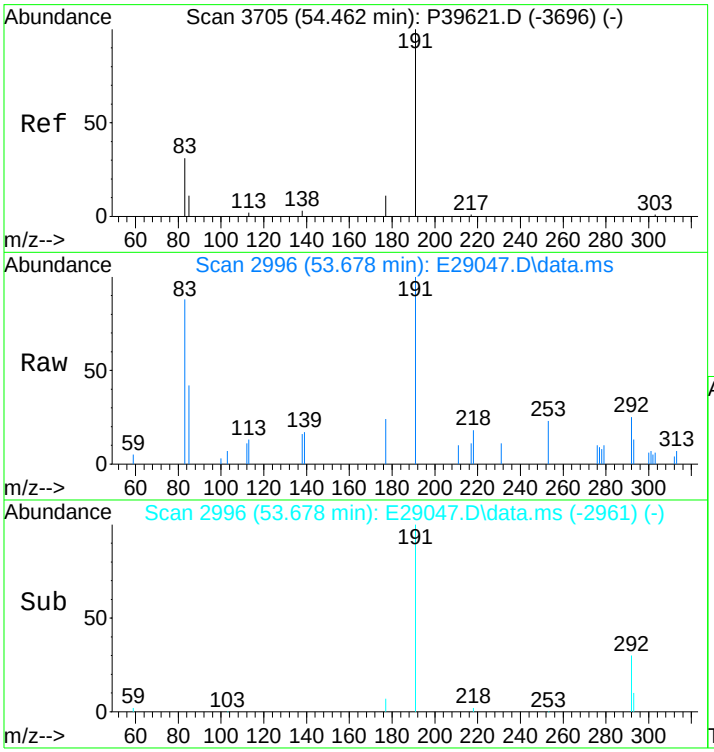




#118
30-Homohopane-22S (T21)
Concen: 584.44 ng/ml m
RT: 53.452 min Scan# 2981
Delta R.T. 0.034 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

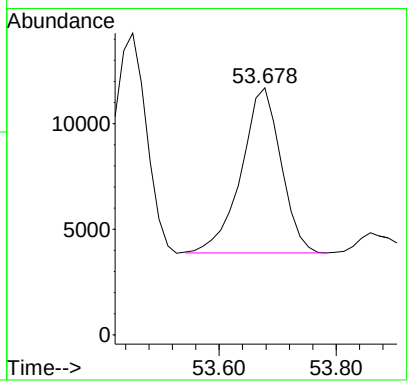
Tgt Ion:191 Resp: 42119

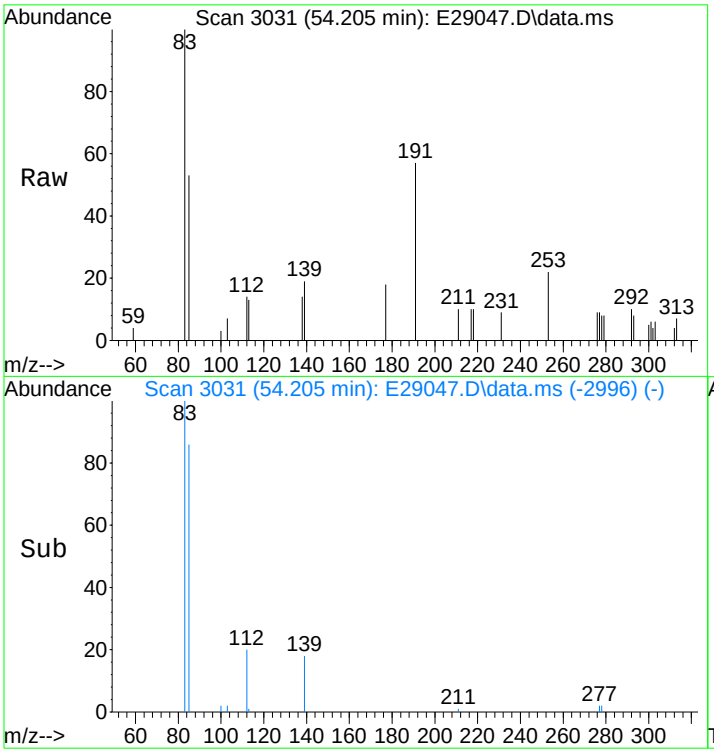




#119
30-Homohopane-22R (T22)
Concen: 510.55 ng/ml
RT: 53.678 min Scan# 2996
Delta R.T. 0.034 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

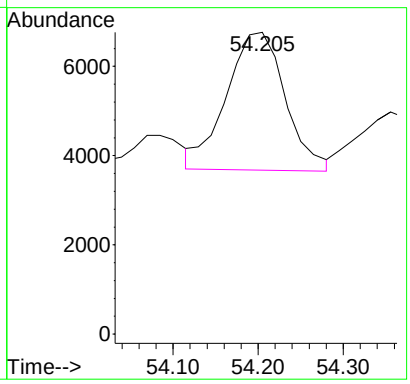
Tgt Ion:191 Resp: 36794

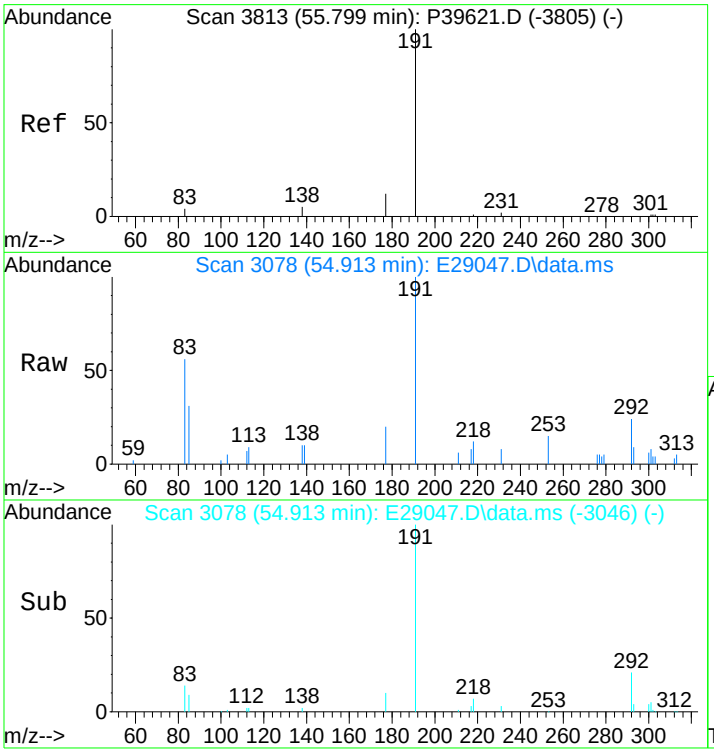




#120
Gammacerane/C32-diahopane
Concen: 206.27 ng/mL
RT: 54.205 min Scan# 3031
Delta R.T. 0.033 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

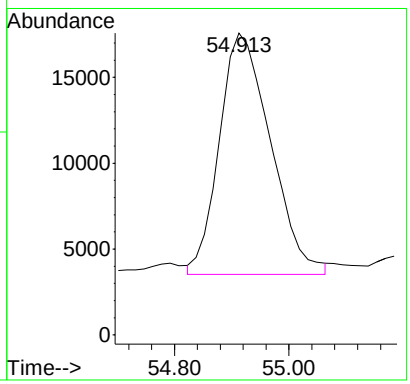
Tgt Ion:191 Resp: 14865

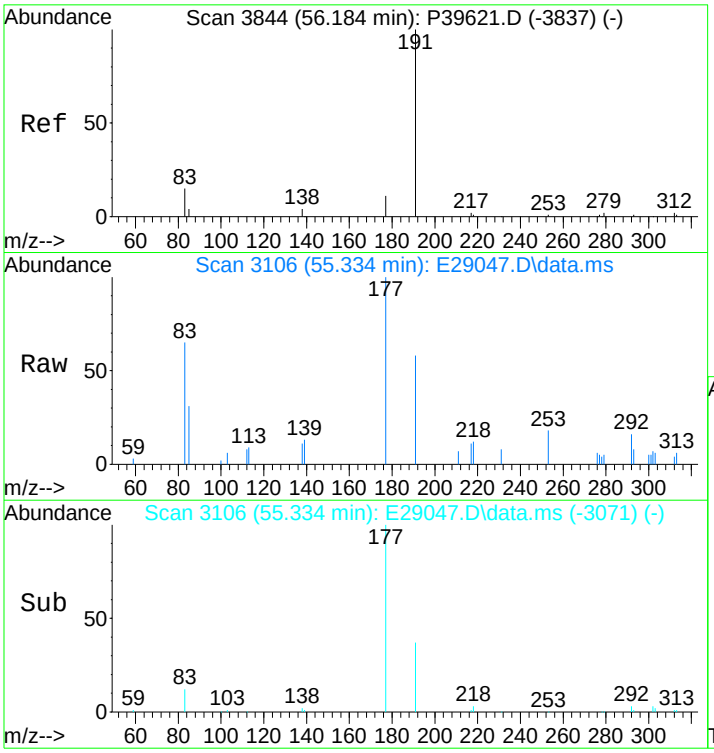




#121
30,31-Bishomohopane-22S (T26)
Concen: 1207.36 ng/ml m
RT: 54.913 min Scan# 3078
Delta R.T. -0.013 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

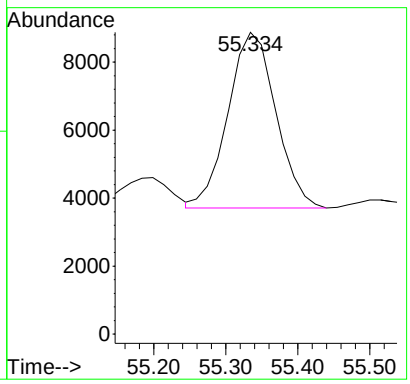
Tgt Ion:191 Resp: 87011

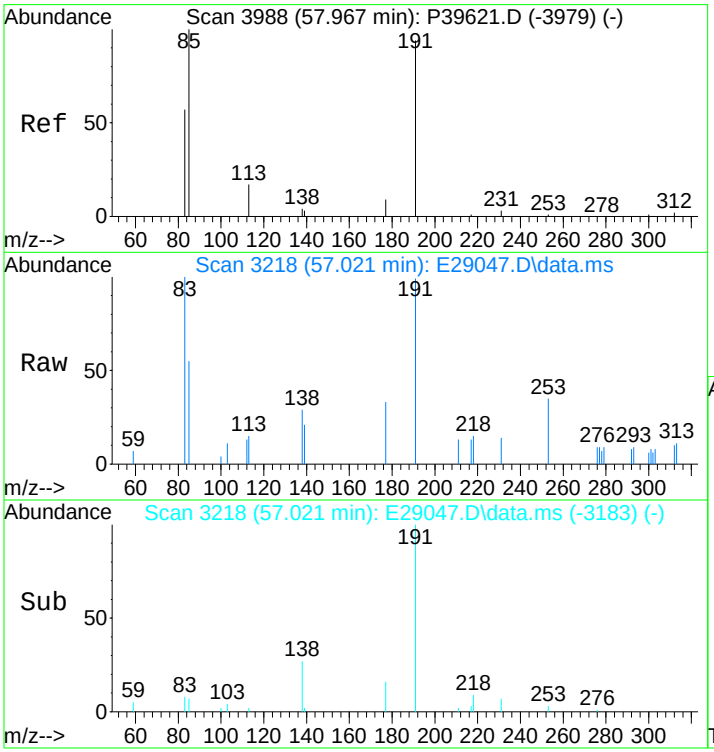




#122
30,31-Bishomohopane-22R (T27)
Concen: 330.61 ng/ml
RT: 55.334 min Scan# 3106
Delta R.T. 0.032 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

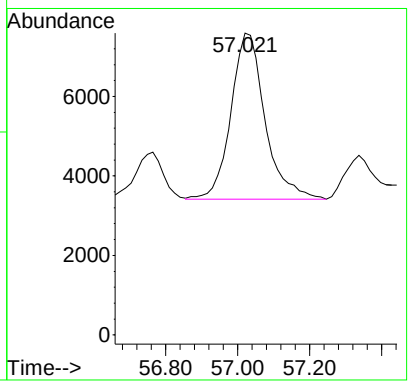
Tgt Ion:191 Resp: 23826

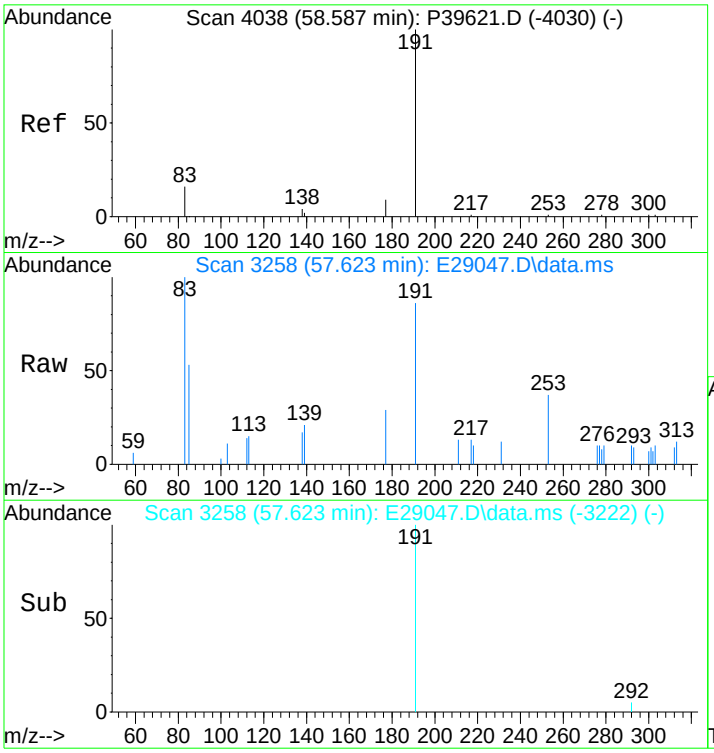




#123
30,31-Trishomohopane-22S (T30)
Concen: 380.58 ng/ml
RT: 57.021 min Scan# 3218
Delta R.T. 0.030 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

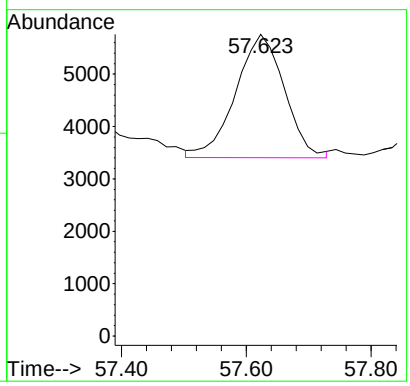
Tgt Ion:191 Resp: 27427

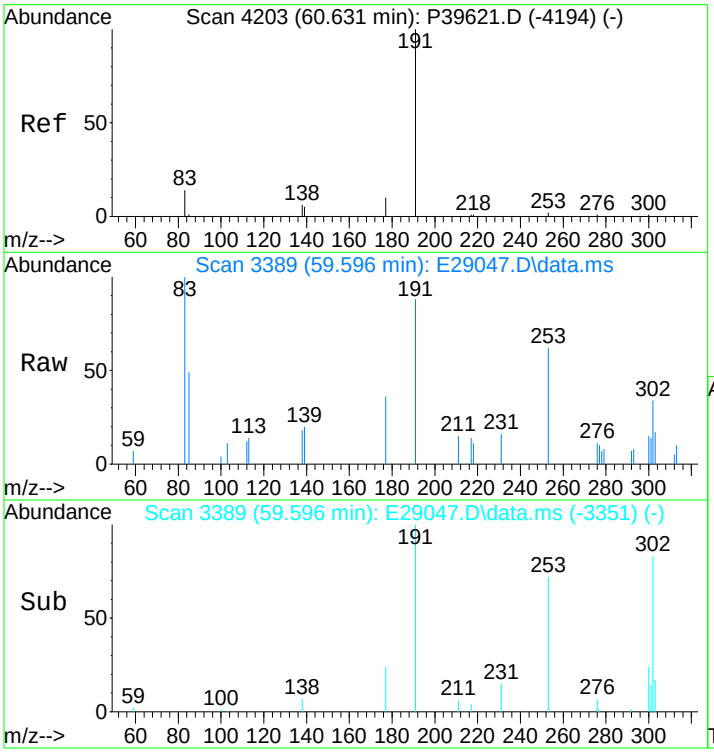




#124
30,31-Trishomohopane-22R (T31)
Concen: 177.65 ng/ml
RT: 57.623 min Scan# 3258
Delta R.T. 0.045 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

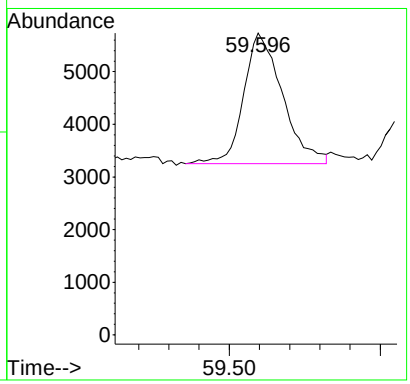
Tgt Ion:191 Resp: 12803

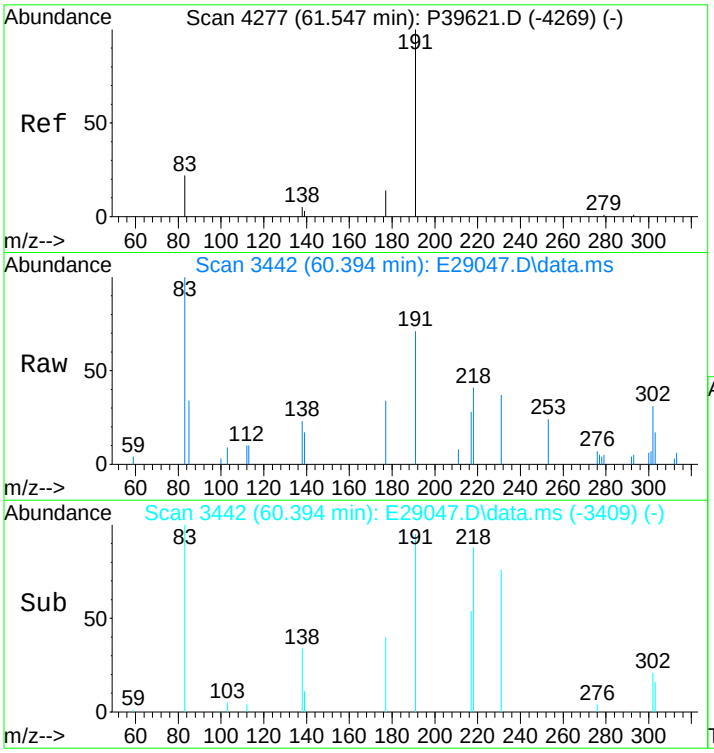




#125
Tetrakishomohopane-22S (T32)
Concen: 308.07 ng/ml
RT: 59.596 min Scan# 3389
Delta R.T. 0.073 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

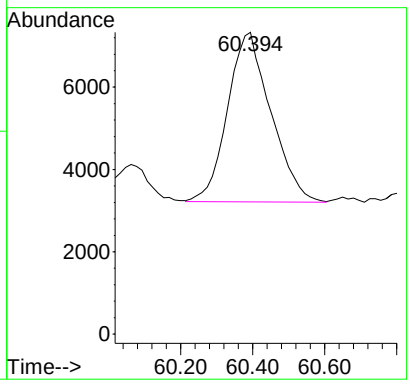
Tgt Ion:191 Resp: 22202

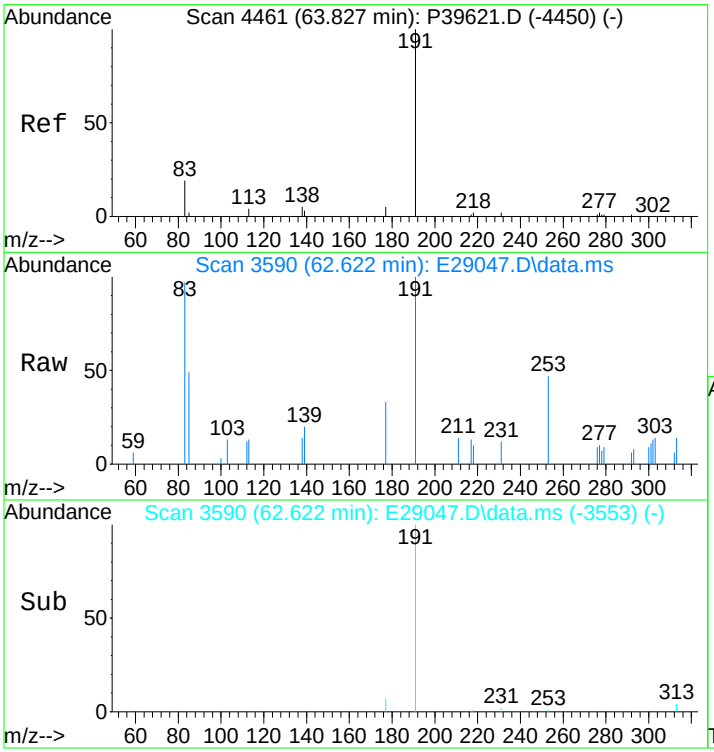




#126
Tetrakishomohopane-22R (T33)
Concen: 474.86 ng/ml
RT: 60.394 min Scan# 3442
Delta R.T. -0.003 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

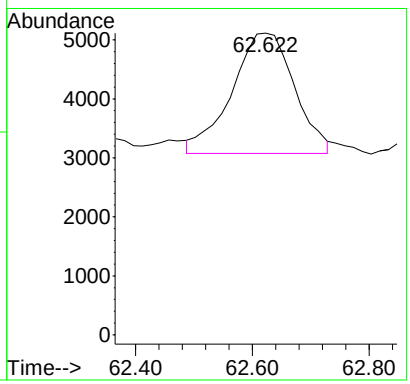
Tgt Ion:191 Resp: 34222

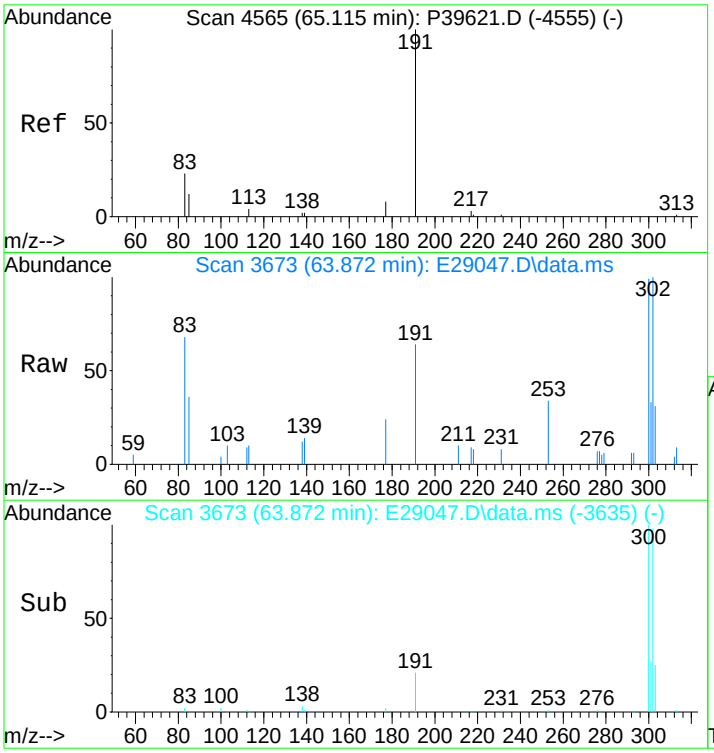




#127
Pentakishomohopane-22S (T34)
Concen: 210.64 ng/ml m
RT: 62.622 min Scan# 3590
Delta R.T. 0.054 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

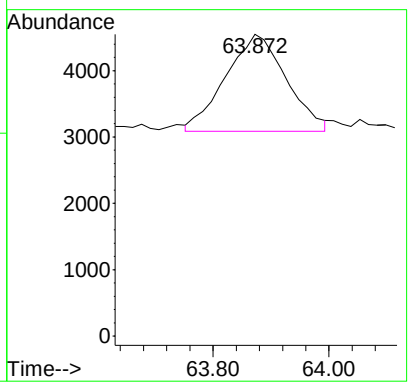
Tgt Ion:191 Resp: 15180

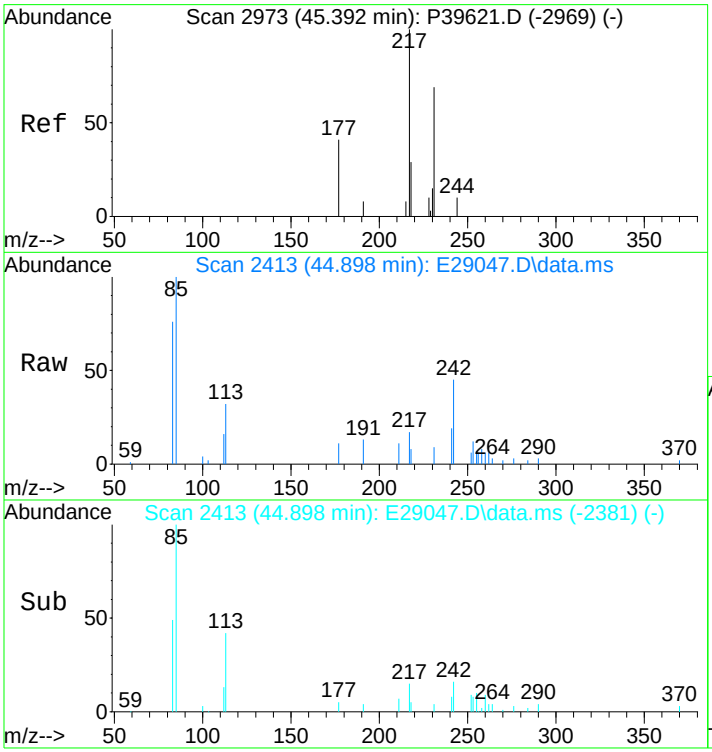




#128
Pentakishomohopane-22R (T35)
Concen: 147.42 ng/ml m
RT: 63.872 min Scan# 3673
Delta R.T. 0.068 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

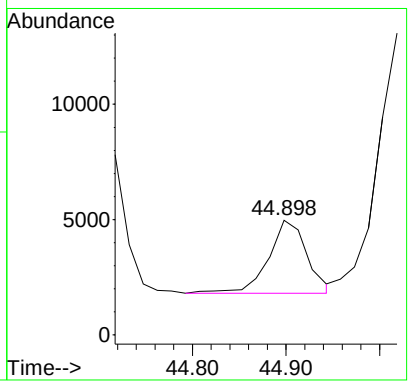
Tgt Ion:191 Resp: 10624

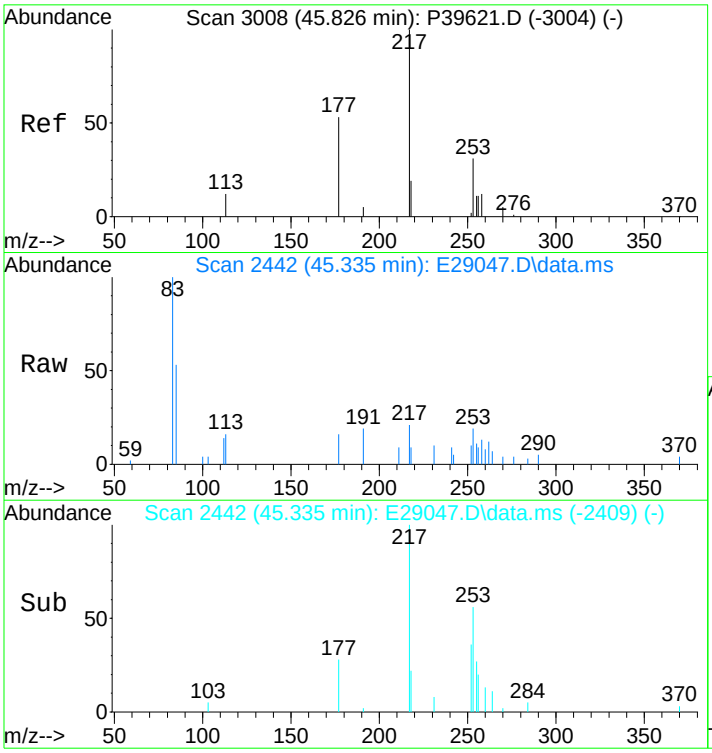




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 237.46 ng/ml
RT: 44.898 min Scan# 2413
Delta R.T. -0.017 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

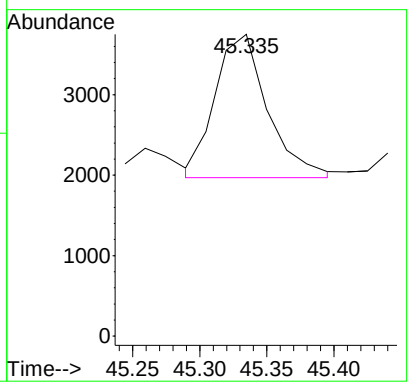
Tgt Ion:217 Resp: 8987

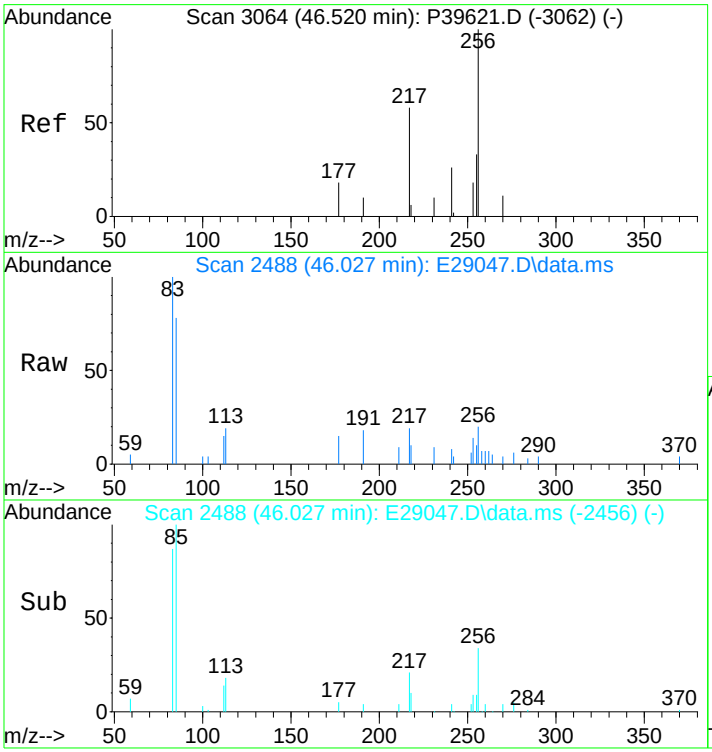




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 128.68 ng/ml m
RT: 45.335 min Scan# 2442
Delta R.T. -0.003 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

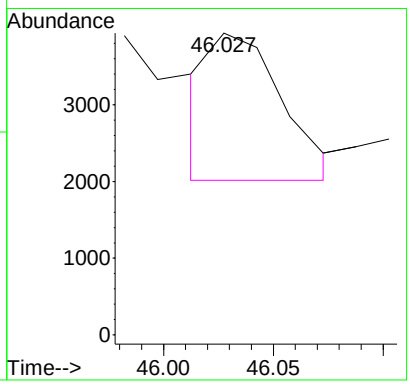
Tgt Ion:217 Resp: 4870

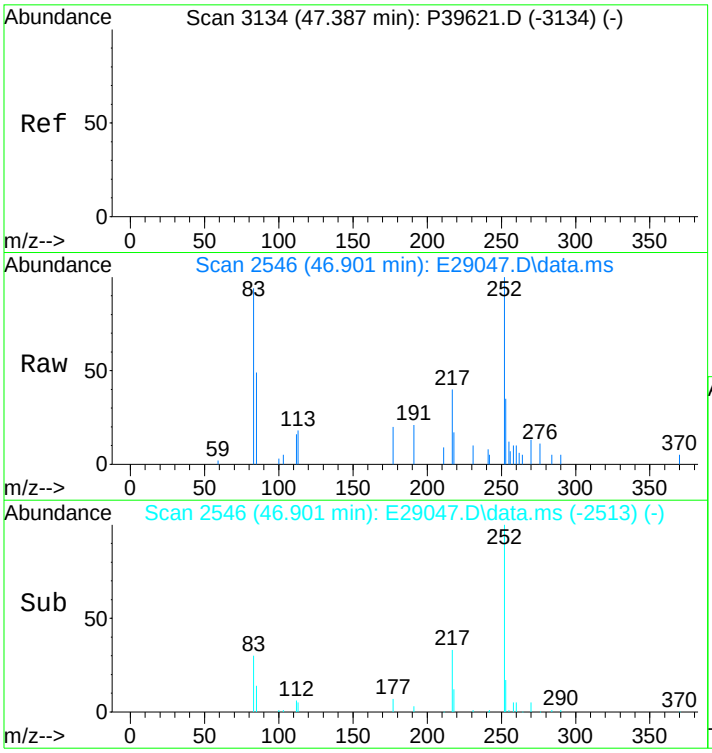




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 115.65 ng/ml m
RT: 46.027 min Scan# 2488
Delta R.T. -0.018 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

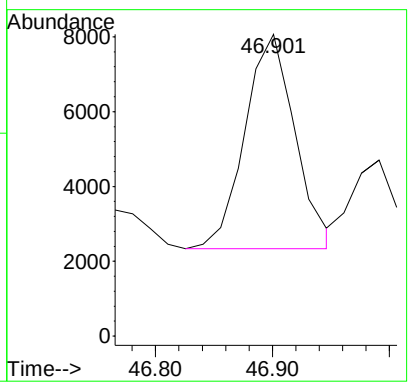
Tgt Ion:217 Resp: 4377

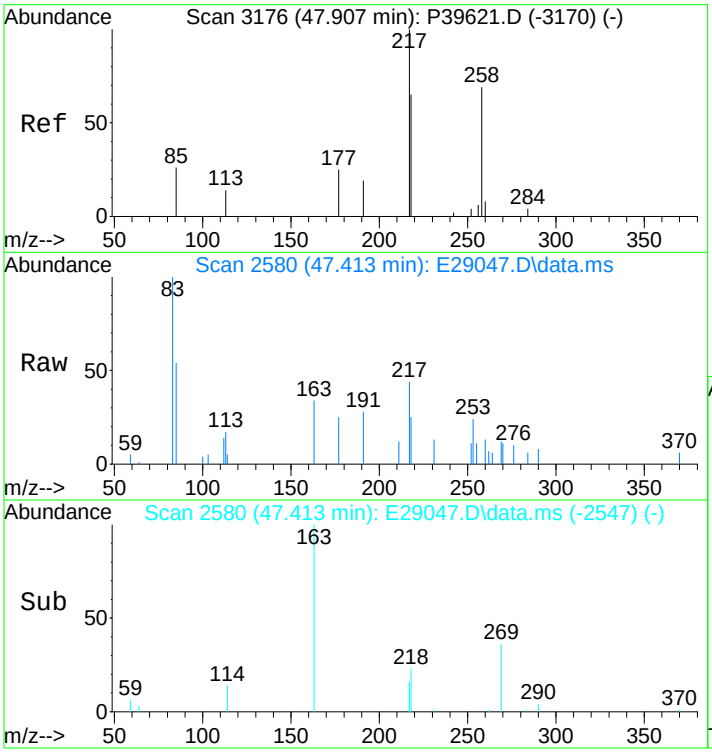




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 452.28 ng/ml
RT: 46.901 min Scan# 2546
Delta R.T. -0.004 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

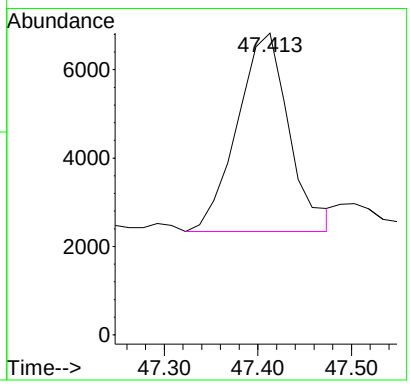
Tgt Ion:217 Resp: 17117

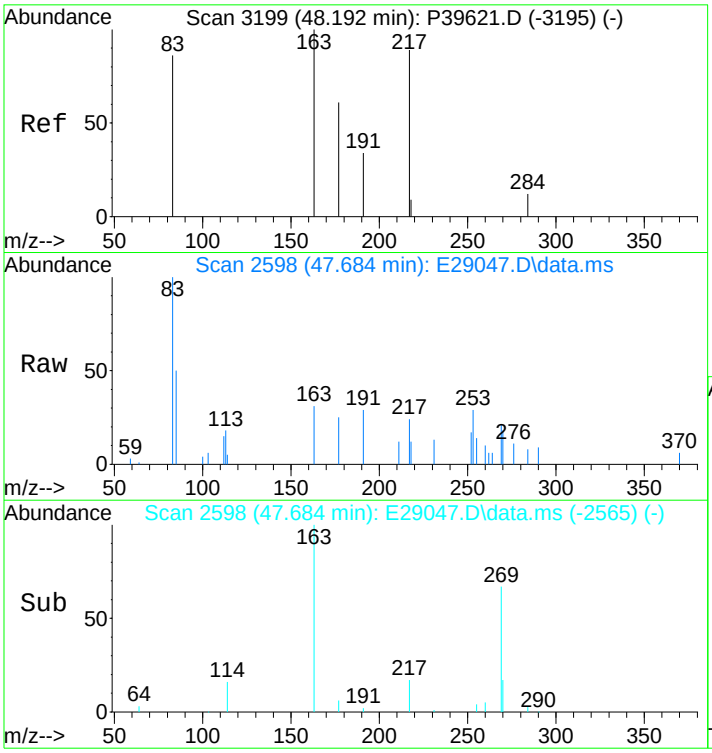




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 456.61 ng/ml
RT: 47.413 min Scan# 2580
Delta R.T. -0.005 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

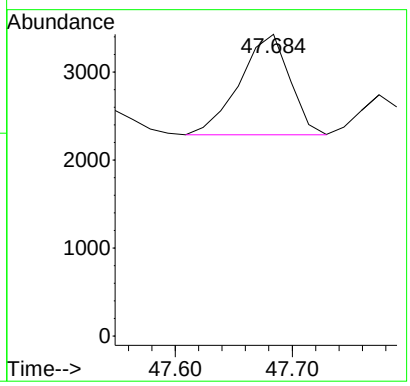
Tgt Ion:217 Resp: 17281

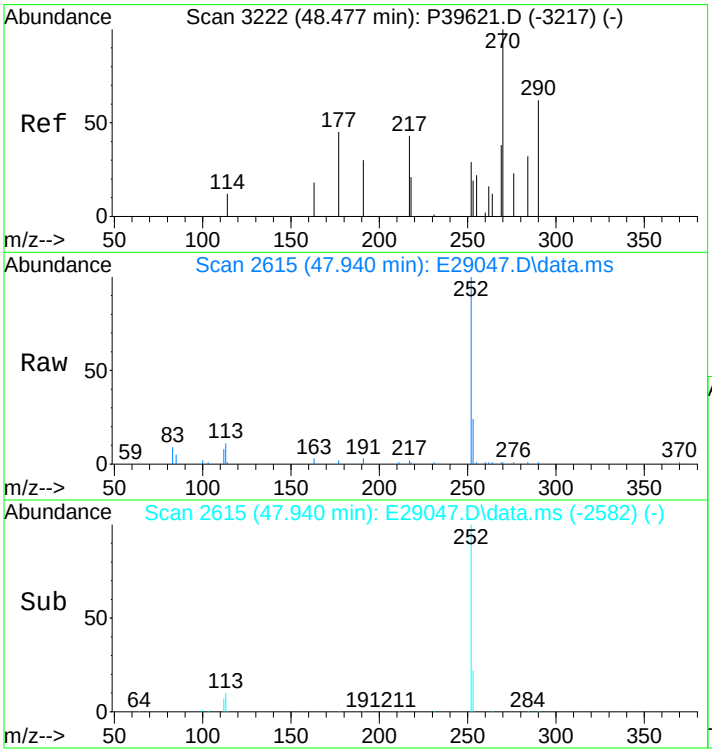




#135
Unknown Sterane (S18)
Concen: 90.02 ng/ml
RT: 47.684 min Scan# 2598
Delta R.T. -0.005 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

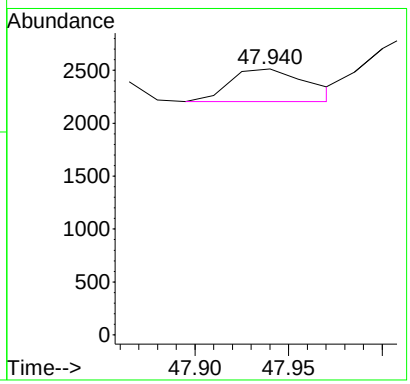
Tgt Ion:217 Resp: 3407

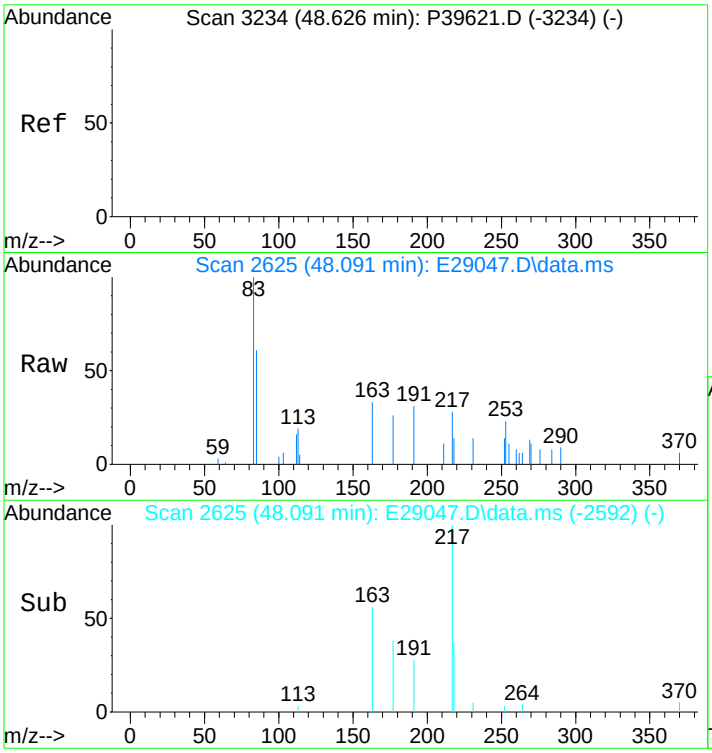




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 24.02 ng/ml
RT: 47.940 min Scan# 2615
Delta R.T. -0.005 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

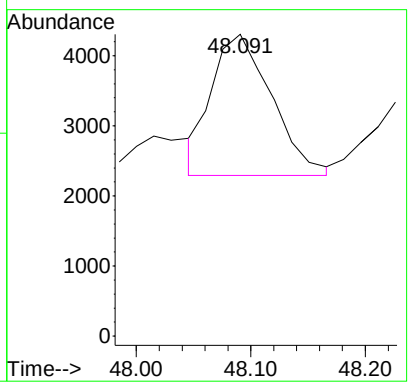
Tgt Ion:217 Resp: 909

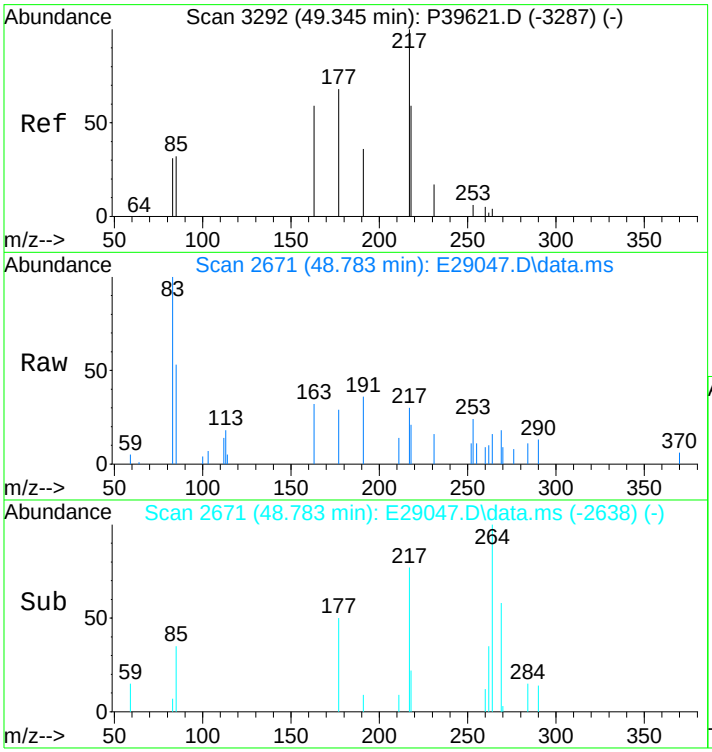




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 194.07 ng/ml m
RT: 48.091 min Scan# 2625
Delta R.T. -0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

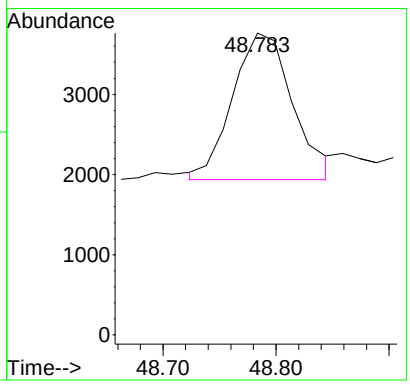
Tgt Ion:217 Resp: 7345

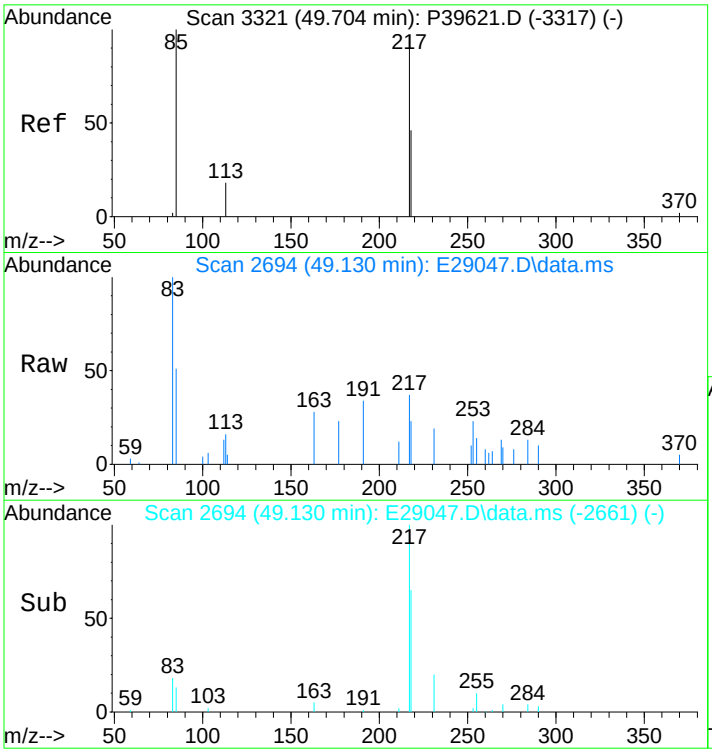




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 178.25 ng/ml m
RT: 48.783 min Scan# 2671
Delta R.T. -0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

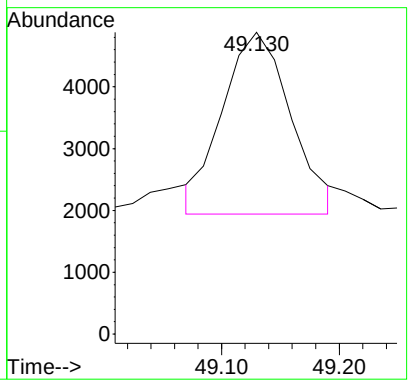
Tgt Ion:217 Resp: 6746

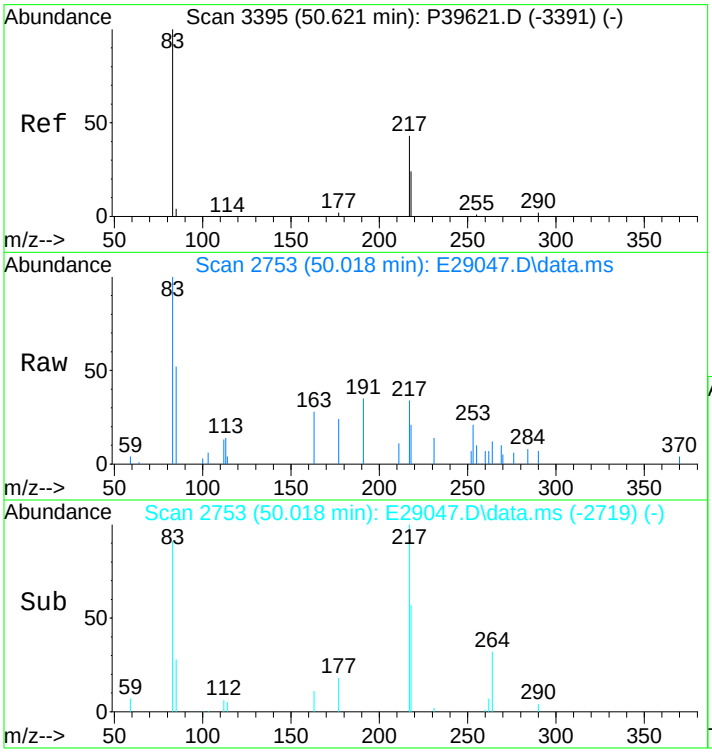




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 312.74 ng/ml m
RT: 49.130 min Scan# 2694
Delta R.T. -0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

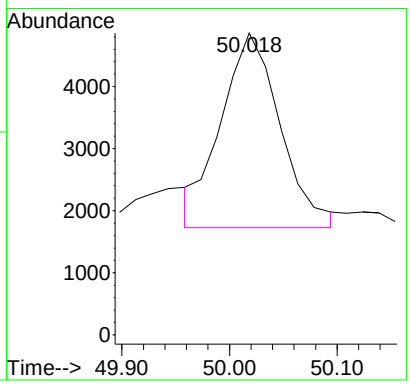
Tgt Ion:217 Resp: 11836

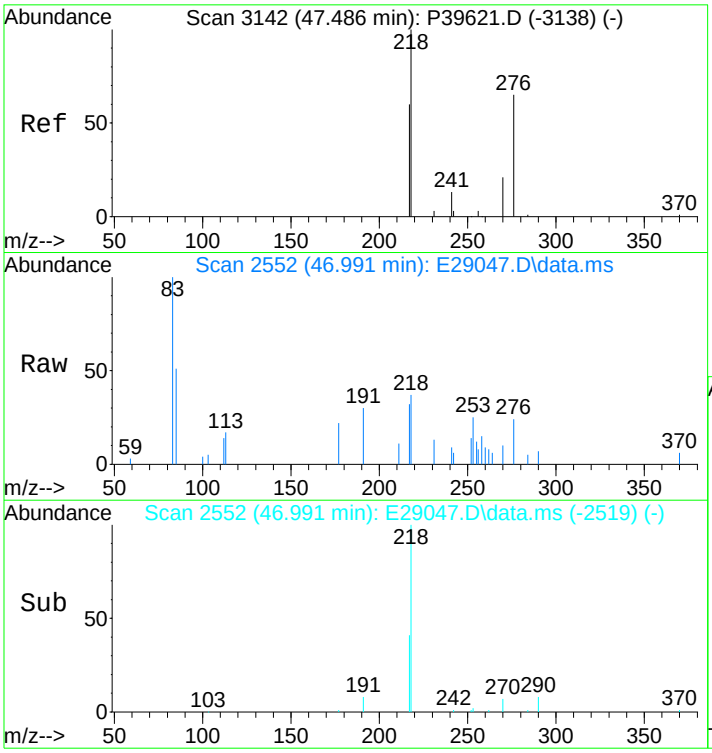




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 316.49 ng/ml m
RT: 50.018 min Scan# 2753
Delta R.T. 0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

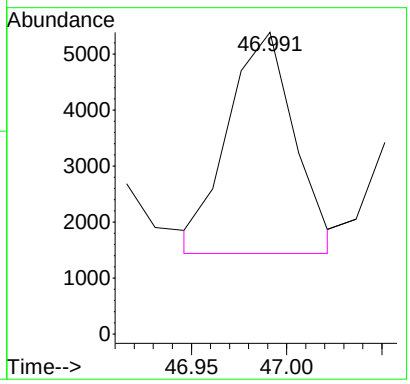
Tgt Ion:217 Resp: 11978

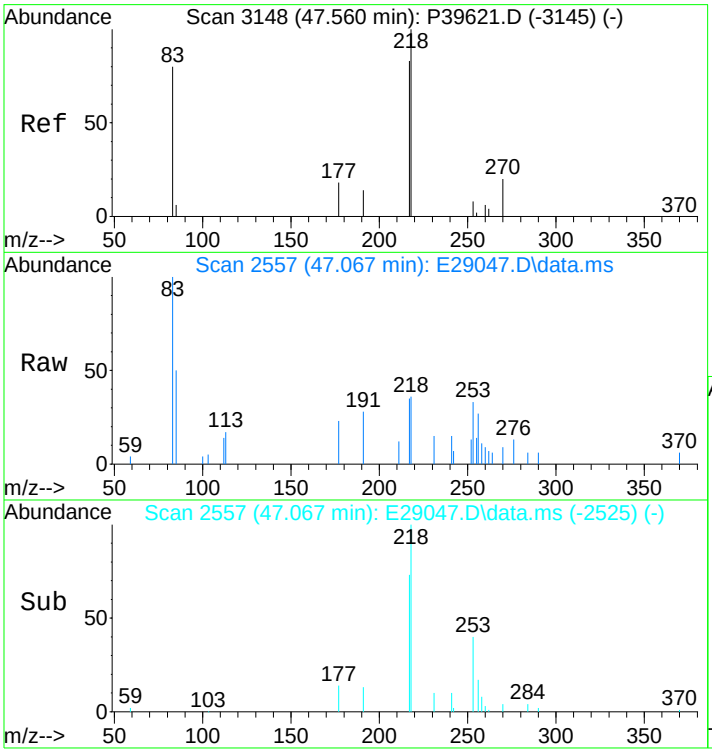




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 252.65 ng/ml m
RT: 46.991 min Scan# 2552
Delta R.T. -0.004 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

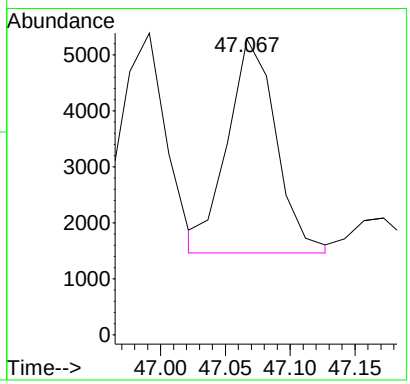
Tgt Ion:218 Resp: 9562

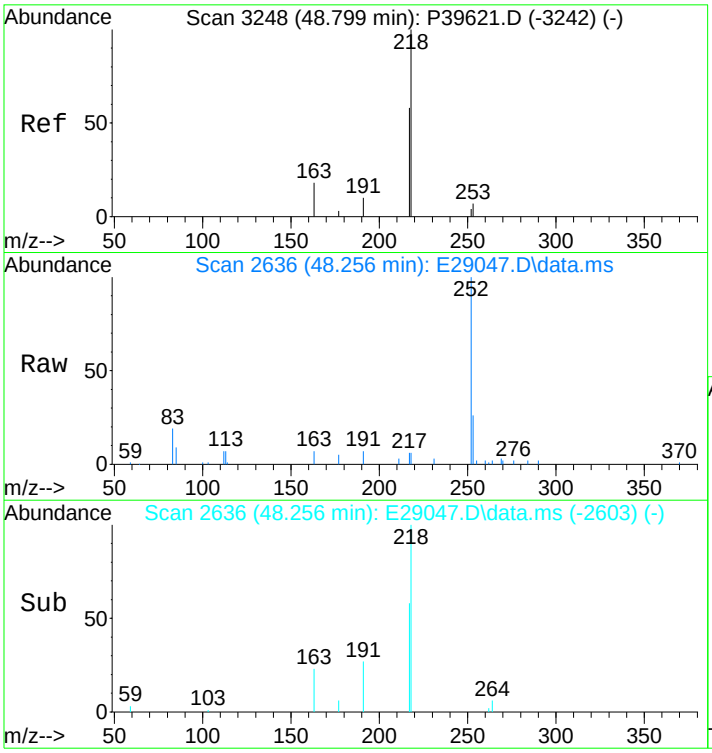




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 261.58 ng/ml m
RT: 47.067 min Scan# 2557
Delta R.T. -0.020 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

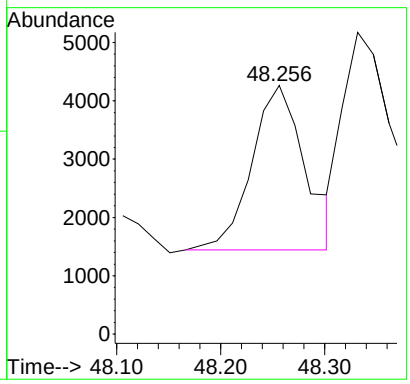
Tgt Ion:218 Resp: 9900

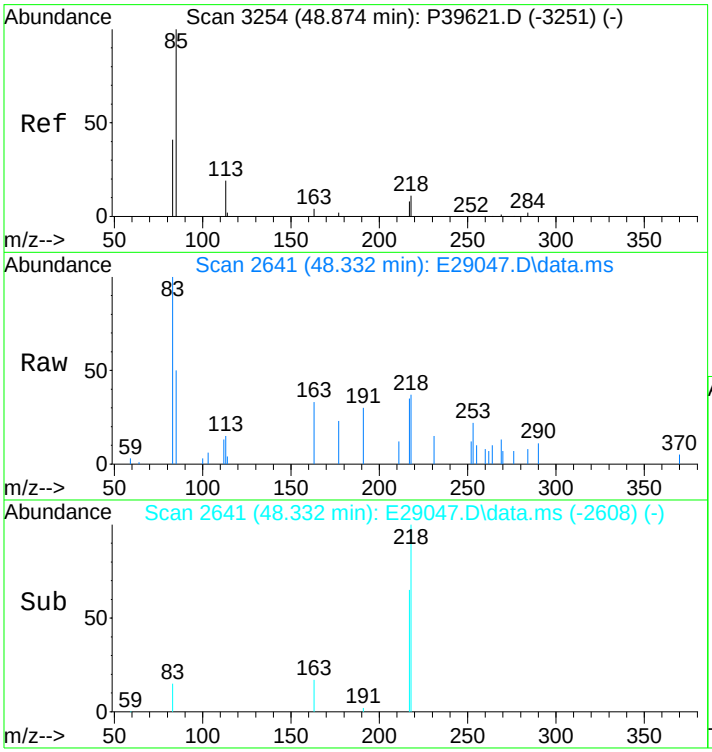




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 266.45 ng/ml
RT: 48.256 min Scan# 2636
Delta R.T. -0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

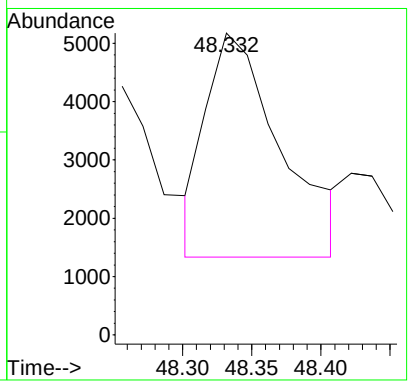
Tgt Ion:218 Resp: 10084

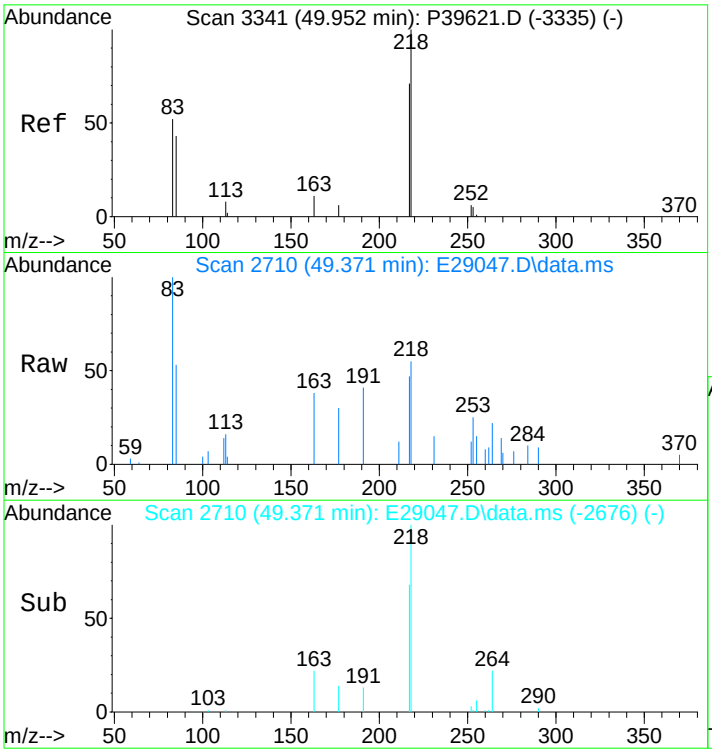




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 383.05 ng/ml m
RT: 48.332 min Scan# 2641
Delta R.T. -0.006 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

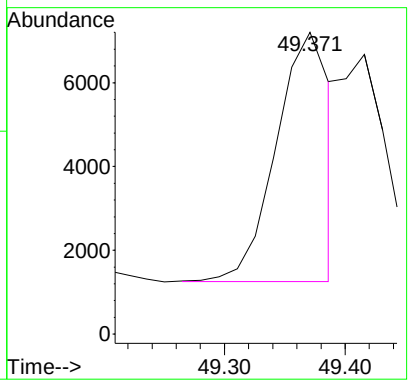
Tgt Ion:218 Resp: 14497

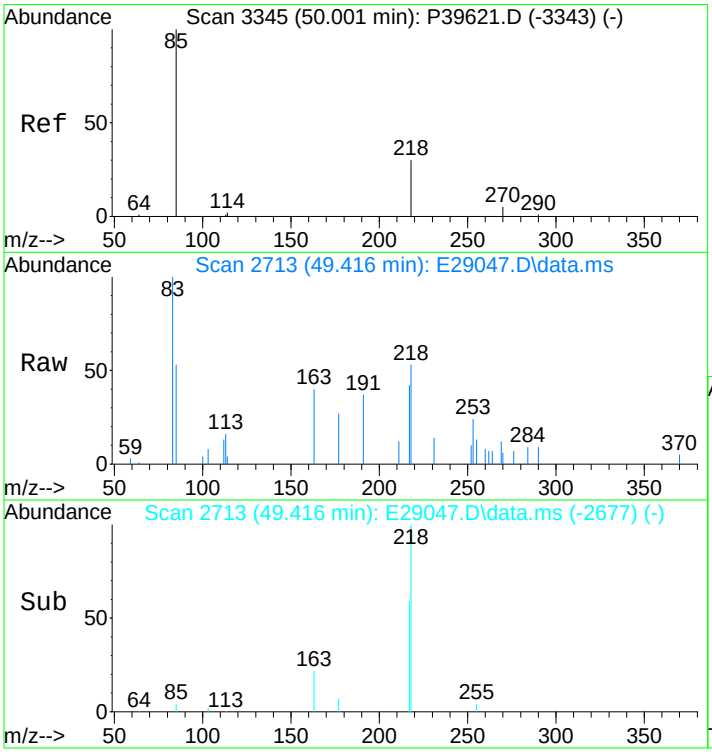




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 485.65 ng/ml m
RT: 49.371 min Scan# 2710
Delta R.T. 0.008 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

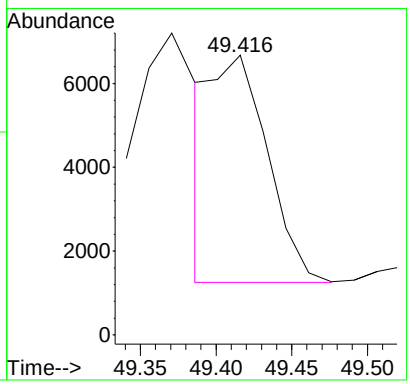
Tgt Ion:218 Resp: 18380

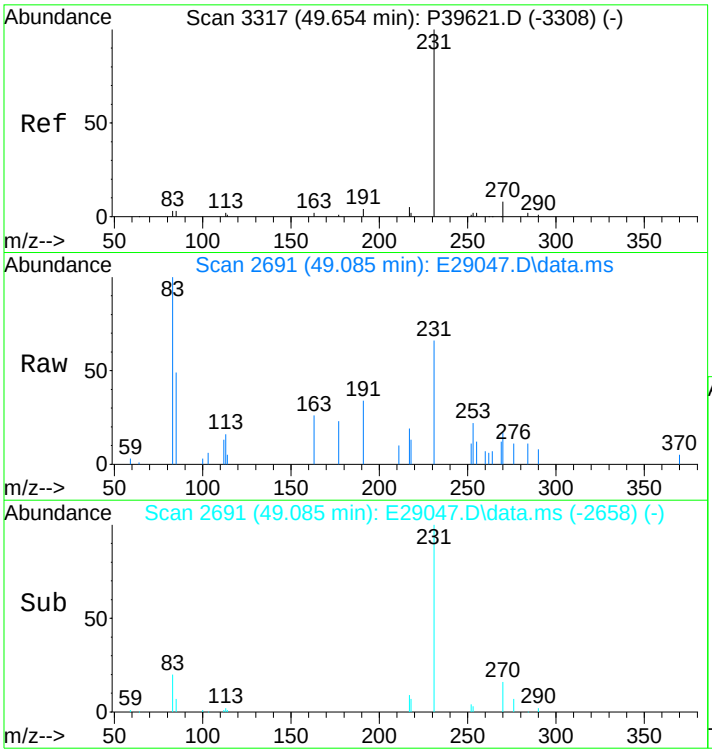




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 368.57 ng/ml m
RT: 49.416 min Scan# 2713
Delta R.T. 0.038 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

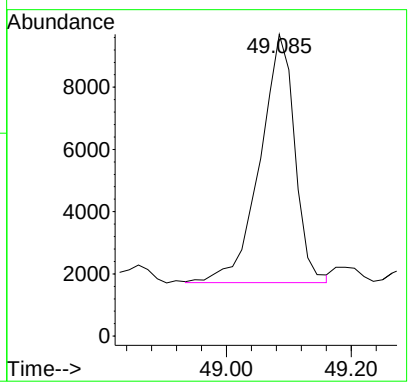
Tgt Ion:218 Resp: 13949

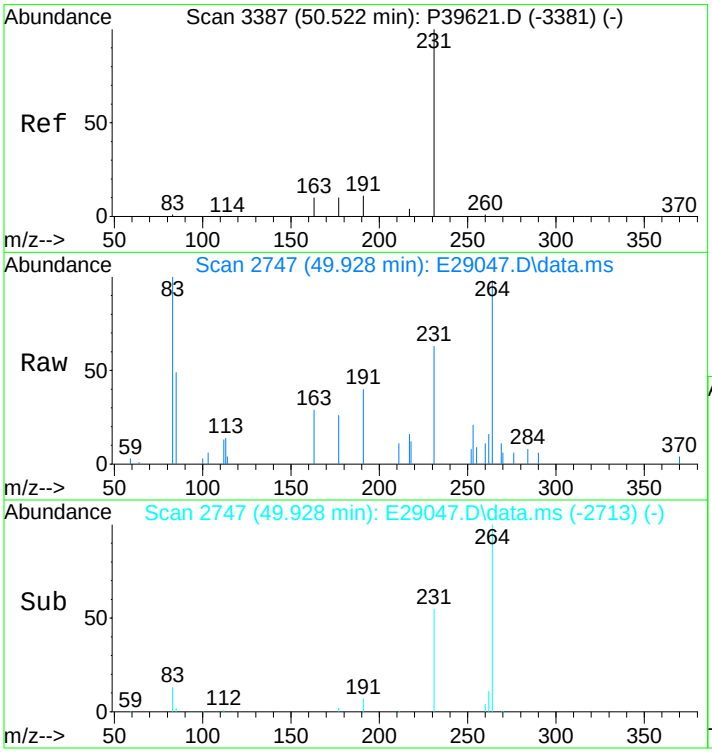




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 816.19 ng/mL
RT: 49.085 min Scan# 2691
Delta R.T. -0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

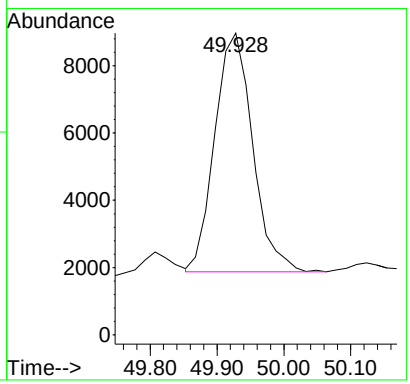
Tgt Ion:231 Resp: 30890

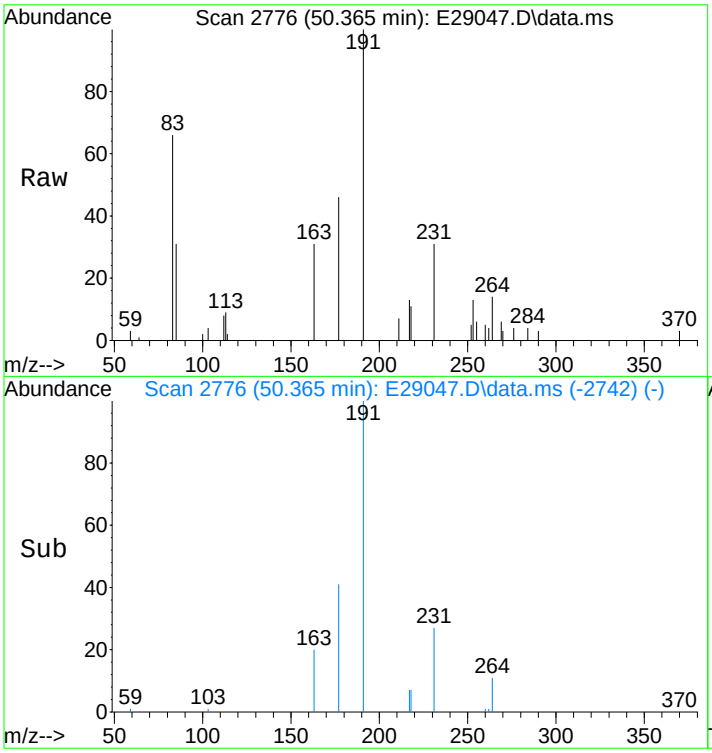




#148
C28,20S-triaromatic steroid
Concen: 740.39 ng/mL
RT: 49.928 min Scan# 2747
Delta R.T. 0.008 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

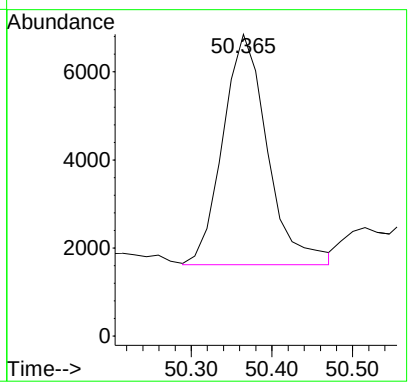
Tgt Ion:231 Resp: 28021

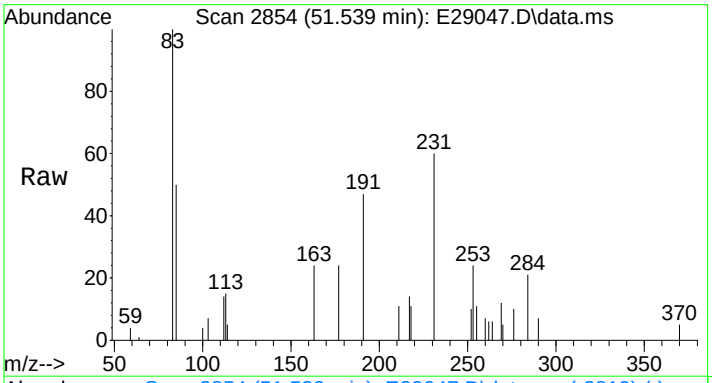




#149
C27,20R-triaromatic steroid
Concen: 531.39 ng/mL m
RT: 50.365 min Scan# 2776
Delta R.T. 0.007 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

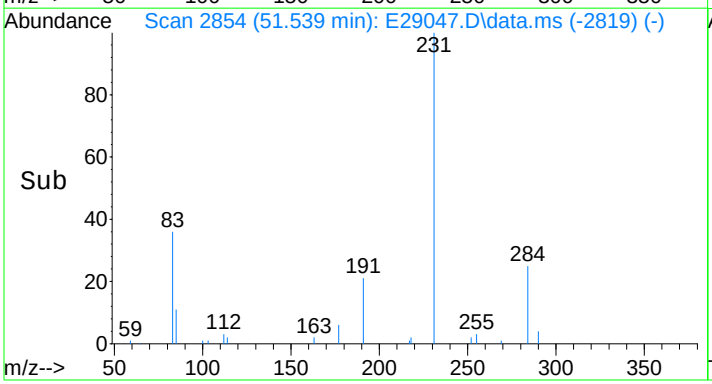
Tgt Ion:231 Resp: 20111

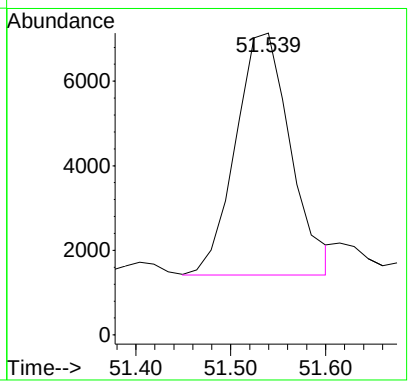




#150
C28,20R-triaromatic steroid
Concen: 607.56 ng/mL m
RT: 51.539 min Scan# 2854
Delta R.T. 0.021 min
Lab File: E29047.D
Acq: 17 Nov 2012 7:05 pm

Tgt Ion:231 Resp: 22994





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 12:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	25956	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51989	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	902	9.329	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.93%#			
42) Phenanthrene-d10	32.462	188	853	8.754	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.88%#			
83) Benzo[b]fluoranthene-d12	46.991	264	1104	11.216	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.12%#			
88) Benzo[a]pyrene-d12	48.166	264	1071	11.998	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.20%#			
129) 5B(H)Cholane - Surr	43.724	217	197	10.279	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.03%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	115	5.322	ng/mL	100
4) cis-Decalin	17.483	138	86M2	5.240	ng/mL	
10) Naphthalene	19.696	128	1087	10.481	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	682	10.161	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	646	10.036	ng/mL#	100
18) Benzothiophene	19.906	134	848	10.023	ng/mL	100
23) Biphenyl	24.272	154	861	10.128	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.875	156	578	9.446	ng/mL#	100
25) Dibenzofuran	27.358	168	873	9.503	ng/mL#	90
26) Acenaphthylene	25.973	152	985	9.620	ng/mL#	100
27) Acenaphthene	26.711	153	670	10.499	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.277	170	527	9.528	ng/mL	94
29) Fluorene	28.728	166	672	9.057	ng/mL	98
33) Dibenzothiophene	32.055	184	919	8.846	ng/mL#	81
43) Phenanthrene	32.552	178	923	8.519	ng/mL	99
54) Retene	39.568	234	303	9.135	ng/mL	99
55) Anthracene	32.733	178	820M3	8.076	ng/mL	
56) Carbazole	33.425	167	765	7.978	ng/mL	96
57) 1-Methylphenanthrene	35.066	192	683M3	8.463	ng/mL	
58) Fluoranthene	37.340	202	989	8.376	ng/mL	97
59) Benzo(b)fluorene	39.869	216	626	8.335	ng/mL	99
60) Pyrene	38.213	202	1069	8.993	ng/mL	97
66) Naphthobenzothiophene	42.083	234	993	8.854	ng/ml#	86
67) Naphthobenzothiophene-...	42.083	234	993	8.854	ng/mL#	86
75) Benz[a]anthracene	43.016	228	956M3	8.294	ng/mL	
76) Chrysene	43.167	228	1070	9.484	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	1070	9.484	ng/mL	100
84) Benzo[b]fluoranthene	47.082	252	1183	9.748	ng/mL#	84
85) Benzo[j]+[k]fluoranthene	47.157	252	1204	10.543	ng/mL#	88
87) Benzo[e]pyrene	48.076	252	1263	11.728	ng/mL#	84
89) Benzo[a]pyrene	48.256	252	1201	11.796	ng/mL#	77
90) Perylene	48.573	252	1215	11.213	ng/mL#	84
91) Indeno[1,2,3-cd]pyrene	53.045	276	1314M3	10.690	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	1404	11.876	ng/mL	97
93) Benzo[g,h,i]perylene	54.325	276	1563	12.940	ng/mL	100
94) Hopane (T19)	52.187	191	427M3	14.965	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.187	191	416M3	14.579	ng/mL	

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Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 31 12:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

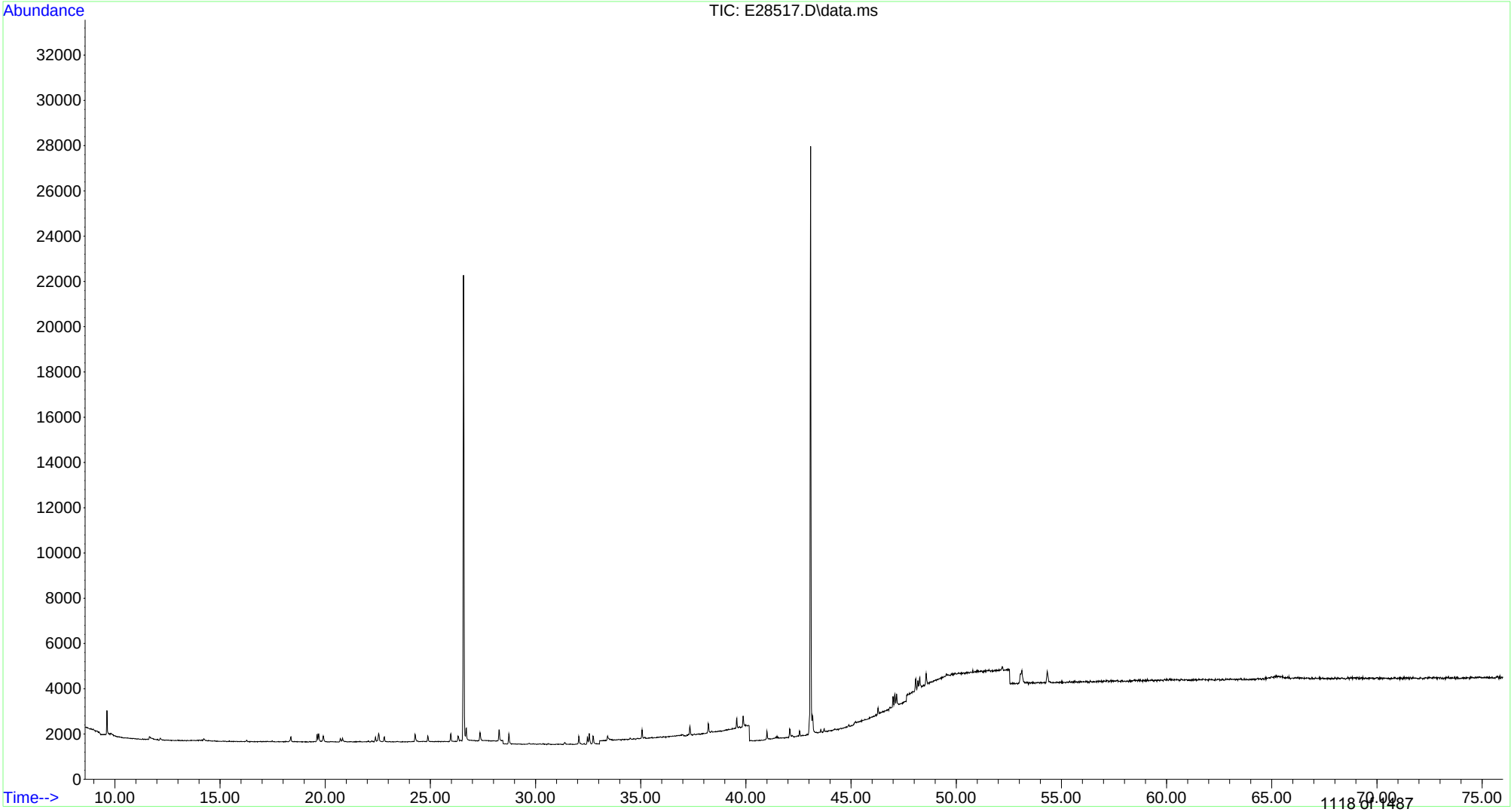
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

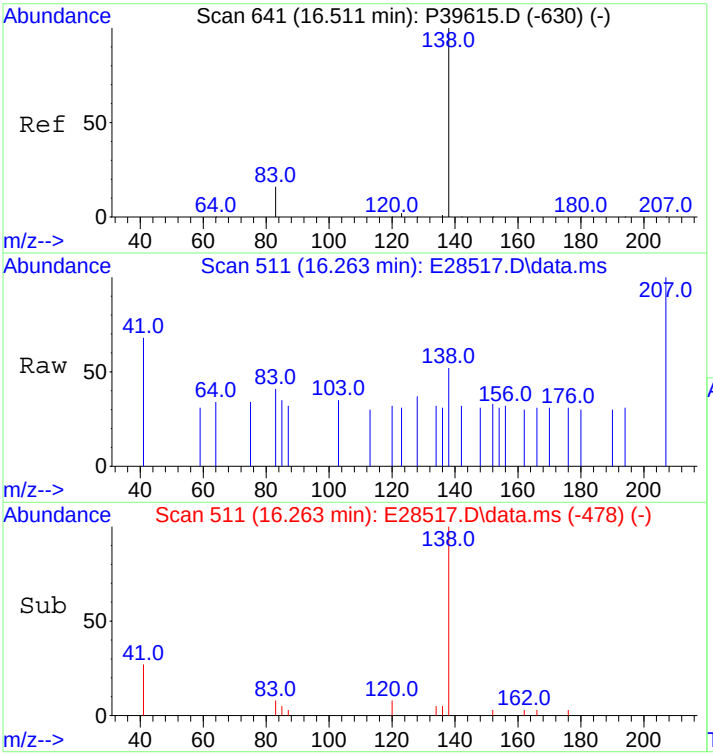
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28517.D
Acq On : 29 Oct 2012 4:29 pm
Operator : AC
Sample : I210291201
Misc : L1 WHAQ33
ALS Vial : 4 Sample Multiplier: 1

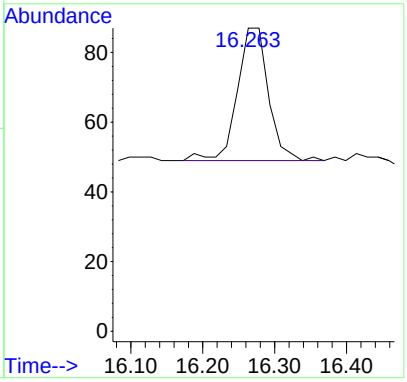
Quant Time: Oct 31 12:58:17 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Mon Sep 24 08:09:13 2012
Response via : Initial Calibration

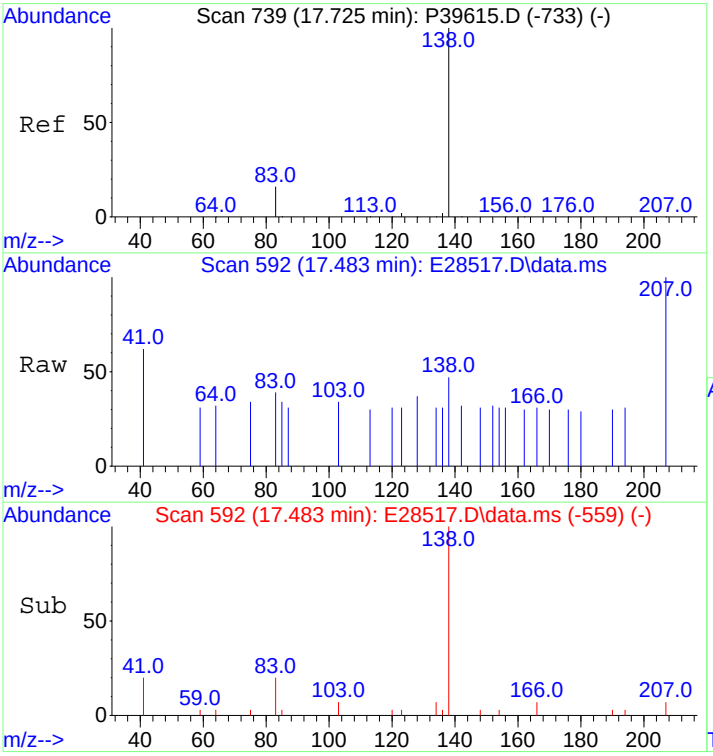




#3
trans-Decalin
Concen: 5.32 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

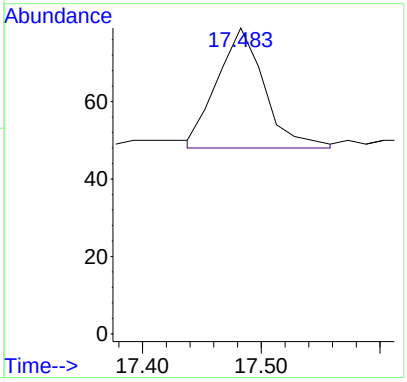
Tgt Ion:138 Resp: 115

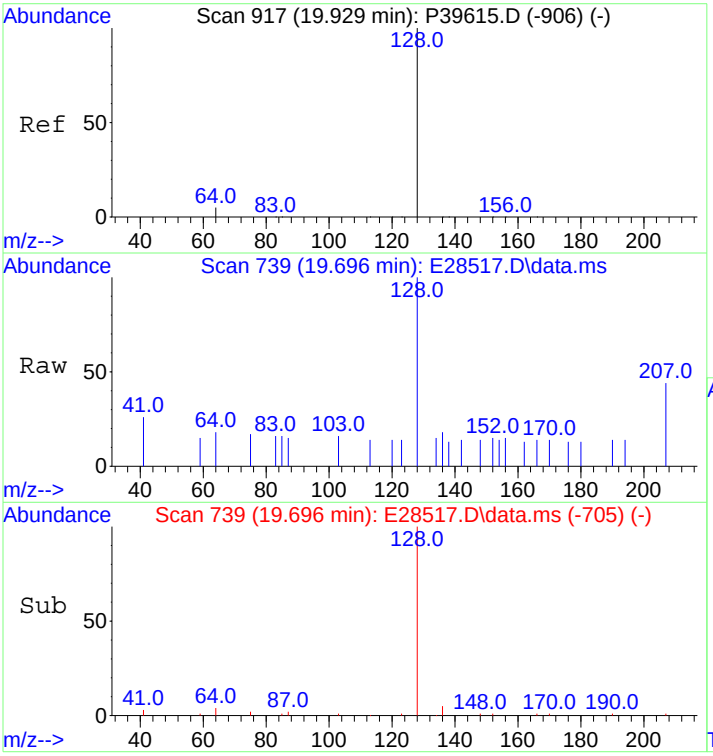




#4
cis-Decalin
Concen: 5.24 ng/mL m
RT: 17.483 min Scan# 592
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:138 Resp: 86

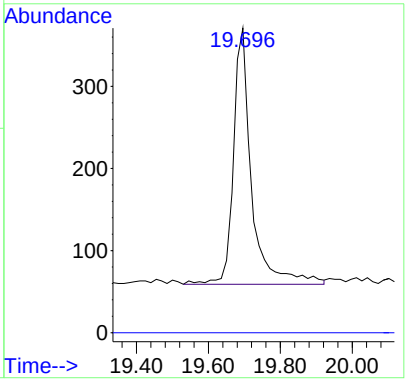


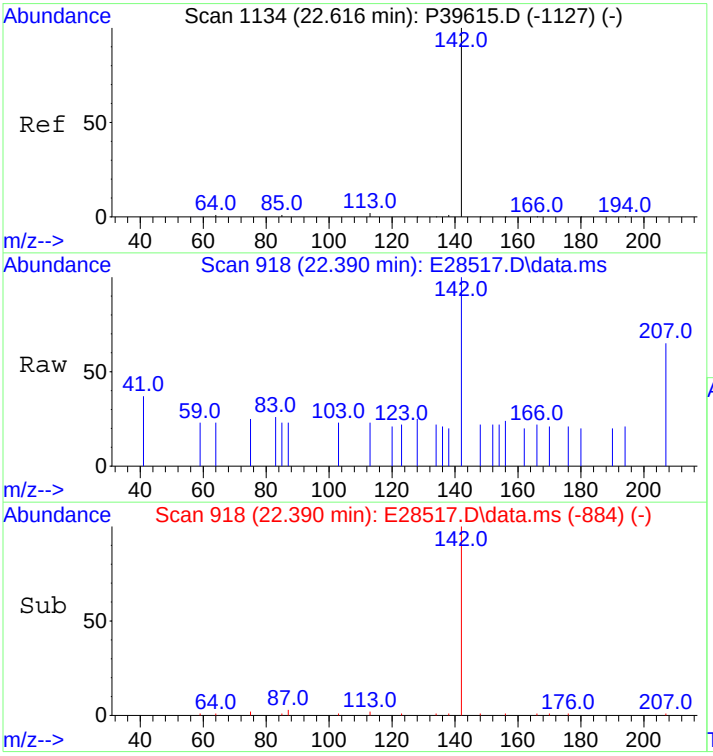


#10
Naphthalene
Concen: 10.48 ng/mL
RT: 19.696 min Scan# 739
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:128 Resp: 1087

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

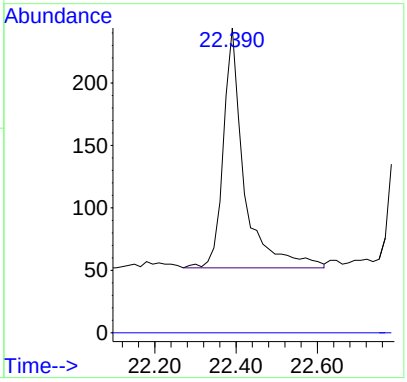


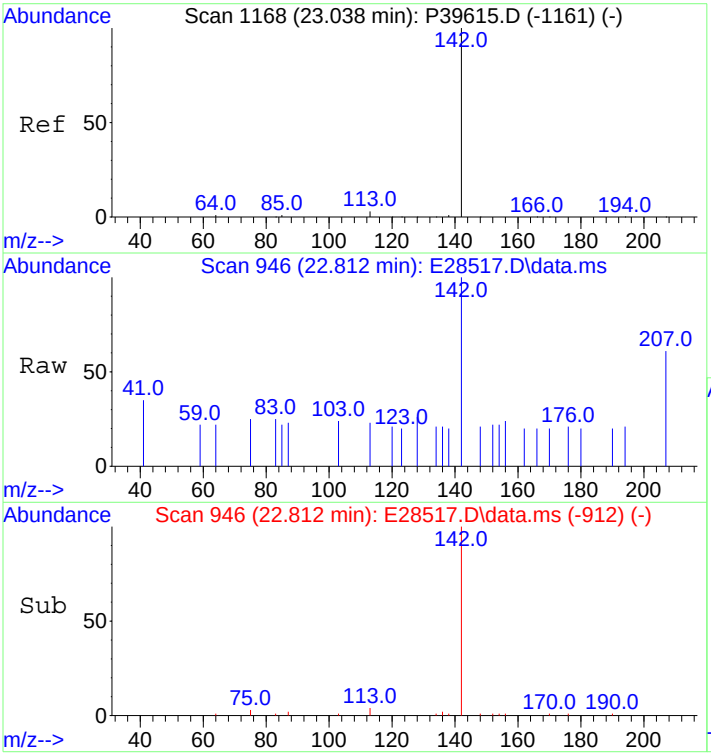


#16
2-Methylnaphthalene
Concen: 10.16 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:142 Resp: 682

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

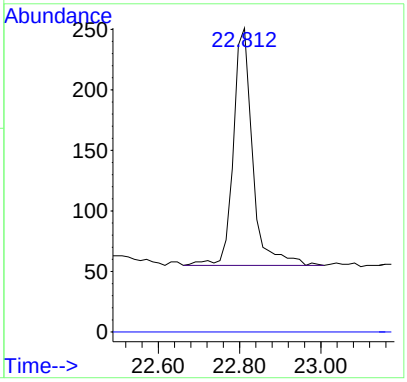


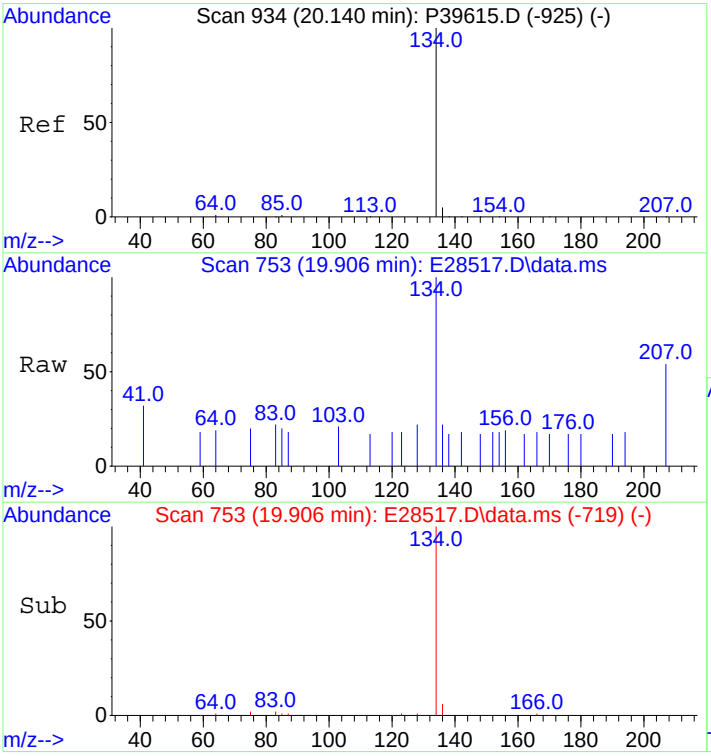


#17
1-Methylnaphthalene
Concen: 10.04 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:142 Resp: 646

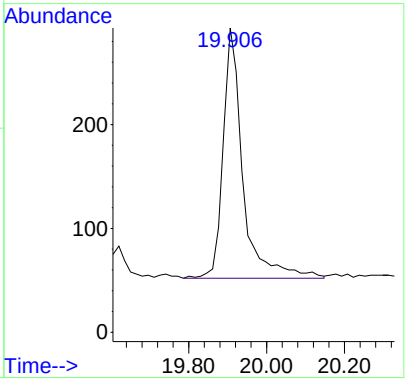
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

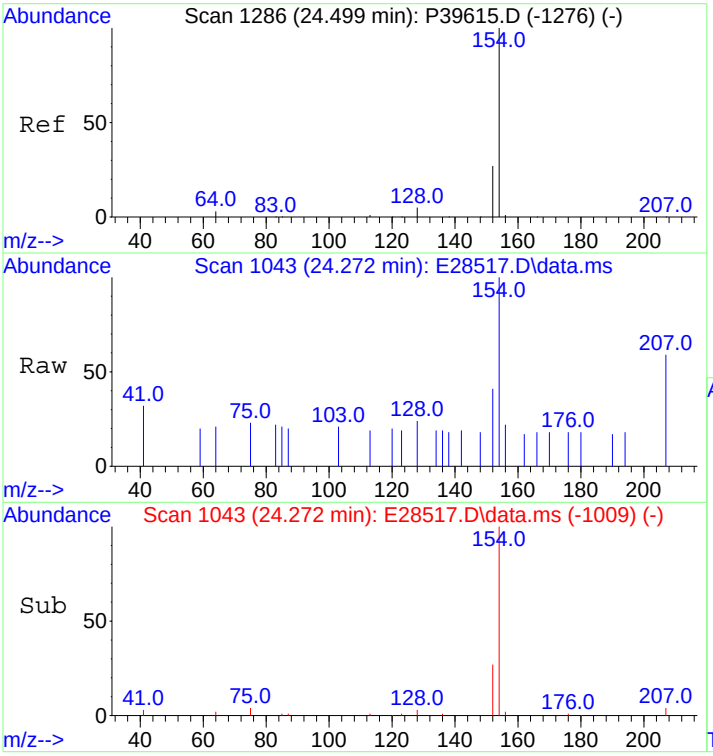




#18
Benzothiophene
Concen: 10.02 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:134 Resp: 848

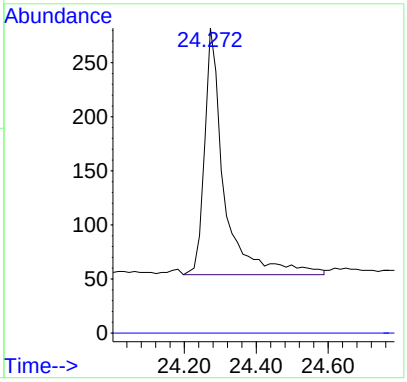


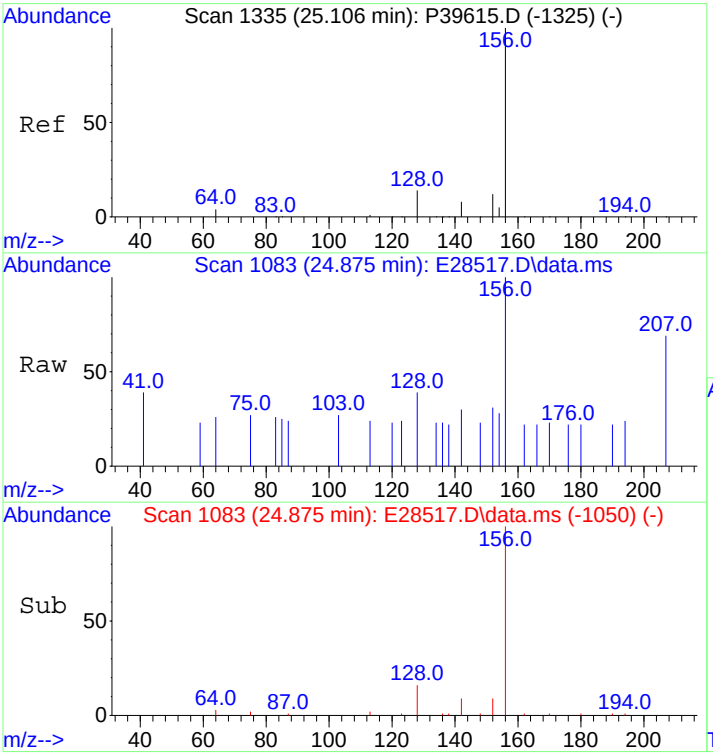


#23
Biphenyl
Concen: 10.13 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:154 Resp: 861

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

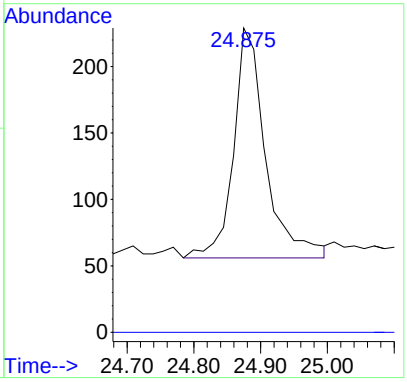


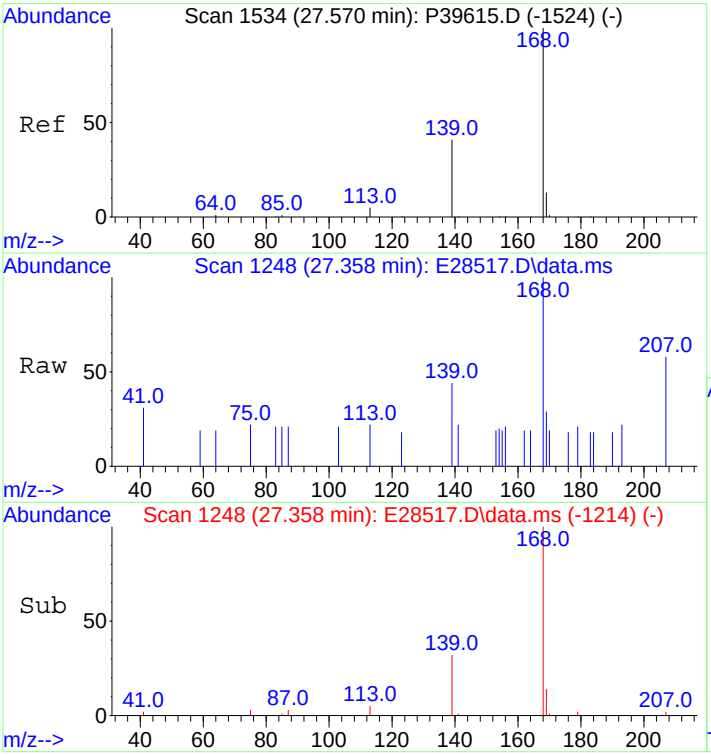


#24
2,6-Dimethylnaphthalene
Concen: 9.45 ng/mL
RT: 24.875 min Scan# 1083
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:156 Resp: 578

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

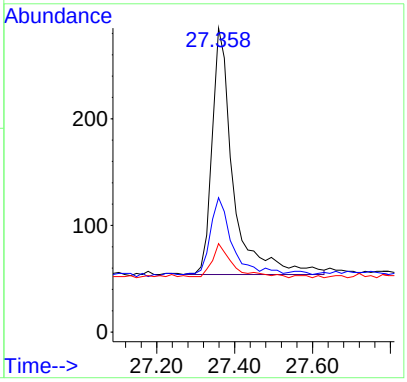


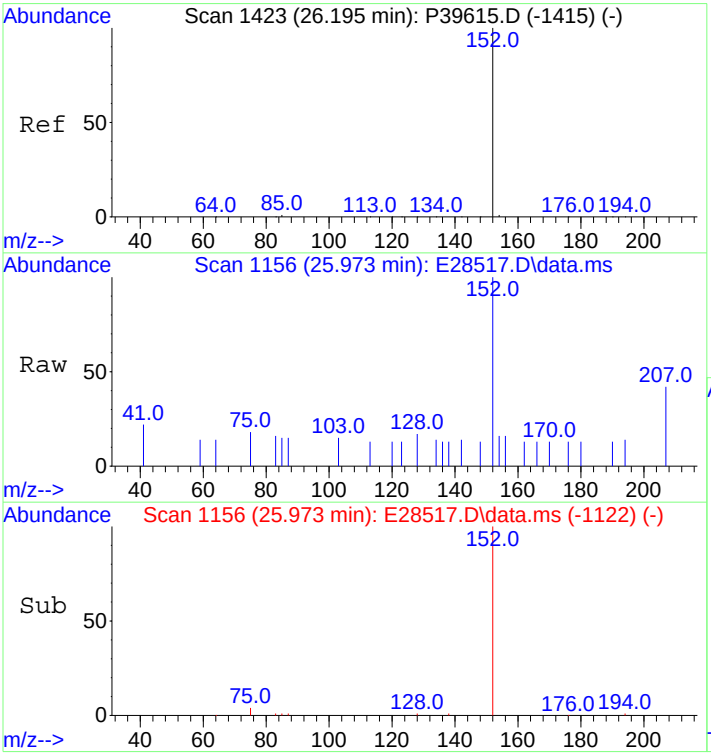


#25
Dibenzofuran
Concen: 9.50 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:168 Resp: 873

Ion	Ratio	Lower	Upper
168	100		
139	30.0	30.6	45.8#
169	13.9	10.6	16.0

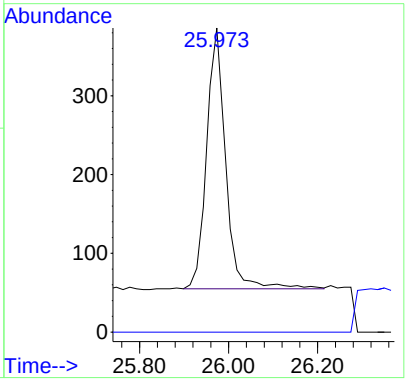


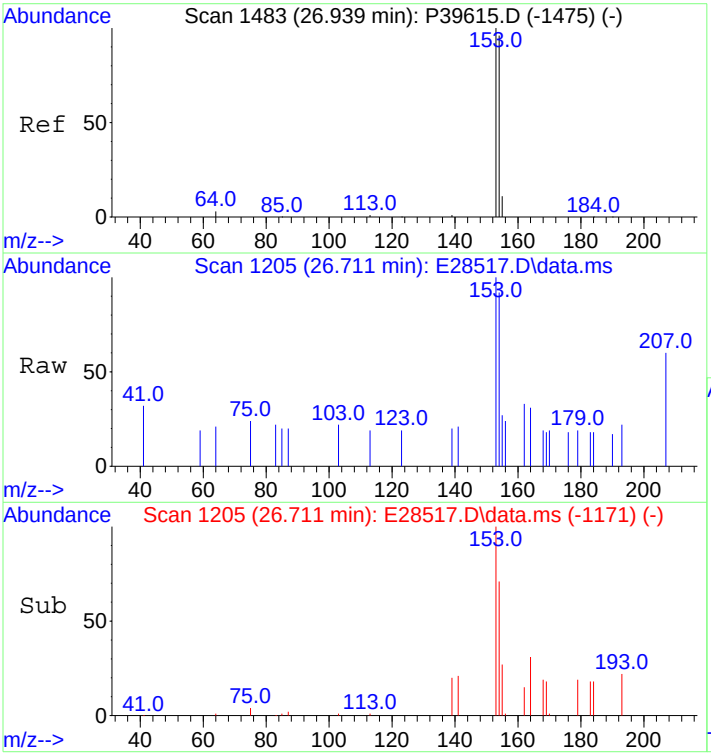


#26
Acenaphthylene
Concen: 9.62 ng/mL
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:152 Resp: 985

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

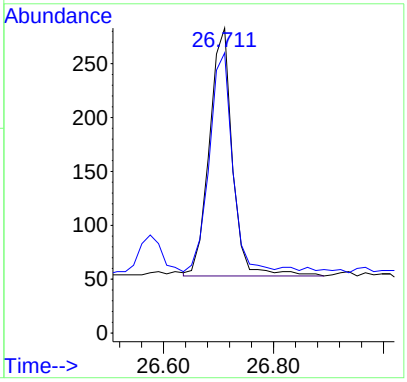


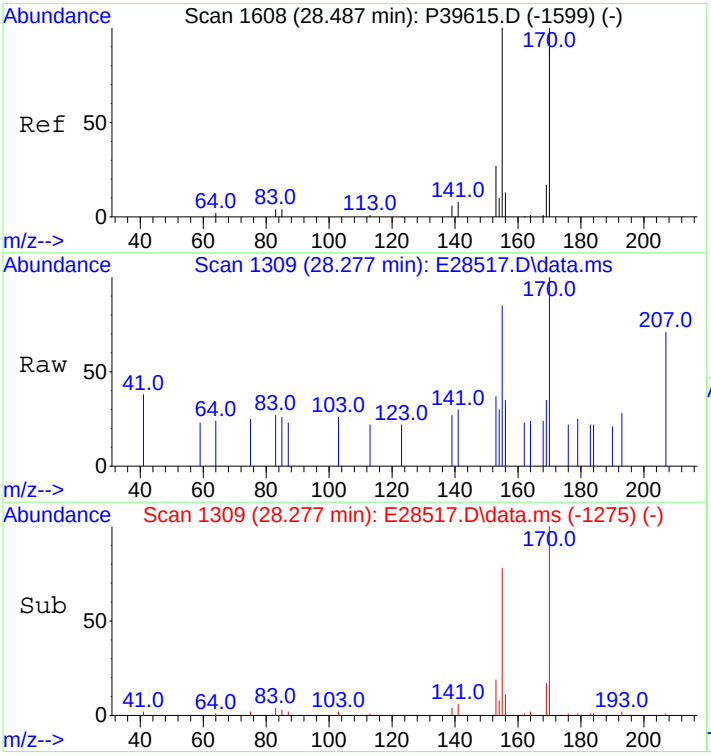


#27
Acenaphthene
Concen: 10.50 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:153 Resp: 670

Ion	Ratio	Lower	Upper
153	100		
154	88.4	72.3	108.5

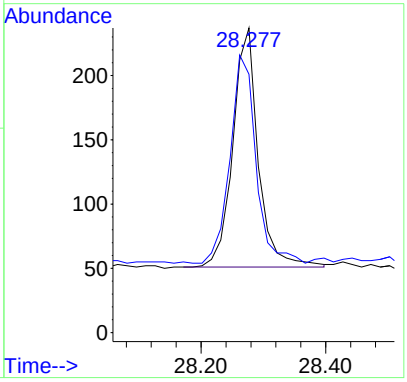


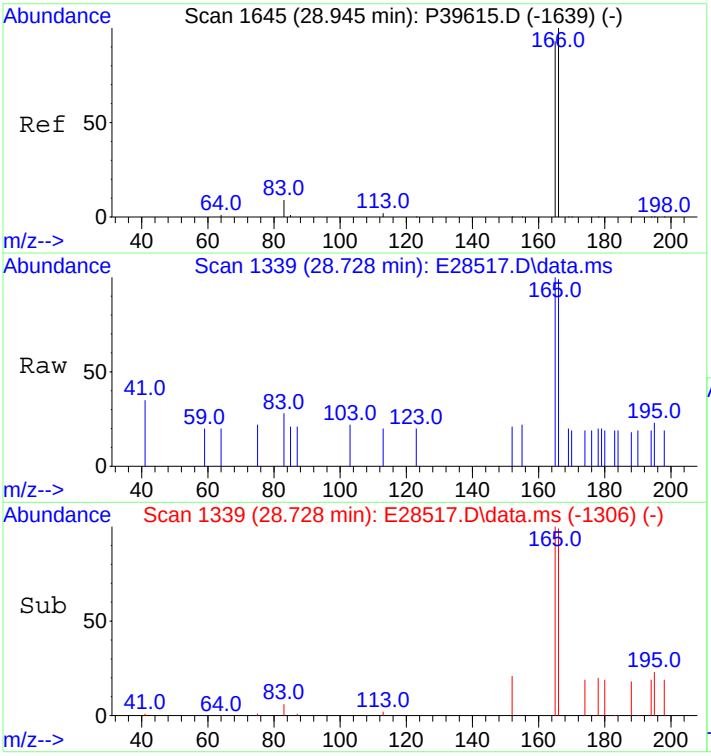


#28
2,3,5-Trimethylnaphthalene
Concen: 9.53 ng/mL
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:170 Resp: 527

Ion	Ratio	Lower	Upper
170	100		
155	88.8	75.9	113.9

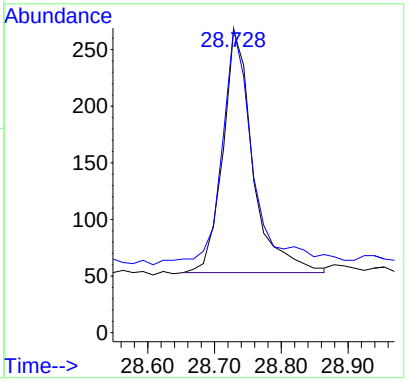


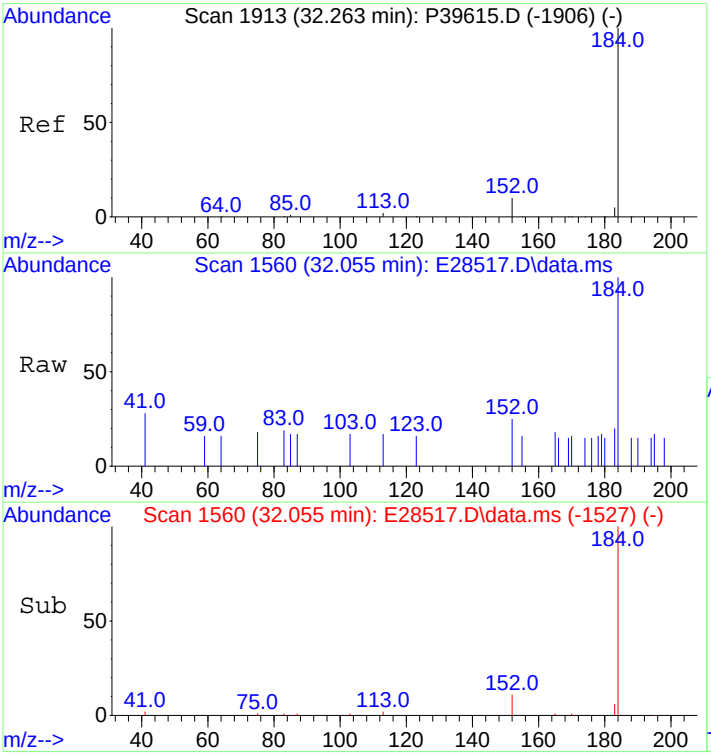


#29
Fluorene
Concen: 9.06 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:166 Resp: 672

Ion	Ratio	Lower	Upper
166	100		
165	90.5	73.8	110.6

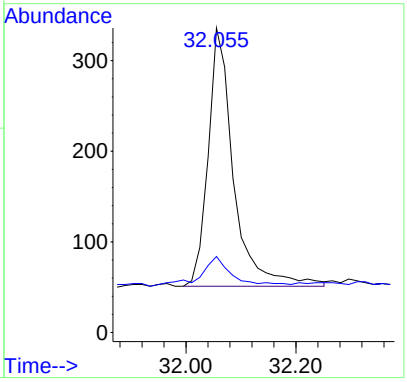


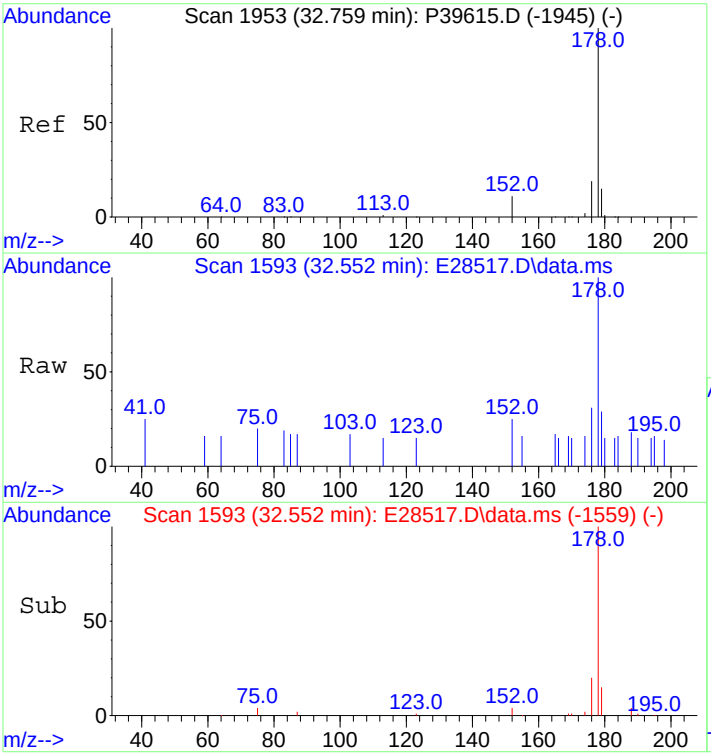


#33
Dibenzothiophene
Concen: 8.85 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:184 Resp: 919

Ion	Ratio	Lower	Upper
184	100		
152	14.5	6.2	9.2#

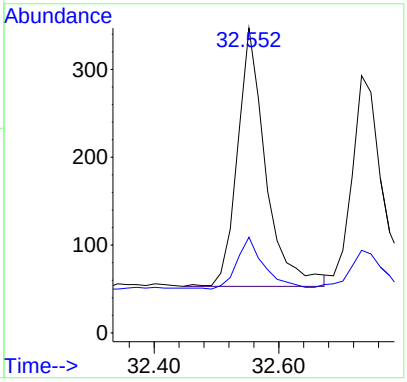


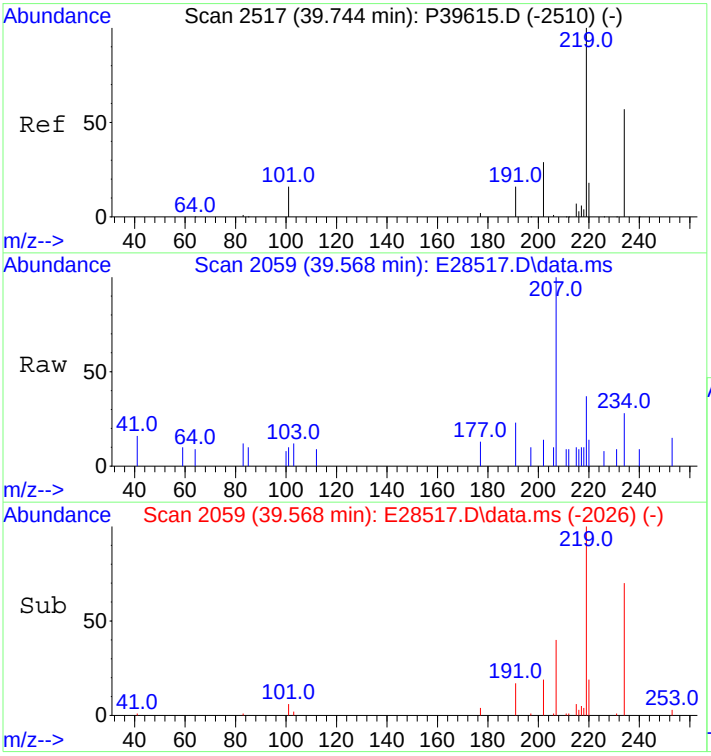


#43
Phenanthrene
Concen: 8.52 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:178 Resp: 923

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.6

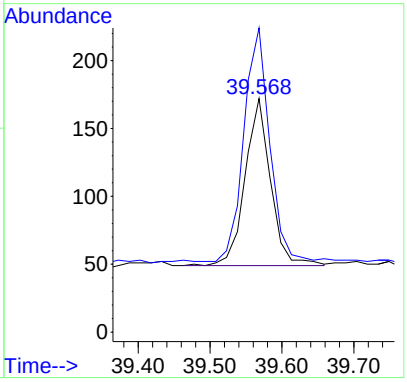


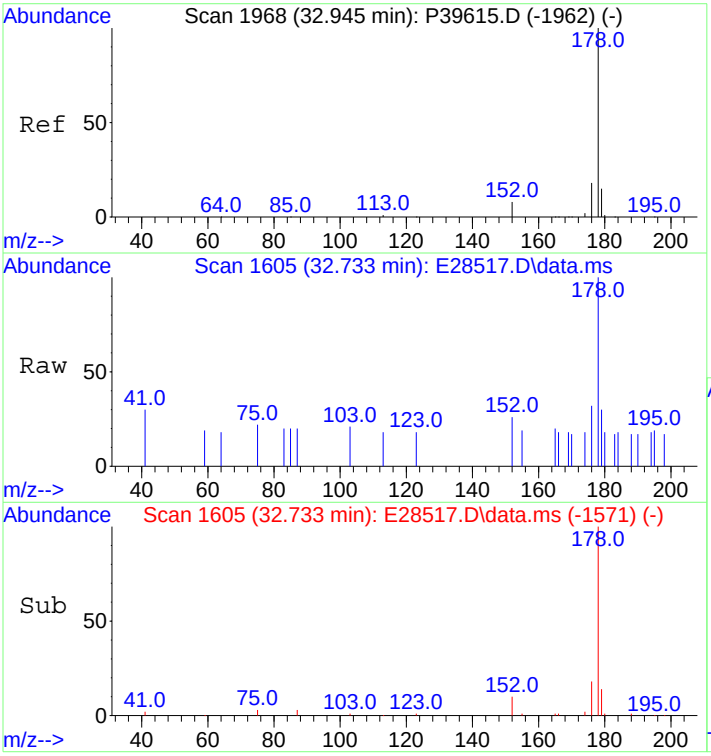


#54
Retene
Concen: 9.14 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:234 Resp: 303

Ion	Ratio	Lower	Upper
234	100		
219	141.9	113.0	169.4

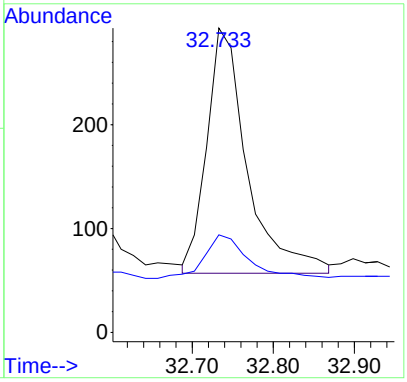


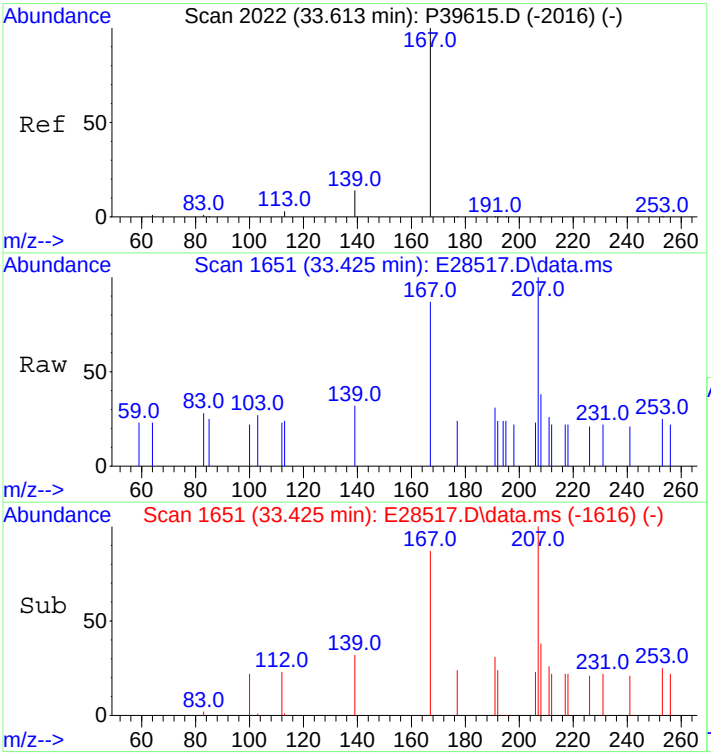


#55
Anthracene
Concen: 8.08 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:178 Resp: 820

Ion	Ratio	Lower	Upper
178	100		
176	18.0	14.5	21.7

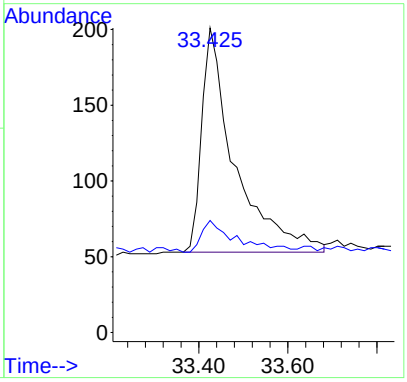


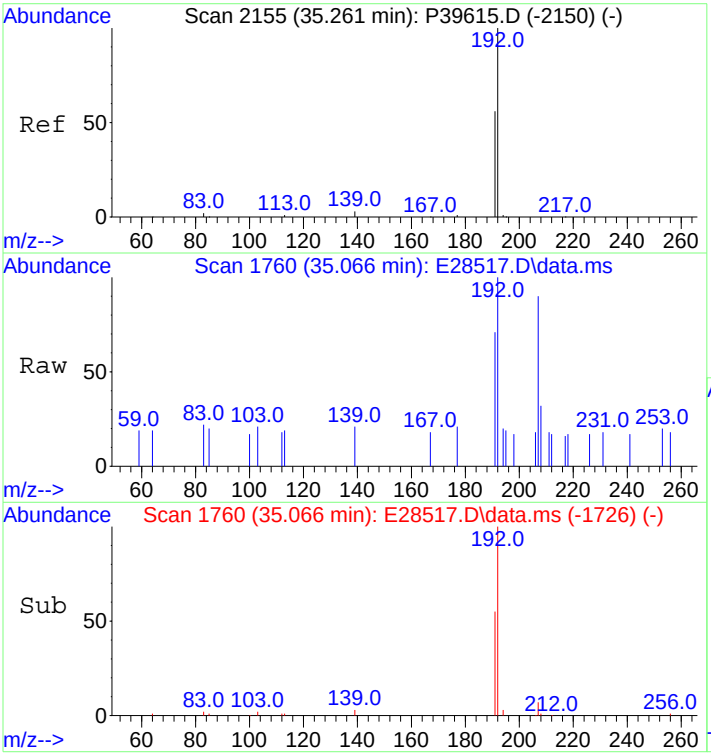


#56
Carbazole
Concen: 7.98 ng/mL
RT: 33.425 min Scan# 1651
Delta R.T. 0.030 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:167 Resp: 765

Ion	Ratio	Lower	Upper
167	100		
139	14.8	10.5	15.7

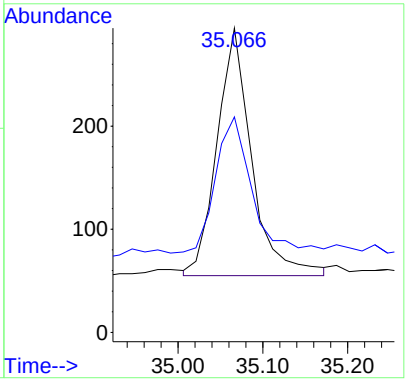


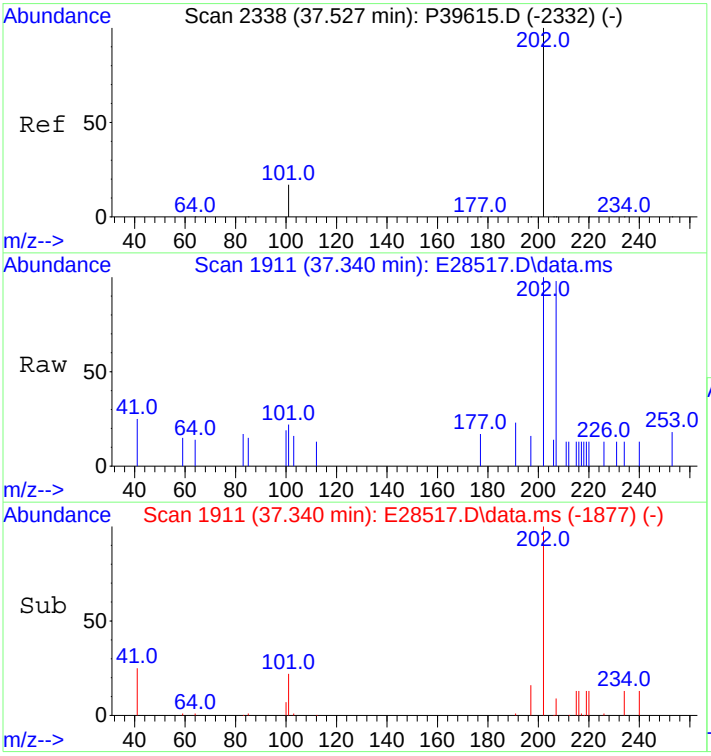


#57
1-Methylphenanthrene
Concen: 8.46 ng/mL m
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:192 Resp: 683

Ion	Ratio	Lower	Upper
192	100		
191	57.2	45.5	68.3

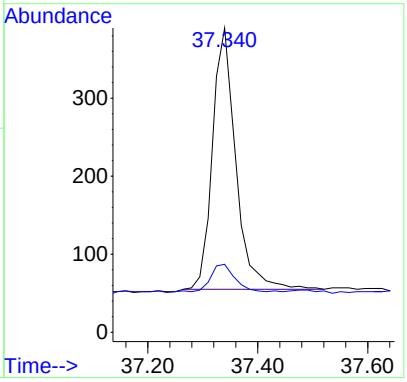


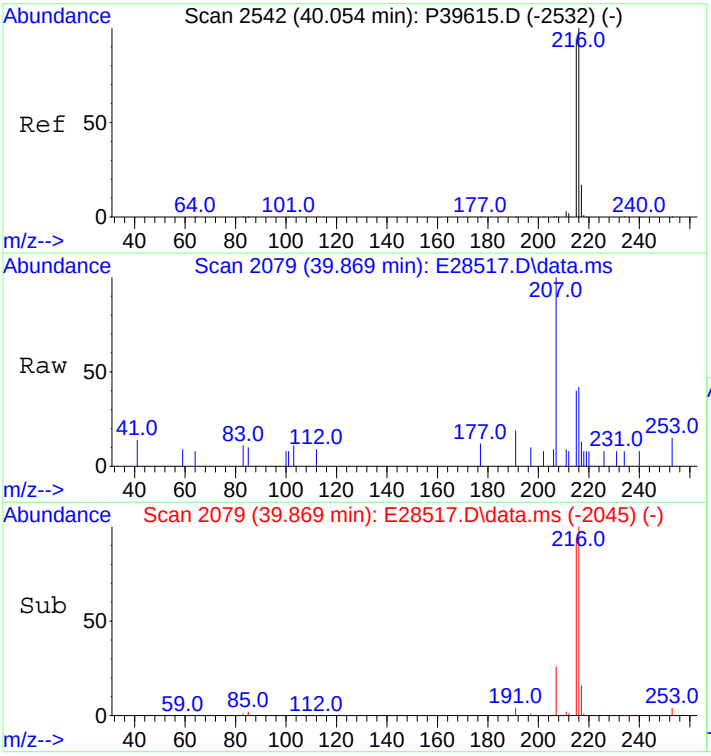


#58
Fluoranthene
Concen: 8.38 ng/mL
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:202 Resp: 989

Ion	Ratio	Lower	Upper
202	100		
101	10.5	9.2	13.8

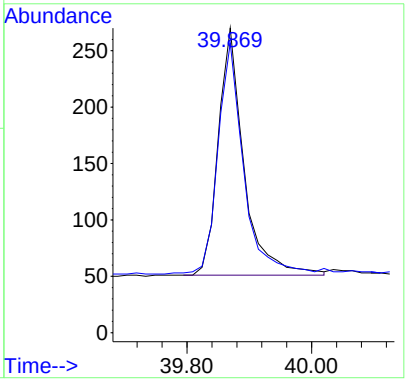


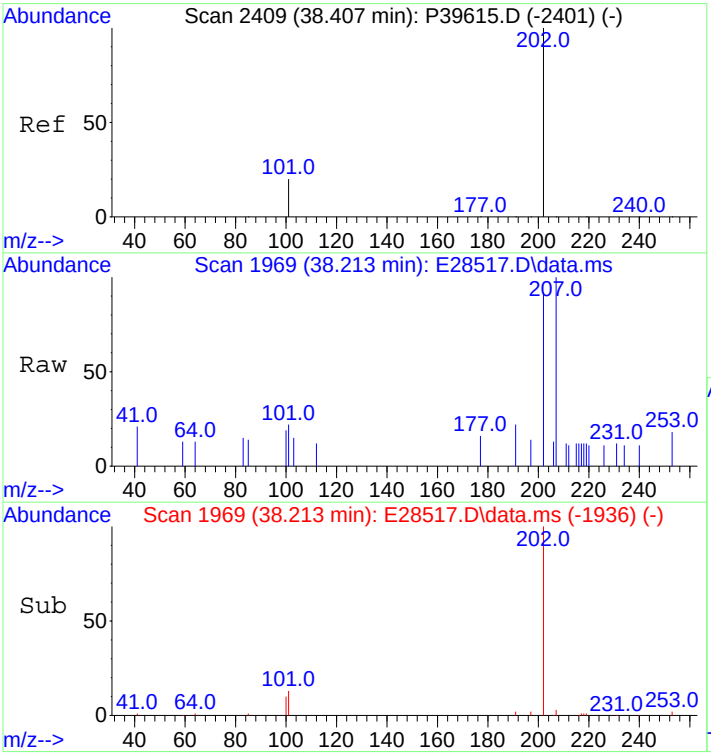


#59
Benzo(b)fluorene
Concen: 8.33 ng/mL
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:216 Resp: 626

Ion	Ratio	Lower	Upper
216	100		
215	93.0	73.8	110.8

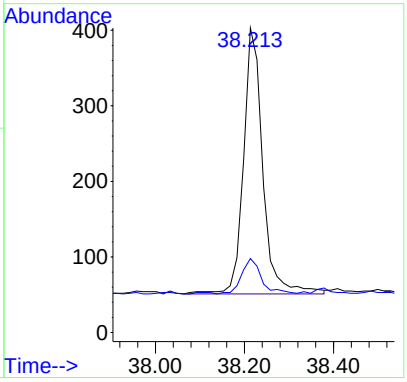


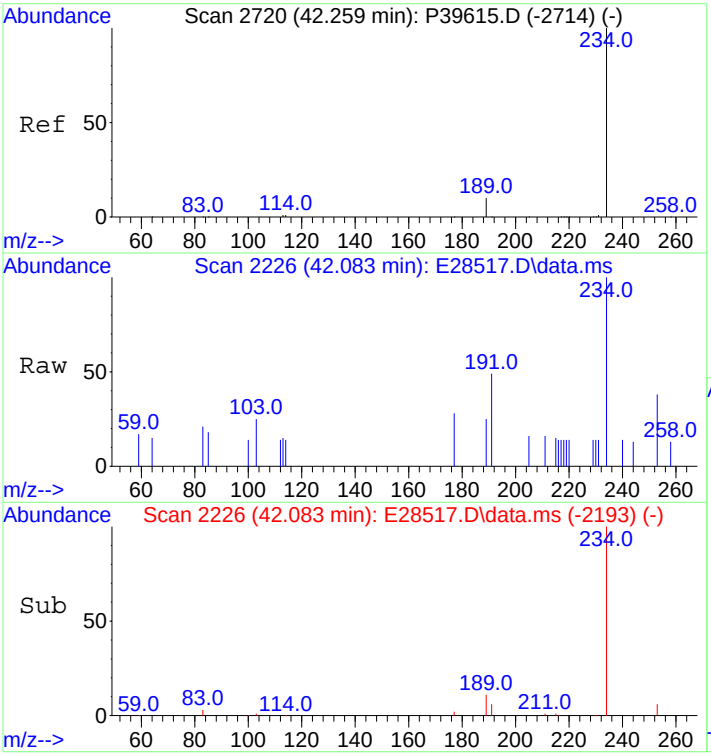


#60
Pyrene
Concen: 8.99 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:202 Resp: 1069

Ion	Ratio	Lower	Upper
202	100		
101	13.7	9.8	14.8

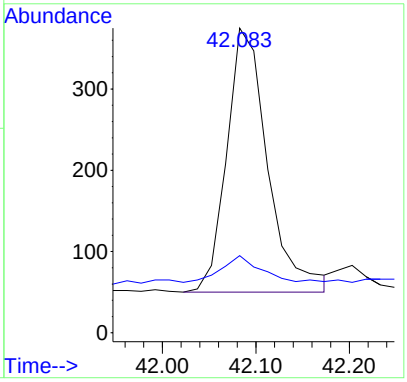


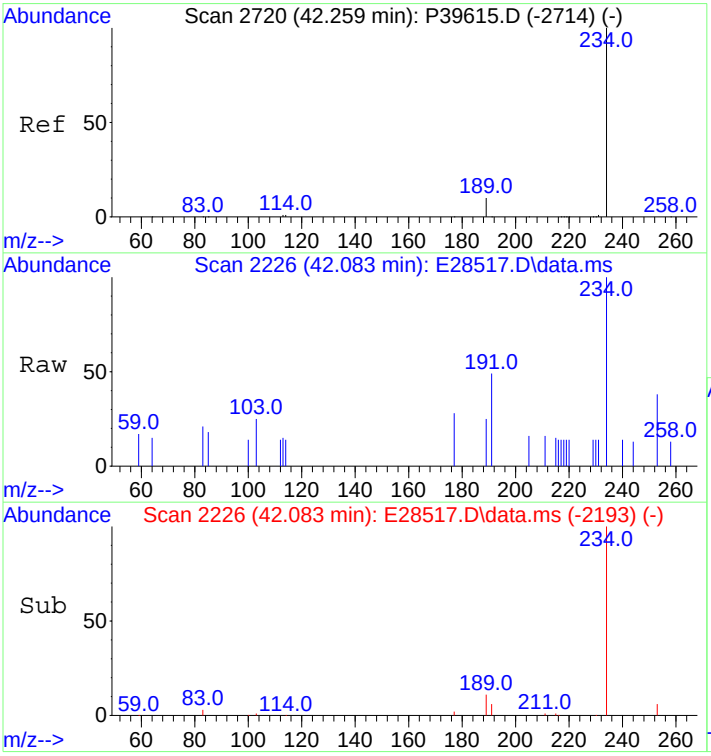


#66
Naphthobenzothiophene
Concen: 8.85 ng/ml
RT: 42.083 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:234 Resp: 993

Ion	Ratio	Lower	Upper
234	100		
189	11.8	5.5	8.3#

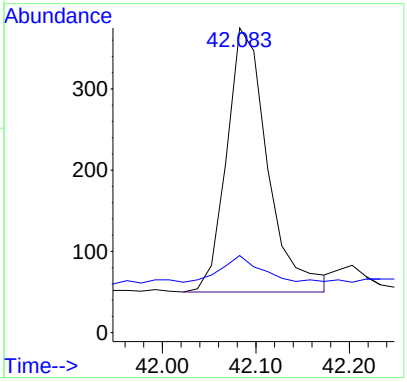


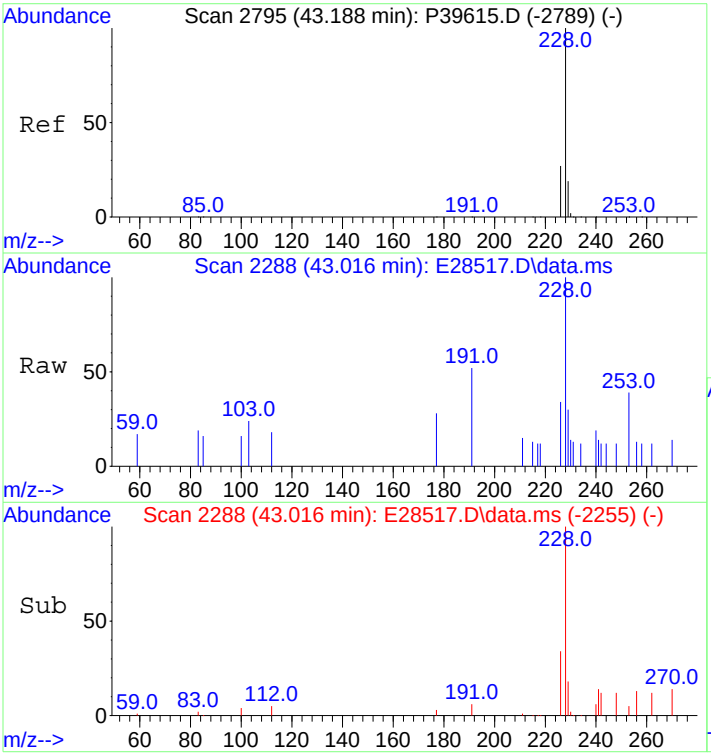


#67
Naphthobenzothiophene-2,1-D
Concen: 8.85 ng/mL
RT: 42.083 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:234 Resp: 993

Ion	Ratio	Lower	Upper
234	100		
189	11.8	5.5	8.3#

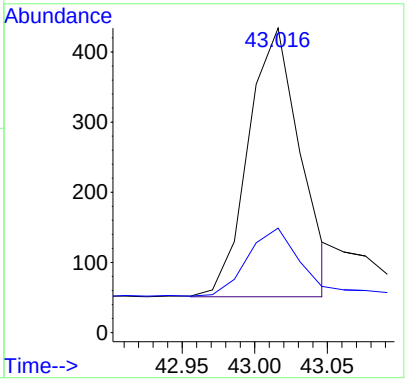


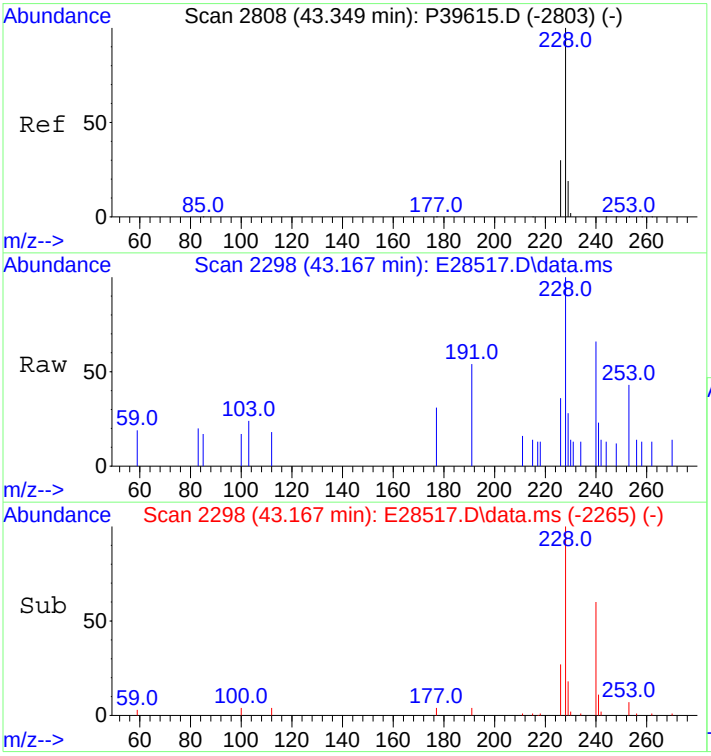


#75
Benz[a]anthracene
Concen: 8.29 ng/mL m
RT: 43.016 min Scan# 2288
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:228 Resp: 956

Ion	Ratio	Lower	Upper
228	100		
226	27.0	20.2	30.4

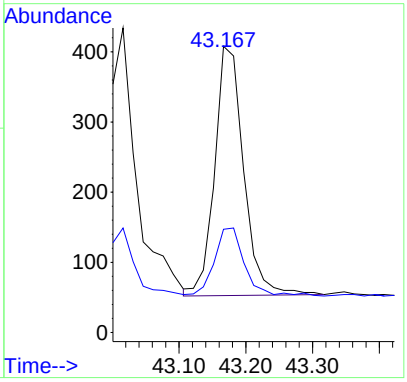


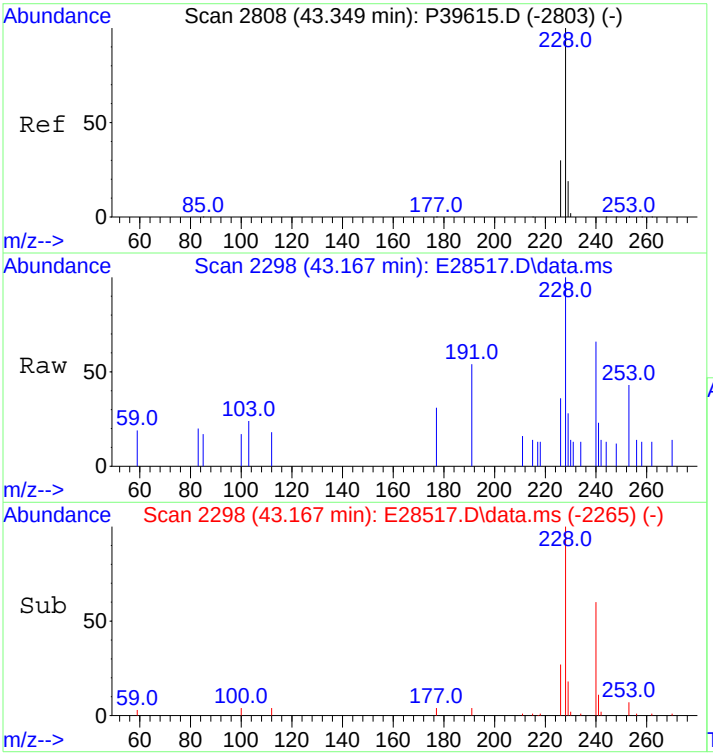


#76
Chrysene
Concen: 9.48 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:228 Resp: 1070

Ion	Ratio	Lower	Upper
228	100		
226	28.5	22.6	34.0

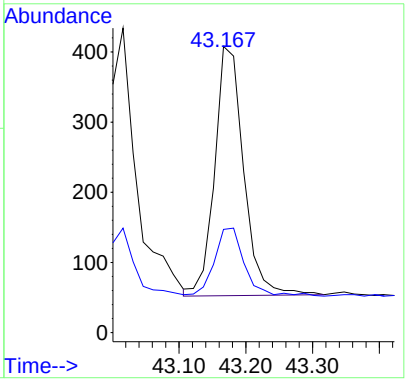


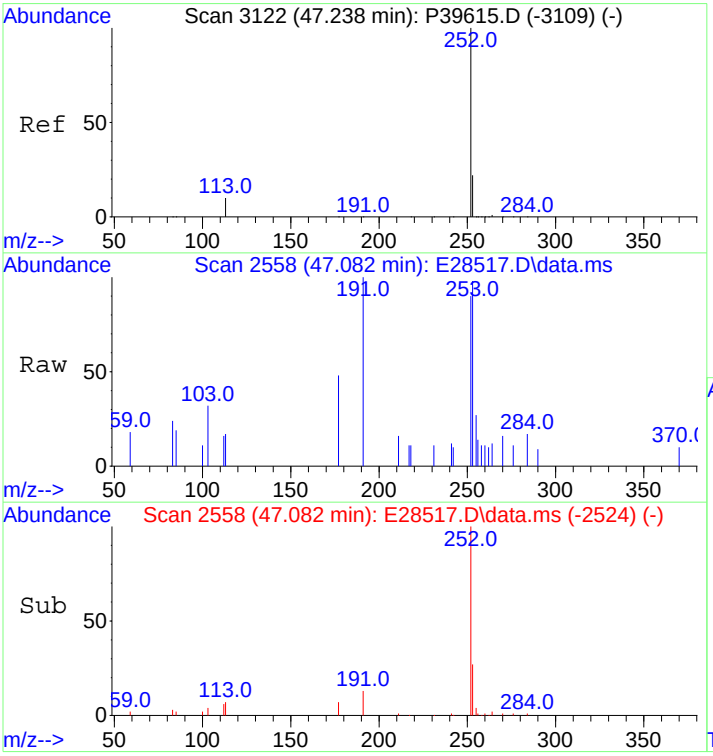


#77
Chrysene/Triphenylene
Concen: 9.48 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:228 Resp: 1070

Ion	Ratio	Lower	Upper
228	100		
226	28.5	22.6	34.0

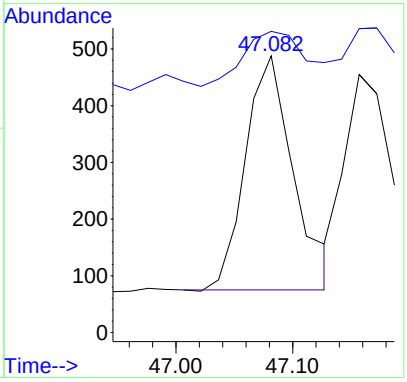


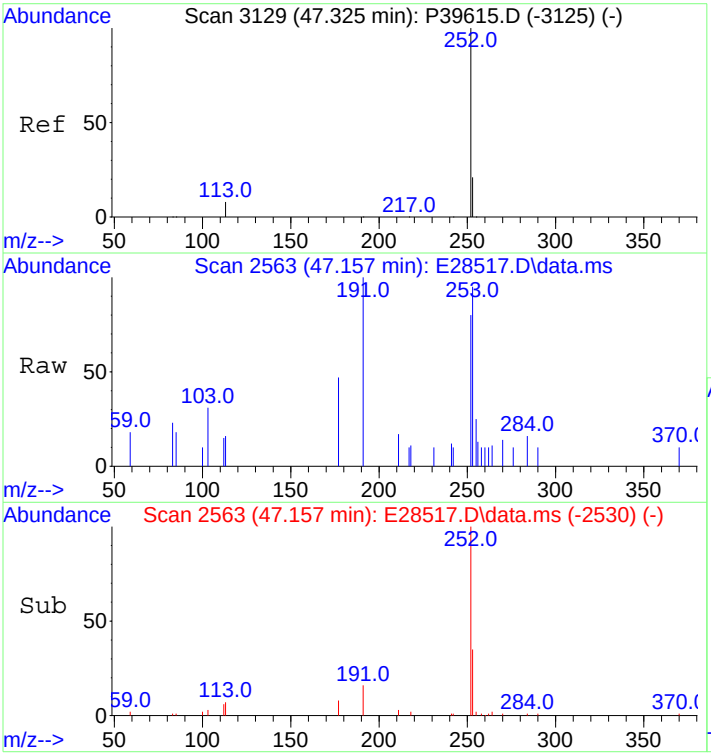


#84
Benzo[b]fluoranthene
Concen: 9.75 ng/mL
RT: 47.082 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1183

Ion	Ratio	Lower	Upper
252	100		
253	30.9	18.3	27.5#

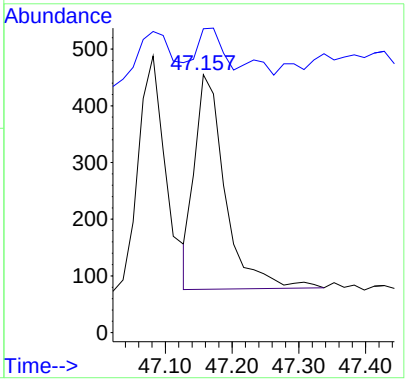


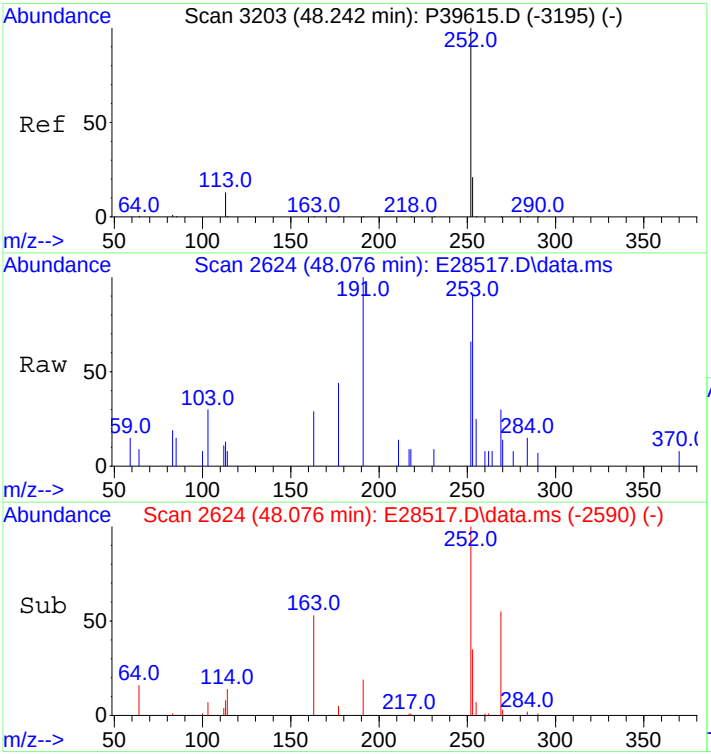


#85
Benzo[j]+[k]fluoranthene
Concen: 10.54 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1204

Ion	Ratio	Lower	Upper
252	100		
253	16.9	18.3	27.5#

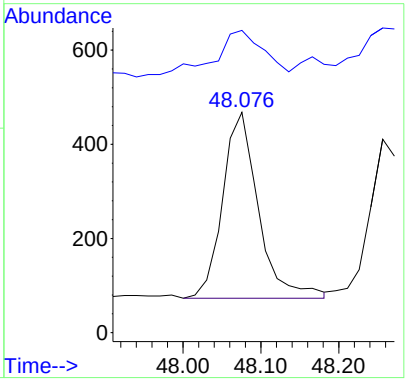


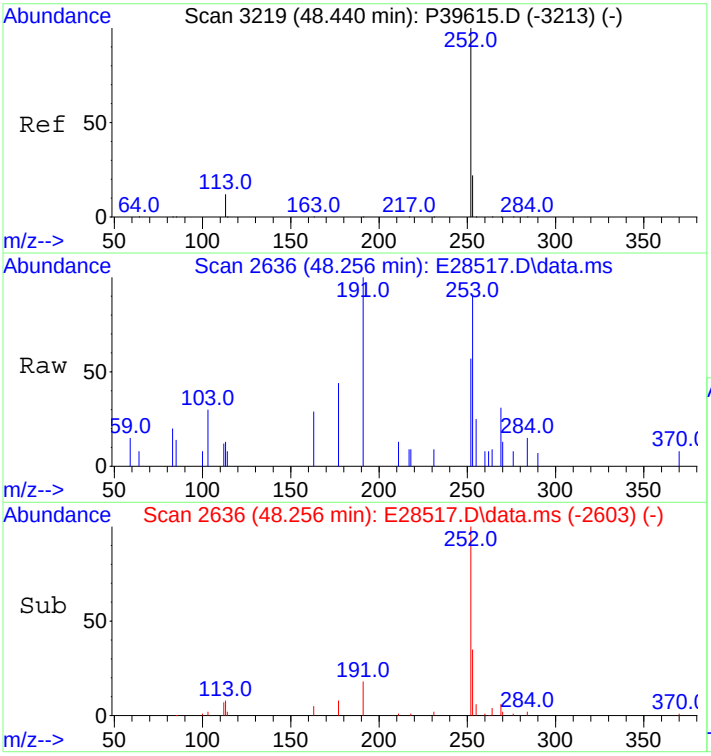


#87
Benzo[e]pyrene
Concen: 11.73 ng/mL
RT: 48.076 min Scan# 2624
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1263

Ion	Ratio	Lower	Upper
252	100		
253	30.9	18.6	28.0#

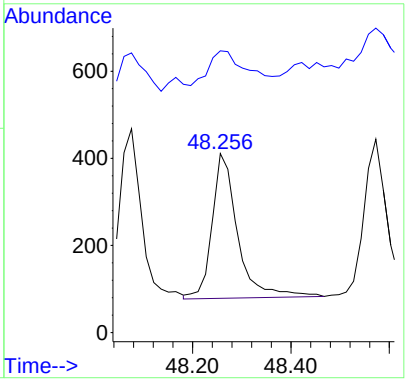


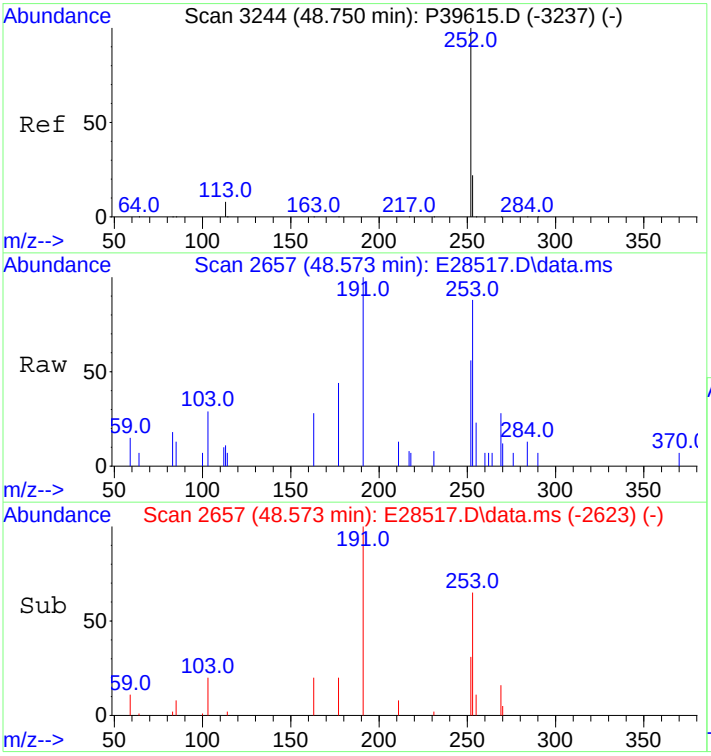


#89
Benzo[a]pyrene
Concen: 11.80 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1201

Ion	Ratio	Lower	Upper
252	100		
253	34.7	18.8	28.2#

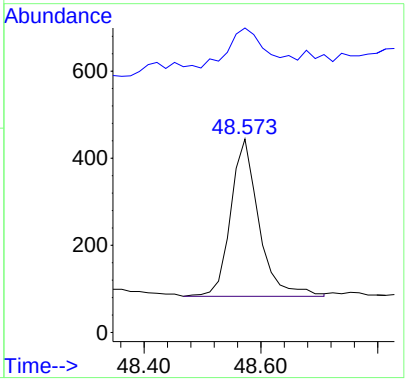


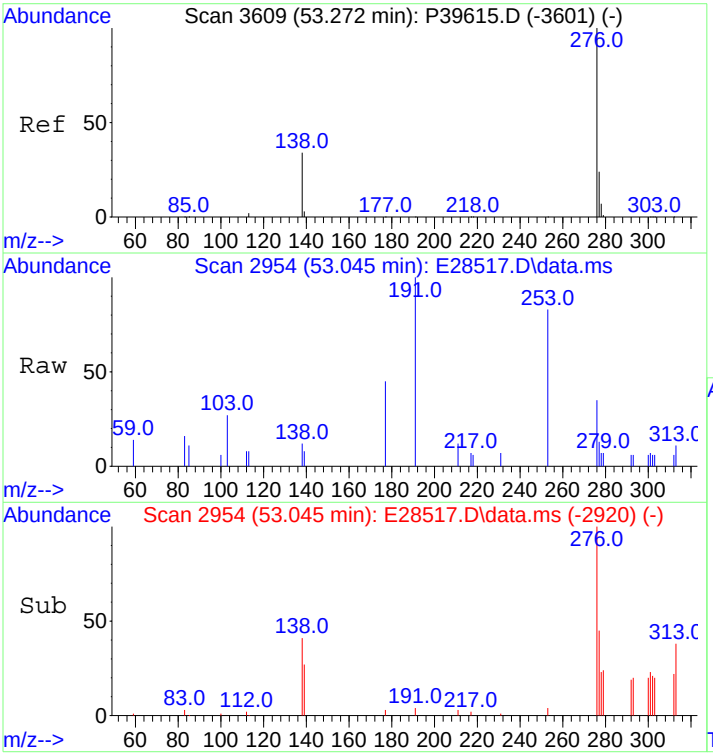


#90
Perylene
Concen: 11.21 ng/mL
RT: 48.573 min Scan# 2657
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:252 Resp: 1215

Ion	Ratio	Lower	Upper
252	100		
253	31.3	18.8	28.2#

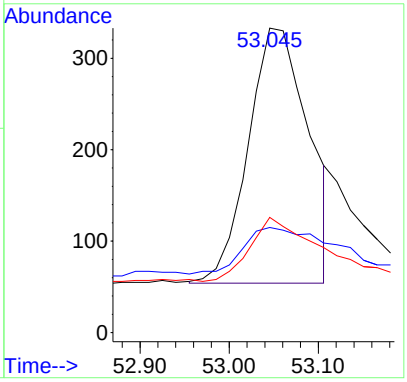


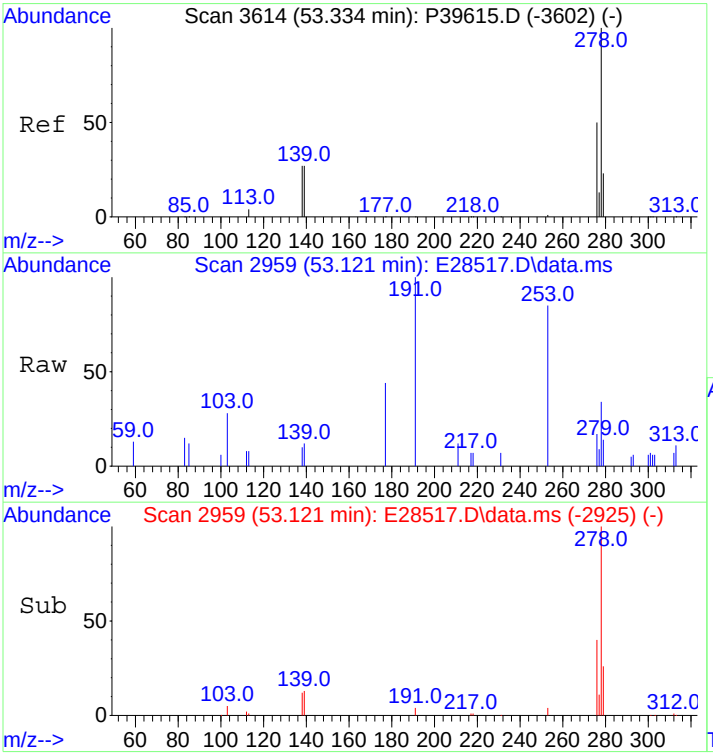


#91
Indeno[1,2,3-cd]pyrene
Concen: 10.69 ng/mL m
RT: 53.045 min Scan# 2954
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:276 Resp: 1314

Ion	Ratio	Lower	Upper
276	100		
138	26.4	15.4	23.2#
277	30.7	19.1	28.7#

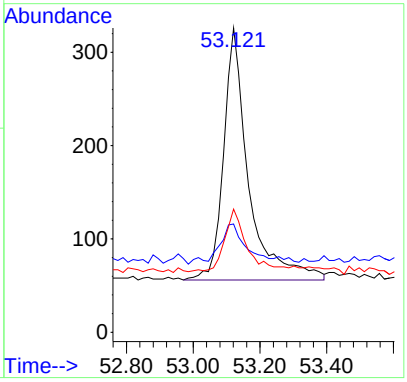


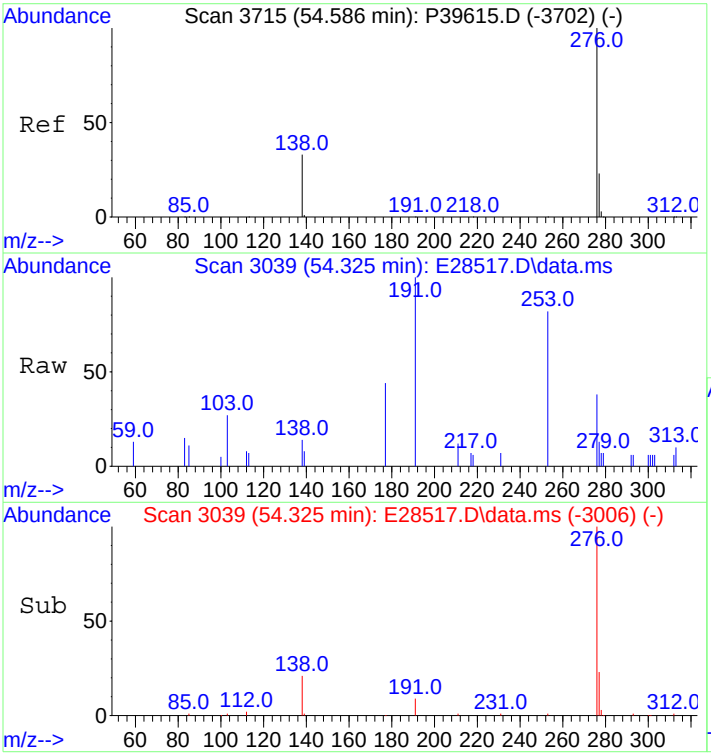


#92
Dibenz[ah]+[ac]anthracene
Concen: 11.88 ng/mL
RT: 53.121 min Scan# 2959
Delta R.T. 0.015 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:278 Resp: 1404

Ion	Ratio	Lower	Upper
278	100		
139	13.6	11.1	16.7
279	22.0	19.4	29.0

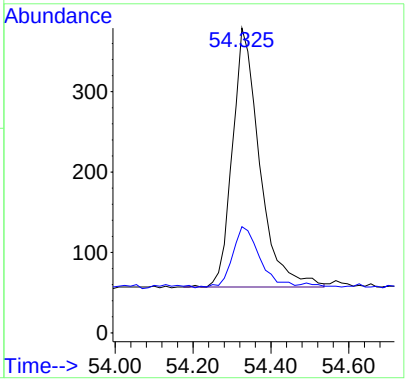


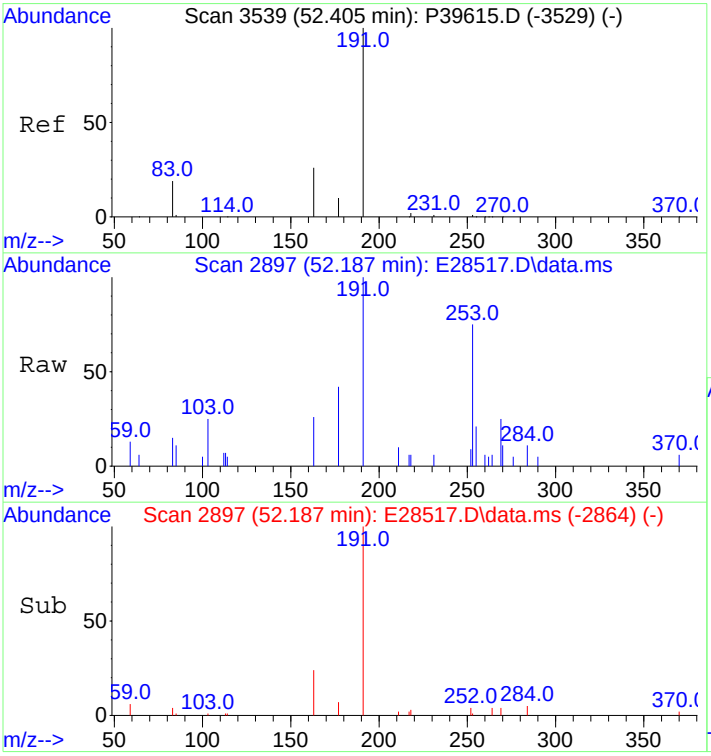


#93
Benzo[g,h,i]perylene
Concen: 12.94 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:276 Resp: 1563

Ion	Ratio	Lower	Upper
276	100		
277	23.9	19.1	28.7

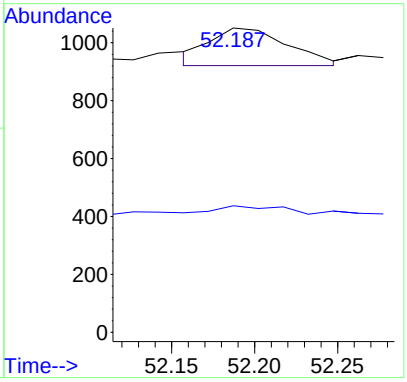


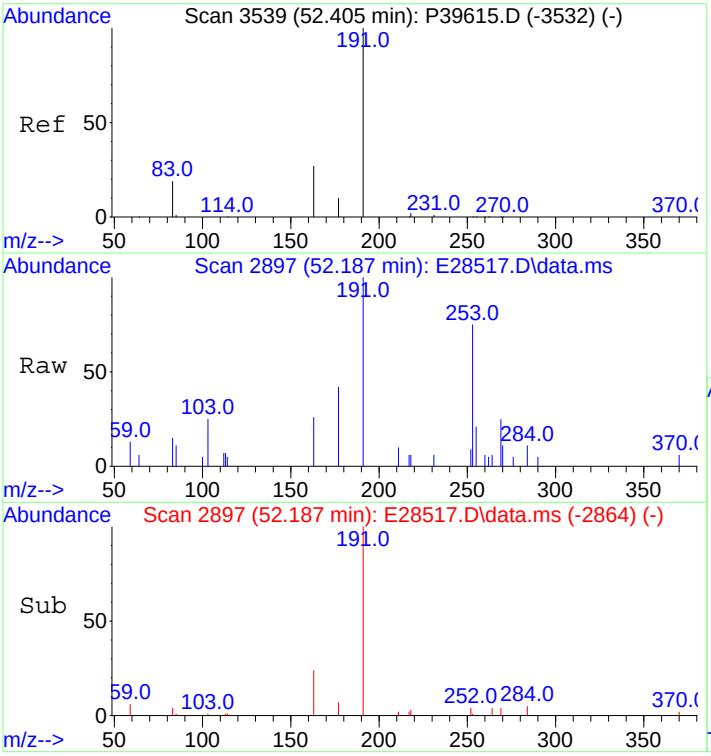


#94
Hopane (T19)
Concen: 14.96 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:191 Resp: 427

Ion	Ratio	Lower	Upper
191	100		
177	42.9	8.7	13.1#

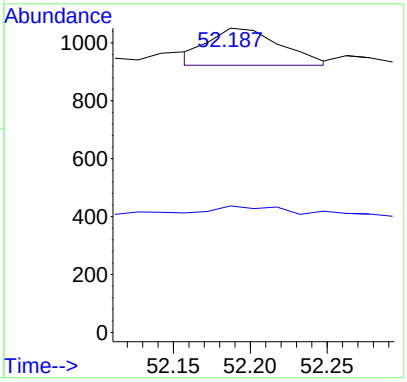




#95
17a(H),21B(H)-hopane - C30H52
Concen: 14.58 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28517.D
Acq: 29 Oct 2012 4:29 pm

Tgt Ion:191 Resp: 416

Ion	Ratio	Lower	Upper
191	100		
177	44.0	8.7	13.1#



Quantitation Report (QT Reviewed)

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Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 12:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	25519	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	51858	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.620	136	2312	24.321	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.43%#		
42) Phenanthrene-d10	32.462	188	2181	22.766	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.28%#		
83) Benzo[b]fluoranthene-d12	46.991	264	2711	27.613	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.76%#		
88) Benzo[a]pyrene-d12	48.166	264	2513	28.222	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.82%#		
129) 5B(H)Cholane - Surr	43.723	217	514	26.886	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.69%#		
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	284	13.369	ng/mL	100
4) cis-Decalin	17.482	138	201	12.456	ng/mL	100
10) Naphthalene	19.680	128	2586	25.362	ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1595	24.170	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1551	24.508	ng/mL#	100
18) Benzothiophene	19.906	134	2072	24.909	ng/mL	100
23) Biphenyl	24.272	154	1956	23.403	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	1382	22.973	ng/mL#	100
25) Dibenzofuran	27.358	168	2140	23.693	ng/mL	94
26) Acenaphthylene	25.973	152	2386	23.701	ng/mL#	100
27) Acenaphthene	26.696	153	1598	25.471	ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.262	170	1297	23.852	ng/mL	98
29) Fluorene	28.728	166	1748	23.964	ng/mL	97
33) Dibenzothiophene	32.055	184	2342	22.930	ng/mL#	94
43) Phenanthrene	32.552	178	2302	21.610	ng/mL	100
54) Retene	39.568	234	719	22.048	ng/mL	93
55) Anthracene	32.733	178	2199M3	22.030	ng/mL	
56) Carbazole	33.425	167	1973	20.927	ng/mL	98
57) 1-Methylphenanthrene	35.066	192	1799	22.673	ng/mL	100
58) Fluoranthene	37.340	202	2616	22.534	ng/mL	98
59) Benzo(b)fluorene	39.869	216	1614	21.858	ng/mL	100
60) Pyrene	38.213	202	2618	22.402	ng/mL	95
66) Naphthobenzothiophene	42.082	234	2577	23.370	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	2577	23.370	ng/mL#	95
75) Benz[a]anthracene	43.016	228	2460M3	21.396	ng/mL	
76) Chrysene	43.166	228	2669	23.716	ng/mL	98
77) Chrysene/Triphenylene	43.166	228	2669	23.716	ng/mL	98
84) Benzo[b]fluoranthene	47.081	252	2739	22.626	ng/mL	92
85) Benzo[j]+[k]fluoranthene	47.157	252	3051	26.783	ng/mL	97
87) Benzo[e]pyrene	48.075	252	2868M3	26.699	ng/mL	
89) Benzo[a]pyrene	48.256	252	2653	26.124	ng/mL	94
90) Perylene	48.572	252	2810	25.999	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.045	276	3010M3	24.550	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	3309	28.060	ng/mL	97
93) Benzo[g,h,i]perylene	54.325	276	3613	29.988	ng/mL	98
94) Hopane (T19)	52.187	191	1010M3	35.486	ng/mL	
95) 17a(H),21B(H)-hopane -...	52.187	191	1032M3	36.259	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
Sample : I210291202
Misc : L2 WHAQ34
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 31 12:58:26 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28519.D
Acq On : 29 Oct 2012 5:58 pm
Operator : AC
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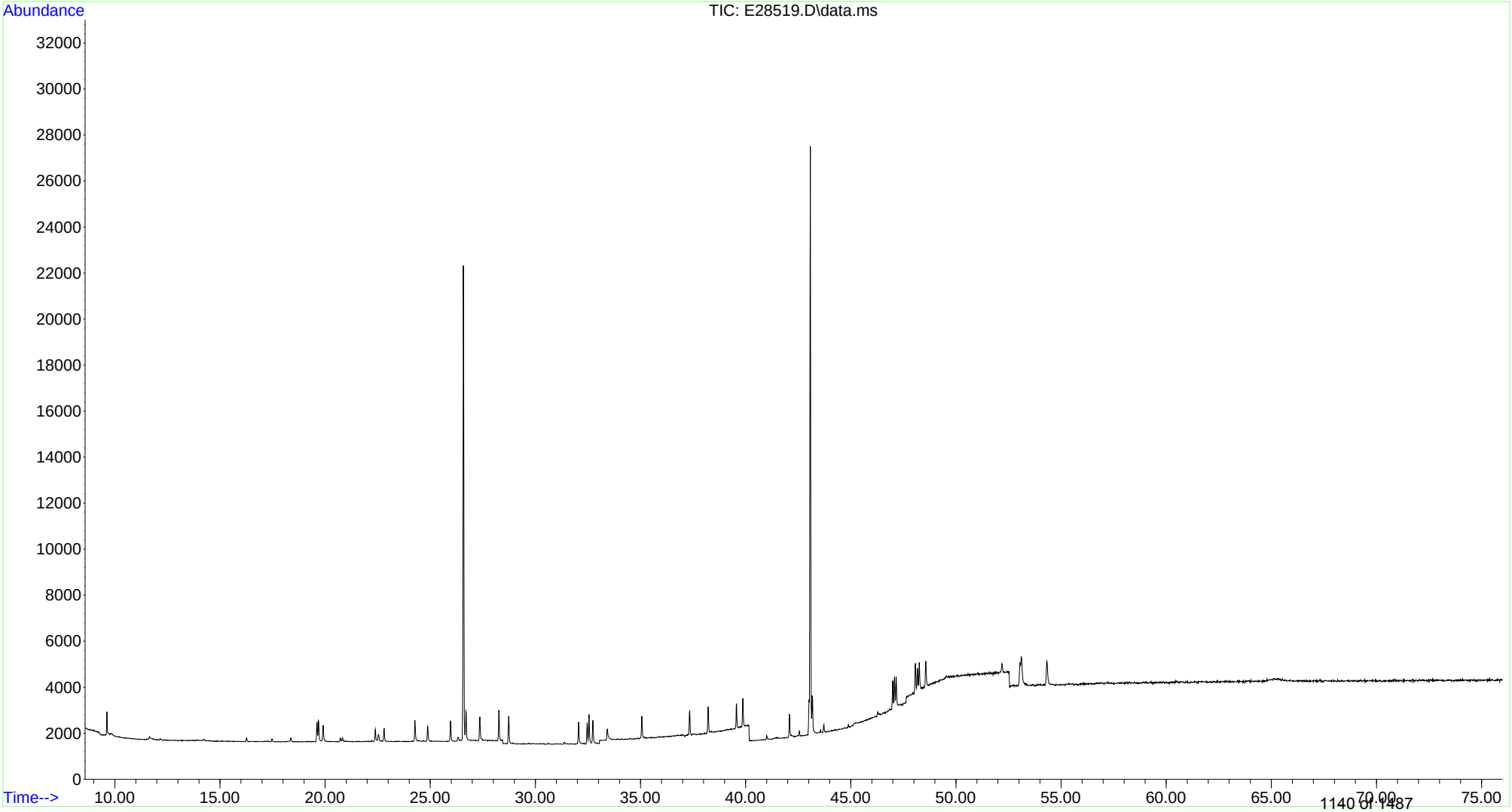
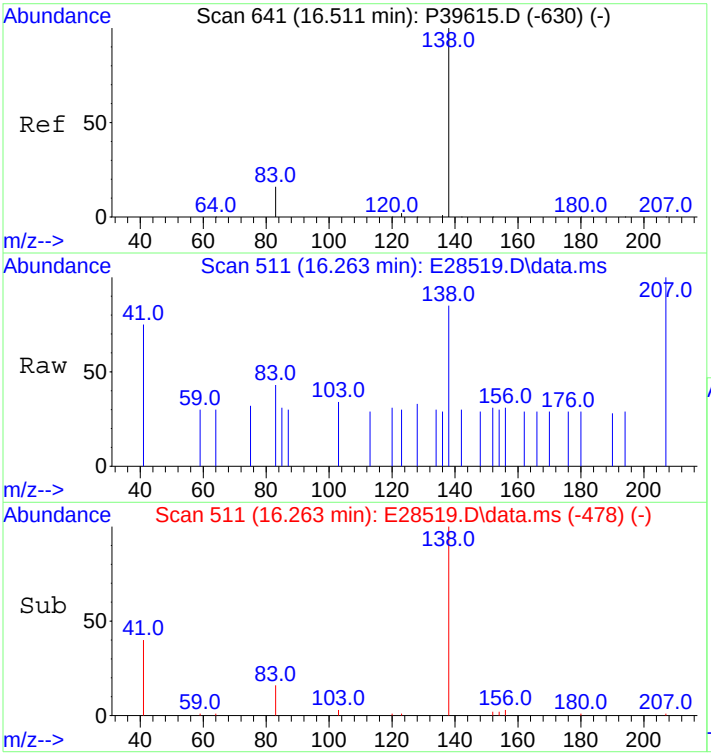
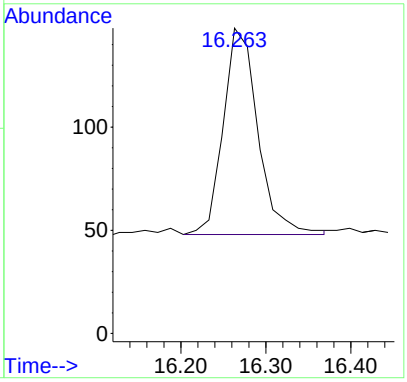
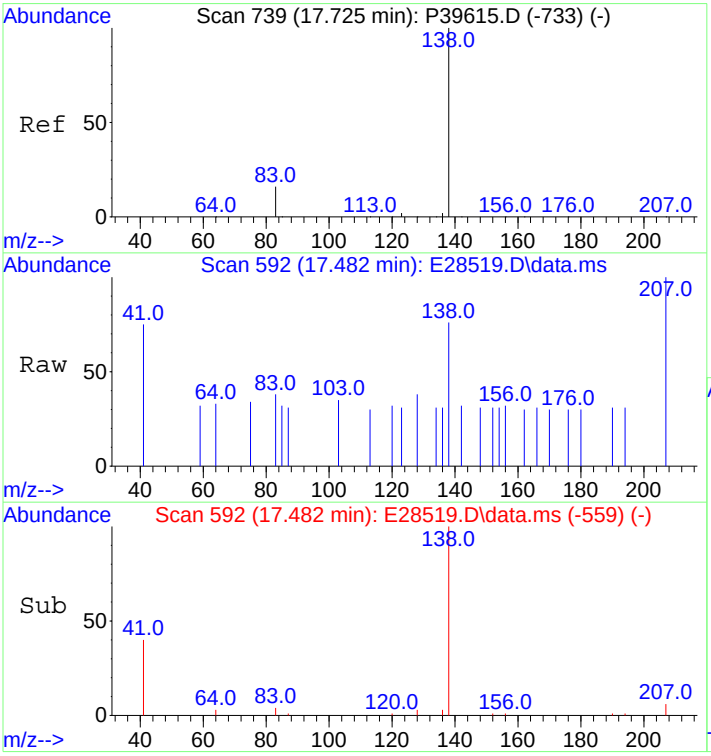




#3
trans-Decalin
Concen: 13.37 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

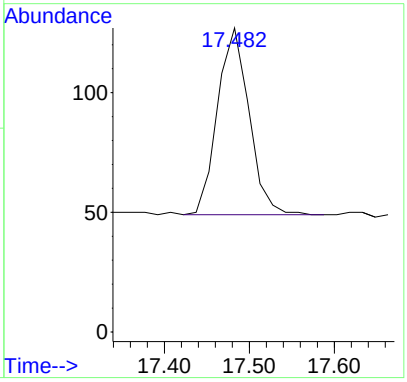
Tgt Ion:138 Resp: 284

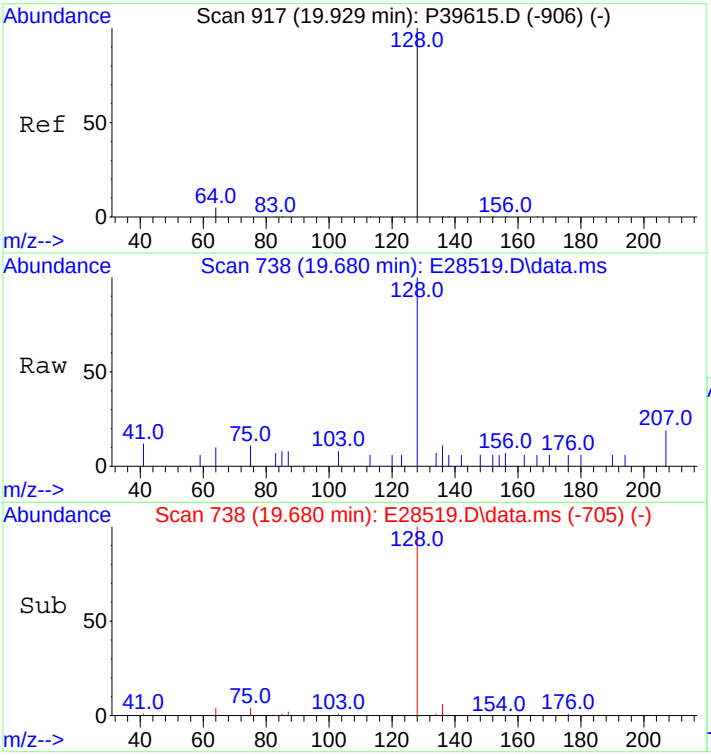




#4
cis-Decalin
Concen: 12.46 ng/mL
RT: 17.482 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:138 Resp: 201

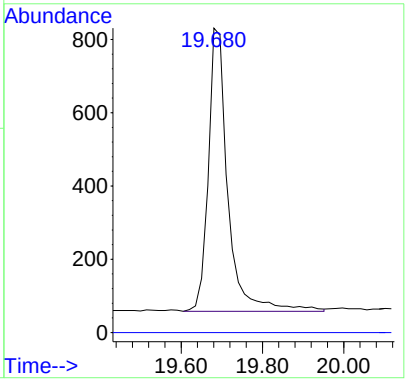


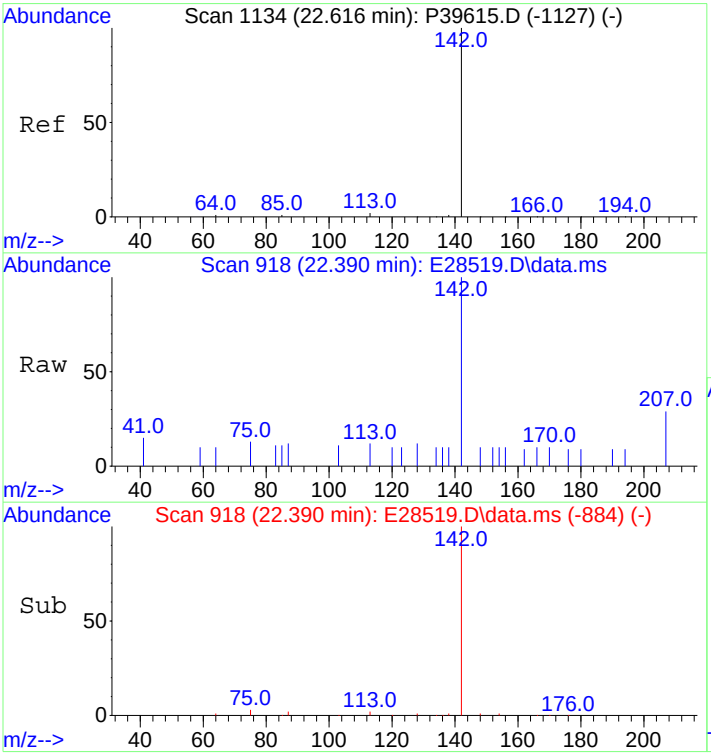


#10
Naphthalene
Concen: 25.36 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:128 Resp: 2586

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

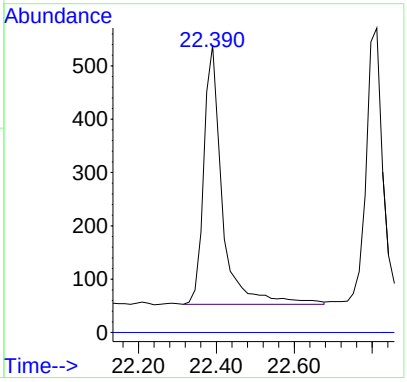


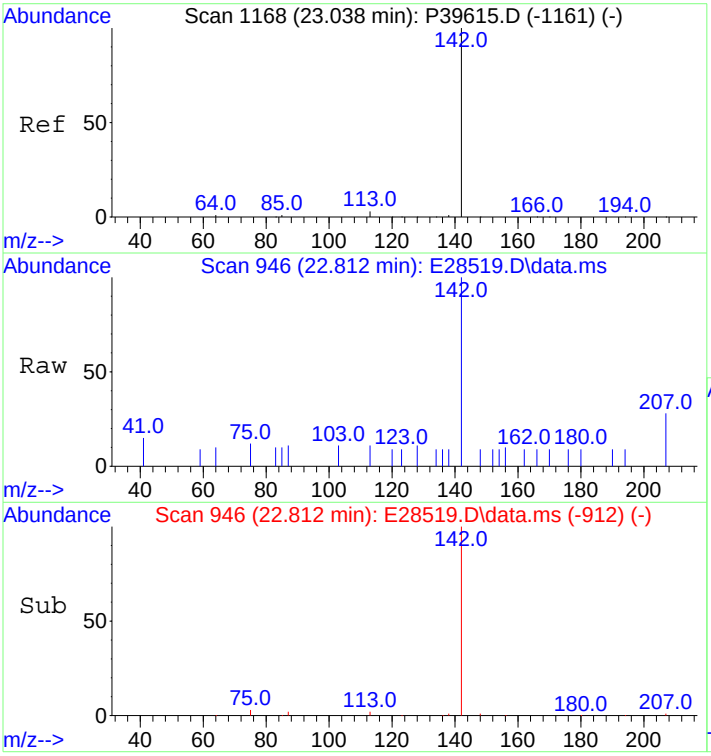


#16
2-Methylnaphthalene
Concen: 24.17 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:142 Resp: 1595

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

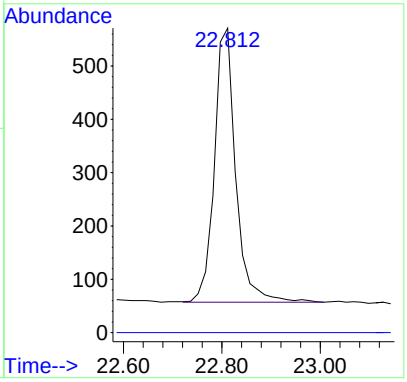


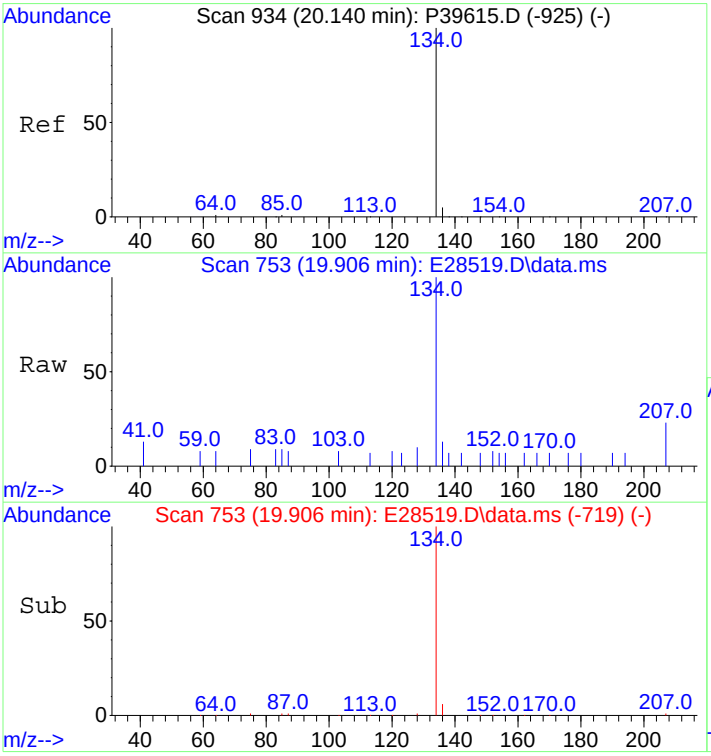


#17
1-Methylnaphthalene
Concen: 24.51 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:142 Resp: 1551

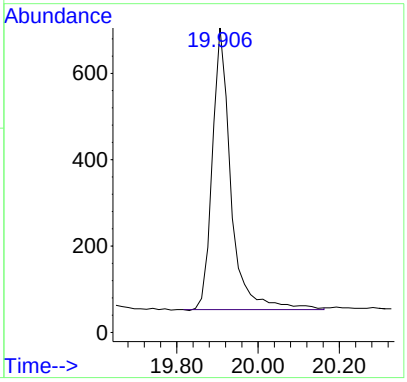
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

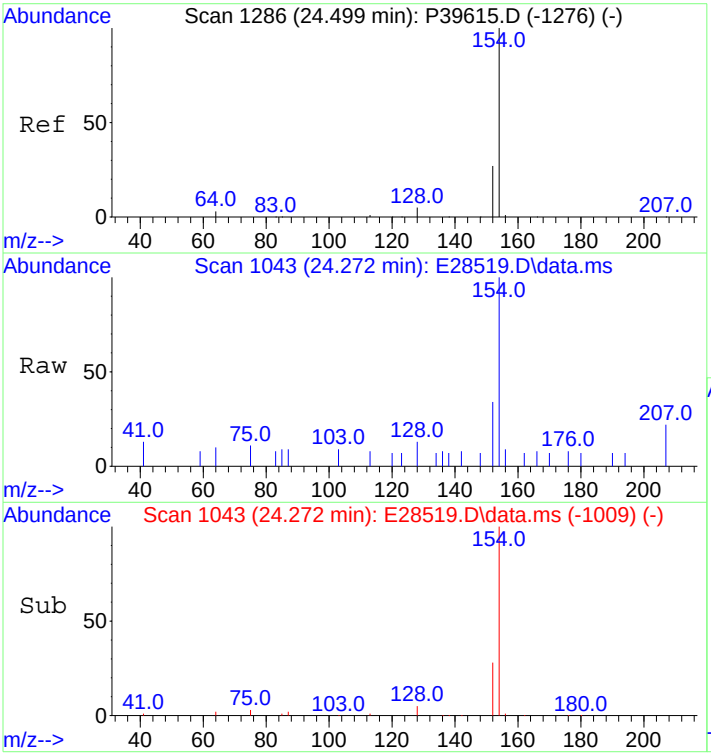




#18
Benzothiophene
Concen: 24.91 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:134 Resp: 2072

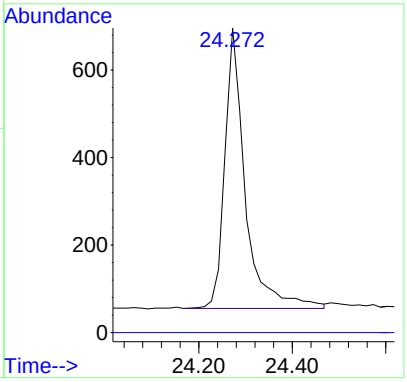


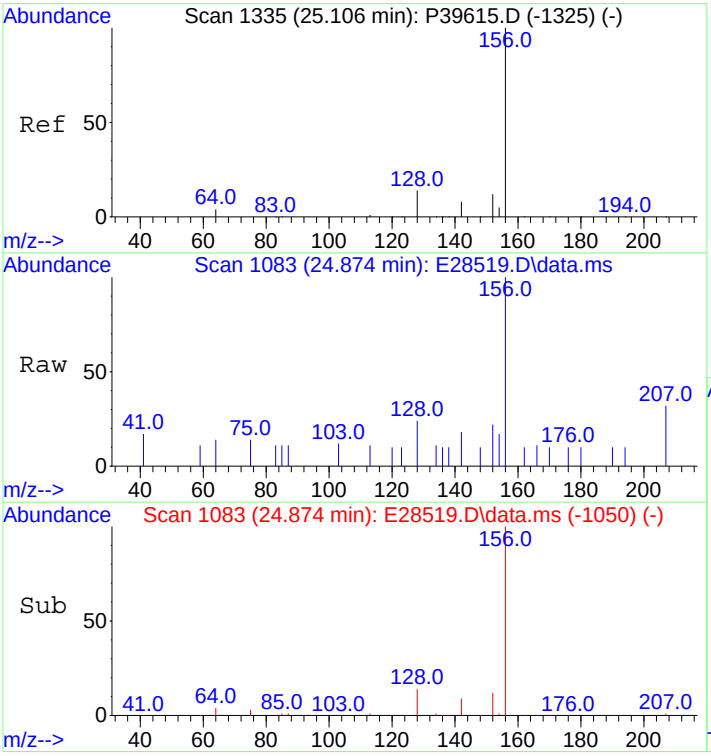


#23
Biphenyl
Concen: 23.40 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:154 Resp: 1956

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

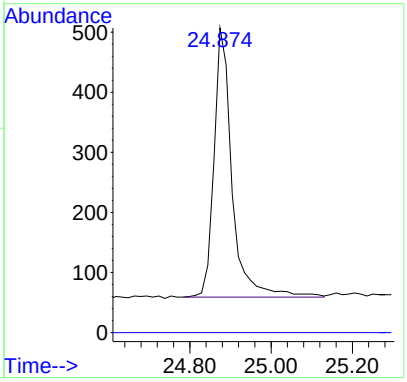


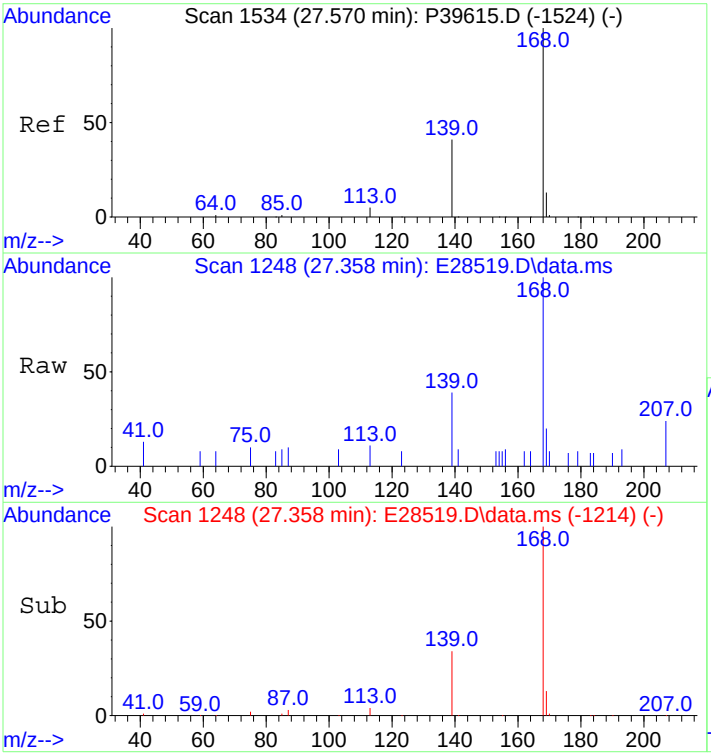


#24
2,6-Dimethylnaphthalene
Concen: 22.97 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:156 Resp: 1382

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

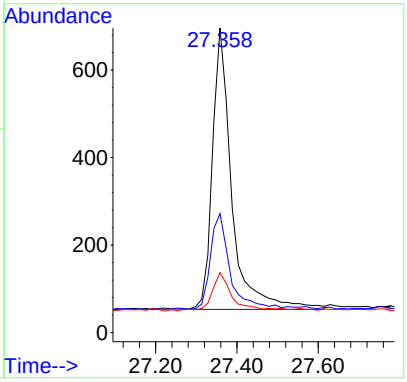


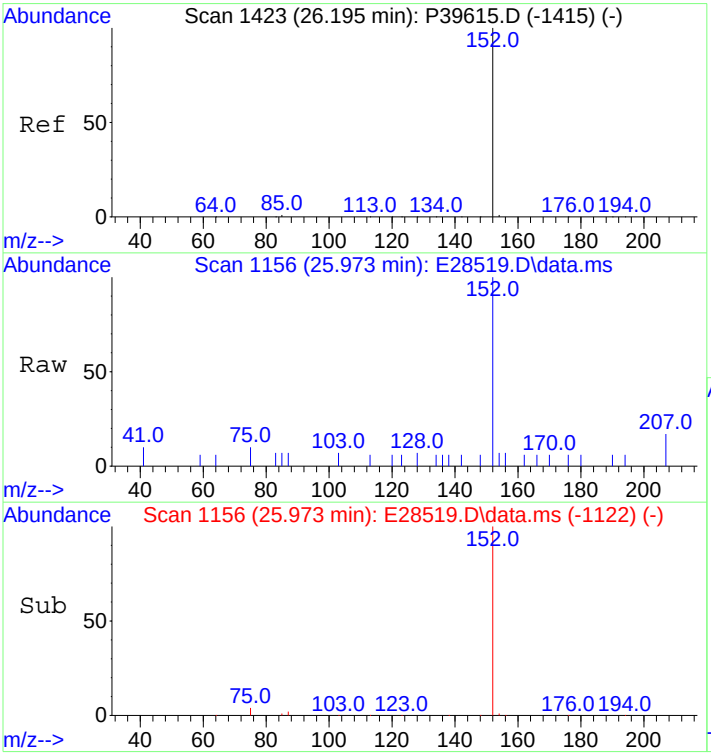


#25
Dibenzofuran
Concen: 23.69 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:168 Resp: 2140

Ion	Ratio	Lower	Upper
168	100		
139	34.6	30.6	45.8
169	15.0	10.6	16.0

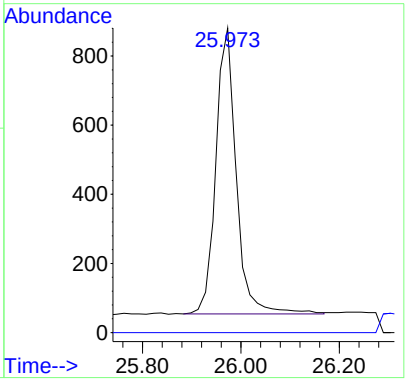


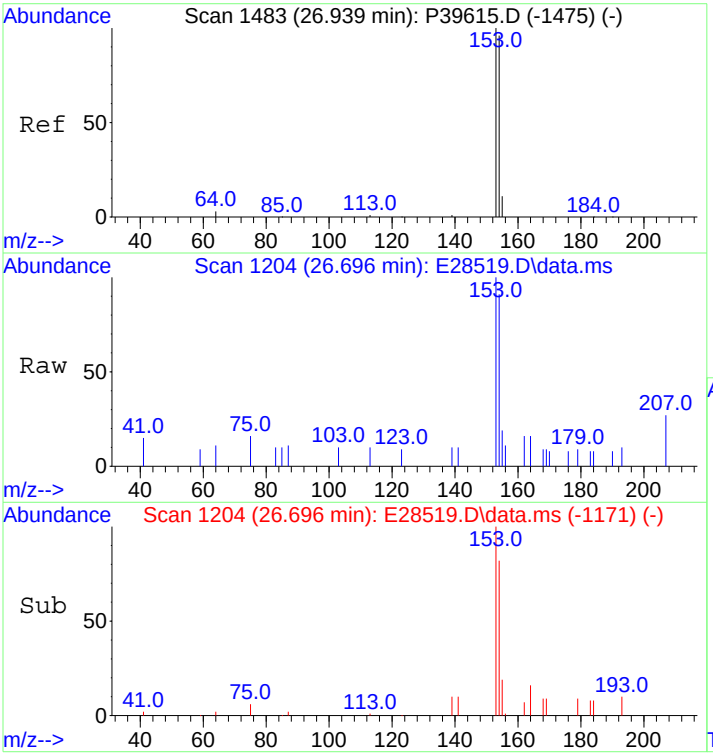


#26
Acenaphthylene
Concen: 23.70 ng/mL
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:152 Resp: 2386

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

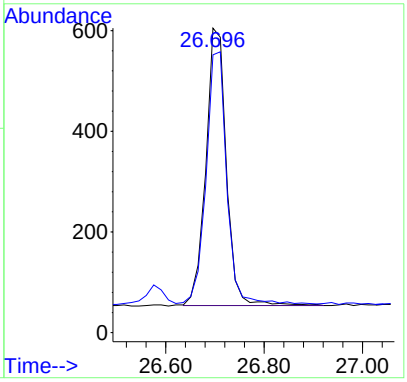


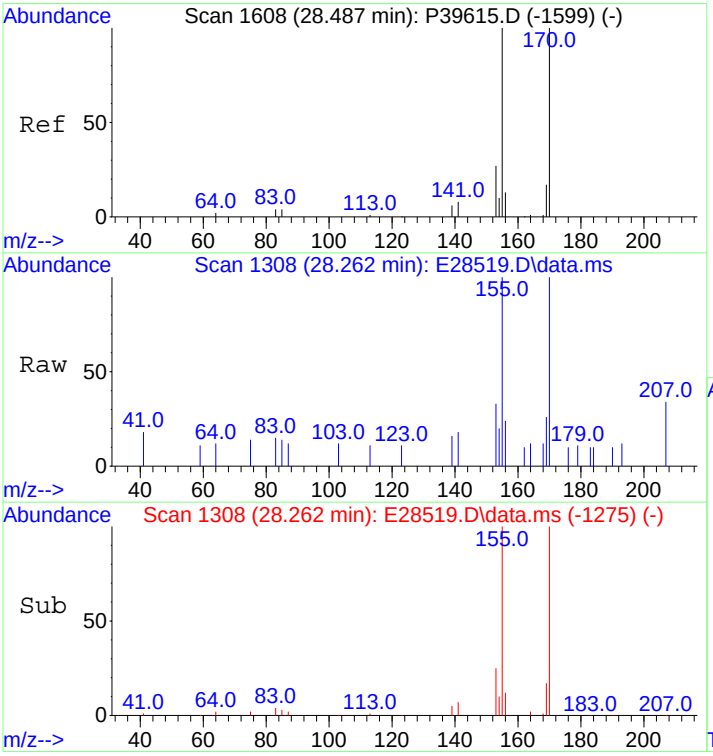


#27
Acenaphthene
Concen: 25.47 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:153 Resp: 1598

Ion	Ratio	Lower	Upper
153	100		
154	91.9	72.3	108.5

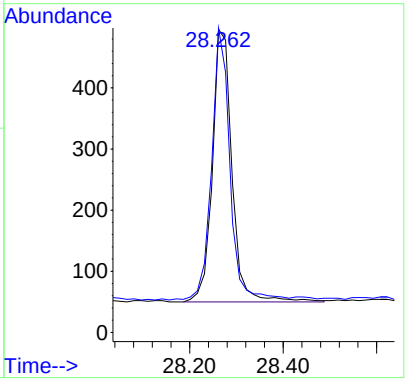


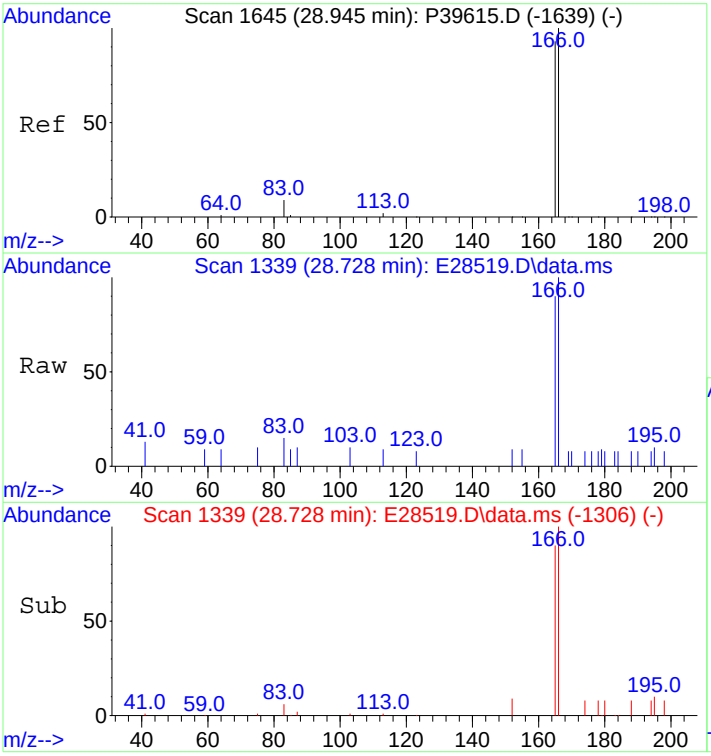


#28
2,3,5-Trimethylnaphthalene
Concen: 23.85 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:170 Resp: 1297

Ion	Ratio	Lower	Upper
170	100		
155	92.6	75.9	113.9

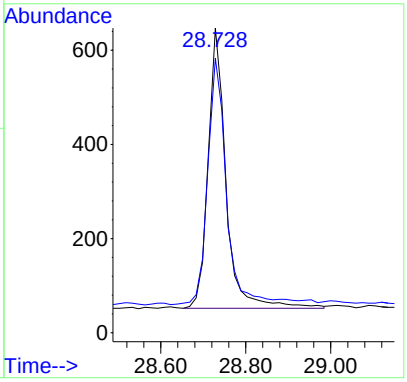


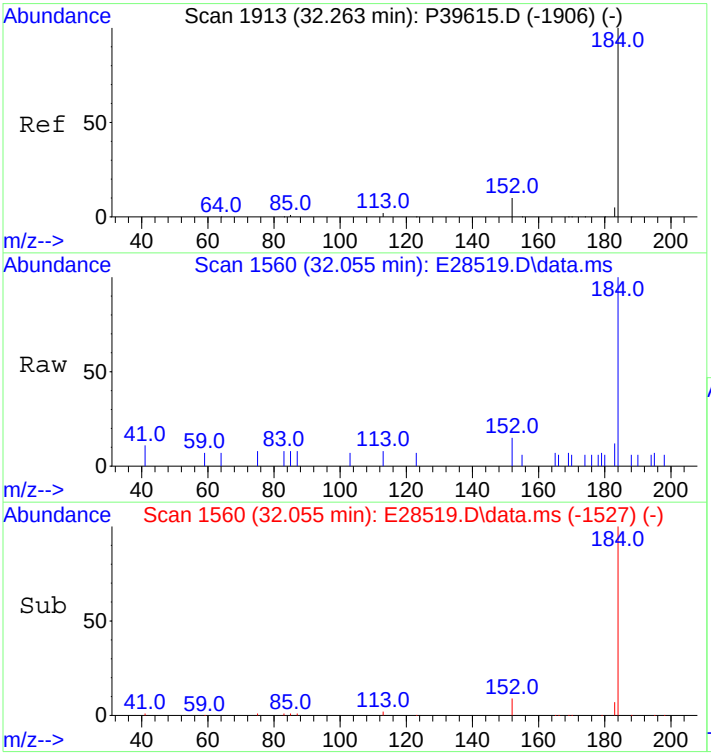


#29
Fluorene
Concen: 23.96 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:166 Resp: 1748

Ion	Ratio	Lower	Upper
166	100		
165	89.5	73.8	110.6

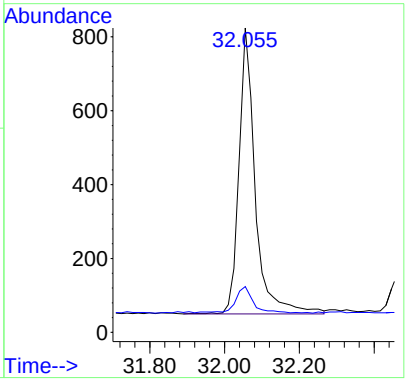


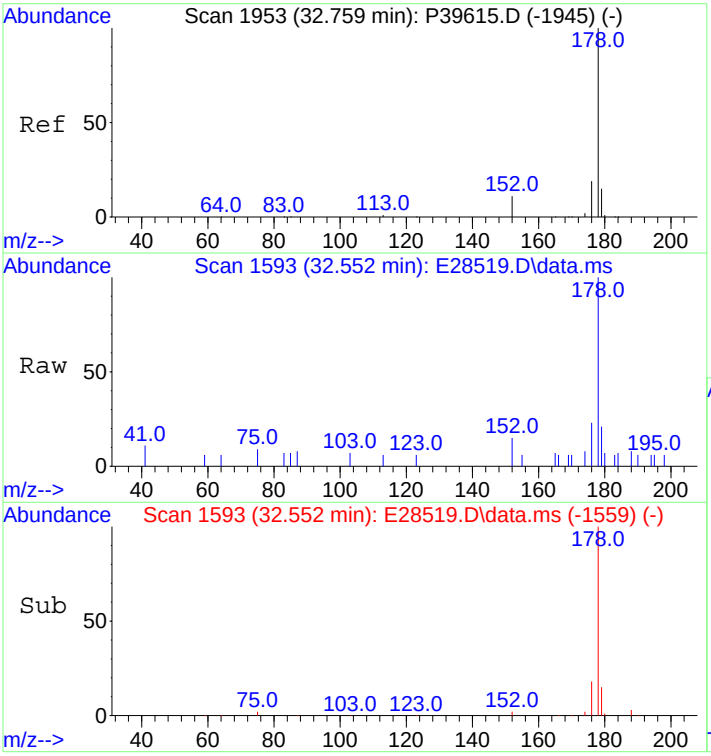


#33
Dibenzothiophene
Concen: 22.93 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:184 Resp: 2342

Ion	Ratio	Lower	Upper
184	100		
152	9.7	6.2	9.2#

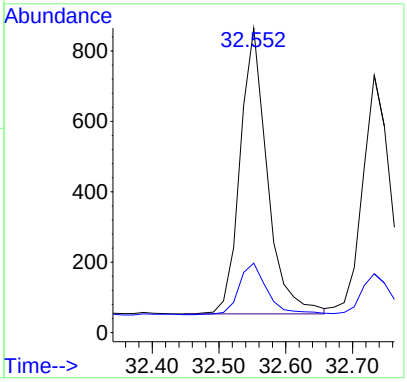


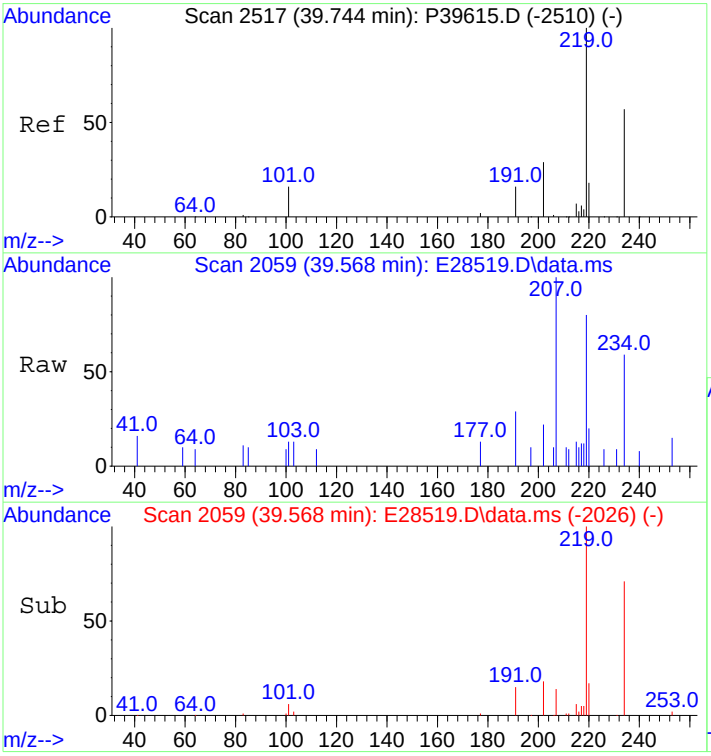


#43
Phenanthrene
Concen: 21.61 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:178 Resp: 2302

Ion	Ratio	Lower	Upper
178	100		
176	18.9	15.0	22.6

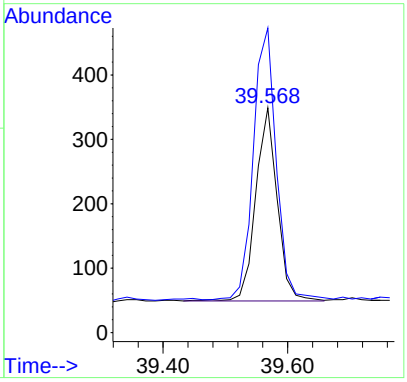


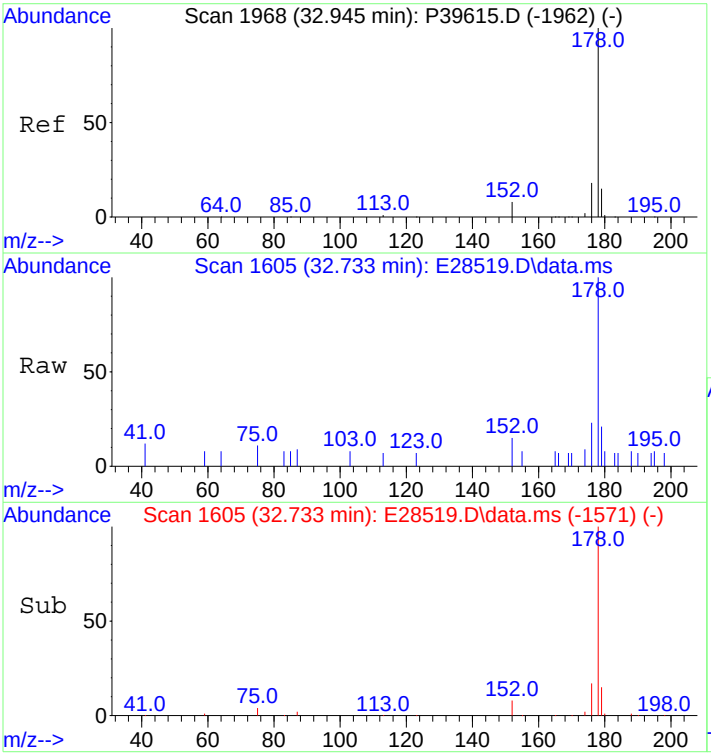


#54
Retene
Concen: 22.05 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:234 Resp: 719

Ion	Ratio	Lower	Upper
234	100		
219	149.4	113.0	169.4

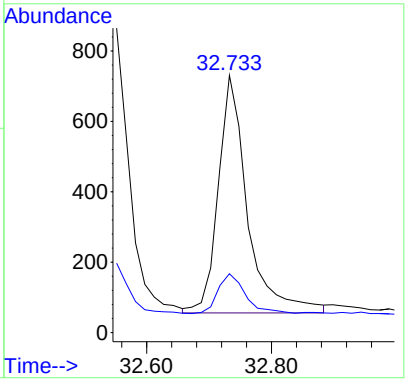


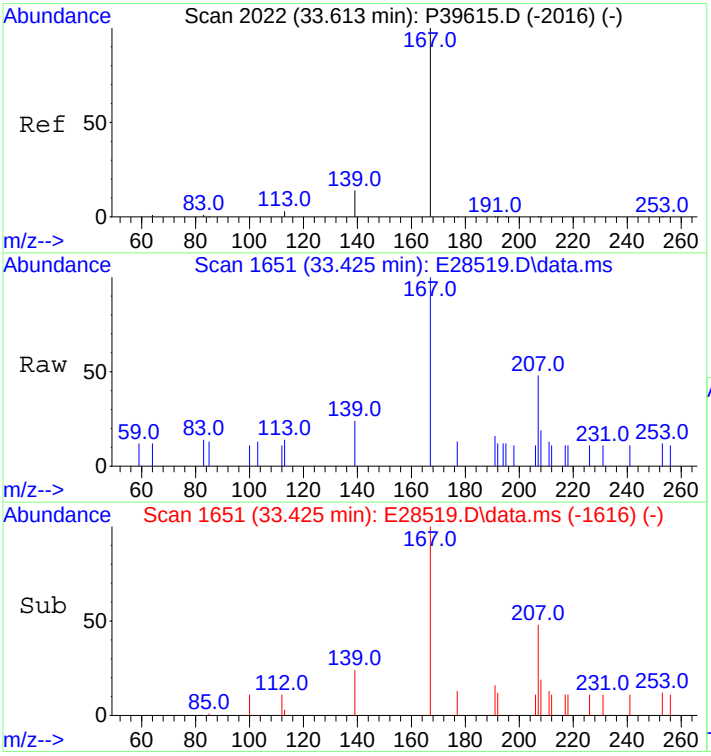


#55
Anthracene
Concen: 22.03 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:178 Resp: 2199

Ion	Ratio	Lower	Upper
178	100		
176	15.7	14.5	21.7

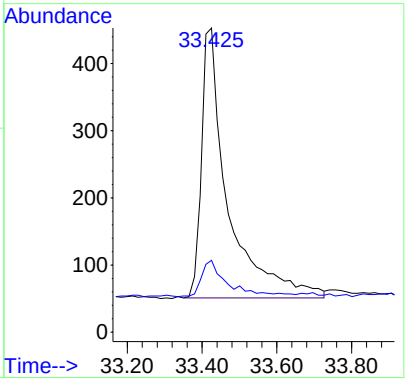


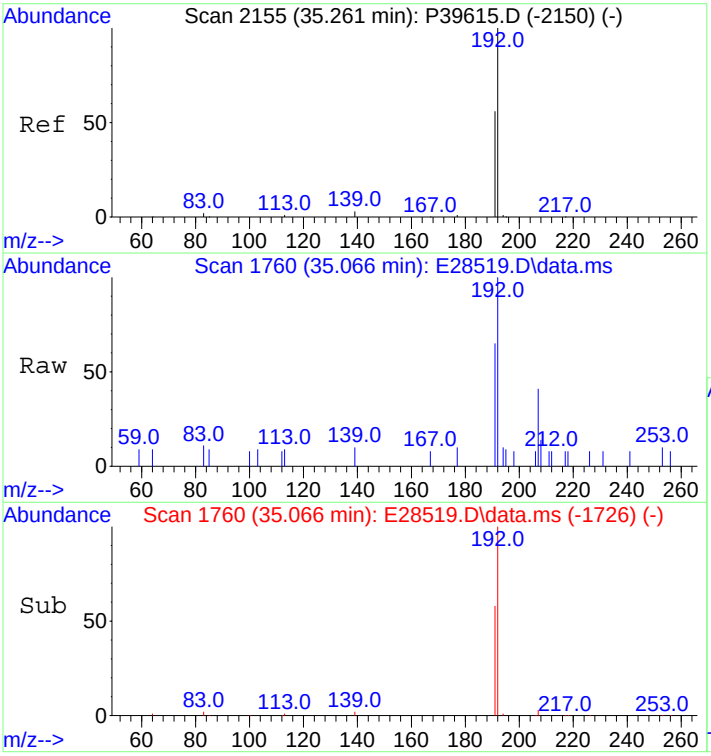


#56
Carbazole
Concen: 20.93 ng/mL
RT: 33.425 min Scan# 1651
Delta R.T. 0.030 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:167 Resp: 1973

Ion	Ratio	Lower	Upper
167	100		
139	12.4	10.5	15.7

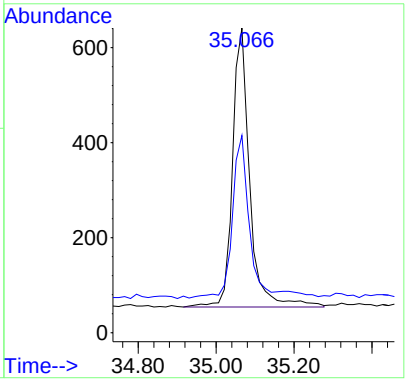


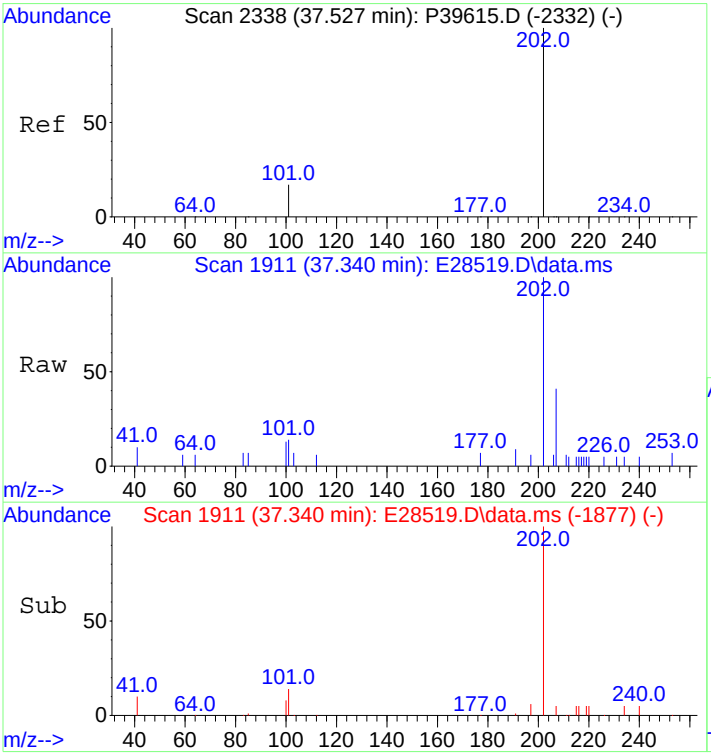


#57
1-Methylphenanthrene
Concen: 22.67 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:192 Resp: 1799

Ion	Ratio	Lower	Upper
192	100		
191	57.3	45.5	68.3

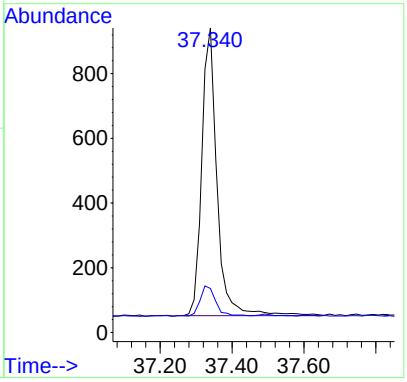


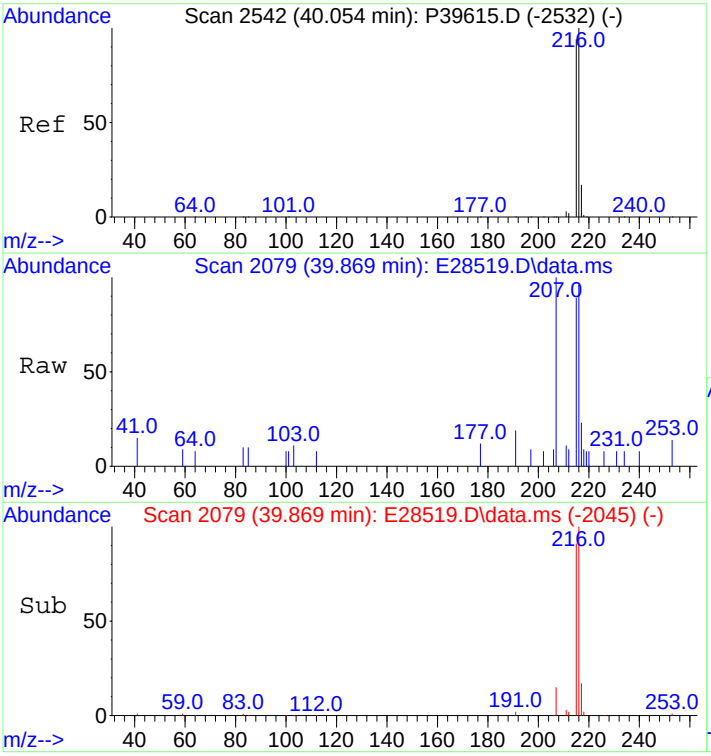


#58
Fluoranthene
Concen: 22.53 ng/mL
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:202 Resp: 2616

Ion	Ratio	Lower	Upper
202	100		
101	10.6	9.2	13.8

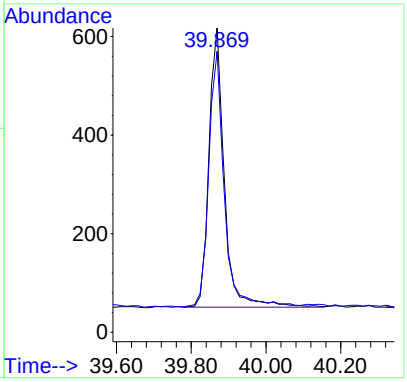


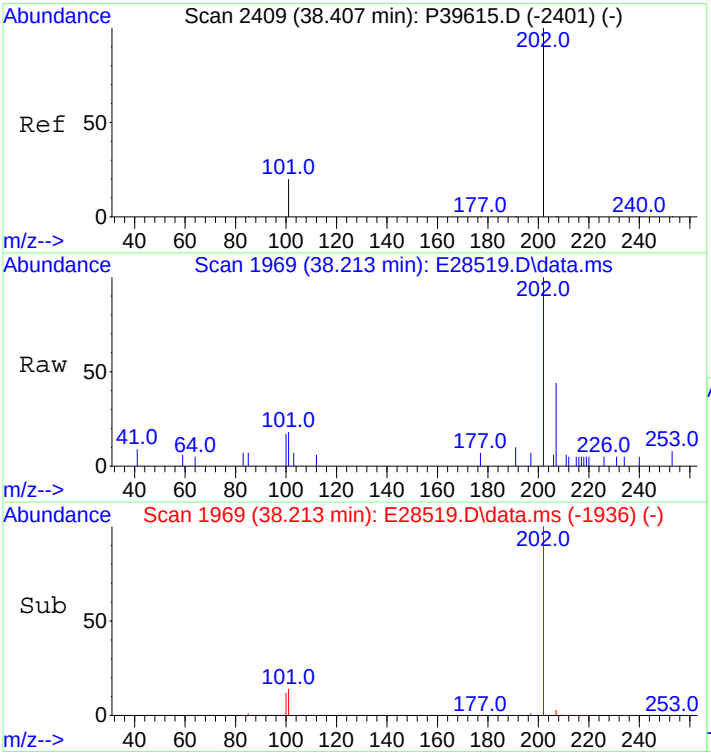


#59
Benzo(b)fluorene
Concen: 21.86 ng/mL
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:216 Resp: 1614

Ion	Ratio	Lower	Upper
216	100		
215	92.1	73.8	110.8

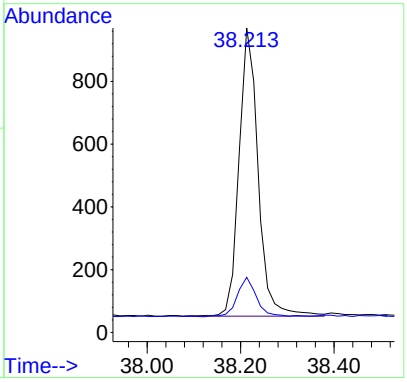


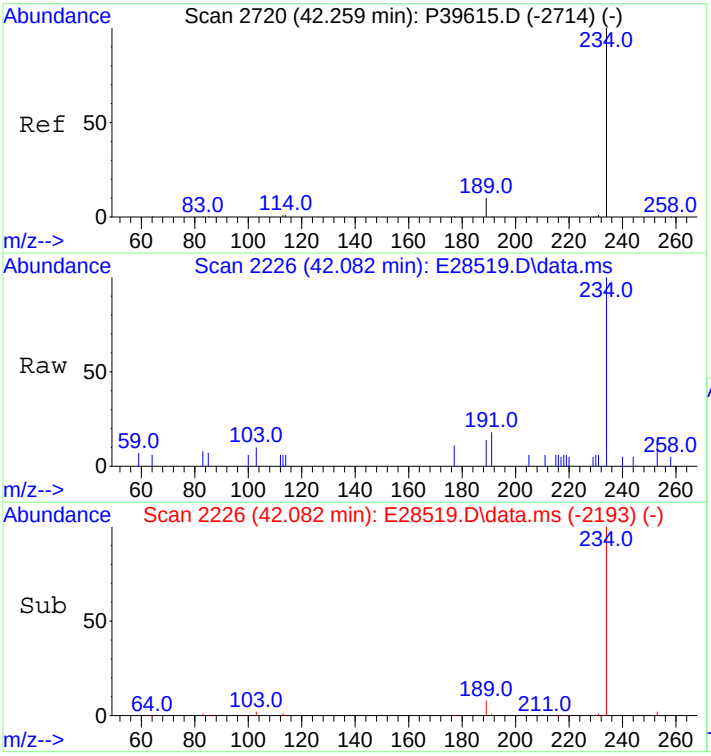


#60
Pyrene
Concen: 22.40 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:202 Resp: 2618

Ion	Ratio	Lower	Upper
202	100		
101	14.1	9.8	14.8

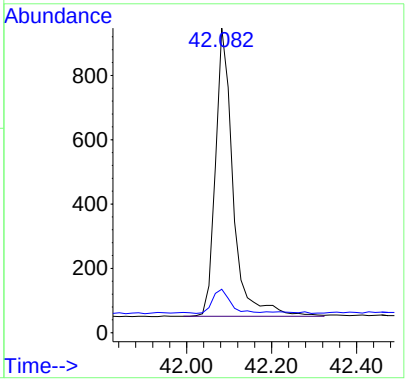


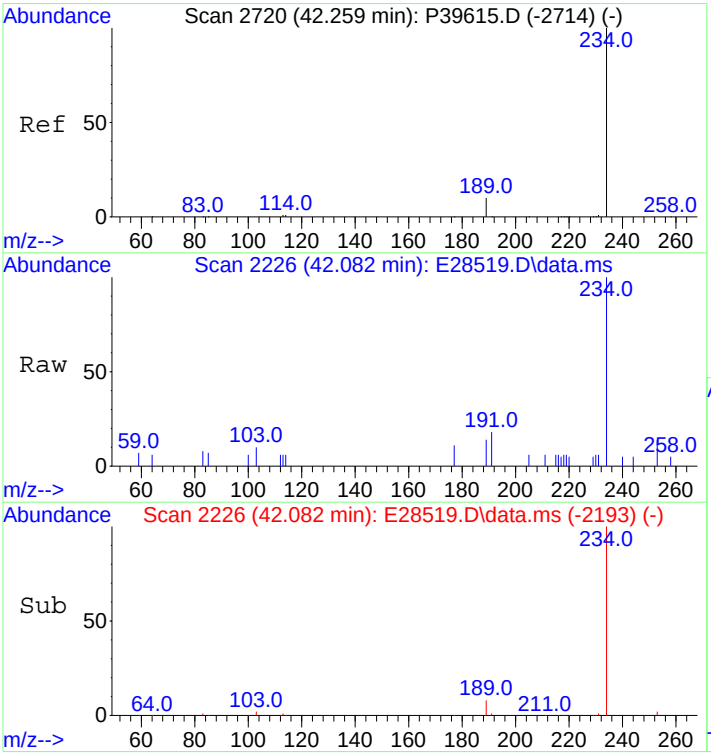


#66
Naphthobenzothiophene
Concen: 23.37 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:234 Resp: 2577

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

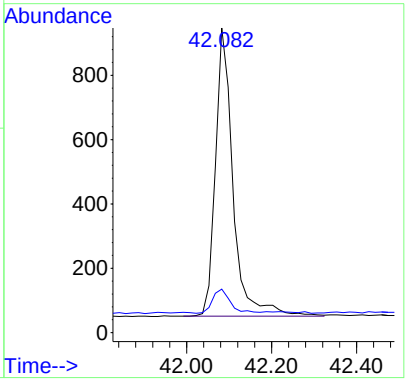


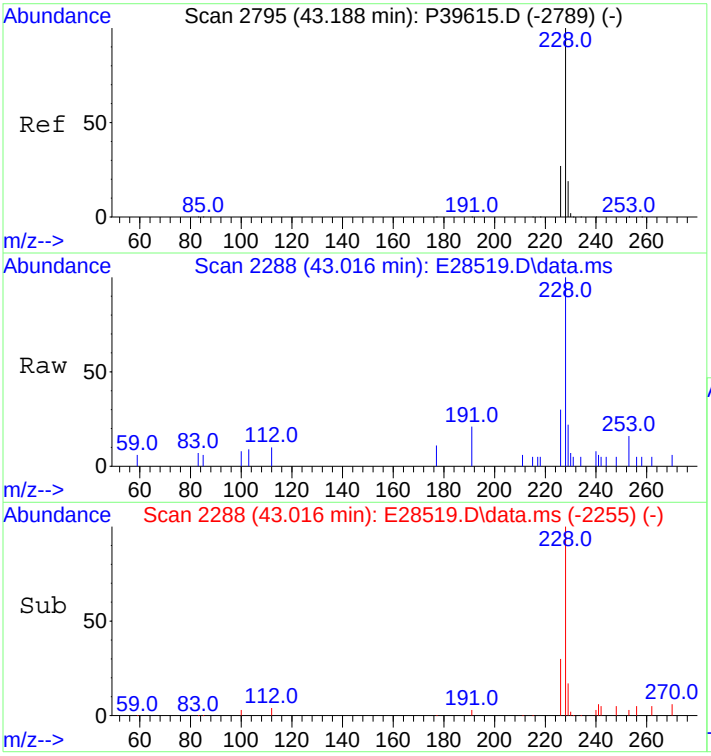


#67
Naphthobenzothiophene-2,1-D
Concen: 23.37 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:234 Resp: 2577

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

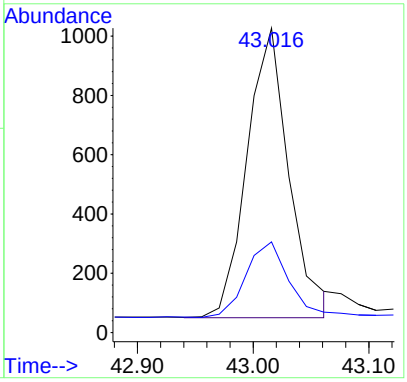


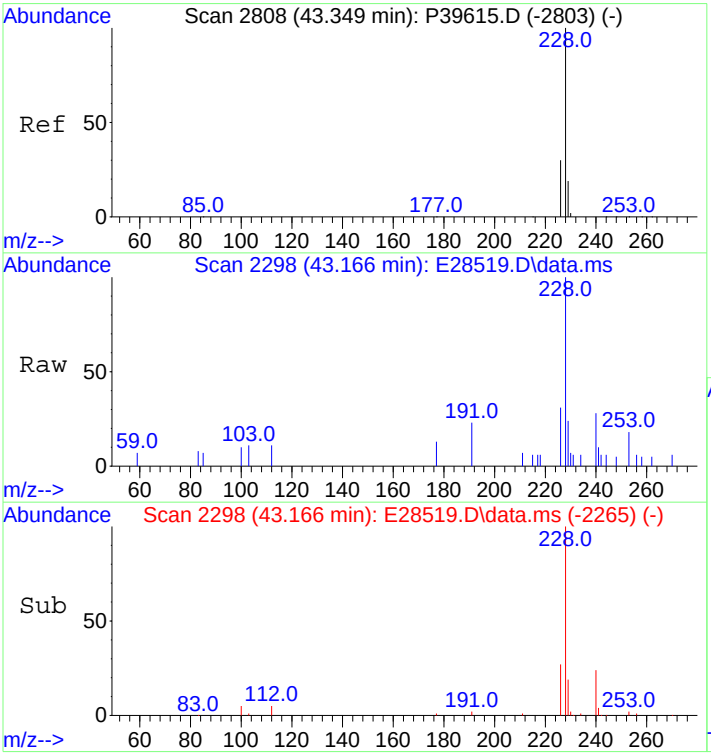


#75
Benz[a]anthracene
Concen: 21.40 ng/mL m
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:228 Resp: 2460

Ion	Ratio	Lower	Upper
228	100		
226	27.5	20.2	30.4

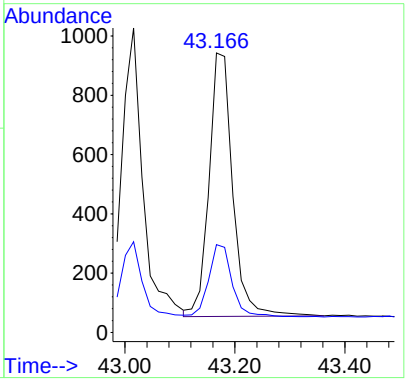


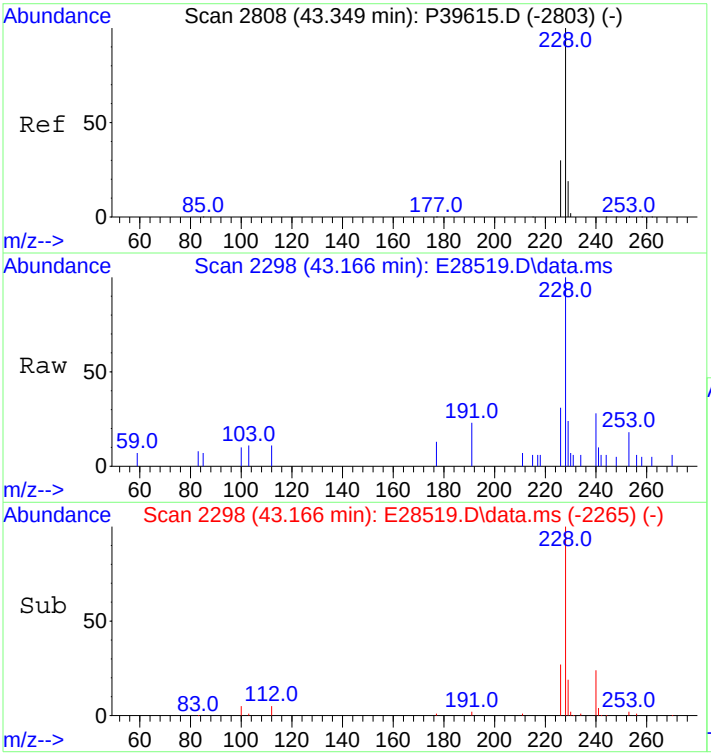


#76
Chrysene
Concen: 23.72 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:228 Resp: 2669

Ion	Ratio	Lower	Upper
228	100		
226	27.1	22.6	34.0

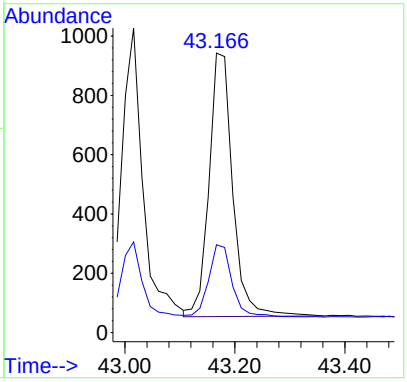


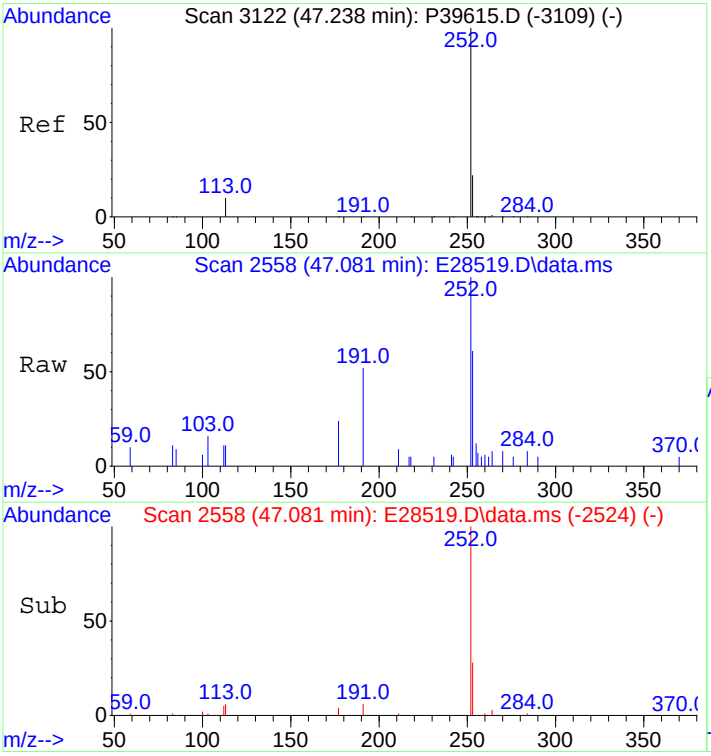


#77
Chrysene/Triphenylene
Concen: 23.72 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:228 Resp: 2669

Ion	Ratio	Lower	Upper
228	100		
226	27.1	22.6	34.0

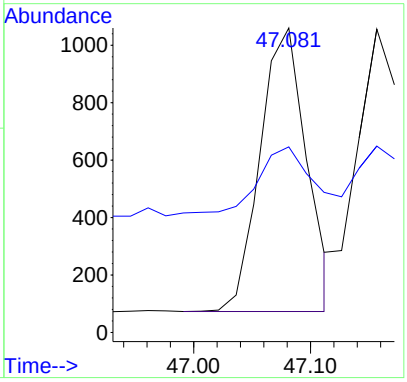


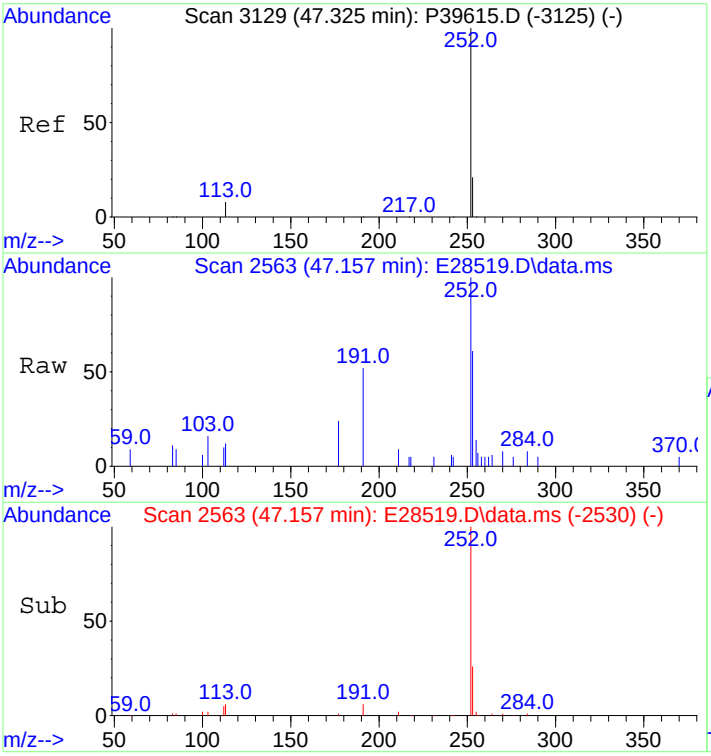


#84
Benzo[b]fluoranthene
Concen: 22.63 ng/mL
RT: 47.081 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2739

Ion	Ratio	Lower	Upper
252	100		
253	26.7	18.3	27.5

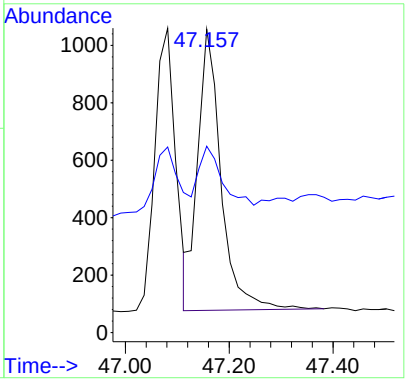


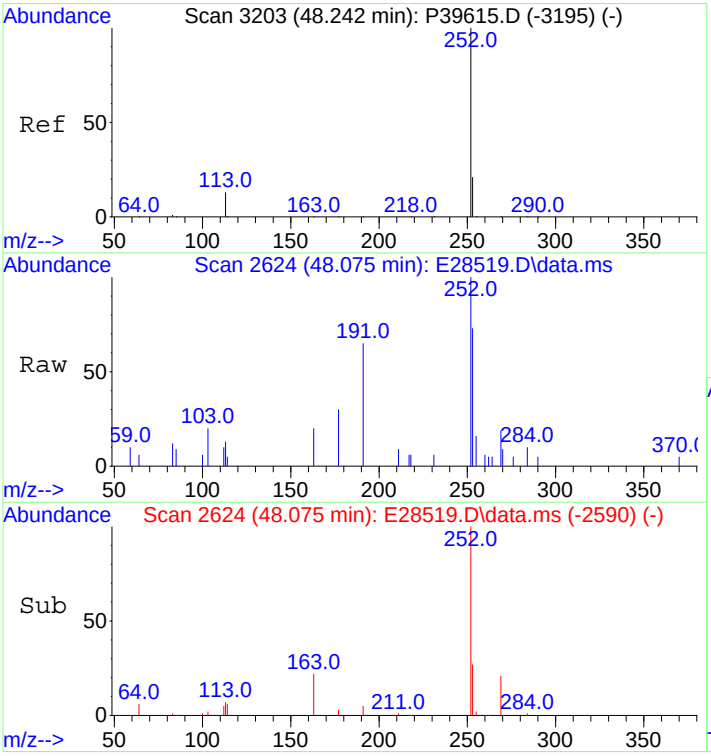


#85
Benzo[j]+[k]fluoranthene
Concen: 26.78 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 3051

Ion	Ratio	Lower	Upper
252	100		
253	21.4	18.3	27.5

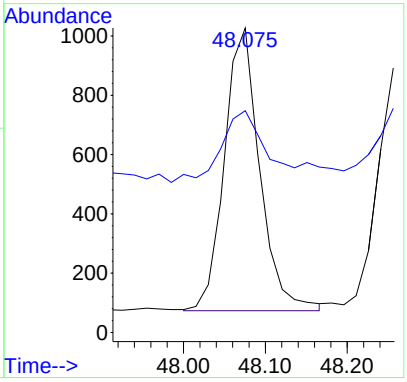


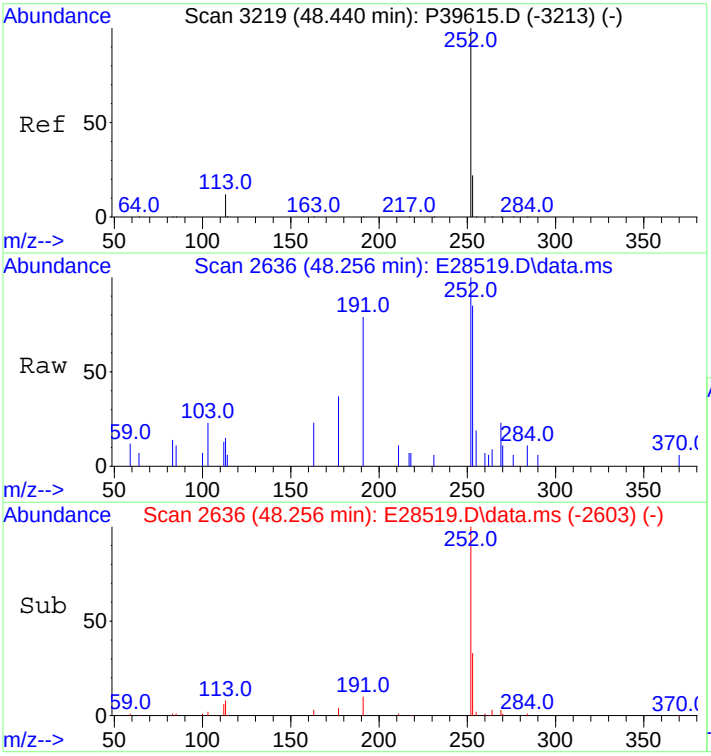


#87
Benzo[e]pyrene
Concen: 26.70 ng/mL m
RT: 48.075 min Scan# 2624
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2868

Ion	Ratio	Lower	Upper
252	100		
253	24.3	18.6	28.0

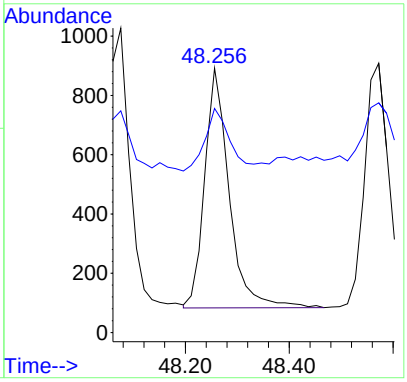


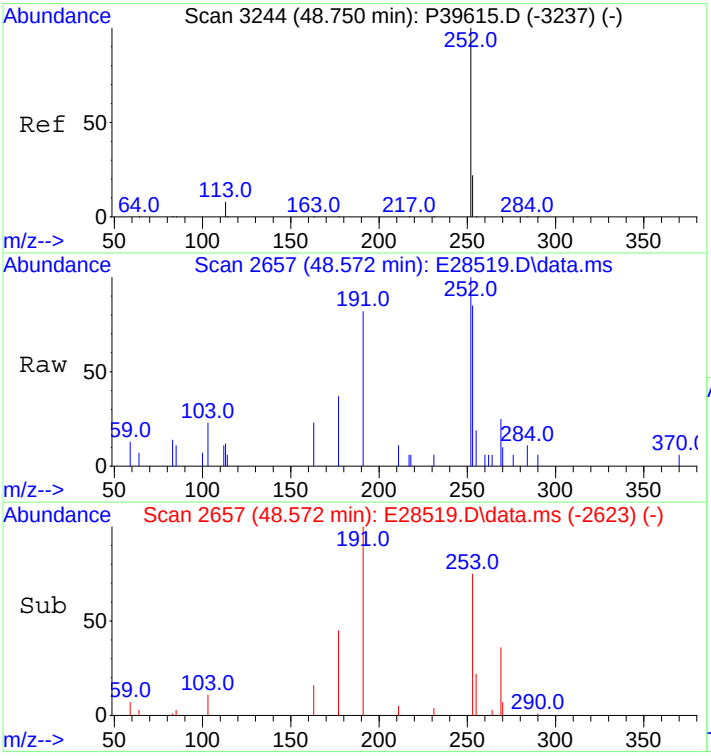


#89
Benzo[a]pyrene
Concen: 26.12 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2653

Ion	Ratio	Lower	Upper
252	100		
253	26.2	18.8	28.2

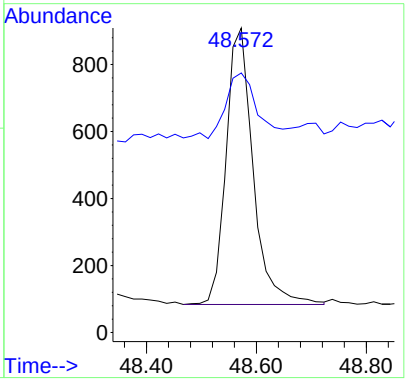


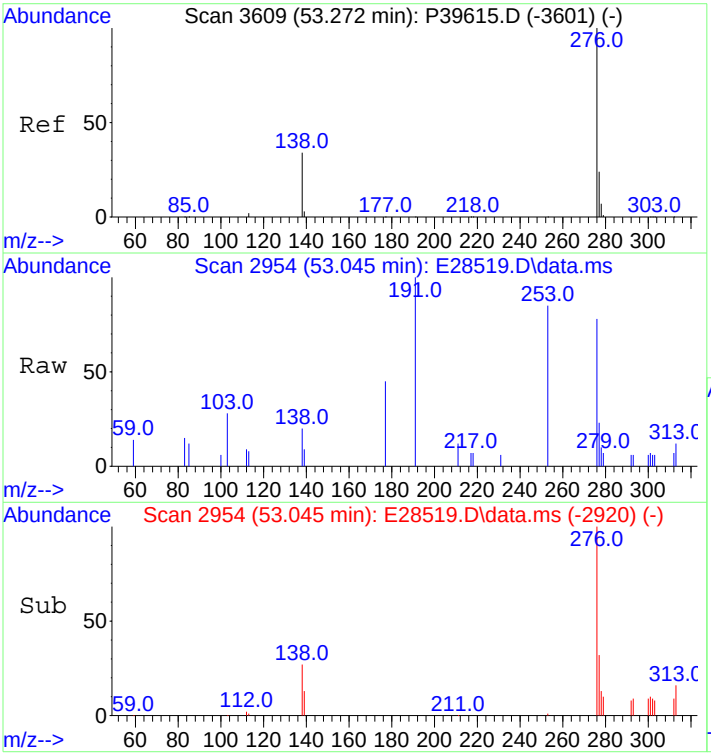


#90
Perylene
Concen: 26.00 ng/mL
RT: 48.572 min Scan# 2657
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:252 Resp: 2810

Ion	Ratio	Lower	Upper
252	100		
253	25.2	18.8	28.2

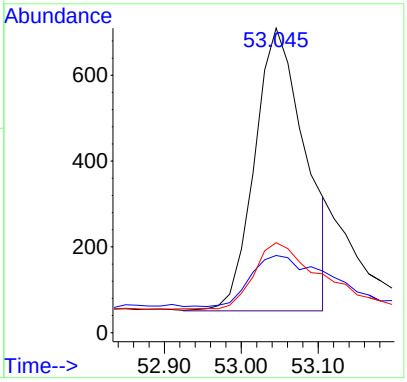


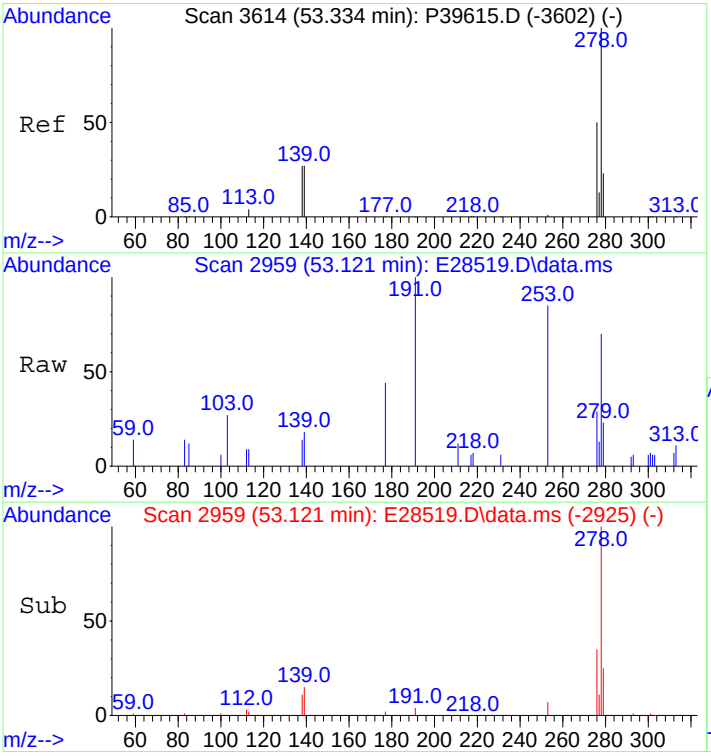


#91
Indeno[1,2,3-cd]pyrene
Concen: 24.55 ng/mL m
RT: 53.045 min Scan# 2954
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:276 Resp: 3010

Ion	Ratio	Lower	Upper
276	100		
138	29.8	15.4	23.2#
277	31.1	19.1	28.7#

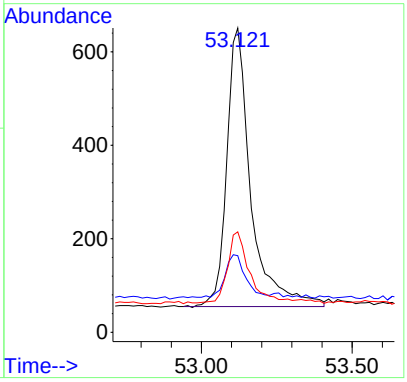


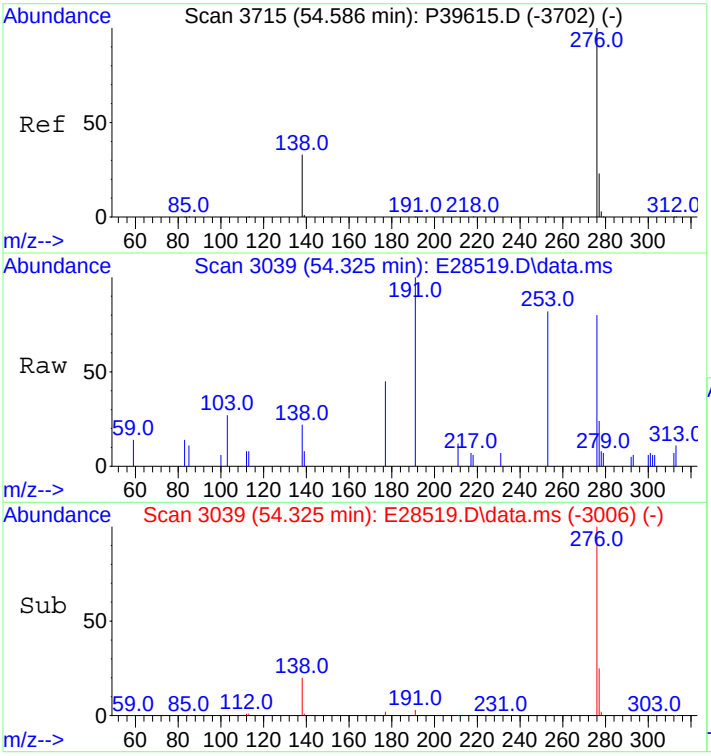


#92
Dibenz[ah]+[ac]anthracene
Concen: 28.06 ng/mL
RT: 53.121 min Scan# 2959
Delta R.T. 0.015 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:278 Resp: 3309

Ion	Ratio	Lower	Upper
278	100		
139	12.7	11.1	16.7
279	23.1	19.4	29.0

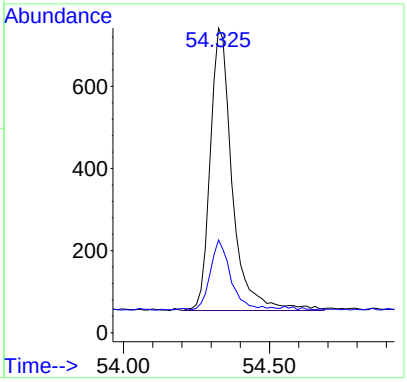


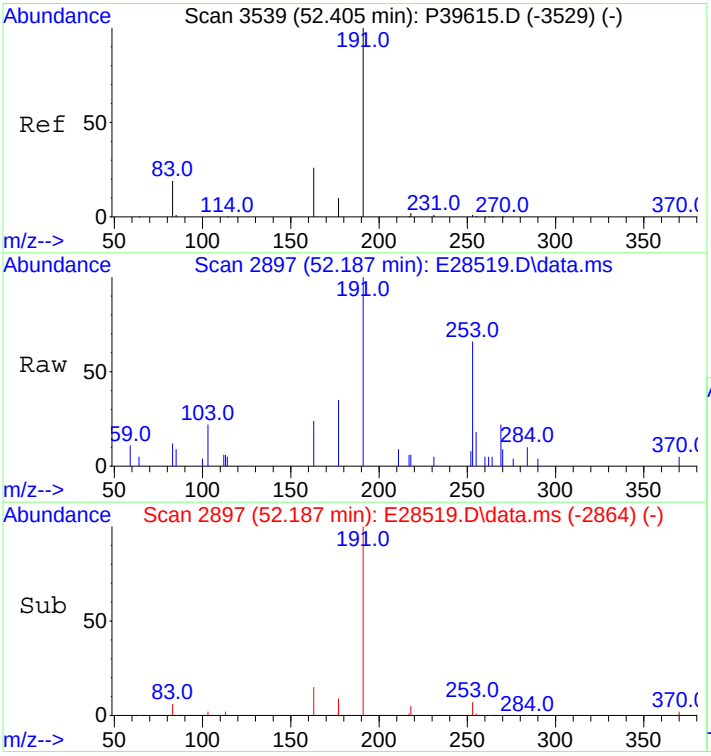


#93
Benzo[g,h,i]perylene
Concen: 29.99 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:276 Resp: 3613

Ion	Ratio	Lower	Upper
276	100		
277	22.9	19.1	28.7

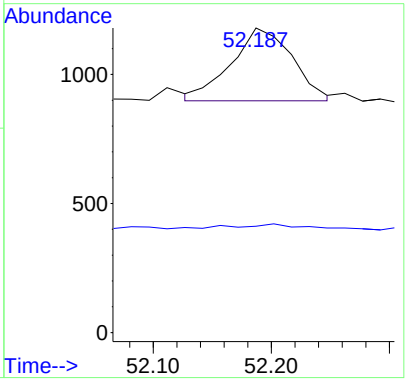


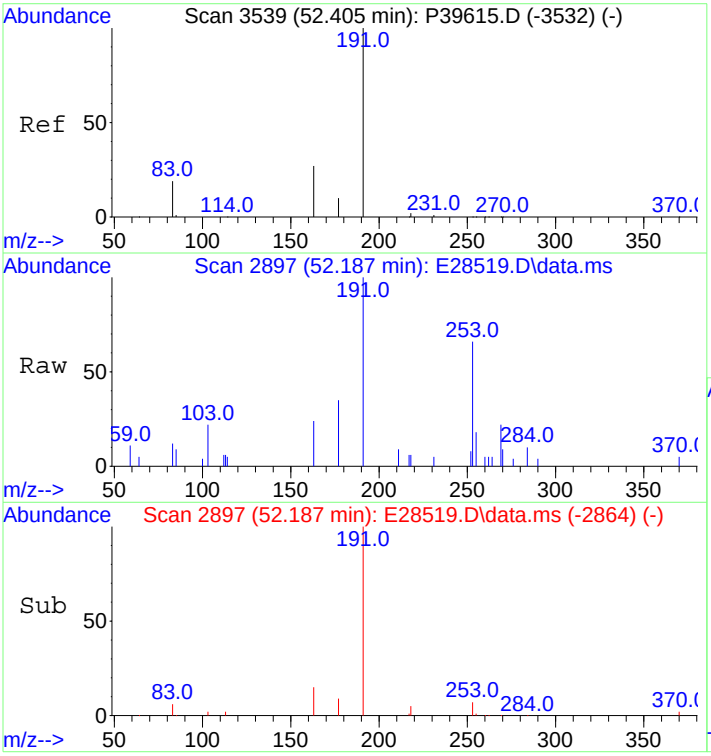


#94
Hopane (T19)
Concen: 35.49 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:191 Resp: 1010

Ion	Ratio	Lower	Upper
191	100		
177	0.0	8.7	13.1#

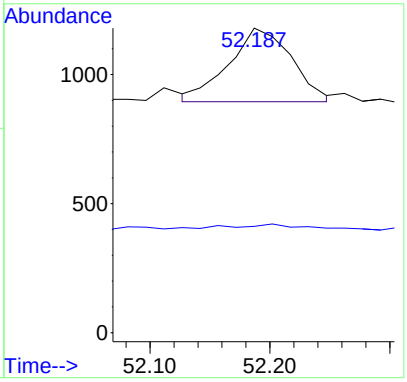




#95
17a(H),21B(H)-hopane - C30H52
Concen: 36.26 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28519.D
Acq: 29 Oct 2012 5:58 pm

Tgt Ion:191 Resp: 1032

Ion	Ratio	Lower	Upper
191	100		
177	0.0	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 12:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
	Internal Standards						
1)	Acenaphthene-d10	26.575	164	23755M3	500.000	ng/mL	0.00
74)	Chrysene-d12	43.076	240	50831	500.000	ng/mL	0.00
	System Monitoring Compounds						
9)	Naphthalene-d8	19.605	136	9092	102.746	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.27%#			
42)	Phenanthrene-d10	32.462	188	8686	97.402	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.74%#			
83)	Benzo[b]fluoranthene-d12	46.991	264	10225	106.250	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.63%#			
88)	Benzo[a]pyrene-d12	48.166	264	9905	113.485	ng/mL	0.00
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 11.35%#			
129)	5B(H)Cholane - Surr	43.708	217	1989	106.142	ng/ml	-0.02
	Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.61%#			
	Target Compounds						Qvalue
3)	trans-Decalin	16.263	138	1011	51.127	ng/mL	100
4)	cis-Decalin	17.482	138	780	51.928	ng/mL	100
10)	Naphthalene	19.680	128	9972	105.060	ng/mL#	100
16)	2-Methylnaphthalene	22.375	142	6102	99.335	ng/mL#	100
17)	1-Methylnaphthalene	22.797	142	6090	103.378	ng/mL#	100
18)	Benzothiophene	19.906	134	8289	107.049	ng/mL	100
23)	Biphenyl	24.272	154	7767	99.833	ng/mL#	100
24)	2,6-Dimethylnaphthalene	24.874	156	5433	97.018	ng/mL#	100
25)	Dibenzofuran	27.358	168	8518	101.311	ng/mL	97
26)	Acenaphthylene	25.973	152	9493M3	101.299	ng/mL	
27)	Acenaphthene	26.696	153	6196	106.092	ng/mL	99
28)	2,3,5-Trimethylnaphtha...	28.262	170	5064	100.043	ng/mL	95
29)	Fluorene	28.728	166	6771	99.718	ng/mL	99
33)	Dibenzothiophene	32.055	184	9356	98.404	ng/mL#	96
43)	Phenanthrene	32.552	178	9481	95.610	ng/mL	99
54)	Retene	39.568	234	2793	92.007	ng/mL	90
55)	Anthracene	32.733	178	9206M3	99.074	ng/mL	
56)	Carbazole	33.410	167	7855	89.504	ng/mL	100
57)	1-Methylphenanthrene	35.066	192	7075	95.788	ng/mL	98
58)	Fluoranthene	37.325	202	10218	94.551	ng/mL	99
59)	Benzo(b)fluorene	39.854	216	6491	94.432	ng/mL	100
60)	Pyrene	38.213	202	10358	95.214	ng/mL	99
66)	Naphthobenzothiophene	42.082	234	10119	98.581	ng/ml	96
67)	Naphthobenzothiophene-...	42.082	234	10119	98.581	ng/mL	96
75)	Benz[a]anthracene	43.016	228	9939	88.192	ng/mL	99
76)	Chrysene	43.166	228	10414	94.407	ng/mL	99
77)	Chrysene/Triphenylene	43.166	228	10414	94.407	ng/mL	99
84)	Benzo[b]fluoranthene	47.066	252	11264	94.928	ng/mL	97
85)	Benzo[j]+[k]fluoranthene	47.157	252	12115	108.499	ng/mL	97
87)	Benzo[e]pyrene	48.060	252	11009	104.557	ng/mL	98
89)	Benzo[a]pyrene	48.256	252	10439	104.868	ng/mL	100
90)	Perylene	48.557	252	11087	104.654	ng/mL	99
91)	Indeno[1,2,3-cd]pyrene	53.045	276	11305M3	94.067	ng/mL	
92)	Dibenz[ah]+[ac]anthracene	53.106	278	12888	111.498	ng/mL	100
93)	Benzo[g,h,i]perylene	54.325	276	13189	111.682	ng/mL	99
94)	Hopane (T19)	52.187	191	3549M3	127.214	ng/mL	
95)	17a(H),21B(H)-hopane -...	52.187	191	3538M3	126.820	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 31 12:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

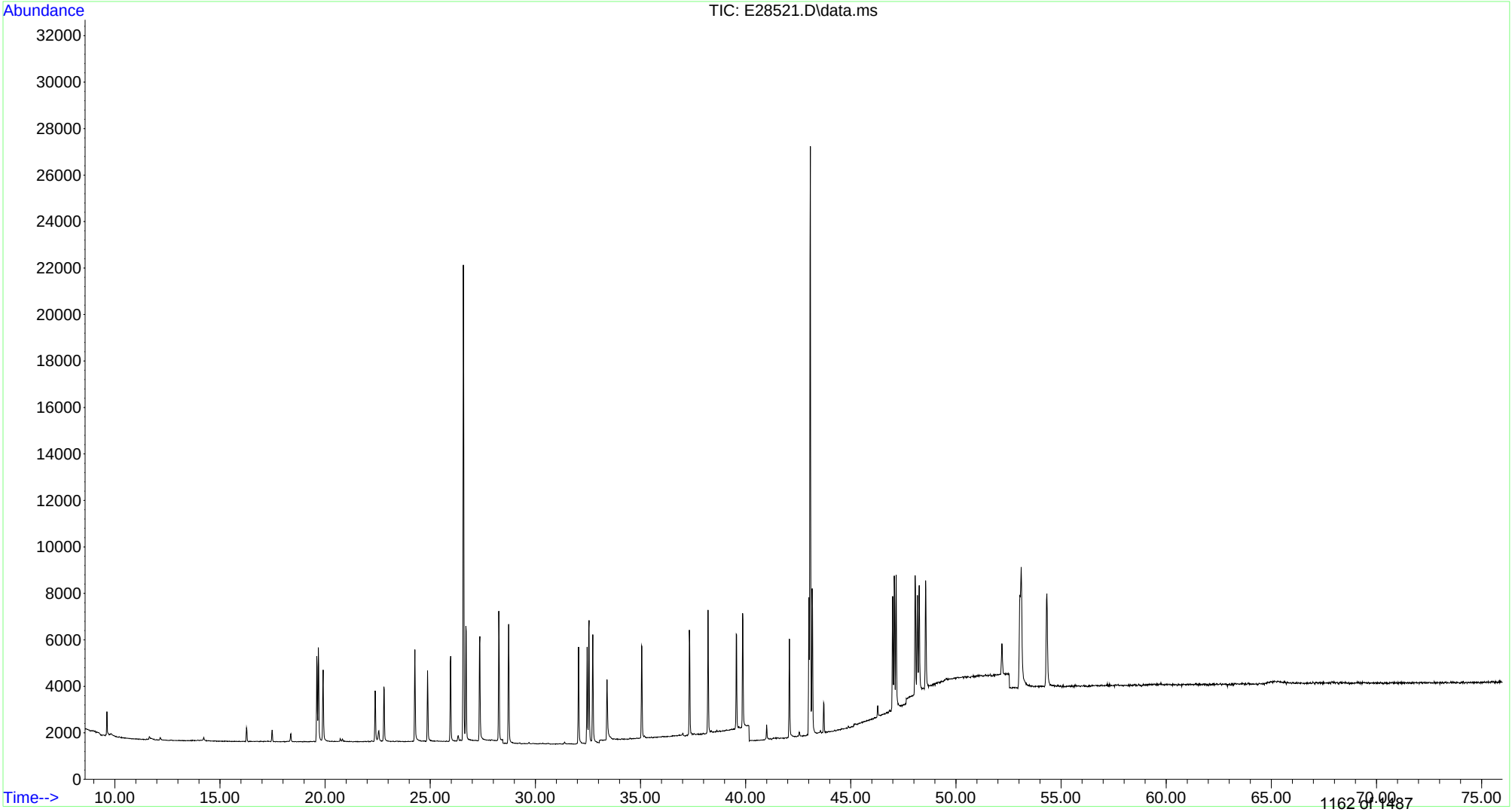
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

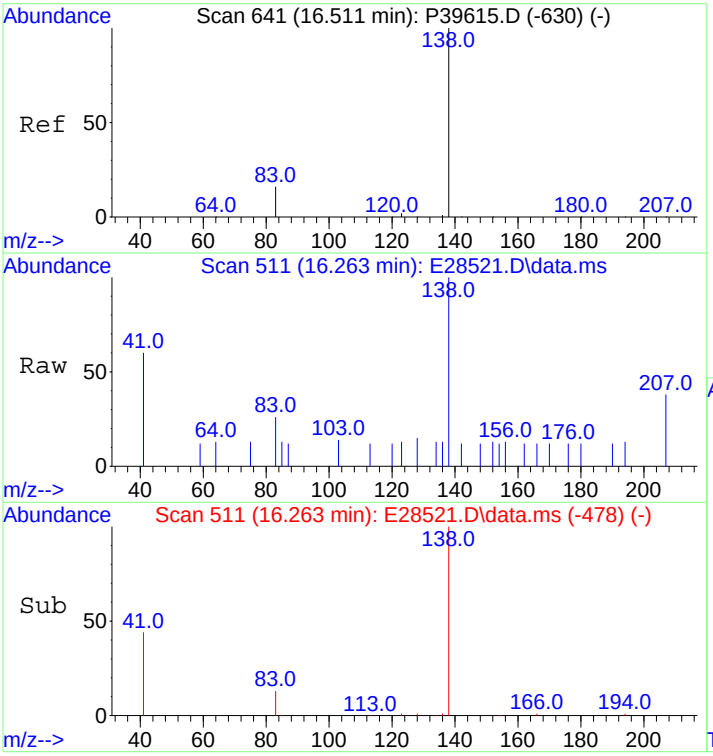
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28521.D
Acq On : 29 Oct 2012 7:27 pm
Operator : AC
Sample : I210291203
Misc : L3 WHAQ35
ALS Vial : 6 Sample Multiplier: 1

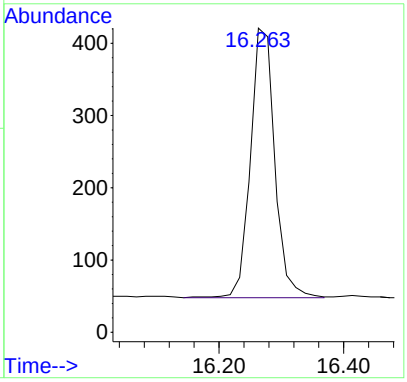
Quant Time: Oct 31 12:58:34 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

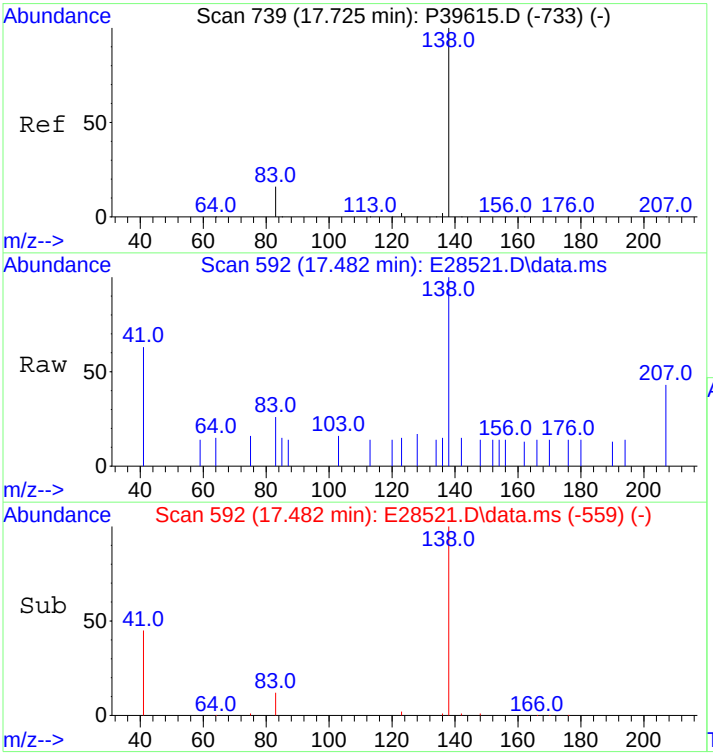




#3
trans-Decalin
Concen: 51.13 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

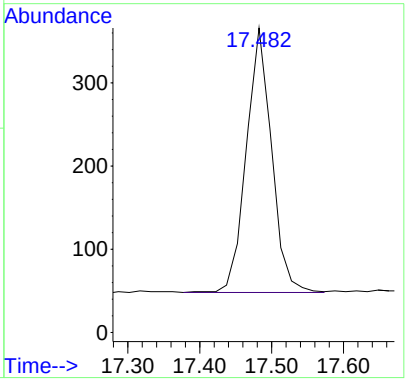
Tgt Ion:138 Resp: 1011

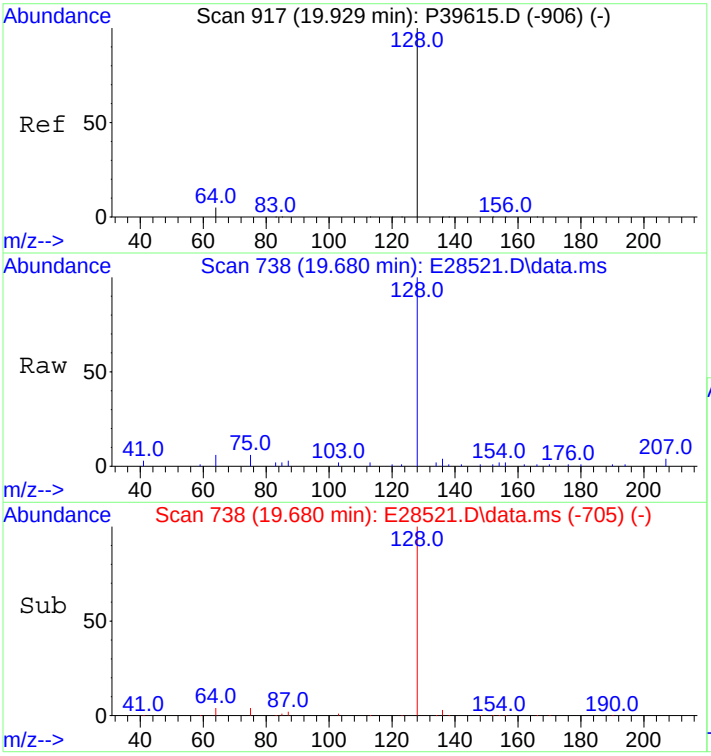




#4
cis-Decalin
Concen: 51.93 ng/mL
RT: 17.482 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:138 Resp: 780

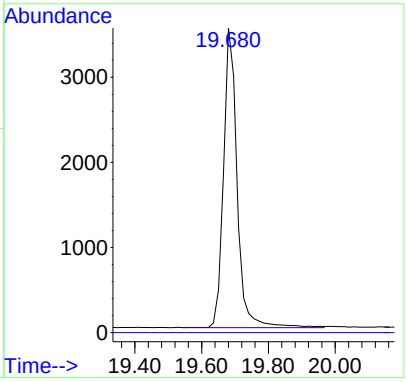


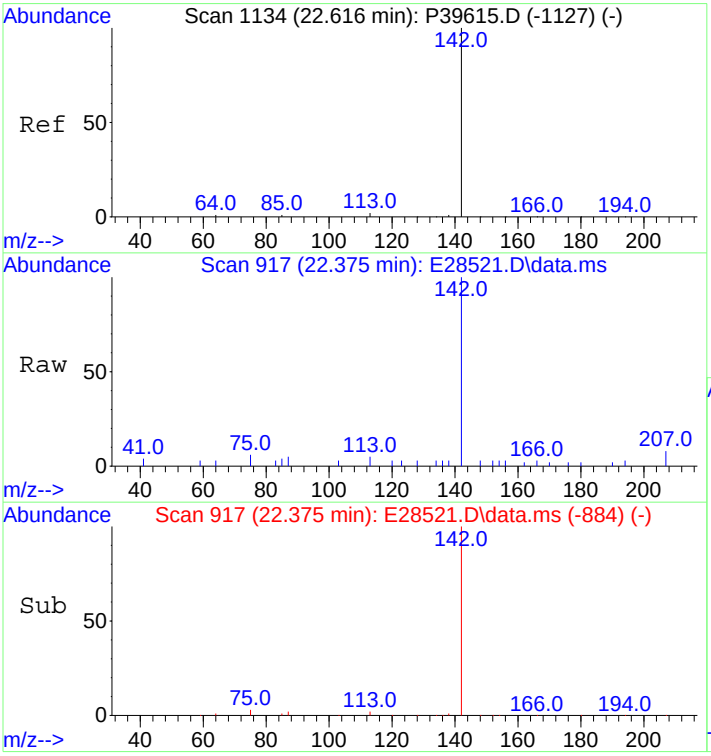


#10
Naphthalene
Concen: 105.06 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:128 Resp: 9972

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

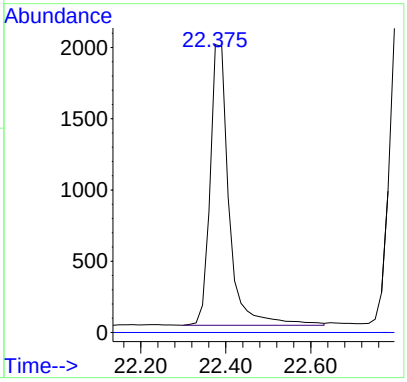


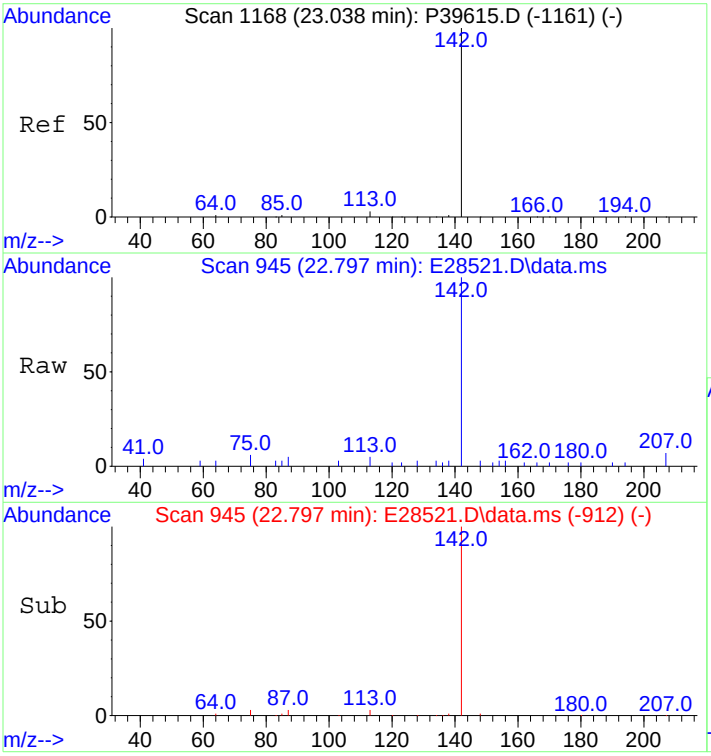


#16
2-Methylnaphthalene
Concen: 99.34 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:142 Resp: 6102

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

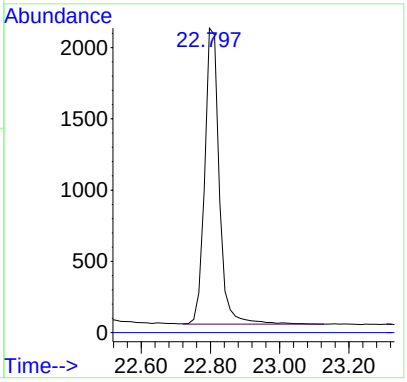


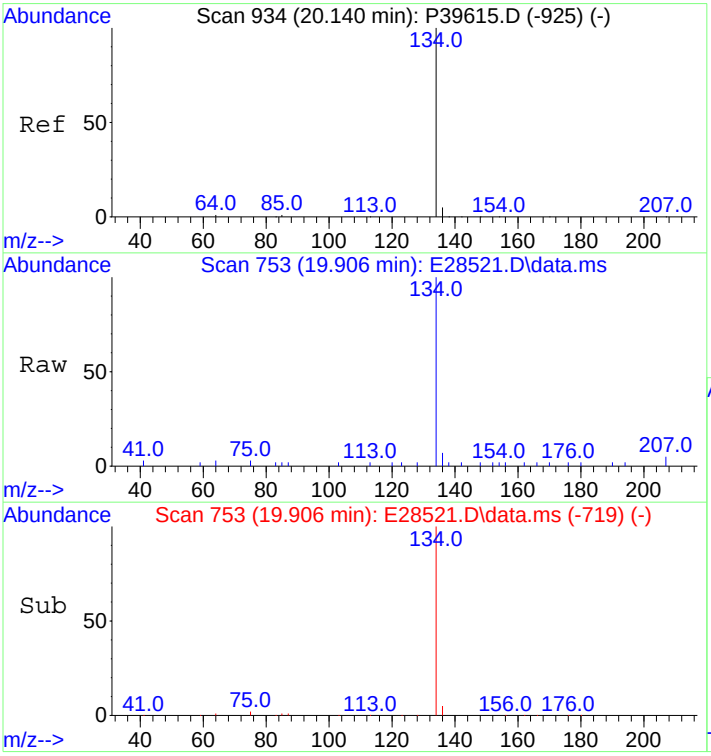


#17
1-Methylnaphthalene
Concen: 103.38 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:142 Resp: 6090

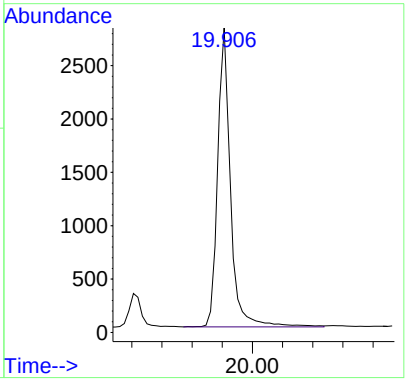
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

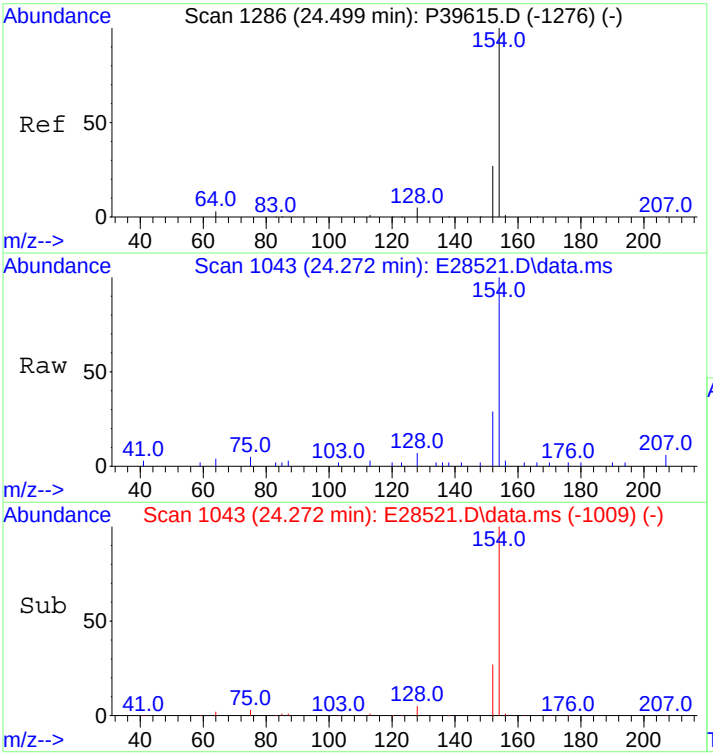




#18
Benzothiophene
Concen: 107.05 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:134 Resp: 8289

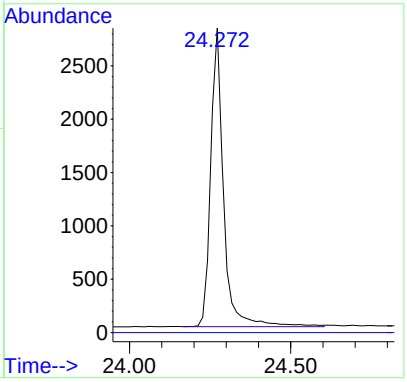


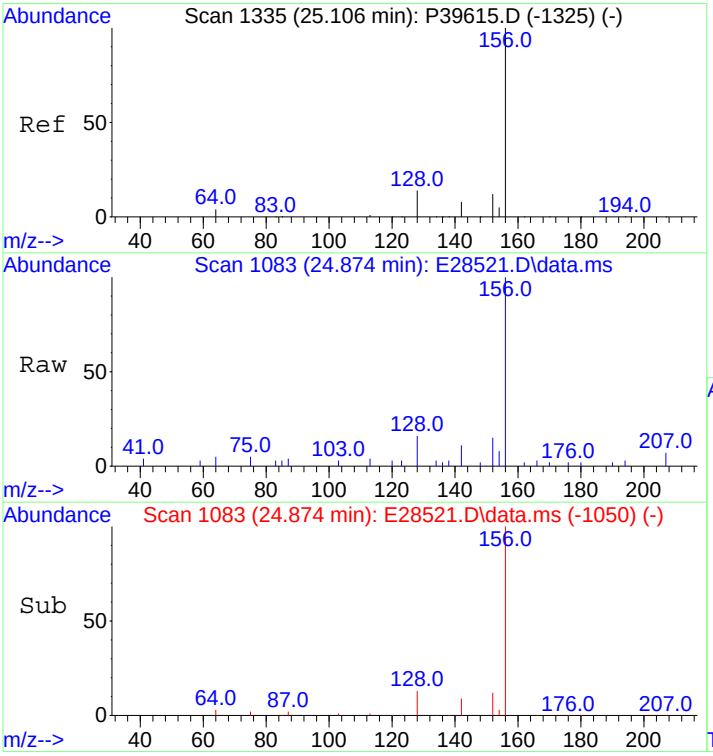


#23
Biphenyl
Concen: 99.83 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:154 Resp: 7767

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

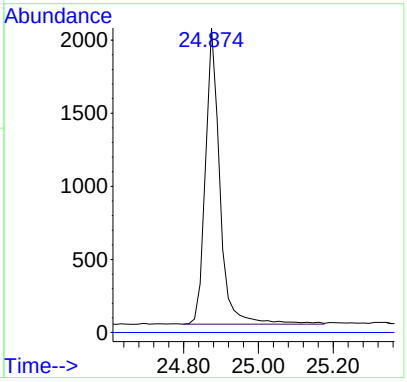


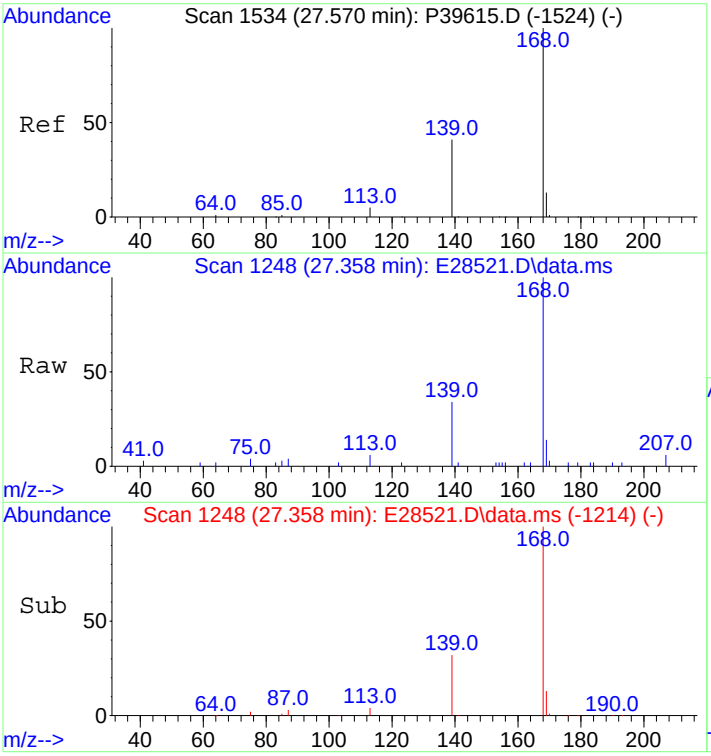


#24
2,6-Dimethylnaphthalene
Concen: 97.02 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:156 Resp: 5433

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

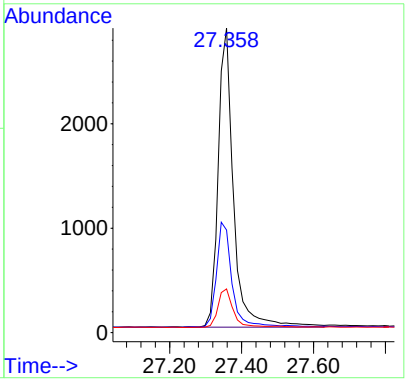


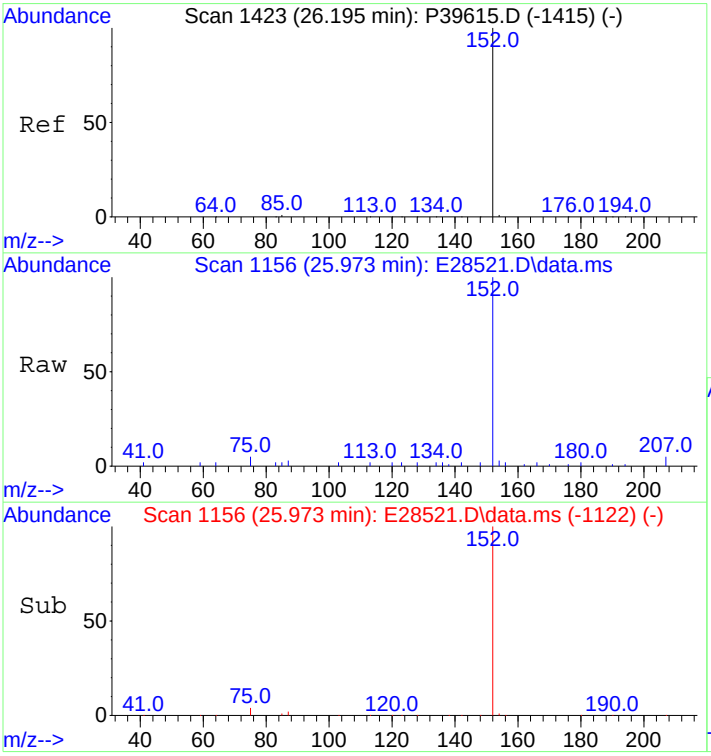


#25
Dibenzofuran
Concen: 101.31 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:168 Resp: 8518

Ion	Ratio	Lower	Upper
168	100		
139	36.1	30.6	45.8
169	12.8	10.6	16.0

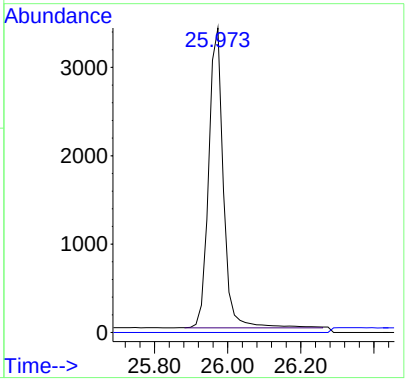


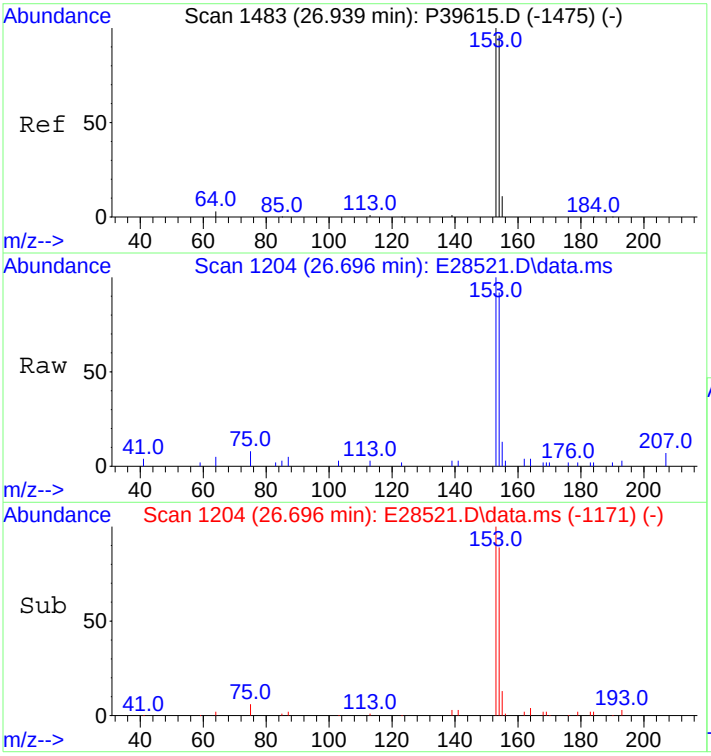


#26
Acenaphthylene
Concen: 101.30 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:152 Resp: 9493

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

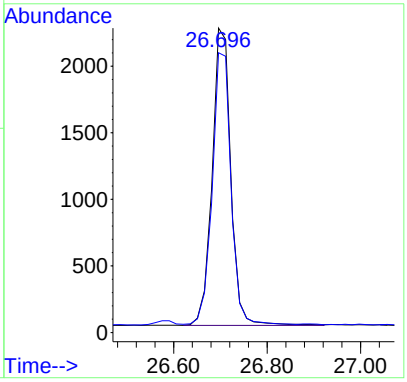


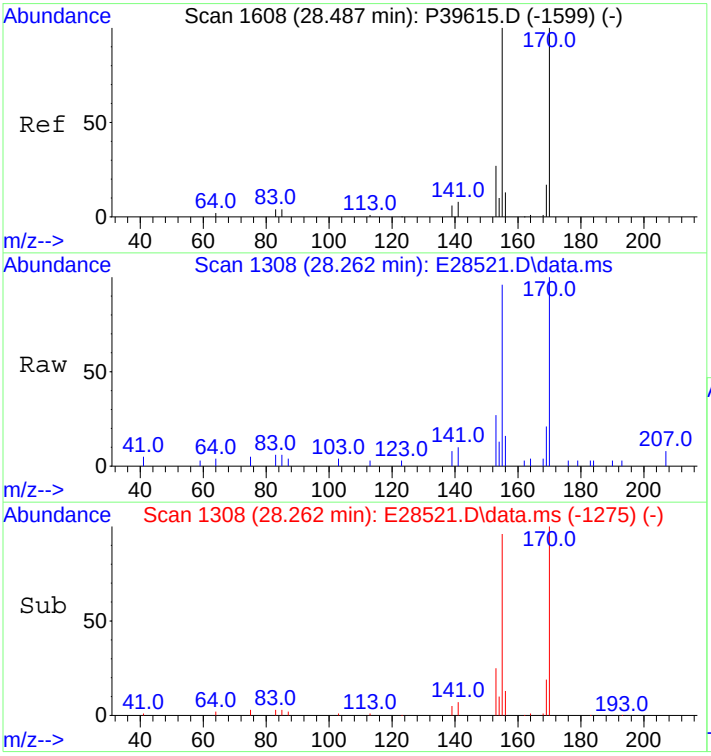


#27
Acenaphthene
Concen: 106.09 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:153 Resp: 6196

Ion	Ratio	Lower	Upper
153	100		
154	91.4	72.3	108.5

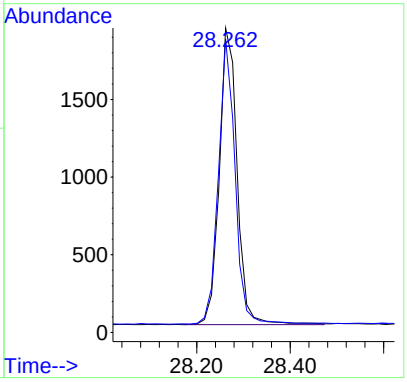


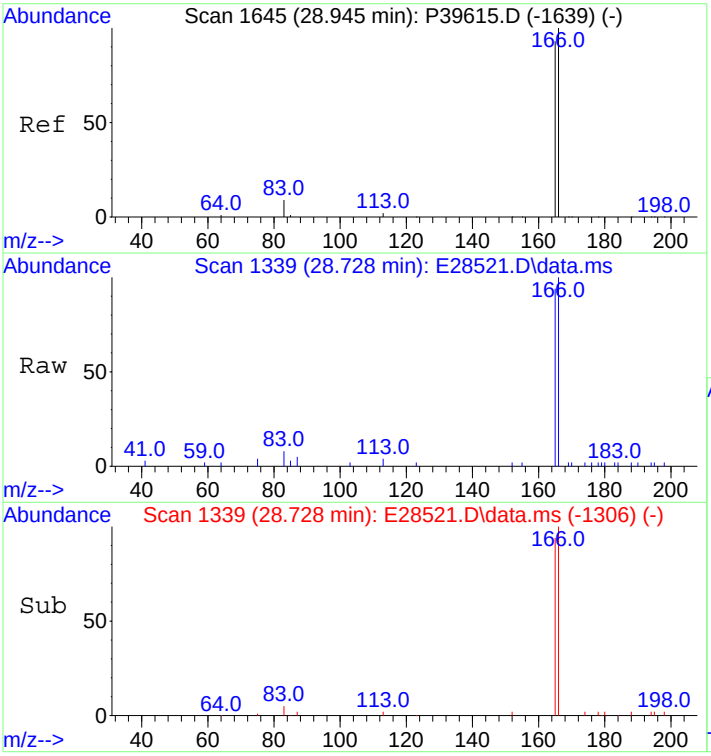


#28
2,3,5-Trimethylnaphthalene
Concen: 100.04 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:170 Resp: 5064

Ion	Ratio	Lower	Upper
170	100		
155	90.4	75.9	113.9

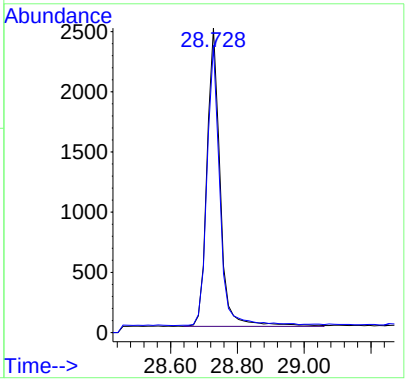


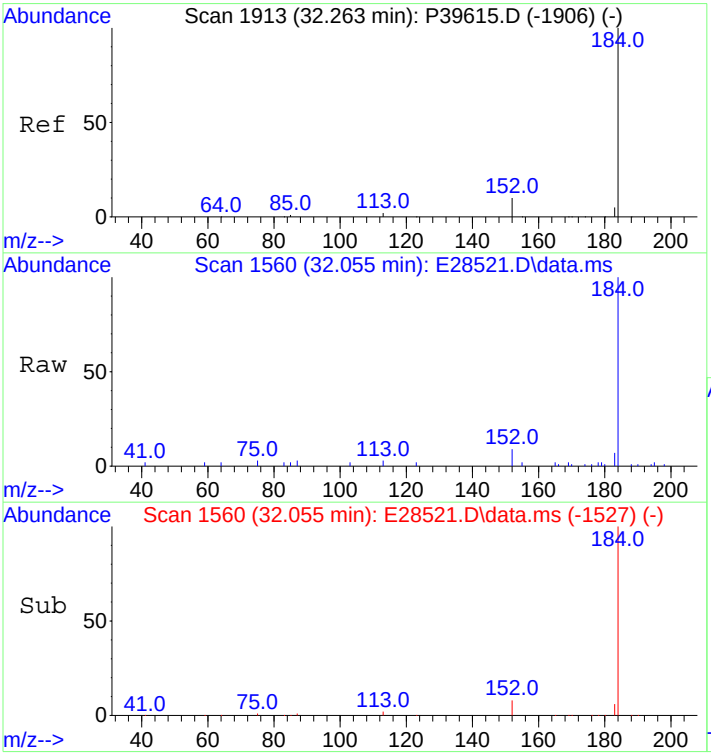


#29
Fluorene
Concen: 99.72 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:166 Resp: 6771

Ion	Ratio	Lower	Upper
166	100		
165	91.0	73.8	110.6

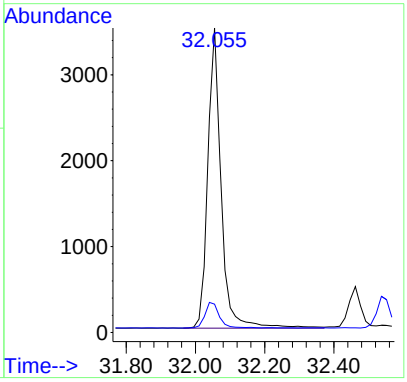


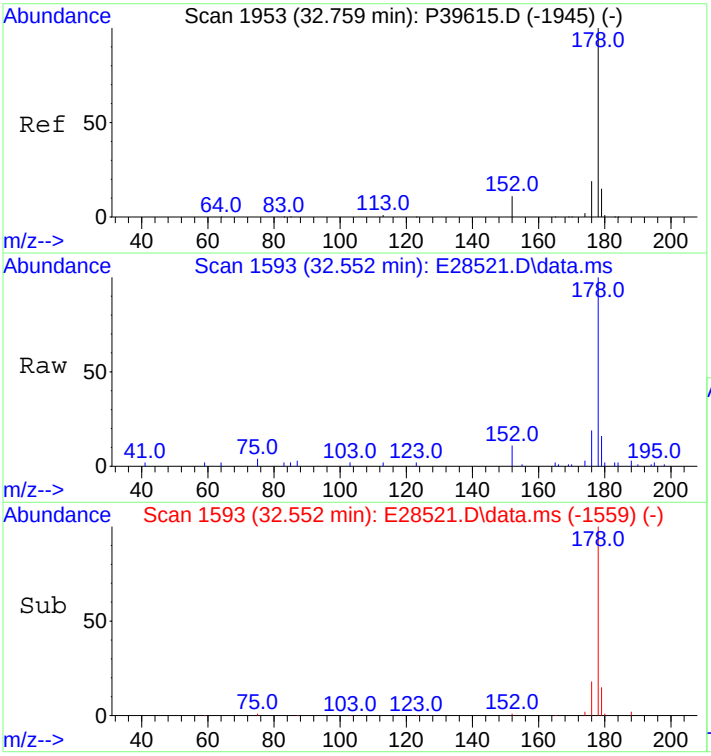


#33
Dibenzothiophene
Concen: 98.40 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:184 Resp: 9356

Ion	Ratio	Lower	Upper
184	100		
152	9.3	6.2	9.2#

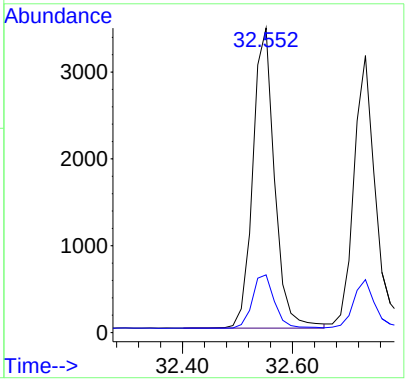


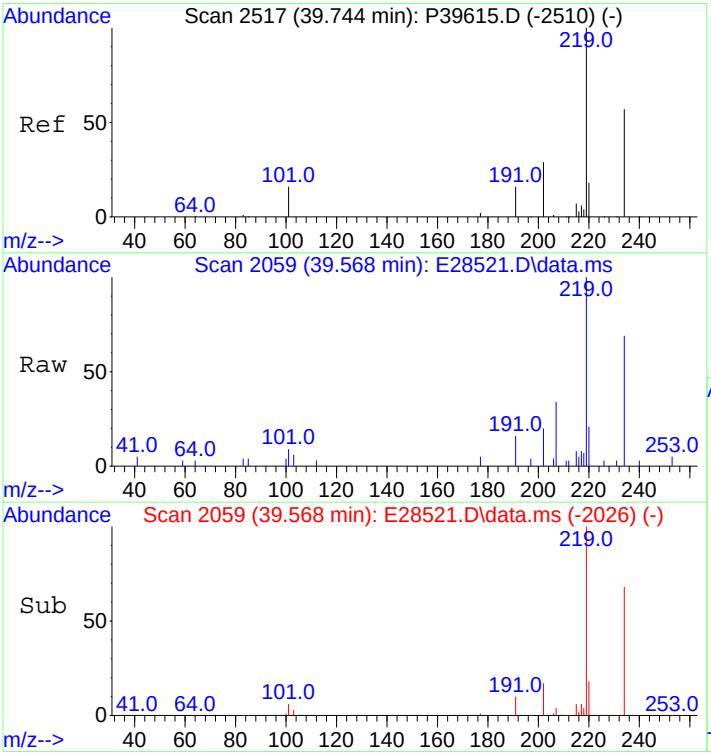


#43
Phenanthrene
Concen: 95.61 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:178 Resp: 9481

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.6

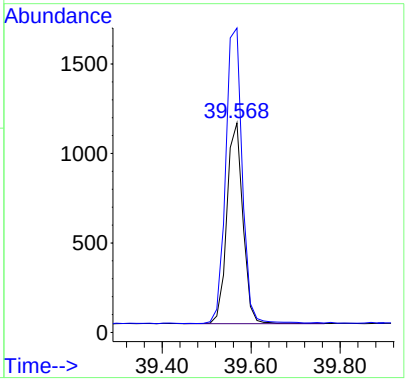


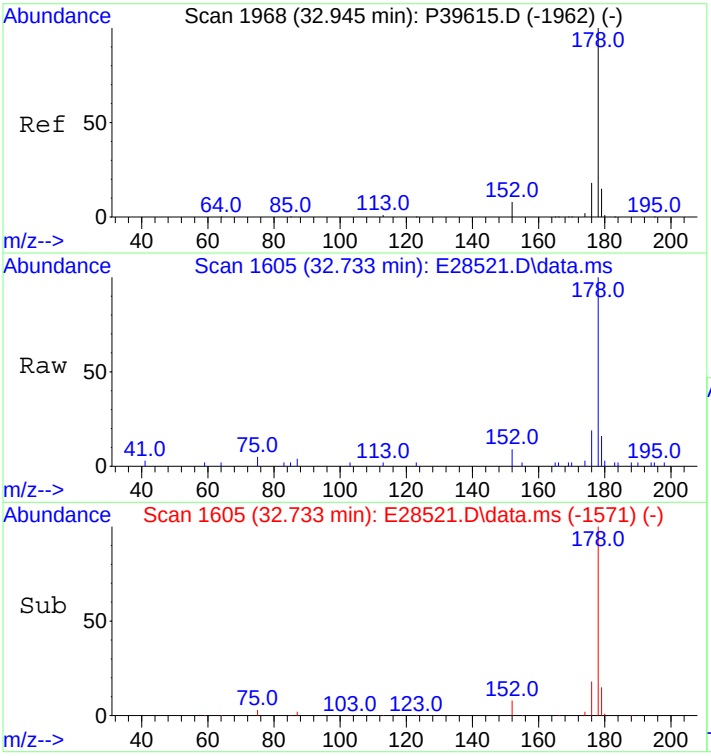


#54
Retene
Concen: 92.01 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:234 Resp: 2793

Ion	Ratio	Lower	Upper
234	100		
219	153.1	113.0	169.4

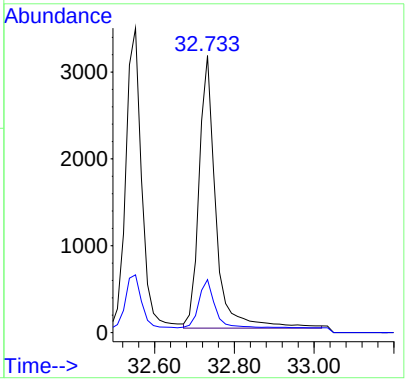


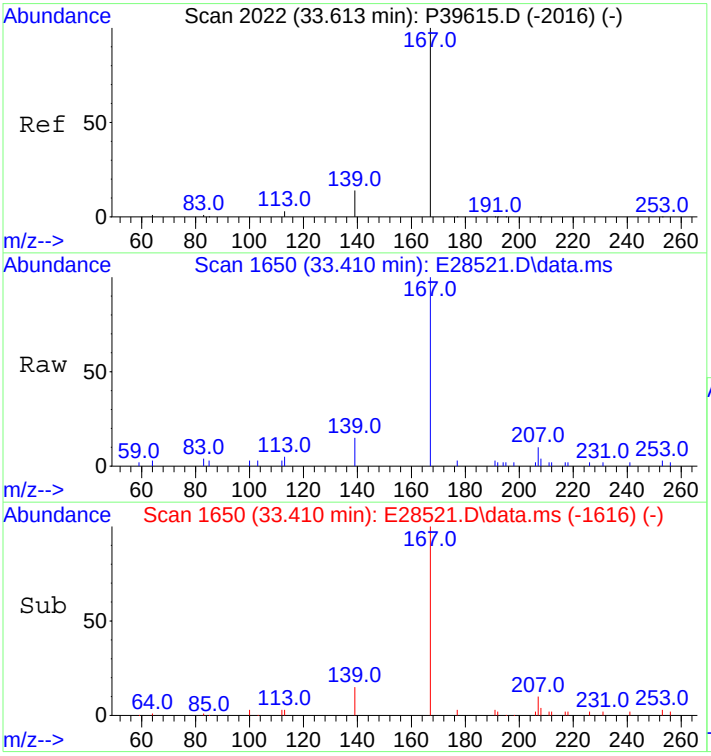


#55
Anthracene
Concen: 99.07 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:178 Resp: 9206

Ion	Ratio	Lower	Upper
178	100		
176	16.5	14.5	21.7

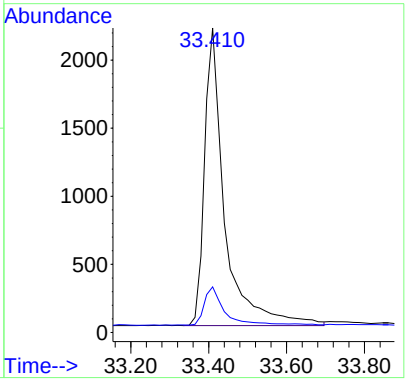


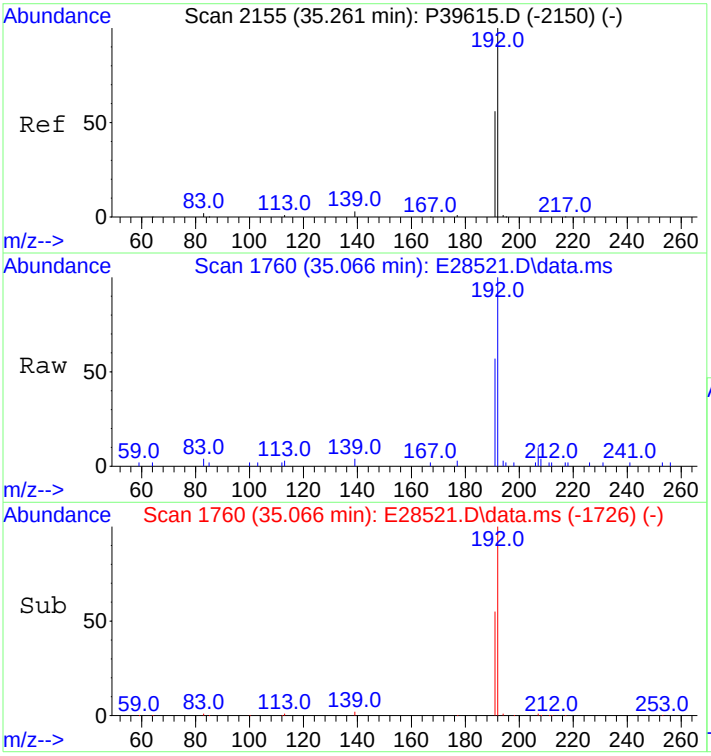


#56
Carbazole
Concen: 89.50 ng/mL
RT: 33.410 min Scan# 1650
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:167 Resp: 7855

Ion	Ratio	Lower	Upper
167	100		
139	13.0	10.5	15.7

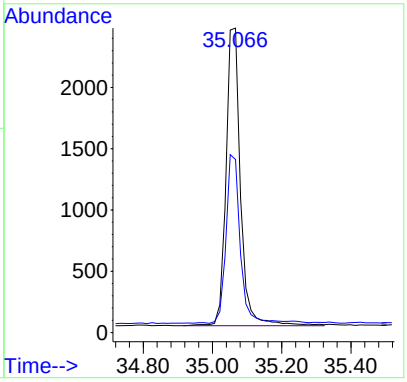


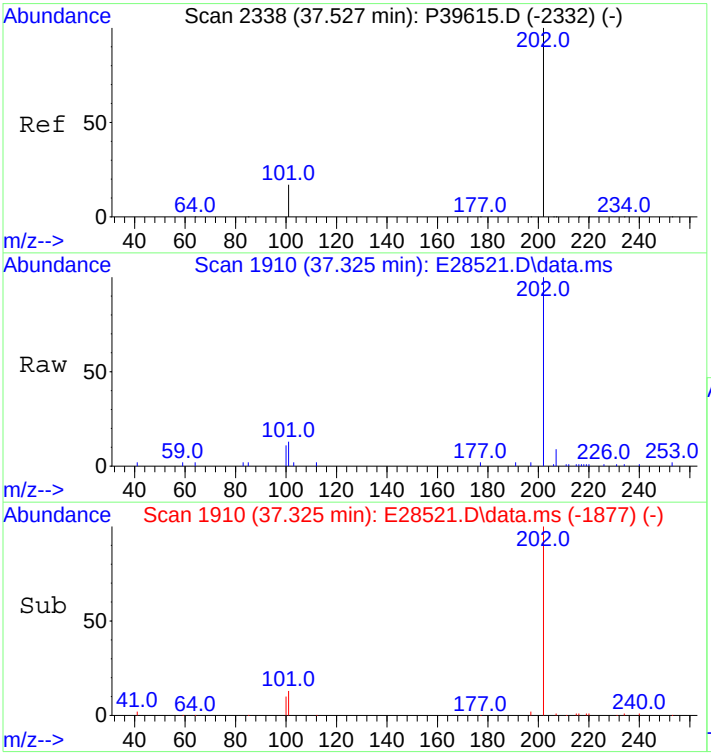


#57
1-Methylphenanthrene
Concen: 95.79 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:192 Resp: 7075

Ion	Ratio	Lower	Upper
192	100		
191	55.5	45.5	68.3

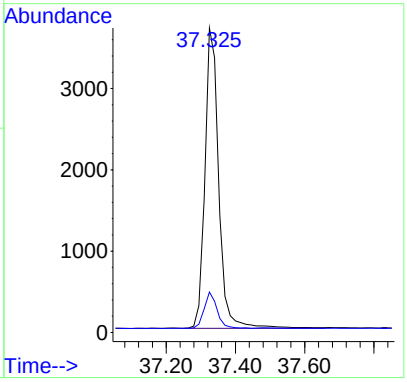


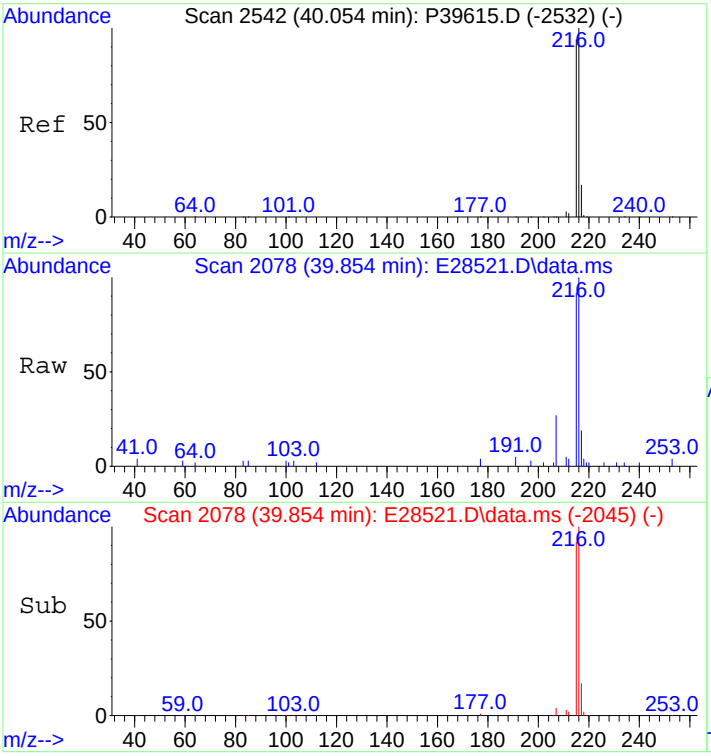


#58
Fluoranthene
Concen: 94.55 ng/mL
RT: 37.325 min Scan# 1910
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:202 Resp: 10218

Ion	Ratio	Lower	Upper
202	100		
101	11.3	9.2	13.8

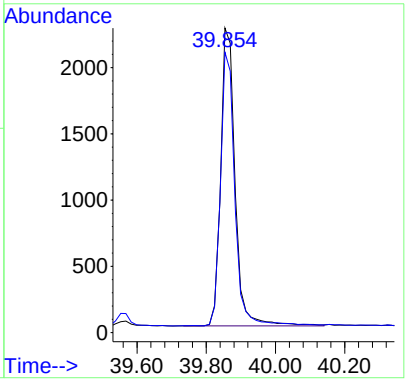


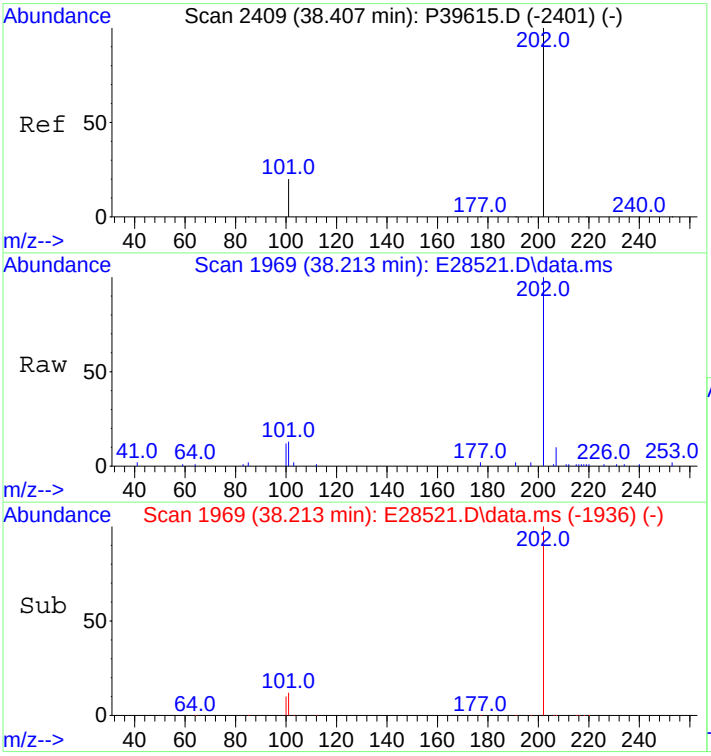


#59
Benzo(b)fluorene
Concen: 94.43 ng/mL
RT: 39.854 min Scan# 2078
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:216 Resp: 6491

Ion	Ratio	Lower	Upper
216	100		
215	92.0	73.8	110.8

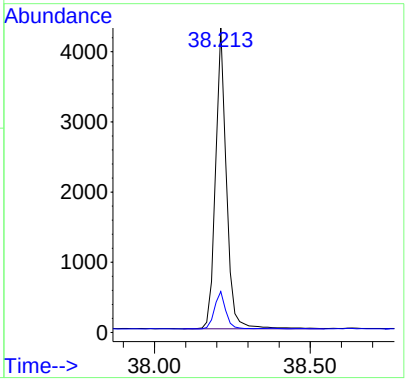


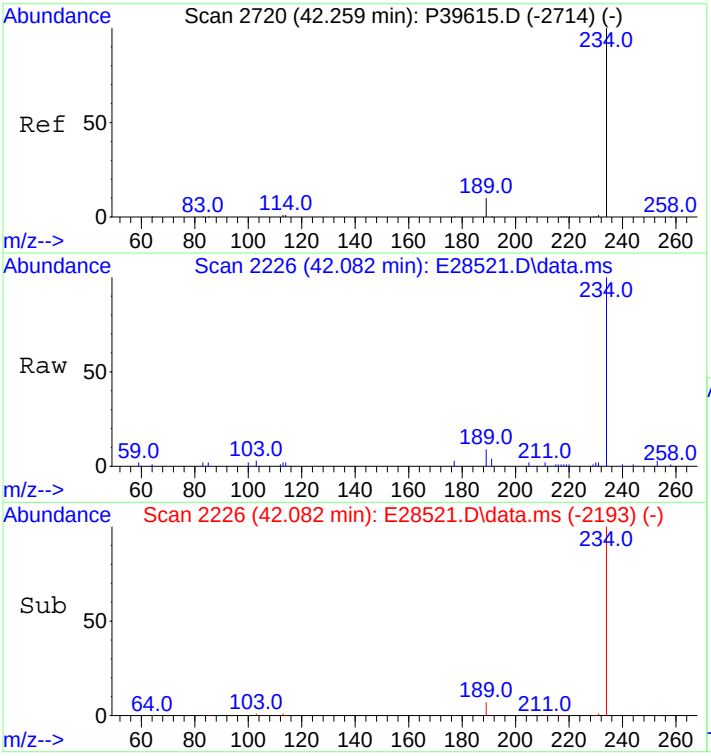


#60
Pyrene
Concen: 95.21 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:202 Resp: 10358

Ion	Ratio	Lower	Upper
202	100		
101	12.9	9.8	14.8

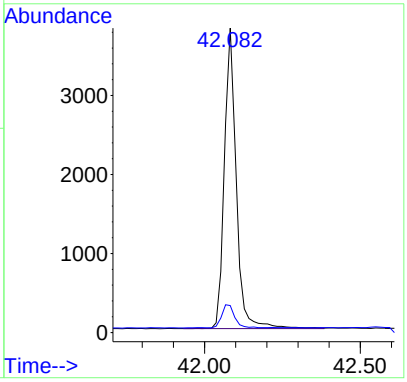


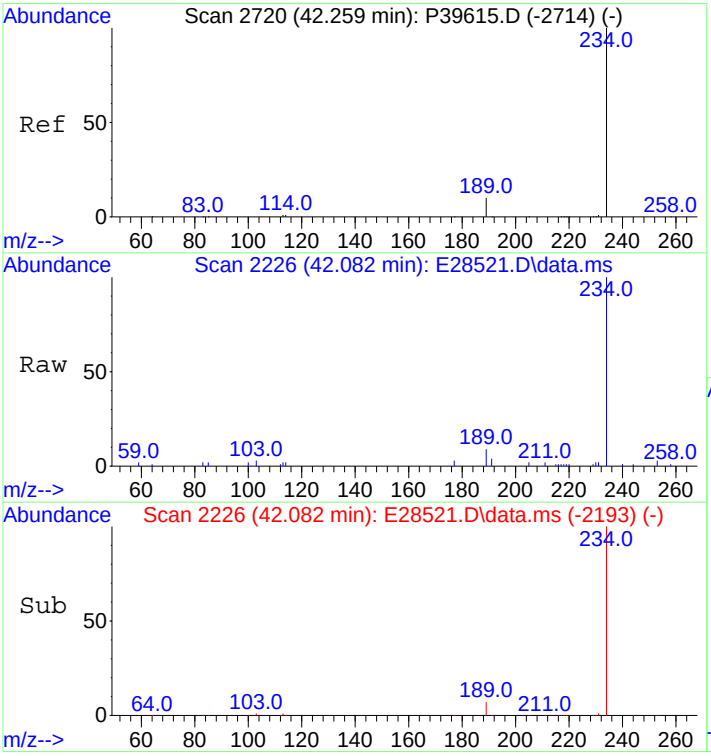


#66
Naphthobenzothiophene
Concen: 98.58 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:234 Resp: 10119

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3

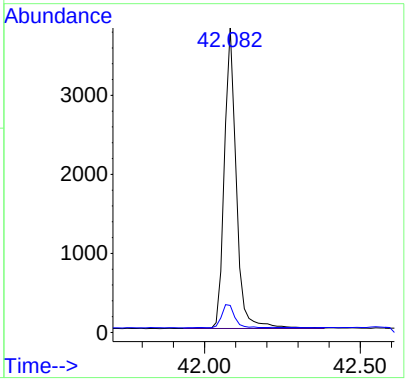


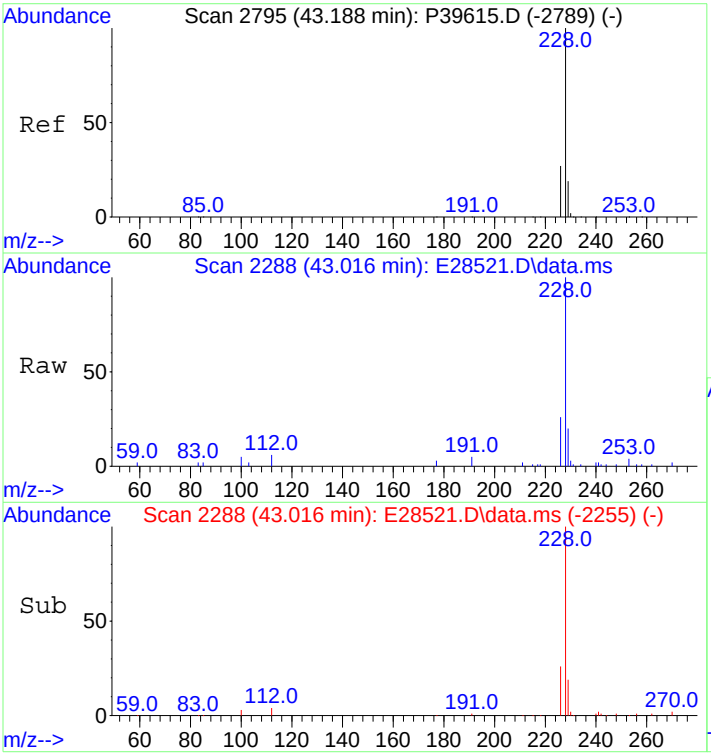


#67
Naphthobenzothiophene-2,1-D
Concen: 98.58 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:234 Resp: 10119

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3

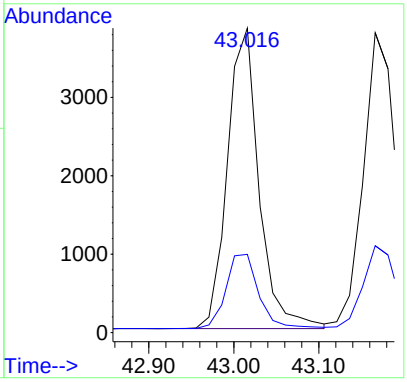


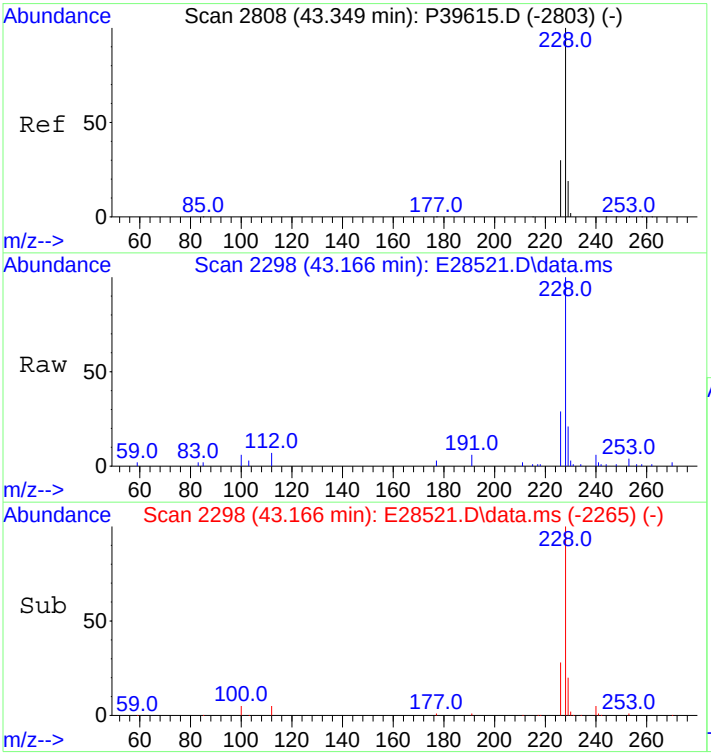


#75
Benz[a]anthracene
Concen: 88.19 ng/mL
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:228 Resp: 9939

Ion	Ratio	Lower	Upper
228	100		
226	25.7	20.2	30.4

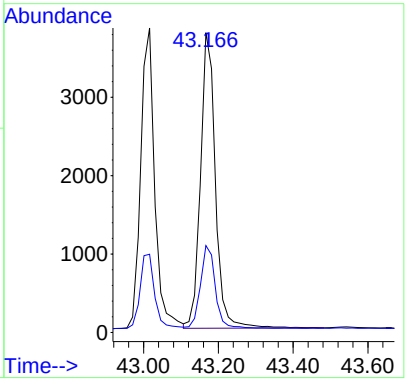


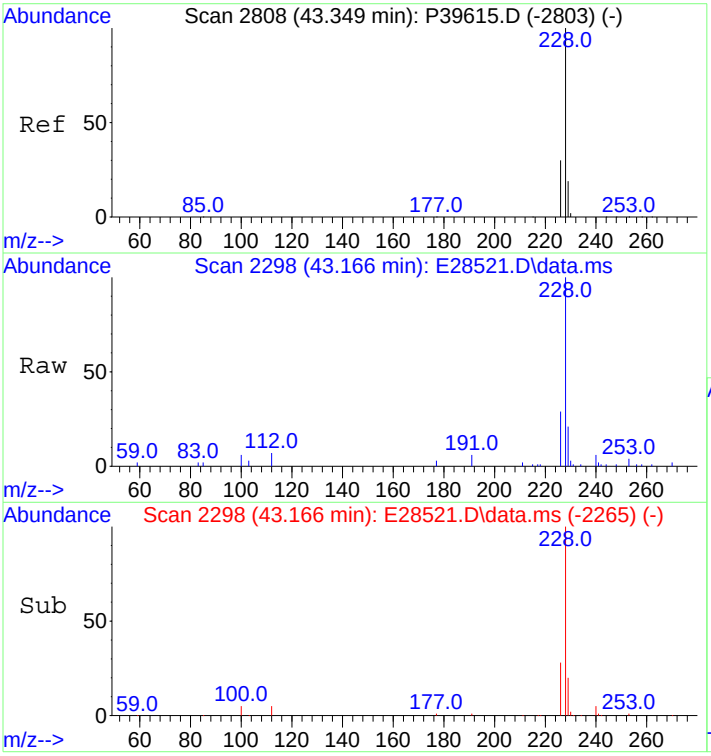


#76
Chrysene
Concen: 94.41 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:228 Resp: 10414

Ion	Ratio	Lower	Upper
228	100		
226	27.7	22.6	34.0

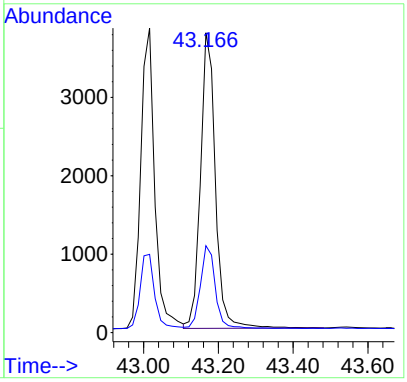


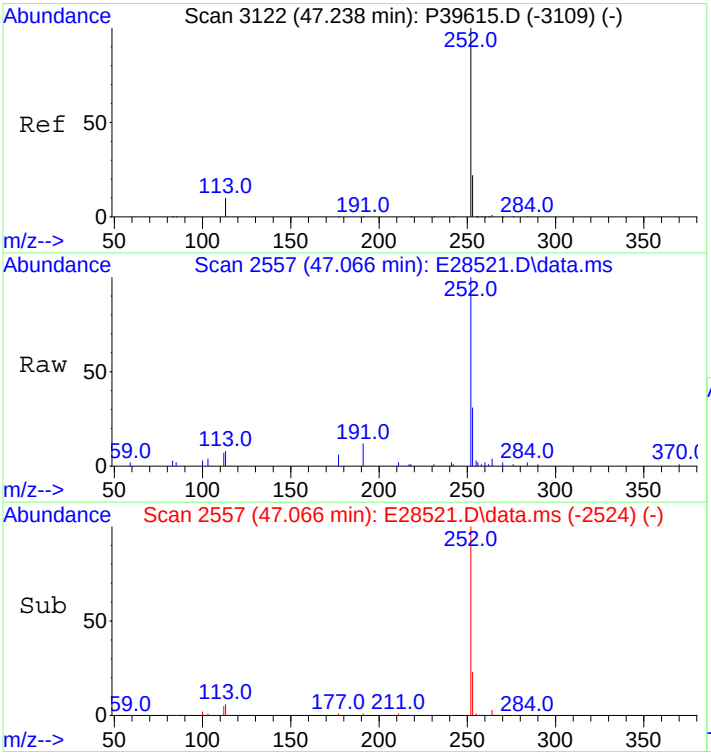


#77
Chrysene/Triphenylene
Concen: 94.41 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:228 Resp: 10414

Ion	Ratio	Lower	Upper
228	100		
226	27.7	22.6	34.0

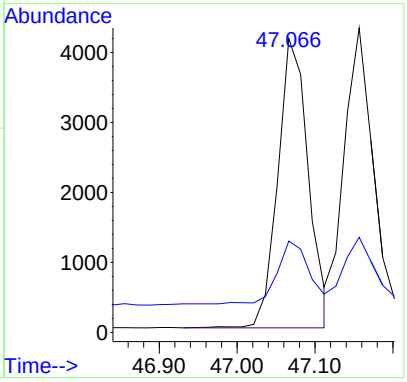


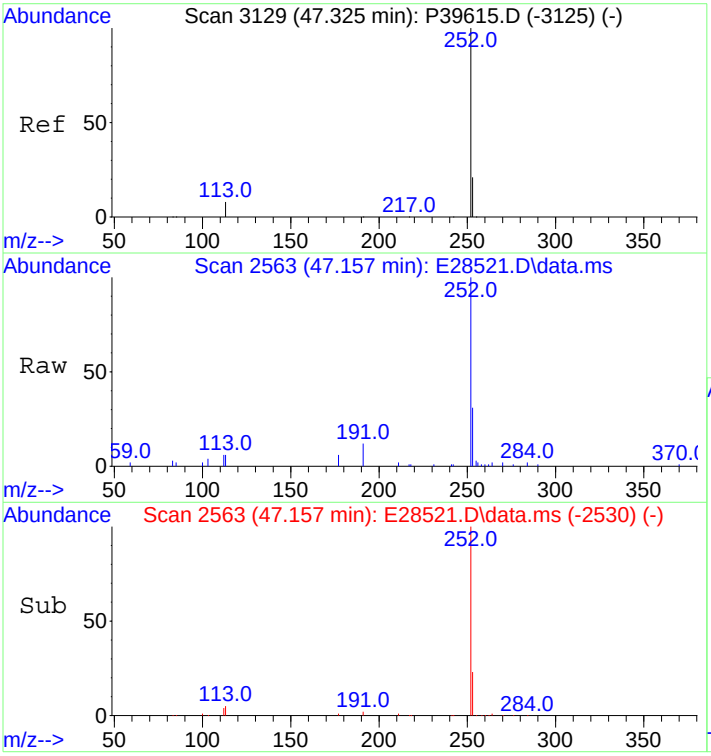


#84
Benzo[b]fluoranthene
Concen: 94.93 ng/mL
RT: 47.066 min Scan# 2557
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 11264

Ion	Ratio	Lower	Upper
252	100		
253	24.5	18.3	27.5

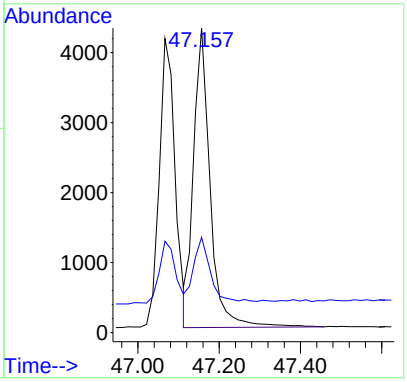


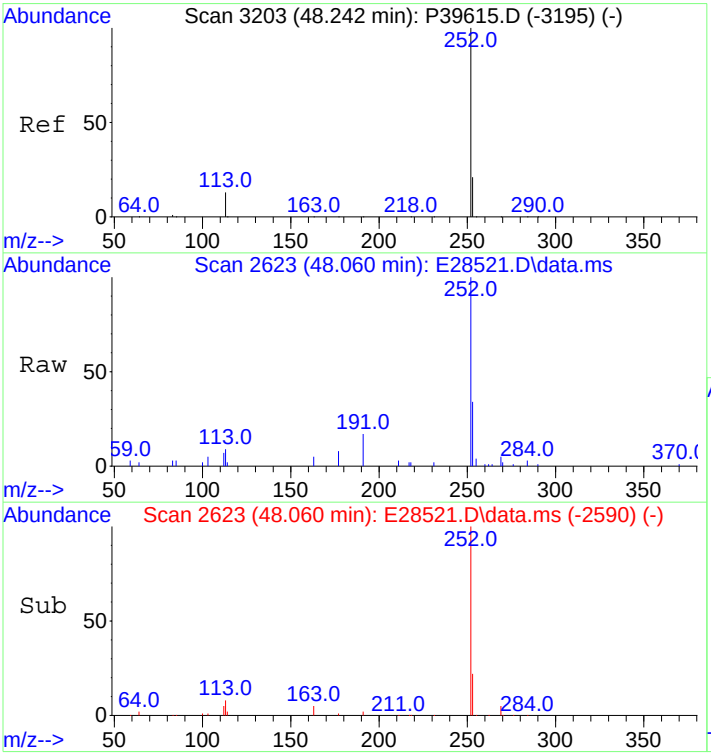


#85
Benzo[j]+[k]fluoranthene
Concen: 108.50 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 12115

Ion	Ratio	Lower	Upper
252	100		
253	21.6	18.3	27.5

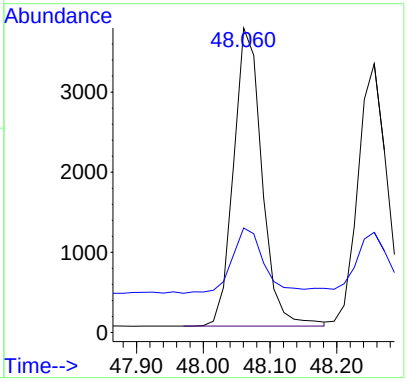


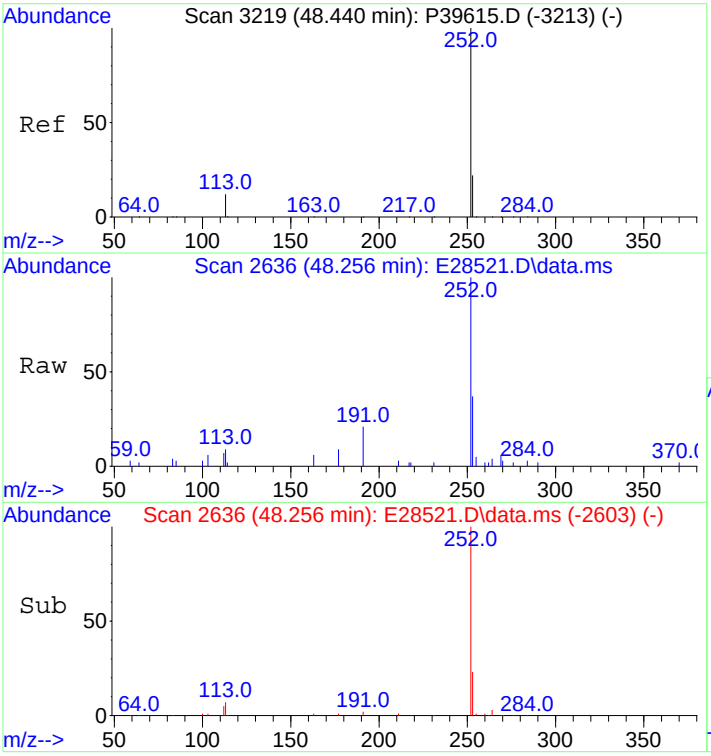


#87
Benzo[e]pyrene
Concen: 104.56 ng/mL
RT: 48.060 min Scan# 2623
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 11009

Ion	Ratio	Lower	Upper
252	100		
253	24.3	18.6	28.0

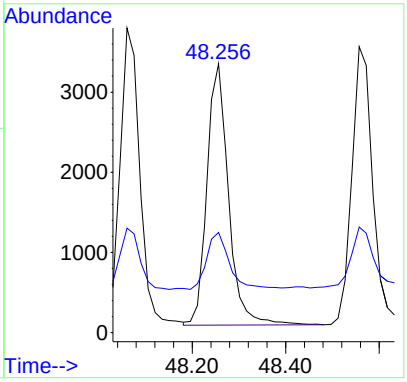


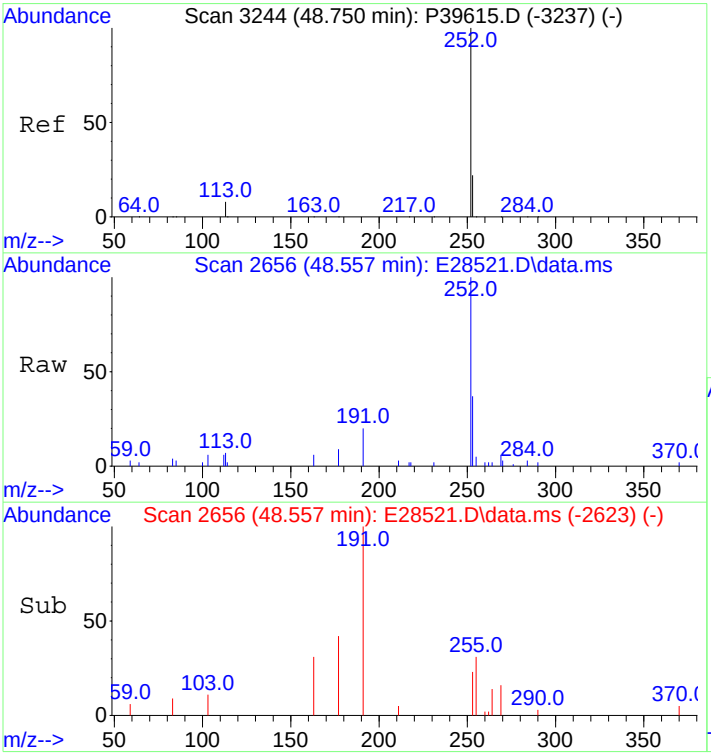


#89
Benzo[a]pyrene
Concen: 104.87 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 10439

Ion	Ratio	Lower	Upper
252	100		
253	23.3	18.8	28.2

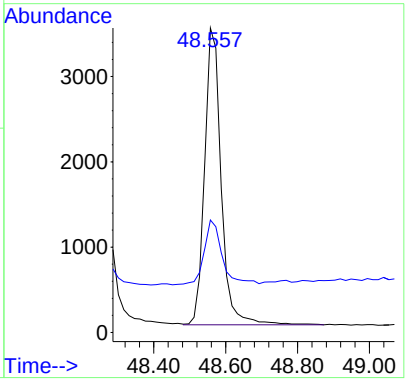


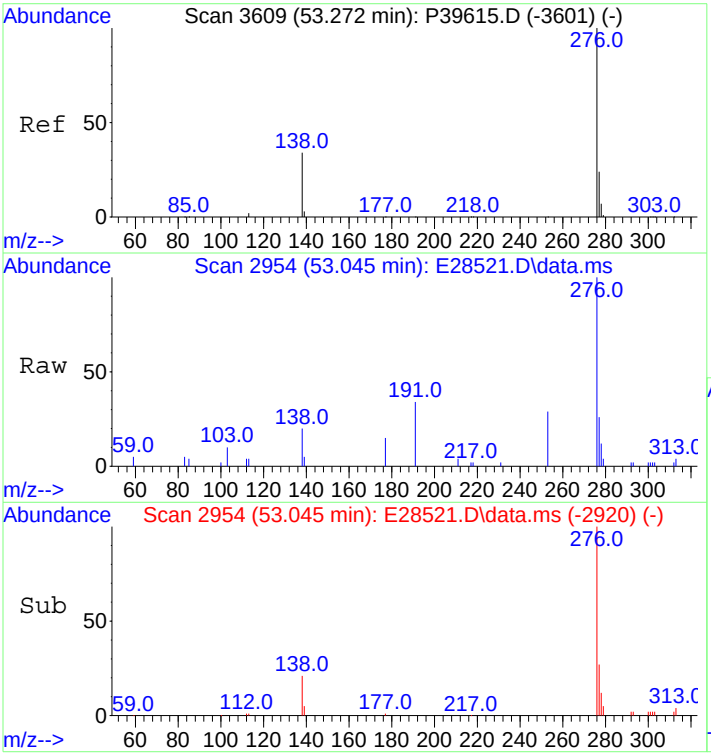


#90
Perylene
Concen: 104.65 ng/mL
RT: 48.557 min Scan# 2656
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:252 Resp: 11087

Ion	Ratio	Lower	Upper
252	100		
253	24.0	18.8	28.2

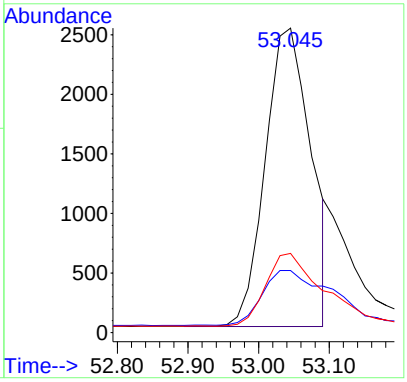


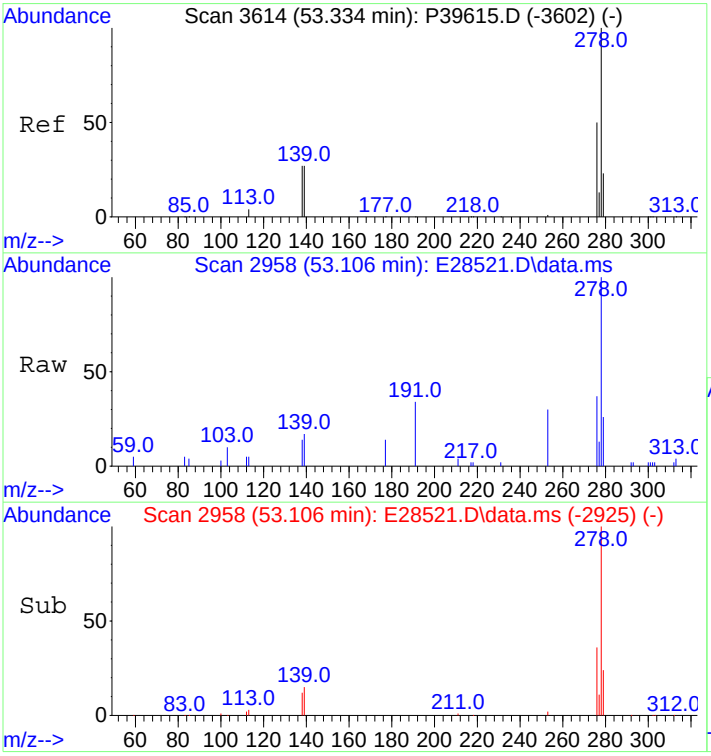


#91
Indeno[1,2,3-cd]pyrene
Concen: 94.07 ng/mL m
RT: 53.045 min Scan# 2954
Delta R.T. 0.015 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:276 Resp: 11305

Ion	Ratio	Lower	Upper
276	100		
138	29.7	15.4	23.2#
277	33.2	19.1	28.7#

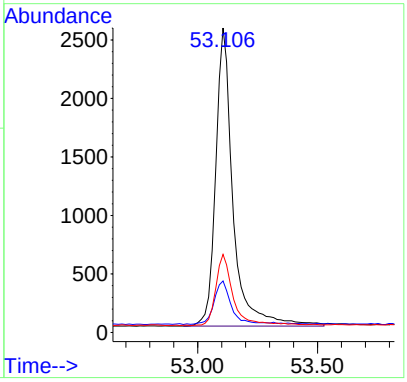


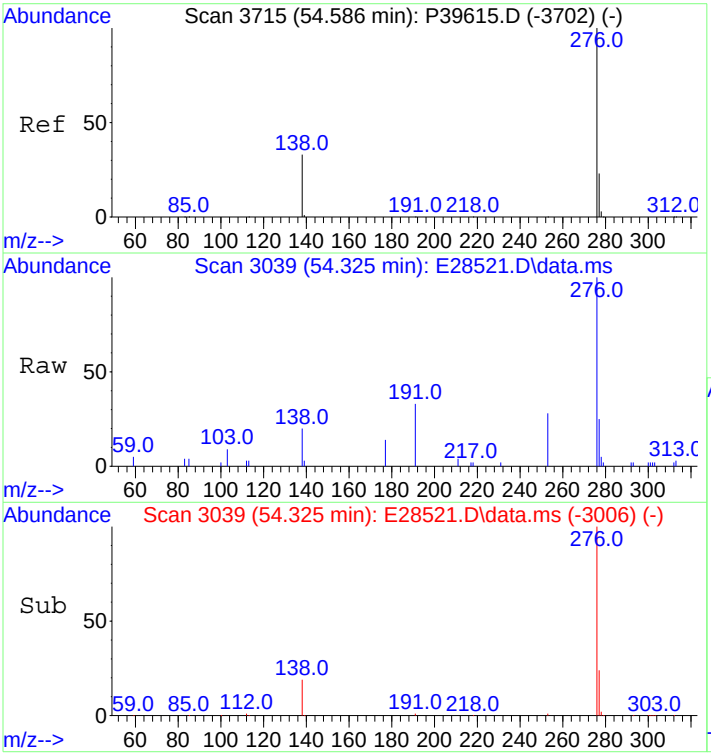


#92
Dibenz[ah]+[ac]anthracene
Concen: 111.50 ng/mL
RT: 53.106 min Scan# 2958
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:278 Resp: 12888

Ion	Ratio	Lower	Upper
278	100		
139	13.9	11.1	16.7
279	24.0	19.4	29.0

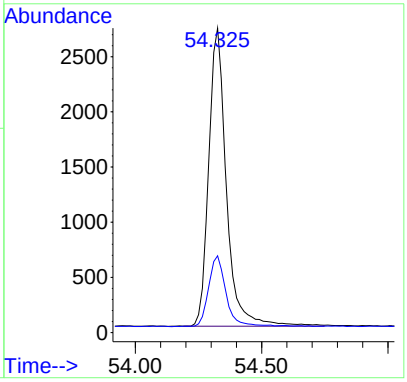


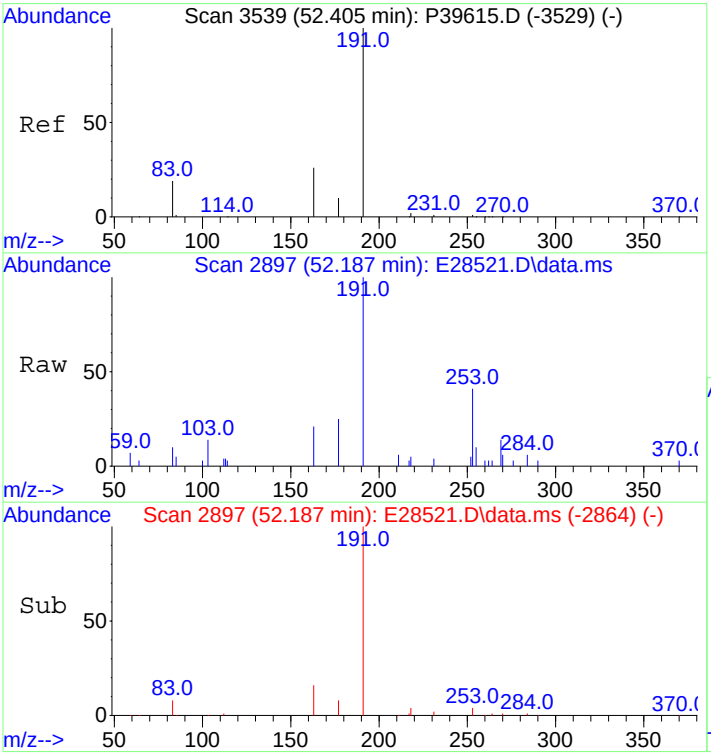


#93
Benzo[g,h,i]perylene
Concen: 111.68 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:276 Resp: 13189

Ion	Ratio	Lower	Upper
276	100		
277	23.6	19.1	28.7

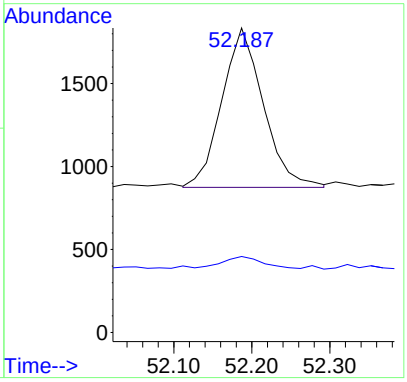


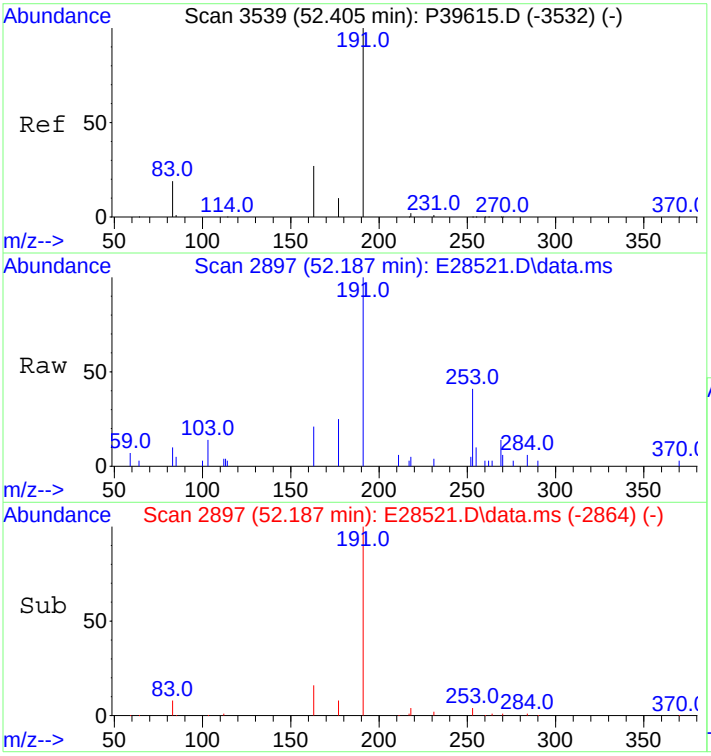


#94
Hopane (T19)
Concen: 127.21 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:191 Resp: 3549

Ion	Ratio	Lower	Upper
191	100		
177	7.4	8.7	13.1#

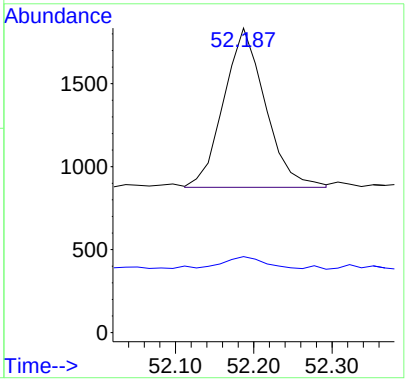




#95
17a(H),21B(H)-hopane - C30H52
Concen: 126.82 ng/mL m
RT: 52.187 min Scan# 2897
Delta R.T. -0.000 min
Lab File: E28521.D
Acq: 29 Oct 2012 7:27 pm

Tgt Ion:191 Resp: 3538

Ion	Ratio	Lower	Upper
191	100		
177	7.5	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 12:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	36682	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	77083	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	68946	504.564	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.46%			
42) Phenanthrene-d10	32.462	188	70047	508.673	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.87%			
83) Benzo[b]fluoranthene-d12	46.991	264	83676	573.370	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 57.34%			
88) Benzo[a]pyrene-d12	48.166	264	78237	591.107	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 59.11%			
129) 5B(H)Cholane - Surr	43.724	217	14895	524.160	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.42%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	6961	227.966	ng/mL	100
4) cis-Decalin	17.483	138	5393	232.508	ng/mL	100
10) Naphthalene	19.681	128	72826	496.872	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	45351	478.102	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	44682	491.184	ng/mL#	100
18) Benzothiophene	19.891	134	60586	506.706	ng/mL	100
23) Biphenyl	24.257	154	57808	481.183	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	41569	480.711	ng/mL#	100
25) Dibenzofuran	27.343	168	64736	498.617	ng/mL	98
26) Acenaphthylene	25.958	152	71193M3	491.972	ng/mL	
27) Acenaphthene	26.696	153	45899	508.953	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.262	170	38267	489.576	ng/mL	96
29) Fluorene	28.728	166	51400	490.213	ng/mL	99
33) Dibenzothiophene	32.055	184	71389	486.246	ng/mL#	95
43) Phenanthrene	32.537	178	74232	484.778	ng/mL	99
54) Retene	39.568	234	22141	472.333	ng/mL	92
55) Anthracene	32.718	178	66927M3	466.436	ng/mL	
56) Carbazole	33.395	167	64221	473.886	ng/mL	100
57) 1-Methylphenanthrene	35.051	192	54645	479.112	ng/mL	99
58) Fluoranthene	37.325	202	79475	476.249	ng/mL	99
59) Benzo(b)fluorene	39.854	216	52291	492.646	ng/mL	99
60) Pyrene	38.213	202	80681	480.284	ng/mL	99
66) Naphthobenzothiophene	42.082	234	79024	498.558	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	79024	498.558	ng/mL#	95
75) Benz[a]anthracene	43.016	228	77932	456.006	ng/mL	100
76) Chrysene	43.167	228	79635	476.059	ng/mL	100
77) Chrysene/Triphenylene	43.167	228	79635	476.059	ng/mL	100
84) Benzo[b]fluoranthene	47.067	252	89104	495.187	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	93062	549.600	ng/mL	98
87) Benzo[e]pyrene	48.060	252	84646	530.127	ng/mL	97
89) Benzo[a]pyrene	48.256	252	79782	528.520	ng/mL	97
90) Perylene	48.557	252	84830	528.035	ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.030	276	93871M3	515.074	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.106	278	102096	582.452	ng/mL	99
93) Benzo[g,h,i]perylene	54.325	276	100489	561.124	ng/mL	100
94) Hopane (T19)	52.187	191	28585	675.673	ng/mL#	91
95) 17a(H),21B(H)-hopane -...	52.187	191	28585	675.673	ng/mL#	91

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 31 12:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

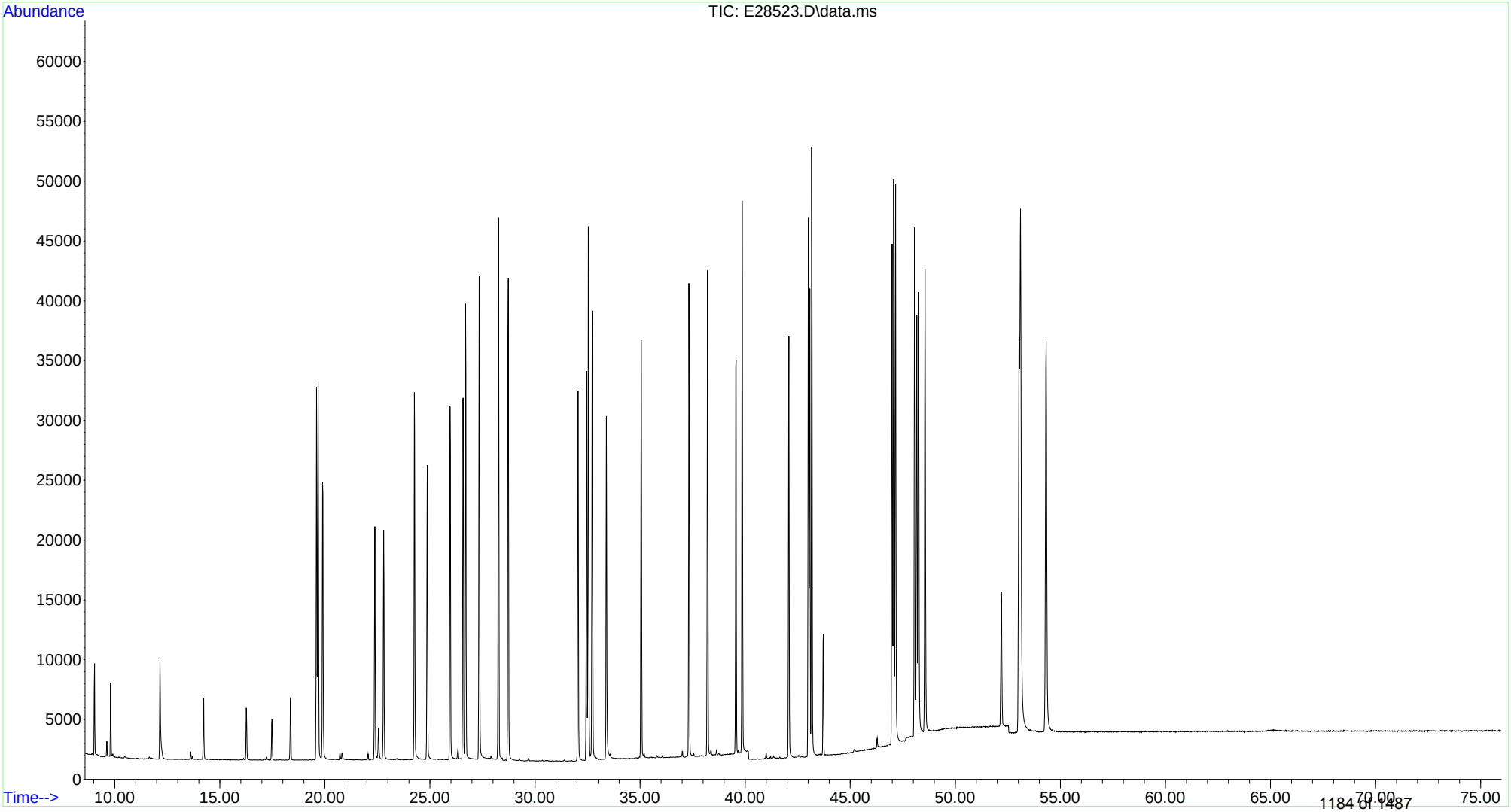
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

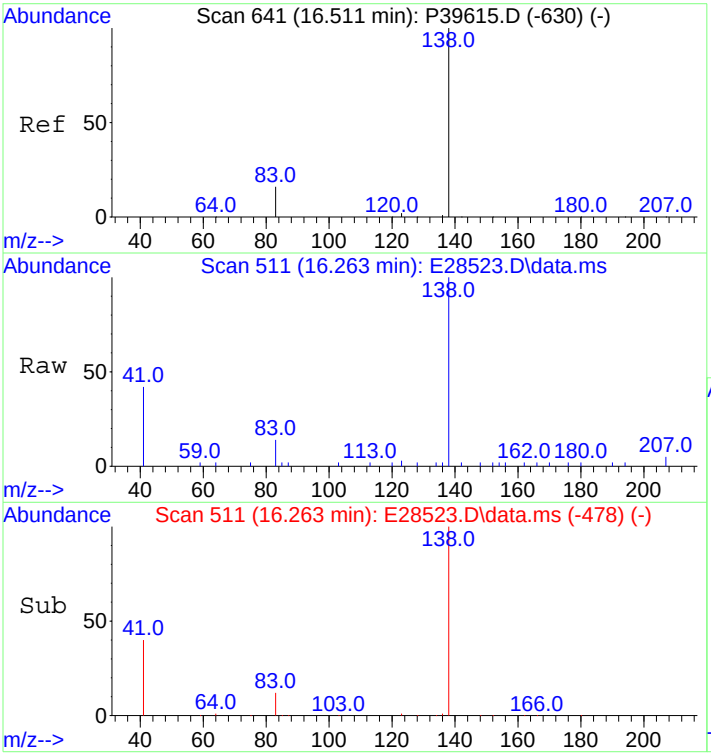
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28523.D
Acq On : 29 Oct 2012 8:56 pm
Operator : AC
Sample : I210291204
Misc : L4 WHAQ66
ALS Vial : 7 Sample Multiplier: 1

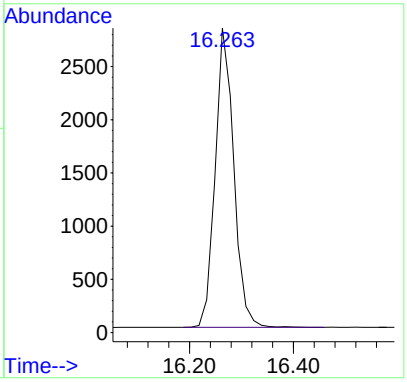
Quant Time: Oct 31 12:58:41 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

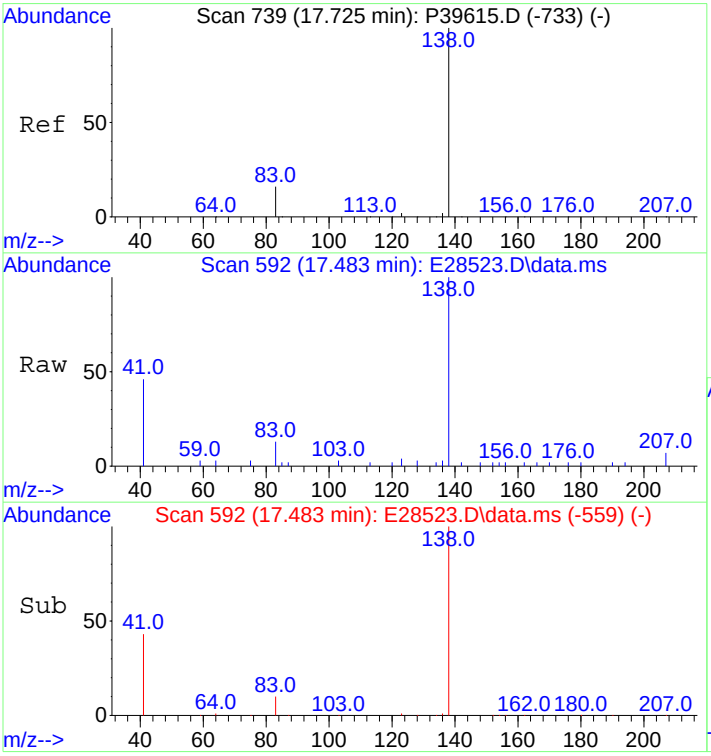




#3
trans-Decalin
Concen: 227.97 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

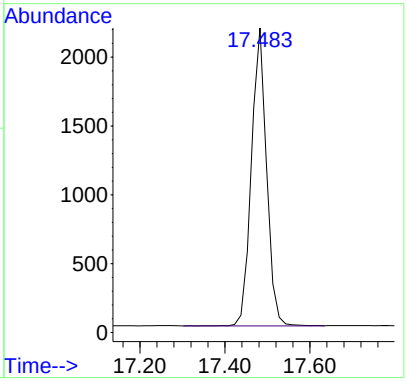
Tgt Ion:138 Resp: 6961

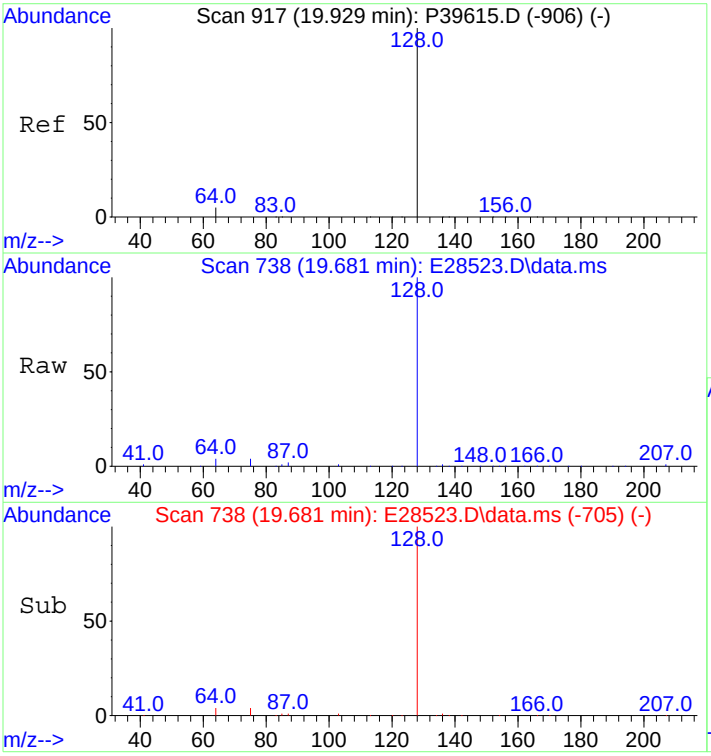




#4
cis-Decalin
Concen: 232.51 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:138 Resp: 5393

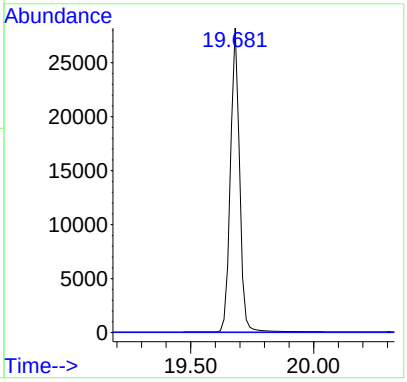


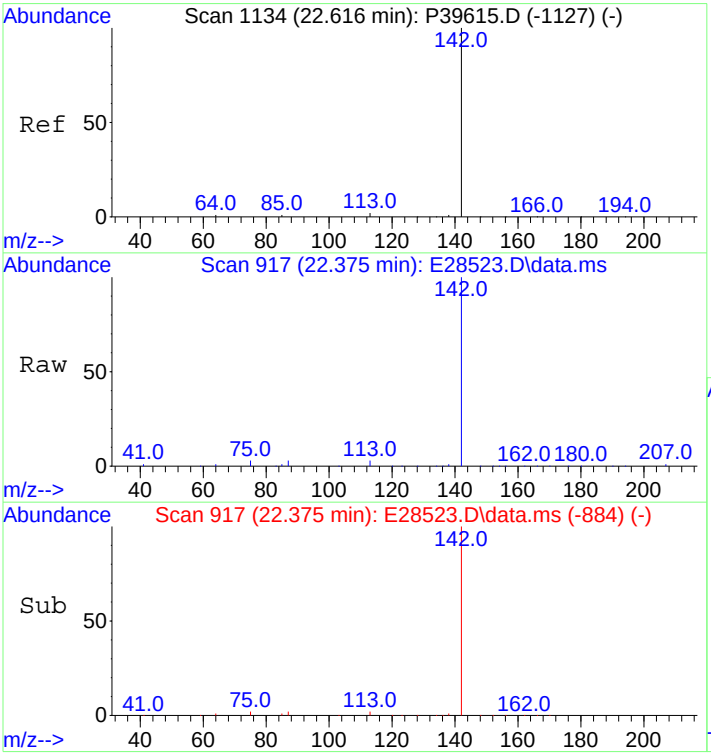


#10
Naphthalene
Concen: 496.87 ng/mL
RT: 19.681 min Scan# 738
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:128 Resp: 72826

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

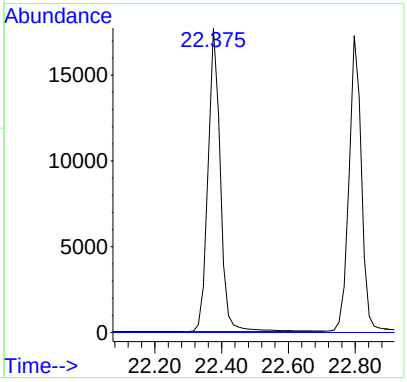


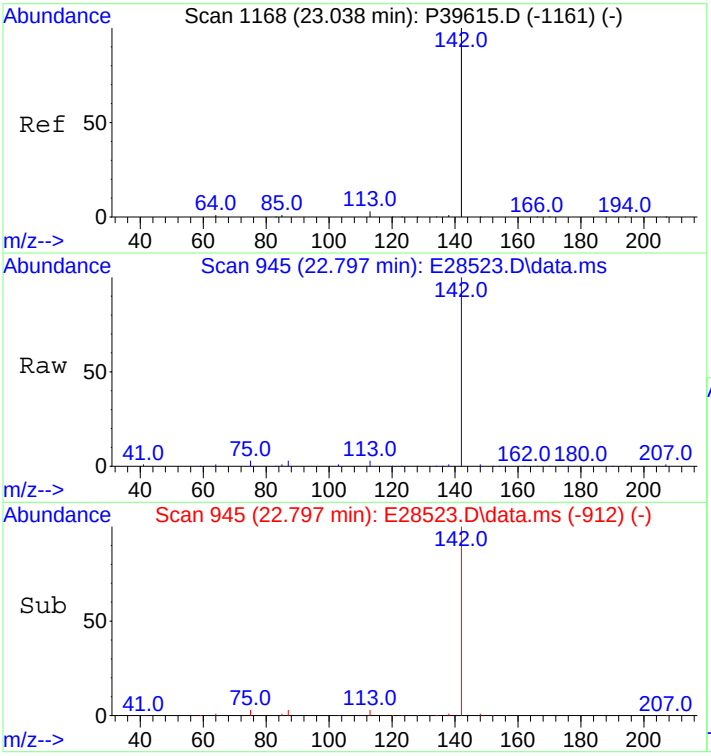


#16
2-Methylnaphthalene
Concen: 478.10 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:142 Resp: 45351

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

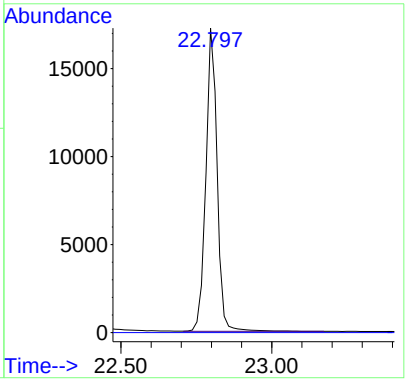


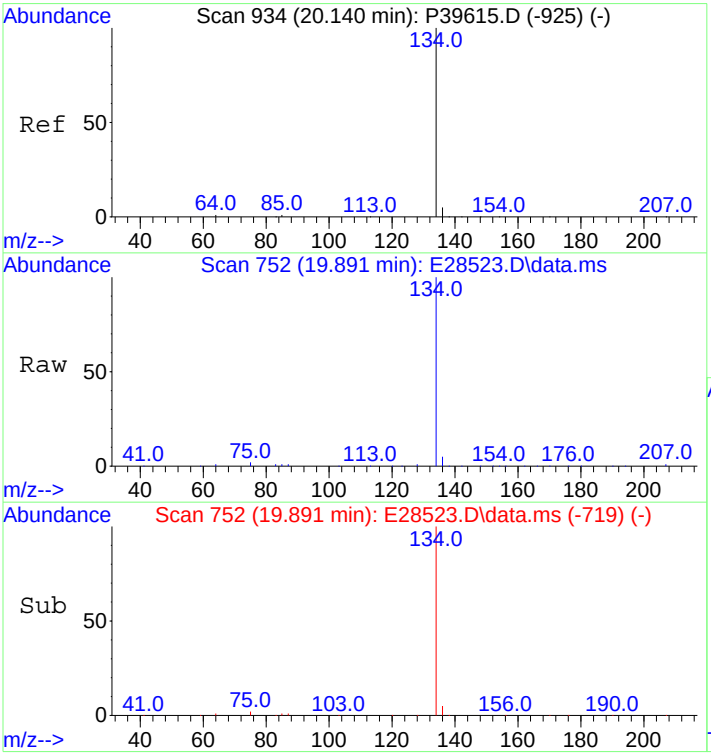


#17
1-Methylnaphthalene
Concen: 491.18 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:142 Resp: 44682

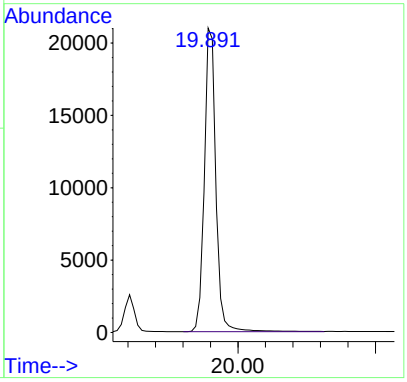
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

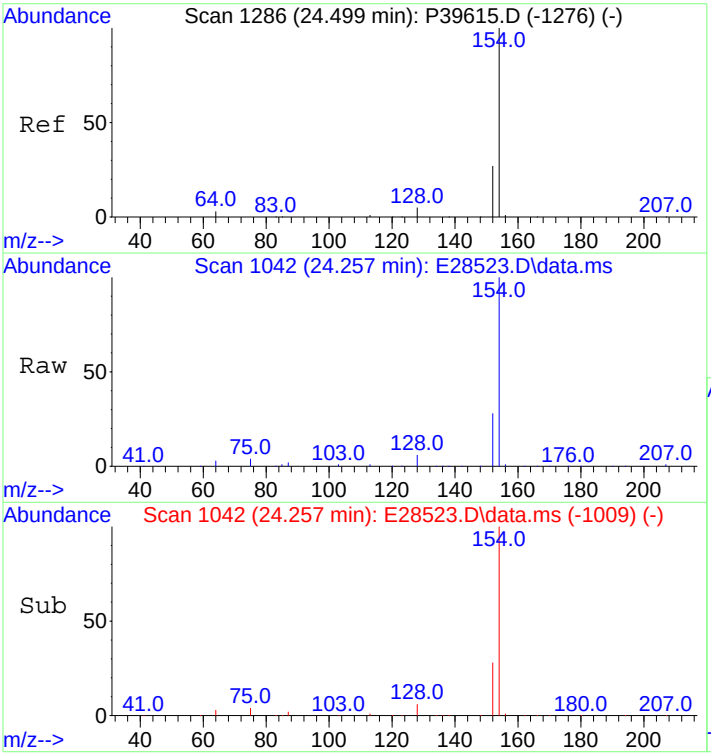




#18
Benzothiophene
Concen: 506.71 ng/mL
RT: 19.891 min Scan# 752
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:134 Resp: 60586

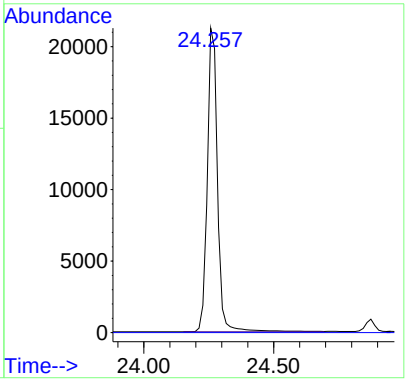


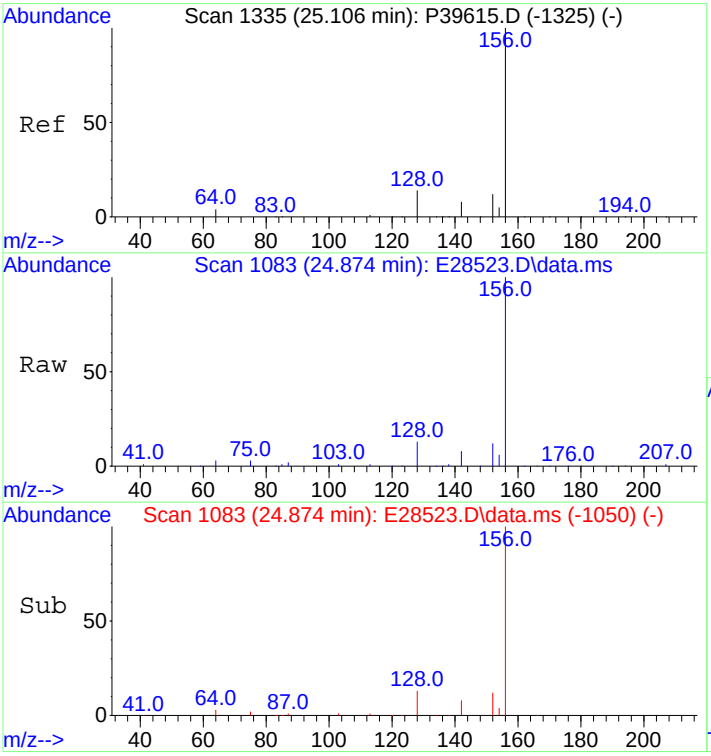


#23
Biphenyl
Concen: 481.18 ng/mL
RT: 24.257 min Scan# 1042
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:154 Resp: 57808

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

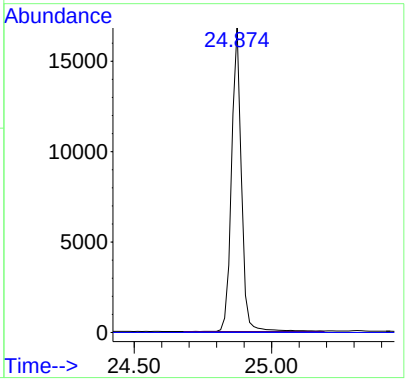


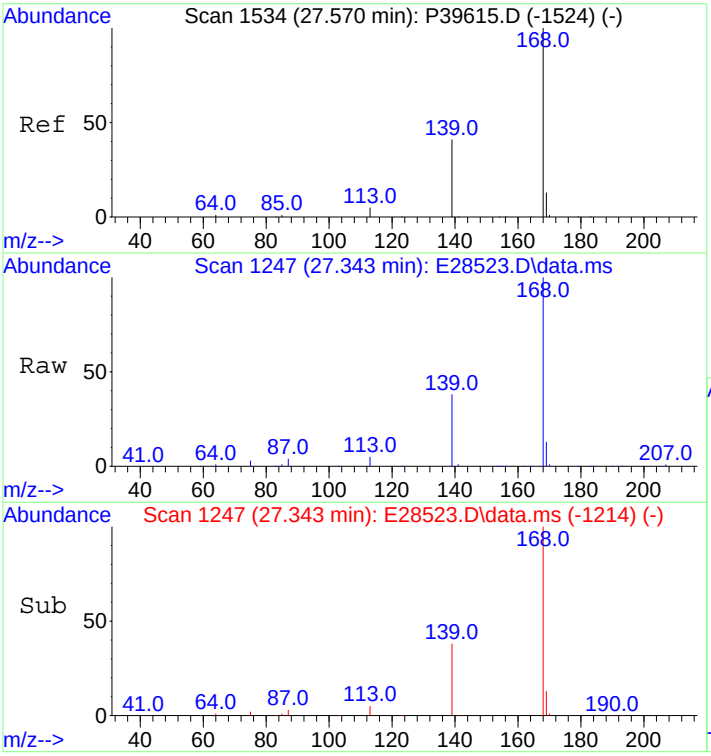


#24
2,6-Dimethylnaphthalene
Concen: 480.71 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:156 Resp: 41569

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

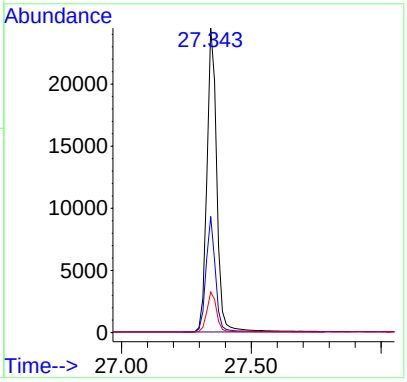


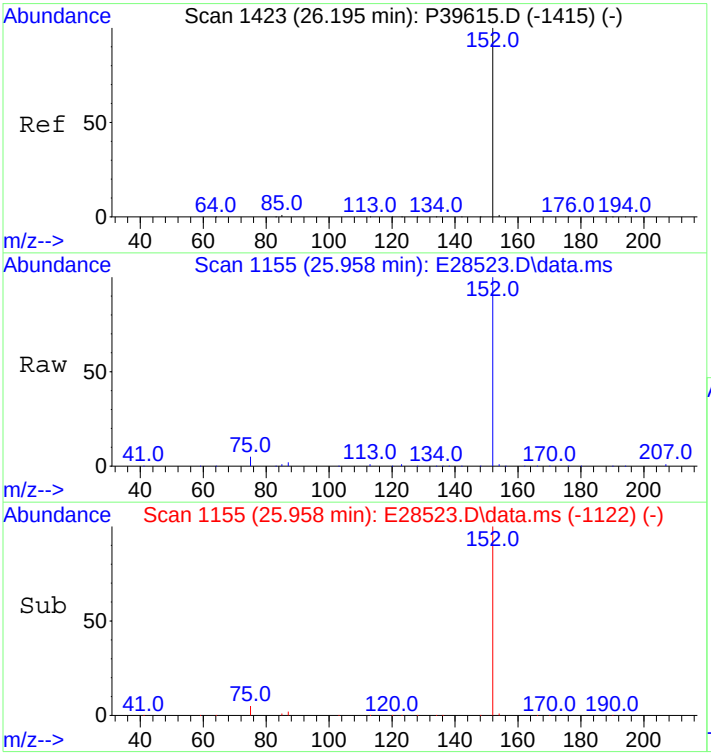


#25
Dibenzofuran
Concen: 498.62 ng/mL
RT: 27.343 min Scan# 1247
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:168 Resp: 64736

Ion	Ratio	Lower	Upper
168	100		
139	36.5	30.6	45.8
169	13.1	10.6	16.0

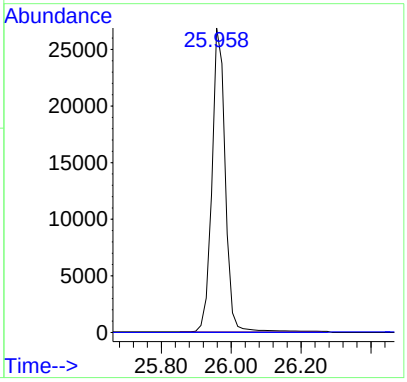


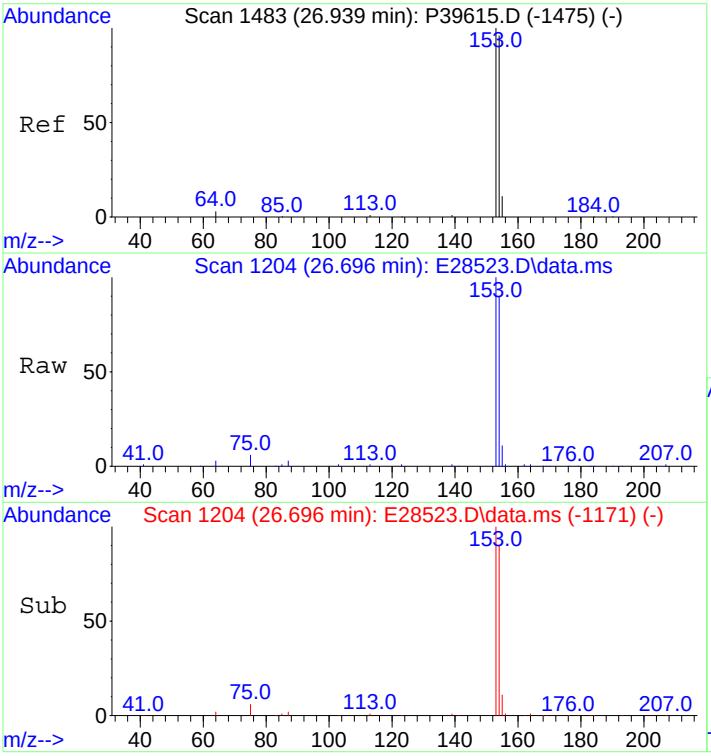


#26
Acenaphthylene
Concen: 491.97 ng/mL m
RT: 25.958 min Scan# 1155
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:152 Resp: 71193

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

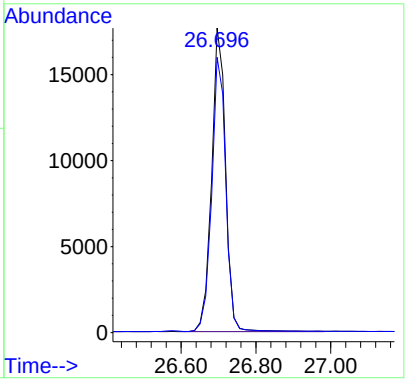


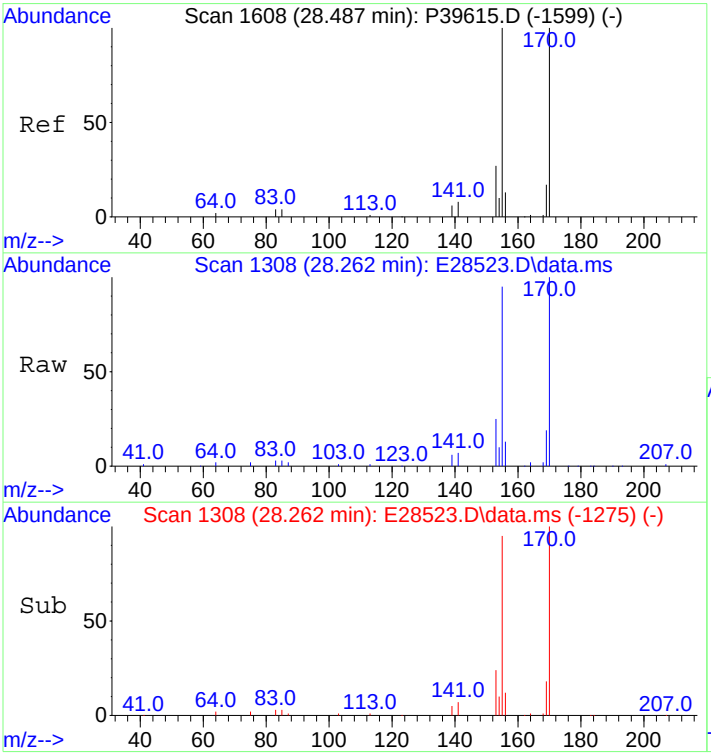


#27
Acenaphthene
Concen: 508.95 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:153 Resp: 45899

Ion	Ratio	Lower	Upper
153	100		
154	91.3	72.3	108.5

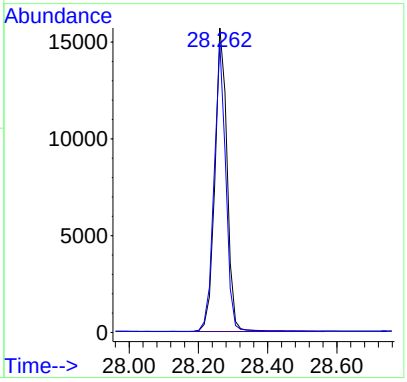


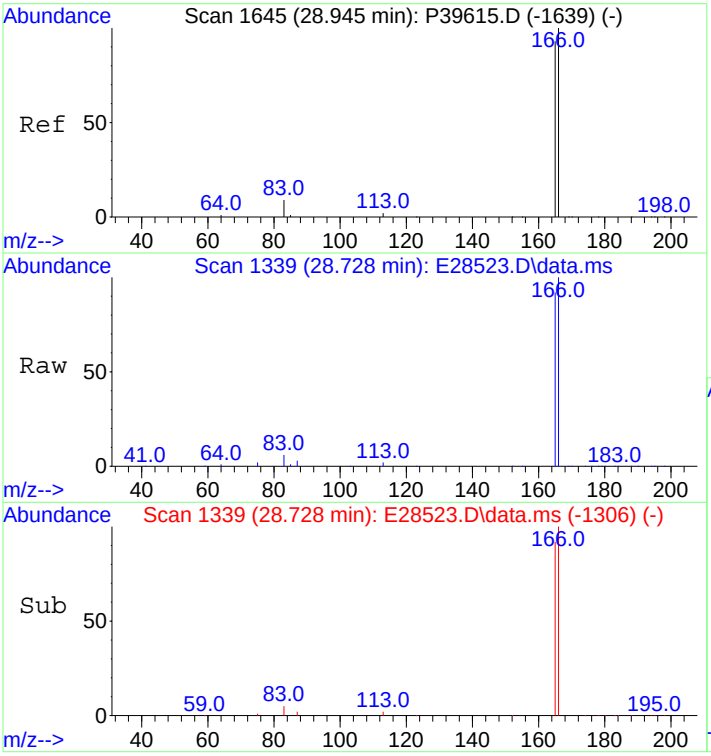


#28
2,3,5-Trimethylnaphthalene
Concen: 489.58 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:170 Resp: 38267

Ion	Ratio	Lower	Upper
170	100		
155	91.4	75.9	113.9

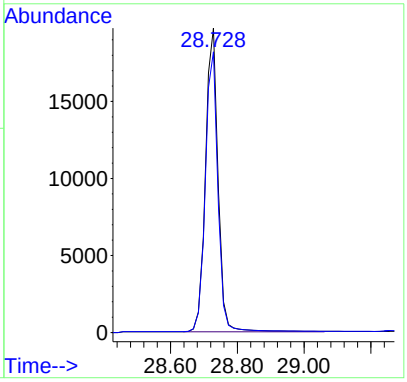


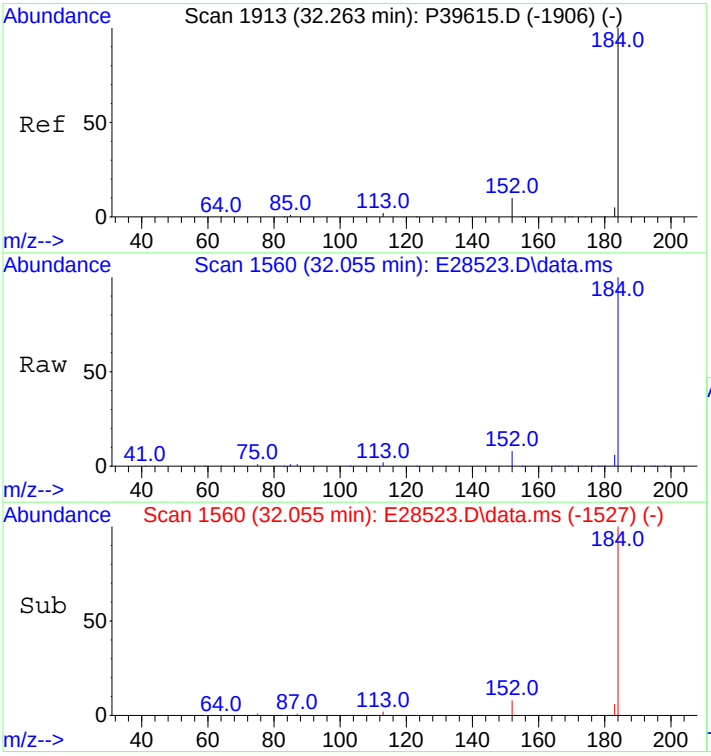


#29
Fluorene
Concen: 490.21 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:166 Resp: 51400

Ion	Ratio	Lower	Upper
166	100		
165	93.6	73.8	110.6

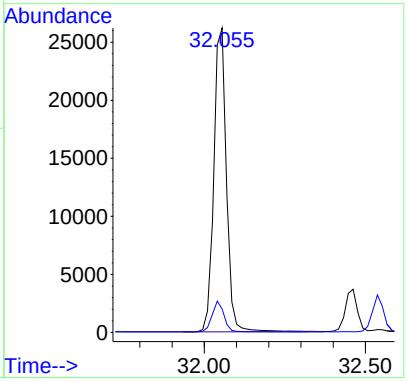


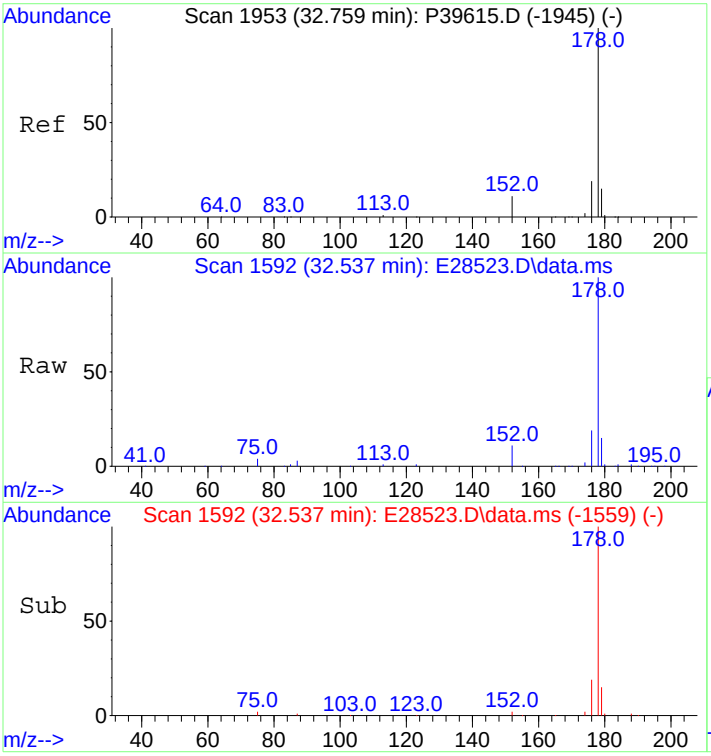


#33
Dibenzothiophene
Concen: 486.25 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:184 Resp: 71389

Ion	Ratio	Lower	Upper
184	100		
152	9.4	6.2	9.2#

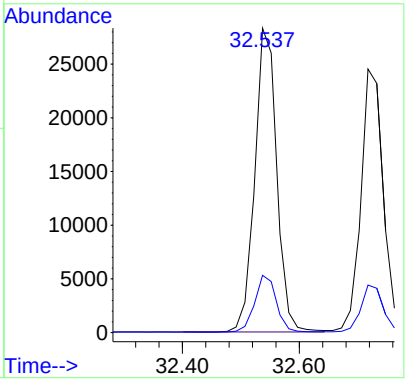


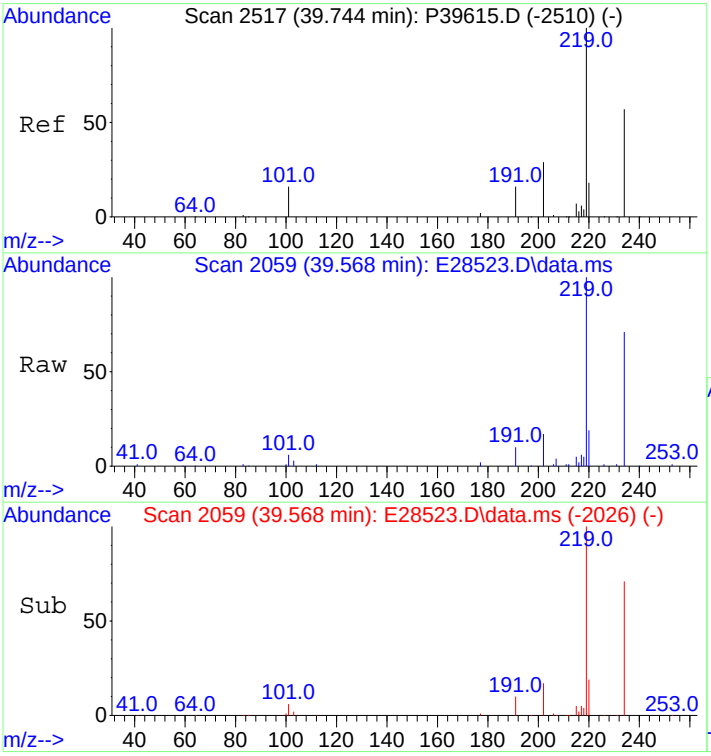


#43
Phenanthrene
Concen: 484.78 ng/mL
RT: 32.537 min Scan# 1592
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:178 Resp: 74232

Ion	Ratio	Lower	Upper
178	100		
176	18.4	15.0	22.6

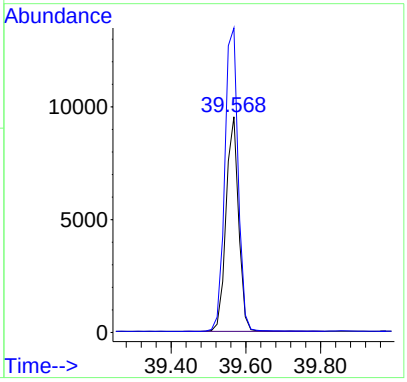


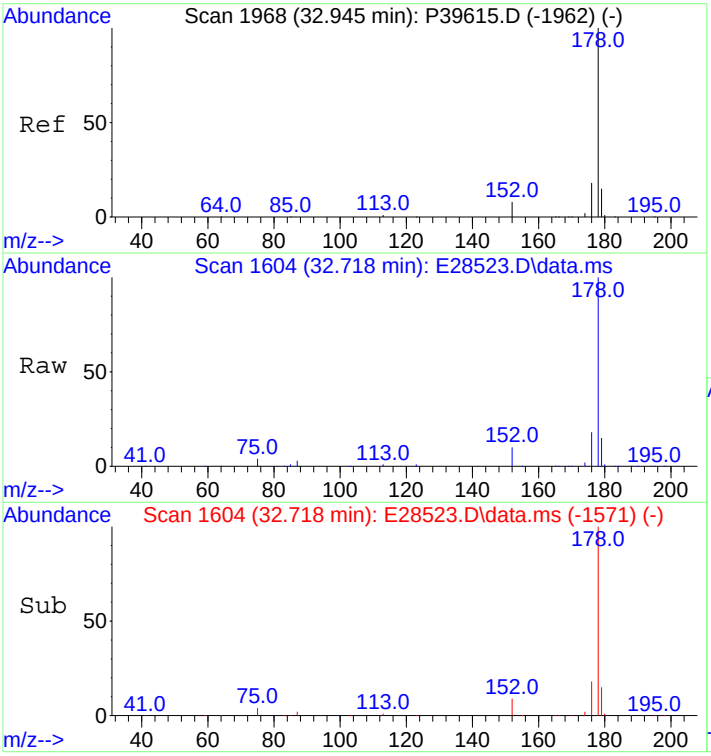


#54
Retene
Concen: 472.33 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:234 Resp: 22141

Ion	Ratio	Lower	Upper
234	100		
219	151.1	113.0	169.4

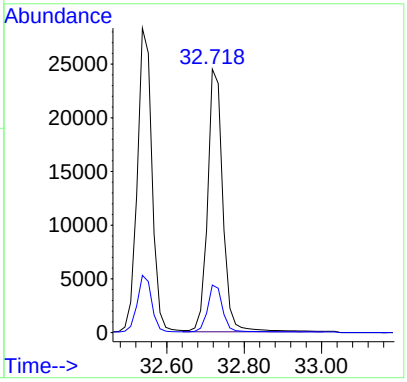


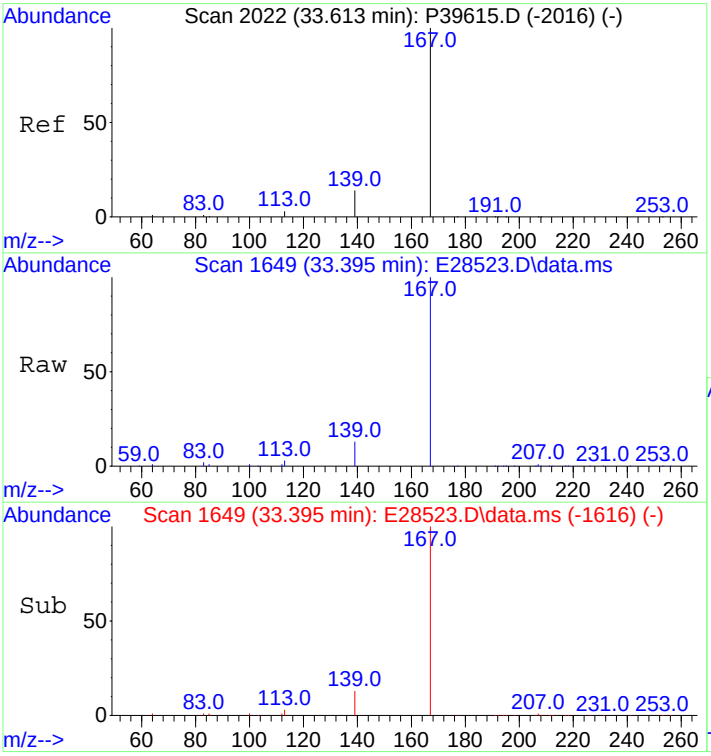


#55
Anthracene
Concen: 466.44 ng/mL m
RT: 32.718 min Scan# 1604
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:178 Resp: 66927

Ion	Ratio	Lower	Upper
178	100		
176	19.7	14.5	21.7

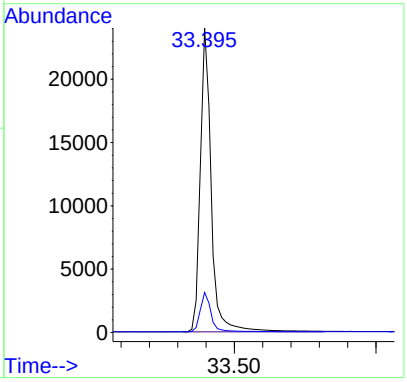


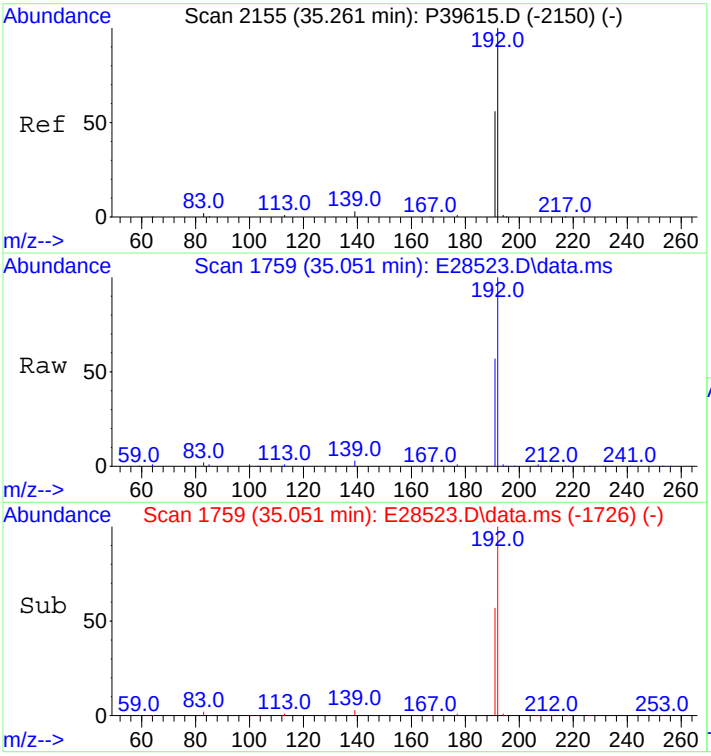


#56
Carbazole
Concen: 473.89 ng/mL
RT: 33.395 min Scan# 1649
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:167 Resp: 64221

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.5	15.7

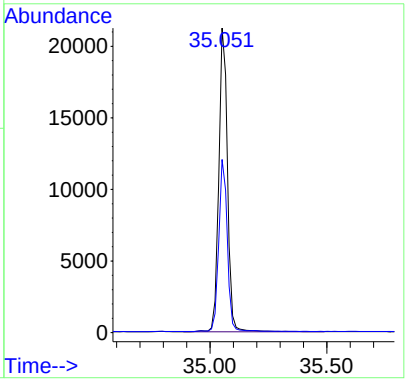


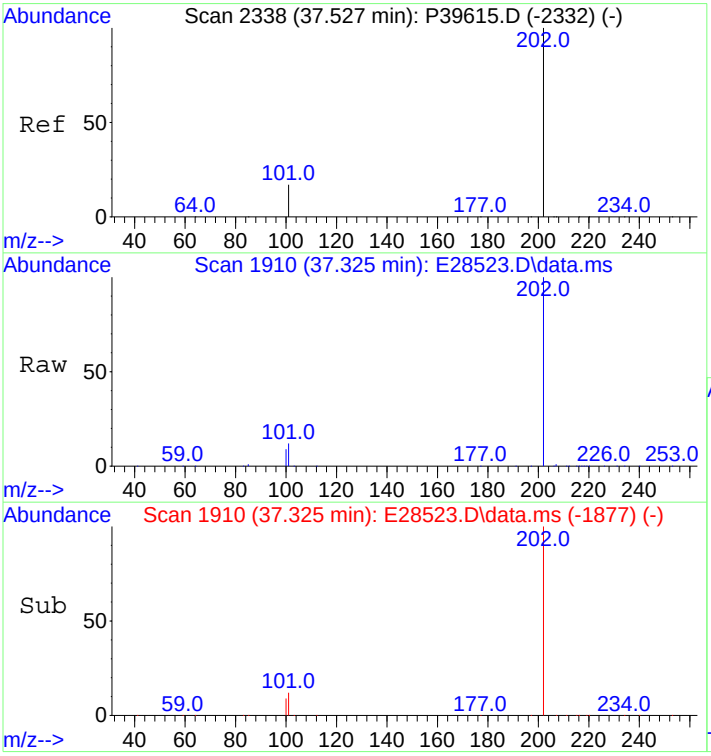


#57
1-Methylphenanthrene
Concen: 479.11 ng/mL
RT: 35.051 min Scan# 1759
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:192 Resp: 54645

Ion	Ratio	Lower	Upper
192	100		
191	56.2	45.5	68.3

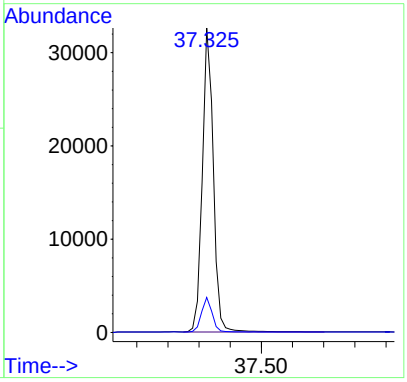


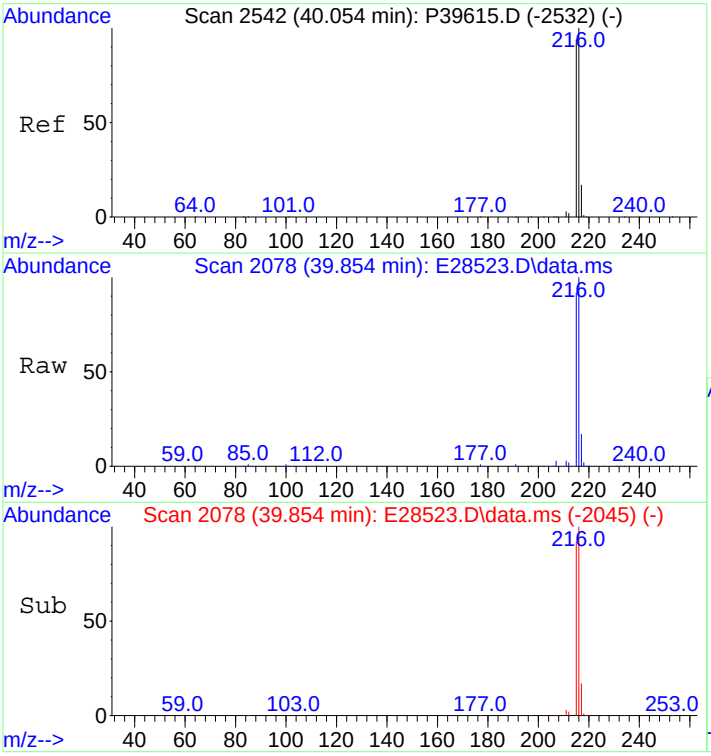


#58
Fluoranthene
Concen: 476.25 ng/mL
RT: 37.325 min Scan# 1910
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:202 Resp: 79475

Ion	Ratio	Lower	Upper
202	100		
101	11.1	9.2	13.8

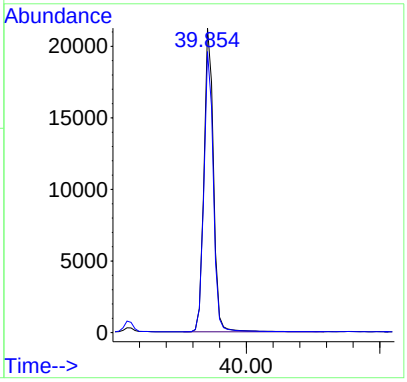


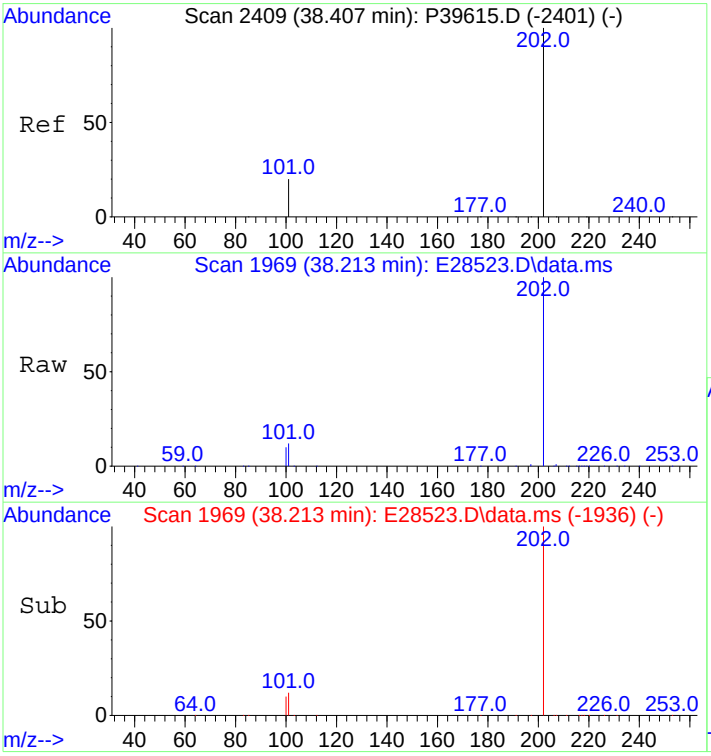


#59
Benzo(b)fluorene
Concen: 492.65 ng/mL
RT: 39.854 min Scan# 2078
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:216 Resp: 52291

Ion	Ratio	Lower	Upper
216	100		
215	91.7	73.8	110.8

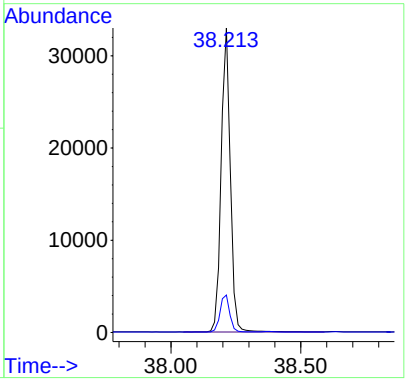


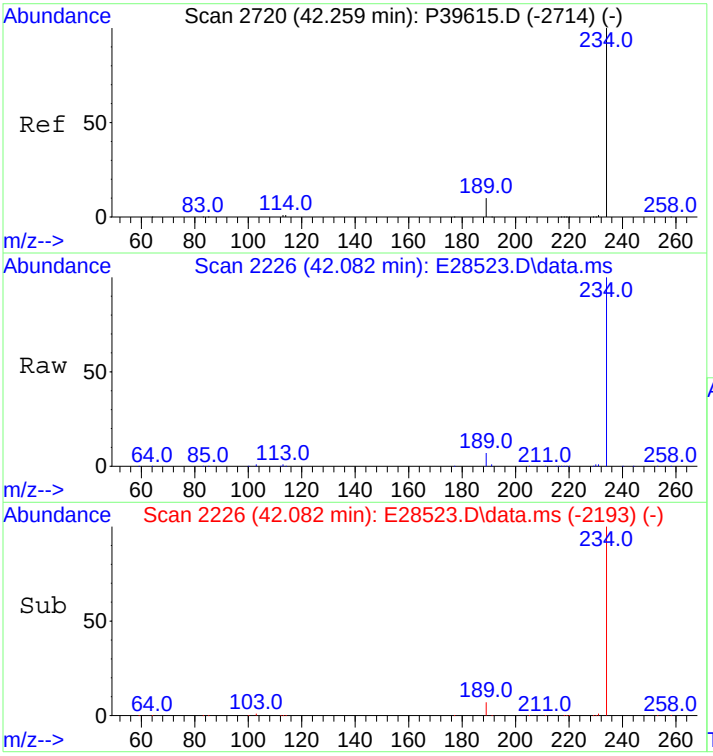


#60
Pyrene
Concen: 480.28 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:202 Resp: 80681

Ion	Ratio	Lower	Upper
202	100		
101	12.8	9.8	14.8

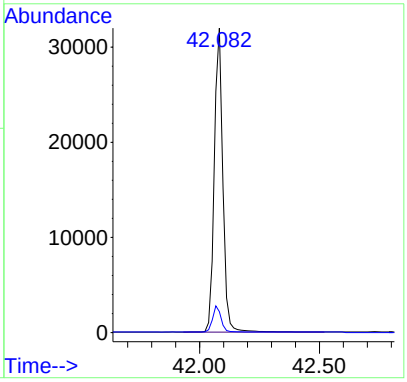


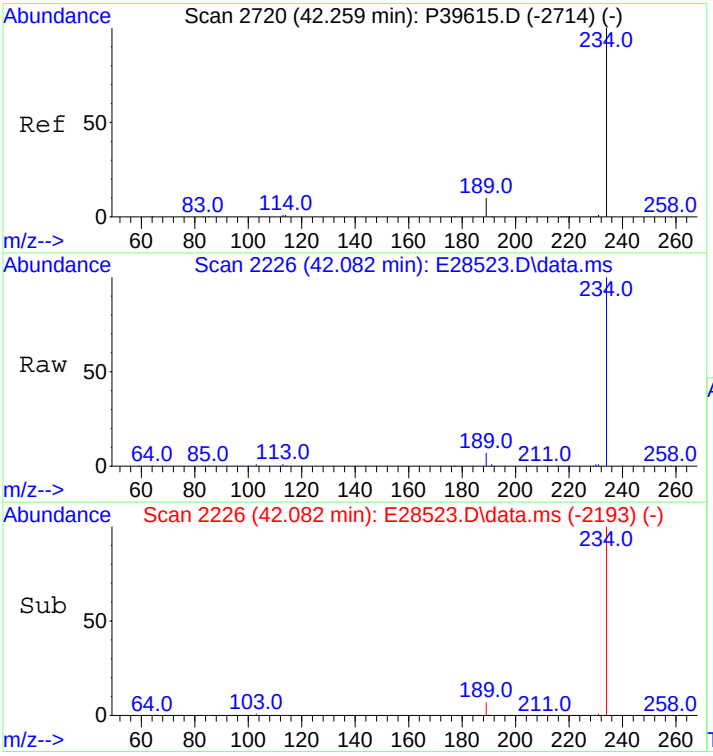


#66
Naphthobenzothiophene
Concen: 498.56 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:234 Resp: 79024

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

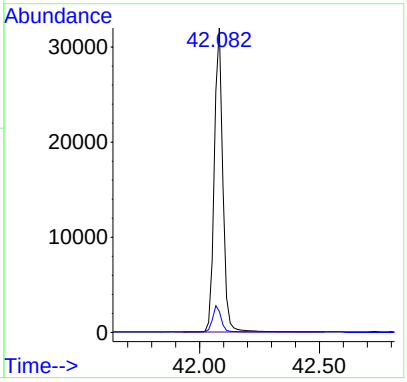


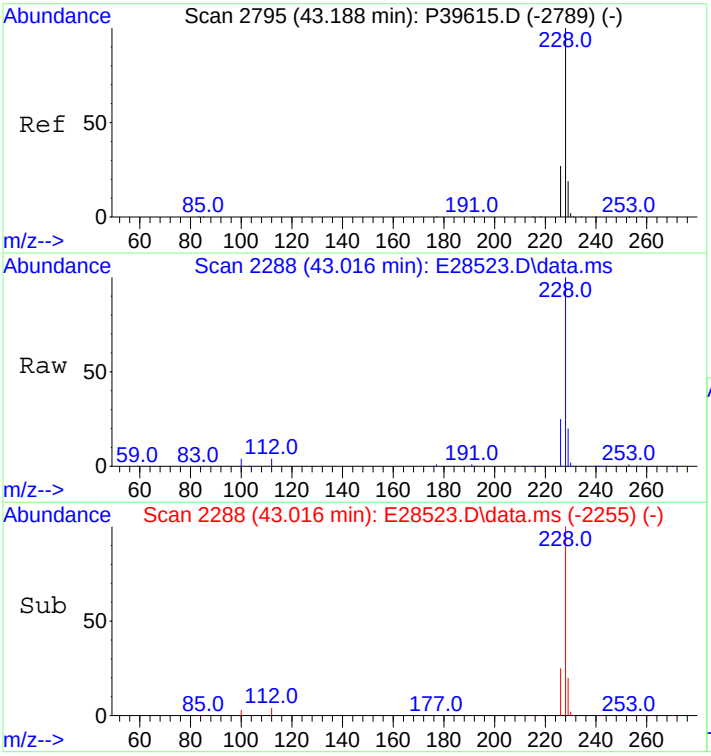


#67
Naphthobenzothiophene-2,1-D
Concen: 498.56 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:234 Resp: 79024

Ion	Ratio	Lower	Upper
234	100		
189	8.5	5.5	8.3#

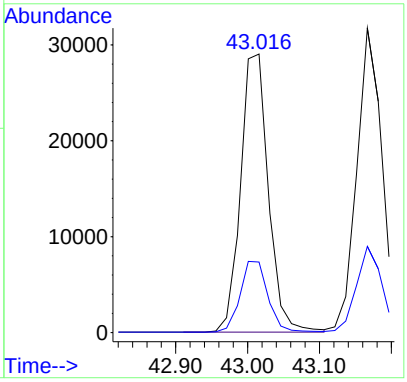


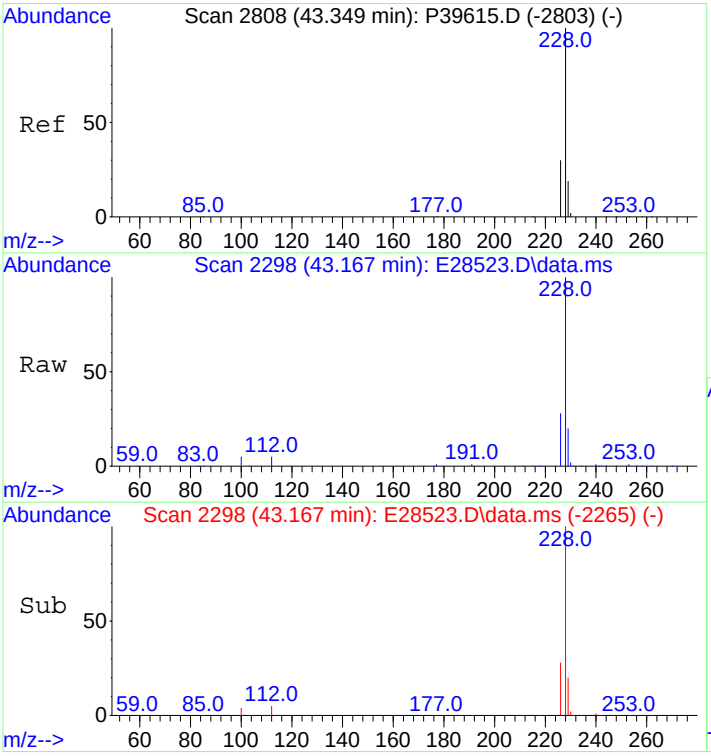


#75
Benz[a]anthracene
Concen: 456.01 ng/mL
RT: 43.016 min Scan# 2288
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:228 Resp: 77932

Ion	Ratio	Lower	Upper
228	100		
226	25.5	20.2	30.4

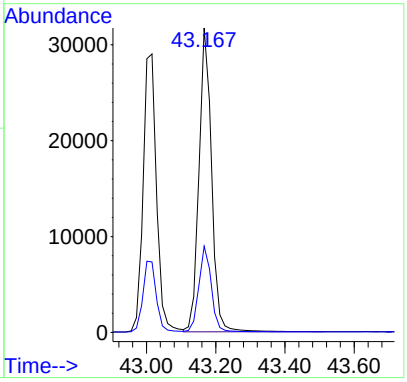


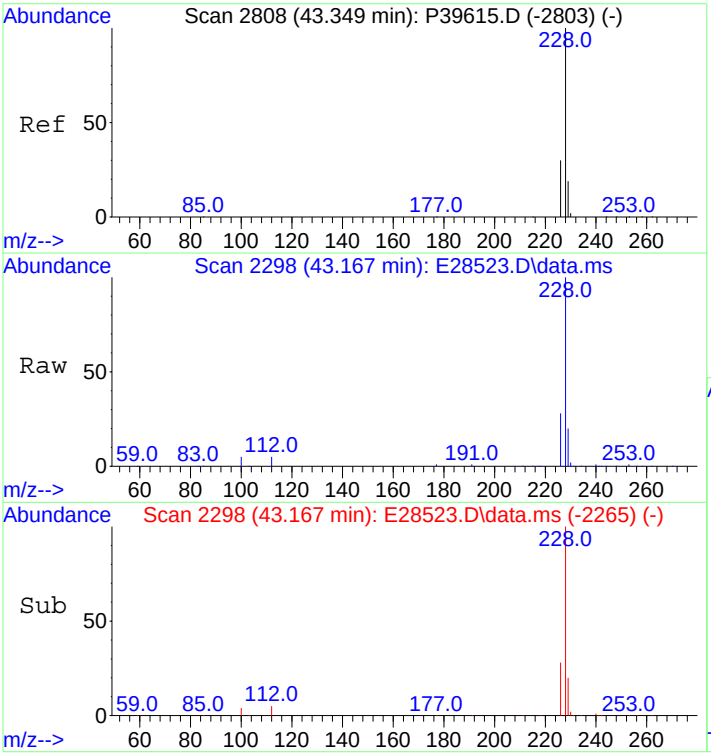


#76
Chrysene
Concen: 476.06 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:228 Resp: 79635

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

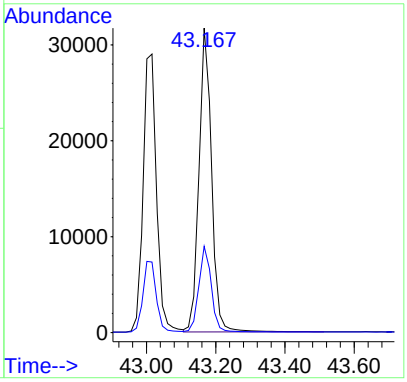


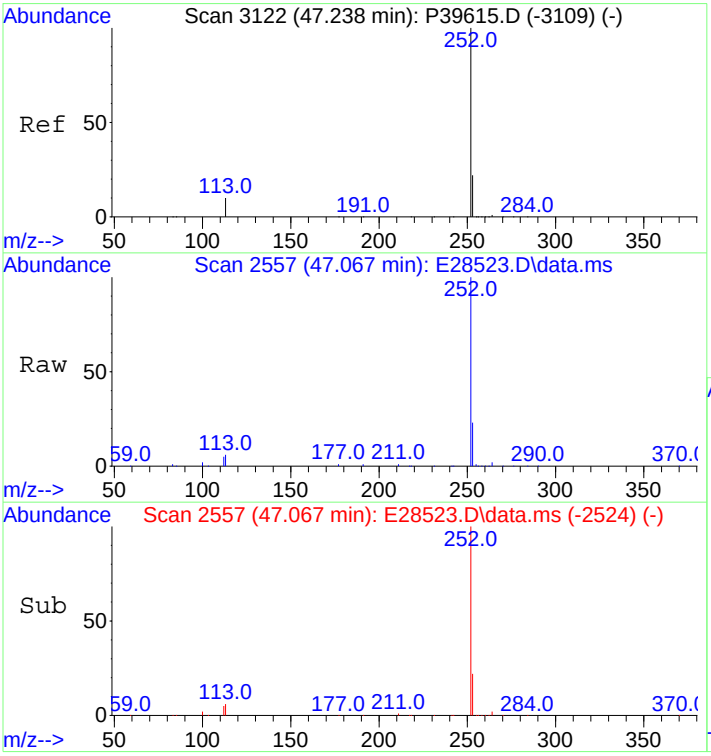


#77
Chrysene/Triphenylene
Concen: 476.06 ng/mL
RT: 43.167 min Scan# 2298
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:228 Resp: 79635

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

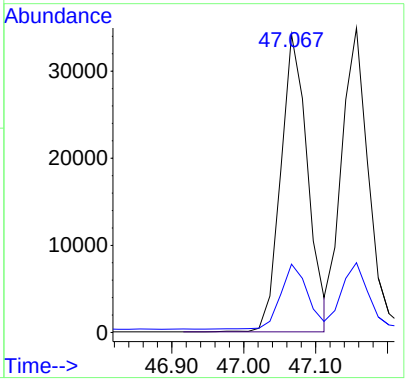


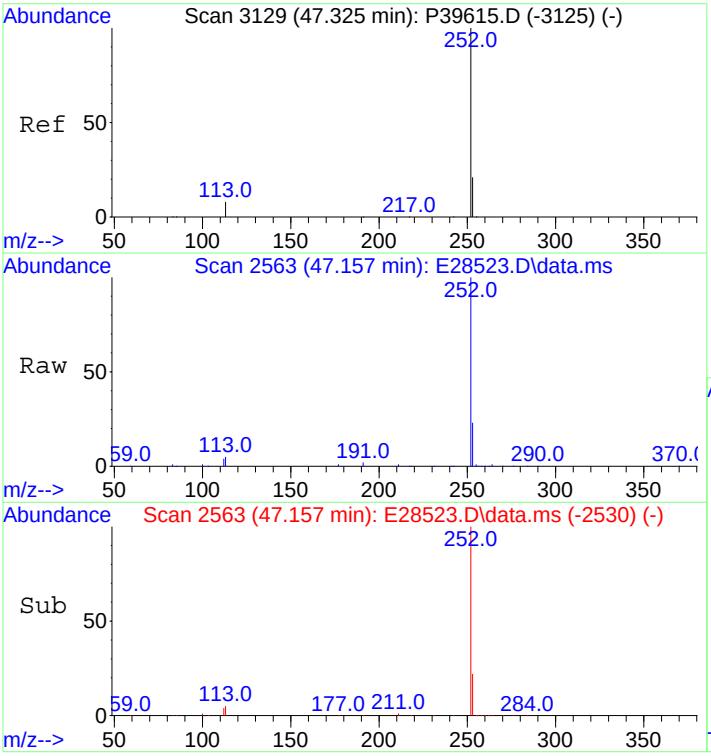


#84
Benzo[b]fluoranthene
Concen: 495.19 ng/mL
RT: 47.067 min Scan# 2557
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 89104

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.3	27.5

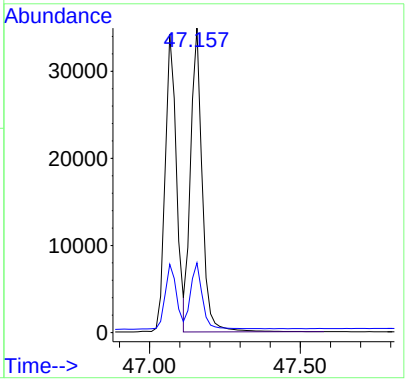


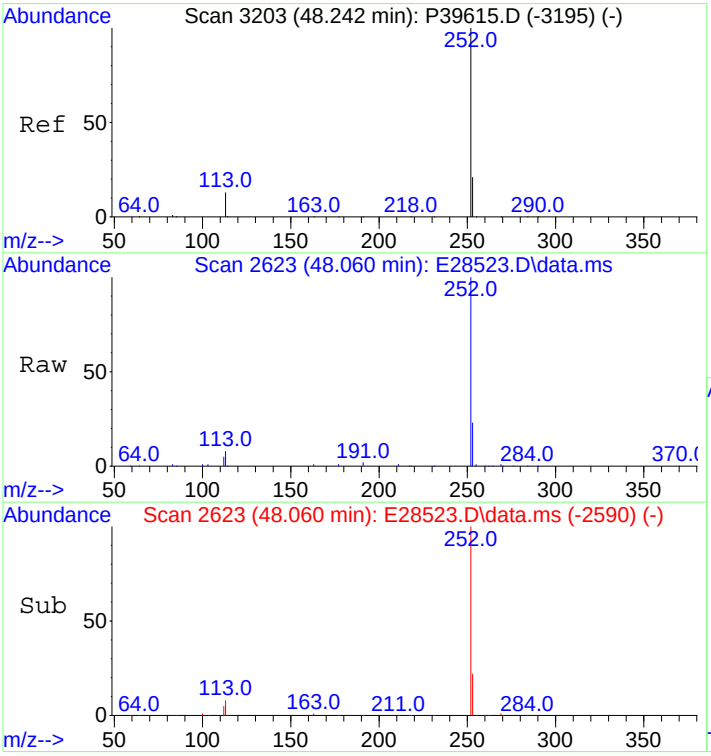


#85
Benzo[j]+[k]fluoranthene
Concen: 549.60 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 93062

Ion	Ratio	Lower	Upper
252	100		
253	21.8	18.3	27.5

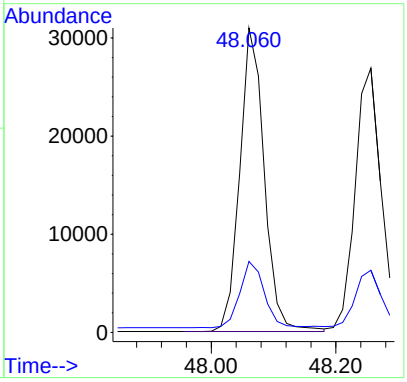


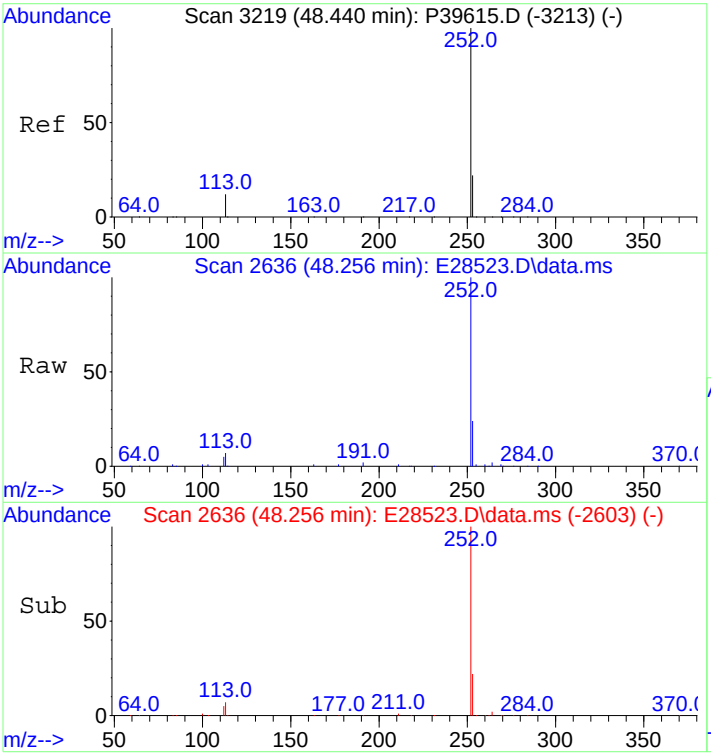


#87
Benzo[e]pyrene
Concen: 530.13 ng/mL
RT: 48.060 min Scan# 2623
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 84646

Ion	Ratio	Lower	Upper
252	100		
253	21.9	18.6	28.0

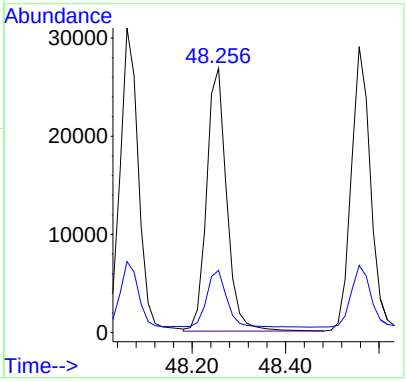


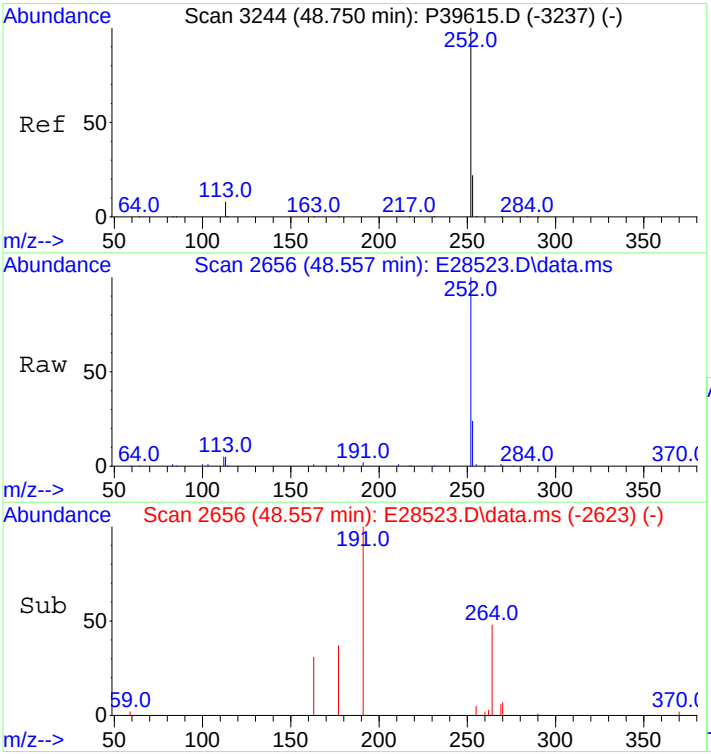


#89
Benzo[a]pyrene
Concen: 528.52 ng/mL
RT: 48.256 min Scan# 2636
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 79782

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

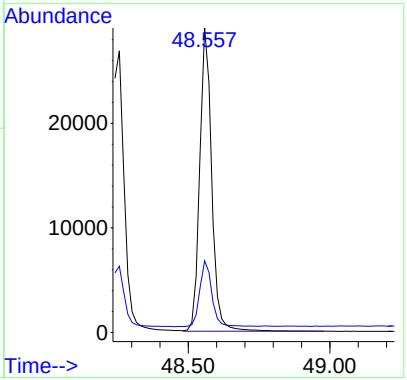


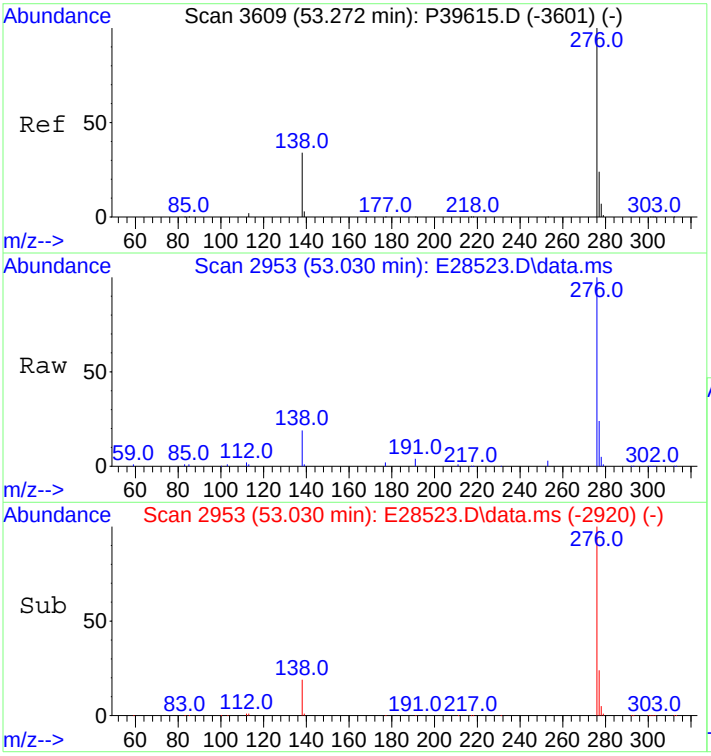


#90
Perylene
Concen: 528.03 ng/mL
RT: 48.557 min Scan# 2656
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:252 Resp: 84830

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.8	28.2

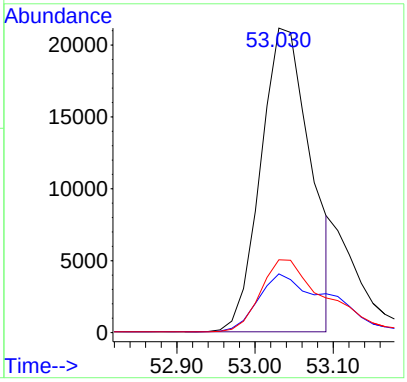


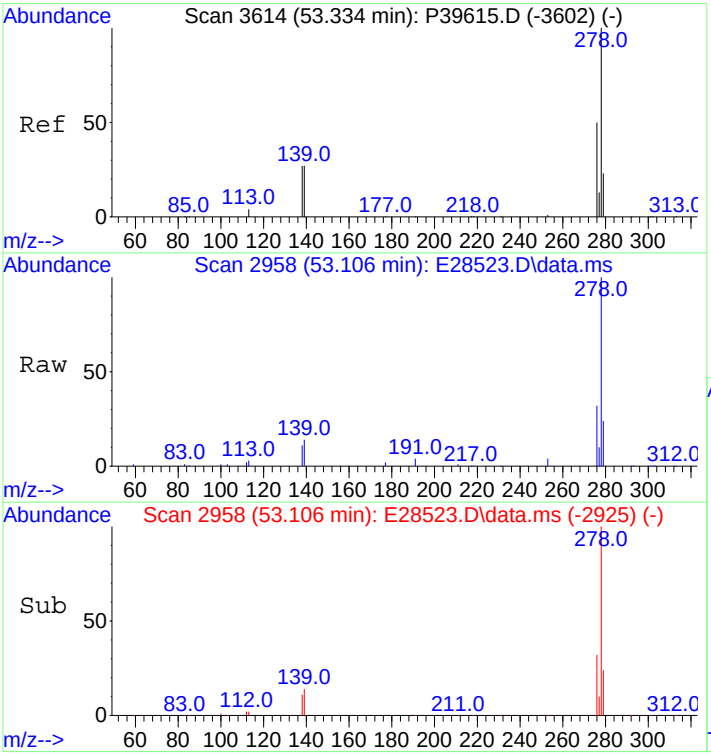


#91
Indeno[1,2,3-cd]pyrene
Concen: 515.07 ng/mL m
RT: 53.030 min Scan# 2953
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:276 Resp: 93871

Ion	Ratio	Lower	Upper
276	100		
138	28.2	15.4	23.2#
277	31.7	19.1	28.7#

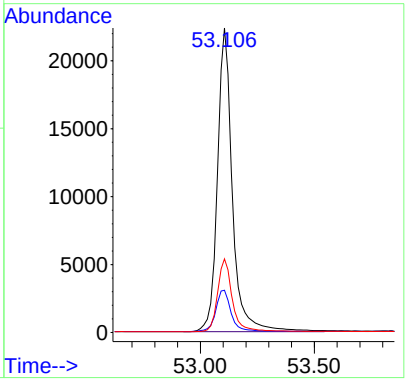


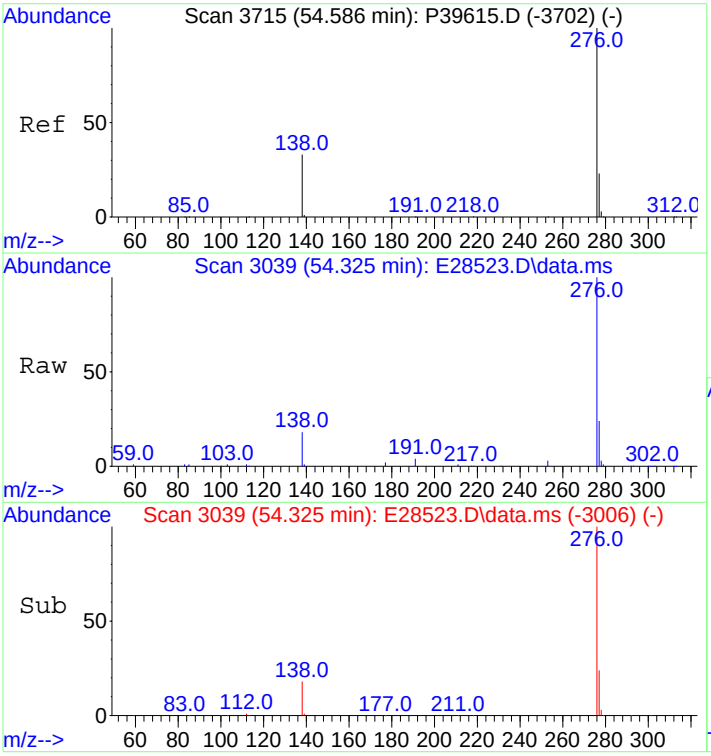


#92
Dibenz[ah]+[ac]anthracene
Concen: 582.45 ng/mL
RT: 53.106 min Scan# 2958
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:278 Resp: 102096

Ion	Ratio	Lower	Upper
278	100		
139	14.1	11.1	16.7
279	23.7	19.4	29.0

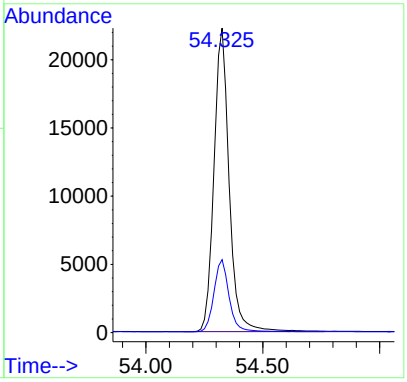


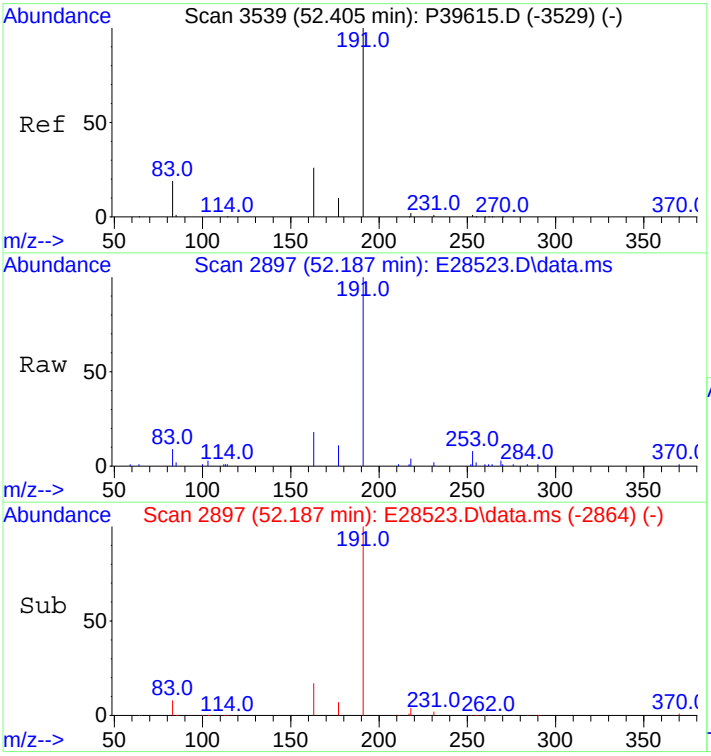


#93
Benzo[g,h,i]perylene
Concen: 561.12 ng/mL
RT: 54.325 min Scan# 3039
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:276 Resp: 100489

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

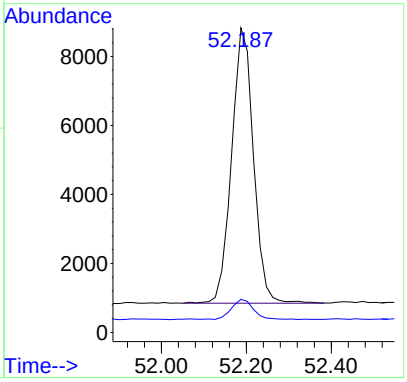


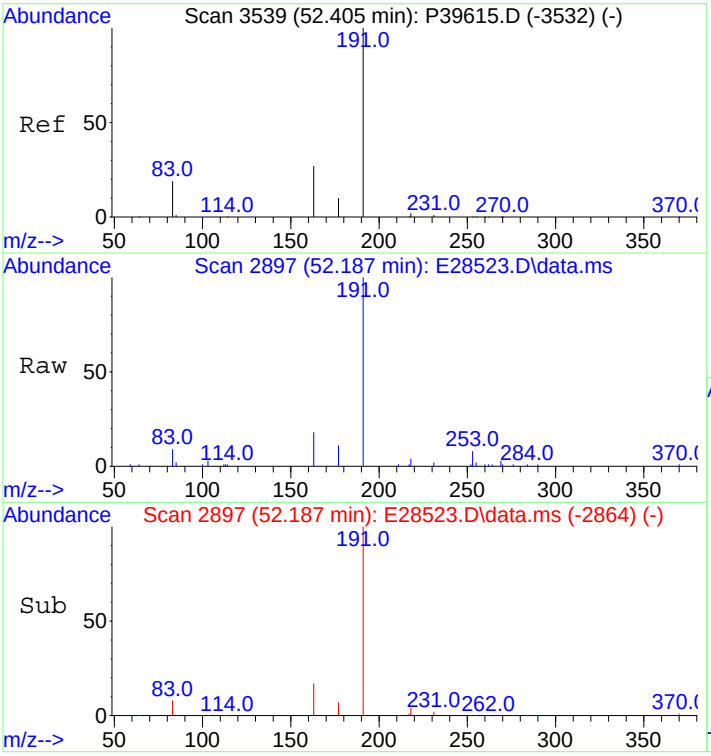


#94
Hopane (T19)
Concen: 675.67 ng/mL
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:191 Resp: 28585

Ion	Ratio	Lower	Upper
191	100		
177	7.5	8.7	13.1#

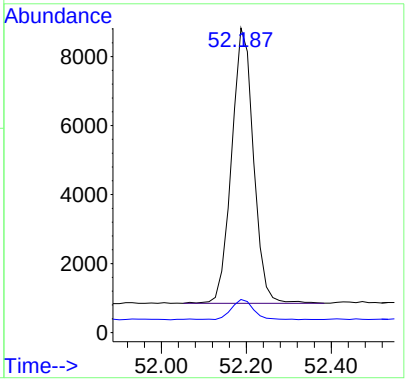




#95
17a(H),21B(H)-hopane - C30H52
Concen: 675.67 ng/mL
RT: 52.187 min Scan# 2897
Delta R.T. 0.000 min
Lab File: E28523.D
Acq: 29 Oct 2012 8:56 pm

Tgt Ion:191 Resp: 28585

Ion	Ratio	Lower	Upper
191	100		
177	7.5	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 12:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.575	164	33843	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	78030	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	551490	4374.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 437.45%#			
42) Phenanthrene-d10	32.462	188	591656	4656.961	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 465.70%#			
83) Benzo[b]fluoranthene-d12	47.006	264	757059	5124.613	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 512.46%#			
88) Benzo[a]pyrene-d12	48.181	264	754524	5631.502	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 563.15%#			
129) 5B(H)Cholane - Surr	43.723	217	164748	5727.173	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 572.72%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	65353	2319.785	ng/mL	100
4) cis-Decalin	17.482	138	50652	2366.946	ng/mL	100
10) Naphthalene	19.680	128	666336	4927.599	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	434650	4966.577	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	418300	4984.067	ng/mL#	100
18) Benzothiophene	19.891	134	560368	5079.742	ng/mL	100
23) Biphenyl	24.272	154	550566	4967.246	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	400289	5017.330	ng/mL#	100
25) Dibenzofuran	27.343	168	624188	5210.994	ng/mL	98
26) Acenaphthylene	25.958	152	705912M3	5287.347	ng/mL	
27) Acenaphthene	26.711	153	436058	5240.867	ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	376690	5223.527	ng/mL	97
29) Fluorene	28.728	166	508103	5252.399	ng/mL	100
33) Dibenzothiophene	32.055	184	701873	5181.642	ng/mL#	95
43) Phenanthrene	32.552	178	715454	5064.281	ng/mL	99
54) Retene	39.568	234	240302	5556.394	ng/mL	93
55) Anthracene	32.733	178	623046M3	4706.465	ng/mL	
56) Carbazole	33.395	167	672100	5375.448	ng/mL	99
57) 1-Methylphenanthrene	35.066	192	557136	5294.589	ng/mL	99
58) Fluoranthene	37.340	202	812711M3	5278.661	ng/mL	
59) Benzo(b)fluorene	39.869	216	563733	5756.591	ng/mL	99
60) Pyrene	38.213	202	811273	5234.531	ng/mL	98
66) Naphthobenzothiophene	42.082	234	818126	5594.497	ng/ml#	95
67) Naphthobenzothiophene-...	42.082	234	818126	5594.497	ng/mL#	95
75) Benz[a]anthracene	43.016	228	819446	4736.655	ng/mL	99
76) Chrysene	43.181	228	799496	4721.396	ng/mL	100
77) Chrysene/Triphenylene	43.181	228	799496	4721.396	ng/mL	100
84) Benzo[b]fluoranthene	47.081	252	948454	5206.972	ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.172	252	946512	5522.013	ng/mL	98
87) Benzo[e]pyrene	48.075	252	890237	5507.774	ng/mL	97
89) Benzo[a]pyrene	48.271	252	873584	5716.864	ng/mL	97
90) Perylene	48.572	252	935392	5751.798	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.060	276	1049897M3	5690.915	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.121	278	1111133	6262.016	ng/mL	99
93) Benzo[g,h,i]perylene	54.355	276	1070138	5903.057	ng/mL	100
94) Hopane (T19)	52.202	191	293886	6862.372	ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	293886	6862.372	ng/mL#	90

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 31 12:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

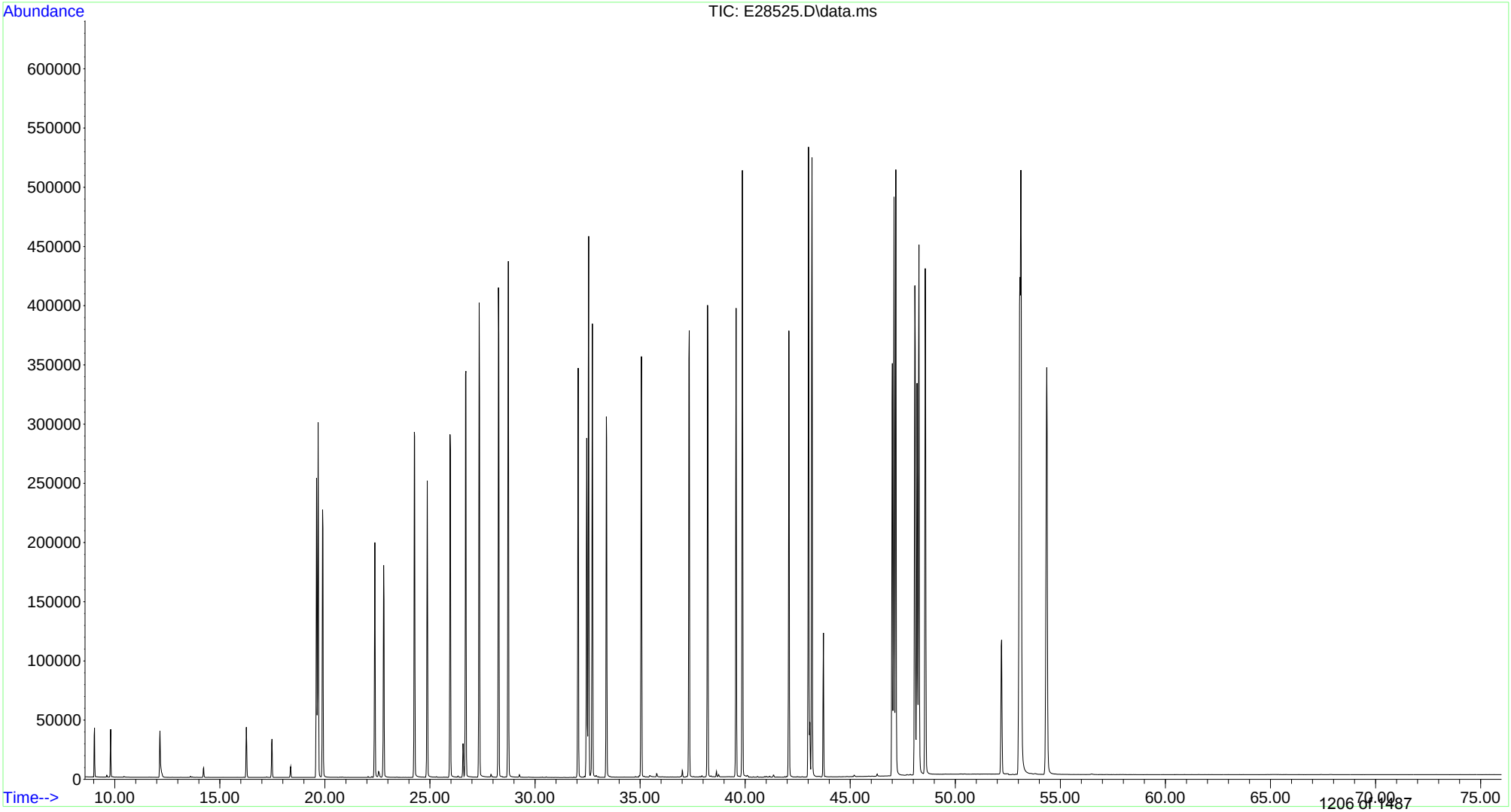
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

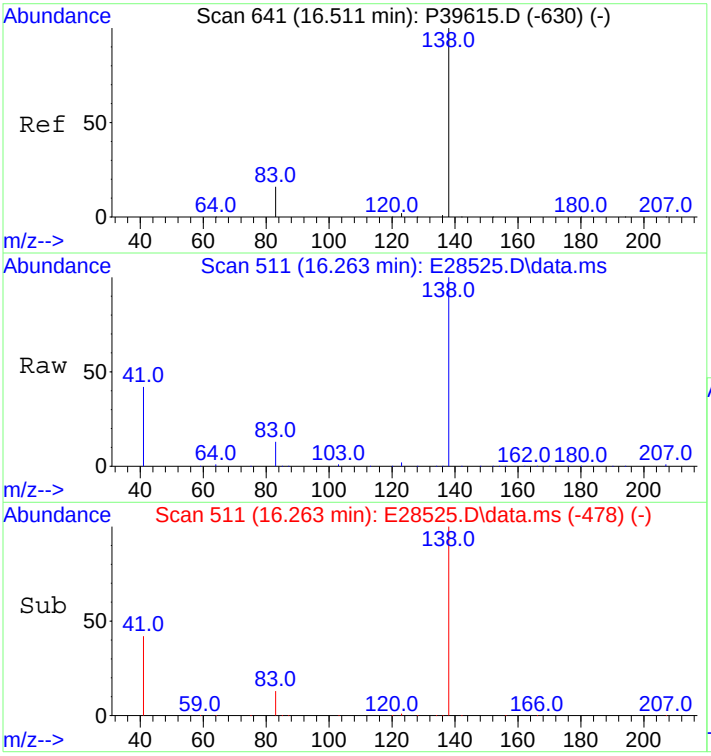
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28525.D
Acq On : 29 Oct 2012 10:25 pm
Operator : AC
Sample : I210291205
Misc : L5 WHAQ38
ALS Vial : 8 Sample Multiplier: 1

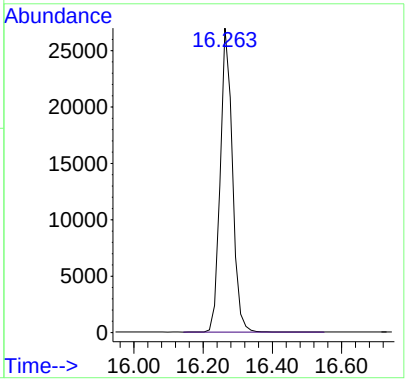
Quant Time: Oct 31 12:58:48 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

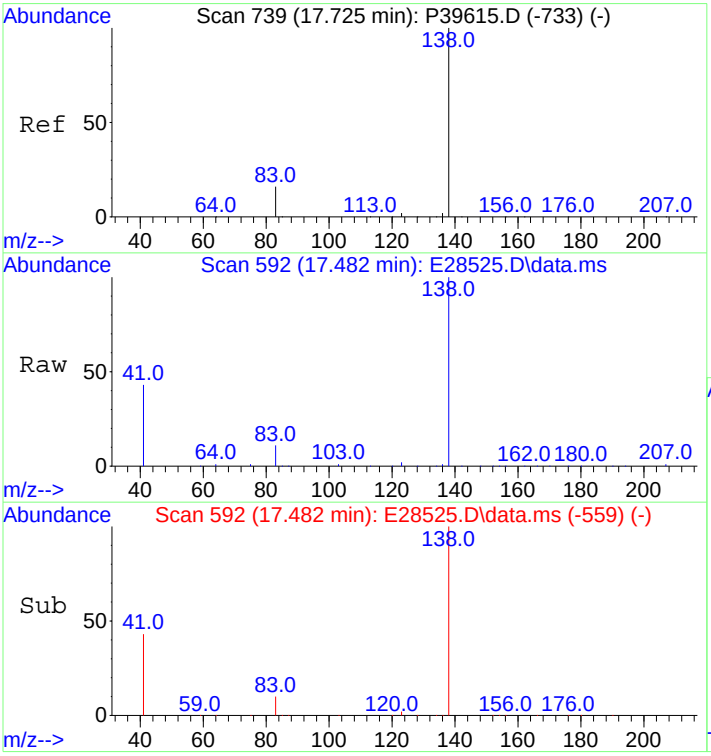




#3
trans-Decalin
Concen: 2319.79 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

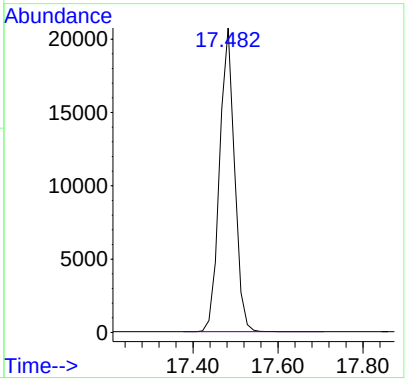
Tgt Ion:138 Resp: 65353

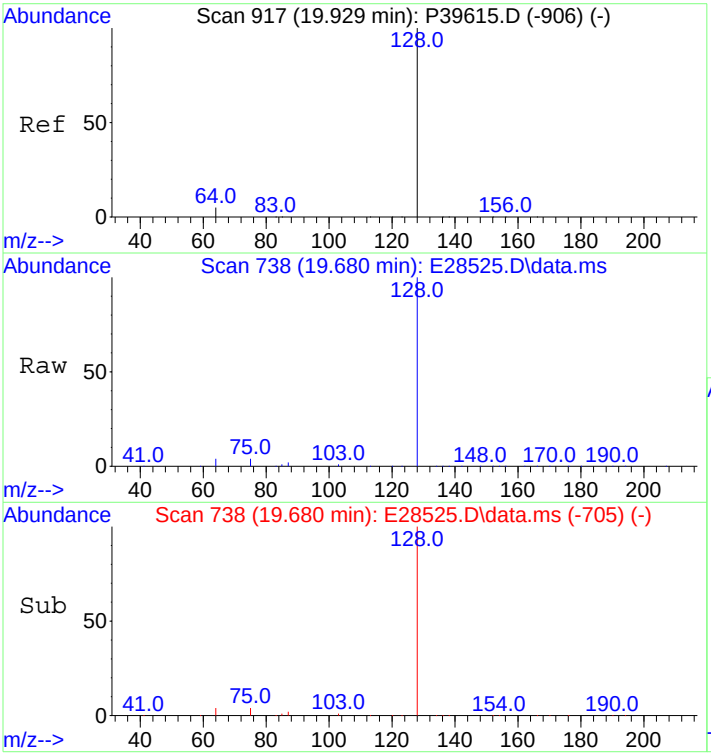




#4
cis-Decalin
Concen: 2366.95 ng/mL
RT: 17.482 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:138 Resp: 50652

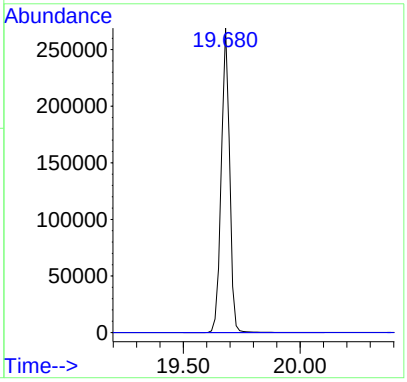


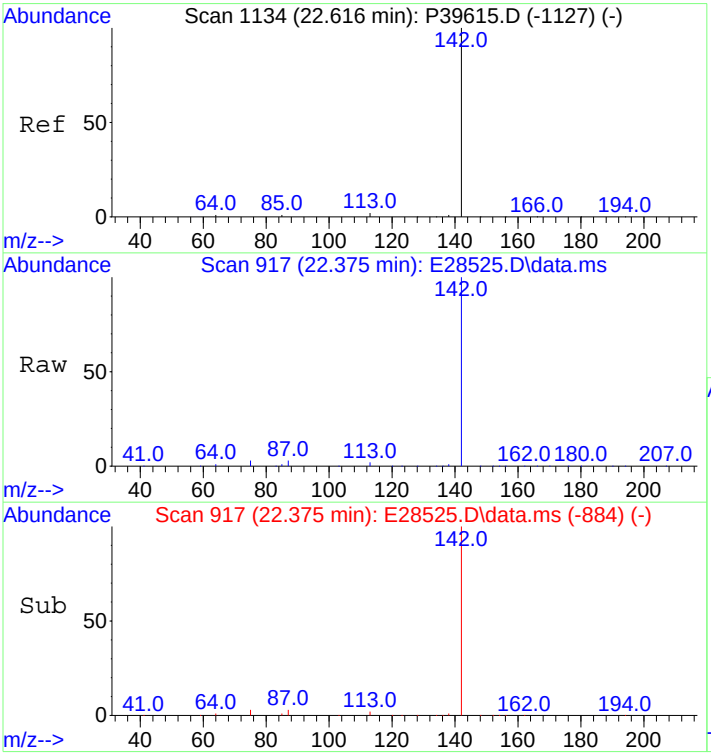


#10
Naphthalene
Concen: 4927.60 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:128 Resp: 666336

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

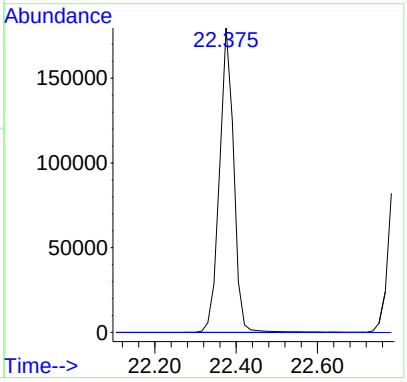


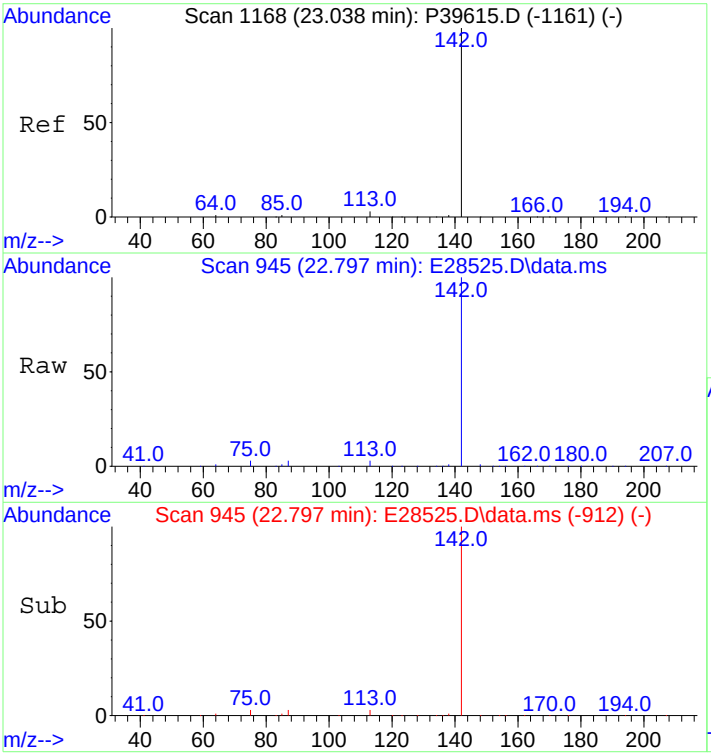


#16
2-Methylnaphthalene
Concen: 4966.58 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:142 Resp: 434650

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

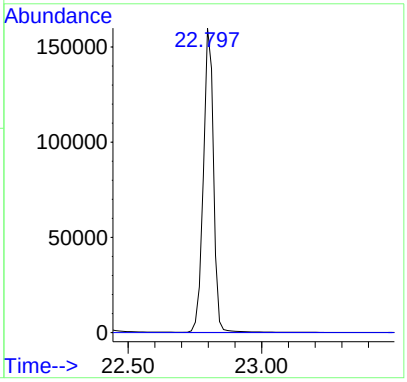


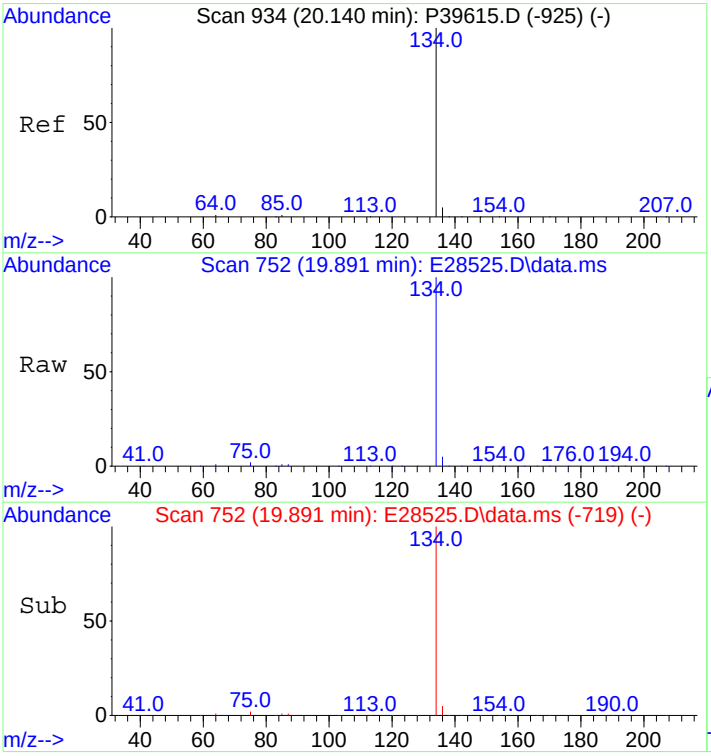


#17
1-Methylnaphthalene
Concen: 4984.07 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:142 Resp: 418300

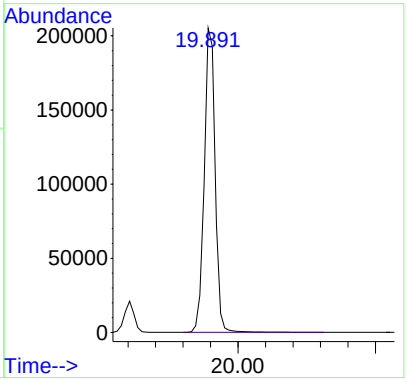
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

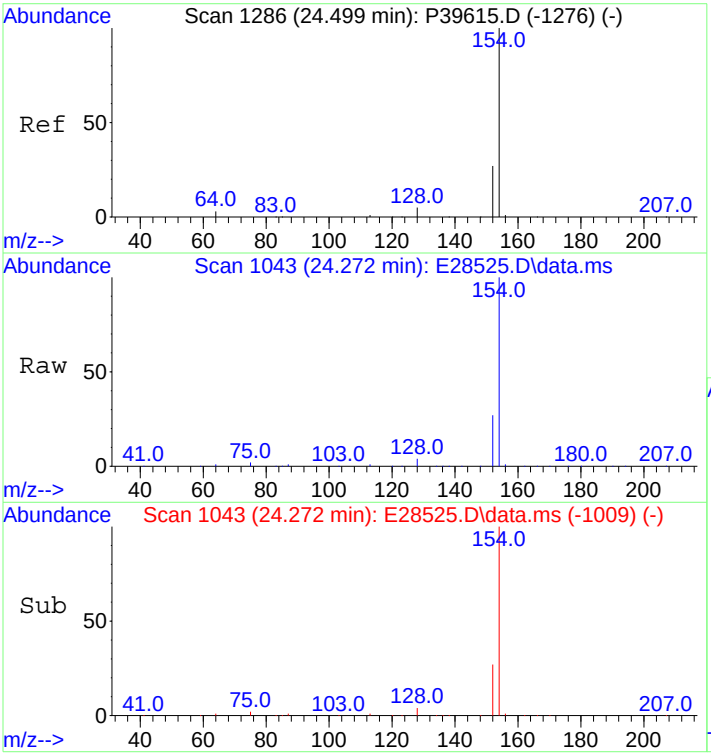




#18
Benzothiophene
Concen: 5079.74 ng/mL
RT: 19.891 min Scan# 752
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:134 Resp: 560368

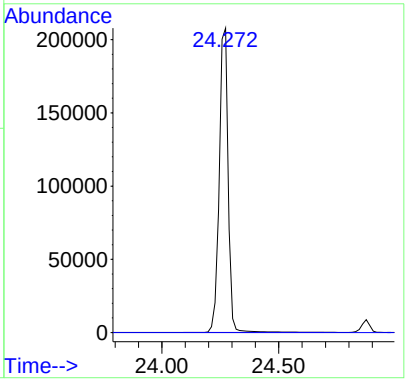


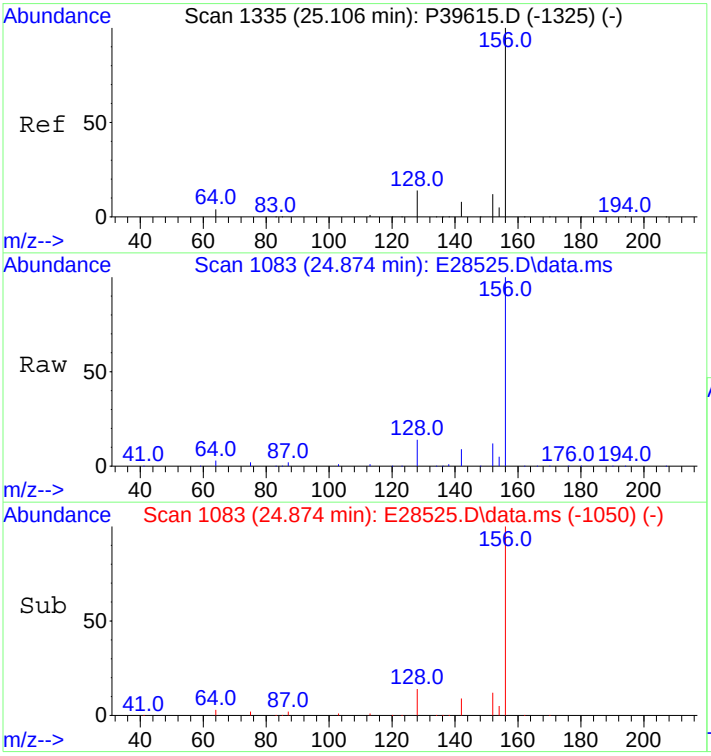


#23
Biphenyl
Concen: 4967.25 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:154 Resp: 550566

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

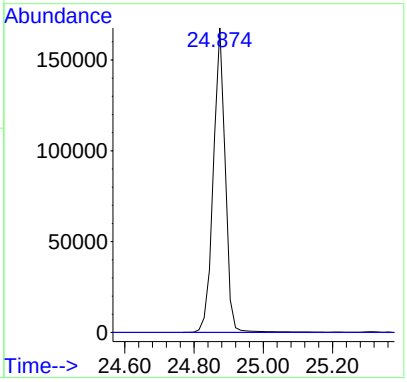


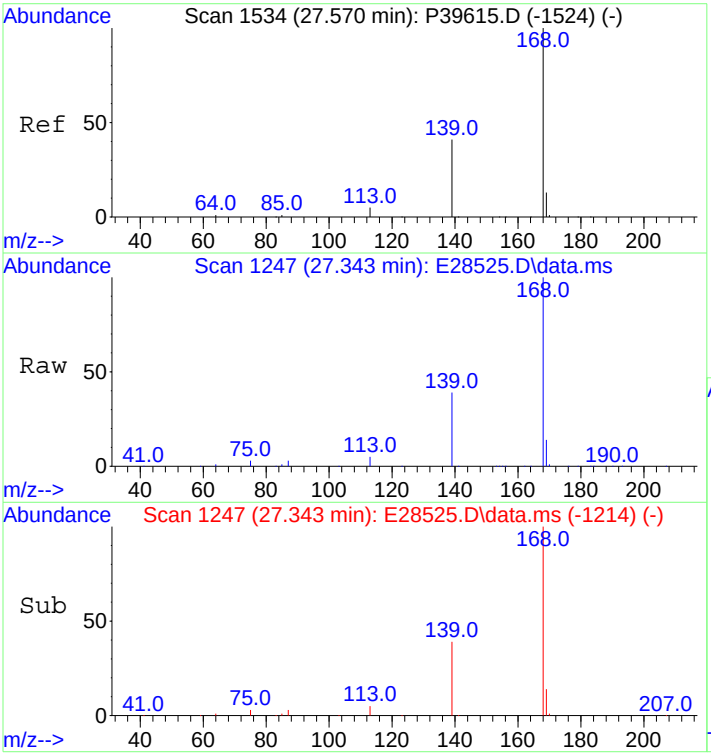


#24
2,6-Dimethylnaphthalene
Concen: 5017.33 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:156 Resp: 400289

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

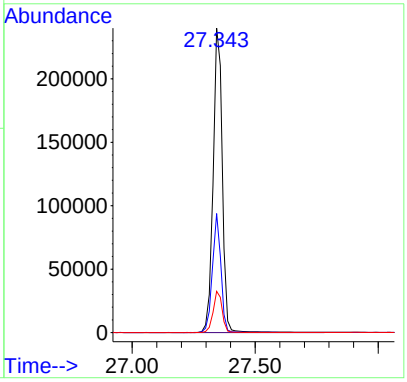


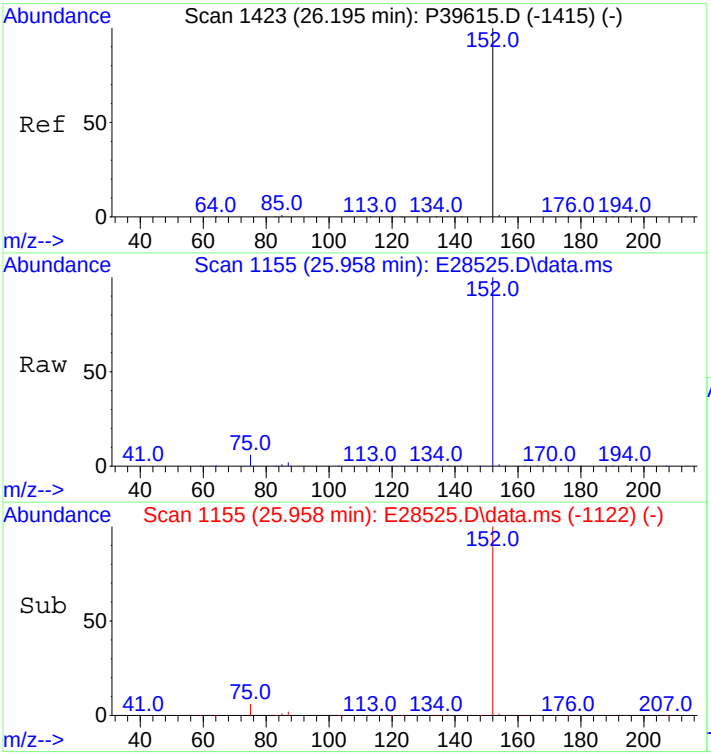


#25
Dibenzofuran
Concen: 5210.99 ng/mL
RT: 27.343 min Scan# 1247
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:168 Resp: 624188

Ion	Ratio	Lower	Upper
168	100		
139	36.4	30.6	45.8
169	13.4	10.6	16.0

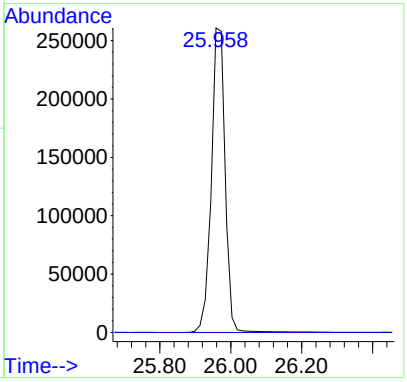


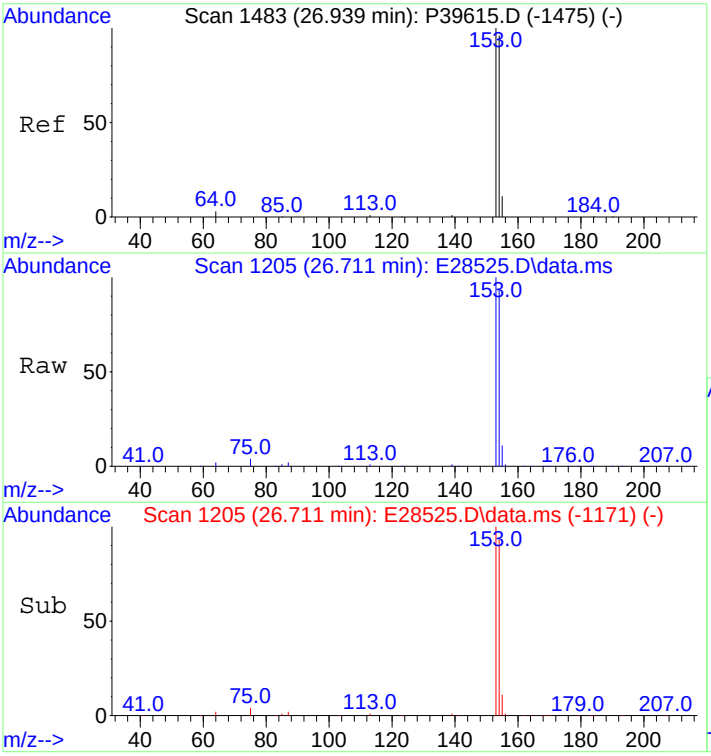


#26
Acenaphthylene
Concen: 5287.35 ng/mL m
RT: 25.958 min Scan# 1155
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:152 Resp: 705912

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

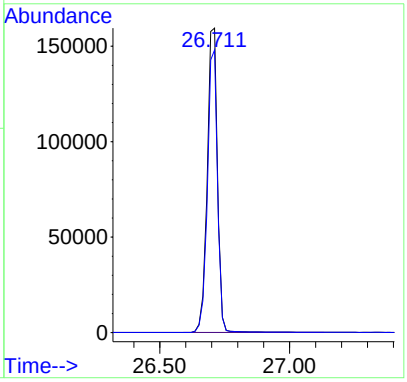


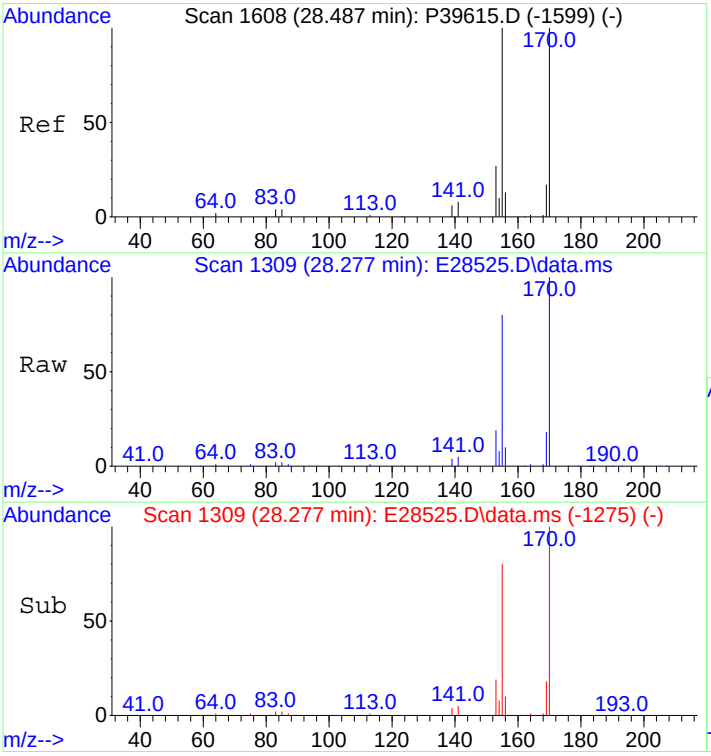


#27
Acenaphthene
Concen: 5240.87 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:153 Resp: 436058

Ion	Ratio	Lower	Upper
153	100		
154	91.4	72.3	108.5

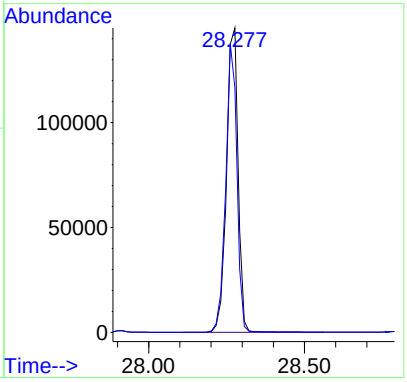


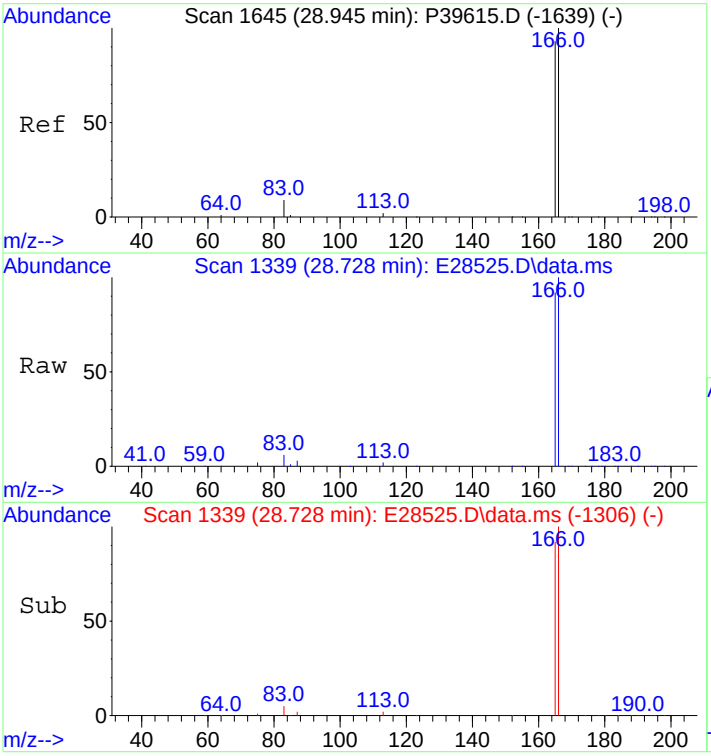


#28
2,3,5-Trimethylnaphthalene
Concen: 5223.53 ng/mL
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:170 Resp: 376690

Ion	Ratio	Lower	Upper
170	100		
155	91.5	75.9	113.9

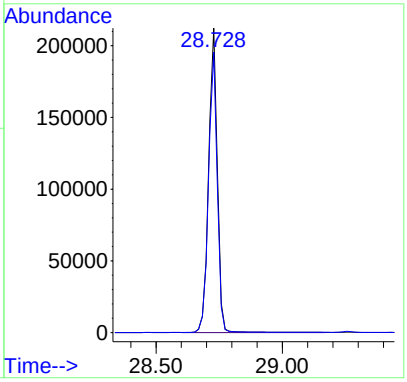


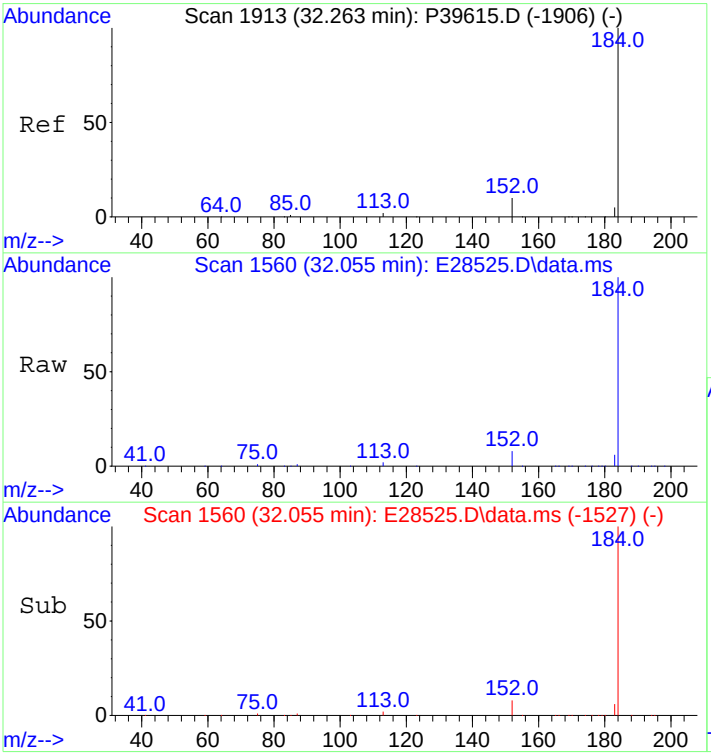


#29
Fluorene
Concen: 5252.40 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:166 Resp: 508103

Ion	Ratio	Lower	Upper
166	100		
165	92.4	73.8	110.6

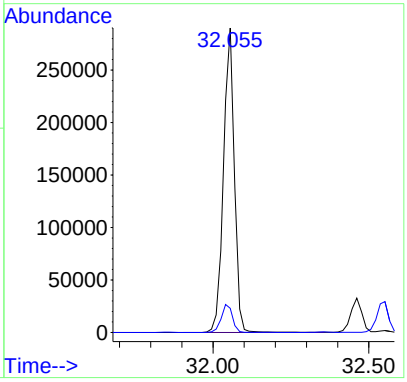


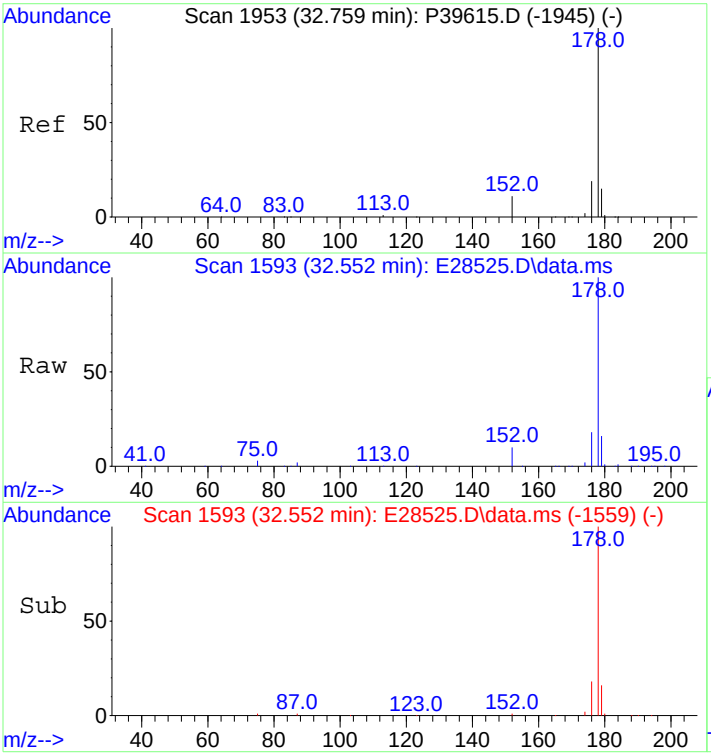


#33
Dibenzothiophene
Concen: 5181.64 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:184 Resp: 701873

Ion	Ratio	Lower	Upper
184	100		
152	9.5	6.2	9.2#

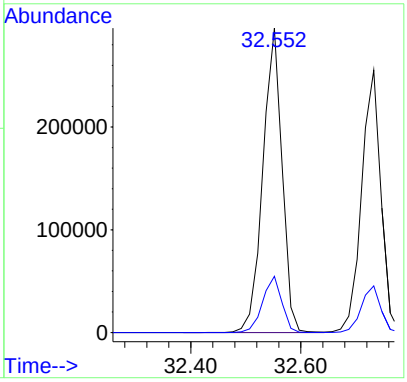


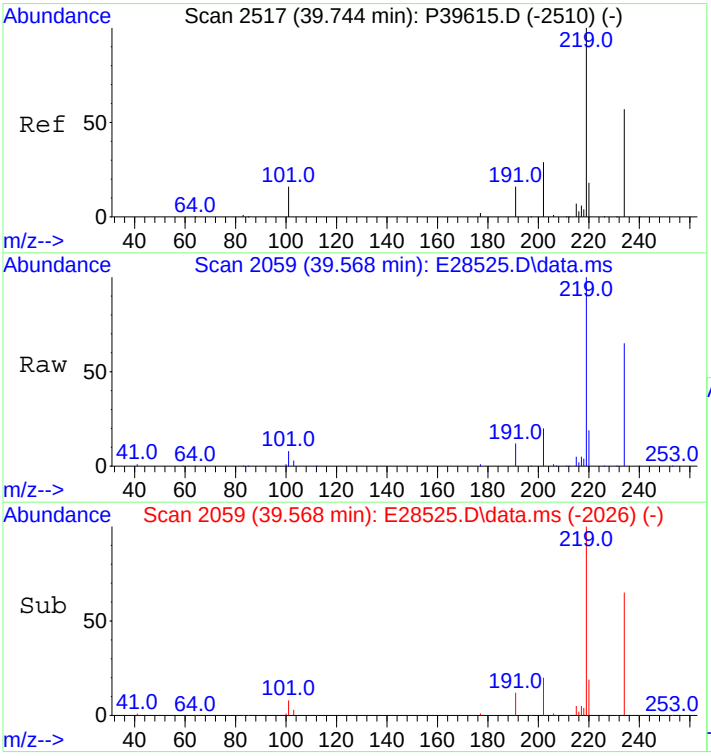


#43
Phenanthrene
Concen: 5064.28 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:178 Resp: 715454

Ion	Ratio	Lower	Upper
178	100		
176	18.5	15.0	22.6

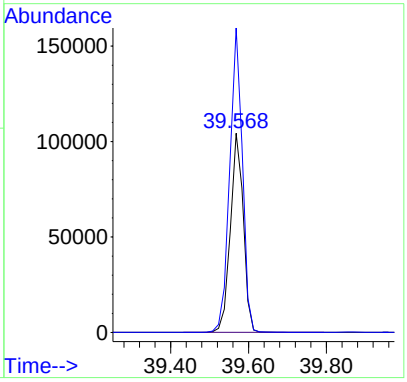


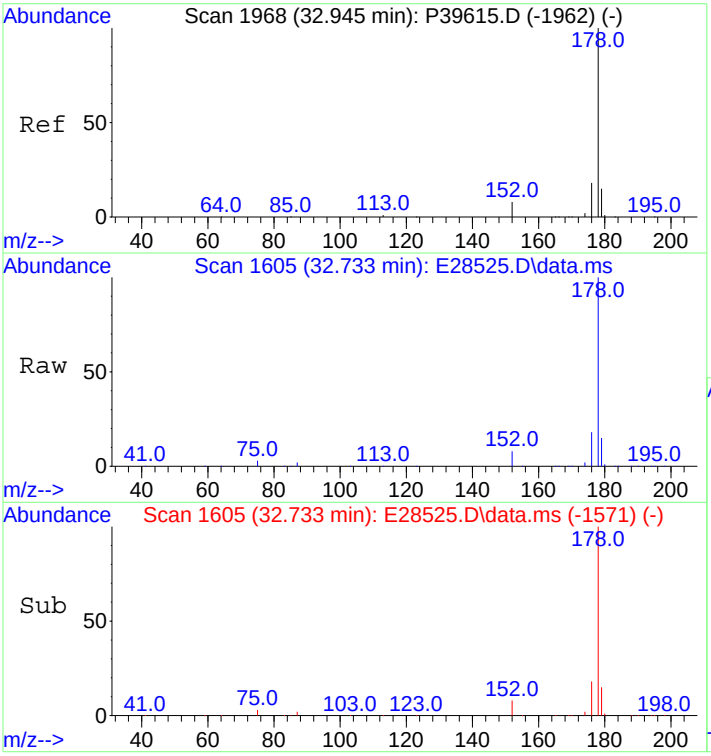


#54
Retene
Concen: 5556.39 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:234 Resp: 240302

Ion	Ratio	Lower	Upper
234	100		
219	149.9	113.0	169.4

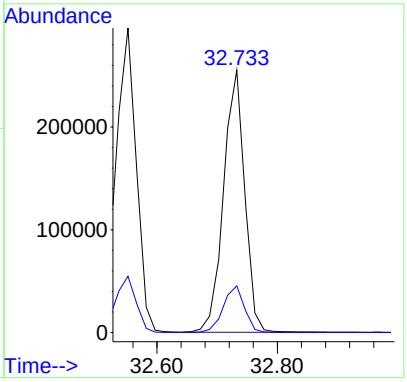


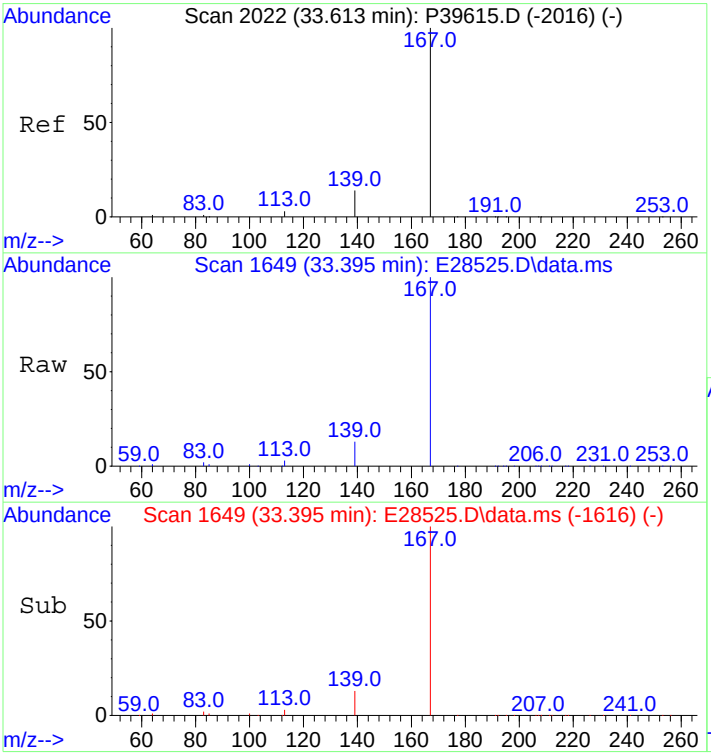


#55
Anthracene
Concen: 4706.47 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:178 Resp: 623046

Ion	Ratio	Lower	Upper
178	100		
176	18.2	14.5	21.7

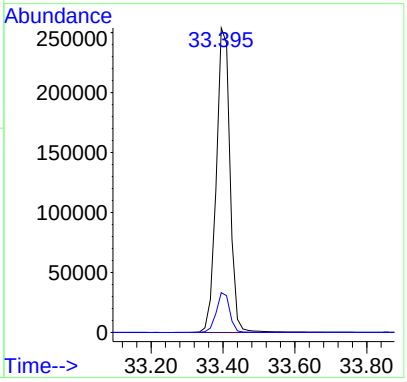


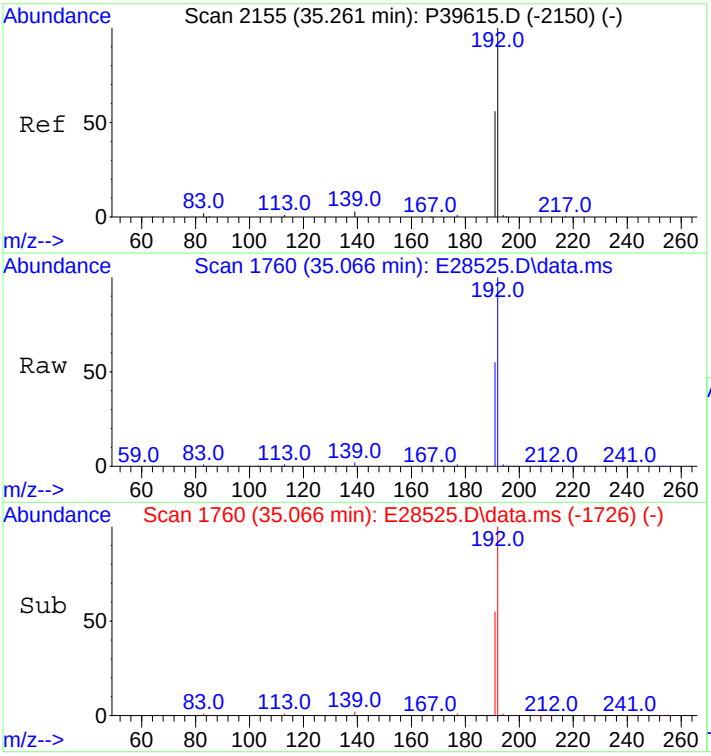


#56
Carbazole
Concen: 5375.45 ng/mL
RT: 33.395 min Scan# 1649
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:167 Resp: 672100

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.5	15.7

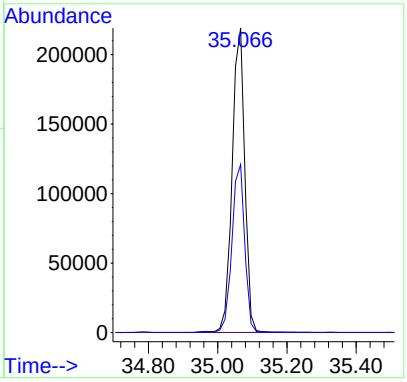


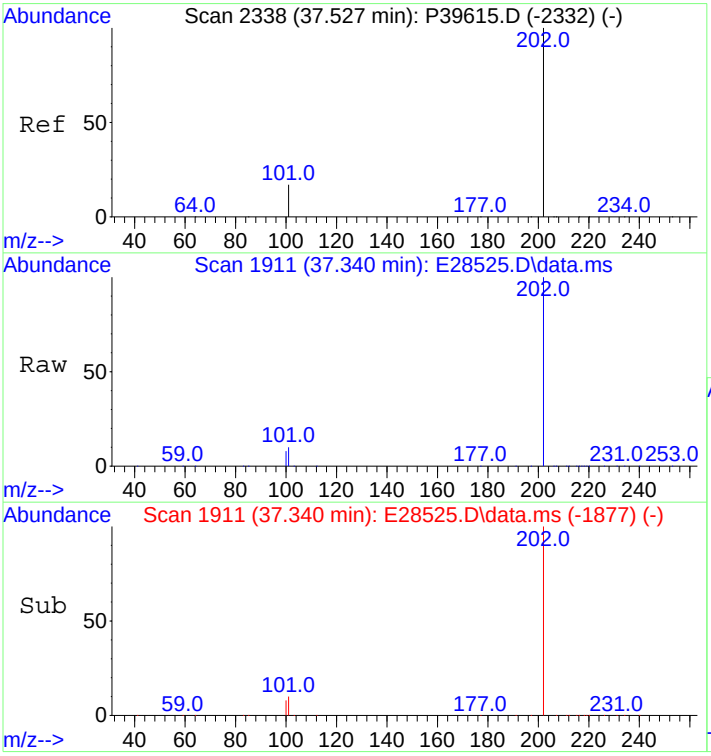


#57
1-Methylphenanthrene
Concen: 5294.59 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:192 Resp: 557136

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.5	68.3

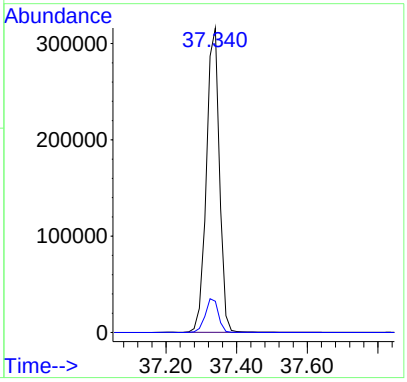


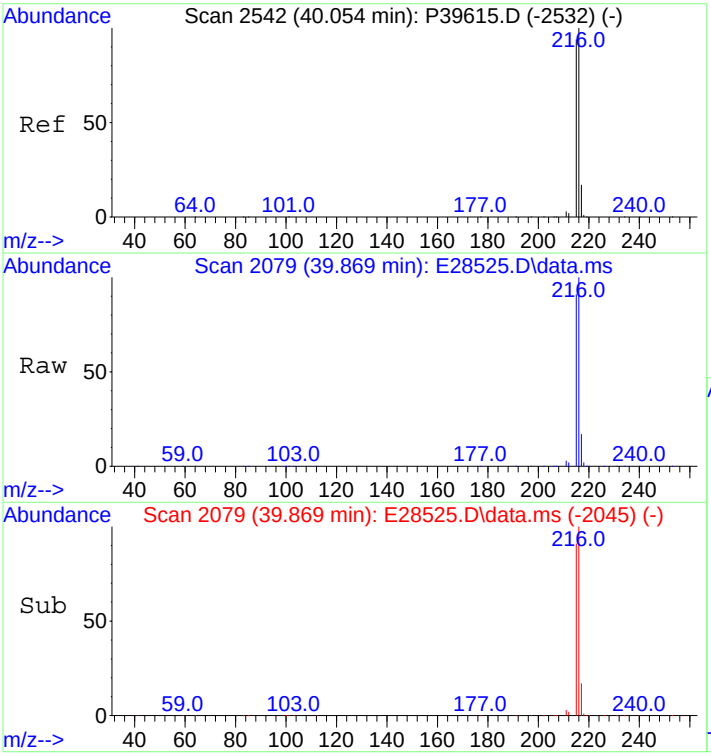


#58
Fluoranthene
Concen: 5278.66 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:202 Resp: 812711

Ion	Ratio	Lower	Upper
202	100		
101	11.2	9.2	13.8

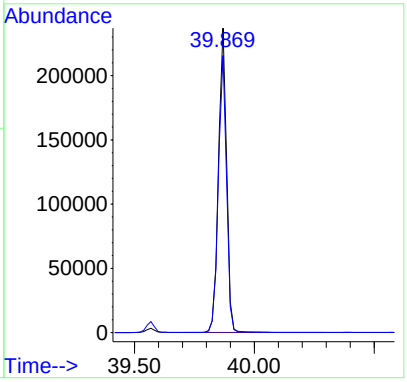


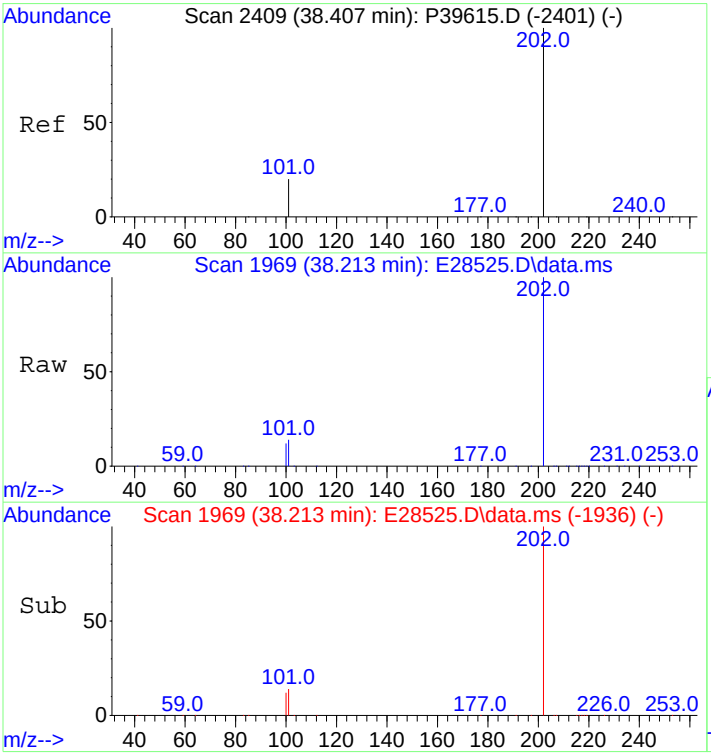


#59
Benzo(b)fluorene
Concen: 5756.59 ng/mL
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:216 Resp: 563733

Ion	Ratio	Lower	Upper
216	100		
215	91.2	73.8	110.8

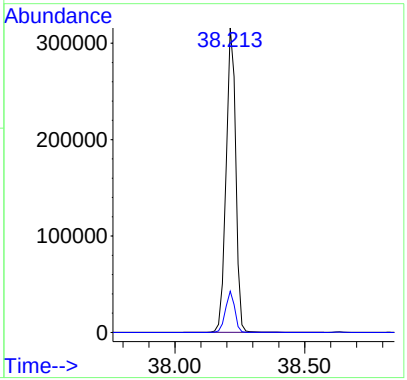


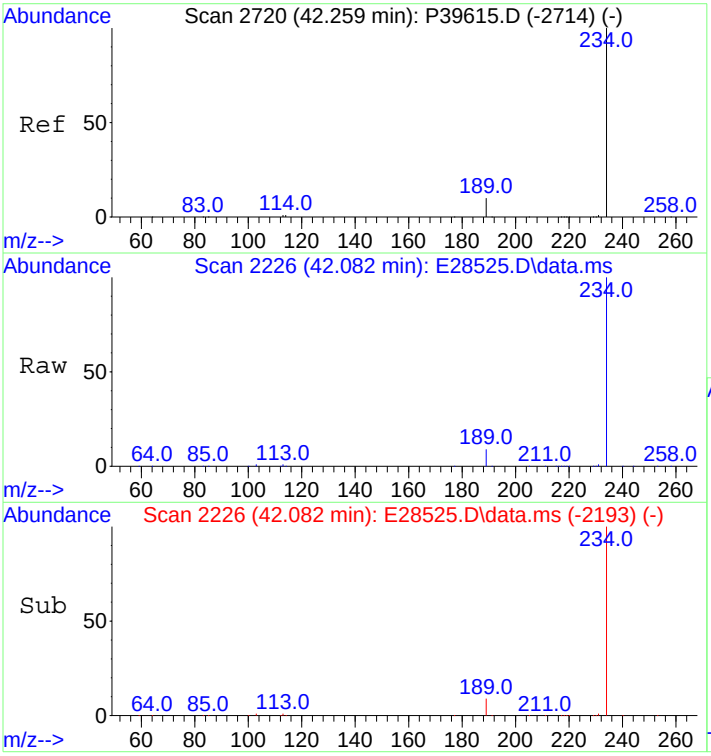


#60
Pyrene
Concen: 5234.53 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:202 Resp: 811273

Ion	Ratio	Lower	Upper
202	100		
101	13.0	9.8	14.8

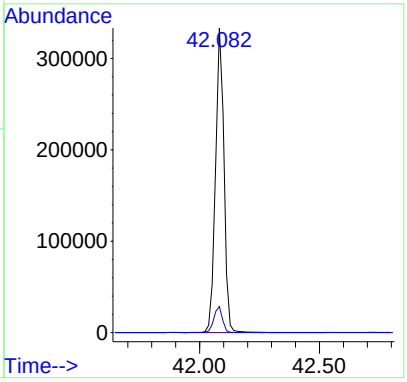


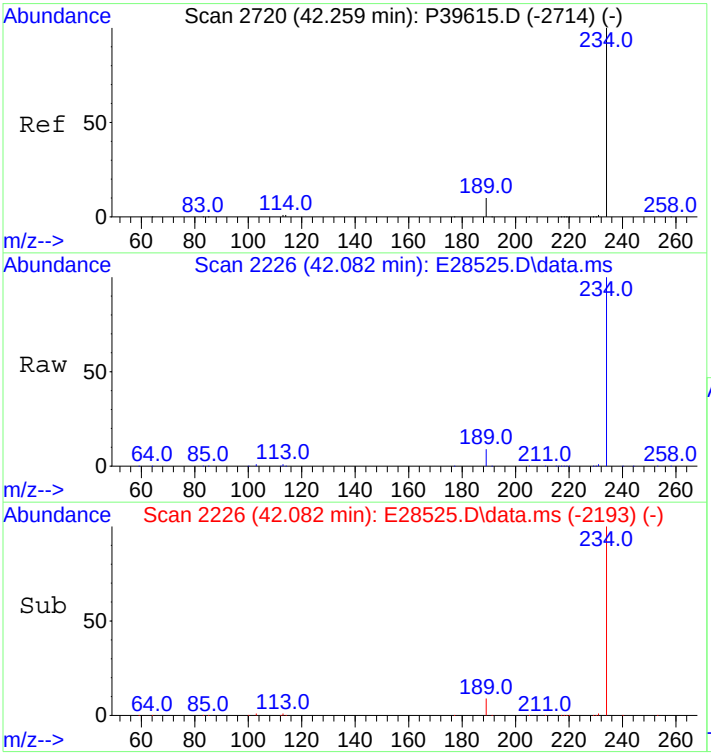


#66
Naphthobenzothiophene
Concen: 5594.50 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:234 Resp: 818126

Ion	Ratio	Lower	Upper
234	100		
189	8.7	5.5	8.3#

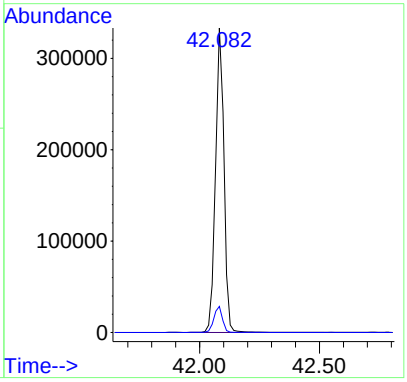


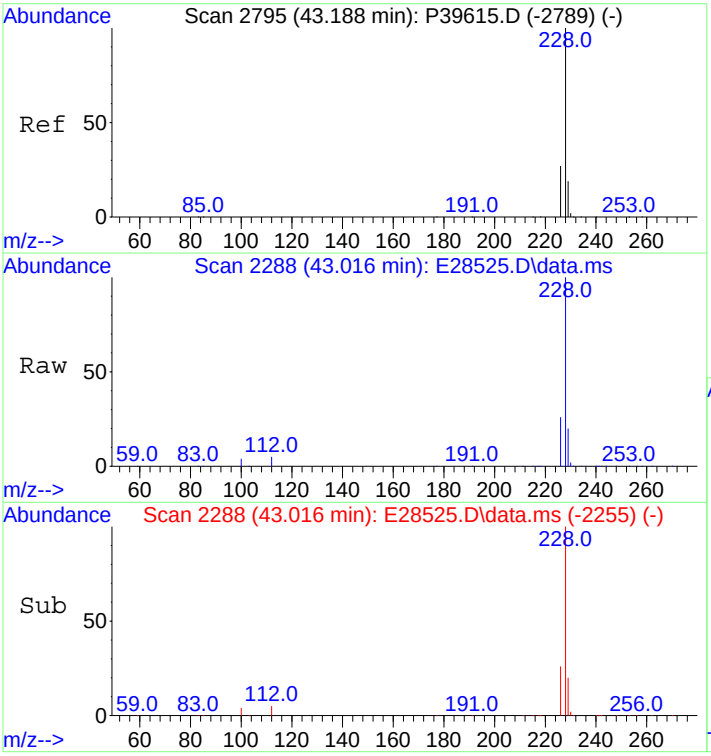


#67
Naphthobenzothiophene-2,1-D
Concen: 5594.50 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:234 Resp: 818126

Ion	Ratio	Lower	Upper
234	100		
189	8.7	5.5	8.3#

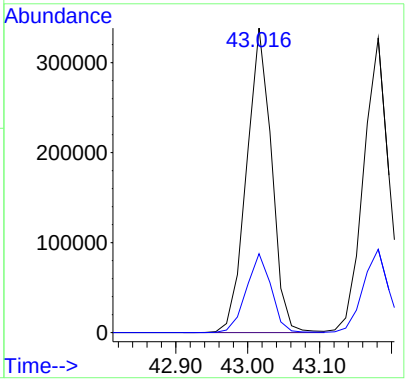


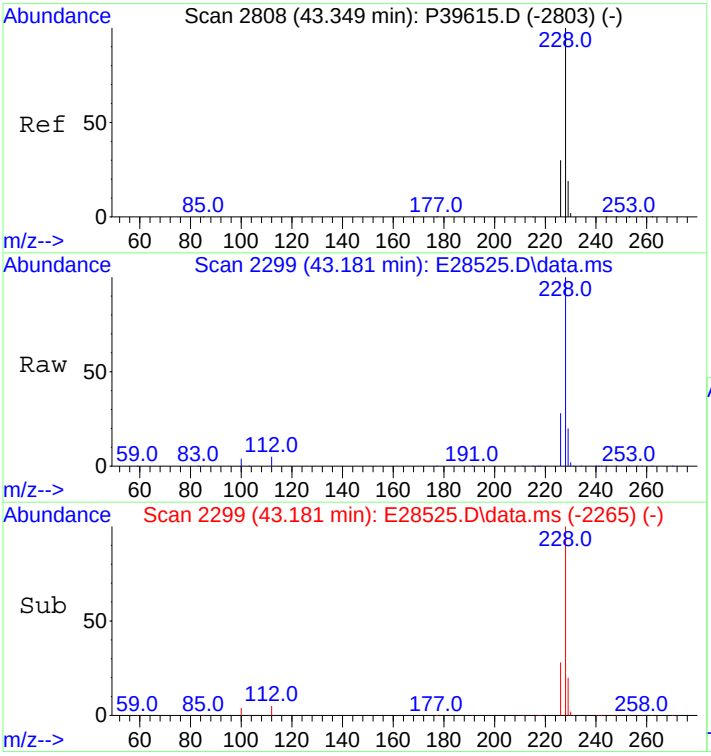


#75
Benz[a]anthracene
Concen: 4736.66 ng/mL
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:228 Resp: 819446

Ion	Ratio	Lower	Upper
228	100		
226	25.8	20.2	30.4

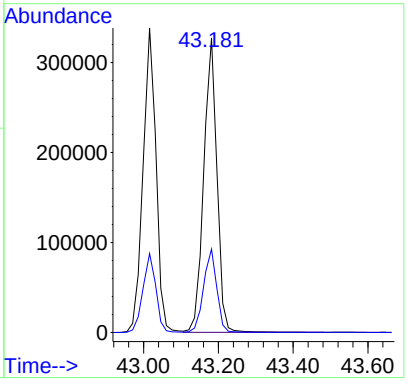


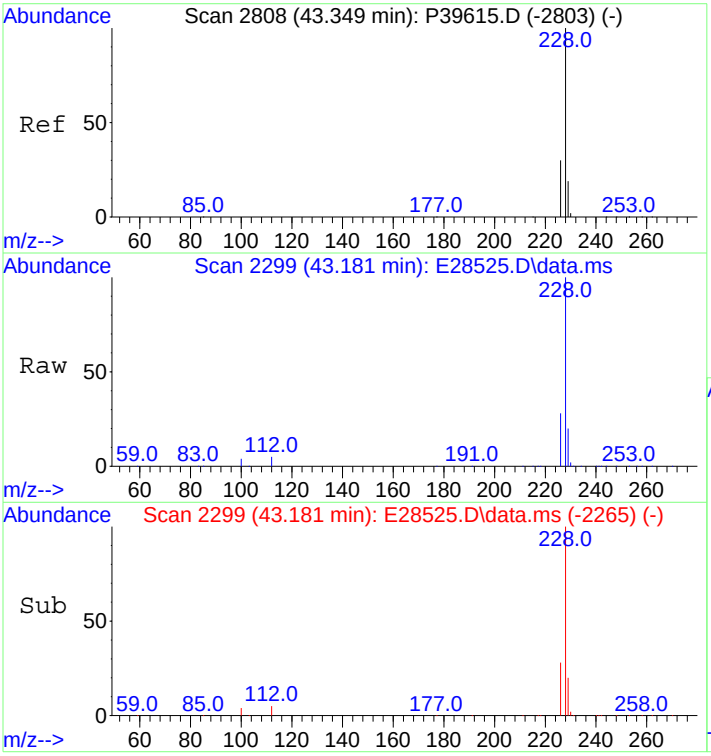


#76
Chrysene
Concen: 4721.40 ng/mL
RT: 43.181 min Scan# 2299
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:228 Resp: 799496

Ion	Ratio	Lower	Upper
228	100		
226	28.3	22.6	34.0

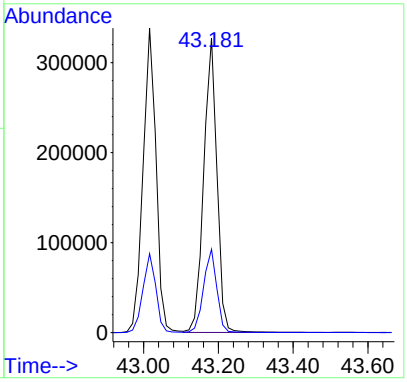


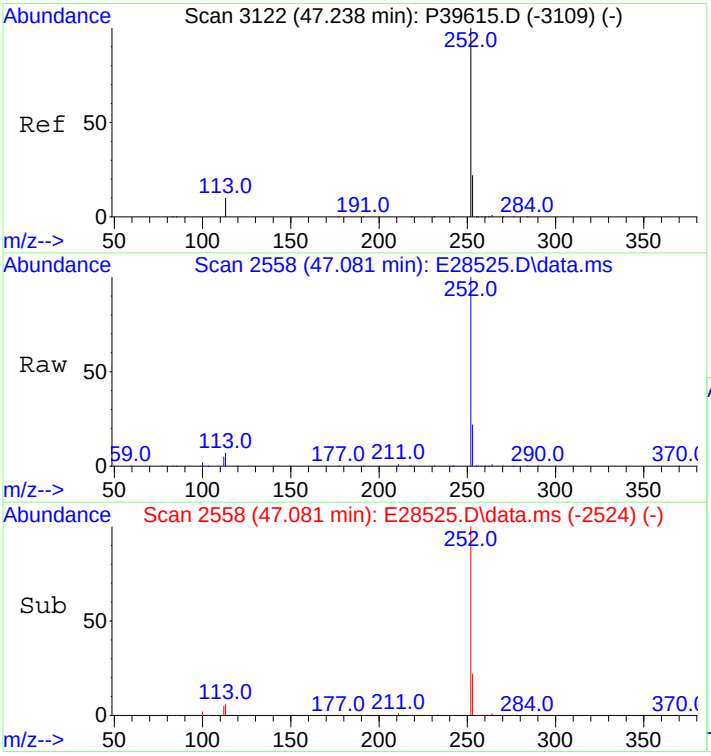


#77
Chrysene/Triphenylene
Concen: 4721.40 ng/mL
RT: 43.181 min Scan# 2299
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:228 Resp: 799496

Ion	Ratio	Lower	Upper
228	100		
226	28.3	22.6	34.0

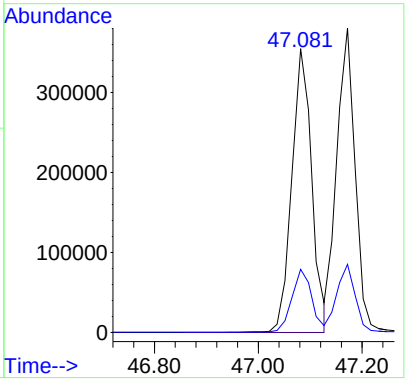


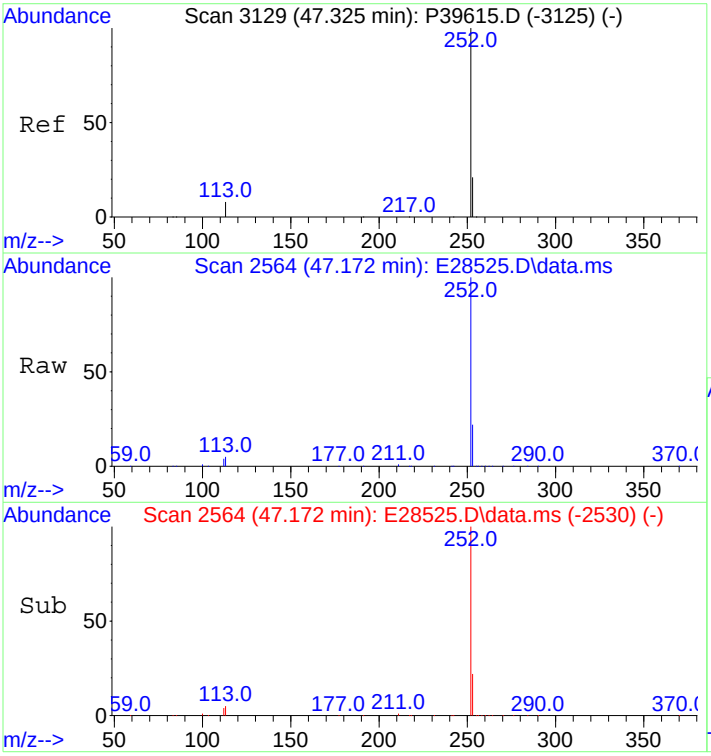


#84
Benzo[b]fluoranthene
Concen: 5206.97 ng/mL
RT: 47.081 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 948454

Ion	Ratio	Lower	Upper
252	100		
253	22.2	18.3	27.5

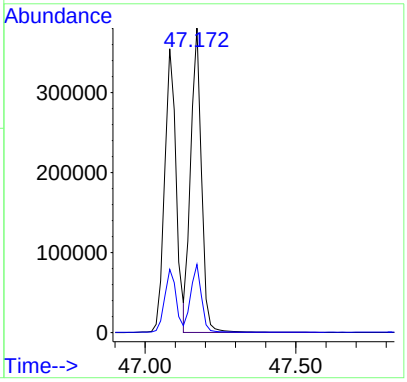


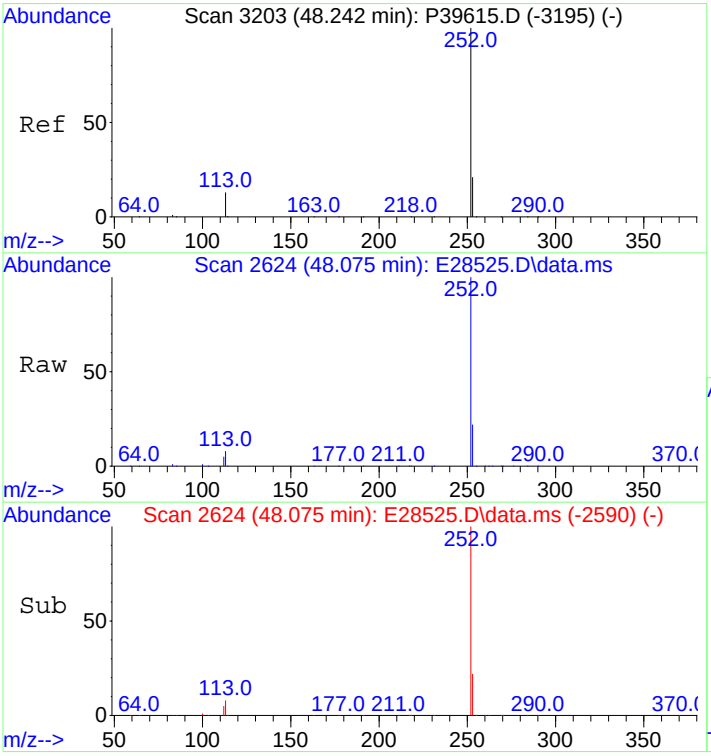


#85
Benzo[j]+[k]fluoranthene
Concen: 5522.01 ng/mL
RT: 47.172 min Scan# 2564
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 946512

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.3	27.5

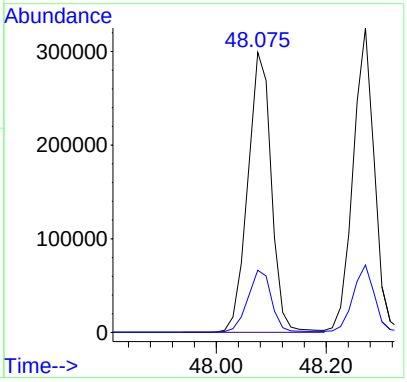


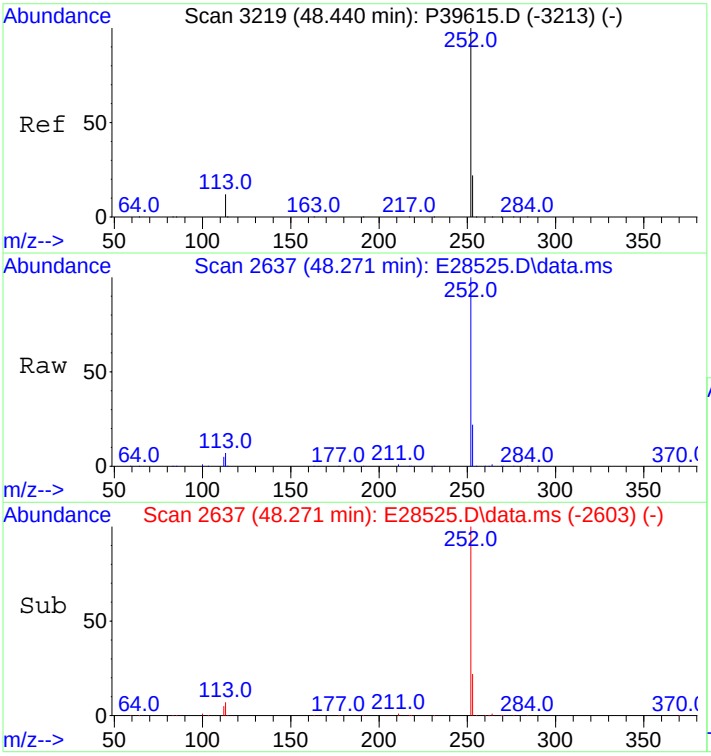


#87
Benzo[e]pyrene
Concen: 5507.77 ng/mL
RT: 48.075 min Scan# 2624
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 890237

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.6	28.0

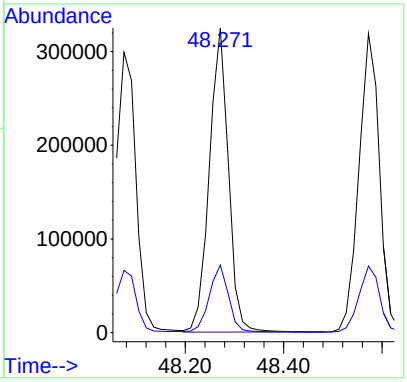


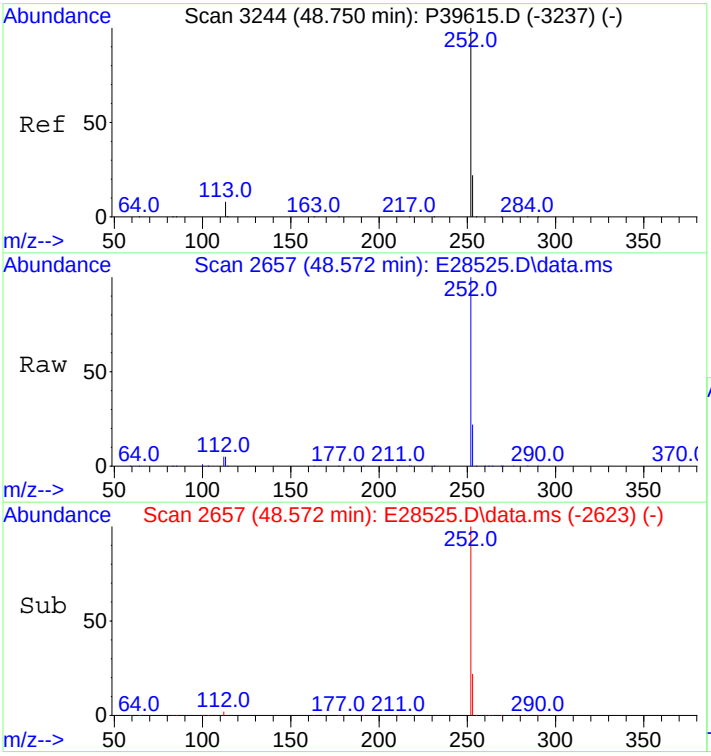


#89
Benzo[a]pyrene
Concen: 5716.86 ng/mL
RT: 48.271 min Scan# 2637
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 873584

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

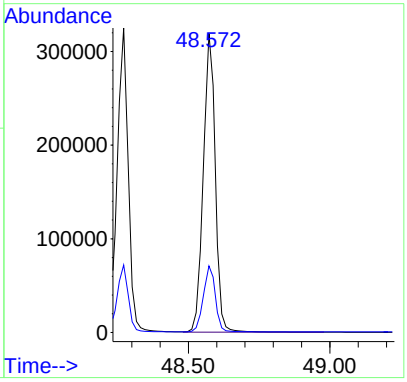


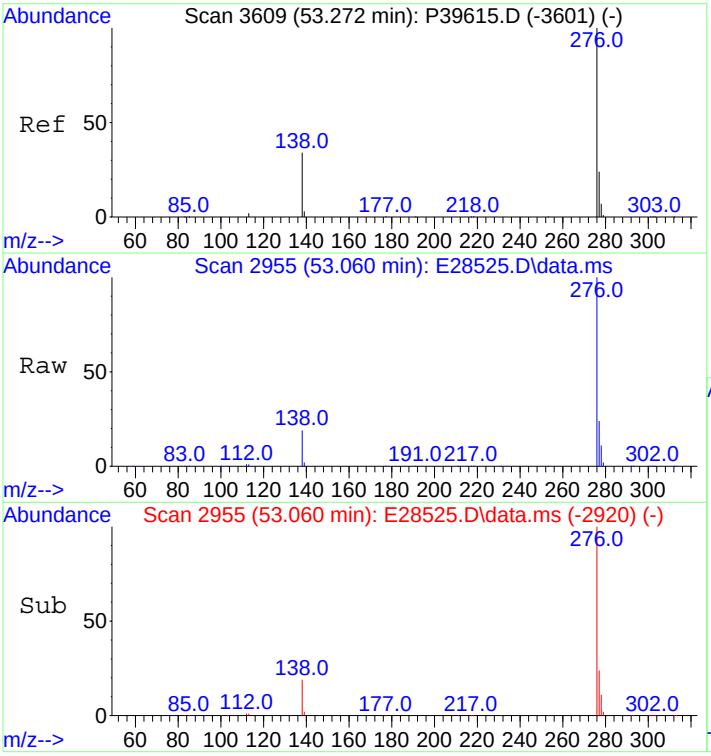


#90
Perylene
Concen: 5751.80 ng/mL
RT: 48.572 min Scan# 2657
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:252 Resp: 935392

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

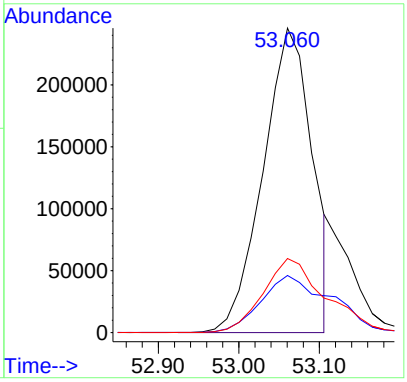


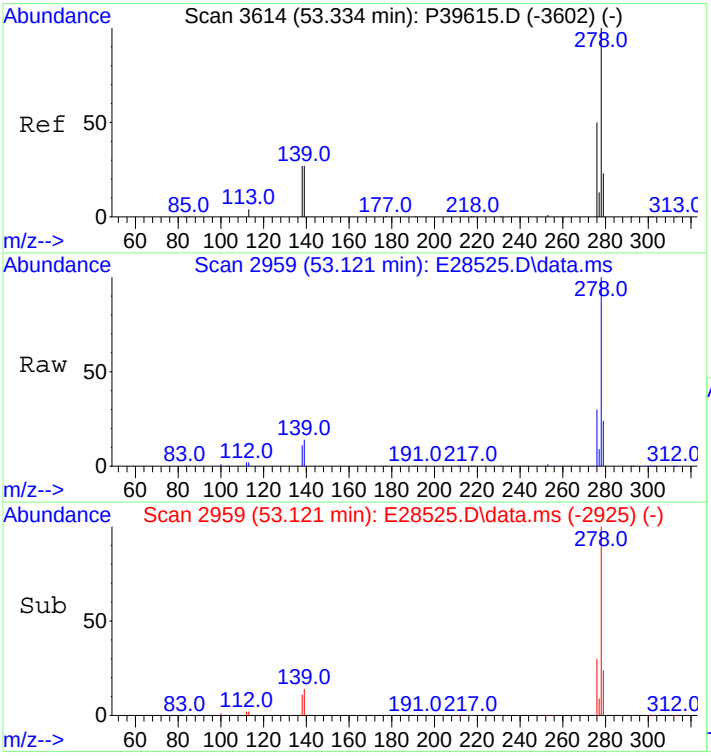


#91
Indeno[1,2,3-cd]pyrene
Concen: 5690.92 ng/mL m
RT: 53.060 min Scan# 2955
Delta R.T. 0.030 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:276 Resp: 1049897

Ion	Ratio	Lower	Upper
276	100		
138	27.1	15.4	23.2#
277	31.1	19.1	28.7#

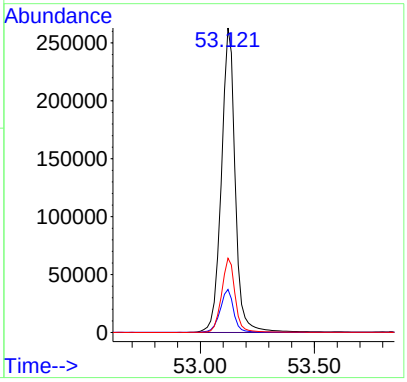


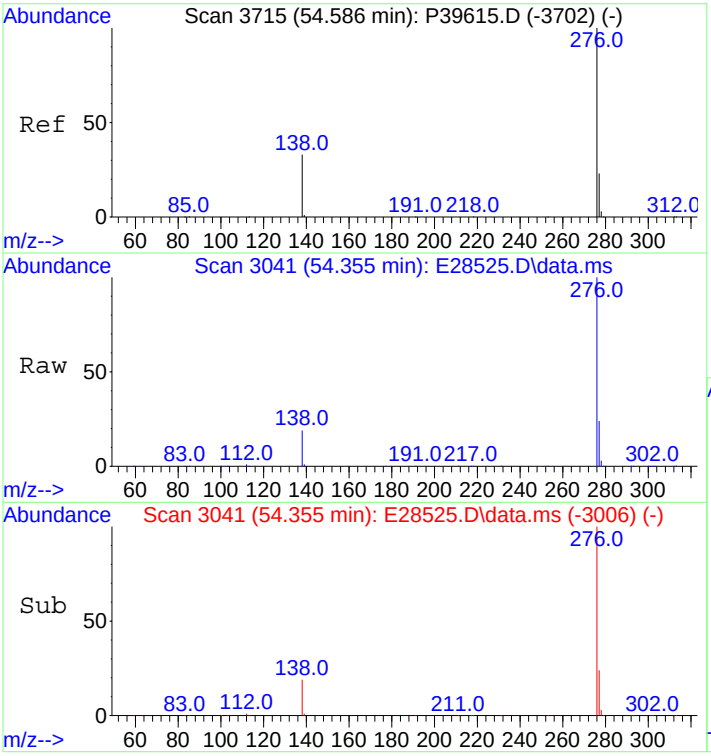


#92
Dibenz[ah]+[ac]anthracene
Concen: 6262.02 ng/mL
RT: 53.121 min Scan# 2959
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:278 Resp: 1111133

Ion	Ratio	Lower	Upper
278	100		
139	14.0	11.1	16.7
279	23.8	19.4	29.0

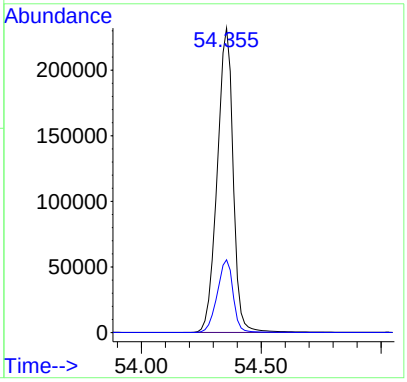


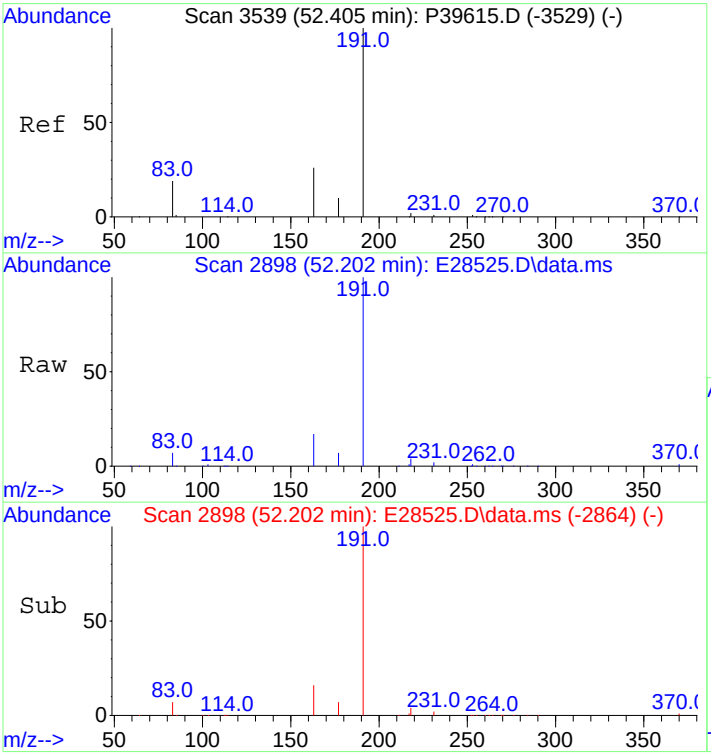


#93
Benzo[g,h,i]perylene
Concen: 5903.06 ng/mL
RT: 54.355 min Scan# 3041
Delta R.T. 0.030 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:276 Resp: 1070138

Ion	Ratio	Lower	Upper
276	100		
277	24.0	19.1	28.7

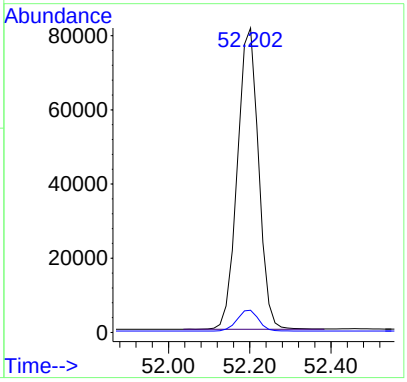


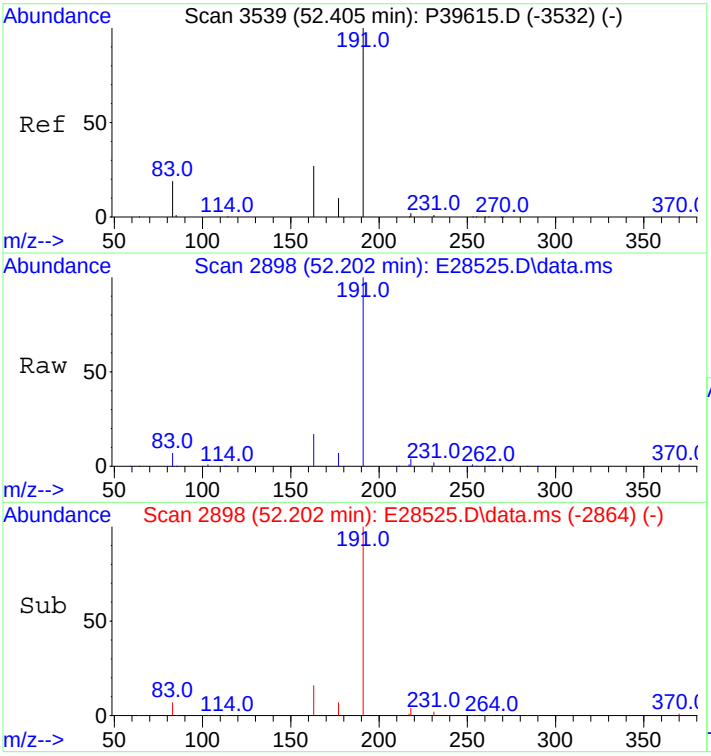


#94
Hopane (T19)
Concen: 6862.37 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:191 Resp: 293886

Ion	Ratio	Lower	Upper
191	100		
177	7.1	8.7	13.1#

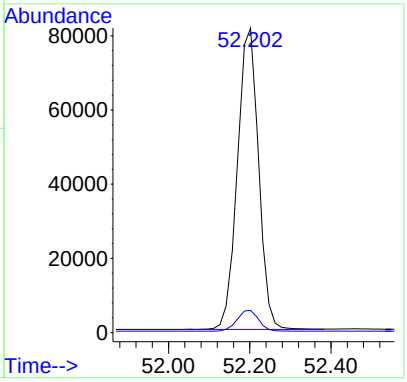




#95
17a(H),21B(H)-hopane - C30H52
Concen: 6862.37 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28525.D
Acq: 29 Oct 2012 10:25 pm

Tgt Ion:191 Resp: 293886

Ion	Ratio	Lower	Upper
191	100		
177	7.1	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 12:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.575	164	34237M3	500.000 ng/mL	0.00
74) Chrysene-d12	43.076	240	83845	500.000 ng/mL	0.00
System Monitoring Compounds					
9) Naphthalene-d8	19.605	136	1249184	9794.704 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 979.47%#		
42) Phenanthrene-d10	32.462	188	1381837	10751.358 ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1075.14%#		
83) Benzo[b]fluoranthene-d12	47.021	264	1786107	11251.833 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1125.18%#		
88) Benzo[a]pyrene-d12	48.196	264	1750732	12160.609 ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1216.06%#		
129) 5B(H)Cholane - Surr	43.723	217	325906	10543.794 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1054.38%#		
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	128304	4501.898 ng/mL	100
4) cis-Decalin	17.483	138	99422	4592.482 ng/mL	100
10) Naphthalene	19.680	128	1288199	9416.689 ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	853166	9636.608 ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	824452	9710.342 ng/mL#	100
18) Benzothiophene	19.906	134	1095341	9815.012 ng/mL	100
23) Biphenyl	24.272	154	1084695	9673.576 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	792979	9825.029 ng/mL#	100
25) Dibenzofuran	27.358	168	1242869	10256.606 ng/mL	97
26) Acenaphthylene	25.973	152	1390024M3	10291.595 ng/mL	
27) Acenaphthene	26.711	153	862774	10250.123 ng/mL	99
28) 2,3,5-Trimethylnaphtha...	28.277	170	754332	10339.879 ng/mL	95
29) Fluorene	28.728	166	1008743	10307.649 ng/mL	100
33) Dibenzothiophene	32.055	184	1394373	10175.622 ng/mL#	95
43) Phenanthrene	32.552	178	1429622	10003.004 ng/mL	100
54) Retene	39.583	234	485174	11089.355 ng/mL	94
55) Anthracene	32.733	178	1096223M3	8185.530 ng/mL	
56) Carbazole	33.410	167	1356581	10725.058 ng/mL	99
57) 1-Methylphenanthrene	35.066	192	1115333	10477.285 ng/mL	99
58) Fluoranthene	37.340	202	1611679M3	10347.593 ng/mL	
59) Benzo(b)fluorene	39.884	216	1126932	11375.299 ng/mL	99
60) Pyrene	38.228	202	1624916	10363.699 ng/mL	98
66) Naphthobenzothiophene	42.097	234	1632867	11037.350 ng/ml#	95
67) Naphthobenzothiophene-...	42.097	234	1632867	11037.350 ng/mL#	95
75) Benz[a]anthracene	43.031	228	1626986M3	8752.250 ng/mL	
76) Chrysene	43.197	228	1589503	8735.745 ng/mL	99
77) Chrysene/Triphenylene	43.197	228	1589503	8735.745 ng/mL	99
84) Benzo[b]fluoranthene	47.097	252	1921388	9816.767 ng/mL	99
85) Benzo[j]+[k]fluoranthene	47.187	252	1850530	10047.358 ng/mL	99
87) Benzo[e]pyrene	48.090	252	1770929	10196.616 ng/mL	98
89) Benzo[a]pyrene	48.286	252	1716035	10451.142 ng/mL	98
90) Perylene	48.587	252	1845721	10562.348 ng/mL	98
91) Indeno[1,2,3-cd]pyrene	53.090	276	2185546M3	11025.031 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.151	278	2240598	11751.587 ng/mL	100
93) Benzo[g,h,i]perylene	54.386	276	2141401	10993.087 ng/mL	99
94) Hopane (T19)	52.202	191	594811	12925.841 ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	594811	12925.841 ng/mL#	90

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 31 12:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

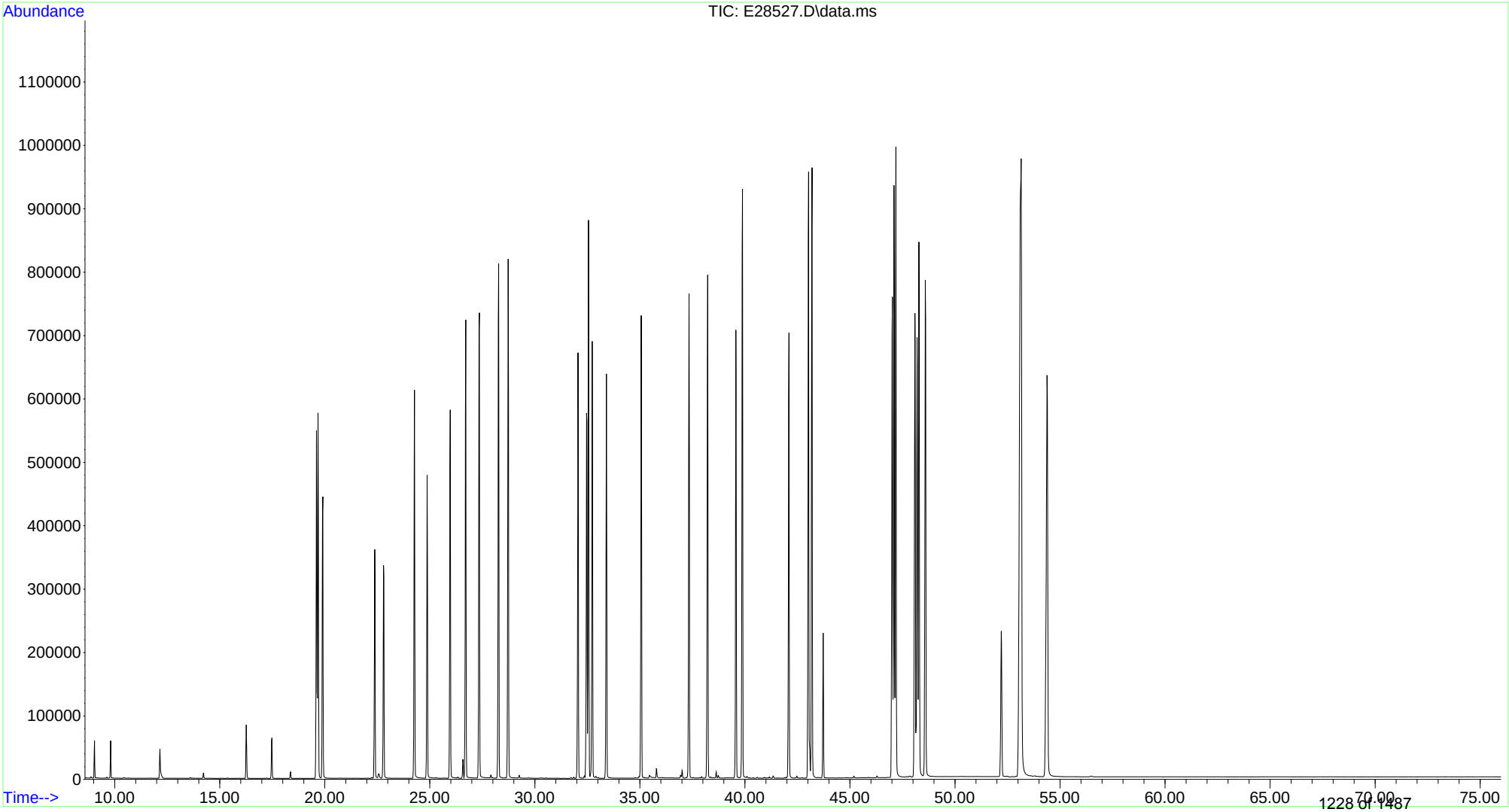
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

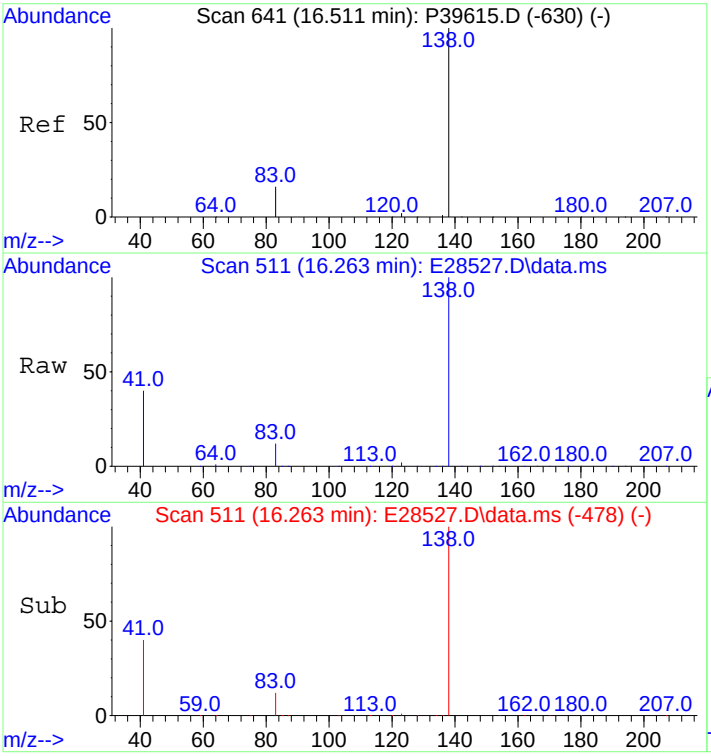
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28527.D
Acq On : 29 Oct 2012 11:54 pm
Operator : AC
Sample : I210291206
Misc : L6 WHAQ39
ALS Vial : 9 Sample Multiplier: 1

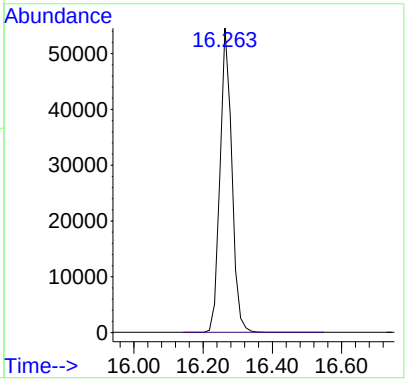
Quant Time: Oct 31 12:58:56 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

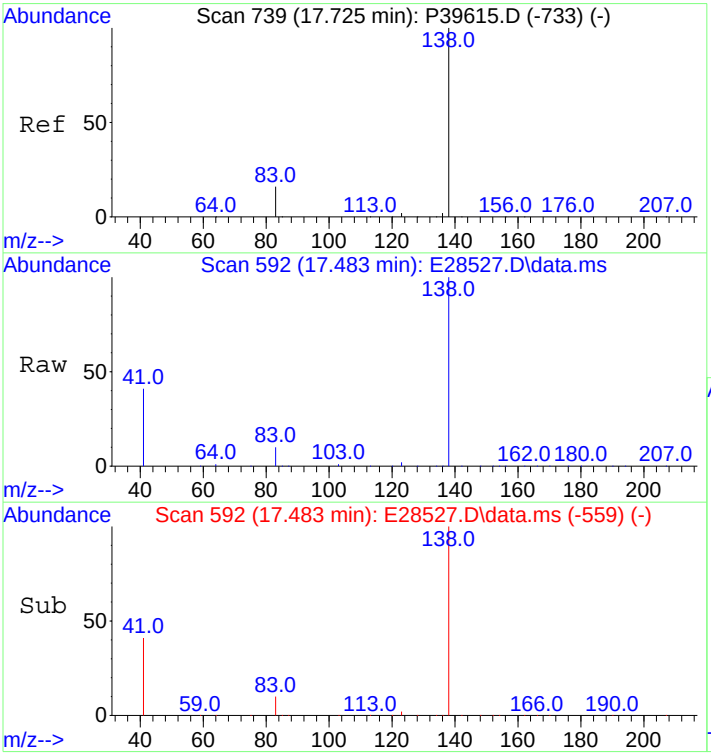




#3
trans-Decalin
Concen: 4501.90 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

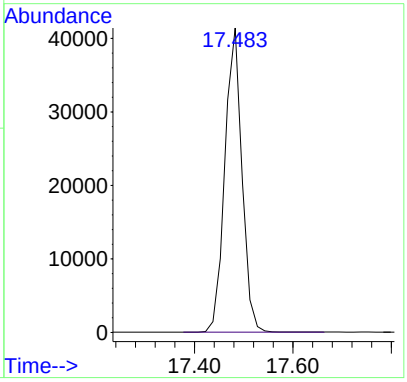
Tgt Ion:138 Resp: 128304

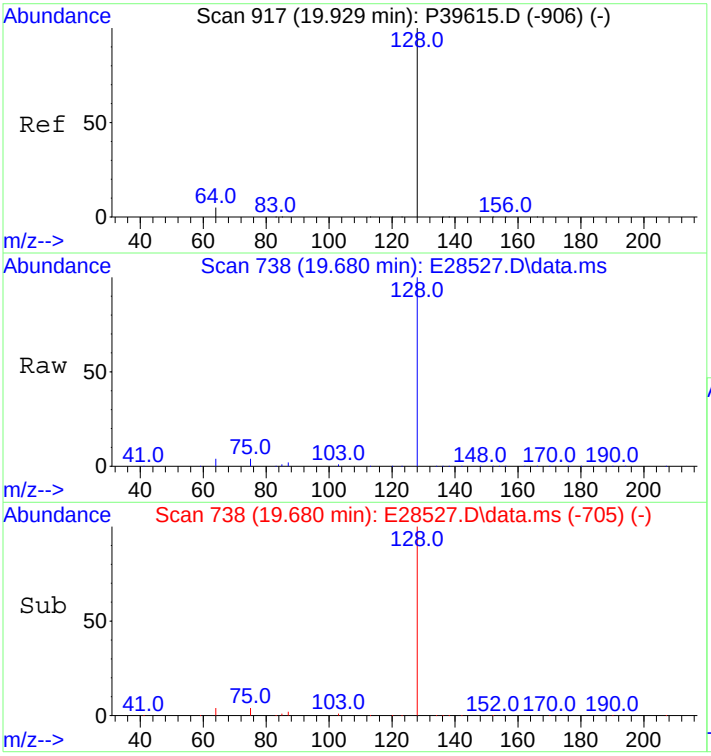




#4
cis-Decalin
Concen: 4592.48 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:138 Resp: 99422

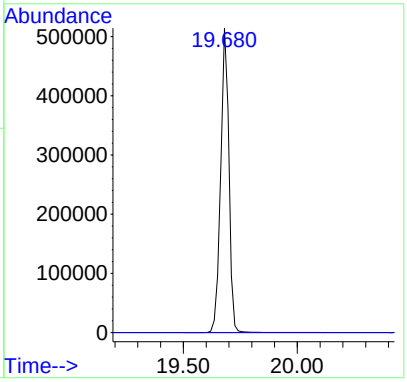


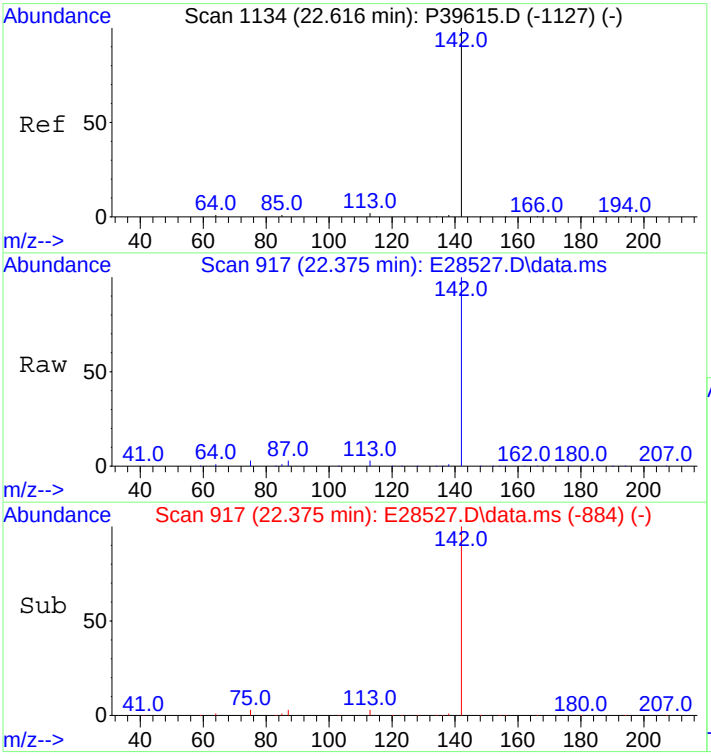


#10
Naphthalene
Concen: 9416.69 ng/mL
RT: 19.680 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:128 Resp: 1288199

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

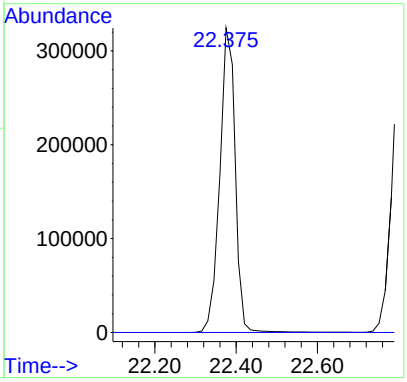


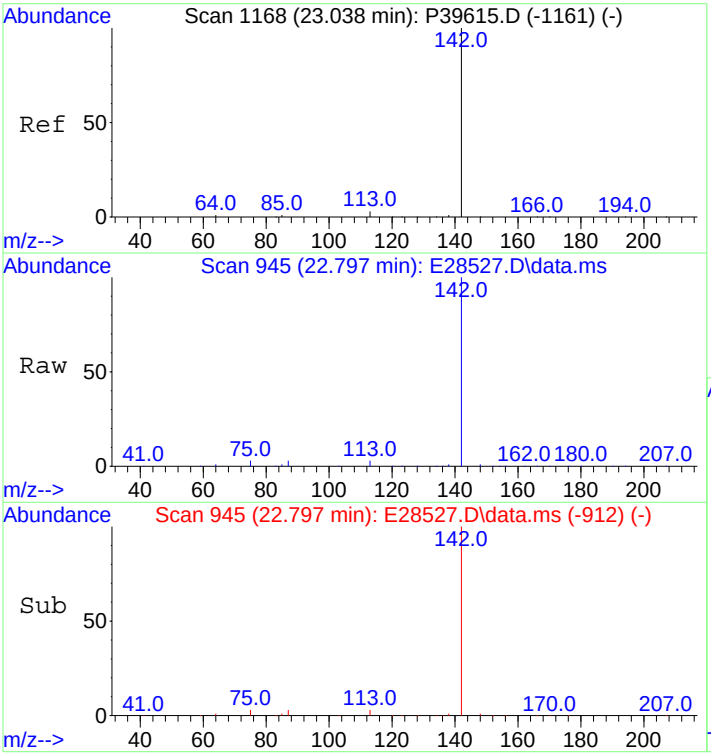


#16
2-Methylnaphthalene
Concen: 9636.61 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:142 Resp: 853166

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

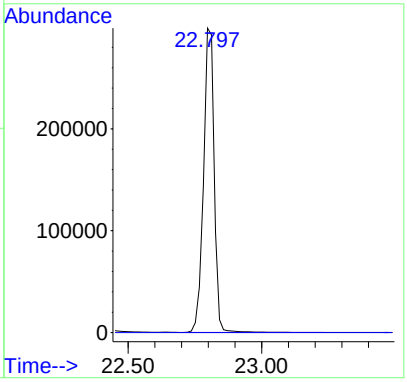


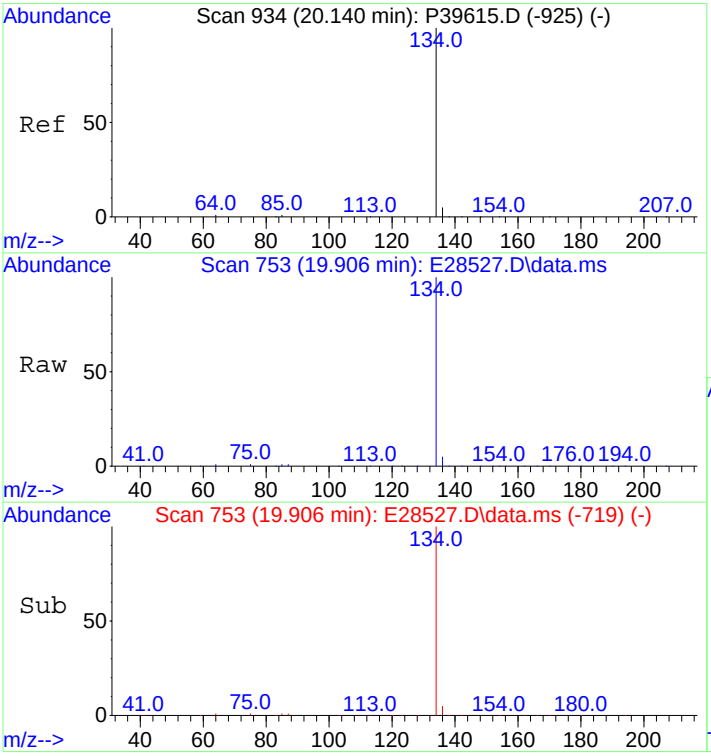


#17
1-Methylnaphthalene
Concen: 9710.34 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:142 Resp: 824452

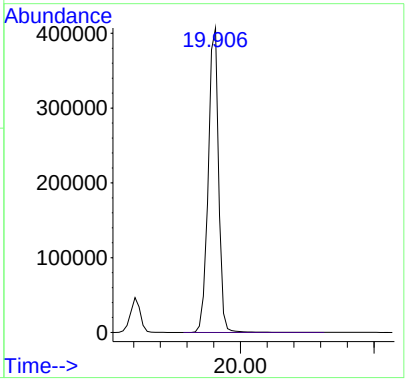
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

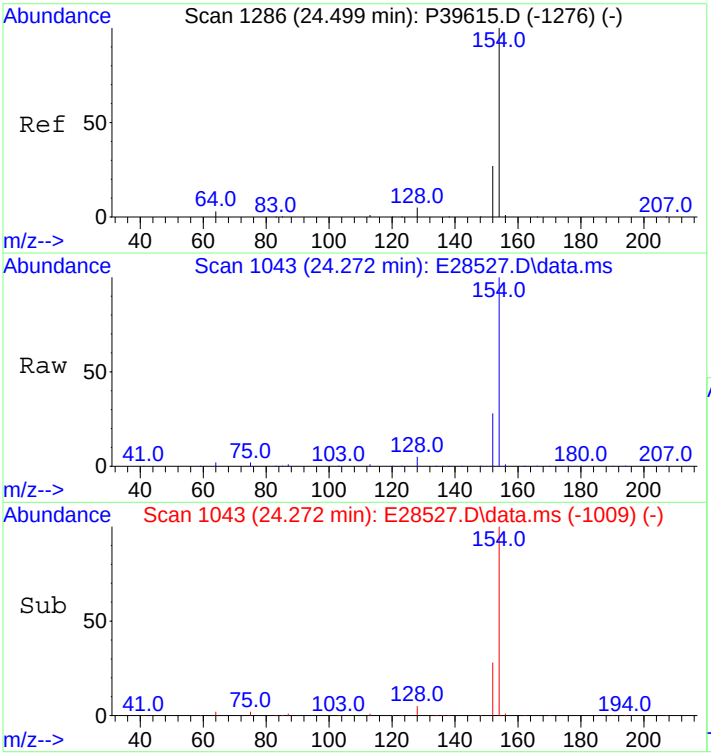




#18
Benzothiophene
Concen: 9815.01 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:134 Resp: 1095341

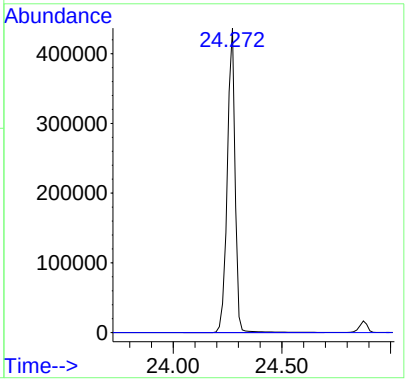


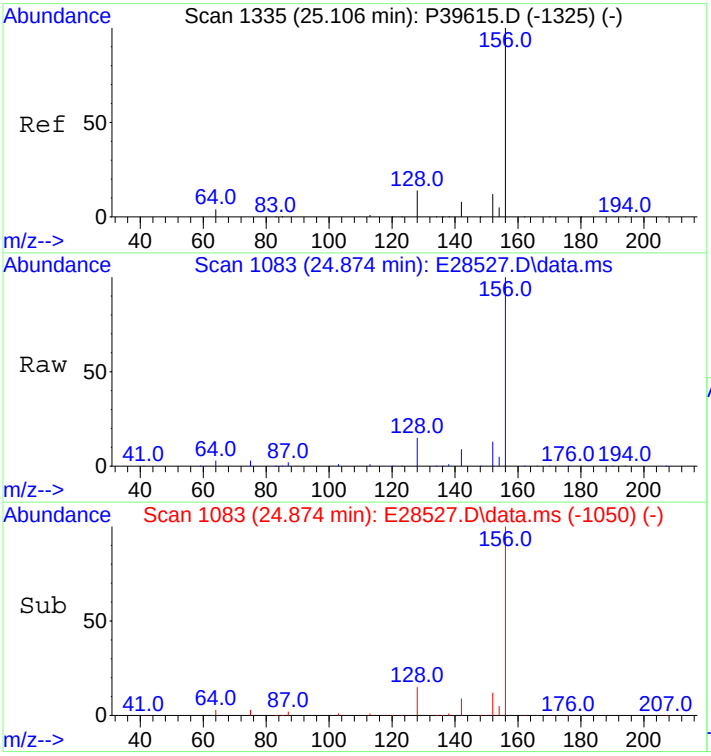


#23
Biphenyl
Concen: 9673.58 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:154 Resp: 1084695

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

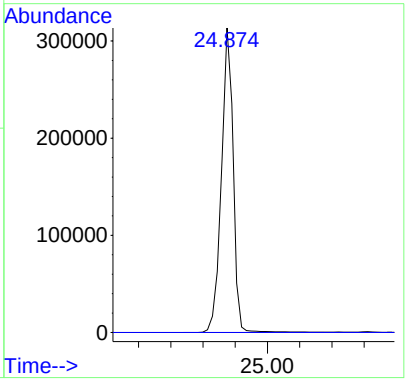


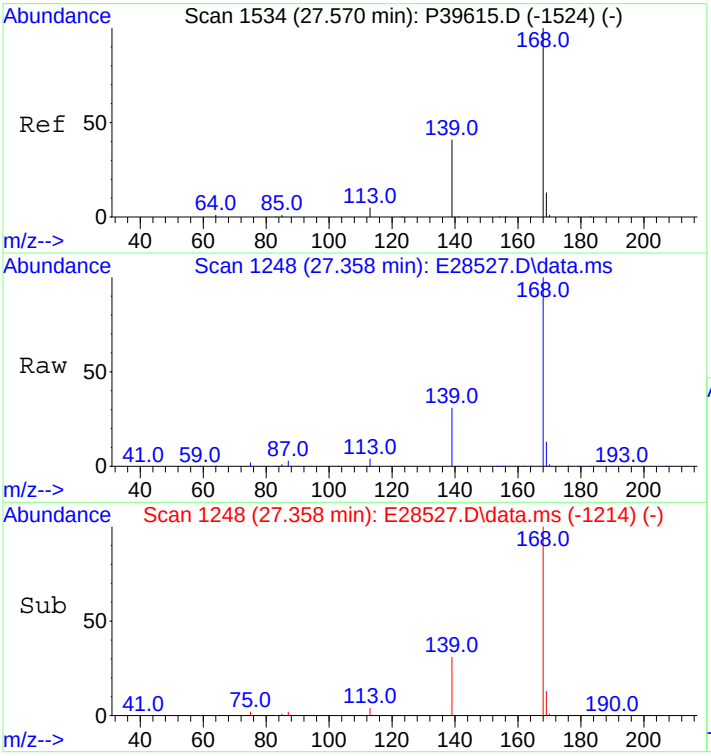


#24
2,6-Dimethylnaphthalene
Concen: 9825.03 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:156 Resp: 792979

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

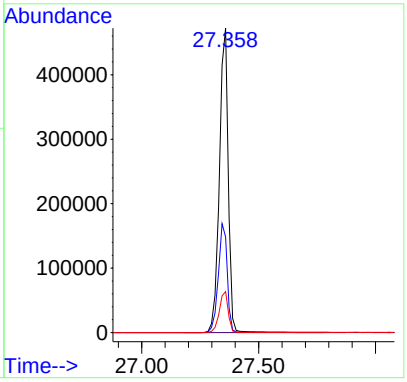


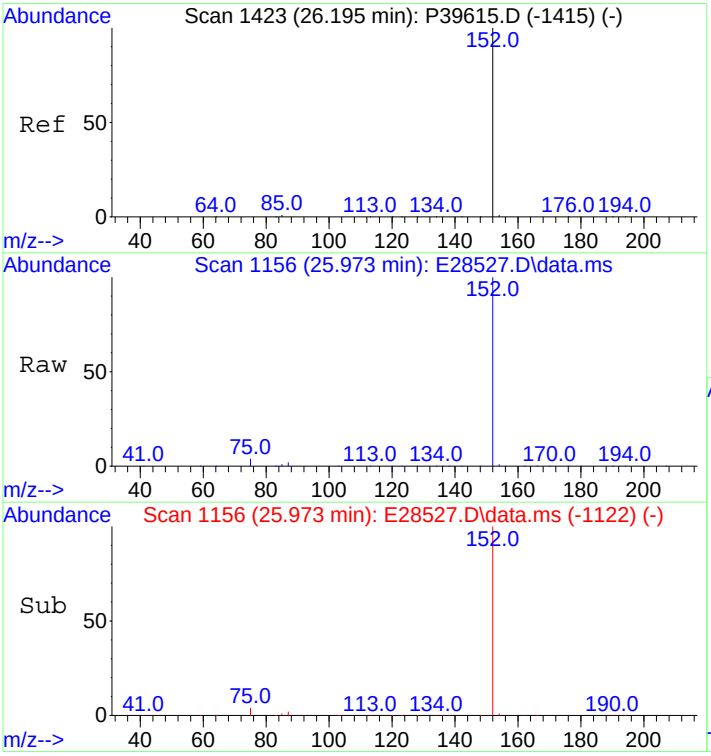


#25
Dibenzofuran
Concen: 10256.61 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:168 Resp: 1242869

Ion	Ratio	Lower	Upper
168	100		
139	36.2	30.6	45.8
169	13.5	10.6	16.0

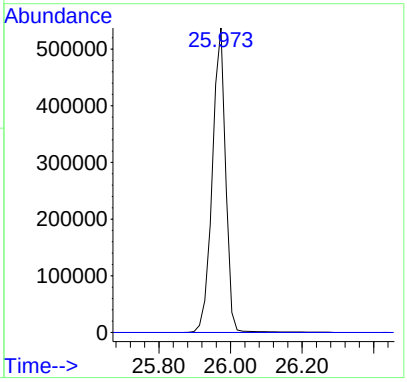


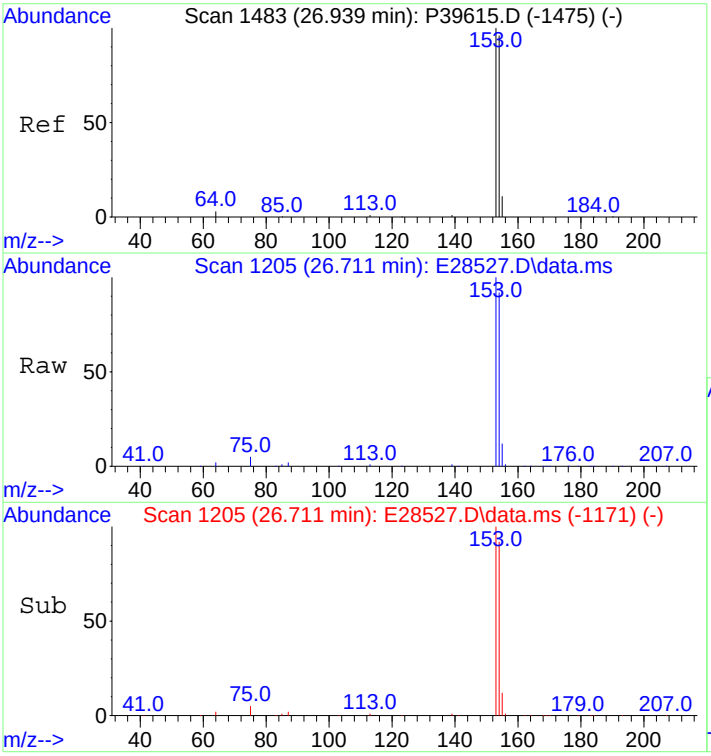


#26
Acenaphthylene
Concen: 10291.60 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:152 Resp: 1390024

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

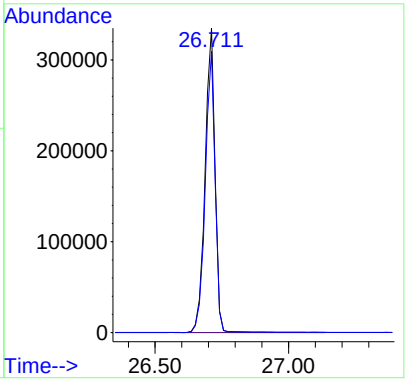


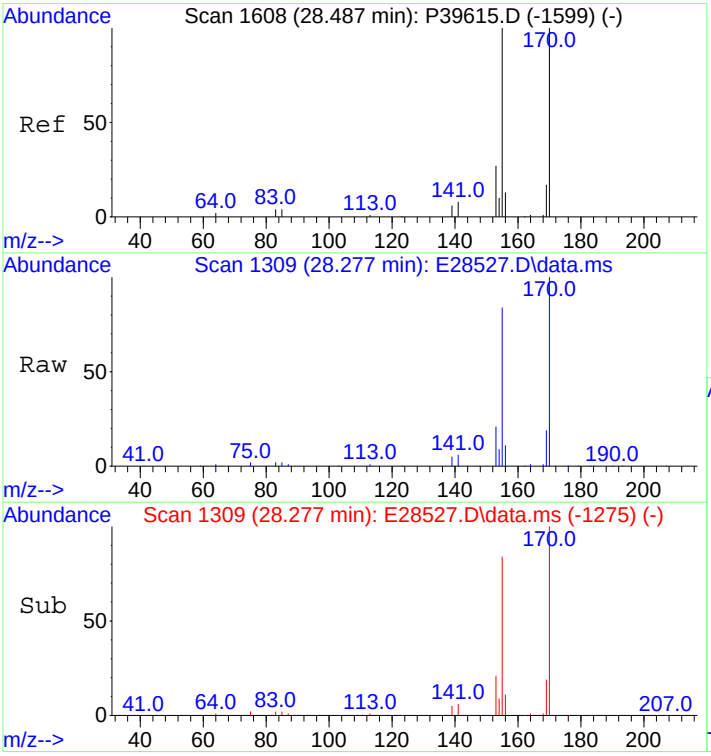


#27
Acenaphthene
Concen: 10250.12 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:153 Resp: 862774

Ion	Ratio	Lower	Upper
153	100		
154	91.8	72.3	108.5

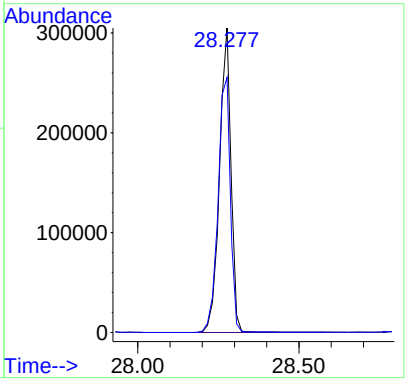


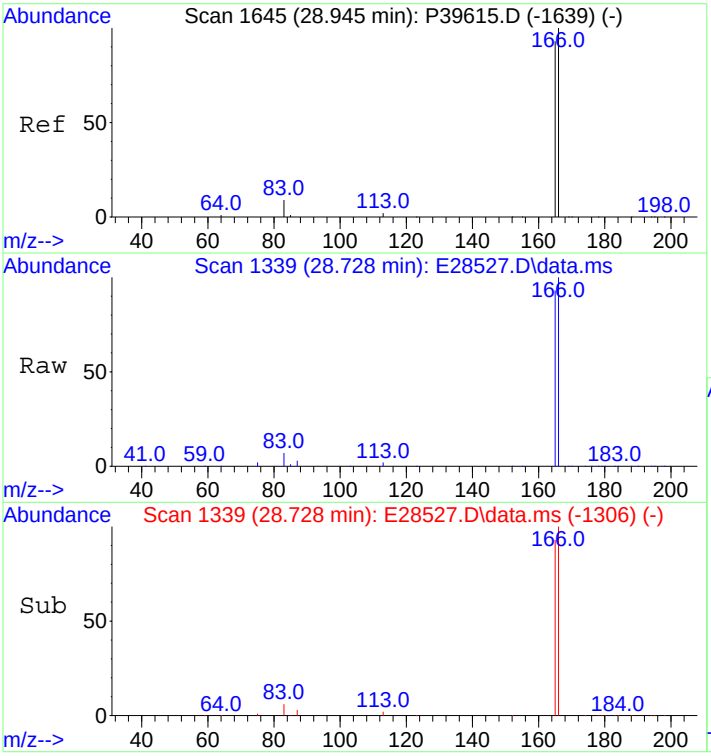


#28
2,3,5-Trimethylnaphthalene
Concen: 10339.88 ng/mL
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:170 Resp: 754332

Ion	Ratio	Lower	Upper
170	100		
155	90.1	75.9	113.9

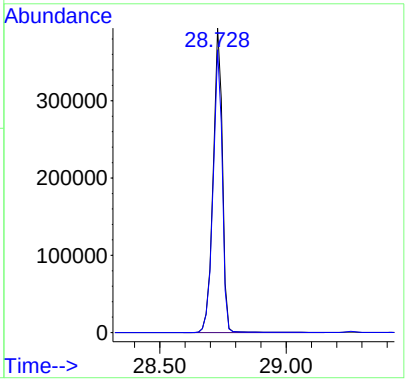


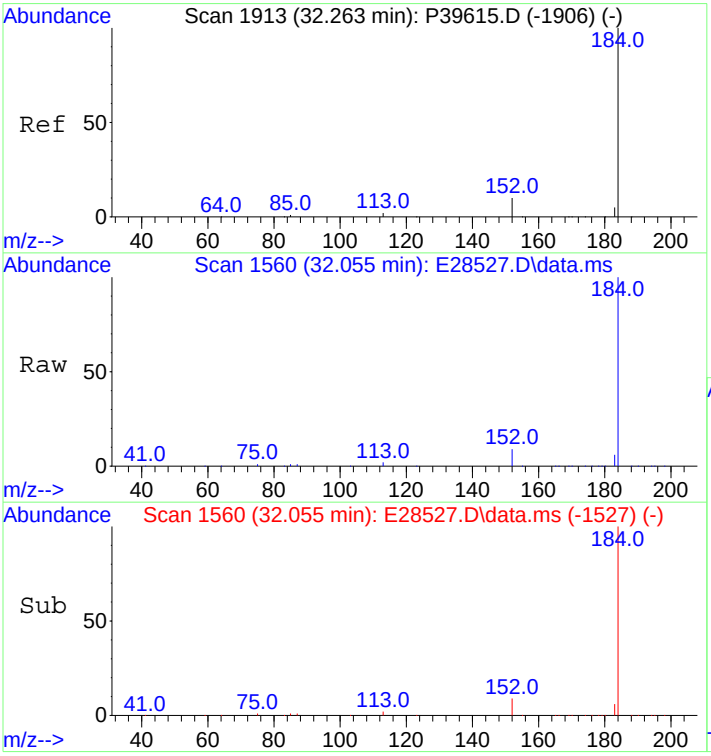


#29
Fluorene
Concen: 10307.65 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:166 Resp: 1008743

Ion	Ratio	Lower	Upper
166	100		
165	92.3	73.8	110.6

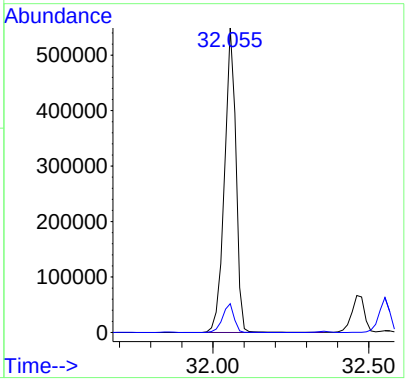


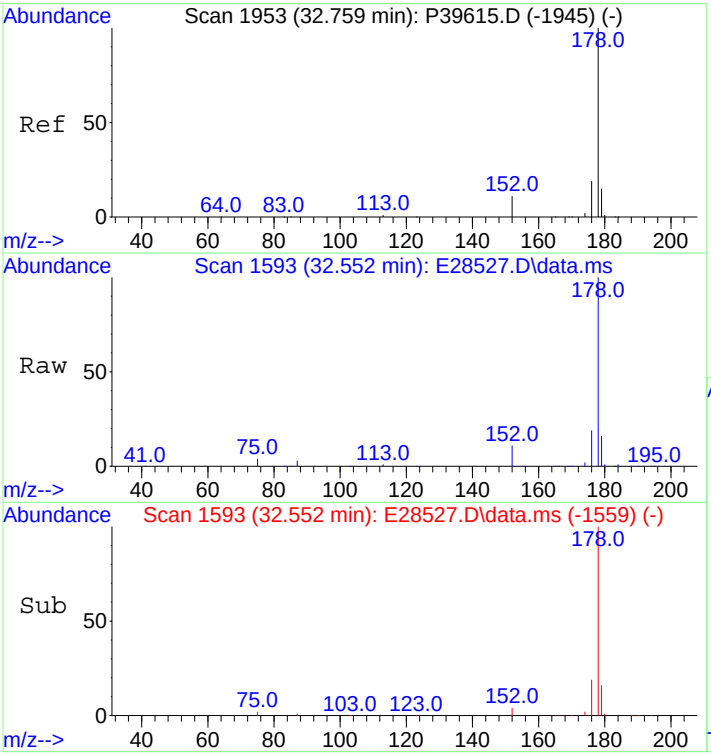


#33
Dibenzothiophene
Concen: 10175.62 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. -0.000 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:184 Resp: 1394373

Ion	Ratio	Lower	Upper
184	100		
152	9.5	6.2	9.2#

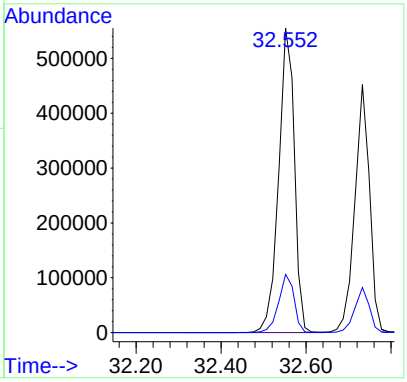


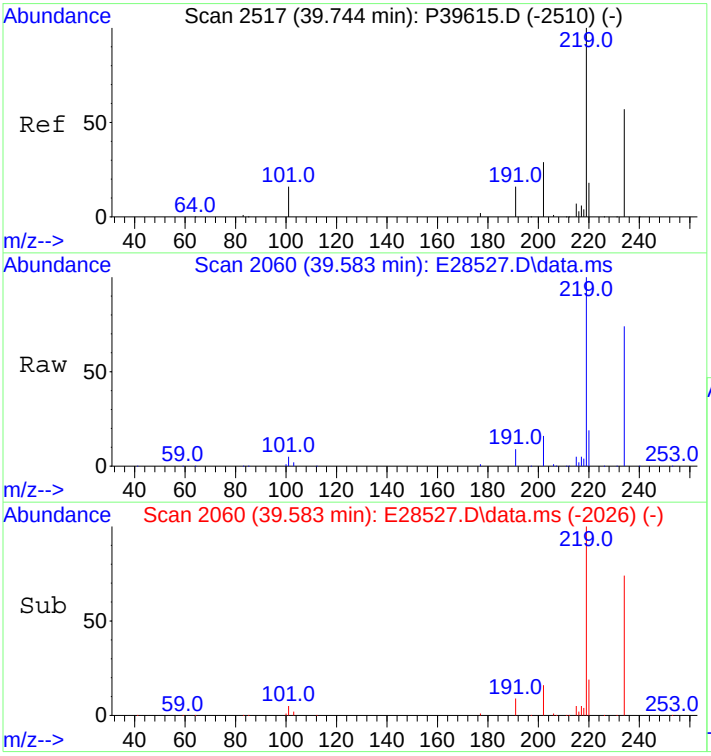


#43
Phenanthrene
Concen: 10003.00 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:178 Resp: 1429622

Ion	Ratio	Lower	Upper
178	100		
176	18.8	15.0	22.6

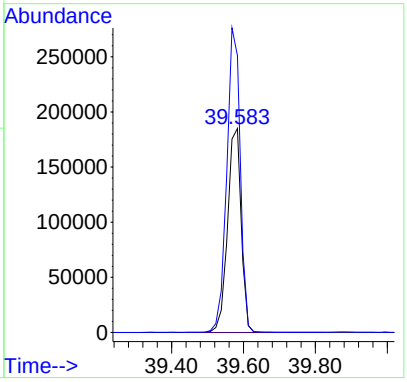


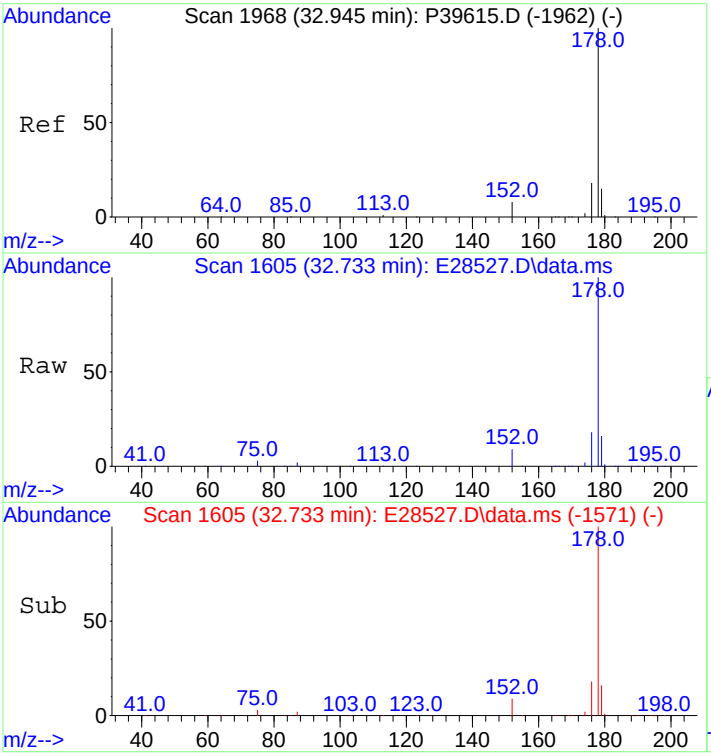


#54
Retene
Concen: 11089.35 ng/mL
RT: 39.583 min Scan# 2060
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:234 Resp: 485174

Ion	Ratio	Lower	Upper
234	100		
219	148.3	113.0	169.4

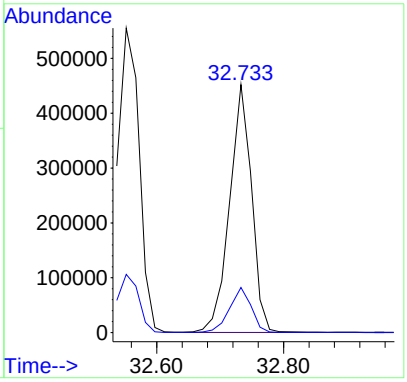


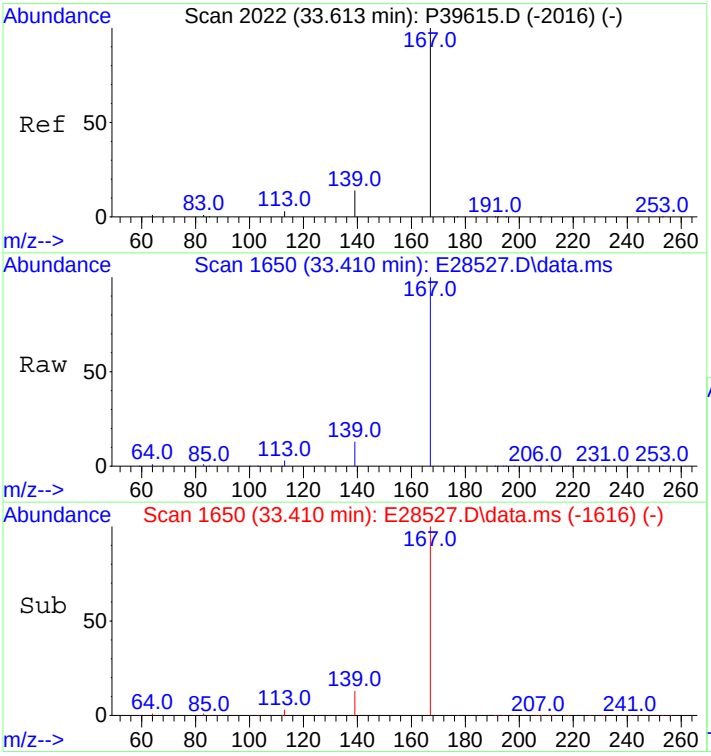


#55
Anthracene
Concen: 8185.53 ng/mL m
RT: 32.733 min Scan# 1605
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:178 Resp: 1096223

Ion	Ratio	Lower	Upper
178	100		
176	18.2	14.5	21.7

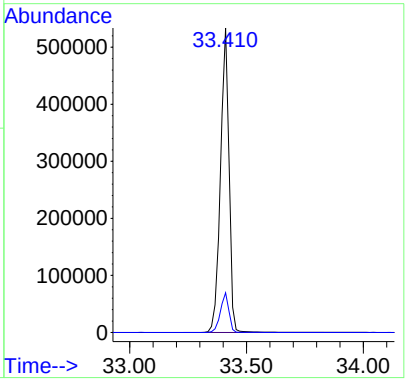


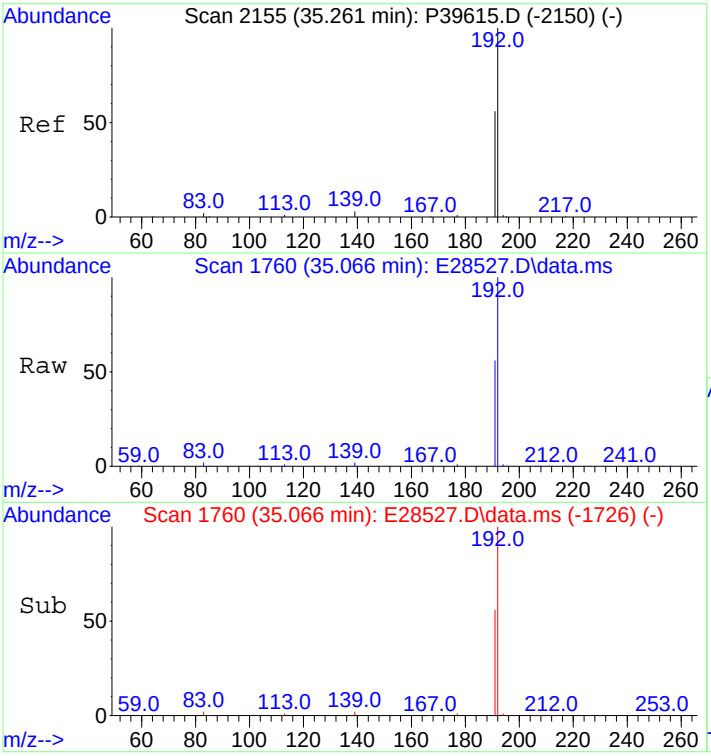


#56
Carbazole
Concen: 10725.06 ng/mL
RT: 33.410 min Scan# 1650
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:167 Resp: 1356581

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.5	15.7

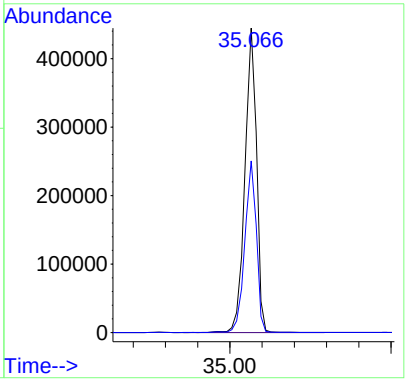


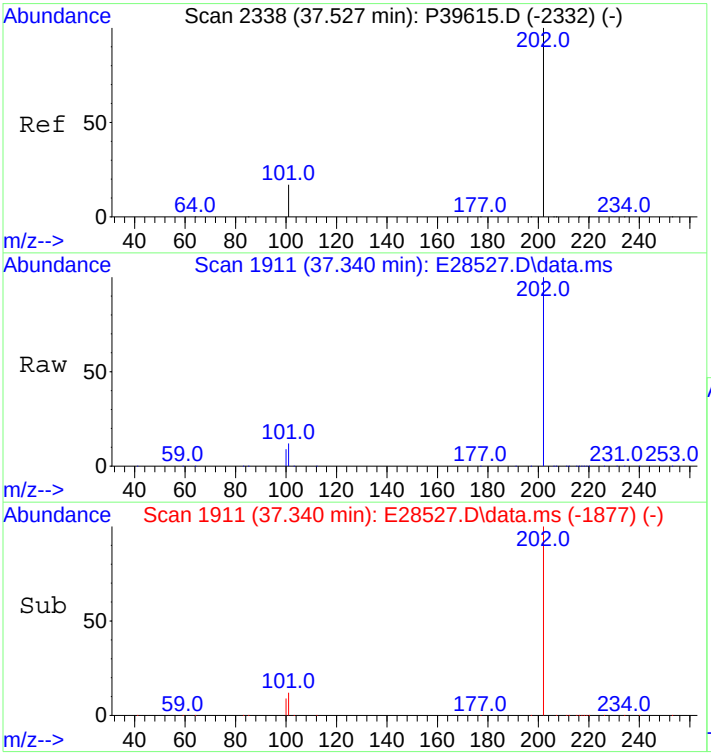


#57
1-Methylphenanthrene
Concen: 10477.28 ng/mL
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:192 Resp: 1115333

Ion	Ratio	Lower	Upper
192	100		
191	56.0	45.5	68.3

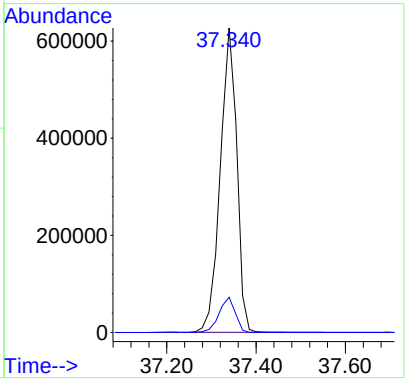


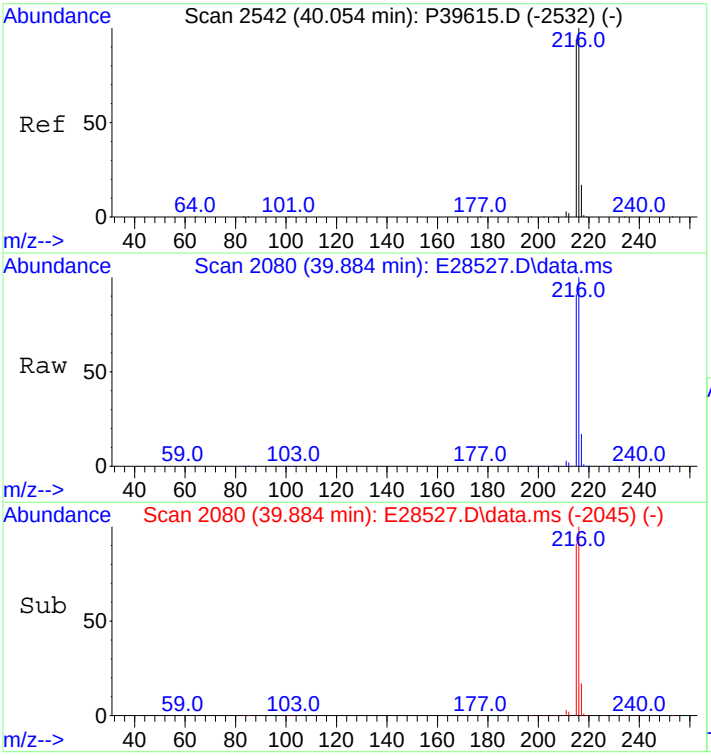


#58
Fluoranthene
Concen: 10347.59 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:202 Resp: 1611679

Ion	Ratio	Lower	Upper
202	100		
101	11.3	9.2	13.8

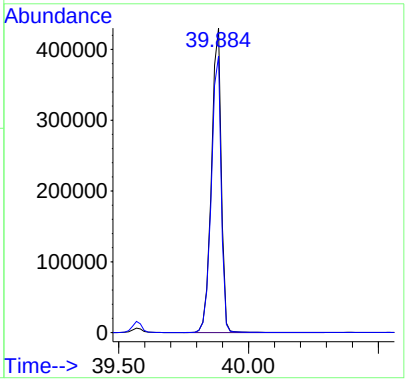


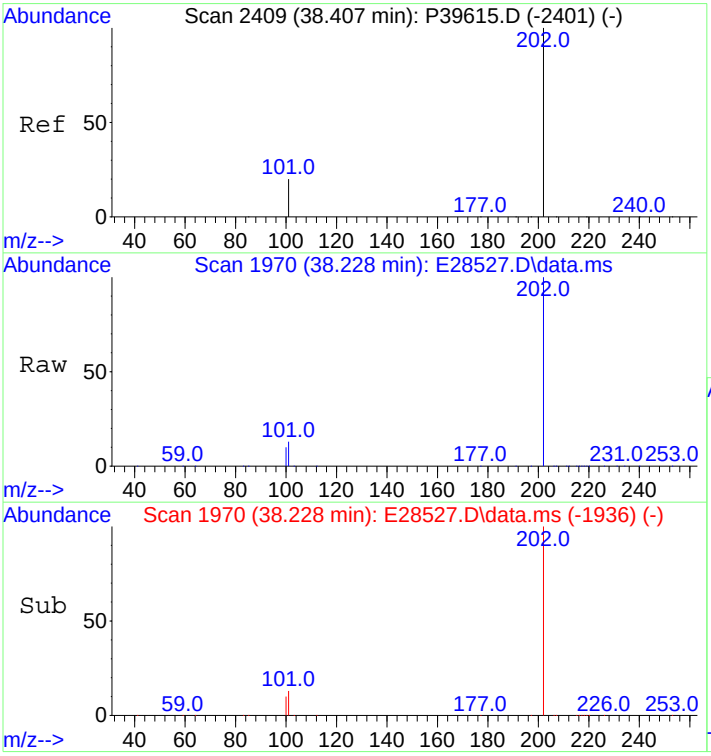


#59
Benzo(b)fluorene
Concen: 11375.30 ng/mL
RT: 39.884 min Scan# 2080
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:216 Resp: 1126932

Ion	Ratio	Lower	Upper
216	100		
215	91.5	73.8	110.8

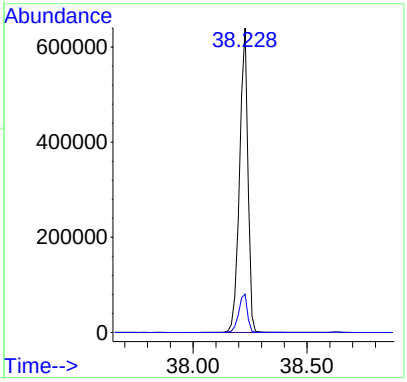


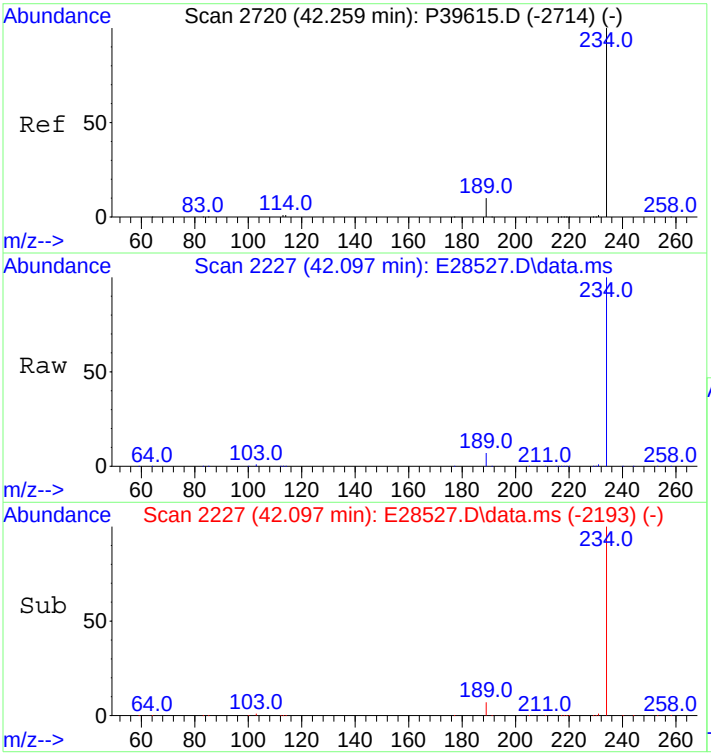


#60
Pyrene
Concen: 10363.70 ng/mL
RT: 38.228 min Scan# 1970
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:202 Resp: 1624916

Ion	Ratio	Lower	Upper
202	100		
101	13.1	9.8	14.8

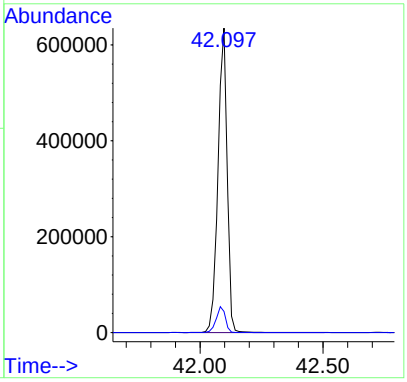


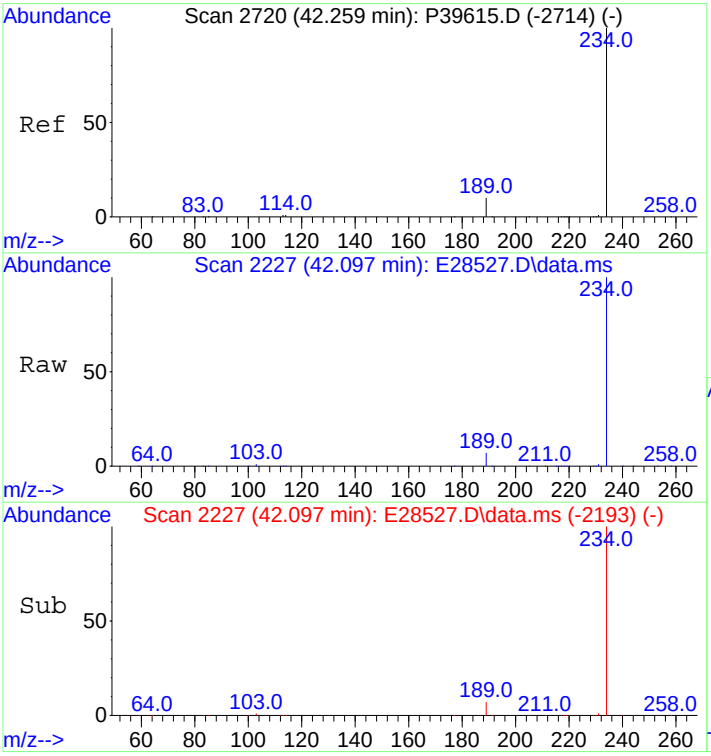


#66
Naphthobenzothiophene
Concen: 11037.35 ng/ml
RT: 42.097 min Scan# 2227
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:234 Resp: 1632867

Ion	Ratio	Lower	Upper
234	100		
189	8.6	5.5	8.3#

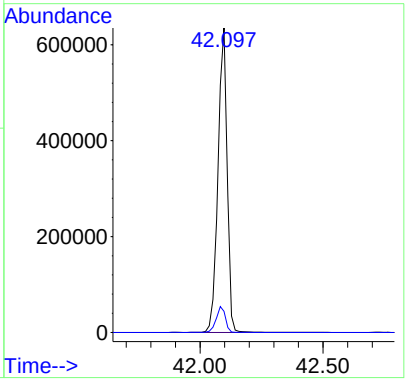


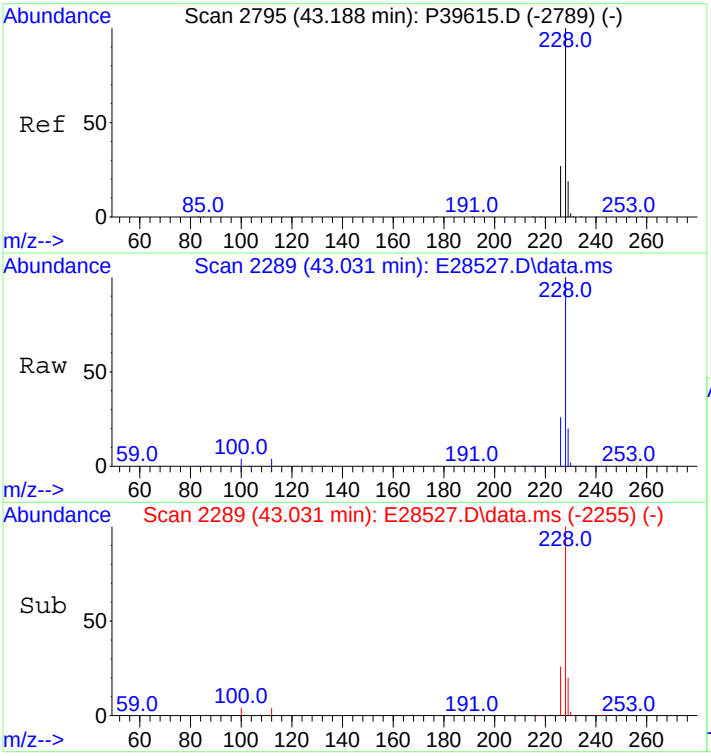


#67
Naphthobenzothiophene-2,1-D
Concen: 11037.35 ng/mL
RT: 42.097 min Scan# 2227
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:234 Resp: 1632867

Ion	Ratio	Lower	Upper
234	100		
189	8.6	5.5	8.3#

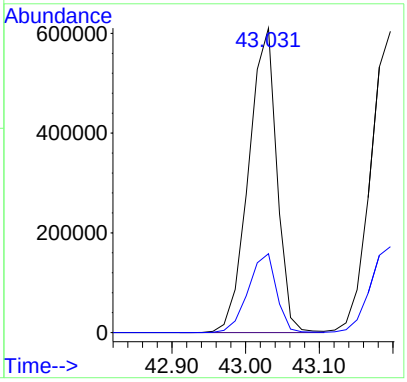


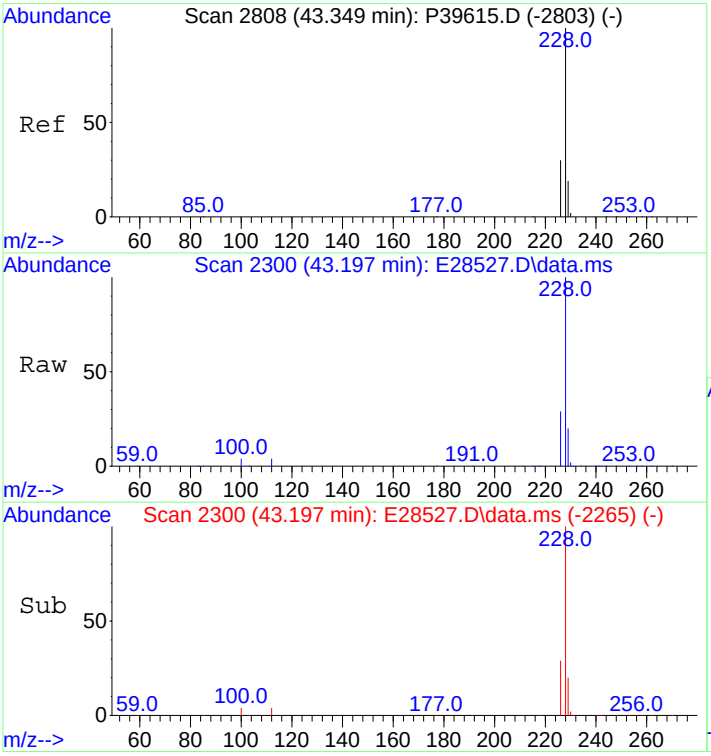


#75
Benz[a]anthracene
Concen: 8752.25 ng/mL m
RT: 43.031 min Scan# 2289
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:228 Resp: 1626986

Ion	Ratio	Lower	Upper
228	100		
226	25.9	20.2	30.4

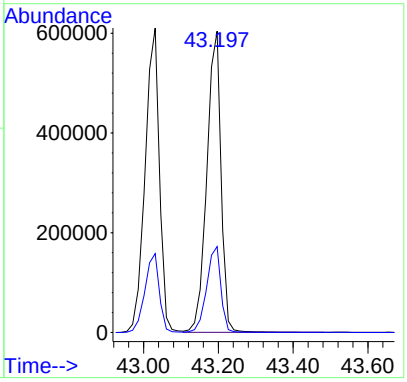


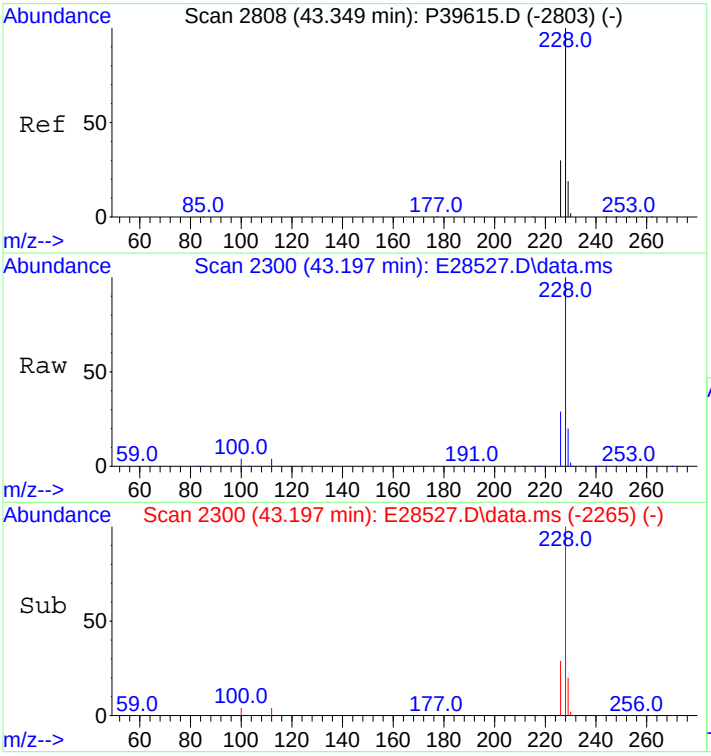


#76
Chrysene
Concen: 8735.75 ng/mL
RT: 43.197 min Scan# 2300
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:228 Resp: 1589503

Ion	Ratio	Lower	Upper
228	100		
226	28.6	22.6	34.0

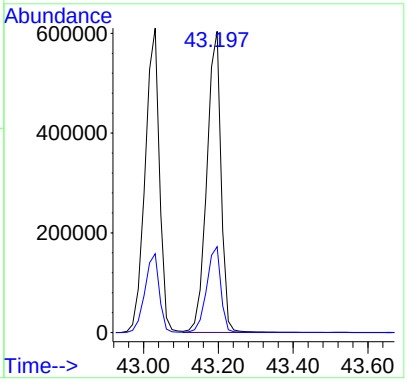


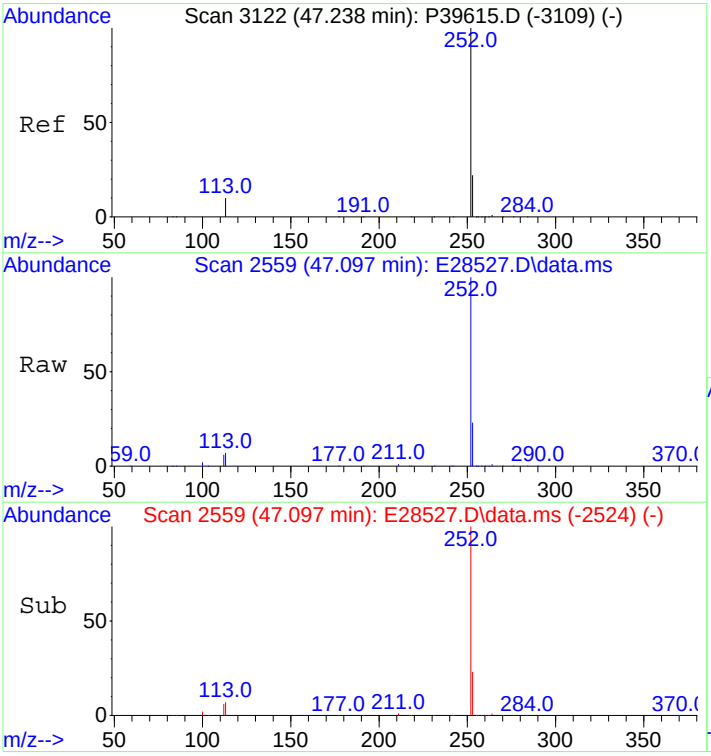


#77
Chrysene/Triphenylene
Concen: 8735.75 ng/mL
RT: 43.197 min Scan# 2300
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:228 Resp: 1589503

Ion	Ratio	Lower	Upper
228	100		
226	28.6	22.6	34.0

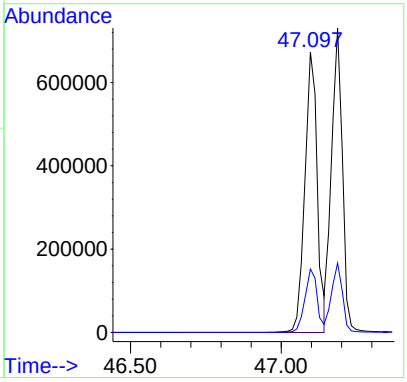


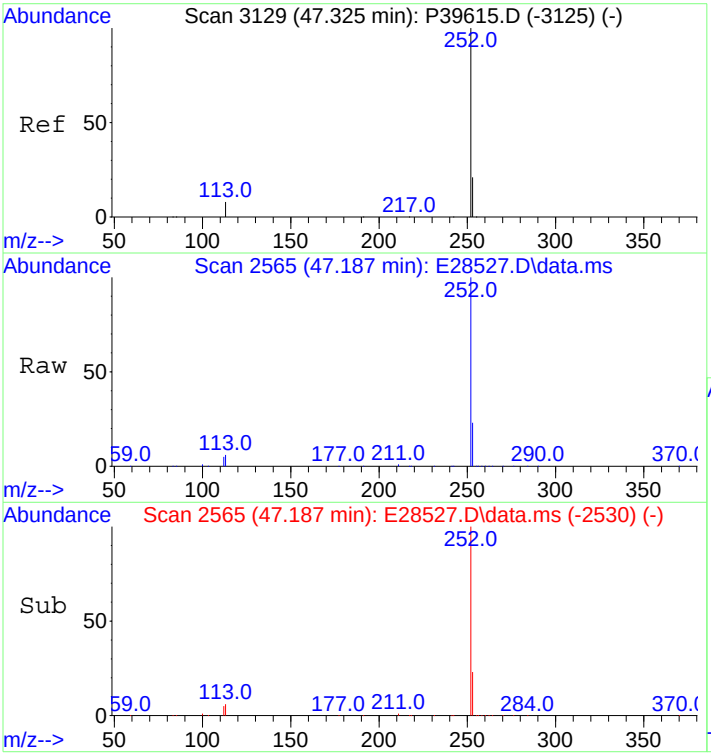


#84
Benzo[b]fluoranthene
Concen: 9816.77 ng/mL
RT: 47.097 min Scan# 2559
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1921388

Ion	Ratio	Lower	Upper
252	100		
253	22.5	18.3	27.5

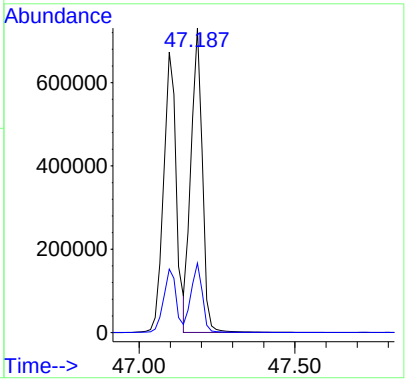


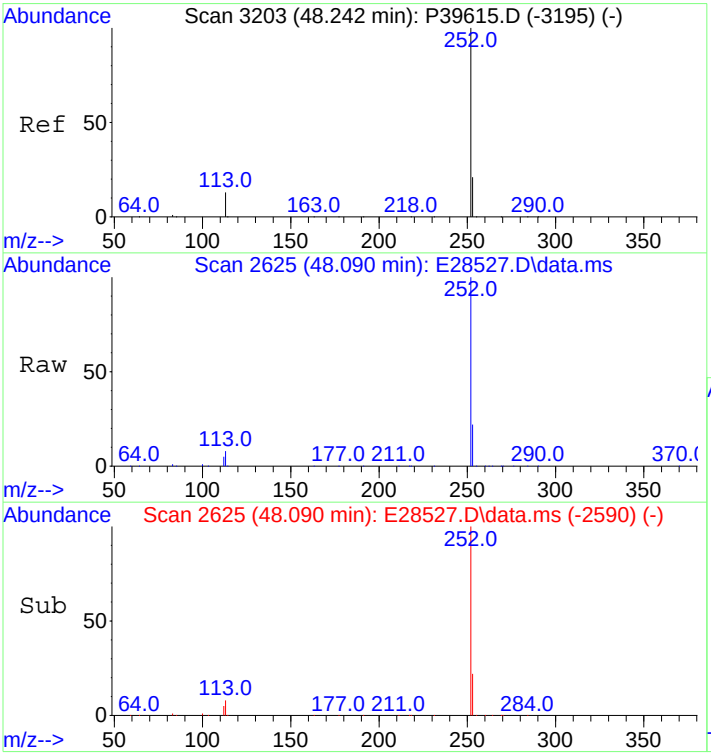


#85
Benzo[j]+[k]fluoranthene
Concen: 10047.36 ng/mL
RT: 47.187 min Scan# 2565
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1850530

Ion	Ratio	Lower	Upper
252	100		
253	22.6	18.3	27.5

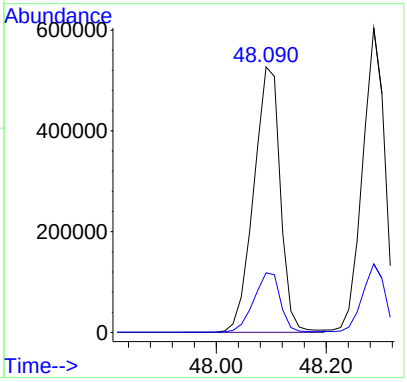


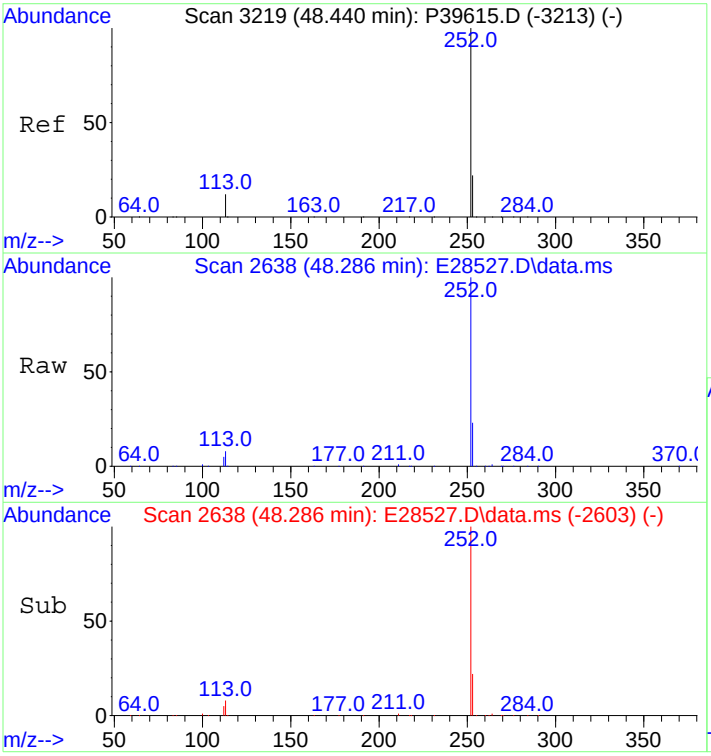


#87
Benzo[e]pyrene
Concen: 10196.62 ng/mL
RT: 48.090 min Scan# 2625
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1770929

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.6	28.0

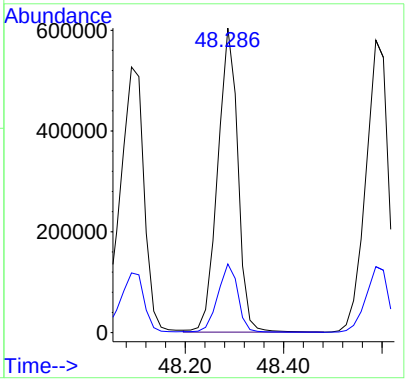


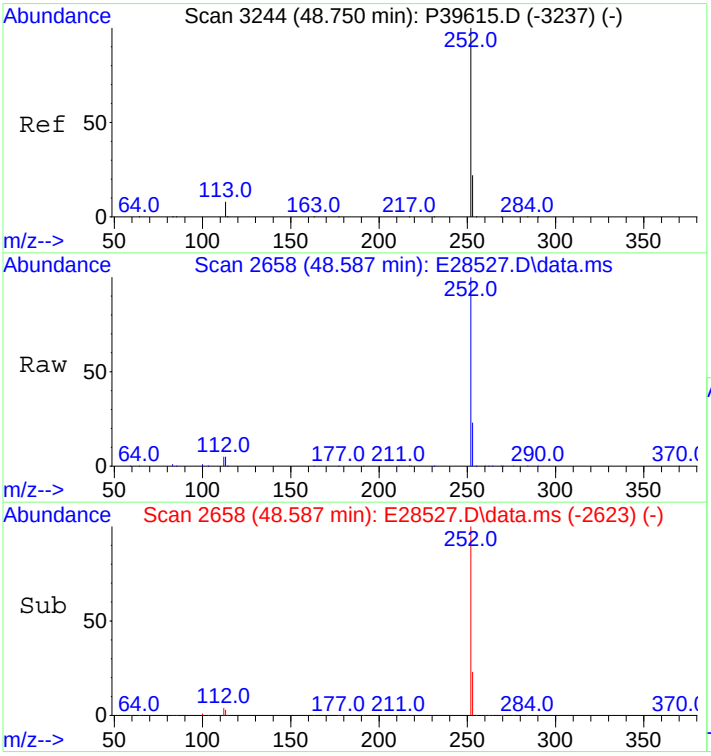


#89
Benzo[a]pyrene
Concen: 10451.14 ng/mL
RT: 48.286 min Scan# 2638
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1716035

Ion	Ratio	Lower	Upper
252	100		
253	22.4	18.8	28.2

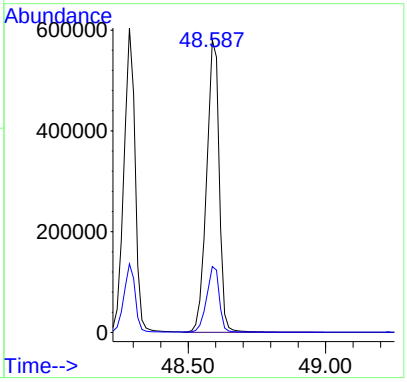


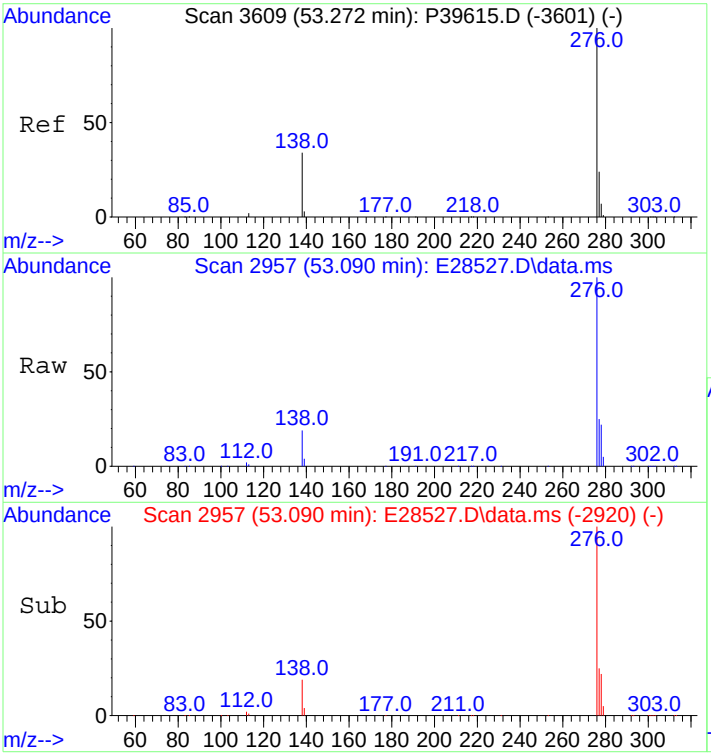


#90
Perylene
Concen: 10562.35 ng/mL
RT: 48.587 min Scan# 2658
Delta R.T. 0.030 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:252 Resp: 1845721

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.8	28.2

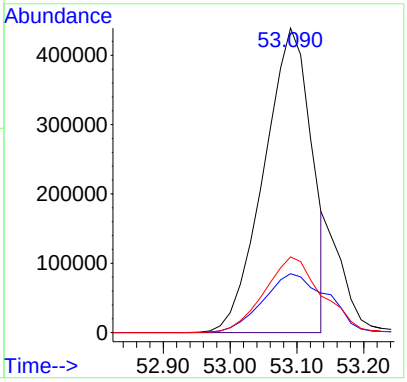


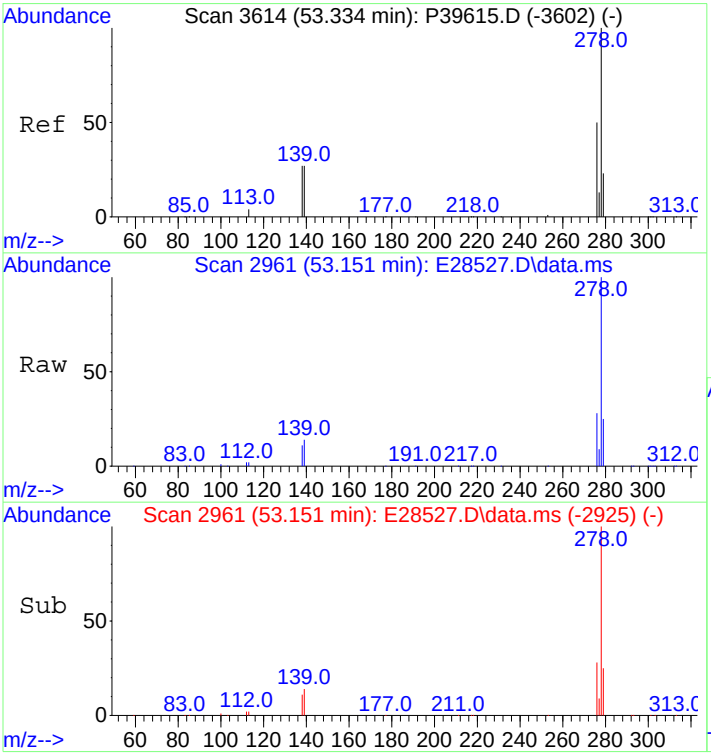


#91
Indeno[1,2,3-cd]pyrene
Concen: 11025.03 ng/mL m
RT: 53.090 min Scan# 2957
Delta R.T. 0.060 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:276 Resp: 2185546

Ion	Ratio	Lower	Upper
276	100		
138	26.3	15.4	23.2#
277	30.2	19.1	28.7#

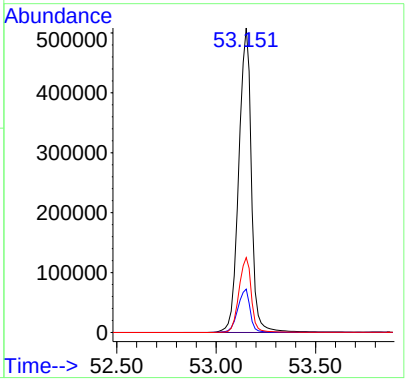


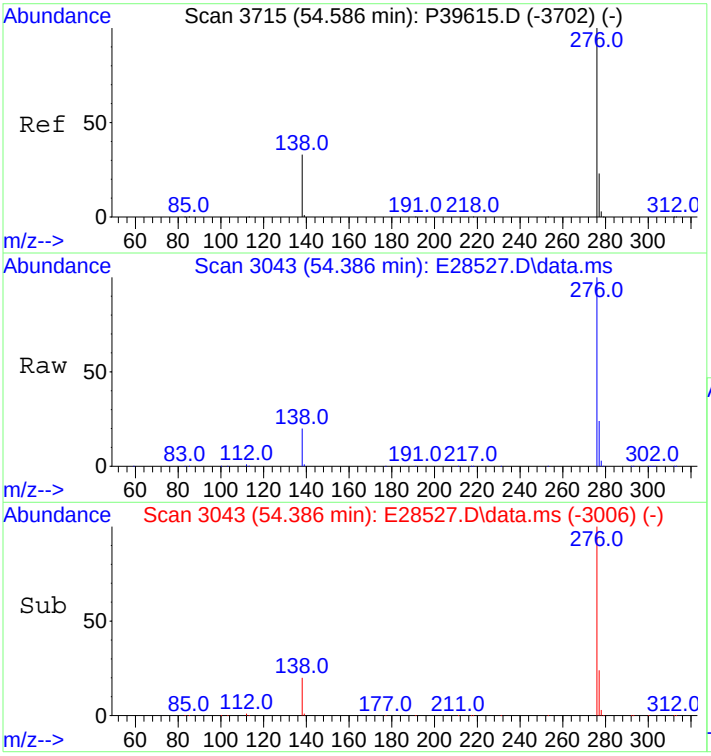


#92
Dibenz[ah]+[ac]anthracene
Concen: 11751.59 ng/mL
RT: 53.151 min Scan# 2961
Delta R.T. 0.045 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:278 Resp: 2240598

Ion	Ratio	Lower	Upper
278	100		
139	14.0	11.1	16.7
279	24.1	19.4	29.0

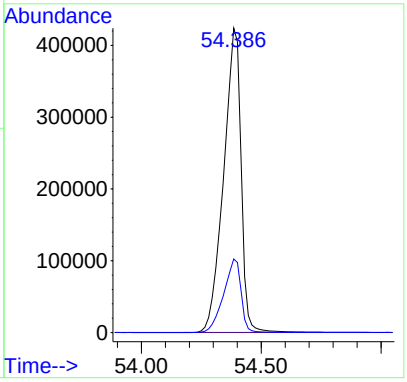


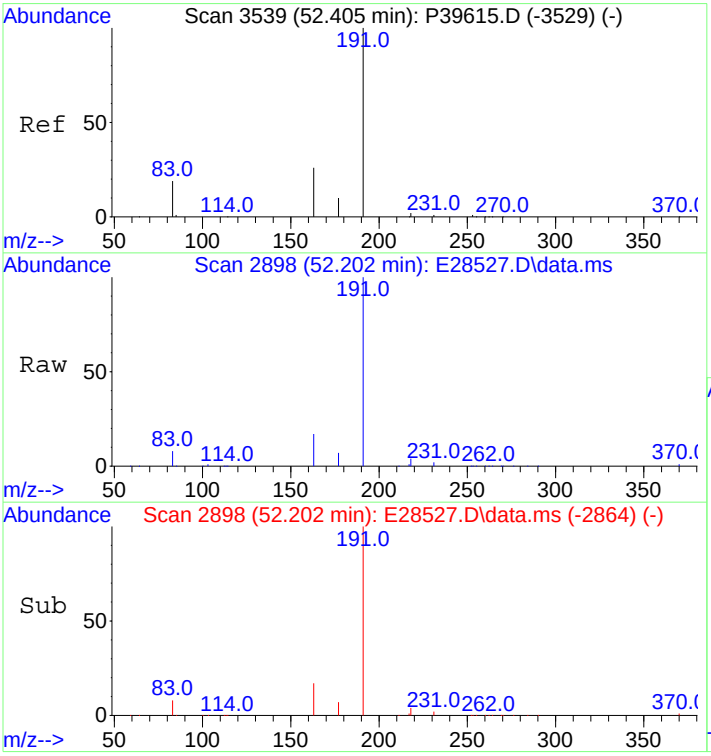


#93
Benzo[g,h,i]perylene
Concen: 10993.09 ng/mL
RT: 54.386 min Scan# 3043
Delta R.T. 0.060 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:276 Resp: 2141401

Ion	Ratio	Lower	Upper
276	100		
277	24.2	19.1	28.7

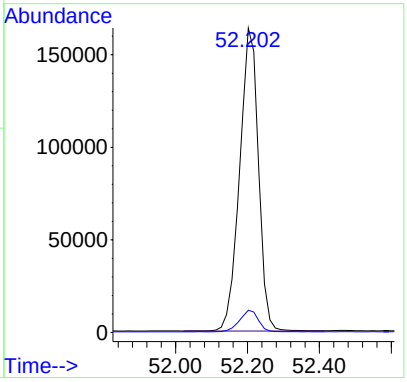


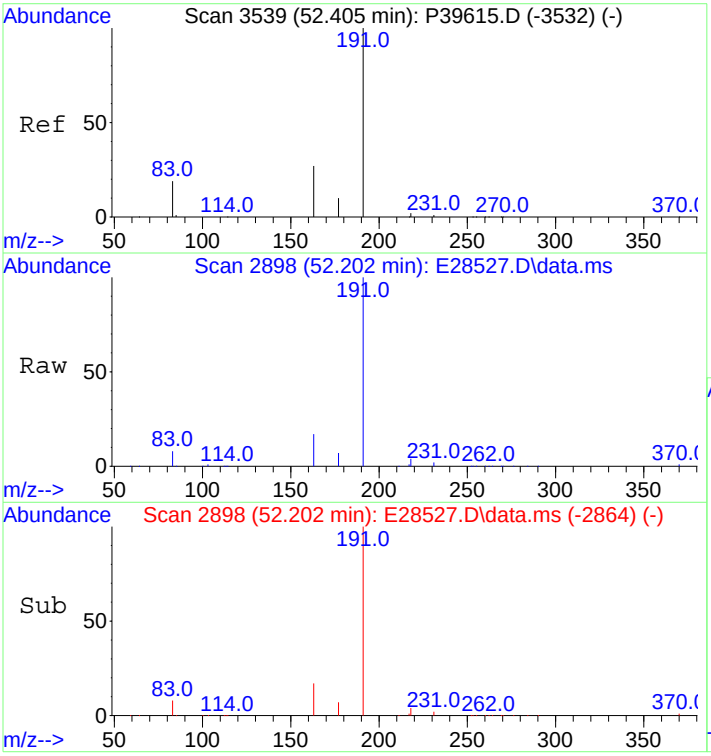


#94
Hopane (T19)
Concen: 12925.84 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:191 Resp: 594811

Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#

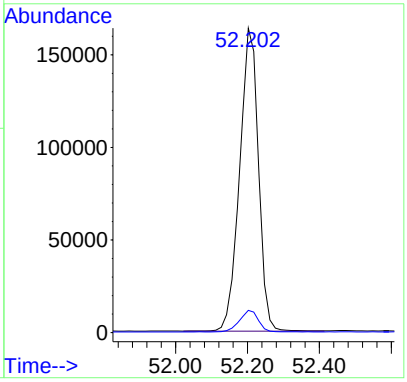




#95
17a(H),21B(H)-hopane - C30H52
Concen: 12925.84 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28527.D
Acq: 29 Oct 2012 11:54 pm

Tgt Ion:191 Resp: 594811

Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 31 12:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

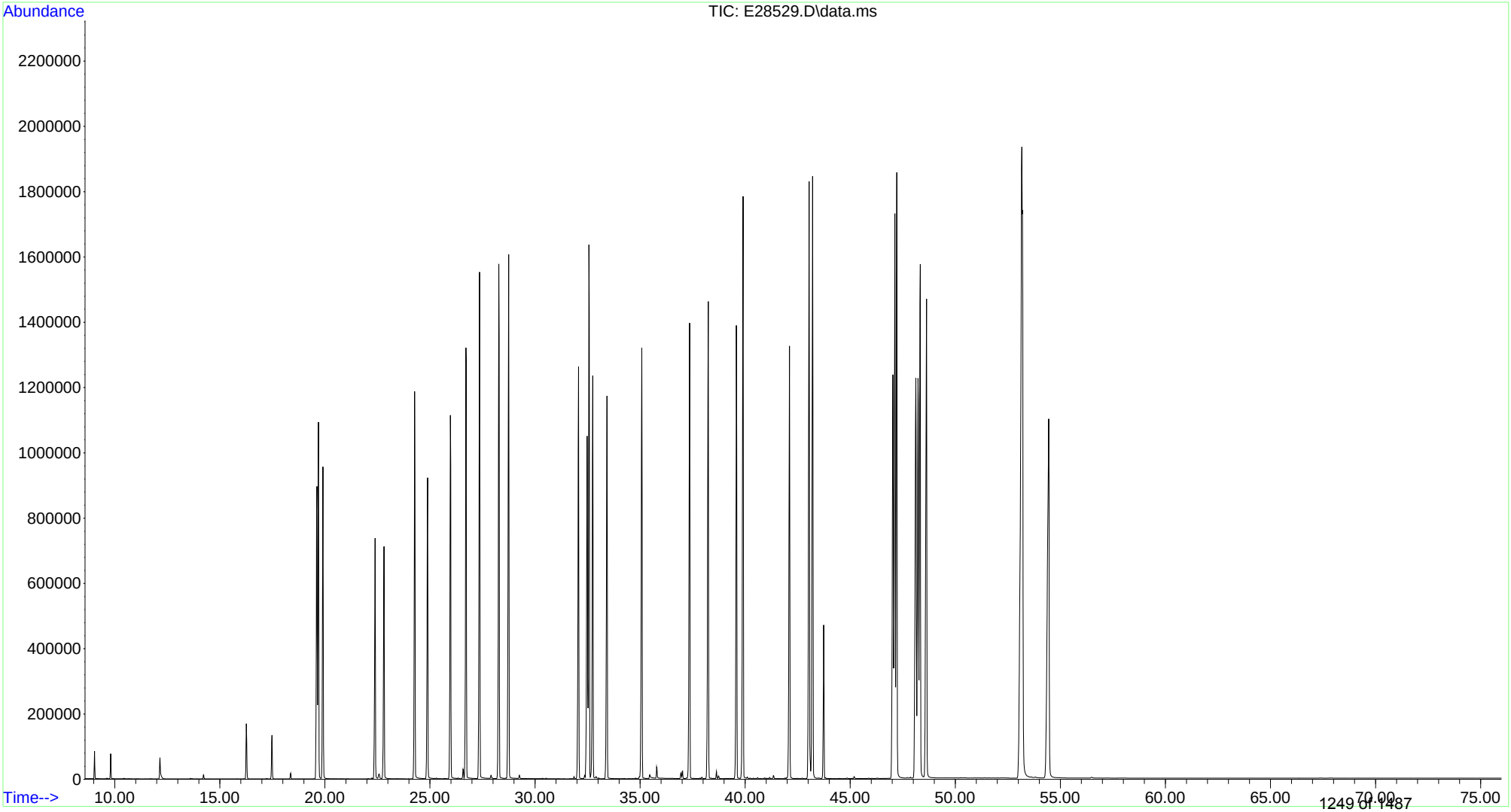
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	26.576	164	37912	500.000 ng/mL	0.00
74) Chrysene-d12	43.091	240	88160	500.000 ng/mL	0.01
System Monitoring Compounds					
9) Naphthalene-d8	19.620	136	2296353	16260.075 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1626.01%#	
42) Phenanthrene-d10	32.477	188	2663465	18714.253 ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1871.43%#	
83) Benzo[b]fluoranthene-d12	47.036	264	3370773	20195.327 ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2019.53%#	
88) Benzo[a]pyrene-d12	48.226	264	3410139	22527.516 ng/mL	0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2252.75%#	
129) 5B(H)Cholane - Surr	43.739	217	695988	21414.696 ng/ml	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2141.47%#	
Target Compounds					Qvalue
3) trans-Decalin	16.263	138	261873	8297.842 ng/mL	100
4) cis-Decalin	17.483	138	203630	8494.264 ng/mL	100
10) Naphthalene	19.696	128	2596569	17140.920 ng/mL#	100
16) 2-Methylnaphthalene	22.390	142	1749682	17847.146 ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	1698936	18070.292 ng/mL#	100
18) Benzothiophene	19.906	134	2232488	18065.485 ng/mL	100
23) Biphenyl	24.272	154	2227434	17939.207 ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.889	156	1652186	18486.304 ng/mL#	100
25) Dibenzofuran	27.358	168	2567457	19133.769 ng/mL	98
26) Acenaphthylene	25.973	152	2887125M3	19303.898 ng/mL	
27) Acenaphthene	26.711	153	1802150	19334.902 ng/mL	98
28) 2,3,5-Trimethylnaphtha...	28.292	170	1575864	19507.008 ng/mL	94
29) Fluorene	28.743	166	2105968	19433.448 ng/mL	100
33) Dibenzothiophene	32.070	184	2867812	18899.560 ng/mL#	95
43) Phenanthrene	32.567	178	2963936	18728.244 ng/mL	99
54) Retene	39.583	234	1015806	20967.109 ng/mL	96
55) Anthracene	32.748	178	2099409M3	14156.763 ng/mL	
56) Carbazole	33.425	167	2801542M3	20001.846 ng/mL	
57) 1-Methylphenanthrene	35.081	192	2299712	19509.074 ng/mL	99
58) Fluoranthene	37.355	202	3284016M3	19040.795 ng/mL	
59) Benzo(b)fluorene	39.899	216	2350585	21426.936 ng/mL	99
60) Pyrene	38.243	202	3308735	19057.454 ng/mL	97
66) Naphthobenzothiophene	42.112	234	3354891	20479.127 ng/ml#	94
67) Naphthobenzothiophene-...	42.112	234	3354891	20479.127 ng/mL#	94
75) Benz[a]anthracene	43.046	228	3308979	16929.163 ng/mL	98
76) Chrysene	43.212	228	3273879	17112.238 ng/mL	98
77) Chrysene/Triphenylene	43.212	228	3273879	17112.238 ng/mL	98
84) Benzo[b]fluoranthene	47.127	252	3888463	18894.567 ng/mL	100
85) Benzo[j]+[k]fluoranthene	47.217	252	3879730	20033.777 ng/mL	99
87) Benzo[e]pyrene	48.121	252	3655053	20014.936 ng/mL	99
89) Benzo[a]pyrene	48.331	252	3592144	20806.399 ng/mL	99
90) Perylene	48.633	252	3822620	20804.685 ng/mL	99
91) Indeno[1,2,3-cd]pyrene	53.136	276	4610873M3	22121.197 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.196	278	4571116	22801.341 ng/mL	99
93) Benzo[g,h,i]perylene	54.446	276	4394931	21457.509 ng/mL	99

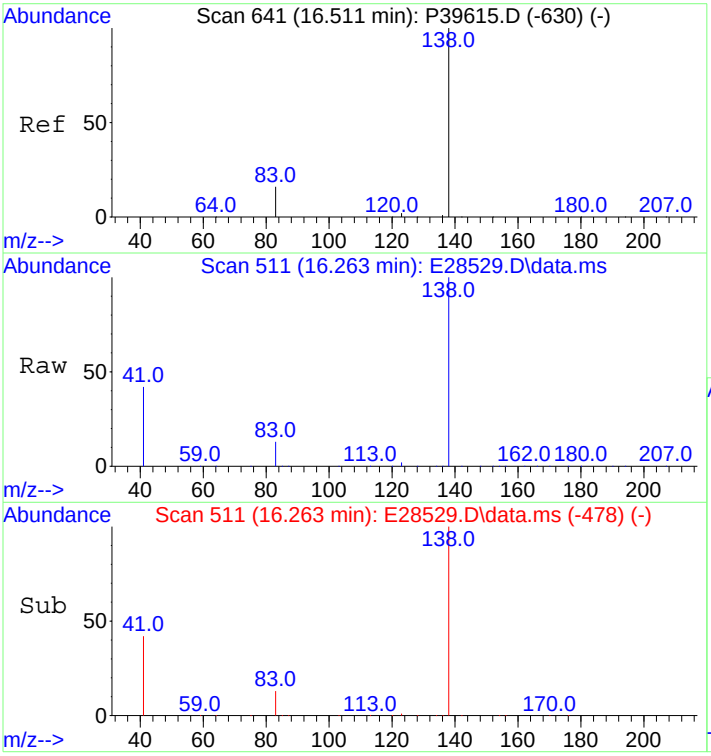
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28529.D
Acq On : 30 Oct 2012 1:23 am
Operator : AC
Sample : I210291207
Misc : L7 WHAQ40
ALS Vial : 10 Sample Multiplier: 1

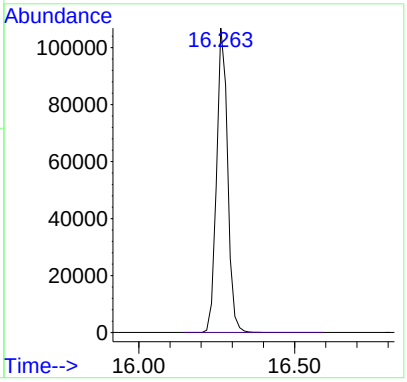
Quant Time: Oct 31 12:59:03 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:37:39 2012
Response via : Initial Calibration

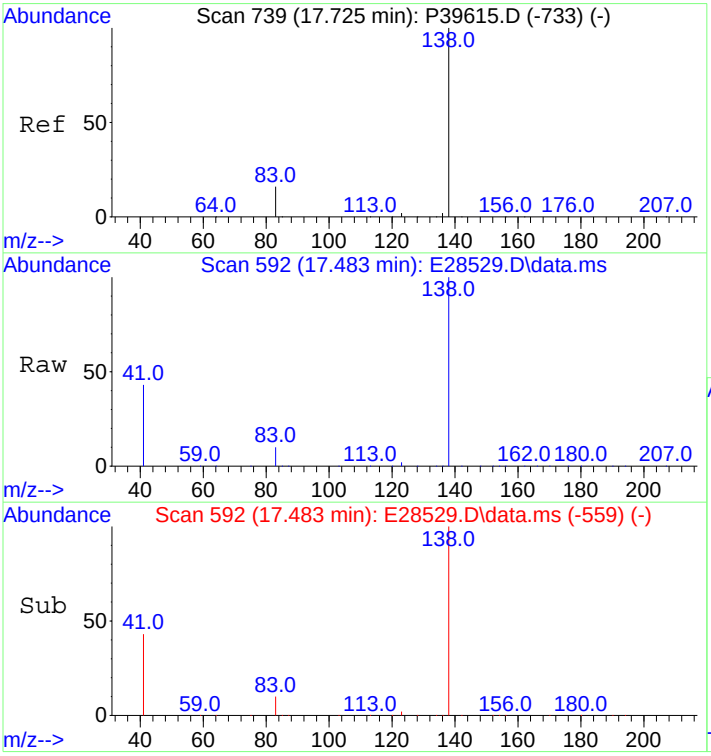




#3
trans-Decalin
Concen: 8297.84 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. -0.000 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

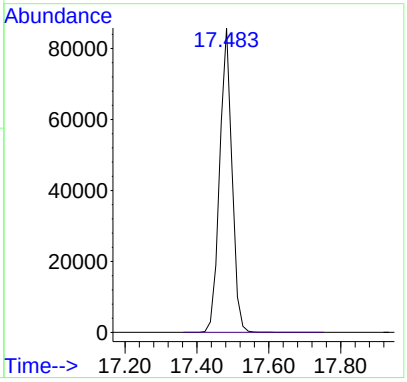
Tgt Ion:138 Resp: 261873

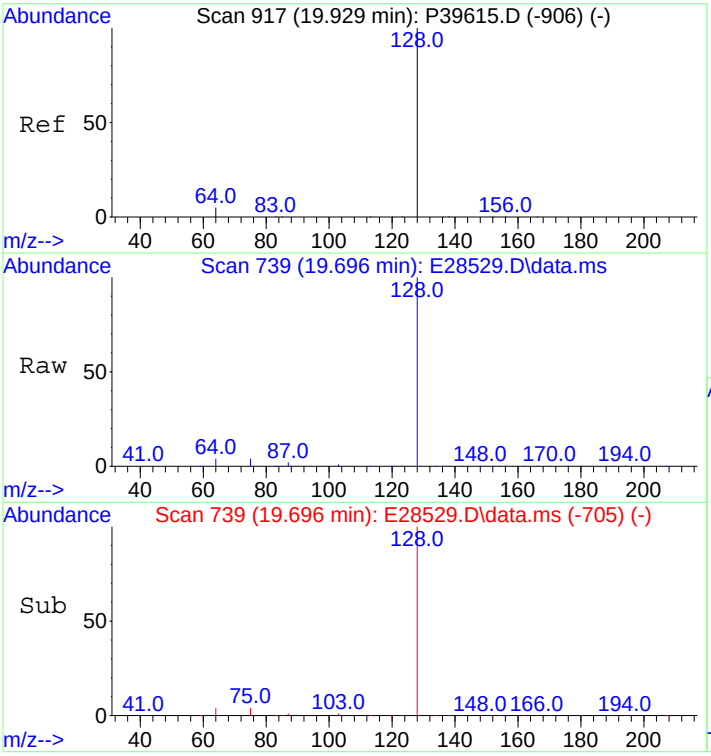




#4
cis-Decalin
Concen: 8494.26 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:138 Resp: 203630

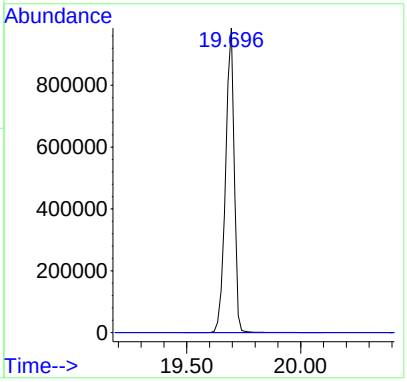


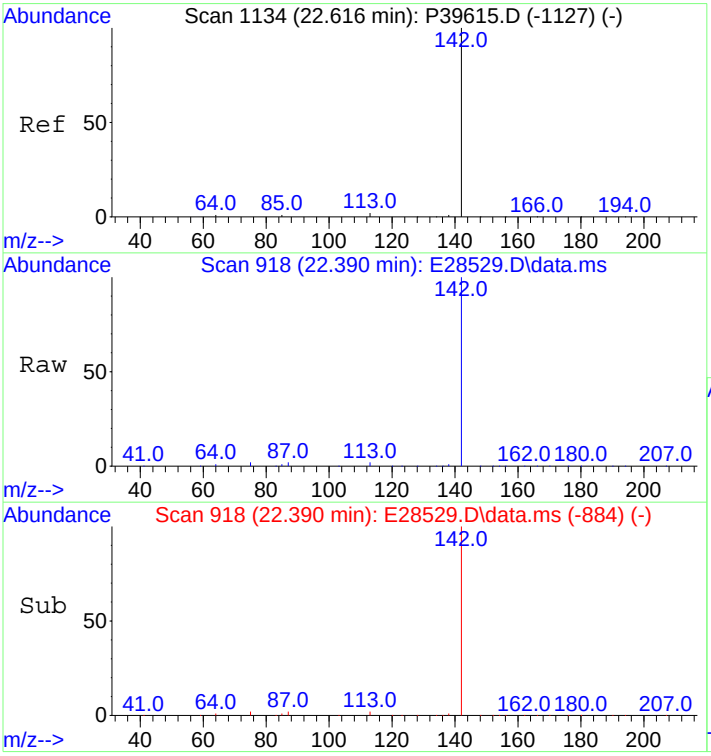


#10
Naphthalene
Concen: 17140.92 ng/mL
RT: 19.696 min Scan# 739
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:128 Resp: 2596569

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

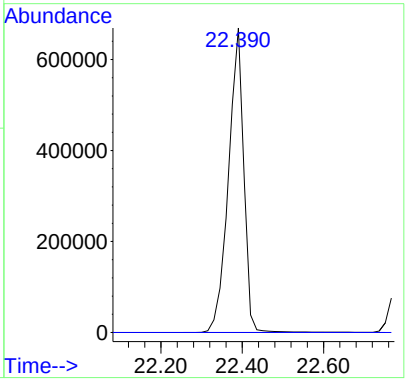


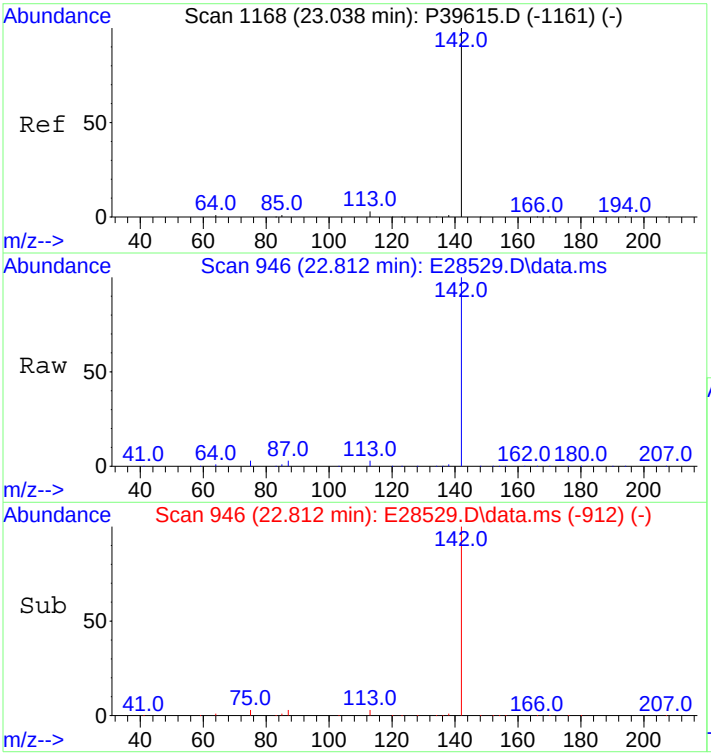


#16
2-Methylnaphthalene
Concen: 17847.15 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:142 Resp: 1749682

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

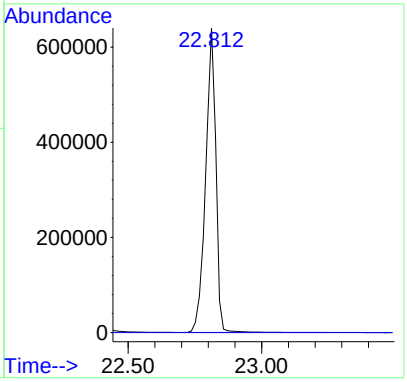


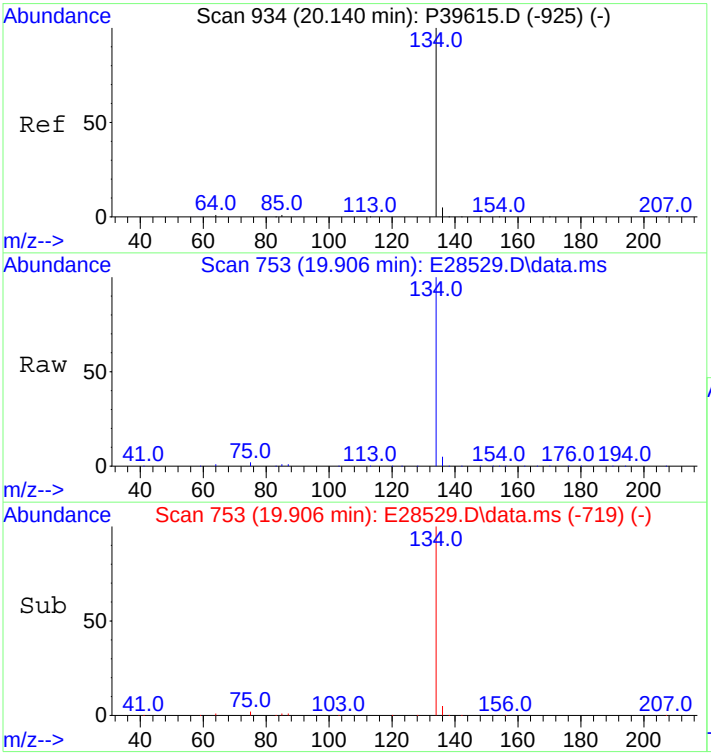


#17
1-Methylnaphthalene
Concen: 18070.29 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:142 Resp: 1698936

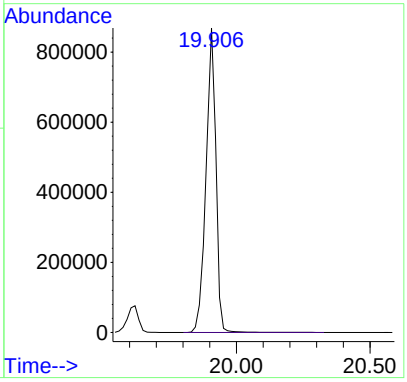
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

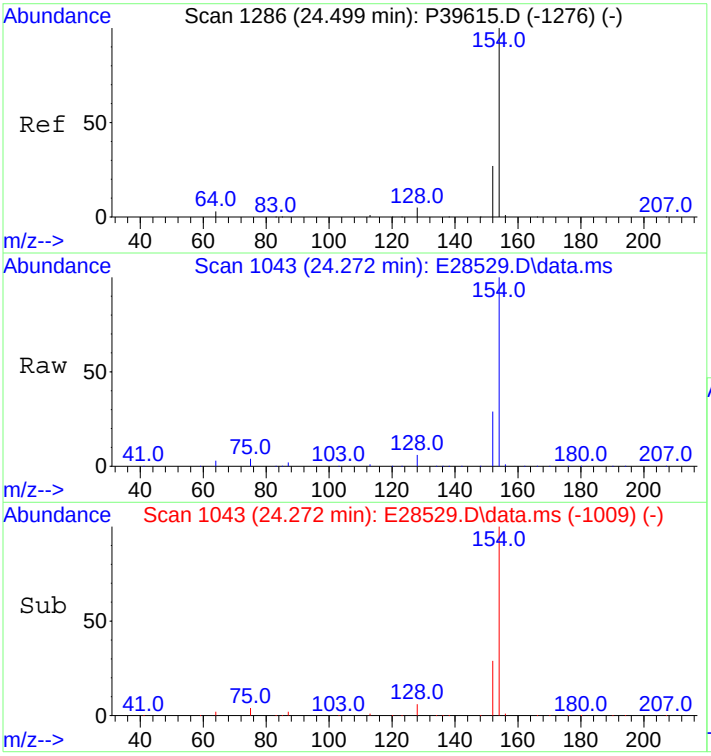




#18
Benzothiophene
Concen: 18065.48 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:134 Resp: 2232488

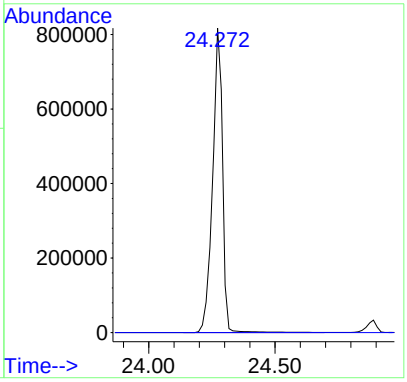


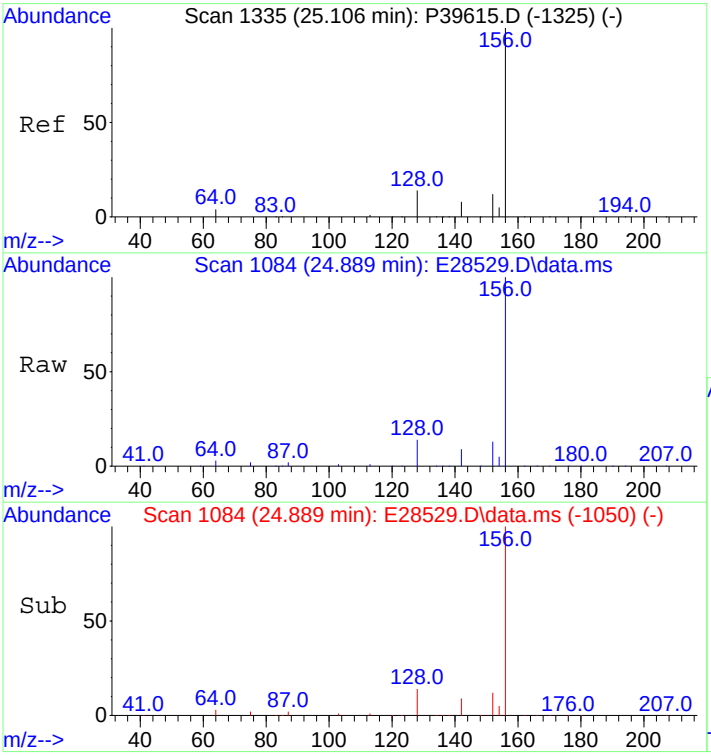


#23
Biphenyl
Concen: 17939.21 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:154 Resp: 2227434

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

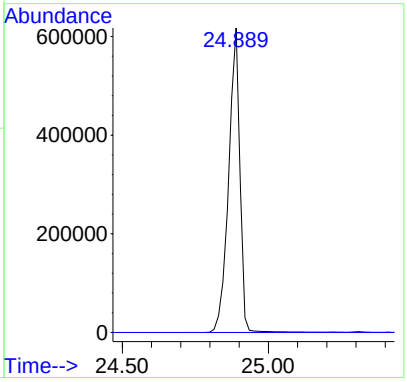


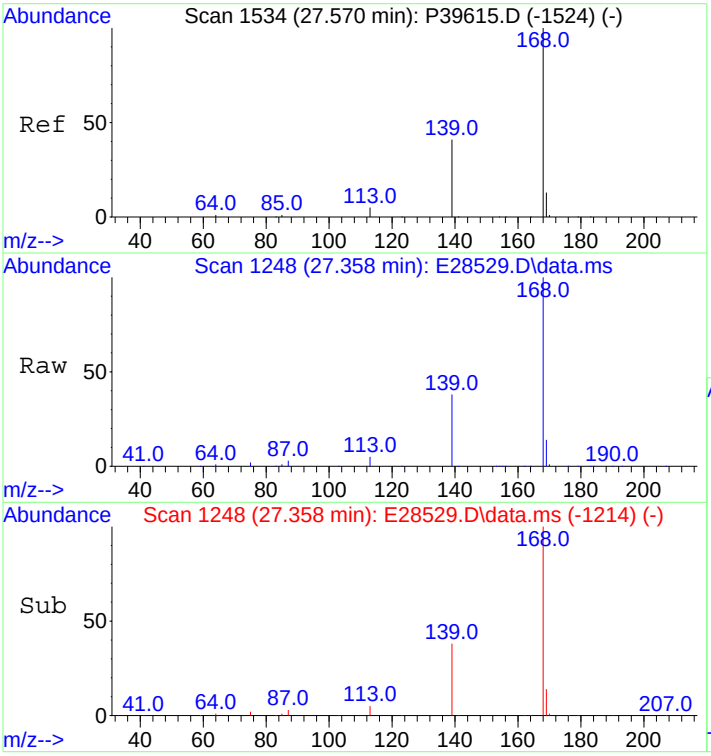


#24
2,6-Dimethylnaphthalene
Concen: 18486.30 ng/mL
RT: 24.889 min Scan# 1084
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:156 Resp: 1652186

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

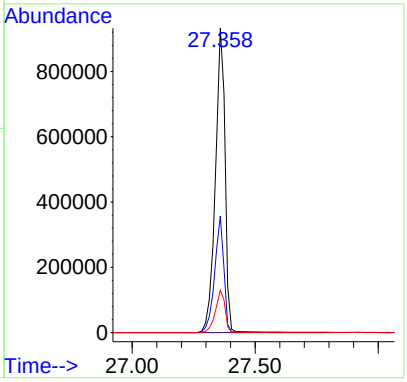


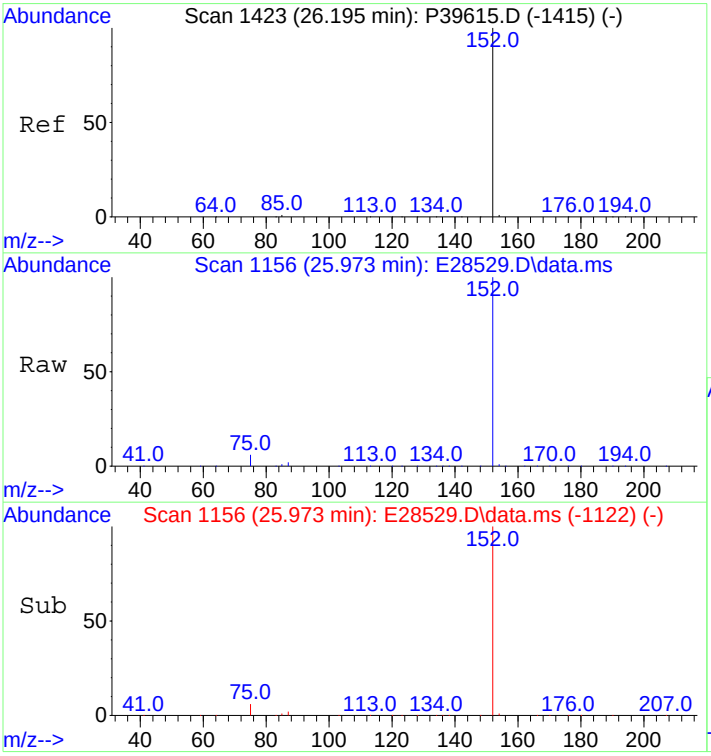


#25
Dibenzofuran
Concen: 19133.77 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:168 Resp: 2567457

Ion	Ratio	Lower	Upper
168	100		
139	36.6	30.6	45.8
169	13.8	10.6	16.0

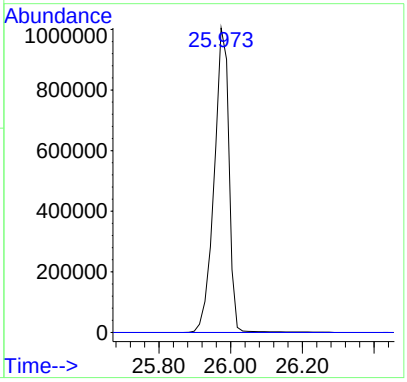


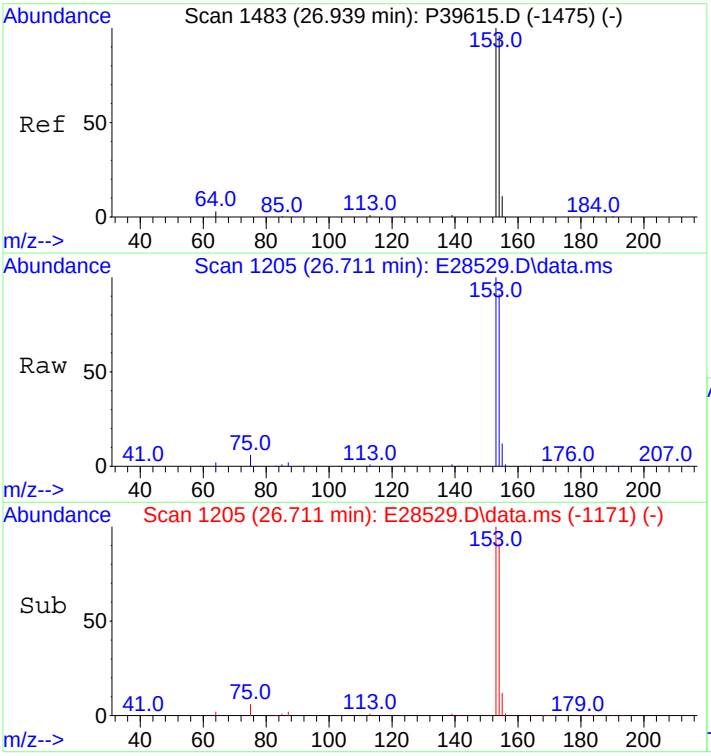


#26
Acenaphthylene
Concen: 19303.90 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:152 Resp: 2887125

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

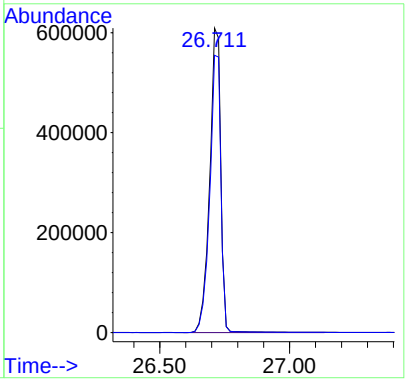


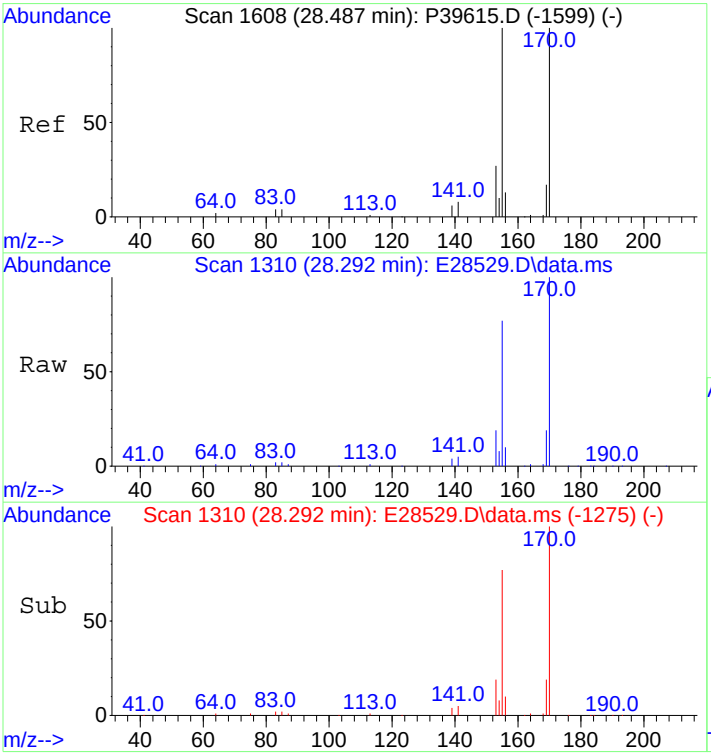


#27
Acenaphthene
Concen: 19334.90 ng/mL
RT: 26.711 min Scan# 1205
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:153 Resp: 1802150

Ion	Ratio	Lower	Upper
153	100		
154	92.0	72.3	108.5

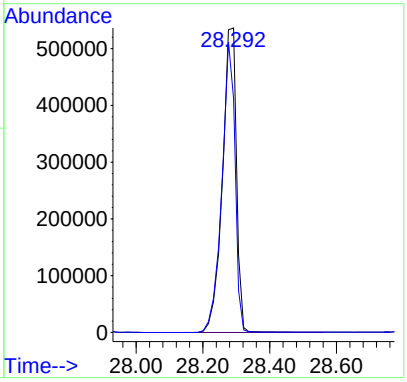


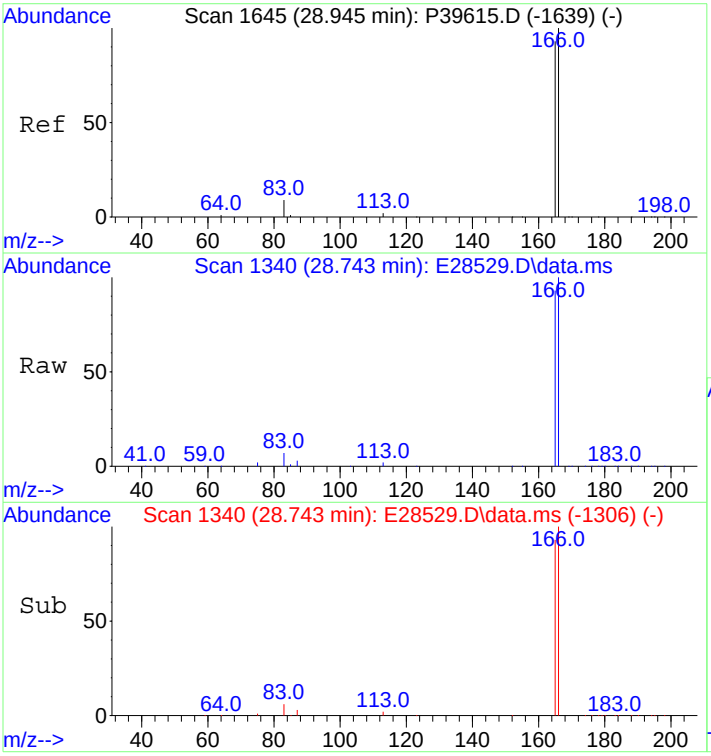


#28
2,3,5-Trimethylnaphthalene
Concen: 19507.01 ng/mL
RT: 28.292 min Scan# 1310
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:170 Resp: 1575864

Ion	Ratio	Lower	Upper
170	100		
155	89.4	75.9	113.9

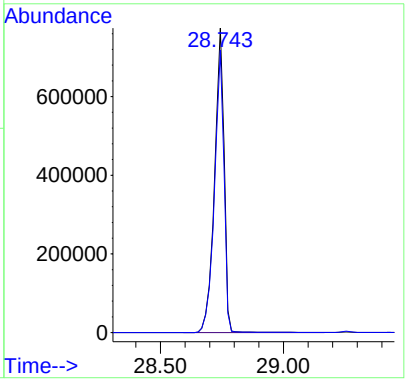


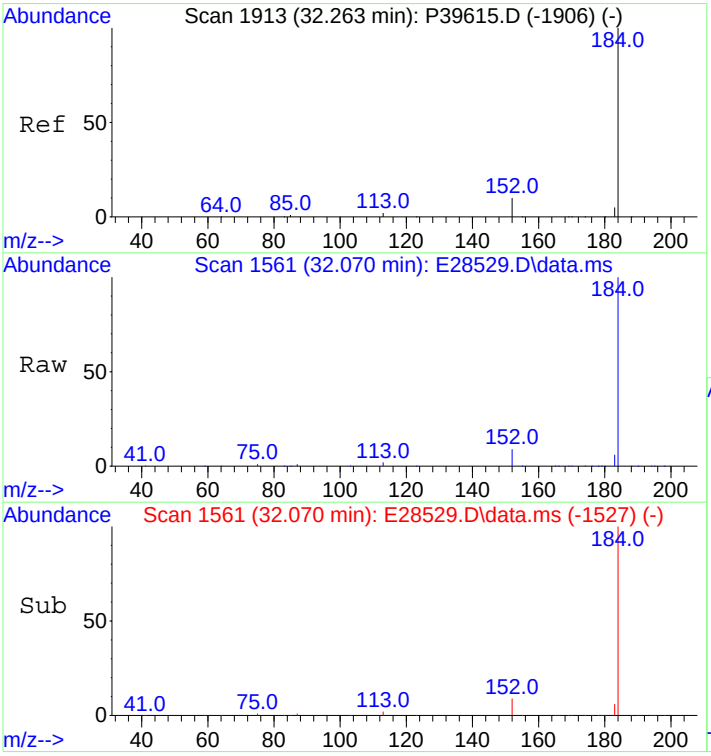


#29
Fluorene
Concen: 19433.45 ng/mL
RT: 28.743 min Scan# 1340
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:166 Resp: 2105968

Ion	Ratio	Lower	Upper
166	100		
165	92.1	73.8	110.6

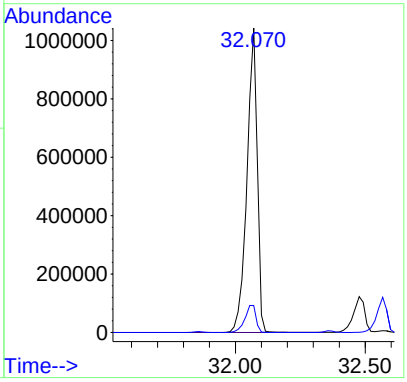


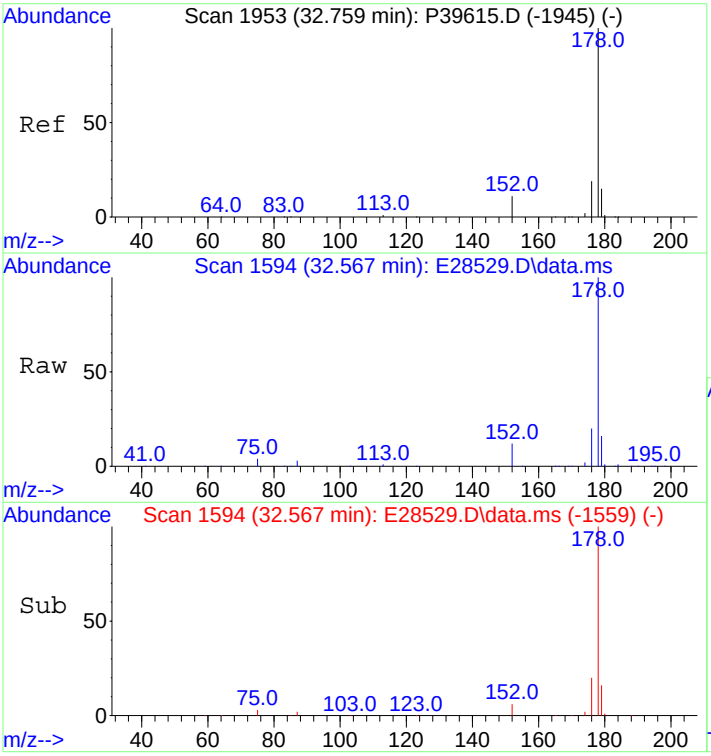


#33
Dibenzothiophene
Concen: 18899.56 ng/mL
RT: 32.070 min Scan# 1561
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:184 Resp: 2867812

Ion	Ratio	Lower	Upper
184	100		
152	9.6	6.2	9.2#

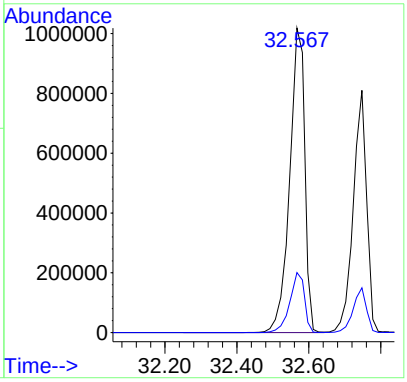


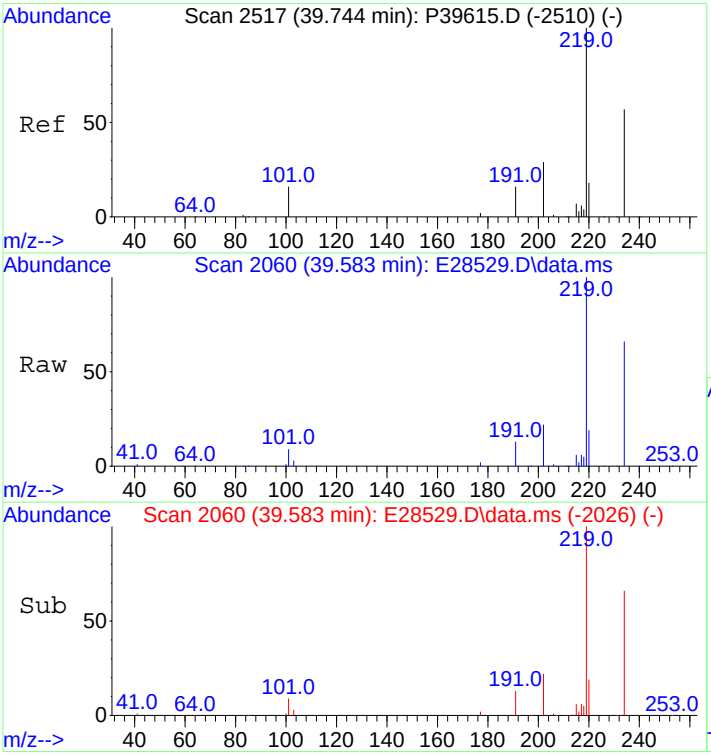


#43
Phenanthrene
Concen: 18728.24 ng/mL
RT: 32.567 min Scan# 1594
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:178 Resp: 2963936

Ion	Ratio	Lower	Upper
178	100		
176	19.2	15.0	22.6

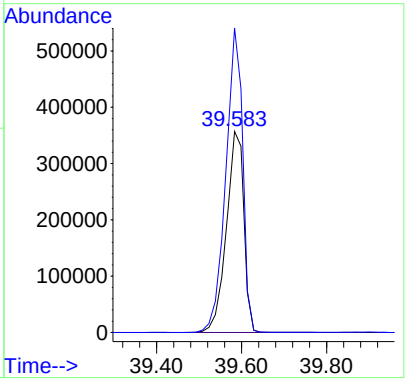


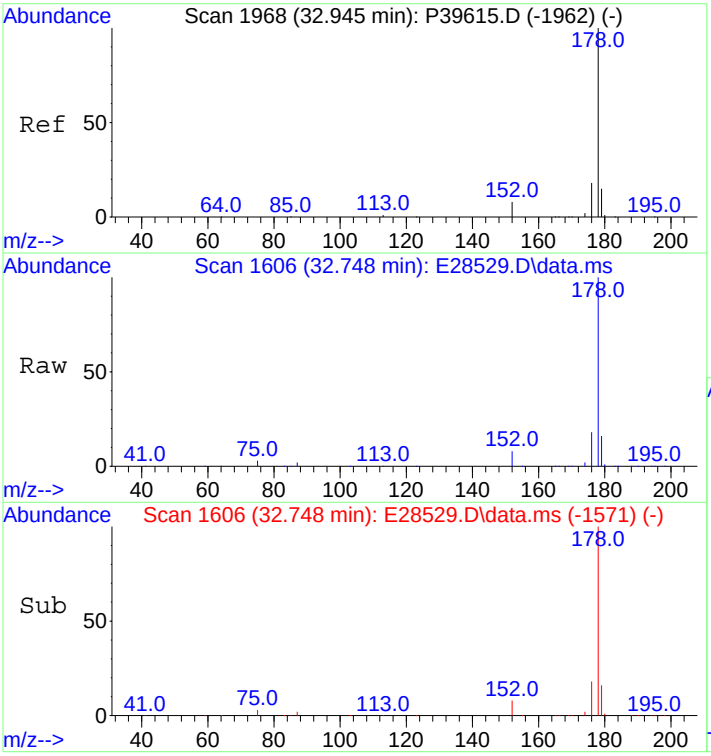


#54
Retene
Concen: 20967.11 ng/mL
RT: 39.583 min Scan# 2060
Delta R.T. 0.015 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:234 Resp: 1015806

Ion	Ratio	Lower	Upper
234	100		
219	146.5	113.0	169.4

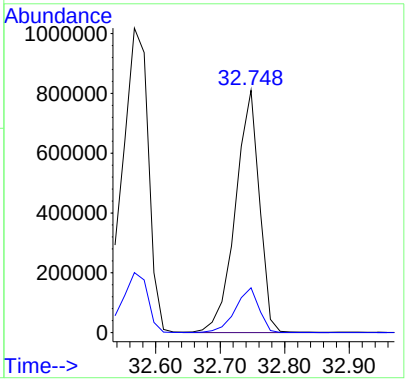


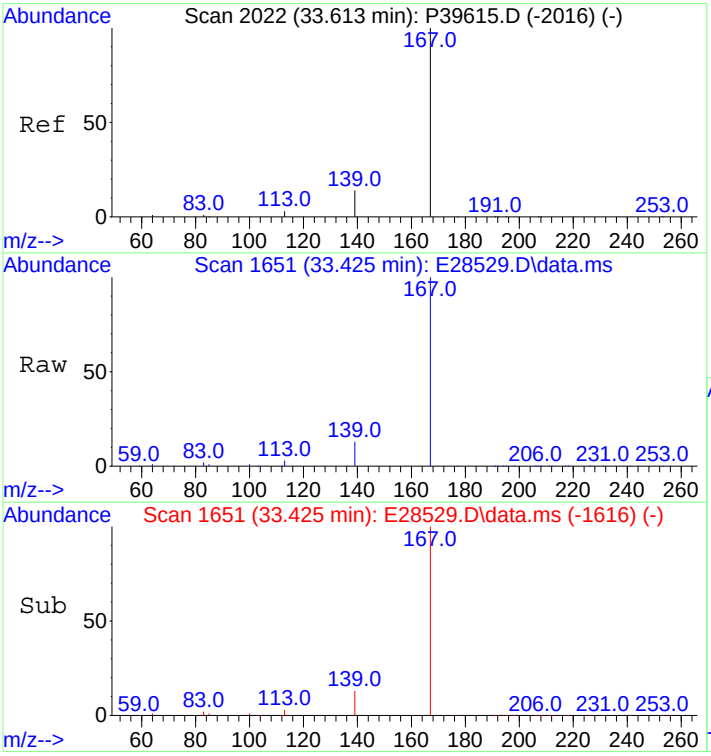


#55
Anthracene
Concen: 14156.76 ng/mL m
RT: 32.748 min Scan# 1606
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:178 Resp: 2099409

Ion	Ratio	Lower	Upper
178	100		
176	18.4	14.5	21.7

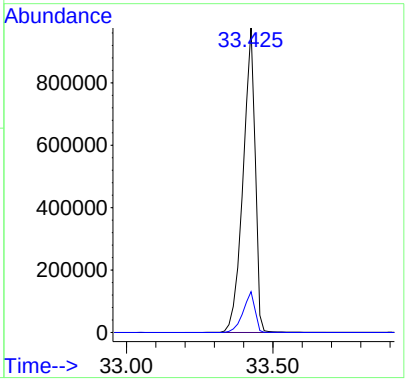


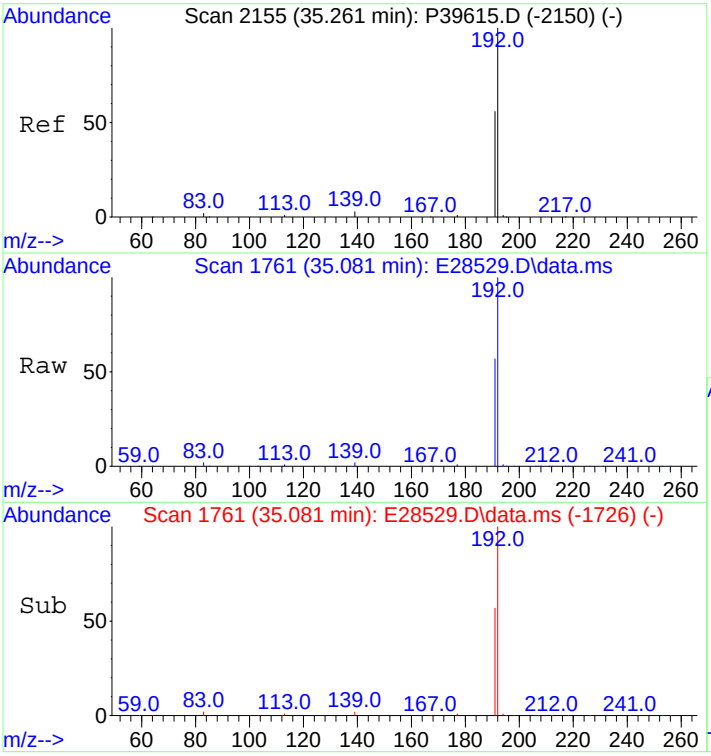


#56
Carbazole
Concen: 20001.85 ng/mL m
RT: 33.425 min Scan# 1651
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:167 Resp: 2801542

Ion	Ratio	Lower	Upper
167	100		
139	13.0	10.5	15.7

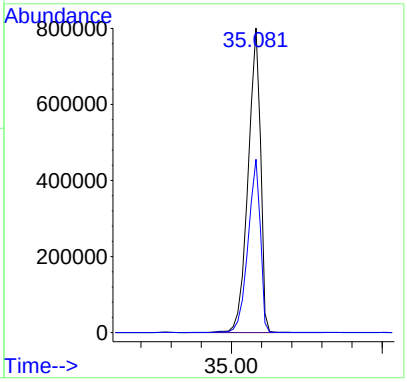


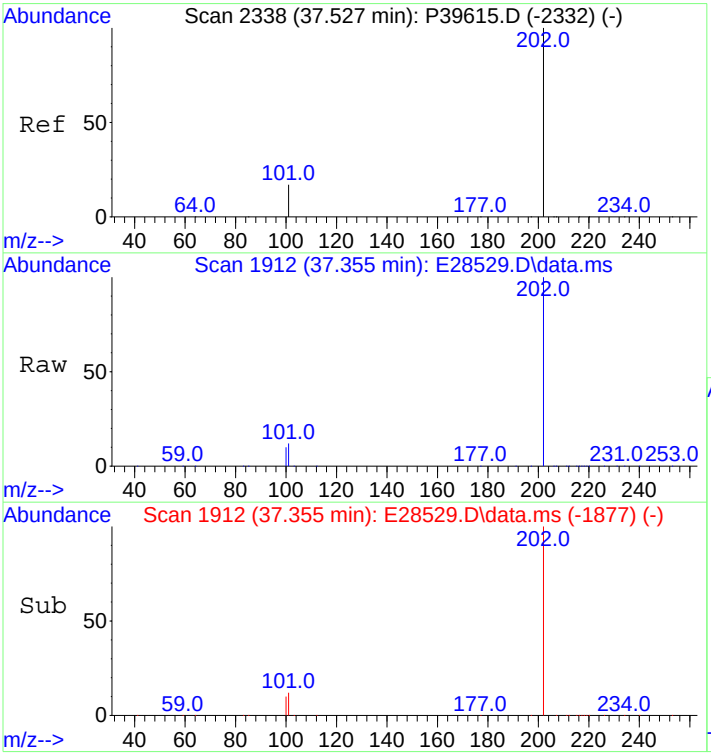


#57
1-Methylphenanthrene
Concen: 19509.07 ng/mL
RT: 35.081 min Scan# 1761
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:192 Resp: 2299712

Ion	Ratio	Lower	Upper
192	100		
191	56.4	45.5	68.3

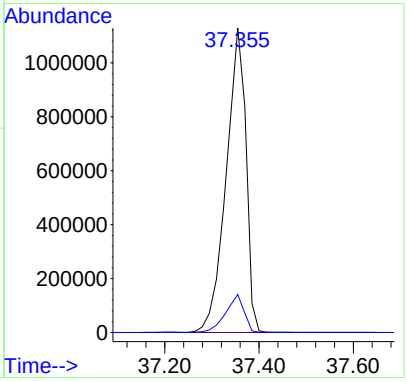


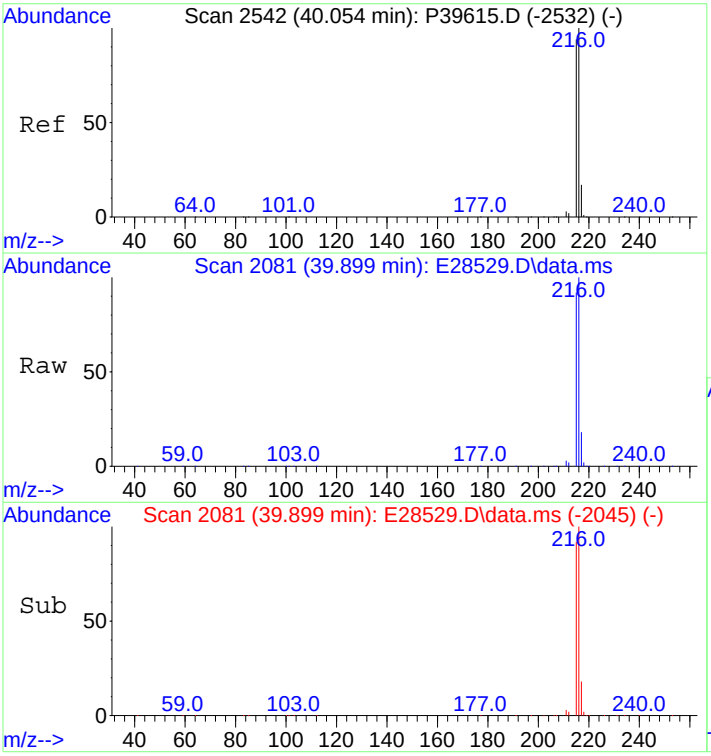


#58
Fluoranthene
Concen: 19040.79 ng/mL m
RT: 37.355 min Scan# 1912
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:202 Resp: 3284016

Ion	Ratio	Lower	Upper
202	100		
101	11.6	9.2	13.8

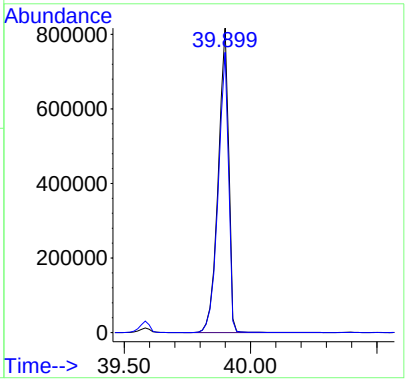


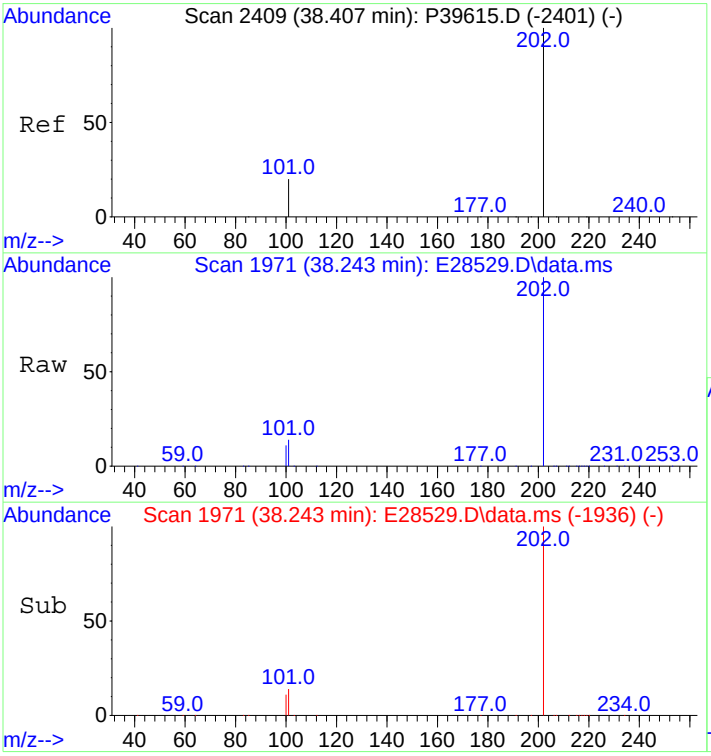


#59
Benzo(b)fluorene
Concen: 21426.94 ng/mL
RT: 39.899 min Scan# 2081
Delta R.T. 0.045 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:216 Resp: 2350585

Ion	Ratio	Lower	Upper
216	100		
215	91.2	73.8	110.8

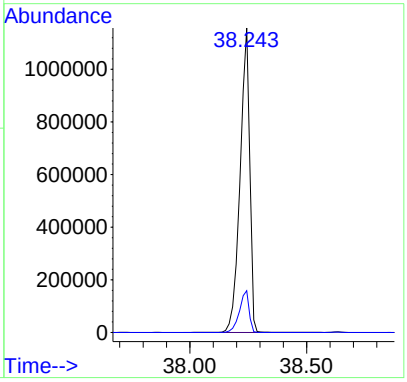


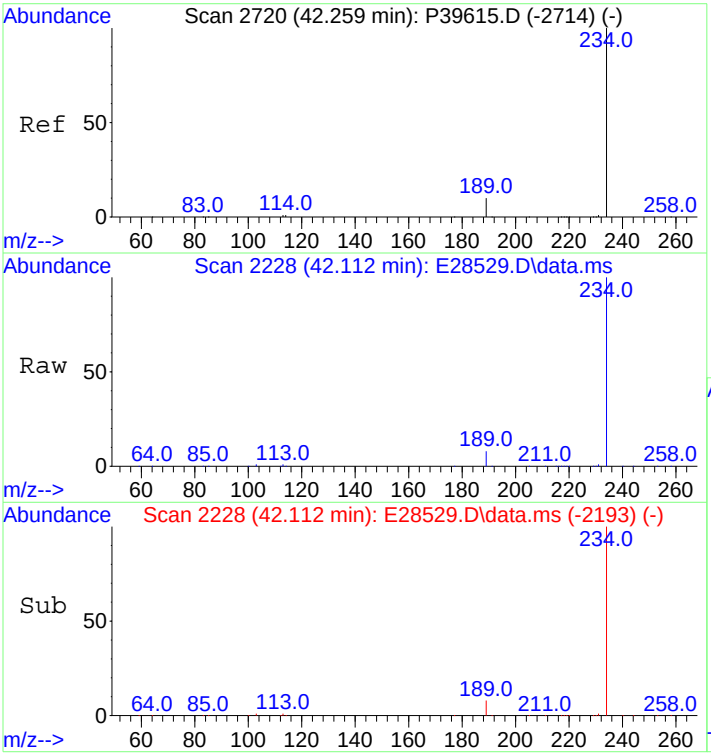


#60
Pyrene
Concen: 19057.45 ng/mL
RT: 38.243 min Scan# 1971
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:202 Resp: 3308735

Ion	Ratio	Lower	Upper
202	100		
101	13.7	9.8	14.8

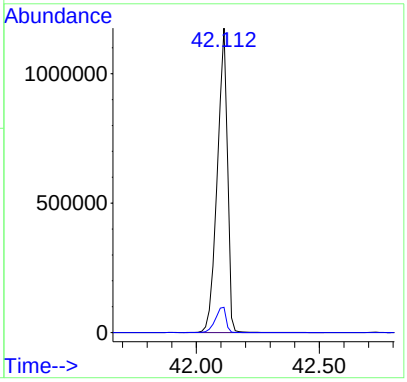


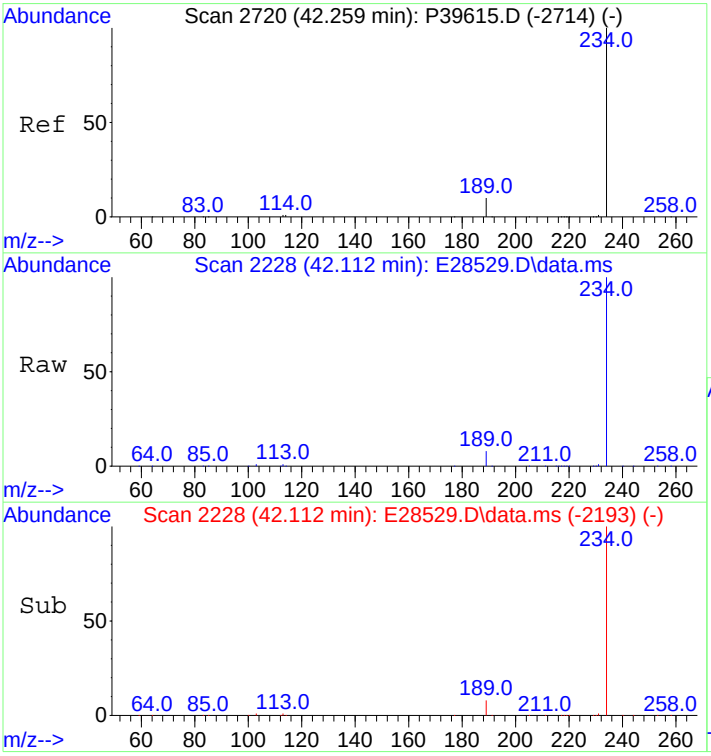


#66
Naphthobenzothiophene
Concen: 20479.13 ng/ml
RT: 42.112 min Scan# 2228
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:234 Resp: 3354891

Ion	Ratio	Lower	Upper
234	100		
189	8.8	5.5	8.3#

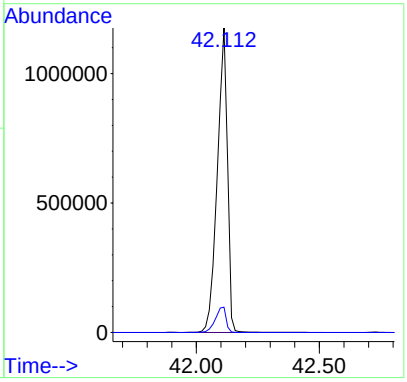


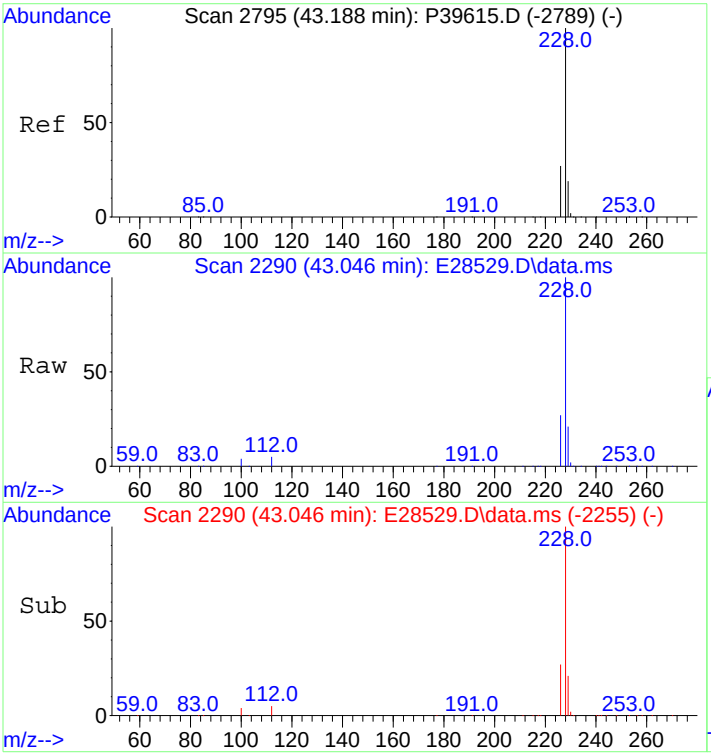


#67
Naphthobenzothiophene-2,1-D
Concen: 20479.13 ng/mL
RT: 42.112 min Scan# 2228
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:234 Resp: 3354891

Ion	Ratio	Lower	Upper
234	100		
189	8.8	5.5	8.3#

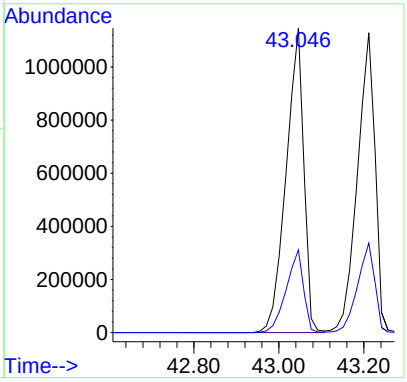


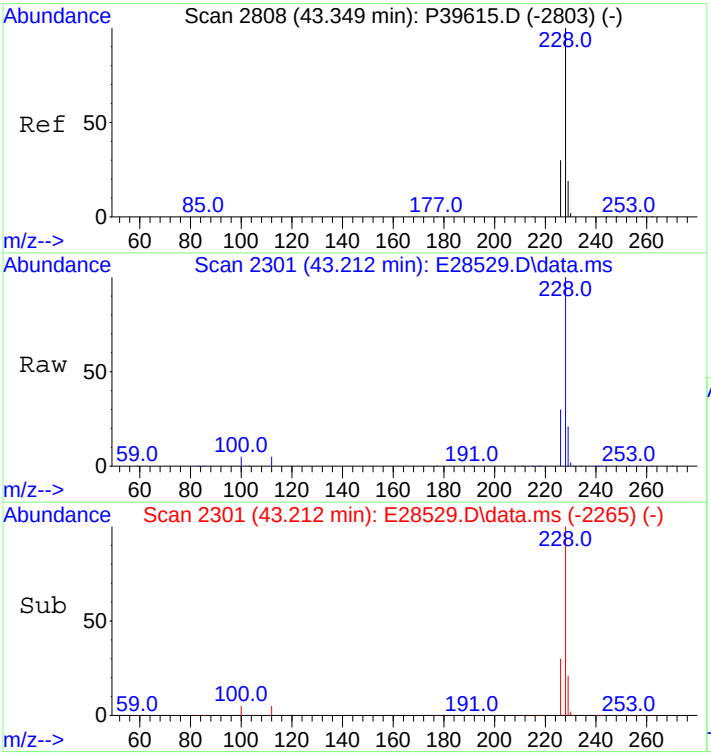


#75
Benz[a]anthracene
Concen: 16929.16 ng/mL
RT: 43.046 min Scan# 2290
Delta R.T. 0.030 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:228 Resp: 3308979

Ion	Ratio	Lower	Upper
228	100		
226	26.5	20.2	30.4

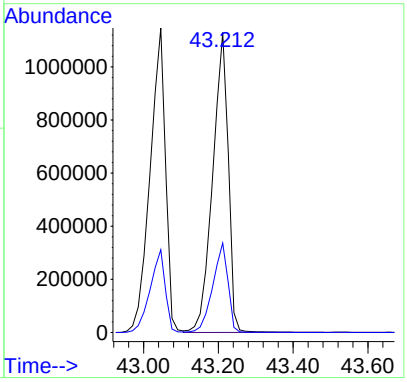


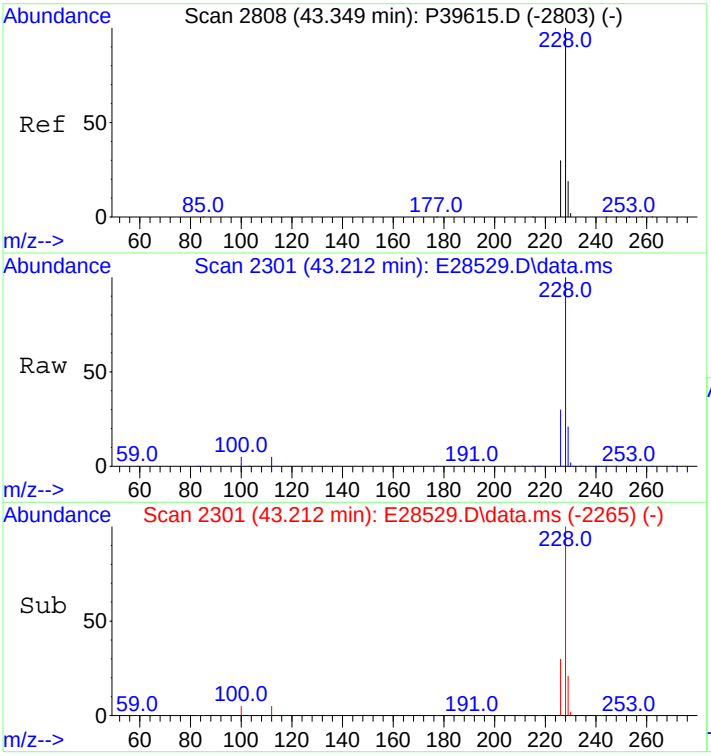


#76
Chrysene
Concen: 17112.24 ng/mL
RT: 43.212 min Scan# 2301
Delta R.T. 0.045 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:228 Resp: 3273879

Ion	Ratio	Lower	Upper
228	100		
226	29.1	22.6	34.0

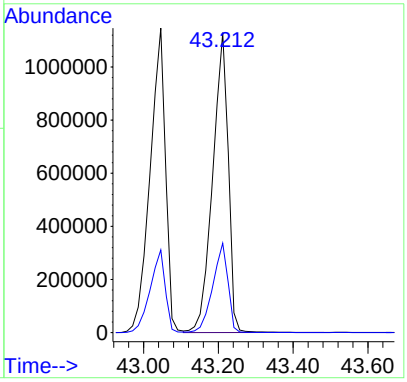


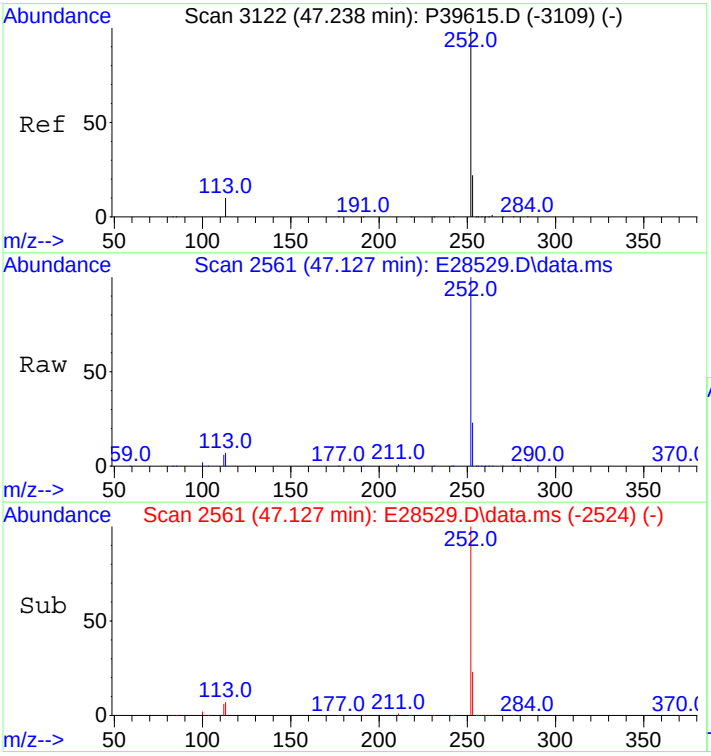


#77
Chrysene/Triphenylene
Concen: 17112.24 ng/mL
RT: 43.212 min Scan# 2301
Delta R.T. 0.045 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:228 Resp: 3273879

Ion	Ratio	Lower	Upper
228	100		
226	29.1	22.6	34.0

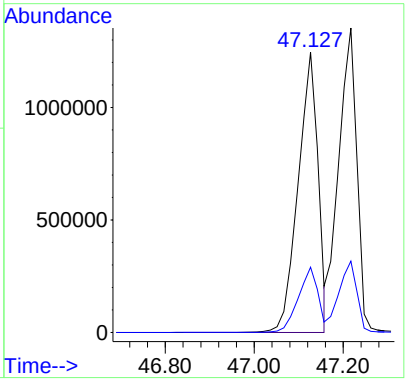


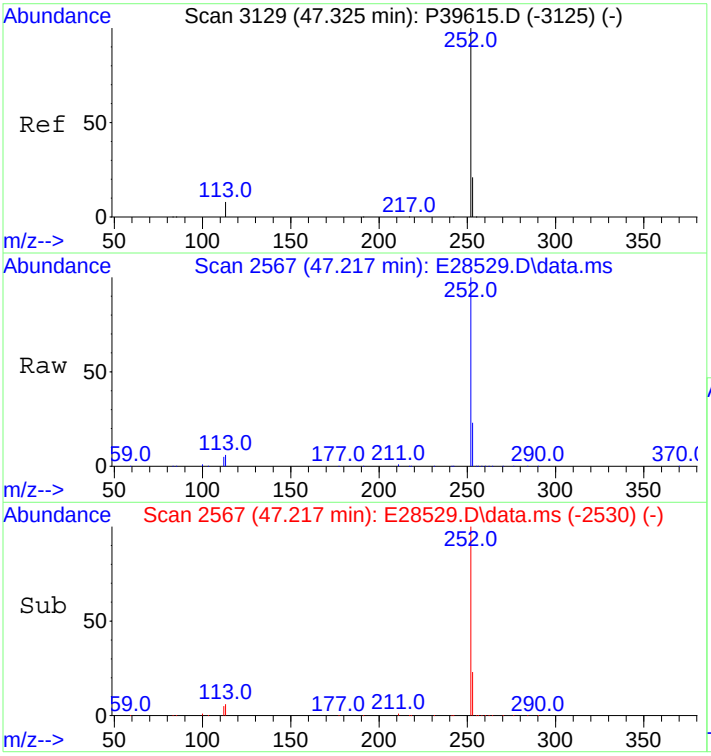


#84
Benzo[b]fluoranthene
Concen: 18894.57 ng/mL
RT: 47.127 min Scan# 2561
Delta R.T. 0.060 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3888463

Ion	Ratio	Lower	Upper
252	100		
253	23.1	18.3	27.5

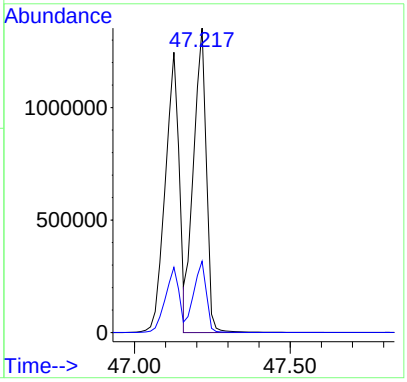


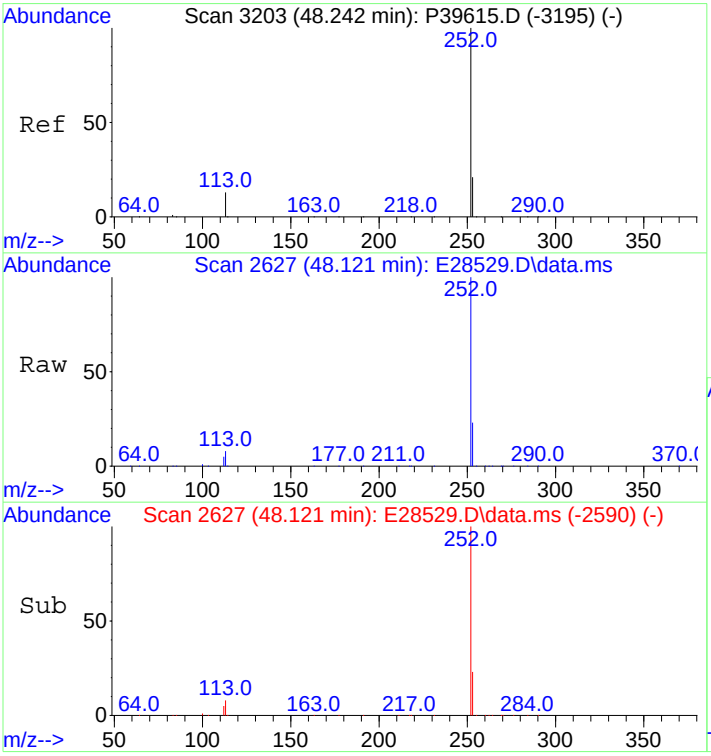


#85
Benzo[j]+[k]fluoranthene
Concen: 20033.78 ng/mL
RT: 47.217 min Scan# 2567
Delta R.T. 0.060 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3879730

Ion	Ratio	Lower	Upper
252	100		
253	23.2	18.3	27.5

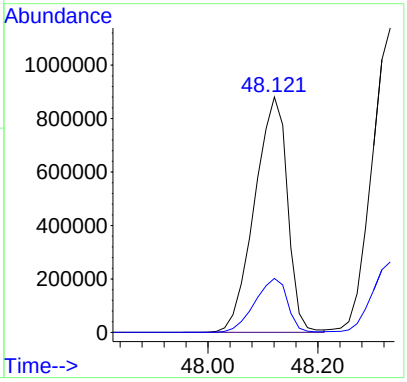


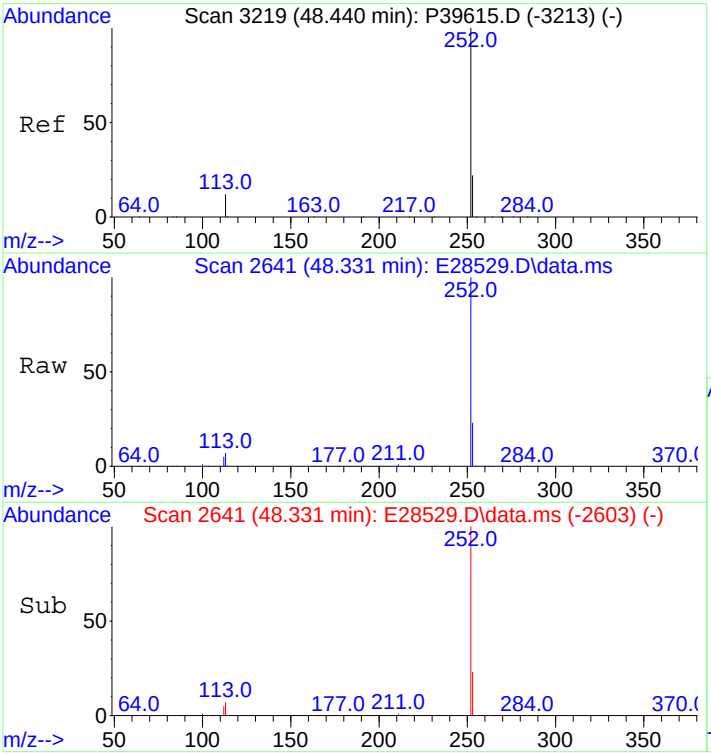


#87
Benzo[e]pyrene
Concen: 20014.94 ng/mL
RT: 48.121 min Scan# 2627
Delta R.T. 0.060 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3655053

Ion	Ratio	Lower	Upper
252	100		
253	22.7	18.6	28.0

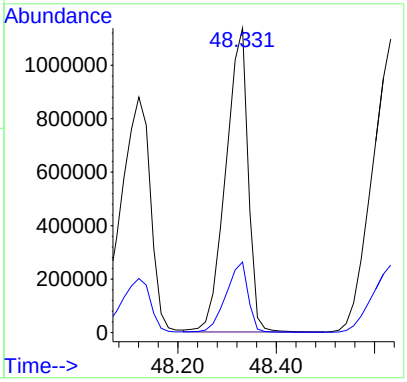


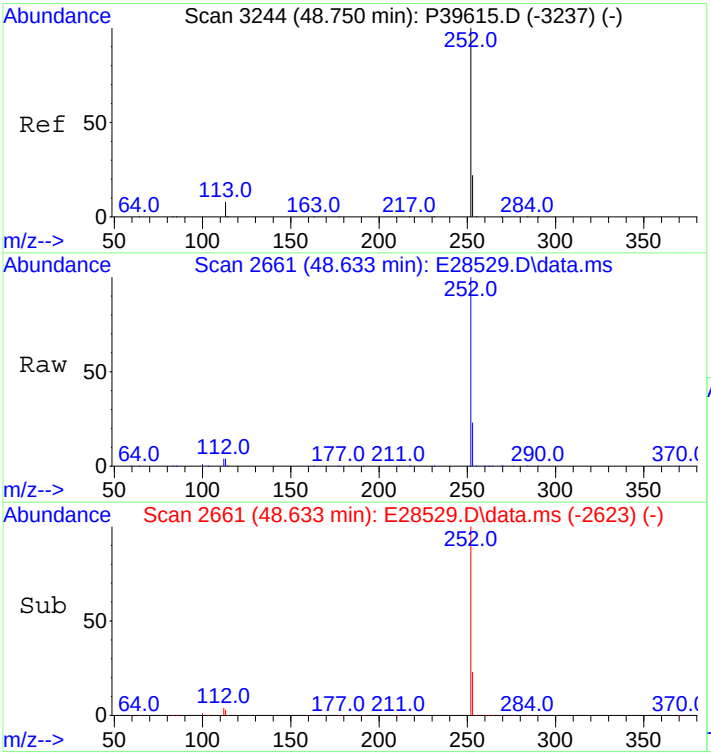


#89
Benzo[a]pyrene
Concen: 20806.40 ng/mL
RT: 48.331 min Scan# 2641
Delta R.T. 0.075 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3592144

Ion	Ratio	Lower	Upper
252	100		
253	22.9	18.8	28.2

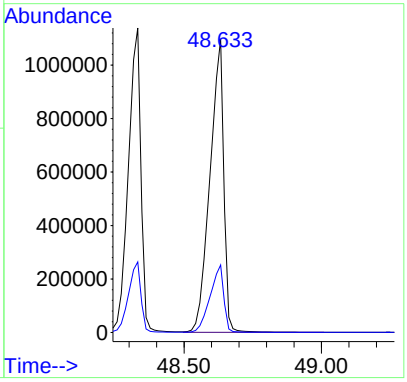


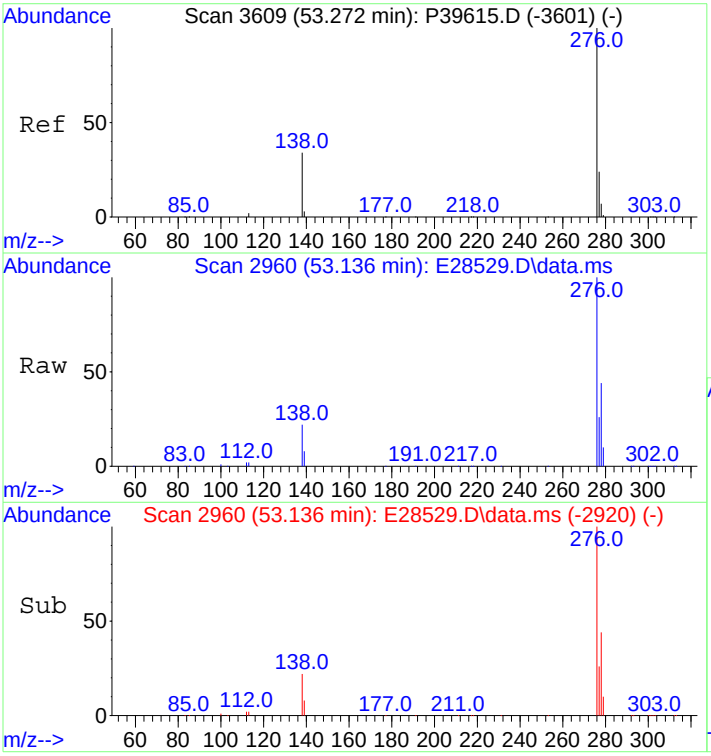


#90
Perylene
Concen: 20804.69 ng/mL
RT: 48.633 min Scan# 2661
Delta R.T. 0.075 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:252 Resp: 3822620

Ion	Ratio	Lower	Upper
252	100		
253	22.8	18.8	28.2

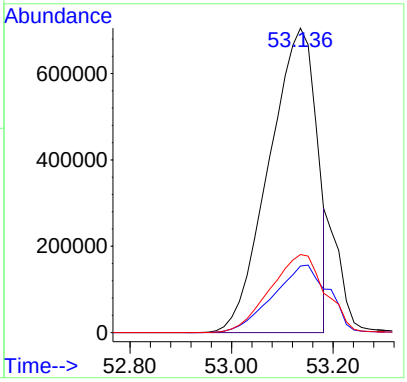


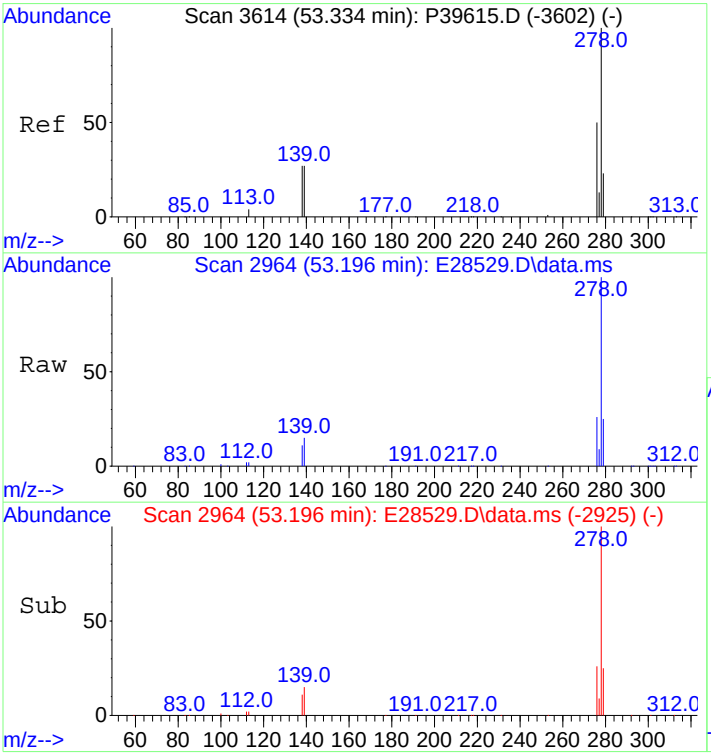


#91
Indeno[1,2,3-cd]pyrene
Concen: 22121.20 ng/mL m
RT: 53.136 min Scan# 2960
Delta R.T. 0.105 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:276 Resp: 4610873

Ion	Ratio	Lower	Upper
276	100		
138	26.0	15.4	23.2#
277	29.7	19.1	28.7#

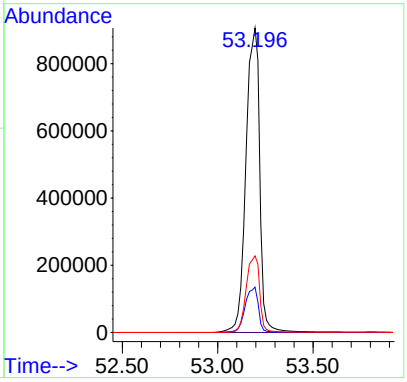


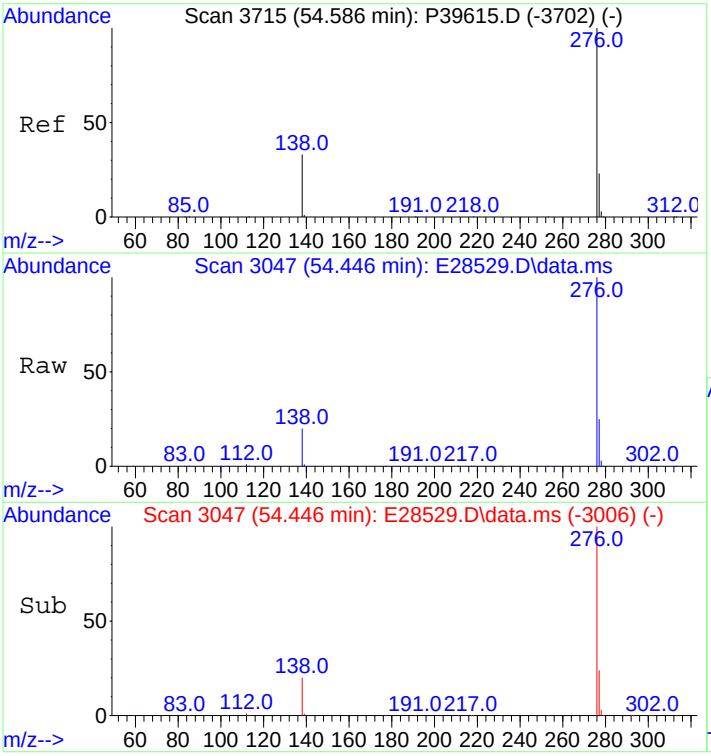


#92
Dibenz[ah]+[ac]anthracene
Concen: 22801.34 ng/mL
RT: 53.196 min Scan# 2964
Delta R.T. 0.090 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:278 Resp: 4571116

Ion	Ratio	Lower	Upper
278	100		
139	14.5	11.1	16.7
279	24.7	19.4	29.0

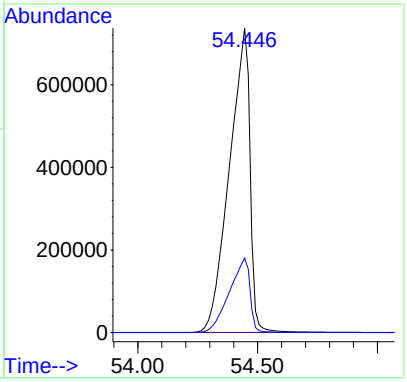




#93
Benzo[g,h,i]perylene
Concen: 21457.51 ng/mL
RT: 54.446 min Scan# 3047
Delta R.T. 0.120 min
Lab File: E28529.D
Acq: 30 Oct 2012 1:23 am

Tgt Ion:276 Resp: 4394931

Ion	Ratio	Lower	Upper
276	100		
277	24.6	19.1	28.7



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
Data File : E28533.D
Acq On : 30 Oct 2012 4:21 am
Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.591	164	47144M3	500.000	ng/mL	0.01
74) Chrysene-d12	43.091	240	105852	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	140871	849.517	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 84.95%			
42) Phenanthrene-d10	32.462	188	163907	964.768	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 96.48%			
83) Benzo[b]fluoranthene-d12	47.006	264	220790	1015.382	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.54%			
88) Benzo[a]pyrene-d12	48.181	264	210972	1001.332	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 100.13%			
129) 5B(H)Cholane - Surr	43.724	217	46433	1113.004	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.30%			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	71200	1888.050	ng/mL	100
4) cis-Decalin	17.483	138	3514	122.649	ng/mL	100
5) C1-Decalins	18.205	152	138309M5	3667.617	ng/mL	
6) C2-Decalins	19.530	166	133037M5	3527.817	ng/mL	
7) C3-Decalins	22.014	180	72889M5	1932.839	ng/mL	
8) C4-Decalins	25.401	194	83324M5	2209.549	ng/mL	
10) Naphthalene	19.681	128	487082	2626.597	ng/mL#	100
11) C1-Naphthalenes	22.390	142	1071394M5	5777.508	ng/mL	
12) C2-Naphthalenes	25.236	156	1371191M5	7394.168	ng/mL	
13) C3-Naphthalenes	27.569	170	1083568M5	5843.156	ng/mL	
14) C4-Naphthalenes	30.339	184	632028M5	3408.220	ng/mL	
16) 2-Methylnaphthalene	22.390	142	627593	5313.630	ng/mL#	100
17) 1-Methylnaphthalene	22.812	142	441379	3845.923	ng/mL#	100
18) Benzothiophene	19.906	134	4341M3	28.316	ng/mL	
19) C1-Benzo(b)thiophenes	21.954	148	23978M5	156.409	ng/mL	
20) C2-Benzo(b)thiophenes	25.431	162	40049M5	261.240	ng/mL	
21) C3-Benzo(b)thiophenes	27.404	176	84299M5	549.883	ng/mL	
22) C4-Benzo(b)thiophenes	29.150	190	78691M5	513.302	ng/mL	
23) Biphenyl	24.272	154	102541	686.942	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.890	156	337170	3167.106	ng/mL#	100
25) Dibenzofuran	27.358	168	42393	256.522	ng/mL	89
26) Acenaphthylene	25.973	152	6691M3	36.190	ng/mL	
27) Acenaphthene	26.741	153	10860M3	91.253	ng/mL	
28) 2,3,5-Trimethylnaphtha...	28.277	170	83122M3	834.531	ng/mL	
29) Fluorene	28.728	166	48225M3	363.326	ng/mL	
30) C1-Fluorenes	31.107	180	118539M5	893.069	ng/mL	
31) C2-Fluorenes	33.305	194	193676M5	1459.150	ng/mL	
32) C3-Fluorenes	35.142	208	189287M5	1426.083	ng/mL	
33) Dibenzothiophene	32.055	184	127296	698.870	ng/mL#	71
34) 4-Methyldibenzothiophe...	33.832	198	131601	722.505	ng/mL#	100
35) 2/3-Methyldibenzothiop...	34.193	198	95587	524.784	ng/mL#	100
36) 1-Methyldibenzothiophe...	34.615	198	43667	239.737	ng/mL#	100
37) OTP	34.283	198	18036	99.020	ng/mL#	100
38) C1-Dibenzothiophenes	33.832	198	294951M5	1619.316	ng/mL	
39) C2-Dibenzothiophenes	35.533	212	404348M5	2219.919	ng/mL	
40) C3-Dibenzothiophenes	37.340	226	379093M5	2081.266	ng/mL	
41) C4-Dibenzothiophenes	39.041	240	214446M5	1177.334	ng/mL	
43) Phenanthrene	32.552	178	195639	1055.722	ng/mL	96
44) 3-Methylphenanthrene(3MP)	34.524	192	93705	505.658	ng/mL	98

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Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
45) 2-Methylphenanthrene(2MP)	34.645	192	101546	547.970 ng/mL	97
46) 2-Methylanthracene(2MA)	34.795	192	2266M3	12.228 ng/mL	
47) 9/4-Methylphenanthrene...	34.976	192	143377	773.702 ng/mL	97
48) 1-Methylphenanthrene(1MP)	35.066	192	100277M3	541.122 ng/mL	
49) C1-Phenanthrenes/Anthr...	34.976	192	441690M5	2383.481 ng/mL	
50) C2-Phenanthrenes/Anthr...	36.798	206	510520M5	2754.907 ng/mL	
52) C3-Phenanthrenes/Anthr...	38.650	220	375728M5	2027.532 ng/mL	
53) C4-Phenanthrenes/Anthr...	40.833	234	154244M5	832.343 ng/mL	
56) Carbazole	33.410	167	6647M3	40.322 ng/mL	
57) 1-Methylphenanthrene	35.066	192	100650M3	711.918 ng/mL	
58) Fluoranthene	37.340	202	4201M3	20.528 ng/mL	
59) Benzo(b)fluorene	39.869	216	5205M3	38.168 ng/mL	
60) Pyrene	38.228	202	15722M3	75.583 ng/mL	
61) C1-Fluoranthenes/Pyrenes	39.628	216	77003M5	370.190 ng/mL	
62) C2-Fluoranthenes/Pyrenes	41.435	230	124873M5	600.323 ng/mL	
63) C3-Fluoranthenes/Pyrenes	43.468	244	153640M5	738.620 ng/mL	
64) C4-Fluoranthenes/Pyrenes	44.823	258	140363M5	674.791 ng/mL	
66) Naphthobenzothiophene	42.098	234	34132	166.369 ng/ml#	72
67) Naphthobenzothiophene-...	42.098	234	34132	166.369 ng/mL#	72
68) Naphthobenzothiophene-...	42.429	234	8220	40.067 ng/mL#	5
69) Naphthobenzothiophene-...	42.730	234	3653M3	17.806 ng/mL	
70) C1-Naphthobenzothiophenes	43.498	248	127630M5	622.106 ng/ml	
71) C2-Naphthobenzothiophenes	45.515	262	185905M5	906.156 ng/ml	
72) C3-Naphthobenzothiophenes	47.112	276	152145M5	741.600 ng/ml	
73) C4-Naphthobenzothiophenes	48.196	290	114807M5	559.603 ng/mL	
75) Benz[a]anthracene	43.016	228	2301M3	11.163 ng/mL	
76) Chrysene	43.151	228	39715M3	187.149 ng/mL	
77) Chrysene/Triphenylene	43.151	228	40725M3	191.908 ng/mL	
78) C1-Chrysenes	44.672	242	75676M5	356.607 ng/mL	
79) C2-Chrysenes	46.750	256	109371M5	515.388 ng/mL	
80) BBF-D12 Surr BKGD	47.006	256	6935	32.680 ng/mL	100
81) C3-Chrysenes	49.446	270	124142M5	584.993 ng/mL	
82) C4-Chrysenes	49.567	284	79808M5	376.078 ng/mL	
84) Benzo[b]fluoranthene	47.082	252	6298M3	26.287 ng/mL	
85) Benzo[j]+[k]fluoranthene	47.142	252	550M3	2.231 ng/mL	
87) Benzo[e]pyrene	48.076	252	11528	49.278 ng/mL	91
89) Benzo[a]pyrene	48.271	252	1881M3	8.403 ng/mL	
90) Perylene	48.588	252	3561M3	15.044 ng/mL	
91) Indeno[1,2,3-cd]pyrene	53.076	276	1091M3	4.141 ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.106	278	1624M3	5.789 ng/mL	
93) Benzo[g,h,i]perylene	54.340	276	4537	15.972 ng/mL#	68
94) Hopane (T19)	52.202	191	61269	771.256 ng/mL#	90
95) 17a(H),21B(H)-hopane -...	52.202	191	61269	771.256 ng/mL#	90
96) C23 Tricyclic Terpane ...	40.743	191	23215	292.231 ng/ml	100
97) C24 Tricyclic Terpane ...	41.480	191	14405M3	181.331 ng/ml	
98) C25 Tricyclic Terpane ...	42.971	191	14231M3	179.140 ng/ml	
99) C24 Tetracyclic Terpan...	44.281	191	4971M3	62.575 ng/ml	
100) C26 Tricyclic Terpane-...	44.025	191	5793M3	72.922 ng/ml	
101) C26 Tricyclic Terpane-...	44.130	191	5231	65.848 ng/ml	100
102) C28 Tricyclic Terpane-...	46.419	191	5851M3	73.653 ng/ml	
103) C28 Tricyclic Terpane-...	46.585	191	6386M3	80.387 ng/ml	
104) C29 Tricyclic Terpane-...	47.112	191	7224	90.936 ng/ml	100
105) C29 Tricyclic Terpane-...	47.307	191	7284M3	91.691 ng/ml	
106) 18a-22,29,30-Trisnorne...	48.422	191	10760	135.447 ng/ml	100
107) C30 Tricyclic Terpane-22S	48.527	191	5804M3	73.061 ng/mL	
108) C30 Tricyclic Terpane-22R	48.768	191	5992M3	75.427 ng/mL	

Quantitation Report (QT Reviewed)

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Operator : AC
Sample : ss110512anc02
Misc : ANS WHAQ46 5.076MG/ML
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Oct 31 12:59:11 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:59:51 2012
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
109) 17a(H)-22,29,30-Trisno...	48.964	191	12728M3	160.220	ng/ml	
110) 17a/b,21b/a 28,30-Bisn...	50.154	191	2831	35.637	ng/ml	100
111) 17a(H),21b(H)-25-Norho...	49.973	191	3191	40.168	ng/ml	100
112) 30-Norhopane (T15)	50.832	191	35454	446.296	ng/ml	100
113) 18a(H)-30-Norneohopane...	50.937	191	9313M3	117.232	ng/ml	
114) 17a(H)-Diahopane (X)	51.073	191	5508M3	69.335	ng/ml	
115) 30-Normoretane (T17)	51.615	191	3970	49.974	ng/ml	100
117) Moretane (T20)	52.895	191	6020M3	75.780	ng/ml	
118) 30-Homohopane-22S (T21)	53.994	191	25836	325.224	ng/ml	100
119) 30-Homohopane-22R (T22)	54.235	191	21801	274.432	ng/ml	100
120) Gammacerane/C32-diahopane	54.777	191	4499	56.634	ng/mL	100
121) 30,31-Bishomohopane-22...	55.575	191	18579	233.873	ng/ml	100
122) 30,31-Bishomohopane-22...	55.952	191	13513	170.102	ng/ml	100
123) 30,31-Trishomohopane-2...	57.714	191	14906	187.637	ng/ml	100
124) 30,31-Trishomohopane-2...	58.331	191	9896M3	124.571	ng/ml	
125) Tetrakishomohopane-22S...	60.349	191	10857	136.668	ng/ml	100
126) Tetrakishomohopane-22R...	61.252	191	7957	100.163	ng/ml	100
127) Pentakishomohopane-22S...	63.511	191	11110	139.853	ng/ml	100
128) Pentakishomohopane-22R...	64.806	191	9965	125.440	ng/ml	100
130) 13b(H),17a(H)-20S-Diac...	45.244	217	10733M3	257.271	ng/ml	
131) 13b(H),17a(H)-20R-Diac...	45.681	217	5589M3	133.969	ng/ml	
132) 13b,17a-20S-Methyldiac...	46.374	217	4399M3	105.445	ng/ml	
133) 14a,17a-20S-Chol/13b,1...	47.247	217	12966	310.796	ng/ml	100
134) 14a,17a-20R-Chol/13b,1...	47.759	217	15015M3	359.911	ng/ml	
135) Unknown Sterane (S18)	48.045	217	4124	98.853	ng/ml	100
136) 13a,17b-20S-Ethyldiach...	48.317	217	1011	24.234	ng/ml	100
137) 14a,17a-20S-Methylchol...	48.467	217	6766M3	162.182	ng/ml	
138) 14a,17a-20R-Methylchol...	49.190	217	7334M3	175.797	ng/ml	
139) 14a(H),17a(H)-20S-Ethy...	49.536	217	9103M3	218.200	ng/ml	
140) 14a(H),17a(H)-20R-Ethy...	50.455	217	8734M3	209.355	ng/ml	
141) 14b(H),17b(H)-20R-Chol...	47.338	218	8433M3	202.140	ng/ml	
142) 14b(H),17b(H)-20S-Chol...	47.413	218	8412M3	201.637	ng/ml	
143) 14b,17b-20R-Methylchol...	48.633	218	9575	229.514	ng/ml	100
144) 14b,17b-20S-Methylchol...	48.723	218	11768M3	282.080	ng/ml	
145) 14b(H),17b(H)-20R-Ethy...	49.777	218	13230M3	317.125	ng/ml	
146) 14b(H),17b(H)-20S-Ethy...	49.823	218	8678M3	208.013	ng/ml	
147) C26,20R- +C27,20S- tri...	49.476	231	48173	1154.712	ng/mL	100
148) C28,20S-triaromatic st...	50.350	231	31642	758.462	ng/mL	100
149) C27,20R-triaromatic st...	50.801	231	29597	709.443	ng/mL	100
150) C28,20R-triaromatic st...	52.006	231	25116M3	602.033	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : Default - All compounds listedport (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALS\ICALPAH2102912\
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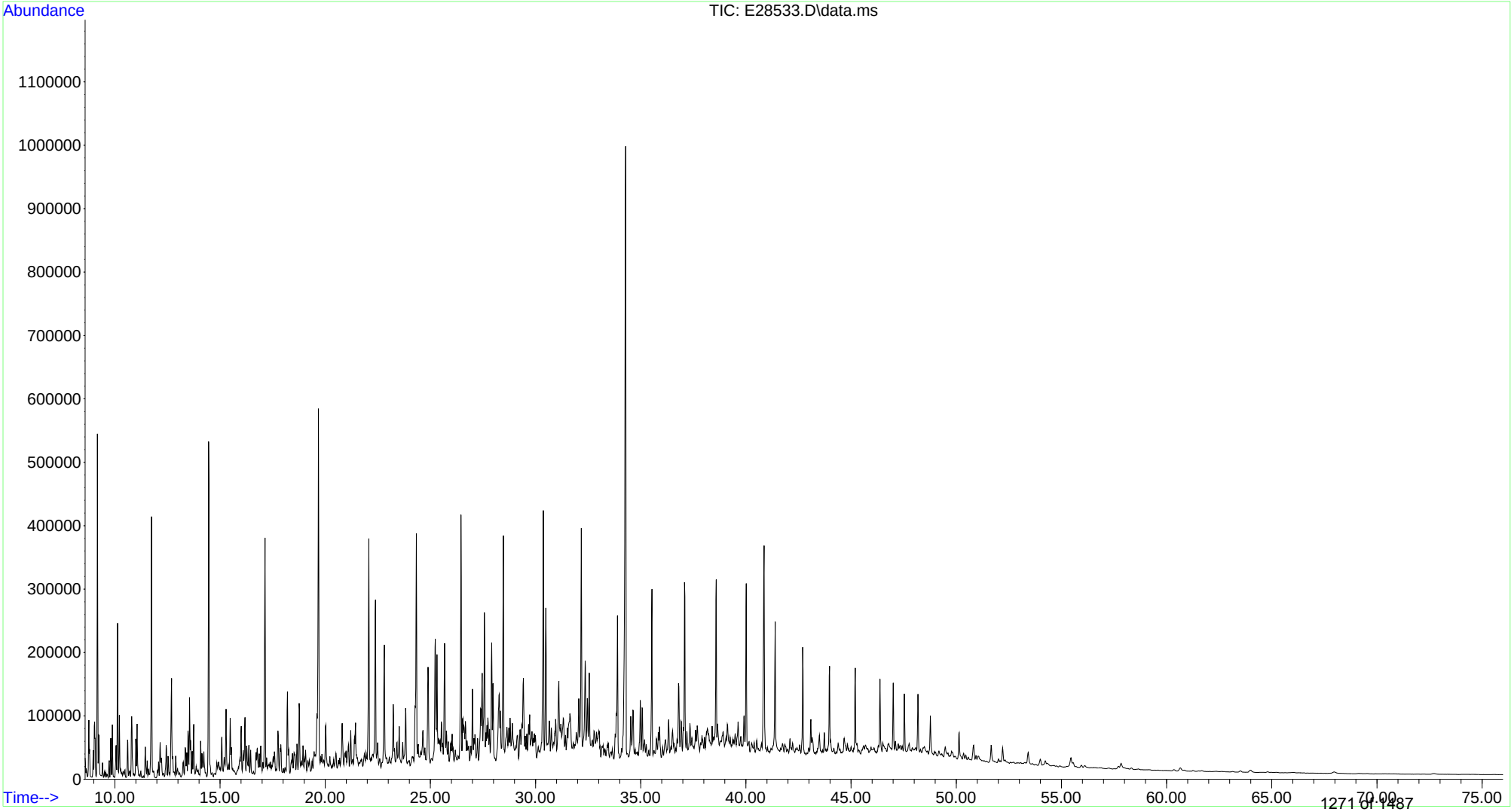
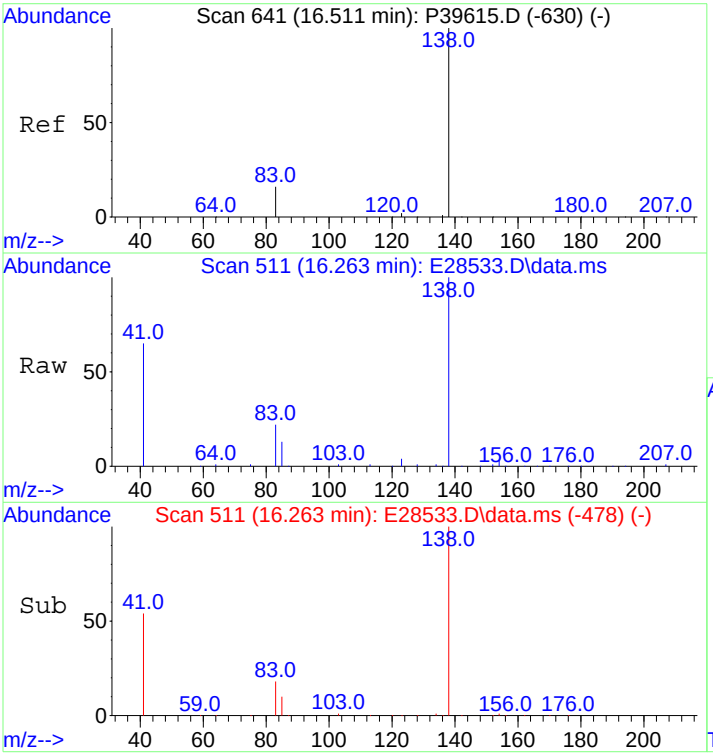
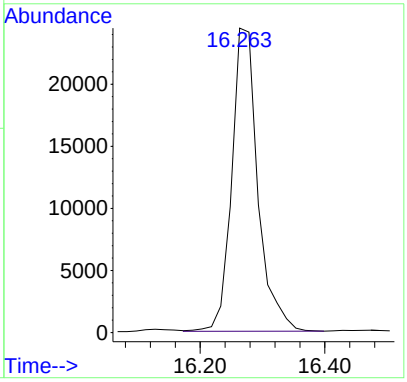
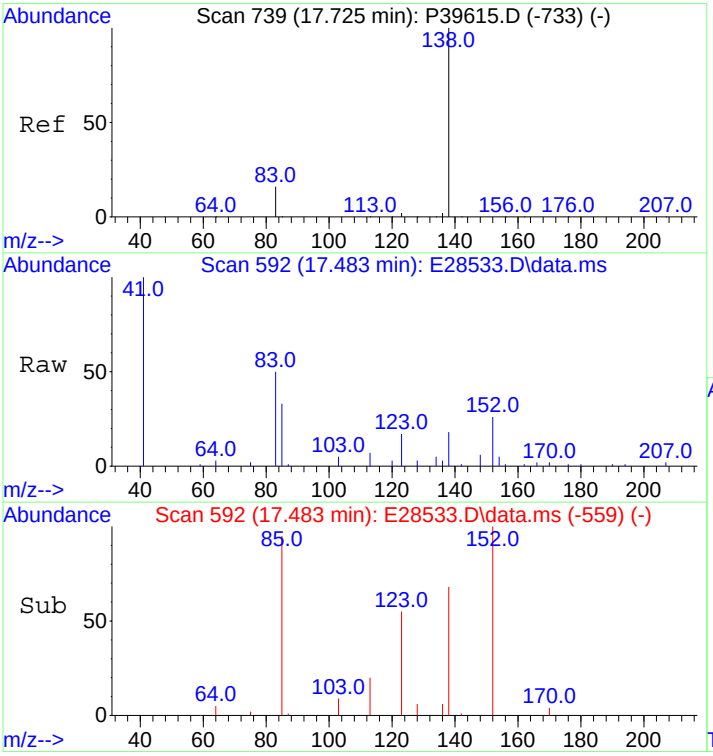




#3
trans-Decalin
Concen: 1888.05 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

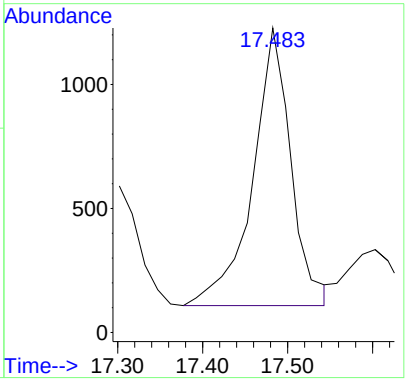
Tgt Ion:138 Resp: 71200

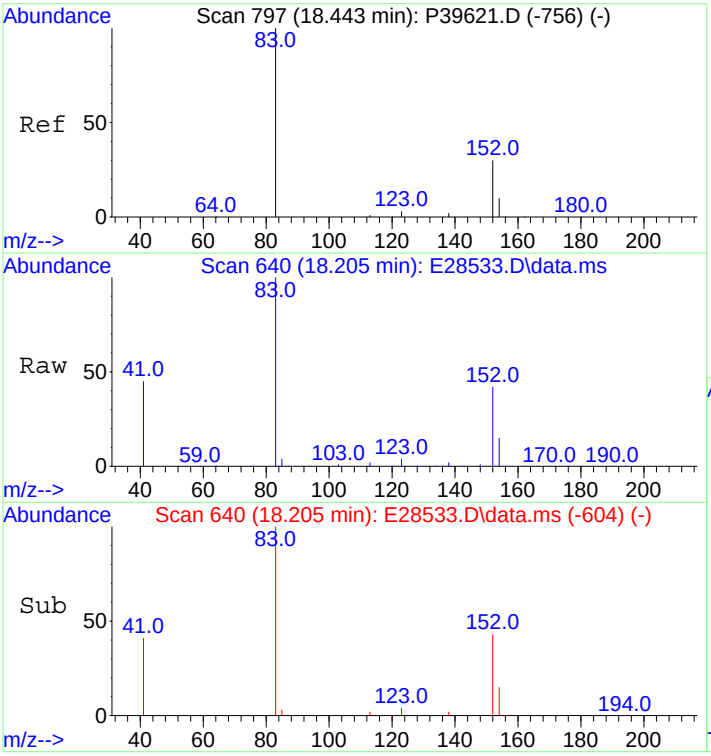




#4
cis-Decalin
Concen: 122.65 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

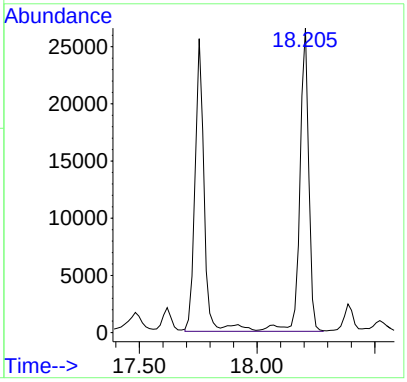
Tgt Ion:138 Resp: 3514

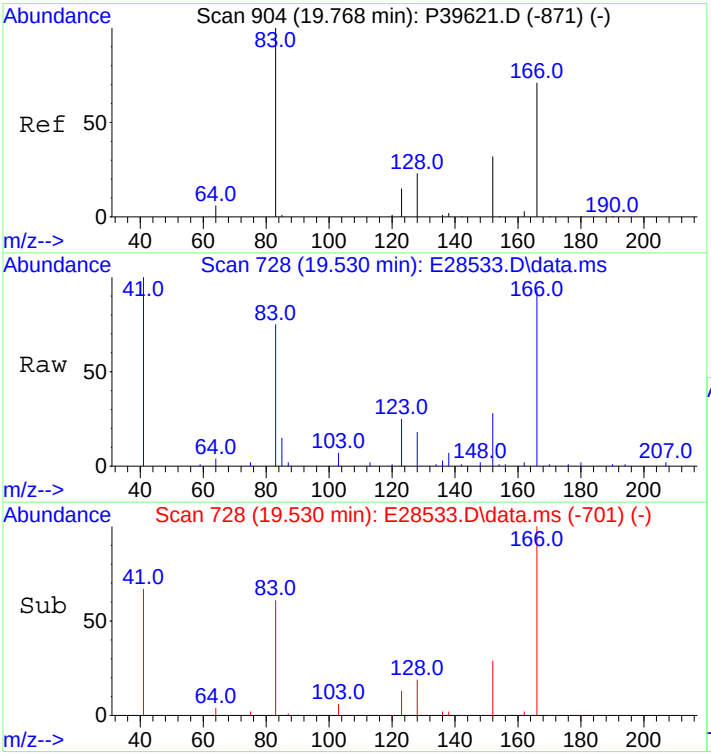




#5
C1-Decalins
Concen: 3667.62 ng/mL m
RT: 18.205 min Scan# 640
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

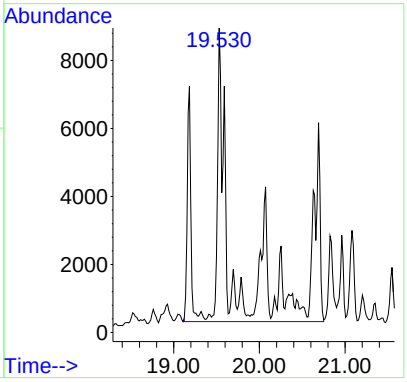
Tgt Ion:152 Resp: 138309

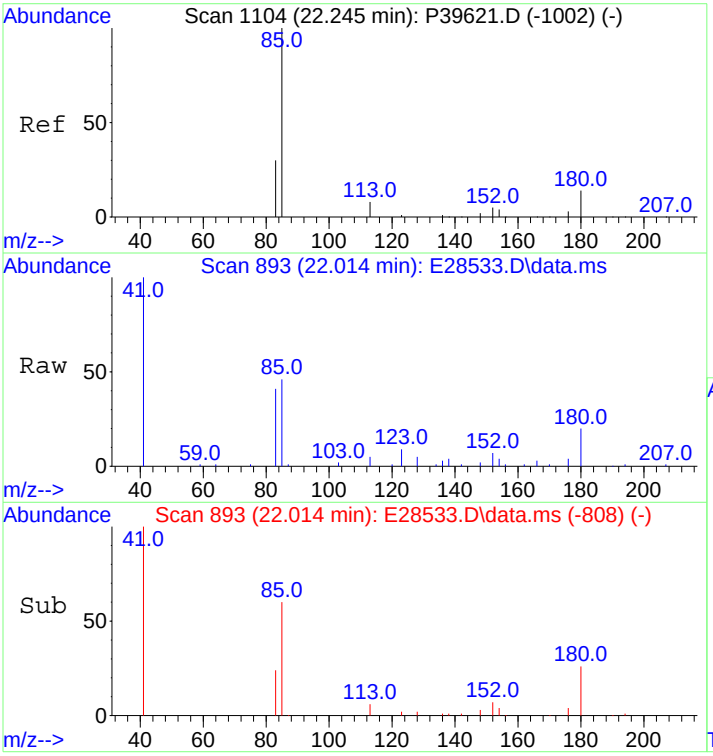




#6
C2-Decalins
Concen: 3527.82 ng/mL m
RT: 19.530 min Scan# 728
Delta R.T. -0.091 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

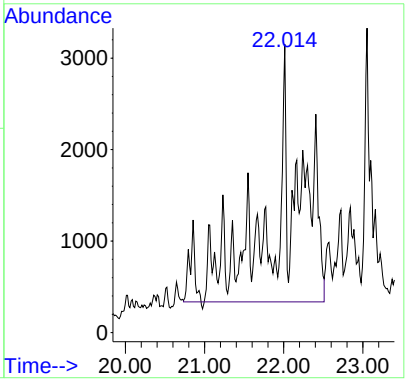
Tgt Ion:166 Resp: 133037

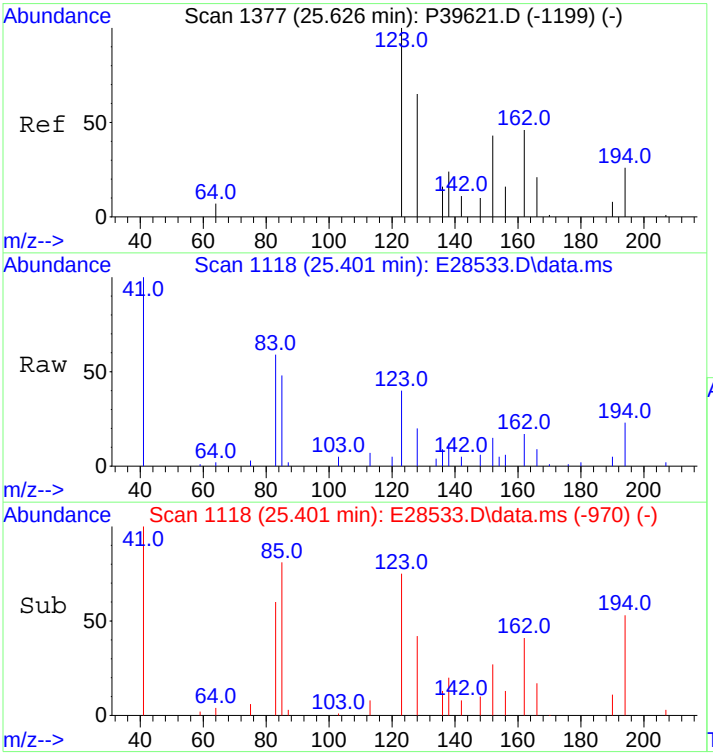




#7
C3-Decalins
Concen: 1932.84 ng/mL m
RT: 22.014 min Scan# 893
Delta R.T. -0.044 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

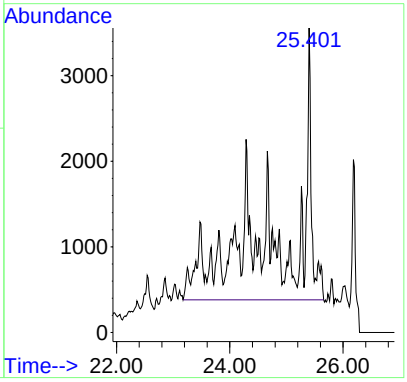
Tgt Ion:180 Resp: 72889

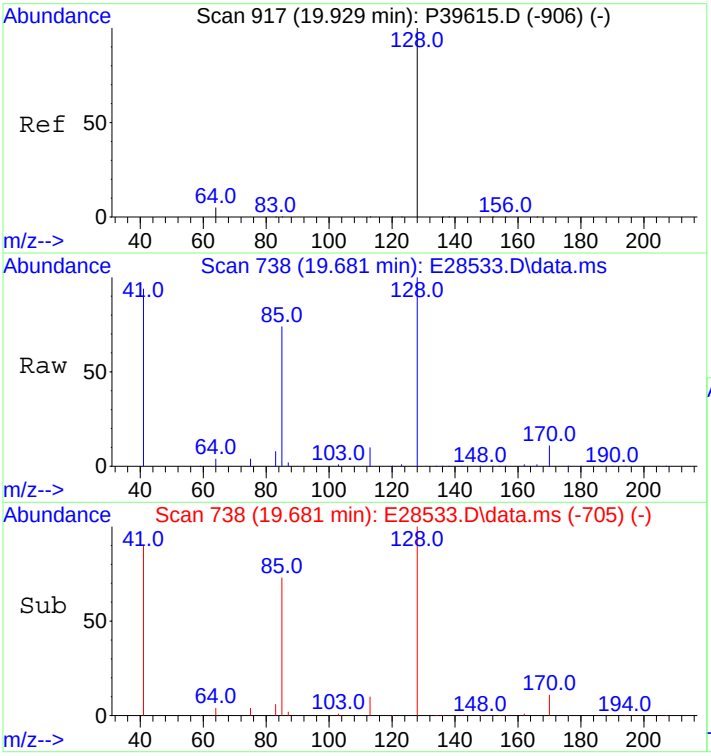




#8
C4-Decalins
Concen: 2209.55 ng/mL m
RT: 25.401 min Scan# 1118
Delta R.T. -0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:194 Resp: 83324

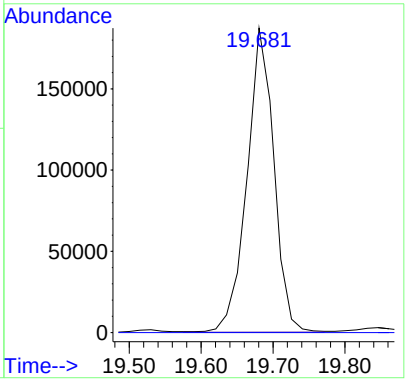


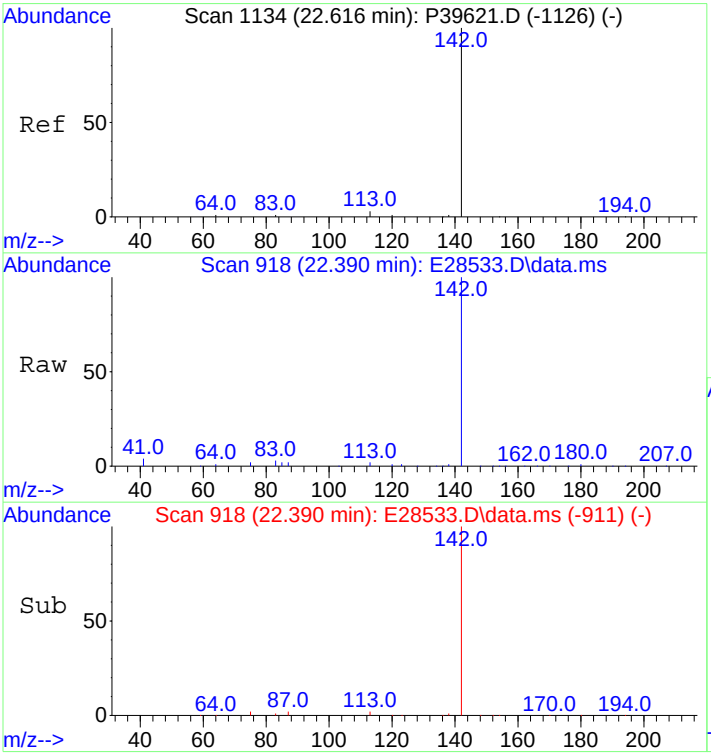


#10
Naphthalene
Concen: 2626.60 ng/mL
RT: 19.681 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:128 Resp: 487082

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

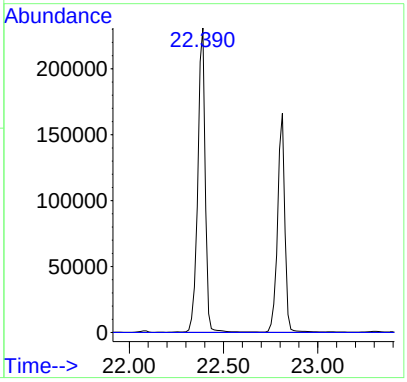


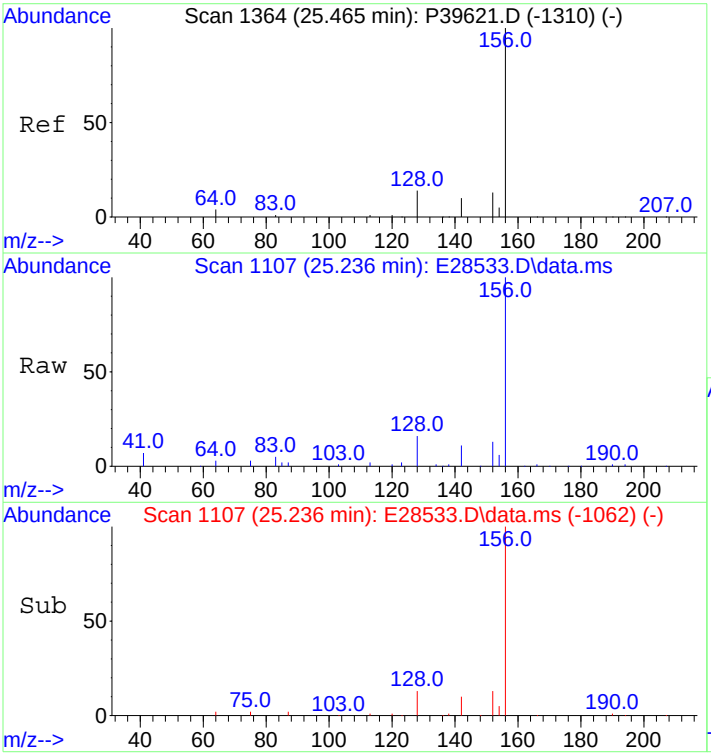


#11
C1-Naphthalenes
Concen: 5777.51 ng/mL m
RT: 22.390 min Scan# 918
Delta R.T. -0.054 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:142 Resp: 1071394

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

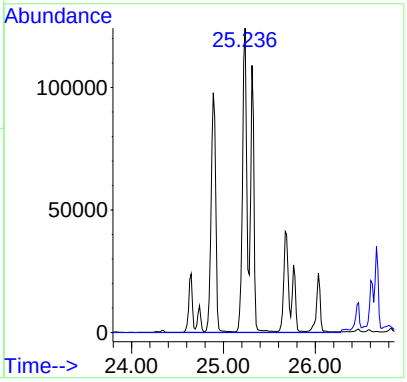


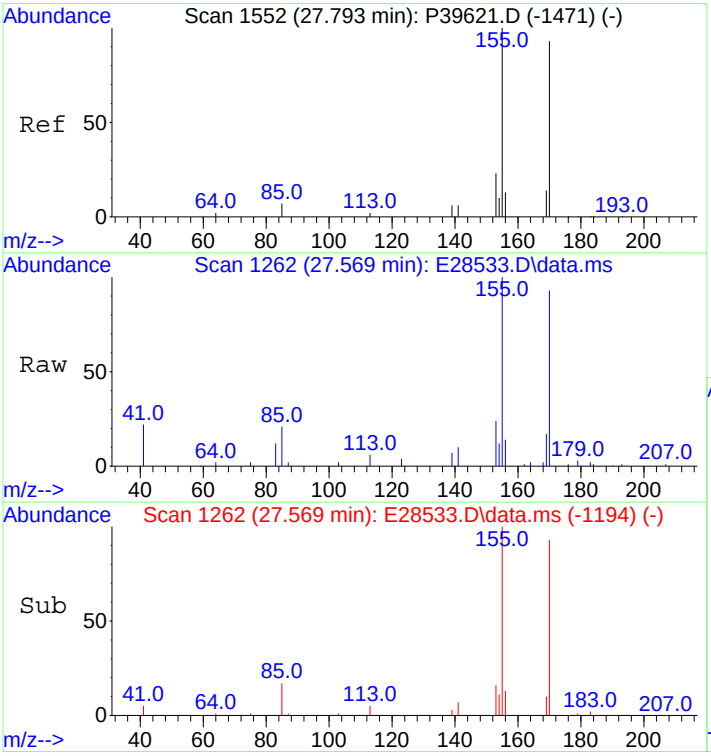


#12
C2-Naphthalenes
Concen: 7394.17 ng/mL m
RT: 25.236 min Scan# 1107
Delta R.T. -0.017 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:156 Resp: 1371191

Ion	Ratio	Lower	Upper
156	100		
141	0.0	0.0	0.0

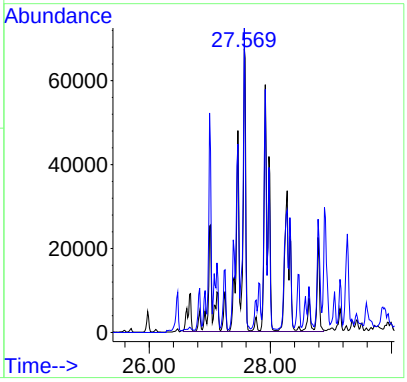


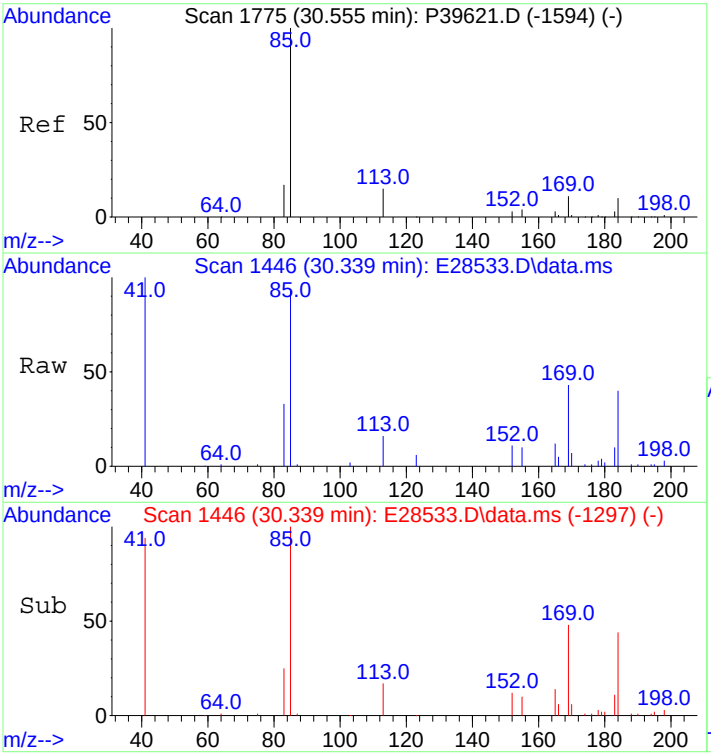


#13
C3-Naphthalenes
Concen: 5843.16 ng/mL m
RT: 27.569 min Scan# 1262
Delta R.T. -0.002 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:170 Resp: 1083568

Ion	Ratio	Lower	Upper
170	100		
155	12.6	66.8	100.2#

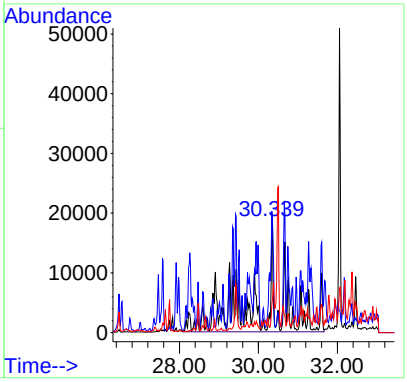


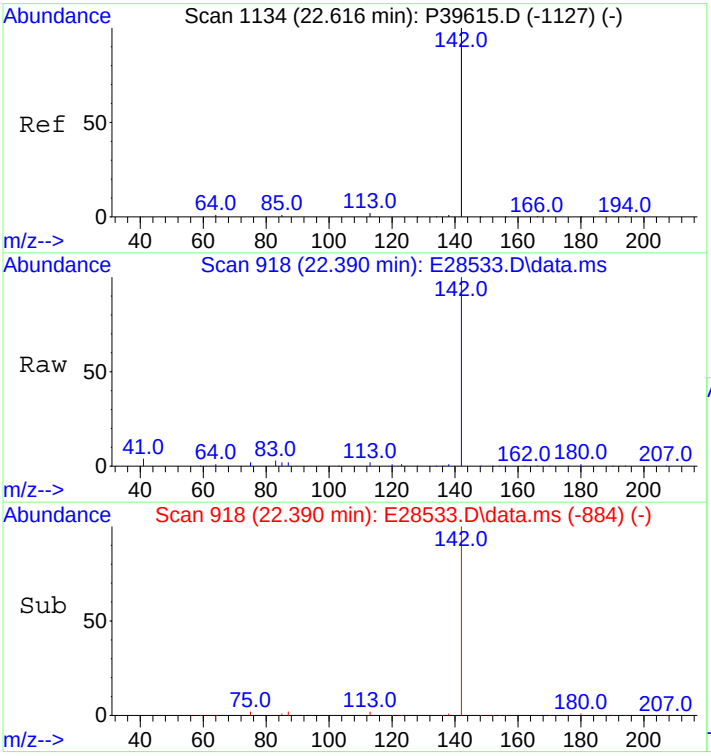


#14
C4-Naphthalenes
Concen: 3408.22 ng/mL m
RT: 30.339 min Scan# 1446
Delta R.T. 0.033 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:184 Resp: 632028

Ion	Ratio	Lower	Upper
184	100		
169	17.2	78.7	118.1#
183	0.0	26.7	40.1#

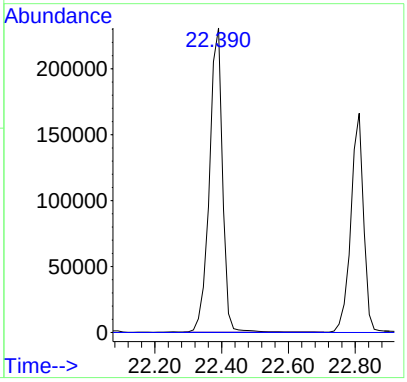


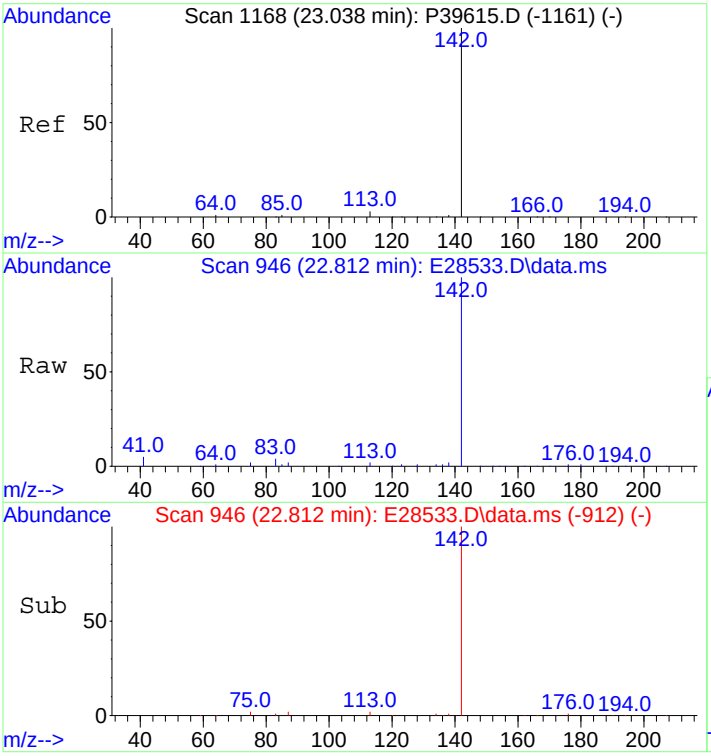


#16
2-Methylnaphthalene
Concen: 5313.63 ng/mL
RT: 22.390 min Scan# 918
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:142 Resp: 627593

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

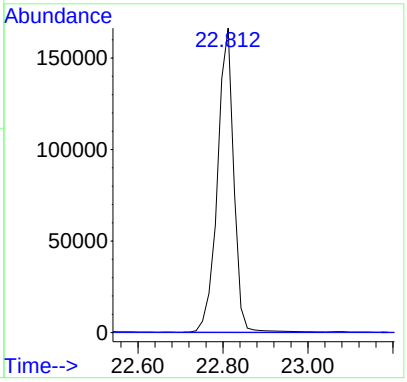


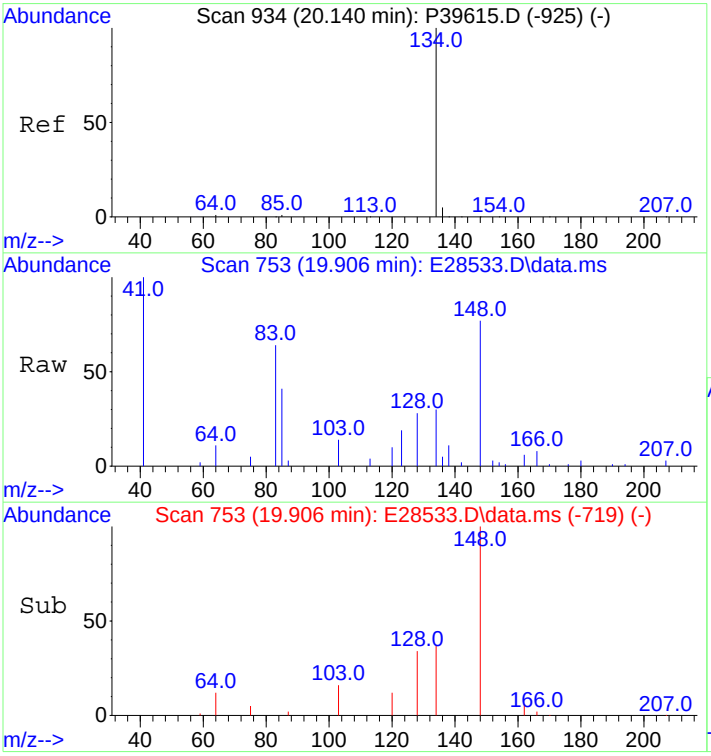


#17
1-Methylnaphthalene
Concen: 3845.92 ng/mL
RT: 22.812 min Scan# 946
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:142 Resp: 441379

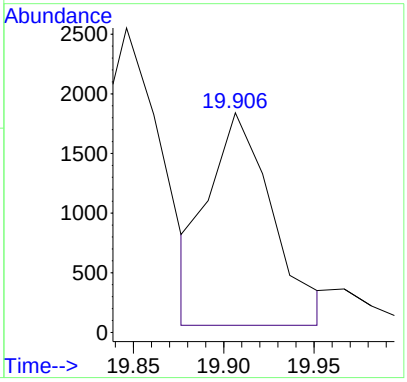
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

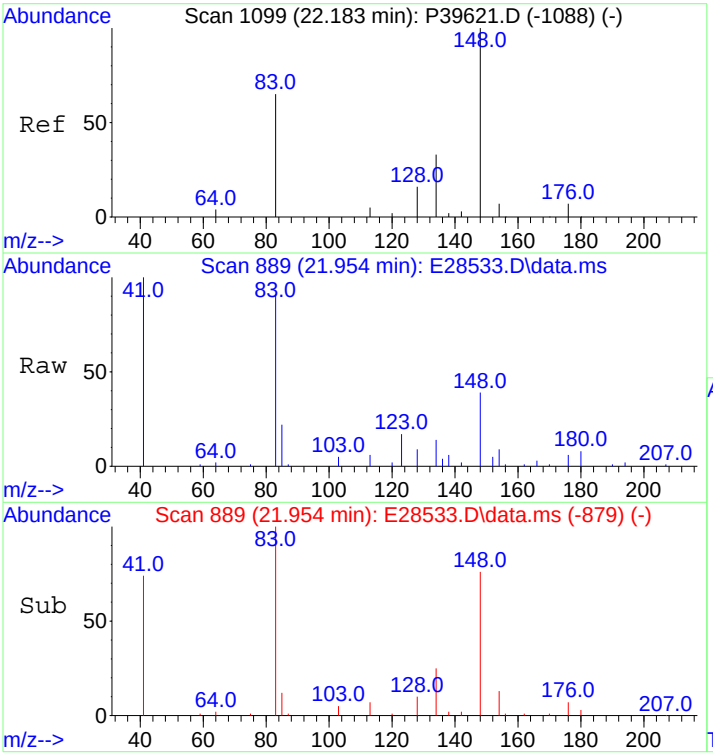




#18
Benzothiophene
Concen: 28.32 ng/mL m
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

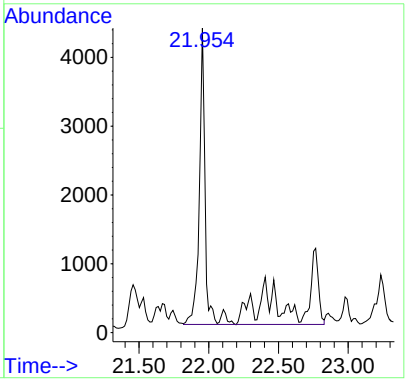
Tgt Ion:134 Resp: 4341

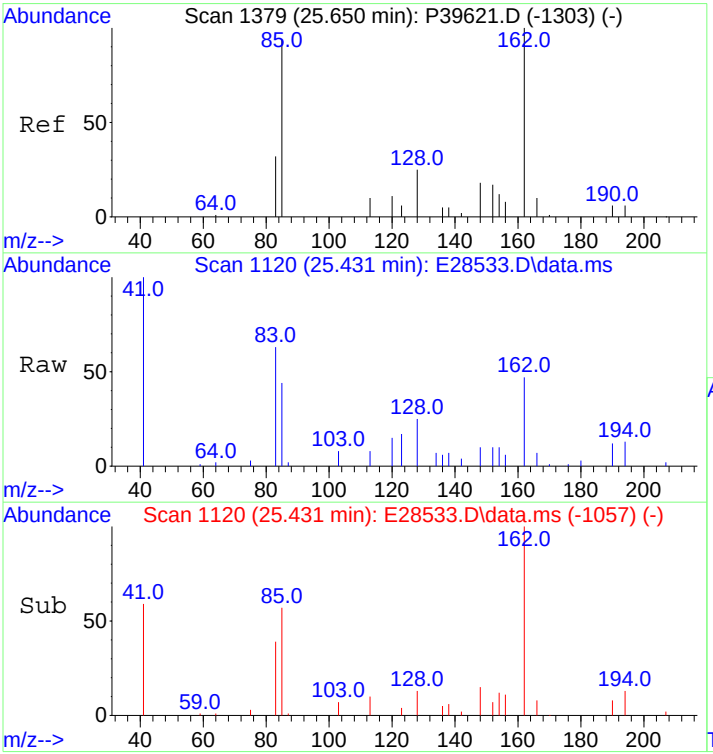




#19
C1-Benzo(b)thiophenes
Concen: 156.41 ng/mL m
RT: 21.954 min Scan# 889
Delta R.T. -0.059 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

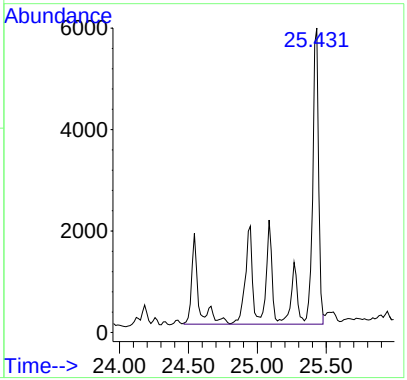
Tgt Ion:148 Resp: 23978

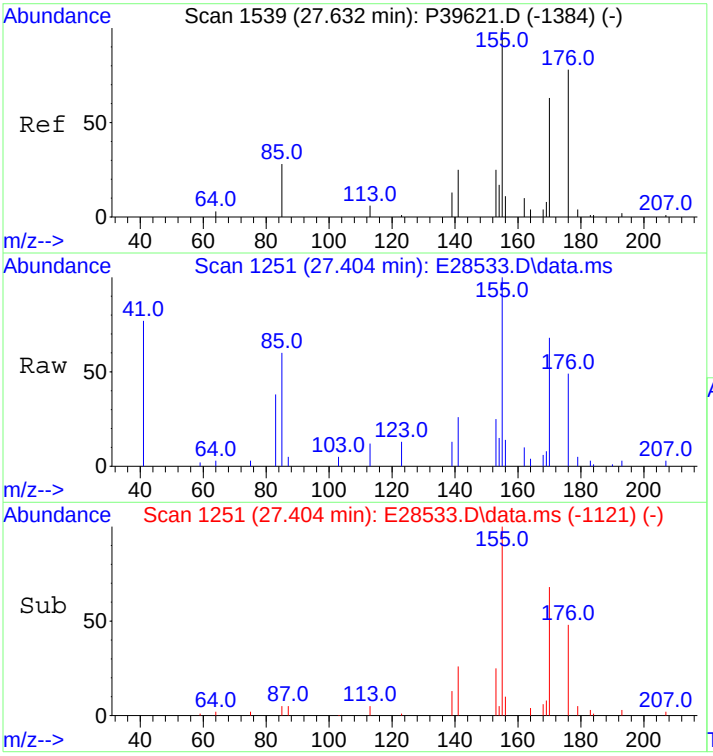




#20
C2-Benzo(b)thiophenes
Concen: 261.24 ng/mL m
RT: 25.431 min Scan# 1120
Delta R.T. -0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

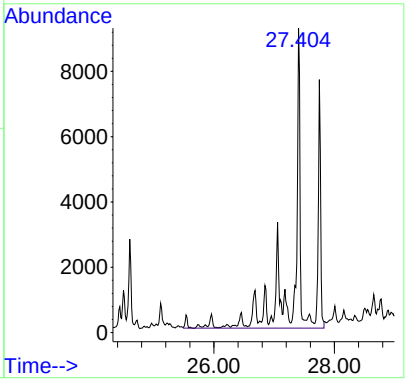
Tgt Ion:162 Resp: 40049

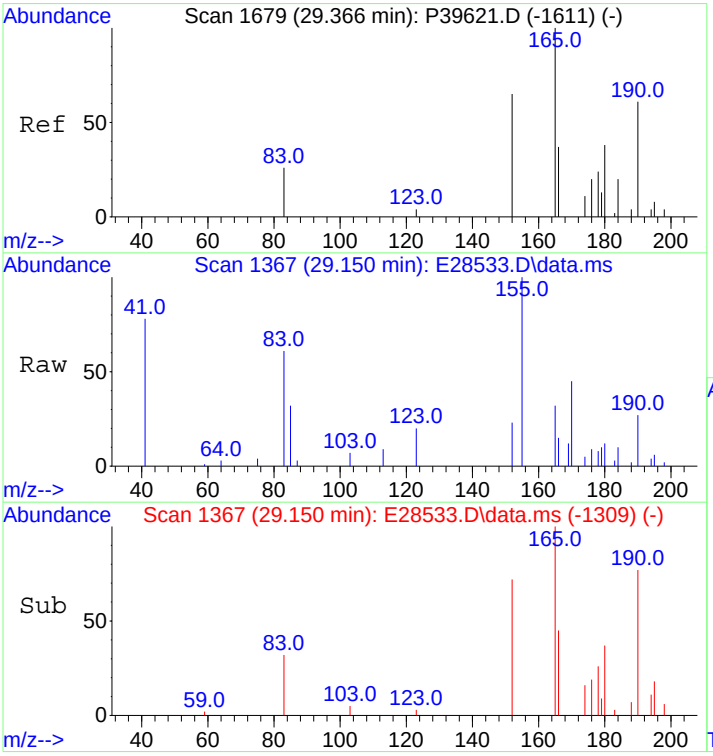




#21
C3-Benzo(b)thiophenes
Concen: 549.88 ng/mL m
RT: 27.404 min Scan# 1251
Delta R.T. -0.004 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

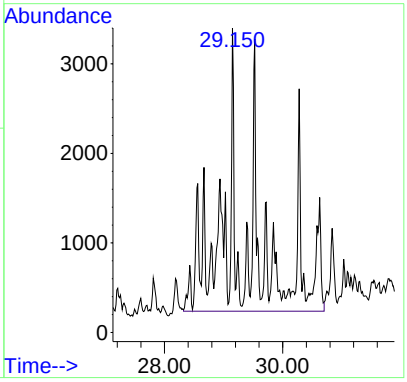
Tgt Ion:176 Resp: 84299

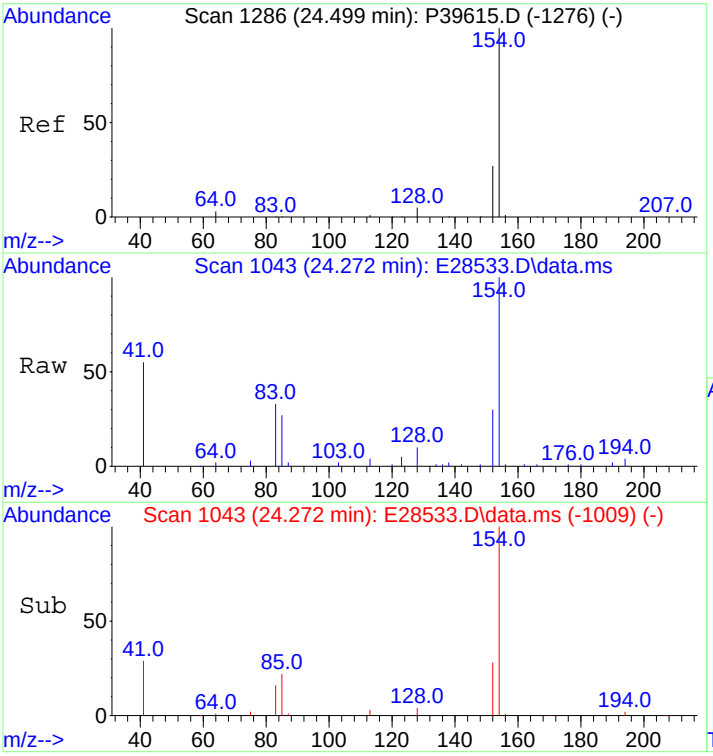




#22
C4-Benzo(b)thiophenes
Concen: 513.30 ng/mL m
RT: 29.150 min Scan# 1367
Delta R.T. -0.338 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:190 Resp: 78691

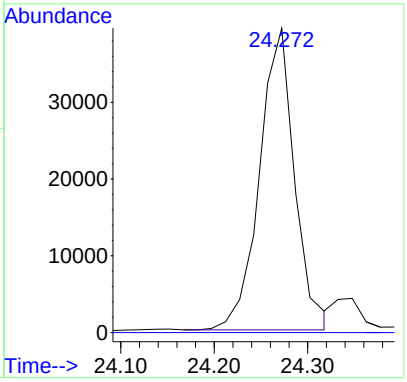


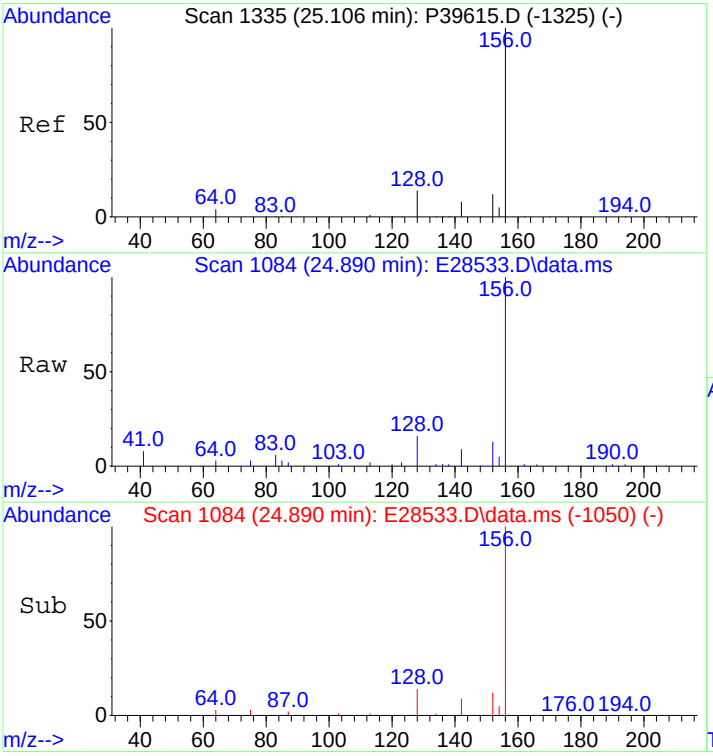


#23
Biphenyl
Concen: 686.94 ng/mL
RT: 24.272 min Scan# 1043
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:154 Resp: 102541

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

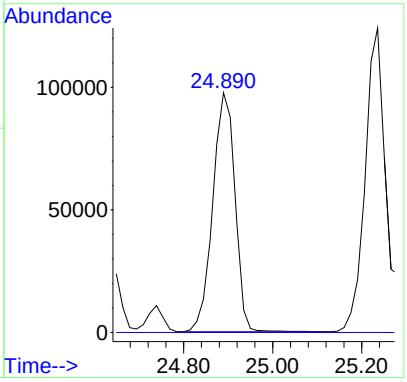


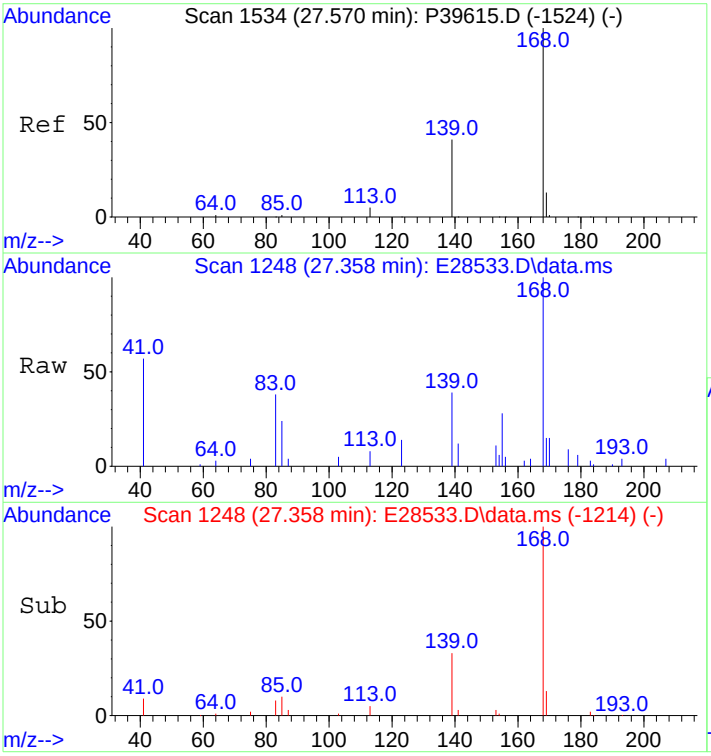


#24
2,6-Dimethylnaphthalene
Concen: 3167.11 ng/mL
RT: 24.890 min Scan# 1084
Delta R.T. 0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:156 Resp: 337170

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

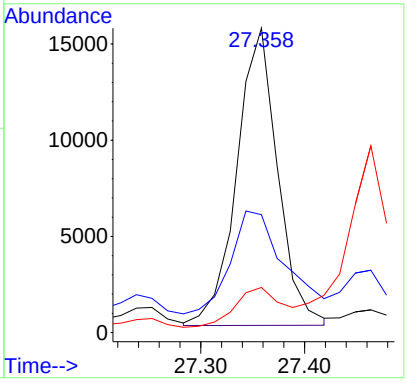


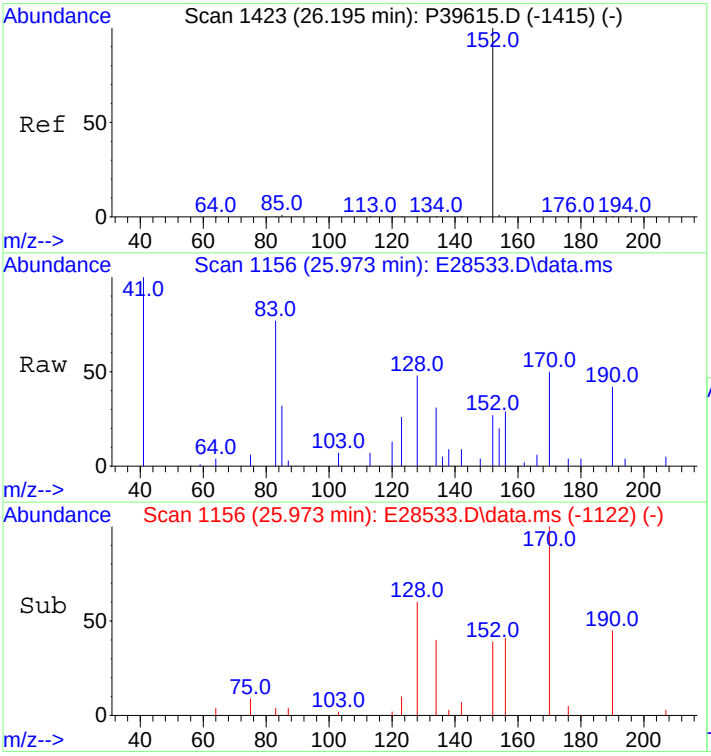


#25
Dibenzofuran
Concen: 256.52 ng/mL
RT: 27.358 min Scan# 1248
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:168 Resp: 42393

Ion	Ratio	Lower	Upper
168	100		
139	45.7	30.6	45.8
169	15.6	10.6	16.0

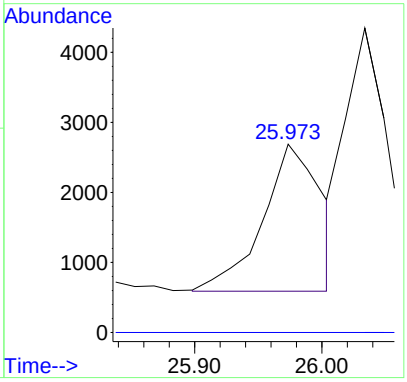


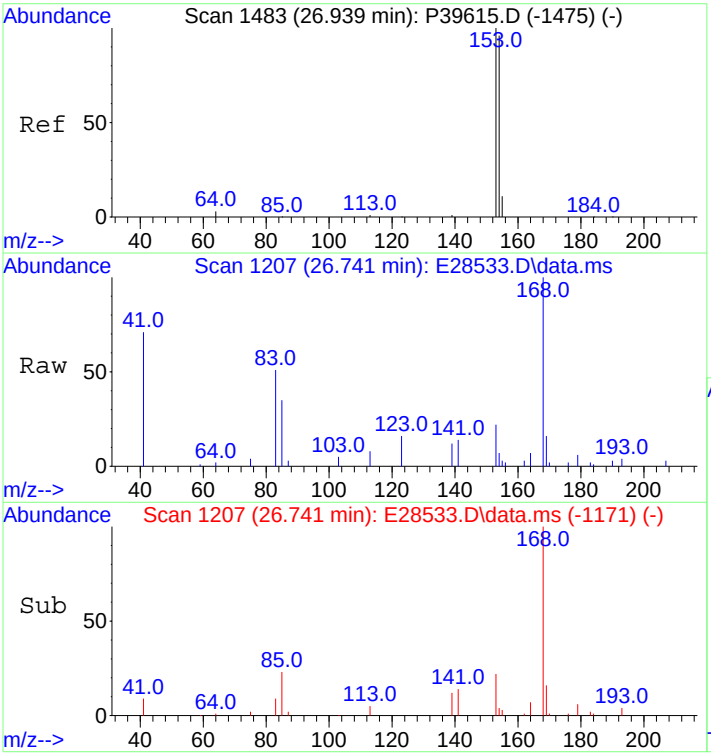


#26
Acenaphthylene
Concen: 36.19 ng/mL m
RT: 25.973 min Scan# 1156
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:152 Resp: 6691

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

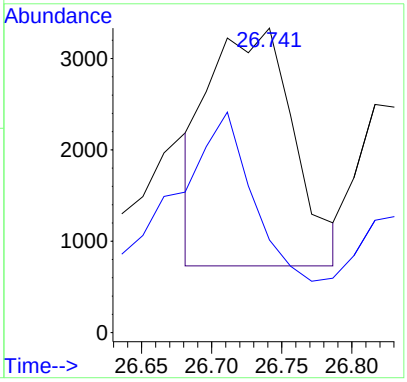


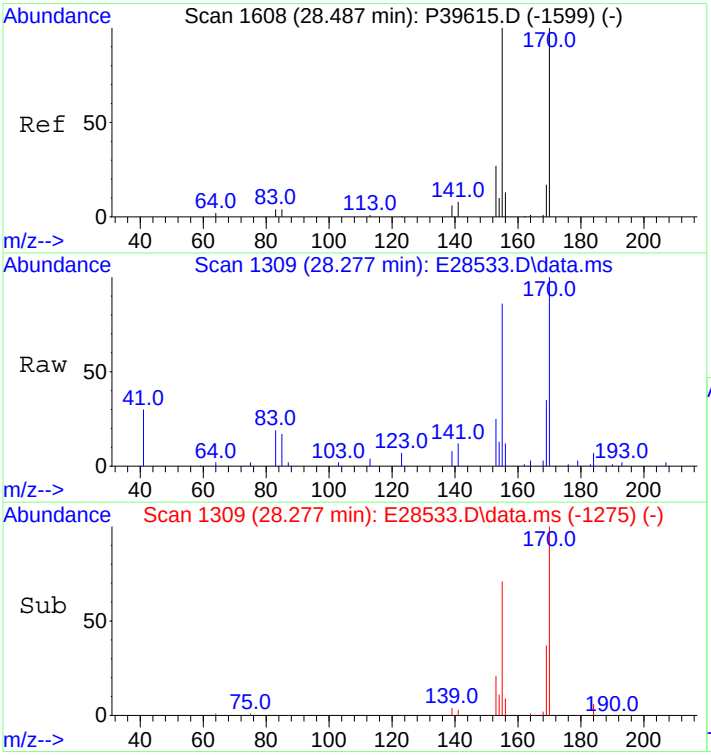


#27
Acenaphthene
Concen: 91.25 ng/mL m
RT: 26.741 min Scan# 1207
Delta R.T. 0.045 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:153 Resp: 10860

Ion	Ratio	Lower	Upper
153	100		
154	0.0	72.3	108.5#

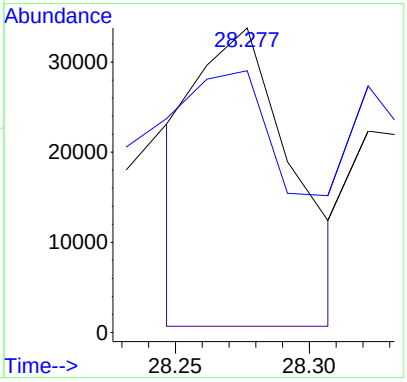


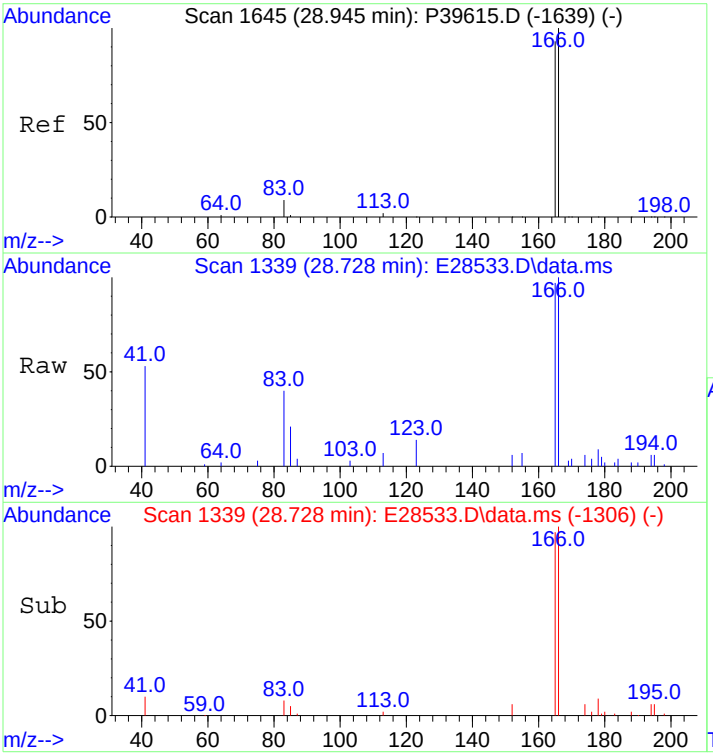


#28
2,3,5-Trimethylnaphthalene
Concen: 834.53 ng/mL m
RT: 28.277 min Scan# 1309
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:170 Resp: 83122

Ion	Ratio	Lower	Upper
170	100		
155	155.1	75.9	113.9#

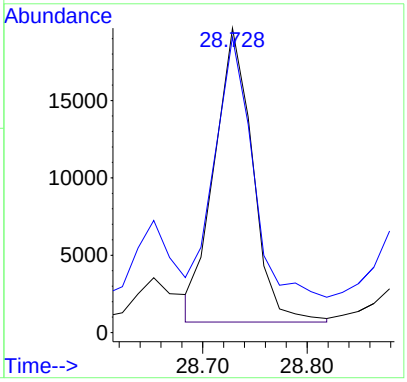


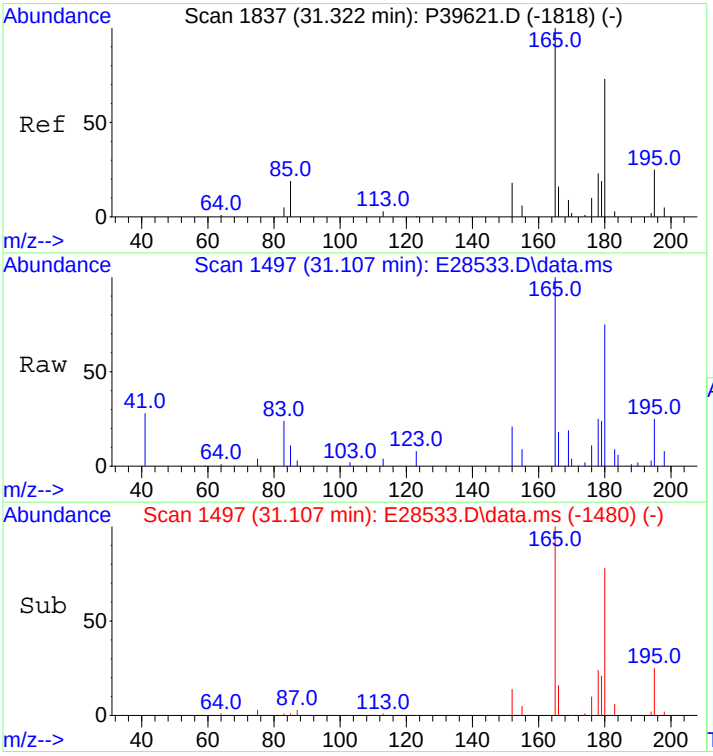


#29
Fluorene
Concen: 363.33 ng/mL m
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:166 Resp: 48225

Ion	Ratio	Lower	Upper
166	100		
165	112.3	73.8	110.6#

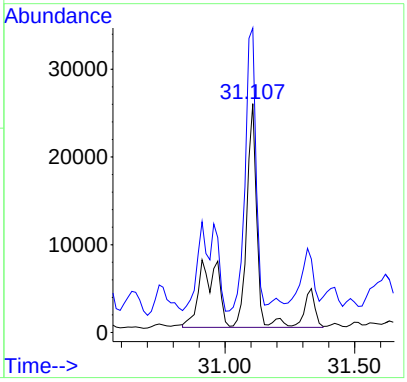


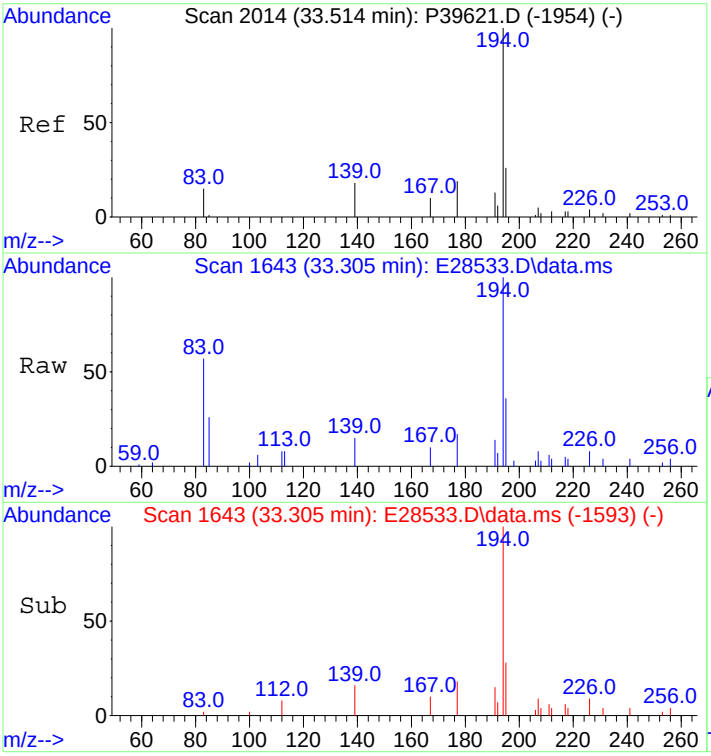


#30
C1-Fluorenes
Concen: 893.07 ng/mL m
RT: 31.107 min Scan# 1497
Delta R.T. 0.044 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:180 Resp: 118539

Ion	Ratio	Lower	Upper
180	100		
165	78.7	94.3	141.5#

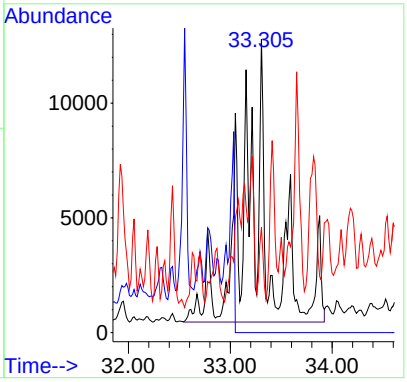


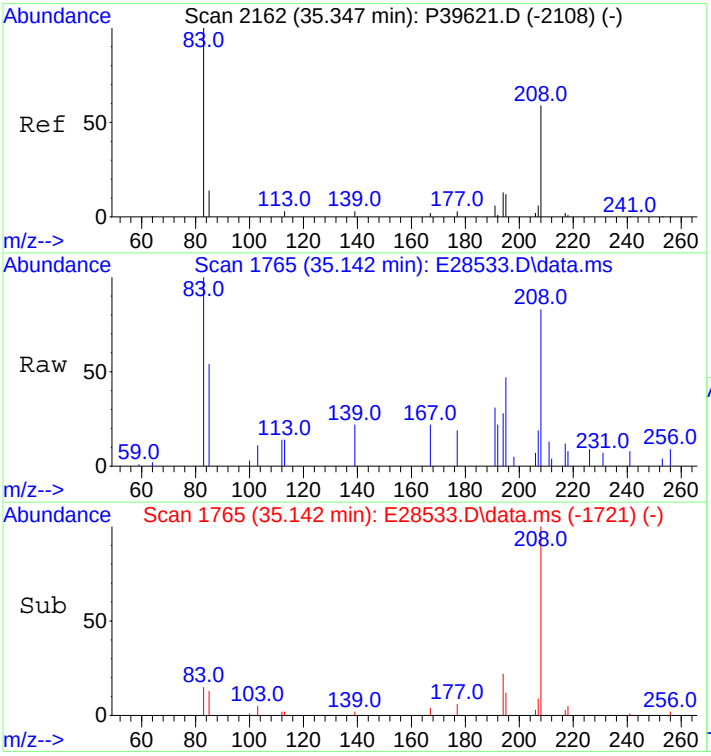


#31
C2-Fluorenes
Concen: 1459.15 ng/mL m
RT: 33.305 min Scan# 1643
Delta R.T. 0.072 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:194 Resp: 193676

Ion	Ratio	Lower	Upper
194	100		
179	0.0	0.0	0.0
195	9.0	27.0	40.4#

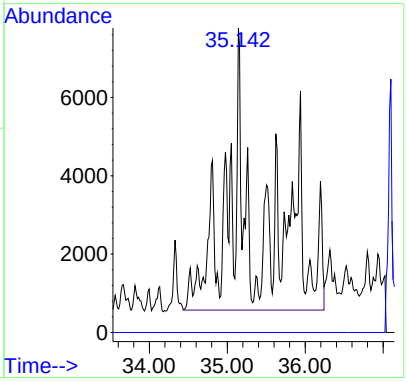


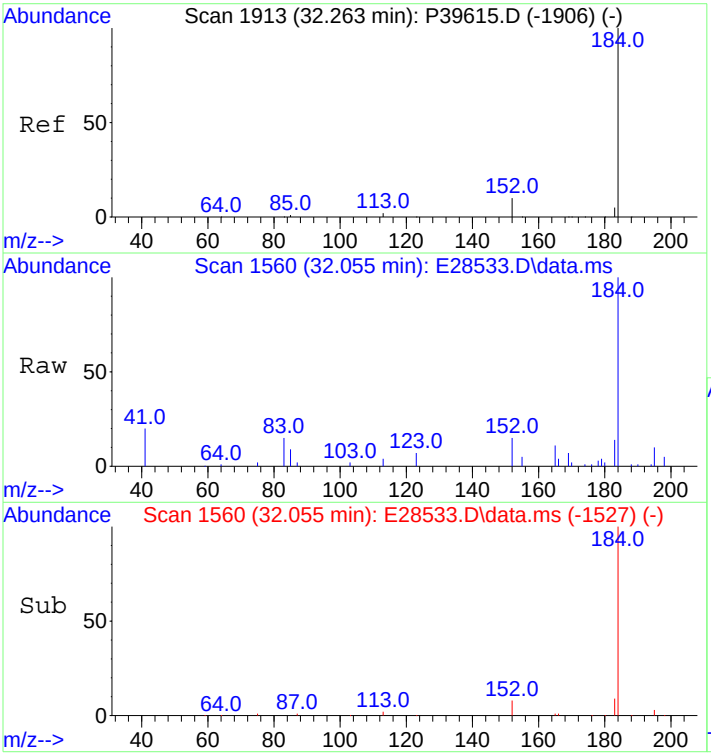


#32
C3-Fluorenes
Concen: 1426.08 ng/mL m
RT: 35.142 min Scan# 1765
Delta R.T. 0.096 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:208 Resp: 189287

Ion	Ratio	Lower	Upper
208	100		
197	0.0	0.0	0.0

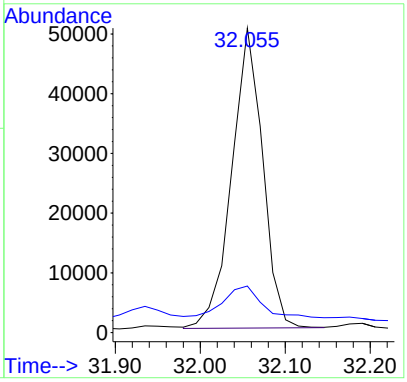


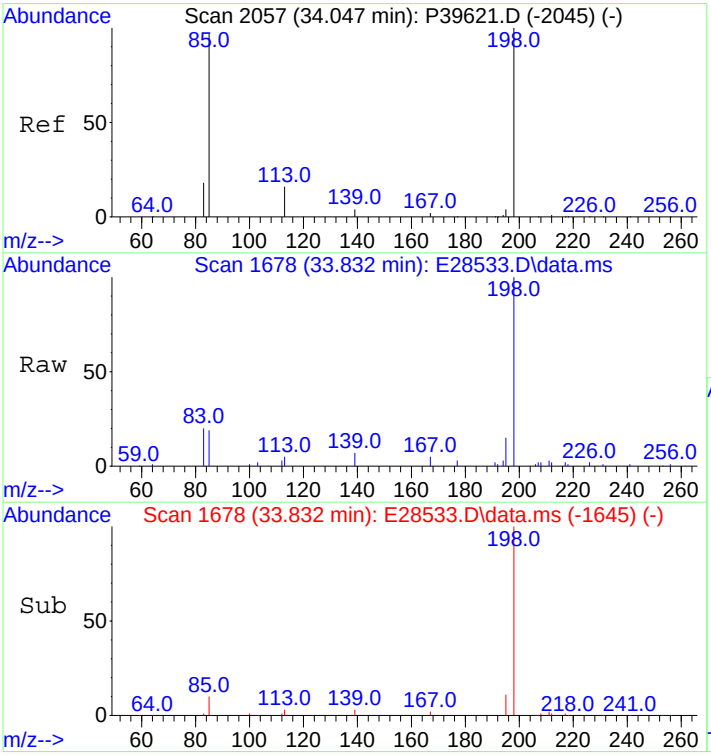


#33
Dibenzothiophene
Concen: 698.87 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:184 Resp: 127296

Ion	Ratio	Lower	Upper
184	100		
152	17.7	6.2	9.2#

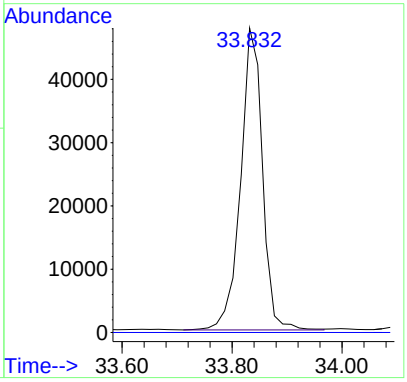


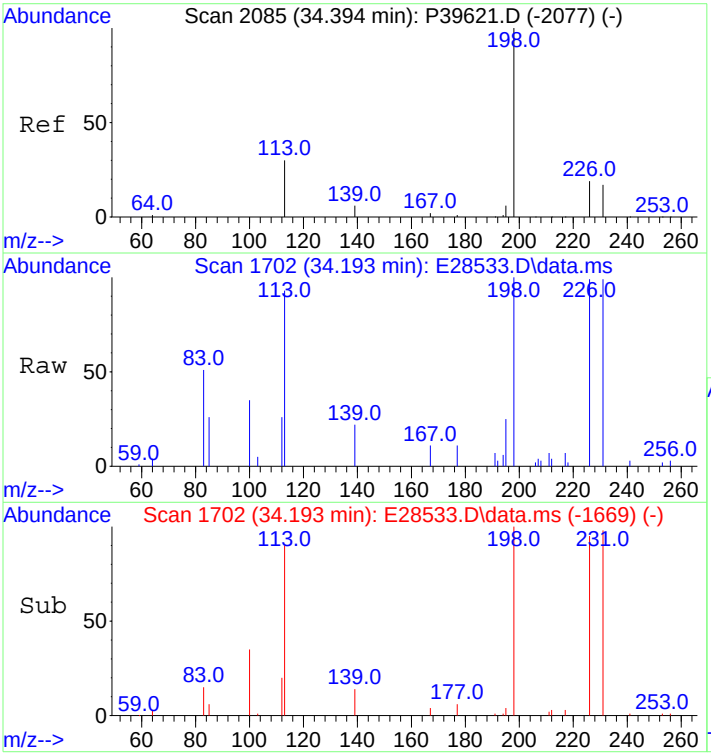


#34
4-Methyldibenzothiophene(4MDT)
Concen: 722.51 ng/mL
RT: 33.832 min Scan# 1678
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 131601

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

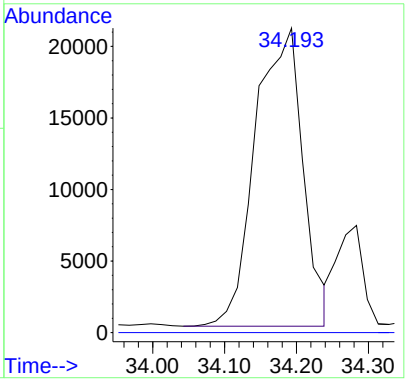


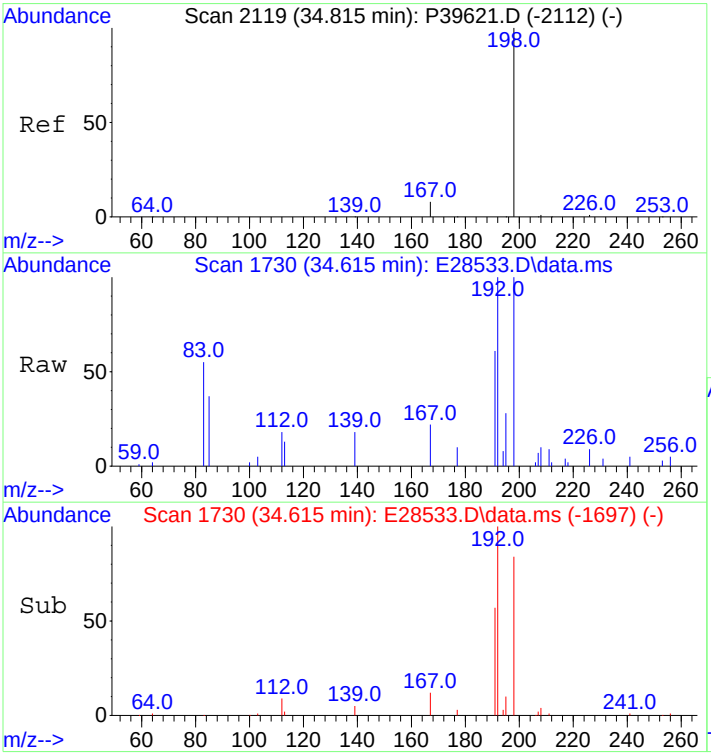


#35
2/3-Methyldibenzothiophene(2MDT)
Concen: 524.78 ng/mL
RT: 34.193 min Scan# 1702
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 95587

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

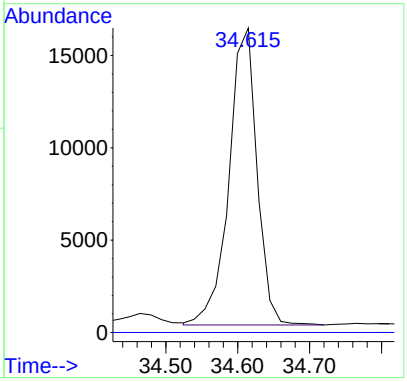


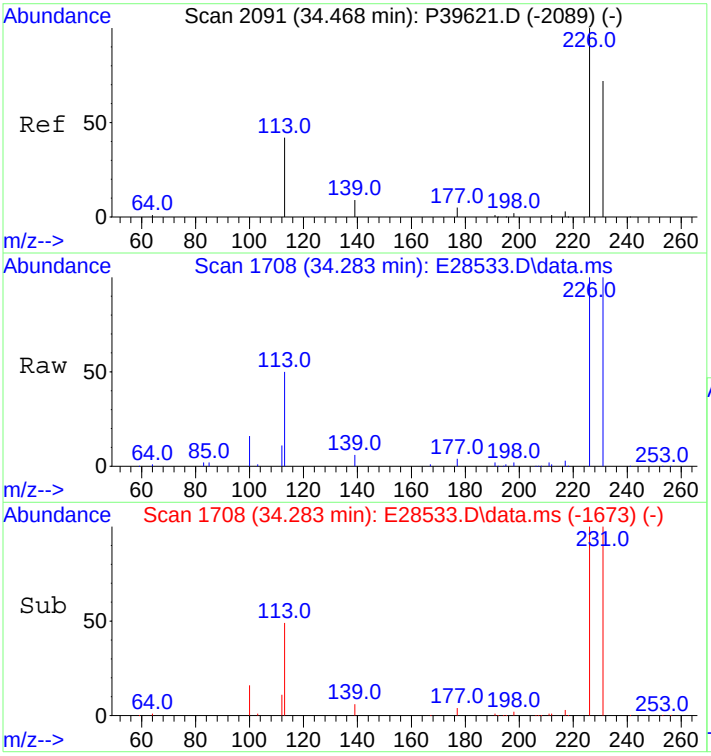


#36
1-Methyldibenzothiophene(1MDT)
Concen: 239.74 ng/mL
RT: 34.615 min Scan# 1730
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 43667

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

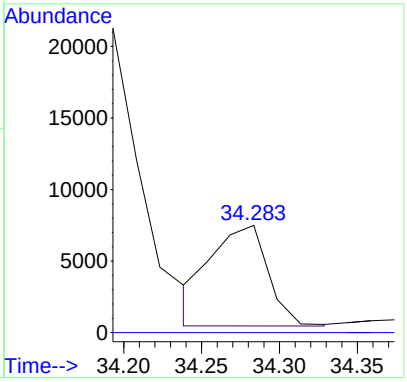


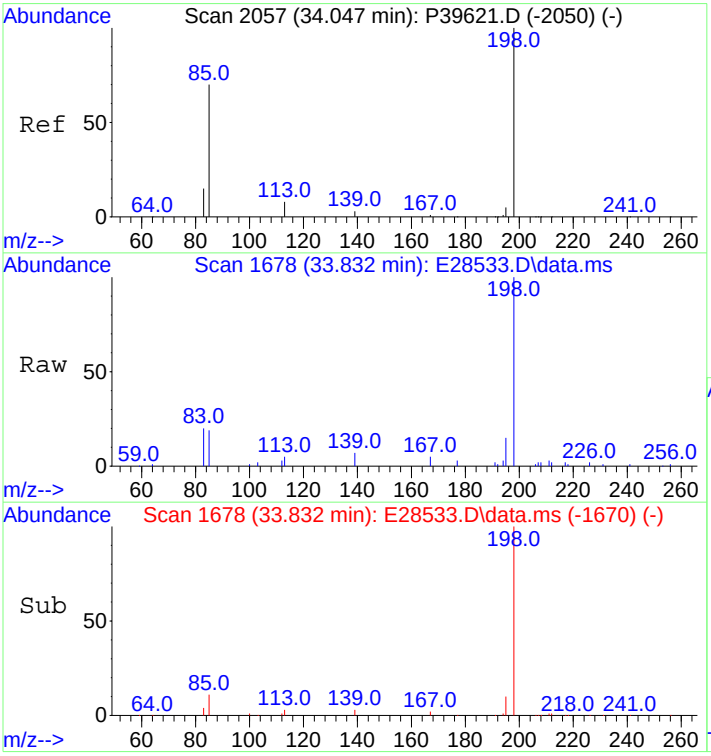


#37
OTP
Concen: 99.02 ng/mL
RT: 34.283 min Scan# 1708
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 18036

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

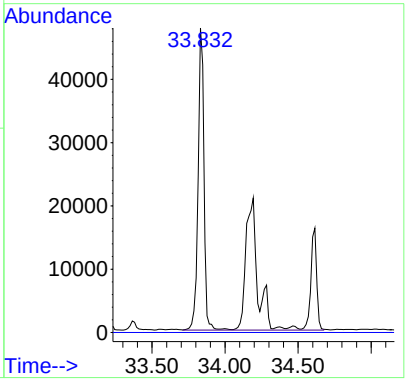


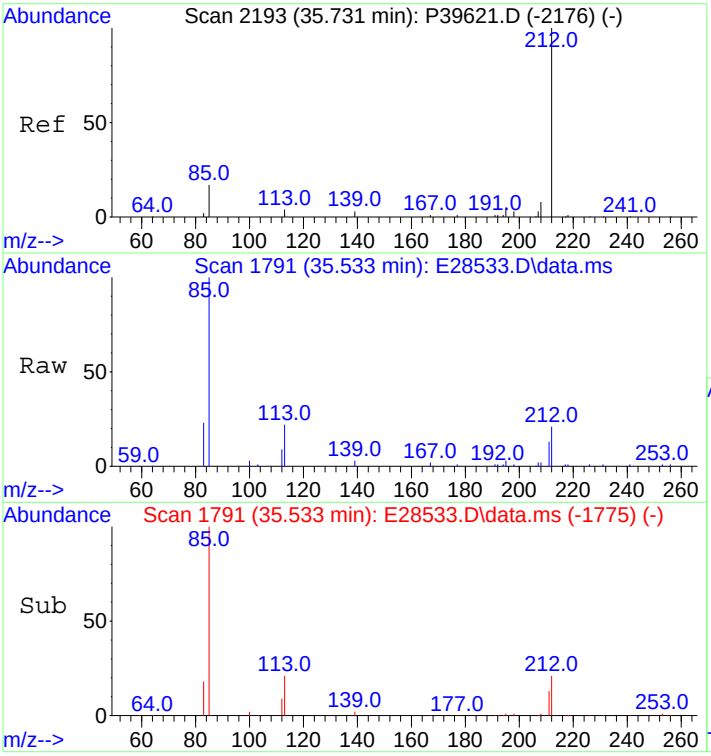


#38
C1-Dibenzothiophenes
Concen: 1619.32 ng/mL m
RT: 33.832 min Scan# 1678
Delta R.T. 0.079 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:198 Resp: 294951

Ion	Ratio	Lower	Upper
198	100		
197	0.0	0.0	0.0

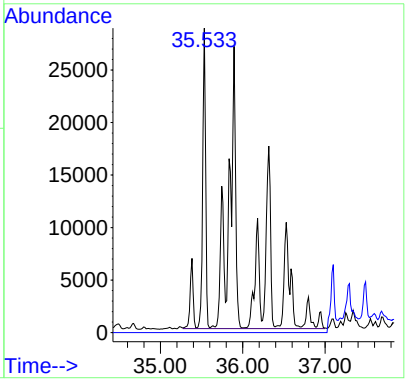


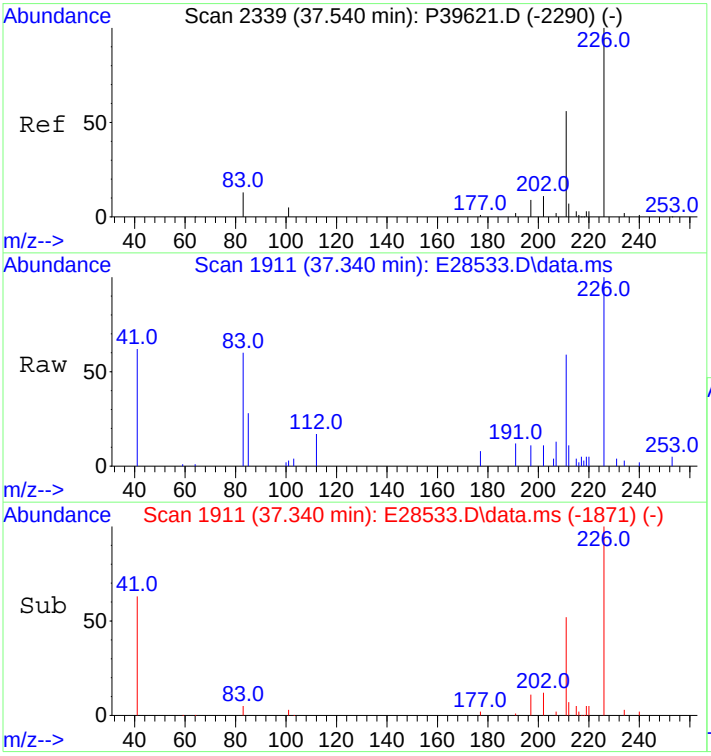


#39
C2-Dibenzothiophenes
Concen: 2219.92 ng/mL m
RT: 35.533 min Scan# 1791
Delta R.T. 0.100 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:212 Resp: 404348

Ion	Ratio	Lower	Upper
212	100		
197	0.0	0.0	0.0

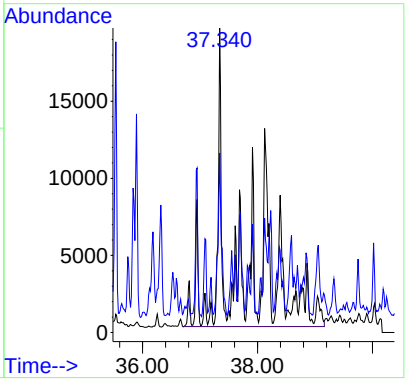


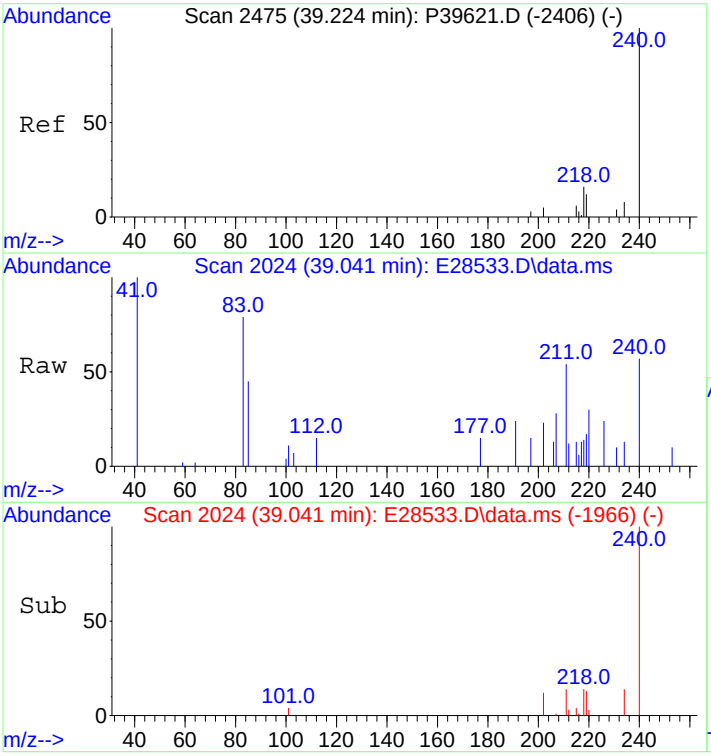


#40
C3-Dibenzothiophenes
Concen: 2081.27 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.124 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:226 Resp: 379093

Ion	Ratio	Lower	Upper
226	100		
211	1.3	44.1	66.1#

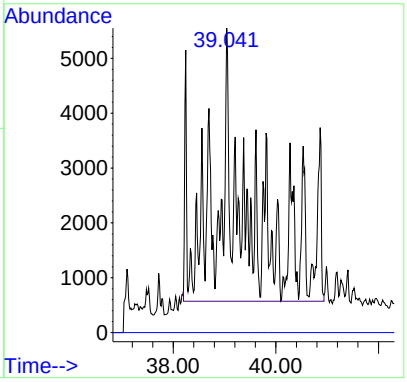


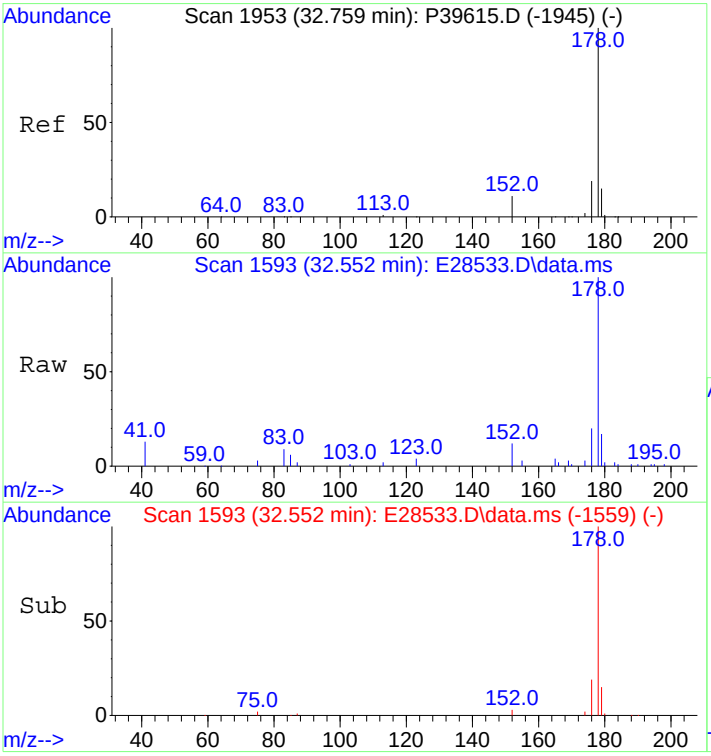


#41
C4-Dibenzothiophenes
Concen: 1177.33 ng/mL m
RT: 39.041 min Scan# 2024
Delta R.T. 0.145 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:240 Resp: 214446

Ion	Ratio	Lower	Upper
240	100		
225	0.0	0.0	0.0

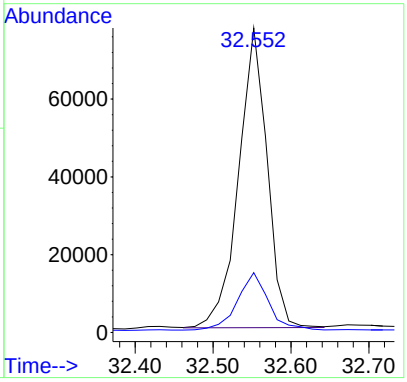


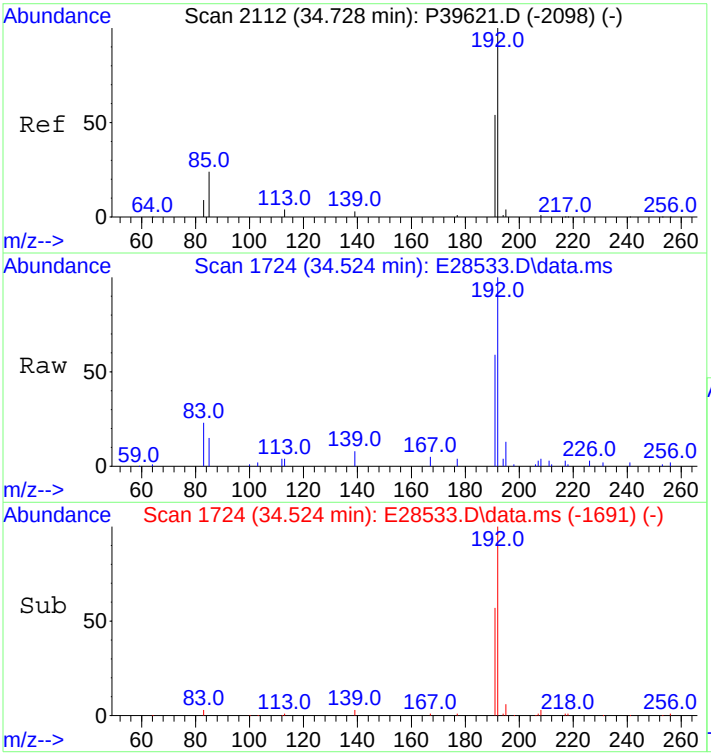


#43
Phenanthrene
Concen: 1055.72 ng/mL
RT: 32.552 min Scan# 1593
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:178 Resp: 195639

Ion	Ratio	Lower	Upper
178	100		
176	20.8	15.0	22.6

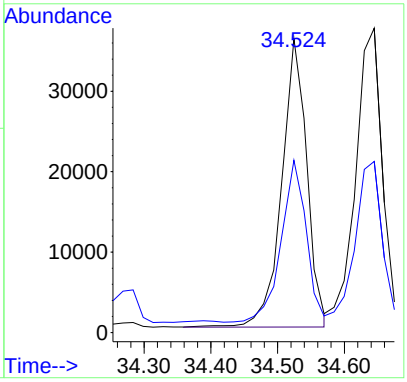


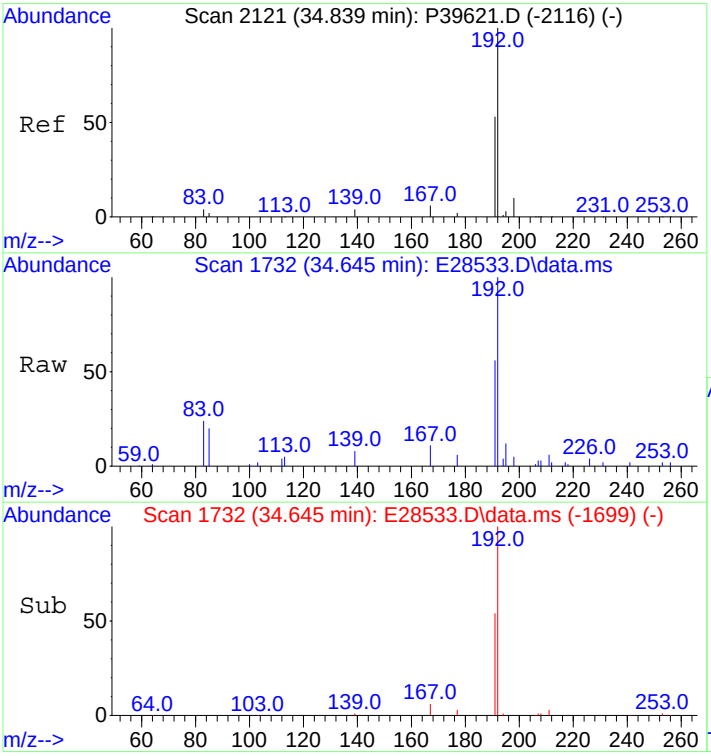


#44
3-Methylphenanthrene(3MP)
Concen: 505.66 ng/mL
RT: 34.524 min Scan# 1724
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 93705

Ion	Ratio	Lower	Upper
192	100		
191	57.0	46.9	70.3

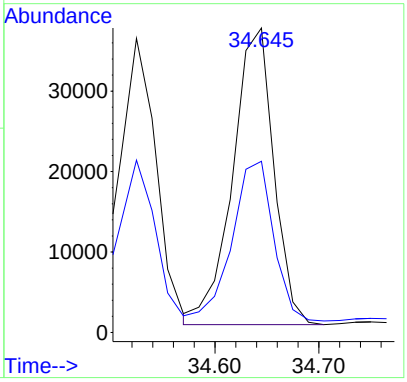


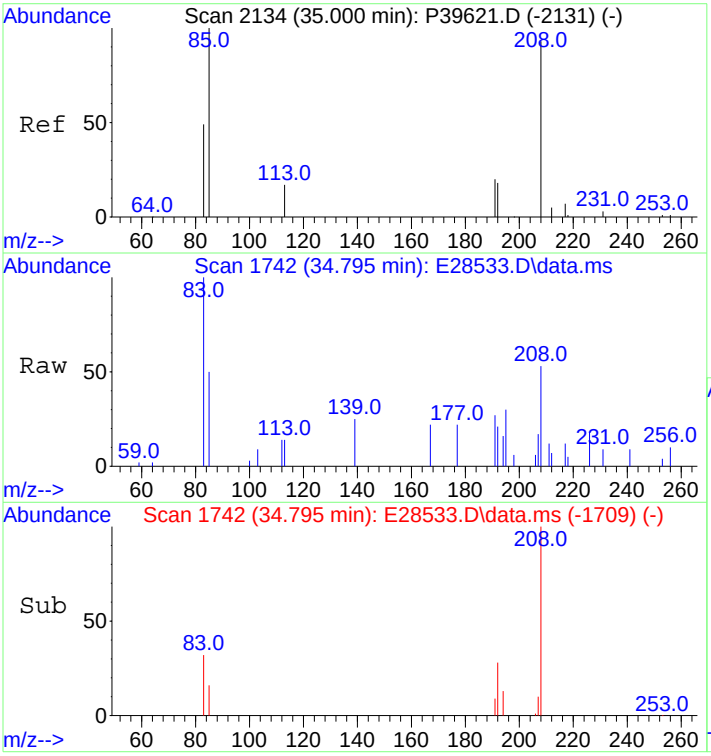


#45
2-Methylphenanthrene(2MP)
Concen: 547.97 ng/mL
RT: 34.645 min Scan# 1732
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 101546

Ion	Ratio	Lower	Upper
192	100		
191	54.3	45.0	67.4

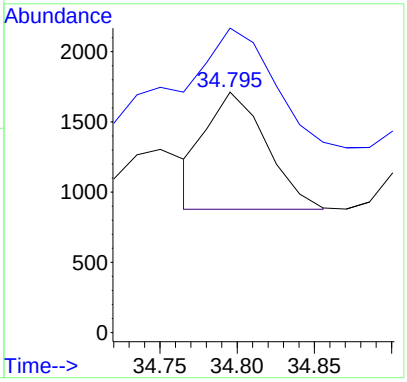


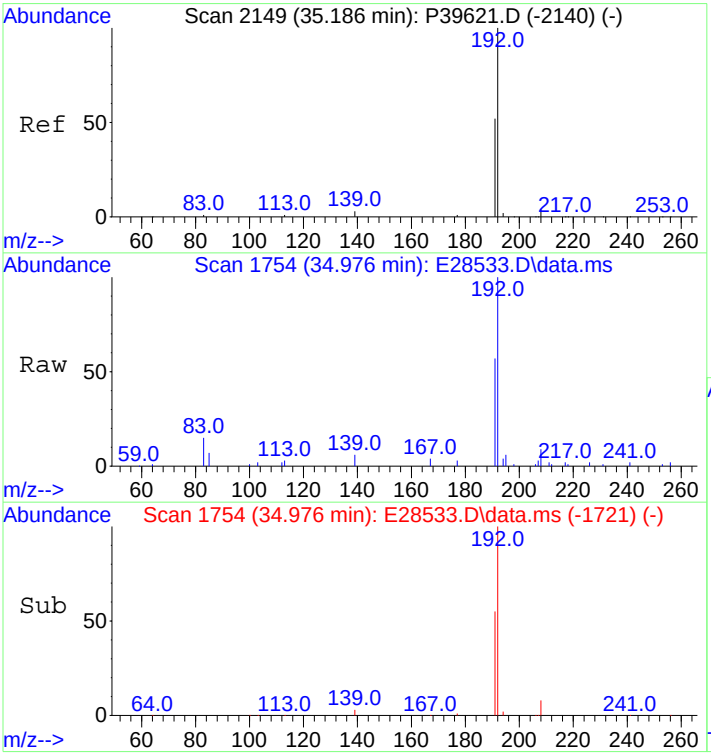


#46
2-Methylanthracene(2MA)
Concen: 12.23 ng/mL m
RT: 34.795 min Scan# 1742
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 2266

Ion	Ratio	Lower	Upper
192	100		
191	168.6	101.3	151.9#

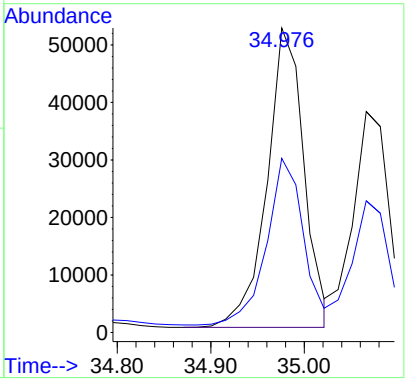


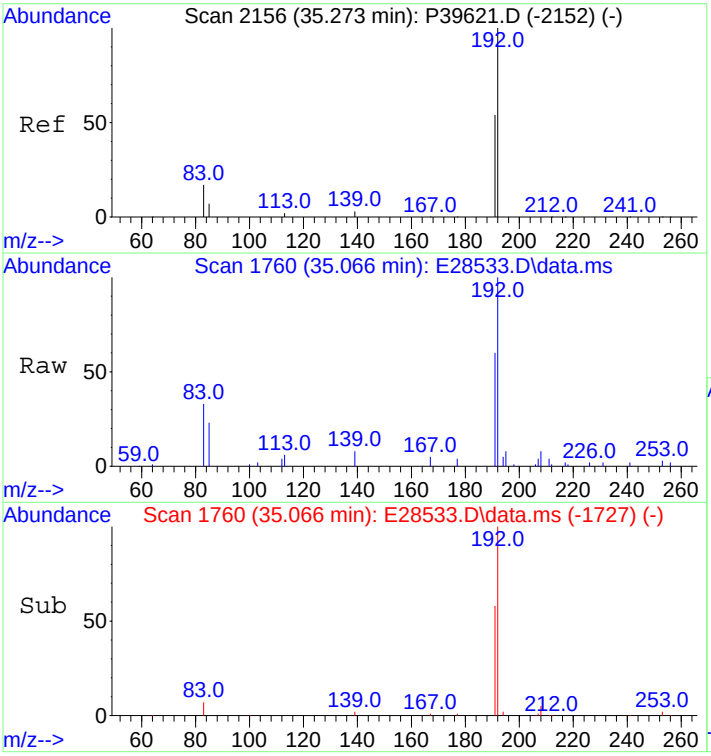


#47
9/4-Methylphenanthrene(9MP)
Concen: 773.70 ng/mL
RT: 34.976 min Scan# 1754
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 143377

Ion	Ratio	Lower	Upper
192	100		
191	55.3	45.8	68.6

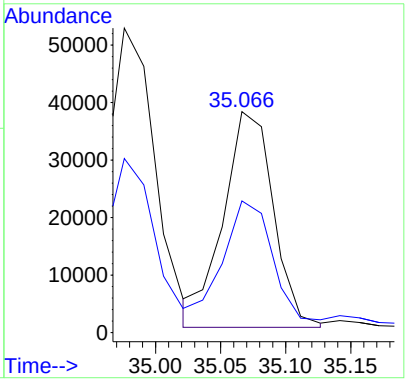


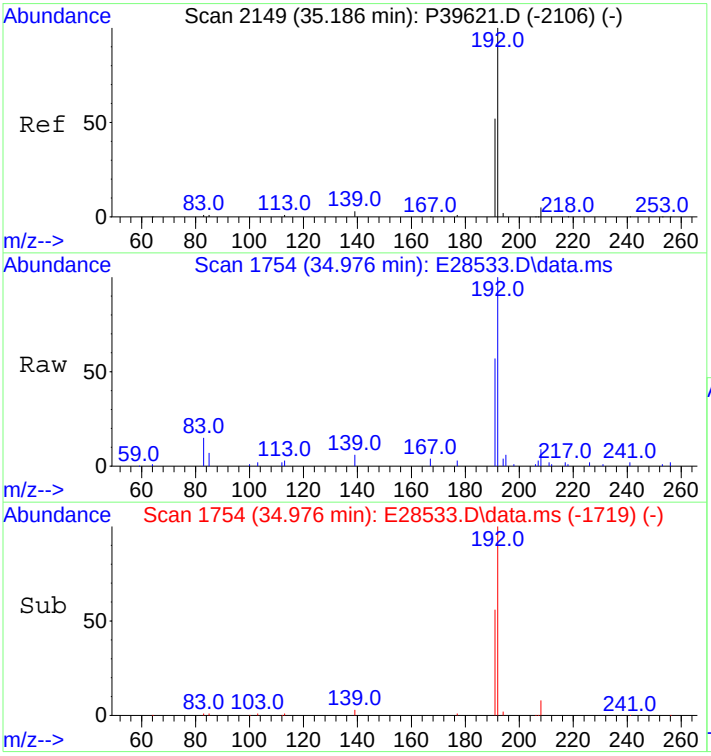


#48
1-Methylphenanthrene(1MP)
Concen: 541.12 ng/mL m
RT: 35.066 min Scan# 1760
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 100277

Ion	Ratio	Lower	Upper
192	100		
191	56.7	47.7	71.5

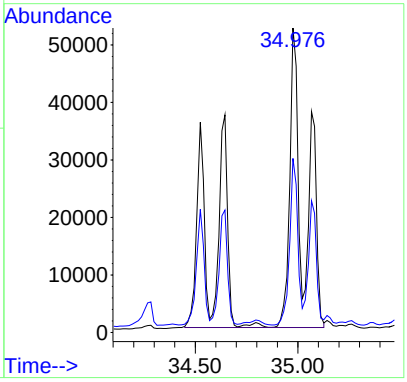


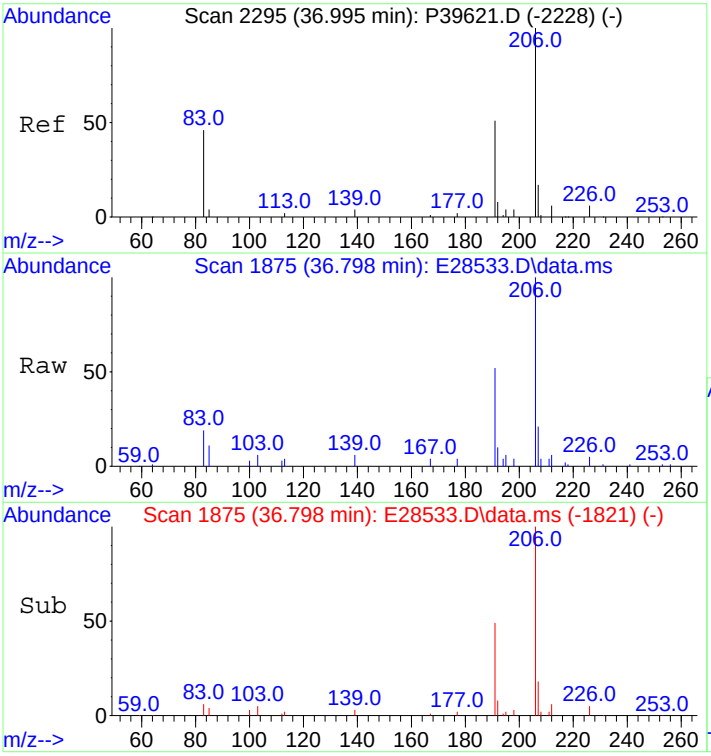


#49
C1-Phenanthrenes/Anthracenes
Concen: 2383.48 ng/mL m
RT: 34.976 min Scan# 1754
Delta R.T. 0.078 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 441690

Ion	Ratio	Lower	Upper
192	100		
191	17.9	44.0	66.0#

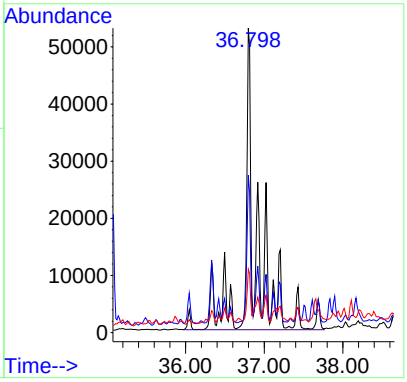


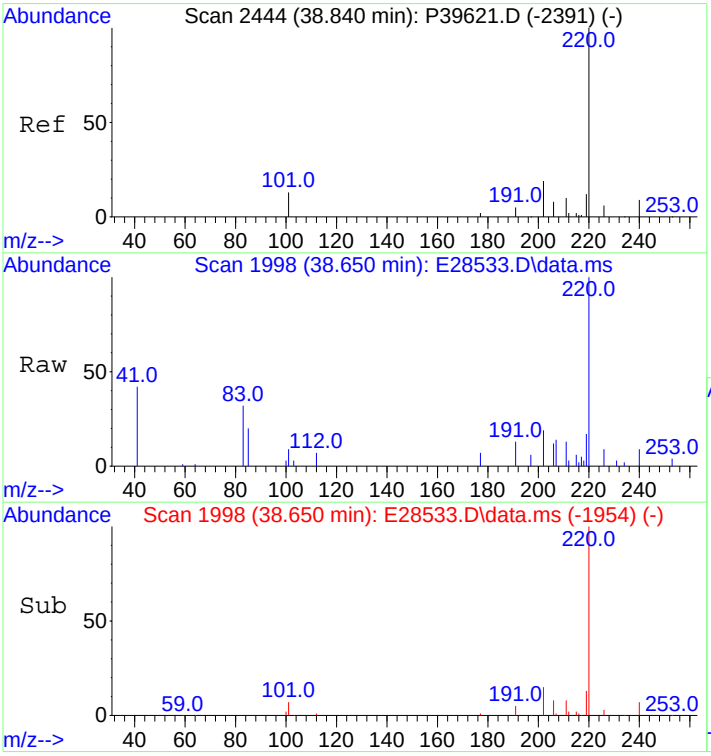


#50
C2-Phenanthrenes/Anthracenes
Concen: 2754.91 ng/mL m
RT: 36.798 min Scan# 1875
Delta R.T. 0.117 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:206 Resp: 510520

Ion	Ratio	Lower	Upper
206	100		
191	15.5	35.7	53.5#
207	5.5	16.5	24.7#

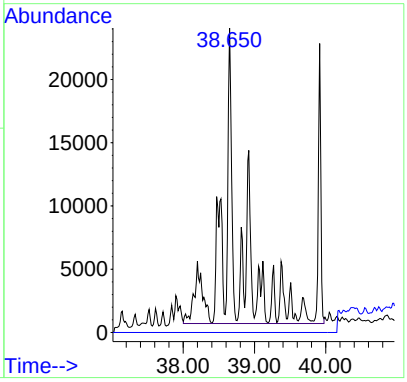


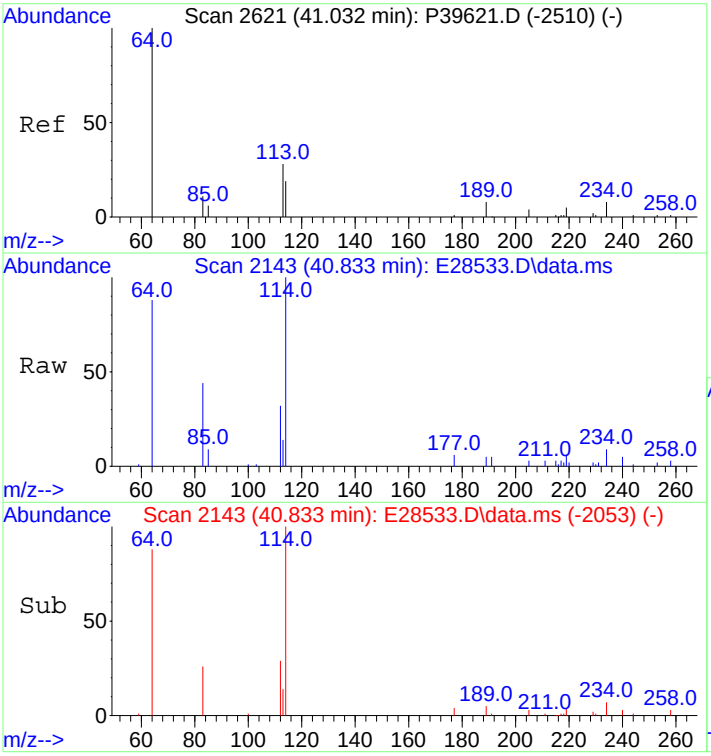


#52
C3-Phenanthrenes/Anthracenes
Concen: 2027.53 ng/mL m
RT: 38.650 min Scan# 1998
Delta R.T. 0.141 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:220 Resp: 375728

Ion	Ratio	Lower	Upper
220	100		
205	0.0	0.0	0.0

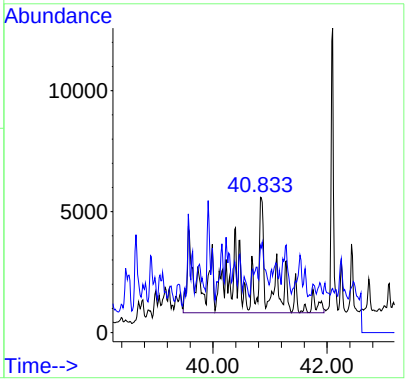


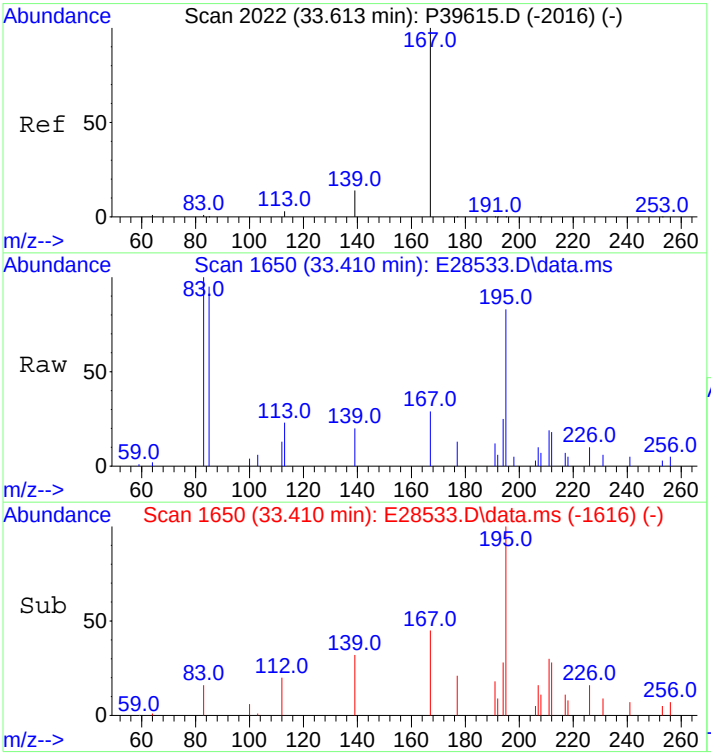


#53
C4-Phenanthrenes/Anthracenes
Concen: 832.34 ng/mL m
RT: 40.833 min Scan# 2143
Delta R.T. 0.169 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 154244

Ion	Ratio	Lower	Upper
234	100		
219	2.3	46.6	70.0#

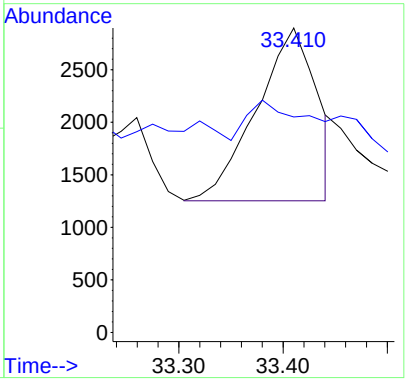


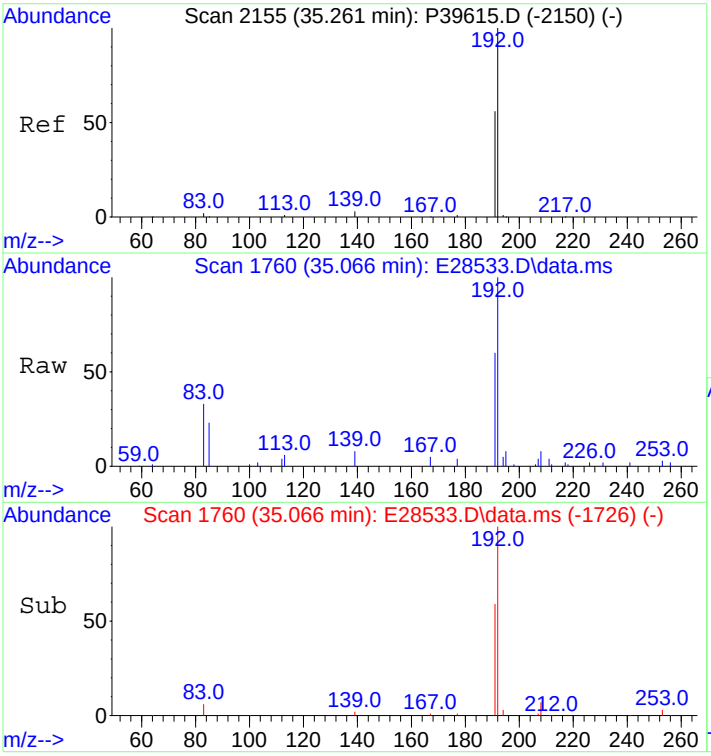


#56
Carbazole
Concen: 40.32 ng/mL m
RT: 33.410 min Scan# 1650
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:167 Resp: 6647

Ion	Ratio	Lower	Upper
167	100		
139	0.0	10.5	15.7#

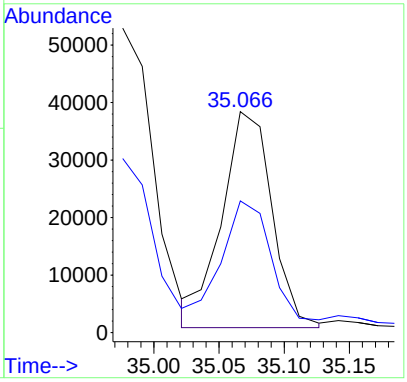


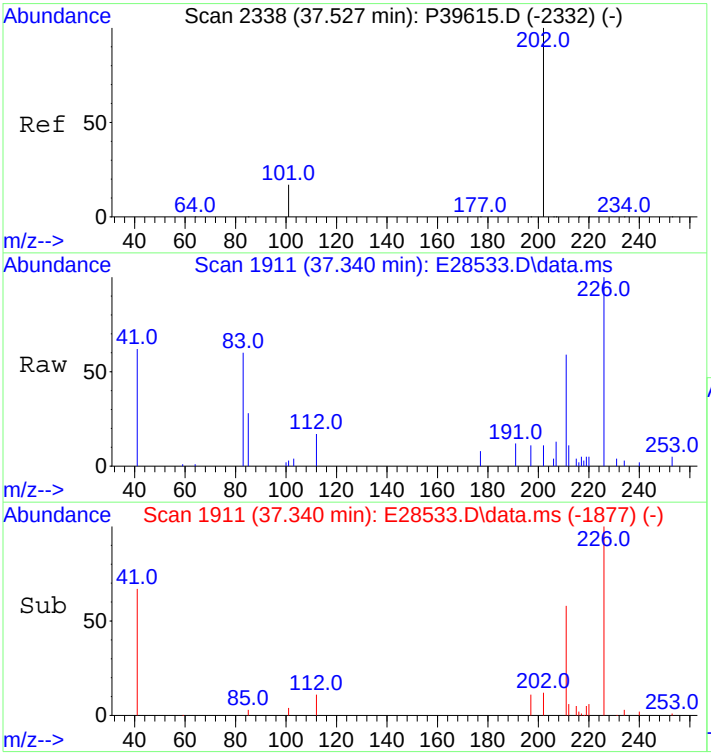


#57
1-Methylphenanthrene
Concen: 711.92 ng/mL m
RT: 35.066 min Scan# 1760
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:192 Resp: 100650

Ion	Ratio	Lower	Upper
192	100		
191	54.2	45.5	68.3

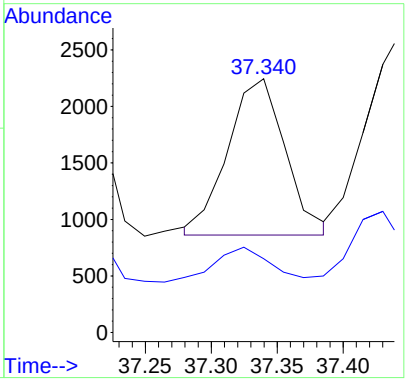


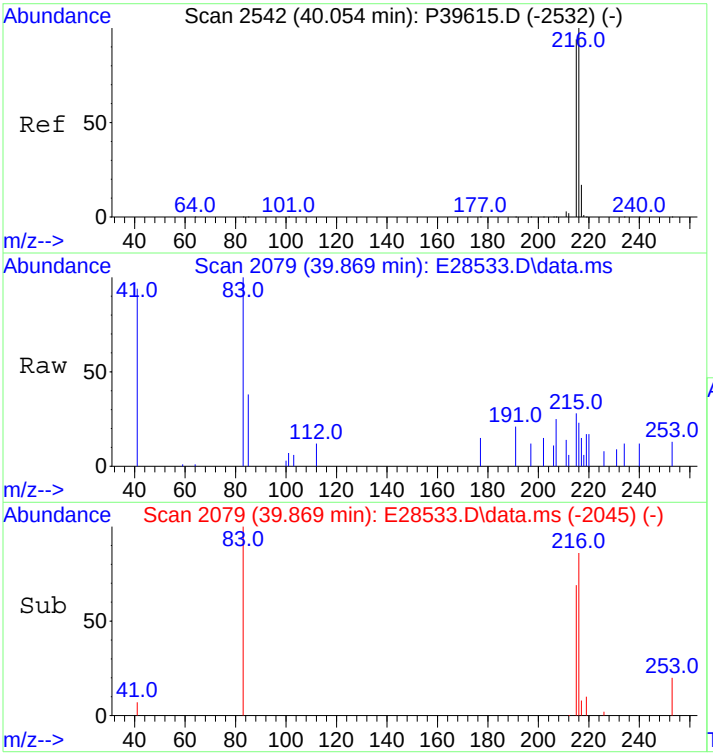


#58
Fluoranthene
Concen: 20.53 ng/mL m
RT: 37.340 min Scan# 1911
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:202 Resp: 4201

Ion	Ratio	Lower	Upper
202	100		
101	65.6	9.2	13.8#

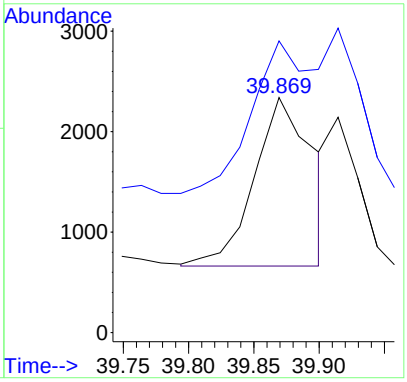


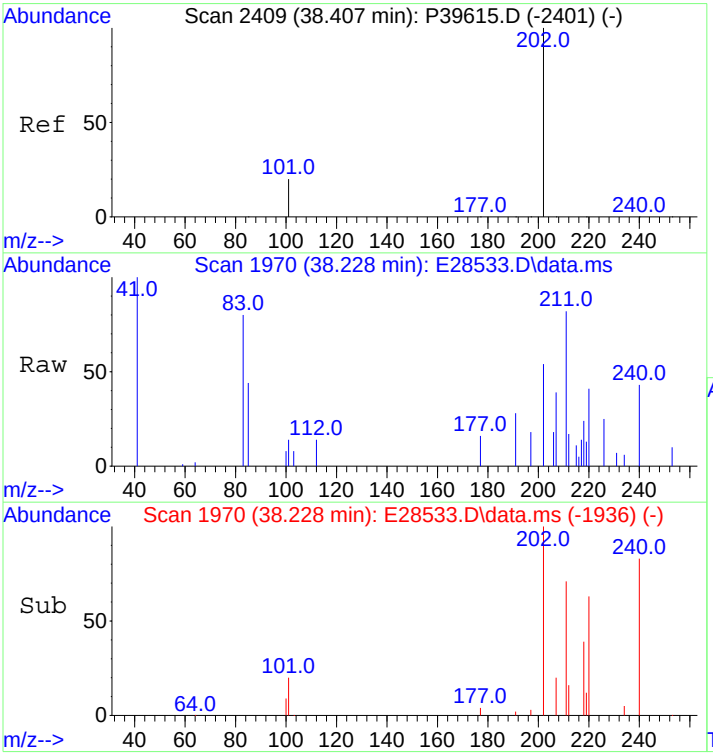


#59
Benzo(b)fluorene
Concen: 38.17 ng/mL m
RT: 39.869 min Scan# 2079
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:216 Resp: 5205

Ion	Ratio	Lower	Upper
216	100		
215	427.7	73.8	110.8#

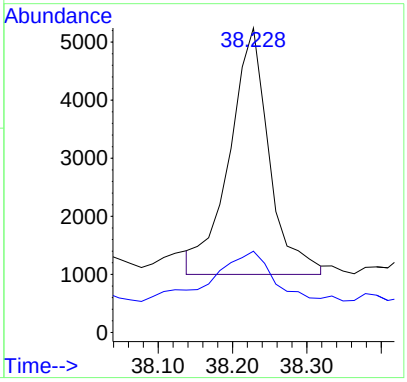


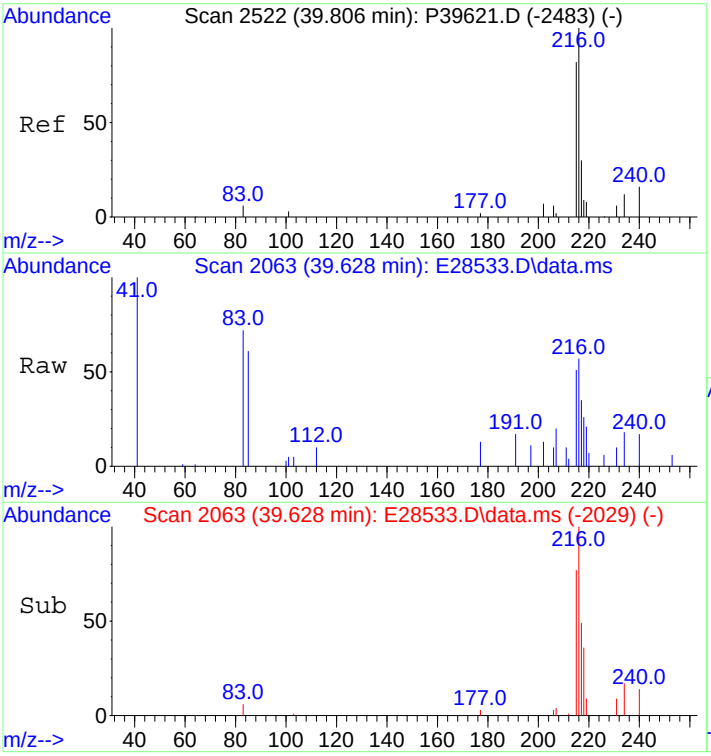


#60
Pyrene
Concen: 75.58 ng/mL m
RT: 38.228 min Scan# 1970
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:202 Resp: 15722

Ion	Ratio	Lower	Upper
202	100		
101	31.4	9.8	14.8#

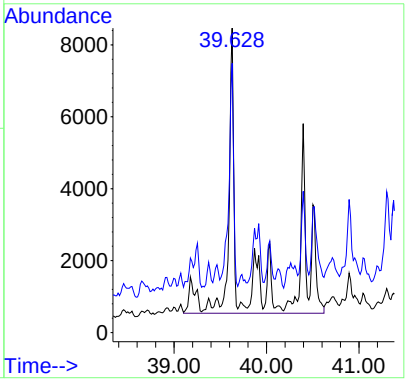


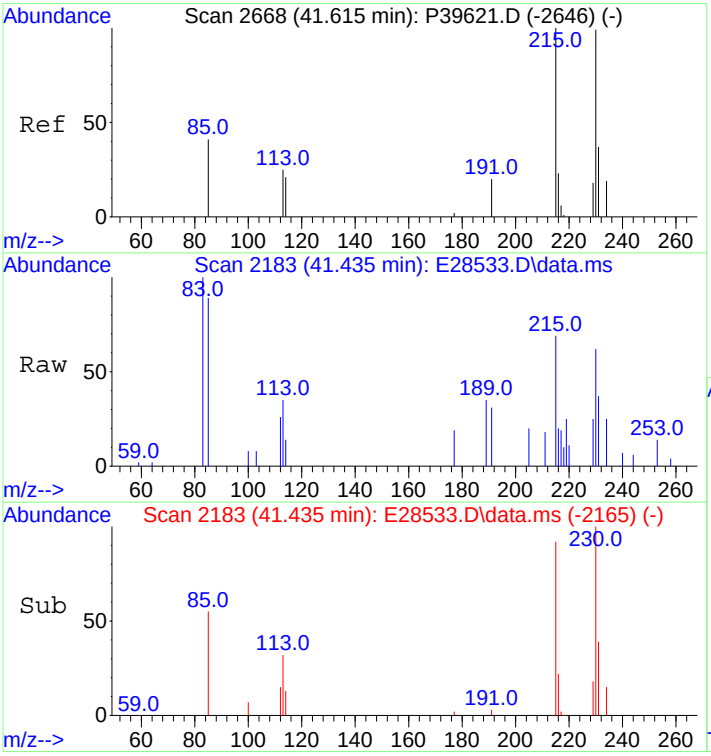


#61
C1-Fluoranthenes/Pyrenes
Concen: 370.19 ng/mL m
RT: 39.628 min Scan# 2063
Delta R.T. 0.153 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:216 Resp: 77003

Ion	Ratio	Lower	Upper
216	100		
215	28.9	73.4	110.2#

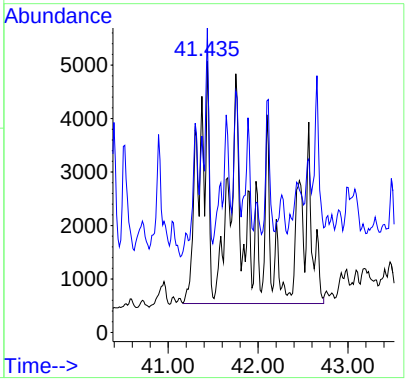


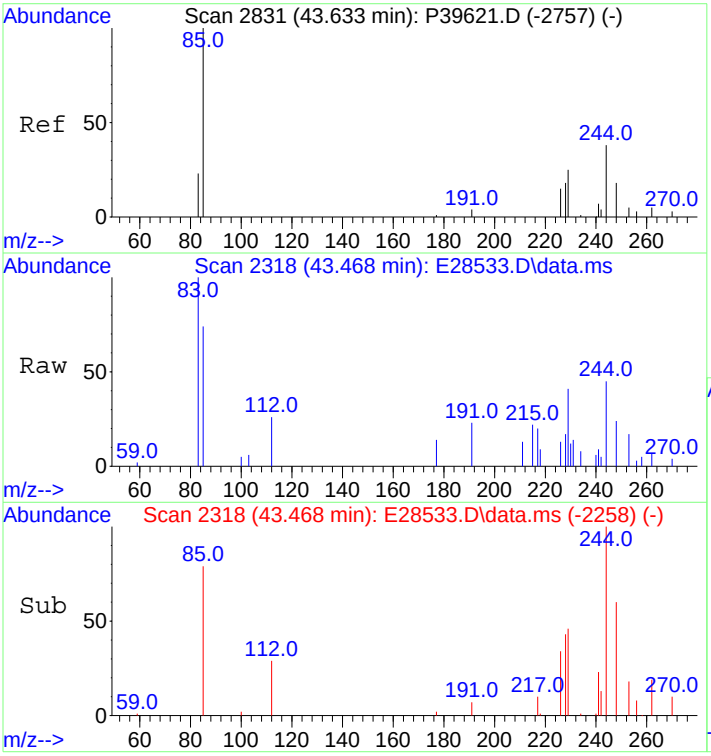


#62
C2-Fluoranthenes/Pyrenes
Concen: 600.32 ng/mL m
RT: 41.435 min Scan# 2183
Delta R.T. 0.236 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:230 Resp: 124873

Ion	Ratio	Lower	Upper
230	100		
215	6.2	62.3	93.5#

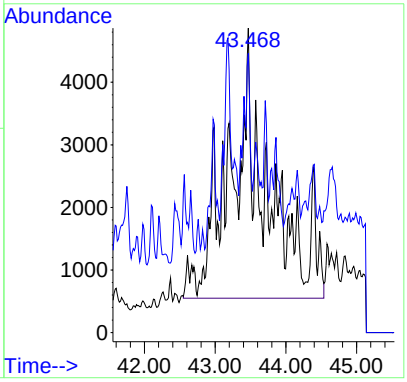


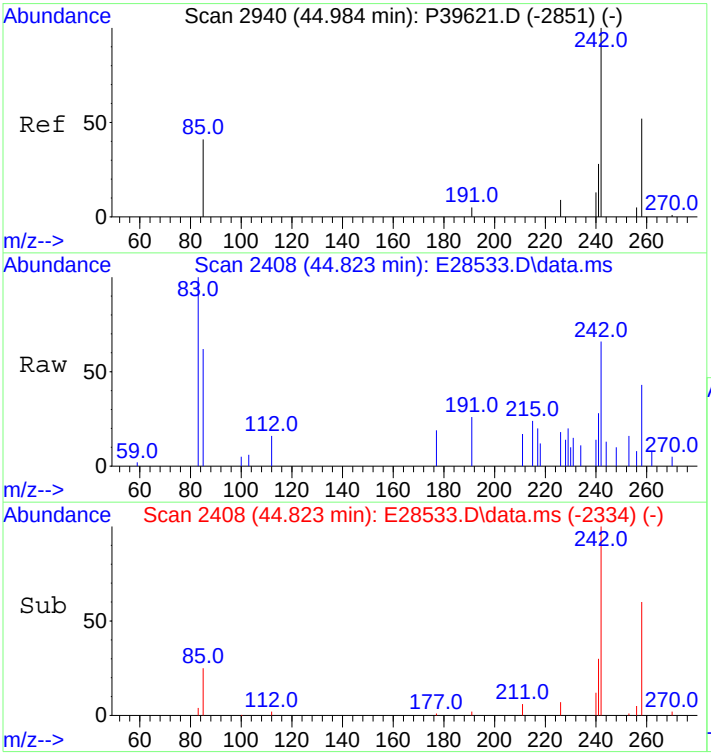


#63
C3-Fluoranthenes/Pyrenes
Concen: 738.62 ng/mL m
RT: 43.468 min Scan# 2318
Delta R.T. 0.203 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:244 Resp: 153640

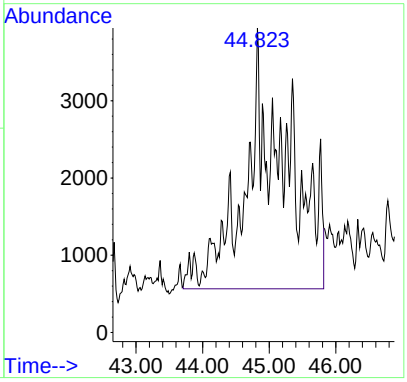
Ion	Ratio	Lower	Upper
244	100		
229	11.2	72.2	108.2#

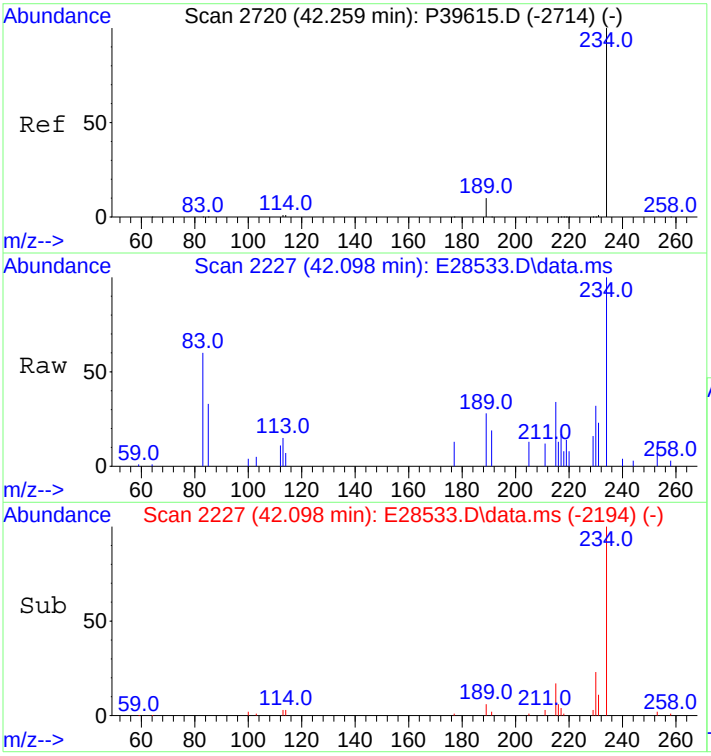




#64
C4-Fluoranthenes/Pyrenes
Concen: 674.79 ng/mL m
RT: 44.823 min Scan# 2408
Delta R.T. 0.220 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:258 Resp: 140363

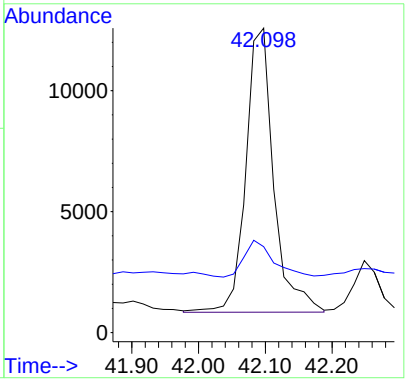


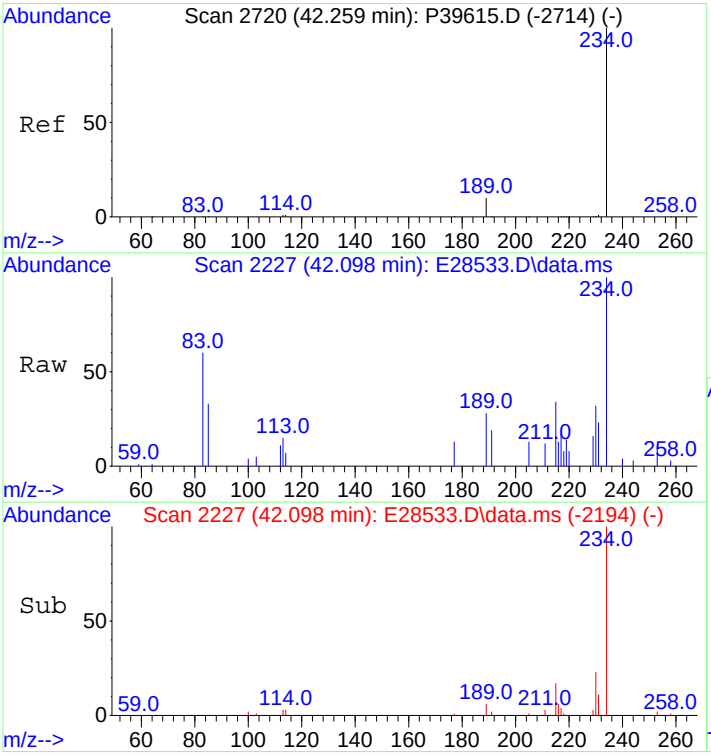


#66
Naphthobenzothiophene
Concen: 166.37 ng/ml
RT: 42.098 min Scan# 2227
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 34132

Ion	Ratio	Lower	Upper
234	100		
189	13.5	22.6	33.8#

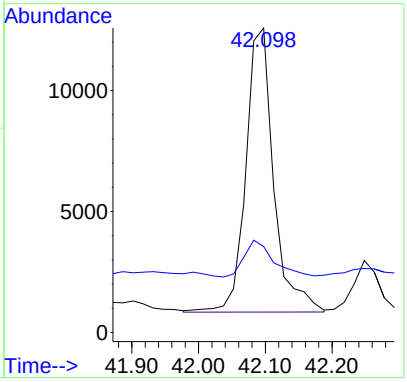


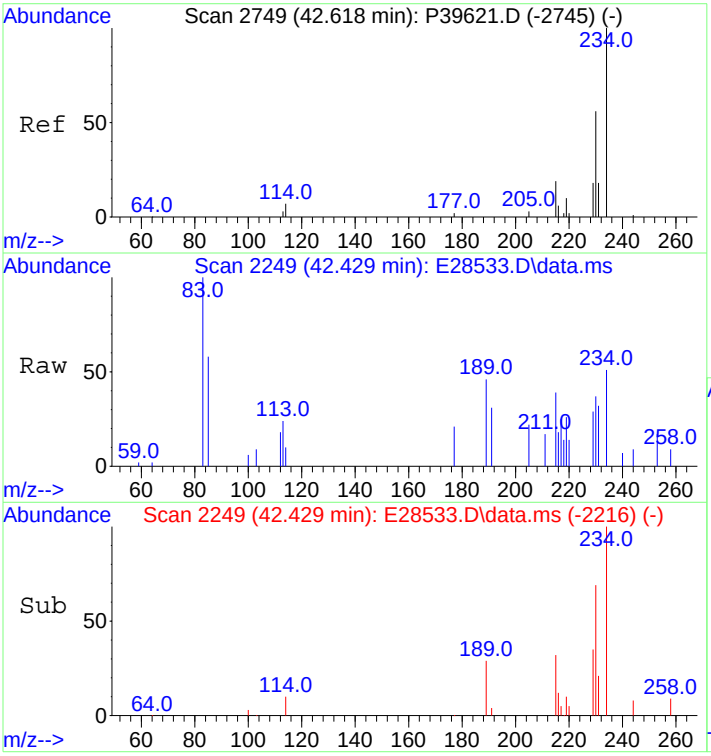


#67
Naphthobenzothiophene-2,1-D
Concen: 166.37 ng/mL
RT: 42.098 min Scan# 2227
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 34132

Ion	Ratio	Lower	Upper
234	100		
189	13.5	22.6	33.8#

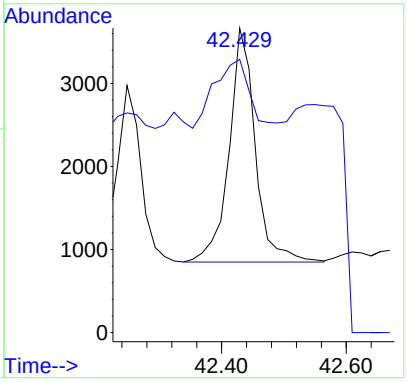


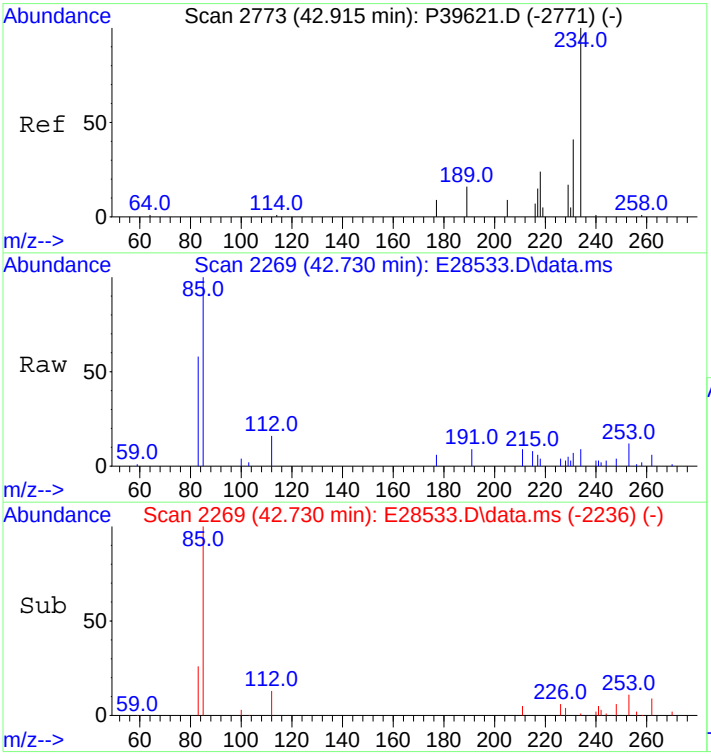


#68
Naphthobenzothiophene-1,2-D
Concen: 40.07 ng/mL
RT: 42.429 min Scan# 2249
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 8220

Ion	Ratio	Lower	Upper
234	100		
189	0.0	71.8	107.8#

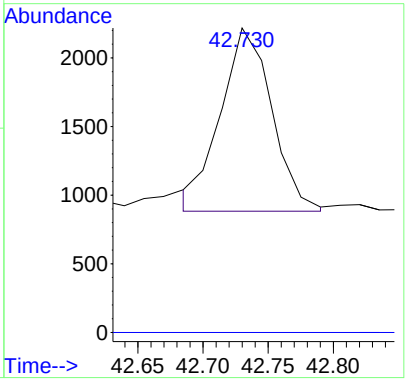


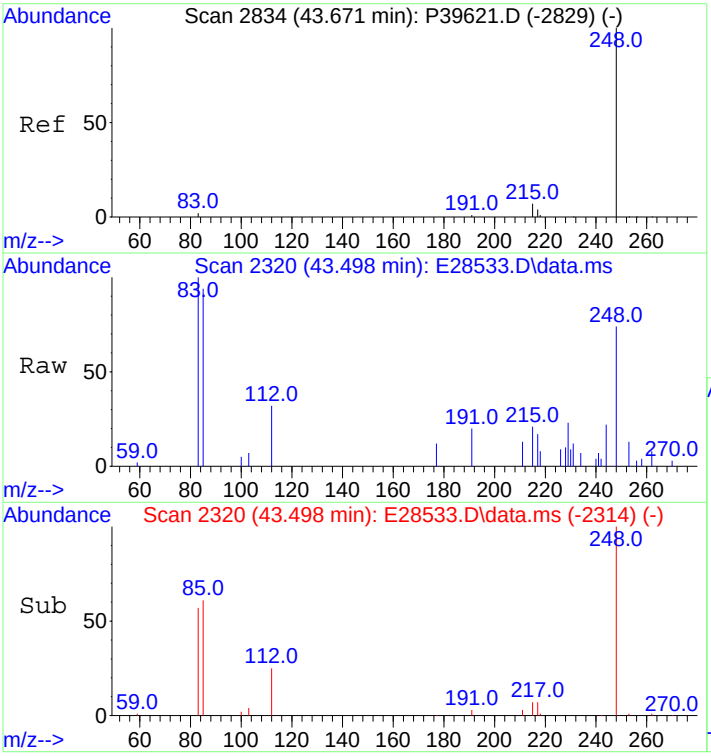


#69
Naphthobenzothiophene-2,3-D
Concen: 17.81 ng/mL m
RT: 42.730 min Scan# 2269
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:234 Resp: 3653

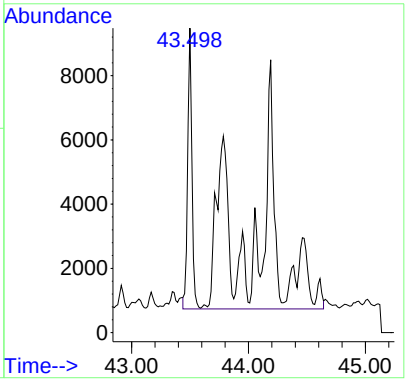
Ion	Ratio	Lower	Upper
234	100		
189	0.0	0.0	0.0

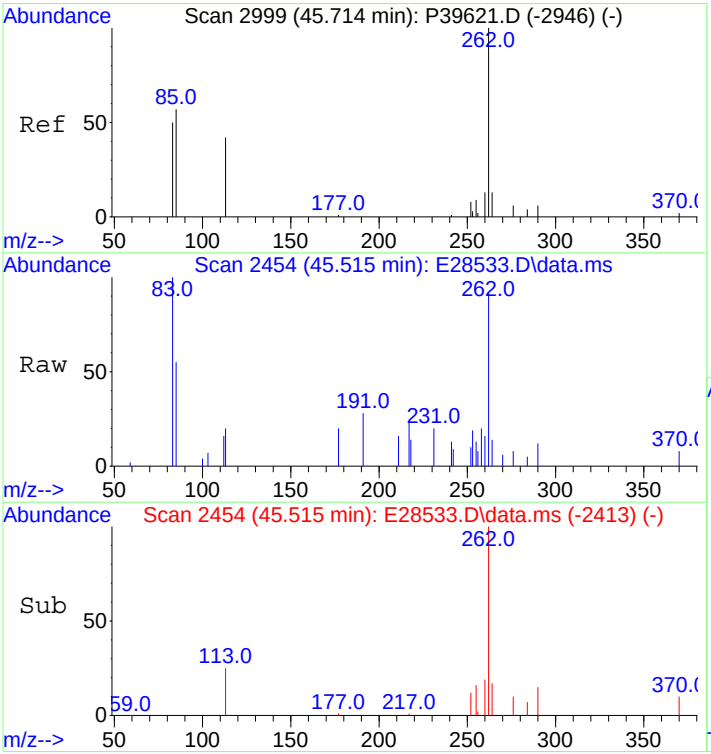




#70
C1-Naphthobenzothiophenes
Concen: 622.11 ng/ml m
RT: 43.498 min Scan# 2320
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

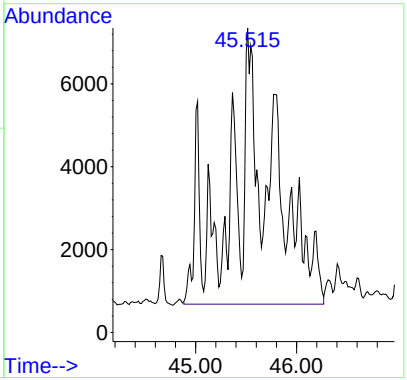
Tgt Ion:248 Resp: 127630

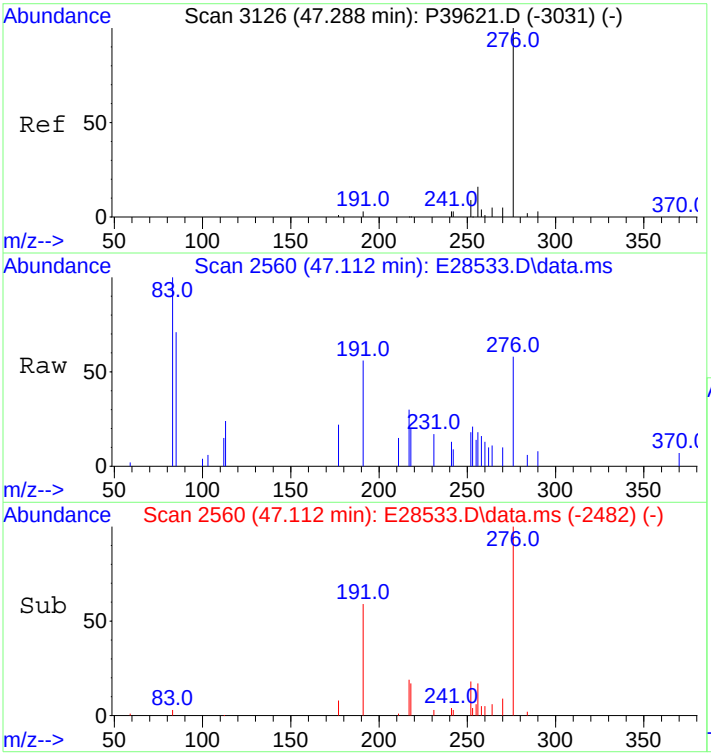




#71
C2-Naphthobenzothiophenes
Concen: 906.16 ng/ml m
RT: 45.515 min Scan# 2454
Delta R.T. 0.228 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

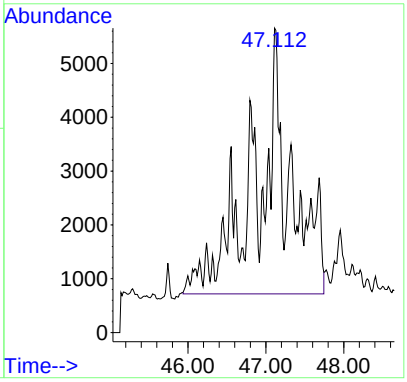
Tgt Ion:262 Resp: 185905

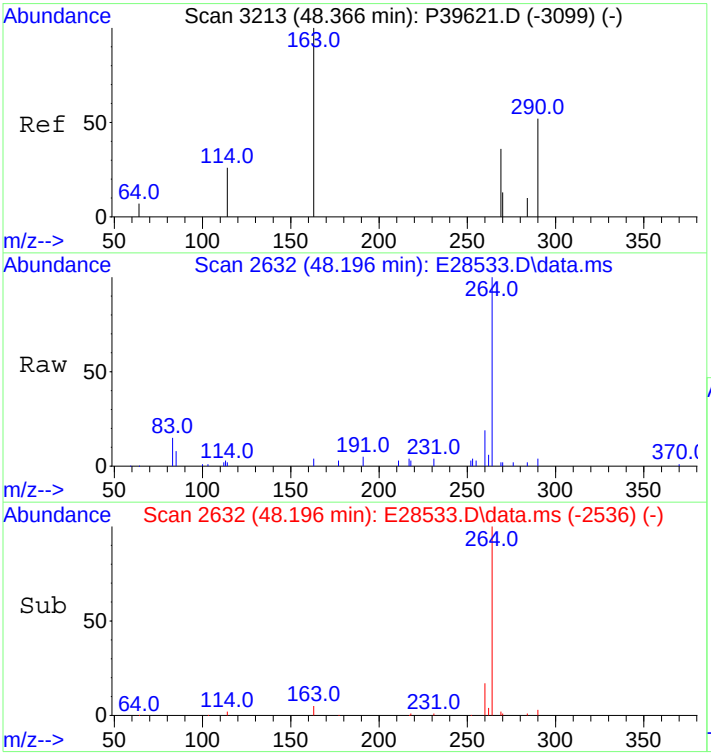




#72
C3-Naphthobenzothiophenes
Concen: 741.60 ng/ml m
RT: 47.112 min Scan# 2560
Delta R.T. 0.220 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

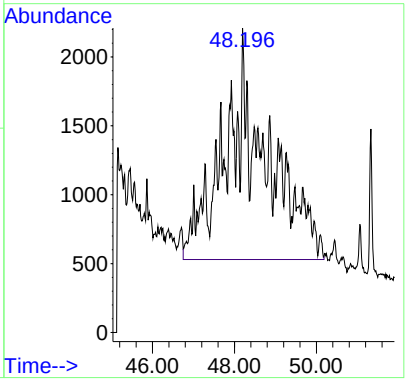
Tgt Ion:276 Resp: 152145

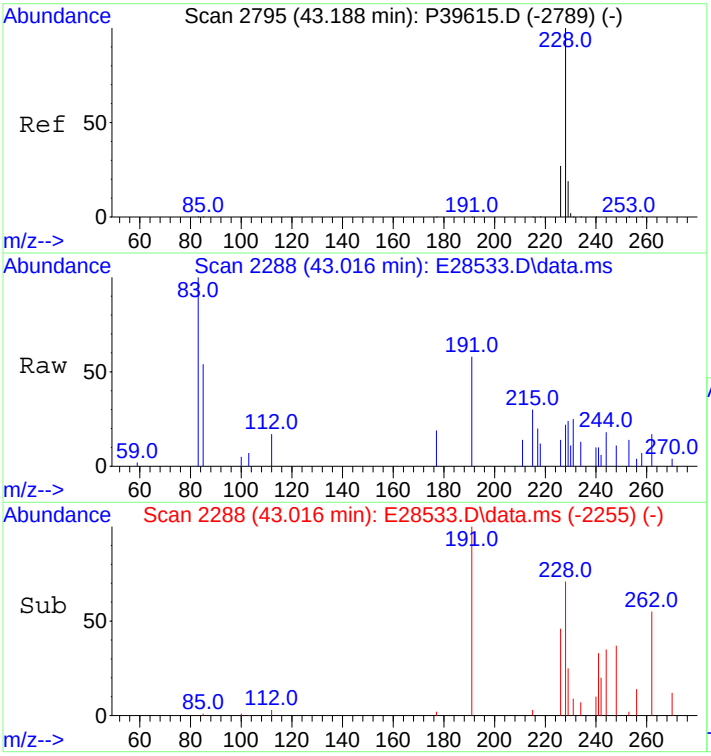




#73
C4-Naphthobenzothiophenes
Concen: 559.60 ng/mL m
RT: 48.196 min Scan# 2632
Delta R.T. 0.219 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:290 Resp: 114807

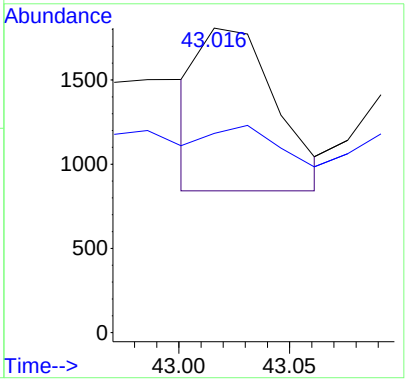


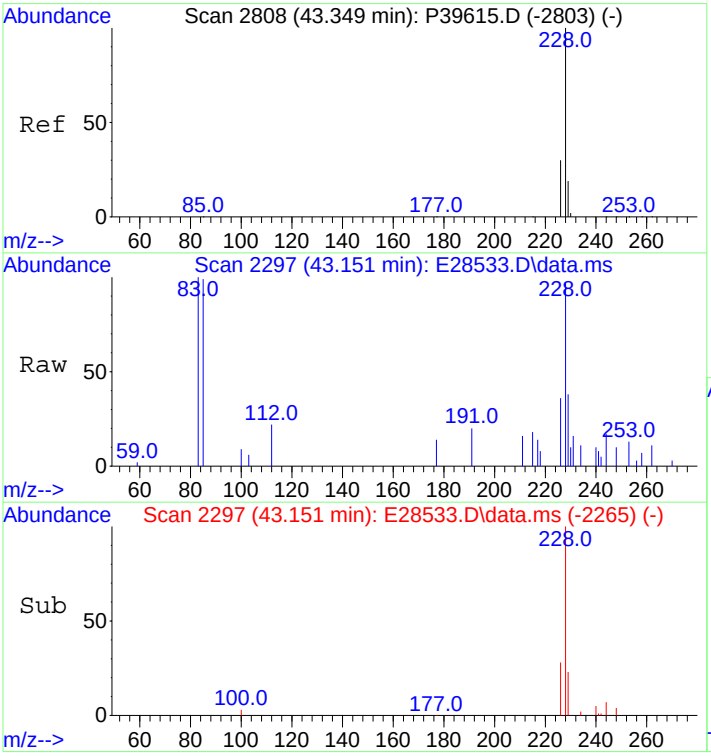


#75
Benz[a]anthracene
Concen: 11.16 ng/mL m
RT: 43.016 min Scan# 2288
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:228 Resp: 2301

Ion	Ratio	Lower	Upper
228	100		
226	532.8	20.2	30.4#

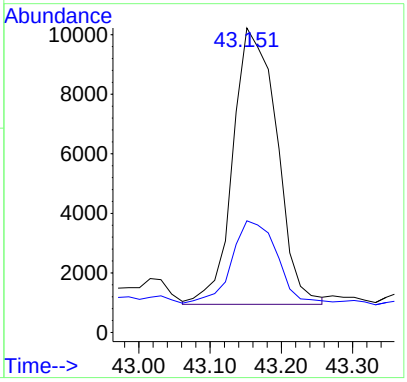


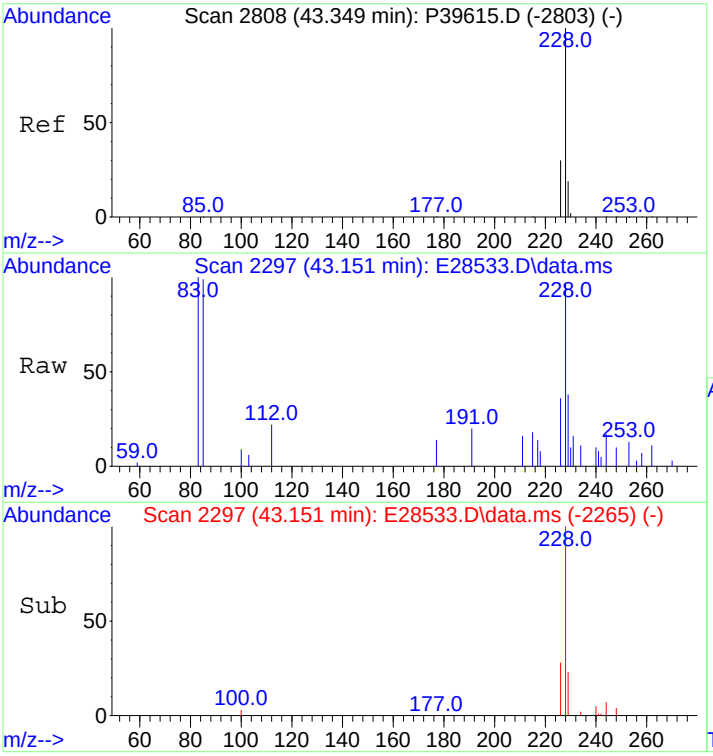


#76
Chrysene
Concen: 187.15 ng/mL m
RT: 43.151 min Scan# 2297
Delta R.T. -0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:228 Resp: 39715

Ion	Ratio	Lower	Upper
228	100		
226	34.1	22.6	34.0#

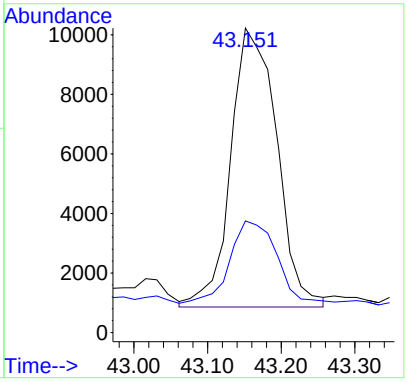


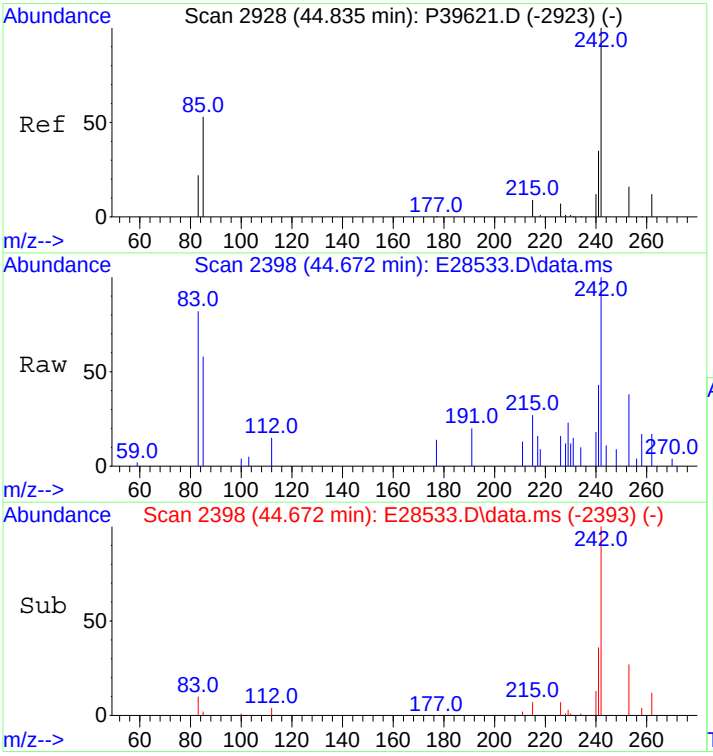


#77
Chrysene/Triphenylene
Concen: 191.91 ng/mL m
RT: 43.151 min Scan# 2297
Delta R.T. -0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:228 Resp: 40725

Ion	Ratio	Lower	Upper
228	100		
226	33.3	22.6	34.0

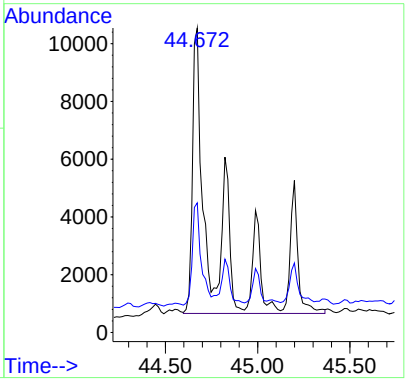


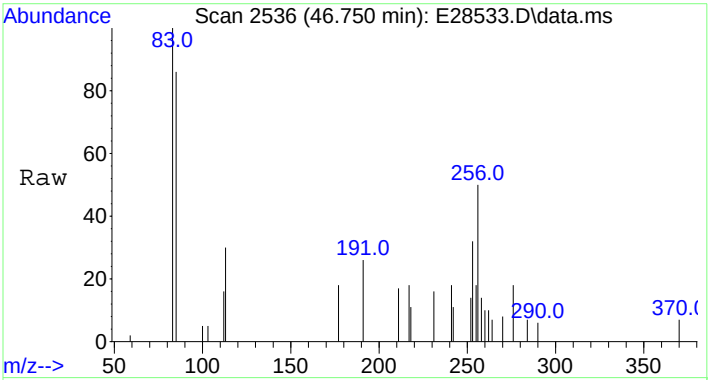


#78
C1-Chrysenes
Concen: 356.61 ng/mL m
RT: 44.672 min Scan# 2398
Delta R.T. 0.013 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:242 Resp: 75676

Ion	Ratio	Lower	Upper
242	100		
241	10.9	32.2	48.4#

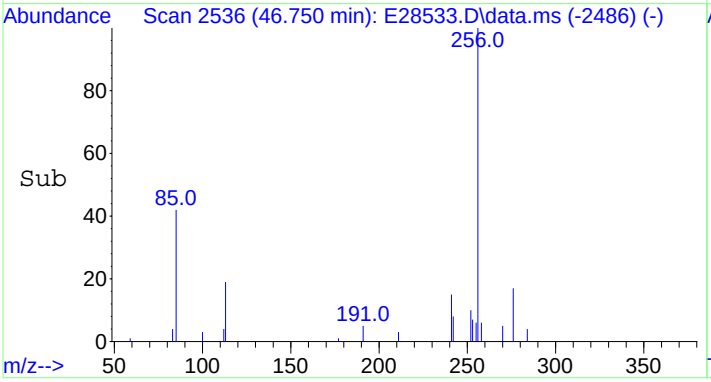


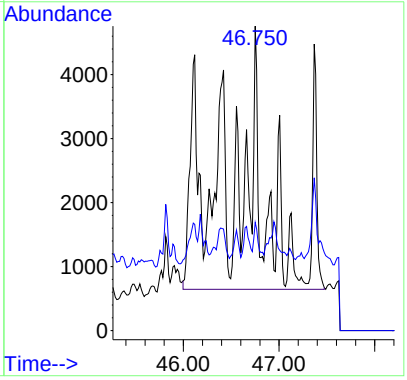


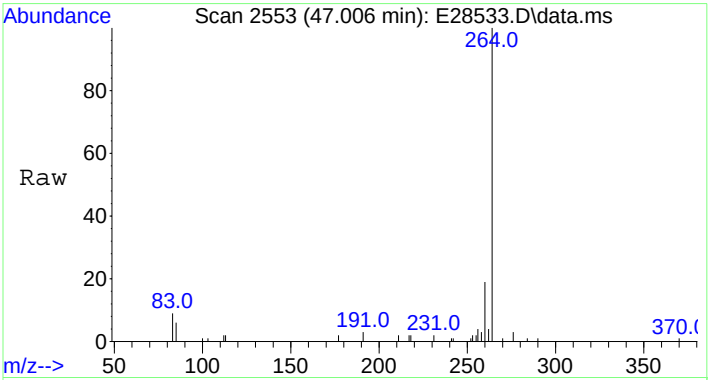
#79
C2-Chrysenes
Concen: 515.39 ng/mL m
RT: 46.750 min Scan# 2536
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:256 Resp: 109371

Ion	Ratio	Lower	Upper
256	100		
241	1.2	25.3	37.9#

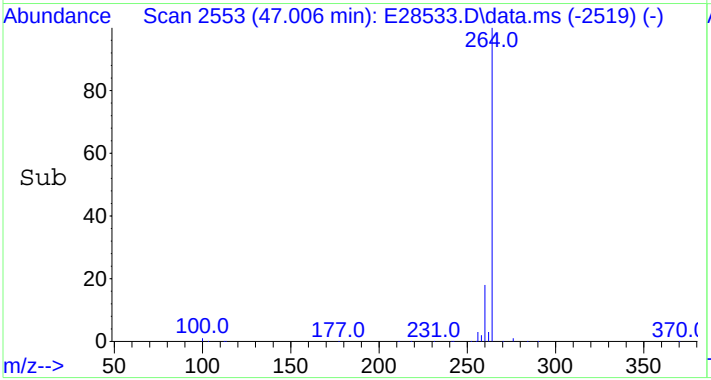


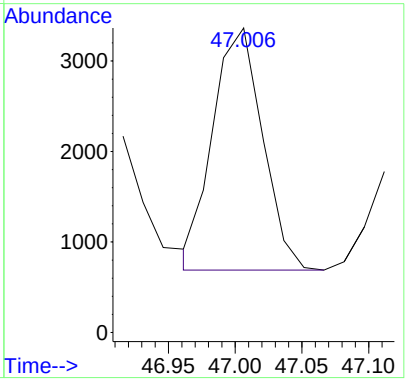


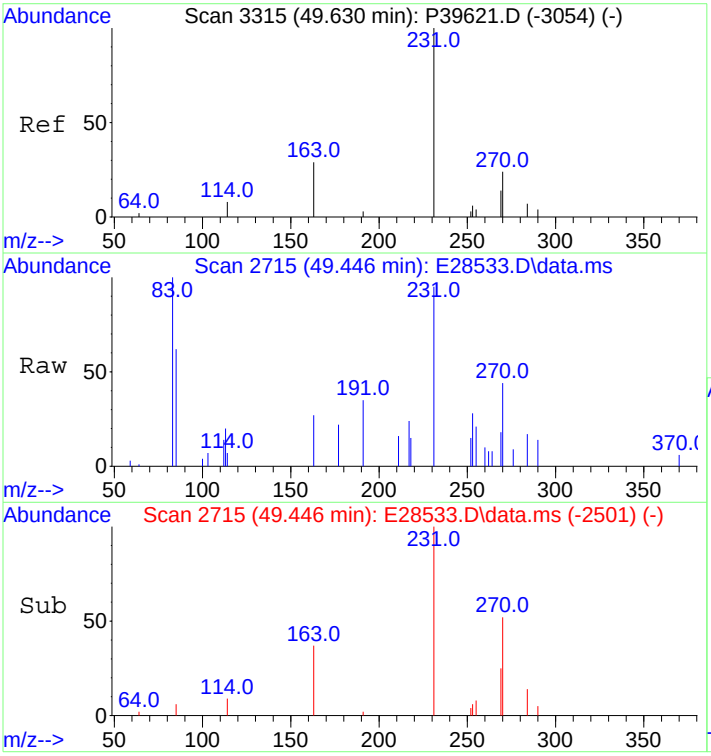


#80
BBF-D12 Surr BKGD
Concen: 32.68 ng/mL
RT: 47.006 min Scan# 2553
Delta R.T. 0.017 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:256 Resp: 6935



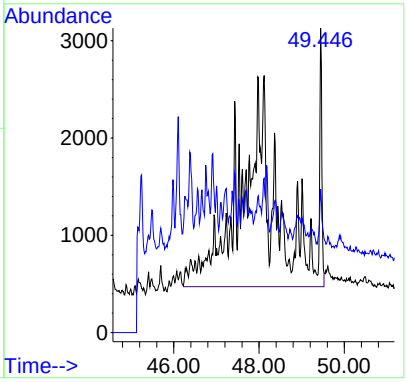


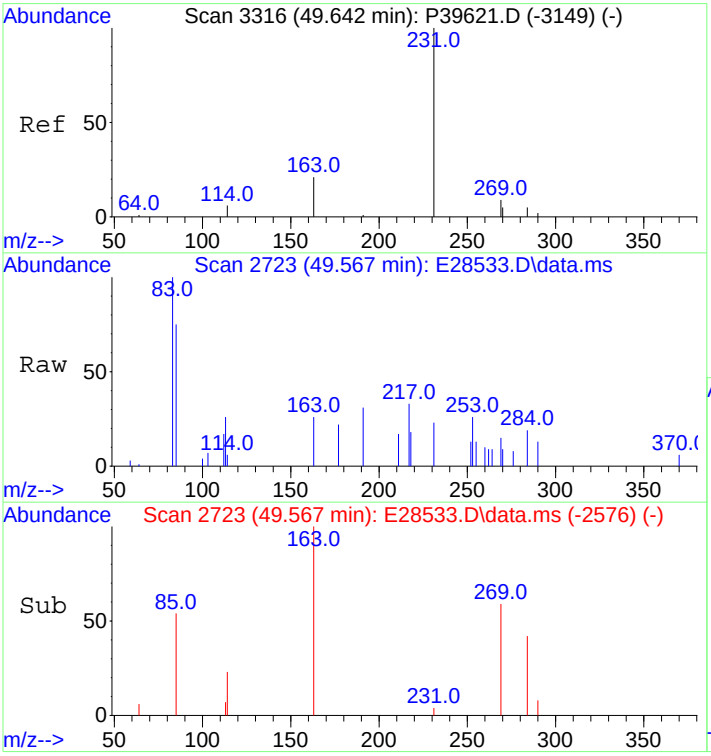


#81
C3-Chrysenes
Concen: 584.99 ng/mL m
RT: 49.446 min Scan# 2715
Delta R.T. -0.037 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:270 Resp: 124142

Ion	Ratio	Lower	Upper
270	100		
255	1.7	38.0	57.0#

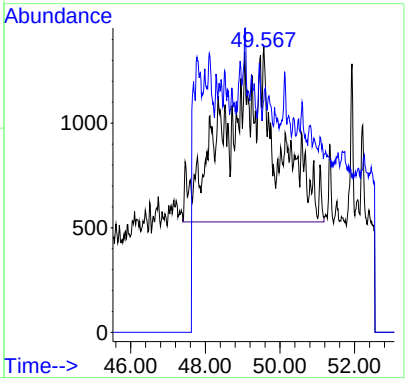


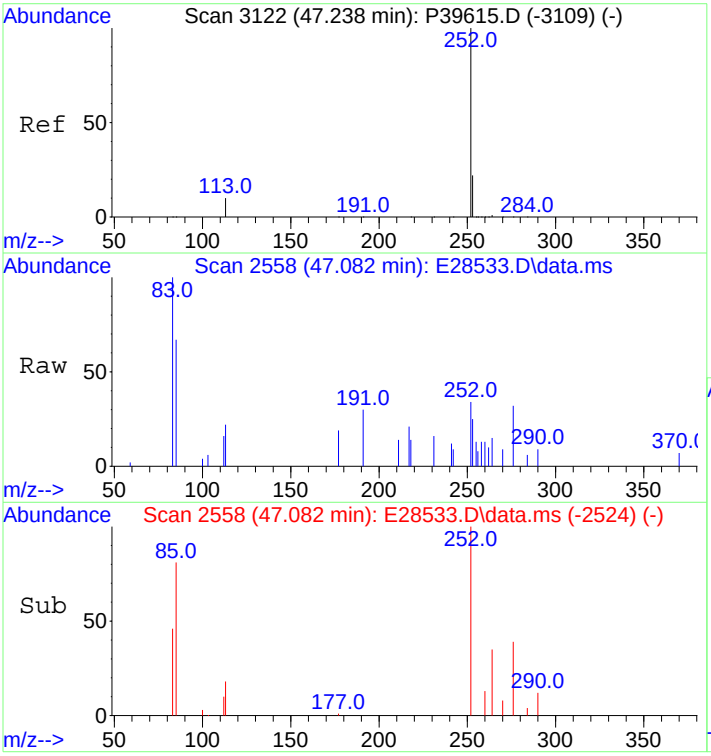


#82
C4-Chrysenes
Concen: 376.08 ng/mL m
RT: 49.567 min Scan# 2723
Delta R.T. -0.035 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:284 Resp: 79808

Ion	Ratio	Lower	Upper
284	100		
269	0.0	64.6	96.8#

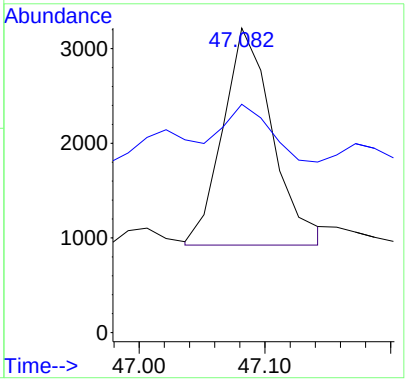


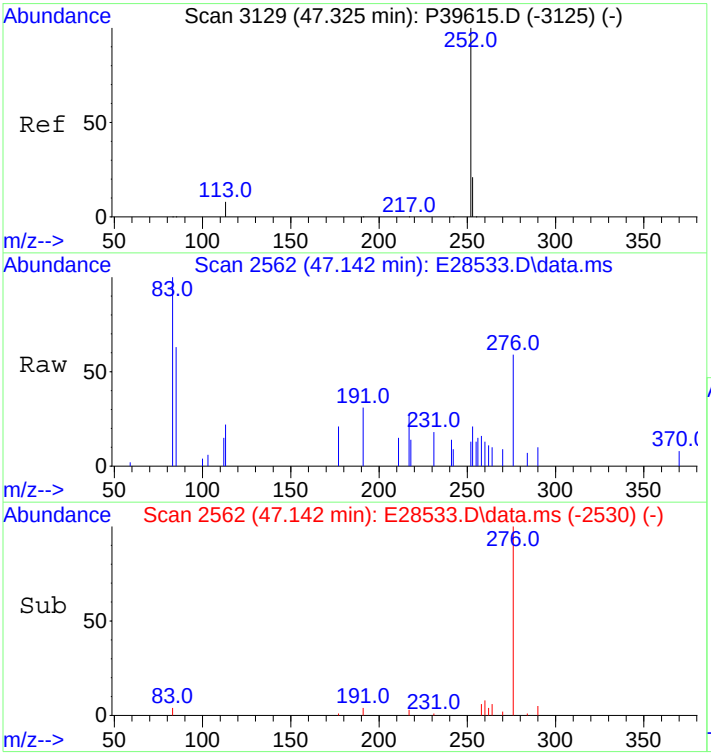


#84
Benzo[b]fluoranthene
Concen: 26.29 ng/mL m
RT: 47.082 min Scan# 2558
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 6298

Ion	Ratio	Lower	Upper
252	100		
253	24.1	18.3	27.5

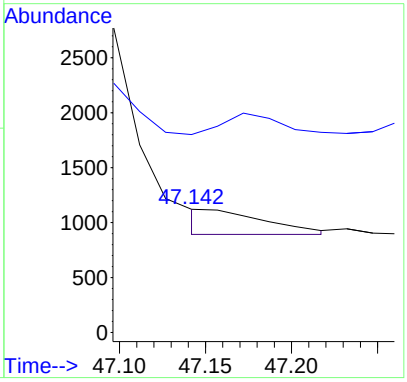


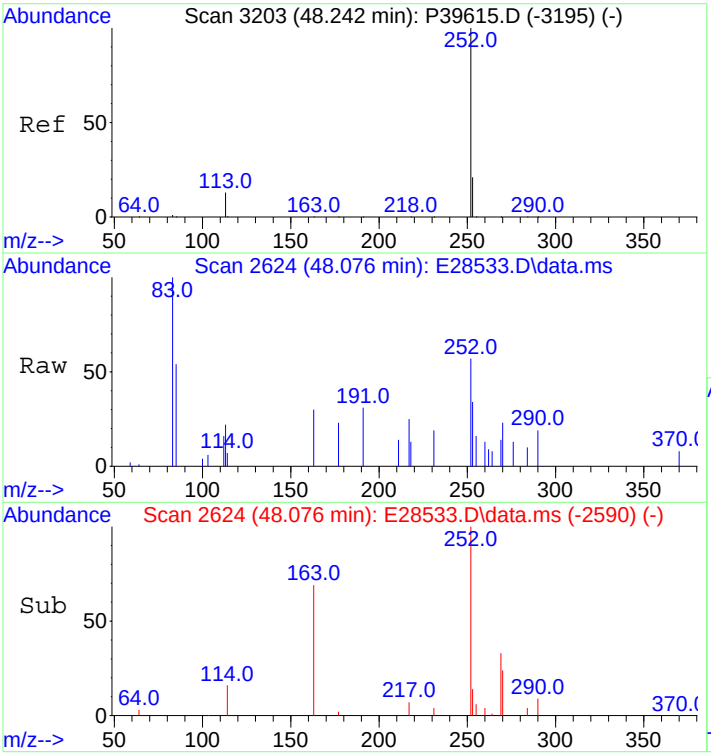


#85
Benzo[j]+[k]fluoranthene
Concen: 2.23 ng/mL m
RT: 47.142 min Scan# 2562
Delta R.T. -0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 550

Ion	Ratio	Lower	Upper
252	100		
253	276.2	18.3	27.5#

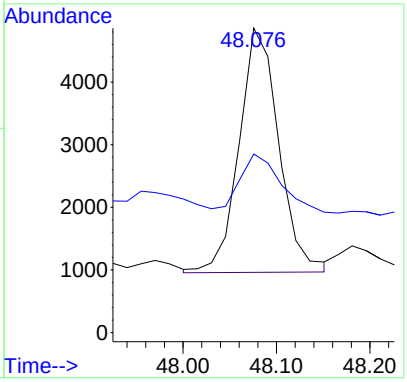


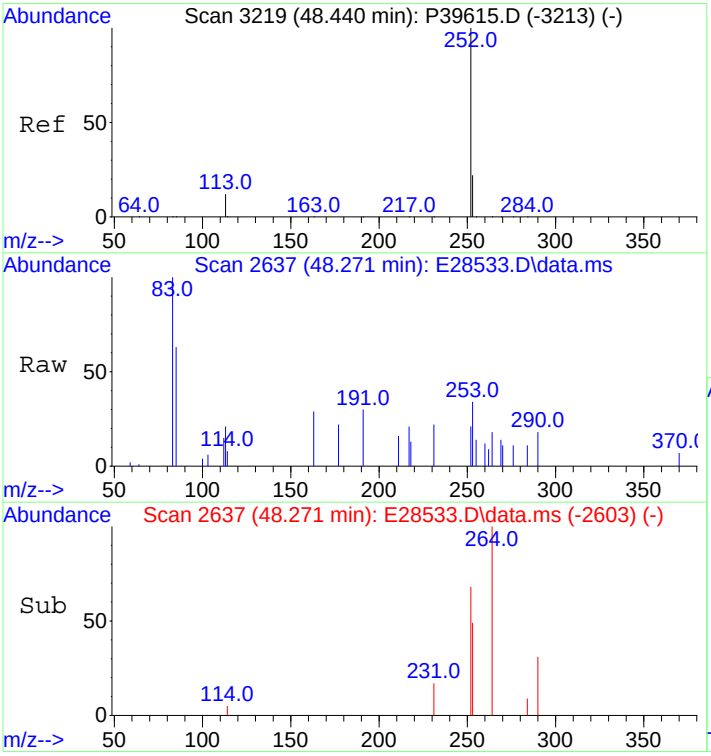


#87
Benzo[e]pyrene
Concen: 49.28 ng/mL
RT: 48.076 min Scan# 2624
Delta R.T. 0.016 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 11528

Ion	Ratio	Lower	Upper
252	100		
253	27.6	18.6	28.0

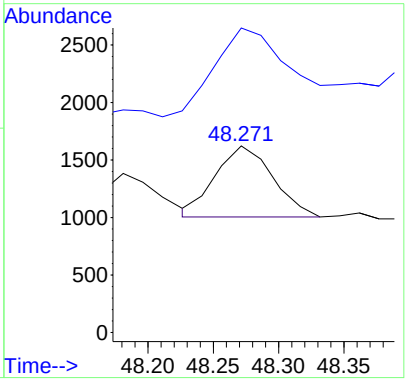


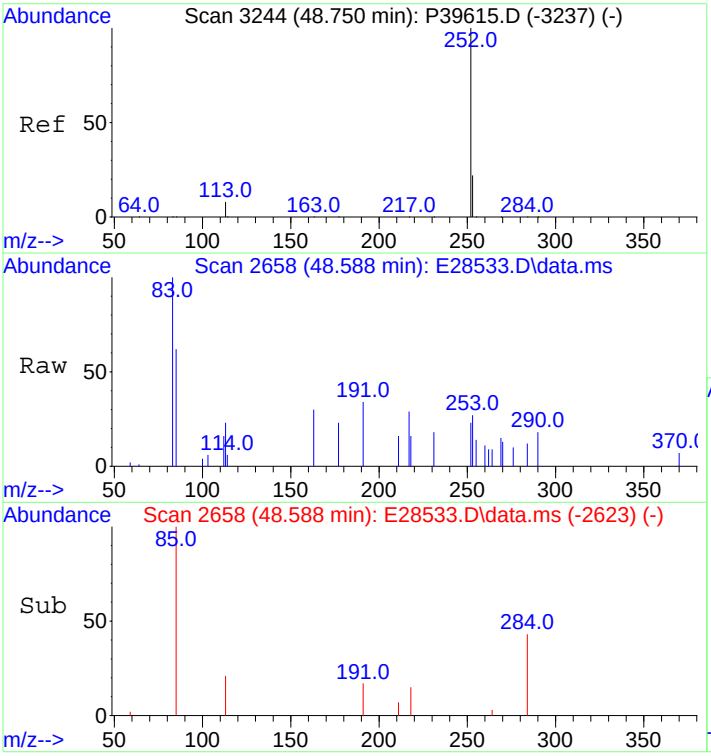


#89
Benzo[a]pyrene
Concen: 8.40 ng/mL m
RT: 48.271 min Scan# 2637
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 1881

Ion	Ratio	Lower	Upper
252	100		
253	152.6	18.8	28.2#

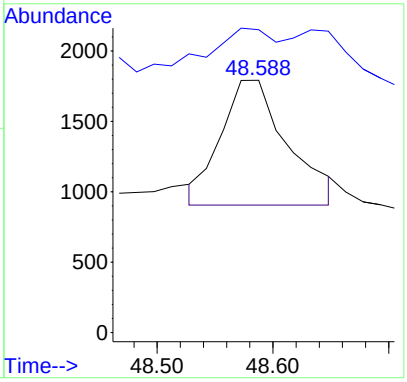


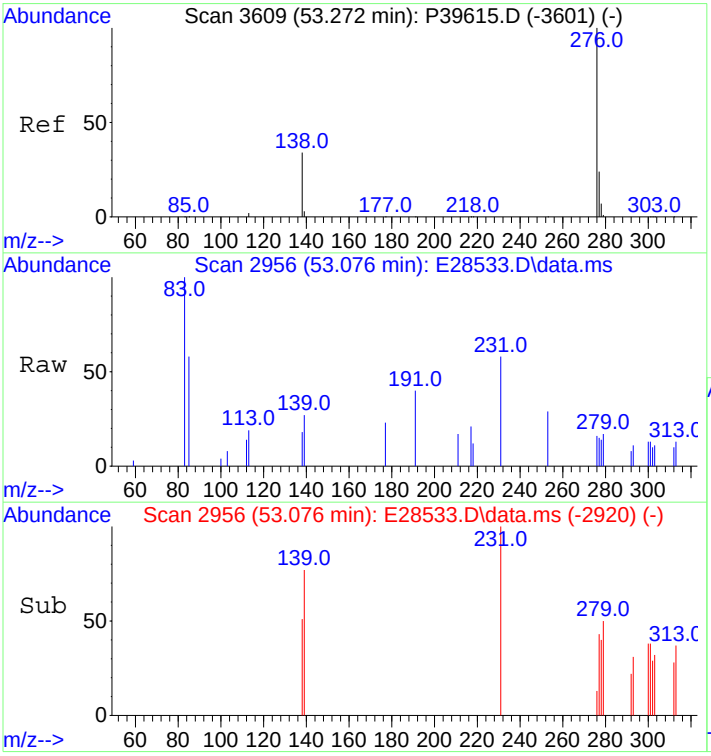


#90
Perylene
Concen: 15.04 ng/mL m
RT: 48.588 min Scan# 2658
Delta R.T. 0.031 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:252 Resp: 3561

Ion	Ratio	Lower	Upper
252	100		
253	25.4	18.8	28.2

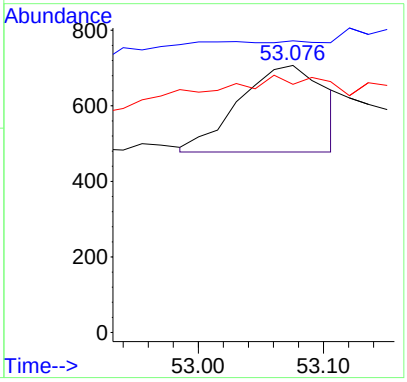


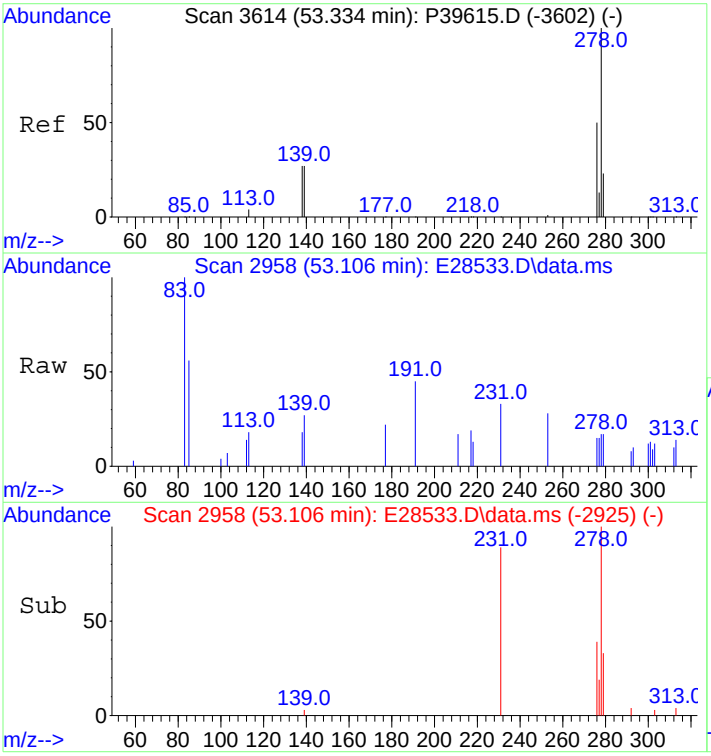


#91
Indeno[1,2,3-cd]pyrene
Concen: 4.14 ng/mL m
RT: 53.076 min Scan# 2956
Delta R.T. 0.046 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:276 Resp: 1091

Ion	Ratio	Lower	Upper
276	100		
138	0.0	15.4	23.2#
277	58.5	19.1	28.7#

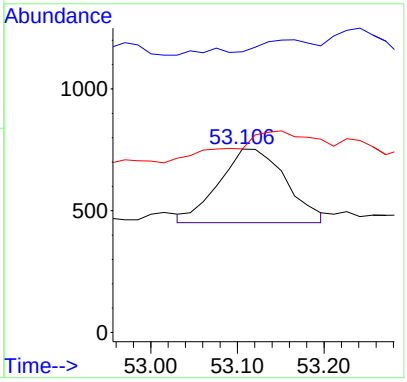


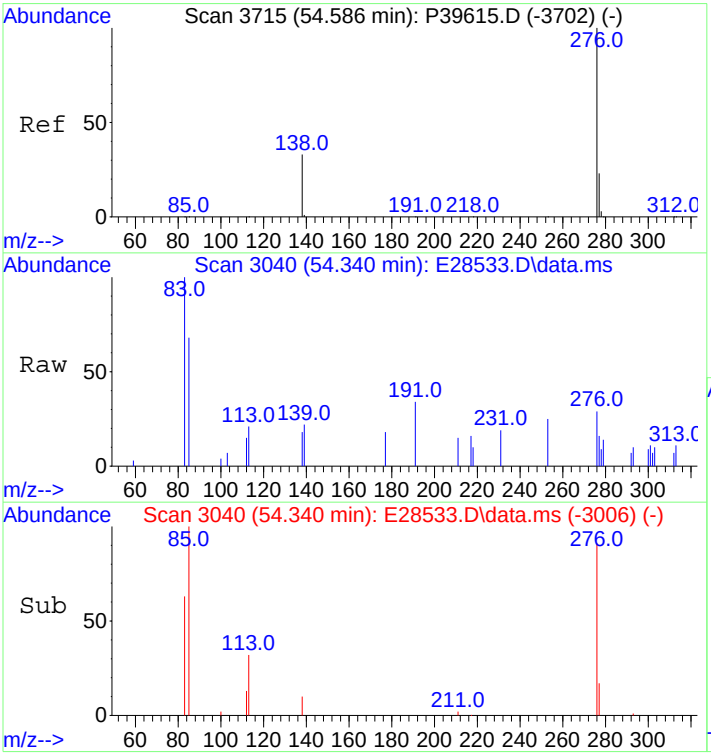


#92
Dibenz[ah]+[ac]anthracene
Concen: 5.79 ng/mL m
RT: 53.106 min Scan# 2958
Delta R.T. -0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:278 Resp: 1624

Ion	Ratio	Lower	Upper
278	100		
139	0.0	11.1	16.7#
279	0.0	19.4	29.0#

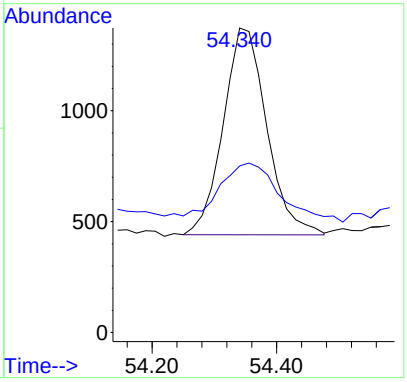


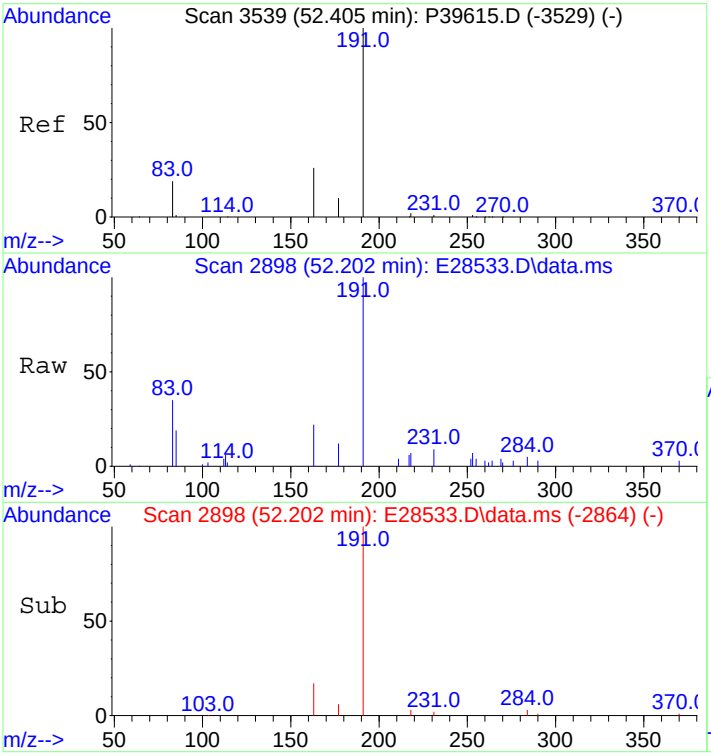


#93
Benzo[g,h,i]perylene
Concen: 15.97 ng/mL
RT: 54.340 min Scan# 3040
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:276 Resp: 4537

Ion	Ratio	Lower	Upper
276	100		
277	39.6	19.1	28.7#

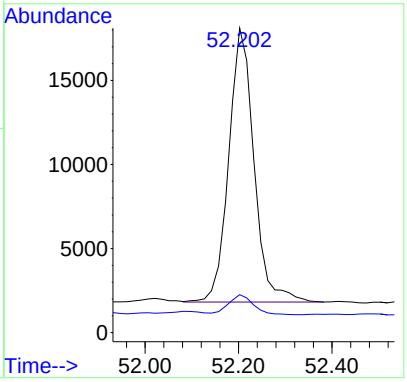


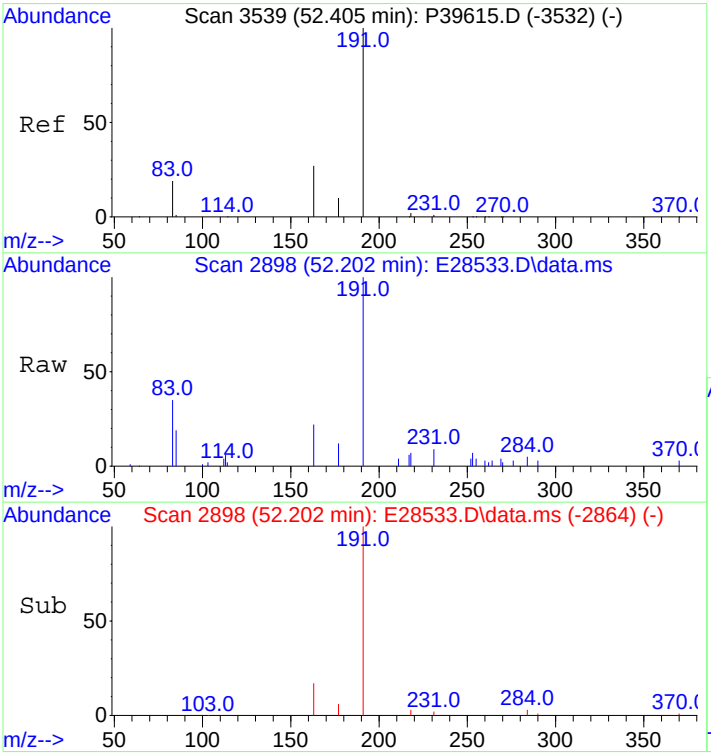


#94
Hopane (T19)
Concen: 771.26 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:191 Resp: 61269

Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#

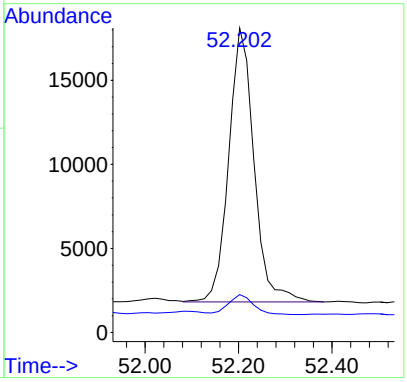


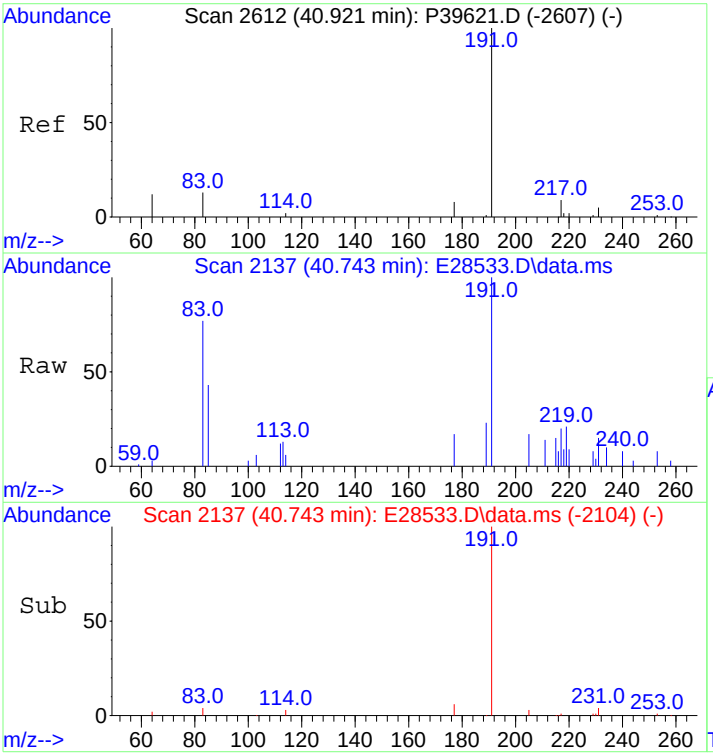


#95
17a(H),21B(H)-hopane - C30H52
Concen: 771.26 ng/mL
RT: 52.202 min Scan# 2898
Delta R.T. 0.015 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:191 Resp: 61269

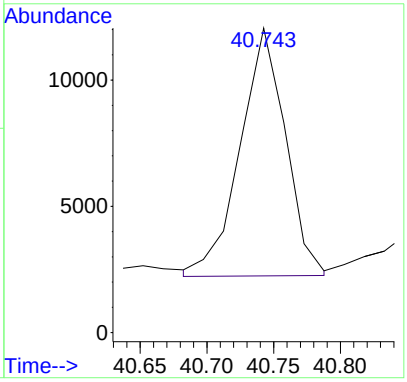
Ion	Ratio	Lower	Upper
191	100		
177	7.0	8.7	13.1#

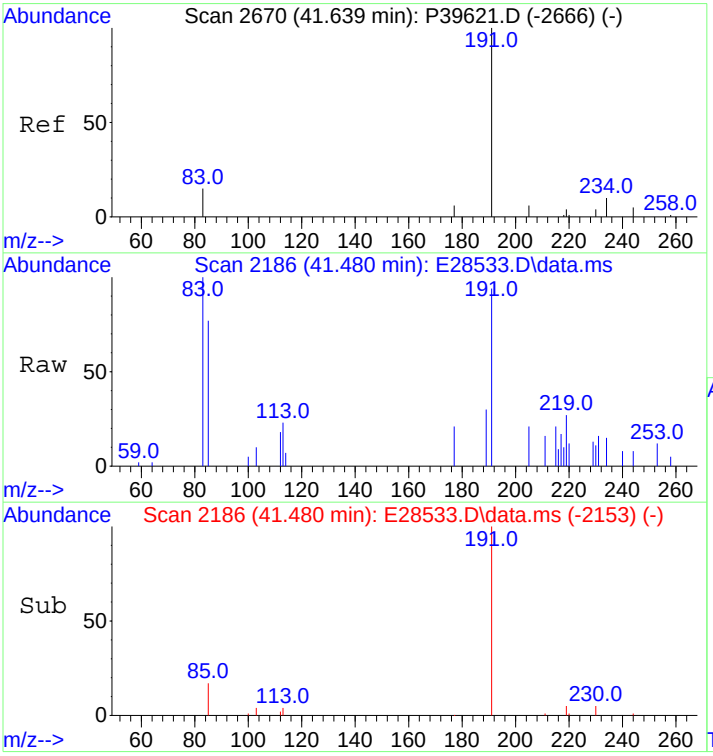




#96
C23 Tricyclic Terpane (T4)
Concen: 292.23 ng/ml
RT: 40.743 min Scan# 2137
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

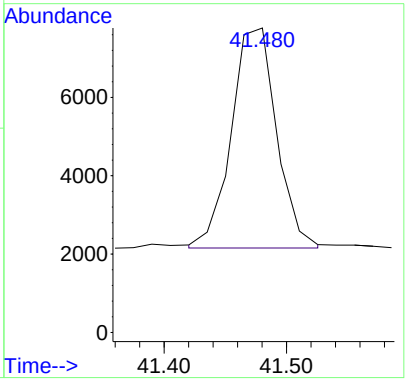
Tgt Ion:191 Resp: 23215

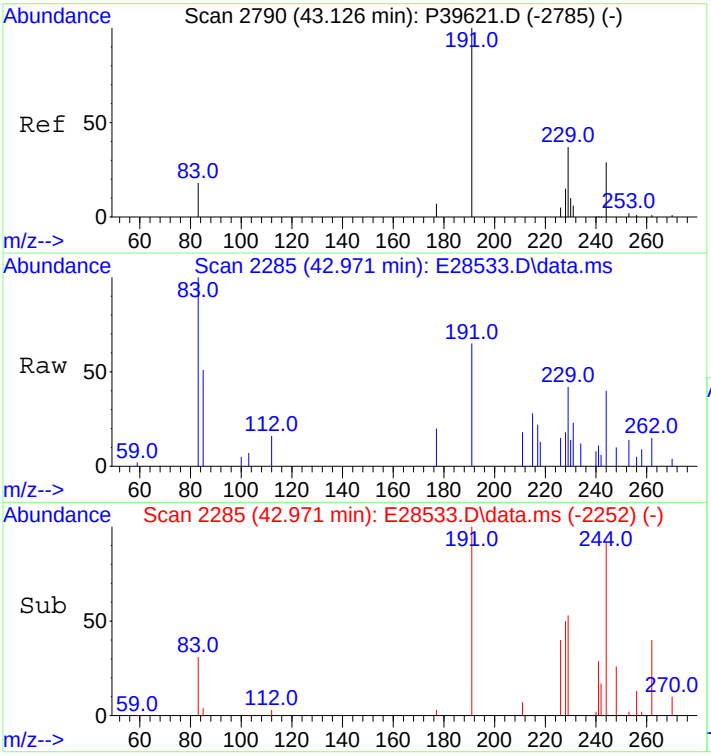




#97
C24 Tricyclic Terpane (T5)
Concen: 181.33 ng/ml m
RT: 41.480 min Scan# 2186
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

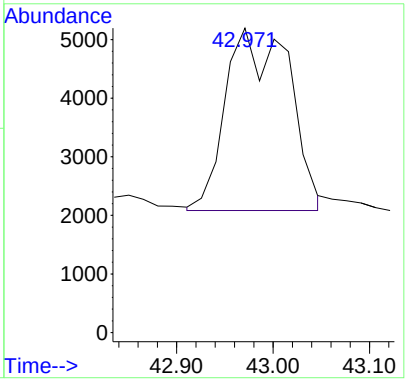
Tgt Ion:191 Resp: 14405

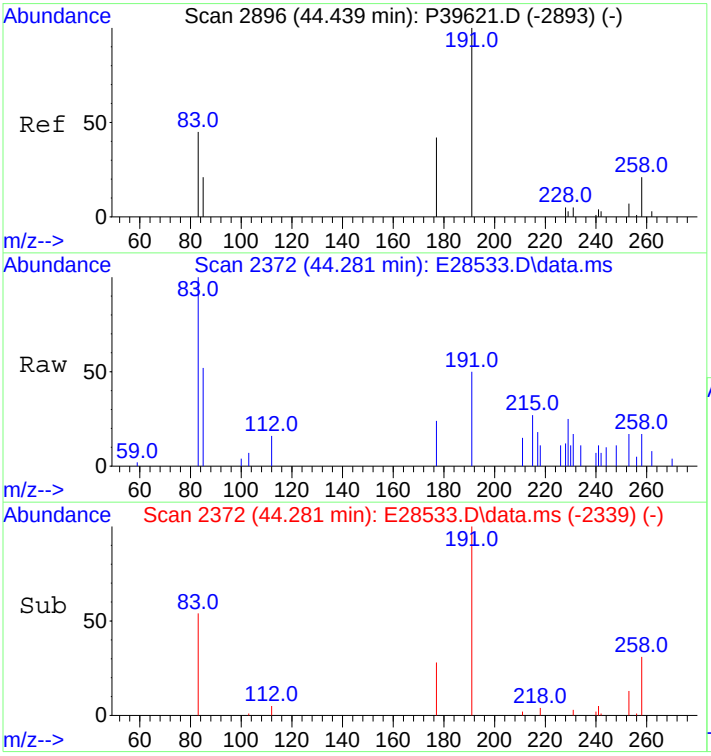




#98
C25 Tricyclic Terpane (T6)
Concen: 179.14 ng/ml m
RT: 42.971 min Scan# 2285
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

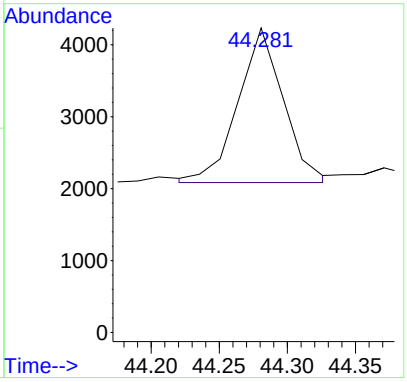
Tgt Ion:191 Resp: 14231

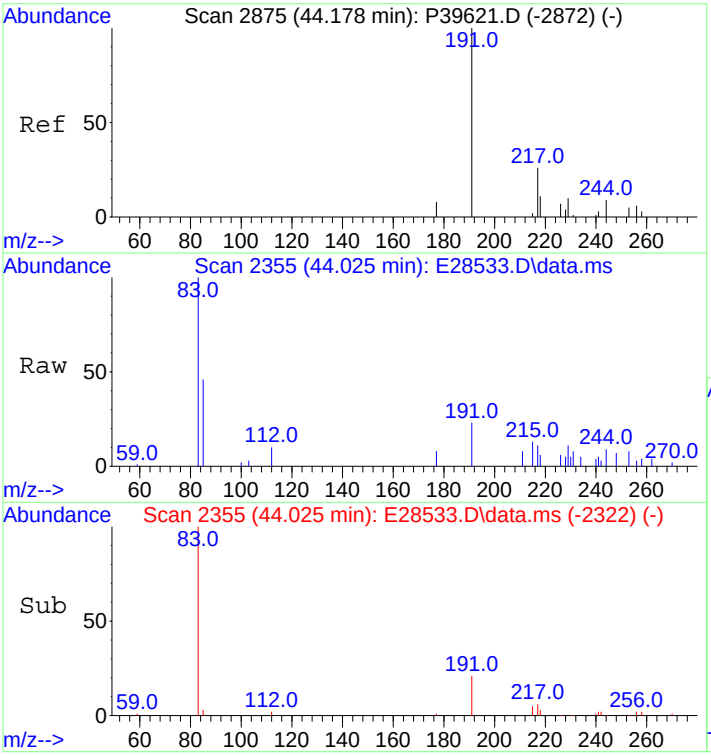




#99
C24 Tetracyclic Terpane (T6a)
Concen: 62.58 ng/ml m
RT: 44.281 min Scan# 2372
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

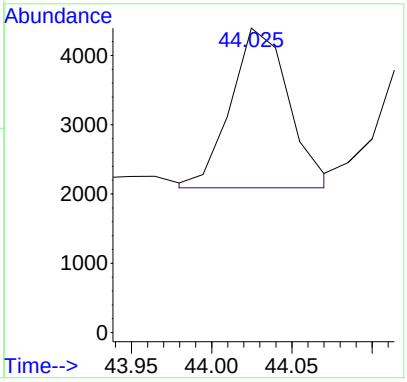
Tgt Ion:191 Resp: 4971

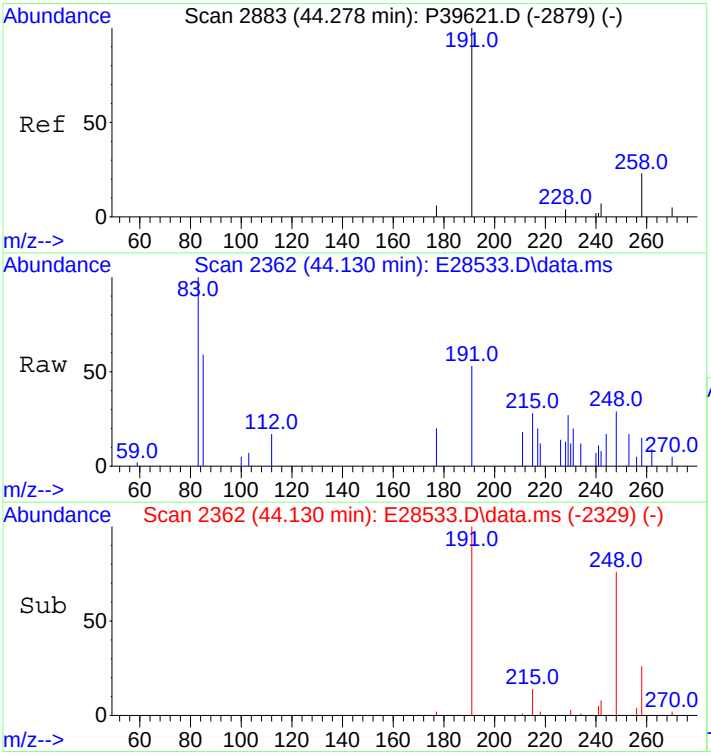




#100
C26 Tricyclic Terpane-22S (T6b)
Concen: 72.92 ng/ml m
RT: 44.025 min Scan# 2355
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

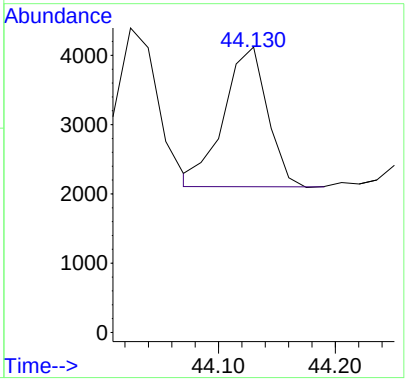
Tgt Ion:191 Resp: 5793

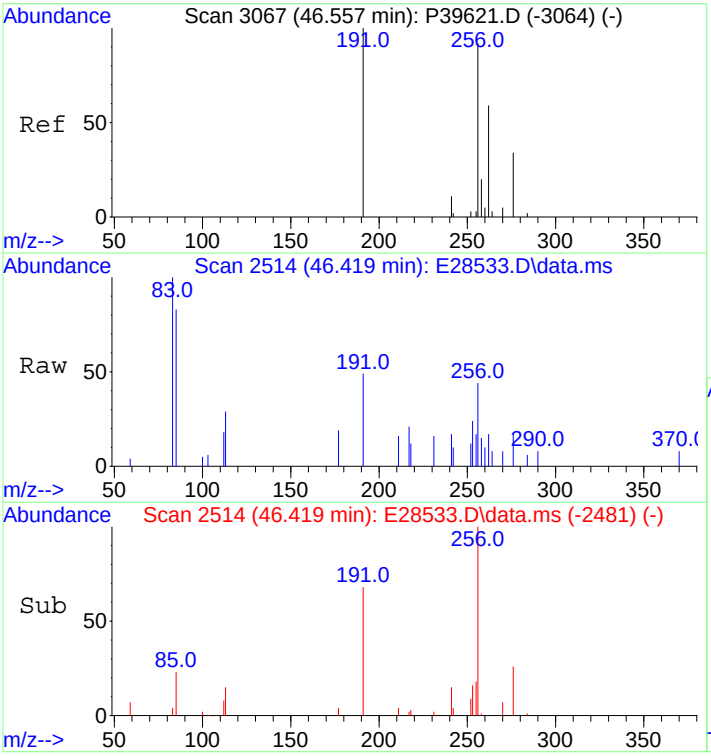




#101
C26 Tricyclic Terpane-22R (T6c)
Concen: 65.85 ng/ml
RT: 44.130 min Scan# 2362
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

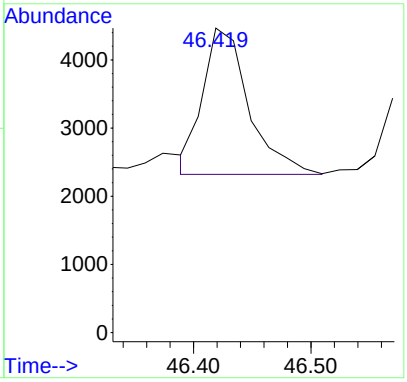
Tgt Ion:191 Resp: 5231

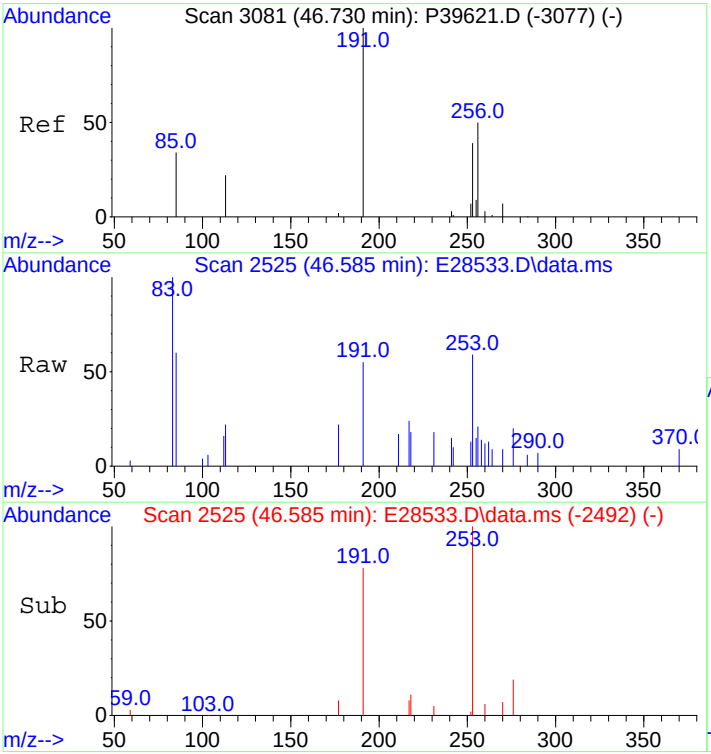




#102
C28 Tricyclic Terpane-22S (T7)
Concen: 73.65 ng/ml m
RT: 46.419 min Scan# 2514
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

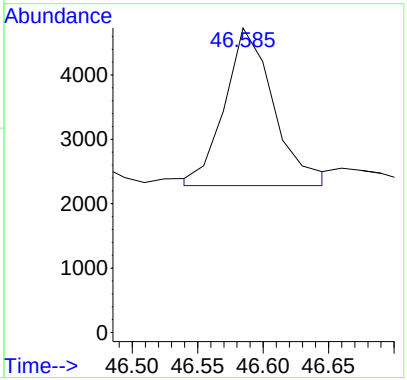
Tgt Ion:191 Resp: 5851

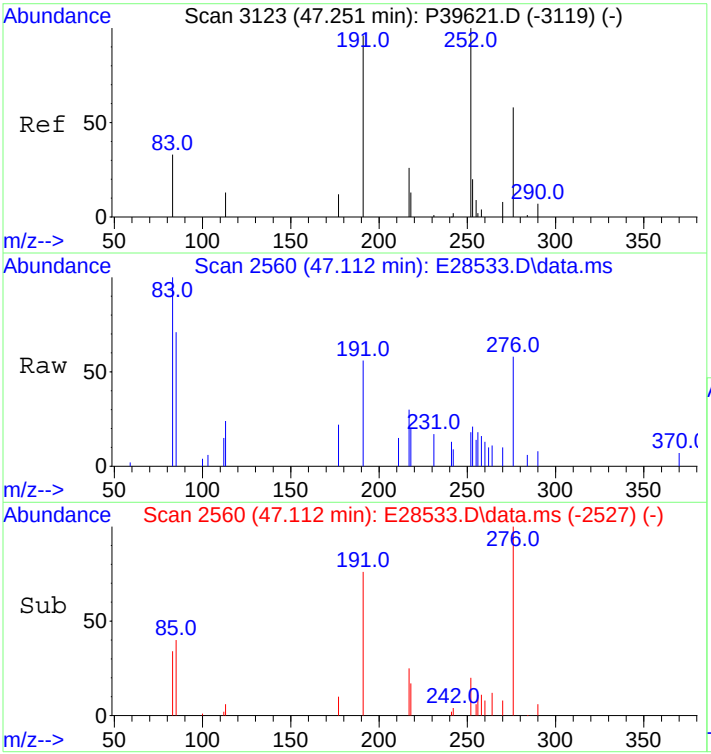




#103
C28 Tricyclic Terpane-22R (T8)
Concen: 80.39 ng/ml m
RT: 46.585 min Scan# 2525
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

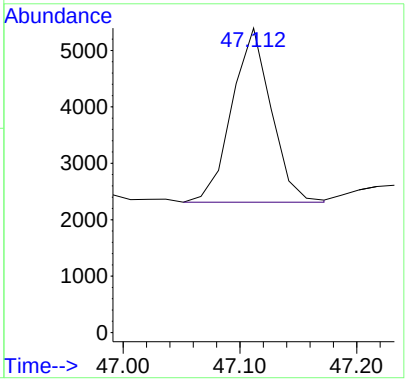
Tgt Ion:191 Resp: 6386

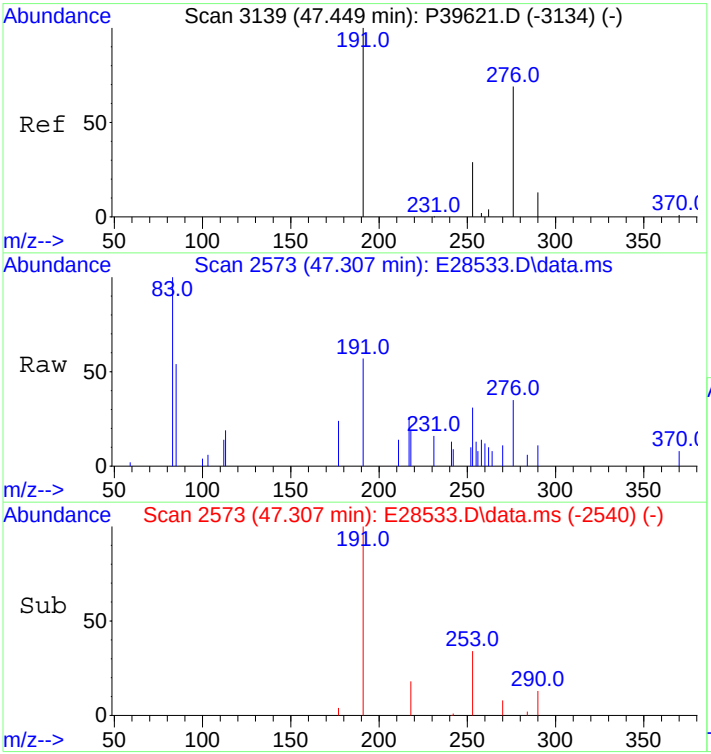




#104
C29 Tricyclic Terpane-22S (T9)
Concen: 90.94 ng/ml
RT: 47.112 min Scan# 2560
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

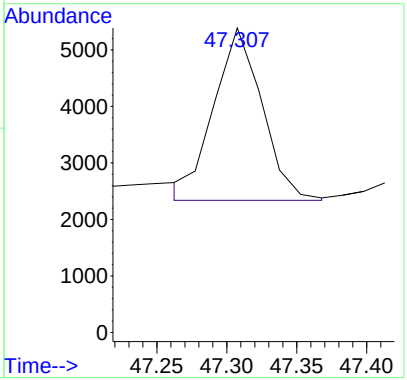
Tgt Ion:191 Resp: 7224

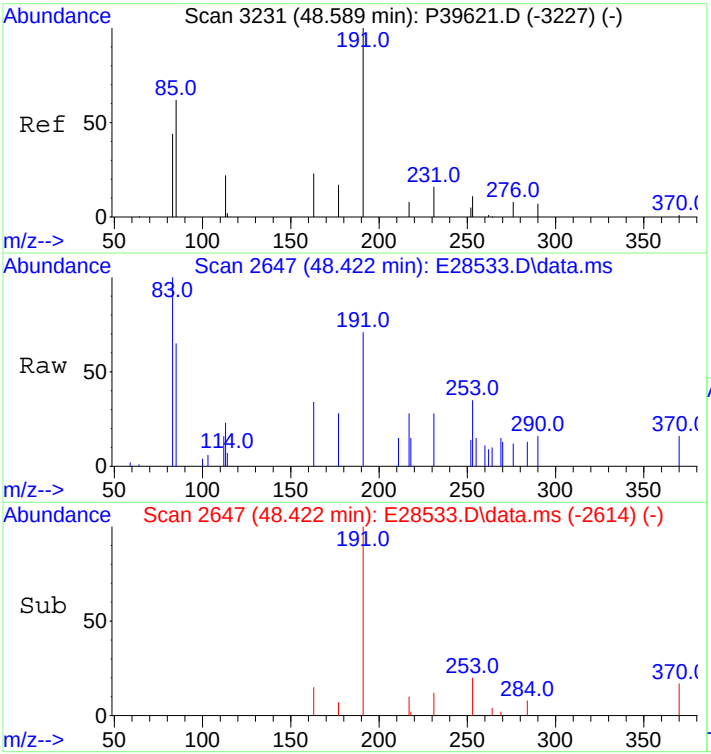




#105
C29 Tricyclic Terpane-22R (T10)
Concen: 91.69 ng/ml m
RT: 47.307 min Scan# 2573
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

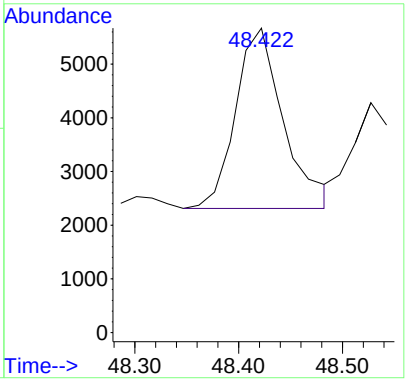
Tgt Ion:191 Resp: 7284

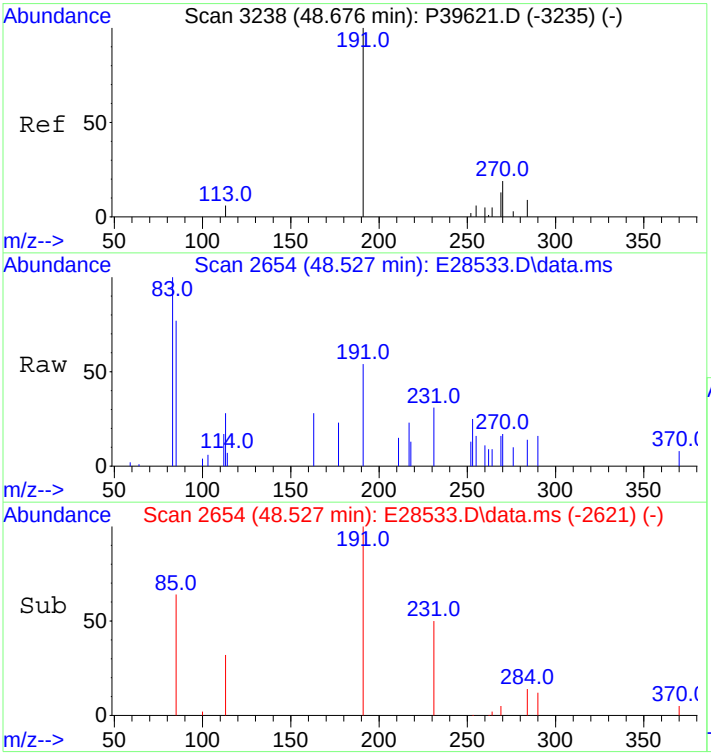




#106
18a-22,29,30-Trisnorneohopane-TS (T11)
Concen: 135.45 ng/ml
RT: 48.422 min Scan# 2647
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

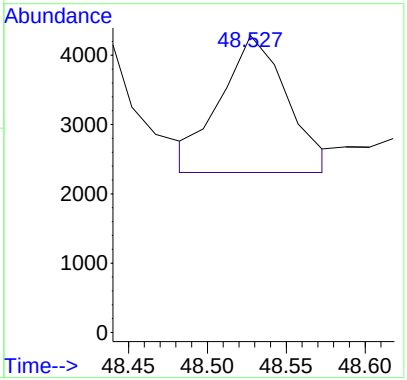
Tgt Ion:191 Resp: 10760

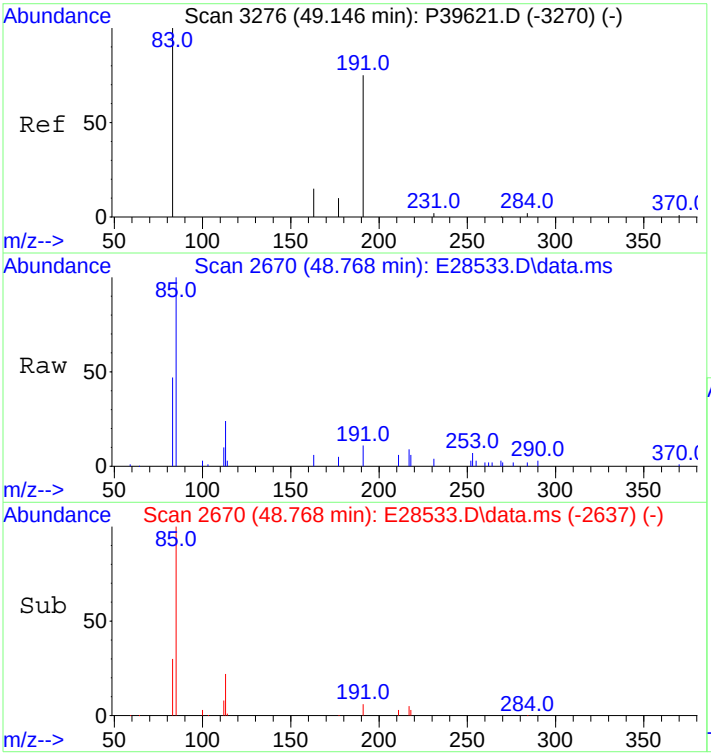




#107
C30 Tricyclic Terpane-22S
Concen: 73.06 ng/mL m
RT: 48.527 min Scan# 2654
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

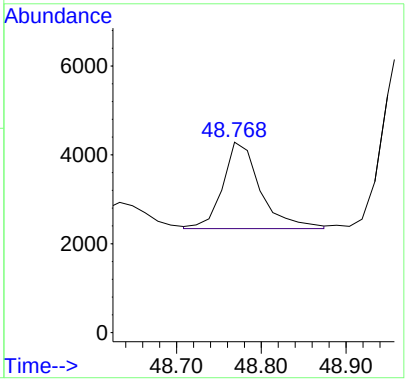
Tgt Ion:191 Resp: 5804

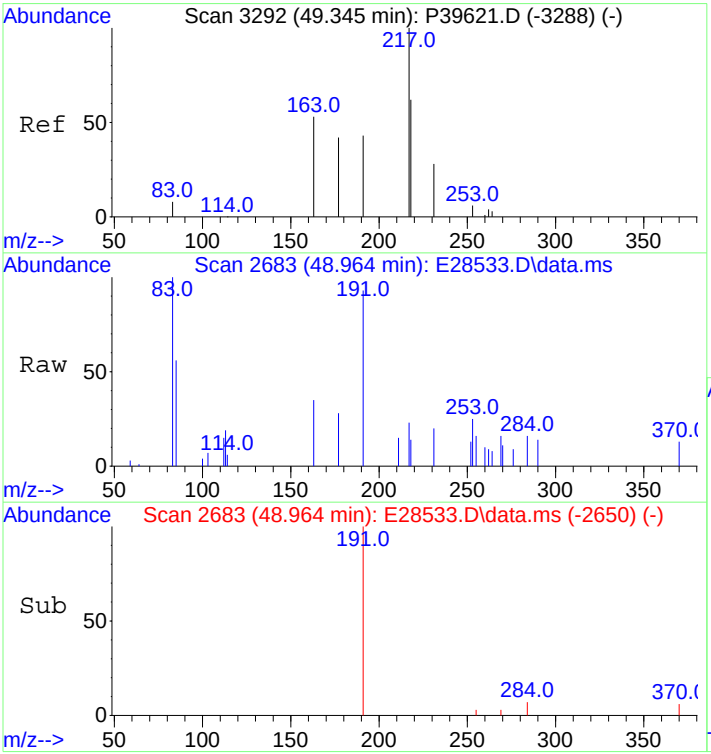




#108
C30 Tricyclic Terpane-22R
Concen: 75.43 ng/mL m
RT: 48.768 min Scan# 2670
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

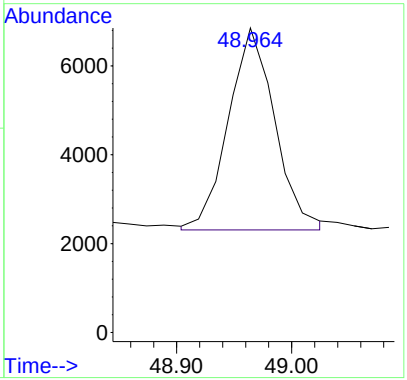
Tgt Ion:191 Resp: 5992

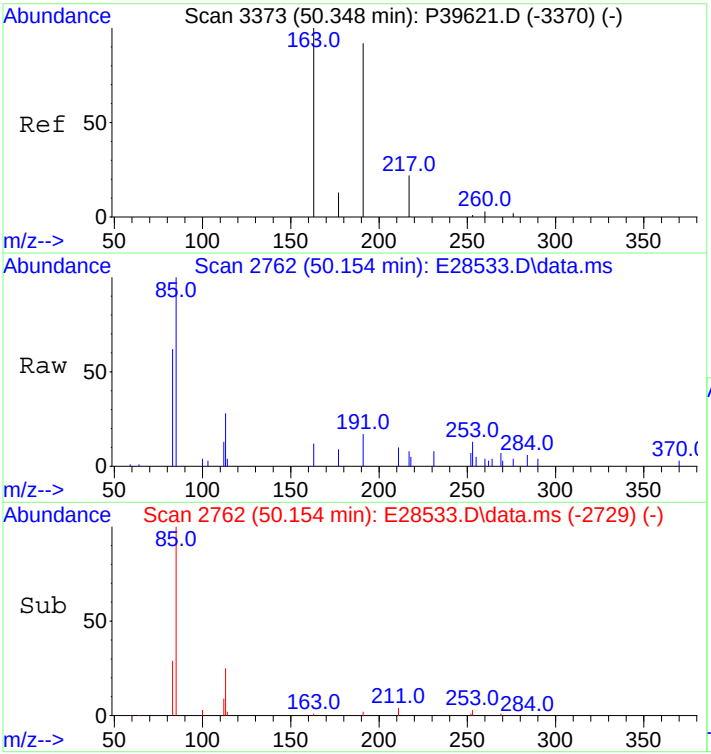




#109
17a(H)-22,29,30-Trisnorhopane-TM (T12)
Concen: 160.22 ng/ml m
RT: 48.964 min Scan# 2683
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

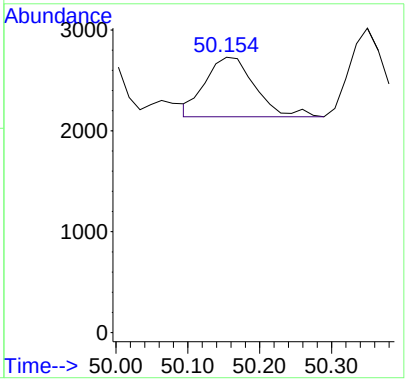
Tgt Ion:191 Resp: 12728

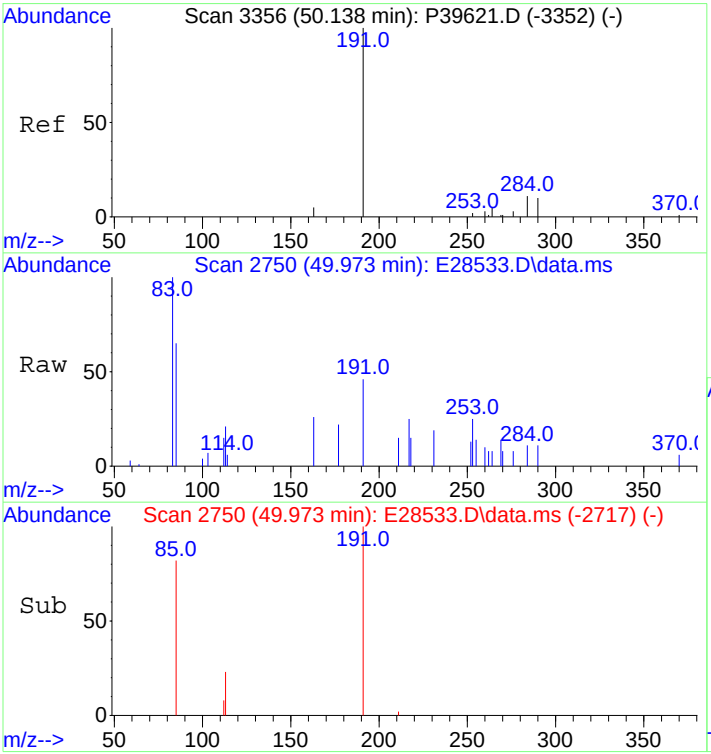




#110
17a/b,21b/a 28,30-Bisnorhopane (T14a)
Concen: 35.64 ng/ml
RT: 50.154 min Scan# 2762
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

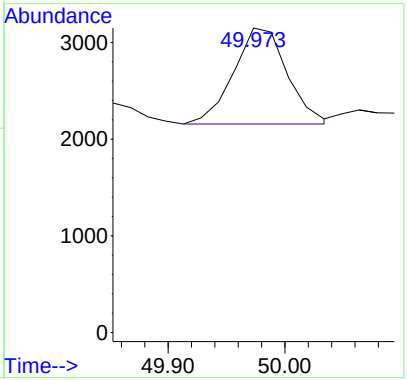
Tgt Ion:191 Resp: 2831

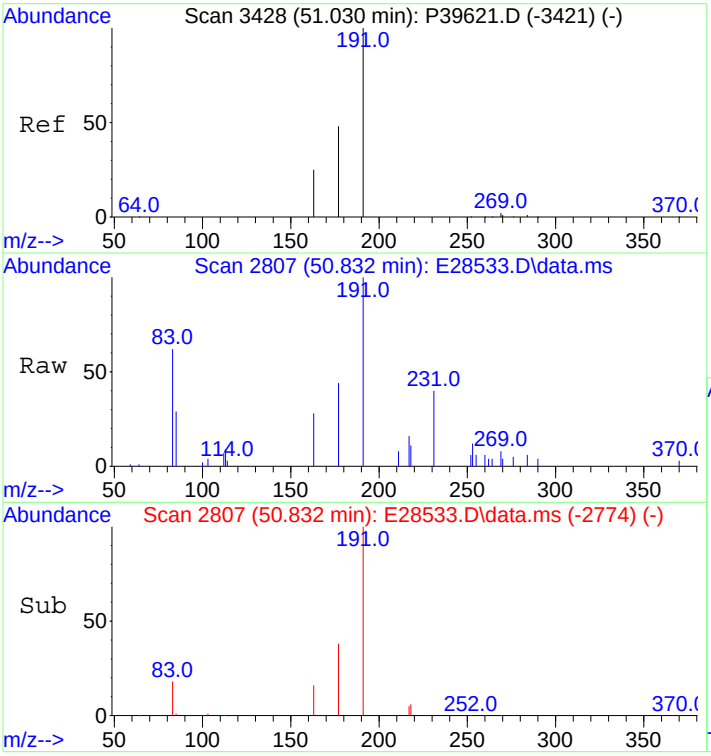




#111
17a(H),21b(H)-25-Norhopane (T14b)
Concen: 40.17 ng/ml
RT: 49.973 min Scan# 2750
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

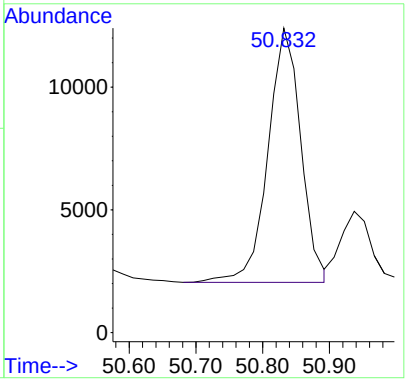
Tgt Ion:191 Resp: 3191

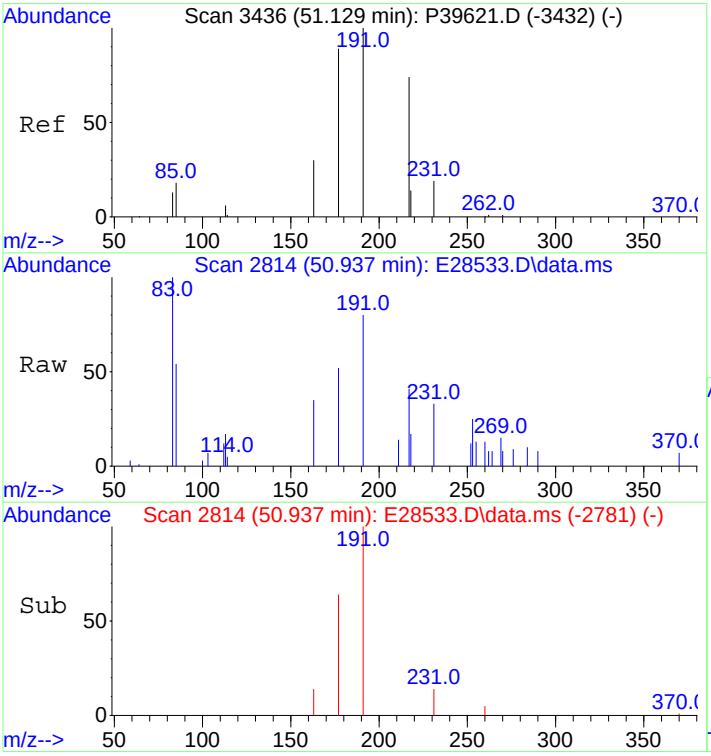




#112
30-Norhopane (T15)
Concen: 446.30 ng/ml
RT: 50.832 min Scan# 2807
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

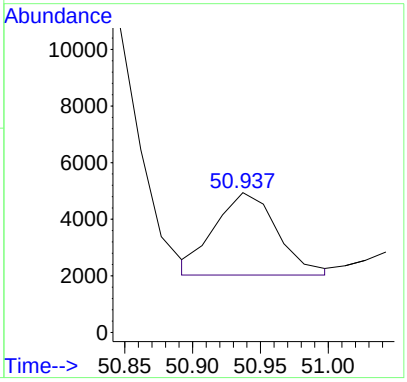
Tgt Ion:191 Resp: 35454

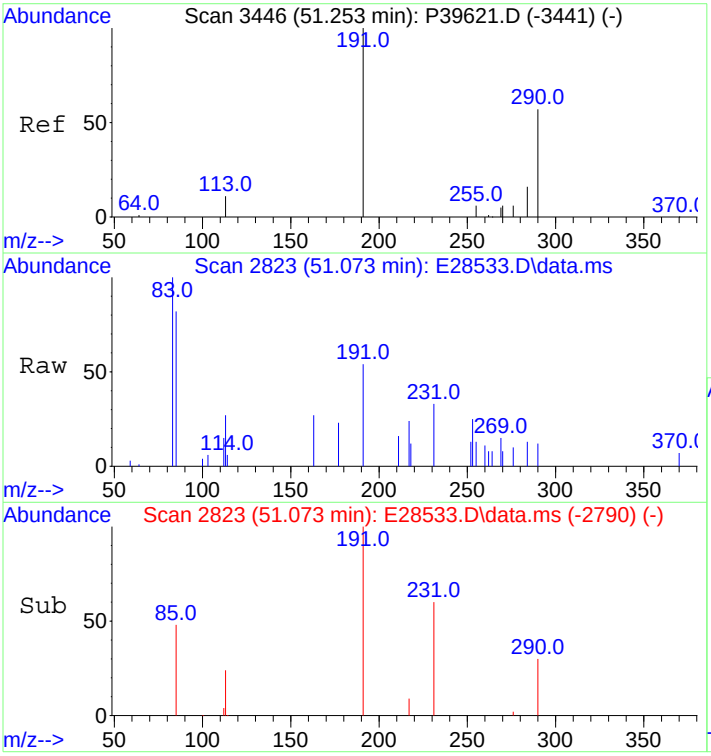




#113
18a(H)-30-Norneohopane-C29Ts (T16)
Concen: 117.23 ng/ml m
RT: 50.937 min Scan# 2814
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

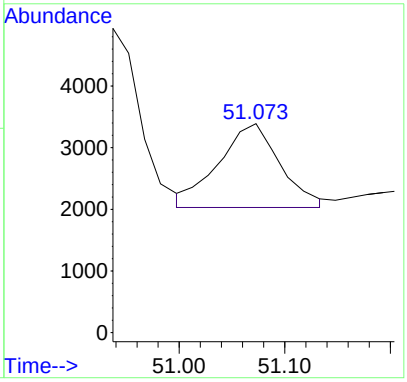
Tgt Ion:191 Resp: 9313

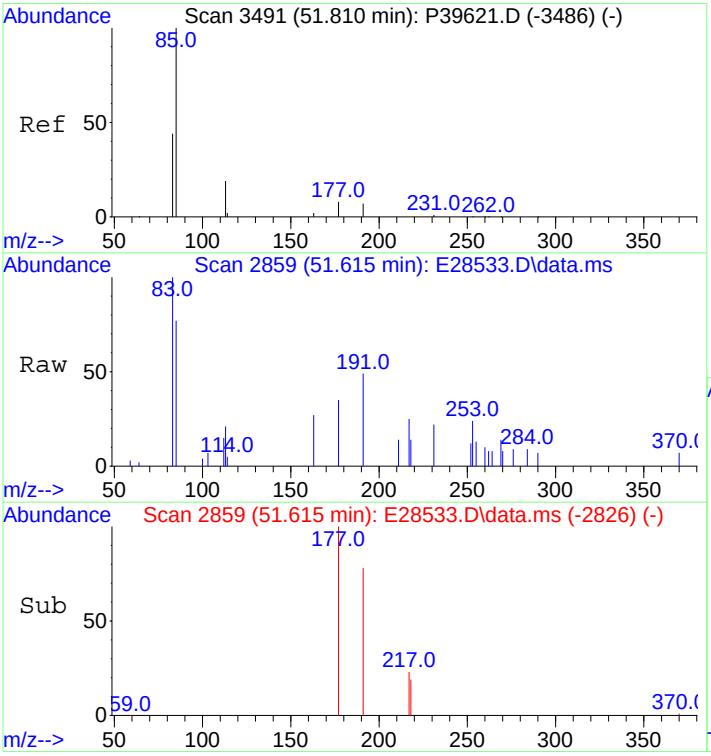




#114
17a(H)-Diahopane (X)
Concen: 69.33 ng/ml m
RT: 51.073 min Scan# 2823
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

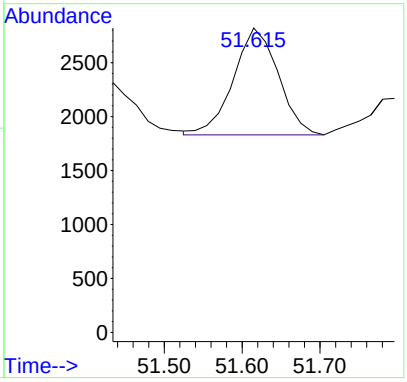
Tgt Ion:191 Resp: 5508

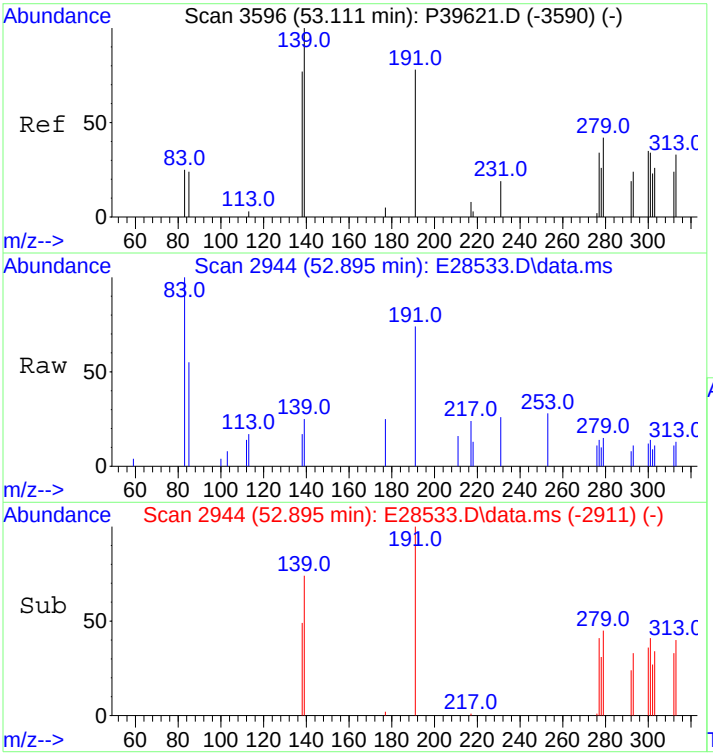




#115
30-Normoretane (T17)
Concen: 49.97 ng/ml
RT: 51.615 min Scan# 2859
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

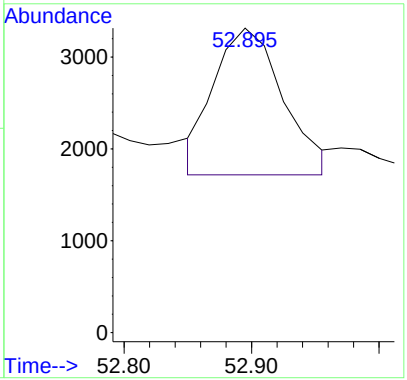
Tgt Ion:191 Resp: 3970

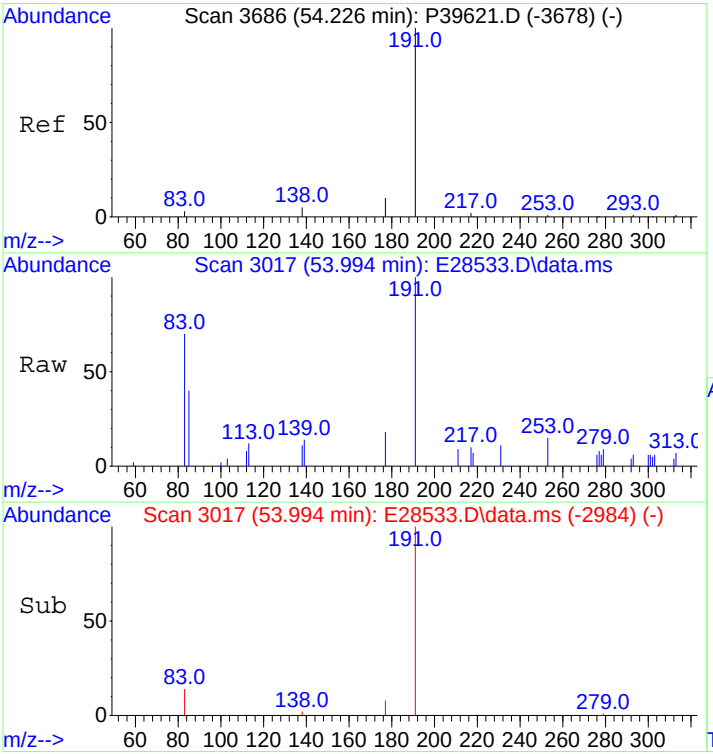




#117
Moretane (T20)
Concen: 75.78 ng/ml m
RT: 52.895 min Scan# 2944
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

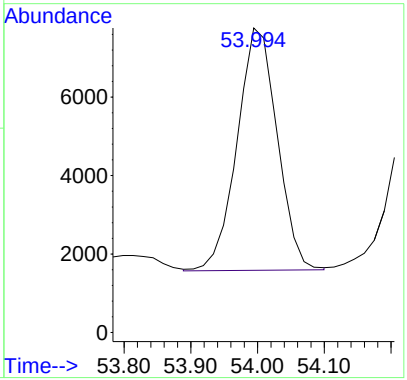
Tgt Ion:191 Resp: 6020

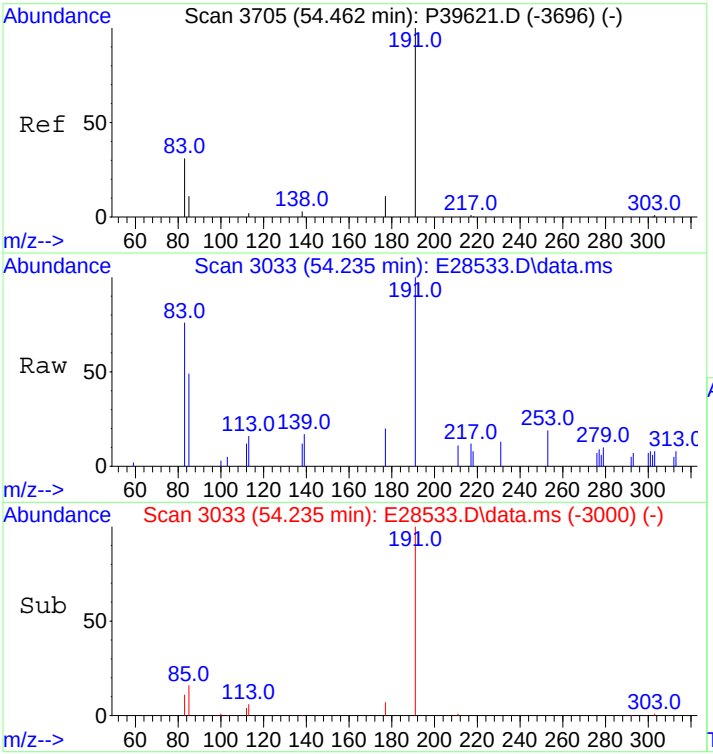




#118
30-Homohopane-22S (T21)
Concen: 325.22 ng/ml
RT: 53.994 min Scan# 3017
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

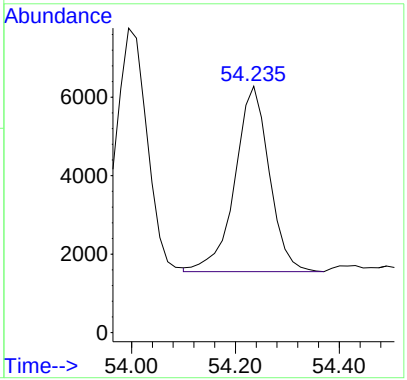
Tgt Ion:191 Resp: 25836

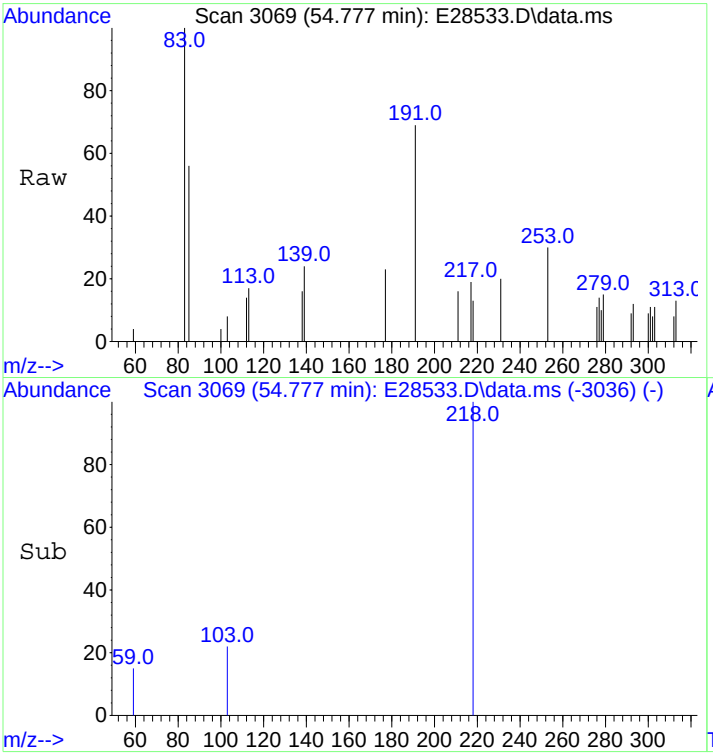




#119
30-Homohopane-22R (T22)
Concen: 274.43 ng/ml
RT: 54.235 min Scan# 3033
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

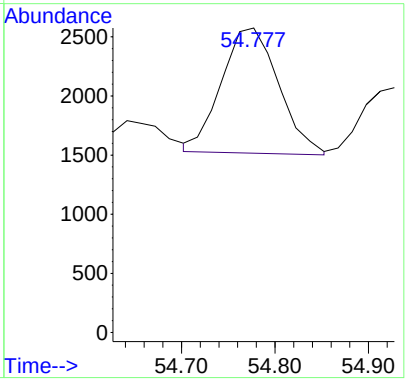
Tgt Ion:191 Resp: 21801

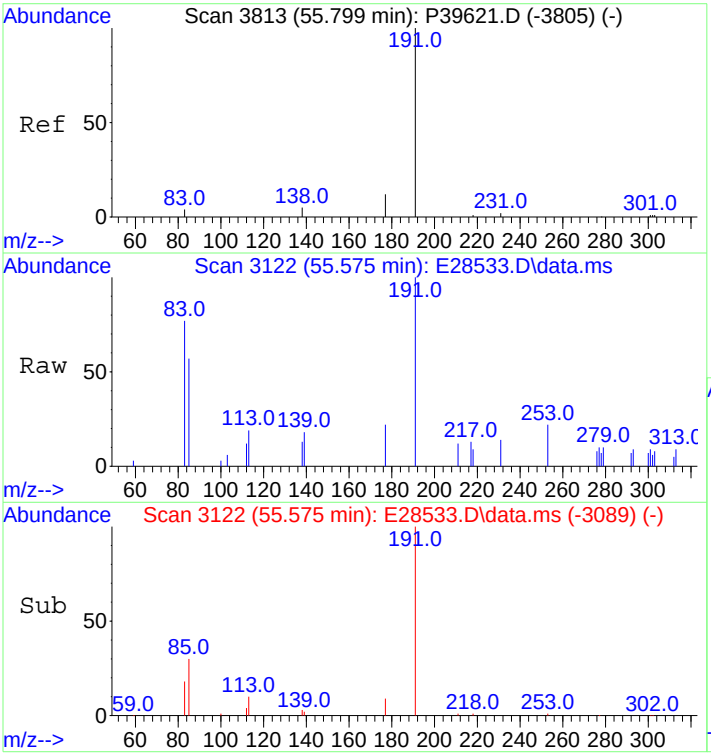




#120
Gammacerane/C32-diahopane
Concen: 56.63 ng/mL
RT: 54.777 min Scan# 3069
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

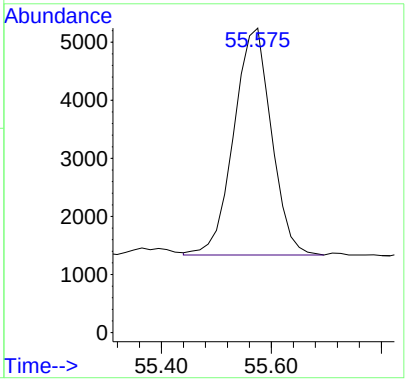
Tgt Ion:191 Resp: 4499

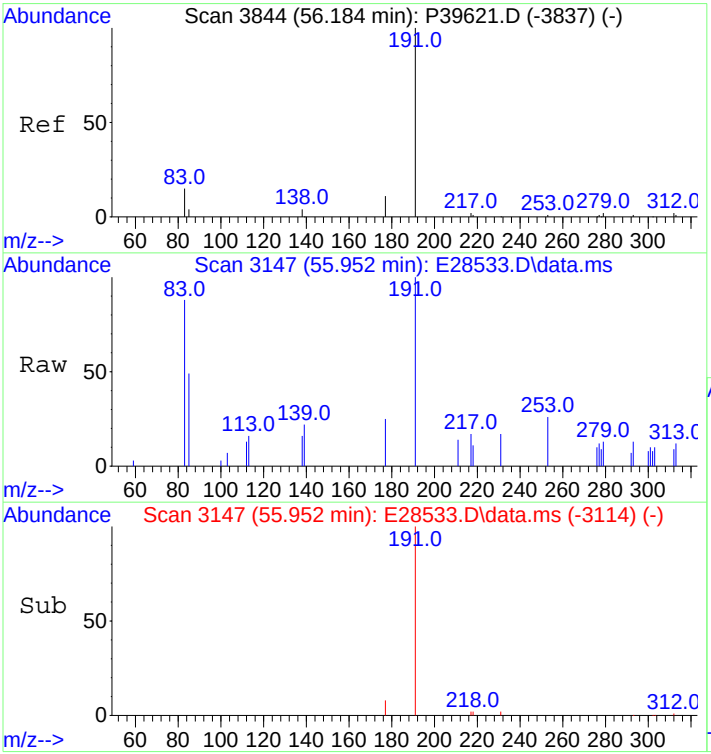




#121
30,31-Bishomohopane-22S (T26)
Concen: 233.87 ng/ml
RT: 55.575 min Scan# 3122
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

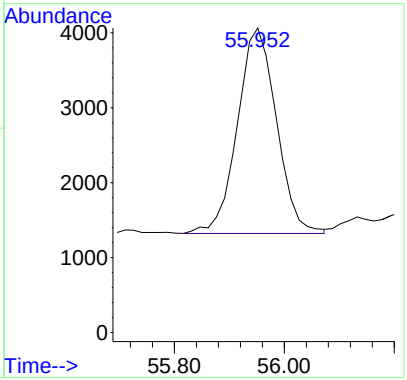
Tgt Ion:191 Resp: 18579

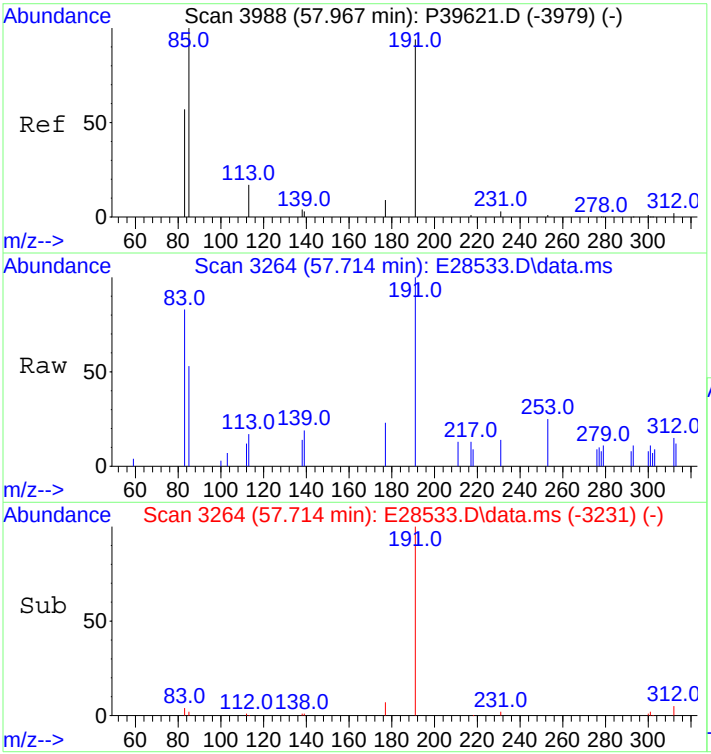




#122
30,31-Bishomohopane-22R (T27)
Concen: 170.10 ng/ml
RT: 55.952 min Scan# 3147
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

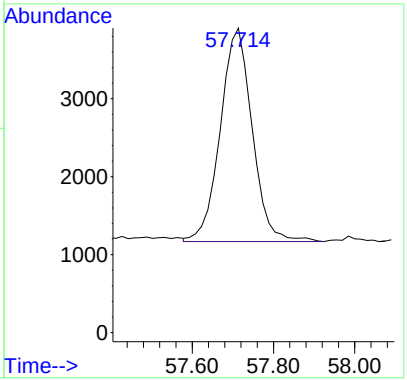
Tgt Ion:191 Resp: 13513

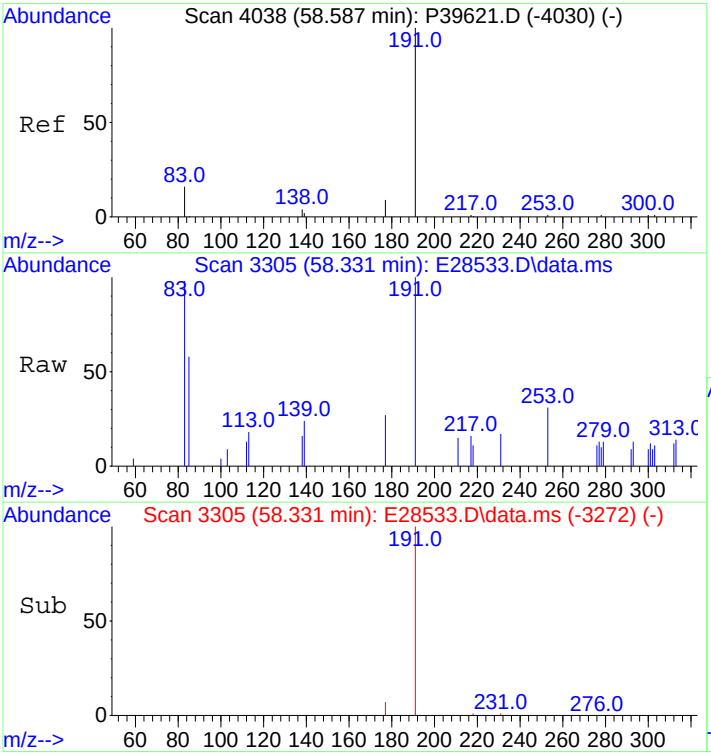




#123
30,31-Trishomohopane-22S (T30)
Concen: 187.64 ng/ml
RT: 57.714 min Scan# 3264
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

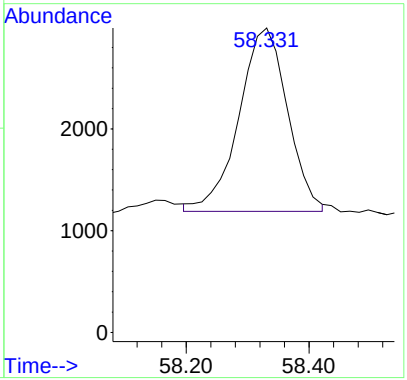
Tgt Ion:191 Resp: 14906

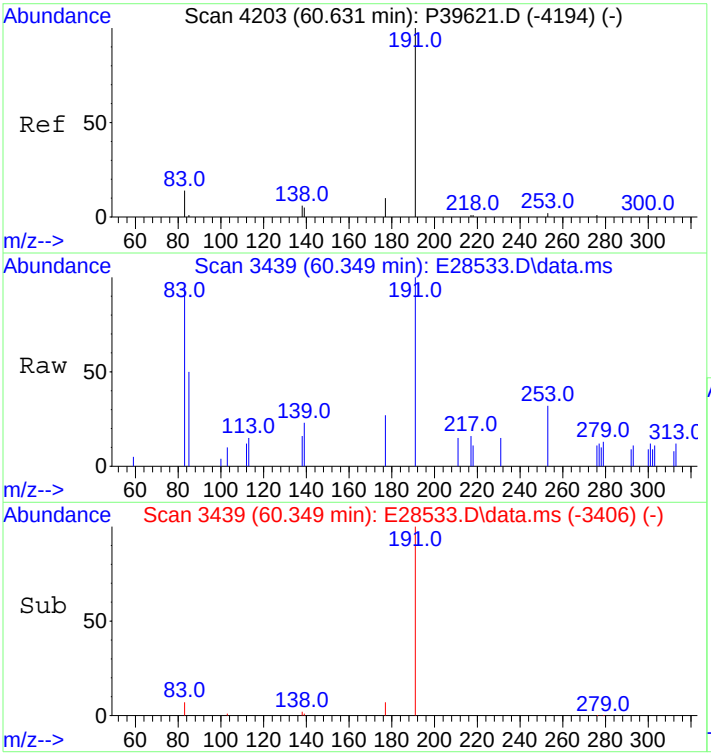




#124
30,31-Trishomohopane-22R (T31)
Concen: 124.57 ng/ml m
RT: 58.331 min Scan# 3305
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

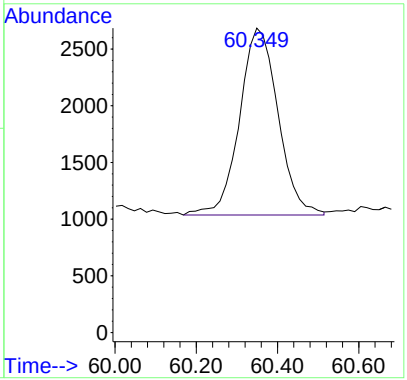
Tgt Ion:191 Resp: 9896

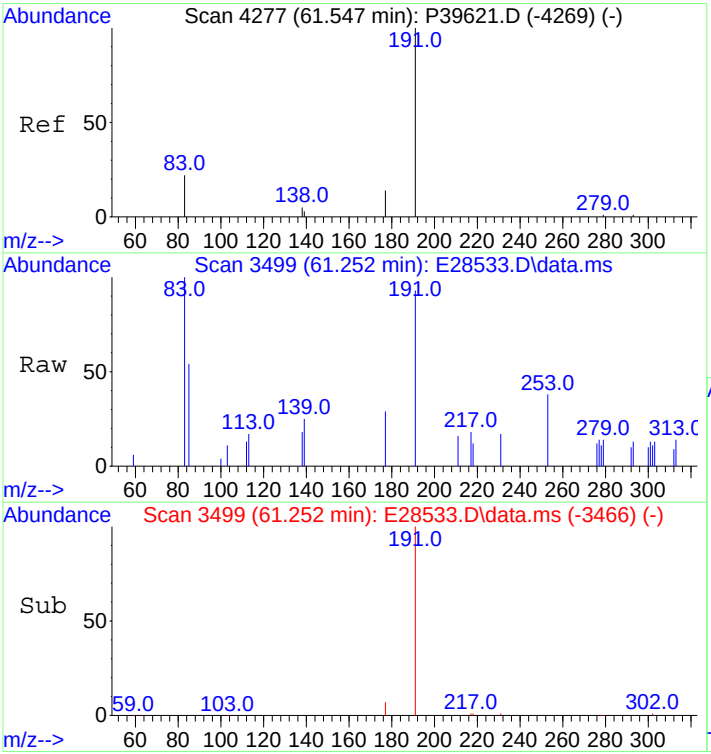




#125
Tetrakishomohopane-22S (T32)
Concen: 136.67 ng/ml
RT: 60.349 min Scan# 3439
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

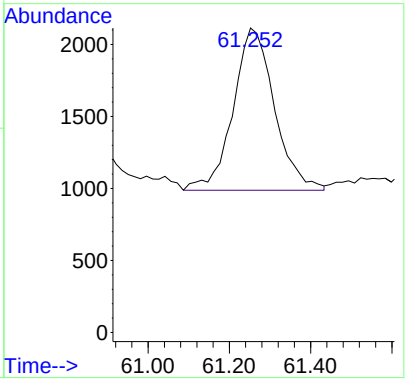
Tgt Ion:191 Resp: 10857

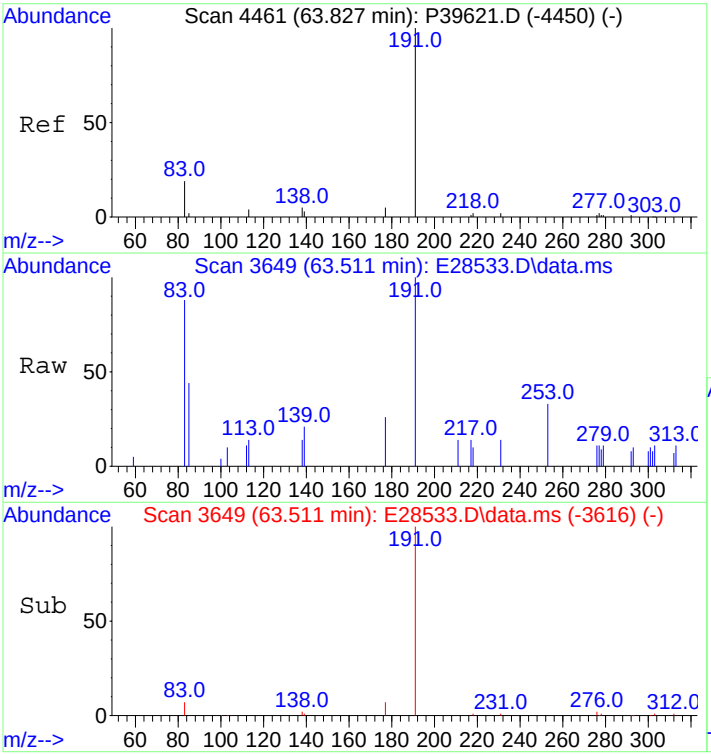




#126
Tetrakishomohopane-22R (T33)
Concen: 100.16 ng/ml
RT: 61.252 min Scan# 3499
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

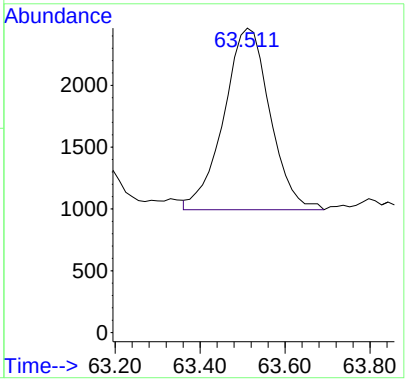
Tgt Ion:191 Resp: 7957

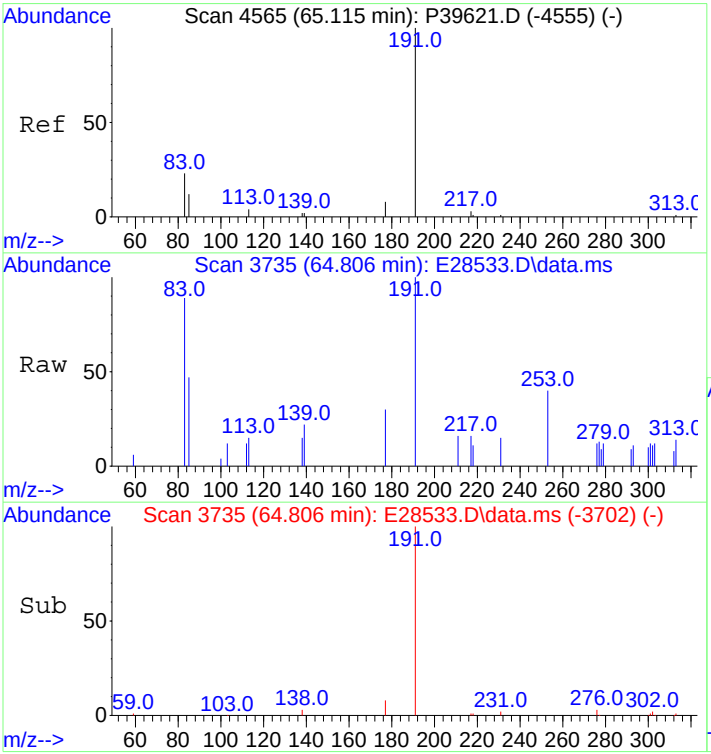




#127
Pentakishomohopane-22S (T34)
Concen: 139.85 ng/ml
RT: 63.511 min Scan# 3649
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

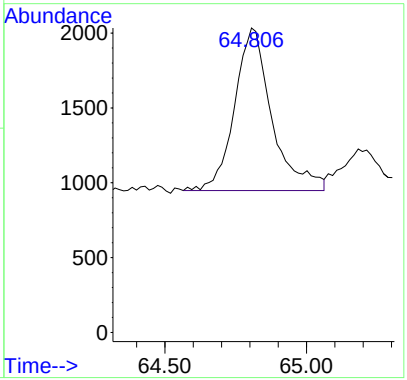
Tgt Ion:191 Resp: 11110

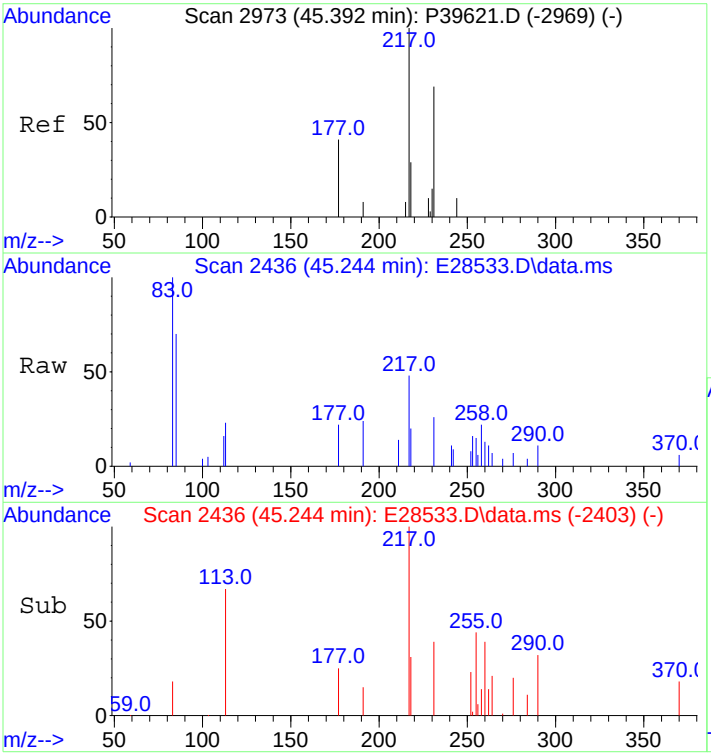




#128
Pentakishomohopane-22R (T35)
Concen: 125.44 ng/ml
RT: 64.806 min Scan# 3735
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

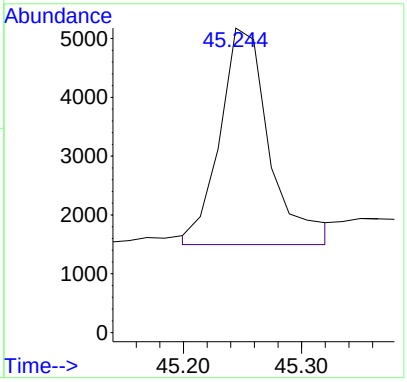
Tgt Ion:191 Resp: 9965

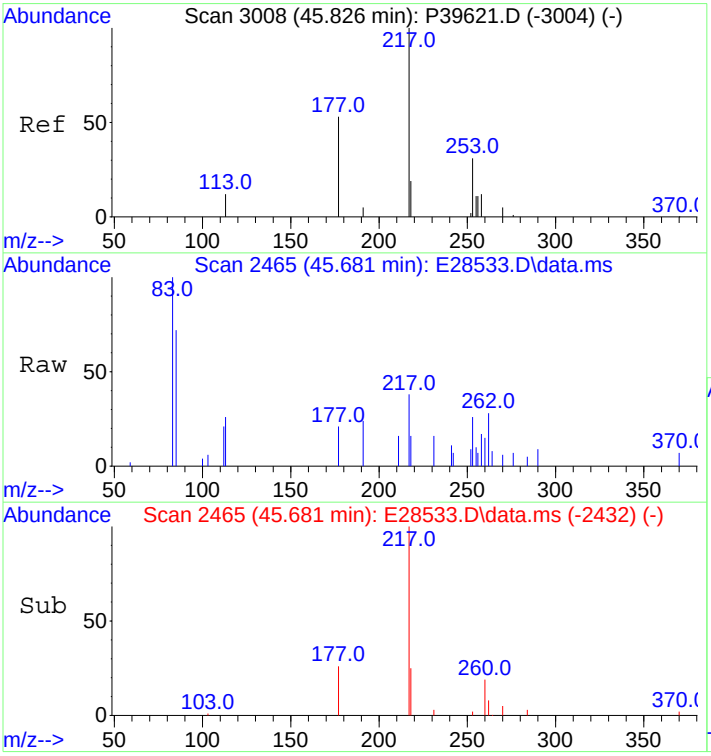




#130
13b(H),17a(H)-20S-Diacholestane (S4)
Concen: 257.27 ng/ml m
RT: 45.244 min Scan# 2436
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

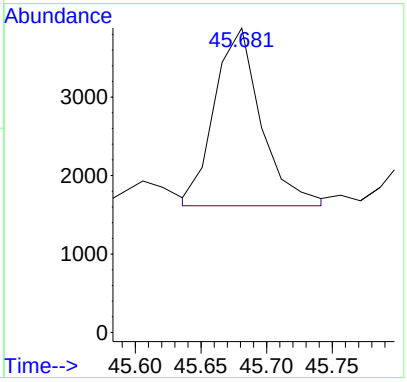
Tgt Ion:217 Resp: 10733

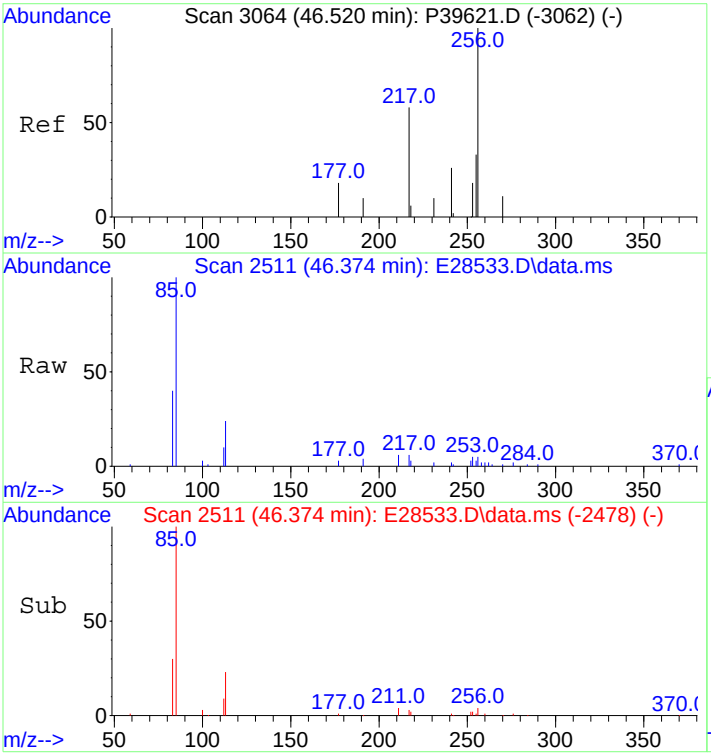




#131
13b(H),17a(H)-20R-Diacholestane (S5)
Concen: 133.97 ng/ml m
RT: 45.681 min Scan# 2465
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

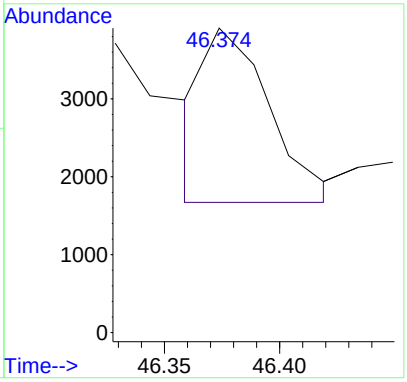
Tgt Ion:217 Resp: 5589

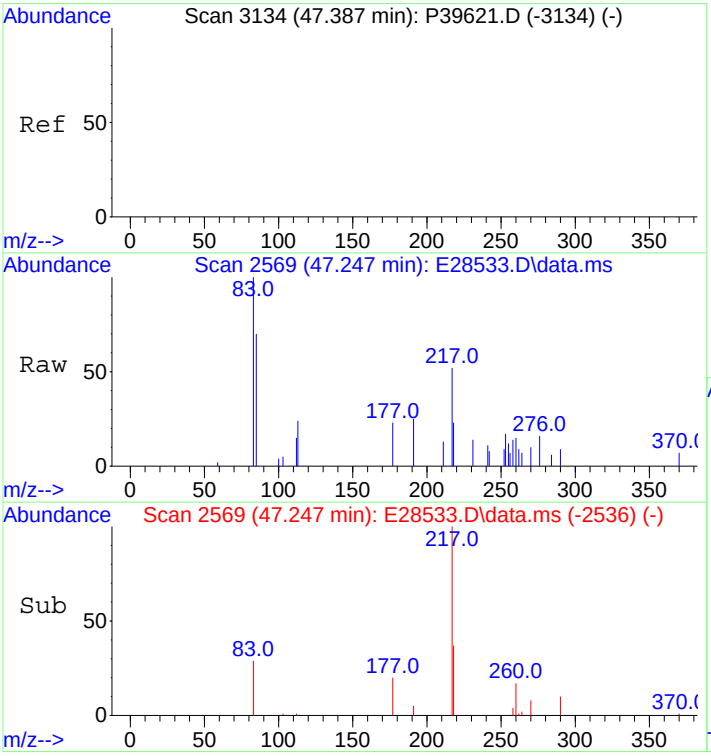




#132
13b,17a-20S-Methyldiacholestane (S8)
Concen: 105.44 ng/ml m
RT: 46.374 min Scan# 2511
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

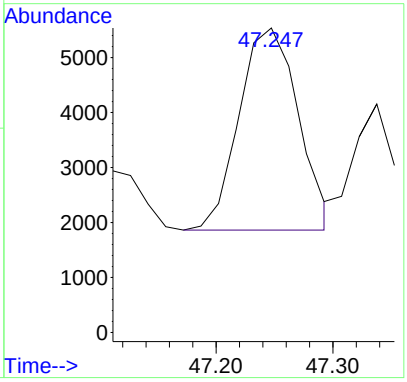
Tgt Ion:217 Resp: 4399

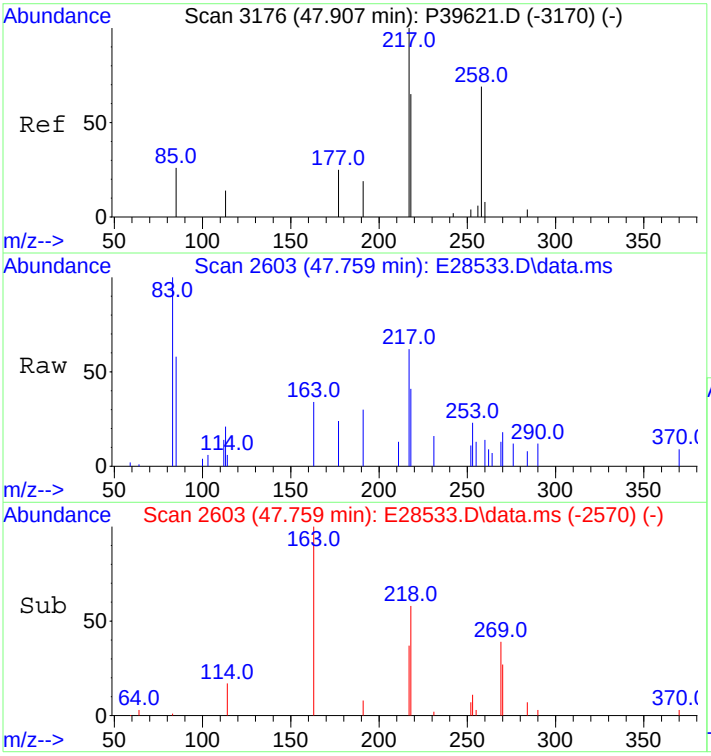




#133
14a,17a-20S-Chol/13b,17a-20S-Ethyldiach
Concen: 310.80 ng/ml
RT: 47.247 min Scan# 2569
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

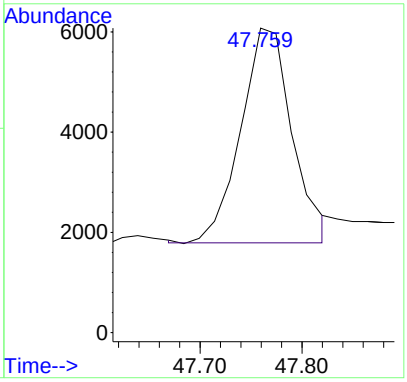
Tgt Ion:217 Resp: 12966

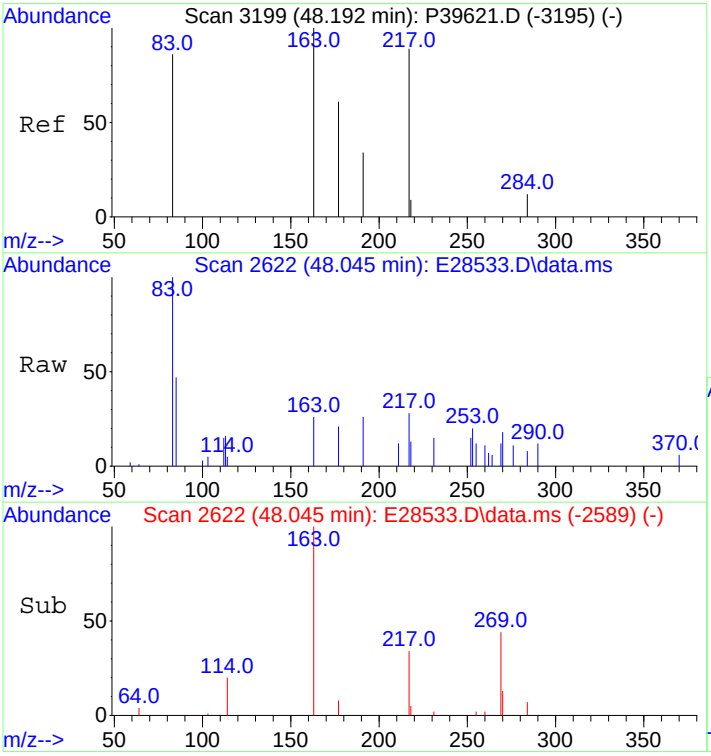




#134
14a,17a-20R-Chol/13b,17a-20R-Ethyldiach
Concen: 359.91 ng/ml m
RT: 47.759 min Scan# 2603
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

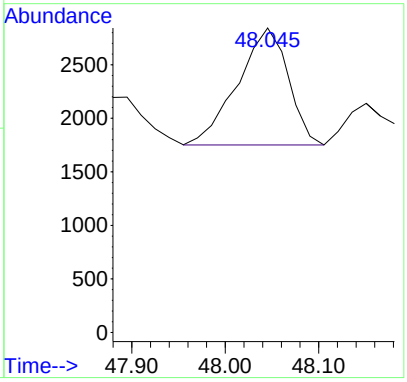
Tgt Ion:217 Resp: 15015

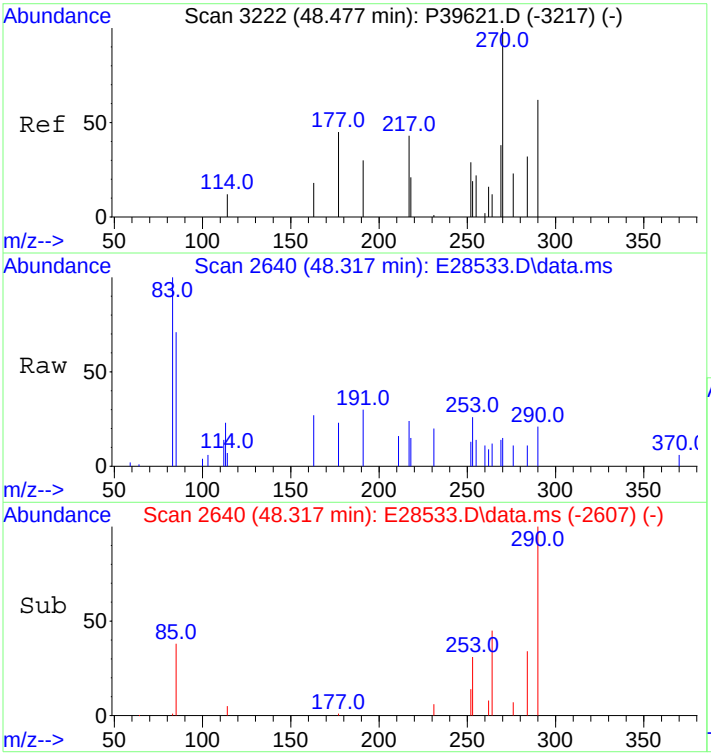




#135
Unknown Sterane (S18)
Concen: 98.85 ng/ml
RT: 48.045 min Scan# 2622
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

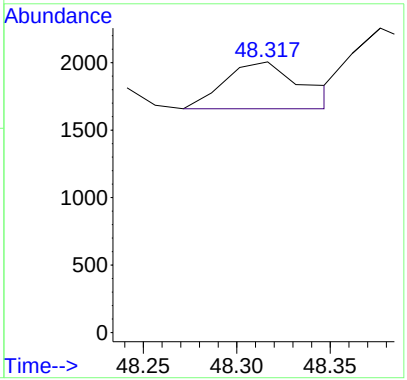
Tgt Ion:217 Resp: 4124

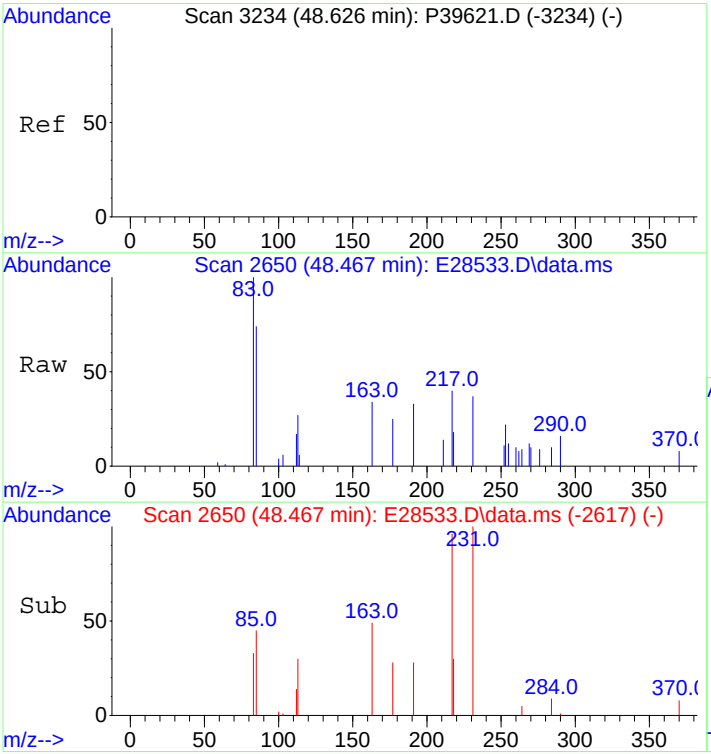




#136
13a,17b-20S-Ethyldiacholestane (S19)
Concen: 24.23 ng/ml
RT: 48.317 min Scan# 2640
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

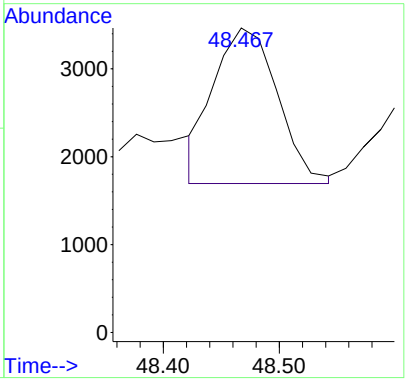
Tgt Ion:217 Resp: 1011

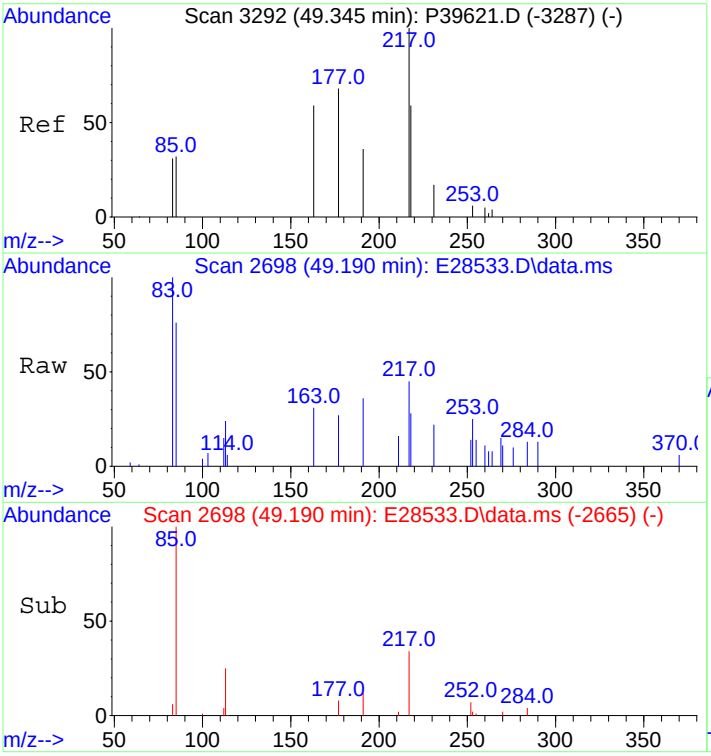




#137
14a,17a-20S-Methylcholestane (S20)
Concen: 162.18 ng/ml m
RT: 48.467 min Scan# 2650
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

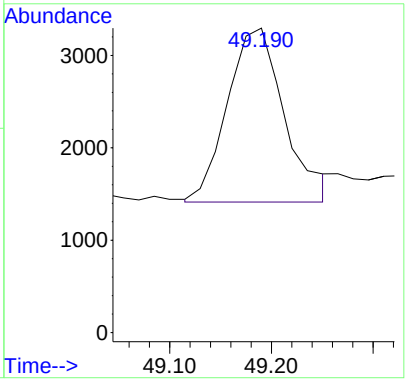
Tgt Ion:217 Resp: 6766

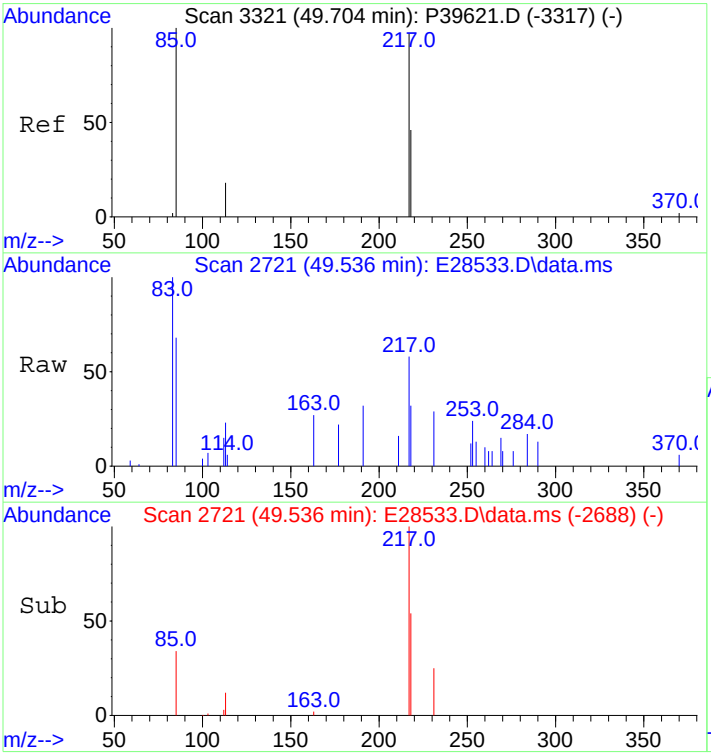




#138
14a,17a-20R-Methylcholestane (S24)
Concen: 175.80 ng/ml m
RT: 49.190 min Scan# 2698
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

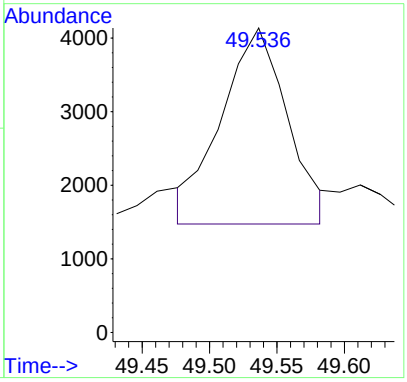
Tgt Ion:217 Resp: 7334

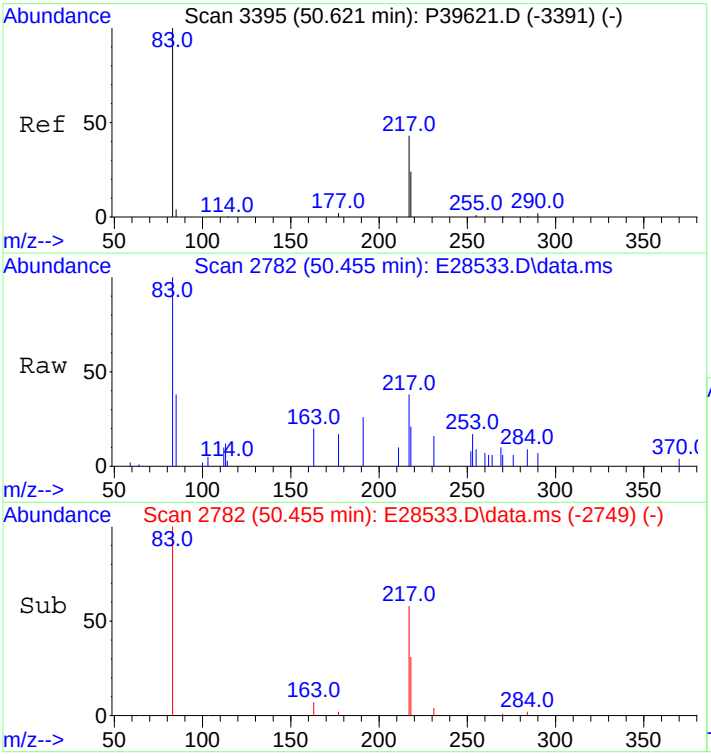




#139
14a(H),17a(H)-20S-Ethylcholestane (S25)
Concen: 218.20 ng/ml m
RT: 49.536 min Scan# 2721
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

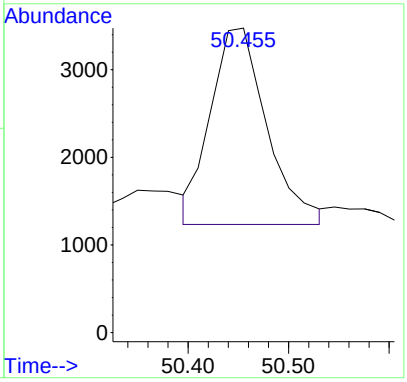
Tgt Ion:217 Resp: 9103

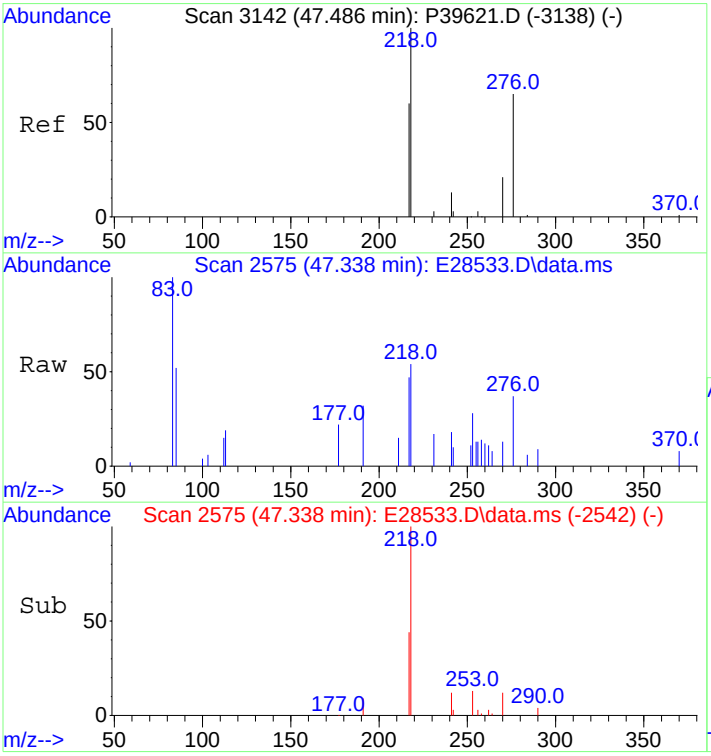




#140
14a(H),17a(H)-20R-Ethylcholestane (S28)
Concen: 209.35 ng/ml m
RT: 50.455 min Scan# 2782
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

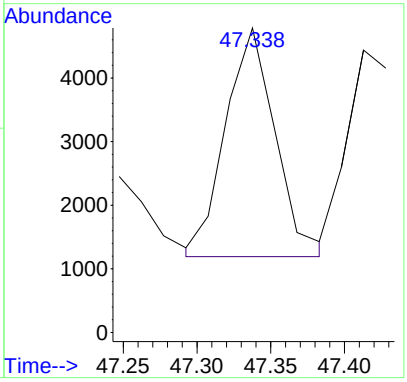
Tgt Ion:217 Resp: 8734

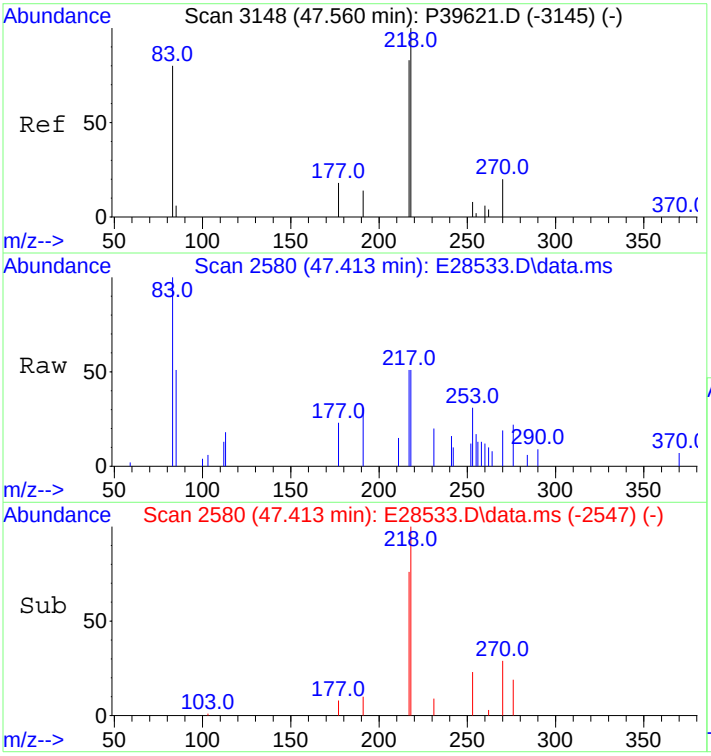




#141
14b(H),17b(H)-20R-Cholestane (S14)
Concen: 202.14 ng/ml m
RT: 47.338 min Scan# 2575
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

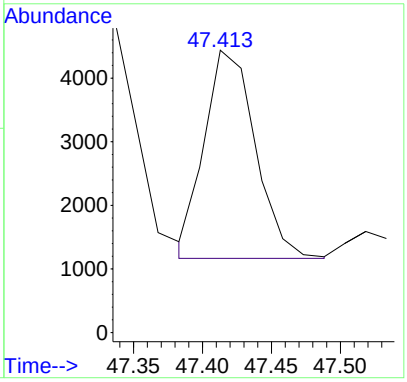
Tgt Ion:218 Resp: 8433

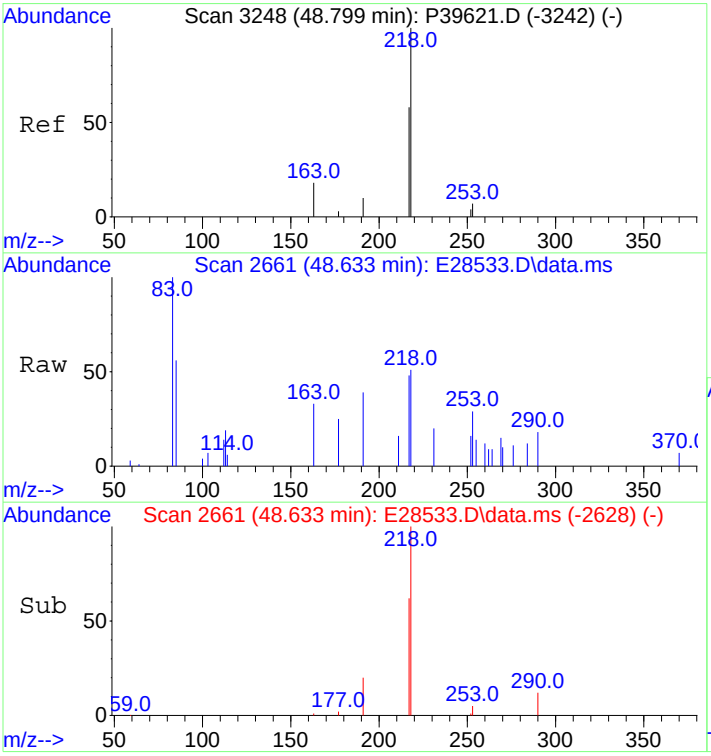




#142
14b(H),17b(H)-20S-Cholestane (S15)
Concen: 201.64 ng/ml m
RT: 47.413 min Scan# 2580
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

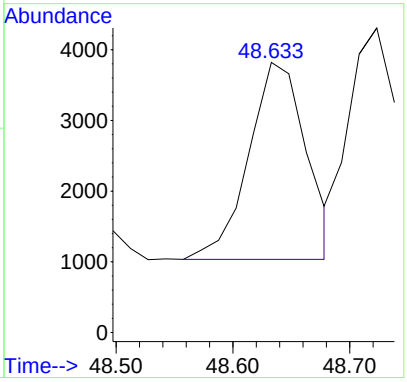
Tgt Ion:218 Resp: 8412

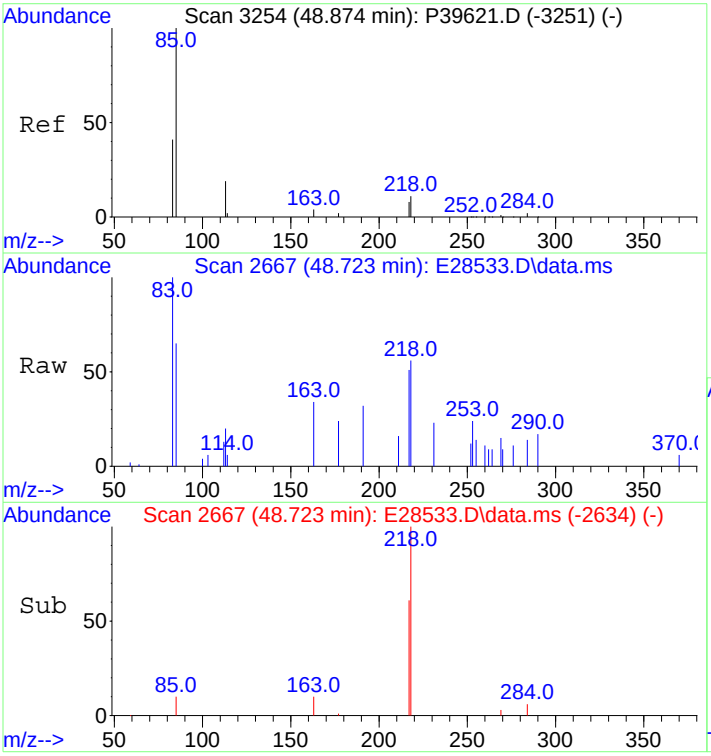




#143
14b,17b-20R-Methylcholestane (S22)
Concen: 229.51 ng/ml
RT: 48.633 min Scan# 2661
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

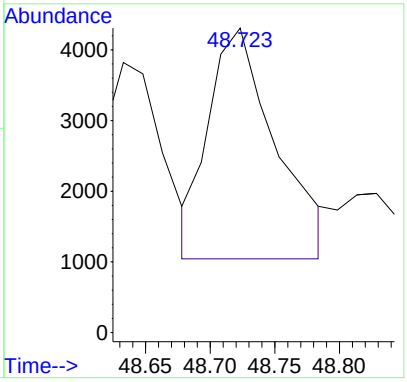
Tgt Ion:218 Resp: 9575

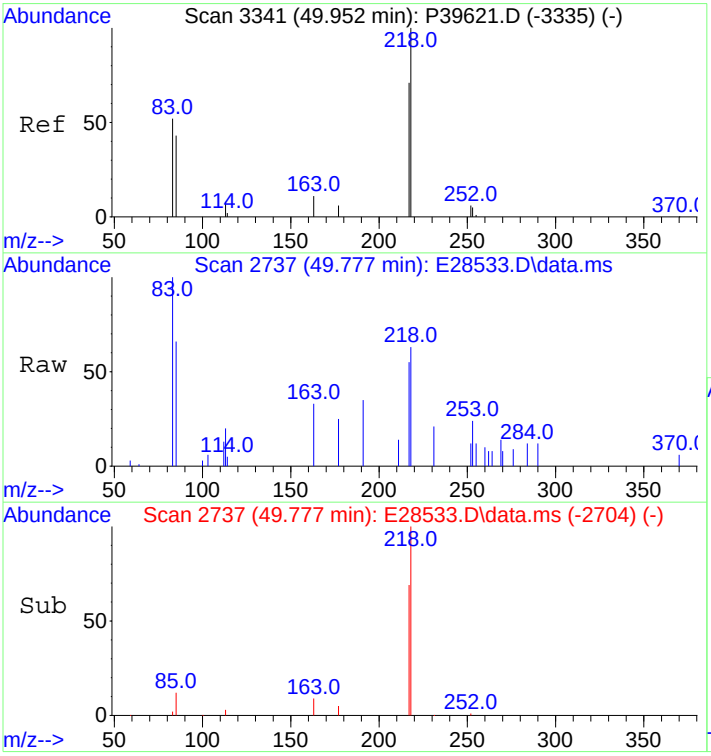




#144
14b,17b-20S-Methylcholestane (S23)
Concen: 282.08 ng/ml m
RT: 48.723 min Scan# 2667
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

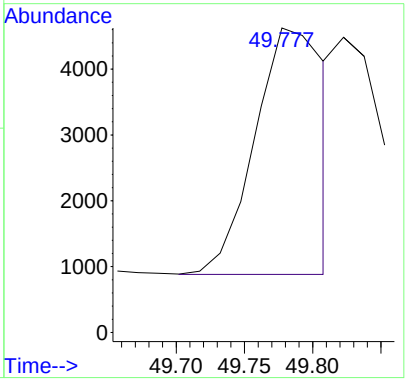
Tgt Ion:218 Resp: 11768

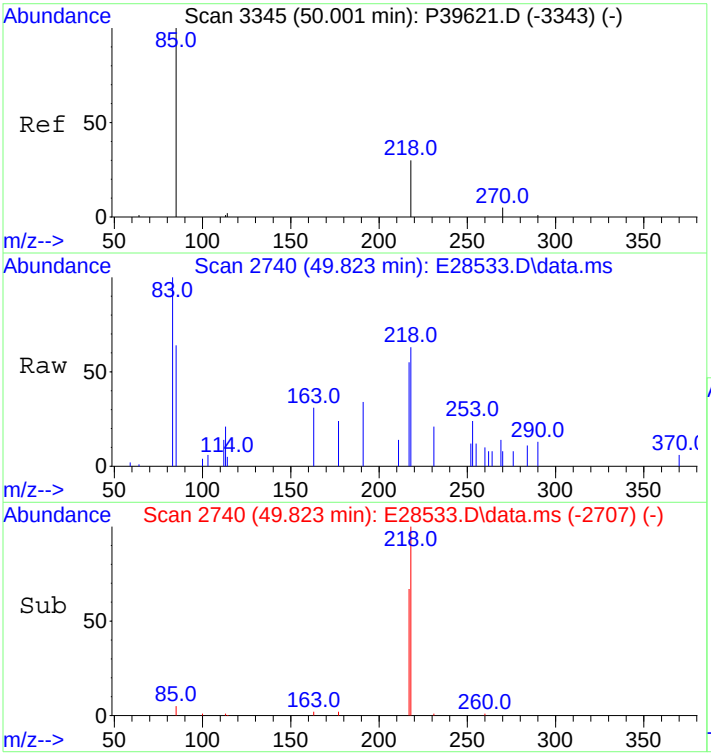




#145
14b(H),17b(H)-20R-Ethylcholestane (S26)
Concen: 317.12 ng/ml m
RT: 49.777 min Scan# 2737
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

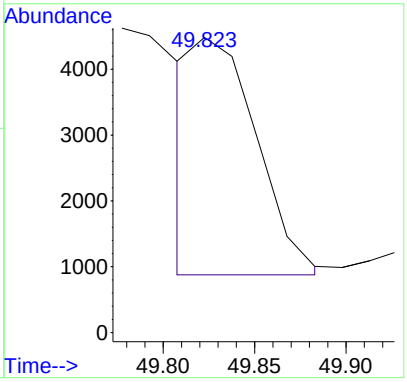
Tgt Ion:218 Resp: 13230

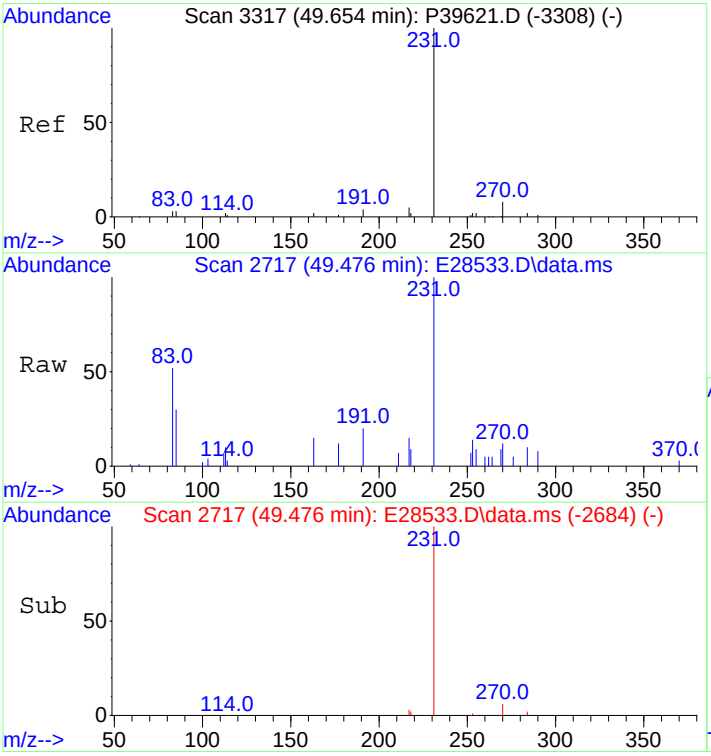




#146
14b(H),17b(H)-20S-Ethylcholestane (S27)
Concen: 208.01 ng/ml m
RT: 49.823 min Scan# 2740
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

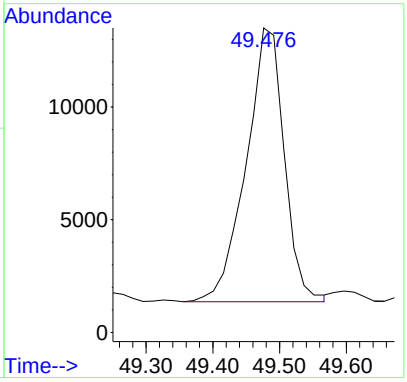
Tgt Ion:218 Resp: 8678

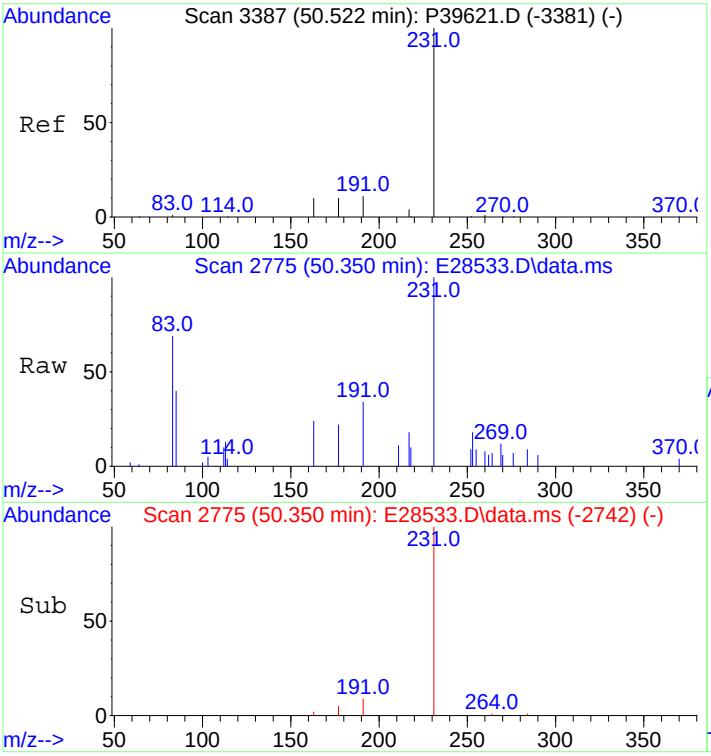




#147
C26,20R- +C27,20S- triaromatic steroid
Concen: 1154.71 ng/mL
RT: 49.476 min Scan# 2717
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

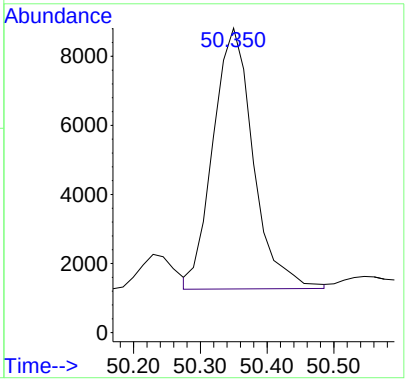
Tgt Ion:231 Resp: 48173

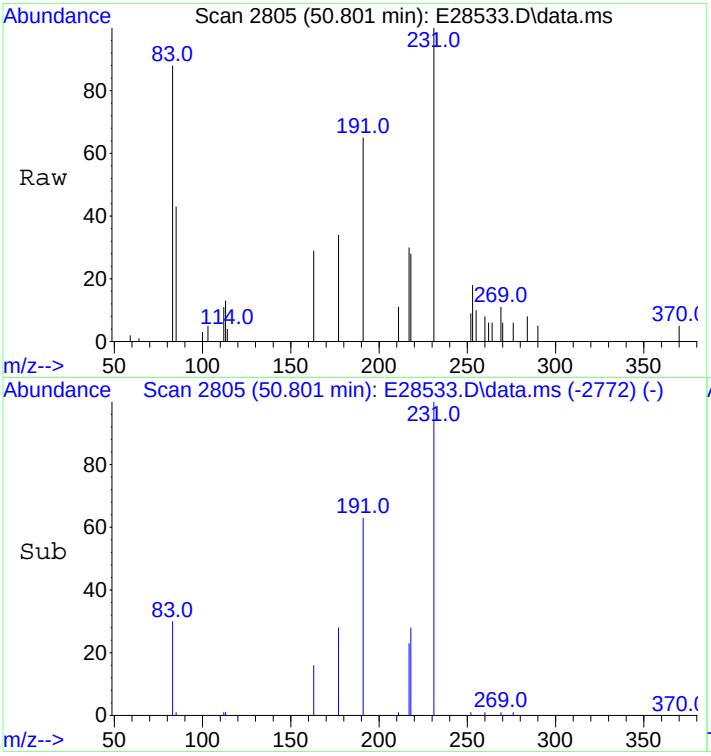




#148
C28,20S-triaromatic steroid
Concen: 758.46 ng/mL
RT: 50.350 min Scan# 2775
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

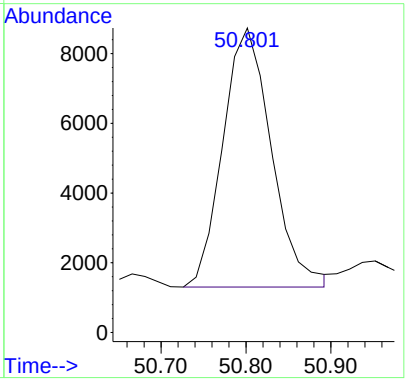
Tgt Ion:231 Resp: 31642

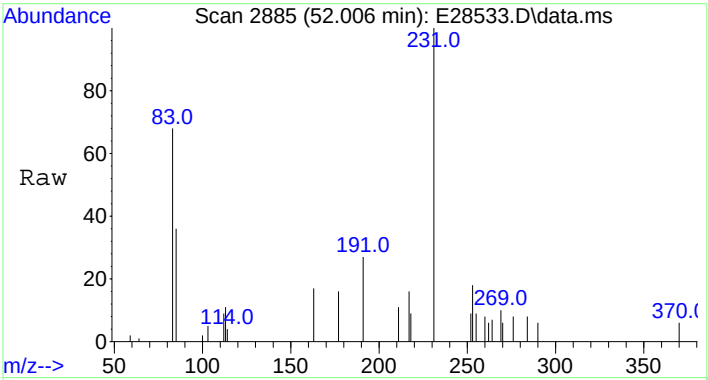




#149
C27,20R-triaromatic steroid
Concen: 709.44 ng/mL
RT: 50.801 min Scan# 2805
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

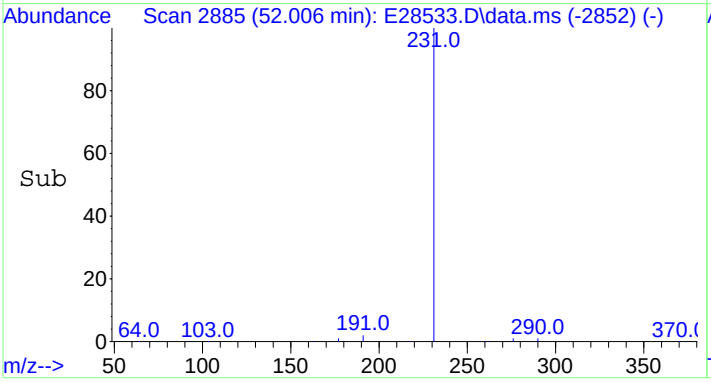
Tgt Ion:231 Resp: 29597

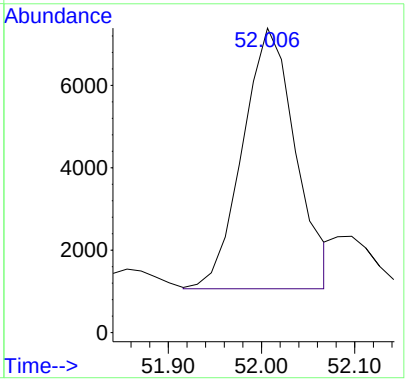




#150
C28,20R-triaromatic steroid
Concen: 602.03 ng/mL m
RT: 52.006 min Scan# 2885
Delta R.T. 0.000 min
Lab File: E28533.D
Acq: 30 Oct 2012 4:21 am

Tgt Ion:231 Resp: 25116





Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

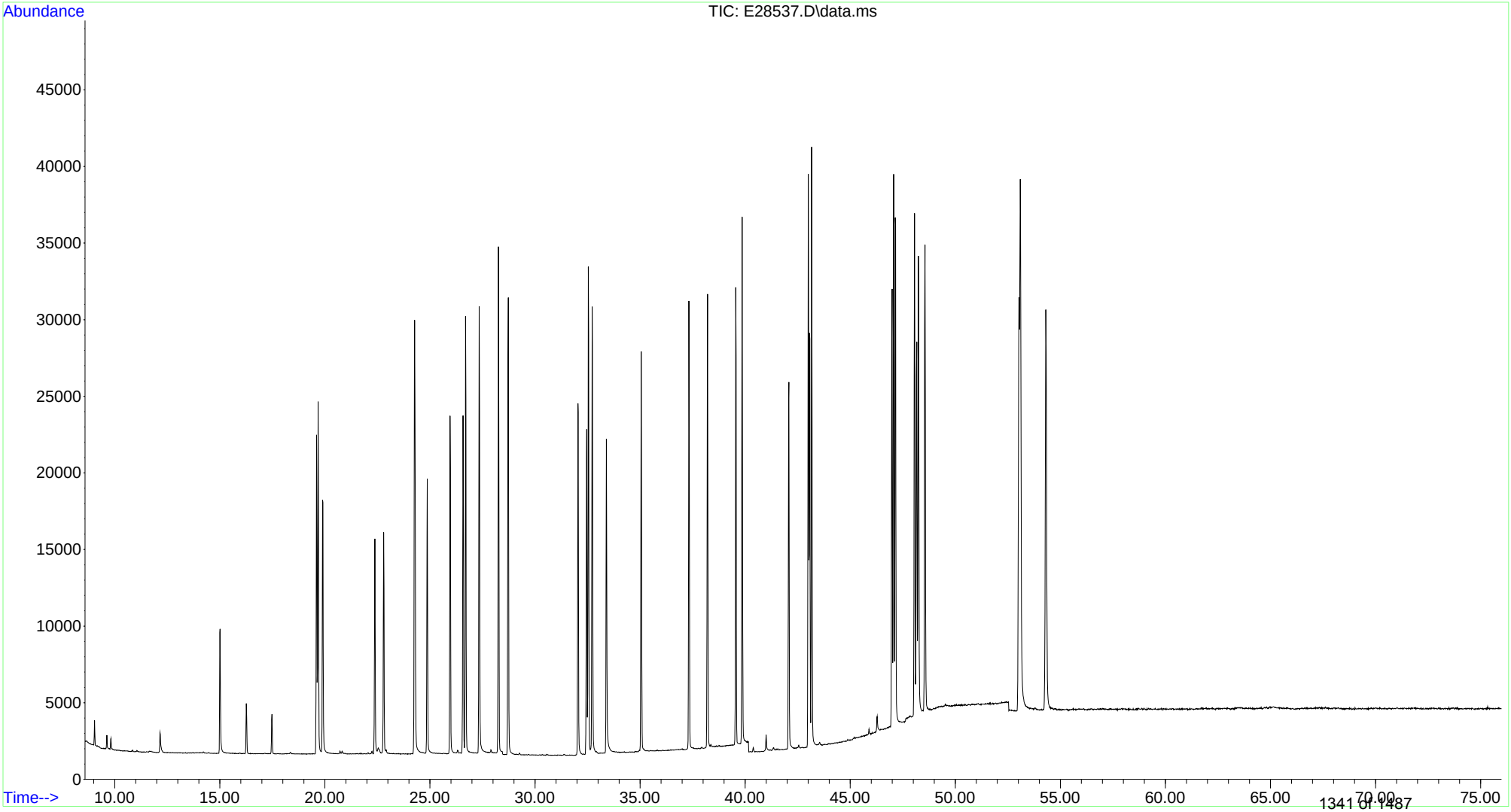
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.576	164	27127M3	500.000	ng/mL	0.00
74) Chrysene-d12	43.076	240	56880	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.605	136	46123	483.384	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.34%#			
42) Phenanthrene-d10	32.462	188	46524	475.913	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.59%#			
83) Benzo[b]fluoranthene-d12	46.991	264	57405	491.292	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.13%#			
88) Benzo[a]pyrene-d12	48.166	264	56528	499.294	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.93%#			
129) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
Target Compounds						Qvalue
3) trans-Decalin	16.263	138	5245	241.715	ng/mL	100
4) cis-Decalin	17.483	138	4006	242.994	ng/mL	100
10) Naphthalene	19.681	128	53569	502.030	ng/mL#	100
16) 2-Methylnaphthalene	22.375	142	32688	480.979	ng/mL#	100
17) 1-Methylnaphthalene	22.797	142	33765	511.305	ng/mL#	100
18) Benzothiophene	19.906	134	44511	504.592	ng/mL	100
23) Biphenyl	24.257	154	43356	504.773	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.874	156	30856	503.707	ng/mL#	100
25) Dibenzofuran	27.343	168	47975	504.511	ng/mL	96
26) Acenaphthylene	25.958	152	53359M3	501.567	ng/mL	
27) Acenaphthene	26.696	153	33896	494.986	ng/mL	100
28) 2,3,5-Trimethylnaphtha...	28.262	170	28417	495.826	ng/mL	96
29) Fluorene	28.728	166	38522	504.380	ng/mL	100
33) Dibenzothiophene	32.055	184	52969	505.392	ng/mL#	95
43) Phenanthrene	32.537	178	53667	503.299	ng/mL	99
54) Retene	39.568	234	18816	548.371	ng/mL	91
55) Anthracene	32.718	178	53410M3	579.496	ng/mL	
56) Carbazole	33.395	167	48151	507.624	ng/mL	99
57) 1-Methylphenanthrene	35.051	192	40451	497.245	ng/mL	99
58) Fluoranthene	37.325	202	59089	501.787	ng/mL	100
59) Benzo(b)fluorene	39.854	216	38785	494.279	ng/mL	100
60) Pyrene	38.213	202	59885	500.333	ng/mL	98
66) Naphthobenzothiophene	42.082	234	59101	500.647	ng/ml#	96
67) Naphthobenzothiophene-...	42.082	234	59101	500.647	ng/mL#	96
75) Benz[a]anthracene	43.001	228	59298	535.360	ng/mL	100
76) Chrysene	43.166	228	59717	523.684	ng/mL	99
77) Chrysene/Triphenylene	43.166	228	59717	523.684	ng/mL	99
84) Benzo[b]fluoranthene	47.066	252	67639	525.377	ng/mL	98
85) Benzo[j]+[k]fluoranthene	47.157	252	69005	520.970	ng/mL	97
87) Benzo[e]pyrene	48.060	252	63965	508.835	ng/mL	98
89) Benzo[a]pyrene	48.241	252	64274	534.340	ng/mL	96
90) Perylene	48.557	252	67099	527.525	ng/mL	97
91) Indeno[1,2,3-cd]pyrene	53.030	276	72058M3	509.020	ng/mL	
92) Dibenz[ah]+[ac]anthracene	53.091	278	80373	533.213	ng/mL	99
93) Benzo[g,h,i]perylene	54.310	276	79347	519.834	ng/mL	99

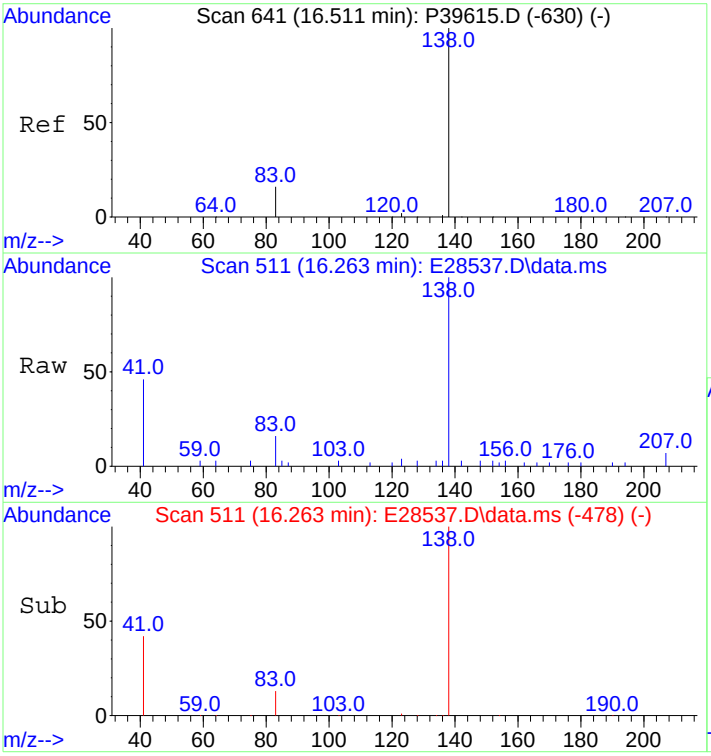
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates)

Data Path : O:\FORENSICS\DATA\PAH2\ICALs\ICALPAH2102912\
Data File : E28537.D
Acq On : 30 Oct 2012 7:19 am
Operator : AC
Sample : Q210291201
Misc : ICC WHAQ50
ALS Vial : 14 Sample Multiplier: 1

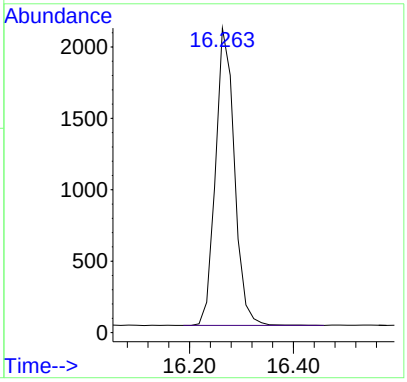
Quant Time: Oct 31 12:59:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\OCT\OCT28\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Oct 30 11:51:57 2012
Response via : Initial Calibration

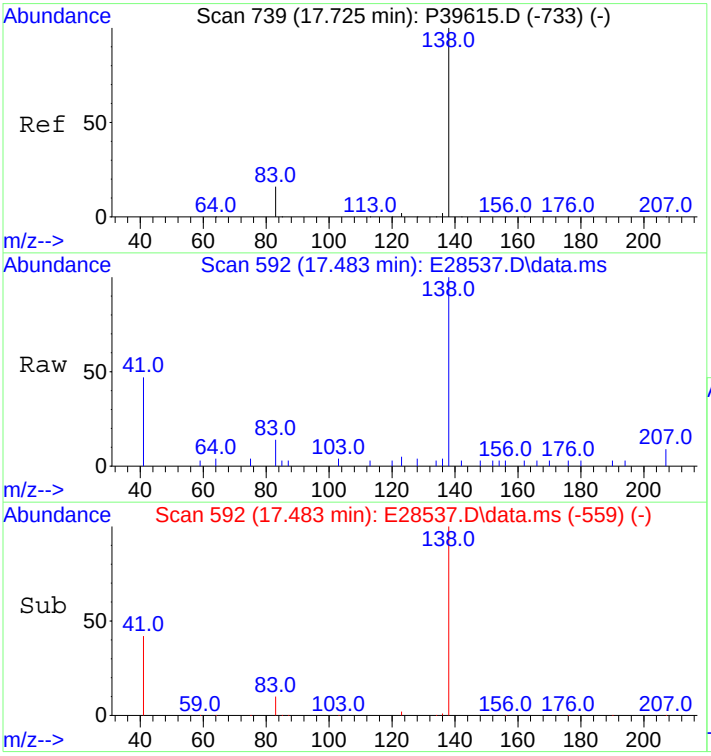




#3
trans-Decalin
Concen: 241.72 ng/mL
RT: 16.263 min Scan# 511
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

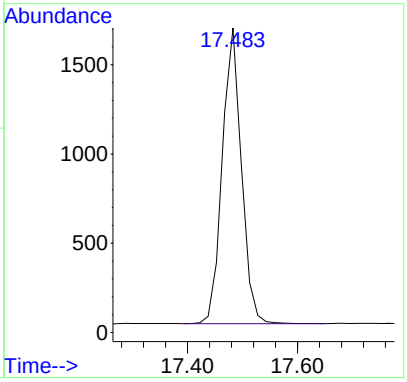
Tgt Ion:138 Resp: 5245

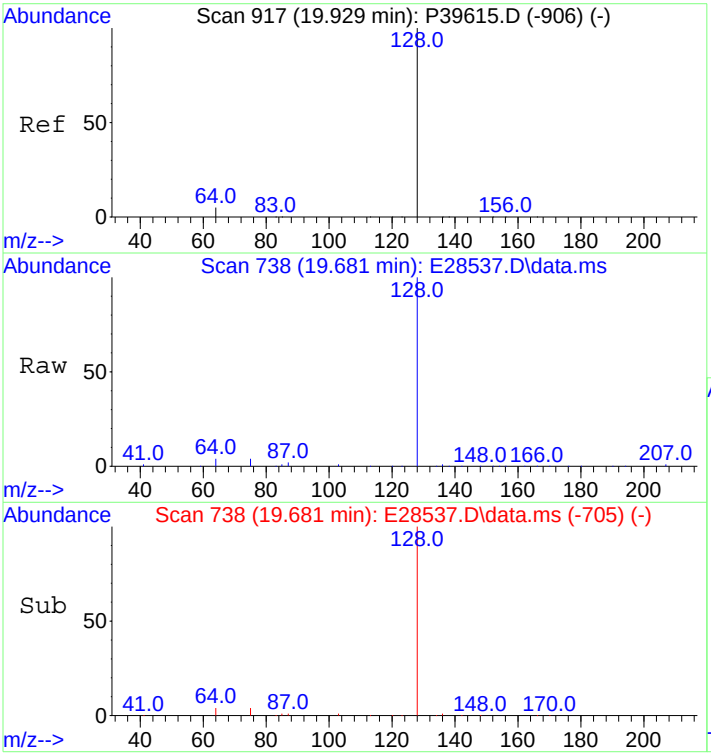




#4
cis-Decalin
Concen: 242.99 ng/mL
RT: 17.483 min Scan# 592
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:138 Resp: 4006

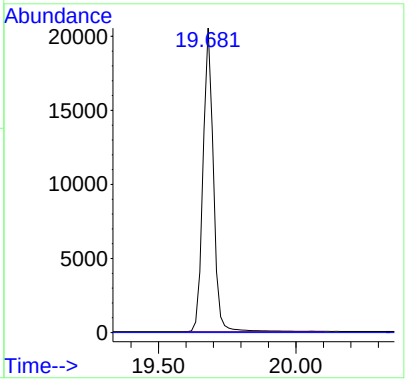


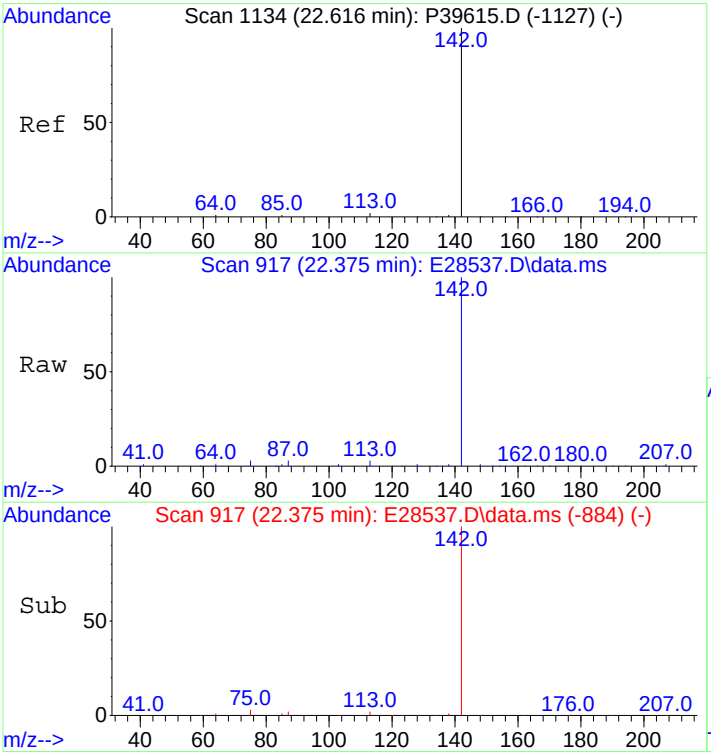


#10
Naphthalene
Concen: 502.03 ng/mL
RT: 19.681 min Scan# 738
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:128 Resp: 53569

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

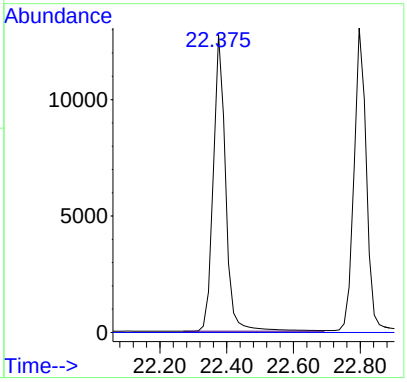


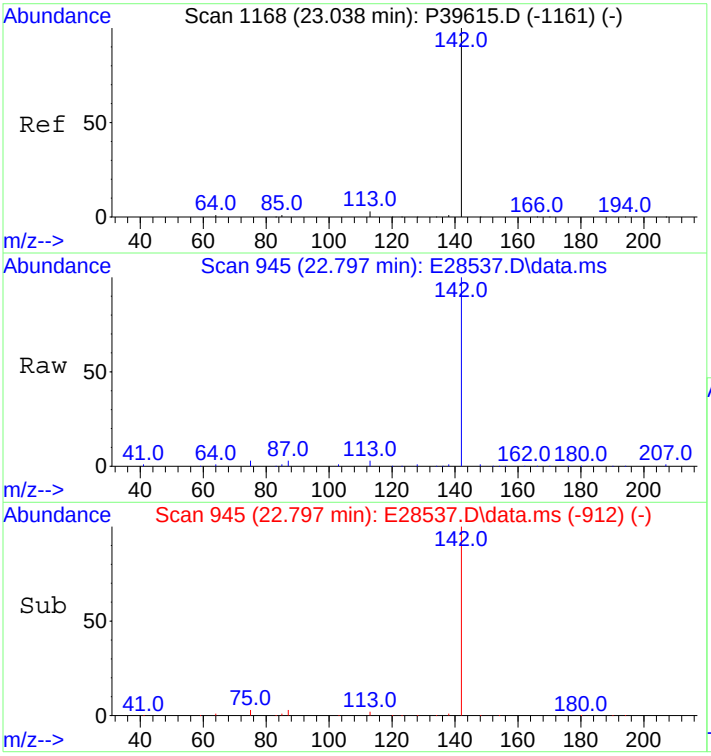


#16
2-Methylnaphthalene
Concen: 480.98 ng/mL
RT: 22.375 min Scan# 917
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:142 Resp: 32688

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

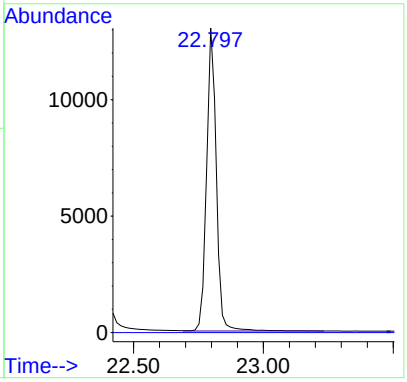


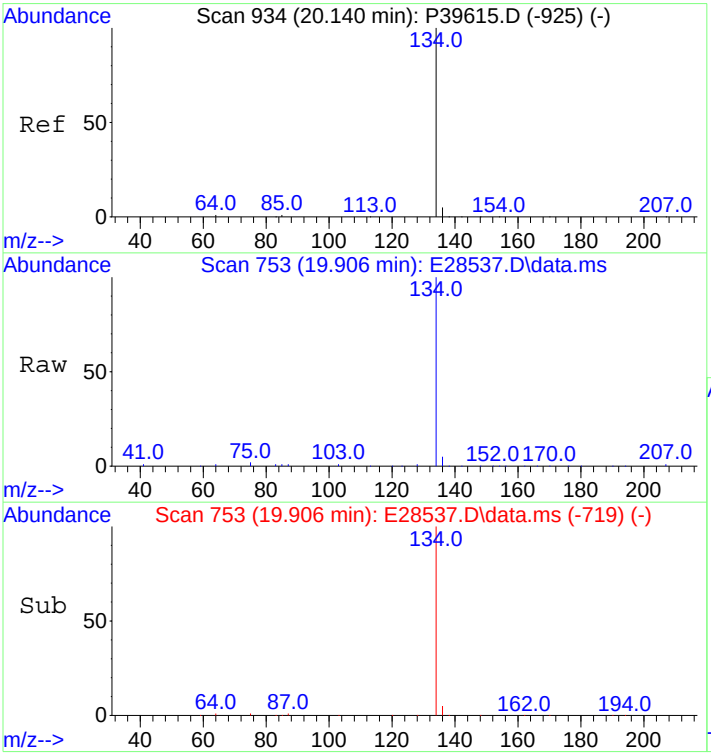


#17
1-Methylnaphthalene
Concen: 511.31 ng/mL
RT: 22.797 min Scan# 945
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:142 Resp: 33765

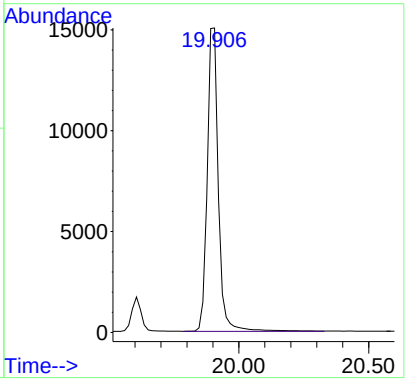
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

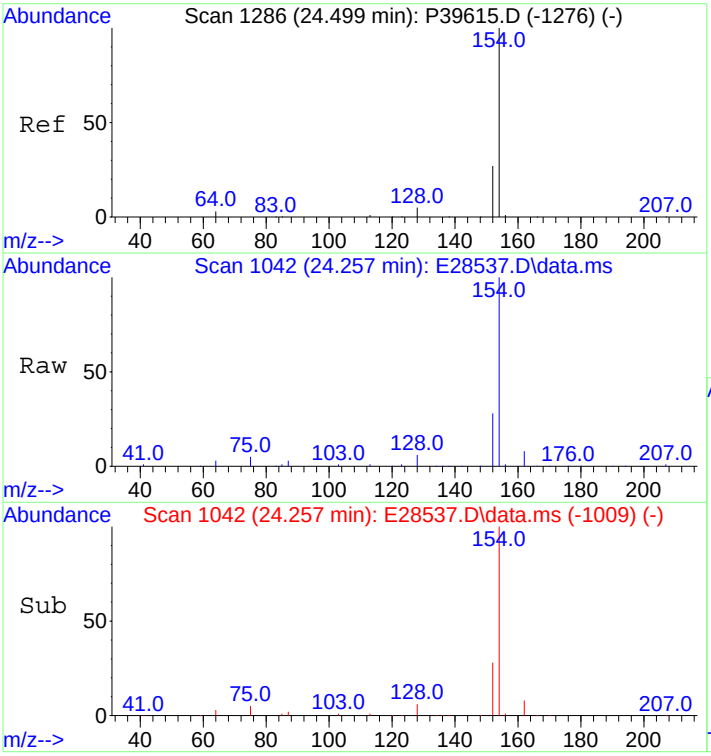




#18
Benzothiophene
Concen: 504.59 ng/mL
RT: 19.906 min Scan# 753
Delta R.T. 0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:134 Resp: 44511

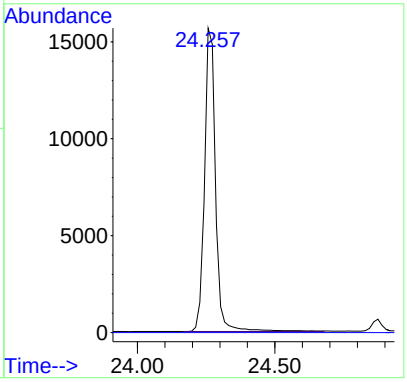


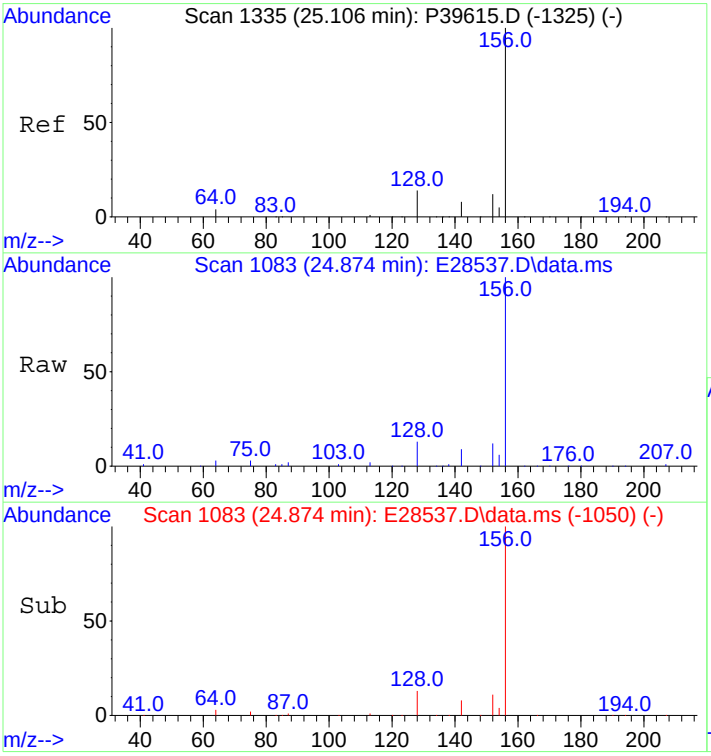


#23
Biphenyl
Concen: 504.77 ng/mL
RT: 24.257 min Scan# 1042
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:154 Resp: 43356

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

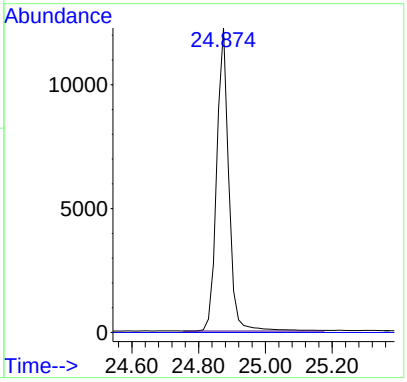


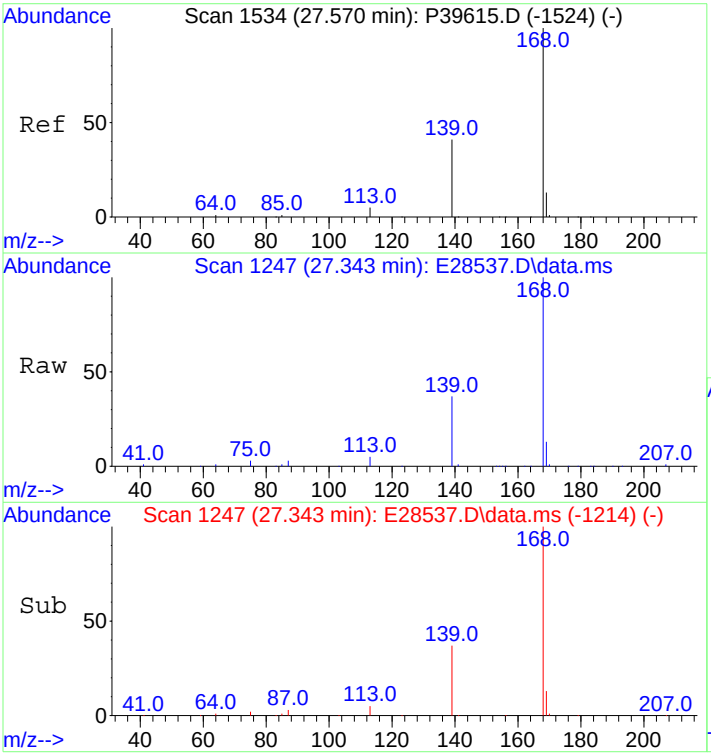


#24
2,6-Dimethylnaphthalene
Concen: 503.71 ng/mL
RT: 24.874 min Scan# 1083
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:156 Resp: 30856

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

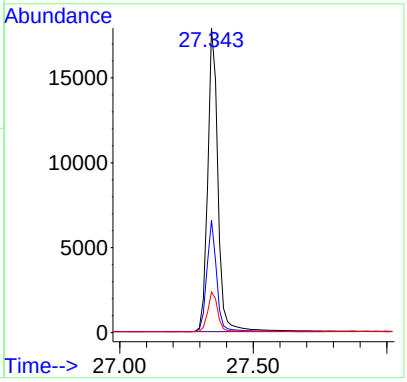


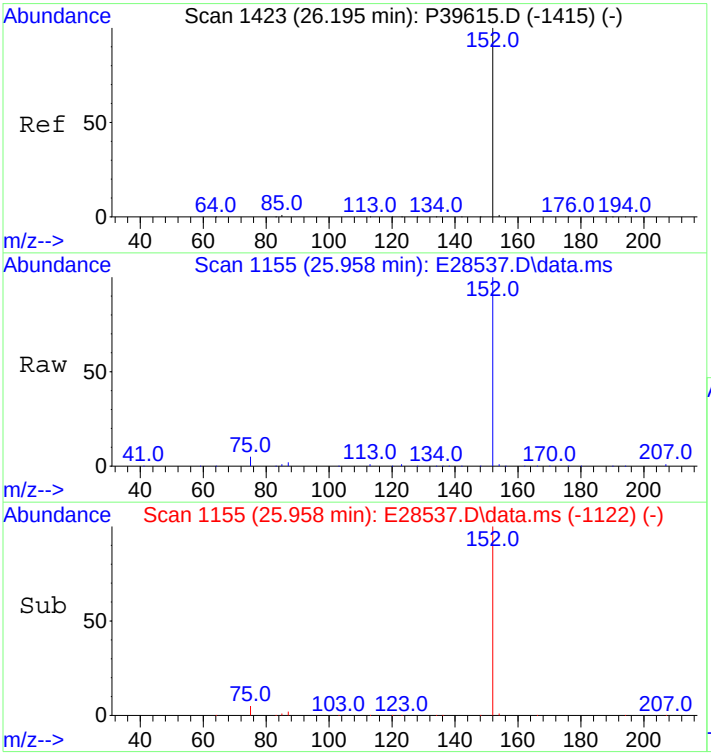


#25
Dibenzofuran
Concen: 504.51 ng/mL
RT: 27.343 min Scan# 1247
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:168 Resp: 47975

Ion	Ratio	Lower	Upper
168	100		
139	35.2	30.6	45.8
169	13.1	10.6	16.0

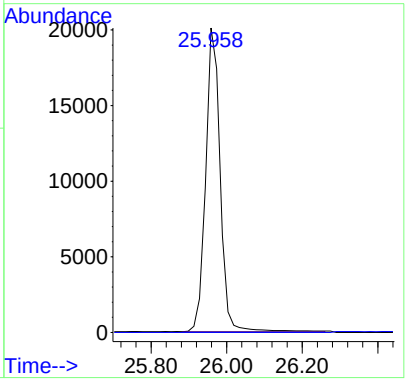


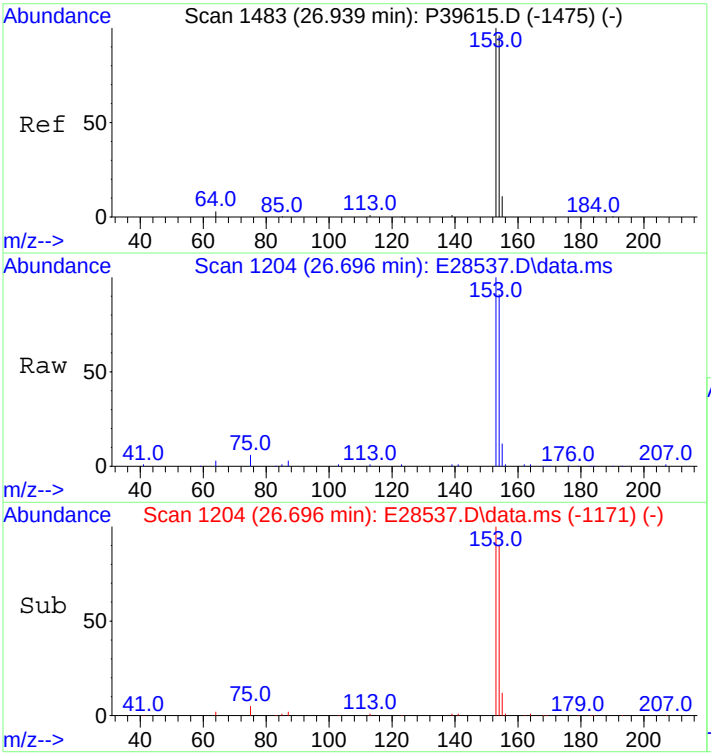


#26
Acenaphthylene
Concen: 501.57 ng/mL m
RT: 25.958 min Scan# 1155
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:152 Resp: 53359

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

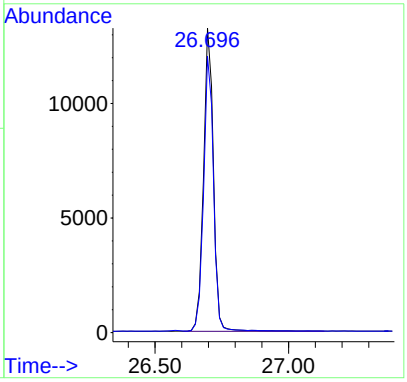


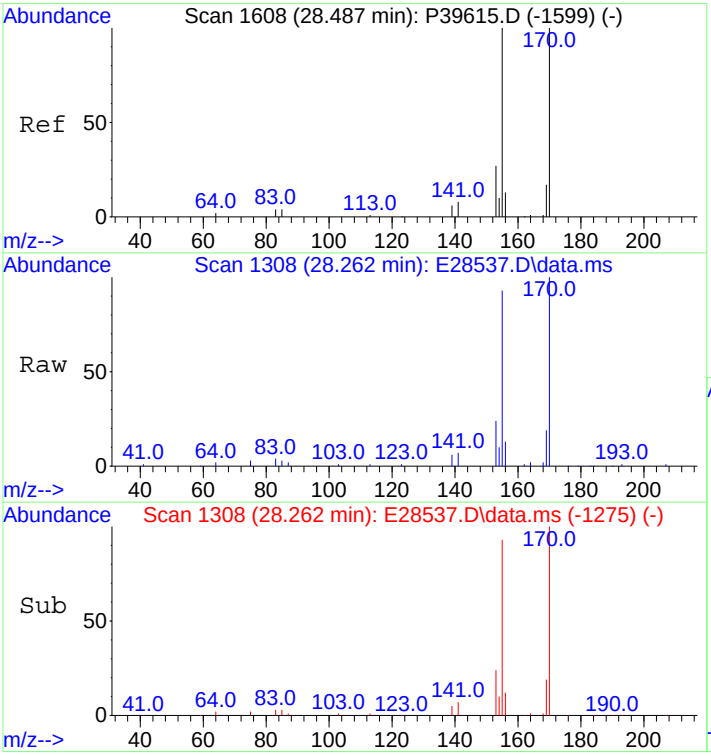


#27
Acenaphthene
Concen: 494.99 ng/mL
RT: 26.696 min Scan# 1204
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:153 Resp: 33896

Ion	Ratio	Lower	Upper
153	100		
154	90.7	72.3	108.5

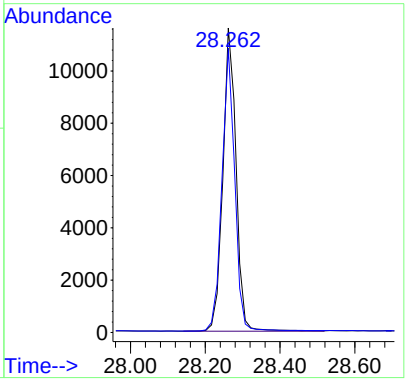


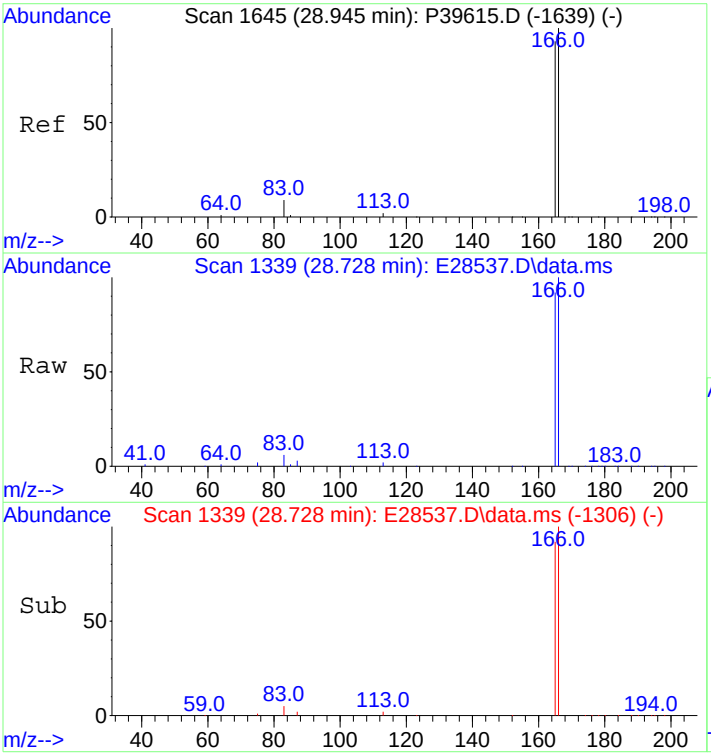


#28
2,3,5-Trimethylnaphthalene
Concen: 495.83 ng/mL
RT: 28.262 min Scan# 1308
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:170 Resp: 28417

Ion	Ratio	Lower	Upper
170	100		
155	90.6	75.9	113.9

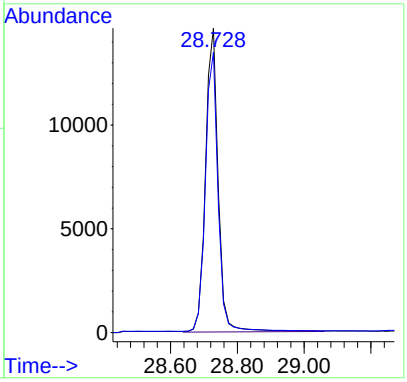


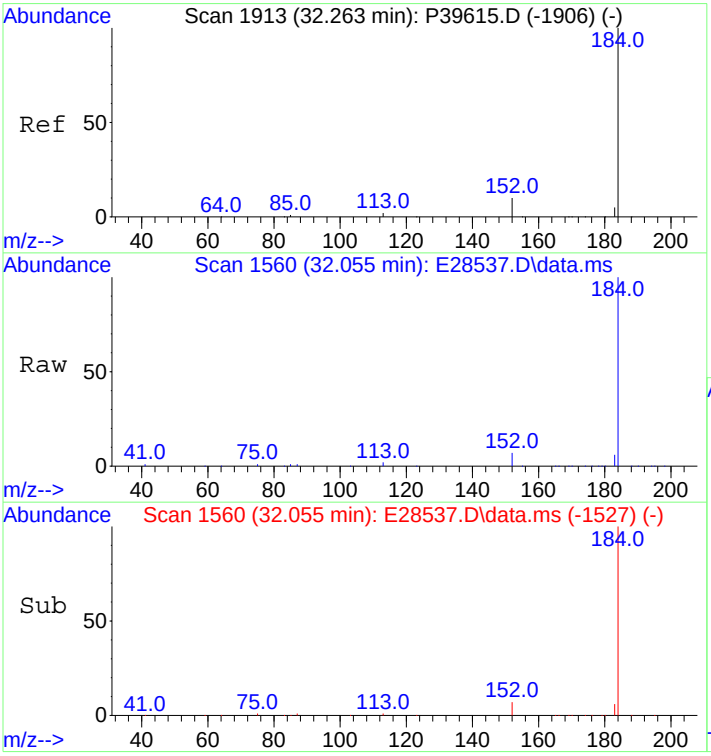


#29
Fluorene
Concen: 504.38 ng/mL
RT: 28.728 min Scan# 1339
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:166 Resp: 38522

Ion	Ratio	Lower	Upper
166	100		
165	91.9	73.8	110.6

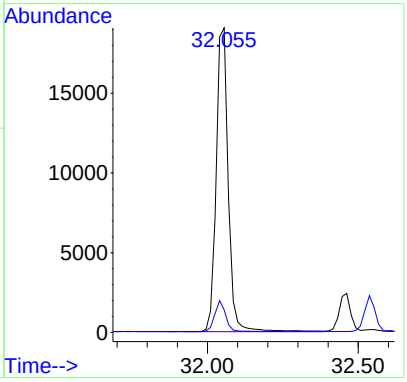


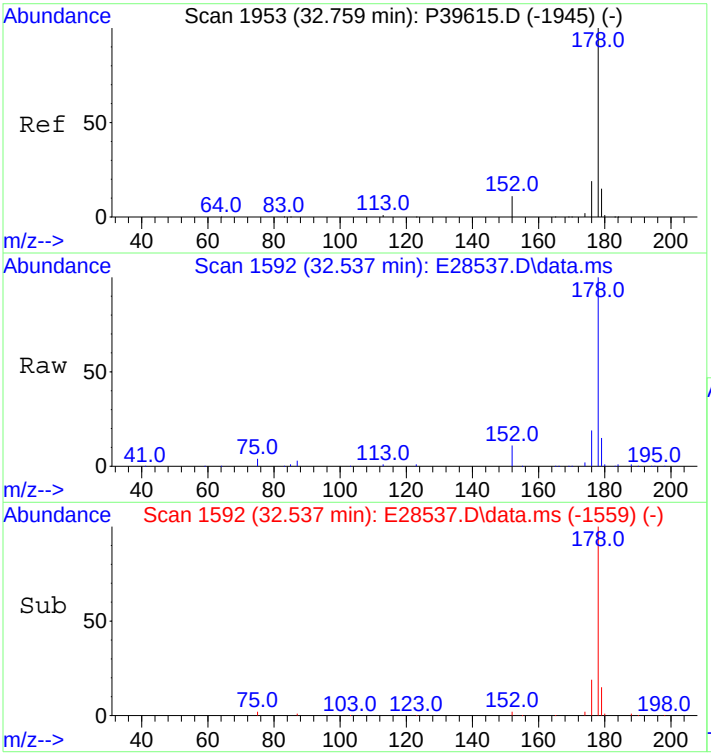


#33
Dibenzothiophene
Concen: 505.39 ng/mL
RT: 32.055 min Scan# 1560
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:184 Resp: 52969

Ion	Ratio	Lower	Upper
184	100		
152	9.3	6.2	9.2#

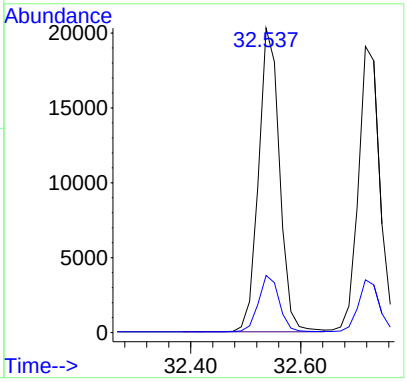


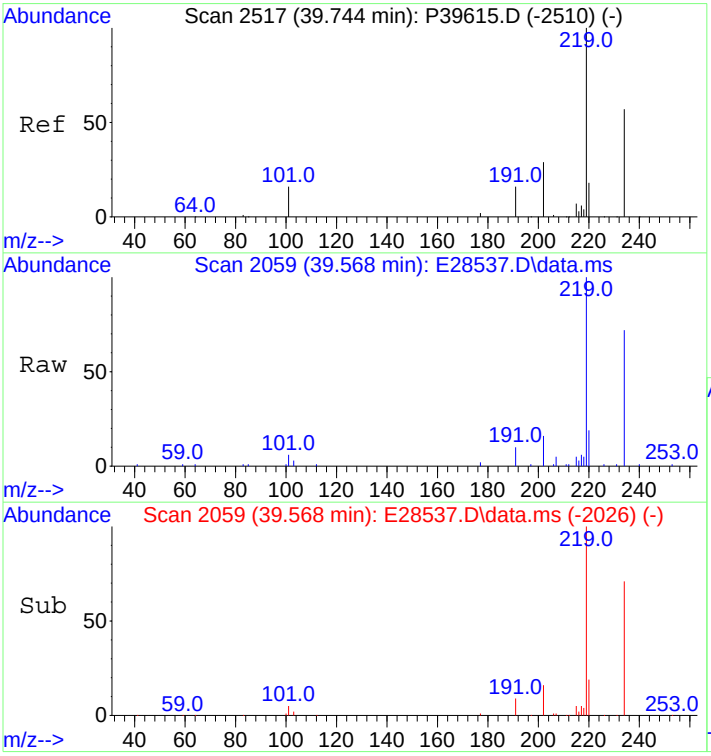


#43
Phenanthrene
Concen: 503.30 ng/mL
RT: 32.537 min Scan# 1592
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:178 Resp: 53667

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.6

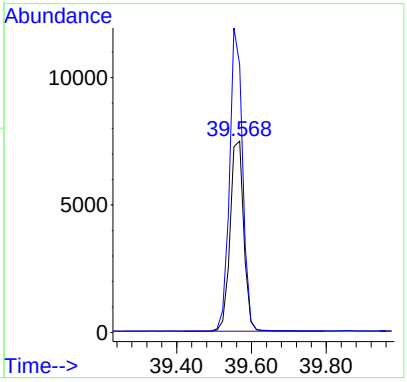


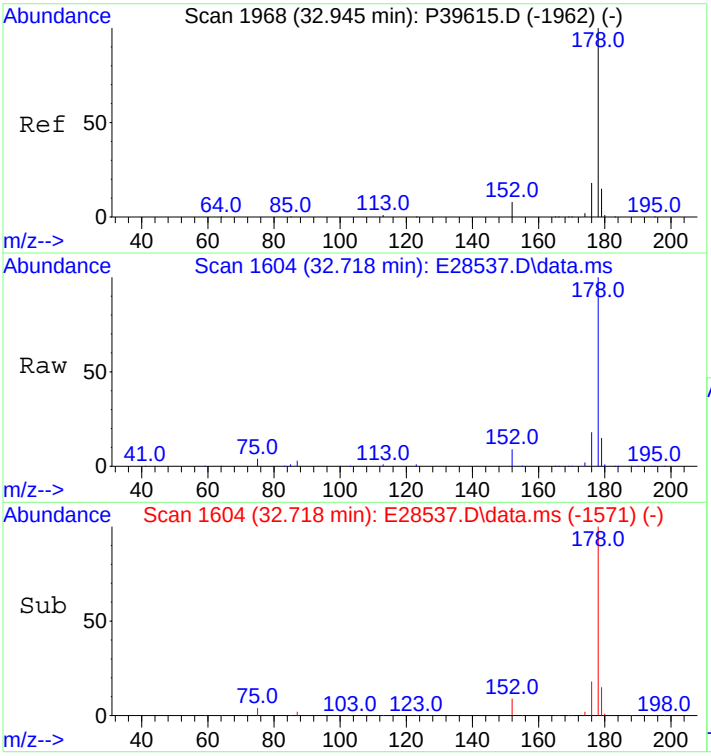


#54
Retene
Concen: 548.37 ng/mL
RT: 39.568 min Scan# 2059
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:234 Resp: 18816

Ion	Ratio	Lower	Upper
234	100		
219	152.1	113.0	169.4

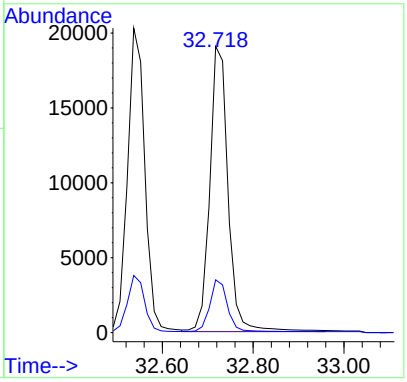


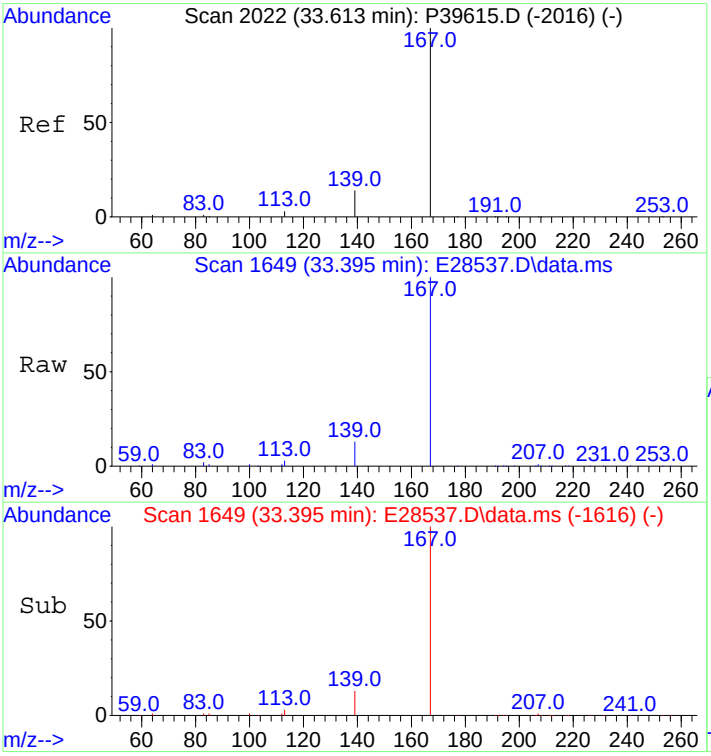


#55
Anthracene
Concen: 579.50 ng/mL m
RT: 32.718 min Scan# 1604
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:178 Resp: 53410

Ion	Ratio	Lower	Upper
178	100		
176	20.2	14.5	21.7

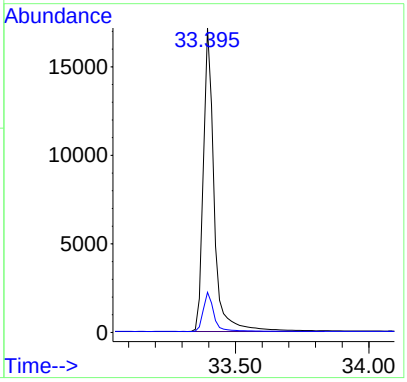


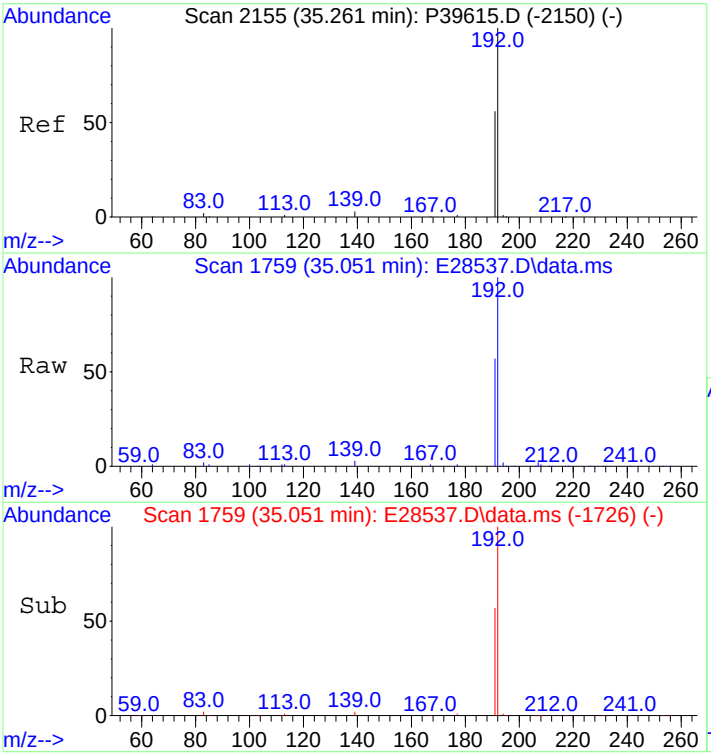


#56
Carbazole
Concen: 507.62 ng/mL
RT: 33.395 min Scan# 1649
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:167 Resp: 48151

Ion	Ratio	Lower	Upper
167	100		
139	12.8	10.5	15.7

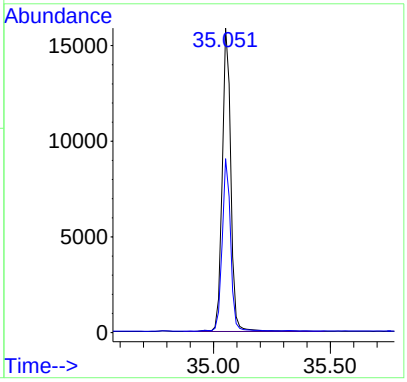


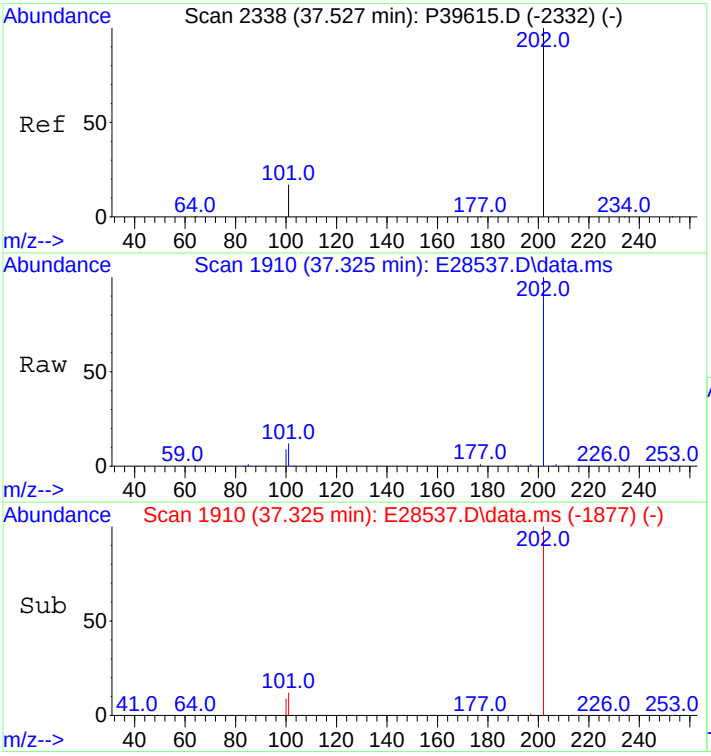


#57
1-Methylphenanthrene
Concen: 497.24 ng/mL
RT: 35.051 min Scan# 1759
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:192 Resp: 40451

Ion	Ratio	Lower	Upper
192	100		
191	55.8	45.5	68.3

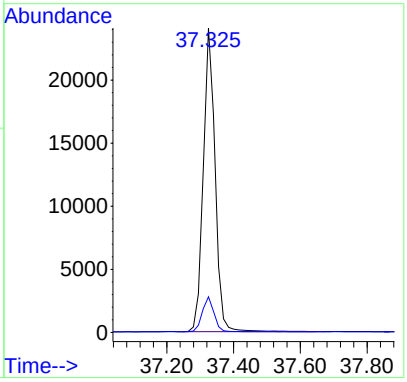


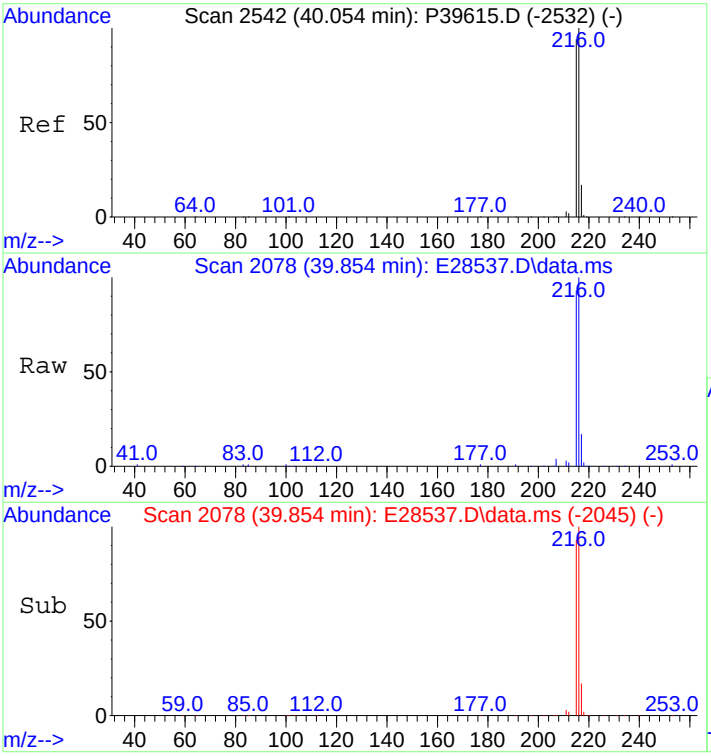


#58
Fluoranthene
Concen: 501.79 ng/mL
RT: 37.325 min Scan# 1910
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:202 Resp: 59089

Ion	Ratio	Lower	Upper
202	100		
101	11.4	9.2	13.8

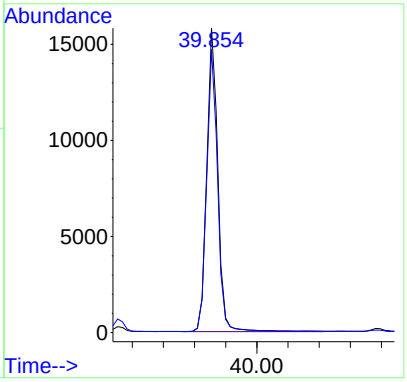


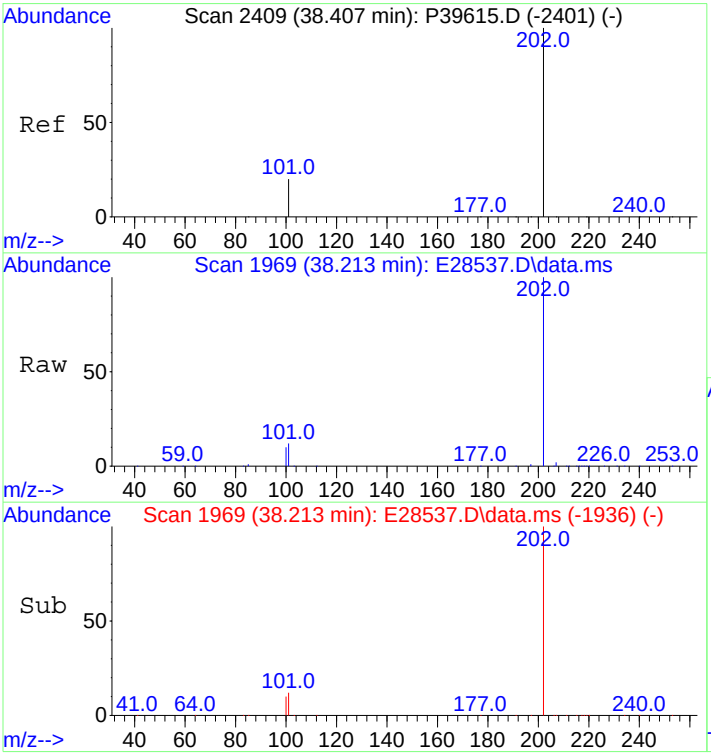


#59
Benzo(b)fluorene
Concen: 494.28 ng/mL
RT: 39.854 min Scan# 2078
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:216 Resp: 38785

Ion	Ratio	Lower	Upper
216	100		
215	92.2	73.8	110.8

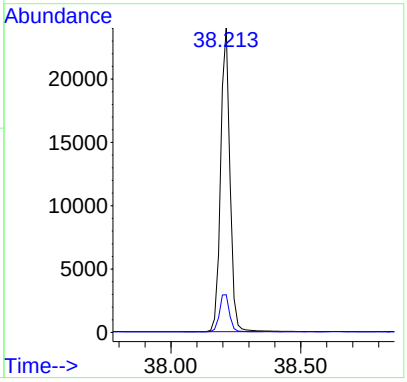


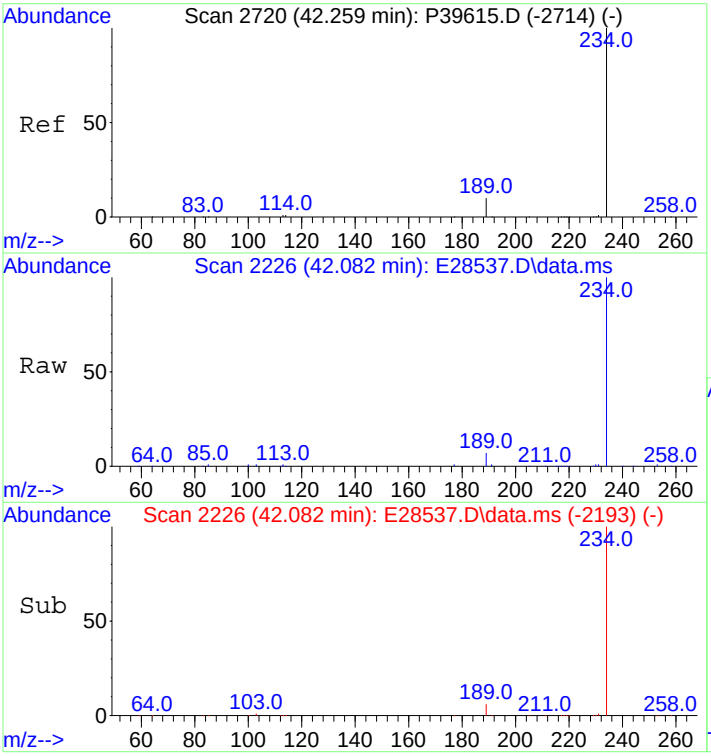


#60
Pyrene
Concen: 500.33 ng/mL
RT: 38.213 min Scan# 1969
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:202 Resp: 59885

Ion	Ratio	Lower	Upper
202	100		
101	13.2	9.8	14.8

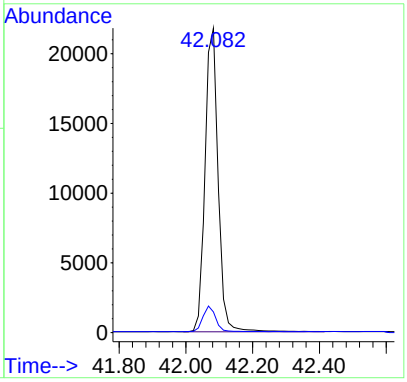


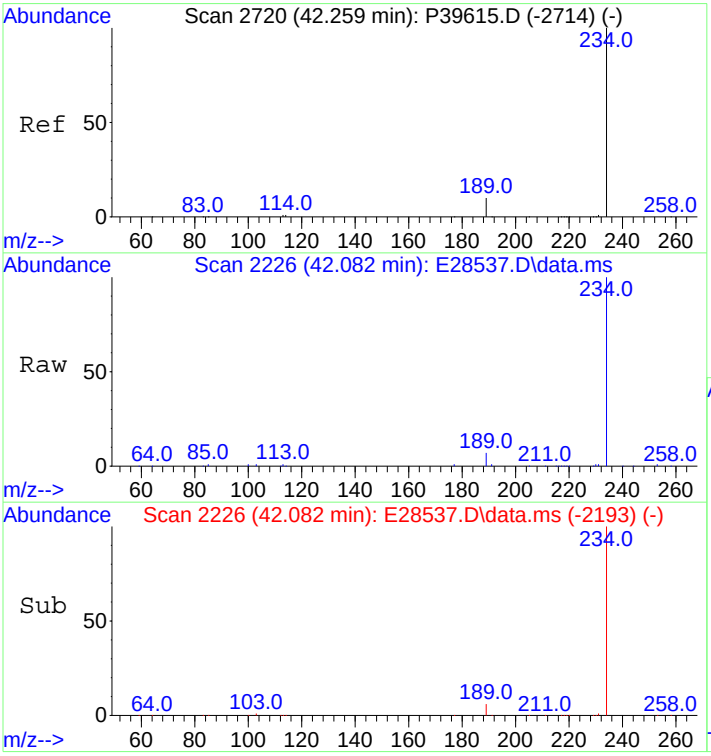


#66
Naphthobenzothiophene
Concen: 500.65 ng/ml
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:234 Resp: 59101

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3#

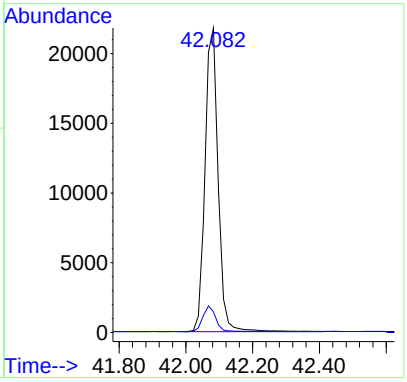


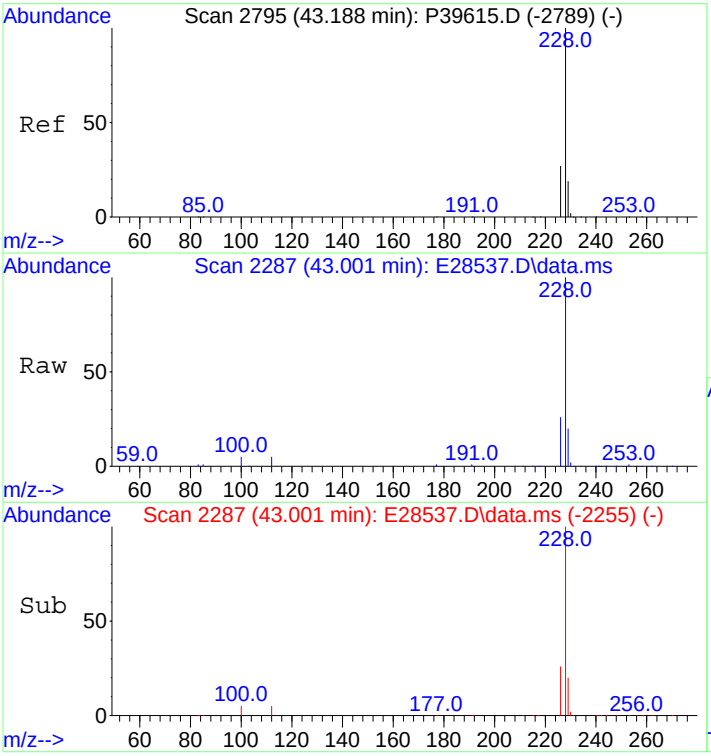


#67
Naphthobenzothiophene-2,1-D
Concen: 500.65 ng/mL
RT: 42.082 min Scan# 2226
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:234 Resp: 59101

Ion	Ratio	Lower	Upper
234	100		
189	8.3	5.5	8.3#

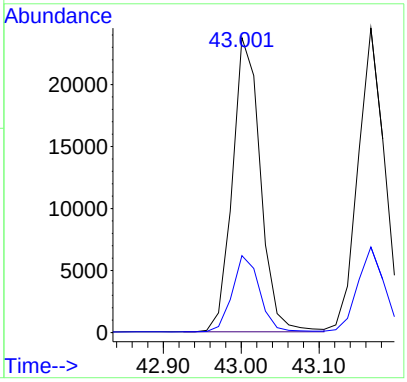


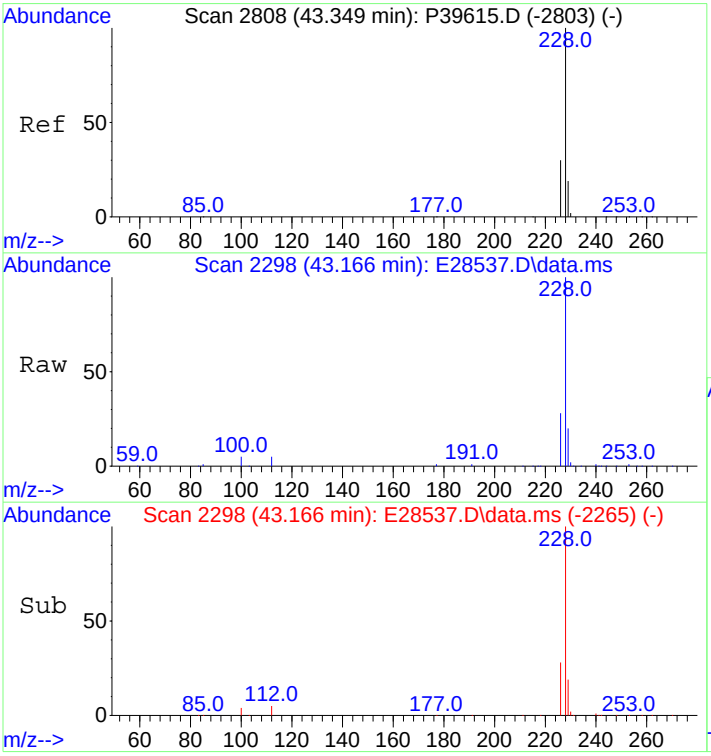


#75
Benz[a]anthracene
Concen: 535.36 ng/mL
RT: 43.001 min Scan# 2287
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:228 Resp: 59298

Ion	Ratio	Lower	Upper
228	100		
226	25.4	20.2	30.4

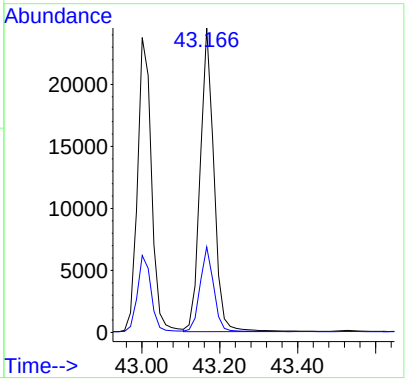


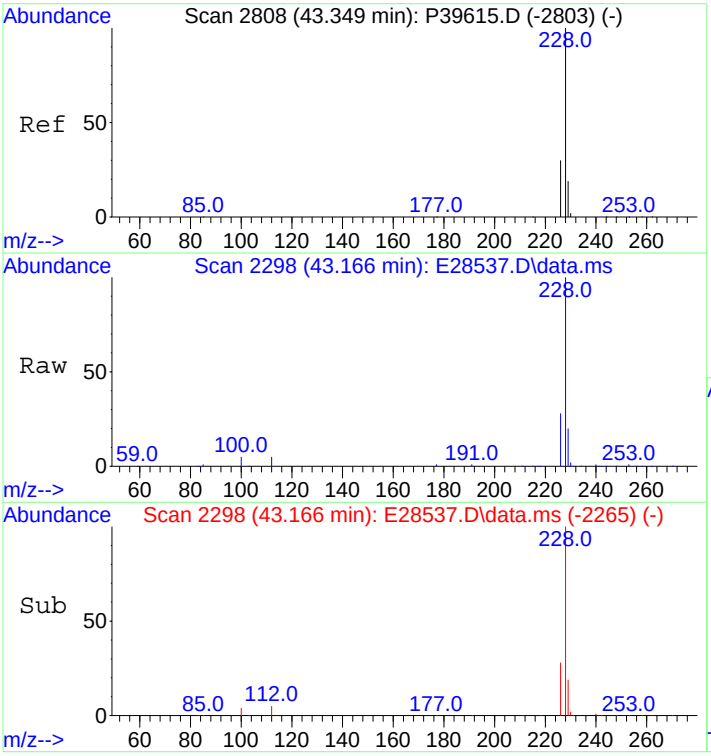


#76
Chrysene
Concen: 523.68 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.001 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:228 Resp: 59717

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.6	34.0

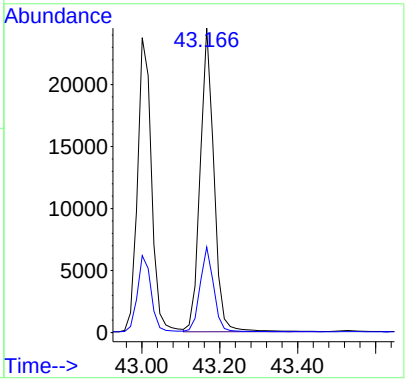


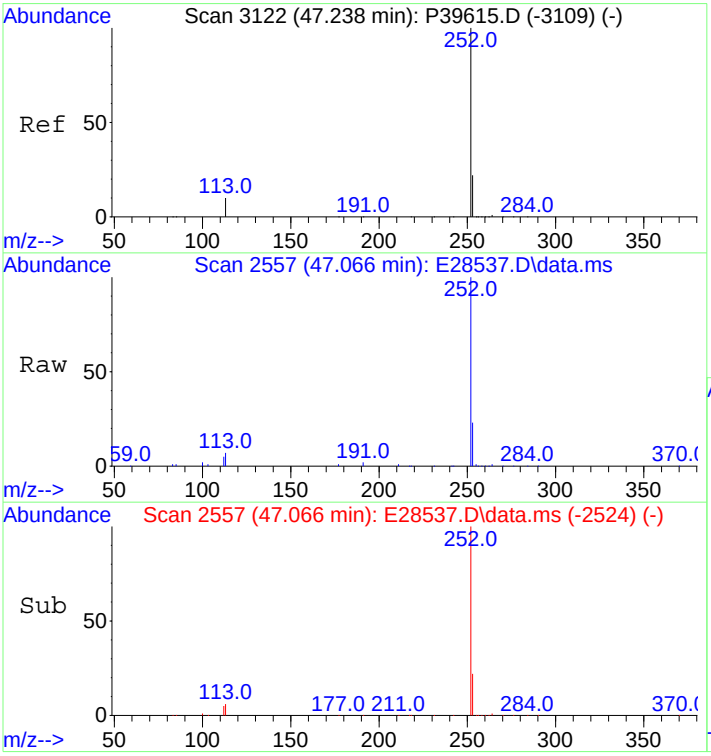


#77
Chrysene/Triphenylene
Concen: 523.68 ng/mL
RT: 43.166 min Scan# 2298
Delta R.T. -0.001 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:228 Resp: 59717

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.6	34.0

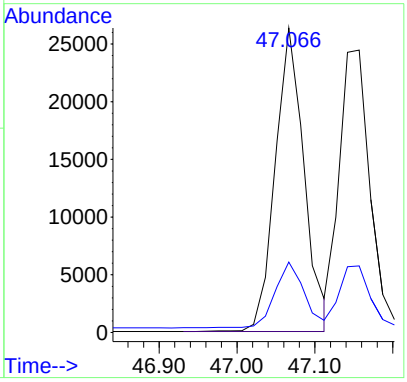


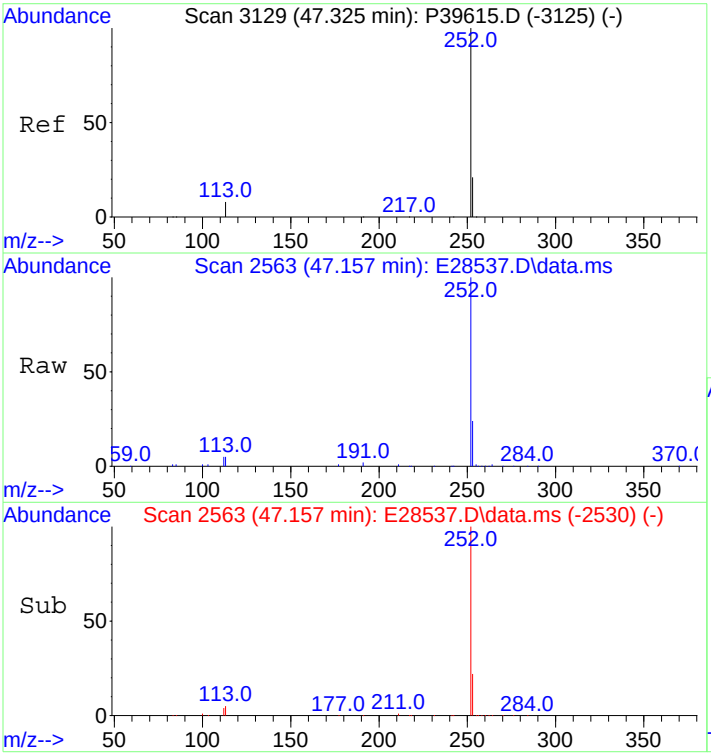


#84
Benzo[b]fluoranthene
Concen: 525.38 ng/mL
RT: 47.066 min Scan# 2557
Delta R.T. -0.001 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 67639

Ion	Ratio	Lower	Upper
252	100		
253	22.1	18.3	27.5

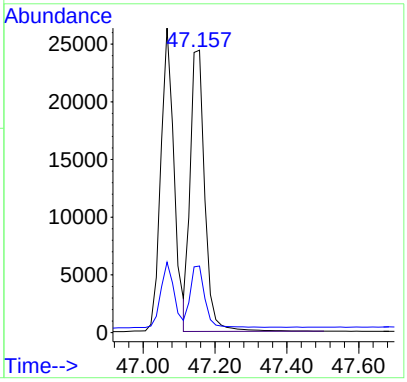


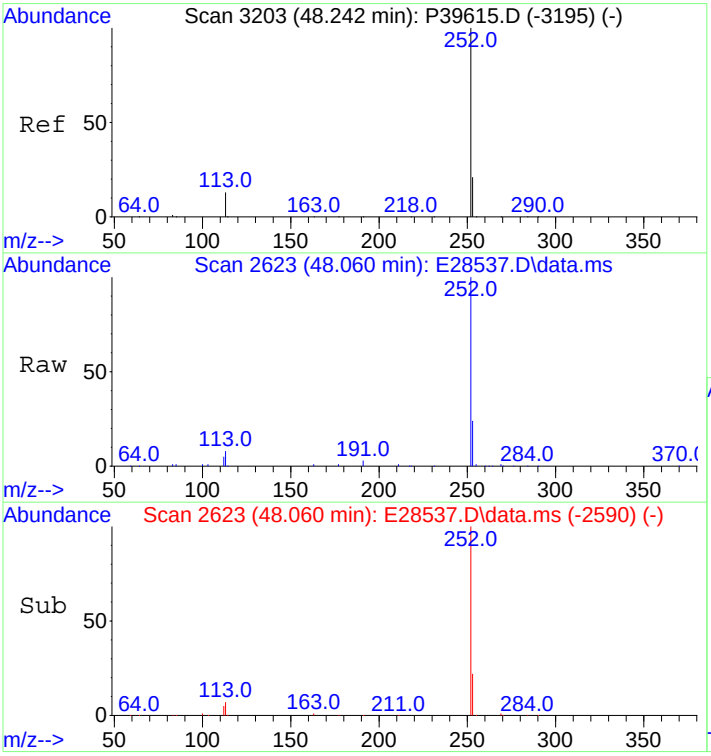


#85
Benzo[j]+[k]fluoranthene
Concen: 520.97 ng/mL
RT: 47.157 min Scan# 2563
Delta R.T. -0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 69005

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.3	27.5

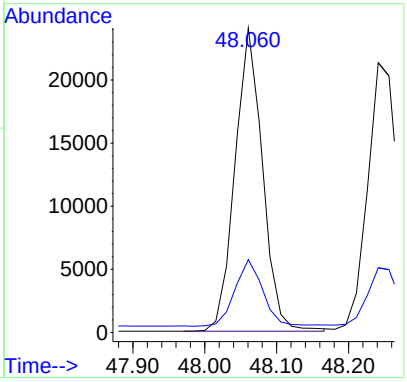


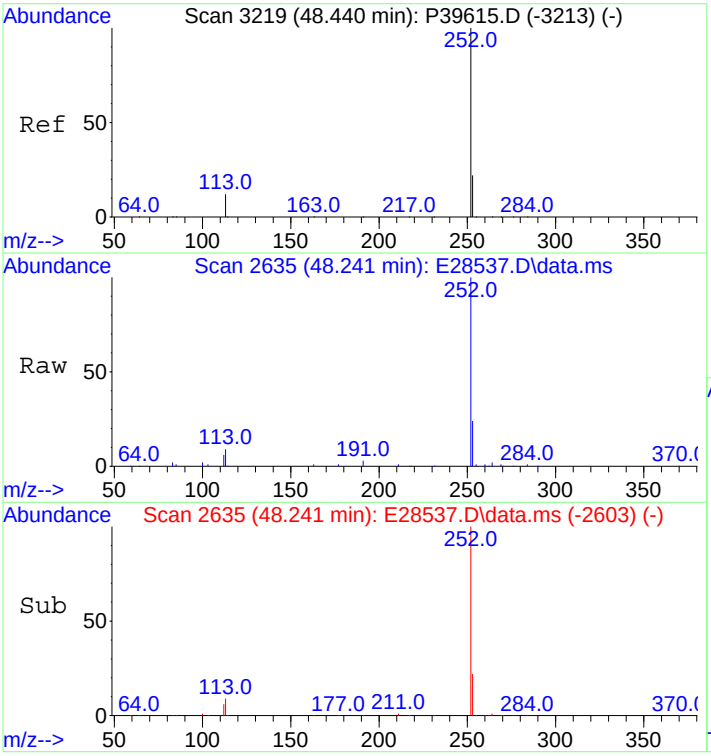


#87
Benzo[e]pyrene
Concen: 508.84 ng/mL
RT: 48.060 min Scan# 2623
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 63965

Ion	Ratio	Lower	Upper
252	100		
253	22.3	18.6	28.0

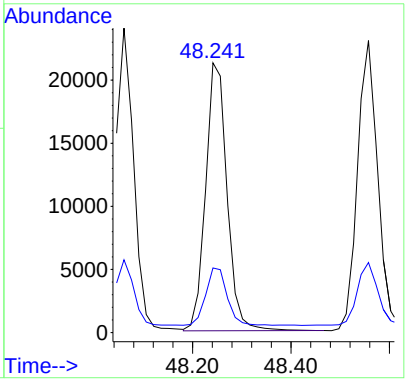


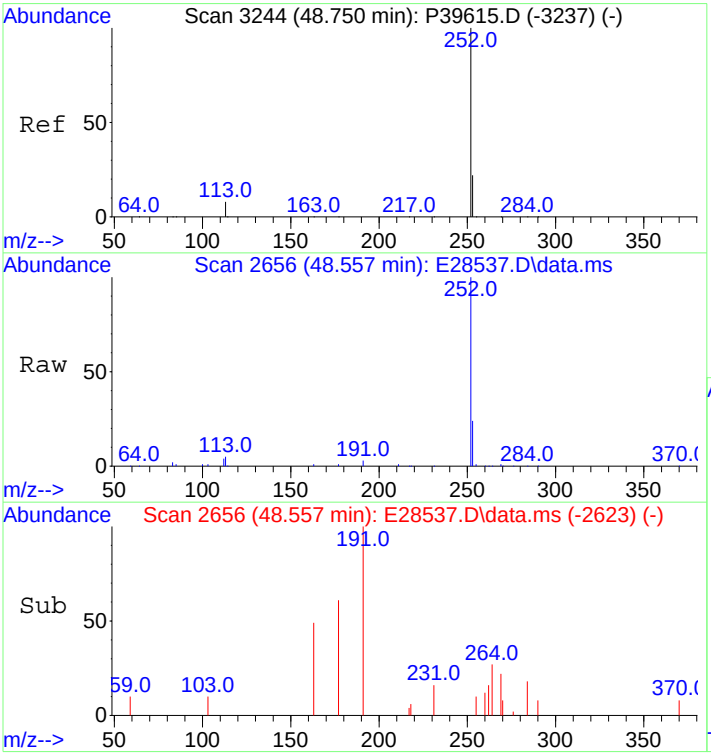


#89
Benzo[a]pyrene
Concen: 534.34 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 64274

Ion	Ratio	Lower	Upper
252	100		
253	21.7	18.8	28.2

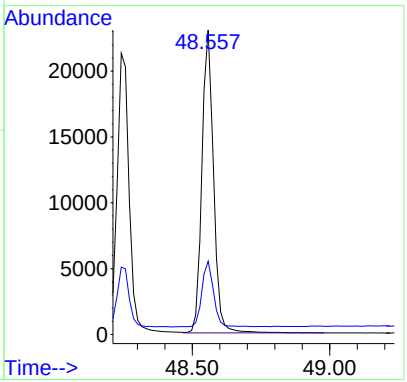


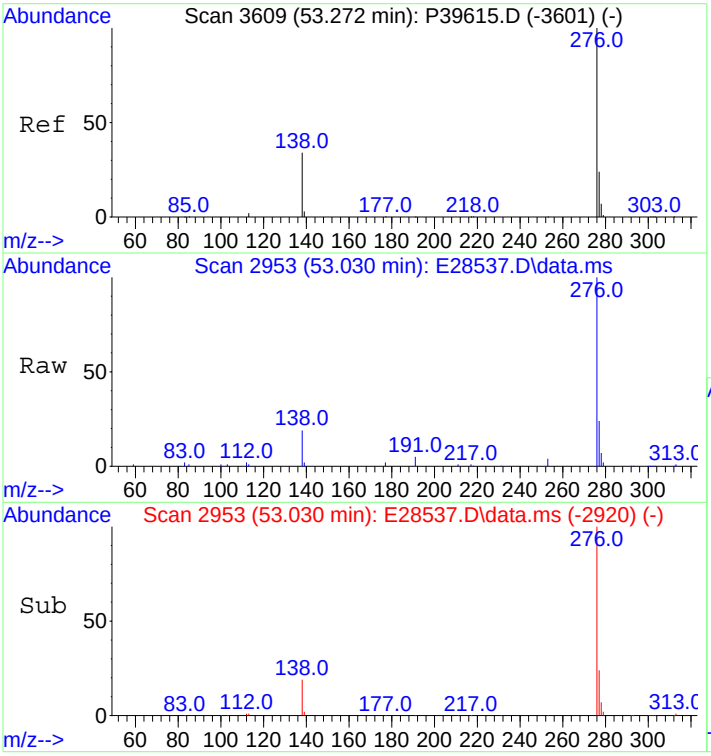


#90
Perylene
Concen: 527.52 ng/mL
RT: 48.557 min Scan# 2656
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:252 Resp: 67099

Ion	Ratio	Lower	Upper
252	100		
253	22.0	18.8	28.2

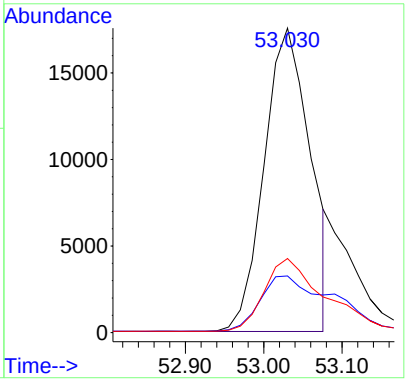


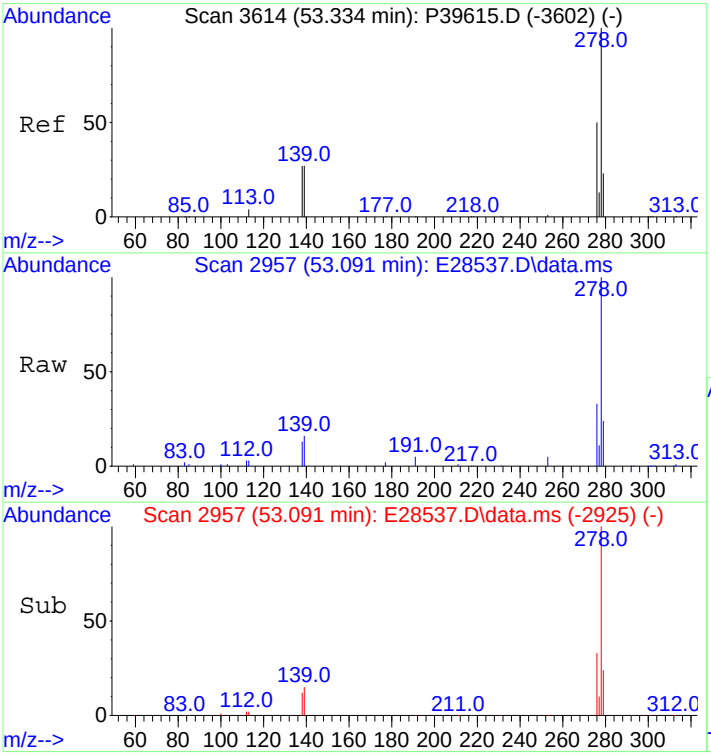


#91
Indeno[1,2,3-cd]pyrene
Concen: 509.02 ng/mL m
RT: 53.030 min Scan# 2953
Delta R.T. 0.000 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:276 Resp: 72058

Ion	Ratio	Lower	Upper
276	100		
138	29.7	15.4	23.2#
277	32.6	19.1	28.7#

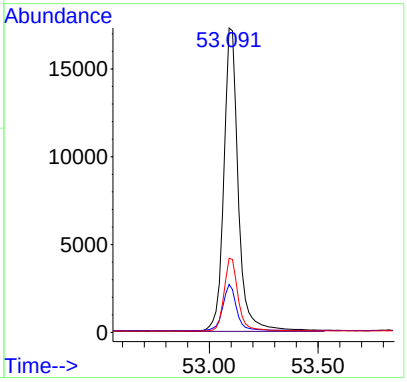


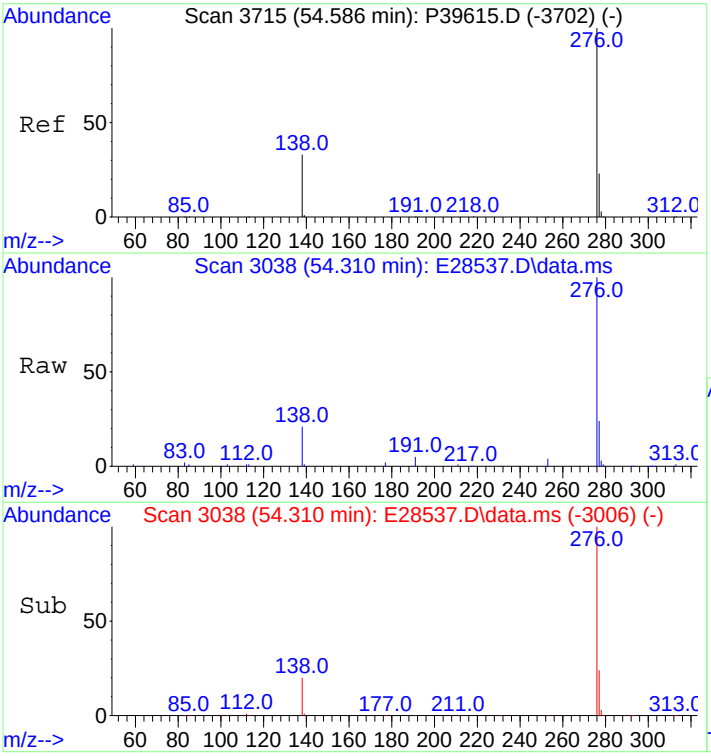


#92
Dibenz[ah]+[ac]anthracene
Concen: 533.21 ng/mL
RT: 53.091 min Scan# 2957
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:278 Resp: 80373

Ion	Ratio	Lower	Upper
278	100		
139	14.6	11.1	16.7
279	23.6	19.4	29.0

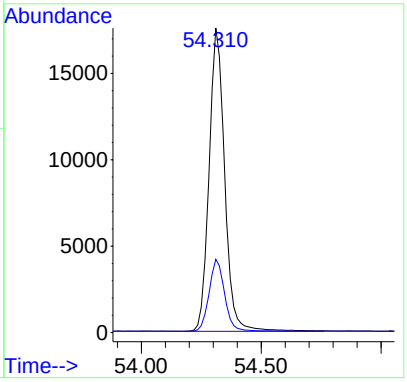




#93
Benzo[g,h,i]perylene
Concen: 519.83 ng/mL
RT: 54.310 min Scan# 3038
Delta R.T. -0.015 min
Lab File: E28537.D
Acq: 30 Oct 2012 7:19 am

Tgt Ion:276 Resp: 79347

Ion	Ratio	Lower	Upper
276	100		
277	23.6	19.1	28.7



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	22394	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	45130	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	40509	514.277	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.43%			
42) Phenanthrene-d10	32.085	188	38736	479.993	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.00%#			
83) Benzo[b]fluoranthene-d12	46.630	264	44824	483.498	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.35%#			
88) Benzo[a]pyrene-d12	47.774	264	43715	486.651	ng/mL	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.67%#			
129) 5B(H)Cholane - Surr	43.332	217	9128	513.191	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.32%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4605	257.074	ng/mL	100
4) cis-Decalin	17.091	138	3538	259.964	ng/mL	100
10) Naphthalene	19.304	128	49129	557.730	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	30072	536.007	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	29611	543.171	ng/mL#	100
18) Benzothiophene	19.515	134	40900	561.650	ng/mL	100
23) Biphenyl	23.881	154	38319	540.420	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	26701	528.002	ng/mL#	100
25) Dibenzofuran	26.967	168	43064	548.580	ng/mL	97
26) Acenaphthylene	25.582	152	48407M3	551.188	ng/mL	
27) Acenaphthene	26.320	153	30245	535.018	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	24255	512.652	ng/mL	96
29) Fluorene	28.352	166	33635	533.470	ng/mL	98
33) Dibenzothiophene	31.664	184	46858	541.577	ng/mL	98
43) Phenanthrene	32.161	178	47604	540.795	ng/mL	99
54) Retene	39.192	234	13249	467.736	ng/mL	88
55) Anthracene	32.356	178	45383M3	596.473	ng/mL	
56) Carbazole	33.034	167	42309	540.306	ng/mL	99
57) 1-Methylphenanthrene	34.690	192	34717	516.956	ng/mL	99
58) Fluoranthene	36.963	202	51557	530.359	ng/mL	98
59) Benzo(b)fluorene	39.493	216	33310	514.225	ng/mL	99
60) Pyrene	37.837	202	51369	519.891	ng/mL	98
66) Naphthobenzothiophene	41.706	234	50698	520.232	ng/ml	98
67) Naphthobenzothiophene-2,1	41.706	234	50698	520.232	ng/mL	98
75) Benz[a]anthracene	42.640	228	48820	555.517	ng/mL	99
76) Chrysene	42.805	228	49206	543.856	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	49206	543.856	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	55487	543.200	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.796	252	57848	550.446	ng/mL	95
87) Benzo[e]pyrene	47.684	252	53477	536.162	ng/mL	93
89) Benzo[a]pyrene	47.865	252	51512	539.740	ng/mL	93
90) Perylene	48.166	252	55381	548.759	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.518	276	68575M3	610.538	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.579	278	67308	562.797	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	66993	553.169	ng/mL	100
94) Hopane (T19)	51.630	191	16129	476.210	ng/mL#	83
95) 17a(H),21B(H)-hopane - C3	51.630	191	16129	476.210	ng/mL#	83

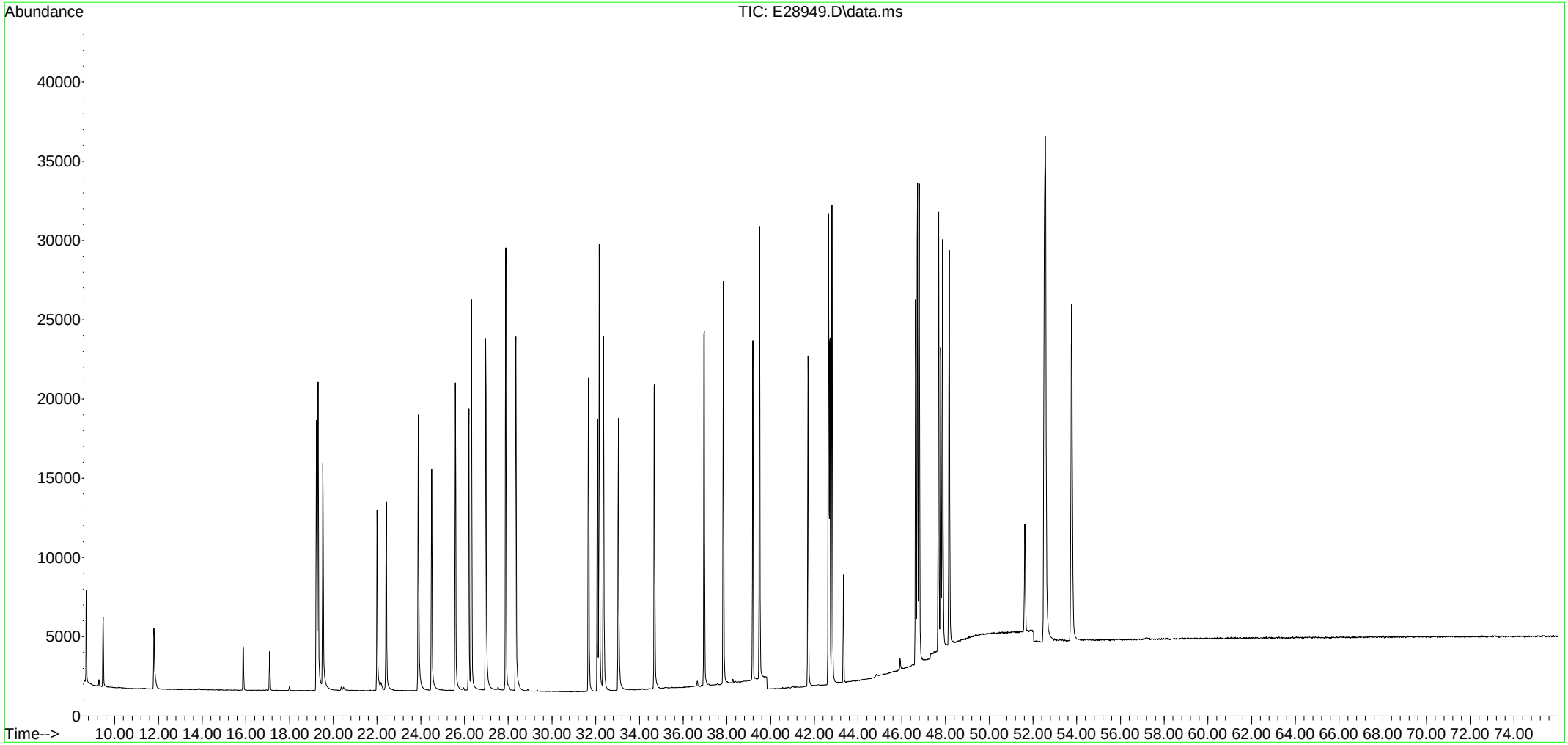
(#) = qualifier out of range (m) = manual integration (+) = signals summed

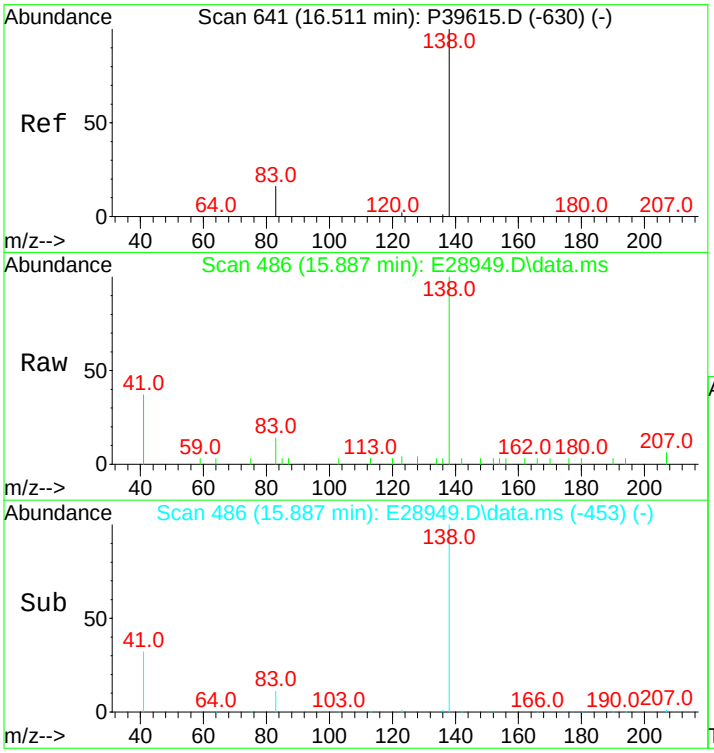
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28949.D
Acq On : 14 Nov 2012 4:50 am
Operator : AC
Sample : C211131202
Misc : CC WHAQ80 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 15 15:03:20 2012
Quant Method : C:\msdchem\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 05:48:37 2012
Response via : Initial Calibration

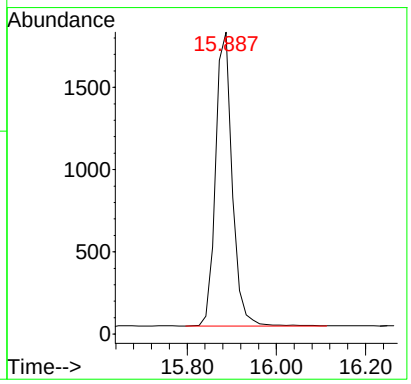
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

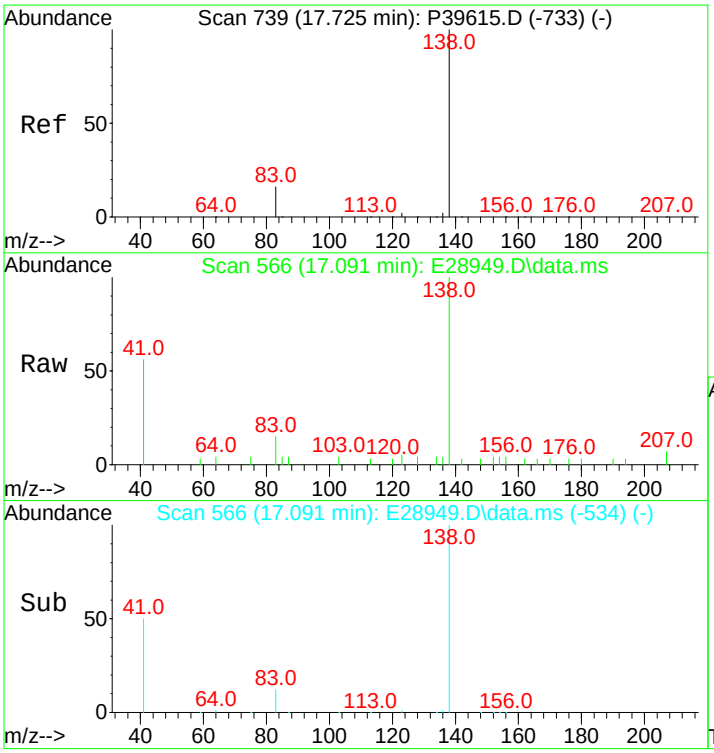




#3
trans-Decalin
Concen: 257.07 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

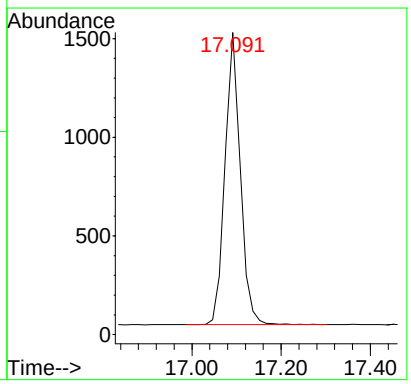
Tgt Ion:138 Resp: 4605

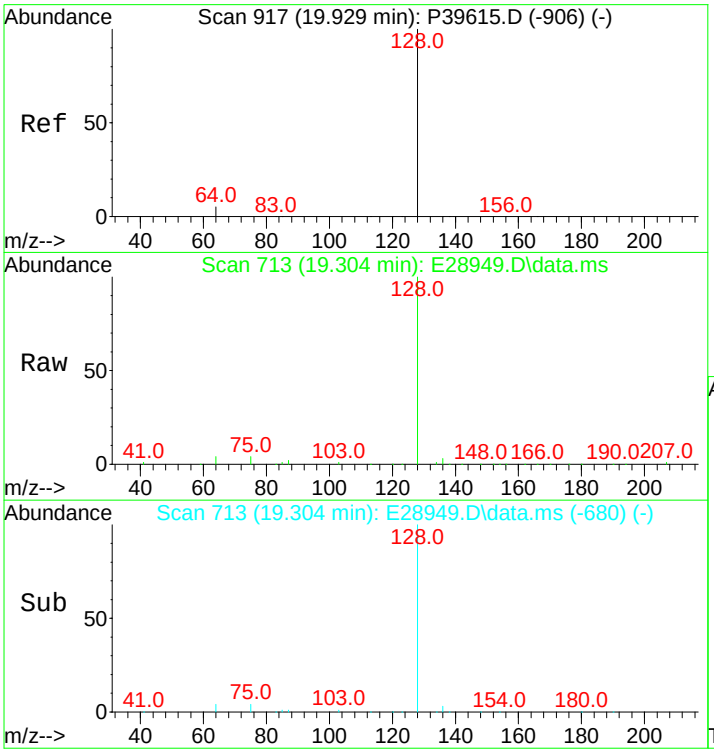




#4
cis-Decalin
Concen: 259.96 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:138 Resp: 3538

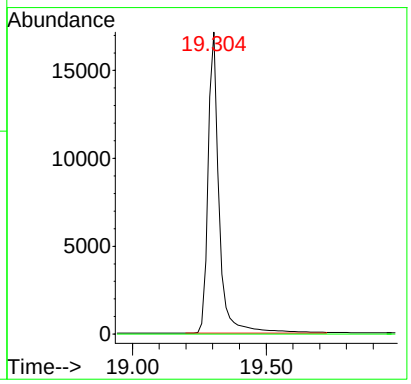


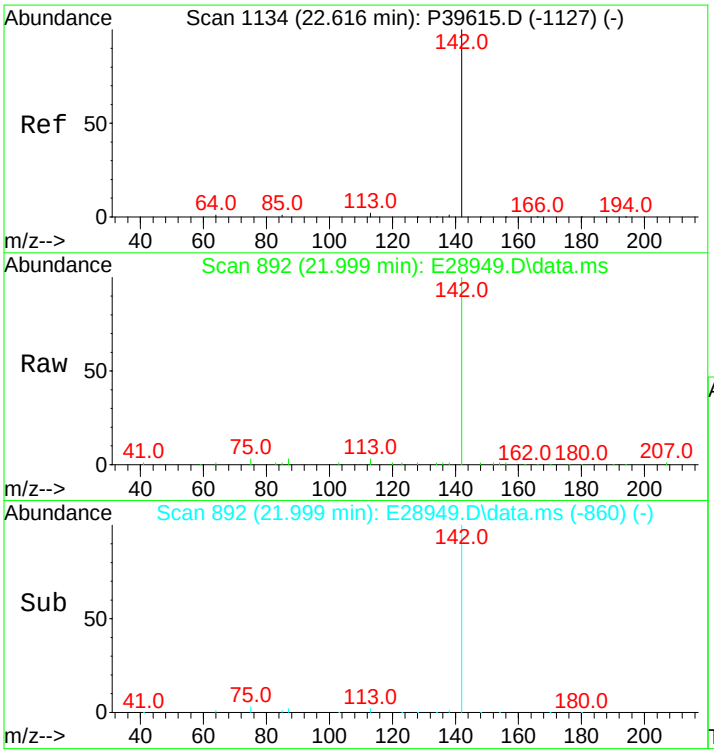


#10
Naphthalene
Concen: 557.73 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:128 Resp: 49129

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

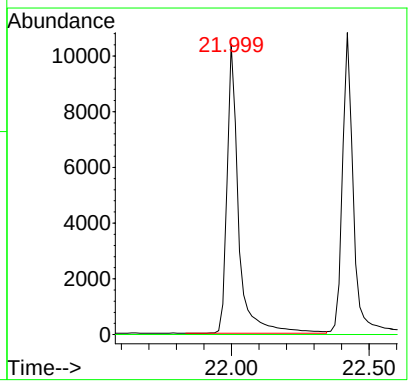


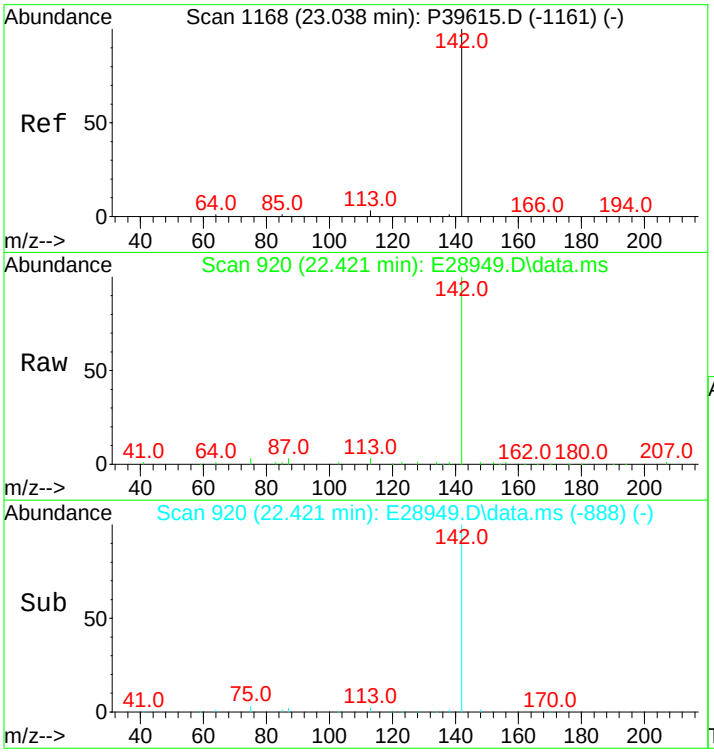


#16
2-Methylnaphthalene
Concen: 536.01 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:142 Resp: 30072

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

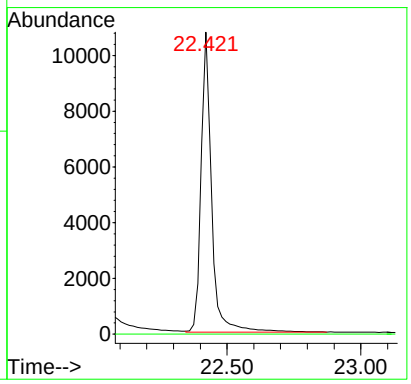


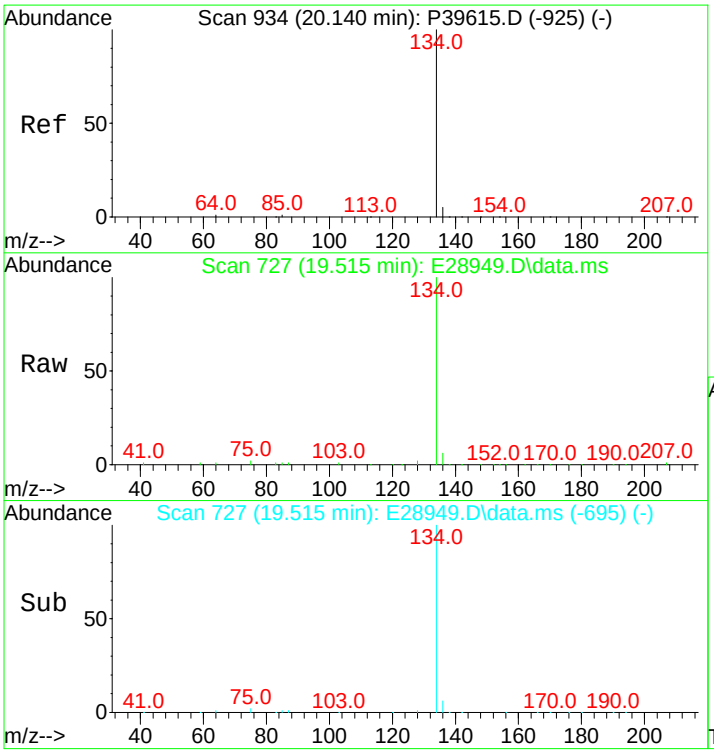


#17
1-Methylnaphthalene
Concen: 543.17 ng/mL
RT: 22.421 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:142 Resp: 29611

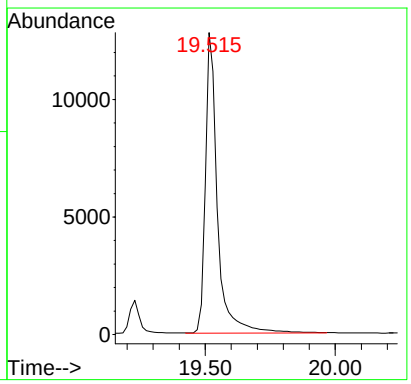
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

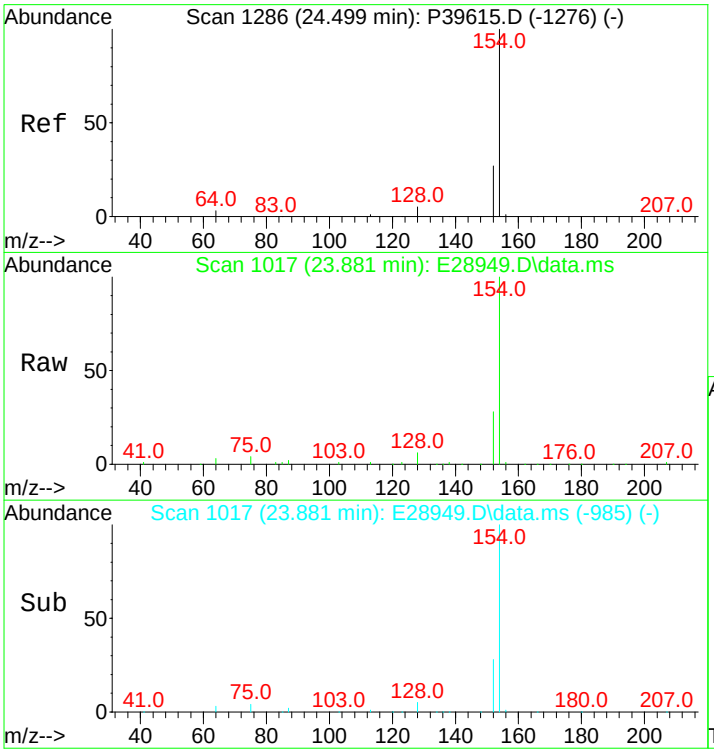




#18
Benzothiophene
Concen: 561.65 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:134 Resp: 40900

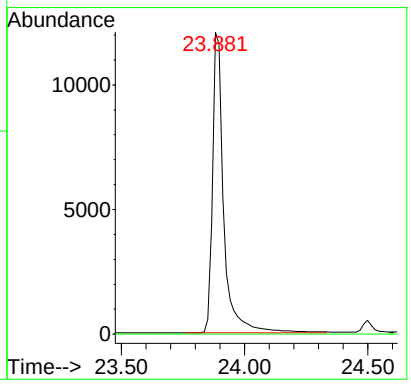


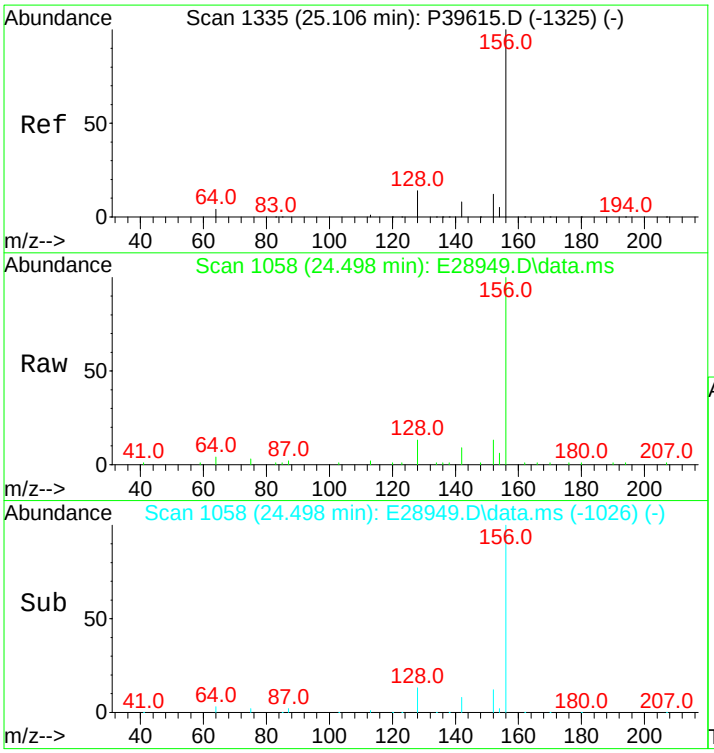


#23
Biphenyl
Concen: 540.42 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:154 Resp: 38319

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

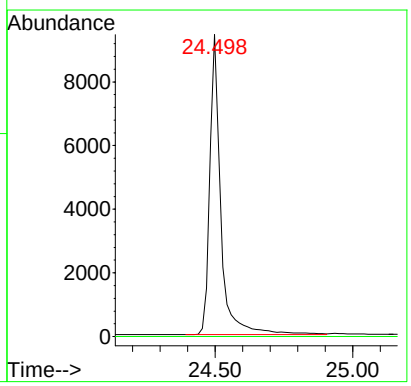


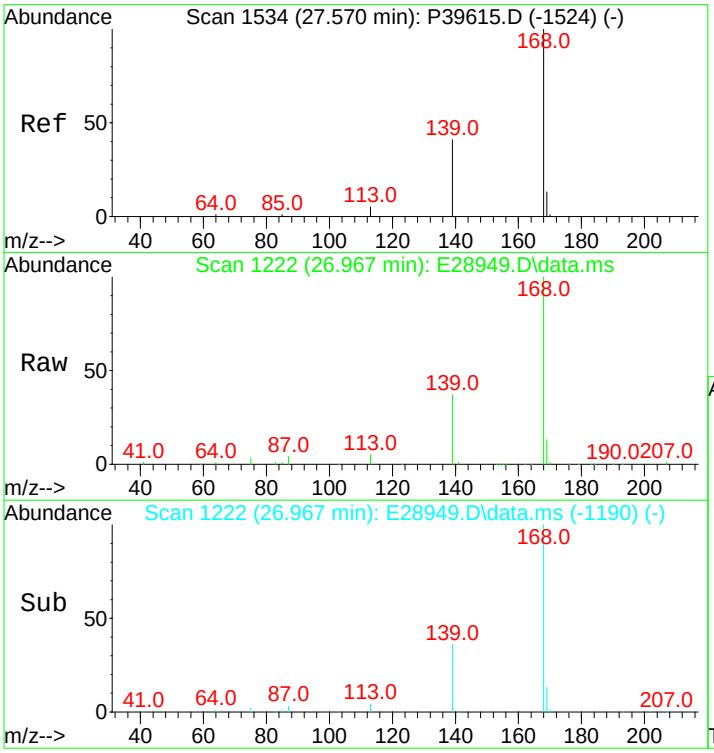


#24
2,6-Dimethylnaphthalene
Concen: 528.00 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:156 Resp: 26701

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

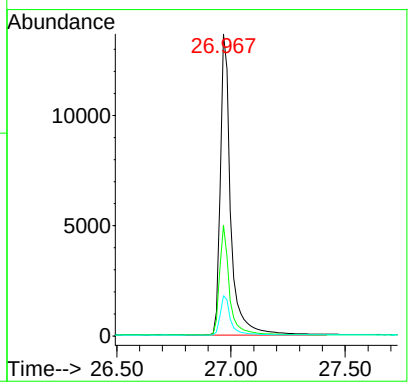


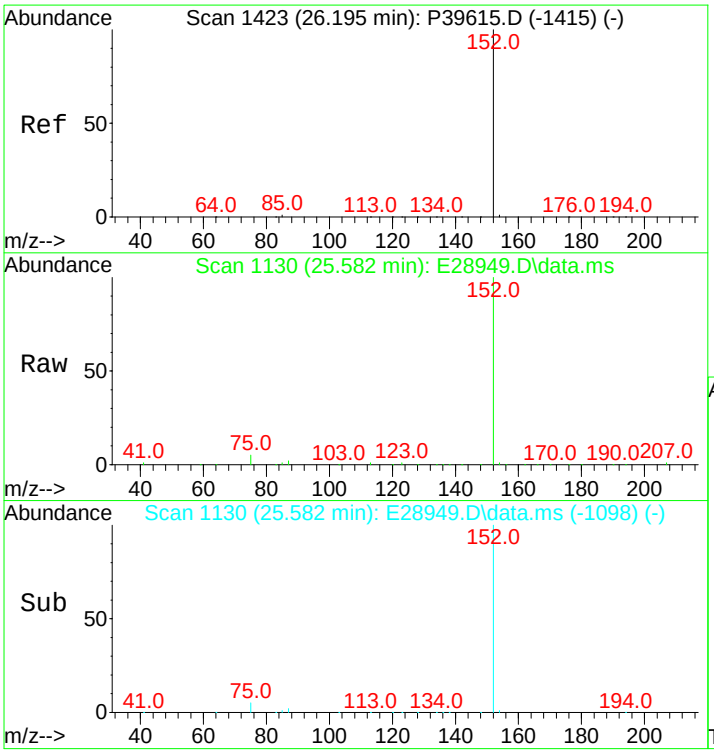


#25
Dibenzofuran
Concen: 548.58 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:168 Resp: 43064

Ion	Ratio	Lower	Upper
168	100		
139	35.1	26.0	39.0
169	13.1	10.6	16.0

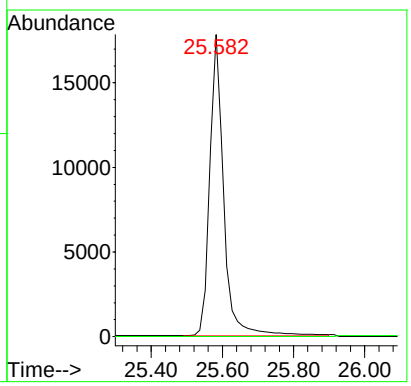


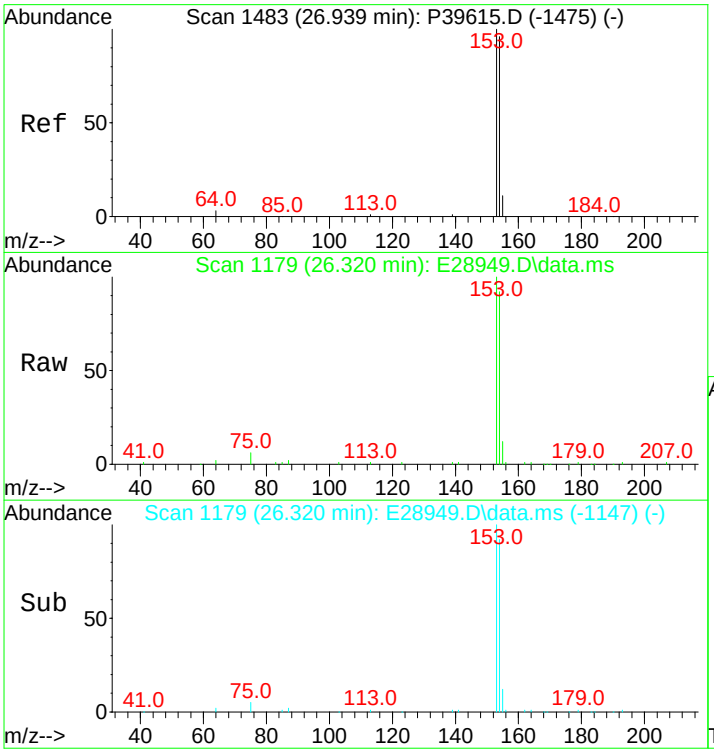


#26
Acenaphthylene
Concen: 551.19 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:152 Resp: 48407

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

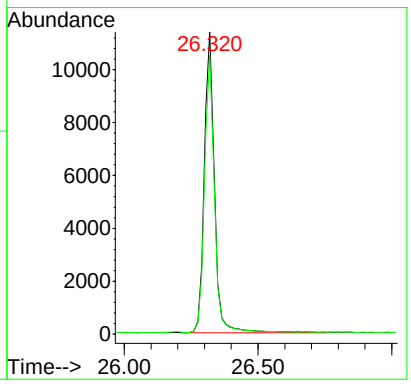


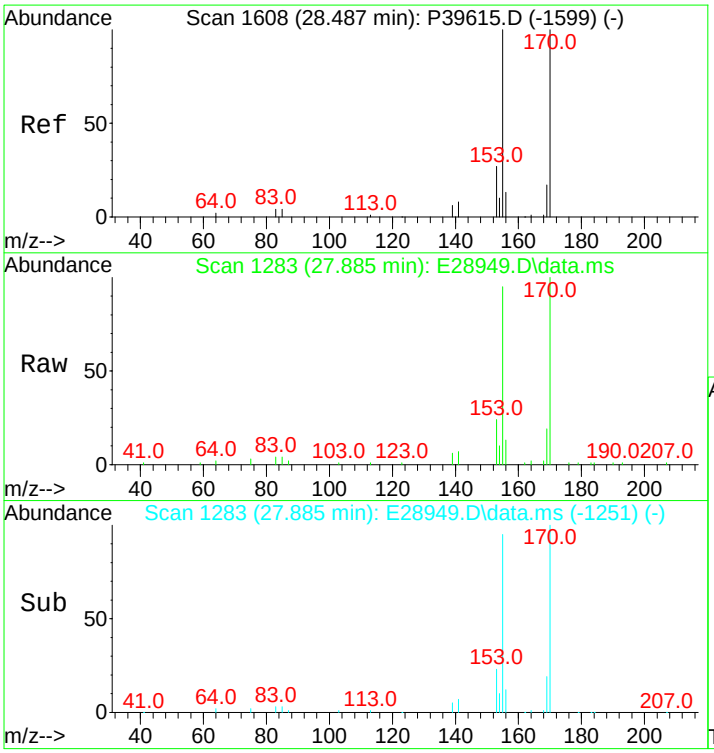


#27
Acenaphthene
Concen: 535.02 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:153 Resp: 30245

Ion	Ratio	Lower	Upper
153	100		
154	90.5	74.1	111.1

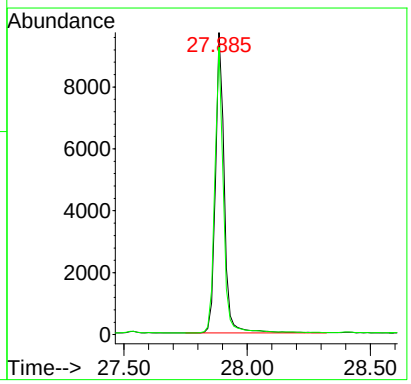


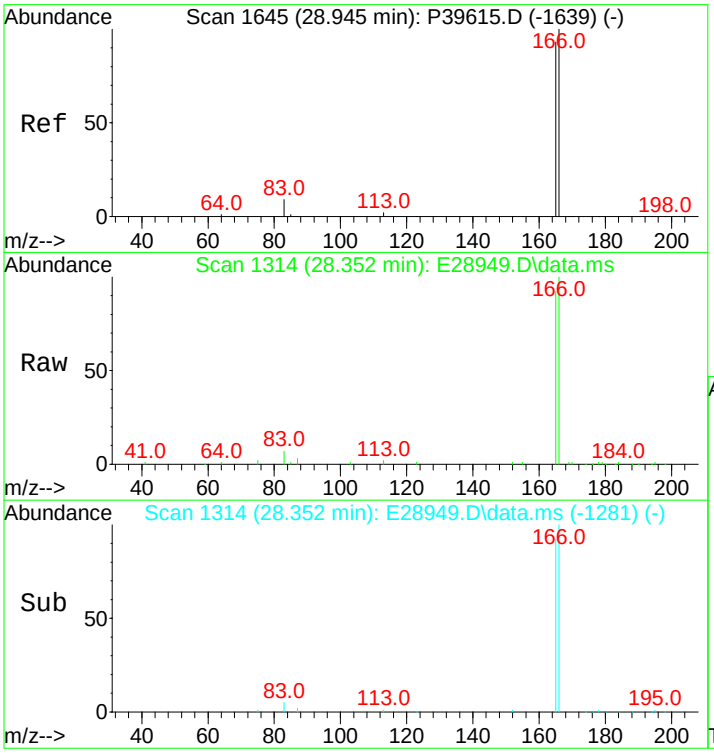


#28
2,3,5-Trimethylnaphthalene
Concen: 512.65 ng/mL
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:170 Resp: 24255

Ion	Ratio	Lower	Upper
170	100		
155	92.4	70.7	106.1

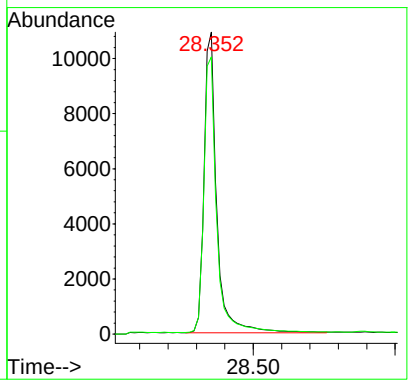


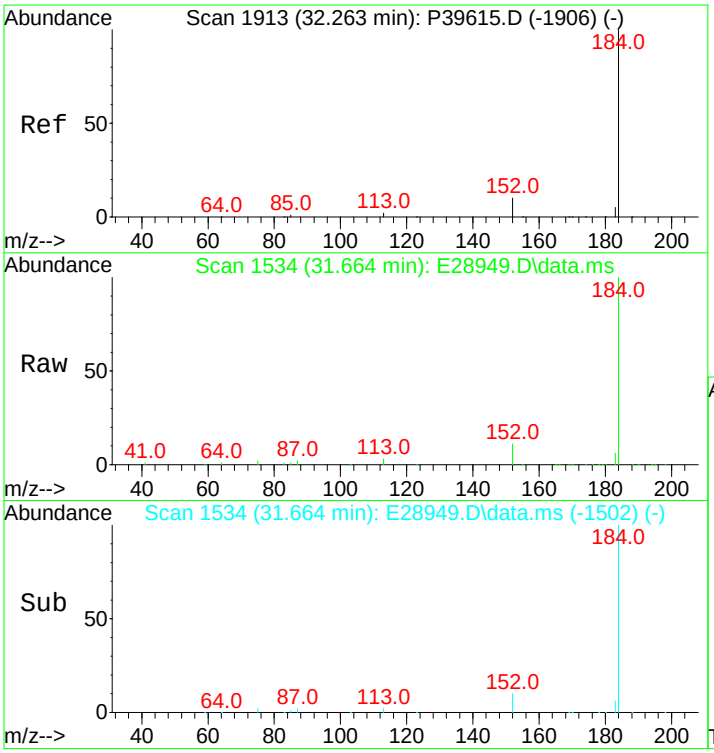


#29
Fluorene
Concen: 533.47 ng/mL
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:166 Resp: 33635

Ion	Ratio	Lower	Upper
166	100		
165	95.1	74.7	112.1

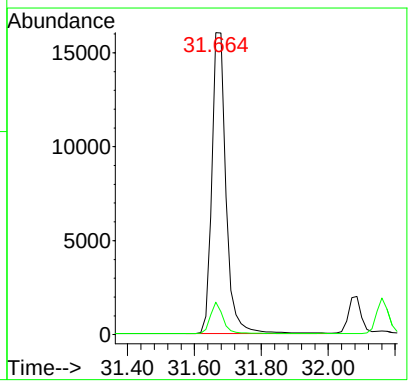


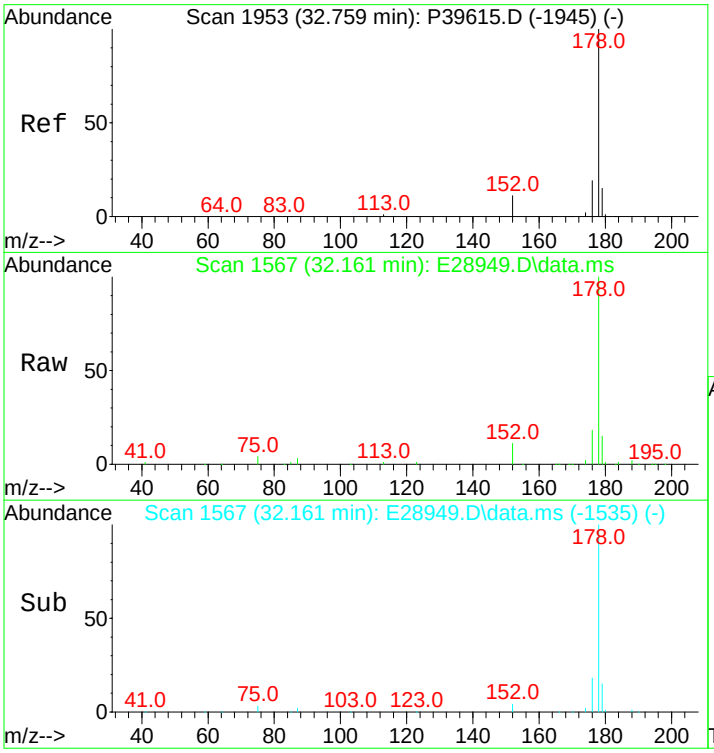


#33
Dibenzothiophene
Concen: 541.58 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:184 Resp: 46858

Ion	Ratio	Lower	Upper
184	100		
152	9.3	7.0	10.6

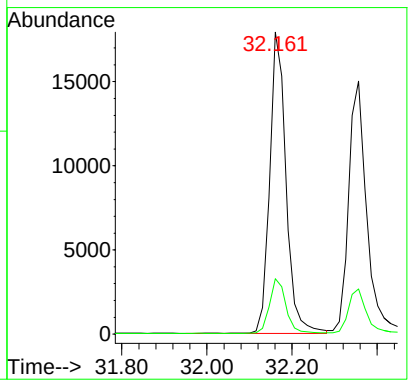


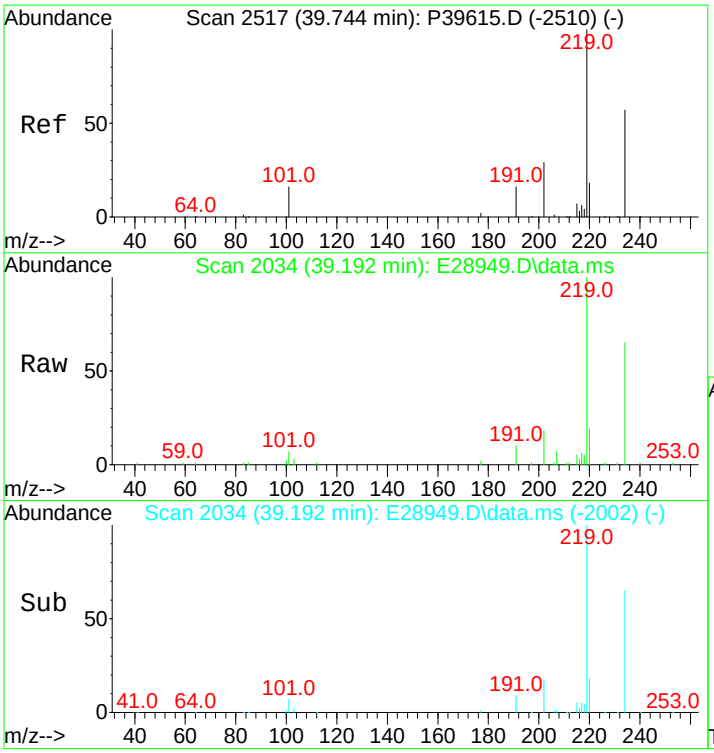


#43
Phenanthrene
Concen: 540.79 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:178 Resp: 47604

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.4

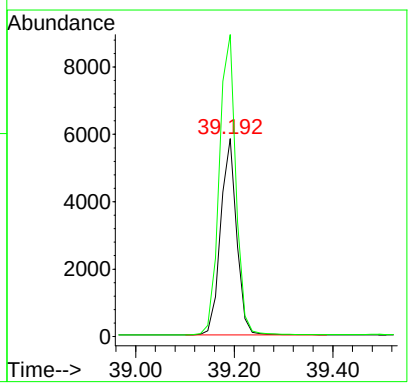


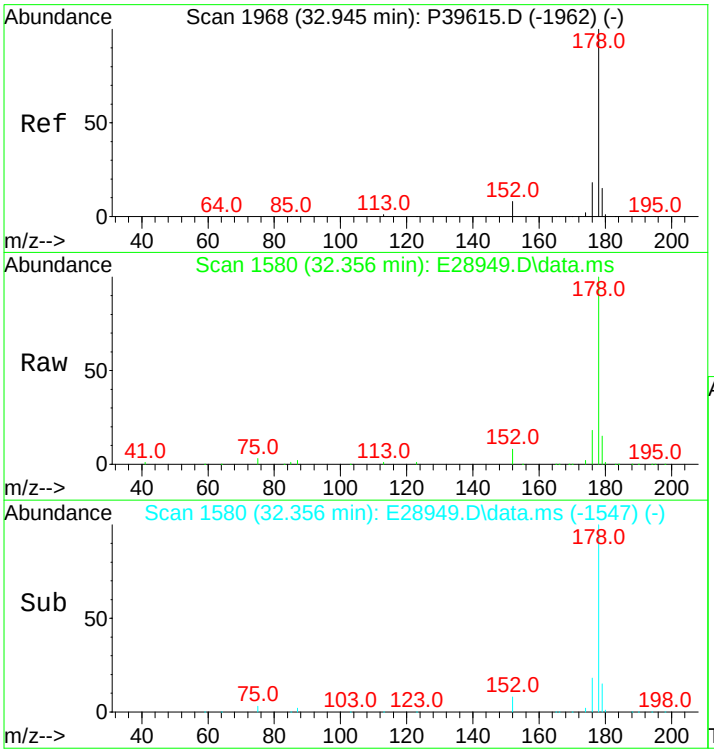


#54
Retene
Concen: 467.74 ng/mL
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:234 Resp: 13249

Ion	Ratio	Lower	Upper
234	100		
219	158.9	115.3	172.9

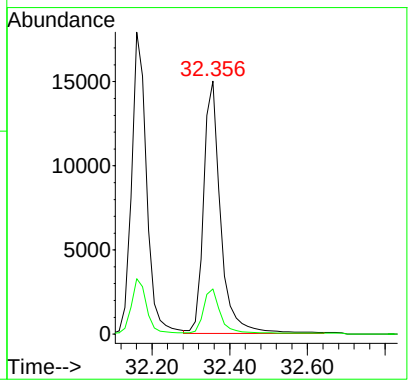


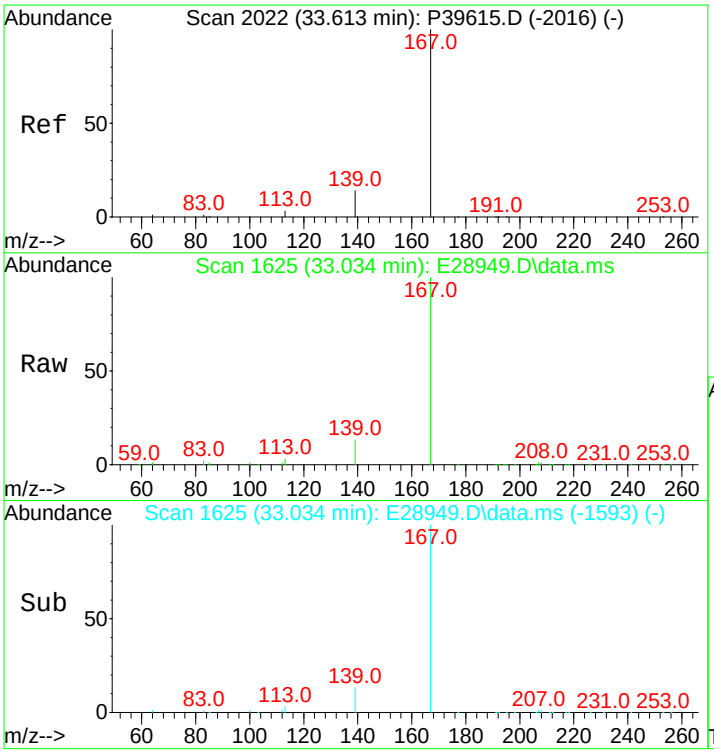


#55
Anthracene
Concen: 596.47 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:178 Resp: 45383

Ion	Ratio	Lower	Upper
178	100		
176	17.3	14.3	21.5

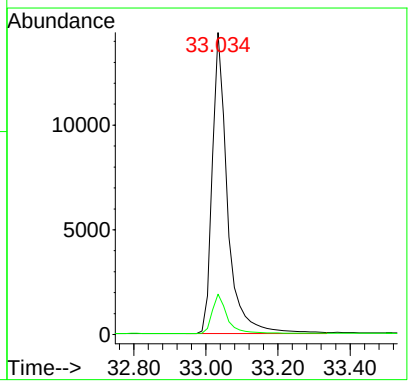


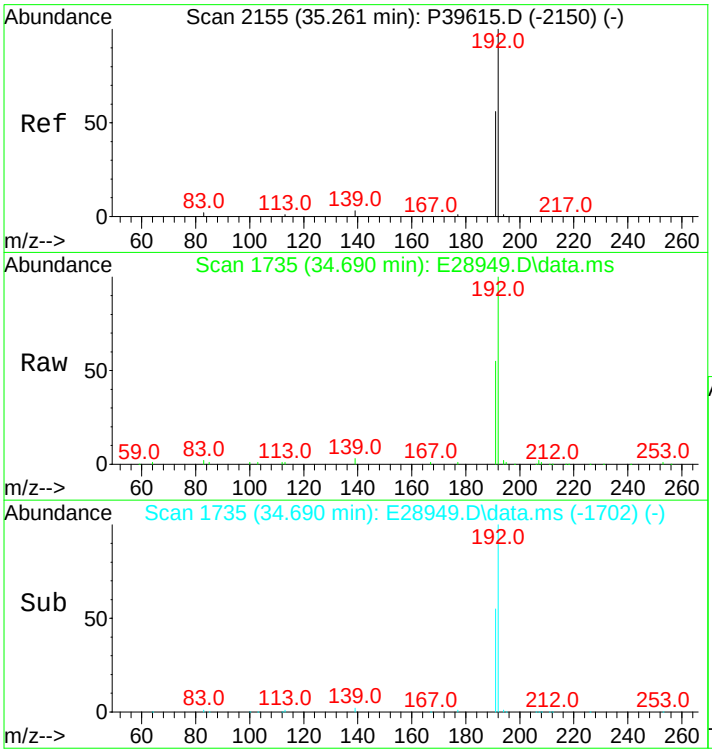


#56
Carbazole
Concen: 540.31 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:167 Resp: 42309

Ion	Ratio	Lower	Upper
167	100		
139	12.9	10.1	15.1

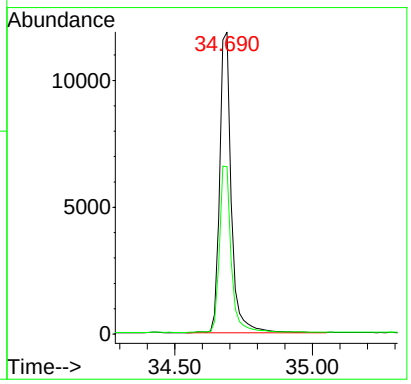


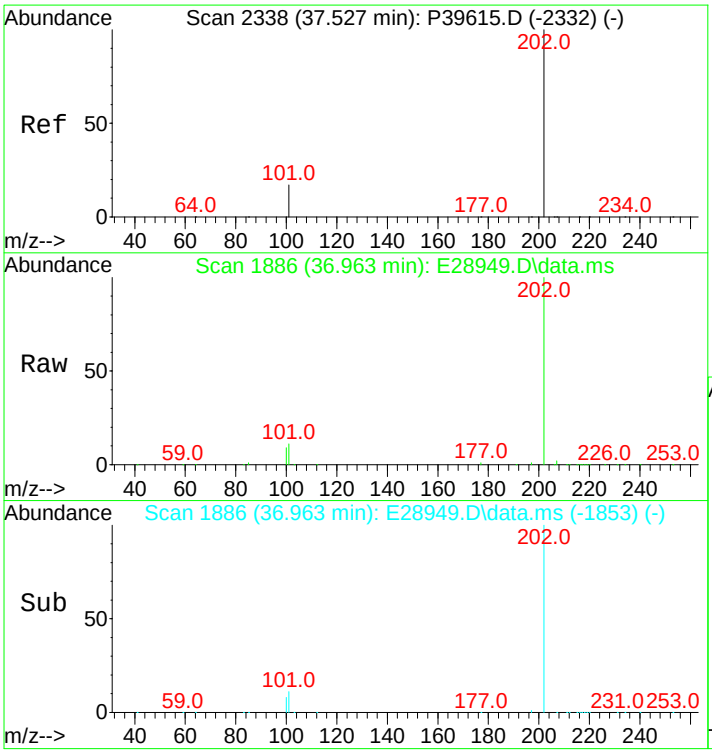


#57
1-Methylphenanthrene
Concen: 516.96 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:192 Resp: 34717

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

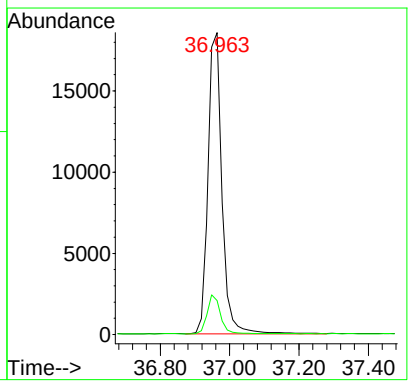


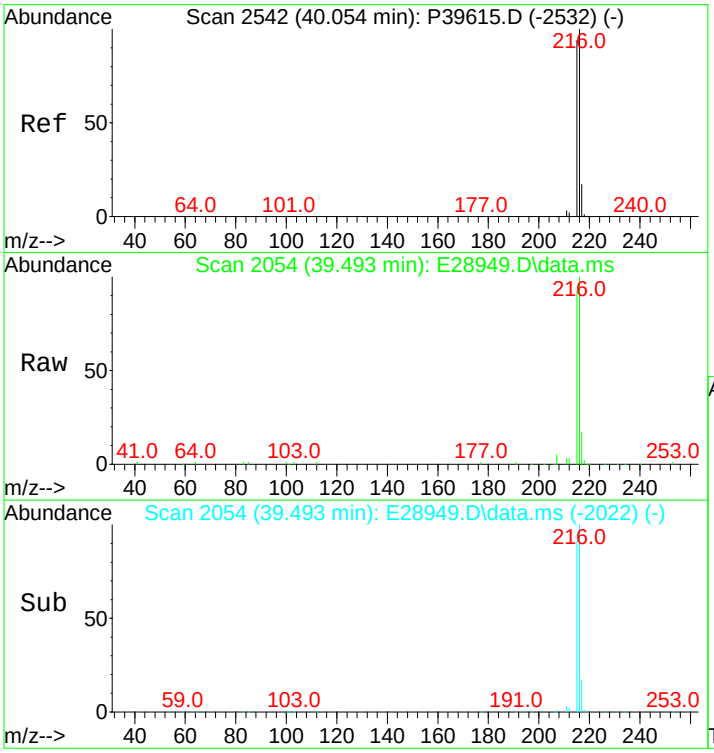


#58
Fluoranthene
Concen: 530.36 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:202 Resp: 51557

Ion	Ratio	Lower	Upper
202	100		
101	12.3	10.4	15.6

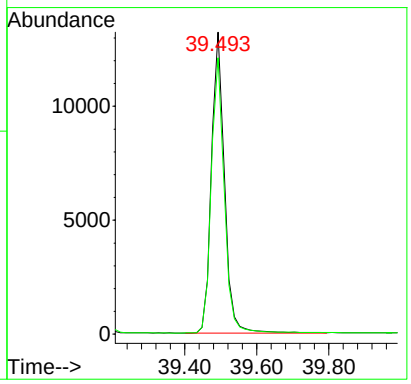


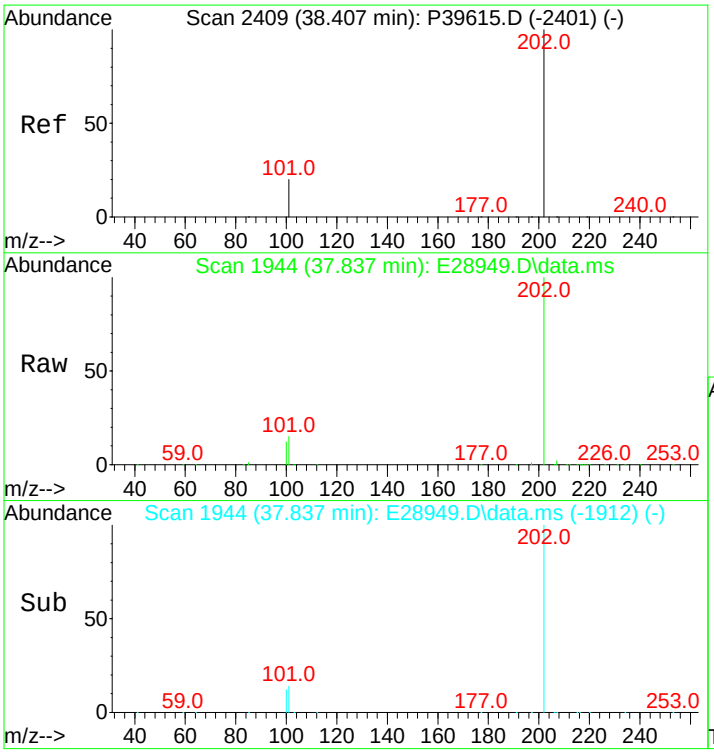


#59
Benzo(b)fluorene
Concen: 514.23 ng/mL
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:216 Resp: 33310

Ion	Ratio	Lower	Upper
216	100		
215	92.2	72.6	109.0

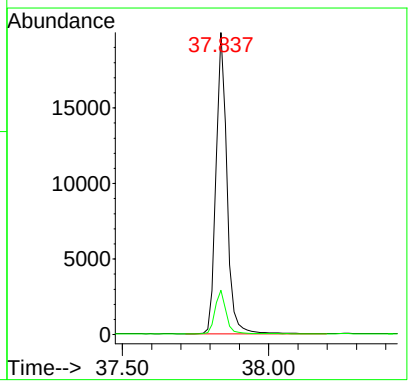


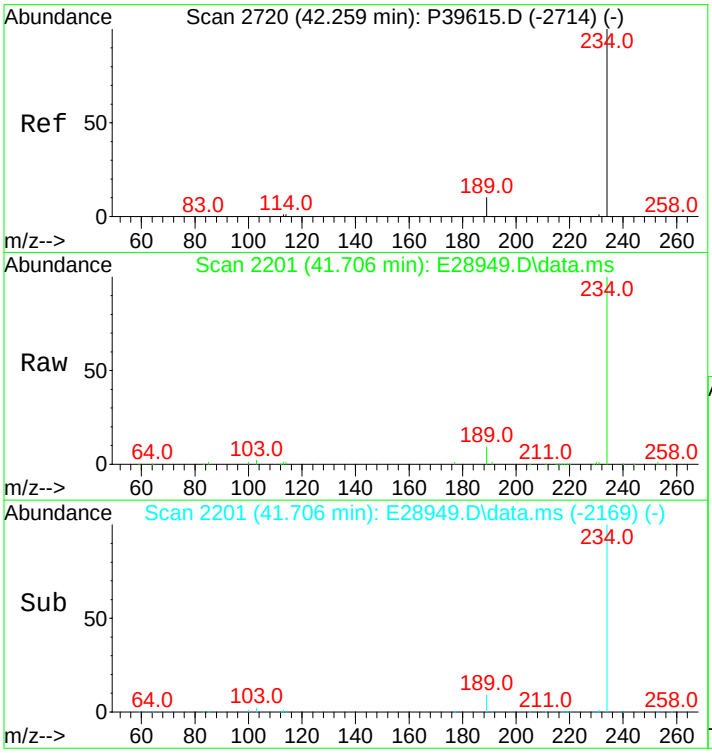


#60
Pyrene
Concen: 519.89 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:202 Resp: 51369

Ion	Ratio	Lower	Upper
202	100		
101	14.5	11.0	16.4

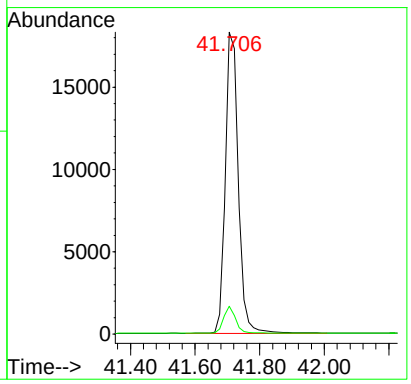


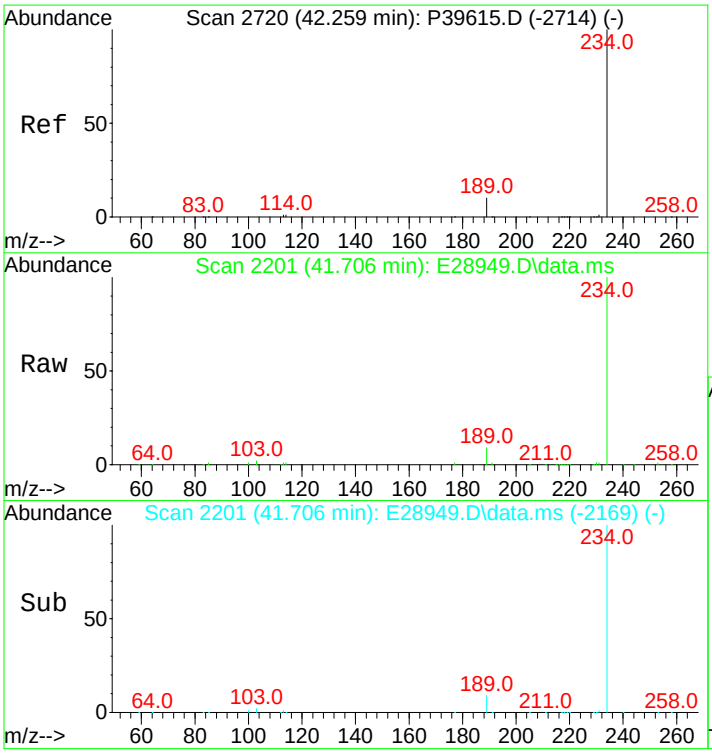


#66
Naphthobenzothiophene
Concen: 520.23 ng/ml
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:234 Resp: 50698

Ion	Ratio	Lower	Upper
234	100		
189	8.3	6.2	9.2

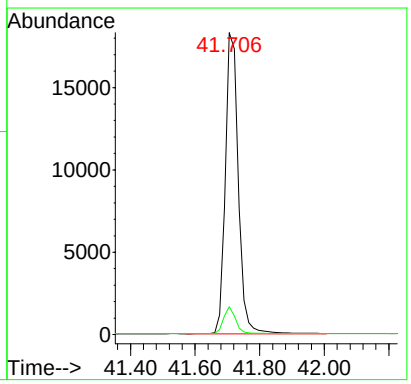


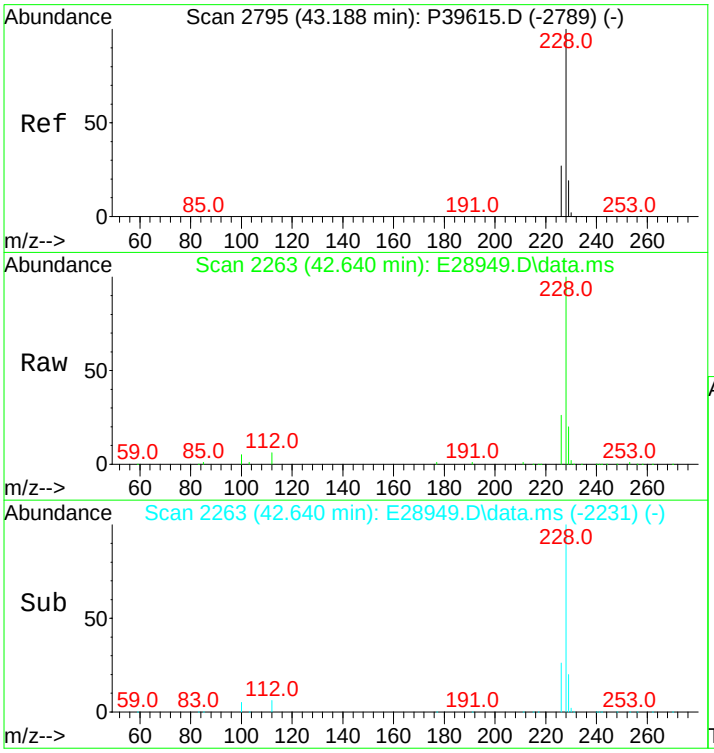


#67
Naphthobenzothiophene-2,1-D
Concen: 520.23 ng/mL
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:234 Resp: 50698

Ion	Ratio	Lower	Upper
234	100		
189	8.3	6.2	9.2

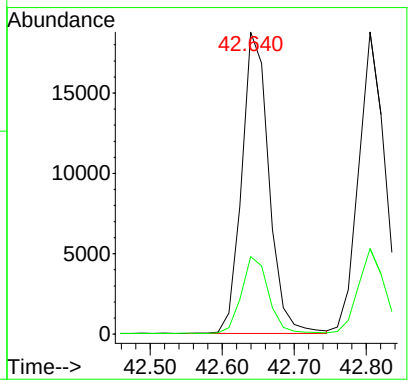


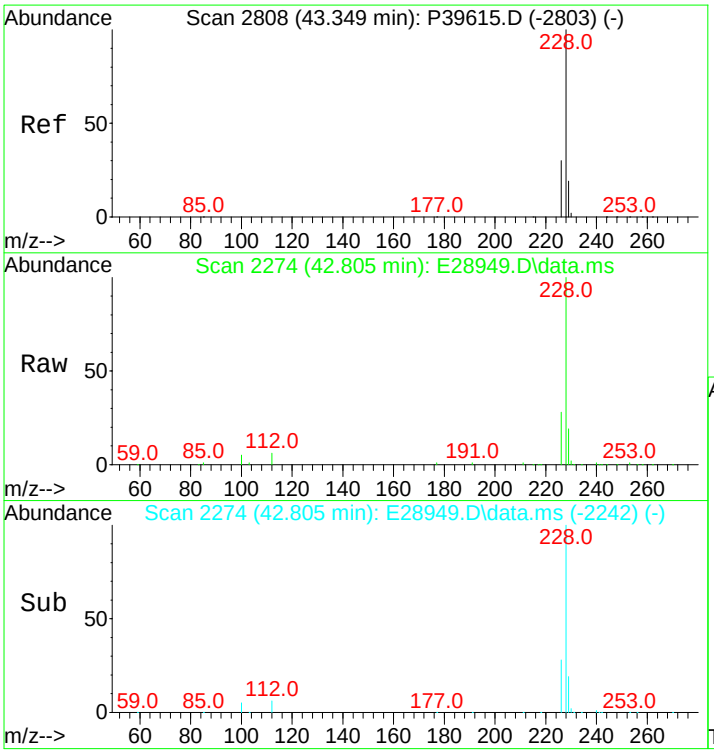


#75
Benz[a]anthracene
Concen: 555.52 ng/mL
RT: 42.640 min Scan# 2263
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:228 Resp: 48820

Ion	Ratio	Lower	Upper
228	100		
226	25.4	20.7	31.1

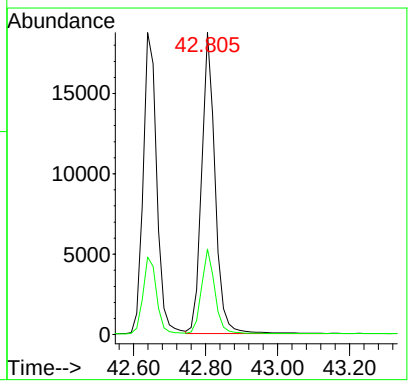


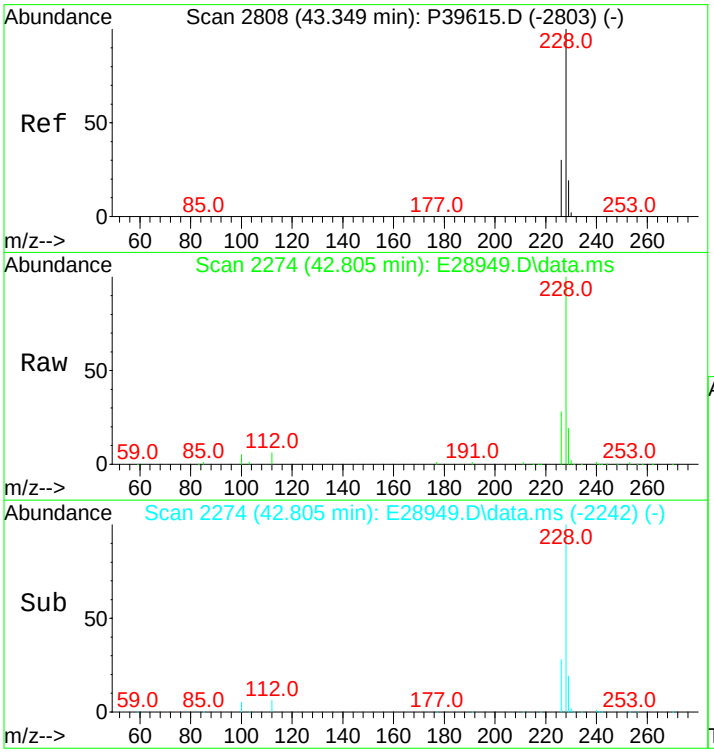


#76
Chrysene
Concen: 543.86 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:228 Resp: 49206

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

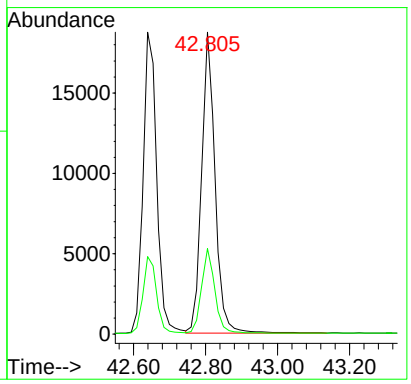


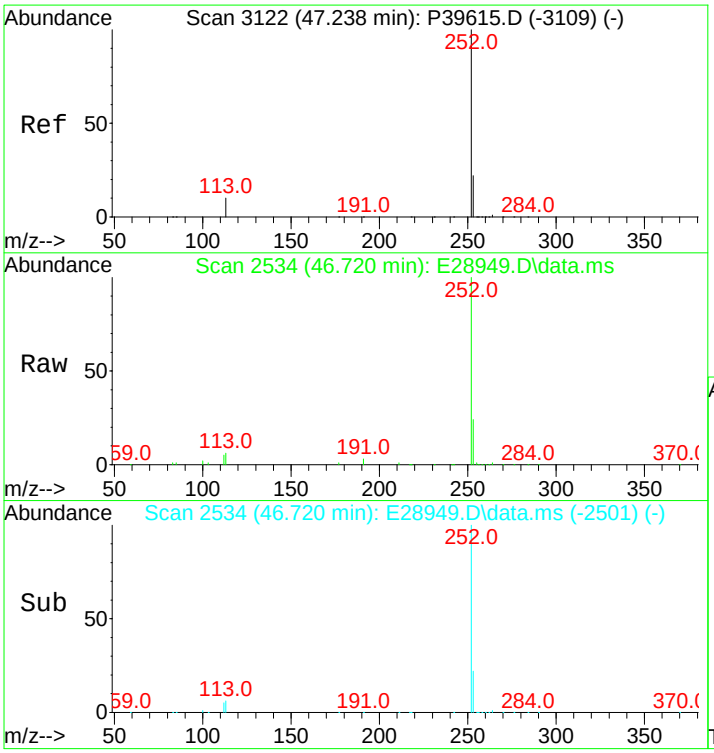


#77
Chrysene/Triphenylene
Concen: 543.86 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:228 Resp: 49206

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

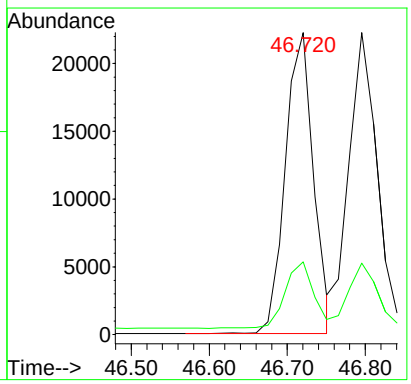


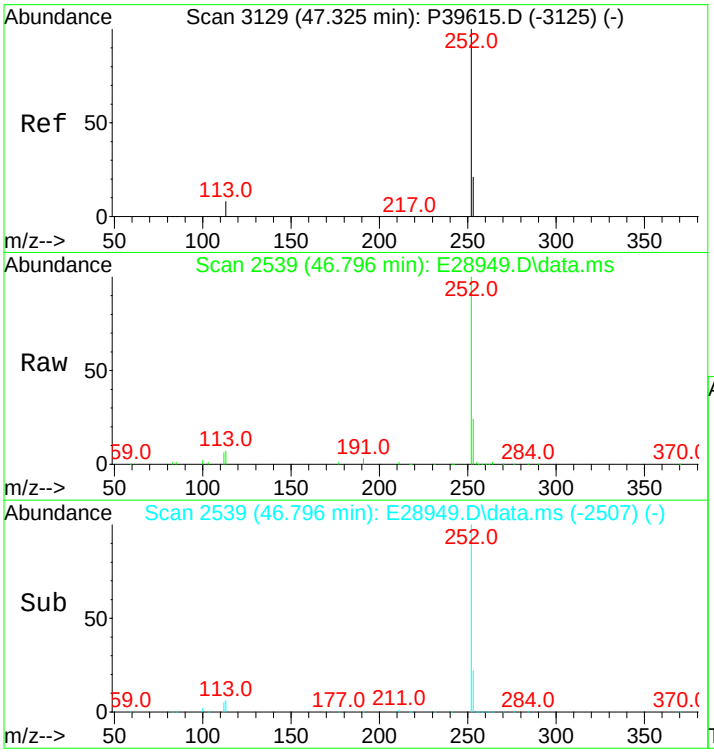


#84
Benzo[b]fluoranthene
Concen: 543.20 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 55487

Ion	Ratio	Lower	Upper
252	100		
253	22.4	19.5	29.3

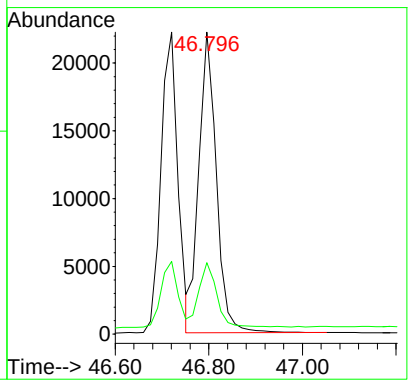


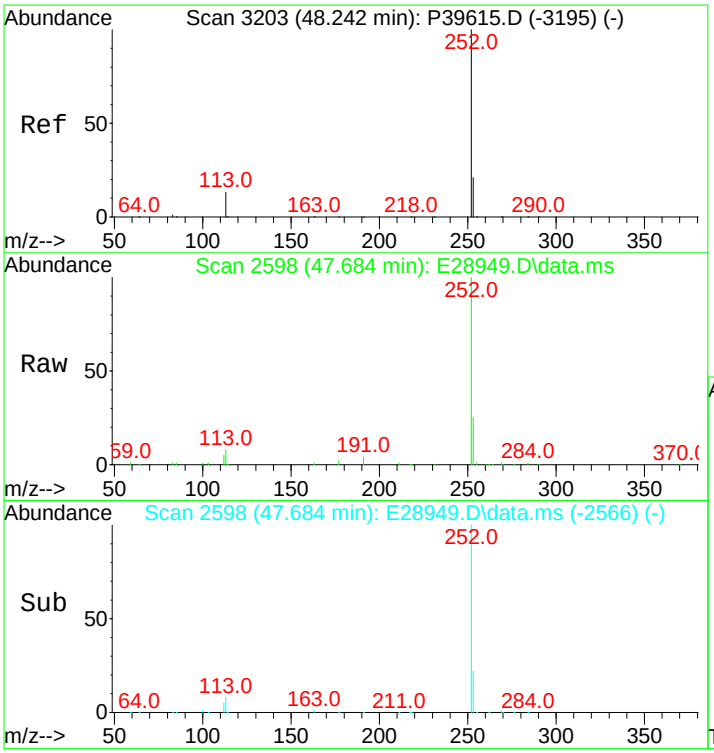


#85
Benzo[j]+[k]fluoranthene
Concen: 550.45 ng/mL
RT: 46.796 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 57848

Ion	Ratio	Lower	Upper
252	100		
253	22.0	19.7	29.5

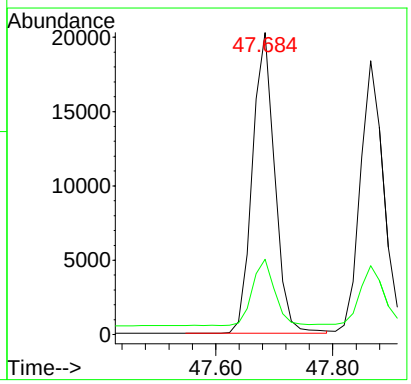


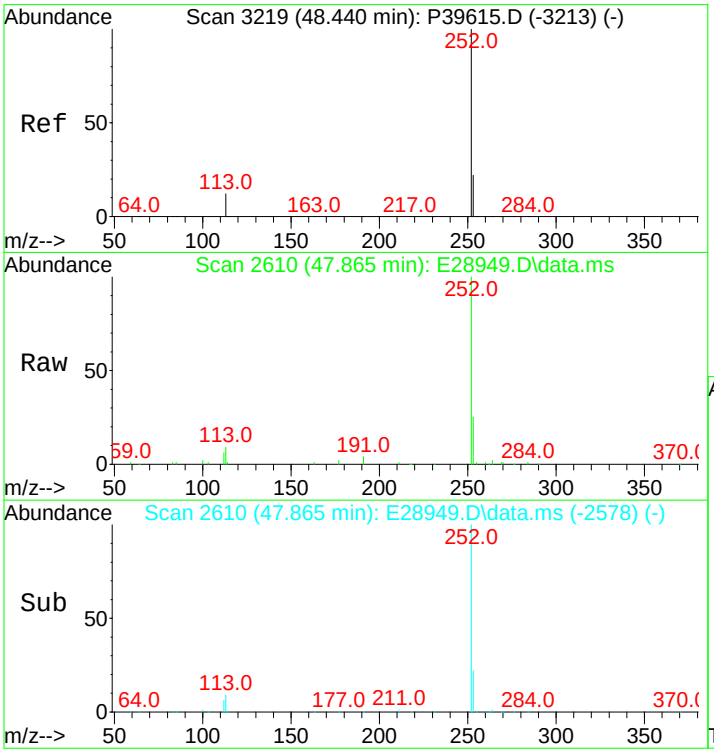


#87
Benzo[e]pyrene
Concen: 536.16 ng/mL
RT: 47.684 min Scan# 2598
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 53477

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.6	31.0

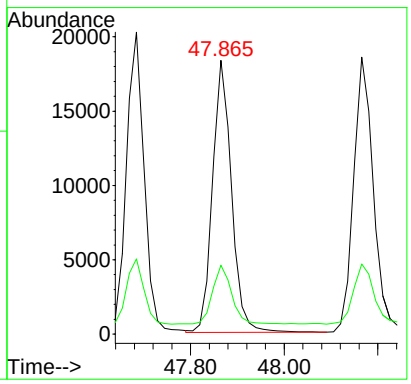


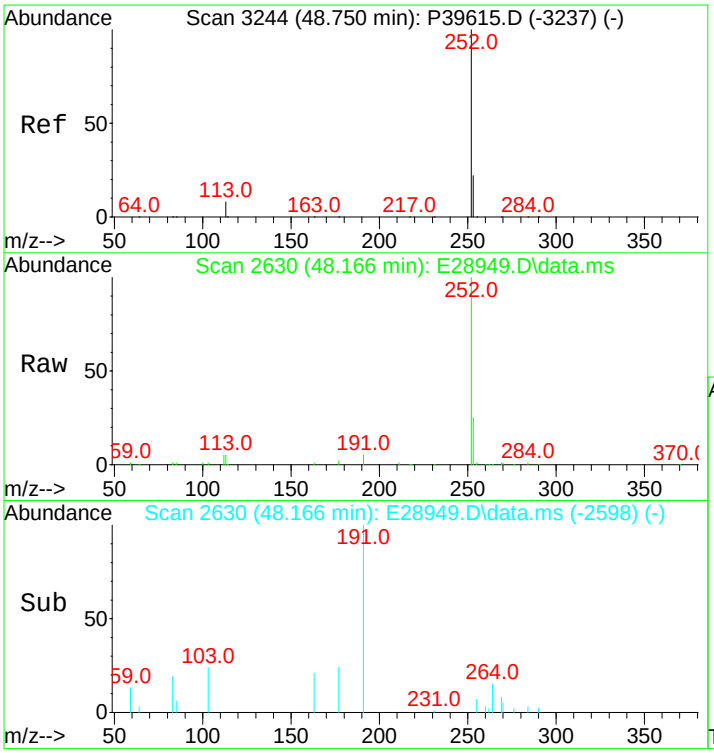


#89
Benzo[a]pyrene
Concen: 539.74 ng/mL
RT: 47.865 min Scan# 2610
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 51512

Ion	Ratio	Lower	Upper
252	100		
253	22.3	20.8	31.2

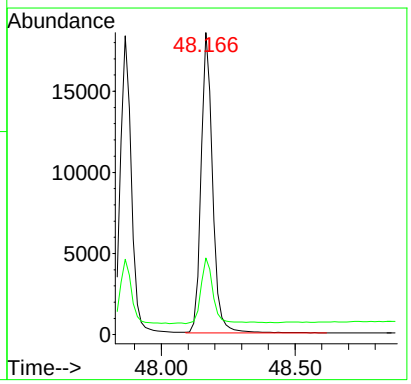


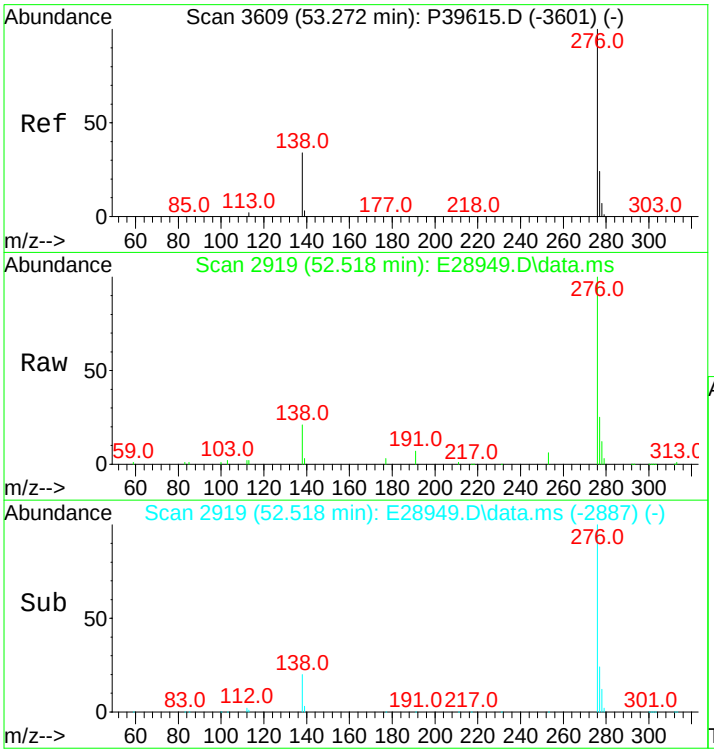


#90
Perylene
Concen: 548.76 ng/mL
RT: 48.166 min Scan# 2630
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:252 Resp: 55381

Ion	Ratio	Lower	Upper
252	100		
253	22.7	20.7	31.1

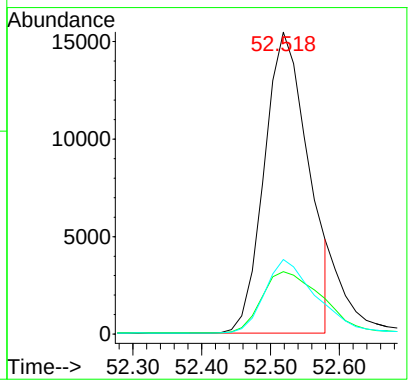


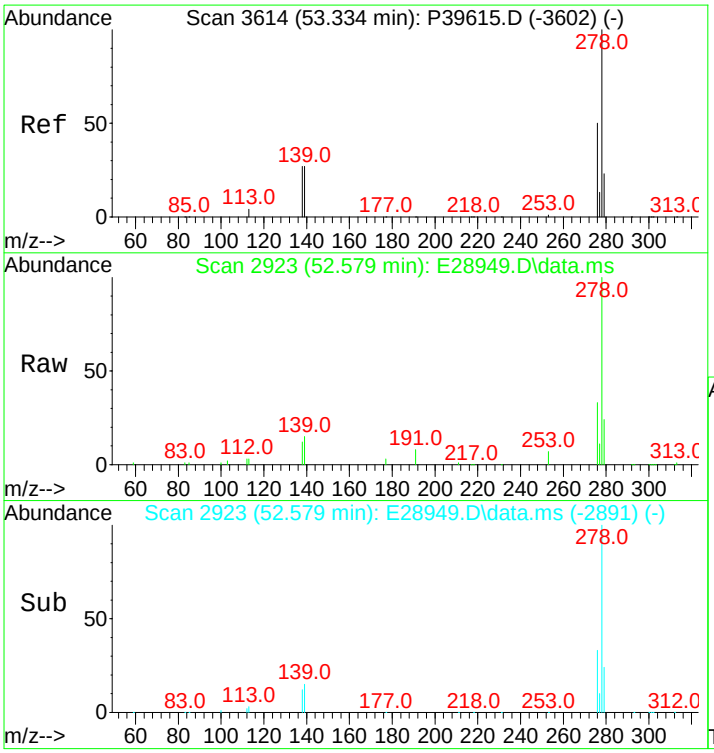


#91
Indeno[1,2,3-cd]pyrene
Concen: 610.54 ng/mL m
RT: 52.518 min Scan# 2919
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:276 Resp: 68575

Ion	Ratio	Lower	Upper
276	100		
138	28.6	16.3	24.5#
277	29.1	19.4	29.2

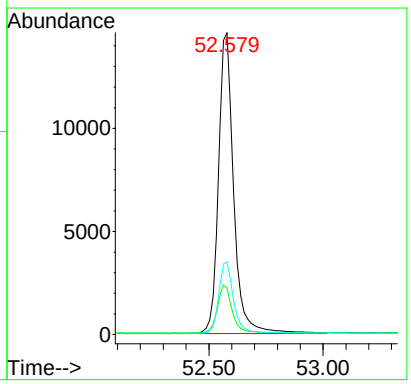


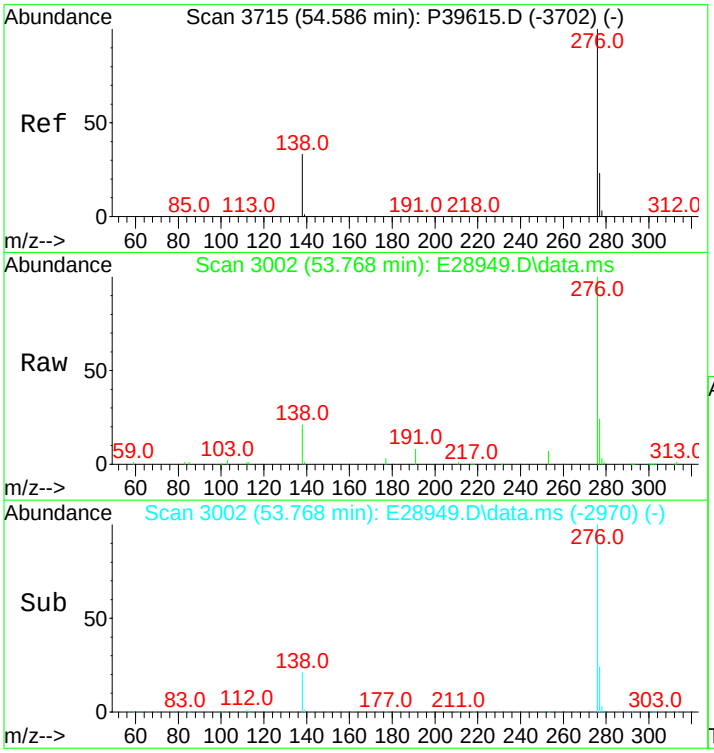


#92
Dibenz[ah]+[ac]anthracene
Concen: 562.80 ng/mL
RT: 52.579 min Scan# 2923
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:278 Resp: 67308

Ion	Ratio	Lower	Upper
278	100		
139	15.7	11.6	17.4
279	23.2	19.3	28.9

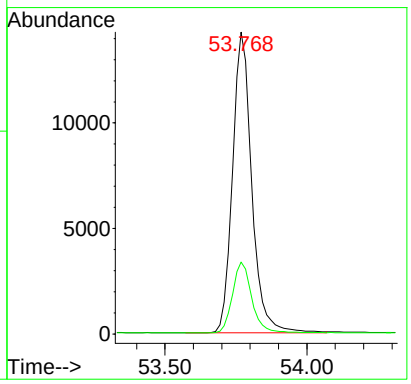


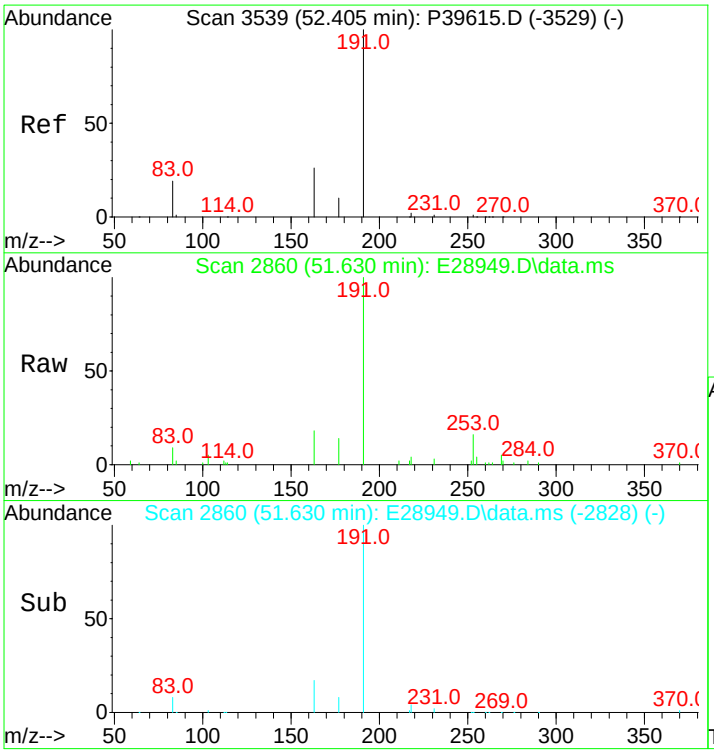


#93
Benzo[g,h,i]perylene
Concen: 553.17 ng/mL
RT: 53.768 min Scan# 3002
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:276 Resp: 66993

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

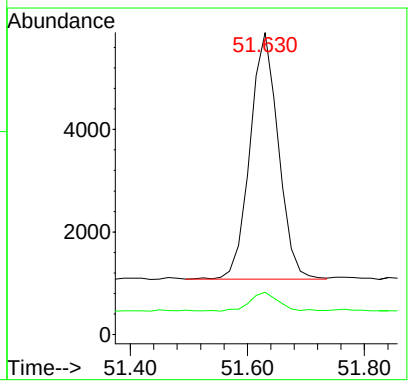


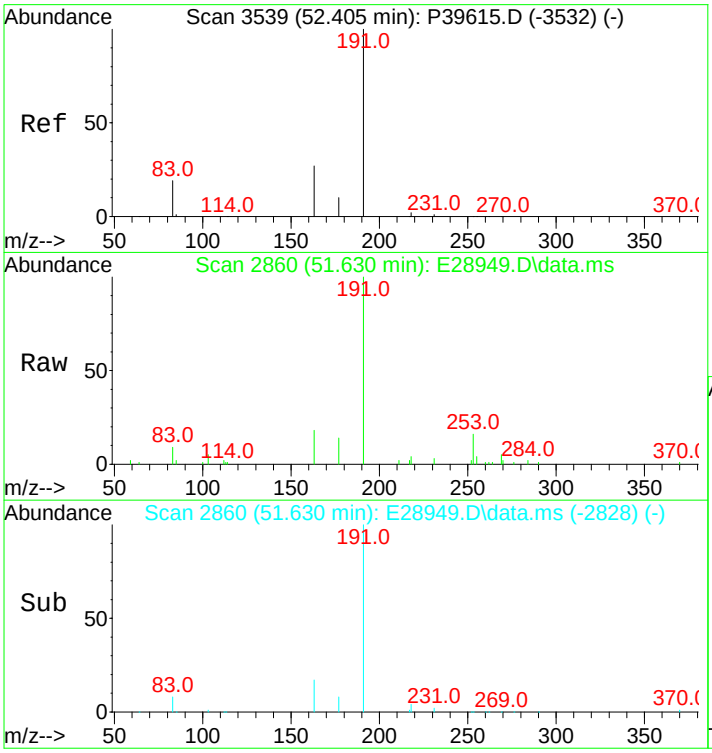


#94
Hopane (T19)
Concen: 476.21 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:191 Resp: 16129

Ion	Ratio	Lower	Upper
191	100		
177	7.6	11.6	17.4#

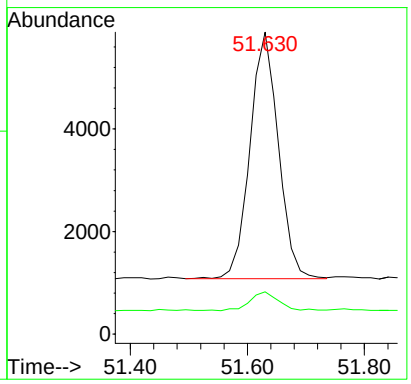




#95
17a(H),21B(H)-hopane - C30H52
Concen: 476.21 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28949.D
Acq: 14 Nov 2012 4:50 am

Tgt Ion:191 Resp: 16129

Ion	Ratio	Lower	Upper
191	100		
177	7.6	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24365	500.000	ng/mL	0.00
74) Chrysene-d12	42.700	240	52429	500.000	ng/mL	-0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43806	511.145	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
42) Phenanthrene-d10	32.070	188	42246	481.140	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.11%#			
83) Benzo[b]fluoranthene-d12	46.630	264	55562	515.888	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.59%			
88) Benzo[a]pyrene-d12	47.774	264	54860	525.698	ng/mL	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.57%			
129) 5B(H)Cholane - Surr	43.332	217	11210	542.504	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.25%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4924	252.646	ng/mL	100
4) cis-Decalin	17.091	138	3820	257.979	ng/mL	100
10) Naphthalene	19.304	128	53459	557.792	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32688	535.503	ng/mL#	100
17) 1-Methylnaphthalene	22.420	142	32095	541.111	ng/mL#	100
18) Benzothiophene	19.515	134	44435	560.833	ng/mL	100
23) Biphenyl	23.881	154	41378	536.354	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	29119	529.237	ng/mL#	100
25) Dibenzofuran	26.967	168	46406	543.332	ng/mL	98
26) Acenaphthylene	25.582	152	53648M3	561.449	ng/mL	
27) Acenaphthene	26.320	153	32791	533.132	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.885	170	26457	513.957	ng/mL	96
29) Fluorene	28.337	166	36791	536.322	ng/mL	99
33) Dibenzothiophene	31.664	184	51254	544.465	ng/mL	99
43) Phenanthrene	32.161	178	51355	536.212	ng/mL	99
54) Retene	39.192	234	15584	505.663	ng/mL	91
55) Anthracene	32.356	178	49682M3	600.153	ng/mL	
56) Carbazole	33.034	167	47641	559.182	ng/mL	100
57) 1-Methylphenanthrene	34.675	192	38623	528.594	ng/mL	99
58) Fluoranthene	36.948	202	57063	539.514	ng/mL	99
59) Benzo(b)fluorene	39.493	216	38675	548.750	ng/mL	99
60) Pyrene	37.837	202	57901	538.596	ng/mL	98
66) Naphthobenzothiophene	41.706	234	59037	556.796	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.706	234	59037	556.796	ng/mL#	64
75) Benz[a]anthracene	42.639	228	57961	567.714	ng/mL	99
76) Chrysene	42.805	228	56830	540.676	ng/mL	99
77) Chrysene/Triphenylene	42.805	228	56830	540.676	ng/mL	99
84) Benzo[b]fluoranthene	46.720	252	67802	571.353	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.795	252	70705	579.122	ng/mL	93
87) Benzo[e]pyrene	47.684	252	64947	560.508	ng/mL	94
89) Benzo[a]pyrene	47.865	252	63567	573.327	ng/mL	92
90) Perylene	48.166	252	68142	581.205	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.518	276	79882M3	612.194	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.564	278	82188	591.544	ng/mL	98
93) Benzo[g,h,i]perylene	53.768	276	80391	571.386	ng/mL	100
94) Hopane (T19)	51.630	191	19942	506.820	ng/mL#	82
95) 17a(H),21B(H)-hopane - C3	51.630	191	19942	506.820	ng/mL#	82

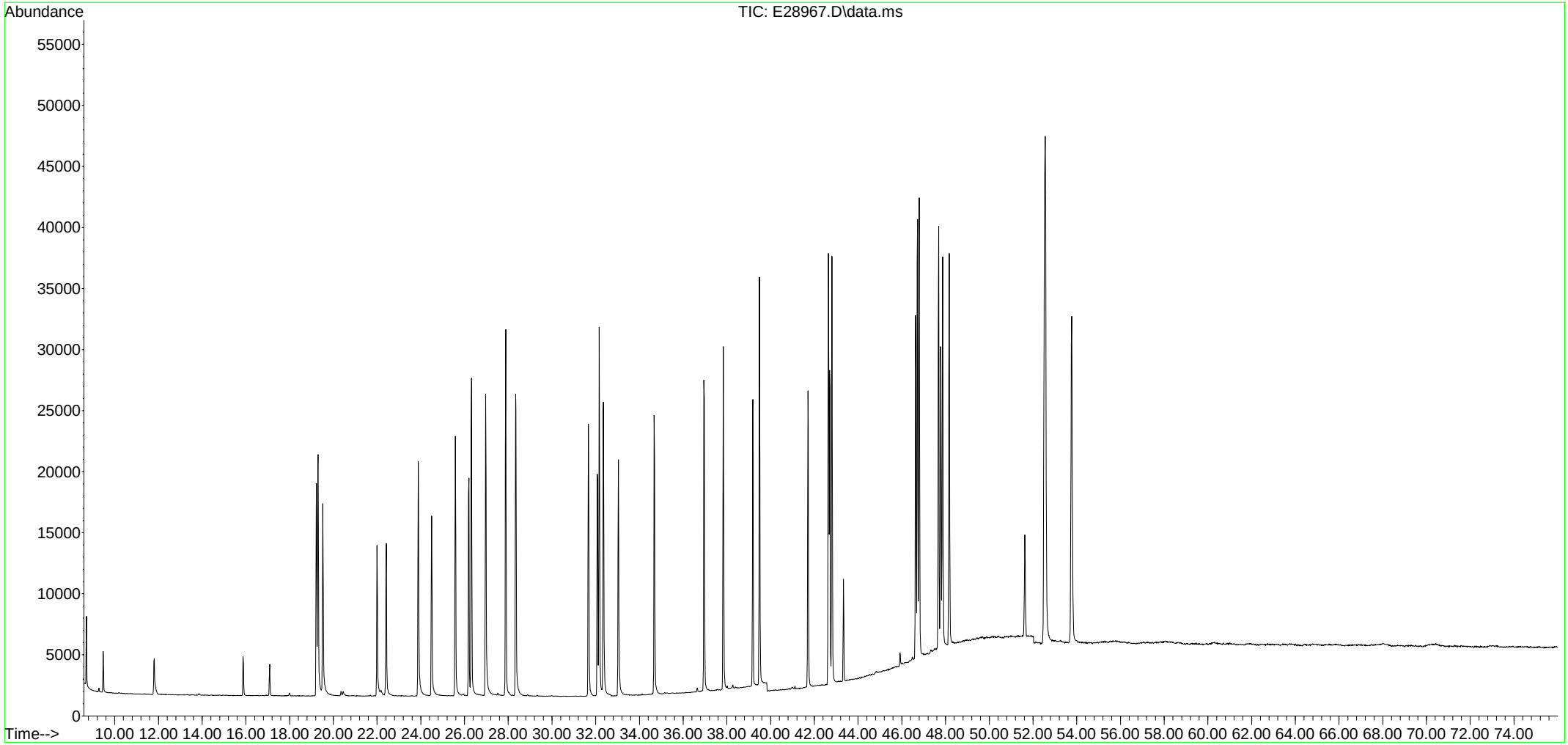
(#) = qualifier out of range (m) = manual integration (+) = signals summed

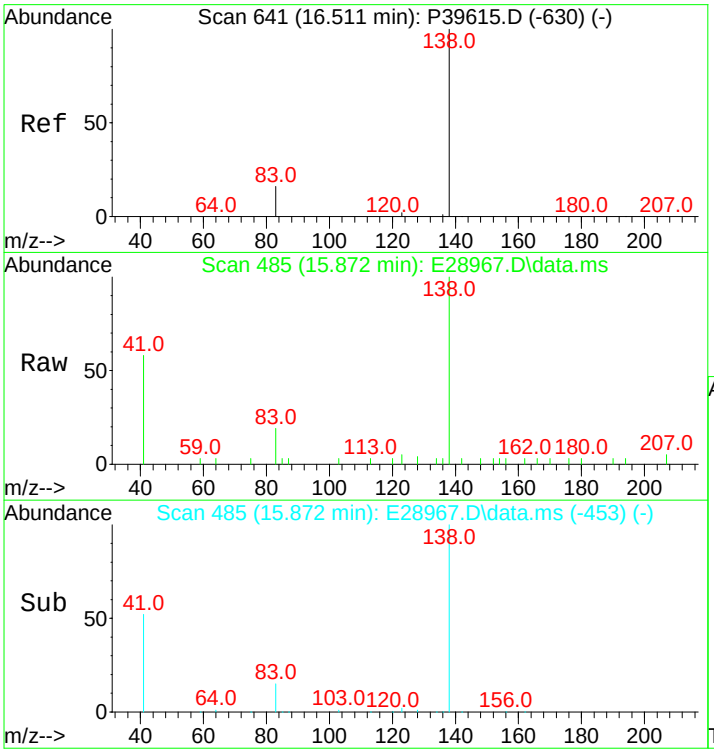
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28967.D
Acq On : 14 Nov 2012 7:59 pm
Operator : AC
Sample : C211131203
Misc : CC WHAQ80 500NG/ML
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Nov 15 15:04:13 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

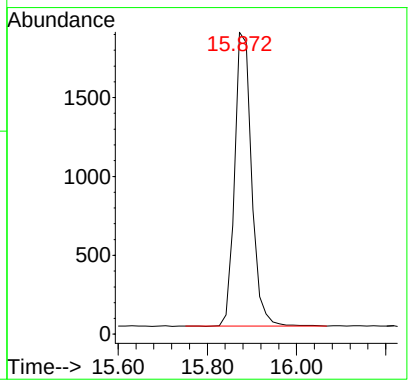
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

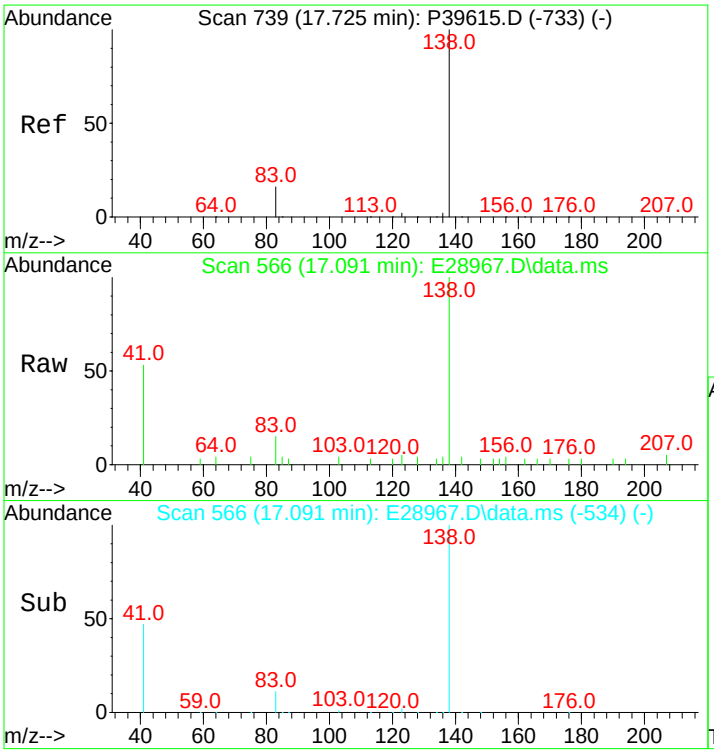




#3
trans-Decalin
Concen: 252.65 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

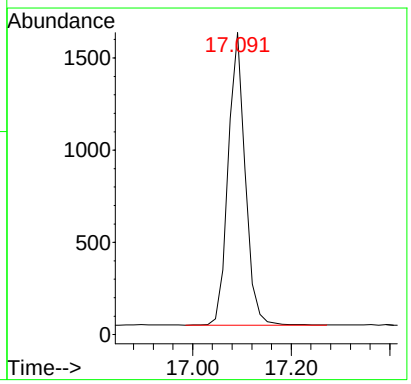
Tgt Ion:138 Resp: 4924

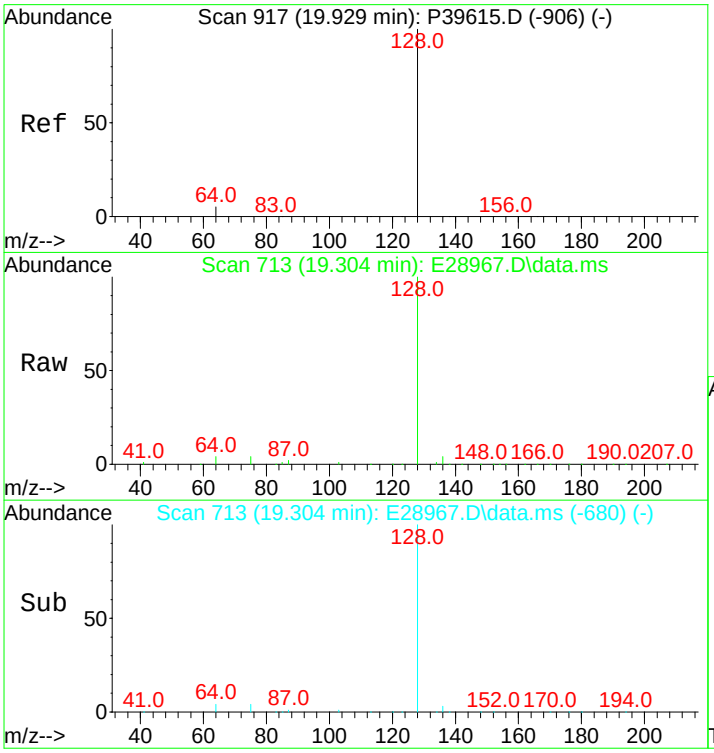




#4
cis-Decalin
Concen: 257.98 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:138 Resp: 3820

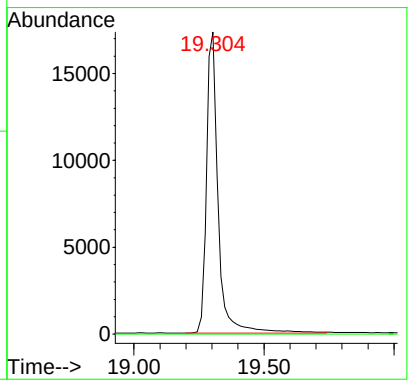


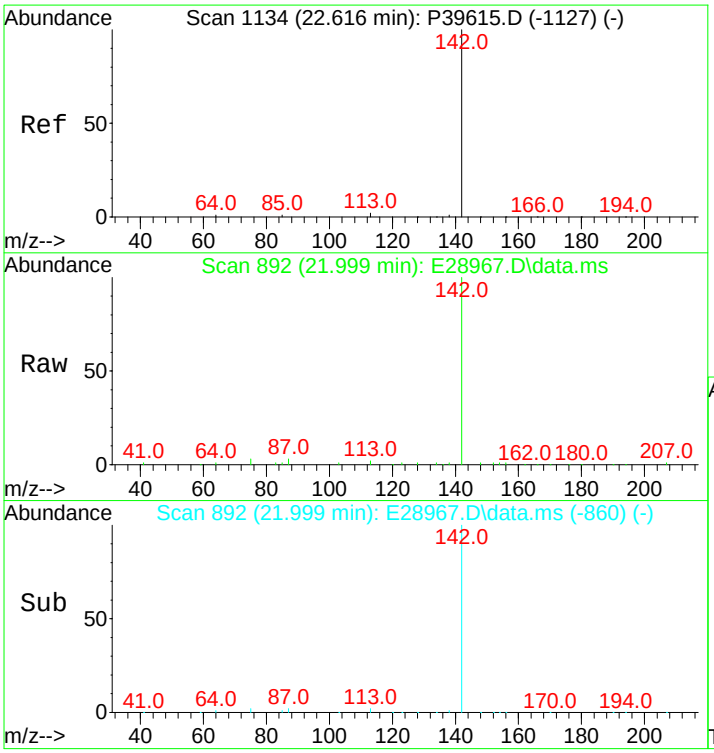


#10
Naphthalene
Concen: 557.79 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. -0.000 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:128 Resp: 53459

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

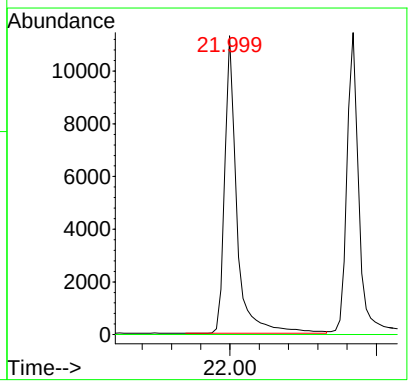


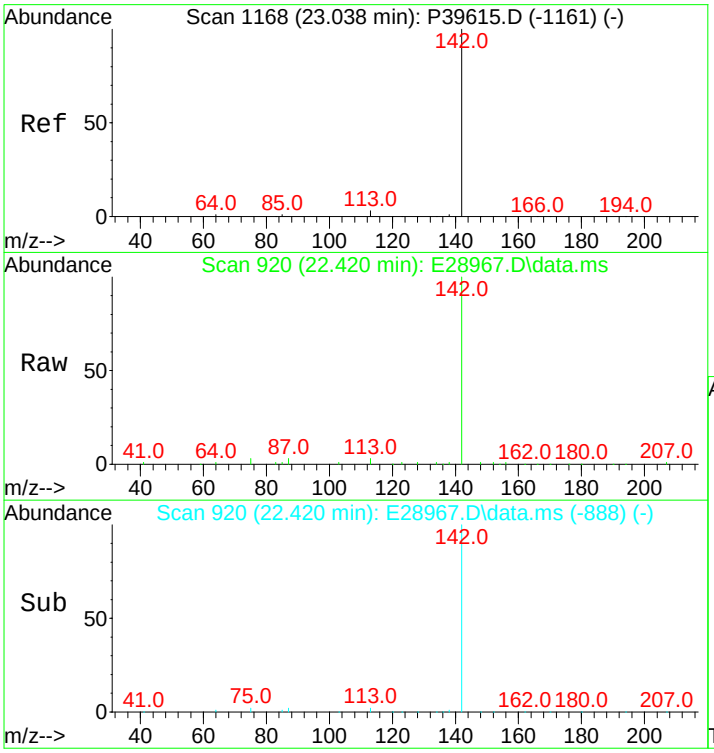


#16
2-Methylnaphthalene
Concen: 535.50 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:142 Resp: 32688

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

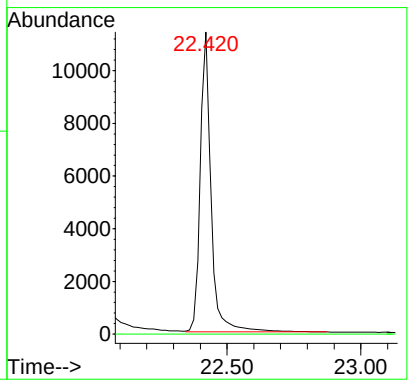


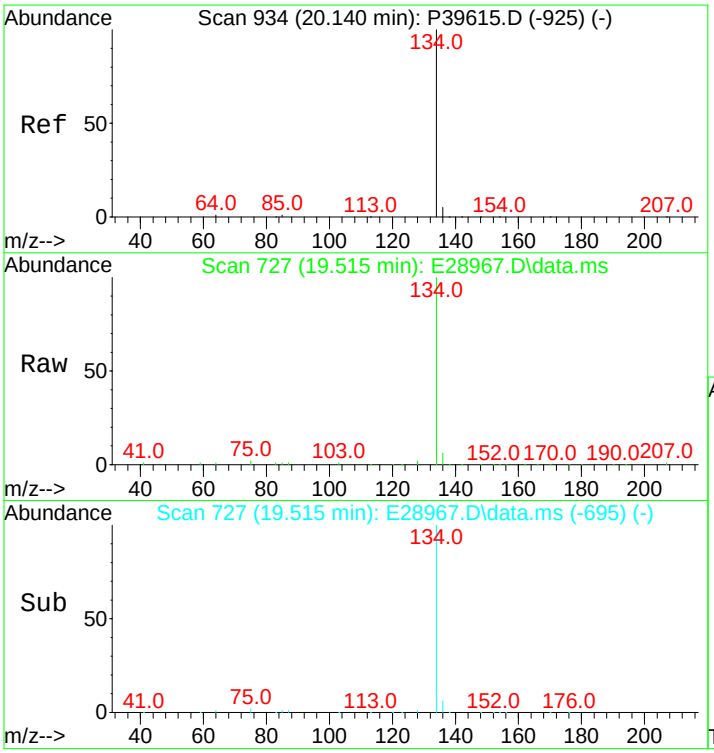


#17
1-Methylnaphthalene
Concen: 541.11 ng/mL
RT: 22.420 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:142 Resp: 32095

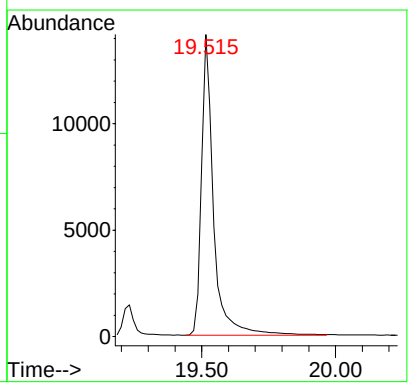
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

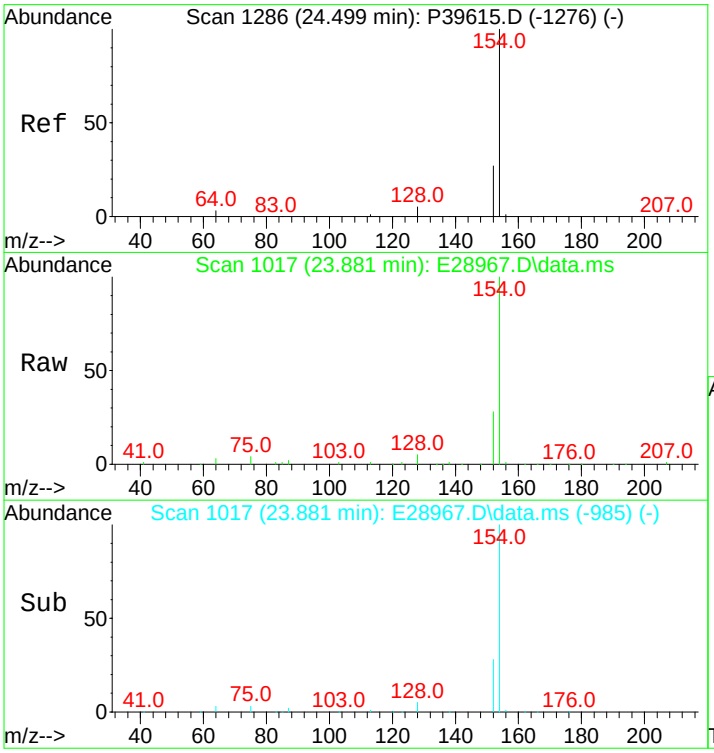




#18
Benzothiophene
Concen: 560.83 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:134 Resp: 44435

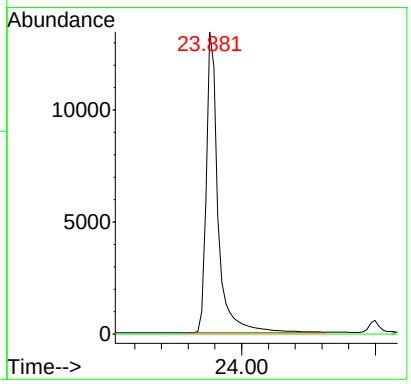


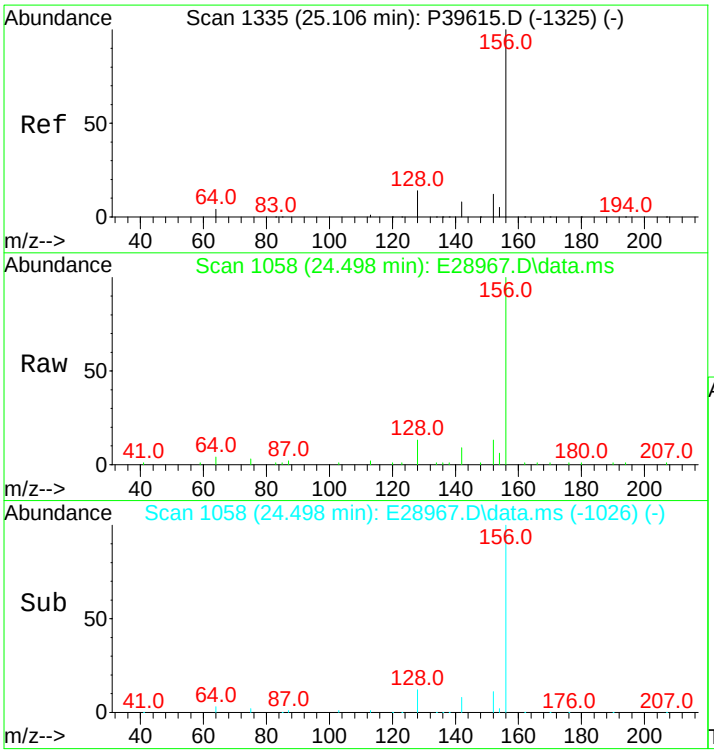


#23
Biphenyl
Concen: 536.35 ng/mL
RT: 23.881 min Scan# 1017
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:154 Resp: 41378

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

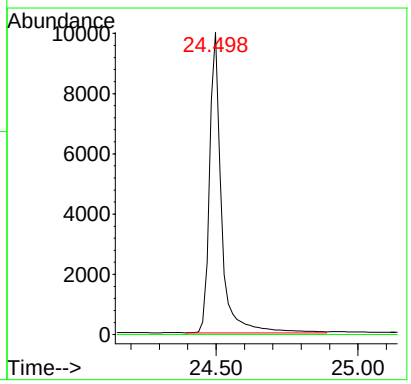


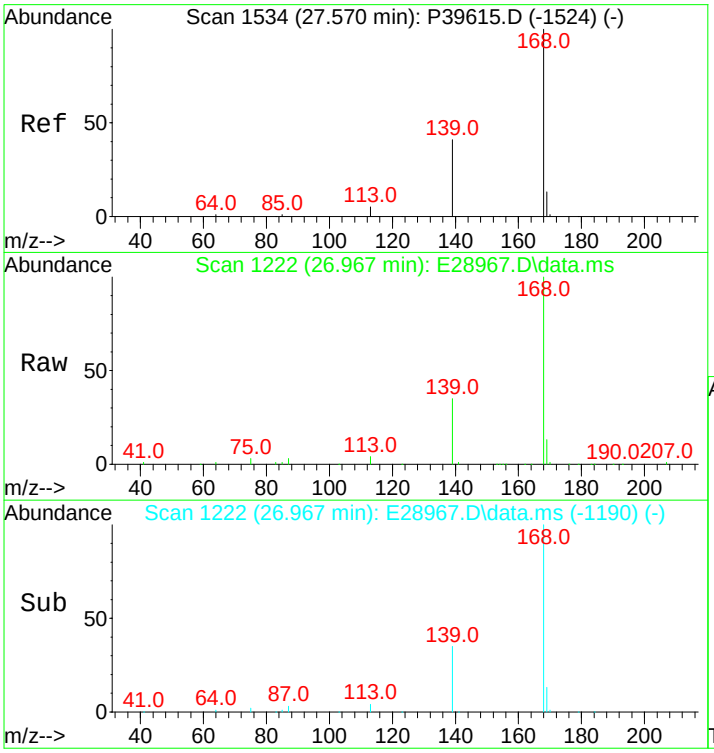


#24
2,6-Dimethylnaphthalene
Concen: 529.24 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:156 Resp: 29119

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

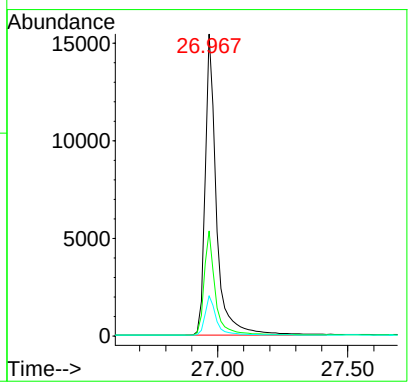


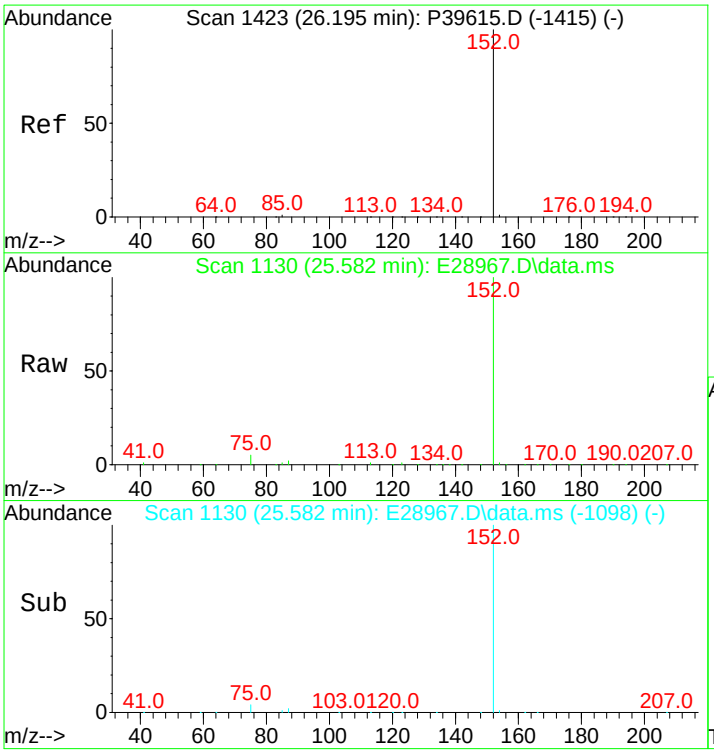


#25
Dibenzofuran
Concen: 543.33 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:168 Resp: 46406

Ion	Ratio	Lower	Upper
168	100		
139	34.2	26.0	39.0
169	13.2	10.6	16.0

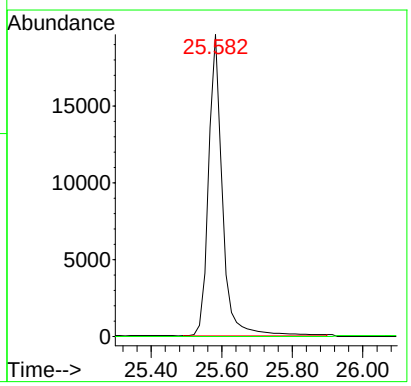


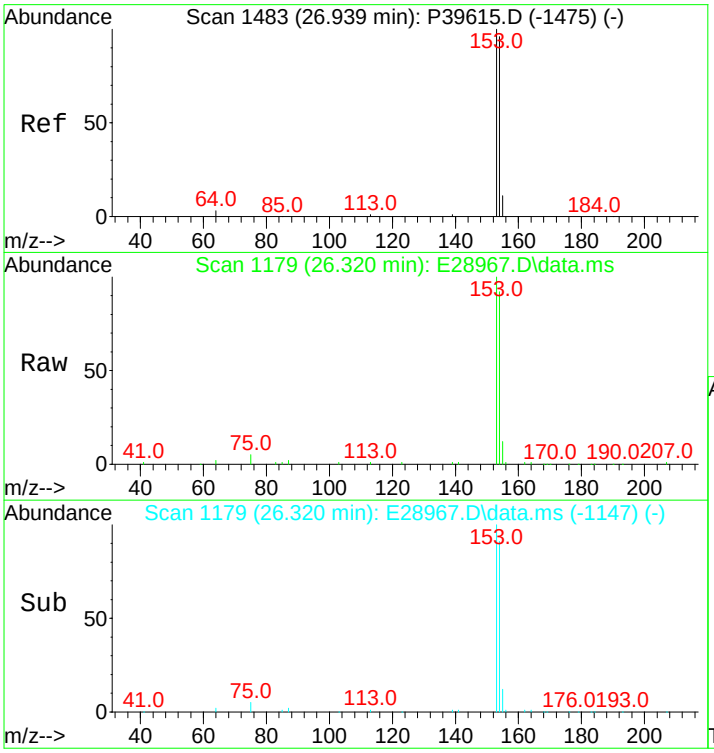


#26
Acenaphthylene
Concen: 561.45 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:152 Resp: 53648

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

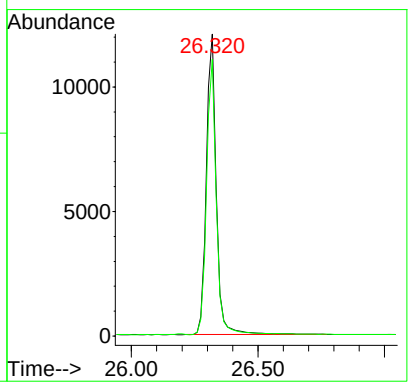


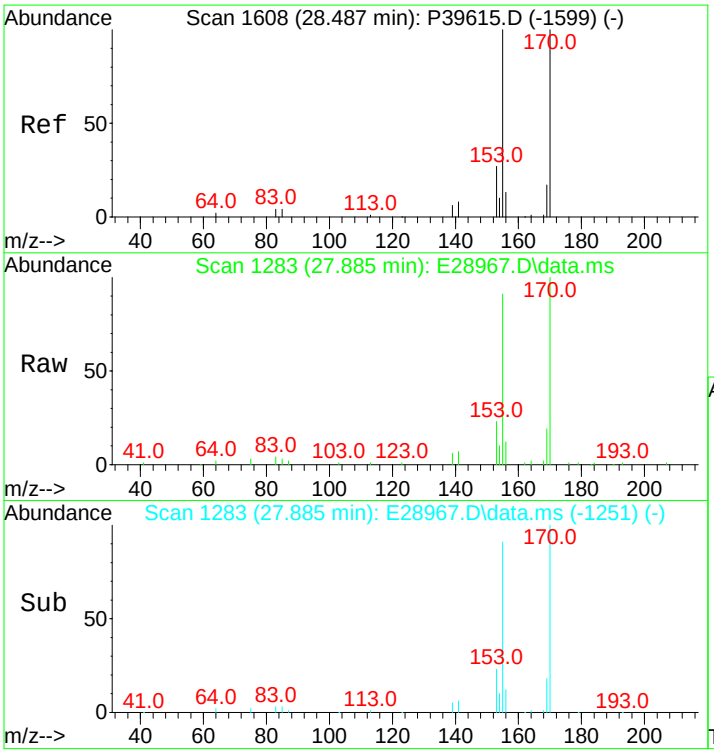


#27
Acenaphthene
Concen: 533.13 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:153 Resp: 32791

Ion	Ratio	Lower	Upper
153	100		
154	90.9	74.1	111.1

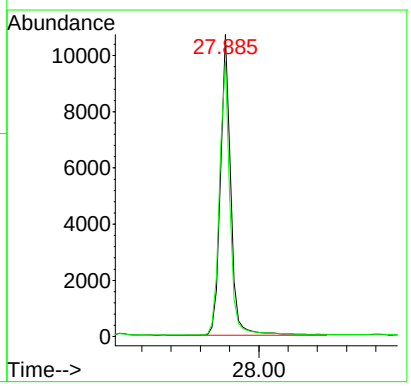


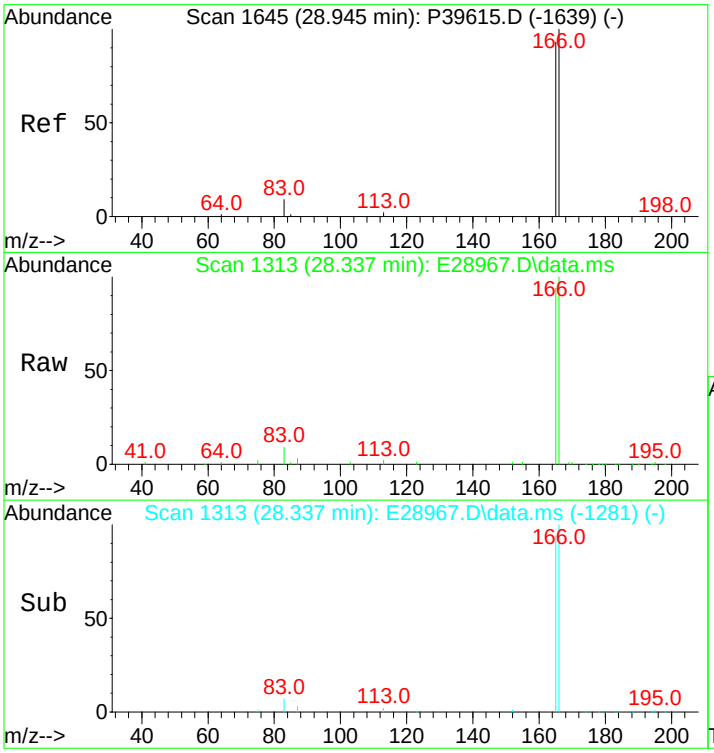


#28
2,3,5-Trimethylnaphthalene
Concen: 513.96 ng/mL
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:170 Resp: 26457

Ion	Ratio	Lower	Upper
170	100		
155	91.8	70.7	106.1

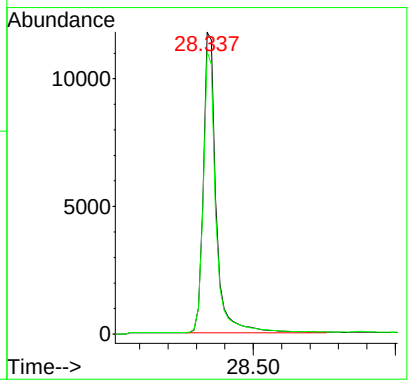


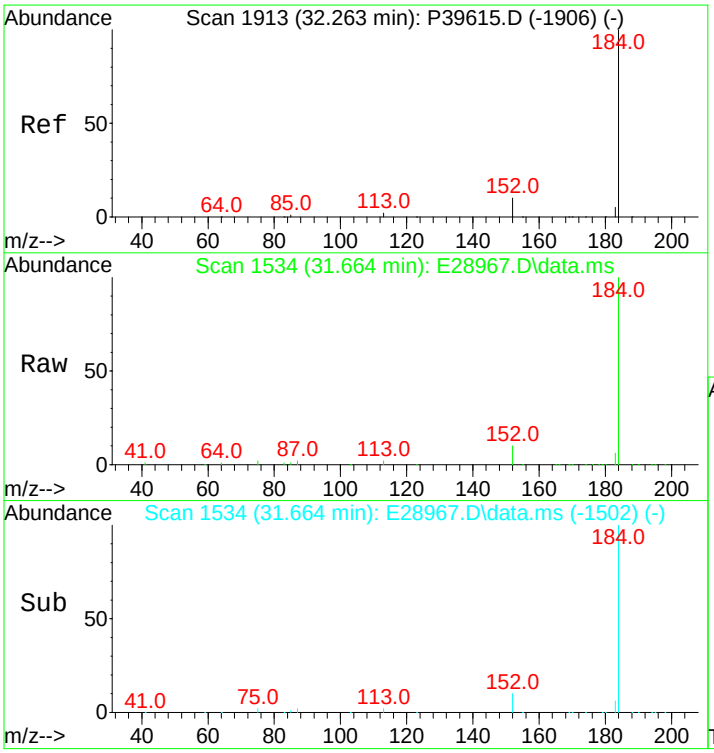


#29
Fluorene
Concen: 536.32 ng/mL
RT: 28.337 min Scan# 1313
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:166 Resp: 36791

Ion	Ratio	Lower	Upper
166	100		
165	92.0	74.7	112.1

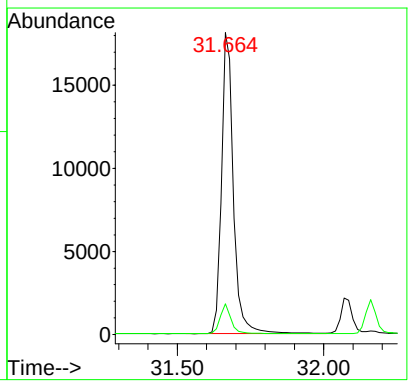


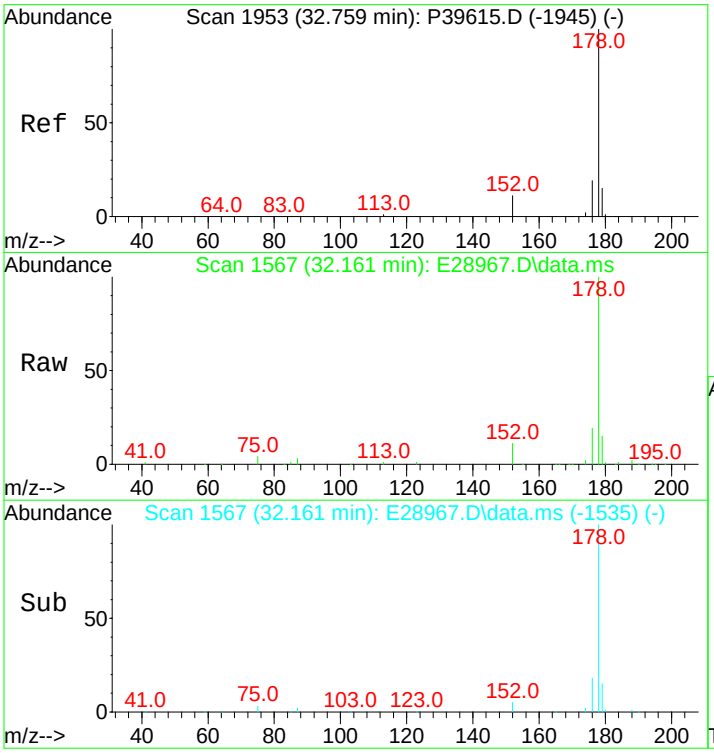


#33
Dibenzothiophene
Concen: 544.46 ng/mL
RT: 31.664 min Scan# 1534
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:184 Resp: 51254

Ion	Ratio	Lower	Upper
184	100		
152	9.2	7.0	10.6

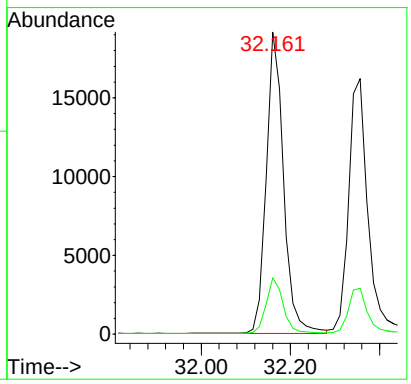


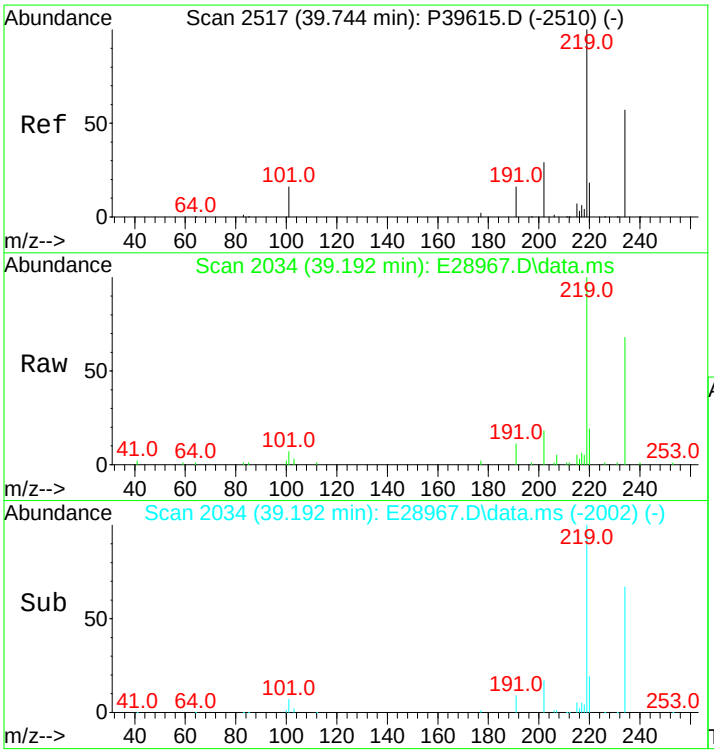


#43
Phenanthrene
Concen: 536.21 ng/mL
RT: 32.161 min Scan# 1567
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:178 Resp: 51355

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.4

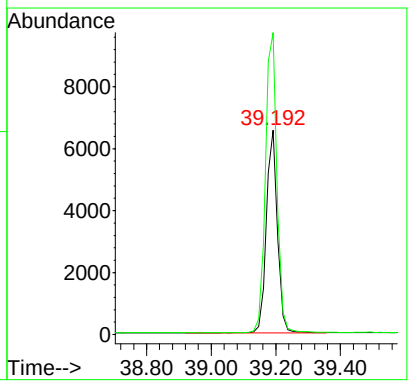


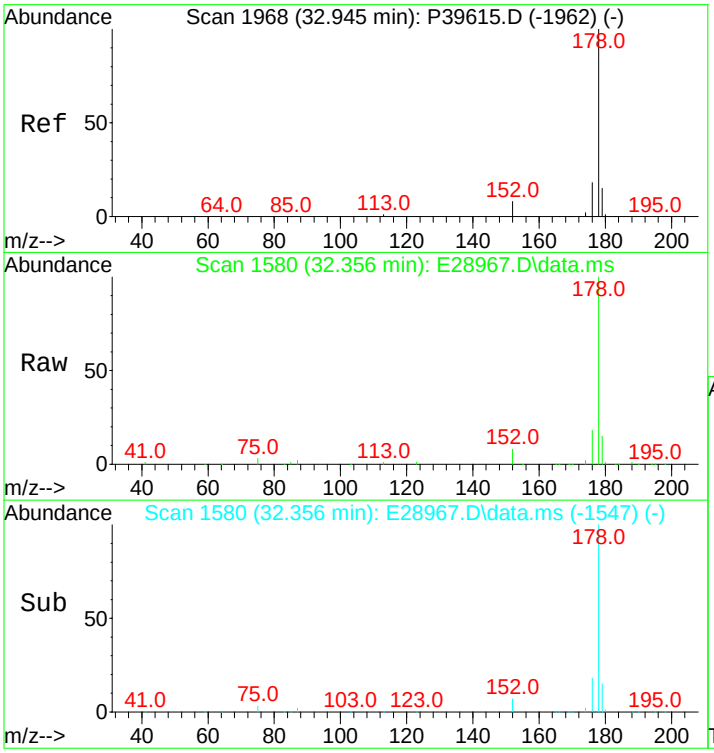


#54
Retene
Concen: 505.66 ng/mL
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:234 Resp: 15584

Ion	Ratio	Lower	Upper
234	100		
219	155.1	115.3	172.9

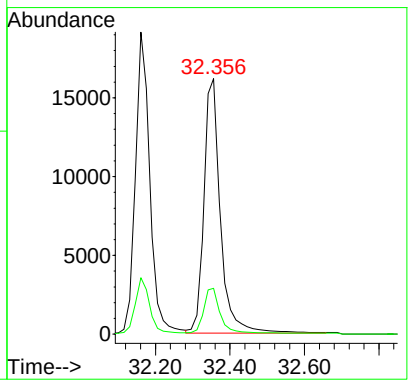


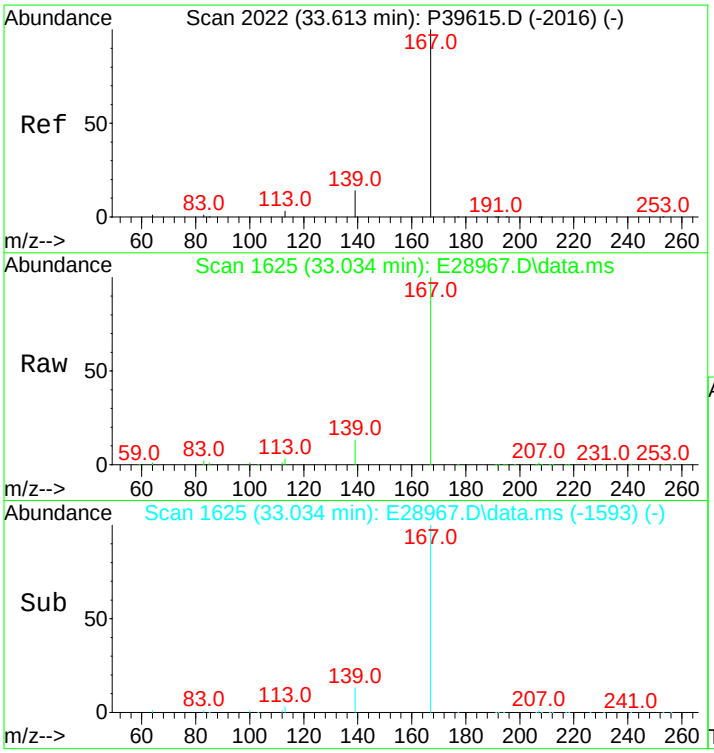


#55
Anthracene
Concen: 600.15 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. -0.000 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:178 Resp: 49682

Ion	Ratio	Lower	Upper
178	100		
176	17.6	14.3	21.5

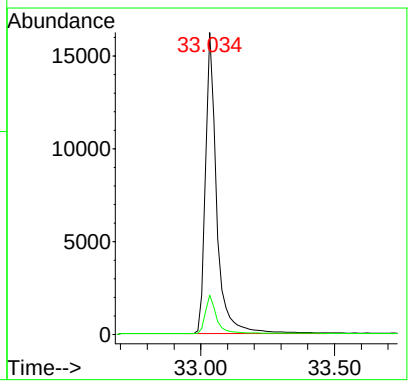


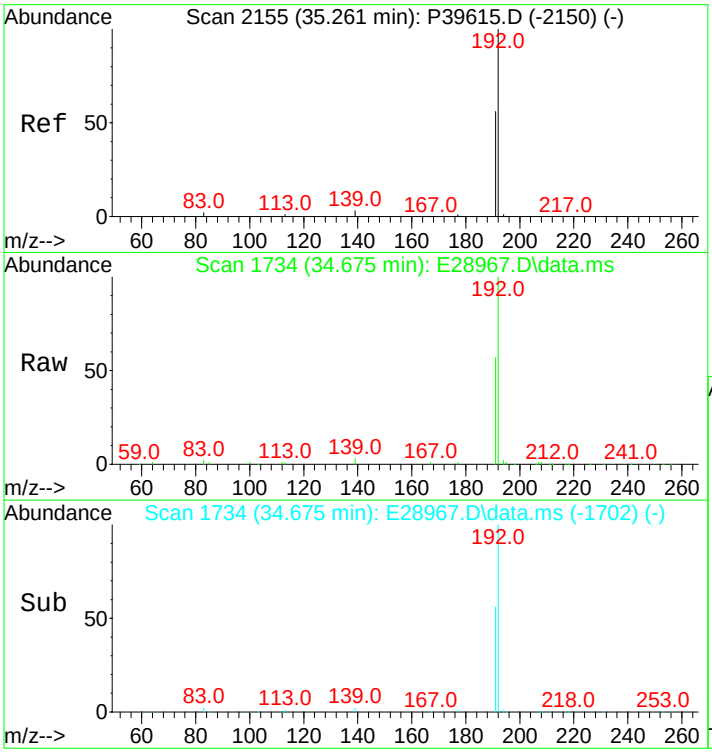


#56
Carbazole
Concen: 559.18 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:167 Resp: 47641

Ion	Ratio	Lower	Upper
167	100		
139	12.5	10.1	15.1

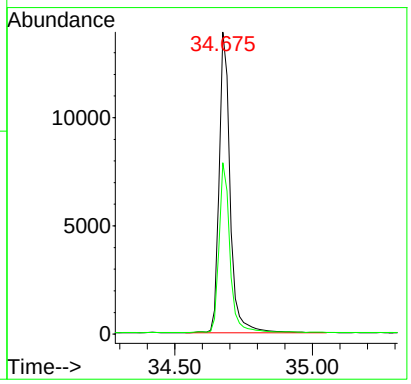


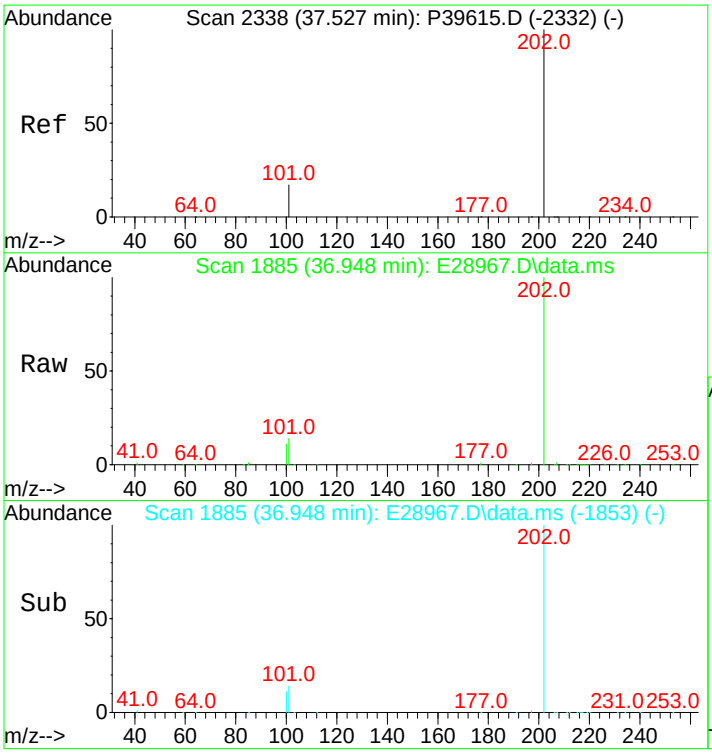


#57
1-Methylphenanthrene
Concen: 528.59 ng/mL
RT: 34.675 min Scan# 1734
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:192 Resp: 38623

Ion	Ratio	Lower	Upper
192	100		
191	56.0	45.4	68.2

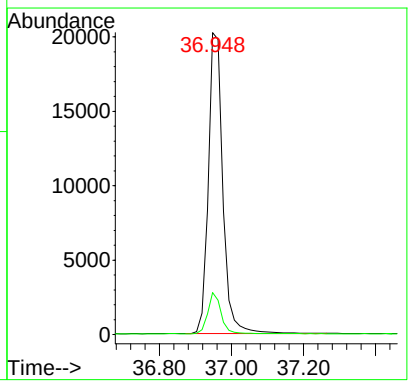


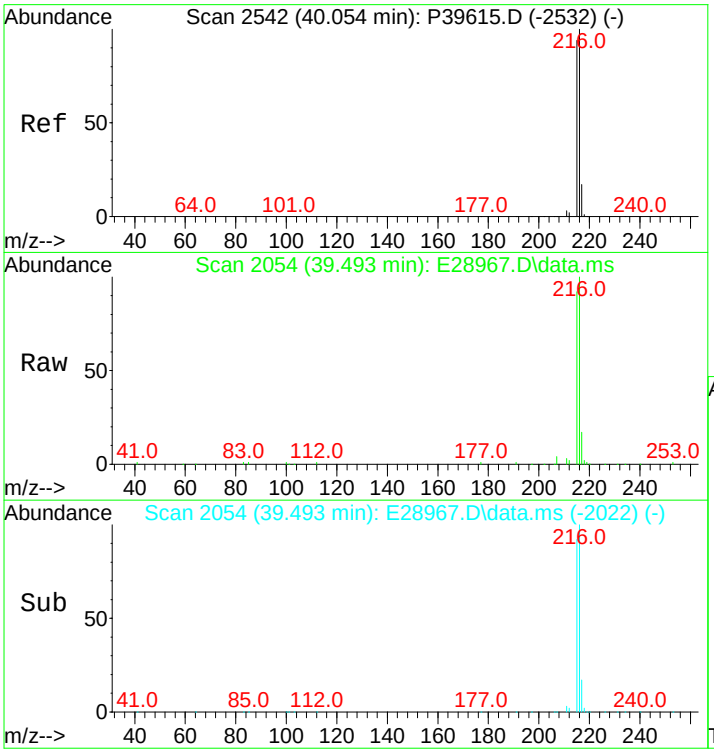


#58
Fluoranthene
Concen: 539.51 ng/mL
RT: 36.948 min Scan# 1885
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:202 Resp: 57063

Ion	Ratio	Lower	Upper
202	100		
101	12.6	10.4	15.6

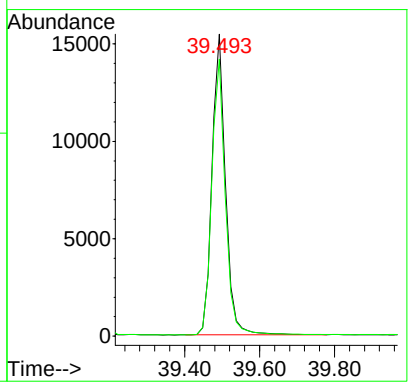


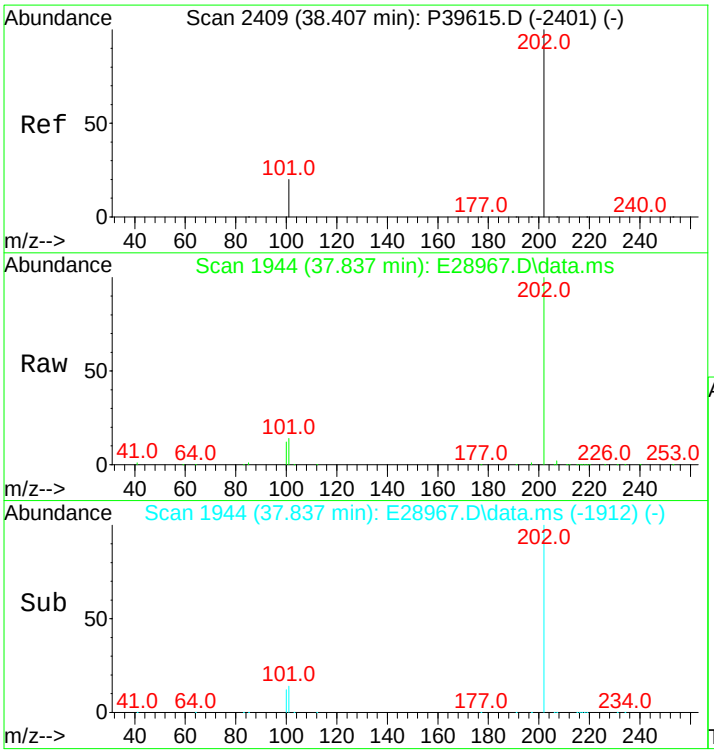


#59
Benzo(b)fluorene
Concen: 548.75 ng/mL
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:216 Resp: 38675

Ion	Ratio	Lower	Upper
216	100		
215	92.0	72.6	109.0

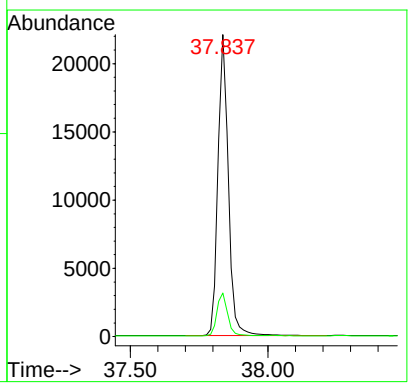


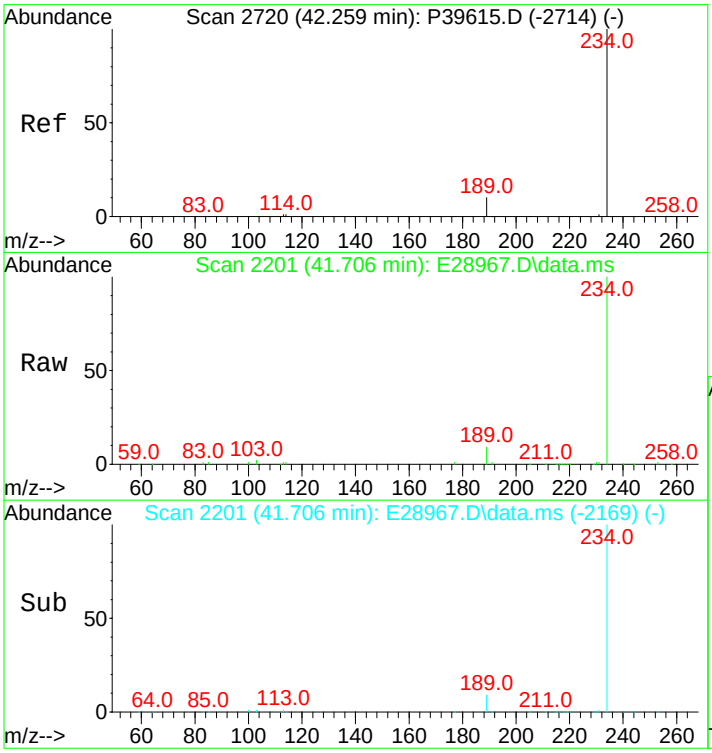


#60
Pyrene
Concen: 538.60 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:202 Resp: 57901

Ion	Ratio	Lower	Upper
202	100		
101	14.6	11.0	16.4

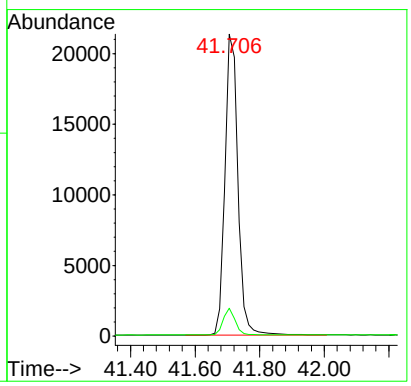


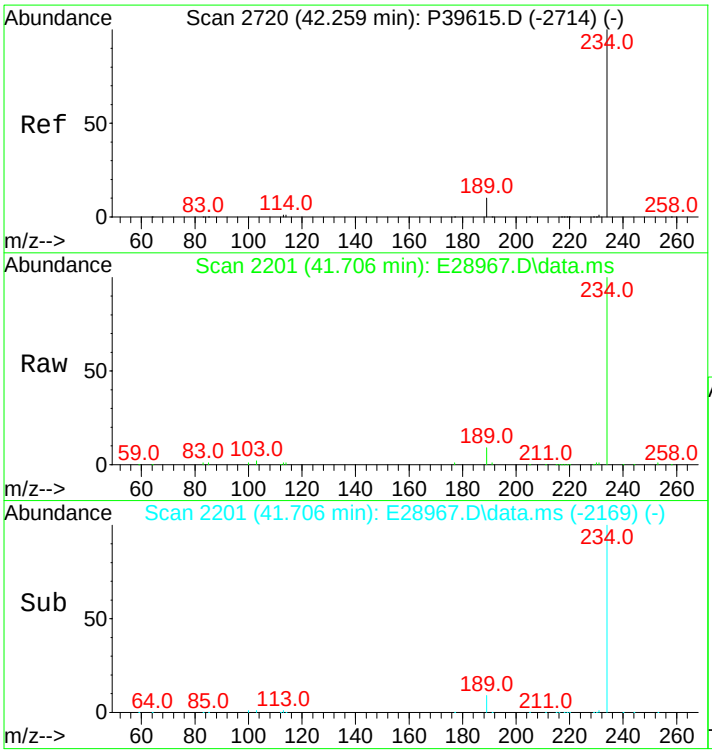


#66
Naphthobenzothiophene
Concen: 556.80 ng/ml
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:234 Resp: 59037

Ion	Ratio	Lower	Upper
234	100		
189	8.1	21.1	31.7#

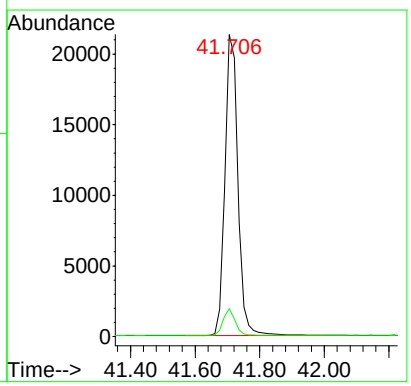


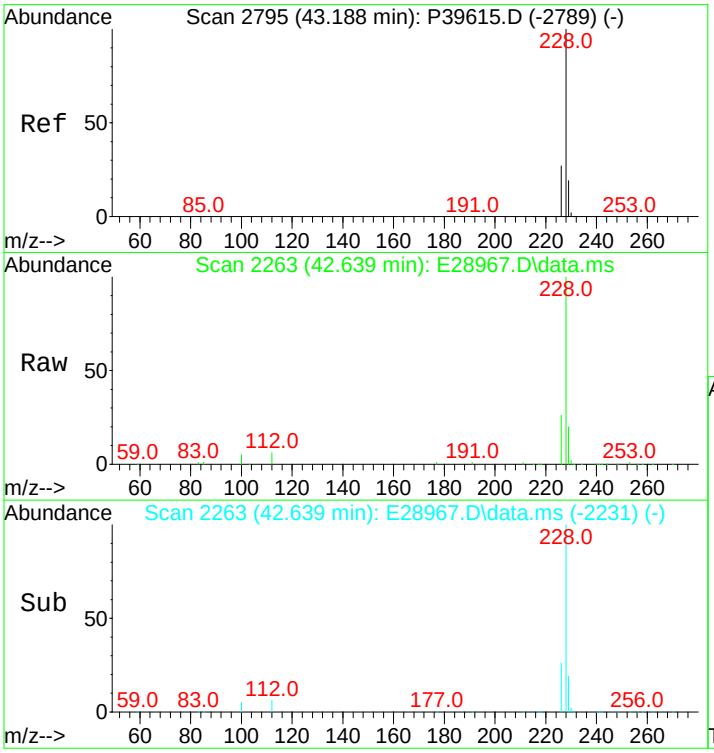


#67
Naphthobenzothiophene-2,1-D
Concen: 556.80 ng/mL
RT: 41.706 min Scan# 2201
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:234 Resp: 59037

Ion	Ratio	Lower	Upper
234	100		
189	8.1	21.1	31.7#

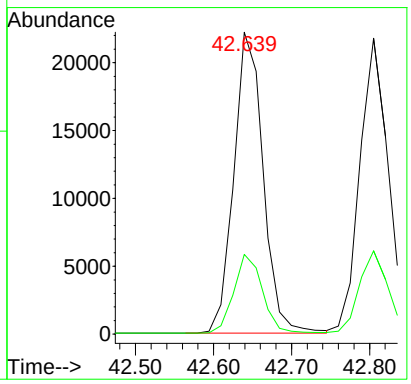


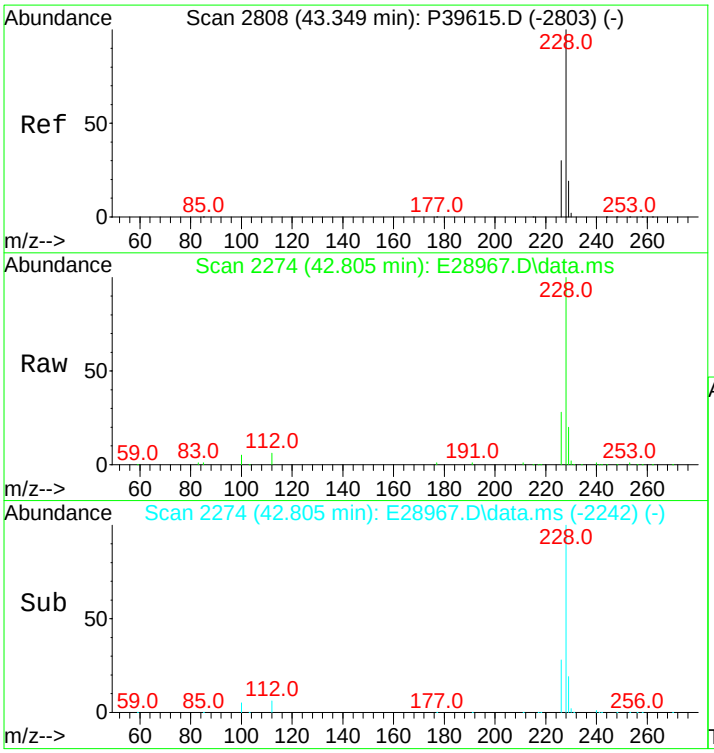


#75
Benz[a]anthracene
Concen: 567.71 ng/mL
RT: 42.639 min Scan# 2263
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:228 Resp: 57961

Ion	Ratio	Lower	Upper
228	100		
226	25.6	20.7	31.1

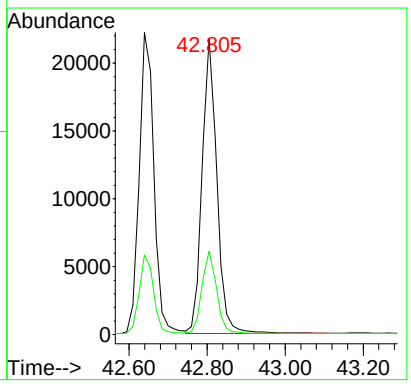


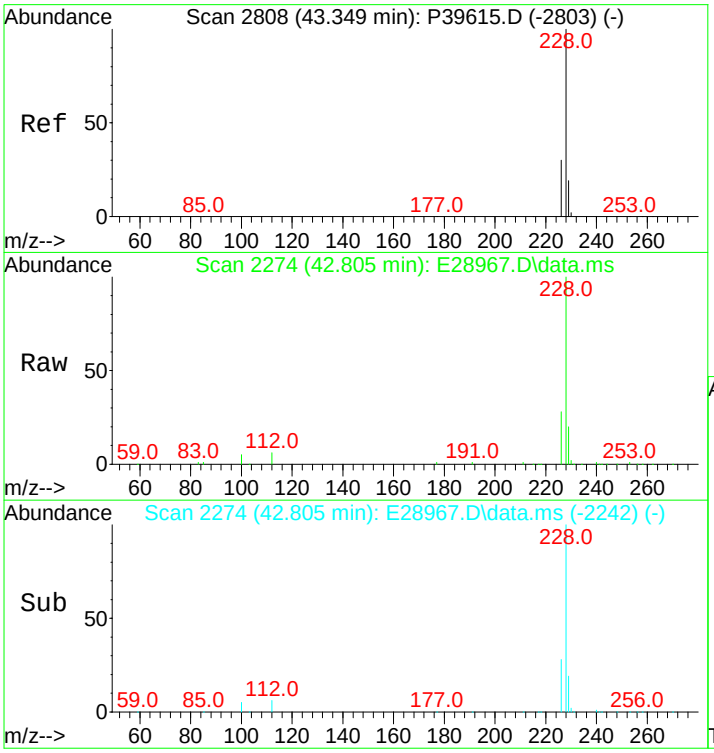


#76
Chrysene
Concen: 540.68 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:228 Resp: 56830

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

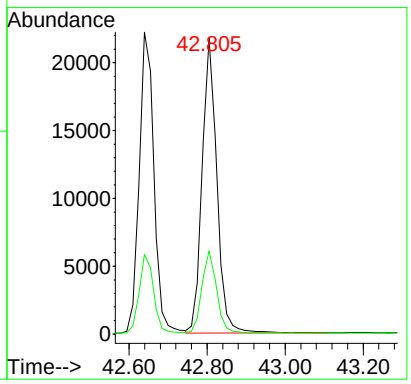


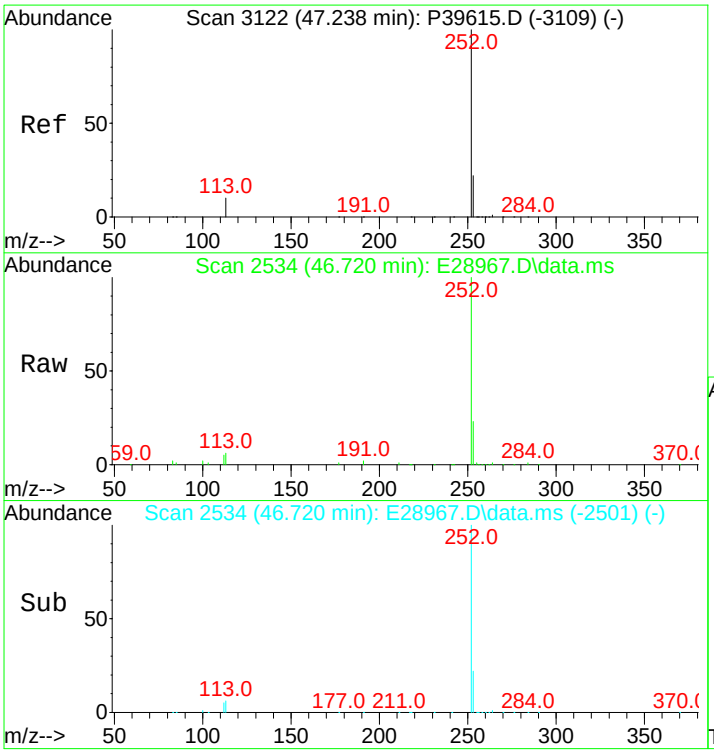


#77
Chrysene/Triphenylene
Concen: 540.68 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:228 Resp: 56830

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

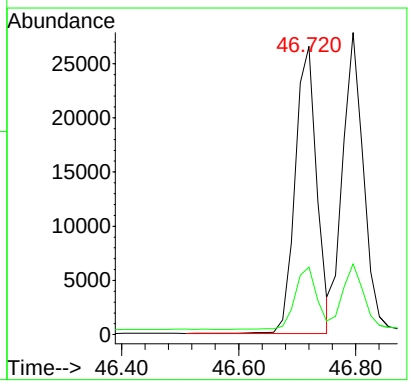


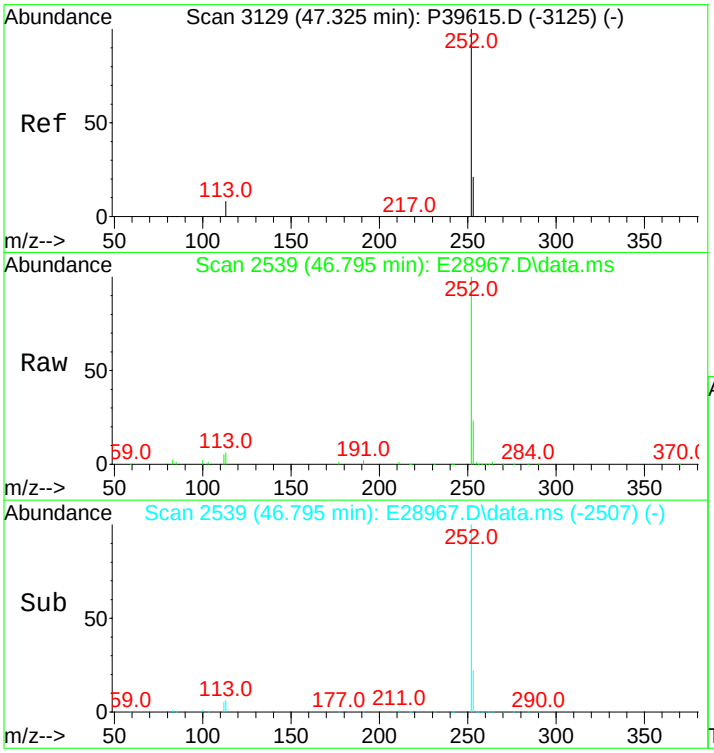


#84
Benzo[b]fluoranthene
Concen: 571.35 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. -0.000 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 67802

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.5	29.3

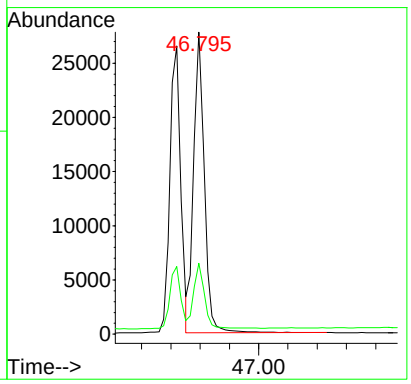


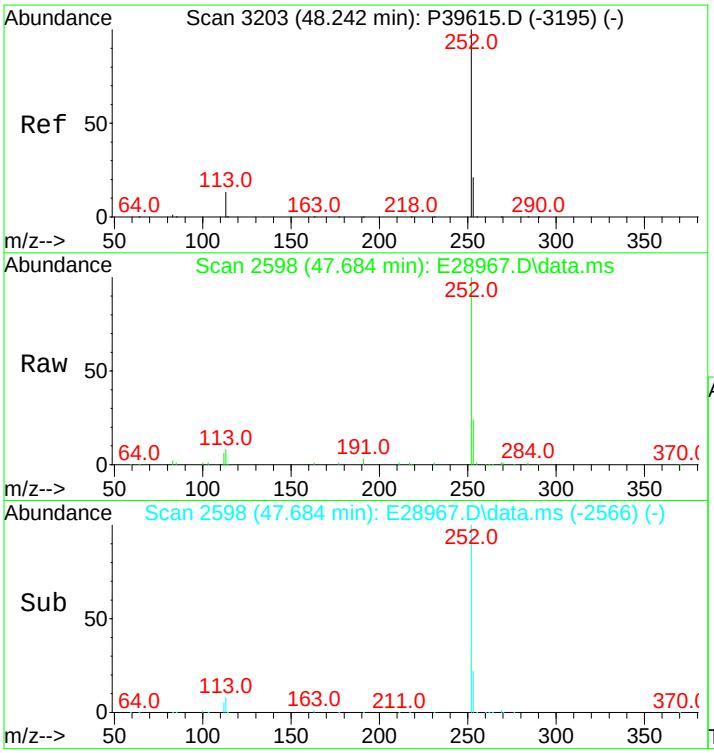


#85
Benzo[j]+[k]fluoranthene
Concen: 579.12 ng/mL
RT: 46.795 min Scan# 2539
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 70705

Ion	Ratio	Lower	Upper
252	100		
253	21.2	19.7	29.5

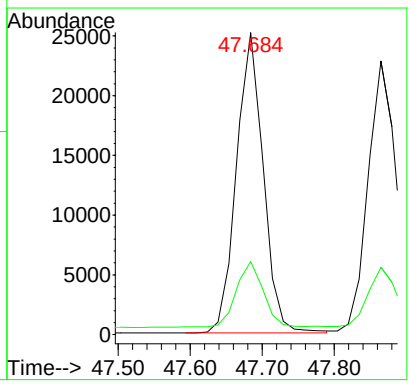


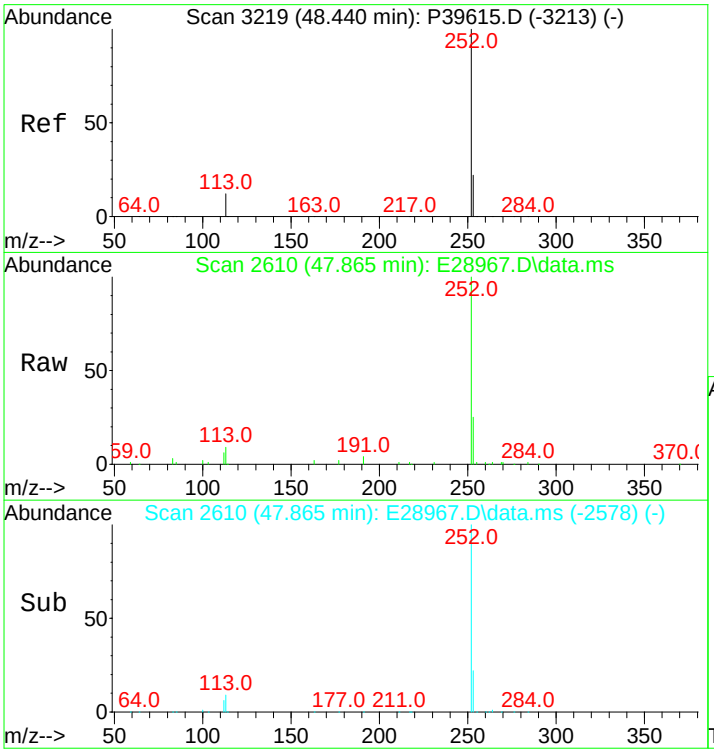


#87
Benzo[e]pyrene
Concen: 560.51 ng/mL
RT: 47.684 min Scan# 2598
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 64947

Ion	Ratio	Lower	Upper
252	100		
253	22.5	20.6	31.0

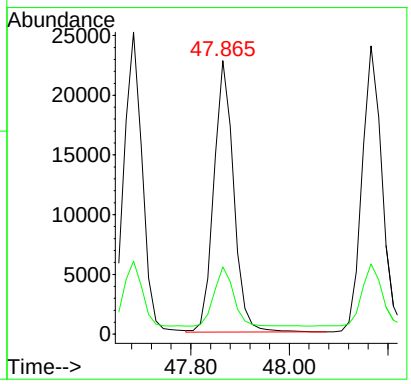


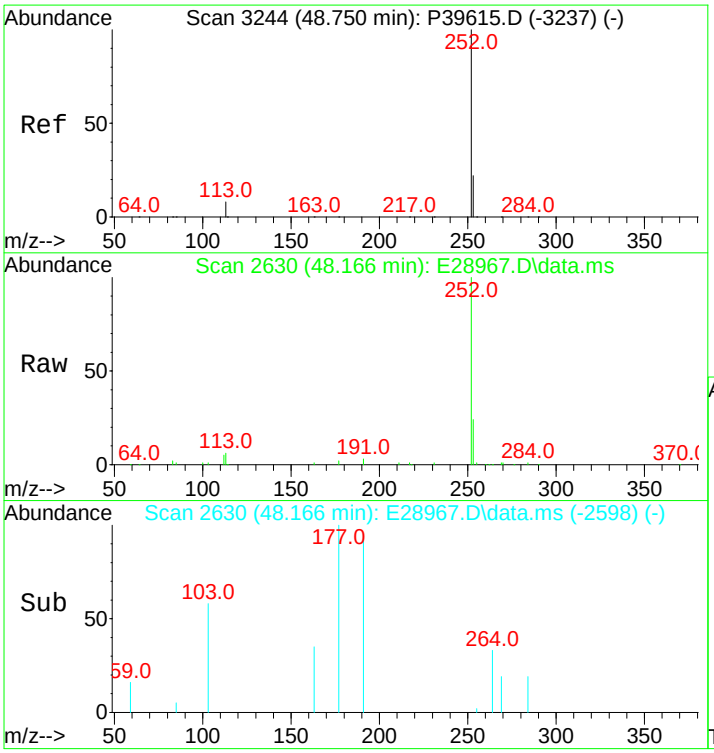


#89
Benzo[a]pyrene
Concen: 573.33 ng/mL
RT: 47.865 min Scan# 2610
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 63567

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.8	31.2

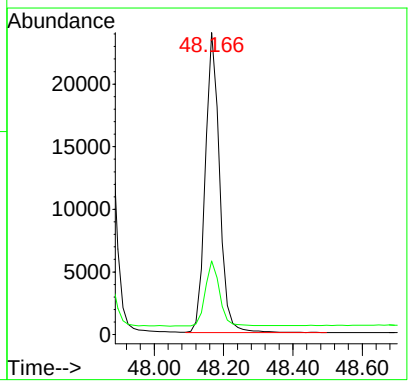


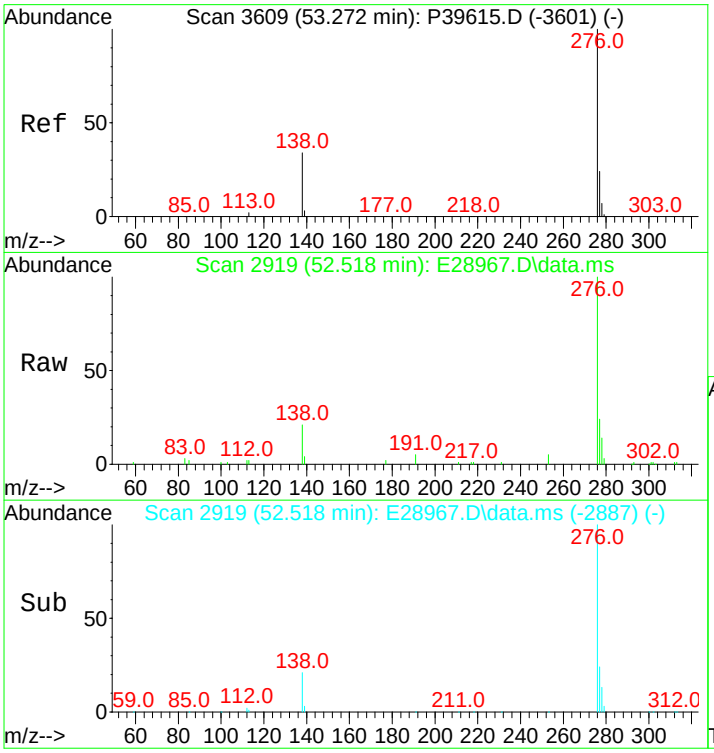


#90
Perylene
Concen: 581.21 ng/mL
RT: 48.166 min Scan# 2630
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:252 Resp: 68142

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.7	31.1

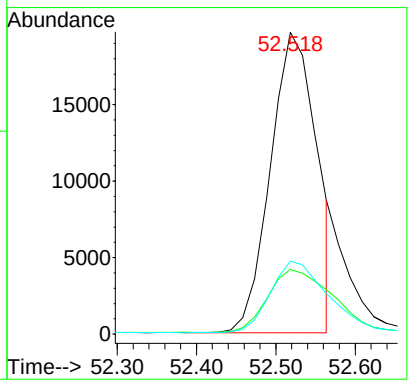


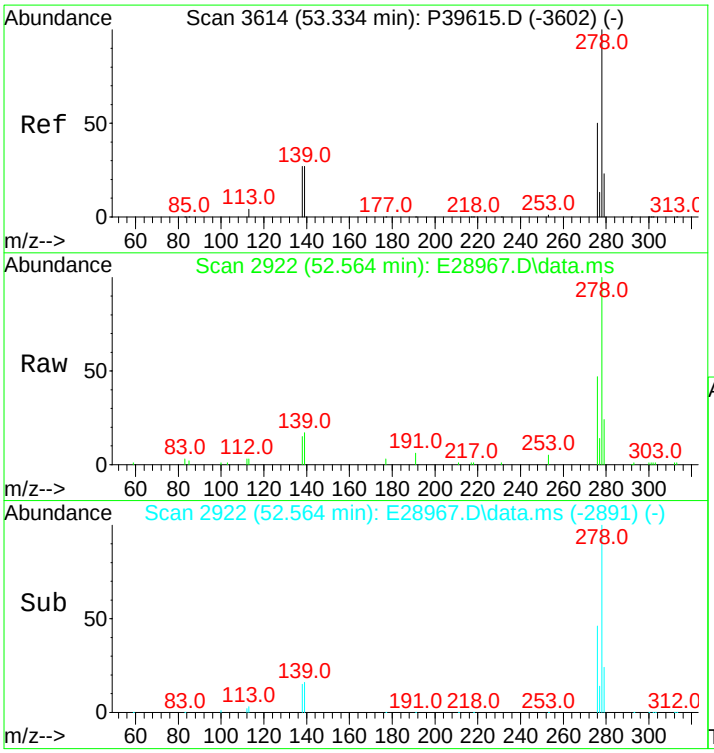


#91
Indeno[1,2,3-cd]pyrene
Concen: 612.19 ng/mL m
RT: 52.518 min Scan# 2919
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:276 Resp: 79882

Ion	Ratio	Lower	Upper
276	100		
138	29.9	16.3	24.5#
277	29.9	19.4	29.2#

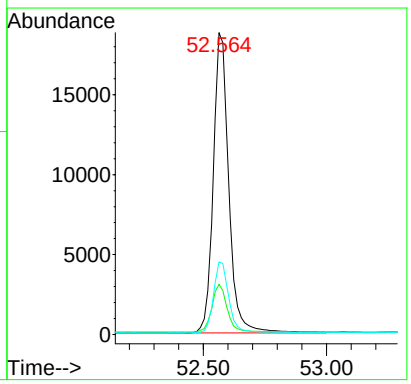


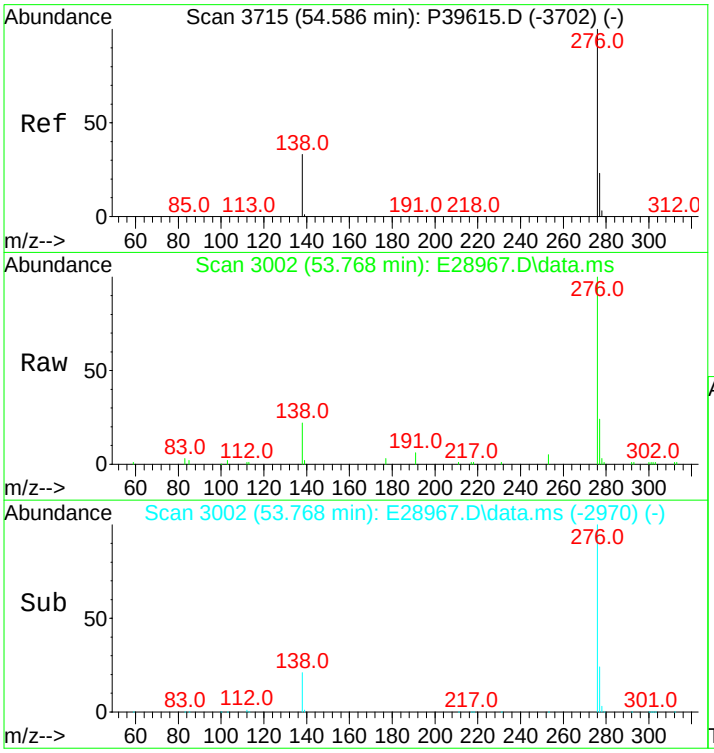


#92
Dibenz[ah]+[ac]anthracene
Concen: 591.54 ng/mL
RT: 52.564 min Scan# 2922
Delta R.T. -0.030 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:278 Resp: 82188

Ion	Ratio	Lower	Upper
278	100		
139	15.4	11.6	17.4
279	23.5	19.3	28.9

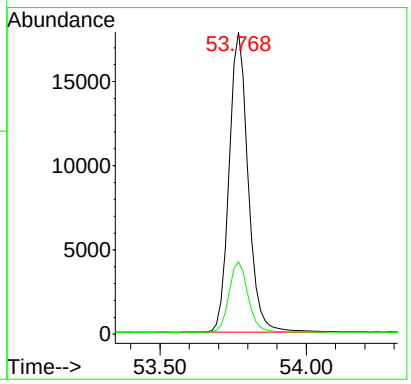


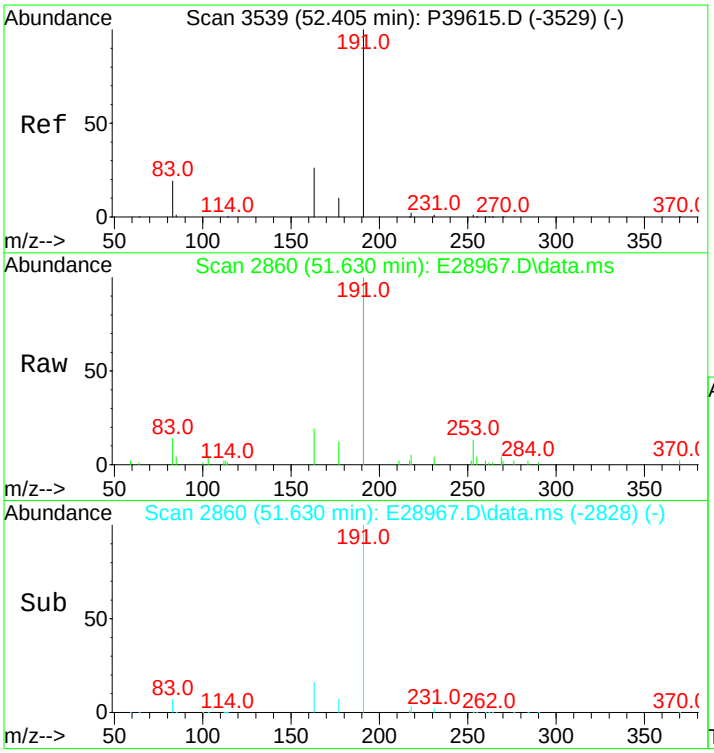


#93
Benzo[g,h,i]perylene
Concen: 571.39 ng/mL
RT: 53.768 min Scan# 3002
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:276 Resp: 80391

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

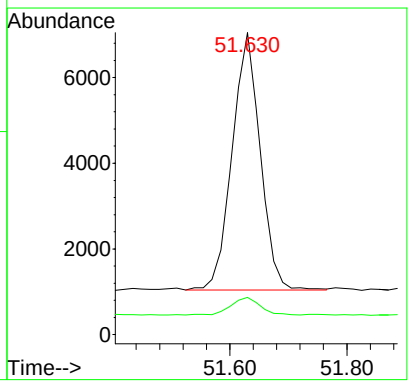


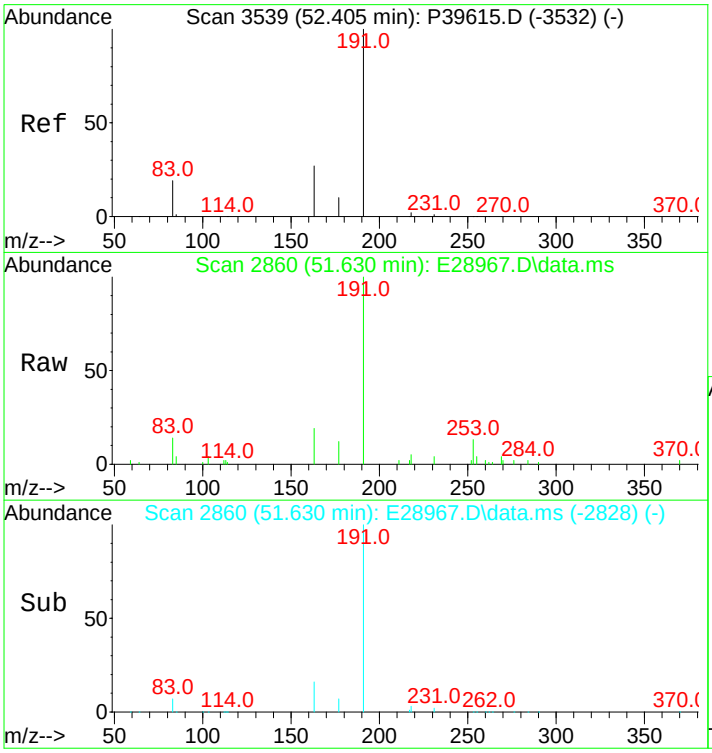


#94
Hopane (T19)
Concen: 506.82 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:191 Resp: 19942

Ion	Ratio	Lower	Upper
191	100		
177	7.2	11.6	17.4#

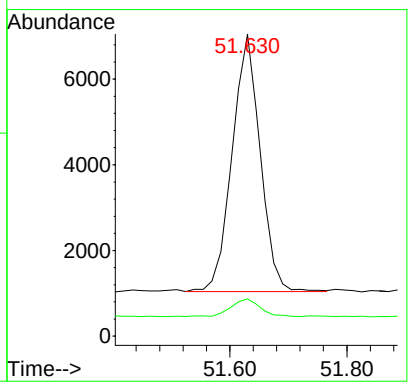




#95
17a(H),21B(H)-hopane - C30H52
Concen: 506.82 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28967.D
Acq: 14 Nov 2012 7:59 pm

Tgt Ion:191 Resp: 19942

Ion	Ratio	Lower	Upper
191	100		
177	7.2	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.199	164	24064M3	500.000	ng/mL	0.00
74) Chrysene-d12	42.715	240	52839	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.229	136	43136	509.623	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.96%			
42) Phenanthrene-d10	32.085	188	42450	489.510	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.95%#			
83) Benzo[b]fluoranthene-d12	46.645	264	56634	521.761	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.18%			
88) Benzo[a]pyrene-d12	47.790	264	56653	538.668	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.87%			
129) 5B(H)Cholane - Surr	43.332	217	11232	539.351	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.94%			
Target Compounds						Qvalue
3) trans-Decalin	15.872	138	4966	257.988	ng/mL	100
4) cis-Decalin	17.091	138	3762	257.240	ng/mL	100
10) Naphthalene	19.304	128	52132	550.750	ng/mL#	100
16) 2-Methylnaphthalene	21.999	142	32089	532.265	ng/mL#	100
17) 1-Methylnaphthalene	22.421	142	31273	533.847	ng/mL#	100
18) Benzothiophene	19.515	134	43328	553.701	ng/mL	100
23) Biphenyl	23.896	154	40583	532.629	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.498	156	28488	524.245	ng/mL#	100
25) Dibenzofuran	26.967	168	45217	536.033	ng/mL	97
26) Acenaphthylene	25.582	152	52457M3	555.852	ng/mL	
27) Acenaphthene	26.320	153	32046	527.536	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	27.885	170	26065	512.676	ng/mL	97
29) Fluorene	28.352	166	36253	535.090	ng/mL	100
33) Dibenzothiophene	31.679	184	50924	547.725	ng/mL	99
43) Phenanthrene	32.176	178	50714	536.143	ng/mL	99
54) Retene	39.192	234	15693	515.569	ng/mL	94
55) Anthracene	32.356	178	48591M3	594.316	ng/mL	
56) Carbazole	33.034	167	46813	556.336	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38281	530.467	ng/mL	99
58) Fluoranthene	36.963	202	56975	545.420	ng/mL	98
59) Benzo(b)fluorene	39.493	216	38424	552.008	ng/mL	99
60) Pyrene	37.837	202	57258	539.276	ng/mL	99
66) Naphthobenzothiophene	41.721	234	58939	562.825	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.721	234	58939	562.825	ng/mL#	64
75) Benz[a]anthracene	42.655	228	58810	571.560	ng/mL	99
76) Chrysene	42.805	228	57925	546.817	ng/mL	100
77) Chrysene/Triphenylene	42.805	228	57925	546.817	ng/mL	100
84) Benzo[b]fluoranthene	46.720	252	70856	592.456	ng/mL	95
85) Benzo[j]+[k]fluoranthene	46.811	252	69397	563.998	ng/mL	93
87) Benzo[e]pyrene	47.699	252	66232	567.162	ng/mL	94
89) Benzo[a]pyrene	47.880	252	64662	578.677	ng/mL	92
90) Perylene	48.181	252	69214	585.768	ng/mL	93
91) Indeno[1,2,3-cd]pyrene	52.533	276	82316M2	625.953	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	84503	603.487	ng/mL	99
93) Benzo[g,h,i]perylene	53.783	276	82167	579.478	ng/mL	100
94) Hopane (T19)	51.630	191	20233	510.226	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.630	191	20233	510.226	ng/mL#	84

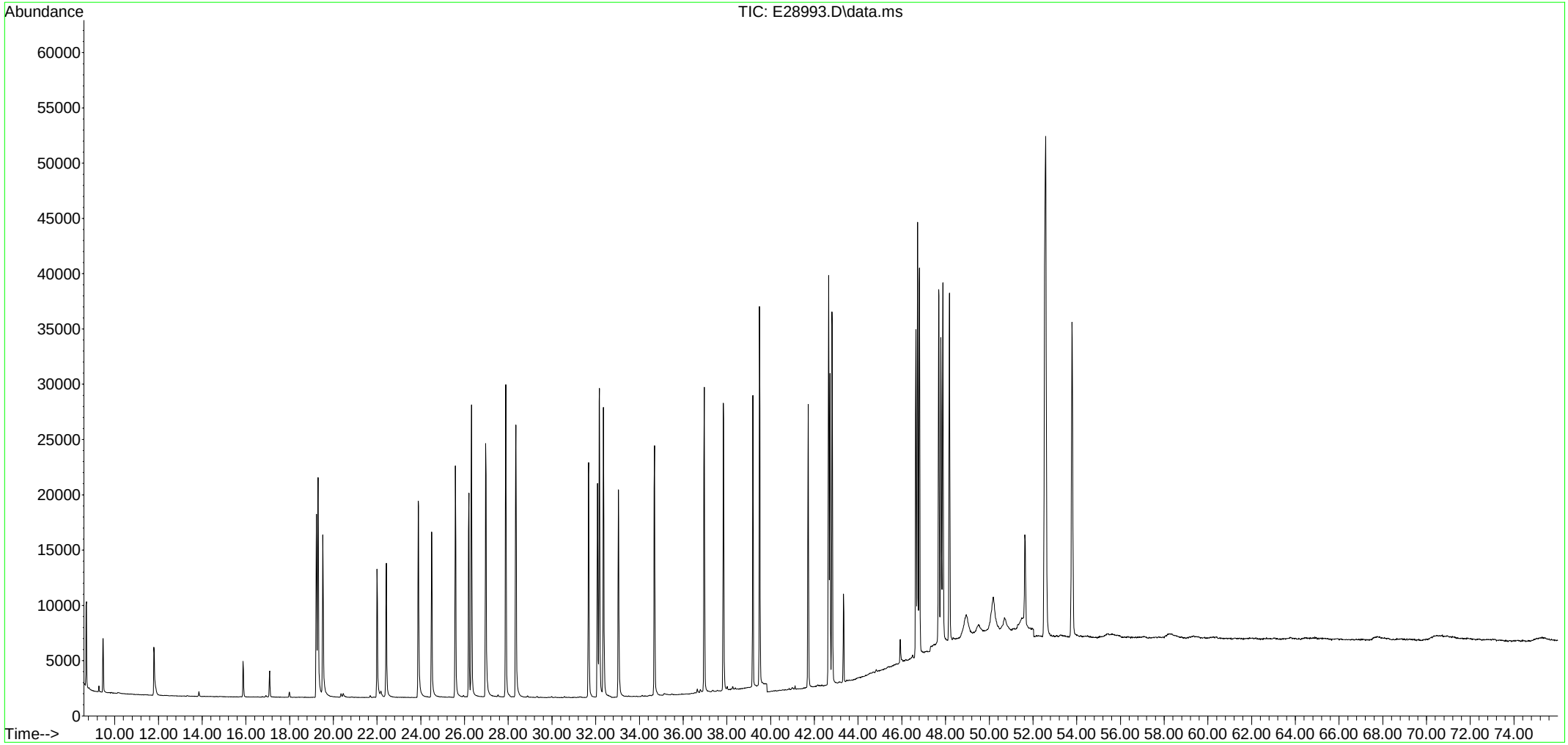
(#) = qualifier out of range (m) = manual integration (+) = signals summed

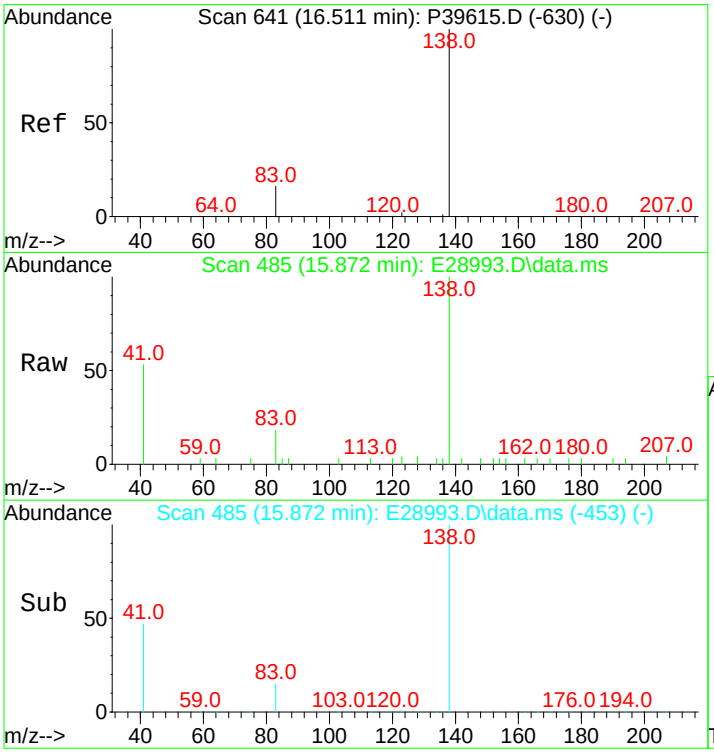
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E28993.D
Acq On : 15 Nov 2012 3:14 pm
Operator : AC
Sample : C211131204
Misc : CC WHAQ80 500NG/ML
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Nov 16 12:29:40 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

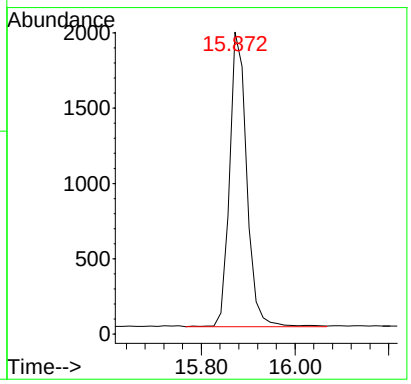
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

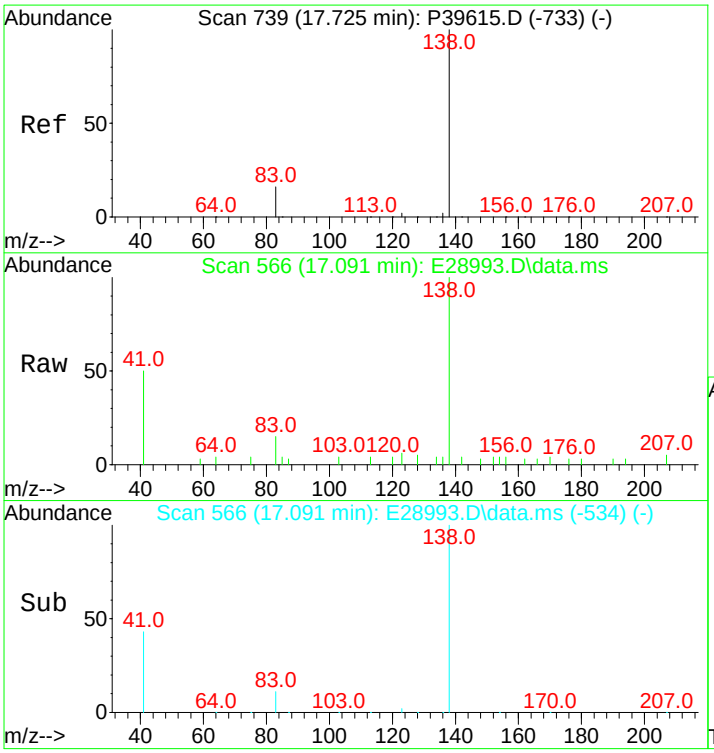




#3
trans-Decalin
Concen: 257.99 ng/mL
RT: 15.872 min Scan# 485
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

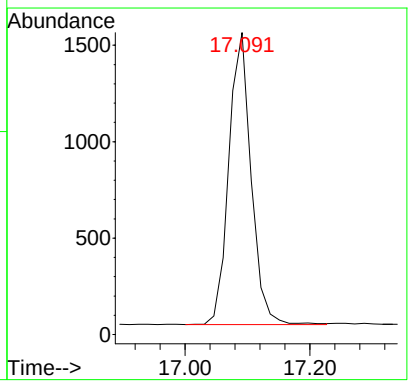
Tgt Ion:138 Resp: 4966

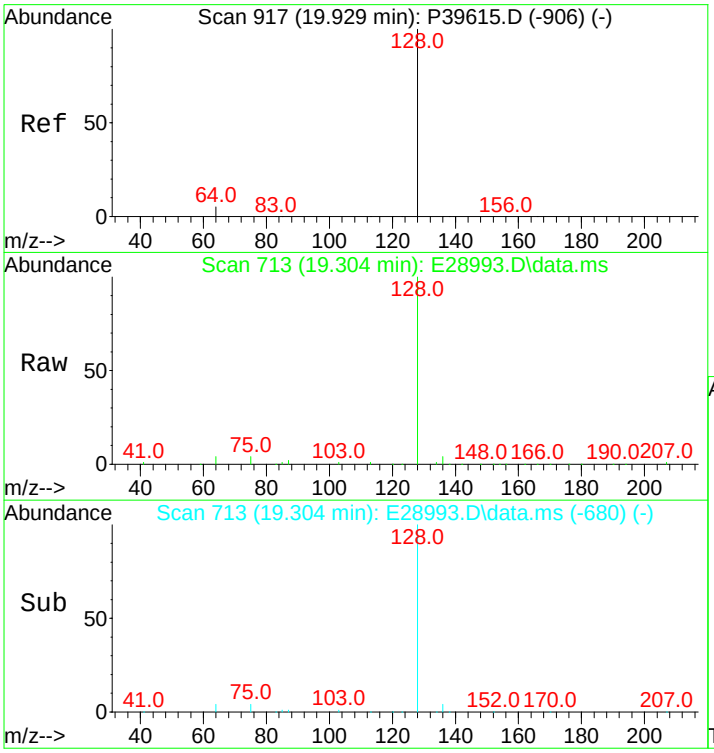




#4
cis-Decalin
Concen: 257.24 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:138 Resp: 3762

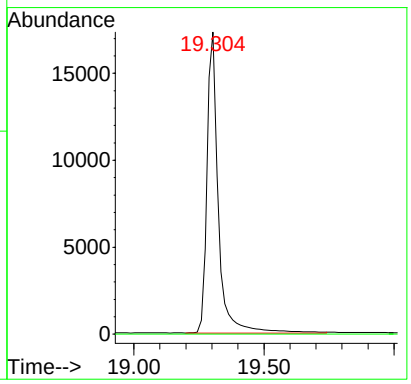


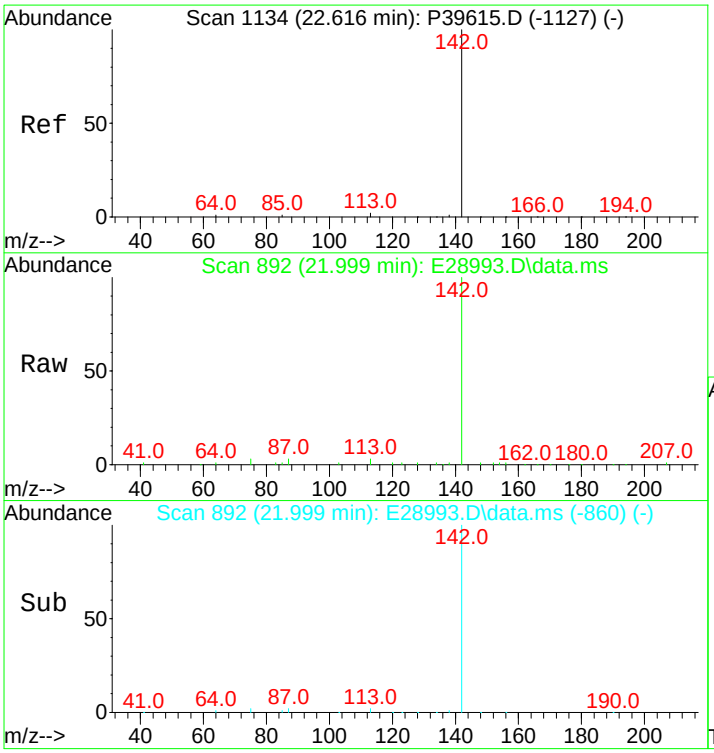


#10
Naphthalene
Concen: 550.75 ng/mL
RT: 19.304 min Scan# 713
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:128 Resp: 52132

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

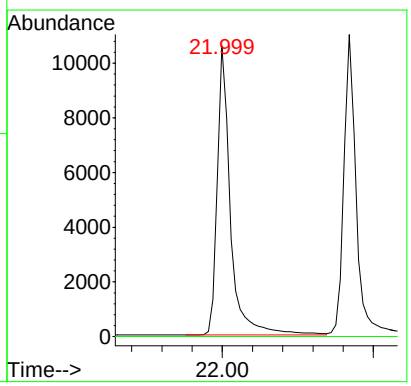


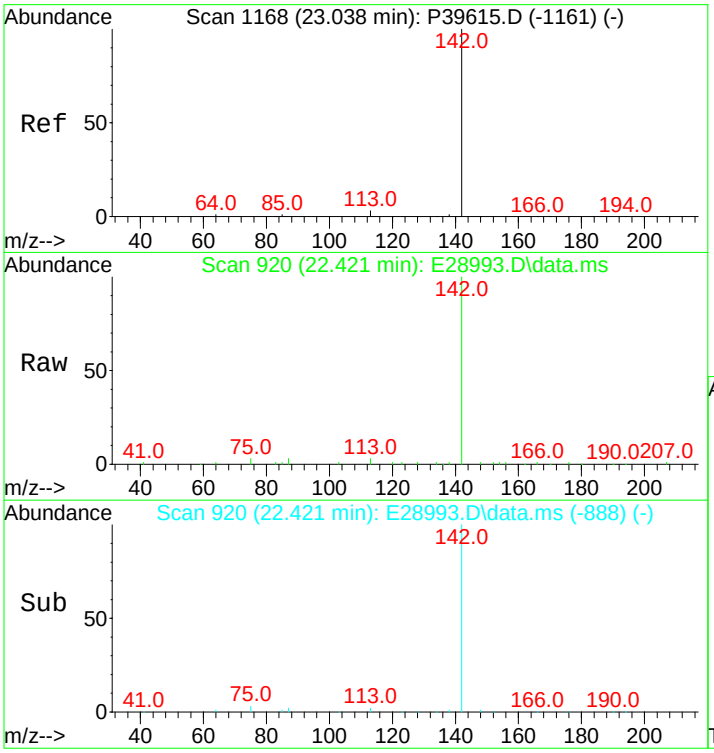


#16
2-Methylnaphthalene
Concen: 532.27 ng/mL
RT: 21.999 min Scan# 892
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:142 Resp: 32089

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

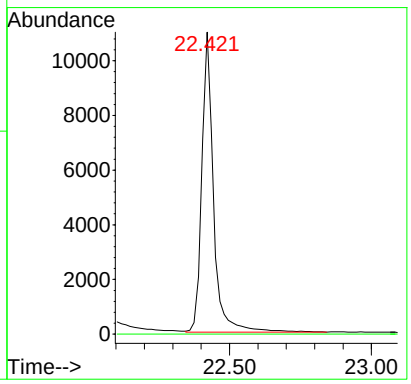


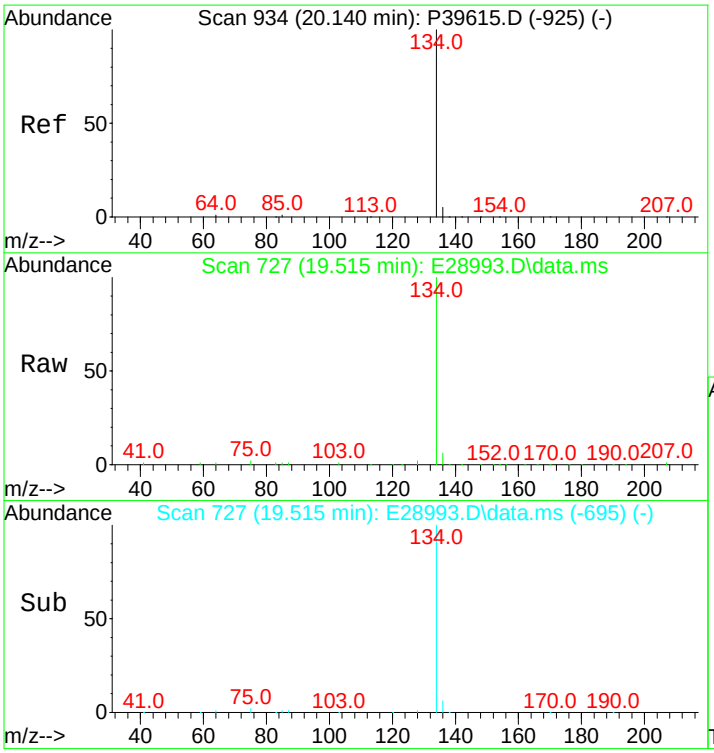


#17
1-Methylnaphthalene
Concen: 533.85 ng/mL
RT: 22.421 min Scan# 920
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:142 Resp: 31273

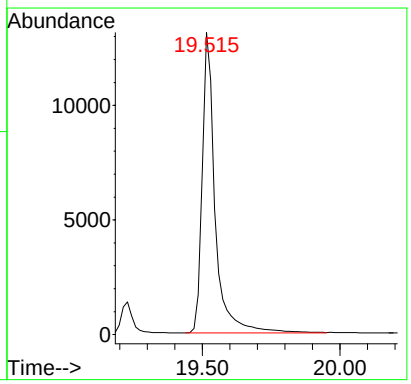
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

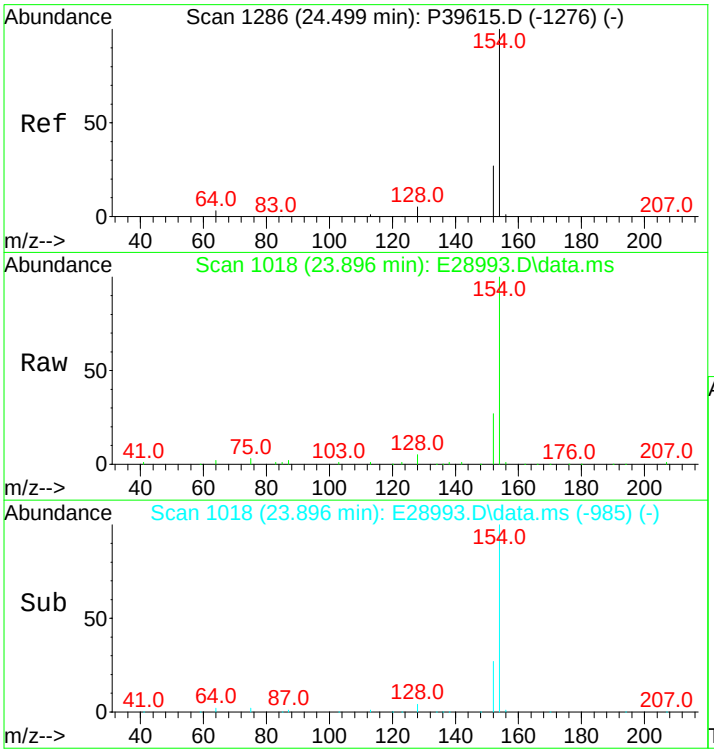




#18
Benzothiophene
Concen: 553.70 ng/mL
RT: 19.515 min Scan# 727
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:134 Resp: 43328

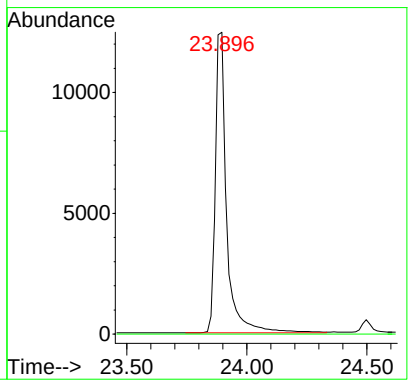


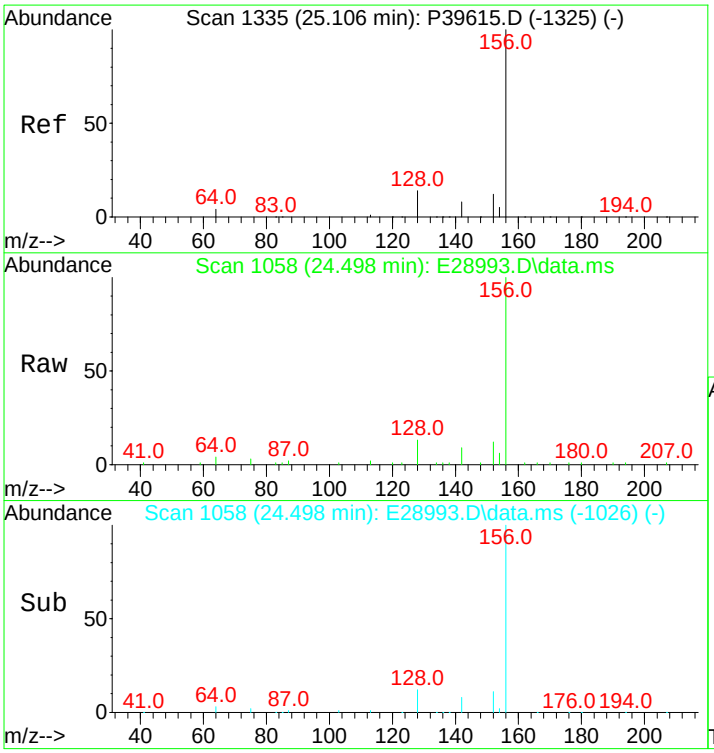


#23
Biphenyl
Concen: 532.63 ng/mL
RT: 23.896 min Scan# 1018
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:154 Resp: 40583

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

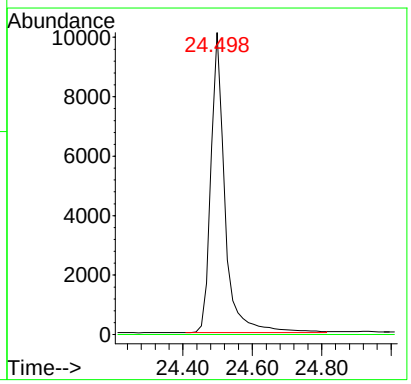


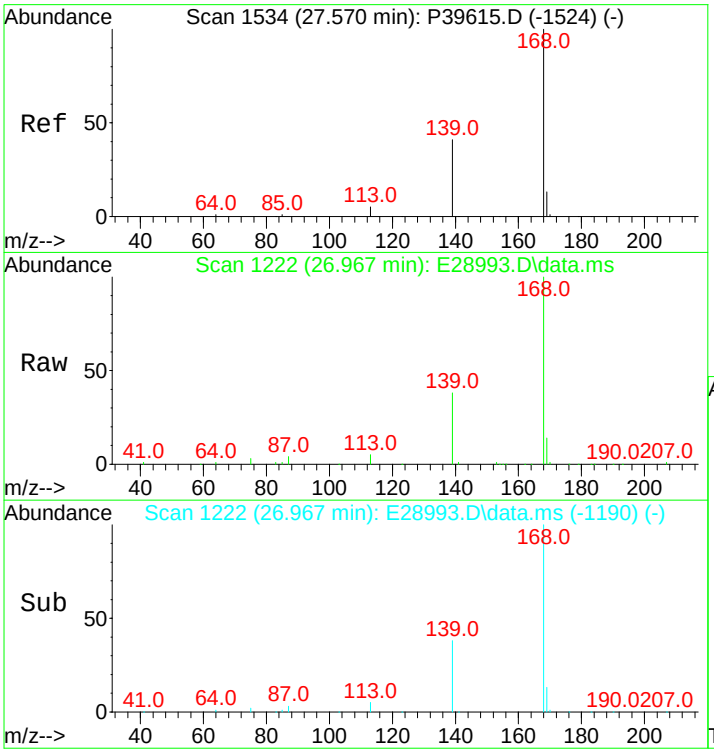


#24
2,6-Dimethylnaphthalene
Concen: 524.24 ng/mL
RT: 24.498 min Scan# 1058
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:156 Resp: 28488

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

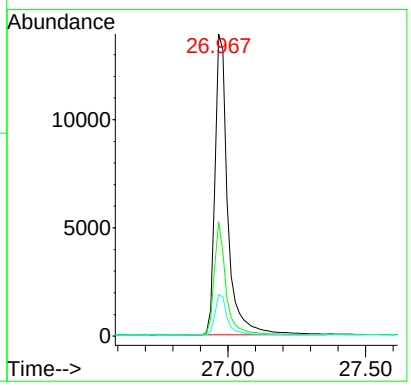


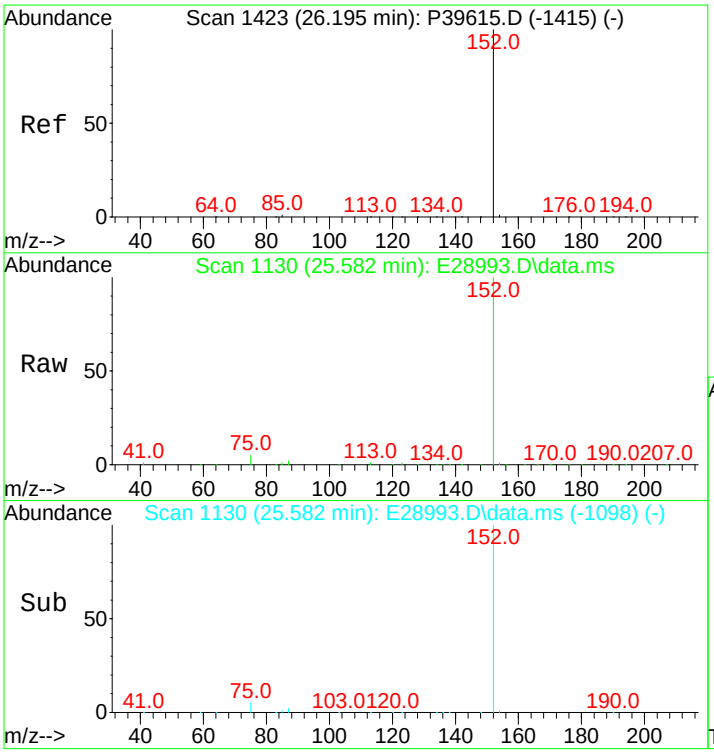


#25
Dibenzofuran
Concen: 536.03 ng/mL
RT: 26.967 min Scan# 1222
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:168 Resp: 45217

Ion	Ratio	Lower	Upper
168	100		
139	34.8	26.0	39.0
169	13.2	10.6	16.0

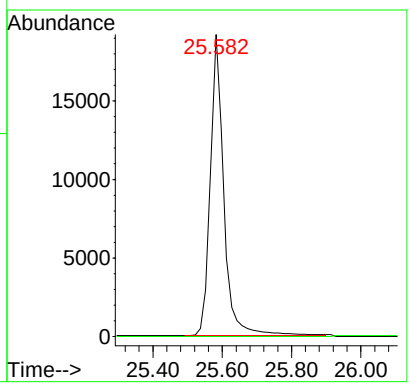


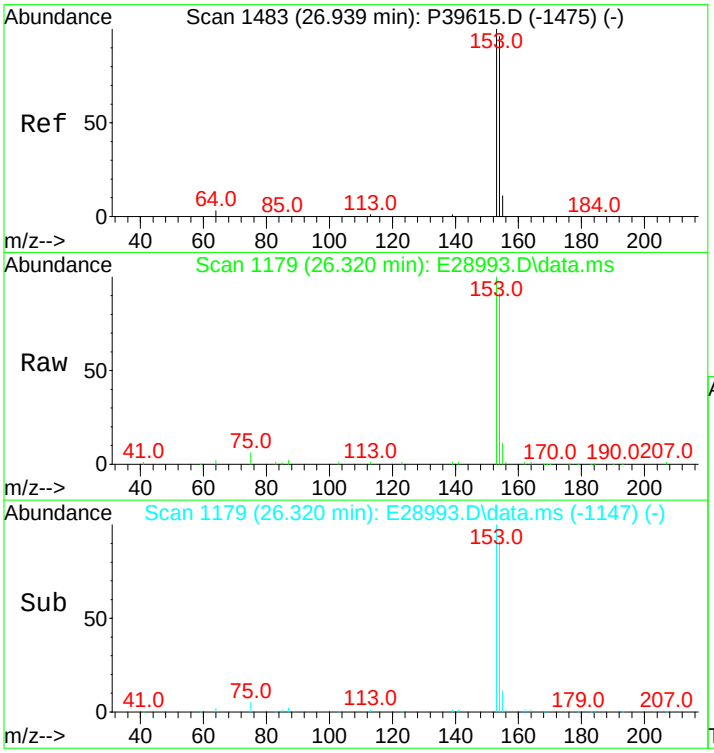


#26
Acenaphthylene
Concen: 555.85 ng/mL m
RT: 25.582 min Scan# 1130
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:152 Resp: 52457

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

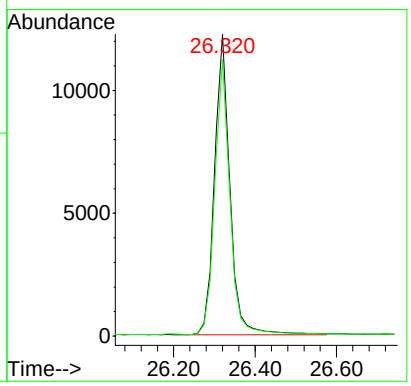


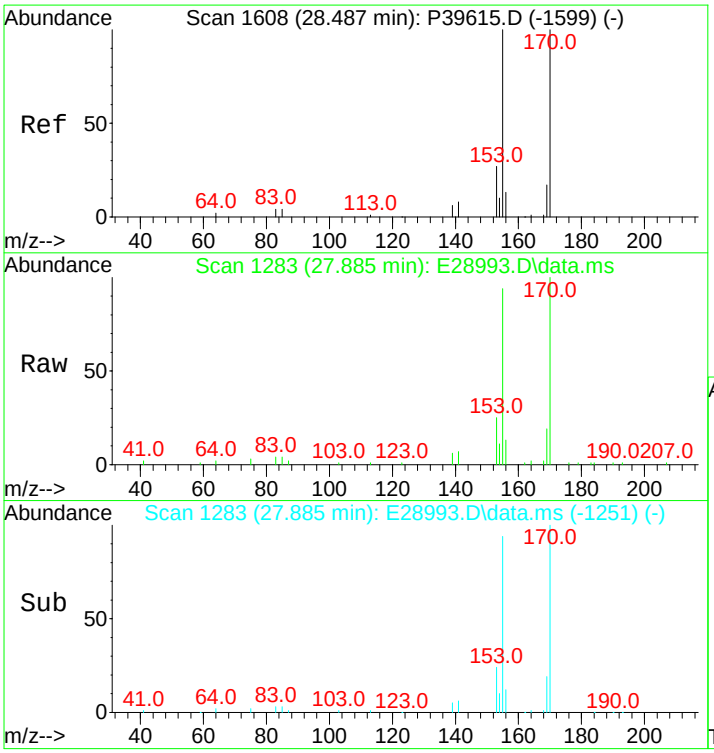


#27
Acenaphthene
Concen: 527.54 ng/mL
RT: 26.320 min Scan# 1179
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:153 Resp: 32046

Ion	Ratio	Lower	Upper
153	100		
154	91.2	74.1	111.1

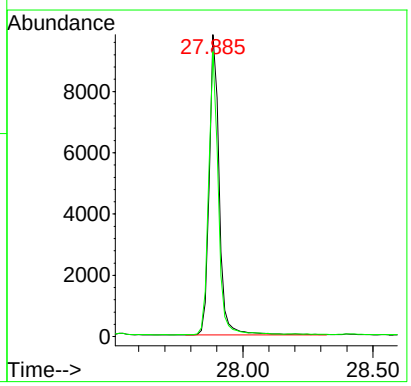


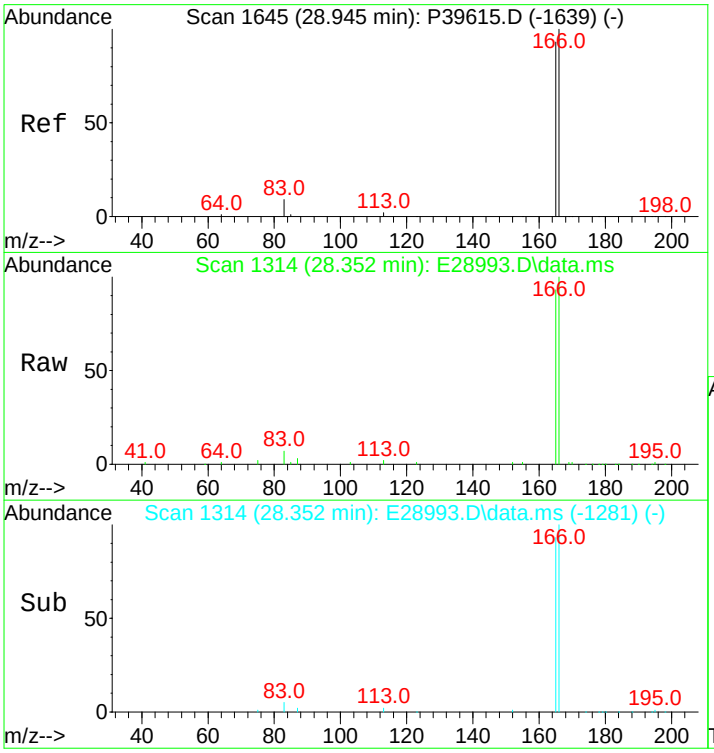


#28
2,3,5-Trimethylnaphthalene
Concen: 512.68 ng/mL
RT: 27.885 min Scan# 1283
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:170 Resp: 26065

Ion	Ratio	Lower	Upper
170	100		
155	91.4	70.7	106.1

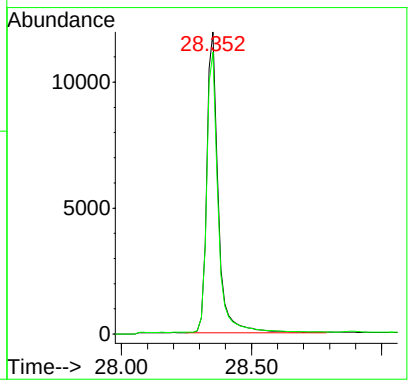


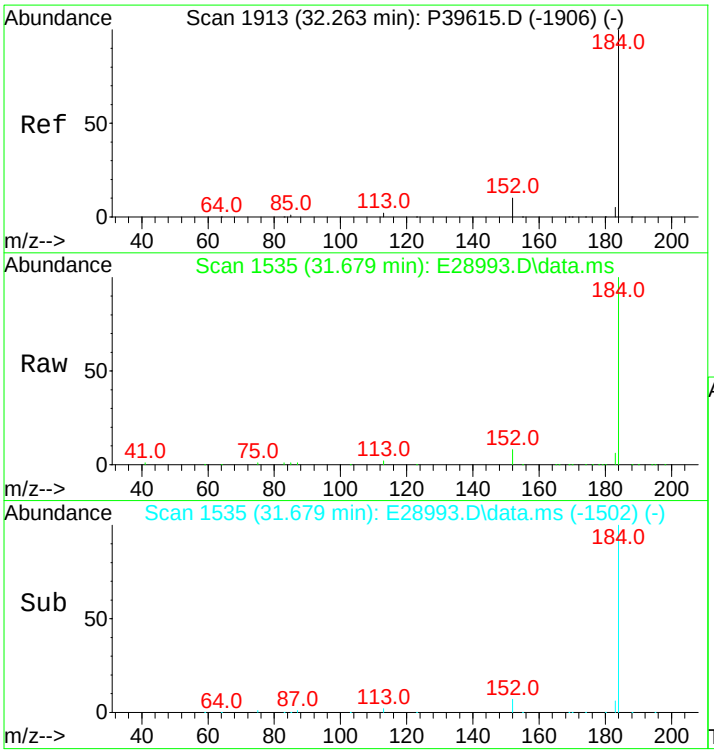


#29
Fluorene
Concen: 535.09 ng/mL
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:166 Resp: 36253

Ion	Ratio	Lower	Upper
166	100		
165	93.0	74.7	112.1

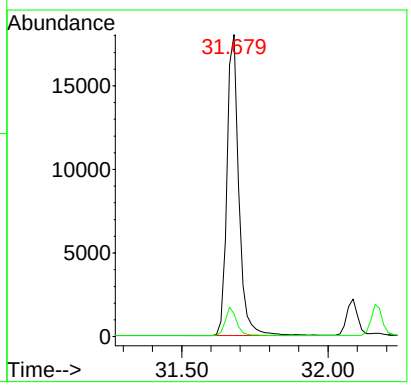


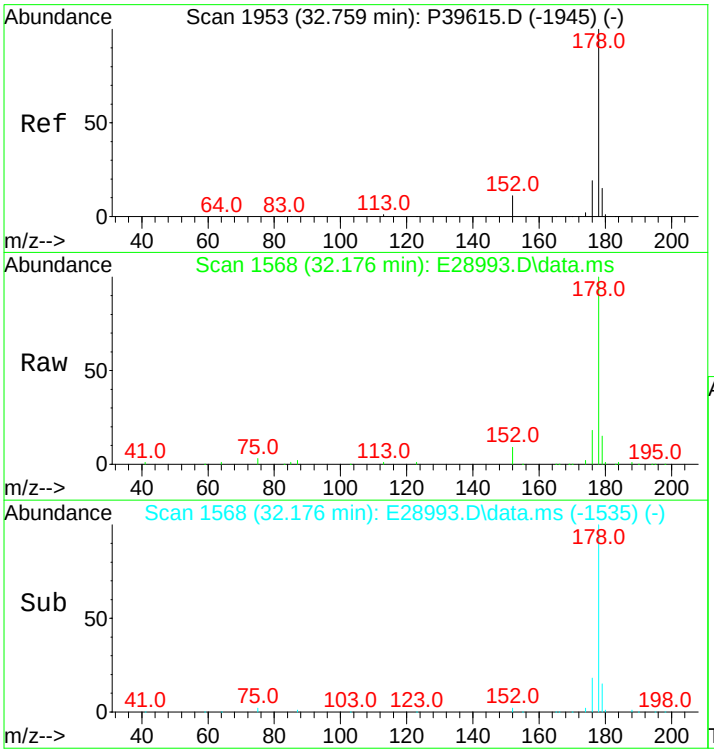


#33
Dibenzothiophene
Concen: 547.73 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:184 Resp: 50924

Ion	Ratio	Lower	Upper
184	100		
152	9.0	7.0	10.6

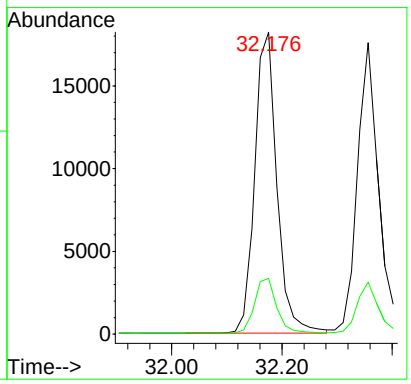


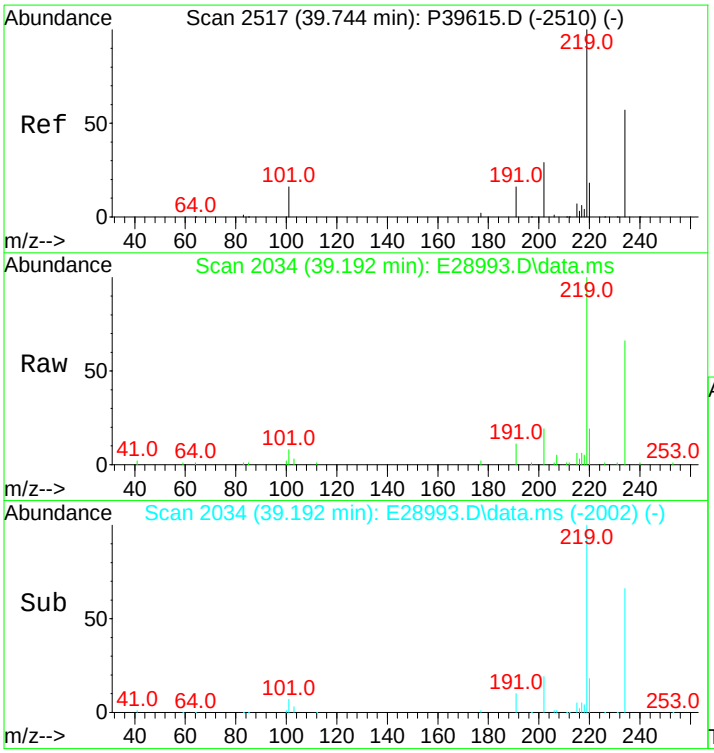


#43
Phenanthrene
Concen: 536.14 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:178 Resp: 50714

Ion	Ratio	Lower	Upper
178	100		
176	18.3	15.0	22.4

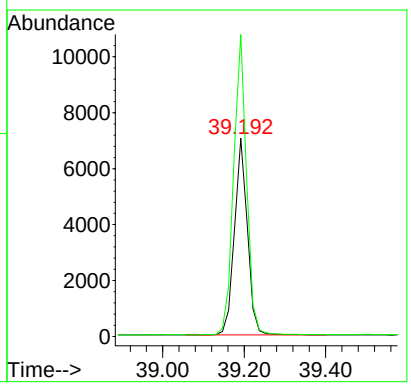


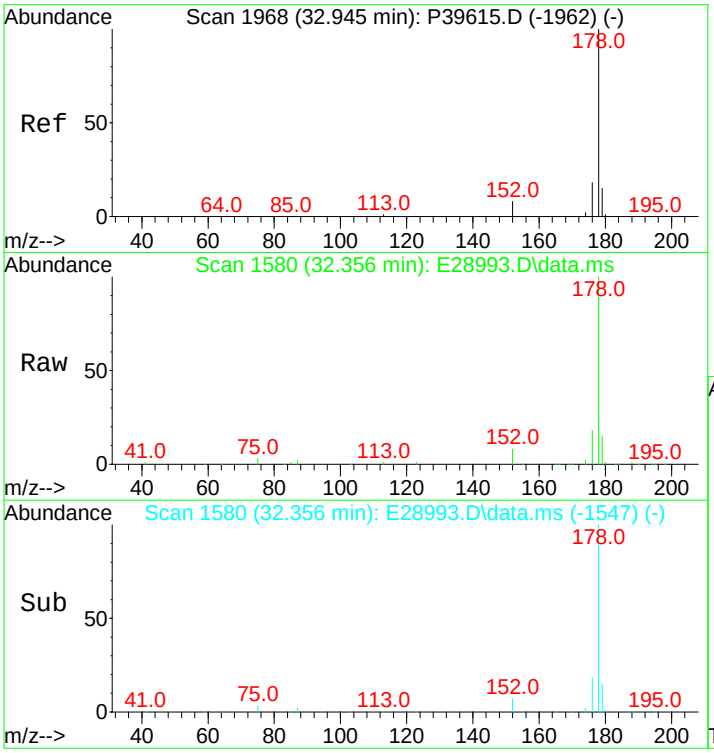


#54
Retene
Concen: 515.57 ng/mL
RT: 39.192 min Scan# 2034
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:234 Resp: 15693

Ion	Ratio	Lower	Upper
234	100		
219	152.2	115.3	172.9

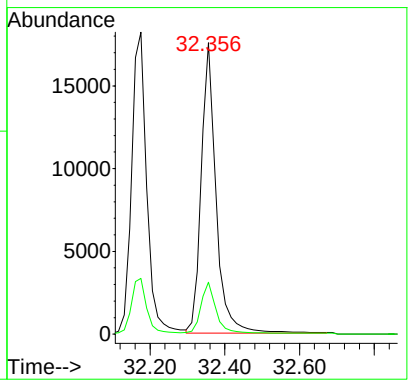


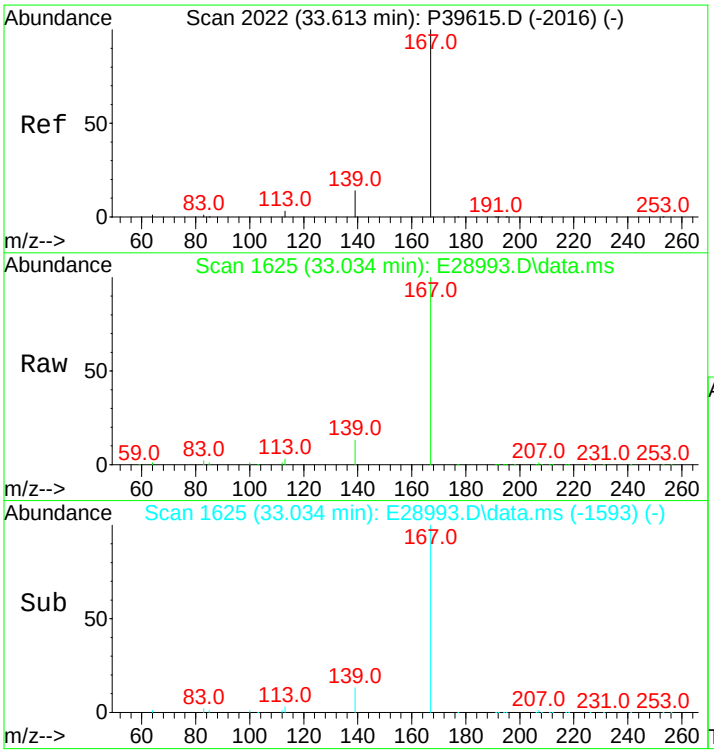


#55
Anthracene
Concen: 594.32 ng/mL m
RT: 32.356 min Scan# 1580
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:178 Resp: 48591

Ion	Ratio	Lower	Upper
178	100		
176	17.5	14.3	21.5

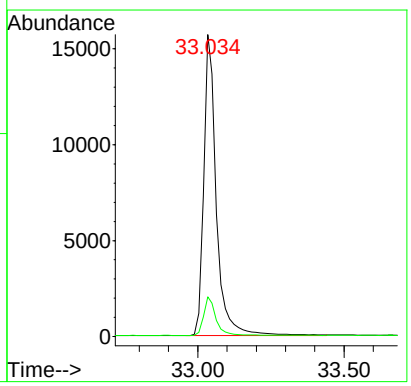


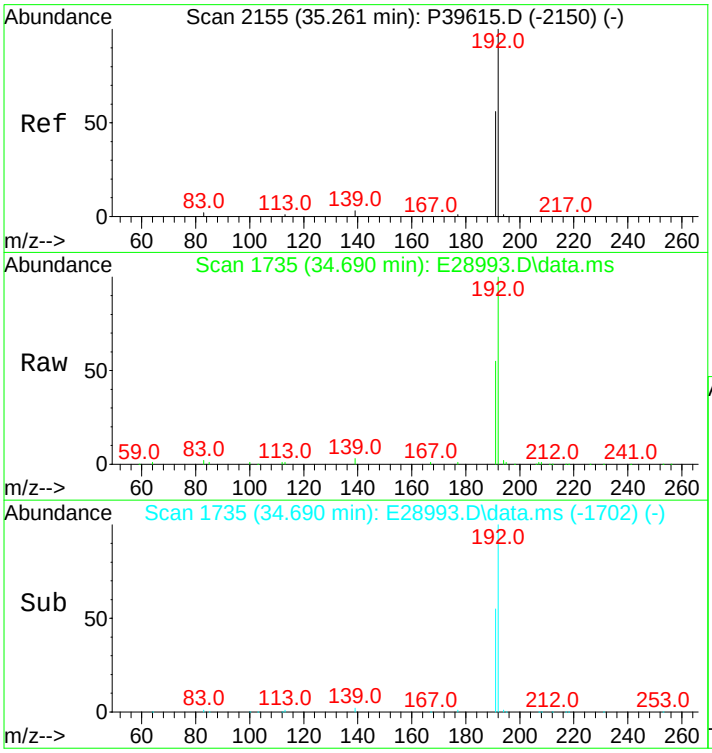


#56
Carbazole
Concen: 556.34 ng/mL
RT: 33.034 min Scan# 1625
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:167 Resp: 46813

Ion	Ratio	Lower	Upper
167	100		
139	12.5	10.1	15.1

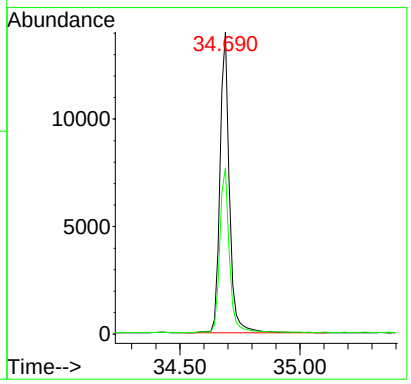


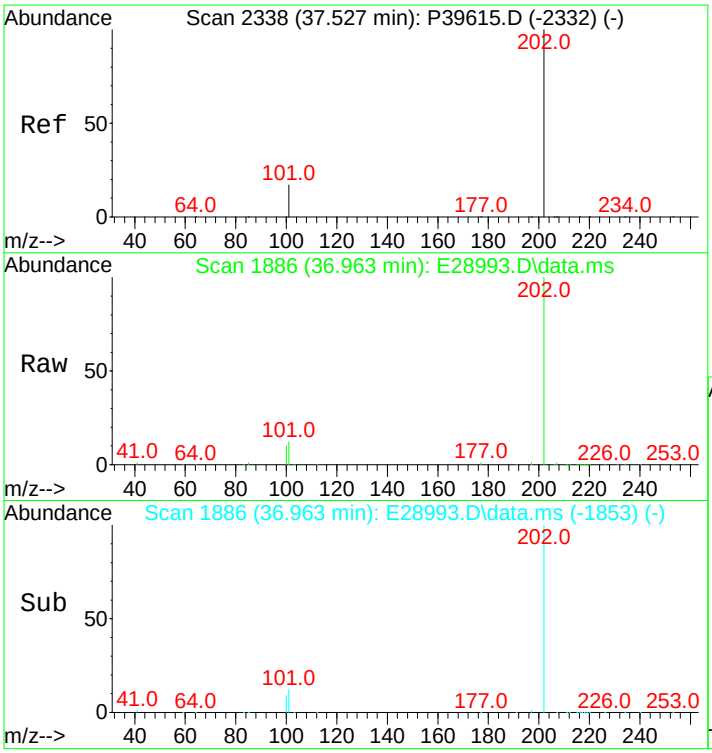


#57
1-Methylphenanthrene
Concen: 530.47 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:192 Resp: 38281

Ion	Ratio	Lower	Upper
192	100		
191	56.2	45.4	68.2

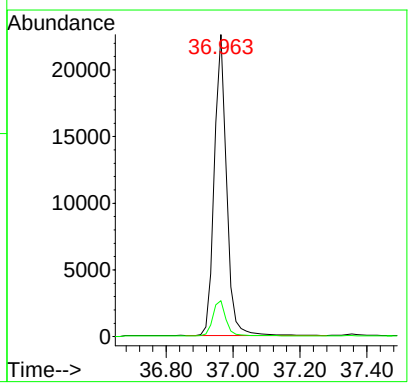


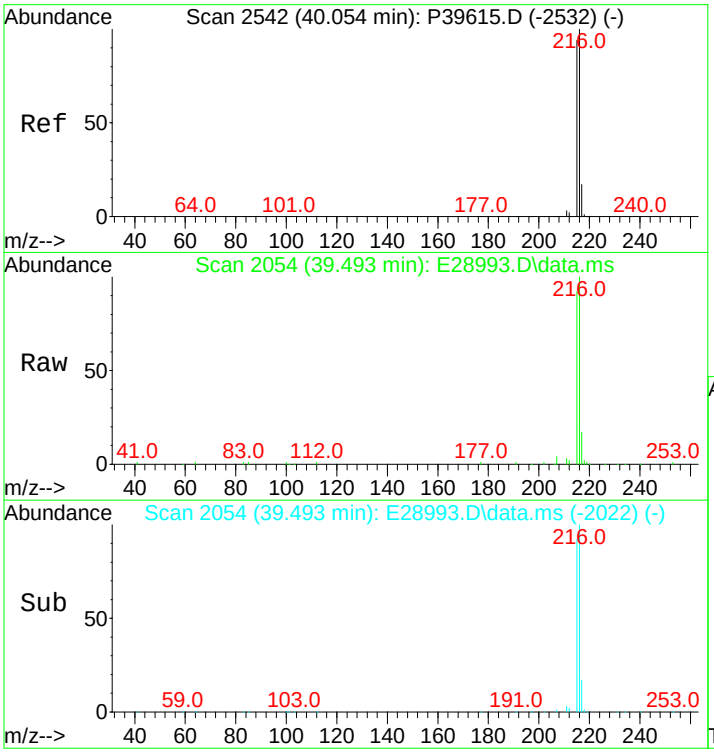


#58
Fluoranthene
Concen: 545.42 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:202 Resp: 56975

Ion	Ratio	Lower	Upper
202	100		
101	12.3	10.4	15.6

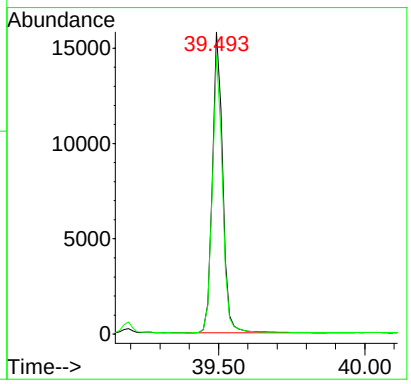


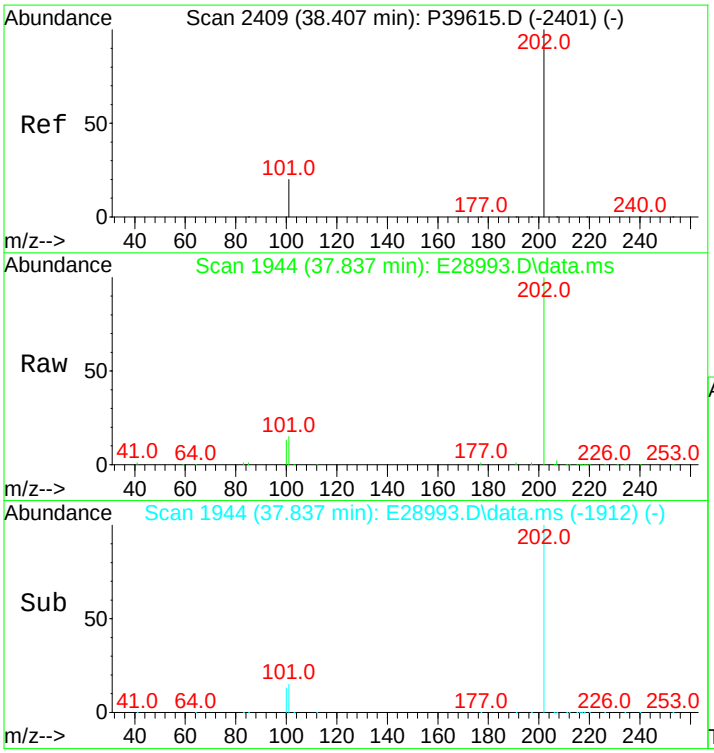


#59
Benzo(b)fluorene
Concen: 552.01 ng/mL
RT: 39.493 min Scan# 2054
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:216 Resp: 38424

Ion	Ratio	Lower	Upper
216	100		
215	92.0	72.6	109.0

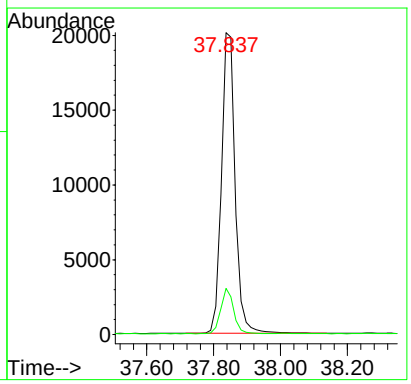


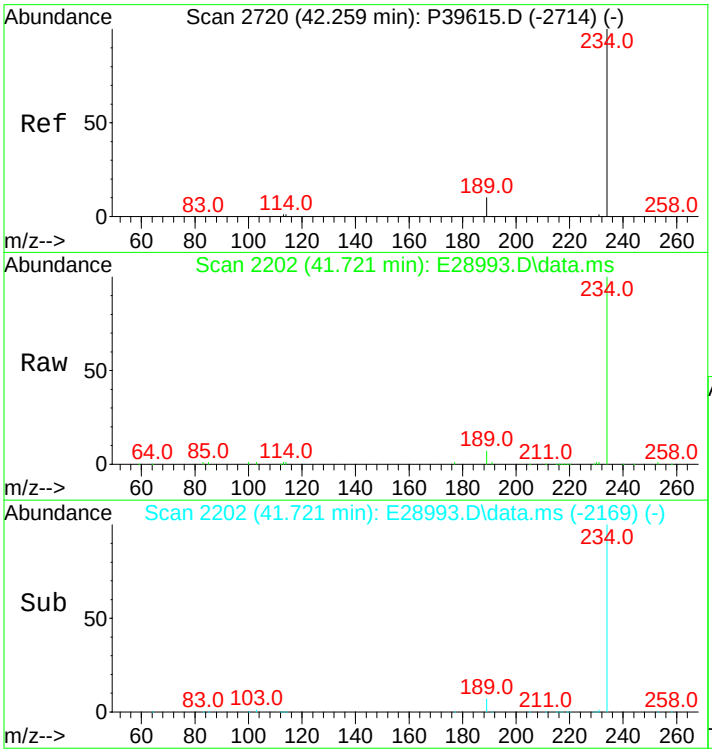


#60
Pyrene
Concen: 539.28 ng/mL
RT: 37.837 min Scan# 1944
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:202 Resp: 57258

Ion	Ratio	Lower	Upper
202	100		
101	14.3	11.0	16.4

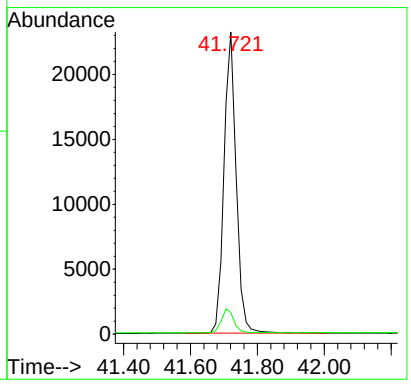


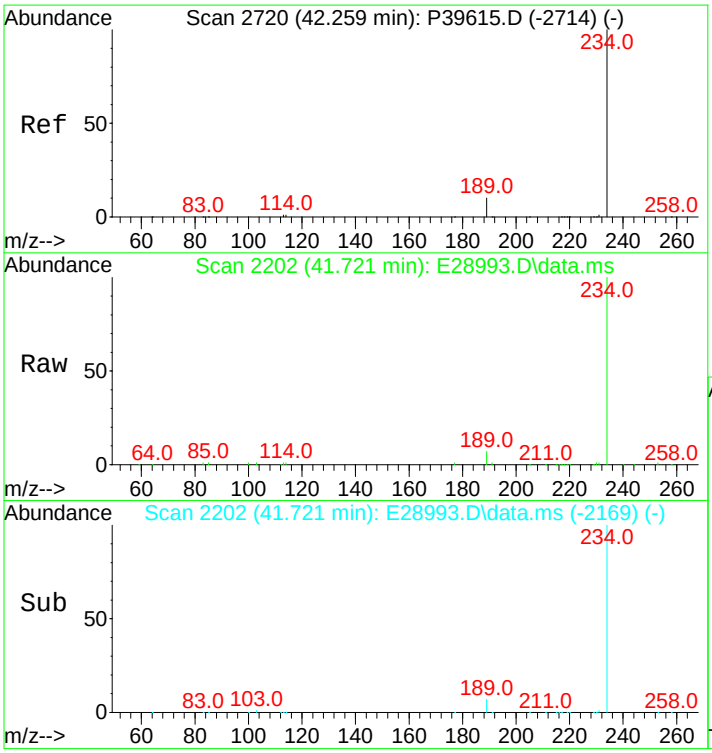


#66
Naphthobenzothiophene
Concen: 562.82 ng/ml
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:234 Resp: 58939

Ion	Ratio	Lower	Upper
234	100		
189	8.2	21.1	31.7#

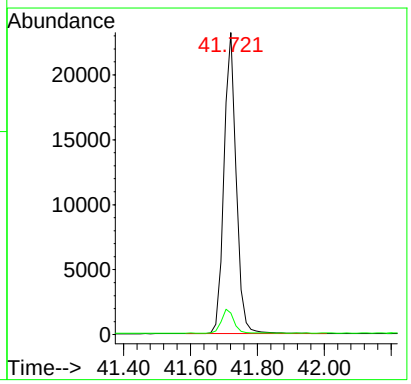


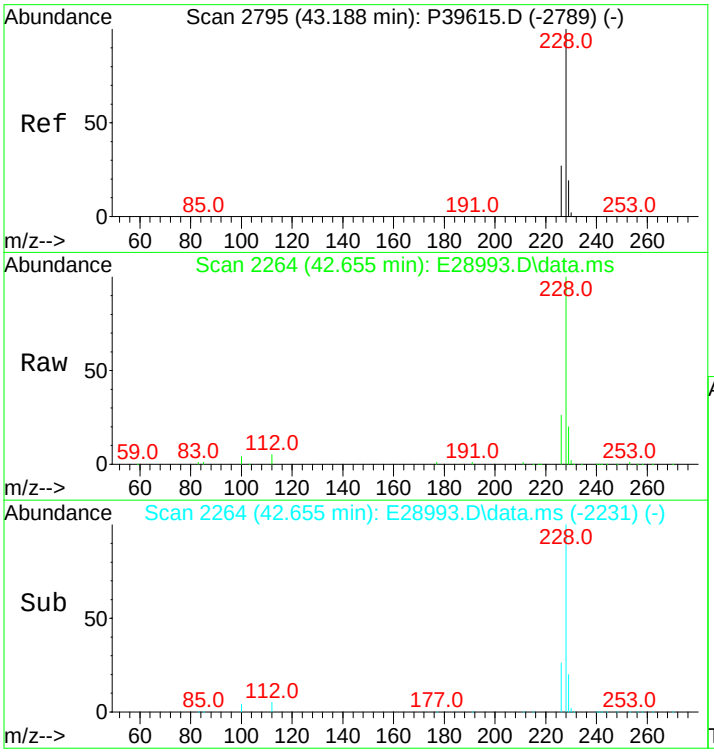


#67
Naphthobenzothiophene-2,1-D
Concen: 562.82 ng/mL
RT: 41.721 min Scan# 2202
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:234 Resp: 58939

Ion	Ratio	Lower	Upper
234	100		
189	8.2	21.1	31.7#

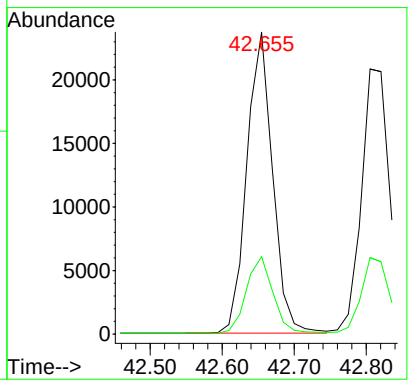


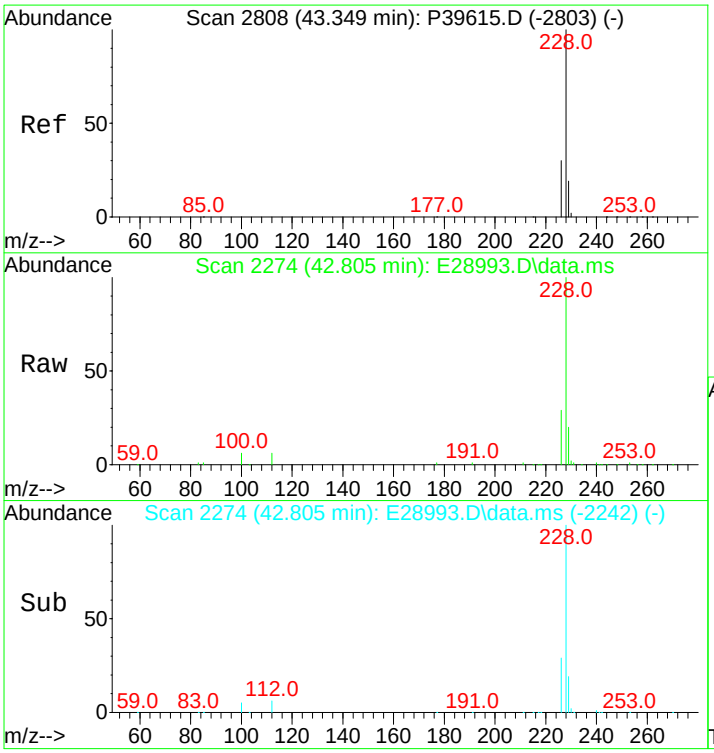


#75
Benz[a]anthracene
Concen: 571.56 ng/mL
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:228 Resp: 58810

Ion	Ratio	Lower	Upper
228	100		
226	26.2	20.7	31.1

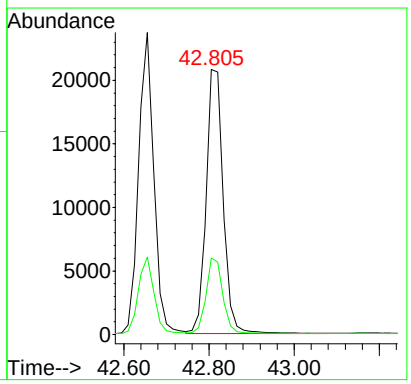


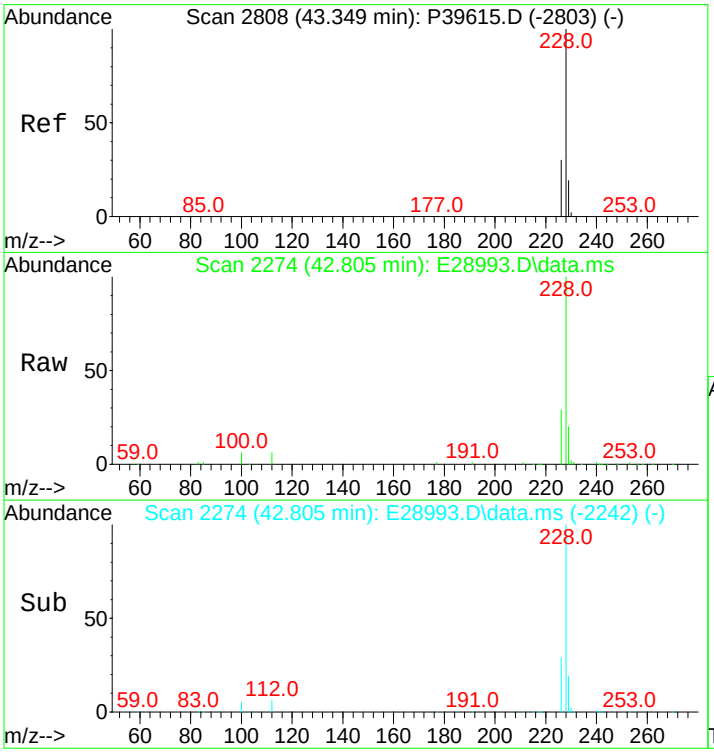


#76
Chrysene
Concen: 546.82 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:228 Resp: 57925

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

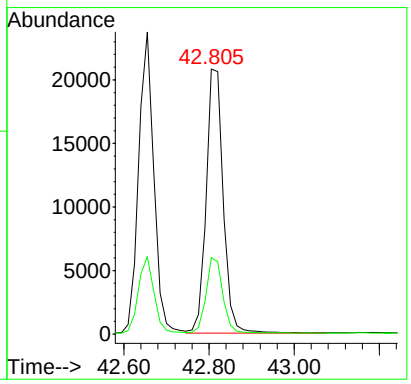


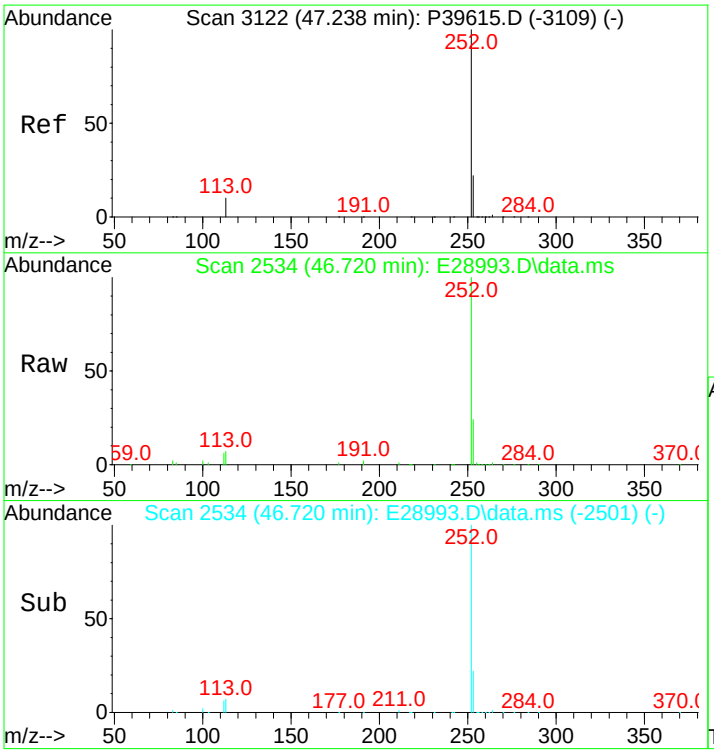


#77
Chrysene/Triphenylene
Concen: 546.82 ng/mL
RT: 42.805 min Scan# 2274
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:228 Resp: 57925

Ion	Ratio	Lower	Upper
228	100		
226	28.1	22.6	34.0

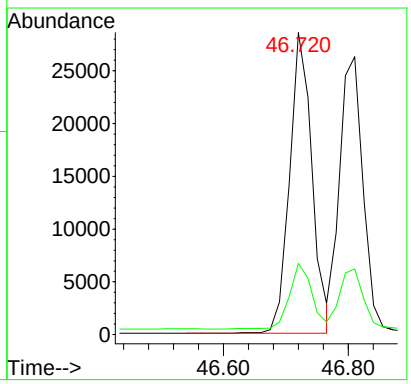


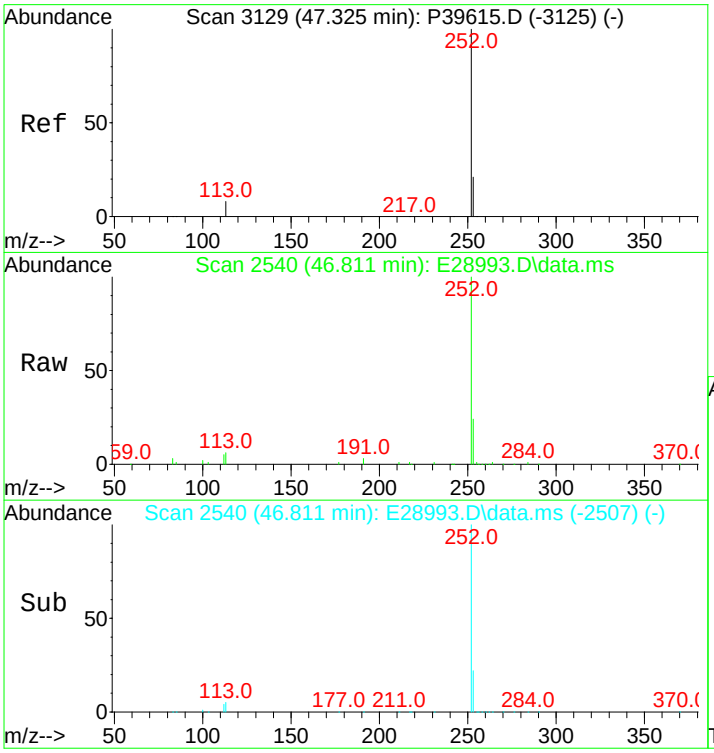


#84
Benzo[b]fluoranthene
Concen: 592.46 ng/mL
RT: 46.720 min Scan# 2534
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 70856

Ion	Ratio	Lower	Upper
252	100		
253	21.9	19.5	29.3

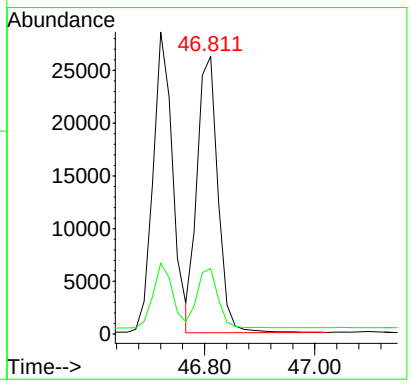


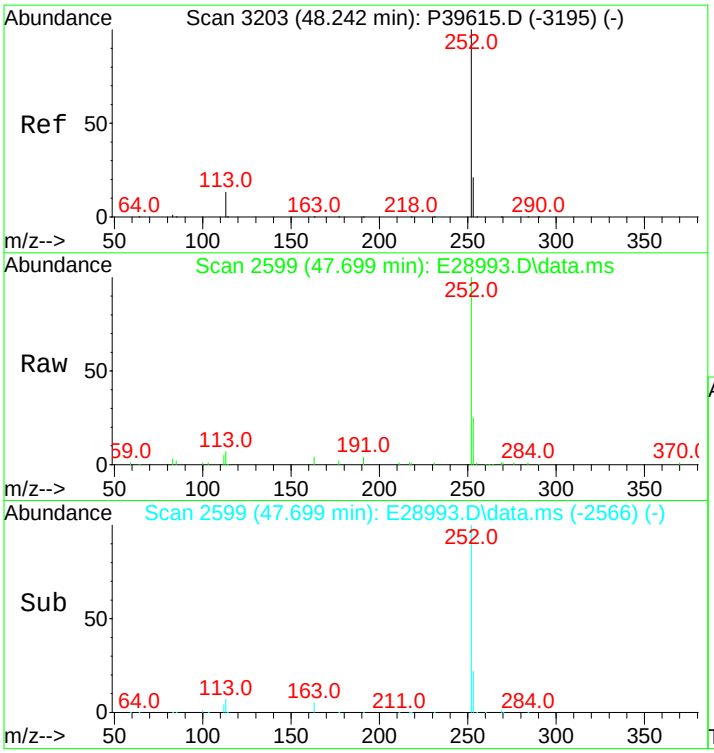


#85
Benzo[j]+[k]fluoranthene
Concen: 564.00 ng/mL
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 69397

Ion	Ratio	Lower	Upper
252	100		
253	21.3	19.7	29.5

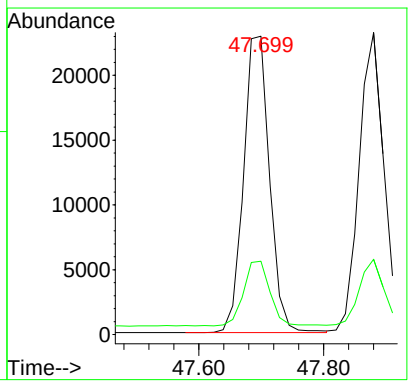


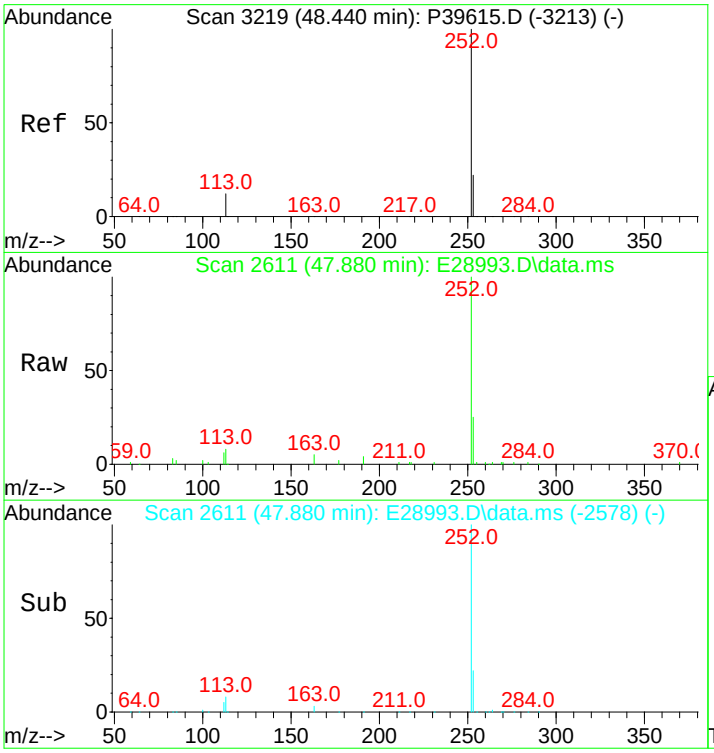


#87
Benzo[e]pyrene
Concen: 567.16 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 66232

Ion	Ratio	Lower	Upper
252	100		
253	22.7	20.6	31.0

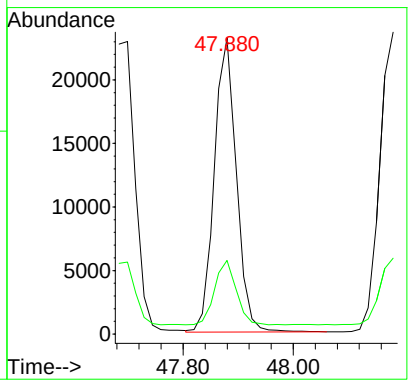


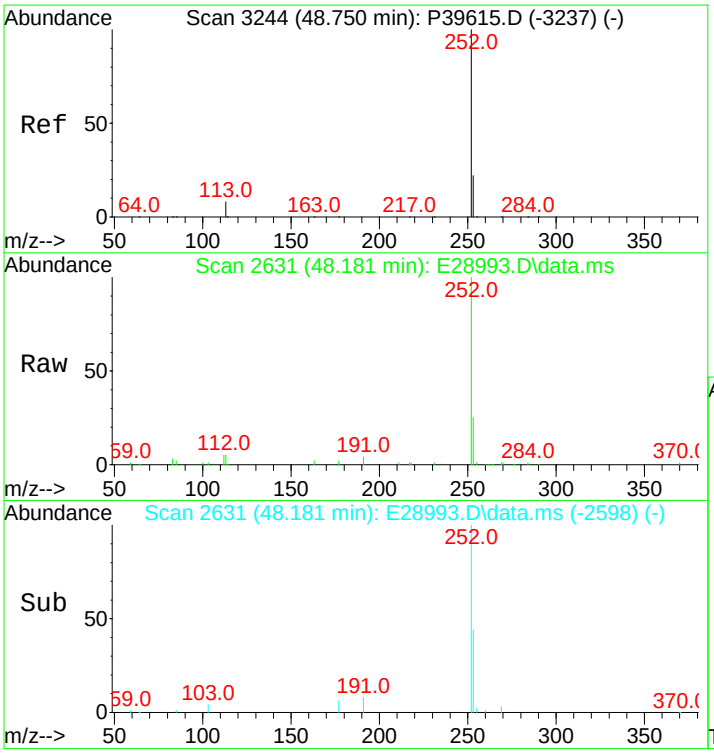


#89
Benzo[a]pyrene
Concen: 578.68 ng/mL
RT: 47.880 min Scan# 2611
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 64662

Ion	Ratio	Lower	Upper
252	100		
253	21.7	20.8	31.2

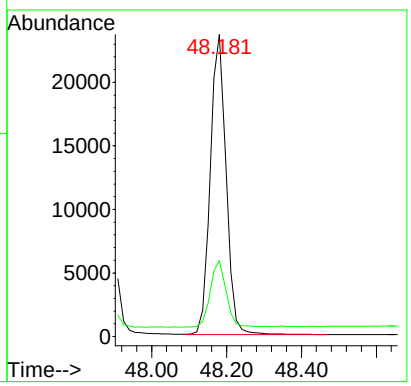


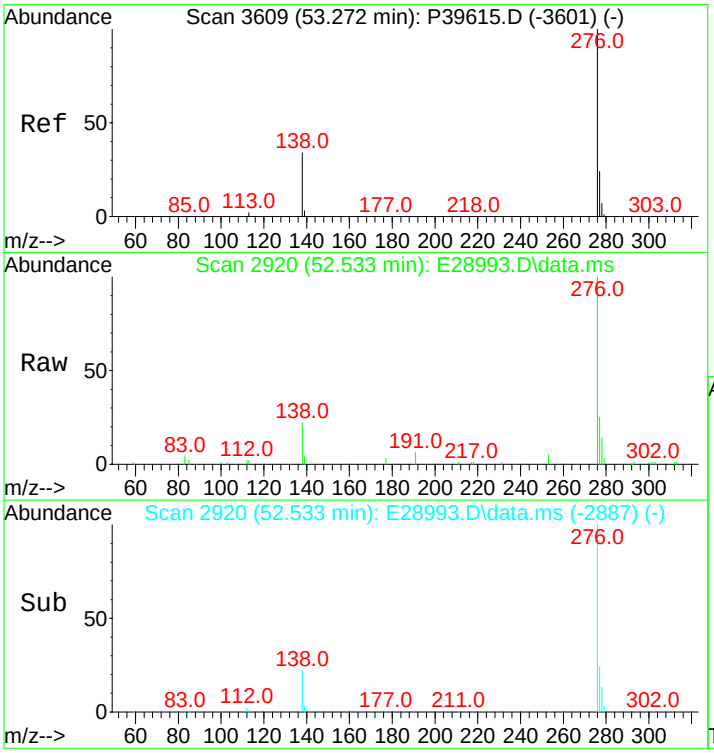


#90
Perylene
Concen: 585.77 ng/mL
RT: 48.181 min Scan# 2631
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:252 Resp: 69214

Ion	Ratio	Lower	Upper
252	100		
253	22.3	20.7	31.1

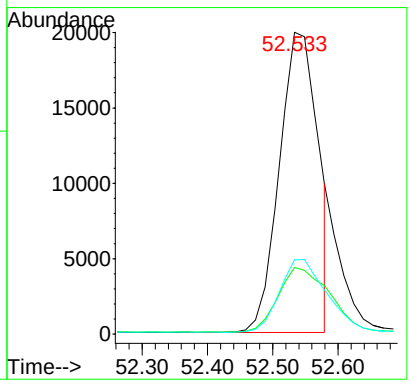


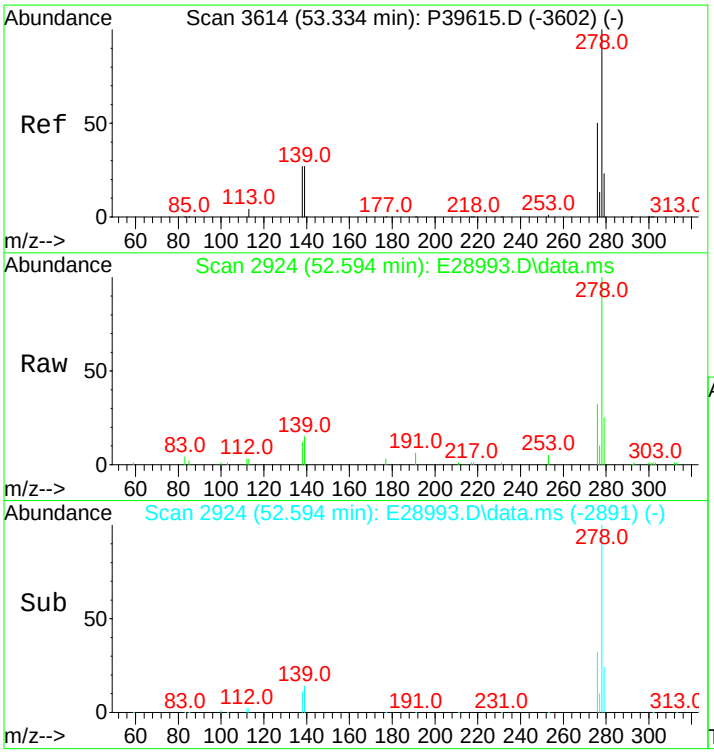


#91
Indeno[1,2,3-cd]pyrene
Concen: 625.95 ng/mL m
RT: 52.533 min Scan# 2920
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:276 Resp: 82316

Ion	Ratio	Lower	Upper
276	100		
138	28.8	16.3	24.5#
277	30.0	19.4	29.2#

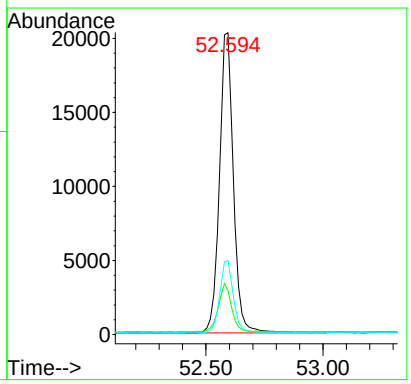


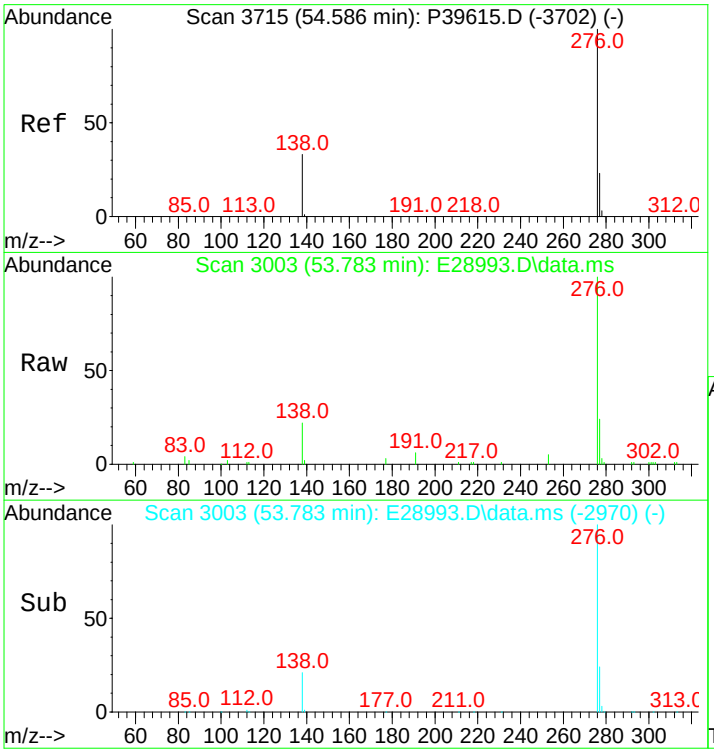


#92
Dibenz[ah]+[ac]anthracene
Concen: 603.49 ng/mL
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:278 Resp: 84503

Ion	Ratio	Lower	Upper
278	100		
139	15.1	11.6	17.4
279	23.5	19.3	28.9

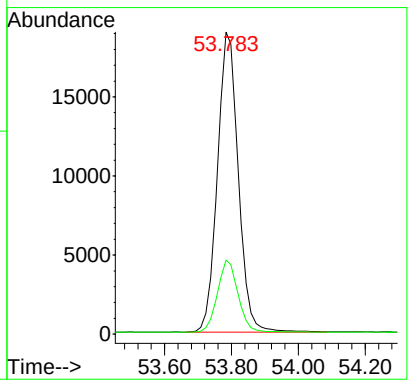


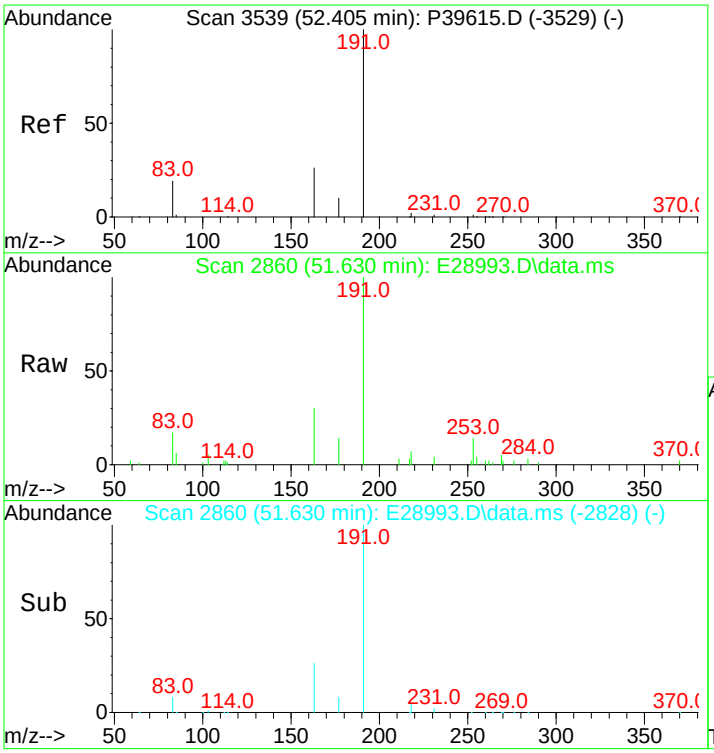


#93
Benzo[g,h,i]perylene
Concen: 579.48 ng/mL
RT: 53.783 min Scan# 3003
Delta R.T. 0.000 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:276 Resp: 82167

Ion	Ratio	Lower	Upper
276	100		
277	23.8	19.1	28.7

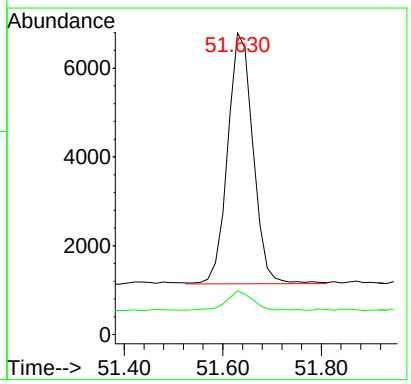


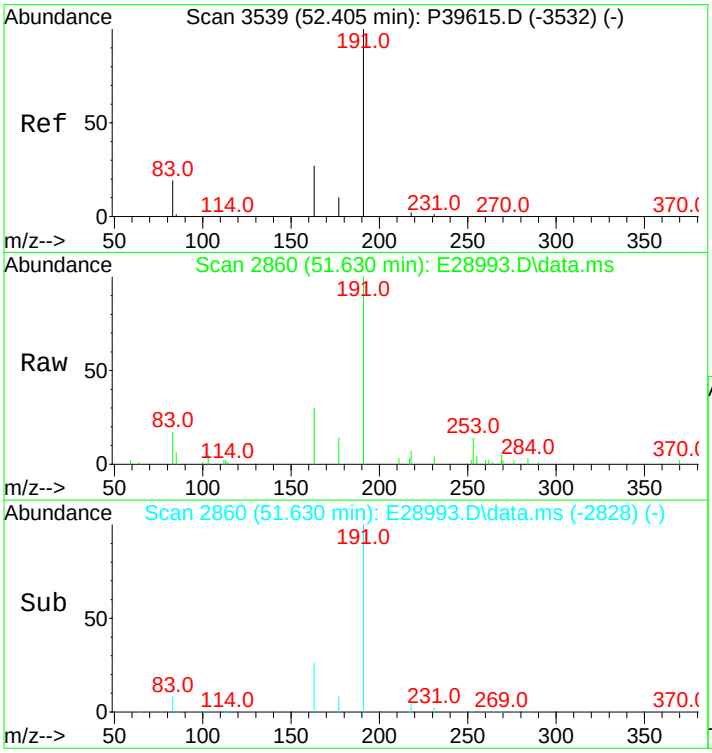


#94
Hopane (T19)
Concen: 510.23 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:191 Resp: 20233

Ion	Ratio	Lower	Upper
191	100		
177	8.0	11.6	17.4#

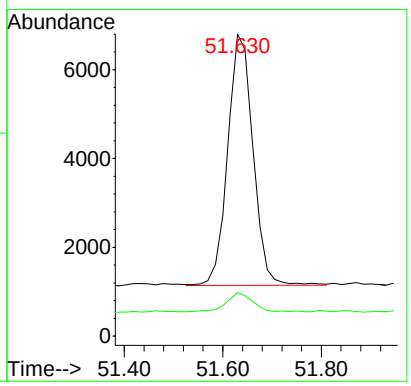




#95
17a(H),21B(H)-hopane - C30H52
Concen: 510.23 ng/mL
RT: 51.630 min Scan# 2860
Delta R.T. -0.015 min
Lab File: E28993.D
Acq: 15 Nov 2012 3:14 pm

Tgt Ion:191 Resp: 20233

Ion	Ratio	Lower	Upper
191	100		
177	8.0	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	24018	500.000	ng/mL	0.02
74) Chrysene-d12	42.730	240	51970	500.000	ng/mL	0.02
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	42087	498.182	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.82%#			
42) Phenanthrene-d10	32.085	188	42292	488.622	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.86%#			
83) Benzo[b]fluoranthene-d12	46.645	264	53512	501.242	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.12%			
88) Benzo[a]pyrene-d12	47.805	264	52874	511.142	ng/mL	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.11%			
129) 5B(H)Cholane - Surr	43.347	217	10939	534.065	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.41%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	4810	250.362	ng/mL	100
4) cis-Decalin	17.106	138	3688	252.663	ng/mL	100
10) Naphthalene	19.319	128	50662	536.245	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	31345	520.920	ng/mL#	100
17) 1-Methylnaphthalene	22.436	142	30282	517.920	ng/mL#	100
18) Benzothiophene	19.530	134	42828	548.360	ng/mL	100
23) Biphenyl	23.896	154	39765	522.893	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	28258	521.008	ng/mL#	100
25) Dibenzofuran	26.982	168	45112	535.812	ng/mL	96
26) Acenaphthylene	25.597	152	51113M3	542.648	ng/mL	
27) Acenaphthene	26.335	153	31260	515.583	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.900	170	26129	514.919	ng/mL	96
29) Fluorene	28.352	166	35474	524.595	ng/mL	99
33) Dibenzothiophene	31.679	184	51505	555.036	ng/mL	98
43) Phenanthrene	32.176	178	50492	534.818	ng/mL	99
54) Retene	39.207	234	15591	513.199	ng/mL	92
55) Anthracene	32.371	178	48471M3	593.984	ng/mL	
56) Carbazole	33.049	167	46782	557.033	ng/mL	100
57) 1-Methylphenanthrene	34.690	192	38225	530.705	ng/mL	99
58) Fluoranthene	36.963	202	56249	539.501	ng/mL	98
59) Benzo(b)fluorene	39.508	216	38135	548.905	ng/mL	99
60) Pyrene	37.852	202	57209	539.847	ng/mL	99
66) Naphthobenzothiophene	41.736	234	57263	547.867	ng/ml#	65
67) Naphthobenzothiophene-2,1	41.736	234	57263	547.867	ng/mL#	65
75) Benz[a]anthracene	42.655	228	56552	558.805	ng/mL	100
76) Chrysene	42.820	228	55852	536.064	ng/mL	99
77) Chrysene/Triphenylene	42.820	228	55852	536.064	ng/mL	99
84) Benzo[b]fluoranthene	46.735	252	68060	578.593	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.811	252	65403	540.427	ng/mL	94
87) Benzo[e]pyrene	47.699	252	63310	551.206	ng/mL	92
89) Benzo[a]pyrene	47.895	252	61523	559.792	ng/mL	92
90) Perylene	48.196	252	65712	565.429	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.548	276	82475M3	637.649	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.594	278	80707	586.015	ng/mL	98
93) Benzo[g,h,i]perylene	53.813	276	79225	568.072	ng/mL	99
94) Hopane (T19)	51.645	191	20115	515.732	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.645	191	20115	515.732	ng/mL#	84

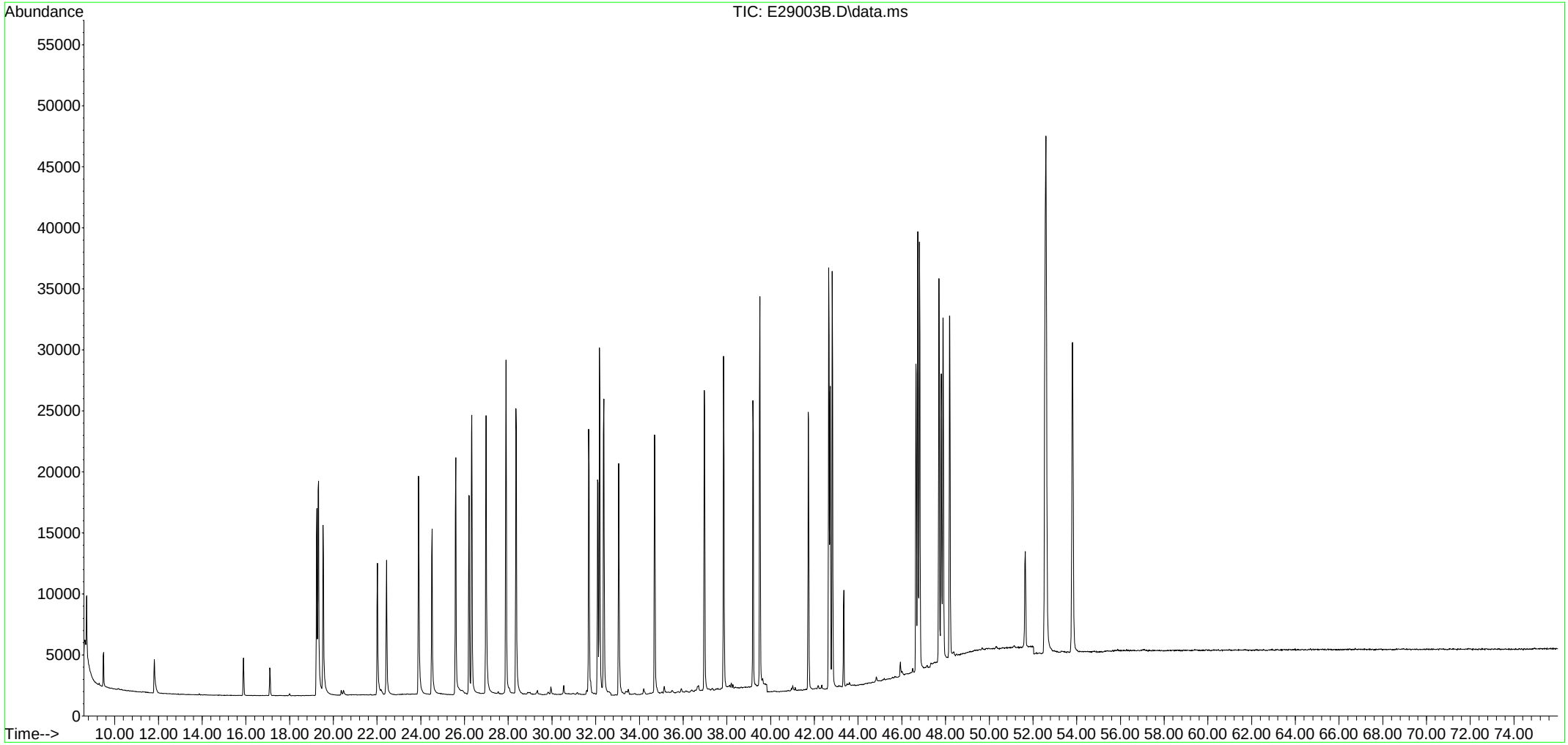
(#) = qualifier out of range (m) = manual integration (+) = signals summed

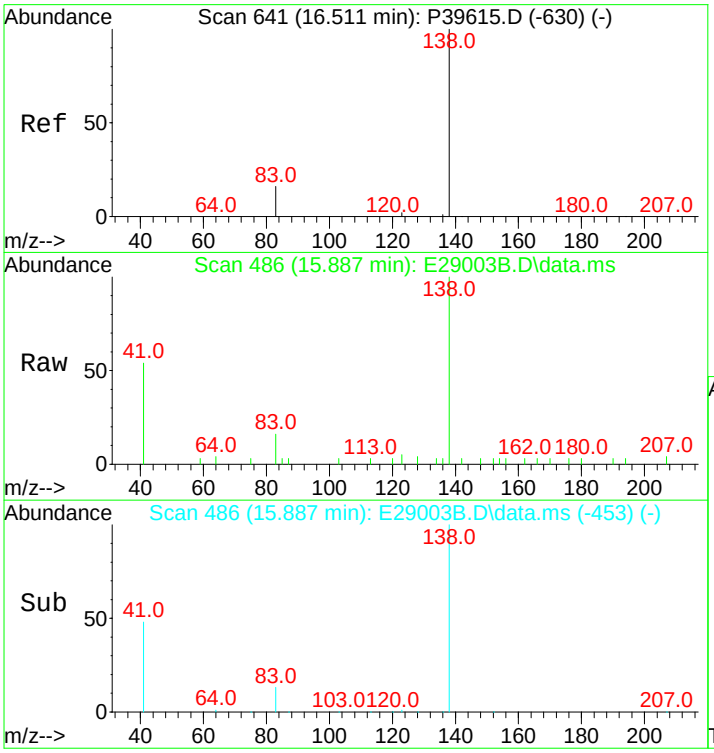
Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH2\2012\NOV12\NOV13\
Data File : E29003B.D
Acq On : 16 Nov 2012 7:41 am
Operator : AC
Sample : C211131205
Misc : CC WHAQ80 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 16 12:29:58 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

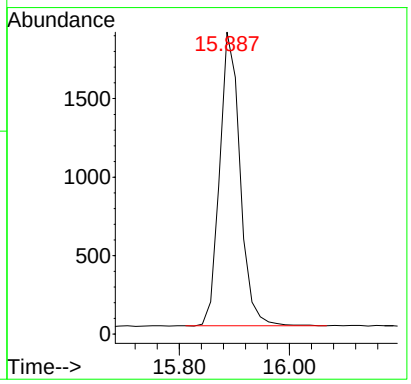
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

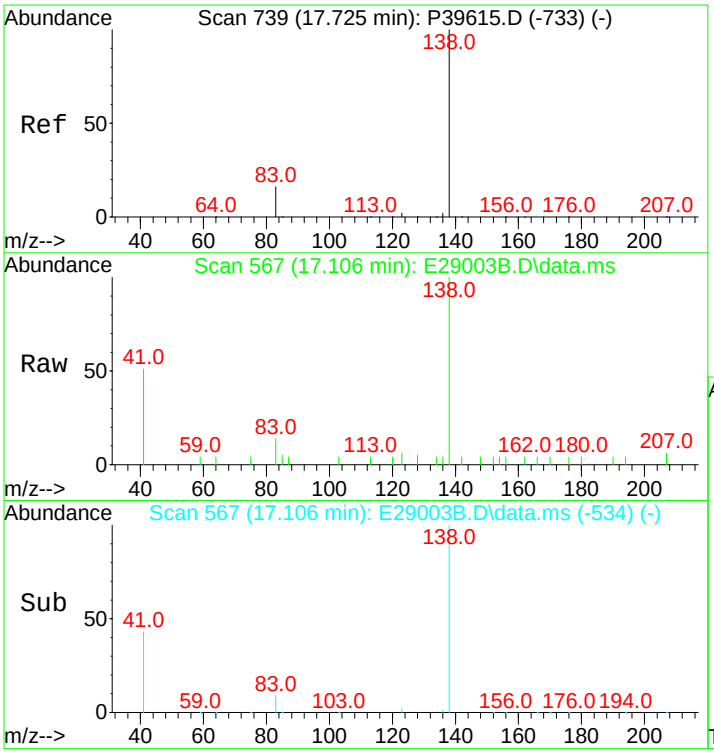




#3
trans-Decalin
Concen: 250.36 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

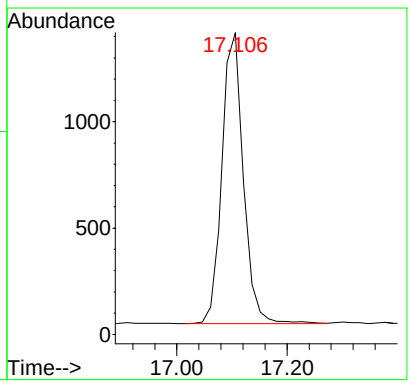
Tgt Ion:138 Resp: 4810

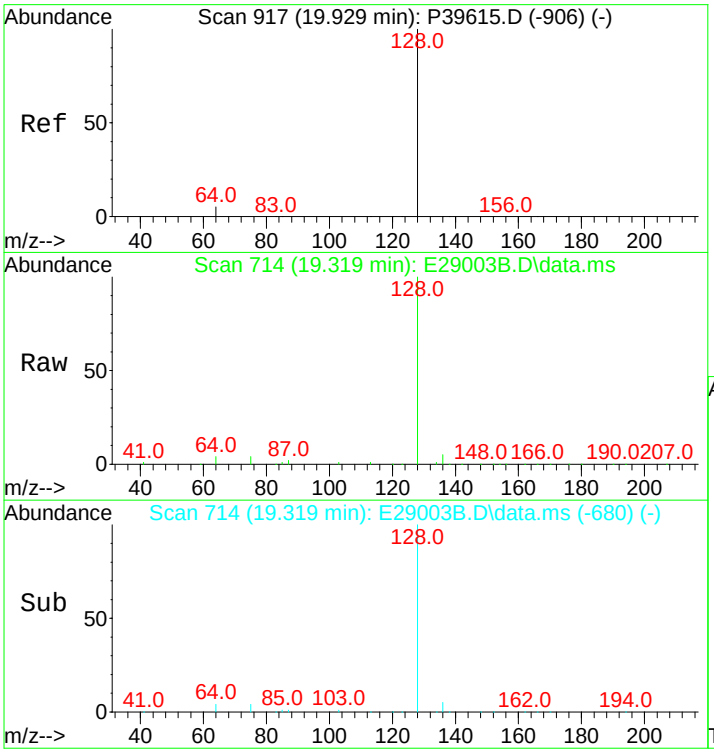




#4
cis-Decalin
Concen: 252.66 ng/mL
RT: 17.106 min Scan# 567
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:138 Resp: 3688

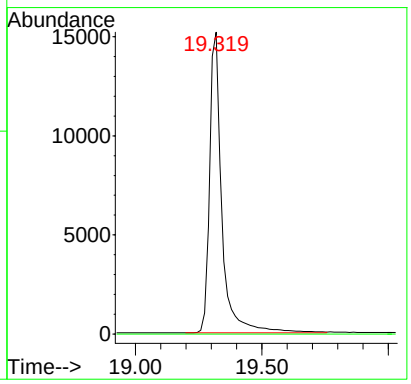


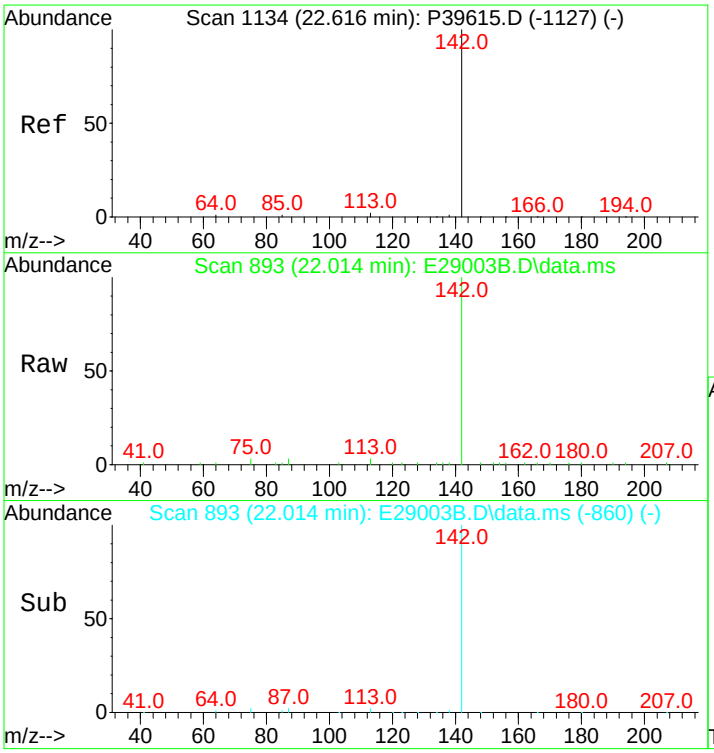


#10
Naphthalene
Concen: 536.25 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:128 Resp: 50662

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

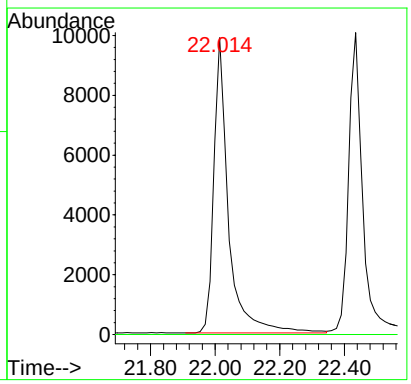


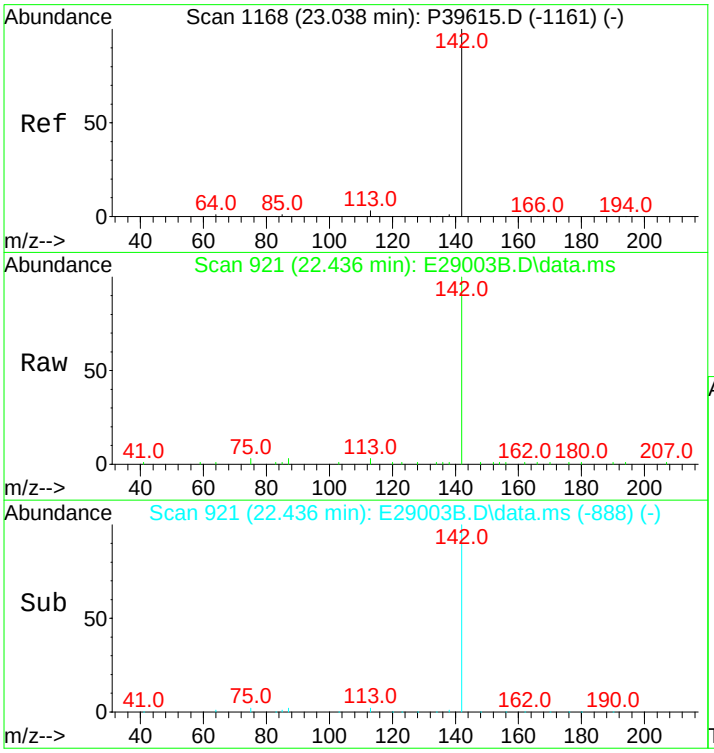


#16
2-Methylnaphthalene
Concen: 520.92 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:142 Resp: 31345

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

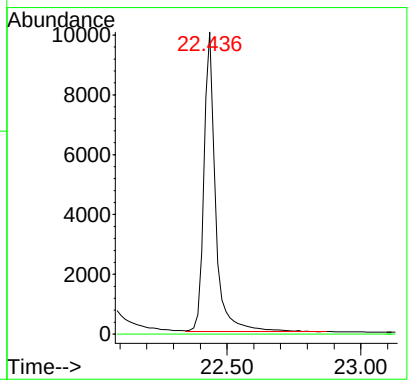


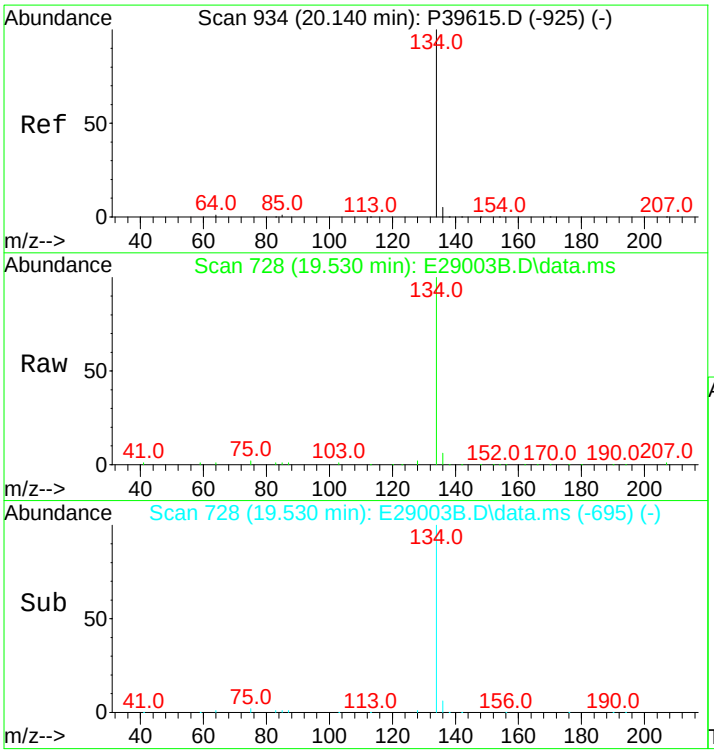


#17
1-Methylnaphthalene
Concen: 517.92 ng/mL
RT: 22.436 min Scan# 921
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:142 Resp: 30282

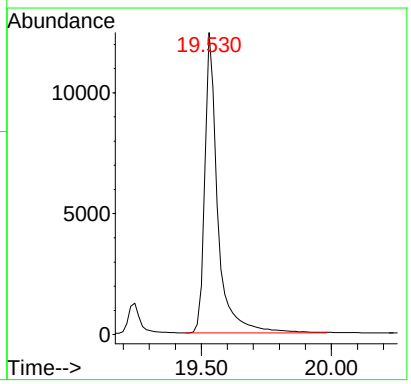
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

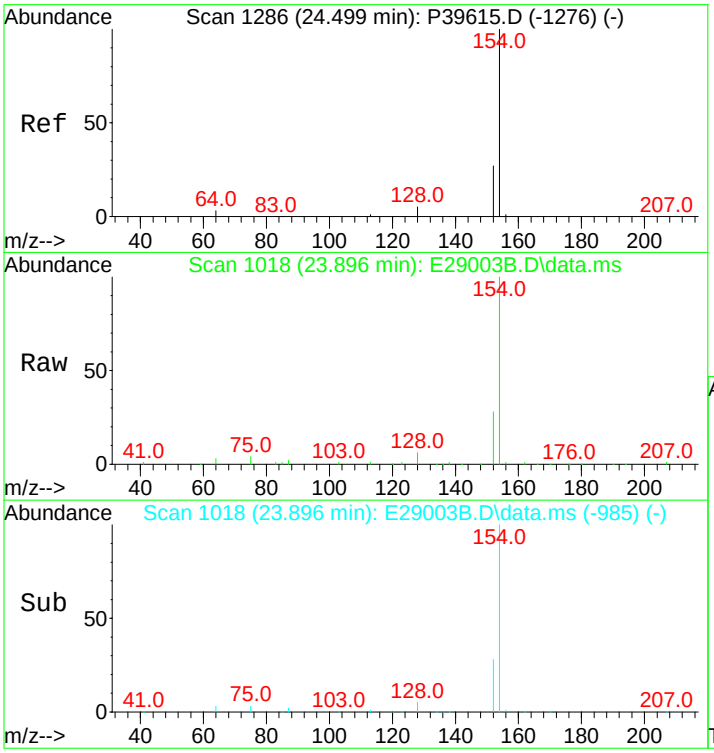




#18
Benzothiophene
Concen: 548.36 ng/mL
RT: 19.530 min Scan# 728
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:134 Resp: 42828

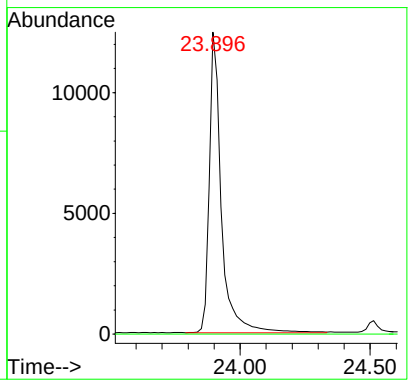


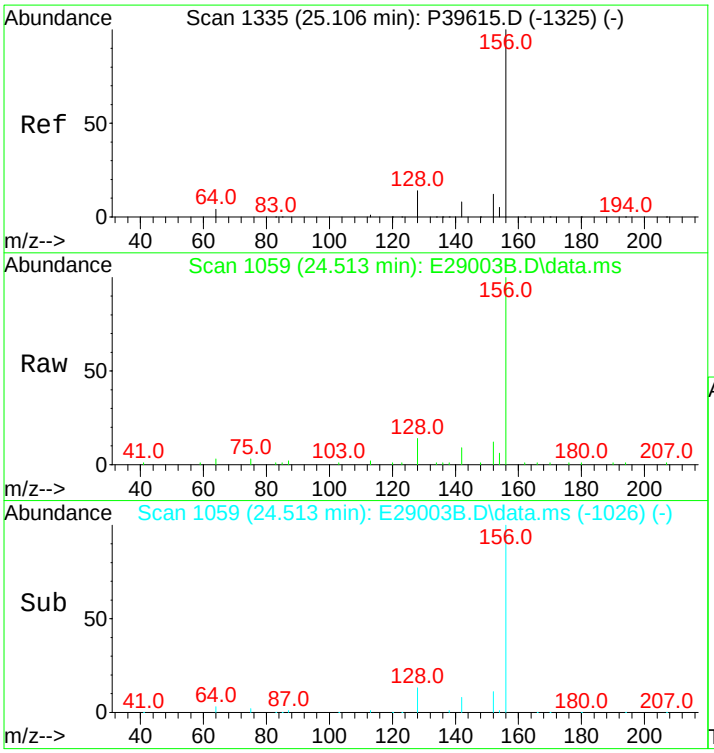


#23
Biphenyl
Concen: 522.89 ng/mL
RT: 23.896 min Scan# 1018
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:154 Resp: 39765

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

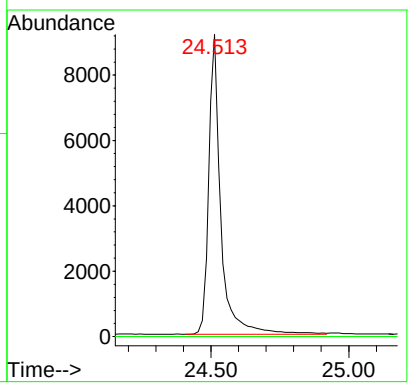


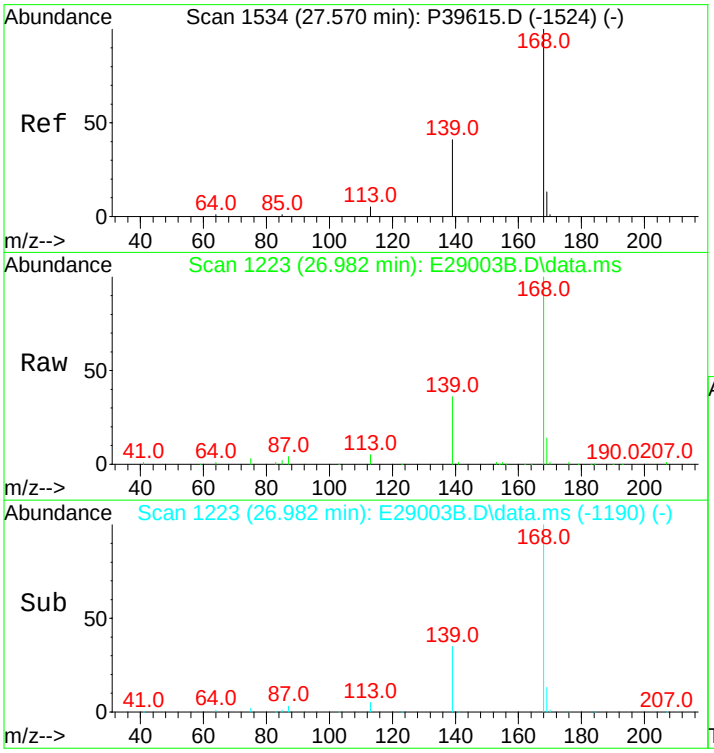


#24
2,6-Dimethylnaphthalene
Concen: 521.01 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:156 Resp: 28258

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

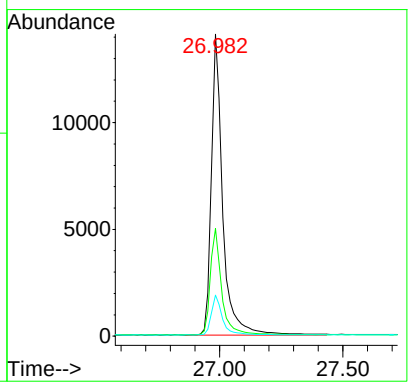


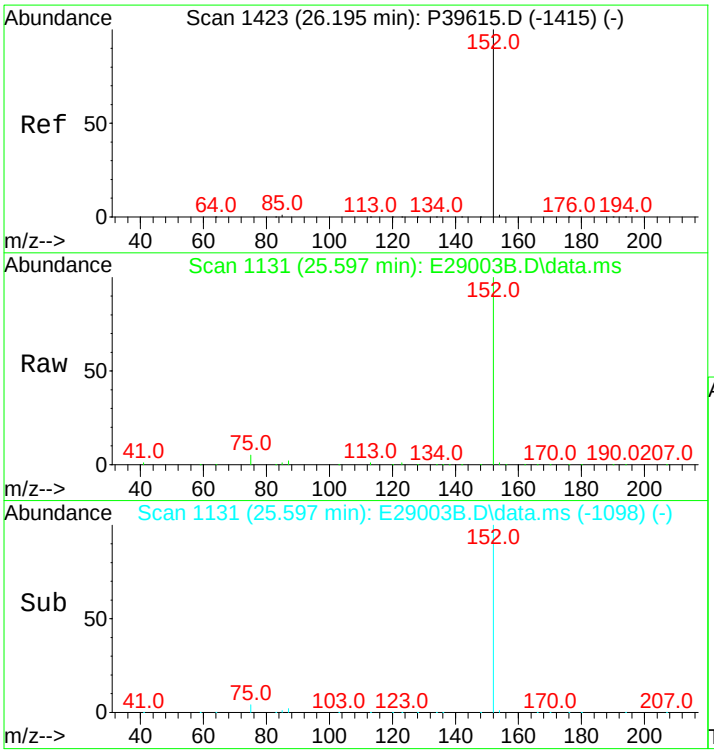


#25
Dibenzofuran
Concen: 535.81 ng/mL
RT: 26.982 min Scan# 1223
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:168 Resp: 45112

Ion	Ratio	Lower	Upper
168	100		
139	35.5	26.0	39.0
169	13.0	10.6	16.0

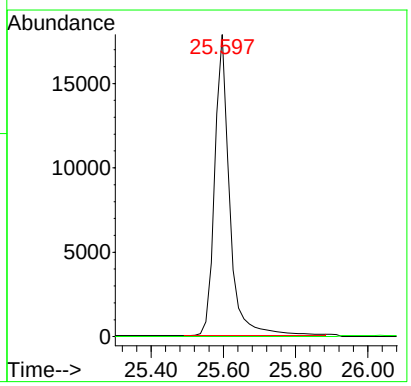


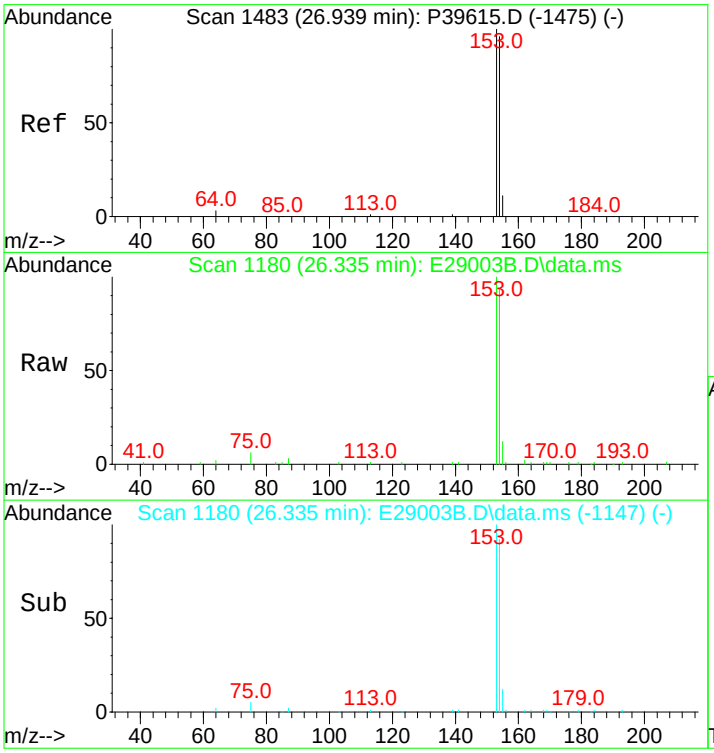


#26
Acenaphthylene
Concen: 542.65 ng/mL m
RT: 25.597 min Scan# 1131
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:152 Resp: 51113

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

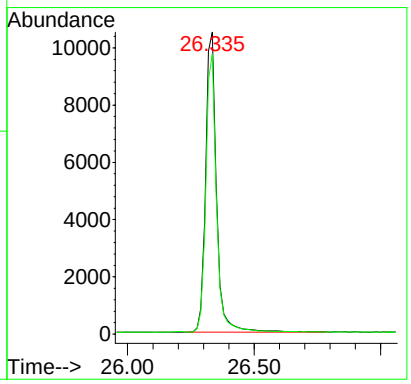


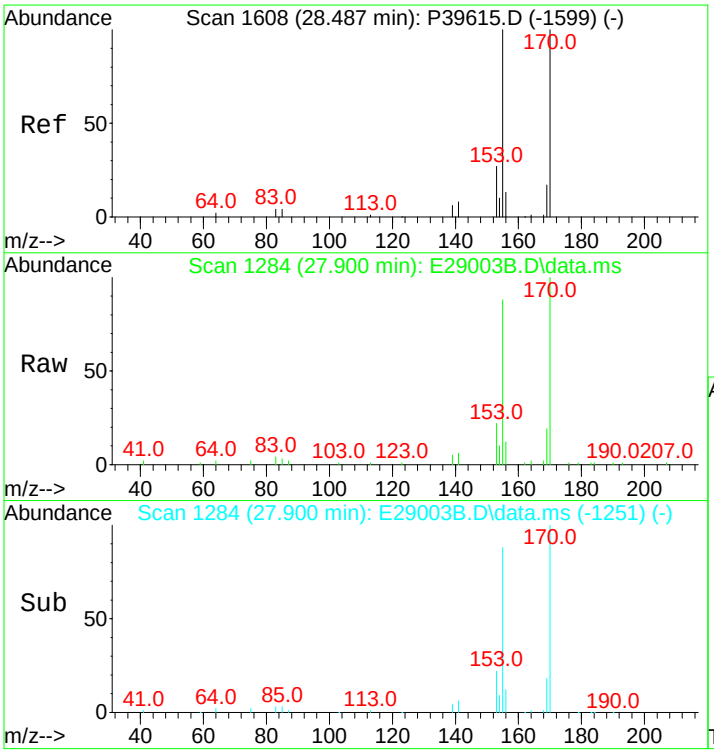


#27
Acenaphthene
Concen: 515.58 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:153 Resp: 31260

Ion	Ratio	Lower	Upper
153	100		
154	90.8	74.1	111.1

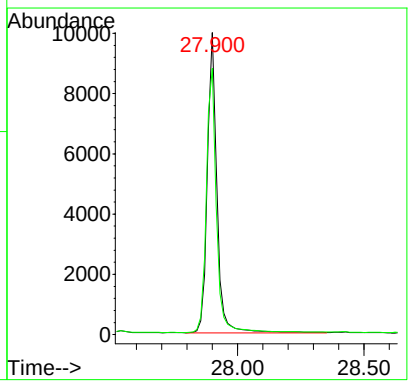


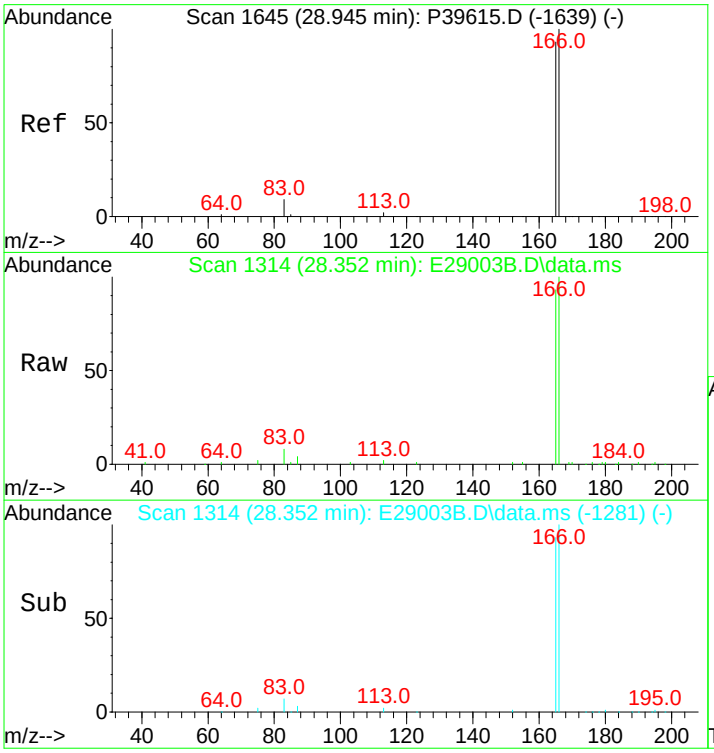


#28
2,3,5-Trimethylnaphthalene
Concen: 514.92 ng/mL
RT: 27.900 min Scan# 1284
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:170 Resp: 26129

Ion	Ratio	Lower	Upper
170	100		
155	91.9	70.7	106.1

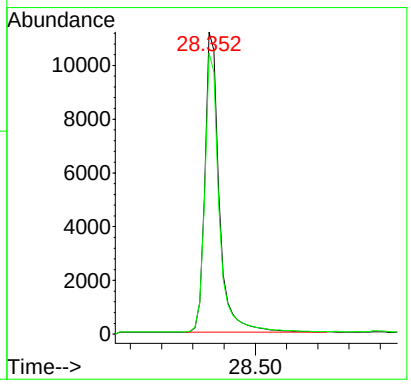


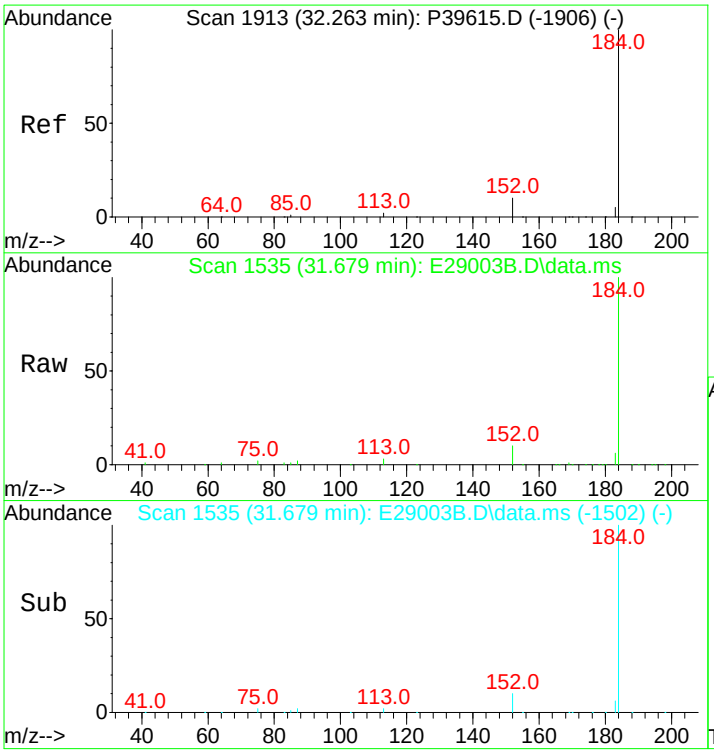


#29
Fluorene
Concen: 524.59 ng/mL
RT: 28.352 min Scan# 1314
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:166 Resp: 35474

Ion	Ratio	Lower	Upper
166	100		
165	92.9	74.7	112.1

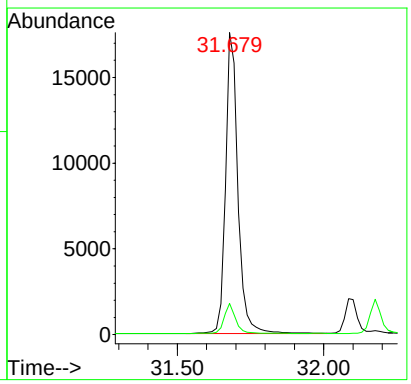


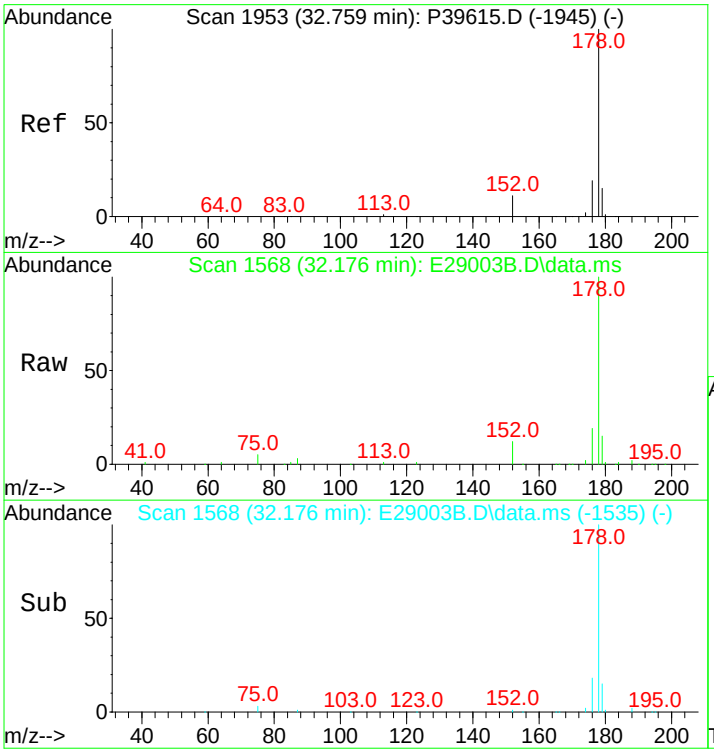


#33
Dibenzothiophene
Concen: 555.04 ng/mL
RT: 31.679 min Scan# 1535
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:184 Resp: 51505

Ion	Ratio	Lower	Upper
184	100		
152	9.4	7.0	10.6

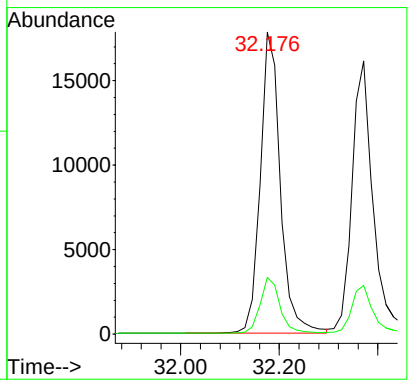


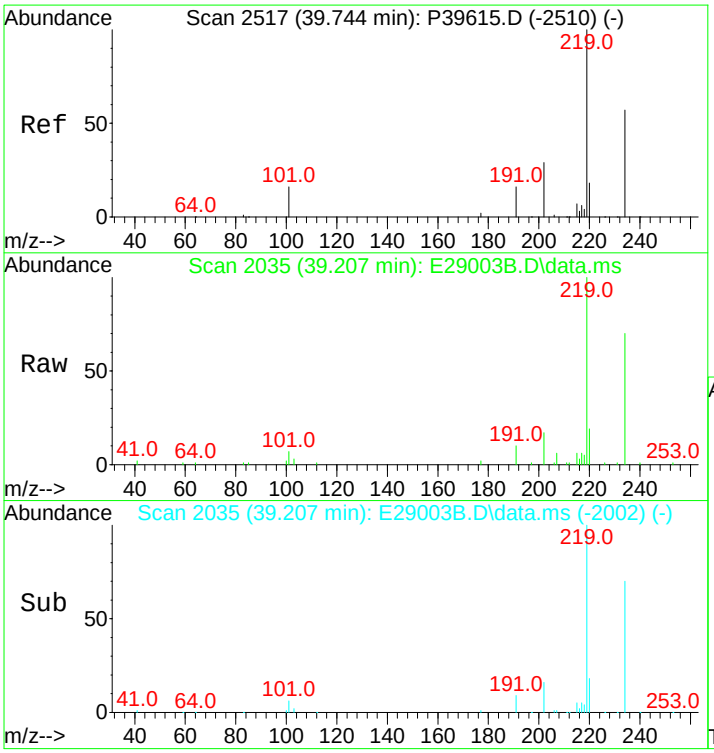


#43
Phenanthrene
Concen: 534.82 ng/mL
RT: 32.176 min Scan# 1568
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:178 Resp: 50492

Ion	Ratio	Lower	Upper
178	100		
176	18.4	15.0	22.4

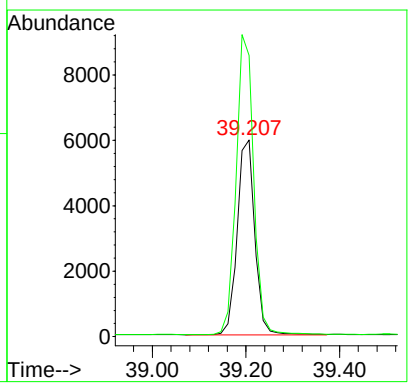


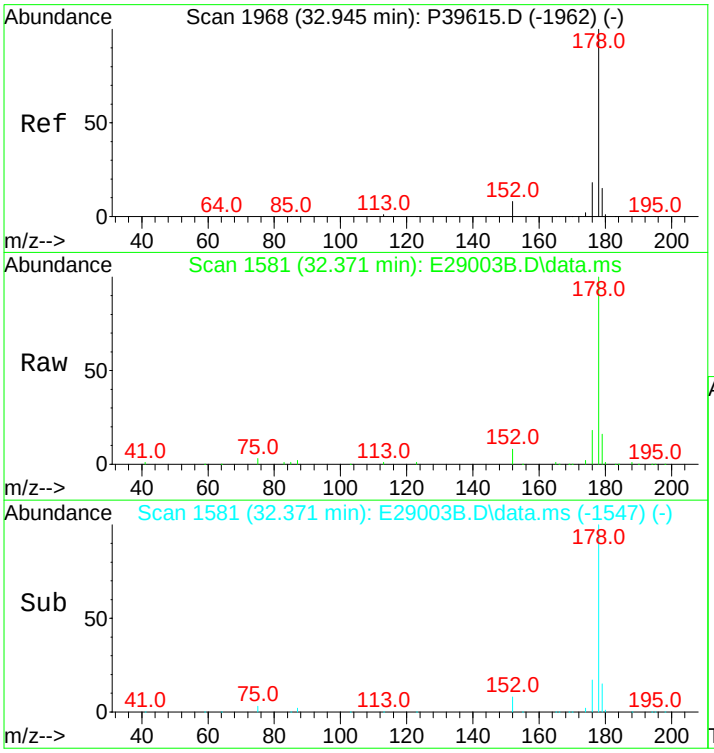


#54
Retene
Concen: 513.20 ng/mL
RT: 39.207 min Scan# 2035
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:234 Resp: 15591

Ion	Ratio	Lower	Upper
234	100		
219	153.6	115.3	172.9

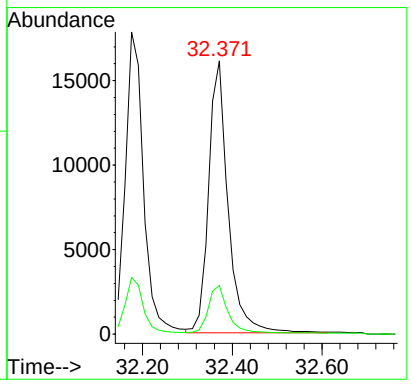


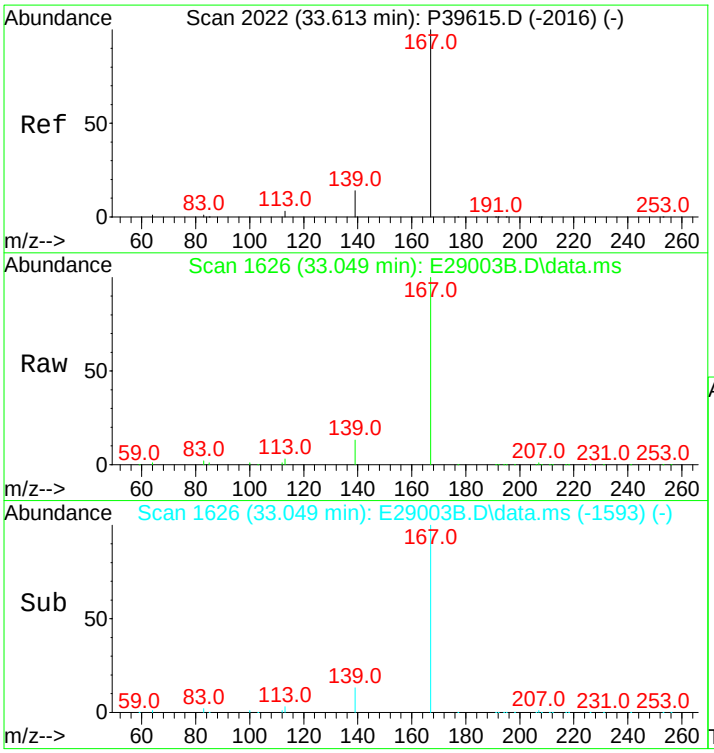


#55
Anthracene
Concen: 593.98 ng/mL m
RT: 32.371 min Scan# 1581
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:178 Resp: 48471

Ion	Ratio	Lower	Upper
178	100		
176	20.7	14.3	21.5

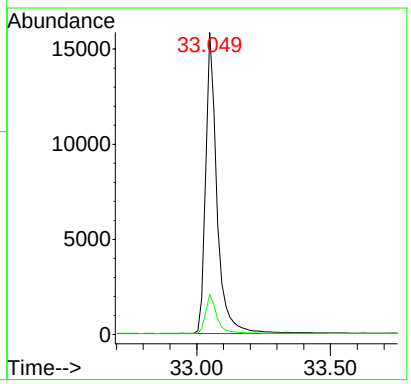


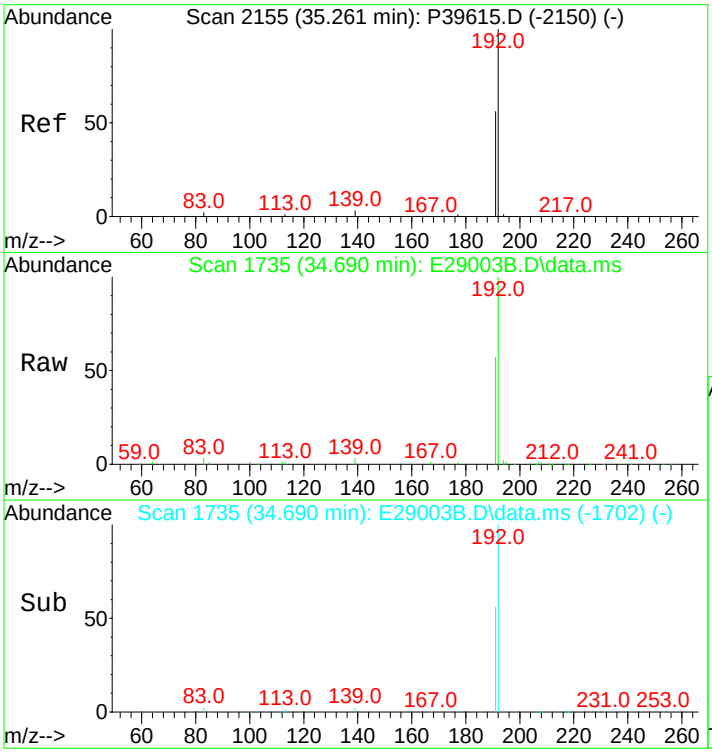


#56
Carbazole
Concen: 557.03 ng/mL
RT: 33.049 min Scan# 1626
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:167 Resp: 46782

Ion	Ratio	Lower	Upper
167	100		
139	12.8	10.1	15.1

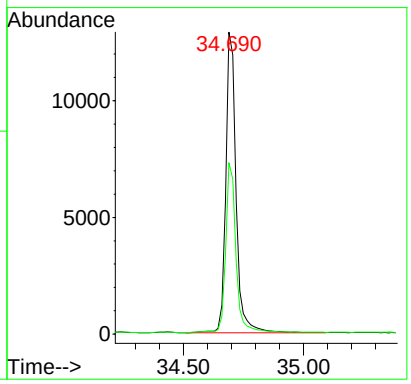


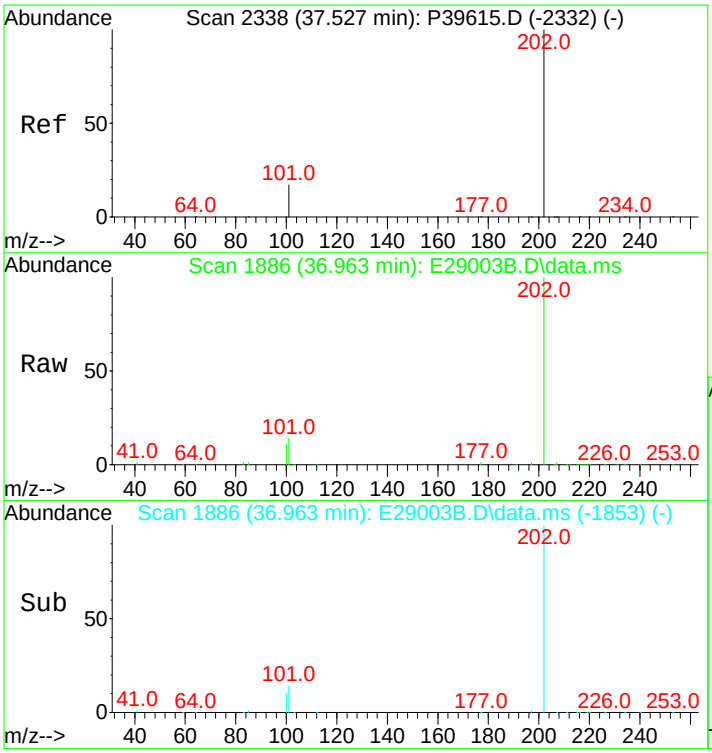


#57
1-Methylphenanthrene
Concen: 530.71 ng/mL
RT: 34.690 min Scan# 1735
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:192 Resp: 38225

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

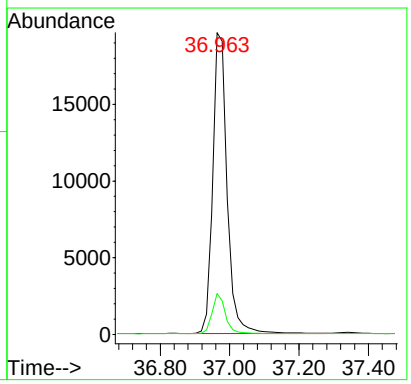


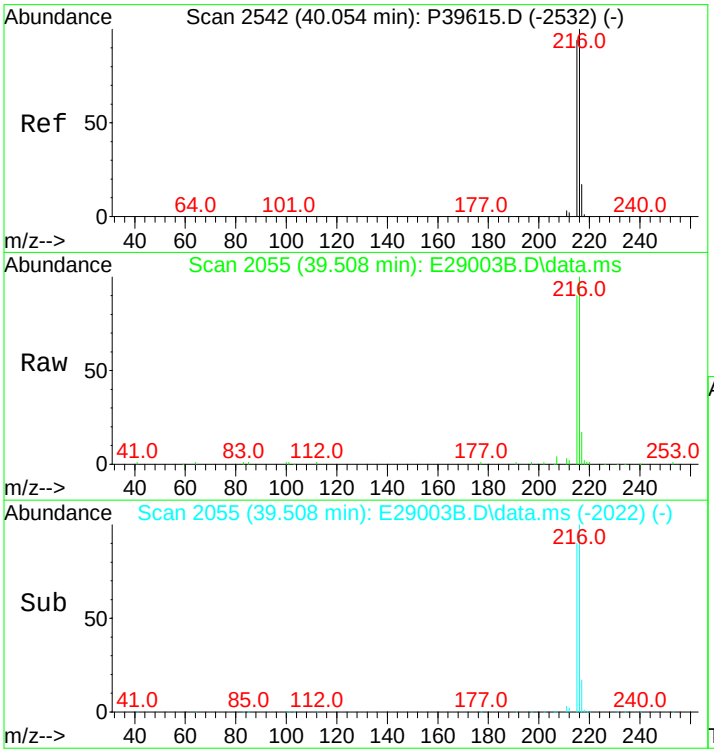


#58
Fluoranthene
Concen: 539.50 ng/mL
RT: 36.963 min Scan# 1886
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:202 Resp: 56249

Ion	Ratio	Lower	Upper
202	100		
101	12.4	10.4	15.6

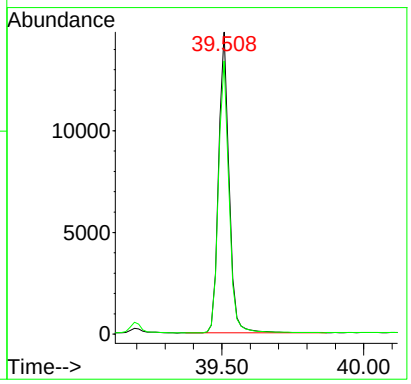


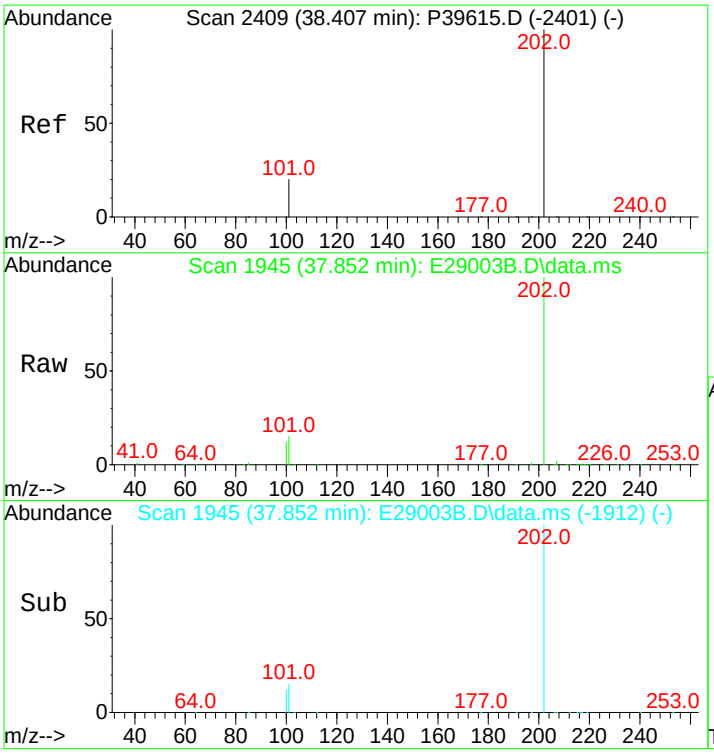


#59
Benzo(b)fluorene
Concen: 548.91 ng/mL
RT: 39.508 min Scan# 2055
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:216 Resp: 38135

Ion	Ratio	Lower	Upper
216	100		
215	91.6	72.6	109.0

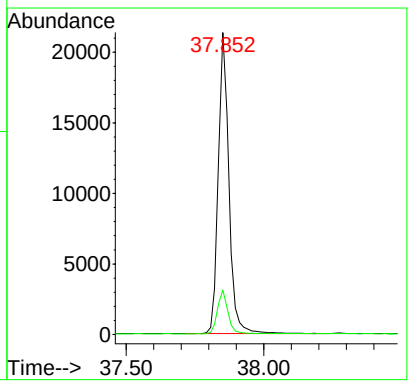


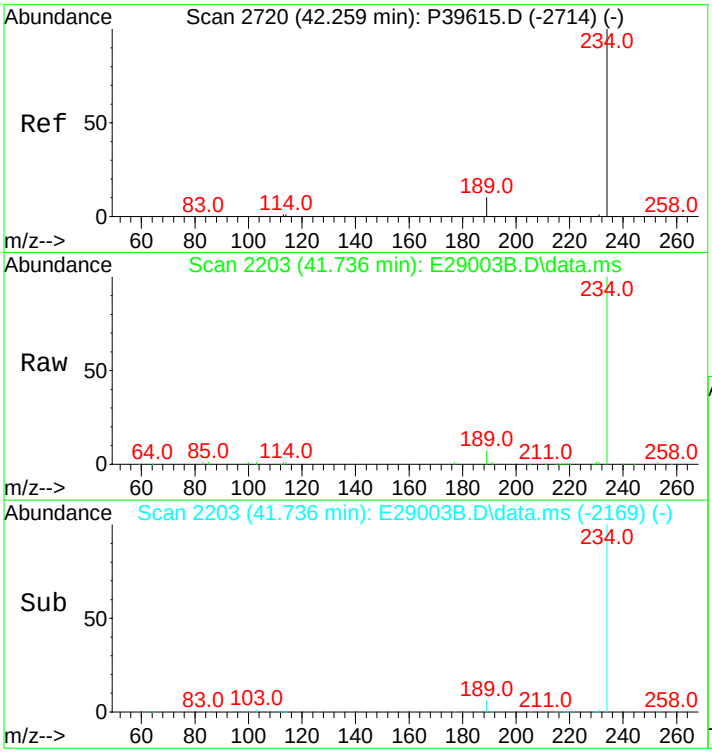


#60
Pyrene
Concen: 539.85 ng/mL
RT: 37.852 min Scan# 1945
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:202 Resp: 57209

Ion	Ratio	Lower	Upper
202	100		
101	14.3	11.0	16.4

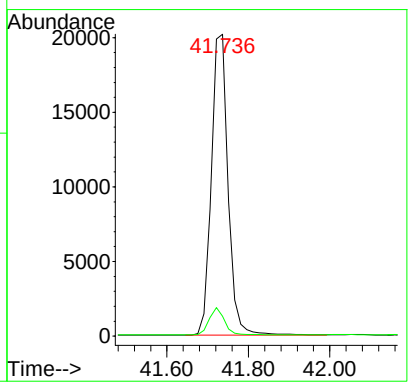


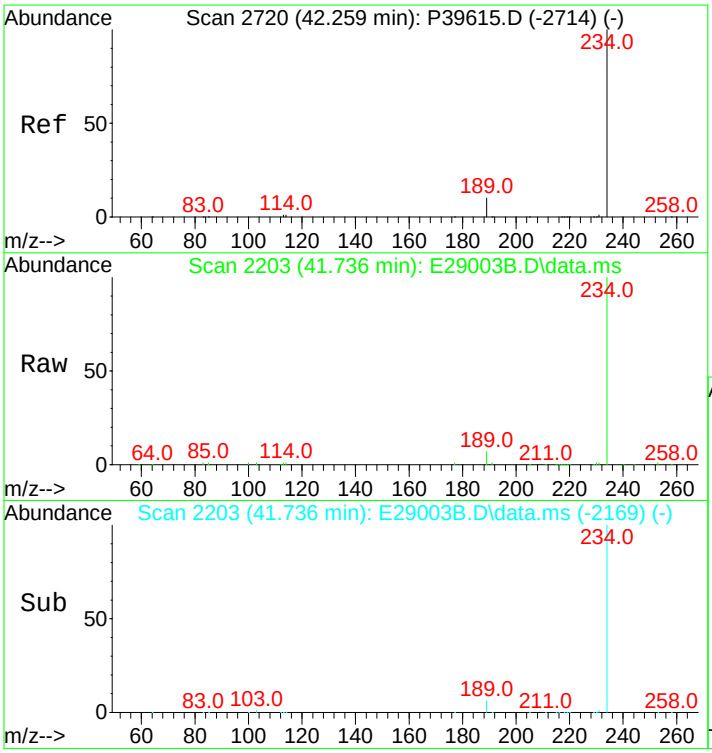


#66
Naphthobenzothiophene
Concen: 547.87 ng/ml
RT: 41.736 min Scan# 2203
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:234 Resp: 57263

Ion	Ratio	Lower	Upper
234	100		
189	8.4	21.1	31.7#

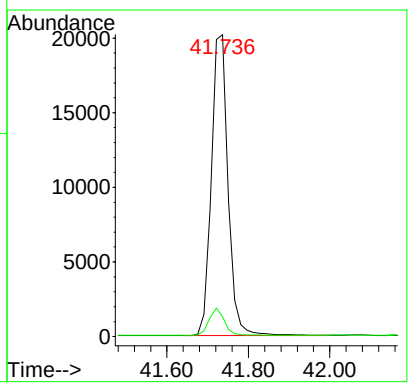


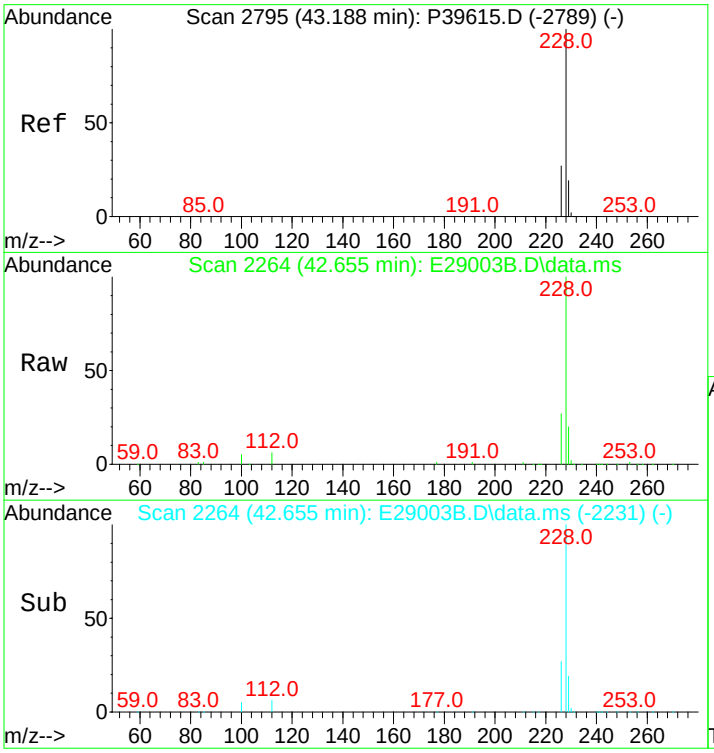


#67
Naphthobenzothiophene-2,1-D
Concen: 547.87 ng/mL
RT: 41.736 min Scan# 2203
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:234 Resp: 57263

Ion	Ratio	Lower	Upper
234	100		
189	8.4	21.1	31.7#

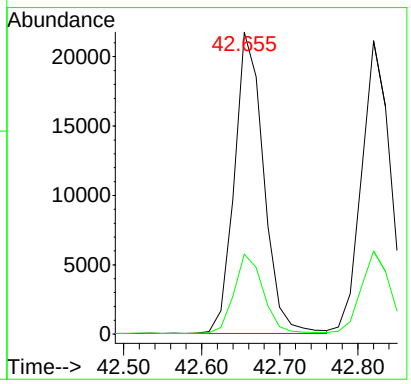


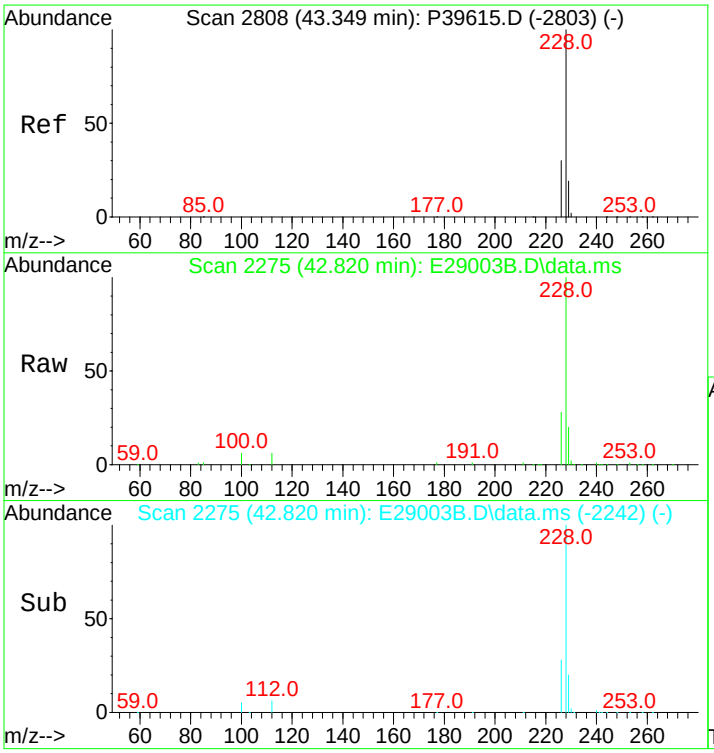


#75
Benz[a]anthracene
Concen: 558.81 ng/mL
RT: 42.655 min Scan# 2264
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:228 Resp: 56552

Ion	Ratio	Lower	Upper
228	100		
226	26.1	20.7	31.1

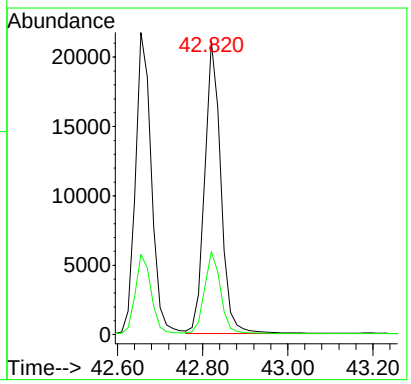


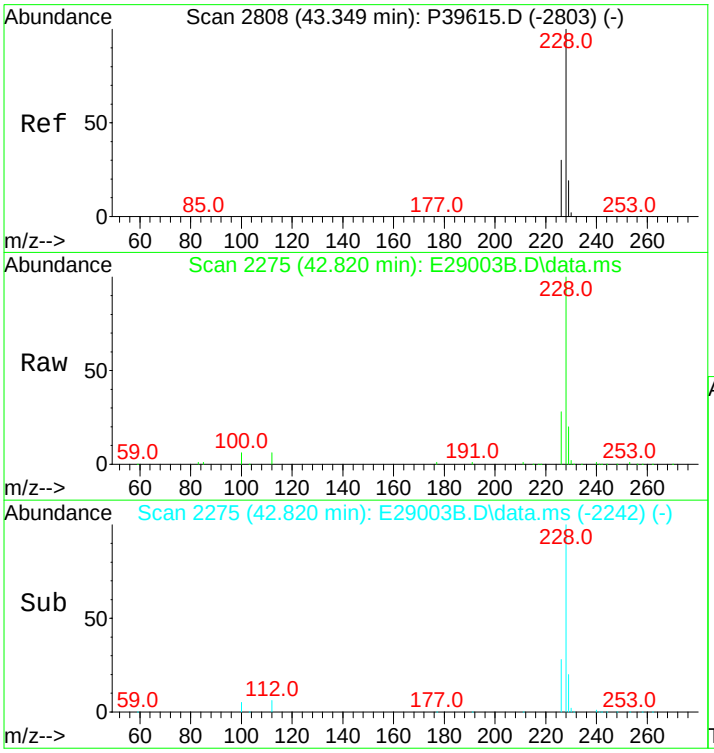


#76
Chrysene
Concen: 536.06 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:228 Resp: 55852

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

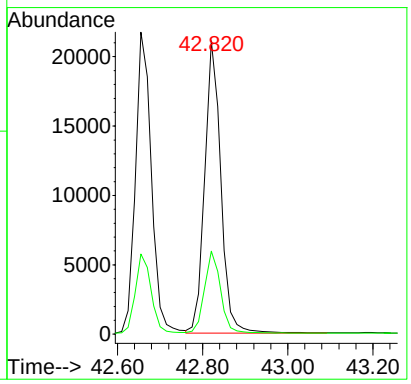


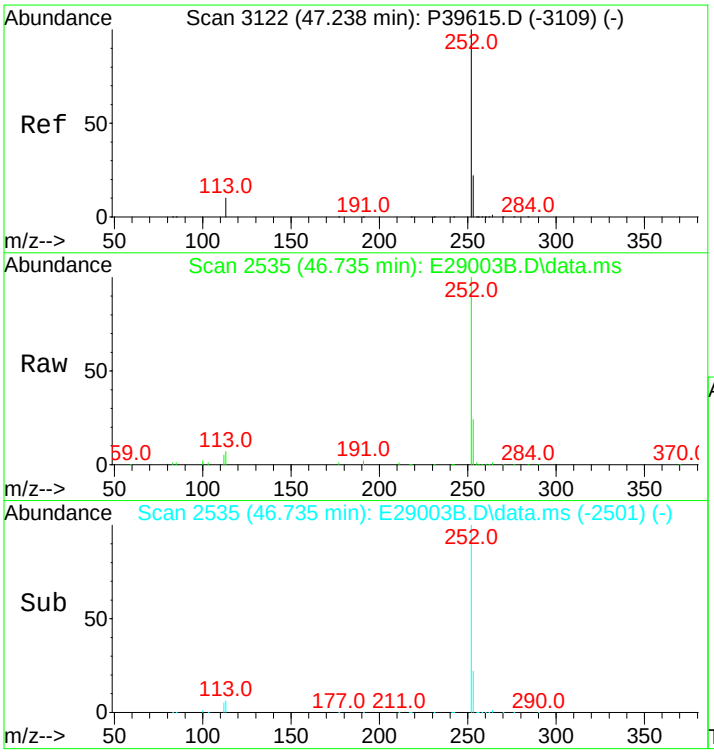


#77
Chrysene/Triphenylene
Concen: 536.06 ng/mL
RT: 42.820 min Scan# 2275
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:228 Resp: 55852

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

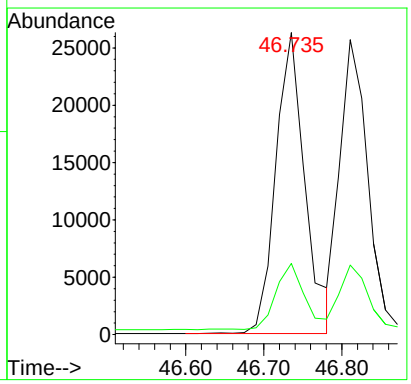


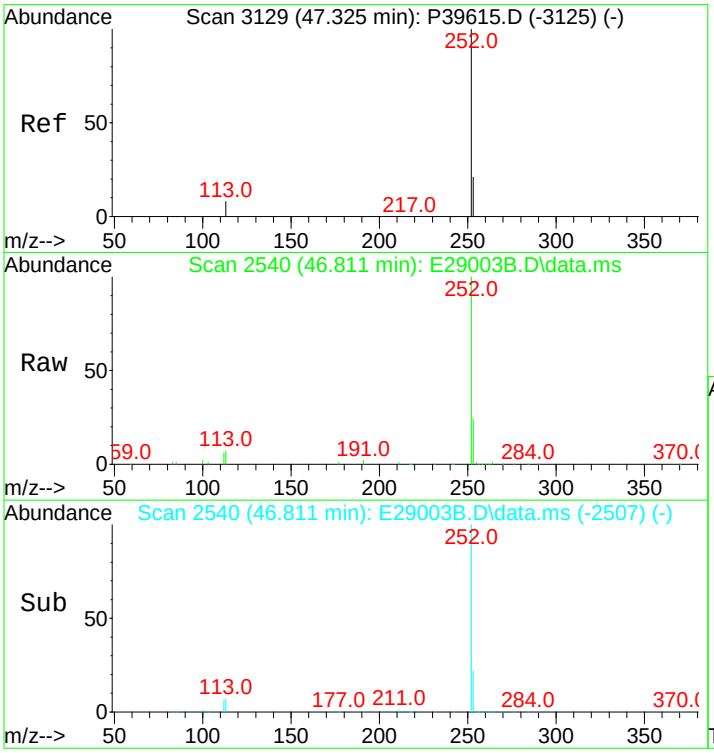


#84
Benzo[b]fluoranthene
Concen: 578.59 ng/mL
RT: 46.735 min Scan# 2535
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 68060

Ion	Ratio	Lower	Upper
252	100		
253	22.2	19.5	29.3

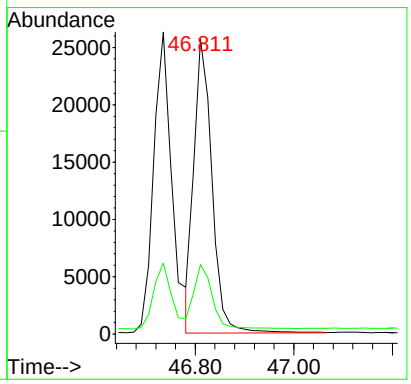


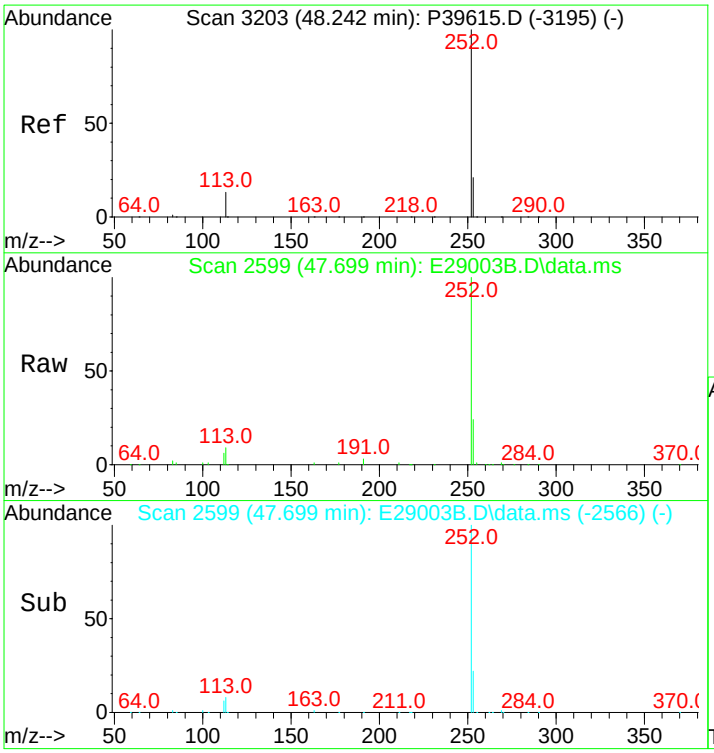


#85
Benzo[j]+[k]fluoranthene
Concen: 540.43 ng/mL
RT: 46.811 min Scan# 2540
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 65403

Ion	Ratio	Lower	Upper
252	100		
253	21.8	19.7	29.5

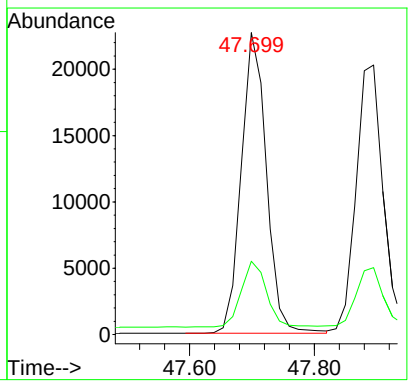


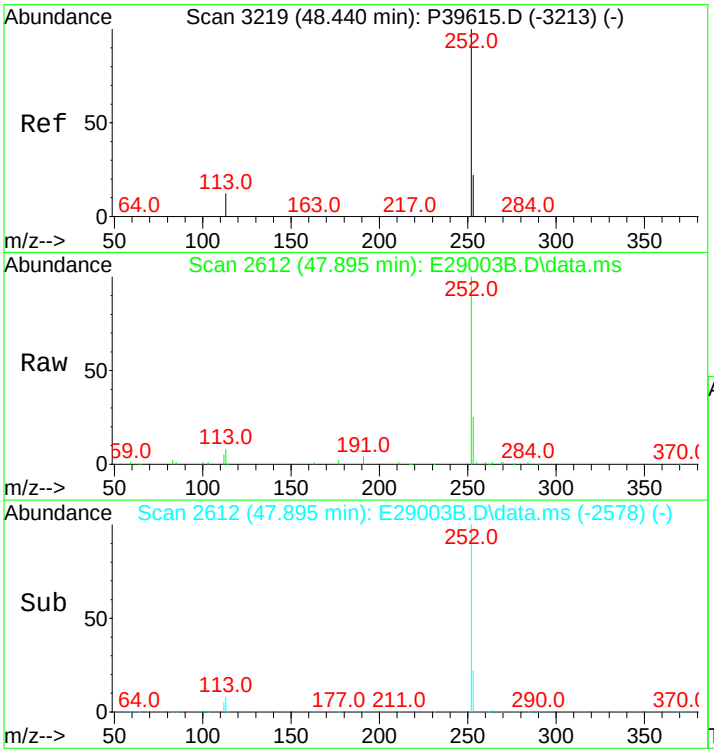


#87
Benzo[e]pyrene
Concen: 551.21 ng/mL
RT: 47.699 min Scan# 2599
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 63310

Ion	Ratio	Lower	Upper
252	100		
253	22.0	20.6	31.0

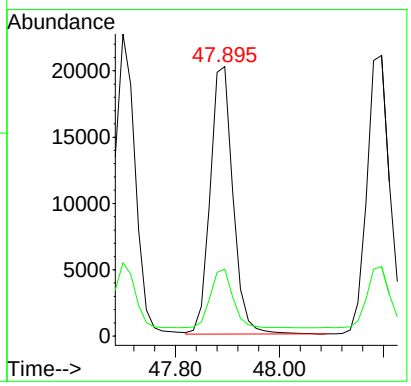


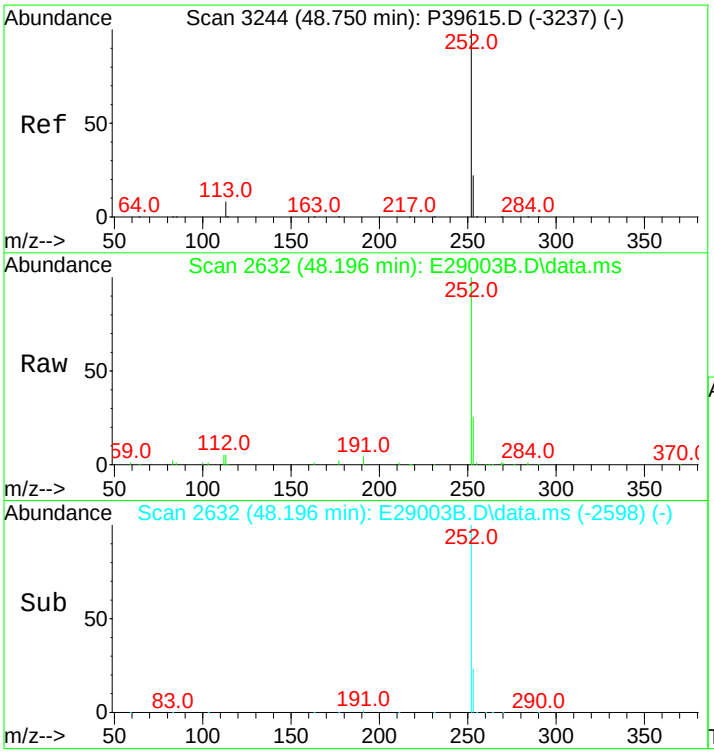


#89
Benzo[a]pyrene
Concen: 559.79 ng/mL
RT: 47.895 min Scan# 2612
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 61523

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.8	31.2

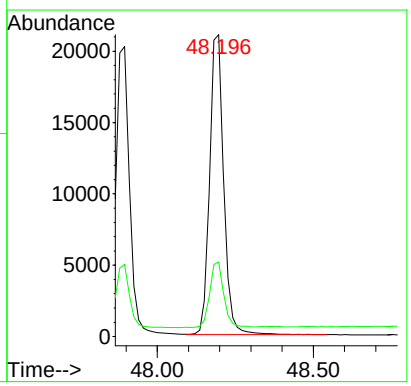


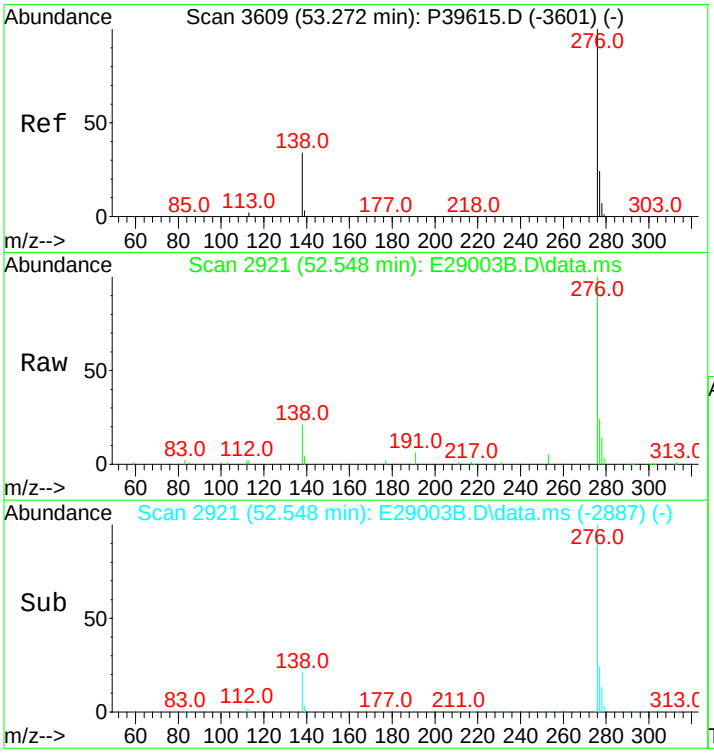


#90
Perylene
Concen: 565.43 ng/mL
RT: 48.196 min Scan# 2632
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:252 Resp: 65712

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.7	31.1

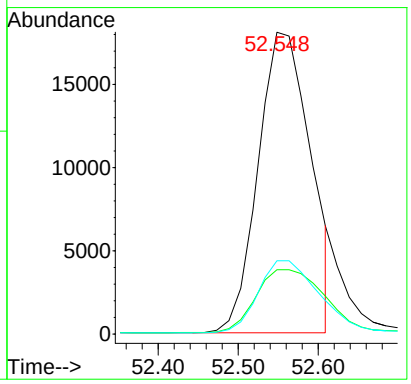


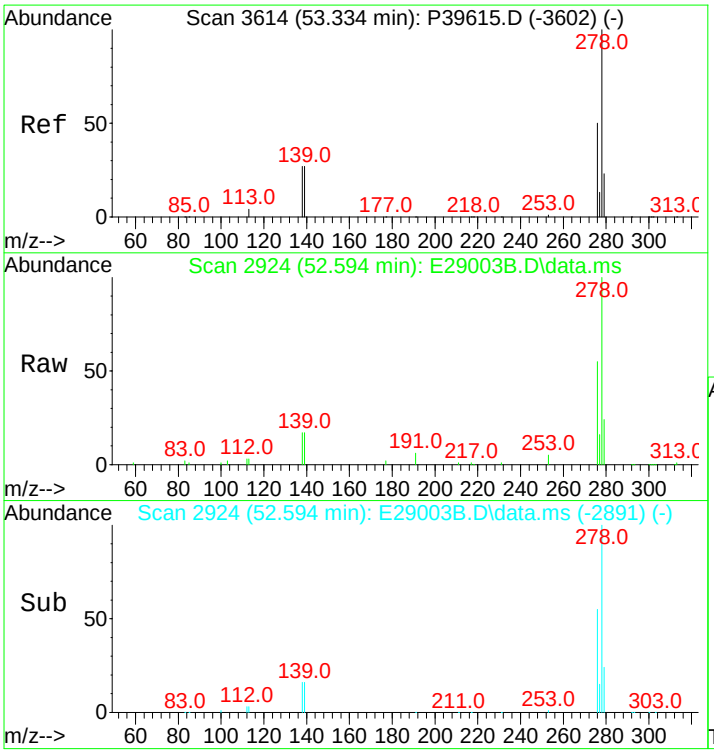


#91
Indeno[1,2,3-cd]pyrene
Concen: 637.65 ng/mL m
RT: 52.548 min Scan# 2921
Delta R.T. 0.015 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:276 Resp: 82475

Ion	Ratio	Lower	Upper
276	100		
138	28.1	16.3	24.5#
277	28.6	19.4	29.2

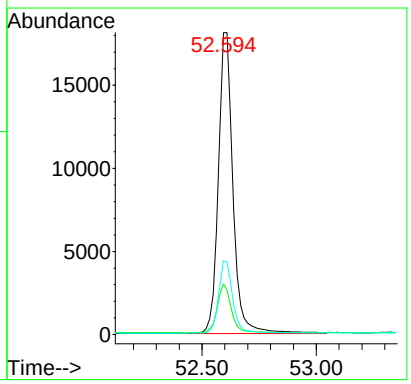


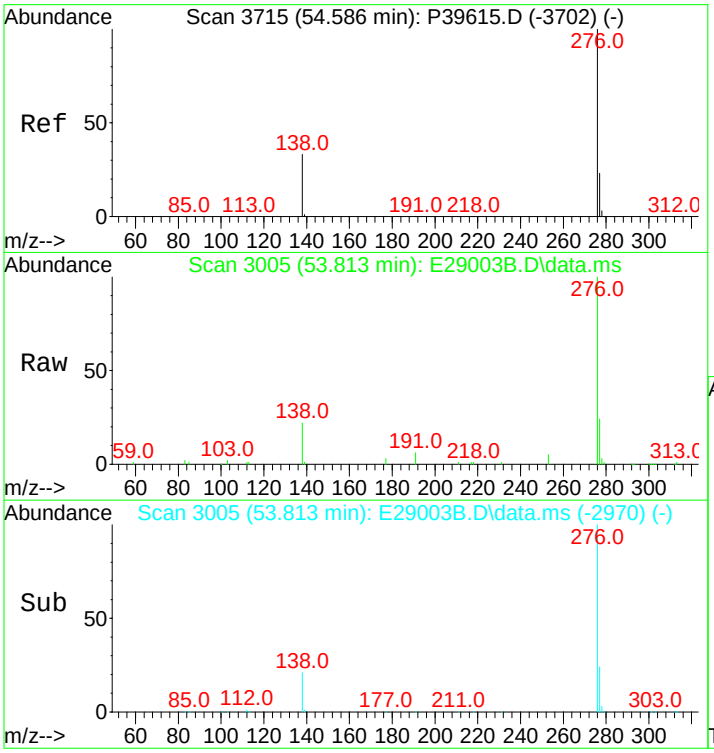


#92
Dibenz[ah]+[ac]anthracene
Concen: 586.02 ng/mL
RT: 52.594 min Scan# 2924
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:278 Resp: 80707

Ion	Ratio	Lower	Upper
278	100		
139	15.5	11.6	17.4
279	23.3	19.3	28.9

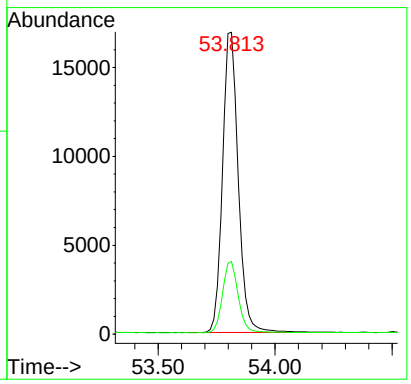


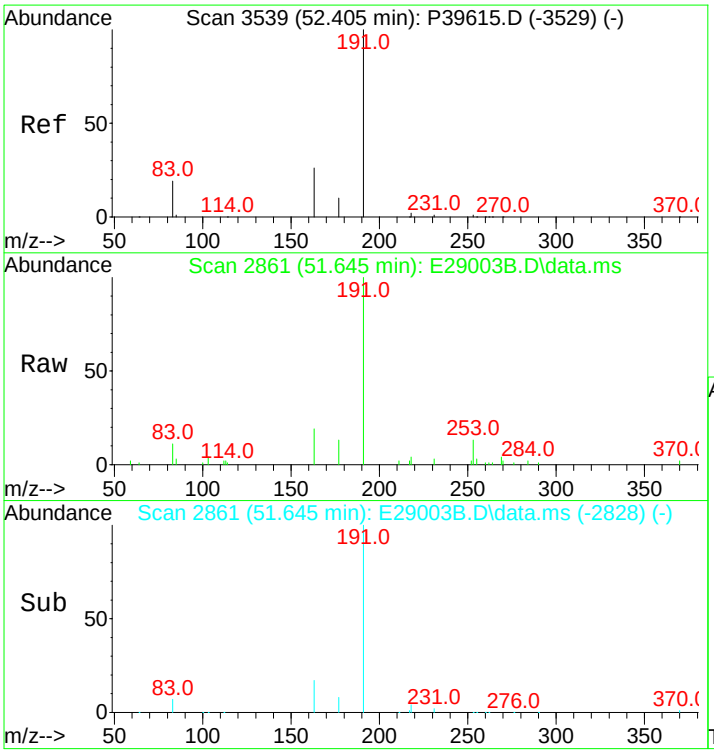


#93
Benzo[g,h,i]perylene
Concen: 568.07 ng/mL
RT: 53.813 min Scan# 3005
Delta R.T. 0.030 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:276 Resp: 79225

Ion	Ratio	Lower	Upper
276	100		
277	23.4	19.1	28.7

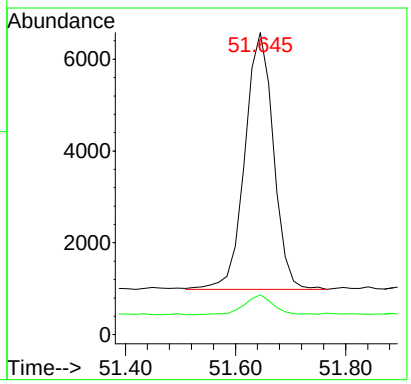


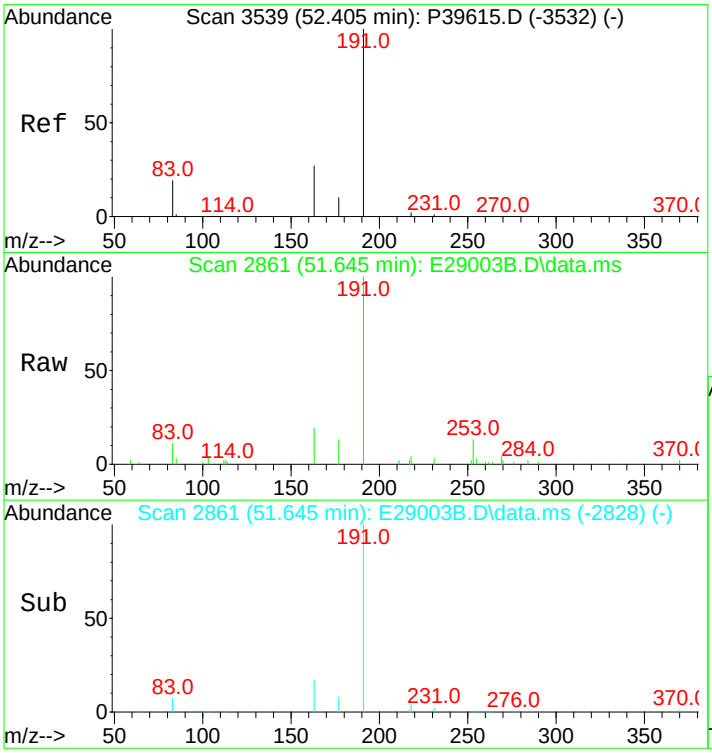


#94
Hopane (T19)
Concen: 515.73 ng/mL
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:191 Resp: 20115

Ion	Ratio	Lower	Upper
191	100		
177	7.7	11.6	17.4#

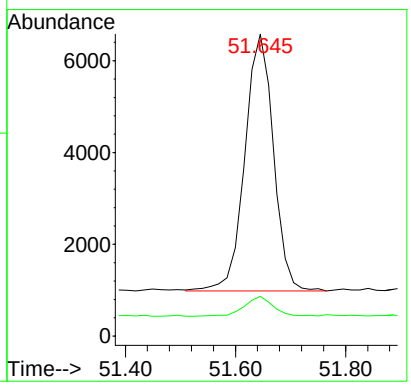




#95
17a(H),21B(H)-hopane - C30H52
Concen: 515.73 ng/mL
RT: 51.645 min Scan# 2861
Delta R.T. 0.000 min
Lab File: E29003B.D
Acq: 16 Nov 2012 7:41 am

Tgt Ion:191 Resp: 20115

Ion	Ratio	Lower	Upper
191	100		
177	7.7	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	47950	500.000	ng/mL	0.01
74) Chrysene-d12	42.760	240	108515	500.000	ng/mL	0.05
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	83664	496.052	ng/mL	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.61%#			
42) Phenanthrene-d10	32.115	188	84186	487.196	ng/mL	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.72%#			
83) Benzo[b]fluoranthene-d12	46.690	264	117445	526.858	ng/mL	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.69%			
88) Benzo[a]pyrene-d12	47.850	264	117125	542.266	ng/mL	0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.23%			
129) 5B(H)Cholane - Surr	43.377	217	22890	535.211	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.52%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	9281	241.973	ng/mL	100
4) cis-Decalin	17.091	138	6925	237.639	ng/mL	100
10) Naphthalene	19.319	128	101638	538.872	ng/mL#	100
16) 2-Methylnaphthalene	22.014	142	63506	528.647	ng/mL#	100
17) 1-Methylnaphthalene	22.435	142	60952	522.173	ng/mL#	100
18) Benzothiophene	19.530	134	84534	542.147	ng/mL	100
23) Biphenyl	23.911	154	80210	528.310	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.513	156	56731	523.928	ng/mL#	100
25) Dibenzofuran	26.997	168	90942	541.045	ng/mL	98
26) Acenaphthylene	25.612	152	104278M3	554.533	ng/mL	
27) Acenaphthene	26.335	153	63230	522.373	ng/mL	98
28) 2,3,5-Trimethylnaphthalen	27.915	170	51839	511.706	ng/mL	97
29) Fluorene	28.367	166	72042	533.639	ng/mL	99
33) Dibenzothiophene	31.709	184	101024	545.311	ng/mL	99
43) Phenanthrene	32.206	178	100960	535.650	ng/mL	99
54) Retene	39.222	234	31882	525.661	ng/mL	92
55) Anthracene	32.386	178	97562M3	598.855	ng/mL	
56) Carbazole	33.064	167	94852	565.714	ng/mL	100
57) 1-Methylphenanthrene	34.720	192	76837	534.349	ng/mL	99
58) Fluoranthene	36.993	202	114151M3	548.410	ng/mL	
59) Benzo(b)fluorene	39.538	216	78136	563.343	ng/mL	100
60) Pyrene	37.882	202	114958	543.368	ng/mL	97
66) Naphthobenzothiophene	41.766	234	118303	566.951	ng/ml#	64
67) Naphthobenzothiophene-2,1	41.766	234	118303	566.951	ng/mL#	64
75) Benz[a]anthracene	42.700	228	119874	567.284	ng/mL	99
76) Chrysene	42.850	228	115113	529.134	ng/mL	99
77) Chrysene/Triphenylene	42.850	228	115113	529.134	ng/mL	99
84) Benzo[b]fluoranthene	46.765	252	141533	576.238	ng/mL	96
85) Benzo[j]+[k]fluoranthene	46.856	252	142986	565.842	ng/mL	94
87) Benzo[e]pyrene	47.744	252	134099	559.152	ng/mL	93
89) Benzo[a]pyrene	47.925	252	131938M4	574.939	ng/mL	
90) Perylene	48.241	252	142179	585.911	ng/mL	92
91) Indeno[1,2,3-cd]pyrene	52.624	276	170389M3	630.905	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.669	278	171816	597.481	ng/mL	99
93) Benzo[g,h,i]perylene	53.889	276	165444	568.140	ng/mL	99
94) Hopane (T19)	51.690	191	41907	514.581	ng/mL#	82
95) 17a(H),21B(H)-hopane - C3	51.690	191	41907	514.581	ng/mL#	82

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

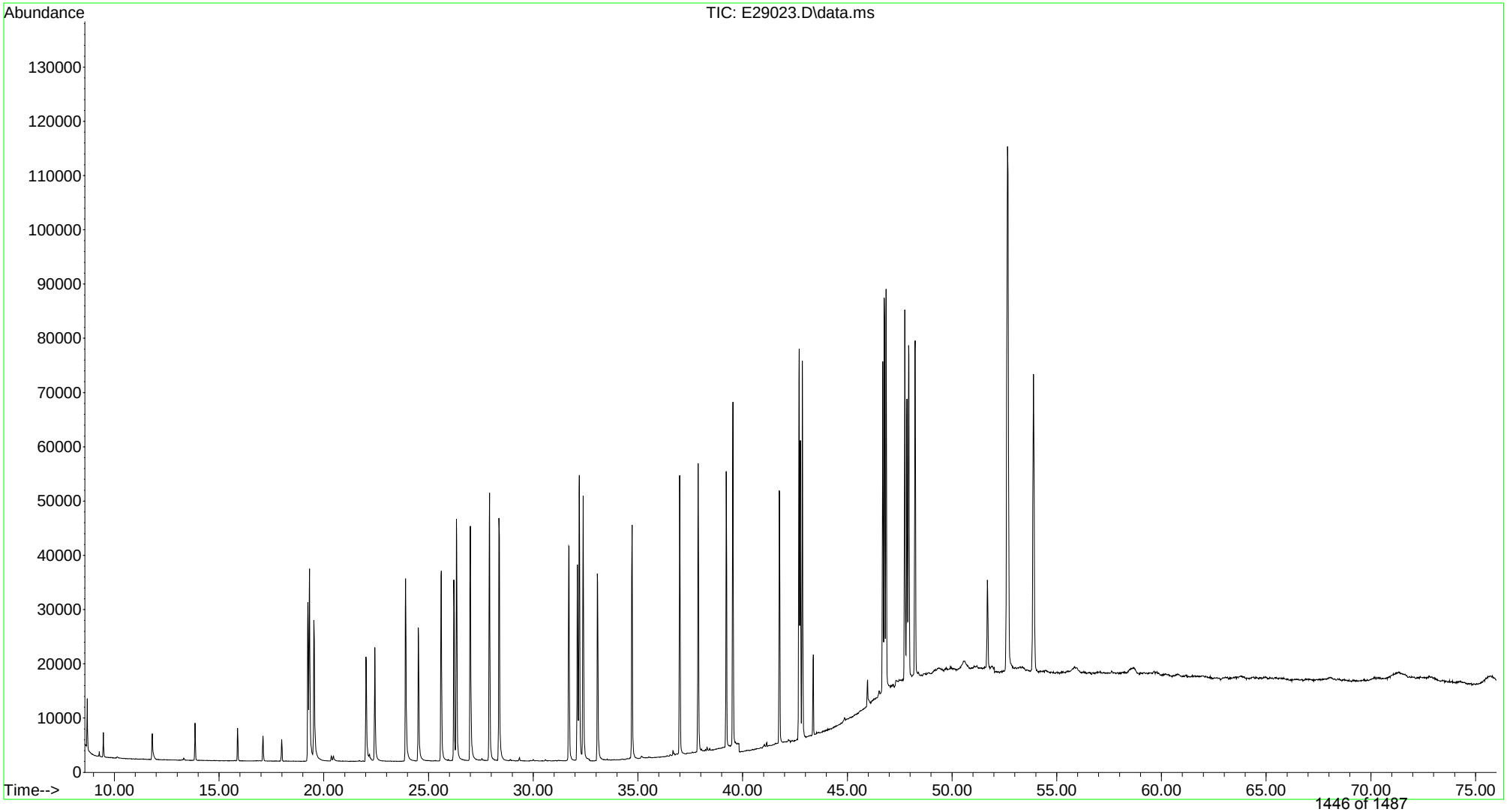
(#) = qualifier out of range (m) = manual integration (+) = signals summed

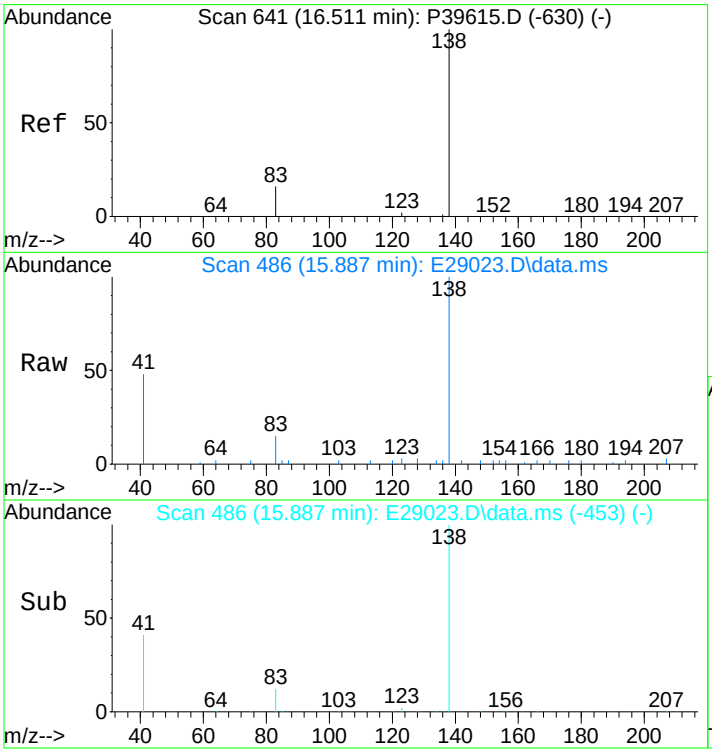
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29023.D
Acq On : 17 Nov 2012 1:27 am
Operator : AC
Sample : C211131208
Misc : CC WHAQ86 500NG/ML
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Nov 19 09:30:33 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Wed Nov 14 10:57:21 2012
Response via : Initial Calibration

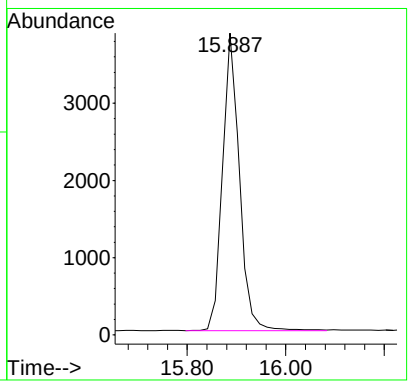
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

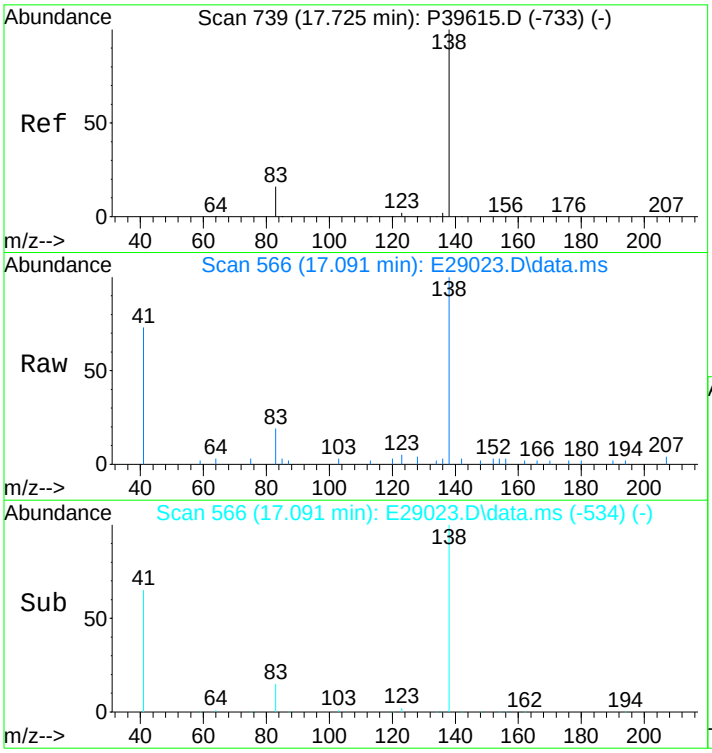




#3
trans-Decalin
Concen: 241.97 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. -0.000 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

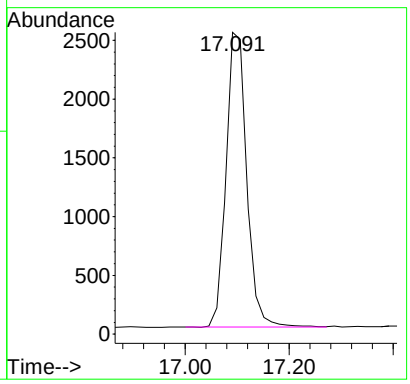
Tgt Ion:138 Resp: 9281

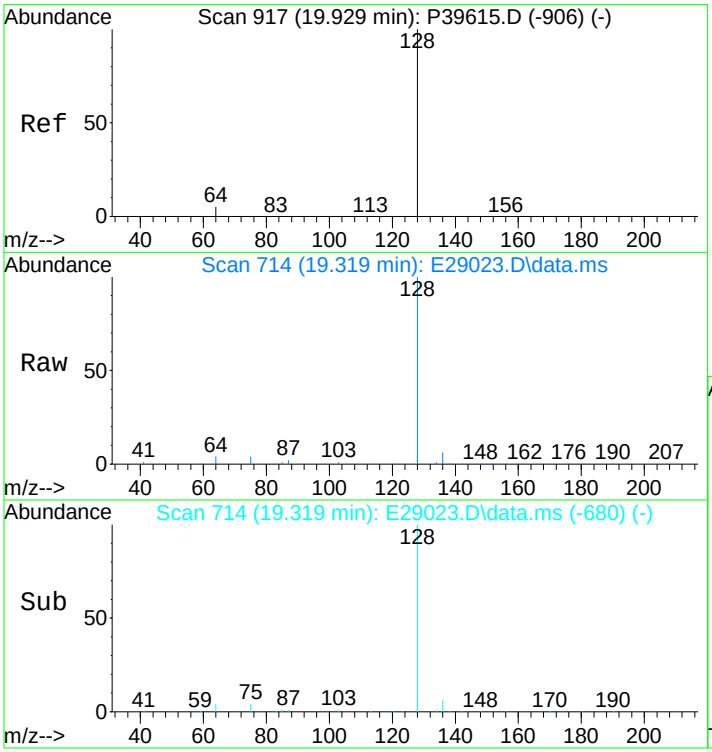




#4
cis-Decalin
Concen: 237.64 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. -0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:138 Resp: 6925

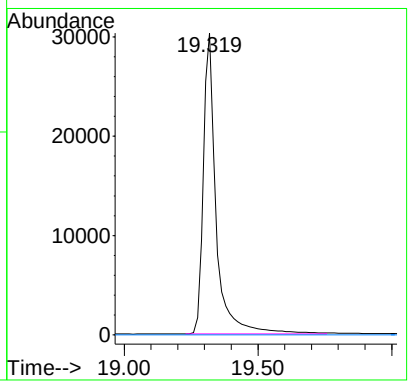


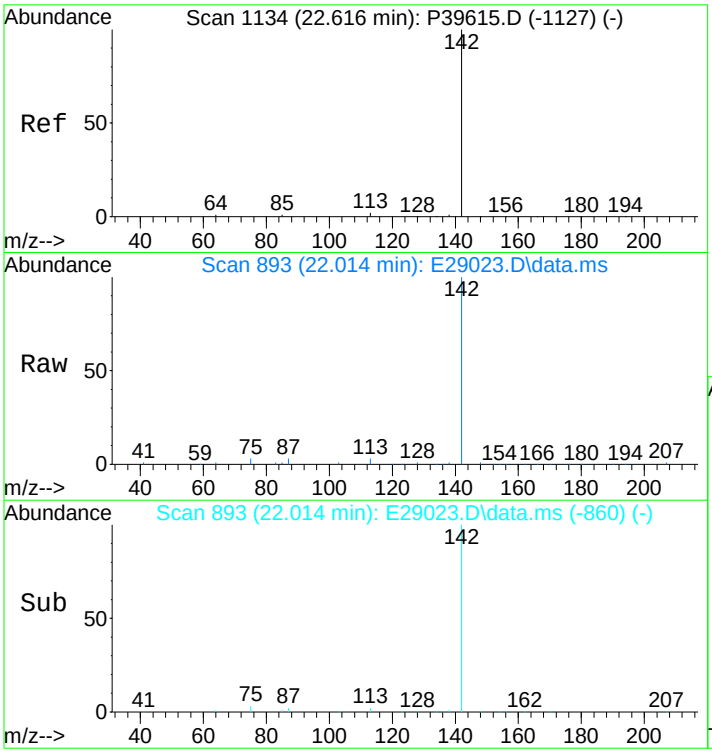


#10
Naphthalene
Concen: 538.87 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:128 Resp: 101638

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

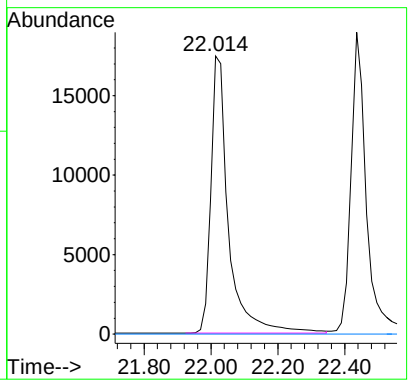


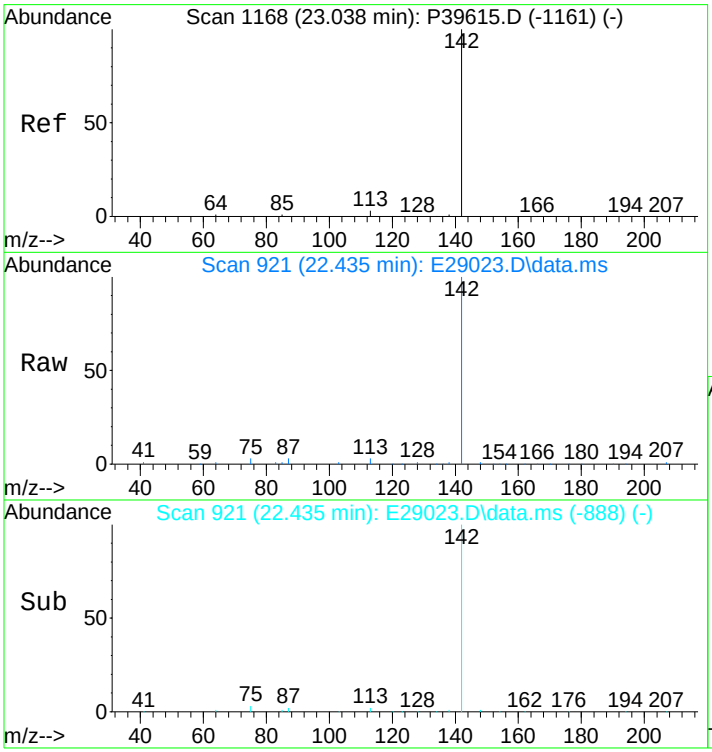


#16
2-Methylnaphthalene
Concen: 528.65 ng/mL
RT: 22.014 min Scan# 893
Delta R.T. -0.000 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:142 Resp: 63506

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

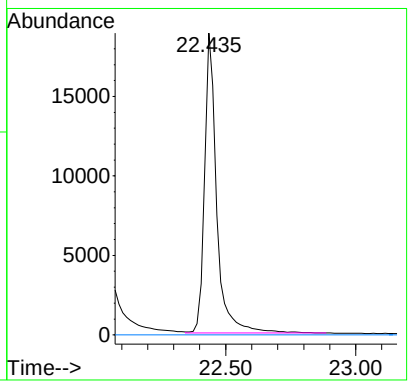


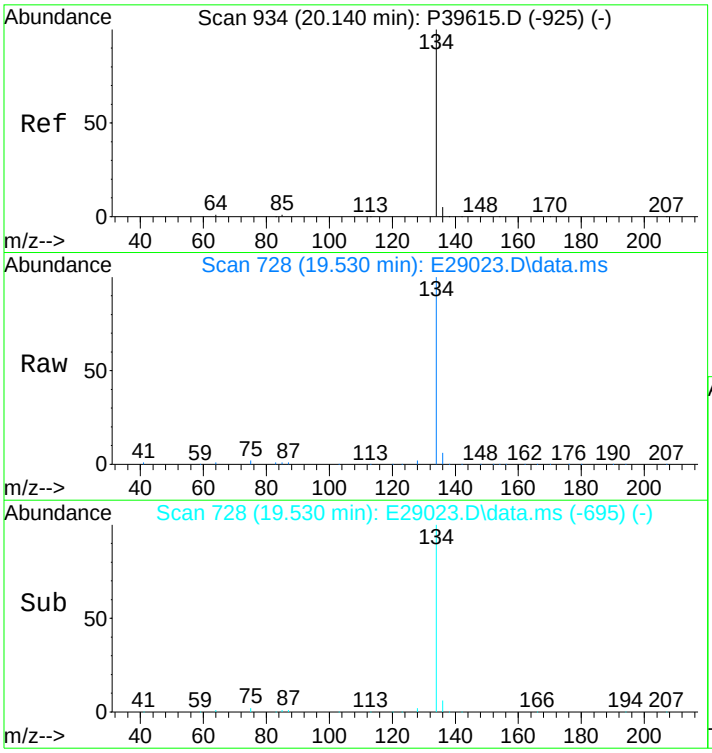


#17
1-Methylnaphthalene
Concen: 522.17 ng/mL
RT: 22.435 min Scan# 921
Delta R.T. -0.000 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:142 Resp: 60952

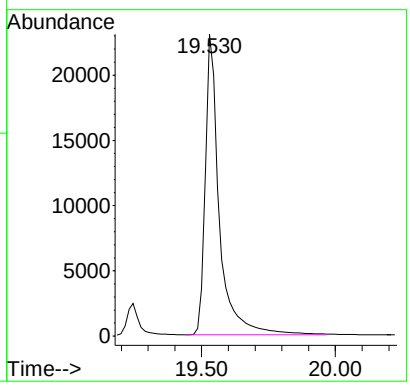
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

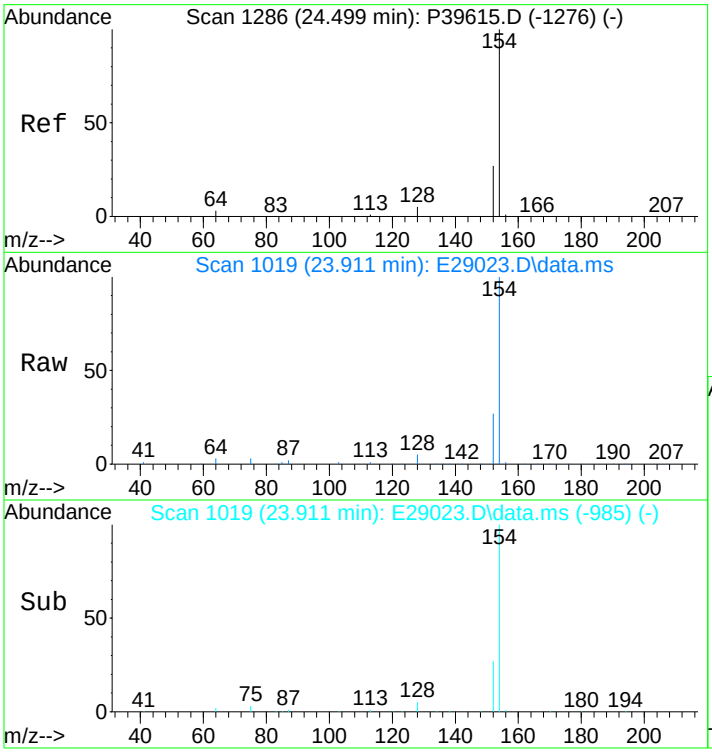




#18
Benzothiophene
Concen: 542.15 ng/mL
RT: 19.530 min Scan# 728
Delta R.T. -0.000 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:134 Resp: 84534

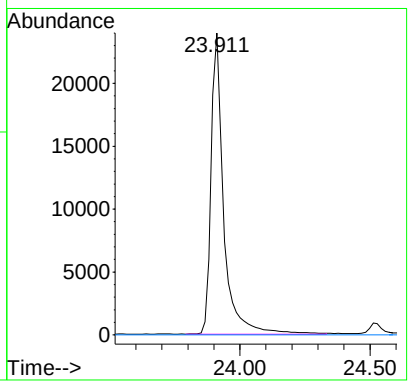


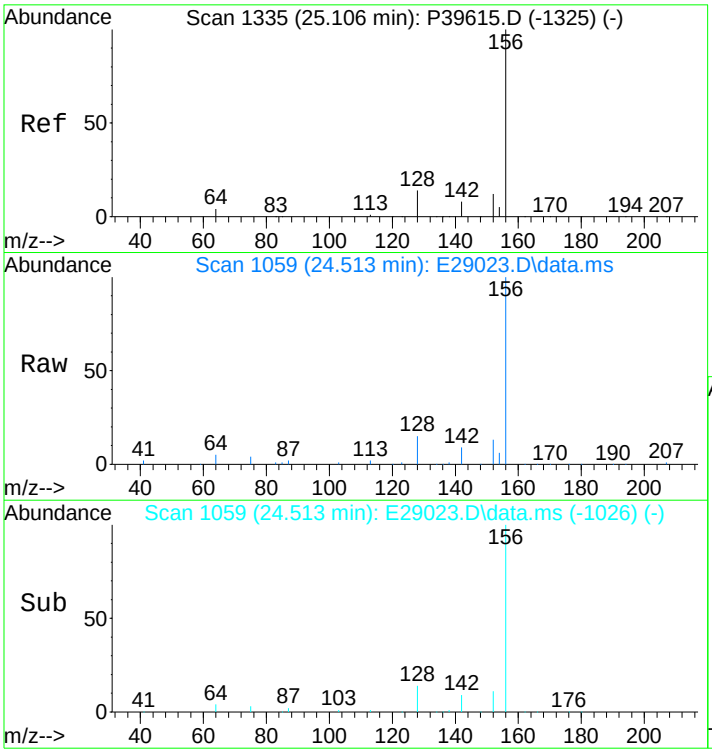


#23
Biphenyl
Concen: 528.31 ng/mL
RT: 23.911 min Scan# 1019
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:154 Resp: 80210

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

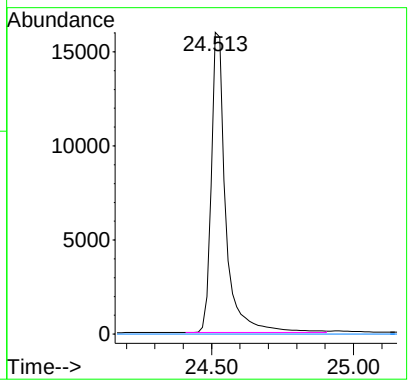


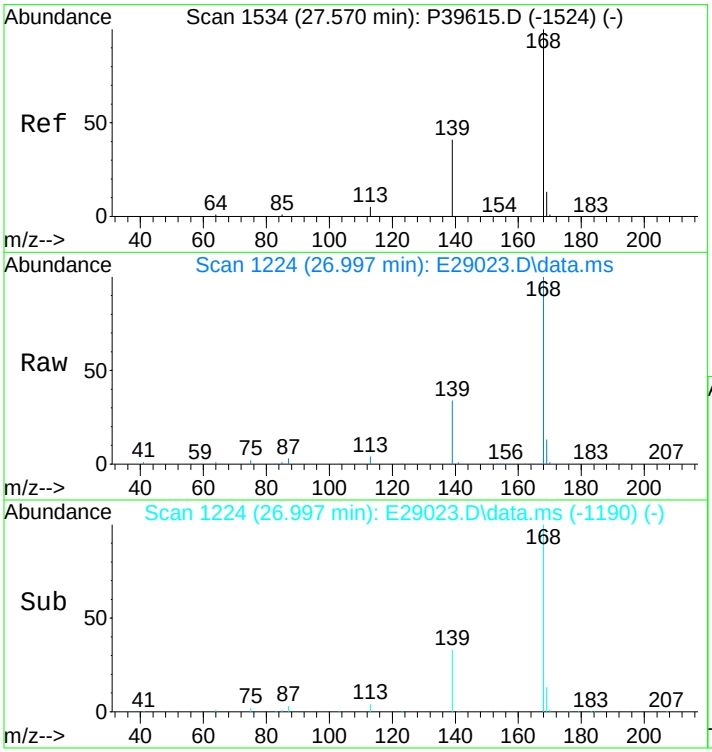


#24
2,6-Dimethylnaphthalene
Concen: 523.93 ng/mL
RT: 24.513 min Scan# 1059
Delta R.T. -0.000 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:156 Resp: 56731

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

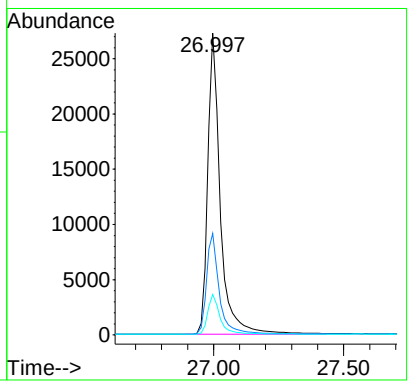


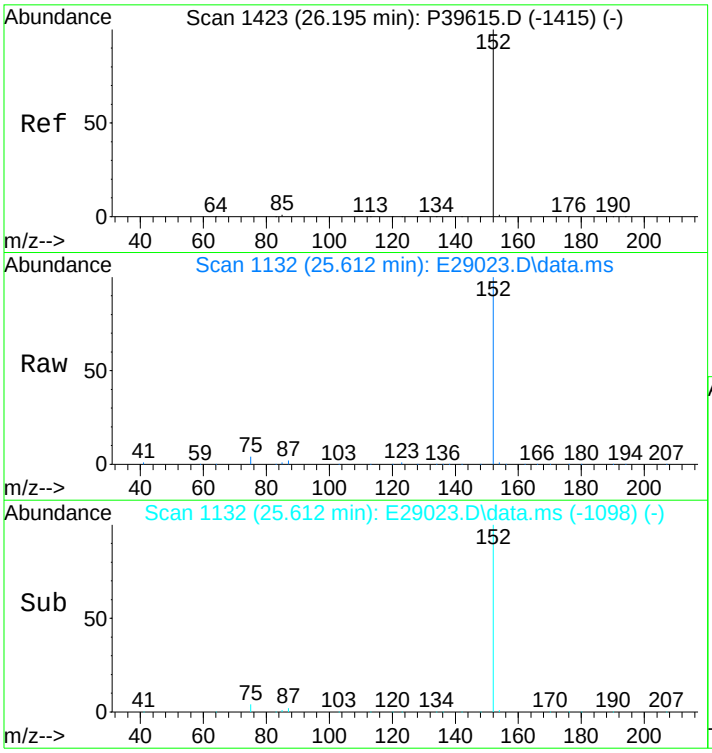


#25
Dibenzofuran
Concen: 541.04 ng/mL
RT: 26.997 min Scan# 1224
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:168 Resp: 90942

Ion	Ratio	Lower	Upper
168	100		
139	34.1	26.0	39.0
169	13.1	10.6	16.0

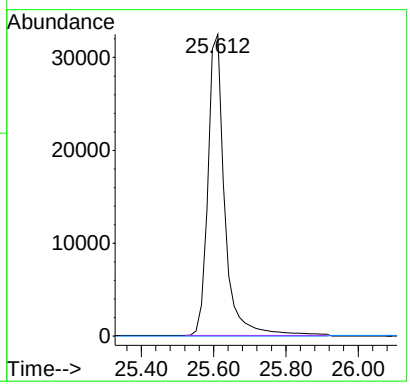


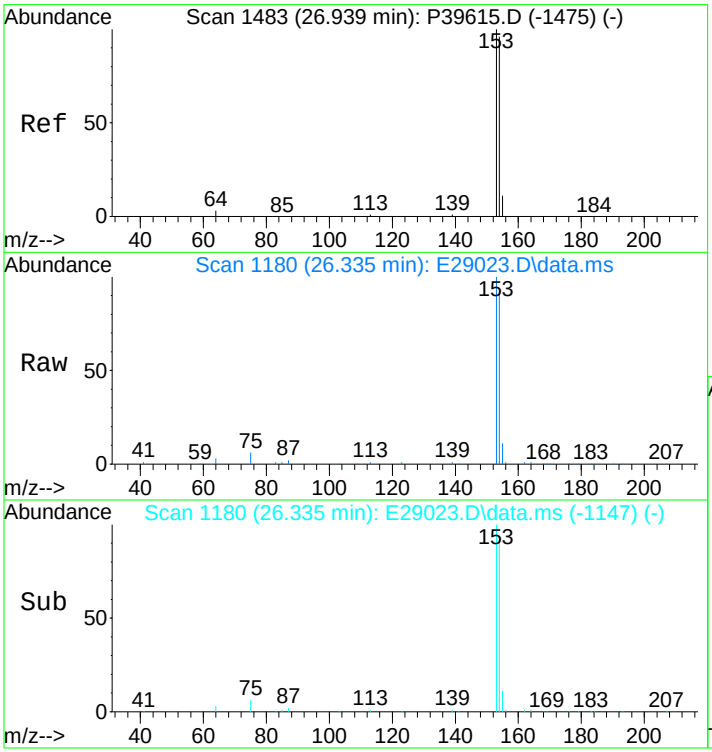


#26
Acenaphthylene
Concen: 554.53 ng/mL m
RT: 25.612 min Scan# 1132
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:152 Resp: 104278

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

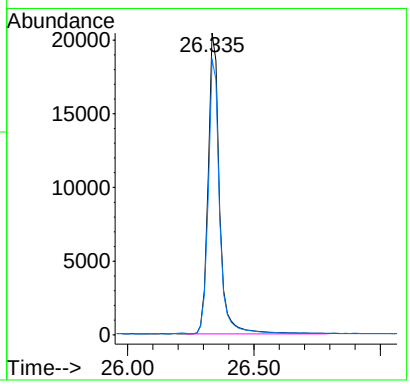


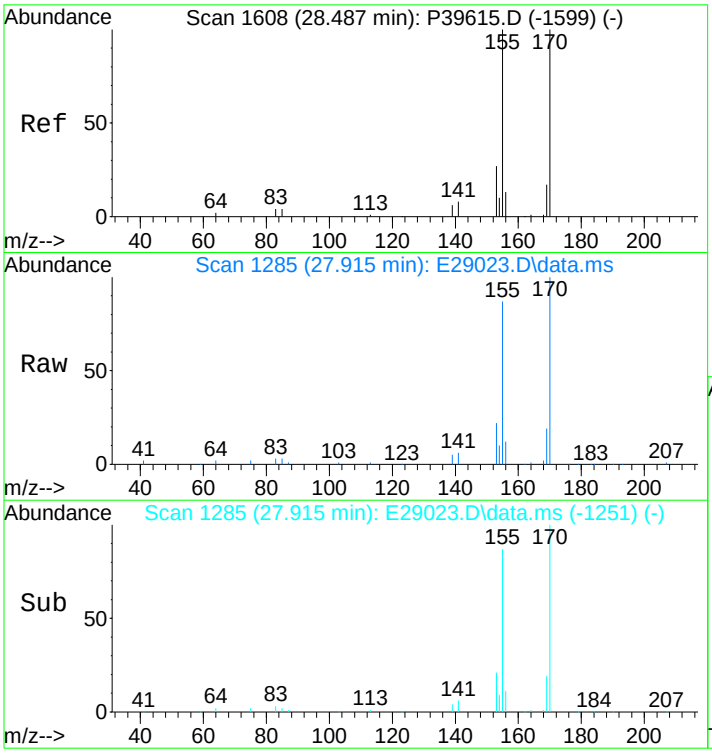


#27
Acenaphthene
Concen: 522.37 ng/mL
RT: 26.335 min Scan# 1180
Delta R.T. -0.000 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:153 Resp: 63230

Ion	Ratio	Lower	Upper
153	100		
154	91.1	74.1	111.1

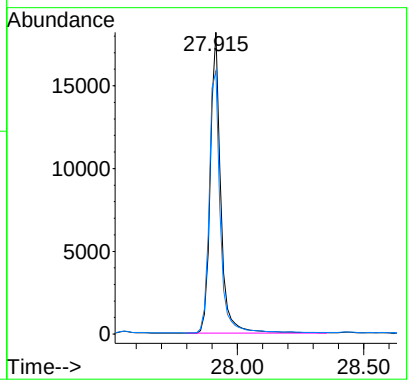


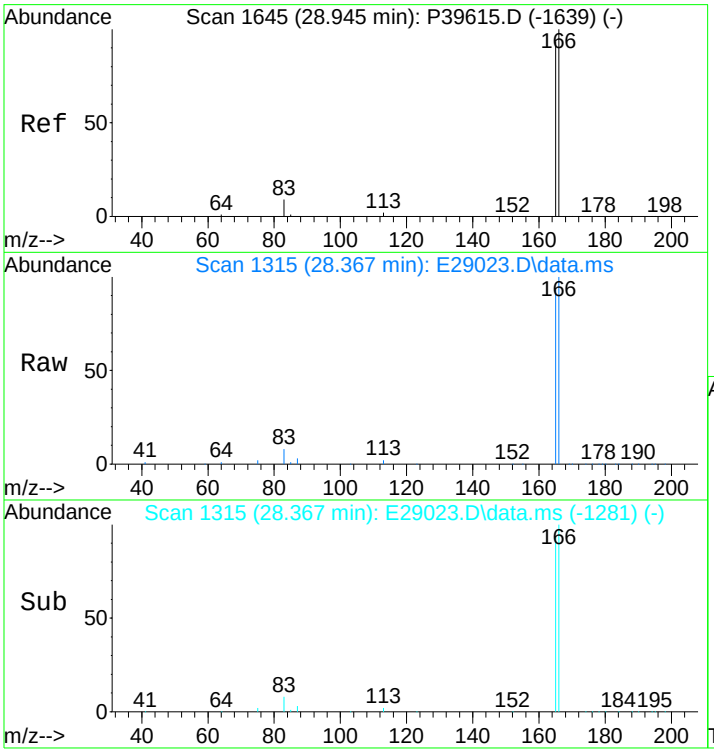


#28
2,3,5-Trimethylnaphthalene
Concen: 511.71 ng/mL
RT: 27.915 min Scan# 1285
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:170 Resp: 51839

Ion	Ratio	Lower	Upper
170	100		
155	91.6	70.7	106.1

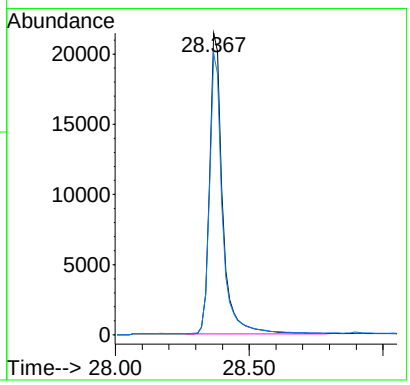


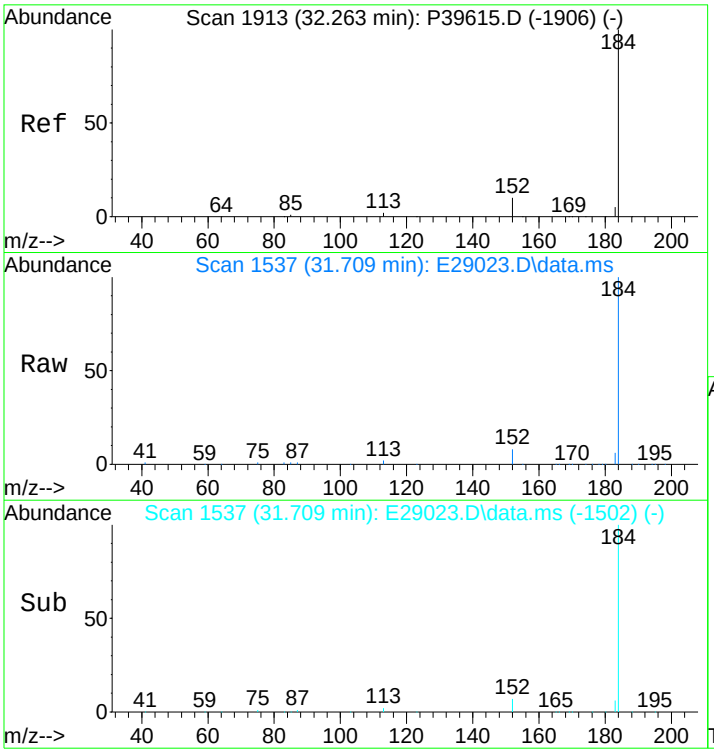


#29
Fluorene
Concen: 533.64 ng/mL
RT: 28.367 min Scan# 1315
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:166 Resp: 72042

Ion	Ratio	Lower	Upper
166	100		
165	92.5	74.7	112.1

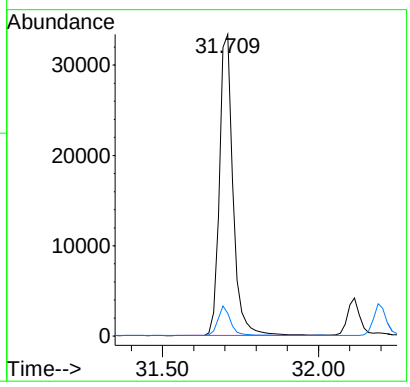


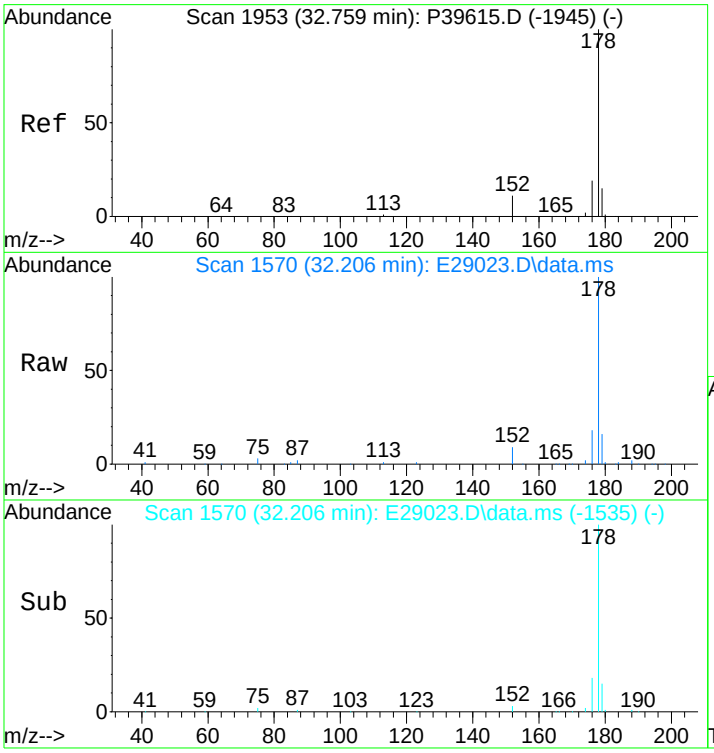


#33
Dibenzothiophene
Concen: 545.31 ng/mL
RT: 31.709 min Scan# 1537
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:184 Resp: 101024

Ion	Ratio	Lower	Upper
184	100		
152	9.0	7.0	10.6

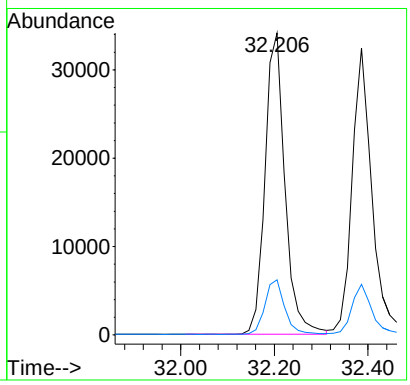


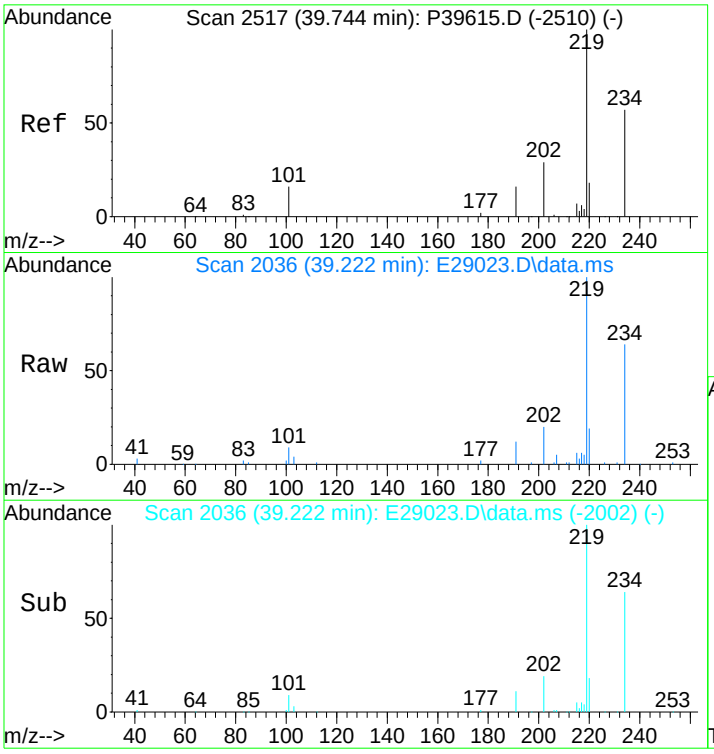


#43
Phenanthrene
Concen: 535.65 ng/mL
RT: 32.206 min Scan# 1570
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:178 Resp: 100960

Ion	Ratio	Lower	Upper
178	100		
176	18.2	15.0	22.4

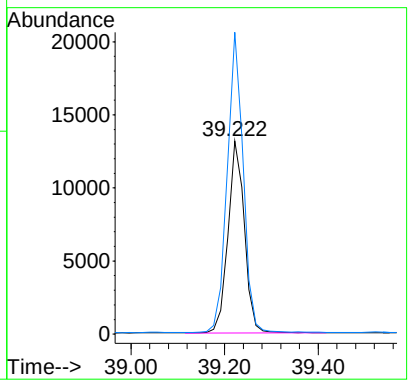


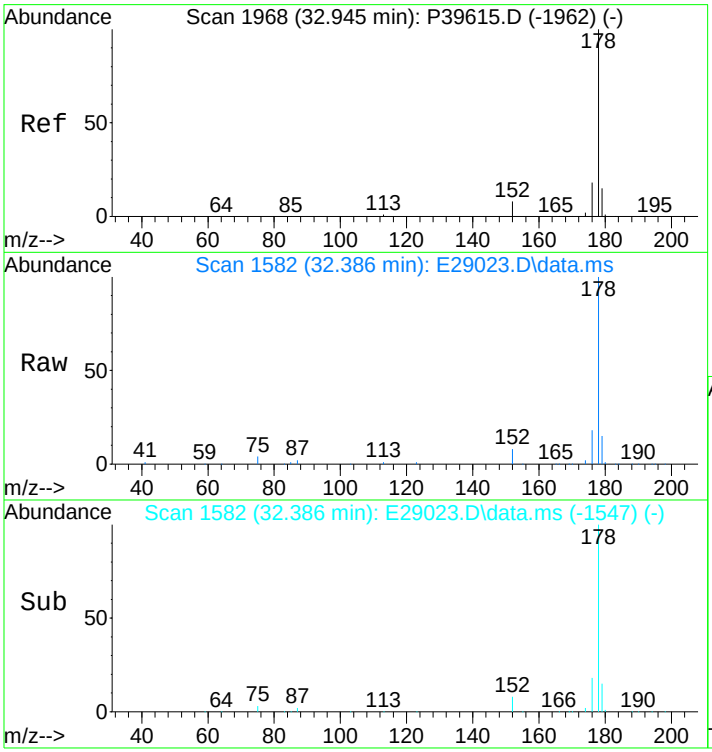


#54
Retene
Concen: 525.66 ng/mL
RT: 39.222 min Scan# 2036
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:234 Resp: 31882

Ion	Ratio	Lower	Upper
234	100		
219	153.7	115.3	172.9

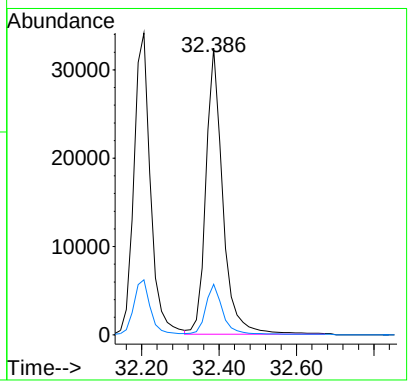


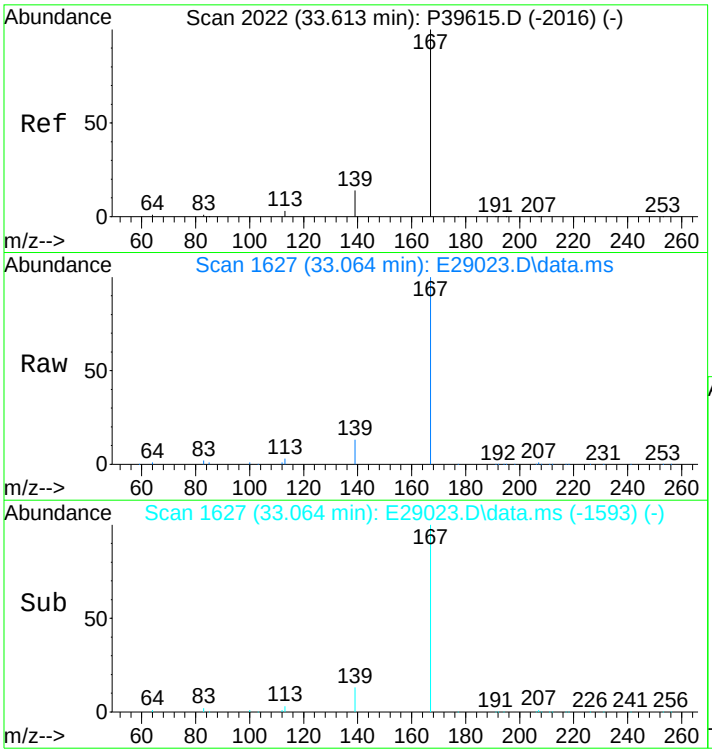


#55
Anthracene
Concen: 598.85 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:178 Resp: 97562

Ion	Ratio	Lower	Upper
178	100		
176	19.1	14.3	21.5

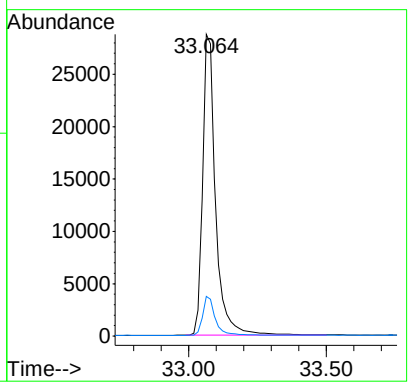


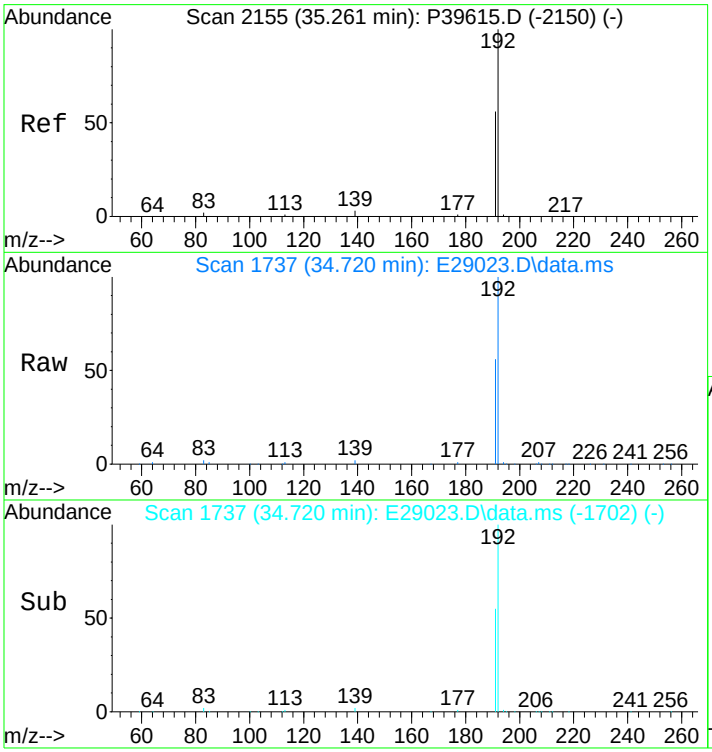


#56
Carbazole
Concen: 565.71 ng/mL
RT: 33.064 min Scan# 1627
Delta R.T. 0.015 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:167 Resp: 94852

Ion	Ratio	Lower	Upper
167	100		
139	12.6	10.1	15.1

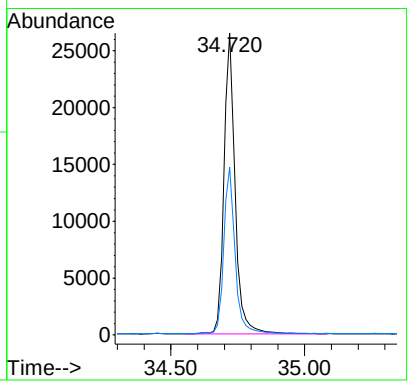


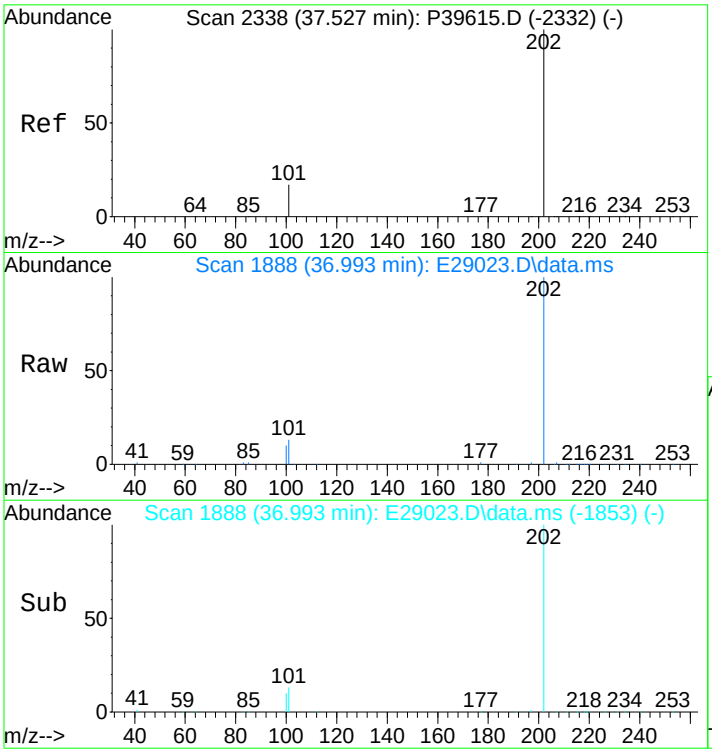


#57
1-Methylphenanthrene
Concen: 534.35 ng/mL
RT: 34.720 min Scan# 1737
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:192 Resp: 76837

Ion	Ratio	Lower	Upper
192	100		
191	56.3	45.4	68.2

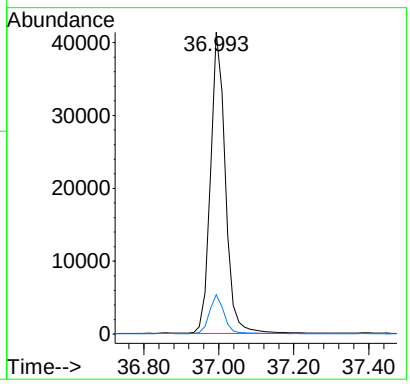


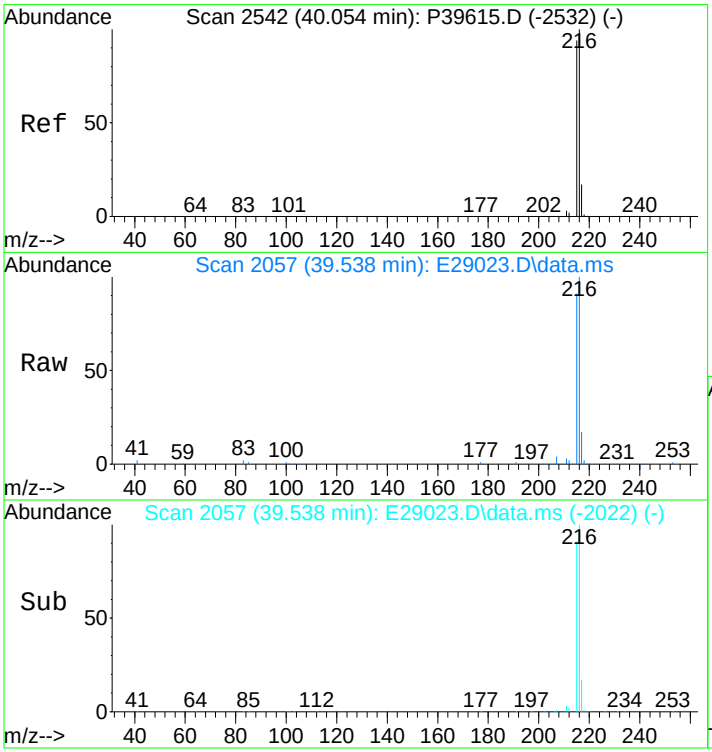


#58
Fluoranthene
Concen: 548.41 ng/mL m
RT: 36.993 min Scan# 1888
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:202 Resp: 114151

Ion	Ratio	Lower	Upper
202	100		
101	12.6	10.4	15.6

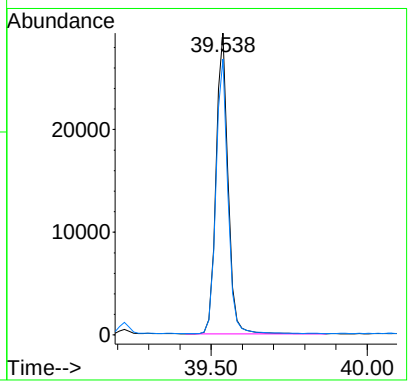


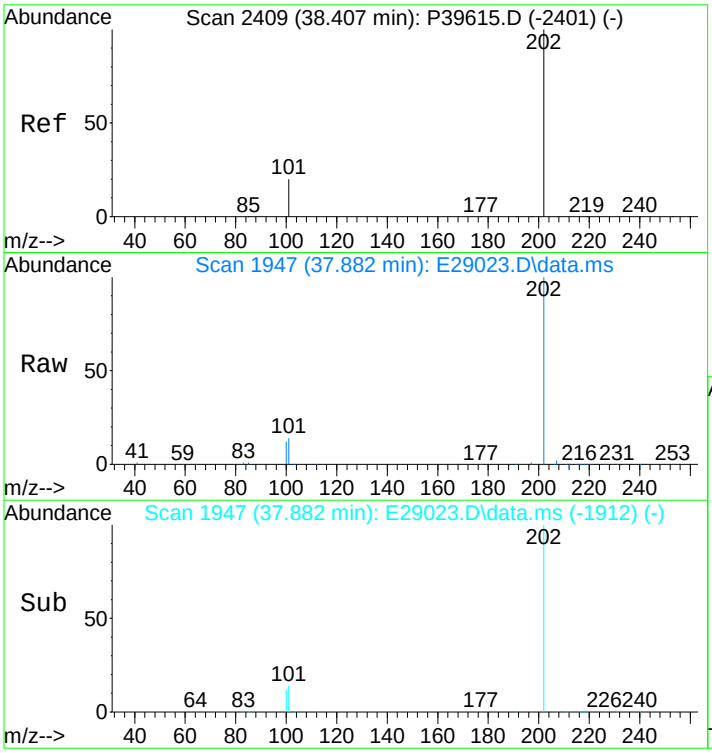


#59
Benzo(b)fluorene
Concen: 563.34 ng/mL
RT: 39.538 min Scan# 2057
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:216 Resp: 78136

Ion	Ratio	Lower	Upper
216	100		
215	91.1	72.6	109.0

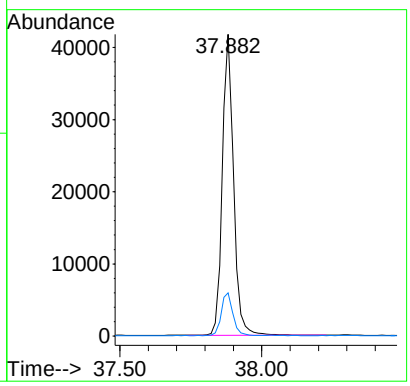


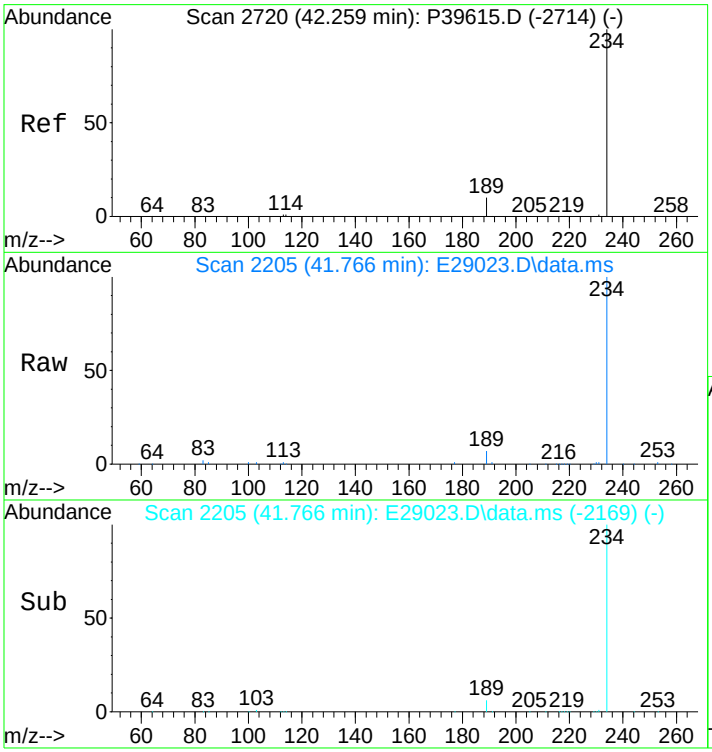


#60
Pyrene
Concen: 543.37 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:202 Resp: 114958

Ion	Ratio	Lower	Upper
202	100		
101	14.7	11.0	16.4

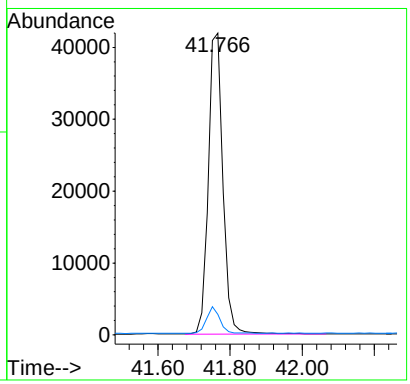


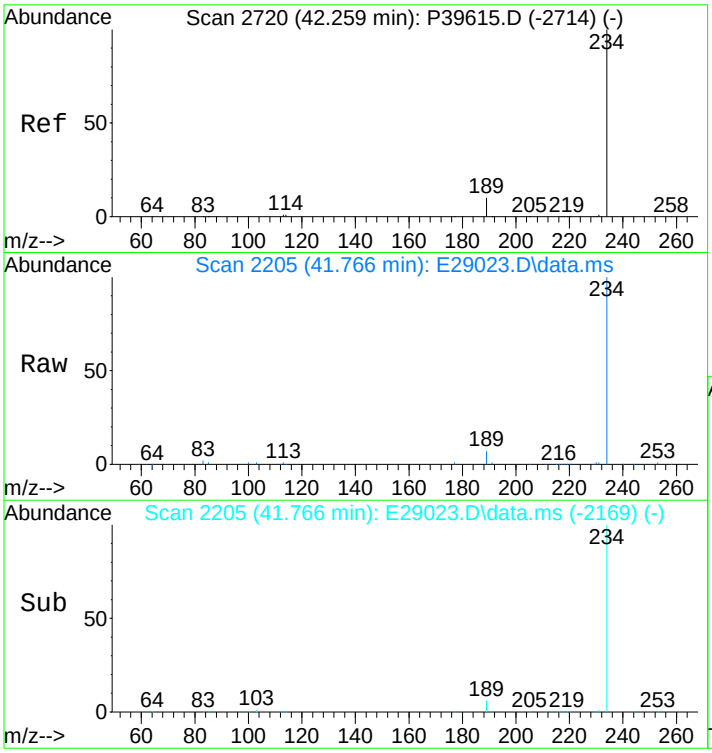


#66
Naphthobenzothiophene
Concen: 566.95 ng/ml
RT: 41.766 min Scan# 2205
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:234 Resp: 118303

Ion	Ratio	Lower	Upper
234	100		
189	8.0	21.1	31.7#

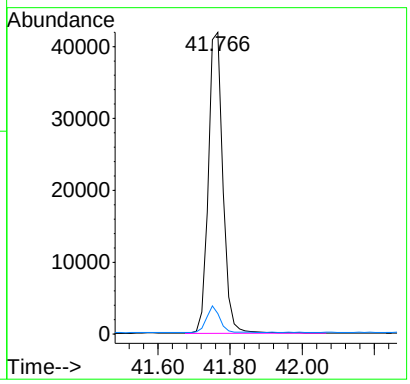


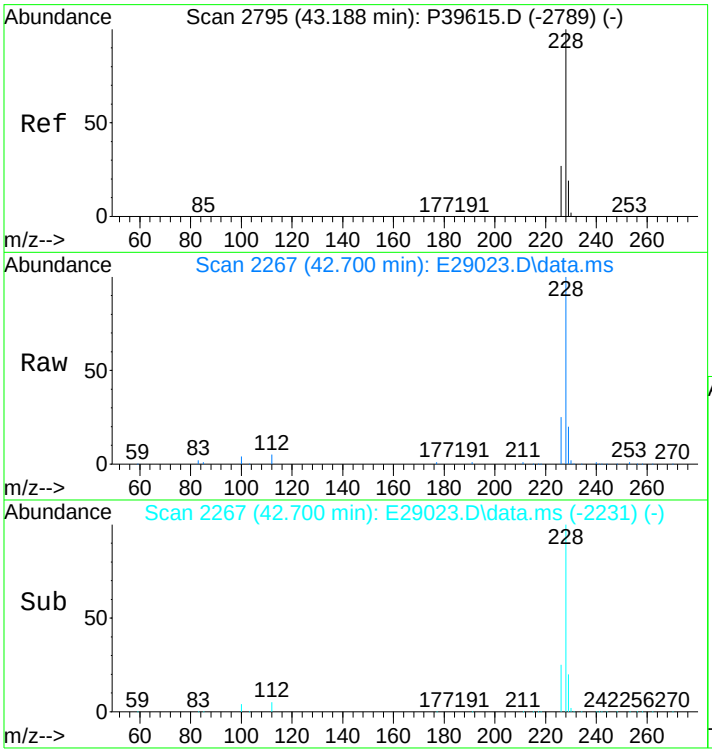


#67
Naphthobenzothiophene-2,1-D
Concen: 566.95 ng/mL
RT: 41.766 min Scan# 2205
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:234 Resp: 118303

Ion	Ratio	Lower	Upper
234	100		
189	8.0	21.1	31.7#

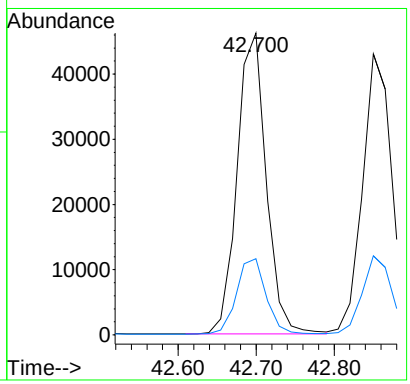


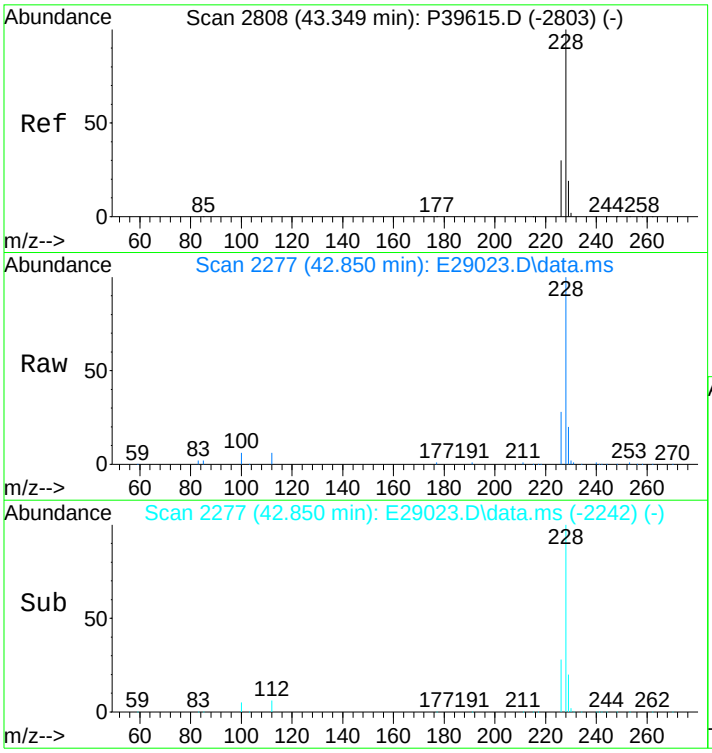


#75
Benz[a]anthracene
Concen: 567.28 ng/mL
RT: 42.700 min Scan# 2267
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:228 Resp: 119874

Ion	Ratio	Lower	Upper
228	100		
226	25.5	20.7	31.1

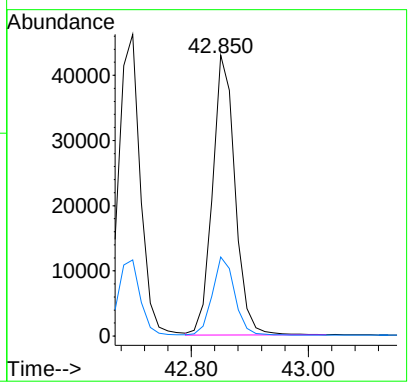


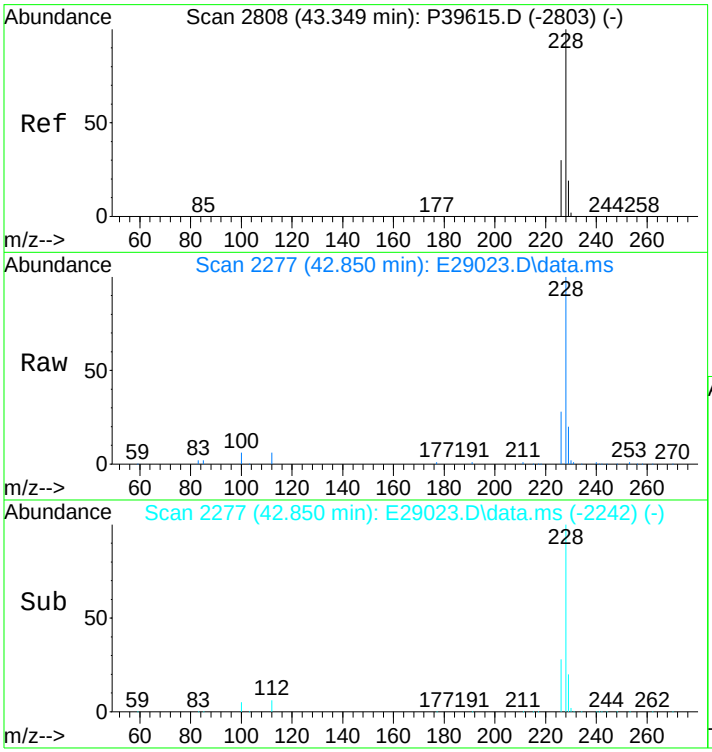


#76
Chrysene
Concen: 529.13 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:228 Resp: 115113

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

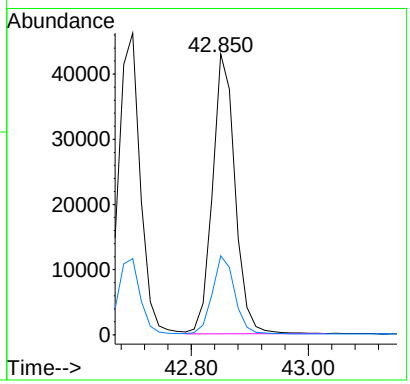


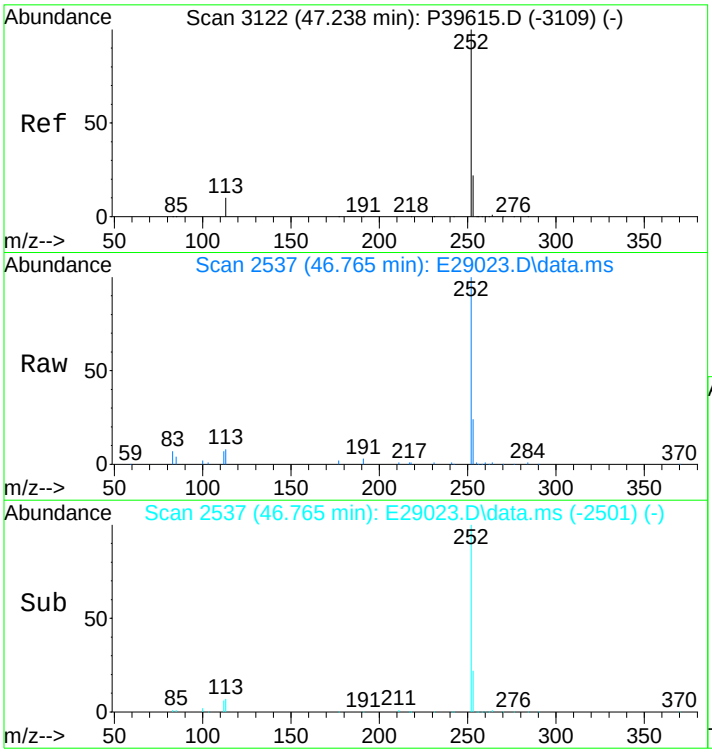


#77
Chrysene/Triphenylene
Concen: 529.13 ng/mL
RT: 42.850 min Scan# 2277
Delta R.T. 0.030 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:228 Resp: 115113

Ion	Ratio	Lower	Upper
228	100		
226	27.9	22.6	34.0

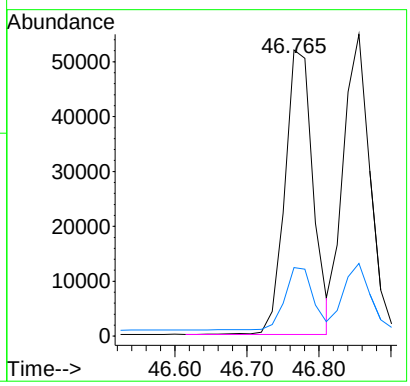


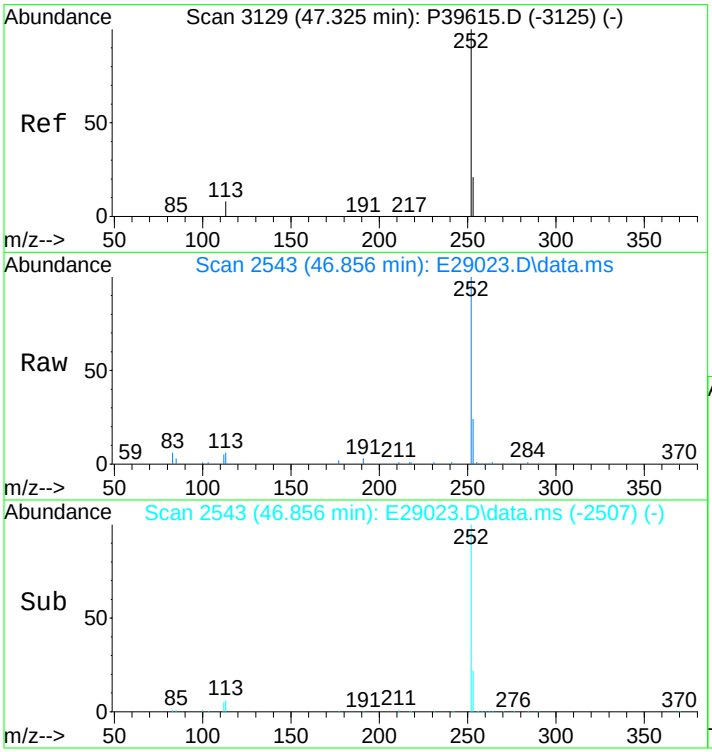


#84
Benzo[b]fluoranthene
Concen: 576.24 ng/mL
RT: 46.765 min Scan# 2537
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:252 Resp: 141533

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.5	29.3

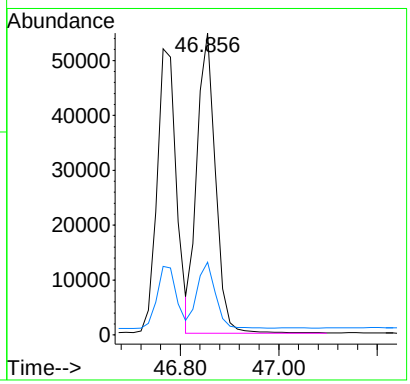


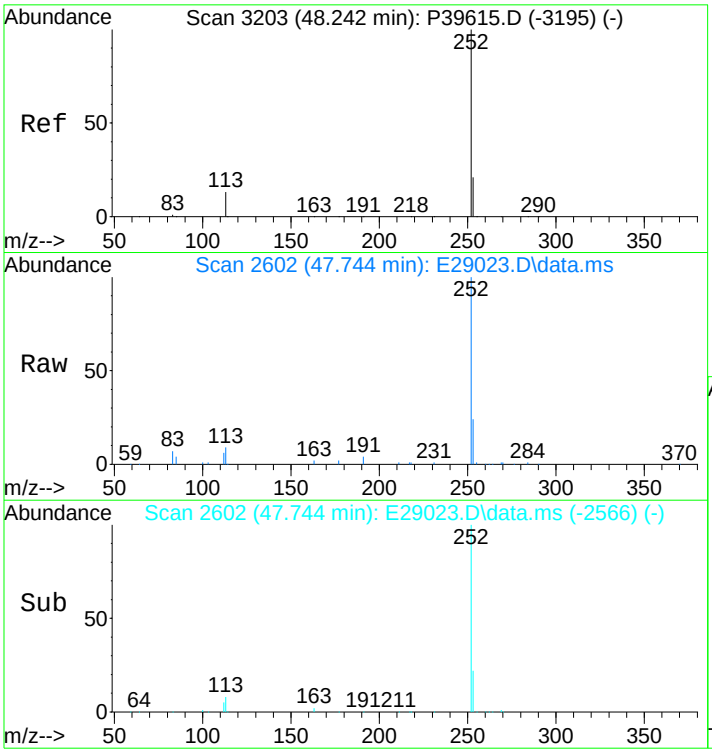


#85
Benzo[j]+[k]fluoranthene
Concen: 565.84 ng/mL
RT: 46.856 min Scan# 2543
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:252 Resp: 142986

Ion	Ratio	Lower	Upper
252	100		
253	21.6	19.7	29.5

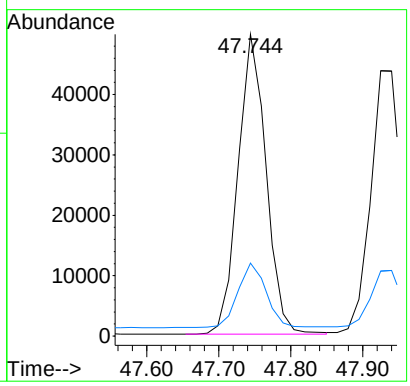


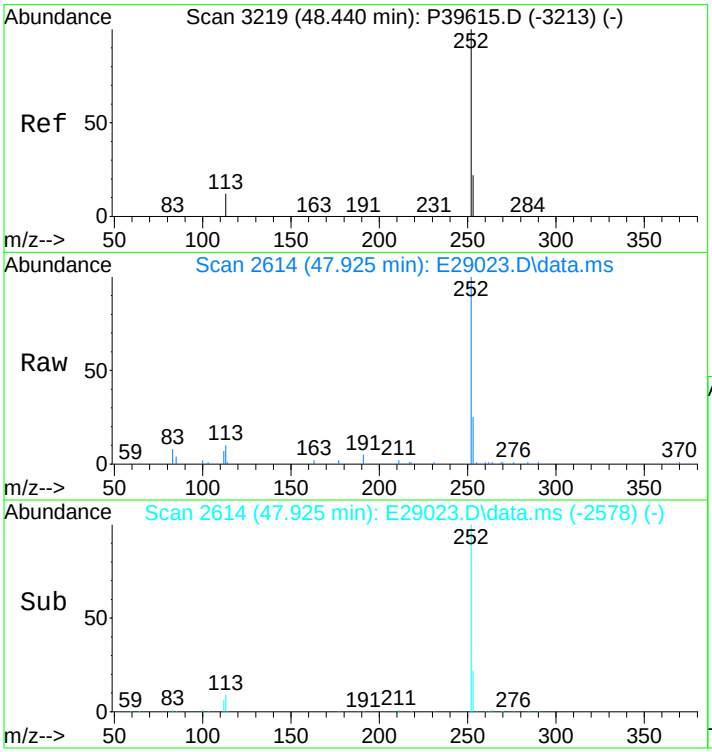


#87
Benzo[e]pyrene
Concen: 559.15 ng/mL
RT: 47.744 min Scan# 2602
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:252 Resp: 134099

Ion	Ratio	Lower	Upper
252	100		
253	22.3	20.6	31.0

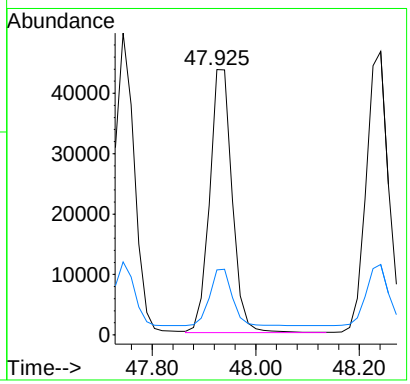


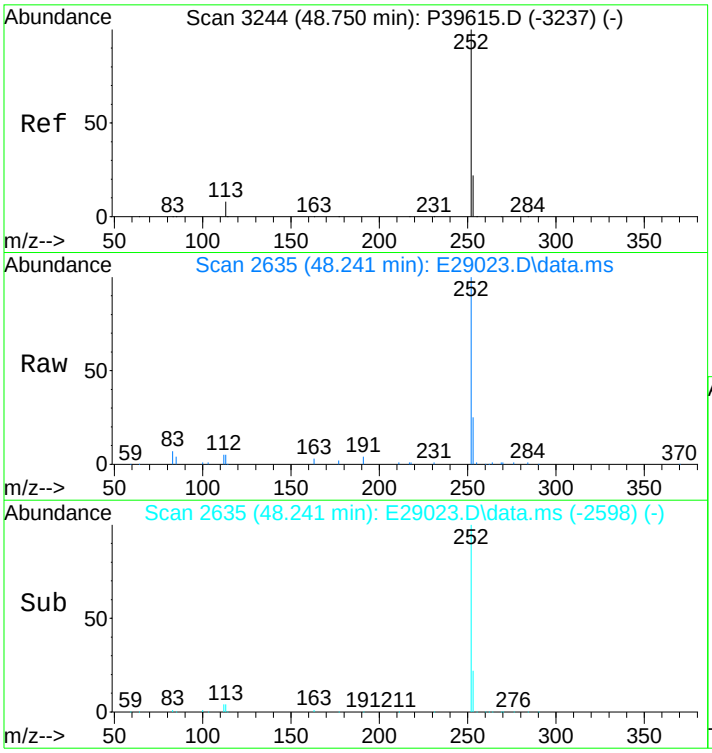


#89
Benzo[a]pyrene
Concen: 574.94 ng/mL m
RT: 47.925 min Scan# 2614
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:252 Resp: 131938

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.8	31.2

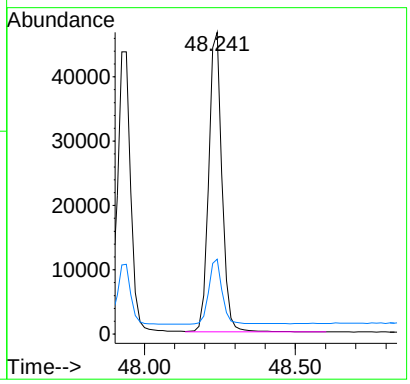


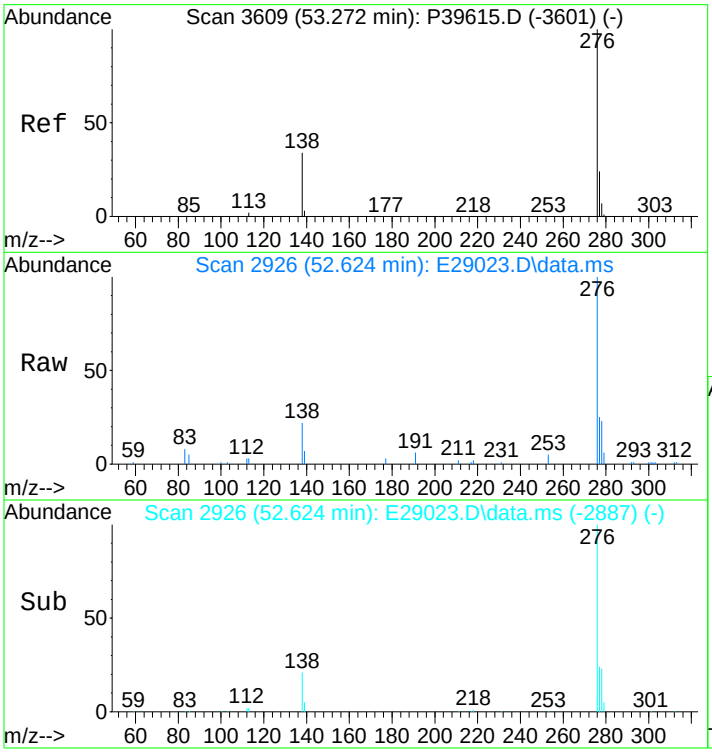


#90
Perylene
Concen: 585.91 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.060 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:252 Resp: 142179

Ion	Ratio	Lower	Upper
252	100		
253	21.9	20.7	31.1

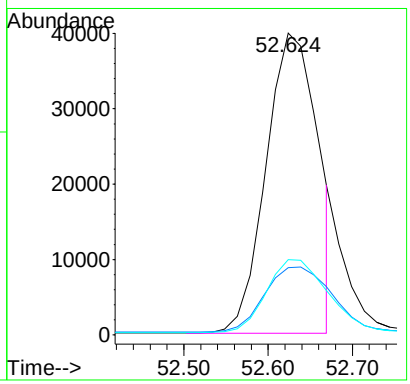


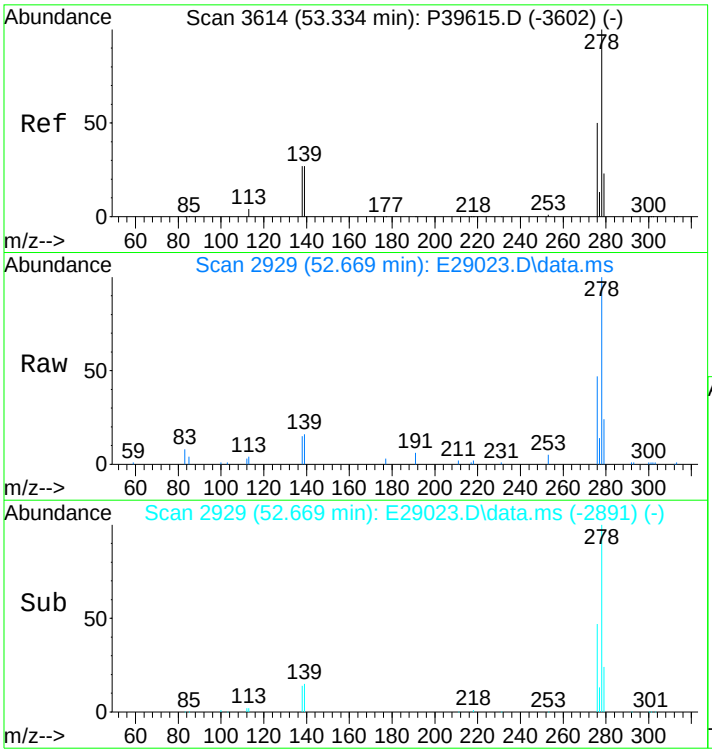


#91
Indeno[1,2,3-cd]pyrene
Concen: 630.90 ng/mL m
RT: 52.624 min Scan# 2926
Delta R.T. 0.090 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:276 Resp: 170389

Ion	Ratio	Lower	Upper
276	100		
138	28.6	16.3	24.5#
277	29.4	19.4	29.2#

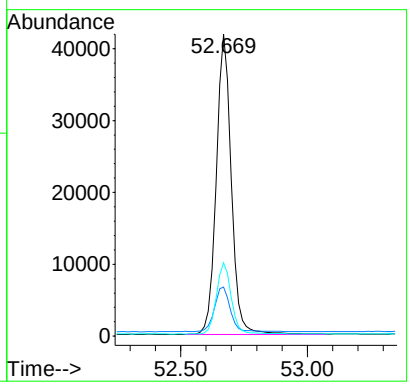


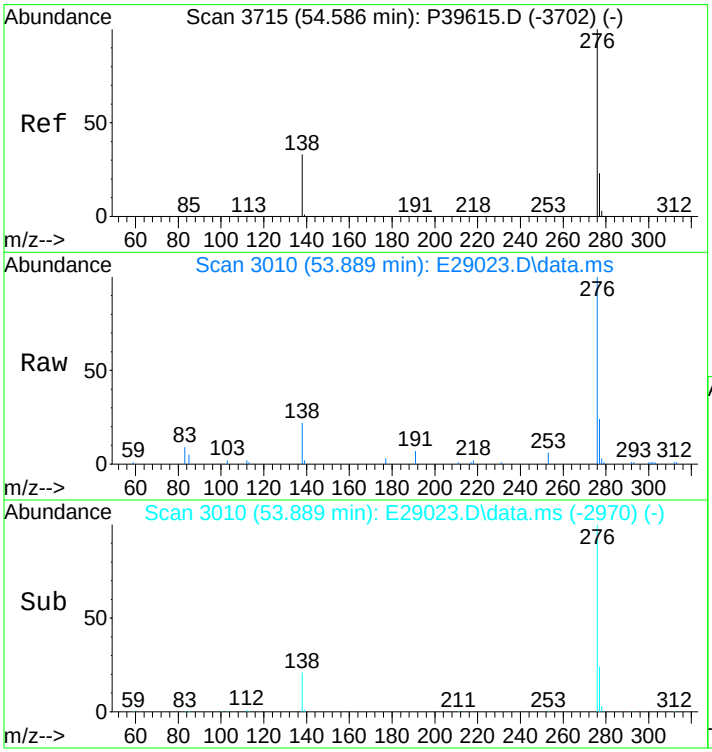


#92
Dibenz[ah]+[ac]anthracene
Concen: 597.48 ng/mL
RT: 52.669 min Scan# 2929
Delta R.T. 0.075 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:278 Resp: 171816

Ion	Ratio	Lower	Upper
278	100		
139	15.2	11.6	17.4
279	23.6	19.3	28.9

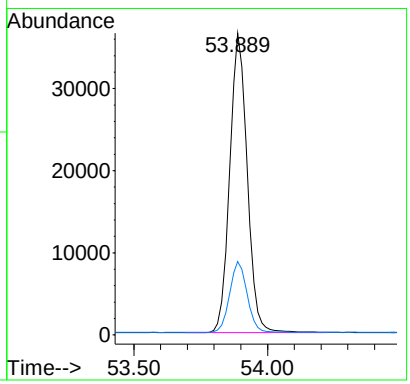


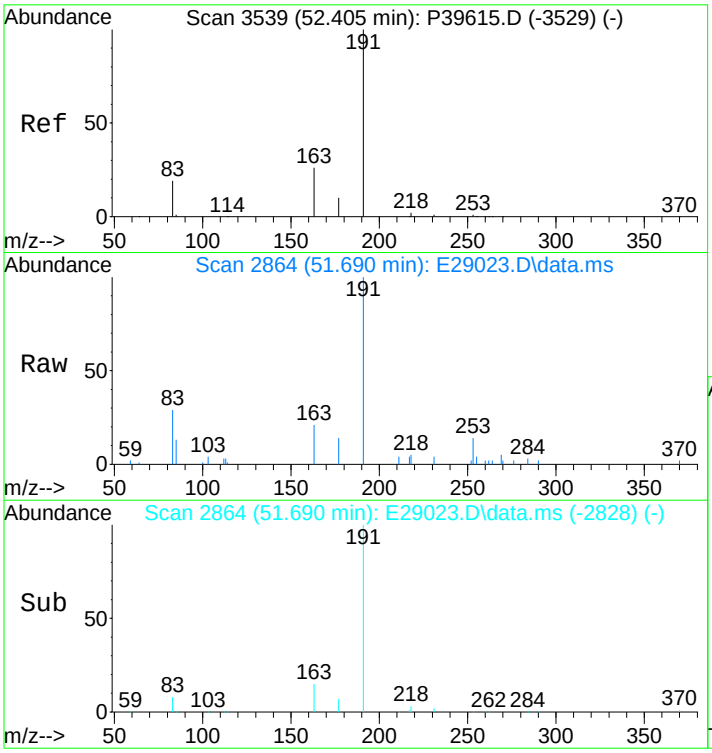


#93
Benzo[g,h,i]perylene
Concen: 568.14 ng/mL
RT: 53.889 min Scan# 3010
Delta R.T. 0.105 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:276 Resp: 165444

Ion	Ratio	Lower	Upper
276	100		
277	23.6	19.1	28.7

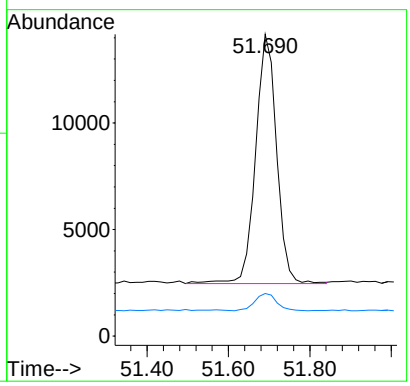


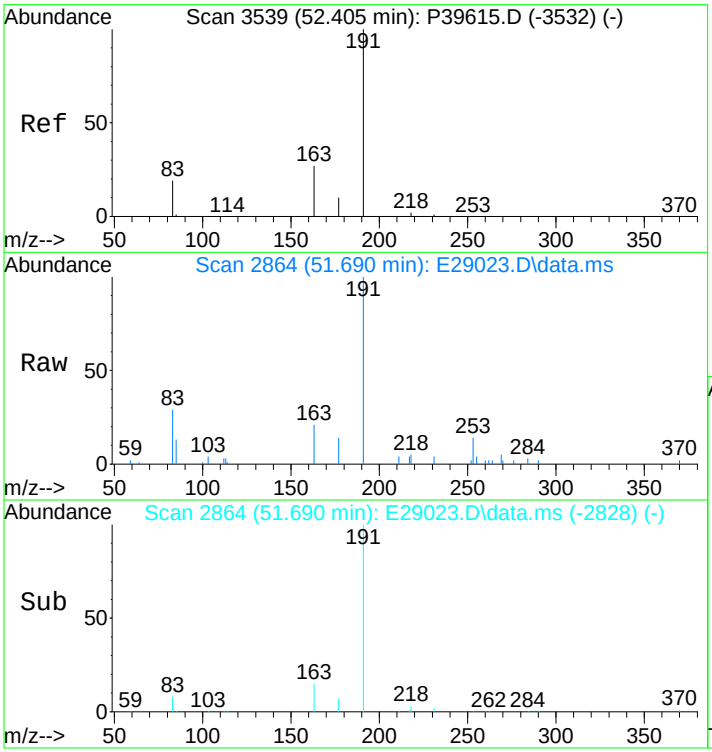


#94
Hopane (T19)
Concen: 514.58 ng/mL
RT: 51.690 min Scan# 2864
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:191 Resp: 41907

Ion	Ratio	Lower	Upper
191	100		
177	7.3	11.6	17.4#

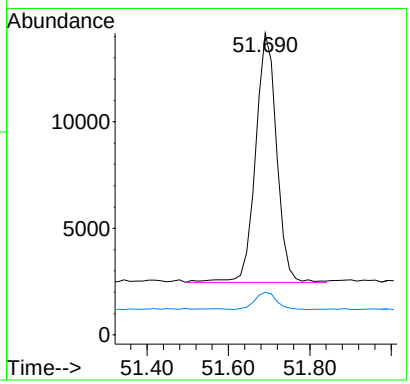




#95
17a(H),21B(H)-hopane - C30H52
Concen: 514.58 ng/mL
RT: 51.690 min Scan# 2864
Delta R.T. 0.045 min
Lab File: E29023.D
Acq: 17 Nov 2012 1:27 am

Tgt Ion:191 Resp: 41907

Ion	Ratio	Lower	Upper
191	100		
177	7.3	11.6	17.4#



Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	26.214	164	38690	500.000	ng/mL	0.00
74) Chrysene-d12	42.760	240	85688	500.000	ng/mL	0.00
System Monitoring Compounds						
9) Naphthalene-d8	19.244	136	68033	499.917	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.99%#			
42) Phenanthrene-d10	32.115	188	67592	484.784	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.48%#			
83) Benzo[b]fluoranthene-d12	46.690	264	91324	518.817	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.88%			
88) Benzo[a]pyrene-d12	47.850	264	90126	528.424	ng/mL	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.84%			
129) 5B(H)Cholane - Surr	43.362	217	18013	533.378	ng/ml	-0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.34%			
Target Compounds						Qvalue
3) trans-Decalin	15.887	138	7320	236.522	ng/mL	100
4) cis-Decalin	17.091	138	5575	237.101	ng/mL	100
10) Naphthalene	19.319	128	83623	549.471	ng/mL#	100
16) 2-Methylnaphthalene	22.029	142	51703	533.404	ng/mL#	100
17) 1-Methylnaphthalene	22.451	142	49856	529.339	ng/mL#	100
18) Benzothiophene	19.545	134	69843	555.135	ng/mL	100
23) Biphenyl	23.911	154	65420	534.024	ng/mL#	100
24) 2,6-Dimethylnaphthalene	24.528	156	46424	531.354	ng/mL#	100
25) Dibenzofuran	27.012	168	73121	539.139	ng/mL	100
26) Acenaphthylene	25.612	152	84317M3	555.699	ng/mL	
27) Acenaphthene	26.350	153	51729	529.641	ng/mL	99
28) 2,3,5-Trimethylnaphthalen	27.915	170	41720	510.385	ng/mL	95
29) Fluorene	28.382	166	58136	533.700	ng/mL	100
33) Dibenzothiophene	31.709	184	81861	547.629	ng/mL	96
43) Phenanthrene	32.206	178	80662	530.385	ng/mL	100
54) Retene	39.222	234	25681	524.762	ng/mL	96
55) Anthracene	32.386	178	76547M3	582.316	ng/mL	
56) Carbazole	33.079	167	75746	559.886	ng/mL	98
57) 1-Methylphenanthrene	34.720	192	61377	528.993	ng/mL	99
58) Fluoranthene	37.008	202	91845	546.854	ng/mL	99
59) Benzo(b)fluorene	39.538	216	61823	552.410	ng/mL	100
60) Pyrene	37.882	202	92803	543.634	ng/mL	99
66) Naphthobenzothiophene	41.766	234	93797	557.094	ng/ml	97
67) Naphthobenzothiophene-2,1	41.766	234	93797	557.094	ng/mL	97
75) Benz[a]anthracene	42.700	228	93896	562.720	ng/mL	99
76) Chrysene	42.865	228	91500	532.638	ng/mL	99
77) Chrysene/Triphenylene	42.865	228	91500	532.638	ng/mL	99
84) Benzo[b]fluoranthene	46.780	252	109237	563.227	ng/mL	97
85) Benzo[j]+[k]fluoranthene	46.856	252	115686	579.766	ng/mL	95
87) Benzo[e]pyrene	47.759	252	105820	558.781	ng/mL	96
89) Benzo[a]pyrene	47.940	252	102998	568.396	ng/mL	94
90) Perylene	48.241	252	110508	576.713	ng/mL	94
91) Indeno[1,2,3-cd]pyrene	52.639	276	134194M3	629.253	ng/mL	
92) Dibenz[ah]+[ac]anthracene	52.684	278	133950	589.893	ng/mL	98
93) Benzo[g,h,i]perylene	53.904	276	129354	562.541	ng/mL	98
94) Hopane (T19)	51.690	191	33169	515.785	ng/mL#	84
95) 17a(H),21B(H)-hopane - C3	51.690	191	33169	515.785	ng/mL#	84

Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

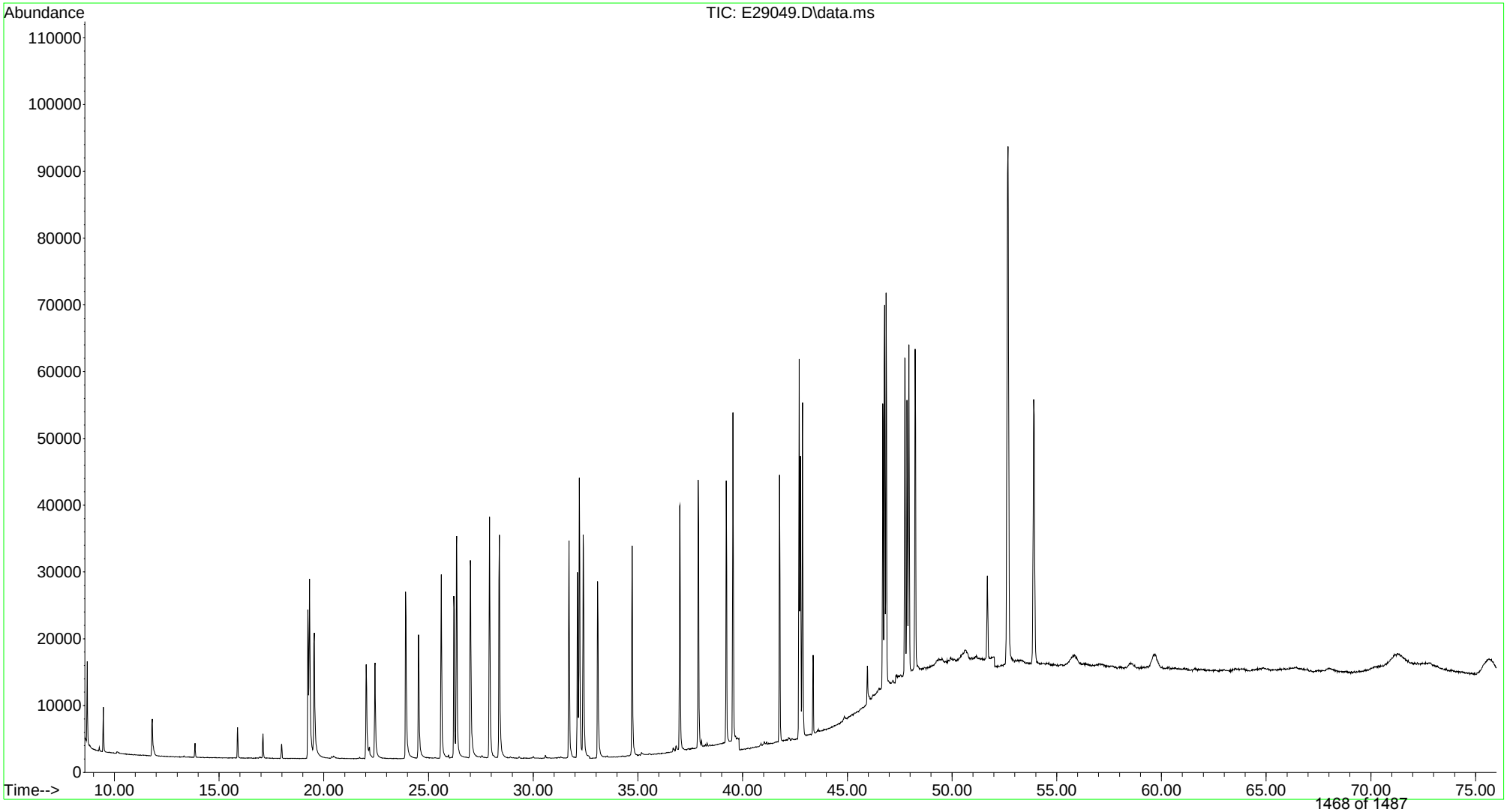
(#) = qualifier out of range (m) = manual integration (+) = signals summed

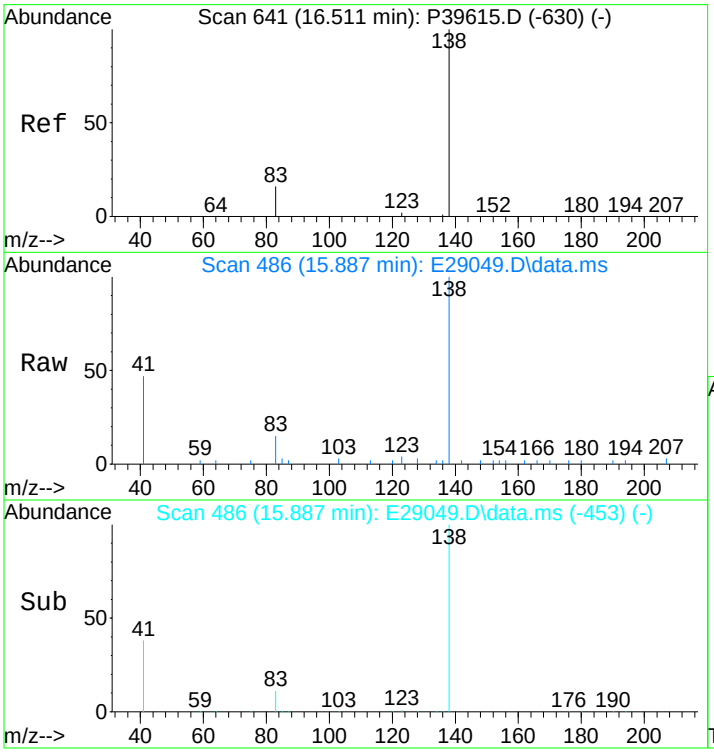
Quantitation Report (QT Reviewed)

Data Path : O:\FORENSICS\DATA\PAH2\2012\NOV12\NOV13\
Data File : E29049.D
Acq On : 17 Nov 2012 8:33 pm
Operator : AC
Sample : C211131209
Misc : CC WHAQ86 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 19 08:47:55 2012
Quant Method : C:\MSDCHEM\1\DATA\PAH2\2012\NOV\NOV13\PAH2102912.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sat Nov 17 13:27:41 2012
Response via : Initial Calibration

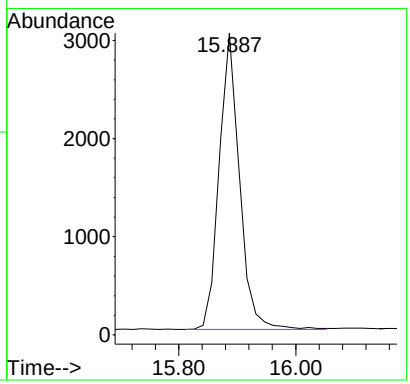
Sub List : ICAL_CCALT_NEW_Default_REV2 - CC with 5 surrogates

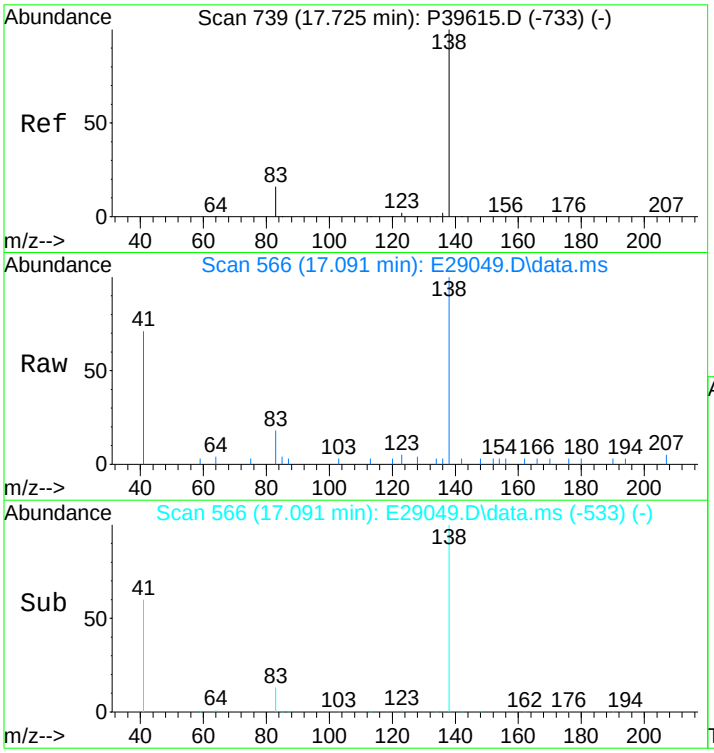




#3
trans-Decalin
Concen: 236.52 ng/mL
RT: 15.887 min Scan# 486
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

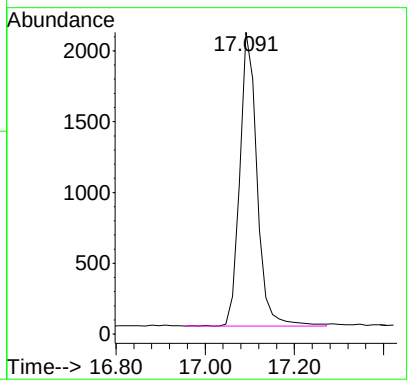
Tgt Ion:138 Resp: 7320

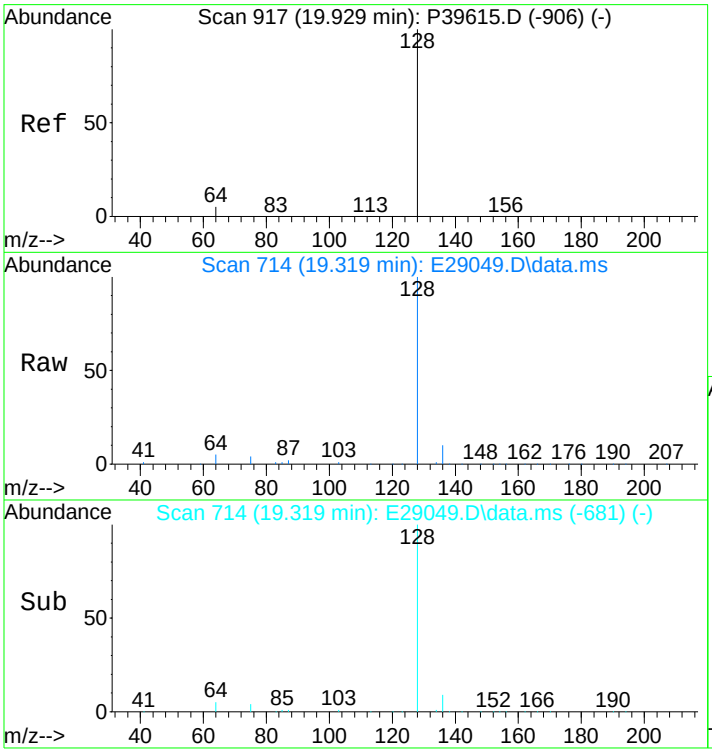




#4
cis-Decalin
Concen: 237.10 ng/mL
RT: 17.091 min Scan# 566
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:138 Resp: 5575

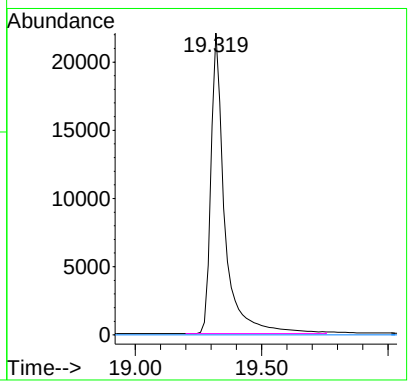


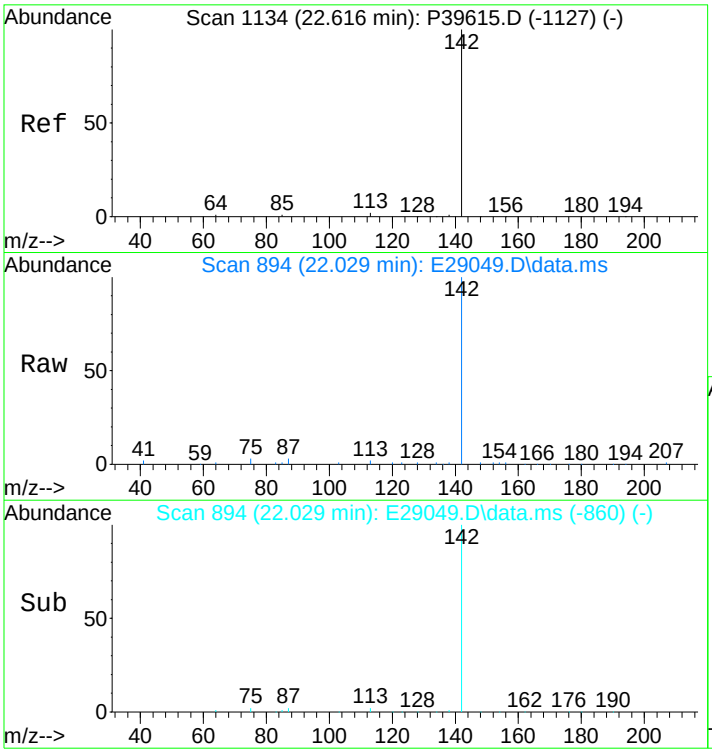


#10
Naphthalene
Concen: 549.47 ng/mL
RT: 19.319 min Scan# 714
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:128 Resp: 83623

Ion	Ratio	Lower	Upper
128	100		
127	0.0	0.0	0.0

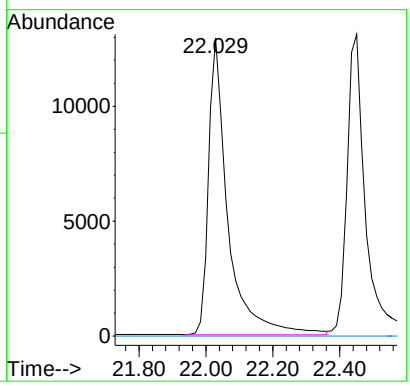


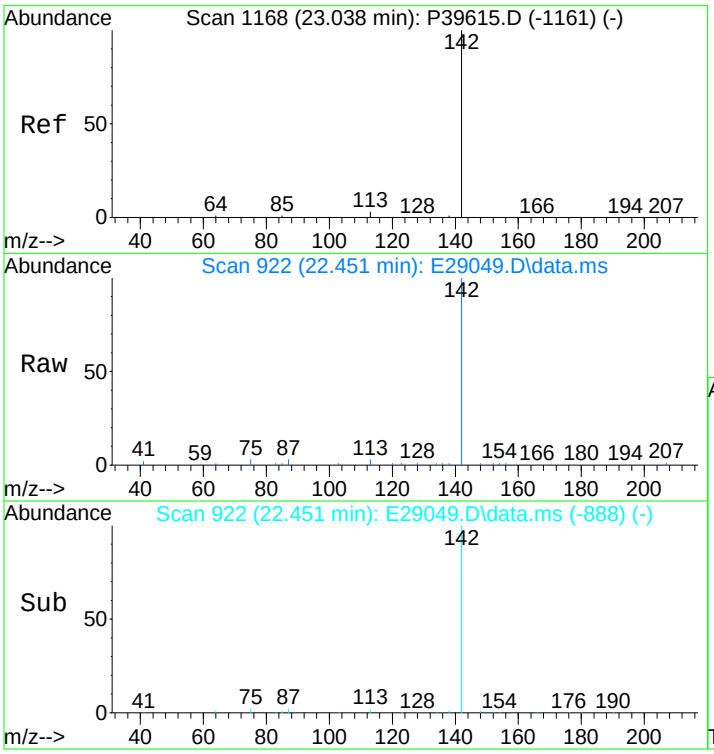


#16
2-Methylnaphthalene
Concen: 533.40 ng/mL
RT: 22.029 min Scan# 894
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:142 Resp: 51703

Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	0.0

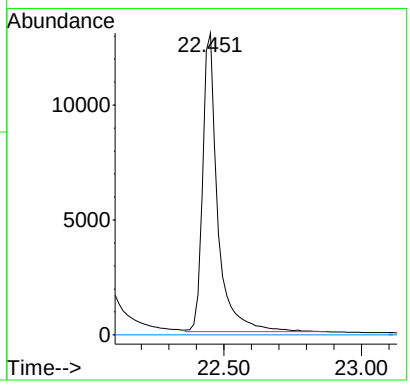


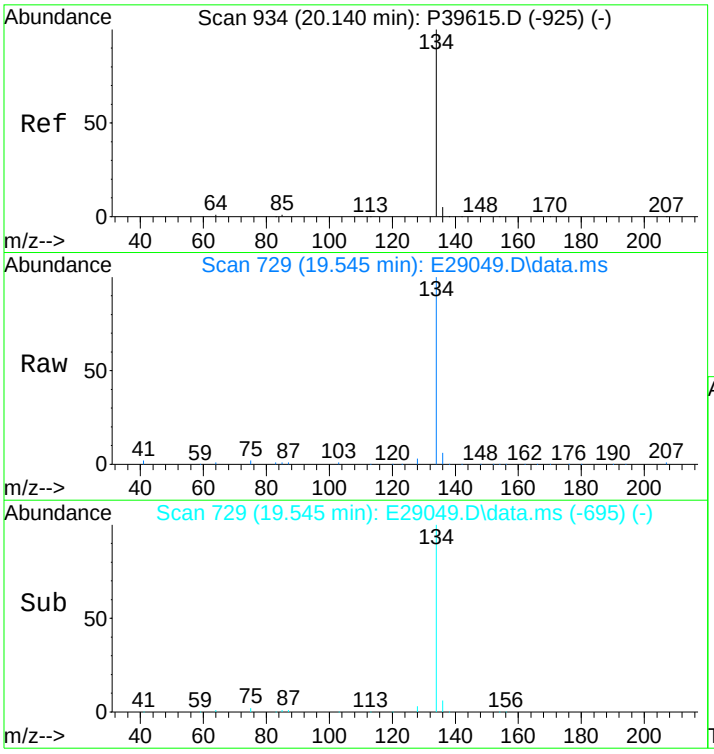


#17
1-Methylnaphthalene
Concen: 529.34 ng/mL
RT: 22.451 min Scan# 922
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:142 Resp: 49856

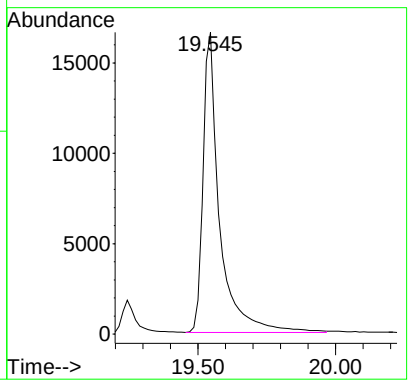
Ion	Ratio	Lower	Upper
142	100		
141	0.0	0.0	20.0

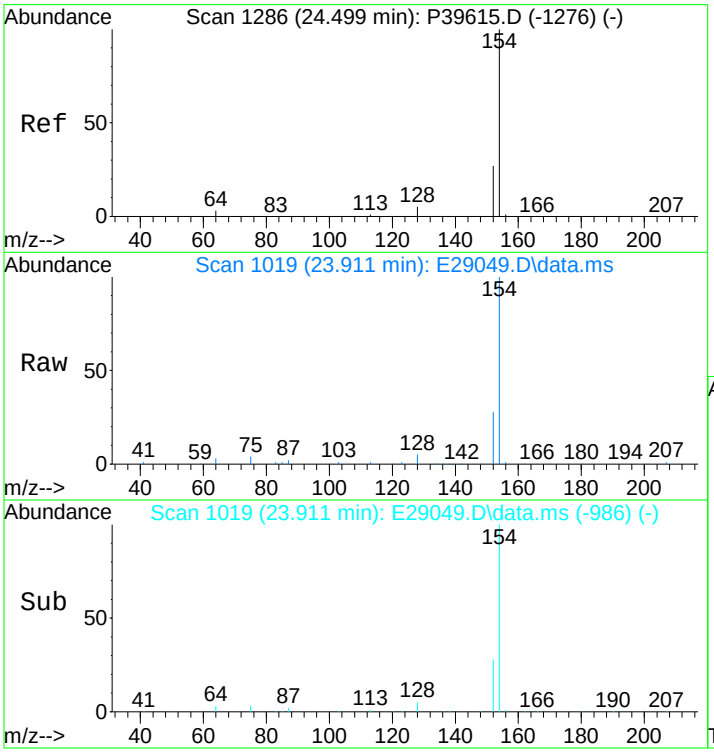




#18
Benzothiophene
Concen: 555.13 ng/mL
RT: 19.545 min Scan# 729
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:134 Resp: 69843

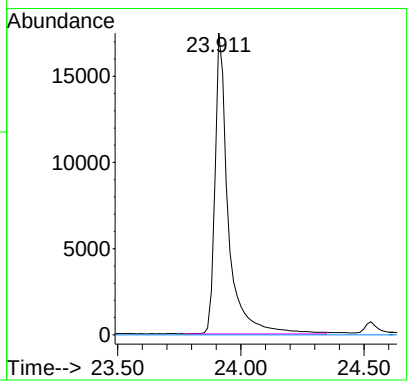


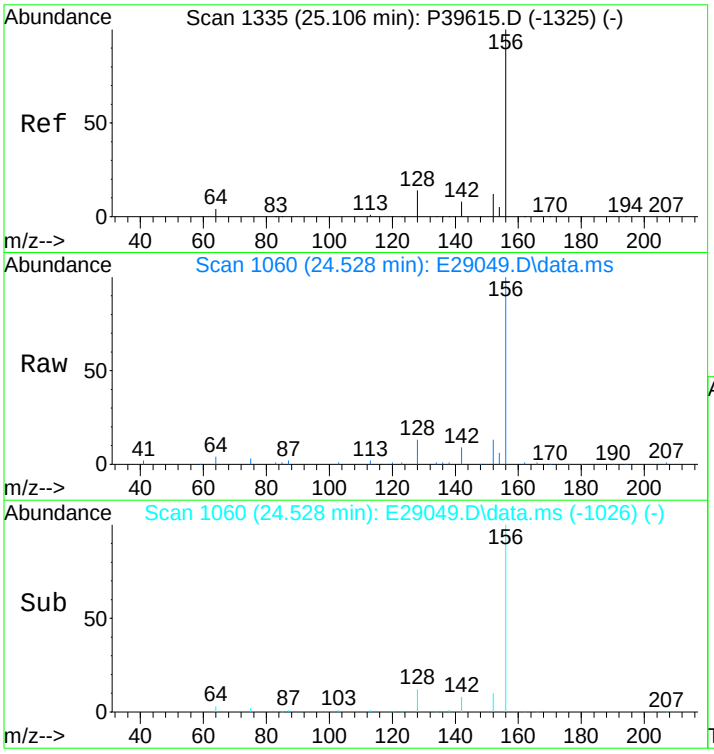


#23
Biphenyl
Concen: 534.02 ng/mL
RT: 23.911 min Scan# 1019
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:154 Resp: 65420

Ion	Ratio	Lower	Upper
154	100		
153	0.0	0.0	0.0

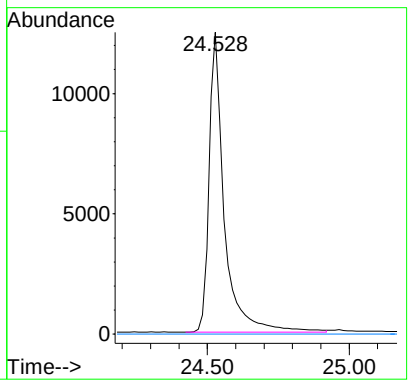


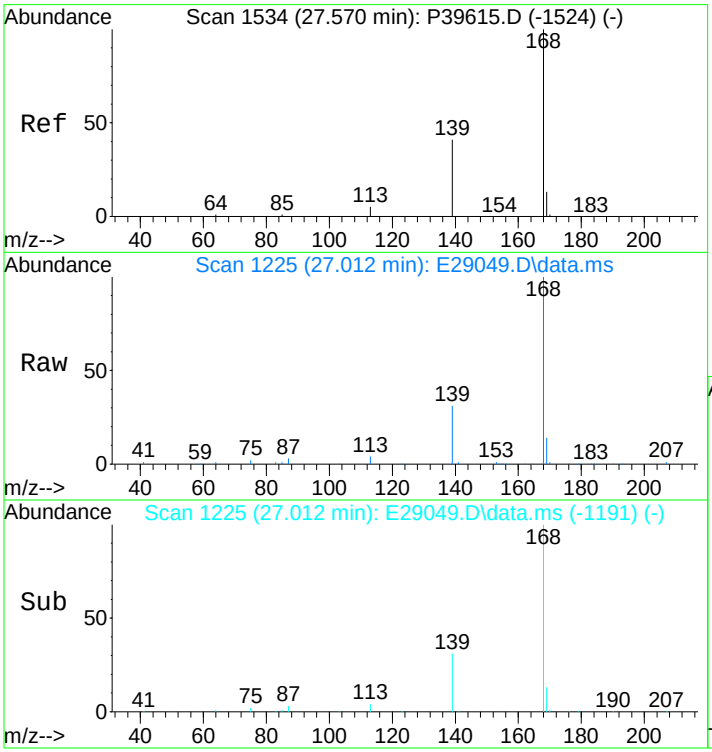


#24
2,6-Dimethylnaphthalene
Concen: 531.35 ng/mL
RT: 24.528 min Scan# 1060
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:156 Resp: 46424

Ion	Ratio	Lower	Upper
156	100		
155	0.0	0.0	0.0

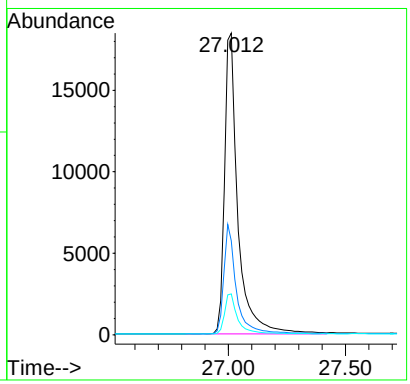


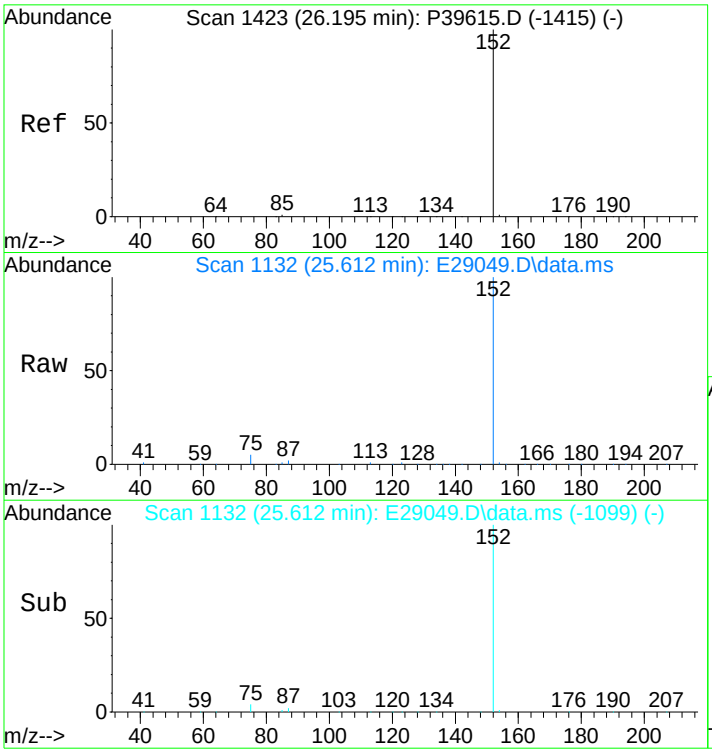


#25
Dibenzofuran
Concen: 539.14 ng/mL
RT: 27.012 min Scan# 1225
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:168 Resp: 73121

Ion	Ratio	Lower	Upper
168	100		
139	33.8	26.9	40.3
169	13.2	10.7	16.1

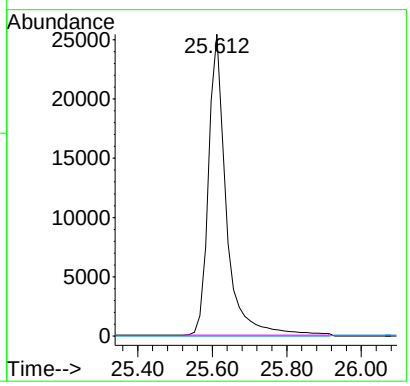


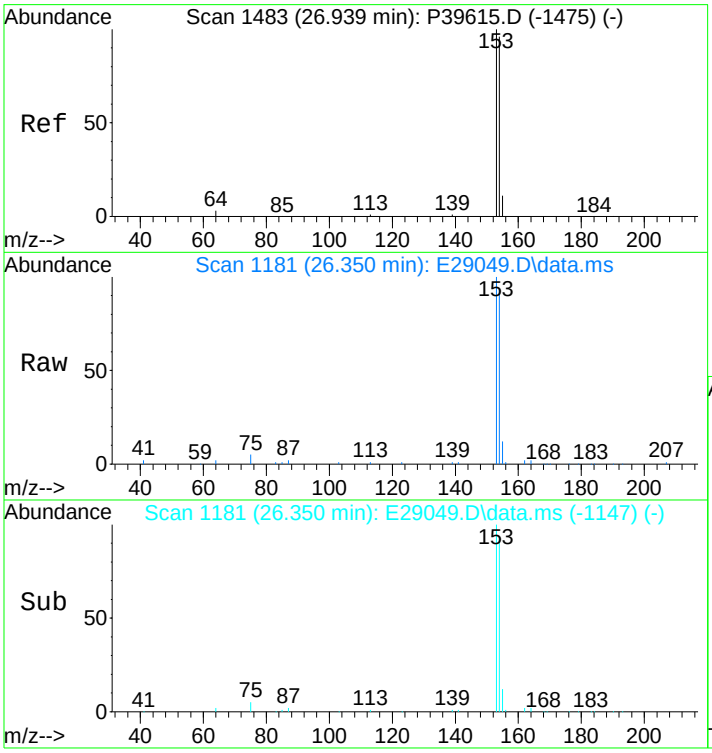


#26
Acenaphthylene
Concen: 555.70 ng/mL m
RT: 25.612 min Scan# 1132
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:152 Resp: 84317

Ion	Ratio	Lower	Upper
152	100		
153	0.0	0.0	0.0

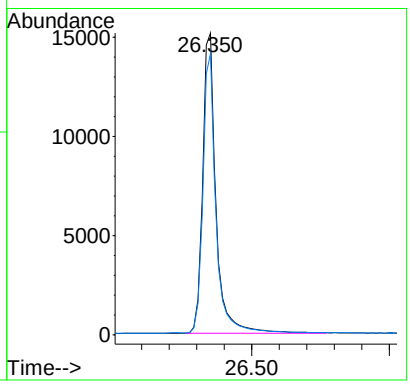


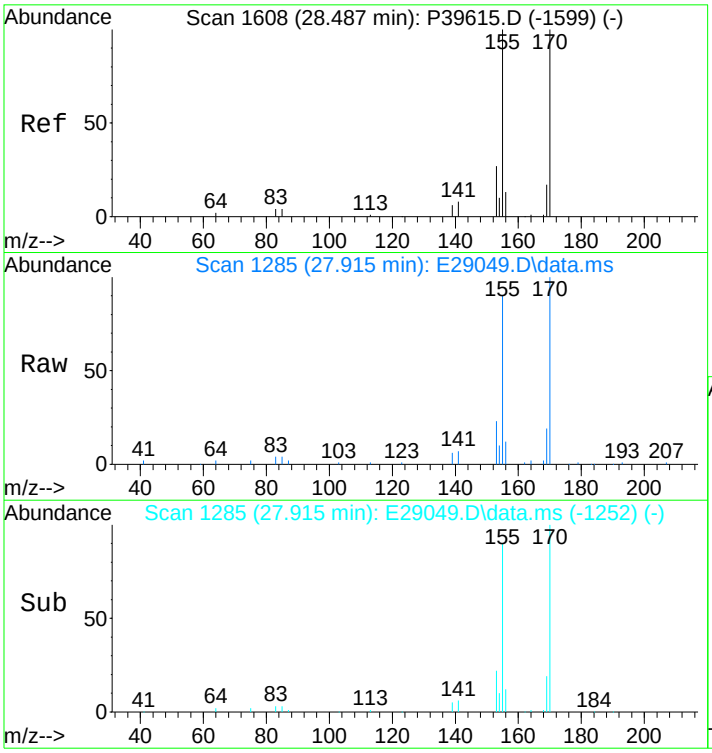


#27
Acenaphthene
Concen: 529.64 ng/mL
RT: 26.350 min Scan# 1181
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:153 Resp: 51729

Ion	Ratio	Lower	Upper
153	100		
154	90.4	73.0	109.4

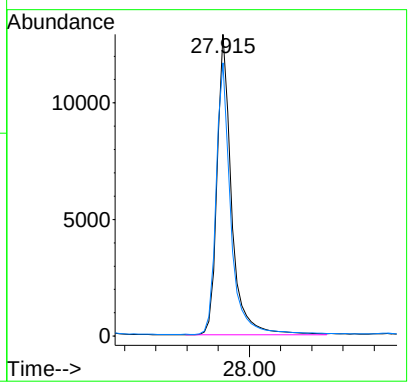


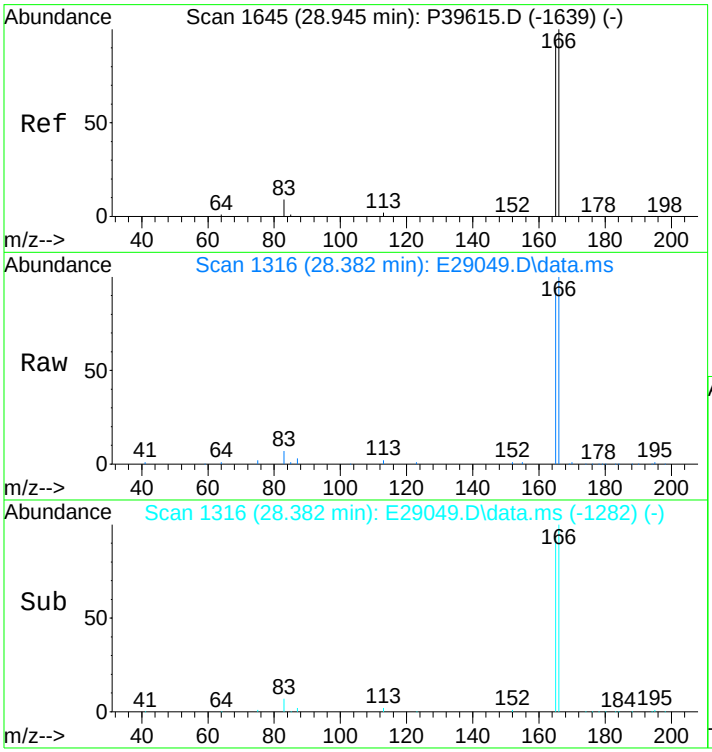


#28
2,3,5-Trimethylnaphthalene
Concen: 510.39 ng/mL
RT: 27.915 min Scan# 1285
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:170 Resp: 41720

Ion	Ratio	Lower	Upper
170	100		
155	91.9	69.8	104.6

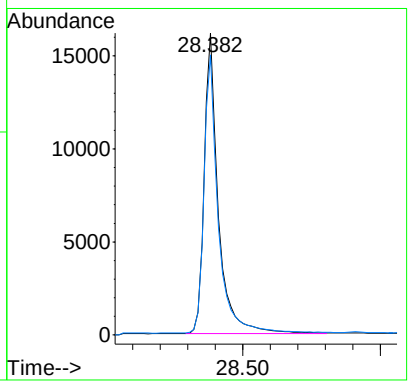


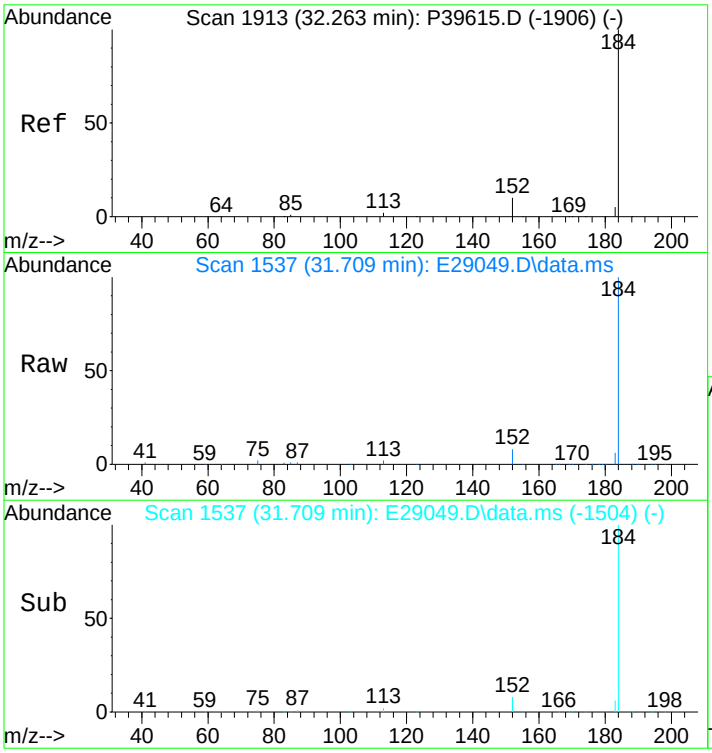


#29
Fluorene
Concen: 533.70 ng/mL
RT: 28.382 min Scan# 1316
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:166 Resp: 58136

Ion	Ratio	Lower	Upper
166	100		
165	92.9	74.4	111.6

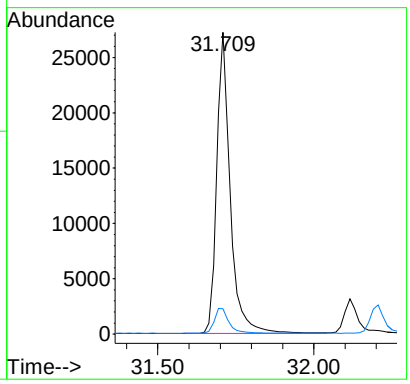


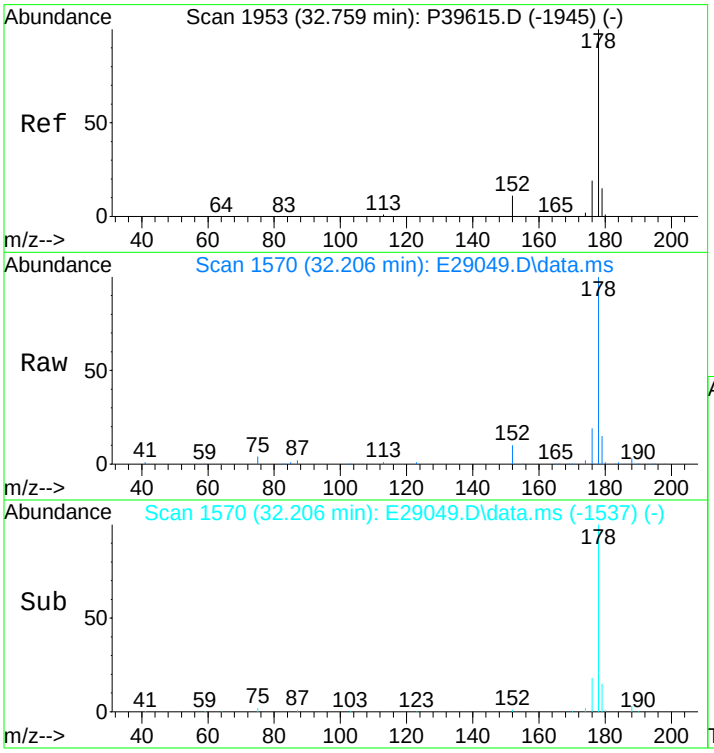


#33
Dibenzothiophene
Concen: 547.63 ng/mL
RT: 31.709 min Scan# 1537
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:184 Resp: 81861

Ion	Ratio	Lower	Upper
184	100		
152	8.9	6.0	9.0

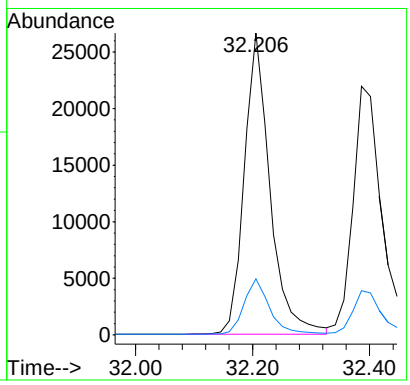


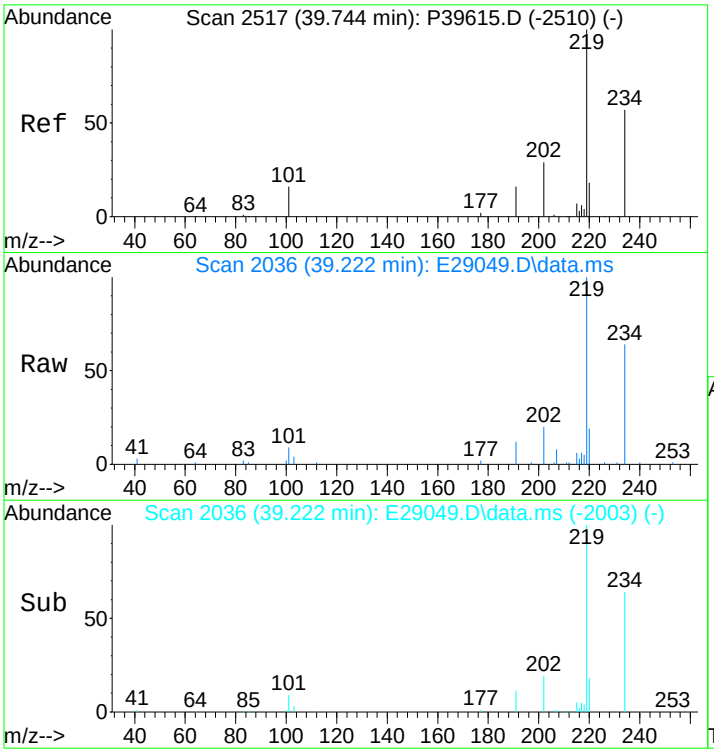


#43
Phenanthrene
Concen: 530.38 ng/mL
RT: 32.206 min Scan# 1570
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:178 Resp: 80662

Ion	Ratio	Lower	Upper
178	100		
176	18.3	14.6	21.8

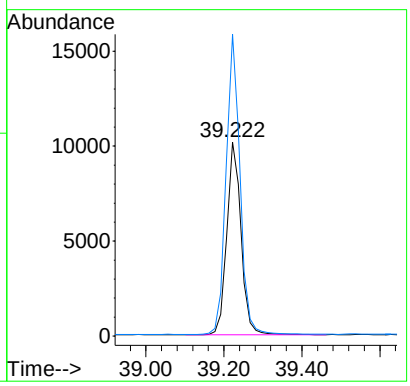


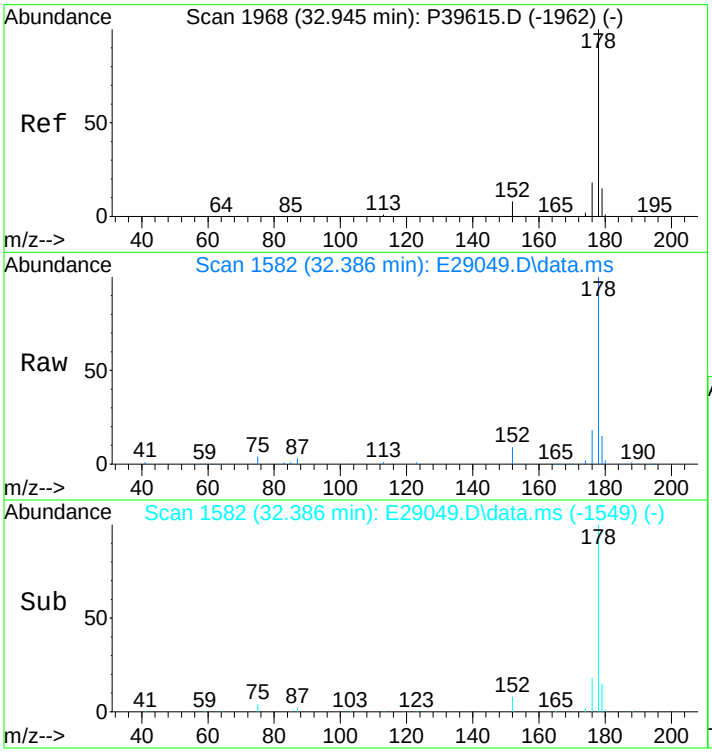


#54
Retene
Concen: 524.76 ng/mL
RT: 39.222 min Scan# 2036
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:234 Resp: 25681

Ion	Ratio	Lower	Upper
234	100		
219	151.8	125.1	187.7

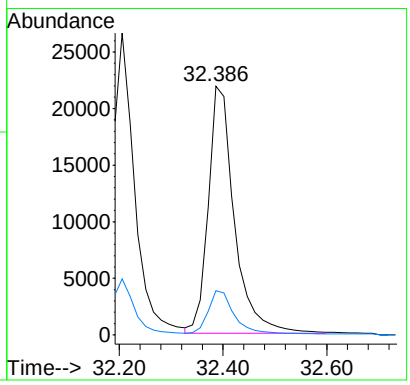


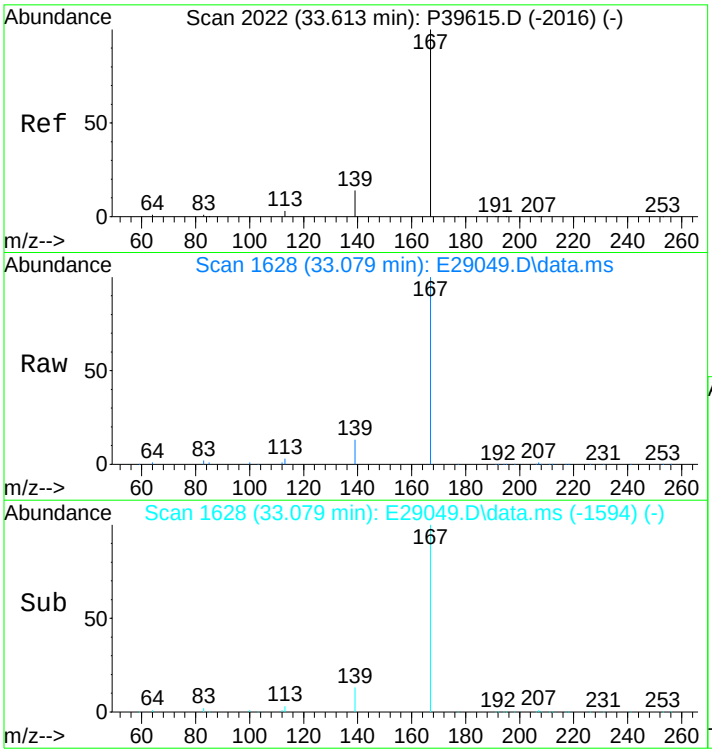


#55
Anthracene
Concen: 582.32 ng/mL m
RT: 32.386 min Scan# 1582
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:178 Resp: 76547

Ion	Ratio	Lower	Upper
178	100		
176	19.8	14.2	21.2

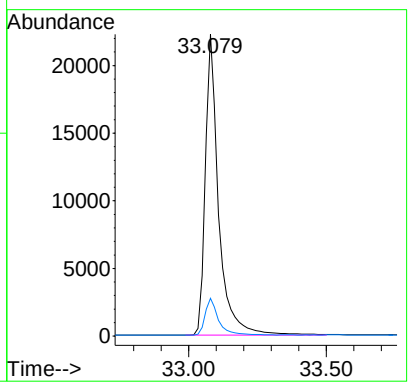


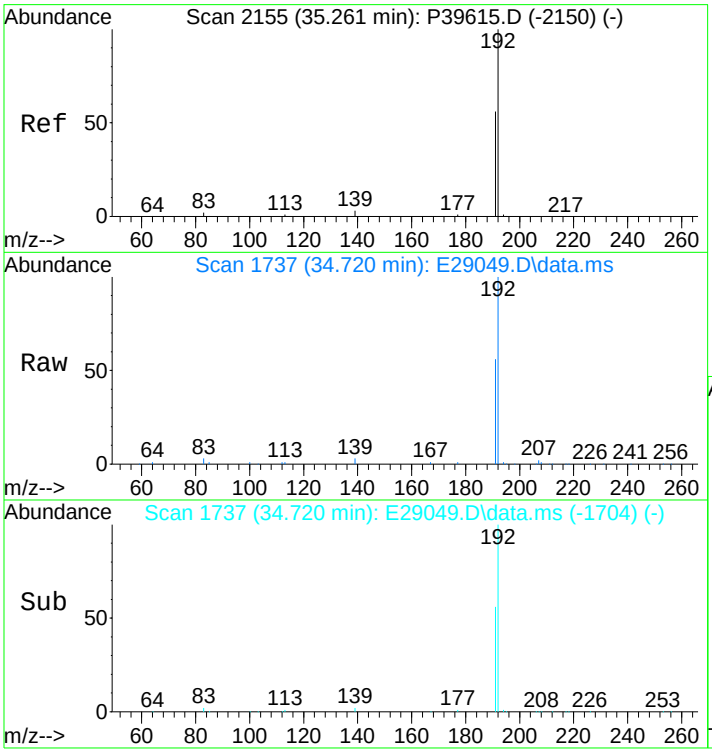


#56
Carbazole
Concen: 559.89 ng/mL
RT: 33.079 min Scan# 1628
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:167 Resp: 75746

Ion	Ratio	Lower	Upper
167	100		
139	12.3	10.6	15.8

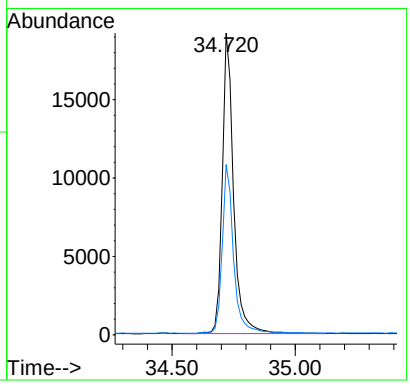


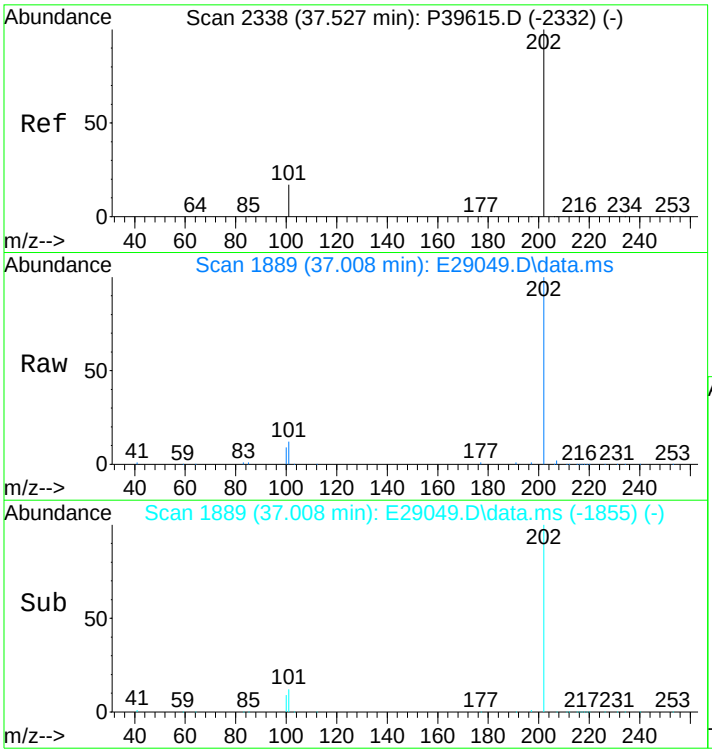


#57
1-Methylphenanthrene
Concen: 528.99 ng/mL
RT: 34.720 min Scan# 1737
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:192 Resp: 61377

Ion	Ratio	Lower	Upper
192	100		
191	56.6	44.4	66.6

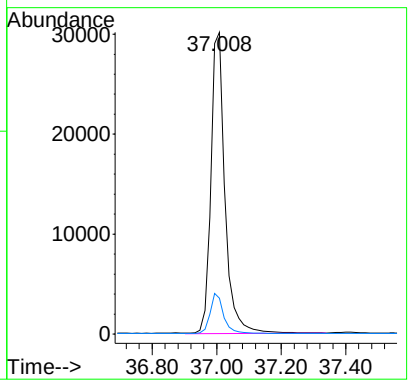


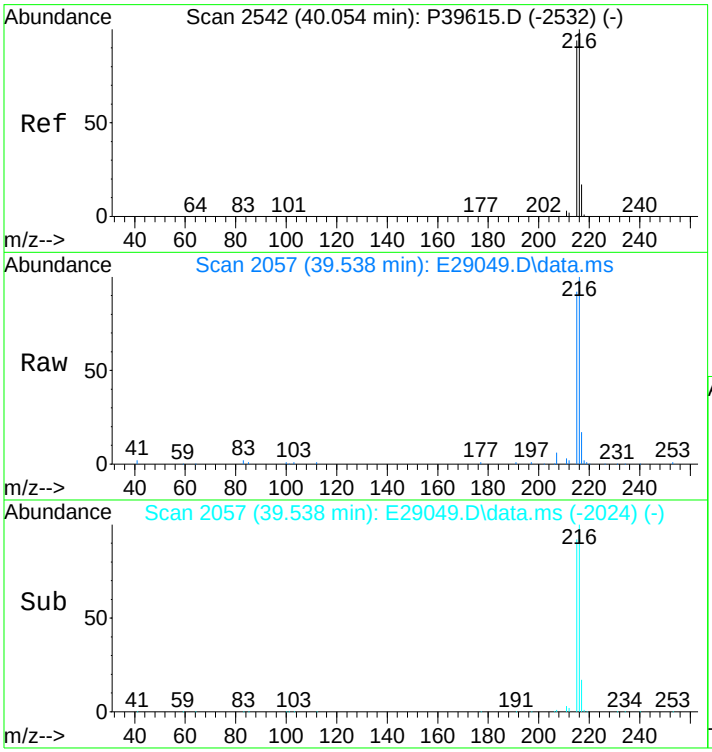


#58
Fluoranthene
Concen: 546.85 ng/mL
RT: 37.008 min Scan# 1889
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:202 Resp: 91845

Ion	Ratio	Lower	Upper
202	100		
101	12.6	10.5	15.7

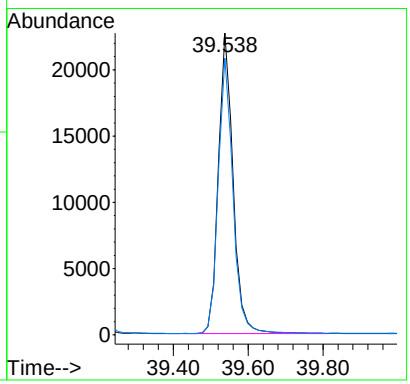


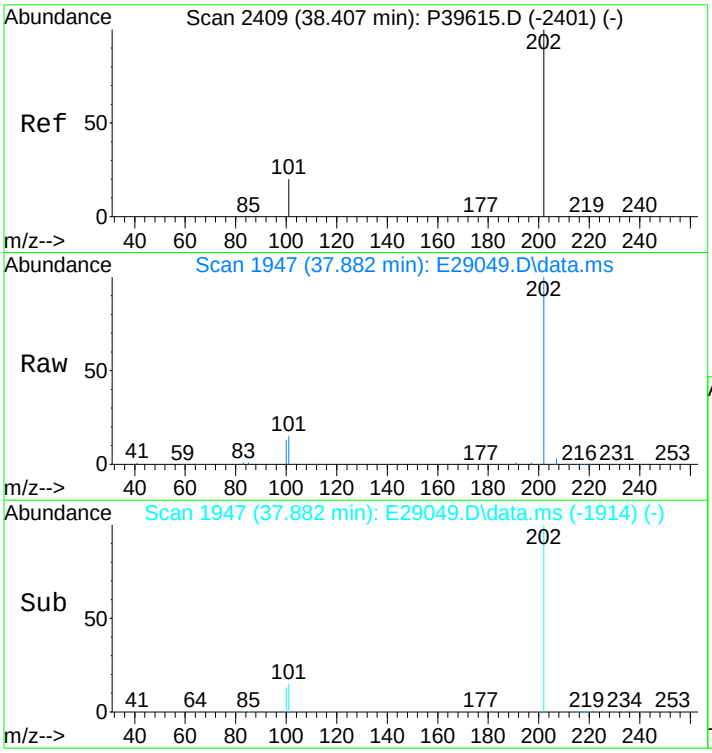


#59
Benzo(b)fluorene
Concen: 552.41 ng/mL
RT: 39.538 min Scan# 2057
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:216 Resp: 61823

Ion	Ratio	Lower	Upper
216	100		
215	91.8	73.0	109.6

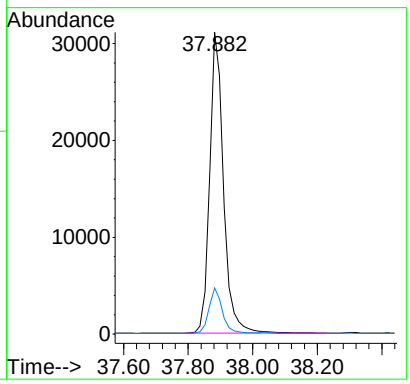


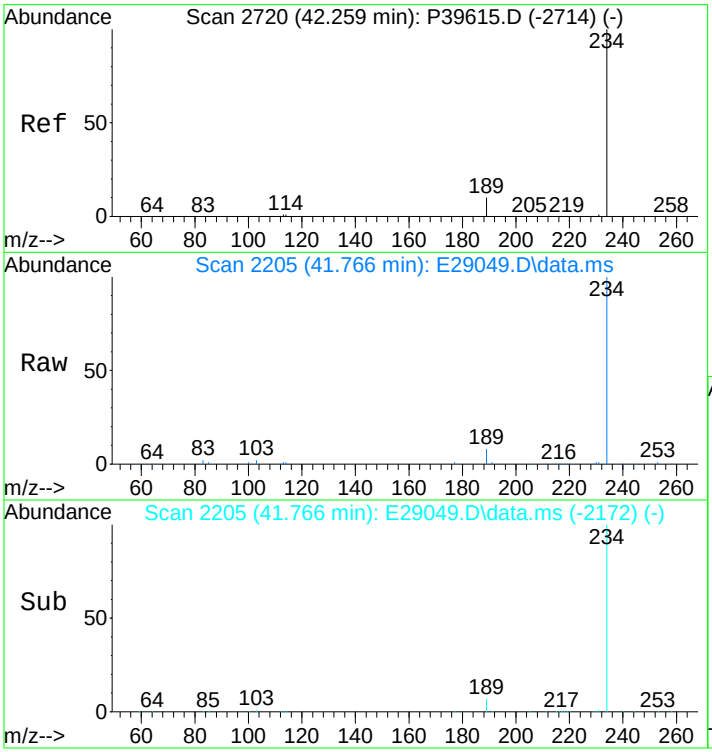


#60
Pyrene
Concen: 543.63 ng/mL
RT: 37.882 min Scan# 1947
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:202 Resp: 92803

Ion	Ratio	Lower	Upper
202	100		
101	14.7	11.5	17.3

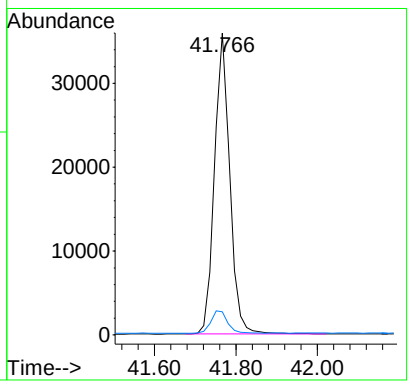


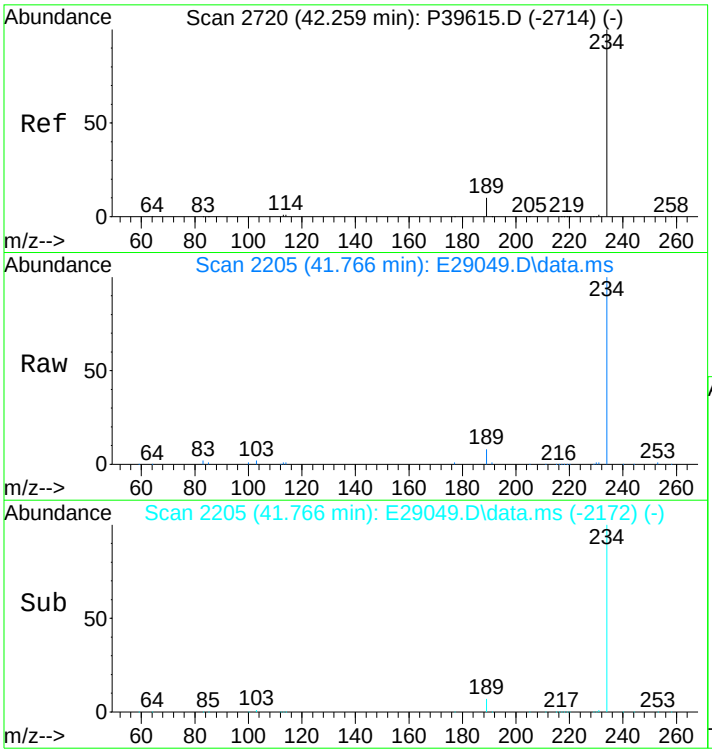


#66
Naphthobenzothiophene
Concen: 557.09 ng/ml
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:234 Resp: 93797

Ion	Ratio	Lower	Upper
234	100		
189	8.0	5.4	8.2

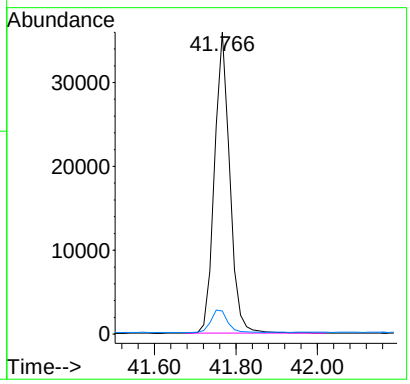


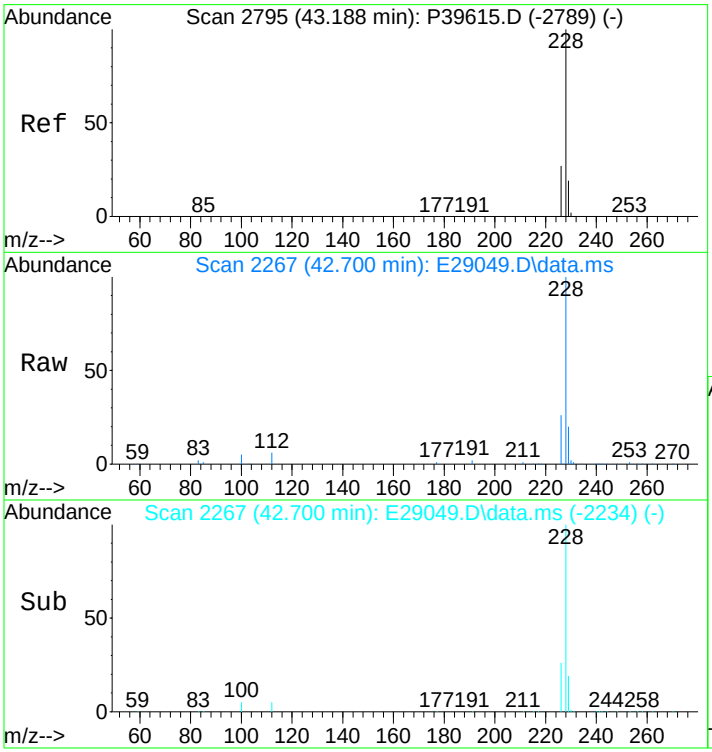


#67
Naphthobenzothiophene-2,1-D
Concen: 557.09 ng/mL
RT: 41.766 min Scan# 2205
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:234 Resp: 93797

Ion	Ratio	Lower	Upper
234	100		
189	8.0	5.4	8.2

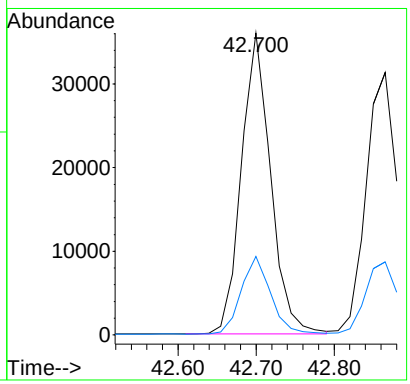


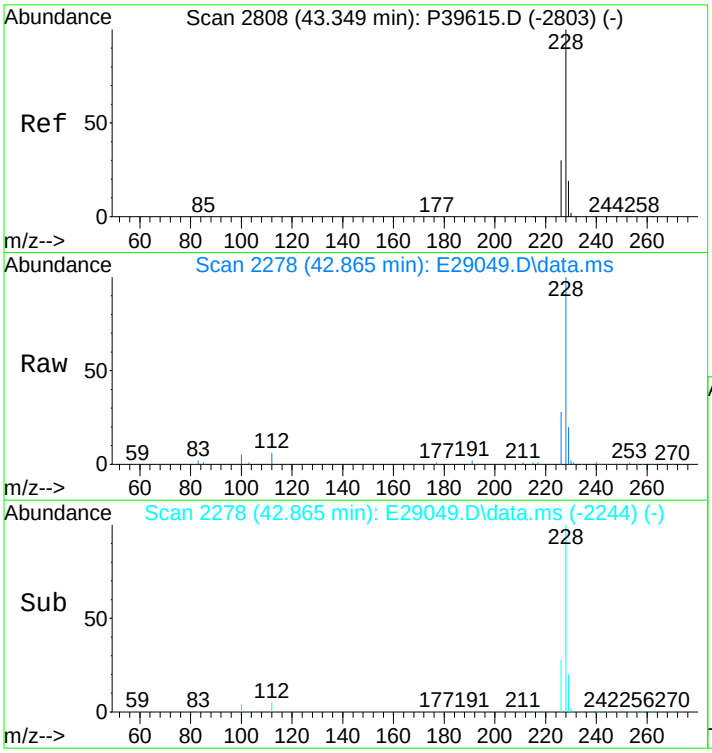


#75
Benz[a]anthracene
Concen: 562.72 ng/mL
RT: 42.700 min Scan# 2267
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:228 Resp: 93896

Ion	Ratio	Lower	Upper
228	100		
226	26.0	20.2	30.4

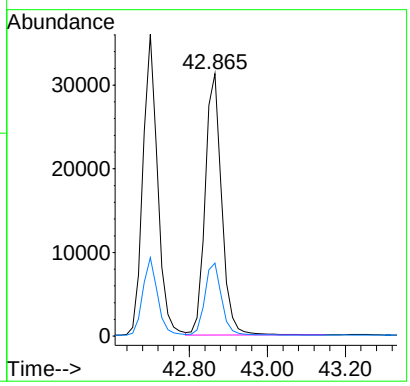


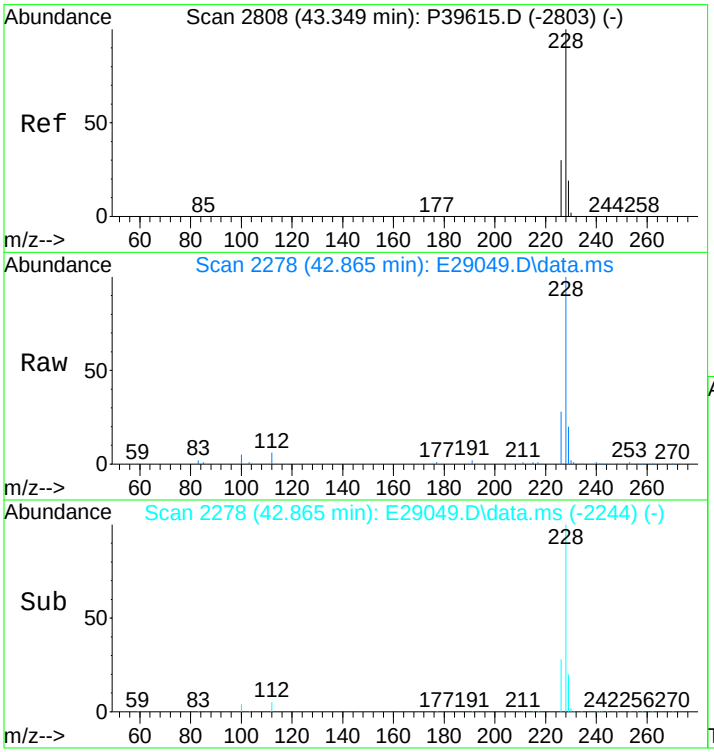


#76
Chrysene
Concen: 532.64 ng/mL
RT: 42.865 min Scan# 2278
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:228 Resp: 91500

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.5	33.7

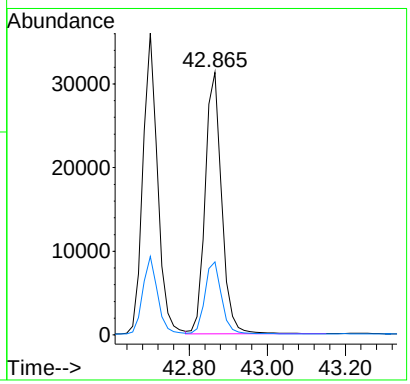


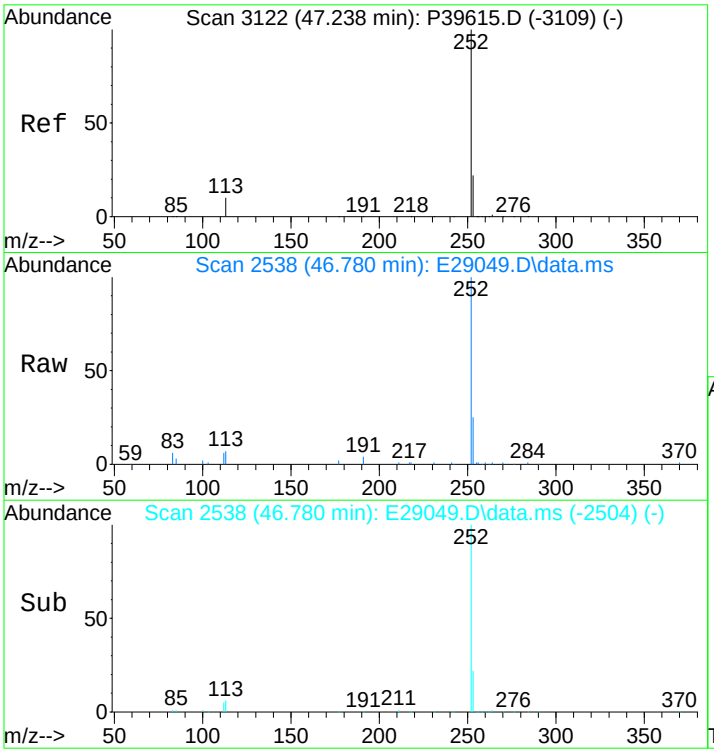


#77
Chrysene/Triphenylene
Concen: 532.64 ng/mL
RT: 42.865 min Scan# 2278
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:228 Resp: 91500

Ion	Ratio	Lower	Upper
228	100		
226	27.8	22.5	33.7

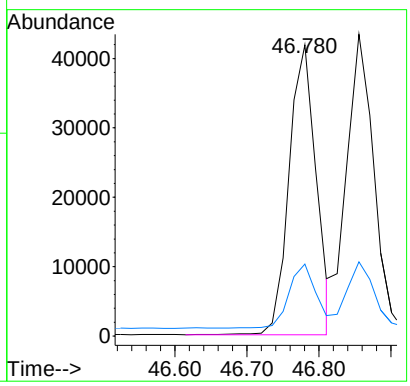


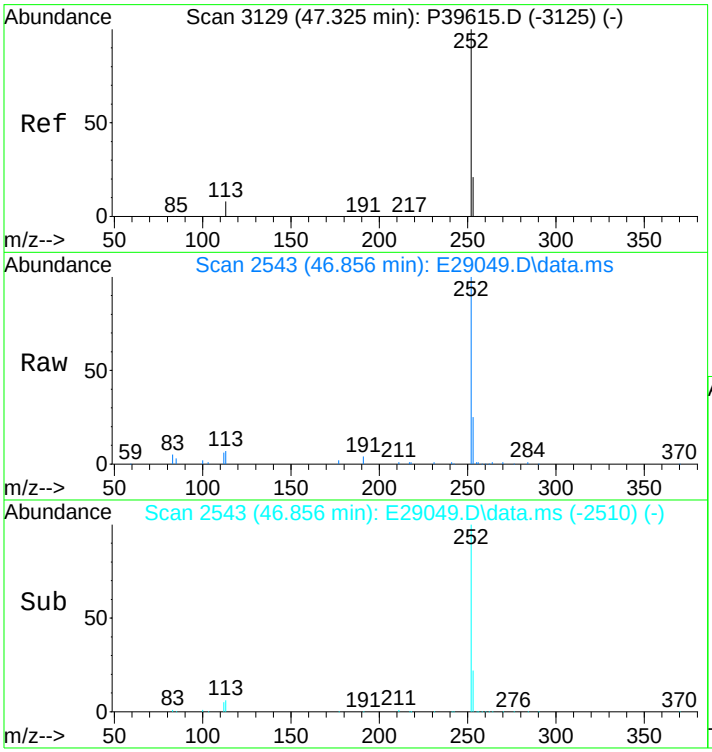


#84
Benzo[b]fluoranthene
Concen: 563.23 ng/mL
RT: 46.780 min Scan# 2538
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:252 Resp: 109237

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.2	28.8

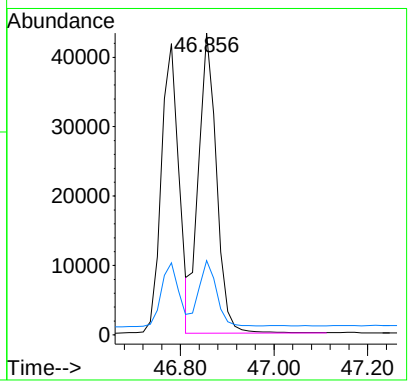


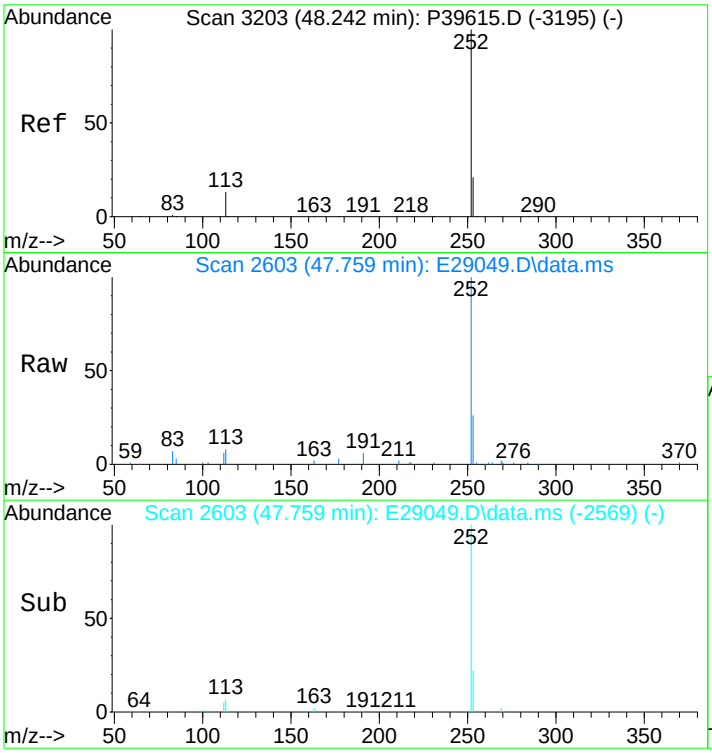


#85
Benzo[j]+[k]fluoranthene
Concen: 579.77 ng/mL
RT: 46.856 min Scan# 2543
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:252 Resp: 115686

Ion	Ratio	Lower	Upper
252	100		
253	21.4	19.3	28.9

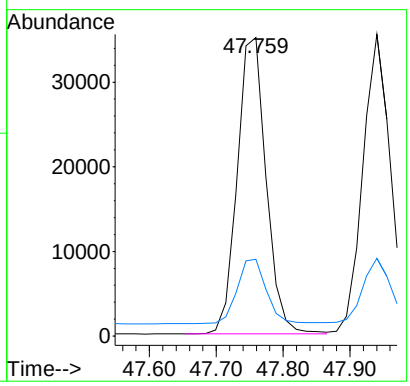


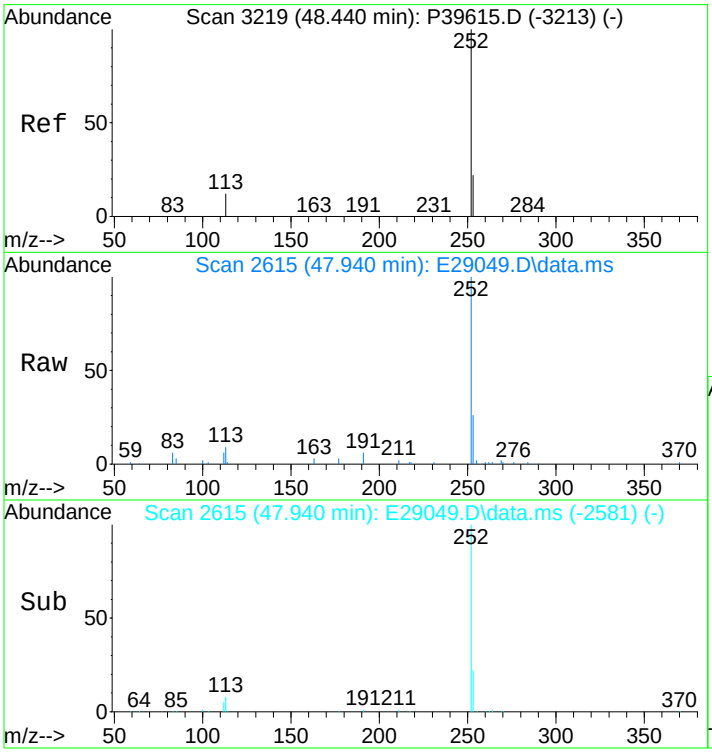


#87
Benzo[e]pyrene
Concen: 558.78 ng/mL
RT: 47.759 min Scan# 2603
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:252 Resp: 105820

Ion	Ratio	Lower	Upper
252	100		
253	22.3	19.4	29.0

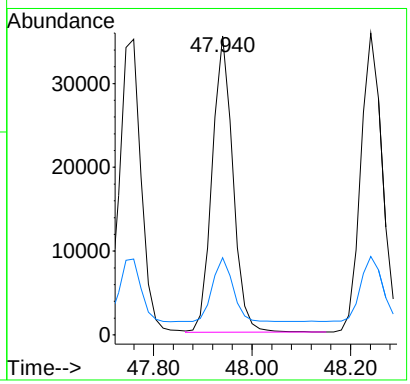


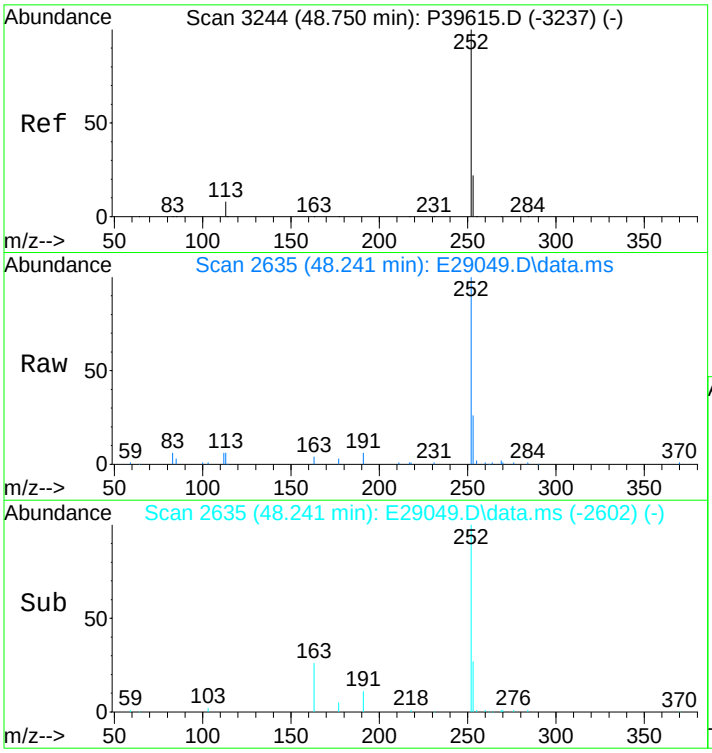


#89
Benzo[a]pyrene
Concen: 568.40 ng/mL
RT: 47.940 min Scan# 2615
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:252 Resp: 102998

Ion	Ratio	Lower	Upper
252	100		
253	21.7	19.6	29.4

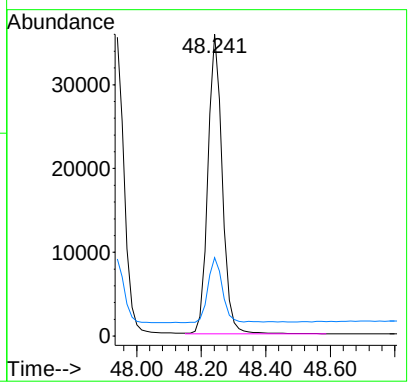


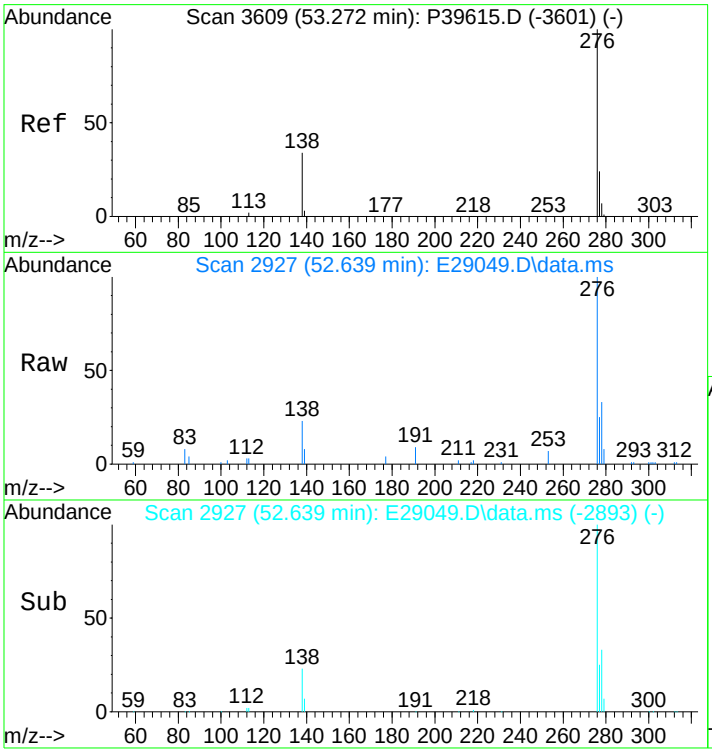


#90
Perylene
Concen: 576.71 ng/mL
RT: 48.241 min Scan# 2635
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:252 Resp: 110508

Ion	Ratio	Lower	Upper
252	100		
253	21.8	19.9	29.9

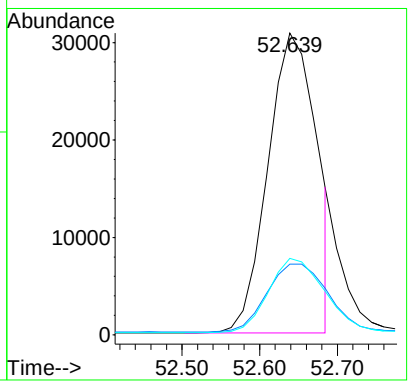


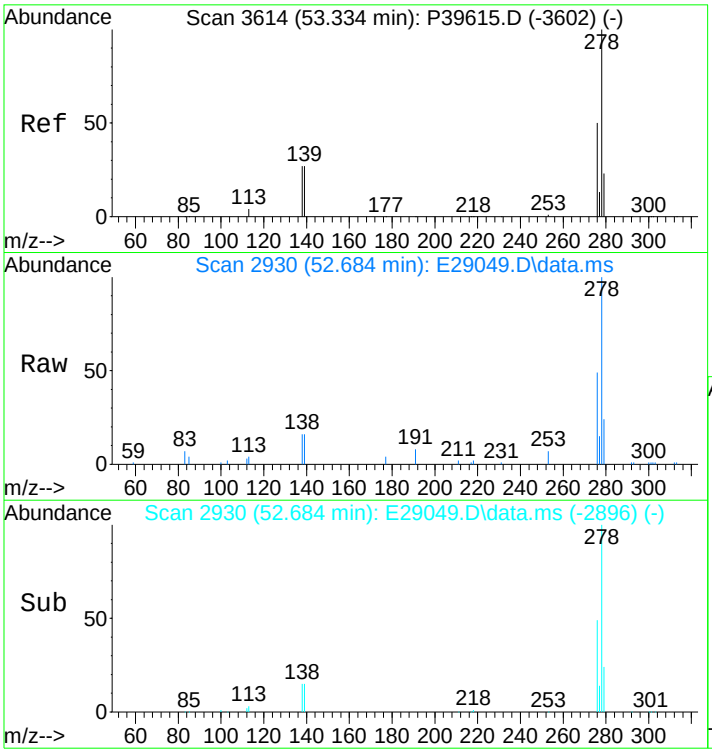


#91
Indeno[1,2,3-cd]pyrene
Concen: 629.25 ng/mL m
RT: 52.639 min Scan# 2927
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:276 Resp: 134194

Ion	Ratio	Lower	Upper
276	100		
138	28.9	17.8	26.8#
277	29.1	20.0	30.0

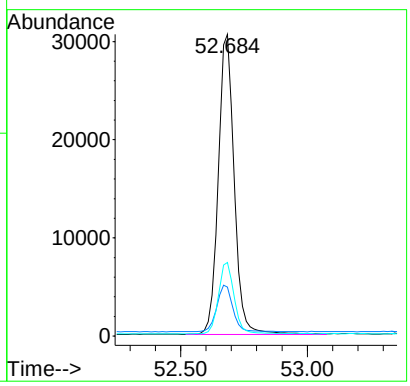


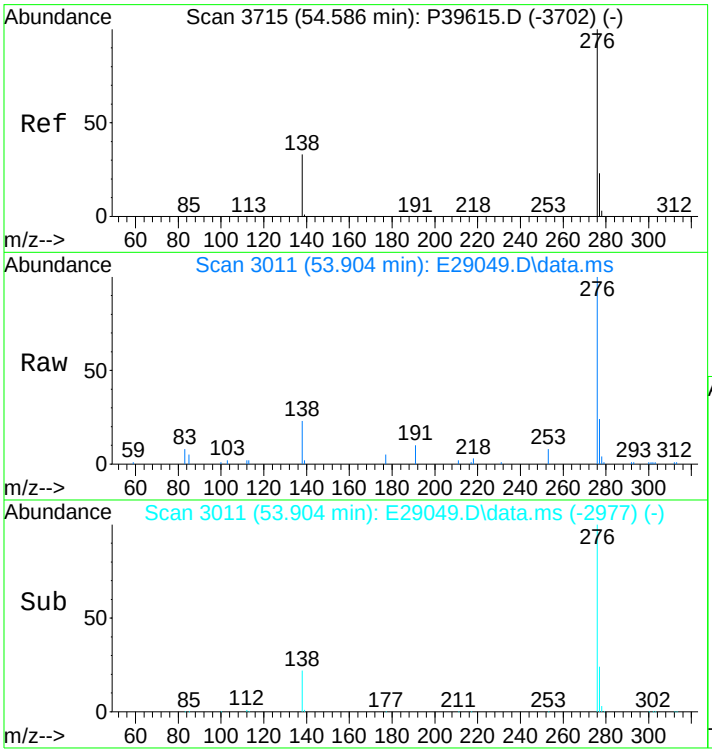


#92
Dibenz[ah]+[ac]anthracene
Concen: 589.89 ng/mL
RT: 52.684 min Scan# 2930
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:278 Resp: 133950

Ion	Ratio	Lower	Upper
278	100		
139	15.5	13.0	19.4
279	23.4	19.4	29.2

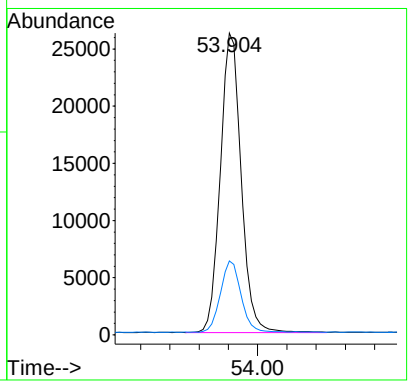


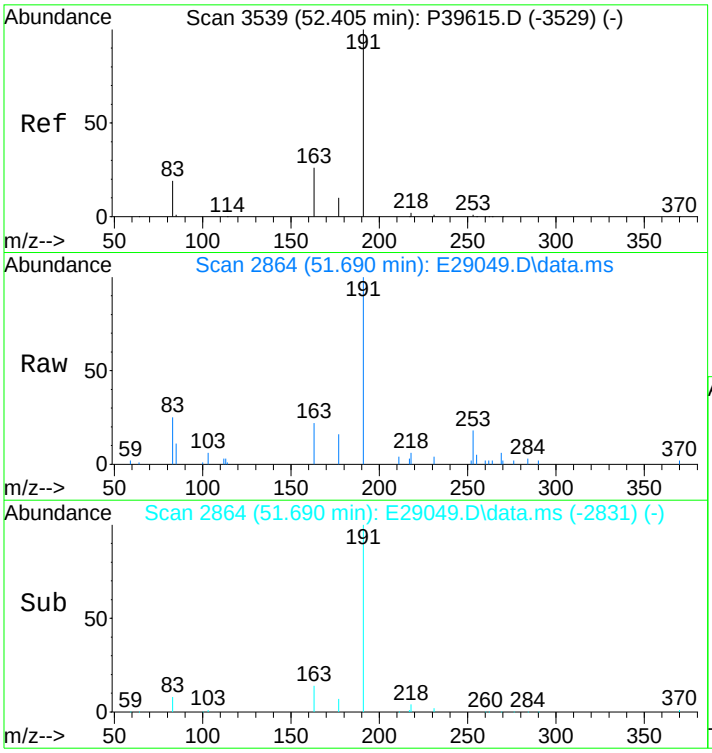


#93
Benzo[g,h,i]perylene
Concen: 562.54 ng/mL
RT: 53.904 min Scan# 3011
Delta R.T. 0.015 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:276 Resp: 129354

Ion	Ratio	Lower	Upper
276	100		
277	23.6	19.4	29.2

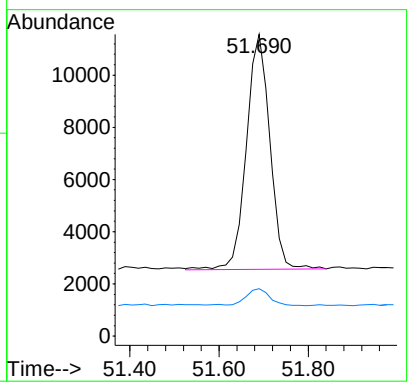


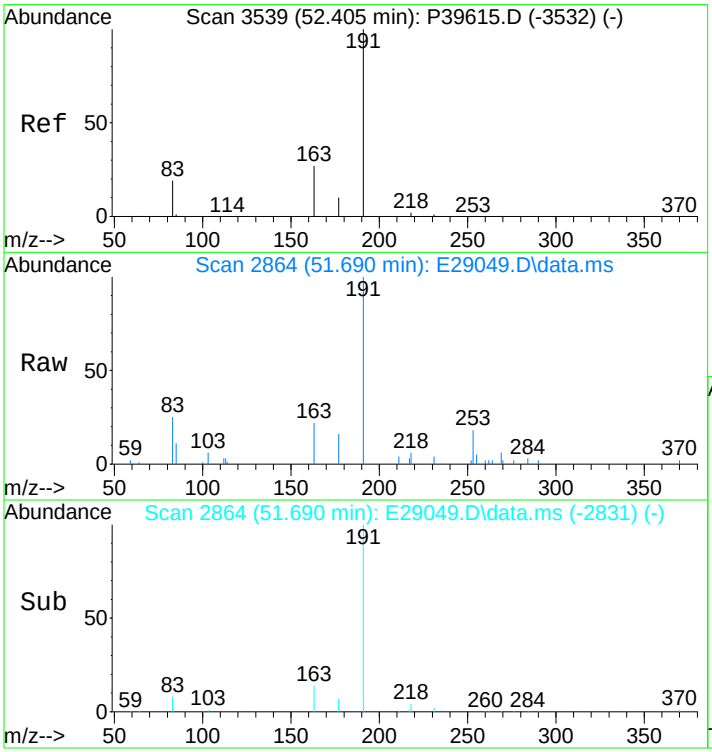


#94
Hopane (T19)
Concen: 515.79 ng/mL
RT: 51.690 min Scan# 2864
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:191 Resp: 33169

Ion	Ratio	Lower	Upper
191	100		
177	7.5	11.3	16.9#

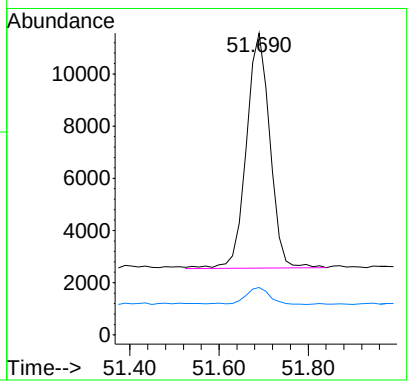




#95
17a(H),21B(H)-hopane - C30H52
Concen: 515.79 ng/mL
RT: 51.690 min Scan# 2864
Delta R.T. 0.000 min
Lab File: E29049.D
Acq: 17 Nov 2012 8:33 pm

Tgt Ion:191 Resp: 33169

Ion	Ratio	Lower	Upper
191	100		
177	7.5	11.3	16.9#



Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix C

Analytical Data Reports for Samples Taken Prior to November 1, 2012

Analytical Data Reports

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

02-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0775-0825I,0900R GW 10/25/12** Work Order: **1210933**

Dear Bryan,

ALS Environmental received 5 samples on 26-Oct-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 18.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Alex Csaszar

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 02-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12
Work Order: **1210933**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1210933-01	SBKR0825I502S102512G015	Groundwater		10/25/2012 15:40	10/26/2012 17:52	☐
1210933-02	SBKR0800I502S102512G015	Groundwater		10/25/2012 14:25	10/26/2012 17:52	☐
1210933-03	SBKR0800I502D102512G015	Groundwater		10/25/2012 14:25	10/26/2012 17:52	☐
1210933-04	SBKR0775I501S102512G020	Groundwater		10/25/2012 11:50	10/26/2012 17:52	☐
1210933-05	SBKR0900R505S102512G039	Groundwater		10/25/2012 10:20	10/26/2012 17:52	☐

Client: AECOM Environment
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12
Work Order: 1210933

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44462, Method SVO_8270_W, Sample 1210933-01B MS: The MS recovery was above the upper control limits for Benzo(a)pyrene. The reported result in the parent sample may be biased high for this analyte.

Batch 44462, Method SVO_8270_W, Sample 1210933-01B MSD: The MSD recovery was above the upper control limits for Benzo(a)pyrene. The reported result in the parent sample may be biased high for this analyte.

Batch 44462, Method SVO_8270_W, Sample SBLKW1-44462: Surrogates out high - no hits in samples.

Batch 44462, Method SVO_8270_W, Sample SLCSW1-44462: The LCS recoveries were above the upper control limits for Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene,, Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene. All sample results in the batch were non-detect. No qualification is necessary for these analytes.

ALS Group USA, Corp

Date: 02-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12
WorkOrder: **1210933**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0825I502S102512G015
Work Order:	1210933	**Collection Date:**	10/25/2012 3:40:00 PM
Project:	Marshall KRRI 0775-0825I,0900R GW 10/25/12		
Lab ID:	1210933-01	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/31/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/1/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/1/2012
Surr: 4-Terphenyl-d14	*60.1*	*21-90*			*%REC*	1	11/1/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/30/2012**		Analyst: **RH**
Beryllium	ND	0.0020	0.0010		mg/L	1	10/31/2012
Molybdenum	ND	0.050	0.050		mg/L	1	10/31/2012
Nickel	ND	0.020	0.020		mg/L	1	10/31/2012
Vanadium	ND	0.0050	0.0040		mg/L	1	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/31/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/1/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/1/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/1/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/1/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/1/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/1/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/1/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/1/2012
Surr: 2,4,6-Tribromophenol	*58.5*	*32-115*			*%REC*	1	11/1/2012
Surr: 2-Fluorobiphenyl	*57.9*	*32-100*			*%REC*	1	11/1/2012
Surr: 2-Fluorophenol	*36.9*	*22-59*			*%REC*	1	11/1/2012
Surr: 4-Terphenyl-d14	*89.1*	*23-112*			*%REC*	1	11/1/2012
Surr: Nitrobenzene-d5	*59.3*	*31-93*			*%REC*	1	11/1/2012
Surr: Phenol-d6	*18.8*	*13-36*			*%REC*	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0800I502S102512G015
Work Order:	1210933	**Collection Date:**	10/25/2012 2:25:00 PM
Project:	Marshall KRRI 0775-0825I,0900R GW 10/25/12		
Lab ID:	1210933-02	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/31/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/1/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/1/2012
Surr: 4-Terphenyl-d14	*56.6*	*21-90*			*%REC*	1	11/1/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/30/2012**		Analyst: **RH**
Beryllium	ND	0.0020	0.0010		mg/L	1	10/31/2012
Molybdenum	ND	0.050	0.050		mg/L	1	10/31/2012
Nickel	ND	0.020	0.020		mg/L	1	10/31/2012
Vanadium	ND	0.0050	0.0040		mg/L	1	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/31/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/1/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/1/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/1/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/1/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/1/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/1/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/1/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/1/2012
Surr: 2,4,6-Tribromophenol	*49.9*	*32-115*			*%REC*	1	11/1/2012
Surr: 2-Fluorobiphenyl	*54.3*	*32-100*			*%REC*	1	11/1/2012
Surr: 2-Fluorophenol	*33.4*	*22-59*			*%REC*	1	11/1/2012
Surr: 4-Terphenyl-d14	*91.7*	*23-112*			*%REC*	1	11/1/2012
Surr: Nitrobenzene-d5	*56.2*	*31-93*			*%REC*	1	11/1/2012
Surr: Phenol-d6	*17.6*	*13-36*			*%REC*	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0800I502D102512G015
Work Order:	1210933	**Collection Date:**	10/25/2012 2:25:00 PM
Project:	Marshall KRRI 0775-0825I,0900R GW 10/25/12		
Lab ID:	1210933-03	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/31/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/1/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/1/2012
Surr: 4-Terphenyl-d14	*57.7*	*21-90*			*%REC*	1	11/1/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/30/2012**		Analyst: **RH**
Beryllium	ND	0.0020	0.0010		mg/L	1	10/31/2012
Molybdenum	ND	0.050	0.050		mg/L	1	10/31/2012
Nickel	ND	0.020	0.020		mg/L	1	10/31/2012
Vanadium	ND	0.0050	0.0040		mg/L	1	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/31/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/1/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/1/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/1/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/1/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/1/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/1/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/1/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/1/2012
Surr: 2,4,6-Tribromophenol	*54.7*	*32-115*			*%REC*	1	11/1/2012
Surr: 2-Fluorobiphenyl	*56.1*	*32-100*			*%REC*	1	11/1/2012
Surr: 2-Fluorophenol	*33.0*	*22-59*			*%REC*	1	11/1/2012
Surr: 4-Terphenyl-d14	*93.2*	*23-112*			*%REC*	1	11/1/2012
Surr: Nitrobenzene-d5	*58.1*	*31-93*			*%REC*	1	11/1/2012
Surr: Phenol-d6	*16.8*	*13-36*			*%REC*	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0775I501S102512G020
Work Order:	1210933	**Collection Date:**	10/25/2012 11:50:00 AM
Project:	Marshall KRRI 0775-0825I,0900R GW 10/25/12		
Lab ID:	1210933-04	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/31/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/1/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/1/2012
Surr: 4-Terphenyl-d14	*55.7*	*21-90*			*%REC*	1	11/1/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/30/2012**		Analyst: **RH**
Beryllium	ND	0.0020	0.0010		mg/L	1	10/31/2012
Molybdenum	ND	0.050	0.050		mg/L	1	10/31/2012
Nickel	ND	0.020	0.020		mg/L	1	10/31/2012
Vanadium	ND	0.0050	0.0040		mg/L	1	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/31/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/1/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/1/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/1/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/1/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/1/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/1/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/1/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/1/2012
Surr: 2,4,6-Tribromophenol	*46.9*	*32-115*			*%REC*	1	11/1/2012
Surr: 2-Fluorobiphenyl	*51.6*	*32-100*			*%REC*	1	11/1/2012
Surr: 2-Fluorophenol	*27.9*	*22-59*			*%REC*	1	11/1/2012
Surr: 4-Terphenyl-d14	*87.4*	*23-112*			*%REC*	1	11/1/2012
Surr: Nitrobenzene-d5	*52.4*	*31-93*			*%REC*	1	11/1/2012
Surr: Phenol-d6	*16.1*	*13-36*			*%REC*	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0900R505S102512G039
Work Order:	1210933	**Collection Date:**	10/25/2012 10:20:00 AM
Project:	Marshall KRRI 0775-0825I,0900R GW 10/25/12		
Lab ID:	1210933-05	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/31/2012**		Analyst: **CW**
DRO (C10-C20)	ND	0.10	0.10		mg/L	1	11/1/2012
ORO (C20-C34)	ND	0.10	0.10		mg/L	1	11/1/2012
Surr: 4-Terphenyl-d14	*59.6*	*21-90*			*%REC*	1	11/1/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/30/2012**		Analyst: **RH**
Beryllium	ND	0.0020	0.0010		mg/L	1	10/31/2012
Molybdenum	ND	0.050	0.050		mg/L	1	10/31/2012
Nickel	ND	0.020	0.020		mg/L	1	10/31/2012
Vanadium	ND	0.0050	0.0040		mg/L	1	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/31/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthene	ND	5.0	5.0		µg/L	1	11/1/2012
Acenaphthylene	ND	5.0	5.0		µg/L	1	11/1/2012
Anthracene	ND	5.0	5.0		µg/L	1	11/1/2012
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	11/1/2012
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Chrysene	ND	1.0	1.0		µg/L	1	11/1/2012
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	11/1/2012
Fluoranthene	ND	1.0	1.0		µg/L	1	11/1/2012
Fluorene	ND	5.0	5.0		µg/L	1	11/1/2012
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	11/1/2012
Naphthalene	ND	5.0	5.0		µg/L	1	11/1/2012
Phenanthrene	ND	2.0	2.0		µg/L	1	11/1/2012
Pyrene	ND	5.0	5.0		µg/L	1	11/1/2012
Surr: 2,4,6-Tribromophenol	*53.2*	*32-115*			*%REC*	1	11/1/2012
Surr: 2-Fluorobiphenyl	*53.0*	*32-100*			*%REC*	1	11/1/2012
Surr: 2-Fluorophenol	*33.8*	*22-59*			*%REC*	1	11/1/2012
Surr: 4-Terphenyl-d14	*97.2*	*23-112*			*%REC*	1	11/1/2012
Surr: Nitrobenzene-d5	*54.1*	*31-93*			*%REC*	1	11/1/2012
Surr: Phenol-d6	*17.2*	*13-36*			*%REC*	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44463** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKW1-44463-44463** Units: **mg/L** Analysis Date: **10/31/2012 11:16 PM**

Client ID: Run ID: **GC8_121031B** SeqNo: **2128726** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	0.10								
ORO (C20-C34)	ND	0.10								
Surr: 4-Terphenyl-d14	*0.02863*	0	*0.05*	0	*57.3*	*21-90*	0			

LCS Sample ID: **DLCSW1-44463-44463** Units: **mg/L** Analysis Date: **10/31/2012 11:43 PM**

Client ID: Run ID: **GC8_121031B** SeqNo: **2128727** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	2.742	0.10	5	0	54.8	44-116	0			
ORO (C20-C34)	3.062	0.10	5	0	61.2	44-116	0			
Surr: 4-Terphenyl-d14	*0.03333*	0	*0.05*	0	*66.7*	*21-90*	0			

MS Sample ID: **1210933-01B MS** Units: **mg/L** Analysis Date: **11/1/2012 12:10 PM**

Client ID: **SBKR0825I502S102512G015** Run ID: **GC8_121031B** SeqNo: **2128733** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	24.89	1.0	50	0	49.8	44-116	0			
ORO (C20-C34)	28.11	1.0	50	0	56.2	44-116	0			
Surr: 4-Terphenyl-d14	*0.345*	0	*0.5*	0	*69*	*21-90*	0			

MSD Sample ID: **1210933-01B MSD** Units: **mg/L** Analysis Date: **11/1/2012 12:37 PM**

Client ID: **SBKR0825I502S102512G015** Run ID: **GC8_121031B** SeqNo: **2128734** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	26.99	1.0	50	0	54	44-116	24.89	8.11	30	
ORO (C20-C34)	30.46	1.0	50	0	60.9	44-116	28.11	8.02	30	
Surr: 4-Terphenyl-d14	*0.3742*	0	*0.5*	0	*74.8*	*21-90*	0.345	*8.12*	*30*	

The following samples were analyzed in this batch:

1210933-01B	1210933-02B	1210933-03B
1210933-04B	1210933-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210933
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12

QC BATCH REPORT

Batch ID: **44449** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44449-44449** Units: **mg/L** Analysis Date: **10/30/2012 03:02 PM**
Client ID: Run ID: **ICPMS2_121030A** SeqNo: **2127279** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.0020								
Molybdenum	ND	0.0050								
Nickel	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44449-44449** Units: **mg/L** Analysis Date: **10/30/2012 03:07 PM**
Client ID: Run ID: **ICPMS2_121030A** SeqNo: **2127280** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09534	0.0020	0.1	0	95.3	80-120	0			
Molybdenum	0.09274	0.0050	0.1	0	92.7	80-120	0			
Nickel	0.0914	0.0050	0.1	0	91.4	80-120	0			
Vanadium	0.09453	0.0050	0.1	0	94.5	80-120	0			

MS Sample ID: **1210915-07CMS** Units: **mg/L** Analysis Date: **10/30/2012 03:27 PM**
Client ID: Run ID: **ICPMS2_121030A** SeqNo: **2127284** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09271	0.0020	0.1	-0.0000219	92.7	75-125	0			
Molybdenum	0.09753	0.0050	0.1	0.006186	91.3	75-125	0			
Nickel	0.09058	0.0050	0.1	0.001439	89.1	75-125	0			
Vanadium	0.0942	0.0050	0.1	0.0001534	94	75-125	0			

MSD Sample ID: **1210915-07CMSD** Units: **mg/L** Analysis Date: **10/30/2012 03:32 PM**
Client ID: Run ID: **ICPMS2_121030A** SeqNo: **2127285** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.09368	0.0020	0.1	-0.0000219	93.7	75-125	0.09271	1.04	20	
Molybdenum	0.09763	0.0050	0.1	0.006186	91.4	75-125	0.09753	0.102	20	
Nickel	0.09026	0.0050	0.1	0.001439	88.8	75-125	0.09058	0.354	20	
Vanadium	0.09623	0.0050	0.1	0.0001534	96.1	75-125	0.0942	2.13	20	

The following samples were analyzed in this batch: 1210933-01A 1210933-02A 1210933-03A 1210933-04A 1210933-05A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210933
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12

QC BATCH REPORT

Batch ID: **44462** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKW1-44462-44462** Units: **µg/L** Analysis Date: **11/1/2012 10:37 AM**
Client ID: Run ID: **SVMS4_121101A** SeqNo: **2129296** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Naphthalene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
Surr: 2,4,6-Tribromophenol	*35.41*	0	*50*	0	*70.8*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*36.16*	0	*50*	0	*72.3*	*32-100*	0			
Surr: 2-Fluorophenol	*40.03*	0	*50*	0	*80.1*	*22-59*	0			*S*
Surr: 4-Terphenyl-d14	*57.88*	0	*50*	0	*116*	*23-112*	0			*S*
Surr: Nitrobenzene-d5	*37.23*	0	*50*	0	*74.5*	*31-93*	0			
Surr: Phenol-d6	*34.13*	0	*50*	0	*68.3*	*13-36*	0			*S*

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210933
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12

QC BATCH REPORT

Batch ID: **44462** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSW1-44462-44462** Units: **µg/L** Analysis Date: **11/1/2012 10:06 AM**
Client ID: Run ID: **SVMS4_121101A** SeqNo: **2129295** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	11.44	5.0	20	0	57.2	45-105	0			
Acenaphthene	11.7	5.0	20	0	58.5	45-110	0			
Acenaphthylene	12.78	5.0	20	0	63.9	50-105	0			
Anthracene	13.75	5.0	20	0	68.8	55-110	0			
Benzo(a)anthracene	19.36	5.0	20	0	96.8	55-110	0			
Benzo(a)pyrene	29.25	5.0	20	0	146	55-110	0			S
Benzo(b)fluoranthene	28.12	5.0	20	0	141	45-120	0			S
Benzo(g,h,i)perylene	30.46	5.0	20	0	152	40-125	0			S
Benzo(k)fluoranthene	31.06	5.0	20	0	155	45-125	0			S
Chrysene	19.31	5.0	20	0	96.6	55-110	0			
Dibenzo(a,h)anthracene	26.11	5.0	20	0	131	40-125	0			S
Fluoranthene	14.92	5.0	20	0	74.6	55-115	0			
Fluorene	11.92	5.0	20	0	59.6	50-110	0			
Indeno(1,2,3-cd)pyrene	26.38	5.0	20	0	132	45-125	0			S
Naphthalene	11.04	5.0	20	0	55.2	40-100	0			
Phenanthrene	13.66	5.0	20	0	68.3	50-115	0			
Pyrene	20.84	5.0	20	0	104	50-130	0			
Surr: 2,4,6-Tribromophenol	*31.63*	0	*50*	0	*63.3*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*28.58*	0	*50*	0	*57.2*	*32-100*	0			
Surr: 2-Fluorophenol	*17.15*	0	*50*	0	*34.3*	*22-59*	0			
Surr: 4-Terphenyl-d14	*48.3*	0	*50*	0	*96.6*	*23-112*	0			
Surr: Nitrobenzene-d5	*29.79*	0	*50*	0	*59.6*	*31-93*	0			
Surr: Phenol-d6	*9.62*	0	*50*	0	*19.2*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210933
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12

QC BATCH REPORT

Batch ID: **44462** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1210933-01B MS** Units: **µg/L** Analysis Date: **11/1/2012 11:52 AM**
Client ID: **SBKR0825I502S102512G015** Run ID: **SVMS4_121101A** SeqNo: **2129297** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	106.6	50	200	0	53.3	45-105	0			
Acenaphthene	108.7	50	200	0	54.4	45-110	0			
Acenaphthylene	117.4	50	200	0	58.7	50-105	0			
Anthracene	123.1	50	200	0	61.6	55-110	0			
Benzo(a)anthracene	151.6	50	200	0	75.8	55-110	0			
Benzo(a)pyrene	230.9	50	200	0	115	55-110	0			S
Benzo(b)fluoranthene	230.2	50	200	0	115	45-120	0			
Benzo(g,h,i)perylene	245.5	50	200	0	123	40-125	0			
Benzo(k)fluoranthene	234	50	200	0	117	45-125	0			
Chrysene	146.7	50	200	0	73.4	55-110	0			
Dibenzo(a,h)anthracene	212.4	50	200	0	106	40-125	0			
Fluoranthene	134.8	50	200	0	67.4	55-115	0			
Fluorene	106.9	50	200	0	53.4	50-110	0			
Indeno(1,2,3-cd)pyrene	214.9	50	200	0	107	45-125	0			
Naphthalene	102.3	50	200	0	51.2	40-100	0			
Phenanthrene	120.6	50	200	0	60.3	50-115	0			
Pyrene	164.2	50	200	0	82.1	50-130	0			
Surr: 2,4,6-Tribromophenol	*284.3*	0	*500*	0	*56.9*	*38-115*	0			
Surr: 2-Fluorobiphenyl	*264.9*	0	*500*	0	*53*	*32-100*	0			
Surr: 2-Fluorophenol	*155.6*	0	*500*	0	*31.1*	*22-59*	0			
Surr: 4-Terphenyl-d14	*487.3*	0	*500*	0	*97.5*	*23-112*	0			
Surr: Nitrobenzene-d5	*270.5*	0	*500*	0	*54.1*	*31-93*	0			
Surr: Phenol-d6	*88.1*	0	*500*	0	*17.6*	*13-36*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210933
Project: Marshall KRRI 0775-0825I,0900R GW 10/25/12

QC BATCH REPORT

Batch ID: **44462** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1210933-01B MSD** Units: **µg/L** Analysis Date: **11/1/2012 12:23 PM**
Client ID: **SBKR0825I502S102512G015** Run ID: **SVMS4_121101A** SeqNo: **2129298** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	121.2	50	200	0	60.6	45-105	106.6	12.8	30	
Acenaphthene	122.6	50	200	0	61.3	45-110	108.7	12	30	
Acenaphthylene	132.8	50	200	0	66.4	50-105	117.4	12.3	30	
Anthracene	137.6	50	200	0	68.8	55-110	123.1	11.1	30	
Benzo(a)anthracene	160.7	50	200	0	80.4	55-110	151.6	5.83	30	
Benzo(a)pyrene	234.5	50	200	0	117	55-110	230.9	1.55	30	S
Benzo(b)fluoranthene	234	50	200	0	117	45-120	230.2	1.64	30	
Benzo(g,h,i)perylene	245.4	50	200	0	123	40-125	245.5	0.0407	30	
Benzo(k)fluoranthene	246.7	50	200	0	123	45-125	234	5.28	30	
Chrysene	150	50	200	0	75	55-110	146.7	2.22	30	
Dibenzo(a,h)anthracene	209.8	50	200	0	105	40-125	212.4	1.23	30	
Fluoranthene	149.1	50	200	0	74.6	55-115	134.8	10.1	30	
Fluorene	121	50	200	0	60.5	50-110	106.9	12.4	30	
Indeno(1,2,3-cd)pyrene	211.5	50	200	0	106	45-125	214.9	1.59	30	
Naphthalene	115.2	50	200	0	57.6	40-100	102.3	11.9	30	
Phenanthrene	136.1	50	200	0	68	50-115	120.6	12.1	30	
Pyrene	168	50	200	0	84	50-130	164.2	2.29	30	
Surr: 2,4,6-Tribromophenol	*319.7*	0	*500*	0	*63.9*	*38-115*	284.3	*11.7*	*40*	
Surr: 2-Fluorobiphenyl	*302.1*	0	*500*	0	*60.4*	*32-100*	264.9	*13.1*	*40*	
Surr: 2-Fluorophenol	*176*	0	*500*	0	*35.2*	*22-59*	155.6	*12.3*	*40*	
Surr: 4-Terphenyl-d14	*496.6*	0	*500*	0	*99.3*	*23-112*	487.3	*1.89*	*40*	
Surr: Nitrobenzene-d5	*306.9*	0	*500*	0	*61.4*	*31-93*	270.5	*12.6*	*40*	
Surr: Phenol-d6	*99.5*	0	*500*	0	*19.9*	*13-36*	88.1	*12.2*	*40*	

The following samples were analyzed in this batch:

1210933-01B	1210933-02B	1210933-03B
1210933-04B	1210933-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1210933

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_102512_AKM1 | Task: KRRI_GW0775-0900
Total # of Samples: 5 | Event Complete?
Turn Around Time: 5 Day | Rush: No

BILLING CODE: 6.00

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
				Phone #:	713-821-2000
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI
				PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Analysis: Be,Mo,V,Ni by 6020 (Preservative: HNO3)	ORO,DRO (None)	PNAs by 8270 (None)
1	SBKR0825I502S102512G015	SBKR0825I502	WG	G	10/25/2012 15:40	3		X	X	X
2	SBKR0800I502S102512G015	SBKR0800I502	WG	G	10/25/2012 14:25	3		X	X	X
3	SBKR0800I502D102512G015	SBKR0800I502	WG	G	10/25/2012 14:25	3	DUPLICATE	X	X	X
4	SBKR0775I501S102512G020	SBKR0775I501	WG	G	10/25/2012 11:50	3		X	X	X
5	SBKR0900R505S102512G039	SBKR0900R505	WG	G	10/25/2012 10:20	3		X	X	X

Additional Comments/Special Instructions:

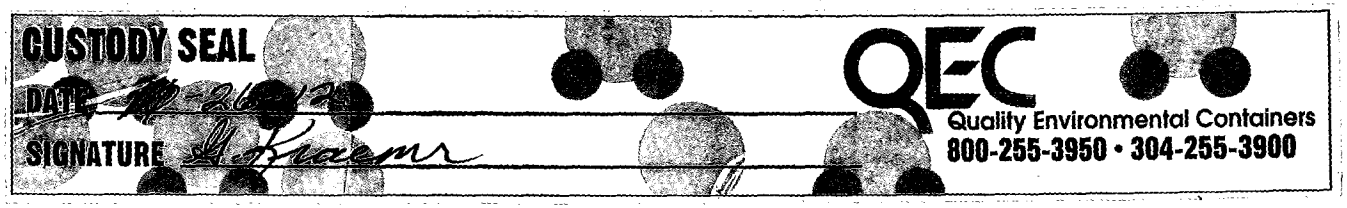
RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-25-12	1640	[signature]	10-26-12	1752

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
5.7°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO. | SAMPLER NAME AND SIGNATURE

Company: | PRINT Name of SAMPLER: APRIL MODERT (AKM1)
Tracking #: | SIGNATURE of SAMPLER: | DATE Signed: | Time:


CUSTODY SEAL
DATE
SIGNATURE
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **26-Oct-12 17:52**

Work Order: **1210933** Received by: **PD**

Checklist completed by Keith Wierenga eSignature 27-Oct-12 Date Reviewed by: Ann Preston eSignature 27-Oct-12 Date

Matrices: Groundwater
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	5.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/27/2012 8:54:43 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

01-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0975-1000L 10/26/12** Work Order: **1210934**

Dear Bryan,

ALS Environmental received 7 samples on 26-Oct-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 57.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Alex Csaszar

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 01-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975-1000L 10/26/12
Work Order: **1210934**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1210934-01	SBKR0975L504S102612S004	Soil		10/26/2012 08:16	10/26/2012 17:52	☐
1210934-02	SBKR0975L505S102612S008	Soil		10/26/2012 09:12	10/26/2012 17:52	☐
1210934-03	SBKR0975L506S102612S005	Soil		10/26/2012 10:32	10/26/2012 17:52	☐
1210934-04	SBKR1000L518S102612S006	Soil		10/26/2012 11:13	10/26/2012 17:52	☐
1210934-05	SBKR1000L519S102612S006	Soil		10/26/2012 11:50	10/26/2012 17:52	☐
1210934-06	SBKR1000L520S102612S006	Soil		10/26/2012 13:35	10/26/2012 17:52	☐
1210934-07	SBKR1000L520T102612MX	Soil		10/26/2012	10/26/2012 17:52	☐

ALS Group USA, Corp

Date: 01-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975-1000L 10/26/12
Work Order: 1210934

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44436, MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification.

Batch 44436, Method VOC_8260_S, Sample LCS-44436: The LCS recovery was above the upper control limits for Chloroethane. All sample results in the batch were non-detect. No qualification is necessary for this analyte.

Batch 44439, MS/MSD data for DRO and ORO are not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 01-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975-1000L 10/26/12
WorkOrder: **1210934**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L504S102612S004
Work Order:	1210934	**Collection Date:**	10/26/2012 8:16:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**96**	**19**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**250**	**38**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*64.0*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**15**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**14**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**340**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**500**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**860**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**340**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Chrysene	**370**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	**520**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**500**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*93.8*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*70.3*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*74.8*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*116*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*67.9*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*68.7*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	180	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	180	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	180	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	180	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	180	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L504S102612S004
Work Order:	1210934	**Collection Date:**	10/26/2012 8:16:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	180	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	180	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	180	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	180	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	180	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	180	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	590	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,500	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	180	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	180	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	180	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	180	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	180	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	180	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	180	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	590	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	180	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	180	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	180	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	180	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L504S102612S004
Work Order:	1210934	**Collection Date:**	10/26/2012 8:16:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	180	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	360	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	180	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	180	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	590	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	180	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	180	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	180	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	180	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	180	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	180	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	180	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	180	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	180	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	180	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	180	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	180	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	180	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	180	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	180	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*94.7*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*96.8*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*99.4*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*90.9*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**50**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L505S102612S008
Work Order:	1210934	**Collection Date:**	10/26/2012 9:12:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**170**	**38**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**450**	**75**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*60.8*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	2.2	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	**7.2**	**5.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Nickel	**16**	**5.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**30**	**5.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**570**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**860**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**920**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**600**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Chrysene	**520**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	**570**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**750**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*83.8*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*67.8*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*75.5*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*107*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*67.1*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*66.4*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	830	100		µg/Kg-dry	1	10/30/2012
1,1,1-Trichloroethane	ND	830	50		µg/Kg-dry	1	10/30/2012
1,1,2,2-Tetrachloroethane	ND	830	50		µg/Kg-dry	1	10/30/2012
1,1,2-Trichloroethane	ND	830	50		µg/Kg-dry	1	10/30/2012
1,1-Dichloroethane	ND	830	50		µg/Kg-dry	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L505S102612S008
Work Order:	1210934	**Collection Date:**	10/26/2012 9:12:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	830	50		µg/Kg-dry	1	10/30/2012
1,2,3-Trichlorobenzene	ND	830	250		µg/Kg-dry	1	10/30/2012
1,2,3-Trichloropropane	ND	830	100		µg/Kg-dry	1	10/30/2012
1,2,3-Trimethylbenzene	ND	830	250		µg/Kg-dry	1	10/30/2012
1,2,4-Trichlorobenzene	ND	830	250		µg/Kg-dry	1	10/30/2012
1,2,4-Trimethylbenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
1,2-Dibromo-3-chloropropane	ND	830	10		µg/Kg-dry	1	10/30/2012
1,2-Dibromoethane	ND	830	20		µg/Kg-dry	1	10/30/2012
1,2-Dichlorobenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
1,2-Dichloroethane	ND	830	50		µg/Kg-dry	1	10/30/2012
1,2-Dichloropropane	ND	830	50		µg/Kg-dry	1	10/30/2012
1,3,5-Trimethylbenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
1,3-Dichlorobenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
1,4-Dichlorobenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
2-Butanone	ND	2,800	750		µg/Kg-dry	1	10/30/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
2-Methylnaphthalene	ND	2,800	330		µg/Kg-dry	1	10/30/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
Acetone	ND	7,000	1,000		µg/Kg-dry	1	10/30/2012
Acrylonitrile	ND	830	100		µg/Kg-dry	1	10/30/2012
Benzene	ND	830	50		µg/Kg-dry	1	10/30/2012
Bromobenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
Bromochloromethane	ND	830	100		µg/Kg-dry	1	10/30/2012
Bromodichloromethane	ND	830	100		µg/Kg-dry	1	10/30/2012
Bromoform	ND	830	100		µg/Kg-dry	1	10/30/2012
Bromomethane	ND	830	200		µg/Kg-dry	1	10/30/2012
Carbon disulfide	ND	830	250		µg/Kg-dry	1	10/30/2012
Carbon tetrachloride	ND	830	50		µg/Kg-dry	1	10/30/2012
Chlorobenzene	ND	830	50		µg/Kg-dry	1	10/30/2012
Chloroethane	ND	2,800	250		µg/Kg-dry	1	10/30/2012
Chloroform	ND	830	50		µg/Kg-dry	1	10/30/2012
Chloromethane	ND	970	250		µg/Kg-dry	1	10/30/2012
cis-1,2-Dichloroethene	ND	830	50		µg/Kg-dry	1	10/30/2012
cis-1,3-Dichloropropene	ND	830	50		µg/Kg-dry	1	10/30/2012
Cyclohexane	ND	830	500		µg/Kg-dry	1	10/30/2012
Dibromochloromethane	ND	830	100		µg/Kg-dry	1	10/30/2012
Dibromomethane	ND	830	250		µg/Kg-dry	1	10/30/2012
Dichlorodifluoromethane	ND	830	250		µg/Kg-dry	1	10/30/2012
Diethyl ether	ND	830	200		µg/Kg-dry	1	10/30/2012
Diisopropyl ether	ND	830	250		µg/Kg-dry	1	10/30/2012
Ethyl tert butyl ether	ND	830	250		µg/Kg-dry	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L505S102612S008
Work Order:	1210934	**Collection Date:**	10/26/2012 9:12:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	830	50		µg/Kg-dry	1	10/30/2012
Hexachloroethane	ND	830	300		µg/Kg-dry	1	10/30/2012
Isopropylbenzene	ND	830	250		µg/Kg-dry	1	10/30/2012
m,p-Xylene	ND	1,700	100		µg/Kg-dry	1	10/30/2012
Methyl iodide	ND	830	100		µg/Kg-dry	1	10/30/2012
Methyl tert-butyl ether	ND	830	250		µg/Kg-dry	1	10/30/2012
Methylene chloride	ND	830	100		µg/Kg-dry	1	10/30/2012
Naphthalene	ND	2,800	330		µg/Kg-dry	1	10/30/2012
n-Butylbenzene	ND	830	50		µg/Kg-dry	1	10/30/2012
n-Propylbenzene	ND	830	100		µg/Kg-dry	1	10/30/2012
o-Xylene	ND	830	50		µg/Kg-dry	1	10/30/2012
p-Isopropyltoluene	ND	830	100		µg/Kg-dry	1	10/30/2012
sec-Butylbenzene	ND	830	50		µg/Kg-dry	1	10/30/2012
Styrene	ND	830	50		µg/Kg-dry	1	10/30/2012
tert-Butyl alcohol	ND	2,800	2,500		µg/Kg-dry	1	10/30/2012
tert-Butylbenzene	ND	830	50		µg/Kg-dry	1	10/30/2012
Tertiaryamylmethylether	ND	830	250		µg/Kg-dry	1	10/30/2012
Tetrachloroethene	ND	830	50		µg/Kg-dry	1	10/30/2012
Tetrahydrofuran	ND	2,800	1,000		µg/Kg-dry	1	10/30/2012
Toluene	ND	830	100		µg/Kg-dry	1	10/30/2012
trans-1,2-Dichloroethene	ND	830	50		µg/Kg-dry	1	10/30/2012
trans-1,3-Dichloropropene	ND	830	50		µg/Kg-dry	1	10/30/2012
trans-1,4-Dichloro-2-butene	ND	830	50		µg/Kg-dry	1	10/30/2012
Trichloroethene	ND	830	50		µg/Kg-dry	1	10/30/2012
Trichlorofluoromethane	ND	830	100		µg/Kg-dry	1	10/30/2012
Vinyl chloride	ND	830	40		µg/Kg-dry	1	10/30/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	10/30/2012
Surr: 4-Bromofluorobenzene	*99.4*	*70-130*			*%REC*	1	10/30/2012
Surr: Dibromofluoromethane	*102*	*70-130*			*%REC*	1	10/30/2012
Surr: Toluene-d8	*99.7*	*70-130*			*%REC*	1	10/30/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**75**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L506S102612S005
Work Order:	1210934	**Collection Date:**	10/26/2012 10:32:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**22**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**280**	**44**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*62.4*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	**9.8**	**3.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Nickel	**19**	**3.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**30**	**3.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*92.2*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*71.4*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*76.7*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*104*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*68.4*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*68.6*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	270	100		µg/Kg-dry	1	10/30/2012
1,1,1-Trichloroethane	ND	270	50		µg/Kg-dry	1	10/30/2012
1,1,2,2-Tetrachloroethane	ND	270	50		µg/Kg-dry	1	10/30/2012
1,1,2-Trichloroethane	ND	270	50		µg/Kg-dry	1	10/30/2012
1,1-Dichloroethane	ND	270	50		µg/Kg-dry	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L506S102612S005
Work Order:	1210934	**Collection Date:**	10/26/2012 10:32:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	270	50		µg/Kg-dry	1	10/30/2012
1,2,3-Trichlorobenzene	ND	270	250		µg/Kg-dry	1	10/30/2012
1,2,3-Trichloropropane	ND	270	100		µg/Kg-dry	1	10/30/2012
1,2,3-Trimethylbenzene	ND	270	250		µg/Kg-dry	1	10/30/2012
1,2,4-Trichlorobenzene	ND	270	250		µg/Kg-dry	1	10/30/2012
1,2,4-Trimethylbenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
1,2-Dibromo-3-chloropropane	ND	270	10		µg/Kg-dry	1	10/30/2012
1,2-Dibromoethane	ND	270	20		µg/Kg-dry	1	10/30/2012
1,2-Dichlorobenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
1,2-Dichloroethane	ND	270	50		µg/Kg-dry	1	10/30/2012
1,2-Dichloropropane	ND	270	50		µg/Kg-dry	1	10/30/2012
1,3,5-Trimethylbenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
1,3-Dichlorobenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
1,4-Dichlorobenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
2-Butanone	ND	900	750		µg/Kg-dry	1	10/30/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
2-Methylnaphthalene	ND	900	330		µg/Kg-dry	1	10/30/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
Acetone	ND	2,200	1,000		µg/Kg-dry	1	10/30/2012
Acrylonitrile	ND	270	100		µg/Kg-dry	1	10/30/2012
Benzene	ND	270	50		µg/Kg-dry	1	10/30/2012
Bromobenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
Bromochloromethane	ND	270	100		µg/Kg-dry	1	10/30/2012
Bromodichloromethane	ND	270	100		µg/Kg-dry	1	10/30/2012
Bromoform	ND	270	100		µg/Kg-dry	1	10/30/2012
Bromomethane	ND	270	200		µg/Kg-dry	1	10/30/2012
Carbon disulfide	ND	270	250		µg/Kg-dry	1	10/30/2012
Carbon tetrachloride	ND	270	50		µg/Kg-dry	1	10/30/2012
Chlorobenzene	ND	270	50		µg/Kg-dry	1	10/30/2012
Chloroethane	ND	900	250		µg/Kg-dry	1	10/30/2012
Chloroform	ND	270	50		µg/Kg-dry	1	10/30/2012
Chloromethane	ND	270	250		µg/Kg-dry	1	10/30/2012
cis-1,2-Dichloroethene	ND	270	50		µg/Kg-dry	1	10/30/2012
cis-1,3-Dichloropropene	ND	270	50		µg/Kg-dry	1	10/30/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/30/2012
Dibromochloromethane	ND	270	100		µg/Kg-dry	1	10/30/2012
Dibromomethane	ND	270	250		µg/Kg-dry	1	10/30/2012
Dichlorodifluoromethane	ND	270	250		µg/Kg-dry	1	10/30/2012
Diethyl ether	ND	270	200		µg/Kg-dry	1	10/30/2012
Diisopropyl ether	ND	270	250		µg/Kg-dry	1	10/30/2012
Ethyl tert butyl ether	ND	270	250		µg/Kg-dry	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L506S102612S005
Work Order:	1210934	**Collection Date:**	10/26/2012 10:32:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	270	50		µg/Kg-dry	1	10/30/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/30/2012
Isopropylbenzene	ND	270	250		µg/Kg-dry	1	10/30/2012
m,p-Xylene	ND	540	100		µg/Kg-dry	1	10/30/2012
Methyl iodide	ND	270	100		µg/Kg-dry	1	10/30/2012
Methyl tert-butyl ether	ND	270	250		µg/Kg-dry	1	10/30/2012
Methylene chloride	ND	270	100		µg/Kg-dry	1	10/30/2012
Naphthalene	ND	900	330		µg/Kg-dry	1	10/30/2012
n-Butylbenzene	ND	270	50		µg/Kg-dry	1	10/30/2012
n-Propylbenzene	ND	270	100		µg/Kg-dry	1	10/30/2012
o-Xylene	ND	270	50		µg/Kg-dry	1	10/30/2012
p-Isopropyltoluene	ND	270	100		µg/Kg-dry	1	10/30/2012
sec-Butylbenzene	ND	270	50		µg/Kg-dry	1	10/30/2012
Styrene	ND	270	50		µg/Kg-dry	1	10/30/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
tert-Butylbenzene	ND	270	50		µg/Kg-dry	1	10/30/2012
Tertiaryamylmethylether	ND	270	250		µg/Kg-dry	1	10/30/2012
Tetrachloroethene	ND	270	50		µg/Kg-dry	1	10/30/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/30/2012
Toluene	ND	270	100		µg/Kg-dry	1	10/30/2012
trans-1,2-Dichloroethene	ND	270	50		µg/Kg-dry	1	10/30/2012
trans-1,3-Dichloropropene	ND	270	50		µg/Kg-dry	1	10/30/2012
trans-1,4-Dichloro-2-butene	ND	270	50		µg/Kg-dry	1	10/30/2012
Trichloroethene	ND	270	50		µg/Kg-dry	1	10/30/2012
Trichlorofluoromethane	ND	270	100		µg/Kg-dry	1	10/30/2012
Vinyl chloride	ND	270	40		µg/Kg-dry	1	10/30/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	10/30/2012
Surr: 4-Bromofluorobenzene	*97.8*	*70-130*			*%REC*	1	10/30/2012
Surr: Dibromofluoromethane	*99.8*	*70-130*			*%REC*	1	10/30/2012
Surr: Toluene-d8	*96.1*	*70-130*			*%REC*	1	10/30/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**58**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L518S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 11:13:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**77**	**16**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**170**	**31**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*64.9*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	0.89	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.2	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**17**	**2.2**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**39**	**2.2**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*87.2*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*72.0*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*75.3*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*111*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*69.5*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*69.0*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	10/30/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	10/30/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	10/30/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	10/30/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L518S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 11:13:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	10/30/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/30/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	10/30/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/30/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/30/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	10/30/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	10/30/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	10/30/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	10/30/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/30/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
2-Methylnaphthalene	ND	350	330		µg/Kg-dry	1	10/30/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	10/30/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	10/30/2012
Benzene	ND	100	50		µg/Kg-dry	1	10/30/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	10/30/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	10/30/2012
Bromoform	ND	100	100		µg/Kg-dry	1	10/30/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/30/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/30/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	10/30/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	10/30/2012
Chloroethane	ND	350	250		µg/Kg-dry	1	10/30/2012
Chloroform	ND	100	50		µg/Kg-dry	1	10/30/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/30/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	10/30/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	10/30/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/30/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	10/30/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/30/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/30/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/30/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/30/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L518S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 11:13:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	10/30/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/30/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/30/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	10/30/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	10/30/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/30/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	10/30/2012
Naphthalene	ND	350	330		µg/Kg-dry	1	10/30/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	10/30/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	10/30/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	10/30/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	10/30/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	10/30/2012
Styrene	ND	100	50		µg/Kg-dry	1	10/30/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/30/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	10/30/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/30/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	10/30/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/30/2012
Toluene	ND	100	100		µg/Kg-dry	1	10/30/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	10/30/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	10/30/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	10/30/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	10/30/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	10/30/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	10/30/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	10/30/2012
Surr: 4-Bromofluorobenzene	*99.0*	*70-130*			*%REC*	1	10/30/2012
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	1	10/30/2012
Surr: Toluene-d8	*99.6*	*70-130*			*%REC*	1	10/30/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**37**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L519S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 11:50:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**100**	**17**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**330**	**35**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*65.5*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**16**	**3.0**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**24**	**3.0**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**400**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**600**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**420**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Chrysene	**470**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	**630**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**630**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*93.6*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*70.9*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*72.7*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*108*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*65.7*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*67.6*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	160	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	160	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	160	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	160	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	160	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L519S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 11:50:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	160	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	160	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	160	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	160	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	160	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	160	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	520	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,300	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	160	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	160	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	160	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	160	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	160	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	160	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	160	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	520	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	160	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	160	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L519S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 11:50:00 AM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	160	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	310	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	160	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	160	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	520	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	160	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	160	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	160	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	160	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	160	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	160	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	160	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	160	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	160	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	160	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	160	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	160	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	160	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*97.8*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**47**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L520S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 1:35:00 PM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**76**	**16**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**170**	**32**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*61.3*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	0.90	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.3	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**18**	**2.3**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**37**	**2.3**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*79.9*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*63.0*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*63.7*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*99.7*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*59.8*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*60.2*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	52	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	52	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	52	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	52	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L520S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 1:35:00 PM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	52	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	52	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	52	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	52	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	52	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	52	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	52	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	52	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	52	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	52	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	52	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L520S102612S006
Work Order:	1210934	**Collection Date:**	10/26/2012 1:35:00 PM
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	52	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	52	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	52	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	52	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	52	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	52	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	52	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	100	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	52	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	52	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	52	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	52	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	52	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*103*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*100*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**43**	**0.050**	**0**		**% of sample**	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L520T102612MX
Work Order:	1210934	**Collection Date:**	10/26/2012
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	10/31/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	10/31/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	10/31/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	10/31/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	10/31/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	10/31/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	10/31/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	10/31/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	10/31/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	10/31/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	10/31/2012
Acetone	ND	1,000	1,000		µg/Kg	1	10/31/2012
Acrylonitrile	ND	100	100		µg/Kg	1	10/31/2012
Benzene	ND	50	50		µg/Kg	1	10/31/2012
Bromobenzene	ND	100	100		µg/Kg	1	10/31/2012
Bromochloromethane	ND	100	100		µg/Kg	1	10/31/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	10/31/2012
Bromoform	ND	100	100		µg/Kg	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg	1	10/31/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	10/31/2012
Chlorobenzene	ND	50	50		µg/Kg	1	10/31/2012
Chloroethane	ND	250	250		µg/Kg	1	10/31/2012
Chloroform	ND	50	50		µg/Kg	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg	1	10/31/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	10/31/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR1000L520T102612MX
Work Order:	1210934	**Collection Date:**	10/26/2012
Project:	Marshall KRRI 0975-1000L 10/26/12		
Lab ID:	1210934-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	10/31/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	10/31/2012
Ethylbenzene	ND	50	50		µg/Kg	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	10/31/2012
m,p-Xylene	ND	100	100		µg/Kg	1	10/31/2012
Methyl iodide	ND	100	100		µg/Kg	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	10/31/2012
Methylene chloride	ND	100	100		µg/Kg	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg	1	10/31/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	10/31/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	10/31/2012
o-Xylene	ND	50	50		µg/Kg	1	10/31/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	10/31/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	10/31/2012
Styrene	ND	50	50		µg/Kg	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	10/31/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	10/31/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	10/31/2012
Toluene	ND	100	100		µg/Kg	1	10/31/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	10/31/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	10/31/2012
Trichloroethene	ND	50	50		µg/Kg	1	10/31/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	10/31/2012
Vinyl chloride	ND	40	40		µg/Kg	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*99.0*	*70-130*			*%REC*	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44439** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44439-44439** Units: **mg/Kg** Analysis Date: **10/31/2012 08:27 A**
Client ID: Run ID: **GC8_121031A** SeqNo: **2128609** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.339*	0	*5*	0	*66.8*	*39-115*	0			

LCS Sample ID: **DLCSS1-44439-44439** Units: **mg/Kg** Analysis Date: **10/31/2012 08:54 A**
Client ID: Run ID: **GC8_121031A** SeqNo: **2128610** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	312.4	10	500	0	62.5	49-124	0			
ORO (C20-C34)	366.9	20	500	0	73.4	60-130	0			
Surr: 4-Terphenyl-d14	*3.857*	0	*5*	0	*77.1*	*39-115*	0			

MS Sample ID: **1210935-12A MS** Units: **mg/Kg** Analysis Date: **10/31/2012 09:21 A**
Client ID: Run ID: **GC8_121031A** SeqNo: **2128612** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.5	10	499.3	48.29	52.5	60-130	0			S
ORO (C20-C34)	427.2	20	499.3	129.2	59.7	60-130	0			S
Surr: 4-Terphenyl-d14	*3.736*	0	*4.993*	0	*74.8*	*39-115*	0			

MSD Sample ID: **1210935-12A MSD** Units: **mg/Kg** Analysis Date: **10/31/2012 09:48 A**
Client ID: Run ID: **GC8_121031A** SeqNo: **2128613** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	267.8	9.1	455.5	48.29	48.2	60-130	310.5	14.8	30	S
ORO (C20-C34)	374.2	18	455.5	129.2	53.8	60-130	427.2	13.2	30	S
Surr: 4-Terphenyl-d14	*3.321*	0	*4.555*	0	*72.9*	*39-115*	3.736	*11.8*	*30*	

The following samples were analyzed in this batch:

1210934-01A	1210934-02A	1210934-03A
1210934-04A	1210934-05A	1210934-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44469** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44469-44469** Units: **mg/Kg** Analysis Date: **10/31/2012 01:31 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127952** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.00741	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44469-44469** Units: **mg/Kg** Analysis Date: **10/31/2012 01:37 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127955** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.702	0.10	5	0	94	80-120	0			
Molybdenum	4.838	0.25	5	0	96.8	80-120	0			
Nickel	4.743	0.25	5	0	94.9	80-120	0			
Vanadium	4.836	0.25	5	0	96.7	80-120	0			

MS Sample ID: **1210643-01BMS** Units: **mg/Kg** Analysis Date: **10/31/2012 01:48 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127961** Prep Date: **10/31/2012** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.552	0.76	7.587	1.057	85.6	75-125	0			
Nickel	15.93	0.76	7.587	9.558	84	75-125	0			
Vanadium	22.87	0.76	7.587	15.08	103	75-125	0			

MS Sample ID: **1210643-01BMS** Units: **mg/Kg** Analysis Date: **10/31/2012 02:16 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127966** Prep Date: **10/31/2012** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.929	3.0	7.587	0.4855	98.1	75-125	0			

MSD Sample ID: **1210643-01BMSD** Units: **mg/Kg** Analysis Date: **10/31/2012 01:54 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127962** Prep Date: **10/31/2012** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.927	0.76	7.645	1.057	89.9	75-125	7.552	4.84	25	
Nickel	16.21	0.76	7.645	9.558	87	75-125	15.93	1.71	25	
Vanadium	23.64	0.76	7.645	15.08	112	75-125	22.87	3.32	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44469** Instrument ID **ICPMS1** Method: **SW6020A**

MSD	Sample ID: **1210643-01BMSD**				Units: **mg/Kg**			Analysis Date: **10/31/2012 02:22 PM**		
Client ID:		Run ID: **ICPMS1_121031A**			SeqNo: **2127967**		Prep Date: **10/31/2012**		DF: **20**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	8.034	3.1	7.645	0.4855	98.7	75-125	7.929	1.32	25	

The following samples were analyzed in this batch:

1210934-01A	1210934-02A	1210934-03A
1210934-04A	1210934-05A	1210934-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44438-44438** Units: **µg/Kg** Analysis Date: **10/31/2012 09:24 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127685** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3866*	0	*5000*	0	*77.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3854*	0	*5000*	0	*77.1*	*12-100*	0			
Surr: 2-Fluorophenol	*4328*	0	*5000*	0	*86.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6124*	0	*5000*	0	*122*	*25-137*	0			
Surr: Nitrobenzene-d5	*3847*	0	*5000*	0	*76.9*	*37-107*	0			
Surr: Phenol-d6	*3759*	0	*5000*	0	*75.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44438-44438** Units: **µg/Kg** Analysis Date: **10/31/2012 08:53 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127684** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1591	50	2000	0	79.6	45-105	0			
Acenaphthene	1586	50	2000	0	79.3	45-110	0			
Acenaphthylene	1749	50	2000	0	87.4	45-105	0			
Anthracene	1744	50	2000	0	87.2	55-105	0			
Benzo(a)anthracene	1743	50	2000	0	87.2	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	2078	50	2000	0	104	45-115	0			
Benzo(g,h,i)perylene	2233	50	2000	0	112	40-125	0			
Benzo(k)fluoranthene	2286	50	2000	0	114	45-115	0			
Chrysene	1697	50	2000	0	84.8	55-110	0			
Dibenzo(a,h)anthracene	1956	50	2000	0	97.8	40-125	0			
Fluoranthene	1682	50	2000	0	84.1	55-115	0			
Fluorene	1493	50	2000	0	74.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1974	50	2000	0	98.7	40-120	0			
Naphthalene	1557	50	2000	0	77.8	40-105	0			
Phenanthrene	1712	50	2000	0	85.6	50-110	0			
Pyrene	1681	50	2000	0	84	45-125	0			
Surr: 2,4,6-Tribromophenol	*4305*	0	*5000*	0	*86.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*4064*	0	*5000*	0	*81.3*	*12-100*	0			
Surr: 2-Fluorophenol	*4380*	0	*5000*	0	*87.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5656*	0	*5000*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*4086*	0	*5000*	0	*81.7*	*37-107*	0			
Surr: Phenol-d6	*3959*	0	*5000*	0	*79.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1210935-12A MS** Units: **µg/Kg** Analysis Date: **10/31/2012 10:39 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127686** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1373	49	1963	0	70	45-105	0			
Acenaphthene	1499	49	1963	0	76.4	45-110	0			
Acenaphthylene	1657	49	1963	0	84.4	45-105	0			
Anthracene	1606	49	1963	0	81.8	55-105	0			
Benzo(a)anthracene	1668	49	1963	66.86	81.5	50-110	0			
Benzo(a)pyrene	2050	49	1963	85.96	100	50-110	0			
Benzo(b)fluoranthene	2239	49	1963	74.5	110	45-115	0			
Benzo(g,h,i)perylene	1708	49	1963	0	87	40-125	0			
Benzo(k)fluoranthene	2080	49	1963	113.7	100	45-115	0			
Chrysene	1595	49	1963	68.77	77.7	55-110	0			
Dibenzo(a,h)anthracene	1565	49	1963	0	79.7	40-125	0			
Fluoranthene	1671	49	1963	94.56	80.3	55-115	0			
Fluorene	1469	49	1963	0	74.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1569	49	1963	59.22	76.9	40-120	0			
Naphthalene	1260	49	1963	0	64.2	40-105	0			
Phenanthrene	1645	49	1963	0	83.8	50-110	0			
Pyrene	1682	49	1963	92.65	81	45-125	0			
Surr: 2,4,6-Tribromophenol	*4384*	0	*4908*	0	*89.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3495*	0	*4908*	0	*71.2*	*12-100*	0			
Surr: 2-Fluorophenol	*3391*	0	*4908*	0	*69.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5222*	0	*4908*	0	*106*	*25-137*	0			
Surr: Nitrobenzene-d5	*3180*	0	*4908*	0	*64.8*	*37-107*	0			
Surr: Phenol-d6	*3262*	0	*4908*	0	*66.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1210935-12A MSD** Units: **µg/Kg** Analysis Date: **10/31/2012 11:11 A**

Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127687** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1425	49	1972	0	72.2	45-105	1373	3.71	30	
Acenaphthene	1539	49	1972	0	78	45-110	1499	2.67	30	
Acenaphthylene	1702	49	1972	0	86.3	45-105	1657	2.7	30	
Anthracene	1694	49	1972	0	85.9	55-105	1606	5.36	30	
Benzo(a)anthracene	1710	49	1972	66.86	83.3	50-110	1668	2.51	30	
Benzo(a)pyrene	2140	49	1972	85.96	104	50-110	2050	4.28	30	
Benzo(b)fluoranthene	2222	49	1972	74.5	109	45-115	2239	0.763	30	
Benzo(g,h,i)perylene	1531	49	1972	0	77.6	40-125	1708	11	30	
Benzo(k)fluoranthene	2334	49	1972	113.7	113	45-115	2080	11.5	30	
Chrysene	1676	49	1972	68.77	81.5	55-110	1595	4.92	30	
Dibenzo(a,h)anthracene	1494	49	1972	0	75.8	40-125	1565	4.61	30	
Fluoranthene	1830	49	1972	94.56	88	55-115	1671	9.13	30	
Fluorene	1472	49	1972	0	74.6	50-110	1469	0.205	30	
Indeno(1,2,3-cd)pyrene	1485	49	1972	59.22	72.3	40-120	1569	5.52	30	
Naphthalene	1303	49	1972	0	66	40-105	1260	3.31	30	
Phenanthrene	1709	49	1972	0	86.6	50-110	1645	3.82	30	
Pyrene	1649	49	1972	92.65	78.9	45-125	1682	2.01	30	
Surr: 2,4,6-Tribromophenol	*4892*	0	*4931*	0	*99.2*	*34-140*	4384	*11*	*40*	
Surr: 2-Fluorobiphenyl	*3720*	0	*4931*	0	*75.4*	*12-100*	3495	*6.23*	*40*	
Surr: 2-Fluorophenol	*3499*	0	*4931*	0	*71*	*33-117*	3391	*3.13*	*40*	
Surr: 4-Terphenyl-d14	*5146*	0	*4931*	0	*104*	*25-137*	5222	*1.46*	*40*	
Surr: Nitrobenzene-d5	*3318*	0	*4931*	0	*67.3*	*37-107*	3180	*4.23*	*40*	
Surr: Phenol-d6	*3419*	0	*4931*	0	*69.3*	*40-106*	3262	*4.71*	*40*	

The following samples were analyzed in this batch:

1210934-01A	1210934-02A	1210934-03A
1210934-04A	1210934-05A	1210934-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/29/2012 04:15 PM**
Client ID: Run ID: **VMS8_121029A** SeqNo: **2126199** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*975*	0	*1000*	0	*97.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Dibromofluoromethane	*983*	0	*1000*	0	*98.3*	*70-130*	0
Surr: Toluene-d8	*966.5*	0	*1000*	0	*96.6*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/31/2012 01:59 A**
Client ID: Run ID: **VMS8_121030A** SeqNo: **2127605** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*943.5*	0	*1000*	0	*94.4*	*70-130*	0
Surr: 4-Bromofluorobenzene	*966.5*	0	*1000*	0	*96.6*	*70-130*	0
Surr: Dibromofluoromethane	*961*	0	*1000*	0	*96.1*	*70-130*	0
Surr: Toluene-d8	*995*	0	*1000*	0	*99.5*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/30/2012 09:43 PM**
Client ID: Run ID: **VMS7_121030A** SeqNo: **2127855** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	50	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	32.5	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	70	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	121	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	ND	30						
m,p-Xylene	ND	60						
Methyl iodide	188	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	36.5	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	22.5	30						J
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	27.5	30						J
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1036*	0	*1000*	0	*104*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1010*	0	*1000*	0	*101*	*70-130*	0	
Surr: Dibromofluoromethane	*1018*	0	*1000*	0	*102*	*70-130*	0	
Surr: Toluene-d8	*993.5*	0	*1000*	0	*99.4*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/31/2012 02:21 PM**
Client ID: Run ID: **VMS9_121031A** SeqNo: **2128925** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	129	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*991*	0	*1000*	0	*99.1*	*70-130*	0
Surr: 4-Bromofluorobenzene	*976.5*	0	*1000*	0	*97.6*	*70-130*	0
Surr: Dibromofluoromethane	*973.5*	0	*1000*	0	*97.4*	*70-130*	0
Surr: Toluene-d8	*927.5*	0	*1000*	0	*92.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44436-44436** Units: **µg/Kg** Analysis Date: **10/29/2012 03:03 PM**
Client ID: Run ID: **VMS8_121029A** SeqNo: **2126197** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	983.5	30	1000	0	98.4	75-125	0			
1,1,1-Trichloroethane	1058	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	907.5	30	1000	0	90.8	55-130	0			
1,1,2-Trichloroethane	878.5	30	1000	0	87.8	60-125	0			
1,1-Dichloroethane	970.5	30	1000	0	97	75-125	0			
1,1-Dichloroethene	1088	30	1000	0	109	65-135	0			
1,2,3-Trichlorobenzene	1106	30	1000	0	111	60-135	0			
1,2,3-Trichloropropane	920.5	30	1000	0	92	65-130	0			
1,2,3-Trimethylbenzene	931	30	1000	0	93.1	65-135	0			
1,2,4-Trichlorobenzene	1124	30	1000	0	112	65-130	0			
1,2,4-Trimethylbenzene	940	30	1000	0	94	65-135	0			
1,2-Dibromo-3-chloropropane	950	30	1000	0	95	40-135	0			
1,2-Dibromoethane	1006	30	1000	0	101	70-125	0			
1,2-Dichlorobenzene	954	30	1000	0	95.4	75-120	0			
1,2-Dichloroethane	950.5	30	1000	0	95	70-135	0			
1,2-Dichloropropane	987	30	1000	0	98.7	70-120	0			
1,3,5-Trimethylbenzene	976.5	30	1000	0	97.6	65-135	0			
1,3-Dichlorobenzene	953.5	30	1000	0	95.4	70-125	0			
1,4-Dichlorobenzene	943.5	30	1000	0	94.4	70-125	0			
2-Butanone	1111	200	1000	0	111	30-160	0			
2-Hexanone	952	30	1000	0	95.2	45-145	0			
4-Methyl-2-pentanone	1284	30	1000	0	128	45-145	0			
Acetone	1061	100	1000	0	106	20-160	0			
Acrylonitrile	1024	100	1000	0	102	70-135	0			
Benzene	959	30	1000	0	95.9	75-125	0			
Bromobenzene	927.5	30	1000	0	92.8	65-120	0			
Bromochloromethane	1020	30	1000	0	102	70-125	0			
Bromodichloromethane	1016	30	1000	0	102	70-130	0			
Bromoform	1038	30	1000	0	104	55-135	0			
Bromomethane	1380	75	1000	0	138	30-160	0			
Carbon disulfide	1150	30	1000	0	115	45-160	0			
Carbon tetrachloride	1087	30	1000	0	109	65-135	0			
Chlorobenzene	936.5	30	1000	0	93.6	75-125	0			
Chloroethane	1608	100	1000	0	161	40-155	0			S
Chloroform	941.5	30	1000	0	94.2	70-125	0			
Chloromethane	1081	100	1000	0	108	50-130	0			
cis-1,2-Dichloroethene	959.5	30	1000	0	96	65-125	0			
cis-1,3-Dichloropropene	1007	30	1000	0	101	70-125	0			
Dibromochloromethane	976	30	1000	0	97.6	65-135	0			
Dibromomethane	949	30	1000	0	94.9	75-130	0			
Dichlorodifluoromethane	1284	30	1000	0	128	35-135	0			
Ethylbenzene	971.5	30	1000	0	97.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1163	30	1000	0	116	70-135	0
Isopropylbenzene	953.5	30	1000	0	95.4	75-130	0
m,p-Xylene	1928	60	2000	0	96.4	80-125	0
Methyl tert-butyl ether	1016	30	1000	0	102	75-125	0
Methylene chloride	932.5	30	1000	0	93.2	55-145	0
Naphthalene	1324	100	1000	0	132	40-140	0
n-Butylbenzene	1079	30	1000	0	108	65-140	0
n-Propylbenzene	934.5	30	1000	0	93.4	65-135	0
o-Xylene	956	30	1000	0	95.6	75-125	0
p-Isopropyltoluene	947.5	30	1000	0	94.8	75-135	0
sec-Butylbenzene	991	30	1000	0	99.1	65-130	0
Styrene	989.5	30	1000	0	99	75-125	0
tert-Butylbenzene	912.5	30	1000	0	91.2	65-130	0
Tetrachloroethene	972.5	30	1000	0	97.2	64-140	0
Tetrahydrofuran	904	200	1000	0	90.4	70-135	0
Toluene	946.5	30	1000	0	94.6	70-125	0
trans-1,2-Dichloroethene	1064	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	1024	30	1000	0	102	65-125	0
trans-1,4-Dichloro-2-butene	1034	30	1000	0	103	70-135	0
Trichloroethene	995	30	1000	0	99.5	75-125	0
Trichlorofluoromethane	1090	30	1000	0	109	25-185	0
Vinyl chloride	1126	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*987.5*	0	*1000*	0	*98.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1005*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1008*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44436-44436** Units: **µg/Kg** Analysis Date: **10/31/2012 12:47 PM**
Client ID: Run ID: **VMS8_121030A** SeqNo: **2127606** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	971	30	1000	0	97.1	75-125	0			
1,1,1-Trichloroethane	1083	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	866	30	1000	0	86.6	55-130	0			
1,1,2-Trichloroethane	853.5	30	1000	0	85.4	60-125	0			
1,1-Dichloroethane	975	30	1000	0	97.5	75-125	0			
1,1-Dichloroethene	1096	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1058	30	1000	0	106	60-135	0			
1,2,3-Trichloropropane	847.5	30	1000	0	84.8	65-130	0			
1,2,3-Trimethylbenzene	927.5	30	1000	0	92.8	65-135	0			
1,2,4-Trichlorobenzene	1064	30	1000	0	106	65-130	0			
1,2,4-Trimethylbenzene	971	30	1000	0	97.1	65-135	0			
1,2-Dibromo-3-chloropropane	876.5	30	1000	0	87.6	40-135	0			
1,2-Dibromoethane	952	30	1000	0	95.2	70-125	0			
1,2-Dichlorobenzene	922.5	30	1000	0	92.2	75-120	0			
1,2-Dichloroethane	956.5	30	1000	0	95.6	70-135	0			
1,2-Dichloropropane	997	30	1000	0	99.7	70-120	0			
1,3,5-Trimethylbenzene	1022	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	941	30	1000	0	94.1	70-125	0			
1,4-Dichlorobenzene	924.5	30	1000	0	92.4	70-125	0			
2-Butanone	896	200	1000	0	89.6	30-160	0			
2-Hexanone	893	30	1000	0	89.3	45-145	0			
4-Methyl-2-pentanone	1138	30	1000	0	114	45-145	0			
Acetone	978.5	100	1000	0	97.8	20-160	0			
Acrylonitrile	903.5	100	1000	0	90.4	70-135	0			
Benzene	972.5	30	1000	0	97.2	75-125	0			
Bromobenzene	937.5	30	1000	0	93.8	65-120	0			
Bromochloromethane	980	30	1000	0	98	70-125	0			
Bromodichloromethane	985	30	1000	0	98.5	70-130	0			
Bromoform	931.5	30	1000	0	93.2	55-135	0			
Bromomethane	1202	75	1000	0	120	30-160	0			
Carbon disulfide	1169	30	1000	0	117	45-160	0			
Carbon tetrachloride	1070	30	1000	0	107	65-135	0			
Chlorobenzene	951.5	30	1000	0	95.2	75-125	0			
Chloroethane	1742	100	1000	0	174	40-155	0			S
Chloroform	942.5	30	1000	0	94.2	70-125	0			
Chloromethane	1076	100	1000	0	108	50-130	0			
cis-1,2-Dichloroethene	935.5	30	1000	0	93.6	65-125	0			
cis-1,3-Dichloropropene	939.5	30	1000	0	94	70-125	0			
Dibromochloromethane	904.5	30	1000	0	90.4	65-135	0			
Dibromomethane	952	30	1000	0	95.2	75-130	0			
Dichlorodifluoromethane	1332	30	1000	0	133	35-135	0			
Ethylbenzene	994	30	1000	0	99.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	984.5	30	1000	0	98.4	70-135	0
Isopropylbenzene	991	30	1000	0	99.1	75-130	0
m,p-Xylene	2000	60	2000	0	100	80-125	0
Methyl tert-butyl ether	1003	30	1000	0	100	75-125	0
Methylene chloride	769	30	1000	0	76.9	55-145	0
Naphthalene	1334	100	1000	0	133	40-140	0
n-Butylbenzene	980.5	30	1000	0	98	65-140	0
n-Propylbenzene	939	30	1000	0	93.9	65-135	0
o-Xylene	972	30	1000	0	97.2	75-125	0
p-Isopropyltoluene	890.5	30	1000	0	89	75-135	0
sec-Butylbenzene	990	30	1000	0	99	65-130	0
Styrene	1012	30	1000	0	101	75-125	0
tert-Butylbenzene	903.5	30	1000	0	90.4	65-130	0
Tetrachloroethene	1005	30	1000	0	100	64-140	0
Tetrahydrofuran	802	200	1000	0	80.2	70-135	0
Toluene	973	30	1000	0	97.3	70-125	0
trans-1,2-Dichloroethene	1047	30	1000	0	105	65-135	0
trans-1,3-Dichloropropene	940	30	1000	0	94	65-125	0
trans-1,4-Dichloro-2-butene	886	30	1000	0	88.6	70-135	0
Trichloroethene	1038	30	1000	0	104	75-125	0
Trichlorofluoromethane	1114	30	1000	0	111	25-185	0
Vinyl chloride	1141	30	1000	0	114	60-125	0
Surr: 1,2-Dichloroethane-d4	*945.5*	0	*1000*	0	*94.6*	*70-130*	0
Surr: 4-Bromofluorobenzene	*987*	0	*1000*	0	*98.7*	*70-130*	0
Surr: Dibromofluoromethane	*996*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Toluene-d8	*1008*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44436-44436**				Units: **µg/Kg**			Analysis Date: **10/30/2012 08:27 PM**		
Client ID:		Run ID: **VMS7_121030A**			SeqNo: **2127854**		Prep Date: **10/29/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	969.5	30	1000	0	97	75-125	0			
1,1,1-Trichloroethane	1018	30	1000	0	102	70-135	0			
1,1,2,2-Tetrachloroethane	967	30	1000	0	96.7	55-130	0			
1,1,2-Trichloroethane	983.5	30	1000	0	98.4	60-125	0			
1,1-Dichloroethane	1041	30	1000	0	104	75-125	0			
1,1-Dichloroethene	993	30	1000	0	99.3	65-135	0			
1,2,3-Trichlorobenzene	1114	30	1000	0	111	60-135	0			
1,2,3-Trichloropropane	1064	30	1000	0	106	65-130	0			
1,2,3-Trimethylbenzene	1042	30	1000	0	104	65-135	0			
1,2,4-Trichlorobenzene	1116	30	1000	0	112	65-130	0			
1,2,4-Trimethylbenzene	1050	30	1000	0	105	65-135	0			B
1,2-Dibromo-3-chloropropane	952	30	1000	0	95.2	40-135	0			
1,2-Dibromoethane	1064	30	1000	0	106	70-125	0			
1,2-Dichlorobenzene	1082	30	1000	0	108	75-120	0			
1,2-Dichloroethane	1000	30	1000	0	100	70-135	0			
1,2-Dichloropropane	954	30	1000	0	95.4	70-120	0			
1,3,5-Trimethylbenzene	1040	30	1000	0	104	65-135	0			B
1,3-Dichlorobenzene	1046	30	1000	0	105	70-125	0			
1,4-Dichlorobenzene	1062	30	1000	0	106	70-125	0			
2-Butanone	1078	200	1000	0	108	30-160	0			
2-Hexanone	1098	30	1000	0	110	45-145	0			
4-Methyl-2-pentanone	1419	30	1000	0	142	45-145	0			
Acetone	809.5	100	1000	0	81	20-160	0			
Acrylonitrile	1082	100	1000	0	108	70-135	0			
Benzene	1052	30	1000	0	105	75-125	0			
Bromobenzene	1019	30	1000	0	102	65-120	0			
Bromochloromethane	989	30	1000	0	98.9	70-125	0			
Bromodichloromethane	909	30	1000	0	90.9	70-130	0			
Bromoform	1039	30	1000	0	104	55-135	0			
Bromomethane	943	75	1000	0	94.3	30-160	0			
Carbon disulfide	1192	30	1000	0	119	45-160	0			
Carbon tetrachloride	1071	30	1000	0	107	65-135	0			
Chlorobenzene	1034	30	1000	0	103	75-125	0			
Chloroethane	1050	100	1000	0	105	40-155	0			
Chloroform	989	30	1000	0	98.9	70-125	0			
Chloromethane	1097	100	1000	0	110	50-130	0			B
cis-1,2-Dichloroethene	996	30	1000	0	99.6	65-125	0			
cis-1,3-Dichloropropene	898.5	30	1000	0	89.8	70-125	0			
Dibromochloromethane	1010	30	1000	0	101	65-135	0			
Dibromomethane	902.5	30	1000	0	90.2	75-130	0			
Dichlorodifluoromethane	1183	30	1000	0	118	35-135	0			
Ethylbenzene	1072	30	1000	0	107	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436**	Instrument ID **VMS8**		Method: **SW8260**				
Hexachloroethane	1080	30	1000	0	108	70-135	0
Isopropylbenzene	1086	30	1000	0	109	75-130	0
m,p-Xylene	2102	60	2000	0	105	80-125	0
Methyl tert-butyl ether	1036	30	1000	0	104	75-125	0
Methylene chloride	963	30	1000	0	96.3	55-145	0
Naphthalene	1142	100	1000	0	114	40-140	0
n-Butylbenzene	1033	30	1000	0	103	65-140	0
n-Propylbenzene	1087	30	1000	0	109	65-135	0
o-Xylene	1047	30	1000	0	105	75-125	0
p-Isopropyltoluene	1004	30	1000	0	100	75-135	0
sec-Butylbenzene	1044	30	1000	0	104	65-130	0
Styrene	1074	30	1000	0	107	75-125	0
tert-Butylbenzene	1044	30	1000	0	104	65-130	0
Tetrachloroethene	1093	30	1000	0	109	64-140	0
Tetrahydrofuran	1062	200	1000	0	106	70-135	0
Toluene	1000	30	1000	0	100	70-125	0
trans-1,2-Dichloroethene	988	30	1000	0	98.8	65-135	0
trans-1,3-Dichloropropene	984	30	1000	0	98.4	65-125	0
trans-1,4-Dichloro-2-butene	841.5	30	1000	0	84.2	70-135	0
Trichloroethene	1022	30	1000	0	102	75-125	0
Trichlorofluoromethane	1029	30	1000	0	103	25-185	0
Vinyl chloride	1150	30	1000	0	115	60-125	0
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1024*	0	*1000*	0	*102*	*70-130*	0
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1018*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44436-44436** Units: **µg/Kg** Analysis Date: **10/31/2012 01:05 PM**
Client ID: Run ID: **VMS9_121031A** SeqNo: **2128924** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1044	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1126	30	1000	0	113	70-135	0			
1,1,2,2-Tetrachloroethane	942.5	30	1000	0	94.2	55-130	0			
1,1,2-Trichloroethane	922	30	1000	0	92.2	60-125	0			
1,1-Dichloroethane	1228	30	1000	0	123	75-125	0			
1,1-Dichloroethene	1069	30	1000	0	107	65-135	0			
1,2,3-Trichlorobenzene	989.5	30	1000	0	99	60-135	0			
1,2,3-Trichloropropane	925.5	30	1000	0	92.6	65-130	0			
1,2,3-Trimethylbenzene	1046	30	1000	0	105	65-135	0			
1,2,4-Trichlorobenzene	1008	30	1000	0	101	65-130	0			
1,2,4-Trimethylbenzene	954	30	1000	0	95.4	65-135	0			
1,2-Dibromo-3-chloropropane	786	30	1000	0	78.6	40-135	0			
1,2-Dibromoethane	973	30	1000	0	97.3	70-125	0			
1,2-Dichlorobenzene	994	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	978.5	30	1000	0	97.8	70-135	0			
1,2-Dichloropropane	1062	30	1000	0	106	70-120	0			
1,3,5-Trimethylbenzene	992.5	30	1000	0	99.2	65-135	0			
1,3-Dichlorobenzene	992	30	1000	0	99.2	70-125	0			
1,4-Dichlorobenzene	1000	30	1000	0	100	70-125	0			
2-Butanone	1328	200	1000	0	133	30-160	0			
2-Hexanone	1054	30	1000	0	105	45-145	0			
4-Methyl-2-pentanone	978	30	1000	0	97.8	45-145	0			
Acetone	1010	100	1000	0	101	20-160	0			B
Acrylonitrile	978.5	100	1000	0	97.8	70-135	0			
Benzene	1060	30	1000	0	106	75-125	0			
Bromobenzene	1026	30	1000	0	103	65-120	0			
Bromochloromethane	1188	30	1000	0	119	70-125	0			
Bromodichloromethane	1098	30	1000	0	110	70-130	0			
Bromoform	994	30	1000	0	99.4	55-135	0			
Bromomethane	1289	75	1000	0	129	30-160	0			
Carbon disulfide	1130	30	1000	0	113	45-160	0			
Carbon tetrachloride	1044	30	1000	0	104	65-135	0			
Chlorobenzene	1004	30	1000	0	100	75-125	0			
Chloroethane	694	100	1000	0	69.4	40-155	0			
Chloroform	1040	30	1000	0	104	70-125	0			
Chloromethane	1002	100	1000	0	100	50-130	0			
cis-1,2-Dichloroethene	1229	30	1000	0	123	65-125	0			
cis-1,3-Dichloropropene	1086	30	1000	0	109	70-125	0			
Dibromochloromethane	992	30	1000	0	99.2	65-135	0			
Dibromomethane	1036	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	957.5	30	1000	0	95.8	35-135	0			
Ethylbenzene	1094	30	1000	0	109	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	971.5	30	1000	0	97.2	70-135	0
Isopropylbenzene	988.5	30	1000	0	98.8	75-130	0
m,p-Xylene	1937	60	2000	0	96.8	80-125	0
Methyl tert-butyl ether	1178	30	1000	0	118	75-125	0
Methylene chloride	1056	30	1000	0	106	55-145	0
Naphthalene	797	100	1000	0	79.7	40-140	0
n-Butylbenzene	1022	30	1000	0	102	65-140	0
n-Propylbenzene	954.5	30	1000	0	95.4	65-135	0
o-Xylene	1076	30	1000	0	108	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1032	30	1000	0	103	65-130	0
Styrene	976.5	30	1000	0	97.6	75-125	0
tert-Butylbenzene	1168	30	1000	0	117	65-130	0
Tetrachloroethene	1032	30	1000	0	103	64-140	0
Tetrahydrofuran	1137	200	1000	0	114	70-135	0
Toluene	1034	30	1000	0	103	70-125	0
trans-1,2-Dichloroethene	1132	30	1000	0	113	65-135	0
trans-1,3-Dichloropropene	905	30	1000	0	90.5	65-125	0
trans-1,4-Dichloro-2-butene	875.5	30	1000	0	87.6	70-135	0
Trichloroethene	1051	30	1000	0	105	75-125	0
Trichlorofluoromethane	1029	30	1000	0	103	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*972*	0	*1000*	0	*97.2*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1055*	0	*1000*	0	*106*	*70-130*	0
Surr: Dibromofluoromethane	*952*	0	*1000*	0	*95.2*	*70-130*	0
Surr: Toluene-d8	*975*	0	*1000*	0	*97.5*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1210935-01B MS** Units: **µg/Kg** Analysis Date: **10/31/2012 11:19 PM**
Client ID: Run ID: **VMS9_121031A** SeqNo: **2128910** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1779	60	1985	0	89.6	75-125	0			
1,1,1-Trichloroethane	1796	60	1985	0	90.4	70-135	0			
1,1,2,2-Tetrachloroethane	1813	60	1985	0	91.4	55-130	0			
1,1,2-Trichloroethane	1813	60	1985	0	91.4	60-125	0			
1,1-Dichloroethane	2419	60	1985	0	122	75-125	0			
1,1-Dichloroethene	1530	60	1985	0	77.1	65-135	0			
1,2,3-Trichlorobenzene	1638	60	1985	0	82.5	60-135	0			
1,2,3-Trichloropropane	1886	60	1985	0	95	65-130	0			
1,2,3-Trimethylbenzene	1926	60	1985	0	97	65-135	0			
1,2,4-Trichlorobenzene	1651	60	1985	0	83.2	65-130	0			
1,2,4-Trimethylbenzene	2180	60	1985	0	110	65-135	0			
1,2-Dibromo-3-chloropropane	1347	60	1985	0	67.8	40-135	0			
1,2-Dibromoethane	1929	60	1985	0	97.2	70-125	0			
1,2-Dichlorobenzene	1773	60	1985	0	89.3	75-120	0			
1,2-Dichloroethane	2168	60	1985	0	109	70-135	0			
1,2-Dichloropropane	2199	60	1985	0	111	70-120	0			
1,3,5-Trimethylbenzene	2116	60	1985	0	107	65-135	0			
1,3-Dichlorobenzene	1732	60	1985	0	87.2	70-125	0			
1,4-Dichlorobenzene	1750	60	1985	0	88.2	70-125	0			
2-Butanone	2591	400	1985	339.4	113	30-160	0			
2-Hexanone	1846	60	1985	0	93	45-145	0			
4-Methyl-2-pentanone	2155	60	1985	0	109	45-145	0			
Acetone	3752	200	1985	648.1	156	20-160	0			B
Acrylonitrile	2598	200	1985	0	131	70-135	0			
Benzene	2066	60	1985	0	104	75-125	0			
Bromobenzene	1934	60	1985	0	97.4	65-120	0			
Bromochloromethane	2404	60	1985	0	121	70-125	0			
Bromodichloromethane	2097	60	1985	0	106	70-130	0			
Bromoform	1610	60	1985	0	81.1	55-135	0			
Bromomethane	1794	150	1985	0	90.4	30-160	0			
Carbon disulfide	1298	60	1985	0	65.4	45-160	0			
Carbon tetrachloride	1391	60	1985	0	70	65-135	0			
Chlorobenzene	1849	60	1985	0	93.2	75-125	0			
Chloroethane	394	200	1985	0	19.8	40-155	0			S
Chloroform	2206	60	1985	0	111	70-125	0			
Chloromethane	1887	200	1985	0	95	50-130	0			
cis-1,2-Dichloroethene	2228	60	1985	0	112	65-125	0			
cis-1,3-Dichloropropene	2161	60	1985	0	109	70-125	0			
Dibromochloromethane	1644	60	1985	0	82.8	65-135	0			
Dibromomethane	2272	60	1985	0	114	75-130	0			
Dichlorodifluoromethane	216.4	60	1985	0	10.9	35-135	0			S
Ethylbenzene	2025	60	1985	0	102	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436**	Instrument ID **VMS8**		Method: **SW8260**					
Hexachloroethane	1355	60	1985	0	68.2	70-135	0	S
Isopropylbenzene	1741	60	1985	0	87.7	75-130	0	
m,p-Xylene	4386	120	3970	0	110	80-125	0	
Methyl tert-butyl ether	2801	60	1985	0	141	75-125	0	S
Methylene chloride	2723	60	1985	0	137	55-145	0	
Naphthalene	1642	200	1985	0	82.7	40-140	0	
n-Butylbenzene	1495	60	1985	0	75.3	65-140	0	
n-Propylbenzene	1692	60	1985	0	85.2	65-135	0	
o-Xylene	2089	60	1985	0	105	75-125	0	
p-Isopropyltoluene	1864	60	1985	0	93.9	75-135	0	
sec-Butylbenzene	1647	60	1985	0	83	65-130	0	
Styrene	1664	60	1985	0	83.8	75-125	0	
tert-Butylbenzene	1974	60	1985	0	99.4	65-130	0	
Tetrachloroethene	1563	60	1985	0	78.8	64-140	0	
Tetrahydrofuran	2475	400	1985	0	125	70-135	0	
Toluene	1925	60	1985	0	97	70-125	0	
trans-1,2-Dichloroethene	2012	60	1985	0	101	65-135	0	
trans-1,3-Dichloropropene	1568	60	1985	0	79	65-125	0	
trans-1,4-Dichloro-2-butene	1371	60	1985	0	69	70-135	0	S
Trichloroethene	1981	60	1985	0	99.8	75-125	0	
Trichlorofluoromethane	989.6	60	1985	0	49.8	25-185	0	
Vinyl chloride	995.5	60	1985	0	50.2	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1857*	0	*1985*	0	*93.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*2088*	0	*1985*	0	*105*	*70-130*	0	
Surr: Dibromofluoromethane	*1915*	0	*1985*	0	*96.4*	*70-130*	0	
Surr: Toluene-d8	*1919*	0	*1985*	0	*96.6*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MSD Sample ID: **1210935-01B MSD** Units: **µg/Kg** Analysis Date: **10/31/2012 11:45 PM**
Client ID: Run ID: **VMS9_121031A** SeqNo: **2128912** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1850	60	1985	0	93.2	75-125	1779	3.94	30	
1,1,1-Trichloroethane	1721	60	1985	0	86.7	70-135	1796	4.23	30	
1,1,2,2-Tetrachloroethane	1957	60	1985	0	98.6	55-130	1813	7.63	30	
1,1,2-Trichloroethane	1798	60	1985	0	90.6	60-125	1813	0.824	30	
1,1-Dichloroethane	2224	60	1985	0	112	75-125	2419	8.38	30	
1,1-Dichloroethene	1474	60	1985	0	74.2	65-135	1530	3.77	30	
1,2,3-Trichlorobenzene	1607	60	1985	0	81	60-135	1638	1.9	30	
1,2,3-Trichloropropane	2030	60	1985	0	102	65-130	1886	7.35	30	
1,2,3-Trimethylbenzene	1869	60	1985	0	94.2	65-135	1926	2.98	30	
1,2,4-Trichlorobenzene	1661	60	1985	0	83.6	65-130	1651	0.6	30	
1,2,4-Trimethylbenzene	1943	60	1985	0	97.9	65-135	2180	11.5	30	
1,2-Dibromo-3-chloropropane	1383	60	1985	0	69.6	40-135	1347	2.62	30	
1,2-Dibromoethane	1948	60	1985	0	98.2	70-125	1929	0.973	30	
1,2-Dichlorobenzene	1737	60	1985	0	87.5	75-120	1773	2.04	30	
1,2-Dichloroethane	2063	60	1985	0	104	70-135	2168	4.93	30	
1,2-Dichloropropane	2169	60	1985	0	109	70-120	2199	1.41	30	
1,3,5-Trimethylbenzene	1946	60	1985	0	98	65-135	2116	8.36	30	
1,3-Dichlorobenzene	1731	60	1985	0	87.2	70-125	1732	0.0573	30	
1,4-Dichlorobenzene	1742	60	1985	0	87.8	70-125	1750	0.455	30	
2-Butanone	2772	400	1985	339.4	123	30-160	2591	6.77	30	
2-Hexanone	2155	60	1985	0	109	45-145	1846	15.4	30	
4-Methyl-2-pentanone	2137	60	1985	0	108	45-145	2155	0.833	30	
Acetone	3649	200	1985	648.1	151	20-160	3752	2.79	30	B
Acrylonitrile	2483	200	1985	0	125	70-135	2598	4.53	30	
Benzene	2004	60	1985	0	101	75-125	2066	3.07	30	
Bromobenzene	1981	60	1985	0	99.8	65-120	1934	2.38	30	
Bromochloromethane	2445	60	1985	0	123	70-125	2404	1.68	30	
Bromodichloromethane	2072	60	1985	0	104	70-130	2097	1.19	30	
Bromoform	1701	60	1985	0	85.7	55-135	1610	5.52	30	
Bromomethane	1624	150	1985	0	81.8	30-160	1794	9.93	30	
Carbon disulfide	1306	60	1985	0	65.8	45-160	1298	0.61	30	
Carbon tetrachloride	1430	60	1985	0	72	65-135	1391	2.81	30	
Chlorobenzene	1896	60	1985	0	95.5	75-125	1849	2.49	30	
Chloroethane	397	200	1985	0	20	40-155	394	0.753	30	S
Chloroform	2235	60	1985	0	113	70-125	2206	1.3	30	
Chloromethane	1767	200	1985	0	89	50-130	1887	6.57	30	
cis-1,2-Dichloroethene	2257	60	1985	0	114	65-125	2228	1.28	30	
cis-1,3-Dichloropropene	2092	60	1985	0	105	70-125	2161	3.22	30	
Dibromochloromethane	1697	60	1985	0	85.5	65-135	1644	3.21	30	
Dibromomethane	2230	60	1985	0	112	75-130	2272	1.85	30	
Dichlorodifluoromethane	196.5	60	1985	0	9.9	35-135	216.4	9.62	30	S
Ethylbenzene	1955	60	1985	0	98.5	75-125	2025	3.49	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1322	60	1985	0	66.6	70-135	1355	2.45	30	S
Isopropylbenzene	1731	60	1985	0	87.2	75-130	1741	0.572	30	
m,p-Xylene	3762	120	3970	0	94.8	80-125	4386	15.3	30	
Methyl tert-butyl ether	2628	60	1985	0	132	75-125	2801	6.36	30	S
Methylene chloride	2504	60	1985	0	126	55-145	2723	8.36	30	
Naphthalene	1580	200	1985	0	79.6	40-140	1642	3.82	30	
n-Butylbenzene	1453	60	1985	0	73.2	65-140	1495	2.83	30	
n-Propylbenzene	1693	60	1985	0	85.3	65-135	1692	0.0586	30	
o-Xylene	2044	60	1985	0	103	75-125	2089	2.21	30	
p-Isopropyltoluene	1781	60	1985	0	89.7	75-135	1864	4.58	30	
sec-Butylbenzene	1677	60	1985	0	84.5	65-130	1647	1.85	30	
Styrene	1657	60	1985	0	83.4	75-125	1664	0.478	30	
tert-Butylbenzene	2000	60	1985	0	101	65-130	1974	1.3	30	
Tetrachloroethene	1538	60	1985	0	77.5	64-140	1563	1.6	30	
Tetrahydrofuran	2568	400	1985	0	129	70-135	2475	3.66	30	
Toluene	1787	60	1985	0	90	70-125	1925	7.44	30	
trans-1,2-Dichloroethene	1842	60	1985	0	92.8	65-135	2012	8.81	30	
trans-1,3-Dichloropropene	1538	60	1985	0	77.5	65-125	1568	1.92	30	
trans-1,4-Dichloro-2-butene	1452	60	1985	0	73.2	70-135	1371	5.77	30	
Trichloroethene	1920	60	1985	0	96.7	75-125	1981	3.16	30	
Trichlorofluoromethane	979.6	60	1985	0	49.4	25-185	989.6	1.01	30	
Vinyl chloride	907.2	60	1985	0	45.7	60-125	995.5	9.29	30	S
Surr: 1,2-Dichloroethane-d4	*1809*	0	*1985*	0	*91.2*	*70-130*	1857	*2.6*	*30*	
Surr: 4-Bromofluorobenzene	*2229*	0	*1985*	0	*112*	*70-130*	2088	*6.53*	*30*	
Surr: Dibromofluoromethane	*1921*	0	*1985*	0	*96.8*	*70-130*	1915	*0.311*	*30*	
Surr: Toluene-d8	*1753*	0	*1985*	0	*88.3*	*70-130*	1919	*9.03*	*30*	

The following samples were analyzed in this batch:

1210934-01B	1210934-02B	1210934-03B
1210934-04B	1210934-05B	1210934-06B
1210934-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **R111882** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R111882** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126558** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R111882** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126554** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1210920-02B DUP** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126528** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.36	0.050	0	0	0	-0 0	16.19	1.04	20	

DUP Sample ID: **1210935-12A DUP1** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126545** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	54.15	0.050	0	0	0	-0 0	58.39	7.54	20	

DUP Sample ID: **1210935-12A DUP2** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126546** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	55.74	0.050	0	0	0	-0 0	58.39	4.64	20	

The following samples were analyzed in this batch:

1210934-01A	1210934-02A	1210934-03A
1210934-04A	1210934-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210934
Project: Marshall KRRI 0975-1000L 10/26/12

QC BATCH REPORT

Batch ID: **R111938** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R111938** Units: **% of sample** Analysis Date: **10/30/2012 03:00 PM**
Client ID: Run ID: **MOIST_121030A** SeqNo: **2127482** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R111938** Units: **% of sample** Analysis Date: **10/30/2012 03:00 PM**
Client ID: Run ID: **MOIST_121030A** SeqNo: **2127478** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1210992-01A DUP** Units: **% of sample** Analysis Date: **10/30/2012 03:00 PM**
Client ID: Run ID: **MOIST_121030A** SeqNo: **2127475** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.05	0.050	0	0	0	-0 0	14.07	6.73	20	

The following samples were analyzed in this batch: 1210934-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1210934

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_102612_GMK1	Task: KRRI_0975,1000
	Total # of Samples: 7	Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email:	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #:	60162778
Site Address:	5555 Glenwood Parkway SE Suite 200
City:	Grand Rapids
State, Zip:	MI
Site PM Name:	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH											
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	O&G by EPA 1664 PNR	VOC by 5035/8260											
1	SBKR0975L504S102612S004	SBKR0975L504	SO	G	10/26/2012 08:16	3			X	X	X	X	X											
2	SBKR0975L505S102612S008	SBKR0975L505	SO	G	10/26/2012 09:12	3			X	X	X	X	X											
3	SBKR0975L506S102612S005	SBKR0975L506	SO	G	10/26/2012 10:32	3			X	X	X	X	X											
4	SBKR1000L518S102612S006	SBKR1000L518	SO	G	10/26/2012 11:13	3			X	X	X	X	X											
5	SBKR1000L519S102612S006	SBKR1000L519	SO	G	10/26/2012 11:50	3			X	X	X	X	X											
6	SBKR1000L520S102612S006	SBKR1000L520	SO	G	10/26/2012 13:35	3			X	X	X	X	X											
7	SBKR1000L520T102612MX	SBKR1000L520	SQ	G	10/26/2012 00:00	1	TRIP BLANK						X											

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	10.26.12	1555		10.26.12	1555
	10.26.12	1752		10.26.12	1752

Sample Receipt Conditions

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?
	Y/N	Y/N	Y/N
3.2°C	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

1210934

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_102612_GMK1 | Task: KRRI_0975,1000
Total # of Samples: 7 | Event Complete?
Turn Around Time: 5 Day | Rush: No

BILLING CODE: 6.00

Lab Information:
Lab Name: ALS Laboratory Group
Address: 3352 128th Ave. Holland, MI 49424-9263
Lab PM: Ann Preston
Phone/Fax: 1-616-399-6070/1-616-399-6185
Lab PM email: ann.preston@alsglobal.com
Applicable Lab Quote #:

Project Information:
Site ID #:
Project #: 60162778
Site Address: 5555 Glenwood Parkway SE Suite 200
City: Grand Rapids | State, Zip: MI
Site PM Name: Bryan Stiemsma
Phone/Fax: [redacted]
Site PM Email: Bryan.Stiemsma@aecom.com

Other Information:
Send Invoice to: Enbridge Energy - ATTN Accounts Payable
Address: 1100 Louisiana Suite 1100
City/State: Houson, TX | Phone #: 713-821-2000
PO #:
Send EDD to:
CC Hardcopy report:
CC Hardcopy report:

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	MeOH	None										
								Analysis	% Moisture	Ba,Mo,V,Ni by 6020	ORO,DRO	VOC by 5035/8260	PNAs by 8270										
1	SBKR0975L504S102612S004	SBKR0975L504	SO	G	10/26/2012 08:16	3			X	X	X	X	X										
2	SBKR0975L505S102612S008	SBKR0975L505	SO	G	10/26/2012 09:12	3			X	X	X	X	X										
3	SBKR0975L506S102612S005	SBKR0975L506	SO	G	10/26/2012 10:32	3			X	X	X	X	X										
4	SBKR1000L518S102612S006	SBKR1000L518	SO	G	10/26/2012 11:13	3			X	X	X	X	X										
5	SBKR1000L519S102612S006	SBKR1000L519	SO	G	10/26/2012 11:50	3			X	X	X	X	X										
6	SBKR1000L520S102612S006	SBKR1000L520	SO	G	10/26/2012 13:35	3			X	X	X	X	X										
7	SBKR1000L520T102612MX	SBKR1000L520	SQ	G	10/26/2012 00:00	1	TRIP BLANK					X											

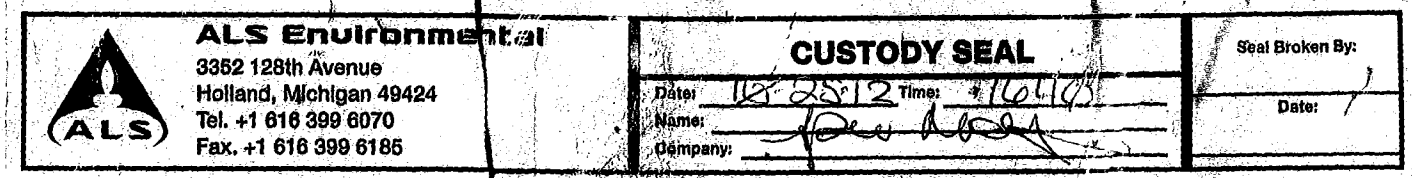
Additional Comments/Special Instructions:

RELINQUISHED BY/AFFILIATION	DATE	TIME	ACCEPTED BY/AFFILIATION	DATE	TIME

Sample Receipt Conditions

	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
Temp in OC	Samples on Ice?		Sample Intact?		Trip Blank?

SHIPPING INFO | SAMPLER NAME AND SIGNATURE
Company:
Tracking #:
PRINT Name of SAMPLER: GERRY KRAMER(GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date: 12-25-12 Time: 1610
Name:
Company:
Seal Broken By:
Date:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **26-Oct-12 17:52**

Work Order: **1210934** Received by: **PD**

Checklist completed by Keith Wierenga eSignature 27-Oct-12 Date Reviewed by: Ann Preston eSignature 27-Oct-12 Date

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/27/2012 8:59:35 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

02-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0950,0975L 10/25/12** Work Order: **1210935**

Dear Bryan,

ALS Environmental received 14 samples on 26-Oct-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 107.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Alex Csaszar

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 02-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950,0975L 10/25/12
Work Order: **1210935**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1210935-01	SBKR0950L502S102412S008	Soil		10/24/2012 16:10	10/26/2012 17:52	☐
1210935-02	SBKR0950L503S102412S004	Soil		10/24/2012 16:35	10/26/2012 17:52	☐
1210935-03	SBKR0950L503T102412MX	Soil		10/24/2012	10/26/2012 17:52	☐
1210935-04	SBKR0950L504S102512S004	Soil		10/25/2012 08:28	10/26/2012 17:52	☐
1210935-05	SBKR0950L505S102512S007	Soil		10/25/2012 09:06	10/26/2012 17:52	☐
1210935-06	SBKR0950L506S102512S008	Soil		10/25/2012 09:43	10/26/2012 17:52	☐
1210935-07	SBKR0950L507S102512S004	Soil		10/25/2012 11:06	10/26/2012 17:52	☐
1210935-08	SBKR0950L508S102512S005	Soil		10/25/2012 11:35	10/26/2012 17:52	☐
1210935-09	SBKR0950L509S102512S005	Soil		10/25/2012 13:25	10/26/2012 17:52	☐
1210935-10	SBKR0950L510S102512S005	Soil		10/25/2012 14:00	10/26/2012 17:52	☐
1210935-11	SBKR0950L510D102512S005	Soil		10/25/2012 14:00	10/26/2012 17:52	☐
1210935-12	SBKR0975L501S102512S005	Soil		10/25/2012 14:48	10/26/2012 17:52	☐
1210935-13	SBKR0975L502S102512S005	Soil		10/25/2012 15:38	10/26/2012 17:52	☐
1210935-14	SBKR0975L503S102512S003	Soil		10/25/2012 16:17	10/26/2012 17:52	☐

Client: AECOM Environment
Project: Marshall KRRI 0950,0975L 10/25/12
Work Order: 1210935

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44418, MS/MSD data for DRO is not related to this project's samples. No data requires qualification.

Batch 44418, Method DRO_8015M_S, Sample 1210935-12A MS: The MS ecovery was below the control limits for DRO and ORO. The reported results in the parent sample may be biased low.

Batch 44418, Method DRO_8015M_S, Sample 1210935-12A MSD: The MSD recovery was below the control limits for DRO and ORO. The reported results in the parent sample may be biased low.

Batch 44436, Method VOC_8260_S, Sample 1210935-01B MS: The MS recovery was above the upper control limits for Methyl tert-butyl ether. The reported result in the parent sample was non-detect. No qualification is required for this analyte.

Batch 44436, Method VOC_8260_S, Sample 1210935-01B MS: The MS recoveries were below the control limits for Chloroethane, Dichlorodifluoromethane, Hexachloroethane, trans-1,4-Dichloro-2-butene and Vinyl chloride. The reported results in the parent sample may be biased low.

Batch 44436, Method VOC_8260_S, Sample 1210935-01B MSD: The MSD recoveries were below the control limits for Chloroethane, Dichlorodifluoromethane, Hexachloroethane and Vinyl chloride. The reported results in the parent sample may be biased low.

Batch 44436, Method VOC_8260_S, Sample 1210935-01B MSD: The MSD recovery was above the upper control limits for Methyl tert-butyl ether. The reported result in the parent sample was non-detect. No qualification is required for this analyte.

Batch 44436, Method VOC_8260_S, Sample LCS-44436: The LCS recovery was above the upper control limits for Chloroethane. All sample results in the batch were non-detect. No qualification is necessary for this analyte.

Batch 44438, Method SVO_8270M_S, Sample 1210935-08, 1210935-09, 1210935-10,

1210935-11 and 1210935-13: The internal standard recoveries were below the lower control limits, but >20%. Per the client's request, the results associated with the IS are being reported and should be considered as estimated for these analytes.

Batch 44469, MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44477, Method ICP_6020_S, Sample 1210935-12AMSD: The matrix spike duplicate recovery was outside of the control limits for Vanadium. However, the matrix spike recovery and the RPD between the MS and MSD was in control. No qualification is required for this analyte.

Batch 44496, Method VOC_8260_S, Sample LCS-44496: The LCS recovery was outside of the lower control limits but within the Sporadic Marginal Exceedence limit for trans-1,4-Dichloro-2-butene. No qualification is necessary for this analyte.

Batch 44496, Method VOC_8260_S, Sample LCS-44496: The LCS recovery was above the upper control limits for Chloroethane. All sample results in the batch were non-detect. No qualification is necessary for this analyte.

Batch 44496, Method VOC_8260_SOIL, Sample 1210935-12B MS: The MS recoveries was above the upper control limits for Chloroethane and Vinyl chloride. The reported results in the parent sample were non-detect. No qualification is required for these analytes.

Batch 44496, Method VOC_8260_SOIL, Sample 1210935-12B MSD: The MSD recovery was above the upper control limits for Chloroethane. The reported result in the parent sample was non-detect. No qualification is required for this analyte.

ALS Group USA, Corp

Date: 02-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950,0975L 10/25/12
WorkOrder: **1210935**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L502S102412S008
Work Order:	1210935	**Collection Date:**	10/24/2012 4:10:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/29/2012**		Analyst: **CW**
DRO (C10-C20)	**83**	**14**	**4.0**		**mg/Kg-dry**	1	10/30/2012
ORO (C20-C34)	**300**	**28**	**4.0**		**mg/Kg-dry**	1	10/30/2012
Surr: 4-Terphenyl-d14	*68.6*	*39-115*			*%REC*	1	10/30/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	0.88	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.2	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**17**	**2.2**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**17**	**2.2**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/29/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/30/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/30/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(a)pyrene	**410**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Benzo(b)fluoranthene	**750**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Chrysene	**370**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Fluoranthene	**520**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/30/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/30/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Pyrene	**510**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Surr: 2,4,6-Tribromophenol	*95.5*	*34-140*			*%REC*	1	10/30/2012
Surr: 2-Fluorobiphenyl	*85.3*	*12-100*			*%REC*	1	10/30/2012
Surr: 2-Fluorophenol	*89.9*	*33-117*			*%REC*	1	10/30/2012
Surr: 4-Terphenyl-d14	*121*	*25-137*			*%REC*	1	10/30/2012
Surr: Nitrobenzene-d5	*78.8*	*37-107*			*%REC*	1	10/30/2012
Surr: Phenol-d6	*82.2*	*40-106*			*%REC*	1	10/30/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	89	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	89	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	89	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	89	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L502S102412S008
Work Order:	1210935	**Collection Date:**	10/24/2012 4:10:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	89	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	89	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	89	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	89	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	89	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	89	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	89	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	89	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	300	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	89	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	89	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	89	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L502S102412S008
Work Order:	1210935	**Collection Date:**	10/24/2012 4:10:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	89	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	180	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	89	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	89	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	89	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	89	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	89	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	89	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	100	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	89	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	89	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	89	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	89	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	89	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*98.2*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*97.9*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*99.8*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*94.6*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**33**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L503S102412S004
Work Order:	1210935	**Collection Date:**	10/24/2012 4:35:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/29/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**33**	**4.0**		**mg/Kg-dry**	1	10/30/2012
ORO (C20-C34)	**750**	**66**	**4.0**		**mg/Kg-dry**	1	10/30/2012
Surr: 4-Terphenyl-d14	*66.9*	*39-115*			*%REC*	1	10/30/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	4.4	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**18**	**4.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**14**	**4.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/29/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/30/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/30/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(a)anthracene	**520**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Benzo(a)pyrene	**710**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Benzo(b)fluoranthene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(k)fluoranthene	**660**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Chrysene	**680**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Fluoranthene	**960**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/30/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/30/2012
Phenanthrene	**380**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Pyrene	**910**	**330**	**330**		**µg/Kg-dry**	1	10/30/2012
Surr: 2,4,6-Tribromophenol	*90.7*	*34-140*			*%REC*	1	10/30/2012
Surr: 2-Fluorobiphenyl	*80.4*	*12-100*			*%REC*	1	10/30/2012
Surr: 2-Fluorophenol	*86.2*	*33-117*			*%REC*	1	10/30/2012
Surr: 4-Terphenyl-d14	*117*	*25-137*			*%REC*	1	10/30/2012
Surr: Nitrobenzene-d5	*74.0*	*37-107*			*%REC*	1	10/30/2012
Surr: Phenol-d6	*78.0*	*40-106*			*%REC*	1	10/30/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	610	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	610	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	610	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	610	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	610	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L503S102412S004
Work Order:	1210935	**Collection Date:**	10/24/2012 4:35:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	610	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	610	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	610	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	610	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	610	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	610	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	610	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	610	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	610	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
2-Butanone	**3,000**	**2,000**	**750**		**µg/Kg-dry**	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	2,000	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	5,100	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	610	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	610	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	610	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	610	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	610	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	610	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	610	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	610	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	610	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	2,000	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	610	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	610	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	610	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	610	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	610	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	610	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	610	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	610	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	610	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	610	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	610	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L503S102412S004
Work Order:	1210935	**Collection Date:**	10/24/2012 4:35:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	610	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	610	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	610	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	1,200	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	610	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	610	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	610	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	2,000	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	610	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	610	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	610	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	610	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	610	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	610	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	610	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	610	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	610	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	2,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	610	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	610	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	610	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	610	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	610	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	610	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	610	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*100*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**71**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L503T102412MX
Work Order:	1210935	**Collection Date:**	10/24/2012
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	10/31/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	10/31/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	10/31/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	10/31/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	10/31/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	10/31/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	10/31/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	10/31/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	10/31/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	10/31/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	10/31/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	10/31/2012
Acetone	ND	1,000	1,000		µg/Kg	1	10/31/2012
Acrylonitrile	ND	100	100		µg/Kg	1	10/31/2012
Benzene	ND	50	50		µg/Kg	1	10/31/2012
Bromobenzene	ND	100	100		µg/Kg	1	10/31/2012
Bromochloromethane	ND	100	100		µg/Kg	1	10/31/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	10/31/2012
Bromoform	ND	100	100		µg/Kg	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg	1	10/31/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	10/31/2012
Chlorobenzene	ND	50	50		µg/Kg	1	10/31/2012
Chloroethane	ND	250	250		µg/Kg	1	10/31/2012
Chloroform	ND	50	50		µg/Kg	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg	1	10/31/2012
cis-1,2-Dichloroethene	**150**	**50**	**50**		**µg/Kg**	1	10/31/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L503T102412MX
Work Order:	1210935	**Collection Date:**	10/24/2012
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	10/31/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	10/31/2012
Ethylbenzene	ND	50	50		µg/Kg	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	10/31/2012
m,p-Xylene	ND	100	100		µg/Kg	1	10/31/2012
Methyl iodide	ND	100	100		µg/Kg	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	10/31/2012
Methylene chloride	ND	100	100		µg/Kg	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg	1	10/31/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	10/31/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	10/31/2012
o-Xylene	ND	50	50		µg/Kg	1	10/31/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	10/31/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	10/31/2012
Styrene	ND	50	50		µg/Kg	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	10/31/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	10/31/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	10/31/2012
Toluene	ND	100	100		µg/Kg	1	10/31/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	10/31/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	10/31/2012
Trichloroethene	ND	50	50		µg/Kg	1	10/31/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	10/31/2012
Vinyl chloride	ND	40	40		µg/Kg	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*98.3*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*98.2*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*87.9*	*70-130*			*%REC*	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L504S102512S004
Work Order:	1210935	**Collection Date:**	10/25/2012 8:28:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/29/2012**		Analyst: **CW**
DRO (C10-C20)	**80**	**17**	**4.0**		**mg/Kg-dry**	1	10/30/2012
ORO (C20-C34)	**220**	**34**	**4.0**		**mg/Kg-dry**	1	10/30/2012
Surr: 4-Terphenyl-d14	*64.0*	*39-115*			*%REC*	1	10/30/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.9	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**6.3**	**2.9**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**11**	**2.9**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/29/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/30/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/30/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/30/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/30/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/30/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/30/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/30/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/30/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/30/2012
Surr: 2,4,6-Tribromophenol	*93.6*	*34-140*			*%REC*	1	10/30/2012
Surr: 2-Fluorobiphenyl	*81.8*	*12-100*			*%REC*	1	10/30/2012
Surr: 2-Fluorophenol	*93.6*	*33-117*			*%REC*	1	10/30/2012
Surr: 4-Terphenyl-d14	*118*	*25-137*			*%REC*	1	10/30/2012
Surr: Nitrobenzene-d5	*79.6*	*37-107*			*%REC*	1	10/30/2012
Surr: Phenol-d6	*83.0*	*40-106*			*%REC*	1	10/30/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	140	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L504S102512S004
Work Order:	1210935	**Collection Date:**	10/25/2012 8:28:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	140	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	140	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	140	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
2-Butanone	**760**	**750**	**750**		**µg/Kg-dry**	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	460	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	**1,900**	**1,200**	**1,000**		**µg/Kg-dry**	1	10/31/2012
Acrylonitrile	ND	140	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	140	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	460	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	140	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

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ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L504S102512S004
Work Order:	1210935	**Collection Date:**	10/25/2012 8:28:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	280	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	140	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	140	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	460	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	140	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	140	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	140	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	140	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	140	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	140	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*99.6*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*102*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*101*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**44**	**0.050**	**0**		**% of sample**	1	10/29/2012

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ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L505S102512S007
Work Order:	1210935	**Collection Date:**	10/25/2012 9:06:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**43**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**350**	**86**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*63.1*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	2.8	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	6.9	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**37**	**6.9**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**46**	**6.9**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*89.2*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*73.6*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*83.1*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*109*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*72.6*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*72.7*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	1,100	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	1,100	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	1,100	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	1,100	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	1,100	50		µg/Kg-dry	1	10/31/2012

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ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L505S102512S007
Work Order:	1210935	**Collection Date:**	10/25/2012 9:06:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	1,100	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	1,100	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	1,100	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	1,100	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	1,100	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	1,100	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	1,100	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	1,100	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
2-Butanone	**5,200**	**3,600**	**750**		**µg/Kg-dry**	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	3,600	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	9,100	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	1,100	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	1,100	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	3,600	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	1,100	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	1,100	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	1,100	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	1,100	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	1,100	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	1,100	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	1,100	250		µg/Kg-dry	1	10/31/2012

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Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L505S102512S007
Work Order:	1210935	**Collection Date:**	10/25/2012 9:06:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	1,100	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	1,100	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	2,200	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	1,100	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	3,600	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	3,600	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	1,100	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	3,600	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	1,100	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	1,100	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	1,100	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	1,100	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*100*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**78**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L506S102512S008
Work Order:	1210935	**Collection Date:**	10/25/2012 9:43:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**83**	**17**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**220**	**34**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*62.4*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**12**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**14**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*83.8*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*70.4*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*78.1*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*109*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*68.8*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*69.2*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L506S102512S008
Work Order:	1210935	**Collection Date:**	10/25/2012 9:43:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	440	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	130	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	130	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	440	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	130	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L506S102512S008
Work Order:	1210935	**Collection Date:**	10/25/2012 9:43:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	260	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	440	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	130	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	130	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*99.8*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*101*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**43**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L507S102512S004
Work Order:	1210935	**Collection Date:**	10/25/2012 11:06:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**81**	**21**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**150**	**42**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*54.8*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**11**	**3.0**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**18**	**3.0**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*75.1*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*53.6*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*59.0*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*93.1*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*52.3*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*51.3*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	230	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	230	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	230	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	230	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	230	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L507S102512S004
Work Order:	1210935	**Collection Date:**	10/25/2012 11:06:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	230	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	230	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	230	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	230	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	230	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	230	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	760	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	760	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,900	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	230	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	230	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	230	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	230	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	230	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	230	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	230	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	230	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	760	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	230	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	230	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	230	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	230	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	230	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L507S102512S004
Work Order:	1210935	**Collection Date:**	10/25/2012 11:06:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	230	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	460	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	230	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	230	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	760	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	230	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	230	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	230	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	230	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	230	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	230	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	230	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	230	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	230	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	230	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	230	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	230	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	230	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	230	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	230	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*95.6*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*95.2*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*94.8*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*96.8*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**55**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L508S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 11:35:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**320**	**29**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**2,000**	**57**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*69.3*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	4.5	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**20**	**4.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**20**	**4.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**710**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**920**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**2,100**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**830**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Chrysene	**870**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	**390**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	**430**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Pyrene	**1,100**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*84.8*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*70.9*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*70.4*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*105*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*62.0*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*66.4*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/31/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	490	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	490	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	490	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	490	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	490	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L508S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 11:35:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	490	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	490	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	490	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	490	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	490	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	490	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	490	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	490	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	490	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	1,600	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	1,600	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	4,100	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	490	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	490	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	490	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	490	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	490	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	490	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	490	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	490	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	490	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	1,600	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	490	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	490	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	490	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	490	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	490	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	490	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	490	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	490	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	490	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	490	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L508S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 11:35:00 AM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	490	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	490	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	490	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	980	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	490	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	490	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	490	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	1,600	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	490	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	490	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	490	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	490	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	490	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	490	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	490	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	490	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	490	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,600	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	490	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	490	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	490	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	490	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	490	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	490	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	490	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*97.2*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*94.8*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*90.0*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**68**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L509S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 1:25:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**100**	**17**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**410**	**35**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*64.2*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**20**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**20**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**440**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**550**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**1,100**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**360**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Chrysene	**410**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	**670**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**690**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*79.4*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*69.2*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*68.9*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*105*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*60.1*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*63.8*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/31/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	140	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L509S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 1:25:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	140	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	140	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	140	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	140	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	480	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,200	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	140	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	140	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	140	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	480	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	140	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L509S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 1:25:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	290	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	140	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	140	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	480	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	140	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	140	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	140	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	140	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	140	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	140	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	140	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	140	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	140	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	140	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	140	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*97.4*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*96.4*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*91.6*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**45**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:00:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**91**	**17**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**320**	**35**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*62.8*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.6	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**15**	**2.6**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**25**	**2.6**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**390**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**490**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**870**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**370**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Chrysene	**380**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	**520**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**540**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*81.1*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*66.0*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*71.1*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*105*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*63.8*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*63.9*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/31/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	150	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:00:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	150	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	150	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	150	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	500	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,200	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	150	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	150	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	500	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	150	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	150	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:00:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	300	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	150	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	150	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	500	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	150	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	150	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	150	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	150	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	150	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	150	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	150	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*96.0*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*97.4*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*90.8*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**46**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510D102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:00:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**95**	**18**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**300**	**37**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*65.8*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**14**	**2.7**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**20**	**2.7**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**380**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**510**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**1,100**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Chrysene	**400**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	**540**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**610**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*86.8*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*70.3*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*75.6*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*115*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*65.3*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*67.5*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/31/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	150	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510D102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:00:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	150	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	150	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	150	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	150	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	510	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,300	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	150	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	150	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	150	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	510	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	150	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	150	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950L510D102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:00:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	300	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	150	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	150	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	510	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	150	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	150	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	150	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	150	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	150	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	150	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	150	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	150	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	150	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	150	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	150	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*99.8*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*97.4*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*98.2*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*89.0*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**46**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L501S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:48:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**23**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**310**	**46**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*61.1*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.5	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	3.7	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**12**	**3.7**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**20**	**3.7**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*90.3*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*69.7*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*76.5*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*105*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*68.9*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*65.6*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/31/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	72	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	72	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	72	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	72	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L501S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:48:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	72	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	72	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	72	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	72	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	72	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	72	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	72	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	72	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	72	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	72	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	72	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L501S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 2:48:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	72	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	140	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	72	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	72	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	72	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	72	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	72	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	72	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	100	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	72	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	72	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	72	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	72	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	72	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*98.5*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*95.1*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*95.6*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*96.6*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**58**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L502S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 3:38:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**100**	**19**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**300**	**39**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*64.8*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	0.99	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**11**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**17**	**2.5**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	**370**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Benzo(a)pyrene	**500**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(b)fluoranthene	**870**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	**400**	**330**	**330**	*	**µg/Kg-dry**	1	10/31/2012
Chrysene	**390**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	**570**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	**620**	**330**	**330**		**µg/Kg-dry**	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*83.4*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*65.9*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*69.5*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*112*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*61.0*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*62.5*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/31/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	170	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	170	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	170	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	170	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	170	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L502S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 3:38:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	170	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	170	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	170	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	170	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	170	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	170	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	570	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,400	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	170	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	170	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	170	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	170	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	170	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	170	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	170	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	570	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	170	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	170	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	170	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	170	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L502S102512S005
Work Order:	1210935	**Collection Date:**	10/25/2012 3:38:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	170	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	340	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	170	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	170	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	570	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	170	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	170	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	170	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	170	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	170	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	170	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	170	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	170	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	170	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	170	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	170	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	170	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	170	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	170	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	170	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*100*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*98.3*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*94.8*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*89.4*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**49**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L503S102512S003
Work Order:	1210935	**Collection Date:**	10/25/2012 4:17:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-14	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**72**	**14**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**190**	**29**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*62.4*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	0.85	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	2.1	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**9.1**	**2.1**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**18**	**2.1**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*83.1*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*67.0*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*72.2*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*97.9*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*65.6*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*65.0*	*40-106*			*%REC*	1	10/31/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **10/29/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,1,1-Trichloroethane	ND	96	50		µg/Kg-dry	1	10/31/2012
1,1,2,2-Tetrachloroethane	ND	96	50		µg/Kg-dry	1	10/31/2012
1,1,2-Trichloroethane	ND	96	50		µg/Kg-dry	1	10/31/2012
1,1-Dichloroethane	ND	96	50		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L503S102512S003
Work Order:	1210935	**Collection Date:**	10/25/2012 4:17:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-14	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	96	50		µg/Kg-dry	1	10/31/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dibromo-3-chloropropane	ND	96	10		µg/Kg-dry	1	10/31/2012
1,2-Dibromoethane	ND	96	20		µg/Kg-dry	1	10/31/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,2-Dichloroethane	ND	96	50		µg/Kg-dry	1	10/31/2012
1,2-Dichloropropane	ND	96	50		µg/Kg-dry	1	10/31/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	10/31/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	10/31/2012
Benzene	ND	96	50		µg/Kg-dry	1	10/31/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromoform	ND	100	100		µg/Kg-dry	1	10/31/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	10/31/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	10/31/2012
Carbon tetrachloride	ND	96	50		µg/Kg-dry	1	10/31/2012
Chlorobenzene	ND	96	50		µg/Kg-dry	1	10/31/2012
Chloroethane	ND	320	250		µg/Kg-dry	1	10/31/2012
Chloroform	ND	96	50		µg/Kg-dry	1	10/31/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
cis-1,2-Dichloroethene	ND	96	50		µg/Kg-dry	1	10/31/2012
cis-1,3-Dichloropropene	ND	96	50		µg/Kg-dry	1	10/31/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	10/31/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	10/31/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	10/31/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975L503S102512S003
Work Order:	1210935	**Collection Date:**	10/25/2012 4:17:00 PM
Project:	Marshall KRRI 0950,0975L 10/25/12		
Lab ID:	1210935-14	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	96	50		µg/Kg-dry	1	10/31/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	10/31/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	10/31/2012
m,p-Xylene	ND	190	100		µg/Kg-dry	1	10/31/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	10/31/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	10/31/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
n-Butylbenzene	ND	96	50		µg/Kg-dry	1	10/31/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	10/31/2012
o-Xylene	ND	96	50		µg/Kg-dry	1	10/31/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	10/31/2012
sec-Butylbenzene	ND	96	50		µg/Kg-dry	1	10/31/2012
Styrene	ND	96	50		µg/Kg-dry	1	10/31/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	10/31/2012
tert-Butylbenzene	ND	96	50		µg/Kg-dry	1	10/31/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	10/31/2012
Tetrachloroethene	ND	96	50		µg/Kg-dry	1	10/31/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	10/31/2012
Toluene	ND	100	100		µg/Kg-dry	1	10/31/2012
trans-1,2-Dichloroethene	ND	96	50		µg/Kg-dry	1	10/31/2012
trans-1,3-Dichloropropene	ND	96	50		µg/Kg-dry	1	10/31/2012
trans-1,4-Dichloro-2-butene	ND	96	50		µg/Kg-dry	1	10/31/2012
Trichloroethene	ND	96	50		µg/Kg-dry	1	10/31/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	10/31/2012
Vinyl chloride	ND	96	40		µg/Kg-dry	1	10/31/2012
Surr: 1,2-Dichloroethane-d4	*97.8*	*70-130*			*%REC*	1	10/31/2012
Surr: 4-Bromofluorobenzene	*97.7*	*70-130*			*%REC*	1	10/31/2012
Surr: Dibromofluoromethane	*96.6*	*70-130*			*%REC*	1	10/31/2012
Surr: Toluene-d8	*99.1*	*70-130*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**35**	**0.050**	**0**		**% of sample**	1	10/29/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44418** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44418-44418** Units: **mg/Kg** Analysis Date: **10/29/2012 08:57 PM**

Client ID: Run ID: **GC8_121029A** SeqNo: **2127133** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*2.89*	0	*5*	0	*57.8*	*39-115*	0			

LCS Sample ID: **DLCSS1-44418-44418** Units: **mg/Kg** Analysis Date: **10/29/2012 09:24 PM**

Client ID: Run ID: **GC8_121029A** SeqNo: **2127134** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	320.9	10	500	0	64.2	49-124	0			
ORO (C20-C34)	370.4	20	500	0	74.1	60-130	0			
Surr: 4-Terphenyl-d14	*3.448*	0	*5*	0	*69*	*39-115*	0			

MS Sample ID: **1210841-03B MS** Units: **mg/Kg** Analysis Date: **10/29/2012 09:51 PM**

Client ID: Run ID: **GC8_121029A** SeqNo: **2127135** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	313.4	9.9	493.4	44.05	54.6	60-130	0			S
ORO (C20-C34)	411	20	493.4	112.5	60.5	60-130	0			
Surr: 4-Terphenyl-d14	*3.394*	0	*4.934*	0	*68.8*	*39-115*	0			

MSD Sample ID: **1210841-03B MSD** Units: **mg/Kg** Analysis Date: **10/29/2012 10:18 PM**

Client ID: Run ID: **GC8_121029A** SeqNo: **2127136** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	309.8	9.9	494.3	44.05	53.8	60-130	313.4	1.15	30	S
ORO (C20-C34)	430.7	20	494.3	112.5	64.4	60-130	411	4.67	30	
Surr: 4-Terphenyl-d14	*3.477*	0	*4.943*	0	*70.3*	*39-115*	3.394	*2.42*	*30*	

The following samples were analyzed in this batch: 1210935-01A 1210935-02A 1210935-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44439** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44439-44439** Units: **mg/Kg** Analysis Date: **10/31/2012 08:27 A**
Client ID: Run ID: **GC8_121031A** SeqNo: **2128609** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.339*	0	*5*	0	*66.8*	*39-115*	0			

LCS Sample ID: **DLCSS1-44439-44439** Units: **mg/Kg** Analysis Date: **10/31/2012 08:54 A**
Client ID: Run ID: **GC8_121031A** SeqNo: **2128610** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	312.4	10	500	0	62.5	49-124	0			
ORO (C20-C34)	366.9	20	500	0	73.4	60-130	0			
Surr: 4-Terphenyl-d14	*3.857*	0	*5*	0	*77.1*	*39-115*	0			

MS Sample ID: **1210935-12A MS** Units: **mg/Kg** Analysis Date: **10/31/2012 09:21 A**
Client ID: **SBKR0975L501S102512S005** Run ID: **GC8_121031A** SeqNo: **2128612** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.5	10	499.3	48.29	52.5	60-130	0			S
ORO (C20-C34)	427.2	20	499.3	129.2	59.7	60-130	0			S
Surr: 4-Terphenyl-d14	*3.736*	0	*4.993*	0	*74.8*	*39-115*	0			

MSD Sample ID: **1210935-12A MSD** Units: **mg/Kg** Analysis Date: **10/31/2012 09:48 A**
Client ID: **SBKR0975L501S102512S005** Run ID: **GC8_121031A** SeqNo: **2128613** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	267.8	9.1	455.5	48.29	48.2	60-130	310.5	14.8	30	S
ORO (C20-C34)	374.2	18	455.5	129.2	53.8	60-130	427.2	13.2	30	S
Surr: 4-Terphenyl-d14	*3.321*	0	*4.555*	0	*72.9*	*39-115*	3.736	*11.8*	*30*	

The following samples were analyzed in this batch:

1210935-05A	1210935-06A	1210935-07A
1210935-08A	1210935-09A	1210935-10A
1210935-11A	1210935-12A	1210935-13A
1210935-14A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44469** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44469-44469** Units: **mg/Kg** Analysis Date: **10/31/2012 01:31 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127952** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.00741	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44469-44469** Units: **mg/Kg** Analysis Date: **10/31/2012 01:37 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127955** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.702	0.10	5	0	94	80-120	0			
Molybdenum	4.838	0.25	5	0	96.8	80-120	0			
Nickel	4.743	0.25	5	0	94.9	80-120	0			
Vanadium	4.836	0.25	5	0	96.7	80-120	0			

MS Sample ID: **1210643-01BMS** Units: **mg/Kg** Analysis Date: **10/31/2012 01:48 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127961** Prep Date: **10/31/2012** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.552	0.76	7.587	1.057	85.6	75-125	0			
Nickel	15.93	0.76	7.587	9.558	84	75-125	0			
Vanadium	22.87	0.76	7.587	15.08	103	75-125	0			

MS Sample ID: **1210643-01BMS** Units: **mg/Kg** Analysis Date: **10/31/2012 02:16 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127966** Prep Date: **10/31/2012** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.929	3.0	7.587	0.4855	98.1	75-125	0			

MSD Sample ID: **1210643-01BMSD** Units: **mg/Kg** Analysis Date: **10/31/2012 01:54 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127962** Prep Date: **10/31/2012** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	7.927	0.76	7.645	1.057	89.9	75-125	7.552	4.84	25	
Nickel	16.21	0.76	7.645	9.558	87	75-125	15.93	1.71	25	
Vanadium	23.64	0.76	7.645	15.08	112	75-125	22.87	3.32	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44469** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **1210643-01BMSD** Units: **mg/Kg** Analysis Date: **10/31/2012 02:22 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2127967** Prep Date: **10/31/2012** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	8.034	3.1	7.645	0.4855	98.7	75-125	7.929	1.32	25	

The following samples were analyzed in this batch:

1210935-01A	1210935-02A	1210935-04A
1210935-05A	1210935-06A	1210935-07A
1210935-08A	1210935-09A	1210935-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44477** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44477-44477** Units: **mg/Kg** Analysis Date: **10/31/2012 07:23 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2128604** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01206	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44477-44477** Units: **mg/Kg** Analysis Date: **10/31/2012 07:28 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2128605** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.698	0.10	5	0	94	80-120	0			
Molybdenum	4.882	0.25	5	0	97.6	80-120	0			
Nickel	4.855	0.25	5	0	97.1	80-120	0			
Vanadium	4.798	0.25	5	0	96	80-120	0			

MS Sample ID: **1210935-12AMS** Units: **mg/Kg** Analysis Date: **10/31/2012 07:40 PM**
Client ID: **SBKR0975L501S102512S005** Run ID: **ICPMS1_121031A** SeqNo: **2128607** Prep Date: **10/31/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.284	0.60	7.485	0.1336	95.5	75-125	0			
Molybdenum	7.913	1.5	7.485	0.327	101	75-125	0			
Nickel	12.75	1.5	7.485	4.895	105	75-125	0			
Vanadium	17.39	1.5	7.485	8.337	121	75-125	0			

MSD Sample ID: **1210935-12AMSD** Units: **mg/Kg** Analysis Date: **10/31/2012 07:45 PM**
Client ID: **SBKR0975L501S102512S005** Run ID: **ICPMS1_121031A** SeqNo: **2128608** Prep Date: **10/31/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.798	0.63	7.874	0.1336	97.3	75-125	7.284	6.82	25	
Molybdenum	8.485	1.6	7.874	0.327	104	75-125	7.913	6.97	25	
Nickel	13.73	1.6	7.874	4.895	112	75-125	12.75	7.38	25	
Vanadium	18.67	1.6	7.874	8.337	131	75-125	17.39	7.13	25	S

The following samples were analyzed in this batch: 1210935-11A 1210935-12A 1210935-13A 1210935-14A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44417** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44417-44417** Units: **µg/Kg** Analysis Date: **10/30/2012 09:42 A**
Client ID: Run ID: **SVMS4_121030A** SeqNo: **2126735** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*4279*	0	*5000*	0	*85.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*4081*	0	*5000*	0	*81.6*	*12-100*	0			
Surr: 2-Fluorophenol	*4395*	0	*5000*	0	*87.9*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6455*	0	*5000*	0	*129*	*25-137*	0			
Surr: Nitrobenzene-d5	*4083*	0	*5000*	0	*81.7*	*37-107*	0			
Surr: Phenol-d6	*4030*	0	*5000*	0	*80.6*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44417** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44417-44417** Units: **µg/Kg** Analysis Date: **10/30/2012 07:37 A**
Client ID: Run ID: **SVMS4_121030A** SeqNo: **2126722** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1669	50	2000	0	83.4	45-105	0			
Acenaphthene	1674	50	2000	0	83.7	45-110	0			
Acenaphthylene	1831	50	2000	0	91.6	45-105	0			
Anthracene	1791	50	2000	0	89.6	55-105	0			
Benzo(a)anthracene	1808	50	2000	0	90.4	50-110	0			
Benzo(a)pyrene	1942	50	2000	0	97.1	50-110	0			
Benzo(b)fluoranthene	1884	50	2000	0	94.2	45-115	0			
Benzo(g,h,i)perylene	1932	50	2000	0	96.6	40-125	0			
Benzo(k)fluoranthene	2066	50	2000	0	103	45-115	0			
Chrysene	1839	50	2000	0	92	55-110	0			
Dibenzo(a,h)anthracene	1654	50	2000	0	82.7	40-125	0			
Fluoranthene	1898	50	2000	0	94.9	55-115	0			
Fluorene	1539	50	2000	0	77	50-110	0			
Indeno(1,2,3-cd)pyrene	1680	50	2000	0	84	40-120	0			
Naphthalene	1643	50	2000	0	82.2	40-105	0			
Phenanthrene	1792	50	2000	0	89.6	50-110	0			
Pyrene	1869	50	2000	0	93.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*4631*	0	*5000*	0	*92.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*4423*	0	*5000*	0	*88.5*	*12-100*	0			
Surr: 2-Fluorophenol	*4500*	0	*5000*	0	*90*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6160*	0	*5000*	0	*123*	*25-137*	0			
Surr: Nitrobenzene-d5	*4375*	0	*5000*	0	*87.5*	*37-107*	0			
Surr: Phenol-d6	*4122*	0	*5000*	0	*82.4*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44417** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1210841-03B MS** Units: **µg/Kg** Analysis Date: **10/30/2012 08:08 A**
Client ID: Run ID: **SVMS4_121030A** SeqNo: **2126723** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1475	47	1866	0	79	45-105	0			
Acenaphthene	1497	47	1866	0	80.2	45-110	0			
Acenaphthylene	1643	47	1866	0	88	45-105	0			
Anthracene	1589	47	1866	0	85.2	55-105	0			
Benzo(a)anthracene	1606	47	1866	0	86	50-110	0			
Benzo(a)pyrene	1644	47	1866	0	88.1	50-110	0			
Benzo(b)fluoranthene	1912	47	1866	0	102	45-115	0			
Benzo(g,h,i)perylene	1607	47	1866	0	86.1	40-125	0			
Benzo(k)fluoranthene	1759	47	1866	0	94.2	45-115	0			
Chrysene	1537	47	1866	0	82.4	55-110	0			
Dibenzo(a,h)anthracene	1428	47	1866	0	76.5	40-125	0			
Fluoranthene	1711	47	1866	0	91.6	55-115	0			
Fluorene	1404	47	1866	0	75.2	50-110	0			
Indeno(1,2,3-cd)pyrene	1415	47	1866	0	75.8	40-120	0			
Naphthalene	1418	47	1866	0	76	40-105	0			
Phenanthrene	1625	47	1866	0	87	50-110	0			
Pyrene	1671	47	1866	0	89.6	45-125	0			
Surr: 2,4,6-Tribromophenol	*4541*	0	*4666*	0	*97.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3957*	0	*4666*	0	*84.8*	*12-100*	0			
Surr: 2-Fluorophenol	*3919*	0	*4666*	0	*84*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5439*	0	*4666*	0	*117*	*25-137*	0			
Surr: Nitrobenzene-d5	*3792*	0	*4666*	0	*81.3*	*37-107*	0			
Surr: Phenol-d6	*3668*	0	*4666*	0	*78.6*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44417** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1210841-03B MSD** Units: **µg/Kg** Analysis Date: **10/30/2012 08:40 A**

Client ID: Run ID: **SVMS4_121030A** SeqNo: **2126724** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1445	47	1861	0	77.6	45-105	1475	2.06	30	
Acenaphthene	1522	47	1861	0	81.8	45-110	1497	1.64	30	
Acenaphthylene	1682	47	1861	0	90.4	45-105	1643	2.31	30	
Anthracene	1634	47	1861	0	87.8	55-105	1589	2.79	30	
Benzo(a)anthracene	1632	47	1861	0	87.7	50-110	1606	1.63	30	
Benzo(a)pyrene	1711	47	1861	0	92	50-110	1644	4.01	30	
Benzo(b)fluoranthene	1896	47	1861	0	102	45-115	1912	0.858	30	
Benzo(g,h,i)perylene	1550	47	1861	0	83.3	40-125	1607	3.58	30	
Benzo(k)fluoranthene	1861	47	1861	0	100	45-115	1759	5.65	30	
Chrysene	1599	47	1861	0	85.9	55-110	1537	3.95	30	
Dibenzo(a,h)anthracene	1423	47	1861	0	76.4	40-125	1428	0.336	30	
Fluoranthene	1694	47	1861	0	91	55-115	1711	0.982	30	
Fluorene	1442	47	1861	0	77.4	50-110	1404	2.68	30	
Indeno(1,2,3-cd)pyrene	1395	47	1861	0	75	40-120	1415	1.4	30	
Naphthalene	1393	47	1861	0	74.8	40-105	1418	1.79	30	
Phenanthrene	1669	47	1861	0	89.6	50-110	1625	2.67	30	
Pyrene	1623	47	1861	0	87.2	45-125	1671	2.93	30	
Surr: 2,4,6-Tribromophenol	*4777*	0	*4653*	0	*103*	*34-140*	4541	*5.07*	*40*	
Surr: 2-Fluorobiphenyl	*4007*	0	*4653*	0	*86.1*	*12-100*	3957	*1.27*	*40*	
Surr: 2-Fluorophenol	*3886*	0	*4653*	0	*83.5*	*33-117*	3919	*0.867*	*40*	
Surr: 4-Terphenyl-d14	*5364*	0	*4653*	0	*115*	*25-137*	5439	*1.37*	*40*	
Surr: Nitrobenzene-d5	*3713*	0	*4653*	0	*79.8*	*37-107*	3792	*2.11*	*40*	
Surr: Phenol-d6	*3709*	0	*4653*	0	*79.7*	*40-106*	3668	*1.09*	*40*	

The following samples were analyzed in this batch: 1210935-01A 1210935-02A 1210935-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44438-44438** Units: **µg/Kg** Analysis Date: **10/31/2012 09:24 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127685** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3866*	0	*5000*	0	*77.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3854*	0	*5000*	0	*77.1*	*12-100*	0			
Surr: 2-Fluorophenol	*4328*	0	*5000*	0	*86.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6124*	0	*5000*	0	*122*	*25-137*	0			
Surr: Nitrobenzene-d5	*3847*	0	*5000*	0	*76.9*	*37-107*	0			
Surr: Phenol-d6	*3759*	0	*5000*	0	*75.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44438-44438** Units: **µg/Kg** Analysis Date: **10/31/2012 08:53 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127684** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1591	50	2000	0	79.6	45-105	0			
Acenaphthene	1586	50	2000	0	79.3	45-110	0			
Acenaphthylene	1749	50	2000	0	87.4	45-105	0			
Anthracene	1744	50	2000	0	87.2	55-105	0			
Benzo(a)anthracene	1743	50	2000	0	87.2	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	2078	50	2000	0	104	45-115	0			
Benzo(g,h,i)perylene	2233	50	2000	0	112	40-125	0			
Benzo(k)fluoranthene	2286	50	2000	0	114	45-115	0			
Chrysene	1697	50	2000	0	84.8	55-110	0			
Dibenzo(a,h)anthracene	1956	50	2000	0	97.8	40-125	0			
Fluoranthene	1682	50	2000	0	84.1	55-115	0			
Fluorene	1493	50	2000	0	74.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1974	50	2000	0	98.7	40-120	0			
Naphthalene	1557	50	2000	0	77.8	40-105	0			
Phenanthrene	1712	50	2000	0	85.6	50-110	0			
Pyrene	1681	50	2000	0	84	45-125	0			
Surr: 2,4,6-Tribromophenol	*4305*	0	*5000*	0	*86.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*4064*	0	*5000*	0	*81.3*	*12-100*	0			
Surr: 2-Fluorophenol	*4380*	0	*5000*	0	*87.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5656*	0	*5000*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*4086*	0	*5000*	0	*81.7*	*37-107*	0			
Surr: Phenol-d6	*3959*	0	*5000*	0	*79.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1210935-12A MS** Units: **µg/Kg** Analysis Date: **10/31/2012 10:39 A**
Client ID: **SBKR0975L501S102512S005** Run ID: **SVMS4_121031A** SeqNo: **2127686** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1373	49	1963	0	70	45-105	0			
Acenaphthene	1499	49	1963	0	76.4	45-110	0			
Acenaphthylene	1657	49	1963	0	84.4	45-105	0			
Anthracene	1606	49	1963	0	81.8	55-105	0			
Benzo(a)anthracene	1668	49	1963	66.86	81.5	50-110	0			
Benzo(a)pyrene	2050	49	1963	85.96	100	50-110	0			
Benzo(b)fluoranthene	2239	49	1963	74.5	110	45-115	0			
Benzo(g,h,i)perylene	1708	49	1963	0	87	40-125	0			
Benzo(k)fluoranthene	2080	49	1963	113.7	100	45-115	0			
Chrysene	1595	49	1963	68.77	77.7	55-110	0			
Dibenzo(a,h)anthracene	1565	49	1963	0	79.7	40-125	0			
Fluoranthene	1671	49	1963	94.56	80.3	55-115	0			
Fluorene	1469	49	1963	0	74.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1569	49	1963	59.22	76.9	40-120	0			
Naphthalene	1260	49	1963	0	64.2	40-105	0			
Phenanthrene	1645	49	1963	0	83.8	50-110	0			
Pyrene	1682	49	1963	92.65	81	45-125	0			
Surr: 2,4,6-Tribromophenol	*4384*	0	*4908*	0	*89.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3495*	0	*4908*	0	*71.2*	*12-100*	0			
Surr: 2-Fluorophenol	*3391*	0	*4908*	0	*69.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5222*	0	*4908*	0	*106*	*25-137*	0			
Surr: Nitrobenzene-d5	*3180*	0	*4908*	0	*64.8*	*37-107*	0			
Surr: Phenol-d6	*3262*	0	*4908*	0	*66.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1210935-12A MSD** Units: **µg/Kg** Analysis Date: **10/31/2012 11:11 A**

Client ID: **SBKR0975L501S102512S005** Run ID: **SVMS4_121031A** SeqNo: **2127687** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1425	49	1972	0	72.2	45-105	1373	3.71	30	
Acenaphthene	1539	49	1972	0	78	45-110	1499	2.67	30	
Acenaphthylene	1702	49	1972	0	86.3	45-105	1657	2.7	30	
Anthracene	1694	49	1972	0	85.9	55-105	1606	5.36	30	
Benzo(a)anthracene	1710	49	1972	66.86	83.3	50-110	1668	2.51	30	
Benzo(a)pyrene	2140	49	1972	85.96	104	50-110	2050	4.28	30	
Benzo(b)fluoranthene	2222	49	1972	74.5	109	45-115	2239	0.763	30	
Benzo(g,h,i)perylene	1531	49	1972	0	77.6	40-125	1708	11	30	
Benzo(k)fluoranthene	2334	49	1972	113.7	113	45-115	2080	11.5	30	
Chrysene	1676	49	1972	68.77	81.5	55-110	1595	4.92	30	
Dibenzo(a,h)anthracene	1494	49	1972	0	75.8	40-125	1565	4.61	30	
Fluoranthene	1830	49	1972	94.56	88	55-115	1671	9.13	30	
Fluorene	1472	49	1972	0	74.6	50-110	1469	0.205	30	
Indeno(1,2,3-cd)pyrene	1485	49	1972	59.22	72.3	40-120	1569	5.52	30	
Naphthalene	1303	49	1972	0	66	40-105	1260	3.31	30	
Phenanthrene	1709	49	1972	0	86.6	50-110	1645	3.82	30	
Pyrene	1649	49	1972	92.65	78.9	45-125	1682	2.01	30	
Surr: 2,4,6-Tribromophenol	*4892*	0	*4931*	0	*99.2*	*34-140*	4384	*11*	*40*	
Surr: 2-Fluorobiphenyl	*3720*	0	*4931*	0	*75.4*	*12-100*	3495	*6.23*	*40*	
Surr: 2-Fluorophenol	*3499*	0	*4931*	0	*71*	*33-117*	3391	*3.13*	*40*	
Surr: 4-Terphenyl-d14	*5146*	0	*4931*	0	*104*	*25-137*	5222	*1.46*	*40*	
Surr: Nitrobenzene-d5	*3318*	0	*4931*	0	*67.3*	*37-107*	3180	*4.23*	*40*	
Surr: Phenol-d6	*3419*	0	*4931*	0	*69.3*	*40-106*	3262	*4.71*	*40*	

The following samples were analyzed in this batch:

1210935-05A	1210935-06A	1210935-07A
1210935-08A	1210935-09A	1210935-10A
1210935-11A	1210935-12A	1210935-13A
1210935-14A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/29/2012 04:15 PM**
Client ID: Run ID: **VMS8_121029A** SeqNo: **2126199** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*975*	0	*1000*	0	*97.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*972.5*	0	*1000*	0	*97.2*	*70-130*	0
Surr: Dibromofluoromethane	*983*	0	*1000*	0	*98.3*	*70-130*	0
Surr: Toluene-d8	*966.5*	0	*1000*	0	*96.6*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/31/2012 01:59 A**
Client ID: Run ID: **VMS8_121030A** SeqNo: **2127605** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*943.5*	0	*1000*	0	*94.4*	*70-130*	0
Surr: 4-Bromofluorobenzene	*966.5*	0	*1000*	0	*96.6*	*70-130*	0
Surr: Dibromofluoromethane	*961*	0	*1000*	0	*96.1*	*70-130*	0
Surr: Toluene-d8	*995*	0	*1000*	0	*99.5*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/30/2012 09:43 PM**
Client ID: Run ID: **VMS7_121030A** SeqNo: **2127855** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	50	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	32.5	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	70	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	121	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	188	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	36.5	100					J
n-Butylbenzene	ND	30					
n-Propylbenzene	22.5	30					J
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	27.5	30					J
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1036*	0	*1000*	0	*104*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1010*	0	*1000*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*1018*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*993.5*	0	*1000*	0	*99.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44436-44436** Units: **µg/Kg** Analysis Date: **10/31/2012 02:21 PM**
Client ID: Run ID: **VMS9_121031A** SeqNo: **2128925** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	129	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*991*	0	*1000*	0	*99.1*	*70-130*	0
Surr: 4-Bromofluorobenzene	*976.5*	0	*1000*	0	*97.6*	*70-130*	0
Surr: Dibromofluoromethane	*973.5*	0	*1000*	0	*97.4*	*70-130*	0
Surr: Toluene-d8	*927.5*	0	*1000*	0	*92.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44436-44436**				Units: **µg/Kg**		Analysis Date: **10/29/2012 03:03 PM**			
Client ID:		Run ID: **VMS8_121029A**			SeqNo: **2126197**		Prep Date: **10/29/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	983.5	30	1000	0	98.4	75-125	0			
1,1,1-Trichloroethane	1058	30	1000	0	106	70-135	0			
1,1,2,2-Tetrachloroethane	907.5	30	1000	0	90.8	55-130	0			
1,1,2-Trichloroethane	878.5	30	1000	0	87.8	60-125	0			
1,1-Dichloroethane	970.5	30	1000	0	97	75-125	0			
1,1-Dichloroethene	1088	30	1000	0	109	65-135	0			
1,2,3-Trichlorobenzene	1106	30	1000	0	111	60-135	0			
1,2,3-Trichloropropane	920.5	30	1000	0	92	65-130	0			
1,2,3-Trimethylbenzene	931	30	1000	0	93.1	65-135	0			
1,2,4-Trichlorobenzene	1124	30	1000	0	112	65-130	0			
1,2,4-Trimethylbenzene	940	30	1000	0	94	65-135	0			
1,2-Dibromo-3-chloropropane	950	30	1000	0	95	40-135	0			
1,2-Dibromoethane	1006	30	1000	0	101	70-125	0			
1,2-Dichlorobenzene	954	30	1000	0	95.4	75-120	0			
1,2-Dichloroethane	950.5	30	1000	0	95	70-135	0			
1,2-Dichloropropane	987	30	1000	0	98.7	70-120	0			
1,3,5-Trimethylbenzene	976.5	30	1000	0	97.6	65-135	0			
1,3-Dichlorobenzene	953.5	30	1000	0	95.4	70-125	0			
1,4-Dichlorobenzene	943.5	30	1000	0	94.4	70-125	0			
2-Butanone	1111	200	1000	0	111	30-160	0			
2-Hexanone	952	30	1000	0	95.2	45-145	0			
4-Methyl-2-pentanone	1284	30	1000	0	128	45-145	0			
Acetone	1061	100	1000	0	106	20-160	0			
Acrylonitrile	1024	100	1000	0	102	70-135	0			
Benzene	959	30	1000	0	95.9	75-125	0			
Bromobenzene	927.5	30	1000	0	92.8	65-120	0			
Bromochloromethane	1020	30	1000	0	102	70-125	0			
Bromodichloromethane	1016	30	1000	0	102	70-130	0			
Bromoform	1038	30	1000	0	104	55-135	0			
Bromomethane	1380	75	1000	0	138	30-160	0			
Carbon disulfide	1150	30	1000	0	115	45-160	0			
Carbon tetrachloride	1087	30	1000	0	109	65-135	0			
Chlorobenzene	936.5	30	1000	0	93.6	75-125	0			
Chloroethane	1608	100	1000	0	161	40-155	0			S
Chloroform	941.5	30	1000	0	94.2	70-125	0			
Chloromethane	1081	100	1000	0	108	50-130	0			
cis-1,2-Dichloroethene	959.5	30	1000	0	96	65-125	0			
cis-1,3-Dichloropropene	1007	30	1000	0	101	70-125	0			
Dibromochloromethane	976	30	1000	0	97.6	65-135	0			
Dibromomethane	949	30	1000	0	94.9	75-130	0			
Dichlorodifluoromethane	1284	30	1000	0	128	35-135	0			
Ethylbenzene	971.5	30	1000	0	97.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44436**	Instrument ID **VMS8**		Method: **SW8260**				
Hexachloroethane	1163	30	1000	0	116	70-135	0
Isopropylbenzene	953.5	30	1000	0	95.4	75-130	0
m,p-Xylene	1928	60	2000	0	96.4	80-125	0
Methyl tert-butyl ether	1016	30	1000	0	102	75-125	0
Methylene chloride	932.5	30	1000	0	93.2	55-145	0
Naphthalene	1324	100	1000	0	132	40-140	0
n-Butylbenzene	1079	30	1000	0	108	65-140	0
n-Propylbenzene	934.5	30	1000	0	93.4	65-135	0
o-Xylene	956	30	1000	0	95.6	75-125	0
p-Isopropyltoluene	947.5	30	1000	0	94.8	75-135	0
sec-Butylbenzene	991	30	1000	0	99.1	65-130	0
Styrene	989.5	30	1000	0	99	75-125	0
tert-Butylbenzene	912.5	30	1000	0	91.2	65-130	0
Tetrachloroethene	972.5	30	1000	0	97.2	64-140	0
Tetrahydrofuran	904	200	1000	0	90.4	70-135	0
Toluene	946.5	30	1000	0	94.6	70-125	0
trans-1,2-Dichloroethene	1064	30	1000	0	106	65-135	0
trans-1,3-Dichloropropene	1024	30	1000	0	102	65-125	0
trans-1,4-Dichloro-2-butene	1034	30	1000	0	103	70-135	0
Trichloroethene	995	30	1000	0	99.5	75-125	0
Trichlorofluoromethane	1090	30	1000	0	109	25-185	0
Vinyl chloride	1126	30	1000	0	113	60-125	0
Surr: 1,2-Dichloroethane-d4	*987.5*	0	*1000*	0	*98.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1005*	0	*1000*	0	*100*	*70-130*	0
Surr: Dibromofluoromethane	*1014*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1008*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44436-44436**				Units: **µg/Kg**		Analysis Date: **10/31/2012 12:47 PM**			
Client ID:		Run ID: **VMS8_121030A**			SeqNo: **2127606**		Prep Date: **10/29/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	971	30	1000	0	97.1	75-125	0			
1,1,1-Trichloroethane	1083	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	866	30	1000	0	86.6	55-130	0			
1,1,2-Trichloroethane	853.5	30	1000	0	85.4	60-125	0			
1,1-Dichloroethane	975	30	1000	0	97.5	75-125	0			
1,1-Dichloroethene	1096	30	1000	0	110	65-135	0			
1,2,3-Trichlorobenzene	1058	30	1000	0	106	60-135	0			
1,2,3-Trichloropropane	847.5	30	1000	0	84.8	65-130	0			
1,2,3-Trimethylbenzene	927.5	30	1000	0	92.8	65-135	0			
1,2,4-Trichlorobenzene	1064	30	1000	0	106	65-130	0			
1,2,4-Trimethylbenzene	971	30	1000	0	97.1	65-135	0			
1,2-Dibromo-3-chloropropane	876.5	30	1000	0	87.6	40-135	0			
1,2-Dibromoethane	952	30	1000	0	95.2	70-125	0			
1,2-Dichlorobenzene	922.5	30	1000	0	92.2	75-120	0			
1,2-Dichloroethane	956.5	30	1000	0	95.6	70-135	0			
1,2-Dichloropropane	997	30	1000	0	99.7	70-120	0			
1,3,5-Trimethylbenzene	1022	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	941	30	1000	0	94.1	70-125	0			
1,4-Dichlorobenzene	924.5	30	1000	0	92.4	70-125	0			
2-Butanone	896	200	1000	0	89.6	30-160	0			
2-Hexanone	893	30	1000	0	89.3	45-145	0			
4-Methyl-2-pentanone	1138	30	1000	0	114	45-145	0			
Acetone	978.5	100	1000	0	97.8	20-160	0			
Acrylonitrile	903.5	100	1000	0	90.4	70-135	0			
Benzene	972.5	30	1000	0	97.2	75-125	0			
Bromobenzene	937.5	30	1000	0	93.8	65-120	0			
Bromochloromethane	980	30	1000	0	98	70-125	0			
Bromodichloromethane	985	30	1000	0	98.5	70-130	0			
Bromoform	931.5	30	1000	0	93.2	55-135	0			
Bromomethane	1202	75	1000	0	120	30-160	0			
Carbon disulfide	1169	30	1000	0	117	45-160	0			
Carbon tetrachloride	1070	30	1000	0	107	65-135	0			
Chlorobenzene	951.5	30	1000	0	95.2	75-125	0			
Chloroethane	1742	100	1000	0	174	40-155	0			S
Chloroform	942.5	30	1000	0	94.2	70-125	0			
Chloromethane	1076	100	1000	0	108	50-130	0			
cis-1,2-Dichloroethene	935.5	30	1000	0	93.6	65-125	0			
cis-1,3-Dichloropropene	939.5	30	1000	0	94	70-125	0			
Dibromochloromethane	904.5	30	1000	0	90.4	65-135	0			
Dibromomethane	952	30	1000	0	95.2	75-130	0			
Dichlorodifluoromethane	1332	30	1000	0	133	35-135	0			
Ethylbenzene	994	30	1000	0	99.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	984.5	30	1000	0	98.4	70-135	0
Isopropylbenzene	991	30	1000	0	99.1	75-130	0
m,p-Xylene	2000	60	2000	0	100	80-125	0
Methyl tert-butyl ether	1003	30	1000	0	100	75-125	0
Methylene chloride	769	30	1000	0	76.9	55-145	0
Naphthalene	1334	100	1000	0	133	40-140	0
n-Butylbenzene	980.5	30	1000	0	98	65-140	0
n-Propylbenzene	939	30	1000	0	93.9	65-135	0
o-Xylene	972	30	1000	0	97.2	75-125	0
p-Isopropyltoluene	890.5	30	1000	0	89	75-135	0
sec-Butylbenzene	990	30	1000	0	99	65-130	0
Styrene	1012	30	1000	0	101	75-125	0
tert-Butylbenzene	903.5	30	1000	0	90.4	65-130	0
Tetrachloroethene	1005	30	1000	0	100	64-140	0
Tetrahydrofuran	802	200	1000	0	80.2	70-135	0
Toluene	973	30	1000	0	97.3	70-125	0
trans-1,2-Dichloroethene	1047	30	1000	0	105	65-135	0
trans-1,3-Dichloropropene	940	30	1000	0	94	65-125	0
trans-1,4-Dichloro-2-butene	886	30	1000	0	88.6	70-135	0
Trichloroethene	1038	30	1000	0	104	75-125	0
Trichlorofluoromethane	1114	30	1000	0	111	25-185	0
Vinyl chloride	1141	30	1000	0	114	60-125	0
Surr: 1,2-Dichloroethane-d4	*945.5*	0	*1000*	0	*94.6*	*70-130*	0
Surr: 4-Bromofluorobenzene	*987*	0	*1000*	0	*98.7*	*70-130*	0
Surr: Dibromofluoromethane	*996*	0	*1000*	0	*99.6*	*70-130*	0
Surr: Toluene-d8	*1008*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44436-44436**				Units: **µg/Kg**		Analysis Date: **10/30/2012 08:27 PM**			
Client ID:		Run ID: **VMS7_121030A**			SeqNo: **2127854**		Prep Date: **10/29/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	969.5	30	1000	0	97	75-125	0			
1,1,1-Trichloroethane	1018	30	1000	0	102	70-135	0			
1,1,2,2-Tetrachloroethane	967	30	1000	0	96.7	55-130	0			
1,1,2-Trichloroethane	983.5	30	1000	0	98.4	60-125	0			
1,1-Dichloroethane	1041	30	1000	0	104	75-125	0			
1,1-Dichloroethene	993	30	1000	0	99.3	65-135	0			
1,2,3-Trichlorobenzene	1114	30	1000	0	111	60-135	0			
1,2,3-Trichloropropane	1064	30	1000	0	106	65-130	0			
1,2,3-Trimethylbenzene	1042	30	1000	0	104	65-135	0			
1,2,4-Trichlorobenzene	1116	30	1000	0	112	65-130	0			
1,2,4-Trimethylbenzene	1050	30	1000	0	105	65-135	0			B
1,2-Dibromo-3-chloropropane	952	30	1000	0	95.2	40-135	0			
1,2-Dibromoethane	1064	30	1000	0	106	70-125	0			
1,2-Dichlorobenzene	1082	30	1000	0	108	75-120	0			
1,2-Dichloroethane	1000	30	1000	0	100	70-135	0			
1,2-Dichloropropane	954	30	1000	0	95.4	70-120	0			
1,3,5-Trimethylbenzene	1040	30	1000	0	104	65-135	0			B
1,3-Dichlorobenzene	1046	30	1000	0	105	70-125	0			
1,4-Dichlorobenzene	1062	30	1000	0	106	70-125	0			
2-Butanone	1078	200	1000	0	108	30-160	0			
2-Hexanone	1098	30	1000	0	110	45-145	0			
4-Methyl-2-pentanone	1419	30	1000	0	142	45-145	0			
Acetone	809.5	100	1000	0	81	20-160	0			
Acrylonitrile	1082	100	1000	0	108	70-135	0			
Benzene	1052	30	1000	0	105	75-125	0			
Bromobenzene	1019	30	1000	0	102	65-120	0			
Bromochloromethane	989	30	1000	0	98.9	70-125	0			
Bromodichloromethane	909	30	1000	0	90.9	70-130	0			
Bromoform	1039	30	1000	0	104	55-135	0			
Bromomethane	943	75	1000	0	94.3	30-160	0			
Carbon disulfide	1192	30	1000	0	119	45-160	0			
Carbon tetrachloride	1071	30	1000	0	107	65-135	0			
Chlorobenzene	1034	30	1000	0	103	75-125	0			
Chloroethane	1050	100	1000	0	105	40-155	0			
Chloroform	989	30	1000	0	98.9	70-125	0			
Chloromethane	1097	100	1000	0	110	50-130	0			B
cis-1,2-Dichloroethene	996	30	1000	0	99.6	65-125	0			
cis-1,3-Dichloropropene	898.5	30	1000	0	89.8	70-125	0			
Dibromochloromethane	1010	30	1000	0	101	65-135	0			
Dibromomethane	902.5	30	1000	0	90.2	75-130	0			
Dichlorodifluoromethane	1183	30	1000	0	118	35-135	0			
Ethylbenzene	1072	30	1000	0	107	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44436**	Instrument ID **VMS8**		Method: **SW8260**				
Hexachloroethane	1080	30	1000	0	108	70-135	0
Isopropylbenzene	1086	30	1000	0	109	75-130	0
m,p-Xylene	2102	60	2000	0	105	80-125	0
Methyl tert-butyl ether	1036	30	1000	0	104	75-125	0
Methylene chloride	963	30	1000	0	96.3	55-145	0
Naphthalene	1142	100	1000	0	114	40-140	0
n-Butylbenzene	1033	30	1000	0	103	65-140	0
n-Propylbenzene	1087	30	1000	0	109	65-135	0
o-Xylene	1047	30	1000	0	105	75-125	0
p-Isopropyltoluene	1004	30	1000	0	100	75-135	0
sec-Butylbenzene	1044	30	1000	0	104	65-130	0
Styrene	1074	30	1000	0	107	75-125	0
tert-Butylbenzene	1044	30	1000	0	104	65-130	0
Tetrachloroethene	1093	30	1000	0	109	64-140	0
Tetrahydrofuran	1062	200	1000	0	106	70-135	0
Toluene	1000	30	1000	0	100	70-125	0
trans-1,2-Dichloroethene	988	30	1000	0	98.8	65-135	0
trans-1,3-Dichloropropene	984	30	1000	0	98.4	65-125	0
trans-1,4-Dichloro-2-butene	841.5	30	1000	0	84.2	70-135	0
Trichloroethene	1022	30	1000	0	102	75-125	0
Trichlorofluoromethane	1029	30	1000	0	103	25-185	0
Vinyl chloride	1150	30	1000	0	115	60-125	0
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1024*	0	*1000*	0	*102*	*70-130*	0
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1018*	0	*1000*	0	*102*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44436-44436**				Units: **µg/Kg**		Analysis Date: **10/31/2012 01:05 PM**			
Client ID:		Run ID: **VMS9_121031A**			SeqNo: **2128924**		Prep Date: **10/29/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1044	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1126	30	1000	0	113	70-135	0			
1,1,2,2-Tetrachloroethane	942.5	30	1000	0	94.2	55-130	0			
1,1,2-Trichloroethane	922	30	1000	0	92.2	60-125	0			
1,1-Dichloroethane	1228	30	1000	0	123	75-125	0			
1,1-Dichloroethene	1069	30	1000	0	107	65-135	0			
1,2,3-Trichlorobenzene	989.5	30	1000	0	99	60-135	0			
1,2,3-Trichloropropane	925.5	30	1000	0	92.6	65-130	0			
1,2,3-Trimethylbenzene	1046	30	1000	0	105	65-135	0			
1,2,4-Trichlorobenzene	1008	30	1000	0	101	65-130	0			
1,2,4-Trimethylbenzene	954	30	1000	0	95.4	65-135	0			
1,2-Dibromo-3-chloropropane	786	30	1000	0	78.6	40-135	0			
1,2-Dibromoethane	973	30	1000	0	97.3	70-125	0			
1,2-Dichlorobenzene	994	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	978.5	30	1000	0	97.8	70-135	0			
1,2-Dichloropropane	1062	30	1000	0	106	70-120	0			
1,3,5-Trimethylbenzene	992.5	30	1000	0	99.2	65-135	0			
1,3-Dichlorobenzene	992	30	1000	0	99.2	70-125	0			
1,4-Dichlorobenzene	1000	30	1000	0	100	70-125	0			
2-Butanone	1328	200	1000	0	133	30-160	0			
2-Hexanone	1054	30	1000	0	105	45-145	0			
4-Methyl-2-pentanone	978	30	1000	0	97.8	45-145	0			
Acetone	1010	100	1000	0	101	20-160	0			B
Acrylonitrile	978.5	100	1000	0	97.8	70-135	0			
Benzene	1060	30	1000	0	106	75-125	0			
Bromobenzene	1026	30	1000	0	103	65-120	0			
Bromochloromethane	1188	30	1000	0	119	70-125	0			
Bromodichloromethane	1098	30	1000	0	110	70-130	0			
Bromoform	994	30	1000	0	99.4	55-135	0			
Bromomethane	1289	75	1000	0	129	30-160	0			
Carbon disulfide	1130	30	1000	0	113	45-160	0			
Carbon tetrachloride	1044	30	1000	0	104	65-135	0			
Chlorobenzene	1004	30	1000	0	100	75-125	0			
Chloroethane	694	100	1000	0	69.4	40-155	0			
Chloroform	1040	30	1000	0	104	70-125	0			
Chloromethane	1002	100	1000	0	100	50-130	0			
cis-1,2-Dichloroethene	1229	30	1000	0	123	65-125	0			
cis-1,3-Dichloropropene	1086	30	1000	0	109	70-125	0			
Dibromochloromethane	992	30	1000	0	99.2	65-135	0			
Dibromomethane	1036	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	957.5	30	1000	0	95.8	35-135	0			
Ethylbenzene	1094	30	1000	0	109	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	971.5	30	1000	0	97.2	70-135	0
Isopropylbenzene	988.5	30	1000	0	98.8	75-130	0
m,p-Xylene	1937	60	2000	0	96.8	80-125	0
Methyl tert-butyl ether	1178	30	1000	0	118	75-125	0
Methylene chloride	1056	30	1000	0	106	55-145	0
Naphthalene	797	100	1000	0	79.7	40-140	0
n-Butylbenzene	1022	30	1000	0	102	65-140	0
n-Propylbenzene	954.5	30	1000	0	95.4	65-135	0
o-Xylene	1076	30	1000	0	108	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1032	30	1000	0	103	65-130	0
Styrene	976.5	30	1000	0	97.6	75-125	0
tert-Butylbenzene	1168	30	1000	0	117	65-130	0
Tetrachloroethene	1032	30	1000	0	103	64-140	0
Tetrahydrofuran	1137	200	1000	0	114	70-135	0
Toluene	1034	30	1000	0	103	70-125	0
trans-1,2-Dichloroethene	1132	30	1000	0	113	65-135	0
trans-1,3-Dichloropropene	905	30	1000	0	90.5	65-125	0
trans-1,4-Dichloro-2-butene	875.5	30	1000	0	87.6	70-135	0
Trichloroethene	1051	30	1000	0	105	75-125	0
Trichlorofluoromethane	1029	30	1000	0	103	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*972*	0	*1000*	0	*97.2*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1055*	0	*1000*	0	*106*	*70-130*	0
Surr: Dibromofluoromethane	*952*	0	*1000*	0	*95.2*	*70-130*	0
Surr: Toluene-d8	*975*	0	*1000*	0	*97.5*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1210935-01B MS** Units: **µg/Kg** Analysis Date: **10/31/2012 11:19 PM**
Client ID: **SBKR0950L502S102412S008** Run ID: **VMS9_121031A** SeqNo: **2128910** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1779	60	1985	0	89.6	75-125	0			
1,1,1-Trichloroethane	1796	60	1985	0	90.4	70-135	0			
1,1,2,2-Tetrachloroethane	1813	60	1985	0	91.4	55-130	0			
1,1,2-Trichloroethane	1813	60	1985	0	91.4	60-125	0			
1,1-Dichloroethane	2419	60	1985	0	122	75-125	0			
1,1-Dichloroethene	1530	60	1985	0	77.1	65-135	0			
1,2,3-Trichlorobenzene	1638	60	1985	0	82.5	60-135	0			
1,2,3-Trichloropropane	1886	60	1985	0	95	65-130	0			
1,2,3-Trimethylbenzene	1926	60	1985	0	97	65-135	0			
1,2,4-Trichlorobenzene	1651	60	1985	0	83.2	65-130	0			
1,2,4-Trimethylbenzene	2180	60	1985	0	110	65-135	0			
1,2-Dibromo-3-chloropropane	1347	60	1985	0	67.8	40-135	0			
1,2-Dibromoethane	1929	60	1985	0	97.2	70-125	0			
1,2-Dichlorobenzene	1773	60	1985	0	89.3	75-120	0			
1,2-Dichloroethane	2168	60	1985	0	109	70-135	0			
1,2-Dichloropropane	2199	60	1985	0	111	70-120	0			
1,3,5-Trimethylbenzene	2116	60	1985	0	107	65-135	0			
1,3-Dichlorobenzene	1732	60	1985	0	87.2	70-125	0			
1,4-Dichlorobenzene	1750	60	1985	0	88.2	70-125	0			
2-Butanone	2591	400	1985	339.4	113	30-160	0			
2-Hexanone	1846	60	1985	0	93	45-145	0			
4-Methyl-2-pentanone	2155	60	1985	0	109	45-145	0			
Acetone	3752	200	1985	648.1	156	20-160	0			B
Acrylonitrile	2598	200	1985	0	131	70-135	0			
Benzene	2066	60	1985	0	104	75-125	0			
Bromobenzene	1934	60	1985	0	97.4	65-120	0			
Bromochloromethane	2404	60	1985	0	121	70-125	0			
Bromodichloromethane	2097	60	1985	0	106	70-130	0			
Bromoform	1610	60	1985	0	81.1	55-135	0			
Bromomethane	1794	150	1985	0	90.4	30-160	0			
Carbon disulfide	1298	60	1985	0	65.4	45-160	0			
Carbon tetrachloride	1391	60	1985	0	70	65-135	0			
Chlorobenzene	1849	60	1985	0	93.2	75-125	0			
Chloroethane	394	200	1985	0	19.8	40-155	0			S
Chloroform	2206	60	1985	0	111	70-125	0			
Chloromethane	1887	200	1985	0	95	50-130	0			
cis-1,2-Dichloroethene	2228	60	1985	0	112	65-125	0			
cis-1,3-Dichloropropene	2161	60	1985	0	109	70-125	0			
Dibromochloromethane	1644	60	1985	0	82.8	65-135	0			
Dibromomethane	2272	60	1985	0	114	75-130	0			
Dichlorodifluoromethane	216.4	60	1985	0	10.9	35-135	0			S
Ethylbenzene	2025	60	1985	0	102	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44436**	Instrument ID **VMS8**		Method: **SW8260**					
Hexachloroethane	1355	60	1985	0	68.2	70-135	0	S
Isopropylbenzene	1741	60	1985	0	87.7	75-130	0	
m,p-Xylene	4386	120	3970	0	110	80-125	0	
Methyl tert-butyl ether	2801	60	1985	0	141	75-125	0	S
Methylene chloride	2723	60	1985	0	137	55-145	0	
Naphthalene	1642	200	1985	0	82.7	40-140	0	
n-Butylbenzene	1495	60	1985	0	75.3	65-140	0	
n-Propylbenzene	1692	60	1985	0	85.2	65-135	0	
o-Xylene	2089	60	1985	0	105	75-125	0	
p-Isopropyltoluene	1864	60	1985	0	93.9	75-135	0	
sec-Butylbenzene	1647	60	1985	0	83	65-130	0	
Styrene	1664	60	1985	0	83.8	75-125	0	
tert-Butylbenzene	1974	60	1985	0	99.4	65-130	0	
Tetrachloroethene	1563	60	1985	0	78.8	64-140	0	
Tetrahydrofuran	2475	400	1985	0	125	70-135	0	
Toluene	1925	60	1985	0	97	70-125	0	
trans-1,2-Dichloroethene	2012	60	1985	0	101	65-135	0	
trans-1,3-Dichloropropene	1568	60	1985	0	79	65-125	0	
trans-1,4-Dichloro-2-butene	1371	60	1985	0	69	70-135	0	S
Trichloroethene	1981	60	1985	0	99.8	75-125	0	
Trichlorofluoromethane	989.6	60	1985	0	49.8	25-185	0	
Vinyl chloride	995.5	60	1985	0	50.2	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*1857*	0	*1985*	0	*93.6*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*2088*	0	*1985*	0	*105*	*70-130*	0	
Surr: Dibromofluoromethane	*1915*	0	*1985*	0	*96.4*	*70-130*	0	
Surr: Toluene-d8	*1919*	0	*1985*	0	*96.6*	*70-130*	0	

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

MSD Sample ID: **1210935-01B MSD** Units: **µg/Kg** Analysis Date: **10/31/2012 11:45 PM**
Client ID: **SBKR0950L502S102412S008** Run ID: **VMS9_121031A** SeqNo: **2128912** Prep Date: **10/29/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1850	60	1985	0	93.2	75-125	1779	3.94	30	
1,1,1-Trichloroethane	1721	60	1985	0	86.7	70-135	1796	4.23	30	
1,1,2,2-Tetrachloroethane	1957	60	1985	0	98.6	55-130	1813	7.63	30	
1,1,2-Trichloroethane	1798	60	1985	0	90.6	60-125	1813	0.824	30	
1,1-Dichloroethane	2224	60	1985	0	112	75-125	2419	8.38	30	
1,1-Dichloroethene	1474	60	1985	0	74.2	65-135	1530	3.77	30	
1,2,3-Trichlorobenzene	1607	60	1985	0	81	60-135	1638	1.9	30	
1,2,3-Trichloropropane	2030	60	1985	0	102	65-130	1886	7.35	30	
1,2,3-Trimethylbenzene	1869	60	1985	0	94.2	65-135	1926	2.98	30	
1,2,4-Trichlorobenzene	1661	60	1985	0	83.6	65-130	1651	0.6	30	
1,2,4-Trimethylbenzene	1943	60	1985	0	97.9	65-135	2180	11.5	30	
1,2-Dibromo-3-chloropropane	1383	60	1985	0	69.6	40-135	1347	2.62	30	
1,2-Dibromoethane	1948	60	1985	0	98.2	70-125	1929	0.973	30	
1,2-Dichlorobenzene	1737	60	1985	0	87.5	75-120	1773	2.04	30	
1,2-Dichloroethane	2063	60	1985	0	104	70-135	2168	4.93	30	
1,2-Dichloropropane	2169	60	1985	0	109	70-120	2199	1.41	30	
1,3,5-Trimethylbenzene	1946	60	1985	0	98	65-135	2116	8.36	30	
1,3-Dichlorobenzene	1731	60	1985	0	87.2	70-125	1732	0.0573	30	
1,4-Dichlorobenzene	1742	60	1985	0	87.8	70-125	1750	0.455	30	
2-Butanone	2772	400	1985	339.4	123	30-160	2591	6.77	30	
2-Hexanone	2155	60	1985	0	109	45-145	1846	15.4	30	
4-Methyl-2-pentanone	2137	60	1985	0	108	45-145	2155	0.833	30	
Acetone	3649	200	1985	648.1	151	20-160	3752	2.79	30	B
Acrylonitrile	2483	200	1985	0	125	70-135	2598	4.53	30	
Benzene	2004	60	1985	0	101	75-125	2066	3.07	30	
Bromobenzene	1981	60	1985	0	99.8	65-120	1934	2.38	30	
Bromochloromethane	2445	60	1985	0	123	70-125	2404	1.68	30	
Bromodichloromethane	2072	60	1985	0	104	70-130	2097	1.19	30	
Bromoform	1701	60	1985	0	85.7	55-135	1610	5.52	30	
Bromomethane	1624	150	1985	0	81.8	30-160	1794	9.93	30	
Carbon disulfide	1306	60	1985	0	65.8	45-160	1298	0.61	30	
Carbon tetrachloride	1430	60	1985	0	72	65-135	1391	2.81	30	
Chlorobenzene	1896	60	1985	0	95.5	75-125	1849	2.49	30	
Chloroethane	397	200	1985	0	20	40-155	394	0.753	30	S
Chloroform	2235	60	1985	0	113	70-125	2206	1.3	30	
Chloromethane	1767	200	1985	0	89	50-130	1887	6.57	30	
cis-1,2-Dichloroethene	2257	60	1985	0	114	65-125	2228	1.28	30	
cis-1,3-Dichloropropene	2092	60	1985	0	105	70-125	2161	3.22	30	
Dibromochloromethane	1697	60	1985	0	85.5	65-135	1644	3.21	30	
Dibromomethane	2230	60	1985	0	112	75-130	2272	1.85	30	
Dichlorodifluoromethane	196.5	60	1985	0	9.9	35-135	216.4	9.62	30	S
Ethylbenzene	1955	60	1985	0	98.5	75-125	2025	3.49	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44436** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1322	60	1985	0	66.6	70-135	1355	2.45	30	S
Isopropylbenzene	1731	60	1985	0	87.2	75-130	1741	0.572	30	
m,p-Xylene	3762	120	3970	0	94.8	80-125	4386	15.3	30	
Methyl tert-butyl ether	2628	60	1985	0	132	75-125	2801	6.36	30	S
Methylene chloride	2504	60	1985	0	126	55-145	2723	8.36	30	
Naphthalene	1580	200	1985	0	79.6	40-140	1642	3.82	30	
n-Butylbenzene	1453	60	1985	0	73.2	65-140	1495	2.83	30	
n-Propylbenzene	1693	60	1985	0	85.3	65-135	1692	0.0586	30	
o-Xylene	2044	60	1985	0	103	75-125	2089	2.21	30	
p-Isopropyltoluene	1781	60	1985	0	89.7	75-135	1864	4.58	30	
sec-Butylbenzene	1677	60	1985	0	84.5	65-130	1647	1.85	30	
Styrene	1657	60	1985	0	83.4	75-125	1664	0.478	30	
tert-Butylbenzene	2000	60	1985	0	101	65-130	1974	1.3	30	
Tetrachloroethene	1538	60	1985	0	77.5	64-140	1563	1.6	30	
Tetrahydrofuran	2568	400	1985	0	129	70-135	2475	3.66	30	
Toluene	1787	60	1985	0	90	70-125	1925	7.44	30	
trans-1,2-Dichloroethene	1842	60	1985	0	92.8	65-135	2012	8.81	30	
trans-1,3-Dichloropropene	1538	60	1985	0	77.5	65-125	1568	1.92	30	
trans-1,4-Dichloro-2-butene	1452	60	1985	0	73.2	70-135	1371	5.77	30	
Trichloroethene	1920	60	1985	0	96.7	75-125	1981	3.16	30	
Trichlorofluoromethane	979.6	60	1985	0	49.4	25-185	989.6	1.01	30	
Vinyl chloride	907.2	60	1985	0	45.7	60-125	995.5	9.29	30	S
Surr: 1,2-Dichloroethane-d4	*1809*	0	*1985*	0	*91.2*	*70-130*	1857	*2.6*	*30*	
Surr: 4-Bromofluorobenzene	*2229*	0	*1985*	0	*112*	*70-130*	2088	*6.53*	*30*	
Surr: Dibromofluoromethane	*1921*	0	*1985*	0	*96.8*	*70-130*	1915	*0.311*	*30*	
Surr: Toluene-d8	*1753*	0	*1985*	0	*88.3*	*70-130*	1919	*9.03*	*30*	

The following samples were analyzed in this batch:

1210935-01B	1210935-02B	1210935-03A
1210935-04B	1210935-05B	1210935-06B
1210935-07B	1210935-14B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44496-44496** Units: **µg/Kg** Analysis Date: **10/31/2012 02:47 PM**
Client ID: Run ID: **VMS8_121031A** SeqNo: **2128736** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*959.5*	0	*1000*	0	*96*	*70-130*	0
Surr: 4-Bromofluorobenzene	*929*	0	*1000*	0	*92.9*	*70-130*	0
Surr: Dibromofluoromethane	*974.5*	0	*1000*	0	*97.4*	*70-130*	0
Surr: Toluene-d8	*944*	0	*1000*	0	*94.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44496-44496** Units: **µg/Kg** Analysis Date: **10/31/2012 02:21 PM**
Client ID: Run ID: **VMS9_121031A** SeqNo: **2128906** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	129	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*991*	0	*1000*	0	*99.1*	*70-130*	0
Surr: 4-Bromofluorobenzene	*976.5*	0	*1000*	0	*97.6*	*70-130*	0
Surr: Dibromofluoromethane	*973.5*	0	*1000*	0	*97.4*	*70-130*	0
Surr: Toluene-d8	*927.5*	0	*1000*	0	*92.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44496-44496** Units: **µg/Kg** Analysis Date: **11/1/2012 12:35 PM**
Client ID: Run ID: **VMS5_121031B** SeqNo: **2128915** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	79	100								J
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1015*	0	*1000*	0	*102*	*70-130*	0
Surr: 4-Bromofluorobenzene	*985*	0	*1000*	0	*98.5*	*70-130*	0
Surr: Dibromofluoromethane	*956*	0	*1000*	0	*95.6*	*70-130*	0
Surr: Toluene-d8	*994*	0	*1000*	0	*99.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44496-44496** Units: **µg/Kg** Analysis Date: **11/1/2012 04:51 PM**
Client ID: Run ID: **VMS8_121101A** SeqNo: **2129462** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1004*	0	*1000*	0	*100*	*70-130*	0
Surr: 4-Bromofluorobenzene	*967.5*	0	*1000*	0	*96.8*	*70-130*	0
Surr: Dibromofluoromethane	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*993*	0	*1000*	0	*99.3*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MBLK Sample ID: **MBLK-44496-44496** Units: **µg/Kg** Analysis Date: **11/1/2012 03:54 PM**
Client ID: Run ID: **VMS7_121101A** SeqNo: **2129712** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	47.5	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	75	100								J
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	65	100								J
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Dichlorodifluoromethane	ND	30						
Diethyl ether	ND	30						
Diisopropyl ether	ND	30						
Ethyl tert butyl ether	ND	30						
Ethylbenzene	ND	30						
Hexachloroethane	ND	30						
Isopropylbenzene	22	30						J
m,p-Xylene	30.5	60						J
Methyl iodide	270.5	75						
Methyl tert-butyl ether	ND	30						
Methylene chloride	ND	30						
Naphthalene	35	100						J
n-Butylbenzene	ND	30						
n-Propylbenzene	22.5	30						J
o-Xylene	ND	30						
p-Isopropyltoluene	ND	30						
sec-Butylbenzene	28.5	30						J
Styrene	ND	30						
tert-Butyl alcohol	ND	200						
tert-Butylbenzene	ND	30						
Tertiaryamylmethylether	ND	30						
Tetrachloroethene	ND	30						
Tetrahydrofuran	ND	200						
Toluene	ND	30						
trans-1,2-Dichloroethene	ND	30						
trans-1,3-Dichloropropene	ND	30						
trans-1,4-Dichloro-2-butene	ND	30						
Trichloroethene	ND	30						
Trichlorofluoromethane	ND	30						
Vinyl chloride	ND	30						
Surr: 1,2-Dichloroethane-d4	*1001*	0	*1000*	0	*100*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1020*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*1010*	0	*1000*	0	*101*	*70-130*	0	
Surr: Toluene-d8	*998*	0	*1000*	0	*99.8*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44496-44496** Units: **µg/Kg** Analysis Date: **10/31/2012 02:00 PM**
Client ID: Run ID: **VMS8_121031A** SeqNo: **2128735** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	995.5	30	1000	0	99.6	75-125	0			
1,1,1-Trichloroethane	1083	30	1000	0	108	70-135	0			
1,1,2,2-Tetrachloroethane	829	30	1000	0	82.9	55-130	0			
1,1,2-Trichloroethane	904.5	30	1000	0	90.4	60-125	0			
1,1-Dichloroethane	987.5	30	1000	0	98.8	75-125	0			
1,1-Dichloroethene	1124	30	1000	0	112	65-135	0			
1,2,3-Trichlorobenzene	1094	30	1000	0	109	60-135	0			
1,2,3-Trichloropropane	868	30	1000	0	86.8	65-130	0			
1,2,3-Trimethylbenzene	947.5	30	1000	0	94.8	65-135	0			
1,2,4-Trichlorobenzene	1108	30	1000	0	111	65-130	0			
1,2,4-Trimethylbenzene	1016	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	841	30	1000	0	84.1	40-135	0			
1,2-Dibromoethane	963	30	1000	0	96.3	70-125	0			
1,2-Dichlorobenzene	926.5	30	1000	0	92.6	75-120	0			
1,2-Dichloroethane	965.5	30	1000	0	96.6	70-135	0			
1,2-Dichloropropane	1026	30	1000	0	103	70-120	0			
1,3,5-Trimethylbenzene	1033	30	1000	0	103	65-135	0			
1,3-Dichlorobenzene	964	30	1000	0	96.4	70-125	0			
1,4-Dichlorobenzene	941	30	1000	0	94.1	70-125	0			
2-Butanone	955.5	200	1000	0	95.6	30-160	0			
2-Hexanone	872	30	1000	0	87.2	45-145	0			
4-Methyl-2-pentanone	1146	30	1000	0	115	45-145	0			
Acetone	902.5	100	1000	0	90.2	20-160	0			
Acrylonitrile	891	100	1000	0	89.1	70-135	0			
Benzene	996.5	30	1000	0	99.6	75-125	0			
Bromobenzene	932	30	1000	0	93.2	65-120	0			
Bromochloromethane	1026	30	1000	0	103	70-125	0			
Bromodichloromethane	1008	30	1000	0	101	70-130	0			
Bromoform	942	30	1000	0	94.2	55-135	0			
Bromomethane	1416	75	1000	0	142	30-160	0			
Carbon disulfide	1176	30	1000	0	118	45-160	0			
Carbon tetrachloride	1112	30	1000	0	111	65-135	0			
Chlorobenzene	1000	30	1000	0	100	75-125	0			
Chloroethane	1755	100	1000	0	176	40-155	0			S
Chloroform	960.5	30	1000	0	96	70-125	0			
Chloromethane	1084	100	1000	0	108	50-130	0			
cis-1,2-Dichloroethene	956.5	30	1000	0	95.6	65-125	0			
cis-1,3-Dichloropropene	1017	30	1000	0	102	70-125	0			
Dibromochloromethane	945.5	30	1000	0	94.6	65-135	0			
Dibromomethane	969	30	1000	0	96.9	75-130	0			
Dichlorodifluoromethane	1278	30	1000	0	128	35-135	0			
Ethylbenzene	1028	30	1000	0	103	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1062	30	1000	0	106	70-135	0
Isopropylbenzene	1000	30	1000	0	100	75-130	0
m,p-Xylene	2048	60	2000	0	102	80-125	0
Methyl tert-butyl ether	991.5	30	1000	0	99.2	75-125	0
Methylene chloride	863	30	1000	0	86.3	55-145	0
Naphthalene	1198	100	1000	0	120	40-140	0
n-Butylbenzene	1066	30	1000	0	107	65-140	0
n-Propylbenzene	964.5	30	1000	0	96.4	65-135	0
o-Xylene	987.5	30	1000	0	98.8	75-125	0
p-Isopropyltoluene	969	30	1000	0	96.9	75-135	0
sec-Butylbenzene	1038	30	1000	0	104	65-130	0
Styrene	1032	30	1000	0	103	75-125	0
tert-Butylbenzene	948	30	1000	0	94.8	65-130	0
Tetrachloroethene	1017	30	1000	0	102	64-140	0
Tetrahydrofuran	763.5	200	1000	0	76.4	70-135	0
Toluene	994.5	30	1000	0	99.4	70-125	0
trans-1,2-Dichloroethene	1041	30	1000	0	104	65-135	0
trans-1,3-Dichloropropene	1026	30	1000	0	103	65-125	0
trans-1,4-Dichloro-2-butene	909	30	1000	0	90.9	70-135	0
Trichloroethene	1025	30	1000	0	102	75-125	0
Trichlorofluoromethane	1114	30	1000	0	111	25-185	0
Vinyl chloride	1160	30	1000	0	116	60-125	0
Surr: 1,2-Dichloroethane-d4	*965*	0	*1000*	0	*96.5*	*70-130*	0
Surr: 4-Bromofluorobenzene	*991*	0	*1000*	0	*99.1*	*70-130*	0
Surr: Dibromofluoromethane	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: Toluene-d8	*1000*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44496-44496**				Units: **µg/Kg**		Analysis Date: **10/31/2012 01:05 PM**			
Client ID:		Run ID: **VMS9_121031A**			SeqNo: **2128905**		Prep Date: **10/31/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1044	30	1000	0	104	75-125	0			
1,1,1-Trichloroethane	1126	30	1000	0	113	70-135	0			
1,1,2,2-Tetrachloroethane	942.5	30	1000	0	94.2	55-130	0			
1,1,2-Trichloroethane	922	30	1000	0	92.2	60-125	0			
1,1-Dichloroethane	1228	30	1000	0	123	75-125	0			
1,1-Dichloroethene	1069	30	1000	0	107	65-135	0			
1,2,3-Trichlorobenzene	989.5	30	1000	0	99	60-135	0			
1,2,3-Trichloropropane	925.5	30	1000	0	92.6	65-130	0			
1,2,3-Trimethylbenzene	1046	30	1000	0	105	65-135	0			
1,2,4-Trichlorobenzene	1008	30	1000	0	101	65-130	0			
1,2,4-Trimethylbenzene	954	30	1000	0	95.4	65-135	0			
1,2-Dibromo-3-chloropropane	786	30	1000	0	78.6	40-135	0			
1,2-Dibromoethane	973	30	1000	0	97.3	70-125	0			
1,2-Dichlorobenzene	994	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	978.5	30	1000	0	97.8	70-135	0			
1,2-Dichloropropane	1062	30	1000	0	106	70-120	0			
1,3,5-Trimethylbenzene	992.5	30	1000	0	99.2	65-135	0			
1,3-Dichlorobenzene	992	30	1000	0	99.2	70-125	0			
1,4-Dichlorobenzene	1000	30	1000	0	100	70-125	0			
2-Butanone	1328	200	1000	0	133	30-160	0			
2-Hexanone	1054	30	1000	0	105	45-145	0			
4-Methyl-2-pentanone	978	30	1000	0	97.8	45-145	0			
Acetone	1010	100	1000	0	101	20-160	0			B
Acrylonitrile	978.5	100	1000	0	97.8	70-135	0			
Benzene	1060	30	1000	0	106	75-125	0			
Bromobenzene	1026	30	1000	0	103	65-120	0			
Bromochloromethane	1188	30	1000	0	119	70-125	0			
Bromodichloromethane	1098	30	1000	0	110	70-130	0			
Bromoform	994	30	1000	0	99.4	55-135	0			
Bromomethane	1289	75	1000	0	129	30-160	0			
Carbon disulfide	1130	30	1000	0	113	45-160	0			
Carbon tetrachloride	1044	30	1000	0	104	65-135	0			
Chlorobenzene	1004	30	1000	0	100	75-125	0			
Chloroethane	694	100	1000	0	69.4	40-155	0			
Chloroform	1040	30	1000	0	104	70-125	0			
Chloromethane	1002	100	1000	0	100	50-130	0			
cis-1,2-Dichloroethene	1229	30	1000	0	123	65-125	0			
cis-1,3-Dichloropropene	1086	30	1000	0	109	70-125	0			
Dibromochloromethane	992	30	1000	0	99.2	65-135	0			
Dibromomethane	1036	30	1000	0	104	75-130	0			
Dichlorodifluoromethane	957.5	30	1000	0	95.8	35-135	0			
Ethylbenzene	1094	30	1000	0	109	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	971.5	30	1000	0	97.2	70-135	0
Isopropylbenzene	988.5	30	1000	0	98.8	75-130	0
m,p-Xylene	1937	60	2000	0	96.8	80-125	0
Methyl tert-butyl ether	1178	30	1000	0	118	75-125	0
Methylene chloride	1056	30	1000	0	106	55-145	0
Naphthalene	797	100	1000	0	79.7	40-140	0
n-Butylbenzene	1022	30	1000	0	102	65-140	0
n-Propylbenzene	954.5	30	1000	0	95.4	65-135	0
o-Xylene	1076	30	1000	0	108	75-125	0
p-Isopropyltoluene	1079	30	1000	0	108	75-135	0
sec-Butylbenzene	1032	30	1000	0	103	65-130	0
Styrene	976.5	30	1000	0	97.6	75-125	0
tert-Butylbenzene	1168	30	1000	0	117	65-130	0
Tetrachloroethene	1032	30	1000	0	103	64-140	0
Tetrahydrofuran	1137	200	1000	0	114	70-135	0
Toluene	1034	30	1000	0	103	70-125	0
trans-1,2-Dichloroethene	1132	30	1000	0	113	65-135	0
trans-1,3-Dichloropropene	905	30	1000	0	90.5	65-125	0
trans-1,4-Dichloro-2-butene	875.5	30	1000	0	87.6	70-135	0
Trichloroethene	1051	30	1000	0	105	75-125	0
Trichlorofluoromethane	1029	30	1000	0	103	25-185	0
Vinyl chloride	1056	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*972*	0	*1000*	0	*97.2*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1055*	0	*1000*	0	*106*	*70-130*	0
Surr: Dibromofluoromethane	*952*	0	*1000*	0	*95.2*	*70-130*	0
Surr: Toluene-d8	*975*	0	*1000*	0	*97.5*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44496-44496**				Units: **µg/Kg**		Analysis Date: **10/31/2012 11:46 PM**			
Client ID:		Run ID: **VMS5_121031B**			SeqNo: **2128911**		Prep Date: **10/31/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	974.5	30	1000	0	97.4	75-125	0			
1,1,1-Trichloroethane	1072	30	1000	0	107	70-135	0			
1,1,2,2-Tetrachloroethane	947.5	30	1000	0	94.8	55-130	0			
1,1,2-Trichloroethane	939.5	30	1000	0	94	60-125	0			
1,1-Dichloroethane	994.5	30	1000	0	99.4	75-125	0			
1,1-Dichloroethene	1042	30	1000	0	104	65-135	0			
1,2,3-Trichlorobenzene	967	30	1000	0	96.7	60-135	0			
1,2,3-Trichloropropane	1012	30	1000	0	101	65-130	0			
1,2,3-Trimethylbenzene	990	30	1000	0	99	65-135	0			
1,2,4-Trichlorobenzene	1048	30	1000	0	105	65-130	0			
1,2,4-Trimethylbenzene	1018	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	851	30	1000	0	85.1	40-135	0			
1,2-Dibromoethane	1011	30	1000	0	101	70-125	0			
1,2-Dichlorobenzene	1013	30	1000	0	101	75-120	0			
1,2-Dichloroethane	984	30	1000	0	98.4	70-135	0			
1,2-Dichloropropane	981	30	1000	0	98.1	70-120	0			
1,3,5-Trimethylbenzene	1038	30	1000	0	104	65-135	0			
1,3-Dichlorobenzene	995.5	30	1000	0	99.6	70-125	0			
1,4-Dichlorobenzene	971.5	30	1000	0	97.2	70-125	0			
2-Butanone	932	200	1000	0	93.2	30-160	0			
2-Hexanone	1028	30	1000	0	103	45-145	0			
4-Methyl-2-pentanone	998.5	30	1000	0	99.8	45-145	0			
Acetone	776	100	1000	0	77.6	20-160	0			
Acrylonitrile	923.5	100	1000	0	92.4	70-135	0			
Benzene	1094	30	1000	0	109	75-125	0			
Bromobenzene	1046	30	1000	0	105	65-120	0			
Bromochloromethane	955	30	1000	0	95.5	70-125	0			
Bromodichloromethane	1032	30	1000	0	103	70-130	0			
Bromoform	1070	30	1000	0	107	55-135	0			
Bromomethane	914.5	75	1000	0	91.4	30-160	0			
Carbon disulfide	1230	30	1000	0	123	45-160	0			
Carbon tetrachloride	1080	30	1000	0	108	65-135	0			
Chlorobenzene	1016	30	1000	0	102	75-125	0			
Chloroethane	1136	100	1000	0	114	40-155	0			
Chloroform	992.5	30	1000	0	99.2	70-125	0			
Chloromethane	989	100	1000	0	98.9	50-130	0			
cis-1,2-Dichloroethene	949	30	1000	0	94.9	65-125	0			
cis-1,3-Dichloropropene	972.5	30	1000	0	97.2	70-125	0			
Dibromochloromethane	1014	30	1000	0	101	65-135	0			
Dibromomethane	970	30	1000	0	97	75-130	0			
Dichlorodifluoromethane	1104	30	1000	0	110	35-135	0			
Ethylbenzene	1042	30	1000	0	104	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	989	30	1000	0	98.9	70-135	0
Isopropylbenzene	1048	30	1000	0	105	75-130	0
m,p-Xylene	2058	60	2000	0	103	80-125	0
Methyl tert-butyl ether	1028	30	1000	0	103	75-125	0
Methylene chloride	1014	30	1000	0	101	55-145	0
Naphthalene	956	100	1000	0	95.6	40-140	0
n-Butylbenzene	1052	30	1000	0	105	65-140	0
n-Propylbenzene	1028	30	1000	0	103	65-135	0
o-Xylene	1037	30	1000	0	104	75-125	0
p-Isopropyltoluene	993	30	1000	0	99.3	75-135	0
sec-Butylbenzene	1050	30	1000	0	105	65-130	0
Styrene	1030	30	1000	0	103	75-125	0
tert-Butylbenzene	1027	30	1000	0	103	65-130	0
Tetrachloroethene	1090	30	1000	0	109	64-140	0
Tetrahydrofuran	951.5	200	1000	0	95.2	70-135	0
Toluene	1029	30	1000	0	103	70-125	0
trans-1,2-Dichloroethene	998.5	30	1000	0	99.8	65-135	0
trans-1,3-Dichloropropene	1006	30	1000	0	101	65-125	0
trans-1,4-Dichloro-2-butene	1278	30	1000	0	128	70-135	0
Trichloroethene	1000	30	1000	0	100	75-125	0
Trichlorofluoromethane	1072	30	1000	0	107	25-185	0
Vinyl chloride	1105	30	1000	0	110	60-125	0
Surr: 1,2-Dichloroethane-d4	*1006*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*990.5*	0	*1000*	0	*99*	*70-130*	0
Surr: Dibromofluoromethane	*994*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Toluene-d8	*1009*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

LCS Sample ID: **LCS-44496-44496** Units: **µg/Kg** Analysis Date: **11/1/2012 03:39 PM**
Client ID: Run ID: **VMS8_121101A** SeqNo: **2129461** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	975	30	1000	0	97.5	75-125	0			
1,1,1-Trichloroethane	1068	30	1000	0	107	70-135	0			
1,1,2,2-Tetrachloroethane	864.5	30	1000	0	86.4	55-130	0			
1,1,2-Trichloroethane	876	30	1000	0	87.6	60-125	0			
1,1-Dichloroethane	1020	30	1000	0	102	75-125	0			
1,1-Dichloroethene	1154	30	1000	0	115	65-135	0			
1,2,3-Trichlorobenzene	1075	30	1000	0	108	60-135	0			
1,2,3-Trichloropropane	895.5	30	1000	0	89.6	65-130	0			
1,2,3-Trimethylbenzene	950.5	30	1000	0	95	65-135	0			
1,2,4-Trichlorobenzene	1093	30	1000	0	109	65-130	0			
1,2,4-Trimethylbenzene	982	30	1000	0	98.2	65-135	0			
1,2-Dibromo-3-chloropropane	860.5	30	1000	0	86	40-135	0			
1,2-Dibromoethane	930.5	30	1000	0	93	70-125	0			
1,2-Dichlorobenzene	918	30	1000	0	91.8	75-120	0			
1,2-Dichloroethane	1006	30	1000	0	101	70-135	0			
1,2-Dichloropropane	999	30	1000	0	99.9	70-120	0			
1,3,5-Trimethylbenzene	1022	30	1000	0	102	65-135	0			
1,3-Dichlorobenzene	922.5	30	1000	0	92.2	70-125	0			
1,4-Dichlorobenzene	901	30	1000	0	90.1	70-125	0			
2-Butanone	1106	200	1000	0	111	30-160	0			
2-Hexanone	881.5	30	1000	0	88.2	45-145	0			
4-Methyl-2-pentanone	1152	30	1000	0	115	45-145	0			
Acetone	984.5	100	1000	0	98.4	20-160	0			
Acrylonitrile	923	100	1000	0	92.3	70-135	0			
Benzene	972.5	30	1000	0	97.2	75-125	0			
Bromobenzene	921	30	1000	0	92.1	65-120	0			
Bromochloromethane	1045	30	1000	0	104	70-125	0			
Bromodichloromethane	1026	30	1000	0	103	70-130	0			
Bromoform	940.5	30	1000	0	94	55-135	0			
Bromomethane	1489	75	1000	0	149	30-160	0			
Carbon disulfide	1139	30	1000	0	114	45-160	0			
Carbon tetrachloride	1118	30	1000	0	112	65-135	0			
Chlorobenzene	969.5	30	1000	0	97	75-125	0			
Chloroethane	1796	100	1000	0	180	40-155	0			S
Chloroform	1002	30	1000	0	100	70-125	0			
Chloromethane	1010	100	1000	0	101	50-130	0			
cis-1,2-Dichloroethene	965.5	30	1000	0	96.6	65-125	0			
cis-1,3-Dichloropropene	1005	30	1000	0	100	70-125	0			
Dibromochloromethane	928	30	1000	0	92.8	65-135	0			
Dibromomethane	960	30	1000	0	96	75-130	0			
Dichlorodifluoromethane	1242	30	1000	0	124	35-135	0			
Ethylbenzene	990.5	30	1000	0	99	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1098	30	1000	0	110	70-135	0
Isopropylbenzene	992	30	1000	0	99.2	75-130	0
m,p-Xylene	1998	60	2000	0	99.9	80-125	0
Methyl tert-butyl ether	1029	30	1000	0	103	75-125	0
Methylene chloride	814.5	30	1000	0	81.4	55-145	0
Naphthalene	1236	100	1000	0	124	40-140	0
n-Butylbenzene	1075	30	1000	0	108	65-140	0
n-Propylbenzene	966.5	30	1000	0	96.6	65-135	0
o-Xylene	961.5	30	1000	0	96.2	75-125	0
p-Isopropyltoluene	930	30	1000	0	93	75-135	0
sec-Butylbenzene	1036	30	1000	0	104	65-130	0
Styrene	973.5	30	1000	0	97.4	75-125	0
tert-Butylbenzene	961.5	30	1000	0	96.2	65-130	0
Tetrachloroethene	984.5	30	1000	0	98.4	64-140	0
Tetrahydrofuran	824.5	200	1000	0	82.4	70-135	0
Toluene	970	30	1000	0	97	70-125	0
trans-1,2-Dichloroethene	1050	30	1000	0	105	65-135	0
trans-1,3-Dichloropropene	999	30	1000	0	99.9	65-125	0
trans-1,4-Dichloro-2-butene	930.5	30	1000	0	93	70-135	0
Trichloroethene	1016	30	1000	0	102	75-125	0
Trichlorofluoromethane	1134	30	1000	0	113	25-185	0
Vinyl chloride	1062	30	1000	0	106	60-125	0
Surr: 1,2-Dichloroethane-d4	*986*	0	*1000*	0	*98.6*	*70-130*	0
Surr: 4-Bromofluorobenzene	*987*	0	*1000*	0	*98.7*	*70-130*	0
Surr: Dibromofluoromethane	*970.5*	0	*1000*	0	*97*	*70-130*	0
Surr: Toluene-d8	*975*	0	*1000*	0	*97.5*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

LCS	Sample ID: **LCS-44496-44496**				Units: **µg/Kg**		Analysis Date: **11/1/2012 02:38 PM**			
Client ID:		Run ID: **VMS7_121101A**			SeqNo: **2129711**		Prep Date: **10/31/2012**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	915	30	1000	0	91.5	75-125	0			
1,1,1-Trichloroethane	992	30	1000	0	99.2	70-135	0			
1,1,2,2-Tetrachloroethane	890	30	1000	0	89	55-130	0			
1,1,2-Trichloroethane	934.5	30	1000	0	93.4	60-125	0			
1,1-Dichloroethane	1044	30	1000	0	104	75-125	0			
1,1-Dichloroethene	1036	30	1000	0	104	65-135	0			
1,2,3-Trichlorobenzene	1108	30	1000	0	111	60-135	0			
1,2,3-Trichloropropane	973	30	1000	0	97.3	65-130	0			
1,2,3-Trimethylbenzene	1007	30	1000	0	101	65-135	0			
1,2,4-Trichlorobenzene	1107	30	1000	0	111	65-130	0			
1,2,4-Trimethylbenzene	1040	30	1000	0	104	65-135	0			B
1,2-Dibromo-3-chloropropane	796	30	1000	0	79.6	40-135	0			
1,2-Dibromoethane	973	30	1000	0	97.3	70-125	0			
1,2-Dichlorobenzene	1028	30	1000	0	103	75-120	0			
1,2-Dichloroethane	926	30	1000	0	92.6	70-135	0			
1,2-Dichloropropane	913	30	1000	0	91.3	70-120	0			
1,3,5-Trimethylbenzene	1037	30	1000	0	104	65-135	0			
1,3-Dichlorobenzene	1010	30	1000	0	101	70-125	0			
1,4-Dichlorobenzene	1035	30	1000	0	104	70-125	0			
2-Butanone	1004	200	1000	0	100	30-160	0			
2-Hexanone	934	30	1000	0	93.4	45-145	0			
4-Methyl-2-pentanone	1232	30	1000	0	123	45-145	0			
Acetone	824.5	100	1000	0	82.4	20-160	0			
Acrylonitrile	904.5	100	1000	0	90.4	70-135	0			
Benzene	1012	30	1000	0	101	75-125	0			
Bromobenzene	995.5	30	1000	0	99.6	65-120	0			
Bromochloromethane	1014	30	1000	0	101	70-125	0			
Bromodichloromethane	863.5	30	1000	0	86.4	70-130	0			
Bromoform	892	30	1000	0	89.2	55-135	0			
Bromomethane	1165	75	1000	0	116	30-160	0			
Carbon disulfide	1150	30	1000	0	115	45-160	0			
Carbon tetrachloride	1017	30	1000	0	102	65-135	0			
Chlorobenzene	1007	30	1000	0	101	75-125	0			
Chloroethane	1130	100	1000	0	113	40-155	0			
Chloroform	1003	30	1000	0	100	70-125	0			
Chloromethane	954	100	1000	0	95.4	50-130	0			
cis-1,2-Dichloroethene	988	30	1000	0	98.8	65-125	0			
cis-1,3-Dichloropropene	850.5	30	1000	0	85	70-125	0			
Dibromochloromethane	935	30	1000	0	93.5	65-135	0			
Dibromomethane	835	30	1000	0	83.5	75-130	0			
Dichlorodifluoromethane	1070	30	1000	0	107	35-135	0			
Ethylbenzene	1048	30	1000	0	105	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	1026	30	1000	0	103	70-135	0	
Isopropylbenzene	1075	30	1000	0	108	75-130	0	
m,p-Xylene	2069	60	2000	0	103	80-125	0	
Methyl tert-butyl ether	918	30	1000	0	91.8	75-125	0	
Methylene chloride	868.5	30	1000	0	86.8	55-145	0	
Naphthalene	1025	100	1000	0	102	40-140	0	
n-Butylbenzene	1088	30	1000	0	109	65-140	0	
n-Propylbenzene	1092	30	1000	0	109	65-135	0	
o-Xylene	1022	30	1000	0	102	75-125	0	
p-Isopropyltoluene	1024	30	1000	0	102	75-135	0	
sec-Butylbenzene	1073	30	1000	0	107	65-130	0	
Styrene	1003	30	1000	0	100	75-125	0	
tert-Butylbenzene	1051	30	1000	0	105	65-130	0	
Tetrachloroethene	1130	30	1000	0	113	64-140	0	
Tetrahydrofuran	953.5	200	1000	0	95.4	70-135	0	
Toluene	984	30	1000	0	98.4	70-125	0	
trans-1,2-Dichloroethene	900.5	30	1000	0	90	65-135	0	
trans-1,3-Dichloropropene	924.5	30	1000	0	92.4	65-125	0	
trans-1,4-Dichloro-2-butene	688.5	30	1000	0	68.8	70-135	0	S
Trichloroethene	984	30	1000	0	98.4	75-125	0	
Trichlorofluoromethane	1021	30	1000	0	102	25-185	0	
Vinyl chloride	1102	30	1000	0	110	60-125	0	
Surr: 1,2-Dichloroethane-d4	*971.5*	0	*1000*	0	*97.2*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*1019*	0	*1000*	0	*102*	*70-130*	0	
Surr: Dibromofluoromethane	*987.5*	0	*1000*	0	*98.8*	*70-130*	0	
Surr: Toluene-d8	*1016*	0	*1000*	0	*102*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MS Sample ID: **1210935-12B MS** Units: **µg/Kg** Analysis Date: **10/31/2012 11:08 PM**
Client ID: **SBKR0975L501S102512S005** Run ID: **VMS8_121031A** SeqNo: **2128741** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	925.5	30	1000	0	92.6	75-125	0			
1,1,1-Trichloroethane	1048	30	1000	0	105	70-135	0			
1,1,2,2-Tetrachloroethane	908	30	1000	0	90.8	55-130	0			
1,1,2-Trichloroethane	851	30	1000	0	85.1	60-125	0			
1,1-Dichloroethane	980	30	1000	0	98	75-125	0			
1,1-Dichloroethene	1158	30	1000	0	116	65-135	0			
1,2,3-Trichlorobenzene	939	30	1000	0	93.9	60-135	0			
1,2,3-Trichloropropane	872	30	1000	0	87.2	65-130	0			
1,2,3-Trimethylbenzene	919	30	1000	0	91.9	65-135	0			
1,2,4-Trichlorobenzene	968.5	30	1000	0	96.8	65-130	0			
1,2,4-Trimethylbenzene	961.5	30	1000	0	96.2	65-135	0			
1,2-Dibromo-3-chloropropane	765	30	1000	0	76.5	40-135	0			
1,2-Dibromoethane	960.5	30	1000	0	96	70-125	0			
1,2-Dichlorobenzene	905	30	1000	0	90.5	75-120	0			
1,2-Dichloroethane	973.5	30	1000	0	97.4	70-135	0			
1,2-Dichloropropane	980.5	30	1000	0	98	70-120	0			
1,3,5-Trimethylbenzene	974	30	1000	0	97.4	65-135	0			
1,3-Dichlorobenzene	904.5	30	1000	0	90.4	70-125	0			
1,4-Dichlorobenzene	898.5	30	1000	0	89.8	70-125	0			
2-Butanone	958.5	100	1000	0	95.8	30-160	0			
2-Hexanone	963	30	1000	0	96.3	45-145	0			
4-Methyl-2-pentanone	1250	30	1000	0	125	45-145	0			
Acetone	1112	100	1000	0	111	20-160	0			
Acrylonitrile	991	30	1000	0	99.1	70-135	0			
Benzene	970	30	1000	0	97	75-125	0			
Bromobenzene	894.5	30	1000	0	89.4	65-120	0			
Bromochloromethane	1040	30	1000	0	104	70-125	0			
Bromodichloromethane	953	30	1000	0	95.3	70-130	0			
Bromoform	865.5	30	1000	0	86.6	55-135	0			
Bromomethane	786	30	1000	0	78.6	30-160	0			
Carbon disulfide	1088	30	1000	0	109	45-160	0			
Carbon tetrachloride	1046	30	1000	0	105	65-135	0			
Chlorobenzene	937	30	1000	0	93.7	75-125	0			
Chloroethane	2088	100	1000	0	209	40-155	0			S
Chloroform	951.5	30	1000	0	95.2	70-125	0			
Chloromethane	1088	30	1000	0	109	50-130	0			
cis-1,2-Dichloroethene	938	30	1000	0	93.8	65-125	0			
cis-1,3-Dichloropropene	937.5	30	1000	0	93.8	70-125	0			
Dibromochloromethane	850	30	1000	0	85	65-135	0			
Dibromomethane	952.5	30	1000	0	95.2	75-130	0			
Dichlorodifluoromethane	1320	30	1000	0	132	35-135	0			
Ethylbenzene	986	30	1000	0	98.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	918.5	30	1000	0	91.8	70-135	0	
Isopropylbenzene	957.5	30	1000	0	95.8	75-130	0	
m,p-Xylene	1968	60	2000	0	98.4	80-125	0	
Methyl tert-butyl ether	1057	30	1000	0	106	75-125	0	
Methylene chloride	996.5	30	1000	0	99.6	55-145	0	
Naphthalene	993.5	100	1000	0	99.4	40-140	0	
n-Butylbenzene	975.5	30	1000	0	97.6	65-140	0	
n-Propylbenzene	917	30	1000	0	91.7	65-135	0	
o-Xylene	944.5	30	1000	0	94.4	75-125	0	
p-Isopropyltoluene	886	30	1000	0	88.6	75-135	0	
sec-Butylbenzene	964	30	1000	0	96.4	65-130	0	
Styrene	969	30	1000	0	96.9	75-125	0	
tert-Butylbenzene	898.5	30	1000	0	89.8	65-130	0	
Tetrachloroethene	952.5	30	1000	0	95.2	64-140	0	
Tetrahydrofuran	1034	100	1000	0	103	70-135	0	
Toluene	964	30	1000	0	96.4	70-125	0	
trans-1,2-Dichloroethene	1042	30	1000	0	104	65-135	0	
trans-1,3-Dichloropropene	927.5	30	1000	0	92.8	65-125	0	
trans-1,4-Dichloro-2-butene	870	30	1000	0	87	70-135	0	
Trichloroethene	993.5	30	1000	0	99.4	75-125	0	
Trichlorofluoromethane	1382	30	1000	0	138	25-185	0	
Vinyl chloride	1278	30	1000	0	128	60-125	0	S
Surr: 1,2-Dichloroethane-d4	*973*	0	*1000*	0	*97.3*	*70-130*	0	
Surr: 4-Bromofluorobenzene	*975.5*	0	*1000*	0	*97.6*	*70-130*	0	
Surr: Dibromofluoromethane	*1002*	0	*1000*	0	*100*	*70-130*	0	
Surr: Toluene-d8	*978.5*	0	*1000*	0	*97.8*	*70-130*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

MSD Sample ID: **1210935-12B MSD** Units: **µg/Kg** Analysis Date: **10/31/2012 11:32 PM**
Client ID: **SBKR0975L501S102512S005** Run ID: **VMS8_121031A** SeqNo: **2128742** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	912.5	30	1000	0	91.2	75-125	925.5	1.41	30	
1,1,1-Trichloroethane	1037	30	1000	0	104	70-135	1048	1.06	30	
1,1,2,2-Tetrachloroethane	829.5	30	1000	0	83	55-130	908	9.04	30	
1,1,2-Trichloroethane	850.5	30	1000	0	85	60-125	851	0.0588	30	
1,1-Dichloroethane	962	30	1000	0	96.2	75-125	980	1.85	30	
1,1-Dichloroethene	1184	30	1000	0	118	65-135	1158	2.18	30	
1,2,3-Trichlorobenzene	979.5	30	1000	0	98	60-135	939	4.22	30	
1,2,3-Trichloropropane	886	30	1000	0	88.6	65-130	872	1.59	30	
1,2,3-Trimethylbenzene	929	30	1000	0	92.9	65-135	919	1.08	30	
1,2,4-Trichlorobenzene	1018	30	1000	0	102	65-130	968.5	5.03	30	
1,2,4-Trimethylbenzene	940.5	30	1000	0	94	65-135	961.5	2.21	30	
1,2-Dibromo-3-chloropropane	800	30	1000	0	80	40-135	765	4.47	30	
1,2-Dibromoethane	926	30	1000	0	92.6	70-125	960.5	3.66	30	
1,2-Dichlorobenzene	883.5	30	1000	0	88.4	75-120	905	2.4	30	
1,2-Dichloroethane	982.5	30	1000	0	98.2	70-135	973.5	0.92	30	
1,2-Dichloropropane	989.5	30	1000	0	99	70-120	980.5	0.914	30	
1,3,5-Trimethylbenzene	950.5	30	1000	0	95	65-135	974	2.44	30	
1,3-Dichlorobenzene	908	30	1000	0	90.8	70-125	904.5	0.386	30	
1,4-Dichlorobenzene	900	30	1000	0	90	70-125	898.5	0.167	30	
2-Butanone	1091	100	1000	0	109	30-160	958.5	12.9	30	
2-Hexanone	956	30	1000	0	95.6	45-145	963	0.73	30	
4-Methyl-2-pentanone	1206	30	1000	0	121	45-145	1250	3.66	30	
Acetone	1140	100	1000	0	114	20-160	1112	2.58	30	
Acrylonitrile	984	30	1000	0	98.4	70-135	991	0.709	30	
Benzene	966.5	30	1000	0	96.6	75-125	970	0.361	30	
Bromobenzene	873	30	1000	0	87.3	65-120	894.5	2.43	30	
Bromochloromethane	1008	30	1000	0	101	70-125	1040	3.12	30	
Bromodichloromethane	944.5	30	1000	0	94.4	70-130	953	0.896	30	
Bromoform	769.5	30	1000	0	77	55-135	865.5	11.7	30	
Bromomethane	718	30	1000	0	71.8	30-160	786	9.04	30	
Carbon disulfide	1020	30	1000	0	102	45-160	1088	6.41	30	
Carbon tetrachloride	1017	30	1000	0	102	65-135	1046	2.81	30	
Chlorobenzene	913.5	30	1000	0	91.4	75-125	937	2.54	30	
Chloroethane	1836	100	1000	0	184	40-155	2088	12.9	30	S
Chloroform	942	30	1000	0	94.2	70-125	951.5	1	30	
Chloromethane	1089	30	1000	0	109	50-130	1088	0.0459	30	
cis-1,2-Dichloroethene	931.5	30	1000	0	93.2	65-125	938	0.695	30	
cis-1,3-Dichloropropene	943	30	1000	0	94.3	70-125	937.5	0.585	30	
Dibromochloromethane	829.5	30	1000	0	83	65-135	850	2.44	30	
Dibromomethane	920.5	30	1000	0	92	75-130	952.5	3.42	30	
Dichlorodifluoromethane	1244	30	1000	0	124	35-135	1320	5.89	30	
Ethylbenzene	959	30	1000	0	95.9	75-125	986	2.78	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44496** Instrument ID **VMS8** Method: **SW8260**

Hexachloroethane	913	30	1000	0	91.3	70-135	918.5	0.601	30
Isopropylbenzene	926	30	1000	0	92.6	75-130	957.5	3.34	30
m,p-Xylene	1878	60	2000	0	93.9	80-125	1968	4.71	30
Methyl tert-butyl ether	1034	30	1000	0	103	75-125	1057	2.25	30
Methylene chloride	1000	30	1000	0	100	55-145	996.5	0.351	30
Naphthalene	1124	100	1000	0	112	40-140	993.5	12.3	30
n-Butylbenzene	972.5	30	1000	0	97.2	65-140	975.5	0.308	30
n-Propylbenzene	886	30	1000	0	88.6	65-135	917	3.44	30
o-Xylene	921	30	1000	0	92.1	75-125	944.5	2.52	30
p-Isopropyltoluene	892	30	1000	0	89.2	75-135	886	0.675	30
sec-Butylbenzene	939.5	30	1000	0	94	65-130	964	2.57	30
Styrene	963	30	1000	0	96.3	75-125	969	0.621	30
tert-Butylbenzene	873	30	1000	0	87.3	65-130	898.5	2.88	30
Tetrachloroethene	914.5	30	1000	0	91.4	64-140	952.5	4.07	30
Tetrahydrofuran	866	100	1000	0	86.6	70-135	1034	17.6	30
Toluene	927	30	1000	0	92.7	70-125	964	3.91	30
trans-1,2-Dichloroethene	999.5	30	1000	0	100	65-135	1042	4.21	30
trans-1,3-Dichloropropene	907.5	30	1000	0	90.8	65-125	927.5	2.18	30
trans-1,4-Dichloro-2-butene	777	30	1000	0	77.7	70-135	870	11.3	30
Trichloroethene	1004	30	1000	0	100	75-125	993.5	1.1	30
Trichlorofluoromethane	1390	30	1000	0	139	25-185	1382	0.505	30
Vinyl chloride	1249	30	1000	0	125	60-125	1278	2.26	30
Surr: 1,2-Dichloroethane-d4	*954*	0	*1000*	0	*95.4*	*70-130*	973	*1.97*	*30*
Surr: 4-Bromofluorobenzene	*941.5*	0	*1000*	0	*94.2*	*70-130*	975.5	*3.55*	*30*
Surr: Dibromofluoromethane	*966*	0	*1000*	0	*96.6*	*70-130*	1002	*3.66*	*30*
Surr: Toluene-d8	*939.5*	0	*1000*	0	*94*	*70-130*	978.5	*4.07*	*30*

The following samples were analyzed in this batch:

1210935-08B	1210935-09B	1210935-10B
1210935-11B	1210935-12B	1210935-13B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210935
Project: Marshall KRRI 0950,0975L 10/25/12

QC BATCH REPORT

Batch ID: **R111882** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R111882** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126558** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R111882** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126554** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1210920-02B DUP** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: Run ID: **MOIST_121029C** SeqNo: **2126528** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.36	0.050	0	0	0	-0 0	16.19	1.04	20	

DUP Sample ID: **1210935-12A DUP1** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: **SBKR0975L501S102512S005** Run ID: **MOIST_121029C** SeqNo: **2126545** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	54.15	0.050	0	0	0	-0 0	58.39	7.54	20	

DUP Sample ID: **1210935-12A DUP2** Units: **% of sample** Analysis Date: **10/29/2012 03:30 PM**
Client ID: **SBKR0975L501S102512S005** Run ID: **MOIST_121029C** SeqNo: **2126546** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	55.74	0.050	0	0	0	-0 0	58.39	4.64	20	

The following samples were analyzed in this batch:

1210935-01A	1210935-02A	1210935-04A
1210935-05A	1210935-06A	1210935-07A
1210935-08A	1210935-09A	1210935-10A
1210935-11A	1210935-12A	1210935-13A
1210935-14A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1210935

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC # ENBRIDGE_102512_GMK1 | Task: KRRI_0950,0975
Total # of Samples: 14 | Event Complete?
Turn Around Time: 5 Day | Rush: No

BILLING CODE: 6.00

Lab Information		Project Information		Other Information	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	
				Phone #:	713-821-2000
				PO #	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH											
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260											
1	SBKR0950L502S102412S008	SBKR0950L502	SO	G	10/24/2012 16:10	3			X	X	X	X	X											
2	SBKR0950L503S102412S004	SBKR0950L503	SO	G	10/24/2012 16:35	3			X	X	X	X	X											
3	SBKR0950L503T102412MX	SBKR0950L503	SQ	G	10/24/2012 00:00	1	TRIP BLANK						X											
4	SBKR0950L504S102512S004	SBKR0950L504	SO	G	10/25/2012 08:28	3			X	X	X	X	X											
5	SBKR0950L505S102512S007	SBKR0950L505	SO	G	10/25/2012 09:06	3			X	X	X	X	X											
6	SBKR0950L506S102512S008	SBKR0950L506	SO	G	10/25/2012 09:43	3			X	X	X	X	X											
7	SBKR0950L507S102512S004	SBKR0950L507	SO	G	10/25/2012 11:06	3			X	X	X	X	X											
8	SBKR0950L508S102512S005	SBKR0950L508	SO	G	10/25/2012 11:35	3			X	X	X	X	X											
9	SBKR0950L509S102512S005	SBKR0950L509	SO	G	10/25/2012 13:25	3			X	X	X	X	X											
10	SBKR0950L510S102512S005	SBKR0950L510	SO	G	10/25/2012 14:00	3			X	X	X	X	X											
11	SBKR0950L510D102512S005	SBKR0950L510	SO	G	10/25/2012 14:00	3	DUPLICATE		X	X	X	X	X											
12	SBKR0975L501S102512S005	SBKR0975L501	SO	G	10/25/2012 14:48	6	MS/MSD		X	X	X	X	X											
13	SBKR0975L502S102512S005	SBKR0975L502	SO	G	10/25/2012 15:38	3			X	X	X	X	X											
14	SBKR0975L503S102512S003	SBKR0975L503	SO	G	10/25/2012 16:17	3			X	X	X	X	X											

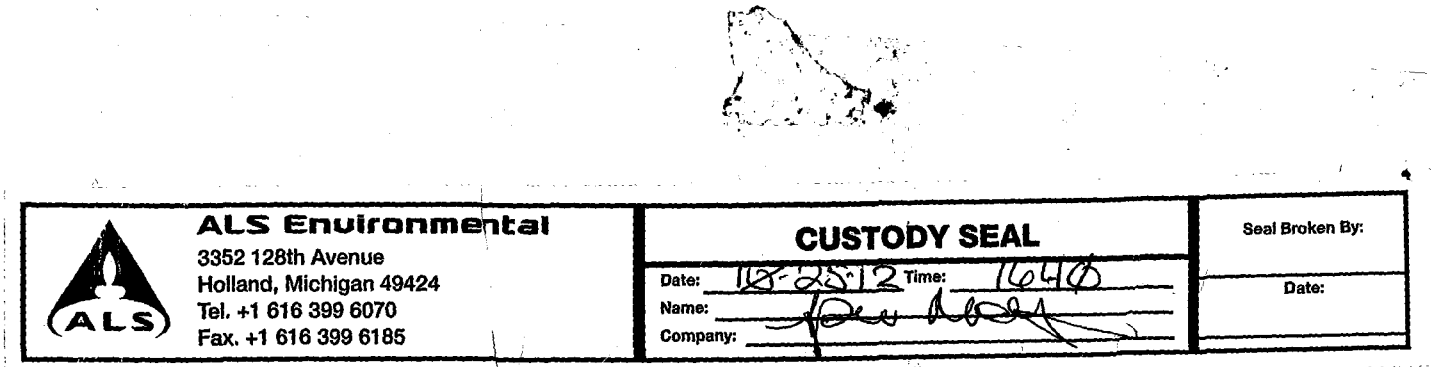
Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10.26.12	1554	[signature]	10.26.12	1554
[signature]	10/26/12	1752	[signature]	10/26/12	1752

Sample Receipt Conditions							
Temp in OC	Y/N	Samples on Ice?	Y/N	Sample intact?	Y/N	Trip Blank?
3.2°c	(Y)N		(Y)N		(Y)N	
	Y/N		Y/N		Y/N	
	Y/N		Y/N		Y/N	

SHIPPING INFO
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed:
Time:



ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 12-25-12 Time: 1640
Name:
Company:

Seal Broken By:

Date:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **26-Oct-12 17:52**

Work Order: **1210935** Received by: **PD**

Checklist completed by Keith Wierenga 27-Oct-12 Reviewed by: Ann Preston 27-Oct-12
eSignature Date eSignature Date

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/27/2012 9:04:58 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

01-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0975L,0975R Sediment 10/26/12** Work Order: **1210936**

Dear Bryan,

ALS Environmental received 3 samples on 26-Oct-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 17.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Alex Csaszar

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 01-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12
Work Order: **1210936**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1210936-01	SEKR0975L501S102612D005	Sediment		10/26/2012 09:46	10/26/2012 17:52	☐
1210936-02	SEKR0975R501S102612D005	Sediment		10/26/2012 14:50	10/26/2012 17:52	☐
1210936-03	SEKR0975R501D102612D005	Sediment		10/26/2012 14:50	10/26/2012 17:52	☐

ALS Group USA, Corp

Date: 01-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12
Work Order: 1210936

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44439, MS/MSD data for DRO and ORO is not related to this project's samples. No data requires qualifacation.

Batch 44384 samples 1210936-02 and 1210936-03. PAH internal standard recoveries were below the lower control limit, but >20%. Per the client's request, the results associated with the IS are being reported and should be considered as estimated for the compounds marked with an asterisk.

Batch 44477, MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 01-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12
WorkOrder: **1210936**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR0975L501S102612D005
Work Order:	1210936	**Collection Date:**	10/26/2012 9:46:00 AM
Project:	Marshall KRRI 0975L,0975R Sediment 10/26/12		
Lab ID:	1210936-01	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**24**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**350**	**47**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*63.1*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	3.3	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**17**	**3.3**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**19**	**3.3**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*87.1*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*65.5*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*72.1*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*104*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*62.2*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*64.3*	*40-106*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**61**	**0.050**	**0**		**% of sample**	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR0975R501S102612D005
Work Order:	1210936	**Collection Date:**	10/26/2012 2:50:00 PM
Project:	Marshall KRRI 0975L,0975R Sediment 10/26/12		
Lab ID:	1210936-02	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**98**	**19**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**500**	**38**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*69.4*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.3	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	3.2	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**11**	**3.2**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**14**	**3.2**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*90.0*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*70.7*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*78.0*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*121*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*67.6*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*69.0*	*40-106*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**51**	**0.050**	**0**		**% of sample**	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *01-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR0975R501D102612D005
Work Order:	1210936	**Collection Date:**	10/26/2012 2:50:00 PM
Project:	Marshall KRRI 0975L,0975R Sediment 10/26/12		
Lab ID:	1210936-03	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **10/30/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**22**	**4.0**		**mg/Kg-dry**	1	10/31/2012
ORO (C20-C34)	**500**	**44**	**4.0**		**mg/Kg-dry**	1	10/31/2012
Surr: 4-Terphenyl-d14	*79.8*	*39-115*			*%REC*	1	10/31/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **10/31/2012**		Analyst: **CES**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	10/31/2012
Molybdenum	ND	3.4	1.0		mg/Kg-dry	4	10/31/2012
Nickel	**13**	**3.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
Vanadium	**17**	**3.4**	**1.0**		**mg/Kg-dry**	4	10/31/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **10/30/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	10/31/2012
Anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	10/31/2012
Benzo(a)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(b)fluoranthene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(g,h,i)perylene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Benzo(k)fluoranthene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Chrysene	ND	330	330		µg/Kg-dry	1	10/31/2012
Dibenzo(a,h)anthracene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	10/31/2012
Fluorene	ND	330	330		µg/Kg-dry	1	10/31/2012
Indeno(1,2,3-cd)pyrene	ND	330	330	*	µg/Kg-dry	1	10/31/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	10/31/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Pyrene	ND	330	330		µg/Kg-dry	1	10/31/2012
Surr: 2,4,6-Tribromophenol	*81.8*	*34-140*			*%REC*	1	10/31/2012
Surr: 2-Fluorobiphenyl	*72.2*	*12-100*			*%REC*	1	10/31/2012
Surr: 2-Fluorophenol	*77.9*	*33-117*			*%REC*	1	10/31/2012
Surr: 4-Terphenyl-d14	*120*	*25-137*			*%REC*	1	10/31/2012
Surr: Nitrobenzene-d5	*67.7*	*37-107*			*%REC*	1	10/31/2012
Surr: Phenol-d6	*69.5*	*40-106*			*%REC*	1	10/31/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**58**	**0.050**	**0**		**% of sample**	1	10/30/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44439** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44439-44439** Units: **mg/Kg** Analysis Date: **10/31/2012 08:27 A**

Client ID: Run ID: **GC8_121031A** SeqNo: **2128609** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.339*	0	*5*	0	*66.8*	*39-115*	0			

LCS Sample ID: **DLCSS1-44439-44439** Units: **mg/Kg** Analysis Date: **10/31/2012 08:54 A**

Client ID: Run ID: **GC8_121031A** SeqNo: **2128610** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	312.4	10	500	0	62.5	49-124	0			
ORO (C20-C34)	366.9	20	500	0	73.4	60-130	0			
Surr: 4-Terphenyl-d14	*3.857*	0	*5*	0	*77.1*	*39-115*	0			

MS Sample ID: **1210935-12A MS** Units: **mg/Kg** Analysis Date: **10/31/2012 09:21 A**

Client ID: Run ID: **GC8_121031A** SeqNo: **2128612** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.5	10	499.3	48.29	52.5	60-130	0			S
ORO (C20-C34)	427.2	20	499.3	129.2	59.7	60-130	0			S
Surr: 4-Terphenyl-d14	*3.736*	0	*4.993*	0	*74.8*	*39-115*	0			

MSD Sample ID: **1210935-12A MSD** Units: **mg/Kg** Analysis Date: **10/31/2012 09:48 A**

Client ID: Run ID: **GC8_121031A** SeqNo: **2128613** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	267.8	9.1	455.5	48.29	48.2	60-130	310.5	14.8	30	S
ORO (C20-C34)	374.2	18	455.5	129.2	53.8	60-130	427.2	13.2	30	S
Surr: 4-Terphenyl-d14	*3.321*	0	*4.555*	0	*72.9*	*39-115*	3.736	*11.8*	*30*	

The following samples were analyzed in this batch: 1210936-01A 1210936-02A 1210936-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210936
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12

QC BATCH REPORT

Batch ID: **44477** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44477-44477** Units: **mg/Kg** Analysis Date: **10/31/2012 07:23 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2128604** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	0.01206	0.25								J
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44477-44477** Units: **mg/Kg** Analysis Date: **10/31/2012 07:28 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2128605** Prep Date: **10/31/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.698	0.10	5	0	94	80-120	0			
Molybdenum	4.882	0.25	5	0	97.6	80-120	0			
Nickel	4.855	0.25	5	0	97.1	80-120	0			
Vanadium	4.798	0.25	5	0	96	80-120	0			

MS Sample ID: **1210935-12AMS** Units: **mg/Kg** Analysis Date: **10/31/2012 07:40 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2128607** Prep Date: **10/31/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.284	0.60	7.485	0.1336	95.5	75-125	0			
Molybdenum	7.913	1.5	7.485	0.327	101	75-125	0			
Nickel	12.75	1.5	7.485	4.895	105	75-125	0			
Vanadium	17.39	1.5	7.485	8.337	121	75-125	0			

MSD Sample ID: **1210935-12AMSD** Units: **mg/Kg** Analysis Date: **10/31/2012 07:45 PM**
Client ID: Run ID: **ICPMS1_121031A** SeqNo: **2128608** Prep Date: **10/31/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.798	0.63	7.874	0.1336	97.3	75-125	7.284	6.82	25	
Molybdenum	8.485	1.6	7.874	0.327	104	75-125	7.913	6.97	25	
Nickel	13.73	1.6	7.874	4.895	112	75-125	12.75	7.38	25	
Vanadium	18.67	1.6	7.874	8.337	131	75-125	17.39	7.13	25	S

The following samples were analyzed in this batch: 1210936-01A 1210936-02A 1210936-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44438-44438** Units: **µg/Kg** Analysis Date: **10/31/2012 09:24 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127685** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3866*	0	*5000*	0	*77.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3854*	0	*5000*	0	*77.1*	*12-100*	0			
Surr: 2-Fluorophenol	*4328*	0	*5000*	0	*86.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6124*	0	*5000*	0	*122*	*25-137*	0			
Surr: Nitrobenzene-d5	*3847*	0	*5000*	0	*76.9*	*37-107*	0			
Surr: Phenol-d6	*3759*	0	*5000*	0	*75.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210936
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

LCS Sample ID: **SLCSS1-44438-44438** Units: **µg/Kg** Analysis Date: **10/31/2012 08:53 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127684** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1591	50	2000	0	79.6	45-105	0			
Acenaphthene	1586	50	2000	0	79.3	45-110	0			
Acenaphthylene	1749	50	2000	0	87.4	45-105	0			
Anthracene	1744	50	2000	0	87.2	55-105	0			
Benzo(a)anthracene	1743	50	2000	0	87.2	50-110	0			
Benzo(a)pyrene	2149	50	2000	0	107	50-110	0			
Benzo(b)fluoranthene	2078	50	2000	0	104	45-115	0			
Benzo(g,h,i)perylene	2233	50	2000	0	112	40-125	0			
Benzo(k)fluoranthene	2286	50	2000	0	114	45-115	0			
Chrysene	1697	50	2000	0	84.8	55-110	0			
Dibenzo(a,h)anthracene	1956	50	2000	0	97.8	40-125	0			
Fluoranthene	1682	50	2000	0	84.1	55-115	0			
Fluorene	1493	50	2000	0	74.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1974	50	2000	0	98.7	40-120	0			
Naphthalene	1557	50	2000	0	77.8	40-105	0			
Phenanthrene	1712	50	2000	0	85.6	50-110	0			
Pyrene	1681	50	2000	0	84	45-125	0			
Surr: 2,4,6-Tribromophenol	*4305*	0	*5000*	0	*86.1*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*4064*	0	*5000*	0	*81.3*	*12-100*	0			
Surr: 2-Fluorophenol	*4380*	0	*5000*	0	*87.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5656*	0	*5000*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*4086*	0	*5000*	0	*81.7*	*37-107*	0			
Surr: Phenol-d6	*3959*	0	*5000*	0	*79.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MS Sample ID: **1210935-12A MS** Units: **µg/Kg** Analysis Date: **10/31/2012 10:39 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127686** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1373	49	1963	0	70	45-105	0			
Acenaphthene	1499	49	1963	0	76.4	45-110	0			
Acenaphthylene	1657	49	1963	0	84.4	45-105	0			
Anthracene	1606	49	1963	0	81.8	55-105	0			
Benzo(a)anthracene	1668	49	1963	66.86	81.5	50-110	0			
Benzo(a)pyrene	2050	49	1963	85.96	100	50-110	0			
Benzo(b)fluoranthene	2239	49	1963	74.5	110	45-115	0			
Benzo(g,h,i)perylene	1708	49	1963	0	87	40-125	0			
Benzo(k)fluoranthene	2080	49	1963	113.7	100	45-115	0			
Chrysene	1595	49	1963	68.77	77.7	55-110	0			
Dibenzo(a,h)anthracene	1565	49	1963	0	79.7	40-125	0			
Fluoranthene	1671	49	1963	94.56	80.3	55-115	0			
Fluorene	1469	49	1963	0	74.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1569	49	1963	59.22	76.9	40-120	0			
Naphthalene	1260	49	1963	0	64.2	40-105	0			
Phenanthrene	1645	49	1963	0	83.8	50-110	0			
Pyrene	1682	49	1963	92.65	81	45-125	0			
Surr: 2,4,6-Tribromophenol	*4384*	0	*4908*	0	*89.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3495*	0	*4908*	0	*71.2*	*12-100*	0			
Surr: 2-Fluorophenol	*3391*	0	*4908*	0	*69.1*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5222*	0	*4908*	0	*106*	*25-137*	0			
Surr: Nitrobenzene-d5	*3180*	0	*4908*	0	*64.8*	*37-107*	0			
Surr: Phenol-d6	*3262*	0	*4908*	0	*66.5*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210936
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12

QC BATCH REPORT

Batch ID: **44438** Instrument ID **SVMS4** Method: **SW8270**

MSD Sample ID: **1210935-12A MSD** Units: **µg/Kg** Analysis Date: **10/31/2012 11:11 A**
Client ID: Run ID: **SVMS4_121031A** SeqNo: **2127687** Prep Date: **10/30/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1425	49	1972	0	72.2	45-105	1373	3.71	30	
Acenaphthene	1539	49	1972	0	78	45-110	1499	2.67	30	
Acenaphthylene	1702	49	1972	0	86.3	45-105	1657	2.7	30	
Anthracene	1694	49	1972	0	85.9	55-105	1606	5.36	30	
Benzo(a)anthracene	1710	49	1972	66.86	83.3	50-110	1668	2.51	30	
Benzo(a)pyrene	2140	49	1972	85.96	104	50-110	2050	4.28	30	
Benzo(b)fluoranthene	2222	49	1972	74.5	109	45-115	2239	0.763	30	
Benzo(g,h,i)perylene	1531	49	1972	0	77.6	40-125	1708	11	30	
Benzo(k)fluoranthene	2334	49	1972	113.7	113	45-115	2080	11.5	30	
Chrysene	1676	49	1972	68.77	81.5	55-110	1595	4.92	30	
Dibenzo(a,h)anthracene	1494	49	1972	0	75.8	40-125	1565	4.61	30	
Fluoranthene	1830	49	1972	94.56	88	55-115	1671	9.13	30	
Fluorene	1472	49	1972	0	74.6	50-110	1469	0.205	30	
Indeno(1,2,3-cd)pyrene	1485	49	1972	59.22	72.3	40-120	1569	5.52	30	
Naphthalene	1303	49	1972	0	66	40-105	1260	3.31	30	
Phenanthrene	1709	49	1972	0	86.6	50-110	1645	3.82	30	
Pyrene	1649	49	1972	92.65	78.9	45-125	1682	2.01	30	
Surr: 2,4,6-Tribromophenol	*4892*	0	*4931*	0	*99.2*	*34-140*	4384	*11*	*40*	
Surr: 2-Fluorobiphenyl	*3720*	0	*4931*	0	*75.4*	*12-100*	3495	*6.23*	*40*	
Surr: 2-Fluorophenol	*3499*	0	*4931*	0	*71*	*33-117*	3391	*3.13*	*40*	
Surr: 4-Terphenyl-d14	*5146*	0	*4931*	0	*104*	*25-137*	5222	*1.46*	*40*	
Surr: Nitrobenzene-d5	*3318*	0	*4931*	0	*67.3*	*37-107*	3180	*4.23*	*40*	
Surr: Phenol-d6	*3419*	0	*4931*	0	*69.3*	*40-106*	3262	*4.71*	*40*	

The following samples were analyzed in this batch: 1210936-01A 1210936-02A 1210936-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1210936
Project: Marshall KRRI 0975L,0975R Sediment 10/26/12

QC BATCH REPORT

Batch ID: **R111938** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R111938** Units: **% of sample** Analysis Date: **10/30/2012 03:00 PM**
Client ID: Run ID: **MOIST_121030A** SeqNo: **2127482** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R111938** Units: **% of sample** Analysis Date: **10/30/2012 03:00 PM**
Client ID: Run ID: **MOIST_121030A** SeqNo: **2127478** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1210992-01A DUP** Units: **% of sample** Analysis Date: **10/30/2012 03:00 PM**
Client ID: Run ID: **MOIST_121030A** SeqNo: **2127475** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.05	0.050	0	0	0	-0 0	14.07	6.73	20	

The following samples were analyzed in this batch: 1210936-01A 1210936-02A 1210936-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1210936

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_102612_GMK2	Task: KRRI_SED0975
	Total # of Samples: 3	Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email:	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #:	60162778
Site Address:	5555 Glenwood Parkway SE Suite 200
City:	Grand Rapids
State, Zip:	MI
Site PM Name:	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	Analysis: % Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270
								None		None	None	None
1	SEKR0975L501S102612D005	SEKR0975L501	SE	G	10/26/2012 09:46	1			X	X	X	X
2	SEKR0975R501S102612D005	SEKR0975R501	SE	G	10/26/2012 14:50	1			X	X	X	X
3	SEKR0975R501D102612D005	SEKR0975R501	SE	G	10/26/2012 14:50	1	DUPLICATE		X	X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-26-12	1553	[signature]	10-26-12	1553
[signature]	10-26-12	1752	[signature]	10/26/12	1752

Sample Receipt Conditions

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?
2.8°C	Y/N	Y/N	Y/N
	(Y)N	(Y)N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO

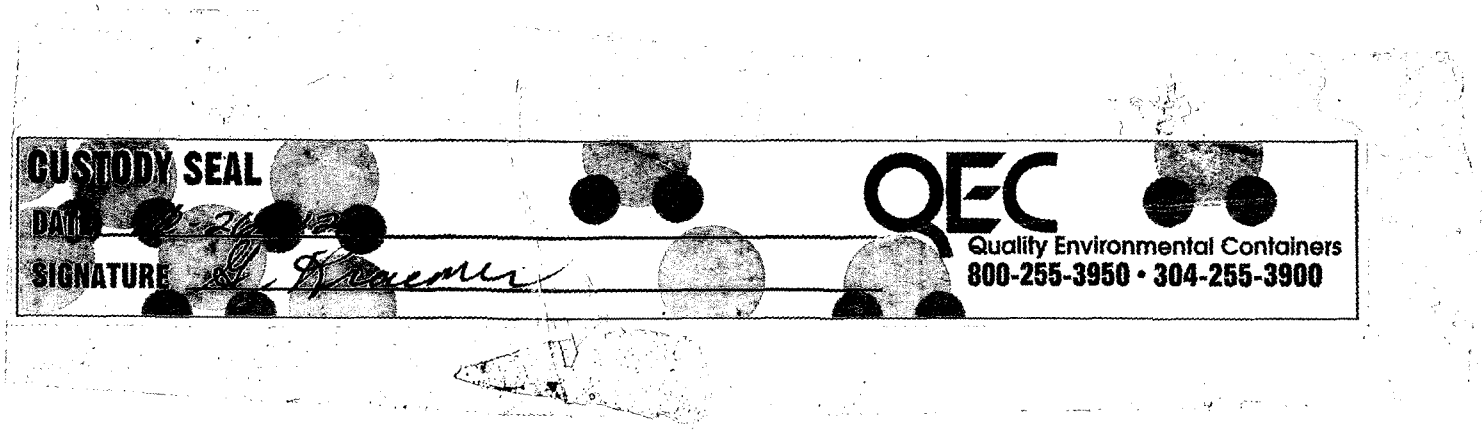
Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: GERRY KRAMER (GMK2)

SIGNATURE of SAMPLER: [signature] DATE Signed: Time:


CUSTODY SEAL
DATE
SIGNATURE
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **26-Oct-12 17:52**

Work Order: **1210936** Received by: **PD**

Checklist completed by Keith Wierenga eSignature 27-Oct-12 Date Reviewed by: Ann Preston eSignature 27-Oct-12 Date

Matrices: Sediment
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.8 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/27/2012 9:09:13 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

07-Nov-2012

Mike Wolf
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall OSBME SPLP Oct. 2012** Work Order: **1211004**

Dear Mike,

ALS Environmental received 14 samples on 01-Nov-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 39.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 07-Nov-12

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: **1211004**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1211004-01	SBKR0575R508S100512S005	Splp Extract		10/5/2012 12:00	11/1/2012	☐
1211004-02	SBKR0975R501S100112S005	Splp Extract		10/1/2012 15:00	11/1/2012	☐
1211004-03	SBKR1075R501S100112S005	Splp Extract		10/1/2012 16:45	11/1/2012	☐
1211004-04	SBKR1100R501S100212S004	Splp Extract		10/2/2012 08:20	11/1/2012	☐
1211004-05	SBKR2100L501S100312S005	Splp Extract		10/3/2012 16:25	11/1/2012	☐
1211004-06	SBKR2100L502S100312S005	Splp Extract		10/3/2012 16:58	11/1/2012	☐
1211004-07	SBKR2100L503S100412S005	Splp Extract		10/4/2012 08:52	11/1/2012	☐
1211004-08	SBKR2100L503D100412S005	Splp Extract		10/4/2012 08:52	11/1/2012	☐
1211004-09	SBKR2100L505S100412S005	Splp Extract		10/4/2012 10:17	11/1/2012	☐
1211004-10	SBKR0275L515S101212S005	Splp Extract		10/12/2012 11:30	11/1/2012	☐
1211004-11	SBKR0650R513S101212S005	Splp Extract		10/12/2012 15:50	11/1/2012	☐
1211004-12	SBKR0725L518S101012S005	Splp Extract		10/10/2012 09:28	11/1/2012	☐
1211004-13	SBKR1875L501S101012S005	Splp Extract		10/10/2012 14:45	11/1/2012	☐
1211004-14	SBKR1025R502S101512S005	Splp Extract		10/15/2012 12:42	11/1/2012	☐

ALS Group USA, Corp

Date: 07-Nov-12

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
WorkOrder: **1211004**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR0575R508S100512S005
Lab ID: 1211004-01
Collection Date: 10/5/2012 12:00 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Vanadium	**0.26**		**0.0050**	**mg/L**	1	11/5/2012 07:58 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR0975R501S100112S005
Lab ID: 1211004-02
Collection Date: 10/1/2012 03:00 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 08:04 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR1075R501S100112S005
Lab ID: 1211004-03
Collection Date: 10/1/2012 04:45 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 08:09 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR1100R501S100212S004
Lab ID: 1211004-04
Collection Date: 10/2/2012 08:20 AM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 08:14 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR2100L501S100312S005
Lab ID: 1211004-05
Collection Date: 10/3/2012 04:25 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 08:34 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR2100L502S100312S005
Lab ID: 1211004-06
Collection Date: 10/3/2012 04:58 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	**0.0068**		**0.0050**	**mg/L**	1	11/5/2012 08:39 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR2100L503S100412S005
Lab ID: 1211004-07
Collection Date: 10/4/2012 08:52 AM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	**0.011**		**0.0050**	**mg/L**	1	11/5/2012 08:44 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR2100L503D100412S005
Lab ID: 1211004-08
Collection Date: 10/4/2012 08:52 AM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 08:49 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Sample ID: SBKR2100L505S100412S005
Collection Date: 10/4/2012 10:17 AM

Work Order: 1211004
Lab ID: 1211004-09
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	**0.0067**		**0.0050**	**mg/L**	1	11/5/2012 08:54 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR0275L515S101212S005
Lab ID: 1211004-10
Collection Date: 10/12/2012 11:30 AM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 08:59 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client: AECOM Environment
Project: Marshall OSBME SPLP Oct. 2012
Work Order: 1211004
Sample ID: SBKR0650R513S101212S005
Lab ID: 1211004-11
Collection Date: 10/12/2012 03:50 PM
Matrix: SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	ND		0.0050	mg/L	1	11/5/2012 09:04 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client:	AECOM Environment		
Project:	Marshall OSBME SPLP Oct. 2012	**Work Order:**	1211004
Sample ID:	SBKR0725L518S101012S005	**Lab ID:**	1211004-12
Collection Date:	10/10/2012 09:28 AM	**Matrix:**	SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	**0.0059**		**0.0050**	**mg/L**	1	11/5/2012 09:09 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client:	AECOM Environment		
Project:	Marshall OSBME SPLP Oct. 2012	**Work Order:**	1211004
Sample ID:	SBKR1875L501S101012S005	**Lab ID:**	1211004-13
Collection Date:	10/10/2012 02:45 PM	**Matrix:**	SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	**0.0055**		**0.0050**	**mg/L**	1	11/5/2012 09:14 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *07-Nov-12*

Client:	AECOM Environment		
Project:	Marshall OSBME SPLP Oct. 2012	**Work Order:**	1211004
Sample ID:	SBKR1025R502S101512S005	**Lab ID:**	1211004-14
Collection Date:	10/15/2012 12:42 PM	**Matrix:**	SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/5/2012**	Analyst: **RH**
Molybdenum	**0.012**		**0.0050**	**mg/L**	1	11/5/2012 09:19 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44553** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44553-44553** Units: **mg/L** Analysis Date: **11/5/2012 03:30 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131433** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.0050								

MBLK Sample ID: **MBLK-44553-44553** Units: **mg/L** Analysis Date: **11/5/2012 05:21 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131571** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-44553-44553** Units: **mg/L** Analysis Date: **11/5/2012 03:36 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131434** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.1025	0.0050	0.1	0	102	80-120	0			

LCS Sample ID: **LCS-44553-44553** Units: **mg/L** Analysis Date: **11/5/2012 05:26 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131572** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Vanadium	0.1077	0.0050	0.1	0	108	80-120	0			

MS Sample ID: **1210750-24CMS** Units: **mg/L** Analysis Date: **11/5/2012 03:51 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131437** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.1021	0.0050	0.1	0.00007219	102	75-125	0			

MS Sample ID: **1210750-24CMS** Units: **mg/L** Analysis Date: **11/5/2012 05:42 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131575** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Vanadium	0.1112	0.0050	0.1	0.000244	111	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 1211004
Project: Marshall OSBME SPLP Oct. 2012

QC BATCH REPORT

Batch ID: **44553** Instrument ID **ICPMS2** Method: **SW6020A**

MSD Sample ID: **1210750-24CMSD** Units: **mg/L** Analysis Date: **11/5/2012 05:16 PM**
Client ID: Run ID: **ICPMS2_121105A** SeqNo: **2131570** Prep Date: **11/5/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.1027	0.0050	0.1	0.00007161	103	75-125	0.1062	3.35	20	
Vanadium	0.1064	0.0050	0.1	0.000244	106	75-125	0.1112	4.41	20	

The following samples were analyzed in this batch:

1211004-01A	1211004-02A	1211004-03A
1211004-04A	1211004-05A	1211004-06A
1211004-07A	1211004-08A	1211004-09A
1211004-10A	1211004-11A	1211004-12A
1211004-13A	1211004-14A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **01-Nov-12 00:00**

Work Order: **1211004** Received by: **AC**

Checklist completed by Alex Csaszar (eSignature) 01-Nov-12 (Date) Reviewed by: Alex Csaszar (eSignature) 01-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0 degrees C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

~~1210239~~ 1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_100512_GMK1
Task:	OSBME
Total # of Samples:	9
Event Complete?	
Turn Around Time	7 Day
Rush	No
BILLING CODE:	6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State.	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Analysis: % Moisture (Preservative: None)	Be,Mo,V,Ni by 6020 (None)	SPLP V
1	SBKR0475L506S100512S005	SBKR0475L506	SO	G	10/05/2012 15:35	1		X	X	
2	SBKR0500L506S100512S005	SBKR0500L506	SO	G	10/05/2012 16:05	1		X	X	
3	SBKR0550L516S100512S005	SBKR0550L516	SO	G	10/05/2012 11:35	1		X	X	
4	SBKR0575R508S100512S005	SBKR0575R508	SO	G	10/05/2012 12:00	1		X	X	X 11/1/12 AL
5	SBKR0600R517S100512S005	SBKR0600R517	SO	G	10/05/2012 13:25	1		X	X	
6	SBKR2350R510S100512S005	SBKR2350R510	SO	G	10/05/2012 08:35	1		X	X	
7	SBKR2775L501D100512S005	SBKR2775L501	SO	G	10/05/2012 09:20	1	DUPLICATE	X	X	
8	SBKR2775L501S100512S005	SBKR2775L501	SO	G	10/05/2012 09:20	1		X	X	
9	SBKR2975L505S100512S005	SBKR2975L505	SO	G	10/05/2012 10:05	1		X	X	

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-5-12	1610	[signature]	10-5-12	1610
[signature]	10-5-12	1612	[signature]	10-5-12	1612

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
3.4°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO.

Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: GERRY KRAMER (GMK1)

SIGNATURE of SAMPLER:

DATE Signed:

Time:

~~1210162~~
1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_100112_GMK1
Task:	OSBME
Total # of Samples:	6
Event Complete?	
Turn Around Time	5 Day
Rush	No
BILLING CODE:	6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State.	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	% Moisture	Be,Mo,V,Ni by 6020	SPLP Mo	11/1/12
								None	None		
1	SBKR0850L501S100112S004	SBKR0850L501	SO	G	10/01/2012 13:15	1		X	X		
2	SBKR0850R501S100112S005	SBKR0850R501	SO	G	10/01/2012 14:00	1		X	X		
3	SBKR0850R501D100112S005	SBKR0850R501	SO	G	10/01/2012 14:00	1	DUPLICATE	X	X		
4	SBKR0975R501S100112S005	SBKR0975R501	SO	G	10/01/2012 15:00	1		X	X	X	
5	SBKR1050L521S100112S005	SBKR1050L521	SO	G	10/01/2012 15:45	1		X	X		
6	SBKR1075R501S100112S005	SBKR1075R501	SO	G	10/01/2012 16:45	2	MS/MSD	X	X	X	

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-2-12	0807	[signature]	10-2-12	0807
[signature]	10-3-12	1340	[signature]	10/3/12	1340

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
4.4°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO.

Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: GERRY KRAMER (GMK1)

SIGNATURE of SAMPLER

DATE Signed

Time:

~~1210164~~
1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_100212_GMK1
Task:	OSBME
Total # of Samples:	10
Event Complete?	
Turn Around Time	5 Day
Rush	No
BILLING CODE:	6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State.	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	% Moisture	Be,Mo,V,Ni by 6020	SPLP MO	11/1/12 AZ
								None	None		
1	SBKR1100R501S100212S004	SBKR1100R501	SO	G	10/02/2012 08:20	1		X	X	X	
2	SBKR1200L522S100212S005	SBKR1200L522	SO	G	10/02/2012 13:00	1		X	X		
3	SBKR1200L523S100212S004	SBKR1200L523	SO	G	10/02/2012 13:43	1		X	X		
4	SBKR1200L524S100212S005	SBKR1200L524	SO	G	10/02/2012 14:10	1		X	X		
5	SBKR1200L525S100212S005	SBKR1200L525	SO	G	10/02/2012 15:00	1		X	X		
6	SBKR1200L526S100212S005	SBKR1200L526	SO	G	10/02/2012 15:35	1		X	X		
7	SBKR1200L526D100212S005	SBKR1200L526	SO	G	10/02/2012 15:35	1	DUPLICATE	X	X		
8	SBKR1200R503S100212S005	SBKR1200R503	SO	G	10/02/2012 08:55	1		X	X		
9	SBKR1450L507S100212S005	SBKR1450L507	SO	G	10/02/2012 16:02	1		X	X		
10	SBKR1450L508S100212S005	SBKR1450L508	SO	G	10/02/2012 16:37	1		X	X		

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Gerry Kramer	10-3-12	0830	[signature]	10-3-12	0830
[signature]	10-3-12	1340	[signature]	10/3/12	1340

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
3.2 i	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO.

Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: GERRY KRAMER (GMK1)

SIGNATURE of SAMPLER:

DATE Signed

Time:

~~1210237~~ 1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_100312_GMK2	Task: OSBME	
Total # of Samples: 3		Event Complete?	
Turn Around Time	5 Day	Rush	No

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State.	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Analysis: % Moisture (Preservative: None)	Be,Mo,V,Ni by 6020 (None)	SPLP MO	1/1/12 AL
1	SBKR1875R501S100312S005	SBKR1875R501	SO	G	10/03/2012 13:55	1		X	X		
2	SBKR2100L501S100312S005	SBKR2100L501	SO	G	10/03/2012 16:25	1		X	X	X	
3	SBKR2100L502S100312S005	SBKR2100L502	SO	G	10/03/2012 16:58	1		X	X	X	

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G Kramer	10-4-12	0900	[signature]	10-4-12	0900
[signature]	10/5/12	1605	[signature]	10/5/12	1605

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
34°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO

Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: GERRY KRAMER (GMK2)

SIGNATURE of SAMPLER:

DATE Signed

Time:

~~1210238~~
1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

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Cooler # of

COC #	ENBRIDGE_100412_GMK1
Task:	OSBME
Total # of Samples:	10
Event Complete?	
Turn Around Time	5 Day
Rush	No
BILLING CODE:	6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	% Moisture (None)	Be,Mo,V,Ni by 6020 (None)	SPLP Mo	11/1/12 AR
1	SBKR2100L503S100412S005	SBKR2100L503	SO	G	10/04/2012 08:52	1		X	X	X	
2	SBKR2100L503D100412S005	SBKR2100L503	SO	G	10/04/2012 08:52	1	DUPLICATE	X	X	X	
3	SBKR2100L504S100412S005	SBKR2100L504	SO	G	10/04/2012 09:34	1		X	X		
4	SBKR2100L505S100412S005	SBKR2100L505	SO	G	10/04/2012 10:17	1		X	X	X	
5	SBKR2325L501S100412S005	SBKR2325L501	SO	G	10/04/2012 13:13	2	MS/MSD	X	X		
6	SBKR2325L502S100412S005	SBKR2325L502	SO	G	10/04/2012 13:54	1		X	X		
7	SBKR2325L503S100412S005	SBKR2325L503	SO	G	10/04/2012 14:29	1		X	X		
8	SBKR2375R507S100412S005	SBKR2375R507	SO	G	10/04/2012 16:32	1		X	X		
9	SBKR2375R508S100412S005	SBKR2375R508	SO	G	10/04/2012 17:05	1		X	X		
10	SBKR2675R506S100412S005	SBKR2675R506	SO	G	10/04/2012 15:18	1		X	X		

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
G Kramer	10-5-12	0845	[signature]	10-5-12	0845
[signature]	10/5/12	1605	[signature]	10/5/12	1605

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
3.4°C	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO.

Company:

Tracking #:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: GERRY KRAMER (GMK1)

SIGNATURE of SAMPLER

DATE Signed

Time:

~~1210509~~
1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_101212_GMK1	Task: OSBME
	Total # of Samples: 8	Event Complete?

Turn Around Time	5 Day	Rush	No	

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:				
Project #	60162778			
Site Address	5555 Glenwood Parkway SE Suite 200			
City	Grand Rapids	State, Zip	MI	
Site PM Name	[redacted]			
Phone/Fax:	[redacted]			
Site PM Email:	Bryan.Sliemsma@aecom.com			

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable		
Address:	1100 Louisiana Suite 1100		
City/State,	Houson, TX	Phone #:	713-821-2000
PO #			
Send EDD to			
CC Hardcopy report			
CC Hardcopy report			

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None				Analysis Requested	% Moisture	Be,Mo,V,Ni by 6020	SPLP Mo	11/1/12	
1	SBKR0275L515S101212S005	SBKR0275L515	SO	G	10/12/2012 11:30	1									X	X	X		
2	SBKR0275L516S101212S005	SBKR0275L516	SO	G	10/12/2012 14:16	1									X	X			
3	SBKR0275L516D101212S005	SBKR0275L516	SO	G	10/12/2012 14:16	1	DUPLICATE								X	X			
4	SBKR0375R506S101212S005	SBKR0375R506	SO	G	10/12/2012 08:37	1									X	X			
5	SBKR0425R504S101212S005	SBKR0425R504	SO	G	10/12/2012 09:07	1									X	X			
6	SBKR0525R509S101212S005	SBKR0525R509	SO	G	10/12/2012 09:49	1									X	X			
7	SBKR0650R512S101212S005	SBKR0650R512	SO	G	10/12/2012 15:23	1									X	X			
8	SBKR0650R513S101212S005	SBKR0650R513	SO	G	10/12/2012 15:50	1									X	X	X		

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-12-12	1810	[signature]	10-12-12	1810
[signature]	10-12-12	1655	[signature]	10-12-12	1655

SHIPPING INFO	SAMPLER NAME AND SIGNATURE			
Company:	PRINT Name of SAMPLER:	GERRY KRAMER (GMK1)		
Tracking #:	SIGNATURE of SAMPLER:	DATE Signed	Time:	

Sample Receipt Conditions	Temp in QC	Samples on Ice?	Sample Intact?	Trip Blank?
	4.2 C	(Y)/N	(Y)/N	Y/(N)
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

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1241004

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ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_101012_GMK1	Task: OSBME
	Total # of Samples: 7	Event Complete?
Turn Around Time	5 Day	Rush: No

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State.	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

| ITEM # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | MATRIX CODE | G=GRAB C=COMP | SAMPLE DATE | #OF CONTAINERS | Comments/Lab Sample I.D. | Preservative: None | None | SPLP MS | ~~1/1/12~~ #2 | | |

~~1210614~~
1211004

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_101512_GMK1	Task: OSBME
	Total # of Samples: 9	Event Complete?

Lab Information		Project Information		Other Information			
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable	Turn Around Time	5 Day / Rush / No
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100	BILLING CODE: 6.00	
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX	Phone #:	713-821-2000
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to			
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report			
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report			

ITEM #	SAMPLE ID (Samples IDs MUST BE UNIQUE)	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None			
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	SPLP Ro	11/1/12	
1	SBKR0725L519S101512S005	SBKR0725L519	SO	G	10/15/2012 08:50	1			X	X			
2	SBKR0750L508S101512S005	SBKR0750L508	SO	G	10/15/2012 09:22	1			X	X			
3	SBKR0750L509S101512S005	SBKR0750L509	SO	G	10/15/2012 10:00	1			X	X			
4	SBKR0975R502S101512S005	SBKR0975R502	SO	G	10/15/2012 10:42	1			X	X			
5	SBKR1025R501S101512S005	SBKR1025R501	SO	G	10/15/2012 11:37	1			X	X			
6	SBKR1025R502S101512S005	SBKR1025R502	SO	G	10/15/2012 12:42	1			X	X	X		
7	SBKR1225R503S101512S005	SBKR1225R503	SO	G	10/15/2012 13:23	1			X	X			
8	SBKR1500L507S101512S005	SBKR1500L507	SO	G	10/15/2012 15:00	1			X	X			
9	SBKR1500L507D101512S005	SBKR1500L507	SO	G	10/15/2012 15:00	1	DUPLICATE		X	X			

10/18/12

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10/17/12	0940	[signature]	10-17-12	0940
[signature]	10-17-12	1310	[signature]	10-17-12	1318

Sample Receipt Conditions				
Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?	
2.0°C	Y/N (Y)	(Y) N	(Y) N	
	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	

SHIPPING INFO.
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER: DATE Signed: Time:

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_101512_GMK1_REV	Task: OSBME
Total # of Samples: 9		Event Complete?

Lab Information:		Project Information:		Other Information:			
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable		
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100		
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State,	Houson, TX	Phone #:	713-821-2000
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to			
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report to			
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report to			

Turn Around Time	5 Day	Rush	No

BILLING CODE: 6.00

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None
								Analysis	% Moisture	Be,Mo,V,Ni by 6020
1	SBKR0725L519S101512S005	SBKR0725L519	SO	G	10/15/2012 08:50	1			X	X
2	SBKR0750L508S101512S005	SBKR0750L508	SO	G	10/15/2012 09:22	1			X	X
3	SBKR0750L509S101512S005	SBKR0750L509	SO	G	10/15/2012 10:00	1			X	X
4	SBKR0975R502S101512S005	SBKR0975R502	SO	G	10/15/2012 10:42	1			X	X
5	SBKR1025R501S101512S005	SBKR1025R501	SO	G	10/15/2012 11:37	1			X	X
6	SBKR1025R502S101512S005	SBKR1025R502	SO	G	10/15/2012 12:42	1			X	X
7	SBKR1500L507D101512S005 - 08	SBKR1500L507	SO	G	10/15/2012 15:00	1	DUPLICATE		X	X
8	SBKR1500L507S101512S005 - 09	SBKR1500L507	SO	G	10/15/2012 15:00	1			X	X
9	SBKR1225R503S101512S005 - 07	SBKR1225R503	SO	G	10/15/2012 13:23	1			X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

Sample Receipt Conditions

	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N
	Y/N		Y/N		Y/N

SHIPPING INFO	SAMPLER NAME AND SIGNATURE			
Company:	PRINT Name of SAMPLER:	GERRY KRAMER (GMK1)		
Tracking #:	SIGNATURE of SAMPLER:	DATE Signed	Time:	

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?

Alex Csaszar

From: Ann Preston
Sent: Wednesday, October 31, 2012 4:56 PM
To: Alex Csaszar
Subject: FW: Enbridge SPLP

Follow Up Flag: Follow up
Flag Status: Flagged

Can you take care of reactivating these for me? See WO 12101048 for a workorder to follow.

Ann

From: Wolf, Michael G. [mailto:Michael.Wolf@aecom.com]
Sent: Wednesday, October 31, 2012 2:53 PM
To: Ann Preston
Subject: RE: Enbridge SPLP

yes
From: Ann Preston [mailto:Ann.Preston@alsglobal.com]
Sent: Wednesday, October 31, 2012 2:50 PM
To: Wolf, Michael G.
Subject: RE: Enbridge SPLP
Are these Std TAT?

From: Wolf, Michael G. [mailto:Michael.Wolf@aecom.com]
Sent: Wednesday, October 31, 2012 2:41 PM
To: Ann Preston
Subject: Enbridge SPLP
Vanadium splp (this sample only)
1210239-04
Molybdenum splp
1210162-04, 06
1210164-01
1210237-02, 03
1210238-01, 02, 04
1210509-01, 08
1210510-01, 04
1210614-06
Thanks

Mike Wolf, CPG
Sr. Hydrogeologist
AECOM Environment
D (616)-940-4408 C[redacted]
michael.wolf@aecom.com
AECOM
5555 Glenwood Hills Pkwy SE, Ste 300
Grand Rapids, MI 49512
Telephone (616)-942-9600 Fax (616)-940-4396

Ann Preston

From: April Modert [a.modert@superiorenvironmental.com]
Sent: Thursday, October 18, 2012 9:41 AM
To: Ann Preston
Cc: Carveth, Jonathan (Jonathan.Carveth@aecom.com)
Subject: FW: COC change
Attachments: ENBRIDGE_101512_GMK1_REV.xls

Ann,

Please see the attached COC for the revision noted below. If you should have any questions please contact me.

Thanks,

From: Carveth, Jonathan [mailto:Jonathan.Carveth@aecom.com]
Sent: Wednesday, October 17, 2012 3:12 PM
To: April Modert; Herberich, Jim
Cc: Albig, Brian
Subject: COC change

April,
Please make the sample correction in the attached COC:

Line 7: SBKR1225R501S101512S005 should be changed to SBKR1225R503S101512S005. Location is now SBKR1225R503.

This sample is part of the metals evaluation.
Please let me know if you have any other questions.

Thanks,
Jon Carveth

ALS Group: Click here to report this email as spam.

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 10-5-12 Time:

Name:

Company:

Seal Broken By:

Date:

3.4°C

4.4°C

~~Horizon~~ Marshall

ALS Environmental 3352 128th Avenue Holland, Michigan 49424 Tel. +1 616 399 6070 Fax. +1 616 399 6185	**CUSTODY SEAL** Date: 10/2/12 Time: Name: Company:	Seal Broken By: Date:

3.2°C

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 10-3-12 Time:

Name:

Company:

Seal Broken By:

Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 10-5-12 Time:
Name:
Company:

Seal Broken By:

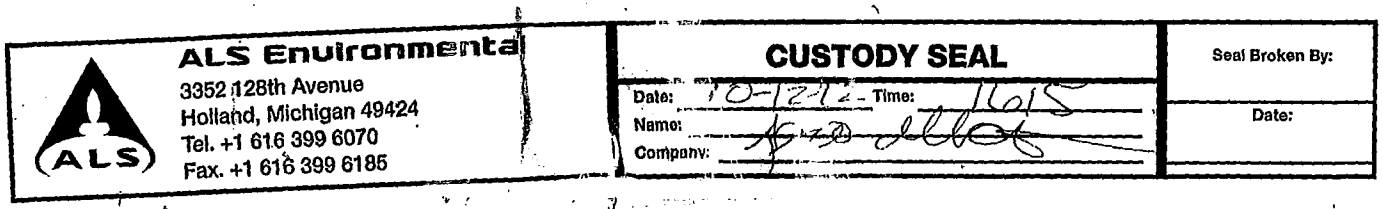
Date:

3.4°C

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

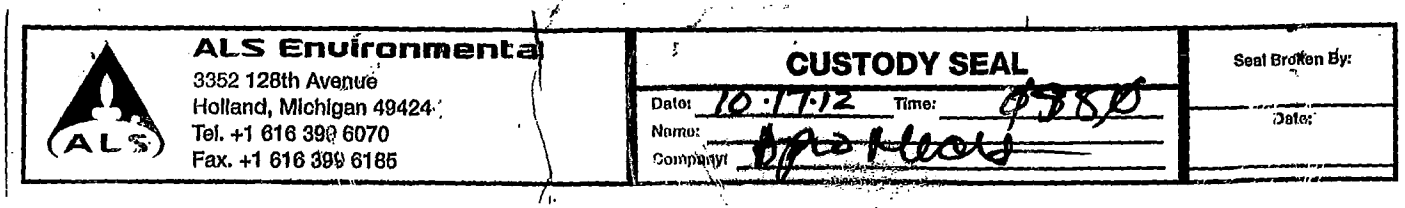
CUSTODY SEAL	Seal Broken By:
Date: 10-5-12 Time:	Date:
Name:	
Company:	

3.4°C


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
ALS
CUSTODY SEAL
Date: 10-12-12 Time: 1615
Name:
Company:
Seal Broken By:
Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL	Seal Broken By:
Date: 10-12-12 Time: 1615	Date:
Name: [illegible]	
Company: [illegible]	



ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: 10.17.12 Time: 0930
Name:
Company: ALS Holland

Seal Broken By:
Date:

02-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI SPLP Oct. 2012** Work Order: **12101048**

Dear Bryan,

ALS Environmental received 5 samples on 31-Oct-2012 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Alex Csaszar

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 02-Nov-12

Client: AECOM Environment
Project: Marshall KRRI SPLP Oct. 2012
Work Order: **12101048**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
12101048-01	SBKR2000R503S101712S007	Splp Extract		10/17/2012 12:12	10/31/2012	☐
12101048-02	SBKR0650R504S101812S006	Splp Extract		10/18/2012 11:34	10/31/2012	☐
12101048-03	SBKR0725R502S101812S005	Splp Extract		10/18/2012 13:27	10/31/2012	☐
12101048-04	SBKR0725R504S101812S006	Splp Extract		10/18/2012 15:49	10/31/2012	☐
12101048-05	SBKR2000R510S101812S004	Splp Extract		10/18/2012 09:38	10/31/2012	☐

ALS Group USA, Corp

Date: 02-Nov-12

Client: AECOM Environment
Project: Marshall KRRI SPLP Oct. 2012
WorkOrder: **12101048**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR2000R503S101712S007
Work Order:	12101048	**Collection Date:**	10/17/2012 12:12:00 PM
Project:	Marshall KRRI SPLP Oct. 2012		
Lab ID:	12101048-01	**Matrix:**	SPLP EXTRACT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/1/2012**		Analyst: **RH**
Molybdenum	ND	0.0050	0		mg/L	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0650R504S101812S006
Work Order:	12101048	**Collection Date:**	10/18/2012 11:34:00 AM
Project:	Marshall KRRI SPLP Oct. 2012		
Lab ID:	12101048-02	**Matrix:**	SPLP EXTRACT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/1/2012**		Analyst: **RH**
Molybdenum	**0.0081**	**0.0050**	**0**		**mg/L**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0725R502S101812S005
Work Order:	12101048	**Collection Date:**	10/18/2012 1:27:00 PM
Project:	Marshall KRRI SPLP Oct. 2012		
Lab ID:	12101048-03	**Matrix:**	SPLP EXTRACT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/1/2012**		Analyst: **RH**
Molybdenum	ND	0.0050	0		mg/L	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0725R504S101812S006
Work Order:	12101048	**Collection Date:**	10/18/2012 3:49:00 PM
Project:	Marshall KRRI SPLP Oct. 2012		
Lab ID:	12101048-04	**Matrix:**	SPLP EXTRACT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/1/2012**		Analyst: **RH**
Molybdenum	ND	0.0050	0		mg/L	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *02-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR2000R510S101812S004
Work Order:	12101048	**Collection Date:**	10/18/2012 9:38:00 AM
Project:	Marshall KRRI SPLP Oct. 2012		
Lab ID:	12101048-05	**Matrix:**	SPLP EXTRACT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/1/2012**		Analyst: **RH**
Molybdenum	ND	0.0050	0		mg/L	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44494** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK	Sample ID: **MBLK-44494-44494**					Units: **mg/L**			Analysis Date: **11/1/2012 05:31 PM**
Client ID:		Run ID: **ICPMS2_121101A**				SeqNo: **2129525**		Prep Date: **11/1/2012**	DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	ND	0.0050								

LCS	Sample ID: **LCS-44494-44494**					Units: **mg/L**			Analysis Date: **11/1/2012 05:36 PM**
Client ID:		Run ID: **ICPMS2_121101A**				SeqNo: **2129526**		Prep Date: **11/1/2012**	DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.09369	0.0050	0.1	0	93.7	80-120	0			

MS	Sample ID: **1210964-01BMS**					Units: **mg/L**			Analysis Date: **11/1/2012 05:51 PM**
Client ID:		Run ID: **ICPMS2_121101A**				SeqNo: **2129529**		Prep Date: **11/1/2012**	DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.09511	0.0050	0.1	0.001568	93.5	75-125	0			

MSD	Sample ID: **1210964-01BMSD**					Units: **mg/L**			Analysis Date: **11/1/2012 05:56 PM**
Client ID:		Run ID: **ICPMS2_121101A**				SeqNo: **2129530**		Prep Date: **11/1/2012**	DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Molybdenum	0.0957	0.0050	0.1	0.001568	94.1	75-125	0.09511	0.618	20	

The following samples were analyzed in this batch:

12101048-01A	12101048-02A	12101048-03A
12101048-04A	12101048-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1210725

1210148

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of
Cooler # of

COC #	ENBRIDGE_101712_GMK1	Task:	KRRI_2000R,3800R
	Total # of Samples: 11		Event Complete?
Turn Around Time	5 Day	Rush	No
BILLING CODE: 6.00			

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave, Holland, MI 49424-9263	Project #	60162776	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	[redacted]	Send EDD to	
Lab PM email:	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative:	None	None	None	None												
								Analysis:	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270												
1	SBKR2000R501S101712S004	SBKR2000R501	SO	G	10/17/2012 10:59	1			X	X	X	X												
2	SBKR2000R502S101712S005	SBKR2000R502	SO	G	10/17/2012 11:39	1			X	X	X	X												
3	SBKR2000R503S101712S007	SBKR2000R503	SO	G	10/17/2012 12:12	1			X	X	X	X		X										
4	SBKR2000R504S101712S004	SBKR2000R504	SO	G	10/17/2012 13:37	1			X	X	X	X												
5	SBKR2000R505S101712S007	SBKR2000R505	SO	G	10/17/2012 14:05	1			X	X	X	X												
6	SBKR2000R506S101712S006	SBKR2000R506	SO	G	10/17/2012 14:50	1			X	X	X	X												
7	SBKR2000R507S101712S006	SBKR2000R507	SO	G	10/17/2012 15:26	1			X	X	X	X												
8	SBKR2000R508S101712S007	SBKR2000R508	SO	G	10/17/2012 16:42	1			X	X	X	X												
9	SBKR3800R501S101712S006	SBKR3800R501	SO	G	10/17/2012 08:30	1			X	X	X	X												
10	SBKR3800R501D101712S006	SBKR3800R501	SO	G	10/17/2012 08:30	1	DUPLICATE		X	X	X	X												
11	SBKR3800R502S101712S005	SBKR3800R502	SO	G	10/17/2012 09:11	2	MS/MSD		X	X	X	X												

SPLP MS 10/31/12

01

Additional Comments/Special Instructions:

RELINQUISHED BY/AFFILIATION	DATE	TIME	ACCEPTED BY/AFFILIATION	DATE	TIME
[signature]	10.19.12	0810	[signature]	10-19-12	0810
[signature]	10-19-12	1720	[signature]	10-19-12	1720

Sample Receipt Conditions	Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?
	4.0°C	(Y)N	(Y)N	Y(N)
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: GERRY KRAMER (GMK1) SIGNATURE of SAMPLER: DATE Signed: Time:

1210727

1210048

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of
Cooler # of

COC #	ENBRIDGE_101812_GMK1	Task: KRR!_0650,0725,2000,2025
	Total # of Samples: 12	Event Complete?
Turn Around Time	5 Day	Rush: No
BILLING CODE: 6.00		

Lab Information:		Project Information:		Other Information:	
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State:	Houson, TX Phone #: 713-821-2000
Lab PM:	Ann Preston	City	Grand Rapids State, Zip MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	[redacted]	Send EDD to	
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report	
Applicable Lab Quote #:		Site PM Email:	Bryan.Sliemsma@aecom.com	CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH		SPLP MO									
	Analysis								% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260											
1	SBKR0650R504S101812S006	SBKR0650R504	SO	G	10/18/2012 11:34	3			X	X	X	X	X		4									
2	SBKR0725R501S101812S007	SBKR0725R501	SO	G	10/18/2012 12:47	3			X	X	X	X	X											
3	SBKR0725R502S101812S005	SBKR0725R502	SO	G	10/18/2012 13:27	3			X	X	X	X	X		4									
4	SBKR0725R503S101812S004	SBKR0725R503	SO	G	10/18/2012 15:01	3			X	X	X	X	X											
5	SBKR0725R504S101812S006	SBKR0725R504	SO	G	10/18/2012 15:49	3			X	X	X	X	X		X									
6	SBKR0725R505S101812S003	SBKR0725R505	SO	G	10/18/2012 16:25	3			X	X	X	X	X											
7	SBKR0725R505T101812MX	SBKR0725R505	SQ	G	10/18/2012 00:00	1	TRIP BLANK						X											
8	SBKR2000R509S101812S006	SBKR2000R509	SO	G	10/18/2012 08:55	1			X	X	X	X												
9	SBKR2000R509D101812S006	SBKR2000R509	SO	G	10/18/2012 08:55	1	DUPLICATE		X	X	X	X												
10	SBKR2000R510S101812S004	SBKR2000R510	SO	G	10/18/2012 09:38	1			X	X	X	X			X									
11	SBKR2025R501S101812S008	SBKR2025R501	SO	G	10/18/2012 10:15	1			X	X	X	X												
12	SBKR2025R502S101812S009	SBKR2025R502	SO	G	10/18/2012 11:07	1			X	X	X	X												

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10.19.12	0755	[signature]	10-19-12	0755
[signature]	10-19-12	1720		10-19-12	1720

Sample Receipt Conditions	Temp in OC	Samples on Ice?	Sample intact?	Trip Blank?
	4.0°C	Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

SHIPPING INFO: Company: Tracking #:

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: GERRY KRAMER (GMK1) SIGNATURE of SAMPLER: DATE Signed: Time:

Ann Preston

From: Wolf, Michael G. [Michael.Wolf@aecom.com]
Sent: Tuesday, October 30, 2012 4:59 PM
To: Ann Preston
Subject: Enbridge SPLP

Hi Ann – Here are the MO splp that need to be run. The first two are the ones I need ASAP. The others can be more normal TAT. ,05
1210725 – 03, 1210727 – 10 -1210048-01
,02,03,04
1210727 – 01, 03, 05

Thanks

1210048

Mike Wolf, CPG
Sr. Hydrogeologist
AECOM Environment
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AECOM
5555 Glenwood Hills Pkwy SE, Ste 300
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ALS Environmental 3352 128th Avenue Holland, Michigan 49424 Tel. +1 616 399 6070 Fax. +1 616 399 6185	CUSTODY SEAL Date: 10-19-12 Time: 0935 Name: Company:	Seal Broken By: Date:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 10-19-12 Time: 0935
Name:
Company: Spectrum

Seal Broken By:

Date:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **31-Oct-12 00:00**

Work Order: **12101048** Received by: **AP**

Checklist completed by Ann Preston 31-Oct-12 Reviewed by: Ann Preston 31-Oct-12
eSignature Date eSignature Date

Matrices: soil
Carrier name: Courier

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0°C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

08-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0950R Sediment 10/29/12** Work Order: **12101050**

Dear Bryan,

ALS Environmental received 1 sample on 31-Oct-2012 12:45 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950R Sediment 10/29/12
Work Order: **12101050**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
12101050-01	SEKR0950R501S102912D006	Sediment		10/29/2012 13:16	10/31/2012 12:45	☐

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950R Sediment 10/29/12
Work Order: 12101050

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44488 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batch 44509 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950 Sediment 10/29/12
WorkOrder: **12101050**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SEKR0950R501S102912D006
Work Order:	12101050	**Collection Date:**	10/29/2012 1:16:00 PM
Project:	Marshall KRRI 0950R Sediment 10/29/12		
Lab ID:	12101050-01	**Matrix:**	SEDIMENT

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/1/2012**		Analyst: **CW**
DRO (C10-C20)	**140**	**29**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**320**	**57**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*73.9*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	4.3	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**8.5**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**11**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/1/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Anthracene	**470**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Benzo(a)anthracene	**840**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Benzo(a)pyrene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Benzo(b)fluoranthene	**840**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(k)fluoranthene	**540**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Chrysene	**680**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluoranthene	**2,100**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Fluorene	**650**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Phenanthrene	**2,000**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Pyrene	**1,400**	**330**	**330**		**µg/Kg-dry**	1	11/5/2012
Surr: 2,4,6-Tribromophenol	*93.5*	*34-140*			*%REC*	1	11/5/2012
Surr: 2-Fluorobiphenyl	*75.0*	*12-100*			*%REC*	1	11/5/2012
Surr: 2-Fluorophenol	*83.4*	*33-117*			*%REC*	1	11/5/2012
Surr: 4-Terphenyl-d14	*120*	*25-137*			*%REC*	1	11/5/2012
Surr: Nitrobenzene-d5	*71.6*	*37-107*			*%REC*	1	11/5/2012
Surr: Phenol-d6	*72.1*	*40-106*			*%REC*	1	11/5/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**67**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44488** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44488-44488** Units: **mg/Kg** Analysis Date: **11/1/2012 04:32 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130108** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.263*	0	*5*	0	*65.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44488-44488** Units: **mg/Kg** Analysis Date: **11/1/2012 04:59 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130109** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	311.3	10	500	0	62.3	49-124	0			
ORO (C20-C34)	377.6	20	500	0	75.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.045*	0	*5*	0	*80.9*	*39-115*	0			

MS Sample ID: **12101051-02A MS** Units: **mg/Kg** Analysis Date: **11/1/2012 05:26 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130110** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	329	9.5	476.1	64.81	55.5	60-130	0			S
ORO (C20-C34)	455.1	19	476.1	153.8	63.3	60-130	0			
Surr: 4-Terphenyl-d14	*4.123*	0	*4.761*	0	*86.6*	*39-115*	0			

MSD Sample ID: **12101051-02A MSD** Units: **mg/Kg** Analysis Date: **11/1/2012 05:53 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130111** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.1	9.7	483.5	64.81	50.7	60-130	329	5.93	30	S
ORO (C20-C34)	396.4	19	483.5	153.8	50.2	60-130	455.1	13.8	30	S
Surr: 4-Terphenyl-d14	*3.866*	0	*4.835*	0	*80*	*39-115*	4.123	*6.44*	*30*	

The following samples were analyzed in this batch: 12101050-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101050
Project: Marshall KRRI 0950R Sediment 10/29/12

QC BATCH REPORT

Batch ID: **44509** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44509-44509** Units: **mg/Kg** Analysis Date: **11/2/2012 06:13 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130784** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44509-44509** Units: **mg/Kg** Analysis Date: **11/2/2012 06:18 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130785** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.37	0.10	5	0	87.4	80-120	0			
Molybdenum	4.934	0.25	5	0	98.7	80-120	0			
Nickel	4.682	0.25	5	0	93.6	80-120	0			
Vanadium	5.015	0.25	5	0	100	80-120	0			

MS Sample ID: **12101051-02AMS** Units: **mg/Kg** Analysis Date: **11/2/2012 06:33 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130788** Prep Date: **11/2/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.013	0.52	6.452	0.3177	88.3	75-125	0			
Molybdenum	7.933	1.3	6.452	1.452	100	75-125	0			
Nickel	18.62	1.3	6.452	12.88	88.9	75-125	0			
Vanadium	24.82	1.3	6.452	13.18	180	75-125	0			S

MSD Sample ID: **12101051-02AMSD** Units: **mg/Kg** Analysis Date: **11/2/2012 06:38 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130789** Prep Date: **11/2/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.912	0.54	6.693	0.3177	83.6	75-125	6.013	1.7	25	
Molybdenum	7.585	1.3	6.693	1.452	91.6	75-125	7.933	4.48	25	
Nickel	17.54	1.3	6.693	12.88	69.7	75-125	18.62	5.93	25	S
Vanadium	23.65	1.3	6.693	13.18	156	75-125	24.82	4.81	25	S

The following samples were analyzed in this batch: 12101050-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44487-44487** Units: **µg/Kg** Analysis Date: **11/2/2012 10:47 AM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2129866** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3816*	0	*5000*	0	*76.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3380*	0	*5000*	0	*67.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3471*	0	*5000*	0	*69.4*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3690*	0	*5000*	0	*73.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3485*	0	*5000*	0	*69.7*	*37-107*	0			
Surr: Phenol-d6	*3810*	0	*5000*	0	*76.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44487-44487** Units: **µg/Kg** Analysis Date: **11/2/2012 09:52 AM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2129864** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1618	50	2000	0	80.9	45-105	0			
Acenaphthene	1671	50	2000	0	83.6	45-110	0			
Acenaphthylene	1710	50	2000	0	85.5	45-105	0			
Anthracene	1766	50	2000	0	88.3	55-105	0			
Benzo(a)anthracene	1795	50	2000	0	89.8	50-110	0			
Benzo(a)pyrene	1872	50	2000	0	93.6	50-110	0			
Benzo(b)fluoranthene	1855	50	2000	0	92.8	45-115	0			
Benzo(g,h,i)perylene	1898	50	2000	0	94.9	40-125	0			
Benzo(k)fluoranthene	1794	50	2000	0	89.7	45-115	0			
Chrysene	1792	50	2000	0	89.6	55-110	0			
Dibenzo(a,h)anthracene	1913	50	2000	0	95.6	40-125	0			
Fluoranthene	1846	50	2000	0	92.3	55-115	0			
Fluorene	1752	50	2000	0	87.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1914	50	2000	0	95.7	40-120	0			
Naphthalene	1605	50	2000	0	80.2	40-105	0			
Phenanthrene	1783	50	2000	0	89.2	50-110	0			
Pyrene	1930	50	2000	0	96.5	45-125	0			
Surr: 2,4,6-Tribromophenol	*4387*	0	*5000*	0	*87.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3425*	0	*5000*	0	*68.5*	*12-100*	0			
Surr: 2-Fluorophenol	*3473*	0	*5000*	0	*69.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4041*	0	*5000*	0	*80.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3494*	0	*5000*	0	*69.9*	*37-107*	0			
Surr: Phenol-d6	*3566*	0	*5000*	0	*71.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101050
Project: Marshall KRRI 0950R Sediment 10/29/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **12101051-02A MS** Units: **µg/Kg** Analysis Date: **11/2/2012 02:12 PM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2131194** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1564	50	1992	0	78.5	45-105	0			
Acenaphthene	1621	50	1992	0	81.4	45-110	0			
Acenaphthylene	1678	50	1992	0	84.2	45-105	0			
Anthracene	1816	50	1992	0	91.2	55-105	0			
Benzo(a)anthracene	1769	50	1992	0	88.8	50-110	0			
Benzo(a)pyrene	1787	50	1992	88.88	85.2	50-110	0			
Benzo(b)fluoranthene	1946	50	1992	117.9	91.8	45-115	0			
Benzo(g,h,i)perylene	1651	50	1992	53.13	80.2	40-125	0			
Benzo(k)fluoranthene	1603	50	1992	0	80.5	45-115	0			
Chrysene	1728	50	1992	85.02	82.5	55-110	0			
Dibenzo(a,h)anthracene	1695	50	1992	0	85.1	40-125	0			
Fluoranthene	1879	50	1992	61.83	91.2	55-115	0			
Fluorene	1741	50	1992	0	87.4	50-110	0			
Indeno(1,2,3-cd)pyrene	1724	50	1992	48.3	84.1	40-120	0			
Naphthalene	1515	50	1992	0	76	40-105	0			
Phenanthrene	1846	50	1992	0	92.7	50-110	0			
Pyrene	1887	50	1992	0	94.8	45-125	0			
Surr: 2,4,6-Tribromophenol	*4708*	0	*4980*	0	*94.5*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3318*	0	*4980*	0	*66.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3263*	0	*4980*	0	*65.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3878*	0	*4980*	0	*77.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*3320*	0	*4980*	0	*66.7*	*37-107*	0			
Surr: Phenol-d6	*3594*	0	*4980*	0	*72.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101050
Project: Marshall KRRI 0950R Sediment 10/29/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **12101051-02A MSD** Units: **µg/Kg** Analysis Date: **11/2/2012 02:39 PM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2131195** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1452	47	1893	0	76.7	45-105	1564	7.39	30	
Acenaphthene	1512	47	1893	0	79.8	45-110	1621	7	30	
Acenaphthylene	1550	47	1893	0	81.8	45-105	1678	7.96	30	
Anthracene	1719	47	1893	0	90.8	55-105	1816	5.46	30	
Benzo(a)anthracene	1675	47	1893	0	88.4	50-110	1769	5.47	30	
Benzo(a)pyrene	1755	47	1893	88.88	88	50-110	1787	1.79	30	
Benzo(b)fluoranthene	1848	47	1893	117.9	91.4	45-115	1946	5.18	30	
Benzo(g,h,i)perylene	1546	47	1893	53.13	78.8	40-125	1651	6.59	30	
Benzo(k)fluoranthene	1597	47	1893	0	84.4	45-115	1603	0.406	30	
Chrysene	1638	47	1893	85.02	82	55-110	1728	5.36	30	
Dibenzo(a,h)anthracene	1587	47	1893	0	83.8	40-125	1695	6.55	30	
Fluoranthene	1768	47	1893	61.83	90.1	55-115	1879	6.09	30	
Fluorene	1616	47	1893	0	85.4	50-110	1741	7.45	30	
Indeno(1,2,3-cd)pyrene	1631	47	1893	48.3	83.6	40-120	1724	5.54	30	
Naphthalene	1416	47	1893	0	74.8	40-105	1515	6.73	30	
Phenanthrene	1753	47	1893	0	92.6	50-110	1846	5.18	30	
Pyrene	1807	47	1893	0	95.4	45-125	1887	4.34	30	
Surr: 2,4,6-Tribromophenol	*4424*	0	*4733*	0	*93.5*	*34-140*	4708	*6.22*	*40*	
Surr: 2-Fluorobiphenyl	*3100*	0	*4733*	0	*65.5*	*12-100*	3318	*6.8*	*40*	
Surr: 2-Fluorophenol	*3094*	0	*4733*	0	*65.4*	*33-117*	3263	*5.29*	*40*	
Surr: 4-Terphenyl-d14	*3719*	0	*4733*	0	*78.6*	*25-137*	3878	*4.18*	*40*	
Surr: Nitrobenzene-d5	*3131*	0	*4733*	0	*66.2*	*37-107*	3320	*5.86*	*40*	
Surr: Phenol-d6	*3385*	0	*4733*	0	*71.5*	*40-106*	3594	*5.99*	*40*	

The following samples were analyzed in this batch: 12101050-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101050
Project: Marshall KRRI 0950R Sediment 10/29/12

QC BATCH REPORT

Batch ID: **R112046** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112046** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129936** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112046** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129932** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **12101051-02A DUP1** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129913** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	50.47	0.050	0	0	0	0-0	48.3	4.39	20	

DUP Sample ID: **12101051-02A DUP2** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129914** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	48.07	0.050	0	0	0	0-0	48.3	0.477	20	

DUP Sample ID: **12101052-13B DUP** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129930** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	66.65	0.050	0	0	0	0-0	65.69	1.45	20	

The following samples were analyzed in this batch: 12101050-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

12101050

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_102912_GMK2	Task: KRRI_SED_0950
Total # of Samples: 1		Event Complete?
Turn Around Time	5 Day	Rush: No

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	[redacted]
Phone/Fax:	
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send Invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	Analysis: % Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270
									None	None	None	None
1	SEKR0950R501S102912D006	SEKR0950R501	SE	G	10/29/2012 13:16	1			X	X	X	X

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-31-12	1240	[signature]	10-31-12	1240
[signature]	10/31/12	1245	[signature]	10/31/12	1245

Sample Receipt Conditions

Temp in OC	Samples on ice?	Sample intact?	Trip Blank?
38 c	(Y) N	(Y) N	Y (N)
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO:
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK2)
SIGNATURE of SAMPLER:
DATE Signed:
Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **31-Oct-12 12:45**

Work Order: **12101050** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 31-Oct-12 (Date) Reviewed by: Alex Csaszar (eSignature) 01-Nov-12 (Date)

Matrices: Sediment
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.8 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/31/2012 3:41:56 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

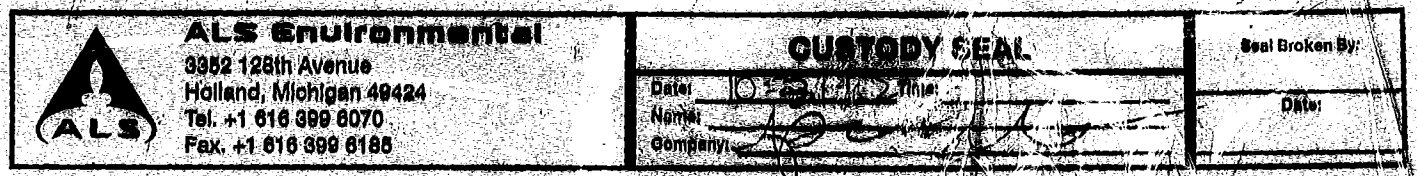
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:


ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185
CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
Date:

08-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0975R 10/30/12** Work Order: **12101051**

Dear Bryan,

ALS Environmental received 5 samples on 31-Oct-2012 01:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 36.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975R 10/30/12
Work Order: **12101051**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
12101051-01	SBKR0975R507S103012S005	Soil		10/30/2012 08:31	10/31/2012 13:00	☐
12101051-02	SBKR0975R508S103012S006	Soil		10/30/2012 09:21	10/31/2012 13:00	☐
12101051-03	SBKR0975R509S103012S008	Soil		10/30/2012 10:21	10/31/2012 13:00	☐
12101051-04	SBKR0975R510S103012S005	Soil		10/30/2012 11:03	10/31/2012 13:00	☐
12101051-05	SBKR0975R510T103012MX	Soil		10/30/2012	10/31/2012 13:00	☐

Client: AECOM Environment
Project: Marshall KRRI 0975R 10/30/12
Work Order: 12101051

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44488 sample SBKR0975R508S103012S006 MS/MSD recoveries for DRO were below control limits. The corresponding result in the parent sample may be biased low for DRO. The MSD recovery for ORO was above control limits. However, the MS recovery and the RPD between the MS and MSD was in control. No qualification is required for ORO.

Batch 44509 sample SBKR0975R508S103012S006 MS/MSD recoveries for Vanadium were above control limits. The corresponding result in the parent sample may be biased high for Vanadium. The MSD recovery for Nickel was below control limits. However, the MS recovery and the RPD between the MS and MSD was in control. No qualification is required for Nickel.

Batch 44535 sample SBKR0975R508S103012S006 MS/MSD recoveries for Chloroethane were below control limits. The corresponding result in the parent sample may be biased high for this compound. The MSD recovery for trans-1,4-Dichloro-2-butene was below control limits. However, the MS recovery and the RPD between the MS and MSD was in control. No qualification is required for this compound. The RPD between the MS/MSD recoveries for Acetone and Carbon Disulfide were above control limits. The individual MS/MSD recoveries met quality control criteria. No data requires qualification.

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0975R 10/30/12
WorkOrder: **12101051**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R507S103012S005
Work Order:	12101051	**Collection Date:**	10/30/2012 8:31:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/1/2012**		Analyst: **CW**
DRO (C10-C20)	**170**	**29**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**420**	**58**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*68.0*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	4.4	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**14**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**22**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/1/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/5/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/5/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Surr: 2,4,6-Tribromophenol	*92.2*	*34-140*			*%REC*	1	11/5/2012
Surr: 2-Fluorobiphenyl	*69.8*	*12-100*			*%REC*	1	11/5/2012
Surr: 2-Fluorophenol	*92.8*	*33-117*			*%REC*	1	11/5/2012
Surr: 4-Terphenyl-d14	*106*	*25-137*			*%REC*	1	11/5/2012
Surr: Nitrobenzene-d5	*66.7*	*37-107*			*%REC*	1	11/5/2012
Surr: Phenol-d6	*71.4*	*40-106*			*%REC*	1	11/5/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	430	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R507S103012S005
Work Order:	12101051	**Collection Date:**	10/30/2012 8:31:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	430	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	430	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	1,400	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	1,400	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	3,500	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	430	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	430	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	430	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	430	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	1,400	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	430	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	430	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	430	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	430	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	430	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	430	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R507S103012S005
Work Order:	12101051	**Collection Date:**	10/30/2012 8:31:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	430	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	850	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	430	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	430	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	1,400	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	430	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	430	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	430	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	430	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,400	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	430	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	430	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	430	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	430	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*88.6*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*119*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.0*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**66**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R508S103012S006
Work Order:	12101051	**Collection Date:**	10/30/2012 9:21:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/1/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**19**	**4.0**		**mg/Kg-dry**	1	11/1/2012
ORO (C20-C34)	**300**	**37**	**4.0**		**mg/Kg-dry**	1	11/1/2012
Surr: 4-Terphenyl-d14	*70.4*	*39-115*			*%REC*	1	11/1/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	**2.8**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Nickel	**25**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**25**	**2.6**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/1/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*96.2*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*63.9*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*65.5*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*74.7*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*64.1*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*72.4*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	170	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R508S103012S006
Work Order:	12101051	**Collection Date:**	10/30/2012 9:21:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	170	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	170	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	170	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	550	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,400	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	170	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	170	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	550	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	170	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	170	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R508S103012S006
Work Order:	12101051	**Collection Date:**	10/30/2012 9:21:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	330	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	170	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	170	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	550	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	170	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	170	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	170	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	170	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	170	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	170	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	170	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*84.8*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*104*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*94.2*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R509S103012S008
Work Order:	12101051	**Collection Date:**	10/30/2012 10:21:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/1/2012**		Analyst: **CW**
DRO (C10-C20)	**86**	**15**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**200**	**31**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*70.5*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	0.96	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	2.4	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**19**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**30**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/1/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/5/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/5/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Surr: 2,4,6-Tribromophenol	*90.1*	*34-140*			*%REC*	1	11/5/2012
Surr: 2-Fluorobiphenyl	*68.5*	*12-100*			*%REC*	1	11/5/2012
Surr: 2-Fluorophenol	*76.3*	*33-117*			*%REC*	1	11/5/2012
Surr: 4-Terphenyl-d14	*111*	*25-137*			*%REC*	1	11/5/2012
Surr: Nitrobenzene-d5	*64.4*	*37-107*			*%REC*	1	11/5/2012
Surr: Phenol-d6	*66.9*	*40-106*			*%REC*	1	11/5/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R509S103012S008
Work Order:	12101051	**Collection Date:**	10/30/2012 10:21:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	340	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	340	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R509S103012S008
Work Order:	12101051	**Collection Date:**	10/30/2012 10:21:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	340	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*88.8*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*110*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*93.9*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**37**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R510S103012S005
Work Order:	12101051	**Collection Date:**	10/30/2012 11:03:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/1/2012**		Analyst: **CW**
DRO (C10-C20)	**80**	**15**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**180**	**30**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*69.2*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	0.90	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	**9.6**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Nickel	**25**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**26**	**2.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/1/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/5/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/5/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Surr: 2,4,6-Tribromophenol	*78.4*	*34-140*			*%REC*	1	11/5/2012
Surr: 2-Fluorobiphenyl	*73.3*	*12-100*			*%REC*	1	11/5/2012
Surr: 2-Fluorophenol	*71.7*	*33-117*			*%REC*	1	11/5/2012
Surr: 4-Terphenyl-d14	*112*	*25-137*			*%REC*	1	11/5/2012
Surr: Nitrobenzene-d5	*70.3*	*37-107*			*%REC*	1	11/5/2012
Surr: Phenol-d6	*66.7*	*40-106*			*%REC*	1	11/5/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	96	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	96	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	96	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	96	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R510S103012S005
Work Order:	12101051	**Collection Date:**	10/30/2012 11:03:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	96	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	96	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	96	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	96	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	96	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	96	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	96	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	96	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	320	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	96	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	96	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	96	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R510S103012S005
Work Order:	12101051	**Collection Date:**	10/30/2012 11:03:00 AM
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	96	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	190	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	96	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	96	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	96	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	96	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	96	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	96	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	96	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	96	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	96	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	96	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	96	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*88.0*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*108*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*92.0*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**35**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R510T103012MX
Work Order:	12101051	**Collection Date:**	10/30/2012
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/3/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/3/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/3/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/3/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/3/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/3/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/3/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/3/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/3/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/3/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/3/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/3/2012
Benzene	ND	50	50		µg/Kg	1	11/3/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/3/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/3/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/3/2012
Bromoform	ND	100	100		µg/Kg	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/3/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/3/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/3/2012
Chloroethane	ND	250	250		µg/Kg	1	11/3/2012
Chloroform	ND	50	50		µg/Kg	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg	1	11/3/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/3/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R510T103012MX
Work Order:	12101051	**Collection Date:**	10/30/2012
Project:	Marshall KRRI 0975R 10/30/12		
Lab ID:	12101051-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/3/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/3/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/3/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/3/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/3/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/3/2012
Naphthalene	ND	330	330		µg/Kg	1	11/3/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/3/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/3/2012
o-Xylene	ND	50	50		µg/Kg	1	11/3/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/3/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/3/2012
Styrene	ND	50	50		µg/Kg	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/3/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/3/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/3/2012
Toluene	ND	100	100		µg/Kg	1	11/3/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/3/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/3/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/3/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/3/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*102*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*92.0*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*104*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.4*	*70-130*			*%REC*	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 12101051

Project: Marshall KRRI 0975R 10/30/12

Batch ID: **44488** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44488-44488** Units: **mg/Kg** Analysis Date: **11/1/2012 04:32 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130108** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.263*	0	*5*	0	*65.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44488-44488** Units: **mg/Kg** Analysis Date: **11/1/2012 04:59 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130109** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	311.3	10	500	0	62.3	49-124	0			
ORO (C20-C34)	377.6	20	500	0	75.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.045*	0	*5*	0	*80.9*	*39-115*	0			

MS Sample ID: **12101051-02A MS** Units: **mg/Kg** Analysis Date: **11/1/2012 05:26 PM**

Client ID: **SBKR0975R508S103012S006** Run ID: **GC8_121101A** SeqNo: **2130110** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	329	9.5	476.1	64.81	55.5	60-130	0			S
ORO (C20-C34)	455.1	19	476.1	153.8	63.3	60-130	0			
Surr: 4-Terphenyl-d14	*4.123*	0	*4.761*	0	*86.6*	*39-115*	0			

MSD Sample ID: **12101051-02A MSD** Units: **mg/Kg** Analysis Date: **11/1/2012 05:53 PM**

Client ID: **SBKR0975R508S103012S006** Run ID: **GC8_121101A** SeqNo: **2130111** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.1	9.7	483.5	64.81	50.7	60-130	329	5.93	30	S
ORO (C20-C34)	396.4	19	483.5	153.8	50.2	60-130	455.1	13.8	30	S
Surr: 4-Terphenyl-d14	*3.866*	0	*4.835*	0	*80*	*39-115*	4.123	*6.44*	*30*	

The following samples were analyzed in this batch: 12101051-01A 12101051-02A 12101051-03A 12101051-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44509** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44509-44509** Units: **mg/Kg** Analysis Date: **11/2/2012 06:13 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130784** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44509-44509** Units: **mg/Kg** Analysis Date: **11/2/2012 06:18 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130785** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.37	0.10	5	0	87.4	80-120	0			
Molybdenum	4.934	0.25	5	0	98.7	80-120	0			
Nickel	4.682	0.25	5	0	93.6	80-120	0			
Vanadium	5.015	0.25	5	0	100	80-120	0			

MS Sample ID: **12101051-02AMS** Units: **mg/Kg** Analysis Date: **11/2/2012 06:33 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **ICPMS2_121102A** SeqNo: **2130788** Prep Date: **11/2/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.013	0.52	6.452	0.3177	88.3	75-125	0			
Molybdenum	7.933	1.3	6.452	1.452	100	75-125	0			
Nickel	18.62	1.3	6.452	12.88	88.9	75-125	0			
Vanadium	24.82	1.3	6.452	13.18	180	75-125	0			S

MSD Sample ID: **12101051-02AMSD** Units: **mg/Kg** Analysis Date: **11/2/2012 06:38 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **ICPMS2_121102A** SeqNo: **2130789** Prep Date: **11/2/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.912	0.54	6.693	0.3177	83.6	75-125	6.013	1.7	25	
Molybdenum	7.585	1.3	6.693	1.452	91.6	75-125	7.933	4.48	25	
Nickel	17.54	1.3	6.693	12.88	69.7	75-125	18.62	5.93	25	S
Vanadium	23.65	1.3	6.693	13.18	156	75-125	24.82	4.81	25	S

The following samples were analyzed in this batch: 12101051-01A 12101051-02A 12101051-03A 12101051-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44487-44487** Units: **µg/Kg** Analysis Date: **11/2/2012 10:47 AM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2129866** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3816*	0	*5000*	0	*76.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3380*	0	*5000*	0	*67.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3471*	0	*5000*	0	*69.4*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3690*	0	*5000*	0	*73.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3485*	0	*5000*	0	*69.7*	*37-107*	0			
Surr: Phenol-d6	*3810*	0	*5000*	0	*76.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44487-44487** Units: **µg/Kg** Analysis Date: **11/2/2012 09:52 AM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2129864** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1618	50	2000	0	80.9	45-105	0			
Acenaphthene	1671	50	2000	0	83.6	45-110	0			
Acenaphthylene	1710	50	2000	0	85.5	45-105	0			
Anthracene	1766	50	2000	0	88.3	55-105	0			
Benzo(a)anthracene	1795	50	2000	0	89.8	50-110	0			
Benzo(a)pyrene	1872	50	2000	0	93.6	50-110	0			
Benzo(b)fluoranthene	1855	50	2000	0	92.8	45-115	0			
Benzo(g,h,i)perylene	1898	50	2000	0	94.9	40-125	0			
Benzo(k)fluoranthene	1794	50	2000	0	89.7	45-115	0			
Chrysene	1792	50	2000	0	89.6	55-110	0			
Dibenzo(a,h)anthracene	1913	50	2000	0	95.6	40-125	0			
Fluoranthene	1846	50	2000	0	92.3	55-115	0			
Fluorene	1752	50	2000	0	87.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1914	50	2000	0	95.7	40-120	0			
Naphthalene	1605	50	2000	0	80.2	40-105	0			
Phenanthrene	1783	50	2000	0	89.2	50-110	0			
Pyrene	1930	50	2000	0	96.5	45-125	0			
Surr: 2,4,6-Tribromophenol	*4387*	0	*5000*	0	*87.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3425*	0	*5000*	0	*68.5*	*12-100*	0			
Surr: 2-Fluorophenol	*3473*	0	*5000*	0	*69.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4041*	0	*5000*	0	*80.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3494*	0	*5000*	0	*69.9*	*37-107*	0			
Surr: Phenol-d6	*3566*	0	*5000*	0	*71.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **12101051-02A MS** Units: **µg/Kg** Analysis Date: **11/2/2012 02:12 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **SVMS7_121102A** SeqNo: **2131194** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1564	50	1992	0	78.5	45-105	0			
Acenaphthene	1621	50	1992	0	81.4	45-110	0			
Acenaphthylene	1678	50	1992	0	84.2	45-105	0			
Anthracene	1816	50	1992	0	91.2	55-105	0			
Benzo(a)anthracene	1769	50	1992	0	88.8	50-110	0			
Benzo(a)pyrene	1787	50	1992	88.88	85.2	50-110	0			
Benzo(b)fluoranthene	1946	50	1992	117.9	91.8	45-115	0			
Benzo(g,h,i)perylene	1651	50	1992	53.13	80.2	40-125	0			
Benzo(k)fluoranthene	1603	50	1992	0	80.5	45-115	0			
Chrysene	1728	50	1992	85.02	82.5	55-110	0			
Dibenzo(a,h)anthracene	1695	50	1992	0	85.1	40-125	0			
Fluoranthene	1879	50	1992	61.83	91.2	55-115	0			
Fluorene	1741	50	1992	0	87.4	50-110	0			
Indeno(1,2,3-cd)pyrene	1724	50	1992	48.3	84.1	40-120	0			
Naphthalene	1515	50	1992	0	76	40-105	0			
Phenanthrene	1846	50	1992	0	92.7	50-110	0			
Pyrene	1887	50	1992	0	94.8	45-125	0			
Surr: 2,4,6-Tribromophenol	*4708*	0	*4980*	0	*94.5*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3318*	0	*4980*	0	*66.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3263*	0	*4980*	0	*65.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3878*	0	*4980*	0	*77.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*3320*	0	*4980*	0	*66.7*	*37-107*	0			
Surr: Phenol-d6	*3594*	0	*4980*	0	*72.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **12101051-02A MSD** Units: **µg/Kg** Analysis Date: **11/2/2012 02:39 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **SVMS7_121102A** SeqNo: **2131195** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1452	47	1893	0	76.7	45-105	1564	7.39	30	
Acenaphthene	1512	47	1893	0	79.8	45-110	1621	7	30	
Acenaphthylene	1550	47	1893	0	81.8	45-105	1678	7.96	30	
Anthracene	1719	47	1893	0	90.8	55-105	1816	5.46	30	
Benzo(a)anthracene	1675	47	1893	0	88.4	50-110	1769	5.47	30	
Benzo(a)pyrene	1755	47	1893	88.88	88	50-110	1787	1.79	30	
Benzo(b)fluoranthene	1848	47	1893	117.9	91.4	45-115	1946	5.18	30	
Benzo(g,h,i)perylene	1546	47	1893	53.13	78.8	40-125	1651	6.59	30	
Benzo(k)fluoranthene	1597	47	1893	0	84.4	45-115	1603	0.406	30	
Chrysene	1638	47	1893	85.02	82	55-110	1728	5.36	30	
Dibenzo(a,h)anthracene	1587	47	1893	0	83.8	40-125	1695	6.55	30	
Fluoranthene	1768	47	1893	61.83	90.1	55-115	1879	6.09	30	
Fluorene	1616	47	1893	0	85.4	50-110	1741	7.45	30	
Indeno(1,2,3-cd)pyrene	1631	47	1893	48.3	83.6	40-120	1724	5.54	30	
Naphthalene	1416	47	1893	0	74.8	40-105	1515	6.73	30	
Phenanthrene	1753	47	1893	0	92.6	50-110	1846	5.18	30	
Pyrene	1807	47	1893	0	95.4	45-125	1887	4.34	30	
Surr: 2,4,6-Tribromophenol	*4424*	0	*4733*	0	*93.5*	*34-140*	4708	*6.22*	*40*	
Surr: 2-Fluorobiphenyl	*3100*	0	*4733*	0	*65.5*	*12-100*	3318	*6.8*	*40*	
Surr: 2-Fluorophenol	*3094*	0	*4733*	0	*65.4*	*33-117*	3263	*5.29*	*40*	
Surr: 4-Terphenyl-d14	*3719*	0	*4733*	0	*78.6*	*25-137*	3878	*4.18*	*40*	
Surr: Nitrobenzene-d5	*3131*	0	*4733*	0	*66.2*	*37-107*	3320	*5.86*	*40*	
Surr: Phenol-d6	*3385*	0	*4733*	0	*71.5*	*40-106*	3594	*5.99*	*40*	

The following samples were analyzed in this batch: 12101051-01A 12101051-02A 12101051-03A 12101051-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44535-44535** Units: **µg/Kg** Analysis Date: **11/3/2012 04:00 AM**
Client ID: Run ID: **VMS9_121102A** SeqNo: **2130870** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*888*	0	*1000*	0	*88.8*	*70-130*	0
Surr: Dibromofluoromethane	*990.5*	0	*1000*	0	*99*	*70-130*	0
Surr: Toluene-d8	*977.5*	0	*1000*	0	*97.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44535-44535** Units: **µg/Kg** Analysis Date: **11/3/2012 02:43 AM**
Client ID: Run ID: **VMS9_121102A** SeqNo: **2130869** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1025	30	1000	0	102	75-125	0			
1,1,1-Trichloroethane	940	30	1000	0	94	70-135	0			
1,1,2,2-Tetrachloroethane	1006	30	1000	0	101	55-130	0			
1,1,2-Trichloroethane	952.5	30	1000	0	95.2	60-125	0			
1,1-Dichloroethane	935	30	1000	0	93.5	75-125	0			
1,1-Dichloroethene	1076	30	1000	0	108	65-135	0			
1,2,3-Trichlorobenzene	961	30	1000	0	96.1	60-135	0			
1,2,3-Trichloropropane	1022	30	1000	0	102	65-130	0			
1,2,3-Trimethylbenzene	1032	30	1000	0	103	65-135	0			
1,2,4-Trichlorobenzene	951	30	1000	0	95.1	65-130	0			
1,2,4-Trimethylbenzene	1024	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	968	30	1000	0	96.8	40-135	0			
1,2-Dibromoethane	1024	30	1000	0	102	70-125	0			
1,2-Dichlorobenzene	981.5	30	1000	0	98.2	75-120	0			
1,2-Dichloroethane	953.5	30	1000	0	95.4	70-135	0			
1,2-Dichloropropane	967.5	30	1000	0	96.8	70-120	0			
1,3,5-Trimethylbenzene	966.5	30	1000	0	96.6	65-135	0			
1,3-Dichlorobenzene	1002	30	1000	0	100	70-125	0			
1,4-Dichlorobenzene	992.5	30	1000	0	99.2	70-125	0			
2-Butanone	1036	200	1000	0	104	30-160	0			
2-Hexanone	952	30	1000	0	95.2	45-145	0			
4-Methyl-2-pentanone	989	30	1000	0	98.9	45-145	0			
Acetone	991	100	1000	0	99.1	20-160	0			
Acrylonitrile	897.5	100	1000	0	89.8	70-135	0			
Benzene	961	30	1000	0	96.1	75-125	0			
Bromobenzene	1018	30	1000	0	102	65-120	0			
Bromochloromethane	881	30	1000	0	88.1	70-125	0			
Bromodichloromethane	969.5	30	1000	0	97	70-130	0			
Bromoform	939.5	30	1000	0	94	55-135	0			
Bromomethane	1262	75	1000	0	126	30-160	0			
Carbon disulfide	1121	30	1000	0	112	45-160	0			
Carbon tetrachloride	991	30	1000	0	99.1	65-135	0			
Chlorobenzene	994.5	30	1000	0	99.4	75-125	0			
Chloroethane	954.5	100	1000	0	95.4	40-155	0			
Chloroform	858.5	30	1000	0	85.8	70-125	0			
Chloromethane	1018	100	1000	0	102	50-130	0			
cis-1,2-Dichloroethene	937	30	1000	0	93.7	65-125	0			
cis-1,3-Dichloropropene	974	30	1000	0	97.4	70-125	0			
Dibromochloromethane	900.5	30	1000	0	90	65-135	0			
Dibromomethane	1032	30	1000	0	103	75-130	0			
Dichlorodifluoromethane	849	30	1000	0	84.9	35-135	0			
Ethylbenzene	1009	30	1000	0	101	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	1080	30	1000	0	108	70-135	0
Isopropylbenzene	1058	30	1000	0	106	75-130	0
m,p-Xylene	1918	60	2000	0	95.9	80-125	0
Methyl tert-butyl ether	1000	30	1000	0	100	75-125	0
Methylene chloride	945	30	1000	0	94.5	55-145	0
Naphthalene	993.5	100	1000	0	99.4	40-140	0
n-Butylbenzene	1040	30	1000	0	104	65-140	0
n-Propylbenzene	1016	30	1000	0	102	65-135	0
o-Xylene	1048	30	1000	0	105	75-125	0
p-Isopropyltoluene	1048	30	1000	0	105	75-135	0
sec-Butylbenzene	1053	30	1000	0	105	65-130	0
Styrene	940.5	30	1000	0	94	75-125	0
tert-Butylbenzene	1046	30	1000	0	105	65-130	0
Tetrachloroethene	936.5	30	1000	0	93.6	64-140	0
Tetrahydrofuran	999.5	200	1000	0	100	70-135	0
Toluene	971.5	30	1000	0	97.2	70-125	0
trans-1,2-Dichloroethene	967.5	30	1000	0	96.8	65-135	0
trans-1,3-Dichloropropene	1046	30	1000	0	105	65-125	0
trans-1,4-Dichloro-2-butene	873.5	30	1000	0	87.4	70-135	0
Trichloroethene	938	30	1000	0	93.8	75-125	0
Trichlorofluoromethane	953.5	30	1000	0	95.4	25-185	0
Vinyl chloride	993	30	1000	0	99.3	60-125	0
Surr: 1,2-Dichloroethane-d4	*958*	0	*1000*	0	*95.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1039*	0	*1000*	0	*104*	*70-130*	0
Surr: Dibromofluoromethane	*965.5*	0	*1000*	0	*96.6*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **12101051-02B MS** Units: **µg/Kg** Analysis Date: **11/3/2012 12:31 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **VMS9_121102A** SeqNo: **2130871** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2647	85	2846	0	93	75-125	0			
1,1,1-Trichloroethane	2949	85	2846	0	104	70-135	0			
1,1,2,2-Tetrachloroethane	1980	85	2846	0	69.6	55-130	0			
1,1,2-Trichloroethane	2489	85	2846	0	87.4	60-125	0			
1,1-Dichloroethane	2811	85	2846	0	98.8	75-125	0			
1,1-Dichloroethene	2506	85	2846	0	88	65-135	0			
1,2,3-Trichlorobenzene	2263	85	2846	0	79.5	60-135	0			
1,2,3-Trichloropropane	2654	85	2846	0	93.2	65-130	0			
1,2,3-Trimethylbenzene	2626	85	2846	0	92.2	65-135	0			
1,2,4-Trichlorobenzene	2389	85	2846	0	84	65-130	0			
1,2,4-Trimethylbenzene	2628	85	2846	0	92.4	65-135	0			
1,2-Dibromo-3-chloropropane	1998	85	2846	0	70.2	40-135	0			
1,2-Dibromoethane	2677	85	2846	0	94	70-125	0			
1,2-Dichlorobenzene	2519	85	2846	0	88.5	75-120	0			
1,2-Dichloroethane	2744	85	2846	0	96.4	70-135	0			
1,2-Dichloropropane	2702	85	2846	0	95	70-120	0			
1,3,5-Trimethylbenzene	2506	85	2846	0	88	65-135	0			
1,3-Dichlorobenzene	2534	85	2846	0	89	70-125	0			
1,4-Dichlorobenzene	2498	85	2846	0	87.8	70-125	0			
2-Butanone	3257	570	2846	0	114	30-160	0			
2-Hexanone	2340	85	2846	0	82.2	45-145	0			
4-Methyl-2-pentanone	2650	85	2846	0	93.1	45-145	0			
Acetone	2833	280	2846	0	99.6	20-160	0			
Acrylonitrile	3135	280	2846	0	110	70-135	0			
Benzene	2695	85	2846	0	94.7	75-125	0			
Bromobenzene	2673	85	2846	0	93.9	65-120	0			
Bromochloromethane	3031	85	2846	0	106	70-125	0			
Bromodichloromethane	2583	85	2846	0	90.8	70-130	0			
Bromoform	2152	85	2846	0	75.6	55-135	0			
Bromomethane	1880	210	2846	0	66	30-160	0			
Carbon disulfide	2227	85	2846	0	78.2	45-160	0			
Carbon tetrachloride	2866	85	2846	0	101	65-135	0			
Chlorobenzene	2597	85	2846	0	91.2	75-125	0			
Chloroethane	758.5	280	2846	0	26.6	40-155	0			S
Chloroform	3010	85	2846	0	106	70-125	0			
Chloromethane	2348	280	2846	0	82.5	50-130	0			
cis-1,2-Dichloroethene	2708	85	2846	0	95.2	65-125	0			
cis-1,3-Dichloropropene	2493	85	2846	0	87.6	70-125	0			
Dibromochloromethane	2146	85	2846	0	75.4	65-135	0			
Dibromomethane	2904	85	2846	0	102	75-130	0			
Dichlorodifluoromethane	2122	85	2846	0	74.6	35-135	0			
Ethylbenzene	2663	85	2846	0	93.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	2422	85	2846	0	85.1	70-135	0
Isopropylbenzene	2751	85	2846	0	96.6	75-130	0
m,p-Xylene	5015	170	5692	0	88.1	80-125	0
Methyl tert-butyl ether	2819	85	2846	0	99	75-125	0
Methylene chloride	2823	85	2846	0	99.2	55-145	0
Naphthalene	2468	280	2846	0	86.7	40-140	0
n-Butylbenzene	2621	85	2846	0	92.1	65-140	0
n-Propylbenzene	2687	85	2846	0	94.4	65-135	0
o-Xylene	2707	85	2846	0	95.1	75-125	0
p-Isopropyltoluene	2401	85	2846	0	84.4	75-135	0
sec-Butylbenzene	2781	85	2846	0	97.7	65-130	0
Styrene	2482	85	2846	0	87.2	75-125	0
tert-Butylbenzene	2727	85	2846	0	95.8	65-130	0
Tetrachloroethene	3632	85	2846	0	128	64-140	0
Tetrahydrofuran	3596	570	2846	0	126	70-135	0
Toluene	2546	85	2846	0	89.4	70-125	0
trans-1,2-Dichloroethene	2829	85	2846	0	99.4	65-135	0
trans-1,3-Dichloropropene	2458	85	2846	0	86.4	65-125	0
trans-1,4-Dichloro-2-butene	2011	85	2846	0	70.6	70-135	0
Trichloroethene	3034	85	2846	0	107	75-125	0
Trichlorofluoromethane	2567	85	2846	0	90.2	25-185	0
Vinyl chloride	1991	85	2846	0	70	60-125	0
Surr: 1,2-Dichloroethane-d4	*2991*	0	*2846*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2880*	0	*2846*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*3135*	0	*2846*	0	*110*	*70-130*	0
Surr: Toluene-d8	*2771*	0	*2846*	0	*97.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **12101051-02B MSD** Units: **µg/Kg** Analysis Date: **11/3/2012 12:56 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **VMS9_121102A** SeqNo: **2130872** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2628	85	2846	0	92.4	75-125	2647	0.701	30	
1,1,1-Trichloroethane	2681	85	2846	0	94.2	70-135	2949	9.5	30	
1,1,2,2-Tetrachloroethane	2118	85	2846	0	74.4	55-130	1980	6.74	30	
1,1,2-Trichloroethane	2614	85	2846	0	91.8	60-125	2489	4.91	30	
1,1-Dichloroethane	2714	85	2846	0	95.4	75-125	2811	3.5	30	
1,1-Dichloroethene	2846	85	2846	0	100	65-135	2506	12.7	30	
1,2,3-Trichlorobenzene	2381	85	2846	0	83.6	60-135	2263	5.09	30	
1,2,3-Trichloropropane	2651	85	2846	0	93.2	65-130	2654	0.107	30	
1,2,3-Trimethylbenzene	2708	85	2846	0	95.2	65-135	2626	3.09	30	
1,2,4-Trichlorobenzene	2398	85	2846	0	84.2	65-130	2389	0.357	30	
1,2,4-Trimethylbenzene	2661	85	2846	0	93.5	65-135	2628	1.24	30	
1,2-Dibromo-3-chloropropane	2081	85	2846	0	73.1	40-135	1998	4.05	30	
1,2-Dibromoethane	2752	85	2846	0	96.7	70-125	2677	2.78	30	
1,2-Dichlorobenzene	2600	85	2846	0	91.4	75-120	2519	3.17	30	
1,2-Dichloroethane	2711	85	2846	0	95.2	70-135	2744	1.2	30	
1,2-Dichloropropane	2717	85	2846	0	95.4	70-120	2702	0.525	30	
1,3,5-Trimethylbenzene	2475	85	2846	0	87	65-135	2506	1.26	30	
1,3-Dichlorobenzene	2567	85	2846	0	90.2	70-125	2534	1.28	30	
1,4-Dichlorobenzene	2591	85	2846	0	91	70-125	2498	3.69	30	
2-Butanone	3432	570	2846	0	121	30-160	3257	5.23	30	
2-Hexanone	2448	85	2846	0	86	45-145	2340	4.52	30	
4-Methyl-2-pentanone	2674	85	2846	0	94	45-145	2650	0.909	30	
Acetone	4291	280	2846	0	151	20-160	2833	40.9	30	R
Acrylonitrile	3206	280	2846	0	113	70-135	3135	2.24	30	
Benzene	2671	85	2846	0	93.8	75-125	2695	0.902	30	
Bromobenzene	2667	85	2846	0	93.7	65-120	2673	0.213	30	
Bromochloromethane	2896	85	2846	0	102	70-125	3031	4.56	30	
Bromodichloromethane	2505	85	2846	0	88	70-130	2583	3.08	30	
Bromoform	2229	85	2846	0	78.3	55-135	2152	3.51	30	
Bromomethane	2052	210	2846	0	72.1	30-160	1880	8.76	30	
Carbon disulfide	3016	85	2846	0	106	45-160	2227	30.1	30	R
Carbon tetrachloride	2674	85	2846	0	94	65-135	2866	6.94	30	
Chlorobenzene	2641	85	2846	0	92.8	75-125	2597	1.68	30	
Chloroethane	833.9	280	2846	0	29.3	40-155	758.5	9.47	30	S
Chloroform	2900	85	2846	0	102	70-125	3010	3.71	30	
Chloromethane	2597	280	2846	0	91.2	50-130	2348	10.1	30	
cis-1,2-Dichloroethene	2784	85	2846	0	97.8	65-125	2708	2.75	30	
cis-1,3-Dichloropropene	2529	85	2846	0	88.8	70-125	2493	1.42	30	
Dibromochloromethane	2231	85	2846	0	78.4	65-135	2146	3.9	30	
Dibromomethane	2934	85	2846	0	103	75-130	2904	1.02	30	
Dichlorodifluoromethane	2368	85	2846	0	83.2	35-135	2122	11	30	
Ethylbenzene	2673	85	2846	0	93.9	75-125	2663	0.373	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	2532	85	2846	0	89	70-135	2422	4.42	30	
Isopropylbenzene	2806	85	2846	0	98.6	75-130	2751	2	30	
m,p-Xylene	5056	170	5692	0	88.8	80-125	5015	0.82	30	
Methyl tert-butyl ether	2973	85	2846	0	104	75-125	2819	5.31	30	
Methylene chloride	3108	85	2846	0	109	55-145	2823	9.6	30	
Naphthalene	2429	280	2846	0	85.4	40-140	2468	1.57	30	
n-Butylbenzene	2643	85	2846	0	92.8	65-140	2621	0.811	30	
n-Propylbenzene	2646	85	2846	0	93	65-135	2687	1.55	30	
o-Xylene	2732	85	2846	0	96	75-125	2707	0.942	30	
p-Isopropyltoluene	2515	85	2846	0	88.4	75-135	2401	4.63	30	
sec-Butylbenzene	2809	85	2846	0	98.7	65-130	2781	1.02	30	
Styrene	2503	85	2846	0	88	75-125	2482	0.856	30	
tert-Butylbenzene	2718	85	2846	0	95.5	65-130	2727	0.314	30	
Tetrachloroethene	3502	85	2846	0	123	64-140	3632	3.63	30	
Tetrahydrofuran	3339	570	2846	0	117	70-135	3596	7.43	30	
Toluene	2580	85	2846	0	90.6	70-125	2546	1.33	30	
trans-1,2-Dichloroethene	2877	85	2846	0	101	65-135	2829	1.7	30	
trans-1,3-Dichloropropene	2603	85	2846	0	91.4	65-125	2458	5.74	30	
trans-1,4-Dichloro-2-butene	1877	85	2846	0	66	70-135	2011	6.88	30	S
Trichloroethene	2877	85	2846	0	101	75-125	3034	5.3	30	
Trichlorofluoromethane	2868	85	2846	0	101	25-185	2567	11.1	30	
Vinyl chloride	2209	85	2846	0	77.6	60-125	1991	10.4	30	
Surr: 1,2-Dichloroethane-d4	*2869*	0	*2846*	0	*101*	*70-130*	2991	*4.18*	*30*	
Surr: 4-Bromofluorobenzene	*2929*	0	*2846*	0	*103*	*70-130*	2880	*1.67*	*30*	
Surr: Dibromofluoromethane	*2677*	0	*2846*	0	*94*	*70-130*	3135	*15.8*	*30*	
Surr: Toluene-d8	*2818*	0	*2846*	0	*99*	*70-130*	2771	*1.68*	*30*	

The following samples were analyzed in this batch:

12101051-01B	12101051-02B	12101051-03B
12101051-04B	12101051-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101051
Project: Marshall KRRI 0975R 10/30/12

QC BATCH REPORT

Batch ID: **R112046** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112046** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129936** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112046** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129932** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **12101051-02A DUP1** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **MOIST_121101B** SeqNo: **2129913** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	50.47	0.050	0	0	0	0-0	48.3	4.39	20	

DUP Sample ID: **12101051-02A DUP2** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: **SBKR0975R508S103012S006** Run ID: **MOIST_121101B** SeqNo: **2129914** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	48.07	0.050	0	0	0	0-0	48.3	0.477	20	

DUP Sample ID: **12101052-13B DUP** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129930** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	66.65	0.050	0	0	0	0-0	65.69	1.45	20	

The following samples were analyzed in this batch: 12101051-01A 12101051-02A 12101051-03A 12101051-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1210105/

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_103012_GMK1	Task: KRRI_0975	
Total # of Samples: 5			Event Complete?
Turn Around Time	5 Day	Rush	No

BILLING CODE: 6.00

Lab Information:

Lab Name:	ALS Laboratory Group
Address:	3352 128th Ave. Holland, MI 49424-9263
Lab PM:	Ann Preston
Phone/Fax:	1-616-399-6070/1-616-399-6185
Lab PM email	ann.preston@alsglobal.com
Applicable Lab Quote #:	

Project Information:

Site ID #:	
Project #	60162778
Site Address	5555 Glenwood Parkway SE Suite 200
City	Grand Rapids
State, Zip	MI
Site PM Name	Bryan Stiemsma
Phone/Fax:	[redacted]
Site PM Email:	Bryan.Stiemsma@aecom.com

Other Information:

Send invoice to:	Enbridge Energy - ATTN Accounts Payable
Address:	1100 Louisiana Suite 1100
City/State:	Houson, TX
Phone #:	713-821-2000
PO #	
Send EDD to	
CC Hardcopy report	
CC Hardcopy report	

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR0975R507S103012S005	SBKR0975R507	SO	G	10/30/2012 08:31	3			X	X	X	X	X										
2	SBKR0975R508S103012S006	SBKR0975R508	SO	G	10/30/2012 09:21	6	MS/MSD		X	X	X	X	X										
3	SBKR0975R509S103012S008	SBKR0975R509	SO	G	10/30/2012 10:21	3			X	X	X	X	X										
4	SBKR0975R510S103012S005	SBKR0975R510	SO	G	10/30/2012 11:03	3			X	X	X	X	X										
5	SBKR0975R510T103012MX	SBKR0975R510	SQ	G	10/30/2012 00:00	1	TRIP BLANK						X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	10-31-12	1255	[signature]	10-31-12	1255
[signature]	10-31-12	1300	[signature]	10-31-12	1300

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample Intact?	Trip Blank?
3.8 c	(Y)N	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO:
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER: DATE Signed: Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **31-Oct-12 13:00**

Work Order: **12101051** Received by: **PD**

Checklist completed by Keith Wierenga (eSignature) 31-Oct-12 (Date) Reviewed by: Alex Csaszar (eSignature) 01-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.8 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/31/2012 4:38:37 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 10-31-12 Time:

Name:

Company:

Seal Broken By:

Date:

08-Nov-2012

Bryan Stiemsma
AECOM Environment
5555 Glenwood Parkway SE
Grand Rapids, MI 49512

Re: **Marshall KRRI 0950-0975R,0975I 10/29/12** Work Order: **12101052**

Dear Bryan,

ALS Environmental received 14 samples on 31-Oct-2012 12:45 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 68.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950-0975R,0975I 10/29/12
Work Order: **12101052**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
12101052-01	SBKR0950R504S102912S008	Soil		10/29/2012 10:45	10/31/2012 12:45	☐
12101052-02	SBKR0950R505S102912S005	Soil		10/29/2012 11:12	10/31/2012 12:45	☐
12101052-03	SBKR0950R506S102912S005	Soil		10/29/2012 11:45	10/31/2012 12:45	☐
12101052-04	SBKR0975I501S102912S003	Soil		10/29/2012 13:50	10/31/2012 12:45	☐
12101052-05	SBKR0975I501S102912S010	Soil		10/29/2012 13:55	10/31/2012 12:45	☐
12101052-06	SBKR0975I502S102912S004	Soil		10/29/2012 14:50	10/31/2012 12:45	☐
12101052-07	SBKR0975I502S102912S013	Soil		10/29/2012 14:55	10/31/2012 12:45	☐
12101052-08	SBKR0975R503S102912S005	Soil		10/29/2012 08:57	10/31/2012 12:45	☐
12101052-09	SBKR0975R503D102912S005	Soil		10/29/2012 08:57	10/31/2012 12:45	☐
12101052-10	SBKR0975R504S102912S006	Soil		10/29/2012 09:46	10/31/2012 12:45	☐
12101052-11	SBKR0975R505S102912S007	Soil		10/29/2012 15:32	10/31/2012 12:45	☐
12101052-12	SBKR0975R506S102912S005	Soil		10/29/2012 16:16	10/31/2012 12:45	☐
12101052-13	SBKR0975R506D102912S005	Soil		10/29/2012 16:16	10/31/2012 12:45	☐
12101052-14	SBKR0975R506T102912MX	Soil		10/29/2012	10/31/2012 12:45	☐

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950-0975R,0975I 10/29/12
Work Order: 12101052

Case Narrative

The extraction procedure used to prepare the soil samples for DRO and PAH analyses in this work order was a modification of the standard 3541 procedure. At the request of the client, a 10 gram sample aliquot dried with hydromatrix is used for extraction as outlined in ALS SOP HN-EXT-003(EN)-R01. All samples extracted starting on 10/1/2011 were prepared using this modified SOP.

Batch 44488 MS/MSD data for DRO/ORO is not related to this project's samples. No data requires qualification.

Batch 44509 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 44535 MS/MSD data for Volatiles is not related to this project's samples. No data requires qualification. Sample 12101052-06 had a high surrogate recovery. All compounds in this sample were ND. No data requires qualification.

Batch 44511 samples 12101052-04 and 12101052-06 PAH reporting limits are elevated due to dilution for high concentrations of non-target analytes.

Batch 44512 sample SBKR0950R506S102912S005 MS/MSD recoveries for DRO were below the control limit. The corresponding result in the parent sample may be biased low for DRO. Sample 12101052-06 DRO surrogate recovery was high due to matrix interference and high levels of DRO/ORO in the sample.

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment
Project: Marshall KRRI 0950-0975R,0975I 10/29/12
WorkOrder: **12101052**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg	Micrograms per Kilogram
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R504S102912S008
Work Order:	12101052	**Collection Date:**	10/29/2012 10:45:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/1/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**26**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**210**	**51**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*69.7*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.6	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	4.0	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**12**	**4.0**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**16**	**4.0**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/1/2012**		Analyst: **HL**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/5/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/5/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/5/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/5/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/5/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/5/2012
Surr: 2,4,6-Tribromophenol	*88.0*	*34-140*			*%REC*	1	11/5/2012
Surr: 2-Fluorobiphenyl	*74.5*	*12-100*			*%REC*	1	11/5/2012
Surr: 2-Fluorophenol	*84.7*	*33-117*			*%REC*	1	11/5/2012
Surr: 4-Terphenyl-d14	*117*	*25-137*			*%REC*	1	11/5/2012
Surr: Nitrobenzene-d5	*72.2*	*37-107*			*%REC*	1	11/5/2012
Surr: Phenol-d6	*72.5*	*40-106*			*%REC*	1	11/5/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	320	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	320	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	320	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	320	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	320	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R504S102912S008
Work Order:	12101052	**Collection Date:**	10/29/2012 10:45:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	320	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	320	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	320	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	320	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	320	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	320	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	320	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	320	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	320	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	1,100	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	1,100	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	2,600	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	320	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	320	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	320	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	320	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	320	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	320	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	320	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	320	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	320	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	1,100	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	320	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	320	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	320	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	320	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	320	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	320	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	320	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	320	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	320	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	320	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R504S102912S008
Work Order:	12101052	**Collection Date:**	10/29/2012 10:45:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-01	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	320	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	320	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	320	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	630	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	320	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	320	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	320	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	1,100	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	320	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	320	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	320	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	320	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	320	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	320	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	320	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	320	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	320	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,100	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	320	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	320	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	320	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	320	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	320	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	320	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	320	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*89.1*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*97.7*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*97.6*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**61**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R505S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 11:12:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**28**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**420**	**57**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*68.7*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	3.6	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**16**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**15**	**3.6**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(a)pyrene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(b)fluoranthene	**540**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	**500**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	**340**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Pyrene	**720**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*99.1*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*69.7*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*75.8*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*105*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*72.2*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*76.0*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	400	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	400	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	400	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	400	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	400	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R505S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 11:12:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	400	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	400	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	400	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	400	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	400	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	400	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	400	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	400	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	400	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	1,300	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	1,300	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	3,300	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	400	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	400	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	400	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	400	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	400	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	400	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	400	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	400	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	400	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	1,300	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	400	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	400	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	400	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	400	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	400	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	400	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	400	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	400	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	400	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	400	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R505S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 11:12:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-02	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	400	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	400	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	400	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	800	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	400	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	400	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	400	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	1,300	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	400	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	400	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	400	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	400	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	400	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	400	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	400	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	400	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	400	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,300	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	400	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	400	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	400	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	400	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	400	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	400	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	400	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*87.8*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*105*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.4*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**65**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

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Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R506S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 11:45:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**46**	**11**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**94**	**22**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*69.3*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	0.70	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	1.8	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**9.4**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**11**	**1.8**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*98.7*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*69.5*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*79.8*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*108*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*76.3*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*76.0*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R506S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 11:45:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	46	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	46	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	50	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	50	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	50	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	50	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	50	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	50	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR0950R506S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 11:45:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-03	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	50	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	100	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	50	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	50	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	50	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	50	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	50	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	46	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*89.7*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*98.1*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*96.7*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**14**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

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Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I501S102912S003
Work Order:	12101052	**Collection Date:**	10/29/2012 1:50:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**2,500**	**330**	**4.0**		**mg/Kg-dry**	20	11/3/2012
ORO (C20-C34)	**11,000**	**670**	**4.0**		**mg/Kg-dry**	20	11/3/2012
Surr: 4-Terphenyl-d14	*112*	*39-115*			*%REC*	20	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**17**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**18**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	830	330		µg/Kg-dry	10	11/2/2012
Acenaphthene	ND	830	330		µg/Kg-dry	10	11/2/2012
Acenaphthylene	ND	830	330		µg/Kg-dry	10	11/2/2012
Anthracene	ND	830	330		µg/Kg-dry	10	11/2/2012
Benzo(a)anthracene	**1,800**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Benzo(a)pyrene	**1,500**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Benzo(b)fluoranthene	**1,700**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Benzo(g,h,i)perylene	ND	830	330		µg/Kg-dry	10	11/2/2012
Benzo(k)fluoranthene	**1,900**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Chrysene	**2,200**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Dibenzo(a,h)anthracene	ND	830	330		µg/Kg-dry	10	11/2/2012
Fluoranthene	**1,300**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Fluorene	ND	830	330		µg/Kg-dry	10	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	830	330		µg/Kg-dry	10	11/2/2012
Naphthalene	ND	830	330		µg/Kg-dry	10	11/2/2012
Phenanthrene	ND	830	330		µg/Kg-dry	10	11/2/2012
Pyrene	**1,900**	**830**	**330**		**µg/Kg-dry**	10	11/2/2012
Surr: 2,4,6-Tribromophenol	*106*	*34-140*			*%REC*	10	11/2/2012
Surr: 2-Fluorobiphenyl	*71.8*	*12-100*			*%REC*	10	11/2/2012
Surr: 2-Fluorophenol	*72.2*	*33-117*			*%REC*	10	11/2/2012
Surr: 4-Terphenyl-d14	*79.2*	*25-137*			*%REC*	10	11/2/2012
Surr: Nitrobenzene-d5	*76.2*	*37-107*			*%REC*	10	11/2/2012
Surr: Phenol-d6	*61.2*	*40-106*			*%REC*	10	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	120	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	120	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	120	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

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Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I501S102912S003
Work Order:	12101052	**Collection Date:**	10/29/2012 1:50:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	120	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	120	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	120	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	120	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	120	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	390	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	120	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	120	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	120	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	120	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	120	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	120	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	120	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	390	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	120	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	120	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I501S102912S003
Work Order:	12101052	**Collection Date:**	10/29/2012 1:50:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-04	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	120	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	230	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	120	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	120	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	390	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	120	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	120	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	120	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	120	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	120	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	120	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	120	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	120	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	120	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	120	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	120	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	120	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	120	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*90.6*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*160*	*70-130*		S	*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.2*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**40**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I501S102912S010
Work Order:	12101052	**Collection Date:**	10/29/2012 1:55:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**120**	**19**	**4.0**		**mg/Kg-dry**	1	11/2/2012
ORO (C20-C34)	**360**	**38**	**4.0**		**mg/Kg-dry**	1	11/2/2012
Surr: 4-Terphenyl-d14	*69.8*	*39-115*			*%REC*	1	11/2/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.0	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	2.5	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**15**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**20**	**2.5**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	**440**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(a)pyrene	**580**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(b)fluoranthene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	**530**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	**430**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	**600**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*128*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*55.3*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*72.4*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*102*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*71.4*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*71.3*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	170	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I501S102912S010
Work Order:	12101052	**Collection Date:**	10/29/2012 1:55:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	170	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	170	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	170	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	170	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	550	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,400	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	170	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	170	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	170	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	550	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	170	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	170	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I501S102912S010
Work Order:	12101052	**Collection Date:**	10/29/2012 1:55:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-05	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	330	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	170	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	170	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	550	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	170	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	170	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	170	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	170	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	170	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	170	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	170	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	170	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	170	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	170	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	170	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*88.3*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*95.8*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*97.6*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S102912S004
Work Order:	12101052	**Collection Date:**	10/29/2012 2:50:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**5,300**	**920**	**4.0**		**mg/Kg-dry**	50	11/3/2012
ORO (C20-C34)	**20,000**	**1,800**	**4.0**		**mg/Kg-dry**	50	11/3/2012
Surr: 4-Terphenyl-d14	*180*	*39-115*		S	*%REC*	50	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.1	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	2.7	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**18**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**22**	**2.7**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Acenaphthene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Acenaphthylene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Anthracene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Benzo(a)anthracene	**2,600**	**1,800**	**330**		**µg/Kg-dry**	20	11/2/2012
Benzo(a)pyrene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Benzo(b)fluoranthene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Benzo(g,h,i)perylene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Benzo(k)fluoranthene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Chrysene	**2,000**	**1,800**	**330**		**µg/Kg-dry**	20	11/2/2012
Dibenzo(a,h)anthracene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Fluoranthene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Fluorene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Naphthalene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Phenanthrene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Pyrene	ND	1,800	330		µg/Kg-dry	20	11/2/2012
Surr: 2,4,6-Tribromophenol	*105*	*34-140*			*%REC*	20	11/2/2012
Surr: 2-Fluorobiphenyl	*63.2*	*12-100*			*%REC*	20	11/2/2012
Surr: 2-Fluorophenol	*68.0*	*33-117*			*%REC*	20	11/2/2012
Surr: 4-Terphenyl-d14	*81.6*	*25-137*			*%REC*	20	11/2/2012
Surr: Nitrobenzene-d5	*68.0*	*37-107*			*%REC*	20	11/2/2012
Surr: Phenol-d6	*54.0*	*40-106*			*%REC*	20	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	160	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S102912S004
Work Order:	12101052	**Collection Date:**	10/29/2012 2:50:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	160	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	160	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	160	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	520	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,300	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	160	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	160	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	520	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	160	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S102912S004
Work Order:	12101052	**Collection Date:**	10/29/2012 2:50:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-06	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	310	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	160	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	160	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	520	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	160	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	160	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	160	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	160	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	160	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	160	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*105*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*93.1*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*93.5*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**47**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S102912S013
Work Order:	12101052	**Collection Date:**	10/29/2012 2:55:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**130**	**22**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**390**	**44**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*64.3*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.4	0.50		mg/Kg-dry	4	11/2/2012
Molybdenum	ND	3.5	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**13**	**3.5**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**20**	**3.5**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(a)pyrene	**1,700**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(b)fluoranthene	**1,000**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(g,h,i)perylene	**810**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Benzo(k)fluoranthene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Chrysene	**1,300**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	**1,200**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	**810**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	**1,900**	**330**	**330**		**µg/Kg-dry**	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*116*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*51.4*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*70.3*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*95.5*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*66.4*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*70.5*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	230	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	230	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	230	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	230	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	230	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S102912S013
Work Order:	12101052	**Collection Date:**	10/29/2012 2:55:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	230	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	230	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	230	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	230	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	230	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	230	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	760	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	760	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,900	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	230	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	230	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	230	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	230	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	230	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	230	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	230	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	230	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	760	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	230	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	230	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	230	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	230	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	230	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975I502S102912S013
Work Order:	12101052	**Collection Date:**	10/29/2012 2:55:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-07	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	230	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	460	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	230	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	230	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	760	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	230	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	230	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	230	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	230	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	230	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	230	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	230	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	230	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	230	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	230	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	230	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	230	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	230	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	230	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	230	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*103*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*87.9*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*95.0*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.2*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**55**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R503S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 8:57:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**74**	**15**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**180**	**31**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*68.6*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	0.83	0.50		mg/Kg-dry	4	11/5/2012
Molybdenum	ND	2.1	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**12**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**21**	**2.1**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*122*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*69.1*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*78.9*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*107*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*76.3*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*78.1*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R503S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 8:57:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	100	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	100	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	100	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	350	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	100	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	100	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	100	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	350	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	100	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R503S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 8:57:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-08	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	210	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	100	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	100	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	350	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	100	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	100	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	100	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	100	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	100	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	100	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	100	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	100	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	100	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	100	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	100	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*101*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*89.5*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*102*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**37**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R503D102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 8:57:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**94**	**18**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**270**	**36**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*68.0*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.2	0.50		mg/Kg-dry	4	11/5/2012
Molybdenum	ND	3.0	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**15**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**32**	**3.0**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*118*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*66.0*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*75.7*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*116*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*72.6*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*75.3*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	160	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R503D102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 8:57:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	160	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	160	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	160	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	160	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	550	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,400	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	160	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	160	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	160	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	550	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	160	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R503D102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 8:57:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-09	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	330	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	160	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	160	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	550	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	160	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	160	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	160	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	160	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	160	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	160	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	160	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	160	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	160	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	160	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	160	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*87.1*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*99.1*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.7*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**48**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R504S102912S006
Work Order:	12101052	**Collection Date:**	10/29/2012 9:46:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**150**	**29**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**450**	**59**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*70.7*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.7	0.50		mg/Kg-dry	4	11/5/2012
Molybdenum	ND	4.3	1.0		mg/Kg-dry	4	11/2/2012
Nickel	**16**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**19**	**4.3**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*133*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*67.7*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*74.5*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*108*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*73.4*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*75.1*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	430	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R504S102912S006
Work Order:	12101052	**Collection Date:**	10/29/2012 9:46:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	430	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	430	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	1,400	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	1,400	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	3,600	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	430	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	430	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	430	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	430	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	1,400	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	430	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	430	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	430	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	430	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	430	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	430	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R504S102912S006
Work Order:	12101052	**Collection Date:**	10/29/2012 9:46:00 AM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-10	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	430	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	870	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	430	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	430	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	1,400	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	430	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	430	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	430	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	430	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,400	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	430	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	430	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	430	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	430	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*108*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*87.2*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*102*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**66**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R505S102912S007
Work Order:	12101052	**Collection Date:**	10/29/2012 3:32:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**110**	**17**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**320**	**34**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*68.2*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	**1.5**	**0.94**	**0.50**		**mg/Kg-dry**	4	11/5/2012
Molybdenum	**15**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Nickel	**17**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**24**	**2.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*133*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*68.2*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*68.9*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*101*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*70.0*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*73.6*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	130	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	130	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	130	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R505S102912S007
Work Order:	12101052	**Collection Date:**	10/29/2012 3:32:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	130	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	130	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	130	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	130	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	130	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	440	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	1,100	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	130	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	130	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	130	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	130	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	130	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	130	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	130	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	440	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	130	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	130	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R505S102912S007
Work Order:	12101052	**Collection Date:**	10/29/2012 3:32:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-11	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	130	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	270	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	130	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	130	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	440	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	130	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	130	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	130	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	130	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	130	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	130	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	130	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	130	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	130	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	130	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	130	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	130	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	130	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*106*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*88.9*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*98.2*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**43**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 4:16:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**170**	**30**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**360**	**59**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*70.2*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	11/5/2012
Molybdenum	**8.3**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Nickel	**16**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**23**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*138*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*65.9*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*70.6*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*108*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*68.9*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*70.6*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	440	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	440	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	440	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	440	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	440	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 4:16:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	440	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	440	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	440	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	440	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	440	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	440	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	440	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	440	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	440	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	1,500	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	1,500	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	3,600	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	440	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	440	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	440	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	440	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	440	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	440	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	440	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	440	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	440	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	1,500	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	440	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	440	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	440	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	440	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	440	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	440	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	440	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	440	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	440	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	440	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506S102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 4:16:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-12	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	440	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	440	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	440	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	870	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	440	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	440	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	440	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	1,500	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	440	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	440	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	440	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	440	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	440	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	440	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	440	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	440	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	440	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,500	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	440	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	440	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	440	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	440	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	440	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	440	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	440	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*109*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*88.2*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*100*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.0*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**66**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506D102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 4:16:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep Date: **11/2/2012**		Analyst: **CW**
DRO (C10-C20)	**190**	**29**	**4.0**		**mg/Kg-dry**	1	11/3/2012
ORO (C20-C34)	**460**	**57**	**4.0**		**mg/Kg-dry**	1	11/3/2012
Surr: 4-Terphenyl-d14	*67.6*	*39-115*			*%REC*	1	11/3/2012
METALS BY ICP-MS			**SW6020A**		Prep Date: **11/2/2012**		Analyst: **RH**
Beryllium	ND	1.8	0.50		mg/Kg-dry	4	11/5/2012
Molybdenum	**8.7**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Nickel	**15**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
Vanadium	**22**	**4.4**	**1.0**		**mg/Kg-dry**	4	11/2/2012
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep Date: **11/2/2012**		Analyst: **RM**
2-Methylnaphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Acenaphthylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(a)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(b)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(g,h,i)perylene	ND	330	330		µg/Kg-dry	1	11/2/2012
Benzo(k)fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Chrysene	ND	330	330		µg/Kg-dry	1	11/2/2012
Dibenzo(a,h)anthracene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluoranthene	ND	330	330		µg/Kg-dry	1	11/2/2012
Fluorene	ND	330	330		µg/Kg-dry	1	11/2/2012
Indeno(1,2,3-cd)pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Naphthalene	ND	330	330		µg/Kg-dry	1	11/2/2012
Phenanthrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Pyrene	ND	330	330		µg/Kg-dry	1	11/2/2012
Surr: 2,4,6-Tribromophenol	*128*	*34-140*			*%REC*	1	11/2/2012
Surr: 2-Fluorobiphenyl	*65.3*	*12-100*			*%REC*	1	11/2/2012
Surr: 2-Fluorophenol	*68.7*	*33-117*			*%REC*	1	11/2/2012
Surr: 4-Terphenyl-d14	*104*	*25-137*			*%REC*	1	11/2/2012
Surr: Nitrobenzene-d5	*66.6*	*37-107*			*%REC*	1	11/2/2012
Surr: Phenol-d6	*70.0*	*40-106*			*%REC*	1	11/2/2012
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	430	100		µg/Kg-dry	1	11/3/2012
1,1,1-Trichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1,2-Trichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,1-Dichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506D102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 4:16:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
1,2,3-Trichlorobenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,3-Trichloropropane	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2,3-Trimethylbenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trichlorobenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
1,2,4-Trimethylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	430	10		µg/Kg-dry	1	11/3/2012
1,2-Dibromoethane	ND	430	20		µg/Kg-dry	1	11/3/2012
1,2-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,2-Dichloroethane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,2-Dichloropropane	ND	430	50		µg/Kg-dry	1	11/3/2012
1,3,5-Trimethylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,3-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
1,4-Dichlorobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
2-Butanone	ND	1,400	750		µg/Kg-dry	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
2-Methylnaphthalene	ND	1,400	330		µg/Kg-dry	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
Acetone	ND	3,600	1,000		µg/Kg-dry	1	11/3/2012
Acrylonitrile	ND	430	100		µg/Kg-dry	1	11/3/2012
Benzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Bromobenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromochloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromodichloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromoform	ND	430	100		µg/Kg-dry	1	11/3/2012
Bromomethane	ND	430	200		µg/Kg-dry	1	11/3/2012
Carbon disulfide	ND	430	250		µg/Kg-dry	1	11/3/2012
Carbon tetrachloride	ND	430	50		µg/Kg-dry	1	11/3/2012
Chlorobenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Chloroethane	ND	1,400	250		µg/Kg-dry	1	11/3/2012
Chloroform	ND	430	50		µg/Kg-dry	1	11/3/2012
Chloromethane	ND	430	250		µg/Kg-dry	1	11/3/2012
cis-1,2-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
cis-1,3-Dichloropropene	ND	430	50		µg/Kg-dry	1	11/3/2012
Cyclohexane	ND	500	500		µg/Kg-dry	1	11/3/2012
Dibromochloromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Dibromomethane	ND	430	250		µg/Kg-dry	1	11/3/2012
Dichlorodifluoromethane	ND	430	250		µg/Kg-dry	1	11/3/2012
Diethyl ether	ND	430	200		µg/Kg-dry	1	11/3/2012
Diisopropyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012
Ethyl tert butyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506D102912S005
Work Order:	12101052	**Collection Date:**	10/29/2012 4:16:00 PM
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-13	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Ethylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Hexachloroethane	ND	430	300		µg/Kg-dry	1	11/3/2012
Isopropylbenzene	ND	430	250		µg/Kg-dry	1	11/3/2012
m,p-Xylene	ND	850	100		µg/Kg-dry	1	11/3/2012
Methyl iodide	ND	430	100		µg/Kg-dry	1	11/3/2012
Methyl tert-butyl ether	ND	430	250		µg/Kg-dry	1	11/3/2012
Methylene chloride	ND	430	100		µg/Kg-dry	1	11/3/2012
Naphthalene	ND	1,400	330		µg/Kg-dry	1	11/3/2012
n-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
n-Propylbenzene	ND	430	100		µg/Kg-dry	1	11/3/2012
o-Xylene	ND	430	50		µg/Kg-dry	1	11/3/2012
p-Isopropyltoluene	ND	430	100		µg/Kg-dry	1	11/3/2012
sec-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Styrene	ND	430	50		µg/Kg-dry	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg-dry	1	11/3/2012
tert-Butylbenzene	ND	430	50		µg/Kg-dry	1	11/3/2012
Tertiaryamylmethylether	ND	430	250		µg/Kg-dry	1	11/3/2012
Tetrachloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
Tetrahydrofuran	ND	1,400	1,000		µg/Kg-dry	1	11/3/2012
Toluene	ND	430	100		µg/Kg-dry	1	11/3/2012
trans-1,2-Dichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
trans-1,3-Dichloropropene	ND	430	50		µg/Kg-dry	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	430	50		µg/Kg-dry	1	11/3/2012
Trichloroethene	ND	430	50		µg/Kg-dry	1	11/3/2012
Trichlorofluoromethane	ND	430	100		µg/Kg-dry	1	11/3/2012
Vinyl chloride	ND	430	40		µg/Kg-dry	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*107*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*87.8*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*102*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*96.3*	*70-130*			*%REC*	1	11/3/2012
MOISTURE			**A2540 G**				Analyst: **LR**
Moisture	**66**	**0.050**	**0**		**% of sample**	1	11/1/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506T102912MX
Work Order:	12101052	**Collection Date:**	10/29/2012
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-14	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260**		Prep Date: **11/2/2012**		Analyst: **RS**
1,1,1,2-Tetrachloroethane	ND	100	100		µg/Kg	1	11/3/2012
1,1,1-Trichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1,2,2-Tetrachloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1,2-Trichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1-Dichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,1-Dichloroethene	ND	50	50		µg/Kg	1	11/3/2012
1,2,3-Trichlorobenzene	ND	250	250		µg/Kg	1	11/3/2012
1,2,3-Trichloropropane	ND	100	100		µg/Kg	1	11/3/2012
1,2,3-Trimethylbenzene	ND	250	250		µg/Kg	1	11/3/2012
1,2,4-Trichlorobenzene	ND	250	250		µg/Kg	1	11/3/2012
1,2,4-Trimethylbenzene	ND	100	100		µg/Kg	1	11/3/2012
1,2-Dibromo-3-chloropropane	ND	30	10		µg/Kg	1	11/3/2012
1,2-Dibromoethane	ND	30	20		µg/Kg	1	11/3/2012
1,2-Dichlorobenzene	ND	100	100		µg/Kg	1	11/3/2012
1,2-Dichloroethane	ND	50	50		µg/Kg	1	11/3/2012
1,2-Dichloropropane	ND	50	50		µg/Kg	1	11/3/2012
1,3,5-Trimethylbenzene	ND	100	100		µg/Kg	1	11/3/2012
1,3-Dichlorobenzene	ND	100	100		µg/Kg	1	11/3/2012
1,4-Dichlorobenzene	ND	100	100		µg/Kg	1	11/3/2012
2-Butanone	ND	750	750		µg/Kg	1	11/3/2012
2-Hexanone	ND	2,500	2,500		µg/Kg	1	11/3/2012
2-Methylnaphthalene	ND	330	330		µg/Kg	1	11/3/2012
4-Methyl-2-pentanone	ND	2,500	2,500		µg/Kg	1	11/3/2012
Acetone	ND	1,000	1,000		µg/Kg	1	11/3/2012
Acrylonitrile	ND	100	100		µg/Kg	1	11/3/2012
Benzene	ND	50	50		µg/Kg	1	11/3/2012
Bromobenzene	ND	100	100		µg/Kg	1	11/3/2012
Bromochloromethane	ND	100	100		µg/Kg	1	11/3/2012
Bromodichloromethane	ND	100	100		µg/Kg	1	11/3/2012
Bromoform	ND	100	100		µg/Kg	1	11/3/2012
Bromomethane	ND	200	200		µg/Kg	1	11/3/2012
Carbon disulfide	ND	250	250		µg/Kg	1	11/3/2012
Carbon tetrachloride	ND	50	50		µg/Kg	1	11/3/2012
Chlorobenzene	ND	50	50		µg/Kg	1	11/3/2012
Chloroethane	ND	250	250		µg/Kg	1	11/3/2012
Chloroform	ND	50	50		µg/Kg	1	11/3/2012
Chloromethane	ND	250	250		µg/Kg	1	11/3/2012
cis-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/3/2012
cis-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *08-Nov-12*

Client:	AECOM Environment	**Client Sample ID:**	SBKR0975R506T102912MX
Work Order:	12101052	**Collection Date:**	10/29/2012
Project:	Marshall KRRI 0950-0975R,0975I 10/29/12		
Lab ID:	12101052-14	**Matrix:**	SOIL

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Cyclohexane	ND	500	500		µg/Kg	1	11/3/2012
Dibromochloromethane	ND	100	100		µg/Kg	1	11/3/2012
Dibromomethane	ND	250	250		µg/Kg	1	11/3/2012
Dichlorodifluoromethane	ND	250	250		µg/Kg	1	11/3/2012
Diethyl ether	ND	200	200		µg/Kg	1	11/3/2012
Diisopropyl ether	ND	250	250		µg/Kg	1	11/3/2012
Ethyl tert butyl ether	ND	250	250		µg/Kg	1	11/3/2012
Ethylbenzene	ND	50	50		µg/Kg	1	11/3/2012
Hexachloroethane	ND	300	300		µg/Kg	1	11/3/2012
Isopropylbenzene	ND	250	250		µg/Kg	1	11/3/2012
m,p-Xylene	ND	100	100		µg/Kg	1	11/3/2012
Methyl iodide	ND	100	100		µg/Kg	1	11/3/2012
Methyl tert-butyl ether	ND	250	250		µg/Kg	1	11/3/2012
Methylene chloride	ND	100	100		µg/Kg	1	11/3/2012
Naphthalene	ND	330	330		µg/Kg	1	11/3/2012
n-Butylbenzene	ND	50	50		µg/Kg	1	11/3/2012
n-Propylbenzene	ND	100	100		µg/Kg	1	11/3/2012
o-Xylene	ND	50	50		µg/Kg	1	11/3/2012
p-Isopropyltoluene	ND	100	100		µg/Kg	1	11/3/2012
sec-Butylbenzene	ND	50	50		µg/Kg	1	11/3/2012
Styrene	ND	50	50		µg/Kg	1	11/3/2012
tert-Butyl alcohol	ND	2,500	2,500		µg/Kg	1	11/3/2012
tert-Butylbenzene	ND	50	50		µg/Kg	1	11/3/2012
Tertiaryamylmethylether	ND	250	250		µg/Kg	1	11/3/2012
Tetrachloroethene	ND	50	50		µg/Kg	1	11/3/2012
Tetrahydrofuran	ND	1,000	1,000		µg/Kg	1	11/3/2012
Toluene	ND	100	100		µg/Kg	1	11/3/2012
trans-1,2-Dichloroethene	ND	50	50		µg/Kg	1	11/3/2012
trans-1,3-Dichloropropene	ND	50	50		µg/Kg	1	11/3/2012
trans-1,4-Dichloro-2-butene	ND	50	50		µg/Kg	1	11/3/2012
Trichloroethene	ND	50	50		µg/Kg	1	11/3/2012
Trichlorofluoromethane	ND	100	100		µg/Kg	1	11/3/2012
Vinyl chloride	ND	40	40		µg/Kg	1	11/3/2012
Surr: 1,2-Dichloroethane-d4	*104*	*70-130*			*%REC*	1	11/3/2012
Surr: 4-Bromofluorobenzene	*91.0*	*70-130*			*%REC*	1	11/3/2012
Surr: Dibromofluoromethane	*105*	*70-130*			*%REC*	1	11/3/2012
Surr: Toluene-d8	*95.6*	*70-130*			*%REC*	1	11/3/2012

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 08-Nov-12

Client: AECOM Environment

QC BATCH REPORT

Work Order: 12101052

Project: Marshall KRRI 0950-0975R,0975I 10/29/12

Batch ID: **44488** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44488-44488** Units: **mg/Kg** Analysis Date: **11/1/2012 04:32 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130108** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.263*	0	*5*	0	*65.3*	*39-115*	0			

LCS Sample ID: **DLCSS1-44488-44488** Units: **mg/Kg** Analysis Date: **11/1/2012 04:59 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130109** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	311.3	10	500	0	62.3	49-124	0			
ORO (C20-C34)	377.6	20	500	0	75.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.045*	0	*5*	0	*80.9*	*39-115*	0			

MS Sample ID: **12101051-02A MS** Units: **mg/Kg** Analysis Date: **11/1/2012 05:26 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130110** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	329	9.5	476.1	64.81	55.5	60-130	0			S
ORO (C20-C34)	455.1	19	476.1	153.8	63.3	60-130	0			
Surr: 4-Terphenyl-d14	*4.123*	0	*4.761*	0	*86.6*	*39-115*	0			

MSD Sample ID: **12101051-02A MSD** Units: **mg/Kg** Analysis Date: **11/1/2012 05:53 PM**

Client ID: Run ID: **GC8_121101A** SeqNo: **2130111** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	310.1	9.7	483.5	64.81	50.7	60-130	329	5.93	30	S
ORO (C20-C34)	396.4	19	483.5	153.8	50.2	60-130	455.1	13.8	30	S
Surr: 4-Terphenyl-d14	*3.866*	0	*4.835*	0	*80*	*39-115*	4.123	*6.44*	*30*	

The following samples were analyzed in this batch: 12101052-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44512** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44512-44512** Units: **mg/Kg** Analysis Date: **11/2/2012 09:02 PM**
Client ID: Run ID: **GC8_121102A** SeqNo: **2131755** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	20								
Surr: 4-Terphenyl-d14	*3.472*	0	*5*	0	*69.4*	*39-115*	0			

LCS Sample ID: **DLCSS1-44512-44512** Units: **mg/Kg** Analysis Date: **11/2/2012 09:29 PM**
Client ID: Run ID: **GC8_121102A** SeqNo: **2131756** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	316.1	10	500	0	63.2	49-124	0			
ORO (C20-C34)	352.6	20	500	0	70.5	60-130	0			
Surr: 4-Terphenyl-d14	*4.204*	0	*5*	0	*84.1*	*39-115*	0			

MS Sample ID: **12101052-03B MS** Units: **mg/Kg** Analysis Date: **11/2/2012 09:56 PM**
Client ID: **SBKR0950R506S102912S005** Run ID: **GC8_121102A** SeqNo: **2131757** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	312	9.5	476.1	40	57.1	60-130	0			S
ORO (C20-C34)	367.2	19	476.1	81.12	60.1	60-130	0			
Surr: 4-Terphenyl-d14	*4.073*	0	*4.761*	0	*85.5*	*39-115*	0			

MSD Sample ID: **12101052-03B MSD** Units: **mg/Kg** Analysis Date: **11/2/2012 10:23 PM**
Client ID: **SBKR0950R506S102912S005** Run ID: **GC8_121102A** SeqNo: **2131758** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	321.9	9.6	481.1	40	58.6	60-130	312	3.12	30	S
ORO (C20-C34)	438.3	19	481.1	81.12	74.2	60-130	367.2	17.6	30	
Surr: 4-Terphenyl-d14	*4.203*	0	*4.811*	0	*87.4*	*39-115*	4.073	*3.14*	*30*	

The following samples were analyzed in this batch:

12101052-02B	12101052-03B	12101052-04B
12101052-05B	12101052-06B	12101052-07B
12101052-08B	12101052-09B	12101052-10B
12101052-11B	12101052-12B	12101052-13B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44509** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-44509-44509** Units: **mg/Kg** Analysis Date: **11/2/2012 06:13 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130784** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Molybdenum	ND	0.25								
Nickel	ND	0.25								
Vanadium	ND	0.25								

LCS Sample ID: **LCS-44509-44509** Units: **mg/Kg** Analysis Date: **11/2/2012 06:18 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130785** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.37	0.10	5	0	87.4	80-120	0			
Molybdenum	4.934	0.25	5	0	98.7	80-120	0			
Nickel	4.682	0.25	5	0	93.6	80-120	0			
Vanadium	5.015	0.25	5	0	100	80-120	0			

MS Sample ID: **12101051-02AMS** Units: **mg/Kg** Analysis Date: **11/2/2012 06:33 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130788** Prep Date: **11/2/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.013	0.52	6.452	0.3177	88.3	75-125	0			
Molybdenum	7.933	1.3	6.452	1.452	100	75-125	0			
Nickel	18.62	1.3	6.452	12.88	88.9	75-125	0			
Vanadium	24.82	1.3	6.452	13.18	180	75-125	0			S

MSD Sample ID: **12101051-02AMSD** Units: **mg/Kg** Analysis Date: **11/2/2012 06:38 PM**
Client ID: Run ID: **ICPMS2_121102A** SeqNo: **2130789** Prep Date: **11/2/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.912	0.54	6.693	0.3177	83.6	75-125	6.013	1.7	25	
Molybdenum	7.585	1.3	6.693	1.452	91.6	75-125	7.933	4.48	25	
Nickel	17.54	1.3	6.693	12.88	69.7	75-125	18.62	5.93	25	S
Vanadium	23.65	1.3	6.693	13.18	156	75-125	24.82	4.81	25	S

The following samples were analyzed in this batch:

12101052-01B	12101052-02B	12101052-03B
12101052-04B	12101052-05B	12101052-06B
12101052-07B	12101052-08B	12101052-09B
12101052-10B	12101052-11B	12101052-12B
12101052-13B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44487-44487** Units: **µg/Kg** Analysis Date: **11/2/2012 10:47 AM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2129866** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*3816*	0	*5000*	0	*76.3*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3380*	0	*5000*	0	*67.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3471*	0	*5000*	0	*69.4*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3690*	0	*5000*	0	*73.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3485*	0	*5000*	0	*69.7*	*37-107*	0			
Surr: Phenol-d6	*3810*	0	*5000*	0	*76.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44487-44487** Units: **µg/Kg** Analysis Date: **11/2/2012 09:52 AM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2129864** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1618	50	2000	0	80.9	45-105	0			
Acenaphthene	1671	50	2000	0	83.6	45-110	0			
Acenaphthylene	1710	50	2000	0	85.5	45-105	0			
Anthracene	1766	50	2000	0	88.3	55-105	0			
Benzo(a)anthracene	1795	50	2000	0	89.8	50-110	0			
Benzo(a)pyrene	1872	50	2000	0	93.6	50-110	0			
Benzo(b)fluoranthene	1855	50	2000	0	92.8	45-115	0			
Benzo(g,h,i)perylene	1898	50	2000	0	94.9	40-125	0			
Benzo(k)fluoranthene	1794	50	2000	0	89.7	45-115	0			
Chrysene	1792	50	2000	0	89.6	55-110	0			
Dibenzo(a,h)anthracene	1913	50	2000	0	95.6	40-125	0			
Fluoranthene	1846	50	2000	0	92.3	55-115	0			
Fluorene	1752	50	2000	0	87.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1914	50	2000	0	95.7	40-120	0			
Naphthalene	1605	50	2000	0	80.2	40-105	0			
Phenanthrene	1783	50	2000	0	89.2	50-110	0			
Pyrene	1930	50	2000	0	96.5	45-125	0			
Surr: 2,4,6-Tribromophenol	*4387*	0	*5000*	0	*87.7*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3425*	0	*5000*	0	*68.5*	*12-100*	0			
Surr: 2-Fluorophenol	*3473*	0	*5000*	0	*69.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*4041*	0	*5000*	0	*80.8*	*25-137*	0			
Surr: Nitrobenzene-d5	*3494*	0	*5000*	0	*69.9*	*37-107*	0			
Surr: Phenol-d6	*3566*	0	*5000*	0	*71.3*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **12101051-02A MS** Units: **µg/Kg** Analysis Date: **11/2/2012 02:12 PM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2131194** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1564	50	1992	0	78.5	45-105	0			
Acenaphthene	1621	50	1992	0	81.4	45-110	0			
Acenaphthylene	1678	50	1992	0	84.2	45-105	0			
Anthracene	1816	50	1992	0	91.2	55-105	0			
Benzo(a)anthracene	1769	50	1992	0	88.8	50-110	0			
Benzo(a)pyrene	1787	50	1992	88.88	85.2	50-110	0			
Benzo(b)fluoranthene	1946	50	1992	117.9	91.8	45-115	0			
Benzo(g,h,i)perylene	1651	50	1992	53.13	80.2	40-125	0			
Benzo(k)fluoranthene	1603	50	1992	0	80.5	45-115	0			
Chrysene	1728	50	1992	85.02	82.5	55-110	0			
Dibenzo(a,h)anthracene	1695	50	1992	0	85.1	40-125	0			
Fluoranthene	1879	50	1992	61.83	91.2	55-115	0			
Fluorene	1741	50	1992	0	87.4	50-110	0			
Indeno(1,2,3-cd)pyrene	1724	50	1992	48.3	84.1	40-120	0			
Naphthalene	1515	50	1992	0	76	40-105	0			
Phenanthrene	1846	50	1992	0	92.7	50-110	0			
Pyrene	1887	50	1992	0	94.8	45-125	0			
Surr: 2,4,6-Tribromophenol	*4708*	0	*4980*	0	*94.5*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3318*	0	*4980*	0	*66.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3263*	0	*4980*	0	*65.5*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3878*	0	*4980*	0	*77.9*	*25-137*	0			
Surr: Nitrobenzene-d5	*3320*	0	*4980*	0	*66.7*	*37-107*	0			
Surr: Phenol-d6	*3594*	0	*4980*	0	*72.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44487** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **12101051-02A MSD** Units: **µg/Kg** Analysis Date: **11/2/2012 02:39 PM**
Client ID: Run ID: **SVMS7_121102A** SeqNo: **2131195** Prep Date: **11/1/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1452	47	1893	0	76.7	45-105	1564	7.39	30	
Acenaphthene	1512	47	1893	0	79.8	45-110	1621	7	30	
Acenaphthylene	1550	47	1893	0	81.8	45-105	1678	7.96	30	
Anthracene	1719	47	1893	0	90.8	55-105	1816	5.46	30	
Benzo(a)anthracene	1675	47	1893	0	88.4	50-110	1769	5.47	30	
Benzo(a)pyrene	1755	47	1893	88.88	88	50-110	1787	1.79	30	
Benzo(b)fluoranthene	1848	47	1893	117.9	91.4	45-115	1946	5.18	30	
Benzo(g,h,i)perylene	1546	47	1893	53.13	78.8	40-125	1651	6.59	30	
Benzo(k)fluoranthene	1597	47	1893	0	84.4	45-115	1603	0.406	30	
Chrysene	1638	47	1893	85.02	82	55-110	1728	5.36	30	
Dibenzo(a,h)anthracene	1587	47	1893	0	83.8	40-125	1695	6.55	30	
Fluoranthene	1768	47	1893	61.83	90.1	55-115	1879	6.09	30	
Fluorene	1616	47	1893	0	85.4	50-110	1741	7.45	30	
Indeno(1,2,3-cd)pyrene	1631	47	1893	48.3	83.6	40-120	1724	5.54	30	
Naphthalene	1416	47	1893	0	74.8	40-105	1515	6.73	30	
Phenanthrene	1753	47	1893	0	92.6	50-110	1846	5.18	30	
Pyrene	1807	47	1893	0	95.4	45-125	1887	4.34	30	
Surr: 2,4,6-Tribromophenol	*4424*	0	*4733*	0	*93.5*	*34-140*	4708	*6.22*	*40*	
Surr: 2-Fluorobiphenyl	*3100*	0	*4733*	0	*65.5*	*12-100*	3318	*6.8*	*40*	
Surr: 2-Fluorophenol	*3094*	0	*4733*	0	*65.4*	*33-117*	3263	*5.29*	*40*	
Surr: 4-Terphenyl-d14	*3719*	0	*4733*	0	*78.6*	*25-137*	3878	*4.18*	*40*	
Surr: Nitrobenzene-d5	*3131*	0	*4733*	0	*66.2*	*37-107*	3320	*5.86*	*40*	
Surr: Phenol-d6	*3385*	0	*4733*	0	*71.5*	*40-106*	3594	*5.99*	*40*	

The following samples were analyzed in this batch: 12101052-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44511** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44511-44511** Units: **µg/Kg** Analysis Date: **11/2/2012 05:02 PM**
Client ID: Run ID: **SVMS6_121102A** SeqNo: **2131129** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	ND	50								
Acenaphthene	ND	50								
Acenaphthylene	ND	50								
Anthracene	ND	50								
Benzo(a)anthracene	ND	50								
Benzo(a)pyrene	ND	50								
Benzo(b)fluoranthene	ND	50								
Benzo(g,h,i)perylene	ND	50								
Benzo(k)fluoranthene	ND	50								
Chrysene	ND	50								
Dibenzo(a,h)anthracene	ND	50								
Fluoranthene	ND	50								
Fluorene	ND	50								
Indeno(1,2,3-cd)pyrene	ND	50								
Naphthalene	ND	50								
Phenanthrene	ND	50								
Pyrene	ND	50								
Surr: 2,4,6-Tribromophenol	*4628*	0	*5000*	0	*92.6*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3820*	0	*5000*	0	*76.4*	*12-100*	0			
Surr: 2-Fluorophenol	*4464*	0	*5000*	0	*89.3*	*33-117*	0			
Surr: 4-Terphenyl-d14	*6055*	0	*5000*	0	*121*	*25-137*	0			
Surr: Nitrobenzene-d5	*4154*	0	*5000*	0	*83.1*	*37-107*	0			
Surr: Phenol-d6	*4362*	0	*5000*	0	*87.2*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44511** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSS1-44511-44511** Units: **µg/Kg** Analysis Date: **11/2/2012 04:37 PM**
Client ID: Run ID: **SVMS6_121102A** SeqNo: **2131128** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1625	50	2000	0	81.2	45-105	0			
Acenaphthene	1633	50	2000	0	81.6	45-110	0			
Acenaphthylene	1721	50	2000	0	86	45-105	0			
Anthracene	1689	50	2000	0	84.4	55-105	0			
Benzo(a)anthracene	1627	50	2000	0	81.4	50-110	0			
Benzo(a)pyrene	1738	50	2000	0	86.9	50-110	0			
Benzo(b)fluoranthene	1789	50	2000	0	89.4	45-115	0			
Benzo(g,h,i)perylene	1542	50	2000	0	77.1	40-125	0			
Benzo(k)fluoranthene	1672	50	2000	0	83.6	45-115	0			
Chrysene	1709	50	2000	0	85.4	55-110	0			
Dibenzo(a,h)anthracene	1691	50	2000	0	84.6	40-125	0			
Fluoranthene	1703	50	2000	0	85.2	55-115	0			
Fluorene	1635	50	2000	0	81.8	50-110	0			
Indeno(1,2,3-cd)pyrene	1542	50	2000	0	77.1	40-120	0			
Naphthalene	1627	50	2000	0	81.4	40-105	0			
Phenanthrene	1669	50	2000	0	83.4	50-110	0			
Pyrene	2111	50	2000	0	106	45-125	0			
Surr: 2,4,6-Tribromophenol	*4723*	0	*5000*	0	*94.5*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3671*	0	*5000*	0	*73.4*	*12-100*	0			
Surr: 2-Fluorophenol	*4343*	0	*5000*	0	*86.9*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5775*	0	*5000*	0	*116*	*25-137*	0			
Surr: Nitrobenzene-d5	*4102*	0	*5000*	0	*82*	*37-107*	0			
Surr: Phenol-d6	*4145*	0	*5000*	0	*82.9*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44511** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **12101052-03B MS** Units: **µg/Kg** Analysis Date: **11/2/2012 05:27 PM**
Client ID: **SBKR0950R506S102912S005** Run ID: **SVMS6_121102A** SeqNo: **2131130** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1551	50	1981	0	78.3	45-105	0			
Acenaphthene	1598	50	1981	0	80.7	45-110	0			
Acenaphthylene	1671	50	1981	0	84.4	45-105	0			
Anthracene	1710	50	1981	0	86.4	55-105	0			
Benzo(a)anthracene	1672	50	1981	0	84.4	50-110	0			
Benzo(a)pyrene	1684	50	1981	0	85	50-110	0			
Benzo(b)fluoranthene	1598	50	1981	0	80.6	45-115	0			
Benzo(g,h,i)perylene	1739	50	1981	0	87.8	40-125	0			
Benzo(k)fluoranthene	1858	50	1981	0	93.8	45-115	0			
Chrysene	1678	50	1981	0	84.7	55-110	0			
Dibenzo(a,h)anthracene	1979	50	1981	0	99.9	40-125	0			
Fluoranthene	1453	50	1981	0	73.4	55-115	0			
Fluorene	1657	50	1981	0	83.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1739	50	1981	0	87.8	40-120	0			
Naphthalene	1527	50	1981	0	77.1	40-105	0			
Phenanthrene	1744	50	1981	0	88	50-110	0			
Pyrene	1816	50	1981	0	91.7	45-125	0			
Surr: 2,4,6-Tribromophenol	*5159*	0	*4952*	0	*104*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*3643*	0	*4952*	0	*73.6*	*12-100*	0			
Surr: 2-Fluorophenol	*3960*	0	*4952*	0	*80*	*33-117*	0			
Surr: 4-Terphenyl-d14	*5615*	0	*4952*	0	*113*	*25-137*	0			
Surr: Nitrobenzene-d5	*3812*	0	*4952*	0	*77*	*37-107*	0			
Surr: Phenol-d6	*3898*	0	*4952*	0	*78.7*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44511** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **12101052-03B MSD** Units: **µg/Kg** Analysis Date: **11/2/2012 05:52 PM**
Client ID: **SBKR0950R506S102912S005** Run ID: **SVMS6_121102A** SeqNo: **2131131** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	1500	48	1938	0	77.4	45-105	1551	3.34	30	
Acenaphthene	1536	48	1938	0	79.2	45-110	1598	4	30	
Acenaphthylene	1584	48	1938	0	81.8	45-105	1671	5.31	30	
Anthracene	1654	48	1938	0	85.4	55-105	1710	3.35	30	
Benzo(a)anthracene	1572	48	1938	0	81.1	50-110	1672	6.17	30	
Benzo(a)pyrene	1569	48	1938	0	81	50-110	1684	7.06	30	
Benzo(b)fluoranthene	1508	48	1938	0	77.8	45-115	1598	5.78	30	
Benzo(g,h,i)perylene	1537	48	1938	0	79.3	40-125	1739	12.4	30	
Benzo(k)fluoranthene	1690	48	1938	0	87.2	45-115	1858	9.47	30	
Chrysene	1568	48	1938	0	80.9	55-110	1678	6.77	30	
Dibenzo(a,h)anthracene	1795	48	1938	0	92.6	40-125	1979	9.76	30	
Fluoranthene	1280	48	1938	0	66	55-115	1453	12.7	30	
Fluorene	1584	48	1938	0	81.8	50-110	1657	4.48	30	
Indeno(1,2,3-cd)pyrene	1537	48	1938	0	79.3	40-120	1739	12.4	30	
Naphthalene	1472	48	1938	0	76	40-105	1527	3.69	30	
Phenanthrene	1658	48	1938	0	85.6	50-110	1744	5.06	30	
Pyrene	1698	48	1938	0	87.6	45-125	1816	6.76	30	
Surr: 2,4,6-Tribromophenol	*5035*	0	*4845*	0	*104*	*34-140*	5159	*2.43*	*40*	
Surr: 2-Fluorobiphenyl	*3543*	0	*4845*	0	*73.1*	*12-100*	3643	*2.78*	*40*	
Surr: 2-Fluorophenol	*3817*	0	*4845*	0	*78.8*	*33-117*	3960	*3.67*	*40*	
Surr: 4-Terphenyl-d14	*5421*	0	*4845*	0	*112*	*25-137*	5615	*3.52*	*40*	
Surr: Nitrobenzene-d5	*3762*	0	*4845*	0	*77.6*	*37-107*	3812	*1.33*	*40*	
Surr: Phenol-d6	*3738*	0	*4845*	0	*77.2*	*40-106*	3898	*4.19*	*40*	

The following samples were analyzed in this batch:

12101052-02B	12101052-03B	12101052-04B
12101052-05B	12101052-06B	12101052-07B
12101052-08B	12101052-09B	12101052-10B
12101052-11B	12101052-12B	12101052-13B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

MBLK Sample ID: **MBLK-44535-44535** Units: **µg/Kg** Analysis Date: **11/3/2012 04:00 AM**
Client ID: Run ID: **VMS9_121102A** SeqNo: **2130870** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	30								
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,3-Trichlorobenzene	ND	30								
1,2,3-Trichloropropane	ND	30								
1,2,3-Trimethylbenzene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2,4-Trimethylbenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3,5-Trimethylbenzene	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
2-Methylnaphthalene	ND	100								
4-Methyl-2-pentanone	ND	30								
Acetone	ND	100								
Acrylonitrile	ND	100								
Benzene	ND	30								
Bromobenzene	ND	30								
Bromochloromethane	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dibromomethane	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Dichlorodifluoromethane	ND	30					
Diethyl ether	ND	30					
Diisopropyl ether	ND	30					
Ethyl tert butyl ether	ND	30					
Ethylbenzene	ND	30					
Hexachloroethane	ND	30					
Isopropylbenzene	ND	30					
m,p-Xylene	ND	60					
Methyl iodide	ND	75					
Methyl tert-butyl ether	ND	30					
Methylene chloride	ND	30					
Naphthalene	ND	100					
n-Butylbenzene	ND	30					
n-Propylbenzene	ND	30					
o-Xylene	ND	30					
p-Isopropyltoluene	ND	30					
sec-Butylbenzene	ND	30					
Styrene	ND	30					
tert-Butyl alcohol	ND	200					
tert-Butylbenzene	ND	30					
Tertiaryamylmethylether	ND	30					
Tetrachloroethene	ND	30					
Tetrahydrofuran	ND	200					
Toluene	ND	30					
trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
trans-1,4-Dichloro-2-butene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Surr: 1,2-Dichloroethane-d4	*1012*	0	*1000*	0	*101*	*70-130*	0
Surr: 4-Bromofluorobenzene	*888*	0	*1000*	0	*88.8*	*70-130*	0
Surr: Dibromofluoromethane	*990.5*	0	*1000*	0	*99*	*70-130*	0
Surr: Toluene-d8	*977.5*	0	*1000*	0	*97.8*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

LCS Sample ID: **LCS-44535-44535** Units: **µg/Kg** Analysis Date: **11/3/2012 02:43 AM**
Client ID: Run ID: **VMS9_121102A** SeqNo: **2130869** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1025	30	1000	0	102	75-125	0			
1,1,1-Trichloroethane	940	30	1000	0	94	70-135	0			
1,1,2,2-Tetrachloroethane	1006	30	1000	0	101	55-130	0			
1,1,2-Trichloroethane	952.5	30	1000	0	95.2	60-125	0			
1,1-Dichloroethane	935	30	1000	0	93.5	75-125	0			
1,1-Dichloroethene	1076	30	1000	0	108	65-135	0			
1,2,3-Trichlorobenzene	961	30	1000	0	96.1	60-135	0			
1,2,3-Trichloropropane	1022	30	1000	0	102	65-130	0			
1,2,3-Trimethylbenzene	1032	30	1000	0	103	65-135	0			
1,2,4-Trichlorobenzene	951	30	1000	0	95.1	65-130	0			
1,2,4-Trimethylbenzene	1024	30	1000	0	102	65-135	0			
1,2-Dibromo-3-chloropropane	968	30	1000	0	96.8	40-135	0			
1,2-Dibromoethane	1024	30	1000	0	102	70-125	0			
1,2-Dichlorobenzene	981.5	30	1000	0	98.2	75-120	0			
1,2-Dichloroethane	953.5	30	1000	0	95.4	70-135	0			
1,2-Dichloropropane	967.5	30	1000	0	96.8	70-120	0			
1,3,5-Trimethylbenzene	966.5	30	1000	0	96.6	65-135	0			
1,3-Dichlorobenzene	1002	30	1000	0	100	70-125	0			
1,4-Dichlorobenzene	992.5	30	1000	0	99.2	70-125	0			
2-Butanone	1036	200	1000	0	104	30-160	0			
2-Hexanone	952	30	1000	0	95.2	45-145	0			
4-Methyl-2-pentanone	989	30	1000	0	98.9	45-145	0			
Acetone	991	100	1000	0	99.1	20-160	0			
Acrylonitrile	897.5	100	1000	0	89.8	70-135	0			
Benzene	961	30	1000	0	96.1	75-125	0			
Bromobenzene	1018	30	1000	0	102	65-120	0			
Bromochloromethane	881	30	1000	0	88.1	70-125	0			
Bromodichloromethane	969.5	30	1000	0	97	70-130	0			
Bromoform	939.5	30	1000	0	94	55-135	0			
Bromomethane	1262	75	1000	0	126	30-160	0			
Carbon disulfide	1121	30	1000	0	112	45-160	0			
Carbon tetrachloride	991	30	1000	0	99.1	65-135	0			
Chlorobenzene	994.5	30	1000	0	99.4	75-125	0			
Chloroethane	954.5	100	1000	0	95.4	40-155	0			
Chloroform	858.5	30	1000	0	85.8	70-125	0			
Chloromethane	1018	100	1000	0	102	50-130	0			
cis-1,2-Dichloroethene	937	30	1000	0	93.7	65-125	0			
cis-1,3-Dichloropropene	974	30	1000	0	97.4	70-125	0			
Dibromochloromethane	900.5	30	1000	0	90	65-135	0			
Dibromomethane	1032	30	1000	0	103	75-130	0			
Dichlorodifluoromethane	849	30	1000	0	84.9	35-135	0			
Ethylbenzene	1009	30	1000	0	101	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	1080	30	1000	0	108	70-135	0
Isopropylbenzene	1058	30	1000	0	106	75-130	0
m,p-Xylene	1918	60	2000	0	95.9	80-125	0
Methyl tert-butyl ether	1000	30	1000	0	100	75-125	0
Methylene chloride	945	30	1000	0	94.5	55-145	0
Naphthalene	993.5	100	1000	0	99.4	40-140	0
n-Butylbenzene	1040	30	1000	0	104	65-140	0
n-Propylbenzene	1016	30	1000	0	102	65-135	0
o-Xylene	1048	30	1000	0	105	75-125	0
p-Isopropyltoluene	1048	30	1000	0	105	75-135	0
sec-Butylbenzene	1053	30	1000	0	105	65-130	0
Styrene	940.5	30	1000	0	94	75-125	0
tert-Butylbenzene	1046	30	1000	0	105	65-130	0
Tetrachloroethene	936.5	30	1000	0	93.6	64-140	0
Tetrahydrofuran	999.5	200	1000	0	100	70-135	0
Toluene	971.5	30	1000	0	97.2	70-125	0
trans-1,2-Dichloroethene	967.5	30	1000	0	96.8	65-135	0
trans-1,3-Dichloropropene	1046	30	1000	0	105	65-125	0
trans-1,4-Dichloro-2-butene	873.5	30	1000	0	87.4	70-135	0
Trichloroethene	938	30	1000	0	93.8	75-125	0
Trichlorofluoromethane	953.5	30	1000	0	95.4	25-185	0
Vinyl chloride	993	30	1000	0	99.3	60-125	0
Surr: 1,2-Dichloroethane-d4	*958*	0	*1000*	0	*95.8*	*70-130*	0
Surr: 4-Bromofluorobenzene	*1039*	0	*1000*	0	*104*	*70-130*	0
Surr: Dibromofluoromethane	*965.5*	0	*1000*	0	*96.6*	*70-130*	0
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

MS Sample ID: **12101051-02B MS** Units: **µg/Kg** Analysis Date: **11/3/2012 12:31 PM**
Client ID: Run ID: **VMS9_121102A** SeqNo: **2130871** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2647	85	2846	0	93	75-125	0			
1,1,1-Trichloroethane	2949	85	2846	0	104	70-135	0			
1,1,2,2-Tetrachloroethane	1980	85	2846	0	69.6	55-130	0			
1,1,2-Trichloroethane	2489	85	2846	0	87.4	60-125	0			
1,1-Dichloroethane	2811	85	2846	0	98.8	75-125	0			
1,1-Dichloroethene	2506	85	2846	0	88	65-135	0			
1,2,3-Trichlorobenzene	2263	85	2846	0	79.5	60-135	0			
1,2,3-Trichloropropane	2654	85	2846	0	93.2	65-130	0			
1,2,3-Trimethylbenzene	2626	85	2846	0	92.2	65-135	0			
1,2,4-Trichlorobenzene	2389	85	2846	0	84	65-130	0			
1,2,4-Trimethylbenzene	2628	85	2846	0	92.4	65-135	0			
1,2-Dibromo-3-chloropropane	1998	85	2846	0	70.2	40-135	0			
1,2-Dibromoethane	2677	85	2846	0	94	70-125	0			
1,2-Dichlorobenzene	2519	85	2846	0	88.5	75-120	0			
1,2-Dichloroethane	2744	85	2846	0	96.4	70-135	0			
1,2-Dichloropropane	2702	85	2846	0	95	70-120	0			
1,3,5-Trimethylbenzene	2506	85	2846	0	88	65-135	0			
1,3-Dichlorobenzene	2534	85	2846	0	89	70-125	0			
1,4-Dichlorobenzene	2498	85	2846	0	87.8	70-125	0			
2-Butanone	3257	570	2846	0	114	30-160	0			
2-Hexanone	2340	85	2846	0	82.2	45-145	0			
4-Methyl-2-pentanone	2650	85	2846	0	93.1	45-145	0			
Acetone	2833	280	2846	0	99.6	20-160	0			
Acrylonitrile	3135	280	2846	0	110	70-135	0			
Benzene	2695	85	2846	0	94.7	75-125	0			
Bromobenzene	2673	85	2846	0	93.9	65-120	0			
Bromochloromethane	3031	85	2846	0	106	70-125	0			
Bromodichloromethane	2583	85	2846	0	90.8	70-130	0			
Bromoform	2152	85	2846	0	75.6	55-135	0			
Bromomethane	1880	210	2846	0	66	30-160	0			
Carbon disulfide	2227	85	2846	0	78.2	45-160	0			
Carbon tetrachloride	2866	85	2846	0	101	65-135	0			
Chlorobenzene	2597	85	2846	0	91.2	75-125	0			
Chloroethane	758.5	280	2846	0	26.6	40-155	0			S
Chloroform	3010	85	2846	0	106	70-125	0			
Chloromethane	2348	280	2846	0	82.5	50-130	0			
cis-1,2-Dichloroethene	2708	85	2846	0	95.2	65-125	0			
cis-1,3-Dichloropropene	2493	85	2846	0	87.6	70-125	0			
Dibromochloromethane	2146	85	2846	0	75.4	65-135	0			
Dibromomethane	2904	85	2846	0	102	75-130	0			
Dichlorodifluoromethane	2122	85	2846	0	74.6	35-135	0			
Ethylbenzene	2663	85	2846	0	93.6	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	2422	85	2846	0	85.1	70-135	0
Isopropylbenzene	2751	85	2846	0	96.6	75-130	0
m,p-Xylene	5015	170	5692	0	88.1	80-125	0
Methyl tert-butyl ether	2819	85	2846	0	99	75-125	0
Methylene chloride	2823	85	2846	0	99.2	55-145	0
Naphthalene	2468	280	2846	0	86.7	40-140	0
n-Butylbenzene	2621	85	2846	0	92.1	65-140	0
n-Propylbenzene	2687	85	2846	0	94.4	65-135	0
o-Xylene	2707	85	2846	0	95.1	75-125	0
p-Isopropyltoluene	2401	85	2846	0	84.4	75-135	0
sec-Butylbenzene	2781	85	2846	0	97.7	65-130	0
Styrene	2482	85	2846	0	87.2	75-125	0
tert-Butylbenzene	2727	85	2846	0	95.8	65-130	0
Tetrachloroethene	3632	85	2846	0	128	64-140	0
Tetrahydrofuran	3596	570	2846	0	126	70-135	0
Toluene	2546	85	2846	0	89.4	70-125	0
trans-1,2-Dichloroethene	2829	85	2846	0	99.4	65-135	0
trans-1,3-Dichloropropene	2458	85	2846	0	86.4	65-125	0
trans-1,4-Dichloro-2-butene	2011	85	2846	0	70.6	70-135	0
Trichloroethene	3034	85	2846	0	107	75-125	0
Trichlorofluoromethane	2567	85	2846	0	90.2	25-185	0
Vinyl chloride	1991	85	2846	0	70	60-125	0
Surr: 1,2-Dichloroethane-d4	*2991*	0	*2846*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*2880*	0	*2846*	0	*101*	*70-130*	0
Surr: Dibromofluoromethane	*3135*	0	*2846*	0	*110*	*70-130*	0
Surr: Toluene-d8	*2771*	0	*2846*	0	*97.4*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

MSD Sample ID: **12101051-02B MSD** Units: **µg/Kg** Analysis Date: **11/3/2012 12:56 PM**
Client ID: Run ID: **VMS9_121102A** SeqNo: **2130872** Prep Date: **11/2/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	2628	85	2846	0	92.4	75-125	2647	0.701	30	
1,1,1-Trichloroethane	2681	85	2846	0	94.2	70-135	2949	9.5	30	
1,1,2,2-Tetrachloroethane	2118	85	2846	0	74.4	55-130	1980	6.74	30	
1,1,2-Trichloroethane	2614	85	2846	0	91.8	60-125	2489	4.91	30	
1,1-Dichloroethane	2714	85	2846	0	95.4	75-125	2811	3.5	30	
1,1-Dichloroethene	2846	85	2846	0	100	65-135	2506	12.7	30	
1,2,3-Trichlorobenzene	2381	85	2846	0	83.6	60-135	2263	5.09	30	
1,2,3-Trichloropropane	2651	85	2846	0	93.2	65-130	2654	0.107	30	
1,2,3-Trimethylbenzene	2708	85	2846	0	95.2	65-135	2626	3.09	30	
1,2,4-Trichlorobenzene	2398	85	2846	0	84.2	65-130	2389	0.357	30	
1,2,4-Trimethylbenzene	2661	85	2846	0	93.5	65-135	2628	1.24	30	
1,2-Dibromo-3-chloropropane	2081	85	2846	0	73.1	40-135	1998	4.05	30	
1,2-Dibromoethane	2752	85	2846	0	96.7	70-125	2677	2.78	30	
1,2-Dichlorobenzene	2600	85	2846	0	91.4	75-120	2519	3.17	30	
1,2-Dichloroethane	2711	85	2846	0	95.2	70-135	2744	1.2	30	
1,2-Dichloropropane	2717	85	2846	0	95.4	70-120	2702	0.525	30	
1,3,5-Trimethylbenzene	2475	85	2846	0	87	65-135	2506	1.26	30	
1,3-Dichlorobenzene	2567	85	2846	0	90.2	70-125	2534	1.28	30	
1,4-Dichlorobenzene	2591	85	2846	0	91	70-125	2498	3.69	30	
2-Butanone	3432	570	2846	0	121	30-160	3257	5.23	30	
2-Hexanone	2448	85	2846	0	86	45-145	2340	4.52	30	
4-Methyl-2-pentanone	2674	85	2846	0	94	45-145	2650	0.909	30	
Acetone	4291	280	2846	0	151	20-160	2833	40.9	30	R
Acrylonitrile	3206	280	2846	0	113	70-135	3135	2.24	30	
Benzene	2671	85	2846	0	93.8	75-125	2695	0.902	30	
Bromobenzene	2667	85	2846	0	93.7	65-120	2673	0.213	30	
Bromochloromethane	2896	85	2846	0	102	70-125	3031	4.56	30	
Bromodichloromethane	2505	85	2846	0	88	70-130	2583	3.08	30	
Bromoform	2229	85	2846	0	78.3	55-135	2152	3.51	30	
Bromomethane	2052	210	2846	0	72.1	30-160	1880	8.76	30	
Carbon disulfide	3016	85	2846	0	106	45-160	2227	30.1	30	R
Carbon tetrachloride	2674	85	2846	0	94	65-135	2866	6.94	30	
Chlorobenzene	2641	85	2846	0	92.8	75-125	2597	1.68	30	
Chloroethane	833.9	280	2846	0	29.3	40-155	758.5	9.47	30	S
Chloroform	2900	85	2846	0	102	70-125	3010	3.71	30	
Chloromethane	2597	280	2846	0	91.2	50-130	2348	10.1	30	
cis-1,2-Dichloroethene	2784	85	2846	0	97.8	65-125	2708	2.75	30	
cis-1,3-Dichloropropene	2529	85	2846	0	88.8	70-125	2493	1.42	30	
Dibromochloromethane	2231	85	2846	0	78.4	65-135	2146	3.9	30	
Dibromomethane	2934	85	2846	0	103	75-130	2904	1.02	30	
Dichlorodifluoromethane	2368	85	2846	0	83.2	35-135	2122	11	30	
Ethylbenzene	2673	85	2846	0	93.9	75-125	2663	0.373	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44535** Instrument ID **VMS9** Method: **SW8260**

Hexachloroethane	2532	85	2846	0	89	70-135	2422	4.42	30	
Isopropylbenzene	2806	85	2846	0	98.6	75-130	2751	2	30	
m,p-Xylene	5056	170	5692	0	88.8	80-125	5015	0.82	30	
Methyl tert-butyl ether	2973	85	2846	0	104	75-125	2819	5.31	30	
Methylene chloride	3108	85	2846	0	109	55-145	2823	9.6	30	
Naphthalene	2429	280	2846	0	85.4	40-140	2468	1.57	30	
n-Butylbenzene	2643	85	2846	0	92.8	65-140	2621	0.811	30	
n-Propylbenzene	2646	85	2846	0	93	65-135	2687	1.55	30	
o-Xylene	2732	85	2846	0	96	75-125	2707	0.942	30	
p-Isopropyltoluene	2515	85	2846	0	88.4	75-135	2401	4.63	30	
sec-Butylbenzene	2809	85	2846	0	98.7	65-130	2781	1.02	30	
Styrene	2503	85	2846	0	88	75-125	2482	0.856	30	
tert-Butylbenzene	2718	85	2846	0	95.5	65-130	2727	0.314	30	
Tetrachloroethene	3502	85	2846	0	123	64-140	3632	3.63	30	
Tetrahydrofuran	3339	570	2846	0	117	70-135	3596	7.43	30	
Toluene	2580	85	2846	0	90.6	70-125	2546	1.33	30	
trans-1,2-Dichloroethene	2877	85	2846	0	101	65-135	2829	1.7	30	
trans-1,3-Dichloropropene	2603	85	2846	0	91.4	65-125	2458	5.74	30	
trans-1,4-Dichloro-2-butene	1877	85	2846	0	66	70-135	2011	6.88	30	S
Trichloroethene	2877	85	2846	0	101	75-125	3034	5.3	30	
Trichlorofluoromethane	2868	85	2846	0	101	25-185	2567	11.1	30	
Vinyl chloride	2209	85	2846	0	77.6	60-125	1991	10.4	30	
Surr: 1,2-Dichloroethane-d4	*2869*	0	*2846*	0	*101*	*70-130*	2991	*4.18*	*30*	
Surr: 4-Bromofluorobenzene	*2929*	0	*2846*	0	*103*	*70-130*	2880	*1.67*	*30*	
Surr: Dibromofluoromethane	*2677*	0	*2846*	0	*94*	*70-130*	3135	*15.8*	*30*	
Surr: Toluene-d8	*2818*	0	*2846*	0	*99*	*70-130*	2771	*1.68*	*30*	

The following samples were analyzed in this batch:

12101052-01A	12101052-02A	12101052-03A
12101052-04A	12101052-05A	12101052-06A
12101052-07A	12101052-08A	12101052-09A
12101052-10A	12101052-11A	12101052-12A
12101052-13A	12101052-14A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AECOM Environment
Work Order: 12101052
Project: Marshall KRRI 0950-0975R,0975I 10/29/12

QC BATCH REPORT

Batch ID: **R112046** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R112046** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129936** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R112046** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129932** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **12101051-02A DUP1** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129913** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	50.47	0.050	0	0	0	0-0	48.3	4.39	20	

DUP Sample ID: **12101051-02A DUP2** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: Run ID: **MOIST_121101B** SeqNo: **2129914** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	48.07	0.050	0	0	0	0-0	48.3	0.477	20	

DUP Sample ID: **12101052-13B DUP** Units: **% of sample** Analysis Date: **11/1/2012 01:00 PM**
Client ID: **SBKR0975R506D102912S005** Run ID: **MOIST_121101B** SeqNo: **2129930** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	66.65	0.050	0	0	0	0-0	65.69	1.45	20	

The following samples were analyzed in this batch:

12101052-01B	12101052-02B	12101052-03B
12101052-04B	12101052-05B	12101052-06B
12101052-07B	12101052-08B	12101052-09B
12101052-10B	12101052-11B	12101052-12B
12101052-13B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

12101052

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

Page: 1 of 1
Cooler # of

COC #	ENBRIDGE_102912_GMK1	Task: KRRI_0950-0975
	Total # of Samples: 14	Event Complete?

Lab Information:		Project Information:		Other Information:			
Lab Name:	ALS Laboratory Group	Site ID #:		Send Invoice to:	Enbridge Energy - ATTN Accounts Payable		
Address:	3352 128th Ave. Holland, MI 49424-9263	Project #	60162778	Address:	1100 Louisiana Suite 1100		
		Site Address	5555 Glenwood Parkway SE Suite 200	City/State	Houson, TX	Phone #:	713-821-2000
Lab PM:	Ann Preston	City	Grand Rapids	State, Zip	MI	PO #	
Phone/Fax:	1-616-399-6070/1-616-399-6185	Site PM Name	Bryan Stiemsma	Send EDD to			
Lab PM email	ann.preston@alsglobal.com	Phone/Fax:	[redacted]	CC Hardcopy report			
Applicable Lab Quote #:		Site PM Email:	Bryan.Stiemsma@aecom.com	CC Hardcopy report			

Turn Around Time	5 Day	Rush	No

BILLING CODE: 6.00

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE DATE	#OF CONTAINERS	Comments/Lab Sample I.D.	Preservative	None	None	None	None	MeOH										
								Analysis	% Moisture	Be,Mo,V,Ni by 6020	ORO,DRO	PNAs by 8270	VOC by 5035/8260										
1	SBKR0950R504S102912S008	SBKR0950R504	SO	G	10/29/2012 10:45	3			X	X	X	X	X										
2	SBKR0950R505S102912S005	SBKR0950R505	SO	G	10/29/2012 11:12	3			X	X	X	X	X										
3	SBKR0950R506S102912S005	SBKR0950R506	SO	G	10/29/2012 11:45	3			X	X	X	X	X										
4	SBKR0975I501S102912S003	SBKR0975I501	SO	G	10/29/2012 13:50	3			X	X	X	X	X										
5	SBKR0975I501S102912S010	SBKR0975I501	SO	G	10/29/2012 13:55	3			X	X	X	X	X										
6	SBKR0975I502S102912S004	SBKR0975I502	SO	G	10/29/2012 14:50	3			X	X	X	X	X										
7	SBKR0975I502S102912S013	SBKR0975I502	SO	G	10/29/2012 14:55	3			X	X	X	X	X										
8	SBKR0975R503S102912S005	SBKR0975R503	SO	G	10/29/2012 08:57	3			X	X	X	X	X										
9	SBKR0975R503D102912S005	SBKR0975R503	SO	G	10/29/2012 08:57	3	DUPLICATE		X	X	X	X	X										
10	SBKR0975R504S102912S006	SBKR0975R504	SO	G	10/29/2012 09:46	3			X	X	X	X	X										
11	SBKR0975R505S102912S007	SBKR0975R505	SO	G	10/29/2012 15:32	3			X	X	X	X	X										
12	SBKR0975R506S102912S005	SBKR0975R506	SO	G	10/29/2012 16:16	3			X	X	X	X	X										
13	SBKR0975R506D102912S005	SBKR0975R506	SO	G	10/29/2012 16:16	3	DUPLICATE		X	X	X	X	X										
14	SBKR0975R506T102912MX	SBKR0975R506	SQ	G	10/29/2012 00:00	1	TRIP BLANK						X										

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	10.31.12	1245		10.31.12	1245
	10/31/12	1245		10/31/12	1245

Sample Receipt Conditions

Temp in 0C	Samples on Ice?	Sample Intact?	Trip Blank?
3.0 C	(Y)/N	(Y)/N	(Y)/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING INFO:
Company:
Tracking #:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: GERRY KRAMER (GMK1)
SIGNATURE of SAMPLER:
DATE Signed
Time:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **AECOM - GR** Date/Time Received: **31-Oct-12 12:45**

Work Order: **12101052** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 31-Oct-12 (Date) Reviewed by: Alex Csaszar (eSignature) 01-Nov-12 (Date)

Matrices: Soil
Carrier name: ALSHN

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/31/2012 3:49:52 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

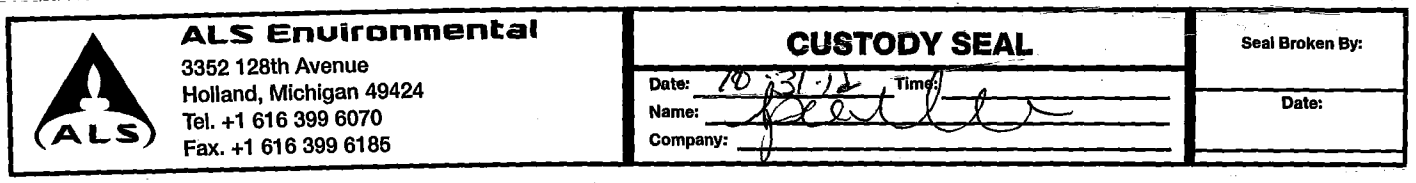
Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL

Date: 10-31-12 Time:
Name:
Company:

Seal Broken By:

Date:

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix D

Work Plans Approved in November 2012

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

Approved

Enbridge Line 6B MP 608

Marshall, MI Pipeline Release

2012 Morrow Lake Delta and Morrow Lake Monitoring and Management Work Plan

Prepared for the United States Environmental Protection Agency

Enbridge Energy, Limited Partnership

Originally Submitted: August 28, 2012

Approved: November 15, 2012

Approved

1.0 INTRODUCTION 1

1.1 Regulatory Framework 1

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FIGURES

Figure 1 2012 Morrow Lake Delta and Morrow Lake Poling Locations and E 4.0 Containment System

Figure 2 2012 Spring Submerged Oil Reassessment Flow Chart

Figure 3 E 4.0 Boom and Curtain Bathymetry September 2012

ATTACHMENT

Attachment A E 4.0 Curtain Monitoring Log

Approved

LIST OF ACRONYMS

CWA	Clean Water Act
Enbridge	Enbridge Energy, Limited Partnership
GPS	Global Positioning System
Line 6B	The pipeline owned by Enbridge Energy, Limited Partnership that runs just south of Marshall, Michigan
MP	Mile Post
U.S. EPA	United States Environmental Protection Agency

Approved

1.0 INTRODUCTION

This work plan has been developed upon written request on August 8, 2012 by the United States Environmental Protection Agency (U.S. EPA). The plan contains elements presented in the *Addendum to the Response Plan for Downstream Impacted Areas, August 2, 2010 (Revised August 17, 2010 per U.S. EPA August 17, 2010 letter), Supplement to Source Area Response Plan, and Supplement to Response Plan for Downstream Impacted Areas, Referred to as Operations and Maintenance Work Plan Commonly referred to as "Consolidated Work Plan from Fall 2011 through Fall 2012"* approved by the U.S. EPA on December 21, 2011 (Enbridge, 2011) for the Enbridge Energy, Limited Partnership (Enbridge) Line 6B Mile Post (MP) 608 oil release which occurred near Marshall, Michigan on July 26, 2010.

1.1 Regulatory Framework

As required by the U.S. EPA Removal Administrative Order Under Section 311(c) of the Clean Water Act (CWA), issued on July 27, 2010 to Enbridge Energy Partners, L.P., Docket Number: CWA 1321-5-10-001, all oil assessment, containment, and recovery activities will be performed in accordance with Section 311(c) of the CWA, 33 U.S.C. § 1321(c), as amended by the Oil Pollution Act of 1990 and 33 U.S.C. §2701 et seq. Paragraph 18 of the Removal Administrative Order and Paragraph 6 of the Supplement require, among other things, that Enbridge perform the following actions in response to the Line 6B release:

- Assess all oil-impacted areas and media,
- Contain all oil,
- Remediate/recover all submerged oil,
- Recover all oil sheen,
- Remediate all oil-containing soils,
- Remediate all oil-containing sediments, and
- Perform operations and maintenance activities as directed by the U.S. EPA.

In addition to the requirements cited above, all activities will be performed in accordance with all federal, state, and local regulations. This Morrow Lake Delta and Morrow Lake Monitoring and Management Plan does not address recovery of accumulated submerged oil. Submerged oil recovery will be addressed separately.

1.2 Purpose and Objective

The activities in this work plan are designed around monitoring and managing the further movement of submerged oil into and within Morrow Lake Delta and Morrow Lake related to the Line 6B release. The objectives of the work plan are to conduct ongoing monitoring of submerged oil movement into and within Morrow Lake and to routinely evaluate the effectiveness of the E 4.0 Containment System in mitigating further submerged oil migration into Morrow Lake. Activities and monitoring tasks described herein will be performed within Morrow Lake Delta and Morrow Lake.

2.0 2012 MORROW LAKE DELTA AND MORROW LAKE MONITORING

2.1 2012 Poling Activities

Enbridge will conduct poling activities as part of the scope of work in Morrow Lake Delta and Morrow Lake, or as directed by the U.S. EPA, at the fixed locations shown in *Figure 1*. Monitoring frequency will be once per month or after event driven river flow rates exceed 800 cubic feet per second at the Battle Creek gaging station (Station ID:04105500). The results of poling activities within Morrow Lake Delta and Morrow Lake will be used to assess the effectiveness of E 4.0 Containment System and the potential migration and distribution of additional submerged oil from Morrow Lake Delta into Morrow Lake.

2.1.1 Procedures

Poling will be performed using procedures developed and utilized during the 2012 Spring Submerged Oil Reassessment. The following poling data will be collected in accordance with the *Sediment Poling Standard Operating Procedure* submitted to U.S. EPA on May 11, 2012 (Enbridge, 2012):

- Measure water depth,
- Measure sediment, just above sediment, and surface water temperatures,
- Measure the soft sediment depth (first and second push techniques),
- Determine bed characteristics,
- Determine the presence/absence of submerged oil, and
- Collect global positioning system (GPS) coordinates.

A determination of the relative amount of submerged oil at each poling location will be made by using a pole with an 8-inch diameter disk to agitate the soft sediment. After agitation, the amount of oil/sheen observed at the water surface will be characterized using the 2012 Spring Submerged

Oil Reassessment Flow Chart shown in *Figure 2*. If "moderate" or "heavy" indications of submerged oil are observed, the area may be delineated with additional poling.

A GPS unit will be used to document the coordinates for each poling location using a differential GPS unit with sub-meter accuracy. The horizontal coordinate system will be the Michigan State Plane Coordinate System, South zone, referenced to the North American Datum 83, in international feet. The objectives of this plan are to conduct ongoing and routine monitoring for submerged oil migration and effectiveness of the E4.0 Containment System. The 60 degree Fahrenheit minimum water and sediment temperature requirement for submerged oil reassessment activities will not be required for the poling activities conducted under this plan. While water and sediment temperatures will continue to be collected during poling activities conducted pursuant to this plan, the poling data will be utilized strictly as an ongoing monitoring tool and will not be considered reassessment data.

2.2 E 4.0 Containment System

The E 4.0 Containment System consists of six segments (Locations A through F) in a gate style surface containment boom along with X-TEX curtain extending from the surface boom to the bottom of the water column leaving 50% of the water column open to flow. The gate style boom allows for navigation around the boom between Morrow Lake Delta and Morrow Lake. The intended purpose of the E 4.0 Containment System is to reduce downstream migration of potential submerged and floating crude oil. The location of the E 4.0 Containment System is presented in *Figure 1*. Enbridge has secured a Michigan Department of Environmental Quality Permit (# 12-39-0027-P) for the containment system.

2.2.1 E 4.0 Containment System Monitoring

The following monitoring activities will be performed on a monthly basis to monitor the effectiveness of the E 4.0 Containment System:

- Poling, and
- Turbidity measurements.

Poling data and turbidity measurements will be collected in Morrow Lake Delta along the E 4.0 Containment System where sediment curtain is present. Poling will be performed approximately 5 feet upstream of the sediment curtain and 10 to 20 feet downstream of the sediment curtain at approximate intervals of 25 feet between locations. Turbidity measurements will be collected

approximately 50 feet upstream of the sediment curtain and 75 feet downstream of the sediment curtain at approximate intervals of every 25 to 50 feet.

Bathymetry measurements will also be collected along the E4.0 Containment System where sediment curtain is still installed. The measurements will be collected at predetermined locations that are shown in *Figure 3*. Bathymetry measurements will be collected along transects parallel to flow, at four locations on the upstream side and four locations on the downstream side of the E 4.0 Containment System half curtains. The predetermined locations are collected at 5-foot intervals and spaced approximately 50 feet between locations along the boom with attached half curtain and collected as follows:

- A Total Station device (i.e., Trimble S6 Robotic Total Station, 1 arc second Robotic Total Station, or equivalent) with 2 millimeter accuracy will be used to collect sediment bed elevations at the predetermined locations.
- A profile will be generated for each transect using the total station data collected.

The following monitoring activities will be performed on a daily basis to maintain the E 4.0 Containment System:

- Measure and maintain the boom and curtain,
- Measure water depth,
- Monitor the inclination of the anchor system,
- Monitor the flow rates from United States Geological Survey Battle Creek gaging station 04105500, and
- Video the sediment curtain and mud-line.

Monitoring and maintenance activities will be recorded on daily data log sheets which is included as *Attachment A*. Enbridge will thoroughly evaluate, present, and discuss E 4.0 Containment System daily monitoring results with the U.S. EPA at least weekly, and more frequently if changed conditions warrant more frequent evaluation/presentation of results.

Prior to making any changes, including but not limited to configuration to the E4.0 Containment System, Enbridge will submit proposed changes to the U.S. EPA. Further, Enbridge shall not make any changes to the E4.0 Containment System without the prior approval from the U.S. EPA. Decommissioning of and/or recovery/removal of accumulated sediment from the E4.0 Containment

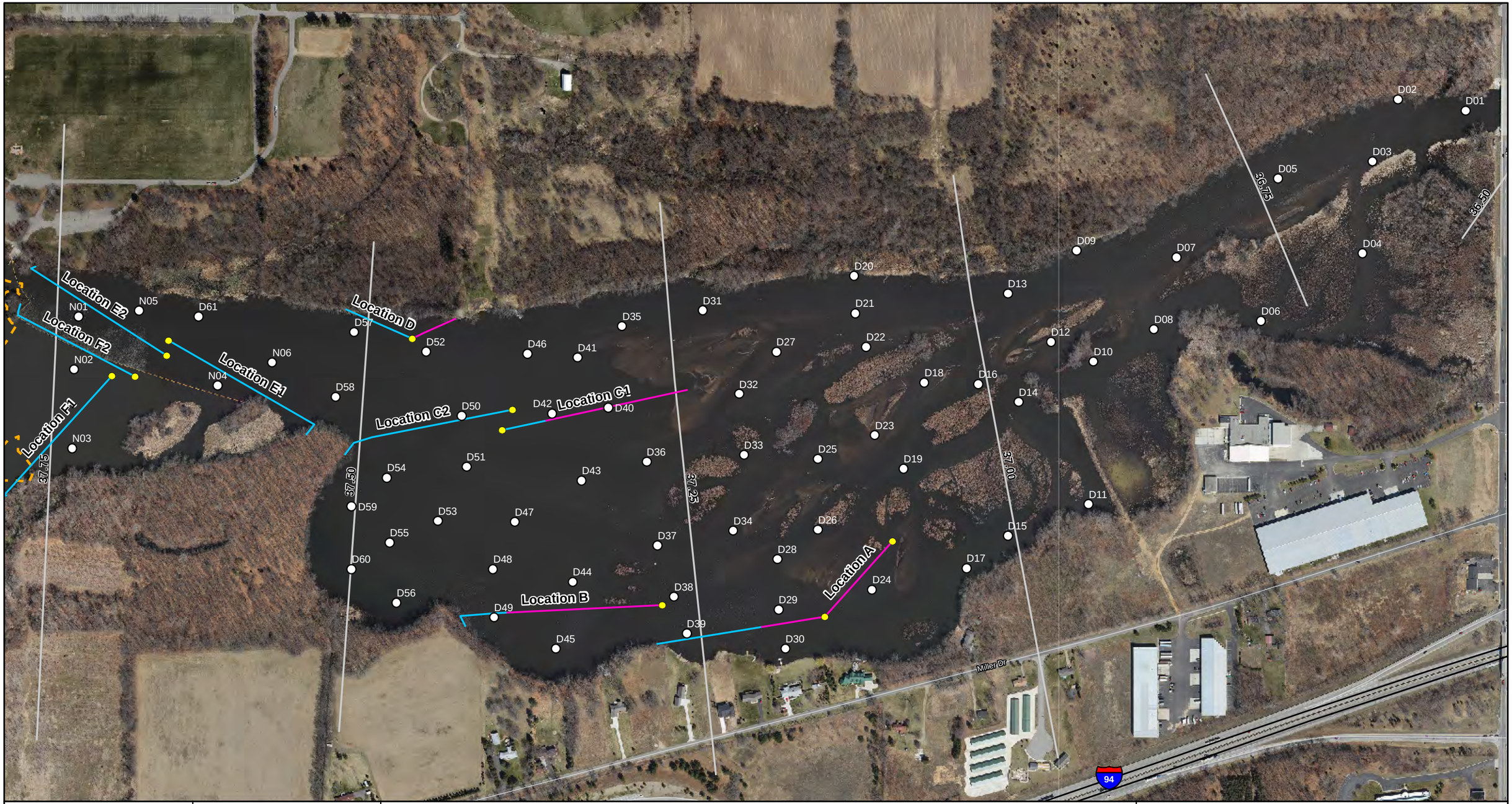
System will be proposed by Enbridge in separate work plan(s), and will not be performed until approved by the U.S. EPA.

3.0 REFERENCES

Enbridge, 2011. Enbridge Line 6B Pipeline Release, Marshall, Michigan*; Addendum to the Response Plan for Downstream Impacted Areas, August 2, 2010 (Revised August 17, 2010 per U.S. EPA August 17, 2010 letter), Supplement to Source Area Response Plan, and Supplement to Response Plan for Downstream Impacted Areas, Referred to as Operations and Maintenance Work Plan commonly referred to as Consolidated Work Plan from Fall 2011 through Fall 2012*. December 21, 2011.

Enbridge, 2012. Enbridge Line 6B Pipeline Release, Marshall, Michigan; *Sediment Poling Standard Operating Procedure.* May 11, 2012

Figures



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Approved:	EE	8/28/2012
Project #:	60246209	

Map Location



Legend

- Poling Monitoring Location
  - D - Morrow Lake Delta
  - M - Morrow Lake
  - N - Morrow Lake Neck
- **E 4.0 Containment System**
  - X-TEX Sediment Curtain
  - No Curtain
  - Anchor Point
- Approximate Sediment Fan Area
- Quarter Mile Grid Segment

N

0 200 400 800

Scale in Feet

FIGURE 1
2012 MORROW LAKE DELTA AND MORROW LAKE
POLING LOCATIONS AND E 4.0 CONTAINMENT SYSTEM
SHEET 1 OF 2

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: 10 April 2011



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Drawn:	NS	8/28/2012
Approved:	EE	8/28/2012
Project #:	60246209	

Map Location



Legend

- Poling Monitoring Location
  - D - Morrow Lake Delta
  - M - Morrow Lake
  - N - Morrow Lake Neck
- **E 4.0 Containment System**
  - X-TEX Sediment Curtain
  - No Curtain
  - Anchor Point
- Approximate Sediment Fan Area
- Quarter Mile Grid Segment

N

0 350 700 1,400

Scale in Feet

FIGURE 1
2012 MORROW LAKE DELTA AND MORROW LAKE
POLING LOCATIONS AND E 4.0 CONTAINMENT SYSTEM
SHEET 2 OF 2

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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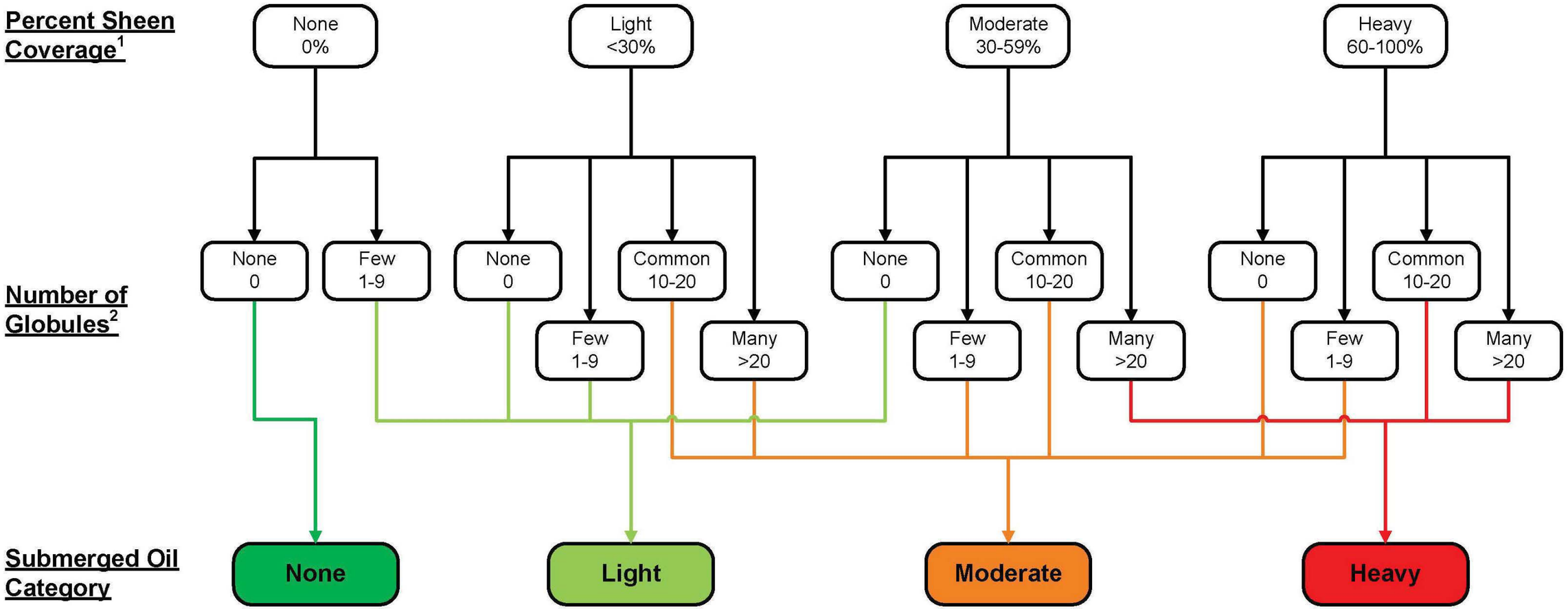
Aerial Photography Date: April 2011

Submerged Oil Field Observation Flowchart



Notes:
1. Percent coverage per square yard
2. Number of globules per square yard

ENBRIDGE	1. Percent sheen coverage per square yard. 2. Number of globules per square yard. 3. Globules are balls of oil larger than 4 millimeters. Flecks are particles of oil less than 4 millimeters. 20 flecks are equal to 1 globule. % = Percent
Drawn: CM 4/26/2012 Approved: DBR 4/26/2012 Project #: 106-4186	FiGURE 2 2012 SPRING SUBMERGED OIL REASSESSMENT FLOW CHART ENBRIDGE LINE 6B MP 608 MARSHALL, MI PIPELINE RELEASE ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Boom E2
Boom F2
Boom E1
Boom F1
Boom D
Boom C2
Boom C1
Boom B
Boom A
37.75
37.50
37.25

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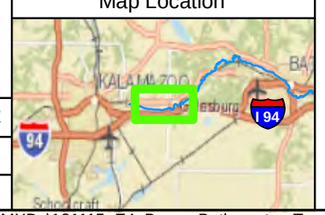
Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 125 250 500

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY OVERVIEW
SHEET 1 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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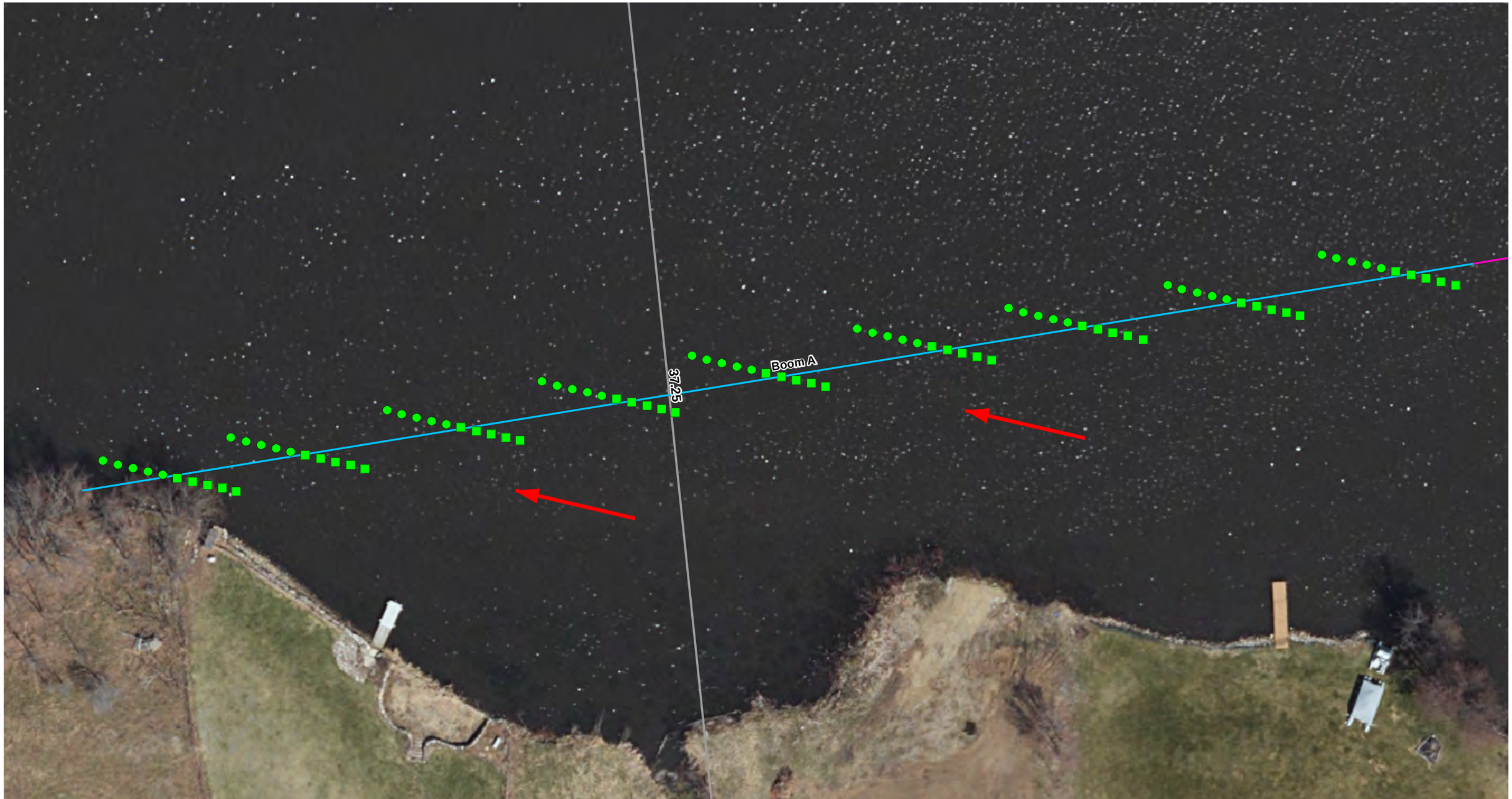

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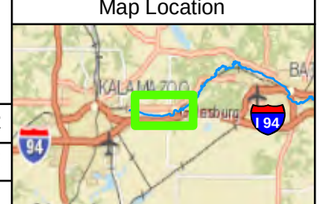
Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM A
SHEET 2 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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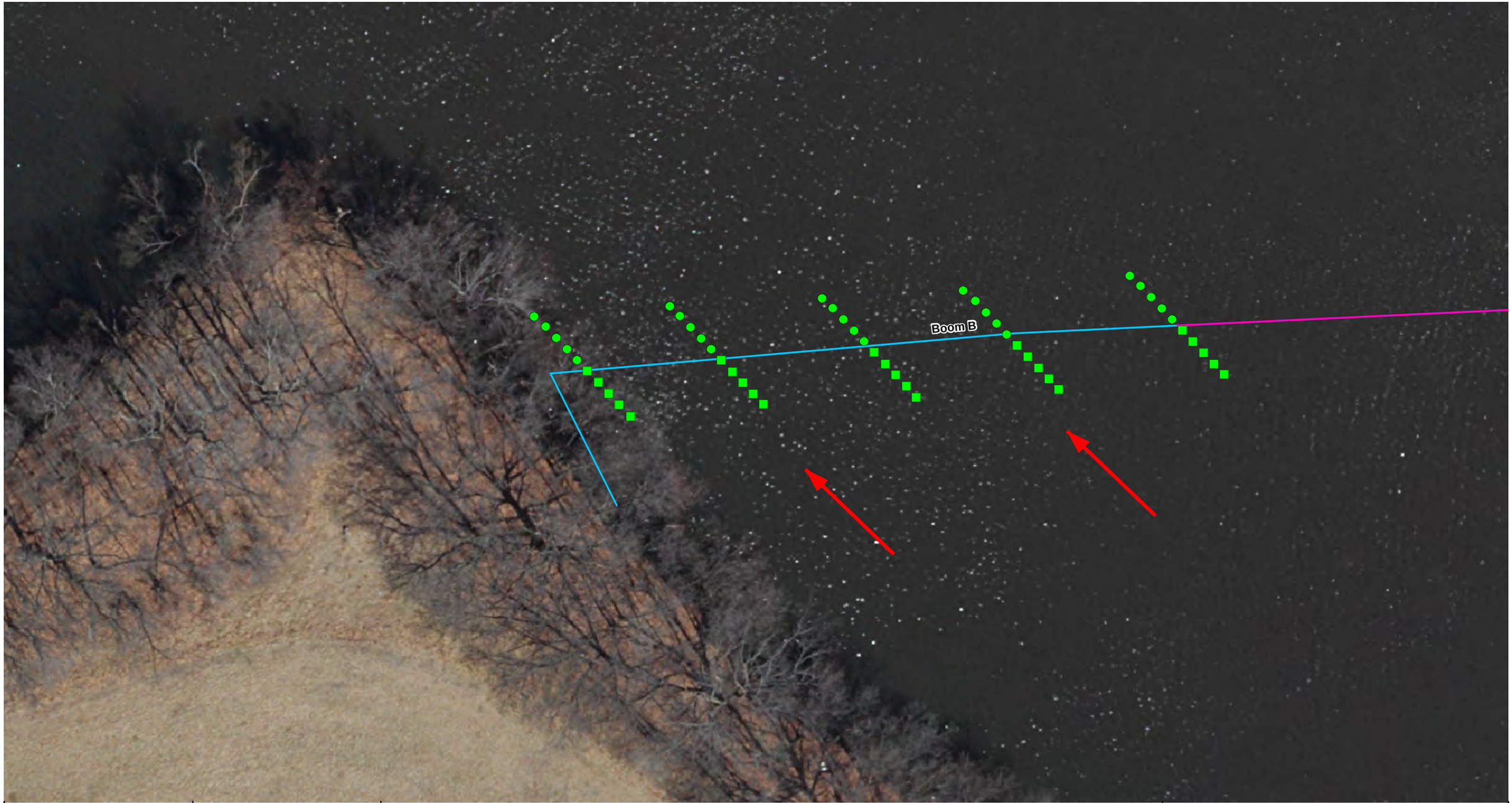

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Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM B
SHEET 3 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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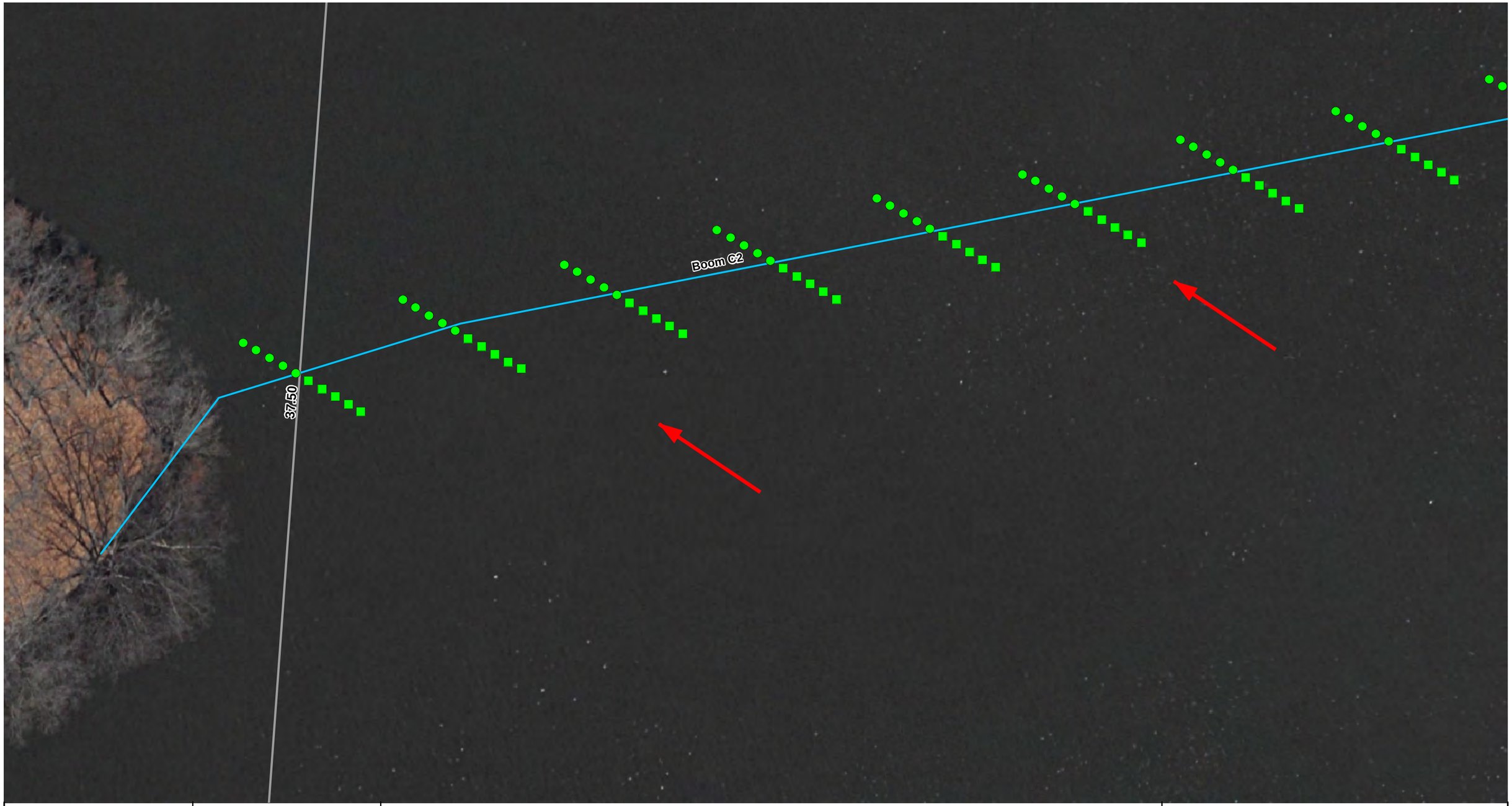

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Project #:	60246209	

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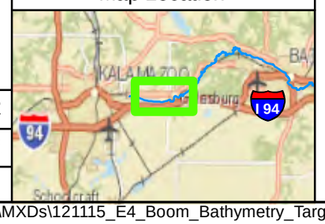

Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM C2
SHEET 4 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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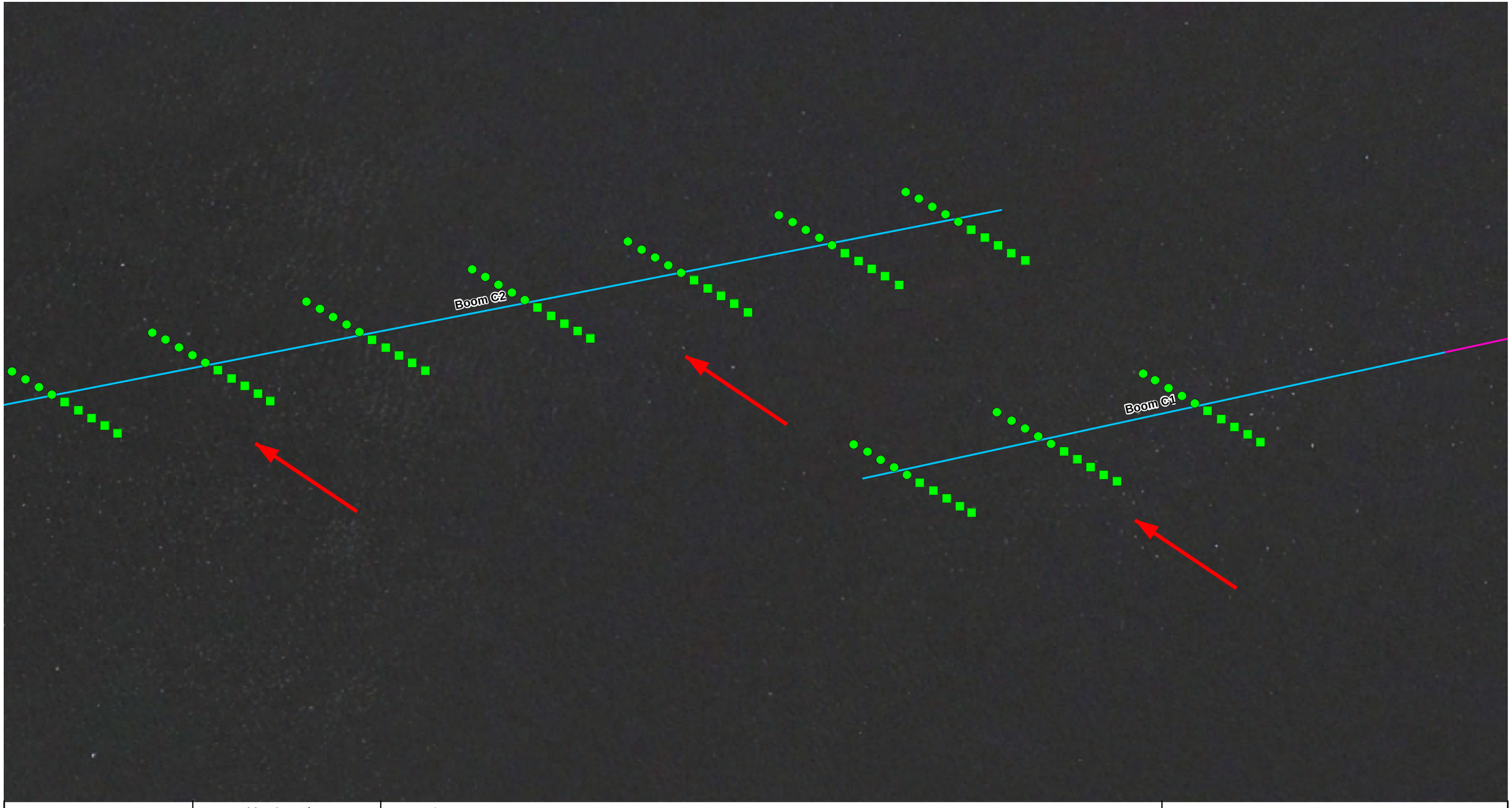

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Project #:	60246209	

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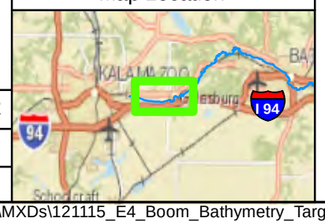

Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM C2/C1
SHEET 5 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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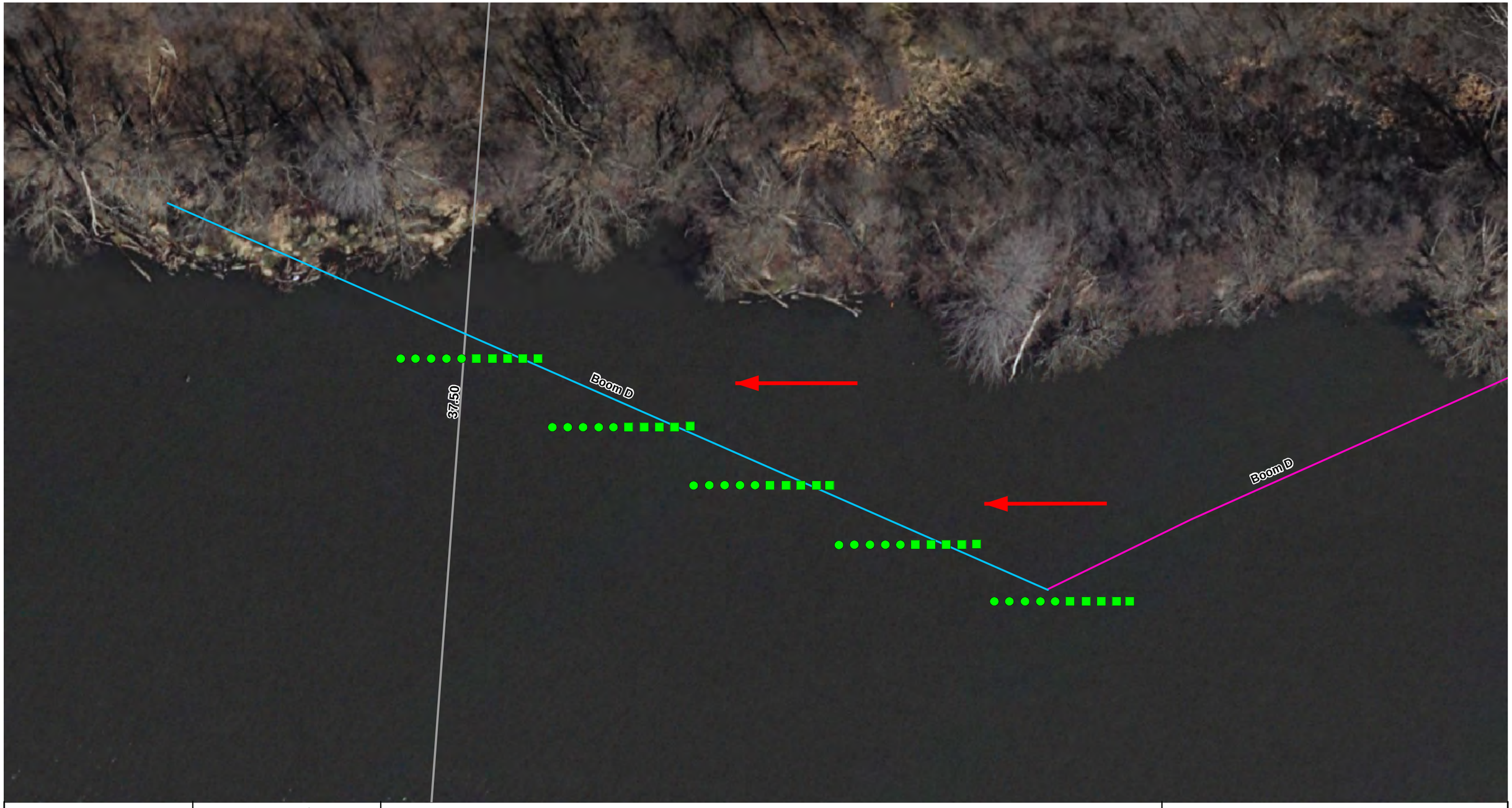

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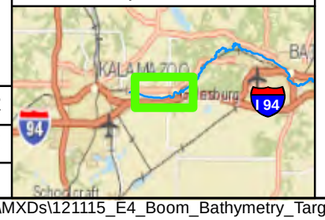

Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM D
SHEET 6 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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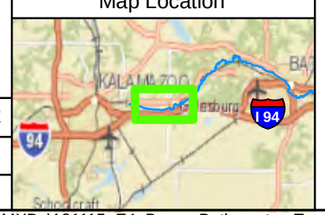
Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM E1
SHEET 7 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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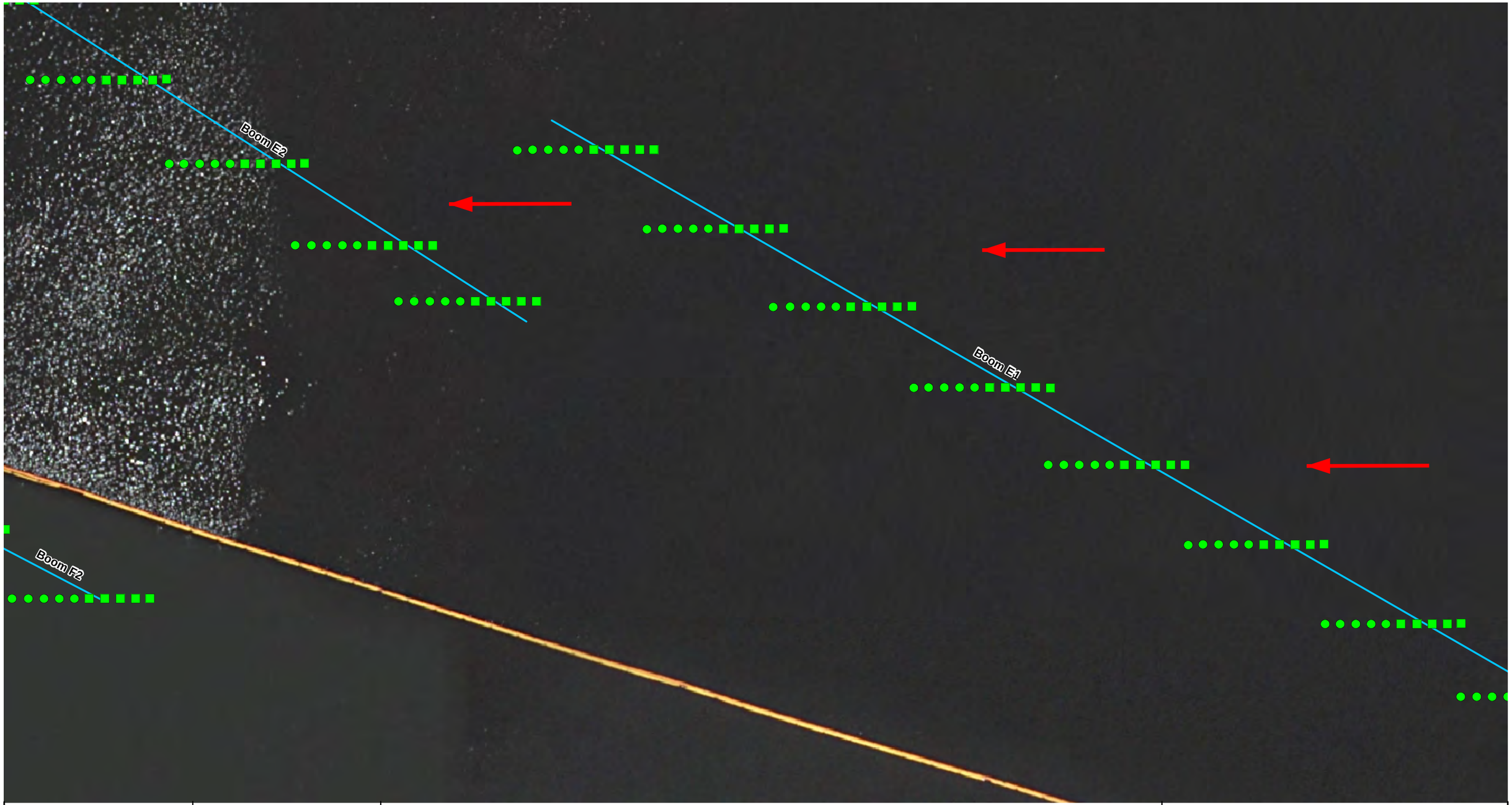

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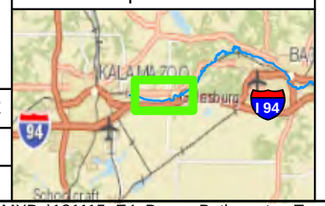

Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM E1/E2
SHEET 8 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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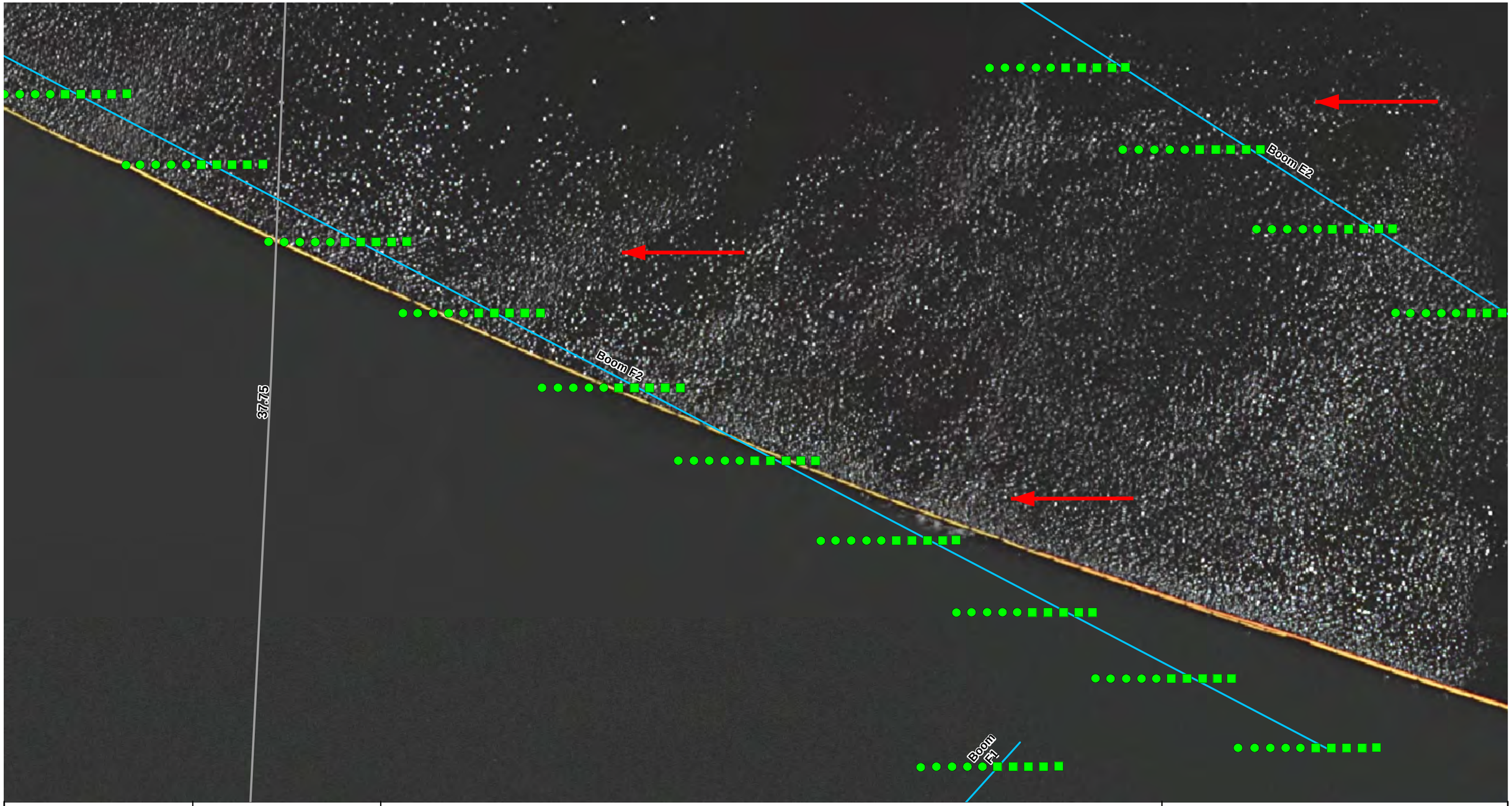

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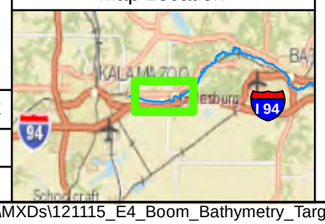
Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM E2/F2
SHEET 9 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



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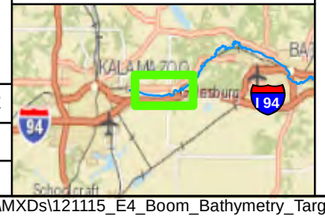
Approved:	EE	11/15/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM E2/F2
SHEET 10 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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Aerial Photography Date: April 2011



ENBRIDGE

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Approved:	EE	11/15/2012
Project #:	60246209	

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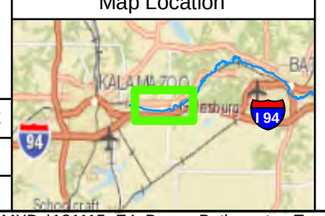

Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM F1
SHEET 11 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

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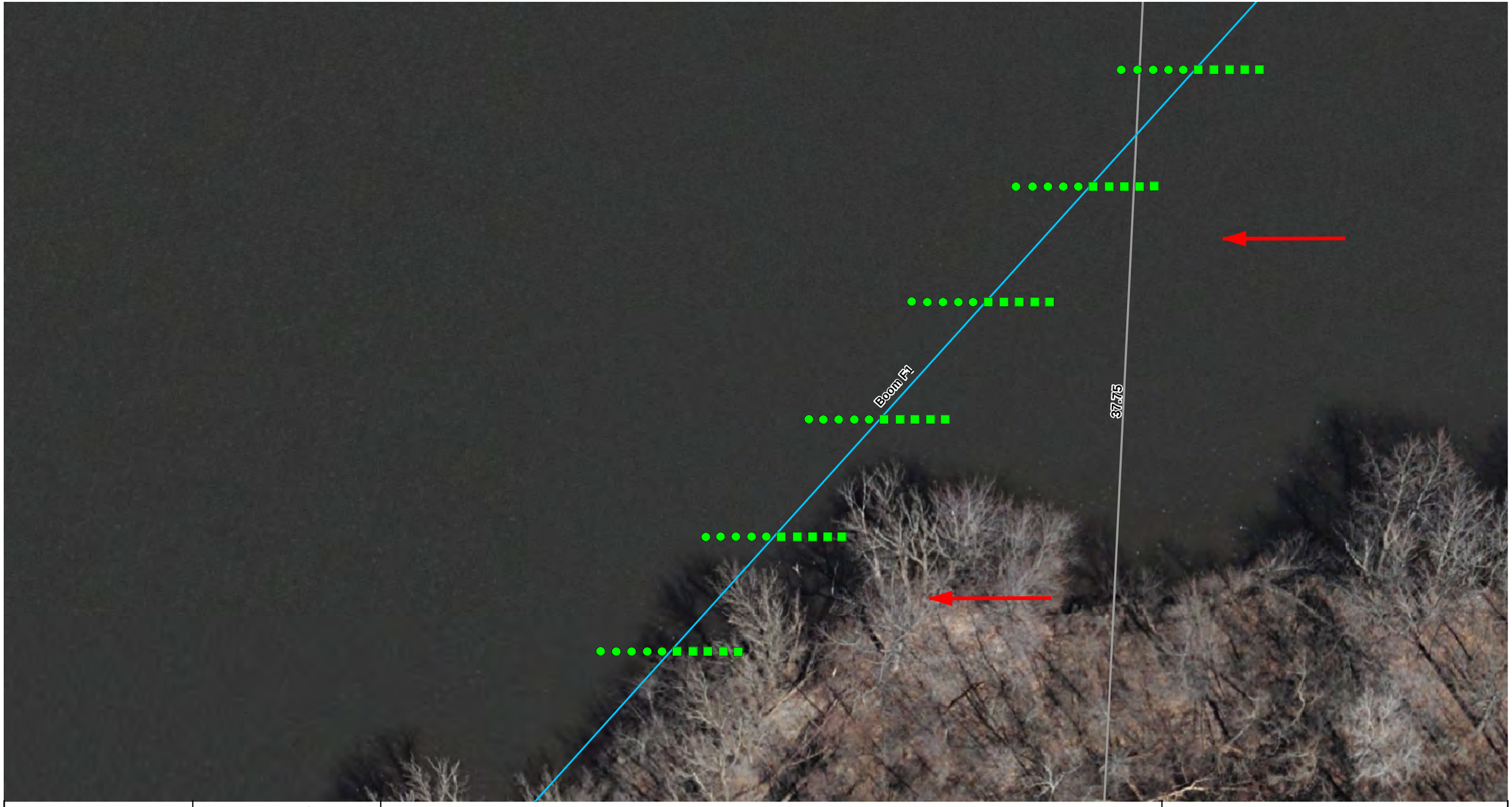
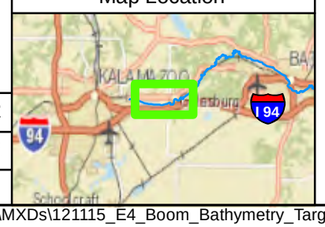
Aerial Photography Date: April 2011



Drawn:	NS	11/15/2012
Approved:	EE	11/15/2012
Project #:	60246209	

Map Location



Legend

Bathymetry Target Point
- Downstream
- Upstream

E 4.0 Containment Curtain
- X-TEX Sediment Curtain
- No Curtain

- Quarter Mile Grid Segments
- Approximate Flow Direction

N

0 15 30 60

Scale in Feet

FIGURE 3
E 4.0 BOOM AND CURTAIN BATHYMETRY
BOOM F1
SHEET 12 OF 12

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\2012_SO_Reassessment\MXDs\121115_E4_Boom_Bathymetry_Target_Transects_Sheets2-12.mxd

Aerial Photography Date: April 2011

Attachment A

E 4.0 Curtain Monitoring Log

E 4.0 Curtain Monitoring Date: _____

Location ID	Time of Inspection & Video	Video Taken (Y/N)	Video File ID	Curtain on Bottom	Anchor Inclination	Total Water Depth	Total Curtain Height	Comments

Approved

Enbridge Line 6B MP 608
Marshall, MI Pipeline Release

Monitoring Well Abandonment – SOP EN-407

Prepared for Michigan Department of Environmental Quality

Enbridge Energy, Limited Partnership

Originally Submitted: September 13, 2012

Approved: November 20, 2012

Approved

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ATTACHMENT

Attachment A ASTM International Method D 5299-99(2005)

Attachment B Monitoring Well Abandonment Log and Monitoring Well Abandonment Record

Approved

LIST OF ACRONYMS

ASTM	American Society for Testing and Materials International
Enbridge	Enbridge Energy, Limited Partnership
HASP	Health and Safety Plan
HSA	Hollow-Stem Auger
IDW	Investigative Derived Waste
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure

Approved

1.0 SCOPE & METHOD SUMMARY

This Standard Operating Procedure (SOP) describes the basic techniques and general considerations to be followed when abandoning (also known as decommissioning) groundwater monitoring wells. Monitoring wells no longer required for the gathering of groundwater information will be permanently abandoned.

Monitoring well abandonment, unless specified otherwise in promulgated state or federal rules and regulations or approved site work plans, generally involves:

- Removal of dedicated sampling and/or groundwater monitoring equipment from the well,
- Removal of monitoring well materials used to construct the well from the borehole, and
- Backfilling of the borehole to prevent migration of potential constituents of concern to the water table or between aquifers.

This SOP is applicable to the abandonment of single monitoring wells within a borehole, nested monitoring wells, multilevel monitoring wells, piezometers, or other special well designs. For further guidance in situations outside the scope of this SOP, refer to the *Standard Guide for Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities* (*ASTM International* (ASTM) *Method D 5299-99(2005)*) (*Attachment A*).

It is expected that the procedures outlined in this SOP will be followed. Procedural modifications may be warranted depending on field conditions, equipment limitations, or limitations imposed by the procedure. Any substantive modification to this SOP will be performed after consultation with the MDEQ. Modifications will be noted in task-specific work plans or on *Field Modification Forms* as appropriate and will be approved in advance by the Task Manager (or other appropriate personnel). Deviations and the reason for deviation from the SOP will be documented in the project records and in subsequent reports.

2.0 PERSONNEL QUALIFICATIONS

Monitoring well abandonment requires a moderate degree of training and experience as numerous drilling situations may occur that will require field decisions. It is recommended that inexperienced personnel be supervised for several well abandonments before working on their

own. Geologists or personnel with geologic experience should supervise monitoring well abandonment.

It is the responsibility of the field personnel to be familiar with the procedures outlined in this SOP and to directly oversee the abandonment of the monitoring well by the drilling subcontractor to ensure that abandonment specifications are completed in accordance with this SOP. It is also the responsibility of the field personnel to be familiar with the procedures outlined within the *Sampling and Analysis Plan (SAP)* (Enbridge Energy, Limited Partnership (Enbridge), 2011a) (SAP), the *Quality Assurance Project Plan (QAPP)* (Enbridge, 2011b) (QAPP), and the *Health and Safety Plan* (Enbridge, 2012) (HASP). Field personnel are also responsible to ensure proper decontamination procedures are followed and that proper documentation in the field logbook, field forms, or field computer is completed.

It will be the responsibility of the drilling subcontractor to provide a trained operator and the necessary equipment and materials for well abandonment. This generally includes a truck or all-terrain vehicle-mounted hollow-stem auger (HSA) drilling rig and other necessary equipment for well abandonment. Equipment decontamination materials should also be provided by the subcontractor and should meet project specifications. Well abandonment materials should be consistent with project requirements. Surface restoration may also be required of the drilling subcontractor.

Monitoring well abandonment personnel who work on sites where hazardous waste materials may be present will be health and safety certified as specified by the Occupational Safety and Health Administration (29 CFR 1910.120(e)(3)(i)).

3.0 HEALTH AND SAFETY

The health and safety considerations for the work associated with this SOP, including both potential physical and chemical hazards, are addressed in the site-specific HASP. All work activities will be conducted in accordance with the HASP.

4.0 INTERFERENCES

Potential interferences could result from cross-contamination between monitoring well abandonment locations. The use of clean drilling tools at each location, which will require decontamination of drilling equipment, will minimize the risk of cross-contamination per *SOP*

EN-105 – Decontamination of Field Equipment (Enbridge, 2011a). Other potential interferences may be due to abandonment materials or interactions between abandonment materials and the geologic formation. Cross-contamination may also result when surface water runoff or other materials enter the borehole from the ground surface. Appropriate steps will be taken to reduce the potential for infiltration into the subsurface.

5.0 EQUIPMENT & SUPPLIES

The following equipment list contains materials which may be necessary to carry out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions or as specified in a work plan.

5.1 Well Abandonment Materials

Well abandonment materials such as Portland cement, bentonite, and potable water are usually provided by the drilling subcontractor. A potable water source may be available on-site or nearby with access coordinated prior to the commencement of field activities.

5.2 Other Required Materials

- Monitoring well installation and construction documents,
- Field logbook and pen,
- Potable water supply (may be provided by the drilling subcontractor),
- Plastic sheeting,
- Trash bags,
- Paper towels,
- Water level meter,
- Equipment decontamination supplies (may be provided by the drilling subcontractor),
- Health and safety supplies (as required by the HASP), and
- Appropriate containers and materials to manage investigative derived waste (IDW) as specified in *SOP EN-106 - Investigative Derived Waste* (Enbridge, 20011a), including non-hazardous waste labels (may be provided by the drilling subcontractor).

6.0 METHODS

The borehole must be sealed in such a manner that the borehole, or well casing in the event of an abandonment in place, cannot act as a conduit for the migration of constituents of concern from the ground surface to the water table or between aquifers. The preferred method of abandonment is to completely remove all well materials and fill the borehole with a cement/bentonite or neat cement grout. Alternatively, the monitoring well may be abandoned in place under certain circumstances outlined in *Section 6.3.2.*

6.1 General Preparation

Prior to abandonment activities, the appropriate utility notification must be performed. Utility markings should be verified before mobilization to the site. Current site surface conditions, including overhead utilities, should also be verified at this time.

If abandonment activities occur within the right-of-way of a roadway, appropriate traffic signage must be installed prior to field activities and maintained until work efforts are complete.

All available information relating to the monitoring well to be abandoned should be reviewed, including but not limited to: soil boring logs, well construction logs, water level records, and site maps. Site-specific documents (e.g. SOPs, HASP, etc.) should also be reviewed and in the possession of field personnel during abandonment activities.

Site access and legal right-of-entry documents must be obtained prior to initiating field activities and remain in the possession of field personnel during abandonment activities. Property owner notifications shall be performed as required by the right-of-entry agreement (as applicable). If an agreement is not available, prior-to and day-of-work notifications should be performed as a courtesy to the affected property owner(s).

Downhole and drilling equipment must be decontaminated prior to its initial use and following the abandonment of each borehole. Site-specific requirements for equipment decontamination are outlined in the SAP. Equipment decontamination procedures are also outlined within *SOP EN-105 - Decontamination of Field Equipment* (Enbridge, 2011a).

6.2 Site Preparation

Upon arrival on site, field personnel will:

- Locate monitoring well(s) to be abandoned,
- Confirm utility clearances,
- Confirm right-of-entry and perform necessary day-of-work notifications,
- Determine current surface conditions (overhead clearance, drill rig access, etc.),
- Determine subsurface condition of monitoring well (e.g. measure the water level in the well and the depth to the bottom of the well),
- Calculate the volume of grout material required for abandonment,
- Confirm correct well abandonment procedure has been determined for current conditions, and
- If required, place protective cover (plastic mats, plastic sheeting, etc.) on work areas such as lawns, landscaping, or access ways.

6.3 Well Abandonment Procedures

The preferred method of abandonment is to completely remove all well construction materials (polyvinyl chloride (PVC) or steel risers and well screen, sand filter pack, previously placed bentonite grout, etc.) from the borehole and then backfill with a cement/bentonite or neat cement grout. Prior to abandonment, all dedicated sampling and/or groundwater monitoring equipment, the well protective casing (flush-mount or above ground), concrete pad, and any traffic control devices (e.g., protective bollards, etc.) shall be removed. Field personnel will be on-site while abandonment activities are being performed and record activities per *Section 7.0*.

6.3.1 Overdrill and Grout

The overdrill and grout method of abandonment completely removes the well casing and screen from the borehole by augering with HSAs over the well casing to slightly deeper than the bottom of the monitoring well. The well materials are removed and grouting material is used to backfill the borehole. PVC monitoring wells constructed with stainless-steel well screens and all steel-constructed monitoring wells should be abandoned in this manner.

- Overdrill the monitoring well with HSAs slightly larger than the original borehole diameter to ream out the sand pack and grout materials installed during well construction,
- Remove the well casing and screen from the borehole and treat as IDW,

- Mix the appropriate grout material, and
- Fill the open borehole with the appropriate grout material to approximately 1 to 2 feet below ground surface.

The grout material should consist of Portland cement and 3 to 5% bentonite mixed with potable water. The grout mixture should be chosen by field personnel and the drilling subcontractor based on site conditions. A higher percentage of bentonite is generally used for formations with higher porosity. The grout material will be injected into the borehole from the bottom to the top using a tremie pipe. Slowly pump the grout into the borehole, evaluating the consistency of the grout returning to the surface. Raise and remove sections of the tremie pipe and HSAs as the grout material returning to the surface is of similar consistency as the grout being pumped in. This procedure must be performed as a continuous operation to avoid dilution or segregation of the grout mixture or bridging of grout solids.

The grout will be inspected within 12 to 24 hours after installation to check for any settling on the emplaced grout material. Grout material will be added as necessary to fill any remaining annular space greater than 4 feet. Bentonite chips or pellets can be utilized to backfill remaining annular space of 4 feet or less. Bentonite chips or pellets will be placed in the borehole and hydrated utilizing potable water, taking care not to allow bridging of the material.

Drill cuttings will be treated as IDW and will not be utilized as fill material.

After the grout has hardened, usually within 12 to 24 hours, the surface elevation will be restored with materials similar to the surrounding ground surface (e.g. soil/grass, concrete, asphalt, etc.).

If the PVC well casing breaks during the overdrill method, the borehole should be abandoned per *Section 6.3.2*.

6.3.2 Abandonment in Place

The in-place abandonment method can either destroy the well casing and screen without removal or leave the well casing in the ground. Monitoring wells having 6-inch or larger diameters, damaged or badly corroded monitoring wells, or monitoring wells with thickly grouted annular space may be considered for abandonment in place.

Abandonment in-place involves overdrilling a PVC-constructed monitoring well with solid-stem augers, a solid cutting head on HSAs, or plugged HSAs to the bottom of the borehole or monitoring well. The PVC well materials are destroyed and grouting material is used to fill the borehole to approximately 1 to 2 feet below ground surface.

Alternatively, a string of drilling rods with a tapered wedge assembly, or similar, on the lead rod can be forced into a PVC or steel-constructed monitoring well to a depth sufficient to split the screened interval and displace the end cap on the bottom of the well screen. Grout material will then be mixed with potable water and placed into the monitoring well from the bottom to the top using a tremie pipe.

The monitoring well riser will be cut off below grade after the grout material has set. Depth below grade will be dependent on surface finish (e.g., soil/grass, concrete, asphalt, etc.) and proposed site-specific activities.

The grout material should consist of Portland cement and 3 to 5% bentonite mixed with potable water. The grout mixture should be chosen by field personnel and the drilling subcontractor based on site conditions. A higher percentage of bentonite is generally used for formations with higher porosity. The grout material will be injected into the borehole from the bottom to the top using a tremie pipe as described in *Section 6.3.1*.

Bentonite chips or pellets utilized to backfill the remaining annular space should be placed in the borehole and hydrated utilizing potable water, taking care not to allow bridging of the material.

Drill cuttings will be treated as IDW and will not be used as fill material.

After the grout has hardened, the area will be restored to the ground surface elevation with materials similar to the surrounding ground surface (e.g. soil/grass, concrete, asphalt, etc.).

6.4 Disposal of Drilling Wastes

Drill cuttings, well construction materials, and other IDW must be contained in an appropriate container, labeled, and disposed as specified in *SOP EN-106 - Investigative Derived Waste* (Enbridge, 2011a) or an approved work plan. Containment of IDW should be performed by the drilling subcontractor.

7.0 DATA AND RECORDS MANAGEMENT

The data associated with the monitoring well abandonment activities may be contained in the following:

- Field logbook or field collection form,
- Electronic data collection unit (Trimble Yuma®, Leica®, or equivalent),
- *Field Modification Forms* (used prior to field work, when required), and/or
- Nonconformance Records (used after field work, when required).

Field personnel will complete a *Monitoring Well Abandonment Log* and a *Monitor Well Abandonment Record* (*Attachment B*) for each monitoring well abandoned. If required, a copy of this form shall be submitted to the relevant municipal, state, and/or federal agency or an agency-specific form shall be completed and submitted.

The records generated in this procedure will become part of the permanent record supporting the associated field work. All documentation will be retained in the project files following project completion.

The following SOPs describe the data collection and record management procedures that will be followed as part of the well abandonment process:

- *SOP EN-101 Field Records* (Enbridge, 2011a)
- *SOP EN-105 Decontamination of Field Equipment* (Enbridge, 2011a), and
- *SOP EN-106 Investigative Derived Waste Management* (Enbridge, 2011a).

See the referenced SOPs for additional details.

8.0 QUALITY ASSURANCE AND QUALITY CONTROL

Field personnel will follow specific quality assurance guidelines as outlined in the QAPP and/or the SAP. Certain quality control measures, as noted below, should be implemented to ensure proper well abandonment.

- Notification of property owners and appropriate authorities (as applicable) including state and local officials, etc.,
- Verify monitoring well identification,

- Verify utility mark-out (underground and overhead) and right-of-entry,
- Inspect the removed well materials to verify that the complete monitoring well has been removed,
- Containerize all drill cuttings, groundwater/grout returns, and well construction materials,
- Utilize a proper grout mixture for backfill,
- Install bentonite chip or pellets without bridging, and
- Restore ground surface to pre-disturbance conditions.

9.0 REFERENCES

Enbridge, 2011a. Enbridge Line 6B MP 608 Pipeline Release; Marshall, Michigan; *Sampling and Analysis Plan (SAP).* August 30, 2011.

Enbridge, 2011b. Enbridge Line 6B MP 608 Pipeline Release; Marshall, Michigan; *Quality Assurance Project Plan (QAPP).* August 19, 2011.

Enbridge, 2012. Enbridge Line 6B MP 608 Pipeline Release; Marshall, Michigan; *Health and Safety Plan (HASP) v. 6.2.* April 17, 2012.

ASTM Method D 5299-99(2005), *Standard Guide for Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities,* ASTM Committee on Standards, Philadelphia, PA.

Attachment A

ASTM International Method D 5299-99 (2005)

Designation: D 5299 – 99

Standard Guide for Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities[1]

This standard is issued under the fixed designation D 5299; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers procedures that are specifically related to permanent decommissioning (closure) of the following as applied to environmental activities. It is intended for use where solid or hazardous materials or wastes are found, or where conditions occur requiring the need for decommissioning. The following devices are considered in this guide:

1.1.1 A borehole used for geoenvironmental purposes (see Note 1),

1.1.2 Monitoring wells,

1.1.3 Observation wells,

1.1.4 Injection wells (see Note 2),

1.1.5 Piezometers,

1.1.6 Wells used for the extraction of contaminated ground water, the removal of floating or submerged materials other than water such as gasoline or tetrachloroethylene, or other devices used for the extraction of soil gas,

1.1.7 A borehole used to construct a monitoring well, and

1.1.8 Any other vadose zone monitoring device.

1.2 Temporary decommissioning of the above is not covered in this guide.

NOTE 1—This guide may be used to decommission boreholes where no contamination is observed at a site (see Practice D 420 for details); however, the primary use of the guide is to decommission boreholes and wells where solid or hazardous waste have been identified. Methods identified in this guide can also be used in other situations such as the decommissioning of water supply wells and boreholes where water contaminated with nonhazardous pollutants (such as nitrates or sulfates) are present. This guide should be consulted in the event that a routine geotechnical investigation indicates the presence of contamination at a site.

NOTE 2—The term "well" is used in this guide to denote monitoring wells, piezometers, or other devices constructed in a manner similar to a well. Some of the devices listed such as injection and extraction wells can be decommissioned using this guide for information, but are not specifically covered in the text.

NOTE 3—Details on the decommissioning of multiple-screened wells are not provided in this guide due to the many methods used to construct these types of wells and the numerous types of commercially available multiple-screened well systems. However, in some instances, the methods presented in this guide may be used with few changes. An example of how this guide may be used is the complete removal of the multiple-screened wells by overdrilling.

1.3 Most monitoring wells and piezometers are intended primarily for water quality sampling, water level observation, or soil gas sampling, or combination thereof, to determine quality. Many wells are relatively small in diameter and are used to monitor for hazardous chemicals in ground water. Decommissioning of monitoring wells is necessary to:

1.3.1 Eliminate the possibility that the well is used for purposes other than intended,

1.3.2 Prevent migration of contaminants into an aquifer or between aquifers,

1.3.3 Prevent migration of contaminants in the vadose zone,

1.3.4 Reduce the potential for vertical or horizontal migration of fluids in the well or adjacent to the well, and

1.3.5 Remove the well from active use when the well is no longer capable of rehabilitation, or has failed structurally; no longer required for monitoring; no longer capable of providing representative samples or is providing unreliable samples; or required to be decommissioned; or to meet regulatory requirements.

NOTE 4—The determination of whether a well is providing a representative water quality sample is not defined in this guide. Examples of when a representative water quality sample may not be collected include the biological or chemical clogging of well screens, a drop in water level to below the base of the well screen, or complete silting of a tail pipe. These conditions may indicate that a well is not functioning properly.

1.4 This guide is intended to provide information for effective permanent closure of wells so that the physical structure of the well does not provide a means of hydraulic communication between aquifers or react chemically in a detrimental way with the environment.

1.5 The intent of this guide is to provide procedures that when followed result in a reasonable level of confidence in the integrity of the decommissioning activity. However, it may not be possible to verify the integrity of the decommissioning procedure. At this time, methods are not available to substantially determine the integrity of the decommissioning activity.

1.6 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

[1] This guide is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.21 on Ground Water and Vadose Zone Investigations.

Current edition approved Dec. 10, 1999. Published March 2000. Originally published as D 5299 – 92. Last previous edition D 5299 – 92ε1.

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1.7 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word" Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.*

NOTE 5—If state and local regulations are in effect where the decommissioning is to occur, the regulations take precedence over this guide.

2. Referenced Documents

2.1 *ASTM Standards:*

C 150 Specification for Portland Cement[2]

C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Concrete Cement[3]

D 420 Guide to Site Characterization for Engineering, Design and Construction Purposes[4]

D 4380 Test Method for Density of Bentonitic Slurries[4]

D 5088 Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites[4]

D 5092 Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers[5]

D 6001 Guide for Direct-Push Water Sampling for Geoenvironmental Investigations[4]

D 6282 Guide for Direct-Push Soil Sampling for Environmental Site Characterization[5]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 **abandonment**—see *decommissioning*.

3.1.2 *attapulgite clay*—a chain-lattice clay mineral. The term also applies to a group of clay minerals that are lightweight, tough, matted, and fibrous.

3.1.3 *borehole television log*—a borehole or well video record produced by lowering a television camera into the borehole or well. This record is useful in visually observing downhole conditions such as collapsed casing or a blocked screen.

3.1.4 *blowout*—a sudden or violent uncontrolled escape of fluids or gas, or both, from a borehole.

3.1.5 *caliper log*—a geophysical borehole log that shows to scale the variations with depth in the mean diameter of a cased or uncased borehole.

3.1.6 *cement, API, Class A*—a cement intended for use from the surface to a depth of 6000 ft (1828 m). This cement is similar to ASTM Type I cement.

3.1.7 *cement, API, Class B*—a cement intended for use from the surface to a depth of 6000 ft (1828 m) when conditions require moderate- to high-sulfate resistance. This cement is similar to ASTM Type II cement.

3.1.8 *cement, API, Class C*—this cement is intended for use from the surface to a depth of 6000 ft (1828 m) when conditions require high early strength. This cement is similar to ASTM Type III cement. Also available as a high sulfate resistant type.

3.1.9 *cement, API, Class G*—this cement is intended for use from the surface to a depth of 8000 ft (2438 m). It can be used with accelerators or retarders to cover a wide range of well depths and temperatures. No additions other than calcium sulfate or water, or both, can be interground or blended with the clinker during manufacture of the cement. Also available as several sulfate-resistant types.

3.1.10 *cement, API, Class H*—this cement is intended for use from the surface to a depth of 8000 ft (2438 m). It can be used with accelerators or retarders to cover a wide range of well depths and temperatures. No additions other than calcium sulfate or water, or both, can be interground or blended with the clinker during manufacture of the cement. Also available as a sulfate-resistant type.

3.1.11 *cement, API, Class J*—this cement is intended for use from depths of 12 000 to 16 000 ft (3658 to 4877 m) under conditions of extremely high temperatures and pressures. It can be used with accelerators and retarders to cover a range of well depths and temperatures. No additions of retarders other than calcium sulfate, or water, or both, can be interground or blended with the clinker during manufacture of the cement.

3.1.12 *cement bond (sonic) log*—a borehole geophysical log that can be used to determine the effectiveness of a cement seal of the annular space of a well.

3.1.13 *channeling*—the process of forming a vertical cavity resulting from a faulty cement job in the annular space.

3.1.14 *curing accelerator*—a material added to cement to decrease the time for curing. Examples are sodium chloride, calcium sulfate (gypsum), and aluminum powder.

3.1.15 *curing retarder*—a material added to cement to increase the time for curing. Sodium chloride in high concentrations is an example.

3.1.16 *decommissioning (closure)*—the engineered closure of a well, borehole, or other subsurface monitoring device sealed with plugging materials. Decommissioning also includes the planning and documenting of all associated activities. A synonym is abandonment.

3.1.17 *decontamination*—the process of removing undesirable physical or chemical constituents, or both, from equipment to reduce the potential for cross-contamination.

3.1.18 *fallback*—shrinkage, settlement, or loss of plugging material placed in a borehole or well.

3.1.19 *fire clay*—a silicious clay rich in hydrous aluminum silicates.

3.1.20 *flow log*—a borehole geophysical log used to record vertical movement of ground water and movement of water

[2] *Annual Book of ASTM Standards*, Vol 04.01.
[3] *Annual Book of ASTM Standards*, Vol 04.02.
[4] *Annual Book of ASTM Standards*, Vol 04.08.
[5] *Annual Book of ASTM Standards*, Vol 04.09.

into or out of a well or borehole and between formations within a well.

3.1.21 *geophysical borehole log*—a log obtained by lowering an instrument into a borehole and continuously recording a physical property of native or backfill material and contained fluids. Examples include resistivity, induction, caliper, sonic, and natural gamma logs.

3.1.22 *grout*—material consisting of bentonite, cement, or a cement-bentonite mixture.

3.1.23 *grout pipe*—a pipe or tube that is used to transport cement, bentonite, or other plugging materials from the ground surface to a specified depth in a well or borehole. The material may be allowed to flow freely or it may be injected under pressure. The term tremie pipe is frequently used interchangeably.

3.1.24 *hydraulic communication*—the migration of fluids from one zone to another, with reference to this guide; especially along a casing, grout plug, or through backfill materials.

3.1.25 *multiple-screened wells*—two or more monitoring wells situated in the same borehole. These devices can be either individual casing strings and screen set at a specific depth, a well with screens in more than one zone, or can consist of devices with screens with tubing or other collecting devices attached that can collect a discrete sample.

3.1.26 *native material*—in place geologic (or soil) materials encountered at a site.

3.1.27 *overdrilling*—the process of drilling out a well casing and any material placed in the annular space.

3.1.28 *perforation*—a slot or hole made in well casing to allow for communication of fluids between the well and the annular space.

3.1.29 *permanent plugging*—a seal that has a hydraulic conductivity that is equivalent or less than the hydraulic conductivity of the geologic formation. This term is often used with uncased boreholes.

3.1.30 *plow layer*—the depth typically reached by a plow or other commonly used earth turning device used in agriculture. This depth is commonly one to two feet (.3 m to .61 m) below land surface.

3.1.31 *plugging material*—a material that has a hydraulic conductivity equal to or less than that of the geologic formation(s) to be sealed. Typical materials include portland cement and bentonite.

3.1.32 *pre-conditioning*—an activity conducted prior to placing plugging material into a borehole in order to stabilize the hole.

3.1.33 *temporary decommissioning*—the engineered closure of a well intended to be returned to service at some later date (generally no more than six months). Temporary plugging should not damage the structural integrity of the well. Plugging materials consist of sand, bentonite, or other easily removed materials.

4. Summary of Guide

4.1 Information is provided on the significance of properly decommissioning boreholes and wells at sites containing or formerly containing solid or hazardous waste or hazardous materials or their byproducts, or that may be affected by solid or hazardous waste materials or their byproducts in the future. This guide may be used in situations where water quality in one aquifer may be detrimental to another aquifer either above or below the aquifer. The primary purpose of decommissioning activities is to permanently decommission the borehole or monitoring device so that the natural migration of ground water or soil vapor is not significantly influenced. Decommissioned boreholes and wells should have no adverse influence on the local environment than the original geologic setting.

4.2 It is important to have a good understanding of the geology, hydrogeology, well construction, historic and future land use, chemicals encountered, and the regulatory environment for successful decommissioning to occur.

4.3 Various materials suitable for decommissioning boreholes and wells are discussed, including their positive and negative attributes for decommissioning. A generalized procedure is provided that discusses the process from planning through implementation and documentation. Examples of typical practices are provided in the appendix.

5. Significance and Use

5.1 Decommissioning of boreholes and monitoring wells, and other devices requires that the specific characteristics of each site be considered. The wide variety of geological, biological, and physical conditions, construction practices, and chemical composition of the surrounding soil, rock, waste, and ground water precludes the use of a single decommissioning practice. The procedures discussed in this guide are intended to aid the geologist or engineer in selecting the tasks required to plan, choose materials for, and carry out an effective permanent decommissioning operation. Each individual situation should be evaluated separately and the appropriate technology applied to best meet site conditions. Considerations for selection of appropriate procedures are presented in this guide, but other considerations based on site specific conditions should also be taken into account.

NOTE 6—Ideally, decommissioning should be considered as an integral part of the design of the monitoring well. Planning at this early stage can make the decommissioning activity easier to accomplish. See Practice D 5092 for details on monitoring well construction.

5.2 This guide is intended to provide technical information and is not intended to supplant statutes or regulations. Approval of the appropriate regulatory authorities should be an important consideration during the decommissioning process.

6. Materials

6.1 The materials used for construction of a monitoring well or other monitoring device to be decommissioned in part determines how it is decommissioned. Various materials are available for use in plugging boreholes and monitoring wells. This section provides information on these materials.

6.2 *Casing and Screen Materials*:

6.2.1 Various materials are used for well casing and screen. The most common materials used are: PVC, PTFE, fiberglass, carbon steel, stainless steel, and aluminum. Typically, the same material is used for casing and screen in a well, however, in some instances different materials may be used in a well to achieve a particular purpose such as corrosion protection, reduction of material costs, or improving the integrity of

ground water or soil vapor samples. This guide does not specifically address the use of more than one type of casing or screen material used in a well, however, the same decommissioning methods can frequently be used when more than one material is used (for example, PVC and PTFE, or stainless steel and carbon steel) in a well.

6.2.2 In selecting a well decommissioning method, PVC, PTFE, and fiberglass wells can be decommissioned using similar methods as all three types of materials tend to be low in tensile strength and easy to drill out or perforate. Appendix X1 provides a discussion on various procedures that can be used for the decommissioning of PVC wells and by reference PTFE and fiberglass wells.

6.2.3 Wells constructed of carbon steel, stainless steel, and heavy walled aluminum can be decommissioned using similar methods as these materials tend to have a higher tensile strength that allows for the casing to be removed. Appendix X1 provides a discussion on various procedures that can be used for the decommissioning of steel wells and by reference stainless steel and aluminum wells.

6.3 *Plugging Materials*:

6.3.1 Plugging materials should be carefully chosen for well closure to be permanent. Basic material characteristics are listed as follows:

6.3.1.1 Plugging materials should not react with contaminants or adversely react with ground water or geologic materials.

6.3.1.2 Plugging materials used in decommissioning wells, borings, etc. should have hydraulic conductivity (saturated condition) that is comparable to or lower than that of the lowest hydraulic conductivity of the geologic material being sealed.

6.3.1.3 Plugging materials must have sufficient structural strength to withstand pressures expected from native conditions.

6.3.1.4 Plugging materials must maintain sealing capabilities and not degrade due to chemical interaction, corrosion, dehydration, or other physical or chemical processes. Materials should maintain their design characteristics for the length of time contamination is present at the site.

6.3.1.5 Plugging materials should not be readily susceptible to cracking or shrinkage, or both.

6.3.1.6 Plugging materials must be capable of being placed at the position in the well or borehole in which they are needed and must have properties that reduce their unintended movement vertically and horizontally.

6.3.1.7 Plugging materials must be capable of forming a tight bond and seal with well casing and the formation.

6.3.1.8 Plugging materials must have properties that eliminate leaching or erosion of the material, under the conditions the material will be subjected. These include vertical or horizontal movement, or both, or contact with ground water or other existing conditions.

NOTE 7—The grain size of plugging material used in decommissioning operations conducted in areas where thick vadose zones occur should be coarser than materials used in areas where thin vadose zones or shallow saturated conditions occur. This is necessary as water is not transported effectively in coarse-grained materials under negative pore pressures. Coarse-grained materials should not be used where saturated conditions are likely to exist during the period of time that hazardous materials can be expected to occur at the site. It is important to determine the lithology and grain size distribution of materials adjacent to the borehole or well prior to selection of plugging materials.

NOTE 8—If coarse-grained materials are used to decommission the borehole or well, a layer of fine-grained material (such as cement or bentonite, or both) 1 or 2 ft (.3 or .61 m) thick should be placed at 10 ft (3 m) intervals in the borehole in the saturated zone. This layer should extend 2 to 3 ft (.61 to .91 m) above the highest expected level saturation is expected based on historical information on the water table for unconfined aquifers. A similar thickness of these materials should be used for confined aquifers. A similar 5-ft (1.5-m) seal of a low-permeability material should be placed near the ground surface to reduce the potential for entrance of fluids at the ground surface.

6.4 *Commonly Used Materials*—Subsections 6.2 and 6.3 introduced the general criteria that must be evaluated during the process of selecting the appropriate procedure and material for plugging a specific well. Because well construction and local geological conditions are site specific, a wide variety of materials and procedures may be used to complete the closure.

6.4.1 Section 6.4 presents a review of the plugging materials most commonly used to decommission monitoring wells. Table 1 summarizes these materials and lists the most important considerations (positive and negative) for their use. A detailed discussion of each material is presented in the following subsections.

6.4.2 *Portland Cement*—Portland cement may be used in any of its various forms to meet placement, strength, and durability criteria listed in 6.1. The amount of shrinkage or settling of neat cement is dependent on the amount of water used. Higher water to cement ratios tend to increase shrinkage **(1)**.[6]

6.5 *Specification C 150*:

6.5.1 *Type 1*—Type 1 cement, a general-purpose material, is the most commonly used cement. This material has a tendency to develop a relatively high heat of hydration when used in confined situations and has relatively low-sulfate resistance.

6.5.2 *Type II*—Somewhat slower strength development than Type I; however, Type II cement has moderate heat of hydration and moderate sulfate resistance.

6.5.3 *Type III*—Type III cement is used when high early strength is desired. This material is not commonly used in decommissioning activities because of its ability to quickly set. Care must be used in working with this material.

6.5.4 *Type IV*—Type IV cement is used where a low heat of hydration is desired. It is not commonly used in decommissioning activities.

6.5.5 *Type V*—Type V cement has high resistance to sulfate, and brine solutions. This material has ultimate strength development somewhat less than either Types I or II.

6.5.6 Type K cement is expansive and can be used to compensate for shrinkage. This cement is essentially Type I or more commonly Type II Portland Cement with additives to produce expansion. It can be of use in plugging situations where water-tightness is important. Type K cement contains calcium sulfoaluminate. When mixed with water, the hydration causes an expansion ranging from approximately 0.05 to 0.20 % **(2)**.

[6] The boldface numbers in parentheses refer to a list of references at the end of the text.

6.6 *API Cements* **(3)**:

6.6.1 *Class A*—Class A cement corresponds closely to ASTM Type 1. This cement is intended to be used from the surface to a depth of 6000 ft (1828 m).

6.6.2 *Class B*—Class B cement corresponds closely to ASTM Type II. It is intended for use from the surface to a depth of 6000 ft (1828 m) and is also available as a high-sulfate resistant variety.

6.6.3 *Class C*—Class C cement corresponds closely to ASTM Type III. It is intended for use from the surface to a depth of 6000 ft (1828 m). It is also available as a high-sulfate resistant variety.

6.6.4 *Class G*—Class G cement is intended for use from the surface to a depth of 8000 ft (2438 m) and can be used with accelerators or retarders to cover a wide range of depths and temperatures. The cement is also available as a high-sulfate resistant variety.

TABLE 1 Properties of Common Plugging Materials

Plugging Material	Description	Positive Attributes	Negative Attributes
ASTM C-50 Portland Cement			
Type I	Most commonly used type of cement for plugging	Forms a good seal when used with bentonite in 3 to 5 % concentration. Commonly available and can be purchased premixed on-site.	High heats of hydration may be a problem in PVC-cased wells. Can shrink and crack; low-sulfate resistance. Should not be used in the presence of strong acids or in low-pH environments.
Type II	Similar to Type I, but with a moderate heat of hydration.	Moderate heat of hydration. Moderate resistance to sulfate.	Somewhat slower strength development than Type I; expensive. Can shrink and crack. Can be difficult to use. Should not be used in the presence of strong acids or in low-pH environments.
Type III	High early strength.	May prove useful in situations where high early strength is needed, such as borehole walls that have a tendency to collapse.	Not a common cement. Can set very quickly before decommissioning is completed. Should not be used in the presence of strong acids or in low-pH environments.
Type IV	Low heat of hydration.	May prove useful in situations where a low heat of hydration is required	Not a common cement. Should not be used in the presence of strong acids or in low-pH environments.
Type V	Similar to Type I, with high resistance to sulfate and brine.	High resistance to sulfate and brine. Low heat of hydration.	Ultimate strength is less than Types I and III. Expensive; should not be used in the presence of strong acids or in low-pH environments. Can be difficult to use. Can shrink or crack.
K	Expansive cement.	Basically Type I or Type II Portland Cement with additions (tricalcium sulfo aluminate for example) to provide for expansion. Expansion is generally in the range from 0.05 to 0.20 % Good resistance to sulfate attack.	
API 10			
Class A	Similar to ASTM Type I.	Can be used to a depth of 6000 ft (1828 m). Forms a good seal when used with bentonite in 3 to 5 % concentration. Commonly available and can be purchased premixed on-site.	High heats of hydration may be a problem in PVC-cased wells. Can shrink and crack; low-sulfate resistance. Should not be used in the presence of strong acids or in low-pH environments.
Class B	Similar to ASTM Type II.	Can be used to depth of 6000 ft (1828 m). Moderate heat of hydration. Moderate resistance to sulfate. Available as a high-sulfate resistant variety.	Somewhat slower strength development than Type I; expensive. Can shrink and crack. Can be difficult to use. Should not be used in the presence of strong acids or in low-pH environments.
Class C	Similar to ASTM Type III.	Can be used to a depth of 6000 ft (1828 m).	Can set very quickly before decommissioning is completed. Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Class G	Useful in a wide range of temperatures and depths through the use of accelerators or retarders.	Can be used to a depth of 8000 ft (2438 m). Available as a sulfate-resistant variety.	Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Class H	Useful in a wide range of depths and temperatures through the use of accelerators or retarders.	Can be used to a depth of 8000 ft (2438 m). Available only as a moderate sulfate type.	Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Class J	Intended for use from a depth 12 000 to 16 000 ft (3658 to 4877 m).	Has use where extremely high temperatures and pressures occur.	Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Pozzolanic cement	Addition of silicious materials to ASTM Type V or API Class A cement.	Good resistance to corrosive conditions and in reducing the permeability of cement.	Many types of materials can be used that can result in variable results.
Epoxy cements	Vinyl ester resins.	Good chemical resistance to acids and bases. Can use available equipment to place cement.	Very expensive. Poor chemical resistance to chlorinated hydrocarbons and acetic aid. Should be used only by experienced personnel. Water accelerates curing, must use diesel oil to precondition hole (diesel may increase contamination of site if hydrocarbons are a concern).
Bentonite Pellets	Granular bentonite compressed into a tablet	Uniform in size. Easy to use. Produces a low permeability seal.	Must be hydrated after placement. Shrinkage may occur when desiccated or when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline. Expensive.

TABLE 1 *Continued*

Plugging Material	Description	Positive Attributes	Negative Attributes
Chips	Raw mined montmorillonite in the form of chunks ¼ to ¾in. (.64 to 1.91 m) in size.	Inexpensive. No mixing equipment required. Forms a low-permeability seal.	Difficult to place. Must be hydrated after placement. Less swelling than beneficiated bentonite. Shrinkage may occur when desiccated when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline.
Granular	Raw mined montmorillonite crushed and seared to an 8 to 20-mesh size.	Can be placed at depth in dry holes. Forms a low- permeability seal.	Difficult to place in holes containing water as it quickly hydrates. Can bridge in hole. May desiccate when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline causing shrinkage.
Powdered	Pulverized and seared bentonite that passes a 200-mesh screen. Used as drilling mud or as an additive to cement.	Used with cement to compensate for shrinkage (under saturated conditions). Other additives can be used to inhibit swelling, etc. Retards cement set; lowers heat of hydration.	May not be a desirable plugging material in deep vadose zones due to the drying out of the material, resulting in cracking. Difficult to place in holes containing water, as it quickly hydrates. Can bridge in hole. May desiccate when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline causing shrinkage.
High solids clay grout	Powdered bentonite (200 mesh) mixed with fresh water to form a slurry with a minimum of 20 % solids and a density of 9.4 lb/gal (1126 Kg/m^3 g/L).	Does not shrink during curing. Low density reduces formation losses. Forms a low-permeability seal that stays flexible as long as it is hydrated.	May not be a desirable plugging material in deep vadose zones due to the drying out of the material, resulting in cracking. May desiccate when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline causing shrinkage. A low-strength material subject to expansion under low-pressure differentials such as artesian conditions.

6.6.5 *Class H*—Class H cement is intended for use from the surface to a depth of 8000 ft (2438 m). It can be used with a wide variety of accelerators and retarders to cover a wide range of depths and temperatures. It is available only as a moderate-sulfate resistant type.

6.6.6 *Class J*—This cement is intended for use from a depth of 12 000 to 16 000 ft (3658 to 4877 m) where extremely high temperatures and pressures can be expected to occur.

6.6.7 *Other Cements*—Other cements have been developed that may have applicability in decommissioning activities. These include the following:

6.6.7.1 Ultralight cements with a slurry density that can be as low as 6 lb/gal (719 cm Kg/L). This material can be made by foaming the cement with nitrogen or through the addition of hollow glass microspheres between 60 and 315 µm in diameter. The latter forms a slurry of between 9 and 12 lb/gal (1078 and 1438 Kg/L). Ultralight cements and microspheres have been reported **(4)** for cement unconsolidated sands and for plugging cavernous formations and lost circulation zones. Reference **(5)** provided similar information on microspheres. Microspheres can also be used in high-pressure applications when it may be desirable to limit density increases. Another advantage is the low water/cement ratio due to the low water absorbency and low density **(5)**.

6.6.7.2 *Pozzolanic-Portland Cements*—These cements consist of silicious materials that develop into a cement in the presence of lime and water. Both natural materials of volcanic origin such as perlites (volcanic ashes), heat-treated clays, shales, tuffs, opaline cherts, diatomaceous earth and artificial materials consisting of byproducts from glass factories, furnace slag, and fly ash have been used **(2, 4, 6)**. The large variety of materials that can be used as a source for pozzolans may result in variable results.

6.6.7.3 Pozzolans act to extend cement and decrease density. The specific gravity of fly ash ranges from 2.3 to 2.7 (depending upon the source) while portland cement is 3.1 to 3.2 **(2)**. These materials can also provide improved resistance to corrosive fluids. Table 2 provides a comparison of sulfate resistance between ASTM Type V cement with and without pozzolans.

6.6.7.4 The improved resistance to corrosive materials is accomplished in part as many pozzolans contain zeolites which have the ability for ion exchange between the corrosive material and the alkaline component in the cement **(7)**. Secondly, the use of pozzolans also decreases cement permeability over time. This occurs as a result of the increased percentage in hydrated cement containing materials resulting from the release of calcium hydroxide and the silica combining with lime from the cement to form a stable material **(8)**.

6.6.7.5 Pozzolans are added to portland cement by adding 74 lb (33.6 Kg) (as fly ash) per sack of cement. If perlites are used, 2 to 6 % of bentonite by weight is needed to keep the perlite from floating **(9)**.

6.6.8 Gypsum cements can be used for high early strength development and their ability to set rapidly. These cements expand approximately 0.3 %. This cement may have use in plugging highly permeable formations. Care should be taken in using gypsum cements due to the solubility of gypsum.

6.6.9 *Epoxy Resin Cements*—Epoxy (vinyl ester resins) cements may have applicability in decommissioning wells and boreholes where corrosive materials may be present **(5)**.

6.6.9.1 Epoxy cement consists of an epoxy base, hardener, accelerator, and inert filler. Resin viscosity is reduced by the addition of a nonreactive liquid diluent that also controls exothermic heat during polymerization. An inert solid filler such as very fine silica or barite is added to further reduce

TABLE 2 Comparison of ASTM Type V Cement With and Without Pozzolan Materials[A]

Cement Type	Relative Degree of Sulfate Attack	Percentage of Water Soluble Sulfate (as SO_4) in Soil, ppm	Sulfate (as SO_4) in Water Samples, ppm
V	Severe	0.20 to 2.00	1 500 to 10 000
V (plus pozzolan)	Very severe	2.00 or more	10 000 or more

[A] See Ref **(4)**.

reaction heat and increase strength **(10)**.

6.6.9.2 There are several advantages of using epoxy cements. Reference **(11)** reports that a stronger bond occurred between the casing and the formation. Cole also reported resistance to various chemicals (see Table 3). The cement is highly resistant to high concentrations of hydrochloric and sulfuric acid, but is not suitable for use in environments where acetic acid, chlorinated hydrocarbons, or toluene are present.

6.6.9.3 This cement is expensive and requires removal of water (that reduces settling time) through the use of gelled and weighted diesel oil to precondition the hole. The use of this material may increase contamination at the site, if diesel oil (hydrocarbons) are a concern at the site.

6.6.10 *Cement Additives*—A number of materials can be added to cement to modify properties to meet a specific need. Cement additives can be used to extend, accelerate, retard, increase density, control fluid losses, control circulation losses, or reduce friction **(4)**. Several of these materials have more than one use; for example, sodium chloride can be used to accelerate or retard cement. The most common cement additives are discussed in the following subsections. Fig. 1 lists these additives and presents the relative impact of their use on selected performance criteria.

6.7 *Extenders*:

6.7.1 Bentonite is the most commonly used material in modifying cement properties. It can be added to most ASTM and API cements. In decommissioning activities, the percentage of bentonite added is generally no more than 4 %. It has the following effects when added to cement **(4)**:

6.7.1.1 Lowers the hydraulic conductivity of the cement;

6.7.1.2 Increases slurry viscosity;

6.7.1.3 Reduces fluid loss to the formation;

6.7.1.4 Provides for a longer pumpability at normal pressures as a result of delaying strength development;

6.7.1.5 Reduces compressive strength; and

6.7.1.6 Lowers resistance to chemical attack.

6.7.2 Bentonite increases shrinkage as it ties up large volumes of water that would normally be in the cement. A second common extender are pozzolans which have already been addressed in 6.6.7.2.

6.8 *Accelerators*:

6.8.1 Accelerators hasten the settling of cement and are useful when voids occur, or when cement plugs are to be used in the first pour. Two common materials are used; calcium chloride and sodium chloride.

6.8.2 Calcium chloride is available as a powder or flake. Flakes are the most commonly used form, as it is easy to store and can absorb some moisture without becoming lumpy **(2)**. Two to four % of calcium chloride by weight is used to achieve maximum acceleration. The use of calcium chloride should be considered when a rapid set, a decrease in viscosity, and early strength are desired.

6.8.3 Sodium chloride can be added between 1.5 to 5 % by weight of cement to reduce setting time. Maximum acceleration occurs at a concentration of 2 to 2.5 % except when higher water ratios are used **(2)**.

6.9 *Retarders*:

6.9.1 Sodium chloride can be used to retard the settling of cement as well as accelerate the setting of cement. Fifteen to seventeen % salt (14 to 16 lb (6.35 to 7.26 Kg) of salt per sack) by weight is added to retard cement **(2)**.

6.9.2 Other chemicals (cellulose, lignosulfates) have been used as retarders, but are not appropriate for decommissioning activities without additional information on their compatibility with waste and their effect on water quality. Reference **(12)** indicates that sugar-derived retarders such as cellulose lignosulfates are destructive to cement strength and should not be used where strength is important. Organic retarders should not be used for decommissioning activities.

6.10 *Density Improvers*—The density of cement can be improved to increase hydrostatic pressure. Sand can be used to increase density without affecting the cement chemically although additional water is required. Barite has been used, but may interact with waste and should not be used.

6.11 *Fluid Loss Controllers*:

6.11.1 Various organic materials such as cellulose can be used to produce a constant water to solids ratio that may have applicability when a grout is placed under pressure and water loss can occur. However, these materials may not be suitable for decommissioning activities, as they may contribute to contamination.

6.11.2 These organic materials (fibrous materials, cellophane flakes) act to block the movement of the grout into the formation. It is not desirable to use these materials in decommissioning activities due to their organic content that may adversely affect water quality and also may not result in a good plug.

6.12 *Friction Reducers (Dispersants)*:

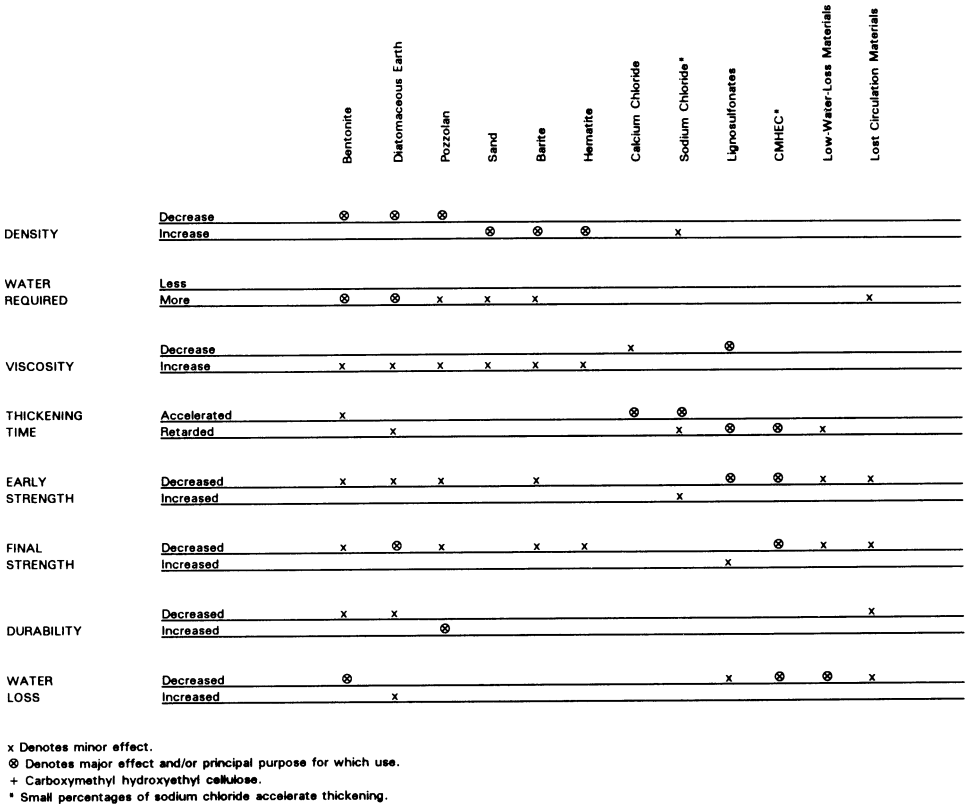
6.12.1 These materials reduce friction to improve flow and can be effective when the water cement ratio is reduced. Reduction of the water cement ratio is a method to decrease cement friction. (It is possible to reduce the amount of water added by using a dispersant **(5)**. These materials (sodium chloride, polymers, and calcium lignosulfonate) also help to reduce the energy required to pump the grout. Polymers and calcium lignosulfonate may not be appropriate materials for decommissioning activity as they may affect water quality.

6.13 *Bentonite*—Bentonite is predominantly composed of the clay mineral sodium montmorillonite. It has the ability to absorb large quantities of water and swell to many times its original size when hydrated, and the material remains flexible. Bentonite clay may be used in any of its various forms to meet placement, strength, and sealing criteria listed in 6.3. The amount of shrinkage or settling of a bentonite seal is dependent on the percent solids of bentonite, composition of surrounding formation and its soil moisture. Higher water to bentonite ratios increase the likelihood of dehydration.

TABLE 3 List of Chemicals Reported Not to Affect Epoxy Cement[A]

Chemical	Concentration, %
Hydrochloric acid	30
Sulfuric acid	25
Chromic acid	up to 10
Nitric acid	5
Hydroxide	up to 20
Hypochlorite	up to 6

[A] See Ref **(11)**.



NOTE 1—See Ref **(3)**.

FIG. 1 Effects of Some Additives on the Physical Properties of Cement

6.13.1 The permeability of bentonite is very low; hydraulic conductivities of 1×10^{-6} cm/s or less can be achieved. However, bentonite may desiccate in the presence of high concentrations of some organic chemicals, strong acids or bases, saline ground water, or when allowed to dry, thereby increasing its hydraulic conductivity. Bentonite is commercially available in the following forms:

6.13.1.1 *Pellets*—Pellets are made from granular powdered bentonite that has been compressed into tablets, commonly ¼ to ¾ in. (.64 cm to 1.91 cm) in diameter. Pellets have a low-moisture content, high density, and uniform size. Pellets should be composed of additive-free, high-swelling granular sodium bentonite. Properly placed in a well or borehole, pellets hydrate and expand creating a low permeability (1×10^{-6} cm/s) plug. Pellets can be used in the saturated zone provided the length of the water column is short. The rate of pour into the hole should not be more than 50 lb (22.7 Kg) of bentonite in 5 min **(1)**.

6.13.1.2 *Preformed Donuts*—Commercial preformed donuts consist of compressed bentonite and may have use in decommissioning activities.

6.13.2 *Chips*—Raw mined sodium montmorillonite in the form of chunks that are ¼to ¾ in. (6.4 to 1.91 cm) in diameter. Their angular shape can make it difficult to place chips to the desired depth in a small-diameter well or borehole without bridging.

6.13.2.1 Fine-grained material resulting from the mechanical breakdown during shipping may cause a problem in the placement of chips due to clumping. Fines should be screened through a ¼-in. (6.4-mm) mesh screen before use.

6.13.2.2 The lower affinity for water that chips have allow them to fall through a water column without rapid hydration.

6.13.2.3 Chips have applicability in large-diameter boreholes and when carefully dropped into the hole to reduce bridging.

6.13.3 *Granular*—Raw-mined sodium montmorillonite without any additives that has been crushed and seared to an 8 to 20-mesh size. This material can be placed at depth in dry holes but hydrates quickly when placed into water. It often sticks to wet borehole walls and bridges when placed through water. Granular material is best suited for use in the unsaturated zone with enough water added to provide adequate hydration.

6.13.3.1 Fines can clump when in contact with water **(1)**. Fines result from mechanical breakdown of the material during shipping. Granular bentonite should be poured slowly to reduce the potential for bridging. In some situations, a pour rate not exceeding 50 lb (227 Kg) in 5 min has been used successfully **(1)**.

6.13.4 *Powdered*—Untreated, seared, and ground bentonite that passes through a 200-mesh screen. It is designed to be used in drilling fluids (muds) and as an additive to other plugging materials such as cement. Bentonite powder slurry can become an effective grout material when combined with density-increasing additives and swelling inhibitors. Powdered bentonite should not be placed in dry form through water as it can bridge and stick to the borehole walls.

6.13.5 *High Solids Clay Grout*—This material is a blend of

powdered polymer-free bentonite clays mixed with fresh water that forms a slurry with a minimum 20 % solids by weight and a density of 9.4 lb/gal (1126m^3 Kg/L). The slurry sets to a low-permeable plastic grout that generates no heat of hydration and does not shrink during curing in the presence of moisture. High solids clay grouts are commonly used for borehole plugging.

6.14 *Other Materials*:

6.14.1 A number of other materials have been used for plugging:

6.14.1.1 Attapulgite clay (may have applicability when used with a salt cement grout),[7]

6.14.1.2 Fire clay,

6.14.1.3 Commercial packing materials, and

6.14.1.4 Packers.

6.14.2 These materials are either inappropriate for use in decommissioning wells or boreholes where hazardous waste are encountered, or are not well studied for decommissioning wells in hazardous waste situations. Therefore, they are not discussed in this guide.

6.14.3 Other materials have been used in the past for plugging wells and boreholes. Such materials as wooden or lead plugs should not be used because wood plugs may decay and lead is a potentially hazardous material. Mechanical packers composed of steel, plastic, or other materials can be used to assist in plugging.

7. Procedure

7.1 The primary purpose of most boreholes and monitoring wells is to monitor chemical compounds in the soil and ground water; however, there are other uses for subsurface monitoring including the measurement of temperature, soil gas sampling, or measurement of geophysical parameters. Use significant care in planning and implementing the decommissioning activity. It is important to obtain any required approvals from regulatory agencies, land owners, responsible parties, and other parties involved with the site. The following subsections present a recommended list of tasks in order that the decommissioning activity is successfully completed. Several of the steps outlined below do not pertain to boreholes and may be omitted.

7.2 *Planning*:

7.2.1 *Records Review*—Carefully review all available records and information relating to use of the monitoring well, borehole, etc. This review may include the following information:

7.2.1.1 Review applicable Federal, state, and local regulations relating to decommissioning activities. This may include contacting the applicable state or local agency having jurisdiction over drilling activities and preparation of the necessary documentation to drill (start card),

7.2.1.2 Collection of drillers' logs, geophysical logs, well construction, or geologic logs, including stratigraphy, structural geology, subsurface information, construction materials, screened interval, depth, hydraulic gradients (if water levels are available from other wells for its determination), legal location, date of installation, and photographs of the well,

7.2.1.3 Review of analytical chemical data for soil and ground water over the life of the well, and variations in water levels over time,

7.2.1.4 Review of records of the repairs, modifications, or other changes made to the well during the lifetime of the well,

7.2.1.5 Evaluation of historic, current, and planned land use,

7.2.1.6 Interviews with local workers and collection of other pertinent data such as discussing site conditions with local drillers, and

7.2.1.7 While not directly part of the decommissioning activity, proper disposal of displaced fluids and other materials (such as pulled or drilled out casing and cement seals) should be considered. Some of these materials may be classified as a hazardous waste under Federal, state, or local regulations. Conduct a review of these regulations and appropriate analytical documentation prior to classifying a material as a hazardous waste.

NOTE 9—This information may be summarized in a work plan. A work plan would also include a description of the site geology and hydrogeology and the decommissioning method to be used.

7.2.2 *Verification of Field Data*—The variety and quality of field practices and reporting require that the well be inspected to verify the actual field situation prior to decommissioning the well. The following list of procedures is recommended so that the actual condition of the well is known. Some of the borehole geophysical logs may not be applicable or may not be available for small diameter (2 in. (5.08 cm) or less) holes or wells.

7.2.2.1 Inspection of well head installation for integrity,

7.2.2.2 Current depth measurement of the casing and well. (The original depth of the borehole may be different than the well.),

7.2.2.3 *Water Quality Sampling and Analysis*—A final water quality sample taken from the well may be required for regulatory purposes;

7.2.2.4 *Downhole Inspections*—Including caliper logs to measure inside diameter; television logs to determine in-well conditions such as casing breaks, screen size, etc.; gamma logs to verify geologic information, if not already available; cement bond logs (sonic) to determine if the casing is firmly attached to grout (presently available for holes 2½ in. (6.35 cm) or larger in diameter); flow logs (flow meter or spinners) to determine if vertical flow occurs within the casing; and hydraulic integrity test to determine if the well casing is intact.

NOTE 10—Care should be taken in running any of these tools in a well with a collapsed or broken casing, or in boreholes that may collapse on the tool. Tools with active radioactive sources should not be used under these circumstances. Conduct downhole inspections only after obstructions are removed from the well casing or borehole.

7.2.2.5 Contact local owner, resident operator/observer to verify operations at the site.

7.2.2.6 Verification of field data is an ongoing responsibility. Use verified information to modify plans in order that the decommissioning activity is correctly conducted. Continue this activity during the field phase and change specifications as needed.

7.2.3 *Review of Decommissioning Options*—After the records have been thoroughly reviewed and verified in the

[7] Sutton, Fred, Personal Communication, 1990.

field, select an appropriate decommissioning procedure. Evaluate each possible option to determine the most appropriate method for the selection. The following list of evaluation criteria is recommended:

7.2.3.1 The potential for fluid movement from one aquifer into another by means of the borehole or well should be eliminated.

7.2.3.2 Materials to be used in plugging must be compatible with well casing and screen (if left in place), and with subsurface formation and ground water, etc. over the period of time hazardous materials are found at these sites.

7.2.3.3 Future land use (as is known at the time of decommissioning) should be compatible with decommissioning plans.

7.2.3.4 Closure options should be compatible with applicable federal, state, and local requirements.

7.3 *Implementation*:

7.3.1 *Field Procedure*:

7.3.1.1 Satisfactory completion of decommissioning is the primary purpose of this guide. All work performed on the borehole or well should be completed by competently trained drillers, equipped with appropriate tools, under the direction of a geological or engineering professional who is qualified to certify that the decommissioning is completed according to the planned procedures and is consistent with applicable regulations.

7.3.1.2 Approve any modifications to the proposed work plan and record in writing by the on-site geologist or engineer (or their representatives) prior to implementation.

7.3.1.3 The geologist or engineer should be on-site during the field activities to verify that the activities are completed as planned. Decommissioning operations can be successfully accomplished by careful planning and documentation (see 7.5). Maintain documentation of decommissioning activities for the post-closure period or period required by regulations (if specified). While regulations may require documentation for a period of 30 years, it is advisable to continue this activity for a period lasting as long as hazardous materials occur at the site.

7.3.1.4 Remove casing from the ground by either pulling or overdrilling (see 7.3.7). Depending upon construction, it may be necessary to leave the casing in place and produce suitable perforations in the screen and blank casing to allow for the plugging material to penetrate the annular space and formation (see 7.3.7). If grout in the annular space can be verified to be in good condition, the well can be decommissioned by cutting the blank casing and filling the screened interval with grout. Verifying the integrity of grout may be difficult to impossible. If a filter pack is present, it may be necessary to remove the filter pack after perforating the casing by washing or overdrilling. Several of the methods identified in this subsection are briefly discussed in the Appendix X1.

7.3.1.5 If well construction conditions are not adequately known and the well site contains hazardous materials, it may not be appropriate to remove the casing and screen, as this may increase the mobility of hazardous materials.

7.3.1.6 The borehole or well, or both, may require preconditioning for decommissioning to be successful. Preconditioning can reduce the potential for sloughing of the borehole wall if for example, a sodium montmorillonite clay occurs naturally in the formation and cement is used as the plugging material. The calcium contained in Portland cement exchanges with the sodium cation in bentonite clay decreasing the water contained in the clay and inducing sloughing. This problem can be significant in sediments or rocks that are under considerable pressure, causing a loss in part of the hole, thereby not completely plugging the borehole and possibly causing loss of all downhole equipment. These conditions are usually known by local drilling and well servicing contractors who should be contacted prior to the start of field operations.

7.3.1.7 Preconditioning consists of removing mud from borehole walls (when mud is used for drilling the borehole), or stabilizing a borehole prior to placement of the plugging material. If a drilling mud has been used to drill a borehole, preconditioning can involve the circulation of a high-quality, low-solids drilling fluid to remove gelled mud from the borehole and borehole walls prior to plugging. For the above situation, a high-quality bentonite or drilling fluid can be used. If a drilling mud is used as the plugging material, prepare fresh mud. The mud used in drilling contains cuttings and may also not have suitable properties **(13)**. The selection and use of material(s) should meet the requirements specified in Section 6.

7.3.2 *Volume of Plugging Material Required*:

7.3.2.1 The geologist or engineer should calculate the volume of plugging material required for the borehole or well after first taking into consideration applicable loss of material to the formation, voids intersecting the borehole, changes in borehole diameter, washout zones, and swelling or shrinkage of material. An approximation of the volume of material that may be required can frequently be provided by contacting local drillers or professionals.

7.3.2.2 Loss of plugging material into the formation may occur rapidly (within minutes) or after several hours or days. The volume of plugging material required to be on-site should be at a minimum, enough to fill one borehole volume, however, it is advisable to have available a minimum of 25 to 50 % in excess of the calculated borehole volume **(1, 2)**. Additional plugging material should be readily available to site personnel under short notice, especially if it is common to lose plugging material into the formation or the material is required for clearing a hole (see 7.3.8.2).

7.3.2.3 A caliper log is helpful in boreholes or overdrilled holes to define hole diameter. If this information is not available, use an estimate of borehole diameter from the available well construction specifications. Calculate the volume of the borehole using the following:

$$v = \pi r^2 L \quad (1)$$

where:

v = volume,
L = length of borehole or well to be plugged, and
r = radius of hole.

7.3.2.4 Manuals listing the volume of a hole per linear foot (metre) such as Ref **(3)** can also be used. These manuals are available through major deep well cementing service companies. Assume in the calculations or table used that the derived

volume is the minimum required for actual conditions due to possible loss of plugging material into the formation. Verify grout emplaced through estimating the volume of material leaving the hole for holes filled with mud or water. For all boreholes, measure the volume of material emplaced and check for the appearance of the material at the top of the interval grouted or land's surface, whichever is applicable.

7.3.2.5 Location of the grout at depth can be difficult because the top of the grout may not be able to be distinguished from water or other fluids in the borehole. One field procedure that has been applied to measure the level of the grout is to use a wooden sounding block with a weight attached to the block. The weight should be slightly denser than the grout.

NOTE 11—Location of the depth of plugging material in a borehole or well does not confirm that the plug has performed its intended purpose. Plugging materials may not have adhered to the walls of the borehole or well or may have been bypassed from the target zone. Therefore, placement of plugging materials is highly dependent upon proper preparation of the hole.

7.3.2.6 In areas where coarse materials are encountered, or considerable fracturing or solution openings occur, two or three times the calculated volume of material may be required to fill the hole. In extreme cases such as in some karst terrains where large conduits may exist, it may be difficult to plug a well or borehole. In these situations, packers can be used to isolate critical intervals for filling with plugged materials above or below the karstic formations. Packers may also be used to isolate critical intervals within a well or borehole throughout the entire depth.

7.3.3 *Quality of Water Used for Grout*—Grout must be carefully mixed using water of a known chemical quality. The quality of the water must be compatible with the grouting material and not introduce contamination into the subsurface. For cement, water used should be free of silt, organic matter, alkali compounds, and have a total solids content of 500 mg/L or less **(14)**. The grout should be weighed using a mud balance.

NOTE 12—Thicker grout mixtures may have greater effectiveness in plugging highly permeable materials or materials with large voids, but may be very difficult to pump through a grout pipe. Less viscous mixtures are easy to pump, but may be too mobile, have greater shrinkage, and take longer to set if additives to compensate these problems are not added.

7.3.4 *Mixing of Cement and Bentonite On-Site*—Both cement and bentonite can be mixed on site. Cement can also be purchased from a contractor and delivered premixed on site, provided the water used is of known and acceptable quality.

7.3.5 *Use of Curing Accelerators*—Curing accelerators can be used to hasten the initial set time for cement from 6 to 8 h to perhaps 2 or 3 h, provided the accelerator (typically calcium chloride, sodium chloride, aluminum powder, or gypsum) does not degrade the cement or react with the environment. The use of these materials may also require approval by regulatory authorities.

7.3.6 *Decommissioning of Boreholes*:

7.3.6.1 To achieve an effective seal, the borehole should be free of debris and foreign matter that may restrict the adhesion of the plugging materials to the borehole wall. Clear boreholes of excessive mud filtercake, or gelled mud (if used) and any bridges resulting from the removal of temporary casing, or when noncohesive materials (such as sand and gravel) are encountered that can lead to a collapsed borehole during decommissioning activities.

7.3.6.2 One method commonly used for effective removal of these materials is to advance a small grout pipe to the bottom of the borehole by use of water or a high-quality bentonite slurry and flush the hole. Flushing is continued until the blockage is removed, or noncohesive formations are stabilized. Use at least two borehole volume of materials. If the flushing fluid returning to the surface contains potentially hazardous materials, it may be necessary to place this material into containers for proper disposal.

7.3.6.3 As soon as the borehole is prepared, pump plugging material slowly through a grout pipe to displace the flushing fluid. Inject grout starting from the bottom of the hole, forcing other fluids upward. Complete grouting slowly to prevent channeling of the grout around any undesirable material remaining in the hole. Complete this operation in one continuous operation. Raise the grout pipe when pumping pressure increases significantly, or when undiluted grout reaches the surface. Regularly sample and evaluate overflowing grout for weight, presence of foreign material, or other changes. When the overflowing grout is similar to that being pumped down the hole, the plugging is considered complete.

7.3.6.4 Grout pipes should be the largest diameter that is practical for field operations to reduce the required pumping pressure. Cut the lower end of the pipe at an angle to allow for the side discharge of the grout. Side discharge reduces the potential for erosion of the borehole wall. Typically, heavy-walled PVC (Schedule 40 or greater) or thin-walled steel pipe is used for grouting purposes. Use caution while grouting deeper holes in order that downhole pressure does not exceed the rupture strength of the grout pipe.

7.3.6.5 Grouting of shallow auger holes or other boreholes where grout pumping equipment is not readily available may be accomplished by placing grout through a side discharge grout pipe that has a funnel attached to the top. As the grouting progresses, slowly raise the pipe. Take care when using this procedure, as the low placement pressure may not completely fill or flush undesirable materials from the borehole. This procedure is only recommended when the entire borehole depth is 10 to 15 ft (3 to 4.6 m) or less.

7.3.6.6 Small diameter (<2-in. (5.08 cm-mm)) holes are difficult to plug. A small diameter (¾-in. (1.9 cm-mm)) grout pipe can be used, however, high-pumping pressures may be required or less viscous plugging materials may be necessary.

NOTE 13—It is important to avoid hydrofracturing or blowout in shallow holes in unconsolidated materials when pressure grouting. A general rule to avoid hydrofracturing is to restrict pumping pressure to about 0.6 lb/in.^{2}(0.42 Kg/cm^2) of hydraulic pressure for each foot (metre) of overburden. In some instances, the pressure used must be reduced further.

7.3.6.7 A conservative method **(15)** of calculating maximum pressure is as follows:

$$Pm = (0.733 - 0.433\,Sg)d \quad (2)$$

where:

Pm = pressure of fluid injected at wellhead, lb/in.^{2}(Kg/cm^2),
Sg = density (specific gravity) of the plugging material (grout) (unitless), and
d = depth measured for the surface to the opening of the grout pipe (metres) feet.

Hydrofracturing typically occurs during start-up or restart of grouting.

7.3.6.8 Inject grout at the bottom of the hole, displacing grout, loose formation materials, and borehole fluids upward. Slowly pump grout to avoid channeling. Do this in one continuous operation. Raise the grout pipe when grout can no longer be easily forced from the pipe into the hole or when undiluted grout reaches the top of the hole and flows out. Sample and weigh this material. The weight of the grout returning to the surface should be the same as the grout pumped into the hole.

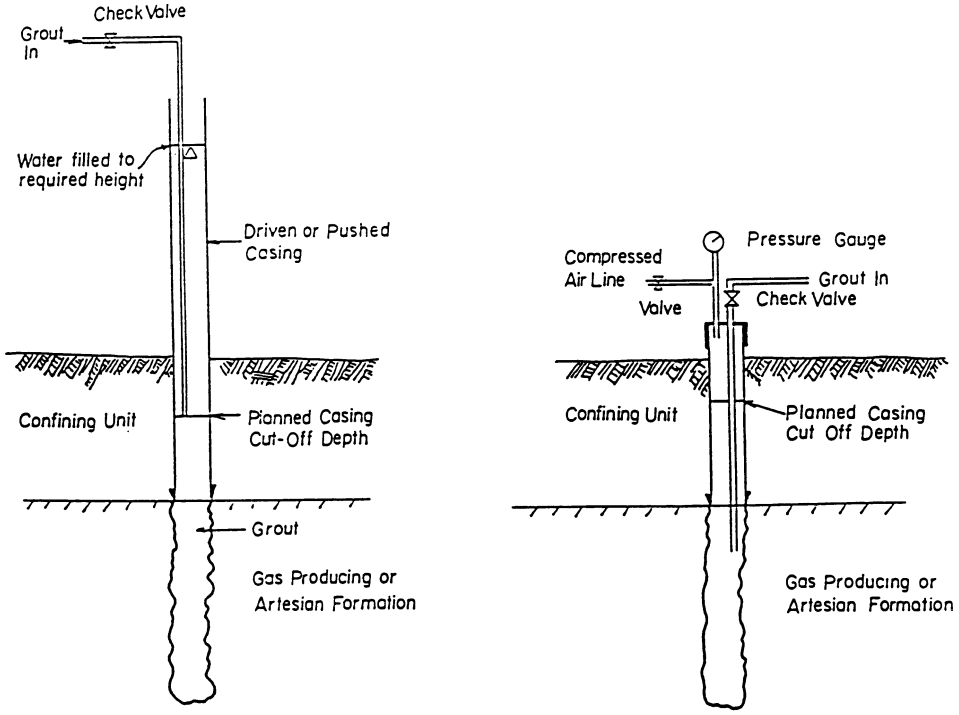
7.3.7 *Control of Elevated Formation Pressures*—Occasionally, a borehole or well may penetrate a formation that is under confined conditions (artesian head), or from which a gas is being released, under pressure. (Gas bubbling upward through the grout may result in open channels, or increase the permeability of the grout.) When this condition is encountered, sealing of the borehole requires that the grout pressure be maintained greater than the formation pressure until initial grout set occurs. The "shut-in-pressure" of the formation can usually be determined by use of pressure gages attached to a casing that has been pushed or driven into the confining unit. This casing must be tightly sealed to prevent leakage around its annulus. (Separate packers or casing grout, or both, may be required to prevent leakage around the casing.)

7.3.7.1 Several procedures may be used to balance the formation pressure until the initial set of the grout has occurred. (See Fig. 2.) The procedure most often used to contain the pressure is to use a sufficient column of grout. If additional head pressure is required, increase the unit weight of the grout by the addition of sand, densifying additives (barite, or hematite) or decreasing the water cement ratio. Another alternative commonly used is to pump the grout through a check valve into the casing until the top of grout reaches the desired elevation. Maintain pressure above the grout by use of compressed air, or by use of a simple standpipe filled with water. If the standpipe procedure is used, pump grout through a tremie pipe extending through the water to prevent dilution.

7.3.7.2 After the initial grout set has occurred (minimum 24 h), the sustaining pressure (above atmospheric pressure) may be released. However, record the air pressure (or fluid level) in the air filled casing above the grout frequently for several days to verify that no leakage is occurring. If gas (of any variety) is present in the formation, analyze a sample of the air from the casing above the grout. Care should be taken under these conditions, as explosive or hazardous conditions may be present. Methane, the most commonly produced gas, is odorless, colorless, toxic, and extremely flammable. Safety precautions are advised.

7.3.7.3 Only after testing results confirm that the seal is effective, is it advisable to complete the permanent closure or removal of the near (or above) surface casing.

7.3.7.4 Measure any fallback or settlement of the grout surface (whether by gravity or under pressure) that occurs after grout emplacement to the nearest foot and record. Correct any fallback with native or imported materials to grade, or to a



Stand Pipe To Contain Excess Formation Pressure

Compressed Air To Contain Excess Formation Pressure

FIG. 2 Two Procedures That Can Be Used to Overcome Elevated Formation Pressure

specified depth below grade, such as below the plow layer. The depth is based on existing and proposed land use and regulatory requirements.

7.3.8 *Decommissioning of Wells and Other Monitoring Devices*:

7.3.8.1 This discussion has applicability in decommissioning ground water monitoring and injection wells and soil gas monitoring wells, neutron probe access tubes, lysimeter and tensiometer and installations, and similar devices. Appendix X1 should be consulted for additional information.

7.3.8.2 It is desirable to remove all existing well construction materials such as screen, casing, filter pack, seal, and grout from the hole to reduce the potential for the formation of a vertical conduit to occur at the contact between casing and annular seal; reduce the potential of these materials interfering with the decommissioning operation; decrease the potential of a reaction between the materials used; or to minimize the reaction with the native materials or ground water. In situations where well materials are removed and borehole collapse occurs, redrill the borehole following the guidance provided in 7.3.6.

7.3.8.3 Steel casing may be removed using jacks to free casing from the hole followed by lifting the casing out by using a drill rig, backhoe, cranes, etc. of sufficient capacity. If the annular space has been cemented over a long distance, this method may not be readily used unless a poor contact occurs between the casing and borehole. Small lengths of cement (typically less than 10 ft (3 m)) can be removed along with the casing if the drill rig has sufficient lifting capacity. When the casing cannot be removed, perforate the casing and screen using a suitable tool. This is necessary as encrustation or corrosion of the screen can block or completely close openings. A wide variety of commercial equipment is available for perforating casings and screens. Due to the diversity of application, consult an experienced contractor prior to selection of the technique. A minimum of four rows of perforations several inches (millimetres) long and a minimum of five perforations per linear foot (metre) of casing or screen is recommended.

7.3.8.4 Remove steel casing by overdrilling (overreaming) the casing. Overreaming can be done using an overreaming tool (see Fig. 3). Select a pilot bit that is nearly the same size as the inside diameter of the casing. The reaming bit should be slightly larger than the borehole diameter to remove all well construction materials and a small amount of native material. As drilling proceeds, the casing, grout, bentonite seal, filter pack, and other well materials are destroyed and returned to the surface. In situations when the grout in the annular space can be verified to be in good condition, it may be very difficult to remove casing and grout and grout can be left in place by pressure grouting the screened interval and casing. Verifying the integrity of the grout can be difficult.

7.3.8.5 PVC and other low tensile strength materials generally cannot be removed by pulling if they have been properly cemented into place. Overdrilling is necessary to remove these casing and screen materials.

7.3.8.6 A hollow stem auger equipped with outward facing carbide cutting teeth with a diameter 2 to 4 in. (50.8 to 1016 cm) larger than the casing may be used for overdrilling. Place the lead auger over the casing and rotate downward (see Fig. 4). The casing guides the cutting head and remains inside the auger. When the full diameter and length of the well has been penetrated, the casing and screen can be retrieved from the center of the auger. It is important to use outward facing cutting teeth in order that the cutting tool does not sever the casing and drift off center. An alternative is to install a steel guide pipe inside the well casing so that the augers can be centered.[8] Firmly attach this temporary working pipe to the inside of the casing by use of a packer, or other type of expansion or friction device. When the auger reaches full depth and the well materials have been removed, pump plugging materials through the hollow stem as the augers are withdrawn.

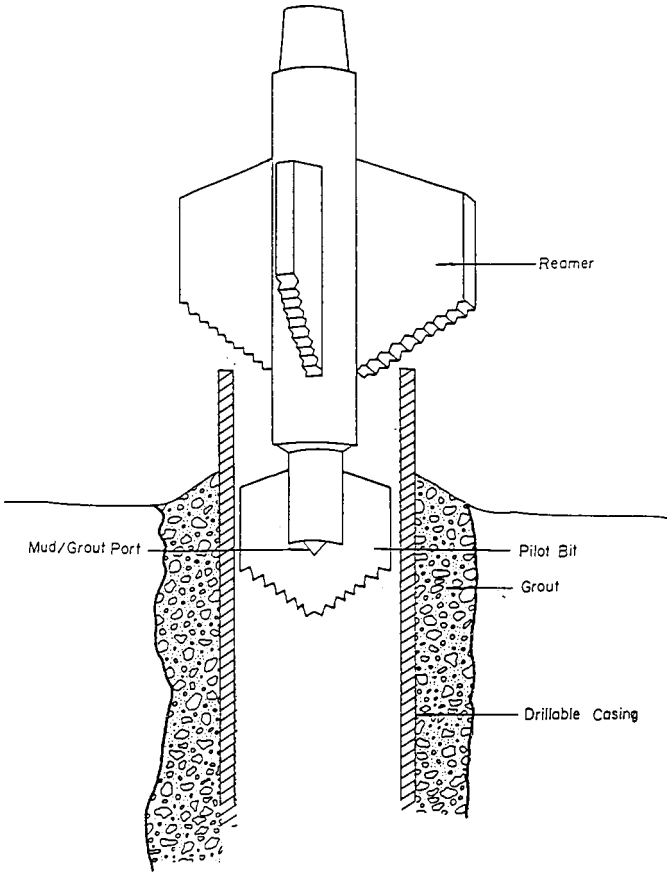


FIG. 3 Over Drilling by Mud Rotary Procedure

NOTE 14—Local regulations may allow leaving the PVC casing in place, if a good annular seal exists, or just removing blank casing if the integrity of the annular seal can be documented. It is generally difficult to document a good annular seal (tight fit, no fractures or channels) without the use of a cement bond log or similar method. A cement bond log cannot be run in small diameter wells (less than 2.5 in. (6.35 cm) in diameter) because a small diameter tool is not currently available. Also, this method is not reliable for PVC casings.

7.3.8.7 After removal of the casing, decommissioning can be completed in accordance with 7.3.6.

NOTE 15—Wells with a maximum depth of 10 to 15 ft (3 to 4.6 m) can be removed by overdrilling, or when possible by pulling the casing out of

[8] Baker, Robert, Personal Communication, Layne Environmental, 1990.

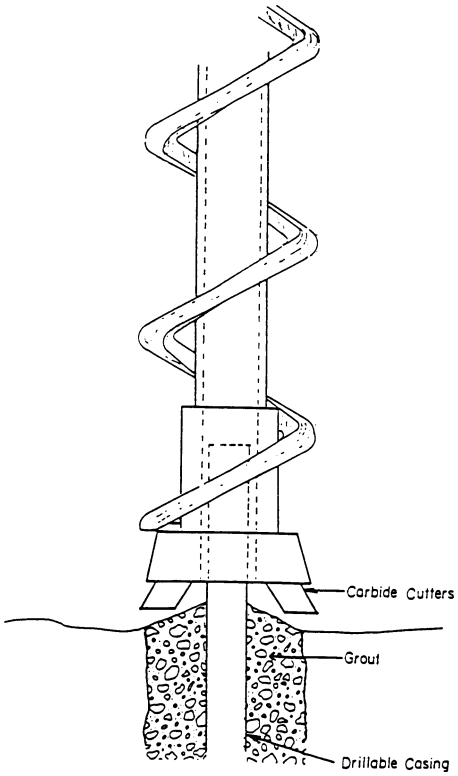


FIG. 4 Over Drilling by Hollow Stem Auger Procedure

the ground. The open hole is then filled with grout or other suitable plugging materials. A tamping rod can be used to tamp the material into place.

7.4 *Decontamination of Downhole Equipment*:

7.4.1 If hazardous waste or other contaminants occur at the site, decontaminate all tools placed into the borehole or well prior to entry (see Practice D 5088). Follow state and local regulations, if applicable. A hot water pressure wash or steam cleaning are examples of two typical decontamination methods. Other methods such as the use of solvents followed by rinsing with clean tap water and allowing equipment to air dry may also be acceptable. Also contain water and other materials used for decontamination for chemical analysis to determine proper disposal methods.

7.4.2 Do not flush grout pipes out with water while in or above the hole. Conduct all cleaning operations aboveground and manage appropriately as a hazardous or nonhazardous situation depending upon chemical analytical data on the site.

7.5 *Documentation*:

7.5.1 *Inspection Records*—The primary purpose of records of field work is to provide that appropriate measures have been taken so that the borehole or monitoring well is permanently decommissioned in a manner that minimizes it from being a conduit for fluid, water, or vapor migration. Properly decommissioned boreholes and wells should have no adverse influence on the local environment than the original geological setting.

7.5.2 *Narrative Report*—Maintain the narrative report of activities as a permanent record of the decommissioning activities and include the full set of field activities including:

7.5.2.1 Decommissioning date,

7.5.2.2 Personnel (with listing of company representation, including phone number and address),

7.5.2.3 Source of decommissioning method,

7.5.2.4 Step-by-step procedures used in the field,

7.5.2.5 Record of all measurements made, depths encountered, types and volume of fluids pumped and photographs before and after, and

7.5.2.6 All other pertinent information that is required based on site conditions or regulatory requirements. Any problems encountered should also be documented in detail.

8. Report

8.1 At the completion of field work, present a formal report to document the entire procedure used in the decommissioning process for the borehole or well. Additional information or requirements may be specified in government regulations and should also be included in this report. Report in detail the following items as a minimum:

8.1.1 *Background Information*:

8.1.1.1 Location of the borehole/well,

8.1.1.2 Purpose of the borehole/well,

8.1.1.3 History of the borehole/well,

8.1.1.4 Chemical parameters and concentrations present during the active life of the well and at the time of plugging; and

8.1.1.5 Information collected prior to the inspection record.

8.1.2 *Testing Prior to Decommissioning*:

8.1.2.1 Site characterization (if applicable),

8.1.2.2 Physical testing (depth, structural condition, etc.),

8.1.2.3 Chemical testing results (last chemical analysis for record), and

8.1.2.4 Geophysical logging results (if any).

8.1.3 *Decommissioning Design Procedure*:

8.1.3.1 Rationale for selection of method used, and

8.1.3.2 Presentation of a decommissioning plan.

8.1.4 *Field Implementation*:

8.1.4.1 Description of activities,

8.1.4.2 Variance from plan, and

8.1.4.3 Result of testing and measurements.

8.1.5 *Confirmation*—Statement of regulatory compliance.

9. Keywords

9.1 abandonment; decommissioning; ground water monitoring wells; hazardous waste; plugging

APPENDIX

(Nonmandatory Information)

X1. EXAMPLES OF SUCCESSFUL MONITORING WELL DECOMMISSIONING PRACTICES

X1.1 This appendix covers a general discussion of field procedures that have been used to decommission monitoring wells. These procedures are presented to provide technical guidance to assist in the development of decommissioning wells or boreholes. Local regulations may not allow implementation of some procedures. Two subsets of procedures are outlined, one for rigid steel casing and the second for lower tensile strength casing materials (plastic).

X1.2 *Steel Casing:*

X1.2.1 *Condition*—Properly grouted steel casing and screen, difficult to pull casing:

X1.2.1.1 *Suggestion*—Pressure pump plugging materials into well to above aquifer, place 3-ft (.91-mm) plug of plastic material (bentonite plug) above rigid plug then complete with rigid plugging material to surface. Place a PVC or neoprene plug or packer, located at the base of the rigid (cement) material to reduce the co-mingling of fluids due to different specific gravities. Complete decommissioning at surface according to local regulations.

X1.2.1.2 *Alternative*—Perforate steel casing and screen to allow plugging material to come into contact with the annular space and formation.

X1.2.1.3 *Advantage*—If (when) casing material corrodes, the continually plastic bentonite plug will continue to provide a suitable sealing zone.

X1.2.2 *Condition*—Steel well materials, that are removable:

X1.2.2.1 *Suggestion*—Pull screen and casing, then redrill borehole to original depth using slightly larger diameter drill bit than the borehole. Complete closure by pressure sealing the borehole by grout pipe from bottom to top.

X1.2.2.2 *Advantage*—Casing and annular materials are completely removed and replaced with sealing material of equal or lower permeability (saturated zone) than the native geologic materials.

X1.2.3 *Condition*—Shallow screened well completed into permeable sand or gravel aquifer:

X1.2.3.1 *Suggestion*—Pull the casing and screen (grout also, if possible) then redrill the borehole to original depth. Completion should be by pressure sealing to the surface.

X1.2.3.2 *Advantage*—The possibility of hydraulic connections with the surface is greatly reduced.

X1.2.4 *Condition*—Steel casing and screen set into highly permeable formation (such as fractured limestone) that results in lost fluid circulation during drilling or decommissioning procedures:

X1.2.4.1 *Suggestion*—Fill highly permeable section with quick setting cement grout (addition of calcium chloride), or coarse gravel to base of casing, or hang “cement basket” at base of casing. Complete decommissioning with plugging materials pumped into place, including at least one section of permanent plastic seal.

X1.2.4.2 *Advantage*—Extremely permeable or highly cavernous materials may not be able to be filled sufficiently to allow closure similar to other cases. In such situations, prevention of vertical migration of fluids to or from that zone is the primary purpose of decommissioning.

X1.3 *Low-Tensile Strength Materials (that is, PVC, ABS, PTFE):*

X1.3.1 *Condition*—Properly constructed well that has a sealed annulus from the surface to the top of screen:

X1.3.1.1 *Suggestions*—Pressure grout in place after perforating the entire casing so that the screen and gravel pack are filled with grout; or over-ream the well using a drill bit diameter that is a minimum or slightly larger than the diameter of the annular space.

X1.3.2 *Condition*—Annulus is not permanently sealed and casing/screen cannot be pulled:

X1.3.2.1 *Suggestion*—Overdrill casing, screen and filter pack with a hollow stemmed auger or other suitable drilling method. Remove casing from bottom to top as augers are removed.

X1.3.2.2 *Advantage*—Complete well structure is removed. Grouting materials provide no avenue of fluid or gas migration after decommissioning.

X1.3.3 *Condition*—Annulus seal questionable; casing screen cannot be pulled:

X1.3.3.1 *Suggestion*—Use rotary tools equipped with pilot bit. Large portion of bit must be equal to or larger than diameter of original borehole. Drill out casing, annular material, to depth of well. Pressure seal after tools are removed.

X1.3.3.2 *Advantage*—Complete well structure is removed. Grouting materials do not provide pathways for fluid or gas migration after decommissioning.

X1.3.4 *Condition*—Annulus seal questionable, casing and screen may be pulled from firm clay soils:

X1.3.4.1 *Suggestion*—Use pulling rig equipped with down hole casing latch tool. Anchor tool at bottom of well and lift casing and screen. Pressure grout open hole from bottom to top. (This method may have applicability for shallow wells.)

X1.3.4.2 *Advantage*—This method is often possible in firm clay soils. Requires less expensive equipment than other procedures.

X1.3.5 *Condition*—Vadose zone monitoring devices such as lysimeters, tensiometers, neutron access holes, and similar devices installed vertically:

X1.3.5.1 *Suggestion*—Drill out the device and backfill as suggested in 7.3.8.5 and 7.3.8.6. (See also Note 15 in the text.)

X1.3.5.2 *Advantage*—The device and materials used to construct the device are removed reducing the potential for fluid movement from the surface to underlying materials and ground water.

REFERENCES

(**1**) Gaber, M. S., and Fisher, B., *Michigan Water Well Grouting Manual*, Michigan Department of Public Health, Lansing, MI, 1988, pp. 83.

(**2**) Roscoe Moss Company, *Handbook of Ground Water Development, Chapter 12, Water Well Cementing*, John Wiley, New York, NY 1990, pp. 232–252.

(**3**) Dowell Division of Dow Chemical, U.S.A., *Engineer's Handbook*, Houston, 1983, p. 77.027.

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(**5**) George, Charles, and Bruce, T., "Cementing to Achieve Zone Isolation in Disposal Wells," in *International Symposium Subsurface Inspection of Liquid Wastes*, NWWA, New Orleans, LA, March 3–6, 1986, pp. 77–89.

(**6**) Anonymous, "Special Cements and Their Uses," *Concrete Construction*, Vol 18, No. 1, January, 1973, pp. 3–7.

(**7**) Berry, E., and Malhortra, V., "Fly Ash for Use in Concrete—A Critical Review," *Journal of the American Concrete Institute*, Vol 77, No. 2, 1980, pp. 57–73.

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(**9**) Dowell Schumberger, *Cementing Technology*, Nova Communications Ltd., New York, 1984.

(**10**) Creech, John, 1986, "Class I Injection Well Design Considerations Using Fiberglass Tubular and Epoxy Cement," *Proceedings of International Symposium Subsurface Injections of Liquid Wastes*, New Orleans, LA, March 3–5, 1986.

(**11**) Cole, Robert C.," Epoxy Sealant for Combating Well Corrosion," *International Symposium on Oilfield and Geothermal Chemistry*, SPE of AIME, Houston, 1979.

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(**14**) Smith, D. K., Cementing, "Society of Petroleum Engineers Monograp Series," Vol 4, *Society of Petroleum Engineers of AIME*, 1976.

(**15**) U.S. EPA, "Construction Requirements for Wells Authorized by Rule," 40 CRF 147.2912b(1), (*Subpart GGG, Osage Mineral Reserve, Class II Wells*), 1988.

(**16**) Portland Cement Association, *Design and Control of Concrete Mixtures*, Skokie, IL, 1979.

(**17**) Lutenegger, A.J., DeGroot, D.J., Mirza, C., and Bozozuk, M., *Recommended Guidelines for Sealing Geotechnical Exploratory Holes*, Report 378, National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 1995.

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Attachment B
Monitoring Well Abandonment Log and Monitor Well Abandonment Record

Monitoring Well Abandonment Log

AECOM Personnel: _____

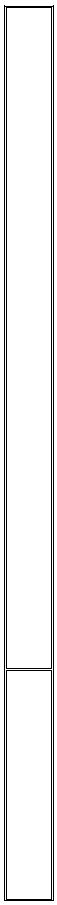
Date: _____

Location:	**Address:**
Monitoring Well ID:	**Township:**
Depth to Water:	**County:**
Bottom of Screen Depth:	**Casing Size:**
	Contractor:

Well Materials Removed	**Y**	**N**
Casing Cut	**Y**	**N**

Above Ground

Flush Mount



Top of Screen:

Bottom of Screen:

Notes:

MONITOR WELL ABANDONMENT RECORD

Site Name: _____ County: _____

Section: _____ Town: _____ Range: _____ MW#: _____

Date Installed:_____ Date Abandoned:_____ Drilling Co.:_____

Well Depth:_____ft. Confirmed Screen Depth:_____ft. Water Table Depth:_____ft.

Casing Type: PVC ___ Galvanized Steel ___ Stainless Steel ___ ID: 2" ___ 4" ___

Screen Type: PVC ___ Stainless Steel ___ Length: _____ft.

Annulus Grouted? Y ___ N ___ From: _____ft. To: _____ft. Grout Type_____

Casing Pulled? Y ___ N ___ Casing Cut? Y ___ @ _____ft. bgl N ___

Well Grouted? Y ___ N ___ Grout Type: Cement ___ Bentonite ___ Other ___ (specify)

Grouting Method Used: Through Casing ___ Tremie ___ Other ___ (explain below)

_____
_____
_____

Comments:_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

ATTACH COPY OF ORIGINAL WELL LOG IF AVAILABLE

Rev. 10/03/03

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix E

Level 1 Reviews of Laboratory Analytical Results

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

Project Name: Marshall Line 6B Incident
Laboratory: Alpha Analytical, Inc.
Laboratory Report No.: 1210081
Matrix: Sediment and Soil/Solid Quality Control Matrix

The laboratory report cited above contained the results for seven field samples.

Level 1 review was performed using the laboratory report and electronic data deliverable. The review included the following:

- Comparison of results to the requested analyses on the Chain-of-Custody;
- Verification of field sample IDs;
- Review of the sample receipt forms for proper sample preservation.
- Identification of potential data usability issues based on holding times, recoveries of surrogates, laboratory control samples, or matrix spikes, and/or quality control issues identified in the laboratory report narrative.

Criteria for assessing data usability were derived from the *USEPA National Functional Guidelines for Organic Data Review, USEPA National Functional Guidelines for Inorganic Data Review*, and the Kalamazoo River Analytical Quality Assurance Plan (version 2.2).

The following samples were reviewed:

Sample ID	Lab ID	Sample Date	Analyses
SEKR0000R024S092112D004_MDL1	1210081-01	09/21/2012	1,2
SEKR0000R024S092112D004_MDL2	1210081-02	09/21/2012	1,2
SEKR0000R024S092112D004_MDL3	1210081-03	09/21/2012	1,2
SEKR0000R024S092112D004_MDL4	1210081-04	09/21/2012	1,2
SEKR0000R024S092112D004_MDL5	1210081-05	09/21/2012	1,2
SEKR0000R024S092112D004_MDL6	1210081-06	09/21/2012	1,2
SEKR0000R024S092112D004_MDL7	1210081-07	09/21/2012	1,2

Analyses Performed Codes:
[1] Alkylated PAHs/Biomarkers by GC/MS Modified8270C-SIM
[2] Saturated Hydrocarbons by GC-FID Modified Method 8015D

Results:

- All requested analyses identified on the Chain-of-Custody were performed.
- Sample IDs match the Chain-of-Custody.
- Sample condition and preservation on receipt at the laboratory was acceptable.
- No significant data usability issues were noted; the data are therefore considered acceptable for use.

Project Name: Marshall Line 6B Incident
Laboratory: Alpha Analytical, Inc.
Laboratory Report No.: 1210082
Matrix: Sediment and Soil/Solid Quality Control Matrix

The laboratory report cited above contained the results for seven field samples.

Level 1 review was performed using the laboratory report and electronic data deliverable. The review included the following:

- Comparison of results to the requested analyses on the Chain-of-Custody;
- Verification of field sample IDs;
- Review of the sample receipt forms for proper sample preservation.
- Identification of potential data usability issues based on holding times, recoveries of surrogates, laboratory control samples, or matrix spikes, and/or quality control issues identified in the laboratory report narrative.

Criteria for assessing data usability were derived from the *USEPA National Functional Guidelines for Organic Data Review, USEPA National Functional Guidelines for Inorganic Data Review*, and the Kalamazoo River Analytical Quality Assurance Plan (version 2.2).

The following samples were reviewed:

Sample ID	Lab ID	Sample Date	Analyses
SEBC0000L012S092112D004_MDL1	1210082-01	09/21/2012	1,2
SEBC0000L012S092112D004_MDL2	1210082-02	09/21/2012	1,2
SEBC0000L012S092112D004_MDL3	1210082-03	09/21/2012	1,2
SEBC0000L012S092112D004_MDL4	1210082-04	09/21/2012	1,2
SEBC0000L012S092112D004_MDL5	1210082-05	09/21/2012	1,2
SEBC0000L012S092112D004_MDL6	1210082-06	09/21/2012	1,2
SEBC0000L012S092112D004_MDL7	1210082-07	09/21/2012	1,2

Analyses Performed Codes:
[1] Alkylated PAHs/Biomarkers by GC/MS Modified8270C-SIM
[2] Saturated Hydrocarbons by GC-FID Modified Method 8015D

Results:

- All requested analyses identified on the Chain-of-Custody were performed.
- Sample IDs match the Chain-of-Custody.
- Sample condition and preservation on receipt at the laboratory was acceptable.
- No significant data usability issues were noted; the data are therefore considered acceptable for use.

Project Name: Marshall Line 6B Incident
Laboratory: Alpha Analytical, Inc.
Laboratory Report No.: 1210083
Matrix: Sediment and Soil/Solid Quality Control Matrix

The laboratory report cited above contained the results for seven field samples.

Level 1 review was performed using the laboratory report and electronic data deliverable. The review included the following:

- Comparison of results to the requested analyses on the Chain-of-Custody;
- Verification of field sample IDs;
- Review of the sample receipt forms for proper sample preservation.
- Identification of potential data usability issues based on holding times, recoveries of surrogates, laboratory control samples, or matrix spikes, and/or quality control issues identified in the laboratory report narrative.

Criteria for assessing data usability were derived from the *USEPA National Functional Guidelines for Organic Data Review, USEPA National Functional Guidelines for Inorganic Data Review*, and the Kalamazoo River Analytical Quality Assurance Plan (version 2.2).

The following samples were reviewed:

Sample ID	Lab ID	Sample Date	Analyses
SEKR3510R018S092112D004_MDL1	1210083-01	09/21/2012	1,2
SEKR3510R018S092112D004_MDL2	1210083-02	09/21/2012	1,2
SEKR3510R018S092112D004_MDL3	1210083-03	09/21/2012	1,2
SEKR3510R018S092112D004_MDL4	1210083-04	09/21/2012	1,2
SEKR3510R018S092112D004_MDL5	1210083-05	09/21/2012	1,2
SEKR3510R018S092112D004_MDL6	1210083-06	09/21/2012	1,2
SEKR3510R018S092112D004_MDL7	1210083-07	09/21/2012	1,2

Analyses Performed Codes:
[1] Alkylated PAHs/Biomarkers by GC/MS Modified8270C-SIM
[2] Saturated Hydrocarbons by GC-FID Modified Method 8015D

Results:

- All requested analyses identified on the Chain-of-Custody were performed.
- Sample IDs match the Chain-of-Custody.
- Sample condition and preservation on receipt at the laboratory was acceptable.
- No significant data usability issues were noted; the data are therefore considered acceptable for use.

Project Name: Marshall Line 6B Incident
Laboratory: Alpha Analytical, Inc.
Laboratory Report No.: 1210001
Matrix: SOIL

The laboratory report cited above contained the results for seventeen field samples and two field duplicates.

Level 1 review was performed using the laboratory report and electronic data deliverable. The review included the following:

- Comparison of results to the requested analyses on the Chain-of-Custody;
- Verification of field sample IDs;
- Review of the sample receipt forms for proper sample preservation.
- Identification of potential data usability issues based on holding times, recoveries of surrogates, laboratory control samples, or matrix spikes, and/or quality control issues identified in the laboratory report narrative.

Criteria for assessing data usability were derived from the *USEPA National Functional Guidelines for Organic Data Review, USEPA National Functional Guidelines for Inorganic Data Review*, and the Kalamazoo River Analytical Quality Assurance Plan (version 2.2).

The following samples were reviewed:

Sample ID	Lab ID	Sample Date	Analyses
SBKR0000L204AS092712S006	1210001-01	09/27/2012	1,3
SBKR0000L204AS092712S006	1210001-01X3	09/27/2012	1,2
SBKR0000L206AS092712S005	1210001-02	09/27/2012	3
SBKR0000L206AS092712S005	1210001-02X3	09/27/2012	1,2
SBKR0225L502ABAS092712S004	1210001-03	09/27/2012	3
SBKR0225L502ABAS092712S004	1210001-03X3	09/27/2012	1,2
SBKR0250L526AS092712S006	1210001-04	09/27/2012	1,3
SBKR0250L526AS092712S006	1210001-04X3	09/27/2012	1,2
SBKR0250L526AD092712S006	1210001-05	09/27/2012	1,3
SBKR0250L526AD092712S006	1210001-05X3	09/27/2012	1,2
SBKR0250L541AS092712S005	1210001-06	09/27/2012	3
SBKR0250L541AS092712S005	1210001-06X3	09/27/2012	1,2
SBKR0250I514AS092712S005	1210001-07	09/27/2012	3
SBKR0250I514AS092712S005	1210001-07X3	09/27/2012	1,2
SBKR0250I514AS092712S015	1210001-08	09/27/2012	3
SBKR0250I514AS092712S015	1210001-08X3	09/27/2012	1,2
SBKR0375I501AS092812S004	1210001-09	09/28/2012	3
SBKR0375I501AS092812S004	1210001-09X3	09/28/2012	1,2
SBKR0600L503AS092812S005	1210001-10	09/28/2012	3

Sample ID	Lab ID	Sample Date	Analyses
SBKR0600L503AS092812S005	1210001-10X3	09/28/2012	1,2
SBKR0000R203AS092812S006	1210001-11	09/28/2012	1,3
SBKR0000R203AS092812S006	1210001-11X3	09/28/2012	1,2
SBKR0000R203AS092812S017	1210001-12	09/28/2012	1,3
SBKR0000R203AS092812S017	1210001-12X3	09/28/2012	1,2
SBKR0825I502AS092812S004	1210001-13	09/28/2012	3
SBKR0825I502AS092812S004	1210001-13X3	09/28/2012	1,2
SBKR0825I502AD092812S004	1210001-14	09/28/2012	3
SBKR0825I502AD092812S004	1210001-14X3	09/28/2012	1,2
SBKR1300R608AS092812S007	1210001-15	09/28/2012	3
SBKR1300R608AS092812S007	1210001-15X3	09/28/2012	1,2
SBKR2150R504AS092812S007	1210001-16	09/28/2012	3
SBKR2150R504AS092812S007	1210001-16X3	09/28/2012	1,2
SBKR3075L501AS092812S004	1210001-17	09/28/2012	3
SBKR3075L501AS092812S004	1210001-17X3	09/28/2012	1,2
SBKR2400R504AS092812S007	1210001-18	09/28/2012	3
SBKR2400R504AS092812S007	1210001-18X3	09/28/2012	1,2
SBKR2400R504AS092812S036	1210001-19	09/28/2012	3
SBKR2400R504AS092812S036	1210001-19X3	09/28/2012	1,2

Analyses Performed Codes:
[1] Alkylated PAHs/Biomarkers by GC/MS Modified8270C-SIM
[2] Saturated Hydrocarbons by GC-FID Modified Method 8015D
[3] Total Organic Carbon

Results:

- All requested analyses identified on the Chain-of-Custody were performed.
- Sample IDs match the Chain-of-Custody.
- Sample condition and preservation on receipt at the laboratory was acceptable.
- No significant data usability issues were noted; the data are therefore considered acceptable for use with the following advisories:

PAH, BIO, SHC all had MB detects <RL. Selected samples needed dilution due to targets over calibration range (PAH/BIO). Surrogate and matrix spike recovery criteria were exceeded in samples 1210001-09X3 and 1210001-15X3, respectively. All samples were noted to have limited volumes and plant material as well as high levels of contamination based on screening. 1210001-08 percent solids was < 30%, and several additional samples had percent solids <50%.

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix F

Waste Disposal

Hazardous Waste Manifests

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
MTK 752	1	218-261-366	007679738 JJK

GENERATOR

5. Generator's Name and Mailing Address

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name — U.S. EPA ID Number

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number

MIK 111224503

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.					
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name — Signature — Month — Day — Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name — Signature — Month — Day — Year

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month — Day — Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month — Day — Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
MIK 752 366 161	1	218-269-0366	007679738 JJK

GENERATOR

5. Generator's Name and Mailing Address
Enbridge Energy Partners
1601 Platt
Marshall, MI 49068
Generator's Phone: 218-269-0369

Generator's Site Address (if different than mailing address)
Enbridge Energy Partners
N 1/2 Section 2 T3S R6W
Marshall, MI 49068

6. Transporter 1 Company Name: Valley City Env
U.S. EPA ID Number: MID 981 956 063

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Plummers Environmental Services Inc.
10675 Sedrac Industrial Dr SW
Facility's Phone:
U.S. EPA ID Number: MIK 111229563

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Water (Not Regulated by USDOT or USEPA	001	TT	10,000	G	029L
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.) Non-Hazardous 800-878-3946

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Alison Schoeff (On behalf of Enbridge Energy, Limited Partnership)
Signature:
Month: 10 Day: 29 Year: 12

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Christopher G Ibbs
Signature:
Month: 10 Day: 29 Year: 12

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name:
Signature:
Month: Day: Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
MIK 752 366 161	1	215-264-0[illegible]	007679739 JJK

5. Generator's Name and Mailing Address
[illegible]
[illegible]
Generator's Phone: 215-264-0361

Generator's Site Address (if different than mailing address)
[illegible]
[illegible] T35 [illegible]
[illegible] MI 49068

6. Transporter 1 Company Name: [illegible]
U.S. EPA ID Number: MID 131 756 063

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Plummers Environmental Services Inc
10075 [illegible] Industrial Dr SW
Facility's Phone:
U.S. EPA ID Number: MIK 111 229 563

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Water (Not Regulated by USDOT [illegible])	[illegible]	TT	1000	G	024
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1) No Hazardous 500-575-3496

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: [illegible]
Signature: [illegible]
Month / Day / Year

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Christ[illegible]
Signature: [illegible]
Month / Day / Year

Transporter 2 Printed/Typed Name:
Signature:
Month / Day / Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month / Day / Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name
Signature
Month / Day / Year

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MIK 752 366 161
2. Page 1 of: 1
3. Emergency Response Phone: 218-269-0366
4. Manifest Tracking Number: 007679739 JJK

GENERATOR

5. Generator's Name and Mailing Address
Enbridge Energy Partners
1601 Pratt Marshall, MI 49068
Generator's Phone: 218-769-0369

Generator's Site Address (if different than mailing address)
Enbridge Energy Partners
N1/2 section 2 T3S R6W
Marshall, MI 49068

6. Transporter 1 Company Name: Valley City Env.
U.S. EPA ID Number: MID981956063

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Plummers Environmental Services Inc.
10075 Scdroc Industrial Dr. SW
U.S. EPA ID Number: MIK111229563
Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Water (Not Regulated by USDOT or EPA)	001	TT	10,000	G	029L
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.) Non Hazardous 800-878-3996

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: On behalf of Enbridge Alison Schaff Energy, Limited Partnership
Signature:
Month: 10 Day: 29 Year: 12

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Christopher Greiling
Signature:
Month: 10 Day: 29 Year: 12

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name:
Signature:
Month: Day: Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Appendix F

Waste Disposal

Non-Hazardous Waste Manifests

Prepared for U.S. EPA and MDEQ

Enbridge Energy, Limited Partnership

Submitted: December 21, 2012

MANIFEST NUMBER
697008

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: EY

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068

d. Address:
BOX #: 2066

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont Media + Debris

Color:
Odor: *Curtain 1.95 tn

h. Special Waste Approval Number: ~~5007-11-0208~~ ANS ~~PO# 21-708~~ ANS 5007 1013039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	- METAL DRUM
DP	- PLASTIC DRUM
DF	- FIBER DRUM
BG	- BAG
TR	- TRUCK
OT	- OTHER
UNITS	
P	- POUNDS
Y	- CUBIC YARDS
T	- TONS
O	- OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
11 20 12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City
b. Address: 1040 Market St
Grand Rapids MI
c. Driver Name: Mark Emmons
d. Phone No. [redacted] Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222518

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] — Authorized Agent Name
[signature] — Signature
11 20 12 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697008

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: EY

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address:
BOX #: 2066

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont Media + Debris

Color:
Odor: *Curtain 1.95 tn

h. Special Waste Approval Number: ~~5007-11-0203~~ ANS ~~PO# 21-0708~~ ANS 5007 1013039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE		
DM	-	METAL DRUM
DP	-	PLASTIC DRUM
DF	-	FIBER DRUM
BG	-	BAG
TR	-	TRUCK
OT	-	OTHER
UNITS		
P	-	POUNDS
Y	-	CUBIC YARDS
T	-	TONS
O	-	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
11 2012 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City
b. Address: 1040 Market St
Grand Rapids MI
c. Driver Name: Mark Emmons
d. Phone No [redacted] Truck No.: 72
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 220518

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Amy Beattie — Authorized Agent Name
[signature] — Signature
11 2012 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011382

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
16	222518	

WEIGHTMASTER: AMY B

DATE IN	TIME IN
29 November 2012	8:48 am

DATE OUT	TIME OUT
29 November 2012	8:48 am

VEHICLE	ROLL OFF
VAL92T250	

REFERENCE	ORIGIN
697008	CALHOUN

00 Gross Weight 37,780.00 lb
Stored Tare Weight 33,880.00 lb Inbound - TICKET
Net Weight 3,900.00 lb 1.95 TN

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
1.95	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE _____

RS-F04

MANIFEST NUMBER
697009

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address:
BOX #: 2021

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont Media + Debris

Color:
Odor: * Boom 2.14 tn

h. Special Waste Approval Number: ~~5007 11 0202~~ ANS ~~PO# 21-4-02~~ ANS 5007 10 13039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
1 1 2 0 1 2 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley city
b. Address: 1040 Market St
Grand Rapids MI
c. Driver Name: Mark Emmons
d. Phone No. [redacted] e. Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] Driver Signature — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature — Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222559

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Amy Beatty — Authorized Agent Name
[signature] — Signature
1 1 2 0 1 2 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697009

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address:
BOX #: 2021

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont Media + Debris
Color:
Odor: * Boom 2.14 in

h. Special Waste Approval Number: ~~5007 11 0202~~ ANS ~~FOR 21 4 08~~ ANS 5007 10 13039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Atison Schoeff — Generator Authorized Agent Name
[signature] — Signature
11 20 12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley city
b. Address: 1040 Market St
Grand Rapids MI
c. Driver Name: Mark Emmons
d. Phone No.: [redacted] e. Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] Driver Signature — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature — Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222559

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] Authorized Agent Name — [signature] Signature — 11 20 12 Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011423

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
16	222559	

WEIGHMASTER	
AMY B	
DATE IN 20 November 2012	TIME IN 11:07 am
DATE OUT 20 November 2012	TIME OUT 11:07 am
VEHICLE VAL92T250	ROLL OFF
REFERENCE 697009	ORIGIN CALHOUN

Gross Weight 38,760.00 lb
Stored Tare Weight 33,880.00 lb
Net Weight 4,880.00 lb 2.44 TN

Inbound - TICKET

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
2.44	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE

RS-F04

MANIFEST NUMBER
697010

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY

b. Generator Location: I4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068

d. Address: BOX # 7013

e. Phone No.: 218-269-0591

f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont Media + Debris

Color:

Odor:

1.23 tn

h. Special Waste Approval Number: ~~5007 11 0003~~ ANS ~~R04 11 00~~ ANS 5007 10 13039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	T	25	Y

TYPE	
DM	- METAL DRUM
DP	- PLASTIC DRUM
DF	- FIBER DRUM
BG	- BAG
TR	- TRUCK
OT	- OTHER

UNITS	
P	- POUNDS
Y	- CUBIC YARDS
T	- TONS
O	- OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name

Signature

Shipment Date: 11/26/12

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City

b. Address: 1040 Market St
Grand Rapids MI

c. Driver Name: Mark Emmons

d. Phone N[redacted] Truck No.: 92

f. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

g. Driver Signature

Shipment Date

TRANSPORTER 2

h. Name:

i. Address:

j. Driver Name:

k. Phone No.: l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

n. Driver Signature

Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL

b. Phone No.: 269-781-9742

c. Physical Address: 14300 P. DRIVE NORTH
MARSHALL, MI 49068

d. Mailing Address:

e. TICKET No.: 222645

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Authorized Agent Name

Signature

Shipment Date: 11/26/12

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697010

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: BOX #: 2113

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont Media + Debris

Color:
Odor: 1.23 tn

h. Special Waste Approval Number: ~~5007 11 0203~~ ANS ~~PO# 210708~~ ANS 5007 10 13039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
[illegible]	I	—	Y

TYPE		
DM	-	METAL DRUM
DP	-	PLASTIC DRUM
DF	-	FIBER DRUM
BG	-	BAG
TR	-	TRUCK
OT	-	OTHER
UNITS		
P	-	POUNDS
Y	-	CUBIC YARDS
T	-	TONS
O	-	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
11 20 12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City
b. Address: 1040 Market St
Grand Rapids MI
c. Driver Name: Mark Emmons
d. Phone No [redacted] Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222645

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] — Authorized Agent Name
[signature] — Signature
11 20 12 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011510

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL MI
49068
000726
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
16	222645	

WEIGHTMASTER: AMY B

DATE IN	TIME IN
20 November 2012	3:22 pm

DATE OUT	TIME OUT
20 November 2012	3:22 pm

VEHICLE	ROLL OFF
VAL92T250	

REFERENCE	ORIGIN
697010	CALHOUN

00 Gross Weight 36,340.00 lb
Stored Tare Weight 33,880.00 lb Inbound - TICKET
Net Weight 2,460.00 lb 1.23 TN

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
1.23	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE _____

RS-F04

MANIFEST NUMBER
697011

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: F4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: BOX # 2066

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude oil Cont Media + Debris + Brom

Color:
Odor: 1.65 ft

h. Special Waste Approval Number: ~~5007-11-0203~~ ANS ~~PO# 21-08~~ ANS 5007 1013039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1	TRANSPORTER 2
a. Name: Valley City	h. Name:
b. Address: 1040 Market St Grand Rapids MI	i. Address:
c. Driver Name: Mark Emmons	j. Driver Name:
d. Phone No. [redacted] e. Truck No.: 92	k. Phone No.: l. Truck No.:
f. Vehicle License No./State:	m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.	Acknowledgement of Receipt of Materials Described Above.
g. [signature] Driver Signature — Shipment Date	n. Driver Signature — Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742

c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222598

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] Authorized Agent Name — [signature] Signature — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697011

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY

b. Generator Location:

c. Address: 1601 PRATT AVE.

MARSHALL, MI 49068

d. Address: BOX

e. Phone No.: 219-269-0891

f. Phone No.: LOC

g. Waste Common Name: SOIL FROM PIPELINE RELEASE — Crude oil Cont Media + Debris

Color:

Odor:

h. Special Waste Approval Number: 5007 1013039

i. Customer Account Number:

On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
1	CI	25	Y

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoff — Generator Authorized Agent Name

Signature

Shipment Date

TYPE	
DM	- METAL DRUM
DP	- PLASTIC DRUM
DF	- FIBER DRUM
BG	- BAG
TR	- TRUCK
OT	- OTHER
UNITS	
P	- POUNDS
Y	- CUBIC YARDS
T	- TONS
O	- OTHER

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City

b. Address: 1040 Market St

Grand Rapids MI

c. Driver Name: [redacted]

d. Phone N[redacted] e. Truck No.: 92

f. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

g. Driver Signature — Shipment Date

TRANSPORTER 2

h. Name:

i. Address:

j. Driver Name:

k. Phone No.: l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

n. Driver Signature — Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL

b. Phone No.: 269-781-9742

c. Physical Address: 14800 P. DRIVE NORTH

MARSHALL, MI 49068

d. Mailing Address:

e. TICKET No.: 222598

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Authorized Agent Name — Signature — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011462

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
16	922598	

WEIGHTMASTER: AMY B

DATE IN	TIME IN
20 November 2012	1:21 pm

DATE OUT	TIME OUT
20 November 2012	1:21 pm

VEHICLE	ROLL OFF
VHL92T250	

REFERENCE	ORIGIN
697011	CALHOUN

Gross Weight 37,180.00 lb
Stored Tare Weight 33,880.00 lb Inbound - TICKET
Net Weight 3,300.00 lb 1.65 TN

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
1.65	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE _____

RS-F04

MANIFEST NUMBER
697032

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY b. Generator Location: CO. 1

c. Address: 1601 PRATT AVE. d. Address: BOX # 2015

MARSHALL, MI 49068

e. Phone No.: 218-269-0591 f. Phone No.: LOC:

g. Waste Common Name: ANS ~~SOIL FROM PIPELINE RELEASE~~ Crude Oil Cont. Media + Debris/Vegetation

Color: Odor: 1.98TN

h. Special Waste Approval Number: ANS 5002-LL0203 ANS ~~PDN-Eb0708~~ 5007 10 13039

i. Customer Account Number:

On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	- METAL DRUM
DP	- PLASTIC DRUM
DF	- FIBER DRUM
BG	- BAG
TR	- TRUCK
OT	- OTHER

UNITS	
P	- POUNDS
Y	- CUBIC YARDS
T	- TONS
O	- OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name

Signature

Shipment Date: 10/31/12

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley city

b. Address: 1040 Market St Grand Rapids MN

c. Driver Name: Mark Emmons

d. Phone No.: [redacted] e. Truck No.: 92

f. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

g. Mark Emmons — Driver Signature

Shipment Date: 10/31/12

TRANSPORTER 2

h. Name:

i. Address:

j. Driver Name:

k. Phone No.: l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

n. Driver Signature

Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL b. Phone No.: 269-781-9742

c. Physical Address: 14300 P. DRIVE NORTH d. Mailing Address:

MARSHALL, MI 49068

e. TICKET No.: 220443

I hereby certify that the material described above has been accepted for disposal at this facility.

f. DEB BOUGHTON — Authorized Agent Name

Signature

Shipment Date: 10/31/12

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697032

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location:

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address:
BOX #: 2015

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~3601 FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media + Debris/Vegetation

Color:
Odor: 1:98TN

h. Special Waste Approval Number: ~~5007 11 0203~~ ANS ~~PO# 210708~~ ANS 5007 10 13 039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE		
DM	-	METAL DRUM
DP	-	PLASTIC DRUM
DF	-	FIBER DRUM
BG	-	BAG
TR	-	TRUCK
OT	-	OTHER
UNITS		
P	-	POUNDS
Y	-	CUBIC YARDS
T	-	TONS
O	-	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff
Generator Authorized Agent Name
Signature
Shipment Date 1 0 3 1 1 2

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley city
b. Address: 1040 Market St
Grand Rapids MI
c. Driver Name: Mark Emmons
d. Phone No. [redacted]
e. Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. Driver Signature
Shipment Date 1 0 3 1 1 2

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:
e. TICKET No.: 220443

I hereby certify that the material described above has been accepted for disposal at this facility.

f. DEB BOUGHTON
Authorized Agent Name
Signature
Shipment Date 1 0 3 1 1 2

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00015297

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL, MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
6	220443	

WEIGHMASTER	
AMY B	
DATE IN October 2012	TIME IN 2:02 pm
DATE OUT October 2012	TIME OUT 2:02 pm
VEHICLE 92T250	ROLL OFF
REFERENCE 697032	ORIGIN CALHOUN

Gross Weight 37,720.00 lb
Stored Tare Weight 33,760.00 lb
Net Weight 3,960.00 lb 1.98 TN

Inbound - TICKET

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
1.98	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE

RS-F04

MANIFEST NUMBER
697033

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY

b. Generator Location: FTC

c. Address: 1601 PRATT AVE.

MARSHALL, MI 49068

d. Address:

BOX #: 2020

e. Phone No.: 219-269-0691

f. Phone No.: LOC:

g. Waste Common Name: ANS ~~SOIL FROM PIPELINE RELEASE~~ Crude Oil Cont. Media + Debris/Vegetation

Color:

Odor:

h. Special Waste Approval Number: ANS ~~[illegible]~~ ANS ~~[illegible]~~ 5007 1013039 697m

i. Customer Account Number:

On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	J. Containers Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE		
DM	-	METAL DRUM
DP	-	PLASTIC DRUM
DF	-	FIBER DRUM
BG	-	BAG
TR	-	TRUCK
OT	-	OTHER

UNITS		
P	-	POUNDS
Y	-	CUBIC YARDS
T	-	TONS
O	-	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name

Signature

Shipment Date: 1 1 0 7 1 2

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Envil.

b. Address: 6852 Quality Way

Portage MI 49024

c. Driver Name: Arnulfo Perez

d. Phone No: [redacted] e. Truck No.: #92

f. Vehicle License No./State: AC44568

Acknowledgement of Receipt of Materials Described Above.

g. Driver Signature — Shipment Date: 1 1 0 7 1 2

TRANSPORTER 2

h. Name:

i. Address:

j. Driver Name:

k. Phone No.: l. Truck No.:

m. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

n. Driver Signature — Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL

b. Phone No.: 269-781-9742

c. Physical Address: 14300 P. DRIVE NORTH

MARSHALL, MI 49068

d. Mailing Address:

e. TICKET No.: 221138

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [illegible] — Authorized Agent Name

Signature

Shipment Date: 1 1 0 7 1 2

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697033

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: FTC

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068

d. Address: BOX #: ~~[illegible]~~ 2020

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media + Debris/Vegetation

Color:
Odor:

h. Special Waste Approval Number: ~~5007 11 0203~~ ANS ~~PO# 21-[illegible]~~ ANS 5007 1013039 6.97m

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
11 07 12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Envir.
b. Address: 6850 Quality Way
Portage MI 49024
c. Driver Name: Manuel Perez
d. Phone No. [redacted] e. Truck No.: #92
f. Vehicle License No./State: AC44562
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
11 07 12 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 221138

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] — Authorized Agent Name
[signature] — Signature
11 07 12 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00015997

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
420 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
Y6	221138	

WEIGHMASTER
AMY B

DATE IN	TIME IN
7 November 2012	9:19 am

DATE OUT	TIME OUT
7 November 2012	9:19 am

VEHICLE	ROLL OFF
VAL22T300	

REFERENCE	ORIGIN
497033	CALHOUN

Gross Weight 46,080.00 lb
Stored Tare Weight 32,140.00 lb Inbound = TICKET
Net Weight 13,940.00 lb 6.97 TN

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
6.97	TN	SW-CONT SOIL				
		Manifest#				

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

THANK YOU ! HAVE A GREAT DAY !
HOURS
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

REPUBLIC SERVICES, INC.

SIGNATURE

REV 06/12

RS-F04

MANIFEST NUMBER
697110

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068

d. Address: BOX ~~#~~ 2021

e. Phone No.: 218-269-0591
f. Phone No.: LOC

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media + Debris
* Curtain 2.19 tn

Color:
Odor:

h. Special Waste Approval Number: ~~5007-11-0202~~ ANS ~~FOR 216708~~ ANS 50071013039

i. Customer Account Number:
~~Enbridge Energy~~ ANS On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER

UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
111912 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Environmental Ser.
b. Address: 6850 Quality Way
Portage Mi 49024
c. Driver Name: Arnulfo Perez
d. Phone No. [redacted] e. Truck No.: 92
f. Vehicle License No./State: AC44568 Mi.
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
111912 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742

c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068

d. Mailing Address:

e. TICKET No.: 222374

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] — Authorized Agent Name
[signature] — Signature
111912 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697110

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: BOX ~~#~~ 2021

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media / Debris
* Contain 2,19 lm

Color:
Odor:

h. Special Waste Approval Number: ~~5007-11-0203~~ ANS ~~PO# 216908~~ ANS 5007 1013039

i. Customer Account Number: ~~Enbridge Energy~~ ANS On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
111912 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Environmental Ser.
b. Address: 6850 Quality Way
Portage Mi 49024
c. Driver Name: Arnulfo Perez
d. Phone No: [redacted]
e. Truck No.: 92
f. Vehicle License No./State: AC44568 Mi.
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
111912 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. — Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222374

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] — Authorized Agent Name
[signature] — Signature
111912 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011238

C&C LANDFILL
14800 P DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 500710130S7

SITE	TICKET	GRID
16	522374	

WEIGHMASTER: AMY B

DATE IN	TIME IN
19 November 2012	8:18 am

DATE OUT	TIME OUT
19 November 2012	8:45 am

VEHICLE	ROLL OFF
VAL92T250	

REFERENCE	ORIGIN
497110	CALHOUN

00 Gross Weight 38,260.00 lb
Tare Weight 33,880.00 lb Inbound - TICKET
Net Weight 4,380.00 lb 2.19 TN

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
2.19	TN	SW-CONT SOIL				
		Manifest:				

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE

RS-F04

MANIFEST NUMBER
697120

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: BOX #: 2013

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media + Debris * Curtain

Color:
Odor:

2.62 tn

h. Special Waste Approval Number: ~~5007-11-0203~~ ANS ~~PO# 216708~~ ANS 5007 10/3039

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER

UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
11/19/12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Environmental Serv.
b. Address: 6850 Quality Way
Portage Mi 49024
c. Driver Name: Arnulfo Perez
d. Phone No. [redacted]
e. Truck No.: 92
f. Vehicle License No./State: AC 44568 Mi.
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
11/19/12 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222392

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Amy Beatler — Authorized Agent Name
[signature] — Signature
11/19/12 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697120

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: E4

c. Address: 1601 PRATT AVE. MARSHALL, MI 49068
d. Address: BOX # 2013

e. Phone No.: 218-269-0591
f. Phone No.: LOC

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media + Debris * Curtain

Color:
Odor:

h. Special Waste Approval Number: ~~9007 11 0203~~ ANS ~~PO# 21-08~~ 500710/3039

i. Customer Account Number: On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
Signature
Shipment Date: 11/19/12

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Environmental Service
b. Address: 1850 Quality Way Portage Mi 49024
c. Driver Name: Arnulfo Perez
d. Phone No.: 616-928-8684
e. Truck No.: 92
f. Vehicle License No./State: AC 44568 Mi.
Acknowledgement of Receipt of Materials Described Above.
g. Driver Signature
Shipment Date: 11/19/12

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742

c. Physical Address: 14800 P. DRIVE NORTH MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222392

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Amy Beallen — Authorized Agent Name
Signature
Shipment Date: 11/19/12

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011256

C&C LANDFILL
14300 F DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
16	222392	

WEIGHTMASTER: AMY P

DATE IN	TIME IN
19 November 2012	10:17 am

DATE OUT	TIME OUT
19 November 2012	10:17 am

VEHICLE	ROLL OFF
VAL92T250	

REFERENCE	ORIGIN
697120	CALHOUN

Gross Weight 39,120.00 lb
Stored Tare Weight 33,860.00 lb Inbound - TICKET
Net Weight 5,240.00 lb 2.62 TN

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
2.62	TN	SW-CONT SOIL				
		Manifest:				

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

THANK YOU ! HAVE A GREAT DAY !
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE _____

RS-F04

MANIFEST NUMBER
697185

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: FTC

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068

d. Address: BOX # 2053

e. Phone No.: 218-269-0591
f. Phone No.: LOC

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ MSW

Color:
Odor:

h. Special Waste Approval Number: ~~5007 11 0208~~ 5007 101 3037 PO# 216908 591 tr

i. Customer Account Number: On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
103112 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Mark
b. Address: 1040 market st
Grand Rapids MT
c. Driver Name: Mark Emmons
d. Phone No.: [redacted] e. Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
103112 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:
e. TICKET No.: 220397

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Jimy Beatter — Authorized Agent Name
[signature] — Signature
103112 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
697185

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY COMPANY
b. Generator Location: [illegible]

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: BOX # 2053

e. Phone No.: 218-269-0591
f. Phone No.: LOC:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ MSW

Color:
Odor:

h. Special Waste Approval Number: ~~5007-11-0203~~ PO# 216908 591 [illegible]

i. Customer Account Number: On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
10 31 12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City
b. Address: 1040 Market St
Grand Rapids MT
c. Driver Name: Mark Emmons
d. Phone No. [redacted] Truck No.: 92
f. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
10 31 12 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 270397

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Jimy Bolton — Authorized Agent Name
[signature] — Signature
10 31 12 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00015251

C&C LANDFILL
14300 F DRIVE NORTH
MARSHALL MI
49068
000736
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013009

SITE	TICKET	GRID
AMY E	WEIGHTMASTER	
DATE IN 10 October 2012		TIME IN 1:31 am
DATE OUT October 2012		TIME OUT 1:31 am
VEHICLE		ROLL OFF
REFERENCE	ORIGIN	
	CALHOUN	

Gross Weight 43,960.00 lb
Stored Tare Weight 32,340.00 lb
Net Weight 11,620.00 lb 5.91 TN

Inbound - TICKET

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
5.91	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY !
HOURS
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

SIGNATURE

REV 06/12

RS-F04

MANIFEST NUMBER
706133

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY LTD PTNRSHIP
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: 2066

e. Phone No.: 319-269-0591
f. Phone No.:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude Oil Cont. Media + Debris

Color:
Odor:

h. Special Waste Approval Number: ~~5007 11 0008~~ ANS 5007 10 13039 1.99 tn

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	- METAL DRUM
DP	- PLASTIC DRUM
DF	- FIBER DRUM
BG	- BAG
TR	- TRUCK
OT	- OTHER
UNITS	
P	- POUNDS
Y	- CUBIC YARDS
T	- TONS
O	- OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
[signature] — Signature
1 1 2 1 1 2 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Envir.
b. Address: 6850 Quality Way
Portage Mi 49024
c. Driver Name: Arnulfo Perez
d. Phone No.: [redacted] e. Truck No.: 92
f. Vehicle License No./State: AC 44568 Mi
Acknowledgement of Receipt of Materials Described Above.
g. [signature] — Driver Signature
1 1 2 1 1 2 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 222703

I hereby certify that the material described above has been accepted for disposal at this facility.

f. [signature] — Authorized Agent Name
[signature] — Signature
1 1 2 1 1 2 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
706133

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY LTD PTNRSHP
b. Generator Location: EM

c. Address: 1601 PRATT AVE.
d. Address: 2066

MARSHALL, MI 49068

e. Phone No.: 219-269-0891
f. Phone No.:

g. Waste Common Name: SOIL FROM PIPELINE RELEASE (AND) Crude oil Cont. Media / Debris

Color:
Odor:

h. Special Waste Approval Number: 5007 10 13039 1,997

i. Customer Account Number:

On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	J. Containers Type	K. Total Quantity	L. Unit Wt/Vol
01	07	25	Y

TYPE		
DM	-	METAL DRUM
DP	-	PLASTIC DRUM
DF	-	FIBER DRUM
BG	-	BAG
TR	-	TRUCK
OT	-	OTHER
UNITS		
P	-	POUNDS
Y	-	CUBIC YARDS
T	-	TONS
O	-	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Shoaff — Generator Authorized Agent Name
Signature
1 1 2 1 1 2 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Envr.
b. Address: 6850 Quality Way
Portage MI. 49024
c. Driver Name: Arnulfo Perez
d. Phone No.: [redacted]
e. Truck No.: 92
f. Vehicle License No./State: AC 44568 M.

Acknowledgement of Receipt of Materials Described Above.

g. Driver Signature
1 1 2 1 1 2 — Shipment Date

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:

Acknowledgement of Receipt of Materials Described Above.

n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: CRC LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.: 722703

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Authorized Agent Name
Signature
1 1 9 1 1 9 — Shipment Date

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011568

C&C LANDFILL
14800 P DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 50071013039

SITE	TICKET	GRID
76	222703	

WEIGHMASTER	
AMY B	
DATE IN 21 November 2012	TIME IN 10:36 am
DATE OUT 21 November 2012	TIME OUT 10:36 am
VEHICLE VAL92T250	ROLL OFF
REFERENCE 706133	ORIGIN CALHOUN

00 Gross Weight 37,860.00 lb
Stored Tare Weight 33,880.00 lb
Net Weight 3,980.00 lb 1.99 TN

Inbound - TICKET

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
1.99	TN	SW-CONT SOIL				
		Manifest:				

THANK YOU ! HAVE A GREAT DAY T
****** HOURS ******
MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE

RS-F04

MANIFEST NUMBER
706134

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY LTD PTNRSHIP
b. Generator Location: E4

c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. ~~Address:~~ Buy #: 2013

e. Phone No.: 218-269-0591
f. Phone No.:

g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude oil Cont. Media + Debris

Color:
Odor: * Boom

h. Special Waste Approval Number: ~~5007-11-0033~~ ANS 5007 10 13039

2.54 tn

i. Customer Account Number:
On behalf of Enbridge Energy, Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE	
DM	METAL DRUM
DP	PLASTIC DRUM
DF	FIBER DRUM
BG	BAG
TR	TRUCK
OT	OTHER
UNITS	
P	POUNDS
Y	CUBIC YARDS
T	TONS
O	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
Signature
11 21 12 — Shipment Date

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Environ.
b. Address: 6850 Quality Way
Portage Mi. 49024
c. Driver Name: Arnulfo Perez
d. Phone No. [redacted] e. Truck No.: 92
f. Vehicle License No./State: AC 44568 Mi.
Acknowledgement of Receipt of Materials Described Above.
g. Driver Signature — Shipment Date 11 21 12

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.: l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature — Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:

e. TICKET No.:

222750

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Authorized Agent Name — Signature — Shipment Date 11 21 12

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

MANIFEST NUMBER
706134

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Directions: Print or type all information except where signature is required.
Make sure information is transmitted on all copies.

GENERATOR INFORMATION

a. Generator Name: ENBRIDGE ENERGY LTD PTNRSHIP
b. Generator Location: E4
c. Address: 1601 PRATT AVE.
MARSHALL, MI 49068
d. Address: Box # 2013
e. Phone No.: 218-269-0591
f. Phone No.:
g. Waste Common Name: ~~SOIL FROM PIPELINE RELEASE~~ ANS Crude oil Cont. Media + Debris
Color:
Odor: * Boom
h. Special Waste Approval Number: ~~5007-11-0000~~ ANS 5007 10 13039
i. Customer Account Number:
On behalf of Enbridge Energy Limited Partnership

J. Containers No.	Type	K. Total Quantity	L. Unit Wt/Vol
01	OT	25	Y

TYPE		
DM	-	METAL DRUM
DP	-	PLASTIC DRUM
DF	-	FIBER DRUM
BG	-	BAG
TR	-	TRUCK
OT	-	OTHER
UNITS		
P	-	POUNDS
Y	-	CUBIC YARDS
T	-	TONS
O	-	OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above mentioned material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law; has been properly classified and packaged, and is in proper condition for transportation according to applicable regulations.

Alison Schoeff — Generator Authorized Agent Name
Signature
Shipment Date: 1 1 2 1 1 2

TRANSPORTER INFORMATION

TRANSPORTER 1

a. Name: Valley City Environ.
b. Address: 6850 Quality Way
Portage MI 49024
c. Driver Name: Arnulfo Perez
d. Phone No. [redacted]
e. Truck No.: 92
f. Vehicle License No./State: AC 4562 MI
Acknowledgement of Receipt of Materials Described Above.
g. Driver Signature
Shipment Date: 1 1 2 1 1 2

TRANSPORTER 2

h. Name:
i. Address:
j. Driver Name:
k. Phone No.:
l. Truck No.:
m. Vehicle License No./State:
Acknowledgement of Receipt of Materials Described Above.
n. Driver Signature
Shipment Date

DISPOSAL FACILITY INFORMATION

a. Site Name: C&C LANDFILL
b. Phone No.: 269-781-9742
c. Physical Address: 14800 P. DRIVE NORTH
MARSHALL, MI 49068
d. Mailing Address:
e. TICKET No.: 622750

I hereby certify that the material described above has been accepted for disposal at this facility.

f. Authorized Agent Name
Signature
Shipment Date: 1 1 2 1 1 2

White - Disposal Facility Yellow - Transporter Copy Pink - Generator 2nd Copy Gold - Generator 1st Copy

00011615

C&C LANDFILL
14800 F DRIVE NORTH
MARSHALL MI
49068
000728
SET ENVIRONMENTAL INC
450 SUMAC ROAD
WHEELING, IL 60090

Contract: 500710130S9

SITE 16	TICKET 222750	GRID
AMY B	WEIGHMASTER	
DATE IN 12 November 2012		TIME IN 1:57 pm
DATE OUT November 2012		TIME OUT 1:57 pm
VEHICLE SAL92T250		ROLL OFF
REFERENCE 706134	ORIGIN CALHOUN	

00 Gross Weight 38,960.00 lb
Stored Tare Weight 33,880.00 lb
Net Weight 5,080.00 lb 2.54 TN

Inbound - TICKET

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
2.54	TN	SW-CONT SOIL				

Manifest:

THANK YOU ! HAVE A GREAT DAY !

HOURS

MONDAY THRU FRIDAY 7 TO 4:30
SATURDAY 7:00 TO NOON

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

REPUBLIC SERVICES, INC.

REV 06/12

SIGNATURE _____

RS-F04